

Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico

Report Prepared for

THEMAC Resources Group Ltd.



Report Prepared by



SRK Consulting (U.S.), Inc.
SRK Project Number 191000.03
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Executive Summary

SRK Consulting (SRK) has undertaken a predictive geochemical modeling exercise to assess future pit lake chemistry associated with the Copper Flat Project, New Mexico and to compare this to existing pit lake water quality. This work has been undertaken on behalf of New Mexico Copper Corporation (NMCC – a subsidiary of THEMAC Resources Group Ltd. [THEMAC]) to demonstrate compliance with New Mexico Mining Act regulations “Performance and Reclamation Standards for New Mining Operations” at 19.10.6.603 NMCA, applicable to the future pit water body, specifically that:

- The operations must be planned and conducted to minimize change in the hydrologic balance in both the permit and potentially affected areas; and
- Reclamation must result in a hydrologic balance similar to pre-mining conditions.

The work also forms part of the geochemical characterization study to assess the Acid Rock Drainage and Metal Leaching (ARDML) potential of the Project.

The Copper Flat Project is a porphyry copper-molybdenum deposit located on the western margin of the Rio Grande Rift. The deposit also contains minor, but potentially recoverable, gold and silver mineralization. The deposit is hosted by a quartz monzonite stock that intrudes a sequence of andesitic volcanic rocks.

Preliminary pit lake predictions for the Project were presented in the SRK December 2014 report entitled *‘Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico’*, which was presented to Regulatory authorities to generate discussion and input. A number of modifications and refinements have been made to the pit lake models since this report was submitted, including:

- Incorporation of the Feasibility Study geologic block model;
- Incorporation of the current open pit design, which is detailed in the 2017 Mine Operation and Reclamation Plan (2017 MORP pit);
- Refinement of the pit wall composition to include delineation of material types by primary lithology, oxidation and mineralized versus weakly-mineralized material;
- Refinement of humidity cell test (HCT) inputs to include separate source terms for major and trace elements, reflecting the different processes that control their release;
- Refinement of mineral equilibrium phases based on predicted chemistry;
- Refinement of the water balance to use a reduced annual evaporation rate of 50 inches and to include a separate runoff term for reclaimed areas in the pit and the open pit watershed;
- Revisions to the groundwater chemistry inputs; and
- Incorporation of pit management and reclamation measures; including rapid fill of the pit and reclamation of the pit haul road and other areas within the pit and the pit watershed.

The objective of the report is to provide an analysis that demonstrates that future pit lake water quality results in a water body with similar chemistry to that of pre-mining conditions upon implementation of the reclamation actions proposed by NMCC in its MORP and Reclamation Plan, including rapid-fill of the open pit after closure of the mine.

Geochemical predictions were developed for three scenarios, including: (i) a calibration model for the existing pit lake; (ii) a natural fill model for the future unreclaimed pit; and (iii) a rapid fill model for the future reclaimed pit. Rapid fill has been proposed as the water quality component of NMCC's reclamation strategy for the future pit lake. It will include filling the pit with 2,202 acre-feet of good quality water from the production water supply wells during the first six months of groundwater recovery and pit infilling.

This report describes the approach taken for the revised pit lake predictive modeling effort, details the assumptions made, and presents the results of the revised pit lake geochemical predictions.

Model Calibration

The results of the existing pit lake model show good calibration of constituents, demonstrating water quality can be predicted with a good degree of accuracy for the future pit lake. The baseline water quality data utilized in the calibration model are data for existing water quality chemistry in the pit lake between 2010 and 2013. This is a subset of the entire baseline data generated between 1998 and July 2017. The full data set was utilized in comparing existing water quality chemistry to projected future water quality of the pit lake in discussed in Sections 5 and 6.

Unreclaimed Fill Scenario

In the unreclaimed pit scenario, allowing the pit to fill naturally will result in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. In this scenario, the proposed future Copper Flat open pit is expected to be seasonally stratified but otherwise well-mixed, oxygenated and not acidic. Waters are predicted to be moderately alkaline (pH 7.9 – 8.2), primarily due to the buffering capacity of the inflowing groundwater. During the early stages of pit infilling (i.e., the first six months post-closure), removal/flushing of soluble salts from the pit walls is likely to result in a spike in boron, lead, mercury, manganese, molybdenum, nickel, selenium, vanadium, zinc and sulfate in the early pit lake. The effects of this initial flush will be dissipated by inflowing groundwater and precipitation, and pit lake chemistry will then evolve over time, with some parameters increasing in concentration as a result of evaporation effects. This is similar to the trends observed in the existing pit lake where elemental concentrations have increased since the start of pit infilling in response to evapoconcentration.

A comparison of predicted pit lake water chemistry for the unreclaimed fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that the concentrations of the majority of constituents are comparable to existing concentrations, and therefore water quality of the future pit lake is expected to be similar to existing pit lake water quality.

Reclaimed Fill Scenario

Rapidly refilling the pit with water from the water supply wells during the first six months post-closure will result in a better initial water quality within the pit lake due to the good quality of the water that will be used. The long-term result is that the effects of evapoconcentration are not as pronounced as the pit lake reaches hydrogeologic equilibrium, and predicted concentrations of many major ions and trace elements will remain lower than in the unreclaimed fill scenario. This is particularly the case for constituents such as boron, sulfate and chloride, which are strongly influenced by evaporation effects and are predicted to be much lower in concentration for the rapid fill scenario compared to the natural fill scenario. In addition, the rapid fill will also quickly submerge walls and benches within six months and thus limit the exposure of sulfide minerals to oxygen, which will reduce trace element release into the pit lake. By contrast, the unreclaimed fill scenario allows the pit to fill naturally and results in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. A comparison of predicted pit lake chemistry for the reclaimed pit rapid fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that concentrations of the majority of

predicted constituent concentrations are comparable to existing concentrations and therefore, water quality of the future pit lake is expected to be similar to existing pit lake water quality.

Conclusions

Based on the model results presented herein, the changes to the hydrologic balance of the future pit water body that will form post-mining will be nil or minimal and the water quality will be very similar to that of the existing pit lake. The existing pit lake at Copper Flat is an artificial water body created as a result of mineral extraction with little or limited ability to sustain aquatic life (Aquatic Consultants, Inc. 2014). The post-mining water body is anticipated to be similar to the existing pit lake and is not expected to be conducive to providing aquatic habitat or supporting fish life.

This geochemical modeling report demonstrates that the mine pit reclamation proposed for the Copper Flat mine that is outlined in Section 3.1.8 of this report meets the water quality similarity requirements of 19.10.6.603 NMAC.

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Appendix I: PHREEQC Output File (electronic)

Appendix J: Aquatic Consultants Inc. Biological Assessment of the Existing Copper Flat Pit Lake

1 Introduction

1.1 Purpose and Scope

SRK Consulting, Inc. (SRK) has undertaken a geochemical modeling assessment on behalf of New Mexico Copper Corporation (NMCC – a subsidiary of THEMAC Resources Group Ltd. [THEMAC]) to predict future pit lake chemistry associated with the Copper Flat Project (the Project), New Mexico. The purpose of the assessment is to evaluate the future environmental impacts of the Project as required by the New Mexico Mining Act and State environmental regulations. The work forms part of the geochemical characterization study to assess the Acid Rock Drainage and Metal Leaching (ARDML) potential of the Project.

Preliminary pit lake model results were presented in the December 18, 2014 report entitled '*Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico*' (SRK, 2014a). The purpose of this preliminary report was to outline the methodology for the pit lake modeling in order to seek feedback from the agencies, and to present the initial results of the pit lake modeling. Since this preliminary report was submitted, a number of modifications and refinements have been made to the pit lake models, including:

- Incorporation of the Feasibility Study geologic block model;
- Incorporation of the current open pit design, which is detailed in the 2017 Mine Operation and Reclamation Plan (2017 MORP pit);
- Refinement of the pit wall composition to include delineation of material types by primary lithology, oxidation and mineralized versus non-mineralized material;
- Refinement of humidity cell test (HCT) inputs to include separate source terms for major and trace elements, reflecting the different processes that control their release;
- Refinement of mineral equilibrium phases based on predicted chemistry;
- Refinement of the water balance to use a reduced annual evaporation rate of 50 inches and to include a separate runoff term for reclaimed areas in the pit and the open pit watershed;
- Revisions to the groundwater chemistry inputs; and
- Incorporation of pit reclamation measures, including rapid fill of the pit and reclamation of the pit haul road and other areas within the pit and the pit watershed.

This final report describes the approach taken for the revised pit lake predictive modeling effort, details the assumptions made, and presents the final results of the revised pit lake geochemical predictions.

Applicable standards to the post-mining Copper Flat pit lake are contained in the New Mexico Mining and Minerals Division (MMD) regulations administered under the Mining Act. Specifically, the performance and reclamation standards require that reclamation must result in a hydrologic balance similar to pre-mining conditions. With respect to water quality in the pit lake, post mining water quality must be similar to baseline pre-mining water quality in the pit lake. The model results presented herein have been compared to pre-mining baseline water quality of the existing pit lake.

1.2 Background

The Copper Flat Project is a porphyry copper/molybdenum deposit located in the Hillsboro Mining District in South Central New Mexico, in Sierra County located approximately 150 miles south of Albuquerque, New Mexico and approximately 20 miles southwest of Truth or Consequences, New Mexico (straight-line distances). Access from Truth or Consequences is by 24 miles of paved highway and 3 miles of all-weather gravel road. The Copper Flat Project location is shown in Figure 1-1.

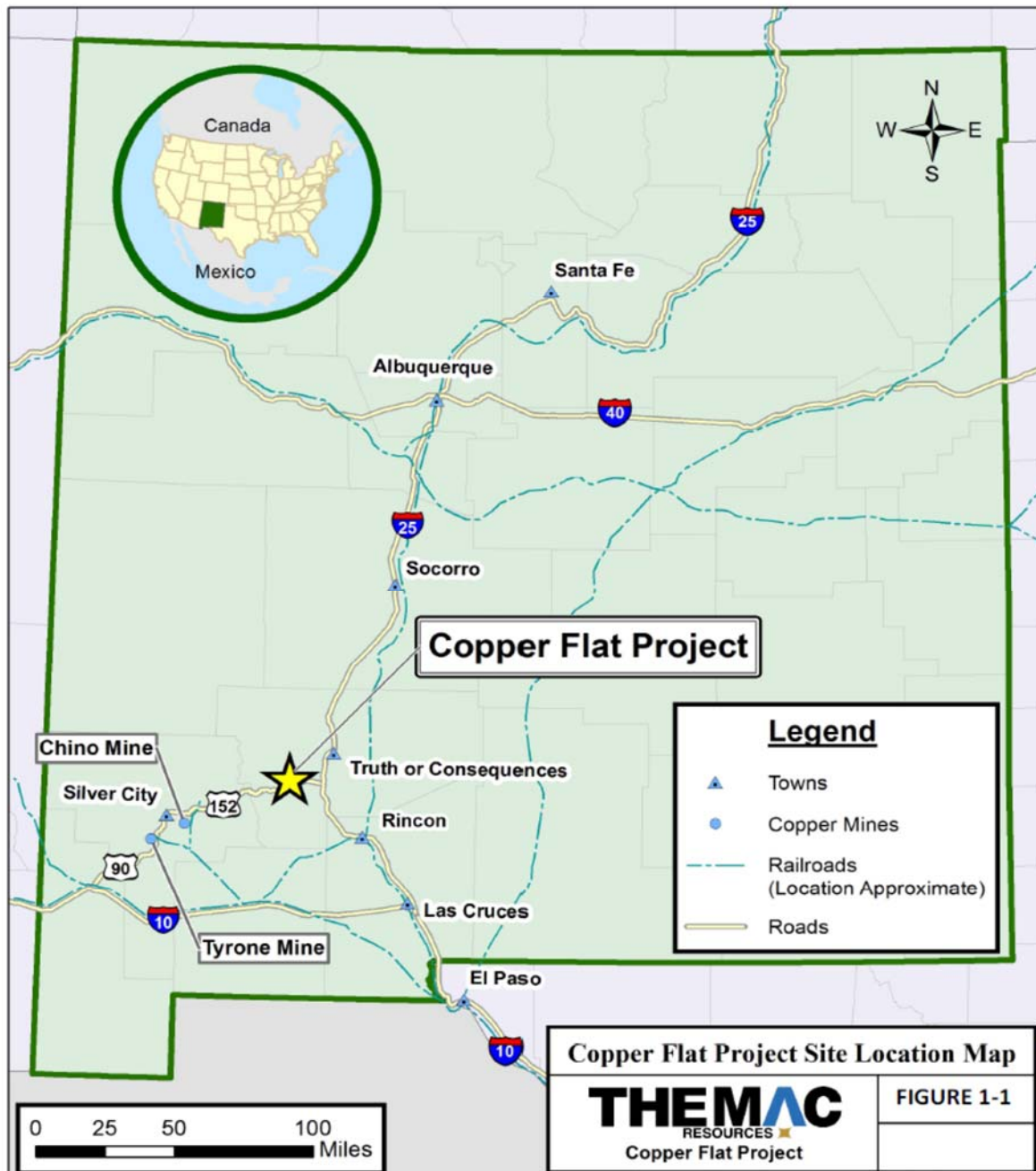


Figure 1-1: Project Location

1.2.1 Climate

The regional climate is high desert, and is generally hot with a July average of 76°F (record maximum 107°F), and January average of 39°F (record minimum 1°F). The area is generally dry with about 13 inches of average annual precipitation, which occurs mostly as rainfall during July to September.

Winters are cold and dry. Snowfall is possible from October through April, but more typically occurring between December and February. The average annual total is 8 inches of snowfall. Prevailing wind direction is predominantly from the west, and secondarily from the north, and averages 10 to 15 miles per hour. Wind speeds in excess of 50 mph may occur as major storms pass through the area.

1.2.2 Prior Mining Operations

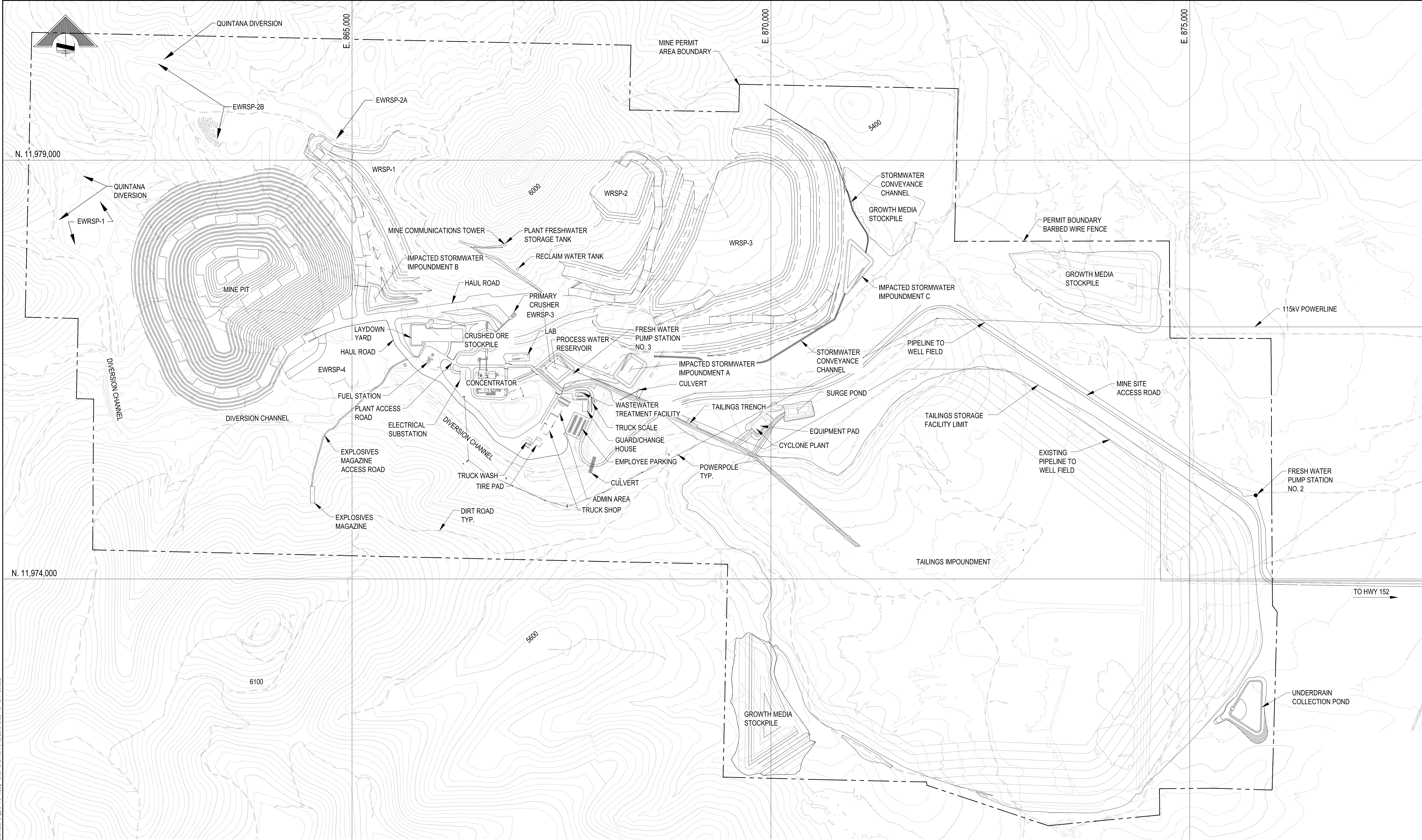
Mining activities in the Hillsboro Mining District began in the late-1800s. Gold was mined from shafts and adits at Copper Flat and from placer workings developed along drainages to the east and southwest of Black and Animas Peaks. Gold mining was further developed during the early 1900s and continued until World War II. Today, small scale placer mining continues. Copper exploration began in the 1950s and continued to the early 1980s, when Quintana Minerals Corporation defined 60 Mt of reserves sufficient to operate for a 11-year mine life at an extraction rate of 15,000 tons of ore per day (tpd). Operations included the development of the open pit, waste rock stockpiles, TSF and other mine disturbances observed today, but mining stopped after three months due to low metal prices. Mine buildings and equipment were dismantled in 1985; however structural foundations, power lines, water wells, and in-ground infrastructure were left in-place for a future restart. During the 1990s, plans to reopen the mine were considered. Existing surface disturbances and facilities in the Project area include the following:

- A pit with a small pit lake;
- Waste rock stockpiles (WRSP);
- A 115-kilovolt power line from the Caballo Substation to the mine site;
- Production wellfield and 20-inch pipeline from the wellfield to the mine site;
- A diversion channel collecting stormwater from west and south of the pit and diverting unimpacted flows down Grayback wash;
- A diversion channel collecting stormwater from north of the pit and diverting unimpacted flows to the east;
- Existing concrete foundations and structures including:
 - Primary crusher structure and stacking conveyor tunnel
 - Coarse ore reclaim tunnel
 - Concentrator building foundation
 - Truck shop foundation
 - Administration building foundation
 - Concentrate storage foundation
 - Mine office and change house foundation.
- Site grading and roads; and
- A tailings storage facility (TSF) containing approximately 1.4 Mt of tailings from the Quintana mining operation.

1.2.3 Mine Plan

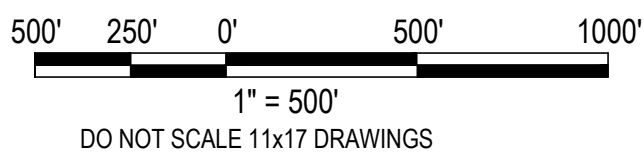
The proposed Project consists of an open pit mine, flotation mill, tailings storage facility, waste rock stockpiles and ancillary facilities. During the mine life, the proposed Project is expected to produce approximately 113 million tons of copper ore and 45 million tons of waste rock. Ore extraction will take place by conventional truck and loader methods using 25-foot high benches. Backfilling of the pit will not take place during or after mining.

Beneficiation will be achieved through the use of a conventional concentrator using standard crushing, grinding and flotation technologies. The operation is designed to recover copper, molybdenum, gold, and silver into separate copper and molybdenum concentrates. The nominal ore throughput rate is 30,000 tpd and an operational life of 11 to 12 years is currently projected. The proposed layout of the mine facilities is shown in Figure 1-2. The current pit configuration is modified from the pit design developed for the Copper Flat Feasibility Study (FS) published in November 2013 (M3, 2013) and matches the pit design presented in the 2017 MORP (THEMAC, 2017a).



EWRSP = EXISTING WASTE ROCK STOCKPILE
WRSP = WASTE ROCK STOCKPILE

SITE PLAN
SCALE: 1:500




PRELIMINARY
FOR AGENCY REVIEW



REFERENCES						REVISIONS						REVISIONS					
DWG. NO.	TITLE					NO.	DESCRIPTION	BY	APP'D	DATE	CLIENT	NO.	DESCRIPTION	BY	APP'D	DATE	CLIENT

SCALE:	1" = 500'	DATE:
DESIGNED BY:	SAM	DEC12
DRAWN BY:	SAM	DEC12
CHECKED BY:	TDL	JAN13
PROJECT MGR:	RKZ	
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DWG NO.
FIGURE 2-2

REV NO. P18

DATE 16 NOV 15

1.2.4 Geology and Mineralization

The following description of geology and mineralization is from the Copper Flat Feasibility Study (FS) published in November 2013 (M3, 2013). The Copper Flat Project is a porphyry copper-molybdenum deposit located on the western margin of the Rio Grande Rift. The deposit also contains recoverable, gold and silver. The deposit is hosted by a small quartz monzonite stock having a porphyritic texture that intrudes a sequence of andesitic volcanic rocks of similar age covering an area approximately 4 miles in diameter.

Regional Geology

The Copper Flat Project lies within the Mexican Highlands portion of the Basin and Range Physiographic Province. The Project is located in the Hillsboro Mining District in the Las Animas Hills, which are part of the Animas Uplift, a horst on the western edge of the Rio Grande valley. The Animas Uplift is separated from the Rio Grande by nearly 20 miles of Santa Fe Group alluvial sediments, referred to as the Palomas Basin of the Rio Grande valley. To the west of the Animas Uplift is the Warm Springs valley, a graben that parallels the Rio Grande valley. Further west, the Black Mountains form the backbone of the Continental Divide, rising to about 9,000 feet above sea level. The regional geology is discussed in more detail in the *Baseline Data Report for the Copper Flat Mine* (BDR) (INTERA, 2012). The focus of this report is on the local and Copper Flat ore body geology.

Basement rocks in the area consist of Precambrian granite and Paleozoic and Mesozoic sandstones, shales, limestones, and evaporites. Sedimentary units that crop out within the Animas Uplift include the Ordovician Montoya Limestone, the Silurian Fusselman Dolomite, and the Devonian Percha Shale. The Cretaceous-age Laramide orogeny, which was characterized by the intrusion of magma associated with the subduction of the Farallon plate beneath the North American plate, affected this region between 75 and 50 million years ago (Ma). Volcanic activity during the late Cretaceous and Tertiary periods resulted in localized flows, dikes, and intrusive bodies, some of which were associated with the development of the nearby Tertiary Emory and Good Sight-Cedar Hills calderas. Later basaltic flows resulted from the tectonic activity associated with the formation of the Rio Grande rift. Tertiary and Quaternary alluvial sediments of the Santa Fe Group and more recent valley fill overlie the older Paleozoic and Mesozoic units in the area.

Local Geology

The district geology described below is modified from McLemore et al. (2000) and Raugust (2003). The predominant geologic feature of the Hillsboro Mining District is the Cretaceous Copper Flat stratovolcano, a circular body of Cretaceous andesite that is 4 miles in diameter (Figure 1-3). The Hillsboro Mining District comprises the Las Animas Hills, a low range formed by the Animas Hills horst at the western edge of the Rio Grande Rift. Faults that bound the Animas Hills horst are related to the tectonic activity of the Miocene-age Rio Grande Rift (Dunn, 1982). Due to the difference in ages and in spite of its close proximity, there is no known connection between the Rio Grande rift and the Copper Flat volcanic/intrusive complex. The Copper Flat volcanic/intrusive complex has been interpreted as an eroded stratovolcano based on the presence of agglomerate and flow band textures in some of the andesite (Richards, 2003).

The Copper Flat Quartz Monzonite (CFQM) intrudes the core of the volcanic complex. The CFQM stock has a surface expression of approximately 0.4 mi² and has been dated by the argon-argon (⁴⁰Ar/³⁹Ar) techniques to be 74.93 ±0.66 million years old (McLemore et al., 2000). The surrounding andesite has also been dated using argon-argon techniques to be 75.4 ±3.5 million years old (McLemore et al., 2000).

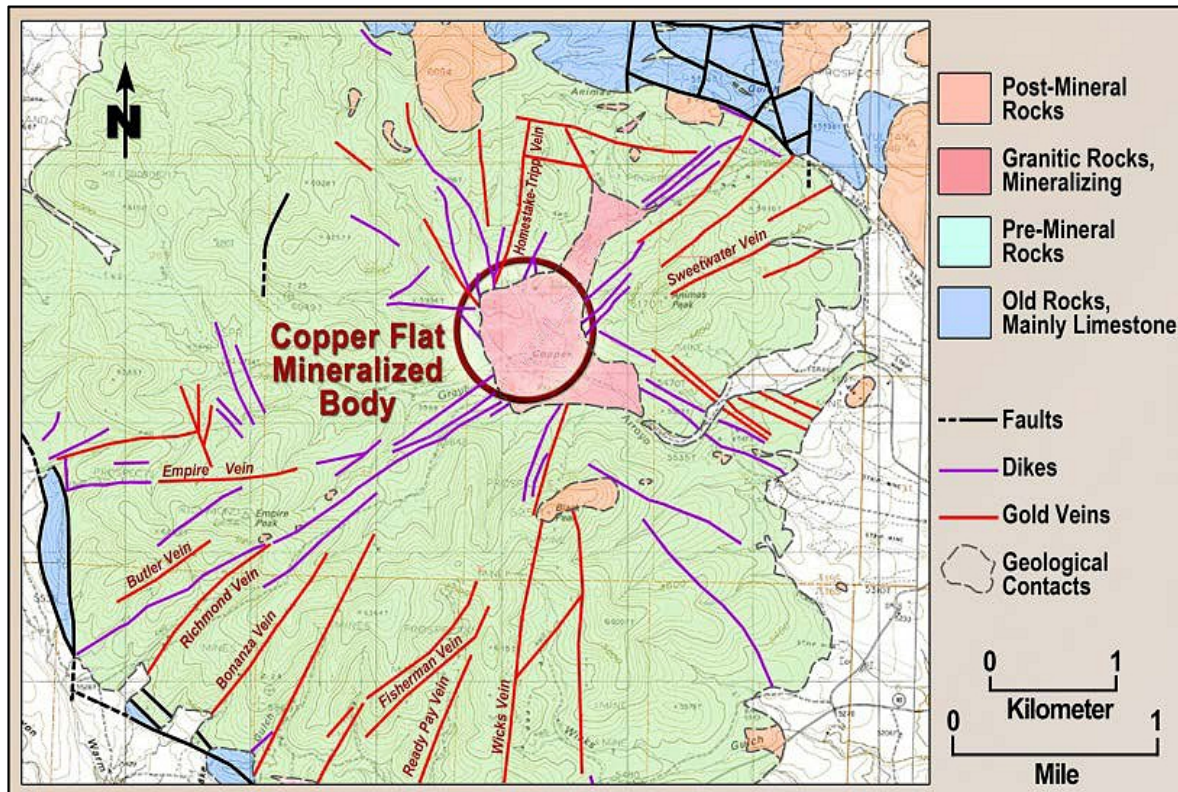


Figure 1-3: Geology of the Copper Flat Mine (Dunn, 1982)

Geology of the Copper Flat Orebody

The Copper Flat andesite is generally fine-grained with phenocrysts of plagioclase (andesine) and amphibole in a groundmass of plagioclase and potassium feldspar and rare quartz. Some agglomerates or flow breccias are locally present, but the andesite is generally massive. Magnetite is commonly associated with the mafic phenocrysts, and accessory apatite is commonly found.

Although the depth of erosion is uncertain, the center of the stratovolcano was eroded to form a topographic low. To the east of the site, this andesite body is in fault contact with Santa Fe Group sediments, which are at least 2,000 feet thick in the immediate Copper Flat area and thickening to the east. Near-vertical faults characterize the contacts on the remaining perimeter of the andesite body; these faults juxtapose the andesite with Paleozoic sedimentary rocks. Historical drill holes indicate the andesite is locally more than 3,000 feet thick. This feature, combined with the concentric fault pattern, indicate that the local geology represents a deeply eroded Cretaceous-age volcanic complex. A detailed geologic map of the Copper Flat orebody is provided in Figure 1-4 and a south-north geologic cross section through the Copper Flat orebody is provided in Figure 1-5.

Copper Flat Quartz Monzonite (CFQM) intrudes the core of the volcanic complex. Sulfide mineralization is present as veinlets and disseminations in the CFQM, but is most strongly developed in and adjacent to the west end of a steeply dipping breccia pipe that is centrally located within the CFQM stock and elongated in the northwest-southeast direction (Figure 1-5).

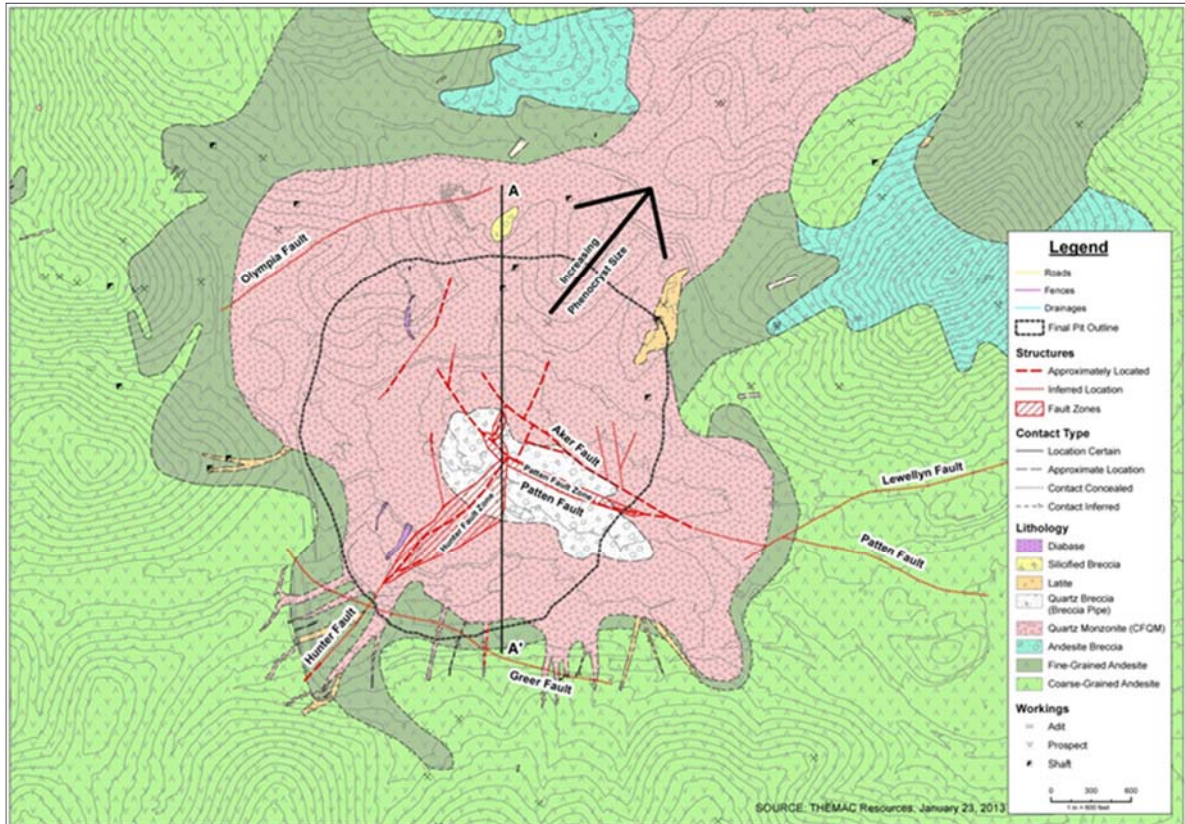


Figure 1-4: Detailed Geologic Map of the Copper Flat Orebody (M3, 2013)

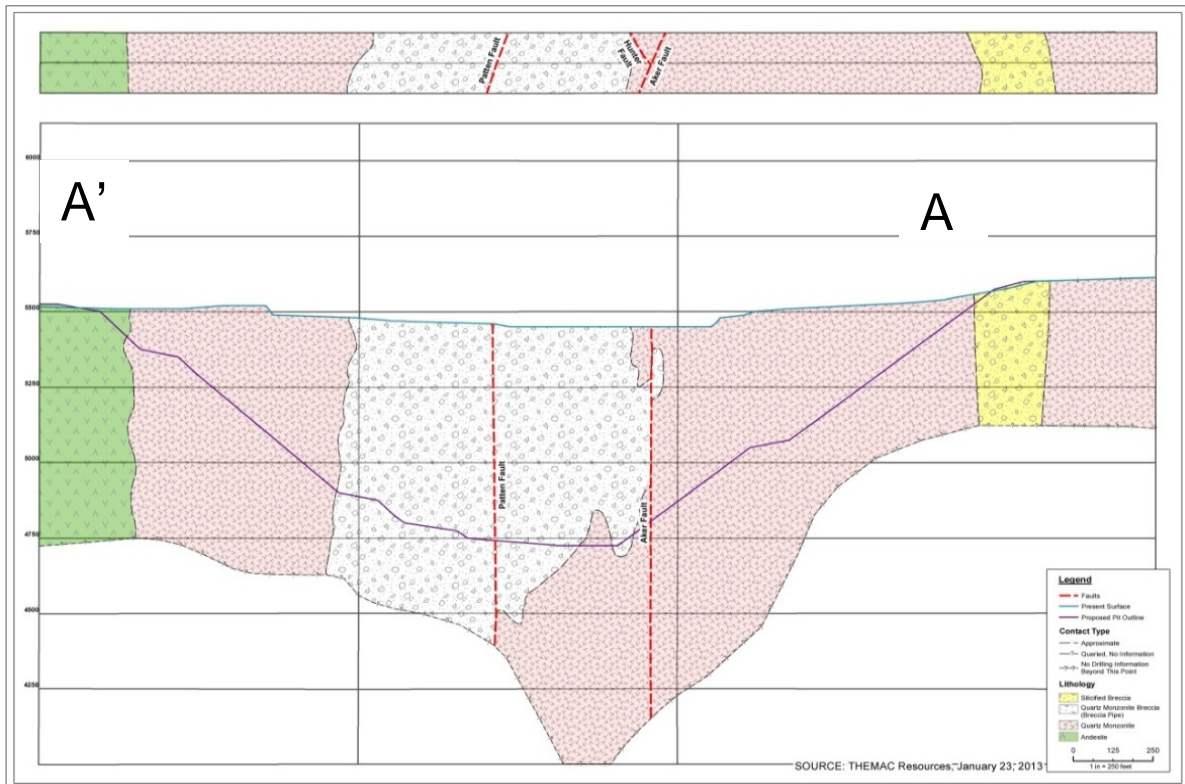


Figure 1-5: Geologic Cross Section through the Copper Flat Orebody (M3, 2013)

Lithology

The CFQM intruded into the center of the andesite sequence at the intersection of two principal structures that trend respectively N50°W and N20°E. The CFQM is an irregular-shaped stock underlying a surface area of approximately 0.40 square miles and has been dated to approximately 75 Ma. In the few exposures in which the CFQM is in contact with the andesite, the andesite shows no obvious signs of contact metamorphism. The CFQM is a medium- to coarse-grained, holocrystalline porphyry composed primarily of potassium feldspar, plagioclase, hornblende, and biotite; trace amounts of magnetite, apatite, zircon, and rutile are also present, along with localized mineralized zones containing pyrite, chalcopyrite, and molybdenite. About 15 percent of the monzonite is quartz, which occurs both as small phenocrysts and as part of the groundmass; however, quartz is absent in some parts of the stock.

Numerous dikes, some of which are more than a mile in length and mostly of latite composition, radiate from and cut the CFQM stock. Most of the dikes trend to the northeast or northwest and represent late stage differentiation of the CFQM stock. Diabase has been mapped in contact with the CFQM at Copper Flat. Immediately south of the quartz monzonite, the andesite is coarse-grained, perhaps indicating a shallow intrusive phase. An irregular mass of andesite breccia along the northwestern contact of the quartz monzonite contains potassium feldspar phenocrysts and andesitic rock fragments in a matrix of sericite with minor quartz. This may represent a pyroclastic unit. Magnetite, chlorite, epidote, and accessory apatite are also present in the andesite breccia.

Structure

Three principal structural zones are present at Copper Flat, the most prominent of which is a northeast-striking fault that trends N 20°-40°E that includes the Hunter and parallel faults or the Hunter fault zone. In addition, west-northwest striking zones of structural weakness (N50°-70°W) are marked by the Patten and Greer faults, and east-northeast striking zones are marked by the Olympia and Lewellyn faults. All faults have a near-vertical dip; the Hunter fault system dips 80°W, the Patten dips approximately 70°S-80°S, and both the Olympia and Lewellyn fault systems dip between 80°S and 90°S. These three major fault zones appear to have been established prior to the emplacement of the CFQM and controlled subsequent igneous events and in the case of the Patten and Hunter controlled mineralization.

As previously stated, the CFQM emplacement is largely controlled by the three structural zones. The southern contact parallels and is cut by the Greer fault, although the contact is cut by the fault, and the southeastern and northwestern contacts are roughly parallel to the Olympia and Lewellyn faults, respectively. The CFQM stock is principally elongated along the Patten fault, as well as along the Hunter fault zone.

Although latite dikes strike in all the three principal fracture directions, most of the dikes strike northeast. The northeast trending fault zones contain a high proportion of wet gouge, often with no recognizable rock fragments. Reportedly in underground exposures the material comprising the Hunter fault zone has the same consistency as wet concrete and has been observed to flow in underground headings. Based on recent drilling the Patten fault consists of a mixture of breccia and gouge. However, the material in the east-northeast fault zones contains only highly broken rock and minor gouge. The width of individual structures in all three systems varies along strike from less than a foot to nearly 25 feet in the Patten fault east of the Project. Despite intense brecciation, the total displacement along the faults does not appear to exceed a few tens of feet. At the western edge of the CFQM intrusion, a younger porphyritic dike was emplaced in a fault that offsets an early latite dike, indicating that fault movement occurred during the time that dikes were being emplaced.

Post-dike movement is evident in all the three principal fault zones, and both the Hunter and Patten fault systems show signs of definite post-mineral movement. Fault movement has smeared sulfide deposits and offset the breccia pipe as well as the zones within the breccia pipe. Post-mineral movement along faults has resulted in wide, strongly brecciated fault zones. Some of the post-mineral dikes have been emplaced within these fault zones.

NMCC has mapped the pit area and diversion cuts in detail at 1 inch equals 40 feet (1:480) and has examined the pre- and post-mineral stress orientations in the andesite and CFQM. Findings indicate no significant difference in the stress fields before and after mineralization. During NMCC's mapping efforts, the Greer and Olympia previously mapped fault locations could not be verified; therefore, these faults were labeled as inferred.

Mineralization

The CFQM hosts mineralization dominated by pyrite and chalcopyrite with subsidiary molybdenite, minor bornite and recoverable amounts of gold and silver. The mineralization is focused along intersecting northeast- and northwest-trending faults, and these intersections may have originally controlled emplacement of the CFQM.

Although copper occurs almost exclusively as chalcopyrite locally accompanied by trace amounts of bornite, minor amounts of chalcocite and copper oxide minerals are locally present near the surface and along fractures. The supergene enrichment typical of many porphyry copper deposits in the Southwest is virtually non-existent at Copper Flat. During the early mining days, a 20 to 50-foot leached oxide zone existed over the ore body, but this material was stripped during the mining activities that occurred in the early 1980s. Most of the remaining ore is unoxidized and consists primarily of chalcopyrite and pyrite with some molybdenite and locally traces of bornite, galena and sphalerite. Recently completed mineralogical studies indicate that fine grained disseminated chalcopyrite is often inter grown with pyrite and occurs interstitial to silicate minerals. Deposition of chalcopyrite and molybdenite (76.2 Ma) occurred within the same mineralizing event as the pyrite.

Sulfide mineralization is present as veinlets and disseminations in the CFQM, but is most strongly developed in and adjacent to the west end of a steeply dipping breccia pipe, that is centrally located within the CFQM stock and elongated in the northwest-southeast direction roughly along, but south of the Patten fault. The sulfide mineralization first formed in narrow veinlets and as disseminations in the quartz monzonite with weakly developed sericitic alteration. This stage of mineralization was followed by the formation of the breccia pipe with the introduction of coarse "clotty" pyrite and chalcopyrite along with veinlet controlled molybdenite and milky quartz, and the development of strong potassic alteration.

The breccia pipe, which can best be described as a crackle breccia, consists largely of subangular fragments of mineralized CFQM, with locally abundant mineralized latite where dikes exposed in the CFQM projected into the brecciated zone that range in size from an inch to several inches in diameter. Andesite occurs only as mixed fragments partially in contact with intrusive CFQM and appears to represent the brecciation of relatively unaltered andesite xenoliths in the CFQM. The matrix contains varying proportions of quartz, biotite (phlogopite), potassium feldspar, pyrite, and chalcopyrite, with magnetite, molybdenite, fluorite, anhydrite, and calcite locally common. Apatite is a common accessory mineral. Breccia fragments are rimmed with either biotite or potassium feldspar, and the quartz and sulfide minerals have generally formed in the center of the matrix.

Two types of breccia within the quartz monzonite breccia pipe have been identified as distinguishable units based on the dominant mineral filling the matrix between clasts. Recent drilling has shown that the two breccia types, biotite breccia and feldspar breccia, grade into one another as well as with the CFQM. Interestingly, from a recovery perspective, metallurgical testing has shown that the mineralization behaves virtually the same irrespective of the lithology.

The total sulfide content ranges from 1 percent (by volume) in the eastern part of the breccia pipe and the surrounding CFQM to 5 percent in the CFQM to the south, north, and west. Sulfide content is highly variable within the breccia, with portions in the western part of the breccia containing as much as 20 percent sulfide minerals. The strongest copper mineralization is concentrated in the western half of the breccia pipe and in the adjoining stockwork veined CFQM in the vicinity of the intersection of the Patten fault and the Hunter fault zone. Sulfide mineralization is concentrated in the CFQM and breccia pipe, and drops significantly at the andesite contact. Minor pyrite mineralization extends into the andesite along the pre-mineral dikes and in quartz-pyrite-bearing structures, some of which were historically prospected for gold.

Molybdenite occurs in some steeply dipping quartz veins or as thin coatings on fractures. Minor sphalerite and galena are present in both carbonate and quartz veinlets in the CFQM stock. Preliminary 2011 evaluations of the mineralization at Copper Flat indicate that copper mineralization concentrates and trends along the N50°W structural influences, whereas the molybdenum, gold and silver appear to favor a N10°-20°E trend.

1.2.5 Hydrology

Hydrological information pertaining to the Copper Flat Project has been summarized from the Baseline Data Report (INTERA, 2012) and is provided herein to provide a context for the pit lake modeling. The mine permit area is located in the Lower Rio Grande watershed, which includes approximately 5,000 square miles in Catron, Socorro, Sierra, and Doña Ana Counties and is dominated by the Rio Grande and its tributaries as well as the two large reservoirs of Elephant Butte and Caballo. Numerous tributaries drain into the Rio Grande from the west, but none contribute perennial flow to the Rio Grande. The mine permit area is drained by ephemeral streams (arroyos) within the Greenhorn Arroyo Drainage Basin. The Greenhorn Arroyo Drainage Basin is composed of Greenhorn Arroyo, Grayback Arroyo, and Hunkidori Gulch. The Grayback Arroyo passes through the permitted mine area and is diverted around the existing mine pit. Drainages within this watershed are ephemeral, flowing in response to heavy or sustained precipitation events. Water quality data for the Grayback Arroyo are summarized in Table 1-1.

Table 1-1: Summary of Hydrochemical Information in the Grayback Arroyo (INTERA, 2012)

Details	pH (s.u.)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)
Min	7.42	0.71	11	78
Max	7.92	130	2,900	4,500

Surface waters in the Grayback Arroyo are typically characterized by higher major ion and trace element concentrations, with sulfate concentrations up to 2,900 mg/L and TDS up to 4,500 mg/L.

1.2.6 Hydrogeology

Hydrogeological information pertaining to the Copper Flat Project has been summarized from the Baseline Data Report (INTERA, 2012) and is provided herein. This report identifies three aquifers within the Copper Flat Project area (Figure 1-6) including:

1. Crystalline bedrock aquifer;
2. Santa Fe Group aquifer; and
3. Quaternary alluvial aquifer.

Details of these aquifers are provided below.

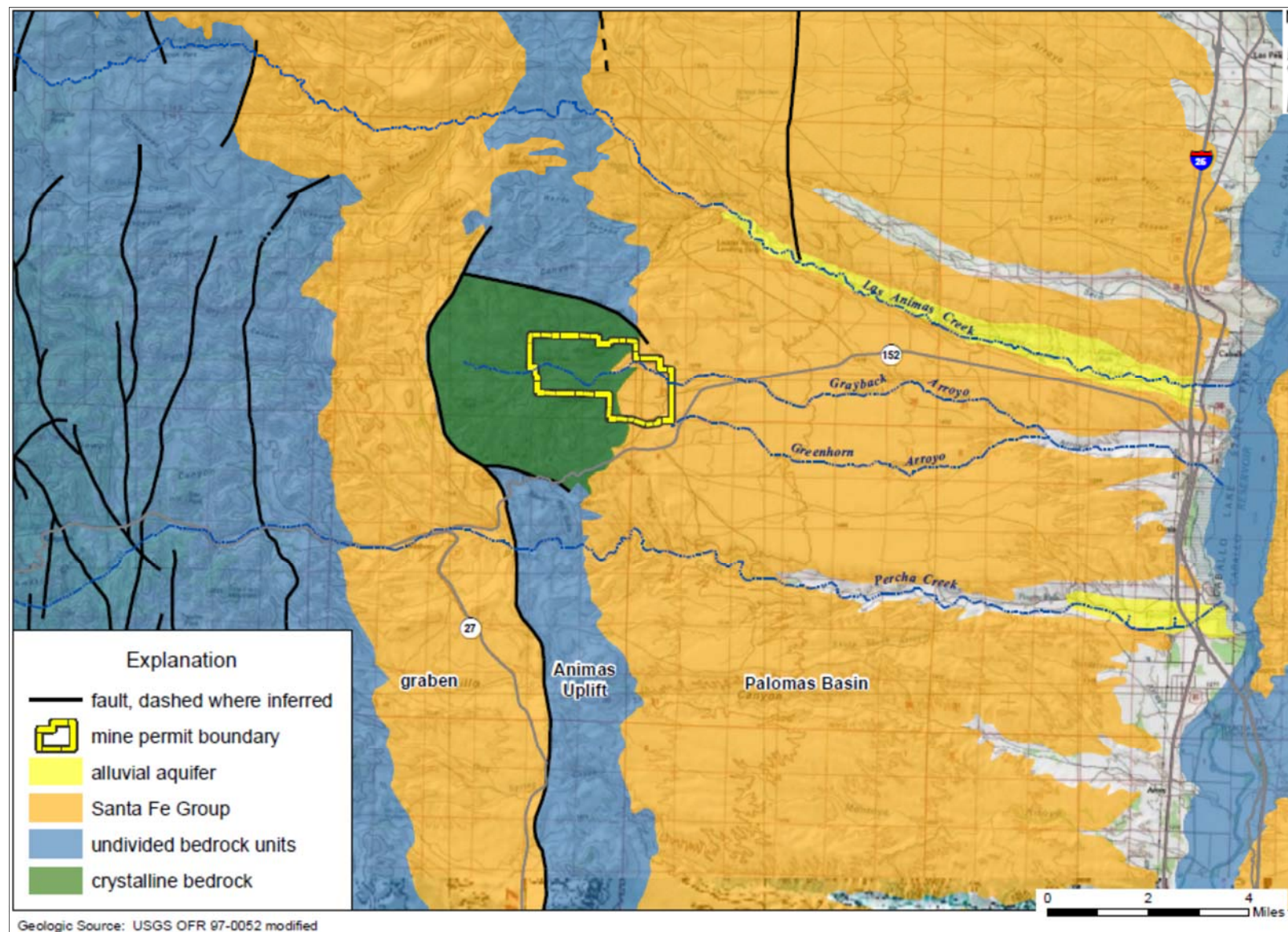


Figure 1-6: Map Showing Location of Crystalline Bedrock, Santa Fe Group Sediments and Alluvial Aquifer Zones (INTERA, 2012)

1. **Crystalline Bedrock Aquifer:** Groundwater is present within the crystalline volcanic rocks (quartz monzonite and andesite) that constitute much of the western portion of the mine permit area. Though the rocks themselves have practically no inter-granular permeability, faulting and jointing of the monzonite have created locally permeable zones through which water can move. Groundwater flow is generally from west to east, with the exception of the area surrounding the pit lake, which behaves as an evaporative sink. The permeability of the andesite is extremely low (<0.003 feet/day), whereas the permeability of the monzonite rocks averages 0.1 feet/day due to localized secondary porosity from fracturing. Groundwater in the Crystalline Bedrock Aquifer is characterized by moderately alkaline pH (~8 s.u.) and can generally be classed as sodium / calcium plus bicarbonate ($\text{Na} / \text{Ca} + \text{HCO}_3$) type waters based on their major ion signature (Figure 1-7).
2. **Santa Fe Group Aquifer:** Overlying and adjacent to the crystalline bedrock aquifer is the Santa Fe Group Aquifer system, which receives recharge from precipitation. The aquifer is located approximately 1 mile downgradient of the existing pit lake, and the low hydraulic conductivity of the andesite limits cross formational flow. The sediments of the Santa Fe Group are stratified, contain a wide variety of grain sizes, and, in general, dip to the east. The direction of groundwater flow is from west to east and the groundwater elevation contours indicate groundwater flows from the andesite to the alluvium and Santa Fe Group sediments. Groundwater in the Santa Fe Group Aquifer is characterized by circum-neutral to moderately alkaline pH (7 – 8 s.u.) and can generally be grouped into the calcium plus bicarbonate ($\text{Ca} + \text{HCO}_3$) or calcium plus sulfate ($\text{Ca} + \text{SO}_4$) hydrochemical facies based on major ion chemistry (Figure 1-7). The sulfate signature of some of the groundwater samples is associated with wells within the Santa Fe Group Aquifer near the existing TSF, which are known to be influenced by a sulfate plume from the historic tailings.
3. **Quaternary Alluvial Aquifer:** This aquifer is comprised of channel and floodplain gravels, sands and silts and represents the uppermost aquifer in the vicinity of the Copper Flat Project. The alluvial aquifer is typically recharged by infiltration of rainfall.

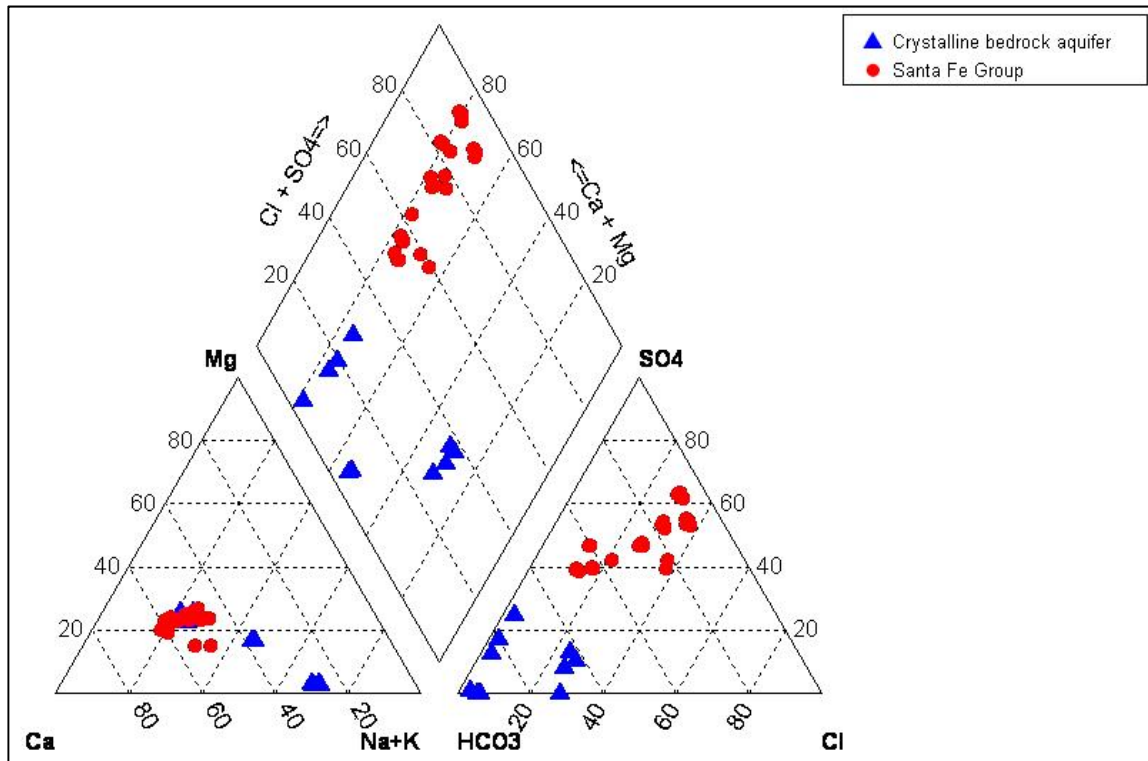


Figure 1-7: Piper Plot of Major Ion Chemistry of Groundwater in the Mine Permit Area (analyses from 2010 and 2011 only)

1.2.7 Existing Pit Lake

Beginning in the late 1980s, a pit lake formed in the existing pit. This lake represents an artificial water body that has formed in a man-made void. The surface area of the pit lake was approximately 13.8 acres at its maximum extent, but the lake has subsequently reduced in size as a result of evaporation and limited precipitation (i.e., drought conditions). A recent evaluation by John Shomaker and Associates (JSAI, who have been assisting THEMAC with site management of water resources) indicates that the pit lake currently covers an area of approximately 5.2 acres and contains approximately 70 acre-feet of water (NMCC estimate, 2015). Bathymetric measurements carried out as part of the INTERA (2012) baseline data collection program indicate that the depth of the existing pit lake varies between 10 and 35 feet. Water levels are typically highest in the winter month of January and lowest in the summer month of July. The analytical results do not indicate the presence of a chemocline or any chemical stratification in the lake. However, the temperature profiles for the winter and summer sampling showed a greater than 1°C per meter change, indicating the presence of a seasonal thermocline. The pit currently represents a hydraulic sink, with evaporation from the lake surface exceeding groundwater inflow, precipitation and surface runoff (M3, 2012).

Monitoring of the existing pit lake water quality has taken place periodically between 1989 and present, with a total of 57 samples being collected for analysis. Monitoring took place on at least an annual basis between 1989 and 1997, with 26 samples collected during this period. The monitoring program was then re-established in 2010 as part of the INTERA (2012) baseline data collection program, which included collection of samples from the deepest part of the pit lake in September 2010, January 2011, April 2011 and July 2011. JSAI collected four quarters of additional data in 2013 as part of the Stage 1 abatement investigation (JSAI, 2014a). Monitoring of pit lake water quality is ongoing, with NMCC collecting three samples in 2014, two samples in 2015, 13 samples in 2016 and two samples to date in 2017.

The results of the existing pit lake monitoring are summarized in Table 1-2 and time-series plots of key parameters are provided in Appendix A. This demonstrates that the pH of the pit lake waters has been variable over the period of record, ranging from a minimum of pH 3.6 to a maximum of pH 8.3. In general, the pit lake waters are circum-neutral (average of pH 6.5); any periodic decreases in pH (for example between March and October 1992, June 2008 and June 2015 [Figure 1-10]) are associated with periodic Acid Wall Seep (AWS) events. Concentrations of sulfate, chloride, TDS, manganese, magnesium, cobalt, fluoride, sodium and potassium have increased between 1989 and 2017 (Appendix A). In particular, evapoconcentration effects have increased the concentrations of sulfate and chloride (Figure 1-8), resulting in supersaturation of pit lake waters and subsequent precipitation of salts (primarily gypsum) around the rim of the existing pit lake. These precipitated solids form a thick crust on the pit walls (Figure 1-11).

Copper concentrations in the open pit are influenced by AWS events (Figure 1-9). The elevated copper concentrations observed in 2010 are naturally mitigated to below analytical detection limits by 2011. This demonstrates that pit lake chemistry is temporally variable, with copper concentrations varying from below analytical detection limits up to a maximum of 26.5 mg/L.

Temperature and dissolved oxygen profiles for the existing pit lake (INTERA, 2012, Aquatic Consultants, 2014) show the pit water is not significantly stratified. The water stays well oxygenated for the entire depth for each season (6 to 8 mg/L dissolved oxygen). Thermal stratification requires a 1°C change in temperature per meter (Wetzel, 2001), which can occur in the summer months as the upper water column heats up and the lower water column remains cool, and well oxygenated. Figure 1-12 also shows that there is no depth-dependent variation in key chemical constituents (pH, TDS, copper, iron, zinc, manganese). This supports the assumption that the current pit lake is not stratified and that no chemocline exists.

A biological assessment of the pit lake was performed by Aquatic Consultants, Inc. (Aquatic Consultants, 2014, Appendix J) as part of the baseline data gathering effort to determine if aquatic life was present in the existing pit lake. While some algae were identified in the waters, no zooplankton, macroinvertebrates and no fish species were recovered during sampling, indicating the pit lake does not provide a suitable aquatic habitat. The biological assessment in conjunction with the other information provided in this section demonstrates that the existing pit lake is an artificial water body created as a result of mineral extraction with little or limited ability to sustain aquatic life and should not be equated to conditions that may be encountered in natural lakes..

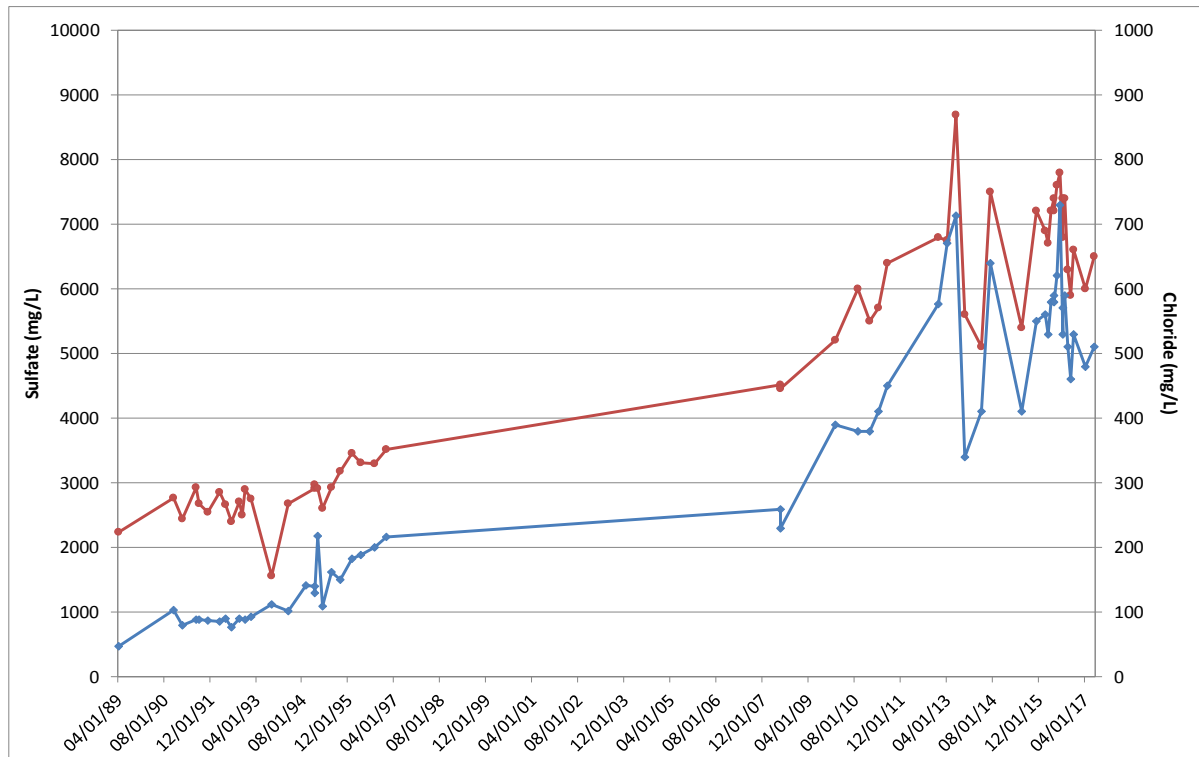


Figure 1-8: Plot of Sulfate and Chloride Concentrations in Existing Pit Lake

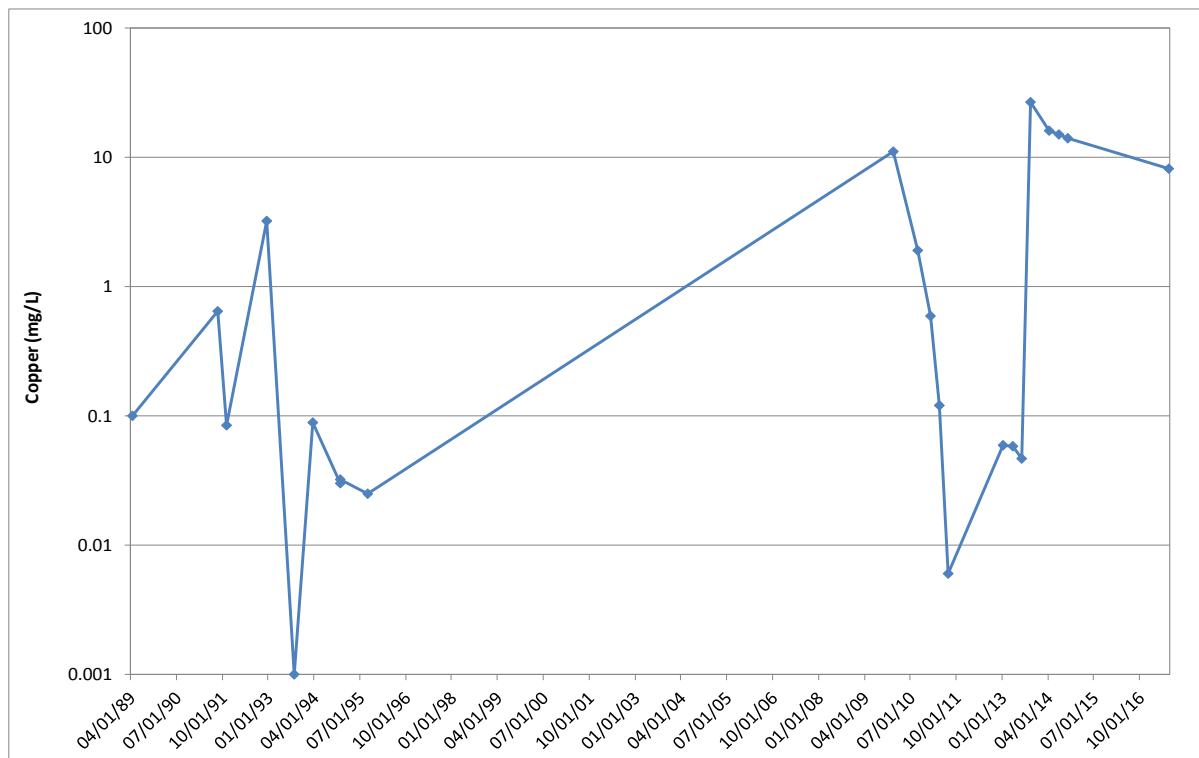


Figure 1-9: Plot of Copper Concentrations in Existing Pit Lake

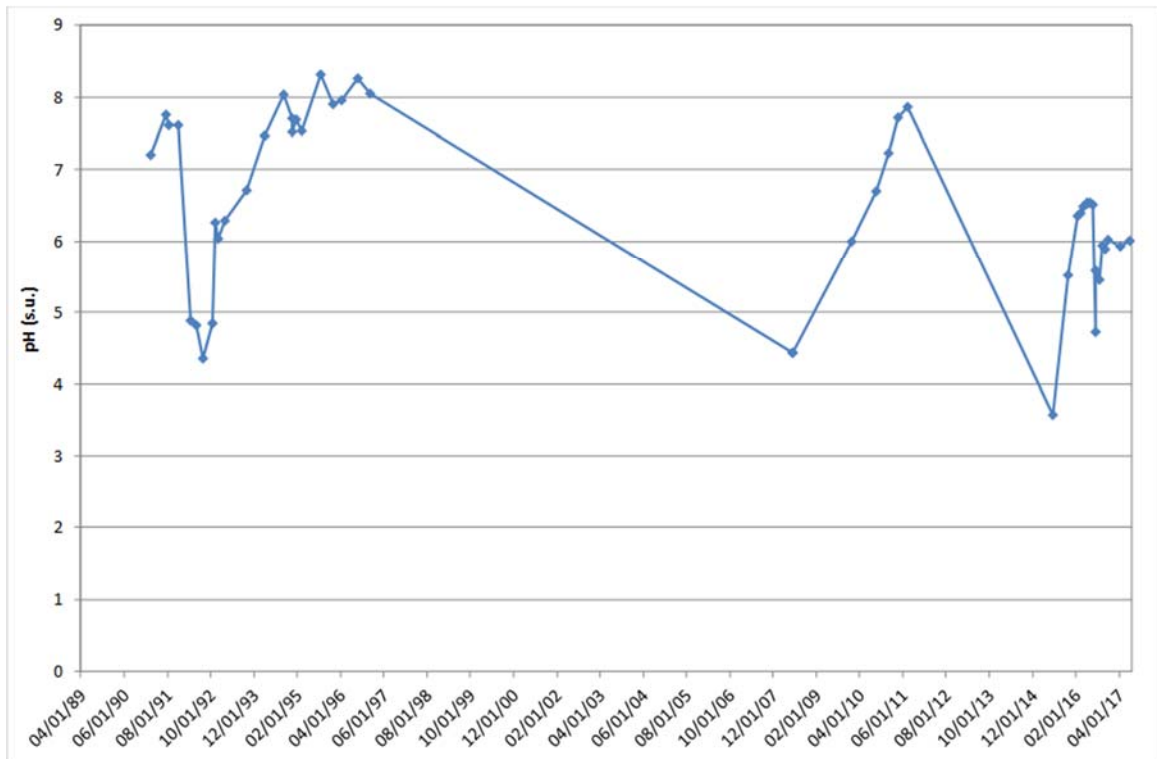


Figure 1-10: Plot of pH in Existing Pit Lake



Figure 1-11: Precipitated Salts around Rim of Existing Pit Lake

Table 1-2: Existing Pit Lake Chemistry (1989 – 2017)

Parameter	Units	n	Average	Minimum	Maximum
pH	s.u.	47	6.5	3.6	8.3
TDS	mg/L	56	7,538	2,711	14,800
Bicarbonate	mg/L	37	40.4	<3	122
Sulfate	mg/L	55	4,803	1,566	8,690
Chloride	mg/L	55	332	47.3	730
Fluoride	mg/L	33	19.2	4.8	34
Calcium	mg/L	37	550	455	684
Magnesium	mg/L	37	698	43	1,120
Sodium	mg/L	37	888	165	1,400
Potassium	mg/L	37	32.1	11	60.6
Aluminum	mg/L	33	10.4	<0.02	82.6
Antimony	mg/L	7	<0.001*		
Arsenic	mg/L	10	0.004	<0.001	0.006
Boron	mg/L	9	0.14	<0.1	0.2
Cadmium	mg/L	35	0.05	<0.005	0.1
Chromium	mg/L	11	0.03	<0.006	0.1
Cobalt	mg/L	32	0.29	<0.05	0.49
Copper	mg/L	22	4.44	0.001	26.5
Iron	mg/L	11	0.2	<0.02	1.3
Lead	mg/L	11	0.02	<0.005	0.1
Manganese	mg/L	35	34.8	0.02	59
Mercury	mg/L	10	0.0005	<0.0002	0.001
Molybdenum	mg/L	9	0.04	0.015	0.1
Nickel	mg/L	9	0.06	0.039	0.1
Selenium	mg/L	34	0.028	<0.001	0.25
Silver	mg/L	12	0.026	<0.005	0.1
Thallium	mg/L	8	0.0045	<0.001	0.005
Uranium	mg/L	4	0.11	0.11	0.12
Vanadium	mg/L	4	0.1	<0.05	0.25
Zinc	mg/L	33	5.4	0.01	9
Total Dissolved Solids	mg/L	56	7,538	2,711	14,800

n Number of samples

** Indicates parameter was uniformly below analytical detection limits in pit lake water over monitoring period, but detection limit was variable. Concentration shown in table represents lower limit of analytical detection.*

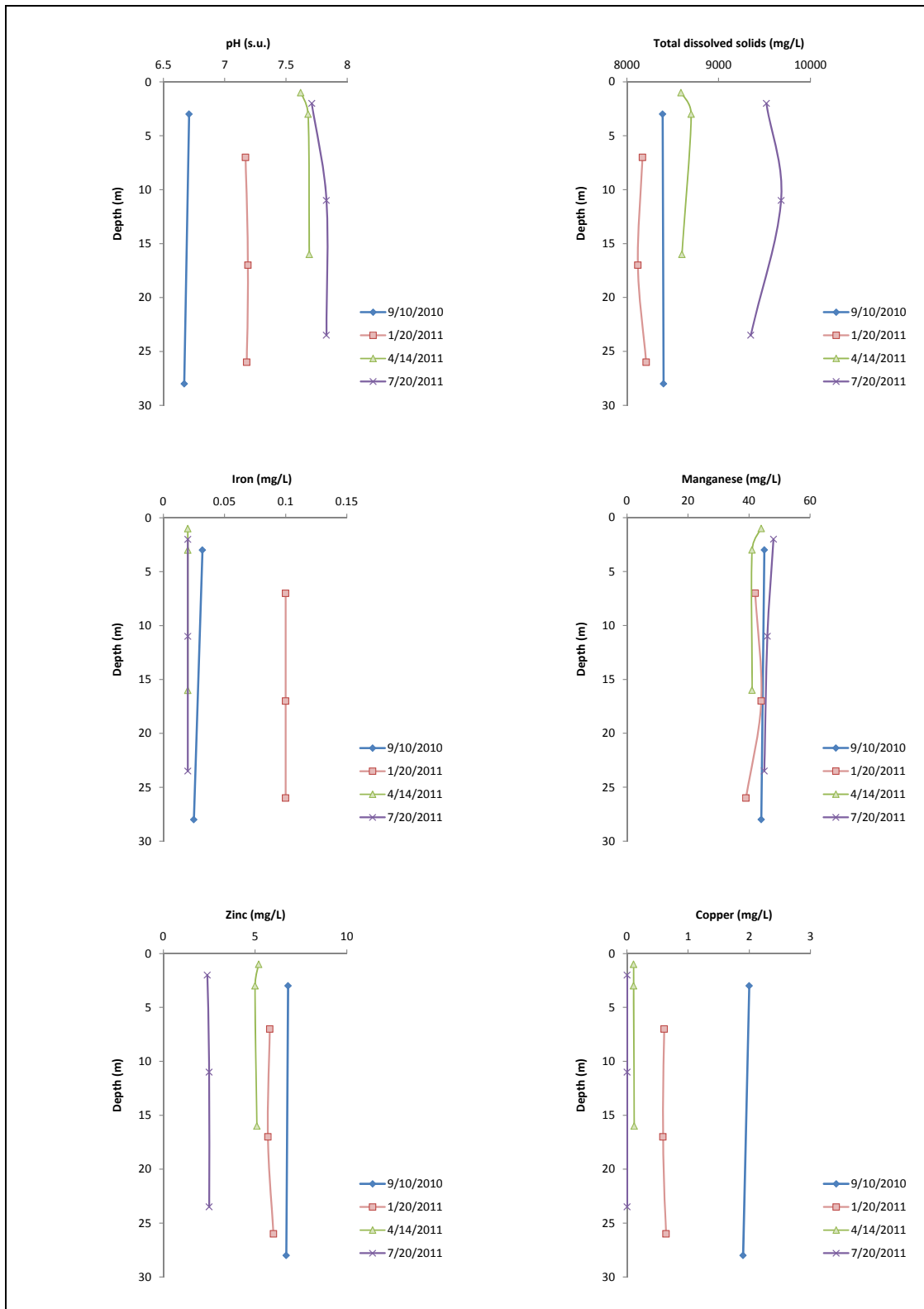


Figure 1-12: Depth Profiles of Key Constituents in Existing Pit Lake

2 Geochemical Characterization Testwork Summary

SRK has conducted a geochemical characterization program for the Copper Flat Project, which has included the testing of 91 waste rock samples, 41 samples representative of low grade ore and 11 samples of tailings material to investigate the potential for ARDML generation. The results of this program are presented in the *Geochemical Characterization Report for the Copper Flat Project, New Mexico* (SRK, 2012) and the main findings are summarized below.

Waste rock and ore sample intervals were selected from both exploration core holes drilled within the proposed pit boundaries in 2009, 2010 and 2011 and from the surface of existing WRSPs and pit walls on site. Samples were selected to represent the range of waste rock and ore material types that will be encountered during future mining. Tailings samples were collected from the metallurgical program and from the existing (historic) TSF on site. The static test methods used for the geochemical characterization program include multi-element analysis using four-acid digest and ICP-MS analysis, modified Sobek Acid Base Accounting (ABA), Net Acid Generation (NAG) test and the ASTM E2242-13 Meteoric Water Mobility Procedure (MWMP; ASTM, 2013). These static tests were selected to address total acid generation or neutralization potential of the samples and concentration of constituents in leachates derived from the material. However, these static tests do not consider the temporal variations that may occur in leachate chemistry as a result of long-term changes in oxidation, dissolution and desorption reaction rates. To address these factors, kinetic testing was also carried out as part of the geochemical characterization program and includes 32 humidity cell tests (HCTs) conducted on samples of waste rock, ore and tailings according to the ASTM D-5744-96 methodology (ASTM, 1996).

The results of the characterization program demonstrate that the acid generating potential of the Copper Flat waste rock is generally low and is largely dependent on the sulfide mineral content, with sulfide concentrations varying from less than analytical detection limits to a maximum of 2.52 wt%. The static testwork results indicate that the transitional waste material (i.e. mixed sulfide/oxide) is likely to be potentially acid forming based on a generally higher sulfide mineral content and the presence of secondary oxide minerals that formed as a result of supergene weathering. In contrast, the diabase, andesite and tailings are likely to be non-acid forming materials. The main material type for the Project consists of sulfide (i.e., non-oxidized) Quartz Monzonite and Breccia, which typically exhibited either non-acid forming characteristics or a low potential for acid generation. This is related to the encapsulation of sulfide minerals in a quartz matrix or occasionally in potassium feldspar. In addition, the sulfide minerals in the Copper Flat deposit are crystalline and often coarse grained and as such have slow weathering reaction kinetics. It is likely that the Copper Flat materials will offer limited silicate buffering (neutralizing) capacity; although this is unlikely to be high magnitude, it may modify/buffer pH in the near neutral range.

The Copper Flat waste rock and ore materials were found to be enriched in copper, sulfur and selenium in whole rock chemistry, which relates to the primary mineralization (predominantly chalcopyrite - CuFeS_2). Silver, arsenic, cadmium, molybdenum, lead, thallium, uranium, tungsten, and zinc were also found to be enriched in one or more material types, with the greatest levels of enrichment occurring in the sulfide and transitional ore material types. Many of these elements are typically associated with copper porphyry deposits, which explain their enrichment in the Copper Flat materials (and more specifically in the ore grade samples). The diabase and andesite material types typically showed much lower levels of elemental enrichment, which is likely related to the lack of primary mineralization in these lithological units.

MWMP tests were conducted on a total of 49 waste rock and tailings samples to provide an indication of elemental mobility and metal(loid) release from the Copper Flat materials during meteoric rinsing. Metal mobility and release was also assessed from the results of the HCT program, the results of which are summarized in Appendix B. In general, metal leaching from the Copper Flat materials was found to be low and the majority of leachates generated during the MWMP and HCT

test programs could be classed as near-neutral, low-metal waters. However, several of the grab samples of transitional material collected from historic waste rock stockpiles produced acidic leachates and showed the potential for higher metal release than observed for the unoxidized sulfide materials. The higher release of acidity and metals from the transitional material likely represents the flushing of soluble acidic sulfate salts from the material surface that were produced by the prolonged weathering (over geological time) of the material.

3 Pit Lake Modeling

3.1 Summary of Modifications to Pit Lake Models since submittal of SRK (2014a) Preliminary Report

A number of modifications and refinements have been made to the Copper Flat pit lake models since the preliminary Pit Lake Geochemical Modeling Report was submitted in December 2014 (SRK, 2014a). These are detailed in Sections 3.1.1 to 3.1.8 below and are summarized in Table 3-1 at the end of this section.

3.1.1 Incorporation of Current Geologic Block Model

The revised models presented herein use the FS geologic block model to calculate the exposed surface areas of each lithology in the final pit walls. The FS block model represents the most up-to-date geological classification for the Project. Using the FS geologic block model results in minor changes to the relative proportions of each lithology that will be exposed in the final pit walls. In addition, the FS block model groups the biotite breccia and quartz feldspar breccia units together.

3.1.2 Incorporation of Current Pit Design

The revised models presented herein use the current pit design. The current pit design was developed along with the FS block model during the feasibility study and then modified to limit the future pit water body to private property with an expanded bench at the 4900 elevation in the NW corner of the pit (Figure 3-1). The current open pit design is detailed in the 2017 Mine Operation and Reclamation Plan (THEMAC, 2017a).

3.1.3 Refinement of Pit Wall Composition

The revised models include differentiation of the pit walls into mineralized and weakly to non-mineralized material, using a copper grade of 0.164% to differentiate between the two. This differentiation was used in addition to the lithology and oxidation classifications that were used in the original pit lake models (SRK, 2014a). The rationale for this refinement was based on a more in-depth review of the humidity cell chemistry data (see Appendix B), which showed that the release of certain parameters is greater from the mineralized material compared to weakly or non-mineralized material. As such, the source terms for these materials were defined separately. The redefinition and refinement of materials types within the pit walls provides a more representative calibration of existing pit lake conditions as described in Section 4 below.

3.1.4 Refinement of HCT Inputs

The revised models use different HCT inputs for trace elements and major ions to represent the different geochemical processes that control their release. An average of all weeks of humidity cell data were used for major ions (calcium, magnesium, sodium, potassium, aluminum, iron, manganese, chloride, sulfate, fluoride, bicarbonate) and an average of steady-state humidity cell data (i.e. minus the first 20 weeks of testing) were used for trace elements (silver, arsenic, boron, barium, cadmium, cobalt, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, uranium, vanadium and zinc). The main driver for this change in the input of HCT data was based around the improved calibration to existing conditions obtained by using the different sources of data. The results indicate that soluble salts are important in the input of major elements to the existing lake and, as such, all weeks of humidity cell data are needed for a valid prediction. By contrast, the release of trace elements is predominantly associated with longer term weathering processes, possibly sulfide oxidation and as a result the initial HCT flush concentrations were not included in the source term chemistry. Consequently, a closer calibration between predicted and

observed chemistry in the existing pit lake is achieved using this ‘mixed’ approach to humidity cell chemistry as described in Section 4.

3.1.5 Refinement of Mineral Equilibrium Phases

Minor modifications have been made to the mineral equilibrium phases specified in the PHREEQC model input file. This refinement was based on mineral phases that were observed to be close to saturation in the preliminary outputs to the refined model.

3.1.6 Refinement of Water Balance

Since submission of the December 2014 preliminary pit lake modeling report, JSAI has refined the pit lake water balance for the future pit lake to reflect an evaporation rate of 50 inches per year, compared to the 64 inch evaporation rate used previously. This refinement was based on the relationship between maximum ET (ET_0), meteorological parameters including temperature, relative humidity and wind speed, and geographical parameters including altitude, latitude and time of year. Further details are provided in Appendix C.

In addition to the revised evaporation rate, the water balance and geochemical models were revised to reflect post-reclamation conditions for the proposed open pit and surface drainage area as presented in the 2017 MORP (THEMAC, 2017a) and summarized herein. The revised geochemical model includes separate source terms for reclaimed and unreclaimed areas of the pit and receiving watershed. Stormwater sourced from reclaimed pit areas is expected to have a chemistry similar to background surface water quality from SWQ-1.

Further details of how runoff coefficients were defined are provided in Appendix G.

3.1.7 Revisions to Groundwater Chemistry Inputs

JSAI developed a revised groundwater input chemistry from the available historic data. JSAI used the water quality database, well construction data and groundwater flow model results to determine the most representative groundwater flow chemistry to the existing and future open pits. Further details on how the groundwater chemistry inputs were refined are provided in Appendix D.

3.1.8 Incorporation of Pit Reclamation Measures

NMCC has developed a Mine Reclamation Plan for the Copper Flat Project (THEMAC, 2017a, THEMAC, 2017b, Golder, 2017). Pit reclamation aspects included in the MORP are:

- Reclamation of the pit haul road;
- Reclamation of the expanded section of the 4900 catch bench;
- Reclamation of benches at the crest of the pit; and
- Rapid fill of the open pit with fresh water from the production water supply wells after mining to create a pit lake with water surface at the 4987 feet elevation.

These reclamation measures are described in the following sections.

Pit Haul Road and Pit Bottom

The open pit will be mined in benches over a 12 year period to create a terraced pit wall (Figure 3-1). Access into the open pit during mining will be via a 90 foot wide haul road constructed in the pit wall as mining advances. After mining, the haul road from pit crest to pit bottom will be covered with a suitable reclamation material. In addition, several benches at the bottom of the pit will also be covered in a similar manner before pit flooding occurs (Figure 3-2). The section of haul road above the final pit lake water surface will be prepared for revegetation as described in the MORP (JSAI, 2017a).

The reclaimed haul road will be used to convey stormwater to the bottom of the pit in a controlled manner. A system of surface water conveyance channels will be constructed around the pit crest to intercept and direct stormwater to the bottom of the pit through an engineered stormwater channel that is constructed in the alignment of the pit haul road.

Expanded 4900 Catch Bench

The 4900 elevation catch bench will be expanded to approximately 2 acres in size in the northwest corner of the pit (Figure 3-1). The surface of this catch bench will remain above water after rapid-fill is complete and the pit lake is established. The catch bench surface will be ripped and a growth media cover placed. The covered area will be revegetated.

Pit Crest

The upper benches of the pit shell will be laid back at an approximate 2:1 slope angle at the end of the mine operations to accommodate revegetation. The reclaimed benches will be blended into the surrounding reclaimed pit perimeter area described in the MORP. Revegetation will be accomplished by ripping the area and a growth media cover placed and re-contoured to blend with reclamation of the pit perimeter area and revegetated as described in the MORP.

Rapid Fill

After mining, the pit will be filled with fresh water coming from the mine freshwater production wells to rapidly create a pit lake (rapid fill). The rapid fill will begin immediately after mining and will be completed in approximately six months. The rapid fill requires pumping 2,200 acre-feet into the pit and will fill the pit to the 4894 ft elevation (JSAI 2017b).

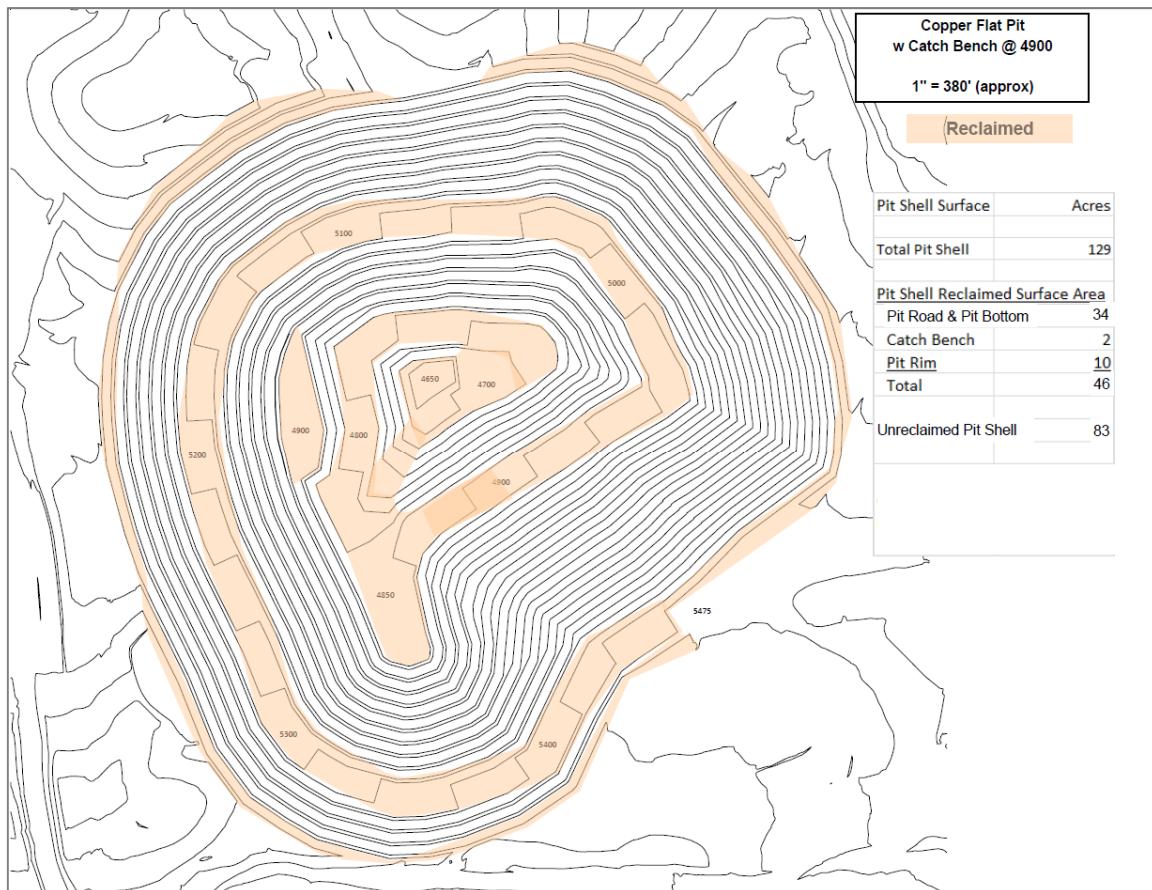


Figure 3-1: 2017 MORP Pit Showing Expanded 4900 Catch Bench and Pit Surfaces Scheduled for Cover

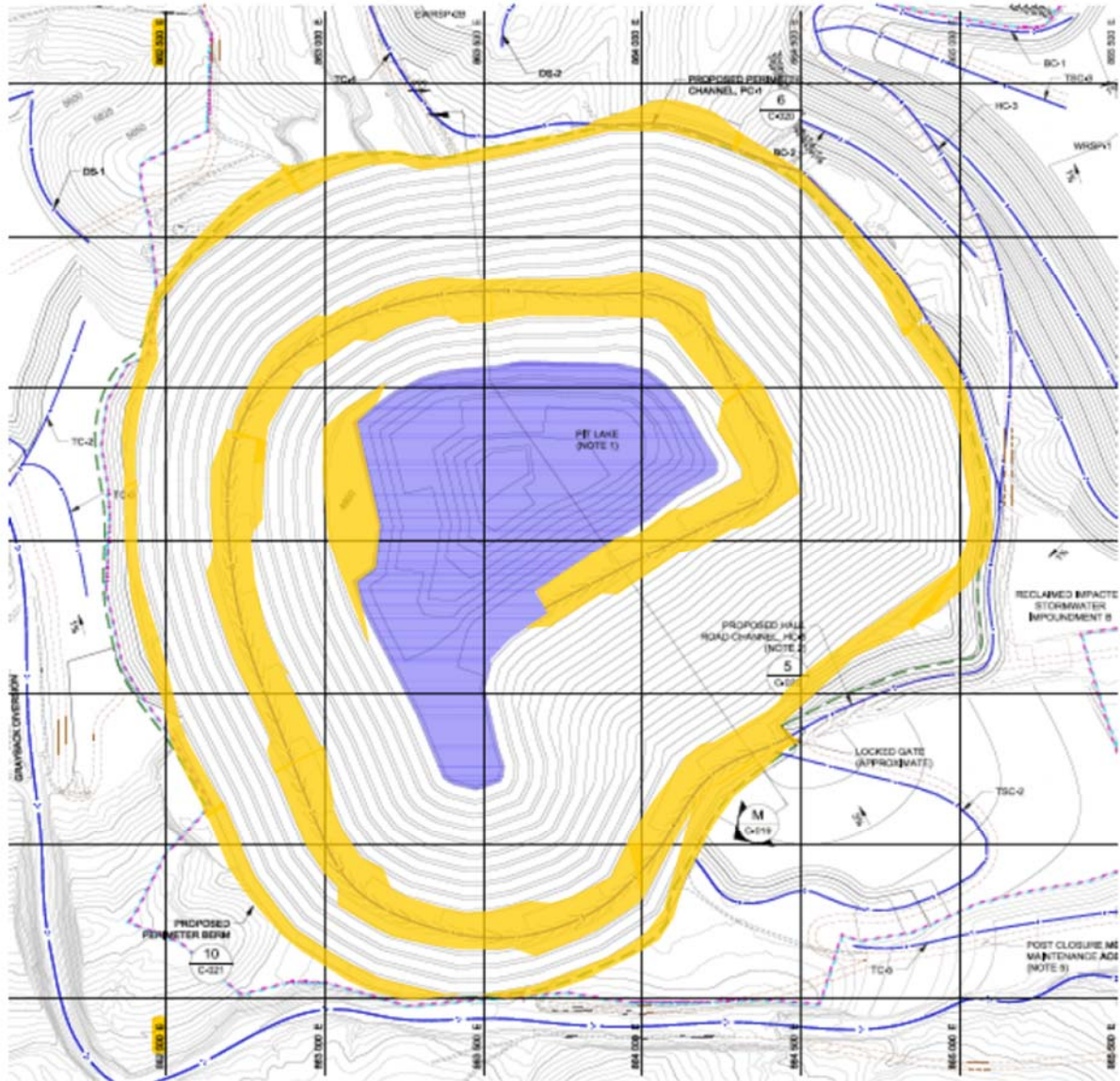


Figure 3-2: 2017 MORP Pit Showing Reclaimed Pit with Pit Lake

Table 3-1: Summary of Modifications to Pit Lake Models since Submittal of Preliminary SRK (2014a) Report

Component	Changed from (SRK, 2014a)	Changed to (current)
Geologic block model	PFS block model	FS block model
Pit shell	PFS pit shell	2017 MORP Pit
Pit wall composition	Delineated based on lithology and oxidation only	Delineated based on lithology, oxidation and mineralized versus weakly/non-mineralized
Source terms/HCT inputs	An average of all weeks of HCT data were used to develop source terms for each material type	Separate source terms were developed for major ions and trace elements. <ul style="list-style-type: none"> • Major ions (Ca, Mg, Na, K, Al, Fe, Mn, Cl, SO₄, F, HCO₃): used an average of all weeks of HCT data • Trace elements (Ag, As, B, Ba, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, U, V, Zn): used steady-state HCT chemistry (i.e., minus the first 20 weeks of testing).
Mineral equilibrium phases	Alunite, Ag ₂ Se, albite, anhydrite, azurite, barite, boehmite, brochantite, brucite, calcite, chrysotile, Cr ₂ O ₃ , diaspore, epsomite, ferrihydrite, fluoride, gypsum, gibbsite, gummite, kaolinite, magnesite, malachite, mirabilite, otavite, pyromorphite, rhodochrosite, rutherfordine, schoepite, sepiolite, SiO ₂ ; tenorite, U ₃ O ₈ , UO ₃ , UO ₂ (OH) ₂	Minor modifications were made to the equilibrium phases based on the predicted geochemical conditions. <ul style="list-style-type: none"> • Phases added: CaMoO₄, CaSeO₃·2H₂O, CdMoO₄, Cr₂O₃, CuMoO₄, Cu₂Se, Mg₃(PO₄)₂, MnSeO₃, NiMoO₄, Ni(OH)₂, Ni₃(AsO₄)₂·8H₂O, PbMoO₄, SbO₂, ZnMoO₄. • Phases removed: boehmite, diaspore, gibbsite, magnesite, malachite, pyromorphite, rhodochrosite, tenorite.
Water balance	Evaporation rate of 64 inches.	Evaporation rate of 50 inches. Separate water balance terms were also developed for run-off from reclaimed surfaces in the pit and pit catchment.
Groundwater chemistry	Average of data for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-22B, GWQ11-24B and GWQ11-25B.	Average of data for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-22B and GWQ11-24B. Different groundwater inputs were also developed for the current and future pits according to the relative contribution of flow from the Quartz Monzonite and Andesite units.
Pit reclamation	None	Haul road will be reclaimed and revegetated, pit shell crest and expanded 4900 catch bench will be revegetated. Pit void will be rapidly filled with water from water supply wells.

3.2 General Pit Lake Modeling Approach

The results of the geochemical characterization testwork have been coupled with site-specific hydrologic, hydrogeologic and mine plan information to develop geochemical predictions of pit lake water quality for the Copper Flat Project. Geochemical predictions have been developed for three scenarios, including:

- (i) Calibration model for the existing pit lake;
- (ii) Natural fill model for the future unreclaimed pit; and
- (iii) Rapid fill model for the future reclaimed pit.

The conceptual models, inputs and assumptions for each of these model scenarios are presented in Sections 4, 5 and 6. The general approach to the modeling is provided in Sections 3.4 to 3.10 below.

Water chemistry predictions were made using the USGS code PHREEQC (Parkhurst and Appelo, 2010), which has been rigorously tested and is the industry standard for pit lake, waste rock dump and tailings facility geochemical predictions. The approach used herein is consistent with the industry-standard approach for modeling pit lake chemistry. Comparable approaches are reported in Tempel et al. (2000), Eary (1998) and Castendyk and Webster-Brown (2007).

The PHREEQC software uses thermodynamic equilibrium chemistry and solubility calculations to determine the residual concentration of mixing of solutions, allowing for mineral precipitation and attenuation of solutes through sorption reactions with specified mineral surface area. Furthermore, dissolution and oxidation can also be factored into the model to account for reaction with solid mineral phases which can be declared in the model in finite quantities. The resulting model output predicts not only the concentration of modeled elements but also the speciation of the aqueous solutes and the potential saturation indices of minerals of constituent components. This allows a geochemist to interpret trends in water quality data and to predict the resulting chemistry of the mixing reactions. These results are then compared to environmental and ecological risk water quality criteria to determine if a potential impact will result from the mineral-solute reactions. If appropriate, these data can also inform the development of mitigation strategies.

Data used as inputs to the models were derived from the following sources:

- Geological and mine planning information from the Baseline Data Report (INTERA, 2012), Feasibility Study (M3, 2013), the FS geologic block model, and the 2017 MORP (THEMAC, 2017a);
- Hydrologic and hydrogeologic information from the JSAI pit lake water balances developed for the three model scenarios;
- Geochemical data from laboratory humidity cell tests performed on representative mineralized and non-mineralized materials and then scaled to field conditions. These data were utilized to provide source term data for chemical leaching of exposed rock in the pit walls;
- Precipitation chemistry data from long-term monitoring at the Gila Cliff Dwellings National Monument meteorological station, New Mexico (NADP, 2012);
- Groundwater chemistry data from the groundwater monitoring program; and
- Published thermodynamic data provided with USGS PHREEQC and updated with additional sorption data for arsenic and manganese species.

These data were used to develop representative conceptual hydrogeochemical models for the three model scenarios.

3.3 Model Logic and Coding

The conceptual models developed for the Copper Flat pit lake were translated into numerical models using a geochemical thermodynamic equilibrium code and several limiting and simplifying assumptions. The Copper Flat models used a modified version of the minteq.v4 thermodynamic database supplied with the v3.3.12.12704 version of PHREEQC (released May 10th 2017). This database is widely used for geochemical modeling and was selected for this study because it includes the full range of elements for consideration in this water quality prediction as well as key sorption reactions for iron oxyhydroxides. The database was modified to include sorption data for arsenic and manganese species.

The PHREEQC model consists of several components including the input data file, the thermodynamic database, the executable code and the output file. The input file consists of a series of logic statements and commands that define each of the components of the system and explains how these components interact. The input file is read by the executable code and commands are executed in a stepwise manner. Influent component waters were speciated and mixed to generate a series of intermediate waters, solid phases, and adsorbed phases. Selected outputs are specified and parceled out to various output files for analysis of results.

A logic flow diagram for the structure of the input code is provided in Figure 3-3 and discussed below. The PHREEQC input code is provided in Appendix H.

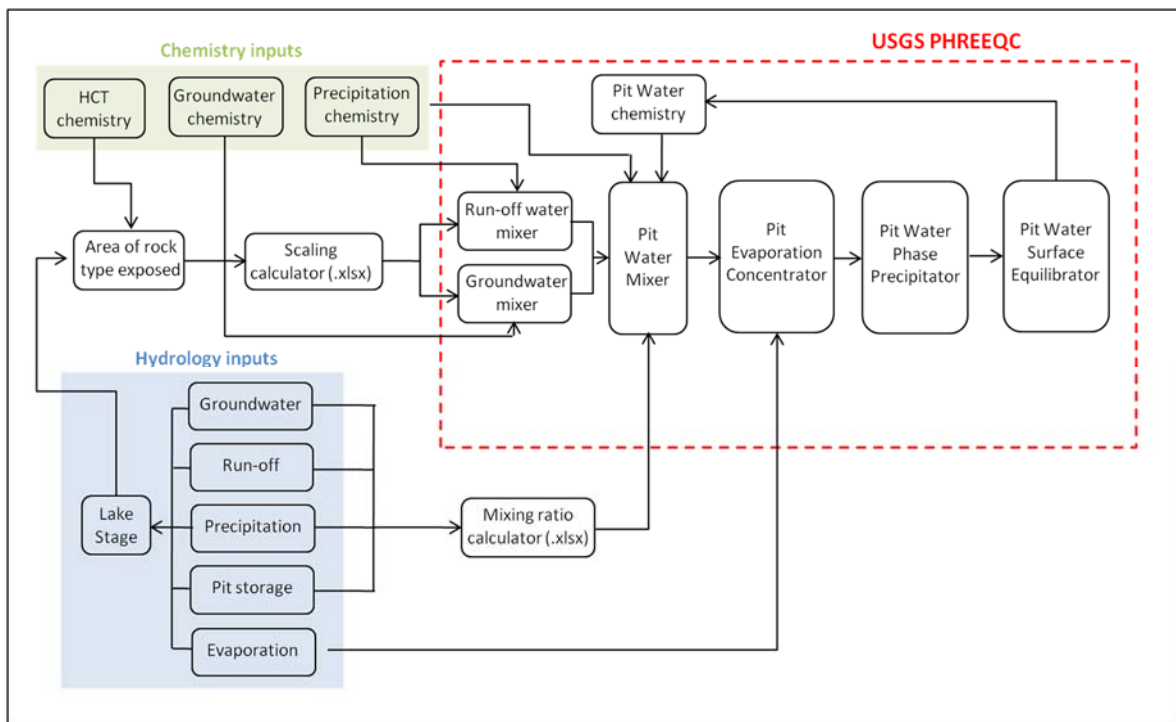


Figure 3-3: Copper Flat Pit Lake Model Execution Mechanics

The steps in the modeling process include the following items:

1. Define run-off water input specific to each exposed rock type. The run-off solution chemistries are comprised of scaled kinetic test cell leachate concentrations for each material type. These leachates are scaled to the water:rock ratio from the cell to the field based on the estimated presence of fractures in the wallrock and the thickness of the reaction rind.
2. Define the run-off solution mixing ratios. Mixing ratios are based on the amount of each material type that is sub-aerially exposed in the pit high wall at each time step.
3. Define the groundwater input. Groundwater chemistry is based on a mass addition function that combines the existing mass found within the groundwater with the mass of solute (per unit surface area and rock mass) released in the kinetic tests for specific material types exposed in the final pit walls. This is scaled to the water:rock ratio from the cell to the field, based on the estimated thickness of the reaction rind within the fractured wallrock.
4. Define groundwater solution mixing ratios based on the exposed surface area for each material type within the pit wall below the pit lake surface (i.e., within the submerged pit wallrock). As with the run-off mixing ratio, this ratio is dependent on the pit lake elevation and changes at each simulated time step.
5. Define precipitation water chemistry based on representative chemical analyses of rainwater.
6. Perform a master mixing calculation where run-off waters, groundwater, atmospheric precipitation and existing pit lake waters are mixed in ratios defined by the site-wide water balance for each time step.
7. Evapoconcentration. The resulting pit water is concentrated by a factor equivalent to the calculated evapoconcentration determined by the site-wide water balance for each determined time step. A fixed percentage of water is removed as a reverse titration of water. At the end of each titration, the volume of water is readjusted to one liter.
8. Equilibrate and precipitate. Once mixed, the model is equilibrated with atmospheric gases and select mineral phases are allowed to precipitate at the calculated pH, with pE fixed at a subatmospheric value equal to 12 minus pH. This represents a transitional equilibrium between mixed pit lake water and the atmosphere and is the most likely scenario based on the conceptual model.
9. Calculate sorption. After mineral precipitation, trace elements were allowed to adsorb onto iron oxyhydroxides (i.e., ferrihydrite). The total mass of ferrihydrite is equivalent to the mass predicted to be generated during the previous reaction step. This assumption is conservative in that it does not account for sorption to other minerals such as aluminum oxide or clay, or to iron oxides present in the pit wallrock.
10. Save chemistry for the next time step. At the end of each time step, the predicted pit water chemistry is exported to a spreadsheet for analysis.
11. The model was terminated after sufficient iterations to simulate water quality over a 100-year filling period.

3.4 Mineral and Gas Phase Equilibration

For the purpose of the Copper Flat geochemical models, it was assumed that any run-off, groundwater and precipitation entering the pit would mix evenly and completely. Under these circumstances the solutes in these waters will react with each other and may form chemical precipitates if the concentrations and geochemical conditions (Eh, pH, pCO₂, pO₂, and ionic strength) allow super saturation to occur. The geochemical models required the specification of a number of equilibrium phases that were allowed to precipitate if they become oversaturated. The suite of minerals chosen was based on the geology and mineralization of the deposit, an understanding of the types of minerals commonly observed in waste rock leachates and an assessment of mineral phases that were close to saturation based on the initial model iterations.

The relative saturation of all minerals was calculated by comparing the calculated concentration of dissolved ionic pairs with their theoretical thermodynamic limit. Where these values were equal, the saturation index was zero and the solution was said to be at equilibrium with that mineral. At equilibrium, any amount of the mineral that dissolves will precipitate to maintain the relative solute: mineral balance. The target saturation index was set to zero and the minerals that were allowed to form in the geochemical model are given in Table 3-2. These precipitates will sink to the bottom of the pit lake and be removed from future chemical interactions as a sediment layer accumulates on the pit bottom. The precipitated mineral phases are unlikely to re-dissolve unless the pH or redox conditions of the pit lake change substantially. As such, the model assumes that precipitated mineral phases are removed from the system and that subsequent re-dissolution of these phases does not occur. Sulfide mineral reactions are already accounted for in the model because HCT data were used as inputs. The HCT test provides an estimate of long-term accelerated rates of elemental release as a result of oxidation reactions, including sulfide mineral oxidation. Kinetic data for sulfide mineral phases are also limited, with data generally being limited to silicate mineral phases. Further, in evaluating long term changes to water chemistry it is reasonable to assume thermodynamic equilibrium will be attained by the system and as such the approach taken in this study is valid.

Table 3-2: Equilibrium Phases Included in the Pit Lake Geochemical Model

Equilibrium phase*	Ideal formula	Rationale for inclusion in PHREEQC model
Alunite	$\text{KAl}_3(\text{SO}_4)_2(\text{OH})_6$	Mineral observed at Copper Flat (SRK, 1996; 1997)
Anhydrite	CaSO_4	Close to saturation in initial model runs.
Barite	BaSO_4	Primary control on barium at neutral to alkaline pH (Eary, 1999). Mineral observed in Copper Flat mineralogical study (SRK, 2014b)
$\text{Ba}_3(\text{AsO}_4)_2$	$\text{Ba}_3(\text{AsO}_4)_2$	Close to saturation in initial model runs.
Brochantite	$\text{Cu}_4^{2+}(\text{SO}_4)(\text{OH})_6$	Primary control on copper at neutral to alkaline pH (Eary, 1999). Mineral observed at Copper Flat (SRK, 1996; 1997).
Brucite	$\text{Mg}(\text{OH})_2$	Close to saturation in initial model runs.
Calcite	CaCO_3	Primary control on alkalinity at neutral to alkaline pH (Eary, 1999). Mineral observed at Copper Flat (SRK, 1996; 1997)
CaMoO_4	CaMoO_4	Close to saturation in initial model runs.
$\text{CaSeO}_3 \cdot 2\text{H}_2\text{O}$	$\text{CaSeO}_3 \cdot 2\text{H}_2\text{O}$	Close to saturation in initial model runs.
Carnotite	$\text{K}_2(\text{UO}_2)_2(\text{VO}_4)_2 \cdot \text{H}_2\text{O}$	Close to saturation in initial model runs.
Chrysotile	$\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$	Close to saturation in initial model runs.
$\text{Cd}(\text{BO}_2)_2$	$\text{Cd}(\text{BO}_2)_2$	Close to saturation in initial model runs.
Cr_2O_3	Cr_2O_3	Close to saturation in initial model runs.
CuMoO_4	CuMoO_4	Close to saturation in initial model runs.
Cu_2Se (alpha)	Cu_2Se (alpha)	Close to saturation in initial model runs.
Epsomite	$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	Close to saturation in initial model runs.
Ferrihydrite	$5\text{Fe}_2\text{O}_3 \cdot 9\text{H}_2\text{O}$	Major control on iron. Thermodynamic properties well defined (Dzombak and Morel, 1990).
Fluorite	CaF_2	Primary control on fluoride (Eary, 1999). Mineral observed in Copper Flat mineralogical study (SRK, 2014b)
Gummite	UO_3	Close to saturation in initial model runs.
Gypsum	$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	Primary control on sulfate (Eary, 1999). Observed in significant quantities around existing pit lake (SRK, 1996; 1997; 2014b).
HgSe	HgSe	Close to saturation in initial model runs.
$\text{Mg}_3(\text{PO}_4)_2$	$\text{Mg}_3(\text{PO}_4)_2$	Close to saturation in initial model runs
Mirabilite	$\text{NaSO}_4 \cdot 10\text{H}_2\text{O}$	Mineral observed at Copper Flat (SRK, 1996; 1997)
MnSeO_3	MnSeO_3	Close to saturation in initial model runs.
NiCO_3	NiCO_3	Primary control on nickel at neutral to alkaline pH
NiMoO_4	NiMoO_4	Close to saturation in initial model runs.
$\text{Ni}(\text{OH})_2$	$\text{Ni}(\text{OH})_2$	Close to saturation in initial model runs.
$\text{Ni}_3(\text{AsO}_4)_2 \cdot 8\text{H}_2\text{O}$	$\text{Ni}_3(\text{AsO}_4)_2 \cdot 8\text{H}_2\text{O}$	Close to saturation in initial model runs.
Otavite	CdCO_3	Primary control on cadmium at neutral to alkaline pH (Eary, 1999)
PbMoO_4	PbMoO_4	Close to saturation in initial model runs.
Rutherfordine	UO_2CO_3	Close to saturation in initial model runs.
SbO_2	SbO_2	Close to saturation in initial model runs.
Schoepite	$\text{UO}_2(\text{OH})_2 \cdot \text{H}_2\text{O}$	Close to saturation in initial model runs.
Sepiolite	$\text{Mg}_4\text{Si}_6\text{O}_{15}(\text{OH})_2 \cdot 6\text{H}_2\text{O}$	Close to saturation in initial model runs.
SiO_2 (am-ppt)	SiO_2	Close to saturation in initial model runs.
Tyuyamunite	$\text{Ca}(\text{UO}_2)_2\text{V}_2\text{O}_8(5-8)\text{H}_2\text{O}$	Close to saturation in initial model runs.
U_3O_8	U_3O_8	Close to saturation in initial model runs.
UO_3	UO_3	Close to saturation in initial model runs.
$\text{UO}_2(\text{OH})_2$ (beta)	$\text{UO}_2(\text{OH})_2$ (beta)	Close to saturation in initial model runs.
ZnMoO_4	ZnMoO_4	Close to saturation in initial model runs.

3.5 Adsorption

In solution, trace element concentrations are mostly controlled by adsorption onto common mineral phases or are removed from solution through a process of co-precipitation. The Copper Flat pit lake models assumed that trace metals may be removed from solution via sorption onto freshly generated mineral precipitates such as iron oxides. Sorption is likely to represent an important metal removal mechanism at circum-neutral to moderately alkaline pH, with many metal ions sorbing more effectively under these pH conditions. Ferrihydrite ($5\text{Fe}_2\text{O}_3 \cdot 9\text{H}_2\text{O}$) was selected as a sorption surface because it is a common sorption substrate in oxygenated natural waters and because the trace element sorption thermodynamic properties of these reactions are well defined by numerous empirical studies. Adsorption of soluble phases to hydrous ferric oxides (HFO) is highly pH dependent as is the solubility of HFO itself. Below a pH of around 4.5, only minimal sorption of most dissolved metal species is observed (Stumm and Morgan, 1996). The mass of ferrihydrite used in the models was assumed to be identical to the mass of the mineral phase ferrihydrite precipitated in the previous model reaction step and is controlled by the chemistry of the system. The model assumes that the ferrihydrite is characterized by both strong (HFO_s) and weak (HFO_w) surface adsorption sites. In order to be consistent with the properties of ferrihydrite published by Dzombak and Morel (1990) the geochemical models assumed a surface site density of 0.2 moles of weak sites and 0.005 moles of strong sites per mole of ferrihydrite. Because the future pit lake predictions start from time zero (i.e., cessation of mining), there will be no prior pit lake in the void at that point. Any HFO/ferrihydrite will therefore originate from the precipitation of oversaturated mineral phases that develop upon solution mixing.

As with mineral phase precipitation, the adsorbed mass of trace elements removed through this mechanism is assumed in the conceptual model to be permanently removed from the system following incorporation and co-precipitation with the HFO phase. In the case of a major shift in pH or redox conditions, it is possible that material adsorbed to the HFO surface may be released. However, based on the HCT results available to date, a major shift in pH conditions is not likely.

3.6 Evapoconcentration

The Copper Flat pit lake is an evaporative sink, both in its current state and under future post-operational conditions (JSAI, 2017b). There will be no outflow to groundwater and the only mechanism of water loss will be through direct evaporation from the pit lake surface. As such, solutes within the pit lake will evapoconcentrate and the only mechanism for removing solutes is the formation and settling of chemical precipitates and the adsorption of trace elements onto these particulates.

3.7 Treatment of Analytical Reporting Limits

The Copper Flat pit lake models incorporate groundwater and humidity cell data that have been collected over extended periods of time, including both detectable elemental concentrations and constituent concentrations that may be below analytical reporting limits (ARL). The treatment of analytical reporting limits within the geochemical model has important implications for the model results, particularly where the data are scaled to address the difference in solid:liquid ratio between the laboratory-scale test and field conditions.

When analysis of the humidity cell leachates identified certain elements to be below the ARL, the reporting limit was adjusted to 10% of the reported limit for the purpose of calculating the average release rate for the model input. Where a constituent was consistently below the ARL throughout the course of the humidity cell testwork, the constituent was excluded from the model input for that material type to limit overstating constituent concentrations that may arise as an artifact of the modeling exercise from the scaling of humidity cell data to field conditions or from equilibration of groundwater source data that are below ARLs.

Nitrate was excluded from the geochemical predictions due to the lack of mineralogical controls in PHREEQC code. The exemption of nitrate is supported by the data as this parameter is consistently below the ARL in both the humidity cell effluent leachates and the groundwater surrounding the pit. Nitrate is also below the ARL in the existing pit lake, supporting the assumption that this parameter is unlikely to be a problem during future operations.

3.8 Model Assumptions and Limitations

The pit water quality predictions presented herein are considered the best representation of likely future water quality associated with the Copper Flat pit lake. However, it is recognized that there are a number of assumptions and limitations associated with the predictive calculations including:

- The models have been developed using site-specific geochemical, hydrochemical, geological, hydrogeological and mine plan information. Therefore, changes in operational decisions may result in a change in the future pit lake water quality at Copper Flat.
- The models assume that groundwater and surface water input chemistry can be simulated using laboratory kinetic (humidity cell) leachate chemistries, which are appropriately scaled to field conditions. The reactive surface area, ratio of water-to-rock and flushing rates in laboratory tests are different from actual field conditions. Grain size is smaller in the kinetic and static test cells and the resulting surface area for reactivity is greater than field conditions. The laboratory test cells are operated at a higher water-to-rock ratio than would be expected in the field and are flushed more frequently, so that mineral-water reaction rates are enhanced. Because the future Copper Flat pit does not yet exist, field scale parameters cannot be measured, so scaling relies on published estimates of future groundwater flux and fracture density. These estimates and assumptions are supported by the geochemical model for the existing pit (Section 4), which shows good calibration to current conditions.
- Modeling was limited to predicting water quality within the pit lake for a 100-year time period. This length of time is not intended to imply that the pit lake geochemistry or hydrogeology for the natural fill scenario will achieve steady-state, hydrogeochemical equilibrium at 100-years.
- The models rely on an external database of thermodynamic constants for mineral phase precipitates and sorbed surface complexes. These thermodynamic constants are valid at 25°C and 1 atmosphere of pressure. The models do not consider the effects associated with the formation and precipitation of mineral species other than those specified. Due to kinetic constraints, a portion of the potentially oversaturated mineral phases will not actually precipitate. A select suite of minerals is therefore specified that are allowed to precipitate, based on relevance for the environment in question, site-specific knowledge, experience in evaluating kinetic constraints and relevance of key phases for given styles of mineralization, and literature review (Eary, 1999). The nature of the thermodynamic databases means that the constants for all major elements and a large number of trace elements are well understood and have been rigorously tested and verified. However, constants for certain parameters (for example vanadium, boron and nitrate) are not as well understood. As such, the mineralogical controls on these elements in PHREEQC are poorly defined, which may affect their precipitation (i.e., removal) from solution in the predictive calculations.
- The models assume atmospheric equilibrium with oxygen and carbon dioxide gas, with pH + pE equal to 12 (based on calculations by Baas-Becking et al., 1960 to define stability limits of natural waters).
- The models are limited to thermodynamic equilibrium reactions and do not simulate the effects of reaction kinetics and rates.
- The models are limited to inorganic reactions and do not take into account the complexities associated with biologically mediated reactions.

None of these limitations affect the ability to use model as intended, which is to assess potential future pit lake chemistry and evaluate the future environmental impacts of the Project.

3.9 Analysis of Model Input Variability

The various parameters that have been used as data inputs for the pit lake geochemical model have been assessed to determine their relative significance in influencing the model results. For the purpose of this exercise, each parameter has been assigned a qualitative value based on the degree to which it influences the final predicted solution chemistry:

- “Minor” represents less than 1% control on the final model output;
- “Moderate” represents between 1% and 10% control on the final model output; and
- “Significant” represents between 10% and 50% control on the final model output.

The results of this exercise are displayed in Table 3-3.

Table 3-3: Analysis of Pit Lake Model Input Variability

Category	Parameter	Assumptions / data used in model	Source	Control on final model results*
Hydrogeologic information	Pit lake water balances	Water balances provided by JSAI for the three model scenarios, including water elevation and surface area, groundwater inflows, direct precipitation, run-off and evaporation data.	JSAI, 2017	Significant. The water balances define the mixing ratios for the PHREEQC input solutions.
Chemical inputs	Groundwater chemistry	Baseline groundwater chemistry data from the ongoing monitoring program: average of data for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-22B and GWQ11-24B.	INTERA, 2012; JSAI, 2017a	Significant during the early years post-closure when groundwater is likely to represent the dominant solution input to the pit lake.
	Precipitation chemistry	Averaged precipitation chemistry from Gila Cliff Dwelling National Monument Meteorological Station (1985-2011)	NADP, 2012	Minor. The precipitation chemistry represents a near-pure solution chemistry. In the absence of site-specific data, published precipitation chemistry from this meteorological station in New Mexico is the best representation of precipitation chemistry in the area.
	HCT chemistry	Averaged HCT chemistry from the HCT programs.	SRK 2012; 2014b	Significant. The solutions generated by the HCT programs represent the main chemical inputs for the pit wall source terms.
	Water Supply well chemistry (rapid fill model only)	Groundwater quality data from water supply wells PW-1 and PW-3	JSAI, 2017c	Significant. The water supply well chemistry represents the largest solution contributor to the pit lake during the first six months of filling.
Geological information	Pit wall surface area and lithologic composition	Pit wall surface areas were calculated for each simulated time step using the geologic block model and 2017 MORP pit	SRK/ NMCC	Significant. The lithological composition of the pit wall defines the mixing ratios for the PHREEQC input solutions.
Geochemical model assumptions	Mass of pit wall rock available for reaction	Mass of future pit wall available for reaction was calculated assuming an oxidized rind of 0.04 feet thickness and a fractured zone of 1 feet thickness (with 10% fractures).	SRK/ NMCC	Moderate. The values were assigned based on communication with NMCC regarding future blasting practices for the Project and are considered a conservative estimate and are consistent with industry practice.
	Equilibrium/mineral phases	The equilibrium/mineral phases listed in Table 3-2 were used as input to the models	SRK	Moderate. Mineral precipitation will influence final solution chemistry. Equilibrium phases were selected based on knowledge of site-specific geologic and mineralogic conditions and were then verified and refined by calibrating with the existing pit lake chemistry.

* Minor: <1%
Moderate: 1 - 10%
Significant: 10 - 50%

3.10 Comparative Guidelines

The standards that apply to the post-mining Copper Flat pit water body are contained in the regulations MMD administers under the Mining Act; specifically “Performance and Reclamation Standards for New Mining Operations” at 19.10.6.603 NMAC. These MMD standards require that the pit water body comply to the following performance standard:

- Operations must be planned and conducted to minimize change in the hydrologic balance in both the permit and potentially affected areas; and
- Reclamation must result in a hydrologic balance similar to pre-mining conditions.

MMD must determine that the NMCC mine operating and reclamation plan complies with these standards before a mining permit can be issued. The mine plan must take into account the site-specific characteristics of the mining operation and the site in meeting the standards and requirements. The MMD regulations require that the permit area be reclaimed to a self-sustaining ecosystem appropriate for the life zone of the surrounding area following closure unless conflicting with the approved post-mining land use. Specifically, NMAC 19.10.6.603.C.(4), Hydrologic Balance states that the performance and reclamation standards identified in this subsection require that, if not in conflict with the approved post-mining land use, reclamation must result in a hydrologic balance similar to pre-mining conditions. Section 19.10.6.602.D.(13)(g)(v) of the regulations identifies the environmental baseline information required to establish pre-mining conditions and outlines the hydrologic and water quality data requirements for baseline data.

There are several site-specific factors to consider regarding the Copper Flat Project in determining what standards apply. First, the existing pit water body is and the future pit water body will be fully confined to private land. The two-acre catch bench at the 4900 ft amsl elevation of the pit ensures that the future pit lake remains on private property. The pit is and will be a hydraulic evaporative sink in the future, and, as such, is not a flow-through system (INTERA, 2012; JSAI, 2017b). As a result of being confined to private land and remaining a hydrologic sink, the current and future pit water body will not be a water of the state and the surface water standards the NMED Surface Water Quality Bureau (SWQB) administers will not apply to the pit water. Because the pit is and will be a hydraulic evaporative sink in the future, NMED Groundwater Quality Bureau (GWQB) standards are also not applicable to the future pit water body.

Therefore, the applicable standard for the future pit water body as provided by the MMD regulations will be “similarity”, NMCC must demonstrate that post-mining hydrologic conditions, i.e., the post-mining hydrologic balance is similar to the pre-mining hydrologic conditions. The MMD regulations do not contain a definition of “hydrologic balance. Nonetheless, Section 19.10.6.602.D.(13)(g)(v) requires that a determination be made of the probable hydrologic consequences of the operation and reclamation, including water quality. These two regulatory requirements are interpreted to require the NMCC demonstrate that the water quality of the future pit lake be similar to that of the pre-mining pit water quality and, thus, allow NMCC to demonstrate that the water quality hydrologic consequence is nil.

This report provides the required demonstration as to the similarity of the future pit lake water quality to present pit lake water quality. In this report, the pit lake predictive model results are compared to existing pit lake water quality to demonstrate that the anticipated post-mining water quality of the future pit is similar to pre-mining pit water body quality present at Copper Flat today. In addition, the existing pit water body has been previously studied by Aquatic Consultants, Inc. (Aquatic Consultants, 2014) and it has been determined that the environment within the existing water body does not reflect a natural lake environment. There are no fish in the existing pit water body and water quality reflects the mineralized nature of the surrounding pit walls. When mining is complete, the pit water body will re-form; the NMCC reclamation and closure plan is designed to leave the future pit water body in a condition similar to its current condition.

4 Existing Pit Calibration Model

Numerical predictions have been undertaken to model the current (i.e., existing) pit lake chemistry in order to calibrate and verify the future pit lake geochemical predictions. A water balance for the existing pit was provided to SRK by JSAI and this was coupled with the results of the HCT testwork and data relating to the existing pit wall geology to carry out numerical simulations of water quality in the existing pit lake.

4.1 Conceptual Model

A conceptual model for the existing pit lake at Copper Flat is provided in Figure 4-1. The inputs to the model are discussed in Sections 4.2 to 4.5 below.

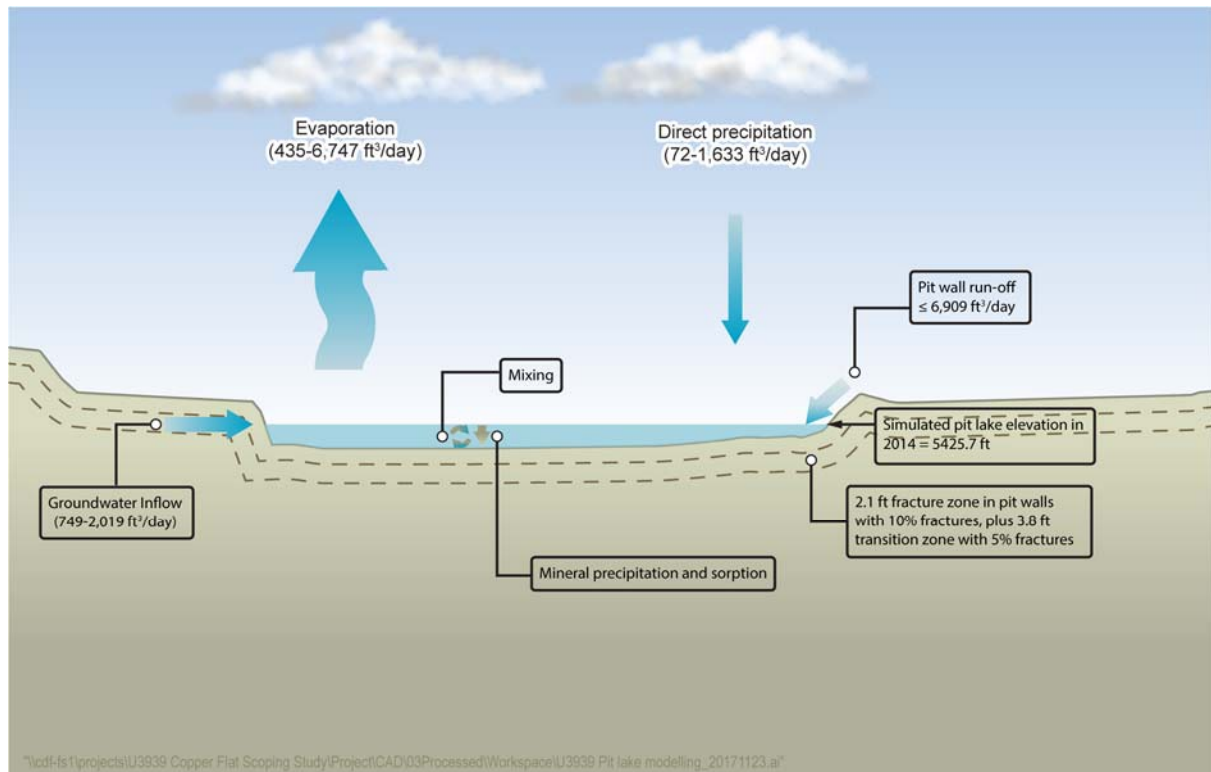


Figure 4-1: Existing Pit Conceptual Model

4.2 Pit Wall Surface Areas

The proportional surface areas of the main material types that are exposed in the existing pit walls have been calculated from the FS geologic block model. Material types have been delineated based on primary lithology, oxidation (redox) and mineralization (i.e., mineralized versus weakly/non-mineralized).

The three-dimensional surface areas used as input to the existing pit model are provided in Table 4-1 and are illustrated in Figure 4-2. This demonstrates that mineralized, oxidized quartz monzonite represents the dominant material type exposed in the existing pit walls.

Table 4-1: Pit Wall Surface Areas used in Existing Pit (Calibration) Model

Mineralization	Rock Type	Redox	Three-dimensional surface area	
			Square feet	%
Weakly/non-mineralized	Biotite Breccia	Oxide	88,213	8.5
		Sulfide (non-ox.)	5,073	0.5
	Quartz Monzonite	Oxide	171,155	16.5
		Sulfide (non-ox.)	27,011	2.6
Mineralized	Biotite Breccia	Oxide	118,474	11.4
		Sulfide (non-ox.)	153,348	14.8
	Quartz Monzonite	Oxide	291,547	28.1
		Sulfide (non-ox.)	184,085	17.1
Total			1,038,906	100%

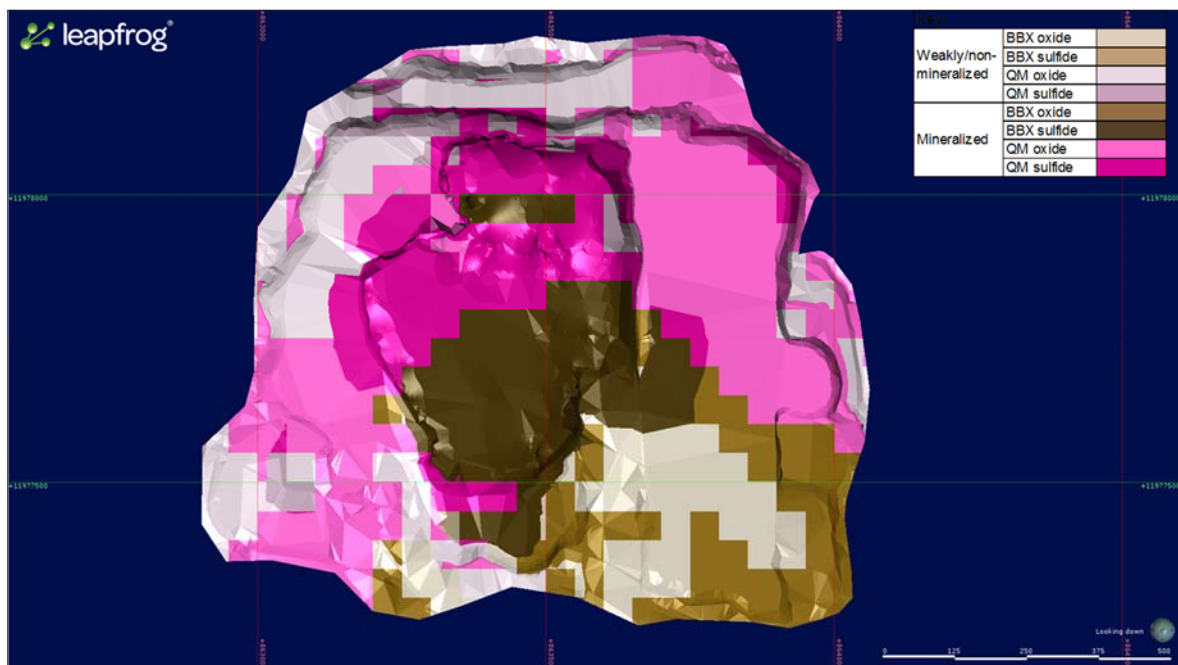


Figure 4-2: Material Types Exposed in Existing Pit (Calibration) Model

4.3 Calculation of Pit Wall Rock Available for Leaching

During Quintana's operations, the existing pit at Copper Flat did not reach its final configuration and the pit walls were not prepared using pre-split drilling and smooth wall blasting. Therefore, the existing pit wall has significantly deeper fracturing than predicted for the future final pit wall from the proposed operation. The literature demonstrates that open pit wall blast damage for granite, granodiorite and quartz monzonite rocks extends 2 to 4 ft in depth when assessing effects from production type blasting (e.g., Carroll and Scott, 1966; Siskind and Fumanti, 1974; Kelsall et al., 1984) (Appendix F).

For the existing pit lake scenario, an estimate of the reactive rind thickness is provided by results from a U.S. Bureau of Mines experimental study on fracturing produced in the vicinity of large-diameter blast holes in Lithonia granite (Siskind and Fumanti, 1974). From this study, a fractured zone ('fracture zone') was identified that extends approximately 2 feet into the pit wall and a second zone ('transition zone') characterized by a lesser degree of fracturing extends from approximately 2 to 4 feet (Figure 4-3). Oxygen infiltration extends no further than the predicted depth of fracturing of 2

feet, and that the percent of the rim rock mass fractured during mining will range from 10% within the fracture zone to 5% within the transition zone. This estimate of fracturing is supported by Atchison (1968). An oxidized rind of 0.04 feet thickness has also been assumed in the pit walls. This scenario is considered a conservative input of pit wall fracturing based on the information provided in Appendix F.

Using these assumptions for the fracture zone, transition zone and oxidized rind, the reactive mass (R_m) of each material type in the pit wall was calculated as:

$$R_m = (S \times F_{FZ} \times L_{FZ} \times D) + (S \times F_{TZ} \times L_{TZ} \times D) + (S \times L_{OR} \times D)$$

Where:

S is the three-dimensional pit wall surface area of the given material type in square meters (defined by the geological block model; see Table 4-1);

F_{FZ} is the fracture density in the fracture zone (10%);

L_{FZ} is the thickness of the fracture zone in meters (0.64m);

F_{TZ} is the fracture density in the transition zone (5%);

L_{TZ} is the thickness of the transition zone in meters (1.16m);

L_{OR} is the thickness of the oxidized rind in meters (0.012m);

D is the rock density in kg/m^3 (2700 kg/m^3 , Young and Olhoeft, 1976).

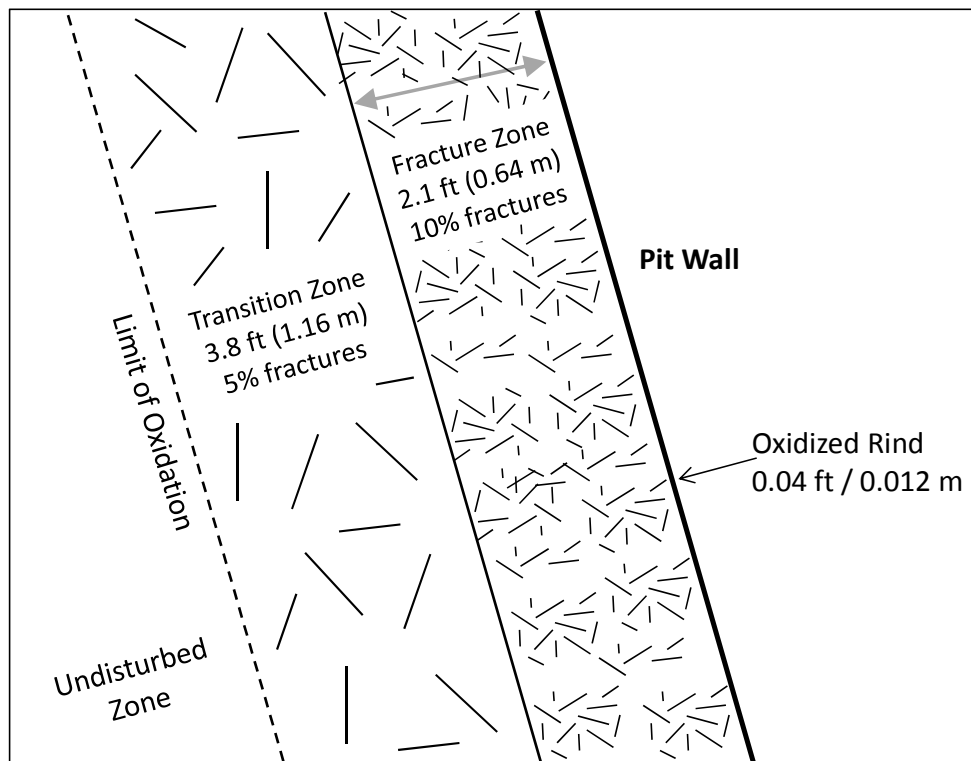


Figure 4-3: Existing Pit Wall Conceptual Model

4.4 Water Balance

A pit lake water balance for the existing pit lake was provided to SRK by JSAI. The water balance data used in the existing pit lake predictions are summarized in Figure 4-4 and Figure 4-5 below. Figure 4-4 shows the simulated pit lake elevation with time and Figure 4-5 shows the simulated inflows and outflows to the existing pit.

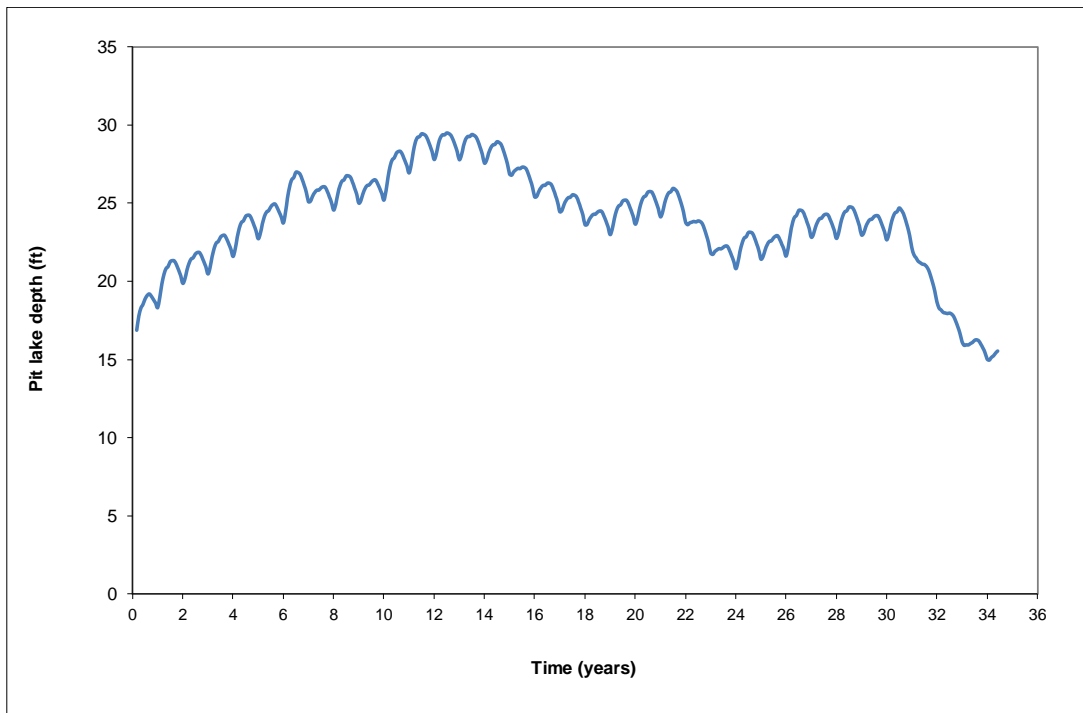


Figure 4-4: Simulated Water Level for the Existing Pit Lake

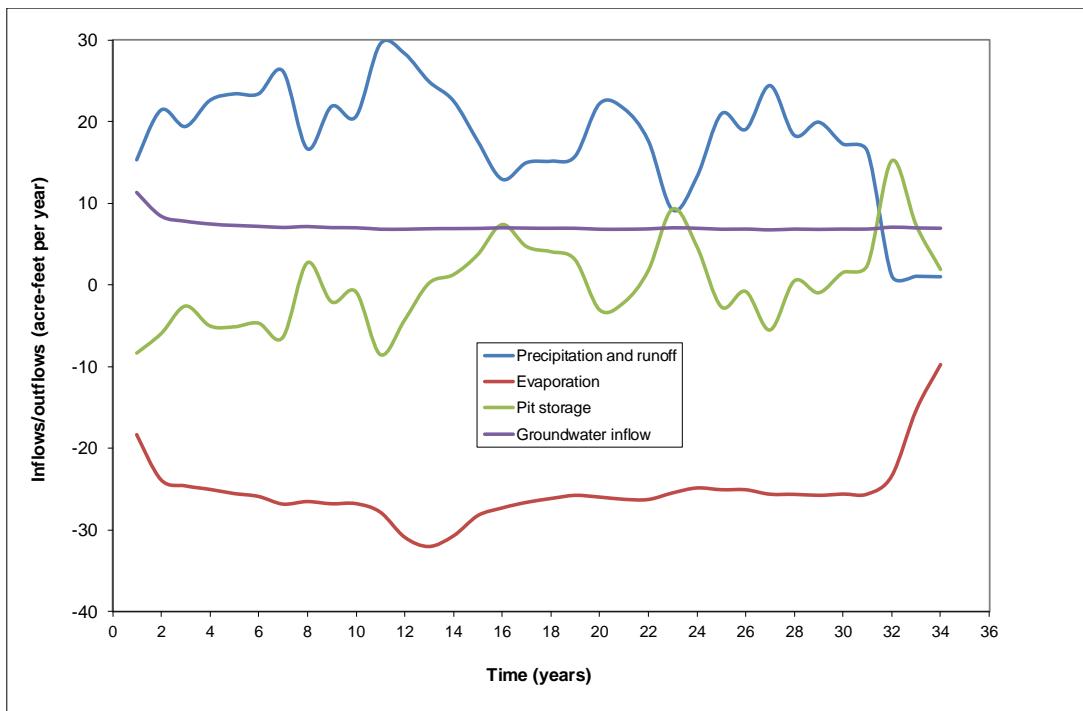


Figure 4-5: Existing Pit Lake Inflows/Outflows

4.5 Solution Inputs

4.5.1 Precipitation Chemistry

The primary wall rock lixiviant for the pit high walls in both the existing pit and the future pit is assumed to be rainwater (i.e. meteoric precipitation). Representative precipitation chemistry data were obtained from monthly monitoring carried out between 1985 and 2011 at the Gila Cliff Dwellings National Monument meteorological station, Catron County, New Mexico (NADP, 2012) (Figure 4-6). In the absence of any site-specific precipitation chemistry, this is considered the most representative precipitation chemistry available for use in both the existing and future pit lake models.

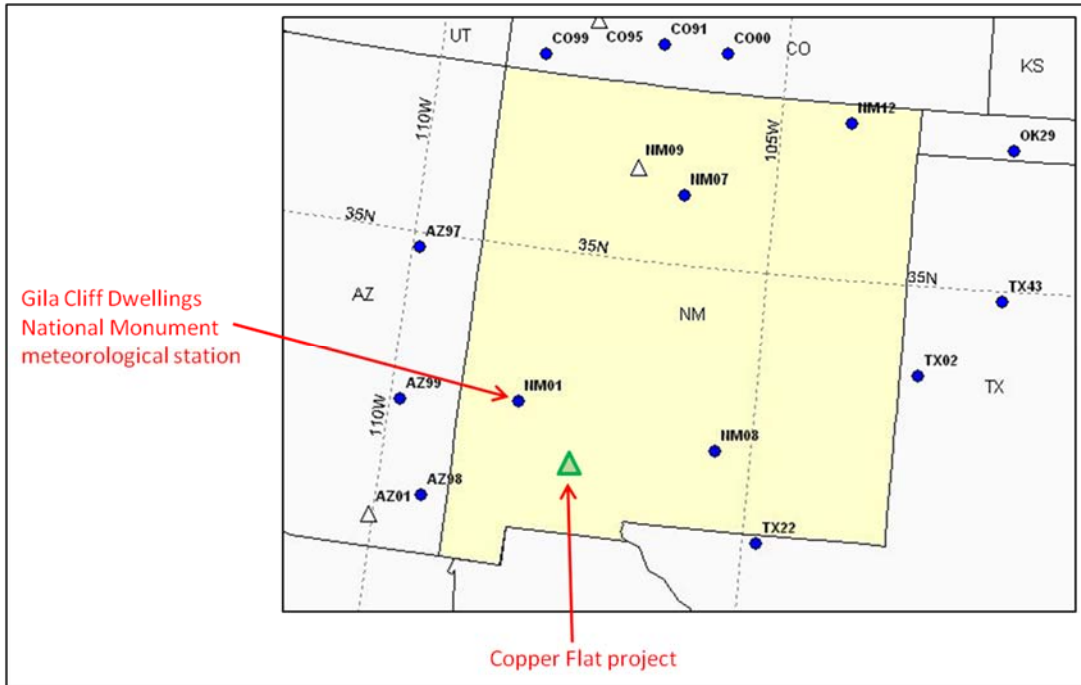


Figure 4-6: Location of Gila Cliff Dwellings National Monument Meteorological Station

4.5.2 Groundwater Chemistry

Representative groundwater chemistry data for the existing pit lake model were obtained from the historical data compiled by JSAI and NMCC. There are four sets of piezometers surrounding the existing pit that have been sampled, with two piezometer sets representing groundwater in the andesite (GWQ96-22[A,B] and GWQ96-23[A,B]), and two in the quartz monzonite (GWQ11-24[A,B] and GWQ11-25[A,B]). GWQ96-23(A,B) is located at the transition between andesite and quartz monzonite; however the water quality is similar to GWQ96-22(A,B) and indicative of andesite.

The results from wells GWQ96-22(A,B), GWQ96-23(A,B), GWQ11-24(B) and GWQ11-25(B) were averaged and used as input to the existing pit lake geochemical model (Table 4-2). Wells GWQ11-24A and GWQ11-25A were not used in the model input as they may have been affected by oxidation of sulfides in fractures during well development and may not be representative of groundwater reporting to the open pit. Furthermore, GWQ11-25A represents a localized and isolated fracture system recharged by oxygenated meteoric water that is not connected to the open pit (JSAI, 2017a). For these reasons, data from GWQ11-24(A) and GWQ11-25(A) were not considered as part of the groundwater inflow to the existing pit.

Further information on how the groundwater chemistry data were derived is provided in the JSAI technical memorandum in Appendix D.

4.5.3 Wall Rock Chemistry

Source term solutions for material types exposed in the existing pit walls at Copper Flat were developed from the results of site-specific HCT testing conducted as part of the SRK (2012) geochemical characterization program that were scaled to field conditions. The application of a scaling factor is necessary because laboratory tests are operated at a higher water-to-rock ratio than would be expected in the field, meaning that mineral-water reaction rates are enhanced in the laboratory. The scaling factor is based on site-specific information relating to the pit water balance, geological model, pit wall fracturing and wall rock density.

The reactive mass (R_m) of pit wall rock available for chemical weathering reactions in both the unsaturated high wall and the submerged pit wall was calculated using the methodology outlined in Section 4.3. The reactive mass for each material type was coupled with the pit water balance to determine the changes in run-off and groundwater chemistry as any water that interacts with the pit walls migrates through the reactive fracture zones. This is demonstrated by the equation below:

$$C_i = \frac{r_i \cdot R_m}{Q}$$

Where:

C_i represents the predicted concentration (in mg/L) of element i ;

r_i represents the average release rate of element i in mg/kg/week in the humidity cell tests;

R_m indicates the pit wall reactive mass in kg; and

Q represents either the rate of groundwater inflow into the pit or the rate of pit wall run-off in L/week.

The modified chemistry of the precipitation from these pit rim reactions was then used as the source term contribution to the pit. Separate source terms were developed for each of the material types exposed in the current pit walls (see Table 4-1).

Different HCT inputs were used for trace elements and major ions to represent the different geochemical processes that control their release. Soluble salts are important in the input of major elements to the existing lake and, as such, all weeks of humidity cell data are needed for a valid prediction. By contrast, the release of trace elements is predominantly associated with longer term weathering processes, possibly sulfide oxidation and as a result the initial HCT flush information does not contribute sufficiently. As such, an average of all weeks of humidity cell data were used for major ions (calcium, magnesium, sodium, potassium, aluminum, iron, manganese, chloride, sulfate, fluoride, bicarbonate) and an average of steady-state humidity cell data (i.e., minus the first 20 weeks of testing) were used for trace elements (silver, arsenic, boron, barium, cadmium, cobalt, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, uranium, vanadium and zinc).

The solutions used as inputs to the geochemical model are provided in Table 4-2.

Table 4-2: Groundwater, Wall Rock and Precipitation Chemistry used as Input to the Existing Pit Model

Parameter		Units	Precipitation chemistry	Groundwater chemistry	Wall rock chemistry							
					Mineralized				Weakly/non-mineralized			
					Biotite breccia oxide	Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide	Biotite breccia oxide	Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide
			<i>Gila Cliff Dwellings National Monument meteorological station</i>	<i>Average of wells GWQ96-22(A,B), GWQ96-23(A,B), GWQ11-24(B) and GWQ11-25(B).</i>	<i>Average of HCT SRK 0854</i>	<i>Average of HCTs 604767, 604787, 604811, 604854, 604862, 604867 and 605033</i>	<i>Average of HCT SRK 0867</i>	<i>Average of HCTs 604652, 604606, 604653, 604656 and 604669</i>	<i>Average of HCT SRK 0872</i>	<i>Average of HCTs 604811, 604854, 604862, 604867 and 605033</i>	<i>Average of HCT 604569</i>	<i>Average of HCTs 604673 and 605153</i>
pH	pH	s.u	4.93	6.91	5.22	7.86	6.9	7.95	6.51	7.91	7.85	5.74
HCO ₃	Bicarbonate	mg/L		316	0.47	45	9.27	38.2	6.4	54.9	22.6	12.3
Ag	Silver	mg/L		0.009	-	-	-	-	-	-	-	-
Al	Aluminum	mg/L		0.12	0.39	0.005	0.07	0.008	0.08	0.006	0.03	0.04
As	Arsenic	mg/L		0.0023	0.0011	0.00034	-	-	0.00095	0.00025	0.00025	-
B	Boron	mg/L		0.136	-	0.005	0.0047	0.0049	-	0.0049	0.005	0.005
Ba	Barium	mg/L		0.089	0.012	0.0091	0.0075	0.012	0.01	0.0062	0.0005	0.035
Ca	Calcium	mg/L	0.21	336	14.1	24.1	25.9	19.5	27.8	28	9.05	6.32
Cd	Cadmium	mg/L		0.001	0.0013	-	0.00005	-	0.00008	-	0.00005	0.00034
Co	Cobalt	mg/L		0.01	0.0009	-	0.0005	-	0.0005	-	-	-
Cr	Chromium	mg/L		0.0066	-	-	-	-	-	-	0.00025	-
Cu	Copper	mg/L		0.0037	18.2	0.0085	0.0056	-	0.0034	0.013	0.0025	0.38
F	Fluoride	mg/L		4.6	0.25	1.09	0.56	0.81	0.33	1.2	0.74	0.43
Fe	Iron	mg/L		1.48	0.7	0.001	0.1	0.001	0.1	0.001	0.001	0.004
Hg	Mercury	mg/L		0.000002	-	-	-	-	-	-	-	0.00002
K	Potassium	mg/L	0.03	4.39	1.42	3.75	1.08	3.84	0.48	4.43	2.5	1.84
Mg	Magnesium	mg/L	0.02	57.8	1.44	3.97	2.24	3.51	1.16	4	2.54	0.98
Mn	Manganese	mg/L		2.47	0.32	0.07	0.47	0.13	0.18	0.04	0.04	0.02
Mo	Molybdenum	mg/L		0.0119	-	0.0052	0.0051	0.0074	0.079	0.0056	0.0005	0.002
Na	Sodium	mg/L	0.08	115	0.61	2.41	0.93	3.46	0.45	2.6	3.23	1.69
Ni	Nickel	mg/L		0.0125	0.0005	-	0.0005	-	0.0005	-	0.0005	-
Pb	Lead	mg/L		0.0025	0.0034	-	-	0.00012	0.00012	-	0.00012	0.0016
Sb	Antimony	mg/L		0.0009	-	-	0.003	-	0.00051	-	-	-
Se	Selenium	mg/L		0.0022	0.00023	0.00031	0.00024	0.00032	0.00024	0.00035	0.00025	0.00025
U	Uranium	mg/L		0.0015	0.0013	0.0033	0.0005	0.0012	0.0013	0.0017	0.0005	0.0046
V	Vanadium	mg/L		0.0009	0.0005	0.001	0.0005	0.0005	0.0005	0.0015	0.0005	0.0005
Zn	Zinc	mg/L		0.08	0.088	0.0027	0.0016	0.0046	0.0013	0.0014	0.0023	0.015
SO ₄	Sulfate	mg/L	0.86	954	99.6	44.5	72.3	38.7	74.4	47.3	21.6	14.9
Cl	Chloride	mg/L	0.12	34	0.69	1.3	0.74	2.17	0.6	1.34	1.07	0.71

- Indicates parameter was uniformly below ARLs in the HCT effluent leachates and was excluded from the PHREEQC model input for the specified material type

4.6 Results

The results of the existing pit calculations are shown in Table 4-3. This shows predicated pit lake chemistry in 2014 (i.e., the final point in the simulated water balance). The predicted chemistry has been compared to average measured chemistry in the existing pit lake between 2010 and 2013 and also the range of chemistry observed during this time period. The PHREEQC model only predicts chemistry at a fixed point in time and does not account for seasonal or longer-term variations in chemistry that may occur. As such, comparison of predicted pit lake chemistry to the range of measured chemistry is likely a more reliable indicator of the accuracy of the model in predicting future chemical conditions.

The model results show good calibration for pH, bicarbonate, calcium, aluminum, cobalt, chromium, copper, mercury, manganese, sodium, nickel, selenium, uranium, zinc and TDS. Predicted concentrations of these constituents are within the range of chemistry measured in the existing pit lake between 2010 and 2013. This demonstrates that they can be predicted with a good degree of accuracy for the future pit lake. In comparison, a few constituents are either positively or negatively-biased in the pit lake calibration model.

Boron, potassium, molybdenum and antimony are slightly overestimated by the PHREEQC model. This likely relates to a combination of factors, including: evapoconcentration effects within the PHREEQC model and a lack of appropriate mineralogical controls in the thermodynamic code. This means the mechanisms that are responsible for removal of these constituents from solution in the existing pit lake (e.g., adsorption only clays or precipitation of mineralogical phases that are not included in the minteq database) are not accounted for in the geochemical model, resulting in concentrations of these constituents being artificially increased over time.

By contrast, concentrations of arsenic, barium, cadmium, fluoride and iron are slightly underestimated by the PHREEQC model. For iron, this underestimate likely relates to the fact that PHREEQC reports only truly dissolved phases. It is possible that iron in the existing pit lake may exist in the form of fine-grained colloids that pass through a 0.45 µm filter, which explains the high measured concentrations of iron in the existing pit lake. This has implications for arsenic concentrations due to the strong affinity of arsenic for Fe-oxyhydroxides (Bowell, 1994). The model predicts that arsenic concentrations will primarily be controlled by adsorption onto Fe-oxyhydroxides; however the calculations assume thermodynamic equilibrium and it may be that speciation of arsenic in the lake is more complex than predicted and adsorption may be limited as a result.

For fluoride and barium, the lower concentrations predicted by the model may relate to an over-estimate of fluorite and barite precipitation. Although both of these minerals have been observed around the existing pit lake at Copper Flat and are likely to form based on the predicted chemistry, the model may overestimate the mass of these minerals that will precipitate, resulting in lower predicted concentrations.

Despite these minor differences in predicted and measured concentrations for a small number of parameters, the existing pit lake model shows that the majority of parameters can be predicted with a good degree of accuracy for the future pit lake.

Table 4-3: Existing Pit (Calibration) Model Results

Parameter		Units	Average measured chemistry in existing pit lake (2010 - 2013)	Range of measured chemistry in existing pit lake (2010 - 2013)	PHREEQC predicted chemistry for existing pit lake
pH	pH	s.u.	7.30	6.0 – 7.9	7.94
pe	pe	s.u.	-	-	4.84
Alk	Alkalinity as CaCO ₃	mg/L	-	-	65.1
HCO ₃	Bicarbonate	mg/L	49.7	<20 – 123	37.8
Ag	Silver	mg/L	<0.005	<0.005	0.002
Al	Aluminium	mg/L	4.58	<0.02 – 82.6	0.02
As	Arsenic	mg/L	0.003	<0.001 – 0.0077	0.0001
B	Boron	mg/L	0.17	0.13 – 0.19	0.85
Ba	Barium	mg/L	0.012	<0.01 – 0.014	0.003
Ca	Calcium	mg/L	567	453 – 670	461
Cd	Cadmium	mg/L	0.055	0.038 – 0.064	0.007
Co	Cobalt	mg/L	0.29	0.049 – 0.49	0.06
Cr	Chromium	mg/L	<0.006	<0.006	0.0001
Cu	Copper	mg/L	2.21	<0.006 – 26.5	0.03
F	Fluoride	mg/L	18.4	15 – 29.8	4.74
Fe	Iron	mg/L	0.12	<0.02 – 1.3	0.0001
Hg	Mercury	mg/L	<0.0002	<0.0002	0.0002
K	Potassium	mg/L	33	24 – 49	397
Mg	Magnesium	mg/L	720	570 – 1120	524
Mn	Manganese	mg/L	41	28 - 48	38.7
Mo	Molybdenum	mg/L	0.02	<0.015 – 0.025	0.29
Na	Sodium	mg/L	871	604 – 1400	923
Ni	Nickel	mg/L	0.058	0.039 – 0.069	0.06
Pb	Lead	mg/L	0.011	<0.005 – 0.026	0.001
Sb	Antimony	mg/L	<0.001	<0.001	0.13
Se	Selenium	mg/L	0.027	0.013 – 0.059	0.03
U	Uranium	mg/L	0.12	0.11 – 0.12	0.10
V	Vanadium	mg/L	<0.05	<0.05	0.006
Zn	Zinc	mg/L	4.29	0.78 – 7.36	2.05
SO ₄	Sulfate	mg/L	6,128	5,200 – 8,690	5,304
Cl	Chloride	mg/L	451	340 – 714	224
TDS	Total Dissolved Solids	mg/L	9,188	7,770 – 14,800	7,918

5 Unreclaimed Pit Model with Natural Fill

5.1 Conceptual Model

The unreclaimed model assumes that dewatering will occur during mining operations and limited water will pond within the pit itself. At the end of open pit mining operations, dewatering will cease and a pit lake will ultimately form by natural refill as a result of inflow of groundwater into the pit, direct precipitation onto the pit lake, run-off from the pit walls and runoff from the open pit surface drainage area. Predictions of future pit lake chemistry for this scenario were made at selected time intervals (beginning when the pit lake starts to fill after mining and dewatering operations cease). Water quality predictions were made for the time periods of 0.5, 1, 2, 5, 10, 25, 50, 75, and 100 years after the start of pit lake formation. These predictions were based on mass load mixing of waters from different sources and allowing the resulting mix to establish thermodynamic equilibrium under imposed conditions by dissolving or precipitating specified solids, with attenuation of trace elements through sorption reactions.

A conceptual geochemical model was developed for the unreclaimed pit model from a review of background and site-specific data in addition to experience with similar projects. The conceptual model is provided in Figure 5-1 and the inputs to the model are discussed in Sections 5.2 to 5.5, below.

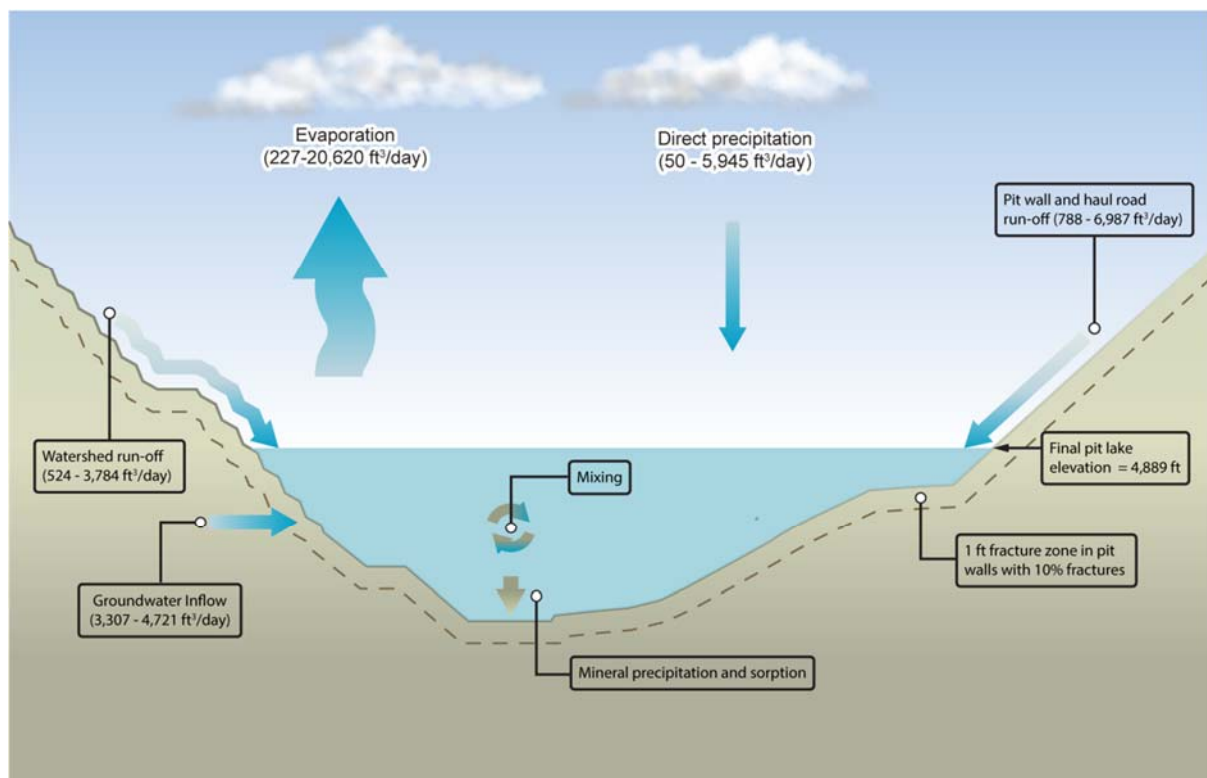


Figure 5-1: Conceptual Model for Unreclaimed Pit with Natural Fill

5.2 Pit Wall Surface Areas

The proportional surface areas of the main material types that will be exposed in the final walls of the unreclaimed pit have been calculated from the FS geologic block model and pit shell with expanded 4900 catch bench. The block model was used to calculate the three-dimensional surface area of each material type that will be exposed in the pit wall both above and below the water level as pit filling progresses. Three-dimensional surface areas were calculated for each of the modeled time steps (i.e., for 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years after the start of pit lake formation). Material types were delineated based on primary lithology, oxidation (redox) and mineralization (i.e., mineralized versus weakly/non-mineralized).

The three-dimensional surface areas of each material type in the unreclaimed pit at the end of mine life are provided in Table 5-1 and are illustrated in Figure 5-2. This demonstrates that unoxidized Quartz Monzonite will represent the dominant material type that will be exposed in the final walls of the unreclaimed pit.

Table 5-1: Three-dimensional Surface Areas of Pit Wall Rock Material Types for Final Unreclaimed Pit

Mineralization	Rock Type	Redox	Three-dimensional surface area	
			Square feet	%
Weakly/non-mineralized	Andesite	Oxide	4,150	0.05%
		Sulfide (non-ox.)	171,177	2.2%
	Biotite Breccia	Oxide	13,856	0.2%
		Sulfide (non-ox.)	340,496	4.4%
	Quartz Monzonite	Oxide	12,826	0.2%
		Sulfide (non-ox.)	2,823,022	36.3%
	Coarse Crystalline Porphyry	Oxide	8,874	0.1%
		Sulfide (non-ox.)	705,534	9.1%
Mineralized	Biotite Breccia	Sulfide (non-ox.)	813,861	10.5%
	Quartz Monzonite	Oxide	1,768	0.02%
		Sulfide (non-ox.)	2,543,813	32.7%
	Coarse Crystalline Porphyry	Oxide	77	0.001%
		Sulfide (non-ox.)	335,045	4.3%
Total			7,774,501	100%

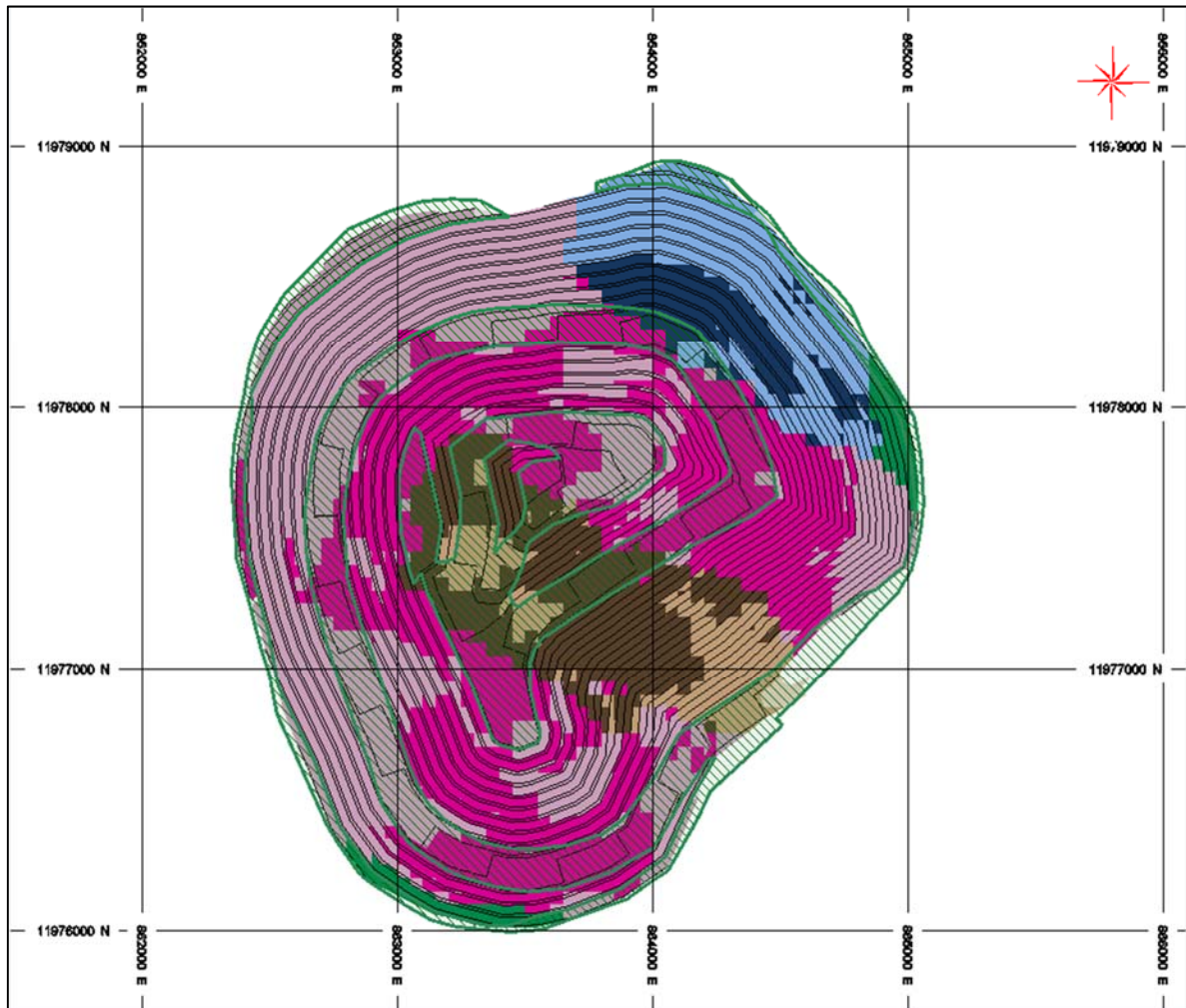


Figure 5-2: Exposed Material Types in Final Walls of Unreclaimed Pit

5.3 Calculation of Pit Wall Rock Available for Leaching

During the period of dewatering the pit walls will be exposed to oxygenated conditions and will weather to form secondary minerals, including soluble salts. As the pit wall resaturates during rebound of the groundwater table, soluble salts and other weathering products will dissolve into the ambient groundwater that drains into the pit. In addition, dissolution of these soluble salts by run-off waters in the unsaturated high wall of the pit may occur. In order that laboratory leach data can be used to determine the mass release of solutes under field leaching conditions, it was necessary to determine the total reactive mass (R_m) of material available for leaching in the pit walls based on the exposed surface areas of each lithology in both the unsaturated high wall and in the submerged pit walls. The reactive mass will be dependent on the density of the pit wall rocks, the density of any fractures produced by blasting, and the depth to which this fracturing penetrates in the pit walls.

A number of studies have evaluated the density and thickness of pit wall fracturing caused by blasting (e.g., Carroll and Scott, 1966; Siskind and Fumanti, 1974; Kelsall et al., 1984; Molebatsi et al., 2009). A detailed summary of this research is presented in Appendix F. This demonstrates that the depth of pit wall fracturing is found to be variable between 1 and 16 feet.

An estimate of the reactive mass in the future pit high wall at Copper Flat was made based on the review of the published information on pit wall fracturing (Appendix F) and from site-specific information provided by NMCC. Future blasting practices at Copper Flat will include pre-split drilling and smooth wall blasting to protect final pit walls, which is considered best practice for geotechnical stability and will effectively reduce fracturing within the final pit walls. Kelsall et al. (1984) studied blasting effects in granite and basalt wall rock and found that blasting enhances permeability by approximately 10 times near the blast face. However, the extent of blast effects is generally limited to <1m (<3.3ft), and as little as 0.3m (1ft) when using low-charge blast methods. Given that the future blasting techniques at Copper Flat will include protective measures such as smooth wall blasting at the final pit wall and that the pit wall composition (i.e., quartz monzonite) will be similar to the granitic material studied in Kelsall et al. (1984), a 1 foot thickness of reactive rock in the pit walls has been assumed for the purpose of the future pit lake model. It is assumed that fracturing in this zone will average 10% (Siskind and Fumanti, 1974; Kelsall et al., 1984). This assumption (i.e., 10% fractures) is considered conservative because the rock comprising the proposed pit shell has low fracture permeability and the limited natural fractures are mineralized (quartz and calcite are common minerals in fractures).

In addition to the fracture zone described above, mineralogy work carried out by SRK on humidity cell tests for previous projects indicates particles generally show water infiltration and products of reactivity up to 0.04 feet into the individual rock fragments. Therefore an oxidized rind of 0.04 feet (0.012 m) thickness has also been assumed on the surface of the pit walls (Figure 5-3).

Using these assumptions for the fracture zone and oxidized rind, the reactive mass (R_m) of each material type in the pit wall was calculated as:

$$R_m = (S \times F_{FZ} \times L_{FZ} \times D) + (S \times L_{OR} \times D)$$

Where:

S is the three-dimensional pit wall surface area of a given material type in square meters (defined by the geological block model; see Table 3-1);

F_{FZ} is the fracture density in the fracture zone (10%);

L_{FZ} is the thickness of the fracture zone in meters (0.3m);

L_{OR} is the thickness of the oxidized rind in meters (0.012m);

D is the rock density in kg/m³ (2700 kg/m³, Young and Olhoeft, 1976).

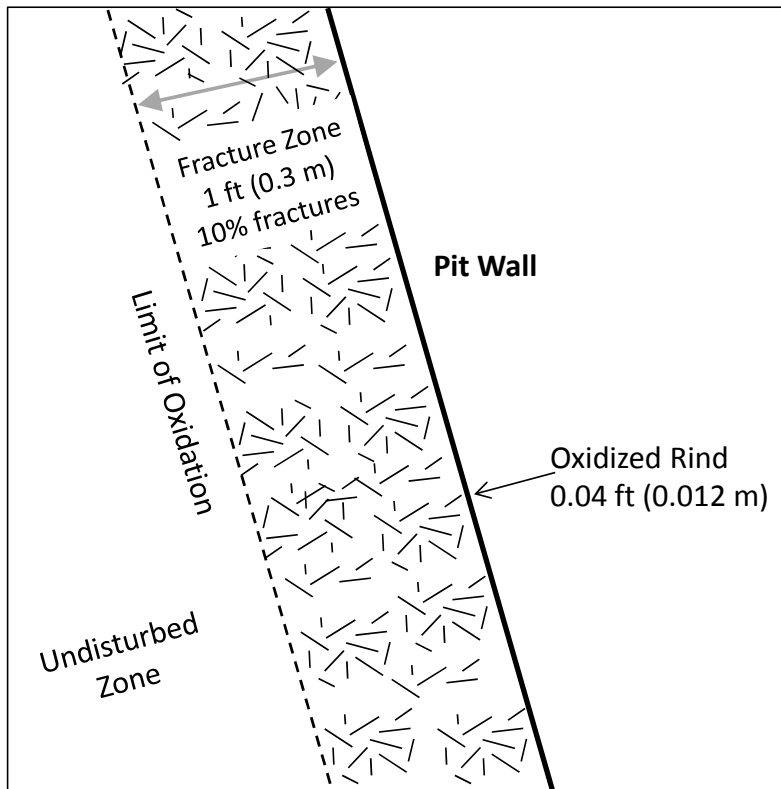


Figure 5-3: Future Pit Wall Conceptual Model

5.4 Water Balance

A pit lake water balance for the unreclaimed pit model was developed by JSAI; details of the groundwater flow model are presented in JSAI (2014b). The post-mining pit water levels and water balance for this scenario were simulated assuming the 2017 MORP pit geometry with expanded 4900 catch bench and watershed shown in Figure 3-1. The model assumes that upon cessation of mining, pumping will cease in and around the pit, allowing the pit to naturally refill over a number of years.

The water balance for the unreclaimed pit natural fill model is based on the following inputs/assumptions from JSAI (JSAI, 2014b; JSAI, 2015a; JSAI, 2017b):

- The primary solution inputs to the pit are assumed to be groundwater inflow, direct precipitation onto the high walls of the pit and run-off from the pit walls, haul road and receiving watershed;
- Evaporation will represent the dominant solution loss;
- The annual average precipitation rate is 12.5 inches per year; and
- The pit lake evaporation rate is 50 inches per year (JSAI, 2015a).

The JSAI water balance projects that the final pit lake elevation for the unreclaimed pit model will be 4,897 ft. The resulting lake will cover an area of approximately 20.7 acres with a depth of approximately 247 ft. The final pit water balance will be approximately 93 acre-feet per year, comprising 57 acre-feet of precipitation and run-off and 36 acre-feet per year of groundwater inflow.

The future pit will be a hydrologic sink, capturing groundwater flowing from all directions (INTERA, 2012; JSAI, 2017b). Surface water from within the footprint of the pit and runoff from the open pit surface drainage area will also be captured. Even with the surface water inflows, the pit will be a hydraulic sink with evaporation rates greatly exceeding precipitation and groundwater inflows on an annual basis (JSAI, 2017b). It is expected that the water levels of the lake will fluctuate seasonally by a few feet depending on precipitation and evaporation rates; rising during periods of lower evaporation (winter months) and decreasing during summer months.

The pit lake filling curve for the unreclaimed pit model is shown in Figure 4-4 and the various inputs/outputs to the pit are shown in Figure 5-5.

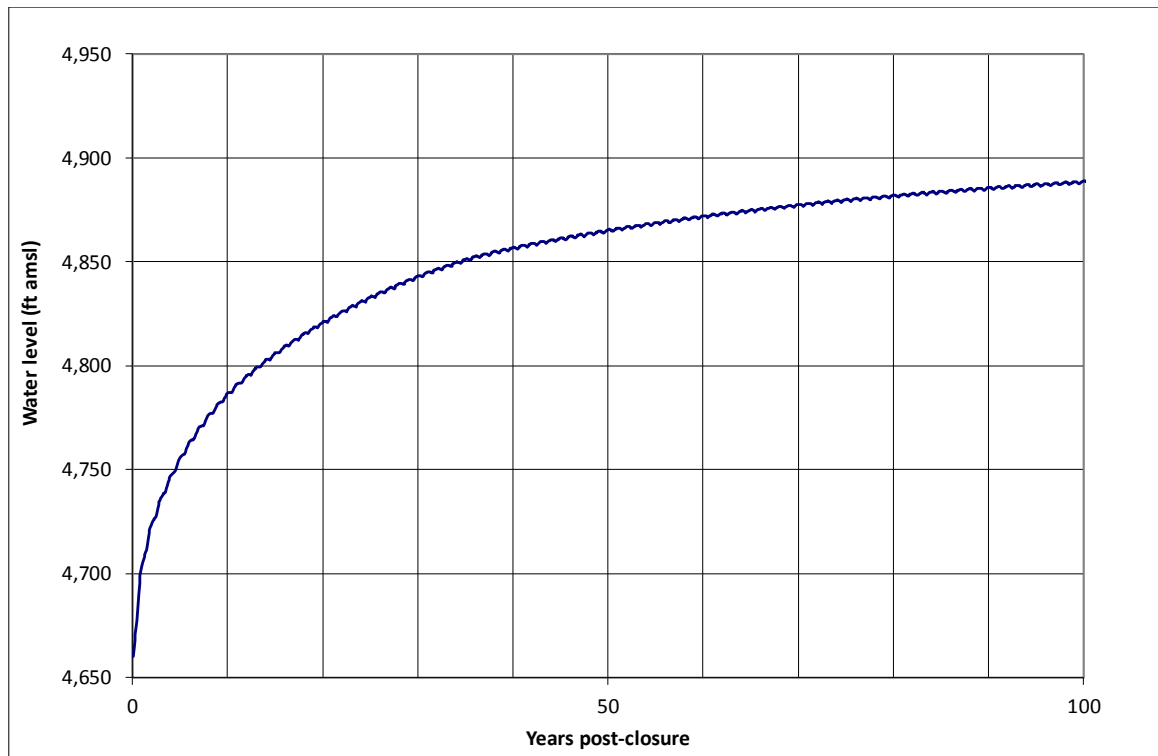


Figure 5-4: Pit Lake Elevation Curve for Unreclaimed Pit Model (source: JSAI)

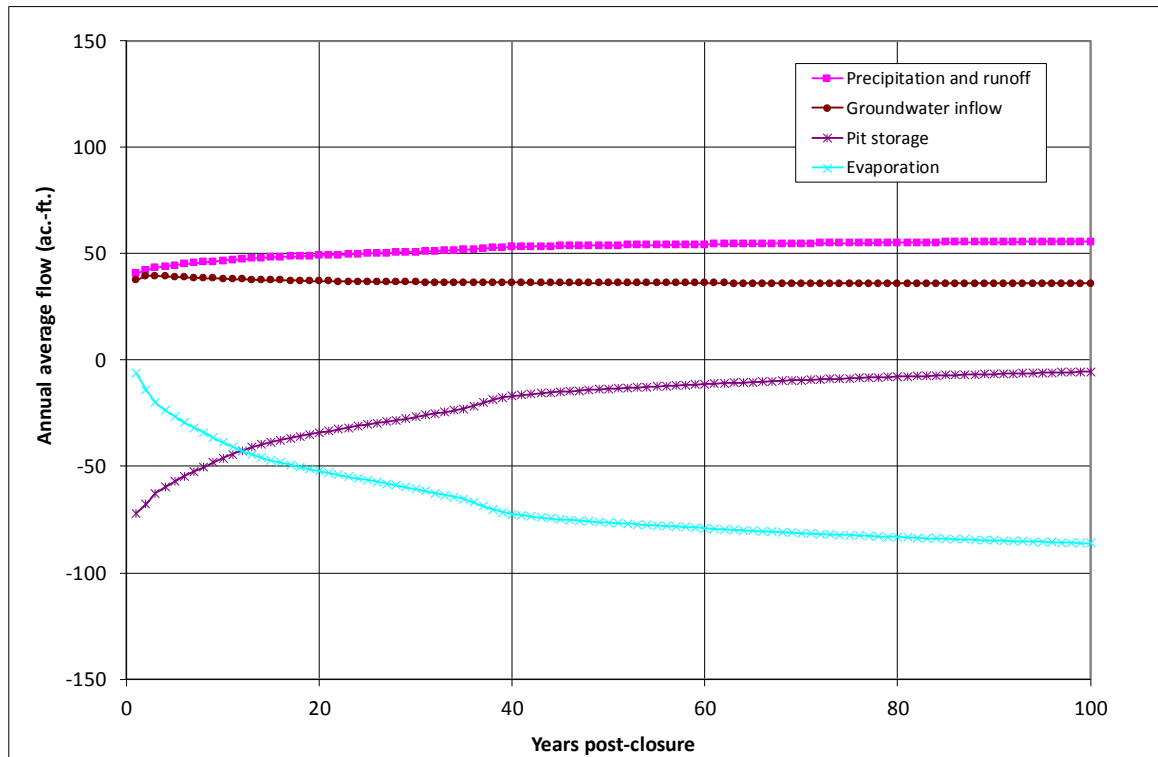


Figure 5-5: Pit Lake Flux for Unreclaimed Pit Model (source: JSAI)

5.5 Solution Inputs

5.5.1 Precipitation Chemistry

As with the existing pit model, the primary wall rock lixiviant for the future pit high walls is assumed to be precipitation. Representative precipitation chemistry data were obtained from monthly monitoring carried out between 1985 and 2011 at the Gila Cliff Dwellings National Monument meteorological station, Catron County, New Mexico (NADP, 2012) (Figure 4-6, Table 5-2).

5.5.2 Groundwater Chemistry

Representative groundwater chemistry data for the future pit lake model were obtained from the historical data compiled by JSAI and NMCC. Based on the current mine plan, a large proportion of the quartz monzonite is removed by mining and the remaining quartz monzonite is dewatered. Groundwater reporting to the future pit is therefore likely to be representative of the andesite rock. Based on this assumption, data from wells GWQ96-22(A), GWQ96-22(B), GWQ96-23(A) and GWQ96-23(B) were used as input to the future pit lake geochemical model.

Further information on how the groundwater chemistry data were derived is provided in the JSAI technical memorandum in Appendix D. The groundwater chemistry used as input to the unreclaimed pit model is presented in Table 5-2.

5.5.3 Wall Rock Chemistry

As with the existing pit model, source term solutions for the future pit lake were developed from the results of site-specific HCT testing conducted as part of the SRK (2012) geochemical characterization program and scaled to field conditions. The HCT testwork results were used to develop separate source terms for each material type that will be exposed in the final pit wall (see Table 5-1). The method used to scale the laboratory HCT data to field conditions was identical to that described in Section 4.5.3 and was based on site-specific information relating to the pit water balance, geological model, pit wall fracturing and wall rock density.

As with the existing pit lake model, different HCT inputs were used for trace elements and major ions to represent the different geochemical processes that control their release. An average of all weeks of humidity cell data were used for major ions (calcium, magnesium, sodium, potassium, aluminum, iron, manganese, chloride, sulfate, fluoride, bicarbonate) and an average of steady-state humidity cell data (i.e., minus the first 20 weeks of testing) were used for trace elements (silver, arsenic, boron, barium, cadmium, cobalt, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, uranium, vanadium and zinc).

The solutions used as inputs to the geochemical model are provided in Table 5-2.

Table 5-2: Groundwater, Wall Rock, Haul Road and Precipitation Chemistry used as Input to the Unreclaimed Pit Model

Parameter		Units	Precipitation chemistry	Groundwater chemistry	Haul road and watershed run-off chemistry	Wall Rock Chemistry												
						Mineralized					Weakly/non-mineralized							
						Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide	Coarse Crystalline Porphyry oxide	Coarse Crystalline Porphyry sulfide	Andesite oxide	Andesite sulfide	Biotite breccia oxide	Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide	Coarse Crystalline Porphyry oxide	Coarse Crystalline Porphyry sulfide
			Gila Cliff Dwellings National Monument meteorological station	Average of wells GWQ96-22(A,B) and GWQ96-23(A,B)	Average of SWQ-1	Average of HCTs 604767, 604787, 604811, 604854, 604862, 604867 and 605033	Average of HCT SRK 0867	Average of HCTs 604652, 604606, 604653, 604656 and 604669	Average of HCT CF-11-02 (0-27)	Average of HCT CF-11-02 (367-408)	Average of HCTs SRK 0864 and SRK 0866	Average of HCTs SRK 0864 and SRK 0866	Average of HCTs SRK 0872 and SRK 0854	Average of HCTs 604811, 604854, 604862, 604867 and 605033	Average of HCTs SRK 0858 604569	Average of HCTs 604673 and 605153	Average of HCT CF-11-02 (0-27)	Average of HCT CF-11-02 (367-408)
pH	pH	s.u	4.93	7.85	8.3	7.86	6.90	7.95	7.92	7.74	7.32	7.32	5.50	7.91	2.99	5.74	7.92	7.74
HCO ₃	Bicarbonate	mg/L		408	430	45.0	9.27	38.2	30.1	19.9	10.6	10.6	3.44	54.9	N/A	12.2	30.1	19.9
Ag	Silver	mg/L		0.009		-	-	-	-	-	-	-	-	-	-	-	-	-
Al	Aluminum	mg/L		0.029		0.0046	0.070	0.0078	0.019	0.050	0.0090	0.0090	0.237	0.0059	2.96	0.037	0.019	0.050
As	Arsenic	mg/L		0.0023		0.00034	-	-	-	-	-	-	0.0010	0.00025	0.00036	-	-	-
B	Boron	mg/L		0.136	0.02	0.0050	0.0047	0.0049	0.0049	0.0048	-	-	-	0.0049	0.018	0.0050	0.0049	0.0048
Ba	Barium	mg/L		0.089		0.0091	0.0075	0.012	0.00049	0.0028	0.0033	0.0033	0.011	0.0062	0.0021	0.035	0.00049	0.0028
Ca	Calcium	mg/L	0.21	85.8	109	24.1	25.9	19.5	9.95	7.36	8.36	8.36	20.9	28.0	9.59	6.32	9.95	7.36
Cd	Cadmium	mg/L		0.0008		-	4.72E-05	-	-	-	-	-	0.00068	-	0.0014	0.00034	-	-
Co	Cobalt	mg/L		0.008		-	0.00047	-	-	-	-	-	0.00070	-	0.015	-	-	-
Cr	Chromium	mg/L		0.0066		-	-	-	-	-	-	-	-	-	0.0056	-	-	-
Cu	Copper	mg/L		0.0061		0.0085	0.0056	-	-	0.0049	-	-	9.11	0.013	2.41	0.384	-	0.0049
F	Fluoride	mg/L		2.1	0.3	1.09	0.558	0.807	0.820	0.548	0.425	0.425	0.289	1.20	1.98	0.432	0.820	0.548
Fe	Iron	mg/L		1.48		0.00069	0.099	0.00087	0.0025	0.0022	0.0014	0.0014	0.400	0.00074	6.75	0.0039	0.0025	0.0022
Hg	Mercury	mg/L		0.000002		-	-	4.91E-06	9.97E-06	4.83E-06	-	-	-	-	-	1.62E-05	9.97E-06	4.83E-06
K	Potassium	mg/L	0.03	2.96	1.80	3.75	1.08	3.84	2.18	1.70	0.974	0.974	0.950	4.43	1.66	1.84	2.18	1.70
Mg	Magnesium	mg/L	0.02	19.3	36.0	3.97	2.24	3.51	1.74	0.570	1.27	1.27	1.30	4.00	1.64	0.978	1.74	0.570
Mn	Manganese	mg/L		0.66		0.072	0.468	0.130	0.019	0.0094	0.0095	0.0095	0.248	0.043	0.125	0.018	0.019	0.0094
Mo	Molybdenum	mg/L		0.012		0.0052	0.0051	0.0074	0.00049	0.00048	0.00046	0.00046	0.040	0.0056	0.0018	0.0020	0.00049	0.00048
Na	Sodium	mg/L	0.08	119	107	2.41	0.932	3.46	2.31	2.04	1.71	1.71	0.530	2.60	1.98	1.69	2.31	2.04
Ni	Nickel	mg/L		0.0125		-	0.00047	-	-	-	-	-	0.00047	-	0.0018	-	-	-
Pb	Lead	mg/L		0.0025		-	-	-	0.00012	0.00012	0.00012	-	0.0018	-	0.0019	0.0016	0.00012	0.00012
Sb	Antimony	mg/L		0.0009		0.00012	0.0030	0.00012	-	-	-	-	0.00040	0.00012	-	-	-	-
Se	Selenium	mg/L		0.0015		0.00031	0.00024	0.00032	0.00024	0.00024	0.00023	0.00023	0.00024	0.00035	0.00023	0.00025	0.00024	0.00024
U	Uranium	mg/L		0.0015		0.0033	0.00047	0.0012	0.0024	0.0024	-	-	0.0013	0.0017	0.0051	0.0046	0.0024	0.0024
V	Vanadium	mg/L		0.0009		0.0010	0.00047	0.00049	0.00049	-	0.00046	0.00046	0.00047	0.0015	0.0018	0.00050	0.00049	-
Zn	Zinc	mg/L		0.03		0.0027	0.0016	0.0046	-	-	-	-	0.045	0.0014	0.017	0.015	-	-
SO ₄	Sulfate	mg/L	0.86	84	261	44.5	72.3	38.7	12.1	7.66	20.3	20.3	87.0	47.3	89.1	14.9	12.1	7.66
Cl	Chloride	mg/L	0.12	49	30	1.30	0.739	2.17	0.999	1.37	0.708	0.708	0.647	1.34	1.26	0.711	0.999	1.37

- Indicates parameter was uniformly below ARLs in the HCT effluent leachates and was excluded from the PHREEQC model input for the specified material type

5.6 Potential for Future Pit Lake Stratification

The existing Copper Flat pit lake contained approximately 70 acre feet of water in 2014 (NMCC estimate). The water surface measures 5.2 acres with an average diameter of 537 feet (Figure 8-8 in INTERRA, 2012). The average depth is approximately 13 feet deep and the maximum depth is 35 feet (INTERRA, 2012), which results in a relative depth (RD) of 7%. Samples taken from various depths of the existing pit lake demonstrate that the pit lake is homogeneous and no stratification exists (SRK, 1996, INTERA, 2012, Aquatic Consultants Inc., 2014). Baseline data from the existing pit water body provides evidence that a thermocline develops in the summer and mixing occurs in the winter (INTERA, 2012). A chemocline does not appear to develop, and the water body remains oxygenated (DO = 6 to 9 mg/L) throughout the full water column year-round with similar chemistry throughout the lake (see JSAI, 2014c, Appendix F). Based on elevation and latitude, the Copper Flat open pit water body is classified as a warm monomitic type lake (Wetzel, 2001). A warm monomitic lake mixes freely once a year in the winter assuming the temperature is above 4°C. However, wind effects and water body geometry can have an effect on the magnitude and frequency of mixing (Castendyk, 2009).

Mine pit lakes can develop vertical density stratification that may be seasonal or permanent. The density of water is a function of both its temperature and its salinity or total dissolved solids (TDS) content. Freshwater is most dense at a temperature of about 4°C. At a given temperature, water density increases with increasing TDS. As TDS increases, the temperature of the maximum density of water also decreases (Atkins et al., 1997; Parshley and Howell, 2003).

Long-term (multi-year) or permanent density stratification can occur if a lake has a significant vertical variation in TDS due to large differences in the TDS of various source waters to the lake and/or to processes in the lake that increase the TDS. This in turn affects the density of the deeper water. For example, if a lake contains enough organic matter to deplete oxygen in the hypolimnion, then during the summer, ferric hydroxide that precipitates at the surface will sink, become reduced, and dissolve in the basal anoxic water, raising the TDS content and the density of the bottom water.

Water in the hypolimnion will generally become anoxic and will continuously dissolve any ferric hydroxide precipitates falling into it from above. This process further increases the TDS of the hypolimnion and strengthens the density gradient between it and the overlying layer, perpetuating the stratification. Sulfidization in the hypolimnion will lead to natural attenuation of metals and metalloids as well as sulfur. Few studies reporting site-specific limnological data have been published to date (Atkins et al., 1997; Parshley and Howell, 2003). For Copper Flat, the presence of solute material that will modify pit lake chemistry (i.e., sulfide minerals and gypsum) will likely prevent permanent chemical stratification or layering of the lake. This was validated in the 1990s from depth sampling of the pit lake at Copper Flat (SRK, 1996), and in 2010 and 2011 from baseline data collection (INTERA, 2012). The results from this study demonstrated that the current pit lake is homogeneous and no stratification exists. Temperature and dissolved oxygen profiles for the existing pit lake (INTERA, 2012, Aquatic Consultants Inc., 2014) show the pit water is not significantly stratified. The water stays well oxygenated for the entire depth for each season (6 to 8 mg/L). Thermal stratification requires a 1°C change in temperature per meter (Wetzel, 2001), which can occur in the summer months as the upper water column heats up and the lower water column remains cool, and well oxygenated.

When established, the future Copper Flat pit lake will contain approximately 2,300 acre feet of water. The water surface is projected to measure 22 acres with an average diameter of 1,105 feet. The average depth will be approximately 105 feet and the maximum depth will be 247 feet, which results in a relative depth (RD) of 22% (JSAI Pit Water Balance, 2017).

The 23% RD for the future Copper Flat pit lake is greater than the average value of 2% for natural lakes and suggests the lake may stratify. Such stratification may result in oxidizing conditions in the upper portions of the lake and more chemically reducing (oxygen-deprived) conditions at depth. However, this stratification is likely to be temporary and influenced by seasonal changes. A prerequisite for permanent stratification is that precipitation plus runoff is greater than evaporation during the summer months when the water body is potentially undergoing temporary thermal stratification (Jewell, 2009). This is not the case at Copper Flat, where annual evaporation from the pit lake (100 acre-feet per year) will greatly exceed precipitation plus run-off (63 acre-feet per year). As such, permanent stratification is unlikely for the current and future Copper Flat pit lake. Consequently, in keeping with many pit lakes in arid regions there is a lower potential for stratification than a single relative depth metric would imply (Jewell, 2009).

Jewell (2009) evaluated six permanently stratified and eight seasonally stratified open pit lakes, and concludes that permanently stratified lakes have vertical density contrast greater than 0.0005 g/cm^3 and a Wedderburn number greater than 1. The Wedderburn number considers thermocline depth, maximum lake length, water density, and wind speed. Jewell (2009) failed to note that most permanently-stratified open pit lakes receive AWS inputs and have resulting acidic water at the surface. A summary table of existing open pit water bodies and their characteristics is presented in Table 5-3.

The future Copper Flat open pit lake is expected to be well mixed, oxygenated, and not acidic, although seasonal stratification may occur. Relative depth does not appear to govern the conditions for creating a permanently stratified open pit water body; however acidic water and higher latitude are key conditions for creating permanent stratification. In addition, another related control is the total dissolved solids or salinity which will also exert control over the density or buoyancy of the mine pit lake. At Copper Flat, direct surface water inputs to the existing lake over time are unlikely to be significant and therefore the potential for turnover is less.

Stratification within the pit lake has implications for redox conditions, mineral solubility and sorption reactions. The pit lake model results presented herein assume the pit lake will be fully mixed. A number of studies on deep mine pit lakes, including Summer Camp Pit in Nevada (Parshley and Howell, 2003) and unpublished reports on Lone Tree Mines, Yerrington mine and the Robinson Mining District, also in Nevada, have demonstrated the tendency for incomplete seasonal overturn.

Based on observations of the current Copper Flat pit lake, the development of a metal-rich brine in the hypolimnion of the future pit lake is unlikely. The conditions for this are summarized in Castendyk (2009). Rather, the future pit lake is expected to be mixed and well oxygenated because: (i) the existing and future pit lake can be classified as monomictic with frequent or continuous periods of circulation with no ice cover in the winter; and (ii) the existing and future pit lake can also be characterized as oligotrophic, i.e., having little to no nutrient input and organic production, with dissolved oxygen content regulated largely by physical processes.

While stratification of an open pit water body has implications for water chemistry at depth, particularly in terms of redox changes, the near surface waters of the future Copper Flat pit lake are expected to remain oxidizing. These near surface waters are considered the most critical from a perspective of potential ecological risks associated with the lake, reduced water quality that may develop at depth is less important since the proposed Copper Flat pit will remain a terminal sink post closure.

Table 5-3: Summary of open pit water bodies and stratification characteristics (JSAI, 2014c)

Open pit	Location	Effective length (ft)	Maximum depth (ft)	Relative depth (%)	Thermocline depth (ft)	Acidic
Permanently stratified						
Brenda	British Columbia	2,296	492	21	39	No
Spenceville	California	253	50	20	13	Yes
Berkeley	Montana	5,900	426	7	23	Yes
Seasonally stratified and well mixed						
Humbolt	Nevada	944	137	15	8	No
Blackhawk	Utah	492	na	na	33	No
Blowout	Utah	656	230	35	39	No
Colosseum	California	482	157	33	na	No
Cunningham	New Mexico	407	90	22	20	No
Copper Flat (existing)**	New Mexico	537	35	7	20	No*
Copper Flat (proposed)***	New Mexico	1105	247	22	TBD	No
Yerington	Nevada	5,412	400	13	49	No

* Predominantly circum-neutral with the development of occasional temporary acidity

** Updated from JSAI (2014c) to reflect Baseline Data Report (INTERA, 2012)

*** Updated from JSAI (2014c) to reflect current pit water balance and mine plan

TBD – to be determined

5.7 Results

The predicted pit lake chemistry for the unreclaimed pit model is summarized in Table 5-4 and illustrated in Figure 5-6 to Figure 5-19 for selected parameters. These show predicted pit lake chemistry at each of the modeled time steps (i.e., 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years post-closure). In each case, the predicted pit lake chemistry is compared to the chemistry measured in the existing pit lake between 1989 and 2017. The full PHREEQC output file is provided in Appendix I, which shows precipitating and dissolving mineral species at each time step as part of the mass transfer calculations.

Pit lake waters for the unreclaimed pit are predicted to be moderately alkaline (pH 7.9– 8.2) with a magnesium plus sulfate (Mg + SO₄) major ion signature. During the early stages of pit infilling (i.e., the first six months post-closure), the prediction is that an early flush will occur in boron, lead, mercury, manganese, molybdenum, nickel, selenium, vanadium, zinc and sulfate. This initial flush occurs due to dissolution of soluble sulfate salts that will have developed on the pit walls during the life of mine. This initial flush is only observed for the natural fill model, but the effects are dissipated in the rapid fill model and no initial flush is observed.

Inflowing groundwater and direct precipitation on the pit lake surface will then provide some dilution and the effects of this initial flush will be dissipated. Following this initial flush, pit lake waters are predicted to evolve over time, with increasing concentrations of chloride, sulfate, TDS and trace elements owing to the effects of evapoconcentration. This is similar to the trends observed in the existing pit lake, where elemental concentrations (particularly boron, cadmium, fluoride, magnesium, manganese, sodium and sulfate) have increased over time. The macrochemistry (Ng-Na-SO₄) changes are reflected in the Piper plot in Figure 5-19, which shows a progressive change in pit lake major ion chemistry post-closure, with waters becoming increasingly dominated by sulfate and magnesium over time. However, pH remains moderately alkaline throughout pit infilling.

Pit lake chemistry is likely to be dominated by groundwater chemistry plus evapoconcentration effects. Over time, the groundwater contribution will decrease slightly as the pit lake is established. Both adsorption and secondary mineral precipitation are likely to be the major controls on trace element chemistry.

Pit lake waters for the unreclaimed pit are predicted to be 'near-neutral, low-metal' waters for years zero (i.e., end of mine life) to year 50, based on pH values between 7.9 and 8.2 and total Ficklin metal concentrations¹ less than 1 mg/L (Figure 5-18). The effects of evapoconcentration are predicted to result in increasing metal concentrations, with pit lake waters being classed as 'near-neutral, high metal' from year 75 onwards (Figure 5-18).

A comparison of predicted pit lake chemistry to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that concentrations of the majority of constituents are either comparable to or less than existing concentrations. In particular, predicted concentrations of arsenic, cadmium, copper, cobalt, chromium, fluoride, lead, manganese, nickel, zinc and sulfate in the future unmitigated pit are lower than those observed in the existing pit lake at Copper Flat. This relates to a number of factors, including:

- The future pit walls will be prepared using pre-split drilling and smooth wall blasting, which will reduce the depth of fracturing and oxidation, and consequently reduce solute loading to the pit lake;
- The future pit walls will contain less mineralized material than the existing Copper Flat pit, which will also reduce solute loading to the pit lake;
- The future pit walls will contain less transitional material than the existing Copper Flat pit, that is the source of the AWS events; and
- The dominant groundwater flow into the future pit will originate from the Andesite, which is typically characterized by lower constituent concentrations than the Quartz Monzonite groundwater (JSAI, 2017a).

The only constituents that are predicted to be higher in the future pit lake compared to the existing pit lake are boron, molybdenum, potassium and antimony. From the calibration model (Section 3.10) these constituents are known to be over-predicted by PHREEQC, and therefore the predicted concentrations of boron, molybdenum, potassium and antimony presented in Table 5-4 are likely to be an overestimate.

¹ Ficklin metals are the base metals copper, cobalt, cadmium, lead, nickel and zinc (Ficklin et al., 1992)

Table 5-4: Unreclaimed Pit Model Results

Parameter		Units	Measured Chemistry in Existing Pit (1989 - 2017)			Predicted Future Chemistry (Years Post-Closure)								
			Average	Minimum	Maximum	0.5	1	2	5	10	25	50	75	100
pH	pH	s.u.	6.5	3.6	8.3	8.2	8.1	8.1	8.0	8.0	8.0	7.9	7.9	7.9
HCO ₃	Bicarbonate	mg/L	40.4	<3	122	54.8	45.4	42.6	40.6	39.3	37.3	35.2	33.8	34.6
Al	Aluminium	mg/L	10.4	<0.02	82.6	0.06	0.10	0.10	0.11	0.12	0.13	0.16	0.18	0.16
As	Arsenic	mg/L	0.004	<0.001	0.006	1.28E-05	1.07E-05	1.27E-05	1.58E-05	1.96E-05	3.07E-05	4.46E-05	5.86E-05	7.27E-05
B	Boron	mg/L	0.14	<0.1	0.2	0.44	0.30	0.31	0.34	0.38	0.49	0.67	0.85	1.04
Ca	Calcium	mg/L	550	455	684	99.8	127	150	177	202	262	360	460	489
Cd	Cadmium	mg/L	0.05	<0.005	0.1	0.0012	0.0014	0.0015	0.0017	0.0019	0.0025	0.0033	0.003	0.003
Co	Cobalt	mg/L	0.29	<0.05	0.49	0.008	0.005	0.006	0.006	0.007	0.009	0.01	0.02	0.02
Cr	Chromium	mg/L	0.03	<0.006	0.1	4.68E-05	5.14E-05	5.43E-05	5.73E-05	5.98E-05	6.53E-05	7.32E-05	8.05E-05	8.24E-05
Cu	Copper	mg/L	4.44	0.001	26.5	0.012	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
F	Fluoride	mg/L	19.2	4.8	34	3.30	3.02	3.34	3.83	4.25	4.11	4.00	3.95	4.16
Fe	Iron	mg/L	0.2	<0.02	1.3	4.64E-05	4.88E-05	5.03E-05	5.18E-05	5.30E-05	5.55E-05	5.88E-05	6.17E-05	6.20E-05
Hg	Mercury	mg/L	0.0005	<0.0002	0.001	0.0006	0.0004	0.0004	0.0004	0.0005	0.0006	0.0008	0.0011	0.0013
K	Potassium	mg/L	32.1	11.0	60.6	192	131	135	148	166	212	290	372	453
Mg	Magnesium	mg/L	698	43	1,120	171	121	125	136	152	194	266	341	416
Mn	Manganese	mg/L	34.8	0.02	59.0	4.66	3.19	3.30	3.62	4.04	5.15	7.04	9.02	11.00
Mo	Molybdenum	mg/L	0.04	0.015	0.1	0.26	0.18	0.19	0.20	0.23	0.28	0.36	0.45	0.53
Na	Sodium	mg/L	888	165	1,400	278	202	210	230	257	326	445	570	694
Ni	Nickel	mg/L	0.06	0.039	0.1	0.009	0.007	0.007	0.008	0.009	0.011	0.015	0.019	0.022
Pb	Lead	mg/L	0.02	<0.005	0.1	0.0005	0.0005	0.0007	0.0008	0.0008	0.0006	0.001	0.0005	0.0005
Sb	Antimony	mg/L	<0.001*			0.005	0.003	0.003	0.004	0.004	0.005	0.007	0.009	0.011
Se	Selenium	mg/L	0.028	<0.001	0.25	0.015	0.011	0.011	0.012	0.013	0.016	0.022	0.028	0.034
U	Uranium	mg/L	0.11	0.11	0.12	0.073	0.051	0.049	0.05	0.06	0.08	0.11	0.15	0.18
V	Vanadium	mg/L	0.1	<0.05	0.25	0.0004	0.0004	0.0003	0.0003	0.0004	0.0005	0.0007	0.0009	0.001
Zn	Zinc	mg/L	5.4	0.01	9	0.52	0.36	0.37	0.40	0.45	0.58	0.79	1.01	1.23
SO ₄	Sulfate	mg/L	4,803	1,566	8,690	1,505	1,196	1,284	1,441	1,626	2,096	2,887	3,708	4,353
Cl	Chloride	mg/L	332	47.3	730	135	95.6	99.1	109	121	154	210	269	328
TDS	Total Dissolved Solids	mg/L	7,538	2,711	14,800	2,446	1,926	2,053	2,291	2,573	3,293	4,507	5,770	6,786

* Indicates parameter was uniformly below analytical detection limits in pit lake water over monitoring period, but detection limit was variable. Concentration shown in table represents lower limit of analytical detection.

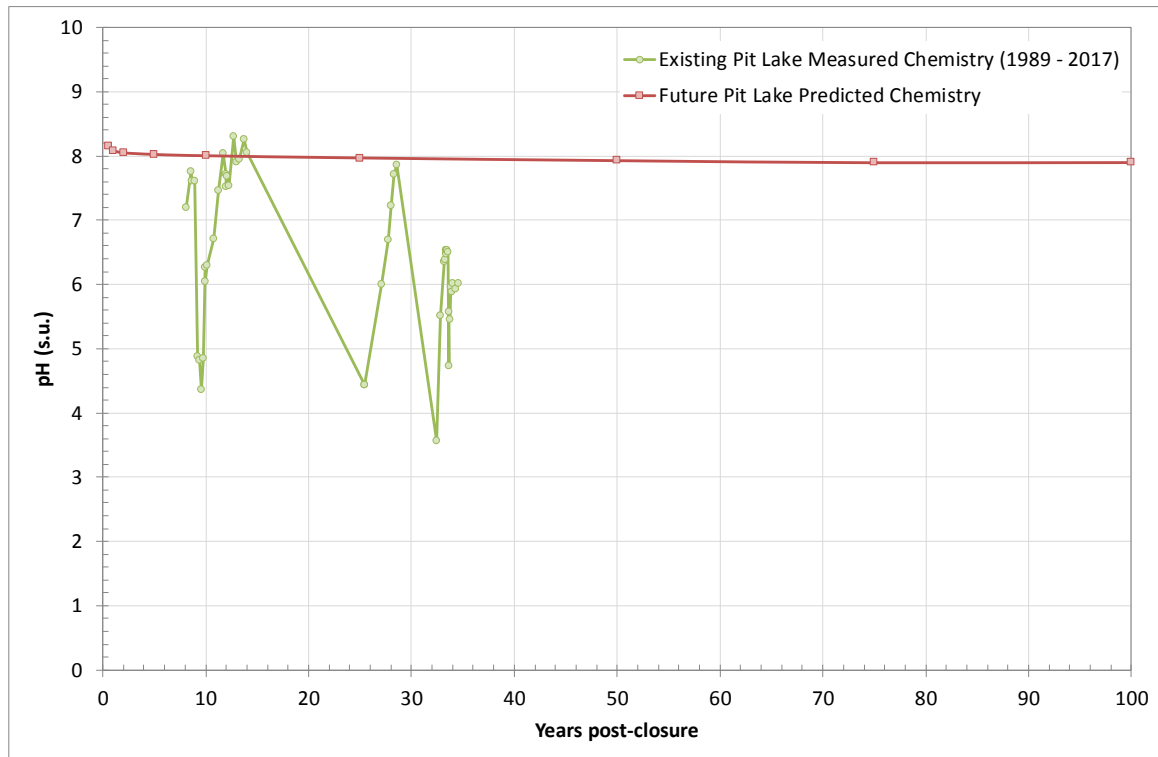


Figure 5-6: Time-series Plot of Predicted pH for the Unreclaimed Pit Model

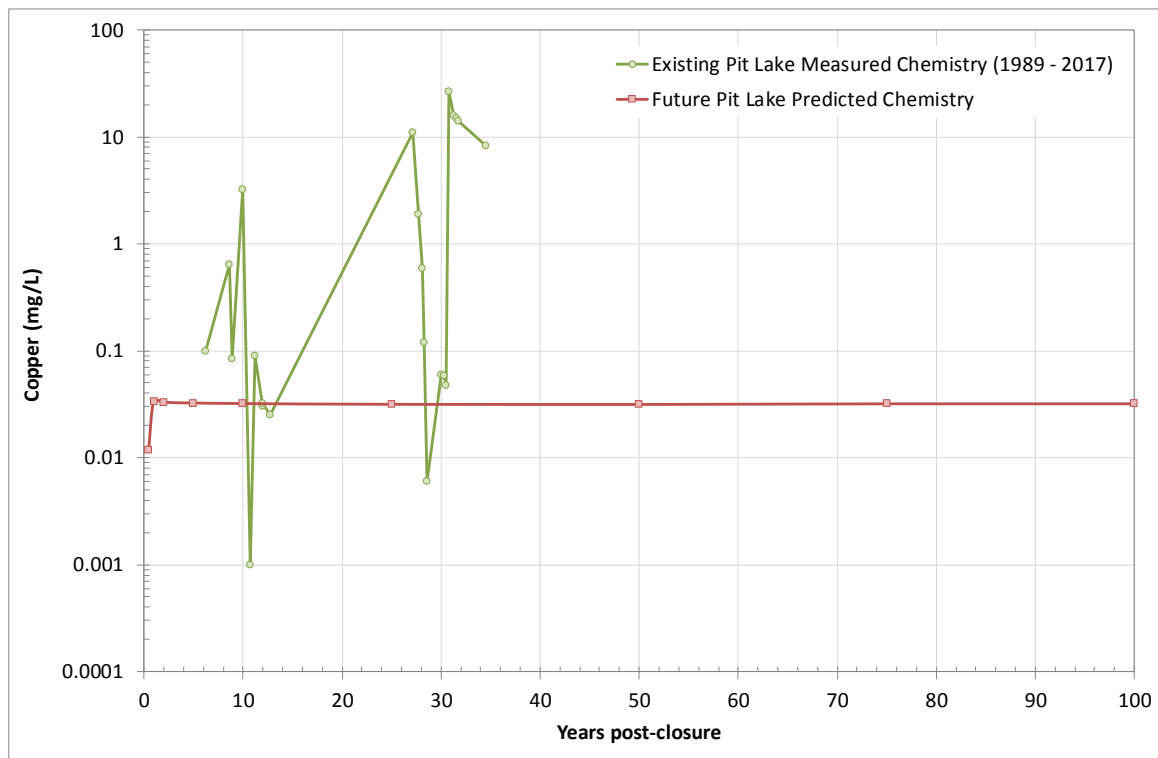


Figure 5-7: Time-series Plot of Predicted Copper for the Unreclaimed Pit Model

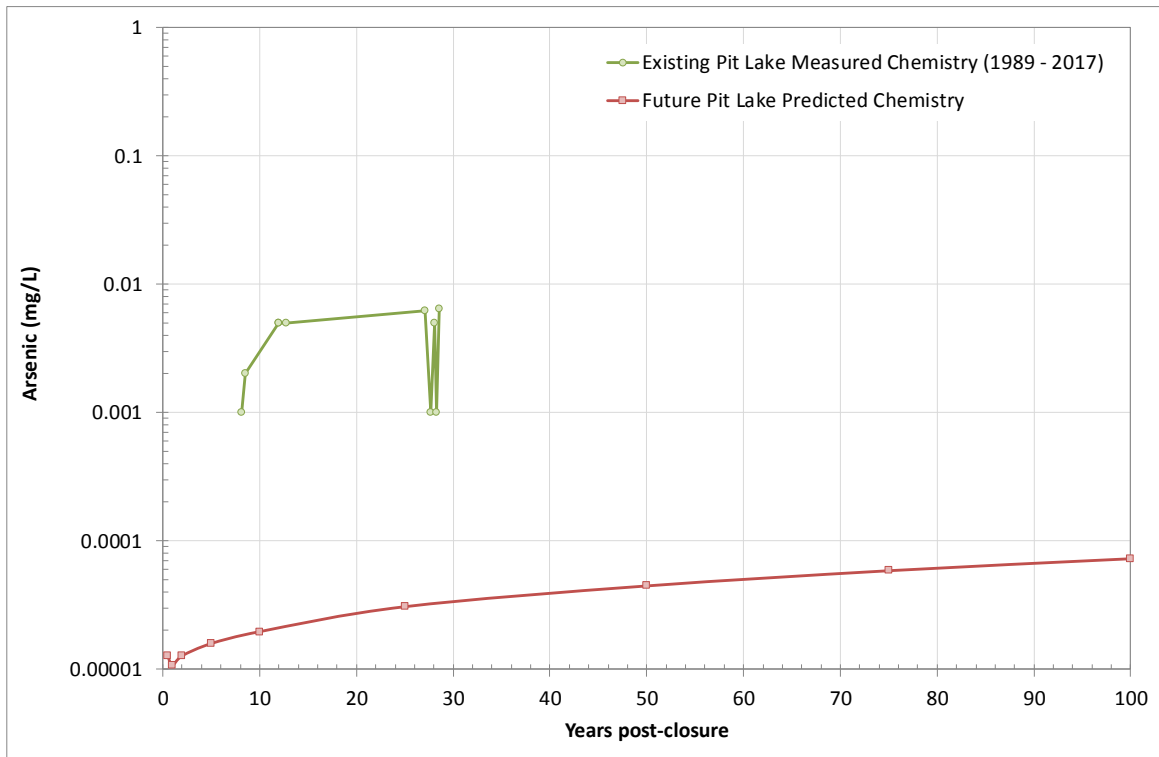


Figure 5-8: Time-series Plot of Predicted Arsenic for the Unreclaimed Pit Model

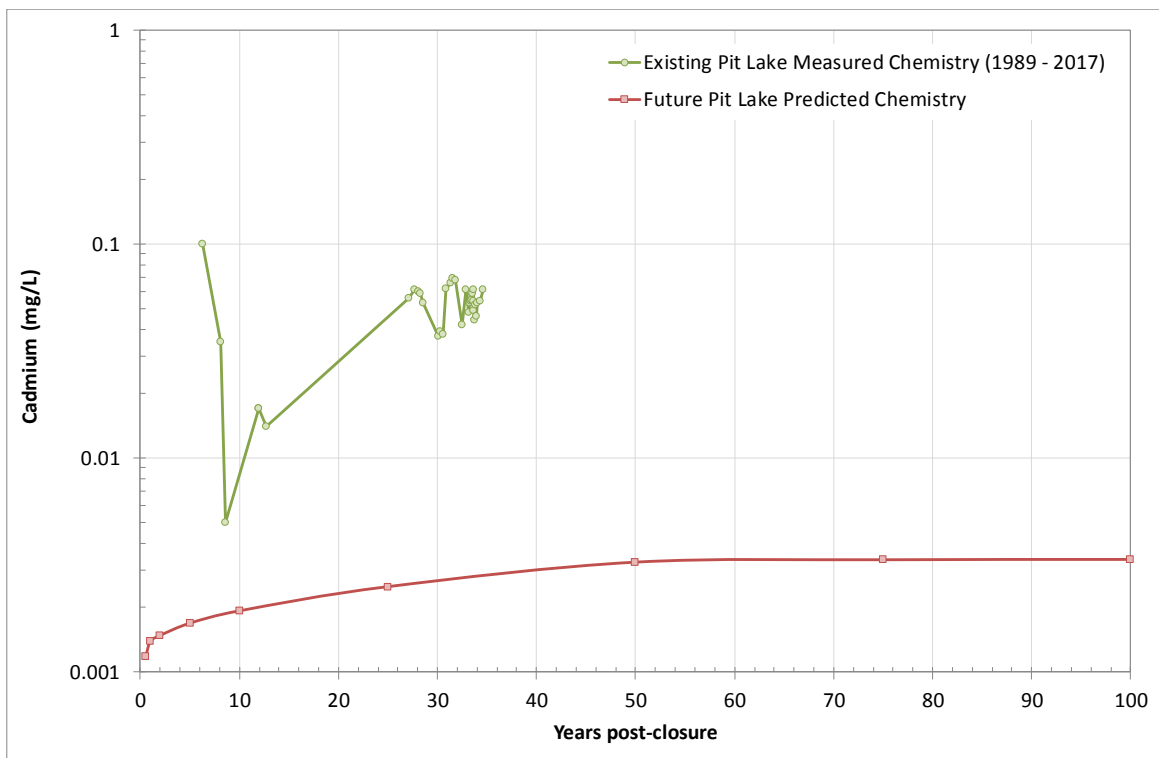


Figure 5-9: Time-series Plot of Predicted Cadmium for the Unreclaimed Pit Model

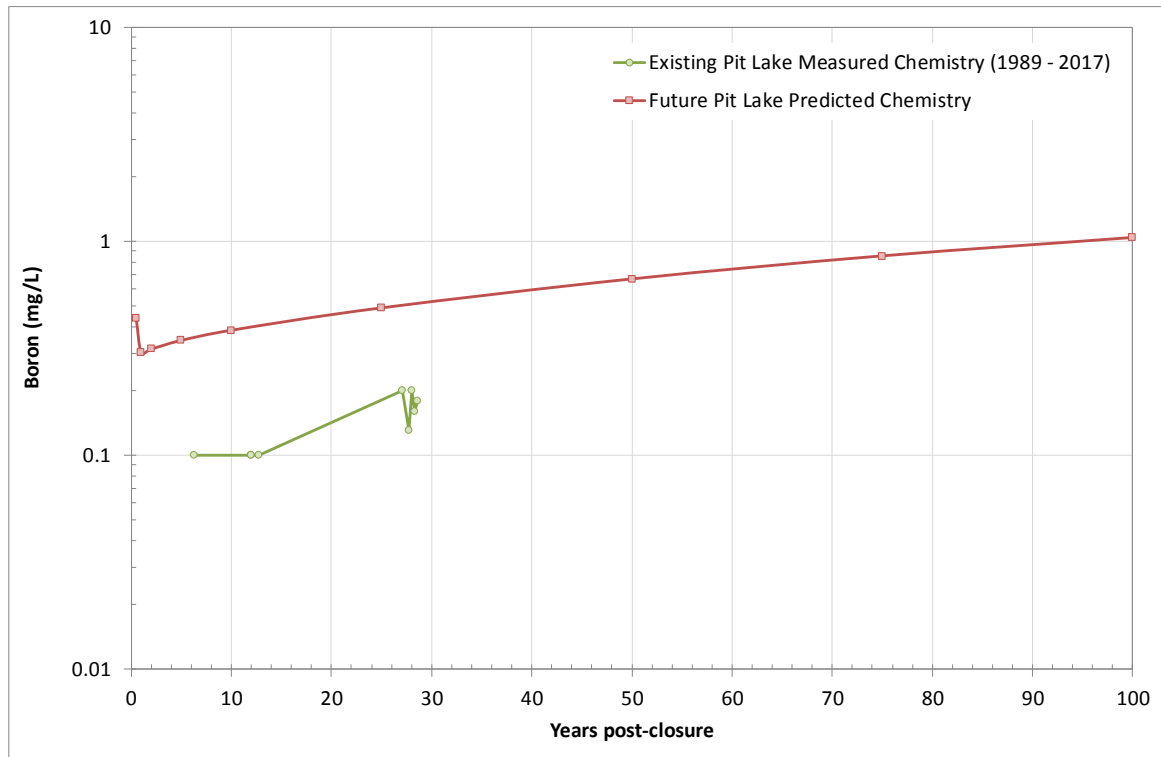


Figure 5-10: Time-series Plot of Predicted Boron for the Unreclaimed Pit Model

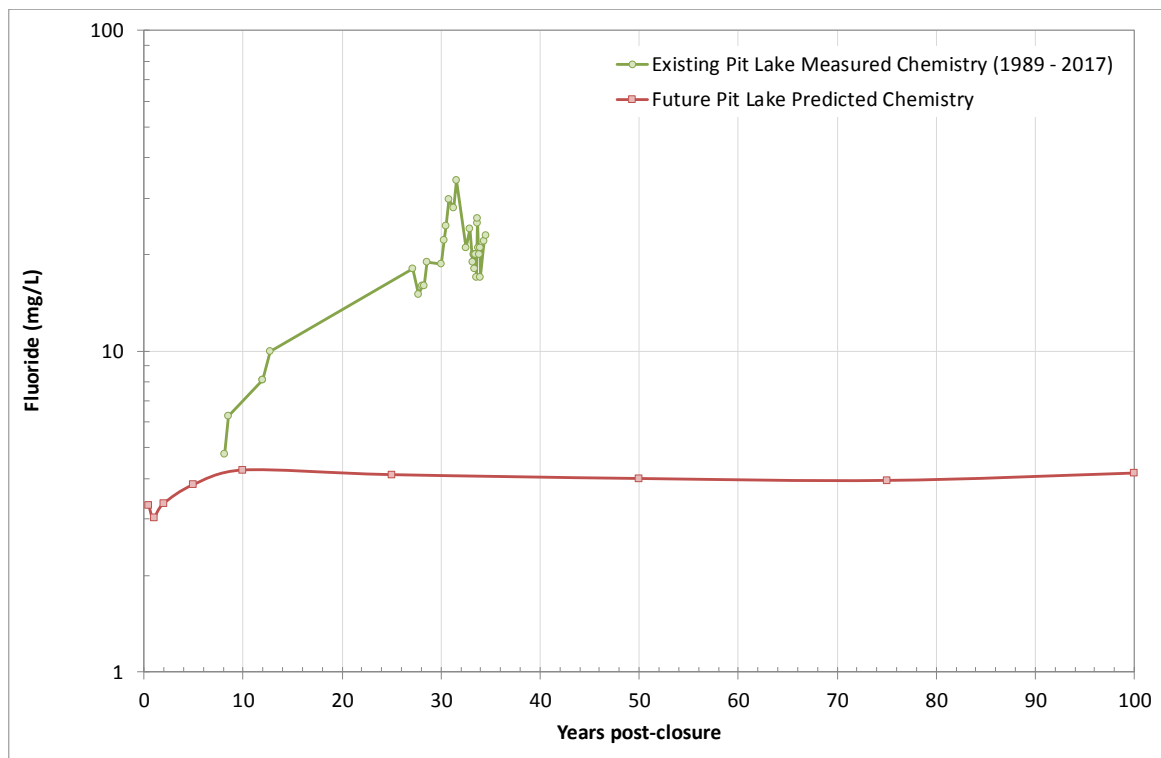


Figure 5-11: Time-series Plot of Predicted Fluoride for the Unreclaimed Pit Model

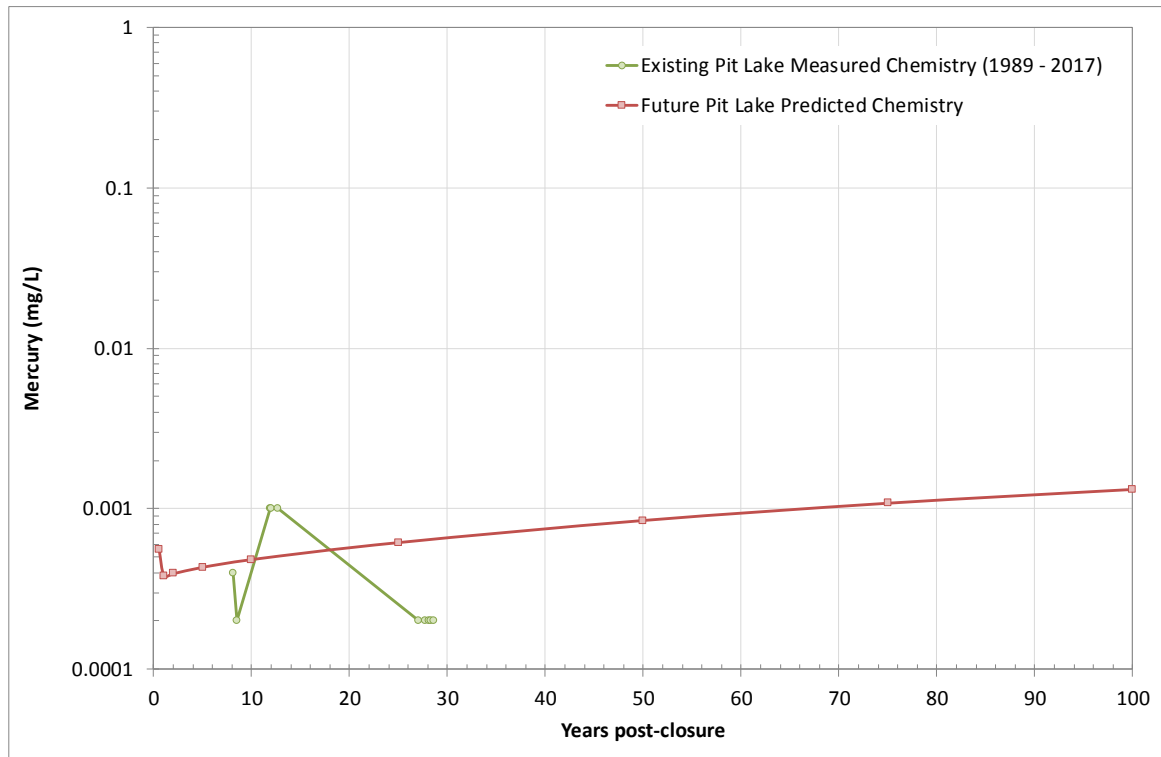


Figure 5-12: Time-series Plot of Predicted Mercury for the Unreclaimed Pit Model

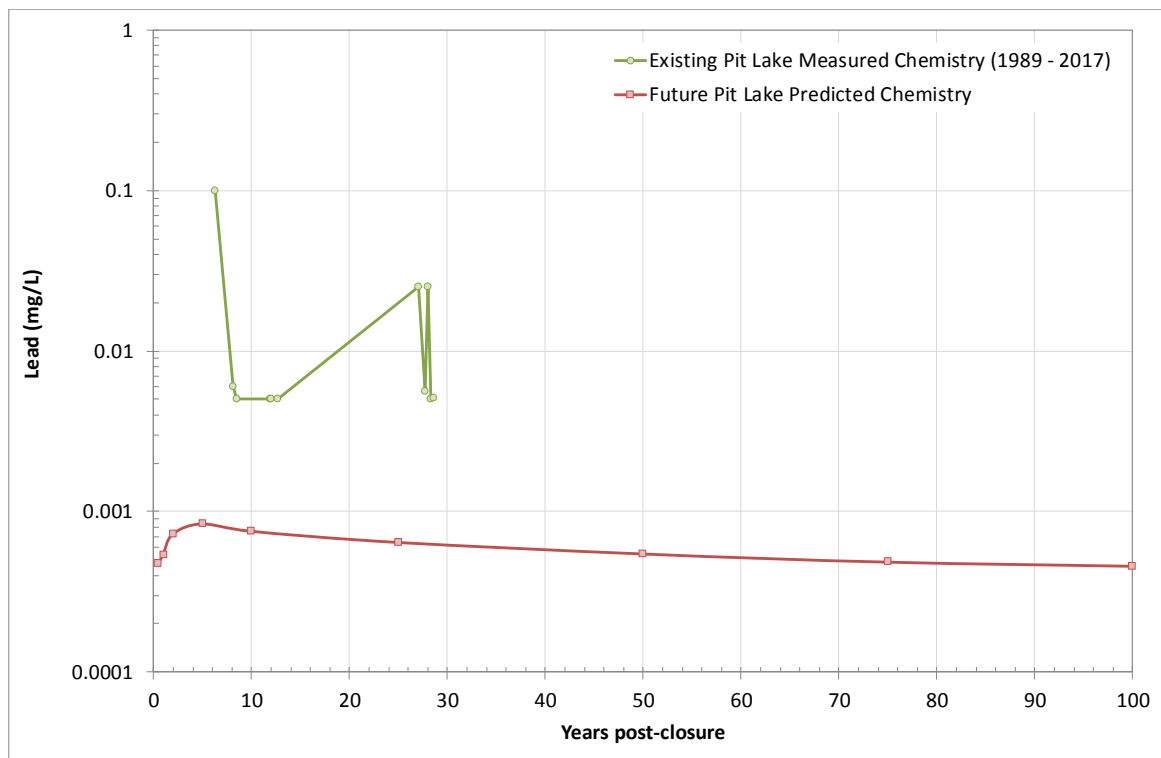


Figure 5-13: Time-series Plot of Predicted Lead for the Unreclaimed Pit Model

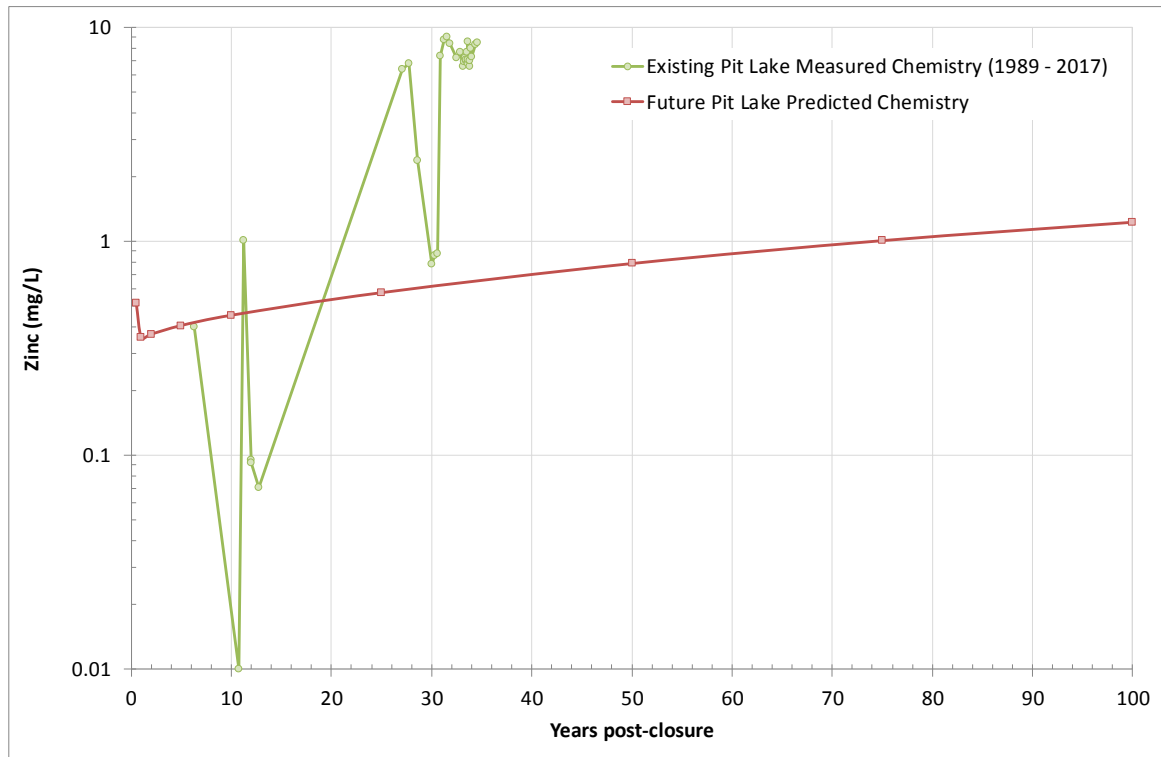


Figure 5-14: Time-series Plot of Predicted Zinc for the Unreclaimed Pit Model

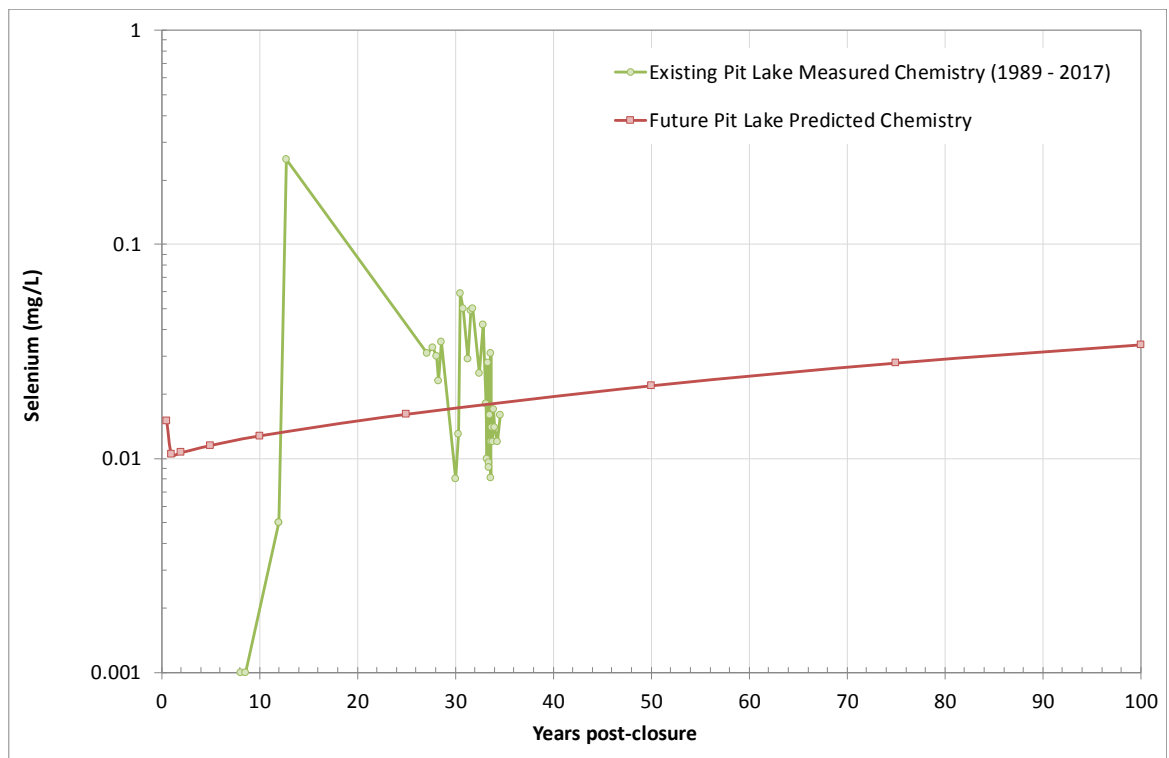


Figure 5-15: Time-series Plot of Predicted Selenium for the Unreclaimed Pit Model

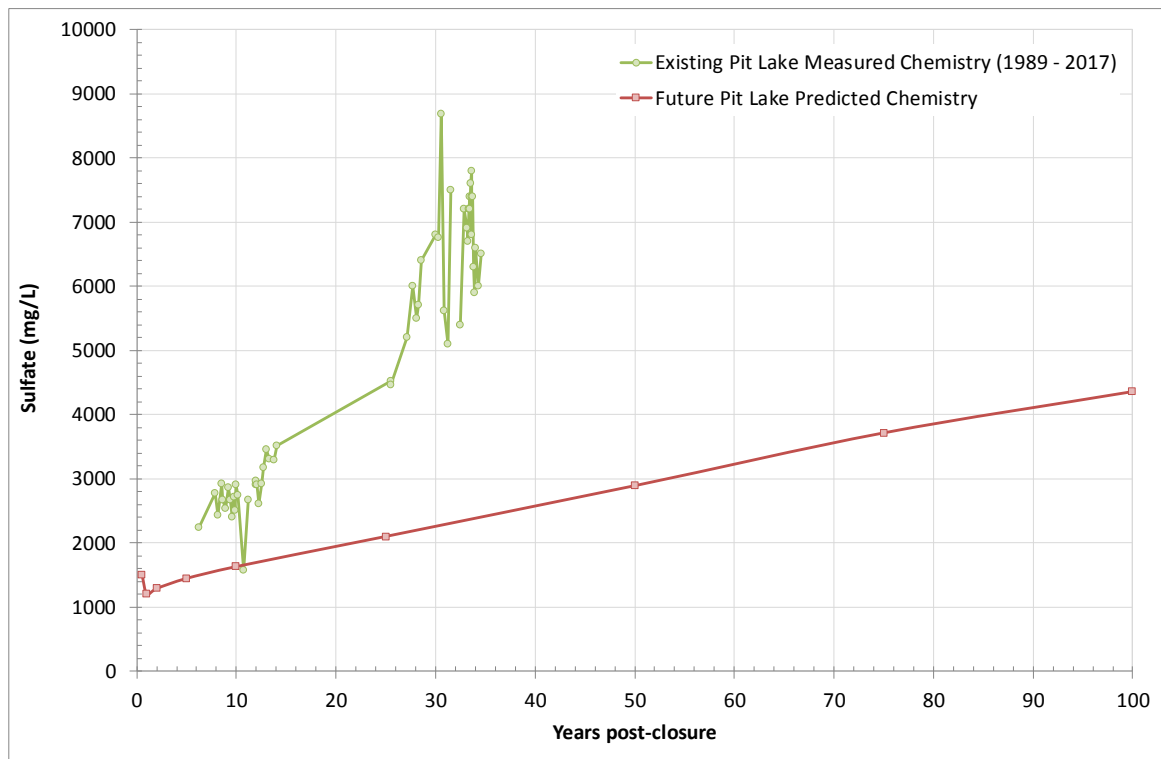


Figure 5-16: Time-series Plot of Predicted Sulfate for the Unreclaimed Pit Model

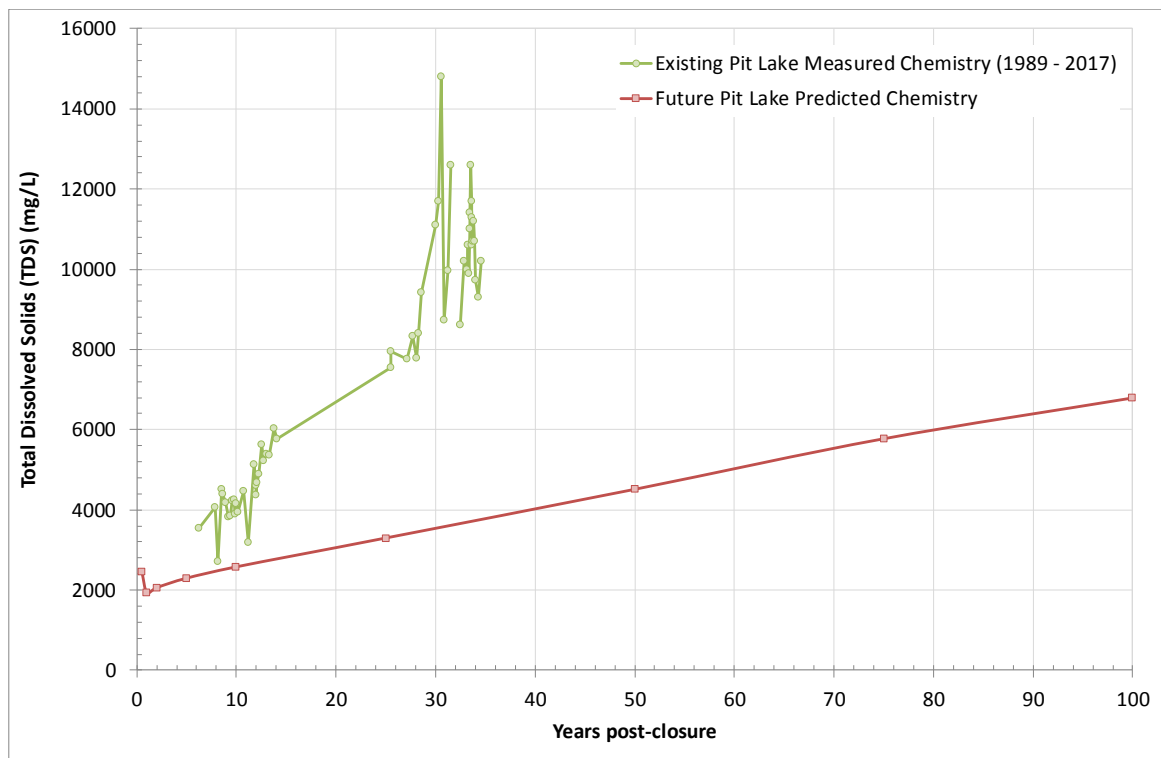


Figure 5-17: Time-series Plot of Predicted TDS for the Unreclaimed Pit Model

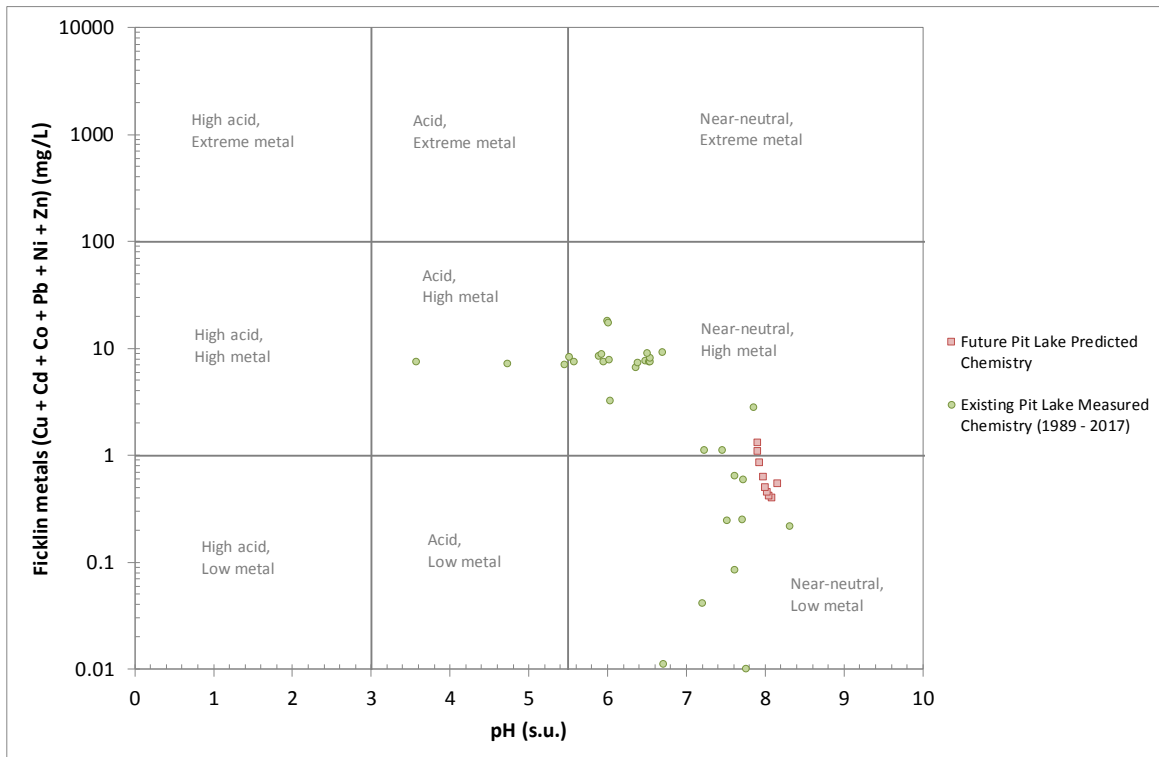


Figure 5-18: Ficklin Plot for the Unreclaimed Pit Model

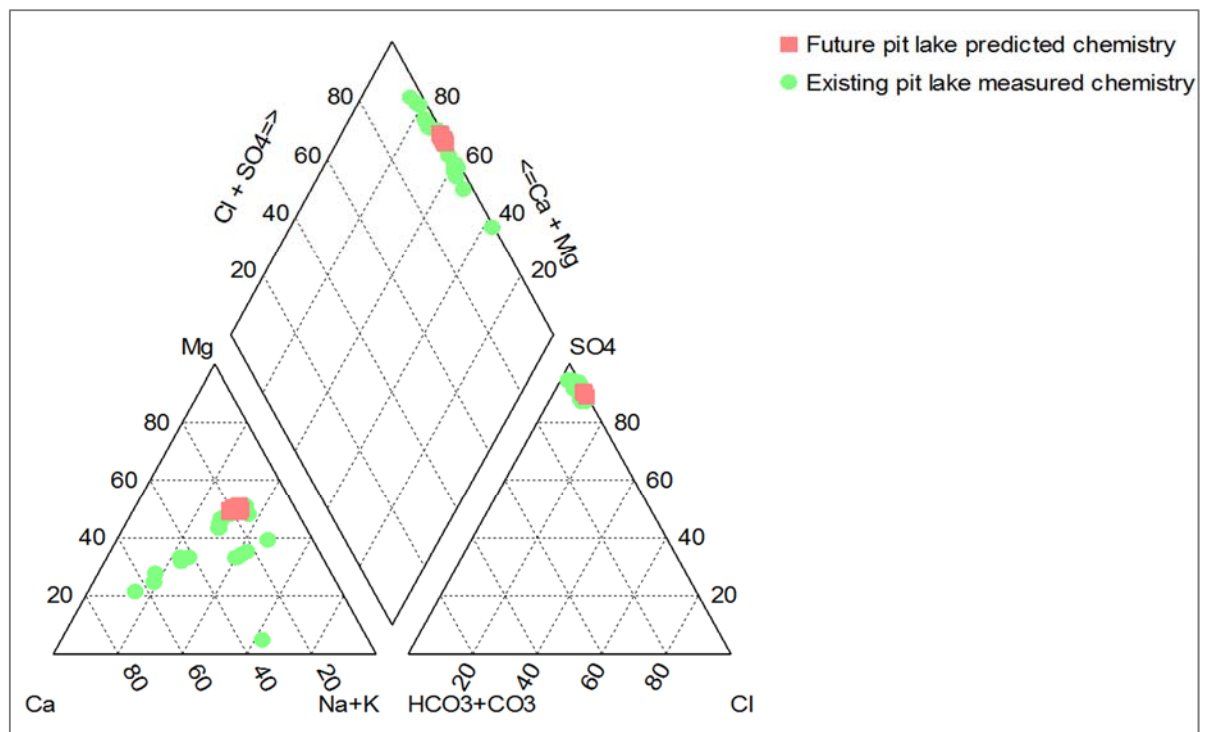


Figure 5-19: Piper Plot of Predicted Major Ion Chemistry for the Unreclaimed Pit Model

6 Reclaimed Pit Model with Rapid Fill

6.1 Conceptual Model

Rapid fill has been proposed as a reclamation strategy for the future pit and will dilute solutes derived from water-rock interaction. Rapid fill will quickly submerge walls and benches to limit the exposure of sulfide minerals to oxygen, and will reduce the effects of evapoconcentration over time. To assess the effects of initial rapid fill on predicted pit lake chemistry for the future pit, an alternative model has been run. This alternative fills the pit with 2,200 acre-feet from the water supply wells during the six months of pit filling. Rapid fill stops when the 4,897 ft water elevation is achieved. Additional reclamation activities for this scenario includes reclamation of the haul road, the expanded section of the 4900 catch bench and the pit shell crest (see Section 3.1.8).

Water quality predictions for this scenario were made for time periods of 0.5, 1, 2, 5, 10, 25, 50, 75, and, 100 years after the start of pit lake formation. A conceptual model for the reclaimed pit rapid fill scenario is presented in Figure 6-1 and inputs to the model are discussed in Sections 6.2 to 6.5.

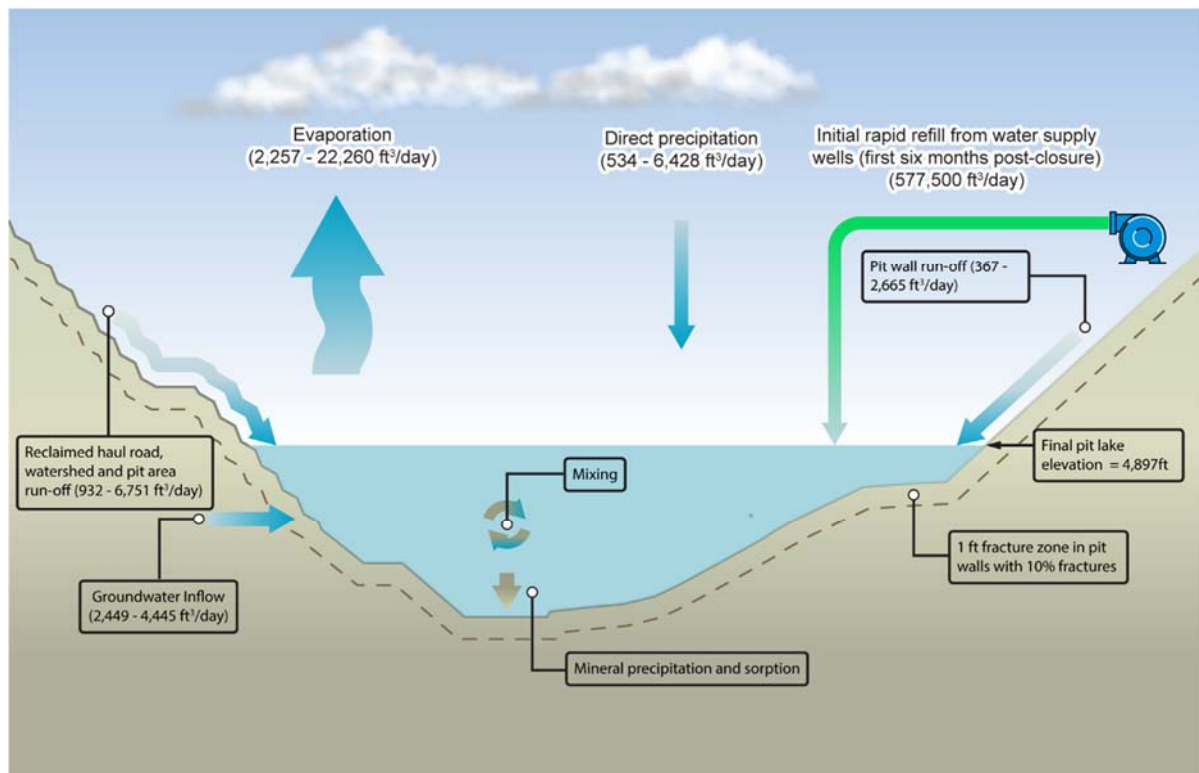


Figure 6-1: Conceptual Model for Reclaimed Pit with Rapid Fill

6.2 Pit Wall Surface Areas

The proportional surface areas of the main material types that will be exposed in the final walls of the reclaimed pit have been calculated from the FS geologic block model and the 2017 MORP pit. The block model was used to calculate the three-dimensional surface area of each material type that will be exposed in the pit wall both above and below the water level as pit filling progresses. Three-dimensional surface areas were calculated for each of the modeled time steps (i.e., for 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years after the start of pit lake formation). Material types were delineated based on primary lithology, oxidation (redox) and mineralization (i.e., mineralized versus weakly/non-mineralized). Areas proposed for cover and reclamation are excluded from the exposed surface areas.

The three-dimensional surface areas of each material type in the reclaimed pit at the end of mine life are provided in Table 6-1 and are illustrated in Figure 6-2. This demonstrates that unoxidized Quartz Monzonite will represent the dominant material type that will be exposed in the final walls of the reclaimed pit.

Table 6-1: Three-dimensional Surface Areas of Pit Wall Rock Material Types for Final Reclaimed Pit

Mineralization	Rock Type	Redox	Three-dimensional surface area	
			Square feet	%
Weakly/non-mineralized	Andesite	Oxide	41	0.001%
		Sulfide (non-ox.)	118,926	1.5%
	Biotite Breccia	Oxide	434	0.01%
		Sulfide (non-ox.)	206,789	2.7%
	Quartz Monzonite	Oxide	236	0.003%
		Sulfide (non-ox.)	2,052,482	26.4%
	Coarse Crystalline Porphyry	Oxide	790	0.01%
		Sulfide (non-ox.)	596,808	7.7%
Mineralized	Biotite Breccia	Sulfide (non-ox.)	526,770	6.8%
	Quartz Monzonite	Oxide	0	0%
		Sulfide (non-ox.)	1,777,718	22.9%
	Coarse Crystalline Porphyry	Oxide	0	0%
		Sulfide (non-ox.)	302,134	3.9%
Reclaimed area			2,191,373	28.2%
Total			7,774,501	100%

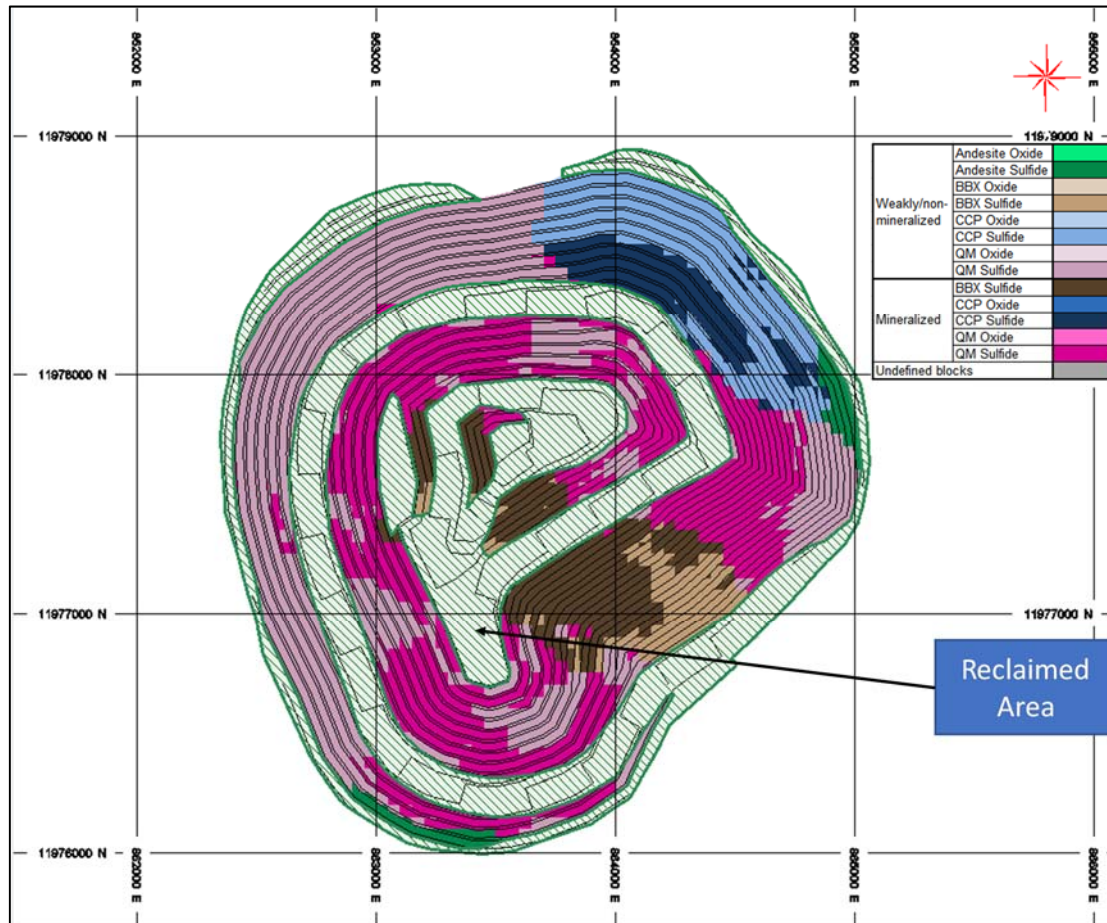


Figure 6-2: Exposed Material Types in Final Walls of the Reclaimed Pit

6.3 Calculation of Pit Wall Rock Available for Leaching

The blasting techniques that will be used for the reclaimed pit will be identical to those for the unreclaimed pit model. As such, a 1 foot thickness of reactive rock in the pit walls has also been assumed for the reclaimed pit model (Siskind and Fumanti, 1974; Kelsall et al., 1984). The method used to calculate the mass of pit wall available for leaching was identical to that used for the unreclaimed pit model (Section 5.3).

6.4 Water Balance

A pit lake water balance for the reclaimed pit model with rapid fill has been developed by JSAI and is based on the following inputs/assumptions (JSAI, 2017):

- The pit will be filled with 2,200 acre-feet from the water supply wells during the six months of pit infilling;
- Rapid fill stops when the 4,897 ft water elevation is achieved;
- Evaporation will represent the dominant solution loss; and
- The pit lake evaporation rate is 50 inches per year.

As with the unreclaimed pit model, the pit lake for the reclaimed pit model will also be a hydrologic sink. The pit lake filling curve is shown in Figure 6-3 and the various inputs/outputs to the pit are shown in Figure 6-4.

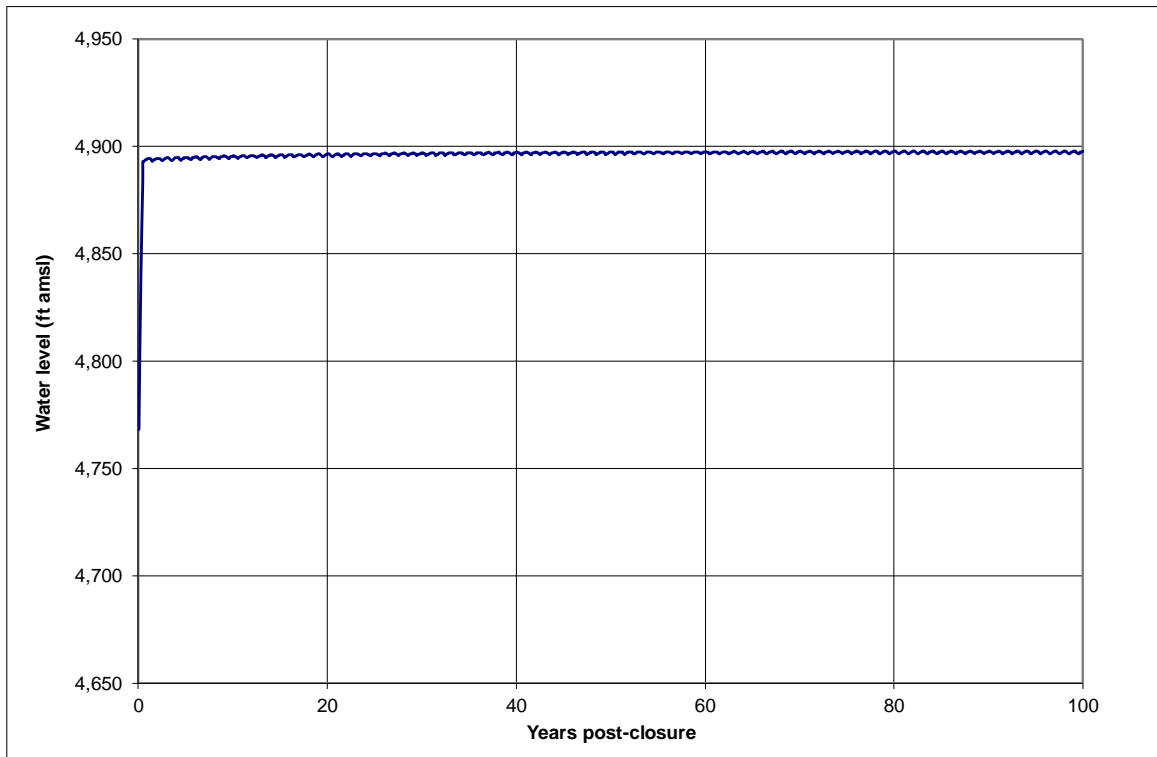


Figure 6-3: Pit Lake Elevation Curve for Reclaimed Pit Model with Rapid Fill

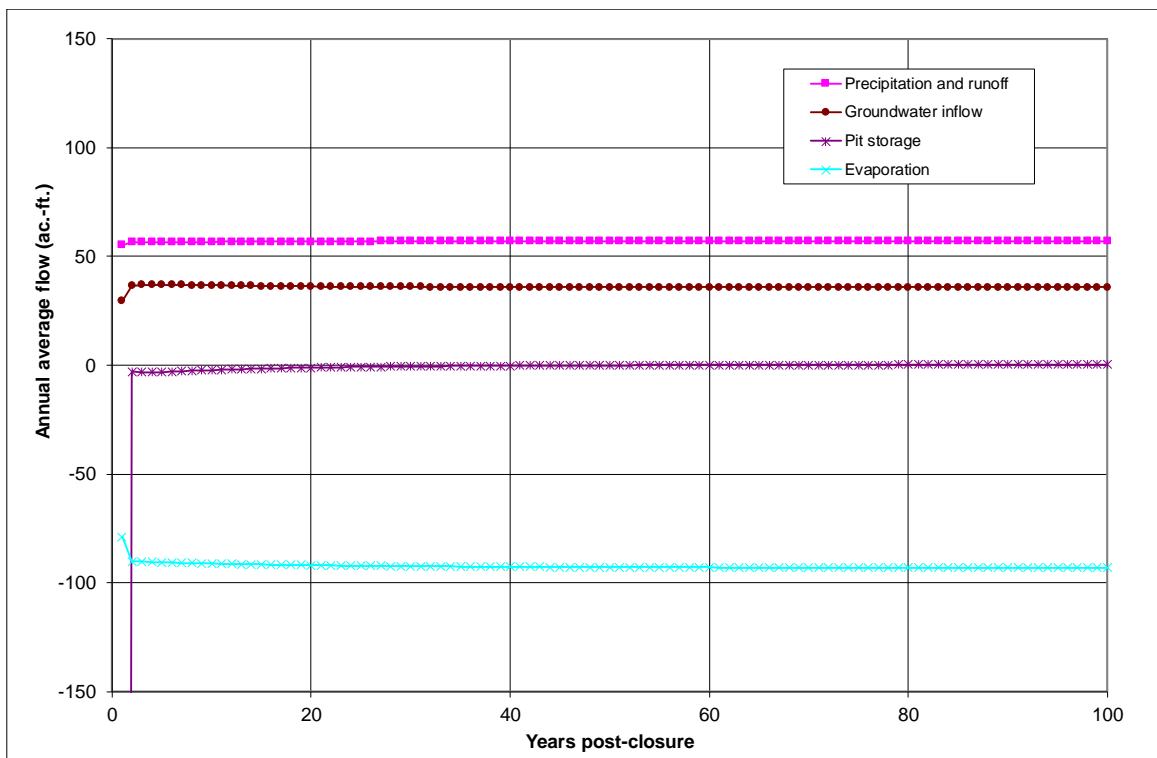


Figure 6-4: Pit Lake Flux for Reclaimed Pit Model with Rapid Fill

6.5 Solution Inputs

6.5.1 Precipitation Chemistry

As with the existing pit model (Section 4) and unreclaimed pit model (Section 5), the primary wall rock lixiviant for the pit high walls in the reclaimed pit model is assumed to be precipitation. Representative precipitation chemistry data were obtained from monthly monitoring carried out between 1985 and 2011 at the Gila Cliff Dwellings National Monument meteorological station, Catron County, New Mexico (NADP, 2012).

6.5.2 Groundwater Chemistry

Following the initial rapid fill with water from the supply wells, groundwater will continue to enter the pit. The groundwater chemistry used for the reclaimed pit model was identical to that used for the unreclaimed pit model (Section 5.5.2, Table 5-2).

6.5.3 Wall Rock Chemistry

The pit shell and exposed wall rocks for the reclaimed pit model will be identical to those in the unreclaimed model. As such, the same wall rock source terms were used in the model (Section 5.5.3, Table 5-2).

6.5.4 Water Supply Well Chemistry

Water used to rapidly fill the pit is represented by hydrochemical data from water supply wells PW-1 and PW-3 (Table 6-2; JSAI, 2017c; Appendix E).

Table 6-2: Water Supply Well Chemistry for PW-1 and PW-3 used to Represent Rapid Fill Water Quality in the Reclaimed Pit Model

Parameter		Units	Average Chemistry for PW-1 and PW-3
pH	pH	s.u.	8.03
HCO ₃	Bicarbonate	mg/L	135
Ag	Silver	mg/L	<0.005*
Al	Aluminum	mg/L	<0.02*
As	Arsenic	mg/L	0.005
B	Boron	mg/L	0.08
Ba	Barium	mg/L	0.009
Be	Beryllium	mg/L	<0.002*
Ca	Calcium	mg/L	28
Cd	Cadmium	mg/L	<0.002*
Cl	Chloride	mg/L	41
Co	Cobalt	mg/L	<0.006*
Cu	Copper	mg/L	<0.006*
Cr	Chromium	mg/L	0.006
F	Fluoride	mg/L	1.45
Fe	Iron	mg/L	0.053
Hg	Mercury	mg/L	<0.0002*
K	Potassium	mg/L	3.35
Mg	Magnesium	mg/L	2.05
Mn	Manganese	mg/L	0.0025
Mo	Molybdenum	mg/L	<0.008*
Na	Sodium	mg/L	69.5
Ni	Nickel	mg/L	<0.01*
Pb	Lead	mg/L	<0.005*
SO ₄	Sulfate	mg/L	27
Se	Selenium	mg/L	<0.001*
Si	Silica	mg/L	19
U	Uranium	mg/L	0.0023
V	Vanadium	mg/L	<0.05*
Tl	Thallium	mg/L	<0.001
Zn	Zinc	mg/L	0.023

* Parameters below analytical detection limits were not included in the input to the PHREEQC model

6.5.5 Reclaimed Surface Chemistry

At closure, several areas of the pit will be reclaimed. Water quality associated with run-off from these areas is therefore likely to have a different chemical composition from the rest of the pit walls. As such, the water balance provided by JSAI includes a separate input to the water balance for the reclaimed areas and receiving watershed. Conveyed stormwater is expected to have a chemistry similar to background surface water quality from SWQ-1 (Table 6-3; JSAI, 2015b).

Table 6-3: Water Supply Well Chemistry for SWQ-1 used to Represent reclaimed pit Run-off Water Quality in the Reclaimed Pit Model

Parameter		Units	Average Chemistry for SWQ-1
pH	pH	s.u.	8.3
HCO ₃	Bicarbonate	mg/L	430
Al	Aluminum	mg/L	<0.1*
As	Arsenic	mg/L	<0.005*
B	Boron	mg/L	0.02
Ba	Barium	mg/L	<0.5*
Ca	Calcium	mg/L	109
Cd	Cadmium	mg/L	<0.002*
Cl	Chloride	mg/L	30
Co	Cobalt	mg/L	<0.05*
Cu	Copper	mg/L	<0.01*
Cr	Chromium	mg/L	<0.02*
F	Fluoride	mg/L	0.3
Fe	Iron	mg/L	<0.05*
Hg	Mercury	mg/L	<0.001*
K	Potassium	mg/L	1.8
Mg	Magnesium	mg/L	36
Mn	Manganese	mg/L	<0.02*
Mo	Molybdenum	mg/L	<0.02*
Na	Sodium	mg/L	107
Pb	Lead	mg/L	<0.02*
Se	Selenium	mg/L	<0.005*
SO ₄	Sulfate	mg/L	261
Zn	Zinc	mg/L	<0.01*

* Parameters below analytical detection limits were not included in the input to the PHREEQC model

6.6 Results

The predicted pit lake chemistry for the reclaimed pit model is summarized in Table 6-4 and illustrated in Figure 6-5 to Figure 6-18 for selected parameters. These show predicted pit lake chemistry at each of the modeled time steps (i.e., 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years post-closure) compared to water quality in the existing pit lake. The full PHREEQC output file is provided in Appendix I, which shows precipitating and dissolving mineral species at each time step as part of the mass transfer calculations.

As with the unreclaimed pit model, pit lake waters for the reclaimed pit model are predicted to be moderately alkaline (pH 8.1 – 8.4) with a predominantly sodium + chloride/sulfate (Na + SO₄/Cl) major ion signature (Figure 6-18). Rapidly filling the pit with the water supply wells during the first six months post-closure results in a more dilute initial water chemistry with a sodium-chloride (Na+Cl) signature. The result is that the effects of evapoconcentration are not as pronounced as the pit lake reaches hydrogeologic equilibrium, and predicted concentrations of many major ions and trace elements at 100 years remain lower than if natural fill were used. This is particularly the case for constituents such as boron, sulfate and chloride, which are strongly influenced by evaporation effects and are predicted to be much lower in concentration for the rapid fill scenario compared to the natural fill scenario. The rapid fill will also quickly submerge walls and benches to limit the exposure of sulfide minerals to oxygen, which will reduce trace element release into the pit lake.

As with the unreclaimed model, concentrations of the majority of constituents are either comparable to or less than concentrations in the existing pit lake at Copper Flat. Pit lake waters for the reclaimed pit model are predicted to be 'near-neutral, low-metal' waters based on pH values between 8.1 and 8.4 and total Ficklin metal concentrations less than 1 mg/L (Figure 6-17).

Table 6-4: Reclaimed Pit Model Results

Parameter		Units	Measured Chemistry in Existing Pit (1989 - 2017)			Predicted Future Chemistry (Years Post-Closure)								
			Average	Minimum	Maximum	0.5	1	2	5	10	25	50	75	100
pH	pH	s.u.	6.5	3.6	8.3	8.4	8.4	8.4	8.3	8.3	8.2	8.2	8.1	8.1
HCO ₃	Bicarbonate	mg/L	40.4	<3	122	85.3	83.6	81.3	72.6	65.9	58.9	54.0	51.5	49.7
Al	Aluminium	mg/L	10.4	<0.02	82.6	0.0004	0.001	0.003	0.008	0.02	0.04	0.07	0.11	0.15
As	Arsenic	mg/L	0.004	<0.001	0.006	5.22E-04	4.61E-04	3.63E-04	1.35E-04	2.75E-05	7.44E-06	1.19E-05	2.32E-05	3.81E-05
B	Boron	mg/L	0.14	<0.1	0.2	0.08	0.09	0.09	0.12	0.16	0.27	0.46	0.64	0.83
Ca	Calcium	mg/L	550	455	684	12.7	13.7	15.4	22.5	32.9	58.9	99.5	138	177
Cd	Cadmium	mg/L	0.05	<0.005	0.1	0.00001	0.00003	0.0001	0.0002	0.0003	0.0008	0.0016	0.002	0.003
Co	Cobalt	mg/L	0.29	<0.05	0.49	0.00005	0.0001	0.0002	0.0006	0.001	0.003	0.006	0.010	0.013
Cr	Chromium	mg/L	0.03	<0.006	0.1	3.07E-05	3.10E-05	3.16E-05	3.38E-05	3.64E-05	4.12E-05	4.70E-05	5.16E-05	5.57E-05
Cu	Copper	mg/L	4.44	0.001	26.5	0.002	0.01	0.01	0.03	0.05	0.04	0.03	0.03	0.03
F	Fluoride	mg/L	19.2	4.8	34	1.49	1.52	1.61	1.88	2.31	3.58	5.68	5.81	5.80
Fe	Iron	mg/L	0.2	<0.02	1.3	3.93E-05	3.94E-05	3.96E-05	4.05E-05	4.16E-05	4.39E-05	4.64E-05	4.84E-05	5.00E-05
Hg	Mercury	mg/L	0.0005	<0.0002	0.001	0.000005	0.00001	0.00002	0.0000	0.0001	0.0002	0.0004	0.0007	0.0009
K	Potassium	mg/L	32.1	11.0	60.6	4.91	6.39	9.43	18.5	33.4	77.7	151	224	298
Mg	Magnesium	mg/L	698	43	1,120	3.47	5.06	7.65	13.7	26.1	68.3	141	214	288
Mn	Manganese	mg/L	34.8	0.02	59.0	0.04	0.08	0.15	0.37	0.74	1.83	3.64	5.44	7.24
Mo	Molybdenum	mg/L	0.04	0.015	0.1	0.002	0.004	0.01	0.019	0.04	0.09	0.19	0.28	0.37
Na	Sodium	mg/L	888	165	1,400	72.6	74.9	80.6	97.6	126	209	348	486	625
Ni	Nickel	mg/L	0.06	0.039	0.1	0.0001	0.0002	0.000	0.001	0.002	0.005	0.010	0.015	0.020
Pb	Lead	mg/L	0.02	<0.005	0.1	0.00001	0.00003	0.0001	0.0002	0.0004	0.001	0.001	0.001	0.001
Sb	Antimony	mg/L	<0.001*			0.00004	0.0001	0.0001	0.0004	0.001	0.002	0.004	0.005	0.007
Se	Selenium	mg/L	0.028	<0.001	0.25	0.0001	0.0003	0.001	0.001	0.003	0.007	0.013	0.019	0.026
U	Uranium	mg/L	0.11	0.11	0.12	0.002	0.002	0.003	0.01	0.01	0.02	0.04	0.06	0.07
V	Vanadium	mg/L	0.1	<0.05	0.25	2.84E-06	9.11E-06	2.00E-05	4.92E-05	9.63E-05	2.32E-04	4.57E-04	6.81E-04	9.06E-04
Zn	Zinc	mg/L	5.4	0.01	9	0.03	0.03	0.04	0.06	0.11	0.23	0.44	0.65	0.85
SO ₄	Sulfate	mg/L	4,803	1,566	8,690	39.3	55.3	83.6	168	307	719	1,402	2,085	2,769
Cl	Chloride	mg/L	332	47.3	730	66.5	67.1	69.5	76.9	89.0	125	186	247	309
TDS	Total Dissolved Solids	mg/L	7,538	2,711	14,800	286	308	349	472	684	1,324	2,393	3,460	4,530

* Indicates parameter was uniformly below analytical detection limits in pit lake water over monitoring period, but detection limit was variable. Concentration shown in table represents lower limit of analytical detection.

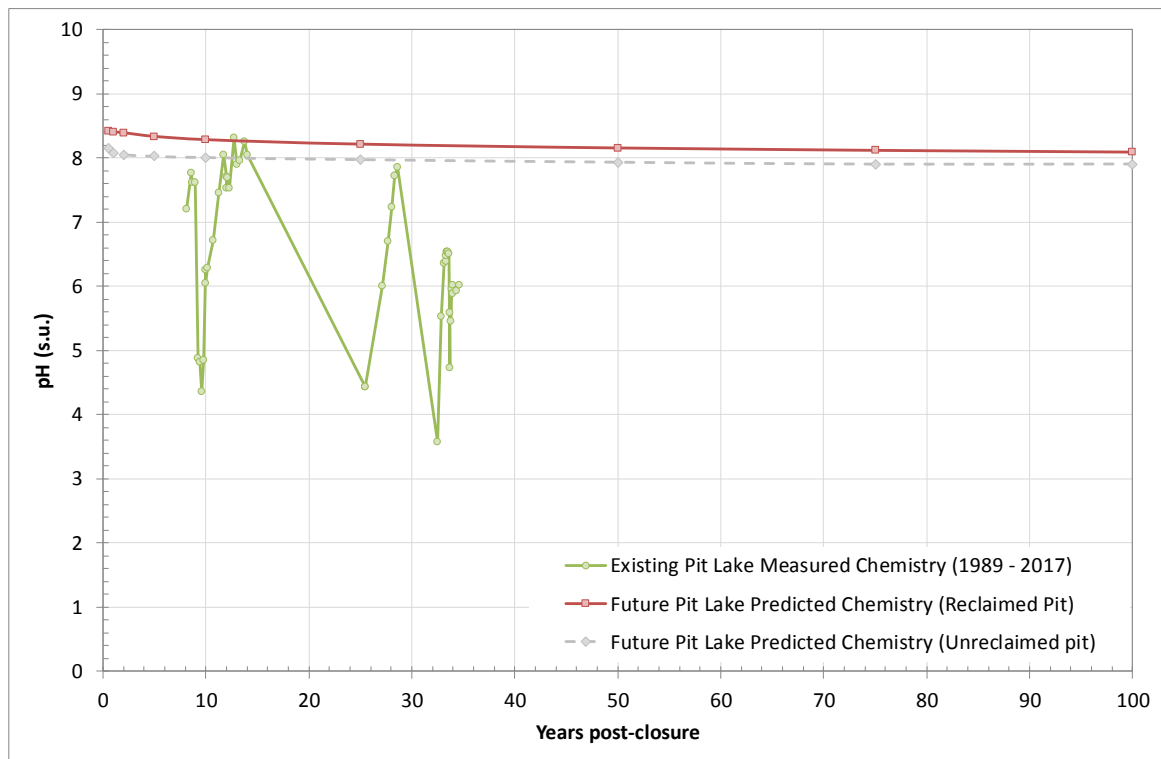


Figure 6-5: Time-series Plot of Predicted pH for the Reclaimed Pit Model

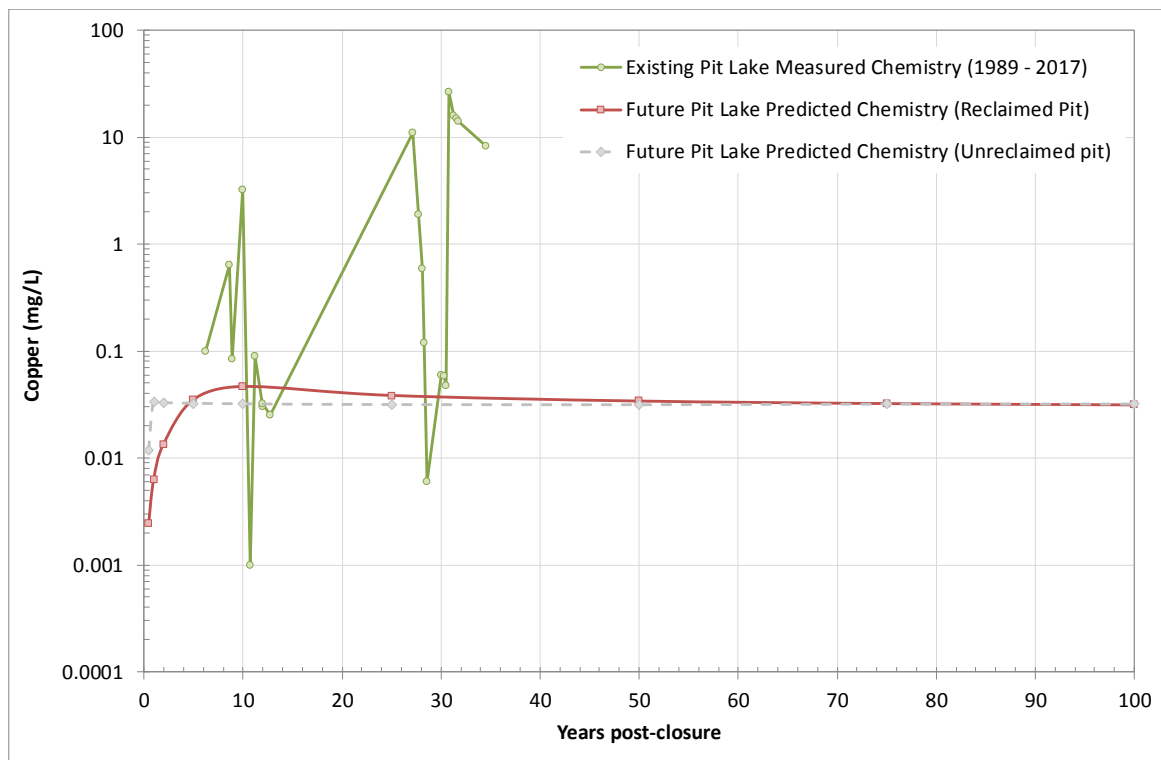


Figure 6-6: Time-series Plot of Predicted Copper for the Reclaimed Pit Model

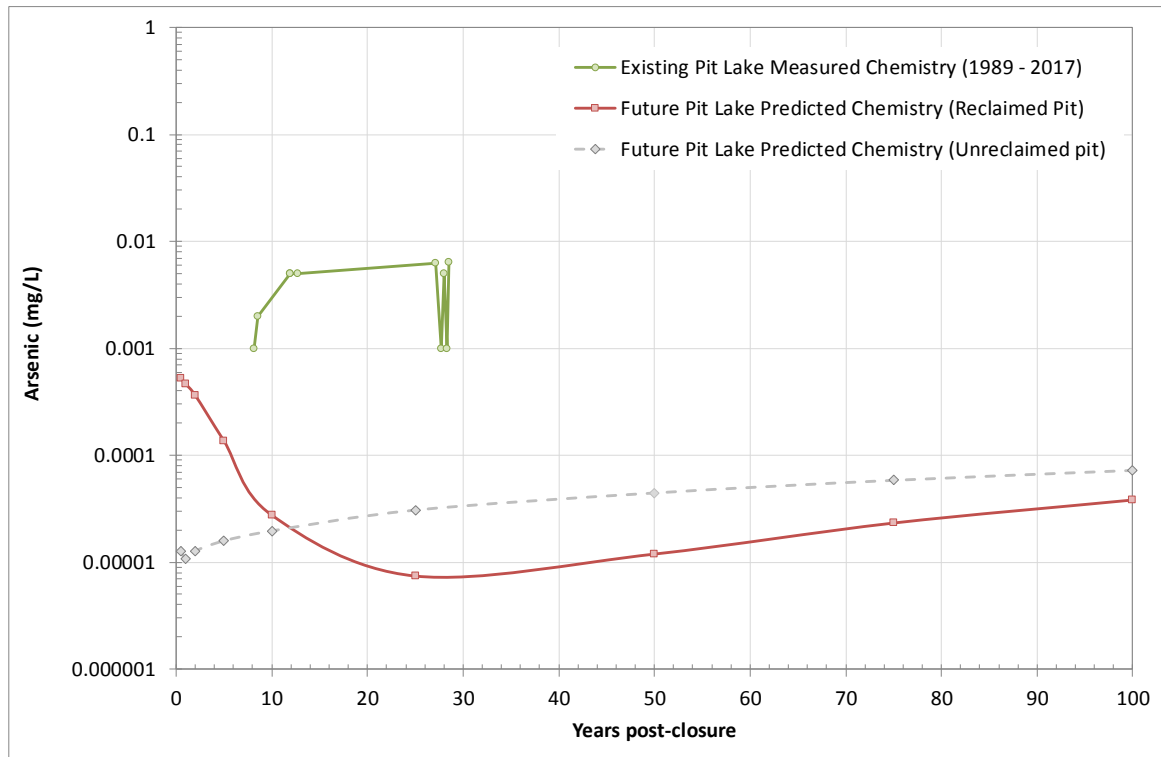


Figure 6-7: Time-series Plot of Predicted Arsenic for the Reclaimed Pit Model

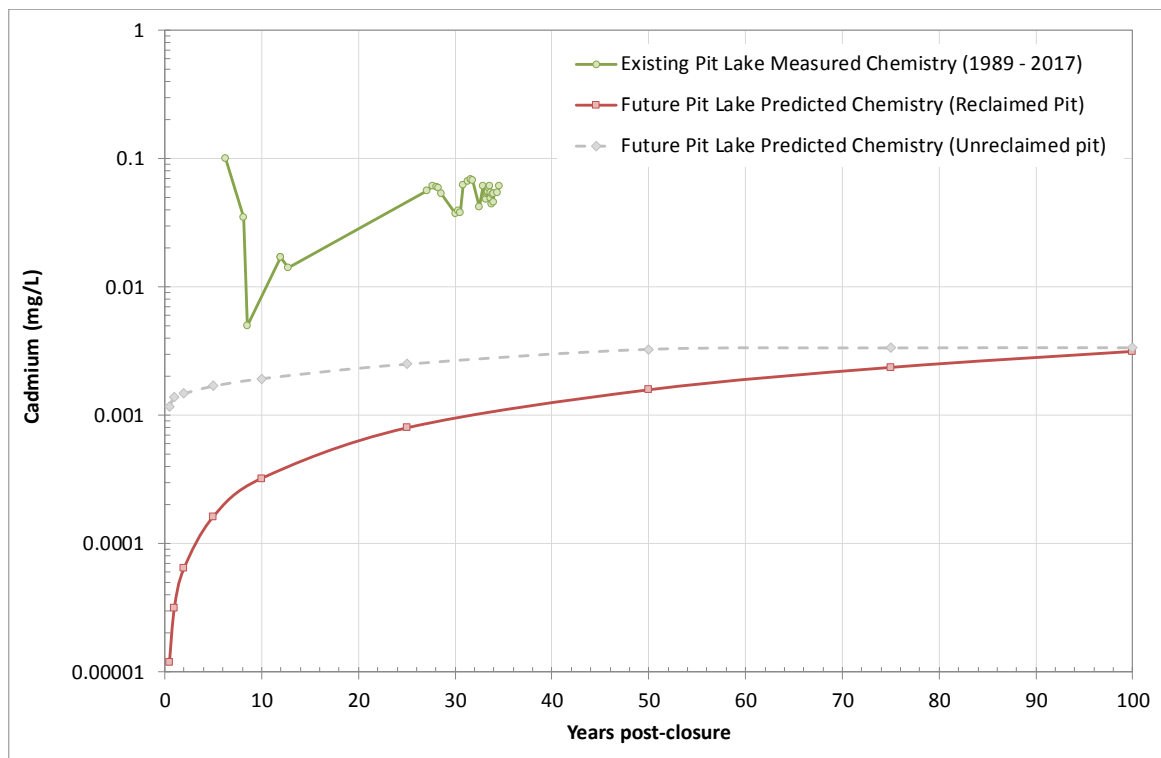


Figure 6-8: Time-series Plot of Predicted Cadmium for the Reclaimed Pit Model

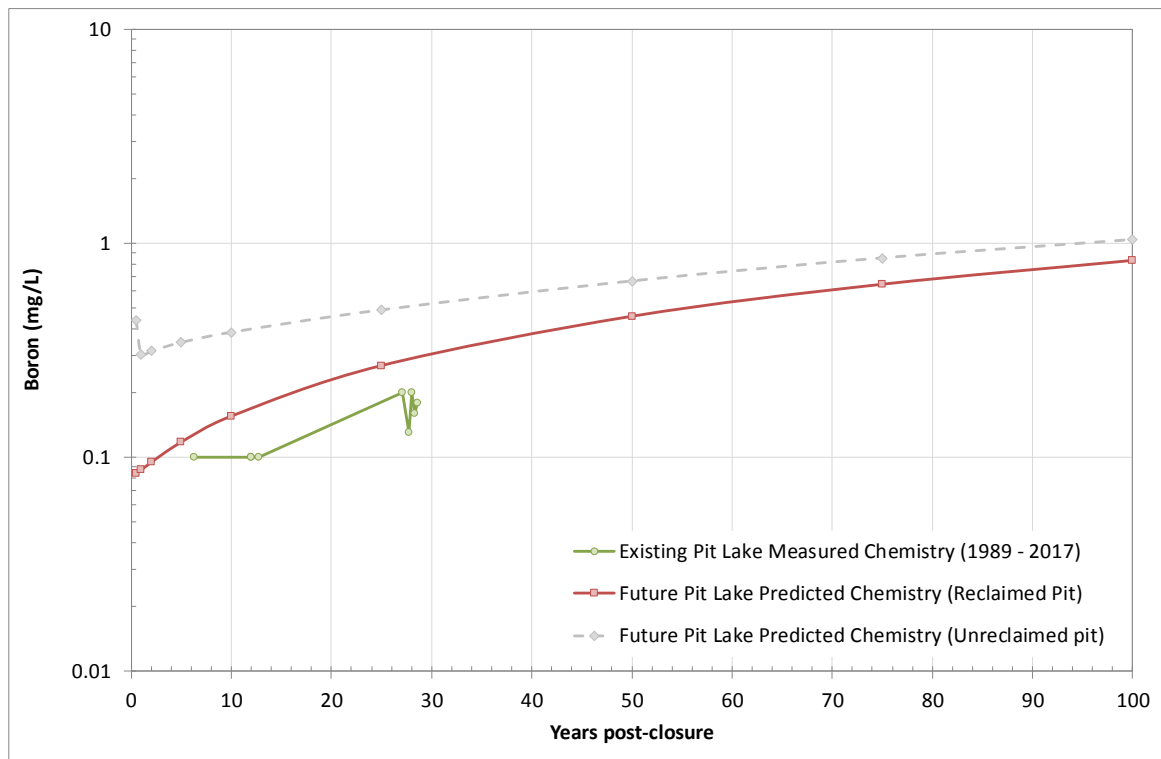


Figure 6-9: Time-series Plot of Predicted Boron for the Reclaimed Pit Model

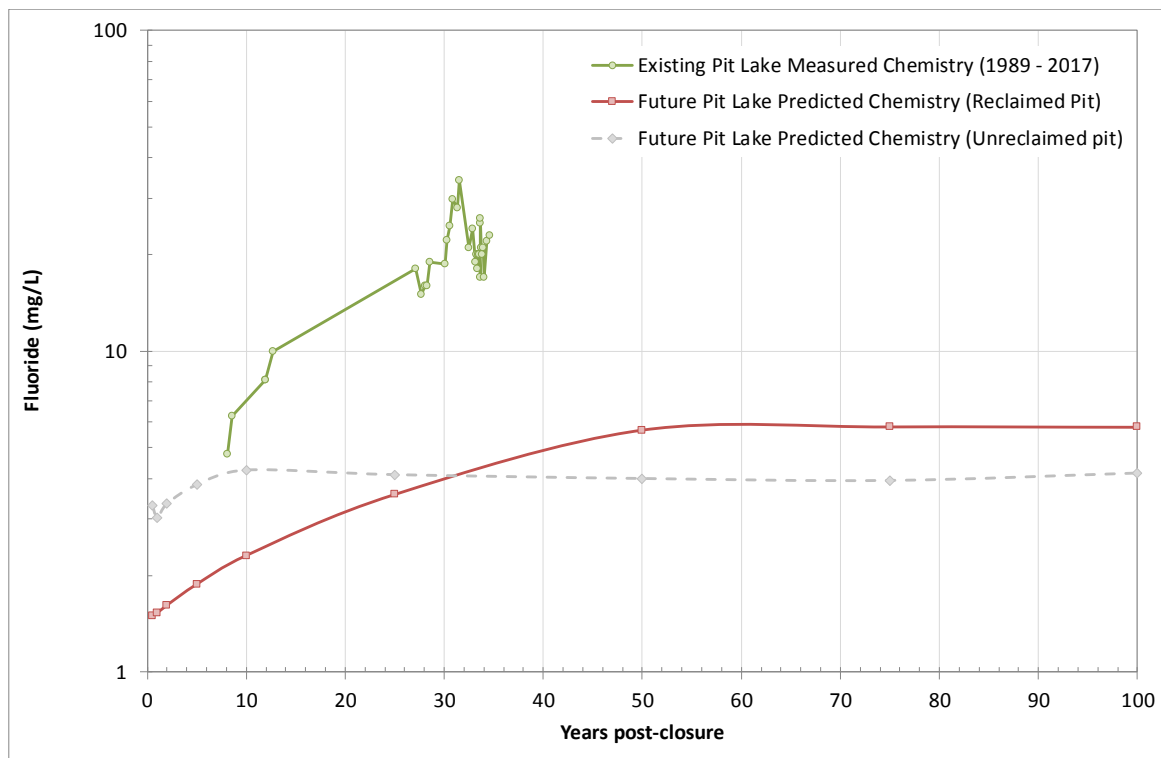


Figure 6-10: Time-series Plot of Predicted Fluoride for the Reclaimed Pit Model

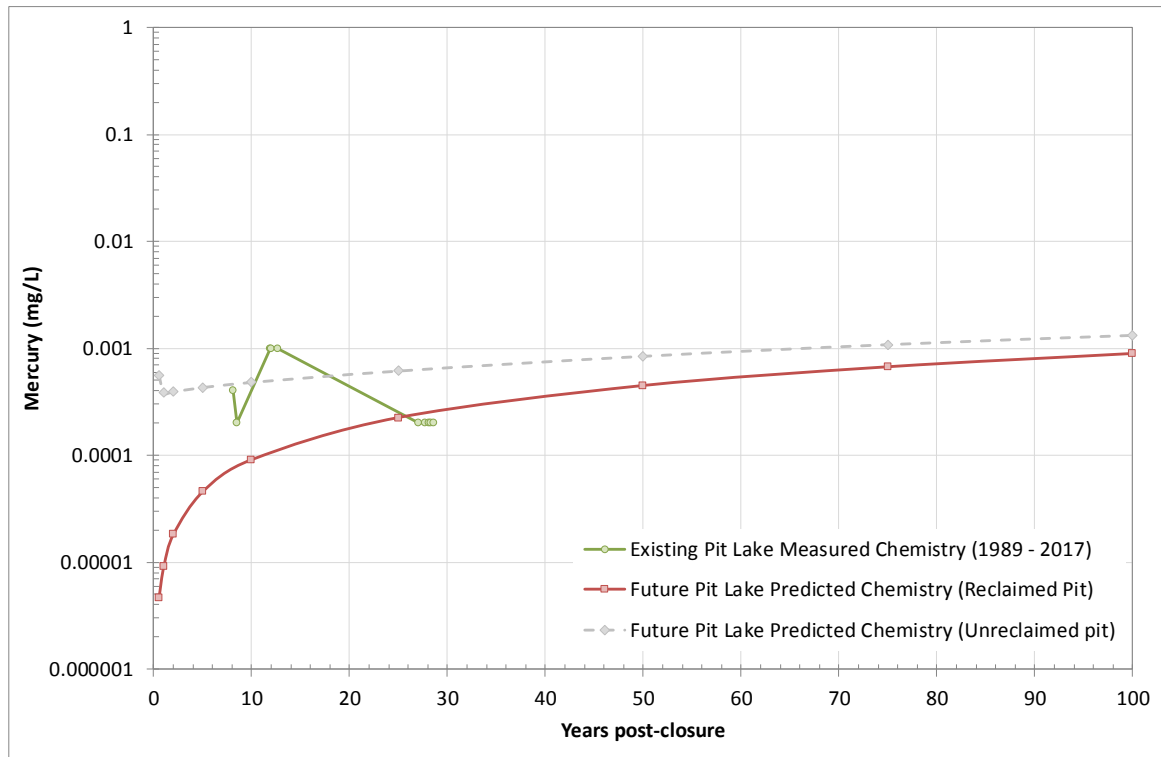


Figure 6-11: Time-series Plot of Predicted Mercury for the Reclaimed Pit Model

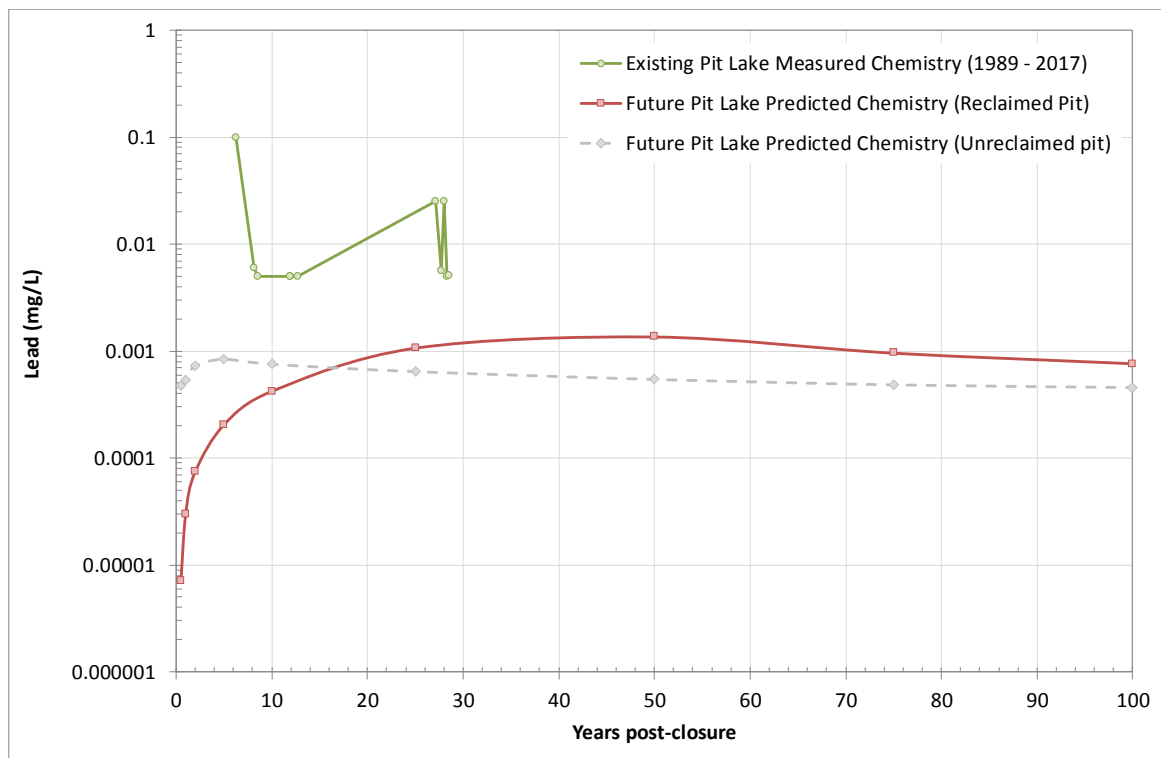


Figure 6-12: Time-series Plot of Predicted Lead for the Reclaimed Pit Model

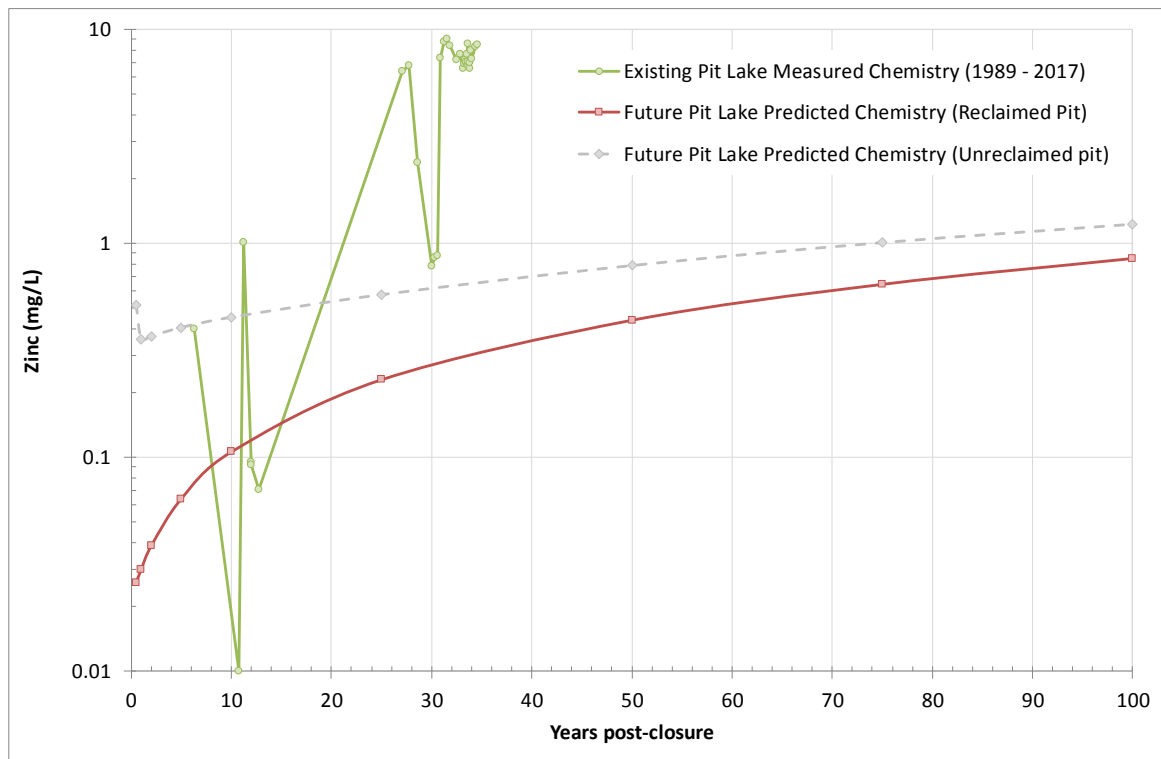


Figure 6-13: Time-series Plot of Predicted Zinc for the Reclaimed Pit Model

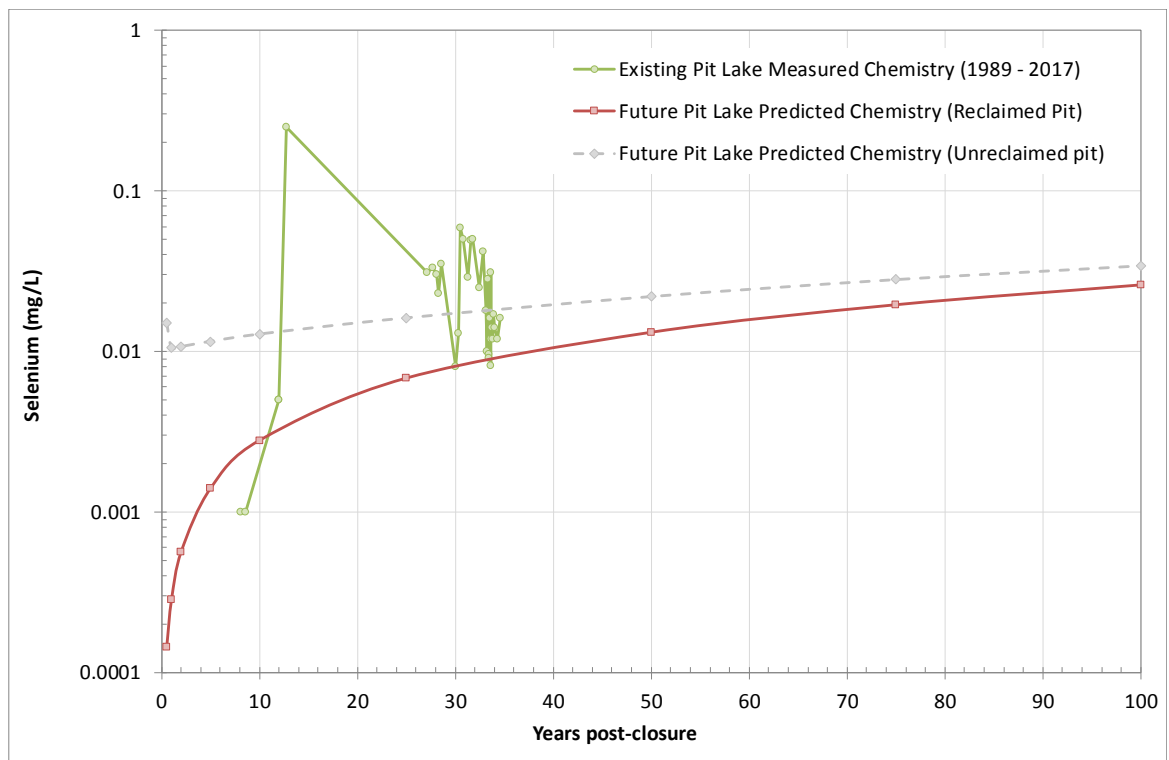


Figure 6-14: Time-series Plot of Predicted Selenium for the Reclaimed Pit Model

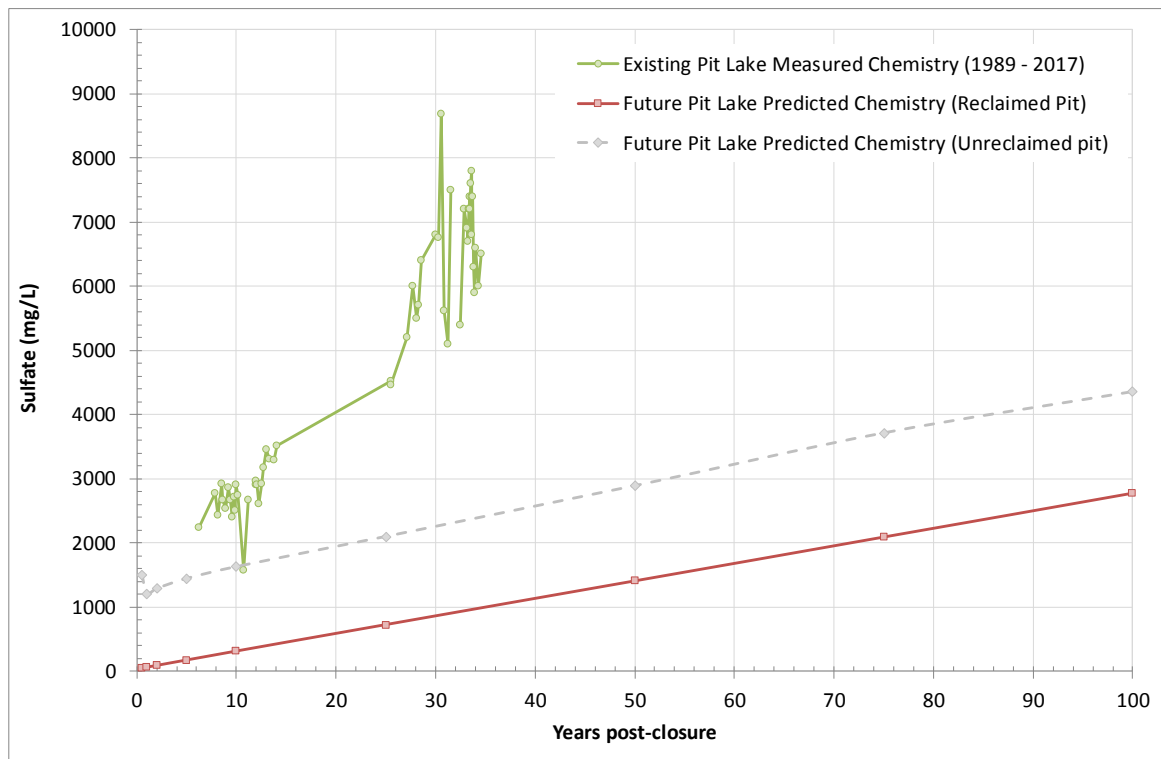


Figure 6-15: Time-series Plot of Predicted Sulfate for the for the Reclaimed Pit Model

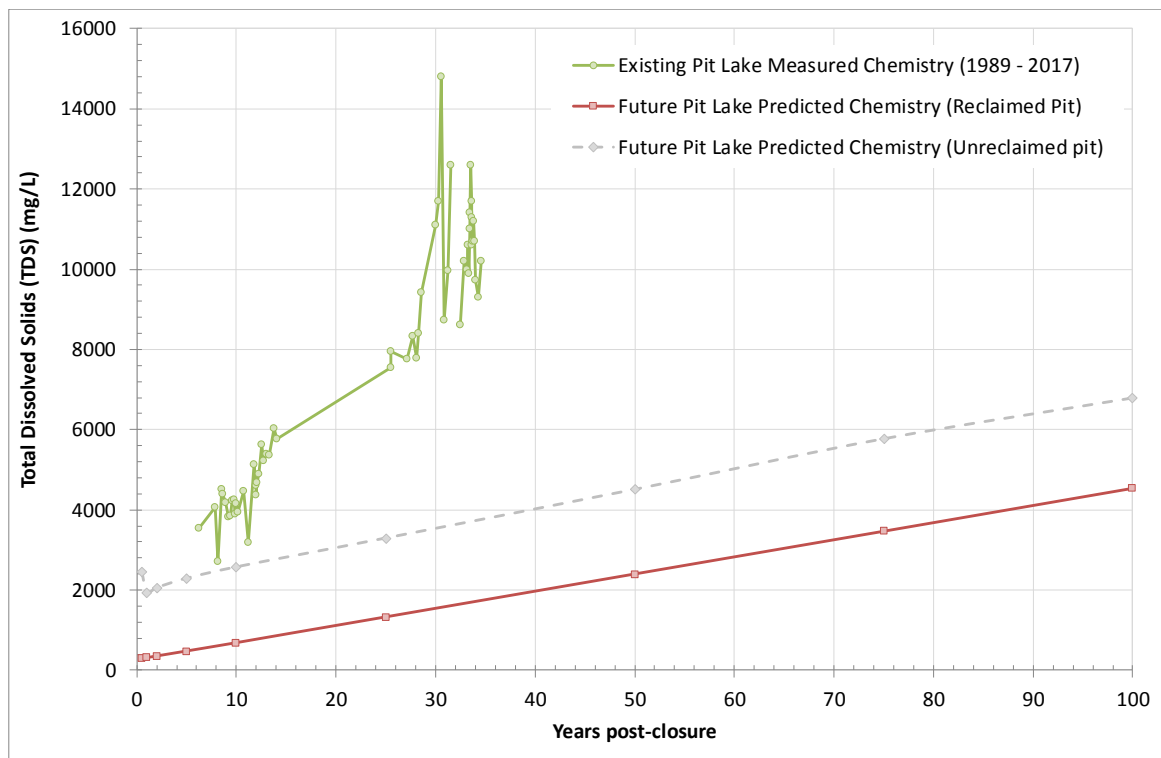


Figure 6-16: Time-series Plot of Predicted TDS for the for the Reclaimed Pit Model

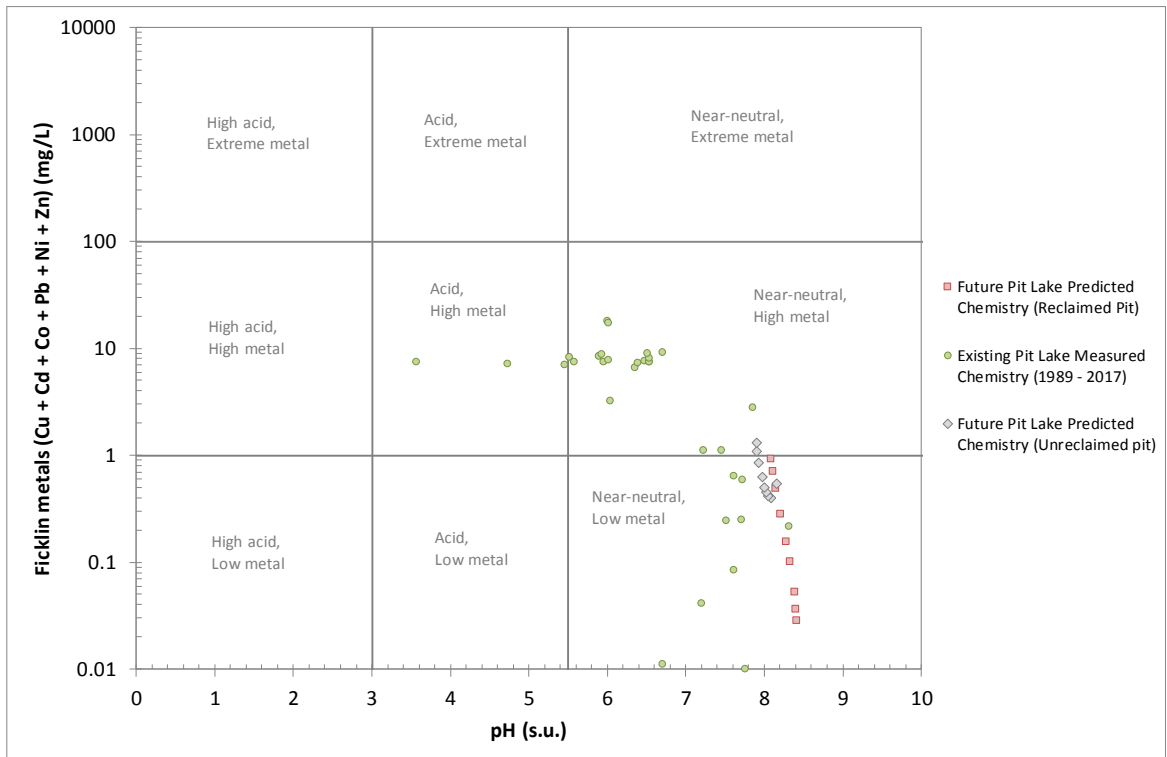


Figure 6-17: Ficklin Plot for the Reclaimed Pit Model

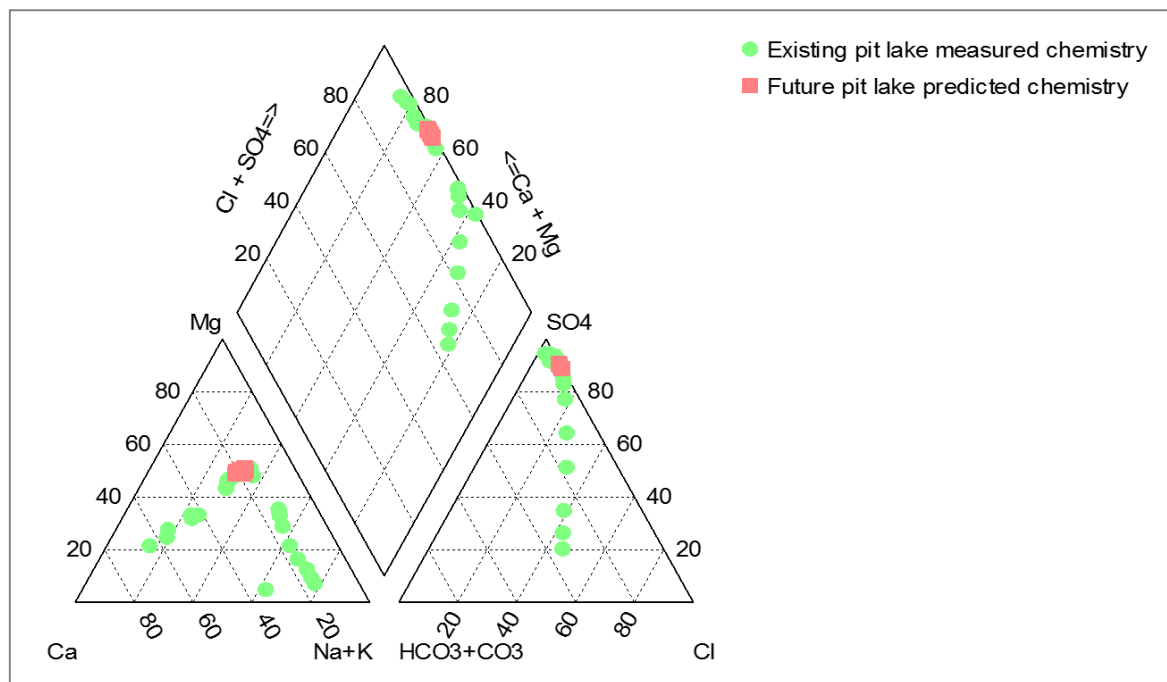


Figure 6-18: Piper Plot of Predicted Major Ion Chemistry for the Reclaimed Pit Model

7 Summary and Conclusions

SRK has undertaken a predictive geochemical modeling exercise to assess potential future pit lake chemistry associated with the Copper Flat Project in New Mexico and to compare this to the chemistry of the existing pit lake. The objective of this model and report is to provide the analysis that demonstrates that future pit lake water quality results in a hydrologic balance similar to that of pre-mining conditions upon implementation of the reclamation actions proposed by NMCC in its MORP and Reclamation Plan, including rapid fill of the open pit after closure of the mine.

Geochemical predictions were developed for three scenarios, including: (i) a calibration model for the existing pit lake; (ii) a natural fill model for the future unreclaimed pit; and (iii) a rapid fill model for the future reclaimed pit. Rapid fill has been proposed as the water component of NMCC's reclamation strategy for the future pit lake. It will include filling the pit with 2,202 acre-feet of good quality water from the production water supply wells during the first six months of groundwater recovery and pit infilling.

7.1 Model Calibration

The results of the existing pit lake model show good calibration for pH, bicarbonate, calcium, aluminum, cobalt, chromium, copper, mercury, manganese, sodium, nickel, selenium, uranium, zinc and TDS, demonstrating these constituents can be predicted with a good degree of accuracy for the future pit lake. The baseline water quality data utilized in the calibration model are data for existing water quality chemistry in the pit lake between 2010 and 2013, as discussed in Section 4. Model calibration was performed as part of the preliminary pit lake model results presented in the December 2014 report (SRK, 2014a). This is a subset of the entire baseline data generated between 1998 and July 2017. The full data set was utilized in comparing existing water quality chemistry to projected future water quality of the pit lake, as discussed in Sections 5 and 6.

7.2 Unreclaimed Fill Scenario

For the unreclaimed fill scenario, allowing the pit to fill naturally will result in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. In the unreclaimed fill scenario, the proposed future Copper Flat open pit is expected to be seasonally stratified but otherwise well-mixed, oxygenated and not acidic. Waters are predicted to be moderately alkaline (pH 7.9 – 8.2), primarily due to the buffering capacity of the inflowing groundwater. During the early stages of pit infilling (i.e., the first six months post-closure), removal/flushing of soluble salts from the pit walls is likely to result in a flush in boron, lead, mercury, manganese, molybdenum, nickel, selenium, vanadium, zinc and sulfate in the early pit lake. The effects of this initial flush will be dissipated by inflowing groundwater and precipitation, and pit lake chemistry will then evolve over time, with some parameters increasing in concentration as a result of evapoconcentration effects. This is similar to the trends observed in the existing pit lake where elemental concentrations have increased since the start of pit infilling. However, the mineralized material to be mined and the future pit walls will be prepared using pre-split drilling and smooth wall blasting. This will reduce the depth of fracturing and oxidation and consequently reduce solute loading to the future pit lake.

A comparison of predicted pit lake water chemistry for the unreclaimed fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that the predicted concentrations of the majority of constituents are comparable to existing concentrations.

7.3 Reclaimed Fill Scenario

Rapidly filling the pit with water from the production supply wells during the first six months post-closure will result in a better initial water quality within the pit lake due to the good quality of the water that will be used. The long-term result is that the effects of evapoconcentration will not be as pronounced as the pit lake reaches hydrogeologic equilibrium. Predicted concentrations of many major ions and trace elements remain lower in the reclaimed fill scenario. This is the case for constituents such as boron, sulfate and chloride, which are strongly influenced by evaporation effects and are predicted to be much lower in concentration for the reclaimed pit rapid fill scenario compared to the unreclaimed pit natural fill scenario. In addition, the rapid fill will also quickly submerge walls and benches to limit the exposure of sulfide minerals to oxygen, which will reduce trace element release into the pit lake. By contrast, the unreclaimed fill scenario allows the pit to fill naturally and results in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. As is the case in the unreclaimed fill scenario, the mineralized material to be mined and the future pit walls will be prepared using pre-split drilling and smooth wall blasting, which will also reduce the depth of fracturing and oxidation and consequently reduce solute loading to the pit lake.

A comparison of predicted pit lake chemistry for the reclaimed pit rapid fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that concentrations of the majority of predicted constituent concentrations are either comparable to or less than concentrations in the existing pit lake.

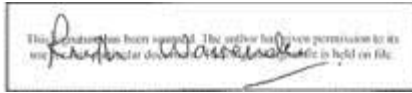
7.4 Conclusions

Standards applicable to the post-mining Copper Flat pit lake are contained in the New Mexico Mining and Minerals Division (MMD) regulations administered under the Mining Act. Specifically, the performance and reclamation standards require that reclamation must result in a hydrologic balance similar to pre-mining conditions. With respect to water quality in the pit lake, post mining water quality must be similar to baseline pre-mining water quality in the pit lake. The predictive geochemical model results presented herein have been compared to pre-mining baseline water quality of the existing pit lake, which has been in existence for more than 35 years.

Based on the model results presented herein, the changes to the hydrologic balance of the future pit water body that will form post-mining will be nil or minimal, and the water quality will be very similar to that of the existing pit lake. As noted above, the existing pit lake at Copper Flat is an artificial water body created as a result of mineral extraction that has little or limited ability to sustain aquatic life (Aquatic Consultants, Inc. 2014). The post-mining water body is anticipated to be similar to the existing pit lake and is not expected to be conducive to providing aquatic habitat or supporting fish life.

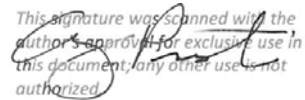
This report demonstrates that implementation of either the unreclaimed fill or reclaimed fill scenario will provide compliance with water quality requirements discussed in Section 3.10 above. However, the reclaimed fill scenario leads to improved water quality during the modeled period. In addition, the overall performance and reclamation standards and requirements of the Mining Act regulations set forth additional standards, beyond those which are the subject of analysis in this report. In this regard, NMCC has committed to the reclamation plan as described in the MORP, including the pit reclamation measures outlined in Section 3.1.8 of this report.

Prepared by



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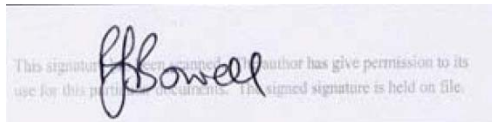
Ruth Warrender EurGeol, CGeol, PhD
Senior Consultant (Geochemistry)



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Amy Prestia, M.Sc., P.G.
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Eur. Geol. Rob Bowell PhD, CChem, CGeol
Corporate Consultant (Geochemistry)

8 References

- ASTM, 1996, Method D5744-96. Standard Test Method for Accelerated Weathering of Solid Materials Using a Modified Humidity Cell
- ASTM, 2013, Method E2242-13. Standard test method for column percolation extraction of mine rock by the meteoric water mobility procedure. ASTM International.
- Atchison, T. (1968). Fragmentation Principles. Chapter 7-2, Surface Mining, 1st Edition. E.P Pfleider (ed). AIME, New York, pp 355-372.
- Atkins, D., Kempton, J.H., and Martin, T., 1997, Limnologic conditions in three existing Nevada pit lakes: observations and modeling using CE-QUAL-W2. In: Proceedings 4th International Conference on Acid Rock Drainage, Vancouver, BC, May 31- June 6, 699-713.
- Aquatic Consultants Inc., 2014, Copper Flat Mine Biological Assessment, November 2014.
- Baas-Becking, L.G.M., Kaplan, I.R. and Moore, D., 1960, Limits of the natural environment in terms of pH and oxidation-reduction potentials. Journal of Geology 68(3), 24-284.
- Bowell, R.J., 1994, Arsenic sorption by iron oxyhydroxides and oxides. Applied Geochemistry, 9, 279-286
- Carroll, R.D. and Scott, J.H., 1966, Uphole seismic measurements as an indication of stress relief in granitic rock tunnels. US Geological Survey Professional Paper 550-D, ppD138-D143
- Castendyk, D.N. and Webster-Brown, J.G., 2007, Sensitivity analyses in pit lake prediction, Martha mine, New Zealand 2: Geochemistry, water-rock reactions, and surface adsorption. Chemical Geology 244, pp56-73
- Dunn, P.G., 1982, Geology of the Copper Flat porphyry copper deposit, Hillsboro, Sierra County, New Mexico. In: S.R. Titley (ed.) Advances in Geology of the Porphyry Copper Deposits, Southwestern North America: Tuscon, University of Arizona Press, pp313-326
- Dzombak, D. and Morel, F., 1990. Surface Complexation Modeling: Hydrous Ferric Oxide. J. Wiley, New York.
- Eary, L.E. 1998. Predicting the effects of evapoconcentration on water quality in mine pit lakes. Journal of Geochemical Exploration, 64, 223-236
- Eary, L.E., 1999, Geochemical and equilibrium trends in mine pit lakes. Applied Geochemistry 15, pp963-987
- Ficklin, W.H., Plumlee, G.S., Smith, K.S., and McHugh, J.B., 1992. Geochemical classification of mine drainages and natural drainages in mineralized areas: Proceedings, 7th International Symposium on Water-Rock Interactions, Park City, Utah, p. 381-384.

- Golder Associates, 2017, Mine Reclamation and Closure Plan, Appendix E, Mine Operation and Reclamation Plan, Copper Flat Mine Project, Sierra County, New Mexico. Revision 1, July 2017
- INTERA, 2012, Baseline Data Characterization Report for Copper Flat Mine, Sierra County, New Mexico. Report prepared for New Mexico Copper Corporation, February 2012.
- Jewell, P.W., 2009, Stratification Controls of Pit Mine Lakes. Mining Engineering 60, pp40-45
- JSAI, 2014a, Results from the First Year of Stage 1 Abatement Investigation at the Copper Flat Mine Site near Hillsboro, News Mexico. May 2014.
- JSAI, 2014b, Conceptual model of groundwater flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico. Prepared for New Mexico Copper Corporation, Albuquerque, New Mexico. August 2014.
- JSAI, 2014c, Review of Methods and Assumptions for Predicting Open Pit Water Quality, Copper Flat Project, New Mexico. Technical Memorandum dated December 14, 2014
- JSAI, 2015a, Estimated Evaporation Rate for Future Copper Flat Open Pit. Technical Memorandum dated September 1, 2015
- JSAI, 2015b, Proposed Copper Flat Open Pit Reclamation Plan and Inputs for Evaluating Water Quality Predictions. Technical Memorandum dated March 25, 2015
- JSAI, 2017a, Copper Flat open pit 1.1.1 Standard Test Method for Accelerated Weathering of Solid Materials Using a Modified Humidity Cell area groundwater chemistry data and application to SRK geochemistry model. Technical memorandum dated September 26, 2017
- JSAI, 2017b, Hydrologic Effects of Proposed Rapid Fill Reclamation of Copper Flat Open Pit. Technical memorandum dated October 12, 2017.
- JSAI, 2017c, Expected Selenium Concentrations from Supply Wells PW-1 through PW-4, Copper Flat Project, New Mexico Copper Corporation. Technical memorandum dated September 26, 2017.
- Kelsall, P.C., Case, J.B. and Chabannes, C.R., 1984, Evaluation of excavation-induced changes in rock permeability. International Journal of Rock Mechanics and Mining Sciences, 21(3), pp123-135
- M3 Engineering & Technology Corporation, 2013, Copper Flat Project Form 43-101 F1 Technical Report Feasibility Study, New Mexico, USA. Report prepared for THEMAC Resources, November 21 2013
- McLemore, V.T., Munroe, E.A., Heizler, M.T., McKee, C., 2000. Geology and evolution of the mineral deposits in the Hillsboro District, Sierra County, New Mexico in Geology and Ore Deposits 2000, The Great Basin and Beyond: Geological Society of Nevada, Program with abstracts, p. 63

- Molebatsi, T., Galindo Torres, S., Li, L., Bringemeier, D. and Wang, X., 2009, Effect of fracture permeability on connectivity of fracture networks: Abstracts of the International Mine Water Conference, 19 – 23 October 2009. Proceedings ISBN Number: 978-0-9802623-5-3, Pretoria, South Africa.
- National Atmospheric Deposition Program (NRSP-3), 2012, NADP Program Office, Illinois State Water Survey, 2204 Griffith Dr., Champaign, IL 61820.
- Parkhurst, D.L., Appelo, C.A.J. 2010. Users Guide to PhreeqC (Version 2)—A Computer Program for Speciation Batch-Reaction, One-Dimensional Transport and Inverse Geochemical Calculations. Distributed with PhreeqC interactive Version 2.17.5.4799. USGS.
- Parshley, J.V. and Bowell, R.J., 2003, The limnology of Summer Camp Pit Lake: A case study. *Mine Water and the Environment*, 22, 170-186.
- Raugust, J.S., 2003. The natural defenses of Copper Flat, Sierra County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-file report 475, Socorro, N. Mex., New Mexico Institute of Mining and Technology.
- Richards, J.P., 2003, Tectono-magmatic precursors for geophysical data over a copper gold porphyry Cu-(Mo-Au) deposit formation. *Journal of Economic Geology* 96, pp1419-1431
- Siskind, D.E. and R.R. Fumanti, 1974. Blast-produced fractures in Lithonia granite. Bureau of Mines Report BM-RI-7901. Twin Cities Mining Research Center.
- SRK Consulting, 1996, Geochemical Review of Waste Rock, Pit Lake Water Quality and Tailings at the Copper Flat Project.
- SRK Consulting, 1997, Copper Flat Mine Compilation of Pit Lake Studies. Report prepared for Alta Gold Co. December 1997
- SRK Consulting, 2012, Geochemical Characterization Report for the Copper Flat Project, New Mexico. Prepared by SRK Consulting for THEMAC Resources Group Limited, May 2013.
- SRK Consulting, 2014a, Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico. Prepared by SRK Consulting for THEMAC Resources Group Limited December 2014.
- SRK Consulting, 2014b, Humidity Cell Termination Report for the Copper Flat Project, New Mexico. Report prepared for THEMAC Resources Group Ltd., February 2014.
- Stumm, W. and Morgan, J.J., 1996, *Aquatic Chemistry – Chemical Equilibria and Rates in Natural Waters*. Wiley-Interscience, New York
- Tempel, R.N., Shevenell, L.A., Lechler, P. and Price, J., 2000, Geochemical modeling approach to predicting arsenic concentrations in a mine pit lake.

THEMAC Resources Group Ltd, 2017a, Mine Operation and Reclamation Plan, Copper Flat Mine Project, Sierra County, New Mexico. Revision 01, July 2017

THEMAC Resources Group Ltd, 2017b, Open Pit Reclamation/Revegetation Plan Supplemental Information for Mine Operation and Reclamation Plan, Copper Flat Mine Project, Sierra County, New Mexico, Revision 1, July 2017

Wetzel, R.G., 2001, Limnology, Lake and River Ecosystems, 3rd Edition. Academic Press, San Diego, CA, 1006pp

Young, E.J. and Olhoeft, G.R., 1976, The relation of specific gravity to chemical composition for crystalline rocks. United States Department of Interior Geological Survey Open File Report.

Appendix A – Time-Series Plots of Existing Pit Lake Chemistry

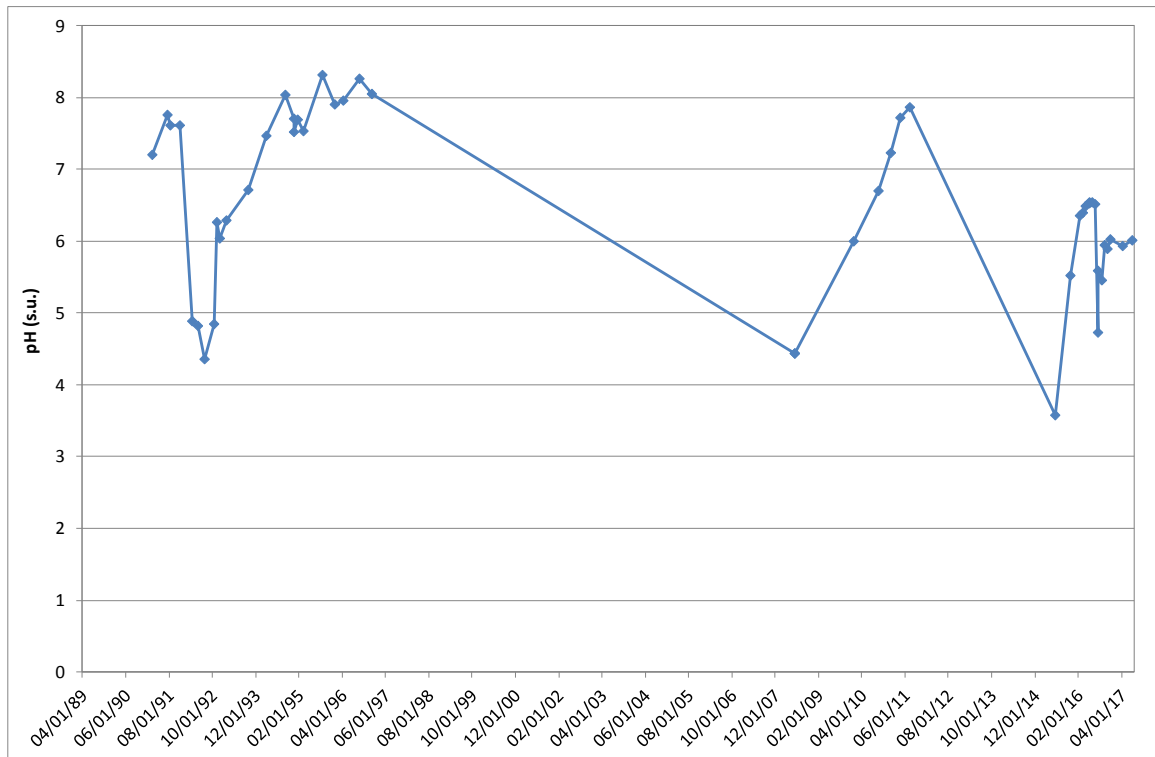


Figure A-1: pH Trends in Existing Pit Lake

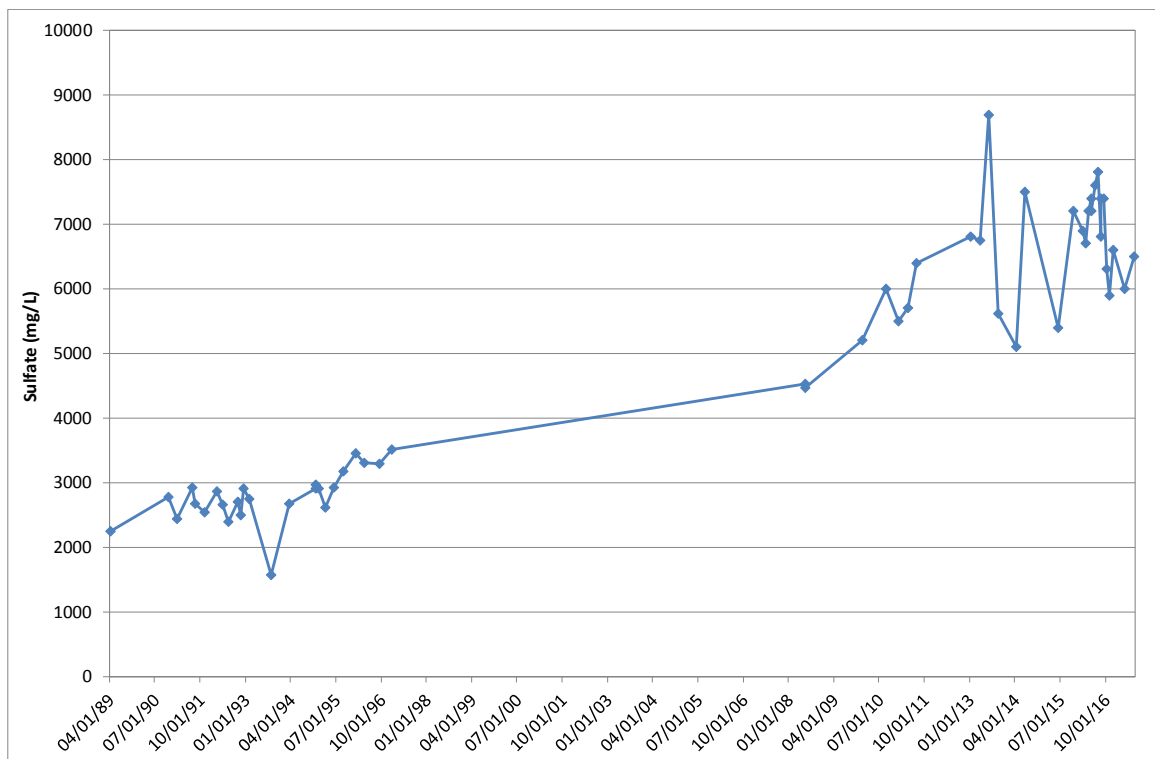


Figure A-2: Sulfate Trends in Existing Pit Lake

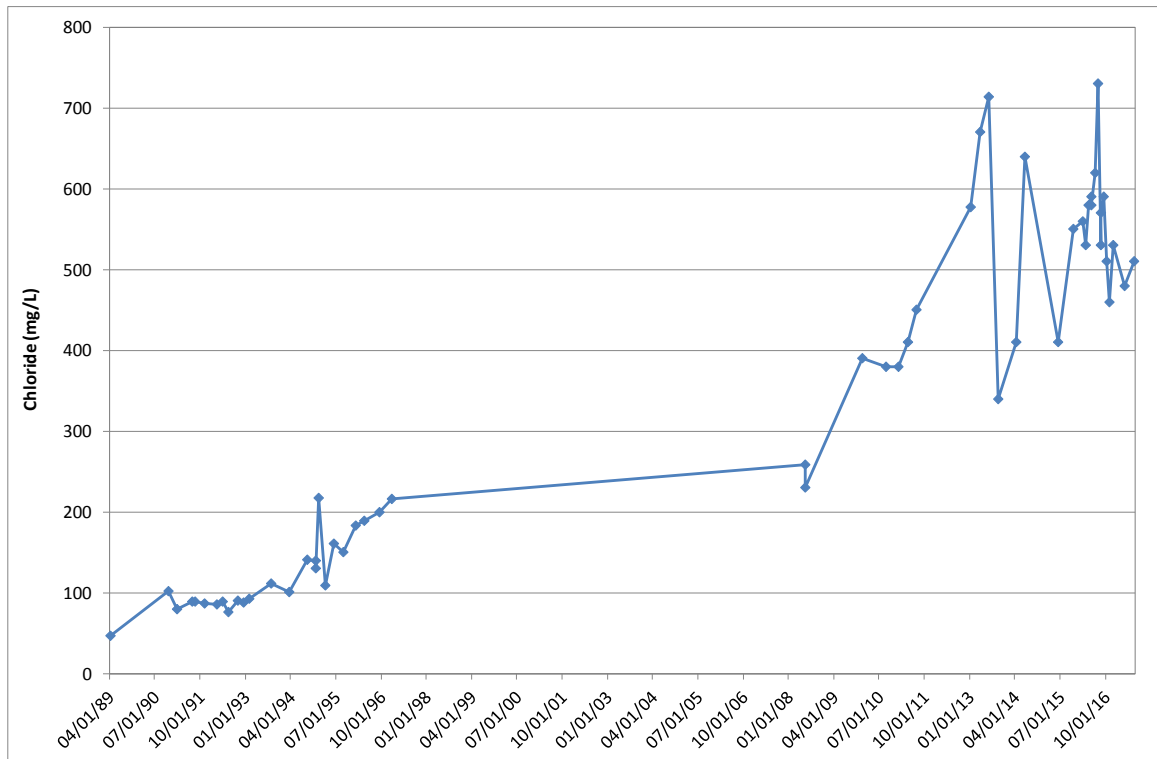


Figure A-3: Chloride Trends in Existing Pit Lake

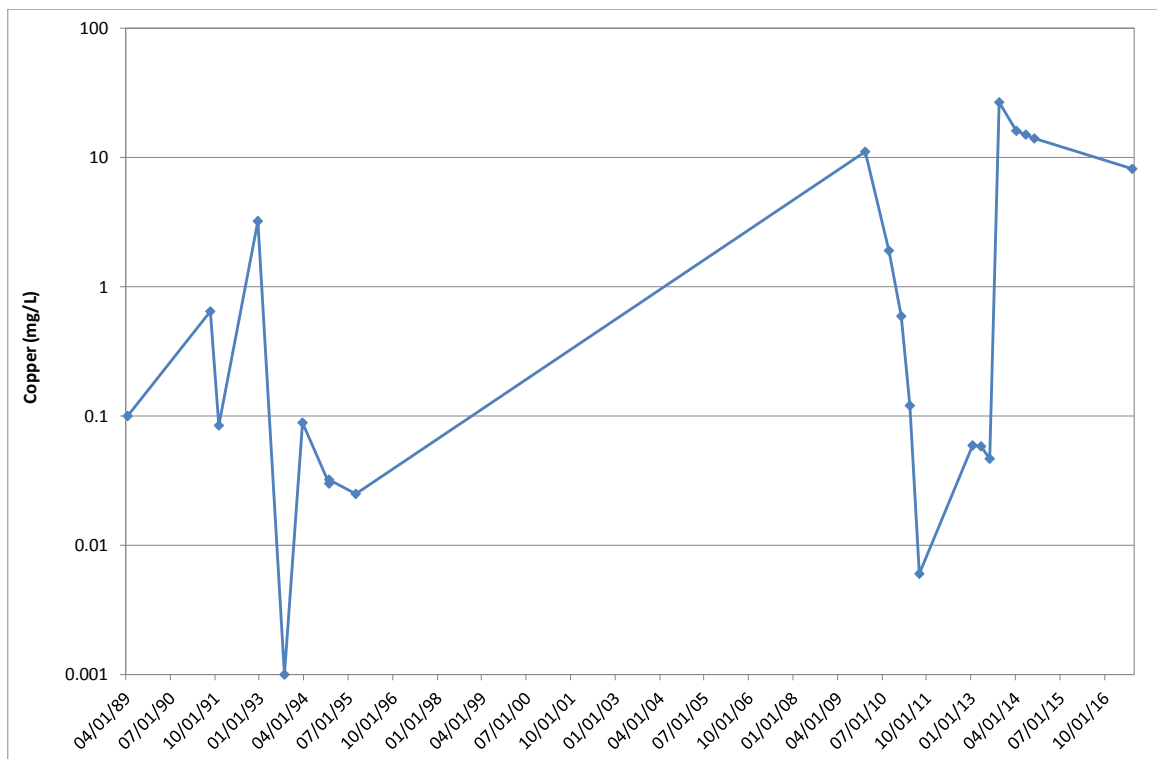


Figure A-4: Copper Trends in Existing Pit Lake

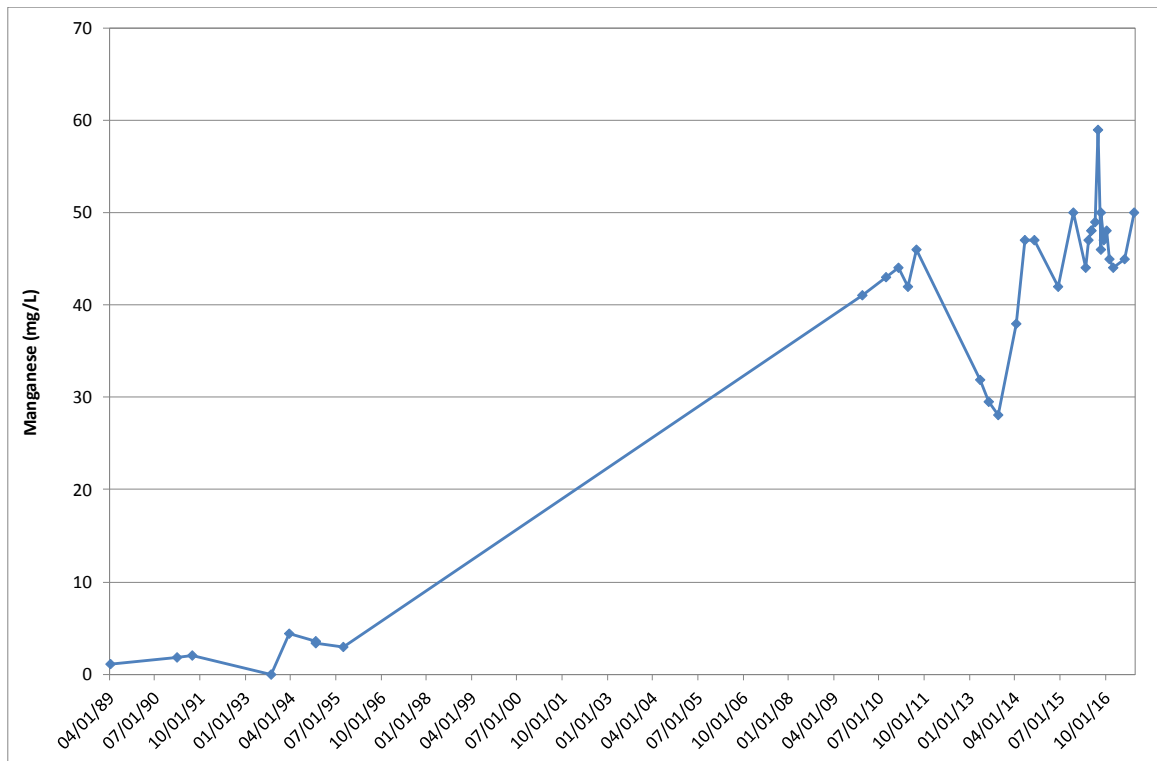


Figure A-5: Manganese Trends in Existing Pit Lake

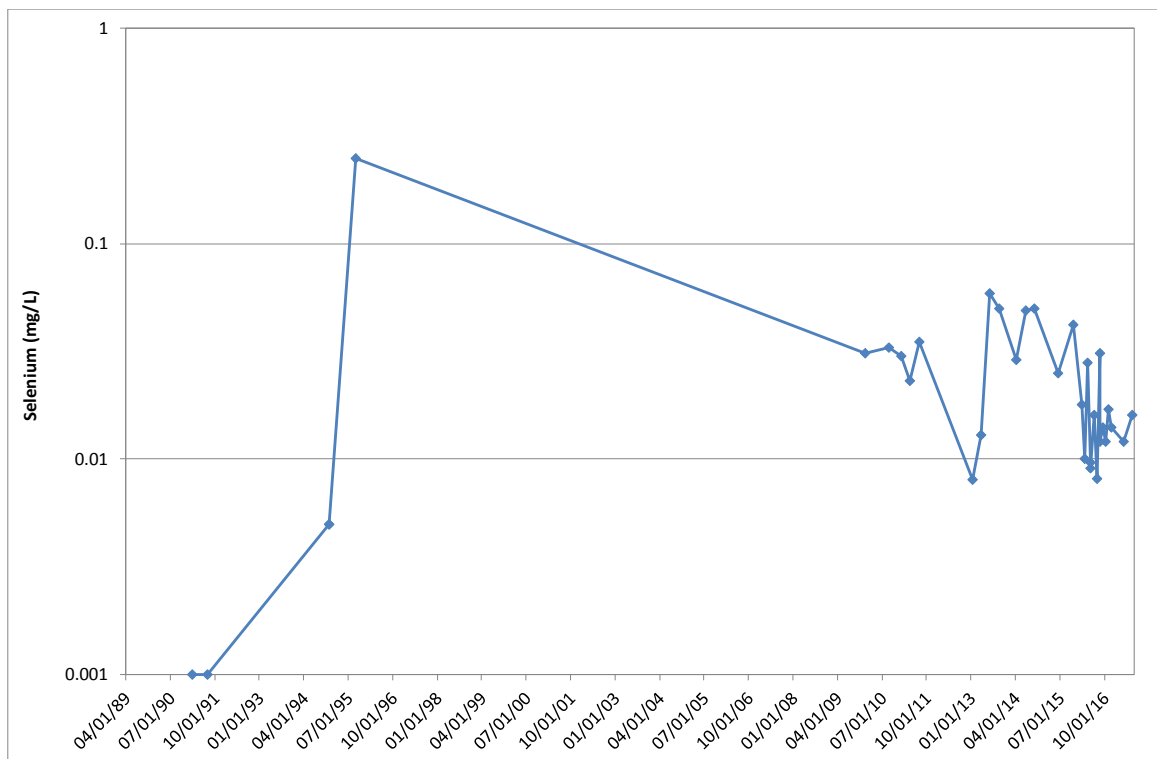


Figure A-6: Selenium Trends in Existing Pit Lake

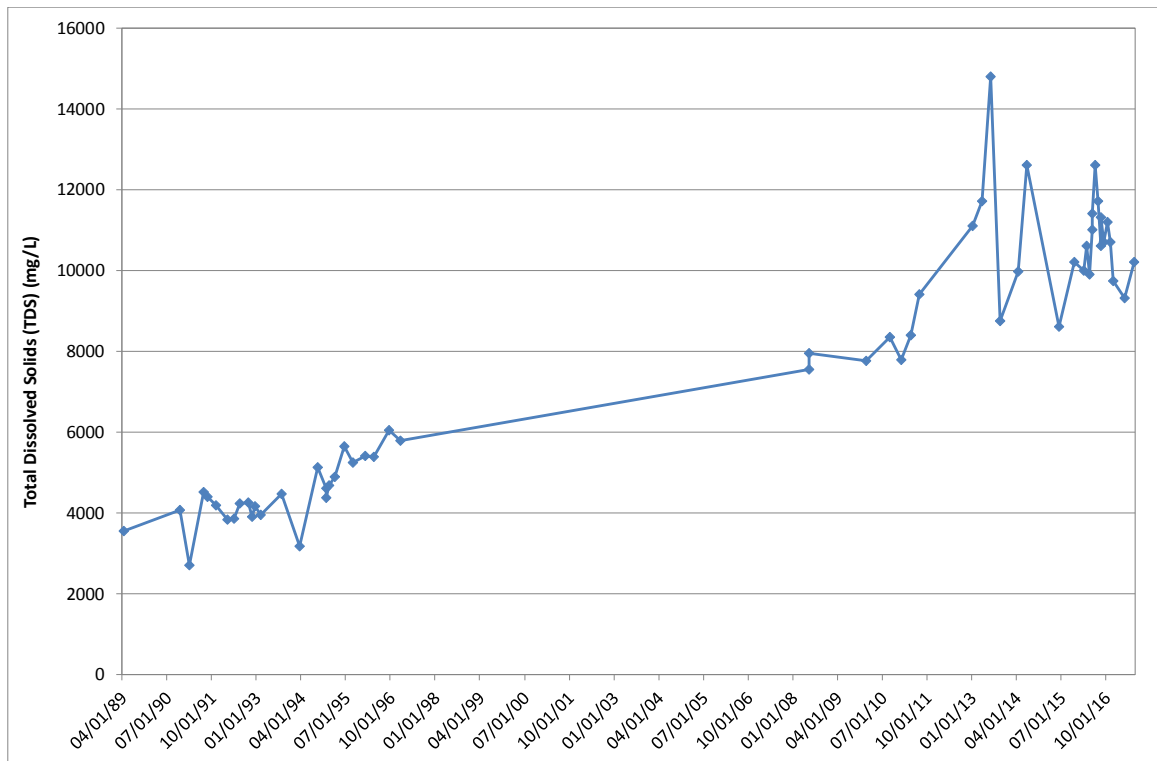


Figure A-7: TDS Trends in Existing Pit Lake

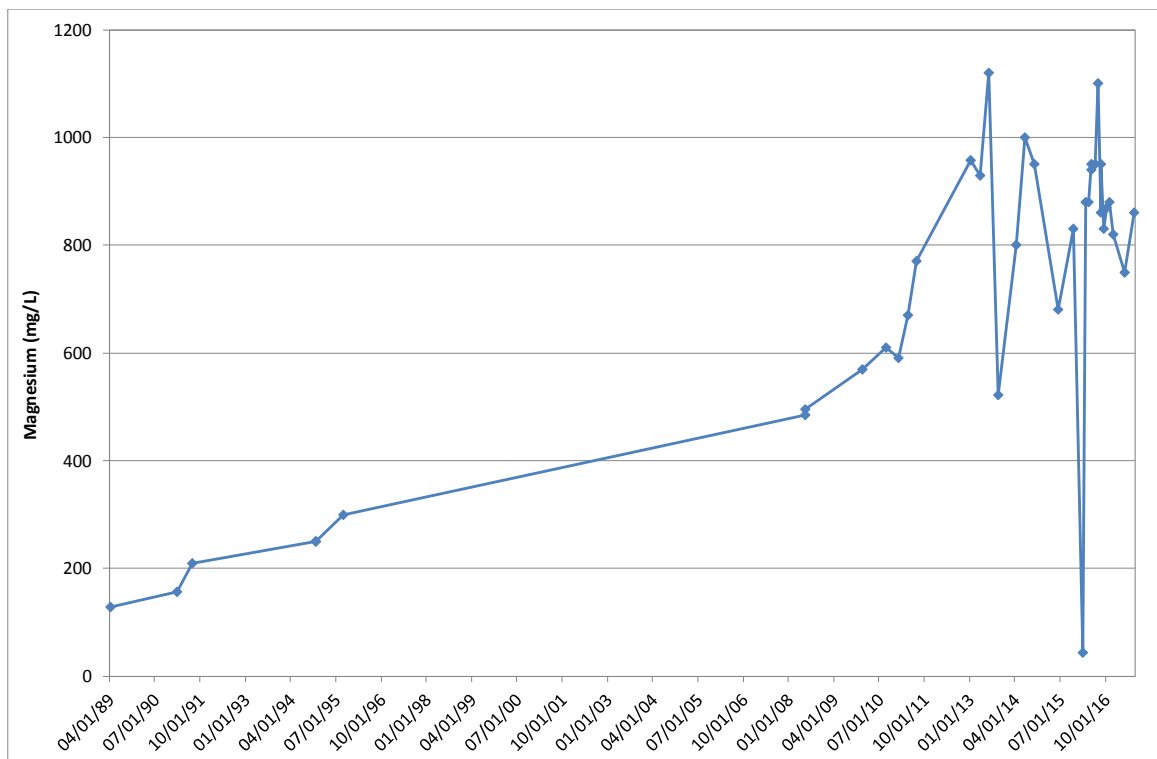


Figure A-8: Magnesium Trends in Existing Pit Lake

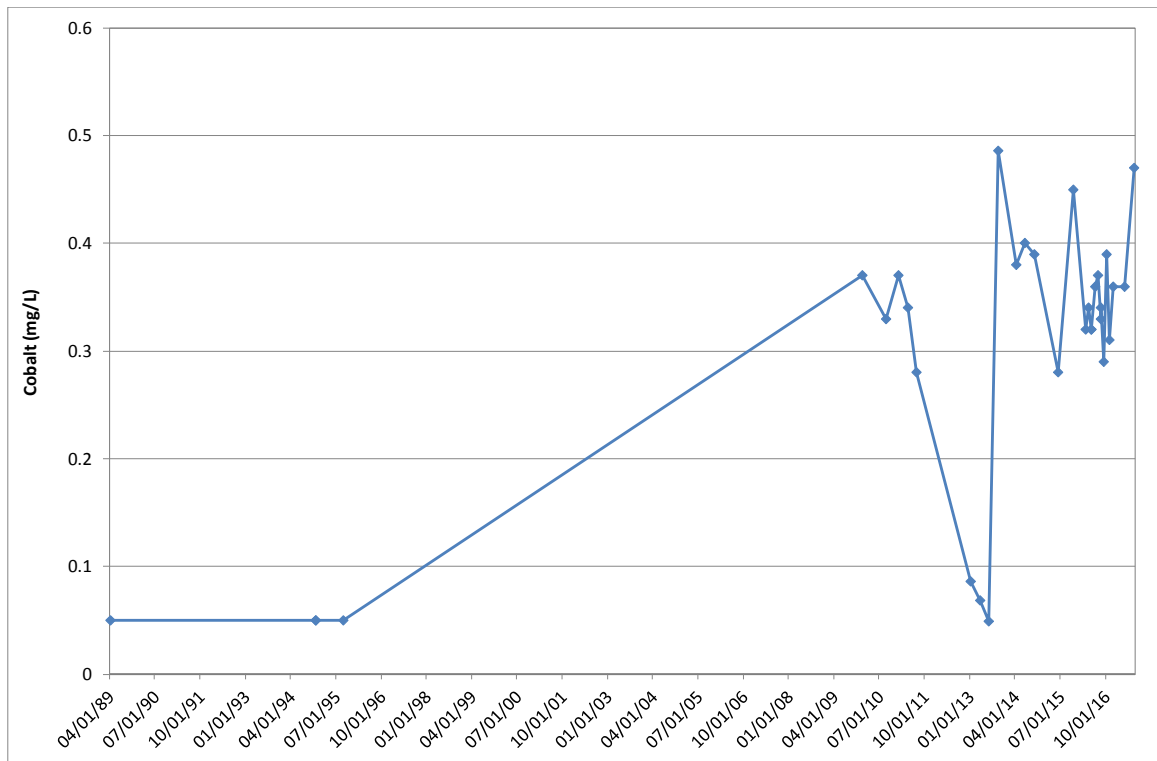


Figure A-9: Cobalt Trends in Existing Pit Lake

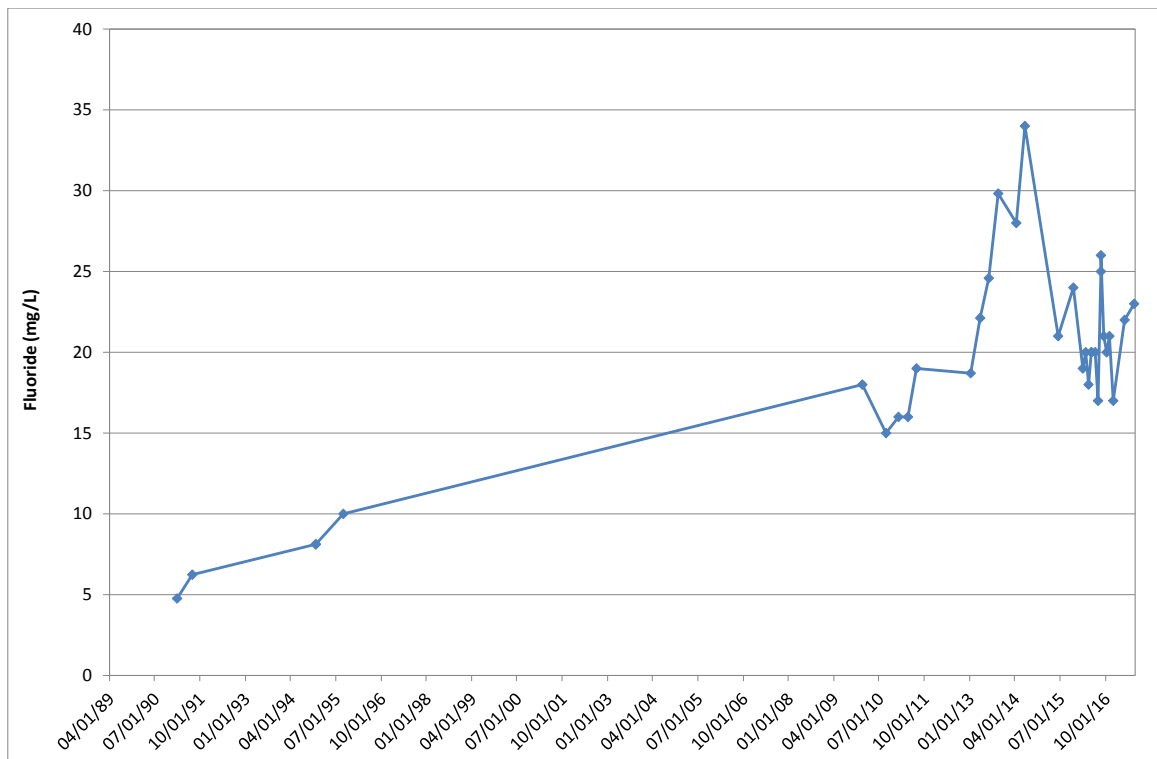


Figure A-10: Fluoride Trends in Existing Pit Lake

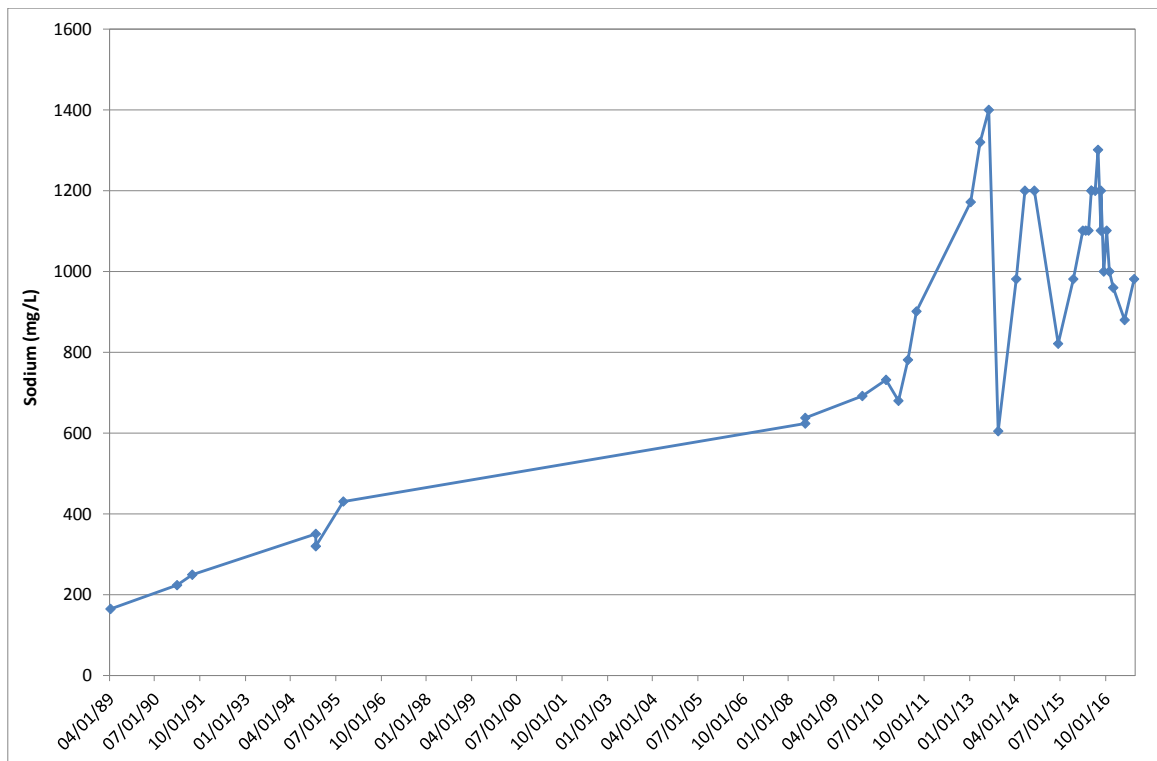


Figure A-11: Sodium Trends in Existing Pit Lake

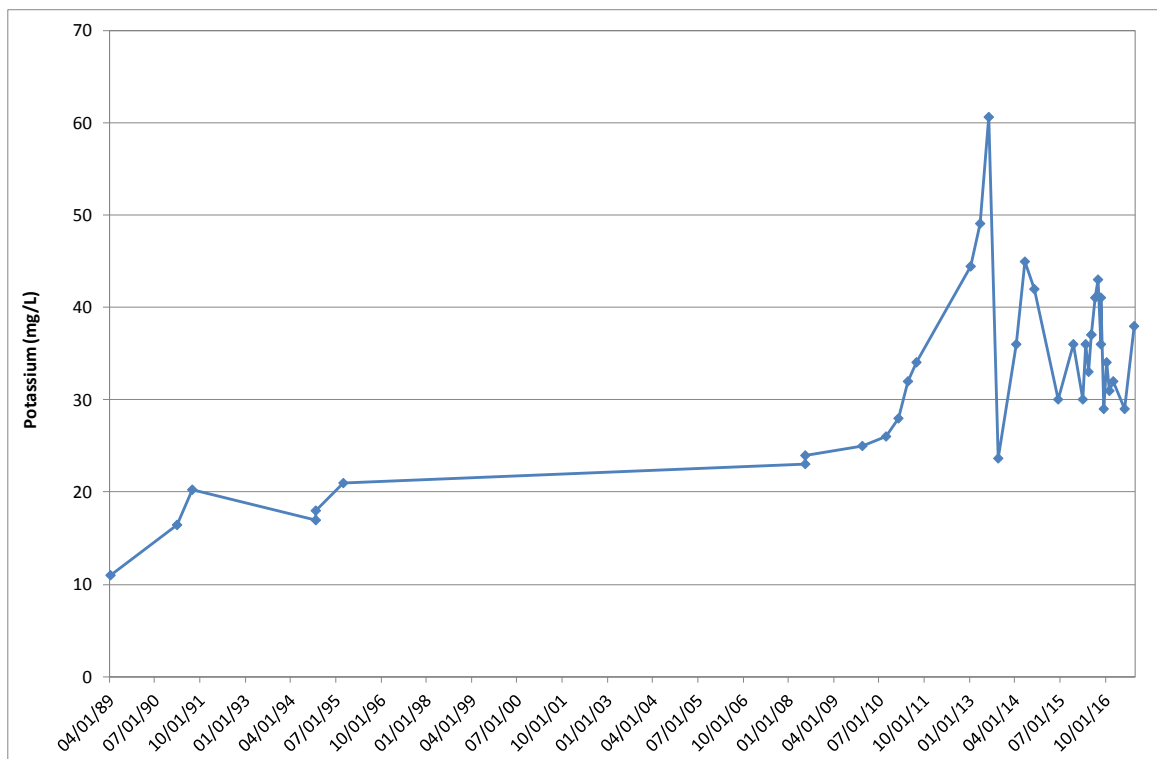


Figure A-12: Potassium Trends in Existing Pit Lake

Appendix B – Humidity Cell Elemental Release Rate Graphs

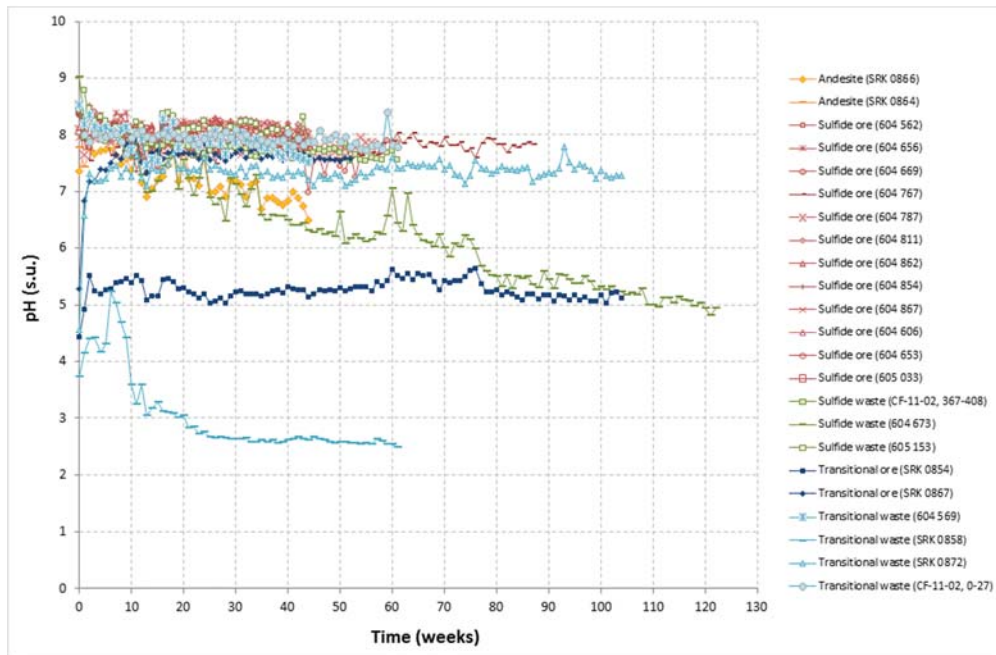


Figure B-1: Humidity Cell Effluent pH

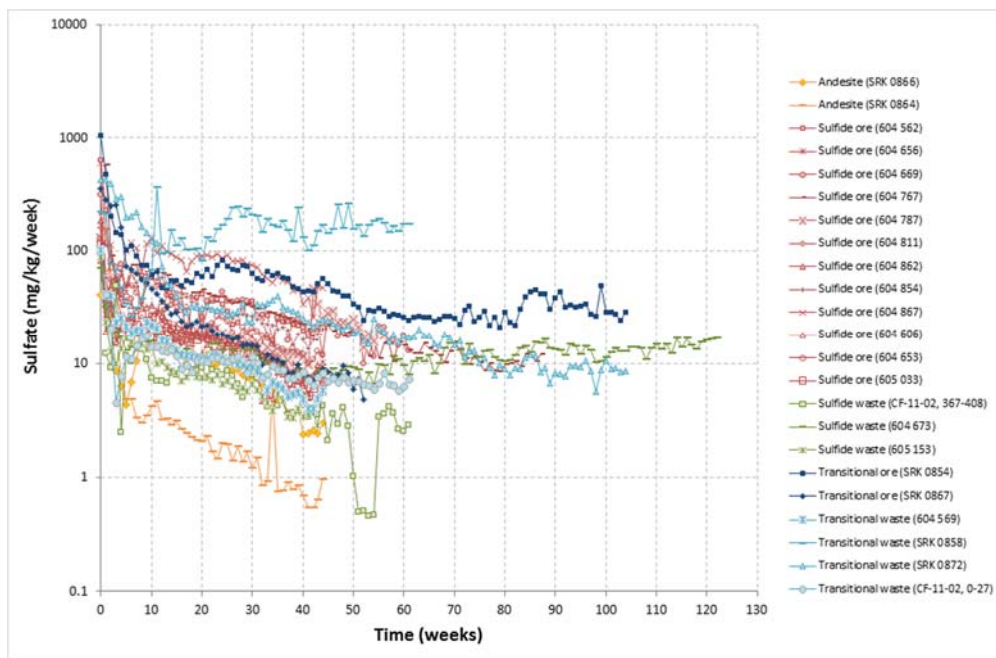


Figure B-2: Humidity Cell Effluent Sulfate

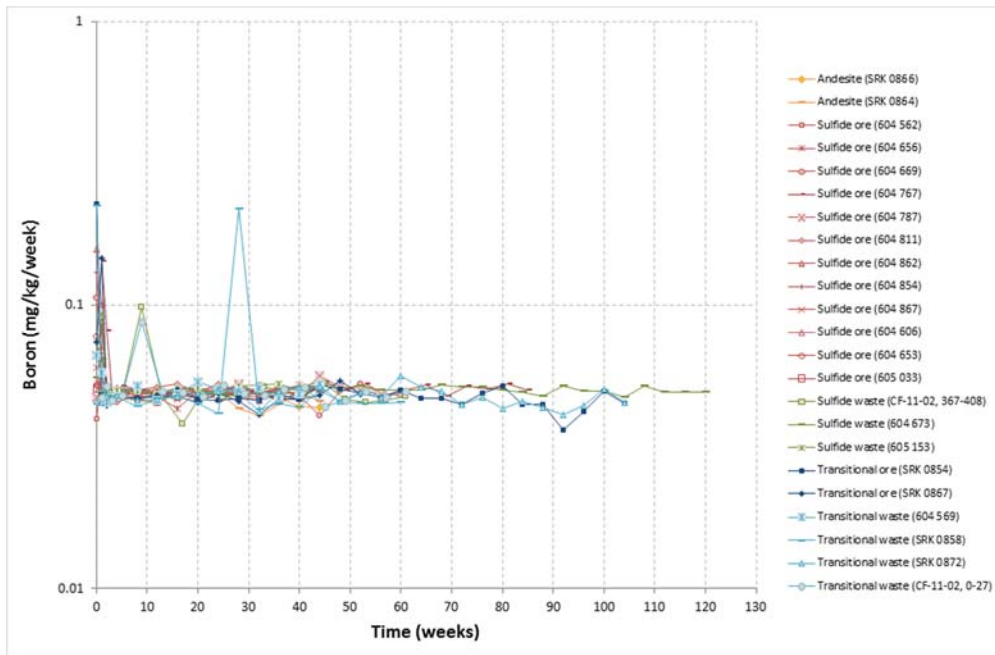


Figure B-3: Humidity Cell Effluent Boron

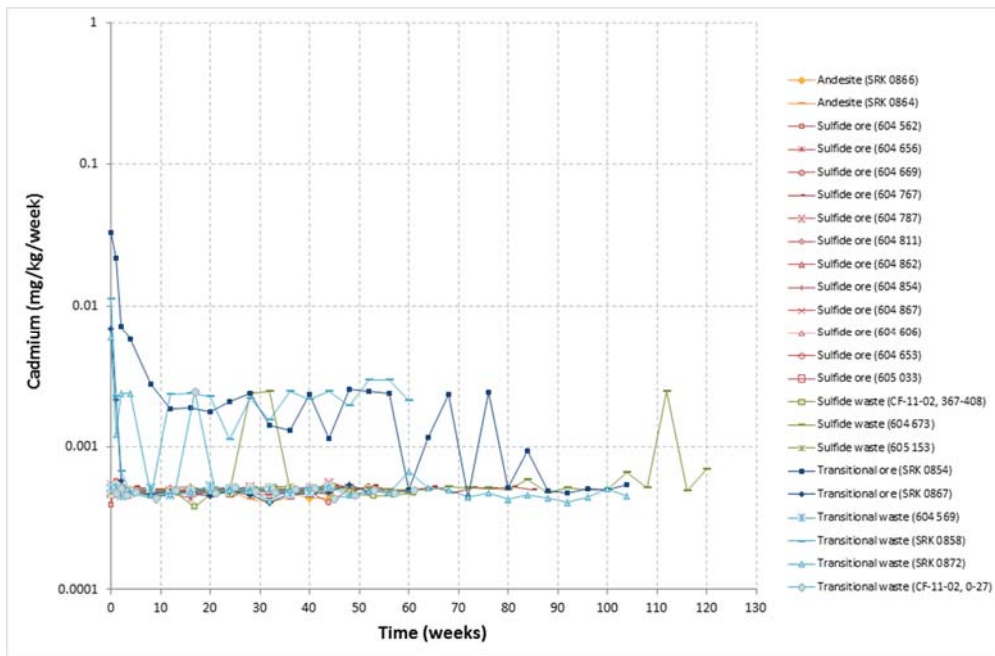


Figure B-4: Humidity Cell Effluent Cadmium

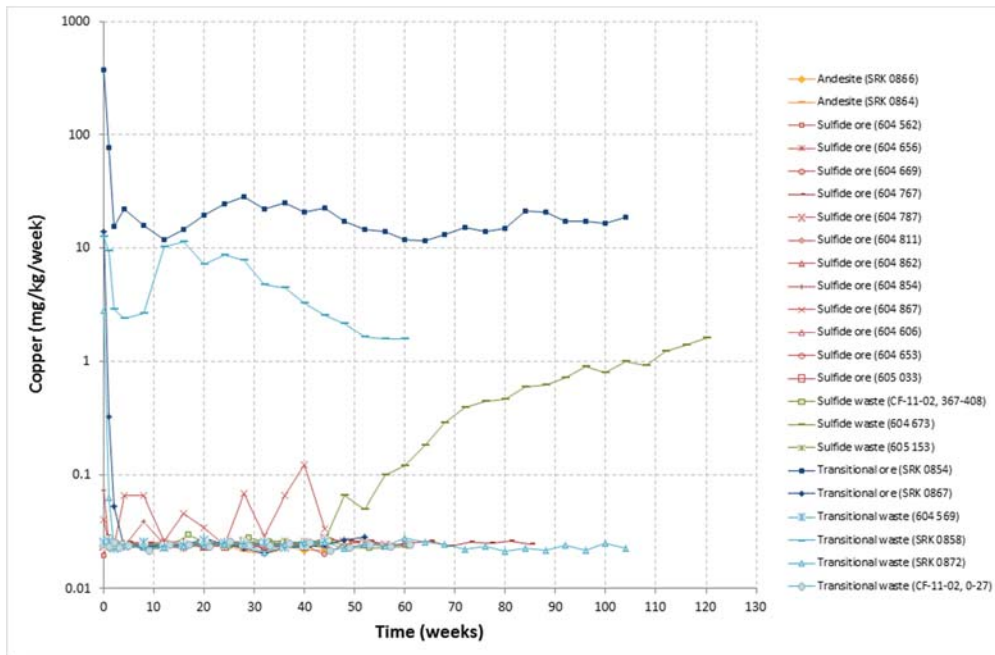


Figure B-5: Humidity Cell Effluent Copper

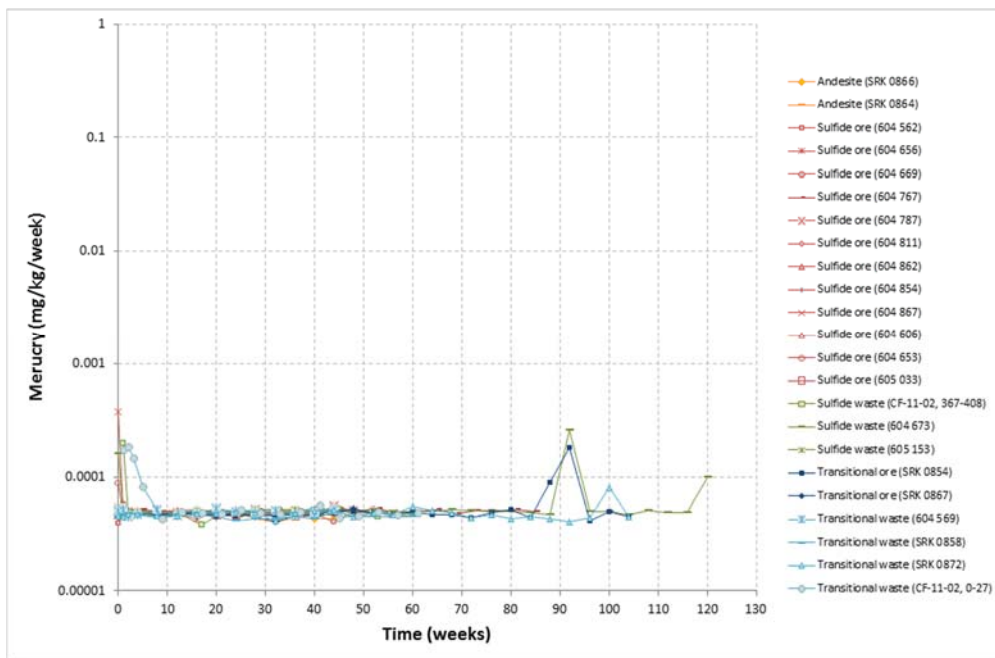


Figure B-6: Humidity Cell Effluent Mercury

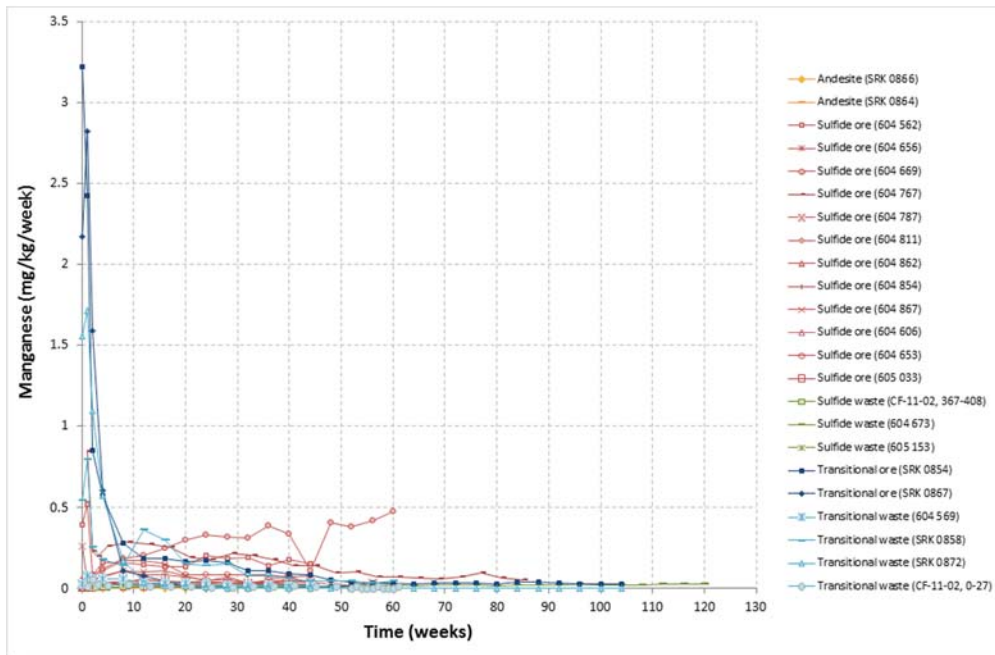


Figure B-7: Humidity Cell Effluent Manganese

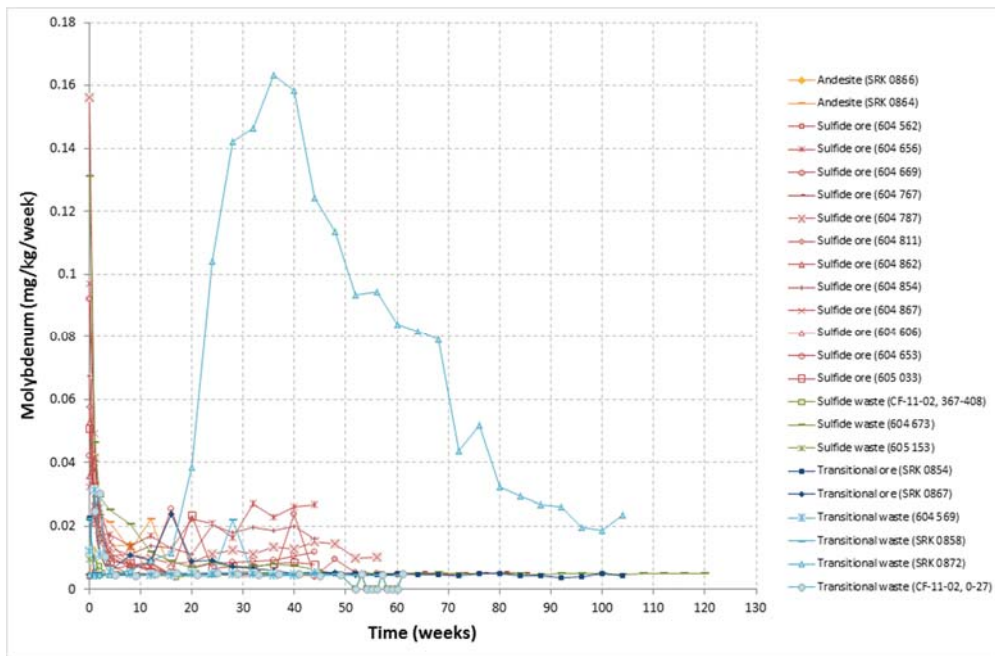


Figure B-8: Humidity Cell Effluent Molybdenum

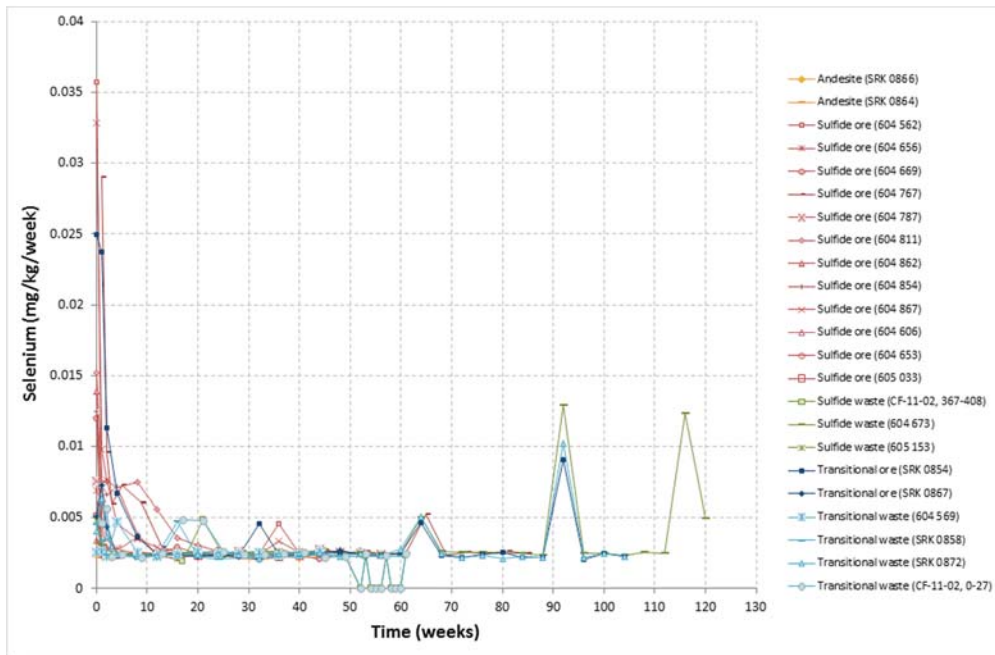


Figure B-9: Humidity Cell Effluent Selenium

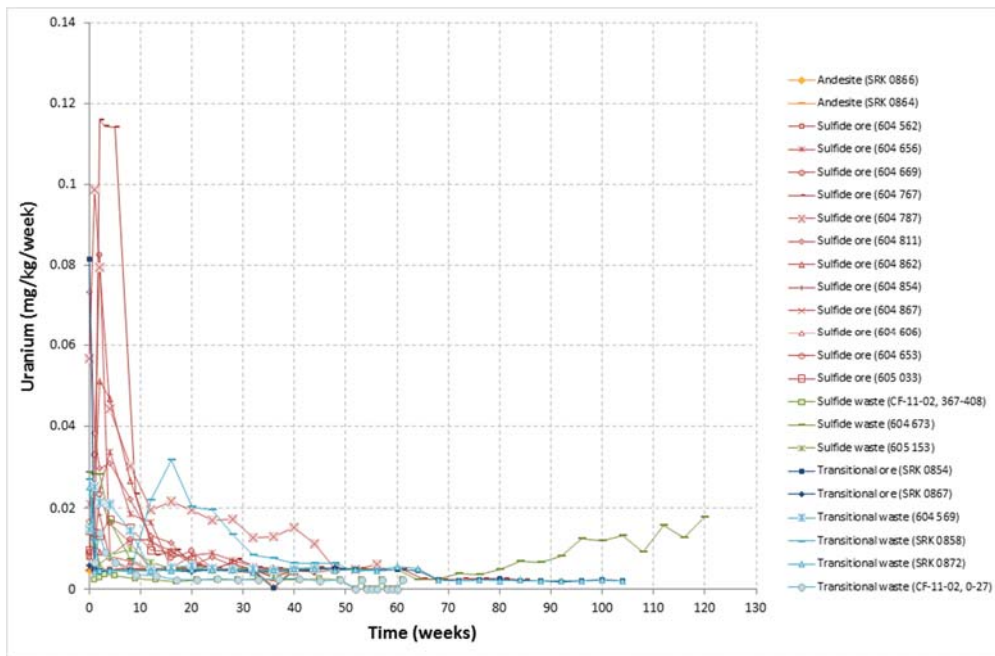


Figure B-10: Humidity Cell Effluent Uranium

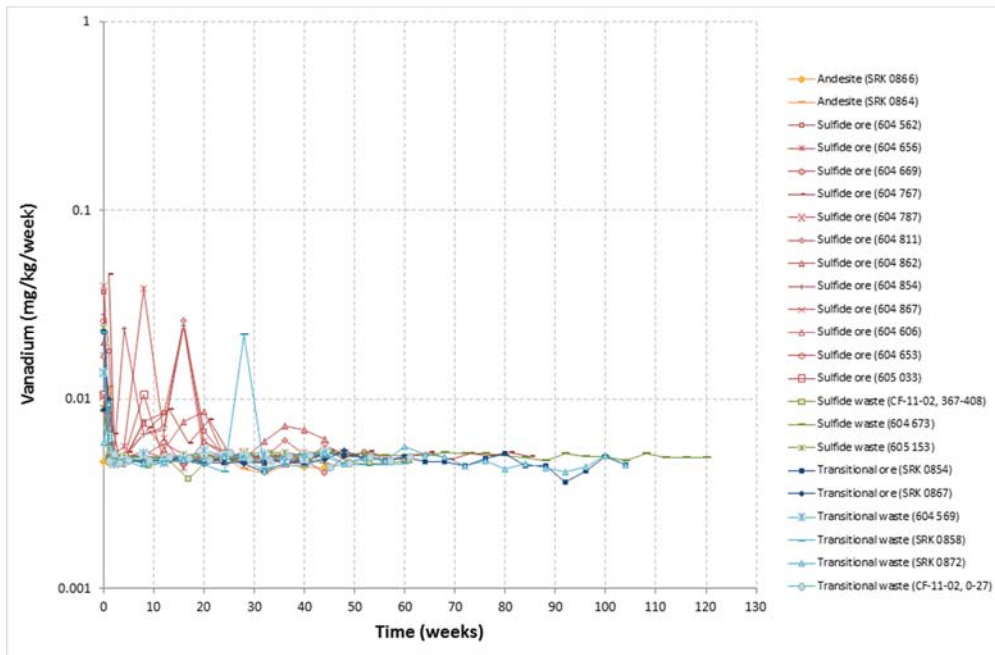


Figure B-11: Humidity Cell Effluent Vanadium

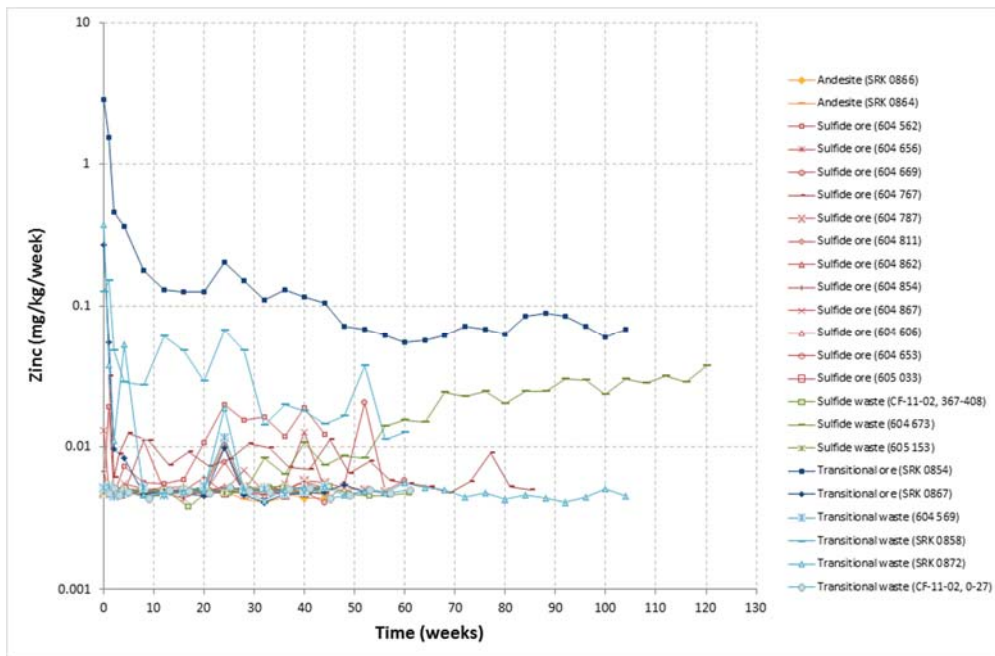


Figure B-12: Humidity Cell Effluent Zinc

Appendix C – JSAI Evaporation Rate Technical Memorandum



TECHNICAL MEMORANDUM

To: Steve Raugust, JS Raugust Consulting
Jeff Smith, New Mexico Copper Corporation

From: Steven T. Finch, Jr., Principal Hydrogeologist-Geochemist, JSAI
Annie McCoy, Senior Hydrogeologist, JSAI

Date: September 1, 2015

Subject: **Estimated evaporation rate for future Copper Flat open pit**

As discussed in the Copper Flat Project groundwater-flow model report (JSAI, 2014), potential evapotranspiration (ET), or the maximum evaporation and plant transpiration that can occur given full availability of water, is a function of geographical and climatic conditions, and is commonly estimated using the Penman-Monteith equations (Monteith, 1965). These relate maximum ET (ET_0) to meteorological parameters including temperature, relative humidity and wind speed, and to geographical parameters (altitude, latitude, and time of year). Annual ET_0 computed from results at Hillsboro meteorological station is about 60 in./yr, which compares well to previous estimates (SRK, 1997) of 65 in./yr of potential evaporation, and 64.6 in./yr estimated as 74 percent (an accepted conversion factor for the region (NOAA, 1982) between pan evaporation and evaporation from a normal open water surface) of Copper Flat pan evaporation. Actual evaporation or ET is less, depending on sun and wind exposure, ground conditions, and availability of water.

If ET_0 is estimated to be 60 to 65 in./yr at the rim of the ultimate Copper Flat open pit (where the prior land surface intersects the open pit), ET_0 will be somewhat less at the bottom of the ultimate open pit due to the fact that the bottom of the pit will have less exposure to sun and wind compared to the rim.

To estimate ET_0 for the bottom of the ultimate Copper Flat open pit, the duration of sunlight at analogous established open pits was evaluated using the “sunlight across the landscape” tool in Google Earth, for the date April 29, 2015. April is a month with close-to-average duration of sunlight (as are the months of March, September, and October; Dunne and Leopold, 1978). Table 1 presents a summary of hours of sunlight for analogous pits ranging in depth from 300 to 1,400 ft.

**Table 1. Summary of hours of sunlight for selected open pits
in New Mexico and California, April 29, 2015**

pit	rim elevation, ft amsl	bottom elevation, ft amsl	sunlight at rim, hours	sunlight at bottom, hours	bottom / rim sunlight ratio
Cobre pit, SW NM	6,800	6,300	6:30 to 19:30 = 13 hours	9:30 to 18:30 = 9 hours	0.69
Santa Rita pit, SW NM	6,600	5,200	7:00 to 19:50 = 12.5 hours	9:30 to 16:30 = 7 hours	0.56
Tyrone main pit, SW NM	6,200	4,900	6:30 to 19:30 = 13 hours	8:30 to 17:30 = 9 hours	0.69
CHMRP pit, N. NM	7,100	6,800	7:30 to 19:30 = 12 hours	8:45 to 16:00 = 7.25 hours	0.60
Colosseum pit, S. CA	5,800	5,400	8:00 to 19:00 = 11 hours	9:00 to 16:00 = 7 hours	0.64
average			12.3 hours	7.85 hours	0.64

CHMRP – Cunningham Hill Mine Reclamation Project

ft amsl – feet above mean sea level

SW – southwest

N. – north

S. – south

Pan evaporation data were collected at the Cunningham Hill Mine Reclamation Project (CHMRP), near the rim of the open pit in June 2000, and at the bottom of the pit between April and July 2011 (JSAI, 2011). Pan evaporation was higher at the rim, despite higher summer precipitation in 2001 compared to 2011. The pan evaporation data were interpreted to represent an average evaporation rate of about 60 in./yr at the rim, and 54 in./yr at the bottom.

CHMRP evaporation data were used for an upper bound of 90 percent, in terms of percentage of evaporation at the rim that represents actual evaporation at the bottom of the pit, and the average sunlight ratio presented in Table 1 was used for a lower bound of 64 percent. For the ultimate Copper Flat open pit, actual evaporation at the bottom of the pit was assumed to be 50 in./yr, which is 77 to 83 percent of ETo values 60 to 65 in./yr estimated at the rim.

The estimate of 50 in./yr evaporation for the ultimate Copper Flat open pit is also in close agreement with the estimate of open water evaporation of 53 in./yr for the North Mine Area (Santa Rita pit) at Chino Mine in southwestern New Mexico (Golder, 2005).

STF:AMM

Enc: References

References

- Dunne, T., and Leopold, L.B., 1978, *Water in environmental planning*: W.H. Freeman and Company, New York, 818 p.
- [Golder] Golder Associates, Inc., 2005, *Report on North Mine Area groundwater flow model: Chino Mine, New Mexico: consultant's report prepared for Chino Mines Company*, January 13, 2005, 64 p. plus tables, figures, and appendices.
- [JSAI] John Shomaker & Associates, Inc., 2011, *Update and recalibration of groundwater-flow and solute-transport model for predicting potential effects from the Cunningham Hill Mine Open Pit, Santa Fe County, New Mexico: consultant's report prepared for LAC Minerals (USA) LLC*, June 27, 2011, 29 p. plus figures and appendices.
- [JSAI] John Shomaker & Associates, Inc., 2014, *Model of groundwater flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico: consultant's report prepared for New Mexico Copper Corporation*, August 15, 2014, 89 p. plus figures and appendices.
- Monteith, J.L., 1965, *Evaporation and environment*: Symp. Soc. Exp. Biol. 19, 205-224 obtained from *Forest Hydrology and Watershed Management - Hydrologie Forestiere et Amenagement des Bassins Hydrologiques* (Proceedings of the Vancouver Symposium, August 1987, Actes du Colloque de Vancouver, Aout 1987): IAHS-AISH Publication No. 167, 1987, pp. 319–327.
- [NOAA] National Oceanic and Atmospheric Administration, 1982, *Evaporation atlas for the contiguous 48 United States*: NOAA Technical Report NWS 33.
- [SRK] Steffen Robertson and Kirsten, Inc., 1997, *Copper Flat Mine compilation of pit lake studies: consultant's report prepared by Steffen Robertson and Kirsten, Inc. prepared for Alta Gold Co.*, December 1997.

Appendix D – JSAI Groundwater Chemistry Technical Memorandum



TECHNICAL MEMORANDUM

To: Jeff Smith, New Mexico Copper Corporation jsmith@themacresourcesgroup.com

From: Steve Finch, Principal Hydrogeologist-Geochemist

Date: September 26, 2017

Subject: Copper Flat open pit area groundwater chemistry data and application to SRK geochemistry model

John Shomaker & Associates, Inc. (JSAI) has evaluated the water quality data regarding Copper Flat open pit influent groundwater chemistry in order to assist SRK with completion of the open pit geochemistry model. All historical data and the Stage 1 abatement data were compiled and reported in JSAI (2014). JSAI used the water quality database, well construction data, and groundwater flow model results to determine the most representative groundwater flow chemistry to the existing and future open pits.

Groundwater quality data for the open pit area come from wells GWQ96-22(A,B), GWQ96-23(A,B), GWQ11-24(A,B), and GWQ11-25(A,B). Monitoring wells GWQ96-22(A,B) and GWQ96(A,B) represents groundwater in the andesite, where monitoring wells GWQ11-24(A) represents groundwater in the quartz monzonite ore body, and GWQ11-24(B) and GWQ11-25(B) represent parts of the quartz monzonite with lower grade of the ore body. Piezometers GWQ11-24(A) and GWQ11-25(A) may have been affected by oxidation of sulfides in fractures during well development, and not representative of groundwater reporting to the open pit. Further analysis of GWQ11-25(A) provided evidence that it represents a localized and isolated fracture system recharged by oxygenated meteoric water that is not connected to the open pit (JSAI, 2014).

Existing Open Pit Influent Groundwater Chemistry

Table 1 is a summary of groundwater chemistry potentially influencing the existing open pit. Individual samples with values less than detection limits were assigned a value of one-half the detection limit. Results for selenium, mercury, and vanadium were evaluated for the lowest possible detection limit. Not all of the constituents analyzed in the baseline data report were analyzed as part of the Stage 1 abatement investigation, so results for GWQ11-24(A,B) and GWQ11-25(A,B) are limited by the Stage 1 constituent list (see Table 1).

Future Post-Mining Open Pit Influent Groundwater Chemistry

Based on the mining plan, a good portion of the quartz monzonite is removed by mining and the remaining quartz monzonite is dewatered. The groundwater flow model simulates localized dewatering rates and volumes (JSAI, 2014a). Groundwater representative of the andesite rocks reports to the future pit, and all of the groundwater in the quartz monzonite surrounding the future pit is dewatered during mining and replaced with groundwater from the surrounding andesite (JSAI, 2014a). The calculated volume of groundwater in the quartz monzonite is removed and flushed three times by inflow of groundwater representative of andesite. A volume of 500 acre feet is calculated to be dewatered during mining of the proposed open pit of which 165 ac-ft represents groundwater stored in quartz monzonite.

A summary of groundwater chemistry potentially influencing the future open pit during post mining conditions is listed in Table 1. Groundwater chemistry representative of the future pit was determined by using data representative of the andesite rocks (column A). These “Column A” sample results represent groundwater from the andesite rocks after dewatering and mining to create the future pit.

Attachments

Table 1. Summary of groundwater chemistry for Copper Flat open pit area

References

- JSAI, 2014, Results of first year of Stage 1 investigation at the Copper Flat Mine Site, Hillsboro, New Mexico: Consultant’s report prepared by Steven T. Finch of John Shomaker & Associates, Inc. for New Mexico Copper Corporation.
- [JSAI] John Shomaker & Associates, Inc., 2014a, Model of groundwater flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico: consultant’s report prepared for New Mexico Copper Corporation, August 15, 2014, 89 p. plus figures and appendices.

Table 1. Summary of Copper Flat open pit influent groundwater chemistry

Column:			A	B	C	AVERAGE A-C	
parameter	parameter name	unit	Groundwater chemistry (average of samples collected from wells GWQ96-22(A,B), GWQ96- 23(A,B) between 1996 and 2013)	GWQ11-24B 2013 average	GWQ11-25B 2013 average	Blended Groundwater chemistry representative of inflow to current open pit ^b	Groundwater chemistry representative of inflow to future open pit
pH	pH	s.u	7.85	6.44	6.45	6.91	7.85
HCO3	bicarbonate	mg/L	408	191	350	316.3	408
Ag	silver	mg/L	0.009	nm	nm	0.009	0.009
Al	aluminum	mg/L	0.029	0.013	0.308	0.12	0.029
As	arsenic	mg/L	0.0023	nm	nm	0.0023	0.0023
B	boron	mg/L	0.136	nm	nm	0.136	0.136
Ba	barium	mg/L	0.089	nm	nm	0.089	0.089
Ca	calcium	mg/L	85.8	442	481	336	85.8
Cd	cadmium	mg/L	0.0008	0.001	0.001	0.001	0.0008
Co	cobalt	mg/L	0.008	0.017	0.004	0.010	0.008
Cr	chromium	mg/L	0.0066	nm	nm	0.0066	0.0066
Cu	copper	mg/L	0.0061	0.0024	0.0026	0.0	0.0061
F	fluoride	mg/L	2.1	3.80	7.90	4.60	2.1
Fe	iron	mg/L	1.48	nm	nm	1.48	1.48
Hg	mercury ^a	mg/L	0.000002	nm	nm	0.000002	0.000002
K	potassium	mg/L	2.96	6.2	4	4.4	2.96
Mg	magnesium	mg/L	19.3	79	75	57.8	19.3
Mn	manganese	mg/L	0.66	3.5	3.25	2.47	0.66
Mo	molybdenum	mg/L	0.012	nm	nm	0.0119	0.012
Na	sodium	mg/L	119	94	131	114.5	119
Ni	nickel	mg/L	0.0125	nm	nm	0.0125	0.0125
Pb	lead	mg/L	0.0025	nm	nm	0.0025	0.0025
Sb	antimony	mg/L	0.0009	nm	nm	0.0009	0.0009
Se	selenium	mg/L	0.0015	0.0024	0.0028	0.0022	0.0015
U	uranium	mg/L	0.0015	nm	nm	0.0015	0.0015
V	vanadium ^a	mg/L	0.0009	nm	nm	0.0009	0.0009
Zn	zinc	mg/L	0.03	0.18	0.02	0.08	0.03
SO4	sulfate	mg/L	84	1408	1370	954	84
Cl	chloride	mg/L	49	27	27	34	49
TDS	total dissolved solids	mg/L	649	2,440	2,540	1,876	649

notes:

nm = not measured

^a = results from sample analyzed for low detection limits for SRK geochemical model (samples collected July 10, 2013)

Appendix E – Water Supply Well Chemistry

Production Well Water Quality Samples				
Parameter		PW1 May 1, 2012	PW3 May 3, 2012	Average
pH	pH	8.02	8.03	8.025
HCO ₃	Bicarbonate	150	120	135
Al	Aluminum	nd	nd	nd
As	Arsenic	0.0033	0.0074	0.00535
B	Boron	0.065	0.095	0.0800
Ba	Barium	0.011	0.0078	0.0094
Ca	Calcium	36	20	28
Cl	Chloride	32	50	41
Cu	Copper	nd	nd	nd
Cr	Chromium	nd	0.006	0.006
F	Fluoride	1	1.9	1.45
Fe	Iron	0.04	0.065	0.0525
Hg	Mercury	nd	nd	nd
K	Potassium	3.4	3.3	3.35
Mg	Magnesium	3.1	1	2.05
Mn	Manganese	0.0024	0.0026	0.0025
Mo	Molybdenum	nd	nd	nd
Na	Sodium	58	81	69.5
Ni	Nickel	nd	nd	nd
Pb	Lead	nd	nd	nd
SO ₄	Sulfate	28	26	27
Se	Selenium	nd	nd	nd
Si	Silica	17	21	19
U	Uranium	0.0032	0.0013	0.00225
V	Vanadium	nd	nd	nd
Tl	Thallium	nd	nd	nd
Zn	Zinc	0.024	0.021	0.0225



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 14, 2012

Katie Emmer

New Mexico Copper Corp
2425 San Pedro Dr NE Ste 100
Albuquerque, New Mexico 87109
TEL: (505) 400-7925
FAX

RE: Cu Flat

OrderNo.: 1205076

Dear Katie Emmer:

Hall Environmental Analysis Laboratory received 1 sample(s) on 5/2/2012 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", with a stylized flourish at the end.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1205076

Date Reported: 5/14/2012

CLIENT: New Mexico Copper Corp

Client Sample ID: PW-1

Project: Cu Flat

Collection Date: 5/1/2012 2:00:00 PM

Lab ID: 1205076-001

Matrix: AQUEOUS

Received Date: 5/2/2012 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: BRM
Fluoride	1.0	0.10		mg/L	1	5/2/2012 12:52:03 PM
Chloride	32	10		mg/L	20	5/2/2012 1:03:17 PM
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	5/2/2012 12:52:03 PM
Nitrogen, Nitrate (As N)	0.59	0.10		mg/L	1	5/2/2012 12:52:03 PM
Sulfate	28	0.50		mg/L	1	5/2/2012 12:52:03 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Aluminum	ND	0.020		mg/L	1	5/8/2012 8:02:55 AM
Barium	0.011	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Beryllium	ND	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Boron	0.065	0.040		mg/L	1	5/9/2012 8:36:51 AM
Cadmium	ND	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Calcium	36	1.0		mg/L	1	5/9/2012 8:36:51 AM
Chromium	ND	0.0060		mg/L	1	5/8/2012 8:02:55 AM
Cobalt	ND	0.0060		mg/L	1	5/8/2012 8:02:55 AM
Copper	ND	0.0060		mg/L	1	5/8/2012 8:02:55 AM
Iron	0.040	0.020		mg/L	1	5/9/2012 8:36:51 AM
Lead	ND	0.0050		mg/L	1	5/8/2012 8:02:55 AM
Magnesium	3.1	1.0		mg/L	1	5/9/2012 8:36:51 AM
Manganese	0.0024	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Molybdenum	ND	0.0080		mg/L	1	5/8/2012 8:02:55 AM
Nickel	ND	0.010		mg/L	1	5/8/2012 8:02:55 AM
Potassium	3.4	1.0		mg/L	1	5/9/2012 8:36:51 AM
Silicon	17	0.40		mg/L	5	5/8/2012 8:06:09 AM
Silver	ND	0.0050		mg/L	1	5/8/2012 8:02:55 AM
Sodium	58	1.0		mg/L	1	5/9/2012 8:36:51 AM
Vanadium	ND	0.050		mg/L	1	5/8/2012 8:02:55 AM
Zinc	0.024	0.010		mg/L	1	5/8/2012 8:02:55 AM
EPA 200.8: DISSOLVED METALS						Analyst: SNV
Antimony	ND	0.0010		mg/L	1	5/8/2012 1:15:26 PM
Arsenic	0.0033	0.0010		mg/L	1	5/8/2012 1:15:26 PM
Selenium	ND	0.0010		mg/L	1	5/10/2012 2:28:58 PM
Thallium	ND	0.0010		mg/L	1	5/8/2012 1:15:26 PM
Uranium	0.0032	0.0010		mg/L	1	5/10/2012 2:28:58 PM
EPA METHOD 245.1: MERCURY						Analyst: ELS
Mercury	ND	0.00020		mg/L	1	5/9/2012 11:59:45 AM
SM2340B: HARDNESS						Analyst: ELS
Hardness (As CaCO3)	100	6.6		mg/L	1	5/9/2012
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: DBD
Conductivity	450	0.010		µmhos/cm	1	5/7/2012 12:31:49 PM

Qualifiers: */X Value exceeds Maximum Contaminant Level.
 E Value above quantitation range
 J Analyte detected below quantitation limits
 R RPD outside accepted recovery limits
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1205076

Date Reported: 5/14/2012

CLIENT: New Mexico Copper Corp

Client Sample ID: PW-1

Project: Cu Flat

Collection Date: 5/1/2012 2:00:00 PM

Lab ID: 1205076-001

Matrix: AQUEOUS

Received Date: 5/2/2012 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM4500-H+B: PH						
						Analyst: JLF
pH	8.02	1.68	H	pH units	1	5/3/2012 1:22:52 PM
SM2320B: ALKALINITY						
						Analyst: JLF
Bicarbonate (As CaCO3)	150	20		mg/L CaCO3	1	5/3/2012 1:22:52 PM
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	5/3/2012 1:22:52 PM
Total Alkalinity (as CaCO3)	150	20		mg/L CaCO3	1	5/3/2012 1:22:52 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						
						Analyst: KS
Total Dissolved Solids	294	20.0		mg/L	1	5/8/2012 3:12:00 PM
SM 2540D: TSS						
						Analyst: KS
Suspended Solids	ND	4.0		mg/L	1	5/3/2012 5:30:00 PM

Qualifiers:

- */X Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RL Reporting Detection Limit

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

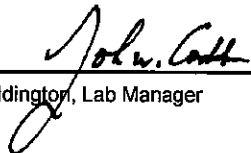
Batch #: 120503026
Project Name: 1205076

Analytical Results Report

Sample Number	120503026-001	Sampling Date	5/1/2012	Date/Time Received	5/3/2012 12:24 PM
Client Sample ID	1205076-001D / PW-1	Sampling Time	2:00 PM	Extraction Date	
Matrix	Water	Sample Location			
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	5/11/2012	CRW	EPA 335.4	

Authorized Signature


John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB	SampType:	MBLK	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	PBW	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	72991	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Lead	ND	0.0050								
Manganese	ND	0.0020								
Molybdenum	ND	0.0080								
Nickel	ND	0.010								
Silicon	ND	0.080								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID	LCS	SampType:	LCS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	LCSW	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	72992	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.52	0.020	0.5000	0	105	85	115			
Barium	0.49	0.0020	0.5000	0	98.9	85	115			
Beryllium	0.52	0.0020	0.5000	0	103	85	115			
Cadmium	0.50	0.0020	0.5000	0	99.2	85	115			
Chromium	0.49	0.0060	0.5000	0	98.5	85	115			
Cobalt	0.47	0.0060	0.5000	0	94.9	85	115			
Copper	0.50	0.0060	0.5000	0	99.9	85	115			
Lead	0.50	0.0050	0.5000	0	99.3	85	115			
Manganese	0.48	0.0020	0.5000	0	96.9	85	115			
Molybdenum	0.49	0.0080	0.5000	0.002030	98.4	85	115			
Nickel	0.47	0.010	0.5000	0	93.9	85	115			
Silicon	2.6	0.080	2.500	0	104	85	115			
Silver	0.094	0.0050	0.1000	0	94.1	85	115			
Vanadium	0.52	0.050	0.5000	0	104	85	115			
Zinc	0.50	0.010	0.5000	0	101	85	115			

Sample ID	1205193-005EMS	SampType:	MS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	73030	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
---------	--------	-----	-----------	-------------	------	----------	-----------	------	----------	------

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205193-005EMS		SampType: MS			TestCode: EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID: R2622			RunNo: 2622				
Prep Date:			Analysis Date: 5/8/2012			SeqNo: 73030		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	107	70	130			
Barium	0.52	0.0020	0.5000	0.02182	98.9	70	130			
Zinc	0.54	0.010	0.5000	0.03785	101	70	130			

Sample ID	1205193-005EMSD		SampType: MSD			TestCode: EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID: R2622			RunNo: 2622				
Prep Date:			Analysis Date: 5/8/2012			SeqNo: 73031		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	106	70	130	1.33	20	
Barium	0.51	0.0020	0.5000	0.02182	97.2	70	130	1.71	20	
Zinc	0.53	0.010	0.5000	0.03785	98.0	70	130	2.48	20	

Sample ID	1205193-005EMS		SampType: MS			TestCode: EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID: R2670			RunNo: 2670				
Prep Date:			Analysis Date: 5/9/2012			SeqNo: 74182		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	56	1.0	50.00	4.808	102	70	130			

Sample ID	1205193-005EMSD		SampType: MSD			TestCode: EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID: R2670			RunNo: 2670				
Prep Date:			Analysis Date: 5/9/2012			SeqNo: 74183		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	57	1.0	50.00	4.808	104	70	130	2.44	20	

Sample ID	1205193-005EMS		SampType: MS			TestCode: EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID: R2670			RunNo: 2670				
Prep Date:			Analysis Date: 5/9/2012			SeqNo: 74185		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.5	0.10	2.500	2.034	99.6	70	130			
Magnesium	390	5.0	250.0	124.9	107	70	130			
Sodium	460	5.0	250.0	192.5	107	70	130			

Sample ID	1205193-005EMSD		SampType: MSD			TestCode: EPA Method 200.7: Dissolved Metals				
Client ID:	BatchQC		Batch ID: R2670			RunNo: 2670				
Prep Date:			Analysis Date: 5/9/2012			SeqNo: 74186		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.6	0.10	2.500	2.034	101	70	130	1.03	20	

Qualifiers:

*X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205193-005EMSD	SampType:	MSD	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74186	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	390	5.0	250.0	124.9	106	70	130	0.684	20	
Sodium	460	5.0	250.0	192.5	106	70	130	0.966	20	

Sample ID	MB	SampType:	MBLK	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	PBW	Batch ID:	R2670	RunNo:	2670					
Prep Date:	5/9/2012	Analysis Date:	5/9/2012	SeqNo:	74215	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	ND	0.040								
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID	LCS	SampType:	LCS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	LCSW	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74216	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.51	0.040	0.5000	0	101	85	115			
Calcium	54	1.0	50.00	0	107	85	115			
Iron	0.47	0.020	0.5000	0.004190	93.2	85	115			
Magnesium	54	1.0	50.00	0	109	85	115			
Potassium	53	1.0	50.00	0	106	85	115			
Sodium	54	1.0	50.00	0	107	85	115			

Qualifiers:

*X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
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R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	LCS		SampType: LCS		TestCode: EPA 200.8: Dissolved Metals					
Client ID:	LCSW		Batch ID: R2629		RunNo: 2629					
Prep Date:			Analysis Date: 5/8/2012		SeqNo: 73283		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	92.8	85	115			
Arsenic	0.023	0.0010	0.02500	0	93.1	85	115			
Thallium	0.023	0.0010	0.02500	0	92.9	85	115			

Sample ID	MB	SampType: MBLK			TestCode: EPA 200.8: Dissolved Metals					
Client ID:	PBW	Batch ID: R2629			RunNo: 2629					
Prep Date:		Analysis Date: 5/8/2012			SeqNo: 73284		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Thallium	ND	0.0010								

Sample ID	LCS		SampType: LCS		TestCode: EPA 200.8: Dissolved Metals					
Client ID:	LCSW		Batch ID: R2708		RunNo: 2708					
Prep Date:			Analysis Date: 5/10/2012		SeqNo: 75447		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	0.026	0.0010	0.02500	0	104	85	115			
Uranium	0.025	0.0010	0.02500	0	99.2	85	115			

Sample ID	MB	SampType: MBLK			TestCode: EPA 200.8: Dissolved Metals					
Client ID:	PBW	Batch ID: R2708			RunNo: 2708					
Prep Date:		Analysis Date: 5/10/2012			SeqNo: 75448		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	ND	0.0010								
Uranium	ND	0.0010								

Qualifiers:

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R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB-1862		SampType:	MBLK		TestCode:	EPA Method 245.1: Mercury				
Client ID:	PBW		Batch ID:	1862		RunNo:	2669				
Prep Date:	5/9/2012		Analysis Date:	5/9/2012		SeqNo:	74223		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	ND	0.00020									

Sample ID	LCS-1862		SampType: LCS		TestCode: EPA Method 245.1: Mercury					
Client ID:	LCSW		Batch ID: 1862		RunNo: 2669					
Prep Date:	5/9/2012		Analysis Date: 5/9/2012		SeqNo: 74224		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.4	80	120			

Sample ID	1204854-004AMS			SampType:	MS		TestCode:	EPA Method 245.1: Mercury			
Client ID:	BatchQC			Batch ID:	1862		RunNo:	2669			
Prep Date:	5/9/2012			Analysis Date:	5/9/2012		SeqNo:	74226		Units: mg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.0049	0.00020	0.005000	0	97.2	75	125				

Sample ID	1204854-004AMSD			SampType:	MSD		TestCode:	EPA Method 245.1: Mercury			
Client ID:	BatchQC			Batch ID:	1862		RunNo:	2669			
Prep Date:	5/9/2012			Analysis Date:	5/9/2012		SeqNo:	74227		Units: mg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.0049	0.00020	0.005000	0	97.1	75	125	0.0957	20		

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID MB	SampType: MBLK		TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R2544		RunNo: 2544							
Prep Date:	Analysis Date: 5/2/2012		SeqNo: 70797		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID LCS	SampType: LCS		TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R2544		RunNo: 2544							
Prep Date:	Analysis Date: 5/2/2012		SeqNo: 70798		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.47	0.10	0.5000	0	93.8	90	110			
Chloride	4.6	0.50	5.000	0	92.9	90	110			
Nitrogen, Nitrite (As N)	0.93	0.10	1.000	0	92.9	90	110			
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	97.4	90	110			
Sulfate	9.5	0.50	10.00	0	94.8	90	110			

Sample ID 1205075-001BMS	SampType: MS		TestCode: EPA Method 300.0: Anions							
Client ID: BatchQC	Batch ID: R2544		RunNo: 2544							
Prep Date:	Analysis Date: 5/2/2012		SeqNo: 70800		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.68	0.10	0.5000	0.1911	98.1	72.9	113			
Nitrogen, Nitrite (As N)	1.0	0.10	1.000	0	101	77.6	111			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	99.9	82.8	116			

Sample ID 1205075-001BMSD	SampType: MSD		TestCode: EPA Method 300.0: Anions							
Client ID: BatchQC	Batch ID: R2544		RunNo: 2544							
Prep Date:	Analysis Date: 5/2/2012		SeqNo: 70801		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.65	0.10	0.5000	0.1911	90.9	72.9	113	5.39	20	
Nitrogen, Nitrite (As N)	0.90	0.10	1.000	0	90.2	77.6	111	10.8	20	
Nitrogen, Nitrate (As N)	2.3	0.10	2.500	0	91.3	82.8	116	8.94	20	

Sample ID 1205079-001AMS	SampType: MS		TestCode: EPA Method 300.0: Anions							
Client ID: BatchQC	Batch ID: R2544		RunNo: 2544							
Prep Date:	Analysis Date: 5/2/2012		SeqNo: 70809		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	1.3	0.10	1.000	0	127	77.6	111			S
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	97.8	82.8	116			

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205079-001AMSD			SampType:	MSD		TestCode:	EPA Method 300.0: Anions			
Client ID:	BatchQC			Batch ID:	R2544		RunNo:	2544			
Prep Date:				Analysis Date:	5/2/2012		SeqNo:	70810		Units:	mg/L
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Nitrogen, Nitrite (As N)	1.2	0.10	1.000	0	122	77.6	111	4.14	20	S	
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	95.5	82.8	116	2.38	20		

Sample ID	MB	SampType: MBLK			TestCode: EPA Method 300.0: Anions					
Client ID:	PBW	Batch ID: R2544			RunNo: 2544					
Prep Date:		Analysis Date: 5/2/2012			SeqNo: 70849		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID	LCS		SampType: LCS		TestCode: EPA Method 300.0: Anions					
Client ID:	LCSW		Batch ID: R2544		RunNo: 2544					
Prep Date:			Analysis Date: 5/2/2012		SeqNo: 70850		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.50	0.10	0.5000	0	99.0	90	110			
Chloride	4.7	0.50	5.000	0	94.2	90	110			
Nitrogen, Nitrite (As N)	0.98	0.10	1.000	0	98.0	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	98.3	90	110			
Sulfate	9.6	0.50	10.00	0	95.7	90	110			

Sample ID	1205066-002AMS		SampType: MS		TestCode: EPA Method 300.0: Anions					
Client ID:	BatchQC		Batch ID: R2544		RunNo: 2544					
Prep Date:			Analysis Date: 5/2/2012		SeqNo: 70852		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.1	0.10	0.5000	0.5616	101	72.9	113			
Nitrogen, Nitrite (As N)	0.93	0.10	1.000	0	92.7	77.6	111			
Nitrogen, Nitrate (As N)	3.3	0.10	2.500	0.5059	111	82.8	116			
Sulfate	48	0.50	10.00	36.66	113	80.5	119			

Sample ID	1205066-002AMSD		SampType: MSD		TestCode: EPA Method 300.0: Anions					
Client ID:	BatchQC		Batch ID: R2544		RunNo: 2544					
Prep Date:			Analysis Date: 5/2/2012		SeqNo: 70853		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.0	0.10	0.5000	0.5616	93.8	72.9	113	3.52	20	
Nitrogen, Nitrite (As N)	0.79	0.10	1.000	0	78.5	77.6	111	16.5	20	

Qualifiers:

*X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205066-002AMSD	SampType:	MSD	TestCode:	EPA Method 300.0: Anions						
Client ID:	BatchQC	Batch ID:	R2544	RunNo:	2544						
Prep Date:		Analysis Date:	5/2/2012	SeqNo:	70853	Units:	mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Nitrogen, Nitrate (As N)	3.0	0.10	2.500	0.5059	98.7	82.8	116	10.2	20		
Sulfate	47	0.50	10.00	36.66	101	80.5	119	2.50	20		

Qualifiers:

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E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

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ND Not Detected at the Reporting Limit

RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205170-001D	SampType:	DUP	TestCode:	EPA 120.1: Specific Conductance					
Client ID:	BatchQC	Batch ID:	R2646	RunNo:	2646					
Prep Date:		Analysis Date:	5/7/2012	SeqNo:	73516	Units:	µmhos/cm			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	610	0.010						0	20	

Qualifiers:

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205005-001A DUP	SampType:	DUP	TestCode:	SM4500-H+B: pH					
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560					
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71363	Units:	pH units			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	3.92	1.68						0.762		H

Sample ID	1205120-001B DUP	SampType:	DUP	TestCode:	SM4500-H+B: pH					
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560					
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71373	Units:	pH units			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.73	1.68						0.645		H

Qualifiers:

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ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205005-001A MS	SampType:	MS	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71221	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	62.6	110			S	

Sample ID	1205005-001A MSD	SampType:	MSD	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71222	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	59.9	111	0	10	S	

Sample ID	1205120-001B MS	SampType:	MS	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71242	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	360	20	80.00	299.4	70.9	62.6	110				

Sample ID	1205120-001B MSD	SampType:	MSD	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71243	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	350	20	80.00	299.4	67.1	59.9	111	0.869	10		

Qualifiers:

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J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB-1832	SampType:	MBLK	TestCode:	SM2540C MOD: Total Dissolved Solids					
Client ID:	PBW	Batch ID:	1832	RunNo:	2634					
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73329	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	LCS-1832	SampType:	LCS	TestCode:	SM2540C MOD: Total Dissolved Solids					
Client ID:	LCSW	Batch ID:	1832	RunNo:	2634					
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73330	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1,020	20.0	1,000	0	102	80	120			

Sample ID	1205078-002GMS	SampType:	MS	TestCode:	SM2540C MOD: Total Dissolved Solids					
Client ID:	BatchQC	Batch ID:	1832	RunNo:	2634					
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73337	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	4,890	20.0	1,000	3,791	110	80	120			

Sample ID	1205078-002GMSD	SampType:	MSD	TestCode:	SM2540C MOD: Total Dissolved Solids					
Client ID:	BatchQC	Batch ID:	1832	RunNo:	2634					
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73338	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	4,930	20.0	1,000	3,791	114	80	120	0.733	20	

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205076

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB-1800		SampType:	MBLK		TestCode:	SM 2540D: TSS				
Client ID:	PBW		Batch ID:	1800		RunNo:	2570				
Prep Date:	5/3/2012		Analysis Date:	5/3/2012		SeqNo:	71656		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Suspended Solids	ND	4.0									

Sample ID	LCS-1800		SampType: LCS		TestCode: SM 2540D: TSS					
Client ID:	LCSW		Batch ID: 1800		RunNo: 2570					
Prep Date:	5/3/2012		Analysis Date: 5/3/2012		SeqNo: 71657		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	93	4.0	96.60	0	96.3	82.9	110			

Sample ID	1205034-001BDUP		SampType:	DUP		TestCode:	SM 2540D: TSS				
Client ID:	BatchQC		Batch ID:	1800		RunNo:	2570				
Prep Date:	5/3/2012		Analysis Date:	5/3/2012		SeqNo:	71663		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Suspended Solids	ND	4.0						0	15		

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

Sample Log-In Check List

Client Name: NEW MEXICO COPPER CORP		Work Order Number: 1205076
Received by/date: <u>AT 05/02/12</u>		
Logged By: Anne Thorne	5/2/2012 7:30:00 AM	<i>Anne Thorne</i>
Completed By: Anne Thorne	5/2/2012	<i>Anne Thorne</i>
Reviewed By: <u>AT 05/02/12</u>		

Chain of Custody

1. Were seals intact? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Coolers are present? (see 19. for cooler specific information) Yes ☒ No ☐ NA ☐
5. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐
7. Sample(s) in proper container(s)? Yes ☒ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
10. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
11. VOA vials have zero headspace? Yes ☒ No ☐ No VOA Vials ☐
12. Were any sample containers received broken? Yes ☐ No ☒
13. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
15. Is it clear what analyses were requested? Yes ☒ No ☐
16. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: 2
(2 or 12 unless noted)
Adjusted? _____

Checked by: AT 05/02/12

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:	_____	Date:	_____
By Whom:	_____	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	_____		
Client Instructions:	_____		

18. Additional remarks:

19. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.4	Good	Not Present			

NMI Copper
May 1, 2012

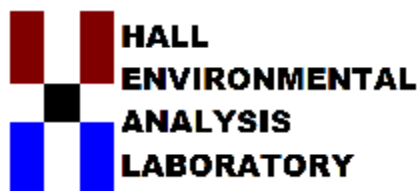
Table 9-3
Analytical Parameters and Analysis Methods for Groundwater Samples

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Anions		
Fluoride	EPA Method 300.0	0.1
Chloride	EPA Method 300.0	0.1
Nitrogen, Nitrite (as N)	EPA Method 300.0	0.1
Nitrogen, Nitrate (as N)	EPA Method 300.0	0.1
Sulfate	EPA Method 300.0	0.5
Dissolved Metals		
Aluminum	EPA Method 200.7	0.02
Antimony	EPA Method 200.8	0.005
Arsenic	EPA Method 200.8	0.02
Barium	EPA Method 200.7	0.002
Beryllium	EPA Method 200.7	0.002
Boron	EPA Method 200.7	0.04
Cadmium	EPA Method 200.7	0.002
Calcium	EPA Method 200.7	0.50
Chromium	EPA Method 200.7	0.006
Cobalt	EPA Method 200.7	0.006
Copper	EPA Method 200.7	0.0003
Iron	EPA Method 200.7	0.02
Lead	EPA Method 200.7	0.005
Magnesium	EPA Method 200.7	0.50
Manganese	EPA Method 200.7	0.002
Mercury	EPA Method 7470 CVAA	0.0002
Molybdenum	EPA Method 200.7	0.008
Nickel	EPA Method 200.7	0.01
Potassium	EPA Method 200.7	1.0
Selenium	EPA Method 200.8	0.02
Silicon	EPA Method 200.7	0.08
Silver	EPA Method 200.7	0.005
Sodium	EPA Method 200.7	0.5

NM Copper
May 1, 2012

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Thallium	EPA Method 200.7	0.01
Titanium	EPA Method 200.7	0.005
Uranium	EPA Method 200.8	0.01
Vanadium	EPA Method 200.7	0.005
Zinc	EPA Method 200.7	0.005
Solids		
Total Suspended Solids (TSS)	SM 2540D	1.0 µg/L
Total Dissolved Solids (TDS)	SM 2540C	10
Alkalinity		
Alkalinity, total (as CaCO ₃)	SM 2320B	20
Carbonate	SM 2320B	20
Bicarbonate	SM 2320B	20
Other		
pH	150.1	12.45
Specific Conductance	120.1	0.01 µS/cm
Cyanide	Kelada-01	0.005

Note: NA = not applicable as sample will not be analyzed for a given parameter.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 14, 2012

Katie Emmer

New Mexico Copper Corp
2425 San Pedro Dr NE Ste 100
Albuquerque, New Mexico 87109
TEL: (505) 400-7925
FAX

RE: Cu Flat

OrderNo.: 1205153

Dear Katie Emmer:

Hall Environmental Analysis Laboratory received 1 sample(s) on 5/3/2012 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1205153

Date Reported: 5/14/2012

CLIENT: New Mexico Copper Corp

Client Sample ID: PW-3

Project: Cu Flat

Collection Date: 5/2/2012 2:30:00 PM

Lab ID: 1205153-001

Matrix: AQUEOUS

Received Date: 5/3/2012 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: BRM
Fluoride	1.9	0.10		mg/L	1	5/3/2012 12:04:13 PM
Chloride	50	10		mg/L	20	5/3/2012 12:41:28 PM
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	5/3/2012 12:04:13 PM
Nitrogen, Nitrate (As N)	0.70	0.10		mg/L	1	5/3/2012 12:04:13 PM
Sulfate	26	0.50		mg/L	1	5/3/2012 12:04:13 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Aluminum	ND	0.020		mg/L	1	5/8/2012 8:09:23 AM
Barium	0.0078	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Beryllium	ND	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Boron	0.095	0.040		mg/L	1	5/9/2012 8:40:03 AM
Cadmium	ND	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Calcium	20	1.0		mg/L	1	5/9/2012 8:40:03 AM
Chromium	0.0060	0.0060		mg/L	1	5/8/2012 8:09:23 AM
Cobalt	ND	0.0060		mg/L	1	5/8/2012 8:09:23 AM
Copper	ND	0.0060		mg/L	1	5/8/2012 8:09:23 AM
Iron	0.065	0.020		mg/L	1	5/9/2012 8:40:03 AM
Lead	ND	0.0050		mg/L	1	5/8/2012 8:09:23 AM
Magnesium	1.0	1.0		mg/L	1	5/9/2012 8:40:03 AM
Manganese	0.0026	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Molybdenum	ND	0.0080		mg/L	1	5/8/2012 8:09:23 AM
Nickel	ND	0.010		mg/L	1	5/8/2012 8:09:23 AM
Potassium	3.3	1.0		mg/L	1	5/9/2012 8:40:03 AM
Silicon	21	0.40		mg/L	5	5/8/2012 8:12:46 AM
Silver	ND	0.0050		mg/L	1	5/8/2012 8:09:23 AM
Sodium	81	1.0		mg/L	1	5/9/2012 8:40:03 AM
Vanadium	ND	0.050		mg/L	1	5/8/2012 8:09:23 AM
Zinc	0.021	0.010		mg/L	1	5/8/2012 8:09:23 AM
EPA 200.8: DISSOLVED METALS						Analyst: SNV
Antimony	ND	0.0010		mg/L	1	5/8/2012 1:19:22 PM
Arsenic	0.0074	0.0010		mg/L	1	5/8/2012 1:19:22 PM
Selenium	ND	0.0010		mg/L	1	5/10/2012 2:32:54 PM
Thallium	ND	0.0010		mg/L	1	5/8/2012 1:19:22 PM
Uranium	0.0013	0.0010		mg/L	1	5/10/2012 2:32:54 PM
EPA METHOD 245.1: MERCURY						Analyst: ELS
Mercury	ND	0.00020		mg/L	1	5/9/2012 12:01:31 PM
SM2340B: HARDNESS						Analyst: ELS
Hardness (As CaCO3)	53	6.6		mg/L	1	5/9/2012
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: DBD
Conductivity	460	0.010		µmhos/cm	1	5/7/2012 12:36:13 PM

Qualifiers: * / X Value exceeds Maximum Contaminant Level.
 E Value above quantitation range
 J Analyte detected below quantitation limits
 R RPD outside accepted recovery limits
 S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1205153

Date Reported: 5/14/2012

CLIENT: New Mexico Copper Corp

Client Sample ID: PW-3

Project: Cu Flat

Collection Date: 5/2/2012 2:30:00 PM

Lab ID: 1205153-001

Matrix: AQUEOUS

Received Date: 5/3/2012 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM4500-H+B: PH						Analyst: JLF
pH	8.03	1.68	H	pH units	1	5/3/2012 5:14:04 PM
SM2320B: ALKALINITY						Analyst: JLF
Bicarbonate (As CaCO3)	120	20		mg/L CaCO3	1	5/3/2012 5:14:04 PM
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	5/3/2012 5:14:04 PM
Total Alkalinity (as CaCO3)	120	20		mg/L CaCO3	1	5/3/2012 5:14:04 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: KS
Total Dissolved Solids	303	20.0		mg/L	1	5/8/2012 3:12:00 PM
SM 2540D: TSS						Analyst: KS
Suspended Solids	ND	4.0		mg/L	1	5/4/2012 4:36:00 PM

Qualifiers:

- * /X Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RL Reporting Detection Limit

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

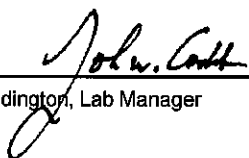
Batch #: 120504004
Project Name: 1205153

Analytical Results Report

Sample Number	120504004-001	Sampling Date	5/2/2012	Date/Time Received	5/4/2012 10:18 AM
Client Sample ID	1205153-001D / PW-3	Sampling Time	2:30 PM		
Matrix	Water	Sample Location			
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	5/8/2012	CRW	EPA 335.4	

Authorized Signature


John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB	SampType:	MBLK	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	PBW	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	72991	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Lead	ND	0.0050								
Manganese	ND	0.0020								
Molybdenum	ND	0.0080								
Nickel	ND	0.010								
Silicon	ND	0.080								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID	LCS	SampType:	LCS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	LCSW	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	72992	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.52	0.020	0.5000	0	105	85	115			
Barium	0.49	0.0020	0.5000	0	98.9	85	115			
Beryllium	0.52	0.0020	0.5000	0	103	85	115			
Cadmium	0.50	0.0020	0.5000	0	99.2	85	115			
Chromium	0.49	0.0060	0.5000	0	98.5	85	115			
Cobalt	0.47	0.0060	0.5000	0	94.9	85	115			
Copper	0.50	0.0060	0.5000	0	99.9	85	115			
Lead	0.50	0.0050	0.5000	0	99.3	85	115			
Manganese	0.48	0.0020	0.5000	0	96.9	85	115			
Molybdenum	0.49	0.0080	0.5000	0.002030	98.4	85	115			
Nickel	0.47	0.010	0.5000	0	93.9	85	115			
Silicon	2.6	0.080	2.500	0	104	85	115			
Silver	0.094	0.0050	0.1000	0	94.1	85	115			
Vanadium	0.52	0.050	0.5000	0	104	85	115			
Zinc	0.50	0.010	0.5000	0	101	85	115			

Sample ID	1205193-005EMS	SampType:	MS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	73030	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Qualifiers:

*/X Value exceeds Maximum Contaminant Level.

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205193-005EMS	SampType:	MS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	73030	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	107	70	130			
Barium	0.52	0.0020	0.5000	0.02182	98.9	70	130			
Zinc	0.54	0.010	0.5000	0.03785	101	70	130			

Sample ID	1205193-005EMSD	SampType:	MSD	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2622	RunNo:	2622					
Prep Date:		Analysis Date:	5/8/2012	SeqNo:	73031	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	106	70	130	1.33	20	
Barium	0.51	0.0020	0.5000	0.02182	97.2	70	130	1.71	20	
Zinc	0.53	0.010	0.5000	0.03785	98.0	70	130	2.48	20	

Sample ID	1205193-005EMS	SampType:	MS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74182	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	56	1.0	50.00	4.808	102	70	130			

Sample ID	1205193-005EMSD	SampType:	MSD	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74183	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	57	1.0	50.00	4.808	104	70	130	2.44	20	

Sample ID	1205193-005EMS	SampType:	MS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74185	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.5	0.10	2.500	2.034	99.6	70	130			
Magnesium	390	5.0	250.0	124.9	107	70	130			
Sodium	460	5.0	250.0	192.5	107	70	130			

Sample ID	1205193-005EMSD	SampType:	MSD	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74186	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.6	0.10	2.500	2.034	101	70	130	1.03	20	

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205193-005EMSD	SampType:	MSD	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	BatchQC	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74186	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	390	5.0	250.0	124.9	106	70	130	0.684	20	
Sodium	460	5.0	250.0	192.5	106	70	130	0.966	20	

Sample ID	MB	SampType:	MBLK	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	PBW	Batch ID:	R2670	RunNo:	2670					
Prep Date:	5/9/2012	Analysis Date:	5/9/2012	SeqNo:	74215	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	ND	0.040								
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID	LCS	SampType:	LCS	TestCode:	EPA Method 200.7: Dissolved Metals					
Client ID:	LCSW	Batch ID:	R2670	RunNo:	2670					
Prep Date:		Analysis Date:	5/9/2012	SeqNo:	74216	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.51	0.040	0.5000	0	101	85	115			
Calcium	54	1.0	50.00	0	107	85	115			
Iron	0.47	0.020	0.5000	0.004190	93.2	85	115			
Magnesium	54	1.0	50.00	0	109	85	115			
Potassium	53	1.0	50.00	0	106	85	115			
Sodium	54	1.0	50.00	0	107	85	115			

Qualifiers:

*X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	LCS		SampType: LCS		TestCode: EPA 200.8: Dissolved Metals					
Client ID:	LCSW		Batch ID: R2629		RunNo: 2629					
Prep Date:			Analysis Date: 5/8/2012		SeqNo: 73283		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	92.8	85	115			
Arsenic	0.023	0.0010	0.02500	0	93.1	85	115			
Thallium	0.023	0.0010	0.02500	0	92.9	85	115			

Sample ID	MB	SampType: MBLK			TestCode: EPA 200.8: Dissolved Metals					
Client ID:	PBW	Batch ID: R2629			RunNo: 2629					
Prep Date:		Analysis Date: 5/8/2012			SeqNo: 73284		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Thallium	ND	0.0010								

Sample ID	LCS		SampType: LCS		TestCode: EPA 200.8: Dissolved Metals					
Client ID:	LCSW		Batch ID: R2708		RunNo: 2708					
Prep Date:			Analysis Date: 5/10/2012		SeqNo: 75447		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	0.026	0.0010	0.02500	0	104	85	115			
Uranium	0.025	0.0010	0.02500	0	99.2	85	115			

Sample ID	MB	SampType: MBLK		TestCode: EPA 200.8: Dissolved Metals						
Client ID:	PBW	Batch ID: R2708		RunNo: 2708						
Prep Date:		Analysis Date: 5/10/2012		SeqNo: 75448		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	ND	0.0010								
Uranium	ND	0.0010								

Qualifiers:

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E Value above quantitation range
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R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB-1862		SampType:	MBLK		TestCode:	EPA Method 245.1: Mercury				
Client ID:	PBW		Batch ID:	1862		RunNo:	2669				
Prep Date:	5/9/2012		Analysis Date:	5/9/2012		SeqNo:	74223		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	ND	0.00020									

Sample ID	LCS-1862		SampType: LCS		TestCode: EPA Method 245.1: Mercury					
Client ID:	LCSW		Batch ID: 1862		RunNo: 2669					
Prep Date:	5/9/2012		Analysis Date: 5/9/2012		SeqNo: 74224		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.4	80	120			

Sample ID	1204854-004AMS			SampType:	MS		TestCode:	EPA Method 245.1: Mercury			
Client ID:	BatchQC			Batch ID:	1862		RunNo:	2669			
Prep Date:	5/9/2012			Analysis Date:	5/9/2012		SeqNo:	74226		Units: mg/L	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Mercury	0.0049	0.00020	0.005000	0	97.2	75	125				

Sample ID	1204854-004AMSD		SampType: MSD		TestCode: EPA Method 245.1: Mercury					
Client ID:	BatchQC		Batch ID: 1862		RunNo: 2669					
Prep Date:	5/9/2012		Analysis Date: 5/9/2012		SeqNo: 74227		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.1	75	125	0.0957	20	

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
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R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID MB	SampType: MBLK		TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R2561		RunNo: 2561							
Prep Date:	Analysis Date: 5/3/2012		SeqNo: 71254		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID LCS	SampType: LCS		TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R2561		RunNo: 2561							
Prep Date:	Analysis Date: 5/3/2012		SeqNo: 71255		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	95.5	90	110			
Chloride	4.8	0.50	5.000	0	96.2	90	110			
Nitrogen, Nitrite (As N)	0.98	0.10	1.000	0	98.2	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Sulfate	9.8	0.50	10.00	0	97.5	90	110			

Sample ID 1205153-001AMS	SampType: MS		TestCode: EPA Method 300.0: Anions							
Client ID: PW-3	Batch ID: R2561		RunNo: 2561							
Prep Date:	Analysis Date: 5/3/2012		SeqNo: 71257		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.4	0.10	0.5000	1.941	84.8	72.9	113			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	96.5	77.6	111			
Nitrogen, Nitrate (As N)	3.3	0.10	2.500	0.7031	102	82.8	116			
Sulfate	37	0.50	10.00	26.34	106	80.5	119			

Sample ID 1205153-001AMSD	SampType: MSD		TestCode: EPA Method 300.0: Anions							
Client ID: PW-3	Batch ID: R2561		RunNo: 2561							
Prep Date:	Analysis Date: 5/3/2012		SeqNo: 71258		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.4	0.10	0.5000	1.941	84.1	72.9	113	0.155	20	
Nitrogen, Nitrite (As N)	0.92	0.10	1.000	0	92.4	77.6	111	4.30	20	
Nitrogen, Nitrate (As N)	3.1	0.10	2.500	0.7031	97.9	82.8	116	3.36	20	
Sulfate	37	0.50	10.00	26.34	102	80.5	119	1.04	20	

Sample ID 1205167-005AMS	SampType: MS		TestCode: EPA Method 300.0: Anions							
Client ID: BatchQC	Batch ID: R2561		RunNo: 2561							
Prep Date:	Analysis Date: 5/3/2012		SeqNo: 71285		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

* / X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205167-005AMS		SampType: MS		TestCode: EPA Method 300.0: Anions					
Client ID:	BatchQC		Batch ID: R2561		RunNo: 2561					
Prep Date:			Analysis Date: 5/3/2012		SeqNo: 71285		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	0.94	0.10	1.000	0	94.4	77.6	111			

Sample ID	1205167-005AMSD		SampType:	MSD		TestCode:	EPA Method 300.0: Anions				
Client ID:	BatchQC		Batch ID:	R2561		RunNo:	2561				
Prep Date:			Analysis Date:	5/3/2012		SeqNo:	71286		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Nitrogen, Nitrite (As N)	0.94	0.10	1.000	0	94.4	77.6	111	0.0232	20		

Sample ID	MB	SampType: MBLK			TestCode: EPA Method 300.0: Anions					
Client ID:	PBW	Batch ID: R2561			RunNo: 2561					
Prep Date:		Analysis Date: 5/4/2012			SeqNo: 71314		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID	LCS		SampType: LCS		TestCode: EPA Method 300.0: Anions					
Client ID:	LCSW		Batch ID: R2561		RunNo: 2561					
Prep Date:			Analysis Date: 5/4/2012		SeqNo: 71315		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.51	0.10	0.5000	0	101	90	110			
Chloride	4.7	0.50	5.000	0	93.9	90	110			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	96.1	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	98.0	90	110			
Sulfate	9.5	0.50	10.00	0	94.7	90	110			

Sample ID	1205174-001BMS		SampType: MS		TestCode: EPA Method 300.0: Anions					
Client ID:	BatchQC		Batch ID: R2561		RunNo: 2561					
Prep Date:			Analysis Date: 5/4/2012		SeqNo: 71317		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.4	0.10	0.5000	0.9876	91.1	72.9	113			
Chloride	14	0.50	5.000	8.329	103	78	107			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	95.8	77.6	111			
Nitrogen, Nitrate (As N)	6.0	0.10	2.500	3.372	106	82.8	116			
Sulfate	45	0.50	10.00	35.20	102	80.5	119			

Qualifiers:

*X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205174-001BMSD	SampType:	MSD	TestCode:	EPA Method 300.0: Anions					
Client ID:	BatchQC	Batch ID:	R2561	RunNo:	2561					
Prep Date:		Analysis Date:	5/4/2012	SeqNo:	71318	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.4	0.10	0.5000	0.9876	90.1	72.9	113	0.330	20	
Chloride	13	0.50	5.000	8.329	103	78	107	0.0337	20	
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	95.7	77.6	111	0.0653	20	
Nitrogen, Nitrate (As N)	6.0	0.10	2.500	3.372	106	82.8	116	0.00611	20	
Sulfate	45	0.50	10.00	35.20	101	80.5	119	0.199	20	

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205170-001D	SampType:	DUP	TestCode:	EPA 120.1: Specific Conductance					
Client ID:	BatchQC	Batch ID:	R2646	RunNo:	2646					
Prep Date:		Analysis Date:	5/7/2012	SeqNo:	73516	Units:	µmhos/cm			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	610	0.010						0	20	

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
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R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205005-001A DUP	SampType:	DUP	TestCode:	SM4500-H+B: pH						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71363	Units:	pH units				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
pH	3.92	1.68						0.762		H	

Sample ID	1205120-001B DUP	SampType:	DUP	TestCode:	SM4500-H+B: pH						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71373	Units:	pH units				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
pH	7.73	1.68						0.645		H	

Qualifiers:

*/X Value exceeds Maximum Contaminant Level.
E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	1205005-001A MS	SampType:	MS	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71221	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	62.6	110			S	

Sample ID	1205005-001A MSD	SampType:	MSD	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71222	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	59.9	111	0	10	S	

Sample ID	1205120-001B MS	SampType:	MS	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71242	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	360	20	80.00	299.4	70.9	62.6	110				

Sample ID	1205120-001B MSD	SampType:	MSD	TestCode:	SM2320B: Alkalinity						
Client ID:	BatchQC	Batch ID:	R2560	RunNo:	2560						
Prep Date:		Analysis Date:	5/3/2012	SeqNo:	71243	Units:	mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	350	20	80.00	299.4	67.1	59.9	111	0.869	10		

Qualifiers:

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E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB-1832		SampType:	MBLK		TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	PBW		Batch ID:	1832		RunNo:	2634				
Prep Date:	5/7/2012		Analysis Date:	5/8/2012		SeqNo:	73329		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Dissolved Solids	ND	20.0									

Sample ID	LCS-1832		SampType: LCS		TestCode: SM2540C MOD: Total Dissolved Solids					
Client ID:	LCSW		Batch ID: 1832		RunNo: 2634					
Prep Date:	5/7/2012		Analysis Date: 5/8/2012		SeqNo: 73330		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1.020	20.0	1.000	0	102	80	120			

Sample ID	1205078-002GMS	SampType:	MS	TestCode:	SM2540C MOD: Total Dissolved Solids					
Client ID:	BatchQC	Batch ID:	1832	RunNo:	2634					
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73337	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	4.890	20.0	1.000	3.791	110	80	120			

Sample ID	1205078-002GMSD		SampType:	MSD		TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	BatchQC		Batch ID:	1832		RunNo:	2634				
Prep Date:	5/7/2012		Analysis Date:	5/8/2012		SeqNo:	73338		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Dissolved Solids	4.930	20.0	1.000	3.791	114	80	120	0.733	20		

Qualifiers:

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E Value above quantitation range
J Analyte detected below quantitation limits
R RPD outside accepted recovery limits

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1205153

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB-1808		SampType:	MBLK		TestCode:	SM 2540D: TSS				
Client ID:	PBW		Batch ID:	1808		RunNo:	2606				
Prep Date:	5/4/2012		Analysis Date:	5/4/2012		SeqNo:	72551		Units:		mg/L
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Suspended Solids	ND	4.0									

Sample ID	LCS-1808		SampType: LCS		TestCode: SM 2540D: TSS					
Client ID:	LCSW		Batch ID: 1808		RunNo: 2606					
Prep Date:	5/4/2012		Analysis Date: 5/4/2012		SeqNo: 72552		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	94	4.0	96.60	0	97.3	82.9	110			

Sample ID	1205122-001BDUP			SampType:	DUP			TestCode:	SM 2540D: TSS			
Client ID:	BatchQC			Batch ID:	1808			RunNo:	2606			
Prep Date:	5/4/2012			Analysis Date:	5/4/2012			SeqNo:	72556		Units:	mg/L
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Suspended Solids	ND	4.0						0	15			

Qualifiers:

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ND Not Detected at the Reporting Limit
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Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87106
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: NEW MEXICO COPPER CORP

Work Order Number: 1205153

Received by/date: AT 05/03/12

Logged By: Anne Thorne 5/3/2012 8:35:00 AM

Anne Thorne

Completed By: Anne Thorne 5/3/2012

Anne Thorne

Reviewed By: AT 05/03/12

Chain of Custody

1. Were seals intact? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Coolers are present? (see 19. for cooler specific information) Yes ☒ No ☐ NA ☐
5. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
6. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
7. Sample(s) in proper container(s)? Yes ☒ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
10. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
11. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
12. Were any sample containers received broken? Yes ☐ No ☒
13. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
15. Is it clear what analyses were requested? Yes ☒ No ☐
16. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: 3 1
(<2 or >12 unless noted)
Adjusted? _____

Checked by: AT 05/03/12

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

18. Additional remarks:

19. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Not Present			

Chain-of-Custody Record

Client: NMCC

Mailing Address: 2425 San Pedro NE Ste 100

Albuquerque, NM

Phone #: 505-400-7925

email or Fax#:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Date Time Matrix Sample Request ID

5/2/12 14:30 H₂O PW-3

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Turn-Around Time: Need Results May 11

☐ Standard ☒ Rush

Project Name:

Cu Flat

Project #:

Production Well Sampling

Project Manager:

Kate Farmer

Sampler:

CNC

On Ice ☐ Yes ☐ No

Sample Temperature 17.0

Container Type and #

Preservative Type

HEAL No. 1205153

500

125

125

500

500

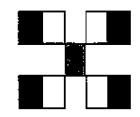
none

H₂SO₄

HNO₃ Filter

HNO₃

NaOH



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F ⁻ , Cl ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See attached list	Air Bubbles (Y or N)
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Remarks: Please add Hardness per Andy of Kaha

Need Results by May 11 5/3

Please email to: Kemmer@the-macresourcegroup.com

Received by: Anna Date 05/03/12 Time 08:35

Received by: Date Time

Relinquished by: [Signature]

Relinquished by: Date Time

Date: 5/2/12 Time: 8:35

Date: Time

Date: Time

Date: Time

Date: Time

Date: Time

Table 9-3
Analytical Parameters and Analysis Methods for Groundwater Samples

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Anions		
Fluoride	EPA Method 300.0	0.1
Chloride	EPA Method 300.0	0.1
Nitrogen, Nitrite (as N)	EPA Method 300.0	0.1
Nitrogen, Nitrate (as N)	EPA Method 300.0	0.1
Sulfate	EPA Method 300.0	0.5
Dissolved Metals		
Aluminum	EPA Method 200.7	0.02
Antimony	EPA Method 200.8	0.005
Arsenic	EPA Method 200.8	0.02
Barium	EPA Method 200.7	0.002
Beryllium	EPA Method 200.7	0.002
Boron	EPA Method 200.7	0.04
Cadmium	EPA Method 200.7	0.002
Calcium	EPA Method 200.7	0.50
Chromium	EPA Method 200.7	0.006
Cobalt	EPA Method 200.7	0.006
Copper	EPA Method 200.7	0.0003
Iron	EPA Method 200.7	0.02
Lead	EPA Method 200.7	0.005
Magnesium	EPA Method 200.7	0.50
Manganese	EPA Method 200.7	0.002
Mercury	EPA Method 7470 CVAA	0.0002
Molybdenum	EPA Method 200.7	0.008
Nickel	EPA Method 200.7	0.01
Potassium	EPA Method 200.7	1.0
Selenium	EPA Method 200.8	0.02
Silicon	EPA Method 200.7	0.08
Silver	EPA Method 200.7	0.005
Sodium	EPA Method 200.7	0.5

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Thallium	EPA Method 200.7	0.01
Titanium	EPA Method 200.7	0.005
Uranium	EPA Method 200.8	0.01
Vanadium	EPA Method 200.7	0.005
Zinc	EPA Method 200.7	0.005
Solids		
Total Suspended Solids (TSS)	SM 2540D	1.0 µg/L
Total Dissolved Solids (TDS)	SM 2540C	10
Alkalinity		
Alkalinity, total (as CaCO ₃)	SM 2320B	20
Carbonate	SM 2320B	20
Bicarbonate	SM 2320B	20
Other		
pH	150.1	12.45
Specific Conductance	120.1	0.01 µS/cm
Cyanide	Kelada-01	0.005

Note: NA = not applicable as sample will not be analyzed for a given parameter.

Appendix F – JSAI Review of Methods and Assumptions for Predicting Open Pit Water Quality

TECHNICAL MEMORANDUM

To: Steve Raugust, New Mexico Copper Corporation
Katie Emmer, New Mexico Copper Corporation

From: Steven T. Finch, Jr., Principal Hydrogeologist-Geochemist, JSAI

Date: December 17, 2014

Subject: Review of methods and assumptions for predicting open pit water quality, Copper Flat Project, New Mexico

New Mexico Copper Corporation (NMCC) is in the process of obtaining a mining permit for the Copper Flat property near Hillsboro, New Mexico. To determine if the proposed Copper Flat open-pit water would meet New Mexico Water Quality Control Commission (NMWQCC) standards for stock and wildlife use, SRK (2013) prepared a report titled *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico*. The SRK (2013) geochemical model incorporated the water model developed by JSAI (2013). Reviewers of the SRK (2013) report have raised questions about the following issues:

1. More detail is needed to validate the assumption of 10-percent average fracture density in the pit walls and the amount of wall rock available for leaching.
2. More detail is needed to demonstrate that the proposed open pit water body will be well mixed, remain oxygenated, and not chemically stratify.
3. The geochemical model needs to be calibrated to chloride concentrations in the existing open pit to make sure the effects of evaporation are accounted for.

This Technical Memorandum consists of three sections for addressing the issues listed above. Sections 1.0 and 2.0 compare the SRK (2013) approach and assumptions to other open pit geochemical investigations, Section 3.0 presents calibration and sensitivity analysis results of the water model (JSAI, 2013) to historical water-quality data from the existing open pit, and Section 4.0 is a summary of findings.

1.0 REVIEW OF OPEN PIT WALL-ROCK STUDIES

1.1 SRK (2013) Copper Flat Model

SRK (2013) used different conceptual models of wall rock available for leaching: one for the existing and one for the future Copper Flat open pit. The difference is due to the blasting technique; the existing pit was mined in 1982 using production blasting similar to the blasting effects analyzed by Siskind and Fumanti (1974), and the proposed pit would be mined using presplit drilling and smooth wall blasting practices. The two conceptual models are summarized below.

1.1.1 Existing Open Pit

For the existing Copper Flat open pit, SRK (2013) estimated 10-percent fracturing in the first 2 ft of open pit wall rock (crushed zone) and 5-percent fracturing for a 3.8-ft-thick transition zone. The limit of oxidation and depth to undisturbed rock was assumed to be about 6 ft behind the pit wall (see fig. 3-9; SRK, 2013). A reactive rim of 0.04 ft around the fractures was assumed for the rock in the pit walls (based on HCT results).

Quintana Minerals only used production blasting to create the existing pit. Production blasting uses large widely-spaced explosive charges that are designed to fragment a large amount of *burden* (the rock that lies between the existing slope face and the blast hole). Production blasting is the most efficient way to remove large rock burdens, but it typically creates radial fractures around the blast hole and back break (fractures that extend into the final slope face), which reduce the strength of the remaining rock mass and increase its susceptibility to slope raveling and rock fall.

1.1.2 Proposed Open Pit

For the future Copper Flat open pit, SRK (2013) estimated fracturing is 10 percent of rock volume for the first 1 ft of open pit wall rock (crushed zone), with no transition zone between the crushed zone and undisturbed zone (see fig. 3-3; SRK, 2013). The open pit wall rock approximate 1 ft from the surface was assumed to be the limit of oxidation and the depth to undisturbed rock (see fig. 3-9, SRK, 2013). A reactive rim of 0.04 ft around the fractures was assumed for the rock in the pit walls. The 1-ft crushed zone and no transition zone represent presplit drilling and smooth wall blasting practices. Presplit holes are blasted before production blasts. Procedure uses small diameter holes at close spacing and lightly loaded with distributed charges. Presplit holes protect the final pit wall cut by producing a fracture plane along the final slope face that fractures from production blasts cannot pass.

1.1.3 Rock Mass Available for Leaching

For both scenarios, water flow is assumed to be mobile in the crushed zone and oxidized rind. The calculation of reactive mass was based on an average rock density of 169 lb/ft³ (2,700 kg/m³).

Chemistry of open pit run-off, for each pit wall material type, is estimated from scaled kinetic test cell (HCT) leachate concentrations. Average HCT solute concentrations are scaled up based on the pit wall water-rock ratio, and computed based on the estimated degree of fracturing and thickness of the reactive rind (SRK, 2013; p. 30).

1.2 Review of Pit Wall Fracturing References

1.2.1 Blasting Effects

Siskind and Fumanti (1974), a key reference used by SRK (2013), studied the fracturing produced in the vicinity of large-diameter blast holes (production blasting) in Lithonia Granite. The purpose of the Siskind and Fumanti (1974) study was to evaluate the use of production blasting to increase permeability for in-situ mining, where the amount of fracturing between holes is intended to be maximized for economic efficiency. A severely fractured zone was found to extend approximately 25 inches (64 cm) from the center of the 6-1/2-inch (16.5 cm) blast holes. A second zone, characterized by a lesser degree of fracturing, extended from 25 to 45 inches (64 to 114 cm). Beyond 45 inches (114 cm), the rock was undamaged. Carroll and Scott (1966) evaluated blasting effects on quartz monzonite and granodiorite (Climax Stock near Mercury, Nevada) and found that production blasting created an altered zone 0 to 8 ft in depth, and blast damage 2 to 4 ft in depth.

Kelsall and others (1984) found that in granite and basalt blasting enhanced permeability by about 10 times near the blast face, but the extent of blast effects were generally limited to <3.3 ft (<1 m), and possibly as little as 1 ft (0.3 m) when using low-charge blast methods.

It is important to note that granite, granodiorite, and quartz monzonite are similar intrusive rocks with similar rock properties. The primary difference is the quartz and feldspar content. The quartz monzonite at Copper Flat is therefore analogous to the granite and granodiorite in the blasting studies cited above. The Siskind and Fumanti (1974) study cites physical properties of the Lithonia Granite. Recent physical properties of the principal rock types of the Copper Flat Ore are presented in a 2013 report prepared by Mine Design Engineering of Kingston, Ontario, Canada for THEMAC Resources (Mine Design, 2013). The Mine Design report (2013) was prepared for the purposes of engineering the future pit walls for geotechnical stability. Table 1 presents a comparison of selected physical properties Lithonia Granite to the Copper Flat Quartz Monzonite and Quartz Monzonite Breccia.

Figure 1 presents the Copper Flat pit outline (Pre-Feasibility Study; PFS) from the 2013 Mine Design report, which shows the major rock types, their distribution, and the locations of the geotechnical drill holes where the samples from Table 1 were collected. From information presented in Mine Design (2013), and other available information, the Definitive Feasibility Study (DFS) pit geometry was developed. For geochemical characterization purposes, the PFS pit is very similar to the DFS Pit (SRK, 2014).

Table 1. Summary of the physical properties of the Lithonia Granite with Copper Flat Quartz Monzonite (QM) and Quartz Monzonite Breccia (QMBX)

	Lithonia Granite (Tested by previous investigators)	Lithonia Granite (Tested by authors at H-100 control hole)	QM (Average Values)	QM (Maximum Values)	QM (Minimum Values)	QMBX (Average Values)	QMBX (Maximum Values)	QMBX (Minimum Values)
Laboratory Analysis								
Specific Gravity	2.63	-	2.68	-	-	2.57	-	-
Density (lb/ft ³)	164	-	167	-	-	160	-	-
Tensile Strength (lb/in ²)	450	-	2,132	3,075	493	1,247	1,697	653
Compressive Strength (lb/in ²)	30,000	28,000	18,490	29,400	11,810	6,614	6,614	6,614
Young's Modulus (lb/in ²)	3,000,000	6,400,000	5,018,000	6,135,000	3,626,000	2,973,000	2,973,000	2,973,000
Poisson's Ratio	0.26	-	0.10	0.09	0.11	0.12	0.12	0.12

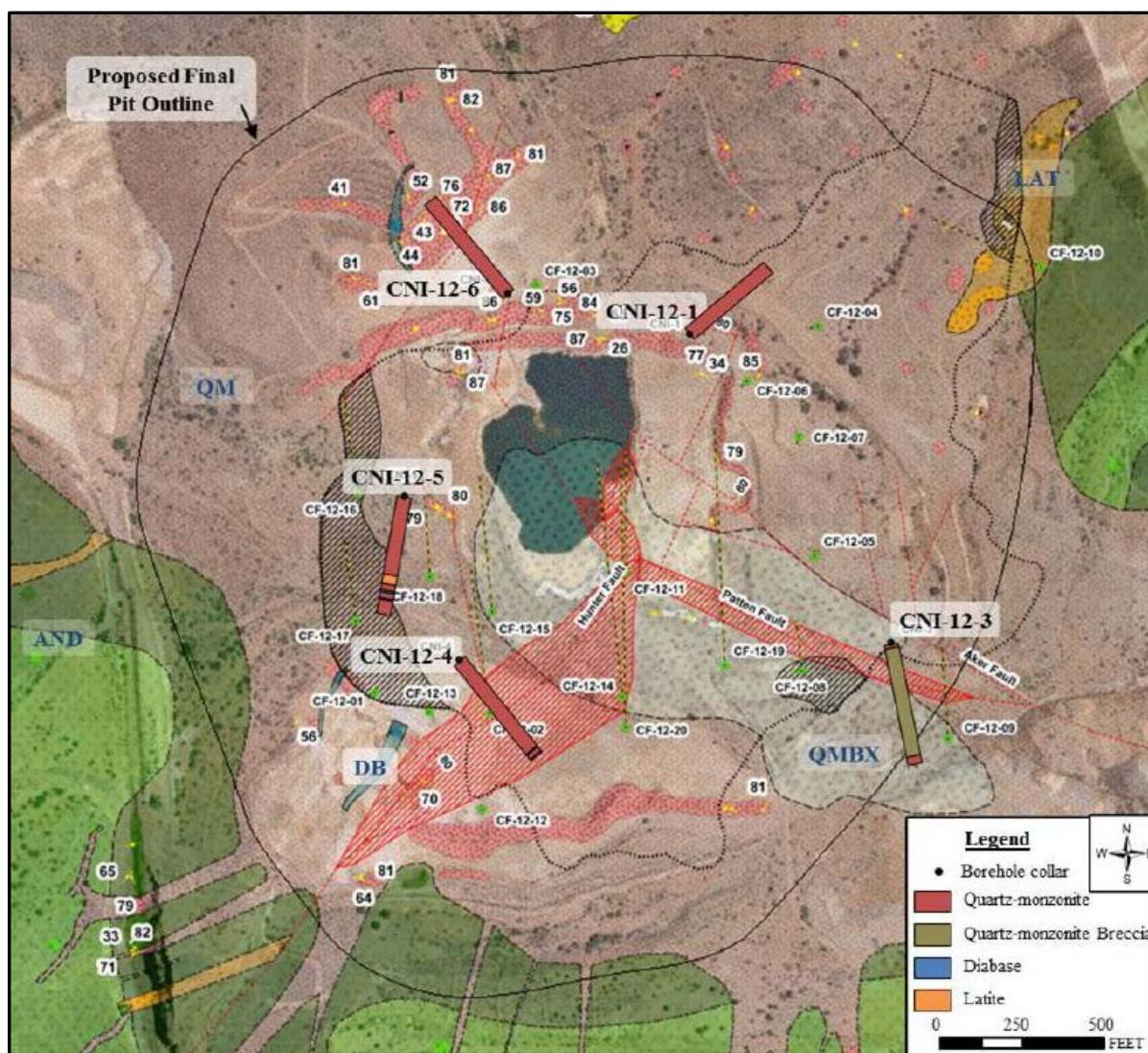


Figure 1. Geotechnical drill hole locations and the Pre-Feasibility Study pit outline (Mine Design, 2013).

1.2.2 Fracture Permeability

Molebatsi and others (2009) noted that many open-pit mines are located in fractured rock systems where water flow paths are complex and difficult to predict. These flow paths are typically controlled by a small subset of fractures that are permeable and interconnected. Most models of flow in fractured rock systems are based on a network of interconnected fractures that are all assumed to be permeable. However, this assumption is rarely observed in natural rocks where a significant number of the fractures within a connected cluster may be impermeable.

Field observations have shown that only a small proportion of fractures contribute to the overall flow, resulting in a complex and heterogeneous flow system. Up to 20 percent of the total number of fractures may contribute to overall flow (Bear et al., 1993). Although fracture connectivity has been used to explain heterogeneous phenomena (de Marsily, 1985), it is likely that additional aspects such as the effect of partial or total closure of individual fractures could further increase flow heterogeneity and tortuosity. Effectively impermeable fractures that (although mappable) will not conduct flow will thus need to be excluded from the conductive fracture cluster.

Not discussed in detail by Molebatsi and others (2009) is the rock type and mineralization of fractures, degree of fracturing, hydraulic conductivity in comparison to fracture density, and specific yield of rock. Obviously, fractured rock with low hydraulic conductivity would have more impermeable fractures than high hydraulic conductivity fractured rock that effectively behaves as a porous medium.

1.3 Other Open-Pit Geochemical Models

1.3.1 URS (2009) Little Rock Mine Post-Closure Pit Lake Model

The Little Rock open pit mine is located near Silver City, New Mexico, and is currently operating. URS (2009) assumed that a mixture of the in-situ field leaching tests and the HCT leachates represents the pit wall runoff. For the most likely case, an equal-weight mixture of the mean in-field leachate results, week-0 HCT results, and HCT results from the first 4-week idle period was used to represent run-on from the exposed pit walls above the pit lake. URS (2009) assumed: 1) rock samples collected within 100 ft of the final pit wall are representative of the exposed wall rock, and 2) a combination of the in-situ field leachates and the HCT leachates mimics weathering of pit wall rock. There is no discussion of blasting effects or increased fracture density on leaching of wall rock.

1.3.2 Tetra Tech (2010) Rosemont Copper Project

The Rosemont Copper project is located in southeastern Arizona. For simulating the initial flushing of blast-fractured pit walls, Tetra Tech (2010) used the first rinse from the HCTs to represent the chemical source terms. The HCT concentrations were generally higher than from the Synthetic Precipitation Leaching Procedure (SPLP) results, which generally correspond to rock that has had more time to weather before contacting water.

The near-surface wall rock of the anticipated ultimate pit shell is expected to be affected by blasting. An initial chemical flushing of the blast-affected pit wall rock was incorporated into the pit lake model. The near-pit wall rock is anticipated to have altered hydraulic properties and increased fracture density as a result of blasting and the extraction of surrounding rock. An increase in the porosity and specific yield (3 to 15 percent) of the near-surface wall rock is expected. The blast-affected wall rock was considered to extend for a distance of six (6) ft behind the ultimate pit wall; there was no basis provided for this assumption.

Where available, the chemical source terms used for flushing of the blast-affected wall rock for each formation were developed using the averaged first-rinse HCT data. Scaling of HCT data was not considered. For formations without HCT data, the concentrations of major cations and anions derived from SPLP tests were multiplied by a factor of three (3) and the trace metals were multiplied by a factor of two (2). Three (3) pore volumes of the blast-affected wall rock were considered in the model for the initial flush, after which standard groundwater inflow chemistry was assumed.

1.3.3 Schafer (2007) Betze Pit Lake Water Quality Predictions

Schafer (2007) estimated the thickness of the weathered zone behind the pit wall by applying the approximate analytical solution (shrinking core model) derived by Davis and others (1986). The shrinking core model considers that particle size and the reactive core shrink simultaneously; therefore, sulfide oxidation rates decrease over time. A porosity of 2 percent was used to represent the highwall, while the rate of interparticle diffusion was determined from historical humidity cell tests. The rate of interparticle diffusion was calculated using the Millington Quirk equation (Jury et al., 1991). For portions of the highwall with relatively low sulfide levels, oxygen can penetrate nearly 16.4 ft (5 m) after 400 years, while the depth of oxygen penetration is closer to 9.8 ft (3 m) after 400 years for higher sulfide zones. The overall average thickness of the oxidized wall rock was estimated to be 9.8 ft (3 m).

1.3.4 Schafer (2010) Dee Pit Lake, Arturo Mine

Schafer (2010) assumes the thickness of a weathered highwall increases with increasing exposure to oxidation. The thickness of the weathered zone was estimated for the Dee pit lakes by applying the approximate analytical solution derived by Davis and others (1986). A porosity of 3 percent was used to represent the highwall. Other data needed to calibrate the Davis and others (1986) equations were determined from pyrite weathering rates observed in humidity cell tests. The rate of interparticle diffusion was calculated using the Millington Quirk equation (Jury et al., 1991). For portions of the highwall with relatively low sulfide levels, oxygen can penetrate over 15 ft (5 m) after 400 years, while the depth of oxygen penetration is closer to 10 ft (3 m) after 400 years for higher sulfide zones (see Fig. 2 below).

1.3.5 Adrian Brown (1997) Cunningham Hill Mine Open Pit

A water model and geochemical model were coupled to predict open pit water quality. The model was calibrated to existing water levels and water-quality data (alkalinity, calcium, and sulfate). Inputs from existing acid wall seepage (AWS) were used to simulate open pit water-rock interactions. The water-quality model was simply a mixing model if open pit water quality remained under-saturated with respect to gypsum.

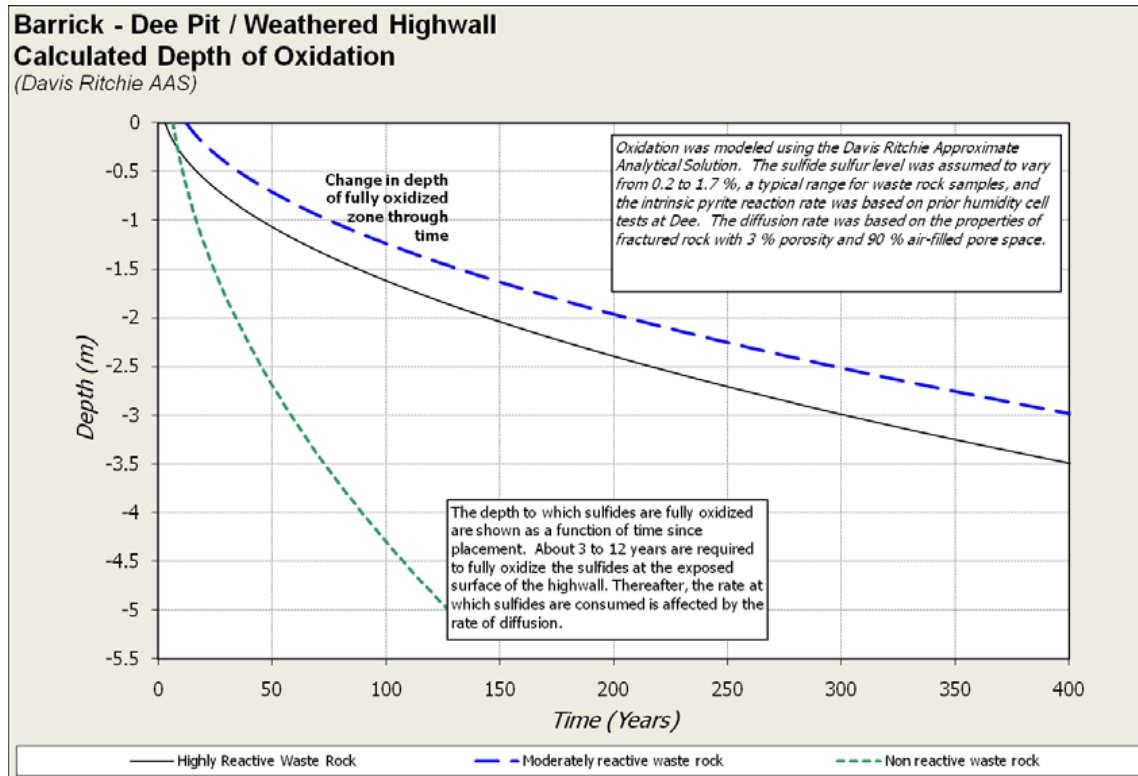


Figure 2. Graph showing depth of oxygen penetration based on the Davis and others (1986) approximate analytical solution (Schafer (2010) Fig. 13).

A groundwater flow and solute transport model of the open pit and surrounding groundwater system was developed by JSAI (1999), and later updated and recalibrated by JSAI (2011). It was demonstrated that the open pit general chemistry is more influenced by water budget components (mixing) than by mineral precipitation reactions.

1.3.6 Kempton and Atkins (2009)

Kempton and Atkins (2009) provide a review of methods for predicting water quality in open pits where sulfide oxidation is a major source term. Shrinking core models have been demonstrated to effectively simulate conditions in uniform materials, such as tailings. However, it is difficult to evaluate accuracy in the more heterogeneous pit benches and walls.

Kempton and Atkins (2009) evaluated a method for direct measurement of sulfide oxidation rates in mine pit benches by sealing a drape-chamber apparatus to the surface. They found that application of this method to benches and waste rock have not found the measured oxidation rates to be meaningfully correlated to sulfide sulfur, presence of surface rubble, moisture conditions, or carbonate content of the underlying rock. This suggests that physical processes such as blast-induced wall rock porosity and depth of pit-wall oxidation were more important than chemical processes. It was noted that fracturing is lower in competent rock, such as granite, and that careful blasting can reduce fracturing. Kempton and Atkins (2009) concluded that reliable comparisons of model-simulated versus observed pit lake water quality are needed to accurately assess model capabilities; this is exactly what SRK (2013) has done.

1.4 Discussion

Geochemical models for predicting open pit water quality are commonly most sensitive to the water budget components and the calculated solute contributions from sulfide oxidation. Open pit water-quality models with the least accurate predictions have under-estimated the potential for sulfide oxidation in wall rock and poorly represented water budget components (Kuipers and others, 2006). One reason for inaccurate water quality predictions is the lack of historical data for model calibration; most projects do not have an existing open pit water body with good time-series data. In contrast, the proposed Copper Flat open pit geochemical and groundwater flow model is calibrated to an existing open pit water body with 30 years of data.

Open pit wall blast damage for granite, granodiorite, and quartz monzonite rocks extends 2 to 4 ft in depth when assessing effects from production type blasting (Carroll and Scott, 1966; Siskind and Fumanti, 1974; and Kelsall and others, 1984).

Kelsall and others (1984) found that production blasting enhances permeability by about 10 times near the blast face. Molebatsi and others (2009) indicate that a small percentage (<20 percent) of the total fractures will contribute to permeability of the system. Typically, fractured rock groundwater systems are assumed to have a specific yield of less than 5 percent, and commonly less than 1 percent. The calibrated Copper Flat groundwater flow model simulates a specific yield of 0.001 (0.1 percent) in the quartz monzonite. If blast fracturing increased the effective porosity (specific yield) by an order of magnitude, the specific yield of the blast zone would be 1 percent. The 5 to 10 percent fracture density used by SRK (2013) can be considered conservative given the properties of the open pit wall rock estimated from the calibrated groundwater flow model.

A summary of the case studies reviewed is presented in Table 2. SRK (2013) is the only open pit water-quality model that includes blasting effects in the pit walls, scaled HCT data, and calibration to existing pit water chemistry.

Table 2. Summary of open pit water-quality prediction studies

reference	open pit	pit wall fracture assumptions	sulfide oxidation model	calibration to existing pit
SRK (2013)	Copper Flat	5 - 10 % fracture density (porosity) with depth based on blasting method; ranging from 1 to 6 ft	based on scaled HCT data	yes
Adrian Brown (1997)	Cunningham Hill	used measured acid wall seepage (AWS) data	used measured AWS data	yes
URS (2009)	Little Rock	none	based on HCT data	no
Tetra Tech (2010)	Rosemont	3 to 6% porosity, 6 ft depth	based on HCT data	no
Schafer (2007)	Betze	2 % porosity with oxidation depth increasing with time; 10 to 16 ft after 400 years	shrinking core model	no
Schafer (2010)	Dee	3 % porosity with oxidation depth increasing with time; 10 to 15 ft after 400 years	shrinking core model	no

2.0 STRATIFICATION OF OPEN PIT WATER BODIES

SRK (2013) concluded the proposed Copper Flat pit will not stratify, and will remain oxygenated. The proposed Copper Flat open pit water body will have a maximum depth of approximately 200 ft with a maximum surface area of about 22 acres.

2.1 Overview

Based on elevation and latitude, the Copper Flat open pit water body is classified as a warm monomitic type lake (Wetzel, 2001; fig 6-7). A warm monomitic lake mixes freely once a year in the winter at or above 4 °C. However, wind effects and water body geometry can have an effect on the degree and frequency of mixing. Baseline data (INTERA, 2012) from the existing pit water body provides evidence that a thermocline develops in the summer and mixing occurs in the winter. A chemocline does not develop, and the water body remains oxygenated (dissolved oxygen = 6 to 9 mg/L) throughout the full water column year-round. The existing open pit water body has an area of about 5 acres, maximum depth of 30 ft, and length of about 460 ft.

The relative depth (RD) of the predicted Copper Flat open pit water body at the maximum pit water stage is approximately 18 percent. RD relates the maximum depth of a lake (Z) to the width (d). Assuming an approximately circular lake, the width is a function of surface area (A) and can be determined from:

$$d = 2(A/\pi)^{0.5}$$

The percent RD is defined as:

$$RD = (Z/d) * 100 \text{ percent}$$

The estimated RD of 18 percent is considerably greater than 5 percent, which typically suggests that the lake is likely to stratify. Such stratification may result in oxidizing conditions in the upper portions of the lake and more chemically reducing (oxygen-deprived) conditions at depth. However, pit lakes that form in arid regions are unlikely to stratify, relative to lakes that form in cooler, wetter climates (Jewell, 2009). A prerequisite for permanent stratification is that precipitation plus runoff is greater than evaporation during the summer months when the water body is potentially undergoing temporary thermal stratification (Jewell, 2009).

While stratification of an open pit water body has implications for water quality at depth, the near-surface waters will remain oxidized. These near-surface waters are considered the most important from an open pit water-quality perspective given the potential ecological risks associated with them. The water quality at depth is less important given the expected terminal nature of the open pit water body.

2.2 Case Studies

Jewell (2009) evaluated six permanently-stratified and eight open pit lakes with seasonal thermocline, and concludes that permanently stratified lakes have vertical density contrast greater than 0.0005 g/cm^3 and a Wedderburn number greater than 1. The Wedderburn number considers thermocline depth, maximum lake length, water density, and wind speed. Jewell (2009) failed to note that most permanently-stratified open pit lakes receive AWS inputs and have acidic water. A summary table of existing open pit water bodies and their characteristics is presented in Table 3.

Table 3. Summary of open pit water bodies and stratification characteristics

open pit	location	effective length (ft)	maximum depth (ft)	relative depth (percent)	thermocline depth (ft)	acidic
permanently stratified						
Brenda	B.C.	2,296	492	21	39	no
Spenceville	California	253	50	20	13	yes
Berkeley	Montana	5,900	426	7	23	yes
Seasonal thermocline and well mixed						
Humbolt	Nevada	944	137	15	8	no
Blackhawk	Utah	492	na	na	33	no
Blowout	Utah	656	230	35	39	no
Colosseum	California	482	157	33	na	no
Cunningham Hill	NM	407	90	22	20	no
Copper Flat (existing)	NM	537	30	6	20	no ¹
Copper Flat (proposed)	NM	1,105	200	18	TBD	no
Yerington	Nevada	5,412	400	13	49	no

¹ there have been temporary acidic conditions where the pit water naturally neutralizes over time

TBD - to be determined

2.3 Discussion

The proposed Copper Flat open pit is expected to have a seasonal thermocline, be well mixed, oxygenated, and not acidic. Relative depth does not appear to govern the conditions for creating a permanently stratified open pit water body; however, acidic water and higher latitude are key conditions for creating permanent stratification.

3.0 COPPER FLAT OPEN PIT WATER MODEL

The Copper Flat open pit and groundwater flow model (water model) developed by JSAI (2013) was calibrated to water levels, water budgets, and hydraulic properties. The water model was used by SRK (2013) in the geochemical model. The JSAI (2013) water model was an interim version that was finalized in 2014, but the pit water balance did not change.

The water model is used here to address calibration to the Copper Flat open pit evaporation. Evaporation accounts for all of the outflow from the open pit water body; however, the water model only simulates average climate conditions. Figures 3 through 5 illustrate the model-simulated effects of evaporation on total dissolved solids, (TDS), sulfate, and chloride concentrations in the open pit when considering mixing without mineral precipitation.

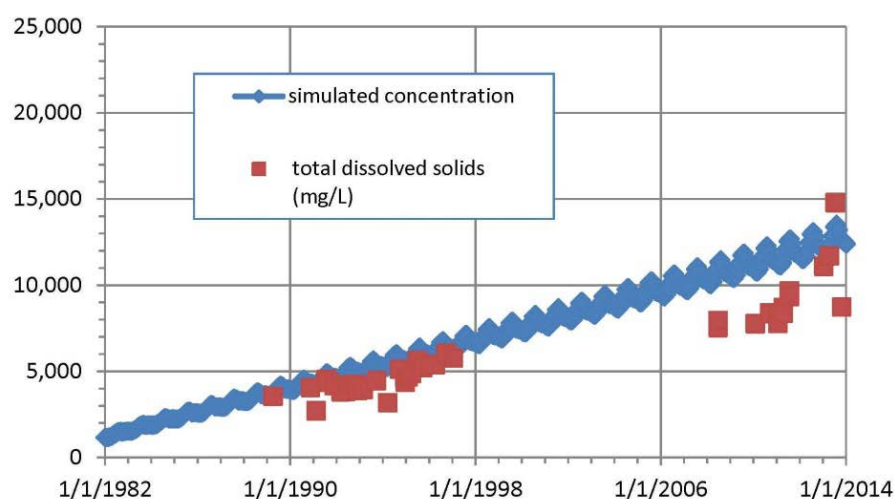


Figure 3. Graph showing water-model simulated and measured TDS concentrations for the Copper Flat open pit water body.

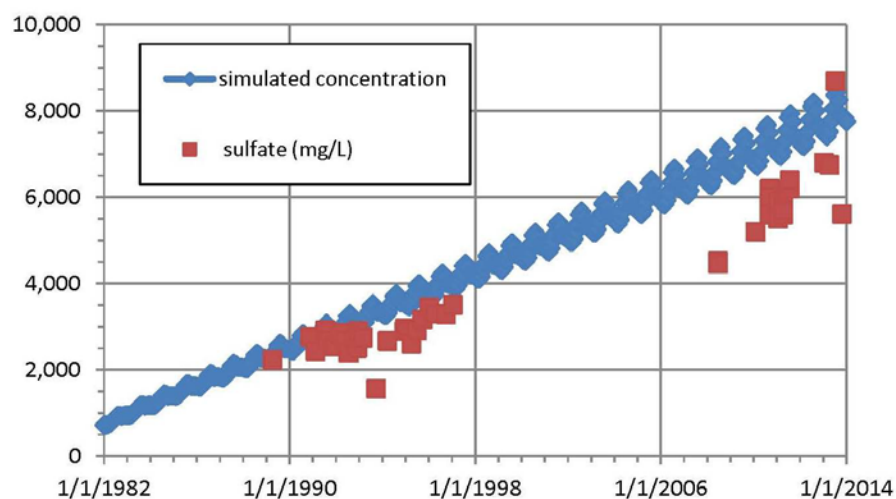


Figure 4. Graph showing water-model simulated and measured sulfate concentrations for the Copper Flat open pit water body.

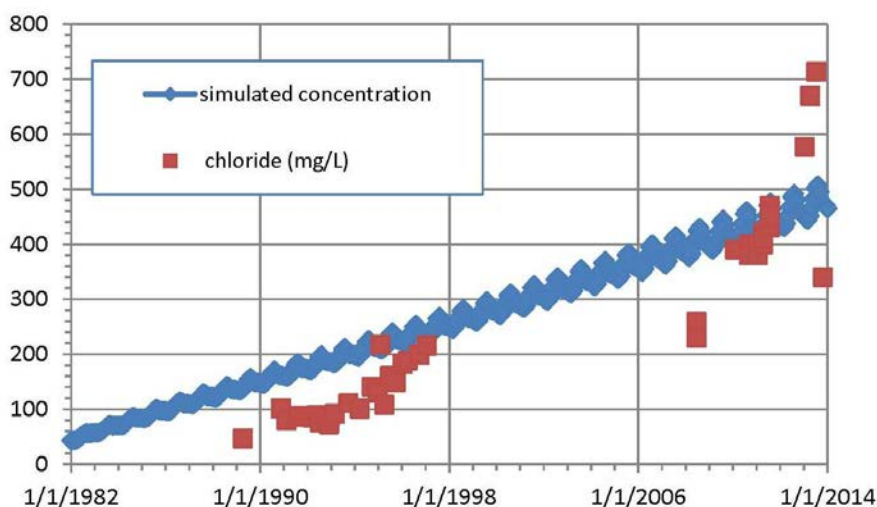


Figure 5. Graph showing water-model simulated and measured chloride concentrations for the Copper Flat open pit water body.

Data collected during 2013 show the evapo-concentration effects of extreme drought with concentrations well above the model-simulated concentrations, but 4th quarter 2013 concentrations were well below the model-simulated concentrations, due to a heavy monsoon period (Figs. 3 through 5). The model appears to reasonably simulate the average climate conditions.

SRK (2013) calibration of the geochemical model to existing pit conditions was performed for the 2011 dataset. The geochemical model considers mixing from the water model and mineral precipitation reactions. The geochemical model calibrates to TDS and sulfate better than the water model with mixing alone, but the water model calibrates better to chloride concentrations than the geochemical model (Table 4). The effects of evaporation are reasonably calibrated in the water model and reflected in the geochemical model.

Table 4. Comparison of water-model and geochemical-model simulated TDS, chloride, and sulfate concentrations to measured concentrations, Copper Flat open pit

constituent	2010-2011 measured range (mg/L)	geochemical- model results (mg/L)	water-model results (mg/L)
total dissolved solids (TDS)	7,770 to 9,410	7,751	11,621
sulfate	5,200 to 6,400	5,152	7,263
chloride	380 to 470	235	436

mg/L - milligrams per liter

4.0 SUMMARY OF FINDINGS

In summary, SRK (2013) assumptions used for reactive wall thickness and fracture density for the existing and proposed future pit are reasonable and supported by detailed studies pertaining to blasting effects on quartz monzonite rocks cited in Section 1.0. SRK (2013) used fracture-density results reflective of production blasting for the existing Quintana pit walls, and fracture density results reflective of low-charge blasting methods for the future open pit. Sensitivity of model results to fracture density and reactive wall thickness is reflected in these two simulations.

Out of the case studies reviewed (Table 2), SRK (2013) is the only open pit water quality model that considers blasting effects in the pit walls, scaled HCT data, and calibration to existing pit water chemistry. Calibration of the water model and geochemical model to existing data strengthens the ability to accurately predict future conditions.

Relative depth does not appear to govern the conditions for creating a permanently stratified open pit water body; however, significant acidic water inputs and higher latitude are key conditions for creating permanent stratification. The proposed Copper Flat open pit is expected to be seasonally stratified (thermocline only), well mixed, oxygenated, and not acidic. Baseline data from profiles in the existing pit at Copper Flat support the conclusion that the proposed pit will be well mixed and oxygenated.

Using the water model to simulate mixing and evapoconcentration effects on chloride, sulfate, and TDS demonstrates that the water model is calibrated to the effects of evaporation. The results in Table 4 compare simulated evapoconcentration with no mineral precipitation (water model only) to simulated evapoconcentration with mineral precipitation (water model and geochemical model). This comparison of model results to historical data is a sensitivity analysis that shows that the water and geochemical models are well calibrated to effects of evaporation.

The SRK (2013) geochemical model is representative of expected conditions at Copper Flat, and presents the best technical approach for predicting water quality at the future Copper Flat open pit.

5.0 REFERENCES

- Adrian Brown, 1997, Effects of the proposed diversion of upper Cunningham Gulch to the Cunningham Hill Mine open pit: consultant's report prepared by Adrian Brown for LAC Minerals (USA) Inc.
- Bear, J., Tsang, C.F., and Marsily, G.D., 1993, Flow and contaminant transport in fractured rocks: Academic Press, San Diego, CA (United States), United States, 560 p.
- Carroll, R.D., and Scott, J.H., 1966, Uphole seismic measurements as an indication of stress relief in granitic rock tunnels: U.S. Geological Survey Professional Paper 550-D, pp. D138-D143.
- Davis, G.B., Doherty, G., and Ritchie, A.I.M., 1986, A model of oxidation in pyritic mine wastes: Part 2: Comparison of numerical and approximate solutions: Appl. Math. Modelling 10:323-329.
- de Marsily, G., 1985, Flow and transport in fractured rocks: connectivity and scale effects, International symposium on the hydrogeology of rocks of low permeability: International Association of Hydrogeologists, Tucson, AZ (USA), pp. 267-277.
- INTERA, 2012, Baseline Data Characterization Report for Copper Flat Mine, Sierra County, New Mexico: consultant's report prepared for New Mexico Copper Corporation, June 2012.
- Jewell, P.W., 2009, Stratification controls of pit mine lakes: Mining Engineering, Feb 2009, Technical Papers, pp. 40-45.
- [JSAI] John Shomaker & Associates, Inc., 1999, Groundwater-flow and solute-transport model for predicting potential effects from the Cunningham Hill Mine open pit, Santa Fe County, New Mexico: consultant's report prepared by John Shomaker & Associates, Inc. for LAC Minerals (USA) LLC.
- [JSAI] John Shomaker & Associates, Inc., 2011, Update and recalibration of groundwater-flow and solute-transport model for predicting potential effects from the Cunningham Hill Mine open pit, Santa Fe County, New Mexico: consultant's report prepared by John Shomaker & Associates, Inc. prepared for LAC Minerals (USA) LLC, 29 p.
- [JSAI] John Shomaker & Associates, Inc., 2013, Model of groundwater flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico: consultant's report prepared by Jones, M.A., Shomaker, J.W., and Finch, S T. for New Mexico Copper Corporation, August 21, 2013
- Jury, W.A., Gardner, W.R., and Gardner, W.H., 1991, Soil physics: John Wiley & Sons, NY.
- Kempton, H., and Atkins, D., 2009, Direct measurement of sulfide mineral oxidation rates and acid rock drainage in wall rock of open pit mines: paper presented at Securing the Future and 8th ICARD, June 23-26, 2009, Skellefteå, Sweden

- Kelsall, P.C., Case, J.B., and Chabannes, C.R., 1984, Evaluation of excavation-induced changes in rock permeability: *Int. J. of Rock Mech. Min. Science & Geomech. Abstr.* 21(3), pp. 123 – 135.
- Kuipers, J.R., Maest, A.S., MacHardy, K.A., and Lawson, G., 2006, Comparison of predicted and actual water quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements: Kuipers & Associates, PO Box 641, Butte, MT USA 59703, <http://www.earthworksaction.org/pubs/ComparisonsReportFinal.pdf>.
- Mine Design, 2013, Feasibility level geotechnical analysis for the open pit mine plans of the Copper Flat copper-molybdenum project, Sierra County, NM: Mine Design Engineering, Kingston, Ontario, Canada.
- Molebatsi, T., Galindo Torres, S., Li, L., Bringemeier, D., and Wang, X., 2009, Effect of fracture permeability on connectivity of fracture networks: Abstracts of the International Mine Water Conference 19th – 23rd October 2009, Proceedings ISBN Number: 978-0-9802623-5-3 Pretoria, South Africa.
- Ouchterlong, F., Olsson, M., and Bavik, S.O., 1999, Bench blasting in granite with holes with axial notches and radial bottom slots: *Fragblast*, Johannesburg, South Africa, South African Institute of Mining and Metallurgy.
- [Schafer] Schafer Limited LLC, 2007, Betze pit lake water quality predictions for Barrick Goldstrike Mining Inc: consultant's report prepared by Schafer Limited LLC for Barrick Goldstrike Mining Inc.
- [Schafer] Schafer Limited LLC, 2010, Dee Arturo pit lake water quality predictions: consultant's report prepared by Schafer Limited LLC for Barrick Exploration & Goldcorp Inc.
- Siskind, D.E., and Fumanti, R.R., 1974, Blast-produced fractures in Lithonia granite: Bureau of Mines Report BM-RI-7901, Twin Cities Mining Research Center.
- SRK, 2013, Predictive geochemical modeling of pit lake water quality at the Copper Flat Project, New Mexico: consultant's report prepared by SRK Consulting, Reno, Nevada for New Mexico Copper Corporation.
- SRK, 2014, Copper Flat PFS and DFS data gap analysis, Technical Memorandum prepared for THEMAC Resources Group, February 13, 2014: SRK Consulting, Cardiff, Wales, United Kingdom.
- Tetra Tech, 2010, Geochemical pit lake prediction model revision 1, Rosemont Copper Project: consultant's report prepared by Tetra Tech for Rosemont Copper.
- URS, 2009, Little Rock Mine post-closure pit lake model: consultant's report prepared by URS Corporation.
- Wetzel, R.G., 2001, *Limnology: Lake and River Ecosystems*, 3rd ed. Academic Press.

Appendix G – JSAI Future Pit Water Balance



TECHNICAL MEMORANDUM

To: Jeff Smith, New Mexico Copper Corporation jsmith@themacresourcesgroup.com

From: Steve Finch, Principal Hydrogeologist-Geochemist
Michael A. Jones, Principal Hydrologist

Date: September 25, 2017

Subject: Post reclamation open pit surface area storm-water runoff calculations, Copper Flat Project, New Mexico Copper Corporation

John Shomaker & Associates, Inc. (JSAI) developed and calibrated a groundwater flow model for the New Mexico Copper Corporation (NMCC) Copper Flat project (JSAI, 2014), which included the proposed Copper Flat open pit. The model was calibrated to historical and current conditions at the Copper Flat Open Pit, and used to predict effects of the proposed mining plan.

The purpose of this technical memorandum is to establish storm-water runoff coefficients and watershed areas representative of the post-mining reclamation of the proposed Copper Flat Open Pit Surface Drainage Area (OPSDA). The post-mining OPSDA and watershed areas discussed in this memo are shown on Figure 1.

After reclamation, there will be three areas with different runoff coefficients inside the OPSDA:

1. Reclaimed watershed area surrounding the open pit;
2. Reclaimed sections of the Open Pit shell; and
3. Un-Reclaimed sections of the Open Pit shell.

Curve numbers for the different areas shown on Figure 1 and listed in Table 1 were derived from the NRCS Part 630 Hydrology National Engineering Handbook. The curve number equation (from NRCS, 2004) and precipitation statistics from the Hillsboro station were used to develop the assigned runoff coefficients presented in Table 1.

Post mining OPSDA reclamation will include re-contouring, placement of cover materials, and revegetation. As described in the NMCC Baseline Data Report, cover materials will resemble sandy to silty loam representative of Hydrologic Soil Group B (NRCS, 2009).

The hydrologic conditions of the reclaimed OPSDA will be classified as poor to fair, resembling desert shrub with less than 40 percent vegetative cover (NRCS, 2004). A Curve Number of 75 is representative of Desert Shrub landscape, Hydrologic Soil Group B, and less than 40 percent vegetative cover (NRCS, 2004; table 9-1).

Table 1. Summary of corresponding Curve Number and assigned Runoff Coefficient for sub-regions within the reclaimed Copper Flat Open Pit Surface Drainage Area

sub-region name	corresponding Curve Number	assigned Runoff Coefficient
Reclaimed OPSDA	75	0.071
Reclaimed Pit Shell	90	0.303
Un-Reclaimed Pit Shell	80	0.126

The reclaimed pit shell includes the haul road and potentially other accessible areas. Reclaimed surface is expected to resemble improved dirt road, and have a corresponding runoff curve number of 90 (NRCS, 2004; table 9-1).

The un-reclaimed pit shell was assigned a runoff curve number of 80, which has been derived from water balance studies for other open pits, such as the Cunningham Hill Mine Reclamation Project (JSAI, 2012).

Precipitation statistics were used with the runoff curve number to calculate the runoff coefficient presented in Table 1. Surface-water runoff is calculated from daily precipitation data, and soil conditions represented by a runoff curve number (NRCS, 2004a). Runoff is estimated using the following equations:

$$I_a = S * 0.2$$

$$S = (1,000/CN) - 10$$

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

where,

I_a equals the initial abstraction including surface storage, interception by vegetation and infiltration prior to runoff, in inches depth over the drainage area.

S equals the potential maximum retention of water by the soil in equivalent inches depth over the drainage area.

CN equals the runoff curve number

P equals the accumulated rainfall in inches depth over the drainage area

Q equals the accumulate volume of runoff in inches depth over the drainage area

The runoff equations (above) are used to calculate the average annual runoff for the period of record from the Hillsboro Station. An example for Curve Number equal 90 is presented in Table 2. The calculated average annual runoff for period of record is divided by the average annual precipitation for period of record (12.5 in./yr) to derive the runoff coefficient.

Table 2. Summary of Hillsboro Station precipitation statistics and calculated runoff used to derive runoff coefficient for reclaimed pit shell area (CN=90)

Range in daily precipitation on events	No. of daily precipitation events within range for period of record*	Average number of precipitation events per year for period of record	average magnitude of precipitation event for range (in.)	P-Ia for CN=90	runoff per average event for range (in.)	average runoff per year (in.)
>3	3	0.031	3.29	3.070	2.86	0.090
2 - 3	21	0.219	2.31	2.090	1.89	0.414
1 - 2	168	1.752	1.32	1.100	0.92	1.606
0.5 - 1	490	5.109	0.7	0.480	0.33	1.682
sum						3.79
Runoff coefficient (CN=90) = (3.79 in.)/(12.5 in) = 0.303						

* Hillsboro station period of record equals 95.9 years or 35,037 days with average annual precipitation of 12.5 inches per year

Attachments

Figure 1. Map showing post-mining watershed areas for the Copper Flat Open Pit Drainage Area.

References

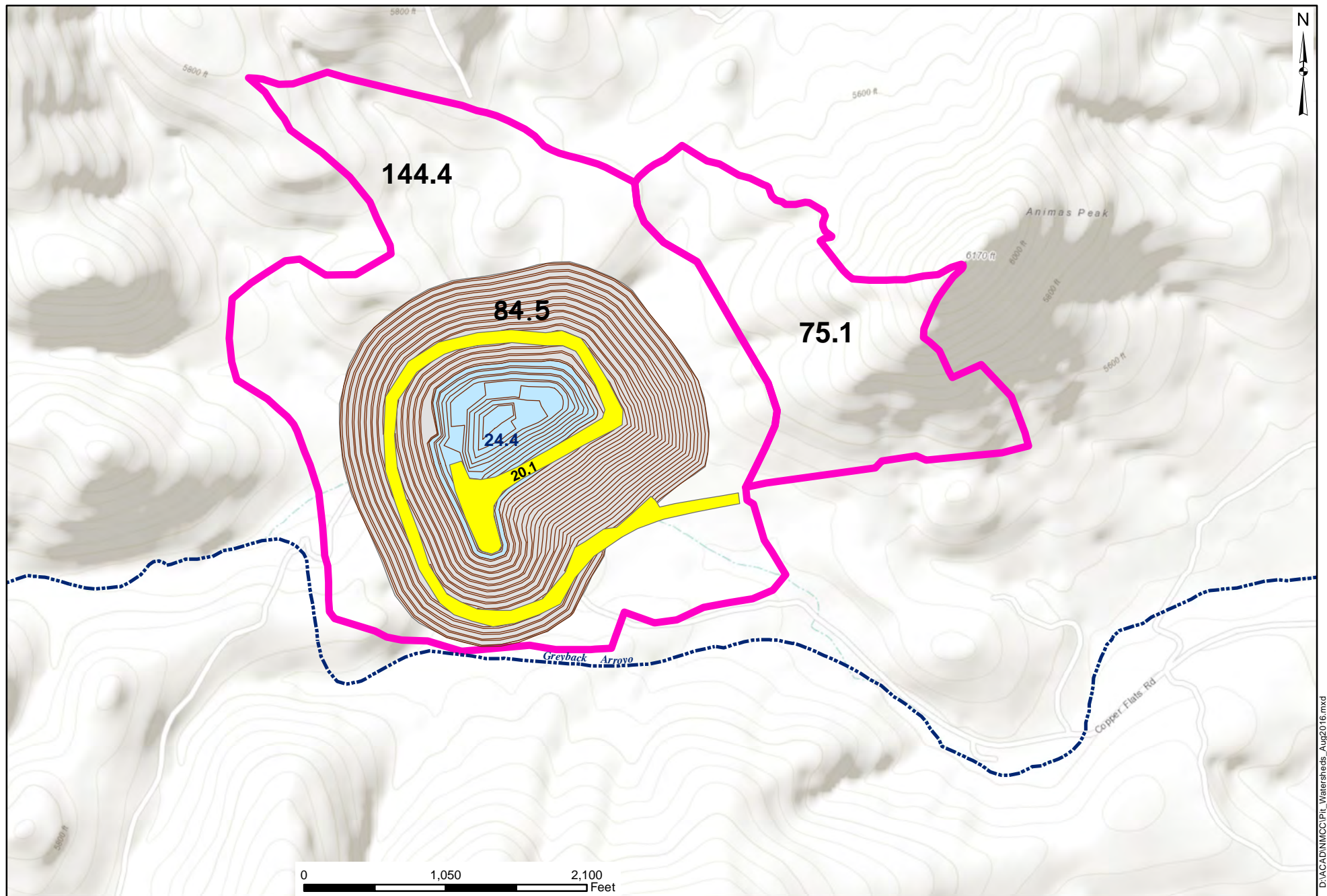
JSAI, 2012, Updated and re-calibrated groundwater flow and solute transport model for predicting potential effects from the Cunningham Hill Mine Open pit, Santa Fe County, New Mexico: Consultant's report prepared for LAC Minerals (USA), LLC.

[JSAI] John Shomaker & Associates, Inc., 2014a, Model of groundwater flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico: consultant's report prepared for New Mexico Copper Corporation, August 15, 2014, 89 p. plus figures and appendices.

[NRCS] National Resources Conservation Service, 2004, Part 630 Hydrology Engineering Handbook, Chapter 9 Hydrologic Soil Groups, July 2004, 13 p.

[NRCS] National Resources Conservation Service, 2004a, Part 630 Hydrology Engineering Handbook, Chapter 10 Estimation of Direct Runoff from Storm Rainfall, July 2004, 79 p.

[NRCS] National Resources Conservation Service, 2009, Part 630 Hydrology Engineering Handbook, Chapter 7 Hydrologic Soil Groups, January 2009, 13 p.



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15June2017

Figure 1. Map showing post-mining watershed areas for the Copper Flat Open Pit Drainage Area.

JSAI Pit Water Balance Summary Statistics

Parameter	Units	Pit Model	
		Un Reclaimed	Reclaimed
Model Date		Jun 2017	Jul 2017
Pit Fill Method		Natural Fill	Rapid Fill
Total Pit Watershed	Acres	314	314
Watershed Ex-Pit	Acres	185	185
Watershed In-Pit	Acres	129	129
Pit Reclaimed Surfaces	Acres	0	46
Pit Unreclaimed Surfaces	Acres	0	83
Pit Lake Surface Area at Static Level	Acres	22	22
Annual Precipitation Rate	Inches	12	12
Annual Evaporation Rate	Inches	50	50
Runoff Coefficient, Ex-Pit Watershed		0.071	0.071
Runoff Coefficient, In-Pit Watershed Reclaimed		0.303	0.303
Runoff Coefficient, In-Pit Watershed Unreclaimed		0.126	0.126
Fresh Water Fill	Acre-Feet	0	2,201
Pit Lake Annual Evaporation @ Static Level	Acre-Feet	91	92
Annual Groundwater Inflow	Acre-Feet	36	36
Annual Stormwater Inflow, Total Watershed	Acre-Feet	54	57
Annual Stormwater Inflow, Ex-Pit	Acre-Feet	14	14
Annual Stormwater Inflow, In-Pit	Acre-Feet	41	43
Pit Lake Volume at Static Level	Acre-Feet	2,278	2,286
Pit Lake Depth at Static Level	Feet	247	248
Pit Lake Surface Elevation at Static Level	Feet AMSL	4,897	4,898

Appendix H – PHREEQC Input Files (electronic)

Appendix H(i) – Existing pit calibration model

Title Copper Flat existing pit lake_v11_mixedHCT_orevswaste_revisedGW

KNOBS

```
-iterations          10000
-convergence_tolerance 1e-007
-tolerance            1e-016
-step_size            100
-pe_step_size         5
```

end

SELECTED_OUTPUT

```
-file                  Copper Flat existing pit
lake_v11_mixedHCT_orevswaste_revisedGW.out
-selected_out          true
-high_precision        true
-simulation            true
-state                true
-solution              true
-distance              false
-time                 false
-step                 false
-ph                   true
-pe                   true
-alkalinity            true
-ionic_strength        false
-water                false
-charge_balance        false
-totals                C(4) Ag Al As B Ba Ca Cd Co Cr
                      Cu F Fe Hg K Mg Mn Mo
                      Na Ni Pb Sb Se U V
                      Zn S(6) Cl N(3) N(5)
-saturation_indices    Gypsum
```

end

SOLUTION 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

```
temp      25
pH         4.93
pe         4
redox      N(-3)/N(5)
units      mg/l
density
Ca         0.209
Mg 0.021
Na 0.075
K          0.030
Cl 0.117
CO2(g)     -3.5
S(6)       0.862 as SO4
N(-3)      0.167 as NH4
N(5)       0.826 as NO3
C(4)       0.1
-water     1 # kg
```

end

SOLUTION 2 Blended groundwater chemistry provided by JSAI (Sept 2015) for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-23B, GWQ11-24B and GWQ11-25B for samples collected between 1996 and 2013

```
temp      25
pH         6.91
units      mg/l
density     1
Alkalinity 316.3 as HCO3
Ag 0.009
Al 0.12
As 0.0023
```



```

B          0.136
Ba 0.089
Ca 336
Cd 0.001
Cl 34
Co 0.01
Cr 0.0066
Cu 0.0037
F          4.60
Fe 1.48
Hg 0.000002
K          4.40
Mg 57.8
Mn 2.47
Mo 0.0119
N(5)       0.956
Na 114.5 charge
Ni 0.0125
Pb 0.0025
S(6)       954 as SO4
Sb 0.0009
Se 0.0022
U          0.0015
V          0.0009
Zn 0.08
-water     1 # kg
end

```

TITLE Average HCT data

```

SOLUTION 3 Average HCT data for biotite breccia - oxide/transitional (waste) (cell
SRK 0872)
temp       25
pH         6.51023
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 6.40158 as HCO3
Al 0.08284
As 0.000945698
Ba 0.010099714
Ca 27.75897
Cd 0.00008
Cl 0.60152
Co 0.000473651
Cu 0.003420825
F          0.33232
Fe 0.10074
K          0.48277
Mg 1.15690
Mn 0.18113
Mo 0.078911429
Na 0.45066 charge
Ni 0.000473651
Pb 0.000118413
S(6)       74.44172 as SO4
Sb 0.000508524
Se 0.000236825
U          0.001336254
V          0.000473651
Zn 0.001346381

-water     1 # kg
END

```

SOLUTION 4 Average HCT data for biotite breccia - oxide/transitional (ore) (cells
SRK 0854)

```

temp      25
pH        5.22250
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 0.47432 as HCO3
Al 0.39035
As 0.001077
Ba 0.01182327
Ca 14.10624
Cd 0.001288213
Cl 0.69324
Co 0.000931397
Cu 18.20993651
F         0.24542
Fe 0.69914
K         1.41745
Mg 1.43887
Mn 0.31515
Na 0.60921 charge
Ni 0.000467556
Pb 0.00342243
S(6)      99.61156 as SO4
Se 0.000233778
U         0.001330413
V         0.000467556
Zn 0.087700952

-water    1 # kg
END

SOLUTION 5 Average HCT data for quartz monzonite - oxide/transitional (waste) (cell
604569)
temp      25
pH        7.84618
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 22.57505 as HCO3
Al 0.03378
As 0.00025
B         0.00497
Ba 0.00050
Ca 9.05082
Cd 0.00005
Cl 1.07023 charge
Cr 0.00025
Cu 0.00248
F         0.74410
Fe 0.00101
K         2.50235
Mg 2.53523
Mn 0.03777
Mo 0.00050
Na 3.22778
Ni 0.00050
Pb 0.00012
S(6)      21.64621 as SO4
Se 0.00025
U         0.00050
V         0.00050
Zn 0.00235

-water    1 # kg
END

```

SOLUTION 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

temp 25
pH 6.90391
pe 4
redox pe
units mg/l
density 1
Alkalinity 9.27214 as HCO3
Al 0.06988
B 0.00472
Ba 0.00751
Ca 25.90591
Cd 0.00005
Cl 0.73852
Co 0.00047
Cu 0.00563
F 0.55791
Fe 0.09893
K 1.07782
Mg 2.23925
Mn 0.46844
Mo 0.00506
Na 0.93238 charge
Ni 0.00047
S(6) 72.31791 as SO4
Sb 0.00297
Se 0.00024
U 0.00047
V 0.00047
Zn 0.00163

-water 1 # kg

END

SOLUTION 7 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.90750
pe 4
redox pe
units mg/l
density 1
Alkalinity 54.86006 as HCO3
Al 0.00593
As 0.00025
B 0.00493
Ba 0.00624
Ca 28.03913
Cl 1.33518
Cu 0.01261
F 1.19649
Fe 0.00074
K 4.43350
Mg 3.99652
Mn 0.04279
Mo 0.00556
Na 2.60160 charge
S(6) 47.33747 as SO4
Se 0.00035
U 0.00169
V 0.00149
Zn 0.00145

-water 1 # kg

END

SOLUTION 8 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604787, 604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.86290
pe 4
redox pe
units mg/l
density 1
Alkalinity 44.99190 as HCO3
Al 0.00457
As 0.00034
B 0.00498
Ba 0.00905
Ca 24.11789
Cl 1.30010
Cu 0.00845
F 1.09342
Fe 0.00069
K 3.75232
Mg 3.96764
Mn 0.07221
Mo 0.00520
Na 2.41114 charge
S(6) 44.45388 as SO4
Se 0.00031
U 0.00331
V 0.00104
Zn 0.00272

-water 1 # kg

END

SOLUTION 9 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

temp 25
pH 5.74453
pe 4
redox pe
units mg/l
density 1
Alkalinity 12.24514 as HCO3
Al 0.03731
B 0.00502
Ba 0.03480
Ca 6.31963
Cd 0.00034
Cl 0.71113
Cu 0.38402
F 0.43171
Fe 0.00394
Hg 0.000016
K 1.83523
Mg 0.97828
Mn 0.01787
Mo 0.00203
Na 1.69417 charge
Pb 0.00164
S(6) 14.90873 as SO4
Se 0.00025
U 0.00462
V 0.00050
Zn 0.01538

-water 1 # kg

END

SOLUTION 10 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

temp 25
pH 7.95176
pe 4
redox pe
units mg/l
density 1
Alkalinity 38.19771 as HCO3
Al 0.00779
B 0.00491
Ba 0.01157
Ca 19.46534
Cl 2.17054
F 0.80723
Fe 0.00087
Hg 0.000005
K 3.84048
Mg 3.50503
Mn 0.12993
Mo 0.00738
Na 3.46033 charge
Pb 0.00012
S(6) 38.71501 as SO4
Se 0.00032
U 0.00124
V 0.00049
Zn 0.00456

-water 1 # kg

END

Title Stage 1 Groundwater mix

MIX 101

2 1
3 0.00000
4 0.00000
5 0.00000
6 0.00000
7 0.65099
8 14.62069
9 0.00000
10 15.47109

Save solution 101

end

REACTION 101

H2O -1
1708.06829 moles ### Addition step. Removes HTC water but solute mass remains
Returns solution volume back to 1L

USE solution 101

SAVE Solution 102

End

Title Precipitate oversaturated phases in groundwater

PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 101

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0

Ba3(AsO4)2 0 0
 Barite 0 0
 Brochantite 0 0
 Brucite 0 0
 Calcite 0 0
 CaMoO4 0 0
 CaSeO3:2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -1.69 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2:8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 102
 SAVE Solution 103 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 101
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 101

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 101
 USE Surface 101
 USE Solution 103
 SAVE Solution 104 #Initial groundwater after Mineral Precipitation and Sorption
 Loss
 END

Title Stage 1 Run-off mix
 Mix 102

1 1
 3 5.350500
 4 7.185961
 5 10.381291
 6 17.683587

```
7      0.089890
8      4.409388
9      1.638334
10     5.989190
```

```
Save solution 105
end
```

```
REACTION 102
  H2O      -1
  2929.58 moles ### Addition step. Removes HTC water but solute mass remains
                      ## Returns solution volume back to 1L
```

```
USE solution 105
SAVE Solution 106
```

```
End
```

```
Title Precipitate oversaturated phases
```

```
PHASES
Fix_pe
  e-=e-
  log_k      0
```

```
EQUILIBRIUM_PHASES 102
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
```

ZnMoO4 0 0

USE solution 106
SAVE Solution 107 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 102
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 102

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 102
USE Surface 102
USE Solution 107
SAVE Solution 108 #Initial Run-off Water After Mineral Precipitation and Sorption
Loss
END

Title Stage 1 Pit lake Mix
Mix 103
104 0.284082
108 0.520573
1 0.195345

Save solution 109
end

Title Stage 1 Pit wall interaction mix calculator
MIX 104
109 1
3 0
4 0
5 0
6 0
7 0.00006
8 0.00142
9 0
10 0.00151

Save solution 110
end

REACTION 104
H2O -1
0.166295301 moles ### Addition step. Removes HTC water but solute mass remains
Returns solution volume back to 1L
USE solution 110
SAVE Solution 111

End

Title Precipitate oversaturated phases
PHASES
Fix_pe
e-=e-
log_k 0

EQUILIBRIUM_PHASES 103
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0


```

Brucite 0 0
Calcite 0 0
CaMoO4 0 0
Carnotite 0 0
CaSeO3:2H2O 0 0
CdMoO4 0 0
Cd(BO2)2 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 111
SAVE Solution 112 Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 103
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 103

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 103
USE Surface 103
USE Solution 112
SAVE Solution 113 #Pit Water After Mineral Precipitation and Sorption Loss
END

Title Evaporate lake water

REACTION 105

H2O -1
27.72 moles ## Removes x m3 water, but solute mass remains the same
## This number must be adjusted manually for each cycle

USE solution 113
Save Solution 114

END

```

Title Return solution back to 1L

Mix 105

114 2.00
save solution 113
end

Title Precipitate oversaturated phases

PHASES

Fix_pe
e-=e-
log_k 0

EQUILIBRIUM_PHASES 104

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
Carnotite 0 0
CaSeO3·2H2O 0 0
CdMoO4 0 0
Cd(BO2)2 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 113

SAVE Solution 114 Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 104

END

Title Determine loss of metals due to HFO sorption and sedimentation

SURFACE 104

```

Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 104
USE Surface 104
USE Solution 114
SAVE Solution 115  #Pit Water After Mineral Precipitation and Sorption Loss
END

REACTION 106

      H2O      -1
      27.72 moles  ## Removes x m3 water, but solute mass remains the same
                   ## This number must be adjusted manually for each cycle

USE solution 115
Save Solution 116

END

Title Return solution back to 1L

Mix 106
      116  2.00
save solution 115
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
e--e-
log_k      0

EQUILIBRIUM_PHASES 105
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
Carnotite 0 0
CaSeO3:2H2O 0 0
CdMoO4 0 0
Cd(BO2)2 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0

```

Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 115
SAVE Solution 116 Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 105
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 105

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 105
USE Surface 105
USE Solution 116
SAVE Solution 117 #Pit Water After Mineral Precipitation and Sorption Loss
END

Title Use solution to allow model output
REACTION 107

H2O -0.0
0 moles

USE solution 117
End

Appendix H(ii) – Un-reclaimed Pit Model with Natural Fill

Title Copper_Flat_natural_refill_July2017_Rev02_unreclaimed

Alt2 pit with 4900 CB, evap=50 in/yr, pptn = 12.5 in/yr; rapid fill (2200 af)

KNOBS

-iterations 10000
-convergence_tolerance 1e-007
-tolerance 1e-016
-step_size 100
-pe_step_size 5

end

SELECTED_OUTPUT

-file Copper_Flat_natural_refill_July2017_Rev02_unreclaimed.xls
-selected_out true
-high_precision true
-simulation true
-state true
-solution true
-distance false
-time false
-step false
-ph true
-pe true
-alkalinity true
-ionic_strength false
-water false
-charge_balance false
-totals C(4) Ag Al As B Ba Ca Cd Co Cr
Cu F Fe Hg K Mg Mn Mo
Na Ni Pb Sb Se U V
Zn S(6) Cl N(3) N(5)
-saturation_indices Gypsum

end

SOLUTION 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

temp 25
pH 4.93
pe 4
redox N(-3)/N(5)
units mg/l
density 1
Ca 0.209
Mg 0.021
Na 0.075
K 0.030
Cl 0.117
S(6) 0.862 as SO4
N(-3) 0.167 as NH4
N(5) 0.826 as NO3
C(4) 0.1
-water 1 # kg

end

SOLUTION 2 JSAI September 2015 average groundwater chemistry for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected between 1996 and 2013

temp 25
pH 7.85
units mg/l
density 1
Alkalinity 408 as HCO3
Ag 0.009
Al 0.029
As 0.0023

```

B          0.136
Ba 0.089
Ca 85.8
Cd 0.0008
Cl 49
Co 0.008
Cr 0.0066
Cu 0.0061
F          2.1
Fe 1.48
Hg 0.000002
K          2.96
Mg 19.3
Mn 0.66
Mo 0.012
Na 119 charge
Ni 0.0125
Pb 0.0025
S(6)      84 as SO4
Sb 0.0009
Se 0.0015
U          0.0015
V          0.0009
Zn 0.03
-water    1 # kg
end

```

TITLE Average HCT data

SOLUTION 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

```

temp      25
pH        7.31754
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F          0.42526
Fe 0.00138
K          0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge
S(6)      20.27695 as SO4
Se 0.00023
V          0.00046

-water    1 # kg
END

```

SOLUTION 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

```

temp      25
pH        5.50170
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 3.43795 as HCO3
Al 0.23659
As 0.00101
Ba 0.01096

```

```

Ca 20.93261
Cd 0.00068
Cl 0.64738
Co 0.00070
Cu 9.10668
F      0.28887
Fe 0.39994
K      0.95011
Mg 1.29789
Mn 0.24814
Mo 0.03969
Na 0.52994 charge
Ni 0.00047
Pb 0.00207
S(6)    87.02664 as SO4
Sb 0.00040
Se 0.00024
U      0.00133
V      0.00047
Zn 0.04452

-water    1 # kg
END

```

SOLUTION 5 Average HCT data for quartz monzonite - oxide/transitional (waste)
(cells SRK 0858 and 604569)

```

temp      25
pH        2.99113
pe        4
redox     pe
units     mg/l
density   1
Al 2.96315
As 0.00036
B      0.01802
Ba 0.00214
Ca 9.58689
Cd 0.00139
Cl 1.26131 charge
Cr 0.00558
Co 0.01515
Cu 2.40842
F      1.98157
Fe 6.75362
K      1.66188
Mg 1.63786
Mn 0.12532
Mo 0.00180
Na 1.97851
Ni 0.00180
Pb 0.00187
S(6)    89.14415 as SO4
Se 0.00023
U      0.00512
V      0.00180
Zn 0.01701

-water    1 # kg
END

```

SOLUTION 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell
SRK 0867)

```

temp      25
pH        6.90391
pe        4
redox     pe

```



```
units      mg/l
density    1
Alkalinity 9.27214 as HCO3
Al 0.06988
B          0.00472
Ba 0.00751
Ca 25.90591
Cd 0.00005
Cl 0.73852
Co 0.00047
Cu 0.00563
F          0.55791
Fe 0.09893
K          1.07782
Mg 2.23925
Mn 0.46844
Mo 0.00506
Na 0.93238 charge
Ni 0.00047
S(6)      72.31791 as SO4
Sb 0.00297
Se 0.00024
U          0.00047
V          0.00047
Zn 0.00163

-water    1 # kg
END
```

SOLUTION 7 Average HCT data for coarse crystalline porphyry - oxide/transitional (waste) (cell CF-11-02, 0-27)

```
temp      25
pH         7.91874
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 30.14978 as HCO3
Al 0.01854
B          0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939
F          0.81954
Fe 0.00248
Hg 0.000010
K          2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049
Na 2.31042 charge
Pb 0.00012
S(6)      12.05373 as SO4
Se 0.00024
U          0.00243
V          0.00049

-water    1 # kg
END
```

SOLUTION 8 Average HCT data for coarse crystalline porphyry - oxide/transitional (ore) (cell CF-11-02, 0-27)

```
temp      25
pH         7.91874
pe         4
redox      pe
```

```
units      mg/l
density    1
Alkalinity 30.14978 as HCO3
Al 0.01854
B          0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939
F          0.81954
Fe 0.00248
Hg 0.000010
K          2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049
Na 2.31042 charge
Pb 0.00012
S(6)      12.05373 as SO4
Se 0.00024
U          0.00243
V          0.00049

-water     1 # kg
END
```

SOLUTION 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

```
temp      25
pH         7.31754
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F          0.42526
Fe 0.00138
K          0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge
S(6)      20.27695 as SO4
Se 0.00023
V          0.00046

-water     1 # kg
END
```

SOLUTION 10 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

```
temp      25
pH         7.90750
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 54.86006 as HCO3
Al 0.00593
As 0.00025
B          0.00493
Ba 0.00624
Ca 28.03913
```

Cl 1.33518
Cu 0.01261
F 1.19649
Fe 0.00074
K 4.43350
Mg 3.99652
Mn 0.04279
Mo 0.00556
Na 2.60160 charge
S(6) 47.33747 as SO4
Sb 0.00012
Se 0.00035
U 0.00169
V 0.00149
Zn 0.00145

-water 1 # kg
END

SOLUTION 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.86290
pe 4
redox pe
units mg/l
density 1
Alkalinity 44.99190 as HCO3
Al 0.00457
As 0.00034
B 0.00498
Ba 0.00905
Ca 24.11789
Cl 1.30010
Cu 0.00845
F 1.09342
Fe 0.00069
K 3.75232
Mg 3.96764
Mn 0.07221
Mo 0.00520
Na 2.41114 charge
S(6) 44.45388 as SO4
Sb 0.00012
Se 0.00031
U 0.00331
V 0.00104
Zn 0.00272

-water 1 # kg
END

SOLUTION 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

temp 25
pH 5.74453
pe 4
redox pe
units mg/l
density 1
Alkalinity 12.24514 as HCO3
Al 0.03731
B 0.00502
Ba 0.03480
Ca 6.31963
Cd 0.00034

Cl 0.71113
Cu 0.38402
F 0.43171
Fe 0.00394
Hg 0.000016
K 1.83523
Mg 0.97828
Mn 0.01787
Mo 0.00203
Na 1.69417 charge
Pb 0.00164
S(6) 14.90873 as SO4
Se 0.00025
U 0.00462
V 0.00050
Zn 0.01538

-water 1 # kg

END

SOLUTION 13 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

temp 25
pH 7.95176
pe 4
redox pe
units mg/l
density 1
Alkalinity 38.19771 as HCO3
Al 0.00779
B 0.00491
Ba 0.01157
Ca 19.46534
Cl 2.17054
F 0.80723
Fe 0.00087
Hg 0.000005
K 3.84048
Mg 3.50503
Mn 0.12993
Mo 0.00738
Na 3.46033 charge
Pb 0.00012
S(6) 38.71501 as SO4
Sb 0.00012
Se 0.00032
U 0.00124
V 0.00049
Zn 0.00456

-water 1 # kg

END

SOLUTION 14 Average HCT data for coarse crystalline porphyry - sulfide (waste) (cell CF-11-02, 367-408)

temp 25
pH 7.74339
pe 4
redox pe
units mg/l
density 1
Alkalinity 19.90015 as HCO3
Al 0.04951
B 0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495

```

F          0.54795
Fe 0.00225
Hg 0.000005
K          1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6)       7.66320 as SO4
Se 0.00024
U          0.00242

-water     1 # kg
END

SOLUTION 15 Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell
CF-11-02, 367-408)
temp       25
pH         7.74339
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 19.90015 as HCO3
Al 0.04951
B          0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495
F          0.54795
Fe 0.00225
Hg 0.000005
K          1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6)       7.66320 as SO4
Se 0.00024
U          0.00242

-water     1 # kg
END

SOLUTION 16 Average water quality for Water Supply Wells PW-1 and PW-3
(representative of water used to rapidly re-fill pit)
temp       25
pH         7.89
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 140 as HCO3
Al 0.0109
As 0.002
B          0.071
Ba 0.013
Ca 26
Cl 25 charge
Cu 0.00033
Cr 0.0025
F          0.78
Fe 0.081
Hg 0.00002
K          2.9

```

```

Mg 2.2
Mn 0.17
Mo 0.002
Na 52
Ni 0.00022
Pb 0.000024
S(6)      18 as SO4
Si 16
U          0.0025
V          0.008
Tl 0.000012
Zn 0.02

-water     1 # kg
END

SOLUTION 17 Average water quality for Background Surface Water SWQ-1
(representative of haul road and watershed run-off)
temp       25
pH          8.3
pe          4
redox       pe
units       mg/l
density     1
Alkalinity  430 as HCO3
B           0.02
Ca 109
Cl 30 charge
F           0.3
K           1.8
Mg 36
Na 107
S(6)       261 as SO4

-water     1 # kg
END

-----
-

Title Stage 1 Groundwater mix
MIX 101
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.015340
11     0.311733
12     0.015648
13     0.369157
14     0
15     0

Save solution 101
end

REACTION 101
H2O      -1
39.5230 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L

USE solution 101
SAVE Solution 102

End

```

Title Precipitate oversaturated phases in groundwater

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 101

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 102

SAVE Solution 103 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 101

END

Title Determine loss of metals due to HFO sorption and sedimentation

SURFACE 101

-equilibrate with solution 1

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200

Hfo_wOH Ferrihydrite equilibrium_phase 0.2

-donnan 1e-008

USE EQUILIBRIUM_PHASES 101

USE Surface 101

```
USE Solution 103
SAVE Solution 104 #Initial Stage 1 groundwater after Mineral Precipitation and
Sorption Loss
END
```

```
Title Stage 1 Run-off mix
```

```
Mix 102
```

```
1      1
3      0.144320
4      0.481830
5      0.446008
6      0.061492
7      0.308570
8      0.002666
9      5.952461
10     11.796791
11     27.416625
12     98.122405
13     87.410481
14     24.534002
15     11.650734
```

```
Save solution 105
end
```

```
REACTION 102
```

```
    H2O      -1
    14894.0 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L
```

```
USE solution 105
SAVE Solution 106
```

```
End
```

```
Title Precipitate oversaturated phases
```

```
PHASES
```

```
Fix_pe
```

```
    e--e-
    log_k      0
```

```
EQUILIBRIUM_PHASES 102
```

```
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
```


MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 106
SAVE Solution 107 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 102
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 102

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 102
USE Surface 102
USE Solution 107
SAVE Solution 108 #Initial Stage 1 Run-off Water After Mineral Precipitation and
Sorption Loss
END

Title Stage 1 Pit lake Mix
Mix 103

104 0.641050
108 0.225985
1 0.010991
17 0.121974
16 0.000000

Save solution 109
end

Title Stage 1 Pit wall interaction mix calculator
MIX 104

109 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0
11 0
12 0
13 0
14 0
15 0

Save solution 110

```

end

REACTION 104
  H2O      -1
  0 moles ### Addition step. Removes HTC water but solute mass remains
                                     ## Returns solution volume back to 1L
USE solution 110
SAVE Solution 111

End
Title Evaporate Stage 1 lake water to produce initial Stage 2 Lake water
REACTION 105
  H2O      -1
  6.43 moles ## Removes x m3 water, but solute mass remains the same
                                     ## This number must be adjusted manually for each cycle
USE solution 111
Save Solution 112

END

Title Return solution back to 1L

Mix 105
  112  1.1309
save solution 113
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e--e-
  log_k      0

EQUILIBRIUM_PHASES 105
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0

```

```

Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
Sb2O3 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 113
SAVE Solution 114 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 105
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 105

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 105
USE Surface 105
USE Solution 114
SAVE Solution 115 #Initial Stage 1 Pit Water After Mineral Precipitation and
Sorption Loss
END

Title Use solution to allow model output
REACTION 106

    H2O      -0.0
    0 moles

USE solution 115
End
Title Stage 2 pit lake GW inflow
Title Stage 2 Groundwater mix
MIX 201
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.043220
11     0.523510
12     0.374727
13     0.631271
14     0
15     0

Save solution 201
end

REACTION 201
    H2O      -1
    87.3170 moles ### Addition step. Removes HTC water but solute mass remains
                    ## Returns solution volume back to 1L

USE solution 201
SAVE Solution 202

```

```

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
    e--e-
    log_k      0

EQUILIBRIUM_PHASES 201
    Ag2Se 0 0
    Alunite 0 0
    Anhydrite 0 0
    Alunite 0 0
    Ba3(AsO4)2 0 0
    Barite 0 0
    Brochantite 0 0
    Brucite 0 0
    Calcite 0 0
    CaMoO4 0 0
    CaSeO3:2H2O 0 0
    Carnotite 0 0
    Cd(BO2)2 0 0
    CdMoO4 0 0
    Chrysotile 0 0
    CO2(g) -1.69 10
    Cr2O3 0 0
    CuMoO4 0 0
    Cu2Se(alpha) 0 0
    Epsomite 0 0
    Ferrihydrite 0 0
    Fluorite 0 0
    Gummite 0 0
    Gypsum 0 0
    HgSe 0 0
    Mg3(PO4)2 0 0
    Mirabilite 0 0
    MnSeO3 0 0
    O2(g) -32 10
    Otavite 0 0
    NiCO3 0 0
    NiMoO4 0 0
    Ni(OH)2 0 0
    Ni3(AsO4)2:8H2O 0 0
    PbMoO4 0 0
    Rutherfordine 0 0
    SbO2 0 0
    Schoepite 0 0
    Sepiolite 0 0
    SiO2(am-ppt) 0 0
    Tyuyamunite 0 0
    U3O8 0 0
    UO3 0 0
    UO2(OH)2(beta) 0 0
    ZnMoO4 0 0

USE solution 202
SAVE Solution 203 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 201
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 201

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite equilibrium_phase 0.2
    -donnan 1e-008

```

```

USE EQUILIBRIUM_PHASES 201
USE Surface 201
USE Solution 203
SAVE Solution 204 #Initial Stage 2 groundwater after Mineral Precipitation and
Sorption Loss
END

```

Title Stage 2 Run-off mix

Mix 202

```

1      1
3      0.047503
4      0.158595
5      0.146804
6      0.020240
7      0.101567
8      0.000877
9      1.959266
10     3.852568
11     8.773920
12     31.924299
13     28.463210
14     8.075423
15     3.834866

```

Save solution 205

end

REACTION 202

H2O -1

4848.95 ### Addition step. Removes HTC water but solute mass remains
 ## Returns solution volume back to 1L

USE solution 205

SAVE Solution 206

End

Title Precipitate oversaturated phases

PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 202

```

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0

```

Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 206
 SAVE Solution 207 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 202
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 202

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 202
 USE Surface 202
 USE Solution 207
 SAVE Solution 208 #Initial Stage 2 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 2 Pit lake Mix
 Mix 203
 204 0.262313
 208 0.253649
 1 0.019922
 17 0.137443
 16 0.000000
 115 0.326673

Save solution 209
 end

Title Stage 2 Pit wall interaction mix calculator
 MIX 204
 209 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0
 9 0
 10 0.000454
 11 0.005503
 12 0.003939
 13 0.006636
 14 0

```

15      0

Save solution 210
end

REACTION 204
    H2O      -1
    0.9436 moles ### Addition step. Removes HTC water but solute mass remains
                    ## Returns solution volume back to 1L
USE solution 210
SAVE Solution 211

End
Title Evaporate Stage 2 lake water to produce initial Stage 2 Lake water
REACTION 205
    H2O      -1
    2.24 moles ## Removes x m3 water, but solute mass remains the same
                    ## This number must be adjusted manually for each cycle
USE solution 211
Save Solution 212

END

Title Return solution back to 1L

Mix 205
    212  1.0419
save solution 213
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
    e--e-
    log_k      0

EQUILIBRIUM_PHASES 205
    Ag2Se 0 0
    Alunite 0 0
    Anhydrite 0 0
    Alunite 0 0
    Ba3(AsO4)2 0 0
    Barite 0 0
    Brochantite 0 0
    Brucite 0 0
    Calcite 0 0
    CaMoO4 0 0
    CaSeO3:2H2O 0 0
    Carnotite 0 0
    Cd(BO2)2 0 0
    CdMoO4 0 0
    Chrysotile 0 0
    CO2(g) -3.5 10
    Cr2O3 0 0
    CuMoO4 0 0
    Cu2Se(alpha) 0 0
    Epsomite 0 0
    Ferrihydrite 0 0
    Fluorite 0 0
    Gummite 0 0
    Gypsum 0 0
    HgSe 0 0
    Mg3(PO4)2 0 0
    Mirabilite 0 0
    MnSeO3 0 0
    O2(g) -32 10
    Otavite 0 0

```

NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 213
SAVE Solution 214 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 205
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 205

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 205
USE Surface 205
USE Solution 214
SAVE Solution 215 #Initial Stage 2 Pit Water After Mineral Precipitation and
Sorption Loss
END

Title Use solution to allow model output
REACTION 206

H2O -0.0
0 moles

USE solution 215
End

Title Stage 3 pit lake GW inflow
Title Stage 3 Groundwater mix
MIX 301

2 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.050588
11 0.760447
12 0.726748
13 0.824755
14 0
15 0

Save solution 301
end

REACTION 301
H2O -1

131.0 moles ### Addition step. Removes HTC water but solute mass remains
Retuns solution volume back to 1L
USE solution 301
SAVE Solution 302

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
e==e-
log_k 0

EQUILIBRIUM_PHASES 301

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 302
SAVE Solution 303 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 301
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 301

```

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 301
USE Surface 301
USE Solution 303
SAVE Solution 304 #Initial Stage 3 groundwater after Mineral Precipitation and
Sorption Loss
END

Title Stage 3 Run-off mix
Mix 302
1      1
3      0.072759
4      0.242916
5      0.224856
6      0.031001
7      0.155567
8      0.001344
9      3.000956
10     5.889154
11     13.062714
12     48.339275
13     43.289040
14     12.368910
15     5.873762

Save solution 305
end

REACTION 302
    H2O      -1
    7357.4 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 305
SAVE Solution 306

End

Title Precipitate oversaturated phases
PHASES
Fix_pe
    e-=e-
    log_k      0

EQUILIBRIUM_PHASES 302
    Ag2Se 0 0
    Alunite 0 0
    Anhydrite 0 0
    Alunite 0 0
    Ba3(AsO4)2 0 0
    Barite 0 0
    Brochantite 0 0
    Brucite 0 0
    Calcite 0 0
    CaMoO4 0 0
    CaSeO3:2H2O 0 0
    Carnotite 0 0
    Cd(BO2)2 0 0
    CdMoO4 0 0
    Chrysotile 0 0
    CO2(g) -3.5 10
    Cr2O3 0 0
    CuMoO4 0 0
    Cu2Se(alpha) 0 0
    Epsomite 0 0

```

```

Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

```

```

USE solution 306
SAVE Solution 307 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 302
END

```

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 302

```

```

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

```

```

USE EQUILIBRIUM_PHASES 302
USE Surface 302
USE Solution 307
SAVE Solution 308 #Initial Stage 3 Run-off Water After Mineral Precipitation and
Sorption Loss
END

```

```

Title Stage 3 Pit lake Mix
Mix 303

```

```

304 0.256178
308 0.161627
1 0.024769
17 0.089062
16 0.000000
215 0.468363
Save solution 309
end

```

```

Title Stage 3 Pit wall interaction mix calculator

```

```

MIX 304
309 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000274

```

```

11      0.004118
12      0.003936
13      0.004467
14      0
15      0

Save solution 310
end

REACTION 304
  H2O      -1
  0.7771 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L
USE solution 310
SAVE Solution 311

End
Title Evaporate Stage 3 lake water to produce initial Stage 2 Lake water
REACTION 305
  H2O      -1
  5.02 moles ## Removes x m3 water, but solute mass remains the same
                ## This number must be adjusted manually for each cycle
USE solution 311
Save Solution 312

END

Title Return solution back to 1L

Mix 305
  312 1.0993
save solution 313
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0

EQUILIBRIUM_PHASES 305
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0

```

Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 313
 SAVE Solution 314 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 305
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 305

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 305
 USE Surface 305
 USE Solution 314
 SAVE Solution 315 #Initial Stage 3 Pit Water After Mineral Precipitation and
 Sorption Loss
 END

Title Use solution to allow model output
 REACTION 306

H2O -0.0
 0 moles

USE solution 315
 End

Title Stage 4 pit lake GW inflow
 Title Stage 4 Groundwater mix
 MIX 401

2 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0
 9 0
 10 0.208742
 11 1.147300
 12 1.140967
 13 1.357108
 14 0
 15 0

```

Save solution 401
end

REACTION 401
  H2O      -1
  213.9351 moles ### Addition step. Removes HTC water but solute mass remains
                      ## Returns solution volume back to 1L

USE solution 401
SAVE Solution 402

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e-=e-
  log_k      0

EQUILIBRIUM_PHASES 401
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0
  Schoepite 0 0
  Sepiolite 0 0
  SiO2(am-ppt) 0 0
  Tyuyamunite 0 0
  U3O8 0 0
  UO3 0 0
  UO2(OH)2(beta) 0 0
  ZnMoO4 0 0

USE solution 402
SAVE Solution 403 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 401
END

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 401

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 401
USE Surface 401
USE Solution 403
SAVE Solution 404 #Initial Stage 4 groundwater after Mineral Precipitation and
Sorption Loss
END

Title Stage 4 Run-off mix

Mix 402

1	1
3	0.074265
4	0.247942
5	0.229509
6	0.031643
7	0.158786
8	0.001372
9	3.063046
10	5.756604
11	12.715171
12	48.677294
13	43.332968
14	12.624826
15	5.995291

Save solution 405
end

REACTION 402

H2O -1
7377.2675 moles ### Addition step. Removes HTC water but solute mass remains
Returns solution volume back to 1L

USE solution 405
SAVE Solution 406

End

Title Precipitate oversaturated phases

PHASES

Fix_pe

e==e-
log_k 0

EQUILIBRIUM_PHASES 402

Ag2Se	0	0
Alunite	0	0
Anhydrite	0	0
Alunite	0	0
Ba3(AsO4)2	0	0
Barite	0	0
Brochantite	0	0
Brucite	0	0
Calcite	0	0
CaMoO4	0	0
CaSeO3:2H2O	0	0
Carnotite	0	0
Cd(BO2)2	0	0
CdMoO4	0	0
Chrysotile	0	0
CO2(g)	-3.5	10

```

Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

```

```

USE solution 406
SAVE Solution 407 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 402
END

```

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 402

```

```

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

```

```

USE EQUILIBRIUM_PHASES 402
USE Surface 402
USE Solution 407
SAVE Solution 408 #Initial Stage 4 Run-off Water After Mineral Precipitation and
Sorption Loss
END

```

```

Title Stage 4 Pit lake Mix
Mix 403
404 0.301948
408 0.187454
1 0.046162
17 0.105486
16 0.000000
315 0.358949
Save solution 409
end

```

```

Title Stage 4 Pit wall interaction mix calculator
MIX 404
409 1
3 0
4 0
5 0
6 0

```



```

7      0
8      0
9      0
10     0.000493
11     0.002707
12     0.002692
13     0.003203
14     0
15     0

```

```

Save solution 410
end

```

```

REACTION 404
  H2O      -1
  0.5550 moles ### Addition step. Removes HTC water but solute mass remains
                  ## Returns solution volume back to 1L

```

```

USE solution 410
SAVE Solution 411

```

```

End
Title Evaporate Stage 4 lake water to produce initial Stage 5 Lake water
REACTION 405

```

```

  H2O      -1
  9.99 moles      ## Removes x m3 water, but solute mass remains the same
                  ## This number must be adjusted manually for each cycle

```

```

USE solution 411
Save Solution 412

```

```

END

```

```

Title Return solution back to 1L

```

```

Mix 405
  412  1.2192
save solution 413
end

```

```

Title Precipitate oversaturated phases

```

```

PHASES
Fix_pe
  e--e-
  log_k      0

```

```

EQUILIBRIUM_PHASES 405

```

```

  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0

```

Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 413
 SAVE Solution 414 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 405
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 405

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 405
 USE Surface 405
 USE Solution 414
 SAVE Solution 415 #Initial Stage 5 Pit Water After Mineral Precipitation and
 Sorption Loss
 END

Title Use solution to allow model output
 REACTION 406

H2O -0.0
 0 moles

USE solution 415
 End

Title Stage 5 pit lake GW inflow
 Title Stage 5 Groundwater mix

MIX 501
 2 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0
 9 0
 10 0.466918
 11 2.019104
 12 1.484217
 13 1.754590

14 0
15 0

Save solution 501
end

REACTION 501
H2O -1
317.7942 moles ### Addition step. Removes HTC water but solute mass remains
Retuns solution volume back to 1L
USE solution 501
SAVE Solution 502

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
e--e-
log_k 0

EQUILIBRIUM_PHASES 501
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 502

```
SAVE Solution 503 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 501
END
```

```
Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 501
```

```
-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008
```

```
USE EQUILIBRIUM_PHASES 501
USE Surface 501
USE Solution 503
SAVE Solution 504 #Initial Stage 5 groundwater after Mineral Precipitation and
Sorption Loss
END
```

```
Title Stage 5 Run-off mix
Mix 502
```

```
1 1
3 0.076369
4 0.254967
5 0.236011
6 0.032539
7 0.163284
8 0.001411
9 3.149826
10 5.507679
11 11.698926
12 49.537500
13 43.960983
14 12.982502
15 6.165145
```

```
Save solution 505
end
```

```
REACTION 502
H2O -1
7424.9 moles ### Addition step. Removes HTC water but solute mass remains
## Returns solution volume back to 1L
```

```
USE solution 505
SAVE Solution 506
```

```
End
```

```
Title Precipitate oversaturated phases
PHASES
```

```
Fix_pe
e=e-
log_k 0
```

```
EQUILIBRIUM_PHASES 502
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
```

CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 506
 SAVE Solution 507 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 502
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 502

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 502
 USE Surface 502
 USE Solution 507
 SAVE Solution 508 #Initial Stage 5 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 5 Pit lake Mix

Mix 503
 504 0.259008
 508 0.159592
 1 0.058214
 17 0.092332
 16 0.000000
 415 0.430854
 Save solution 509
 end

Title Stage 5 Pit wall interaction mix calculator

MIX 504
 509 1
 3 0

```

4      0
5      0
6      0
7      0
8      0
9      0
10     0.000604
11     0.002610
12     0.001919
13     0.002268
14     0
15     0

Save solution 510
end

REACTION 504
      H2O      -1
      0.3885 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 510
SAVE Solution 511

End
Title Evaporate Stage 5 lake water to produce initial Stage 5 Lake water
REACTION 505
      H2O      -1
      12.75 moles ## Removes x m3 water, but solute mass remains the same
                        ## This number must be adjusted manually for each cycle

USE solution 511
Save Solution 512

END

Title Return solution back to 1L

Mix 505
      512  1.2977
save solution 513
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
      e--e-
      log_k      0

EQUILIBRIUM_PHASES 505
      Ag2Se 0 0
      Alunite 0 0
      Anhydrite 0 0
      Alunite 0 0
      Ba3(AsO4)2 0 0
      Barite 0 0
      Brochantite 0 0
      Brucite 0 0
      Calcite 0 0
      CaMoO4 0 0
      CaSeO3:2H2O 0 0
      Carnotite 0 0
      Cd(BO2)2 0 0
      CdMoO4 0 0
      Chrysotile 0 0
      CO2(g) -3.5 10
      Cr2O3 0 0
      CuMoO4 0 0
      Cu2Se(alpha) 0 0

```

Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg₃(PO₄)₂ 0 0
 Mirabilite 0 0
 MnSeO₃ 0 0
 O₂(g) -32 10
 Otavite 0 0
 NiCO₃ 0 0
 NiMoO₄ 0 0
 Ni(OH)₂ 0 0
 Ni₃(AsO₄)₂·8H₂O 0 0
 PbMoO₄ 0 0
 Rutherfordine 0 0
 SbO₂ 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO₂(am-ppt) 0 0
 Tyuyamunite 0 0
 U₃O₈ 0 0
 UO₃ 0 0
 UO₂(OH)₂(beta) 0 0
 ZnMoO₄ 0 0

USE solution 513
 SAVE Solution 514 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 505
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 505

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 505
 USE Surface 505
 USE Solution 514
 SAVE Solution 515 #Stage 5 Pit Water After Mineral Precipitation and Sorption Loss
 END

Title Use solution to allow model output
 REACTION 506

H₂O -0.0
 0 moles

USE solution 515
 End

Title Stage 6 pit lake GW inflow
 Title Stage 6 Groundwater mix

MIX 601
 2 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0
 9 0
 10 1.001983
 11 3.190329

```
12      1.818402
13      2.857901
14      0
15      0
```

```
Save solution 601
end
```

```
REACTION 601
```

```
    H2O      -1
    492.1 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L
```

```
USE solution 601
SAVE Solution 602
```

```
End
```

```
Title Precipitate oversaturated phases in groundwater
```

```
    PHASES
```

```
Fix_pe
```

```
    e--e-
    log_k      0
```

```
EQUILIBRIUM_PHASES 601
```

```
    Ag2Se 0 0
    Alunite 0 0
    Anhydrite 0 0
    Alunite 0 0
    Ba3(AsO4)2 0 0
    Barite 0 0
    Brochantite 0 0
    Brucite 0 0
    Calcite 0 0
    CaMoO4 0 0
    CaSeO3:2H2O 0 0
    Carnotite 0 0
    Cd(BO2)2 0 0
    CdMoO4 0 0
    Chrysotile 0 0
    CO2(g) -1.69 10
    Cr2O3 0 0
    CuMoO4 0 0
    Cu2Se(alpha) 0 0
    Epsomite 0 0
    Ferrihydrite 0 0
    Fluorite 0 0
    Gummite 0 0
    Gypsum 0 0
    HgSe 0 0
    Mg3(PO4)2 0 0
    Mirabilite 0 0
    MnSeO3 0 0
    O2(g) -32 10
    Otavite 0 0
    NiCO3 0 0
    NiMoO4 0 0
    Ni(OH)2 0 0
    Ni3(AsO4)2:8H2O 0 0
    PbMoO4 0 0
    Rutherfordine 0 0
    SbO2 0 0
    Schoepite 0 0
    Sepiolite 0 0
    SiO2(am-ppt) 0 0
    Tyuyamunite 0 0
    U3O8 0 0
    UO3 0 0
    UO2(OH)2(beta) 0 0
    ZnMoO4 0 0
```



```
USE solution 602
SAVE Solution 603 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 601
END
```

```
Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 601
```

```
-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008
```

```
USE EQUILIBRIUM_PHASES 601
USE Surface 601
USE Solution 603
SAVE Solution 604 #Initial Stage 6 groundwater after Mineral Precipitation and
Sorption Loss
END
```

```
Title Stage 6 Run-off mix
Mix 602
```

```
1 1
3 0.079876
4 0.266675
5 0.246848
6 0.034033
7 0.170782
8 0.001475
9 3.294464
10 4.905363
11 10.416871
12 51.341208
13 44.258072
14 13.578652
15 6.448245
```

```
Save solution 605
end
```

```
REACTION 602
H2O -1
7495.7 moles ### Addition step. Removes HTC water but solute mass remains
## Returns solution volume back to 1L
```

```
USE solution 605
SAVE Solution 606
```

```
End
```

```
Title Precipitate oversaturated phases
```

```
PHASES
Fix_pe
e-=e-
log_k 0
```

```
EQUILIBRIUM_PHASES 602
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
```

Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2:8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 606
 SAVE Solution 607 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 602
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 602

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 602
 USE Surface 602
 USE Solution 607
 SAVE Solution 608 #Initial Stage 6 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 6 Pit lake Mix
 Mix 603
 604 0.299845
 608 0.182327
 1 0.100552
 17 0.110341
 16 0.000000
 515 0.306934
 Save solution 609
 end

Title Stage 6 Pit wall interaction mix calculator
 MIX 604

```

609      1
3        0
4        0
5        0
6        0
7        0
8        0
9        0
10       0.000641
11       0.002042
12       0.001164
13       0.001829
14       0
15       0

Save solution 610
end

REACTION 604
      H2O      -1
      0.3885 moles ### Addition step. Removes HTC water but solute mass remains
                      ## Returns solution volume back to 1L

USE solution 610
SAVE Solution 611

End
Title Evaporate Stage 6 lake water to produce initial Stage 7 Lake water
REACTION 605

      H2O      -1
      22.18 moles ## Removes x m3 water, but solute mass remains the same
                      ## This number must be adjusted manually for each cycle

USE solution 611
Save Solution 612

END

Title Return solution back to 1L

Mix 605
      612 1.6646
save solution 613
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e--e-
  log_k      0

EQUILIBRIUM_PHASES 605
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0

```

CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 613
 SAVE Solution 614 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 605
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 605

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 605
 USE Surface 605
 USE Solution 614
 SAVE Solution 615 #Initial Stage 7 Pit Water After Mineral Precipitation and Sorption Loss
 END

Title Use solution to allow model output
 REACTION 606

H2O -0.0
 0 moles

USE solution 615
 End

Title Stage 7 pit lake GW inflow
 Title Stage 7 Groundwater mix
 MIX 701
 2 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0

```

9      0
10     1.314578
11     4.026585
12     2.398069
13     4.581093
14     0
15     0

```

```

Save solution 701
end

```

```

REACTION 701
  H2O      -1
  683.8821 moles ### Addition step. Removes HTC water but solute mass remains
                      ## Returns solution volume back to 1L

```

```

USE solution 701
SAVE Solution 702

```

```

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e--e-
  log_k      0

```

```

EQUILIBRIUM_PHASES 701
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0
  Schoepite 0 0
  Sepiolite 0 0
  SiO2(am-ppt) 0 0
  Tyuyamunite 0 0
  U3O8 0 0

```

```

UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 702
SAVE Solution 703 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 701
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 701

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 701
USE Surface 701
USE Solution 703
SAVE Solution 704 #Initial Stage 7 groundwater after Mineral Precipitation and
Sorption Loss
END

Title Stage 7 Run-off mix
Mix 702
1      1
3      0.083783
4      0.279721
5      0.258924
6      0.035698
7      0.179137
8      0.001548
9      3.455632
10     4.661593
11     9.653870
12     52.954140
13     43.644048
14     14.242928
15     6.763698

Save solution 705
end

REACTION 702
    H2O      -1
    7560.8 moles ### Addition step. Removes HTC water but solute mass remains
                    ## Returns solution volume back to 1L

USE solution 705
SAVE Solution 706

End

Title Precipitate oversaturated phases
PHASES
Fix_pe
e==e-
log_k      0

EQUILIBRIUM_PHASES 702
    Ag2Se 0 0
    Alunite 0 0
    Anhydrite 0 0
    Alunite 0 0
    Ba3(AsO4)2 0 0
    Barite 0 0
    Brochantite 0 0
    Brucite 0 0

```

Calcite 0 0
 CaMoO4 0 0
 CaSeO3:2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2:8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 706
 SAVE Solution 707 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 702
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 702

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 702
 USE Surface 702
 USE Solution 707
 SAVE Solution 708 #Initial Stage 7 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 7 Pit lake Mix
 Mix 703
 704 0.272038
 708 0.161659
 1 0.128474
 17 0.102615
 16 0.000000
 615 0.335213
 Save solution 709
 end

Title Stage 7 Pit wall interaction mix calculator

MIX 704

```
709    1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.000563
11     0.001723
12     0.001026
13     0.001961
14     0
15     0
```

Save solution 710

end

REACTION 704

```
H2O      -1
0.2775 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L
```

USE solution 710

SAVE Solution 711

End

Title Evaporate Stage 7 lake water to produce initial Stage 8 Lake water

REACTION 705

```
H2O      -1
28.39 moles ## Removes x m3 water, but solute mass remains the same
                ## This number must be adjusted manually for each cycle
```

USE solution 711

Save Solution 712

END

Title Return solution back to 1L

Mix 705

```
712    2.0452
save solution 713
end
```

Title Precipitate oversaturated phases

PHASES

Fix_pe

```
e--e-
log_k    0
```

EQUILIBRIUM_PHASES 705

```
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3·2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
```


Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 713

SAVE Solution 714 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 705

END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 705

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 705

USE Surface 705

USE Solution 714

SAVE Solution 715 #Initial Stage 8 Pit Water After Mineral Precipitation and Sorption Loss

END

Title Use solution to allow model output

REACTION 706

H2O -0.0
 0 moles

USE solution 715

End

Title Stage 8 pit lake GW inflow

Title Stage 8 Groundwater mix

MIX 801

2 1
 3 0
 4 0
 5 0
 6 0

```
7      0
8      0
9      0
10     1.376004
11     4.547481
12     2.620220
13     5.186052
14     0
15     0
```

```
Save solution 801
end
```

```
REACTION 801
```

```
  H2O      -1
  762 moles ### Addition step. Removes HTC water but solute mass remains
                  ## Returns solution volume back to 1L
```

```
USE solution 801
SAVE Solution 802
```

```
End
```

```
Title Precipitate oversaturated phases in groundwater
```

```
PHASES
```

```
Fix_pe
  e-=e-
  log_k      0
```

```
EQUILIBRIUM_PHASES 801
```

```
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
```

```

    Tyuyamunite 0 0
    U3O8 0 0
    UO3 0 0
    UO2(OH)2(beta) 0 0
    ZnMoO4 0 0

USE solution 802
SAVE Solution 803 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 801
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 801

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 801
USE Surface 801
USE Solution 803
SAVE Solution 804 #Initial Stage 8 groundwater after Mineral Precipitation and
Sorption Loss
END

Title Stage 8 Run-off mix
Mix 802
1      1
3      0.086330
4      0.288222
5      0.266794
6      0.036783
7      0.184581
8      0.001595
9      3.560661
10     4.716759
11     9.110157
12     54.216485
13     43.996939
14     14.675823
15     6.969271

Save solution 805
end

REACTION 802
    H2O -1
    7665.9190 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 805
SAVE Solution 806

End

Title Precipitate oversaturated phases
PHASES
Fix_pe
    e-=e-
    log_k 0

EQUILIBRIUM_PHASES 802
    Ag2Se 0 0
    Alunite 0 0
    Anhydrite 0 0
    Alunite 0 0
    Ba3(AsO4)2 0 0
    Barite 0 0

```

Brochantite 0 0
 Brucite 0 0
 Calcite 0 0
 CaMoO4 0 0
 CaSeO3:2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2:8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 806
 SAVE Solution 807 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 802
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 802

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 802
 USE Surface 802
 USE Solution 807
 SAVE Solution 808 #Initial Stage 8 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 8 Pit lake Mix
 Mix 803
 804 0.231029
 808 0.134366
 1 0.127962
 17 0.087888
 16 0.000000
 715 0.418756

Save solution 809
end

Title Stage 8 Pit wall interaction mix calculator
MIX 804

809	1
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0.000499
11	0.001649
12	0.000950
13	0.001880
14	0
15	0

Save solution 810
end

REACTION 804

H2O	-1	
0.3330 moles	###	Addition step. Removes HTC water but solute mass remains
	##	Retuns solution volume back to 1L

USE solution 810
SAVE Solution 811

End

Title Evaporate Stage 8 lake water to produce initial Stage 9 Lake water
REACTION 805

H2O	-1	
28.32 moles	##	Removes x m3 water, but solute mass remains the same
	##	This number must be adjusted manually for each cycle

USE solution 811
Save Solution 812

END

Title Return solution back to 1L

Mix 805
812 2.0400
save solution 813
end

Title Precipitate oversaturated phases

PHASES
Fix_pe
e-=e-
log_k 0

EQUILIBRIUM_PHASES 805

Ag2Se	0	0
Alunite	0	0
Anhydrite	0	0
Alunite	0	0
Ba3(AsO4)2	0	0
Barite	0	0
Brochantite	0	0
Brucite	0	0
Calcite	0	0
CaMoO4	0	0
CaSeO3:2H2O	0	0
Carnotite	0	0

Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 813
 SAVE Solution 814 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 805
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 805

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 805
 USE Surface 805
 USE Solution 814
 SAVE Solution 815 #Initial Stage 9 Pit Water After Mineral Precipitation and Sorption Loss
 END

Title Use solution to allow model output
 REACTION 806

H2O -0.0
 0 moles

USE solution 815
 End

Title Stage 9 pit lake GW inflow
 Title Stage 9 Groundwater mix
 MIX 901
 2 1
 3 0

```

4      0
5      0
6      0
7      0
8      0
9      0
10     1.384756
11     4.935977
12     2.764387
13     5.736297
14     0
15     0

```

```

Save solution 901
end

```

```

REACTION 901
      H2O      -1
      822.6568 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

```

```

USE solution 901
SAVE Solution 902

```

```

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e--e-
  log_k      0

```

```

EQUILIBRIUM_PHASES 901
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0

```

```

Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 902
SAVE Solution 903 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 901
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 901

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 901
USE Surface 901
USE Solution 903
SAVE Solution 904 #Initial Stage 9 groundwater after Mineral Precipitation and
Sorption Loss
END

Title Stage 9 Run-off mix
Mix 902
1      1
3      0.087465
4      0.292013
5      0.270303
6      0.037267
7      0.187009
8      0.001616
9      3.607493
10     4.774572
11     8.592495
12     54.700431
13     43.662729
14     14.868848
15     7.060935

Save solution 905
end

REACTION 902
H2O      -1
7667.9190 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L

USE solution 905
SAVE Solution 906

End

Title Precipitate oversaturated phases
PHASES
Fix_pe
    e==e-
    log_k      0

EQUILIBRIUM_PHASES 902
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0

```


Alunite 0 0
 Ba3(AsO4)2 0 0
 Barite 0 0
 Brochantite 0 0
 Brucite 0 0
 Calcite 0 0
 CaMoO4 0 0
 CaSeO3·2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 906
 SAVE Solution 907 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 902
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 902

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 902
 USE Surface 902
 USE Solution 907
 SAVE Solution 908 #Initial Stage 9 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 9 Pit lake Mix
 Mix 903
 904 0.213684
 908 0.123227
 1 0.125946

```
17      0.081658
16      0.000000
815     0.455485
Save solution 909
end
```

```
Title Stage 9 Pit wall interaction mix calculator
MIX 904
```

```
909     1
3        0
4        0
5        0
6        0
7        0
8        0
9        0
10       0.000457
11       0.001629
12       0.000912
13       0.001893
14        0
15        0
```

```
Save solution 910
end
```

```
REACTION 904
```

```
      H2O      -1
0.2775 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L
```

```
USE solution 910
SAVE Solution 911
```

```
End
```

```
Title Evaporate Stage 9 lake water
```

```
REACTION 905
```

```
      H2O      -1
27.88 moles    ## Removes x m3 water, but solute mass remains the same
                ## This number must be adjusted manually for each cycle
```

```
USE solution 911
Save Solution 912
```

```
END
```

```
Title Return solution back to 1L
```

```
Mix 905
```

```
      912  2.0074
save solution 913
end
```

```
Title Precipitate oversaturated phases
```

```
PHASES
Fix_pe
e--e-
log_k      0
```

```
EQUILIBRIUM_PHASES 905
```

```
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
```

Calcite 0 0
 CaMoO4 0 0
 CaSeO3:2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2:8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 913
 SAVE Solution 914 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 905
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 905

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 905
 USE Surface 905
 USE Solution 914
 SAVE Solution 915 #Final Stage 9 Pit Water After Mineral Precipitation and Sorption Loss
 END

Title Use solution to allow model output
 REACTION 906

H2O -0.0
 0 moles

USE solution 915
 End

Appendix H(iii) – Reclaimed Pit Model with Rapid Fill

Title Copper_Flat_rapid_refill_July2017_Rev03_reclaimed

Alt2 pit with 4900 CB, evap=50 in/yr, pptn = 12.5 in/yr; rapid fill (2200 af)

KNOBS

```
-iterations          10000
-convergence_tolerance 1e-007
-tolerance            1e-016
-step_size            100
-pe_step_size         5
```

end

SELECTED_OUTPUT

```
-file                  Copper_Flat_rapid_refill_July2017_Rev03_reclaimed.xls
-selected_out          true
-high_precision        true
-simulation            true
-state                true
-solution              true
-distance              false
-time                 false
-step                 false
-ph                   true
-pe                   true
-alkalinity            true
-ionic_strength        false
-water                false
-charge_balance        false
-totals                C(4)  Ag Al  As  B  Ba Ca  Cd  Co  Cr
                       Cu  F  Fe  Hg  K  Mg  Mn  Mo
                       Na  Ni  Pb  Sb  Se  U  V
                       Zn  S(6) Cl  N(3) N(5)
-saturation_indices    Gypsum
```

end

SOLUTION 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

```
temp      25
pH         4.93
pe         4
redox      N(-3)/N(5)
units      mg/l
density    1
Ca         0.209
Mg 0.021
Na 0.075
K          0.030
Cl 0.117
CO2(g)     -3.5
S(6)       0.862 as SO4
N(-3)      0.167 as NH4
N(5)       0.826 as NO3
C(4)       0.1
-water     1 # kg
```

end

SOLUTION 2 JSAI September 2015 average groundwater chemistry for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected between 1996 and 2013

```
temp      25
pH         7.85
units      mg/l
density    1
Alkalinity 408 as HCO3
Ag 0.009
Al 0.029
As 0.0023
```

B 0.136
Ba 0.089
Ca 85.8
Cd 0.0008
Cl 49
Co 0.008
Cr 0.0066
Cu 0.0061
F 2.1
Fe 1.48
Hg 0.000002
K 2.96
Mg 19.3
Mn 0.66
Mo 0.012
Na 119 charge
Ni 0.0125
Pb 0.0025
S(6) 84 as SO4
Sb 0.0009
Se 0.0015
U 0.0015
V 0.0009
Zn 0.03
-water 1 # kg
end

TITLE Average HCT data

SOLUTION 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

temp 25
pH 7.31754
pe 4
redox pe
units mg/l
density 1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F 0.42526
Fe 0.00138
K 0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge
S(6) 20.27695 as SO4
Se 0.00023
V 0.00046
-water 1 # kg
END

SOLUTION 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

temp 25
pH 5.50170
pe 4
redox pe
units mg/l
density 1
Alkalinity 3.43795 as HCO3
Al 0.23659
As 0.00101
Ba 0.01096

```

Ca 20.93261
Cd 0.00068
Cl 0.64738
Co 0.00070
Cu 9.10668
F      0.28887
Fe 0.39994
K      0.95011
Mg 1.29789
Mn 0.24814
Mo 0.03969
Na 0.52994 charge
Ni 0.00047
Pb 0.00207
S(6)    87.02664 as SO4
Sb 0.00040
Se 0.00024
U      0.00133
V      0.00047
Zn 0.04452

-water    1 # kg
END

```

SOLUTION 5 Average HCT data for quartz monzonite - oxide/transitional (waste)
(cells SRK 0858 and 604569)

```

temp      25
pH        2.99113
pe        4
redox     pe
units     mg/l
density   1
Al 2.96315
As 0.00036
B      0.01802
Ba 0.00214
Ca 9.58689
Cd 0.00139
Cl 1.26131 charge
Cr 0.00558
Co 0.01515
Cu 2.40842
F      1.98157
Fe 6.75362
K      1.66188
Mg 1.63786
Mn 0.12532
Mo 0.00180
Na 1.97851
Ni 0.00180
Pb 0.00187
S(6)    89.14415 as SO4
Se 0.00023
U      0.00512
V      0.00180
Zn 0.01701

-water    1 # kg
END

```

SOLUTION 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell
SRK 0867)

```

temp      25
pH        6.90391
pe        4
redox     pe

```

```
units      mg/l
density    1
Alkalinity 9.27214 as HCO3
Al 0.06988
B          0.00472
Ba 0.00751
Ca 25.90591
Cd 0.00005
Cl 0.73852
Co 0.00047
Cu 0.00563
F          0.55791
Fe 0.09893
K          1.07782
Mg 2.23925
Mn 0.46844
Mo 0.00506
Na 0.93238 charge
Ni 0.00047
S(6)      72.31791 as SO4
Sb 0.00297
Se 0.00024
U          0.00047
V          0.00047
Zn 0.00163

-water    1 # kg
END
```

SOLUTION 7 Average HCT data for coarse crystalline porphyry - oxide/transitional (waste) (cell CF-11-02, 0-27)

```
temp      25
pH        7.91874
pe        4
redox     pe
units     mg/l
density    1
Alkalinity 30.14978 as HCO3
Al 0.01854
B          0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939
F          0.81954
Fe 0.00248
Hg 0.000010
K          2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049
Na 2.31042 charge
Pb 0.00012
S(6)      12.05373 as SO4
Se 0.00024
U          0.00243
V          0.00049

-water    1 # kg
END
```

SOLUTION 8 Average HCT data for coarse crystalline porphyry - oxide/transitional (ore) (cell CF-11-02, 0-27)

```
temp      25
pH        7.91874
pe        4
redox     pe
```



```

units      mg/l
density    1
Alkalinity 30.14978 as HCO3
Al 0.01854
B          0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939
F          0.81954
Fe 0.00248
Hg 0.000010
K          2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049
Na 2.31042 charge
Pb 0.00012
S(6)      12.05373 as SO4
Se 0.00024
U          0.00243
V          0.00049

-water    1 # kg
END

```

SOLUTION 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

```

temp      25
pH         7.31754
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F          0.42526
Fe 0.00138
K          0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge
S(6)      20.27695 as SO4
Se 0.00023
V          0.00046

-water    1 # kg
END

```

SOLUTION 10 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

```

temp      25
pH         7.90750
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 54.86006 as HCO3
Al 0.00593
As 0.00025
B          0.00493
Ba 0.00624
Ca 28.03913

```

Cl 1.33518
Cu 0.01261
F 1.19649
Fe 0.00074
K 4.43350
Mg 3.99652
Mn 0.04279
Mo 0.00556
Na 2.60160 charge
S(6) 47.33747 as SO4
Sb 0.00012
Se 0.00035
U 0.00169
V 0.00149
Zn 0.00145

-water 1 # kg
END

SOLUTION 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.86290
pe 4
redox pe
units mg/l
density 1
Alkalinity 44.99190 as HCO3
Al 0.00457
As 0.00034
B 0.00498
Ba 0.00905
Ca 24.11789
Cl 1.30010
Cu 0.00845
F 1.09342
Fe 0.00069
K 3.75232
Mg 3.96764
Mn 0.07221
Mo 0.00520
Na 2.41114 charge
S(6) 44.45388 as SO4
Sb 0.00012
Se 0.00031
U 0.00331
V 0.00104
Zn 0.00272

-water 1 # kg
END

SOLUTION 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

temp 25
pH 5.74453
pe 4
redox pe
units mg/l
density 1
Alkalinity 12.24514 as HCO3
Al 0.03731
B 0.00502
Ba 0.03480
Ca 6.31963
Cd 0.00034

Cl 0.71113
Cu 0.38402
F 0.43171
Fe 0.00394
Hg 0.000016
K 1.83523
Mg 0.97828
Mn 0.01787
Mo 0.00203
Na 1.69417 charge
Pb 0.00164
S(6) 14.90873 as SO4
Se 0.00025
U 0.00462
V 0.00050
Zn 0.01538

-water 1 # kg

END

SOLUTION 13 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

temp 25
pH 7.95176
pe 4
redox pe
units mg/l
density 1
Alkalinity 38.19771 as HCO3
Al 0.00779
B 0.00491
Ba 0.01157
Ca 19.46534
Cl 2.17054
F 0.80723
Fe 0.00087
Hg 0.000005
K 3.84048
Mg 3.50503
Mn 0.12993
Mo 0.00738
Na 3.46033 charge
Pb 0.00012
S(6) 38.71501 as SO4
Sb 0.00012
Se 0.00032
U 0.00124
V 0.00049
Zn 0.00456

-water 1 # kg

END

SOLUTION 14 Average HCT data for coarse crystalline porphyry - sulfide (waste) (cell CF-11-02, 367-408)

temp 25
pH 7.74339
pe 4
redox pe
units mg/l
density 1
Alkalinity 19.90015 as HCO3
Al 0.04951
B 0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495

```

F          0.54795
Fe 0.00225
Hg 0.000005
K          1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6)       7.66320 as SO4
Se 0.00024
U          0.00242

-water     1 # kg
END

SOLUTION 15 Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell
CF-11-02, 367-408)
temp       25
pH         7.74339
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 19.90015 as HCO3
Al 0.04951
B          0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495
F          0.54795
Fe 0.00225
Hg 0.000005
K          1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6)       7.66320 as SO4
Se 0.00024
U          0.00242

-water     1 # kg
END

SOLUTION 16 Average water quality for Water Supply Wells PW-1 and PW-3
(representative of water used to rapidly re-fill pit)
temp       25
pH         8.03
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 135 as HCO3
As 0.0054
B          0.08
Ba 0.0094
Ca 28
Cl 41 charge
Cr 0.006
F          1.45
Fe 0.053
K          3.35
Mg 2.05
Mn 0.0025
Na 69.5

```

```
S(6)      27 as SO4
Si 19
U         0.0023
Zn 0.023
```

```
-water    1 # kg
END
```

SOLUTION 17 Average water quality for Background Surface Water SWQ-1
(representative of haul road and watershed run-off)

```
temp      25
pH         8.3
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 430 as HCO3
B          0.02
Ca 109
Cl 30 charge
F          0.3
K          1.8
Mg 36
Na 107
S(6)      261 as SO4
```

```
-water    1 # kg
END
```

-

Title Stage 1 Groundwater mix

```
MIX 101
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.350634
11     2.834068
12     2.067624
13     4.849646
14     0
15     0
```

```
Save solution 101
end
```

```
REACTION 101
H2O      -1
560.6500 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L
```

```
USE solution 101
SAVE Solution 102
```

```
End
Title Precipitate oversaturated phases in groundwater
```

```
PHASES
Fix_pe
e-=e-
log_k      0
```

```
EQUILIBRIUM_PHASES 101
Ag2Se 0 0
Alunite 0 0
```

Anhydrite 0 0
 Alunite 0 0
 Ba3(AsO4)2 0 0
 Barite 0 0
 Brochantite 0 0
 Brucite 0 0
 Calcite 0 0
 CaMoO4 0 0
 CaSeO3:2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -1.69 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2:8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 102
 SAVE Solution 103 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 101
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 101

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 101
 USE Surface 101
 USE Solution 103
 SAVE Solution 104 #Initial Stage 1 groundwater after Mineral Precipitation and
 Sorption Loss
 END

Title Stage 1 Run-off mix
 Mix 102
 1 1
 3 0.003657

```

4      0.038411
5      0.020843
6      0.000000
7      0.069884
8      0.000000
9      10.521681
10     16.471143
11     31.861298
12     170.832300
13     132.050553
14     52.801148
15     26.730607

```

```

Save solution 105
end

```

```

REACTION 102
      H2O      -1
      24500.7 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

```

```

USE solution 105
SAVE Solution 106

```

```

End

```

```

Title Precipitate oversaturated phases

```

```

PHASES
Fix_pe
  e-=e-
  log_k      0

```

```

EQUILIBRIUM_PHASES 102
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0

```

```

SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 106
SAVE Solution 107 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 102
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 102

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 102
USE Surface 102
USE Solution 107
SAVE Solution 108 #Initial Stage 1 Run-off Water After Mineral Precipitation and
Sorption Loss
END

Title Stage 1 Pit lake Mix
Mix 103
104 0.005764
108 0.001108
1 0.001817
17 0.002835
16 0.988476

Save solution 109
end

Title Stage 1 Pit wall interaction mix calculator
MIX 104
109 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0
11 0
12 0
13 0
14 0
15 0

Save solution 110
end

REACTION 104
H2O -1
0 moles ### Addition step. Removes HTC water but solute mass remains
### Returns solution volume back to 1L

USE solution 110
SAVE Solution 111

```



```

End
Title Evaporate Stage 1 lake water to produce initial Stage 2 Lake water
REACTION 105

      H2O      -1
      1.11 moles      ## Removes x m3 water, but solute mass remains the same
                        ## This number must be adjusted manually for each cycle

USE solution 111
Save Solution 112

END

Title Return solution back to 1L

Mix 105
      112  1.0205
save solution 113
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e--e-
  log_k      0

EQUILIBRIUM_PHASES 105
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0
  Schoepite 0 0
  Sepiolite 0 0
  SiO2(am-ppt) 0 0
  Tyuyamunite 0 0
  U3O8 0 0

```

```

UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 113
SAVE Solution 114 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 105
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 105

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 105
USE Surface 105
USE Solution 114
SAVE Solution 115 #Initial Stage 1 Pit Water After Mineral Precipitation and
Sorption Loss
END

Title Use solution to allow model output
REACTION 106

    H2O      -0.0
    0 moles

USE solution 115
End
Title Stage 2 pit lake GW inflow
Title Stage 2 Groundwater mix
MIX 201
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.256688
11     2.078061
12     1.534887
13     3.602556
14     0
15     0

Save solution 201
end

REACTION 201
    H2O      -1
    414.7700 moles ### Addition step. Removes HTC water but solute mass remains
                    ## Returns solution volume back to 1L

USE solution 201
SAVE Solution 202

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
    e--e-
    log_k      0

EQUILIBRIUM_PHASES 201

```

Ag2Se 0 0
 Alunite 0 0
 Anhydrite 0 0
 Alunite 0 0
 Ba3(AsO4)2 0 0
 Barite 0 0
 Brochantite 0 0
 Brucite 0 0
 Calcite 0 0
 CaMoO4 0 0
 CaSeO3·2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -1.69 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 202
 SAVE Solution 203 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 201
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 201

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 201
 USE Surface 201
 USE Solution 203
 SAVE Solution 204 #Initial Stage 2 groundwater after Mineral Precipitation and Sorption Loss
 END

Title Stage 2 Run-off mix
 Mix 202

```

1      1
3      0.001240
4      0.013022
5      0.007066
6      0.000000
7      0.023691
8      0.000000
9      3.566961
10     5.583891
11     10.793291
12     57.862766
13     44.640567
14     17.900146
15     9.061957

```

```

Save solution 205
end

```

```

REACTION 202

```

```

    H2O      -1
    8295.75 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

```

```

USE solution 205
SAVE Solution 206

```

```

End

```

```

Title Precipitate oversaturated phases

```

```

PHASES
Fix_pe
e--e-
log_k      0

```

```

EQUILIBRIUM_PHASES 202

```

```

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0

```

```

PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 206
SAVE Solution 207 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 202
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 202

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 202
USE Surface 202
USE Solution 207
SAVE Solution 208 #Initial Stage 2 Run-off Water After Mineral Precipitation and
Sorption Loss
END

Title Stage 2 Pit lake Mix
Mix 203
204 0.007822
208 0.003247
1 0.007582
17 0.008224
16 0.000000
115 0.973125
Save solution 209
end

Title Stage 2 Pit wall interaction mix calculator
MIX 204
209 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000078
11 0.000635
12 0.000469
13 0.001101
14 0
15 0

Save solution 210
end

REACTION 204
    H2O -1
    0.126837 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L
USE solution 210

```

SAVE Solution 211

End

Title Evaporate Stage 2 lake water to produce initial Stage 2 Lake water

REACTION 205

H2O -1
0.85 moles ## Removes x m3 water, but solute mass remains the same
This number must be adjusted manually for each cycle

USE solution 211

Save Solution 212

END

Title Return solution back to 1L

Mix 205

212 1.0155
save solution 213
end

Title Precipitate oversaturated phases

PHASES

Fix_pe

e-=e-
log_k 0

EQUILIBRIUM_PHASES 205

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0

```

Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 213
SAVE Solution 214 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 205
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 205

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 205
USE Surface 205
USE Solution 214
SAVE Solution 215 #Initial Stage 2 Pit Water After Mineral Precipitation and
Sorption Loss
END

Title Use solution to allow model output
REACTION 206

    H2O      -0.0
    0 moles

USE solution 215
End

Title Stage 3 pit lake GW inflow
Title Stage 3 Groundwater mix
MIX 301
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.246706
11     1.997676
12     1.477751
13     3.468753
14     0
15     0

Save solution 301
end

REACTION 301
    H2O      -1
    399.1717 moles ### Addition step. Removes HTC water but solute mass remains
                    ## Returns solution volume back to 1L

USE solution 301
SAVE Solution 302

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
    e-=e-

```

log_k 0

EQUILIBRIUM_PHASES 301

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 302

SAVE Solution 303 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 301

END

Title Determine loss of metals due to HFO sorption and sedimentation

SURFACE 301

-equilibrate with solution 1

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200

Hfo_wOH Ferrihydrite equilibrium_phase 0.2

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USE EQUILIBRIUM_PHASES 301

USE Surface 301

USE Solution 303

SAVE Solution 304 #Initial Stage 3 groundwater after Mineral Precipitation and Sorption Loss

END

Title Stage 3 Run-off mix

Mix 302

1	1
3	0.001868
4	0.019618
5	0.010646
6	0.000000
7	0.035693
8	0.000000
9	5.373865
10	8.412506
11	16.259210
12	87.164501
13	67.230252
14	26.967769
15	13.652446

Save solution 305

end

REACTION 302

H2O -1

12496.15 moles ### Addition step. Removes HTC water but solute mass remains
Returns solution volume back to 1L

USE solution 305

SAVE Solution 306

End

Title Precipitate oversaturated phases

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 302

Ag2Se	0	0
Alunite	0	0
Anhydrite	0	0
Alunite	0	0
Ba3(AsO4)2	0	0
Barite	0	0
Brochantite	0	0
Brucite	0	0
Calcite	0	0
CaMoO4	0	0
CaSeO3:2H2O	0	0
Carnotite	0	0
Cd(BO2)2	0	0
CdMoO4	0	0
Chrysotile	0	0
CO2(g)	-3.5	10
Cr2O3	0	0
CuMoO4	0	0
Cu2Se(alpha)	0	0
Epsomite	0	0
Ferrihydrite	0	0
Fluorite	0	0
Gummite	0	0
Gypsum	0	0
HgSe	0	0
Mg3(PO4)2	0	0
Mirabilite	0	0
MnSeO3	0	0
O2(g)	-32	10
Otavite	0	0

NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 306
SAVE Solution 307 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 302
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 302

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 302
USE Surface 302
USE Solution 307
SAVE Solution 308 #Initial Stage 3 Run-off Water After Mineral Precipitation and
Sorption Loss
END

Title Stage 3 Pit lake Mix
Mix 303

304 0.015860
308 0.004200
1 0.009823
17 0.010640
16 0.000000
215 0.959477
Save solution 309
end

Title Stage 3 Pit wall interaction mix calculator

MIX 304
309 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000078
11 0.000634
12 0.000469
13 0.001101
14 0
15 0

Save solution 310
end

REACTION 304

```

      H2O      -1
      0.126817 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 310
SAVE Solution 311

End
Title Evaporate Stage 3 lake water to produce initial Stage 2 Lake water
REACTION 305

      H2O      -1
      2.17 moles    ## Removes x m3 water, but solute mass remains the same
                        ## This number must be adjusted manually for each cycle

USE solution 311
Save Solution 312

END

Title Return solution back to 1L

Mix 305
      312  1.0407
save solution 313
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e-=e-
  log_k      0

EQUILIBRIUM_PHASES 305
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0

```

```

Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 313
SAVE Solution 314 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 305
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 305

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 305
USE Surface 305
USE Solution 314
SAVE Solution 315 #Initial Stage 3 Pit Water After Mineral Precipitation and
Sorption Loss
END

Title Use solution to allow model output
REACTION 306

    H2O      -0.0
    0 moles

USE solution 315
End

Title Stage 4 pit lake GW inflow
Title Stage 4 Groundwater mix
MIX 401
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.242991
11     1.968794
12     1.463415
13     3.436091
14     0
15     0

Save solution 401
end

REACTION 401
    H2O      -1
    394.7309 moles ### Addition step. Removes HTC water but solute mass remains
                    ## Returns solution volume back to 1L

USE solution 401
SAVE Solution 402

```

```

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e--e-
  log_k      0

EQUILIBRIUM_PHASES 401
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0
  Schoepite 0 0
  Sepiolite 0 0
  SiO2(am-ppt) 0 0
  Tyuyamunite 0 0
  U3O8 0 0
  UO3 0 0
  UO2(OH)2(beta) 0 0
  ZnMoO4 0 0

USE solution 402
SAVE Solution 403 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 401
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 401

  -equilibrate with solution 1
  Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite equilibrium_phase 0.2
  -donnan 1e-008

USE EQUILIBRIUM_PHASES 401

```

```

USE Surface 401
USE Solution 403
SAVE Solution 404 #Initial Stage 4 groundwater after Mineral Precipitation and
Sorption Loss
END

```

```

Title Stage 4 Run-off mix
Mix 402

```

```

1      1
3      0.001868
4      0.019620
5      0.010646
6      0.000000
7      0.035695
8      0.000000
9      5.374214
10     8.412976
11     16.255055
12     87.139351
13     67.158507
14     26.969520
15     13.653333

```

```

Save solution 405
end

```

```

REACTION 402
      H2O      -1
      12490.6 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

```

```

USE solution 405
SAVE Solution 406

```

```

End

```

```

Title Precipitate oversaturated phases
PHASES

```

```

Fix_pe
  e-=e-
  log_k      0

```

```

EQUILIBRIUM_PHASES 402
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0

```

Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 406
SAVE Solution 407 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 402
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 402

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 402
USE Surface 402
USE Solution 407
SAVE Solution 408 #Initial Stage 4 Run-off Water After Mineral Precipitation and
Sorption Loss
END

Title Stage 4 Pit lake Mix
Mix 403
404 0.044597
408 0.011630
1 0.027303
17 0.029472
16 0.000000
315 0.886998
Save solution 409
end

Title Stage 4 Pit wall interaction mix calculator
MIX 404

409 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000078
11 0.000632
12 0.000469
13 0.001102
14 0
15 0

```

Save solution 410
end

REACTION 404
  H2O      -1
  0.126739 moles ### Addition step. Removes HTC water but solute mass remains
                  ## Returns solution volume back to 1L

USE solution 410
SAVE Solution 411

End
Title Evaporate Stage 4 lake water to produce initial Stage 5 Lake water
REACTION 405
  H2O      -1
  6.04 moles ## Removes x m3 water, but solute mass remains the same
              ## This number must be adjusted manually for each cycle

USE solution 411
Save Solution 412

END

Title Return solution back to 1L

Mix 405
  412 1.1221
save solution 413
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0

EQUILIBRIUM_PHASES 405
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0

```



```

Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
Sb2O3 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 413
SAVE Solution 414 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 405
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 405

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 405
USE Surface 405
USE Solution 414
SAVE Solution 415 #Initial Stage 5 Pit Water After Mineral Precipitation and
Sorption Loss
END

Title Use solution to allow model output
REACTION 406

    H2O      -0.0
    0 moles

USE solution 415
End

Title Stage 5 pit lake GW inflow
Title Stage 5 Groundwater mix
MIX 501
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.244362
11     1.981130
12     1.482260
13     3.481749
14     0
15     0

Save solution 501
end

REACTION 501
    H2O      -1
    399 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L

```

USE solution 501
SAVE Solution 502

End

Title Precipitate oversaturated phases in groundwater

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 501

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 502

SAVE Solution 503 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 501

END

Title Determine loss of metals due to HFO sorption and sedimentation

SURFACE 501

-equilibrate with solution 1

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200

Hfo_wOH Ferrihydrite equilibrium_phase 0.2

-donnan 1e-008

USE EQUILIBRIUM_PHASES 501
USE Surface 501
USE Solution 503
SAVE Solution 504 #Initial Stage 5 groundwater after Mineral Precipitation and
Sorption Loss
END

Title Stage 5 Run-off mix
Mix 502

1	1
3	0.001870
4	0.019645
5	0.010660
6	0.000000
7	0.035741
8	0.000000
9	5.381124
10	8.423469
11	16.268645
12	87.208998
13	67.139944
14	27.004194
15	13.670886

Save solution 505
end

REACTION 502
H2O -1
12498.2 moles ### Addition step. Removes HTC water but solute mass remains
Returns solution volume back to 1L

USE solution 505
SAVE Solution 506

End

Title Precipitate oversaturated phases
PHASES

Fix_pe
e-=e-
log_k 0

EQUILIBRIUM_PHASES 502

Ag2Se	0	0
Alunite	0	0
Anhydrite	0	0
Alunite	0	0
Ba3(AsO4)2	0	0
Barite	0	0
Brochantite	0	0
Brucite	0	0
Calcite	0	0
CaMoO4	0	0
CaSeO3:2H2O	0	0
Carnotite	0	0
Cd(BO2)2	0	0
CdMoO4	0	0
Chrysotile	0	0
CO2(g)	-3.5	10
Cr2O3	0	0
CuMoO4	0	0
Cu2Se(alpha)	0	0
Epsomite	0	0
Ferrihydrite	0	0
Fluorite	0	0
Gummite	0	0

Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 506
 SAVE Solution 507 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 502
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 502

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 502
 USE Surface 502
 USE Solution 507
 SAVE Solution 508 #Initial Stage 5 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 5 Pit lake Mix
 Mix 503

504 0.068502
 508 0.017936
 1 0.042385
 17 0.045476
 16 0.000000
 415 0.825701
 Save solution 509
 end

Title Stage 5 Pit wall interaction mix calculator

MIX 504
 509 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0
 9 0
 10 0.000077
 11 0.000628
 12 0.000470
 13 0.001104

```

14      0
15      0

Save solution 510
end

REACTION 504
    H2O      -1
    0.126626 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 510
SAVE Solution 511

End
Title Evaporate Stage 5 lake water to produce initial Stage 5 Lake water
REACTION 505
    H2O      -1
    9.38 moles ## Removes x m3 water, but solute mass remains the same
                ## This number must be adjusted manually for each cycle

USE solution 511
Save Solution 512

END

Title Return solution back to 1L

Mix 505
    512  1.2032
save solution 513
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
    e==e-
    log_k      0

EQUILIBRIUM_PHASES 505
    Ag2Se 0 0
    Alunite 0 0
    Anhydrite 0 0
    Alunite 0 0
    Ba3(AsO4)2 0 0
    Barite 0 0
    Brochantite 0 0
    Brucite 0 0
    Calcite 0 0
    CaMoO4 0 0
    CaSeO3:2H2O 0 0
    Carnotite 0 0
    Cd(BO2)2 0 0
    CdMoO4 0 0
    Chrysotile 0 0
    CO2(g) -3.5 10
    Cr2O3 0 0
    CuMoO4 0 0
    Cu2Se(alpha) 0 0
    Epsomite 0 0
    Ferrihydrite 0 0
    Fluorite 0 0
    Gummite 0 0
    Gypsum 0 0
    HgSe 0 0
    Mg3(PO4)2 0 0
    Mirabilite 0 0
    MnSeO3 0 0
    O2(g) -32 10

```

Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 513
SAVE Solution 514 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 505
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 505

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 505
USE Surface 505
USE Solution 514
SAVE Solution 515 #Stage 5 Pit Water After Mineral Precipitation and Sorption Loss
END

Title Use solution to allow model output
REACTION 506

H2O -0.0
0 moles

USE solution 515
End

Title Stage 6 pit lake GW inflow
Title Stage 6 Groundwater mix
MIX 601

2 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.248204
11 2.013510
12 1.523472
13 3.581174
14 0
15 0

Save solution 601
end

REACTION 601
H2O -1

```
408.8859 moles ### Addition step. Removes HTC water but solute mass remains
                                ## Retuns solution volume back to 1L
USE solution 601
SAVE Solution 602
```

```
End
Title Precipitate oversaturated phases in groundwater
PHASES
```

```
Fix_pe
  e--e-
  log_k      0
```

```
EQUILIBRIUM_PHASES 601
```

```
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3·2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
```

```
USE solution 602
SAVE Solution 603 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 601
END
```

```
Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 601
```

```
-equilibrate with solution 1
```

```
Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
-donnan 1e-008
```

```
USE EQUILIBRIUM_PHASES 601
USE Surface 601
USE Solution 603
SAVE Solution 604 #Initial Stage 6 groundwater after Mineral Precipitation and
Sorption Loss
END
```

```
Title Stage 6 Run-off mix
Mix 602
```

```
1      1
3      0.001873
4      0.019678
5      0.010678
6      0.000000
7      0.035801
8      0.000000
9      5.390138
10     8.436524
11     16.282688
12     87.281163
13     67.068880
14     27.049432
15     13.693788
```

```
Save solution 605
end
```

```
REACTION 602
  H2O      -1
  12503.95 moles ### Addition step. Removes HTC water but solute mass remains
                  ## Returns solution volume back to 1L
```

```
USE solution 605
SAVE Solution 606
```

```
End
```

```
Title Precipitate oversaturated phases
```

```
PHASES
Fix_pe
  e--e-
  log_k      0
```

```
EQUILIBRIUM_PHASES 602
```

```
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
```



```

Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

```

```

USE solution 606
SAVE Solution 607 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 602
END

```

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 602

```

```

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

```

```

USE EQUILIBRIUM_PHASES 602
USE Surface 602
USE Solution 607
SAVE Solution 608 #Initial Stage 6 Run-off Water After Mineral Precipitation and
Sorption Loss
END

```

```

Title Stage 6 Pit lake Mix
Mix 603
604 0.149812
608 0.039730
1 0.094917
17 0.100825
16 0.000000
515 0.614716
Save solution 609
end

```

```

Title Stage 6 Pit wall interaction mix calculator
MIX 604
609 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000077
11 0.000622

```

```
12      0.000471
13      0.001106
14      0
15      0
```

```
Save solution 610
end
```

```
REACTION 604
      H2O      -1
      0.126425 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L
USE solution 610
SAVE Solution 611
```

```
End
Title Evaporate Stage 6 lake water to produce initial Stage 7 Lake water
REACTION 605
```

```
      H2O      -1
      21.01 moles ## Removes x m3 water, but solute mass remains the same
                  ## This number must be adjusted manually for each cycle
USE solution 611
Save Solution 612
```

```
END
```

```
Title Return solution back to 1L
```

```
Mix 605
      612 1.6083
save solution 613
end
```

```
Title Precipitate oversaturated phases
PHASES
Fix_pe
  e--e-
  log_k      0
```

```
EQUILIBRIUM_PHASES 605
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
```

```

MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 613
SAVE Solution 614 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 605
END

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 605

    -equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    -donnan 1e-008

USE EQUILIBRIUM_PHASES 605
USE Surface 605
USE Solution 614
SAVE Solution 615 #Initial Stage 7 Pit Water After Mineral Precipitation and
Sorption Loss
END

Title Use solution to allow model output
REACTION 606

    H2O      -0.0
    0 moles

USE solution 615
End

Title Stage 7 pit lake GW inflow
Title Stage 7 Groundwater mix
MIX 701
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.251123
11     2.037716
12     1.552630
13     3.651462
14     0
15     0

Save solution 701
end

```

```
REACTION 701
  H2O      -1
  415.9357 moles ### Addition step. Removes HTC water but solute mass remains
                      ## Returns solution volume back to 1L
```

```
USE solution 701
SAVE Solution 702
```

```
End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e-=e-
  log_k      0
```

```
EQUILIBRIUM_PHASES 701
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0
  Schoepite 0 0
  Sepiolite 0 0
  SiO2(am-ppt) 0 0
  Tyuyamunite 0 0
  U3O8 0 0
  UO3 0 0
  UO2(OH)2(beta) 0 0
  ZnMoO4 0 0
```

```
USE solution 702
SAVE Solution 703 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 701
END
```

```
Title Determine loss of metals due to HFO sorption and sedimentation
```

SURFACE 701

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 701

USE Surface 701

USE Solution 703

SAVE Solution 704 #Initial Stage 7 groundwater after Mineral Precipitation and Sorption Loss

END

Title Stage 7 Run-off mix

Mix 702

1	1
3	0.001877
4	0.019712
5	0.010697
6	0.000000
7	0.035864
8	0.000000
9	5.399655
10	8.450607
11	16.302900
12	87.388282
13	67.070334
14	27.097188
15	13.717965

Save solution 705

end

REACTION 702

H2O -1
12516.4855 moles ### Addition step. Removes HTC water but solute mass remains
Returns solution volume back to 1L

USE solution 705

SAVE Solution 706

End

Title Precipitate oversaturated phases

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 702

Ag2Se	0	0
Alunite	0	0
Anhydrite	0	0
Alunite	0	0
Ba3(AsO4)2	0	0
Barite	0	0
Brochantite	0	0
Brucite	0	0
Calcite	0	0
CaMoO4	0	0
CaSeO3:2H2O	0	0
Carnotite	0	0
Cd(BO2)2	0	0
CdMoO4	0	0
Chrysotile	0	0
CO2(g)	-3.5	10
Cr2O3	0	0
CuMoO4	0	0

Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 706
 SAVE Solution 707 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 702
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 702

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 702
 USE Surface 702
 USE Solution 707
 SAVE Solution 708 #Initial Stage 7 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 7 Pit lake Mix
 Mix 703
 704 0.195667
 708 0.052364
 1 0.126410
 17 0.132998
 16 0.000000
 615 0.492561
 Save solution 709
 end

Title Stage 7 Pit wall interaction mix calculator
 MIX 704
 709 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0

```

9      0
10     0.000076
11     0.000618
12     0.000471
13     0.001107
14     0
15     0

Save solution 710
end

REACTION 704
      H2O      -1
      0.126267 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 710
SAVE Solution 711

End
Title Evaporate Stage 7 lake water to produce initial Stage 8 Lake water
REACTION 705
      H2O      -1
      27.99 moles  ## Removes x m3 water, but solute mass remains the same
                        ## This number must be adjusted manually for each cycle

USE solution 711
Save Solution 712

END

Title Return solution back to 1L

Mix 705
      712  2.0151
save solution 713
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0

EQUILIBRIUM_PHASES 705
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0

```

HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 713

SAVE Solution 714 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 705

END

Title Determine loss of metals due to HFO sorption and sedimentation

SURFACE 705

-equilibrate with solution 1

Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200

Hfo_wOH Ferrihydrite equilibrium_phase 0.2

-donnan 1e-008

USE EQUILIBRIUM_PHASES 705

USE Surface 705

USE Solution 714

SAVE Solution 715 #Initial Stage 8 Pit Water After Mineral Precipitation and

Sorption Loss

END

Title Use solution to allow model output

REACTION 706

H2O -0.0
 0 moles

USE solution 715

End

Title Stage 8 pit lake GW inflow

Title Stage 8 Groundwater mix

MIX 801

2 1
 3 0
 4 0
 5 0
 6 0
 7 0
 8 0
 9 0
 10 0.252012
 11 2.045062
 12 1.562094
 13 3.674360
 14 0
 15 0


```

Save solution 801
end

REACTION 801
  H2O      -1
  418.1 moles ### Addition step. Removes HTC water but solute mass remains
                ## Returns solution volume back to 1L

USE solution 801
SAVE Solution 802

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e-=e-
  log_k      0

EQUILIBRIUM_PHASES 801
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0
  Schoepite 0 0
  Sepiolite 0 0
  SiO2(am-ppt) 0 0
  Tyuyamunite 0 0
  U3O8 0 0
  UO3 0 0
  UO2(OH)2(beta) 0 0
  ZnMoO4 0 0

USE solution 802
SAVE Solution 803 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 801
END

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 801

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

USE EQUILIBRIUM_PHASES 801
USE Surface 801
USE Solution 803
SAVE Solution 804 #Initial Stage 8 groundwater after Mineral Precipitation and
Sorption Loss
END

Title Stage 8 Run-off mix

Mix 802

1	1
3	0.001878
4	0.019728
5	0.010705
6	0.000000
7	0.035891
8	0.000000
9	5.403801
10	8.456786
11	16.312381
12	87.438662
13	67.080111
14	27.117998
15	13.728500

Save solution 805
end

REACTION 802

H2O -1
12522.6 moles ### Addition step. Removes HTC water but solute mass remains
Returns solution volume back to 1L

USE solution 805
SAVE Solution 806

End

Title Precipitate oversaturated phases

PHASES

Fix_pe

e==e-
log_k 0

EQUILIBRIUM_PHASES 802

Ag2Se	0	0
Alunite	0	0
Anhydrite	0	0
Alunite	0	0
Ba3(AsO4)2	0	0
Barite	0	0
Brochantite	0	0
Brucite	0	0
Calcite	0	0
CaMoO4	0	0
CaSeO3:2H2O	0	0
Carnotite	0	0
Cd(BO2)2	0	0
CdMoO4	0	0
Chrysotile	0	0
CO2(g)	-3.5	10

Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 806
 SAVE Solution 807 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 802
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 802

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 802
 USE Surface 802
 USE Solution 807
 SAVE Solution 808 #Initial Stage 8 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 8 Pit lake Mix
 Mix 803
 804 0.194360
 808 0.052140
 1 0.126503
 17 0.132485
 16 0.000000
 715 0.494512
 Save solution 809
 end

Title Stage 8 Pit wall interaction mix calculator
 MIX 804
 809 1
 3 0
 4 0
 5 0
 6 0

```

7      0
8      0
9      0
10     0.000076
11     0.000617
12     0.000471
13     0.001108
14     0
15     0

Save solution 810
end

REACTION 804
      H2O      -1
      0.126204 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 810
SAVE Solution 811

End
Title Evaporate Stage 8 lake water to produce initial Stage 9 Lake water
REACTION 805
      H2O      -1
      28.01 moles ## Removes x m3 water, but solute mass remains the same
                  ## This number must be adjusted manually for each cycle

USE solution 811
Save Solution 812

END

Title Return solution back to 1L

Mix 805
      812  2.0167
save solution 813
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0

EQUILIBRIUM_PHASES 805
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0

```

```

Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

```

```

USE solution 813
SAVE Solution 814 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 805
END

```

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 805

```

```

-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008

```

```

USE EQUILIBRIUM_PHASES 805
USE Surface 805
USE Solution 814
SAVE Solution 815 #Initial Stage 9 Pit Water After Mineral Precipitation and
Sorption Loss
END

```

```

Title Use solution to allow model output
REACTION 806

```

```

H2O -0.0
0 moles

```

```

USE solution 815
End

```

```

Title Stage 9 pit lake GW inflow
Title Stage 9 Groundwater mix

```

```

MIX 901
2 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.252297
11 2.047419
12 1.565236
13 3.681966

```

14 0
15 0

Save solution 901
end

REACTION 901
H2O -1
418.9332 moles ### Addition step. Removes HTC water but solute mass remains
Retuns solution volume back to 1L
USE solution 901
SAVE Solution 902

End
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
e--e-
log_k 0

EQUILIBRIUM_PHASES 901
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0

USE solution 902

```
SAVE Solution 903 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 901
END
```

```
Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 901
```

```
-equilibrate with solution 1
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
-donnan 1e-008
```

```
USE EQUILIBRIUM_PHASES 901
USE Surface 901
USE Solution 903
SAVE Solution 904 #Initial Stage 9 groundwater after Mineral Precipitation and
Sorption Loss
END
```

```
Title Stage 9 Run-off mix
Mix 902
```

```
1 1
3 0.001879
4 0.019735
5 0.010709
6 0.000000
7 0.035904
8 0.000000
9 5.405758
10 8.459738
11 16.317235
12 87.464526
13 67.089950
14 27.127819
15 13.733471
```

```
Save solution 905
end
```

```
REACTION 902
H2O -1
12525.85 moles ### Addition step. Removes HTC water but solute mass remains
## Returns solution volume back to 1L
```

```
USE solution 905
SAVE Solution 906
```

```
End
```

```
Title Precipitate oversaturated phases
PHASES
```

```
Fix_pe
e=e-
log_k 0
```

```
EQUILIBRIUM_PHASES 902
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
```

CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -3.5 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 906
 SAVE Solution 907 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 902
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 902

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 902
 USE Surface 902
 USE Solution 907
 SAVE Solution 908 #Initial Stage 9 Run-off Water After Mineral Precipitation and Sorption Loss
 END

Title Stage 9 Pit lake Mix

Mix 903
 904 0.193915
 908 0.052055
 1 0.126523
 17 0.132288
 16 0.000000
 815 0.495218
 Save solution 909
 end

Title Stage 9 Pit wall interaction mix calculator

MIX 904
 909 1
 3 0


```

4      0
5      0
6      0
7      0
8      0
9      0
10     0.000076
11     0.000616
12     0.000471
13     0.001108
14     0
15     0

Save solution 910
end

REACTION 904
      H2O      -1
      0.126157 moles ### Addition step. Removes HTC water but solute mass remains
                        ## Returns solution volume back to 1L

USE solution 910
SAVE Solution 911

End
Title Evaporate Stage 9 lake water

REACTION 905
      H2O      -1
      28.01 moles  ## Removes x m3 water, but solute mass remains the same
                        ## This number must be adjusted manually for each cycle

USE solution 911
Save Solution 912

END

Title Return solution back to 1L

Mix 905
      912  2.0170
save solution 913
end

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e--e-
  log_k      0

EQUILIBRIUM_PHASES 905
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0

```

Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2·8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0
 Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0

USE solution 913
 SAVE Solution 914 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 905
 END

Title Determine loss of metals due to HFO sorption and sedimentation
 SURFACE 905

-equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 -donnan 1e-008

USE EQUILIBRIUM_PHASES 905
 USE Surface 905
 USE Solution 914
 SAVE Solution 915 #Final Stage 9 Pit Water After Mineral Precipitation and
 Sorption Loss
 END

Title Use solution to allow model output
 REACTION 906

H2O -0.0
 0 moles

USE solution 915
 End

Appendix I – PHREEQC output files (electronic)

Appendix I(i) – Existing pit calibration model

Input file: P:\U3939 Copper Flat Scoping Study\Project\Data\Geochemical modelling\Pit Lake models\Existing pit lake (calibration) model\With mixed HCT input orevwaste and revised GW Sept 2015\Copper Flat existing pit lake_v11_mixedHCT_orevwaste_revisedGW.pqi

Output file: P:\U3939 Copper Flat Scoping Study\Project\Data\Geochemical modelling\Pit Lake models\Existing pit lake (calibration) model\With mixed HCT input orevwaste and revised GW Sept 2015\Copper Flat existing pit lake_v11_mixedHCT_orevwaste_revisedGW.pqi

Database file: C:\Program Files (x86)\USGS\Phreeqc Interactive 3.0.0-7430\database\minteq.v8.dat

Reading data base.

SOLUTION_MASTER_SPECIES
SOLUTION_SPECIES
SOLUTION_SPECIES
PHASES
PHASES
SURFACE_MASTER_SPECIES
SURFACE_SPECIES
END

Reading input data for simulation 1.

DATABASE C:\Program Files (x86)\USGS\Phreeqc Interactive 3.0.0-7430\database\minteq.v8.dat

Title Copper Flat existing pit lake_v11_mixedHCT_orevwaste_revisedGW
KNOBS

iterations	10000
convergence_tolerance	1e-007
tolerance	1e-016
step_size	100
pe_step_size	5

end

TITLE

Copper Flat existing pit lake_v11_mixedHCT_orevwaste_revisedGW

End of simulation.

Reading input data for simulation 2.

SELECTED_OUTPUT	
file	Copper Flat existing pit
lake_v11_mixedHCT_orevwaste_revisedGW.out	
selected_out	true
high_precision	true
simulation	true
state	true
solution	true
distance	false
time	false
step	false
ph	true
pe	true
alkalinity	true
ionic_strength	false
water	false
charge_balance	false

```

totals          C(4) Ag Al As B Ba Ca Cd Co Cr
                Cu F Fe Hg K Mg Mn Mo
                Na Ni Pb Sb Se U V
                Zn S(6) Cl N(3) N(5)
saturation_indices Gypsum
end
-----
End of simulation.
-----

-----
Reading input data for simulation 3.
-----

SOLUTION 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila
Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric
Deposition Program.
temp          25
pH            4.93
pe            4
redox         N(-3)/N(5)
units         mg/l
density
Ca            0.209
Mg 0.021
Na 0.075
K             0.030
Cl 0.117
CO2(g)        -3.5
S(6)          0.862 as SO4
N(-3)         0.167 as NH4
N(5)          0.826 as NO3
C(4)          0.1
water         1 # kg
end
-----
Beginning of initial solution calculations.
-----

Initial solution 1. Average rainwater chemistry (1985-2011) - Station NM01 (Gila
Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric
Deposition Program.

-----Solution composition-----

Elements          Molality          Moles
C(4)              6.665e-008  6.665e-008
Ca                2.086e-007  2.086e-007
Cl               1.320e-007  1.320e-007
K                3.069e-008  3.069e-008
Mg              3.456e-008  3.456e-008
N(-3)            3.703e-007  3.703e-007
N(5)            5.328e-007  5.328e-007
Na              1.305e-007  1.305e-007
S(6)            3.589e-007  3.589e-007

-----Description of solution-----

pH = 4.930
pe = 4.000
Activity of water = 1.000
Ionic strength = 7.697e-006
Mass of water (kg) = 1.000e+000
Total alkalinity (eq/kg) = -1.178e-005
Total CO2 (mol/kg) = 6.665e-008
Temperature (deg C) = 25.00
Electrical balance (eq) = 1.142e-005

```

Percent error, $100 \cdot (\text{Cat} - |\text{An}|) / (\text{Cat} + |\text{An}|) = 80.47$
Iterations = 4
Total H = 1.110137e+002
Total O = 5.550684e+001

-----Redox couples-----

Redox couple pe Eh (volts)

N(-3)/N(5) 8.7419 0.5171

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.179e-005	1.175e-005	-4.929	-4.930	-0.001	0.00
OH-	8.598e-010	8.570e-010	-9.066	-9.067	-0.001	(0)
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
C(4)	6.665e-008					
H2CO3	6.422e-008	6.422e-008	-7.192	-7.192	0.000	(0)
HCO3-	2.438e-009	2.430e-009	-8.613	-8.614	-0.001	(0)
CO3-2	9.824e-015	9.697e-015	-14.008	-14.013	-0.006	(0)
CaHCO3+	9.347e-015	9.317e-015	-14.029	-14.031	-0.001	(0)
MgHCO3+	8.511e-016	8.483e-016	-15.070	-15.071	-0.001	(0)
NaHCO3	1.778e-016	1.778e-016	-15.750	-15.750	0.000	(0)
CaCO3	3.164e-018	3.164e-018	-17.500	-17.500	0.000	(0)
MgCO3	2.751e-019	2.751e-019	-18.560	-18.560	0.000	(0)
NaCO3-	2.356e-020	2.349e-020	-19.628	-19.629	-0.001	(0)
Ca	2.086e-007					
Ca+2	2.086e-007	2.059e-007	-6.681	-6.686	-0.006	(0)
CaSO4	1.669e-011	1.669e-011	-10.778	-10.778	0.000	(0)
CaNO3+	3.469e-013	3.458e-013	-12.460	-12.461	-0.001	(0)
CaHCO3+	9.347e-015	9.317e-015	-14.029	-14.031	-0.001	(0)
CaOH+	3.532e-015	3.521e-015	-14.452	-14.453	-0.001	(0)
CaNH3+2	4.704e-018	4.643e-018	-17.328	-17.333	-0.006	(0)
CaCO3	3.164e-018	3.164e-018	-17.500	-17.500	0.000	(0)
Ca(NH3) 2+2	3.354e-029	3.311e-029	-28.474	-28.480	-0.006	(0)
Cl	1.320e-007					
Cl-	1.320e-007	1.316e-007	-6.879	-6.881	-0.001	(0)
H(0)	6.416e-031					
H2	3.208e-031	3.208e-031	-30.494	-30.494	0.000	(0)
K	3.069e-008					
K+	3.069e-008	3.059e-008	-7.513	-7.514	-0.001	(0)
KSO4-	7.689e-014	7.664e-014	-13.114	-13.116	-0.001	(0)
Mg	3.456e-008					
Mg+2	3.456e-008	3.411e-008	-7.461	-7.467	-0.006	(0)
MgSO4	2.197e-012	2.197e-012	-11.658	-11.658	0.000	(0)
MgOH+	1.168e-014	1.164e-014	-13.933	-13.934	-0.001	(0)
MgHCO3+	8.511e-016	8.483e-016	-15.070	-15.071	-0.001	(0)
MgCO3	2.751e-019	2.751e-019	-18.560	-18.560	0.000	(0)
N(-3)	3.703e-007					
NH4+	3.703e-007	3.691e-007	-6.431	-6.433	-0.001	(0)
NH3	1.791e-011	1.791e-011	-10.747	-10.747	0.000	(0)
NH4SO4-	1.404e-012	1.400e-012	-11.853	-11.854	-0.001	(0)
CaNH3+2	4.704e-018	4.643e-018	-17.328	-17.333	-0.006	(0)
Ca(NH3) 2+2	3.354e-029	3.311e-029	-28.474	-28.480	-0.006	(0)
N(5)	5.328e-007					
NO3-	5.328e-007	5.311e-007	-6.273	-6.275	-0.001	(0)
CaNO3+	3.469e-013	3.458e-013	-12.460	-12.461	-0.001	(0)
Na	1.305e-007					
Na+	1.305e-007	1.301e-007	-6.884	-6.886	-0.001	(0)
NaSO4-	2.480e-013	2.472e-013	-12.606	-12.607	-0.001	(0)
NaHCO3	1.778e-016	1.778e-016	-15.750	-15.750	0.000	(0)
NaCO3-	2.356e-020	2.349e-020	-19.628	-19.629	-0.001	(0)
O(0)	9.851e-032					
O2	4.925e-032	4.925e-032	-31.308	-31.308	0.000	(0)
S(6)	3.589e-007					

SO4-2	3.585e-007	3.539e-007	-6.446	-6.451	-0.006	(0)
HSO4-	4.076e-010	4.063e-010	-9.390	-9.391	-0.001	(0)
CaSO4	1.669e-011	1.669e-011	-10.778	-10.778	0.000	(0)
MgSO4	2.197e-012	2.197e-012	-11.658	-11.658	0.000	(0)
NH4SO4-	1.404e-012	1.400e-012	-11.853	-11.854	-0.001	(0)
NaSO4-	2.480e-013	2.472e-013	-12.606	-12.607	-0.001	(0)
KSO4-	7.689e-014	7.664e-014	-13.114	-13.116	-0.001	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Anhydrite	-8.78	-13.14	-4.36	CaSO4
Aragonite	-12.40	-20.70	-8.30	CaCO3
Artinite	-28.69	-19.09	9.60	MgCO3:Mg(OH)2:3H2O
Brucite	-14.45	2.39	16.84	Mg(OH)2
Calcite	-12.22	-20.70	-8.48	CaCO3
CH4(g)	-92.20	-133.25	-41.05	CH4
CO2(g)	-5.73	-23.87	-18.15	CO2
Dolomite(disordered)	-25.64	-42.18	-16.54	CaMg(CO3)2
Dolomite(ordered)	-25.09	-42.18	-17.09	CaMg(CO3)2
Epsomite	-11.79	-13.92	-2.13	MgSO4:7H2O
Gypsum	-8.53	-13.14	-4.61	CaSO4:2H2O
Halite	-15.37	-13.77	1.60	NaCl
Huntite	-55.17	-85.14	-29.97	CaMg3(CO3)4
Hydromagnesite	-74.76	-83.53	-8.77	Mg5(CO3)4(OH)2:4H2O
Lime	-29.53	3.17	32.70	CaO
Magnesite	-14.02	-21.48	-7.46	MgCO3
Mg(OH)2(active)	-16.40	2.39	18.79	Mg(OH)2
Mirabilite	-19.11	-20.22	-1.11	Na2SO4:10H2O
Natron	-26.47	-27.79	-1.31	Na2CO3:10H2O
Nesquehonite	-16.81	-21.48	-4.67	MgCO3:3H2O
O2(g)	-28.40	54.69	83.09	O2
Periclase	-19.19	2.39	21.58	MgO
Portlandite	-19.63	3.17	22.80	Ca(OH)2
Thenardite	-20.54	-20.22	0.32	Na2SO4
Thermonatrite	-28.42	-27.79	0.64	Na2CO3:H2O

End of simulation.

Reading input data for simulation 4.

SOLUTION 2 Blended groundwater chemistry provided by JSAI (Sept 2015) for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-23B, GWQ11-24B and GWQ11-25B for samples collected between 1996 and 2013

temp 25
pH 6.91
units mg/l
density 1
Alkalinity 316.3 as HCO3
Ag 0.009
Al 0.12
As 0.0023
B 0.136
Ba 0.089
Ca 336
Cd 0.001
Cl 34
Co 0.01
Cr 0.0066
Cu 0.0037
F 4.60
Fe 1.48


```

Hg 0.000002
K      4.40
Mg 57.8
Mn 2.47
Mo 0.0119
N(5)    0.956
Na 114.5 charge
Ni 0.0125
Pb 0.0025
S(6)    954 as SO4
Sb 0.0009
Se 0.0022
U      0.0015
V      0.0009
Zn 0.08
water   1 # kg

```

end

Beginning of initial solution calculations.

Initial solution 2. Blended groundwater chemistry provided by JSAI (Sept 2015) for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-23B, GWQ11-24B and GWQ11-25B for samples collected between 1996 and 2013

-----Solution composition-----

Elements	Molality	Moles
Ag	8.359e-008	8.359e-008
Al	4.456e-006	4.456e-006
Alkalinity	5.193e-003	5.193e-003
As	3.075e-008	3.075e-008
B	1.260e-005	1.260e-005
Ba	6.493e-007	6.493e-007
Ca	8.399e-003	8.399e-003
Cd	8.912e-009	8.912e-009
Cl	9.608e-004	9.608e-004
Co	1.700e-007	1.700e-007
Cr	1.272e-007	1.272e-007
Cu	5.833e-008	5.833e-008
F	2.426e-004	2.426e-004
Fe	2.655e-005	2.655e-005
Hg	9.989e-012	9.989e-012
K	1.127e-004	1.127e-004
Mg	2.382e-003	2.382e-003
Mn	4.504e-005	4.504e-005
Mo	1.243e-007	1.243e-007
N(5)	6.838e-005	6.838e-005
Na	4.536e-003	4.536e-003
Ni	2.134e-007	2.134e-007
Pb	1.209e-008	1.209e-008
S(6)	9.949e-003	9.949e-003
Sb	7.406e-009	7.406e-009
Se	2.791e-008	2.791e-008
U	6.313e-009	6.313e-009
V	1.770e-008	1.770e-008
Zn	1.226e-006	1.226e-006
Charge balance		

-----Description of solution-----

```

pH = 6.910
pe = 4.000
Activity of water = 0.999
Ionic strength = 3.465e-002
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 6.315e-003
Total CO2 (mol/kg) = 6.315e-003

```

Temperature (deg C) = 25.00
 Electrical balance (eq) = 4.150e-018
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 12
 Total H = 1.110212e+002
 Total O = 5.556584e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.461e-007	1.230e-007	-6.835	-6.910	-0.075	0.00
OH-	9.795e-008	8.181e-008	-7.009	-7.087	-0.078	(0)
H2O	5.551e+001	9.995e-001	1.744	-0.000	0.000	18.07
Ag	8.359e-008					
Ag2Se	2.791e-008	2.791e-008	-7.554	-7.554	0.000	(0)
AgCl	1.493e-008	1.493e-008	-7.826	-7.826	0.000	(0)
Ag+	1.074e-008	9.039e-009	-7.969	-8.044	-0.075	(0)
AgCl2-	1.309e-009	1.052e-009	-8.883	-8.978	-0.095	(0)
AgSO4-	7.845e-010	6.304e-010	-9.105	-9.200	-0.095	(0)
AgF	3.932e-012	3.932e-012	-11.405	-11.405	0.000	(0)
AgCl3-2	1.817e-012	7.581e-013	-11.741	-12.120	-0.380	(0)
AgNO3	4.094e-013	4.094e-013	-12.388	-12.388	0.000	(0)
AgOH	7.394e-014	7.394e-014	-13.131	-13.131	0.000	(0)
AgCl4-3	8.954e-015	1.252e-015	-14.048	-14.902	-0.854	(0)
AgH2BO3	8.532e-015	8.532e-015	-14.069	-14.069	0.000	(0)
Ag(OH) 2-	7.355e-019	5.911e-019	-18.133	-18.228	-0.095	(0)
AgSeO3-	4.797e-020	3.855e-020	-19.319	-19.414	-0.095	(0)
Ag2MoO4	1.928e-024	1.928e-024	-23.715	-23.715	0.000	(0)
Ag(SeO3) 2-3	1.638e-032	2.291e-033	-31.786	-32.640	-0.854	(0)
AgOH(Se) 2-4	0.000e+000	0.000e+000	-72.879	-74.398	-1.519	(0)
Al	4.456e-006					
AlF3	2.100e-006	2.100e-006	-5.678	-5.678	0.000	(0)
AlF2+	1.135e-006	9.631e-007	-5.945	-6.016	-0.071	(0)
Al(OH) 4-	8.555e-007	7.208e-007	-6.068	-6.142	-0.074	(0)
AlF4-	2.163e-007	1.822e-007	-6.665	-6.739	-0.074	(0)
Al(OH) 3	6.998e-008	6.998e-008	-7.155	-7.155	0.000	(0)
Al(OH) 2+	5.054e-008	4.288e-008	-7.296	-7.368	-0.071	(0)
AlF+2	2.696e-008	1.397e-008	-7.569	-7.855	-0.285	(0)
AlOH+2	1.273e-009	6.598e-010	-8.895	-9.181	-0.285	(0)
AlSO4+	2.598e-010	2.189e-010	-9.585	-9.660	-0.074	(0)
Al+3	3.796e-011	8.066e-012	-10.421	-11.093	-0.673	(0)
Al(SO4) 2-	9.732e-012	8.198e-012	-11.012	-11.086	-0.074	(0)
AlMo6O21-3	1.155e-040	0.000e+000	-39.937	-40.792	-0.854	(0)
As (3)	2.340e-016					
H3AsO3	2.328e-016	2.328e-016	-15.633	-15.633	0.000	(0)
H2AsO3-	1.208e-018	9.706e-019	-17.918	-18.013	-0.095	(0)
H4AsO3+	1.766e-023	1.419e-023	-22.753	-22.848	-0.095	(0)
HAsO3-2	1.725e-023	7.195e-024	-22.763	-23.143	-0.380	(0)
AsO3-3	1.613e-029	2.255e-030	-28.792	-29.647	-0.854	(0)
As (5)	3.075e-008					
HAsO4-2	1.944e-008	8.106e-009	-7.711	-8.091	-0.380	(0)
H2AsO4-	1.132e-008	9.096e-009	-7.946	-8.041	-0.095	(0)
AsO4-3	1.490e-012	2.084e-013	-11.827	-12.681	-0.854	(0)
H3AsO4	1.929e-013	1.945e-013	-12.715	-12.711	0.003	(0)
B	1.260e-005					
H3BO3	1.252e-005	1.262e-005	-4.903	-4.899	0.003	(0)
H2BO3-	7.199e-008	5.956e-008	-7.143	-7.225	-0.082	(0)
CaH2BO3+	1.206e-008	9.974e-009	-7.919	-8.001	-0.082	(0)
MgH2BO3+	2.202e-009	1.821e-009	-8.657	-8.740	-0.082	(0)
BF(OH) 3-	1.054e-009	8.718e-010	-8.977	-9.060	-0.082	(0)
NaH2BO3	3.531e-010	3.531e-010	-9.452	-9.452	0.000	(0)
BF2(OH) 2-	2.402e-012	1.987e-012	-11.619	-11.702	-0.082	(0)
H5(BO3) 2-	7.731e-013	6.396e-013	-12.112	-12.194	-0.082	(0)
BaH2BO3+	7.089e-013	5.864e-013	-12.149	-12.232	-0.082	(0)
AgH2BO3	8.532e-015	8.532e-015	-14.069	-14.069	0.000	(0)
H8(BO3) 3-	9.754e-016	8.069e-016	-15.011	-15.093	-0.082	(0)

	BF3OH-	1.992e-017	1.648e-017	-16.701	-16.783	-0.082	(0)
	BF4-	2.089e-021	1.728e-021	-20.680	-20.762	-0.082	(0)
Ba	6.493e-007						
	Ba+2	6.342e-007	3.186e-007	-6.198	-6.497	-0.299	(0)
	BaHCO3+	1.469e-008	1.252e-008	-7.833	-7.902	-0.069	(0)
	BaCO3	2.562e-010	2.562e-010	-9.591	-9.591	0.000	(0)
	BaNO3+	1.133e-010	9.105e-011	-9.946	-10.041	-0.095	(0)
	BaH2BO3+	7.089e-013	5.864e-013	-12.149	-12.232	-0.082	(0)
	BaOH+	1.345e-013	1.138e-013	-12.871	-12.944	-0.073	(0)
C (4)	6.315e-003						
	HCO3-	4.849e-003	4.114e-003	-2.314	-2.386	-0.071	(0)
	H2CO3	1.138e-003	1.138e-003	-2.944	-2.944	0.000	(0)
	CaHCO3+	2.616e-004	2.229e-004	-3.582	-3.652	-0.069	(0)
	MgHCO3+	4.426e-005	3.713e-005	-4.354	-4.430	-0.076	(0)
	NaHCO3	8.655e-006	8.655e-006	-5.063	-5.063	0.000	(0)
	CaCO3	7.231e-006	7.231e-006	-5.141	-5.141	0.000	(0)
	CO3-2	3.120e-006	1.568e-006	-5.506	-5.805	-0.299	(0)
	MnHCO3+	1.398e-006	1.183e-006	-5.854	-5.927	-0.073	(0)
	MgCO3	1.150e-006	1.150e-006	-5.939	-5.939	0.000	(0)
	FeHCO3+	3.045e-007	2.595e-007	-6.516	-6.586	-0.069	(0)
	NaCO3-	1.287e-007	1.092e-007	-6.890	-6.962	-0.071	(0)
	ZnHCO3+	6.441e-008	5.176e-008	-7.191	-7.286	-0.095	(0)
	CuCO3	4.178e-008	4.178e-008	-7.379	-7.379	0.000	(0)
	NiHCO3+	3.976e-008	3.195e-008	-7.401	-7.496	-0.095	(0)
	ZnCO3	3.589e-008	3.589e-008	-7.445	-7.445	0.000	(0)
	CoHCO3+	1.916e-008	1.540e-008	-7.718	-7.812	-0.095	(0)
	BaHCO3+	1.469e-008	1.252e-008	-7.833	-7.902	-0.069	(0)
	PbCO3	4.498e-009	4.498e-009	-8.347	-8.347	0.000	(0)
	NiCO3	3.684e-009	3.684e-009	-8.434	-8.434	0.000	(0)
	PbHCO3+	3.630e-009	2.918e-009	-8.440	-8.535	-0.095	(0)
	UO2 (CO3) 3-4	3.261e-009	9.870e-011	-8.487	-10.006	-1.519	(0)
	UO2 (CO3) 2-2	3.012e-009	1.256e-009	-8.521	-8.901	-0.380	(0)
	CuHCO3+	1.462e-009	1.175e-009	-8.835	-8.930	-0.095	(0)
	CoCO3	1.275e-009	1.275e-009	-8.894	-8.894	0.000	(0)
	Cu (CO3) 2-2	4.227e-010	1.763e-010	-9.374	-9.754	-0.380	(0)
	BaCO3	2.562e-010	2.562e-010	-9.591	-9.591	0.000	(0)
	CdCO3	1.044e-010	1.044e-010	-9.981	-9.981	0.000	(0)
	Pb (CO3) 2-2	4.876e-011	2.034e-011	-10.312	-10.692	-0.380	(0)
	UO2CO3	4.016e-011	4.016e-011	-10.396	-10.396	0.000	(0)
	CdHCO3+	3.404e-011	2.736e-011	-10.468	-10.563	-0.095	(0)
	Cd (CO3) 2-2	2.908e-013	1.213e-013	-12.536	-12.916	-0.380	(0)
	HgCO3	2.030e-019	2.030e-019	-18.692	-18.692	0.000	(0)
	Hg (CO3) 2-2	2.413e-021	1.007e-021	-20.617	-20.997	-0.380	(0)
	HgHCO3+	5.788e-022	4.651e-022	-21.237	-21.332	-0.095	(0)
Ca	8.399e-003						
	Ca+2	5.793e-003	2.910e-003	-2.237	-2.536	-0.299	(0)
	CaSO4	2.330e-003	2.330e-003	-2.633	-2.633	0.000	(0)
	CaHCO3+	2.616e-004	2.229e-004	-3.582	-3.652	-0.069	(0)
	CaCO3	7.231e-006	7.231e-006	-5.141	-5.141	0.000	(0)
	CaF+	6.503e-006	5.501e-006	-5.187	-5.260	-0.073	(0)
	CaNO3+	6.529e-007	5.247e-007	-6.185	-6.280	-0.095	(0)
	CaH2BO3+	1.206e-008	9.974e-009	-7.919	-8.001	-0.082	(0)
	CaOH+	5.574e-009	4.750e-009	-8.254	-8.323	-0.069	(0)
Cd	8.912e-009						
	Cd+2	5.814e-009	2.921e-009	-8.236	-8.534	-0.299	(0)
	CdSO4	2.394e-009	2.394e-009	-8.621	-8.621	0.000	(0)
	CdCl+	2.808e-010	2.256e-010	-9.552	-9.647	-0.095	(0)
	Cd (SO4) 2-2	2.706e-010	1.129e-010	-9.568	-9.947	-0.380	(0)
	CdCO3	1.044e-010	1.044e-010	-9.981	-9.981	0.000	(0)
	CdHCO3+	3.404e-011	2.736e-011	-10.468	-10.563	-0.095	(0)
	CdF+	9.976e-012	8.017e-012	-11.001	-11.096	-0.095	(0)
	CdOH+	2.362e-012	1.898e-012	-11.627	-11.722	-0.095	(0)
	CdCl2	7.608e-013	7.608e-013	-12.119	-12.119	0.000	(0)
	CdOHC1	7.571e-013	7.571e-013	-12.121	-12.121	0.000	(0)
	CdNO3+	6.553e-013	5.267e-013	-12.184	-12.278	-0.095	(0)
	Cd (CO3) 2-2	2.908e-013	1.213e-013	-12.536	-12.916	-0.380	(0)
	CdF2	2.770e-015	2.770e-015	-14.557	-14.557	0.000	(0)
	Cd (OH) 2	9.797e-016	9.797e-016	-15.009	-15.009	0.000	(0)

CdCl3-	4.831e-016	3.883e-016	-15.316	-15.411	-0.095	(0)
Cd(NO3)2	1.505e-017	1.505e-017	-16.822	-16.822	0.000	(0)
Cd2OH+3	1.987e-019	2.779e-020	-18.702	-19.556	-0.854	(0)
Cd(OH)3-	6.093e-021	4.896e-021	-20.215	-20.310	-0.095	(0)
CdSeO4	2.946e-027	2.946e-027	-26.531	-26.531	0.000	(0)
Cd(OH)4-2	1.572e-028	6.556e-029	-27.804	-28.183	-0.380	(0)
Cd(SeO3)2-2	2.542e-031	1.060e-031	-30.595	-30.975	-0.380	(0)
Cl	9.608e-004					
Cl-	9.607e-004	8.088e-004	-3.017	-3.092	-0.075	(0)
MnCl+	1.735e-008	1.467e-008	-7.761	-7.833	-0.073	(0)
AgCl	1.493e-008	1.493e-008	-7.826	-7.826	0.000	(0)
AgCl2-	1.309e-009	1.052e-009	-8.883	-8.978	-0.095	(0)
ZnCl+	9.636e-010	8.084e-010	-9.016	-9.092	-0.076	(0)
CdCl+	2.808e-010	2.256e-010	-9.552	-9.647	-0.095	(0)
CuCl	2.257e-010	2.257e-010	-9.646	-9.646	0.000	(0)
CoCl+	1.676e-010	1.347e-010	-9.776	-9.871	-0.095	(0)
NiCl+	1.622e-010	1.304e-010	-9.790	-9.885	-0.095	(0)
ZnOHC1	8.657e-011	8.657e-011	-10.063	-10.063	0.000	(0)
CuCl2-	4.547e-011	3.815e-011	-10.342	-10.419	-0.076	(0)
PbCl+	3.408e-011	2.739e-011	-10.467	-10.562	-0.095	(0)
MnCl2	1.676e-011	1.676e-011	-10.776	-10.776	0.000	(0)
CuCl+	6.916e-012	5.802e-012	-11.160	-11.236	-0.076	(0)
AgCl3-2	1.817e-012	7.581e-013	-11.741	-12.120	-0.380	(0)
ZnCl2	1.036e-012	1.036e-012	-11.985	-11.985	0.000	(0)
CdCl2	7.608e-013	7.608e-013	-12.119	-12.119	0.000	(0)
CdOHC1	7.571e-013	7.571e-013	-12.121	-12.121	0.000	(0)
PbCl2	9.896e-014	9.896e-014	-13.005	-13.005	0.000	(0)
CuCl3-2	1.289e-014	6.597e-015	-13.890	-14.181	-0.291	(0)
CrCl+2	1.117e-014	4.658e-015	-13.952	-14.332	-0.380	(0)
AgCl4-3	8.954e-015	1.252e-015	-14.048	-14.902	-0.854	(0)
MnCl3-	4.415e-015	3.735e-015	-14.355	-14.428	-0.073	(0)
CuCl2	1.627e-015	1.627e-015	-14.789	-14.789	0.000	(0)
ZnCl3-	7.936e-016	6.658e-016	-15.100	-15.177	-0.076	(0)
NiCl2	5.309e-016	5.309e-016	-15.275	-15.275	0.000	(0)
CdCl3-	4.831e-016	3.883e-016	-15.316	-15.411	-0.095	(0)
FeCl+2	2.221e-016	1.137e-016	-15.653	-15.944	-0.291	(0)
PbCl3-	3.965e-017	3.187e-017	-16.402	-16.497	-0.095	(0)
HgClOH	1.265e-017	1.265e-017	-16.898	-16.898	0.000	(0)
UO2Cl+	1.050e-017	8.441e-018	-16.979	-17.074	-0.095	(0)
HgCl2	7.080e-018	7.080e-018	-17.150	-17.150	0.000	(0)
CrOHC12	5.858e-018	5.858e-018	-17.232	-17.232	0.000	(0)
VOCl+	1.400e-018	1.125e-018	-17.854	-17.949	-0.095	(0)
ZnCl4-2	5.261e-019	2.693e-019	-18.279	-18.570	-0.291	(0)
FeCl2+	4.856e-019	4.107e-019	-18.314	-18.386	-0.073	(0)
CrCl2+	4.448e-019	3.575e-019	-18.352	-18.447	-0.095	(0)
HgCl3-	7.126e-020	5.727e-020	-19.147	-19.242	-0.095	(0)
PbCl4-2	2.825e-020	1.178e-020	-19.549	-19.929	-0.380	(0)
CuCl3-	1.464e-020	1.228e-020	-19.834	-19.911	-0.076	(0)
HgCl+	2.173e-021	1.747e-021	-20.663	-20.758	-0.095	(0)
HgCl4-2	4.421e-022	1.844e-022	-21.354	-21.734	-0.380	(0)
FeCl3	3.322e-023	3.322e-023	-22.479	-22.479	0.000	(0)
CuCl4-2	9.728e-026	4.980e-026	-25.012	-25.303	-0.291	(0)
CrO3Cl-	2.981e-031	2.395e-031	-30.526	-30.621	-0.095	(0)
CoCl+2	7.560e-037	3.153e-037	-36.121	-36.501	-0.380	(0)
UCl+3	0.000e+000	0.000e+000	-41.153	-42.007	-0.854	(0)
Co(2)	1.700e-007					
Co+2	1.154e-007	4.813e-008	-6.938	-7.318	-0.380	(0)
CoSO4	3.357e-008	3.357e-008	-7.474	-7.474	0.000	(0)
CoHCO3+	1.916e-008	1.540e-008	-7.718	-7.812	-0.095	(0)
CoCO3	1.275e-009	1.275e-009	-8.894	-8.894	0.000	(0)
CoF+	3.280e-010	2.636e-010	-9.484	-9.579	-0.095	(0)
CoCl+	1.676e-010	1.347e-010	-9.776	-9.871	-0.095	(0)
CoOH+	9.775e-011	7.856e-011	-10.010	-10.105	-0.095	(0)
CoNO3+	5.412e-012	4.349e-012	-11.267	-11.362	-0.095	(0)
Co(OH)2	5.105e-013	5.105e-013	-12.292	-12.292	0.000	(0)
Co(NO3)2	5.045e-016	5.045e-016	-15.297	-15.297	0.000	(0)
Co2OH+3	1.355e-018	1.895e-019	-17.868	-18.722	-0.854	(0)
Co(OH)3-	1.037e-018	8.332e-019	-17.984	-18.079	-0.095	(0)

	CoOOH-	2.603e-019	2.092e-019	-18.585	-18.680	-0.095	(0)
	CoSeO4	1.307e-025	1.307e-025	-24.884	-24.884	0.000	(0)
	Co (OH) 4-2	2.590e-026	1.080e-026	-25.587	-25.966	-0.380	(0)
	Co4 (OH) 4+4	2.510e-031	7.598e-033	-30.600	-32.119	-1.519	(0)
Co (3)	1.910e-030						
	CoOH+2	1.910e-030	7.965e-031	-29.719	-30.099	-0.380	(0)
	Co+3	9.017e-036	1.916e-036	-35.045	-35.718	-0.673	(0)
	CoCl+2	7.560e-037	3.153e-037	-36.121	-36.501	-0.380	(0)
Cr (2)	2.549e-022						
	Cr+2	2.549e-022	1.063e-022	-21.594	-21.973	-0.380	(0)
Cr (3)	1.272e-007						
	Cr (OH) 2+	9.864e-008	7.927e-008	-7.006	-7.101	-0.095	(0)
	Cr (OH) +2	1.909e-008	7.964e-009	-7.719	-8.099	-0.380	(0)
	CrOHSO4	6.606e-009	6.606e-009	-8.180	-8.180	0.000	(0)
	Cr (OH) 3	2.436e-009	2.436e-009	-8.613	-8.613	0.000	(0)
	CrF+2	2.928e-010	1.221e-010	-9.533	-9.913	-0.380	(0)
	CrSO4+	4.520e-011	3.632e-011	-10.345	-10.440	-0.095	(0)
	Cr+3	3.183e-011	4.450e-012	-10.497	-11.352	-0.854	(0)
	CrO2-	1.171e-011	9.408e-012	-10.932	-11.026	-0.095	(0)
	Cr (OH) 4-	9.872e-012	7.934e-012	-11.006	-11.101	-0.095	(0)
	Cr2 (OH) 2SO4+2	1.140e-014	4.755e-015	-13.943	-14.323	-0.380	(0)
	CrCl+2	1.117e-014	4.658e-015	-13.952	-14.332	-0.380	(0)
	Cr2 (OH) 2 (SO4) 2	9.875e-016	9.875e-016	-15.005	-15.005	0.000	(0)
	CrNO3+2	2.659e-017	1.109e-017	-16.575	-16.955	-0.380	(0)
	CrOHC12	5.858e-018	5.858e-018	-17.232	-17.232	0.000	(0)
	CrCl2+	4.448e-019	3.575e-019	-18.352	-18.447	-0.095	(0)
Cr (6)	2.411e-021						
	CrO4-2	1.913e-021	9.609e-022	-20.718	-21.017	-0.299	(0)
	HCrO4-	4.760e-022	3.825e-022	-21.322	-21.417	-0.095	(0)
	NaCrO4-	2.223e-023	1.786e-023	-22.653	-22.748	-0.095	(0)
	KCrO4-	4.115e-025	3.307e-025	-24.386	-24.481	-0.095	(0)
	CrO3SO4-2	1.202e-028	5.013e-029	-27.920	-28.300	-0.380	(0)
	H2CrO4	3.815e-029	3.815e-029	-28.419	-28.419	0.000	(0)
	CrO3Cl-	2.981e-031	2.395e-031	-30.526	-30.621	-0.095	(0)
	Cr2O7-2	0.000e+000	0.000e+000	-40.915	-41.294	-0.380	(0)
Cu (1)	5.471e-010						
	Cu+	2.758e-010	2.217e-010	-9.559	-9.654	-0.095	(0)
	CuCl	2.257e-010	2.257e-010	-9.646	-9.646	0.000	(0)
	CuCl2-	4.547e-011	3.815e-011	-10.342	-10.419	-0.076	(0)
	CuCl3-2	1.289e-014	6.597e-015	-13.890	-14.181	-0.291	(0)
Cu (2)	5.779e-008						
	CuCO3	4.178e-008	4.178e-008	-7.379	-7.379	0.000	(0)
	Cu+2	9.009e-009	4.526e-009	-8.045	-8.344	-0.299	(0)
	CuSO4	3.625e-009	3.625e-009	-8.441	-8.441	0.000	(0)
	CuHCO3+	1.462e-009	1.175e-009	-8.835	-8.930	-0.095	(0)
	CuOH+	1.396e-009	1.171e-009	-8.855	-8.931	-0.076	(0)
	Cu (CO3) 2-2	4.227e-010	1.763e-010	-9.374	-9.754	-0.380	(0)
	CuF+	6.154e-011	4.946e-011	-10.211	-10.306	-0.095	(0)
	Cu (OH) 2	1.911e-011	1.911e-011	-10.719	-10.719	0.000	(0)
	CuCl+	6.916e-012	5.802e-012	-11.160	-11.236	-0.076	(0)
	CuNO3+	1.015e-012	8.161e-013	-11.993	-12.088	-0.095	(0)
	Cu2 (OH) 2+2	8.256e-014	3.444e-014	-13.083	-13.463	-0.380	(0)
	Cu (OH) 3-	3.990e-015	3.207e-015	-14.399	-14.494	-0.095	(0)
	CuCl2	1.627e-015	1.627e-015	-14.789	-14.789	0.000	(0)
	Cu (NO3) 2	5.858e-018	5.858e-018	-17.232	-17.232	0.000	(0)
	CuCl3-	1.464e-020	1.228e-020	-19.834	-19.911	-0.076	(0)
	Cu (OH) 4-2	4.950e-021	2.065e-021	-20.305	-20.685	-0.380	(0)
	CuCl4-2	9.728e-026	4.980e-026	-25.012	-25.303	-0.291	(0)
F	2.426e-004						
	F-	2.057e-004	1.732e-004	-3.687	-3.762	-0.075	(0)
	MgF+	2.034e-005	1.714e-005	-4.692	-4.766	-0.074	(0)
	CaF+	6.503e-006	5.501e-006	-5.187	-5.260	-0.073	(0)
	AlF3	2.100e-006	2.100e-006	-5.678	-5.678	0.000	(0)
	AlF2+	1.135e-006	9.631e-007	-5.945	-6.016	-0.071	(0)
	NaF	4.088e-007	4.088e-007	-6.388	-6.388	0.000	(0)
	AlF4-	2.163e-007	1.822e-007	-6.665	-6.739	-0.074	(0)
	MnF+	1.174e-007	9.934e-008	-6.930	-7.003	-0.073	(0)
	HF	3.151e-008	3.151e-008	-7.502	-7.502	0.000	(0)

AlF+2	2.696e-008	1.397e-008	-7.569	-7.855	-0.285	(0)
ZnF+	1.711e-009	1.375e-009	-8.767	-8.862	-0.095	(0)
BF (OH) 3-	1.054e-009	8.718e-010	-8.977	-9.060	-0.082	(0)
NiF+	3.410e-010	2.740e-010	-9.467	-9.562	-0.095	(0)
CoF+	3.280e-010	2.636e-010	-9.484	-9.579	-0.095	(0)
CrF+2	2.928e-010	1.221e-010	-9.533	-9.913	-0.380	(0)
CuF+	6.154e-011	4.946e-011	-10.211	-10.306	-0.095	(0)
HF2-	2.484e-011	2.075e-011	-10.605	-10.683	-0.078	(0)
PbF+	1.449e-011	1.165e-011	-10.839	-10.934	-0.095	(0)
CdF+	9.976e-012	8.017e-012	-11.001	-11.096	-0.095	(0)
FeF2+	4.842e-012	4.096e-012	-11.315	-11.388	-0.073	(0)
AgF	3.932e-012	3.932e-012	-11.405	-11.405	0.000	(0)
BF2 (OH) 2-	2.402e-012	1.987e-012	-11.619	-11.702	-0.082	(0)
FeF+2	1.727e-012	8.838e-013	-11.763	-12.054	-0.291	(0)
FeF3	1.001e-012	1.001e-012	-12.000	-12.000	0.000	(0)
UO2F+	1.914e-013	1.538e-013	-12.718	-12.813	-0.095	(0)
UO2F2	7.683e-014	7.683e-014	-13.114	-13.114	0.000	(0)
PbF2	3.970e-014	3.970e-014	-13.401	-13.401	0.000	(0)
UO2F3-	4.159e-015	3.342e-015	-14.381	-14.476	-0.095	(0)
CdF2	2.770e-015	2.770e-015	-14.557	-14.557	0.000	(0)
H2F2	2.661e-015	2.661e-015	-14.575	-14.575	0.000	(0)
VO2F	1.244e-015	1.244e-015	-14.905	-14.905	0.000	(0)
VOF+	6.409e-016	5.151e-016	-15.193	-15.288	-0.095	(0)
VO2F2-	9.729e-017	7.819e-017	-16.012	-16.107	-0.095	(0)
VOF2	3.345e-017	3.345e-017	-16.476	-16.476	0.000	(0)
BF3OH-	1.992e-017	1.648e-017	-16.701	-16.783	-0.082	(0)
PbF3-	1.622e-017	1.304e-017	-16.790	-16.885	-0.095	(0)
UO2F4-2	1.102e-017	4.597e-018	-16.958	-17.337	-0.380	(0)
VO2F3-2	4.049e-019	1.689e-019	-18.393	-18.772	-0.380	(0)
VOF3-	2.557e-019	2.055e-019	-18.592	-18.687	-0.095	(0)
Sb (OH) 2F	8.804e-021	8.804e-021	-20.055	-20.055	0.000	(0)
SbOF	8.661e-021	8.661e-021	-20.062	-20.062	0.000	(0)
PbF4-2	2.591e-021	1.081e-021	-20.587	-20.966	-0.380	(0)
BF4-	2.089e-021	1.728e-021	-20.680	-20.762	-0.082	(0)
VOF4-2	3.444e-022	1.437e-022	-21.463	-21.843	-0.380	(0)
VO2F4-3	1.029e-022	1.439e-023	-21.987	-22.842	-0.854	(0)
HgF+	8.645e-028	6.947e-028	-27.063	-27.158	-0.095	(0)
UF3+	6.243e-031	5.017e-031	-30.205	-30.300	-0.095	(0)
UF2+2	4.382e-032	1.828e-032	-31.358	-31.738	-0.380	(0)
UF4	9.527e-033	9.527e-033	-32.021	-32.021	0.000	(0)
UF5-	8.136e-035	6.538e-035	-34.090	-34.185	-0.095	(0)
UF+3	5.997e-035	8.384e-036	-34.222	-35.077	-0.854	(0)
UF6-2	8.198e-036	3.419e-036	-35.086	-35.466	-0.380	(0)
Fe (2)	1.663e-005					
Fe+2	1.201e-005	5.010e-006	-4.920	-5.300	-0.380	(0)
FeSO4	4.299e-006	4.299e-006	-5.367	-5.367	0.000	(0)
FeHCO3+	3.045e-007	2.595e-007	-6.516	-6.586	-0.069	(0)
FeOH+	1.929e-008	1.632e-008	-7.715	-7.787	-0.073	(0)
Fe (OH) 2	1.060e-012	1.060e-012	-11.975	-11.975	0.000	(0)
Fe (OH) 3-	3.243e-014	2.743e-014	-13.489	-13.562	-0.073	(0)
Fe (3)	9.915e-006					
Fe (OH) 2+	9.221e-006	7.824e-006	-5.035	-5.107	-0.071	(0)
Fe (OH) 3	6.874e-007	6.874e-007	-6.163	-6.163	0.000	(0)
Fe (OH) 4-	6.171e-009	5.236e-009	-8.210	-8.281	-0.071	(0)
FeOH+2	4.802e-010	2.458e-010	-9.319	-9.609	-0.291	(0)
FeF2+	4.842e-012	4.096e-012	-11.315	-11.388	-0.073	(0)
FeF+2	1.727e-012	8.838e-013	-11.763	-12.054	-0.291	(0)
FeF3	1.001e-012	1.001e-012	-12.000	-12.000	0.000	(0)
FeSO4+	2.158e-013	1.825e-013	-12.666	-12.739	-0.073	(0)
Fe+3	2.190e-014	4.654e-015	-13.660	-14.332	-0.673	(0)
Fe (SO4) 2-	1.698e-014	1.364e-014	-13.770	-13.865	-0.095	(0)
FeCl+2	2.221e-016	1.137e-016	-15.653	-15.944	-0.291	(0)
Fe2 (OH) 2+4	6.611e-017	2.001e-018	-16.180	-17.699	-1.519	(0)
FeNO3+2	6.362e-018	2.654e-018	-17.196	-17.576	-0.380	(0)
FeCl2+	4.856e-019	4.107e-019	-18.314	-18.386	-0.073	(0)
Fe3 (OH) 4+5	5.347e-020	2.263e-022	-19.272	-21.645	-2.373	(0)
FeCl3	3.322e-023	3.322e-023	-22.479	-22.479	0.000	(0)
FeHSeO3+2	6.047e-024	2.522e-024	-23.218	-23.598	-0.380	(0)

H (0)	2.126e-025					
H2	1.063e-025	1.072e-025	-24.973	-24.970	0.003	(0)
Hg (0)	9.989e-012					
Hg	9.989e-012	9.989e-012	-11.000	-11.000	0.000	(0)
Hg (1)	3.519e-027					
Hg2+2	1.759e-027	7.339e-028	-26.755	-27.134	-0.380	(0)
Hg (2)	2.454e-017					
HgClOH	1.265e-017	1.265e-017	-16.898	-16.898	0.000	(0)
HgCl2	7.080e-018	7.080e-018	-17.150	-17.150	0.000	(0)
Hg (OH) 2	4.533e-018	4.570e-018	-17.344	-17.340	0.003	(0)
HgCO3	2.030e-019	2.030e-019	-18.692	-18.692	0.000	(0)
HgCl3-	7.126e-020	5.727e-020	-19.147	-19.242	-0.095	(0)
Hg (CO3) 2-2	2.413e-021	1.007e-021	-20.617	-20.997	-0.380	(0)
HgCl+	2.173e-021	1.747e-021	-20.663	-20.758	-0.095	(0)
HgHCO3+	5.788e-022	4.651e-022	-21.237	-21.332	-0.095	(0)
HgCl4-2	4.421e-022	1.844e-022	-21.354	-21.734	-0.380	(0)
HgOH+	4.386e-022	3.524e-022	-21.358	-21.453	-0.095	(0)
Hg+2	2.595e-025	1.082e-025	-24.586	-24.966	-0.380	(0)
HgSO4	9.905e-026	9.905e-026	-25.004	-25.004	0.000	(0)
Hg (OH) 3-	5.856e-026	4.706e-026	-25.232	-25.327	-0.095	(0)
HgF+	8.645e-028	6.947e-028	-27.063	-27.158	-0.095	(0)
HgNO3+	2.835e-030	2.278e-030	-29.547	-29.642	-0.095	(0)
Hg (NO3) 2	5.399e-035	5.399e-035	-34.268	-34.268	0.000	(0)
K	1.127e-004					
K+	1.100e-004	9.264e-005	-3.958	-4.033	-0.075	(0)
KSO4-	2.702e-006	2.293e-006	-5.568	-5.640	-0.071	(0)
KCrO4-	4.115e-025	3.307e-025	-24.386	-24.481	-0.095	(0)
Mg	2.382e-003					
Mg+2	1.756e-003	8.820e-004	-2.756	-3.055	-0.299	(0)
MgSO4	5.611e-004	5.611e-004	-3.251	-3.251	0.000	(0)
MgHCO3+	4.426e-005	3.713e-005	-4.354	-4.430	-0.076	(0)
MgF+	2.034e-005	1.714e-005	-4.692	-4.766	-0.074	(0)
MgCO3	1.150e-006	1.150e-006	-5.939	-5.939	0.000	(0)
MgOH+	3.359e-008	2.872e-008	-7.474	-7.542	-0.068	(0)
MgH2BO3+	2.202e-009	1.821e-009	-8.657	-8.740	-0.082	(0)
Mn (2)	4.504e-005					
Mn+2	3.455e-005	1.441e-005	-4.462	-4.841	-0.380	(0)
MnSO4	8.957e-006	8.957e-006	-5.048	-5.048	0.000	(0)
MnHCO3+	1.398e-006	1.183e-006	-5.854	-5.927	-0.073	(0)
MnF+	1.174e-007	9.934e-008	-6.930	-7.003	-0.073	(0)
MnCl+	1.735e-008	1.467e-008	-7.761	-7.833	-0.073	(0)
MnOH+	3.501e-009	2.961e-009	-8.456	-8.529	-0.073	(0)
MnNO3+	1.620e-009	1.302e-009	-8.790	-8.885	-0.095	(0)
MnCl2	1.676e-011	1.676e-011	-10.776	-10.776	0.000	(0)
Mn (NO3) 2	1.865e-013	1.865e-013	-12.729	-12.729	0.000	(0)
MnCl3-	4.415e-015	3.735e-015	-14.355	-14.428	-0.073	(0)
Mn (OH) 3-	1.448e-019	1.225e-019	-18.839	-18.912	-0.073	(0)
MnSeO4	2.101e-023	2.101e-023	-22.678	-22.678	0.000	(0)
Mn (OH) 4-2	6.318e-026	3.234e-026	-25.199	-25.490	-0.291	(0)
MnSe	2.490e-037	2.490e-037	-36.604	-36.604	0.000	(0)
Mn (3)	3.029e-026					
Mn+3	3.029e-026	6.436e-027	-25.519	-26.191	-0.673	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-51.693	-51.984	-0.291	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-57.276	-57.356	-0.080	(0)
Mo	1.243e-007					
MoO4-2	1.241e-007	6.233e-008	-6.906	-7.205	-0.299	(0)
HMoO4-	1.899e-010	1.526e-010	-9.722	-9.816	-0.095	(0)
H2MoO4	1.375e-013	1.375e-013	-12.862	-12.862	0.000	(0)
Ag2MoO4	1.928e-024	1.928e-024	-23.715	-23.715	0.000	(0)
AlMo6O21-3	1.155e-040	0.000e+000	-39.937	-40.792	-0.854	(0)
Mo7O24-6	0.000e+000	0.000e+000	-49.308	-52.726	-3.418	(0)
HMo7O24-5	0.000e+000	0.000e+000	-50.876	-53.249	-2.373	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-53.858	-55.377	-1.519	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-58.187	-59.041	-0.854	(0)
N (5)	6.838e-005					
NO3-	6.772e-005	5.702e-005	-4.169	-4.244	-0.075	(0)

CaNO3+	6.529e-007	5.247e-007	-6.185	-6.280	-0.095	(0)
MnNO3+	1.620e-009	1.302e-009	-8.790	-8.885	-0.095	(0)
BaNO3+	1.133e-010	9.105e-011	-9.946	-10.041	-0.095	(0)
ZnNO3+	7.091e-011	5.698e-011	-10.149	-10.244	-0.095	(0)
NiNO3+	1.123e-011	9.022e-012	-10.950	-11.045	-0.095	(0)
CoNO3+	5.412e-012	4.349e-012	-11.267	-11.362	-0.095	(0)
CuNO3+	1.015e-012	8.161e-013	-11.993	-12.088	-0.095	(0)
PbNO3+	1.002e-012	8.049e-013	-11.999	-12.094	-0.095	(0)
CdNO3+	6.553e-013	5.267e-013	-12.184	-12.278	-0.095	(0)
AgNO3	4.094e-013	4.094e-013	-12.388	-12.388	0.000	(0)
Mn (NO3) 2	1.865e-013	1.865e-013	-12.729	-12.729	0.000	(0)
Zn (NO3) 2	6.482e-016	6.482e-016	-15.188	-15.188	0.000	(0)
Co (NO3) 2	5.045e-016	5.045e-016	-15.297	-15.297	0.000	(0)
Pb (NO3) 2	7.794e-017	7.794e-017	-16.108	-16.108	0.000	(0)
CrNO3+2	2.659e-017	1.109e-017	-16.575	-16.955	-0.380	(0)
Cd (NO3) 2	1.505e-017	1.505e-017	-16.822	-16.822	0.000	(0)
FeNO3+2	6.362e-018	2.654e-018	-17.196	-17.576	-0.380	(0)
Cu (NO3) 2	5.858e-018	5.858e-018	-17.232	-17.232	0.000	(0)
UO2NO3+	9.109e-019	7.320e-019	-18.041	-18.135	-0.095	(0)
VO2NO3	1.181e-019	1.181e-019	-18.928	-18.928	0.000	(0)
HgNO3+	2.835e-030	2.278e-030	-29.547	-29.642	-0.095	(0)
Hg (NO3) 2	5.399e-035	5.399e-035	-34.268	-34.268	0.000	(0)
Na	4.536e-003					
Na+	4.444e-003	3.741e-003	-2.352	-2.427	-0.075	(0)
NaSO4-	8.278e-005	7.023e-005	-4.082	-4.153	-0.071	(0)
NaHCO3	8.655e-006	8.655e-006	-5.063	-5.063	0.000	(0)
NaF	4.088e-007	4.088e-007	-6.388	-6.388	0.000	(0)
NaCO3-	1.287e-007	1.092e-007	-6.890	-6.962	-0.071	(0)
NaH2BO3	3.531e-010	3.531e-010	-9.452	-9.452	0.000	(0)
NaCrO4-	2.223e-023	1.786e-023	-22.653	-22.748	-0.095	(0)
Ni	2.134e-007					
Ni+2	1.254e-007	6.299e-008	-6.902	-7.201	-0.299	(0)
NiSO4	4.394e-008	4.394e-008	-7.357	-7.357	0.000	(0)
NiHCO3+	3.976e-008	3.195e-008	-7.401	-7.496	-0.095	(0)
NiCO3	3.684e-009	3.684e-009	-8.434	-8.434	0.000	(0)
NiF+	3.410e-010	2.740e-010	-9.467	-9.562	-0.095	(0)
NiCl+	1.622e-010	1.304e-010	-9.790	-9.885	-0.095	(0)
NiOH+	8.073e-011	6.488e-011	-10.093	-10.188	-0.095	(0)
Ni (SO4) 2-2	1.219e-011	5.086e-012	-10.914	-11.294	-0.380	(0)
NiNO3+	1.123e-011	9.022e-012	-10.950	-11.045	-0.095	(0)
Ni (OH) 2	4.216e-013	4.216e-013	-12.375	-12.375	0.000	(0)
NiCl2	5.309e-016	5.309e-016	-15.275	-15.275	0.000	(0)
Ni (OH) 3-	4.291e-017	3.449e-017	-16.367	-16.462	-0.095	(0)
NiSeO4	1.596e-025	1.596e-025	-24.797	-24.797	0.000	(0)
O (0)	0.000e+000					
O2	0.000e+000	0.000e+000	-42.359	-42.356	0.003	(0)
Pb	1.209e-008					
PbCO3	4.498e-009	4.498e-009	-8.347	-8.347	0.000	(0)
PbHCO3+	3.630e-009	2.918e-009	-8.440	-8.535	-0.095	(0)
Pb+2	1.900e-009	9.544e-010	-8.721	-9.020	-0.299	(0)
PbSO4	1.634e-009	1.634e-009	-8.787	-8.787	0.000	(0)
PbOH+	2.440e-010	1.961e-010	-9.613	-9.707	-0.095	(0)
Pb (SO4) 2-2	8.252e-011	3.442e-011	-10.083	-10.463	-0.380	(0)
Pb (CO3) 2-2	4.876e-011	2.034e-011	-10.312	-10.692	-0.380	(0)
PbCl+	3.408e-011	2.739e-011	-10.467	-10.562	-0.095	(0)
PbF+	1.449e-011	1.165e-011	-10.839	-10.934	-0.095	(0)
PbNO3+	1.002e-012	8.049e-013	-11.999	-12.094	-0.095	(0)
Pb (OH) 2	5.074e-013	5.074e-013	-12.295	-12.295	0.000	(0)
PbCl2	9.896e-014	9.896e-014	-13.005	-13.005	0.000	(0)
PbF2	3.970e-014	3.970e-014	-13.401	-13.401	0.000	(0)
Pb (NO3) 2	7.794e-017	7.794e-017	-16.108	-16.108	0.000	(0)
Pb (OH) 3-	5.165e-017	4.150e-017	-16.287	-16.382	-0.095	(0)
PbCl3-	3.965e-017	3.187e-017	-16.402	-16.497	-0.095	(0)
Pb2OH+3	2.122e-017	2.967e-018	-16.673	-17.528	-0.854	(0)
PbF3-	1.622e-017	1.304e-017	-16.790	-16.885	-0.095	(0)
PbCl4-2	2.825e-020	1.178e-020	-19.549	-19.929	-0.380	(0)
PbF4-2	2.591e-021	1.081e-021	-20.587	-20.966	-0.380	(0)
Pb (OH) 4-2	1.994e-021	8.315e-022	-20.700	-21.080	-0.380	(0)

Pb3(OH) 4+2	1.175e-023	4.902e-024	-22.930	-23.310	-0.380	(0)
Pb4(OH) 4+4	1.228e-027	3.716e-029	-26.911	-28.430	-1.519	(0)
S(6)	9.949e-003					
SO4-2	6.958e-003	3.496e-003	-2.158	-2.456	-0.299	(0)
CaSO4	2.330e-003	2.330e-003	-2.633	-2.633	0.000	(0)
MgSO4	5.611e-004	5.611e-004	-3.251	-3.251	0.000	(0)
NaSO4-	8.278e-005	7.023e-005	-4.082	-4.153	-0.071	(0)
MnSO4	8.957e-006	8.957e-006	-5.048	-5.048	0.000	(0)
FeSO4	4.299e-006	4.299e-006	-5.367	-5.367	0.000	(0)
KSO4-	2.702e-006	2.293e-006	-5.568	-5.640	-0.071	(0)
ZnSO4	3.043e-007	3.043e-007	-6.517	-6.517	0.000	(0)
HSO4-	4.989e-008	4.203e-008	-7.302	-7.376	-0.074	(0)
NiSO4	4.394e-008	4.394e-008	-7.357	-7.357	0.000	(0)
CoSO4	3.357e-008	3.357e-008	-7.474	-7.474	0.000	(0)
Zn(SO4) 2-2	2.221e-008	9.264e-009	-7.653	-8.033	-0.380	(0)
CrOHSO4	6.606e-009	6.606e-009	-8.180	-8.180	0.000	(0)
CuSO4	3.625e-009	3.625e-009	-8.441	-8.441	0.000	(0)
CdSO4	2.394e-009	2.394e-009	-8.621	-8.621	0.000	(0)
PbSO4	1.634e-009	1.634e-009	-8.787	-8.787	0.000	(0)
AgSO4-	7.845e-010	6.304e-010	-9.105	-9.200	-0.095	(0)
Cd(SO4) 2-2	2.706e-010	1.129e-010	-9.568	-9.947	-0.380	(0)
AlSO4+	2.598e-010	2.189e-010	-9.585	-9.660	-0.074	(0)
Pb(SO4) 2-2	8.252e-011	3.442e-011	-10.083	-10.463	-0.380	(0)
CrSO4+	4.520e-011	3.632e-011	-10.345	-10.440	-0.095	(0)
Ni(SO4) 2-2	1.219e-011	5.086e-012	-10.914	-11.294	-0.380	(0)
Al(SO4) 2-	9.732e-012	8.198e-012	-11.012	-11.086	-0.074	(0)
FeSO4+	2.158e-013	1.825e-013	-12.666	-12.739	-0.073	(0)
UO2SO4	3.405e-014	3.405e-014	-13.468	-13.468	0.000	(0)
Fe(SO4) 2-	1.698e-014	1.364e-014	-13.770	-13.865	-0.095	(0)
Cr2(OH) 2SO4+2	1.140e-014	4.755e-015	-13.943	-14.323	-0.380	(0)
UO2(SO4) 2-2	3.762e-015	1.569e-015	-14.425	-14.804	-0.380	(0)
Cr2(OH) 2(SO4) 2	9.875e-016	9.875e-016	-15.005	-15.005	0.000	(0)
VOSO4	4.774e-016	4.774e-016	-15.321	-15.321	0.000	(0)
VO2SO4-	4.252e-016	3.417e-016	-15.371	-15.466	-0.095	(0)
HgSO4	9.905e-026	9.905e-026	-25.004	-25.004	0.000	(0)
VSO4+	7.657e-028	6.154e-028	-27.116	-27.211	-0.095	(0)
CrO3SO4-2	1.202e-028	5.013e-029	-27.920	-28.300	-0.380	(0)
U(SO4) 2	9.377e-036	9.377e-036	-35.028	-35.028	0.000	(0)
USO4+2	8.096e-037	3.377e-037	-36.092	-36.471	-0.380	(0)
Sb(3)	5.226e-016					
Sb(OH) 3	2.644e-016	2.644e-016	-15.578	-15.578	0.000	(0)
HSbO2	2.582e-016	2.582e-016	-15.588	-15.588	0.000	(0)
Sb(OH) 2F	8.804e-021	8.804e-021	-20.055	-20.055	0.000	(0)
SbOF	8.661e-021	8.661e-021	-20.062	-20.062	0.000	(0)
SbO2-	4.230e-021	3.399e-021	-20.374	-20.469	-0.095	(0)
Sb(OH) 4-	2.421e-021	1.946e-021	-20.616	-20.711	-0.095	(0)
Sb(OH) 2+	9.833e-022	7.902e-022	-21.007	-21.102	-0.095	(0)
SbO+	3.392e-022	2.726e-022	-21.470	-21.565	-0.095	(0)
Sb(5)	7.406e-009					
SbO3-	7.397e-009	5.945e-009	-8.131	-8.226	-0.095	(0)
Sb(OH) 6-	8.248e-012	6.944e-012	-11.084	-11.158	-0.075	(0)
SbO2+	3.213e-023	2.582e-023	-22.493	-22.588	-0.095	(0)
Se(-2)	2.791e-008					
Ag2Se	2.791e-008	2.791e-008	-7.554	-7.554	0.000	(0)
HSe-	6.420e-034	5.159e-034	-33.192	-33.287	-0.095	(0)
H2Se	4.927e-037	4.927e-037	-36.307	-36.307	0.000	(0)
MnSe	2.490e-037	2.490e-037	-36.604	-36.604	0.000	(0)
Se-2	0.000e+000	0.000e+000	-40.998	-41.377	-0.380	(0)
AgOH(Se) 2-4	0.000e+000	0.000e+000	-72.879	-74.398	-1.519	(0)
Se(4)	2.711e-013					
HSeO3-	2.552e-013	2.051e-013	-12.593	-12.688	-0.095	(0)
SeO3-2	1.591e-014	6.636e-015	-13.798	-14.178	-0.380	(0)
H2SeO3	1.076e-017	1.076e-017	-16.968	-16.968	0.000	(0)
AgSeO3-	4.797e-020	3.855e-020	-19.319	-19.414	-0.095	(0)
FeHSeO3+2	6.047e-024	2.522e-024	-23.218	-23.598	-0.380	(0)
Cd(SeO3) 2-2	2.542e-031	1.060e-031	-30.595	-30.975	-0.380	(0)
Ag(SeO3) 2-3	1.638e-032	2.291e-033	-31.786	-32.640	-0.854	(0)
Se(6)	1.080e-020					

SeO4-2	1.078e-020	5.416e-021	-19.967	-20.266	-0.299	(0)
MnSeO4	2.101e-023	2.101e-023	-22.678	-22.678	0.000	(0)
ZnSeO4	3.338e-025	3.338e-025	-24.477	-24.477	0.000	(0)
NiSeO4	1.596e-025	1.596e-025	-24.797	-24.797	0.000	(0)
CoSeO4	1.307e-025	1.307e-025	-24.884	-24.884	0.000	(0)
HSeO4-	4.156e-026	3.340e-026	-25.381	-25.476	-0.095	(0)
CdSeO4	2.946e-027	2.946e-027	-26.531	-26.531	0.000	(0)
Zn(SeO4) 2-2	0.000e+000	0.000e+000	-44.357	-44.737	-0.380	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-52.557	-53.411	-0.854	(0)
U (4)	8.140e-020					
U (OH) 5-	8.106e-020	6.514e-020	-19.091	-19.186	-0.095	(0)
U (OH) 4	3.358e-022	3.358e-022	-21.474	-21.474	0.000	(0)
U (OH) 3+	1.880e-025	1.511e-025	-24.726	-24.821	-0.095	(0)
U (OH) 2+2	2.062e-029	8.601e-030	-28.686	-29.065	-0.380	(0)
UF3+	6.243e-031	5.017e-031	-30.205	-30.300	-0.095	(0)
UF2+2	4.382e-032	1.828e-032	-31.358	-31.738	-0.380	(0)
UF4	9.527e-033	9.527e-033	-32.021	-32.021	0.000	(0)
UOH+3	3.566e-034	4.986e-035	-33.448	-34.302	-0.854	(0)
UF5-	8.136e-035	6.538e-035	-34.090	-34.185	-0.095	(0)
UF+3	5.997e-035	8.384e-036	-34.222	-35.077	-0.854	(0)
U(SO4) 2	9.377e-036	9.377e-036	-35.028	-35.028	0.000	(0)
UF6-2	8.198e-036	3.419e-036	-35.086	-35.466	-0.380	(0)
USO4+2	8.096e-037	3.377e-037	-36.092	-36.471	-0.380	(0)
U+4	8.017e-040	0.000e+000	-39.096	-40.615	-1.519	(0)
UCl+3	0.000e+000	0.000e+000	-41.153	-42.007	-0.854	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-149.508	-157.198	-7.690	(0)
U (5)	4.881e-016					
UO2+	4.881e-016	3.922e-016	-15.312	-15.406	-0.095	(0)
U (6)	6.313e-009					
UO2 (CO3) 3-4	3.261e-009	9.870e-011	-8.487	-10.006	-1.519	(0)
UO2 (CO3) 2-2	3.012e-009	1.256e-009	-8.521	-8.901	-0.380	(0)
UO2CO3	4.016e-011	4.016e-011	-10.396	-10.396	0.000	(0)
UO2F+	1.914e-013	1.538e-013	-12.718	-12.813	-0.095	(0)
UO2OH+	8.246e-014	6.627e-014	-13.084	-13.179	-0.095	(0)
UO2F2	7.683e-014	7.683e-014	-13.114	-13.114	0.000	(0)
UO2SO4	3.405e-014	3.405e-014	-13.468	-13.468	0.000	(0)
UO2+2	1.281e-014	6.435e-015	-13.893	-14.191	-0.299	(0)
UO2F3-	4.159e-015	3.342e-015	-14.381	-14.476	-0.095	(0)
UO2 (SO4) 2-2	3.762e-015	1.569e-015	-14.425	-14.804	-0.380	(0)
UO2F4-2	1.102e-017	4.597e-018	-16.958	-17.337	-0.380	(0)
UO2Cl+	1.050e-017	8.441e-018	-16.979	-17.074	-0.095	(0)
UO2NO3+	9.109e-019	7.320e-019	-18.041	-18.135	-0.095	(0)
(UO2) 2 (OH) 2+2	1.747e-020	7.288e-021	-19.758	-20.137	-0.380	(0)
(UO2) 3 (OH) 5+	3.051e-024	2.452e-024	-23.516	-23.610	-0.095	(0)
V (2)	1.039e-035					
VOH+	6.016e-036	4.835e-036	-35.221	-35.316	-0.095	(0)
V+2	4.379e-036	1.826e-036	-35.359	-35.738	-0.380	(0)
V (3)	1.647e-010					
V (OH) 3	1.647e-010	1.647e-010	-9.783	-9.783	0.000	(0)
V (OH) 2+	1.630e-020	1.310e-020	-19.788	-19.883	-0.095	(0)
VOH+2	3.665e-023	1.529e-023	-22.436	-22.816	-0.380	(0)
V+3	2.667e-027	3.729e-028	-26.574	-27.428	-0.854	(0)
VSO4+	7.657e-028	6.154e-028	-27.116	-27.211	-0.095	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-43.312	-44.831	-1.519	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-43.392	-44.247	-0.854	(0)
V (4)	1.241e-014					
V (OH) 3+	1.007e-014	8.090e-015	-13.997	-14.092	-0.095	(0)
VO+2	1.189e-015	4.959e-016	-14.925	-15.305	-0.380	(0)
VOF+	6.409e-016	5.151e-016	-15.193	-15.288	-0.095	(0)
VOSO4	4.774e-016	4.774e-016	-15.321	-15.321	0.000	(0)
VOF2	3.345e-017	3.345e-017	-16.476	-16.476	0.000	(0)
VOC1+	1.400e-018	1.125e-018	-17.854	-17.949	-0.095	(0)
VOF3-	2.557e-019	2.055e-019	-18.592	-18.687	-0.095	(0)
VOF4-2	3.444e-022	1.437e-022	-21.463	-21.843	-0.380	(0)
H2V2O4+2	7.872e-024	3.283e-024	-23.104	-23.484	-0.380	(0)
V (5)	1.754e-008					
H2VO4-	1.685e-008	1.354e-008	-7.773	-7.868	-0.095	(0)

HVO4-2	6.629e-010	2.765e-010	-9.179	-9.558	-0.380	(0)
H3VO4	1.666e-011	1.666e-011	-10.778	-10.778	0.000	(0)
H3V2O7-	1.814e-012	1.458e-012	-11.741	-11.836	-0.095	(0)
HV2O7-3	9.080e-015	1.270e-015	-14.042	-14.896	-0.854	(0)
VO2+	4.863e-015	4.094e-015	-14.313	-14.388	-0.075	(0)
VO2F	1.244e-015	1.244e-015	-14.905	-14.905	0.000	(0)
VO2SO4-	4.252e-016	3.417e-016	-15.371	-15.466	-0.095	(0)
VO2F2-	9.729e-017	7.819e-017	-16.012	-16.107	-0.095	(0)
VO4-3	8.057e-017	1.126e-017	-16.094	-16.948	-0.854	(0)
V3O9-3	1.863e-017	2.605e-018	-16.730	-17.584	-0.854	(0)
V2O7-4	9.177e-018	2.778e-019	-17.037	-18.556	-1.519	(0)
VO2F3-2	4.049e-019	1.689e-019	-18.393	-18.772	-0.380	(0)
VO2NO3	1.181e-019	1.181e-019	-18.928	-18.928	0.000	(0)
V4O12-4	4.862e-022	1.471e-023	-21.313	-22.832	-1.519	(0)
VO2F4-3	1.029e-022	1.439e-023	-21.987	-22.842	-0.854	(0)
HV10O28-5	0.000e+000	0.000e+000	-53.764	-56.138	-2.373	(0)
V10O28-6	0.000e+000	0.000e+000	-53.997	-57.414	-3.418	(0)
H2V10O28-4	0.000e+000	0.000e+000	-56.321	-57.840	-1.519	(0)
Zn	1.226e-006					
Zn+2	7.919e-007	3.979e-007	-6.101	-6.400	-0.299	(0)
ZnSO4	3.043e-007	3.043e-007	-6.517	-6.517	0.000	(0)
ZnHCO3+	6.441e-008	5.176e-008	-7.191	-7.286	-0.095	(0)
ZnCO3	3.589e-008	3.589e-008	-7.445	-7.445	0.000	(0)
Zn(SO4) 2-2	2.221e-008	9.264e-009	-7.653	-8.033	-0.380	(0)
ZnOH+	4.050e-009	3.255e-009	-8.393	-8.487	-0.095	(0)
ZnF+	1.711e-009	1.375e-009	-8.767	-8.862	-0.095	(0)
ZnCl+	9.636e-010	8.084e-010	-9.016	-9.092	-0.076	(0)
ZnOHCl	8.657e-011	8.657e-011	-10.063	-10.063	0.000	(0)
ZnNO3+	7.091e-011	5.698e-011	-10.149	-10.244	-0.095	(0)
Zn(OH) 2	4.220e-011	4.220e-011	-10.375	-10.375	0.000	(0)
ZnCl2	1.036e-012	1.036e-012	-11.985	-11.985	0.000	(0)
Zn(OH) 3-	2.153e-014	1.730e-014	-13.667	-13.762	-0.095	(0)
ZnCl3-	7.936e-016	6.658e-016	-15.100	-15.177	-0.076	(0)
Zn(NO3) 2	6.482e-016	6.482e-016	-15.188	-15.188	0.000	(0)
ZnCl4-2	5.261e-019	2.693e-019	-18.279	-18.570	-0.291	(0)
Zn(OH) 4-2	1.351e-019	5.635e-020	-18.869	-19.249	-0.380	(0)
ZnSeO4	3.338e-025	3.338e-025	-24.477	-24.477	0.000	(0)
Zn(SeO4) 2-2	0.000e+000	0.000e+000	-44.357	-44.737	-0.380	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Ag2CO3	-10.80	-21.89	-11.09	Ag2CO3
Ag2CrO4	-25.52	-37.11	-11.59	Ag2CrO4
Ag2HVO4	-11.23	-9.75	1.48	Ag2HVO4
Ag2MoO4	-11.74	-23.29	-11.55	Ag2MoO4
Ag2O	-14.84	-2.27	12.57	Ag2O
Ag2Se	6.23	-42.47	-48.70	Ag2Se
Ag2SeO3	-14.72	-21.87	-7.15	Ag2SeO3
Ag2SeO4	-27.44	-36.35	-8.91	Ag2SeO4
Ag2SO4	-13.72	-18.54	-4.82	Ag2SO4
Ag3AsO3	-21.19	-19.03	2.16	Ag3AsO3
Ag3AsO4	-13.33	-16.11	-2.79	Ag3AsO4
Ag3H2VO5	-16.06	-10.88	5.18	Ag3H2VO5
AgF:4H2O	-12.86	-11.81	1.05	AgF:4H2O
Agmetal	1.46	-12.04	-13.51	Ag
AgVO3	-9.38	-8.61	0.77	AgVO3
Al(OH) 3(am)	-1.16	9.64	10.80	Al(OH) 3
Al2(MoO4) 3	-46.17	-43.80	2.37	Al2(MoO4) 3
Al2O3	-0.38	19.27	19.65	Al2O3
Al4(OH) 10SO4	-0.43	22.27	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-7.87	-3.07	4.80	AlAsO4:2H2O
AlOHSO4	-3.41	-6.64	-3.23	AlOHSO4
AlSb	-137.02	-71.40	65.62	AlSb
Alunite	0.63	-0.77	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-3.69	-11.48	-7.79	PbSO4
Anhydrite	-0.63	-4.99	-4.36	CaSO4

Antlerite	-8.64	0.15	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.04	-8.34	-8.30	CaCO ₃
Arsenolite	-59.77	-62.53	-2.76	As ₄ O ₆
Artinite	-7.69	1.91	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-32.13	-25.42	6.71	As ₂ O ₅
Atacamite	-6.44	0.95	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-5.92	-22.82	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.07	7.32	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-16.18	-0.31	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	5.46	-3.45	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-25.93	7.01	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-17.84	-27.51	-9.67	BaCrO ₄
BaF ₂	-8.20	-14.02	-5.82	BaF ₂
BaMoO ₄	-6.74	-13.70	-6.96	BaMoO ₄
Barite	1.03	-8.95	-9.98	BaSO ₄
BaSeO ₃	-14.10	-12.27	1.83	BaSeO ₃
BaSeO ₄	-19.30	-26.76	-7.46	BaSeO ₄
Bianchite	-7.09	-8.86	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-12.64	5.45	18.09	MnO ₂
Bixbyite	-10.28	-10.92	-0.64	Mn ₂ O ₃
Boehmite	1.06	9.64	8.58	AlOOH
Breithauptite	-44.99	-63.51	-18.52	NiSb
Brochantite	-9.60	5.63	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.08	10.77	16.84	Mg(OH) ₂
Bunsenite	-5.83	6.62	12.45	NiO
Ca(VO ₃) ₂	-9.33	-3.67	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-9.89	7.61	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-13.94	7.61	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-13.87	8.43	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-20.06	18.90	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-20.97	18.89	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-271.20	-128.22	142.97	Ca ₃ Sb ₂
CaCrO ₄	-21.29	-23.55	-2.27	CaCrO ₄
Calcite	0.14	-8.34	-8.48	CaCO ₃
Calomel	-15.41	-33.32	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.79	-9.74	-7.95	CaMoO ₄
Carnotite	-5.20	-4.97	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-11.13	-8.31	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-19.78	-22.80	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-14.35	-4.51	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.36	5.29	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.44	5.29	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.41	-16.70	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.98	-0.42	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-23.54	4.86	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-14.06	-14.72	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-13.03	-14.72	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.81	-14.72	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.85	-16.06	-1.21	CdF ₂
Cdmetal(alpha)	-30.05	-16.53	13.51	Cd
Cdmetal(gamma)	-30.15	-16.53	13.62	Cd
CdMoO ₄	-1.59	-15.74	-14.15	CdMoO ₄
CdOHCl	-8.25	-4.72	3.54	CdOHCl
CdSb	-64.49	-64.84	-0.35	CdSb
CdSe	-14.71	-34.91	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-26.95	-28.80	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.82	-10.99	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.27	-10.99	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.12	-10.99	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.39	-11.14	-9.75	AgCl
Cerrusite	-1.69	-14.82	-13.13	PbCO ₃
CH ₄ (g)	-65.86	-106.90	-41.05	CH ₄
Chalcanthite	-8.16	-10.80	-2.64	CuSO ₄ :5H ₂ O
Claudetite	-59.47	-62.53	-3.06	As ₄ O ₆
Clausthalite	-8.30	-35.40	-27.10	PbSe
Co(BO ₂) ₂	-30.37	-3.30	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.59	6.50	13.09	Co(OH) ₂
Co(OH) ₃	-12.68	-14.99	-2.31	Co(OH) ₃

CO2 (g)	-1.48	-19.62	-18.15	CO2
Co3 (AsO4) 2	-18.95	-5.92	13.03	Co3 (AsO4) 2
Co3O4	-12.98	-23.47	-10.50	Co3O4
CoCl2	-21.77	-13.50	8.27	CoCl2
CoCl2:6H2O	-16.04	-13.50	2.54	CoCl2:6H2O
CoCO3	-3.14	-13.12	-9.98	CoCO3
CoF2	-13.24	-14.84	-1.60	CoF2
CoF3	-45.54	-47.00	-1.46	CoF3
CoFe2O4	22.83	19.30	-3.53	CoFe2O4
CoMoO4	-6.76	-14.52	-7.76	CoMoO4
CoO	-7.08	6.50	13.59	CoO
CoSe	-17.50	-33.70	-16.20	CoSe
CoSeO3	-14.42	-13.10	1.32	CoSeO3
CoSeO4:6H2O	-26.06	-27.59	-1.53	CoSeO4:6H2O
CoSO4	-12.58	-9.77	2.80	CoSO4
CoSO4:6H2O	-7.30	-9.78	-2.47	CoSO4:6H2O
Cotunnite	-10.42	-15.20	-4.78	PbCl2
Cr (OH) 2	-18.97	-8.15	10.82	Cr (OH) 2
Cr (OH) 3	-1.53	-0.19	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.56	-0.19	-0.75	Cr (OH) 3
Cr2O3	1.98	-0.38	-2.36	Cr2O3
CrCl2	-42.25	-28.16	14.09	CrCl2
CrCl3	-45.31	-30.20	15.11	CrCl3
CrF3	-20.87	-32.20	-11.34	CrF3
Crmetal	-60.46	-29.97	30.48	Cr
CrO3	-31.63	-34.84	-3.21	CrO3
Cryolite	-7.10	-40.94	-33.84	Na3AlF6
Cu (OH) 2	-3.20	5.48	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.25	17.96	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.45	-0.20	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-43.42	-78.31	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	0.11	-45.69	-45.80	Cu2Se
Cu2SO4	-19.82	-21.77	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.10	-9.00	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-46.68	-89.27	-42.59	Cu3Sb
Cu3Se2	-16.92	-80.41	-63.49	Cu3Se2
CuCO3	-2.65	-14.15	-11.50	CuCO3
CuCrO4	-23.92	-29.36	-5.44	CuCrO4
CuF	-8.51	-13.42	-4.91	CuF
CuF2	-16.98	-15.87	1.12	CuF2
CuF2:2H2O	-11.32	-15.87	-4.55	CuF2:2H2O
Cumetal	-4.90	-13.65	-8.76	Cu
CuMoO4	-2.47	-15.55	-13.08	CuMoO4
CuOCuSO4	-15.63	-5.33	10.30	CuOCuSO4
Cupricferrite	12.28	18.27	5.99	CuFe2O4
Cuprite	-4.08	-5.49	-1.41	Cu2O
Cuprousferrite	12.57	3.65	-8.92	CuFeO2
CuSe	-1.62	-34.72	-33.10	CuSe
CuSe2	-19.73	-53.10	-33.37	CuSe2
CuSeO3:2H2O	-14.63	-14.12	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-26.17	-28.61	-2.44	CuSeO4:5H2O
CuSO4	-13.74	-10.80	2.94	CuSO4
Diaspore	2.76	9.64	6.87	AlOOH
Dolomite (disordered)	-0.66	-17.20	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.11	-17.20	-17.09	CaMg (CO3) 2
Epsomite	-3.39	-5.51	-2.13	MgSO4:7H2O
Fe (OH) 2	-5.04	8.52	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.44	3.40	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-2.72	-6.44	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-8.36	-6.80	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-25.37	-46.00	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-32.30	-36.03	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	1.09	21.31	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.71	-6.31	0.40	FeAsO4:2H2O
FeCr2O4	0.94	8.14	7.20	FeCr2O4
FeMoO4	-2.41	-12.51	-10.09	FeMoO4
Ferrihydrite	3.21	6.40	3.19	Fe (OH) 3
Ferroselite	-31.46	-50.05	-18.60	FeSe2

FeSe	-20.68	-31.68	-11.00	FeSe
Fluorite	0.44	-10.06	-10.50	CaF2
Gibbsite	1.35	9.64	8.29	Al(OH)3
Goethite	5.91	6.40	0.49	FeOOH
Goslarite	-6.85	-8.86	-2.01	ZnSO4:7H2O
Gummite	-8.04	-0.37	7.67	UO3
Gypsum	-0.38	-4.99	-4.61	CaSO4:2H2O
H-Jarosite	-1.26	-13.36	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.15	-21.03	-12.88	H2MoO4
H2Se(g)	-35.24	-40.20	-4.96	H2Se
Halite	-7.12	-5.52	1.60	NaCl
Hausmannite	-12.27	48.76	61.03	Mn3O4
Hematite	14.21	12.80	-1.42	Fe2O3
Hercynite	4.90	27.79	22.89	FeAl2O4
Hg(CH3)2(g)	-157.44	-231.15	-73.71	Hg(CH3)2
Hg(g)	-9.69	-17.57	-7.87	Hg
Hg(OH)2	-13.84	-17.34	-3.50	Hg(OH)2
Hg2(g)	-20.18	-35.13	-14.96	Hg2
Hg2(OH)2	-18.58	-13.31	5.26	Hg2(OH)2
Hg2CO3	-16.89	-32.94	-16.05	Hg2CO3
Hg2CrO4	-39.45	-48.15	-8.70	Hg2CrO4
Hg2F2	-24.30	-34.66	-10.36	Hg2F2
Hg2SeO3	-28.26	-32.91	-4.66	Hg2SeO3
Hg2SO4	-23.46	-29.59	-6.13	Hg2SO4
Hg3O2CO3	-41.96	-71.64	-29.68	Hg3O2CO3
HgCl(g)	-36.16	-16.66	19.50	HgCl
HgCl2	-16.08	-37.34	-21.26	HgCl2
HgF(g)	-50.00	-17.33	32.68	HgF
HgF2(g)	-51.25	-38.68	12.57	HgF2
Hgmetal(l)	-4.12	-17.57	-13.45	Hg
HgSe	-1.84	-57.54	-55.69	HgSe
HgSeO3	-24.51	-36.94	-12.43	HgSeO3
HgSO4	-24.20	-33.62	-9.42	HgSO4
Huntite	-4.95	-34.92	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.08	-24.85	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-15.91	-24.67	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-14.87	-20.04	-5.17	KAl(SO4)2:12H2O
K-Jarosite	4.32	-10.48	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-46.68	-63.92	-17.24	K2Cr2O7
K2CrO4	-28.57	-29.08	-0.51	K2CrO4
K2MoO4	-18.53	-15.27	3.26	K2MoO4
K2SeO4	-27.60	-28.33	-0.73	K2SeO4
Langite	-11.86	5.62	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.24	-6.68	-0.43	PbO:PbSO4
Laurionite	-5.83	-5.20	0.62	PbOHCl
Lepidocrocite	5.03	6.40	1.37	FeOOH
Lime	-21.42	11.28	32.70	CaO
Litharge	-7.89	4.80	12.69	PbO
Maghemite	6.41	12.80	6.39	Fe2O3
Magnesioferrite	6.70	23.56	16.86	Fe2MgO4
Magnesite	-1.40	-8.86	-7.46	MgCO3
Magnetite	17.91	21.31	3.40	Fe3O4
Malachite	-3.37	-8.67	-5.31	Cu2(OH)2CO3
Manganite	-5.45	19.89	25.34	MnOOH
Massicot	-8.09	4.80	12.89	PbO
Matlockite	-6.90	-15.87	-8.97	PbClF
Melanothallite	-20.79	-14.53	6.26	CuCl2
Melanterite	-5.55	-7.76	-2.21	FeSO4:7H2O
Mg(OH)2(active)	-8.03	10.77	18.79	Mg(OH)2
Mg(VO3)2	-15.47	-4.19	11.28	Mg(VO3)2
Mg2Sb3	-241.71	-167.03	74.68	Mg2Sb3
Mg2V2O7	-19.79	6.57	26.36	Mg2V2O7
MgCr2O4	-5.82	10.38	16.20	MgCr2O4
MgCrO4	-29.45	-24.07	5.38	MgCrO4
MgF2	-2.45	-10.58	-8.13	MgF2
MgMoO4	-8.41	-10.26	-1.85	MgMoO4
MgSeO3:6H2O	-11.89	-8.83	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-22.12	-23.32	-1.20	MgSeO4:6H2O

Minium	-37.30	36.22	73.52	Pb3O4
Mirabilite	-6.20	-7.31	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-10.88	-5.98	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-54.04	-59.75	-5.71	Mn2 (SO4) 3
Mn2Sb	-135.07	-73.99	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.99	1.51	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.74	-11.03	2.72	MnCl2:4H2O
MnSb	-83.59	-86.50	-2.91	MnSb
MnSe	-34.72	-31.22	3.50	MnSe
MnSeO3	-11.75	-10.62	1.13	MnSeO3
MnSeO3:2H2O	-11.60	-10.62	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-23.06	-25.11	-2.05	MnSeO4:5H2O
MnSO4	-9.88	-7.30	2.58	MnSO4
Monteponite	-9.82	5.29	15.10	CdO
Montroydite	-13.70	-17.34	-3.64	HgO
MoO3	-13.03	-21.03	-8.00	MoO3
Morenosite	-7.51	-9.66	-2.14	NiSO4:7H2O
Na-Jarosite	2.32	-8.88	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-50.81	-60.71	-9.90	Na2Cr2O7
Na2CrO4	-28.80	-25.87	2.93	Na2CrO4
Na2Mo2O7	-16.49	-33.08	-16.60	Na2Mo2O7
Na2MoO4	-13.55	-12.06	1.49	Na2MoO4
Na2MoO4:2H2O	-13.28	-12.06	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.93	-10.63	10.30	Na2SeO3:5H2O
Na2SeO4	-26.40	-25.12	1.28	Na2SeO4
Na3Sb	-162.04	-67.59	94.45	Na3Sb
Na3VO4	-30.71	5.97	36.68	Na3VO4
Na4V2O7	-34.42	2.98	37.40	Na4V2O7
Nantokite	-6.02	-12.75	-6.73	CuCl
NaSb	-77.90	-54.73	23.17	NaSb
Natron	-9.35	-10.66	-1.31	Na2CO3:10H2O
NaVO3	-6.85	-3.00	3.86	NaVO3
Nesquehonite	-4.19	-8.86	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.18	6.62	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-21.27	-5.57	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-21.80	10.20	32.00	Ni4 (OH) 6SO4
NiCO3	-6.14	-13.01	-6.87	NiCO3
NiMoO4	-3.26	-14.41	-11.14	NiMoO4
NiSe	-15.88	-33.58	-17.70	NiSe
NiSeO3:2H2O	-15.79	-12.98	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-25.95	-27.47	-1.52	NiSeO4:6H2O
Nsutite	-12.06	5.45	17.50	MnO2
O2 (g)	-39.45	43.64	83.09	O2
Otavite	-2.34	-14.34	-12.00	CdCO3
Pb (BO2) 2	-11.52	-5.00	6.52	Pb (BO2) 2
Pb (OH) 2	-3.35	4.80	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-60.99	-69.75	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-9.20	-0.40	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-16.59	9.60	26.19	Pb2O (OH) 2
Pb2O3	-29.62	31.42	61.04	Pb2O3
Pb2OCO3	-9.47	-10.03	-0.56	Pb2OCO3
Pb2V2O7	-3.46	-5.36	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-16.82	-11.02	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-6.70	-0.56	6.14	Pb3 (VO4) 2
Pb3O2CO3	-16.25	-5.23	11.02	Pb3O2CO3
Pb3O2SO4	-12.56	-1.88	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-18.18	2.92	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.96	2.92	21.88	Pb4O3SO4
PbCrO4	-17.44	-30.04	-12.60	PbCrO4
PbF2	-9.10	-16.54	-7.44	PbF2
Pbmetal	-21.27	-17.02	4.25	Pb
PbMoO4	-0.61	-16.23	-15.62	PbMoO4
PbO:0.3H2O	-8.18	4.80	12.98	PbO:0.33H2O
PbSeO4	-22.45	-29.29	-6.84	PbSeO4
Periclase	-10.82	10.77	21.58	MgO
Phosgenite	-10.22	-30.03	-19.81	PbCl2:PbCO3
Plattnerite	-22.98	26.62	49.60	PbO2
Portlandite	-11.52	11.28	22.80	Ca (OH) 2

Pyrochroite	-6.22	8.98	15.19	Mn(OH)2
Pyrolusite	-10.58	30.80	41.38	MnO2
Retgersite	-7.62	-9.66	-2.04	NiSO4:6H2O
Rhodochrosite	-0.07	-10.65	-10.58	MnCO3
Rutherfordine	-5.50	-20.00	-14.50	UO2CO3
Sb(OH)3	-8.47	-15.58	-7.11	Sb(OH)3
Sb2O4	-12.74	-9.34	3.40	Sb2O4
Sb2O5	-26.47	-36.14	-9.67	Sb2O5
Sb2Se3	-83.99	-151.75	-67.76	Sb2Se3
Sb4O6(cubic)	-44.05	-62.31	-18.26	Sb4O6
Sb4O6(orth)	-44.41	-62.31	-17.90	Sb4O6
SbCl3	-46.16	-45.58	0.57	SbCl3
SbF3	-37.37	-47.59	-10.23	SbF3
Sbmetal	-36.62	-48.31	-11.69	Sb
SbO2	-1.15	-28.98	-27.82	SbO2
Schoepite	-6.37	-0.37	5.99	UO2(OH)2:H2O
Semetal(am)	-11.27	-18.38	-7.11	Se
Semetal(hex)	-10.67	-18.38	-7.71	Se
Senarmontite	-18.79	-31.15	-12.37	Sb2O3
SeO2	-19.72	-19.60	0.12	SeO2
SeO3	-55.13	-34.09	21.04	SeO3
Siderite	-0.86	-11.10	-10.24	FeCO3
Smithsonite	-2.20	-12.20	-10.00	ZnCO3
Spinel	-6.81	30.04	36.85	MgAl2O4
Tenorite	-2.17	5.48	7.64	CuO
Thenardite	-7.63	-7.31	0.32	Na2SO4
Thermonatrite	-11.30	-10.66	0.64	Na2CO3:H2O
Tyuyamunite	-8.50	-4.42	4.08	Ca(UO2)2(VO4)2
U3O8	-16.37	4.71	21.08	U3O8
U3Sb4	-515.46	-363.07	152.38	U3Sb4
U4O9	-27.06	-30.08	-3.02	U4O9
UF4	-26.12	-55.66	-29.54	UF4
UF4:2.5H2O	-22.94	-55.66	-32.72	UF4:2.5H2O
UO2(am)	-13.91	-12.98	0.93	UO2
UO2(NO3)2	-34.83	-22.68	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-27.53	-22.68	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-26.07	-22.68	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-24.73	-22.68	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-5.98	-0.37	5.61	UO2(OH)2
UO2SeO4:4H2O	-32.21	-34.46	-2.25	UO2SeO4:4H2O
UO3	-8.07	-0.37	7.70	UO3
Uraninite	-8.31	-12.98	-4.67	UO2
USb2	-192.02	-162.45	29.58	USb2
V(OH)3	-14.29	-6.70	7.59	V(OH)3
V2O5	-13.60	-14.96	-1.36	V2O5
V3O5	-28.11	-26.27	1.84	V3O5
V4O7	-34.95	-27.76	7.19	V4O7
V6O13	-27.65	-88.51	-60.86	V6O13
Valentinite	-22.67	-31.15	-8.48	Sb2O3
VC12	-56.49	-37.61	18.87	VC12
VC13	-60.14	-36.70	23.43	VC13
VF4	-59.10	-44.17	14.93	VF4
Vmetal	-83.45	-39.43	44.03	V
VO	-32.36	-17.61	14.76	VO
VO(OH)2	-6.64	-1.49	5.15	VO(OH)2
VO2Cl	-20.32	-17.48	2.84	VO2Cl
VOC1	-27.85	-16.70	11.15	VOC1
VOC12	-34.25	-21.49	12.76	VOC12
VOSO4	-21.37	-17.76	3.61	VOSO4
Witherite	-3.73	-12.30	-8.57	BaCO3
Zincite	-3.91	7.42	11.33	ZnO
Zincosite	-12.79	-8.86	3.93	ZnSO4
Zn(BO2)2	-10.67	-2.38	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-18.20	-14.89	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.78	7.42	12.20	Zn(OH)2
Zn(OH)2(am)	-5.05	7.42	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.33	7.42	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.11	7.42	11.53	Zn(OH)2

Zn(OH)2(gamma)	-4.31	7.42	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.94	-1.44	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.35	4.84	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.81	-3.16	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.21	-10.29	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.00	13.40	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-21.41	17.09	38.50	Zn5(OH)8Cl2
ZnCl2	-19.63	-12.58	7.05	ZnCl2
ZnCO3:1H2O	-1.95	-12.21	-10.26	ZnCO3:1H2O
ZnF2	-13.39	-13.92	-0.53	ZnF2
Znmetal	-40.19	-14.40	25.79	Zn
ZnMoO4	-3.48	-13.61	-10.13	ZnMoO4
ZnO(active)	-3.77	7.42	11.19	ZnO
ZnSb	-73.72	-62.71	11.01	ZnSb
ZnSe	-18.38	-32.78	-14.40	ZnSe
ZnSeO4:6H2O	-25.15	-26.67	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.22	-8.86	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 5.

TITLE Average HCT data
SOLUTION 3 Average HCT data for biotite breccia - oxide/transitional (waste)
(cell SRK 0872)

temp	25
pH	6.51023
pe	4
redox	pe
units	mg/l
density	1
Alkalinity	6.40158 as HCO3
Al	0.08284
As	0.000945698
Ba	0.010099714
Ca	27.75897
Cd	0.00008
Cl	0.60152
Co	0.000473651
Cu	0.003420825
F	0.33232
Fe	0.10074
K	0.48277
Mg	1.15690
Mn	0.18113
Mo	0.078911429
Na	0.45066 charge
Ni	0.000473651
Pb	0.000118413
S(6)	74.44172 as SO4
Sb	0.000508524
Se	0.000236825
U	0.001336254
V	0.000473651
Zn	0.001346381
water	1 # kg

END

TITLE

Average HCT data

Beginning of initial solution calculations.

Initial solution 3. Average HCT data for biotite breccia - oxide/transitional
(waste) (cell SRK 0872)

-----Solution composition-----

Elements	Molality	Moles	
Al	3.071e-006	3.071e-006	
Alkalinity	1.049e-004	1.049e-004	
As	1.262e-008	1.262e-008	
Ba	7.355e-008	7.355e-008	
Ca	6.927e-004	6.927e-004	
Cd	7.118e-010	7.118e-010	
Cl	1.697e-005	1.697e-005	
Co	8.038e-009	8.038e-009	
Cu	5.384e-008	5.384e-008	
F	1.749e-005	1.749e-005	
Fe	1.804e-006	1.804e-006	
K	1.235e-005	1.235e-005	
Mg	4.760e-005	4.760e-005	
Mn	3.297e-006	3.297e-006	
Mo	8.226e-007	8.226e-007	
Na	1.786e-004	1.786e-004	Charge balance
Ni	8.071e-009	8.071e-009	
Pb	5.716e-010	5.716e-010	
S (6)	7.750e-004	7.750e-004	
Sb	4.177e-009	4.177e-009	
Se	3.000e-009	3.000e-009	
U	5.614e-009	5.614e-009	
V	9.299e-009	9.299e-009	
Zn	2.059e-008	2.059e-008	

-----Description of solution-----

pH	=	6.510
pe	=	4.000
Activity of water	=	1.000
Ionic strength	=	2.932e-003
Mass of water (kg)	=	1.000e+000
Total carbon (mol/kg)	=	1.607e-004
Total CO2 (mol/kg)	=	1.607e-004
Temperature (deg C)	=	25.00
Electrical balance (eq)	=	-7.471e-020
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	11
Total H	=	1.110139e+002
Total O	=	5.551043e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	3.277e-007	3.089e-007	-6.484	-6.510	-0.026	0.00
OH-	3.461e-008	3.260e-008	-7.461	-7.487	-0.026	(0)
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	3.071e-006					
Al (OH) 4-	1.419e-006	1.337e-006	-5.848	-5.874	-0.026	(0)
AlF2+	5.562e-007	5.248e-007	-6.255	-6.280	-0.025	(0)
Al (OH) 2+	5.309e-007	5.010e-007	-6.275	-6.300	-0.025	(0)
Al (OH) 3	3.259e-007	3.259e-007	-6.487	-6.487	0.000	(0)
AlF+2	1.116e-007	8.846e-008	-6.952	-7.053	-0.101	(0)
AlF3	9.847e-008	9.847e-008	-7.007	-7.007	0.000	(0)
AlOH+2	2.440e-008	1.935e-008	-7.613	-7.713	-0.101	(0)

AlSO4+	2.726e-009	2.570e-009	-8.565	-8.590	-0.026	(0)
Al+3	1.012e-009	5.935e-010	-8.995	-9.227	-0.232	(0)
AlF4-	7.802e-010	7.356e-010	-9.108	-9.133	-0.026	(0)
Al (SO4) 2-	1.629e-011	1.536e-011	-10.788	-10.814	-0.026	(0)
AlMo6O21-3	6.498e-031	3.666e-031	-30.187	-30.436	-0.249	(0)
As (3)	3.361e-015					
H3AsO3	3.355e-015	3.355e-015	-14.474	-14.474	0.000	(0)
H2AsO3-	5.936e-018	5.570e-018	-17.226	-17.254	-0.028	(0)
H4AsO3+	5.471e-022	5.134e-022	-21.262	-21.290	-0.028	(0)
HAsO3-2	2.121e-023	1.645e-023	-22.673	-22.784	-0.110	(0)
AsO3-3	3.638e-030	2.053e-030	-29.439	-29.688	-0.249	(0)
As (5)	1.262e-008					
H2AsO4-	8.830e-009	8.286e-009	-8.054	-8.082	-0.028	(0)
HAsO4-2	3.794e-009	2.941e-009	-8.421	-8.531	-0.110	(0)
H3AsO4	4.444e-013	4.447e-013	-12.352	-12.352	0.000	(0)
AsO4-3	5.338e-014	3.012e-014	-13.273	-13.521	-0.249	(0)
Ba	7.355e-008					
Ba+2	7.350e-008	5.798e-008	-7.134	-7.237	-0.103	(0)
BaHCO3+	5.339e-011	5.041e-011	-10.273	-10.298	-0.025	(0)
BaCO3	4.109e-013	4.109e-013	-12.386	-12.386	0.000	(0)
BaOH+	8.747e-015	8.251e-015	-14.058	-14.084	-0.025	(0)
C (4)	1.607e-004					
HCO3-	9.647e-005	9.103e-005	-4.016	-4.041	-0.025	(0)
H2CO3	6.324e-005	6.324e-005	-4.199	-4.199	0.000	(0)
CaHCO3+	8.900e-007	8.403e-007	-6.051	-6.076	-0.025	(0)
MgHCO3+	3.430e-008	3.232e-008	-7.465	-7.490	-0.026	(0)
CO3-2	1.752e-008	1.382e-008	-7.757	-7.860	-0.103	(0)
CaCO3	1.086e-008	1.086e-008	-7.964	-7.964	0.000	(0)
NaHCO3	8.591e-009	8.591e-009	-8.066	-8.066	0.000	(0)
MnHCO3+	4.563e-009	4.304e-009	-8.341	-8.366	-0.025	(0)
UO2CO3	3.701e-009	3.701e-009	-8.432	-8.432	0.000	(0)
CuCO3	2.659e-009	2.659e-009	-8.575	-8.575	0.000	(0)
UO2 (CO3) 2-2	1.316e-009	1.020e-009	-8.881	-8.991	-0.110	(0)
FeHCO3+	1.288e-009	1.216e-009	-8.890	-8.915	-0.025	(0)
MgCO3	3.988e-010	3.988e-010	-9.399	-9.399	0.000	(0)
CuHCO3+	2.001e-010	1.877e-010	-9.699	-9.726	-0.028	(0)
NiHCO3+	6.933e-011	6.506e-011	-10.159	-10.187	-0.028	(0)
BaHCO3+	5.339e-011	5.041e-011	-10.273	-10.298	-0.025	(0)
NaCO3-	4.576e-011	4.318e-011	-10.340	-10.365	-0.025	(0)
ZnHCO3+	4.518e-011	4.240e-011	-10.345	-10.373	-0.028	(0)
CoHCO3+	4.302e-011	4.037e-011	-10.366	-10.394	-0.028	(0)
PbHCO3+	2.361e-011	2.216e-011	-10.627	-10.654	-0.028	(0)
PbCO3	1.361e-011	1.361e-011	-10.866	-10.866	0.000	(0)
ZnCO3	1.171e-011	1.171e-011	-10.931	-10.931	0.000	(0)
NiCO3	2.988e-012	2.988e-012	-11.525	-11.525	0.000	(0)
UO2 (CO3) 3-4	1.955e-012	7.067e-013	-11.709	-12.151	-0.442	(0)
CoCO3	1.332e-012	1.332e-012	-11.876	-11.876	0.000	(0)
BaCO3	4.109e-013	4.109e-013	-12.386	-12.386	0.000	(0)
CdCO3	1.598e-013	1.598e-013	-12.796	-12.796	0.000	(0)
Cu (CO3) 2-2	1.275e-013	9.890e-014	-12.894	-13.005	-0.110	(0)
CdHCO3+	1.121e-013	1.052e-013	-12.950	-12.978	-0.028	(0)
Pb (CO3) 2-2	6.993e-016	5.422e-016	-15.155	-15.266	-0.110	(0)
Cd (CO3) 2-2	2.112e-018	1.637e-018	-17.675	-17.786	-0.110	(0)
Ca	6.927e-004					
Ca+2	6.284e-004	4.957e-004	-3.202	-3.305	-0.103	(0)
CaSO4	6.334e-005	6.334e-005	-4.198	-4.198	0.000	(0)
CaHCO3+	8.900e-007	8.403e-007	-6.051	-6.076	-0.025	(0)
CaF+	8.548e-008	8.063e-008	-7.068	-7.093	-0.025	(0)
CaCO3	1.086e-008	1.086e-008	-7.964	-7.964	0.000	(0)
CaOH+	3.415e-010	3.224e-010	-9.467	-9.492	-0.025	(0)
Cd	7.118e-010					
Cd+2	6.434e-010	5.075e-010	-9.192	-9.295	-0.103	(0)
CdSO4	6.637e-011	6.637e-011	-10.178	-10.178	0.000	(0)
CdCl+	8.260e-013	7.751e-013	-12.083	-12.111	-0.028	(0)
Cd (SO4) 2-2	6.441e-013	4.994e-013	-12.191	-12.302	-0.110	(0)
CdCO3	1.598e-013	1.598e-013	-12.796	-12.796	0.000	(0)
CdOH+	1.401e-013	1.314e-013	-12.854	-12.881	-0.028	(0)
CdF+	1.278e-013	1.199e-013	-12.894	-12.921	-0.028	(0)

	CdHCO3+	1.121e-013	1.052e-013	-12.950	-12.978	-0.028	(0)
	CdOHC1	1.037e-015	1.037e-015	-14.984	-14.984	0.000	(0)
	CdCl2	5.167e-017	5.167e-017	-16.287	-16.287	0.000	(0)
	Cd(OH) 2	2.703e-017	2.703e-017	-16.568	-16.568	0.000	(0)
	CdF2	3.565e-018	3.565e-018	-17.448	-17.448	0.000	(0)
	Cd(CO3) 2-2	2.112e-018	1.637e-018	-17.675	-17.786	-0.110	(0)
	Cd2OH+3	5.925e-022	3.343e-022	-21.227	-21.476	-0.249	(0)
	CdCl3-	5.556e-022	5.214e-022	-21.255	-21.283	-0.028	(0)
	Cd(OH) 3-	5.738e-023	5.384e-023	-22.241	-22.269	-0.028	(0)
	Cd(SeO3) 2-2	6.883e-025	5.337e-025	-24.162	-24.273	-0.110	(0)
	CdSeO4	4.373e-025	4.373e-025	-24.359	-24.359	0.000	(0)
	Cd(OH) 4-2	3.705e-031	2.873e-031	-30.431	-30.542	-0.110	(0)
C1		1.697e-005					
	Cl-	1.697e-005	1.599e-005	-4.770	-4.796	-0.026	(0)
	MnCl+	5.057e-011	4.771e-011	-10.296	-10.321	-0.025	(0)
	CuCl	3.223e-011	3.223e-011	-10.492	-10.492	0.000	(0)
	CuCl+	8.790e-013	8.284e-013	-12.056	-12.082	-0.026	(0)
	CdCl+	8.260e-013	7.751e-013	-12.083	-12.111	-0.028	(0)
	ZnCl+	6.278e-013	5.916e-013	-12.202	-12.228	-0.026	(0)
	CoCl+	3.361e-013	3.154e-013	-12.474	-12.501	-0.028	(0)
	NiCl+	2.528e-013	2.372e-013	-12.597	-12.625	-0.028	(0)
	PbCl+	1.981e-013	1.859e-013	-12.703	-12.731	-0.028	(0)
	CuCl2-	1.143e-013	1.077e-013	-12.942	-12.968	-0.026	(0)
	ZnOHC1	2.525e-014	2.525e-014	-13.598	-13.598	0.000	(0)
	UO2Cl+	1.860e-015	1.745e-015	-14.731	-14.758	-0.028	(0)
	MnCl2	1.078e-015	1.078e-015	-14.968	-14.968	0.000	(0)
	CdOHC1	1.037e-015	1.037e-015	-14.984	-14.984	0.000	(0)
	CdCl2	5.167e-017	5.167e-017	-16.287	-16.287	0.000	(0)
	ZnCl2	1.499e-017	1.499e-017	-16.824	-16.824	0.000	(0)
	PbCl2	1.328e-017	1.328e-017	-16.877	-16.877	0.000	(0)
	CuCl2	4.593e-018	4.593e-018	-17.338	-17.338	0.000	(0)
	FeCl+2	6.011e-019	4.759e-019	-18.221	-18.322	-0.101	(0)
	VOCl+	5.077e-019	4.764e-019	-18.294	-18.322	-0.028	(0)
	CuCl3-2	4.650e-019	3.681e-019	-18.333	-18.434	-0.101	(0)
	NiCl2	1.910e-020	1.910e-020	-19.719	-19.719	0.000	(0)
	MnCl3-	5.032e-021	4.746e-021	-20.298	-20.324	-0.025	(0)
	CdCl3-	5.556e-022	5.214e-022	-21.255	-21.283	-0.028	(0)
	ZnCl3-	2.021e-022	1.905e-022	-21.694	-21.720	-0.026	(0)
	PbCl3-	9.008e-023	8.453e-023	-22.045	-22.073	-0.028	(0)
	FeCl2+	3.604e-023	3.399e-023	-22.443	-22.469	-0.025	(0)
	CuCl3-	7.274e-025	6.855e-025	-24.138	-24.164	-0.026	(0)
	ZnCl4-2	1.924e-027	1.523e-027	-26.716	-26.817	-0.101	(0)
	PbCl4-2	7.968e-028	6.179e-028	-27.099	-27.209	-0.110	(0)
	FeCl3	5.436e-029	5.436e-029	-28.265	-28.265	0.000	(0)
	CuCl4-2	6.940e-032	5.494e-032	-31.159	-31.260	-0.101	(0)
	UCl+3	1.430e-038	8.071e-039	-37.845	-38.093	-0.249	(0)
	CoCl+2	9.524e-040	7.385e-040	-39.021	-39.132	-0.110	(0)
Co(2)		8.038e-009					
	Co+2	7.352e-009	5.701e-009	-8.134	-8.244	-0.110	(0)
	CoSO4	6.345e-010	6.345e-010	-9.198	-9.198	0.000	(0)
	CoHCO3+	4.302e-011	4.037e-011	-10.366	-10.394	-0.028	(0)
	CoOH+	3.952e-012	3.708e-012	-11.403	-11.431	-0.028	(0)
	CoF+	2.863e-012	2.687e-012	-11.543	-11.571	-0.028	(0)
	CoCO3	1.332e-012	1.332e-012	-11.876	-11.876	0.000	(0)
	CoCl+	3.361e-013	3.154e-013	-12.474	-12.501	-0.028	(0)
	Co(OH) 2	9.602e-015	9.602e-015	-14.018	-14.018	0.000	(0)
	Co(OH) 3-	6.656e-021	6.246e-021	-20.177	-20.204	-0.028	(0)
	Co2OH+3	1.878e-021	1.059e-021	-20.726	-20.975	-0.249	(0)
	CoOOH-	1.670e-021	1.567e-021	-20.777	-20.805	-0.028	(0)
	CoSeO4	1.322e-023	1.322e-023	-22.879	-22.879	0.000	(0)
	Co(OH) 4-2	4.162e-029	3.227e-029	-28.381	-28.491	-0.110	(0)
	Co4(OH) 4+4	1.043e-037	3.772e-038	-36.982	-37.423	-0.442	(0)
Co(3)		4.849e-032					
	CoOH+2	4.849e-032	3.760e-032	-31.314	-31.425	-0.110	(0)
	Co+3	3.870e-037	2.270e-037	-36.412	-36.644	-0.232	(0)
	CoCl+2	9.524e-040	7.385e-040	-39.021	-39.132	-0.110	(0)
Cu(1)		1.738e-009					
	Cu+	1.706e-009	1.601e-009	-8.768	-8.796	-0.028	(0)

CuCl	3.223e-011	3.223e-011	-10.492	-10.492	0.000	(0)
CuCl2-	1.143e-013	1.077e-013	-12.942	-12.968	-0.026	(0)
CuCl3-2	4.650e-019	3.681e-019	-18.333	-18.434	-0.101	(0)
Cu (2)	5.210e-008					
Cu+2	4.143e-008	3.268e-008	-7.383	-7.486	-0.103	(0)
CuSO4	4.177e-009	4.177e-009	-8.379	-8.379	0.000	(0)
CuOH+	3.575e-009	3.369e-009	-8.447	-8.472	-0.026	(0)
CuCO3	2.659e-009	2.659e-009	-8.575	-8.575	0.000	(0)
CuHCO3+	2.001e-010	1.877e-010	-9.699	-9.726	-0.028	(0)
CuF+	3.275e-011	3.074e-011	-10.485	-10.512	-0.028	(0)
Cu (OH) 2	2.192e-011	2.192e-011	-10.659	-10.659	0.000	(0)
CuCl+	8.790e-013	8.284e-013	-12.056	-12.082	-0.026	(0)
Cu2 (OH) 2+2	3.678e-013	2.852e-013	-12.434	-12.545	-0.110	(0)
Cu (CO3) 2-2	1.275e-013	9.890e-014	-12.894	-13.005	-0.110	(0)
Cu (OH) 3-	1.562e-015	1.465e-015	-14.806	-14.834	-0.028	(0)
CuCl2	4.593e-018	4.593e-018	-17.338	-17.338	0.000	(0)
Cu (OH) 4-2	4.849e-022	3.760e-022	-21.314	-21.425	-0.110	(0)
CuCl3-	7.274e-025	6.855e-025	-24.138	-24.164	-0.026	(0)
CuCl4-2	6.940e-032	5.494e-032	-31.159	-31.260	-0.101	(0)
F	1.749e-005					
F-	1.581e-005	1.490e-005	-4.801	-4.827	-0.026	(0)
AlF2+	5.562e-007	5.248e-007	-6.255	-6.280	-0.025	(0)
AlF+2	1.116e-007	8.846e-008	-6.952	-7.053	-0.101	(0)
AlF3	9.847e-008	9.847e-008	-7.007	-7.007	0.000	(0)
CaF+	8.548e-008	8.063e-008	-7.068	-7.093	-0.025	(0)
MgF+	6.154e-008	5.802e-008	-7.211	-7.236	-0.026	(0)
HF	6.809e-009	6.809e-009	-8.167	-8.167	0.000	(0)
NaF	1.578e-009	1.578e-009	-8.802	-8.802	0.000	(0)
MnF+	1.491e-009	1.406e-009	-8.827	-8.852	-0.025	(0)
AlF4-	7.802e-010	7.356e-010	-9.108	-9.133	-0.026	(0)
UO2F+	1.475e-010	1.384e-010	-9.831	-9.859	-0.028	(0)
CuF+	3.275e-011	3.074e-011	-10.485	-10.512	-0.028	(0)
UO2F2	5.950e-012	5.950e-012	-11.225	-11.225	0.000	(0)
ZnF+	4.667e-012	4.380e-012	-11.331	-11.359	-0.028	(0)
CoF+	2.863e-012	2.687e-012	-11.543	-11.571	-0.028	(0)
NiF+	2.313e-012	2.170e-012	-11.636	-11.663	-0.028	(0)
HF2-	4.096e-013	3.858e-013	-12.388	-12.414	-0.026	(0)
PbF+	3.666e-013	3.441e-013	-12.436	-12.463	-0.028	(0)
CdF+	1.278e-013	1.199e-013	-12.894	-12.921	-0.028	(0)
UO2F3-	2.374e-014	2.228e-014	-13.625	-13.652	-0.028	(0)
FeF+2	2.034e-014	1.610e-014	-13.692	-13.793	-0.101	(0)
FeF2+	6.809e-015	6.423e-015	-14.167	-14.192	-0.025	(0)
VOF+	1.012e-015	9.493e-016	-14.995	-15.023	-0.028	(0)
VO2F	3.638e-016	3.638e-016	-15.439	-15.439	0.000	(0)
FeF3	1.351e-016	1.351e-016	-15.869	-15.869	0.000	(0)
H2F2	1.242e-016	1.242e-016	-15.906	-15.906	0.000	(0)
PbF2	1.009e-016	1.009e-016	-15.996	-15.996	0.000	(0)
VOF2	5.305e-018	5.305e-018	-17.275	-17.275	0.000	(0)
CdF2	3.565e-018	3.565e-018	-17.448	-17.448	0.000	(0)
UO2F4-2	3.401e-018	2.637e-018	-17.468	-17.579	-0.110	(0)
VO2F2-	2.098e-018	1.969e-018	-17.678	-17.706	-0.028	(0)
Sb (OH) 2F	1.981e-020	1.981e-020	-19.703	-19.703	0.000	(0)
SbOF	1.948e-020	1.948e-020	-19.710	-19.710	0.000	(0)
PbF3-	3.040e-021	2.853e-021	-20.517	-20.545	-0.028	(0)
VOF3-	2.990e-021	2.806e-021	-20.524	-20.552	-0.028	(0)
VO2F3-2	4.720e-022	3.660e-022	-21.326	-21.437	-0.110	(0)
VOF4-2	2.177e-025	1.688e-025	-24.662	-24.773	-0.110	(0)
PbF4-2	2.624e-026	2.035e-026	-25.581	-25.691	-0.110	(0)
VO2F4-3	4.757e-027	2.684e-027	-26.323	-26.571	-0.249	(0)
UF3+	1.414e-028	1.327e-028	-27.849	-27.877	-0.028	(0)
UF2+2	7.246e-029	5.619e-029	-28.140	-28.250	-0.110	(0)
UF+3	5.308e-031	2.995e-031	-30.275	-30.524	-0.249	(0)
UF4	2.169e-031	2.169e-031	-30.664	-30.664	0.000	(0)
UF5-	1.365e-034	1.281e-034	-33.865	-33.892	-0.028	(0)
UF6-2	7.435e-037	5.765e-037	-36.129	-36.239	-0.110	(0)
Fe (2)	1.516e-006					
Fe+2	1.368e-006	1.061e-006	-5.864	-5.974	-0.110	(0)
FeSO4	1.453e-007	1.453e-007	-6.838	-6.838	0.000	(0)

FeOH+	1.459e-009	1.377e-009	-8.836	-8.861	-0.025	(0)
FeHCO3+	1.288e-009	1.216e-009	-8.890	-8.915	-0.025	(0)
Fe (OH) 2	3.565e-014	3.565e-014	-13.448	-13.448	0.000	(0)
Fe (OH) 3-	3.896e-016	3.675e-016	-15.409	-15.435	-0.025	(0)
Fe (3)	2.880e-007					
Fe (OH) 2+	2.788e-007	2.631e-007	-6.555	-6.580	-0.025	(0)
Fe (OH) 3	9.210e-009	9.210e-009	-8.036	-8.036	0.000	(0)
Fe (OH) 4-	2.963e-011	2.796e-011	-10.528	-10.554	-0.025	(0)
FeOH+2	2.620e-011	2.074e-011	-10.582	-10.683	-0.101	(0)
FeF+2	2.034e-014	1.610e-014	-13.692	-13.793	-0.101	(0)
FeF2+	6.809e-015	6.423e-015	-14.167	-14.192	-0.025	(0)
FeSO4+	6.539e-015	6.168e-015	-14.185	-14.210	-0.025	(0)
Fe+3	1.680e-015	9.854e-016	-14.775	-15.006	-0.232	(0)
FeF3	1.351e-016	1.351e-016	-15.869	-15.869	0.000	(0)
Fe (SO4) 2-	7.838e-017	7.356e-017	-16.106	-16.133	-0.028	(0)
FeCl+2	6.011e-019	4.759e-019	-18.221	-18.322	-0.101	(0)
Fe2 (OH) 2+4	3.941e-020	1.425e-020	-19.404	-19.846	-0.442	(0)
FeHSeO3+2	9.306e-021	7.216e-021	-20.031	-20.142	-0.110	(0)
FeCl2+	3.604e-023	3.399e-023	-22.443	-22.469	-0.025	(0)
Fe3 (OH) 4+5	2.656e-025	5.417e-026	-24.576	-25.266	-0.690	(0)
FeCl3	5.436e-029	5.436e-029	-28.265	-28.265	0.000	(0)
H (0)	1.350e-024					
H2	6.749e-025	6.754e-025	-24.171	-24.170	0.000	(0)
K	1.235e-005					
K+	1.230e-005	1.159e-005	-4.910	-4.936	-0.026	(0)
KSO4-	4.851e-008	4.578e-008	-7.314	-7.339	-0.025	(0)
Mg	4.760e-005					
Mg+2	4.399e-005	3.470e-005	-4.357	-4.460	-0.103	(0)
MgSO4	3.522e-006	3.522e-006	-5.453	-5.453	0.000	(0)
MgF+	6.154e-008	5.802e-008	-7.211	-7.236	-0.026	(0)
MgHCO3+	3.430e-008	3.232e-008	-7.465	-7.490	-0.026	(0)
MgOH+	4.767e-010	4.503e-010	-9.322	-9.346	-0.025	(0)
MgCO3	3.988e-010	3.988e-010	-9.399	-9.399	0.000	(0)
Mn (2)	3.297e-006					
Mn+2	3.056e-006	2.370e-006	-5.515	-5.625	-0.110	(0)
MnSO4	2.351e-007	2.351e-007	-6.629	-6.629	0.000	(0)
MnHCO3+	4.563e-009	4.304e-009	-8.341	-8.366	-0.025	(0)
MnF+	1.491e-009	1.406e-009	-8.827	-8.852	-0.025	(0)
MnOH+	2.057e-010	1.940e-010	-9.687	-9.712	-0.025	(0)
MnCl+	5.057e-011	4.771e-011	-10.296	-10.321	-0.025	(0)
MnCl2	1.078e-015	1.078e-015	-14.968	-14.968	0.000	(0)
MnCl3-	5.032e-021	4.746e-021	-20.298	-20.324	-0.025	(0)
MnSeO4	2.951e-021	2.951e-021	-20.530	-20.530	0.000	(0)
Mn (OH) 3-	1.351e-021	1.274e-021	-20.869	-20.895	-0.025	(0)
Mn (OH) 4-2	1.694e-028	1.341e-028	-27.771	-27.872	-0.101	(0)
MnSe	5.511e-032	5.511e-032	-31.259	-31.259	0.000	(0)
Mn (3)	1.805e-027					
Mn+3	1.805e-027	1.058e-027	-26.744	-26.975	-0.232	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-55.864	-55.966	-0.101	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-61.311	-61.338	-0.026	(0)
Mo	8.226e-007					
MoO4-2	8.184e-007	6.456e-007	-6.087	-6.190	-0.103	(0)
HMoO4-	4.228e-009	3.967e-009	-8.374	-8.401	-0.028	(0)
H2MoO4	8.976e-012	8.976e-012	-11.047	-11.047	0.000	(0)
AlMo6O21-3	6.498e-031	3.666e-031	-30.187	-30.436	-0.249	(0)
Mo7O24-6	0.000e+000	0.000e+000	-41.428	-42.422	-0.994	(0)
HMo7O24-5	0.000e+000	0.000e+000	-41.855	-42.546	-0.690	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-43.832	-44.274	-0.442	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-47.289	-47.538	-0.249	(0)
Na	1.786e-004					
Na+	1.781e-004	1.678e-004	-3.749	-3.775	-0.026	(0)
NaSO4-	5.328e-007	5.027e-007	-6.273	-6.299	-0.025	(0)
NaHCO3	8.591e-009	8.591e-009	-8.066	-8.066	0.000	(0)
NaF	1.578e-009	1.578e-009	-8.802	-8.802	0.000	(0)
NaCO3-	4.576e-011	4.318e-011	-10.340	-10.365	-0.025	(0)
Ni	8.071e-009					

Ni+2	7.349e-009	5.797e-009	-8.134	-8.237	-0.103	(0)
NiSO4	6.452e-010	6.452e-010	-9.190	-9.190	0.000	(0)
NiHCO3+	6.933e-011	6.506e-011	-10.159	-10.187	-0.028	(0)
NiCO3	2.988e-012	2.988e-012	-11.525	-11.525	0.000	(0)
NiOH+	2.535e-012	2.379e-012	-11.596	-11.624	-0.028	(0)
NiF+	2.313e-012	2.170e-012	-11.636	-11.663	-0.028	(0)
NiCl+	2.528e-013	2.372e-013	-12.597	-12.625	-0.028	(0)
Ni (SO4) 2-2	1.537e-014	1.192e-014	-13.813	-13.924	-0.110	(0)
Ni (OH) 2	6.161e-015	6.161e-015	-14.210	-14.210	0.000	(0)
Ni (OH) 3-	2.140e-019	2.008e-019	-18.670	-18.697	-0.028	(0)
NiCl2	1.910e-020	1.910e-020	-19.719	-19.719	0.000	(0)
NiSeO4	1.255e-023	1.255e-023	-22.901	-22.901	0.000	(0)
O (0)	0.000e+000					
O2	0.000e+000	0.000e+000	-43.954	-43.954	0.000	(0)
Pb	5.716e-010					
Pb+2	4.153e-010	3.276e-010	-9.382	-9.485	-0.103	(0)
PbSO4	8.950e-011	8.950e-011	-10.048	-10.048	0.000	(0)
PbOH+	2.859e-011	2.683e-011	-10.544	-10.571	-0.028	(0)
PbHCO3+	2.361e-011	2.216e-011	-10.627	-10.654	-0.028	(0)
PbCO3	1.361e-011	1.361e-011	-10.866	-10.866	0.000	(0)
Pb (SO4) 2-2	3.880e-013	3.008e-013	-12.411	-12.522	-0.110	(0)
PbF+	3.666e-013	3.441e-013	-12.436	-12.463	-0.028	(0)
PbCl+	1.981e-013	1.859e-013	-12.703	-12.731	-0.028	(0)
Pb (OH) 2	2.765e-014	2.765e-014	-13.558	-13.558	0.000	(0)
Pb (CO3) 2-2	6.993e-016	5.422e-016	-15.155	-15.266	-0.110	(0)
PbF2	1.009e-016	1.009e-016	-15.996	-15.996	0.000	(0)
PbCl2	1.328e-017	1.328e-017	-16.877	-16.877	0.000	(0)
Pb (OH) 3-	9.607e-019	9.015e-019	-18.017	-18.045	-0.028	(0)
Pb2OH+3	2.468e-019	1.393e-019	-18.608	-18.856	-0.249	(0)
PbF3-	3.040e-021	2.853e-021	-20.517	-20.545	-0.028	(0)
PbCl3-	9.008e-023	8.453e-023	-22.045	-22.073	-0.028	(0)
Pb (OH) 4-2	9.282e-024	7.198e-024	-23.032	-23.143	-0.110	(0)
PbF4-2	2.624e-026	2.035e-026	-25.581	-25.691	-0.110	(0)
Pb3 (OH) 4+2	6.446e-027	4.999e-027	-26.191	-26.301	-0.110	(0)
PbCl4-2	7.968e-028	6.179e-028	-27.099	-27.209	-0.110	(0)
Pb4 (OH) 4+4	3.598e-032	1.301e-032	-31.444	-31.886	-0.442	(0)
S (6)	7.750e-004					
SO4-2	7.071e-004	5.578e-004	-3.150	-3.254	-0.103	(0)
CaSO4	6.334e-005	6.334e-005	-4.198	-4.198	0.000	(0)
MgSO4	3.522e-006	3.522e-006	-5.453	-5.453	0.000	(0)
NaSO4-	5.328e-007	5.027e-007	-6.273	-6.299	-0.025	(0)
MnSO4	2.351e-007	2.351e-007	-6.629	-6.629	0.000	(0)
FeSO4	1.453e-007	1.453e-007	-6.838	-6.838	0.000	(0)
KSO4-	4.851e-008	4.578e-008	-7.314	-7.339	-0.025	(0)
HSO4-	1.786e-008	1.684e-008	-7.748	-7.774	-0.026	(0)
CuSO4	4.177e-009	4.177e-009	-8.379	-8.379	0.000	(0)
AlSO4+	2.726e-009	2.570e-009	-8.565	-8.590	-0.026	(0)
ZnSO4	1.797e-009	1.797e-009	-8.745	-8.745	0.000	(0)
NiSO4	6.452e-010	6.452e-010	-9.190	-9.190	0.000	(0)
CoSO4	6.345e-010	6.345e-010	-9.198	-9.198	0.000	(0)
PbSO4	8.950e-011	8.950e-011	-10.048	-10.048	0.000	(0)
CdSO4	6.637e-011	6.637e-011	-10.178	-10.178	0.000	(0)
UO2SO4	5.681e-011	5.681e-011	-10.246	-10.246	0.000	(0)
Al (SO4) 2-	1.629e-011	1.536e-011	-10.788	-10.814	-0.026	(0)
Zn (SO4) 2-2	1.126e-011	8.732e-012	-10.948	-11.059	-0.110	(0)
Cd (SO4) 2-2	6.441e-013	4.994e-013	-12.191	-12.302	-0.110	(0)
UO2 (SO4) 2-2	5.387e-013	4.177e-013	-12.269	-12.379	-0.110	(0)
Pb (SO4) 2-2	3.880e-013	3.008e-013	-12.411	-12.522	-0.110	(0)
Ni (SO4) 2-2	1.537e-014	1.192e-014	-13.813	-13.924	-0.110	(0)
FeSO4+	6.539e-015	6.168e-015	-14.185	-14.210	-0.025	(0)
VO2SO4	1.632e-015	1.632e-015	-14.787	-14.787	0.000	(0)
VO2SO4-	1.976e-016	1.854e-016	-15.704	-15.732	-0.028	(0)
Fe (SO4) 2-	7.838e-017	7.356e-017	-16.106	-16.133	-0.028	(0)
VSO4+	1.412e-026	1.325e-026	-25.850	-25.878	-0.028	(0)
U (SO4) 2	9.909e-032	9.909e-032	-31.004	-31.004	0.000	(0)
USO4+2	2.884e-032	2.236e-032	-31.540	-31.650	-0.110	(0)
Sb (3)	5.445e-015					
Sb (OH) 3	2.755e-015	2.755e-015	-14.560	-14.560	0.000	(0)

HSbO2	2.690e-015	2.690e-015	-14.570	-14.570	0.000	(0)
Sb (OH) 2+	2.202e-020	2.067e-020	-19.657	-19.685	-0.028	(0)
Sb (OH) 2F	1.981e-020	1.981e-020	-19.703	-19.703	0.000	(0)
SbOF	1.948e-020	1.948e-020	-19.710	-19.710	0.000	(0)
SbO2-	1.503e-020	1.410e-020	-19.823	-19.851	-0.028	(0)
Sb (OH) 4-	8.612e-021	8.082e-021	-20.065	-20.093	-0.028	(0)
SbO+	7.593e-021	7.125e-021	-20.120	-20.147	-0.028	(0)
Sb (5)	4.177e-009					
SbO3-	4.172e-009	3.915e-009	-8.380	-8.407	-0.028	(0)
Sb (OH) 6-	4.859e-012	4.580e-012	-11.313	-11.339	-0.026	(0)
SbO2+	1.142e-022	1.071e-022	-21.942	-21.970	-0.028	(0)
Se (-2)	1.862e-027					
HSe-	1.858e-027	1.743e-027	-26.731	-26.759	-0.028	(0)
H2Se	4.179e-030	4.179e-030	-29.379	-29.379	0.000	(0)
MnSe	5.511e-032	5.511e-032	-31.259	-31.259	0.000	(0)
Se-2	7.278e-036	5.644e-036	-35.138	-35.248	-0.110	(0)
Se (4)	3.000e-009					
HSeO3-	2.953e-009	2.771e-009	-8.530	-8.557	-0.028	(0)
SeO3-2	4.607e-011	3.572e-011	-10.337	-10.447	-0.110	(0)
H2SeO3	3.651e-013	3.651e-013	-12.438	-12.438	0.000	(0)
FeHSeO3+2	9.306e-021	7.216e-021	-20.031	-20.142	-0.110	(0)
Cd (SeO3) 2-2	6.883e-025	5.337e-025	-24.162	-24.273	-0.110	(0)
Se (6)	5.869e-018					
SeO4-2	5.866e-018	4.628e-018	-17.232	-17.335	-0.103	(0)
MnSeO4	2.951e-021	2.951e-021	-20.530	-20.530	0.000	(0)
HSeO4-	7.634e-023	7.163e-023	-22.117	-22.145	-0.028	(0)
CoSeO4	1.322e-023	1.322e-023	-22.879	-22.879	0.000	(0)
NiSeO4	1.255e-023	1.255e-023	-22.901	-22.901	0.000	(0)
ZnSeO4	1.056e-023	1.056e-023	-22.977	-22.977	0.000	(0)
CdSeO4	4.373e-025	4.373e-025	-24.359	-24.359	0.000	(0)
Zn (SeO4) 2-2	0.000e+000	0.000e+000	-40.195	-40.305	-0.110	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-47.544	-47.793	-0.249	(0)
U (4)	2.931e-016					
U (OH) 5-	2.896e-016	2.717e-016	-15.538	-15.566	-0.028	(0)
U (OH) 4	3.515e-018	3.515e-018	-17.454	-17.454	0.000	(0)
U (OH) 3+	4.230e-021	3.969e-021	-20.374	-20.401	-0.028	(0)
U (OH) 2+2	7.310e-025	5.668e-025	-24.136	-24.247	-0.110	(0)
UF3+	1.414e-028	1.327e-028	-27.849	-27.877	-0.028	(0)
UF2+2	7.246e-029	5.619e-029	-28.140	-28.250	-0.110	(0)
UOH+3	1.462e-029	8.246e-030	-28.835	-29.084	-0.249	(0)
UF+3	5.308e-031	2.995e-031	-30.275	-30.524	-0.249	(0)
UF4	2.169e-031	2.169e-031	-30.664	-30.664	0.000	(0)
U (SO4) 2	9.909e-032	9.909e-032	-31.004	-31.004	0.000	(0)
USO4+2	2.884e-032	2.236e-032	-31.540	-31.650	-0.110	(0)
UF5-	1.365e-034	1.281e-034	-33.865	-33.892	-0.028	(0)
U+4	2.786e-035	1.007e-035	-34.555	-34.997	-0.442	(0)
UF6-2	7.435e-037	5.765e-037	-36.129	-36.239	-0.110	(0)
UCl+3	1.430e-038	8.071e-039	-37.845	-38.093	-0.249	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-127.247	-129.484	-2.237	(0)
U (5)	4.371e-012					
UO2+	4.371e-012	4.101e-012	-11.359	-11.387	-0.028	(0)
U (6)	5.610e-009					
UO2CO3	3.701e-009	3.701e-009	-8.432	-8.432	0.000	(0)
UO2 (CO3) 2-2	1.316e-009	1.020e-009	-8.881	-8.991	-0.110	(0)
UO2OH+	2.943e-010	2.761e-010	-9.531	-9.559	-0.028	(0)
UO2F+	1.475e-010	1.384e-010	-9.831	-9.859	-0.028	(0)
UO2+2	8.529e-011	6.729e-011	-10.069	-10.172	-0.103	(0)
UO2SO4	5.681e-011	5.681e-011	-10.246	-10.246	0.000	(0)
UO2F2	5.950e-012	5.950e-012	-11.225	-11.225	0.000	(0)
UO2 (CO3) 3-4	1.955e-012	7.067e-013	-11.709	-12.151	-0.442	(0)
UO2 (SO4) 2-2	5.387e-013	4.177e-013	-12.269	-12.379	-0.110	(0)
(UO2) 2 (OH) 2+2	1.632e-013	1.266e-013	-12.787	-12.898	-0.110	(0)
(UO2) 3 (OH) 5+	3.002e-014	2.817e-014	-13.523	-13.550	-0.028	(0)
UO2F3-	2.374e-014	2.228e-014	-13.625	-13.652	-0.028	(0)
UO2Cl+	1.860e-015	1.745e-015	-14.731	-14.758	-0.028	(0)
UO2F4-2	3.401e-018	2.637e-018	-17.468	-17.579	-0.110	(0)
V (2)	5.948e-034					

V+2	3.178e-034	2.464e-034	-33.498	-33.608	-0.110	(0)
VOH+	2.770e-034	2.600e-034	-33.557	-33.585	-0.028	(0)
V (3)	1.406e-009					
V (OH) 3	1.406e-009	1.406e-009	-8.852	-8.852	0.000	(0)
V (OH) 2+	2.990e-019	2.806e-019	-18.524	-18.552	-0.028	(0)
VOH+2	1.060e-021	8.220e-022	-20.975	-21.085	-0.110	(0)
V+3	8.917e-026	5.031e-026	-25.050	-25.298	-0.249	(0)
VSO4+	1.412e-026	1.325e-026	-25.850	-25.878	-0.028	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-40.928	-41.370	-0.442	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-40.937	-41.185	-0.249	(0)
V (4)	8.996e-014					
V (OH) 3+	7.361e-014	6.908e-014	-13.133	-13.161	-0.028	(0)
VO+2	1.370e-014	1.062e-014	-13.863	-13.974	-0.110	(0)
VOSO4	1.632e-015	1.632e-015	-14.787	-14.787	0.000	(0)
VOF+	1.012e-015	9.493e-016	-14.995	-15.023	-0.028	(0)
VOF2	5.305e-018	5.305e-018	-17.275	-17.275	0.000	(0)
VOC1+	5.077e-019	4.764e-019	-18.294	-18.322	-0.028	(0)
VOF3-	2.990e-021	2.806e-021	-20.524	-20.552	-0.028	(0)
H2V2O4+2	3.084e-022	2.392e-022	-21.511	-21.621	-0.110	(0)
VOF4-2	2.177e-025	1.688e-025	-24.662	-24.773	-0.110	(0)
V (5)	7.893e-009					
H2VO4-	7.791e-009	7.311e-009	-8.108	-8.136	-0.028	(0)
HVO4-2	7.668e-011	5.946e-011	-10.115	-10.226	-0.110	(0)
H3VO4	2.258e-011	2.258e-011	-10.646	-10.646	0.000	(0)
H3V2O7-	1.136e-012	1.066e-012	-11.945	-11.972	-0.028	(0)
VO2+	1.477e-014	1.392e-014	-13.831	-13.856	-0.026	(0)
VO2F	3.638e-016	3.638e-016	-15.439	-15.439	0.000	(0)
HV2O7-3	2.611e-016	1.473e-016	-15.583	-15.832	-0.249	(0)
VO2SO4-	1.976e-016	1.854e-016	-15.704	-15.732	-0.028	(0)
VO2F2-	2.098e-018	1.969e-018	-17.678	-17.706	-0.028	(0)
VO4-3	1.710e-018	9.649e-019	-17.767	-18.016	-0.249	(0)
V3O9-3	7.255e-019	4.093e-019	-18.139	-18.388	-0.249	(0)
V2O7-4	3.551e-020	1.284e-020	-19.450	-19.892	-0.442	(0)
VO2F3-2	4.720e-022	3.660e-022	-21.326	-21.437	-0.110	(0)
V4O12-4	3.451e-024	1.248e-024	-23.462	-23.904	-0.442	(0)
VO2F4-3	4.757e-027	2.684e-027	-26.323	-26.571	-0.249	(0)
HV10O28-5	0.000e+000	0.000e+000	-56.128	-56.819	-0.690	(0)
V10O28-6	0.000e+000	0.000e+000	-57.501	-58.495	-0.994	(0)
H2V10O28-4	0.000e+000	0.000e+000	-57.679	-58.121	-0.442	(0)
Zn	2.059e-008					
Zn+2	1.867e-008	1.473e-008	-7.729	-7.832	-0.103	(0)
ZnSO4	1.797e-009	1.797e-009	-8.745	-8.745	0.000	(0)
ZnOH+	5.117e-011	4.801e-011	-10.291	-10.319	-0.028	(0)
ZnHCO3+	4.518e-011	4.240e-011	-10.345	-10.373	-0.028	(0)
ZnCO3	1.171e-011	1.171e-011	-10.931	-10.931	0.000	(0)
Zn (SO4) 2-2	1.126e-011	8.732e-012	-10.948	-11.059	-0.110	(0)
ZnF+	4.667e-012	4.380e-012	-11.331	-11.359	-0.028	(0)
ZnCl+	6.278e-013	5.916e-013	-12.202	-12.228	-0.026	(0)
Zn (OH) 2	2.481e-013	2.481e-013	-12.605	-12.605	0.000	(0)
ZnOHC1	2.525e-014	2.525e-014	-13.598	-13.598	0.000	(0)
Zn (OH) 3-	4.319e-017	4.053e-017	-16.365	-16.392	-0.028	(0)
ZnCl2	1.499e-017	1.499e-017	-16.824	-16.824	0.000	(0)
ZnCl3-	2.021e-022	1.905e-022	-21.694	-21.720	-0.026	(0)
Zn (OH) 4-2	6.784e-023	5.260e-023	-22.169	-22.279	-0.110	(0)
ZnSeO4	1.056e-023	1.056e-023	-22.977	-22.977	0.000	(0)
ZnCl4-2	1.924e-027	1.523e-027	-26.716	-26.817	-0.101	(0)
Zn (SeO4) 2-2	0.000e+000	0.000e+000	-40.195	-40.305	-0.110	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-0.50	10.30	10.80	Al (OH) 3
Al2 (MoO4) 3	-39.39	-37.02	2.37	Al2 (MoO4) 3
Al2O3	0.96	20.61	19.65	Al2O3
Al4 (OH) 10SO4	2.24	24.94	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-6.85	-2.05	4.80	AlAsO4:2H2O
AlOHSO4	-2.74	-5.97	-3.23	AlOHSO4

AlSb	-132.94	-67.32	65.62	AlSb
Alunite	1.34	-0.06	-1.40	KA13(SO4)2(OH)6
Anglesite	-4.95	-12.74	-7.79	PbSO4
Anhydrite	-2.20	-6.56	-4.36	CaSO4
Antlerite	-8.46	0.33	8.79	Cu3(OH)4SO4
Aragonite	-2.86	-11.16	-8.30	CaCO3
Arsenolite	-55.14	-57.90	-2.76	As4O6
Artinite	-13.36	-3.76	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-31.41	-24.70	6.71	As2O5
Atacamite	-7.63	-0.24	7.39	Cu2(OH)3Cl
Azurite	-8.25	-25.16	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-18.61	5.78	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-19.00	-3.13	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	1.56	-7.35	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-30.28	2.66	32.94	Ba3(VO4)2:4H2O
BaF2	-11.07	-16.89	-5.82	BaF2
BaMoO4	-6.47	-13.43	-6.96	BaMoO4
Barite	-0.51	-10.49	-9.98	BaSO4
BaSeO3	-11.11	-9.28	1.83	BaSeO3
BaSeO4	-17.11	-24.57	-7.46	BaSeO4
Bianchite	-9.32	-11.09	-1.76	ZnSO4:6H2O
Birnessite	-15.03	3.07	18.09	MnO2
Bixbyite	-14.24	-14.89	-0.64	Mn2O3
Boehmite	1.73	10.30	8.58	AlOOH
Breithauptite	-43.80	-62.33	-18.52	NiSb
Brochantite	-9.36	5.87	15.22	Cu4(OH)6SO4
Brucite	-8.28	8.56	16.84	Mg(OH)2
Bunsenite	-7.66	4.78	12.45	NiO
Ca(VO3)2	-10.64	-4.98	5.66	Ca(VO3)2
Ca2V2O7	-12.76	4.74	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.81	4.74	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.86	4.44	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-24.51	14.45	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-25.41	14.45	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-269.07	-126.10	142.97	Ca3Sb2
Calcite	-2.68	-11.16	-8.48	CaCO3
CaMoO4	-1.54	-9.49	-7.95	CaMoO4
Carnotite	-3.15	-2.92	0.23	KUO2VO4
CaSeO3:2H2O	-8.17	-5.35	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-17.62	-20.64	-3.02	CaSeO4:2H2O
Cd(OH)2	-9.92	3.73	13.64	Cd(OH)2
Cd(OH)2(am)	-10.00	3.73	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.08	-21.37	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.66	-5.10	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.77	-1.37	28.40	Cd4(OH)6SO4
CdCl2	-18.23	-18.89	-0.66	CdCl2
CdCl2:1H2O	-17.19	-18.89	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.97	-18.89	-1.91	CdCl2:2.5H2O
CdF2	-17.74	-18.95	-1.21	CdF2
Cdmetal(alpha)	-30.81	-17.29	13.51	Cd
Cdmetal(gamma)	-30.91	-17.29	13.62	Cd
CdMoO4	-1.33	-15.48	-14.15	CdMoO4
CdOHCl	-11.12	-7.58	3.54	CdOHCl
CdSb	-63.03	-63.39	-0.35	CdSb
CdSe	-9.34	-29.54	-20.20	CdSe
CdSeO4:2H2O	-24.78	-26.63	-1.85	CdSeO4:2H2O
CdSO4	-12.38	-12.55	-0.17	CdSO4
CdSO4:1H2O	-10.82	-12.55	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.68	-12.55	-1.87	CdSO4:2.67H2O
Cerrusite	-4.21	-17.34	-13.13	PbCO3
CH4(g)	-63.92	-104.96	-41.05	CH4
Chalcanthite	-8.10	-10.74	-2.64	CuSO4:5H2O
Claudetite	-54.83	-57.90	-3.06	As4O6
Clausthalite	-2.63	-29.73	-27.10	PbSe
Co(OH)2	-8.32	4.78	13.09	Co(OH)2
Co(OH)3	-14.80	-17.11	-2.31	Co(OH)3
CO2(g)	-2.73	-20.88	-18.15	CO2
Co3(AsO4)2	-23.41	-10.37	13.03	Co3(AsO4)2

Co3O4	-18.95	-29.45	-10.50	Co3O4
CoCl2	-26.10	-17.84	8.27	CoCl2
CoCl2:6H2O	-20.37	-17.84	2.54	CoCl2:6H2O
CoCO3	-6.12	-16.10	-9.98	CoCO3
CoF2	-16.30	-17.90	-1.60	CoF2
CoF3	-49.67	-51.12	-1.46	CoF3
CoFe2O4	17.35	13.82	-3.53	CoFe2O4
CoMoO4	-6.67	-14.43	-7.76	CoMoO4
CoO	-8.81	4.78	13.59	CoO
CoSe	-12.29	-28.49	-16.20	CoSe
CoSeO3	-11.61	-10.29	1.32	CoSeO3
CoSeO4:6H2O	-24.05	-25.58	-1.53	CoSeO4:6H2O
CoSO4	-14.30	-11.50	2.80	CoSO4
CoSO4:6H2O	-9.03	-11.50	-2.47	CoSO4:6H2O
Cotunnite	-14.30	-19.08	-4.78	PbCl2
Cryolite	-15.67	-49.51	-33.84	Na3AlF6
Cu(OH)2	-3.14	5.53	8.67	Cu(OH)2
Cu(SbO3)2	-26.75	18.46	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-39.49	-74.37	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	7.96	-37.84	-45.80	Cu2Se
Cu2SO4	-18.89	-20.84	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.20	-8.10	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-41.88	-84.48	-42.59	Cu3Sb
Cu3Se2	-2.08	-65.57	-63.49	Cu3Se2
CuCO3	-3.85	-15.35	-11.50	CuCO3
CuF	-8.72	-13.62	-4.91	CuF
CuF2	-18.25	-17.14	1.12	CuF2
CuF2:2H2O	-12.59	-17.14	-4.55	CuF2:2H2O
Cumetal	-4.04	-12.80	-8.76	Cu
CuMoO4	-0.60	-13.68	-13.08	CuMoO4
CuOCuSO4	-15.51	-5.20	10.30	CuOCuSO4
Cupricferrite	8.60	14.58	5.99	CuFe2O4
Cuprite	-3.16	-4.57	-1.41	Cu2O
Cuprousferrite	11.16	2.24	-8.92	CuFeO2
CuSe	5.37	-27.73	-33.10	CuSe
CuSe2	-6.62	-39.98	-33.37	CuSe2
CuSeO3:2H2O	-10.04	-9.53	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-22.38	-24.82	-2.44	CuSeO4:5H2O
CuSO4	-13.68	-10.74	2.94	CuSO4
Diaspore	3.43	10.30	6.87	AlOOH
Dolomite(disordered)	-6.94	-23.48	-16.54	CaMg(CO3)2
Dolomite(ordered)	-6.39	-23.48	-17.09	CaMg(CO3)2
Epsomite	-5.59	-7.71	-2.13	MgSO4:7H2O
Fe(OH)2	-6.52	7.05	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	4.17	1.13	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-3.93	-7.65	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-7.57	-6.02	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.53	-36.15	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-36.04	-39.77	-3.73	Fe2(SO4)3
Fe3(OH)8	-4.13	16.09	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.23	-7.83	0.40	FeAsO4:2H2O
FeMoO4	-2.07	-12.16	-10.09	FeMoO4
Ferrihydrite	1.33	4.52	3.19	Fe(OH)3
Ferroselite	-19.88	-38.47	-18.60	FeSe2
FeSe	-15.22	-26.22	-11.00	FeSe
Fluorite	-2.46	-12.96	-10.50	CaF2
Gibbsite	2.01	10.30	8.29	Al(OH)3
Goethite	4.03	4.52	0.49	FeOOH
Goslarite	-9.07	-11.09	-2.01	ZnSO4:7H2O
Gummite	-4.82	2.85	7.67	UO3
Gypsum	-1.95	-6.56	-4.61	CaSO4:2H2O
H-Jarosite	-6.88	-18.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-6.33	-19.21	-12.88	H2MoO4
H2Se(g)	-28.31	-33.27	-4.96	H2Se
Halite	-10.17	-8.57	1.60	NaCl
Hausmannite	-17.82	43.21	61.03	Mn3O4
Hematite	10.47	9.05	-1.42	Fe2O3
Hercynite	4.76	27.65	22.89	FeAl2O4

Huntite	-18.15	-48.12	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-12.38	-31.15	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-31.95	-40.72	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.50	-20.67	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-2.60	-17.40	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ MoO ₄	-19.32	-16.06	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-26.48	-27.21	-0.73	K ₂ SeO ₄
Langite	-11.62	5.87	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-8.77	-9.20	-0.43	PbO·PbSO ₄
Laurionite	-8.39	-7.77	0.62	PbOHCl
Lepidocrocite	3.15	4.52	1.37	FeOOH
Lime	-22.98	9.72	32.70	CaO
Litharge	-9.16	3.54	12.69	PbO
Maghemite	2.66	9.05	6.39	Fe ₂ O ₃
Magnesioferrite	0.75	17.61	16.86	Fe ₂ MgO ₄
Magnesite	-4.86	-12.32	-7.46	MgCO ₃
Magnetite	12.69	16.09	3.40	Fe ₃ O ₄
Malachite	-4.50	-9.81	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-7.43	17.91	25.34	MnOOH
Massicot	-9.36	3.54	12.89	PbO
Matlockite	-10.13	-19.11	-8.97	PbClF
Melanothallite	-23.34	-17.08	6.26	CuCl ₂
Melanterite	-7.02	-9.23	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-10.23	8.56	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.41	-6.13	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-237.87	-163.19	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.93	2.43	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-5.98	-14.11	-8.13	MgF ₂
MgMoO ₄	-8.80	-10.65	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-9.56	-6.51	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-20.59	-21.79	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-41.89	31.63	73.52	Pb ₃ O ₄
Mirabilite	-9.69	-10.80	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.20	-7.30	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-58.00	-63.71	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-134.42	-73.34	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-15.02	-2.52	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-17.93	-15.22	2.72	MnCl ₂ ·4H ₂ O
MnSb	-82.16	-85.07	-2.91	MnSb
MnSe	-29.37	-25.87	3.50	MnSe
MnSeO ₃	-8.80	-7.67	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-8.65	-7.67	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-20.91	-22.96	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.46	-8.88	2.58	MnSO ₄
Monteponite	-11.38	3.73	15.10	CdO
MoO ₃	-11.21	-19.21	-8.00	MoO ₃
Morenosite	-9.35	-11.49	-2.14	NiSO ₄ ·7H ₂ O
Na-Jarosite	-5.04	-16.24	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-16.35	-32.95	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-15.23	-13.74	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-14.96	-13.74	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-19.90	-9.60	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-26.16	-24.88	1.28	Na ₂ SeO ₄
Na ₃ Sb	-163.87	-69.42	94.45	Na ₃ Sb
Na ₃ VO ₄	-35.82	0.86	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-41.15	-3.75	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.86	-13.59	-6.73	CuCl
NaSb	-77.03	-53.87	23.17	NaSb
Natron	-14.10	-15.41	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.47	-4.61	3.86	NaVO ₃
Nesquehonite	-7.65	-12.32	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-8.01	4.78	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-26.05	-10.35	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-29.14	2.86	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-9.23	-16.10	-6.87	NiCO ₃
NiMoO ₄	-3.28	-14.43	-11.14	NiMoO ₄
NiSe	-10.79	-28.49	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-13.10	-10.28	2.81	NiSeO ₃ ·2H ₂ O

NiSeO4:6H2O	-24.05	-25.57	-1.52	NiSeO4:6H2O
Nsutite	-14.44	3.07	17.50	MnO2
O2(g)	-41.05	42.04	83.09	O2
Otavite	-5.15	-17.15	-12.00	CdCO3
Pb(OH)2	-4.61	3.54	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-81.16	-89.92	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-13.03	-4.23	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-19.12	7.07	26.19	Pb2O(OH)2
Pb2O3	-32.95	28.09	61.04	Pb2O3
Pb2OCO3	-13.25	-13.81	-0.56	Pb2OCO3
Pb2V2O7	-5.72	-7.62	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.90	-14.10	5.80	Pb3(AsO4)2
Pb3(VO4)2	-10.23	-4.09	6.14	Pb3(VO4)2
Pb3O2CO3	-21.29	-10.27	11.02	Pb3O2CO3
Pb3O2SO4	-16.35	-5.67	10.69	Pb3O2SO4
Pb4(OH)6SO4	-23.23	-2.13	21.10	Pb4(OH)6SO4
Pb4O3SO4	-24.01	-2.13	21.88	Pb4O3SO4
PbF2	-11.70	-19.14	-7.44	PbF2
Pbmetal	-21.73	-17.48	4.25	Pb
PbMoO4	-0.05	-15.67	-15.62	PbMoO4
PbO:0.3H2O	-9.44	3.54	12.98	PbO:0.33H2O
PbSeO4	-19.98	-26.82	-6.84	PbSeO4
Periclase	-13.02	8.56	21.58	MgO
Phosgenite	-16.61	-36.42	-19.81	PbCl2:PbCO3
Plattnerite	-25.04	24.56	49.60	PbO2
Portlandite	-13.09	9.72	22.80	Ca(OH)2
Pyrochroite	-7.80	7.40	15.19	Mn(OH)2
Pyrolusite	-12.96	28.42	41.38	MnO2
Retgersite	-9.45	-11.49	-2.04	NiSO4:6H2O
Rhodochrosite	-2.90	-13.48	-10.58	MnCO3
Rutherfordine	-3.53	-18.03	-14.50	UO2CO3
Sb(OH)3	-7.45	-14.56	-7.11	Sb(OH)3
Sb2O4	-11.50	-8.10	3.40	Sb2O4
Sb2O5	-26.03	-35.70	-9.67	Sb2O5
Sb2Se3	-61.17	-128.93	-67.76	Sb2Se3
Sb4O6(cubic)	-39.98	-58.24	-18.26	Sb4O6
Sb4O6(orth)	-40.34	-58.24	-17.90	Sb4O6
SbCl3	-49.05	-48.48	0.57	SbCl3
SbF3	-38.35	-48.57	-10.23	SbF3
Sbmetal	-34.40	-46.09	-11.69	Sb
SbO2	-0.54	-28.36	-27.82	SbO2
Schoepite	-3.15	2.85	5.99	UO2(OH)2:H2O
Semetal(am)	-5.14	-12.25	-7.11	Se
Semetal(hex)	-4.54	-12.25	-7.71	Se
Senarmontite	-16.75	-29.12	-12.37	Sb2O3
SeO2	-15.19	-15.07	0.12	SeO2
SeO3	-51.40	-30.36	21.04	SeO3
Siderite	-3.59	-13.83	-10.24	FeCO3
Smithsonite	-5.69	-15.69	-10.00	ZnCO3
Spinel	-7.68	29.17	36.85	MgAl2O4
Tenorite	-2.11	5.53	7.64	CuO
Thenardite	-11.13	-10.80	0.32	Na2SO4
Thermonatrite	-16.05	-15.41	0.64	Na2CO3:H2O
Tyuyamunite	-3.36	0.72	4.08	Ca(UO2)2(VO4)2
U3O8	-5.91	15.17	21.08	U3O8
U3Sb4	-489.74	-337.35	152.38	U3Sb4
U4O9	-11.78	-14.80	-3.02	U4O9
UF4	-24.77	-54.30	-29.54	UF4
UF4:2.5H2O	-21.59	-54.30	-32.72	UF4:2.5H2O
UO2(am)	-9.89	-8.96	0.93	UO2
UO2(OH)2(beta)	-2.76	2.85	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.26	-27.51	-2.25	UO2SeO4:4H2O
UO3	-4.85	2.85	7.70	UO3
Uraninite	-4.29	-8.96	-4.67	UO2
USb2	-181.97	-152.39	29.58	USb2
V(OH)3	-13.36	-5.77	7.59	V(OH)3
V2O5	-13.33	-14.69	-1.36	V2O5
V3O5	-25.72	-23.88	1.84	V3O5

V4O7	-32.02	-24.83	7.19	V4O7
V6O13	-25.26	-86.12	-60.86	V6O13
Valentinite	-20.64	-29.12	-8.48	Sb2O3
VC12	-57.76	-38.89	18.87	VC12
VC13	-63.12	-39.69	23.43	VC13
VF4	-61.23	-46.30	14.93	VF4
Vmetal	-81.32	-37.30	44.03	V
VO	-31.03	-16.28	14.76	VO
VO(OH)2	-6.10	-0.95	5.15	VO(OH)2
VO2Cl	-21.49	-18.65	2.84	VO2Cl
VOC1	-28.23	-17.07	11.15	VOC1
VOC12	-36.33	-23.57	12.76	VOC12
VOSO4	-20.84	-17.23	3.61	VOSO4
Witherite	-6.53	-15.10	-8.57	BaCO3
Zincite	-6.15	5.19	11.33	ZnO
Zincosite	-15.02	-11.09	3.93	ZnSO4
Zn(OH)2	-7.01	5.19	12.20	Zn(OH)2
Zn(OH)2(am)	-7.29	5.19	12.47	Zn(OH)2
Zn(OH)2(beta)	-6.57	5.19	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-6.35	5.19	11.53	Zn(OH)2
Zn(OH)2(gamma)	-6.55	5.19	11.73	Zn(OH)2
Zn2(OH)2SO4	-13.40	-5.90	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-16.12	-0.93	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-22.79	-9.14	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-35.90	-16.98	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-23.92	4.48	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-35.17	3.33	38.50	Zn5(OH)8Cl2
ZnCl2	-24.47	-17.42	7.05	ZnCl2
ZnCO3:1H2O	-5.43	-15.69	-10.26	ZnCO3:1H2O
ZnF2	-16.95	-17.49	-0.53	ZnF2
Znmetal	-41.62	-15.83	25.79	Zn
ZnMoO4	-3.90	-14.02	-10.13	ZnMoO4
ZnO(active)	-6.00	5.19	11.19	ZnO
ZnSb	-72.94	-61.92	11.01	ZnSb
ZnSe	-13.68	-28.08	-14.40	ZnSe
ZnSeO4:6H2O	-23.65	-25.17	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.45	-11.09	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 6.

SOLUTION 4 Average HCT data for biotite breccia - oxide/transitional (ore)
(cells SRK 0854)

temp	25
pH	5.22250
pe	4
redox	pe
units	mg/l
density	1
Alkalinity	0.47432 as HCO3
Al	0.39035
As	0.001077
Ba	0.01182327
Ca	14.10624
Cd	0.001288213
Cl	0.69324
Co	0.000931397
Cu	18.20993651
F	0.24542
Fe	0.69914
K	1.41745
Mg	1.43887

Mn 0.31515
 Na 0.60921 charge
 Ni 0.000467556
 Pb 0.00342243
 S(6) 99.61156 as SO4
 Se 0.000233778
 U 0.001330413
 V 0.000467556
 Zn 0.087700952
 water 1 # kg

END

 Beginning of initial solution calculations.

Initial solution 4. Average HCT data for biotite breccia - oxide/transitional (ore)
 (cells SRK 0854)

-----Solution composition-----

Elements	Molality	Moles	
Al	1.447e-005	1.447e-005	
Alkalinity	7.774e-006	7.774e-006	
As	1.438e-008	1.438e-008	
Ba	8.611e-008	8.611e-008	
Ca	3.520e-004	3.520e-004	
Cd	1.146e-008	1.146e-008	
Cl	1.956e-005	1.956e-005	
Co	1.581e-008	1.581e-008	
Cu	2.866e-004	2.866e-004	
F	1.292e-005	1.292e-005	
Fe	1.252e-005	1.252e-005	
K	3.626e-005	3.626e-005	
Mg	5.921e-005	5.921e-005	
Mn	5.737e-006	5.737e-006	
Na	6.097e-004	6.097e-004	Charge balance
Ni	7.968e-009	7.968e-009	
Pb	1.652e-008	1.652e-008	
S(6)	1.037e-003	1.037e-003	
Se	2.961e-009	2.961e-009	
U	5.590e-009	5.590e-009	
V	9.180e-009	9.180e-009	
Zn	1.341e-006	1.341e-006	

-----Description of solution-----

pH	=	5.223
pe	=	4.000
Activity of water	=	1.000
Ionic strength	=	3.524e-003
Mass of water (kg)	=	1.000e+000
Total carbon (mol/kg)	=	1.373e-004
Total CO2 (mol/kg)	=	1.373e-004
Temperature (deg C)	=	25.00
Electrical balance (eq)	=	5.622e-016
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	45
Total H	=	1.110139e+002
Total O	=	5.551140e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	6.391e-006	5.991e-006	-5.194	-5.223	-0.028	0.00
OH-	1.794e-009	1.681e-009	-8.746	-8.775	-0.028	(0)

	H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	1.447e-005						
	AlF+2	6.505e-006	5.054e-006	-5.187	-5.296	-0.110	(0)
	AlSO4+	2.623e-006	2.460e-006	-5.581	-5.609	-0.028	(0)
	AlF2+	2.512e-006	2.359e-006	-5.600	-5.627	-0.027	(0)
	Al (OH) 2+	1.030e-006	9.675e-007	-5.987	-6.014	-0.027	(0)
	AlOH+2	9.327e-007	7.247e-007	-6.030	-6.140	-0.110	(0)
	Al+3	7.710e-007	4.312e-007	-6.113	-6.365	-0.252	(0)
	AlF3	3.481e-008	3.481e-008	-7.458	-7.458	0.000	(0)
	Al (OH) 3	3.244e-008	3.244e-008	-7.489	-7.489	0.000	(0)
	Al (SO4) 2-	2.065e-008	1.937e-008	-7.685	-7.713	-0.028	(0)
	Al (OH) 4-	7.319e-009	6.864e-009	-8.136	-8.163	-0.028	(0)
	AlF4-	2.180e-011	2.045e-011	-10.662	-10.689	-0.028	(0)
As (3)	3.861e-011						
	H3AsO3	3.860e-011	3.860e-011	-10.413	-10.413	0.000	(0)
	H2AsO3-	3.543e-015	3.305e-015	-14.451	-14.481	-0.030	(0)
	H4AsO3+	1.229e-016	1.146e-016	-15.911	-15.941	-0.030	(0)
	HAsO3-2	6.649e-022	5.031e-022	-21.177	-21.298	-0.121	(0)
	AsO3-3	6.062e-030	3.237e-030	-29.217	-29.490	-0.272	(0)
As (5)	1.434e-008						
	H2AsO4-	1.401e-008	1.307e-008	-7.854	-7.884	-0.030	(0)
	HAsO4-2	3.160e-010	2.391e-010	-9.500	-9.621	-0.121	(0)
	H3AsO4	1.359e-011	1.360e-011	-10.867	-10.866	0.000	(0)
	AsO4-3	2.364e-016	1.262e-016	-15.626	-15.899	-0.272	(0)
Ba	8.611e-008						
	Ba+2	8.610e-008	6.650e-008	-7.065	-7.177	-0.112	(0)
	BaHCO3+	6.371e-012	5.985e-012	-11.196	-11.223	-0.027	(0)
	BaCO3	2.515e-015	2.515e-015	-14.599	-14.599	0.000	(0)
	BaOH+	5.199e-016	4.879e-016	-15.284	-15.312	-0.028	(0)
C (4)	1.373e-004						
	H2CO3	1.270e-004	1.270e-004	-3.896	-3.896	0.000	(0)
	HCO3-	1.004e-005	9.425e-006	-4.998	-5.026	-0.027	(0)
	CuHCO3+	1.199e-007	1.118e-007	-6.921	-6.951	-0.030	(0)
	CuCO3	8.168e-008	8.168e-008	-7.088	-7.088	0.000	(0)
	CaHCO3+	4.494e-008	4.222e-008	-7.347	-7.374	-0.027	(0)
	MgHCO3+	4.264e-009	3.997e-009	-8.370	-8.398	-0.028	(0)
	NaHCO3	3.017e-009	3.017e-009	-8.520	-8.520	0.000	(0)
	FeHCO3+	1.052e-009	9.884e-010	-8.978	-9.005	-0.027	(0)
	MnHCO3+	7.914e-010	7.427e-010	-9.102	-9.129	-0.028	(0)
	UO2CO3	5.158e-010	5.158e-010	-9.288	-9.288	0.000	(0)
	ZnHCO3+	2.941e-010	2.743e-010	-9.531	-9.562	-0.030	(0)
	CO3-2	9.548e-011	7.375e-011	-10.020	-10.132	-0.112	(0)
	PbHCO3+	7.428e-011	6.928e-011	-10.129	-10.159	-0.030	(0)
	CaCO3	2.812e-011	2.812e-011	-10.551	-10.551	0.000	(0)
	CoHCO3+	8.457e-012	7.887e-012	-11.073	-11.103	-0.030	(0)
	NiHCO3+	6.880e-012	6.417e-012	-11.162	-11.193	-0.030	(0)
	BaHCO3+	6.371e-012	5.985e-012	-11.196	-11.223	-0.027	(0)
	ZnCO3	3.906e-012	3.906e-012	-11.408	-11.408	0.000	(0)
	MgCO3	2.542e-012	2.542e-012	-11.595	-11.595	0.000	(0)
	PbCO3	2.193e-012	2.193e-012	-11.659	-11.659	0.000	(0)
	UO2 (CO3) 2-2	1.003e-012	7.590e-013	-11.999	-12.120	-0.121	(0)
	NaCO3-	8.327e-013	7.818e-013	-12.080	-12.107	-0.027	(0)
	CdHCO3+	1.792e-013	1.672e-013	-12.747	-12.777	-0.030	(0)
	Cu (CO3) 2-2	2.143e-014	1.621e-014	-13.669	-13.790	-0.121	(0)
	NiCO3	1.520e-014	1.520e-014	-13.818	-13.818	0.000	(0)
	CoCO3	1.341e-014	1.341e-014	-13.872	-13.872	0.000	(0)
	CdCO3	1.310e-014	1.310e-014	-13.883	-13.883	0.000	(0)
	BaCO3	2.515e-015	2.515e-015	-14.599	-14.599	0.000	(0)
	UO2 (CO3) 3-4	8.559e-018	2.805e-018	-17.068	-17.552	-0.484	(0)
	Pb (CO3) 2-2	6.166e-019	4.665e-019	-18.210	-18.331	-0.121	(0)
	Cd (CO3) 2-2	9.463e-022	7.160e-022	-21.024	-21.145	-0.121	(0)
Ca	3.520e-004						
	Ca+2	3.115e-004	2.406e-004	-3.507	-3.619	-0.112	(0)
	CaSO4	4.050e-005	4.050e-005	-4.393	-4.393	0.000	(0)
	CaHCO3+	4.494e-008	4.222e-008	-7.347	-7.374	-0.027	(0)
	CaF+	3.280e-009	3.078e-009	-8.484	-8.512	-0.028	(0)
	CaCO3	2.812e-011	2.812e-011	-10.551	-10.551	0.000	(0)
	CaOH+	8.587e-012	8.067e-012	-11.066	-11.093	-0.027	(0)

Cd	1.146e-008					
Cd+2	1.009e-008	7.791e-009	-7.996	-8.108	-0.112	(0)
CdSO4	1.342e-009	1.342e-009	-8.872	-8.872	0.000	(0)
Cd(SO4) 2-2	1.759e-011	1.331e-011	-10.755	-10.876	-0.121	(0)
CdCl+	1.446e-011	1.349e-011	-10.840	-10.870	-0.030	(0)
CdHCO3+	1.792e-013	1.672e-013	-12.747	-12.777	-0.030	(0)
CdF+	1.552e-013	1.447e-013	-12.809	-12.839	-0.030	(0)
CdOH+	1.115e-013	1.040e-013	-12.953	-12.983	-0.030	(0)
CdCO3	1.310e-014	1.310e-014	-13.883	-13.883	0.000	(0)
CdCl2	1.019e-015	1.019e-015	-14.992	-14.992	0.000	(0)
CdOHC1	9.299e-016	9.299e-016	-15.032	-15.032	0.000	(0)
Cd(OH) 2	1.103e-018	1.103e-018	-17.957	-17.957	0.000	(0)
CdF2	3.385e-019	3.385e-019	-18.470	-18.470	0.000	(0)
CdCl3-	1.250e-020	1.166e-020	-19.903	-19.933	-0.030	(0)
Cd2OH+3	7.606e-021	4.061e-021	-20.119	-20.391	-0.272	(0)
Cd(CO3) 2-2	9.463e-022	7.160e-022	-21.024	-21.145	-0.121	(0)
Cd(OH) 3-	1.214e-025	1.132e-025	-24.916	-24.946	-0.030	(0)
Cd(SeO3) 2-2	2.840e-026	2.149e-026	-25.547	-25.668	-0.121	(0)
CdSeO4	9.138e-028	9.138e-028	-27.039	-27.039	0.000	(0)
Cd(OH) 4-2	4.117e-035	3.115e-035	-34.385	-34.506	-0.121	(0)
Cl	1.956e-005					
Cl-	1.934e-005	1.813e-005	-4.714	-4.742	-0.028	(0)
CuCl	2.102e-007	2.102e-007	-6.677	-6.677	0.000	(0)
CuCl+	5.765e-009	5.404e-009	-8.239	-8.267	-0.028	(0)
CuCl2-	8.495e-010	7.963e-010	-9.071	-9.099	-0.028	(0)
MnCl+	9.606e-011	9.015e-011	-10.017	-10.045	-0.028	(0)
ZnCl+	4.471e-011	4.191e-011	-10.350	-10.378	-0.028	(0)
CdCl+	1.446e-011	1.349e-011	-10.840	-10.870	-0.030	(0)
PbCl+	6.824e-012	6.364e-012	-11.166	-11.196	-0.030	(0)
CoCl+	7.235e-013	6.747e-013	-12.141	-12.171	-0.030	(0)
NiCl+	2.747e-013	2.562e-013	-12.561	-12.591	-0.030	(0)
ZnOHC1	9.222e-014	9.222e-014	-13.035	-13.035	0.000	(0)
UO2Cl+	5.538e-014	5.165e-014	-13.257	-13.287	-0.030	(0)
CuCl2	3.397e-014	3.397e-014	-13.469	-13.469	0.000	(0)
CuCl3-2	3.980e-015	3.087e-015	-14.400	-14.511	-0.110	(0)
MnCl2	2.309e-015	2.309e-015	-14.637	-14.637	0.000	(0)
ZnCl2	1.204e-015	1.204e-015	-14.919	-14.919	0.000	(0)
CdCl2	1.019e-015	1.019e-015	-14.992	-14.992	0.000	(0)
CdOHC1	9.299e-016	9.299e-016	-15.032	-15.032	0.000	(0)
PbCl2	5.154e-016	5.154e-016	-15.288	-15.288	0.000	(0)
VOCl+	7.326e-017	6.833e-017	-16.135	-16.165	-0.030	(0)
FeCl+2	5.463e-018	4.237e-018	-17.263	-17.373	-0.110	(0)
NiCl2	2.338e-020	2.338e-020	-19.631	-19.631	0.000	(0)
ZnCl3-	1.850e-020	1.734e-020	-19.733	-19.761	-0.028	(0)
CdCl3-	1.250e-020	1.166e-020	-19.903	-19.933	-0.030	(0)
MnCl3-	1.228e-020	1.153e-020	-19.911	-19.938	-0.028	(0)
CuCl3-	6.132e-021	5.748e-021	-20.212	-20.241	-0.028	(0)
PbCl3-	3.988e-021	3.720e-021	-20.399	-20.429	-0.030	(0)
FeCl2+	3.656e-022	3.431e-022	-21.437	-21.465	-0.028	(0)
ZnCl4-2	2.027e-025	1.572e-025	-24.693	-24.803	-0.110	(0)
PbCl4-2	4.074e-026	3.082e-026	-25.390	-25.511	-0.121	(0)
CuCl4-2	6.733e-028	5.222e-028	-27.172	-27.282	-0.110	(0)
FeCl3	6.221e-028	6.221e-028	-27.206	-27.206	0.000	(0)
UCl+3	6.333e-032	3.382e-032	-31.198	-31.471	-0.272	(0)
CoCl+2	2.088e-039	1.580e-039	-38.680	-38.801	-0.121	(0)
Co (2)	1.581e-008					
Co+2	1.422e-008	1.076e-008	-7.847	-7.968	-0.121	(0)
CoSO4	1.578e-009	1.578e-009	-8.802	-8.802	0.000	(0)
CoHCO3+	8.457e-012	7.887e-012	-11.073	-11.103	-0.030	(0)
CoCl+	7.235e-013	6.747e-013	-12.141	-12.171	-0.030	(0)
CoF+	4.276e-013	3.988e-013	-12.369	-12.399	-0.030	(0)
CoOH+	3.868e-013	3.608e-013	-12.412	-12.443	-0.030	(0)
CoCO3	1.341e-014	1.341e-014	-13.872	-13.872	0.000	(0)
Co(OH) 2	4.816e-017	4.816e-017	-16.317	-16.317	0.000	(0)
Co2OH+3	3.643e-022	1.945e-022	-21.439	-21.711	-0.272	(0)
Co(OH) 3-	1.732e-024	1.615e-024	-23.762	-23.792	-0.030	(0)
CoOOH-	4.345e-025	4.052e-025	-24.362	-24.392	-0.030	(0)
CoSeO4	3.396e-027	3.396e-027	-26.469	-26.469	0.000	(0)

Co (OH) 4-2	5.686e-034	4.302e-034	-33.245	-33.366	-0.121	(0)
Co4 (OH) 4+4	0.000e+000	0.000e+000	-40.987	-41.471	-0.484	(0)
Co (3)	4.835e-033					
CoOH+2	4.834e-033	3.658e-033	-32.316	-32.437	-0.121	(0)
Co+3	7.658e-037	4.283e-037	-36.116	-36.368	-0.252	(0)
CoCl+2	2.088e-039	1.580e-039	-38.680	-38.801	-0.121	(0)
Cu (1)	1.009e-005					
Cu+	9.877e-006	9.211e-006	-5.005	-5.036	-0.030	(0)
CuCl	2.102e-007	2.102e-007	-6.677	-6.677	0.000	(0)
CuCl2-	8.495e-010	7.963e-010	-9.071	-9.099	-0.028	(0)
CuCl3-2	3.980e-015	3.087e-015	-14.400	-14.511	-0.110	(0)
Cu (2)	2.765e-004					
Cu+2	2.435e-004	1.881e-004	-3.614	-3.726	-0.112	(0)
CuSO4	3.166e-005	3.166e-005	-4.499	-4.499	0.000	(0)
CuOH+	1.066e-006	9.996e-007	-5.972	-6.000	-0.028	(0)
CuHCO3+	1.199e-007	1.118e-007	-6.921	-6.951	-0.030	(0)
CuCO3	8.168e-008	8.168e-008	-7.088	-7.088	0.000	(0)
Cu2 (OH) 2+2	3.317e-008	2.510e-008	-7.479	-7.600	-0.121	(0)
CuF+	1.491e-008	1.391e-008	-7.826	-7.857	-0.030	(0)
CuCl+	5.765e-009	5.404e-009	-8.239	-8.267	-0.028	(0)
Cu (OH) 2	3.352e-010	3.352e-010	-9.475	-9.475	0.000	(0)
CuCl2	3.397e-014	3.397e-014	-13.469	-13.469	0.000	(0)
Cu (CO3) 2-2	2.143e-014	1.621e-014	-13.669	-13.790	-0.121	(0)
Cu (OH) 3-	1.239e-015	1.156e-015	-14.907	-14.937	-0.030	(0)
CuCl3-	6.132e-021	5.748e-021	-20.212	-20.241	-0.028	(0)
Cu (OH) 4-2	2.020e-023	1.528e-023	-22.695	-22.816	-0.121	(0)
CuCl4-2	6.733e-028	5.222e-028	-27.172	-27.282	-0.110	(0)
F	1.292e-005					
AlF+2	6.505e-006	5.054e-006	-5.187	-5.296	-0.110	(0)
AlF2+	2.512e-006	2.359e-006	-5.600	-5.627	-0.027	(0)
F-	1.250e-006	1.172e-006	-5.903	-5.931	-0.028	(0)
AlF3	3.481e-008	3.481e-008	-7.458	-7.458	0.000	(0)
CuF+	1.491e-008	1.391e-008	-7.826	-7.857	-0.030	(0)
HF	1.039e-008	1.039e-008	-7.984	-7.984	0.000	(0)
MgF+	5.811e-009	5.451e-009	-8.236	-8.264	-0.028	(0)
CaF+	3.280e-009	3.078e-009	-8.484	-8.512	-0.028	(0)
NaF	4.210e-010	4.210e-010	-9.376	-9.376	0.000	(0)
UO2F+	3.048e-010	2.843e-010	-9.516	-9.546	-0.030	(0)
MnF+	1.964e-010	1.843e-010	-9.707	-9.734	-0.028	(0)
ZnF+	2.308e-011	2.153e-011	-10.637	-10.667	-0.030	(0)
AlF4-	2.180e-011	2.045e-011	-10.662	-10.689	-0.028	(0)
UO2F2	9.609e-013	9.609e-013	-12.017	-12.017	0.000	(0)
PbF+	8.762e-013	8.172e-013	-12.057	-12.088	-0.030	(0)
CoF+	4.276e-013	3.988e-013	-12.369	-12.399	-0.030	(0)
NiF+	1.744e-013	1.626e-013	-12.759	-12.789	-0.030	(0)
CdF+	1.552e-013	1.447e-013	-12.809	-12.839	-0.030	(0)
HF2-	4.941e-014	4.629e-014	-13.306	-13.335	-0.028	(0)
FeF+2	1.282e-014	9.947e-015	-13.892	-14.002	-0.110	(0)
VOF+	1.013e-014	9.445e-015	-13.995	-14.025	-0.030	(0)
FeF2+	3.325e-016	3.120e-016	-15.478	-15.506	-0.028	(0)
UO2F3-	3.034e-016	2.829e-016	-15.518	-15.548	-0.030	(0)
H2F2	2.891e-016	2.891e-016	-15.539	-15.539	0.000	(0)
PbF2	1.885e-017	1.885e-017	-16.725	-16.725	0.000	(0)
VO2F	9.620e-018	9.620e-018	-17.017	-17.017	0.000	(0)
VOF2	4.151e-018	4.151e-018	-17.382	-17.382	0.000	(0)
FeF3	5.160e-019	5.160e-019	-18.287	-18.287	0.000	(0)
CdF2	3.385e-019	3.385e-019	-18.470	-18.470	0.000	(0)
VO2F2-	4.390e-021	4.094e-021	-20.358	-20.388	-0.030	(0)
UO2F4-2	3.482e-021	2.634e-021	-20.458	-20.579	-0.121	(0)
VOF3-	1.851e-022	1.727e-022	-21.733	-21.763	-0.030	(0)
PbF3-	4.494e-023	4.191e-023	-22.347	-22.378	-0.030	(0)
UF2+2	1.698e-024	1.285e-024	-23.770	-23.891	-0.121	(0)
UF3+	2.559e-025	2.386e-025	-24.592	-24.622	-0.030	(0)
UF+3	1.630e-025	8.704e-026	-24.788	-25.060	-0.272	(0)
VO2F3-2	7.912e-026	5.986e-026	-25.102	-25.223	-0.121	(0)
VOF4-2	1.080e-027	8.169e-028	-26.967	-27.088	-0.121	(0)
PbF4-2	3.108e-029	2.351e-029	-28.508	-28.629	-0.121	(0)
UF4	3.067e-029	3.067e-029	-28.513	-28.513	0.000	(0)

VO2F4-3	6.466e-032	3.453e-032	-31.189	-31.462	-0.272	(0)
UF5-	1.528e-033	1.425e-033	-32.816	-32.846	-0.030	(0)
UF6-2	6.665e-037	5.043e-037	-36.176	-36.297	-0.121	(0)
Fe (2)	1.251e-005					
Fe+2	1.101e-005	8.331e-006	-4.958	-5.079	-0.121	(0)
FeSO4	1.503e-006	1.503e-006	-5.823	-5.823	0.000	(0)
FeHCO3+	1.052e-009	9.884e-010	-8.978	-9.005	-0.027	(0)
FeOH+	5.940e-010	5.574e-010	-9.226	-9.254	-0.028	(0)
Fe (OH) 2	7.441e-016	7.441e-016	-15.128	-15.128	0.000	(0)
Fe (OH) 3-	4.214e-019	3.955e-019	-18.375	-18.403	-0.028	(0)
Fe (3)	5.869e-009					
Fe (OH) 2+	5.848e-009	5.491e-009	-8.233	-8.260	-0.027	(0)
FeOH+2	1.083e-011	8.398e-012	-10.965	-11.076	-0.110	(0)
Fe (OH) 3	9.911e-012	9.911e-012	-11.004	-11.004	0.000	(0)
FeSO4+	6.800e-014	6.381e-014	-13.167	-13.195	-0.028	(0)
Fe+3	1.384e-014	7.739e-015	-13.859	-14.111	-0.252	(0)
FeF+2	1.282e-014	9.947e-015	-13.892	-14.002	-0.110	(0)
Fe (OH) 4-	1.652e-015	1.551e-015	-14.782	-14.809	-0.027	(0)
Fe (SO4) 2-	1.075e-015	1.003e-015	-14.969	-14.999	-0.030	(0)
FeF2+	3.325e-016	3.120e-016	-15.478	-15.506	-0.028	(0)
FeCl+2	5.463e-018	4.237e-018	-17.263	-17.373	-0.110	(0)
FeF3	5.160e-019	5.160e-019	-18.287	-18.287	0.000	(0)
FeHSeO3+2	7.440e-020	5.630e-020	-19.128	-19.250	-0.121	(0)
Fe2 (OH) 2+4	7.125e-021	2.335e-021	-20.147	-20.632	-0.484	(0)
FeCl2+	3.656e-022	3.431e-022	-21.437	-21.465	-0.028	(0)
Fe3 (OH) 4+5	1.059e-027	1.853e-028	-26.975	-27.732	-0.757	(0)
FeCl3	6.221e-028	6.221e-028	-27.206	-27.206	0.000	(0)
H (0)	5.078e-022					
H2	2.539e-022	2.541e-022	-21.595	-21.595	0.000	(0)
K	3.626e-005					
K+	3.607e-005	3.382e-005	-4.443	-4.471	-0.028	(0)
KSO4-	1.874e-007	1.759e-007	-6.727	-6.755	-0.027	(0)
Mg	5.921e-005					
Mg+2	5.366e-005	4.144e-005	-4.270	-4.383	-0.112	(0)
MgSO4	5.542e-006	5.542e-006	-5.256	-5.256	0.000	(0)
MgF+	5.811e-009	5.451e-009	-8.236	-8.264	-0.028	(0)
MgHCO3+	4.264e-009	3.997e-009	-8.370	-8.398	-0.028	(0)
MgOH+	2.950e-011	2.773e-011	-10.530	-10.557	-0.027	(0)
MgCO3	2.542e-012	2.542e-012	-11.595	-11.595	0.000	(0)
Mn (2)	5.737e-006					
Mn+2	5.220e-006	3.950e-006	-5.282	-5.403	-0.121	(0)
MnSO4	5.162e-007	5.162e-007	-6.287	-6.287	0.000	(0)
MnHCO3+	7.914e-010	7.427e-010	-9.102	-9.129	-0.028	(0)
MnF+	1.964e-010	1.843e-010	-9.707	-9.734	-0.028	(0)
MnCl+	9.606e-011	9.015e-011	-10.017	-10.045	-0.028	(0)
MnOH+	1.777e-011	1.667e-011	-10.750	-10.778	-0.028	(0)
MnCl2	2.309e-015	2.309e-015	-14.637	-14.637	0.000	(0)
MnCl3-	1.228e-020	1.153e-020	-19.911	-19.938	-0.028	(0)
MnSeO4	6.696e-025	6.696e-025	-24.174	-24.174	0.000	(0)
Mn (OH) 3-	3.102e-025	2.911e-025	-24.508	-24.536	-0.028	(0)
MnSe	2.506e-025	2.506e-025	-24.601	-24.601	0.000	(0)
Mn (OH) 4-2	2.036e-033	1.579e-033	-32.691	-32.802	-0.110	(0)
Mn (3)	3.155e-027					
Mn+3	3.155e-027	1.764e-027	-26.501	-26.753	-0.252	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-65.935	-66.046	-0.110	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-71.389	-71.418	-0.029	(0)
Na	6.097e-004					
Na+	6.073e-004	5.693e-004	-3.217	-3.245	-0.028	(0)
NaSO4-	2.393e-006	2.247e-006	-5.621	-5.648	-0.027	(0)
NaHCO3	3.017e-009	3.017e-009	-8.520	-8.520	0.000	(0)
NaF	4.210e-010	4.210e-010	-9.376	-9.376	0.000	(0)
NaCO3-	8.327e-013	7.818e-013	-12.080	-12.107	-0.027	(0)
Ni	7.968e-009					
Ni+2	7.150e-009	5.523e-009	-8.146	-8.258	-0.112	(0)
NiSO4	8.098e-010	8.098e-010	-9.092	-9.092	0.000	(0)
NiHCO3+	6.880e-012	6.417e-012	-11.162	-11.193	-0.030	(0)

NiCl+	2.747e-013	2.562e-013	-12.561	-12.591	-0.030	(0)
NiF+	1.744e-013	1.626e-013	-12.759	-12.789	-0.030	(0)
NiOH+	1.253e-013	1.169e-013	-12.902	-12.932	-0.030	(0)
Ni (SO4) 2-2	2.604e-014	1.971e-014	-13.584	-13.705	-0.121	(0)
NiCO3	1.520e-014	1.520e-014	-13.818	-13.818	0.000	(0)
Ni (OH) 2	1.560e-017	1.560e-017	-16.807	-16.807	0.000	(0)
NiCl2	2.338e-020	2.338e-020	-19.631	-19.631	0.000	(0)
Ni (OH) 3-	2.811e-023	2.622e-023	-22.551	-22.581	-0.030	(0)
NiSeO4	1.627e-027	1.627e-027	-26.789	-26.789	0.000	(0)
O (0)	0.000e+000					
O2	0.000e+000	0.000e+000	-49.105	-49.105	0.000	(0)
Pb	1.652e-008					
Pb+2	1.281e-008	9.893e-009	-7.892	-8.005	-0.112	(0)
PbSO4	3.561e-009	3.561e-009	-8.448	-8.448	0.000	(0)
PbHCO3+	7.428e-011	6.928e-011	-10.129	-10.159	-0.030	(0)
PbOH+	4.478e-011	4.177e-011	-10.349	-10.379	-0.030	(0)
Pb (SO4) 2-2	2.084e-011	1.577e-011	-10.681	-10.802	-0.121	(0)
PbCl+	6.824e-012	6.364e-012	-11.166	-11.196	-0.030	(0)
PbCO3	2.193e-012	2.193e-012	-11.659	-11.659	0.000	(0)
PbF+	8.762e-013	8.172e-013	-12.057	-12.088	-0.030	(0)
Pb (OH) 2	2.220e-015	2.220e-015	-14.654	-14.654	0.000	(0)
PbCl2	5.154e-016	5.154e-016	-15.288	-15.288	0.000	(0)
PbF2	1.885e-017	1.885e-017	-16.725	-16.725	0.000	(0)
Pb2OH+3	1.227e-017	6.549e-018	-16.911	-17.184	-0.272	(0)
Pb (CO3) 2-2	6.166e-019	4.665e-019	-18.210	-18.331	-0.121	(0)
Pb (OH) 3-	4.000e-021	3.731e-021	-20.398	-20.428	-0.030	(0)
PbCl3-	3.988e-021	3.720e-021	-20.399	-20.429	-0.030	(0)
PbF3-	4.494e-023	4.191e-023	-22.347	-22.378	-0.030	(0)
PbCl4-2	4.074e-026	3.082e-026	-25.390	-25.511	-0.121	(0)
Pb (OH) 4-2	2.029e-027	1.536e-027	-26.693	-26.814	-0.121	(0)
Pb3 (OH) 4+2	1.286e-027	9.727e-028	-26.891	-27.012	-0.121	(0)
PbF4-2	3.108e-029	2.351e-029	-28.508	-28.629	-0.121	(0)
Pb4 (OH) 4+4	2.332e-031	7.644e-032	-30.632	-31.117	-0.484	(0)
S (6)	1.037e-003					
SO4-2	9.515e-004	7.349e-004	-3.022	-3.134	-0.112	(0)
CaSO4	4.050e-005	4.050e-005	-4.393	-4.393	0.000	(0)
CuSO4	3.166e-005	3.166e-005	-4.499	-4.499	0.000	(0)
MgSO4	5.542e-006	5.542e-006	-5.256	-5.256	0.000	(0)
AlSO4+	2.623e-006	2.460e-006	-5.581	-5.609	-0.028	(0)
NaSO4-	2.393e-006	2.247e-006	-5.621	-5.648	-0.027	(0)
FeSO4	1.503e-006	1.503e-006	-5.823	-5.823	0.000	(0)
MnSO4	5.162e-007	5.162e-007	-6.287	-6.287	0.000	(0)
HSO4-	4.587e-007	4.303e-007	-6.338	-6.366	-0.028	(0)
KSO4-	1.874e-007	1.759e-007	-6.727	-6.755	-0.027	(0)
ZnSO4	1.480e-007	1.480e-007	-6.830	-6.830	0.000	(0)
Al (SO4) 2-	2.065e-008	1.937e-008	-7.685	-7.713	-0.028	(0)
PbSO4	3.561e-009	3.561e-009	-8.448	-8.448	0.000	(0)
UO2SO4	1.954e-009	1.954e-009	-8.709	-8.709	0.000	(0)
CoSO4	1.578e-009	1.578e-009	-8.802	-8.802	0.000	(0)
CdSO4	1.342e-009	1.342e-009	-8.872	-8.872	0.000	(0)
Zn (SO4) 2-2	1.252e-009	9.472e-010	-8.902	-9.024	-0.121	(0)
NiSO4	8.098e-010	8.098e-010	-9.092	-9.092	0.000	(0)
UO2 (SO4) 2-2	2.502e-011	1.893e-011	-10.602	-10.723	-0.121	(0)
Pb (SO4) 2-2	2.084e-011	1.577e-011	-10.681	-10.802	-0.121	(0)
Cd (SO4) 2-2	1.759e-011	1.331e-011	-10.755	-10.876	-0.121	(0)
VOSO4	2.719e-013	2.719e-013	-12.566	-12.566	0.000	(0)
FeSO4+	6.800e-014	6.381e-014	-13.167	-13.195	-0.028	(0)
Ni (SO4) 2-2	2.604e-014	1.971e-014	-13.584	-13.705	-0.121	(0)
Fe (SO4) 2-	1.075e-015	1.003e-015	-14.969	-14.999	-0.030	(0)
VO2SO4-	8.804e-017	8.211e-017	-16.055	-16.086	-0.030	(0)
VSO4+	8.907e-022	8.307e-022	-21.050	-21.081	-0.030	(0)
U (SO4) 2	6.356e-025	6.356e-025	-24.197	-24.197	0.000	(0)
USO4+2	1.439e-025	1.089e-025	-24.842	-24.963	-0.121	(0)
Se (-2)	1.032e-019					
HSe-	9.888e-020	9.222e-020	-19.005	-19.035	-0.030	(0)
H2Se	4.289e-021	4.289e-021	-20.368	-20.368	0.000	(0)
MnSe	2.506e-025	2.506e-025	-24.601	-24.601	0.000	(0)
Se-2	2.034e-029	1.539e-029	-28.692	-28.813	-0.121	(0)

Se (4)	2.961e-009					
HSeO3-	2.952e-009	2.753e-009	-8.530	-8.560	-0.030	(0)
H2SeO3	7.035e-012	7.035e-012	-11.153	-11.153	0.000	(0)
SeO3-2	2.418e-012	1.829e-012	-11.617	-11.738	-0.121	(0)
FeHSeO3+2	7.440e-020	5.630e-020	-19.128	-19.250	-0.121	(0)
Cd (SeO3) 2-2	2.840e-026	2.149e-026	-25.547	-25.668	-0.121	(0)
Se (6)	8.165e-022					
SeO4-2	8.155e-022	6.299e-022	-21.089	-21.201	-0.112	(0)
MnSeO4	6.696e-025	6.696e-025	-24.174	-24.174	0.000	(0)
HSeO4-	2.028e-025	1.891e-025	-24.693	-24.723	-0.030	(0)
ZnSeO4	8.979e-026	8.979e-026	-25.047	-25.047	0.000	(0)
CoSeO4	3.396e-027	3.396e-027	-26.469	-26.469	0.000	(0)
NiSeO4	1.627e-027	1.627e-027	-26.789	-26.789	0.000	(0)
CdSeO4	9.138e-028	9.138e-028	-27.039	-27.039	0.000	(0)
Zn (SeO4) 2-2	0.000e+000	0.000e+000	-46.120	-46.241	-0.121	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-40.953	-41.225	-0.272	(0)
U (4)	4.861e-016					
U (OH) 5-	3.921e-016	3.657e-016	-15.407	-15.437	-0.030	(0)
U (OH) 4	9.176e-017	9.176e-017	-16.037	-16.037	0.000	(0)
U (OH) 3+	2.155e-018	2.010e-018	-17.667	-17.697	-0.030	(0)
U (OH) 2+2	7.359e-021	5.568e-021	-20.133	-20.254	-0.121	(0)
UOH+3	2.943e-024	1.571e-024	-23.531	-23.804	-0.272	(0)
UF2+2	1.698e-024	1.285e-024	-23.770	-23.891	-0.121	(0)
U (SO4) 2	6.356e-025	6.356e-025	-24.197	-24.197	0.000	(0)
UF3+	2.559e-025	2.386e-025	-24.592	-24.622	-0.030	(0)
UF+3	1.630e-025	8.704e-026	-24.788	-25.060	-0.272	(0)
USO4+2	1.439e-025	1.089e-025	-24.842	-24.963	-0.121	(0)
U+4	1.135e-028	3.722e-029	-27.945	-28.429	-0.484	(0)
UF4	3.067e-029	3.067e-029	-28.513	-28.513	0.000	(0)
UCl+3	6.333e-032	3.382e-032	-31.198	-31.471	-0.272	(0)
UF5-	1.528e-033	1.425e-033	-32.816	-32.846	-0.030	(0)
UF6-2	6.665e-037	5.043e-037	-36.176	-36.297	-0.121	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-106.941	-109.393	-2.452	(0)
U (5)	1.148e-010					
UO2+	1.148e-010	1.071e-010	-9.940	-9.970	-0.030	(0)
U (6)	5.475e-009					
UO2+2	2.274e-009	1.757e-009	-8.643	-8.755	-0.112	(0)
UO2SO4	1.954e-009	1.954e-009	-8.709	-8.709	0.000	(0)
UO2CO3	5.158e-010	5.158e-010	-9.288	-9.288	0.000	(0)
UO2OH+	3.985e-010	3.717e-010	-9.400	-9.430	-0.030	(0)
UO2F+	3.048e-010	2.843e-010	-9.516	-9.546	-0.030	(0)
UO2 (SO4) 2-2	2.502e-011	1.893e-011	-10.602	-10.723	-0.121	(0)
UO2 (CO3) 2-2	1.003e-012	7.590e-013	-11.999	-12.120	-0.121	(0)
UO2F2	9.609e-013	9.609e-013	-12.017	-12.017	0.000	(0)
(UO2) 2 (OH) 2+2	3.030e-013	2.293e-013	-12.519	-12.640	-0.121	(0)
UO2Cl+	5.538e-014	5.165e-014	-13.257	-13.287	-0.030	(0)
UO2F3-	3.034e-016	2.829e-016	-15.518	-15.548	-0.030	(0)
(UO2) 3 (OH) 5+	1.958e-016	1.826e-016	-15.708	-15.738	-0.030	(0)
UO2 (CO3) 3-4	8.559e-018	2.805e-018	-17.068	-17.552	-0.484	(0)
UO2F4-2	3.482e-021	2.634e-021	-20.458	-20.579	-0.121	(0)
V (2)	1.618e-029					
V+2	1.550e-029	1.173e-029	-28.810	-28.931	-0.121	(0)
VOH+	6.839e-031	6.378e-031	-30.165	-30.195	-0.030	(0)
V (3)	9.170e-009					
V (OH) 3	9.170e-009	9.170e-009	-8.038	-8.038	0.000	(0)
V (OH) 2+	3.806e-017	3.550e-017	-16.420	-16.450	-0.030	(0)
VOH+2	2.666e-018	2.017e-018	-17.574	-17.695	-0.121	(0)
V+3	4.484e-021	2.395e-021	-20.348	-20.621	-0.272	(0)
VSO4+	8.907e-022	8.307e-022	-21.050	-21.081	-0.030	(0)
V2 (OH) 2+4	7.831e-035	2.567e-035	-34.106	-34.591	-0.484	(0)
V2 (OH) 3+3	3.796e-036	2.027e-036	-35.421	-35.693	-0.272	(0)
V (4)	2.541e-012					
VO+2	1.775e-012	1.343e-012	-11.751	-11.872	-0.121	(0)
V (OH) 3+	4.830e-013	4.505e-013	-12.316	-12.346	-0.030	(0)
VOSO4	2.719e-013	2.719e-013	-12.566	-12.566	0.000	(0)
VOF+	1.013e-014	9.445e-015	-13.995	-14.025	-0.030	(0)
VOC1+	7.326e-017	6.833e-017	-16.135	-16.165	-0.030	(0)

VOF2	4.151e-018	4.151e-018	-17.382	-17.382	0.000	(0)
H2V2O4+2	1.344e-020	1.017e-020	-19.872	-19.993	-0.121	(0)
VOF3-	1.851e-022	1.727e-022	-21.733	-21.763	-0.030	(0)
VOF4-2	1.080e-027	8.169e-028	-26.967	-27.088	-0.121	(0)
V(5)	7.405e-012					
H2VO4-	7.005e-012	6.533e-012	-11.155	-11.185	-0.030	(0)
H3VO4	3.914e-013	3.914e-013	-12.407	-12.407	0.000	(0)
VO2+	4.991e-015	4.679e-015	-14.302	-14.330	-0.028	(0)
HVO4-2	3.620e-015	2.739e-015	-14.441	-14.562	-0.121	(0)
VO2SO4-	8.804e-017	8.211e-017	-16.055	-16.086	-0.030	(0)
H3V2O7-	1.770e-017	1.651e-017	-16.752	-16.782	-0.030	(0)
VO2F	9.620e-018	9.620e-018	-17.017	-17.017	0.000	(0)
VO2F2-	4.390e-021	4.094e-021	-20.358	-20.388	-0.030	(0)
HV2O7-3	1.136e-023	6.065e-024	-22.945	-23.217	-0.272	(0)
VO4-3	4.292e-024	2.292e-024	-23.367	-23.640	-0.272	(0)
VO2F3-2	7.912e-026	5.986e-026	-25.102	-25.223	-0.121	(0)
V3O9-3	5.470e-028	2.921e-028	-27.262	-27.535	-0.272	(0)
V2O7-4	8.313e-029	2.725e-029	-28.080	-28.565	-0.484	(0)
VO2F4-3	6.466e-032	3.453e-032	-31.189	-31.462	-0.272	(0)
V4O12-4	2.427e-036	7.955e-037	-35.615	-36.099	-0.484	(0)
HV10O28-5	0.000e+000	0.000e+000	-80.111	-80.868	-0.757	(0)
H2V10O28-4	0.000e+000	0.000e+000	-80.399	-80.883	-0.484	(0)
V10O28-6	0.000e+000	0.000e+000	-82.743	-83.833	-1.090	(0)
Zn	1.341e-006					
Zn+2	1.192e-006	9.204e-007	-5.924	-6.036	-0.112	(0)
ZnSO4	1.480e-007	1.480e-007	-6.830	-6.830	0.000	(0)
Zn(SO4) 2-2	1.252e-009	9.472e-010	-8.902	-9.024	-0.121	(0)
ZnHCO3+	2.941e-010	2.743e-010	-9.531	-9.562	-0.030	(0)
ZnOH+	1.659e-010	1.547e-010	-9.780	-9.811	-0.030	(0)
ZnCl+	4.471e-011	4.191e-011	-10.350	-10.378	-0.028	(0)
ZnF+	2.308e-011	2.153e-011	-10.637	-10.667	-0.030	(0)
ZnCO3	3.906e-012	3.906e-012	-11.408	-11.408	0.000	(0)
ZnOHCl	9.222e-014	9.222e-014	-13.035	-13.035	0.000	(0)
Zn(OH) 2	4.120e-014	4.120e-014	-13.385	-13.385	0.000	(0)
ZnCl2	1.204e-015	1.204e-015	-14.919	-14.919	0.000	(0)
Zn(OH) 3-	3.721e-019	3.471e-019	-18.429	-18.460	-0.030	(0)
ZnCl3-	1.850e-020	1.734e-020	-19.733	-19.761	-0.028	(0)
ZnCl4-2	2.027e-025	1.572e-025	-24.693	-24.803	-0.110	(0)
ZnSeO4	8.979e-026	8.979e-026	-25.047	-25.047	0.000	(0)
Zn(OH) 4-2	3.069e-026	2.322e-026	-25.513	-25.634	-0.121	(0)
Zn(SeO4) 2-2	0.000e+000	0.000e+000	-46.120	-46.241	-0.121	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Al(OH) 3(am)	-1.50	9.30	10.80	Al(OH) 3
Al2O3	-1.05	18.60	19.65	Al2O3
Al4(OH) 10SO4	0.93	23.63	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-6.36	-1.56	4.80	AlAsO4:2H2O
AlOHSO4	-1.05	-4.28	-3.23	AlOHSO4
Alunite	2.90	1.50	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-3.35	-11.14	-7.79	PbSO4
Anhydrite	-2.39	-6.75	-4.36	CaSO4
Antlerite	-2.21	6.58	8.79	Cu3(OH) 4SO4
Aragonite	-5.45	-13.75	-8.30	CaCO3
Arsenolite	-38.89	-41.65	-2.76	As4O6
Artinite	-18.05	-8.45	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-28.44	-21.73	6.71	As2O5
Atacamite	-3.92	3.47	7.39	Cu2(OH) 3Cl
Azurite	-4.09	-21.00	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-21.13	3.27	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-27.55	-11.68	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-3.02	-11.93	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-41.35	-8.41	32.94	Ba3(VO4) 2:4H2O
BaF2	-13.22	-19.04	-5.82	BaF2
Barite	-0.33	-10.31	-9.98	BaSO4
BaSeO3	-12.34	-10.51	1.83	BaSeO3

BaSeO4	-20.92	-28.38	-7.46	BaSeO4
Bianchite	-7.40	-9.17	-1.76	ZnSO4:6H2O
Birnessite	-19.95	-1.86	18.09	MnO2
Bixbyite	-21.53	-22.17	-0.64	Mn2O3
Boehmite	0.72	9.30	8.58	AlOOH
Brochantite	-1.92	13.30	15.22	Cu4(OH)6SO4
Brucite	-10.78	6.06	16.84	Mg(OH)2
Bunsenite	-10.26	2.19	12.45	NiO
Ca(VO3)2	-17.05	-11.39	5.66	Ca(VO3)2
Ca2V2O7	-22.06	-4.56	17.50	Ca2V2O7
Ca2V2O7:2H2O	-26.11	-4.56	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-23.55	-1.25	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-36.70	2.26	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-37.60	2.26	39.86	Ca3(VO4)2:4H2O
Calcite	-5.27	-13.75	-8.48	CaCO3
Carnotite	-6.90	-6.67	0.23	KUO2VO4
CaSeO3:2H2O	-9.77	-6.96	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-21.80	-24.82	-3.02	CaSeO4:2H2O
Cd(OH)2	-11.31	2.34	13.64	Cd(OH)2
Cd(OH)2(am)	-11.39	2.34	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.86	-20.15	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-29.13	-6.57	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-32.63	-4.23	28.40	Cd4(OH)6SO4
CdCl2	-16.93	-17.59	-0.66	CdCl2
CdCl2:1H2O	-15.90	-17.59	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-15.68	-17.59	-1.91	CdCl2:2.5H2O
CdF2	-18.76	-19.97	-1.21	CdF2
Cdmetal(alpha)	-29.62	-16.11	13.51	Cd
Cdmetal(gamma)	-29.73	-16.11	13.62	Cd
CdOHCl	-11.16	-7.63	3.54	CdOHCl
CdSe	-1.72	-21.92	-20.20	CdSe
CdSeO4:2H2O	-27.46	-29.31	-1.85	CdSeO4:2H2O
CdSO4	-11.07	-11.24	-0.17	CdSO4
CdSO4:1H2O	-9.52	-11.24	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.37	-11.24	-1.87	CdSO4:2.67H2O
Cerrusite	-5.01	-18.14	-13.13	PbCO3
CH4(g)	-53.31	-94.36	-41.05	CH4
Chalcanthite	-4.22	-6.86	-2.64	CuSO4:5H2O
Claudetite	-38.59	-41.65	-3.06	As4O6
Clausthalite	5.28	-21.82	-27.10	PbSe
Co(OH)2	-10.62	2.48	13.09	Co(OH)2
Co(OH)3	-18.39	-20.70	-2.31	Co(OH)3
CO2(g)	-2.43	-20.58	-18.15	CO2
Co3(AsO4)2	-27.34	-14.30	13.03	Co3(AsO4)2
Co3O4	-28.43	-38.92	-10.50	Co3O4
CoCl2	-25.72	-17.45	8.27	CoCl2
CoCl2:6H2O	-19.99	-17.45	2.54	CoCl2:6H2O
CoCO3	-8.12	-18.10	-9.98	CoCO3
CoF2	-18.23	-19.83	-1.60	CoF2
CoF3	-52.70	-54.16	-1.46	CoF3
CoFe2O4	9.12	5.59	-3.53	CoFe2O4
CoO	-11.11	2.48	13.59	CoO
CoSe	-5.58	-21.78	-16.20	CoSe
CoSeO3	-12.63	-11.31	1.32	CoSeO3
CoSeO4:6H2O	-27.64	-29.17	-1.53	CoSeO4:6H2O
CoSO4	-13.90	-11.10	2.80	CoSO4
CoSO4:6H2O	-8.63	-11.10	-2.47	CoSO4:6H2O
Cotunnite	-12.71	-17.49	-4.78	PbCl2
Cryolite	-17.85	-51.69	-33.84	Na3AlF6
Cu(OH)2	-1.95	6.72	8.67	Cu(OH)2
Cu2Se(alpha)	21.92	-23.88	-45.80	Cu2Se
Cu2SO4	-11.26	-13.21	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-7.67	-1.57	6.10	Cu3(AsO4)2:2H2O
Cu3Se2	22.07	-41.42	-63.49	Cu3Se2
CuCO3	-2.36	-13.86	-11.50	CuCO3
CuF	-6.06	-10.97	-4.91	CuF
CuF2	-16.70	-15.59	1.12	CuF2
CuF2:2H2O	-11.04	-15.59	-4.55	CuF2:2H2O

Cumetal	-0.28	-9.04	-8.76	Cu
CuOCuSO4	-10.44	-0.14	10.30	CuOCuSO4
Cupricferrite	3.84	9.83	5.99	CuFe2O4
Cuprite	1.78	0.37	-1.41	Cu2O
Cuprousferrite	10.66	1.74	-8.92	CuFeO2
CuSe	15.56	-17.54	-33.10	CuSe
CuSe2	10.01	-23.35	-33.37	CuSe2
CuSeO3:2H2O	-7.58	-7.06	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-22.49	-24.93	-2.44	CuSeO4:5H2O
CuSO4	-9.80	-6.86	2.94	CuSO4
Diaspore	2.43	9.30	6.87	AlOOH
Dolomite (disordered)	-11.73	-28.27	-16.54	CaMg(CO3)2
Dolomite (ordered)	-11.18	-28.27	-17.09	CaMg(CO3)2
Epsomite	-5.39	-7.52	-2.13	MgSO4:7H2O
Fe(OH)2	-8.20	5.37	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	1.61	-1.43	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.13	-12.85	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.22	-10.67	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.61	-38.24	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.89	-37.62	-3.73	Fe2(SO4)3
Fe3(OH)8	-11.74	8.48	20.22	Fe3(OH)8
FeAsO4:2H2O	-9.71	-9.31	0.40	FeAsO4:2H2O
Ferrihydrite	-1.63	1.56	3.19	Fe(OH)3
Ferroselite	-6.11	-24.70	-18.60	FeSe2
FeSe	-7.89	-18.89	-11.00	FeSe
Fluorite	-4.98	-15.48	-10.50	CaF2
Gibbsite	1.01	9.30	8.29	Al(OH)3
Goethite	1.07	1.56	0.49	FeOOH
Goslarite	-7.16	-9.17	-2.01	ZnSO4:7H2O
Gummite	-5.98	1.69	7.67	UO3
Gypsum	-2.14	-6.75	-4.61	CaSO4:2H2O
H-Jarosite	-10.39	-22.49	-12.10	(H3O)Fe3(SO4)2(OH)6
H2Se(g)	-19.30	-24.26	-4.96	H2Se
Halite	-9.59	-7.99	1.60	NaCl
Hausmannite	-27.46	33.57	61.03	Mn3O4
Hematite	4.53	3.11	-1.42	Fe2O3
Hercynite	1.08	23.97	22.89	FeAl2O4
Huntite	-27.33	-57.30	-29.97	CaMg3(CO3)4
Hydrocerrusite	-15.06	-33.83	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-43.23	-52.00	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-11.93	-17.10	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.94	-21.74	-14.80	KFe3(SO4)2(OH)6
K2SeO4	-29.41	-30.14	-0.73	K2SeO4
Langite	-4.19	13.30	17.49	Cu4(OH)6SO4:H2O
Larnakite	-8.26	-8.70	-0.43	PbO:PbSO4
Laurionite	-8.15	-7.52	0.62	PbOHCl
Lepidocrocite	0.19	1.56	1.37	FeOOH
Lime	-25.87	6.83	32.70	CaO
Litharge	-10.25	2.44	12.69	PbO
Maghemite	-3.27	3.11	6.39	Fe2O3
Magnesioferrite	-7.68	9.17	16.86	Fe2MgO4
Magnesite	-7.05	-14.51	-7.46	MgCO3
Magnetite	5.08	8.48	3.40	Fe3O4
Malachite	-1.83	-7.14	-5.31	Cu2(OH)2CO3
Manganite	-11.08	14.26	25.34	MnOOH
Massicot	-10.45	2.44	12.89	PbO
Matlockite	-9.70	-18.68	-8.97	PbClF
Melanothallite	-19.47	-13.21	6.26	CuCl2
Melanterite	-6.00	-8.21	-2.21	FeSO4:7H2O
Mg(OH)2(active)	-12.73	6.06	18.79	Mg(OH)2
Mg(VO3)2	-23.43	-12.15	11.28	Mg(VO3)2
Mg2V2O7	-32.45	-6.09	26.36	Mg2V2O7
MgF2	-8.11	-16.24	-8.13	MgF2
MgSeO3:6H2O	-10.78	-7.72	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-24.38	-25.58	-1.20	MgSeO4:6H2O
Minium	-47.76	25.77	73.52	Pb3O4
Mirabilite	-8.51	-9.62	-1.11	Na2SO4:10H2O
Mn(VO3)2	-18.07	-13.17	4.90	Mn(VO3)2

Mn2 (SO4) 3	-57.20	-62.91	-5.71	Mn2 (SO4) 3
Mn3 (AsO4) 2:8H2O	-19.11	-6.61	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-17.60	-14.89	2.72	MnCl2:4H2O
MnSe	-22.72	-19.22	3.50	MnSe
MnSeO3	-9.87	-8.74	1.13	MnSeO3
MnSeO3:2H2O	-9.72	-8.74	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-24.55	-26.60	-2.05	MnSeO4:5H2O
MnSO4	-11.12	-8.54	2.58	MnSO4
Monteponite	-12.77	2.34	15.10	CdO
Morenosite	-9.25	-11.39	-2.14	NiSO4:7H2O
Na-Jarosite	-9.31	-20.51	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2SeO3:5H2O	-20.13	-9.83	10.30	Na2SeO3:5H2O
Na2SeO4	-28.97	-27.69	1.28	Na2SeO4
Na3VO4	-39.86	-3.17	36.68	Na3VO4
Na4V2O7	-47.70	-10.30	37.40	Na4V2O7
Nantokite	-3.05	-9.78	-6.73	CuCl
Natron	-15.31	-16.62	-1.31	Na2CO3:10H2O
NaVO3	-10.99	-7.13	3.86	NaVO3
Nesquehonite	-9.84	-14.51	-4.67	MgCO3:3H2O
Ni (OH) 2	-10.61	2.19	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-30.87	-15.17	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-36.83	-4.83	32.00	Ni4 (OH) 6SO4
NiCO3	-11.52	-18.39	-6.87	NiCO3
NiSe	-4.37	-22.07	-17.70	NiSe
NiSeO3:2H2O	-14.41	-11.60	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-27.94	-29.46	-1.52	NiSeO4:6H2O
Nsutite	-19.37	-1.86	17.50	MnO2
O2 (g)	-46.20	36.89	83.09	O2
Otavite	-6.24	-18.24	-12.00	CdCO3
Pb (OH) 2	-5.71	2.44	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-90.30	-99.06	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-13.88	-5.08	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-21.31	4.88	26.19	Pb2O (OH) 2
Pb2O3	-37.71	23.33	61.04	Pb2O3
Pb2OCO3	-15.14	-15.70	-0.56	Pb2OCO3
Pb2V2O7	-11.43	-13.33	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.21	-14.41	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-17.03	-10.89	6.14	Pb3 (VO4) 2
Pb3O2CO3	-24.28	-13.26	11.02	Pb3O2CO3
Pb3O2SO4	-16.94	-6.26	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-24.92	-3.82	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-25.69	-3.82	21.88	Pb4O3SO4
PbF2	-12.43	-19.87	-7.44	PbF2
Pbmetal	-20.25	-16.00	4.25	Pb
PbO:0.3H2O	-10.54	2.44	12.98	PbO:0.33H2O
PbSeO4	-22.37	-29.21	-6.84	PbSeO4
Periclase	-15.52	6.06	21.58	MgO
Phosgenite	-15.81	-35.62	-19.81	PbCl2:PbCO3
Plattnerite	-28.71	20.89	49.60	PbO2
Portlandite	-15.98	6.83	22.80	Ca (OH) 2
Pyrochroite	-10.15	5.04	15.19	Mn (OH) 2
Pyrolusite	-17.89	23.49	41.38	MnO2
Retgersite	-9.35	-11.39	-2.04	NiSO4:6H2O
Rhodochrosite	-4.96	-15.54	-10.58	MnCO3
Rutherfordine	-4.39	-18.89	-14.50	UO2CO3
Schoepite	-4.30	1.69	5.99	UO2 (OH) 2:H2O
Semetal (am)	1.30	-5.81	-7.11	Se
Semetal (hex)	1.90	-5.81	-7.71	Se
SeO2	-13.91	-13.78	0.12	SeO2
SeO3	-52.69	-31.65	21.04	SeO3
Siderite	-4.97	-15.21	-10.24	FeCO3
Smithsonite	-6.17	-16.17	-10.00	ZnCO3
Spinel	-12.18	24.67	36.85	MgAl2O4
Tenorite	-0.92	6.72	7.64	CuO
Thenardite	-9.94	-9.62	0.32	Na2SO4
Thermonatrite	-17.26	-16.62	0.64	Na2CO3:H2O
Tyuyamunite	-12.09	-8.01	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-6.81	14.27	21.08	U3O8

U4O9	-8.69	-11.71	-3.02	U4O9
UF4	-22.62	-52.15	-29.54	UF4
UF4:2.5H2O	-19.44	-52.15	-32.72	UF4:2.5H2O
UO2 (am)	-8.47	-7.54	0.93	UO2
UO2 (OH) 2 (beta)	-3.92	1.69	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-27.71	-29.96	-2.25	UO2SeO4:4H2O
UO3	-6.01	1.69	7.70	UO3
Uraninite	-2.87	-7.54	-4.67	UO2
V(OH) 3	-12.54	-4.95	7.59	V(OH) 3
V2O5	-16.85	-18.21	-1.36	V2O5
V3O5	-24.56	-22.73	1.84	V3O5
V4O7	-31.34	-24.15	7.19	V4O7
V6O13	-30.67	-91.53	-60.86	V6O13
VC12	-52.98	-34.10	18.87	VC12
VC13	-58.28	-34.85	23.43	VC13
VF4	-60.97	-46.04	14.93	VF4
Vmetal	-76.65	-32.62	44.03	V
VO	-28.93	-14.18	14.76	VO
VO(OH) 2	-6.58	-1.43	5.15	VO(OH) 2
VO2Cl	-21.91	-19.07	2.84	VO2Cl
VOC1	-26.07	-14.92	11.15	VOC1
VOC12	-34.12	-21.36	12.76	VOC12
VOSO4	-18.62	-15.01	3.61	VOSO4
Witherite	-8.74	-17.31	-8.57	BaCO3
Zincite	-6.93	4.41	11.33	ZnO
Zincosite	-13.10	-9.17	3.93	ZnSO4
Zn(OH) 2	-7.79	4.41	12.20	Zn(OH) 2
Zn(OH) 2 (am)	-8.07	4.41	12.47	Zn(OH) 2
Zn(OH) 2 (beta)	-7.35	4.41	11.75	Zn(OH) 2
Zn(OH) 2 (epsilon)	-7.13	4.41	11.53	Zn(OH) 2
Zn(OH) 2 (gamma)	-7.33	4.41	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-12.26	-4.76	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-16.34	-1.15	15.19	Zn2(OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-22.16	-8.51	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-32.84	-13.93	18.91	Zn3O(SO4) 2
Zn4(OH) 6SO4	-24.34	4.06	28.40	Zn4(OH) 6SO4
Zn5(OH) 8Cl2	-36.38	2.12	38.50	Zn5(OH) 8Cl2
ZnCl2	-22.57	-15.52	7.05	ZnCl2
ZnCO3:1H2O	-5.91	-16.17	-10.26	ZnCO3:1H2O
ZnF2	-17.36	-17.90	-0.53	ZnF2
Znmetal	-39.82	-14.04	25.79	Zn
ZnO (active)	-6.78	4.41	11.19	ZnO
ZnSe	-5.45	-19.85	-14.40	ZnSe
ZnSeO4:6H2O	-25.72	-27.24	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.53	-9.17	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 7.

SOLUTION 5 Average HCT data for quartz monzonite - oxide/transitional
(waste) (cell 604569)

temp	25
pH	7.84618
pe	4
redox	pe
units	mg/l
density	1
Alkalinity	22.57505 as HCO3
Al	0.03378
As	0.00025
B	0.00497
Ba	0.00050

Ca 9.05082
Cd 0.00005
Cl 1.07023 charge
Cr 0.00025
Cu 0.00248
F 0.74410
Fe 0.00101
K 2.50235
Mg 2.53523
Mn 0.03777
Mo 0.00050
Na 3.22778
Ni 0.00050
Pb 0.00012
S(6) 21.64621 as SO4
Se 0.00025
U 0.00050
V 0.00050
Zn 0.00235
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 5. Average HCT data for quartz monzonite - oxide/transitional
(waste) (cell 604569)

-----Solution composition-----

Elements	Molality	Moles	
Al	1.252e-006	1.252e-006	
Alkalinity	3.700e-004	3.700e-004	
As	3.337e-009	3.337e-009	
B	4.598e-007	4.598e-007	
Ba	3.641e-009	3.641e-009	
Ca	2.258e-004	2.258e-004	
Cd	4.448e-010	4.448e-010	
Cl	1.020e-005	1.020e-005	Charge balance
Cr	4.808e-009	4.808e-009	
Cu	3.903e-008	3.903e-008	
F	3.917e-005	3.917e-005	
Fe	1.809e-008	1.809e-008	
K	6.401e-005	6.401e-005	
Mg	1.043e-004	1.043e-004	
Mn	6.875e-007	6.875e-007	
Mo	5.212e-009	5.212e-009	
Na	1.404e-004	1.404e-004	
Ni	8.520e-009	8.520e-009	
Pb	5.792e-010	5.792e-010	
S(6)	2.253e-004	2.253e-004	
Se	3.166e-009	3.166e-009	
U	2.101e-009	2.101e-009	
V	9.816e-009	9.816e-009	
Zn	3.594e-008	3.594e-008	

-----Description of solution-----

pH	=	7.846
pe	=	4.000
Activity of water	=	1.000
Ionic strength	=	1.376e-003
Mass of water (kg)	=	1.000e+000
Total carbon (mol/kg)	=	3.735e-004
Total CO2 (mol/kg)	=	3.735e-004
Temperature (deg C)	=	25.00
Electrical balance (eq)	=	2.304e-019

Percent error, $100 * (Cat - |An|) / (Cat + |An|)$ = 0.00
Iterations = 10
Total H = 1.110141e+002
Total O = 5.550886e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	7.367e-007	7.066e-007	-6.133	-6.151	-0.018	(0)
H+	1.485e-008	1.425e-008	-7.828	-7.846	-0.018	0.00
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	1.252e-006					
Al (OH) 4-	1.238e-006	1.188e-006	-5.907	-5.925	-0.018	(0)
Al (OH) 3	1.335e-008	1.335e-008	-7.874	-7.874	0.000	(0)
Al (OH) 2+	9.865e-010	9.470e-010	-9.006	-9.024	-0.018	(0)
AlF2+	1.366e-011	1.311e-011	-10.865	-10.882	-0.018	(0)
AlF3	6.131e-012	6.131e-012	-11.212	-11.212	0.000	(0)
AlOH+2	1.987e-012	1.687e-012	-11.702	-11.773	-0.071	(0)
AlF+2	1.044e-012	8.868e-013	-11.981	-12.052	-0.071	(0)
AlF4-	1.189e-013	1.141e-013	-12.925	-12.943	-0.018	(0)
AlSO4+	3.512e-015	3.370e-015	-14.454	-14.472	-0.018	(0)
Al+3	3.470e-015	2.388e-015	-14.460	-14.622	-0.162	(0)
Al (SO4) 2-	6.841e-018	6.564e-018	-17.165	-17.183	-0.018	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-56.668	-56.838	-0.170	(0)
As (3)	1.349e-020					
H3AsO3	1.300e-020	1.300e-020	-19.886	-19.886	0.000	(0)
H2AsO3-	4.887e-022	4.679e-022	-21.311	-21.330	-0.019	(0)
HAsO3-2	3.565e-026	2.994e-026	-25.448	-25.524	-0.076	(0)
H4AsO3+	9.587e-029	9.179e-029	-28.018	-28.037	-0.019	(0)
AsO3-3	1.199e-031	8.100e-032	-30.921	-31.092	-0.170	(0)
As (5)	3.337e-009					
HAsO4-2	2.995e-009	2.516e-009	-8.524	-8.599	-0.076	(0)
H2AsO4-	3.415e-010	3.270e-010	-9.467	-9.486	-0.019	(0)
AsO4-3	8.263e-013	5.583e-013	-12.083	-12.253	-0.170	(0)
H3AsO4	8.094e-016	8.097e-016	-15.092	-15.092	0.000	(0)
B	4.598e-007					
H3BO3	4.408e-007	4.409e-007	-6.356	-6.356	0.000	(0)
H2BO3-	1.875e-008	1.797e-008	-7.727	-7.745	-0.018	(0)
CaH2BO3+	1.979e-010	1.897e-010	-9.704	-9.722	-0.018	(0)
MgH2BO3+	5.544e-011	5.314e-011	-10.256	-10.275	-0.018	(0)
BF (OH) 3-	6.817e-012	6.535e-012	-11.166	-11.185	-0.018	(0)
NaH2BO3	3.832e-012	3.832e-012	-11.417	-11.417	0.000	(0)
H5 (BO3) 2-	7.035e-015	6.744e-015	-14.153	-14.171	-0.018	(0)
BaH2BO3+	1.780e-015	1.707e-015	-14.749	-14.768	-0.018	(0)
BF2 (OH) 2-	3.857e-016	3.697e-016	-15.414	-15.432	-0.018	(0)
H8 (BO3) 3-	3.102e-019	2.973e-019	-18.508	-18.527	-0.018	(0)
BF3OH-	7.942e-023	7.614e-023	-22.100	-22.118	-0.018	(0)
BF4-	2.068e-028	1.983e-028	-27.684	-27.703	-0.018	(0)
Ba	3.641e-009					
Ba+2	3.629e-009	3.073e-009	-8.440	-8.512	-0.072	(0)
BaHCO3+	1.054e-011	1.012e-011	-10.977	-10.995	-0.018	(0)
BaCO3	1.787e-012	1.787e-012	-11.748	-11.748	0.000	(0)
BaOH+	9.877e-015	9.480e-015	-14.005	-14.023	-0.018	(0)
BaH2BO3+	1.780e-015	1.707e-015	-14.749	-14.768	-0.018	(0)
C (4)	3.735e-004					
HCO3-	3.591e-004	3.447e-004	-3.445	-3.463	-0.018	(0)
H2CO3	1.105e-005	1.105e-005	-4.957	-4.957	0.000	(0)
CO3-2	1.339e-006	1.134e-006	-5.873	-5.945	-0.072	(0)
CaHCO3+	1.226e-006	1.177e-006	-5.911	-5.929	-0.018	(0)
CaCO3	3.297e-007	3.297e-007	-6.482	-6.482	0.000	(0)
MgHCO3+	3.136e-007	3.008e-007	-6.504	-6.522	-0.018	(0)
MgCO3	8.045e-008	8.045e-008	-7.094	-7.094	0.000	(0)
NaHCO3	2.608e-008	2.608e-008	-7.584	-7.584	0.000	(0)
CuCO3	2.448e-008	2.448e-008	-7.611	-7.611	0.000	(0)
MnHCO3+	3.995e-009	3.834e-009	-8.399	-8.416	-0.018	(0)
NaCO3-	2.959e-009	2.841e-009	-8.529	-8.547	-0.018	(0)

UO2 (CO3) 2-2	1.853e-009	1.556e-009	-8.732	-8.808	-0.076	(0)
ZnCO3	1.700e-009	1.700e-009	-8.770	-8.770	0.000	(0)
ZnHCO3+	2.966e-010	2.839e-010	-9.528	-9.547	-0.019	(0)
PbCO3	2.880e-010	2.880e-010	-9.541	-9.541	0.000	(0)
NiHCO3+	2.877e-010	2.754e-010	-9.541	-9.560	-0.019	(0)
NiCO3	2.742e-010	2.742e-010	-9.562	-9.562	0.000	(0)
UO2 (CO3) 3-4	1.776e-010	8.846e-011	-9.751	-10.053	-0.303	(0)
Cu (CO3) 2-2	8.893e-011	7.471e-011	-10.051	-10.127	-0.076	(0)
CuHCO3+	8.328e-011	7.973e-011	-10.079	-10.098	-0.019	(0)
UO2CO3	6.879e-011	6.879e-011	-10.162	-10.162	0.000	(0)
PbHCO3+	2.260e-011	2.164e-011	-10.646	-10.665	-0.019	(0)
BaHCO3+	1.054e-011	1.012e-011	-10.977	-10.995	-0.018	(0)
CdCO3	9.142e-012	9.142e-012	-11.039	-11.039	0.000	(0)
BaCO3	1.787e-012	1.787e-012	-11.748	-11.748	0.000	(0)
Pb (CO3) 2-2	1.121e-012	9.418e-013	-11.950	-12.026	-0.076	(0)
FeHCO3+	3.765e-013	3.615e-013	-12.424	-12.442	-0.018	(0)
CdHCO3+	2.899e-013	2.776e-013	-12.538	-12.557	-0.019	(0)
Cd (CO3) 2-2	9.148e-015	7.685e-015	-14.039	-14.114	-0.076	(0)
Ca	2.258e-004					
Ca+2	2.166e-004	1.834e-004	-3.664	-3.737	-0.072	(0)
CaSO4	7.639e-006	7.639e-006	-5.117	-5.117	0.000	(0)
CaHCO3+	1.226e-006	1.177e-006	-5.911	-5.929	-0.018	(0)
CaCO3	3.297e-007	3.297e-007	-6.482	-6.482	0.000	(0)
CaF+	7.747e-008	7.436e-008	-7.111	-7.129	-0.018	(0)
CaOH+	2.693e-009	2.586e-009	-8.570	-8.587	-0.018	(0)
CaH2BO3+	1.979e-010	1.897e-010	-9.704	-9.722	-0.018	(0)
Cd	4.448e-010					
Cd+2	4.176e-010	3.537e-010	-9.379	-9.451	-0.072	(0)
CdSO4	1.507e-011	1.507e-011	-10.822	-10.822	0.000	(0)
CdCO3	9.142e-012	9.142e-012	-11.039	-11.039	0.000	(0)
CdOH+	2.074e-012	1.985e-012	-11.683	-11.702	-0.019	(0)
CdCl+	3.453e-013	3.306e-013	-12.462	-12.481	-0.019	(0)
CdHCO3+	2.899e-013	2.776e-013	-12.538	-12.557	-0.019	(0)
CdF+	2.175e-013	2.082e-013	-12.663	-12.681	-0.019	(0)
Cd (SO4) 2-2	4.400e-014	3.697e-014	-13.357	-13.432	-0.076	(0)
CdOHC1	9.582e-015	9.582e-015	-14.019	-14.019	0.000	(0)
Cd (CO3) 2-2	9.148e-015	7.685e-015	-14.039	-14.114	-0.076	(0)
Cd (OH) 2	8.851e-015	8.851e-015	-14.053	-14.053	0.000	(0)
CdF2	1.543e-017	1.543e-017	-16.812	-16.812	0.000	(0)
CdCl2	1.349e-017	1.349e-017	-16.870	-16.870	0.000	(0)
Cd (OH) 3-	3.991e-019	3.821e-019	-18.399	-18.418	-0.019	(0)
Cd2OH+3	5.209e-021	3.519e-021	-20.283	-20.454	-0.170	(0)
CdSeO4	2.575e-021	2.575e-021	-20.589	-20.589	0.000	(0)
Cd (SeO3) 2-2	1.432e-022	1.203e-022	-21.844	-21.920	-0.076	(0)
CdCl3-	8.699e-023	8.328e-023	-22.061	-22.079	-0.019	(0)
Cd (OH) 4-2	5.260e-026	4.419e-026	-25.279	-25.355	-0.076	(0)
Cl	1.020e-005					
Cl-	1.020e-005	9.787e-006	-4.991	-5.009	-0.018	(0)
MnCl+	7.157e-012	6.869e-012	-11.145	-11.163	-0.018	(0)
CuCl	2.212e-012	2.212e-012	-11.655	-11.655	0.000	(0)
ZnCl+	6.675e-013	6.404e-013	-12.176	-12.194	-0.018	(0)
ZnOHC1	5.924e-013	5.924e-013	-12.227	-12.227	0.000	(0)
CdCl+	3.453e-013	3.306e-013	-12.462	-12.481	-0.019	(0)
NiCl+	1.695e-013	1.623e-013	-12.771	-12.790	-0.019	(0)
CuCl+	5.927e-014	5.686e-014	-13.227	-13.245	-0.018	(0)
PbCl+	3.064e-014	2.933e-014	-13.514	-13.533	-0.019	(0)
CdOHC1	9.582e-015	9.582e-015	-14.019	-14.019	0.000	(0)
CuCl2-	4.715e-015	4.523e-015	-14.327	-14.345	-0.018	(0)
MnCl2	9.495e-017	9.495e-017	-16.022	-16.022	0.000	(0)
CdCl2	1.349e-017	1.349e-017	-16.870	-16.870	0.000	(0)
ZnCl2	9.932e-018	9.932e-018	-17.003	-17.003	0.000	(0)
PbCl2	1.282e-018	1.282e-018	-17.892	-17.892	0.000	(0)
UO2Cl+	2.526e-019	2.419e-019	-18.598	-18.616	-0.019	(0)
CuCl2	1.929e-019	1.929e-019	-18.715	-18.715	0.000	(0)
CrCl+2	4.066e-020	3.416e-020	-19.391	-19.466	-0.076	(0)
CuCl3-2	1.115e-020	9.464e-021	-19.953	-20.024	-0.071	(0)
NiCl2	7.998e-021	7.998e-021	-20.097	-20.097	0.000	(0)
MnCl3-	2.667e-022	2.559e-022	-21.574	-21.592	-0.018	(0)

CdCl3-	8.699e-023	8.328e-023	-22.061	-22.079	-0.019	(0)
ZnCl3-	8.049e-023	7.721e-023	-22.094	-22.112	-0.018	(0)
FeCl+2	2.696e-023	2.287e-023	-22.569	-22.641	-0.071	(0)
PbCl3-	5.219e-024	4.996e-024	-23.282	-23.301	-0.019	(0)
CrOHCl2	4.490e-024	4.490e-024	-23.348	-23.348	0.000	(0)
VOCl+	1.477e-024	1.414e-024	-23.831	-23.850	-0.019	(0)
CrCl2+	3.314e-026	3.172e-026	-25.480	-25.499	-0.019	(0)
CuCl3-	1.837e-026	1.762e-026	-25.736	-25.754	-0.018	(0)
FeCl2+	1.042e-027	9.999e-028	-26.982	-27.000	-0.018	(0)
ZnCl4-2	4.453e-028	3.778e-028	-27.351	-27.423	-0.071	(0)
PbCl4-2	2.660e-029	2.235e-029	-28.575	-28.651	-0.076	(0)
CrO3Cl-	7.609e-031	7.284e-031	-30.119	-30.138	-0.019	(0)
CuCl4-2	1.019e-033	8.644e-034	-32.992	-33.063	-0.071	(0)
FeCl3	9.785e-034	9.785e-034	-33.009	-33.009	0.000	(0)
UCl+3	0.000e+000	0.000e+000	-47.125	-47.295	-0.170	(0)
Cr (2)	7.670e-026					
Cr+2	7.670e-026	6.443e-026	-25.115	-25.191	-0.076	(0)
Cr (3)	4.808e-009					
Cr (OH) 2+	3.744e-009	3.585e-009	-8.427	-8.446	-0.019	(0)
Cr (OH) 3	9.515e-010	9.515e-010	-9.022	-9.022	0.000	(0)
Cr (OH) +2	4.963e-011	4.169e-011	-10.304	-10.380	-0.076	(0)
CrO2-	3.312e-011	3.171e-011	-10.480	-10.499	-0.019	(0)
Cr (OH) 4-	2.796e-011	2.677e-011	-10.553	-10.572	-0.019	(0)
CrOHSO4	1.799e-012	1.799e-012	-11.745	-11.745	0.000	(0)
CrF+2	1.890e-014	1.588e-014	-13.724	-13.799	-0.076	(0)
Cr+3	3.992e-015	2.697e-015	-14.399	-14.569	-0.170	(0)
CrSO4+	1.196e-015	1.145e-015	-14.922	-14.941	-0.019	(0)
CrCl+2	4.066e-020	3.416e-020	-19.391	-19.466	-0.076	(0)
Cr2 (OH) 2SO4+2	8.069e-021	6.779e-021	-20.093	-20.169	-0.076	(0)
Cr2 (OH) 2 (SO4) 2	7.320e-023	7.320e-023	-22.135	-22.135	0.000	(0)
CrOHCl2	4.490e-024	4.490e-024	-23.348	-23.348	0.000	(0)
CrCl2+	3.314e-026	3.172e-026	-25.480	-25.499	-0.019	(0)
Cr (6)	2.215e-017					
CrO4-2	2.126e-017	1.801e-017	-16.672	-16.744	-0.072	(0)
HCrO4-	8.675e-019	8.305e-019	-18.062	-18.081	-0.019	(0)
NaCrO4-	1.258e-020	1.204e-020	-19.900	-19.919	-0.019	(0)
KCrO4-	4.286e-021	4.103e-021	-20.368	-20.387	-0.019	(0)
H2CrO4	9.593e-027	9.593e-027	-26.018	-26.018	0.000	(0)
CrO3SO4-2	7.801e-028	6.553e-028	-27.108	-27.184	-0.076	(0)
CrO3Cl-	7.609e-031	7.284e-031	-30.119	-30.138	-0.019	(0)
Cr2O7-2	2.847e-035	2.392e-035	-34.546	-34.621	-0.076	(0)
Cu (1)	1.898e-010					
Cu+	1.875e-010	1.795e-010	-9.727	-9.746	-0.019	(0)
CuCl	2.212e-012	2.212e-012	-11.655	-11.655	0.000	(0)
CuCl2-	4.715e-015	4.523e-015	-14.327	-14.345	-0.018	(0)
CuCl3-2	1.115e-020	9.464e-021	-19.953	-20.024	-0.071	(0)
Cu (2)	3.884e-008					
CuCO3	2.448e-008	2.448e-008	-7.611	-7.611	0.000	(0)
CuOH+	8.539e-009	8.191e-009	-8.069	-8.087	-0.018	(0)
Cu+2	4.328e-009	3.666e-009	-8.364	-8.436	-0.072	(0)
Cu (OH) 2	1.155e-009	1.155e-009	-8.937	-8.937	0.000	(0)
CuSO4	1.527e-010	1.527e-010	-9.816	-9.816	0.000	(0)
Cu (CO3) 2-2	8.893e-011	7.471e-011	-10.051	-10.127	-0.076	(0)
CuHCO3+	8.328e-011	7.973e-011	-10.079	-10.098	-0.019	(0)
CuF+	8.973e-012	8.591e-012	-11.047	-11.066	-0.019	(0)
Cu2 (OH) 2+2	2.006e-012	1.685e-012	-11.698	-11.773	-0.076	(0)
Cu (OH) 3-	1.748e-012	1.674e-012	-11.757	-11.776	-0.019	(0)
CuCl+	5.927e-014	5.686e-014	-13.227	-13.245	-0.018	(0)
Cu (OH) 4-2	1.108e-017	9.308e-018	-16.955	-17.031	-0.076	(0)
CuCl2	1.929e-019	1.929e-019	-18.715	-18.715	0.000	(0)
CuCl3-	1.837e-026	1.762e-026	-25.736	-25.754	-0.018	(0)
CuCl4-2	1.019e-033	8.644e-034	-32.992	-33.063	-0.071	(0)
F	3.917e-005					
F-	3.872e-005	3.714e-005	-4.412	-4.430	-0.018	(0)
MgF+	3.704e-007	3.554e-007	-6.431	-6.449	-0.018	(0)
CaF+	7.747e-008	7.436e-008	-7.111	-7.129	-0.018	(0)
NaF	3.153e-009	3.153e-009	-8.501	-8.501	0.000	(0)
MnF+	8.589e-010	8.243e-010	-9.066	-9.084	-0.018	(0)

HF	7.829e-010	7.829e-010	-9.106	-9.106	0.000	(0)
ZnF+	2.016e-011	1.930e-011	-10.695	-10.714	-0.019	(0)
AlF2+	1.366e-011	1.311e-011	-10.865	-10.882	-0.018	(0)
CuF+	8.973e-012	8.591e-012	-11.047	-11.066	-0.019	(0)
BF(OH) 3-	6.817e-012	6.535e-012	-11.166	-11.185	-0.018	(0)
NiF+	6.316e-012	6.047e-012	-11.200	-11.218	-0.019	(0)
AlF3	6.131e-012	6.131e-012	-11.212	-11.212	0.000	(0)
AlF+2	1.044e-012	8.868e-013	-11.981	-12.052	-0.071	(0)
PbF+	2.310e-013	2.211e-013	-12.636	-12.655	-0.019	(0)
CdF+	2.175e-013	2.082e-013	-12.663	-12.681	-0.019	(0)
AlF4-	1.189e-013	1.141e-013	-12.925	-12.943	-0.018	(0)
HF2-	1.153e-013	1.105e-013	-12.938	-12.956	-0.018	(0)
UO2F+	8.161e-014	7.813e-014	-13.088	-13.107	-0.019	(0)
CrF+2	1.890e-014	1.588e-014	-13.724	-13.799	-0.076	(0)
UO2F2	8.369e-015	8.369e-015	-14.077	-14.077	0.000	(0)
BF2(OH) 2-	3.857e-016	3.697e-016	-15.414	-15.432	-0.018	(0)
PbF2	1.616e-016	1.616e-016	-15.792	-15.792	0.000	(0)
UO2F3-	8.155e-017	7.808e-017	-16.089	-16.107	-0.019	(0)
CdF2	1.543e-017	1.543e-017	-16.812	-16.812	0.000	(0)
FeF+2	3.714e-018	3.152e-018	-17.430	-17.501	-0.071	(0)
FeF2+	3.264e-018	3.133e-018	-17.486	-17.504	-0.018	(0)
VO2F	2.065e-018	2.065e-018	-17.685	-17.685	0.000	(0)
H2F2	1.642e-018	1.642e-018	-17.785	-17.785	0.000	(0)
FeF3	1.642e-019	1.642e-019	-18.785	-18.785	0.000	(0)
VO2F2-	2.909e-020	2.785e-020	-19.536	-19.555	-0.019	(0)
UO2F4-2	2.742e-020	2.303e-020	-19.562	-19.638	-0.076	(0)
VOF+	1.198e-020	1.147e-020	-19.921	-19.940	-0.019	(0)
PbF3-	1.189e-020	1.138e-020	-19.925	-19.944	-0.019	(0)
VOF2	1.598e-022	1.598e-022	-21.797	-21.797	0.000	(0)
BF3OH-	7.942e-023	7.614e-023	-22.100	-22.118	-0.018	(0)
VO2F3-2	1.536e-023	1.290e-023	-22.814	-22.889	-0.076	(0)
PbF4-2	2.409e-025	2.024e-025	-24.618	-24.694	-0.076	(0)
VOF3-	2.199e-025	2.105e-025	-24.658	-24.677	-0.019	(0)
VO2F4-3	3.490e-028	2.358e-028	-27.457	-27.627	-0.170	(0)
BF4-	2.068e-028	1.983e-028	-27.684	-27.703	-0.018	(0)
VOF4-2	3.757e-029	3.156e-029	-28.425	-28.501	-0.076	(0)
UF3+	2.202e-036	2.108e-036	-35.657	-35.676	-0.019	(0)
UF2+2	4.262e-037	3.581e-037	-36.370	-36.446	-0.076	(0)
UF4	8.584e-039	8.584e-039	-38.066	-38.066	0.000	(0)
UF+3	1.133e-039	7.658e-040	-38.946	-39.116	-0.170	(0)
UF5-	0.000e+000	0.000e+000	-40.880	-40.898	-0.019	(0)
UF6-2	0.000e+000	0.000e+000	-42.773	-42.849	-0.076	(0)
Fe (2)	1.057e-010					
Fe+2	9.916e-011	8.331e-011	-10.004	-10.079	-0.076	(0)
FeSO4	3.718e-012	3.718e-012	-11.430	-11.430	0.000	(0)
FeOH+	2.442e-012	2.343e-012	-11.612	-11.630	-0.018	(0)
FeHCO3+	3.765e-013	3.615e-013	-12.424	-12.442	-0.018	(0)
Fe(OH) 2	1.315e-015	1.315e-015	-14.881	-14.881	0.000	(0)
Fe(OH) 3-	3.062e-016	2.939e-016	-15.514	-15.532	-0.018	(0)
Fe (3)	1.798e-008					
Fe(OH) 2+	1.011e-008	9.706e-009	-7.995	-8.013	-0.018	(0)
Fe(OH) 3	7.365e-009	7.365e-009	-8.133	-8.133	0.000	(0)
Fe(OH) 4-	5.048e-010	4.846e-010	-9.297	-9.315	-0.018	(0)
FeOH+2	4.161e-014	3.531e-014	-13.381	-13.452	-0.071	(0)
FeF+2	3.714e-018	3.152e-018	-17.430	-17.501	-0.071	(0)
FeF2+	3.264e-018	3.133e-018	-17.486	-17.504	-0.018	(0)
FeSO4+	1.645e-019	1.579e-019	-18.784	-18.802	-0.018	(0)
FeF3	1.642e-019	1.642e-019	-18.785	-18.785	0.000	(0)
Fe+3	1.125e-019	7.739e-020	-18.949	-19.111	-0.162	(0)
Fe(SO4) 2-	6.409e-022	6.135e-022	-21.193	-21.212	-0.019	(0)
FeCl+2	2.696e-023	2.287e-023	-22.569	-22.641	-0.071	(0)
FeHSeO3+2	5.597e-025	4.702e-025	-24.252	-24.328	-0.076	(0)
Fe2(OH) 2+4	8.287e-026	4.128e-026	-25.082	-25.384	-0.303	(0)
FeCl2+	1.042e-027	9.999e-028	-26.982	-27.000	-0.018	(0)
Fe3(OH) 4+5	1.721e-032	5.790e-033	-31.764	-32.237	-0.473	(0)
FeCl3	9.785e-034	9.785e-034	-33.009	-33.009	0.000	(0)
H (0)	2.874e-027					
H2	1.437e-027	1.438e-027	-26.842	-26.842	0.000	(0)

K	6.401e-005						
K+	6.392e-005	6.132e-005	-4.194	-4.212	-0.018	(0)	
KSO4-	8.222e-008	7.892e-008	-7.085	-7.103	-0.018	(0)	
KCrO4-	4.286e-021	4.103e-021	-20.368	-20.387	-0.019	(0)	
Mg	1.043e-004						
Mg+2	1.007e-004	8.529e-005	-3.997	-4.069	-0.072	(0)	
MgSO4	2.822e-006	2.822e-006	-5.550	-5.550	0.000	(0)	
MgF+	3.704e-007	3.554e-007	-6.431	-6.449	-0.018	(0)	
MgHCO3+	3.136e-007	3.008e-007	-6.504	-6.522	-0.018	(0)	
MgCO3	8.045e-008	8.045e-008	-7.094	-7.094	0.000	(0)	
MgOH+	2.498e-008	2.399e-008	-7.602	-7.620	-0.018	(0)	
MgH2BO3+	5.544e-011	5.314e-011	-10.256	-10.275	-0.018	(0)	
Mn (2)	6.875e-007						
Mn+2	6.636e-007	5.575e-007	-6.178	-6.254	-0.076	(0)	
MnSO4	1.802e-008	1.802e-008	-7.744	-7.744	0.000	(0)	
MnHCO3+	3.995e-009	3.834e-009	-8.399	-8.416	-0.018	(0)	
MnOH+	1.031e-009	9.895e-010	-8.987	-9.005	-0.018	(0)	
MnF+	8.589e-010	8.243e-010	-9.066	-9.084	-0.018	(0)	
MnCl+	7.157e-012	6.869e-012	-11.145	-11.163	-0.018	(0)	
MnCl2	9.495e-017	9.495e-017	-16.022	-16.022	0.000	(0)	
MnSeO4	5.866e-018	5.866e-018	-17.232	-17.232	0.000	(0)	
Mn (OH) 3-	3.181e-018	3.053e-018	-17.497	-17.515	-0.018	(0)	
MnCl3-	2.667e-022	2.559e-022	-21.574	-21.592	-0.018	(0)	
Mn (OH) 4-2	8.209e-024	6.965e-024	-23.086	-23.157	-0.071	(0)	
MnSe	2.249e-039	2.249e-039	-38.648	-38.648	0.000	(0)	
Mn (3)	3.619e-028						
Mn+3	3.619e-028	2.490e-028	-27.441	-27.604	-0.162	(0)	
Mn (6)	0.000e+000						
MnO4-2	0.000e+000	0.000e+000	-45.835	-45.906	-0.071	(0)	
Mn (7)	0.000e+000						
MnO4-	0.000e+000	0.000e+000	-51.260	-51.278	-0.018	(0)	
Mo	5.212e-009						
MoO4-2	5.211e-009	4.413e-009	-8.283	-8.355	-0.072	(0)	
HMoO4-	1.307e-012	1.251e-012	-11.884	-11.903	-0.019	(0)	
H2MoO4	1.306e-016	1.306e-016	-15.884	-15.884	0.000	(0)	
AlMo6O21-3	0.000e+000	0.000e+000	-56.668	-56.838	-0.170	(0)	
Mo7O24-6	0.000e+000	0.000e+000	-67.585	-68.266	-0.681	(0)	
HMo7O24-5	0.000e+000	0.000e+000	-69.252	-69.725	-0.473	(0)	
H2Mo7O24-4	0.000e+000	0.000e+000	-72.487	-72.789	-0.303	(0)	
H3Mo7O24-3	0.000e+000	0.000e+000	-77.219	-77.390	-0.170	(0)	
Na	1.404e-004						
Na+	1.402e-004	1.345e-004	-3.853	-3.871	-0.018	(0)	
NaSO4-	1.368e-007	1.313e-007	-6.864	-6.882	-0.018	(0)	
NaHCO3	2.608e-008	2.608e-008	-7.584	-7.584	0.000	(0)	
NaF	3.153e-009	3.153e-009	-8.501	-8.501	0.000	(0)	
NaCO3-	2.959e-009	2.841e-009	-8.529	-8.547	-0.018	(0)	
NaH2BO3	3.832e-012	3.832e-012	-11.417	-11.417	0.000	(0)	
NaCrO4-	1.258e-020	1.204e-020	-19.900	-19.919	-0.019	(0)	
Ni	8.520e-009						
Ni+2	7.653e-009	6.482e-009	-8.116	-8.188	-0.072	(0)	
NiHCO3+	2.877e-010	2.754e-010	-9.541	-9.560	-0.019	(0)	
NiCO3	2.742e-010	2.742e-010	-9.562	-9.562	0.000	(0)	
NiSO4	2.351e-010	2.351e-010	-9.629	-9.629	0.000	(0)	
NiOH+	6.023e-011	5.766e-011	-10.220	-10.239	-0.019	(0)	
NiF+	6.316e-012	6.047e-012	-11.200	-11.218	-0.019	(0)	
Ni (OH) 2	3.236e-012	3.236e-012	-11.490	-11.490	0.000	(0)	
NiCl+	1.695e-013	1.623e-013	-12.771	-12.790	-0.019	(0)	
Ni (OH) 3-	2.389e-015	2.287e-015	-14.622	-14.641	-0.019	(0)	
Ni (SO4) 2-2	1.685e-015	1.415e-015	-14.773	-14.849	-0.076	(0)	
NiSeO4	1.185e-019	1.185e-019	-18.926	-18.926	0.000	(0)	
NiCl2	7.998e-021	7.998e-021	-20.097	-20.097	0.000	(0)	
O (0)	4.904e-039						
O2	2.452e-039	2.453e-039	-38.611	-38.610	0.000	(0)	
Pb	5.792e-010						
PbCO3	2.880e-010	2.880e-010	-9.541	-9.541	0.000	(0)	
PbOH+	1.566e-010	1.499e-010	-9.805	-9.824	-0.019	(0)	
Pb+2	9.974e-011	8.448e-011	-10.001	-10.073	-0.072	(0)	
PbHCO3+	2.260e-011	2.164e-011	-10.646	-10.665	-0.019	(0)	

PbSO4	7.522e-012	7.522e-012	-11.124	-11.124	0.000	(0)
Pb(OH) 2	3.350e-012	3.350e-012	-11.475	-11.475	0.000	(0)
Pb(CO3) 2-2	1.121e-012	9.418e-013	-11.950	-12.026	-0.076	(0)
PbF+	2.310e-013	2.211e-013	-12.636	-12.655	-0.019	(0)
PbCl+	3.064e-014	2.933e-014	-13.514	-13.533	-0.019	(0)
Pb(SO4) 2-2	9.808e-015	8.240e-015	-14.008	-14.084	-0.076	(0)
Pb(OH) 3-	2.473e-015	2.367e-015	-14.607	-14.626	-0.019	(0)
PbF2	1.616e-016	1.616e-016	-15.792	-15.792	0.000	(0)
PbCl2	1.282e-018	1.282e-018	-17.892	-17.892	0.000	(0)
Pb(OH) 4-2	4.876e-019	4.097e-019	-18.312	-18.388	-0.076	(0)
Pb2OH+3	2.971e-019	2.007e-019	-18.527	-18.697	-0.170	(0)
PbF3-	1.189e-020	1.138e-020	-19.925	-19.944	-0.019	(0)
Pb3(OH) 4+2	2.252e-023	1.892e-023	-22.647	-22.723	-0.076	(0)
PbCl3-	5.219e-024	4.996e-024	-23.282	-23.301	-0.019	(0)
PbF4-2	2.409e-025	2.024e-025	-24.618	-24.694	-0.076	(0)
PbCl4-2	2.660e-029	2.235e-029	-28.575	-28.651	-0.076	(0)
Pb4(OH) 4+4	2.549e-029	1.270e-029	-28.594	-28.896	-0.303	(0)
S(6)	2.253e-004					
SO4-2	2.146e-004	1.818e-004	-3.668	-3.740	-0.072	(0)
CaSO4	7.639e-006	7.639e-006	-5.117	-5.117	0.000	(0)
MgSO4	2.822e-006	2.822e-006	-5.550	-5.550	0.000	(0)
NaSO4-	1.368e-007	1.313e-007	-6.864	-6.882	-0.018	(0)
KSO4-	8.222e-008	7.892e-008	-7.085	-7.103	-0.018	(0)
MnSO4	1.802e-008	1.802e-008	-7.744	-7.744	0.000	(0)
ZnSO4	1.036e-009	1.036e-009	-8.985	-8.985	0.000	(0)
HSO4-	2.638e-010	2.532e-010	-9.579	-9.597	-0.018	(0)
NiSO4	2.351e-010	2.351e-010	-9.629	-9.629	0.000	(0)
CuSO4	1.527e-010	1.527e-010	-9.816	-9.816	0.000	(0)
CdSO4	1.507e-011	1.507e-011	-10.822	-10.822	0.000	(0)
PbSO4	7.522e-012	7.522e-012	-11.124	-11.124	0.000	(0)
FeSO4	3.718e-012	3.718e-012	-11.430	-11.430	0.000	(0)
Zn(SO4) 2-2	1.953e-012	1.640e-012	-11.709	-11.785	-0.076	(0)
CrOHSO4	1.799e-012	1.799e-012	-11.745	-11.745	0.000	(0)
Cd(SO4) 2-2	4.400e-014	3.697e-014	-13.357	-13.432	-0.076	(0)
Pb(SO4) 2-2	9.808e-015	8.240e-015	-14.008	-14.084	-0.076	(0)
UO2SO4	4.193e-015	4.193e-015	-14.377	-14.377	0.000	(0)
AlSO4+	3.512e-015	3.370e-015	-14.454	-14.472	-0.018	(0)
Ni(SO4) 2-2	1.685e-015	1.415e-015	-14.773	-14.849	-0.076	(0)
CrSO4+	1.196e-015	1.145e-015	-14.922	-14.941	-0.019	(0)
UO2(SO4) 2-2	1.196e-017	1.005e-017	-16.922	-16.998	-0.076	(0)
Al(SO4) 2-	6.841e-018	6.564e-018	-17.165	-17.183	-0.018	(0)
FeSO4+	1.645e-019	1.579e-019	-18.784	-18.802	-0.018	(0)
VO2SO4-	1.438e-019	1.376e-019	-18.842	-18.861	-0.019	(0)
Cr2(OH) 2SO4+2	8.069e-021	6.779e-021	-20.093	-20.169	-0.076	(0)
VOSO4	2.578e-021	2.578e-021	-20.589	-20.589	0.000	(0)
Fe(SO4) 2-	6.409e-022	6.135e-022	-21.193	-21.212	-0.019	(0)
Cr2(OH) 2(SO4) 2	7.320e-023	7.320e-023	-22.135	-22.135	0.000	(0)
CrO3SO4-2	7.801e-028	6.553e-028	-27.108	-27.184	-0.076	(0)
VSO4+	4.655e-035	4.456e-035	-34.332	-34.351	-0.019	(0)
U(SO4) 2	0.000e+000	0.000e+000	-40.967	-40.967	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-41.050	-41.126	-0.076	(0)
Se(-2)	1.457e-035					
HSe-	1.457e-035	1.395e-035	-34.837	-34.855	-0.019	(0)
MnSe	2.249e-039	2.249e-039	-38.648	-38.648	0.000	(0)
H2Se	1.543e-039	1.543e-039	-38.812	-38.812	0.000	(0)
Se-2	0.000e+000	0.000e+000	-41.934	-42.009	-0.076	(0)
Se(4)	3.166e-009					
HSeO3-	2.402e-009	2.299e-009	-8.619	-8.638	-0.019	(0)
SeO3-2	7.646e-010	6.424e-010	-9.117	-9.192	-0.076	(0)
H2SeO3	1.398e-014	1.398e-014	-13.855	-13.855	0.000	(0)
Cd(SeO3) 2-2	1.432e-022	1.203e-022	-21.844	-21.920	-0.076	(0)
FeHSeO3+2	5.597e-025	4.702e-025	-24.252	-24.328	-0.076	(0)
Se(6)	4.617e-014					
SeO4-2	4.616e-014	3.910e-014	-13.336	-13.408	-0.072	(0)
MnSeO4	5.866e-018	5.866e-018	-17.232	-17.232	0.000	(0)
ZnSeO4	1.577e-019	1.577e-019	-18.802	-18.802	0.000	(0)
NiSeO4	1.185e-019	1.185e-019	-18.926	-18.926	0.000	(0)
HSeO4-	2.917e-020	2.792e-020	-19.535	-19.554	-0.019	(0)

CdSeO4	2.575e-021	2.575e-021	-20.589	-20.589	0.000	(0)
Zn(SeO4) 2-2	7.442e-033	6.252e-033	-32.128	-32.204	-0.076	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-56.611	-56.782	-0.170	(0)
U (4)	1.394e-018					
U (OH) 5-	1.393e-018	1.334e-018	-17.856	-17.875	-0.019	(0)
U (OH) 4	7.960e-022	7.960e-022	-21.099	-21.099	0.000	(0)
U (OH) 3+	4.332e-026	4.147e-026	-25.363	-25.382	-0.019	(0)
U (OH) 2+2	3.253e-031	2.733e-031	-30.488	-30.563	-0.076	(0)
UF3+	2.202e-036	2.108e-036	-35.657	-35.676	-0.019	(0)
UF2+2	4.262e-037	3.581e-037	-36.370	-36.446	-0.076	(0)
UOH+3	2.715e-037	1.834e-037	-36.566	-36.737	-0.170	(0)
UF4	8.584e-039	8.584e-039	-38.066	-38.066	0.000	(0)
UF+3	1.133e-039	7.658e-040	-38.946	-39.116	-0.170	(0)
UF5-	0.000e+000	0.000e+000	-40.880	-40.898	-0.019	(0)
U (SO4) 2	0.000e+000	0.000e+000	-40.967	-40.967	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-41.050	-41.126	-0.076	(0)
UF6-2	0.000e+000	0.000e+000	-42.773	-42.849	-0.076	(0)
U+4	0.000e+000	0.000e+000	-43.683	-43.986	-0.303	(0)
UCl+3	0.000e+000	0.000e+000	-47.125	-47.295	-0.170	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-161.844	-163.377	-1.533	(0)
U (5)	9.702e-016					
UO2+	9.702e-016	9.288e-016	-15.013	-15.032	-0.019	(0)
U (6)	2.101e-009					
UO2 (CO3) 2-2	1.853e-009	1.556e-009	-8.732	-8.808	-0.076	(0)
UO2 (CO3) 3-4	1.776e-010	8.846e-011	-9.751	-10.053	-0.303	(0)
UO2CO3	6.879e-011	6.879e-011	-10.162	-10.162	0.000	(0)
UO2OH+	1.416e-012	1.356e-012	-11.849	-11.868	-0.019	(0)
UO2F+	8.161e-014	7.813e-014	-13.088	-13.107	-0.019	(0)
UO2+2	1.799e-014	1.524e-014	-13.745	-13.817	-0.072	(0)
UO2F2	8.369e-015	8.369e-015	-14.077	-14.077	0.000	(0)
UO2SO4	4.193e-015	4.193e-015	-14.377	-14.377	0.000	(0)
UO2F3-	8.155e-017	7.808e-017	-16.089	-16.107	-0.019	(0)
UO2 (SO4) 2-2	1.196e-017	1.005e-017	-16.922	-16.998	-0.076	(0)
(UO2) 2 (OH) 2+2	3.630e-018	3.049e-018	-17.440	-17.516	-0.076	(0)
(UO2) 3 (OH) 5+	1.635e-018	1.566e-018	-17.786	-17.805	-0.019	(0)
UO2Cl+	2.526e-019	2.419e-019	-18.598	-18.616	-0.019	(0)
UO2F4-2	2.742e-020	2.303e-020	-19.562	-19.638	-0.076	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-40.216	-40.235	-0.019	(0)
V+2	0.000e+000	0.000e+000	-41.519	-41.595	-0.076	(0)
V (3)	1.478e-013					
V (OH) 3	1.478e-013	1.478e-013	-12.830	-12.830	0.000	(0)
V (OH) 2+	1.421e-024	1.361e-024	-23.847	-23.866	-0.019	(0)
VOH+2	2.189e-028	1.839e-028	-27.660	-27.735	-0.076	(0)
V+3	7.686e-034	5.193e-034	-33.114	-33.285	-0.170	(0)
VSO4+	4.655e-035	4.456e-035	-34.332	-34.351	-0.019	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-52.979	-53.150	-0.170	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-54.368	-54.671	-0.303	(0)
V (4)	7.659e-018					
V (OH) 3+	7.583e-018	7.260e-018	-17.120	-17.139	-0.019	(0)
VO+2	6.130e-020	5.149e-020	-19.213	-19.288	-0.076	(0)
VOF+	1.198e-020	1.147e-020	-19.921	-19.940	-0.019	(0)
VOSO4	2.578e-021	2.578e-021	-20.589	-20.589	0.000	(0)
VOF2	1.598e-022	1.598e-022	-21.797	-21.797	0.000	(0)
VOC1+	1.477e-024	1.414e-024	-23.831	-23.850	-0.019	(0)
VOF3-	2.199e-025	2.105e-025	-24.658	-24.677	-0.019	(0)
VOF4-2	3.757e-029	3.156e-029	-28.425	-28.501	-0.076	(0)
H2V2O4+2	3.144e-030	2.642e-030	-29.502	-29.578	-0.076	(0)
V (5)	9.816e-009					
H2VO4-	8.173e-009	7.824e-009	-8.088	-8.107	-0.019	(0)
HVO4-2	1.642e-009	1.379e-009	-8.785	-8.860	-0.076	(0)
H3VO4	1.115e-012	1.115e-012	-11.953	-11.953	0.000	(0)
H3V2O7-	5.884e-014	5.633e-014	-13.230	-13.249	-0.019	(0)
HV2O7-3	5.412e-015	3.657e-015	-14.267	-14.437	-0.170	(0)
VO4-3	7.180e-016	4.851e-016	-15.144	-15.314	-0.170	(0)
VO2+	3.305e-017	3.170e-017	-16.481	-16.499	-0.018	(0)
V2O7-4	1.387e-017	6.907e-018	-16.858	-17.161	-0.303	(0)

VO2F	2.065e-018	2.065e-018	-17.685	-17.685	0.000	(0)
V3O9-3	7.425e-019	5.016e-019	-18.129	-18.300	-0.170	(0)
VO2SO4-	1.438e-019	1.376e-019	-18.842	-18.861	-0.019	(0)
VO2F2-	2.909e-020	2.785e-020	-19.536	-19.555	-0.019	(0)
VO2F3-2	1.536e-023	1.290e-023	-22.814	-22.889	-0.076	(0)
V4O12-4	3.285e-024	1.636e-024	-23.483	-23.786	-0.303	(0)
VO2F4-3	3.490e-028	2.358e-028	-27.457	-27.627	-0.170	(0)
HV10028-5	0.000e+000	0.000e+000	-62.731	-63.204	-0.473	(0)
V10028-6	0.000e+000	0.000e+000	-62.863	-63.544	-0.681	(0)
H2V10028-4	0.000e+000	0.000e+000	-65.540	-65.842	-0.303	(0)
Zn	3.594e-008					
Zn+2	3.076e-008	2.605e-008	-7.512	-7.584	-0.072	(0)
ZnOH+	1.923e-009	1.841e-009	-8.716	-8.735	-0.019	(0)
ZnCO3	1.700e-009	1.700e-009	-8.770	-8.770	0.000	(0)
ZnSO4	1.036e-009	1.036e-009	-8.985	-8.985	0.000	(0)
ZnHCO3+	2.966e-010	2.839e-010	-9.528	-9.547	-0.019	(0)
Zn (OH) 2	2.061e-010	2.061e-010	-9.686	-9.686	0.000	(0)
ZnF+	2.016e-011	1.930e-011	-10.695	-10.714	-0.019	(0)
Zn (SO4) 2-2	1.953e-012	1.640e-012	-11.709	-11.785	-0.076	(0)
Zn (OH) 3-	7.625e-013	7.300e-013	-12.118	-12.137	-0.019	(0)
ZnCl+	6.675e-013	6.404e-013	-12.176	-12.194	-0.018	(0)
ZnOHCl	5.924e-013	5.924e-013	-12.227	-12.227	0.000	(0)
Zn (OH) 4-2	2.444e-017	2.053e-017	-16.612	-16.688	-0.076	(0)
ZnCl2	9.932e-018	9.932e-018	-17.003	-17.003	0.000	(0)
ZnSeO4	1.577e-019	1.577e-019	-18.802	-18.802	0.000	(0)
ZnCl3-	8.049e-023	7.721e-023	-22.094	-22.112	-0.018	(0)
ZnCl4-2	4.453e-028	3.778e-028	-27.351	-27.423	-0.071	(0)
Zn (SeO4) 2-2	7.442e-033	6.252e-033	-32.128	-32.204	-0.076	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-1.88	8.92	10.80	Al (OH) 3
Al2 (MoO4) 3	-56.68	-54.31	2.37	Al2 (MoO4) 3
Al2O3	-1.82	17.83	19.65	Al2O3
Al4 (OH) 10SO4	-6.47	16.23	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.98	-6.18	4.80	AlAsO4:2H2O
AlOHSO4	-7.29	-10.52	-3.23	AlOHSO4
Alunite	-7.08	-8.48	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-6.02	-13.81	-7.79	PbSO4
Anhydrite	-3.12	-7.48	-4.36	CaSO4
Antlerite	-6.45	2.34	8.79	Cu3 (OH) 4SO4
Aragonite	-1.38	-9.68	-8.30	CaCO3
Arsenolite	-76.78	-79.54	-2.76	As4O6
Artinite	-7.99	1.61	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-36.89	-30.18	6.71	As2O5
Atacamite	-5.73	1.66	7.39	Cu2 (OH) 3Cl
Azurite	-4.60	-21.51	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.21	7.18	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.82	-2.95	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.27	-8.64	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.71	4.23	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-15.59	-25.26	-9.67	BaCrO4
BaF2	-11.55	-17.37	-5.82	BaF2
BaMoO4	-9.91	-16.87	-6.96	BaMoO4
Barite	-2.27	-12.25	-9.98	BaSO4
BaSeO3	-11.13	-9.30	1.83	BaSeO3
BaSeO4	-14.46	-21.92	-7.46	BaSeO4
Bianchite	-9.56	-11.32	-1.76	ZnSO4:6H2O
Birnessite	-10.31	7.78	18.09	MnO2
Bixbyite	-7.49	-8.13	-0.64	Mn2O3
Boehmite	0.34	8.92	8.58	AlOOH
Brochantite	-5.63	9.59	15.22	Cu4 (OH) 6SO4
Brucite	-5.22	11.62	16.84	Mg (OH) 2
Bunsenite	-4.94	7.50	12.45	NiO
Ca (VO3) 2	-11.01	-5.35	5.66	Ca (VO3) 2
Ca2V2O7	-10.89	6.61	17.50	Ca2V2O7

Ca ₂ V ₂ O ₇ :2H ₂ O	-14.95	6.61	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-16.62	5.68	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-20.40	18.56	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-21.30	18.56	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
CaCrO ₄	-18.22	-20.48	-2.27	CaCrO ₄
Calcite	-1.20	-9.68	-8.48	CaCO ₃
CaMoO ₄	-4.14	-12.09	-7.95	CaMoO ₄
Carnotite	-3.37	-3.14	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.34	-4.53	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-14.12	-17.14	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-16.31	-6.47	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.40	6.24	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.49	6.24	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-26.85	-20.14	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-23.27	-0.71	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-22.87	5.53	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-18.81	-19.47	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-17.78	-19.47	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-17.56	-19.47	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-17.10	-18.31	-1.21	CdF ₂
Cdmetal(alpha)	-30.97	-17.45	13.51	Cd
Cdmetal(gamma)	-31.07	-17.45	13.62	Cd
CdMoO ₄	-3.66	-17.81	-14.15	CdMoO ₄
CdOHC1	-10.15	-6.61	3.54	CdOHC1
CdSe	-16.26	-36.46	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-21.01	-22.86	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-13.02	-13.19	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.47	-13.19	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-11.32	-13.19	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-2.89	-16.02	-13.13	PbCO ₃
CH ₄ (g)	-75.36	-116.41	-41.05	CH ₄
Chalcanthite	-9.54	-12.18	-2.64	CuSO ₄ :5H ₂ O
Claudetite	-76.48	-79.54	-3.06	As ₄ O ₆
Clausthalite	-9.98	-37.08	-27.10	PbSe
CO ₂ (g)	-3.49	-21.64	-18.15	CO ₂
Cotunnite	-15.31	-20.09	-4.78	PbCl ₂
Cr(OH) ₂	-20.32	-9.50	10.82	Cr(OH) ₂
Cr(OH) ₃	-1.93	-0.60	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	0.15	-0.60	-0.75	Cr(OH) ₃
Cr ₂ O ₃	1.16	-1.20	-2.36	Cr ₂ O ₃
CrCl ₂	-49.30	-35.21	14.09	CrCl ₂
CrCl ₃	-54.28	-39.17	15.11	CrCl ₃
CrF ₃	-26.09	-37.43	-11.34	CrF ₃
Crmetal	-63.67	-33.19	30.48	Cr
CrO ₃	-29.23	-32.44	-3.21	CrO ₃
Cryolite	-18.98	-52.82	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-1.42	7.26	8.67	Cu(OH) ₂
Cu ₂ Se(alpha)	-0.70	-46.50	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-21.28	-23.23	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ :2H ₂ O	-14.51	-8.41	6.10	Cu ₃ (AsO ₄) ₂ :2H ₂ O
Cu ₃ Se ₂	-18.45	-81.95	-63.49	Cu ₃ Se ₂
CuCO ₃	-2.88	-14.38	-11.50	CuCO ₃
CuCrO ₄	-19.74	-25.18	-5.44	CuCrO ₄
CuF	-9.27	-14.18	-4.91	CuF
CuF ₂	-18.41	-17.30	1.12	CuF ₂
CuF ₂ :2H ₂ O	-12.75	-17.30	-4.55	CuF ₂ :2H ₂ O
Cumetal	-4.99	-13.75	-8.76	Cu
CuMoO ₄	-3.71	-16.79	-13.08	CuMoO ₄
CuOCuSO ₄	-15.22	-4.92	10.30	CuOCuSO ₄
Cupricferrite	10.12	16.11	5.99	CuFe ₂ O ₄
Cuprite	-2.39	-3.80	-1.41	Cu ₂ O
Cuprousferrite	11.44	2.53	-8.92	CuFeO ₂
CuSe	-2.35	-35.45	-33.10	CuSe
CuSe ₂	-21.09	-54.45	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-9.74	-9.23	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-19.40	-21.84	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-15.12	-12.18	2.94	CuSO ₄
Diaspore	2.04	8.92	6.87	AlOOH

Dolomite(disordered)	-3.16	-19.70	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.61	-19.70	-17.09	CaMg(CO3)2
Epsomite	-5.68	-7.81	-2.13	MgSO4:7H2O
Fe(OH)2	-7.95	5.61	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.61	0.57	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-7.97	-11.69	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.18	-7.63	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.97	-40.60	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.71	-49.44	-3.73	Fe2(SO4)3
Fe3(OH)8	-5.75	14.47	20.22	Fe3(OH)8
FeAsO4:2H2O	-11.06	-10.66	0.40	FeAsO4:2H2O
FeCr2O4	-2.79	4.41	7.20	FeCr2O4
FeMoO4	-8.34	-18.43	-10.09	FeMoO4
Ferrihydrite	1.24	4.43	3.19	Fe(OH)3
Ferroselite	-37.50	-56.10	-18.60	FeSe2
FeSe	-26.09	-37.09	-11.00	FeSe
Fluorite	-2.10	-12.60	-10.50	CaF2
Gibbsite	0.63	8.92	8.29	Al(OH)3
Goethite	3.94	4.43	0.49	FeOOH
Goslarite	-9.31	-11.32	-2.01	ZnSO4:7H2O
Gummite	-5.80	1.88	7.67	UO3
Gypsum	-2.87	-7.48	-4.61	CaSO4:2H2O
H-Jarosite	-13.48	-25.58	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.17	-24.05	-12.88	H2MoO4
H2Se(g)	-37.74	-42.70	-4.96	H2Se
Halite	-10.48	-8.88	1.60	NaCl
Hausmannite	-9.02	52.01	61.03	Mn3O4
Hematite	10.27	8.85	-1.42	Fe2O3
Hercynite	0.55	23.45	22.89	FeAl2O4
Huntite	-9.76	-39.73	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.65	-26.42	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-19.67	-28.43	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-21.15	-26.32	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-7.15	-21.95	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-40.36	-57.61	-17.24	K2Cr2O7
K2CrO4	-24.66	-25.17	-0.51	K2CrO4
K2MoO4	-20.04	-16.78	3.26	K2MoO4
K2SeO4	-21.10	-21.83	-0.73	K2SeO4
Langite	-7.90	9.59	17.49	Cu4(OH)6SO4:H2O
Larnakite	-7.76	-8.19	-0.43	PbO:PbSO4
Laurionite	-7.86	-7.24	0.62	PbOHCl
Lepidocrocite	3.06	4.43	1.37	FeOOH
Lime	-20.74	11.96	32.70	CaO
Litharge	-7.07	5.62	12.69	PbO
Maghemite	2.47	8.85	6.39	Fe2O3
Magnesioferrite	3.62	20.48	16.86	Fe2MgO4
Magnesite	-2.55	-10.01	-7.46	MgCO3
Magnetite	11.06	14.47	3.40	Fe3O4
Malachite	-1.82	-7.12	-5.31	Cu2(OH)2CO3
Manganite	-4.06	21.28	25.34	MnOOH
Massicot	-7.27	5.62	12.89	PbO
Matlockite	-10.54	-19.51	-8.97	PbClF
Melanothallite	-24.71	-18.45	6.26	CuCl2
Melanterite	-11.61	-13.82	-2.21	FeSO4:7H2O
Mg(OH)2(active)	-7.17	11.62	18.79	Mg(OH)2
Mg(VO3)2	-16.96	-5.68	11.28	Mg(VO3)2
Mg2V2O7	-20.42	5.94	26.36	Mg2V2O7
MgCr2O4	-5.78	10.42	16.20	MgCr2O4
MgCrO4	-26.19	-20.81	5.38	MgCrO4
MgF2	-4.80	-12.93	-8.13	MgF2
MgMoO4	-10.57	-12.42	-1.85	MgMoO4
MgSeO3:6H2O	-7.92	-4.86	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.28	-17.48	-1.20	MgSeO4:6H2O
Minium	-32.97	40.55	73.52	Pb3O4
Mirabilite	-10.37	-11.48	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.77	-7.87	4.90	Mn(VO3)2
Mn2(SO4)3	-60.72	-66.43	-5.71	Mn2(SO4)3
Mn3(AsO4)2:8H2O	-14.37	-1.87	12.50	Mn3(AsO4)2:8H2O

MnCl2:4H2O	-18.99	-16.27	2.72	MnCl2:4H2O
MnSe	-36.76	-33.26	3.50	MnSe
MnSeO3	-8.18	-7.05	1.13	MnSeO3
MnSeO3:2H2O	-8.03	-7.05	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.61	-19.66	-2.05	MnSeO4:5H2O
MnSO4	-12.58	-9.99	2.58	MnSO4
Monteponite	-8.86	6.24	15.10	CdO
MoO3	-16.05	-24.05	-8.00	MoO3
Morenosite	-9.78	-11.93	-2.14	NiSO4:7H2O
Na-Jarosite	-10.41	-21.61	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-47.03	-56.92	-9.90	Na2Cr2O7
Na2CrO4	-27.42	-24.49	2.93	Na2CrO4
Na2Mo2O7	-23.55	-40.15	-16.60	Na2Mo2O7
Na2MoO4	-17.59	-16.10	1.49	Na2MoO4
Na2MoO4:2H2O	-17.32	-16.10	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.83	-8.53	10.30	Na2SeO3:5H2O
Na2SeO4	-22.43	-21.15	1.28	Na2SeO4
Na3VO4	-33.41	3.27	36.68	Na3VO4
Na4V2O7	-38.81	-1.41	37.40	Na4V2O7
Nantokite	-8.03	-14.76	-6.73	CuCl
Natron	-12.38	-13.69	-1.31	Na2CO3:10H2O
NaVO3	-8.54	-4.68	3.86	NaVO3
Nesquehonite	-5.34	-10.01	-4.67	MgCO3:3H2O
Ni(OH)2	-5.29	7.50	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.37	-7.67	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.42	10.58	32.00	Ni4(OH)6SO4
NiCO3	-7.26	-14.13	-6.87	NiCO3
NiMoO4	-5.40	-16.54	-11.14	NiMoO4
NiSe	-17.50	-35.20	-17.70	NiSe
NiSeO3:2H2O	-11.80	-8.98	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-20.08	-21.60	-1.52	NiSeO4:6H2O
Nsutite	-9.72	7.78	17.50	MnO2
O2(g)	-35.70	47.38	83.09	O2
Otavite	-3.40	-15.40	-12.00	CdCO3
Pb(BO2)2	-13.61	-7.09	6.52	Pb(BO2)2
Pb(OH)2	-2.53	5.62	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-64.88	-73.64	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-10.41	-1.62	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.95	11.24	26.19	Pb2O(OH)2
Pb2O3	-26.11	34.93	61.04	Pb2O3
Pb2OCO3	-9.84	-10.40	-0.56	Pb2OCO3
Pb2V2O7	-4.17	-6.07	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.13	-13.33	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.59	-0.45	6.14	Pb3(VO4)2
Pb3O2CO3	-15.80	-4.78	11.02	Pb3O2CO3
Pb3O2SO4	-13.26	-2.58	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.06	3.04	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.83	3.04	21.88	Pb4O3SO4
PbCrO4	-14.22	-26.82	-12.60	PbCrO4
PbF2	-11.49	-18.93	-7.44	PbF2
Pbmetal	-22.32	-18.07	4.25	Pb
PbMoO4	-2.81	-18.43	-15.62	PbMoO4
PbO:0.3H2O	-7.36	5.62	12.98	PbO:0.33H2O
PbSeO4	-16.64	-23.48	-6.84	PbSeO4
Periclase	-9.96	11.62	21.58	MgO
Phosgenite	-16.30	-36.11	-19.81	PbCl2:PbCO3
Plattnerite	-20.29	29.31	49.60	PbO2
Portlandite	-10.85	11.96	22.80	Ca(OH)2
Pyrochroite	-5.76	9.44	15.19	Mn(OH)2
Pyrolusite	-8.25	33.13	41.38	MnO2
Retgersite	-9.89	-11.93	-2.04	NiSO4:6H2O
Rhodochrosite	-1.62	-12.20	-10.58	MnCO3
Rutherfordine	-5.26	-19.76	-14.50	UO2CO3
Schoepite	-4.12	1.88	5.99	UO2(OH)2:H2O
Semetal(am)	-11.90	-19.01	-7.11	Se
Semetal(hex)	-11.30	-19.01	-7.71	Se
SeO2	-16.61	-16.48	0.12	SeO2
SeO3	-50.14	-29.10	21.04	SeO3

Siderite	-5.78	-16.02	-10.24	FeCO3
Smithsonite	-3.53	-13.53	-10.00	ZnCO3
Spinel	-7.39	29.46	36.85	MgAl2O4
Tenorite	-0.39	7.26	7.64	CuO
Thenardite	-11.80	-11.48	0.32	Na2SO4
Thermonatrite	-14.32	-13.69	0.64	Na2CO3:H2O
Tyuyamunite	-5.68	-1.60	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.50	9.58	21.08	U3O8
U4O9	-23.69	-26.71	-3.02	U4O9
UF4	-32.17	-61.71	-29.54	UF4
UF4:2.5H2O	-28.99	-61.71	-32.72	UF4:2.5H2O
UO2 (am)	-13.54	-12.60	0.93	UO2
UO2 (OH) 2 (beta)	-3.74	1.88	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.97	-27.22	-2.25	UO2SeO4:4H2O
UO3	-5.82	1.88	7.70	UO3
Uraninite	-7.93	-12.60	-4.67	UO2
V (OH) 3	-17.34	-9.75	7.59	V (OH) 3
V2O5	-15.95	-17.31	-1.36	V2O5
V3O5	-36.32	-34.48	1.84	V3O5
V4O7	-45.26	-38.08	7.19	V4O7
V6O13	-38.44	-99.30	-60.86	V6O13
VC12	-66.18	-47.30	18.87	VC12
VC13	-71.75	-48.31	23.43	VC13
VF4	-67.63	-52.70	14.93	VF4
Vmetal	-89.31	-45.28	44.03	V
VO	-36.35	-21.59	14.76	VO
VO (OH) 2	-8.75	-3.60	5.15	VO (OH) 2
VO2Cl	-24.35	-21.51	2.84	VO2Cl
VOC1	-33.75	-22.60	11.15	VOC1
VOC12	-42.07	-29.31	12.76	VOC12
VOSO4	-26.64	-23.03	3.61	VOSO4
Witherite	-5.89	-14.46	-8.57	BaCO3
Zincite	-3.23	8.11	11.33	ZnO
Zincosite	-15.25	-11.32	3.93	ZnSO4
Zn (BO2) 2	-12.89	-4.60	8.29	Zn (BO2) 2
Zn (OH) 2	-4.09	8.11	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.37	8.11	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.65	8.11	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.43	8.11	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.63	8.11	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.72	-3.22	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.83	3.36	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.51	-5.86	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-33.45	-14.54	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.40	13.00	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-23.67	14.83	38.50	Zn5 (OH) 8Cl2
ZnCl2	-24.65	-17.60	7.05	ZnCl2
ZnCO3:1H2O	-3.27	-13.53	-10.26	ZnCO3:1H2O
ZnF2	-15.91	-16.44	-0.53	ZnF2
Znmetal	-41.37	-15.58	25.79	Zn
ZnMoO4	-5.81	-15.94	-10.13	ZnMoO4
ZnO (active)	-3.08	8.11	11.19	ZnO
ZnSe	-20.19	-34.59	-14.40	ZnSe
ZnSeO4:6H2O	-19.47	-20.99	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.69	-11.32	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 8.

SOLUTION 6 Average HCT data for quartz monzonite - oxide/transitional (ore)
(cell SRK 0867)

temp 25

pH 6.90391
 pe 4
 redox pe
 units mg/l
 density 1
 Alkalinity 9.27214 as HCO3
 Al 0.06988
 B 0.00472
 Ba 0.00751
 Ca 25.90591
 Cd 0.00005
 Cl 0.73852
 Co 0.00047
 Cu 0.00563
 F 0.55791
 Fe 0.09893
 K 1.07782
 Mg 2.23925
 Mn 0.46844
 Mo 0.00506
 Na 0.93238 charge
 Ni 0.00047
 S(6) 72.31791 as SO4
 Sb 0.00297
 Se 0.00024
 U 0.00047
 V 0.00047
 Zn 0.00163
 water 1 # kg

END

 Beginning of initial solution calculations.

Initial solution 6. Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

-----Solution composition-----

Elements	Molality	Moles
Al	2.590e-006	2.590e-006
Alkalinity	1.520e-004	1.520e-004
B	4.367e-007	4.367e-007
Ba	5.469e-008	5.469e-008
Ca	6.465e-004	6.465e-004
Cd	4.449e-010	4.449e-010
Cl	2.083e-005	2.083e-005
Co	7.976e-009	7.976e-009
Cu	8.861e-008	8.861e-008
F	2.937e-005	2.937e-005
Fe	1.772e-006	1.772e-006
K	2.757e-005	2.757e-005
Mg	9.214e-005	9.214e-005
Mn	8.528e-006	8.528e-006
Mo	5.275e-008	5.275e-008
Na	1.755e-004	1.755e-004
Ni	8.009e-009	8.009e-009
S(6)	7.529e-004	7.529e-004
Sb	2.440e-008	2.440e-008
Se	3.040e-009	3.040e-009
U	1.975e-009	1.975e-009
V	9.228e-009	9.228e-009
Zn	2.493e-008	2.493e-008
		Charge balance

-----Description of solution-----

pH = 6.904


```

pe = 4.000
Activity of water = 1.000
Ionic strength = 2.937e-003
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 1.797e-004
Total CO2 (mol/kg) = 1.797e-004
Temperature (deg C) = 25.00
Electrical balance (eq) = -2.055e-018
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
Iterations = 11
Total H = 1.110139e+002
Total O = 5.551040e+001

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.324e-007	1.248e-007	-6.878	-6.904	-0.026	0.00
OH-	8.569e-008	8.070e-008	-7.067	-7.093	-0.026	(0)
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	2.590e-006					
Al(OH) 4-	2.150e-006	2.027e-006	-5.668	-5.693	-0.026	(0)
Al(OH) 3	1.995e-007	1.995e-007	-6.700	-6.700	0.000	(0)
Al(OH) 2+	1.313e-007	1.239e-007	-6.882	-6.907	-0.025	(0)
AlF2+	7.424e-008	7.005e-008	-7.129	-7.155	-0.025	(0)
AlF3	2.390e-008	2.390e-008	-7.622	-7.622	0.000	(0)
AlF+2	8.189e-009	6.492e-009	-8.087	-8.188	-0.101	(0)
AlOH+2	2.438e-009	1.933e-009	-8.613	-8.714	-0.101	(0)
AlF4-	3.444e-010	3.247e-010	-9.463	-9.488	-0.026	(0)
AlSO4+	1.069e-010	1.008e-010	-9.971	-9.997	-0.026	(0)
Al+3	4.085e-011	2.395e-011	-10.389	-10.621	-0.232	(0)
Al(SO4) 2-	6.211e-013	5.855e-013	-12.207	-12.232	-0.026	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-41.094	-41.342	-0.249	(0)
B	4.367e-007					
H3BO3	4.345e-007	4.348e-007	-6.362	-6.362	0.000	(0)
H2BO3-	2.151e-009	2.024e-009	-8.667	-8.694	-0.026	(0)
CaH2BO3+	5.735e-011	5.396e-011	-10.241	-10.268	-0.026	(0)
MgH2BO3+	5.011e-012	4.715e-012	-11.300	-11.327	-0.026	(0)
BF(OH) 3-	4.998e-012	4.702e-012	-11.301	-11.328	-0.026	(0)
NaH2BO3	5.290e-013	5.290e-013	-12.277	-12.277	0.000	(0)
BaH2BO3+	2.864e-015	2.695e-015	-14.543	-14.569	-0.026	(0)
BF2(OH) 2-	1.807e-015	1.700e-015	-14.743	-14.770	-0.026	(0)
H5(BO3) 2-	7.959e-016	7.489e-016	-15.099	-15.126	-0.026	(0)
H8(BO3) 3-	3.460e-020	3.256e-020	-19.461	-19.487	-0.026	(0)
BF3OH-	2.377e-021	2.237e-021	-20.624	-20.650	-0.026	(0)
BF4-	3.956e-026	3.722e-026	-25.403	-25.429	-0.026	(0)
Ba	5.469e-008					
Ba+2	5.463e-008	4.309e-008	-7.263	-7.366	-0.103	(0)
BaHCO3+	5.794e-011	5.471e-011	-10.237	-10.262	-0.025	(0)
BaCO3	1.104e-012	1.104e-012	-11.957	-11.957	0.000	(0)
BaOH+	1.609e-014	1.518e-014	-13.793	-13.819	-0.025	(0)
BaH2BO3+	2.864e-015	2.695e-015	-14.543	-14.569	-0.026	(0)
C(4)	1.797e-004					
HCO3-	1.409e-004	1.329e-004	-3.851	-3.876	-0.025	(0)
H2CO3	3.730e-005	3.730e-005	-4.428	-4.428	0.000	(0)
CaHCO3+	1.215e-006	1.147e-006	-5.915	-5.940	-0.025	(0)
MgHCO3+	9.700e-008	9.141e-008	-7.013	-7.039	-0.026	(0)
CO3-2	6.334e-008	4.995e-008	-7.198	-7.301	-0.103	(0)
CaCO3	3.669e-008	3.669e-008	-7.435	-7.435	0.000	(0)
MnHCO3+	1.725e-008	1.627e-008	-7.763	-7.789	-0.025	(0)
CuCO3	1.287e-008	1.287e-008	-7.891	-7.891	0.000	(0)
NaHCO3	1.233e-008	1.233e-008	-7.909	-7.909	0.000	(0)
MgCO3	2.792e-009	2.792e-009	-8.554	-8.554	0.000	(0)
UO2(CO3) 2-2	1.067e-009	8.272e-010	-8.972	-9.082	-0.111	(0)
FeHCO3+	9.902e-010	9.349e-010	-9.004	-9.029	-0.025	(0)
UO2CO3	8.299e-010	8.299e-010	-9.081	-9.081	0.000	(0)
CuHCO3+	3.910e-010	3.669e-010	-9.408	-9.435	-0.028	(0)

NaCO3-	1.626e-010	1.534e-010	-9.789	-9.814	-0.025	(0)
NiHCO3+	1.001e-010	9.394e-011	-9.999	-10.027	-0.028	(0)
ZnHCO3+	7.956e-011	7.465e-011	-10.099	-10.127	-0.028	(0)
CoHCO3+	6.222e-011	5.839e-011	-10.206	-10.234	-0.028	(0)
BaHCO3+	5.794e-011	5.471e-011	-10.237	-10.262	-0.025	(0)
ZnCO3	5.104e-011	5.104e-011	-10.292	-10.292	0.000	(0)
NiCO3	1.068e-011	1.068e-011	-10.971	-10.971	0.000	(0)
UO2 (CO3) 3-4	5.734e-012	2.071e-012	-11.242	-11.684	-0.442	(0)
CoCO3	4.768e-012	4.768e-012	-11.322	-11.322	0.000	(0)
Cu (CO3) 2-2	2.232e-012	1.730e-012	-11.651	-11.762	-0.111	(0)
BaCO3	1.104e-012	1.104e-012	-11.957	-11.957	0.000	(0)
CdCO3	3.616e-013	3.616e-013	-12.442	-12.442	0.000	(0)
CdHCO3+	1.024e-013	9.612e-014	-12.990	-13.017	-0.028	(0)
Cd (CO3) 2-2	1.727e-017	1.339e-017	-16.763	-16.873	-0.111	(0)
Ca	6.465e-004					
Ca+2	5.875e-004	4.634e-004	-3.231	-3.334	-0.103	(0)
CaSO4	5.755e-005	5.755e-005	-4.240	-4.240	0.000	(0)
CaHCO3+	1.215e-006	1.147e-006	-5.915	-5.940	-0.025	(0)
CaF+	1.453e-007	1.371e-007	-6.838	-6.863	-0.025	(0)
CaCO3	3.669e-008	3.669e-008	-7.435	-7.435	0.000	(0)
CaOH+	7.903e-010	7.461e-010	-9.102	-9.127	-0.025	(0)
CaH2BO3+	5.735e-011	5.396e-011	-10.241	-10.268	-0.026	(0)
Cd	4.449e-010					
Cd+2	4.026e-010	3.176e-010	-9.395	-9.498	-0.103	(0)
CdSO4	4.036e-011	4.036e-011	-10.394	-10.394	0.000	(0)
CdCl+	6.345e-013	5.954e-013	-12.198	-12.225	-0.028	(0)
Cd (SO4) 2-2	3.808e-013	2.952e-013	-12.419	-12.530	-0.111	(0)
CdCO3	3.616e-013	3.616e-013	-12.442	-12.442	0.000	(0)
CdOH+	2.170e-013	2.036e-013	-12.664	-12.691	-0.028	(0)
CdF+	1.454e-013	1.364e-013	-12.837	-12.865	-0.028	(0)
CdHCO3+	1.024e-013	9.612e-014	-12.990	-13.017	-0.028	(0)
CdOHC1	1.971e-015	1.971e-015	-14.705	-14.705	0.000	(0)
Cd (OH) 2	1.037e-016	1.037e-016	-15.984	-15.984	0.000	(0)
CdCl2	4.873e-017	4.873e-017	-16.312	-16.312	0.000	(0)
Cd (CO3) 2-2	1.727e-017	1.339e-017	-16.763	-16.873	-0.111	(0)
CdF2	7.378e-018	7.378e-018	-17.132	-17.132	0.000	(0)
CdCl3-	6.433e-022	6.036e-022	-21.192	-21.219	-0.028	(0)
Cd2OH+3	5.746e-022	3.240e-022	-21.241	-21.489	-0.249	(0)
Cd (OH) 3-	5.447e-022	5.111e-022	-21.264	-21.291	-0.028	(0)
CdSeO4	4.114e-024	4.114e-024	-23.386	-23.386	0.000	(0)
Cd (SeO3) 2-2	2.592e-024	2.010e-024	-23.586	-23.697	-0.111	(0)
Cd (OH) 4-2	8.709e-030	6.752e-030	-29.060	-29.171	-0.111	(0)
Cl	2.083e-005					
Cl-	2.083e-005	1.963e-005	-4.681	-4.707	-0.026	(0)
MnCl+	1.607e-010	1.516e-010	-9.794	-9.819	-0.025	(0)
CuCl	5.295e-011	5.295e-011	-10.276	-10.276	0.000	(0)
CuCl+	1.444e-012	1.361e-012	-11.840	-11.866	-0.026	(0)
ZnCl+	9.293e-013	8.757e-013	-12.032	-12.058	-0.026	(0)
CdCl+	6.345e-013	5.954e-013	-12.198	-12.225	-0.028	(0)
CoCl+	4.087e-013	3.835e-013	-12.389	-12.416	-0.028	(0)
NiCl+	3.068e-013	2.879e-013	-12.513	-12.541	-0.028	(0)
CuCl2-	2.305e-013	2.172e-013	-12.637	-12.663	-0.026	(0)
ZnOHC1	9.252e-014	9.252e-014	-13.034	-13.034	0.000	(0)
MnCl2	4.203e-015	4.203e-015	-14.376	-14.376	0.000	(0)
CdOHC1	1.971e-015	1.971e-015	-14.705	-14.705	0.000	(0)
UO2Cl+	1.416e-016	1.329e-016	-15.849	-15.877	-0.028	(0)
CdCl2	4.873e-017	4.873e-017	-16.312	-16.312	0.000	(0)
ZnCl2	2.725e-017	2.725e-017	-16.565	-16.565	0.000	(0)
CuCl2	9.266e-018	9.266e-018	-17.033	-17.033	0.000	(0)
CuCl3-2	1.152e-018	9.117e-019	-17.939	-18.040	-0.102	(0)
FeCl+2	3.887e-019	3.077e-019	-18.410	-18.512	-0.102	(0)
NiCl2	2.846e-020	2.846e-020	-19.546	-19.546	0.000	(0)
MnCl3-	2.410e-020	2.273e-020	-19.618	-19.643	-0.025	(0)
VOCl+	1.894e-020	1.778e-020	-19.723	-19.750	-0.028	(0)
CdCl3-	6.433e-022	6.036e-022	-21.192	-21.219	-0.028	(0)
ZnCl3-	4.510e-022	4.249e-022	-21.346	-21.372	-0.026	(0)
FeCl2+	2.860e-023	2.698e-023	-22.544	-22.569	-0.025	(0)
CuCl3-	1.802e-024	1.698e-024	-23.744	-23.770	-0.026	(0)

ZnCl4-2	5.270e-027	4.172e-027	-26.278	-26.380	-0.102	(0)
FeCl3	5.297e-029	5.297e-029	-28.276	-28.276	0.000	(0)
CuCl4-2	2.110e-031	1.670e-031	-30.676	-30.777	-0.102	(0)
CoCl+2	1.158e-039	8.979e-040	-38.936	-39.047	-0.111	(0)
UCl+3	0.000e+000	0.000e+000	-40.537	-40.786	-0.249	(0)
Co (2)	7.976e-009					
Co+2	7.283e-009	5.646e-009	-8.138	-8.248	-0.111	(0)
CoSO4	6.108e-010	6.108e-010	-9.214	-9.214	0.000	(0)
CoHCO3+	6.222e-011	5.839e-011	-10.206	-10.234	-0.028	(0)
CoOH+	9.689e-012	9.092e-012	-11.014	-11.041	-0.028	(0)
CoF+	5.158e-012	4.839e-012	-11.288	-11.315	-0.028	(0)
CoCO3	4.768e-012	4.768e-012	-11.322	-11.322	0.000	(0)
CoCl+	4.087e-013	3.835e-013	-12.389	-12.416	-0.028	(0)
Co (OH) 2	5.828e-014	5.828e-014	-13.234	-13.234	0.000	(0)
Co (OH) 3-	1.000e-019	9.385e-020	-19.000	-19.028	-0.028	(0)
CoOOH-	2.509e-020	2.355e-020	-19.600	-19.628	-0.028	(0)
Co2OH+3	4.562e-021	2.573e-021	-20.341	-20.590	-0.249	(0)
CoSeO4	1.969e-022	1.969e-022	-21.706	-21.706	0.000	(0)
Co (OH) 4-2	1.548e-027	1.200e-027	-26.810	-26.921	-0.111	(0)
Co4 (OH) 4+4	3.774e-036	1.363e-036	-35.423	-35.865	-0.442	(0)
Co (3)	1.189e-031					
CoOH+2	1.189e-031	9.218e-032	-30.925	-31.035	-0.111	(0)
Co+3	3.834e-037	2.248e-037	-36.416	-36.648	-0.232	(0)
CoCl+2	1.158e-039	8.979e-040	-38.936	-39.047	-0.111	(0)
Cu (1)	2.336e-009					
Cu+	2.283e-009	2.142e-009	-8.641	-8.669	-0.028	(0)
CuCl	5.295e-011	5.295e-011	-10.276	-10.276	0.000	(0)
CuCl2-	2.305e-013	2.172e-013	-12.637	-12.663	-0.026	(0)
CuCl3-2	1.152e-018	9.117e-019	-17.939	-18.040	-0.102	(0)
Cu (2)	8.627e-008					
Cu+2	5.546e-008	4.374e-008	-7.256	-7.359	-0.103	(0)
CuCO3	1.287e-008	1.287e-008	-7.891	-7.891	0.000	(0)
CuOH+	1.185e-008	1.116e-008	-7.926	-7.952	-0.026	(0)
CuSO4	5.433e-009	5.433e-009	-8.265	-8.265	0.000	(0)
CuHCO3+	3.910e-010	3.669e-010	-9.408	-9.435	-0.028	(0)
Cu (OH) 2	1.798e-010	1.798e-010	-9.745	-9.745	0.000	(0)
CuF+	7.973e-011	7.481e-011	-10.098	-10.126	-0.028	(0)
Cu2 (OH) 2+2	4.038e-012	3.130e-012	-11.394	-11.504	-0.111	(0)
Cu (CO3) 2-2	2.232e-012	1.730e-012	-11.651	-11.762	-0.111	(0)
CuCl+	1.444e-012	1.361e-012	-11.840	-11.866	-0.026	(0)
Cu (OH) 3-	3.171e-014	2.976e-014	-13.499	-13.526	-0.028	(0)
CuCl2	9.266e-018	9.266e-018	-17.033	-17.033	0.000	(0)
Cu (OH) 4-2	2.438e-020	1.890e-020	-19.613	-19.724	-0.111	(0)
CuCl3-	1.802e-024	1.698e-024	-23.744	-23.770	-0.026	(0)
CuCl4-2	2.110e-031	1.670e-031	-30.676	-30.777	-0.102	(0)
F	2.937e-005					
F-	2.876e-005	2.711e-005	-4.541	-4.567	-0.026	(0)
MgF+	2.168e-007	2.044e-007	-6.664	-6.690	-0.026	(0)
CaF+	1.453e-007	1.371e-007	-6.838	-6.863	-0.025	(0)
AlF2+	7.424e-008	7.005e-008	-7.129	-7.155	-0.025	(0)
AlF3	2.390e-008	2.390e-008	-7.622	-7.622	0.000	(0)
AlF+2	8.189e-009	6.492e-009	-8.087	-8.188	-0.101	(0)
MnF+	7.016e-009	6.618e-009	-8.154	-8.179	-0.025	(0)
HF	5.002e-009	5.002e-009	-8.301	-8.301	0.000	(0)
NaF	2.821e-009	2.821e-009	-8.550	-8.550	0.000	(0)
AlF4-	3.444e-010	3.247e-010	-9.463	-9.488	-0.026	(0)
CuF+	7.973e-011	7.481e-011	-10.098	-10.126	-0.028	(0)
UO2F+	1.664e-011	1.561e-011	-10.779	-10.806	-0.028	(0)
ZnF+	1.023e-011	9.604e-012	-10.990	-11.018	-0.028	(0)
CoF+	5.158e-012	4.839e-012	-11.288	-11.315	-0.028	(0)
BF (OH) 3-	4.998e-012	4.702e-012	-11.301	-11.328	-0.026	(0)
NiF+	4.159e-012	3.903e-012	-11.381	-11.409	-0.028	(0)
UO2F2	1.221e-012	1.221e-012	-11.913	-11.913	0.000	(0)
HF2-	5.473e-013	5.155e-013	-12.262	-12.288	-0.026	(0)
CdF+	1.454e-013	1.364e-013	-12.837	-12.865	-0.028	(0)
FeF+2	1.948e-014	1.542e-014	-13.710	-13.812	-0.102	(0)
FeF2+	1.186e-014	1.119e-014	-13.926	-13.951	-0.025	(0)
UO2F3-	8.857e-015	8.311e-015	-14.053	-14.080	-0.028	(0)

BF2 (OH) 2-	1.807e-015	1.700e-015	-14.743	-14.770	-0.026	(0)
FeF3	4.278e-016	4.278e-016	-15.369	-15.369	0.000	(0)
VO2F	1.232e-016	1.232e-016	-15.909	-15.909	0.000	(0)
H2F2	6.703e-017	6.703e-017	-16.174	-16.174	0.000	(0)
VOF+	5.592e-017	5.247e-017	-16.252	-16.280	-0.028	(0)
CdF2	7.378e-018	7.378e-018	-17.132	-17.132	0.000	(0)
UO2F4-2	2.308e-018	1.789e-018	-17.637	-17.747	-0.111	(0)
VO2F2-	1.292e-018	1.213e-018	-17.889	-17.916	-0.028	(0)
VOF2	5.333e-019	5.333e-019	-18.273	-18.273	0.000	(0)
Sb (OH) 2F	5.603e-021	5.603e-021	-20.252	-20.252	0.000	(0)
SbOF	5.510e-021	5.510e-021	-20.259	-20.259	0.000	(0)
BF3OH-	2.377e-021	2.237e-021	-20.624	-20.650	-0.026	(0)
VOF3-	5.466e-022	5.129e-022	-21.262	-21.290	-0.028	(0)
VO2F3-2	5.289e-022	4.100e-022	-21.277	-21.387	-0.111	(0)
VOF4-2	7.238e-026	5.611e-026	-25.140	-25.251	-0.111	(0)
BF4-	3.956e-026	3.722e-026	-25.403	-25.429	-0.026	(0)
VO2F4-3	9.697e-027	5.468e-027	-26.013	-26.262	-0.249	(0)
UF3+	1.405e-030	1.318e-030	-29.852	-29.880	-0.028	(0)
UF2+2	3.959e-031	3.069e-031	-30.402	-30.513	-0.111	(0)
UF4	3.918e-033	3.918e-033	-32.407	-32.407	0.000	(0)
UF+3	1.595e-033	8.993e-034	-32.797	-33.046	-0.249	(0)
UF5-	4.485e-036	4.209e-036	-35.348	-35.376	-0.028	(0)
UF6-2	4.444e-038	3.445e-038	-37.352	-37.463	-0.111	(0)
Fe (2)	7.978e-007					
Fe+2	7.205e-007	5.586e-007	-6.142	-6.253	-0.111	(0)
FeSO4	7.434e-008	7.434e-008	-7.129	-7.129	0.000	(0)
FeOH+	1.903e-009	1.795e-009	-8.721	-8.746	-0.025	(0)
FeHCO3+	9.902e-010	9.349e-010	-9.004	-9.029	-0.025	(0)
Fe (OH) 2	1.150e-013	1.150e-013	-12.939	-12.939	0.000	(0)
Fe (OH) 3-	3.113e-015	2.936e-015	-14.507	-14.532	-0.025	(0)
Fe (3)	9.739e-007					
Fe (OH) 2+	8.997e-007	8.489e-007	-6.046	-6.071	-0.025	(0)
Fe (OH) 3	7.358e-008	7.358e-008	-7.133	-7.133	0.000	(0)
Fe (OH) 4-	5.860e-010	5.529e-010	-9.232	-9.257	-0.025	(0)
FeOH+2	3.416e-011	2.704e-011	-10.466	-10.568	-0.102	(0)
FeF+2	1.948e-014	1.542e-014	-13.710	-13.812	-0.102	(0)
FeF2+	1.186e-014	1.119e-014	-13.926	-13.951	-0.025	(0)
FeSO4+	3.346e-015	3.157e-015	-14.475	-14.501	-0.025	(0)
Fe+3	8.852e-016	5.189e-016	-15.053	-15.285	-0.232	(0)
FeF3	4.278e-016	4.278e-016	-15.369	-15.369	0.000	(0)
Fe (SO4) 2-	3.899e-017	3.659e-017	-16.409	-16.437	-0.028	(0)
FeCl+2	3.887e-019	3.077e-019	-18.410	-18.512	-0.102	(0)
Fe2 (OH) 2+4	6.702e-020	2.421e-020	-19.174	-19.616	-0.442	(0)
FeHSeO3+2	4.857e-021	3.765e-021	-20.314	-20.424	-0.111	(0)
FeCl2+	2.860e-023	2.698e-023	-22.544	-22.569	-0.025	(0)
Fe3 (OH) 4+5	1.458e-024	2.970e-025	-23.836	-24.527	-0.691	(0)
FeCl3	5.297e-029	5.297e-029	-28.276	-28.276	0.000	(0)
H (0)	2.203e-025					
H2	1.101e-025	1.102e-025	-24.958	-24.958	0.000	(0)
K	2.757e-005					
K+	2.746e-005	2.588e-005	-4.561	-4.587	-0.026	(0)
KSO4-	1.053e-007	9.934e-008	-6.978	-7.003	-0.025	(0)
Mg	9.214e-005					
Mg+2	8.519e-005	6.719e-005	-4.070	-4.173	-0.103	(0)
MgSO4	6.629e-006	6.629e-006	-5.179	-5.179	0.000	(0)
MgF+	2.168e-007	2.044e-007	-6.664	-6.690	-0.026	(0)
MgHCO3+	9.700e-008	9.141e-008	-7.013	-7.039	-0.026	(0)
MgCO3	2.792e-009	2.792e-009	-8.554	-8.554	0.000	(0)
MgOH+	2.286e-009	2.159e-009	-8.641	-8.666	-0.025	(0)
MgH2BO3+	5.011e-012	4.715e-012	-11.300	-11.327	-0.026	(0)
Mn (2)	8.528e-006					
Mn+2	7.911e-006	6.133e-006	-5.102	-5.212	-0.111	(0)
MnSO4	5.912e-007	5.912e-007	-6.228	-6.228	0.000	(0)
MnHCO3+	1.725e-008	1.627e-008	-7.763	-7.789	-0.025	(0)
MnF+	7.016e-009	6.618e-009	-8.154	-8.179	-0.025	(0)
MnOH+	1.318e-009	1.243e-009	-8.880	-8.905	-0.025	(0)
MnCl+	1.607e-010	1.516e-010	-9.794	-9.819	-0.025	(0)
MnCl2	4.203e-015	4.203e-015	-14.376	-14.376	0.000	(0)

MnSeO4	1.148e-019	1.148e-019	-18.940	-18.940	0.000	(0)
Mn (OH) 3-	5.305e-020	5.004e-020	-19.275	-19.301	-0.025	(0)
MnCl3-	2.410e-020	2.273e-020	-19.618	-19.643	-0.025	(0)
Mn (OH) 4-2	1.647e-026	1.304e-026	-25.783	-25.885	-0.102	(0)
MnSe	1.520e-033	1.520e-033	-32.818	-32.818	0.000	(0)
Mn (3)	4.673e-027					
Mn+3	4.673e-027	2.739e-027	-26.330	-26.562	-0.232	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-52.302	-52.403	-0.102	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-57.749	-57.775	-0.026	(0)
Mo	5.275e-008					
MoO4-2	5.264e-008	4.152e-008	-7.279	-7.382	-0.103	(0)
HMoO4-	1.098e-010	1.031e-010	-9.959	-9.987	-0.028	(0)
H2MoO4	9.419e-014	9.419e-014	-13.026	-13.026	0.000	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-41.094	-41.342	-0.249	(0)
Mo7O24-6	0.000e+000	0.000e+000	-52.919	-53.914	-0.995	(0)
HMo7O24-5	0.000e+000	0.000e+000	-53.740	-54.431	-0.691	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-56.110	-56.553	-0.442	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-59.962	-60.211	-0.249	(0)
Na	1.755e-004					
Na+	1.750e-004	1.649e-004	-3.757	-3.783	-0.026	(0)
NaSO4-	5.089e-007	4.802e-007	-6.293	-6.319	-0.025	(0)
NaHCO3	1.233e-008	1.233e-008	-7.909	-7.909	0.000	(0)
NaF	2.821e-009	2.821e-009	-8.550	-8.550	0.000	(0)
NaCO3-	1.626e-010	1.534e-010	-9.789	-9.814	-0.025	(0)
NaH2BO3	5.290e-013	5.290e-013	-12.277	-12.277	0.000	(0)
Ni	8.009e-009					
Ni+2	7.268e-009	5.732e-009	-8.139	-8.242	-0.103	(0)
NiSO4	6.200e-010	6.200e-010	-9.208	-9.208	0.000	(0)
NiHCO3+	1.001e-010	9.394e-011	-9.999	-10.027	-0.028	(0)
NiCO3	1.068e-011	1.068e-011	-10.971	-10.971	0.000	(0)
NiOH+	6.206e-012	5.824e-012	-11.207	-11.235	-0.028	(0)
NiF+	4.159e-012	3.903e-012	-11.381	-11.409	-0.028	(0)
NiCl+	3.068e-013	2.879e-013	-12.513	-12.541	-0.028	(0)
Ni (OH) 2	3.733e-014	3.733e-014	-13.428	-13.428	0.000	(0)
Ni (SO4) 2-2	1.436e-014	1.113e-014	-13.843	-13.953	-0.111	(0)
Ni (OH) 3-	3.211e-018	3.013e-018	-17.493	-17.521	-0.028	(0)
NiCl2	2.846e-020	2.846e-020	-19.546	-19.546	0.000	(0)
NiSeO4	1.865e-022	1.865e-022	-21.729	-21.729	0.000	(0)
O (0)	0.000e+000					
O2	0.000e+000	0.000e+000	-42.380	-42.379	0.000	(0)
S (6)	7.529e-004					
SO4-2	6.874e-004	5.422e-004	-3.163	-3.266	-0.103	(0)
CaSO4	5.755e-005	5.755e-005	-4.240	-4.240	0.000	(0)
MgSO4	6.629e-006	6.629e-006	-5.179	-5.179	0.000	(0)
MnSO4	5.912e-007	5.912e-007	-6.228	-6.228	0.000	(0)
NaSO4-	5.089e-007	4.802e-007	-6.293	-6.319	-0.025	(0)
KSO4-	1.053e-007	9.934e-008	-6.978	-7.003	-0.025	(0)
FeSO4	7.434e-008	7.434e-008	-7.129	-7.129	0.000	(0)
HSO4-	7.011e-009	6.610e-009	-8.154	-8.180	-0.026	(0)
CuSO4	5.433e-009	5.433e-009	-8.265	-8.265	0.000	(0)
ZnSO4	2.106e-009	2.106e-009	-8.676	-8.676	0.000	(0)
NiSO4	6.200e-010	6.200e-010	-9.208	-9.208	0.000	(0)
CoSO4	6.108e-010	6.108e-010	-9.214	-9.214	0.000	(0)
AlSO4+	1.069e-010	1.008e-010	-9.971	-9.997	-0.026	(0)
CdSO4	4.036e-011	4.036e-011	-10.394	-10.394	0.000	(0)
Zn (SO4) 2-2	1.283e-011	9.946e-012	-10.892	-11.002	-0.111	(0)
UO2SO4	3.424e-012	3.424e-012	-11.465	-11.465	0.000	(0)
Al (SO4) 2-	6.211e-013	5.855e-013	-12.207	-12.232	-0.026	(0)
Cd (SO4) 2-2	3.808e-013	2.952e-013	-12.419	-12.530	-0.111	(0)
UO2 (SO4) 2-2	3.157e-014	2.447e-014	-13.501	-13.611	-0.111	(0)
Ni (SO4) 2-2	1.436e-014	1.113e-014	-13.843	-13.953	-0.111	(0)
FeSO4+	3.346e-015	3.157e-015	-14.475	-14.501	-0.025	(0)
VOSO4	4.819e-017	4.819e-017	-16.317	-16.317	0.000	(0)
Fe (SO4) 2-	3.899e-017	3.659e-017	-16.409	-16.437	-0.028	(0)
VO2SO4-	3.576e-017	3.356e-017	-16.447	-16.474	-0.028	(0)
VSO4+	6.804e-029	6.385e-029	-28.167	-28.195	-0.028	(0)

U(SO4)2	1.546e-034	1.546e-034	-33.811	-33.811	0.000	(0)
USO4+2	4.630e-035	3.589e-035	-34.334	-34.445	-0.111	(0)
Sb(3)	2.096e-015					
Sb(OH)3	1.061e-015	1.061e-015	-14.974	-14.974	0.000	(0)
HSbO2	1.035e-015	1.035e-015	-14.985	-14.985	0.000	(0)
SbO2-	1.432e-020	1.344e-020	-19.844	-19.872	-0.028	(0)
Sb(OH)4-	8.207e-021	7.701e-021	-20.086	-20.113	-0.028	(0)
Sb(OH)2F	5.603e-021	5.603e-021	-20.252	-20.252	0.000	(0)
SbOF	5.510e-021	5.510e-021	-20.259	-20.259	0.000	(0)
Sb(OH)2+	3.425e-021	3.213e-021	-20.465	-20.493	-0.028	(0)
SbO+	1.181e-021	1.108e-021	-20.928	-20.956	-0.028	(0)
Sb(5)	2.440e-008					
SbO3-	2.437e-008	2.287e-008	-7.613	-7.641	-0.028	(0)
Sb(OH)6-	2.838e-011	2.675e-011	-10.547	-10.573	-0.026	(0)
SbO2+	1.088e-022	1.021e-022	-21.963	-21.991	-0.028	(0)
Se(-2)	8.006e-030					
HSe-	7.998e-030	7.504e-030	-29.097	-29.125	-0.028	(0)
H2Se	7.268e-033	7.268e-033	-32.139	-32.139	0.000	(0)
MnSe	1.520e-033	1.520e-033	-32.818	-32.818	0.000	(0)
Se-2	7.759e-038	6.015e-038	-37.110	-37.221	-0.111	(0)
Se(4)	3.040e-009					
HSeO3-	2.927e-009	2.746e-009	-8.534	-8.561	-0.028	(0)
SeO3-2	1.130e-010	8.763e-011	-9.947	-10.057	-0.111	(0)
H2SeO3	1.462e-013	1.462e-013	-12.835	-12.835	0.000	(0)
FeHSeO3+2	4.857e-021	3.765e-021	-20.314	-20.424	-0.111	(0)
Cd(SeO3)2-2	2.592e-024	2.010e-024	-23.586	-23.697	-0.111	(0)
Se(6)	8.833e-017					
SeO4-2	8.821e-017	6.957e-017	-16.054	-16.158	-0.103	(0)
MnSeO4	1.148e-019	1.148e-019	-18.940	-18.940	0.000	(0)
HSeO4-	4.636e-022	4.350e-022	-21.334	-21.361	-0.028	(0)
CoSeO4	1.969e-022	1.969e-022	-21.706	-21.706	0.000	(0)
ZnSeO4	1.913e-022	1.913e-022	-21.718	-21.718	0.000	(0)
NiSeO4	1.865e-022	1.865e-022	-21.729	-21.729	0.000	(0)
CdSeO4	4.114e-024	4.114e-024	-23.386	-23.386	0.000	(0)
Zn(SeO4)2-2	1.741e-038	1.350e-038	-37.759	-37.870	-0.111	(0)
U(3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-50.326	-50.575	-0.249	(0)
U(4)	4.468e-017					
U(OH)5-	4.446e-017	4.172e-017	-16.352	-16.380	-0.028	(0)
U(OH)4	2.180e-019	2.180e-019	-18.662	-18.662	0.000	(0)
U(OH)3+	1.060e-022	9.944e-023	-21.975	-22.002	-0.028	(0)
U(OH)2+2	7.400e-027	5.736e-027	-26.131	-26.241	-0.111	(0)
UF3+	1.405e-030	1.318e-030	-29.852	-29.880	-0.028	(0)
UF2+2	3.959e-031	3.069e-031	-30.402	-30.513	-0.111	(0)
UOH+3	5.978e-032	3.371e-032	-31.223	-31.472	-0.249	(0)
UF4	3.918e-033	3.918e-033	-32.407	-32.407	0.000	(0)
UF+3	1.595e-033	8.993e-034	-32.797	-33.046	-0.249	(0)
U(SO4)2	1.546e-034	1.546e-034	-33.811	-33.811	0.000	(0)
USO4+2	4.630e-035	3.589e-035	-34.334	-34.445	-0.111	(0)
UF5-	4.485e-036	4.209e-036	-35.348	-35.376	-0.028	(0)
U+4	4.604e-038	1.663e-038	-37.337	-37.779	-0.442	(0)
UF6-2	4.444e-038	3.445e-038	-37.352	-37.463	-0.111	(0)
UC1+3	0.000e+000	0.000e+000	-40.537	-40.786	-0.249	(0)
U6(OH)15+9	0.000e+000	0.000e+000	-138.032	-140.271	-2.239	(0)
U(5)	2.711e-013					
UO2+	2.711e-013	2.544e-013	-12.567	-12.595	-0.028	(0)
U(6)	1.975e-009					
UO2(CO3)2-2	1.067e-009	8.272e-010	-8.972	-9.082	-0.111	(0)
UO2CO3	8.299e-010	8.299e-010	-9.081	-9.081	0.000	(0)
UO2OH+	4.519e-011	4.240e-011	-10.345	-10.373	-0.028	(0)
UO2F+	1.664e-011	1.561e-011	-10.779	-10.806	-0.028	(0)
UO2(CO3)3-4	5.734e-012	2.071e-012	-11.242	-11.684	-0.442	(0)
UO2+2	5.291e-012	4.173e-012	-11.276	-11.380	-0.103	(0)
UO2SO4	3.424e-012	3.424e-012	-11.465	-11.465	0.000	(0)
UO2F2	1.221e-012	1.221e-012	-11.913	-11.913	0.000	(0)
UO2(SO4)2-2	3.157e-014	2.447e-014	-13.501	-13.611	-0.111	(0)
UO2F3-	8.857e-015	8.311e-015	-14.053	-14.080	-0.028	(0)
(UO2)2(OH)2+2	3.849e-015	2.983e-015	-14.415	-14.525	-0.111	(0)

(UO ₂) ₃ (OH) ₅ ⁺	6.661e-016	6.250e-016	-15.176	-15.204	-0.028	(0)
UO ₂ Cl ⁺	1.416e-016	1.329e-016	-15.849	-15.877	-0.028	(0)
UO ₂ F ₄ - ₂	2.308e-018	1.789e-018	-17.637	-17.747	-0.111	(0)
V(2)	4.977e-036					
VOH ⁺	3.401e-036	3.191e-036	-35.468	-35.496	-0.028	(0)
V+ ₂	1.576e-036	1.222e-036	-35.802	-35.913	-0.111	(0)
V(3)	1.058e-010					
V(OH) ₃	1.058e-010	1.058e-010	-9.976	-9.976	0.000	(0)
V(OH) ₂ ⁺	9.088e-021	8.527e-021	-20.042	-20.069	-0.028	(0)
VOH+ ₂	1.302e-023	1.009e-023	-22.886	-22.996	-0.111	(0)
V+ ₃	4.424e-028	2.495e-028	-27.354	-27.603	-0.249	(0)
VSO ₄ ⁺	6.804e-029	6.385e-029	-28.167	-28.195	-0.028	(0)
V ₂ (OH) ₃ + ₃	0.000e+000	0.000e+000	-44.365	-44.613	-0.249	(0)
V ₂ (OH) ₂ + ₄	0.000e+000	0.000e+000	-44.750	-45.192	-0.442	(0)
V(4)	6.059e-015					
V(OH) ₃ ⁺	5.538e-015	5.197e-015	-14.257	-14.284	-0.028	(0)
VO+ ₂	4.163e-016	3.227e-016	-15.381	-15.491	-0.111	(0)
VOF ⁺	5.592e-017	5.247e-017	-16.252	-16.280	-0.028	(0)
VOSO ₄	4.819e-017	4.819e-017	-16.317	-16.317	0.000	(0)
VOF ₂	5.333e-019	5.333e-019	-18.273	-18.273	0.000	(0)
VOCl ⁺	1.894e-020	1.778e-020	-19.723	-19.750	-0.028	(0)
VOF ₃ -	5.466e-022	5.129e-022	-21.262	-21.290	-0.028	(0)
H ₂ V ₂ O ₄ + ₂	1.746e-024	1.353e-024	-23.758	-23.869	-0.111	(0)
VOF ₄ - ₂	7.238e-026	5.611e-026	-25.140	-25.251	-0.111	(0)
V(5)	9.122e-009					
H ₂ VO ₄ -	8.893e-009	8.345e-009	-8.051	-8.079	-0.028	(0)
HVO ₄ - ₂	2.167e-010	1.680e-010	-9.664	-9.775	-0.111	(0)
H ₃ VO ₄	1.041e-011	1.041e-011	-10.982	-10.982	0.000	(0)
H ₃ V ₂ O ₇ -	5.979e-013	5.610e-013	-12.223	-12.251	-0.028	(0)
VO ₂ ⁺	2.750e-015	2.592e-015	-14.561	-14.586	-0.026	(0)
HV ₂ O ₇ - ₃	8.425e-016	4.751e-016	-15.074	-15.323	-0.249	(0)
VO ₂ F	1.232e-016	1.232e-016	-15.909	-15.909	0.000	(0)
VO ₂ SO ₄ -	3.576e-017	3.356e-017	-16.447	-16.474	-0.028	(0)
VO ₄ - ₃	1.197e-017	6.749e-018	-16.922	-17.171	-0.249	(0)
VO ₂ F ₂ -	1.292e-018	1.213e-018	-17.889	-17.916	-0.028	(0)
V ₃ O ₉ - ₃	1.079e-018	6.086e-019	-17.967	-18.216	-0.249	(0)
V ₂ O ₇ - ₄	2.838e-019	1.025e-019	-18.547	-18.989	-0.442	(0)
VO ₂ F ₃ - ₂	5.289e-022	4.100e-022	-21.277	-21.387	-0.111	(0)
V ₄ O ₁₂ - ₄	5.862e-024	2.117e-024	-23.232	-23.674	-0.442	(0)
VO ₂ F ₄ - ₃	9.697e-027	5.468e-027	-26.013	-26.262	-0.249	(0)
HV ₁₀ O ₂₈ - ₅	0.000e+000	0.000e+000	-57.522	-58.213	-0.691	(0)
V ₁₀ O ₂₈ - ₆	0.000e+000	0.000e+000	-58.500	-59.495	-0.995	(0)
H ₂ V ₁₀ O ₂₈ - ₄	0.000e+000	0.000e+000	-59.467	-59.909	-0.442	(0)
Zn	2.493e-008					
Zn+ ₂	2.251e-008	1.776e-008	-7.648	-7.751	-0.103	(0)
ZnSO ₄	2.106e-009	2.106e-009	-8.676	-8.676	0.000	(0)
ZnOH ⁺	1.527e-010	1.433e-010	-9.816	-9.844	-0.028	(0)
ZnHCO ₃ ⁺	7.956e-011	7.465e-011	-10.099	-10.127	-0.028	(0)
ZnCO ₃	5.104e-011	5.104e-011	-10.292	-10.292	0.000	(0)
Zn(SO ₄) ₂ - ₂	1.283e-011	9.946e-012	-10.892	-11.002	-0.111	(0)
ZnF ⁺	1.023e-011	9.604e-012	-10.990	-11.018	-0.028	(0)
Zn(OH) ₂	1.833e-012	1.833e-012	-11.737	-11.737	0.000	(0)
ZnCl ⁺	9.293e-013	8.757e-013	-12.032	-12.058	-0.026	(0)
ZnOHCl	9.252e-014	9.252e-014	-13.034	-13.034	0.000	(0)
Zn(OH) ₃ -	7.902e-016	7.414e-016	-15.102	-15.130	-0.028	(0)
ZnCl ₂	2.725e-017	2.725e-017	-16.565	-16.565	0.000	(0)
Zn(OH) ₄ - ₂	3.073e-021	2.382e-021	-20.512	-20.623	-0.111	(0)
ZnCl ₃ -	4.510e-022	4.249e-022	-21.346	-21.372	-0.026	(0)
ZnSeO ₄	1.913e-022	1.913e-022	-21.718	-21.718	0.000	(0)
ZnCl ₄ - ₂	5.270e-027	4.172e-027	-26.278	-26.380	-0.102	(0)
Zn(SeO ₄) ₂ - ₂	1.741e-038	1.350e-038	-37.759	-37.870	-0.111	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)
Al(OH) ₃ (am)	-0.71	10.09	10.80
Al ₂ (MoO ₄) ₃	-45.75	-43.39	2.37

Al2O3	0.53	20.18	19.65	Al2O3
Al4(OH)10SO4	0.59	23.29	22.70	Al4(OH)10SO4
AlOHSO4	-3.75	-6.98	-3.23	AlOHSO4
AlSb	-135.93	-70.31	65.62	AlSb
Alunite	-0.16	-1.56	-1.40	KAl3(SO4)2(OH)6
Anhydrite	-2.24	-6.60	-4.36	CaSO4
Antlerite	-6.52	2.27	8.79	Cu3(OH)4SO4
Aragonite	-2.34	-10.64	-8.30	CaCO3
Artinite	-11.44	-1.84	9.60	MgCO3:Mg(OH)2:3H2O
Atacamite	-6.10	1.29	7.39	Cu2(OH)3Cl
Azurite	-5.97	-22.87	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.95	6.44	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.35	-2.48	15.87	Ba2V2O7:2H2O
Ba3(VO4)2:4H2O	-28.98	3.96	32.94	Ba3(VO4)2:4H2O
BaF2	-10.68	-16.50	-5.82	BaF2
BaMoO4	-7.79	-14.75	-6.96	BaMoO4
Barite	-0.65	-10.63	-9.98	BaSO4
BaSeO3	-10.85	-9.02	1.83	BaSeO3
BaSeO4	-16.06	-23.52	-7.46	BaSeO4
Bianchite	-9.25	-11.02	-1.76	ZnSO4:6H2O
Birnessite	-13.04	5.05	18.09	MnO2
Bixbyite	-11.06	-11.70	-0.64	Mn2O3
Boehmite	1.51	10.09	8.58	AlOOH
Breithauptite	-45.41	-63.93	-18.52	NiSb
Brochantite	-6.50	8.72	15.22	Cu4(OH)6SO4
Brucite	-7.21	9.64	16.84	Mg(OH)2
Bunsenite	-6.88	5.57	12.45	NiO
Ca(VO3)2	-10.55	-4.89	5.66	Ca(VO3)2
Ca2V2O7	-11.92	5.58	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.97	5.58	21.55	Ca2V2O7:2H2O
Ca3(VO4)2	-22.90	16.06	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-23.80	16.06	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-272.35	-129.37	142.97	Ca3Sb2
Calcite	-2.16	-10.64	-8.48	CaCO3
CaMoO4	-2.77	-10.72	-7.95	CaMoO4
Carnotite	-3.17	-2.94	0.23	KUO2VO4
CaSeO3:2H2O	-7.81	-4.99	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-16.47	-19.49	-3.02	CaSeO4:2H2O
Cd(BO2)2	-18.25	-8.41	9.84	Cd(BO2)2
Cd(OH)2	-9.33	4.31	13.64	Cd(OH)2
Cd(OH)2(am)	-9.42	4.31	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-27.93	-21.22	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-26.70	-4.14	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-28.24	0.16	28.40	Cd4(OH)6SO4
CdCl2	-18.25	-18.91	-0.66	CdCl2
CdCl2:1H2O	-17.22	-18.91	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-17.00	-18.91	-1.91	CdCl2:2.5H2O
CdF2	-17.42	-18.63	-1.21	CdF2
Cdmetal(alpha)	-31.01	-17.50	13.51	Cd
Cdmetal(gamma)	-31.12	-17.50	13.62	Cd
CdMoO4	-2.73	-16.88	-14.15	CdMoO4
CdOHCl	-10.84	-7.30	3.54	CdOHCl
CdSb	-64.83	-65.18	-0.35	CdSb
CdSe	-11.52	-31.72	-20.20	CdSe
CdSeO4:2H2O	-23.81	-25.66	-1.85	CdSeO4:2H2O
CdSO4	-12.59	-12.76	-0.17	CdSO4
CdSO4:1H2O	-11.04	-12.76	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.89	-12.76	-1.87	CdSO4:2.67H2O
CH4(g)	-67.30	-108.34	-41.05	CH4
Chalcanthite	-7.99	-10.63	-2.64	CuSO4:5H2O
Co(BO2)2	-34.23	-7.16	27.07	Co(BO2)2
Co(OH)2	-7.53	5.56	13.09	Co(OH)2
Co(OH)3	-13.63	-15.94	-2.31	Co(OH)3
CO2(g)	-2.96	-21.11	-18.15	CO2
Co3O4	-15.82	-26.31	-10.50	Co3O4
CoCl2	-25.93	-17.66	8.27	CoCl2
CoCl2:6H2O	-20.20	-17.66	2.54	CoCl2:6H2O
CoCO3	-5.57	-15.55	-9.98	CoCO3

CoF2	-15.79	-17.38	-1.60	CoF2
CoF3	-48.89	-50.35	-1.46	CoF3
CoFe2O4	19.94	16.41	-3.53	CoFe2O4
CoMoO4	-7.87	-15.63	-7.76	CoMoO4
CoO	-8.03	5.56	13.59	CoO
CoSe	-14.27	-30.47	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-22.88	-24.41	-1.53	CoSeO4:6H2O
CoSO4	-14.32	-11.51	2.80	CoSO4
CoSO4:6H2O	-9.04	-11.51	-2.47	CoSO4:6H2O
Cryolite	-15.53	-49.37	-33.84	Na3AlF6
Cu(OH)2	-2.23	6.45	8.67	Cu(OH)2
Cu(SbO3)2	-25.10	20.12	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-40.83	-75.71	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	6.24	-39.56	-45.80	Cu2Se
Cu2SO4	-18.65	-20.60	-1.95	Cu2SO4
Cu3Sb	-43.10	-85.69	-42.59	Cu3Sb
Cu3Se2	-5.65	-69.14	-63.49	Cu3Se2
CuCO3	-3.16	-14.66	-11.50	CuCO3
CuF	-8.33	-13.24	-4.91	CuF
CuF2	-17.61	-16.49	1.12	CuF2
CuF2:2H2O	-11.94	-16.49	-4.55	CuF2:2H2O
Cumetal	-3.91	-12.67	-8.76	Cu
CuMoO4	-1.66	-14.74	-13.08	CuMoO4
CuOCuSO4	-14.48	-4.18	10.30	CuOCuSO4
Cupricferrite	11.31	17.30	5.99	CuFe2O4
Cuprite	-2.12	-3.53	-1.41	Cu2O
Cuprousferrite	12.58	3.66	-8.92	CuFeO2
CuSe	3.52	-29.58	-33.10	CuSe
CuSe2	-10.44	-43.80	-33.37	CuSe2
CuSeO3:2H2O	-9.53	-9.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-21.08	-23.52	-2.44	CuSeO4:5H2O
CuSO4	-13.56	-10.62	2.94	CuSO4
Diaspore	3.22	10.09	6.87	AlOOH
Dolomite(disordered)	-5.57	-22.11	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.02	-22.11	-17.09	CaMg(CO3)2
Epsomite	-5.31	-7.44	-2.13	MgSO4:7H2O
Fe(OH)2	-6.01	7.55	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	4.98	1.94	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.09	-7.81	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-6.17	-4.61	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-14.92	-35.54	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-36.63	-40.37	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.81	18.41	20.22	Fe3(OH)8
FeMoO4	-3.54	-13.63	-10.09	FeMoO4
Ferrihydrite	2.24	5.43	3.19	Fe(OH)3
Ferroselite	-24.10	-42.69	-18.60	FeSe2
FeSe	-17.47	-28.47	-11.00	FeSe
Fluorite	-1.97	-12.47	-10.50	CaF2
Gibbsite	1.80	10.09	8.29	Al(OH)3
Goethite	4.94	5.43	0.49	FeOOH
Goslarite	-9.01	-11.02	-2.01	ZnSO4:7H2O
Gummite	-5.24	2.43	7.67	UO3
Gypsum	-1.99	-6.60	-4.61	CaSO4:2H2O
H-Jarosite	-5.77	-17.87	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.31	-21.19	-12.88	H2MoO4
H2Se(g)	-31.07	-36.03	-4.96	H2Se
Halite	-10.09	-8.49	1.60	NaCl
Hausmannite	-13.44	47.59	61.03	Mn3O4
Hematite	12.27	10.85	-1.42	Fe2O3
Hercynite	4.84	27.74	22.89	FeAl2O4
Huntite	-15.09	-45.06	-29.97	CaMg3(CO3)4
Hydromagnesite	-27.50	-36.26	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.57	-21.74	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-0.75	-15.55	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-19.82	-16.56	3.26	K2MoO4
K2SeO4	-24.60	-25.33	-0.73	K2SeO4
Langite	-8.77	8.72	17.49	Cu4(OH)6SO4:H2O

Lepidocrocite	4.06	5.43	1.37	FeOOH
Lime	-22.23	10.47	32.70	CaO
Maghemite	4.47	10.85	6.39	Fe ₂ O ₃
Magnesioferrite	3.63	20.49	16.86	Fe ₂ MgO ₄
Magnesite	-4.01	-11.47	-7.46	MgCO ₃
Magnetite	15.01	18.41	3.40	Fe ₃ O ₄
Malachite	-2.91	-8.21	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-5.84	19.50	25.34	MnOOH
Melanothallite	-23.03	-16.77	6.26	CuCl ₂
Melanterite	-7.31	-9.52	-2.21	FeSO ₄ :7H ₂ O
Mg (OH) ₂ (active)	-9.16	9.64	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-17.01	-5.73	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-242.09	-167.40	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-22.45	3.91	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-5.18	-13.31	-8.13	MgF ₂
MgMoO ₄	-9.70	-11.55	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-8.89	-5.83	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-19.13	-20.33	-1.20	MgSeO ₄ :6H ₂ O
Mirabilite	-9.72	-10.83	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn (VO ₃) ₂	-11.67	-6.77	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.21	-62.92	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-135.19	-74.11	61.08	Mn ₂ Sb
MnCl ₂ :4H ₂ O	-17.34	-14.63	2.72	MnCl ₂ :4H ₂ O
MnSb	-83.34	-86.25	-2.91	MnSb
MnSe	-30.93	-27.43	3.50	MnSe
MnSeO ₃	-8.00	-6.87	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-7.85	-6.87	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-19.32	-21.37	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-11.06	-8.48	2.58	MnSO ₄
Monteponite	-10.79	4.31	15.10	CdO
MoO ₃	-13.19	-21.19	-8.00	MoO ₃
Morenosite	-9.36	-11.51	-2.14	NiSO ₄ :7H ₂ O
Na-Jarosite	-3.55	-14.75	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-19.54	-36.14	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.44	-14.95	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-16.17	-14.95	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-19.52	-9.22	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-25.00	-23.72	1.28	Na ₂ SeO ₄
Na ₃ Sb	-165.49	-71.03	94.45	Na ₃ Sb
Na ₃ VO ₄	-35.00	1.68	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-40.28	-2.88	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.65	-13.38	-6.73	CuCl
NaSb	-78.63	-55.47	23.17	NaSb
Natron	-13.56	-14.87	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-8.42	-4.56	3.86	NaVO ₃
Nesquehonite	-6.80	-11.47	-4.67	MgCO ₃ :3H ₂ O
Ni (OH) ₂	-7.23	5.57	12.79	Ni (OH) ₂
Ni ₄ (OH) ₆ SO ₄	-26.81	5.19	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-8.67	-15.54	-6.87	NiCO ₃
NiMoO ₄	-4.48	-15.62	-11.14	NiMoO ₄
NiSe	-12.76	-30.46	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-12.71	-9.90	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-22.88	-24.40	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-12.45	5.05	17.50	MnO ₂
O ₂ (g)	-39.47	43.62	83.09	O ₂
Otavite	-4.80	-16.80	-12.00	CdCO ₃
Periclase	-11.95	9.64	21.58	MgO
Portlandite	-12.33	10.47	22.80	Ca (OH) ₂
Pyrochroite	-6.60	8.60	15.19	Mn (OH) ₂
Pyrolusite	-10.98	30.40	41.38	MnO ₂
Retgersite	-9.47	-11.51	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	-1.93	-12.51	-10.58	MnCO ₃
Rutherfordine	-4.18	-18.68	-14.50	UO ₂ CO ₃
Sb (OH) ₃	-7.86	-14.97	-7.11	Sb (OH) ₃
Sb ₂ O ₄	-11.54	-8.14	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-25.29	-34.95	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-70.28	-138.03	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-41.64	-59.90	-18.26	Sb ₄ O ₆

Sb4O6 (orth)	-42.00	-59.90	-17.90	Sb4O6
SbCl3	-50.38	-49.81	0.57	SbCl3
SbF3	-39.16	-49.39	-10.23	SbF3
Sbmetal	-36.00	-47.69	-11.69	Sb
SbO2	-0.56	-28.38	-27.82	SbO2
Schoepite	-3.57	2.43	5.99	UO2 (OH) 2:H2O
Semetal (am)	-7.11	-14.22	-7.11	Se
Semetal (hex)	-6.51	-14.22	-7.71	Se
Senarmontite	-17.58	-29.95	-12.37	Sb2O3
SeO2	-15.59	-15.47	0.12	SeO2
SeO3	-51.01	-29.97	21.04	SeO3
Siderite	-3.31	-13.55	-10.24	FeCO3
Smithsonite	-5.05	-15.05	-10.00	ZnCO3
Spinel	-7.03	29.82	36.85	MgAl2O4
Tenorite	-1.20	6.45	7.64	CuO
Thenardite	-11.15	-10.83	0.32	Na2SO4
Thermonatrite	-15.50	-14.87	0.64	Na2CO3:H2O
Tyuyamunite	-4.11	-0.03	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-7.96	13.13	21.08	U3O8
U3Sb4	-504.46	-352.08	152.38	U3Sb4
U4O9	-15.83	-18.85	-3.02	U4O9
UF4	-26.51	-56.05	-29.54	UF4
UF4:2.5H2O	-23.33	-56.05	-32.72	UF4:2.5H2O
UO2 (am)	-11.10	-10.16	0.93	UO2
UO2 (OH) 2 (beta)	-3.18	2.43	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.29	-27.54	-2.25	UO2SeO4:4H2O
UO3	-5.27	2.43	7.70	UO3
Uraninite	-5.49	-10.16	-4.67	UO2
USb2	-187.94	-158.37	29.58	USb2
V (OH) 3	-14.48	-6.89	7.59	V (OH) 3
V2O5	-14.00	-15.36	-1.36	V2O5
V3O5	-28.69	-26.86	1.84	V3O5
V4O7	-35.73	-28.54	7.19	V4O7
V6O13	-28.85	-89.71	-60.86	V6O13
Valentinite	-21.47	-29.95	-8.48	Sb2O3
VC12	-59.89	-41.02	18.87	VC12
VC13	-65.16	-41.72	23.43	VC13
VF4	-62.50	-47.57	14.93	VF4
Vmetal	-83.63	-39.60	44.03	V
VO	-32.55	-17.80	14.76	VO
VO (OH) 2	-6.83	-1.68	5.15	VO (OH) 2
VO2Cl	-22.13	-19.29	2.84	VO2Cl
VOC1	-29.65	-18.50	11.15	VOC1
VOC12	-37.67	-24.91	12.76	VOC12
VOSO4	-22.37	-18.76	3.61	VOSO4
Witherite	-6.10	-14.67	-8.57	BaCO3
Zincite	-5.28	6.06	11.33	ZnO
Zincosite	-14.95	-11.02	3.93	ZnSO4
Zn (BO2) 2	-14.96	-6.67	8.29	Zn (BO2) 2
Zn (OH) 2	-6.14	6.06	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-6.42	6.06	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-5.70	6.06	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-5.48	6.06	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-5.68	6.06	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-12.46	-4.96	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-14.69	0.50	15.19	Zn2 (OH) 3Cl
Zn3O (SO4) 2	-34.89	-15.98	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-21.24	7.16	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-31.44	7.06	38.50	Zn5 (OH) 8Cl2
ZnCl2	-24.21	-17.16	7.05	ZnCl2
ZnCO3:1H2O	-4.79	-15.05	-10.26	ZnCO3:1H2O
ZnF2	-16.35	-16.88	-0.53	ZnF2
Znmetal	-41.54	-15.75	25.79	Zn
ZnMoO4	-5.01	-15.13	-10.13	ZnMoO4
ZnO (active)	-5.13	6.06	11.19	ZnO
ZnSb	-74.45	-63.44	11.01	ZnSb
ZnSe	-15.57	-29.97	-14.40	ZnSe
ZnSeO4:6H2O	-22.39	-23.91	-1.52	ZnSeO4:6H2O

ZnSO4:1H2O -10.38 -11.02 -0.64 ZnSO4:1H2O

End of simulation.

Reading input data for simulation 9.

SOLUTION 7 Average HCT data for biotite breccia - sulfide (waste) (cells
604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.90750
pe 4
redox pe
units mg/l
density 1
Alkalinity 54.86006 as HCO3
Al 0.00593
As 0.00025
B 0.00493
Ba 0.00624
Ca 28.03913
Cl 1.33518
Cu 0.01261
F 1.19649
Fe 0.00074
K 4.43350
Mg 3.99652
Mn 0.04279
Mo 0.00556
Na 2.60160 charge
S(6) 47.33747 as SO4
Se 0.00035
U 0.00169
V 0.00149
Zn 0.00145
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 7. Average HCT data for biotite breccia - sulfide (waste) (cells
604811, 604854, 604862, 604867 and 605033)

-----Solution composition-----

Elements	Molality	Moles	
Al	2.198e-007	2.198e-007	
Alkalinity	8.992e-004	8.992e-004	
As	3.337e-009	3.337e-009	
B	4.561e-007	4.561e-007	
Ba	4.544e-008	4.544e-008	
Ca	6.997e-004	6.997e-004	
Cl	3.767e-005	3.767e-005	
Cu	1.985e-007	1.985e-007	
F	6.299e-005	6.299e-005	
Fe	1.325e-008	1.325e-008	
K	1.134e-004	1.134e-004	
Mg	1.645e-004	1.645e-004	
Mn	7.790e-007	7.790e-007	
Mo	5.796e-008	5.796e-008	
Na	1.411e-004	1.411e-004	Charge balance
S(6)	4.928e-004	4.928e-004	

Se	4.433e-009	4.433e-009
U	7.101e-009	7.101e-009
V	2.925e-008	2.925e-008
Zn	2.218e-008	2.218e-008

-----Description of solution-----

pH	=	7.907
pe	=	4.000
Activity of water	=	1.000
Ionic strength	=	3.123e-003
Mass of water (kg)	=	1.000e+000
Total carbon (mol/kg)	=	9.133e-004
Total CO2 (mol/kg)	=	9.133e-004
Temperature (deg C)	=	25.00
Electrical balance (eq)	=	-6.245e-018
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	11
Total H	=	1.110146e+002
Total O	=	5.551155e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	8.655e-007	8.137e-007	-6.063	-6.090	-0.027	(0)
H+	1.315e-008	1.237e-008	-7.881	-7.907	-0.027	0.00
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	2.198e-007					
Al(OH) 4-	2.177e-007	2.049e-007	-6.662	-6.689	-0.026	(0)
Al(OH) 3	2.000e-009	2.000e-009	-8.699	-8.699	0.000	(0)
Al(OH) 2+	1.308e-010	1.232e-010	-9.884	-9.909	-0.026	(0)
AlF2+	3.345e-012	3.151e-012	-11.476	-11.502	-0.026	(0)
AlF3	2.307e-012	2.307e-012	-11.637	-11.637	0.000	(0)
AlOH+2	2.420e-013	1.906e-013	-12.616	-12.720	-0.104	(0)
AlF+2	1.729e-013	1.362e-013	-12.762	-12.866	-0.104	(0)
AlF4-	7.141e-014	6.721e-014	-13.146	-13.173	-0.026	(0)
AlSO4+	6.719e-016	6.324e-016	-15.173	-15.199	-0.026	(0)
Al+3	4.057e-016	2.342e-016	-15.392	-15.630	-0.239	(0)
Al(SO4) 2-	2.505e-018	2.357e-018	-17.601	-17.628	-0.026	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-51.884	-52.141	-0.257	(0)
As (3)	7.204e-021					
H3AsO3	6.899e-021	6.899e-021	-20.161	-20.161	0.000	(0)
H2AsO3-	3.053e-022	2.859e-022	-21.515	-21.544	-0.029	(0)
HAsO3-2	2.740e-026	2.108e-026	-25.562	-25.676	-0.114	(0)
H4AsO3+	4.516e-029	4.229e-029	-28.345	-28.374	-0.029	(0)
AsO3-3	1.185e-031	6.566e-032	-30.926	-31.183	-0.257	(0)
As (5)	3.337e-009					
HAsO4-2	3.053e-009	2.348e-009	-8.515	-8.629	-0.114	(0)
H2AsO4-	2.830e-010	2.650e-010	-9.548	-9.577	-0.029	(0)
AsO4-3	1.083e-012	6.001e-013	-11.965	-12.222	-0.257	(0)
H3AsO4	5.694e-016	5.698e-016	-15.245	-15.244	0.000	(0)
B	4.561e-007					
H3BO3	4.337e-007	4.340e-007	-6.363	-6.363	0.000	(0)
H2BO3-	2.169e-008	2.037e-008	-7.664	-7.691	-0.027	(0)
CaH2BO3+	6.337e-010	5.951e-010	-9.198	-9.225	-0.027	(0)
MgH2BO3+	9.102e-011	8.549e-011	-10.041	-10.068	-0.027	(0)
BF(OH) 3-	1.072e-011	1.007e-011	-10.970	-10.997	-0.027	(0)
NaH2BO3	4.276e-012	4.276e-012	-11.369	-11.369	0.000	(0)
BaH2BO3+	2.368e-014	2.224e-014	-13.626	-13.653	-0.027	(0)
H5(BO3) 2-	8.012e-015	7.525e-015	-14.096	-14.124	-0.027	(0)
BF2(OH) 2-	8.245e-016	7.744e-016	-15.084	-15.111	-0.027	(0)
H8(BO3) 3-	3.477e-019	3.266e-019	-18.459	-18.486	-0.027	(0)
BF3OH-	2.308e-022	2.167e-022	-21.637	-21.664	-0.027	(0)
BF4-	8.169e-028	7.672e-028	-27.088	-27.115	-0.027	(0)
Ba	4.544e-008					
Ba+2	4.509e-008	3.532e-008	-7.346	-7.452	-0.106	(0)

BaHCO3+	2.946e-010	2.777e-010	-9.531	-9.556	-0.026	(0)
BaCO3	5.651e-011	5.651e-011	-10.248	-10.248	0.000	(0)
BaOH+	1.332e-013	1.255e-013	-12.875	-12.901	-0.026	(0)
BaH2BO3+	2.368e-014	2.224e-014	-13.626	-13.653	-0.027	(0)
C (4)	9.133e-004					
HCO3-	8.739e-004	8.233e-004	-3.059	-3.084	-0.026	(0)
H2CO3	2.291e-005	2.291e-005	-4.640	-4.640	0.000	(0)
CaHCO3+	8.257e-006	7.783e-006	-5.083	-5.109	-0.026	(0)
CO3-2	3.982e-006	3.119e-006	-5.400	-5.506	-0.106	(0)
CaCO3	2.510e-006	2.510e-006	-5.600	-5.600	0.000	(0)
MgHCO3+	1.084e-006	1.020e-006	-5.965	-5.992	-0.027	(0)
MgCO3	3.140e-007	3.140e-007	-6.503	-6.503	0.000	(0)
CuCO3	1.572e-007	1.572e-007	-6.804	-6.804	0.000	(0)
NaHCO3	6.132e-008	6.132e-008	-7.212	-7.212	0.000	(0)
MnHCO3+	9.817e-009	9.245e-009	-8.008	-8.034	-0.026	(0)
NaCO3-	8.167e-009	7.694e-009	-8.088	-8.114	-0.026	(0)
UO2 (CO3) 2-2	5.236e-009	4.027e-009	-8.281	-8.395	-0.114	(0)
ZnCO3	2.399e-009	2.399e-009	-8.620	-8.620	0.000	(0)
UO2 (CO3) 3-4	1.799e-009	6.296e-010	-8.745	-9.201	-0.456	(0)
Cu (CO3) 2-2	1.715e-009	1.319e-009	-8.766	-8.880	-0.114	(0)
CuHCO3+	4.746e-010	4.445e-010	-9.324	-9.352	-0.029	(0)
ZnHCO3+	3.716e-010	3.480e-010	-9.430	-9.458	-0.029	(0)
BaHCO3+	2.946e-010	2.777e-010	-9.531	-9.556	-0.026	(0)
UO2CO3	6.471e-011	6.471e-011	-10.189	-10.189	0.000	(0)
BaCO3	5.651e-011	5.651e-011	-10.248	-10.248	0.000	(0)
FeHCO3+	4.680e-013	4.412e-013	-12.330	-12.355	-0.026	(0)
Ca	6.997e-004					
Ca+2	6.481e-004	5.077e-004	-3.188	-3.294	-0.106	(0)
CaSO4	4.046e-005	4.046e-005	-4.393	-4.393	0.000	(0)
CaHCO3+	8.257e-006	7.783e-006	-5.083	-5.109	-0.026	(0)
CaCO3	2.510e-006	2.510e-006	-5.600	-5.600	0.000	(0)
CaF+	3.421e-007	3.222e-007	-6.466	-6.492	-0.026	(0)
CaOH+	8.745e-009	8.243e-009	-8.058	-8.084	-0.026	(0)
CaH2BO3+	6.337e-010	5.951e-010	-9.198	-9.225	-0.027	(0)
Cl	3.767e-005					
Cl-	3.767e-005	3.544e-005	-4.424	-4.451	-0.027	(0)
MnCl+	2.666e-011	2.511e-011	-10.574	-10.600	-0.026	(0)
CuCl	1.869e-011	1.869e-011	-10.728	-10.728	0.000	(0)
ZnOHCl	1.267e-012	1.267e-012	-11.897	-11.897	0.000	(0)
ZnCl+	1.265e-012	1.190e-012	-11.898	-11.925	-0.027	(0)
CuCl+	5.108e-013	4.805e-013	-12.292	-12.318	-0.027	(0)
CuCl2-	1.471e-013	1.384e-013	-12.832	-12.859	-0.027	(0)
MnCl2	1.257e-015	1.257e-015	-14.901	-14.901	0.000	(0)
ZnCl2	6.682e-017	6.682e-017	-16.175	-16.175	0.000	(0)
CuCl2	5.904e-018	5.904e-018	-17.229	-17.229	0.000	(0)
CuCl3-2	1.334e-018	1.049e-018	-17.875	-17.979	-0.104	(0)
UO2Cl+	3.198e-019	2.995e-019	-18.495	-18.524	-0.029	(0)
MnCl3-	1.302e-020	1.226e-020	-19.885	-19.911	-0.026	(0)
ZnCl3-	1.999e-021	1.881e-021	-20.699	-20.726	-0.027	(0)
FeCl+2	5.382e-023	4.231e-023	-22.269	-22.374	-0.104	(0)
VOCl+	8.724e-024	8.169e-024	-23.059	-23.088	-0.029	(0)
CuCl3-	2.076e-024	1.952e-024	-23.683	-23.709	-0.027	(0)
ZnCl4-2	4.238e-026	3.332e-026	-25.373	-25.477	-0.104	(0)
FeCl2+	7.113e-027	6.698e-027	-26.148	-26.174	-0.026	(0)
CuCl4-2	4.410e-031	3.467e-031	-30.356	-30.460	-0.104	(0)
FeCl3	2.373e-032	2.373e-032	-31.625	-31.625	0.000	(0)
UCl+3	0.000e+000	0.000e+000	-47.191	-47.448	-0.257	(0)
Cu (1)	4.663e-010					
Cu+	4.475e-010	4.191e-010	-9.349	-9.378	-0.029	(0)
CuCl	1.869e-011	1.869e-011	-10.728	-10.728	0.000	(0)
CuCl2-	1.471e-013	1.384e-013	-12.832	-12.859	-0.027	(0)
CuCl3-2	1.334e-018	1.049e-018	-17.875	-17.979	-0.104	(0)
Cu (2)	1.980e-007					
CuCO3	1.572e-007	1.572e-007	-6.804	-6.804	0.000	(0)
CuOH+	2.341e-008	2.202e-008	-7.631	-7.657	-0.027	(0)
Cu+2	1.092e-008	8.556e-009	-7.962	-8.068	-0.106	(0)
Cu (OH) 2	3.575e-009	3.575e-009	-8.447	-8.447	0.000	(0)
Cu (CO3) 2-2	1.715e-009	1.319e-009	-8.766	-8.880	-0.114	(0)

	CuSO4	6.819e-010	6.819e-010	-9.166	-9.166	0.000	(0)
	CuHCO3+	4.746e-010	4.445e-010	-9.324	-9.352	-0.029	(0)
	CuF+	3.352e-011	3.139e-011	-10.475	-10.503	-0.029	(0)
	Cu2(OH) 2+2	1.583e-011	1.218e-011	-10.800	-10.914	-0.114	(0)
	Cu(OH) 3-	6.371e-012	5.966e-012	-11.196	-11.224	-0.029	(0)
	CuCl+	5.108e-013	4.805e-013	-12.292	-12.318	-0.027	(0)
	Cu(OH) 4-2	4.968e-017	3.821e-017	-16.304	-16.418	-0.114	(0)
	CuCl2	5.904e-018	5.904e-018	-17.229	-17.229	0.000	(0)
	CuCl3-	2.076e-024	1.952e-024	-23.683	-23.709	-0.027	(0)
	CuCl4-2	4.410e-031	3.467e-031	-30.356	-30.460	-0.104	(0)
F	6.299e-005						
	F-	6.180e-005	5.814e-005	-4.209	-4.236	-0.027	(0)
	MgF+	8.389e-007	7.895e-007	-6.076	-6.103	-0.026	(0)
	CaF+	3.421e-007	3.222e-007	-6.466	-6.492	-0.026	(0)
	NaF	4.859e-009	4.859e-009	-8.313	-8.313	0.000	(0)
	MnF+	1.383e-009	1.303e-009	-8.859	-8.885	-0.026	(0)
	HF	1.064e-009	1.064e-009	-8.973	-8.973	0.000	(0)
	CuF+	3.352e-011	3.139e-011	-10.475	-10.503	-0.029	(0)
	ZnF+	1.656e-011	1.551e-011	-10.781	-10.810	-0.029	(0)
	BF(OH) 3-	1.072e-011	1.007e-011	-10.970	-10.997	-0.027	(0)
	AlF2+	3.345e-012	3.151e-012	-11.476	-11.502	-0.026	(0)
	AlF3	2.307e-012	2.307e-012	-11.637	-11.637	0.000	(0)
	HF2-	2.502e-013	2.352e-013	-12.602	-12.629	-0.027	(0)
	AlF+2	1.729e-013	1.362e-013	-12.762	-12.866	-0.104	(0)
	AlF4-	7.141e-014	6.721e-014	-13.146	-13.173	-0.026	(0)
	UO2F+	4.466e-014	4.182e-014	-13.350	-13.379	-0.029	(0)
	UO2F2	7.012e-015	7.012e-015	-14.154	-14.154	0.000	(0)
	BF2(OH) 2-	8.245e-016	7.744e-016	-15.084	-15.111	-0.027	(0)
	UO2F3-	1.093e-016	1.024e-016	-15.961	-15.990	-0.029	(0)
	VO2F	6.842e-018	6.842e-018	-17.165	-17.165	0.000	(0)
	FeF2+	4.165e-018	3.922e-018	-17.380	-17.407	-0.026	(0)
	FeF+2	3.206e-018	2.521e-018	-17.494	-17.598	-0.104	(0)
	H2F2	3.033e-018	3.033e-018	-17.518	-17.518	0.000	(0)
	FeF3	3.217e-019	3.217e-019	-18.493	-18.493	0.000	(0)
	VO2F2-	1.542e-019	1.444e-019	-18.812	-18.840	-0.029	(0)
	UO2F4-2	6.149e-020	4.729e-020	-19.211	-19.325	-0.114	(0)
	VOF+	3.060e-020	2.866e-020	-19.514	-19.543	-0.029	(0)
	VOF2	6.247e-022	6.247e-022	-21.204	-21.204	0.000	(0)
	BF3OH-	2.308e-022	2.167e-022	-21.637	-21.664	-0.027	(0)
	VO2F3-2	1.362e-022	1.047e-022	-21.866	-21.980	-0.114	(0)
	VOF3-	1.376e-024	1.289e-024	-23.861	-23.890	-0.029	(0)
	VO2F4-3	5.409e-027	2.996e-027	-26.267	-26.523	-0.257	(0)
	BF4-	8.169e-028	7.672e-028	-27.088	-27.115	-0.027	(0)
	VOF4-2	3.932e-028	3.024e-028	-27.405	-27.519	-0.114	(0)
	UF3+	1.678e-036	1.572e-036	-35.775	-35.804	-0.029	(0)
	UF2+2	2.218e-037	1.706e-037	-36.654	-36.768	-0.114	(0)
	UF4	1.002e-038	1.002e-038	-37.999	-37.999	0.000	(0)
	UF+3	4.207e-040	2.330e-040	-39.376	-39.633	-0.257	(0)
	UF5-	0.000e+000	0.000e+000	-40.608	-40.637	-0.029	(0)
	UF6-2	0.000e+000	0.000e+000	-42.278	-42.392	-0.114	(0)
Fe(2)	6.091e-011						
	Fe+2	5.534e-011	4.256e-011	-10.257	-10.371	-0.114	(0)
	FeSO4	3.635e-012	3.635e-012	-11.440	-11.440	0.000	(0)
	FeOH+	1.464e-012	1.379e-012	-11.834	-11.860	-0.026	(0)
	FeHCO3+	4.680e-013	4.412e-013	-12.330	-12.355	-0.026	(0)
	Fe(OH) 2	8.913e-016	8.913e-016	-15.050	-15.050	0.000	(0)
	Fe(OH) 3-	2.436e-016	2.293e-016	-15.613	-15.640	-0.026	(0)
Fe(3)	1.319e-008						
	Fe(OH) 2+	6.981e-009	6.577e-009	-8.156	-8.182	-0.026	(0)
	Fe(OH) 3	5.748e-009	5.748e-009	-8.241	-8.241	0.000	(0)
	Fe(OH) 4-	4.623e-010	4.355e-010	-9.335	-9.361	-0.026	(0)
	FeOH+2	2.642e-014	2.077e-014	-13.578	-13.682	-0.104	(0)
	FeF2+	4.165e-018	3.922e-018	-17.380	-17.407	-0.026	(0)
	FeF+2	3.206e-018	2.521e-018	-17.494	-17.598	-0.104	(0)
	FeF3	3.217e-019	3.217e-019	-18.493	-18.493	0.000	(0)
	FeSO4+	1.639e-019	1.543e-019	-18.785	-18.812	-0.026	(0)
	Fe+3	6.850e-020	3.954e-020	-19.164	-19.403	-0.239	(0)
	Fe(SO4) 2-	1.226e-021	1.148e-021	-20.912	-20.940	-0.029	(0)

	FeCl+2	5.382e-023	4.231e-023	-22.269	-22.374	-0.104	(0)
	FeHSeO3+2	4.052e-025	3.117e-025	-24.392	-24.506	-0.114	(0)
	Fe2 (OH) 2+4	4.084e-026	1.429e-026	-25.389	-25.845	-0.456	(0)
	FeCl2+	7.113e-027	6.698e-027	-26.148	-26.174	-0.026	(0)
	FeCl3	2.373e-032	2.373e-032	-31.625	-31.625	0.000	(0)
	Fe3 (OH) 4+5	7.009e-033	1.359e-033	-32.154	-32.867	-0.713	(0)
H (0)	2.166e-027						
	H2	1.083e-027	1.084e-027	-26.965	-26.965	0.000	(0)
K	1.134e-004						
	K+	1.131e-004	1.064e-004	-3.946	-3.973	-0.027	(0)
	KSO4-	2.783e-007	2.621e-007	-6.556	-6.581	-0.026	(0)
Mg	1.645e-004						
	Mg+2	1.545e-004	1.210e-004	-3.811	-3.917	-0.106	(0)
	MgSO4	7.662e-006	7.662e-006	-5.116	-5.116	0.000	(0)
	MgHCO3+	1.084e-006	1.020e-006	-5.965	-5.992	-0.027	(0)
	MgF+	8.389e-007	7.895e-007	-6.076	-6.103	-0.026	(0)
	MgCO3	3.140e-007	3.140e-007	-6.503	-6.503	0.000	(0)
	MgOH+	4.158e-008	3.921e-008	-7.381	-7.407	-0.025	(0)
	MgH2BO3+	9.102e-011	8.549e-011	-10.041	-10.068	-0.027	(0)
Mn (2)	7.790e-007						
	Mn+2	7.317e-007	5.628e-007	-6.136	-6.250	-0.114	(0)
	MnSO4	3.482e-008	3.482e-008	-7.458	-7.458	0.000	(0)
	MnHCO3+	9.817e-009	9.245e-009	-8.008	-8.034	-0.026	(0)
	MnF+	1.383e-009	1.303e-009	-8.859	-8.885	-0.026	(0)
	MnOH+	1.222e-009	1.150e-009	-8.913	-8.939	-0.026	(0)
	MnCl+	2.666e-011	2.511e-011	-10.574	-10.600	-0.026	(0)
	MnCl2	1.257e-015	1.257e-015	-14.901	-14.901	0.000	(0)
	MnSeO4	1.173e-017	1.173e-017	-16.931	-16.931	0.000	(0)
	Mn (OH) 3-	4.999e-018	4.707e-018	-17.301	-17.327	-0.026	(0)
	MnCl3-	1.302e-020	1.226e-020	-19.885	-19.911	-0.026	(0)
	Mn (OH) 4-2	1.573e-023	1.237e-023	-22.803	-22.908	-0.104	(0)
	MnSe	1.454e-039	1.454e-039	-38.837	-38.837	0.000	(0)
Mn (3)	4.355e-028						
	Mn+3	4.355e-028	2.514e-028	-27.361	-27.600	-0.239	(0)
Mn (6)	0.000e+000						
	MnO4-2	0.000e+000	0.000e+000	-45.307	-45.412	-0.104	(0)
Mn (7)	0.000e+000						
	MnO4-	0.000e+000	0.000e+000	-50.757	-50.784	-0.027	(0)
Mo	5.796e-008						
	MoO4-2	5.795e-008	4.539e-008	-7.237	-7.343	-0.106	(0)
	HMoO4-	1.193e-011	1.118e-011	-10.923	-10.952	-0.029	(0)
	H2MoO4	1.013e-015	1.013e-015	-14.994	-14.994	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-51.884	-52.141	-0.257	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-60.645	-61.671	-1.026	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-62.479	-63.192	-0.713	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-65.861	-66.317	-0.456	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-70.722	-70.979	-0.257	(0)
Na	1.411e-004						
	Na+	1.408e-004	1.325e-004	-3.851	-3.878	-0.027	(0)
	NaSO4-	2.627e-007	2.475e-007	-6.581	-6.606	-0.026	(0)
	NaHCO3	6.132e-008	6.132e-008	-7.212	-7.212	0.000	(0)
	NaCO3-	8.167e-009	7.694e-009	-8.088	-8.114	-0.026	(0)
	NaF	4.859e-009	4.859e-009	-8.313	-8.313	0.000	(0)
	NaH2BO3	4.276e-012	4.276e-012	-11.369	-11.369	0.000	(0)
O (0)	8.622e-039						
	O2	4.311e-039	4.314e-039	-38.365	-38.365	0.000	(0)
S (6)	4.928e-004						
	SO4-2	4.441e-004	3.479e-004	-3.352	-3.459	-0.106	(0)
	CaSO4	4.046e-005	4.046e-005	-4.393	-4.393	0.000	(0)
	MgSO4	7.662e-006	7.662e-006	-5.116	-5.116	0.000	(0)
	KSO4-	2.783e-007	2.621e-007	-6.556	-6.581	-0.026	(0)
	NaSO4-	2.627e-007	2.475e-007	-6.581	-6.606	-0.026	(0)
	MnSO4	3.482e-008	3.482e-008	-7.458	-7.458	0.000	(0)
	ZnSO4	1.017e-009	1.017e-009	-8.993	-8.993	0.000	(0)
	CuSO4	6.819e-010	6.819e-010	-9.166	-9.166	0.000	(0)
	HSO4-	4.470e-010	4.207e-010	-9.350	-9.376	-0.026	(0)
	Zn (SO4) 2-2	4.008e-012	3.083e-012	-11.397	-11.511	-0.114	(0)
	FeSO4	3.635e-012	3.635e-012	-11.440	-11.440	0.000	(0)

UO2SO4	2.744e-015	2.744e-015	-14.562	-14.562	0.000	(0)
AlSO4+	6.719e-016	6.324e-016	-15.173	-15.199	-0.026	(0)
UO2 (SO4) 2-2	1.636e-017	1.258e-017	-16.786	-16.900	-0.114	(0)
Al (SO4) 2-	2.505e-018	2.357e-018	-17.601	-17.628	-0.026	(0)
VO2SO4-	5.952e-019	5.574e-019	-18.225	-18.254	-0.029	(0)
FeSO4+	1.639e-019	1.543e-019	-18.785	-18.812	-0.026	(0)
VOSO4	7.874e-021	7.874e-021	-20.104	-20.104	0.000	(0)
Fe (SO4) 2-	1.226e-021	1.148e-021	-20.912	-20.940	-0.029	(0)
VSO4+	1.096e-034	1.026e-034	-33.960	-33.989	-0.029	(0)
U (SO4) 2	0.000e+000	0.000e+000	-41.114	-41.114	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-41.442	-41.556	-0.114	(0)
Se (-2)	8.286e-036					
HSe-	8.283e-036	7.757e-036	-35.082	-35.110	-0.029	(0)
MnSe	1.454e-039	1.454e-039	-38.837	-38.837	0.000	(0)
H2Se	7.451e-040	7.451e-040	-39.128	-39.128	0.000	(0)
Se-2	0.000e+000	0.000e+000	-42.089	-42.203	-0.114	(0)
Se (4)	4.433e-009					
HSeO3-	3.185e-009	2.983e-009	-8.497	-8.525	-0.029	(0)
SeO3-2	1.248e-009	9.597e-010	-8.904	-9.018	-0.114	(0)
H2SeO3	1.575e-014	1.575e-014	-13.803	-13.803	0.000	(0)
FeHSeO3+2	4.052e-025	3.117e-025	-24.392	-24.506	-0.114	(0)
Se (6)	9.891e-014					
SeO4-2	9.890e-014	7.747e-014	-13.005	-13.111	-0.106	(0)
MnSeO4	1.173e-017	1.173e-017	-16.931	-16.931	0.000	(0)
ZnSeO4	1.604e-019	1.604e-019	-18.795	-18.795	0.000	(0)
HSeO4-	5.130e-020	4.804e-020	-19.290	-19.318	-0.029	(0)
Zn (SeO4) 2-2	1.638e-032	1.260e-032	-31.786	-31.900	-0.114	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.237	-57.493	-0.257	(0)
U (4)	5.611e-019					
U (OH) 5-	5.609e-019	5.252e-019	-18.251	-18.280	-0.029	(0)
U (OH) 4	2.722e-022	2.722e-022	-21.565	-21.565	0.000	(0)
U (OH) 3+	1.315e-026	1.231e-026	-25.881	-25.910	-0.029	(0)
U (OH) 2+2	9.161e-032	7.046e-032	-31.038	-31.152	-0.114	(0)
UF3+	1.678e-036	1.572e-036	-35.775	-35.804	-0.029	(0)
UF2+2	2.218e-037	1.706e-037	-36.654	-36.768	-0.114	(0)
UOH+3	7.412e-038	4.106e-038	-37.130	-37.387	-0.257	(0)
UF4	1.002e-038	1.002e-038	-37.999	-37.999	0.000	(0)
UF+3	4.207e-040	2.330e-040	-39.376	-39.633	-0.257	(0)
UF5-	0.000e+000	0.000e+000	-40.608	-40.637	-0.029	(0)
U (SO4) 2	0.000e+000	0.000e+000	-41.114	-41.114	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-41.442	-41.556	-0.114	(0)
UF6-2	0.000e+000	0.000e+000	-42.278	-42.392	-0.114	(0)
U+4	0.000e+000	0.000e+000	-44.241	-44.697	-0.456	(0)
UCl+3	0.000e+000	0.000e+000	-47.191	-47.448	-0.257	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-164.416	-166.725	-2.309	(0)
U (5)	3.392e-016					
UO2+	3.392e-016	3.176e-016	-15.470	-15.498	-0.029	(0)
U (6)	7.101e-009					
UO2 (CO3) 2-2	5.236e-009	4.027e-009	-8.281	-8.395	-0.114	(0)
UO2 (CO3) 3-4	1.799e-009	6.296e-010	-8.745	-9.201	-0.456	(0)
UO2CO3	6.471e-011	6.471e-011	-10.189	-10.189	0.000	(0)
UO2OH+	5.700e-013	5.338e-013	-12.244	-12.273	-0.029	(0)
UO2F+	4.466e-014	4.182e-014	-13.350	-13.379	-0.029	(0)
UO2F2	7.012e-015	7.012e-015	-14.154	-14.154	0.000	(0)
UO2+2	6.652e-015	5.211e-015	-14.177	-14.283	-0.106	(0)
UO2SO4	2.744e-015	2.744e-015	-14.562	-14.562	0.000	(0)
UO2F3-	1.093e-016	1.024e-016	-15.961	-15.990	-0.029	(0)
UO2 (SO4) 2-2	1.636e-017	1.258e-017	-16.786	-16.900	-0.114	(0)
(UO2) 2 (OH) 2+2	6.149e-019	4.729e-019	-18.211	-18.325	-0.114	(0)
UO2Cl+	3.198e-019	2.995e-019	-18.495	-18.524	-0.029	(0)
(UO2) 3 (OH) 5+	1.354e-019	1.268e-019	-18.868	-18.897	-0.029	(0)
UO2F4-2	6.149e-020	4.729e-020	-19.211	-19.325	-0.114	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-40.065	-40.094	-0.029	(0)
V+2	0.000e+000	0.000e+000	-41.400	-41.514	-0.114	(0)
V (3)	2.716e-013					
V (OH) 3	2.716e-013	2.716e-013	-12.566	-12.566	0.000	(0)

V(OH) 2+	2.319e-024	2.171e-024	-23.635	-23.663	-0.029	(0)
VOH+2	3.313e-028	2.548e-028	-27.480	-27.594	-0.114	(0)
V+3	1.128e-033	6.249e-034	-32.948	-33.204	-0.257	(0)
VSO4+	1.096e-034	1.026e-034	-33.960	-33.989	-0.029	(0)
V2(OH) 3+3	0.000e+000	0.000e+000	-52.549	-52.805	-0.257	(0)
V2(OH) 2+4	0.000e+000	0.000e+000	-53.931	-54.387	-0.456	(0)
V(4)	1.439e-017					
V(OH) 3+	1.425e-017	1.334e-017	-16.846	-16.875	-0.029	(0)
VO+2	1.068e-019	8.218e-020	-18.971	-19.085	-0.114	(0)
VOF+	3.060e-020	2.866e-020	-19.514	-19.543	-0.029	(0)
VOSO4	7.874e-021	7.874e-021	-20.104	-20.104	0.000	(0)
VOF2	6.247e-022	6.247e-022	-21.204	-21.204	0.000	(0)
VOC1+	8.724e-024	8.169e-024	-23.059	-23.088	-0.029	(0)
VOF3-	1.376e-024	1.289e-024	-23.861	-23.890	-0.029	(0)
VOF4-2	3.932e-028	3.024e-028	-27.405	-27.519	-0.114	(0)
H2V2O4+2	1.160e-029	8.922e-030	-28.936	-29.050	-0.114	(0)
V(5)	2.925e-008					
H2VO4-	2.345e-008	2.196e-008	-7.630	-7.658	-0.029	(0)
HVO4-2	5.797e-009	4.459e-009	-8.237	-8.351	-0.114	(0)
H3VO4	2.718e-012	2.718e-012	-11.566	-11.566	0.000	(0)
H3V2O7-	4.116e-013	3.854e-013	-12.386	-12.414	-0.029	(0)
HV2O7-3	5.990e-014	3.318e-014	-13.223	-13.479	-0.257	(0)
VO4-3	3.260e-015	1.806e-015	-14.487	-14.743	-0.257	(0)
V2O7-4	2.063e-016	7.218e-017	-15.686	-16.142	-0.456	(0)
VO2+	7.133e-017	6.710e-017	-16.147	-16.173	-0.027	(0)
V3O9-3	2.003e-017	1.110e-017	-16.698	-16.955	-0.257	(0)
VO2F	6.842e-018	6.842e-018	-17.165	-17.165	0.000	(0)
VO2SO4-	5.952e-019	5.574e-019	-18.225	-18.254	-0.029	(0)
VO2F2-	1.542e-019	1.444e-019	-18.812	-18.840	-0.029	(0)
V4O12-4	2.903e-022	1.016e-022	-21.537	-21.993	-0.456	(0)
VO2F3-2	1.362e-022	1.047e-022	-21.866	-21.980	-0.114	(0)
VO2F4-3	5.409e-027	2.996e-027	-26.267	-26.523	-0.257	(0)
V10O28-6	0.000e+000	0.000e+000	-58.281	-59.307	-1.026	(0)
HV10O28-5	0.000e+000	0.000e+000	-58.315	-59.028	-0.713	(0)
H2V10O28-4	0.000e+000	0.000e+000	-61.272	-61.728	-0.456	(0)
Zn	2.218e-008					
Zn+2	1.706e-008	1.337e-008	-7.768	-7.874	-0.106	(0)
ZnCO3	2.399e-009	2.399e-009	-8.620	-8.620	0.000	(0)
ZnOH+	1.161e-009	1.088e-009	-8.935	-8.963	-0.029	(0)
ZnSO4	1.017e-009	1.017e-009	-8.993	-8.993	0.000	(0)
ZnHCO3+	3.716e-010	3.480e-010	-9.430	-9.458	-0.029	(0)
Zn(OH) 2	1.403e-010	1.403e-010	-9.853	-9.853	0.000	(0)
ZnF+	1.656e-011	1.551e-011	-10.781	-10.810	-0.029	(0)
Zn(SO4) 2-2	4.008e-012	3.083e-012	-11.397	-11.511	-0.114	(0)
ZnOHCl	1.267e-012	1.267e-012	-11.897	-11.897	0.000	(0)
ZnCl+	1.265e-012	1.190e-012	-11.898	-11.925	-0.027	(0)
Zn(OH) 3-	6.109e-013	5.721e-013	-12.214	-12.243	-0.029	(0)
ZnCl2	6.682e-017	6.682e-017	-16.175	-16.175	0.000	(0)
Zn(OH) 4-2	2.410e-017	1.853e-017	-16.618	-16.732	-0.114	(0)
ZnSeO4	1.604e-019	1.604e-019	-18.795	-18.795	0.000	(0)
ZnCl3-	1.999e-021	1.881e-021	-20.699	-20.726	-0.027	(0)
ZnCl4-2	4.238e-026	3.332e-026	-25.373	-25.477	-0.104	(0)
Zn(SeO4) 2-2	1.638e-032	1.260e-032	-31.786	-31.900	-0.114	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Al(OH) 3(am)	-2.71	8.09	10.80	Al(OH) 3
Al2(MoO4) 3	-55.66	-53.29	2.37	Al2(MoO4) 3
Al2O3	-3.47	16.18	19.65	Al2O3
Al4(OH) 10SO4	-9.61	13.09	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-11.95	-7.15	4.80	AlAsO4:2H2O
AlOHSO4	-7.95	-11.18	-3.23	AlOHSO4
Alunite	-8.94	-10.34	-1.40	KAl3(SO4) 2(OH) 6
Anhydrite	-2.39	-6.75	-4.36	CaSO4
Antlerite	-4.82	3.97	8.79	Cu3(OH) 4SO4
Aragonite	-0.50	-8.80	-8.30	CaCO3

Arsenolite	-77.88	-80.64	-2.76	As4O6
Artinite	-7.13	2.47	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-37.19	-30.49	6.71	As2O5
Atacamite	-4.25	3.14	7.39	Cu2(OH)3Cl
Azurite	-2.49	-19.40	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.03	8.36	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.68	0.19	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	3.51	-5.40	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-24.38	8.56	32.94	Ba3(VO4)2:4H2O
BaF2	-10.10	-15.92	-5.82	BaF2
BaMoO4	-7.83	-14.79	-6.96	BaMoO4
Barite	-0.93	-10.91	-9.98	BaSO4
BaSeO3	-9.90	-8.07	1.83	BaSeO3
BaSeO4	-13.10	-20.56	-7.46	BaSeO4
Bianchite	-9.57	-11.33	-1.76	ZnSO4:6H2O
Birnessite	-10.06	8.03	18.09	MnO2
Bixbyite	-7.11	-7.75	-0.64	Mn2O3
Boehmite	-0.49	8.09	8.58	AlOOH
Brochantite	-3.51	11.72	15.22	Cu4(OH)6SO4
Brucite	-4.95	11.90	16.84	Mg(OH)2
Ca(VO3)2	-9.67	-4.01	5.66	Ca(VO3)2
Ca2V2O7	-8.99	8.51	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.04	8.51	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.23	7.07	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.93	21.03	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.83	21.03	39.86	Ca3(VO4)2:4H2O
Calcite	-0.32	-8.80	-8.48	CaCO3
CaMoO4	-2.69	-10.64	-7.95	CaMoO4
Carnotite	-3.03	-2.80	0.23	KUO2VO4
CaSeO3:2H2O	-6.73	-3.91	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.39	-16.41	-3.02	CaSeO4:2H2O
CH4(g)	-75.54	-116.58	-41.05	CH4
Chalcanthite	-8.89	-11.53	-2.64	CuSO4:5H2O
Claudetite	-77.58	-80.64	-3.06	As4O6
CO2(g)	-3.17	-21.32	-18.15	CO2
Cryolite	-18.84	-52.68	-33.84	Na3AlF6
Cu(OH)2	-0.93	7.75	8.67	Cu(OH)2
Cu2Se(alpha)	-0.16	-45.96	-45.80	Cu2Se
Cu2SO4	-20.26	-22.21	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.35	-7.25	6.10	Cu3(AsO4)2:2H2O
Cu3Se2	-17.74	-81.23	-63.49	Cu3Se2
CuCO3	-2.07	-13.57	-11.50	CuCO3
CuF	-8.71	-13.61	-4.91	CuF
CuF2	-17.65	-16.54	1.12	CuF2
CuF2:2H2O	-11.99	-16.54	-4.55	CuF2:2H2O
Cumetal	-4.62	-13.38	-8.76	Cu
CuMoO4	-2.33	-15.41	-13.08	CuMoO4
CuOCuSO4	-14.08	-3.78	10.30	CuOCuSO4
Cupricferrite	10.40	16.39	5.99	CuFe2O4
Cuprite	-1.53	-2.94	-1.41	Cu2O
Cuprousferrite	11.77	2.85	-8.92	CuFeO2
CuSe	-2.17	-35.27	-33.10	CuSe
CuSe2	-21.11	-54.47	-33.37	CuSe2
CuSeO3:2H2O	-9.20	-8.69	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.74	-21.18	-2.44	CuSeO4:5H2O
CuSO4	-14.47	-11.53	2.94	CuSO4
Diaspore	1.22	8.09	6.87	AlOOH
Dolomite(disordered)	-1.68	-18.22	-16.54	CaMg(CO3)2
Dolomite(ordered)	-1.13	-18.22	-17.09	CaMg(CO3)2
Epsomite	-5.25	-7.38	-2.13	MgSO4:7H2O
Fe(OH)2	-8.12	5.44	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	3.65	0.61	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-7.37	-11.09	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.35	-7.79	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.03	-40.66	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.45	-49.18	-3.73	Fe2(SO4)3
Fe3(OH)8	-6.14	14.08	20.22	Fe3(OH)8
FeAsO4:2H2O	-11.32	-10.92	0.40	FeAsO4:2H2O

FeMoO4	-7.62	-17.71	-10.09	FeMoO4
Ferrihydrite	1.13	4.32	3.19	Fe(OH) 3
Ferroselite	-38.18	-56.78	-18.60	FeSe2
FeSe	-26.57	-37.57	-11.00	FeSe
Fluorite	-1.27	-11.77	-10.50	CaF2
Gibbsite	-0.20	8.09	8.29	Al(OH) 3
Goethite	3.83	4.32	0.49	FeOOH
Goslarite	-9.32	-11.33	-2.01	ZnSO4:7H2O
Gummite	-6.14	1.53	7.67	UO3
Gypsum	-2.14	-6.75	-4.61	CaSO4:2H2O
H-Jarosite	-13.49	-25.59	-12.10	(H3O) Fe3(SO4) 2(OH) 6
H2MoO4	-10.28	-23.16	-12.88	H2MoO4
H2Se(g)	-38.06	-43.02	-4.96	H2Se
Halite	-9.93	-8.33	1.60	NaCl
Hausmannite	-8.52	52.51	61.03	Mn3O4
Hematite	10.06	8.64	-1.42	Fe2O3
Hercynite	-1.26	21.63	22.89	FeAl2O4
Huntite	-7.10	-37.07	-29.97	CaMg3(CO3) 4
Hydromagnesite	-17.03	-25.79	-8.77	Mg5(CO3) 4(OH) 2:4H2O
K-Alum	-21.35	-26.52	-5.17	KAl(SO4) 2:12H2O
K-Jarosite	-6.85	-21.65	-14.80	KFe3(SO4) 2(OH) 6
K2MoO4	-18.55	-15.29	3.26	K2MoO4
K2SeO4	-20.33	-21.06	-0.73	K2SeO4
Langite	-5.77	11.72	17.49	Cu4(OH) 6SO4:H2O
Lepidocrocite	2.95	4.32	1.37	FeOOH
Lime	-20.18	12.52	32.70	CaO
Maghemite	2.25	8.64	6.39	Fe2O3
Magnesioferrite	3.68	20.54	16.86	Fe2MgO4
Magnesite	-1.96	-9.42	-7.46	MgCO3
Magnetite	10.68	14.08	3.40	Fe3O4
Malachite	-0.52	-5.83	-5.31	Cu2(OH) 2CO3
Manganite	-3.87	21.47	25.34	MnOOH
Melanothallite	-23.23	-16.97	6.26	CuCl2
Melanterite	-11.62	-13.83	-2.21	FeSO4:7H2O
Mg(OH) 2(active)	-6.90	11.90	18.79	Mg(OH) 2
Mg(VO3) 2	-15.91	-4.63	11.28	Mg(VO3) 2
Mg2V2O7	-19.10	7.26	26.36	Mg2V2O7
MgF2	-4.26	-12.39	-8.13	MgF2
MgMoO4	-9.41	-11.26	-1.85	MgMoO4
MgSeO3:6H2O	-7.59	-4.54	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.83	-17.03	-1.20	MgSeO4:6H2O
Mirabilite	-10.10	-11.21	-1.11	Na2SO4:10H2O
Mn(VO3) 2	-11.87	-6.97	4.90	Mn(VO3) 2
Mn2(SO4) 3	-59.86	-65.57	-5.71	Mn2(SO4) 3
Mn3(AsO4) 2:8H2O	-14.29	-1.79	12.50	Mn3(AsO4) 2:8H2O
MnCl2:4H2O	-17.87	-15.15	2.72	MnCl2:4H2O
MnSe	-36.95	-33.45	3.50	MnSe
MnSeO3	-8.00	-6.87	1.13	MnSeO3
MnSeO3:2H2O	-7.85	-6.87	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.31	-19.36	-2.05	MnSeO4:5H2O
MnSO4	-12.29	-9.71	2.58	MnSO4
MoO3	-15.16	-23.16	-8.00	MoO3
Na-Jarosite	-10.36	-21.56	-11.20	NaFe3(SO4) 2(OH) 6
Na2Mo2O7	-21.66	-38.26	-16.60	Na2Mo2O7
Na2MoO4	-16.59	-15.10	1.49	Na2MoO4
Na2MoO4:2H2O	-16.32	-15.10	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.67	-8.37	10.30	Na2SeO3:5H2O
Na2SeO4	-22.15	-20.87	1.28	Na2SeO4
Na3VO4	-32.86	3.82	36.68	Na3VO4
Na4V2O7	-37.81	-0.41	37.40	Na4V2O7
Nantokite	-7.10	-13.83	-6.73	CuCl
Natron	-11.95	-13.26	-1.31	Na2CO3:10H2O
NaVO3	-8.09	-4.24	3.86	NaVO3
Nesquehonite	-4.75	-9.42	-4.67	MgCO3:3H2O
Nsutite	-9.47	8.03	17.50	MnO2
O2(g)	-35.46	47.63	83.09	O2
Periclase	-9.69	11.90	21.58	MgO
Portlandite	-10.28	12.52	22.80	Ca(OH) 2

Pyrochroite	-5.63	9.57	15.19	Mn (OH) 2
Pyrolusite	-8.00	33.38	41.38	MnO2
Rhodochrosite	-1.18	-11.76	-10.58	MnCO3
Rutherfordine	-5.29	-19.79	-14.50	UO2CO3
Schoepite	-4.46	1.53	5.99	UO2 (OH) 2:H2O
Semetal (am)	-12.09	-19.20	-7.11	Se
Semetal (hex)	-11.49	-19.20	-7.71	Se
SeO2	-16.56	-16.43	0.12	SeO2
SeO3	-49.97	-28.93	21.04	SeO3
Siderite	-5.64	-15.88	-10.24	FeCO3
Smithsonite	-3.38	-13.38	-10.00	ZnCO3
Spinel	-8.77	28.08	36.85	MgAl2O4
Tenorite	0.10	7.75	7.64	CuO
Thenardite	-11.54	-11.21	0.32	Na2SO4
Thermonatrite	-13.90	-13.26	0.64	Na2CO3:H2O
Tyuyamunite	-5.03	-0.95	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.65	8.43	21.08	U3O8
U4O9	-25.43	-28.45	-3.02	U4O9
UF4	-32.10	-61.64	-29.54	UF4
UF4:2.5H2O	-28.92	-61.64	-32.72	UF4:2.5H2O
UO2 (am)	-14.00	-13.07	0.93	UO2
UO2 (OH) 2 (beta)	-4.08	1.53	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.14	-27.39	-2.25	UO2SeO4:4H2O
UO3	-6.17	1.53	7.70	UO3
Uraninite	-8.40	-13.07	-4.67	UO2
V (OH) 3	-17.07	-9.48	7.59	V (OH) 3
V2O5	-15.17	-16.53	-1.36	V2O5
V3O5	-35.46	-33.63	1.84	V3O5
V4O7	-44.08	-36.90	7.19	V4O7
V6O13	-36.36	-97.22	-60.86	V6O13
VC12	-64.98	-46.11	18.87	VC12
VC13	-69.99	-46.56	23.43	VC13
VF4	-66.77	-51.84	14.93	VF4
Vmetal	-89.23	-45.20	44.03	V
VO	-36.15	-21.39	14.76	VO
VO (OH) 2	-8.42	-3.27	5.15	VO (OH) 2
VO2Cl	-23.47	-20.62	2.84	VO2Cl
VOC1	-32.99	-21.84	11.15	VOC1
VOC12	-40.75	-27.99	12.76	VOC12
VOSO4	-26.15	-22.54	3.61	VOSO4
Witherite	-4.39	-12.96	-8.57	BaCO3
Zincite	-3.39	7.94	11.33	ZnO
Zincosite	-15.26	-11.33	3.93	ZnSO4
Zn (BO2) 2	-13.07	-4.78	8.29	Zn (BO2) 2
Zn (OH) 2	-4.26	7.94	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.53	7.94	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.81	7.94	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.59	7.94	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.79	7.94	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.89	-3.39	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.67	3.52	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-20.32	-6.67	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-33.64	-14.72	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.91	12.49	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-23.51	14.99	38.50	Zn5 (OH) 8Cl2
ZnCl2	-23.83	-16.78	7.05	ZnCl2
ZnCO3:1H2O	-3.12	-13.38	-10.26	ZnCO3:1H2O
ZnF2	-15.81	-16.35	-0.53	ZnF2
Znmetal	-41.66	-15.87	25.79	Zn
ZnMoO4	-5.09	-15.22	-10.13	ZnMoO4
ZnO (active)	-3.25	7.94	11.19	ZnO
ZnSe	-20.68	-35.08	-14.40	ZnSe
ZnSeO4:6H2O	-19.46	-20.98	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.69	-11.33	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 10.

SOLUTION 8 Average HCT data for biotite breccia - sulfide (ore) (cells
604767, 604787, 604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.86290
pe 4
redox pe
units mg/l
density 1
Alkalinity 44.99190 as HCO3
Al 0.00457
As 0.00034
B 0.00498
Ba 0.00905
Ca 24.11789
Cl 1.30010
Cu 0.00845
F 1.09342
Fe 0.00069
K 3.75232
Mg 3.96764
Mn 0.07221
Mo 0.00520
Na 2.41114 charge
S(6) 44.45388 as SO4
Se 0.00031
U 0.00331
V 0.00104
Zn 0.00272
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 8. Average HCT data for biotite breccia - sulfide (ore) (cells
604767, 604787, 604811, 604854, 604862, 604867 and 605033)

-----Solution composition-----

Elements	Molality	Moles
Al	1.694e-007	1.694e-007
Alkalinity	7.374e-004	7.374e-004
As	4.539e-009	4.539e-009
B	4.607e-007	4.607e-007
Ba	6.591e-008	6.591e-008
Ca	6.018e-004	6.018e-004
Cl	3.668e-005	3.668e-005
Cu	1.330e-007	1.330e-007
F	5.756e-005	5.756e-005
Fe	1.236e-008	1.236e-008
K	9.598e-005	9.598e-005
Mg	1.633e-004	1.633e-004
Mn	1.315e-006	1.315e-006
Mo	5.421e-008	5.421e-008
Na	1.275e-004	1.275e-004
S(6)	4.628e-004	4.628e-004
Se	3.927e-009	3.927e-009
U	1.391e-008	1.391e-008
V	2.042e-008	2.042e-008
Zn	4.160e-008	4.160e-008
		Charge balance

-----Description of solution-----

pH = 7.863
 pe = 4.000
 Activity of water = 1.000
 Ionic strength = 2.801e-003
 Mass of water (kg) = 1.000e+000
 Total carbon (mol/kg) = 7.519e-004
 Total CO2 (mol/kg) = 7.519e-004
 Temperature (deg C) = 25.00
 Electrical balance (eq) = 1.499e-018
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 10
 Total H = 1.110144e+002
 Total O = 5.551094e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	7.786e-007	7.343e-007	-6.109	-6.134	-0.025	(0)
H+	1.453e-008	1.371e-008	-7.838	-7.863	-0.025	0.00
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	1.694e-007					
Al (OH) 4-	1.676e-007	1.582e-007	-6.776	-6.801	-0.025	(0)
Al (OH) 3	1.711e-009	1.711e-009	-8.767	-8.767	0.000	(0)
Al (OH) 2+	1.236e-010	1.168e-010	-9.908	-9.933	-0.025	(0)
AlF2+	3.266e-012	3.086e-012	-11.486	-11.511	-0.025	(0)
AlF3	2.071e-012	2.071e-012	-11.684	-11.684	0.000	(0)
AlOH+2	2.513e-013	2.002e-013	-12.600	-12.699	-0.099	(0)
AlF+2	1.825e-013	1.454e-013	-12.739	-12.838	-0.099	(0)
AlF4-	5.864e-014	5.535e-014	-13.232	-13.257	-0.025	(0)
AlSO4+	7.482e-016	7.063e-016	-15.126	-15.151	-0.025	(0)
Al+3	4.597e-016	2.726e-016	-15.338	-15.564	-0.227	(0)
Al (SO4) 2-	2.675e-018	2.526e-018	-17.573	-17.598	-0.025	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-51.708	-51.950	-0.243	(0)
As (3)	1.477e-020					
H3AsO3	1.420e-020	1.420e-020	-19.848	-19.848	0.000	(0)
H2AsO3-	5.653e-022	5.312e-022	-21.248	-21.275	-0.027	(0)
HAsO3-2	4.530e-026	3.533e-026	-25.344	-25.452	-0.108	(0)
H4AsO3+	1.027e-028	9.649e-029	-27.989	-28.016	-0.027	(0)
AsO3-3	1.738e-031	9.933e-032	-30.760	-31.003	-0.243	(0)
As (5)	4.539e-009					
HAsO4-2	4.111e-009	3.206e-009	-8.386	-8.494	-0.108	(0)
H2AsO4-	4.266e-010	4.009e-010	-9.370	-9.397	-0.027	(0)
AsO4-3	1.294e-012	7.394e-013	-11.888	-12.131	-0.243	(0)
H3AsO4	9.547e-016	9.553e-016	-15.020	-15.020	0.000	(0)
B	4.607e-007					
H3BO3	4.403e-007	4.406e-007	-6.356	-6.356	0.000	(0)
H2BO3-	1.981e-008	1.866e-008	-7.703	-7.729	-0.026	(0)
CaH2BO3+	5.061e-010	4.768e-010	-9.296	-9.322	-0.026	(0)
MgH2BO3+	8.380e-011	7.896e-011	-10.077	-10.103	-0.026	(0)
BF (OH) 3-	9.950e-012	9.375e-012	-11.002	-11.028	-0.026	(0)
NaH2BO3	3.552e-012	3.552e-012	-11.450	-11.450	0.000	(0)
BaH2BO3+	3.178e-014	2.994e-014	-13.498	-13.524	-0.026	(0)
H5 (BO3) 2-	7.428e-015	6.999e-015	-14.129	-14.155	-0.026	(0)
BF2 (OH) 2-	7.777e-016	7.327e-016	-15.109	-15.135	-0.026	(0)
H8 (BO3) 3-	3.273e-019	3.084e-019	-18.485	-18.511	-0.026	(0)
BF3OH-	2.212e-022	2.084e-022	-21.655	-21.681	-0.026	(0)
BF4-	7.959e-028	7.498e-028	-27.099	-27.125	-0.026	(0)
Ba	6.591e-008					
Ba+2	6.549e-008	5.192e-008	-7.184	-7.285	-0.101	(0)
BaHCO3+	3.564e-010	3.369e-010	-9.448	-9.473	-0.024	(0)
BaCO3	6.185e-011	6.185e-011	-10.209	-10.209	0.000	(0)
BaOH+	1.762e-013	1.664e-013	-12.754	-12.779	-0.025	(0)
BaH2BO3+	3.178e-014	2.994e-014	-13.498	-13.524	-0.026	(0)
C (4)	7.519e-004					

HCO3-	7.191e-004	6.794e-004	-3.143	-3.168	-0.025	(0)
H2CO3	2.095e-005	2.095e-005	-4.679	-4.679	0.000	(0)
CaHCO3+	5.942e-006	5.617e-006	-5.226	-5.250	-0.024	(0)
CO3-2	2.930e-006	2.323e-006	-5.533	-5.634	-0.101	(0)
CaCO3	1.635e-006	1.635e-006	-5.787	-5.787	0.000	(0)
MgHCO3+	8.991e-007	8.483e-007	-6.046	-6.071	-0.025	(0)
MgCO3	2.357e-007	2.357e-007	-6.628	-6.628	0.000	(0)
CuCO3	1.009e-007	1.009e-007	-6.996	-6.996	0.000	(0)
NaHCO3	4.588e-008	4.588e-008	-7.338	-7.338	0.000	(0)
MnHCO3+	1.387e-008	1.310e-008	-7.858	-7.883	-0.025	(0)
UO2 (CO3) 2-2	1.102e-008	8.592e-009	-7.958	-8.066	-0.108	(0)
NaCO3-	5.498e-009	5.194e-009	-8.260	-8.285	-0.025	(0)
ZnCO3	3.521e-009	3.521e-009	-8.453	-8.453	0.000	(0)
UO2 (CO3) 3-4	2.704e-009	1.000e-009	-8.568	-9.000	-0.432	(0)
Cu (CO3) 2-2	8.086e-010	6.306e-010	-9.092	-9.200	-0.108	(0)
ZnHCO3+	6.023e-010	5.660e-010	-9.220	-9.247	-0.027	(0)
BaHCO3+	3.564e-010	3.369e-010	-9.448	-9.473	-0.024	(0)
CuHCO3+	3.364e-010	3.161e-010	-9.473	-9.500	-0.027	(0)
UO2CO3	1.854e-010	1.854e-010	-9.732	-9.732	0.000	(0)
BaCO3	6.185e-011	6.185e-011	-10.209	-10.209	0.000	(0)
FeHCO3+	4.639e-013	4.385e-013	-12.334	-12.358	-0.024	(0)
Ca	6.018e-004					
Ca+2	5.600e-004	4.440e-004	-3.252	-3.353	-0.101	(0)
CaSO4	3.395e-005	3.395e-005	-4.469	-4.469	0.000	(0)
CaHCO3+	5.942e-006	5.617e-006	-5.226	-5.250	-0.024	(0)
CaCO3	1.635e-006	1.635e-006	-5.787	-5.787	0.000	(0)
CaF+	2.736e-007	2.584e-007	-6.563	-6.588	-0.025	(0)
CaOH+	6.882e-009	6.505e-009	-8.162	-8.187	-0.024	(0)
CaH2BO3+	5.061e-010	4.768e-010	-9.296	-9.322	-0.026	(0)
Cl	3.668e-005					
Cl-	3.668e-005	3.461e-005	-4.436	-4.461	-0.025	(0)
MnCl+	4.458e-011	4.211e-011	-10.351	-10.376	-0.025	(0)
CuCl	1.574e-011	1.574e-011	-10.803	-10.803	0.000	(0)
ZnCl+	2.427e-012	2.290e-012	-11.615	-11.640	-0.025	(0)
ZnOHCl	2.202e-012	2.202e-012	-11.657	-11.657	0.000	(0)
CuCl+	4.287e-013	4.045e-013	-12.368	-12.393	-0.025	(0)
CuCl2-	1.206e-013	1.138e-013	-12.919	-12.944	-0.025	(0)
MnCl2	2.058e-015	2.058e-015	-14.686	-14.686	0.000	(0)
ZnCl2	1.256e-016	1.256e-016	-15.901	-15.901	0.000	(0)
CuCl2	4.854e-018	4.854e-018	-17.314	-17.314	0.000	(0)
UO2Cl+	1.197e-018	1.125e-018	-17.922	-17.949	-0.027	(0)
CuCl3-2	1.058e-018	8.419e-019	-17.975	-18.075	-0.099	(0)
MnCl3-	2.077e-020	1.962e-020	-19.682	-19.707	-0.025	(0)
ZnCl3-	3.660e-021	3.453e-021	-20.437	-20.462	-0.025	(0)
FeCl+2	6.257e-023	4.978e-023	-22.204	-22.303	-0.099	(0)
VOCl+	9.161e-024	8.609e-024	-23.038	-23.065	-0.027	(0)
CuCl3-	1.662e-024	1.568e-024	-23.779	-23.805	-0.025	(0)
ZnCl4-2	7.511e-026	5.975e-026	-25.124	-25.224	-0.099	(0)
FeCl2+	8.148e-027	7.695e-027	-26.089	-26.114	-0.025	(0)
CuCl4-2	3.418e-031	2.719e-031	-30.466	-30.566	-0.099	(0)
FeCl3	2.663e-032	2.663e-032	-31.575	-31.575	0.000	(0)
UCl+3	0.000e+000	0.000e+000	-46.451	-46.694	-0.243	(0)
Cu (1)	4.002e-010					
Cu+	3.844e-010	3.612e-010	-9.415	-9.442	-0.027	(0)
CuCl	1.574e-011	1.574e-011	-10.803	-10.803	0.000	(0)
CuCl2-	1.206e-013	1.138e-013	-12.919	-12.944	-0.025	(0)
CuCl3-2	1.058e-018	8.419e-019	-17.975	-18.075	-0.099	(0)
Cu (2)	1.326e-007					
CuCO3	1.009e-007	1.009e-007	-6.996	-6.996	0.000	(0)
CuOH+	1.815e-008	1.713e-008	-7.741	-7.766	-0.025	(0)
Cu+2	9.302e-009	7.375e-009	-8.031	-8.132	-0.101	(0)
Cu (OH) 2	2.509e-009	2.509e-009	-8.600	-8.600	0.000	(0)
Cu (CO3) 2-2	8.086e-010	6.306e-010	-9.092	-9.200	-0.108	(0)
CuSO4	5.638e-010	5.638e-010	-9.249	-9.249	0.000	(0)
CuHCO3+	3.364e-010	3.161e-010	-9.473	-9.500	-0.027	(0)
CuF+	2.640e-011	2.481e-011	-10.578	-10.605	-0.027	(0)
Cu2 (OH) 2+2	9.446e-012	7.367e-012	-11.025	-11.133	-0.108	(0)
Cu (OH) 3-	4.022e-012	3.779e-012	-11.396	-11.423	-0.027	(0)

	CuCl+	4.287e-013	4.045e-013	-12.368	-12.393	-0.025	(0)
	Cu(OH) 4-2	2.801e-017	2.184e-017	-16.553	-16.661	-0.108	(0)
	CuCl2	4.854e-018	4.854e-018	-17.314	-17.314	0.000	(0)
	CuCl3-	1.662e-024	1.568e-024	-23.779	-23.805	-0.025	(0)
	CuCl4-2	3.418e-031	2.719e-031	-30.466	-30.566	-0.099	(0)
F	5.756e-005						
	F-	5.651e-005	5.332e-005	-4.248	-4.273	-0.025	(0)
	MgF+	7.733e-007	7.300e-007	-6.112	-6.137	-0.025	(0)
	CaF+	2.736e-007	2.584e-007	-6.563	-6.588	-0.025	(0)
	NaF	4.040e-009	4.040e-009	-8.394	-8.394	0.000	(0)
	MnF+	2.172e-009	2.051e-009	-8.663	-8.688	-0.025	(0)
	HF	1.081e-009	1.081e-009	-8.966	-8.966	0.000	(0)
	ZnF+	2.982e-011	2.803e-011	-10.525	-10.552	-0.027	(0)
	CuF+	2.640e-011	2.481e-011	-10.578	-10.605	-0.027	(0)
	BF(OH) 3-	9.950e-012	9.375e-012	-11.002	-11.028	-0.026	(0)
	AlF2+	3.266e-012	3.086e-012	-11.486	-11.511	-0.025	(0)
	AlF3	2.071e-012	2.071e-012	-11.684	-11.684	0.000	(0)
	HF2-	2.324e-013	2.192e-013	-12.634	-12.659	-0.025	(0)
	AlF+2	1.825e-013	1.454e-013	-12.739	-12.838	-0.099	(0)
	UO2F+	1.570e-013	1.475e-013	-12.804	-12.831	-0.027	(0)
	AlF4-	5.864e-014	5.535e-014	-13.232	-13.257	-0.025	(0)
	UO2F2	2.269e-014	2.269e-014	-13.644	-13.644	0.000	(0)
	BF2(OH) 2-	7.777e-016	7.327e-016	-15.109	-15.135	-0.026	(0)
	UO2F3-	3.234e-016	3.039e-016	-15.490	-15.517	-0.027	(0)
	VO2F	5.514e-018	5.514e-018	-17.259	-17.259	0.000	(0)
	FeF2+	4.207e-018	3.973e-018	-17.376	-17.401	-0.025	(0)
	FeF+2	3.500e-018	2.785e-018	-17.456	-17.555	-0.099	(0)
	H2F2	3.133e-018	3.133e-018	-17.504	-17.504	0.000	(0)
	FeF3	2.989e-019	2.989e-019	-18.524	-18.524	0.000	(0)
	UO2F4-2	1.650e-019	1.287e-019	-18.782	-18.890	-0.108	(0)
	VO2F2-	1.136e-019	1.067e-019	-18.945	-18.972	-0.027	(0)
	VOF+	3.018e-020	2.836e-020	-19.520	-19.547	-0.027	(0)
	VOF2	5.670e-022	5.670e-022	-21.246	-21.246	0.000	(0)
	BF3OH-	2.212e-022	2.084e-022	-21.655	-21.681	-0.026	(0)
	VO2F3-2	9.104e-023	7.100e-023	-22.041	-22.149	-0.108	(0)
	VOF3-	1.141e-024	1.073e-024	-23.943	-23.970	-0.027	(0)
	VO2F4-3	3.259e-027	1.863e-027	-26.487	-26.730	-0.243	(0)
	BF4-	7.959e-028	7.498e-028	-27.099	-27.125	-0.026	(0)
	VOF4-2	2.960e-028	2.309e-028	-27.529	-27.637	-0.108	(0)
	UF3+	7.484e-036	7.033e-036	-35.126	-35.153	-0.027	(0)
	UF2+2	1.067e-036	8.322e-037	-35.972	-36.080	-0.108	(0)
	UF4	4.112e-038	4.112e-038	-37.386	-37.386	0.000	(0)
	UF+3	2.169e-039	1.240e-039	-38.664	-38.907	-0.243	(0)
	UF5-	0.000e+000	0.000e+000	-40.034	-40.061	-0.027	(0)
	UF6-2	0.000e+000	0.000e+000	-41.746	-41.854	-0.108	(0)
Fe (2)	7.200e-011						
	Fe+2	6.574e-011	5.127e-011	-10.182	-10.290	-0.108	(0)
	FeSO4	4.200e-012	4.200e-012	-11.377	-11.377	0.000	(0)
	FeOH+	1.587e-012	1.499e-012	-11.799	-11.824	-0.025	(0)
	FeHCO3+	4.639e-013	4.385e-013	-12.334	-12.358	-0.024	(0)
	Fe(OH) 2	8.743e-016	8.743e-016	-15.058	-15.058	0.000	(0)
	Fe(OH) 3-	2.150e-016	2.030e-016	-15.668	-15.692	-0.025	(0)
Fe (3)	1.228e-008						
	Fe(OH) 2+	6.829e-009	6.451e-009	-8.166	-8.190	-0.025	(0)
	Fe(OH) 3	5.088e-009	5.088e-009	-8.293	-8.293	0.000	(0)
	Fe(OH) 4-	3.682e-010	3.479e-010	-9.434	-9.459	-0.025	(0)
	FeOH+2	2.839e-014	2.258e-014	-13.547	-13.646	-0.099	(0)
	FeF2+	4.207e-018	3.973e-018	-17.376	-17.401	-0.025	(0)
	FeF+2	3.500e-018	2.785e-018	-17.456	-17.555	-0.099	(0)
	FeF3	2.989e-019	2.989e-019	-18.524	-18.524	0.000	(0)
	FeSO4+	1.888e-019	1.784e-019	-18.724	-18.749	-0.025	(0)
	Fe+3	8.031e-020	4.763e-020	-19.095	-19.322	-0.227	(0)
	Fe(SO4) 2-	1.354e-021	1.273e-021	-20.868	-20.895	-0.027	(0)
	FeCl+2	6.257e-023	4.978e-023	-22.204	-22.303	-0.099	(0)
	FeHSeO3+2	4.411e-025	3.440e-025	-24.355	-24.463	-0.108	(0)
	Fe2(OH) 2+4	4.565e-026	1.689e-026	-25.341	-25.772	-0.432	(0)
	FeCl2+	8.148e-027	7.695e-027	-26.089	-26.114	-0.025	(0)
	FeCl3	2.663e-032	2.663e-032	-31.575	-31.575	0.000	(0)

	Fe3(OH) 4+5	7.447e-033	1.575e-033	-32.128	-32.803	-0.675	(0)
H(0)	2.660e-027						
	H2	1.330e-027	1.331e-027	-26.876	-26.876	0.000	(0)
K	9.598e-005						
	K+	9.576e-005	9.036e-005	-4.019	-4.044	-0.025	(0)
	KSO4-	2.260e-007	2.135e-007	-6.646	-6.671	-0.025	(0)
Mg	1.633e-004						
	Mg+2	1.539e-004	1.220e-004	-3.813	-3.914	-0.101	(0)
	MgSO4	7.410e-006	7.410e-006	-5.130	-5.130	0.000	(0)
	MgHCO3+	8.991e-007	8.483e-007	-6.046	-6.071	-0.025	(0)
	MgF+	7.733e-007	7.300e-007	-6.112	-6.137	-0.025	(0)
	MgCO3	2.357e-007	2.357e-007	-6.628	-6.628	0.000	(0)
	MgOH+	3.772e-008	3.567e-008	-7.423	-7.448	-0.024	(0)
	MgH2BO3+	8.380e-011	7.896e-011	-10.077	-10.103	-0.026	(0)
Mn(2)	1.315e-006						
	Mn+2	1.239e-006	9.665e-007	-5.907	-6.015	-0.108	(0)
	MnSO4	5.735e-008	5.735e-008	-7.241	-7.241	0.000	(0)
	MnHCO3+	1.387e-008	1.310e-008	-7.858	-7.883	-0.025	(0)
	MnF+	2.172e-009	2.051e-009	-8.663	-8.688	-0.025	(0)
	MnOH+	1.888e-009	1.783e-009	-8.724	-8.749	-0.025	(0)
	MnCl+	4.458e-011	4.211e-011	-10.351	-10.376	-0.025	(0)
	MnCl2	2.058e-015	2.058e-015	-14.686	-14.686	0.000	(0)
	MnSeO4	1.357e-017	1.357e-017	-16.867	-16.867	0.000	(0)
	Mn(OH) 3-	6.290e-018	5.941e-018	-17.201	-17.226	-0.025	(0)
	MnCl3-	2.077e-020	1.962e-020	-19.682	-19.707	-0.025	(0)
	Mn(OH) 4-2	1.770e-023	1.408e-023	-22.752	-22.851	-0.099	(0)
	MnSe	3.823e-039	3.823e-039	-38.418	-38.418	0.000	(0)
Mn(3)	7.279e-028						
	Mn+3	7.279e-028	4.317e-028	-27.138	-27.365	-0.227	(0)
Mn(6)	0.000e+000						
	MnO4-2	0.000e+000	0.000e+000	-45.434	-45.534	-0.099	(0)
Mn(7)	0.000e+000						
	MnO4-	0.000e+000	0.000e+000	-50.880	-50.906	-0.026	(0)
Mo	5.421e-008						
	MoO4-2	5.419e-008	4.297e-008	-7.266	-7.367	-0.101	(0)
	HMoO4-	1.247e-011	1.172e-011	-10.904	-10.931	-0.027	(0)
	H2MoO4	1.177e-015	1.177e-015	-14.929	-14.929	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-51.708	-51.950	-0.243	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-60.509	-61.481	-0.972	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-62.283	-62.957	-0.675	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-65.606	-66.038	-0.432	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-70.412	-70.655	-0.243	(0)
Na	1.275e-004						
	Na+	1.273e-004	1.201e-004	-3.895	-3.921	-0.025	(0)
	NaSO4-	2.278e-007	2.152e-007	-6.642	-6.667	-0.025	(0)
	NaHCO3	4.588e-008	4.588e-008	-7.338	-7.338	0.000	(0)
	NaCO3-	5.498e-009	5.194e-009	-8.260	-8.285	-0.025	(0)
	NaF	4.040e-009	4.040e-009	-8.394	-8.394	0.000	(0)
	NaH2BO3	3.552e-012	3.552e-012	-11.450	-11.450	0.000	(0)
O(0)	5.718e-039						
	O2	2.859e-039	2.861e-039	-38.544	-38.544	0.000	(0)
S(6)	4.628e-004						
	SO4-2	4.209e-004	3.337e-004	-3.376	-3.477	-0.101	(0)
	CaSO4	3.395e-005	3.395e-005	-4.469	-4.469	0.000	(0)
	MgSO4	7.410e-006	7.410e-006	-5.130	-5.130	0.000	(0)
	NaSO4-	2.278e-007	2.152e-007	-6.642	-6.667	-0.025	(0)
	KSO4-	2.260e-007	2.135e-007	-6.646	-6.671	-0.025	(0)
	MnSO4	5.735e-008	5.735e-008	-7.241	-7.241	0.000	(0)
	ZnSO4	1.923e-009	1.923e-009	-8.716	-8.716	0.000	(0)
	CuSO4	5.638e-010	5.638e-010	-9.249	-9.249	0.000	(0)
	HSO4-	4.737e-010	4.472e-010	-9.324	-9.350	-0.025	(0)
	Zn(SO4) 2-2	7.168e-012	5.591e-012	-11.145	-11.253	-0.108	(0)
	FeSO4	4.200e-012	4.200e-012	-11.377	-11.377	0.000	(0)
	UO2SO4	1.013e-014	1.013e-014	-13.995	-13.995	0.000	(0)
	AlSO4+	7.482e-016	7.063e-016	-15.126	-15.151	-0.025	(0)
	UO2(SO4) 2-2	5.712e-017	4.455e-017	-16.243	-16.351	-0.108	(0)
	Al(SO4) 2-	2.675e-018	2.526e-018	-17.573	-17.598	-0.025	(0)
	VO2SO4-	5.000e-019	4.699e-019	-18.301	-18.328	-0.027	(0)

FeSO4+	1.888e-019	1.784e-019	-18.724	-18.749	-0.025	(0)
VOSO4	8.151e-021	8.151e-021	-20.089	-20.089	0.000	(0)
Fe (SO4) 2-	1.354e-021	1.273e-021	-20.868	-20.895	-0.027	(0)
VSO4+	1.388e-034	1.304e-034	-33.858	-33.885	-0.027	(0)
U (SO4) 2	0.000e+000	0.000e+000	-40.387	-40.387	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.702	-40.810	-0.108	(0)
Se (-2)	1.401e-035					
HSe-	1.401e-035	1.316e-035	-34.854	-34.881	-0.027	(0)
MnSe	3.823e-039	3.823e-039	-38.418	-38.418	0.000	(0)
H2Se	1.401e-039	1.401e-039	-38.854	-38.854	0.000	(0)
Se-2	0.000e+000	0.000e+000	-41.910	-42.018	-0.108	(0)
Se (4)	3.926e-009					
HSeO3-	2.909e-009	2.734e-009	-8.536	-8.563	-0.027	(0)
SeO3-2	1.018e-009	7.936e-010	-8.992	-9.100	-0.108	(0)
H2SeO3	1.599e-014	1.599e-014	-13.796	-13.796	0.000	(0)
FeHSeO3+2	4.411e-025	3.440e-025	-24.355	-24.463	-0.108	(0)
Se (6)	6.582e-014					
SeO4-2	6.580e-014	5.217e-014	-13.182	-13.283	-0.101	(0)
MnSeO4	1.357e-017	1.357e-017	-16.867	-16.867	0.000	(0)
ZnSeO4	2.129e-019	2.129e-019	-18.672	-18.672	0.000	(0)
HSeO4-	3.815e-020	3.585e-020	-19.419	-19.445	-0.027	(0)
Zn (SeO4) 2-2	1.444e-032	1.126e-032	-31.841	-31.948	-0.108	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-56.487	-56.730	-0.243	(0)
U (4)	1.941e-018					
U (OH) 5-	1.940e-018	1.823e-018	-17.712	-17.739	-0.027	(0)
U (OH) 4	1.047e-021	1.047e-021	-20.980	-20.980	0.000	(0)
U (OH) 3+	5.586e-026	5.250e-026	-25.253	-25.280	-0.027	(0)
U (OH) 2+2	4.268e-031	3.328e-031	-30.370	-30.478	-0.108	(0)
UF3+	7.484e-036	7.033e-036	-35.126	-35.153	-0.027	(0)
UF2+2	1.067e-036	8.322e-037	-35.972	-36.080	-0.108	(0)
UOH+3	3.761e-037	2.150e-037	-36.425	-36.668	-0.243	(0)
UF4	4.112e-038	4.112e-038	-37.386	-37.386	0.000	(0)
UF+3	2.169e-039	1.240e-039	-38.664	-38.907	-0.243	(0)
UF5-	0.000e+000	0.000e+000	-40.034	-40.061	-0.027	(0)
U (SO4) 2	0.000e+000	0.000e+000	-40.387	-40.387	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.702	-40.810	-0.108	(0)
UF6-2	0.000e+000	0.000e+000	-41.746	-41.854	-0.108	(0)
U+4	0.000e+000	0.000e+000	-43.502	-43.934	-0.432	(0)
UC1+3	0.000e+000	0.000e+000	-46.451	-46.694	-0.243	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-160.627	-162.813	-2.186	(0)
U (5)	1.300e-015					
UO2+	1.300e-015	1.222e-015	-14.886	-14.913	-0.027	(0)
U (6)	1.391e-008					
UO2 (CO3) 2-2	1.102e-008	8.592e-009	-7.958	-8.066	-0.108	(0)
UO2 (CO3) 3-4	2.704e-009	1.000e-009	-8.568	-9.000	-0.432	(0)
UO2CO3	1.854e-010	1.854e-010	-9.732	-9.732	0.000	(0)
UO2OH+	1.972e-012	1.853e-012	-11.705	-11.732	-0.027	(0)
UO2F+	1.570e-013	1.475e-013	-12.804	-12.831	-0.027	(0)
UO2+2	2.529e-014	2.005e-014	-13.597	-13.698	-0.101	(0)
UO2F2	2.269e-014	2.269e-014	-13.644	-13.644	0.000	(0)
UO2SO4	1.013e-014	1.013e-014	-13.995	-13.995	0.000	(0)
UO2F3-	3.234e-016	3.039e-016	-15.490	-15.517	-0.027	(0)
UO2 (SO4) 2-2	5.712e-017	4.455e-017	-16.243	-16.351	-0.108	(0)
(UO2) 2 (OH) 2+2	7.308e-018	5.700e-018	-17.136	-17.244	-0.108	(0)
(UO2) 3 (OH) 5+	4.598e-018	4.320e-018	-17.337	-17.364	-0.027	(0)
UO2C1+	1.197e-018	1.125e-018	-17.922	-17.949	-0.027	(0)
UO2F4-2	1.650e-019	1.287e-019	-18.782	-18.890	-0.108	(0)
V (2)	1.025e-040					
VOH+	1.025e-040	0.000e+000	-39.989	-40.016	-0.027	(0)
V+2	0.000e+000	0.000e+000	-41.284	-41.392	-0.108	(0)
V (3)	2.645e-013					
V (OH) 3	2.645e-013	2.645e-013	-12.578	-12.578	0.000	(0)
V (OH) 2+	2.493e-024	2.343e-024	-23.603	-23.630	-0.027	(0)
VOH+2	3.907e-028	3.047e-028	-27.408	-27.516	-0.108	(0)
V+3	1.449e-033	8.280e-034	-32.839	-33.082	-0.243	(0)
VSO4+	1.388e-034	1.304e-034	-33.858	-33.885	-0.027	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-52.451	-52.694	-0.243	(0)

V2 (OH) 2+4	0.000e+000	0.000e+000	-53.800	-54.232	-0.432	(0)
V (4)	1.398e-017					
V (OH) 3+	1.382e-017	1.299e-017	-16.859	-16.886	-0.027	(0)
VO+2	1.137e-019	8.868e-020	-18.944	-19.052	-0.108	(0)
VOF+	3.018e-020	2.836e-020	-19.520	-19.547	-0.027	(0)
VOSO4	8.151e-021	8.151e-021	-20.089	-20.089	0.000	(0)
VOF2	5.670e-022	5.670e-022	-21.246	-21.246	0.000	(0)
VOC1+	9.161e-024	8.609e-024	-23.038	-23.065	-0.027	(0)
VOF3-	1.141e-024	1.073e-024	-23.943	-23.970	-0.027	(0)
VOF4-2	2.960e-028	2.309e-028	-27.529	-27.637	-0.108	(0)
H2V2O4+2	1.085e-029	8.460e-030	-28.965	-29.073	-0.108	(0)
V (5)	2.042e-008					
H2VO4-	1.672e-008	1.572e-008	-7.777	-7.804	-0.027	(0)
HVO4-2	3.692e-009	2.879e-009	-8.433	-8.541	-0.108	(0)
H3VO4	2.155e-012	2.155e-012	-11.667	-11.667	0.000	(0)
H3V2O7-	2.327e-013	2.187e-013	-12.633	-12.660	-0.027	(0)
HV2O7-3	2.683e-014	1.533e-014	-13.571	-13.814	-0.243	(0)
VO4-3	1.841e-015	1.052e-015	-14.735	-14.978	-0.243	(0)
V2O7-4	8.136e-017	3.010e-017	-16.090	-16.521	-0.432	(0)
VO2+	6.249e-017	5.896e-017	-16.204	-16.229	-0.025	(0)
V3O9-3	7.113e-018	4.065e-018	-17.148	-17.391	-0.243	(0)
VO2F	5.514e-018	5.514e-018	-17.259	-17.259	0.000	(0)
VO2SO4-	5.000e-019	4.699e-019	-18.301	-18.328	-0.027	(0)
VO2F2-	1.136e-019	1.067e-019	-18.945	-18.972	-0.027	(0)
VO2F3-2	9.104e-023	7.100e-023	-22.041	-22.149	-0.108	(0)
V4O12-4	7.200e-023	2.664e-023	-22.143	-22.575	-0.432	(0)
VO2F4-3	3.259e-027	1.863e-027	-26.487	-26.730	-0.243	(0)
HV10O28-5	0.000e+000	0.000e+000	-59.584	-60.258	-0.675	(0)
V10O28-6	0.000e+000	0.000e+000	-59.610	-60.582	-0.972	(0)
H2V10O28-4	0.000e+000	0.000e+000	-62.482	-62.914	-0.432	(0)
Zn	4.160e-008					
Zn+2	3.323e-008	2.634e-008	-7.478	-7.579	-0.101	(0)
ZnCO3	3.521e-009	3.521e-009	-8.453	-8.453	0.000	(0)
ZnOH+	2.059e-009	1.935e-009	-8.686	-8.713	-0.027	(0)
ZnSO4	1.923e-009	1.923e-009	-8.716	-8.716	0.000	(0)
ZnHCO3+	6.023e-010	5.660e-010	-9.220	-9.247	-0.027	(0)
Zn (OH) 2	2.251e-010	2.251e-010	-9.648	-9.648	0.000	(0)
ZnF+	2.982e-011	2.803e-011	-10.525	-10.552	-0.027	(0)
Zn (SO4) 2-2	7.168e-012	5.591e-012	-11.145	-11.253	-0.108	(0)
ZnCl+	2.427e-012	2.290e-012	-11.615	-11.640	-0.025	(0)
ZnOHCl	2.202e-012	2.202e-012	-11.657	-11.657	0.000	(0)
Zn (OH) 3-	8.817e-013	8.286e-013	-12.055	-12.082	-0.027	(0)
ZnCl2	1.256e-016	1.256e-016	-15.901	-15.901	0.000	(0)
Zn (OH) 4-2	3.106e-017	2.422e-017	-16.508	-16.616	-0.108	(0)
ZnSeO4	2.129e-019	2.129e-019	-18.672	-18.672	0.000	(0)
ZnCl3-	3.660e-021	3.453e-021	-20.437	-20.462	-0.025	(0)
ZnCl4-2	7.511e-026	5.975e-026	-25.124	-25.224	-0.099	(0)
Zn (SeO4) 2-2	1.444e-032	1.126e-032	-31.841	-31.948	-0.108	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-2.78	8.02	10.80	Al (OH) 3
Al2 (MoO4) 3	-55.60	-53.23	2.37	Al2 (MoO4) 3
Al2O3	-3.60	16.05	19.65	Al2O3
Al4 (OH) 10SO4	-9.81	12.89	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.80	-7.00	4.80	AlAsO4:2H2O
AlOHSO4	-7.95	-11.18	-3.23	AlOHSO4
Alunite	-9.11	-10.51	-1.40	KAl3 (SO4) 2 (OH) 6
Anhydrite	-2.47	-6.83	-4.36	CaSO4
Antlerite	-5.21	3.58	8.79	Cu3 (OH) 4SO4
Aragonite	-0.69	-8.99	-8.30	CaCO3
Arsenolite	-76.63	-79.39	-2.76	As4O6
Artinite	-7.34	2.26	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-36.75	-30.04	6.71	As2O5
Atacamite	-4.53	2.86	7.39	Cu2 (OH) 3Cl
Azurite	-3.03	-19.94	-16.91	Cu3 (OH) 2 (CO3) 2

Ba(OH)2:8H2O	-15.95	8.44	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.72	0.15	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	4.19	-4.72	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-24.35	8.59	32.94	Ba3(VO4)2:4H2O
BaF2	-10.01	-15.83	-5.82	BaF2
BaMoO4	-7.69	-14.65	-6.96	BaMoO4
Barite	-0.78	-10.76	-9.98	BaSO4
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-13.11	-20.57	-7.46	BaSeO4
Bianchite	-9.29	-11.06	-1.76	ZnSO4:6H2O
Birnessite	-10.00	8.09	18.09	MnO2
Bixbyite	-6.91	-7.55	-0.64	Mn2O3
Boehmite	-0.55	8.02	8.58	AlOOH
Brochantite	-4.05	11.17	15.22	Cu4(OH)6SO4
Brucite	-5.03	11.81	16.84	Mg(OH)2
Ca(VO3)2	-10.02	-4.36	5.66	Ca(VO3)2
Ca2V2O7	-9.49	8.01	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.54	8.01	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.22	7.08	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.57	20.39	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-19.47	20.39	39.86	Ca3(VO4)2:4H2O
Calcite	-0.51	-8.99	-8.48	CaCO3
CaMoO4	-2.77	-10.72	-7.95	CaMoO4
Carnotite	-2.75	-2.52	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.05	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.62	-16.64	-3.02	CaSeO4:2H2O
CH4(g)	-75.22	-116.26	-41.05	CH4
Chalcanthite	-8.97	-11.61	-2.64	CuSO4:5H2O
Claudetite	-76.33	-79.39	-3.06	As4O6
CO2(g)	-3.21	-21.36	-18.15	CO2
Cryolite	-19.12	-52.96	-33.84	Na3AlF6
Cu(OH)2	-1.08	7.59	8.67	Cu(OH)2
Cu2Se(alpha)	-0.10	-45.90	-45.80	Cu2Se
Cu2SO4	-20.41	-22.36	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.36	-7.26	6.10	Cu3(AsO4)2:2H2O
Cu3Se2	-17.56	-81.05	-63.49	Cu3Se2
CuCO3	-2.27	-13.77	-11.50	CuCO3
CuF	-8.81	-13.72	-4.91	CuF
CuF2	-17.79	-16.68	1.12	CuF2
CuF2:2H2O	-12.13	-16.68	-4.55	CuF2:2H2O
Cumetal	-4.69	-13.44	-8.76	Cu
CuMoO4	-2.42	-15.50	-13.08	CuMoO4
CuOCuSO4	-14.32	-4.02	10.30	CuOCuSO4
Cupricferrite	10.14	16.13	5.99	CuFe2O4
Cuprite	-1.75	-3.16	-1.41	Cu2O
Cuprousferrite	11.60	2.69	-8.92	CuFeO2
CuSe	-2.05	-35.15	-33.10	CuSe
CuSe2	-20.80	-54.17	-33.37	CuSe2
CuSeO3:2H2O	-9.34	-8.83	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.97	-21.41	-2.44	CuSeO4:5H2O
CuSO4	-14.55	-11.61	2.94	CuSO4
Diaspore	1.15	8.02	6.87	AlOOH
Dolomite(disordered)	-1.99	-18.53	-16.54	CaMg(CO3)2
Dolomite(ordered)	-1.44	-18.53	-17.09	CaMg(CO3)2
Epsomite	-5.26	-7.39	-2.13	MgSO4:7H2O
Fe(OH)2	-8.13	5.44	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	3.61	0.57	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-7.58	-11.30	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.45	-7.89	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.12	-40.75	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.34	-49.07	-3.73	Fe2(SO4)3
Fe3(OH)8	-6.25	13.97	20.22	Fe3(OH)8
FeAsO4:2H2O	-11.15	-10.75	0.40	FeAsO4:2H2O
FeMoO4	-7.57	-17.66	-10.09	FeMoO4
Ferrihydrite	1.08	4.27	3.19	Fe(OH)3
Ferroselite	-37.73	-56.33	-18.60	FeSe2
FeSe	-26.31	-37.31	-11.00	FeSe
Fluorite	-1.40	-11.90	-10.50	CaF2

Gibbsite	-0.27	8.02	8.29	Al (OH) 3
Goethite	3.78	4.27	0.49	FeOOH
Goslarite	-9.04	-11.06	-2.01	ZnSO4:7H2O
Gummite	-5.64	2.03	7.67	UO3
Gypsum	-2.22	-6.83	-4.61	CaSO4:2H2O
H-Jarosite	-13.51	-25.61	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.22	-23.09	-12.88	H2MoO4
H2Se (g)	-37.78	-42.74	-4.96	H2Se
Halite	-9.98	-8.38	1.60	NaCl
Hausmannite	-8.17	52.86	61.03	Mn3O4
Hematite	9.95	8.53	-1.42	Fe2O3
Hercynite	-1.41	21.48	22.89	FeAl2O4
Huntite	-7.66	-37.63	-29.97	CaMg3 (CO3) 4
Hydromagnesite	-17.61	-26.38	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-21.39	-26.56	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.99	-21.79	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-18.72	-15.45	3.26	K2MoO4
K2SeO4	-20.64	-21.37	-0.73	K2SeO4
Langite	-6.32	11.17	17.49	Cu4 (OH) 6SO4:H2O
Lepidocrocite	2.90	4.27	1.37	FeOOH
Lime	-20.33	12.37	32.70	CaO
Maghemite	2.15	8.53	6.39	Fe2O3
Magnesioferrite	3.49	20.35	16.86	Fe2MgO4
Magnesite	-2.09	-9.55	-7.46	MgCO3
Magnetite	10.57	13.97	3.40	Fe3O4
Malachite	-0.87	-6.17	-5.31	Cu2 (OH) 2CO3
Manganite	-3.77	21.57	25.34	MnOOH
Melanothallite	-23.31	-17.05	6.26	CuCl2
Melanterite	-11.56	-13.77	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-6.98	11.81	18.79	Mg (OH) 2
Mg (VO3) 2	-16.20	-4.92	11.28	Mg (VO3) 2
Mg2V2O7	-19.47	6.89	26.36	Mg2V2O7
MgF2	-4.33	-12.46	-8.13	MgF2
MgMoO4	-9.43	-11.28	-1.85	MgMoO4
MgSeO3:6H2O	-7.67	-4.61	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.00	-17.20	-1.20	MgSeO4:6H2O
Mirabilite	-10.20	-11.32	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.92	-7.02	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-59.45	-65.16	-5.71	Mn2 (SO4) 3
Mn3 (AsO4) 2:8H2O	-13.41	-0.91	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-17.65	-14.94	2.72	MnCl2:4H2O
MnSe	-36.53	-33.03	3.50	MnSe
MnSeO3	-7.85	-6.72	1.13	MnSeO3
MnSeO3:2H2O	-7.70	-6.72	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.25	-19.30	-2.05	MnSeO4:5H2O
MnSO4	-12.07	-9.49	2.58	MnSO4
MoO3	-15.09	-23.09	-8.00	MoO3
Na-Jarosite	-10.46	-21.66	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-21.70	-38.30	-16.60	Na2Mo2O7
Na2MoO4	-16.70	-15.21	1.49	Na2MoO4
Na2MoO4:2H2O	-16.43	-15.21	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.84	-8.54	10.30	Na2SeO3:5H2O
Na2SeO4	-22.40	-21.12	1.28	Na2SeO4
Na3VO4	-33.22	3.46	36.68	Na3VO4
Na4V2O7	-38.36	-0.96	37.40	Na4V2O7
Nantokite	-7.17	-13.90	-6.73	CuCl
Natron	-12.16	-13.48	-1.31	Na2CO3:10H2O
NaVO3	-8.28	-4.42	3.86	NaVO3
Nesquehonite	-4.88	-9.55	-4.67	MgCO3:3H2O
Nsutite	-9.42	8.09	17.50	MnO2
O2 (g)	-35.64	47.45	83.09	O2
Periclase	-9.77	11.81	21.58	MgO
Portlandite	-10.43	12.37	22.80	Ca (OH) 2
Pyrochroite	-5.48	9.71	15.19	Mn (OH) 2
Pyrolusite	-7.94	33.44	41.38	MnO2
Rhodochrosite	-1.07	-11.65	-10.58	MnCO3
Rutherfordine	-4.83	-19.33	-14.50	UO2CO3
Schoepite	-3.97	2.03	5.99	UO2 (OH) 2:H2O

Semetal (am)	-11.91	-19.02	-7.11	Se
Semetal (hex)	-11.31	-19.02	-7.71	Se
SeO2	-16.55	-16.43	0.12	SeO2
SeO3	-50.05	-29.01	21.04	SeO3
Siderite	-5.68	-15.92	-10.24	FeCO3
Smithsonite	-3.21	-13.21	-10.00	ZnCO3
Spinel	-8.99	27.86	36.85	MgAl2O4
Tenorite	-0.05	7.59	7.64	CuO
Thenardite	-11.64	-11.32	0.32	Na2SO4
Thermonatrite	-14.11	-13.48	0.64	Na2CO3:H2O
Tyuyamunite	-4.38	-0.30	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.08	10.01	21.08	U3O8
U4O9	-23.18	-26.20	-3.02	U4O9
UF4	-31.49	-61.03	-29.54	UF4
UF4:2.5H2O	-28.31	-61.03	-32.72	UF4:2.5H2O
UO2 (am)	-13.42	-12.48	0.93	UO2
UO2 (OH) 2 (beta)	-3.58	2.03	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.73	-26.98	-2.25	UO2SeO4:4H2O
UO3	-5.67	2.03	7.70	UO3
Uraninite	-7.81	-12.48	-4.67	UO2
V (OH) 3	-17.08	-9.49	7.59	V (OH) 3
V2O5	-15.37	-16.73	-1.36	V2O5
V3O5	-35.54	-33.71	1.84	V3O5
V4O7	-44.22	-37.03	7.19	V4O7
V6O13	-36.79	-97.65	-60.86	V6O13
VC12	-64.88	-46.00	18.87	VC12
VC13	-69.90	-46.46	23.43	VC13
VF4	-66.80	-51.87	14.93	VF4
Vmetal	-89.11	-45.08	44.03	V
VO	-36.11	-21.36	14.76	VO
VO (OH) 2	-8.48	-3.33	5.15	VO (OH) 2
VO2Cl	-23.53	-20.69	2.84	VO2Cl
VOC1	-32.97	-21.82	11.15	VOC1
VOC12	-40.73	-27.97	12.76	VOC12
VOSO4	-26.14	-22.53	3.61	VOSO4
Witherite	-4.35	-12.92	-8.57	BaCO3
Zincite	-3.19	8.15	11.33	ZnO
Zincosite	-14.99	-11.06	3.93	ZnSO4
Zn (BO2) 2	-12.86	-4.57	8.29	Zn (BO2) 2
Zn (OH) 2	-4.05	8.15	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.33	8.15	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.61	8.15	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.39	8.15	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.59	8.15	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.41	-2.91	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.22	3.97	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.25	-5.60	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-32.88	-13.97	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.02	13.38	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-22.42	16.08	38.50	Zn5 (OH) 8Cl2
ZnCl2	-23.55	-16.50	7.05	ZnCl2
ZnCO3:1H2O	-2.95	-13.21	-10.26	ZnCO3:1H2O
ZnF2	-15.59	-16.13	-0.53	ZnF2
Znmetal	-41.37	-15.58	25.79	Zn
ZnMoO4	-4.82	-14.95	-10.13	ZnMoO4
ZnO (active)	-3.04	8.15	11.19	ZnO
ZnSe	-20.20	-34.60	-14.40	ZnSe
ZnSeO4:6H2O	-19.34	-20.86	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.42	-11.06	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 11.

SOLUTION 9 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

temp 25
 pH 5.74453
 pe 4
 redox pe
 units mg/l
 density 1
 Alkalinity 12.24514 as HCO3
 Al 0.03731
 B 0.00502
 Ba 0.03480
 Ca 6.31963
 Cd 0.00034
 Cl 0.71113
 Cu 0.38402
 F 0.43171
 Fe 0.00394
 Hg 0.000016
 K 1.83523
 Mg 0.97828
 Mn 0.01787
 Mo 0.00203
 Na 1.69417 charge
 Pb 0.00164
 S(6) 14.90873 as SO4
 Se 0.00025
 U 0.00462
 V 0.00050
 Zn 0.01538
 water 1 # kg

END

 Beginning of initial solution calculations.

Initial solution 9. Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

-----Solution composition-----

Elements	Molality	Moles	
Al	1.383e-006	1.383e-006	
Alkalinity	2.007e-004	2.007e-004	
B	4.644e-007	4.644e-007	
Ba	2.534e-007	2.534e-007	
Ca	1.577e-004	1.577e-004	
Cd	3.025e-009	3.025e-009	
Cl	2.006e-005	2.006e-005	
Cu	6.043e-006	6.043e-006	
F	2.272e-005	2.272e-005	
Fe	7.055e-008	7.055e-008	
Hg	7.977e-011	7.977e-011	
K	4.694e-005	4.694e-005	
Mg	4.025e-005	4.025e-005	
Mn	3.253e-007	3.253e-007	
Mo	2.116e-008	2.116e-008	
Na	9.327e-005	9.327e-005	Charge balance
Pb	7.915e-009	7.915e-009	
S(6)	1.552e-004	1.552e-004	
Se	3.166e-009	3.166e-009	
U	1.941e-008	1.941e-008	
V	9.816e-009	9.816e-009	
Zn	2.352e-007	2.352e-007	

-----Description of solution-----

pH = 5.745
 pe = 4.000
 Activity of water = 1.000
 Ionic strength = 8.906e-004
 Mass of water (kg) = 1.000e+000
 Total carbon (mol/kg) = 9.917e-004
 Total CO2 (mol/kg) = 9.917e-004
 Temperature (deg C) = 25.00
 Electrical balance (eq) = -3.346e-019
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
 Iterations = 14
 Total H = 1.110155e+002
 Total O = 5.551043e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.863e-006	1.801e-006	-5.730	-5.745	-0.015	0.00
OH-	5.784e-009	5.591e-009	-8.238	-8.252	-0.015	(0)
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	1.383e-006					
AlF2+	9.833e-007	9.511e-007	-6.007	-6.022	-0.014	(0)
AlF3	2.287e-007	2.287e-007	-6.641	-6.641	0.000	(0)
AlF+2	1.429e-007	1.251e-007	-6.845	-6.903	-0.058	(0)
Al(OH)2+	1.681e-008	1.626e-008	-7.774	-7.789	-0.014	(0)
AlOH+2	4.183e-009	3.662e-009	-8.378	-8.436	-0.058	(0)
AlF4-	2.264e-009	2.189e-009	-8.645	-8.660	-0.015	(0)
Al(OH)3	1.814e-009	1.814e-009	-8.741	-8.741	0.000	(0)
Al(OH)4-	1.321e-009	1.277e-009	-8.879	-8.894	-0.015	(0)
Al+3	8.871e-010	6.549e-010	-9.052	-9.184	-0.132	(0)
AlSO4+	6.894e-010	6.667e-010	-9.162	-9.176	-0.015	(0)
Al(SO4)2-	9.687e-013	9.367e-013	-12.014	-12.028	-0.015	(0)
AlMo6O21-3	9.907e-036	7.227e-036	-35.004	-35.141	-0.137	(0)
B	4.644e-007					
H3BO3	4.642e-007	4.643e-007	-6.333	-6.333	0.000	(0)
H2BO3-	1.550e-010	1.497e-010	-9.810	-9.825	-0.015	(0)
BF(OH)3-	3.662e-012	3.539e-012	-11.436	-11.451	-0.015	(0)
CaH2BO3+	1.193e-012	1.153e-012	-11.923	-11.938	-0.015	(0)
MgH2BO3+	1.845e-013	1.782e-013	-12.734	-12.749	-0.015	(0)
NaH2BO3	2.138e-014	2.138e-014	-13.670	-13.670	0.000	(0)
BF2(OH)2-	1.347e-014	1.301e-014	-13.871	-13.886	-0.015	(0)
BaH2BO3+	1.059e-015	1.023e-015	-14.975	-14.990	-0.015	(0)
H5(BO3)2-	6.124e-017	5.918e-017	-16.213	-16.228	-0.015	(0)
BF3OH-	1.802e-019	1.741e-019	-18.744	-18.759	-0.015	(0)
H8(BO3)3-	2.844e-021	2.748e-021	-20.546	-20.561	-0.015	(0)
BF4-	3.050e-023	2.947e-023	-22.516	-22.531	-0.015	(0)
Ba	2.534e-007					
Ba+2	2.530e-007	2.211e-007	-6.597	-6.655	-0.059	(0)
BaHCO3+	4.253e-010	4.115e-010	-9.371	-9.386	-0.014	(0)
BaCO3	5.753e-013	5.753e-013	-12.240	-12.240	0.000	(0)
BaOH+	5.579e-015	5.396e-015	-14.253	-14.268	-0.015	(0)
BaH2BO3+	1.059e-015	1.023e-015	-14.975	-14.990	-0.015	(0)
C(4)	9.917e-004					
H2CO3	7.894e-004	7.894e-004	-3.103	-3.103	0.000	(0)
HCO3-	2.015e-004	1.949e-004	-3.696	-3.710	-0.014	(0)
CaHCO3+	5.020e-007	4.857e-007	-6.299	-6.314	-0.014	(0)
CuCO3	1.401e-007	1.401e-007	-6.853	-6.853	0.000	(0)
MgHCO3+	7.082e-008	6.847e-008	-7.150	-7.165	-0.015	(0)
CuHCO3+	5.973e-008	5.767e-008	-7.224	-7.239	-0.015	(0)
UO2CO3	1.422e-008	1.422e-008	-7.847	-7.847	0.000	(0)
NaHCO3	9.876e-009	9.876e-009	-8.005	-8.005	0.000	(0)
CO3-2	5.807e-009	5.074e-009	-8.236	-8.295	-0.059	(0)
UO2(CO3)2-2	1.657e-009	1.440e-009	-8.781	-8.842	-0.061	(0)
ZnHCO3+	1.272e-009	1.228e-009	-8.896	-8.911	-0.015	(0)
MnHCO3+	1.110e-009	1.073e-009	-8.955	-8.969	-0.015	(0)

	CaCO3	1.076e-009	1.076e-009	-8.968	-8.968	0.000	(0)
	PbHCO3+	8.538e-010	8.244e-010	-9.069	-9.084	-0.015	(0)
	BaHCO3+	4.253e-010	4.115e-010	-9.371	-9.386	-0.014	(0)
	FeHCO3+	1.500e-010	1.451e-010	-9.824	-9.838	-0.014	(0)
	MgCO3	1.449e-010	1.449e-010	-9.839	-9.839	0.000	(0)
	PbCO3	8.682e-011	8.682e-011	-10.061	-10.061	0.000	(0)
	ZnCO3	5.816e-011	5.816e-011	-10.235	-10.235	0.000	(0)
	NaCO3-	8.801e-012	8.513e-012	-11.055	-11.070	-0.014	(0)
	Cu (CO3) 2-2	2.202e-012	1.914e-012	-11.657	-11.718	-0.061	(0)
	CdHCO3+	1.180e-012	1.139e-012	-11.928	-11.943	-0.015	(0)
	UO2 (CO3) 3-4	6.416e-013	3.662e-013	-12.193	-12.436	-0.244	(0)
	BaCO3	5.753e-013	5.753e-013	-12.240	-12.240	0.000	(0)
	CdCO3	2.970e-013	2.970e-013	-12.527	-12.527	0.000	(0)
	Pb (CO3) 2-2	1.462e-015	1.271e-015	-14.835	-14.896	-0.061	(0)
	Cd (CO3) 2-2	1.285e-018	1.117e-018	-17.891	-17.952	-0.061	(0)
	HgCO3	5.248e-021	5.248e-021	-20.280	-20.280	0.000	(0)
	HgHCO3+	1.823e-022	1.760e-022	-21.739	-21.755	-0.015	(0)
	Hg (CO3) 2-2	9.688e-026	8.421e-026	-25.014	-25.075	-0.061	(0)
Ca	1.577e-004						
	Ca+2	1.531e-004	1.338e-004	-3.815	-3.873	-0.059	(0)
	CaSO4	4.020e-006	4.020e-006	-5.396	-5.396	0.000	(0)
	CaHCO3+	5.020e-007	4.857e-007	-6.299	-6.314	-0.014	(0)
	CaF+	2.884e-008	2.790e-008	-7.540	-7.554	-0.015	(0)
	CaCO3	1.076e-009	1.076e-009	-8.968	-8.968	0.000	(0)
	CaOH+	1.543e-011	1.493e-011	-10.812	-10.826	-0.014	(0)
	CaH2BO3+	1.193e-012	1.153e-012	-11.923	-11.938	-0.015	(0)
Cd	3.025e-009						
	Cd+2	2.938e-009	2.568e-009	-8.532	-8.590	-0.059	(0)
	CdSO4	7.893e-011	7.893e-011	-10.103	-10.103	0.000	(0)
	CdCl+	4.924e-012	4.754e-012	-11.308	-11.323	-0.015	(0)
	CdHCO3+	1.180e-012	1.139e-012	-11.928	-11.943	-0.015	(0)
	CdF+	8.050e-013	7.772e-013	-12.094	-12.109	-0.015	(0)
	CdCO3	2.970e-013	2.970e-013	-12.527	-12.527	0.000	(0)
	Cd (SO4) 2-2	1.606e-013	1.396e-013	-12.794	-12.855	-0.061	(0)
	CdOH+	1.181e-013	1.140e-013	-12.928	-12.943	-0.015	(0)
	CdOHC1	1.090e-015	1.090e-015	-14.962	-14.962	0.000	(0)
	CdCl2	3.843e-016	3.843e-016	-15.415	-15.415	0.000	(0)
	CdF2	2.962e-017	2.962e-017	-16.528	-16.528	0.000	(0)
	Cd (OH) 2	4.023e-018	4.023e-018	-17.395	-17.395	0.000	(0)
	Cd (CO3) 2-2	1.285e-018	1.117e-018	-17.891	-17.952	-0.061	(0)
	CdCl3-	4.868e-021	4.701e-021	-20.313	-20.328	-0.015	(0)
	Cd2OH+3	2.012e-021	1.468e-021	-20.696	-20.833	-0.137	(0)
	Cd (OH) 3-	1.423e-024	1.374e-024	-23.847	-23.862	-0.015	(0)
	Cd (SeO3) 2-2	1.105e-025	9.605e-026	-24.957	-25.018	-0.061	(0)
	CdSeO4	1.228e-026	1.228e-026	-25.911	-25.911	0.000	(0)
	Cd (OH) 4-2	1.447e-033	1.258e-033	-32.840	-32.900	-0.061	(0)
Cl	2.006e-005						
	Cl-	2.005e-005	1.939e-005	-4.698	-4.712	-0.015	(0)
	CuCl	5.607e-009	5.607e-009	-8.251	-8.251	0.000	(0)
	CuCl+	1.491e-010	1.441e-010	-9.827	-9.841	-0.015	(0)
	CuCl2-	2.349e-011	2.271e-011	-10.629	-10.644	-0.015	(0)
	ZnCl+	1.003e-011	9.701e-012	-10.999	-11.013	-0.015	(0)
	MnCl+	6.965e-012	6.736e-012	-11.157	-11.172	-0.015	(0)
	CdCl+	4.924e-012	4.754e-012	-11.308	-11.323	-0.015	(0)
	PbCl+	4.055e-012	3.916e-012	-11.392	-11.407	-0.015	(0)
	ZnOHC1	7.101e-014	7.101e-014	-13.149	-13.149	0.000	(0)
	UO2Cl+	2.293e-014	2.214e-014	-13.640	-13.655	-0.015	(0)
	CdOHC1	1.090e-015	1.090e-015	-14.962	-14.962	0.000	(0)
	CuCl2	9.688e-016	9.688e-016	-15.014	-15.014	0.000	(0)
	CdCl2	3.843e-016	3.843e-016	-15.415	-15.415	0.000	(0)
	PbCl2	3.391e-016	3.391e-016	-15.470	-15.470	0.000	(0)
	ZnCl2	2.981e-016	2.981e-016	-15.526	-15.526	0.000	(0)
	MnCl2	1.845e-016	1.845e-016	-15.734	-15.734	0.000	(0)
	CuCl3-2	1.076e-016	9.414e-017	-15.968	-16.026	-0.058	(0)
	VOCl+	2.369e-017	2.287e-017	-16.625	-16.641	-0.015	(0)
	HgClOH	1.655e-019	1.655e-019	-18.781	-18.781	0.000	(0)
	FeCl+2	3.677e-020	3.217e-020	-19.435	-19.493	-0.058	(0)
	HgCl2	3.249e-020	3.249e-020	-19.488	-19.488	0.000	(0)

CdCl3-	4.868e-021	4.701e-021	-20.313	-20.328	-0.015	(0)
ZnCl3-	4.749e-021	4.591e-021	-20.323	-20.338	-0.015	(0)
PbCl3-	2.711e-021	2.618e-021	-20.567	-20.582	-0.015	(0)
MnCl3-	1.019e-021	9.852e-022	-20.992	-21.006	-0.015	(0)
HgCl+	3.463e-022	3.343e-022	-21.461	-21.476	-0.015	(0)
CuCl3-	1.813e-022	1.753e-022	-21.742	-21.756	-0.015	(0)
HgCl3-	6.523e-024	6.299e-024	-23.186	-23.201	-0.015	(0)
FeCl2+	2.880e-024	2.786e-024	-23.541	-23.555	-0.015	(0)
ZnCl4-2	5.087e-026	4.451e-026	-25.294	-25.352	-0.058	(0)
PbCl4-2	2.669e-026	2.320e-026	-25.574	-25.635	-0.061	(0)
HgCl4-2	5.594e-028	4.862e-028	-27.252	-27.313	-0.061	(0)
CuCl4-2	1.947e-029	1.703e-029	-28.711	-28.769	-0.058	(0)
FeCl3	5.401e-030	5.401e-030	-29.268	-29.268	0.000	(0)
UCl+3	1.622e-034	1.183e-034	-33.790	-33.927	-0.137	(0)
Cu (1)	2.435e-007					
Cu+	2.379e-007	2.297e-007	-6.624	-6.639	-0.015	(0)
CuCl	5.607e-009	5.607e-009	-8.251	-8.251	0.000	(0)
CuCl2-	2.349e-011	2.271e-011	-10.629	-10.644	-0.015	(0)
CuCl3-2	1.076e-016	9.414e-017	-15.968	-16.026	-0.058	(0)
Cu (2)	5.800e-006					
Cu+2	5.367e-006	4.690e-006	-5.270	-5.329	-0.059	(0)
CuSO4	1.409e-007	1.409e-007	-6.851	-6.851	0.000	(0)
CuCO3	1.401e-007	1.401e-007	-6.853	-6.853	0.000	(0)
CuOH+	8.577e-008	8.292e-008	-7.067	-7.081	-0.015	(0)
CuHCO3+	5.973e-008	5.767e-008	-7.224	-7.239	-0.015	(0)
CuF+	5.853e-009	5.652e-009	-8.233	-8.248	-0.015	(0)
Cu2 (OH) 2+2	1.987e-010	1.727e-010	-9.702	-9.763	-0.061	(0)
CuCl+	1.491e-010	1.441e-010	-9.827	-9.841	-0.015	(0)
Cu (OH) 2	9.251e-011	9.251e-011	-10.034	-10.034	0.000	(0)
Cu (CO3) 2-2	2.202e-012	1.914e-012	-11.657	-11.718	-0.061	(0)
Cu (OH) 3-	1.099e-015	1.061e-015	-14.959	-14.974	-0.015	(0)
CuCl2	9.688e-016	9.688e-016	-15.014	-15.014	0.000	(0)
CuCl3-	1.813e-022	1.753e-022	-21.742	-21.756	-0.015	(0)
Cu (OH) 4-2	5.372e-023	4.669e-023	-22.270	-22.331	-0.061	(0)
CuCl4-2	1.947e-029	1.703e-029	-28.711	-28.769	-0.058	(0)
F	2.272e-005					
F-	1.975e-005	1.910e-005	-4.704	-4.719	-0.015	(0)
AlF2+	9.833e-007	9.511e-007	-6.007	-6.022	-0.014	(0)
AlF3	2.287e-007	2.287e-007	-6.641	-6.641	0.000	(0)
AlF+2	1.429e-007	1.251e-007	-6.845	-6.903	-0.058	(0)
MgF+	7.608e-008	7.357e-008	-7.119	-7.133	-0.015	(0)
HF	5.087e-008	5.087e-008	-7.294	-7.294	0.000	(0)
CaF+	2.884e-008	2.790e-008	-7.540	-7.554	-0.015	(0)
CuF+	5.853e-009	5.652e-009	-8.233	-8.248	-0.015	(0)
AlF4-	2.264e-009	2.189e-009	-8.645	-8.660	-0.015	(0)
UO2F+	1.923e-009	1.856e-009	-8.716	-8.731	-0.015	(0)
NaF	1.086e-009	1.086e-009	-8.964	-8.964	0.000	(0)
MnF+	2.170e-010	2.098e-010	-9.664	-9.678	-0.015	(0)
UO2F2	1.023e-010	1.023e-010	-9.990	-9.990	0.000	(0)
ZnF+	7.862e-011	7.591e-011	-10.104	-10.120	-0.015	(0)
PbF+	7.935e-012	7.661e-012	-11.100	-11.116	-0.015	(0)
HF2-	3.822e-012	3.694e-012	-11.418	-11.432	-0.015	(0)
BF (OH) 3-	3.662e-012	3.539e-012	-11.436	-11.451	-0.015	(0)
CdF+	8.050e-013	7.772e-013	-12.094	-12.109	-0.015	(0)
UO2F3-	5.081e-013	4.906e-013	-12.294	-12.309	-0.015	(0)
VOF+	4.990e-014	4.818e-014	-13.302	-13.317	-0.015	(0)
BF2 (OH) 2-	1.347e-014	1.301e-014	-13.871	-13.886	-0.015	(0)
H2F2	6.934e-015	6.934e-015	-14.159	-14.159	0.000	(0)
PbF2	2.880e-015	2.880e-015	-14.541	-14.541	0.000	(0)
FeF+2	1.315e-015	1.150e-015	-14.881	-14.939	-0.058	(0)
FeF2+	6.080e-016	5.880e-016	-15.216	-15.231	-0.015	(0)
VO2F	5.431e-016	5.431e-016	-15.265	-15.265	0.000	(0)
VOF2	3.450e-016	3.450e-016	-15.462	-15.462	0.000	(0)
UO2F4-2	8.563e-017	7.443e-017	-16.067	-16.128	-0.061	(0)
CdF2	2.962e-017	2.962e-017	-16.528	-16.528	0.000	(0)
FeF3	1.585e-017	1.585e-017	-16.800	-16.800	0.000	(0)
VO2F2-	3.901e-018	3.766e-018	-17.409	-17.424	-0.015	(0)
VOF3-	2.422e-019	2.338e-019	-18.616	-18.631	-0.015	(0)

BF3OH-	1.802e-019	1.741e-019	-18.744	-18.759	-0.015	(0)
PbF3-	1.080e-019	1.043e-019	-18.966	-18.982	-0.015	(0)
VO2F3-2	1.032e-021	8.973e-022	-20.986	-21.047	-0.061	(0)
BF4-	3.050e-023	2.947e-023	-22.516	-22.531	-0.015	(0)
VOF4-2	2.074e-023	1.803e-023	-22.683	-22.744	-0.061	(0)
UF3+	3.498e-024	3.378e-024	-23.456	-23.471	-0.015	(0)
UF2+2	1.284e-024	1.116e-024	-23.892	-23.952	-0.061	(0)
PbF4-2	1.097e-024	9.536e-025	-23.960	-24.021	-0.061	(0)
VO2F4-3	1.156e-026	8.433e-027	-25.937	-26.074	-0.137	(0)
UF4	7.073e-027	7.073e-027	-26.150	-26.150	0.000	(0)
UF+3	6.361e-027	4.640e-027	-26.196	-26.333	-0.137	(0)
HgF+	6.337e-028	6.119e-028	-27.198	-27.213	-0.015	(0)
UF5-	5.545e-030	5.354e-030	-29.256	-29.271	-0.015	(0)
UF6-2	3.553e-032	3.088e-032	-31.449	-31.510	-0.061	(0)
Fe (2)	7.010e-008					
Fe+2	6.804e-008	5.914e-008	-7.167	-7.228	-0.061	(0)
FeSO4	1.904e-009	1.904e-009	-8.720	-8.720	0.000	(0)
FeHCO3+	1.500e-010	1.451e-010	-9.824	-9.838	-0.014	(0)
FeOH+	1.361e-011	1.316e-011	-10.866	-10.881	-0.015	(0)
Fe (OH) 2	5.847e-017	5.847e-017	-16.233	-16.233	0.000	(0)
Fe (OH) 3-	1.069e-019	1.034e-019	-18.971	-18.986	-0.015	(0)
Fe (3)	4.488e-010					
Fe (OH) 2+	4.460e-010	4.314e-010	-9.351	-9.365	-0.014	(0)
Fe (OH) 3	2.591e-012	2.591e-012	-11.587	-11.587	0.000	(0)
FeOH+2	2.267e-013	1.983e-013	-12.645	-12.703	-0.058	(0)
Fe (OH) 4-	1.394e-015	1.349e-015	-14.856	-14.870	-0.014	(0)
FeF+2	1.315e-015	1.150e-015	-14.881	-14.939	-0.058	(0)
FeF2+	6.080e-016	5.880e-016	-15.216	-15.231	-0.015	(0)
FeSO4+	8.358e-017	8.083e-017	-16.078	-16.092	-0.015	(0)
Fe+3	7.441e-017	5.494e-017	-16.128	-16.260	-0.132	(0)
FeF3	1.585e-017	1.585e-017	-16.800	-16.800	0.000	(0)
Fe (SO4) 2-	2.347e-019	2.266e-019	-18.629	-18.645	-0.015	(0)
FeCl+2	3.677e-020	3.217e-020	-19.435	-19.493	-0.058	(0)
FeHSeO3+2	5.090e-022	4.424e-022	-21.293	-21.354	-0.061	(0)
FeCl2+	2.880e-024	2.786e-024	-23.541	-23.555	-0.015	(0)
Fe2 (OH) 2+4	2.282e-024	1.302e-024	-23.642	-23.885	-0.244	(0)
FeCl3	5.401e-030	5.401e-030	-29.268	-29.268	0.000	(0)
Fe3 (OH) 4+5	1.951e-032	8.122e-033	-31.710	-32.090	-0.381	(0)
H (0)	4.591e-023					
H2	2.295e-023	2.296e-023	-22.639	-22.639	0.000	(0)
Hg (0)	7.977e-011					
Hg	7.977e-011	7.977e-011	-10.098	-10.098	0.000	(0)
Hg (1)	1.077e-025					
Hg2+2	5.384e-026	4.680e-026	-25.269	-25.330	-0.061	(0)
Hg (2)	3.744e-019					
Hg (OH) 2	1.704e-019	1.705e-019	-18.768	-18.768	0.000	(0)
HgClOH	1.655e-019	1.655e-019	-18.781	-18.781	0.000	(0)
HgCl2	3.249e-020	3.249e-020	-19.488	-19.488	0.000	(0)
HgCO3	5.248e-021	5.248e-021	-20.280	-20.280	0.000	(0)
HgCl+	3.463e-022	3.343e-022	-21.461	-21.476	-0.015	(0)
HgOH+	1.992e-022	1.924e-022	-21.701	-21.716	-0.015	(0)
HgHCO3+	1.823e-022	1.760e-022	-21.739	-21.755	-0.015	(0)
HgCl3-	6.523e-024	6.299e-024	-23.186	-23.201	-0.015	(0)
Hg+2	9.943e-025	8.642e-025	-24.002	-24.063	-0.061	(0)
Hg (CO3) 2-2	9.688e-026	8.421e-026	-25.014	-25.075	-0.061	(0)
HgSO4	2.967e-026	2.967e-026	-25.528	-25.528	0.000	(0)
HgF+	6.337e-028	6.119e-028	-27.198	-27.213	-0.015	(0)
HgCl4-2	5.594e-028	4.862e-028	-27.252	-27.313	-0.061	(0)
Hg (OH) 3-	1.243e-028	1.200e-028	-27.906	-27.921	-0.015	(0)
K	4.694e-005					
K+	4.690e-005	4.534e-005	-4.329	-4.343	-0.015	(0)
KSO4-	4.352e-008	4.209e-008	-7.361	-7.376	-0.014	(0)
Mg	4.025e-005					
Mg+2	3.929e-005	3.433e-005	-4.406	-4.464	-0.059	(0)
MgSO4	8.192e-007	8.192e-007	-6.087	-6.087	0.000	(0)
MgF+	7.608e-008	7.357e-008	-7.119	-7.133	-0.015	(0)
MgHCO3+	7.082e-008	6.847e-008	-7.150	-7.165	-0.015	(0)
MgCO3	1.449e-010	1.449e-010	-9.839	-9.839	0.000	(0)

MgOH+	7.897e-011	7.641e-011	-10.103	-10.117	-0.014	(0)
MgH2BO3+	1.845e-013	1.782e-013	-12.734	-12.749	-0.015	(0)
Mn (2)	3.253e-007					
Mn+2	3.175e-007	2.760e-007	-6.498	-6.559	-0.061	(0)
MnSO4	6.436e-009	6.436e-009	-8.191	-8.191	0.000	(0)
MnHCO3+	1.110e-009	1.073e-009	-8.955	-8.969	-0.015	(0)
MnF+	2.170e-010	2.098e-010	-9.664	-9.678	-0.015	(0)
MnCl+	6.965e-012	6.736e-012	-11.157	-11.172	-0.015	(0)
MnOH+	4.008e-012	3.876e-012	-11.397	-11.412	-0.015	(0)
MnCl2	1.845e-016	1.845e-016	-15.734	-15.734	0.000	(0)
MnCl3-	1.019e-021	9.852e-022	-20.992	-21.006	-0.015	(0)
MnSeO4	1.907e-024	1.907e-024	-23.720	-23.720	0.000	(0)
Mn (OH) 3-	7.744e-025	7.489e-025	-24.111	-24.126	-0.015	(0)
MnSe	4.756e-029	4.756e-029	-28.323	-28.323	0.000	(0)
Mn (OH) 4-2	1.545e-032	1.352e-032	-31.811	-31.869	-0.058	(0)
Mn (3)	1.670e-028					
Mn+3	1.670e-028	1.233e-028	-27.777	-27.909	-0.132	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-62.967	-63.025	-0.058	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-68.382	-68.397	-0.015	(0)
Mo	2.116e-008					
MoO4-2	2.049e-008	1.790e-008	-7.689	-7.747	-0.059	(0)
HMoO4-	6.644e-010	6.415e-010	-9.178	-9.193	-0.015	(0)
H2MoO4	8.462e-012	8.462e-012	-11.073	-11.073	0.000	(0)
AlMo6O21-3	9.907e-036	7.227e-036	-35.004	-35.141	-0.137	(0)
HMo7O24-5	0.000e+000	0.000e+000	-46.173	-46.554	-0.381	(0)
Mo7O24-6	0.000e+000	0.000e+000	-46.648	-47.196	-0.548	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-47.272	-47.516	-0.244	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-49.877	-50.014	-0.137	(0)
Na	9.327e-005					
Na+	9.319e-005	9.010e-005	-4.031	-4.045	-0.015	(0)
NaSO4-	6.560e-008	6.345e-008	-7.183	-7.198	-0.014	(0)
NaHCO3	9.876e-009	9.876e-009	-8.005	-8.005	0.000	(0)
NaF	1.086e-009	1.086e-009	-8.964	-8.964	0.000	(0)
NaCO3-	8.801e-012	8.513e-012	-11.055	-11.070	-0.014	(0)
NaH2BO3	2.138e-014	2.138e-014	-13.670	-13.670	0.000	(0)
O (0)	0.000e+000					
O2	0.000e+000	0.000e+000	-47.017	-47.017	0.000	(0)
Pb	7.915e-009					
Pb+2	6.514e-009	5.692e-009	-8.186	-8.245	-0.059	(0)
PbHCO3+	8.538e-010	8.244e-010	-9.069	-9.084	-0.015	(0)
PbSO4	3.656e-010	3.656e-010	-9.437	-9.437	0.000	(0)
PbCO3	8.682e-011	8.682e-011	-10.061	-10.061	0.000	(0)
PbOH+	8.280e-011	7.995e-011	-10.082	-10.097	-0.015	(0)
PbF+	7.935e-012	7.661e-012	-11.100	-11.116	-0.015	(0)
PbCl+	4.055e-012	3.916e-012	-11.392	-11.407	-0.015	(0)
Pb (SO4) 2-2	3.324e-013	2.889e-013	-12.478	-12.539	-0.061	(0)
Pb (OH) 2	1.414e-014	1.414e-014	-13.850	-13.850	0.000	(0)
PbF2	2.880e-015	2.880e-015	-14.541	-14.541	0.000	(0)
Pb (CO3) 2-2	1.462e-015	1.271e-015	-14.835	-14.896	-0.061	(0)
PbCl2	3.391e-016	3.391e-016	-15.470	-15.470	0.000	(0)
Pb2OH+3	9.887e-018	7.212e-018	-17.005	-17.142	-0.137	(0)
PbF3-	1.080e-019	1.043e-019	-18.966	-18.982	-0.015	(0)
Pb (OH) 3-	8.186e-020	7.904e-020	-19.087	-19.102	-0.015	(0)
PbCl3-	2.711e-021	2.618e-021	-20.567	-20.582	-0.015	(0)
PbF4-2	1.097e-024	9.536e-025	-23.960	-24.021	-0.061	(0)
Pb (OH) 4-2	1.245e-025	1.082e-025	-24.905	-24.966	-0.061	(0)
PbCl4-2	2.669e-026	2.320e-026	-25.574	-25.635	-0.061	(0)
Pb3 (OH) 4+2	2.611e-026	2.269e-026	-25.583	-25.644	-0.061	(0)
Pb4 (OH) 4+4	1.798e-030	1.026e-030	-29.745	-29.989	-0.244	(0)
S (6)	1.552e-004					
SO4-2	1.501e-004	1.311e-004	-3.824	-3.882	-0.059	(0)
CaSO4	4.020e-006	4.020e-006	-5.396	-5.396	0.000	(0)
MgSO4	8.192e-007	8.192e-007	-6.087	-6.087	0.000	(0)
CuSO4	1.409e-007	1.409e-007	-6.851	-6.851	0.000	(0)
NaSO4-	6.560e-008	6.345e-008	-7.183	-7.198	-0.014	(0)
KSO4-	4.352e-008	4.209e-008	-7.361	-7.376	-0.014	(0)

HSO4-	2.387e-008	2.308e-008	-7.622	-7.637	-0.015	(0)
MnSO4	6.436e-009	6.436e-009	-8.191	-8.191	0.000	(0)
ZnSO4	5.715e-009	5.715e-009	-8.243	-8.243	0.000	(0)
FeSO4	1.904e-009	1.904e-009	-8.720	-8.720	0.000	(0)
AlSO4+	6.894e-010	6.667e-010	-9.162	-9.176	-0.015	(0)
PbSO4	3.656e-010	3.656e-010	-9.437	-9.437	0.000	(0)
UO2SO4	1.398e-010	1.398e-010	-9.855	-9.855	0.000	(0)
CdSO4	7.893e-011	7.893e-011	-10.103	-10.103	0.000	(0)
Zn(SO4) 2-2	7.509e-012	6.527e-012	-11.124	-11.185	-0.061	(0)
Al(SO4) 2-	9.687e-013	9.367e-013	-12.014	-12.028	-0.015	(0)
Pb(SO4) 2-2	3.324e-013	2.889e-013	-12.478	-12.539	-0.061	(0)
UO2(SO4) 2-2	2.779e-013	2.416e-013	-12.556	-12.617	-0.061	(0)
Cd(SO4) 2-2	1.606e-013	1.396e-013	-12.794	-12.855	-0.061	(0)
VOSO4	1.519e-014	1.519e-014	-13.818	-13.818	0.000	(0)
FeSO4+	8.358e-017	8.083e-017	-16.078	-16.092	-0.015	(0)
VO2SO4-	5.258e-017	5.077e-017	-16.279	-16.294	-0.015	(0)
Fe(SO4) 2-	2.347e-019	2.266e-019	-18.629	-18.645	-0.015	(0)
VSO4+	4.342e-024	4.193e-024	-23.362	-23.378	-0.015	(0)
HgSO4	2.967e-026	2.967e-026	-25.528	-25.528	0.000	(0)
USO4+2	7.314e-029	6.357e-029	-28.136	-28.197	-0.061	(0)
U(SO4) 2	6.622e-029	6.622e-029	-28.179	-28.179	0.000	(0)
Se(-2)	7.904e-023					
HSe-	7.799e-023	7.530e-023	-22.108	-22.123	-0.015	(0)
H2Se	1.053e-024	1.053e-024	-23.978	-23.978	0.000	(0)
MnSe	4.756e-029	4.756e-029	-28.323	-28.323	0.000	(0)
Se-2	4.811e-032	4.181e-032	-31.318	-31.379	-0.061	(0)
Se(4)	3.166e-009					
HSeO3-	3.156e-009	3.047e-009	-8.501	-8.516	-0.015	(0)
SeO3-2	7.751e-012	6.737e-012	-11.111	-11.172	-0.061	(0)
H2SeO3	2.341e-012	2.341e-012	-11.631	-11.631	0.000	(0)
FeHSeO3+2	5.090e-022	4.424e-022	-21.293	-21.354	-0.061	(0)
Cd(SeO3) 2-2	1.105e-025	9.605e-026	-24.957	-25.018	-0.061	(0)
Se(6)	2.939e-020					
SeO4-2	2.938e-020	2.568e-020	-19.532	-19.590	-0.059	(0)
HSeO4-	2.400e-024	2.317e-024	-23.620	-23.635	-0.015	(0)
MnSeO4	1.907e-024	1.907e-024	-23.720	-23.720	0.000	(0)
ZnSeO4	7.921e-025	7.921e-025	-24.101	-24.101	0.000	(0)
CdSeO4	1.228e-026	1.228e-026	-25.911	-25.911	0.000	(0)
Zn(SeO4) 2-2	0.000e+000	0.000e+000	-43.625	-43.686	-0.061	(0)
U(3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-43.573	-43.710	-0.137	(0)
U(4)	5.421e-016					
U(OH) 5-	5.051e-016	4.877e-016	-15.297	-15.312	-0.015	(0)
U(OH) 4	3.678e-017	3.678e-017	-16.434	-16.434	0.000	(0)
U(OH) 3+	2.508e-019	2.422e-019	-18.601	-18.616	-0.015	(0)
U(OH) 2+2	2.320e-022	2.016e-022	-21.635	-21.695	-0.061	(0)
UF3+	3.498e-024	3.378e-024	-23.456	-23.471	-0.015	(0)
UF2+2	1.284e-024	1.116e-024	-23.892	-23.952	-0.061	(0)
UOH+3	2.344e-026	1.710e-026	-25.630	-25.767	-0.137	(0)
UF4	7.073e-027	7.073e-027	-26.150	-26.150	0.000	(0)
UF+3	6.361e-027	4.640e-027	-26.196	-26.333	-0.137	(0)
USO4+2	7.314e-029	6.357e-029	-28.136	-28.197	-0.061	(0)
U(SO4) 2	6.622e-029	6.622e-029	-28.179	-28.179	0.000	(0)
UF5-	5.545e-030	5.354e-030	-29.256	-29.271	-0.015	(0)
U+4	2.133e-031	1.218e-031	-30.671	-30.914	-0.244	(0)
UF6-2	3.553e-032	3.088e-032	-31.449	-31.510	-0.061	(0)
UCl+3	1.622e-034	1.183e-034	-33.790	-33.927	-0.137	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-115.241	-116.474	-1.233	(0)
U(5)	4.445e-011					
UO2+	4.445e-011	4.292e-011	-10.352	-10.367	-0.015	(0)
U(6)	1.937e-008					
UO2CO3	1.422e-008	1.422e-008	-7.847	-7.847	0.000	(0)
UO2F+	1.923e-009	1.856e-009	-8.716	-8.731	-0.015	(0)
UO2(CO3) 2-2	1.657e-009	1.440e-009	-8.781	-8.842	-0.061	(0)
UO2+2	8.058e-010	7.041e-010	-9.094	-9.152	-0.059	(0)
UO2OH+	5.133e-010	4.956e-010	-9.290	-9.305	-0.015	(0)
UO2SO4	1.398e-010	1.398e-010	-9.855	-9.855	0.000	(0)
UO2F2	1.023e-010	1.023e-010	-9.990	-9.990	0.000	(0)

UO2 (CO3) 3-4	6.416e-013	3.662e-013	-12.193	-12.436	-0.244	(0)
UO2F3-	5.081e-013	4.906e-013	-12.294	-12.309	-0.015	(0)
(UO2) 2 (OH) 2+2	4.690e-013	4.077e-013	-12.329	-12.390	-0.061	(0)
UO2 (SO4) 2-2	2.779e-013	2.416e-013	-12.556	-12.617	-0.061	(0)
UO2Cl+	2.293e-014	2.214e-014	-13.640	-13.655	-0.015	(0)
(UO2) 3 (OH) 5+	4.963e-015	4.792e-015	-14.304	-14.320	-0.015	(0)
UO2F4-2	8.563e-017	7.443e-017	-16.067	-16.128	-0.061	(0)
V (2)	4.438e-031					
V+2	3.816e-031	3.317e-031	-30.418	-30.479	-0.061	(0)
VOH+	6.216e-032	6.002e-032	-31.206	-31.222	-0.015	(0)
V (3)	9.550e-009					
V (OH) 3	9.550e-009	9.550e-009	-8.020	-8.020	0.000	(0)
V (OH) 2+	1.151e-017	1.111e-017	-16.939	-16.954	-0.015	(0)
VOH+2	2.184e-019	1.898e-019	-18.661	-18.722	-0.061	(0)
V+3	9.284e-023	6.773e-023	-22.032	-22.169	-0.137	(0)
VSO4+	4.342e-024	4.193e-024	-23.362	-23.378	-0.015	(0)
V2 (OH) 2+4	3.982e-037	2.273e-037	-36.400	-36.643	-0.244	(0)
V2 (OH) 3+3	8.184e-038	5.970e-038	-37.087	-37.224	-0.137	(0)
V (4)	1.035e-012					
V (OH) 3+	4.859e-013	4.692e-013	-12.313	-12.329	-0.015	(0)
VO+2	4.838e-013	4.205e-013	-12.315	-12.376	-0.061	(0)
VOF+	4.990e-014	4.818e-014	-13.302	-13.317	-0.015	(0)
VOSO4	1.519e-014	1.519e-014	-13.818	-13.818	0.000	(0)
VOF2	3.450e-016	3.450e-016	-15.462	-15.462	0.000	(0)
VOC1+	2.369e-017	2.287e-017	-16.625	-16.641	-0.015	(0)
VOF3-	2.422e-019	2.338e-019	-18.616	-18.631	-0.015	(0)
H2V2O4+2	1.269e-020	1.103e-020	-19.896	-19.957	-0.061	(0)
VOF4-2	2.074e-023	1.803e-023	-22.683	-22.744	-0.061	(0)
V (5)	2.644e-010					
H2VO4-	2.595e-010	2.506e-010	-9.586	-9.601	-0.015	(0)
H3VO4	4.512e-012	4.512e-012	-11.346	-11.346	0.000	(0)
HVO4-2	4.021e-013	3.495e-013	-12.396	-12.457	-0.061	(0)
VO2+	1.677e-014	1.621e-014	-13.775	-13.790	-0.015	(0)
H3V2O7-	7.560e-015	7.299e-015	-14.121	-14.137	-0.015	(0)
VO2F	5.431e-016	5.431e-016	-15.265	-15.265	0.000	(0)
VO2SO4-	5.258e-017	5.077e-017	-16.279	-16.294	-0.015	(0)
VO2F2-	3.901e-018	3.766e-018	-17.409	-17.424	-0.015	(0)
HV2O7-3	4.067e-020	2.967e-020	-19.391	-19.528	-0.137	(0)
VO4-3	1.333e-021	9.727e-022	-20.875	-21.012	-0.137	(0)
VO2F3-2	1.032e-021	8.973e-022	-20.986	-21.047	-0.061	(0)
V3O9-3	2.258e-023	1.647e-023	-22.646	-22.783	-0.137	(0)
V2O7-4	7.770e-025	4.435e-025	-24.110	-24.353	-0.244	(0)
VO2F4-3	1.156e-026	8.433e-027	-25.937	-26.074	-0.137	(0)
V4O12-4	3.014e-030	1.720e-030	-29.521	-29.764	-0.244	(0)
HV10O28-5	0.000e+000	0.000e+000	-67.261	-67.641	-0.381	(0)
H2V10O28-4	0.000e+000	0.000e+000	-67.935	-68.178	-0.244	(0)
V10O28-6	0.000e+000	0.000e+000	-69.535	-70.083	-0.548	(0)
Zn	2.352e-007					
Zn+2	2.280e-007	1.992e-007	-6.642	-6.701	-0.059	(0)
ZnSO4	5.715e-009	5.715e-009	-8.243	-8.243	0.000	(0)
ZnHCO3+	1.272e-009	1.228e-009	-8.896	-8.911	-0.015	(0)
ZnOH+	1.154e-010	1.114e-010	-9.938	-9.953	-0.015	(0)
ZnF+	7.862e-011	7.591e-011	-10.104	-10.120	-0.015	(0)
ZnCO3	5.816e-011	5.816e-011	-10.235	-10.235	0.000	(0)
ZnCl+	1.003e-011	9.701e-012	-10.999	-11.013	-0.015	(0)
Zn (SO4) 2-2	7.509e-012	6.527e-012	-11.124	-11.185	-0.061	(0)
Zn (OH) 2	9.870e-014	9.870e-014	-13.006	-13.006	0.000	(0)
ZnOHCl	7.101e-014	7.101e-014	-13.149	-13.149	0.000	(0)
ZnCl2	2.981e-016	2.981e-016	-15.526	-15.526	0.000	(0)
Zn (OH) 3-	2.865e-018	2.766e-018	-17.543	-17.558	-0.015	(0)
ZnCl3-	4.749e-021	4.591e-021	-20.323	-20.338	-0.015	(0)
ZnSeO4	7.921e-025	7.921e-025	-24.101	-24.101	0.000	(0)
Zn (OH) 4-2	7.083e-025	6.157e-025	-24.150	-24.211	-0.061	(0)
ZnCl4-2	5.087e-026	4.451e-026	-25.294	-25.352	-0.058	(0)
Zn (SeO4) 2-2	0.000e+000	0.000e+000	-43.625	-43.686	-0.061	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-2.75	8.05	10.80	Al (OH) 3
Al2 (MoO4) 3	-43.98	-41.61	2.37	Al2 (MoO4) 3
Al2O3	-3.55	16.10	19.65	Al2O3
Al4 (OH) 10SO4	-5.87	16.83	22.70	Al4 (OH) 10SO4
AlOHSO4	-4.09	-7.32	-3.23	AlOHSO4
Alunite	-3.79	-5.19	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.34	-12.13	-7.79	PbSO4
Anhydrite	-3.40	-7.76	-4.36	CaSO4
Antlerite	-5.68	3.11	8.79	Cu3 (OH) 4SO4
Aragonite	-3.87	-12.17	-8.30	CaCO3
Artinite	-15.33	-5.73	9.60	MgCO3:Mg (OH) 2:3H2O
Atacamite	-5.53	1.86	7.39	Cu2 (OH) 3Cl
Azurite	-4.18	-21.09	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-19.56	4.83	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-22.30	-6.42	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-34.53	-1.59	32.94	Ba3 (VO4) 2:4H2O
BaF2	-10.27	-16.09	-5.82	BaF2
BaMoO4	-7.44	-14.40	-6.96	BaMoO4
Barite	-0.56	-10.54	-9.98	BaSO4
BaSeO3	-11.26	-9.43	1.83	BaSeO3
BaSeO4	-18.79	-26.25	-7.46	BaSeO4
Bianchite	-8.82	-10.58	-1.76	ZnSO4:6H2O
Birnessite	-19.02	-0.93	18.09	MnO2
Bixbyite	-20.71	-21.35	-0.64	Mn2O3
Boehmite	-0.53	8.05	8.58	AlOOH
Brochantite	-5.95	9.27	15.22	Cu4 (OH) 6SO4
Brucite	-9.82	7.02	16.84	Mg (OH) 2
Ca (VO3) 2	-14.14	-8.48	5.66	Ca (VO3) 2
Ca2V2O7	-18.36	-0.86	17.50	Ca2V2O7
Ca2V2O7:2H2O	-22.41	-0.86	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-32.20	6.76	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-33.10	6.76	39.86	Ca3 (VO4) 2:4H2O
Calcite	-3.69	-12.17	-8.48	CaCO3
Calomel	-16.84	-34.75	-17.91	Hg2Cl2
CaMoO4	-3.67	-11.62	-7.95	CaMoO4
Carnotite	-4.54	-4.31	0.23	KUO2VO4
CaSeO3:2H2O	-9.46	-6.65	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-20.44	-23.46	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-19.61	-9.77	9.84	Cd (BO2) 2
Cd (OH) 2	-10.75	2.90	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-10.83	2.90	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-28.76	-22.05	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-29.24	-6.68	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-32.18	-3.78	28.40	Cd4 (OH) 6SO4
CdCl2	-17.36	-18.02	-0.66	CdCl2
CdCl2:1H2O	-16.32	-18.02	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.10	-18.02	-1.91	CdCl2:2.5H2O
CdF2	-16.82	-18.03	-1.21	CdF2
Cdmetal (alpha)	-30.11	-16.59	13.51	Cd
Cdmetal (gamma)	-30.21	-16.59	13.62	Cd
CdMoO4	-2.19	-16.34	-14.15	CdMoO4
CdOHCl	-11.10	-7.56	3.54	CdOHCl
CdSe	-4.77	-24.97	-20.20	CdSe
CdSeO4:2H2O	-26.33	-28.18	-1.85	CdSeO4:2H2O
CdSO4	-12.30	-12.47	-0.17	CdSO4
CdSO4:1H2O	-10.75	-12.47	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.60	-12.47	-1.87	CdSO4:2.67H2O
Cerrusite	-3.41	-16.54	-13.13	PbCO3
CH4 (g)	-56.69	-97.74	-41.05	CH4
Chalcanthite	-6.57	-9.21	-2.64	CuSO4:5H2O
Clausthalite	2.48	-24.62	-27.10	PbSe
CO2 (g)	-1.64	-19.78	-18.15	CO2
Cotunnite	-12.89	-17.67	-4.78	PbCl2
Cryolite	-15.79	-49.63	-33.84	Na3AlF6
Cu (OH) 2	-2.51	6.16	8.67	Cu (OH) 2
Cu2Se (alpha)	16.14	-29.66	-45.80	Cu2Se

Cu2SO4	-15.21	-17.16	-1.95	Cu2SO4
Cu3Se2	12.13	-51.36	-63.49	Cu3Se2
CuCO3	-2.12	-13.62	-11.50	CuCO3
CuF	-6.45	-11.36	-4.91	CuF
CuF2	-15.88	-14.77	1.12	CuF2
CuF2:2H2O	-10.22	-14.77	-4.55	CuF2:2H2O
Cumetal	-1.88	-10.64	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-13.35	-3.05	10.30	CuOCuSO4
Cupricferrite	2.12	8.11	5.99	CuFe2O4
Cuprite	-0.38	-1.79	-1.41	Cu2O
Cuprousferrite	9.00	0.08	-8.92	CuFeO2
CuSe	11.39	-21.71	-33.10	CuSe
CuSe2	3.28	-30.09	-33.37	CuSe2
CuSeO3:2H2O	-8.61	-8.10	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-22.48	-24.92	-2.44	CuSeO4:5H2O
CuSO4	-12.15	-9.21	2.94	CuSO4
Diaspore	1.18	8.05	6.87	AlOOH
Dolomite(disordered)	-8.39	-24.93	-16.54	CaMg(CO3)2
Dolomite(ordered)	-7.84	-24.93	-17.09	CaMg(CO3)2
Epsomite	-6.22	-8.35	-2.13	MgSO4:7H2O
Fe(OH)2	-9.30	4.26	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	0.88	-2.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-8.11	-11.83	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-13.87	-12.31	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.21	-40.83	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-40.43	-44.17	-3.73	Fe2(SO4)3
Fe3(OH)8	-14.01	6.21	20.22	Fe3(OH)8
FeMoO4	-4.88	-14.98	-10.09	FeMoO4
Ferrihydrite	-2.22	0.97	3.19	Fe(OH)3
Ferroselite	-13.39	-31.99	-18.60	FeSe2
FeSe	-12.61	-23.61	-11.00	FeSe
Fluorite	-2.81	-13.31	-10.50	CaF2
Gibbsite	-0.24	8.05	8.29	Al(OH)3
Goethite	0.48	0.97	0.49	FeOOH
Goslarite	-8.57	-10.58	-2.01	ZnSO4:7H2O
Gummite	-5.34	2.34	7.67	UO3
Gypsum	-3.15	-7.76	-4.61	CaSO4:2H2O
H-Jarosite	-15.72	-27.82	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-6.36	-19.24	-12.88	H2MoO4
H2Se(g)	-22.91	-27.87	-4.96	H2Se
Halite	-10.36	-8.76	1.60	NaCl
Hausmannite	-26.75	34.28	61.03	Mn3O4
Hematite	3.36	1.95	-1.42	Fe2O3
Hercynite	-2.53	20.36	22.89	FeAl2O4
Hg(CH3)2(g)	-140.54	-214.25	-73.71	Hg(CH3)2
Hg(g)	-8.79	-16.66	-7.87	Hg
Hg(OH)2	-15.27	-18.77	-3.50	Hg(OH)2
Hg2(g)	-18.37	-33.33	-14.96	Hg2
Hg2(OH)2	-19.10	-13.84	5.26	Hg2(OH)2
Hg2CO3	-17.57	-33.62	-16.05	Hg2CO3
Hg2F2	-24.41	-34.77	-10.36	Hg2F2
Hg2SeO3	-23.44	-28.10	-4.66	Hg2SeO3
Hg2SO4	-23.08	-29.21	-6.13	Hg2SO4
Hg3O2CO3	-46.41	-76.09	-29.68	Hg3O2CO3
HgCl(g)	-36.87	-17.38	19.50	HgCl
HgCl2	-18.42	-39.68	-21.26	HgCl2
HgF(g)	-50.06	-17.38	32.68	HgF
HgF2(g)	-52.26	-39.70	12.57	HgF2
Hgmetal(l)	-3.21	-16.66	-13.45	Hg
HgSe	9.06	-46.64	-55.69	HgSe
HgSeO3	-20.60	-33.03	-12.43	HgSeO3
HgSO4	-24.72	-34.14	-9.42	HgSO4
Huntite	-20.48	-50.45	-29.97	CaMg3(CO3)4
Hydrocerrusite	-11.06	-29.83	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-35.25	-44.01	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.12	-21.29	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-11.62	-26.42	-14.80	KFe3(SO4)2(OH)6

K2MoO4	-19.70	-16.43	3.26	K2MoO4
K2SeO4	-27.55	-28.28	-0.73	K2SeO4
Langite	-8.22	9.27	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-8.45	-8.88	-0.43	PbO:PbSO4
Laurionite	-7.84	-7.21	0.62	PbOHCl
Lepidocrocite	-0.40	0.97	1.37	FeOOH
Lime	-25.08	7.62	32.70	CaO
Litharge	-9.45	3.24	12.69	PbO
Maghemite	-4.44	1.95	6.39	Fe2O3
Magnesioferrite	-7.89	8.97	16.86	Fe2MgO4
Magnesite	-5.30	-12.76	-7.46	MgCO3
Magnetite	2.80	6.21	3.40	Fe3O4
Malachite	-2.16	-7.46	-5.31	Cu2 (OH) 2CO3
Manganite	-10.67	14.67	25.34	MnOOH
Massicot	-9.65	3.24	12.89	PbO
Matlockite	-8.70	-17.68	-8.97	PbClF
Melanothallite	-21.01	-14.75	6.26	CuCl2
Melanterite	-8.90	-11.11	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-11.77	7.02	18.79	Mg (OH) 2
Mg (VO3) 2	-20.35	-9.07	11.28	Mg (VO3) 2
Mg2V2O7	-28.40	-2.04	26.36	Mg2V2O7
MgF2	-5.77	-13.90	-8.13	MgF2
MgMoO4	-10.36	-12.21	-1.85	MgMoO4
MgSeO3:6H2O	-10.29	-7.24	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-22.85	-24.05	-1.20	MgSeO4:6H2O
Minium	-44.30	29.22	73.52	Pb3O4
Mirabilite	-10.86	-11.97	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-16.06	-11.16	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-61.75	-67.47	-5.71	Mn2 (SO4) 3
MnCl2:4H2O	-18.70	-15.98	2.72	MnCl2:4H2O
MnSe	-26.44	-22.94	3.50	MnSe
MnSeO3	-10.46	-9.33	1.13	MnSeO3
MnSeO3:2H2O	-10.31	-9.33	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-24.10	-26.15	-2.05	MnSeO4:5H2O
MnSO4	-13.02	-10.44	2.58	MnSO4
Monteponite	-12.20	2.90	15.10	CdO
Montroydite	-15.13	-18.77	-3.64	HgO
MoO3	-11.24	-19.24	-8.00	MoO3
Na-Jarosite	-14.92	-26.12	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-18.48	-35.07	-16.60	Na2Mo2O7
Na2MoO4	-17.33	-15.84	1.49	Na2MoO4
Na2MoO4:2H2O	-17.06	-15.84	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-21.16	-10.86	10.30	Na2SeO3:5H2O
Na2SeO4	-28.96	-27.68	1.28	Na2SeO4
Na3VO4	-39.63	-2.95	36.68	Na3VO4
Na4V2O7	-46.69	-9.29	37.40	Na4V2O7
Nantokite	-4.62	-11.35	-6.73	CuCl
Natron	-15.07	-16.39	-1.31	Na2CO3:10H2O
NaVO3	-10.20	-6.35	3.86	NaVO3
Nesquehonite	-8.09	-12.76	-4.67	MgCO3:3H2O
Nsutite	-18.44	-0.93	17.50	MnO2
O2 (g)	-44.11	38.98	83.09	O2
Otavite	-4.89	-16.89	-12.00	CdCO3
Pb (BO2) 2	-15.94	-9.42	6.52	Pb (BO2) 2
Pb (OH) 2	-4.91	3.24	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-77.50	-86.26	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-12.76	-3.97	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-19.70	6.49	26.19	Pb2O (OH) 2
Pb2O3	-35.06	25.98	61.04	Pb2O3
Pb2OCO3	-12.74	-13.30	-0.56	Pb2OCO3
Pb2V2O7	-7.70	-9.60	-1.90	Pb2V2O7
Pb3 (VO4) 2	-12.50	-6.36	6.14	Pb3 (VO4) 2
Pb3O2CO3	-21.07	-10.05	11.02	Pb3O2CO3
Pb3O2SO4	-16.32	-5.64	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-23.49	-2.39	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-24.27	-2.39	21.88	Pb4O3SO4
PbF2	-10.24	-17.68	-7.44	PbF2
Pbmetal	-20.49	-16.24	4.25	Pb

PbMoO4	-0.37	-15.99	-15.62	PbMoO4
PbO:0.3H2O	-9.74	3.24	12.98	PbO:0.33H2O
PbSeO4	-21.00	-27.84	-6.84	PbSeO4
Periclase	-14.56	7.02	21.58	MgO
Phosgenite	-14.40	-34.21	-19.81	PbCl2:PbCO3
Plattnerite	-26.87	22.73	49.60	PbO2
Portlandite	-15.19	7.62	22.80	Ca (OH) 2
Pyrochroite	-10.26	4.93	15.19	Mn (OH) 2
Pyrolusite	-16.96	24.42	41.38	MnO2
Rhodochrosite	-4.27	-14.85	-10.58	MnCO3
Rutherfordine	-2.95	-17.45	-14.50	UO2CO3
Schoepite	-3.66	2.34	5.99	UO2 (OH) 2:H2O
Semetal (am)	-1.27	-8.38	-7.11	Se
Semetal (hex)	-0.67	-8.38	-7.71	Se
SeO2	-14.39	-14.26	0.12	SeO2
SeO3	-52.12	-31.08	21.04	SeO3
Siderite	-5.28	-15.52	-10.24	FeCO3
Smithsonite	-5.00	-15.00	-10.00	ZnCO3
Spinel	-13.72	23.12	36.85	MgAl2O4
Tenorite	-1.48	6.16	7.64	CuO
Thenardite	-12.29	-11.97	0.32	Na2SO4
Thermonatrite	-17.02	-16.39	0.64	Na2CO3:H2O
Tyuyamunite	-7.88	-3.80	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-5.91	15.17	21.08	U3O8
U4O9	-9.24	-12.26	-3.02	U4O9
UF4	-20.25	-49.79	-29.54	UF4
UF4:2.5H2O	-17.07	-49.79	-32.72	UF4:2.5H2O
UO2 (am)	-8.87	-7.94	0.93	UO2
UO2 (OH) 2 (beta)	-3.27	2.34	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-26.49	-28.74	-2.25	UO2SeO4:4H2O
UO3	-5.36	2.34	7.70	UO3
Uraninite	-3.27	-7.94	-4.67	UO2
V (OH) 3	-12.53	-4.94	7.59	V (OH) 3
V2O5	-14.73	-16.09	-1.36	V2O5
V3O5	-23.99	-22.15	1.84	V3O5
V4O7	-30.22	-23.04	7.19	V4O7
V6O13	-26.39	-87.25	-60.86	V6O13
VC12	-54.47	-35.59	18.87	VC12
VC13	-59.74	-36.31	23.43	VC13
VF4	-57.67	-42.74	14.93	VF4
Vmetal	-78.19	-34.17	44.03	V
VO	-29.44	-14.68	14.76	VO
VO (OH) 2	-6.04	-0.89	5.15	VO (OH) 2
VO2Cl	-21.34	-18.50	2.84	VO2Cl
VOC1	-26.55	-15.39	11.15	VOC1
VOC12	-34.56	-21.80	12.76	VOC12
VOSO4	-19.87	-16.26	3.61	VOSO4
Witherite	-6.38	-14.95	-8.57	BaCO3
Zincite	-6.55	4.79	11.33	ZnO
Zincosite	-14.51	-10.58	3.93	ZnSO4
Zn (BO2) 2	-16.17	-7.88	8.29	Zn (BO2) 2
Zn (OH) 2	-7.41	4.79	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-7.69	4.79	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-6.97	4.79	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-6.75	4.79	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-6.95	4.79	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-13.29	-5.79	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-16.07	-0.88	15.19	Zn2 (OH) 3Cl
Zn3O (SO4) 2	-35.29	-16.38	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-24.62	3.78	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-35.47	3.03	38.50	Zn5 (OH) 8Cl2
ZnCl2	-23.18	-16.13	7.05	ZnCl2
ZnCO3:1H2O	-4.74	-15.00	-10.26	ZnCO3:1H2O
ZnF2	-15.60	-16.14	-0.53	ZnF2
Znmetal	-40.49	-14.70	25.79	Zn
ZnMoO4	-4.32	-14.45	-10.13	ZnMoO4
ZnO (active)	-6.40	4.79	11.19	ZnO
ZnSe	-8.68	-23.08	-14.40	ZnSe

ZnSeO4:6H2O	-24.77	-26.29	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.95	-10.58	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 12.

SOLUTION 10 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

```

temp      25
pH        7.95176
pe         4
redox     pe
units     mg/l
density   1
Alkalinity 38.19771 as HCO3
Al 0.00779
B         0.00491
Ba 0.01157
Ca 19.46534
Cl 2.17054
F         0.80723
Fe 0.00087
Hg 0.000005
K         3.84048
Mg 3.50503
Mn 0.12993
Mo 0.00738
Na 3.46033 charge
Pb 0.00012
S(6)     38.71501 as SO4
Se 0.00032
U         0.00124
V         0.00049
Zn 0.00456
water    1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 10. Average HCT data for quartz monzonite - sulfide (ore)
(cells 604562, 604606, 604653, 604656 and 604669)

-----Solution composition-----

Elements	Molality	Moles	
Al	2.887e-007	2.887e-007	
Alkalinity	6.261e-004	6.261e-004	
B	4.543e-007	4.543e-007	
Ba	8.426e-008	8.426e-008	
Ca	4.857e-004	4.857e-004	
Cl	6.123e-005	6.123e-005	
F	4.249e-005	4.249e-005	
Fe	1.558e-008	1.558e-008	
Hg	2.493e-011	2.493e-011	
K	9.824e-005	9.824e-005	
Mg	1.442e-004	1.442e-004	
Mn	2.365e-006	2.365e-006	
Mo	7.693e-008	7.693e-008	
Na	1.720e-004	1.720e-004	Charge balance
Pb	5.792e-010	5.792e-010	

S (6)	4.030e-004	4.030e-004
Se	4.053e-009	4.053e-009
U	5.210e-009	5.210e-009
V	9.620e-009	9.620e-009
Zn	6.974e-008	6.974e-008

-----Description of solution-----

pH	=	7.952
pe	=	4.000
Activity of water	=	1.000
Ionic strength	=	2.432e-003
Mass of water (kg)	=	1.000e+000
Total carbon (mol/kg)	=	6.337e-004
Total CO2 (mol/kg)	=	6.337e-004
Temperature (deg C)	=	25.00
Electrical balance (eq)	=	-3.740e-019
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110143e+002
Total O	=	5.551035e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	9.518e-007	9.010e-007	-6.021	-6.045	-0.024	(0)
H+	1.180e-008	1.117e-008	-7.928	-7.952	-0.024	0.00
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	2.887e-007					
Al (OH) 4-	2.862e-007	2.712e-007	-6.543	-6.567	-0.023	(0)
Al (OH) 3	2.391e-009	2.391e-009	-8.621	-8.621	0.000	(0)
Al (OH) 2+	1.402e-010	1.330e-010	-9.853	-9.876	-0.023	(0)
AlF2+	1.357e-012	1.287e-012	-11.867	-11.891	-0.023	(0)
AlF3	6.414e-013	6.414e-013	-12.193	-12.193	0.000	(0)
AlOH+2	2.299e-013	1.858e-013	-12.638	-12.731	-0.093	(0)
AlF+2	1.010e-013	8.164e-014	-12.996	-13.088	-0.093	(0)
AlF4-	1.343e-014	1.273e-014	-13.872	-13.895	-0.023	(0)
AlSO4+	5.049e-016	4.783e-016	-15.297	-15.320	-0.023	(0)
Al+3	3.362e-016	2.062e-016	-15.473	-15.686	-0.212	(0)
Al (SO4) 2-	1.617e-018	1.532e-018	-17.791	-17.815	-0.023	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-51.428	-51.654	-0.226	(0)
B	4.543e-007					
H3BO3	4.300e-007	4.303e-007	-6.367	-6.366	0.000	(0)
H2BO3-	2.364e-008	2.236e-008	-7.626	-7.651	-0.024	(0)
CaH2BO3+	4.980e-010	4.710e-010	-9.303	-9.327	-0.024	(0)
MgH2BO3+	9.021e-011	8.533e-011	-10.045	-10.069	-0.024	(0)
BF (OH) 3-	7.186e-012	6.797e-012	-11.143	-11.168	-0.024	(0)
NaH2BO3	5.760e-012	5.760e-012	-11.240	-11.240	0.000	(0)
BaH2BO3+	4.925e-014	4.659e-014	-13.308	-13.332	-0.024	(0)
H5 (BO3) 2-	8.657e-015	8.189e-015	-14.063	-14.087	-0.024	(0)
BF2 (OH) 2-	3.399e-016	3.215e-016	-15.469	-15.493	-0.024	(0)
H8 (BO3) 3-	3.725e-019	3.523e-019	-18.429	-18.453	-0.024	(0)
BF3OH-	5.851e-023	5.535e-023	-22.233	-22.257	-0.024	(0)
BF4-	1.274e-028	1.205e-028	-27.895	-27.919	-0.024	(0)
Ba	8.426e-008					
Ba+2	8.378e-008	6.742e-008	-7.077	-7.171	-0.094	(0)
BaHCO3+	3.923e-010	3.721e-010	-9.406	-9.429	-0.023	(0)
BaCO3	8.384e-011	8.384e-011	-10.077	-10.077	0.000	(0)
BaOH+	2.798e-013	2.652e-013	-12.553	-12.576	-0.023	(0)
BaH2BO3+	4.925e-014	4.659e-014	-13.308	-13.332	-0.024	(0)
C (4)	6.337e-004					
HCO3-	6.096e-004	5.780e-004	-3.215	-3.238	-0.023	(0)
H2CO3	1.453e-005	1.453e-005	-4.838	-4.838	0.000	(0)
CaHCO3+	4.154e-006	3.940e-006	-5.382	-5.405	-0.023	(0)
CO3-2	3.014e-006	2.425e-006	-5.521	-5.615	-0.094	(0)
CaCO3	1.407e-006	1.407e-006	-5.852	-5.852	0.000	(0)

	MgHCO ₃ ⁺	6.873e-007	6.509e-007	-6.163	-6.186	-0.024	(0)
	MgCO ₃	2.220e-007	2.220e-007	-6.654	-6.654	0.000	(0)
	NaHCO ₃	5.283e-008	5.283e-008	-7.277	-7.277	0.000	(0)
	MnHCO ₃ ⁺	2.164e-008	2.051e-008	-7.665	-7.688	-0.023	(0)
	NaCO ₃ ⁻	7.741e-009	7.339e-009	-8.111	-8.134	-0.023	(0)
	ZnCO ₃	6.172e-009	6.172e-009	-8.210	-8.210	0.000	(0)
	UO ₂ (CO ₃) ₂₋₂	4.135e-009	3.280e-009	-8.384	-8.484	-0.101	(0)
	UO ₂ (CO ₃) ₃₋₄	1.007e-009	3.986e-010	-8.997	-9.399	-0.402	(0)
	ZnHCO ₃ ⁺	8.566e-010	8.084e-010	-9.067	-9.092	-0.025	(0)
	BaHCO ₃ ⁺	3.923e-010	3.721e-010	-9.406	-9.429	-0.023	(0)
	PbCO ₃	3.619e-010	3.619e-010	-9.441	-9.441	0.000	(0)
	BaCO ₃	8.384e-011	8.384e-011	-10.077	-10.077	0.000	(0)
	UO ₂ CO ₃	6.778e-011	6.778e-011	-10.169	-10.169	0.000	(0)
	PbHCO ₃ ⁺	2.259e-011	2.132e-011	-10.646	-10.671	-0.025	(0)
	Pb(CO ₃) ₂₋₂	3.191e-012	2.531e-012	-11.496	-11.597	-0.101	(0)
	FeHCO ₃ ⁺	2.982e-013	2.829e-013	-12.525	-12.548	-0.023	(0)
	HgCO ₃	7.838e-019	7.838e-019	-18.106	-18.106	0.000	(0)
	Hg(CO ₃) ₂₋₂	7.577e-021	6.010e-021	-20.121	-20.221	-0.101	(0)
	HgHCO ₃ ⁺	1.728e-022	1.631e-022	-21.762	-21.788	-0.025	(0)
Ca		4.857e-004					
	Ca+2	4.549e-004	3.661e-004	-3.342	-3.436	-0.094	(0)
	CaSO ₄	2.506e-005	2.506e-005	-4.601	-4.601	0.000	(0)
	CaHCO ₃ ⁺	4.154e-006	3.940e-006	-5.382	-5.405	-0.023	(0)
	CaCO ₃	1.407e-006	1.407e-006	-5.852	-5.852	0.000	(0)
	CaF ⁺	1.669e-007	1.582e-007	-6.778	-6.801	-0.023	(0)
	CaOH ⁺	6.938e-009	6.581e-009	-8.159	-8.182	-0.023	(0)
	CaH ₂ BO ₃ ⁺	4.980e-010	4.710e-010	-9.303	-9.327	-0.024	(0)
Cl		6.123e-005					
	Cl ⁻	6.123e-005	5.799e-005	-4.213	-4.237	-0.024	(0)
	MnCl ⁺	1.370e-010	1.298e-010	-9.863	-9.887	-0.023	(0)
	ZnOHCl	7.600e-012	7.600e-012	-11.119	-11.119	0.000	(0)
	ZnCl ⁺	6.803e-012	6.443e-012	-11.167	-11.191	-0.024	(0)
	PbCl ⁺	1.082e-013	1.022e-013	-12.966	-12.991	-0.025	(0)
	MnCl ₂	1.063e-014	1.063e-014	-13.973	-13.973	0.000	(0)
	ZnCl ₂	5.922e-016	5.922e-016	-15.228	-15.228	0.000	(0)
	PbCl ₂	2.646e-017	2.646e-017	-16.577	-16.577	0.000	(0)
	HgClOH	2.492e-017	2.492e-017	-16.603	-16.603	0.000	(0)
	UO ₂ Cl ⁺	6.997e-019	6.604e-019	-18.155	-18.180	-0.025	(0)
	MnCl ₃ ⁻	1.792e-019	1.699e-019	-18.747	-18.770	-0.023	(0)
	HgCl ₂	9.083e-020	9.083e-020	-19.042	-19.042	0.000	(0)
	ZnCl ₃ ⁻	2.880e-020	2.728e-020	-19.541	-19.564	-0.024	(0)
	PbCl ₃ ⁻	6.474e-022	6.109e-022	-21.189	-21.214	-0.025	(0)
	HgCl ⁺	3.311e-022	3.125e-022	-21.480	-21.505	-0.025	(0)
	FeCl+2	7.837e-023	6.325e-023	-22.106	-22.199	-0.093	(0)
	HgCl ₃ ⁻	5.581e-023	5.267e-023	-22.253	-22.278	-0.025	(0)
	VOCl ⁺	3.073e-024	2.900e-024	-23.512	-23.538	-0.025	(0)
	ZnCl ₄ -2	9.800e-025	7.910e-025	-24.009	-24.102	-0.093	(0)
	PbCl ₄ -2	2.042e-026	1.619e-026	-25.690	-25.791	-0.101	(0)
	FeCl ₂ ⁺	1.729e-026	1.638e-026	-25.762	-25.786	-0.023	(0)
	HgCl ₄ -2	1.533e-026	1.216e-026	-25.814	-25.915	-0.101	(0)
	FeCl ₃	9.501e-032	9.501e-032	-31.022	-31.022	0.000	(0)
	UCl+3	0.000e+000	0.000e+000	-47.055	-47.281	-0.226	(0)
F		4.249e-005					
	F ⁻	4.180e-005	3.959e-005	-4.379	-4.402	-0.024	(0)
	MgF ⁺	5.160e-007	4.889e-007	-6.287	-6.311	-0.023	(0)
	CaF ⁺	1.669e-007	1.582e-007	-6.778	-6.801	-0.023	(0)
	NaF	4.060e-009	4.060e-009	-8.391	-8.391	0.000	(0)
	MnF ⁺	2.957e-009	2.803e-009	-8.529	-8.552	-0.023	(0)
	HF	6.544e-010	6.544e-010	-9.184	-9.184	0.000	(0)
	ZnF ⁺	3.702e-011	3.494e-011	-10.432	-10.457	-0.025	(0)
	BF(OH) ₃₋	7.186e-012	6.797e-012	-11.143	-11.168	-0.024	(0)
	AlF ₂ ⁺	1.357e-012	1.287e-012	-11.867	-11.891	-0.023	(0)
	AlF ₃	6.414e-013	6.414e-013	-12.193	-12.193	0.000	(0)
	PbF ⁺	1.468e-013	1.385e-013	-12.833	-12.858	-0.025	(0)
	HF ₂ ⁻	1.041e-013	9.851e-014	-12.983	-13.007	-0.024	(0)
	AlF+2	1.010e-013	8.164e-014	-12.996	-13.088	-0.093	(0)
	UO ₂ F ⁺	4.066e-014	3.837e-014	-13.391	-13.416	-0.025	(0)
	AlF ₄ ⁻	1.343e-014	1.273e-014	-13.872	-13.895	-0.023	(0)

UO2F2	4.382e-015	4.382e-015	-14.358	-14.358	0.000	(0)
BF2 (OH) 2-	3.399e-016	3.215e-016	-15.469	-15.493	-0.024	(0)
PbF2	1.079e-016	1.079e-016	-15.967	-15.967	0.000	(0)
UO2F3-	4.618e-017	4.358e-017	-16.336	-16.361	-0.025	(0)
FeF+2	1.943e-018	1.568e-018	-17.712	-17.805	-0.093	(0)
FeF2+	1.753e-018	1.661e-018	-17.756	-17.780	-0.023	(0)
VO2F	1.239e-018	1.239e-018	-17.907	-17.907	0.000	(0)
H2F2	1.147e-018	1.147e-018	-17.940	-17.940	0.000	(0)
FeF3	9.280e-020	9.280e-020	-19.032	-19.032	0.000	(0)
VO2F2-	1.888e-020	1.782e-020	-19.724	-19.749	-0.025	(0)
UO2F4-2	1.728e-020	1.370e-020	-19.763	-19.863	-0.101	(0)
PbF3-	8.588e-021	8.105e-021	-20.066	-20.091	-0.025	(0)
VOF+	4.486e-021	4.233e-021	-20.348	-20.373	-0.025	(0)
VOF2	6.285e-023	6.285e-023	-22.202	-22.202	0.000	(0)
BF3OH-	5.851e-023	5.535e-023	-22.233	-22.257	-0.024	(0)
VO2F3-2	1.109e-023	8.799e-024	-22.955	-23.056	-0.101	(0)
PbF4-2	1.936e-025	1.536e-025	-24.713	-24.814	-0.101	(0)
VOF3-	9.355e-026	8.829e-026	-25.029	-25.054	-0.025	(0)
HgF+	4.200e-028	3.964e-028	-27.377	-27.402	-0.025	(0)
VO2F4-3	2.887e-028	1.714e-028	-27.540	-27.766	-0.226	(0)
BF4-	1.274e-028	1.205e-028	-27.895	-27.919	-0.024	(0)
VOF4-2	1.779e-029	1.411e-029	-28.750	-28.850	-0.101	(0)
UF3+	4.714e-037	4.449e-037	-36.327	-36.352	-0.025	(0)
UF2+2	8.938e-038	7.090e-038	-37.049	-37.149	-0.101	(0)
UF4	1.931e-039	1.931e-039	-38.714	-38.714	0.000	(0)
UF+3	2.396e-040	1.422e-040	-39.621	-39.847	-0.226	(0)
UF5-	0.000e+000	0.000e+000	-41.493	-41.519	-0.025	(0)
UF6-2	0.000e+000	0.000e+000	-43.340	-43.441	-0.101	(0)
Fe (2)	5.364e-011					
Fe+2	4.901e-011	3.888e-011	-10.310	-10.410	-0.101	(0)
FeSO4	2.852e-012	2.852e-012	-11.545	-11.545	0.000	(0)
FeOH+	1.471e-012	1.395e-012	-11.832	-11.856	-0.023	(0)
FeHCO3+	2.982e-013	2.829e-013	-12.525	-12.548	-0.023	(0)
Fe (OH) 2	9.981e-016	9.981e-016	-15.001	-15.001	0.000	(0)
Fe (OH) 3-	3.001e-016	2.844e-016	-15.523	-15.546	-0.023	(0)
Fe (3)	1.553e-008					
Fe (OH) 2+	7.768e-009	7.365e-009	-8.110	-8.133	-0.023	(0)
Fe (OH) 3	7.127e-009	7.127e-009	-8.147	-8.147	0.000	(0)
Fe (OH) 4-	6.307e-010	5.980e-010	-9.200	-9.223	-0.023	(0)
FeOH+2	2.603e-014	2.101e-014	-13.584	-13.678	-0.093	(0)
FeF+2	1.943e-018	1.568e-018	-17.712	-17.805	-0.093	(0)
FeF2+	1.753e-018	1.661e-018	-17.756	-17.780	-0.023	(0)
FeSO4+	1.278e-019	1.211e-019	-18.894	-18.917	-0.023	(0)
FeF3	9.280e-020	9.280e-020	-19.032	-19.032	0.000	(0)
Fe+3	5.890e-020	3.612e-020	-19.230	-19.442	-0.212	(0)
Fe (SO4) 2-	8.200e-022	7.738e-022	-21.086	-21.111	-0.025	(0)
FeCl+2	7.837e-023	6.325e-023	-22.106	-22.199	-0.093	(0)
FeHSeO3+2	3.232e-025	2.564e-025	-24.491	-24.591	-0.101	(0)
Fe2 (OH) 2+4	3.693e-026	1.462e-026	-25.433	-25.835	-0.402	(0)
FeCl2+	1.729e-026	1.638e-026	-25.762	-25.786	-0.023	(0)
FeCl3	9.501e-032	9.501e-032	-31.022	-31.022	0.000	(0)
Fe3 (OH) 4+5	6.621e-033	1.556e-033	-32.179	-32.808	-0.629	(0)
H (0)	1.767e-027					
H2	8.836e-028	8.841e-028	-27.054	-27.054	0.000	(0)
Hg (0)	2.493e-011					
Hg	2.493e-011	2.493e-011	-10.603	-10.603	0.000	(0)
Hg (1)	1.152e-026					
Hg2+2	5.762e-027	4.571e-027	-26.239	-26.340	-0.101	(0)
Hg (2)	1.409e-015					
Hg (OH) 2	1.383e-015	1.383e-015	-14.859	-14.859	0.000	(0)
HgClOH	2.492e-017	2.492e-017	-16.603	-16.603	0.000	(0)
HgCO3	7.838e-019	7.838e-019	-18.106	-18.106	0.000	(0)
HgCl2	9.083e-020	9.083e-020	-19.042	-19.042	0.000	(0)
HgOH+	1.027e-020	9.688e-021	-19.989	-20.014	-0.025	(0)
Hg (CO3) 2-2	7.577e-021	6.010e-021	-20.121	-20.221	-0.101	(0)
HgCl+	3.311e-022	3.125e-022	-21.480	-21.505	-0.025	(0)
HgHCO3+	1.728e-022	1.631e-022	-21.762	-21.788	-0.025	(0)
Hg (OH) 3-	1.663e-022	1.569e-022	-21.779	-21.804	-0.025	(0)

	HgCl3-	5.581e-023	5.267e-023	-22.253	-22.278	-0.025	(0)
	Hg+2	3.405e-025	2.701e-025	-24.468	-24.569	-0.101	(0)
	HgSO4	2.113e-026	2.113e-026	-25.675	-25.675	0.000	(0)
	HgCl4-2	1.533e-026	1.216e-026	-25.814	-25.915	-0.101	(0)
	HgF+	4.200e-028	3.964e-028	-27.377	-27.402	-0.025	(0)
K		9.824e-005					
	K+	9.803e-005	9.285e-005	-4.009	-4.032	-0.024	(0)
	KSO4-	2.072e-007	1.964e-007	-6.684	-6.707	-0.023	(0)
Mg		1.442e-004					
	Mg+2	1.368e-004	1.101e-004	-3.864	-3.958	-0.094	(0)
	MgSO4	5.985e-006	5.985e-006	-5.223	-5.223	0.000	(0)
	MgHCO3+	6.873e-007	6.509e-007	-6.163	-6.186	-0.024	(0)
	MgF+	5.160e-007	4.889e-007	-6.287	-6.311	-0.023	(0)
	MgCO3	2.220e-007	2.220e-007	-6.654	-6.654	0.000	(0)
	MgOH+	4.160e-008	3.948e-008	-7.381	-7.404	-0.023	(0)
	MgH2BO3+	9.021e-011	8.533e-011	-10.045	-10.069	-0.024	(0)
Mn (2)		2.365e-006					
	Mn+2	2.242e-006	1.778e-006	-5.649	-5.750	-0.101	(0)
	MnSO4	9.451e-008	9.451e-008	-7.025	-7.025	0.000	(0)
	MnHCO3+	2.164e-008	2.051e-008	-7.665	-7.688	-0.023	(0)
	MnOH+	4.246e-009	4.025e-009	-8.372	-8.395	-0.023	(0)
	MnF+	2.957e-009	2.803e-009	-8.529	-8.552	-0.023	(0)
	MnCl+	1.370e-010	1.298e-010	-9.863	-9.887	-0.023	(0)
	MnCl2	1.063e-014	1.063e-014	-13.973	-13.973	0.000	(0)
	MnSeO4	4.533e-017	4.533e-017	-16.344	-16.344	0.000	(0)
	Mn (OH) 3-	2.131e-017	2.019e-017	-16.672	-16.695	-0.023	(0)
	MnCl3-	1.792e-019	1.699e-019	-18.747	-18.770	-0.023	(0)
	Mn (OH) 4-2	7.278e-023	5.874e-023	-22.138	-22.231	-0.093	(0)
	MnSe	2.485e-039	2.485e-039	-38.605	-38.605	0.000	(0)
Mn (3)		1.295e-027					
	Mn+3	1.295e-027	7.943e-028	-26.888	-27.100	-0.212	(0)
Mn (6)		0.000e+000					
	MnO4-2	0.000e+000	0.000e+000	-44.465	-44.558	-0.093	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-49.906	-49.930	-0.024	(0)
Mo		7.693e-008					
	MoO4-2	7.692e-008	6.189e-008	-7.114	-7.208	-0.094	(0)
	HMoO4-	1.458e-011	1.376e-011	-10.836	-10.861	-0.025	(0)
	H2MoO4	1.126e-015	1.126e-015	-14.948	-14.948	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-51.428	-51.654	-0.226	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-60.177	-61.083	-0.905	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-62.019	-62.648	-0.629	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-65.415	-65.817	-0.402	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-70.297	-70.523	-0.226	(0)
Na		1.720e-004					
	Na+	1.716e-004	1.625e-004	-3.765	-3.789	-0.024	(0)
	NaSO4-	2.751e-007	2.609e-007	-6.560	-6.584	-0.023	(0)
	NaHCO3	5.283e-008	5.283e-008	-7.277	-7.277	0.000	(0)
	NaCO3-	7.741e-009	7.339e-009	-8.111	-8.134	-0.023	(0)
	NaF	4.060e-009	4.060e-009	-8.391	-8.391	0.000	(0)
	NaH2BO3	5.760e-012	5.760e-012	-11.240	-11.240	0.000	(0)
O (0)		1.296e-038					
	O2	6.482e-039	6.485e-039	-38.188	-38.188	0.000	(0)
Pb		5.792e-010					
	PbCO3	3.619e-010	3.619e-010	-9.441	-9.441	0.000	(0)
	PbOH+	1.191e-010	1.124e-010	-9.924	-9.949	-0.025	(0)
	Pb+2	6.170e-011	4.965e-011	-10.210	-10.304	-0.094	(0)
	PbHCO3+	2.259e-011	2.132e-011	-10.646	-10.671	-0.025	(0)
	PbSO4	7.267e-012	7.267e-012	-11.139	-11.139	0.000	(0)
	Pb (OH) 2	3.202e-012	3.202e-012	-11.495	-11.495	0.000	(0)
	Pb (CO3) 2-2	3.191e-012	2.531e-012	-11.496	-11.597	-0.101	(0)
	PbF+	1.468e-013	1.385e-013	-12.833	-12.858	-0.025	(0)
	PbCl+	1.082e-013	1.022e-013	-12.966	-12.991	-0.025	(0)
	Pb (SO4) 2-2	1.650e-014	1.309e-014	-13.783	-13.883	-0.101	(0)
	Pb (OH) 3-	3.057e-015	2.885e-015	-14.515	-14.540	-0.025	(0)
	PbF2	1.079e-016	1.079e-016	-15.967	-15.967	0.000	(0)
	PbCl2	2.646e-017	2.646e-017	-16.577	-16.577	0.000	(0)
	Pb (OH) 4-2	8.026e-019	6.366e-019	-18.096	-18.196	-0.101	(0)

Pb2OH+3	1.489e-019	8.842e-020	-18.827	-19.053	-0.226	(0)
PbF3-	8.588e-021	8.105e-021	-20.066	-20.091	-0.025	(0)
PbCl3-	6.474e-022	6.109e-022	-21.189	-21.214	-0.025	(0)
Pb3(OH) 4+2	1.280e-023	1.016e-023	-22.893	-22.993	-0.101	(0)
PbF4-2	1.936e-025	1.536e-025	-24.713	-24.814	-0.101	(0)
PbCl4-2	2.042e-026	1.619e-026	-25.690	-25.791	-0.101	(0)
Pb4(OH) 4+4	1.012e-029	4.005e-030	-28.995	-29.397	-0.402	(0)
S (6)	4.030e-004					
SO4-2	3.714e-004	2.989e-004	-3.430	-3.525	-0.094	(0)
CaSO4	2.506e-005	2.506e-005	-4.601	-4.601	0.000	(0)
MgSO4	5.985e-006	5.985e-006	-5.223	-5.223	0.000	(0)
NaSO4-	2.751e-007	2.609e-007	-6.560	-6.584	-0.023	(0)
KSO4-	2.072e-007	1.964e-007	-6.684	-6.707	-0.023	(0)
MnSO4	9.451e-008	9.451e-008	-7.025	-7.025	0.000	(0)
ZnSO4	2.892e-009	2.892e-009	-8.539	-8.539	0.000	(0)
HSO4-	3.445e-010	3.264e-010	-9.463	-9.486	-0.023	(0)
Zn (SO4) 2-2	9.490e-012	7.528e-012	-11.023	-11.123	-0.101	(0)
PbSO4	7.267e-012	7.267e-012	-11.139	-11.139	0.000	(0)
FeSO4	2.852e-012	2.852e-012	-11.545	-11.545	0.000	(0)
Pb (SO4) 2-2	1.650e-014	1.309e-014	-13.783	-13.883	-0.101	(0)
UO2SO4	3.176e-015	3.176e-015	-14.498	-14.498	0.000	(0)
AlSO4+	5.049e-016	4.783e-016	-15.297	-15.320	-0.023	(0)
UO2 (SO4) 2-2	1.578e-017	1.251e-017	-16.802	-16.903	-0.101	(0)
Al (SO4) 2-	1.617e-018	1.532e-018	-17.791	-17.815	-0.023	(0)
VO2SO4-	1.350e-019	1.274e-019	-18.870	-18.895	-0.025	(0)
FeSO4+	1.278e-019	1.211e-019	-18.894	-18.917	-0.023	(0)
VOSO4	1.467e-021	1.467e-021	-20.833	-20.833	0.000	(0)
Fe (SO4) 2-	8.200e-022	7.738e-022	-21.086	-21.111	-0.025	(0)
HgSO4	2.113e-026	2.113e-026	-25.675	-25.675	0.000	(0)
VSO4+	1.653e-035	1.560e-035	-34.782	-34.807	-0.025	(0)
U (SO4) 2	0.000e+000	0.000e+000	-41.294	-41.294	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-41.569	-41.669	-0.101	(0)
Se (-2)	4.019e-036					
HSe-	4.016e-036	3.790e-036	-35.396	-35.421	-0.025	(0)
MnSe	2.485e-039	2.485e-039	-38.605	-38.605	0.000	(0)
H2Se	3.288e-040	3.288e-040	-39.483	-39.483	0.000	(0)
Se-2	0.000e+000	0.000e+000	-42.369	-42.470	-0.101	(0)
Se (4)	4.053e-009					
HSeO3-	2.846e-009	2.686e-009	-8.546	-8.571	-0.025	(0)
SeO3-2	1.207e-009	9.570e-010	-8.918	-9.019	-0.101	(0)
H2SeO3	1.281e-014	1.281e-014	-13.893	-13.893	0.000	(0)
FeHSeO3+2	3.232e-025	2.564e-025	-24.491	-24.591	-0.101	(0)
Se (6)	1.178e-013					
SeO4-2	1.177e-013	9.472e-014	-12.929	-13.024	-0.094	(0)
MnSeO4	4.533e-017	4.533e-017	-16.344	-16.344	0.000	(0)
ZnSeO4	6.488e-019	6.488e-019	-18.188	-18.188	0.000	(0)
HSeO4-	5.621e-020	5.305e-020	-19.250	-19.275	-0.025	(0)
Zn (SeO4) 2-2	7.855e-032	6.231e-032	-31.105	-31.205	-0.101	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.314	-57.541	-0.226	(0)
U (4)	8.308e-019					
U (OH) 5-	8.304e-019	7.837e-019	-18.081	-18.106	-0.025	(0)
U (OH) 4	3.668e-022	3.668e-022	-21.436	-21.436	0.000	(0)
U (OH) 3+	1.588e-026	1.498e-026	-25.799	-25.824	-0.025	(0)
U (OH) 2+2	9.761e-032	7.743e-032	-31.010	-31.111	-0.101	(0)
UF3+	4.714e-037	4.449e-037	-36.327	-36.352	-0.025	(0)
UF2+2	8.938e-038	7.090e-038	-37.049	-37.149	-0.101	(0)
UOH+3	6.863e-038	4.075e-038	-37.163	-37.390	-0.226	(0)
UF4	1.931e-039	1.931e-039	-38.714	-38.714	0.000	(0)
UF+3	2.396e-040	1.422e-040	-39.621	-39.847	-0.226	(0)
U (SO4) 2	0.000e+000	0.000e+000	-41.294	-41.294	0.000	(0)
UF5-	0.000e+000	0.000e+000	-41.493	-41.519	-0.025	(0)
USO4+2	0.000e+000	0.000e+000	-41.569	-41.669	-0.101	(0)
UF6-2	0.000e+000	0.000e+000	-43.340	-43.441	-0.101	(0)
U+4	0.000e+000	0.000e+000	-44.342	-44.745	-0.402	(0)
UCl+3	0.000e+000	0.000e+000	-47.055	-47.281	-0.226	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-164.309	-166.346	-2.037	(0)
U (5)	4.535e-016					

UO2+	4.535e-016	4.280e-016	-15.343	-15.369	-0.025	(0)
U(6)	5.210e-009					
UO2 (CO3) 2-2	4.135e-009	3.280e-009	-8.384	-8.484	-0.101	(0)
UO2 (CO3) 3-4	1.007e-009	3.986e-010	-8.997	-9.399	-0.402	(0)
UO2CO3	6.778e-011	6.778e-011	-10.169	-10.169	0.000	(0)
UO2OH+	8.440e-013	7.965e-013	-12.074	-12.099	-0.025	(0)
UO2F+	4.066e-014	3.837e-014	-13.391	-13.416	-0.025	(0)
UO2+2	8.726e-015	7.021e-015	-14.059	-14.154	-0.094	(0)
UO2F2	4.382e-015	4.382e-015	-14.358	-14.358	0.000	(0)
UO2SO4	3.176e-015	3.176e-015	-14.498	-14.498	0.000	(0)
UO2F3-	4.618e-017	4.358e-017	-16.336	-16.361	-0.025	(0)
UO2 (SO4) 2-2	1.578e-017	1.251e-017	-16.802	-16.903	-0.101	(0)
(UO2) 2 (OH) 2+2	1.327e-018	1.053e-018	-17.877	-17.978	-0.101	(0)
UO2Cl+	6.997e-019	6.604e-019	-18.155	-18.180	-0.025	(0)
(UO2) 3 (OH) 5+	5.472e-019	5.164e-019	-18.262	-18.287	-0.025	(0)
UO2F4-2	1.728e-020	1.370e-020	-19.763	-19.863	-0.101	(0)
V(2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-40.777	-40.802	-0.025	(0)
V+2	0.000e+000	0.000e+000	-42.166	-42.266	-0.101	(0)
V(3)	6.524e-014					
V(OH) 3	6.524e-014	6.524e-014	-13.186	-13.186	0.000	(0)
V(OH) 2+	4.991e-025	4.710e-025	-24.302	-24.327	-0.025	(0)
VOH+2	6.294e-029	4.992e-029	-28.201	-28.302	-0.101	(0)
V+3	1.862e-034	1.106e-034	-33.730	-33.956	-0.226	(0)
VSO4+	1.653e-035	1.560e-035	-34.782	-34.807	-0.025	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-53.950	-54.177	-0.226	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-55.401	-55.803	-0.402	(0)
V(4)	3.424e-018					
V(OH) 3+	3.396e-018	3.205e-018	-17.469	-17.494	-0.025	(0)
VO+2	2.247e-020	1.783e-020	-19.648	-19.749	-0.101	(0)
VOF+	4.486e-021	4.233e-021	-20.348	-20.373	-0.025	(0)
VOSO4	1.467e-021	1.467e-021	-20.833	-20.833	0.000	(0)
VOF2	6.285e-023	6.285e-023	-22.202	-22.202	0.000	(0)
VOC1+	3.073e-024	2.900e-024	-23.512	-23.538	-0.025	(0)
VOF3-	9.355e-026	8.829e-026	-25.029	-25.054	-0.025	(0)
VOF4-2	1.779e-029	1.411e-029	-28.750	-28.850	-0.101	(0)
H2V2O4+2	6.490e-031	5.148e-031	-30.188	-30.288	-0.101	(0)
V(5)	9.620e-009					
H2VO4-	7.590e-009	7.162e-009	-8.120	-8.145	-0.025	(0)
HVO4-2	2.030e-009	1.610e-009	-8.693	-8.793	-0.101	(0)
H3VO4	8.004e-013	8.004e-013	-12.097	-12.097	0.000	(0)
H3V2O7-	3.922e-014	3.702e-014	-13.406	-13.432	-0.025	(0)
HV2O7-3	6.581e-015	3.908e-015	-14.182	-14.408	-0.226	(0)
VO4-3	1.216e-015	7.221e-016	-14.915	-15.141	-0.226	(0)
V2O7-4	2.377e-017	9.412e-018	-16.624	-17.026	-0.402	(0)
VO2+	1.884e-017	1.785e-017	-16.725	-16.748	-0.024	(0)
VO2F	1.239e-018	1.239e-018	-17.907	-17.907	0.000	(0)
V3O9-3	6.480e-019	3.848e-019	-18.188	-18.415	-0.226	(0)
VO2SO4-	1.350e-019	1.274e-019	-18.870	-18.895	-0.025	(0)
VO2F2-	1.888e-020	1.782e-020	-19.724	-19.749	-0.025	(0)
VO2F3-2	1.109e-023	8.799e-024	-22.955	-23.056	-0.101	(0)
V4O12-4	2.902e-024	1.149e-024	-23.537	-23.940	-0.402	(0)
VO2F4-3	2.887e-028	1.714e-028	-27.540	-27.766	-0.226	(0)
V10O28-6	0.000e+000	0.000e+000	-63.445	-64.351	-0.905	(0)
HV10O28-5	0.000e+000	0.000e+000	-63.487	-64.116	-0.629	(0)
H2V10O28-4	0.000e+000	0.000e+000	-66.457	-66.860	-0.402	(0)
Zn	6.974e-008					
Zn+2	5.497e-008	4.423e-008	-7.260	-7.354	-0.094	(0)
ZnCO3	6.172e-009	6.172e-009	-8.210	-8.210	0.000	(0)
ZnOH+	4.223e-009	3.985e-009	-8.374	-8.400	-0.025	(0)
ZnSO4	2.892e-009	2.892e-009	-8.539	-8.539	0.000	(0)
ZnHCO3+	8.566e-010	8.084e-010	-9.067	-9.092	-0.025	(0)
Zn (OH) 2	5.691e-010	5.691e-010	-9.245	-9.245	0.000	(0)
ZnF+	3.702e-011	3.494e-011	-10.432	-10.457	-0.025	(0)
Zn (SO4) 2-2	9.490e-012	7.528e-012	-11.023	-11.123	-0.101	(0)
ZnOHC1	7.600e-012	7.600e-012	-11.119	-11.119	0.000	(0)
ZnCl+	6.803e-012	6.443e-012	-11.167	-11.191	-0.024	(0)
Zn (OH) 3-	2.723e-012	2.570e-012	-11.565	-11.590	-0.025	(0)

ZnCl2	5.922e-016	5.922e-016	-15.228	-15.228	0.000	(0)
Zn(OH) 4-2	1.162e-016	9.219e-017	-15.935	-16.035	-0.101	(0)
ZnSeO4	6.488e-019	6.488e-019	-18.188	-18.188	0.000	(0)
ZnCl3-	2.880e-020	2.728e-020	-19.541	-19.564	-0.024	(0)
ZnCl4-2	9.800e-025	7.910e-025	-24.009	-24.102	-0.093	(0)
Zn(SeO4) 2-2	7.855e-032	6.231e-032	-31.105	-31.205	-0.101	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
Al(OH) 3(am)	-2.63	8.17	10.80	Al(OH) 3
Al2(MoO4) 3	-55.36	-53.00	2.37	Al2(MoO4) 3
Al2O3	-3.31	16.34	19.65	Al2O3
Al4(OH) 10SO4	-9.45	13.25	22.70	Al4(OH) 10SO4
AlOHSO4	-8.03	-11.26	-3.23	AlOHSO4
Alunite	-9.03	-10.43	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-6.04	-13.83	-7.79	PbSO4
Anhydrite	-2.60	-6.96	-4.36	CaSO4
Aragonite	-0.75	-9.05	-8.30	CaCO3
Artinite	-7.23	2.37	9.60	MgCO3:Mg(OH) 2:3H2O
Ba(OH) 2:8H2O	-15.66	8.73	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-16.00	-0.13	15.87	Ba2V2O7:2H2O
Ba3(VO4) 2:4H2O	-24.34	8.60	32.94	Ba3(VO4) 2:4H2O
BaF2	-10.16	-15.98	-5.82	BaF2
BaMoO4	-7.42	-14.38	-6.96	BaMoO4
Barite	-0.72	-10.70	-9.98	BaSO4
BaSeO3	-9.62	-7.79	1.83	BaSeO3
BaSeO4	-12.73	-20.19	-7.46	BaSeO4
Bianchite	-9.11	-10.88	-1.76	ZnSO4:6H2O
Birnessite	-9.38	8.71	18.09	MnO2
Bixbyite	-5.85	-6.49	-0.64	Mn2O3
Boehmite	-0.41	8.17	8.58	AlOOH
Brucite	-4.90	11.95	16.84	Mg(OH) 2
Ca(VO3) 2	-10.79	-5.13	5.66	Ca(VO3) 2
Ca2V2O7	-10.16	7.34	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.21	7.34	21.55	Ca2V2O7:2H2O
Ca3(VO4) 2	-19.15	19.81	38.96	Ca3(VO4) 2
Ca3(VO4) 2:4H2O	-20.05	19.81	39.86	Ca3(VO4) 2:4H2O
Calcite	-0.57	-9.05	-8.48	CaCO3
Calomel	-16.90	-34.81	-17.91	Hg2Cl2
CaMoO4	-2.69	-10.64	-7.95	CaMoO4
Carnotite	-3.36	-3.13	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.06	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.44	-16.46	-3.02	CaSeO4:2H2O
Cerrusite	-2.79	-15.92	-13.13	PbCO3
CH4(g)	-76.09	-117.13	-41.05	CH4
Clausthalite	-10.67	-37.77	-27.10	PbSe
CO2(g)	-3.37	-21.52	-18.15	CO2
Cotunnite	-14.00	-18.78	-4.78	PbCl2
Cryolite	-19.63	-53.47	-33.84	Na3AlF6
Diaspore	1.30	8.17	6.87	AlOOH
Dolomite(disordered)	-2.09	-18.63	-16.54	CaMg(CO3) 2
Dolomite(ordered)	-1.54	-18.63	-17.09	CaMg(CO3) 2
Epsomite	-5.36	-7.48	-2.13	MgSO4:7H2O
Fe(OH) 2	-8.07	5.49	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	3.80	0.76	-3.04	Fe(OH) 2.7Cl.3
Fe(VO3) 2	-8.38	-12.10	-3.72	Fe(VO3) 2
Fe2(OH) 4SeO3	-9.25	-7.70	1.55	Fe2(OH) 4SeO3
Fe2(SeO3) 3:2H2O	-20.12	-40.74	-20.63	Fe2(SeO3) 3:2H2O
Fe2(SO4) 3	-45.72	-49.46	-3.73	Fe2(SO4) 3
Fe3(OH) 8	-5.90	14.32	20.22	Fe3(OH) 8
FeMoO4	-7.53	-17.62	-10.09	FeMoO4
Ferrihydrite	1.22	4.41	3.19	Fe(OH) 3
Ferroselite	-38.75	-57.35	-18.60	FeSe2
FeSe	-26.88	-37.88	-11.00	FeSe
Fluorite	-1.74	-12.24	-10.50	CaF2
Gibbsite	-0.12	8.17	8.29	Al(OH) 3

Goethite	3.92	4.41	0.49	FeOOH
Goslarite	-8.87	-10.88	-2.01	ZnSO ₄ :7H ₂ O
Gummite	-5.92	1.75	7.67	UO ₃
Gypsum	-2.35	-6.96	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-13.52	-25.62	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-10.24	-23.11	-12.88	H ₂ MoO ₄
H ₂ Se(g)	-38.41	-43.37	-4.96	H ₂ Se
Halite	-9.63	-8.03	1.60	NaCl
Hausmannite	-6.67	54.36	61.03	Mn ₃ O ₄
Hematite	10.24	8.83	-1.42	Fe ₂ O ₃
Hercynite	-1.06	21.83	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-175.42	-249.12	-73.71	Hg(CH ₃) ₂
Hg(g)	-9.30	-17.17	-7.87	Hg
Hg(OH) ₂	-11.36	-14.86	-3.50	Hg(OH) ₂
Hg ₂ (g)	-19.38	-34.34	-14.96	Hg ₂
Hg ₂ (OH) ₂	-15.70	-10.44	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-15.91	-31.96	-16.05	Hg ₂ CO ₃
Hg ₂ F ₂	-24.78	-35.14	-10.36	Hg ₂ F ₂
Hg ₂ SeO ₃	-22.30	-26.96	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-23.73	-29.86	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-36.41	-66.10	-29.68	Hg ₃ O ₂ CO ₃
HgCl(g)	-36.90	-17.41	19.50	HgCl
HgCl ₂	-17.97	-39.24	-21.26	HgCl ₂
HgF(g)	-50.25	-17.57	32.68	HgF
HgF ₂ (g)	-52.13	-39.57	12.57	HgF ₂
Hgmetal(l)	-3.72	-17.17	-13.45	Hg
HgSe	-2.54	-58.23	-55.69	HgSe
HgSeO ₃	-18.95	-31.38	-12.43	HgSeO ₃
HgSO ₄	-24.87	-34.29	-9.42	HgSO ₄
Huntite	-7.80	-37.77	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-7.47	-26.24	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-17.58	-26.35	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ :4H ₂ O
K-Alum	-21.60	-26.77	-5.17	KAl(SO ₄) ₂ :12H ₂ O
K-Jarosite	-6.90	-21.70	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ MoO ₄	-18.53	-15.27	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-20.36	-21.09	-0.73	K ₂ SeO ₄
Larnakite	-7.79	-8.23	-0.43	PbO:PbSO ₄
Laurionite	-7.21	-6.59	0.62	PbOHCl
Lepidocrocite	3.04	4.41	1.37	FeOOH
Lime	-20.23	12.47	32.70	CaO
Litharge	-7.09	5.60	12.69	PbO
Maghemite	2.44	8.83	6.39	Fe ₂ O ₃
Magnesioferrite	3.91	20.77	16.86	Fe ₂ MgO ₄
Magnesite	-2.11	-9.57	-7.46	MgCO ₃
Magnetite	10.92	14.32	3.40	Fe ₃ O ₄
Manganite	-3.23	22.11	25.34	MnOOH
Massicot	-7.29	5.60	12.89	PbO
Matlockite	-9.97	-18.94	-8.97	PbClF
Melanterite	-11.73	-13.93	-2.21	FeSO ₄ :7H ₂ O
Mg(OH) ₂ (active)	-6.85	11.95	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.93	-5.65	11.28	Mg(VO ₃) ₂
Mg ₂ V ₂ O ₇	-20.06	6.30	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-4.63	-12.76	-8.13	MgF ₂
MgMoO ₄	-9.32	-11.17	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-7.63	-4.58	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-15.78	-16.98	-1.20	MgSeO ₄ :6H ₂ O
Minium	-32.82	40.70	73.52	Pb ₃ O ₄
Mirabilite	-9.99	-11.10	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn(VO ₃) ₂	-12.34	-7.44	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-59.06	-64.77	-5.71	Mn ₂ (SO ₄) ₃
MnCl ₂ :4H ₂ O	-16.94	-14.22	2.72	MnCl ₂ :4H ₂ O
MnSe	-36.72	-33.22	3.50	MnSe
MnSeO ₃	-7.50	-6.37	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-7.35	-6.37	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-16.72	-18.77	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-11.86	-9.27	2.58	MnSO ₄
Montroydite	-11.22	-14.86	-3.64	HgO
MoO ₃	-15.11	-23.11	-8.00	MoO ₃

Na-Jarosite	-10.25	-21.45	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-21.30	-37.90	-16.60	Na2Mo2O7
Na2MoO4	-16.28	-14.79	1.49	Na2MoO4
Na2MoO4:2H2O	-16.01	-14.79	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.50	-8.20	10.30	Na2SeO3:5H2O
Na2SeO4	-21.88	-20.60	1.28	Na2SeO4
Na3VO4	-32.99	3.69	36.68	Na3VO4
Na4V2O7	-38.34	-0.94	37.40	Na4V2O7
Natron	-11.88	-13.19	-1.31	Na2CO3:10H2O
NaVO3	-8.49	-4.63	3.86	NaVO3
Nesquehonite	-4.90	-9.57	-4.67	MgCO3:3H2O
Nsutite	-8.80	8.71	17.50	MnO2
O2(g)	-35.28	47.81	83.09	O2
Pb(BO2)2	-13.65	-7.13	6.52	Pb(BO2)2
Pb(OH)2	-2.55	5.60	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.36	-73.12	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.78	-0.99	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.99	11.20	26.19	Pb2O(OH)2
Pb2O3	-25.94	35.10	61.04	Pb2O3
Pb2OCO3	-9.76	-10.32	-0.56	Pb2OCO3
Pb2V2O7	-4.49	-6.39	-1.90	Pb2V2O7
Pb3(VO4)2	-6.94	-0.80	6.14	Pb3(VO4)2
Pb3O2CO3	-15.74	-4.72	11.02	Pb3O2CO3
Pb3O2SO4	-13.32	-2.63	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.13	2.97	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.97	21.88	Pb4O3SO4
PbF2	-11.67	-19.11	-7.44	PbF2
Pbmetal	-22.55	-18.30	4.25	Pb
PbMoO4	-1.89	-17.51	-15.62	PbMoO4
PbO:0.3H2O	-7.38	5.60	12.98	PbO:0.33H2O
PbSeO4	-16.49	-23.33	-6.84	PbSeO4
Periclase	-9.64	11.95	21.58	MgO
Phosgenite	-14.89	-34.70	-19.81	PbCl2:PbCO3
Plattnerite	-20.10	29.50	49.60	PbO2
Portlandite	-10.34	12.47	22.80	Ca(OH)2
Pyrochroite	-5.04	10.15	15.19	Mn(OH)2
Pyrolusite	-7.32	34.06	41.38	MnO2
Rhodochrosite	-0.79	-11.37	-10.58	MnCO3
Rutherfordine	-5.27	-19.77	-14.50	UO2CO3
Schoepite	-4.24	1.75	5.99	UO2(OH)2:H2O
Semetal(am)	-12.36	-19.47	-7.11	Se
Semetal(hex)	-11.76	-19.47	-7.71	Se
SeO2	-16.65	-16.52	0.12	SeO2
SeO3	-49.97	-28.93	21.04	SeO3
Siderite	-5.79	-16.03	-10.24	FeCO3
Smithsonite	-2.97	-12.97	-10.00	ZnCO3
Spinel	-8.56	28.28	36.85	MgAl2O4
Thenardite	-11.42	-11.10	0.32	Na2SO4
Thermonatrite	-13.83	-13.19	0.64	Na2CO3:H2O
Tyuyamunite	-5.71	-1.63	4.08	Ca(UO2)2(VO4)2
U3O8	-12.09	8.99	21.08	U3O8
U4O9	-24.83	-27.85	-3.02	U4O9
UF4	-32.82	-62.35	-29.54	UF4
UF4:2.5H2O	-29.64	-62.35	-32.72	UF4:2.5H2O
UO2(am)	-13.87	-12.94	0.93	UO2
UO2(OH)2(beta)	-3.86	1.75	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.93	-27.18	-2.25	UO2SeO4:4H2O
UO3	-5.95	1.75	7.70	UO3
Uraninite	-8.27	-12.94	-4.67	UO2
V(OH)3	-17.69	-10.10	7.59	V(OH)3
V2O5	-16.23	-17.59	-1.36	V2O5
V3O5	-37.28	-35.44	1.84	V3O5
V4O7	-46.47	-39.29	7.19	V4O7
V6O13	-39.73	-100.59	-60.86	V6O13
VC12	-65.30	-46.43	18.87	VC12
VC13	-70.10	-46.67	23.43	VC13
VF4	-68.19	-53.26	14.93	VF4
Vmetal	-89.98	-45.96	44.03	V

VO	-36.81	-22.05	14.76	VO
VO(OH)2	-9.00	-3.85	5.15	VO(OH)2
VO2Cl	-23.83	-20.99	2.84	VO2Cl
VOC1	-33.44	-22.29	11.15	VOC1
VOC12	-40.98	-28.22	12.76	VOC12
VOSO4	-26.88	-23.27	3.61	VOSO4
Witherite	-4.22	-12.79	-8.57	BaCO3
Zincite	-2.78	8.55	11.33	ZnO
Zincosite	-14.81	-10.88	3.93	ZnSO4
Zn(BO2)2	-12.47	-4.18	8.29	Zn(BO2)2
Zn(OH)2	-3.65	8.55	12.20	Zn(OH)2
Zn(OH)2(am)	-3.92	8.55	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.20	8.55	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.98	8.55	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.18	8.55	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.83	-2.33	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.28	4.91	15.19	Zn2(OH)3Cl
Zn3O(SO4)2	-32.12	-13.21	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.63	14.77	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.13	18.37	38.50	Zn5(OH)8Cl2
ZnCl2	-22.88	-15.83	7.05	ZnCl2
ZnCO3:1H2O	-2.71	-12.97	-10.26	ZnCO3:1H2O
ZnF2	-15.62	-16.16	-0.53	ZnF2
Znmetal	-41.14	-15.35	25.79	Zn
ZnMoO4	-4.44	-14.56	-10.13	ZnMoO4
ZnO(active)	-2.64	8.55	11.19	ZnO
ZnSe	-20.42	-34.82	-14.40	ZnSe
ZnSeO4:6H2O	-18.86	-20.38	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.24	-10.88	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 13.

```

Title Stage 1 Groundwater mix
MIX 101
2      1
3      0.00000
4      0.00000
5      0.00000
6      0.00000
7      0.65099
8      14.62069
9      0.00000
10     15.47109
Save solution 101
end

```

TITLE

Stage 1 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 101.

Mixture 101.

1.000e+000 Solution 2 Blended groundwater chemistry provided by JSAI
 (Sept 2015) for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-23B, GWQ11-24B and
 GWQ11-25B for samples collected between 1996 and 2013
 0.000e+000 Solution 3 Average HCT data for biotite breccia -
 oxide/transitional (waste) (cell SRK 0872)
 0.000e+000 Solution 4 Average HCT data for biotite breccia -
 oxide/transitional (ore) (cells SRK 0854)
 0.000e+000 Solution 5 Average HCT data for quartz monzonite -
 oxide/transitional (waste) (cell 604569)
 0.000e+000 Solution 6 Average HCT data for quartz monzonite -
 oxide/transitional (ore) (cell SRK 0867)
 6.510e-001 Solution 7 Average HCT data for biotite breccia - sulfide
 (waste) (cells 604811, 604854, 604862, 604867 and 605033)
 1.462e+001 Solution 8 Average HCT data for biotite breccia - sulfide
 (ore) (cells 604767, 604787, 604811, 604854, 604862, 604867 and 605033)
 0.000e+000 Solution 9 Average HCT data for quartz monzonite - sulfide
 (waste) (cells 604673 and 605153)
 1.547e+001 Solution 10 Average HCT data for quartz monzonite - sulfide
 (ore) (cells 604562, 604606, 604653, 604656 and 604669)

-----Solution composition-----

Elements	Molality	Moles
Ag	2.633e-009	8.359e-008
Al	3.636e-007	1.154e-005
As	3.128e-009	9.929e-008
B	8.400e-007	2.667e-005
Ba	9.281e-008	2.946e-006
C	8.729e-004	2.771e-002
Ca	7.929e-004	2.517e-002
Cd	2.808e-010	8.912e-009
Cl	7.778e-005	2.469e-003
Co	5.355e-009	1.700e-007
Cr	4.006e-009	1.272e-007
Cu	6.716e-008	2.132e-006
F	5.616e-005	1.783e-003
Fe	8.500e-007	2.698e-005
Hg	1.246e-011	3.957e-010
K	9.797e-005	3.110e-003
Mg	2.239e-004	7.108e-003
Mn	3.193e-006	1.014e-004
Mo	6.757e-008	2.145e-006
N	2.154e-006	6.838e-005
Na	2.883e-004	9.153e-003
Ni	6.722e-009	2.134e-007
Pb	6.631e-010	2.105e-008
S	7.331e-004	2.327e-002
Sb	2.333e-010	7.406e-009
Se	4.754e-009	1.509e-007
U	9.290e-009	2.949e-007
V	1.525e-008	4.841e-007
Zn	9.222e-008	2.927e-006

-----Description of solution-----

	pH	=	7.520	Charge balance
	pe	=	7.187	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength	=	3.844e-003	
	Mass of water (kg)	=	3.174e+001	
	Total alkalinity (eq/kg)	=	8.263e-004	
	Total CO2 (mol/kg)	=	8.729e-004	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	-4.278e-017	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00	
	Iterations	=	15	

Total H = 3.523911e+003
Total O = 1.762117e+003

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	3.571e-007	3.336e-007	-6.447	-6.477	-0.030	(0)
H+	3.228e-008	3.018e-008	-7.491	-7.520	-0.029	0.00
H2O	5.551e+001	9.999e-001	1.744	-0.000	0.000	18.07
Ag	2.633e-009					
Ag+	2.290e-009	2.141e-009	-8.640	-8.669	-0.029	(0)
AgCl	3.179e-010	3.179e-010	-9.498	-9.498	0.000	(0)
AgSO4-	2.298e-011	2.136e-011	-10.639	-10.670	-0.032	(0)
AgCl2-	2.165e-012	2.013e-012	-11.664	-11.696	-0.032	(0)
AgF	2.757e-013	2.757e-013	-12.559	-12.559	0.000	(0)
AgNO2	1.127e-013	1.127e-013	-12.948	-12.948	0.000	(0)
AgOH	7.143e-014	7.143e-014	-13.146	-13.146	0.000	(0)
AgNO3	2.991e-015	2.991e-015	-14.524	-14.524	0.000	(0)
AgH2BO3	5.375e-016	5.375e-016	-15.270	-15.270	0.000	(0)
AgCl3-2	1.746e-016	1.305e-016	-15.758	-15.884	-0.126	(0)
AgSeO3-	1.367e-016	1.271e-016	-15.864	-15.896	-0.032	(0)
Ag (OH) 2-	2.504e-018	2.329e-018	-17.601	-17.633	-0.032	(0)
Ag (NO2) 2-	4.729e-020	4.396e-020	-19.325	-19.357	-0.032	(0)
AgCl4-3	3.731e-020	1.937e-020	-19.428	-19.713	-0.285	(0)
Ag (SeO3) 2-3	2.025e-025	1.052e-025	-24.694	-24.978	-0.285	(0)
Ag2MoO4	8.956e-026	8.956e-026	-25.048	-25.048	0.000	(0)
AgNH3+	3.752e-027	3.489e-027	-26.426	-26.457	-0.032	(0)
Ag2Se	3.597e-028	3.597e-028	-27.444	-27.444	0.000	(0)
Ag (NH3) 2+	0.000e+000	0.000e+000	-43.614	-43.645	-0.032	(0)
AgHS	0.000e+000	0.000e+000	-89.672	-89.672	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-111.185	-111.691	-0.506	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-180.255	-180.352	-0.097	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-180.357	-180.389	-0.032	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-182.075	-182.272	-0.197	(0)
AgS4S5-3	0.000e+000	0.000e+000	-182.392	-182.583	-0.191	(0)
Al	3.636e-007					
Al (OH) 4-	3.542e-007	3.314e-007	-6.451	-6.480	-0.029	(0)
Al (OH) 3	7.890e-009	7.890e-009	-8.103	-8.103	0.000	(0)
Al (OH) 2+	1.266e-009	1.185e-009	-8.898	-8.926	-0.028	(0)
AlF2+	1.498e-010	1.403e-010	-9.824	-9.853	-0.028	(0)
AlF3	9.058e-011	9.058e-011	-10.043	-10.043	0.000	(0)
AlF+2	8.937e-012	6.874e-012	-11.049	-11.163	-0.114	(0)
AlOH+2	5.815e-012	4.473e-012	-11.235	-11.349	-0.114	(0)
AlF4-	2.488e-012	2.328e-012	-11.604	-11.633	-0.029	(0)
AlSO4+	5.564e-014	5.205e-014	-13.255	-13.284	-0.029	(0)
Al+3	2.455e-014	1.341e-014	-13.610	-13.873	-0.263	(0)
Al (SO4) 2-	2.981e-016	2.789e-016	-15.526	-15.555	-0.029	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-47.440	-47.725	-0.285	(0)
As (3)	8.576e-026					
H3AsO3	8.422e-026	8.422e-026	-25.075	-25.075	0.000	(0)
H2AsO3-	1.539e-027	1.431e-027	-26.813	-26.844	-0.032	(0)
HAsO3-2	5.787e-032	4.325e-032	-31.238	-31.364	-0.126	(0)
H4AsO3+	1.354e-033	1.259e-033	-32.868	-32.900	-0.032	(0)
AsO3-3	1.064e-037	5.523e-038	-36.973	-37.258	-0.285	(0)
As (5)	3.128e-009					
HAsO4-2	2.561e-009	1.914e-009	-8.592	-8.718	-0.126	(0)
H2AsO4-	5.666e-010	5.268e-010	-9.247	-9.278	-0.032	(0)
AsO4-3	3.861e-013	2.005e-013	-12.413	-12.698	-0.285	(0)
H3AsO4	2.761e-015	2.763e-015	-14.559	-14.559	0.000	(0)
B	8.400e-007					
H3BO3	8.224e-007	8.231e-007	-6.085	-6.085	0.000	(0)
H2BO3-	1.698e-008	1.584e-008	-7.770	-7.800	-0.030	(0)
CaH2BO3+	5.377e-010	5.017e-010	-9.269	-9.300	-0.030	(0)
MgH2BO3+	9.315e-011	8.691e-011	-10.031	-10.061	-0.030	(0)
BF (OH) 3-	1.805e-011	1.684e-011	-10.744	-10.774	-0.030	(0)
NaH2BO3	6.747e-012	6.747e-012	-11.171	-11.171	0.000	(0)

	BaH ₂ BO ₃ +	3.698e-014	3.450e-014	-13.432	-13.462	-0.030	(0)
	H ₅ (BO ₃) ₂ -	1.189e-014	1.110e-014	-13.925	-13.955	-0.030	(0)
	BF ₂ (OH) ₂ -	2.986e-015	2.786e-015	-14.525	-14.555	-0.030	(0)
	AgH ₂ BO ₃	5.375e-016	5.375e-016	-15.270	-15.270	0.000	(0)
	H ₈ (BO ₃) ₃ -	9.790e-019	9.134e-019	-18.009	-18.039	-0.030	(0)
	BF ₃ OH-	1.798e-021	1.678e-021	-20.745	-20.775	-0.030	(0)
	BF ₄ -	1.369e-026	1.277e-026	-25.864	-25.894	-0.030	(0)
Ba		9.281e-008					
	Ba+2	9.222e-008	7.048e-008	-7.035	-7.152	-0.117	(0)
	BaHCO ₃ +	5.441e-010	5.099e-010	-9.264	-9.292	-0.028	(0)
	BaCO ₃	4.254e-011	4.254e-011	-10.371	-10.371	0.000	(0)
	BaNO ₃ +	6.682e-013	6.213e-013	-12.175	-12.207	-0.032	(0)
	BaOH+	1.097e-013	1.026e-013	-12.960	-12.989	-0.029	(0)
	BaH ₂ BO ₃ +	3.698e-014	3.450e-014	-13.432	-13.462	-0.030	(0)
	BaNH ₃ +2	4.750e-029	3.549e-029	-28.323	-28.450	-0.126	(0)
C (4)		8.729e-004					
	HCO ₃ -	8.089e-004	7.576e-004	-3.092	-3.121	-0.028	(0)
	H ₂ CO ₃	5.142e-005	5.142e-005	-4.289	-4.289	0.000	(0)
	CaHCO ₃ +	8.285e-006	7.764e-006	-5.082	-5.110	-0.028	(0)
	CO ₃ -2	1.540e-006	1.177e-006	-5.813	-5.929	-0.117	(0)
	MgHCO ₃ +	1.312e-006	1.227e-006	-5.882	-5.911	-0.029	(0)
	CaCO ₃	1.027e-006	1.027e-006	-5.989	-5.989	0.000	(0)
	MgCO ₃	1.549e-007	1.549e-007	-6.810	-6.810	0.000	(0)
	NaHCO ₃	1.145e-007	1.145e-007	-6.941	-6.941	0.000	(0)
	CuCO ₃	4.830e-008	4.830e-008	-7.316	-7.316	0.000	(0)
	MnHCO ₃ +	3.565e-008	3.337e-008	-7.448	-7.477	-0.029	(0)
	UO ₂ (CO ₃) ₂ -2	7.916e-009	5.916e-009	-8.101	-8.228	-0.126	(0)
	NaCO ₃ -	6.288e-009	5.889e-009	-8.201	-8.230	-0.028	(0)
	ZnCO ₃	4.026e-009	4.026e-009	-8.395	-8.395	0.000	(0)
	ZnHCO ₃ +	1.532e-009	1.424e-009	-8.815	-8.846	-0.032	(0)
	UO ₂ (CO ₃) ₃ -4	1.119e-009	3.489e-010	-8.951	-9.457	-0.506	(0)
	BaHCO ₃ +	5.441e-010	5.099e-010	-9.264	-9.292	-0.028	(0)
	NiHCO ₃ +	4.332e-010	4.027e-010	-9.363	-9.395	-0.032	(0)
	CuHCO ₃ +	3.583e-010	3.332e-010	-9.446	-9.477	-0.032	(0)
	PbCO ₃	3.538e-010	3.538e-010	-9.451	-9.451	0.000	(0)
	UO ₂ CO ₃	2.520e-010	2.520e-010	-9.599	-9.599	0.000	(0)
	CoHCO ₃ +	2.218e-010	2.062e-010	-9.654	-9.686	-0.032	(0)
	Cu(CO ₃) ₂ -2	2.047e-010	1.530e-010	-9.689	-9.815	-0.126	(0)
	NiCO ₃	1.893e-010	1.893e-010	-9.723	-9.723	0.000	(0)
	CoCO ₃	6.960e-011	6.960e-011	-10.157	-10.157	0.000	(0)
	PbHCO ₃ +	6.055e-011	5.630e-011	-10.218	-10.250	-0.032	(0)
	BaCO ₃	4.254e-011	4.254e-011	-10.371	-10.371	0.000	(0)
	CdCO ₃	5.134e-012	5.134e-012	-11.290	-11.290	0.000	(0)
	Pb(CO ₃) ₂ -2	1.607e-012	1.201e-012	-11.794	-11.921	-0.126	(0)
	CdHCO ₃ +	3.551e-013	3.301e-013	-12.450	-12.481	-0.032	(0)
	FeHCO ₃ +	1.507e-013	1.412e-013	-12.822	-12.850	-0.028	(0)
	HgCO ₃	2.235e-014	2.235e-014	-13.651	-13.651	0.000	(0)
	Cd(CO ₃) ₂ -2	5.993e-015	4.479e-015	-14.222	-14.349	-0.126	(0)
	Hg(CO ₃) ₂ -2	1.113e-016	8.316e-017	-15.954	-16.080	-0.126	(0)
	HgHCO ₃ +	1.351e-017	1.256e-017	-16.869	-16.901	-0.032	(0)
Ca		7.929e-004					
	Ca+2	7.202e-004	5.504e-004	-3.143	-3.259	-0.117	(0)
	CaSO ₄	6.306e-005	6.306e-005	-4.200	-4.200	0.000	(0)
	CaHCO ₃ +	8.285e-006	7.764e-006	-5.082	-5.110	-0.028	(0)
	CaCO ₃	1.027e-006	1.027e-006	-5.989	-5.989	0.000	(0)
	CaF+	3.291e-007	3.080e-007	-6.483	-6.511	-0.029	(0)
	CaOH+	3.909e-009	3.664e-009	-8.408	-8.436	-0.028	(0)
	CaNO ₃ +	3.293e-009	3.061e-009	-8.482	-8.514	-0.032	(0)
	CaH ₂ BO ₃ +	5.377e-010	5.017e-010	-9.269	-9.300	-0.030	(0)
	CaNH ₃ +2	7.401e-025	5.531e-025	-24.131	-24.257	-0.126	(0)
	Ca(NH ₃) ₂ +2	0.000e+000	0.000e+000	-45.629	-45.755	-0.126	(0)
Cd		2.808e-010					
	Cd+2	2.505e-010	1.914e-010	-9.601	-9.718	-0.117	(0)
	CdSO ₄	2.244e-011	2.244e-011	-10.649	-10.649	0.000	(0)
	CdCO ₃	5.134e-012	5.134e-012	-11.290	-11.290	0.000	(0)
	CdCl+	1.430e-012	1.329e-012	-11.845	-11.876	-0.032	(0)
	CdOH+	5.456e-013	5.073e-013	-12.263	-12.295	-0.032	(0)
	CdHCO ₃ +	3.551e-013	3.301e-013	-12.450	-12.481	-0.032	(0)

Cd(SO ₄) 2-2	2.026e-013	1.514e-013	-12.693	-12.820	-0.126	(0)
CdF+	1.673e-013	1.556e-013	-12.776	-12.808	-0.032	(0)
CdOHC1	1.819e-014	1.819e-014	-13.740	-13.740	0.000	(0)
Cd(CO ₃) 2-2	5.993e-015	4.479e-015	-14.222	-14.349	-0.126	(0)
CdNO ₃ +	1.145e-015	1.065e-015	-14.941	-14.973	-0.032	(0)
Cd(OH) 2	1.068e-015	1.068e-015	-14.972	-14.972	0.000	(0)
CdCl ₂	4.030e-016	4.030e-016	-15.395	-15.395	0.000	(0)
CdSeO ₄	1.056e-016	1.056e-016	-15.976	-15.976	0.000	(0)
CdF ₂	1.591e-017	1.591e-017	-16.798	-16.798	0.000	(0)
Cd(OH) 3-	2.341e-020	2.176e-020	-19.631	-19.662	-0.032	(0)
CdCl ₃ -	1.989e-020	1.849e-020	-19.701	-19.733	-0.032	(0)
Cd(NO ₃) 2	9.384e-022	9.384e-022	-21.028	-21.028	0.000	(0)
Cd ₂ OH+3	9.372e-022	4.867e-022	-21.028	-21.313	-0.285	(0)
Cd(SeO ₃) 2-2	1.802e-024	1.347e-024	-23.744	-23.871	-0.126	(0)
Cd(OH) 4-2	1.590e-027	1.188e-027	-26.799	-26.925	-0.126	(0)
CdHS+	0.000e+000	0.000e+000	-96.495	-96.527	-0.032	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-184.140	-184.140	0.000	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-277.026	-277.057	-0.032	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-369.552	-369.678	-0.126	(0)
C1	7.778e-005					
Cl-	7.777e-005	7.272e-005	-4.109	-4.138	-0.029	(0)
AgCl	3.179e-010	3.179e-010	-9.498	-9.498	0.000	(0)
MnCl+	2.159e-010	2.021e-010	-9.666	-9.694	-0.029	(0)
ZnCl+	1.162e-011	1.086e-011	-10.935	-10.964	-0.029	(0)
ZnOHC1	4.744e-012	4.744e-012	-11.324	-11.324	0.000	(0)
AgCl ₂ -	2.165e-012	2.013e-012	-11.664	-11.696	-0.032	(0)
CdCl+	1.430e-012	1.329e-012	-11.845	-11.876	-0.032	(0)
CoCl+	9.467e-013	8.803e-013	-12.024	-12.055	-0.032	(0)
NiCl+	8.629e-013	8.024e-013	-12.064	-12.096	-0.032	(0)
CuCl+	8.593e-013	8.033e-013	-12.066	-12.095	-0.029	(0)
HgClOH	6.799e-013	6.799e-013	-12.168	-12.168	0.000	(0)
PbCl+	2.776e-013	2.581e-013	-12.557	-12.588	-0.032	(0)
MnCl ₂	2.076e-014	2.076e-014	-13.683	-13.683	0.000	(0)
CuCl	2.033e-014	2.033e-014	-13.692	-13.692	0.000	(0)
CdOHC1	1.819e-014	1.819e-014	-13.740	-13.740	0.000	(0)
HgCl ₂	8.392e-015	8.392e-015	-14.076	-14.076	0.000	(0)
ZnCl ₂	1.252e-015	1.252e-015	-14.902	-14.902	0.000	(0)
CdCl ₂	4.030e-016	4.030e-016	-15.395	-15.395	0.000	(0)
CuCl ₂ -	3.304e-016	3.089e-016	-15.481	-15.510	-0.029	(0)
AgCl ₃ -2	1.746e-016	1.305e-016	-15.758	-15.884	-0.126	(0)
PbCl ₂	8.383e-017	8.383e-017	-16.077	-16.077	0.000	(0)
HgCl+	2.476e-017	2.303e-017	-16.606	-16.638	-0.032	(0)
CuCl ₂	2.026e-017	2.026e-017	-16.693	-16.693	0.000	(0)
UO ₂ Cl+	6.823e-018	6.344e-018	-17.166	-17.198	-0.032	(0)
HgCl ₃ -	6.563e-018	6.103e-018	-17.183	-17.214	-0.032	(0)
CrCl+2	1.115e-018	8.335e-019	-17.953	-18.079	-0.126	(0)
MnCl ₃ -	4.442e-019	4.158e-019	-18.352	-18.381	-0.029	(0)
NiCl ₂	2.938e-019	2.938e-019	-18.532	-18.532	0.000	(0)
ZnCl ₃ -	7.734e-020	7.231e-020	-19.112	-19.141	-0.029	(0)
FeCl+2	6.048e-020	4.643e-020	-19.218	-19.333	-0.115	(0)
AgCl ₄ -3	3.731e-020	1.937e-020	-19.428	-19.713	-0.285	(0)
CdCl ₃ -	1.989e-020	1.849e-020	-19.701	-19.733	-0.032	(0)
CuCl ₃ -2	6.256e-021	4.803e-021	-20.204	-20.319	-0.115	(0)
PbCl ₃ -	2.610e-021	2.427e-021	-20.583	-20.615	-0.032	(0)
HgCl ₄ -2	2.364e-021	1.767e-021	-20.626	-20.753	-0.126	(0)
CrO ₃ Cl-	7.692e-022	7.152e-022	-21.114	-21.146	-0.032	(0)
CrOHC12	3.843e-022	3.843e-022	-21.415	-21.415	0.000	(0)
FeCl ₂ +	1.611e-023	1.508e-023	-22.793	-22.822	-0.029	(0)
CuCl ₃ -	1.470e-023	1.375e-023	-22.833	-22.862	-0.029	(0)
CrCl ₂ +	6.186e-024	5.751e-024	-23.209	-23.240	-0.032	(0)
ZnCl ₄ -2	3.425e-024	2.629e-024	-23.465	-23.580	-0.115	(0)
VOCl+	2.428e-025	2.258e-025	-24.615	-24.646	-0.032	(0)
PbCl ₄ -2	1.079e-025	8.066e-026	-24.967	-25.093	-0.126	(0)
FeCl ₃	1.097e-028	1.097e-028	-27.960	-27.960	0.000	(0)
CuCl ₄ -2	6.526e-030	5.010e-030	-29.185	-29.300	-0.115	(0)
CoCl+2	4.240e-036	3.168e-036	-35.373	-35.499	-0.126	(0)
UCl+3	0.000e+000	0.000e+000	-50.662	-50.946	-0.285	(0)
Co(NH ₃) 5Cl+2	0.000e+000	0.000e+000	-114.909	-115.036	-0.126	(0)

Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-130.550	-130.677	-0.126	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-142.723	-142.849	-0.126	(0)
Co (2)	5.355e-009					
Co+2	4.682e-009	3.499e-009	-8.330	-8.456	-0.126	(0)
CoSO4	3.492e-010	3.492e-010	-9.457	-9.457	0.000	(0)
CoHCO3+	2.218e-010	2.062e-010	-9.654	-9.686	-0.032	(0)
CoCO3	6.960e-011	6.960e-011	-10.157	-10.157	0.000	(0)
CoOH+	2.505e-011	2.329e-011	-10.601	-10.633	-0.032	(0)
CoF+	6.102e-012	5.674e-012	-11.215	-11.246	-0.032	(0)
CoCl+	9.467e-013	8.803e-013	-12.024	-12.055	-0.032	(0)
Co (OH) 2	6.172e-013	6.172e-013	-12.210	-12.210	0.000	(0)
CoNO3+	1.049e-014	9.754e-015	-13.979	-14.011	-0.032	(0)
CoNO2+	6.681e-015	6.212e-015	-14.175	-14.207	-0.032	(0)
CoSeO4	5.194e-015	5.194e-015	-14.284	-14.284	0.000	(0)
Co (OH) 3-	4.419e-018	4.108e-018	-17.355	-17.386	-0.032	(0)
CoOOH-	1.109e-018	1.031e-018	-17.955	-17.987	-0.032	(0)
Co (NO3) 2	3.490e-020	3.490e-020	-19.457	-19.457	0.000	(0)
Co2OH+3	7.866e-021	4.085e-021	-20.104	-20.389	-0.285	(0)
Co (OH) 4-2	2.907e-025	2.172e-025	-24.537	-24.663	-0.126	(0)
Co (NH3) +2	4.493e-028	3.358e-028	-27.347	-27.474	-0.126	(0)
Co4 (OH) 4+4	1.882e-034	5.872e-035	-33.725	-34.231	-0.506	(0)
Co (NH3) 2+2	0.000e+000	0.000e+000	-46.815	-46.942	-0.126	(0)
Co (NH3) 3+2	0.000e+000	0.000e+000	-66.813	-66.940	-0.126	(0)
Co (NH3) 4+2	0.000e+000	0.000e+000	-87.191	-87.318	-0.126	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-108.069	-108.196	-0.126	(0)
Co (3)	4.857e-028					
CoOH+2	4.857e-028	3.630e-028	-27.314	-27.440	-0.126	(0)
Co+3	3.921e-034	2.141e-034	-33.407	-33.669	-0.263	(0)
CoCl+2	4.240e-036	3.168e-036	-35.373	-35.499	-0.126	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-114.909	-115.036	-0.126	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-137.055	-137.086	-0.032	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-140.861	-140.987	-0.126	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-142.723	-142.849	-0.126	(0)
Cr (2)	1.842e-028					
Cr+2	1.842e-028	1.376e-028	-27.735	-27.861	-0.126	(0)
Cr (3)	3.255e-009					
Cr (OH) 2+	2.822e-009	2.624e-009	-8.549	-8.581	-0.032	(0)
Cr (OH) 3	3.288e-010	3.288e-010	-9.483	-9.483	0.000	(0)
Cr (OH) +2	8.649e-011	6.464e-011	-10.063	-10.190	-0.126	(0)
CrOHSO4	7.671e-012	7.671e-012	-11.115	-11.115	0.000	(0)
CrO2-	5.565e-012	5.174e-012	-11.255	-11.286	-0.032	(0)
Cr (OH) 4-	4.697e-012	4.367e-012	-11.328	-11.360	-0.032	(0)
CrF+2	9.630e-014	7.197e-014	-13.016	-13.143	-0.126	(0)
Cr+3	1.705e-014	8.856e-015	-13.768	-14.053	-0.285	(0)
CrSO4+	1.112e-014	1.034e-014	-13.954	-13.985	-0.032	(0)
CrCl+2	1.115e-018	8.335e-019	-17.953	-18.079	-0.126	(0)
Cr2 (OH) 2SO4+2	5.997e-020	4.482e-020	-19.222	-19.349	-0.126	(0)
Cr2 (OH) 2 (SO4) 2	1.331e-021	1.331e-021	-20.876	-20.876	0.000	(0)
CrNO3+2	9.111e-022	6.809e-022	-21.040	-21.167	-0.126	(0)
CrOHC12	3.843e-022	3.843e-022	-21.415	-21.415	0.000	(0)
CrCl2+	6.186e-024	5.751e-024	-23.209	-23.240	-0.032	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-105.520	-105.647	-0.126	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-127.356	-127.640	-0.285	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-130.550	-130.677	-0.126	(0)
Cr (6)	7.507e-010					
CrO4-2	6.941e-010	5.305e-010	-9.159	-9.275	-0.117	(0)
HCrO4-	5.572e-011	5.181e-011	-10.254	-10.286	-0.032	(0)
NaCrO4-	7.620e-013	7.085e-013	-12.118	-12.150	-0.032	(0)
KCrO4-	1.935e-013	1.799e-013	-12.713	-12.745	-0.032	(0)
H2CrO4	1.267e-018	1.267e-018	-17.897	-17.897	0.000	(0)
CrO3SO4-2	3.187e-019	2.382e-019	-18.497	-18.623	-0.126	(0)
Cr2O7-2	1.245e-019	9.307e-020	-18.905	-19.031	-0.126	(0)
CrO3Cl-	7.692e-022	7.152e-022	-21.114	-21.146	-0.032	(0)
Cu (1)	2.595e-013					
Cu+	2.389e-013	2.221e-013	-12.622	-12.653	-0.032	(0)
CuCl	2.033e-014	2.033e-014	-13.692	-13.692	0.000	(0)
CuCl2-	3.304e-016	3.089e-016	-15.481	-15.510	-0.029	(0)
CuCl3-2	6.256e-021	4.803e-021	-20.204	-20.319	-0.115	(0)

Cu (S4) 2-3	0.000e+000	0.000e+000	-183.663	-183.857	-0.194	(0)
CuS4S5-3	0.000e+000	0.000e+000	-184.398	-184.587	-0.189	(0)
Cu (2)	6.716e-008					
CuCO3	4.830e-008	4.830e-008	-7.316	-7.316	0.000	(0)
Cu+2	9.120e-009	6.970e-009	-8.040	-8.157	-0.117	(0)
CuOH+	7.866e-009	7.353e-009	-8.104	-8.134	-0.029	(0)
CuSO4	7.986e-010	7.986e-010	-9.098	-9.098	0.000	(0)
Cu (OH) 2	4.895e-010	4.895e-010	-9.310	-9.310	0.000	(0)
CuHCO3+	3.583e-010	3.332e-010	-9.446	-9.477	-0.032	(0)
Cu (CO3) 2-2	2.047e-010	1.530e-010	-9.689	-9.815	-0.126	(0)
CuF+	2.425e-011	2.255e-011	-10.615	-10.647	-0.032	(0)
Cu2 (OH) 2+2	1.817e-012	1.358e-012	-11.741	-11.867	-0.126	(0)
CuCl+	8.593e-013	8.033e-013	-12.066	-12.095	-0.029	(0)
Cu (OH) 3-	3.602e-013	3.349e-013	-12.443	-12.475	-0.032	(0)
CuNO2+	1.977e-013	1.839e-013	-12.704	-12.736	-0.032	(0)
CuNO3+	4.169e-014	3.877e-014	-13.380	-13.412	-0.032	(0)
CuCl2	2.026e-017	2.026e-017	-16.693	-16.693	0.000	(0)
Cu (OH) 4-2	1.177e-018	8.795e-019	-17.929	-18.056	-0.126	(0)
Cu (NO2) 2	4.740e-019	4.740e-019	-18.324	-18.324	0.000	(0)
Cu (NO3) 2	8.583e-021	8.583e-021	-20.066	-20.066	0.000	(0)
CuCl3-	1.470e-023	1.375e-023	-22.833	-22.862	-0.029	(0)
CuNH3+2	7.617e-026	5.693e-026	-25.118	-25.245	-0.126	(0)
CuCl4-2	6.526e-030	5.010e-030	-29.185	-29.300	-0.115	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-266.677	-266.709	-0.032	(0)
F	5.616e-005					
F-	5.484e-005	5.127e-005	-4.261	-4.290	-0.029	(0)
MgF+	9.732e-007	9.104e-007	-6.012	-6.041	-0.029	(0)
CaF+	3.291e-007	3.080e-007	-6.483	-6.511	-0.029	(0)
NaF	8.695e-009	8.695e-009	-8.061	-8.061	0.000	(0)
MnF+	4.815e-009	4.507e-009	-8.317	-8.346	-0.029	(0)
HF	2.289e-009	2.289e-009	-8.640	-8.640	0.000	(0)
AlF2+	1.498e-010	1.403e-010	-9.824	-9.853	-0.028	(0)
AlF3	9.058e-011	9.058e-011	-10.043	-10.043	0.000	(0)
ZnF+	6.542e-011	6.083e-011	-10.184	-10.216	-0.032	(0)
CuF+	2.425e-011	2.255e-011	-10.615	-10.647	-0.032	(0)
BF (OH) 3-	1.805e-011	1.684e-011	-10.744	-10.774	-0.030	(0)
AlF+2	8.937e-012	6.874e-012	-11.049	-11.163	-0.114	(0)
CoF+	6.102e-012	5.674e-012	-11.215	-11.246	-0.032	(0)
NiF+	5.974e-012	5.554e-012	-11.224	-11.255	-0.032	(0)
AlF4-	2.488e-012	2.328e-012	-11.604	-11.633	-0.029	(0)
HF2-	4.776e-013	4.462e-013	-12.321	-12.350	-0.030	(0)
UO2F+	4.094e-013	3.807e-013	-12.388	-12.419	-0.032	(0)
PbF+	3.887e-013	3.614e-013	-12.410	-12.442	-0.032	(0)
AgF	2.757e-013	2.757e-013	-12.559	-12.559	0.000	(0)
CdF+	1.673e-013	1.556e-013	-12.776	-12.808	-0.032	(0)
CrF+2	9.630e-014	7.197e-014	-13.016	-13.143	-0.126	(0)
UO2F2	5.630e-014	5.630e-014	-13.250	-13.250	0.000	(0)
BF2 (OH) 2-	2.986e-015	2.786e-015	-14.525	-14.555	-0.030	(0)
FeF2+	1.742e-015	1.631e-015	-14.759	-14.788	-0.029	(0)
FeF+2	1.548e-015	1.189e-015	-14.810	-14.925	-0.115	(0)
UO2F3-	7.798e-016	7.250e-016	-15.108	-15.140	-0.032	(0)
PbF2	3.646e-016	3.646e-016	-15.438	-15.438	0.000	(0)
FeF3	1.180e-016	1.180e-016	-15.928	-15.928	0.000	(0)
VO2F	2.100e-017	2.100e-017	-16.678	-16.678	0.000	(0)
CdF2	1.591e-017	1.591e-017	-16.798	-16.798	0.000	(0)
H2F2	1.404e-017	1.404e-017	-16.853	-16.853	0.000	(0)
VO2F2-	4.204e-019	3.909e-019	-18.376	-18.408	-0.032	(0)
UO2F4-2	3.951e-019	2.953e-019	-18.403	-18.530	-0.126	(0)
PbF3-	3.814e-020	3.546e-020	-19.419	-19.450	-0.032	(0)
BF3OH-	1.798e-021	1.678e-021	-20.745	-20.775	-0.030	(0)
VOF+	3.661e-022	3.404e-022	-21.436	-21.468	-0.032	(0)
VO2F3-2	3.345e-022	2.500e-022	-21.476	-21.602	-0.126	(0)
HgF+	3.244e-023	3.016e-023	-22.489	-22.521	-0.032	(0)
VOF2	6.544e-024	6.544e-024	-23.184	-23.184	0.000	(0)
PbF4-2	1.165e-024	8.703e-025	-23.934	-24.060	-0.126	(0)
BF4-	1.369e-026	1.277e-026	-25.864	-25.894	-0.030	(0)
VOF3-	1.280e-026	1.191e-026	-25.893	-25.924	-0.032	(0)
VO2F4-3	1.215e-026	6.308e-027	-25.916	-26.200	-0.285	(0)

VOF4-2	3.297e-030	2.464e-030	-29.482	-29.608	-0.126	(0)
Sb(OH) 2F	1.455e-031	1.455e-031	-30.837	-30.837	0.000	(0)
SbOF	1.431e-031	1.431e-031	-30.844	-30.844	0.000	(0)
UF3+	1.793e-040	1.667e-040	-39.746	-39.778	-0.032	(0)
UF2+2	0.000e+000	0.000e+000	-40.562	-40.688	-0.126	(0)
UF4	0.000e+000	0.000e+000	-42.028	-42.028	0.000	(0)
UF+3	0.000e+000	0.000e+000	-43.213	-43.498	-0.285	(0)
UF5-	0.000e+000	0.000e+000	-44.689	-44.720	-0.032	(0)
UF6-2	0.000e+000	0.000e+000	-46.404	-46.530	-0.126	(0)
Fe (2)	2.199e-011					
Fe+2	1.981e-011	1.481e-011	-10.703	-10.830	-0.126	(0)
FeSO4	1.818e-012	1.818e-012	-11.741	-11.741	0.000	(0)
FeOH+	2.101e-013	1.966e-013	-12.678	-12.706	-0.029	(0)
FeHCO3+	1.507e-013	1.412e-013	-12.822	-12.850	-0.028	(0)
Fe (OH) 2	5.211e-017	5.211e-017	-16.283	-16.283	0.000	(0)
Fe (OH) 3-	5.873e-018	5.497e-018	-17.231	-17.260	-0.029	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-191.514	-191.514	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-284.262	-284.294	-0.032	(0)
Fe (3)	8.499e-007					
Fe (OH) 2+	6.311e-007	5.911e-007	-6.200	-6.228	-0.028	(0)
Fe (OH) 3	2.118e-007	2.118e-007	-6.674	-6.674	0.000	(0)
Fe (OH) 4-	7.024e-009	6.578e-009	-8.153	-8.182	-0.028	(0)
FeOH+2	5.932e-012	4.554e-012	-11.227	-11.342	-0.115	(0)
FeF2+	1.742e-015	1.631e-015	-14.759	-14.788	-0.029	(0)
FeF+2	1.548e-015	1.189e-015	-14.810	-14.925	-0.115	(0)
FeSO4+	1.267e-016	1.186e-016	-15.897	-15.926	-0.029	(0)
FeF3	1.180e-016	1.180e-016	-15.928	-15.928	0.000	(0)
Fe+3	3.871e-017	2.114e-017	-16.412	-16.675	-0.263	(0)
Fe (SO4) 2-	1.364e-018	1.268e-018	-17.865	-17.897	-0.032	(0)
FeCl+2	6.048e-020	4.643e-020	-19.218	-19.333	-0.115	(0)
Fe2 (OH) 2+4	2.201e-021	6.867e-022	-20.657	-21.163	-0.506	(0)
FeNO3+2	4.976e-022	3.718e-022	-21.303	-21.430	-0.126	(0)
FeHSeO3+2	5.236e-023	3.913e-023	-22.281	-22.407	-0.126	(0)
FeCl2+	1.611e-023	1.508e-023	-22.793	-22.822	-0.029	(0)
Fe3 (OH) 4+5	3.622e-026	5.867e-027	-25.441	-26.232	-0.791	(0)
FeCl3	1.097e-028	1.097e-028	-27.960	-27.960	0.000	(0)
H (0)	5.453e-033					
H2	2.727e-033	2.729e-033	-32.564	-32.564	0.000	(0)
Hg (0)	6.199e-013					
Hg	6.199e-013	6.199e-013	-12.208	-12.208	0.000	(0)
Hg (1)	1.787e-023					
Hg2+2	8.936e-024	6.678e-024	-23.049	-23.175	-0.126	(0)
Hg (2)	1.185e-011					
Hg (OH) 2	1.113e-011	1.114e-011	-10.953	-10.953	0.000	(0)
HgClOH	6.799e-013	6.799e-013	-12.168	-12.168	0.000	(0)
HgCO3	2.235e-014	2.235e-014	-13.651	-13.651	0.000	(0)
HgCl2	8.392e-015	8.392e-015	-14.076	-14.076	0.000	(0)
HgOH+	2.267e-016	2.108e-016	-15.645	-15.676	-0.032	(0)
Hg (CO3) 2-2	1.113e-016	8.316e-017	-15.954	-16.080	-0.126	(0)
HgCl+	2.476e-017	2.303e-017	-16.606	-16.638	-0.032	(0)
HgHCO3+	1.351e-017	1.256e-017	-16.869	-16.901	-0.032	(0)
HgCl3-	6.563e-018	6.103e-018	-17.183	-17.214	-0.032	(0)
Hg (OH) 3-	5.034e-019	4.680e-019	-18.298	-18.330	-0.032	(0)
Hg+2	2.123e-020	1.587e-020	-19.673	-19.799	-0.126	(0)
HgCl4-2	2.364e-021	1.767e-021	-20.626	-20.753	-0.126	(0)
HgSO4	2.078e-021	2.078e-021	-20.682	-20.682	0.000	(0)
HgF+	3.244e-023	3.016e-023	-22.489	-22.521	-0.032	(0)
HgNO3+	1.108e-026	1.031e-026	-25.955	-25.987	-0.032	(0)
HgNH3+2	1.069e-032	7.992e-033	-31.971	-32.097	-0.126	(0)
Hg (NO3) 2	7.533e-033	7.533e-033	-32.123	-32.123	0.000	(0)
Hg (NH3) 2+2	0.000e+000	0.000e+000	-44.069	-44.195	-0.126	(0)
Hg (NH3) 3+2	0.000e+000	0.000e+000	-64.567	-64.693	-0.126	(0)
Hg (NH3) 4+2	0.000e+000	0.000e+000	-84.765	-84.891	-0.126	(0)
HgHS2-	0.000e+000	0.000e+000	-169.954	-169.985	-0.032	(0)
HgS2-2	0.000e+000	0.000e+000	-171.047	-171.173	-0.126	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-171.112	-171.112	0.000	(0)
K	9.797e-005					
K+	9.762e-005	9.128e-005	-4.010	-4.040	-0.029	(0)

	KSO4-	3.451e-007	3.232e-007	-6.462	-6.491	-0.028	(0)
	KCrO4-	1.935e-013	1.799e-013	-12.713	-12.745	-0.032	(0)
Mg		2.239e-004					
	Mg+2	2.071e-004	1.582e-004	-3.684	-3.801	-0.117	(0)
	MgSO4	1.440e-005	1.440e-005	-4.842	-4.842	0.000	(0)
	MgHCO3+	1.312e-006	1.227e-006	-5.882	-5.911	-0.029	(0)
	MgF+	9.732e-007	9.104e-007	-6.012	-6.041	-0.029	(0)
	MgCO3	1.549e-007	1.549e-007	-6.810	-6.810	0.000	(0)
	MgOH+	2.241e-008	2.102e-008	-7.649	-7.677	-0.028	(0)
	MgH2BO3+	9.315e-011	8.691e-011	-10.031	-10.061	-0.030	(0)
Mn (2)		3.193e-006					
	Mn+2	2.954e-006	2.208e-006	-5.530	-5.656	-0.126	(0)
	MnSO4	1.963e-007	1.963e-007	-6.707	-6.707	0.000	(0)
	MnHCO3+	3.565e-008	3.337e-008	-7.448	-7.477	-0.029	(0)
	MnF+	4.815e-009	4.507e-009	-8.317	-8.346	-0.029	(0)
	MnOH+	1.977e-009	1.850e-009	-8.704	-8.733	-0.029	(0)
	MnCl+	2.159e-010	2.021e-010	-9.666	-9.694	-0.029	(0)
	MnNO3+	6.619e-012	6.154e-012	-11.179	-11.211	-0.032	(0)
	MnSeO4	1.760e-012	1.760e-012	-11.754	-11.754	0.000	(0)
	MnCl2	2.076e-014	2.076e-014	-13.683	-13.683	0.000	(0)
	Mn (NO3) 2	2.719e-017	2.719e-017	-16.566	-16.566	0.000	(0)
	Mn (OH) 3-	1.360e-018	1.273e-018	-17.867	-17.895	-0.029	(0)
	MnCl3-	4.442e-019	4.158e-019	-18.352	-18.381	-0.029	(0)
	Mn (OH) 4-2	1.785e-024	1.371e-024	-23.748	-23.863	-0.115	(0)
	MnSe	0.000e+000	0.000e+000	-56.057	-56.057	0.000	(0)
Mn (3)		2.776e-024					
	Mn+3	2.776e-024	1.516e-024	-23.557	-23.819	-0.263	(0)
Mn (6)		8.824e-036					
	MnO4-2	8.824e-036	6.775e-036	-35.054	-35.169	-0.115	(0)
Mn (7)		4.736e-038					
	MnO4-	4.736e-038	4.422e-038	-37.325	-37.354	-0.030	(0)
Mo		6.757e-008					
	MoO4-2	6.753e-008	5.161e-008	-7.170	-7.287	-0.117	(0)
	HMoO4-	3.334e-011	3.100e-011	-10.477	-10.509	-0.032	(0)
	H2MoO4	6.852e-015	6.852e-015	-14.164	-14.164	0.000	(0)
	Ag2MoO4	8.956e-026	8.956e-026	-25.048	-25.048	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-47.440	-47.725	-0.285	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-57.044	-58.183	-1.138	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-58.526	-59.316	-0.791	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-61.548	-62.054	-0.506	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-66.044	-66.328	-0.285	(0)
N (-3)		4.632e-020					
	NH4+	4.528e-020	4.225e-020	-19.344	-19.374	-0.030	(0)
	NH3	7.981e-022	7.981e-022	-21.098	-21.098	0.000	(0)
	NH4SO4-	2.419e-022	2.264e-022	-21.616	-21.645	-0.029	(0)
	CaNH3+2	7.401e-025	5.531e-025	-24.131	-24.257	-0.126	(0)
	CuNH3+2	7.617e-026	5.693e-026	-25.118	-25.245	-0.126	(0)
	AgNH3+	3.752e-027	3.489e-027	-26.426	-26.457	-0.032	(0)
	NiNH3+2	2.473e-027	1.848e-027	-26.607	-26.733	-0.126	(0)
	Co (NH3) +2	4.493e-028	3.358e-028	-27.347	-27.474	-0.126	(0)
	BaNH3+2	4.750e-029	3.549e-029	-28.323	-28.450	-0.126	(0)
	HgNH3+2	1.069e-032	7.992e-033	-31.971	-32.097	-0.126	(0)
	Ag (NH3) 2+	0.000e+000	0.000e+000	-43.614	-43.645	-0.032	(0)
	Hg (NH3) 2+2	0.000e+000	0.000e+000	-44.069	-44.195	-0.126	(0)
	Ni (NH3) 2+2	0.000e+000	0.000e+000	-45.545	-45.671	-0.126	(0)
	Ca (NH3) 2+2	0.000e+000	0.000e+000	-45.629	-45.755	-0.126	(0)
	Co (NH3) 2+2	0.000e+000	0.000e+000	-46.815	-46.942	-0.126	(0)
	Hg (NH3) 3+2	0.000e+000	0.000e+000	-64.567	-64.693	-0.126	(0)
	Co (NH3) 3+2	0.000e+000	0.000e+000	-66.813	-66.940	-0.126	(0)
	Hg (NH3) 4+2	0.000e+000	0.000e+000	-84.765	-84.891	-0.126	(0)
	Co (NH3) 4+2	0.000e+000	0.000e+000	-87.191	-87.318	-0.126	(0)
	Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-105.520	-105.647	-0.126	(0)
	Co (NH3) 5+2	0.000e+000	0.000e+000	-108.069	-108.196	-0.126	(0)
	Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-114.909	-115.036	-0.126	(0)
	Cr (NH3) 6+3	0.000e+000	0.000e+000	-127.356	-127.640	-0.285	(0)
	Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-130.550	-130.677	-0.126	(0)
	Co (NH3) 6SO4+	0.000e+000	0.000e+000	-137.055	-137.086	-0.032	(0)
	Co (NH3) 6OH+2	0.000e+000	0.000e+000	-140.861	-140.987	-0.126	(0)

Co(NH3)6Cl+2	0.000e+000	0.000e+000	-142.723	-142.849	-0.126	(0)
N(3)	2.698e-007					
NO2-	2.698e-007	2.519e-007	-6.569	-6.599	-0.030	(0)
CuNO2+	1.977e-013	1.839e-013	-12.704	-12.736	-0.032	(0)
AgNO2	1.127e-013	1.127e-013	-12.948	-12.948	0.000	(0)
CoNO2+	6.681e-015	6.212e-015	-14.175	-14.207	-0.032	(0)
Cu(NO2)2	4.740e-019	4.740e-019	-18.324	-18.324	0.000	(0)
Ag(NO2)2-	4.729e-020	4.396e-020	-19.325	-19.357	-0.032	(0)
N(5)	1.884e-006					
NO3-	1.881e-006	1.759e-006	-5.726	-5.755	-0.029	(0)
CaNO3+	3.293e-009	3.061e-009	-8.482	-8.514	-0.032	(0)
MnNO3+	6.619e-012	6.154e-012	-11.179	-11.211	-0.032	(0)
BaNO3+	6.682e-013	6.213e-013	-12.175	-12.207	-0.032	(0)
ZnNO3+	2.825e-013	2.627e-013	-12.549	-12.581	-0.032	(0)
CuNO3+	4.169e-014	3.877e-014	-13.380	-13.412	-0.032	(0)
NiNO3+	2.049e-014	1.905e-014	-13.688	-13.720	-0.032	(0)
CoNO3+	1.049e-014	9.754e-015	-13.979	-14.011	-0.032	(0)
AgNO3	2.991e-015	2.991e-015	-14.524	-14.524	0.000	(0)
PbNO3+	2.798e-015	2.602e-015	-14.553	-14.585	-0.032	(0)
CdNO3+	1.145e-015	1.065e-015	-14.941	-14.973	-0.032	(0)
Mn(NO3)2	2.719e-017	2.719e-017	-16.566	-16.566	0.000	(0)
UO2NO3+	2.030e-019	1.888e-019	-18.692	-18.724	-0.032	(0)
Zn(NO3)2	9.218e-020	9.218e-020	-19.035	-19.035	0.000	(0)
Co(NO3)2	3.490e-020	3.490e-020	-19.457	-19.457	0.000	(0)
Cu(NO3)2	8.583e-021	8.583e-021	-20.066	-20.066	0.000	(0)
Pb(NO3)2	7.771e-021	7.771e-021	-20.110	-20.110	0.000	(0)
Cd(NO3)2	9.384e-022	9.384e-022	-21.028	-21.028	0.000	(0)
CrNO3+2	9.111e-022	6.809e-022	-21.040	-21.167	-0.126	(0)
FeNO3+2	4.976e-022	3.718e-022	-21.303	-21.430	-0.126	(0)
VO2NO3	2.077e-022	2.077e-022	-21.683	-21.683	0.000	(0)
HgNO3+	1.108e-026	1.031e-026	-25.955	-25.987	-0.032	(0)
Hg(NO3)2	7.533e-033	7.533e-033	-32.123	-32.123	0.000	(0)
Na	2.883e-004					
Na+	2.874e-004	2.688e-004	-3.541	-3.571	-0.029	(0)
NaSO4-	7.707e-007	7.218e-007	-6.113	-6.142	-0.028	(0)
NaHCO3	1.145e-007	1.145e-007	-6.941	-6.941	0.000	(0)
NaF	8.695e-009	8.695e-009	-8.061	-8.061	0.000	(0)
NaCO3-	6.288e-009	5.889e-009	-8.201	-8.230	-0.028	(0)
NaH2BO3	6.747e-012	6.747e-012	-11.171	-11.171	0.000	(0)
NaCrO4-	7.620e-013	7.085e-013	-12.118	-12.150	-0.032	(0)
Ni	6.722e-009					
Ni+2	5.642e-009	4.312e-009	-8.249	-8.365	-0.117	(0)
NiHCO3+	4.332e-010	4.027e-010	-9.363	-9.395	-0.032	(0)
NiSO4	4.303e-010	4.303e-010	-9.366	-9.366	0.000	(0)
NiCO3	1.893e-010	1.893e-010	-9.723	-9.723	0.000	(0)
NiOH+	1.948e-011	1.811e-011	-10.710	-10.742	-0.032	(0)
NiF+	5.974e-012	5.554e-012	-11.224	-11.255	-0.032	(0)
NiCl+	8.629e-013	8.024e-013	-12.064	-12.096	-0.032	(0)
Ni(OH)2	4.799e-013	4.799e-013	-12.319	-12.319	0.000	(0)
NiNO3+	2.049e-014	1.905e-014	-13.688	-13.720	-0.032	(0)
Ni(SO4)2-2	9.535e-015	7.126e-015	-14.021	-14.147	-0.126	(0)
NiSeO4	5.974e-015	5.974e-015	-14.224	-14.224	0.000	(0)
Ni(OH)3-	1.722e-016	1.601e-016	-15.764	-15.796	-0.032	(0)
NiCl2	2.938e-019	2.938e-019	-18.532	-18.532	0.000	(0)
NiNH3+2	2.473e-027	1.848e-027	-26.607	-26.733	-0.126	(0)
Ni(NH3)2+2	0.000e+000	0.000e+000	-45.545	-45.671	-0.126	(0)
O(0)	1.360e-027					
O2	6.799e-028	6.805e-028	-27.168	-27.167	0.000	(0)
Pb	6.631e-010					
PbCO3	3.538e-010	3.538e-010	-9.451	-9.451	0.000	(0)
Pb+2	1.309e-010	1.000e-010	-9.883	-10.000	-0.117	(0)
PbOH+	9.014e-011	8.381e-011	-10.045	-10.077	-0.032	(0)
PbHCO3+	6.055e-011	5.630e-011	-10.218	-10.250	-0.032	(0)
PbSO4	2.450e-011	2.450e-011	-10.611	-10.611	0.000	(0)
Pb(CO3)2-2	1.607e-012	1.201e-012	-11.794	-11.921	-0.126	(0)
Pb(OH)2	8.842e-013	8.842e-013	-12.053	-12.053	0.000	(0)
PbF+	3.887e-013	3.614e-013	-12.410	-12.442	-0.032	(0)
PbCl+	2.776e-013	2.581e-013	-12.557	-12.588	-0.032	(0)

Pb(SO4) 2-2	9.878e-014	7.382e-014	-13.005	-13.132	-0.126	(0)
PbNO3+	2.798e-015	2.602e-015	-14.553	-14.585	-0.032	(0)
PbF2	3.646e-016	3.646e-016	-15.438	-15.438	0.000	(0)
Pb(OH) 3-	3.173e-016	2.950e-016	-15.499	-15.530	-0.032	(0)
PbCl2	8.383e-017	8.383e-017	-16.077	-16.077	0.000	(0)
Pb2OH+3	2.558e-019	1.329e-019	-18.592	-18.877	-0.285	(0)
PbF3-	3.814e-020	3.546e-020	-19.419	-19.450	-0.032	(0)
Pb(OH) 4-2	3.225e-020	2.410e-020	-19.491	-19.618	-0.126	(0)
Pb(NO3) 2	7.771e-021	7.771e-021	-20.110	-20.110	0.000	(0)
PbCl3-	2.610e-021	2.427e-021	-20.583	-20.615	-0.032	(0)
Pb3(OH) 4+2	2.088e-024	1.560e-024	-23.680	-23.807	-0.126	(0)
PbF4-2	1.165e-024	8.703e-025	-23.934	-24.060	-0.126	(0)
PbCl4-2	1.079e-025	8.066e-026	-24.967	-25.093	-0.126	(0)
Pb4(OH) 4+4	3.974e-030	1.240e-030	-29.401	-29.907	-0.506	(0)
Pb(HS) 2	0.000e+000	0.000e+000	-184.364	-184.364	0.000	(0)
Pb(HS) 3-	0.000e+000	0.000e+000	-277.849	-277.881	-0.032	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-89.672	-89.672	0.000	(0)
HS-	0.000e+000	0.000e+000	-94.785	-94.817	-0.032	(0)
H2S	0.000e+000	0.000e+000	-95.317	-95.317	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-96.495	-96.527	-0.032	(0)
S5-2	0.000e+000	0.000e+000	-96.535	-96.662	-0.126	(0)
S6-2	0.000e+000	0.000e+000	-97.051	-97.178	-0.126	(0)
S4-2	0.000e+000	0.000e+000	-97.131	-97.258	-0.126	(0)
S3-2	0.000e+000	0.000e+000	-97.937	-98.063	-0.126	(0)
S2-2	0.000e+000	0.000e+000	-98.953	-99.080	-0.126	(0)
S-2	0.000e+000	0.000e+000	-104.482	-104.597	-0.115	(0)
HgHS2-	0.000e+000	0.000e+000	-169.954	-169.985	-0.032	(0)
HgS2-2	0.000e+000	0.000e+000	-171.047	-171.173	-0.126	(0)
Hg(HS) 2	0.000e+000	0.000e+000	-171.112	-171.112	0.000	(0)
Ag(HS) S4-2	0.000e+000	0.000e+000	-180.255	-180.352	-0.097	(0)
Ag(HS) 2-	0.000e+000	0.000e+000	-180.357	-180.389	-0.032	(0)
Ag(S4) 2-3	0.000e+000	0.000e+000	-182.075	-182.272	-0.197	(0)
AgS4S5-3	0.000e+000	0.000e+000	-182.392	-182.583	-0.191	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-182.498	-182.530	-0.032	(0)
Cu(S4) 2-3	0.000e+000	0.000e+000	-183.663	-183.857	-0.194	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-184.040	-184.040	0.000	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-184.140	-184.140	0.000	(0)
Pb(HS) 2	0.000e+000	0.000e+000	-184.364	-184.364	0.000	(0)
CuS4S5-3	0.000e+000	0.000e+000	-184.398	-184.587	-0.189	(0)
Fe(HS) 2	0.000e+000	0.000e+000	-191.514	-191.514	0.000	(0)
Cu(HS) 3-	0.000e+000	0.000e+000	-266.677	-266.709	-0.032	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-275.545	-275.577	-0.032	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-277.026	-277.057	-0.032	(0)
Pb(HS) 3-	0.000e+000	0.000e+000	-277.849	-277.881	-0.032	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-277.910	-278.037	-0.126	(0)
Fe(HS) 3-	0.000e+000	0.000e+000	-284.262	-284.294	-0.032	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-369.552	-369.678	-0.126	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-371.727	-371.854	-0.126	(0)
Sb2S4-2	0.000e+000	0.000e+000	-395.234	-395.361	-0.126	(0)
S(6)	7.331e-004					
SO4-2	6.544e-004	5.001e-004	-3.184	-3.301	-0.117	(0)
CaSO4	6.306e-005	6.306e-005	-4.200	-4.200	0.000	(0)
MgSO4	1.440e-005	1.440e-005	-4.842	-4.842	0.000	(0)
NaSO4-	7.707e-007	7.218e-007	-6.113	-6.142	-0.028	(0)
KSO4-	3.451e-007	3.232e-007	-6.462	-6.491	-0.028	(0)
MnSO4	1.963e-007	1.963e-007	-6.707	-6.707	0.000	(0)
ZnSO4	6.506e-009	6.506e-009	-8.187	-8.187	0.000	(0)
HSO4-	1.577e-009	1.475e-009	-8.802	-8.831	-0.029	(0)
CuSO4	7.986e-010	7.986e-010	-9.098	-9.098	0.000	(0)
NiSO4	4.303e-010	4.303e-010	-9.366	-9.366	0.000	(0)
CoSO4	3.492e-010	3.492e-010	-9.457	-9.457	0.000	(0)
Zn(SO4) 2-2	3.792e-011	2.834e-011	-10.421	-10.548	-0.126	(0)
PbSO4	2.450e-011	2.450e-011	-10.611	-10.611	0.000	(0)
AgSO4-	2.298e-011	2.136e-011	-10.639	-10.670	-0.032	(0)
CdSO4	2.244e-011	2.244e-011	-10.649	-10.649	0.000	(0)
CrOHSO4	7.671e-012	7.671e-012	-11.115	-11.115	0.000	(0)
FeSO4	1.818e-012	1.818e-012	-11.741	-11.741	0.000	(0)

Cd(SO4) 2-2	2.026e-013	1.514e-013	-12.693	-12.820	-0.126	(0)
Pb(SO4) 2-2	9.878e-014	7.382e-014	-13.005	-13.132	-0.126	(0)
AlSO4+	5.564e-014	5.205e-014	-13.255	-13.284	-0.029	(0)
UO2SO4	4.071e-014	4.071e-014	-13.390	-13.390	0.000	(0)
CrSO4+	1.112e-014	1.034e-014	-13.954	-13.985	-0.032	(0)
Ni(SO4) 2-2	9.535e-015	7.126e-015	-14.021	-14.147	-0.126	(0)
UO2(SO4) 2-2	3.592e-016	2.684e-016	-15.445	-15.571	-0.126	(0)
Al(SO4) 2-	2.981e-016	2.789e-016	-15.526	-15.555	-0.029	(0)
FeSO4+	1.267e-016	1.186e-016	-15.897	-15.926	-0.029	(0)
VO2SO4-	2.999e-018	2.788e-018	-17.523	-17.555	-0.032	(0)
Fe(SO4) 2-	1.364e-018	1.268e-018	-17.865	-17.897	-0.032	(0)
CrO3SO4-2	3.187e-019	2.382e-019	-18.497	-18.623	-0.126	(0)
Cr2(OH) 2SO4+2	5.997e-020	4.482e-020	-19.222	-19.349	-0.126	(0)
HgSO4	2.078e-021	2.078e-021	-20.682	-20.682	0.000	(0)
Cr2(OH) 2(SO4) 2	1.331e-021	1.331e-021	-20.876	-20.876	0.000	(0)
NH4SO4-	2.419e-022	2.264e-022	-21.616	-21.645	-0.029	(0)
VOSO4	1.524e-022	1.524e-022	-21.817	-21.817	0.000	(0)
VSO4+	8.270e-039	7.689e-039	-38.083	-38.114	-0.032	(0)
U(SO4) 2	0.000e+000	0.000e+000	-44.610	-44.610	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-45.082	-45.209	-0.126	(0)
Co(NH3) 6SO4+	0.000e+000	0.000e+000	-137.055	-137.086	-0.032	(0)
Sb(3)	1.190e-025					
Sb(OH) 3	6.021e-026	6.021e-026	-25.220	-25.220	0.000	(0)
HSbO2	5.877e-026	5.877e-026	-25.231	-25.231	0.000	(0)
SbO2-	3.392e-030	3.154e-030	-29.470	-29.501	-0.032	(0)
Sb(OH) 4-	1.944e-030	1.807e-030	-29.711	-29.743	-0.032	(0)
Sb(OH) 2F	1.455e-031	1.455e-031	-30.837	-30.837	0.000	(0)
SbOF	1.431e-031	1.431e-031	-30.844	-30.844	0.000	(0)
Sb(OH) 2+	4.746e-032	4.413e-032	-31.324	-31.355	-0.032	(0)
SbO+	1.636e-032	1.521e-032	-31.786	-31.818	-0.032	(0)
Sb2S4-2	0.000e+000	0.000e+000	-395.234	-395.361	-0.126	(0)
Sb(5)	2.333e-010					
SbO3-	2.330e-010	2.167e-010	-9.633	-9.664	-0.032	(0)
Sb(OH) 6-	2.710e-013	2.534e-013	-12.567	-12.596	-0.029	(0)
SbO2+	6.089e-026	5.661e-026	-25.215	-25.247	-0.032	(0)
Se(-2)	3.597e-028					
Ag2Se	3.597e-028	3.597e-028	-27.444	-27.444	0.000	(0)
HSe-	0.000e+000	0.000e+000	-52.505	-52.537	-0.032	(0)
MnSe	0.000e+000	0.000e+000	-56.057	-56.057	0.000	(0)
H2Se	0.000e+000	0.000e+000	-56.167	-56.167	0.000	(0)
Se-2	0.000e+000	0.000e+000	-59.890	-60.016	-0.126	(0)
AgOH(Se) 2-4	0.000e+000	0.000e+000	-111.185	-111.691	-0.506	(0)
Se(4)	8.770e-010					
HSeO3-	7.533e-010	7.004e-010	-9.123	-9.155	-0.032	(0)
SeO3-2	1.236e-010	9.239e-011	-9.908	-10.034	-0.126	(0)
H2SeO3	9.018e-015	9.018e-015	-14.045	-14.045	0.000	(0)
AgSeO3-	1.367e-016	1.271e-016	-15.864	-15.896	-0.032	(0)
FeHSeO3+2	5.236e-023	3.913e-023	-22.281	-22.407	-0.126	(0)
Cd(SeO3) 2-2	1.802e-024	1.347e-024	-23.744	-23.871	-0.126	(0)
Ag(SeO3) 2-3	2.025e-025	1.052e-025	-24.694	-24.978	-0.285	(0)
Se(6)	3.877e-009					
SeO4-2	3.876e-009	2.962e-009	-8.412	-8.528	-0.117	(0)
MnSeO4	1.760e-012	1.760e-012	-11.754	-11.754	0.000	(0)
ZnSeO4	2.728e-014	2.728e-014	-13.564	-13.564	0.000	(0)
NiSeO4	5.974e-015	5.974e-015	-14.224	-14.224	0.000	(0)
CoSeO4	5.194e-015	5.194e-015	-14.284	-14.284	0.000	(0)
HSeO4-	4.819e-015	4.480e-015	-14.317	-14.349	-0.032	(0)
CdSeO4	1.056e-016	1.056e-016	-15.976	-15.976	0.000	(0)
Zn(SeO4) 2-2	1.096e-022	8.192e-023	-21.960	-22.087	-0.126	(0)
U(3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-64.206	-64.491	-0.285	(0)
U(4)	1.013e-024					
U(OH) 5-	1.012e-024	9.406e-025	-23.995	-24.027	-0.032	(0)
U(OH) 4	1.189e-027	1.189e-027	-26.925	-26.925	0.000	(0)
U(OH) 3+	1.411e-031	1.312e-031	-30.850	-30.882	-0.032	(0)
U(OH) 2+2	2.450e-036	1.831e-036	-35.611	-35.737	-0.126	(0)
UF3+	1.793e-040	1.667e-040	-39.746	-39.778	-0.032	(0)
UF2+2	0.000e+000	0.000e+000	-40.562	-40.688	-0.126	(0)

UOH+3	0.000e+000	0.000e+000	-41.300	-41.585	-0.285	(0)
UF4	0.000e+000	0.000e+000	-42.028	-42.028	0.000	(0)
UF+3	0.000e+000	0.000e+000	-43.213	-43.498	-0.285	(0)
U(SO4) 2	0.000e+000	0.000e+000	-44.610	-44.610	0.000	(0)
UF5-	0.000e+000	0.000e+000	-44.689	-44.720	-0.032	(0)
USO4+2	0.000e+000	0.000e+000	-45.082	-45.209	-0.126	(0)
UF6-2	0.000e+000	0.000e+000	-46.404	-46.530	-0.126	(0)
U+4	0.000e+000	0.000e+000	-48.002	-48.508	-0.506	(0)
UC1+3	0.000e+000	0.000e+000	-50.662	-50.946	-0.285	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-192.837	-195.398	-2.561	(0)
U(5)	2.294e-018					
UO2+	2.294e-018	2.133e-018	-17.639	-17.671	-0.032	(0)
U(6)	9.290e-009					
UO2(CO3) 2-2	7.916e-009	5.916e-009	-8.101	-8.228	-0.126	(0)
UO2(CO3) 3-4	1.119e-009	3.489e-010	-8.951	-9.457	-0.506	(0)
UO2CO3	2.520e-010	2.520e-010	-9.599	-9.599	0.000	(0)
UO2OH+	2.430e-012	2.259e-012	-11.614	-11.646	-0.032	(0)
UO2F+	4.094e-013	3.807e-013	-12.388	-12.419	-0.032	(0)
UO2+2	7.038e-014	5.379e-014	-13.153	-13.269	-0.117	(0)
UO2F2	5.630e-014	5.630e-014	-13.250	-13.250	0.000	(0)
UO2SO4	4.071e-014	4.071e-014	-13.390	-13.390	0.000	(0)
UO2F3-	7.798e-016	7.250e-016	-15.108	-15.140	-0.032	(0)
UO2(SO4) 2-2	3.592e-016	2.684e-016	-15.445	-15.571	-0.126	(0)
(UO2) 2(OH) 2+2	1.133e-017	8.469e-018	-16.946	-17.072	-0.126	(0)
UO2Cl+	6.823e-018	6.344e-018	-17.166	-17.198	-0.032	(0)
(UO2) 3(OH) 5+	1.737e-018	1.615e-018	-17.760	-17.792	-0.032	(0)
UO2F4-2	3.951e-019	2.953e-019	-18.403	-18.530	-0.126	(0)
UO2NO3+	2.030e-019	1.888e-019	-18.692	-18.724	-0.032	(0)
V(2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-47.919	-47.951	-0.032	(0)
V+2	0.000e+000	0.000e+000	-48.857	-48.984	-0.126	(0)
V(3)	9.755e-019					
V(OH) 3	9.755e-019	9.755e-019	-18.011	-18.011	0.000	(0)
V(OH) 2+	2.046e-029	1.902e-029	-28.689	-28.721	-0.032	(0)
VOH+2	7.287e-033	5.446e-033	-32.137	-32.264	-0.126	(0)
V+3	6.272e-038	3.257e-038	-37.203	-37.487	-0.285	(0)
VSO4+	8.270e-039	7.689e-039	-38.083	-38.114	-0.032	(0)
V2(OH) 3+3	0.000e+000	0.000e+000	-62.248	-62.533	-0.285	(0)
V2(OH) 2+4	0.000e+000	0.000e+000	-63.222	-63.728	-0.506	(0)
V(4)	8.124e-020					
V(OH) 3+	7.923e-020	7.367e-020	-19.101	-19.133	-0.032	(0)
VO+2	1.481e-021	1.107e-021	-20.829	-20.956	-0.126	(0)
VOF+	3.661e-022	3.404e-022	-21.436	-21.468	-0.032	(0)
VOSO4	1.524e-022	1.524e-022	-21.817	-21.817	0.000	(0)
VOF2	6.544e-024	6.544e-024	-23.184	-23.184	0.000	(0)
VOC1+	2.428e-025	2.258e-025	-24.615	-24.646	-0.032	(0)
VOF3-	1.280e-026	1.191e-026	-25.893	-25.924	-0.032	(0)
VOF4-2	3.297e-030	2.464e-030	-29.482	-29.608	-0.126	(0)
H2V2O4+2	3.640e-034	2.720e-034	-33.439	-33.565	-0.126	(0)
V(5)	1.525e-008					
H2VO4-	1.382e-008	1.285e-008	-7.860	-7.891	-0.032	(0)
HVO4-2	1.431e-009	1.069e-009	-8.844	-8.971	-0.126	(0)
H3VO4	3.877e-012	3.877e-012	-11.412	-11.412	0.000	(0)
H3V2O7-	3.459e-013	3.216e-013	-12.461	-12.493	-0.032	(0)
HV2O7-3	8.962e-015	4.654e-015	-14.048	-14.332	-0.285	(0)
VO4-3	3.419e-016	1.775e-016	-15.466	-15.751	-0.285	(0)
VO2+	2.497e-016	2.335e-016	-15.603	-15.632	-0.029	(0)
VO2F	2.100e-017	2.100e-017	-16.678	-16.678	0.000	(0)
V2O7-4	1.330e-017	4.150e-018	-16.876	-17.382	-0.506	(0)
V3O9-3	4.275e-018	2.220e-018	-17.369	-17.654	-0.285	(0)
VO2SO4-	2.999e-018	2.788e-018	-17.523	-17.555	-0.032	(0)
VO2F2-	4.204e-019	3.909e-019	-18.376	-18.408	-0.032	(0)
VO2F3-2	3.345e-022	2.500e-022	-21.476	-21.602	-0.126	(0)
VO2NO3	2.077e-022	2.077e-022	-21.683	-21.683	0.000	(0)
V4O12-4	3.811e-023	1.189e-023	-22.419	-22.925	-0.506	(0)
VO2F4-3	1.215e-026	6.308e-027	-25.916	-26.200	-0.285	(0)
HV10O28-5	0.000e+000	0.000e+000	-58.630	-59.421	-0.791	(0)
V10O28-6	0.000e+000	0.000e+000	-58.949	-60.087	-1.138	(0)

H2V10028-4	0.000e+000	0.000e+000	-61.228	-61.734	-0.506	(0)
Zn	9.222e-008					
Zn+2	7.780e-008	5.946e-008	-7.109	-7.226	-0.117	(0)
ZnSO4	6.506e-009	6.506e-009	-8.187	-8.187	0.000	(0)
ZnCO3	4.026e-009	4.026e-009	-8.395	-8.395	0.000	(0)
ZnOH+	2.133e-009	1.984e-009	-8.671	-8.703	-0.032	(0)
ZnHCO3+	1.532e-009	1.424e-009	-8.815	-8.846	-0.032	(0)
Zn(OH) 2	1.049e-010	1.049e-010	-9.979	-9.979	0.000	(0)
ZnF+	6.542e-011	6.083e-011	-10.184	-10.216	-0.032	(0)
Zn(SO4) 2-2	3.792e-011	2.834e-011	-10.421	-10.548	-0.126	(0)
ZnCl+	1.162e-011	1.086e-011	-10.935	-10.964	-0.029	(0)
ZnOHCl	4.744e-012	4.744e-012	-11.324	-11.324	0.000	(0)
ZnNO3+	2.825e-013	2.627e-013	-12.549	-12.581	-0.032	(0)
Zn(OH) 3-	1.886e-013	1.754e-013	-12.724	-12.756	-0.032	(0)
ZnSeO4	2.728e-014	2.728e-014	-13.564	-13.564	0.000	(0)
ZnCl2	1.252e-015	1.252e-015	-14.902	-14.902	0.000	(0)
Zn(OH) 4-2	3.117e-018	2.329e-018	-17.506	-17.633	-0.126	(0)
Zn(NO3) 2	9.218e-020	9.218e-020	-19.035	-19.035	0.000	(0)
ZnCl3-	7.734e-020	7.231e-020	-19.112	-19.141	-0.029	(0)
Zn(SeO4) 2-2	1.096e-022	8.192e-023	-21.960	-22.087	-0.126	(0)
ZnCl4-2	3.425e-024	2.629e-024	-23.465	-23.580	-0.115	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-182.498	-182.530	-0.032	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-184.040	-184.040	0.000	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-275.545	-275.577	-0.032	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-277.910	-278.037	-0.126	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-371.727	-371.854	-0.126	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2-114.88	-108.59	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2-109.86	-105.35	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3-117.09	-105.35	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3-139.99	-122.06	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3 -137.24	-117.21	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-48.43	-48.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-47.73	-47.28	0.45	(NH4)2SeO4
Acanthite	-68.42	-104.64	-36.22	Ag2S
Ag2CO3	-12.18	-23.27	-11.09	Ag2CO3
Ag2CrO4	-15.02	-26.61	-11.59	Ag2CrO4
Ag2HVO4	-11.89	-10.41	1.48	Ag2HVO4
Ag2MoO4	-13.08	-24.63	-11.55	Ag2MoO4
Ag2O	-14.87	-2.30	12.57	Ag2O
Ag2Se	-13.66	-62.36	-48.70	Ag2Se
Ag2SeO3	-11.82	-18.97	-7.15	Ag2SeO3
Ag2SeO4	-16.96	-25.87	-8.91	Ag2SeO4
Ag2SO4	-15.82	-20.64	-4.82	Ag2SO4
Ag3AsO3	-30.68	-28.52	2.16	Ag3AsO3
Ag3AsO4	-15.22	-18.01	-2.79	Ag3AsO4
Ag3H2VO5	-16.74	-11.56	5.18	Ag3H2VO5
AgF:4H2O	-14.01	-12.96	1.05	AgF:4H2O
Agmetal	-2.35	-15.86	-13.51	Ag
AgVO3	-10.03	-9.26	0.77	AgVO3
Al(OH)3(am)	-2.11	8.69	10.80	Al(OH)3
Al2(MoO4)3	-51.97	-49.61	2.37	Al2(MoO4)3
Al2O3	-2.28	17.38	19.65	Al2O3
Al4(OH)10SO4	-6.29	16.41	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.67	-5.87	4.80	AlAsO4:2H2O
AlOHSO4	-6.42	-9.65	-3.23	AlOHSO4
AlSb	-170.40	-104.77	65.62	AlSb
Alunite	-5.74	-7.14	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.51	-13.30	-7.79	PbSO4
Anhydrite	-2.20	-6.56	-4.36	CaSO4
Anilite	-76.44	-108.32	-31.88	Cu0.25Cu1.5S
Antlerite	-6.48	2.31	8.79	Cu3(OH)4SO4
Aragonite	-0.89	-9.19	-8.30	CaCO3
Arsenolite	-97.54	-100.30	-2.76	As4O6

Artinite	-8.09	1.51	9.60	MgCO ₃ :Mg(OH) 2:3H ₂ O
As ₂ O ₅	-35.82	-29.12	6.71	As ₂ O ₅
Atacamite	-5.28	2.11	7.39	Cu ₂ (OH) 3Cl
Azurite	-4.38	-21.29	-16.91	Cu ₃ (OH) 2(CO ₃) 2
Ba(OH) 2:8H ₂ O	-16.51	7.89	24.39	Ba(OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-16.32	-0.45	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	3.46	-5.45	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-25.50	7.44	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-6.76	-16.43	-9.67	BaCrO ₄
BaF ₂	-9.91	-15.73	-5.82	BaF ₂
BaMoO ₄	-7.48	-14.44	-6.96	BaMoO ₄
Barite	-0.47	-10.45	-9.98	BaSO ₄
BaS	-110.63	-94.45	16.18	BaS
BaSeO ₃	-10.62	-8.79	1.83	BaSeO ₃
BaSeO ₄	-8.22	-15.68	-7.46	BaSeO ₄
Bianchite	-8.76	-10.53	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-4.64	13.45	18.09	MnO ₂
Bixbyite	-1.87	-2.52	-0.64	Mn ₂ O ₃
BlaubleiI	-73.01	-97.17	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-75.03	-102.31	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.11	8.69	8.58	AlOOH
Breithauptite	-73.56	-92.08	-18.52	NiSb
Brochantite	-6.03	9.19	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-5.60	11.24	16.84	Mg(OH) 2
Bunsenite	-5.77	6.68	12.45	NiO
Ca(VO ₃) 2	-10.10	-4.44	5.66	Ca(VO ₃) 2
Ca ₂ V ₂ O ₇	-10.16	7.34	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.21	7.34	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-16.07	6.23	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-19.84	19.12	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-20.74	19.12	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-334.55	-191.58	142.97	Ca ₃ Sb ₂
CaCrO ₄	-10.27	-12.53	-2.27	CaCrO ₄
Calcite	-0.71	-9.19	-8.48	CaCO ₃
Calomel	-13.54	-31.45	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.60	-10.55	-7.95	CaMoO ₄
Carnotite	-3.09	-2.86	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.71	-4.89	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-8.77	-11.79	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) 2	-16.69	-6.85	9.84	Cd(BO ₂) 2
Cd(OH) 2	-8.32	5.32	13.64	Cd(OH) 2
Cd(OH) 2(am)	-8.41	5.32	13.73	Cd(OH) 2
Cd ₃ (OH) 2(SO ₄) 2	-27.43	-20.72	6.71	Cd ₃ (OH) 2(SO ₄) 2
Cd ₃ (OH) 4SO ₄	-24.93	-2.37	22.56	Cd ₃ (OH) 4SO ₄
Cd ₄ (OH) 6SO ₄	-25.45	2.95	28.40	Cd ₄ (OH) 6SO ₄
CdCl ₂	-17.34	-17.99	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-16.30	-17.99	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-16.08	-17.99	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-17.09	-18.30	-1.21	CdF ₂
Cdmetal(alpha)	-37.61	-24.09	13.51	Cd
Cdmetal(gamma)	-37.71	-24.09	13.62	Cd
CdMoO ₄	-2.86	-17.01	-14.15	CdMoO ₄
CdOHCl	-9.87	-6.34	3.54	CdOHCl
CdSb	-93.08	-93.43	-0.35	CdSb
CdSe	-34.53	-54.73	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.40	-18.25	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-12.85	-13.02	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.29	-13.02	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-11.15	-13.02	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-3.06	-12.81	-9.75	AgCl
Cerrusite	-2.80	-15.93	-13.13	PbCO ₃
CH ₄ (g)	-97.58	-138.63	-41.05	CH ₄
Chalcanthite	-8.82	-11.46	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-77.68	-112.60	-34.92	Cu ₂ S
Chalcopyrite	-158.31	-193.58	-35.27	CuFeS ₂
Cinnabar	-67.60	-113.29	-45.69	HgS
Claudetite	-97.23	-100.30	-3.06	As ₄ O ₆
Clausthalite	-27.92	-55.02	-27.10	PbSe

Co (BO2) 2	-32.65	-5.58	27.07	Co (BO2) 2
Co (OH) 2	-6.51	6.58	13.09	Co (OH) 2
Co (OH) 3	-8.80	-11.11	-2.31	Co (OH) 3
CO2 (g)	-2.82	-20.97	-18.15	CO2
Co3 (AsO4) 2	-22.40	-9.36	13.03	Co3 (AsO4) 2
Co3O4	-5.14	-15.63	-10.50	Co3O4
CoCl2	-25.00	-16.73	8.27	CoCl2
CoCl2:6H2O	-19.27	-16.73	2.54	CoCl2:6H2O
CoCO3	-4.41	-14.39	-9.98	CoCO3
CoF2	-15.44	-17.04	-1.60	CoF2
CoF3	-45.08	-46.54	-1.46	CoF3
CoFe2O4	21.88	18.36	-3.53	CoFe2O4
CoMoO4	-7.98	-15.74	-7.76	CoMoO4
CoO	-7.00	6.58	13.59	CoO
CoS (alpha)	-88.31	-95.75	-7.44	CoS
CoS (beta)	-84.68	-95.75	-11.07	CoS
CoSe	-37.27	-53.47	-16.20	CoSe
CoSeO3	-11.41	-10.09	1.32	CoSeO3
CoSeO4:6H2O	-15.45	-16.98	-1.53	CoSeO4:6H2O
CoSO4	-14.56	-11.76	2.80	CoSO4
CoSO4:6H2O	-9.28	-11.76	-2.47	CoSO4:6H2O
Cotunnite	-13.50	-18.28	-4.78	PbCl2
Covellite	-73.15	-95.45	-22.30	CuS
Cr (OH) 2	-23.64	-12.82	10.82	Cr (OH) 2
Cr (OH) 3	-2.40	-1.06	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.31	-1.06	-0.75	Cr (OH) 3
Cr2O3	0.24	-2.12	-2.36	Cr2O3
CrCl2	-50.23	-36.14	14.09	CrCl2
CrCl3	-51.15	-36.04	15.11	CrCl3
CrF3	-25.16	-36.49	-11.34	CrF3
Crmetal	-72.72	-42.23	30.48	Cr
CrO3	-21.11	-24.32	-3.21	CrO3
Cryolite	-16.49	-50.33	-33.84	Na3AlF6
Cu (OH) 2	-1.79	6.88	8.67	Cu (OH) 2
Cu (SbO3) 2	-29.94	15.27	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.76	0.49	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-76.83	-111.71	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-24.52	-70.32	-45.80	Cu2Se
Cu2SO4	-26.66	-28.61	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.57	-8.47	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-86.27	-128.86	-42.59	Cu3Sb
Cu3Se2	-60.01	-123.50	-63.49	Cu3Se2
CuCO3	-2.59	-14.09	-11.50	CuCO3
CuCrO4	-11.99	-17.43	-5.44	CuCrO4
CuF	-12.04	-16.94	-4.91	CuF
CuF2	-17.85	-16.74	1.12	CuF2
CuF2:2H2O	-12.19	-16.74	-4.55	CuF2:2H2O
Cumetal	-11.08	-19.84	-8.76	Cu
CuMoO4	-2.37	-15.44	-13.08	CuMoO4
CuOCuSO4	-14.88	-4.57	10.30	CuOCuSO4
Cupricferrite	12.67	18.66	5.99	CuFe2O4
Cuprite	-8.86	-10.27	-1.41	Cu2O
Cuprousferrite	9.67	0.75	-8.92	CuFeO2
CuSe	-20.07	-53.17	-33.10	CuSe
CuSe2	-50.45	-83.82	-33.37	CuSe2
CuSeO3:2H2O	-10.30	-9.79	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.25	-16.69	-2.44	CuSeO4:5H2O
CuSO4	-14.40	-11.46	2.94	CuSO4
Diaspore	1.82	8.69	6.87	AlOOH
Djurleite	-77.55	-111.47	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-2.38	-18.92	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-1.83	-18.92	-17.09	CaMg (CO3) 2
Epsomite	-4.98	-7.10	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.35	4.21	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	5.43	2.39	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-8.29	-12.01	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-6.46	-4.90	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.63	-38.25	-20.63	Fe2 (SeO3) 3:2H2O

Fe2 (SO4) 3	-39.52	-43.25	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-4.24	15.98	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-9.07	-8.67	0.40	FeAsO4:2H2O
FeCr2O4	-5.11	2.09	7.20	FeCr2O4
FeMoO4	-8.03	-18.12	-10.09	FeMoO4
Ferrihydrite	2.69	5.89	3.19	Fe (OH) 3
Ferroselite	-67.89	-86.49	-18.60	FeSe2
FeS (ppt)	-95.18	-98.13	-2.95	FeS
FeSe	-44.85	-55.85	-11.00	FeSe
Fluorite	-1.34	-11.84	-10.50	CaF2
Galena	-83.33	-97.30	-13.97	PbS
Gibbsite	0.40	8.69	8.29	Al (OH) 3
Goethite	5.39	5.89	0.49	FeOOH
Goslarite	-8.52	-10.53	-2.01	ZnSO4:7H2O
Greenockite	-82.65	-97.01	-14.36	CdS
Greigite	-348.33	-393.37	-45.03	Fe3S4
Gummite	-5.90	1.77	7.67	UO3
Gypsum	-1.95	-6.56	-4.61	CaSO4:2H2O
H-Jarosite	-6.93	-19.03	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.45	-22.33	-12.88	H2MoO4
H2S (g)	-94.33	-102.34	-8.01	H2S
H2Se (g)	-55.10	-60.06	-4.96	H2Se
Halite	-9.31	-7.71	1.60	NaCl
Hausmannite	-3.46	57.57	61.03	Mn3O4
Hematite	13.19	11.77	-1.42	Fe2O3
Hercynite	-1.31	21.59	22.89	FeAl2O4
Hg (CH3) 2 (g)	-214.50	-288.20	-73.71	Hg (CH3) 2
Hg (g)	-10.90	-18.77	-7.87	Hg
Hg (OH) 2	-7.46	-10.95	-3.50	Hg (OH) 2
Hg2 (g)	-22.59	-37.55	-14.96	Hg2
Hg2 (OH) 2	-13.40	-8.13	5.26	Hg2 (OH) 2
Hg2CO3	-13.05	-29.10	-16.05	Hg2CO3
Hg2CrO4	-23.75	-32.45	-8.70	Hg2CrO4
Hg2F2	-21.39	-31.76	-10.36	Hg2F2
Hg2S	-98.80	-110.47	-11.68	Hg2S
Hg2SeO3	-20.15	-24.81	-4.66	Hg2SeO3
Hg2SO4	-20.35	-26.48	-6.13	Hg2SO4
Hg3O2CO3	-24.15	-53.83	-29.68	Hg3O2CO3
HgCl (g)	-35.22	-15.73	19.50	HgCl
HgCl2	-13.01	-34.27	-21.26	HgCl2
HgF (g)	-48.55	-15.88	32.68	HgF
HgF2 (g)	-47.14	-34.57	12.57	HgF2
Hgmetal (l)	-5.32	-18.77	-13.45	Hg
HgSe	-15.32	-71.01	-55.69	HgSe
HgSeO3	-15.20	-27.63	-12.43	HgSeO3
HgSO4	-19.88	-29.29	-9.42	HgSO4
Huntite	-8.41	-38.38	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-8.05	-26.82	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-18.91	-27.68	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-19.34	-24.51	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-0.74	-15.54	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-24.43	-41.67	-17.24	K2Cr2O7
K2CrO4	-16.84	-17.35	-0.51	K2CrO4
K2MoO4	-18.63	-15.37	3.26	K2MoO4
K2SeO4	-15.88	-16.61	-0.73	K2SeO4
Langite	-8.30	9.19	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.83	-8.26	-0.43	PbO:PbSO4
Laurionite	-7.24	-6.62	0.62	PbOHCl
Lepidocrocite	4.51	5.89	1.37	FeOOH
Lime	-20.92	11.78	32.70	CaO
Litharge	-7.65	5.04	12.69	PbO
Mackinawite	-94.53	-98.13	-3.60	FeS
Maghemite	5.39	11.77	6.39	Fe2O3
Magnesioferrite	6.15	23.01	16.86	Fe2MgO4
Magnesite	-2.27	-9.73	-7.46	MgCO3
Magnetite	12.58	15.98	3.40	Fe3O4
Malachite	-1.90	-7.20	-5.31	Cu2 (OH) 2CO3
Manganite	-1.25	24.09	25.34	MnOOH

Massicot	-7.85	5.04	12.89	PbO
Matlockite	-9.46	-18.43	-8.97	PbClF
Melanothallite	-22.69	-16.43	6.26	CuCl ₂
Melanterite	-11.92	-14.13	-2.21	FeSO ₄ :7H ₂ O
Metacinnabar	-68.20	-113.29	-45.09	HgS
Mg(OH) ₂ (active)	-7.55	11.24	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.26	-4.98	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-319.06	-244.37	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.10	6.26	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.08	9.12	16.20	MgCr ₂ O ₄
MgCrO ₄	-18.46	-13.08	5.38	MgCrO ₄
MgF ₂	-4.25	-12.38	-8.13	MgF ₂
MgMoO ₄	-9.24	-11.09	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-8.49	-5.44	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-11.13	-12.33	-1.20	MgSeO ₄ :6H ₂ O
Minium	-28.99	44.54	73.52	Pb ₃ O ₄
Mirabilite	-9.33	-10.44	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn(VO ₃) ₂	-11.74	-6.84	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-51.83	-57.54	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-170.48	-109.40	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ :8H ₂ O	-13.46	-0.96	12.50	Mn ₃ (AsO ₄) ₂ :8H ₂ O
MnCl ₂ :4H ₂ O	-16.65	-13.93	2.72	MnCl ₂ :4H ₂ O
MnS(grn)	-93.12	-92.95	0.17	MnS
MnS(pnk)	-96.29	-92.95	3.34	MnS
MnSb	-111.81	-114.72	-2.91	MnSb
MnSe	-54.17	-50.67	3.50	MnSe
MnSeO ₃	-8.42	-7.29	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-8.27	-7.29	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-12.13	-14.18	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-11.54	-8.96	2.58	MnSO ₄
Monteponite	-9.78	5.32	15.10	CdO
Montroydite	-7.31	-10.95	-3.64	HgO
MoO ₃	-14.33	-22.33	-8.00	MoO ₃
Morenosite	-9.52	-11.67	-2.14	NiSO ₄ :7H ₂ O
MoS ₂	-186.16	-256.42	-70.26	MoS ₂
Na-Jarosite	-3.88	-15.08	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-30.84	-40.73	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-19.35	-16.42	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-20.16	-36.76	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-15.92	-14.43	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-15.65	-14.43	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-19.08	-8.78	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-16.95	-15.67	1.28	Na ₂ SeO ₄
Na ₃ Sb	-196.07	-101.61	94.45	Na ₃ Sb
Na ₃ VO ₄	-32.94	3.74	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-37.82	-0.42	37.40	Na ₄ V ₂ O ₇
Nantokite	-10.06	-16.79	-6.73	CuCl
NaSb	-103.26	-80.10	23.17	NaSb
Natron	-11.76	-13.07	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-8.02	-4.16	3.86	NaVO ₃
Nesquehonite	-5.06	-9.73	-4.67	MgCO ₃ :3H ₂ O
Ni(OH) ₂	-6.12	6.68	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ :8H ₂ O	-24.79	-9.09	15.70	Ni ₃ (AsO ₄) ₂ :8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-23.64	8.36	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-7.42	-14.29	-6.87	NiCO ₃
NiMoO ₄	-4.51	-15.65	-11.14	NiMoO ₄
NiS(alpha)	-90.06	-95.66	-5.60	NiS
NiS(beta)	-84.56	-95.66	-11.10	NiS
NiS(gamma)	-82.86	-95.66	-12.80	NiS
NiSe	-35.68	-53.38	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-12.81	-10.00	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-15.37	-16.89	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-4.06	13.45	17.50	MnO ₂
O ₂ (g)	-24.26	58.83	83.09	O ₂
Orpiment	-296.09	-357.16	-61.07	As ₂ S ₃
Otavite	-3.65	-15.65	-12.00	CdCO ₃
Pb(BO ₂) ₂	-13.65	-7.13	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.11	5.04	8.15	Pb(OH) ₂

Pb10 (OH) 6O (CO3) 6	-66.65	-75.41	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-10.37	-1.58	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-16.11	10.08	26.19	Pb2O (OH) 2
Pb2O3	-21.54	39.50	61.04	Pb2O3
Pb2OCO3	-10.33	-10.89	-0.56	Pb2OCO3
Pb2V2O7	-4.24	-6.14	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.80	-14.00	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.24	-1.10	6.14	Pb3 (VO4) 2
Pb3O2CO3	-16.87	-5.85	11.02	Pb3O2CO3
Pb3O2SO4	-13.91	-3.22	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-19.28	1.82	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-20.06	1.82	21.88	Pb4O3SO4
PbCrO4	-6.68	-19.28	-12.60	PbCrO4
PbF2	-11.14	-18.58	-7.44	PbF2
Pbmetal	-28.62	-24.37	4.25	Pb
PbMoO4	-1.67	-17.29	-15.62	PbMoO4
PbO:0.3H2O	-7.94	5.04	12.98	PbO:0.33H2O
PbSeO4	-11.69	-18.53	-6.84	PbSeO4
Periclase	-10.34	11.24	21.58	MgO
Phosgenite	-14.40	-34.21	-19.81	PbCl2:PbCO3
Plattnerite	-15.15	34.45	49.60	PbO2
Portlandite	-11.02	11.78	22.80	Ca (OH) 2
Pyrite	-152.54	-171.05	-18.51	FeS2
Pyrochroite	-5.81	9.38	15.19	Mn (OH) 2
Pyrolusite	-2.58	38.80	41.38	MnO2
Realgar	-122.37	-142.12	-19.75	AsS
Retgersite	-9.63	-11.67	-2.04	NiSO4:6H2O
Rhodochrosite	-1.01	-11.59	-10.58	MnCO3
Rutherfordine	-4.70	-19.20	-14.50	UO2CO3
Sb (OH) 3	-18.11	-25.22	-7.11	Sb (OH) 3
Sb2O4	-24.43	-21.03	3.40	Sb2O4
Sb2O5	-30.57	-40.23	-9.67	Sb2O5
Sb2Se3	-162.85	-230.61	-67.76	Sb2Se3
Sb4O6 (cubic)	-82.62	-100.88	-18.26	Sb4O6
Sb4O6 (orth)	-82.98	-100.88	-17.90	Sb4O6
SbCl3	-60.77	-60.20	0.57	SbCl3
SbF3	-50.43	-60.65	-10.23	SbF3
Sbmetal	-57.65	-69.34	-11.69	Sb
SbO2	-7.00	-34.82	-27.82	SbO2
Schoepite	-4.22	1.77	5.99	UO2 (OH) 2:H2O
Semetal (am)	-23.53	-30.64	-7.11	Se
Semetal (hex)	-22.93	-30.64	-7.71	Se
Senarmontite	-38.08	-50.44	-12.37	Sb2O3
SeO2	-16.80	-16.67	0.12	SeO2
SeO3	-44.61	-23.57	21.04	SeO3
Siderite	-6.52	-16.76	-10.24	FeCO3
Smithsonite	-3.16	-13.16	-10.00	ZnCO3
Sphalerite	-83.07	-94.52	-11.45	ZnS
Spinel	-8.23	28.62	36.85	MgAl2O4
Stibnite	-306.99	-357.45	-50.46	Sb2S3
Sulfur	-70.78	-72.92	-2.14	S
Tenorite	-0.76	6.88	7.64	CuO
Thenardite	-10.76	-10.44	0.32	Na2SO4
Thermonatrite	-13.71	-13.07	0.64	Na2CO3:H2O
Tyuyamunite	-4.98	-0.90	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-17.54	3.55	21.08	U3O8
U3Sb4	-661.51	-509.13	152.38	U3Sb4
U4O9	-41.27	-44.29	-3.02	U4O9
UF4	-36.13	-65.67	-29.54	UF4
UF4:2.5H2O	-32.95	-65.67	-32.72	UF4:2.5H2O
UO2 (am)	-19.36	-18.43	0.93	UO2
UO2 (NO3) 2	-36.93	-24.78	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-29.63	-24.78	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-28.17	-24.78	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-26.83	-24.78	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.84	1.77	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-19.55	-21.80	-2.25	UO2SeO4:4H2O
UO3	-5.93	1.77	7.70	UO3

Uraninite	-13.76	-18.43	-4.67	UO2
USb2	-254.73	-225.15	29.58	USb2
V(OH)3	-22.52	-14.93	7.59	V(OH)3
V2O5	-14.86	-16.22	-1.36	V2O5
V3O5	-49.00	-47.16	1.84	V3O5
V4O7	-60.26	-53.08	7.19	V4O7
V6O13	-46.64	-107.50	-60.86	V6O13
Valentinite	-41.96	-50.44	-8.48	Sb2O3
VC12	-71.83	-52.95	18.87	VC12
VC13	-73.33	-49.90	23.43	VC13
VF4	-68.09	-53.16	14.93	VF4
Vmetal	-103.07	-59.05	44.03	V
VO	-44.39	-29.63	14.76	VO
VO(OH)2	-11.07	-5.92	5.15	VO(OH)2
VO2Cl	-22.61	-19.77	2.84	VO2Cl
VOC1	-37.74	-26.59	11.15	VOC1
VOC12	-41.99	-29.23	12.76	VOC12
VOSO4	-27.87	-24.26	3.61	VOSO4
Witherite	-4.51	-13.08	-8.57	BaCO3
Wurtzite	-85.57	-94.52	-8.95	ZnS
Zincite	-3.52	7.81	11.33	ZnO
Zincosite	-14.46	-10.53	3.93	ZnSO4
Zn(BO2)2	-12.64	-4.35	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-22.05	-18.74	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.39	7.81	12.20	Zn(OH)2
Zn(OH)2(am)	-4.66	7.81	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.94	7.81	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.72	7.81	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.92	7.81	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.21	-2.71	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.22	3.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.32	-5.67	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.15	-13.24	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.48	12.92	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-22.74	15.76	38.50	Zn5(OH)8Cl2
ZnCl2	-22.55	-15.50	7.05	ZnCl2
ZnCO3:1H2O	-2.90	-13.16	-10.26	ZnCO3:1H2O
ZnF2	-15.27	-15.81	-0.53	ZnF2
Znmetal	-47.39	-21.60	25.79	Zn
ZnMoO4	-4.39	-14.51	-10.13	ZnMoO4
ZnO(active)	-3.37	7.81	11.19	ZnO
ZnS(am)	-85.47	-94.52	-9.05	ZnS
ZnSb	-101.95	-90.94	11.01	ZnSb
ZnSe	-37.84	-52.24	-14.40	ZnSe
ZnSeO4:6H2O	-14.23	-15.75	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.89	-10.53	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 14.

```

REACTION 101
  H2O      -1
  1708.06829 moles ### Addition step. Removes HTC water but solute mass
remains
  USE solution 101
  SAVE Solution 102
  End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 101. Solution after simulation 13.
Using reaction 101.

Reaction 101.

1.708e+003 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.612e-008	8.359e-008
Al	1.189e-005	1.154e-005
As	1.023e-007	9.929e-008
B	2.747e-005	2.667e-005
Ba	3.035e-006	2.946e-006
C	2.855e-002	2.771e-002
Ca	2.593e-002	2.517e-002
Cd	9.183e-009	8.912e-009
Cl	2.544e-003	2.469e-003
Co	1.752e-007	1.700e-007
Cr	1.310e-007	1.272e-007
Cu	2.197e-006	2.132e-006
F	1.837e-003	1.783e-003
Fe	2.780e-005	2.698e-005
Hg	4.077e-010	3.957e-010
K	3.204e-003	3.110e-003
Mg	7.324e-003	7.108e-003
Mn	1.044e-004	1.014e-004
Mo	2.210e-006	2.145e-006
N	7.045e-005	6.838e-005
Na	9.430e-003	9.153e-003
Ni	2.198e-007	2.134e-007
Pb	2.169e-008	2.105e-008
S	2.398e-002	2.327e-002
Sb	7.630e-009	7.406e-009
Se	1.555e-007	1.509e-007
U	3.038e-007	2.949e-007
V	4.988e-007	4.841e-007
Zn	3.016e-006	2.927e-006

-----Description of solution-----

	pH =	7.362	Charge balance
	pe =	7.348	Adjusted to redox

equilibrium

Activity of water	=	0.998
Ionic strength	=	9.127e-002
Mass of water (kg)	=	9.706e-001
Total alkalinity (eq/kg)	=	2.703e-002
Total CO2 (mol/kg)	=	2.855e-002
Temperature (deg C)	=	25.00
Electrical balance (eq)	=	3.006e-017
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	23
Total H	=	1.077741e+002
Total O	=	5.404893e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	3.012e-007	2.315e-007	-6.521	-6.636	-0.114	(0)
H+	5.523e-008	4.344e-008	-7.258	-7.362	-0.104	0.00
H2O	5.551e+001	9.985e-001	1.744	-0.001	0.000	18.07
Ag	8.612e-008					
AgCl	5.382e-008	5.382e-008	-7.269	-7.269	0.000	(0)
Ag+	1.676e-008	1.318e-008	-7.776	-7.880	-0.104	(0)
AgCl2-	1.337e-008	9.376e-009	-7.874	-8.028	-0.154	(0)
AgSO4-	2.050e-009	1.437e-009	-8.688	-8.842	-0.154	(0)
AgCl3-2	6.909e-011	1.671e-011	-10.161	-10.777	-0.616	(0)
AgF	3.676e-011	3.676e-011	-10.435	-10.435	0.000	(0)
AgNO2	1.845e-011	1.845e-011	-10.734	-10.734	0.000	(0)
AgCl4-3	1.663e-012	6.826e-014	-11.779	-13.166	-1.387	(0)
AgNO3	4.969e-013	4.969e-013	-12.304	-12.304	0.000	(0)
AgOH	3.050e-013	3.050e-013	-12.516	-12.516	0.000	(0)
AgH2BO3	7.635e-014	7.635e-014	-13.117	-13.117	0.000	(0)
AgSeO3-	1.789e-014	1.255e-014	-13.747	-13.901	-0.154	(0)
Ag (NO2) 2-	2.729e-016	1.914e-016	-15.564	-15.718	-0.154	(0)
Ag (OH) 2-	9.839e-018	6.900e-018	-17.007	-17.161	-0.154	(0)
Ag (SeO3) 2-3	4.056e-021	1.665e-022	-20.392	-21.779	-1.387	(0)
Ag2MoO4	5.553e-023	5.553e-023	-22.255	-22.255	0.000	(0)
AgNH3+	1.119e-024	7.850e-025	-23.951	-24.105	-0.154	(0)
Ag2Se	2.091e-025	2.091e-025	-24.680	-24.680	0.000	(0)
Ag (NH3) 2+	2.655e-040	1.862e-040	-39.576	-39.730	-0.154	(0)
AgHS	0.000e+000	0.000e+000	-87.712	-87.712	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-106.223	-108.689	-2.465	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-177.104	-177.258	-0.154	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-177.131	-177.379	-0.248	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-179.021	-179.457	-0.436	(0)
AgS4S5-3	0.000e+000	0.000e+000	-179.358	-179.768	-0.410	(0)
Al	1.189e-005					
AlF3	6.220e-006	6.220e-006	-5.206	-5.206	0.000	(0)
AlF4-	4.424e-006	3.462e-006	-5.354	-5.461	-0.107	(0)
Al (OH) 4-	6.635e-007	5.192e-007	-6.178	-6.285	-0.107	(0)
AlF2+	5.606e-007	4.449e-007	-6.251	-6.352	-0.100	(0)
Al (OH) 3	1.782e-008	1.782e-008	-7.749	-7.749	0.000	(0)
Al (OH) 2+	4.860e-009	3.858e-009	-8.313	-8.414	-0.100	(0)
AlF+2	2.536e-009	1.007e-009	-8.596	-8.997	-0.401	(0)
AlOH+2	5.286e-011	2.098e-011	-10.277	-10.678	-0.401	(0)
AlSO4+	4.916e-012	3.847e-012	-11.308	-11.415	-0.107	(0)
Al+3	7.882e-013	9.064e-014	-12.103	-13.043	-0.939	(0)
Al (SO4) 2-	2.880e-013	2.253e-013	-12.541	-12.647	-0.107	(0)
AlMo6O21-3	5.318e-038	2.183e-039	-37.274	-38.661	-1.387	(0)
As (3)	1.987e-024					
H3AsO3	1.955e-024	1.955e-024	-23.709	-23.709	0.000	(0)
H2AsO3-	3.291e-026	2.308e-026	-25.483	-25.637	-0.154	(0)
HAsO3-2	2.003e-030	4.846e-031	-29.698	-30.315	-0.616	(0)
H4AsO3+	5.997e-032	4.206e-032	-31.222	-31.376	-0.154	(0)
AsO3-3	1.048e-035	4.300e-037	-34.980	-36.366	-1.387	(0)
As (5)	1.023e-007					
HAsO4-2	8.997e-008	2.176e-008	-7.046	-7.662	-0.616	(0)
H2AsO4-	1.229e-008	8.622e-009	-7.910	-8.064	-0.154	(0)
AsO4-3	3.860e-011	1.585e-012	-10.413	-11.800	-1.387	(0)
H3AsO4	6.373e-014	6.508e-014	-13.196	-13.187	0.009	(0)
B	2.747e-005					
H3BO3	2.677e-005	2.734e-005	-4.572	-4.563	0.009	(0)
H2BO3-	4.857e-007	3.655e-007	-6.314	-6.437	-0.123	(0)
CaH2BO3+	1.668e-007	1.255e-007	-6.778	-6.901	-0.123	(0)
MgH2BO3+	3.060e-008	2.303e-008	-7.514	-7.638	-0.123	(0)
BF (OH) 3-	1.610e-008	1.211e-008	-7.793	-7.917	-0.123	(0)
NaH2BO3	4.138e-009	4.138e-009	-8.383	-8.383	0.000	(0)
BF2 (OH) 2-	8.312e-011	6.255e-011	-10.080	-10.204	-0.123	(0)
BaH2BO3+	1.601e-011	1.205e-011	-10.796	-10.919	-0.123	(0)

H5 (BO3) 2-	1.130e-011	8.506e-012	-10.947	-11.070	-0.123	(0)
AgH2BO3	7.635e-014	7.635e-014	-13.117	-13.117	0.000	(0)
H8 (BO3) 3-	3.090e-014	2.325e-014	-13.510	-13.633	-0.123	(0)
BF3OH-	1.562e-015	1.176e-015	-14.806	-14.930	-0.123	(0)
BF4-	3.713e-019	2.794e-019	-18.430	-18.554	-0.123	(0)
Ba	3.035e-006					
Ba+2	2.788e-006	1.066e-006	-5.555	-5.972	-0.417	(0)
BaHCO3+	2.358e-007	1.888e-007	-6.627	-6.724	-0.097	(0)
BaCO3	1.094e-008	1.094e-008	-7.961	-7.961	0.000	(0)
BaNO3+	3.617e-010	2.537e-010	-9.442	-9.596	-0.154	(0)
BaH2BO3+	1.601e-011	1.205e-011	-10.796	-10.919	-0.123	(0)
BaOH+	1.366e-012	1.077e-012	-11.865	-11.968	-0.103	(0)
BaNH3+2	8.114e-026	1.963e-026	-25.091	-25.707	-0.616	(0)
C (4)	2.855e-002					
HCO3-	2.336e-002	1.854e-002	-1.632	-1.732	-0.100	(0)
CaHCO3+	2.573e-003	2.060e-003	-2.590	-2.686	-0.097	(0)
H2CO3	1.811e-003	1.811e-003	-2.742	-2.742	0.000	(0)
MgHCO3+	4.444e-004	3.447e-004	-3.352	-3.463	-0.110	(0)
CaCO3	1.892e-004	1.892e-004	-3.723	-3.723	0.000	(0)
NaHCO3	7.447e-005	7.447e-005	-4.128	-4.128	0.000	(0)
CO3-2	5.233e-005	2.001e-005	-4.281	-4.699	-0.417	(0)
MgCO3	3.024e-005	3.024e-005	-4.519	-4.519	0.000	(0)
MnHCO3+	8.691e-006	6.856e-006	-5.061	-5.164	-0.103	(0)
NaCO3-	3.353e-006	2.661e-006	-5.475	-5.575	-0.100	(0)
CuCO3	1.718e-006	1.718e-006	-5.765	-5.765	0.000	(0)
ZnCO3	5.687e-007	5.687e-007	-6.245	-6.245	0.000	(0)
ZnHCO3+	4.128e-007	2.895e-007	-6.384	-6.538	-0.154	(0)
Cu (CO3) 2-2	3.824e-007	9.251e-008	-6.417	-7.034	-0.616	(0)
UO2 (CO3) 3-4	2.996e-007	1.026e-009	-6.523	-8.989	-2.465	(0)
BaHCO3+	2.358e-007	1.888e-007	-6.627	-6.724	-0.097	(0)
NiHCO3+	9.229e-008	6.472e-008	-7.035	-7.189	-0.154	(0)
CoHCO3+	4.686e-008	3.286e-008	-7.329	-7.483	-0.154	(0)
CuHCO3+	2.432e-008	1.705e-008	-7.614	-7.768	-0.154	(0)
NiCO3	2.114e-008	2.114e-008	-7.675	-7.675	0.000	(0)
PbCO3	1.294e-008	1.294e-008	-7.888	-7.888	0.000	(0)
BaCO3	1.094e-008	1.094e-008	-7.961	-7.961	0.000	(0)
CoCO3	7.709e-009	7.709e-009	-8.113	-8.113	0.000	(0)
UO2 (CO3) 2-2	4.230e-009	1.023e-009	-8.374	-8.990	-0.616	(0)
PbHCO3+	4.224e-009	2.962e-009	-8.374	-8.528	-0.154	(0)
Pb (CO3) 2-2	3.086e-009	7.465e-010	-8.511	-9.127	-0.616	(0)
CdCO3	8.156e-010	8.156e-010	-9.089	-9.089	0.000	(0)
FeHCO3+	1.918e-010	1.535e-010	-9.717	-9.814	-0.097	(0)
CdHCO3+	1.076e-010	7.548e-011	-9.968	-10.122	-0.154	(0)
Cd (CO3) 2-2	5.001e-011	1.210e-011	-10.301	-10.917	-0.616	(0)
HgCO3	6.066e-012	6.066e-012	-11.217	-11.217	0.000	(0)
UO2CO3	2.563e-012	2.563e-012	-11.591	-11.591	0.000	(0)
Hg (CO3) 2-2	1.587e-012	3.839e-013	-11.800	-12.416	-0.616	(0)
HgHCO3+	6.996e-015	4.906e-015	-14.155	-14.309	-0.154	(0)
Ca	2.593e-002					
Ca+2	1.560e-002	5.967e-003	-1.807	-2.224	-0.417	(0)
CaSO4	7.473e-003	7.473e-003	-2.126	-2.126	0.000	(0)
CaHCO3+	2.573e-003	2.060e-003	-2.590	-2.686	-0.097	(0)
CaCO3	1.892e-004	1.892e-004	-3.723	-3.723	0.000	(0)
CaF+	9.167e-005	7.232e-005	-4.038	-4.141	-0.103	(0)
CaNO3+	1.277e-006	8.958e-007	-5.894	-6.048	-0.154	(0)
CaH2BO3+	1.668e-007	1.255e-007	-6.778	-6.901	-0.123	(0)
CaOH+	3.442e-008	2.756e-008	-7.463	-7.560	-0.097	(0)
CaNH3+2	9.060e-022	2.192e-022	-21.043	-21.659	-0.616	(0)
Ca (NH3) 2+2	0.000e+000	0.000e+000	-40.978	-41.594	-0.616	(0)
Cd	9.183e-009					
Cd+2	4.676e-009	1.788e-009	-8.330	-8.748	-0.417	(0)
CdSO4	2.292e-009	2.292e-009	-8.640	-8.640	0.000	(0)
CdCO3	8.156e-010	8.156e-010	-9.089	-9.089	0.000	(0)
Cd (SO4) 2-2	6.986e-010	1.690e-010	-9.156	-9.772	-0.616	(0)
CdCl+	4.870e-010	3.416e-010	-9.312	-9.467	-0.154	(0)
CdHCO3+	1.076e-010	7.548e-011	-9.968	-10.122	-0.154	(0)
Cd (CO3) 2-2	5.001e-011	1.210e-011	-10.301	-10.917	-0.616	(0)
CdF+	4.487e-011	3.147e-011	-10.348	-10.502	-0.154	(0)

CdOH+	4.688e-012	3.288e-012	-11.329	-11.483	-0.154	(0)
CdOHC1	3.243e-012	3.243e-012	-11.489	-11.489	0.000	(0)
CdCl2	2.848e-012	2.848e-012	-11.545	-11.545	0.000	(0)
CdNO3+	3.828e-013	2.684e-013	-12.417	-12.571	-0.154	(0)
CdF2	6.972e-014	6.972e-014	-13.157	-13.157	0.000	(0)
CdSeO4	1.605e-014	1.605e-014	-13.794	-13.794	0.000	(0)
CdCl3-	5.125e-015	3.595e-015	-14.290	-14.444	-0.154	(0)
Cd(OH)2	4.802e-015	4.802e-015	-14.319	-14.319	0.000	(0)
Cd(NO3)2	6.387e-018	6.387e-018	-17.195	-17.195	0.000	(0)
Cd2OH+3	7.179e-019	2.947e-020	-18.144	-19.531	-1.387	(0)
Cd(OH)3-	9.682e-020	6.790e-020	-19.014	-19.168	-0.154	(0)
Cd(SeO3)2-2	1.337e-020	3.235e-021	-19.874	-20.490	-0.616	(0)
Cd(OH)4-2	1.063e-026	2.573e-027	-25.973	-26.590	-0.616	(0)
CdHS+	0.000e+000	0.000e+000	-94.232	-94.386	-0.154	(0)
Cd(HS)2	0.000e+000	0.000e+000	-180.828	-180.828	0.000	(0)
Cd(HS)3-	0.000e+000	0.000e+000	-272.420	-272.574	-0.154	(0)
Cd(HS)4-2	0.000e+000	0.000e+000	-363.407	-364.024	-0.616	(0)
C1	2.544e-003					
Cl-	2.544e-003	2.000e-003	-2.595	-2.699	-0.104	(0)
MnCl+	5.916e-008	4.667e-008	-7.228	-7.331	-0.103	(0)
AgCl	5.382e-008	5.382e-008	-7.269	-7.269	0.000	(0)
AgCl2-	1.337e-008	9.376e-009	-7.874	-8.028	-0.154	(0)
ZnCl+	3.199e-009	2.481e-009	-8.495	-8.605	-0.110	(0)
ZnOHC1	7.519e-010	7.519e-010	-9.124	-9.124	0.000	(0)
CdCl+	4.870e-010	3.416e-010	-9.312	-9.467	-0.154	(0)
CoCl+	2.249e-010	1.577e-010	-9.648	-9.802	-0.154	(0)
HgClOH	2.071e-010	2.071e-010	-9.684	-9.684	0.000	(0)
NiCl+	2.066e-010	1.449e-010	-9.685	-9.839	-0.154	(0)
MnCl2	1.319e-010	1.319e-010	-9.880	-9.880	0.000	(0)
HgCl2	1.014e-010	1.014e-010	-9.994	-9.994	0.000	(0)
AgCl3-2	6.909e-011	1.671e-011	-10.161	-10.777	-0.616	(0)
CuCl+	5.958e-011	4.621e-011	-10.225	-10.335	-0.110	(0)
PbCl+	2.176e-011	1.526e-011	-10.662	-10.816	-0.154	(0)
ZnCl2	7.866e-012	7.866e-012	-11.104	-11.104	0.000	(0)
CdOHC1	3.243e-012	3.243e-012	-11.489	-11.489	0.000	(0)
HgCl3-	2.891e-012	2.027e-012	-11.539	-11.693	-0.154	(0)
CdCl2	2.848e-012	2.848e-012	-11.545	-11.545	0.000	(0)
AgCl4-3	1.663e-012	6.826e-014	-11.779	-13.166	-1.387	(0)
CuCl	8.061e-013	8.061e-013	-12.094	-12.094	0.000	(0)
CuCl2-	4.343e-013	3.369e-013	-12.362	-12.473	-0.110	(0)
PbCl2	1.364e-013	1.364e-013	-12.865	-12.865	0.000	(0)
MnCl3-	9.209e-014	7.265e-014	-13.036	-13.139	-0.103	(0)
HgCl4-2	6.673e-014	1.614e-014	-13.176	-13.792	-0.616	(0)
CuCl2	3.205e-014	3.205e-014	-13.494	-13.494	0.000	(0)
ZnCl3-	1.611e-014	1.250e-014	-13.793	-13.903	-0.110	(0)
HgCl+	1.442e-014	1.011e-014	-13.841	-13.995	-0.154	(0)
CrCl+2	5.138e-015	1.243e-015	-14.289	-14.905	-0.616	(0)
CdCl3-	5.125e-015	3.595e-015	-14.290	-14.444	-0.154	(0)
NiCl2	1.460e-015	1.460e-015	-14.836	-14.836	0.000	(0)
CuCl3-2	3.720e-016	1.441e-016	-15.430	-15.841	-0.412	(0)
FeCl+2	2.126e-016	8.233e-017	-15.673	-16.084	-0.412	(0)
PbCl3-	1.548e-016	1.086e-016	-15.810	-15.964	-0.154	(0)
ZnCl4-2	3.227e-017	1.250e-017	-16.491	-16.903	-0.412	(0)
CrOHC12	1.094e-017	1.094e-017	-16.961	-16.961	0.000	(0)
FeCl2+	9.324e-019	7.356e-019	-18.030	-18.133	-0.103	(0)
CuCl3-	7.713e-019	5.983e-019	-18.113	-18.223	-0.110	(0)
CrO3Cl-	5.205e-019	3.651e-019	-18.284	-18.438	-0.154	(0)
PbCl4-2	4.104e-019	9.927e-020	-18.387	-19.003	-0.616	(0)
CrCl2+	3.364e-019	2.359e-019	-18.473	-18.627	-0.154	(0)
UO2Cl+	1.488e-019	1.044e-019	-18.827	-18.981	-0.154	(0)
VOCl+	6.122e-022	4.293e-022	-21.213	-21.367	-0.154	(0)
FeCl3	1.471e-022	1.471e-022	-21.832	-21.832	0.000	(0)
CuCl4-2	1.549e-023	5.998e-024	-22.810	-23.222	-0.412	(0)
CoCl+2	3.404e-033	8.235e-034	-32.468	-33.084	-0.616	(0)
UCl+3	0.000e+000	0.000e+000	-51.033	-52.419	-1.387	(0)
Co(NH3)5Cl+2	0.000e+000	0.000e+000	-104.190	-104.806	-0.616	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-117.509	-118.125	-0.616	(0)
Co(NH3)6Cl+2	0.000e+000	0.000e+000	-130.440	-131.057	-0.616	(0)

Co (2)	1.752e-007					
Co+2	9.420e-008	2.279e-008	-7.026	-7.642	-0.616	(0)
CoHCO3+	4.686e-008	3.286e-008	-7.329	-7.483	-0.154	(0)
CoSO4	2.486e-008	2.486e-008	-7.605	-7.605	0.000	(0)
CoCO3	7.709e-009	7.709e-009	-8.113	-8.113	0.000	(0)
CoF+	1.141e-009	8.002e-010	-8.943	-9.097	-0.154	(0)
CoCl+	2.249e-010	1.577e-010	-9.648	-9.802	-0.154	(0)
CoOH+	1.501e-010	1.053e-010	-9.824	-9.978	-0.154	(0)
CoNO3+	2.445e-012	1.715e-012	-11.612	-11.766	-0.154	(0)
Co (OH) 2	1.935e-012	1.935e-012	-11.713	-11.713	0.000	(0)
CoNO2+	1.534e-012	1.076e-012	-11.814	-11.968	-0.154	(0)
CoSeO4	5.507e-013	5.507e-013	-12.259	-12.259	0.000	(0)
Co (NO3) 2	1.656e-016	1.656e-016	-15.781	-15.781	0.000	(0)
Co (OH) 3-	1.274e-017	8.938e-018	-16.895	-17.049	-0.154	(0)
CoOH-	3.202e-018	2.246e-018	-17.495	-17.649	-0.154	(0)
Co2OH+3	2.929e-018	1.202e-019	-17.533	-18.920	-1.387	(0)
Co (OH) 4-2	1.355e-024	3.279e-025	-23.868	-24.484	-0.616	(0)
Co (NH3) +2	3.304e-025	7.994e-026	-24.481	-25.097	-0.616	(0)
Co4 (OH) 4+4	7.148e-030	2.449e-032	-29.146	-31.611	-2.465	(0)
Co (NH3) 2+2	0.000e+000	0.000e+000	-42.386	-43.002	-0.616	(0)
Co (NH3) 3+2	0.000e+000	0.000e+000	-60.821	-61.437	-0.616	(0)
Co (NH3) 4+2	0.000e+000	0.000e+000	-79.636	-80.252	-0.616	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-98.951	-99.567	-0.616	(0)
Co (3)	9.838e-027					
CoOH+2	9.838e-027	2.380e-027	-26.007	-26.623	-0.616	(0)
Co+3	1.760e-032	2.024e-033	-31.755	-32.694	-0.939	(0)
CoCl+2	3.404e-033	8.235e-034	-32.468	-33.084	-0.616	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-104.190	-104.806	-0.616	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-125.541	-125.695	-0.154	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-130.177	-130.793	-0.616	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-130.440	-131.057	-0.616	(0)
Cr (2)	2.126e-026					
Cr+2	2.126e-026	5.143e-027	-25.672	-26.289	-0.616	(0)
Cr (3)	1.174e-007					
Cr (OH) 2+	9.766e-008	6.849e-008	-7.010	-7.164	-0.154	(0)
Cr (OH) +2	1.005e-008	2.432e-009	-7.998	-8.614	-0.616	(0)
Cr (OH) 3	5.955e-009	5.955e-009	-8.225	-8.225	0.000	(0)
CrOHSO4	3.155e-009	3.155e-009	-8.501	-8.501	0.000	(0)
CrF+2	3.493e-010	8.451e-011	-9.457	-10.073	-0.616	(0)
CrO2-	9.299e-011	6.521e-011	-10.032	-10.186	-0.154	(0)
Cr (OH) 4-	7.825e-011	5.488e-011	-10.107	-10.261	-0.154	(0)
Cr+3	1.170e-011	4.802e-013	-10.932	-12.319	-1.387	(0)
CrSO4+	8.741e-012	6.130e-012	-11.058	-11.213	-0.154	(0)
CrCl+2	5.138e-015	1.243e-015	-14.289	-14.905	-0.616	(0)
Cr2 (OH) 2SO4+2	2.866e-015	6.934e-016	-14.543	-15.159	-0.616	(0)
Cr2 (OH) 2 (SO4) 2	2.252e-016	2.252e-016	-15.647	-15.647	0.000	(0)
CrOHC12	1.094e-017	1.094e-017	-16.961	-16.961	0.000	(0)
CrNO3+2	4.119e-018	9.965e-019	-17.385	-18.002	-0.616	(0)
CrCl2+	3.364e-019	2.359e-019	-18.473	-18.627	-0.154	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-95.640	-96.257	-0.616	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-115.142	-116.528	-1.387	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-117.509	-118.125	-0.616	(0)
Cr (6)	1.366e-008					
CrO4-2	1.241e-008	4.746e-009	-7.906	-8.324	-0.417	(0)
HCrO4-	9.512e-010	6.671e-010	-9.022	-9.176	-0.154	(0)
NaCrO4-	2.402e-010	1.685e-010	-9.619	-9.773	-0.154	(0)
KCrO4-	6.101e-011	4.279e-011	-10.215	-10.369	-0.154	(0)
CrO3SO4-2	1.997e-016	4.832e-017	-15.700	-16.316	-0.616	(0)
Cr2O7-2	6.388e-017	1.545e-017	-16.195	-16.811	-0.616	(0)
H2CrO4	2.349e-017	2.349e-017	-16.629	-16.629	0.000	(0)
CrO3Cl-	5.205e-019	3.651e-019	-18.284	-18.438	-0.154	(0)
Cu (1)	1.697e-012					
CuCl	8.061e-013	8.061e-013	-12.094	-12.094	0.000	(0)
Cu+	4.565e-013	3.201e-013	-12.341	-12.495	-0.154	(0)
CuCl2-	4.343e-013	3.369e-013	-12.362	-12.473	-0.110	(0)
CuCl3-2	3.720e-016	1.441e-016	-15.430	-15.841	-0.412	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-181.250	-181.672	-0.422	(0)
CuS4S5-3	0.000e+000	0.000e+000	-182.004	-182.402	-0.398	(0)

Cu (2)	2.197e-006					
CuCO3	1.718e-006	1.718e-006	-5.765	-5.765	0.000	(0)
Cu (CO3) 2-2	3.824e-007	9.251e-008	-6.417	-7.034	-0.616	(0)
Cu+2	3.812e-008	1.458e-008	-7.419	-7.836	-0.417	(0)
CuHCO3+	2.432e-008	1.705e-008	-7.614	-7.768	-0.154	(0)
CuSO4	1.826e-008	1.826e-008	-7.739	-7.739	0.000	(0)
CuOH+	1.376e-008	1.067e-008	-7.862	-7.972	-0.110	(0)
CuF+	1.456e-009	1.021e-009	-8.837	-8.991	-0.154	(0)
Cu (OH) 2	4.928e-010	4.928e-010	-9.307	-9.307	0.000	(0)
CuCl+	5.958e-011	4.621e-011	-10.225	-10.335	-0.110	(0)
CuNO2+	1.458e-011	1.023e-011	-10.836	-10.990	-0.154	(0)
Cu2 (OH) 2+2	1.182e-011	2.860e-012	-10.927	-11.544	-0.616	(0)
CuNO3+	3.120e-012	2.188e-012	-11.506	-11.660	-0.154	(0)
Cu (OH) 3-	3.336e-013	2.340e-013	-12.477	-12.631	-0.154	(0)
CuCl2	3.205e-014	3.205e-014	-13.494	-13.494	0.000	(0)
Cu (NO2) 2	7.011e-016	7.011e-016	-15.154	-15.154	0.000	(0)
Cu (NO3) 2	1.308e-017	1.308e-017	-16.883	-16.883	0.000	(0)
Cu (OH) 4-2	1.762e-018	4.263e-019	-17.754	-18.370	-0.616	(0)
CuCl3-	7.713e-019	5.983e-019	-18.113	-18.223	-0.110	(0)
CuNH3+2	1.799e-023	4.352e-024	-22.745	-23.361	-0.616	(0)
CuCl4-2	1.549e-023	5.998e-024	-22.810	-23.222	-0.412	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-262.721	-262.875	-0.154	(0)
F	1.837e-003					
F-	1.412e-003	1.110e-003	-2.850	-2.955	-0.104	(0)
MgF+	2.893e-004	2.264e-004	-3.539	-3.645	-0.107	(0)
CaF+	9.167e-005	7.232e-005	-4.038	-4.141	-0.103	(0)
AlF3	6.220e-006	6.220e-006	-5.206	-5.206	0.000	(0)
NaF	5.004e-006	5.004e-006	-5.301	-5.301	0.000	(0)
AlF4-	4.424e-006	3.462e-006	-5.354	-5.461	-0.107	(0)
MnF+	1.039e-006	8.194e-007	-5.984	-6.087	-0.103	(0)
AlF2+	5.606e-007	4.449e-007	-6.251	-6.352	-0.100	(0)
HF	7.134e-008	7.134e-008	-7.147	-7.147	0.000	(0)
BF (OH) 3-	1.610e-008	1.211e-008	-7.793	-7.917	-0.123	(0)
ZnF+	1.560e-008	1.094e-008	-7.807	-7.961	-0.154	(0)
AlF+2	2.536e-009	1.007e-009	-8.596	-8.997	-0.401	(0)
CuF+	1.456e-009	1.021e-009	-8.837	-8.991	-0.154	(0)
CoF+	1.141e-009	8.002e-010	-8.943	-9.097	-0.154	(0)
NiF+	1.126e-009	7.898e-010	-8.948	-9.102	-0.154	(0)
HF2-	3.919e-010	3.012e-010	-9.407	-9.521	-0.114	(0)
CrF+2	3.493e-010	8.451e-011	-9.457	-10.073	-0.616	(0)
BF2 (OH) 2-	8.312e-011	6.255e-011	-10.080	-10.204	-0.123	(0)
FeF3	7.726e-011	7.726e-011	-10.112	-10.112	0.000	(0)
FeF2+	6.251e-011	4.931e-011	-10.204	-10.307	-0.103	(0)
CdF+	4.487e-011	3.147e-011	-10.348	-10.502	-0.154	(0)
AgF	3.676e-011	3.676e-011	-10.435	-10.435	0.000	(0)
PbF+	2.399e-011	1.683e-011	-10.620	-10.774	-0.154	(0)
FeF+2	4.284e-012	1.659e-012	-11.368	-11.780	-0.412	(0)
PbF2	3.677e-013	3.677e-013	-12.435	-12.435	0.000	(0)
CdF2	6.972e-014	6.972e-014	-13.157	-13.157	0.000	(0)
VO2F	2.199e-014	2.199e-014	-13.658	-13.658	0.000	(0)
UO2F2	1.579e-014	1.579e-014	-13.802	-13.802	0.000	(0)
H2F2	1.363e-014	1.363e-014	-13.865	-13.865	0.000	(0)
VO2F2-	1.264e-014	8.865e-015	-13.898	-14.052	-0.154	(0)
UO2F+	7.032e-015	4.932e-015	-14.153	-14.307	-0.154	(0)
UO2F3-	6.281e-015	4.405e-015	-14.202	-14.356	-0.154	(0)
BF3OH-	1.562e-015	1.176e-015	-14.806	-14.930	-0.123	(0)
PbF3-	1.104e-015	7.744e-016	-14.957	-15.111	-0.154	(0)
VO2F3-2	5.076e-016	1.228e-016	-15.295	-15.911	-0.616	(0)
UO2F4-2	1.606e-016	3.885e-017	-15.794	-16.411	-0.616	(0)
PbF4-2	1.701e-018	4.116e-019	-17.769	-18.386	-0.616	(0)
VO2F4-3	1.634e-018	6.709e-020	-17.787	-19.173	-1.387	(0)
VOF+	7.266e-019	5.096e-019	-18.139	-18.293	-0.154	(0)
BF4-	3.713e-019	2.794e-019	-18.430	-18.554	-0.123	(0)
VOF2	2.122e-019	2.122e-019	-18.673	-18.673	0.000	(0)
HgF+	1.487e-020	1.043e-020	-19.828	-19.982	-0.154	(0)
VOF3-	1.192e-020	8.359e-021	-19.924	-20.078	-0.154	(0)
VOF4-2	1.549e-022	3.747e-023	-21.810	-22.426	-0.616	(0)
Sb (OH) 2F	1.587e-028	1.587e-028	-27.799	-27.799	0.000	(0)

SbOF	1.563e-028	1.563e-028	-27.806	-27.806	0.000	(0)
UF3+	2.951e-039	2.070e-039	-38.530	-38.684	-0.154	(0)
UF4	2.520e-040	2.520e-040	-39.599	-39.599	0.000	(0)
UF2+2	0.000e+000	0.000e+000	-40.313	-40.930	-0.616	(0)
UF5-	0.000e+000	0.000e+000	-40.801	-40.955	-0.154	(0)
UF6-2	0.000e+000	0.000e+000	-40.813	-41.430	-0.616	(0)
UF+3	0.000e+000	0.000e+000	-43.688	-45.075	-1.387	(0)
Fe (2)	3.801e-009					
Fe+2	2.719e-009	6.578e-010	-8.566	-9.182	-0.616	(0)
FeSO4	8.828e-010	8.828e-010	-9.054	-9.054	0.000	(0)
FeHCO3+	1.918e-010	1.535e-010	-9.717	-9.814	-0.097	(0)
FeOH+	7.684e-012	6.062e-012	-11.114	-11.217	-0.103	(0)
Fe (OH) 2	1.115e-015	1.115e-015	-14.953	-14.953	0.000	(0)
Fe (OH) 3-	1.034e-016	8.158e-017	-15.985	-16.088	-0.103	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-187.524	-187.524	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-278.979	-279.133	-0.154	(0)
Fe (3)	2.779e-005					
Fe (OH) 2+	2.311e-005	1.834e-005	-4.636	-4.737	-0.100	(0)
Fe (OH) 3	4.560e-006	4.560e-006	-5.341	-5.341	0.000	(0)
Fe (OH) 4-	1.238e-007	9.828e-008	-6.907	-7.008	-0.100	(0)
FeOH+2	5.259e-010	2.037e-010	-9.279	-9.691	-0.412	(0)
FeF3	7.726e-011	7.726e-011	-10.112	-10.112	0.000	(0)
FeF2+	6.251e-011	4.931e-011	-10.204	-10.307	-0.103	(0)
FeF+2	4.284e-012	1.659e-012	-11.368	-11.780	-0.412	(0)
FeSO4+	1.060e-013	8.360e-014	-12.975	-13.078	-0.103	(0)
Fe (SO4) 2-	1.393e-014	9.771e-015	-13.856	-14.010	-0.154	(0)
Fe+3	1.185e-014	1.363e-015	-13.926	-14.866	-0.939	(0)
Fe2 (OH) 2+4	4.011e-016	1.374e-018	-15.397	-17.862	-2.465	(0)
FeCl+2	2.126e-016	8.233e-017	-15.673	-16.084	-0.412	(0)
FeNO3+2	2.675e-018	6.470e-019	-17.573	-18.189	-0.616	(0)
Fe3 (OH) 4+5	2.591e-018	3.643e-022	-17.587	-21.439	-3.852	(0)
FeCl2+	9.324e-019	7.356e-019	-18.030	-18.133	-0.103	(0)
FeHSeO3+2	2.407e-019	5.822e-020	-18.619	-19.235	-0.616	(0)
FeCl3	1.471e-022	1.471e-022	-21.832	-21.832	0.000	(0)
H (0)	5.258e-033					
H2	2.629e-033	2.685e-033	-32.580	-32.571	0.009	(0)
Hg (0)	4.700e-012					
Hg	4.700e-012	4.700e-012	-11.328	-11.328	0.000	(0)
Hg (1)	6.683e-021					
Hg2+2	3.341e-021	8.084e-022	-20.476	-21.092	-0.616	(0)
Hg (2)	4.030e-010					
HgClOH	2.071e-010	2.071e-010	-9.684	-9.684	0.000	(0)
HgCl2	1.014e-010	1.014e-010	-9.994	-9.994	0.000	(0)
Hg (OH) 2	8.386e-011	8.564e-011	-10.076	-10.067	0.009	(0)
HgCO3	6.066e-012	6.066e-012	-11.217	-11.217	0.000	(0)
HgCl3-	2.891e-012	2.027e-012	-11.539	-11.693	-0.154	(0)
Hg (CO3) 2-2	1.587e-012	3.839e-013	-11.800	-12.416	-0.616	(0)
HgCl4-2	6.673e-014	1.614e-014	-13.176	-13.792	-0.616	(0)
HgCl+	1.442e-014	1.011e-014	-13.841	-13.995	-0.154	(0)
HgHCO3+	6.996e-015	4.906e-015	-14.155	-14.309	-0.154	(0)
HgOH+	3.329e-015	2.334e-015	-14.478	-14.632	-0.154	(0)
Hg (OH) 3-	3.558e-018	2.496e-018	-17.449	-17.603	-0.154	(0)
Hg+2	1.047e-018	2.533e-019	-17.980	-18.596	-0.616	(0)
HgSO4	3.626e-019	3.626e-019	-18.441	-18.441	0.000	(0)
HgF+	1.487e-020	1.043e-020	-19.828	-19.982	-0.154	(0)
HgNO3+	6.331e-024	4.440e-024	-23.199	-23.353	-0.154	(0)
Hg (NO3) 2	8.761e-029	8.761e-029	-28.057	-28.057	0.000	(0)
HgNH3+2	1.928e-029	4.663e-030	-28.715	-29.331	-0.616	(0)
Hg (NH3) 2+2	5.624e-040	1.361e-040	-39.250	-39.866	-0.616	(0)
Hg (NH3) 3+2	0.000e+000	0.000e+000	-58.185	-58.801	-0.616	(0)
Hg (NH3) 4+2	0.000e+000	0.000e+000	-76.820	-77.436	-0.616	(0)
HgHS2-	0.000e+000	0.000e+000	-166.444	-166.598	-0.154	(0)
HgS2-2	0.000e+000	0.000e+000	-167.328	-167.944	-0.616	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-167.566	-167.566	0.000	(0)
K	3.204e-003					
K+	3.086e-003	2.427e-003	-2.511	-2.615	-0.104	(0)
KSO4-	1.183e-004	9.391e-005	-3.927	-4.027	-0.100	(0)
KCrO4-	6.101e-011	4.279e-011	-10.215	-10.369	-0.154	(0)

Mg	7.324e-003						
Mg+2	4.752e-003	1.817e-003	-2.323	-2.741	-0.417	(0)	
MgSO4	1.808e-003	1.808e-003	-2.743	-2.743	0.000	(0)	
MgHCO3+	4.444e-004	3.447e-004	-3.352	-3.463	-0.110	(0)	
MgF+	2.893e-004	2.264e-004	-3.539	-3.645	-0.107	(0)	
MgCO3	3.024e-005	3.024e-005	-4.519	-4.519	0.000	(0)	
MgOH+	2.077e-007	1.674e-007	-6.682	-6.776	-0.094	(0)	
MgH2BO3+	3.060e-008	2.303e-008	-7.514	-7.638	-0.123	(0)	
Mn (2)	1.044e-004						
Mn+2	7.661e-005	1.853e-005	-4.116	-4.732	-0.616	(0)	
MnSO4	1.802e-005	1.802e-005	-4.744	-4.744	0.000	(0)	
MnHCO3+	8.691e-006	6.856e-006	-5.061	-5.164	-0.103	(0)	
MnF+	1.039e-006	8.194e-007	-5.984	-6.087	-0.103	(0)	
MnCl+	5.916e-008	4.667e-008	-7.228	-7.331	-0.103	(0)	
MnOH+	1.366e-008	1.078e-008	-7.865	-7.968	-0.103	(0)	
MnNO3+	1.988e-009	1.395e-009	-8.701	-8.856	-0.154	(0)	
MnSeO4	2.405e-010	2.405e-010	-9.619	-9.619	0.000	(0)	
MnCl2	1.319e-010	1.319e-010	-9.880	-9.880	0.000	(0)	
Mn (NO3) 2	1.663e-013	1.663e-013	-12.779	-12.779	0.000	(0)	
MnCl3-	9.209e-014	7.265e-014	-13.036	-13.139	-0.103	(0)	
Mn (OH) 3-	4.523e-018	3.568e-018	-17.345	-17.448	-0.103	(0)	
Mn (OH) 4-2	6.885e-024	2.667e-024	-23.162	-23.574	-0.412	(0)	
MnSe	0.000e+000	0.000e+000	-53.947	-53.947	0.000	(0)	
Mn (3)	1.606e-022						
Mn+3	1.606e-022	1.847e-023	-21.794	-22.734	-0.939	(0)	
Mn (6)	3.516e-035						
MnO4-2	3.516e-035	1.362e-035	-34.454	-34.866	-0.412	(0)	
Mn (7)	1.695e-037						
MnO4-	1.695e-037	1.290e-037	-36.771	-36.890	-0.119	(0)	
Mo	2.210e-006						
MoO4-2	2.209e-006	8.447e-007	-5.656	-6.073	-0.417	(0)	
HMoO4-	1.041e-009	7.300e-010	-8.983	-9.137	-0.154	(0)	
H2MoO4	2.323e-013	2.323e-013	-12.634	-12.634	0.000	(0)	
Ag2MoO4	5.553e-023	5.553e-023	-22.255	-22.255	0.000	(0)	
AlMo6O21-3	5.318e-038	2.183e-039	-37.274	-38.661	-1.387	(0)	
Mo7O24-6	0.000e+000	0.000e+000	-42.871	-48.418	-5.547	(0)	
HMo7O24-5	0.000e+000	0.000e+000	-45.541	-49.393	-3.852	(0)	
H2Mo7O24-4	0.000e+000	0.000e+000	-49.508	-51.973	-2.465	(0)	
H3Mo7O24-3	0.000e+000	0.000e+000	-54.703	-56.089	-1.387	(0)	
N (-3)	3.149e-018						
NH4+	2.953e-018	2.223e-018	-17.530	-17.653	-0.123	(0)	
NH4SO4-	1.650e-019	1.302e-019	-18.782	-18.885	-0.103	(0)	
NH3	2.918e-020	2.918e-020	-19.535	-19.535	0.000	(0)	
CaNH3+2	9.060e-022	2.192e-022	-21.043	-21.659	-0.616	(0)	
CuNH3+2	1.799e-023	4.352e-024	-22.745	-23.361	-0.616	(0)	
NiNH3+2	1.834e-024	4.437e-025	-23.737	-24.353	-0.616	(0)	
AgNH3+	1.119e-024	7.850e-025	-23.951	-24.105	-0.154	(0)	
Co (NH3) +2	3.304e-025	7.994e-026	-24.481	-25.097	-0.616	(0)	
BaNH3+2	8.114e-026	1.963e-026	-25.091	-25.707	-0.616	(0)	
HgNH3+2	1.928e-029	4.663e-030	-28.715	-29.331	-0.616	(0)	
Hg (NH3) 2+2	5.624e-040	1.361e-040	-39.250	-39.866	-0.616	(0)	
Ag (NH3) 2+	2.655e-040	1.862e-040	-39.576	-39.730	-0.154	(0)	
Ca (NH3) 2+2	0.000e+000	0.000e+000	-40.978	-41.594	-0.616	(0)	
Ni (NH3) 2+2	0.000e+000	0.000e+000	-41.112	-41.728	-0.616	(0)	
Co (NH3) 2+2	0.000e+000	0.000e+000	-42.386	-43.002	-0.616	(0)	
Hg (NH3) 3+2	0.000e+000	0.000e+000	-58.185	-58.801	-0.616	(0)	
Co (NH3) 3+2	0.000e+000	0.000e+000	-60.821	-61.437	-0.616	(0)	
Hg (NH3) 4+2	0.000e+000	0.000e+000	-76.820	-77.436	-0.616	(0)	
Co (NH3) 4+2	0.000e+000	0.000e+000	-79.636	-80.252	-0.616	(0)	
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-95.640	-96.257	-0.616	(0)	
Co (NH3) 5+2	0.000e+000	0.000e+000	-98.951	-99.567	-0.616	(0)	
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-104.190	-104.806	-0.616	(0)	
Cr (NH3) 6+3	0.000e+000	0.000e+000	-115.142	-116.528	-1.387	(0)	
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-117.509	-118.125	-0.616	(0)	
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-125.541	-125.695	-0.154	(0)	
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-130.177	-130.793	-0.616	(0)	
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-130.440	-131.057	-0.616	(0)	
N (3)	8.806e-006						

NO2-	8.806e-006	6.699e-006	-5.055	-5.174	-0.119	(0)
AgNO2	1.845e-011	1.845e-011	-10.734	-10.734	0.000	(0)
CuNO2+	1.458e-011	1.023e-011	-10.836	-10.990	-0.154	(0)
CoNO2+	1.534e-012	1.076e-012	-11.814	-11.968	-0.154	(0)
Cu (NO2) 2	7.011e-016	7.011e-016	-15.154	-15.154	0.000	(0)
Ag (NO2) 2-	2.729e-016	1.914e-016	-15.564	-15.718	-0.154	(0)
N (5)	6.165e-005					
NO3-	6.037e-005	4.747e-005	-4.219	-4.324	-0.104	(0)
CaNO3+	1.277e-006	8.958e-007	-5.894	-6.048	-0.154	(0)
MnNO3+	1.988e-009	1.395e-009	-8.701	-8.856	-0.154	(0)
BaNO3+	3.617e-010	2.537e-010	-9.442	-9.596	-0.154	(0)
ZnNO3+	8.397e-011	5.889e-011	-10.076	-10.230	-0.154	(0)
NiNO3+	4.815e-012	3.377e-012	-11.317	-11.472	-0.154	(0)
CuNO3+	3.120e-012	2.188e-012	-11.506	-11.660	-0.154	(0)
CoNO3+	2.445e-012	1.715e-012	-11.612	-11.766	-0.154	(0)
AgNO3	4.969e-013	4.969e-013	-12.304	-12.304	0.000	(0)
CdNO3+	3.828e-013	2.684e-013	-12.417	-12.571	-0.154	(0)
PbNO3+	2.153e-013	1.510e-013	-12.667	-12.821	-0.154	(0)
Mn (NO3) 2	1.663e-013	1.663e-013	-12.779	-12.779	0.000	(0)
Zn (NO3) 2	5.578e-016	5.578e-016	-15.254	-15.254	0.000	(0)
Co (NO3) 2	1.656e-016	1.656e-016	-15.781	-15.781	0.000	(0)
Cu (NO3) 2	1.308e-017	1.308e-017	-16.883	-16.883	0.000	(0)
Pb (NO3) 2	1.217e-017	1.217e-017	-16.915	-16.915	0.000	(0)
Cd (NO3) 2	6.387e-018	6.387e-018	-17.195	-17.195	0.000	(0)
CrNO3+2	4.119e-018	9.965e-019	-17.385	-18.002	-0.616	(0)
FeNO3+2	2.675e-018	6.470e-019	-17.573	-18.189	-0.616	(0)
VO2NO3	2.711e-019	2.711e-019	-18.567	-18.567	0.000	(0)
UO2NO3+	4.345e-021	3.047e-021	-20.362	-20.516	-0.154	(0)
HgNO3+	6.331e-024	4.440e-024	-23.199	-23.353	-0.154	(0)
Hg (NO3) 2	8.761e-029	8.761e-029	-28.057	-28.057	0.000	(0)
Na	9.430e-003					
Na+	9.083e-003	7.143e-003	-2.042	-2.146	-0.104	(0)
NaSO4-	2.642e-004	2.097e-004	-3.578	-3.678	-0.100	(0)
NaHCO3	7.447e-005	7.447e-005	-4.128	-4.128	0.000	(0)
NaF	5.004e-006	5.004e-006	-5.301	-5.301	0.000	(0)
NaCO3-	3.353e-006	2.661e-006	-5.475	-5.575	-0.100	(0)
NaH2BO3	4.138e-009	4.138e-009	-8.383	-8.383	0.000	(0)
NaCrO4-	2.402e-010	1.685e-010	-9.619	-9.773	-0.154	(0)
Ni	2.198e-007					
NiHCO3+	9.229e-008	6.472e-008	-7.035	-7.189	-0.154	(0)
Ni+2	7.405e-008	2.832e-008	-7.130	-7.548	-0.417	(0)
NiSO4	3.089e-008	3.089e-008	-7.510	-7.510	0.000	(0)
NiCO3	2.114e-008	2.114e-008	-7.675	-7.675	0.000	(0)
NiF+	1.126e-009	7.898e-010	-8.948	-9.102	-0.154	(0)
NiCl+	2.066e-010	1.449e-010	-9.685	-9.839	-0.154	(0)
NiOH+	1.177e-010	8.252e-011	-9.929	-10.083	-0.154	(0)
Ni (SO4) 2-2	2.311e-011	5.592e-012	-10.636	-11.252	-0.616	(0)
NiNO3+	4.815e-012	3.377e-012	-11.317	-11.472	-0.154	(0)
Ni (OH) 2	1.517e-012	1.517e-012	-11.819	-11.819	0.000	(0)
NiSeO4	6.386e-013	6.386e-013	-12.195	-12.195	0.000	(0)
NiCl2	1.460e-015	1.460e-015	-14.836	-14.836	0.000	(0)
Ni (OH) 3-	5.008e-016	3.512e-016	-15.300	-15.454	-0.154	(0)
NiNH3+2	1.834e-024	4.437e-025	-23.737	-24.353	-0.616	(0)
Ni (NH3) 2+2	0.000e+000	0.000e+000	-41.112	-41.728	-0.616	(0)
O (0)	1.373e-027					
O2	6.864e-028	7.010e-028	-27.163	-27.154	0.009	(0)
Pb	2.169e-008					
PbCO3	1.294e-008	1.294e-008	-7.888	-7.888	0.000	(0)
PbHCO3+	4.224e-009	2.962e-009	-8.374	-8.528	-0.154	(0)
Pb (CO3) 2-2	3.086e-009	7.465e-010	-8.511	-9.127	-0.616	(0)
PbSO4	5.758e-010	5.758e-010	-9.240	-9.240	0.000	(0)
Pb+2	5.624e-010	2.150e-010	-9.250	-9.667	-0.417	(0)
PbOH+	1.783e-010	1.250e-010	-9.749	-9.903	-0.154	(0)
Pb (SO4) 2-2	7.840e-011	1.897e-011	-10.106	-10.722	-0.616	(0)
PbF+	2.399e-011	1.683e-011	-10.620	-10.774	-0.154	(0)
PbCl+	2.176e-011	1.526e-011	-10.662	-10.816	-0.154	(0)
Pb (OH) 2	9.152e-013	9.152e-013	-12.038	-12.038	0.000	(0)
PbF2	3.677e-013	3.677e-013	-12.435	-12.435	0.000	(0)

PbNO3+	2.153e-013	1.510e-013	-12.667	-12.821	-0.154	(0)
PbCl2	1.364e-013	1.364e-013	-12.865	-12.865	0.000	(0)
PbF3-	1.104e-015	7.744e-016	-14.957	-15.111	-0.154	(0)
Pb(OH) 3-	3.021e-016	2.118e-016	-15.520	-15.674	-0.154	(0)
PbCl3-	1.548e-016	1.086e-016	-15.810	-15.964	-0.154	(0)
Pb(NO3) 2	1.217e-017	1.217e-017	-16.915	-16.915	0.000	(0)
Pb2OH+3	1.038e-017	4.262e-019	-16.984	-18.370	-1.387	(0)
PbF4-2	1.701e-018	4.116e-019	-17.769	-18.386	-0.616	(0)
PbCl4-2	4.104e-019	9.927e-020	-18.387	-19.003	-0.616	(0)
Pb(OH) 4-2	4.964e-020	1.201e-020	-19.304	-19.920	-0.616	(0)
Pb3(OH) 4+2	1.486e-023	3.594e-024	-22.828	-23.444	-0.616	(0)
Pb4(OH) 4+4	1.792e-027	6.139e-030	-26.747	-29.212	-2.465	(0)
Pb(HS) 2	0.000e+000	0.000e+000	-181.689	-181.689	0.000	(0)
Pb(HS) 3-	0.000e+000	0.000e+000	-273.881	-274.036	-0.154	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-87.712	-87.712	0.000	(0)
HS-	0.000e+000	0.000e+000	-93.492	-93.646	-0.154	(0)
H2S	0.000e+000	0.000e+000	-93.988	-93.988	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-94.232	-94.386	-0.154	(0)
S5-2	0.000e+000	0.000e+000	-95.033	-95.649	-0.616	(0)
S6-2	0.000e+000	0.000e+000	-95.549	-96.165	-0.616	(0)
S4-2	0.000e+000	0.000e+000	-95.628	-96.245	-0.616	(0)
S3-2	0.000e+000	0.000e+000	-96.434	-97.051	-0.616	(0)
S2-2	0.000e+000	0.000e+000	-97.450	-98.067	-0.616	(0)
S-2	0.000e+000	0.000e+000	-103.172	-103.584	-0.412	(0)
HgHS2-	0.000e+000	0.000e+000	-166.444	-166.598	-0.154	(0)
HgS2-2	0.000e+000	0.000e+000	-167.328	-167.944	-0.616	(0)
Hg(HS) 2	0.000e+000	0.000e+000	-167.566	-167.566	0.000	(0)
Ag(HS) 2-	0.000e+000	0.000e+000	-177.104	-177.258	-0.154	(0)
Ag(HS) S4-2	0.000e+000	0.000e+000	-177.131	-177.379	-0.248	(0)
Ag(S4) 2-3	0.000e+000	0.000e+000	-179.021	-179.457	-0.436	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-179.272	-179.426	-0.154	(0)
AgS4S5-3	0.000e+000	0.000e+000	-179.358	-179.768	-0.410	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-180.778	-180.778	0.000	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-180.828	-180.828	0.000	(0)
Cu(S4) 2-3	0.000e+000	0.000e+000	-181.250	-181.672	-0.422	(0)
Pb(HS) 2	0.000e+000	0.000e+000	-181.689	-181.689	0.000	(0)
CuS4S5-3	0.000e+000	0.000e+000	-182.004	-182.402	-0.398	(0)
Fe(HS) 2	0.000e+000	0.000e+000	-187.524	-187.524	0.000	(0)
Cu(HS) 3-	0.000e+000	0.000e+000	-262.721	-262.875	-0.154	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-270.990	-271.144	-0.154	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-272.420	-272.574	-0.154	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-273.146	-273.762	-0.616	(0)
Pb(HS) 3-	0.000e+000	0.000e+000	-273.881	-274.036	-0.154	(0)
Fe(HS) 3-	0.000e+000	0.000e+000	-278.979	-279.133	-0.154	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-363.407	-364.024	-0.616	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-365.634	-366.250	-0.616	(0)
Sb2S4-2	0.000e+000	0.000e+000	-386.654	-387.270	-0.616	(0)
S(6)	2.398e-002					
SO4-2	1.430e-002	5.467e-003	-1.845	-2.262	-0.417	(0)
CaSO4	7.473e-003	7.473e-003	-2.126	-2.126	0.000	(0)
MgSO4	1.808e-003	1.808e-003	-2.743	-2.743	0.000	(0)
NaSO4-	2.642e-004	2.097e-004	-3.578	-3.678	-0.100	(0)
KSO4-	1.183e-004	9.391e-005	-3.927	-4.027	-0.100	(0)
MnSO4	1.802e-005	1.802e-005	-4.744	-4.744	0.000	(0)
ZnSO4	5.907e-007	5.907e-007	-6.229	-6.229	0.000	(0)
Zn(SO4) 2-2	1.162e-007	2.812e-008	-6.935	-7.551	-0.616	(0)
NiSO4	3.089e-008	3.089e-008	-7.510	-7.510	0.000	(0)
HSO4-	2.965e-008	2.320e-008	-7.528	-7.634	-0.107	(0)
CoSO4	2.486e-008	2.486e-008	-7.605	-7.605	0.000	(0)
CuSO4	1.826e-008	1.826e-008	-7.739	-7.739	0.000	(0)
CrOHSO4	3.155e-009	3.155e-009	-8.501	-8.501	0.000	(0)
CdSO4	2.292e-009	2.292e-009	-8.640	-8.640	0.000	(0)
AgSO4-	2.050e-009	1.437e-009	-8.688	-8.842	-0.154	(0)
FeSO4	8.828e-010	8.828e-010	-9.054	-9.054	0.000	(0)
Cd(SO4) 2-2	6.986e-010	1.690e-010	-9.156	-9.772	-0.616	(0)
PbSO4	5.758e-010	5.758e-010	-9.240	-9.240	0.000	(0)
Pb(SO4) 2-2	7.840e-011	1.897e-011	-10.106	-10.722	-0.616	(0)

Ni (SO4) 2-2	2.311e-011	5.592e-012	-10.636	-11.252	-0.616	(0)
CrSO4+	8.741e-012	6.130e-012	-11.058	-11.213	-0.154	(0)
AlSO4+	4.916e-012	3.847e-012	-11.308	-11.415	-0.107	(0)
Al (SO4) 2-	2.880e-013	2.253e-013	-12.541	-12.647	-0.107	(0)
FeSO4+	1.060e-013	8.360e-014	-12.975	-13.078	-0.103	(0)
Fe (SO4) 2-	1.393e-014	9.771e-015	-13.856	-14.010	-0.154	(0)
Cr2 (OH) 2SO4+2	2.866e-015	6.934e-016	-14.543	-15.159	-0.616	(0)
VO2SO4-	2.102e-015	1.474e-015	-14.677	-14.832	-0.154	(0)
UO2SO4	2.662e-016	2.662e-016	-15.575	-15.575	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.252e-016	2.252e-016	-15.647	-15.647	0.000	(0)
CrO3SO4-2	1.997e-016	4.832e-017	-15.700	-16.316	-0.616	(0)
UO2 (SO4) 2-2	7.930e-017	1.919e-017	-16.101	-16.717	-0.616	(0)
HgSO4	3.626e-019	3.626e-019	-18.441	-18.441	0.000	(0)
NH4SO4-	1.650e-019	1.302e-019	-18.782	-18.885	-0.103	(0)
VOSO4	1.152e-019	1.152e-019	-18.939	-18.939	0.000	(0)
VSO4+	1.184e-035	8.306e-036	-34.927	-35.081	-0.154	(0)
U (SO4) 2	0.000e+000	0.000e+000	-45.445	-45.445	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-46.466	-47.083	-0.616	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-125.541	-125.695	-0.154	(0)
Sb (3)	4.160e-024					
Sb (OH) 3	2.103e-024	2.103e-024	-23.677	-23.677	0.000	(0)
HSbO2	2.056e-024	2.056e-024	-23.687	-23.687	0.000	(0)
Sb (OH) 2F	1.587e-028	1.587e-028	-27.799	-27.799	0.000	(0)
SbOF	1.563e-028	1.563e-028	-27.806	-27.806	0.000	(0)
SbO2-	1.093e-028	7.667e-029	-27.961	-28.115	-0.154	(0)
Sb (OH) 4-	6.246e-029	4.380e-029	-28.204	-28.359	-0.154	(0)
Sb (OH) 2+	3.168e-030	2.222e-030	-29.499	-29.653	-0.154	(0)
SbO+	1.094e-030	7.671e-031	-29.961	-30.115	-0.154	(0)
Sb2S4-2	0.000e+000	0.000e+000	-386.654	-387.270	-0.616	(0)
Sb (5)	7.630e-009					
SbO3-	7.622e-009	5.346e-009	-8.118	-8.272	-0.154	(0)
Sb (OH) 6-	7.916e-012	6.225e-012	-11.102	-11.206	-0.104	(0)
SbO2+	4.131e-024	2.897e-024	-23.384	-23.538	-0.154	(0)
Se (-2)	2.091e-025					
Ag2Se	2.091e-025	2.091e-025	-24.680	-24.680	0.000	(0)
HSe-	0.000e+000	0.000e+000	-51.039	-51.193	-0.154	(0)
MnSe	0.000e+000	0.000e+000	-53.947	-53.947	0.000	(0)
H2Se	0.000e+000	0.000e+000	-54.665	-54.665	0.000	(0)
Se-2	0.000e+000	0.000e+000	-58.214	-58.830	-0.616	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-106.223	-108.689	-2.465	(0)
Se (4)	2.918e-008					
HSeO3-	2.305e-008	1.617e-008	-7.637	-7.791	-0.154	(0)
SeO3-2	6.125e-009	1.482e-009	-8.213	-8.829	-0.616	(0)
H2SeO3	2.995e-013	2.995e-013	-12.524	-12.524	0.000	(0)
AgSeO3-	1.789e-014	1.255e-014	-13.747	-13.901	-0.154	(0)
FeHSeO3+2	2.407e-019	5.822e-020	-18.619	-19.235	-0.616	(0)
Cd (SeO3) 2-2	1.337e-020	3.235e-021	-19.874	-20.490	-0.616	(0)
Ag (SeO3) 2-3	4.056e-021	1.665e-022	-20.392	-21.779	-1.387	(0)
Se (6)	1.263e-007					
SeO4-2	1.261e-007	4.821e-008	-6.899	-7.317	-0.417	(0)
MnSeO4	2.405e-010	2.405e-010	-9.619	-9.619	0.000	(0)
ZnSeO4	3.688e-012	3.688e-012	-11.433	-11.433	0.000	(0)
NiSeO4	6.386e-013	6.386e-013	-12.195	-12.195	0.000	(0)
CoSeO4	5.507e-013	5.507e-013	-12.259	-12.259	0.000	(0)
HSeO4-	1.496e-013	1.050e-013	-12.825	-12.979	-0.154	(0)
CdSeO4	1.605e-014	1.605e-014	-13.794	-13.794	0.000	(0)
Zn (SeO4) 2-2	7.451e-019	1.803e-019	-18.128	-18.744	-0.616	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-66.178	-67.565	-1.387	(0)
U (4)	2.640e-028					
U (OH) 5-	2.636e-028	1.849e-028	-27.579	-27.733	-0.154	(0)
U (OH) 4	3.368e-031	3.368e-031	-30.473	-30.473	0.000	(0)
U (OH) 3+	7.639e-035	5.357e-035	-34.117	-34.271	-0.154	(0)
U (OH) 2+2	4.454e-039	1.078e-039	-38.351	-38.968	-0.616	(0)
UF3+	2.951e-039	2.070e-039	-38.530	-38.684	-0.154	(0)
UF4	2.520e-040	2.520e-040	-39.599	-39.599	0.000	(0)
UF2+2	0.000e+000	0.000e+000	-40.313	-40.930	-0.616	(0)
UF5-	0.000e+000	0.000e+000	-40.801	-40.955	-0.154	(0)

UF6-2	0.000e+000	0.000e+000	-40.813	-41.430	-0.616	(0)
UOH+3	0.000e+000	0.000e+000	-43.269	-44.656	-1.387	(0)
UF+3	0.000e+000	0.000e+000	-43.688	-45.075	-1.387	(0)
U(SO4) 2	0.000e+000	0.000e+000	-45.445	-45.445	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-46.466	-47.083	-0.616	(0)
U+4	0.000e+000	0.000e+000	-48.955	-51.421	-2.465	(0)
UC1+3	0.000e+000	0.000e+000	-51.033	-52.419	-1.387	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-202.775	-215.256	-12.480	(0)
U(5)	1.254e-021					
UO2+	1.254e-021	8.793e-022	-20.902	-21.056	-0.154	(0)
U(6)	3.038e-007					
UO2(CO3) 3-4	2.996e-007	1.026e-009	-6.523	-8.989	-2.465	(0)
UO2(CO3) 2-2	4.230e-009	1.023e-009	-8.374	-8.990	-0.616	(0)
UO2CO3	2.563e-012	2.563e-012	-11.591	-11.591	0.000	(0)
UO2F2	1.579e-014	1.579e-014	-13.802	-13.802	0.000	(0)
UO2F+	7.032e-015	4.932e-015	-14.153	-14.307	-0.154	(0)
UO2F3-	6.281e-015	4.405e-015	-14.202	-14.356	-0.154	(0)
UO2OH+	1.337e-015	9.376e-016	-14.874	-15.028	-0.154	(0)
UO2SO4	2.662e-016	2.662e-016	-15.575	-15.575	0.000	(0)
UO2F4-2	1.606e-016	3.885e-017	-15.794	-16.411	-0.616	(0)
UO2+2	8.413e-017	3.217e-017	-16.075	-16.492	-0.417	(0)
UO2(SO4) 2-2	7.930e-017	1.919e-017	-16.101	-16.717	-0.616	(0)
UO2C1+	1.488e-019	1.044e-019	-18.827	-18.981	-0.154	(0)
UO2NO3+	4.345e-021	3.047e-021	-20.362	-20.516	-0.154	(0)
(UO2) 2 (OH) 2+2	6.030e-024	1.459e-024	-23.220	-23.836	-0.616	(0)
(UO2) 3 (OH) 5+	7.926e-029	5.559e-029	-28.101	-28.255	-0.154	(0)
V(2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-46.122	-46.276	-0.154	(0)
V+2	0.000e+000	0.000e+000	-46.534	-47.151	-0.616	(0)
V(3)	3.220e-017					
V(OH) 3	3.220e-017	3.220e-017	-16.492	-16.492	0.000	(0)
V(OH) 2+	1.290e-027	9.051e-028	-26.889	-27.043	-0.154	(0)
VOH+2	1.543e-030	3.734e-031	-29.812	-30.428	-0.616	(0)
V+3	7.842e-035	3.219e-036	-34.106	-35.492	-1.387	(0)
VSO4+	1.184e-035	8.306e-036	-34.927	-35.081	-0.154	(0)
V2(OH) 2+4	0.000e+000	0.000e+000	-57.590	-60.056	-2.465	(0)
V2(OH) 3+3	0.000e+000	0.000e+000	-57.633	-59.019	-1.387	(0)
V(4)	6.413e-018					
V(OH) 3+	5.031e-018	3.528e-018	-17.298	-17.452	-0.154	(0)
VOF+	7.266e-019	5.096e-019	-18.139	-18.293	-0.154	(0)
VO+2	3.162e-019	7.651e-020	-18.500	-19.116	-0.616	(0)
VOF2	2.122e-019	2.122e-019	-18.673	-18.673	0.000	(0)
VOSO4	1.152e-019	1.152e-019	-18.939	-18.939	0.000	(0)
VOF3-	1.192e-020	8.359e-021	-19.924	-20.078	-0.154	(0)
VOC1+	6.122e-022	4.293e-022	-21.213	-21.367	-0.154	(0)
VOF4-2	1.549e-022	3.747e-023	-21.810	-22.426	-0.616	(0)
H2V2O4+2	2.587e-030	6.258e-031	-29.587	-30.204	-0.616	(0)
V(5)	4.988e-007					
H2VO4-	4.264e-007	2.990e-007	-6.370	-6.524	-0.154	(0)
HVO4-2	7.148e-008	1.729e-008	-7.146	-7.762	-0.616	(0)
H3V2O7-	3.581e-010	2.512e-010	-9.446	-9.600	-0.154	(0)
H3VO4	1.299e-010	1.299e-010	-9.886	-9.886	0.000	(0)
HV2O7-3	4.276e-011	1.755e-012	-10.369	-11.756	-1.387	(0)
V3O9-3	6.853e-013	2.813e-014	-12.164	-13.551	-1.387	(0)
V2O7-4	3.175e-013	1.087e-015	-12.498	-14.964	-2.465	(0)
VO4-3	4.861e-014	1.995e-015	-13.313	-14.700	-1.387	(0)
VO2F	2.199e-014	2.199e-014	-13.658	-13.658	0.000	(0)
VO2+	1.436e-014	1.129e-014	-13.843	-13.947	-0.104	(0)
VO2F2-	1.264e-014	8.865e-015	-13.898	-14.052	-0.154	(0)
VO2SO4-	2.102e-015	1.474e-015	-14.677	-14.832	-0.154	(0)
V4O12-4	1.025e-015	3.512e-018	-14.989	-17.454	-2.465	(0)
VO2F3-2	5.076e-016	1.228e-016	-15.295	-15.911	-0.616	(0)
VO2F4-3	1.634e-018	6.709e-020	-17.787	-19.173	-1.387	(0)
VO2NO3	2.711e-019	2.711e-019	-18.567	-18.567	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-40.231	-45.778	-5.547	(0)
HV10O28-5	0.000e+000	0.000e+000	-41.101	-44.953	-3.852	(0)
H2V10O28-4	0.000e+000	0.000e+000	-44.642	-47.108	-2.465	(0)
Zn	3.016e-006					

Zn+2	1.291e-006	4.939e-007	-5.889	-6.306	-0.417	(0)
ZnSO4	5.907e-007	5.907e-007	-6.229	-6.229	0.000	(0)
ZnCO3	5.687e-007	5.687e-007	-6.245	-6.245	0.000	(0)
ZnHCO3+	4.128e-007	2.895e-007	-6.384	-6.538	-0.154	(0)
Zn(SO4) 2-2	1.162e-007	2.812e-008	-6.935	-7.551	-0.616	(0)
ZnOH+	1.630e-008	1.143e-008	-7.788	-7.942	-0.154	(0)
ZnF+	1.560e-008	1.094e-008	-7.807	-7.961	-0.154	(0)
ZnCl+	3.199e-009	2.481e-009	-8.495	-8.605	-0.110	(0)
ZnOHCl	7.519e-010	7.519e-010	-9.124	-9.124	0.000	(0)
Zn(OH) 2	4.194e-010	4.194e-010	-9.377	-9.377	0.000	(0)
ZnNO3+	8.397e-011	5.889e-011	-10.076	-10.230	-0.154	(0)
ZnCl2	7.866e-012	7.866e-012	-11.104	-11.104	0.000	(0)
ZnSeO4	3.688e-012	3.688e-012	-11.433	-11.433	0.000	(0)
Zn(OH) 3-	6.937e-013	4.865e-013	-12.159	-12.313	-0.154	(0)
ZnCl3-	1.611e-014	1.250e-014	-13.793	-13.903	-0.110	(0)
Zn(NO3) 2	5.578e-016	5.578e-016	-15.254	-15.254	0.000	(0)
ZnCl4-2	3.227e-017	1.250e-017	-16.491	-16.903	-0.412	(0)
Zn(OH) 4-2	1.853e-017	4.483e-018	-16.732	-17.348	-0.616	(0)
Zn(SeO4) 2-2	7.451e-019	1.803e-019	-18.128	-18.744	-0.616	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-179.272	-179.426	-0.154	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-180.778	-180.778	0.000	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-270.990	-271.144	-0.154	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-273.146	-273.762	-0.616	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-365.634	-366.250	-0.616	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-101.78	-95.49	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-96.76	-92.25	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-103.98	-92.25	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-125.34	-107.41	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-122.57	-102.54	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-44.03	-43.63	0.40	(NH4)2CrO4
(NH4)2SeO4	-43.07	-42.62	0.45	(NH4)2SeO4
Acanthite	-65.82	-102.04	-36.22	Ag2S
Ag2CO3	-9.37	-20.46	-11.09	Ag2CO3
Ag2CrO4	-12.49	-24.08	-11.59	Ag2CrO4
Ag2HVO4	-9.10	-7.62	1.48	Ag2HVO4
Ag2MoO4	-10.28	-21.83	-11.55	Ag2MoO4
Ag2O	-13.61	-1.04	12.57	Ag2O
Ag2Se	-10.89	-59.59	-48.70	Ag2Se
Ag2SeO3	-9.04	-16.19	-7.15	Ag2SeO3
Ag2SeO4	-14.17	-23.08	-8.91	Ag2SeO4
Ag2SO4	-13.20	-18.02	-4.82	Ag2SO4
Ag3AsO3	-27.42	-25.26	2.16	Ag3AsO3
Ag3AsO4	-11.95	-14.74	-2.79	Ag3AsO4
Ag3H2VO5	-13.32	-8.14	5.18	Ag3H2VO5
AgF·4H2O	-11.89	-10.84	1.05	AgF·4H2O
Agmetal	-1.72	-15.23	-13.51	Ag
AgVO3	-7.87	-7.10	0.77	AgVO3
Al(OH) 3(am)	-1.76	9.04	10.80	Al(OH) 3
Al2(MoO4) 3	-46.67	-44.31	2.37	Al2(MoO4) 3
Al2O3	-1.57	18.09	19.65	Al2O3
Al4(OH)10SO4	-3.52	19.18	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-8.94	-4.14	4.80	AlAsO4·2H2O
AlOHSO4	-4.71	-7.94	-3.23	AlOHSO4
AlSb	-168.52	-102.89	65.62	AlSb
Alunite	-0.70	-2.10	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.14	-11.93	-7.79	PbSO4
Anhydrite	-0.13	-4.49	-4.36	CaSO4
Anilite	-75.11	-106.98	-31.88	Cu0.25Cu1.5S
Antlerite	-5.11	3.67	8.79	Cu3(OH) 4SO4
Aragonite	1.38	-6.92	-8.30	CaCO3
Arsenolite	-92.07	-94.83	-2.76	As4O6
Artinite	-5.06	4.54	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-33.08	-26.37	6.71	As2O5

Atacamite	-3.68	3.71	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.28	-18.18	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-15.65	8.75	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-11.54	4.33	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	8.79	-0.12	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-19.86	13.08	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-4.63	-14.30	-9.67	BaCrO ₄
BaF ₂	-6.06	-11.88	-5.82	BaF ₂
BaMoO ₄	-5.09	-12.05	-6.96	BaMoO ₄
Barite	1.75	-8.23	-9.98	BaSO ₄
BaS	-108.44	-92.26	16.18	BaS
BaSeO ₃	-8.23	-6.40	1.83	BaSeO ₃
BaSeO ₄	-5.83	-13.29	-7.46	BaSeO ₄
Bianchite	-6.81	-8.57	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-4.03	14.06	18.09	MnO ₂
Bixbyite	-0.65	-1.30	-0.64	Mn ₂ O ₃
Blaubleil	-71.67	-95.84	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleilII	-73.70	-100.98	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.46	9.04	8.58	AlOOH
Breithauptite	-71.53	-90.05	-18.52	NiSb
Brochantite	-4.66	10.56	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.86	11.98	16.84	Mg(OH) ₂
Bunsenite	-5.27	7.18	12.45	NiO
Ca(VO ₃) ₂	-6.33	-0.67	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-5.67	11.83	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-9.73	11.83	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-11.18	11.12	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-14.63	24.33	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-15.54	24.32	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-329.35	-186.38	142.97	Ca ₃ Sb ₂
CaCrO ₄	-8.28	-10.55	-2.27	CaCrO ₄
Calcite	1.56	-6.92	-8.48	CaCO ₃
Calomel	-8.58	-26.49	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.35	-8.30	-7.95	CaMoO ₄
Carnotite	-3.84	-3.61	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-5.47	-2.65	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-6.52	-9.54	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-12.99	-3.15	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.67	5.98	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.75	5.98	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.75	-16.04	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.62	0.94	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.48	6.92	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.49	-14.15	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.45	-14.15	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-12.23	-14.15	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-13.44	-14.66	-1.21	CdF ₂
Cdmetal(alpha)	-36.96	-23.44	13.51	Cd
Cdmetal(gamma)	-37.06	-23.44	13.62	Cd
CdMoO ₄	-0.67	-14.82	-14.15	CdMoO ₄
CdOHCl	-7.62	-4.09	3.54	CdOHCl
CdSb	-90.90	-91.25	-0.35	CdSb
CdSe	-32.38	-52.58	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-14.22	-16.07	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.84	-11.01	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.28	-11.01	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-9.14	-11.01	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.24	-14.37	-13.13	PbCO ₃
CH ₄ (g)	-96.06	-137.11	-41.05	CH ₄
Chalcanthite	-7.46	-10.10	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-76.35	-111.27	-34.92	Cu ₂ S
Chalcopyrite	-154.32	-189.59	-35.27	CuFeS ₂
Cinnabar	-65.38	-111.07	-45.69	HgS
Claudetite	-91.77	-94.83	-3.06	As ₄ O ₆
Clausthalite	-26.40	-53.50	-27.10	PbSe
Co(BO ₂) ₂	-29.11	-2.04	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.01	7.08	13.09	Co(OH) ₂

Co (OH) 3	-8.30	-10.61	-2.31	Co (OH) 3
CO2 (g)	-1.28	-19.42	-18.15	CO2
Co3 (AsO4) 2	-18.16	-5.13	13.03	Co3 (AsO4) 2
Co3O4	-3.64	-14.14	-10.50	Co3O4
CoCl2	-21.31	-13.04	8.27	CoCl2
CoCl2:6H2O	-15.58	-13.04	2.54	CoCl2:6H2O
CoCO3	-2.36	-12.34	-9.98	CoCO3
CoF2	-11.95	-13.55	-1.60	CoF2
CoF3	-40.10	-41.56	-1.46	CoF3
CoFe2O4	25.05	21.52	-3.53	CoFe2O4
CoMoO4	-5.95	-13.72	-7.76	CoMoO4
CoO	-6.51	7.08	13.59	CoO
CoS (alpha)	-86.49	-93.93	-7.44	CoS
CoS (beta)	-82.86	-93.93	-11.07	CoS
CoSe	-35.27	-51.47	-16.20	CoSe
CoSeO3	-9.39	-8.07	1.32	CoSeO3
CoSeO4:6H2O	-13.43	-14.96	-1.53	CoSeO4:6H2O
CoSO4	-12.71	-9.90	2.80	CoSO4
CoSO4:6H2O	-7.44	-9.91	-2.47	CoSO4:6H2O
Cotunnite	-10.29	-15.07	-4.78	PbCl2
Covellite	-71.82	-94.12	-22.30	CuS
Cr (OH) 2	-22.38	-11.57	10.82	Cr (OH) 2
Cr (OH) 3	-1.14	0.20	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.95	0.20	-0.75	Cr (OH) 3
Cr2O3	2.75	0.40	-2.36	Cr2O3
CrCl2	-45.78	-31.69	14.09	CrCl2
CrCl3	-45.10	-29.98	15.11	CrCl3
CrF3	-19.41	-30.75	-11.34	CrF3
Crmetal	-71.47	-40.99	30.48	Cr
CrO3	-19.84	-23.05	-3.21	CrO3
Cryolite	-3.37	-37.21	-33.84	Na3AlF6
Cu (OH) 2	-1.79	6.89	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.83	18.38	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.16	2.09	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-75.30	-110.18	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-23.02	-68.82	-45.80	Cu2Se
Cu2SO4	-25.30	-27.25	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-11.81	-5.71	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-84.74	-127.34	-42.59	Cu3Sb
Cu3Se2	-57.00	-120.49	-63.49	Cu3Se2
CuCO3	-1.04	-12.54	-11.50	CuCO3
CuCrO4	-10.72	-16.16	-5.44	CuCrO4
CuF	-10.54	-15.45	-4.91	CuF
CuF2	-14.86	-13.75	1.12	CuF2
CuF2:2H2O	-9.20	-13.75	-4.55	CuF2:2H2O
Cumetal	-11.09	-19.84	-8.76	Cu
CuMoO4	-0.83	-13.91	-13.08	CuMoO4
CuOCuSO4	-13.51	-3.21	10.30	CuOCuSO4
Cupricferrite	15.34	21.33	5.99	CuFe2O4
Cuprite	-8.86	-10.27	-1.41	Cu2O
Cuprousferrite	11.00	2.09	-8.92	CuFeO2
CuSe	-18.57	-51.67	-33.10	CuSe
CuSe2	-47.43	-80.80	-33.37	CuSe2
CuSeO3:2H2O	-8.78	-8.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.72	-15.16	-2.44	CuSeO4:5H2O
CuSO4	-13.04	-10.10	2.94	CuSO4
Diaspore	2.17	9.04	6.87	AlOOH
Djurleite	-76.22	-110.14	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	2.18	-14.36	-16.54	CaMg (CO3) 2
Dolomite (ordered)	2.73	-14.36	-17.09	CaMg (CO3) 2
Epsomite	-2.88	-5.01	-2.13	MgSO4:7H2O
Fe (OH) 2	-8.02	5.54	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	7.24	4.20	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-3.91	-7.63	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-2.27	-0.71	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-10.39	-31.02	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-32.78	-36.52	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-0.24	19.98	20.22	Fe3 (OH) 8

FeAsO ₄ ·2H ₂ O	-6.37	-5.97	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-1.26	5.94	7.20	FeCr ₂ O ₄
FeMoO ₄	-5.16	-15.26	-10.09	FeMoO ₄
Ferrihydrite	4.03	7.22	3.19	Fe(OH) ₃
Ferroselite	-63.55	-82.15	-18.60	FeSe ₂
FeS (ppt)	-92.52	-95.47	-2.95	FeS
FeSe	-42.01	-53.01	-11.00	FeSe
Fluorite	2.37	-8.13	-10.50	CaF ₂
Galena	-81.98	-95.95	-13.97	PbS
Gibbsite	0.75	9.04	8.29	Al(OH) ₃
Goethite	6.73	7.22	0.49	FeOOH
Goslarite	-6.56	-8.57	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-80.67	-95.03	-14.36	CdS
Greigite	-339.01	-384.05	-45.03	Fe ₃ S ₄
Gummite	-9.44	-1.77	7.67	UO ₃
Gypsum	0.12	-4.49	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-0.21	-12.31	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-7.92	-20.80	-12.88	H ₂ MoO ₄
H ₂ S (g)	-93.00	-101.01	-8.01	H ₂ S
H ₂ Se (g)	-53.59	-58.55	-4.96	H ₂ Se
Halite	-6.45	-4.85	1.60	NaCl
Hausmannite	-1.63	59.40	61.03	Mn ₃ O ₄
Hematite	15.86	14.44	-1.42	Fe ₂ O ₃
Hercynite	0.73	23.63	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-210.57	-284.28	-73.71	Hg(CH ₃) ₂
Hg (g)	-10.02	-17.89	-7.87	Hg
Hg(OH) ₂	-6.57	-10.07	-3.50	Hg(OH) ₂
Hg ₂ (g)	-20.83	-35.79	-14.96	Hg ₂
Hg ₂ (OH) ₂	-11.63	-6.37	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-9.74	-25.79	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-20.72	-29.42	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-16.64	-27.00	-10.36	Hg ₂ F ₂
Hg ₂ S	-95.70	-107.38	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-16.86	-21.52	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-17.22	-23.35	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-19.94	-49.62	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-32.74	-13.25	19.50	HgCl
HgCl ₂	-8.93	-30.19	-21.26	HgCl ₂
HgF (g)	-46.18	-13.50	32.68	HgF
HgF ₂ (g)	-43.26	-30.70	12.57	HgF ₂
Hgmetal (l)	-4.44	-17.89	-13.45	Hg
HgSe	-12.93	-68.62	-55.69	HgSe
HgSeO ₃	-12.79	-25.22	-12.43	HgSeO ₃
HgSO ₄	-17.63	-27.05	-9.42	HgSO ₄
Huntite	0.73	-29.24	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-4.91	-23.68	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-9.01	-17.78	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.02	-20.19	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	7.23	-7.57	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-19.36	-36.60	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-13.04	-13.55	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-14.57	-11.30	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-11.82	-12.55	-0.73	K ₂ SeO ₄
Langite	-6.93	10.56	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-6.44	-6.87	-0.43	PbO·PbSO ₄
Laurionite	-5.63	-5.00	0.62	PbOHCl
Lepidocrocite	5.85	7.22	1.37	FeOOH
Lime	-20.20	12.50	32.70	CaO
Litharge	-7.64	5.06	12.69	PbO
Mackinawite	-91.87	-95.47	-3.60	FeS
Maghemite	8.05	14.44	6.39	Fe ₂ O ₃
Magnesioferrite	9.56	26.42	16.86	Fe ₂ MgO ₄
Magnesite	0.02	-7.44	-7.46	MgCO ₃
Magnetite	16.58	19.98	3.40	Fe ₃ O ₄
Malachite	-0.34	-5.65	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-0.64	24.70	25.34	MnOOH
Massicot	-7.84	5.06	12.89	PbO
Matlockite	-6.35	-15.32	-8.97	PbClF

Melanothallite	-19.49	-13.23	6.26	CuCl ₂
Melanterite	-9.24	-11.45	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-65.98	-111.07	-45.09	HgS
Mg(OH) ₂ (active)	-6.81	11.98	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-12.47	-1.19	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-312.98	-238.29	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-15.56	10.80	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-3.82	12.38	16.20	MgCr ₂ O ₄
MgCrO ₄	-16.44	-11.06	5.38	MgCrO ₄
MgF ₂	-0.52	-8.65	-8.13	MgF ₂
MgMoO ₄	-6.96	-8.81	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.23	-3.17	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-8.86	-10.06	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-28.93	44.59	73.52	Pb ₃ O ₄
Mirabilite	-5.45	-6.56	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-8.08	-3.18	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-46.54	-52.25	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-167.74	-106.66	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-8.90	3.60	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.85	-10.13	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-91.19	-91.02	0.17	MnS
MnS(pnk)	-94.36	-91.02	3.34	MnS
MnSb	-109.68	-112.59	-2.91	MnSb
MnSe	-52.06	-48.56	3.50	MnSe
MnSeO ₃	-6.29	-5.16	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.14	-5.16	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-10.00	-12.05	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.58	-6.99	2.58	MnSO ₄
Monteponite	-9.13	5.98	15.10	CdO
Montroydite	-6.43	-10.07	-3.64	HgO
MoO ₃	-12.80	-20.80	-8.00	MoO ₃
Morenosite	-7.67	-9.81	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-181.97	-252.23	-70.26	MoS ₂
Na-Jarosite	4.10	-7.10	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-25.77	-35.66	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-15.55	-12.62	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.57	-31.16	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.86	-10.37	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.59	-10.37	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.02	-4.72	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-12.89	-11.61	1.28	Na ₂ SeO ₄
Na ₃ Sb	-190.74	-96.29	94.45	Na ₃ Sb
Na ₃ VO ₄	-27.62	9.06	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.71	7.69	37.40	Na ₄ V ₂ O ₇
Nantokite	-8.46	-15.19	-6.73	CuCl
NaSb	-100.47	-77.30	23.17	NaSb
Natron	-7.69	-9.00	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-5.23	-1.37	3.86	NaVO ₃
Nesquehonite	-2.77	-7.44	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.62	7.18	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-20.55	-4.85	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.29	11.71	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.38	-12.25	-6.87	NiCO ₃
NiMoO ₄	-2.48	-13.62	-11.14	NiMoO ₄
NiS(alpha)	-88.23	-93.83	-5.60	NiS
NiS(beta)	-82.73	-93.83	-11.10	NiS
NiS(gamma)	-81.03	-93.83	-12.80	NiS
NiSe	-33.68	-51.38	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.79	-7.98	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-13.35	-14.87	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-3.44	14.06	17.50	MnO ₂
O ₂ (g)	-24.25	58.84	83.09	O ₂
Orpiment	-289.37	-350.44	-61.07	As ₂ S ₃
Otavite	-1.45	-13.45	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.59	-4.07	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.09	5.06	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-57.21	-65.97	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.74	0.05	8.79	Pb ₂ (OH) ₃ Cl

Pb2O(OH)2	-16.08	10.11	26.19	Pb2O(OH)2
Pb2O3	-21.51	39.53	61.04	Pb2O3
Pb2OCO3	-8.75	-9.31	-0.56	Pb2OCO3
Pb2V2O7	-1.16	-3.06	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.00	-11.20	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.14	2.00	6.14	Pb3(VO4)2
Pb3O2CO3	-15.27	-4.25	11.02	Pb3O2CO3
Pb3O2SO4	-12.50	-1.82	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.86	3.24	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.64	3.24	21.88	Pb4O3SO4
PbCrO4	-5.39	-17.99	-12.60	PbCrO4
PbF2	-8.14	-15.58	-7.44	PbF2
Pbmetal	-28.61	-24.36	4.25	Pb
PbMoO4	-0.12	-15.74	-15.62	PbMoO4
PbO:0.3H2O	-7.92	5.06	12.98	PbO:0.33H2O
PbSeO4	-10.14	-16.98	-6.84	PbSeO4
Periclase	-9.60	11.98	21.58	MgO
Phosgenite	-9.62	-29.43	-19.81	PbCl2:PbCO3
Plattnerite	-15.12	34.48	49.60	PbO2
Portlandite	-10.31	12.50	22.80	Ca(OH)2
Pyrite	-148.54	-167.05	-18.51	FeS2
Pyrochroite	-5.20	9.99	15.19	Mn(OH)2
Pyrolusite	-1.97	39.41	41.38	MnO2
Realgar	-119.68	-139.43	-19.75	AsS
Retgersite	-7.77	-9.81	-2.04	NiSO4:6H2O
Rhodochrosite	1.15	-9.43	-10.58	MnCO3
Rutherfordine	-6.69	-21.19	-14.50	UO2CO3
Sb(OH)3	-16.57	-23.68	-7.11	Sb(OH)3
Sb2O4	-21.33	-17.93	3.40	Sb2O4
Sb2O5	-27.46	-37.13	-9.67	Sb2O5
Sb2Se3	-155.26	-223.01	-67.76	Sb2Se3
Sb4O6(cubic)	-76.44	-94.70	-18.26	Sb4O6
Sb4O6(orth)	-76.80	-94.70	-17.90	Sb4O6
SbCl3	-54.43	-53.86	0.57	SbCl3
SbF3	-44.40	-54.63	-10.23	SbF3
Sbmetal	-56.12	-67.81	-11.69	Sb
SbO2	-5.45	-33.28	-27.82	SbO2
Schoepite	-7.76	-1.77	5.99	UO2(OH)2:H2O
Semetal(am)	-22.02	-29.13	-7.11	Se
Semetal(hex)	-21.43	-29.13	-7.71	Se
Senarmontite	-34.99	-47.35	-12.37	Sb2O3
SeO2	-15.28	-15.15	0.12	SeO2
SeO3	-43.08	-22.04	21.04	SeO3
Siderite	-3.64	-13.88	-10.24	FeCO3
Smithsonite	-1.01	-11.01	-10.00	ZnCO3
Sphalerite	-81.14	-92.59	-11.45	ZnS
Spinel	-6.78	30.07	36.85	MgAl2O4
Stibnite	-299.91	-350.37	-50.46	Sb2S3
Sulfur	-69.44	-71.59	-2.14	S
Tenorite	-0.76	6.89	7.64	CuO
Thenardite	-6.88	-6.55	0.32	Na2SO4
Thermonatrite	-9.63	-8.99	0.64	Na2CO3:H2O
Tyuyamunite	-8.29	-4.21	4.08	Ca(UO2)2(VO4)2
U3O8	-28.16	-7.08	21.08	U3O8
U3Sb4	-666.05	-513.67	152.38	U3Sb4
U4O9	-55.45	-58.47	-3.02	U4O9
UF4	-33.70	-63.24	-29.54	UF4
UF4:2.5H2O	-30.52	-63.24	-32.72	UF4:2.5H2O
UO2(am)	-22.91	-21.97	0.93	UO2
UO2(NO3)2	-37.29	-25.14	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-29.99	-25.14	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-28.53	-25.14	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-27.19	-25.14	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-7.38	-1.77	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.56	-23.81	-2.25	UO2SeO4:4H2O
UO3	-9.47	-1.77	7.70	UO3
Uraninite	-17.30	-21.97	-4.67	UO2
USb2	-255.22	-225.64	29.58	USb2

V(OH) 3	-21.00	-13.41	7.59	V(OH) 3
V2O5	-11.81	-13.17	-1.36	V2O5
V3O5	-44.43	-42.60	1.84	V3O5
V4O7	-54.18	-46.99	7.19	V4O7
V6O13	-37.49	-98.35	-60.86	V6O13
Valentinite	-38.87	-47.35	-8.48	Sb2O3
VC12	-67.11	-48.24	18.87	VC12
VC13	-67.02	-43.59	23.43	VC13
VF4	-60.59	-45.66	14.93	VF4
Vmetal	-101.56	-57.54	44.03	V
VO	-42.87	-28.12	14.76	VO
VO(OH) 2	-9.54	-4.39	5.15	VO(OH) 2
VO2Cl	-19.49	-16.65	2.84	VO2Cl
VOC1	-34.62	-23.47	11.15	VOC1
VOC12	-37.27	-24.51	12.76	VOC12
VOSO4	-24.99	-21.38	3.61	VOSO4
Witherite	-2.10	-10.67	-8.57	BaCO3
Wurtzite	-83.64	-92.59	-8.95	ZnS
Zincite	-2.92	8.42	11.33	ZnO
Zincosite	-12.50	-8.57	3.93	ZnSO4
Zn(BO2) 2	-9.00	-0.71	8.29	Zn(BO2) 2
Zn(NO3) 2:6H2O	-18.27	-14.96	3.32	Zn(NO3) 2:6H2O
Zn(OH) 2	-3.78	8.42	12.20	Zn(OH) 2
Zn(OH) 2 (am)	-4.06	8.42	12.47	Zn(OH) 2
Zn(OH) 2 (beta)	-3.34	8.42	11.75	Zn(OH) 2
Zn(OH) 2 (epsilon)	-3.12	8.42	11.53	Zn(OH) 2
Zn(OH) 2 (gamma)	-3.32	8.42	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-7.65	-0.15	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-8.42	6.77	15.19	Zn2(OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-14.77	-1.12	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-27.63	-8.72	18.91	Zn3O(SO4) 2
Zn4(OH) 6SO4	-11.72	16.68	28.40	Zn4(OH) 6SO4
Zn5(OH) 8Cl2	-16.54	21.96	38.50	Zn5(OH) 8Cl2
ZnCl2	-18.75	-11.70	7.05	ZnCl2
ZnCO3:1H2O	-0.75	-11.01	-10.26	ZnCO3:1H2O
ZnF2	-11.68	-12.22	-0.53	ZnF2
Znmetal	-46.79	-21.00	25.79	Zn
ZnMoO4	-2.25	-12.38	-10.13	ZnMoO4
ZnO (active)	-2.77	8.42	11.19	ZnO
ZnS (am)	-83.54	-92.59	-9.05	ZnS
ZnSb	-99.82	-88.81	11.01	ZnSb
ZnSe	-35.74	-50.14	-14.40	ZnSe
ZnSeO4:6H2O	-12.11	-13.63	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.93	-8.57	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 15.

```

Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e-=e-
  log_k      0
EQUILIBRIUM_PHASES 101
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0

```

```

Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 102
SAVE Solution 103 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 101
END

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TITLE
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```

Precipitate oversaturated phases in groundwater

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Beginning of batch-reaction calculations.
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```

Reaction step 1.

Using solution 102. Solution after simulation 14.
Using pure phase assemblage 101.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+000	2.866e-008	2.866e-008
Alunite	0.00	-1.40	-1.40	0.000e+000	3.769e-006	3.769e-006
Anhydrite	-0.29	-4.65	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+000	4.643e-008	4.643e-008
Barite	0.00	-9.98	-9.98	0.000e+000	2.770e-006	2.770e-006
Brochantite	-3.32	11.90	15.22	0.000e+000	0	0.000e+000
Brucite	-5.71	11.14	16.84	0.000e+000	0	0.000e+000

CO2 (g)	-1.69	-19.84	-18.15	1.000e+001	1.001e+001	1.224e-002
CaMoO4	-0.75	-8.70	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-5.44	-2.63	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	0.000e+000	1.145e-002	1.145e-002
Carnotite	-0.57	-0.34	0.23	0.000e+000	0	0.000e+000
Cd(BO2)2	-13.83	-3.99	9.84	0.000e+000	0	0.000e+000
CdMoO4	-0.78	-14.93	-14.15	0.000e+000	0	0.000e+000
Chrysotile	Element not present.			0.000e+000	0	0.000e+000
Cr2O3	-0.00	-2.36	-2.36	0.000e+000	5.626e-008	5.626e-008
Cu2Se(alpha)	-6.17	-51.97	-45.80	0.000e+000	0	0.000e+000
CuMoO4	0.00	-13.08	-13.08	0.000e+000	7.281e-007	7.281e-007
Epsomite	-2.75	-4.88	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	0.00	3.19	3.19	0.000e+000	2.697e-005	2.697e-005
Fluorite	0.00	-10.50	-10.50	0.000e+000	8.168e-004	8.168e-004
Gummite	-6.24	1.43	7.67	0.000e+000	0	0.000e+000
Gypsum	-0.04	-4.65	-4.61	0.000e+000	0	0.000e+000
HgSe	-2.09	-57.78	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2	Element not present.			0.000e+000	0	0.000e+000
Mirabilite	-5.34	-6.45	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-5.93	-4.80	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-6.24	6.55	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2:8H2O	-23.04	-7.34	15.70	0.000e+000	0	0.000e+000
NiCO3	-6.41	-13.28	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-2.36	-13.50	-11.14	0.000e+000	0	0.000e+000
O2 (g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	8.557e-005
Otavite	-2.72	-14.72	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	0.000e+000	1.638e-008	1.638e-008
Rutherfordine	-3.91	-18.41	-14.50	0.000e+000	0	0.000e+000
SbO2	-3.05	-30.87	-27.82	0.000e+000	0	0.000e+000
Schoepite	-4.57	1.43	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2(am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-2.01	2.07	4.08	0.000e+000	0	0.000e+000
U3O8	-14.69	6.39	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-4.18	1.43	5.61	0.000e+000	0	0.000e+000
UO3	-6.27	1.43	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-2.25	-12.38	-10.13	0.000e+000	0	0.000e+000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.707e-008	2.627e-008
Al	2.436e-007	2.365e-007
As	6.629e-009	6.436e-009
B	2.747e-005	2.667e-005
Ba	3.803e-008	3.692e-008
C	4.136e-003	4.015e-003
Ca	1.329e-002	1.290e-002
Cd	9.181e-009	8.912e-009
Cl	2.543e-003	2.469e-003
Co	1.751e-007	1.700e-007
Cr	1.509e-008	1.465e-008
Cu	1.446e-006	1.404e-006
F	1.535e-004	1.490e-004
Fe	6.544e-009	6.353e-009
Hg	4.076e-010	3.957e-010
K	3.199e-003	3.106e-003
Mg	7.322e-003	7.108e-003
Mn	1.044e-004	1.014e-004
Mo	1.442e-006	1.400e-006
N	7.044e-005	6.838e-005
Na	9.428e-003	9.153e-003
Ni	2.198e-007	2.134e-007
Pb	4.807e-009	4.667e-009
S	2.396e-002	2.326e-002
Sb	7.629e-009	7.406e-009
Se	1.259e-007	1.223e-007

U	3.038e-007	2.949e-007
V	4.987e-007	4.841e-007
Zn	3.015e-006	2.927e-006

-----Description of solution-----

	pH =	6.917	Charge balance
	pe =	5.856	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength =	6.699e-002	
	Mass of water (kg) =	9.708e-001	
	Total alkalinity (eq/kg) =	3.450e-003	
	Total CO2 (mol/kg) =	4.136e-003	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	2.573e-017	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	34	
	Total H =	1.077740e+002	
	Total O =	5.398977e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.506e-007	1.211e-007	-6.822	-6.917	-0.095	0.00
OH-	1.050e-007	8.307e-008	-6.979	-7.081	-0.102	(0)
H2O	5.551e+001	9.990e-001	1.744	-0.000	0.000	18.07
Ag	2.707e-008					
AgCl	1.708e-008	1.708e-008	-7.768	-7.768	0.000	(0)
Ag+	5.085e-009	4.090e-009	-8.294	-8.388	-0.095	(0)
AgCl2-	4.123e-009	3.042e-009	-8.385	-8.517	-0.132	(0)
AgSO4-	7.371e-010	5.439e-010	-9.132	-9.264	-0.132	(0)
AgNO2	2.163e-011	2.163e-011	-10.665	-10.665	0.000	(0)
AgCl3-2	1.870e-011	5.545e-012	-10.728	-11.256	-0.528	(0)
AgNH3+	1.475e-012	1.088e-012	-11.831	-11.963	-0.132	(0)
AgF	9.996e-013	9.996e-013	-12.000	-12.000	0.000	(0)
AgCl4-3	3.570e-013	2.315e-014	-12.447	-13.635	-1.188	(0)
AgOH	3.397e-014	3.397e-014	-13.469	-13.469	0.000	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
AgSeO3-	1.006e-014	7.420e-015	-13.998	-14.130	-0.132	(0)
AgH2BO3	8.602e-015	8.602e-015	-14.065	-14.065	0.000	(0)
Ag (NH3) 2+	1.563e-015	1.153e-015	-14.806	-14.938	-0.132	(0)
Ag (NO2) 2-	1.150e-015	8.482e-016	-14.939	-15.071	-0.132	(0)
AgNO3	7.759e-017	7.759e-017	-16.110	-16.110	0.000	(0)
Ag (OH) 2-	3.737e-019	2.758e-019	-18.427	-18.559	-0.132	(0)
Ag (SeO3) 2-3	2.892e-021	1.876e-022	-20.539	-21.727	-1.188	(0)
Ag2MoO4	3.815e-024	3.815e-024	-23.418	-23.418	0.000	(0)
AgHS	0.000e+000	0.000e+000	-72.186	-72.186	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-83.716	-85.828	-2.112	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-145.565	-145.697	-0.132	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-146.032	-146.264	-0.232	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.373	-148.787	-0.414	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.708	-149.098	-0.391	(0)
Al	2.436e-007					
Al (OH) 4-	1.242e-007	9.971e-008	-6.906	-7.001	-0.095	(0)
AlF2+	4.873e-008	3.957e-008	-7.312	-7.403	-0.090	(0)
AlF3	4.847e-008	4.847e-008	-7.315	-7.315	0.000	(0)
Al (OH) 3	9.535e-009	9.535e-009	-8.021	-8.021	0.000	(0)
Al (OH) 2+	7.086e-009	5.753e-009	-8.150	-8.240	-0.090	(0)
AlF4-	2.945e-009	2.364e-009	-8.531	-8.626	-0.095	(0)
AlF+2	2.350e-009	1.021e-009	-8.629	-8.991	-0.362	(0)
AlOH+2	2.006e-010	8.719e-011	-9.698	-10.060	-0.362	(0)
AlSO4+	6.767e-011	5.431e-011	-10.170	-10.265	-0.095	(0)
Al+3	7.457e-012	1.050e-012	-11.127	-11.979	-0.852	(0)
Al (SO4) 2-	4.833e-012	3.879e-012	-11.316	-11.411	-0.095	(0)
AlMo6O21-3	2.411e-035	1.564e-036	-34.618	-35.806	-1.188	(0)

As (3)	7.178e-021					
H3AsO3	7.138e-021	7.138e-021	-20.146	-20.146	0.000	(0)
H2AsO3-	4.096e-023	3.023e-023	-22.388	-22.520	-0.132	(0)
HAsO3-2	7.678e-028	2.276e-028	-27.115	-27.643	-0.528	(0)
H4AsO3+	5.804e-028	4.283e-028	-27.236	-27.368	-0.132	(0)
AsO3-3	1.117e-033	7.245e-035	-32.952	-34.140	-1.188	(0)
As (5)	6.629e-009					
HAsO4-2	4.591e-009	1.361e-009	-8.338	-8.866	-0.528	(0)
H2AsO4-	2.037e-009	1.503e-009	-8.691	-8.823	-0.132	(0)
AsO4-3	5.480e-013	3.554e-014	-12.261	-13.449	-1.188	(0)
H3AsO4	3.116e-014	3.164e-014	-13.506	-13.500	0.007	(0)
B	2.747e-005					
H3BO3	2.725e-005	2.767e-005	-4.565	-4.558	0.007	(0)
H2BO3-	1.705e-007	1.327e-007	-6.768	-6.877	-0.109	(0)
CaH2BO3+	3.277e-008	2.551e-008	-7.484	-7.593	-0.109	(0)
MgH2BO3+	1.186e-008	9.229e-009	-7.926	-8.035	-0.109	(0)
NaH2BO3	1.538e-009	1.538e-009	-8.813	-8.813	0.000	(0)
BF (OH) 3-	1.381e-009	1.074e-009	-8.860	-8.969	-0.109	(0)
H5 (BO3) 2-	4.016e-012	3.126e-012	-11.396	-11.505	-0.109	(0)
BF2 (OH) 2-	1.741e-012	1.355e-012	-11.759	-11.868	-0.109	(0)
BaH2BO3+	8.278e-014	6.443e-014	-13.082	-13.191	-0.109	(0)
H8 (BO3) 3-	1.111e-014	8.650e-015	-13.954	-14.063	-0.109	(0)
AgH2BO3	8.602e-015	8.602e-015	-14.065	-14.065	0.000	(0)
BF3OH-	7.989e-018	6.217e-018	-17.098	-17.206	-0.109	(0)
BF4-	4.636e-022	3.608e-022	-21.334	-21.443	-0.109	(0)
Ba	3.803e-008					
Ba+2	3.755e-008	1.571e-008	-7.425	-7.804	-0.378	(0)
BaHCO3+	4.699e-010	3.842e-010	-9.328	-9.415	-0.087	(0)
BaCO3	7.988e-012	7.988e-012	-11.098	-11.098	0.000	(0)
BaH2BO3+	8.278e-014	6.443e-014	-13.082	-13.191	-0.109	(0)
BaOH+	7.050e-015	5.696e-015	-14.152	-14.244	-0.093	(0)
BaNH3+2	4.358e-015	1.292e-015	-14.361	-14.889	-0.528	(0)
BaNO3+	2.549e-015	1.881e-015	-14.594	-14.726	-0.132	(0)
C (4)	4.136e-003					
HCO3-	3.154e-003	2.561e-003	-2.501	-2.592	-0.090	(0)
H2CO3	6.976e-004	6.976e-004	-3.156	-3.156	0.000	(0)
CaHCO3+	1.948e-004	1.593e-004	-3.710	-3.798	-0.087	(0)
MgHCO3+	6.595e-005	5.256e-005	-4.181	-4.279	-0.099	(0)
NaHCO3	1.053e-005	1.053e-005	-4.977	-4.977	0.000	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CO3-2	2.370e-006	9.914e-007	-5.625	-6.004	-0.378	(0)
MgCO3	1.654e-006	1.654e-006	-5.781	-5.781	0.000	(0)
MnHCO3+	1.426e-006	1.152e-006	-5.846	-5.938	-0.093	(0)
CuCO3	8.128e-007	8.128e-007	-6.090	-6.090	0.000	(0)
UO2 (CO3) 3-4	1.982e-007	1.531e-009	-6.703	-8.815	-2.112	(0)
NaCO3-	1.663e-007	1.350e-007	-6.779	-6.870	-0.090	(0)
UO2 (CO3) 2-2	1.040e-007	3.082e-008	-6.983	-7.511	-0.528	(0)
ZnHCO3+	7.658e-008	5.651e-008	-7.116	-7.248	-0.132	(0)
ZnCO3	3.980e-008	3.980e-008	-7.400	-7.400	0.000	(0)
CuHCO3+	3.049e-008	2.250e-008	-7.516	-7.648	-0.132	(0)
NiHCO3+	2.240e-008	1.653e-008	-7.650	-7.782	-0.132	(0)
CoHCO3+	9.444e-009	6.969e-009	-8.025	-8.157	-0.132	(0)
Cu (CO3) 2-2	7.316e-009	2.169e-009	-8.136	-8.664	-0.528	(0)
NiCO3	1.936e-009	1.936e-009	-8.713	-8.713	0.000	(0)
UO2CO3	1.558e-009	1.558e-009	-8.807	-8.807	0.000	(0)
PbCO3	1.186e-009	1.186e-009	-8.926	-8.926	0.000	(0)
PbHCO3+	1.027e-009	7.575e-010	-8.989	-9.121	-0.132	(0)
CoCO3	5.862e-010	5.862e-010	-9.232	-9.232	0.000	(0)
BaHCO3+	4.699e-010	3.842e-010	-9.328	-9.415	-0.087	(0)
CdCO3	4.388e-011	4.388e-011	-10.358	-10.358	0.000	(0)
CdHCO3+	1.535e-011	1.132e-011	-10.814	-10.946	-0.132	(0)
Pb (CO3) 2-2	1.144e-011	3.392e-012	-10.942	-11.470	-0.528	(0)
BaCO3	7.988e-012	7.988e-012	-11.098	-11.098	0.000	(0)
FeHCO3+	1.636e-012	1.338e-012	-11.786	-11.874	-0.087	(0)
Cd (CO3) 2-2	1.088e-013	3.225e-014	-12.963	-13.491	-0.528	(0)
HgCO3	2.584e-014	2.584e-014	-13.588	-13.588	0.000	(0)
Hg (CO3) 2-2	2.733e-016	8.102e-017	-15.563	-16.091	-0.528	(0)
HgHCO3+	7.898e-017	5.828e-017	-16.102	-16.234	-0.132	(0)

Ca	1.329e-002					
Ca+2	7.984e-003	3.340e-003	-2.098	-2.476	-0.378	(0)
CaSO4	5.100e-003	5.100e-003	-2.292	-2.292	0.000	(0)
CaHCO3+	1.948e-004	1.593e-004	-3.710	-3.798	-0.087	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CaF+	4.390e-006	3.547e-006	-5.357	-5.450	-0.093	(0)
CaH2BO3+	3.277e-008	2.551e-008	-7.484	-7.593	-0.109	(0)
CaOH+	6.770e-009	5.536e-009	-8.169	-8.257	-0.087	(0)
CaNH3+2	1.849e-009	5.480e-010	-8.733	-9.261	-0.528	(0)
CaNO3+	3.419e-010	2.523e-010	-9.466	-9.598	-0.132	(0)
Ca (NH3) 2+2	9.592e-017	2.844e-017	-16.018	-16.546	-0.528	(0)
Cd	9.181e-009					
Cd+2	4.642e-009	1.942e-009	-8.333	-8.712	-0.378	(0)
CdSO4	3.034e-009	3.034e-009	-8.518	-8.518	0.000	(0)
Cd (SO4) 2-2	9.203e-010	2.728e-010	-9.036	-9.564	-0.528	(0)
CdCl+	5.140e-010	3.793e-010	-9.289	-9.421	-0.132	(0)
CdCO3	4.388e-011	4.388e-011	-10.358	-10.358	0.000	(0)
CdHCO3+	1.535e-011	1.132e-011	-10.814	-10.946	-0.132	(0)
CdF+	4.059e-012	2.995e-012	-11.392	-11.524	-0.132	(0)
CdCl2	3.234e-012	3.234e-012	-11.490	-11.490	0.000	(0)
CdOH+	1.737e-012	1.281e-012	-11.760	-11.892	-0.132	(0)
CdOHC1	1.292e-012	1.292e-012	-11.889	-11.889	0.000	(0)
Cd (CO3) 2-2	1.088e-013	3.225e-014	-12.963	-13.491	-0.528	(0)
CdCl3-	5.656e-015	4.173e-015	-14.248	-14.380	-0.132	(0)
Cd (OH) 2	6.716e-016	6.716e-016	-15.173	-15.173	0.000	(0)
CdF2	5.814e-016	5.814e-016	-15.235	-15.235	0.000	(0)
CdNO3+	1.988e-016	1.467e-016	-15.702	-15.834	-0.132	(0)
CdSeO4	4.423e-018	4.423e-018	-17.354	-17.354	0.000	(0)
Cd2OH+3	1.923e-019	1.247e-020	-18.716	-19.904	-1.188	(0)
Cd (SeO3) 2-2	4.302e-020	1.276e-020	-19.366	-19.894	-0.528	(0)
Cd (OH) 3-	4.619e-021	3.408e-021	-20.335	-20.467	-0.132	(0)
Cd (NO3) 2	1.756e-024	1.756e-024	-23.756	-23.756	0.000	(0)
Cd (OH) 4-2	1.563e-028	4.634e-029	-27.806	-28.334	-0.528	(0)
CdHS+	0.000e+000	0.000e+000	-78.184	-78.316	-0.132	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-148.723	-148.723	0.000	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-224.303	-224.435	-0.132	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-299.323	-299.851	-0.528	(0)
Cl	2.543e-003					
Cl-	2.543e-003	2.045e-003	-2.595	-2.689	-0.095	(0)
MnCl+	7.187e-008	5.807e-008	-7.143	-7.236	-0.093	(0)
AgCl	1.708e-008	1.708e-008	-7.768	-7.768	0.000	(0)
ZnCl+	4.497e-009	3.584e-009	-8.347	-8.446	-0.099	(0)
AgCl2-	4.123e-009	3.042e-009	-8.385	-8.517	-0.132	(0)
CuCl+	5.662e-010	4.513e-010	-9.247	-9.346	-0.099	(0)
CdCl+	5.140e-010	3.793e-010	-9.289	-9.421	-0.132	(0)
ZnOHC1	3.898e-010	3.898e-010	-9.409	-9.409	0.000	(0)
NiCl+	3.713e-010	2.740e-010	-9.430	-9.562	-0.132	(0)
CoCl+	3.354e-010	2.475e-010	-9.474	-9.606	-0.132	(0)
CuCl	2.448e-010	2.448e-010	-9.611	-9.611	0.000	(0)
MnCl2	1.678e-010	1.678e-010	-9.775	-9.775	0.000	(0)
CuCl2-	1.312e-010	1.046e-010	-9.882	-9.981	-0.099	(0)
PbCl+	3.915e-011	2.889e-011	-10.407	-10.539	-0.132	(0)
AgCl3-2	1.870e-011	5.545e-012	-10.728	-11.256	-0.528	(0)
ZnCl2	1.162e-011	1.162e-011	-10.935	-10.935	0.000	(0)
HgCl2	9.111e-012	9.111e-012	-11.040	-11.040	0.000	(0)
HgClOH	6.535e-012	6.535e-012	-11.185	-11.185	0.000	(0)
CdCl2	3.234e-012	3.234e-012	-11.490	-11.490	0.000	(0)
CdOHC1	1.292e-012	1.292e-012	-11.889	-11.889	0.000	(0)
AgCl4-3	3.570e-013	2.315e-014	-12.447	-13.635	-1.188	(0)
CuCl2	3.201e-013	3.201e-013	-12.495	-12.495	0.000	(0)
PbCl2	2.639e-013	2.639e-013	-12.579	-12.579	0.000	(0)
HgCl3-	2.525e-013	1.863e-013	-12.598	-12.730	-0.132	(0)
MnCl3-	1.170e-013	9.449e-014	-12.932	-13.025	-0.093	(0)
CuCl3-2	1.073e-013	4.573e-014	-12.969	-13.340	-0.371	(0)
ZnCl3-	2.368e-014	1.888e-014	-13.626	-13.724	-0.099	(0)
CdCl3-	5.656e-015	4.173e-015	-14.248	-14.380	-0.132	(0)
HgCl4-2	5.118e-015	1.517e-015	-14.291	-14.819	-0.528	(0)
CrCl+2	3.898e-015	1.156e-015	-14.409	-14.937	-0.528	(0)

NiCl2	2.821e-015	2.821e-015	-14.550	-14.550	0.000	(0)
UO2Cl+	1.774e-015	1.309e-015	-14.751	-14.883	-0.132	(0)
HgCl+	1.205e-015	8.889e-016	-14.919	-15.051	-0.132	(0)
PbCl3-	2.912e-016	2.149e-016	-15.536	-15.668	-0.132	(0)
ZnCl4-2	4.530e-017	1.930e-017	-16.344	-16.714	-0.371	(0)
CuCl3-	7.664e-018	6.109e-018	-17.116	-17.214	-0.099	(0)
CrOHC12	3.732e-018	3.732e-018	-17.428	-17.428	0.000	(0)
VOC1+	1.298e-018	9.578e-019	-17.887	-18.019	-0.132	(0)
PbCl4-2	6.775e-019	2.009e-019	-18.169	-18.697	-0.528	(0)
FeCl+2	4.009e-019	1.708e-019	-18.397	-18.768	-0.371	(0)
CrCl2+	3.039e-019	2.243e-019	-18.517	-18.649	-0.132	(0)
FeCl2+	1.931e-021	1.560e-021	-20.714	-20.807	-0.093	(0)
CuCl4-2	1.470e-022	6.262e-023	-21.833	-22.203	-0.371	(0)
FeCl3	3.191e-025	3.191e-025	-24.496	-24.496	0.000	(0)
CrO3Cl-	3.263e-026	2.408e-026	-25.486	-25.618	-0.132	(0)
CoCl+2	1.402e-034	4.157e-035	-33.853	-34.381	-0.528	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-41.729	-42.257	-0.528	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-42.325	-42.853	-0.528	(0)
UCl+3	0.000e+000	0.000e+000	-42.367	-43.555	-1.188	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-55.925	-56.453	-0.528	(0)
Co (2)	1.751e-007					
Co+2	1.180e-007	3.498e-008	-6.928	-7.456	-0.528	(0)
CoSO4	4.652e-008	4.652e-008	-7.332	-7.332	0.000	(0)
CoHCO3+	9.444e-009	6.969e-009	-8.025	-8.157	-0.132	(0)
CoCO3	5.862e-010	5.862e-010	-9.232	-9.232	0.000	(0)
CoCl+	3.354e-010	2.475e-010	-9.474	-9.606	-0.132	(0)
CoF+	1.459e-010	1.076e-010	-9.836	-9.968	-0.132	(0)
CoOH+	7.857e-011	5.798e-011	-10.105	-10.237	-0.132	(0)
CoNO2+	8.458e-012	6.241e-012	-11.073	-11.205	-0.132	(0)
Co (NH3) +2	1.849e-012	5.481e-013	-11.733	-12.261	-0.528	(0)
Co (OH) 2	3.825e-013	3.825e-013	-12.417	-12.417	0.000	(0)
CoNO3+	1.794e-015	1.324e-015	-14.746	-14.878	-0.132	(0)
CoSeO4	2.144e-016	2.144e-016	-15.669	-15.669	0.000	(0)
Co (NH3) 2+2	1.028e-017	3.048e-018	-16.988	-17.516	-0.528	(0)
Co2OH+3	1.567e-018	1.016e-019	-17.805	-18.993	-1.188	(0)
Co (OH) 3-	8.592e-019	6.340e-019	-18.066	-18.198	-0.132	(0)
CoOOH-	2.158e-019	1.592e-019	-18.666	-18.798	-0.132	(0)
Co (NO3) 2	6.435e-023	6.435e-023	-22.191	-22.191	0.000	(0)
Co (NH3) 3+2	1.687e-023	5.001e-024	-22.773	-23.301	-0.528	(0)
Co (OH) 4-2	2.815e-026	8.346e-027	-25.550	-26.078	-0.528	(0)
Co (NH3) 4+2	1.154e-029	3.421e-030	-28.938	-29.466	-0.528	(0)
Co4 (OH) 4+4	2.918e-031	2.254e-033	-30.535	-32.647	-2.112	(0)
Co (NH3) 5+2	2.496e-036	7.399e-037	-35.603	-36.131	-0.528	(0)
Co (3)	1.422e-028					
CoOH+2	1.422e-028	4.217e-029	-27.847	-28.375	-0.528	(0)
Co+3	7.097e-034	9.990e-035	-33.149	-34.000	-0.852	(0)
CoCl+2	1.402e-034	4.157e-035	-33.853	-34.381	-0.528	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-42.325	-42.853	-0.528	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-50.883	-51.015	-0.132	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-55.925	-56.453	-0.528	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-56.116	-56.644	-0.528	(0)
Cr (2)	4.905e-025					
Cr+2	4.905e-025	1.454e-025	-24.309	-24.837	-0.528	(0)
Cr (3)	1.509e-008					
Cr (OH) 2+	1.087e-008	8.020e-009	-7.964	-8.096	-0.132	(0)
Cr (OH) +2	2.676e-009	7.935e-010	-8.572	-9.100	-0.528	(0)
CrOHSO4	1.255e-009	1.255e-009	-8.901	-8.901	0.000	(0)
Cr (OH) 3	2.503e-010	2.503e-010	-9.602	-9.602	0.000	(0)
CrF+2	2.271e-011	6.734e-012	-10.644	-11.172	-0.528	(0)
CrSO4+	9.210e-012	6.796e-012	-11.036	-11.168	-0.132	(0)
Cr+3	6.732e-012	4.366e-013	-11.172	-12.360	-1.188	(0)
CrO2-	1.331e-012	9.823e-013	-11.876	-12.008	-0.132	(0)
Cr (OH) 4-	1.122e-012	8.276e-013	-11.950	-12.082	-0.132	(0)
CrCl+2	3.898e-015	1.156e-015	-14.409	-14.937	-0.528	(0)
Cr2 (OH) 2SO4+2	3.036e-016	9.001e-017	-15.518	-16.046	-0.528	(0)
Cr2 (OH) 2 (SO4) 2	3.564e-017	3.564e-017	-16.448	-16.448	0.000	(0)
CrOHC12	3.732e-018	3.732e-018	-17.428	-17.428	0.000	(0)
CrCl2+	3.039e-019	2.243e-019	-18.517	-18.649	-0.132	(0)

CrNO3+2	1.538e-021	4.559e-022	-20.813	-21.341	-0.528	(0)
Cr (NH3) 5OH+2	1.084e-033	3.215e-034	-32.965	-33.493	-0.528	(0)
Cr (NH3) 6+3	3.300e-040	0.000e+000	-39.481	-40.669	-1.188	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-41.729	-42.257	-0.528	(0)
Cr (6)	1.175e-016					
CrO4-2	9.418e-017	3.940e-017	-16.026	-16.404	-0.378	(0)
HCrO4-	2.093e-017	1.544e-017	-16.679	-16.811	-0.132	(0)
NaCrO4-	1.941e-018	1.432e-018	-17.712	-17.844	-0.132	(0)
KCrO4-	4.877e-019	3.599e-019	-18.312	-18.444	-0.132	(0)
CrO3SO4-2	1.282e-023	3.800e-024	-22.892	-23.420	-0.528	(0)
H2CrO4	1.516e-024	1.516e-024	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.263e-026	2.408e-026	-25.486	-25.618	-0.132	(0)
Cr2O7-2	2.791e-032	8.275e-033	-31.554	-32.082	-0.528	(0)
Cu (1)	5.049e-010					
CuCl	2.448e-010	2.448e-010	-9.611	-9.611	0.000	(0)
CuCl2-	1.312e-010	1.046e-010	-9.882	-9.981	-0.099	(0)
Cu+	1.288e-010	9.507e-011	-9.890	-10.022	-0.132	(0)
CuCl3-2	1.073e-013	4.573e-014	-12.969	-13.340	-0.371	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.620	-148.022	-0.402	(0)
CuS4S5-3	0.000e+000	0.000e+000	-148.372	-148.752	-0.380	(0)
Cu (2)	1.446e-006					
CuCO3	8.128e-007	8.128e-007	-6.090	-6.090	0.000	(0)
Cu+2	3.328e-007	1.392e-007	-6.478	-6.856	-0.378	(0)
CuSO4	2.126e-007	2.126e-007	-6.672	-6.672	0.000	(0)
CuOH+	4.589e-008	3.657e-008	-7.338	-7.437	-0.099	(0)
CuHCO3+	3.049e-008	2.250e-008	-7.516	-7.648	-0.132	(0)
Cu (CO3) 2-2	7.316e-009	2.169e-009	-8.136	-8.664	-0.528	(0)
CuF+	1.158e-009	8.548e-010	-8.936	-9.068	-0.132	(0)
CuNH3+2	6.264e-010	1.857e-010	-9.203	-9.731	-0.528	(0)
Cu (OH) 2	6.062e-010	6.062e-010	-9.217	-9.217	0.000	(0)
CuCl+	5.662e-010	4.513e-010	-9.247	-9.346	-0.099	(0)
CuNO2+	5.002e-010	3.691e-010	-9.301	-9.433	-0.132	(0)
Cu2 (OH) 2+2	1.133e-010	3.360e-011	-9.946	-10.474	-0.528	(0)
CuCl2	3.201e-013	3.201e-013	-12.495	-12.495	0.000	(0)
Cu (OH) 3-	1.400e-013	1.033e-013	-12.854	-12.986	-0.132	(0)
Cu (NO2) 2	9.563e-014	9.563e-014	-13.019	-13.019	0.000	(0)
CuNO3+	1.425e-014	1.052e-014	-13.846	-13.978	-0.132	(0)
CuCl3-	7.664e-018	6.109e-018	-17.116	-17.214	-0.099	(0)
Cu (OH) 4-2	2.277e-019	6.752e-020	-18.643	-19.171	-0.528	(0)
CuCl4-2	1.470e-022	6.262e-023	-21.833	-22.203	-0.371	(0)
Cu (NO3) 2	3.162e-023	3.162e-023	-22.500	-22.500	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.661	-213.793	-0.132	(0)
F	1.535e-004					
F-	1.210e-004	9.730e-005	-3.917	-4.012	-0.095	(0)
MgF+	2.728e-005	2.190e-005	-4.564	-4.660	-0.095	(0)
CaF+	4.390e-006	3.547e-006	-5.357	-5.450	-0.093	(0)
NaF	4.490e-007	4.490e-007	-6.348	-6.348	0.000	(0)
MnF+	1.081e-007	8.736e-008	-6.966	-7.059	-0.093	(0)
AlF2+	4.873e-008	3.957e-008	-7.312	-7.403	-0.090	(0)
AlF3	4.847e-008	4.847e-008	-7.315	-7.315	0.000	(0)
HF	1.743e-008	1.743e-008	-7.759	-7.759	0.000	(0)
AlF4-	2.945e-009	2.364e-009	-8.531	-8.626	-0.095	(0)
AlF+2	2.350e-009	1.021e-009	-8.629	-8.991	-0.362	(0)
ZnF+	1.836e-009	1.355e-009	-8.736	-8.868	-0.132	(0)
BF (OH) 3-	1.381e-009	1.074e-009	-8.860	-8.969	-0.109	(0)
CuF+	1.158e-009	8.548e-010	-8.936	-9.068	-0.132	(0)
NiF+	1.734e-010	1.280e-010	-9.761	-9.893	-0.132	(0)
CoF+	1.459e-010	1.076e-010	-9.836	-9.968	-0.132	(0)
CrF+2	2.271e-011	6.734e-012	-10.644	-11.172	-0.528	(0)
HF2-	8.150e-012	6.448e-012	-11.089	-11.191	-0.102	(0)
UO2F+	7.185e-012	5.302e-012	-11.144	-11.276	-0.132	(0)
CdF+	4.059e-012	2.995e-012	-11.392	-11.524	-0.132	(0)
PbF+	3.699e-012	2.729e-012	-11.432	-11.564	-0.132	(0)
BF2 (OH) 2-	1.741e-012	1.355e-012	-11.759	-11.868	-0.109	(0)
UO2F2	1.488e-012	1.488e-012	-11.827	-11.827	0.000	(0)
AgF	9.996e-013	9.996e-013	-12.000	-12.000	0.000	(0)
UO2F3-	4.928e-014	3.637e-014	-13.307	-13.439	-0.132	(0)
VO2F	1.740e-014	1.740e-014	-13.759	-13.759	0.000	(0)

PbF2	5.226e-015	5.226e-015	-14.282	-14.282	0.000	(0)
FeF2+	9.509e-016	7.682e-016	-15.022	-15.115	-0.093	(0)
VO2F2-	8.332e-016	6.148e-016	-15.079	-15.211	-0.132	(0)
H2F2	8.139e-016	8.139e-016	-15.089	-15.089	0.000	(0)
FeF+2	6.924e-016	2.950e-016	-15.160	-15.530	-0.371	(0)
CdF2	5.814e-016	5.814e-016	-15.235	-15.235	0.000	(0)
VOF+	1.320e-016	9.742e-017	-15.879	-16.011	-0.132	(0)
FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
UO2F4-2	9.481e-017	2.811e-017	-16.023	-16.551	-0.528	(0)
BF3OH-	7.989e-018	6.217e-018	-17.098	-17.206	-0.109	(0)
VOF2	3.554e-018	3.554e-018	-17.449	-17.449	0.000	(0)
VO2F3-2	2.517e-018	7.462e-019	-17.599	-18.127	-0.528	(0)
PbF3-	1.307e-018	9.646e-019	-17.884	-18.016	-0.132	(0)
VOF3-	1.663e-020	1.227e-020	-19.779	-19.911	-0.132	(0)
VO2F4-3	5.509e-022	3.573e-023	-21.259	-22.447	-1.188	(0)
BF4-	4.636e-022	3.608e-022	-21.334	-21.443	-0.109	(0)
PbF4-2	1.515e-022	4.492e-023	-21.820	-22.348	-0.528	(0)
HgF+	1.065e-022	7.857e-023	-21.973	-22.105	-0.132	(0)
VOF4-2	1.626e-023	4.820e-024	-22.789	-23.317	-0.528	(0)
Sb(OH)2F	8.542e-025	8.542e-025	-24.068	-24.068	0.000	(0)
SbOF	8.407e-025	8.407e-025	-24.075	-24.075	0.000	(0)
UF3+	1.351e-033	9.971e-034	-32.869	-33.001	-0.132	(0)
UF2+2	2.181e-034	6.466e-035	-33.661	-34.189	-0.528	(0)
UF4	1.064e-035	1.064e-035	-34.973	-34.973	0.000	(0)
UF+3	8.138e-037	5.278e-038	-36.089	-37.278	-1.188	(0)
UF5-	5.559e-038	4.102e-038	-37.255	-37.387	-0.132	(0)
UF6-2	4.066e-039	1.205e-039	-38.391	-38.919	-0.528	(0)
Fe(2)	2.097e-010					
Fe+2	1.400e-010	4.150e-011	-9.854	-10.382	-0.528	(0)
FeSO4	6.790e-011	6.790e-011	-10.168	-10.168	0.000	(0)
FeHCO3+	1.636e-012	1.338e-012	-11.786	-11.874	-0.087	(0)
FeOH+	1.698e-013	1.372e-013	-12.770	-12.863	-0.093	(0)
Fe(OH)2	9.054e-018	9.054e-018	-17.043	-17.043	0.000	(0)
Fe(OH)3-	2.944e-019	2.378e-019	-18.531	-18.624	-0.093	(0)
Fe(HS)2	0.000e+000	0.000e+000	-156.656	-156.656	0.000	(0)
Fe(HS)3-	0.000e+000	0.000e+000	-232.098	-232.230	-0.132	(0)
Fe(3)	6.335e-009					
Fe(OH)2+	5.903e-009	4.793e-009	-8.229	-8.319	-0.090	(0)
Fe(OH)3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe(OH)4-	4.073e-012	3.307e-012	-11.390	-11.481	-0.090	(0)
FeOH+2	3.481e-013	1.483e-013	-12.458	-12.829	-0.371	(0)
FeF2+	9.509e-016	7.682e-016	-15.022	-15.115	-0.093	(0)
FeF+2	6.924e-016	2.950e-016	-15.160	-15.530	-0.371	(0)
FeSO4+	2.560e-016	2.068e-016	-15.592	-15.684	-0.093	(0)
FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
Fe(SO4)2-	3.994e-017	2.947e-017	-16.399	-16.531	-0.132	(0)
Fe+3	1.965e-017	2.765e-018	-16.707	-17.558	-0.852	(0)
FeCl+2	4.009e-019	1.708e-019	-18.397	-18.768	-0.371	(0)
FeHSeO3+2	2.117e-021	6.275e-022	-20.674	-21.202	-0.528	(0)
FeCl2+	1.931e-021	1.560e-021	-20.714	-20.807	-0.093	(0)
Fe2(OH)2+4	9.428e-023	7.283e-025	-22.026	-24.138	-2.112	(0)
FeNO3+2	2.228e-024	6.605e-025	-23.652	-24.180	-0.528	(0)
FeCl3	3.191e-025	3.191e-025	-24.496	-24.496	0.000	(0)
Fe3(OH)4+5	1.007e-028	5.045e-032	-27.997	-31.297	-3.300	(0)
H(0)	3.974e-029					
H2	1.987e-029	2.018e-029	-28.702	-28.695	0.007	(0)
Hg(0)	3.907e-010					
Hg	3.907e-010	3.907e-010	-9.408	-9.408	0.000	(0)
Hg(1)	3.898e-020					
Hg2+2	1.949e-020	5.778e-021	-19.710	-20.238	-0.528	(0)
Hg(2)	1.687e-011					
HgCl2	9.111e-012	9.111e-012	-11.040	-11.040	0.000	(0)
HgClOH	6.535e-012	6.535e-012	-11.185	-11.185	0.000	(0)
Hg(OH)2	9.338e-013	9.483e-013	-12.030	-12.023	0.007	(0)
HgCl3-	2.525e-013	1.863e-013	-12.598	-12.730	-0.132	(0)
HgCO3	2.584e-014	2.584e-014	-13.588	-13.588	0.000	(0)
HgCl4-2	5.118e-015	1.517e-015	-14.291	-14.819	-0.528	(0)
HgCl+	1.205e-015	8.889e-016	-14.919	-15.051	-0.132	(0)

	Hg (NH3) 2+2	7.875e-016	2.335e-016	-15.104	-15.632	-0.528	(0)
	Hg (CO3) 2-2	2.733e-016	8.102e-017	-15.563	-16.091	-0.528	(0)
	HgOH+	9.762e-017	7.203e-017	-16.010	-16.142	-0.132	(0)
	HgHCO3+	7.898e-017	5.828e-017	-16.102	-16.234	-0.132	(0)
	HgNH3+2	6.042e-018	1.791e-018	-17.219	-17.747	-0.528	(0)
	Hg+2	7.347e-020	2.178e-020	-19.134	-19.662	-0.528	(0)
	HgSO4	3.801e-020	3.801e-020	-19.420	-19.420	0.000	(0)
	Hg (OH) 3-	1.344e-020	9.917e-021	-19.872	-20.004	-0.132	(0)
	Hg (NH3) 3+2	4.086e-022	1.211e-022	-21.389	-21.917	-0.528	(0)
	HgF+	1.065e-022	7.857e-023	-21.973	-22.105	-0.132	(0)
	Hg (NH3) 4+2	4.231e-028	1.254e-028	-27.374	-27.902	-0.528	(0)
	HgNO3+	2.603e-028	1.921e-028	-27.584	-27.716	-0.132	(0)
	Hg (NO3) 2	1.907e-036	1.907e-036	-35.720	-35.720	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-135.909	-136.041	-0.132	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-136.563	-136.563	0.000	(0)
	HgS2-2	0.000e+000	0.000e+000	-137.304	-137.832	-0.528	(0)
K		3.199e-003					
	K+	3.057e-003	2.458e-003	-2.515	-2.609	-0.095	(0)
	KSO4-	1.429e-004	1.160e-004	-3.845	-3.936	-0.090	(0)
	KCrO4-	4.877e-019	3.599e-019	-18.312	-18.444	-0.132	(0)
Mg		7.322e-003					
	Mg+2	4.794e-003	2.006e-003	-2.319	-2.698	-0.378	(0)
	MgSO4	2.433e-003	2.433e-003	-2.614	-2.614	0.000	(0)
	MgHCO3+	6.595e-005	5.256e-005	-4.181	-4.279	-0.099	(0)
	MgF+	2.728e-005	2.190e-005	-4.564	-4.660	-0.095	(0)
	MgCO3	1.654e-006	1.654e-006	-5.781	-5.781	0.000	(0)
	MgOH+	8.067e-008	6.633e-008	-7.093	-7.178	-0.085	(0)
	MgH2BO3+	1.186e-008	9.229e-009	-7.926	-8.035	-0.109	(0)
Mn (2)		1.044e-004					
	Mn+2	7.607e-005	2.255e-005	-4.119	-4.647	-0.528	(0)
	MnSO4	2.673e-005	2.673e-005	-4.573	-4.573	0.000	(0)
	MnHCO3+	1.426e-006	1.152e-006	-5.846	-5.938	-0.093	(0)
	MnF+	1.081e-007	8.736e-008	-6.966	-7.059	-0.093	(0)
	MnCl+	7.187e-008	5.807e-008	-7.143	-7.236	-0.093	(0)
	MnOH+	5.824e-009	4.706e-009	-8.235	-8.327	-0.093	(0)
	MnCl2	1.678e-010	1.678e-010	-9.775	-9.775	0.000	(0)
	MnNO3+	1.157e-012	8.537e-013	-11.937	-12.069	-0.132	(0)
	MnCl3-	1.170e-013	9.449e-014	-12.932	-13.025	-0.093	(0)
	MnSeO4	7.424e-014	7.424e-014	-13.129	-13.129	0.000	(0)
	Mn (OH) 3-	2.484e-019	2.007e-019	-18.605	-18.698	-0.093	(0)
	Mn (NO3) 2	5.122e-020	5.122e-020	-19.291	-19.291	0.000	(0)
	Mn (OH) 4-2	1.263e-025	5.381e-026	-24.899	-25.269	-0.371	(0)
	MnSe	0.000e+000	0.000e+000	-41.955	-41.955	0.000	(0)
Mn (3)		5.134e-024					
	Mn+3	5.134e-024	7.226e-025	-23.290	-24.141	-0.852	(0)
Mn (6)		0.000e+000					
	MnO4-2	0.000e+000	0.000e+000	-43.942	-44.313	-0.371	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-47.724	-47.829	-0.105	(0)
Mo		1.442e-006					
	MoO4-2	1.440e-006	6.026e-007	-5.841	-6.220	-0.378	(0)
	HMoO4-	1.968e-009	1.452e-009	-8.706	-8.838	-0.132	(0)
	H2MoO4	1.288e-012	1.288e-012	-11.890	-11.890	0.000	(0)
	Ag2MoO4	3.815e-024	3.815e-024	-23.418	-23.418	0.000	(0)
	AlMo6O21-3	2.411e-035	1.564e-036	-34.618	-35.806	-1.188	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-41.130	-45.883	-4.752	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-43.113	-46.413	-3.300	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-46.435	-48.547	-2.112	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-51.030	-52.218	-1.188	(0)
N (-3)		3.815e-005					
	NH4+	3.557e-005	2.768e-005	-4.449	-4.558	-0.109	(0)
	NH4SO4-	2.447e-006	1.977e-006	-5.611	-5.704	-0.093	(0)
	NH3	1.303e-007	1.303e-007	-6.885	-6.885	0.000	(0)
	CaNH3+2	1.849e-009	5.480e-010	-8.733	-9.261	-0.528	(0)
	CuNH3+2	6.264e-010	1.857e-010	-9.203	-9.731	-0.528	(0)
	NiNH3+2	1.236e-011	3.665e-012	-10.908	-11.436	-0.528	(0)
	Co (NH3) +2	1.849e-012	5.481e-013	-11.733	-12.261	-0.528	(0)
	AgNH3+	1.475e-012	1.088e-012	-11.831	-11.963	-0.132	(0)

BaNH3+2	4.358e-015	1.292e-015	-14.361	-14.889	-0.528	(0)
Ag (NH3) 2+	1.563e-015	1.153e-015	-14.806	-14.938	-0.132	(0)
Hg (NH3) 2+2	7.875e-016	2.335e-016	-15.104	-15.632	-0.528	(0)
Ni (NH3) 2+2	2.329e-016	6.904e-017	-15.633	-16.161	-0.528	(0)
Ca (NH3) 2+2	9.592e-017	2.844e-017	-16.018	-16.546	-0.528	(0)
Co (NH3) 2+2	1.028e-017	3.048e-018	-16.988	-17.516	-0.528	(0)
HgNH3+2	6.042e-018	1.791e-018	-17.219	-17.747	-0.528	(0)
Hg (NH3) 3+2	4.086e-022	1.211e-022	-21.389	-21.917	-0.528	(0)
Co (NH3) 3+2	1.687e-023	5.001e-024	-22.773	-23.301	-0.528	(0)
Hg (NH3) 4+2	4.231e-028	1.254e-028	-27.374	-27.902	-0.528	(0)
Co (NH3) 4+2	1.154e-029	3.421e-030	-28.938	-29.466	-0.528	(0)
Cr (NH3) 5OH+2	1.084e-033	3.215e-034	-32.965	-33.493	-0.528	(0)
Co (NH3) 5+2	2.496e-036	7.399e-037	-35.603	-36.131	-0.528	(0)
Cr (NH3) 6+3	3.300e-040	0.000e+000	-39.481	-40.669	-1.188	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-41.729	-42.257	-0.528	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-42.325	-42.853	-0.528	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-50.883	-51.015	-0.132	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-55.925	-56.453	-0.528	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-56.116	-56.644	-0.528	(0)
N (3)	3.226e-005					
NO2-	3.225e-005	2.532e-005	-4.491	-4.597	-0.105	(0)
CuNO2+	5.002e-010	3.691e-010	-9.301	-9.433	-0.132	(0)
AgNO2	2.163e-011	2.163e-011	-10.665	-10.665	0.000	(0)
CoNO2+	8.458e-012	6.241e-012	-11.073	-11.205	-0.132	(0)
Cu (NO2) 2	9.563e-014	9.563e-014	-13.019	-13.019	0.000	(0)
Ag (NO2) 2-	1.150e-015	8.482e-016	-14.939	-15.071	-0.132	(0)
N (5)	3.004e-008					
NO3-	2.970e-008	2.388e-008	-7.527	-7.622	-0.095	(0)
CaNO3+	3.419e-010	2.523e-010	-9.466	-9.598	-0.132	(0)
MnNO3+	1.157e-012	8.537e-013	-11.937	-12.069	-0.132	(0)
ZnNO3+	5.673e-014	4.186e-014	-13.246	-13.378	-0.132	(0)
CuNO3+	1.425e-014	1.052e-014	-13.846	-13.978	-0.132	(0)
NiNO3+	4.257e-015	3.141e-015	-14.371	-14.503	-0.132	(0)
BaNO3+	2.549e-015	1.881e-015	-14.594	-14.726	-0.132	(0)
CoNO3+	1.794e-015	1.324e-015	-14.746	-14.878	-0.132	(0)
CdNO3+	1.988e-016	1.467e-016	-15.702	-15.834	-0.132	(0)
PbNO3+	1.906e-016	1.406e-016	-15.720	-15.852	-0.132	(0)
AgNO3	7.759e-017	7.759e-017	-16.110	-16.110	0.000	(0)
Mn (NO3) 2	5.122e-020	5.122e-020	-19.291	-19.291	0.000	(0)
UO2NO3+	2.549e-020	1.881e-020	-19.594	-19.726	-0.132	(0)
CrNO3+2	1.538e-021	4.559e-022	-20.813	-21.341	-0.528	(0)
VO2NO3	1.232e-021	1.232e-021	-20.909	-20.909	0.000	(0)
Zn (NO3) 2	1.995e-022	1.995e-022	-21.700	-21.700	0.000	(0)
Co (NO3) 2	6.435e-023	6.435e-023	-22.191	-22.191	0.000	(0)
Cu (NO3) 2	3.162e-023	3.162e-023	-22.500	-22.500	0.000	(0)
Pb (NO3) 2	5.704e-024	5.704e-024	-23.244	-23.244	0.000	(0)
FeNO3+2	2.228e-024	6.605e-025	-23.652	-24.180	-0.528	(0)
Cd (NO3) 2	1.756e-024	1.756e-024	-23.756	-23.756	0.000	(0)
HgNO3+	2.603e-028	1.921e-028	-27.584	-27.716	-0.132	(0)
Hg (NO3) 2	1.907e-036	1.907e-036	-35.720	-35.720	0.000	(0)
Na	9.428e-003					
Na+	9.095e-003	7.314e-003	-2.041	-2.136	-0.095	(0)
NaSO4-	3.225e-004	2.618e-004	-3.492	-3.582	-0.090	(0)
NaHCO3	1.053e-005	1.053e-005	-4.977	-4.977	0.000	(0)
NaF	4.490e-007	4.490e-007	-6.348	-6.348	0.000	(0)
NaCO3-	1.663e-007	1.350e-007	-6.779	-6.870	-0.090	(0)
NaH2BO3	1.538e-009	1.538e-009	-8.813	-8.813	0.000	(0)
NaCrO4-	1.941e-018	1.432e-018	-17.712	-17.844	-0.132	(0)
Ni	2.198e-007					
Ni+2	1.251e-007	5.236e-008	-6.903	-7.281	-0.378	(0)
NiSO4	6.963e-008	6.963e-008	-7.157	-7.157	0.000	(0)
NiHCO3+	2.240e-008	1.653e-008	-7.650	-7.782	-0.132	(0)
NiCO3	1.936e-009	1.936e-009	-8.713	-8.713	0.000	(0)
NiCl+	3.713e-010	2.740e-010	-9.430	-9.562	-0.132	(0)
NiF+	1.734e-010	1.280e-010	-9.761	-9.893	-0.132	(0)
NiOH+	7.420e-011	5.475e-011	-10.130	-10.262	-0.132	(0)
Ni (SO4) 2-2	5.184e-011	1.537e-011	-10.285	-10.813	-0.528	(0)
NiNH3+2	1.236e-011	3.665e-012	-10.908	-11.436	-0.528	(0)

Ni (OH) 2	3.612e-013	3.612e-013	-12.442	-12.442	0.000	(0)
NiNO3+	4.257e-015	3.141e-015	-14.371	-14.503	-0.132	(0)
NiCl2	2.821e-015	2.821e-015	-14.550	-14.550	0.000	(0)
NiSeO4	2.995e-016	2.995e-016	-15.524	-15.524	0.000	(0)
Ni (NH3) 2+2	2.329e-016	6.904e-017	-15.633	-16.161	-0.528	(0)
Ni (OH) 3-	4.067e-017	3.001e-017	-16.391	-16.523	-0.132	(0)
O (0)	2.447e-035					
O2	1.224e-035	1.243e-035	-34.912	-34.906	0.007	(0)
Pb	4.807e-009					
PbSO4	1.300e-009	1.300e-009	-8.886	-8.886	0.000	(0)
PbCO3	1.186e-009	1.186e-009	-8.926	-8.926	0.000	(0)
PbHCO3+	1.027e-009	7.575e-010	-8.989	-9.121	-0.132	(0)
Pb+2	9.515e-010	3.981e-010	-9.022	-9.400	-0.378	(0)
Pb (SO4) 2-2	1.760e-010	5.219e-011	-9.754	-10.282	-0.528	(0)
PbOH+	1.126e-010	8.306e-011	-9.949	-10.081	-0.132	(0)
PbCl+	3.915e-011	2.889e-011	-10.407	-10.539	-0.132	(0)
Pb (CO3) 2-2	1.144e-011	3.392e-012	-10.942	-11.470	-0.528	(0)
PbF+	3.699e-012	2.729e-012	-11.432	-11.564	-0.132	(0)
PbCl2	2.639e-013	2.639e-013	-12.579	-12.579	0.000	(0)
Pb (OH) 2	2.182e-013	2.182e-013	-12.661	-12.661	0.000	(0)
PbF2	5.226e-015	5.226e-015	-14.282	-14.282	0.000	(0)
PbCl3-	2.912e-016	2.149e-016	-15.536	-15.668	-0.132	(0)
PbNO3+	1.906e-016	1.406e-016	-15.720	-15.852	-0.132	(0)
Pb (OH) 3-	2.456e-017	1.812e-017	-16.610	-16.742	-0.132	(0)
Pb2OH+3	8.079e-018	5.240e-019	-17.093	-18.281	-1.188	(0)
PbF3-	1.307e-018	9.646e-019	-17.884	-18.016	-0.132	(0)
PbCl4-2	6.775e-019	2.009e-019	-18.169	-18.697	-0.528	(0)
Pb (OH) 4-2	1.244e-021	3.687e-022	-20.905	-21.433	-0.528	(0)
PbF4-2	1.515e-022	4.492e-023	-21.820	-22.348	-0.528	(0)
Pb (NO3) 2	5.704e-024	5.704e-024	-23.244	-23.244	0.000	(0)
Pb3 (OH) 4+2	1.275e-024	3.780e-025	-23.894	-24.422	-0.528	(0)
Pb4 (OH) 4+4	1.547e-028	1.195e-030	-27.810	-29.923	-2.112	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-149.354	-149.354	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-225.533	-225.665	-0.132	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-72.186	-72.186	0.000	(0)
HS-	0.000e+000	0.000e+000	-77.480	-77.612	-0.132	(0)
H2S	0.000e+000	0.000e+000	-77.509	-77.509	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.184	-78.316	-0.132	(0)
S5-2	0.000e+000	0.000e+000	-79.532	-80.060	-0.528	(0)
S6-2	0.000e+000	0.000e+000	-80.048	-80.576	-0.528	(0)
S4-2	0.000e+000	0.000e+000	-80.128	-80.656	-0.528	(0)
S3-2	0.000e+000	0.000e+000	-80.934	-81.462	-0.528	(0)
S2-2	0.000e+000	0.000e+000	-81.950	-82.478	-0.528	(0)
S-2	0.000e+000	0.000e+000	-87.624	-87.995	-0.371	(0)
HgHS2-	0.000e+000	0.000e+000	-135.909	-136.041	-0.132	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.563	-136.563	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.304	-137.832	-0.528	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-145.565	-145.697	-0.132	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-146.032	-146.264	-0.232	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.521	-147.653	-0.132	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.620	-148.022	-0.402	(0)
CuS4S5-3	0.000e+000	0.000e+000	-148.372	-148.752	-0.380	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.373	-148.787	-0.414	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.560	-148.560	0.000	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.708	-149.098	-0.391	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-148.723	-148.723	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-149.354	-149.354	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.656	-156.656	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.661	-213.793	-0.132	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.760	-222.892	-0.132	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-224.303	-224.435	-0.132	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.427	-225.955	-0.528	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-225.533	-225.665	-0.132	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-232.098	-232.230	-0.132	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-299.323	-299.851	-0.528	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.436	-301.964	-0.528	(0)
Sb2S4-2	0.000e+000	0.000e+000	-313.030	-313.558	-0.528	(0)

S (6)	2.396e-002						
SO4-2	1.593e-002	6.665e-003	-1.798	-2.176	-0.378	(0)	
CaSO4	5.100e-003	5.100e-003	-2.292	-2.292	0.000	(0)	
MgSO4	2.433e-003	2.433e-003	-2.614	-2.614	0.000	(0)	
NaSO4-	3.225e-004	2.618e-004	-3.492	-3.582	-0.090	(0)	
KSO4-	1.429e-004	1.160e-004	-3.845	-3.936	-0.090	(0)	
MnSO4	2.673e-005	2.673e-005	-4.573	-4.573	0.000	(0)	
NH4SO4-	2.447e-006	1.977e-006	-5.611	-5.704	-0.093	(0)	
ZnSO4	1.017e-006	1.017e-006	-5.992	-5.992	0.000	(0)	
CuSO4	2.126e-007	2.126e-007	-6.672	-6.672	0.000	(0)	
Zn (SO4) 2-2	1.992e-007	5.907e-008	-6.701	-7.229	-0.528	(0)	
HSO4-	9.828e-008	7.889e-008	-7.008	-7.103	-0.095	(0)	
NiSO4	6.963e-008	6.963e-008	-7.157	-7.157	0.000	(0)	
CoSO4	4.652e-008	4.652e-008	-7.332	-7.332	0.000	(0)	
CdSO4	3.034e-009	3.034e-009	-8.518	-8.518	0.000	(0)	
PbSO4	1.300e-009	1.300e-009	-8.886	-8.886	0.000	(0)	
CrOHSO4	1.255e-009	1.255e-009	-8.901	-8.901	0.000	(0)	
Cd (SO4) 2-2	9.203e-010	2.728e-010	-9.036	-9.564	-0.528	(0)	
AgSO4-	7.371e-010	5.439e-010	-9.132	-9.264	-0.132	(0)	
Pb (SO4) 2-2	1.760e-010	5.219e-011	-9.754	-10.282	-0.528	(0)	
FeSO4	6.790e-011	6.790e-011	-10.168	-10.168	0.000	(0)	
AlSO4+	6.767e-011	5.431e-011	-10.170	-10.265	-0.095	(0)	
Ni (SO4) 2-2	5.184e-011	1.537e-011	-10.285	-10.813	-0.528	(0)	
CrSO4+	9.210e-012	6.796e-012	-11.036	-11.168	-0.132	(0)	
Al (SO4) 2-	4.833e-012	3.879e-012	-11.316	-11.411	-0.095	(0)	
UO2SO4	3.982e-012	3.982e-012	-11.400	-11.400	0.000	(0)	
UO2 (SO4) 2-2	1.180e-012	3.499e-013	-11.928	-12.456	-0.528	(0)	
VO2SO4-	2.200e-014	1.623e-014	-13.658	-13.790	-0.132	(0)	
VOSO4	3.064e-016	3.064e-016	-15.514	-15.514	0.000	(0)	
Cr2 (OH) 2SO4+2	3.036e-016	9.001e-017	-15.518	-16.046	-0.528	(0)	
FeSO4+	2.560e-016	2.068e-016	-15.592	-15.684	-0.093	(0)	
Fe (SO4) 2-	3.994e-017	2.947e-017	-16.399	-16.531	-0.132	(0)	
Cr2 (OH) 2 (SO4) 2	3.564e-017	3.564e-017	-16.448	-16.448	0.000	(0)	
HgSO4	3.801e-020	3.801e-020	-19.420	-19.420	0.000	(0)	
CrO3SO4-2	1.282e-023	3.800e-024	-22.892	-23.420	-0.528	(0)	
VSO4+	7.234e-030	5.338e-030	-29.141	-29.273	-0.132	(0)	
U (SO4) 2	3.820e-037	3.820e-037	-36.418	-36.418	0.000	(0)	
USO4+2	2.433e-038	7.214e-039	-37.614	-38.142	-0.528	(0)	
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-50.883	-51.015	-0.132	(0)	
Sb (3)	9.166e-020						
Sb (OH) 3	4.636e-020	4.636e-020	-19.334	-19.334	0.000	(0)	
HSbO2	4.529e-020	4.529e-020	-19.344	-19.344	0.000	(0)	
Sb (OH) 2F	8.542e-025	8.542e-025	-24.068	-24.068	0.000	(0)	
SbOF	8.407e-025	8.407e-025	-24.075	-24.075	0.000	(0)	
SbO2-	8.209e-025	6.057e-025	-24.086	-24.218	-0.132	(0)	
Sb (OH) 4-	4.695e-025	3.465e-025	-24.328	-24.460	-0.132	(0)	
Sb (OH) 2+	1.849e-025	1.365e-025	-24.733	-24.865	-0.132	(0)	
SbO+	6.382e-026	4.709e-026	-25.195	-25.327	-0.132	(0)	
Sb2S4-2	0.000e+000	0.000e+000	-313.030	-313.558	-0.528	(0)	
Sb (5)	7.629e-009						
SbO3-	7.621e-009	5.623e-009	-8.118	-8.250	-0.132	(0)	
Sb (OH) 6-	8.156e-012	6.559e-012	-11.089	-11.183	-0.095	(0)	
SbO2+	3.209e-023	2.368e-023	-22.494	-22.626	-0.132	(0)	
Se (-2)	1.626e-014						
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)	
HSe-	1.958e-039	1.445e-039	-38.708	-38.840	-0.132	(0)	
H2Se	0.000e+000	0.000e+000	-41.867	-41.867	0.000	(0)	
MnSe	0.000e+000	0.000e+000	-41.955	-41.955	0.000	(0)	
Se-2	0.000e+000	0.000e+000	-46.395	-46.923	-0.528	(0)	
AgOH (Se) 2-4	0.000e+000	0.000e+000	-83.716	-85.828	-2.112	(0)	
Se (4)	1.259e-007						
HSeO3-	1.164e-007	8.588e-008	-6.934	-7.066	-0.132	(0)	
SeO3-2	9.522e-009	2.823e-009	-8.021	-8.549	-0.528	(0)	
H2SeO3	4.437e-012	4.437e-012	-11.353	-11.353	0.000	(0)	
AgSeO3-	1.006e-014	7.420e-015	-13.998	-14.130	-0.132	(0)	
Cd (SeO3) 2-2	4.302e-020	1.276e-020	-19.366	-19.894	-0.528	(0)	
Ag (SeO3) 2-3	2.892e-021	1.876e-022	-20.539	-21.727	-1.188	(0)	
FeHSeO3+2	2.117e-021	6.275e-022	-20.674	-21.202	-0.528	(0)	

Se (6)	2.931e-011						
SeO4-2	2.923e-011	1.223e-011	-10.534	-10.913	-0.378	(0)	
MnSeO4	7.424e-014	7.424e-014	-13.129	-13.129	0.000	(0)	
ZnSeO4	1.322e-015	1.322e-015	-14.879	-14.879	0.000	(0)	
NiSeO4	2.995e-016	2.995e-016	-15.524	-15.524	0.000	(0)	
CoSeO4	2.144e-016	2.144e-016	-15.669	-15.669	0.000	(0)	
HSeO4-	1.006e-016	7.423e-017	-15.997	-16.129	-0.132	(0)	
CdSeO4	4.423e-018	4.423e-018	-17.354	-17.354	0.000	(0)	
Zn (SeO4) 2-2	5.528e-026	1.639e-026	-25.257	-25.785	-0.528	(0)	
U (3)	0.000e+000						
U+3	0.000e+000	0.000e+000	-56.029	-57.217	-1.188	(0)	
U (4)	1.072e-021						
U (OH) 5-	1.068e-021	7.879e-022	-20.972	-21.104	-0.132	(0)	
U (OH) 4	4.000e-024	4.000e-024	-23.398	-23.398	0.000	(0)	
U (OH) 3+	2.402e-027	1.773e-027	-26.619	-26.751	-0.132	(0)	
U (OH) 2+2	3.351e-031	9.936e-032	-30.475	-31.003	-0.528	(0)	
UF3+	1.351e-033	9.971e-034	-32.869	-33.001	-0.132	(0)	
UF2+2	2.181e-034	6.466e-035	-33.661	-34.189	-0.528	(0)	
UF4	1.064e-035	1.064e-035	-34.973	-34.973	0.000	(0)	
UOH+3	8.746e-036	5.673e-037	-35.058	-36.246	-1.188	(0)	
UF+3	8.138e-037	5.278e-038	-36.089	-37.278	-1.188	(0)	
U (SO4) 2	3.820e-037	3.820e-037	-36.418	-36.418	0.000	(0)	
UF5-	5.559e-038	4.102e-038	-37.255	-37.387	-0.132	(0)	
USO4+2	2.433e-038	7.214e-039	-37.614	-38.142	-0.528	(0)	
UF6-2	4.066e-039	1.205e-039	-38.391	-38.919	-0.528	(0)	
U+4	0.000e+000	0.000e+000	-40.454	-42.566	-2.112	(0)	
UC1+3	0.000e+000	0.000e+000	-42.367	-43.555	-1.188	(0)	
U6 (OH) 15+9	0.000e+000	0.000e+000	-158.110	-168.803	-10.692	(0)	
U (5)	4.546e-016						
UO2+	4.546e-016	3.354e-016	-15.342	-15.474	-0.132	(0)	
U (6)	3.038e-007						
UO2 (CO3) 3-4	1.982e-007	1.531e-009	-6.703	-8.815	-2.112	(0)	
UO2 (CO3) 2-2	1.040e-007	3.082e-008	-6.983	-7.511	-0.528	(0)	
UO2CO3	1.558e-009	1.558e-009	-8.807	-8.807	0.000	(0)	
UO2F+	7.185e-012	5.302e-012	-11.144	-11.276	-0.132	(0)	
UO2OH+	5.594e-012	4.128e-012	-11.252	-11.384	-0.132	(0)	
UO2SO4	3.982e-012	3.982e-012	-11.400	-11.400	0.000	(0)	
UO2F2	1.488e-012	1.488e-012	-11.827	-11.827	0.000	(0)	
UO2 (SO4) 2-2	1.180e-012	3.499e-013	-11.928	-12.456	-0.528	(0)	
UO2+2	9.436e-013	3.947e-013	-12.025	-12.404	-0.378	(0)	
UO2F3-	4.928e-014	3.637e-014	-13.307	-13.439	-0.132	(0)	
UO2Cl+	1.774e-015	1.309e-015	-14.751	-14.883	-0.132	(0)	
(UO2) 2 (OH) 2+2	9.539e-017	2.828e-017	-16.021	-16.549	-0.528	(0)	
UO2F4-2	9.481e-017	2.811e-017	-16.023	-16.551	-0.528	(0)	
(UO2) 3 (OH) 5+	8.281e-019	6.110e-019	-18.082	-18.214	-0.132	(0)	
UO2NO3+	2.549e-020	1.881e-020	-19.594	-19.726	-0.132	(0)	
V (2)	8.126e-040						
VOH+	4.219e-040	3.113e-040	-39.375	-39.507	-0.132	(0)	
V+2	3.907e-040	1.158e-040	-39.408	-39.936	-0.528	(0)	
V (3)	7.843e-013						
V (OH) 3	7.843e-013	7.843e-013	-12.106	-12.106	0.000	(0)	
V (OH) 2+	8.325e-023	6.143e-023	-22.080	-22.212	-0.132	(0)	
VOH+2	2.382e-025	7.063e-026	-24.623	-25.151	-0.528	(0)	
V+3	2.616e-029	1.696e-030	-28.582	-29.770	-1.188	(0)	
VSO4+	7.234e-030	5.338e-030	-29.141	-29.273	-0.132	(0)	
V2 (OH) 2+4	0.000e+000	0.000e+000	-47.390	-49.502	-2.112	(0)	
V2 (OH) 3+3	0.000e+000	0.000e+000	-47.723	-48.911	-1.188	(0)	
V (4)	4.752e-015						
V (OH) 3+	3.746e-015	2.764e-015	-14.426	-14.558	-0.132	(0)	
VO+2	5.630e-016	1.669e-016	-15.249	-15.777	-0.528	(0)	
VOSO4	3.064e-016	3.064e-016	-15.514	-15.514	0.000	(0)	
VOF+	1.320e-016	9.742e-017	-15.879	-16.011	-0.132	(0)	
VOF2	3.554e-018	3.554e-018	-17.449	-17.449	0.000	(0)	
VOC1+	1.298e-018	9.578e-019	-17.887	-18.019	-0.132	(0)	
VOF3-	1.663e-020	1.227e-020	-19.779	-19.911	-0.132	(0)	
VOF4-2	1.626e-023	4.820e-024	-22.789	-23.317	-0.528	(0)	
H2V2O4+2	1.294e-024	3.836e-025	-23.888	-24.416	-0.528	(0)	
V (5)	4.987e-007						

H2VO4-	4.713e-007	3.478e-007	-6.327	-6.459	-0.132	(0)
HVO4-2	2.433e-008	7.214e-009	-7.614	-8.142	-0.528	(0)
H3V2O7-	1.283e-009	9.468e-010	-8.892	-9.024	-0.132	(0)
H3VO4	4.212e-010	4.212e-010	-9.376	-9.376	0.000	(0)
HV2O7-3	1.312e-011	8.510e-013	-10.882	-12.070	-1.188	(0)
V3O9-3	6.812e-013	4.418e-014	-12.167	-13.355	-1.188	(0)
VO2+	1.268e-013	1.020e-013	-12.897	-12.992	-0.095	(0)
V2O7-4	2.448e-014	1.891e-016	-13.611	-15.723	-2.112	(0)
VO2SO4-	2.200e-014	1.623e-014	-13.658	-13.790	-0.132	(0)
VO2F	1.740e-014	1.740e-014	-13.759	-13.759	0.000	(0)
VO4-3	4.603e-015	2.985e-016	-14.337	-15.525	-1.188	(0)
VO2F2-	8.332e-016	6.148e-016	-15.079	-15.211	-0.132	(0)
V4O12-4	8.300e-016	6.412e-018	-15.081	-17.193	-2.112	(0)
VO2F3-2	2.517e-018	7.462e-019	-17.599	-18.127	-0.528	(0)
VO2NO3	1.232e-021	1.232e-021	-20.909	-20.909	0.000	(0)
VO2F4-3	5.509e-022	3.573e-023	-21.259	-22.447	-1.188	(0)
V10O28-6	2.563e-039	0.000e+000	-38.591	-43.343	-4.752	(0)
HV10O28-5	1.685e-039	0.000e+000	-38.773	-42.073	-3.300	(0)
H2V10O28-4	0.000e+000	0.000e+000	-41.671	-43.783	-2.112	(0)
Zn	3.015e-006					
Zn+2	1.668e-006	6.977e-007	-5.778	-6.156	-0.378	(0)
ZnSO4	1.017e-006	1.017e-006	-5.992	-5.992	0.000	(0)
Zn (SO4) 2-2	1.992e-007	5.907e-008	-6.701	-7.229	-0.528	(0)
ZnHCO3+	7.658e-008	5.651e-008	-7.116	-7.248	-0.132	(0)
ZnCO3	3.980e-008	3.980e-008	-7.400	-7.400	0.000	(0)
ZnOH+	7.854e-009	5.796e-009	-8.105	-8.237	-0.132	(0)
ZnCl+	4.497e-009	3.584e-009	-8.347	-8.446	-0.099	(0)
ZnF+	1.836e-009	1.355e-009	-8.736	-8.868	-0.132	(0)
ZnOHC1	3.898e-010	3.898e-010	-9.409	-9.409	0.000	(0)
Zn (OH) 2	7.630e-011	7.630e-011	-10.117	-10.117	0.000	(0)
ZnCl2	1.162e-011	1.162e-011	-10.935	-10.935	0.000	(0)
ZnNO3+	5.673e-014	4.186e-014	-13.246	-13.378	-0.132	(0)
Zn (OH) 3-	4.305e-014	3.176e-014	-13.366	-13.498	-0.132	(0)
ZnCl3-	2.368e-014	1.888e-014	-13.626	-13.724	-0.099	(0)
ZnSeO4	1.322e-015	1.322e-015	-14.879	-14.879	0.000	(0)
ZnCl4-2	4.530e-017	1.930e-017	-16.344	-16.714	-0.371	(0)
Zn (OH) 4-2	3.543e-019	1.050e-019	-18.451	-18.979	-0.528	(0)
Zn (NO3) 2	1.995e-022	1.995e-022	-21.700	-21.700	0.000	(0)
Zn (SeO4) 2-2	5.528e-026	1.639e-026	-25.257	-25.785	-0.528	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.521	-147.653	-0.132	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.560	-148.560	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.760	-222.892	-0.132	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.427	-225.955	-0.528	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.436	-301.964	-0.528	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-46.43	-40.14	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-34.78	-30.27	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-42.01	-30.27	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-60.65	-42.71	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-47.95	-27.91	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-25.92	-25.52	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-20.48	-20.03	0.45	(NH4) 2SeO4
Acanthite	-51.25	-87.47	-36.22	Ag2S
Ag2CO3	-11.69	-22.78	-11.09	Ag2CO3
Ag2CrO4	-21.59	-33.18	-11.59	Ag2CrO4
Ag2HVO4	-10.50	-9.02	1.48	Ag2HVO4
Ag2MoO4	-11.45	-23.00	-11.55	Ag2MoO4
Ag2O	-15.52	-2.94	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.13	-18.95	-4.82	Ag2SO4
Ag3AsO3	-26.72	-24.56	2.16	Ag3AsO3
Ag3AsO4	-15.13	-17.91	-2.79	Ag3AsO4

Ag3H2VO5	-15.67	-10.49	5.18	Ag3H2VO5
AgF:4H2O	-13.45	-12.40	1.05	AgF:4H2O
Agmetal	-0.74	-14.24	-13.51	Ag
AgVO3	-8.32	-7.55	0.77	AgVO3
Al (OH) 3 (am)	-2.03	8.77	10.80	Al (OH) 3
Al2 (MoO4) 3	-44.99	-42.62	2.37	Al2 (MoO4) 3
Al2O3	-2.11	17.54	19.65	Al2O3
Al4 (OH) 10SO4	-3.63	19.07	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.53	-4.73	4.80	AlAsO4:2H2O
AlOHSO4	-4.01	-7.24	-3.23	AlOHSO4
AlSb	-152.82	-87.20	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.79	-11.58	-7.79	PbSO4
Anhydrite	-0.29	-4.65	-4.36	CaSO4
Anilite	-55.56	-87.44	-31.88	Cu0.25Cu1.5S
Antlerite	-3.87	4.92	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-77.82	-80.58	-2.76	As4O6
Artinite	-7.17	2.43	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-33.70	-27.00	6.71	As2O5
Atacamite	-3.04	4.35	7.39	Cu2 (OH) 3Cl
Azurite	-1.84	-18.74	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-18.37	6.03	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-15.96	-0.09	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.00	5.94	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-14.54	-24.21	-9.67	BaCrO4
BaF2	-10.01	-15.83	-5.82	BaF2
BaMoO4	-7.06	-14.02	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.78	-7.95	1.83	BaSeO3
BaSeO4	-11.26	-18.72	-7.46	BaSeO4
Bianchite	-6.57	-8.33	-1.76	ZnSO4:6H2O
Birnessite	-8.71	9.38	18.09	MnO2
Bixbyite	-6.14	-6.78	-0.64	Mn2O3
BlaubleiI	-54.71	-78.87	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.55	-82.83	-27.28	Cu0.6Cu0.8S
Boehmite	0.19	8.77	8.58	AlOOH
Breithauptite	-58.12	-76.64	-18.52	NiSb
Brochantite	-3.32	11.90	15.22	Cu4 (OH) 6SO4
Brucite	-5.71	11.14	16.84	Mg (OH) 2
Bunsenite	-5.89	6.55	12.45	NiO
Ca (VO3) 2	-6.45	-0.79	5.66	Ca (VO3) 2
Ca2V2O7	-6.94	10.56	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.99	10.56	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.23	7.07	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.04	21.92	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-17.94	21.92	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.84	-157.86	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-7.71	-25.62	-17.91	Hg2Cl2
CaMoO4	-0.75	-8.70	-7.95	CaMoO4
Carnotite	-0.57	-0.34	0.23	KUO2VO4
CaSeO3:2H2O	-5.44	-2.63	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.37	-13.39	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.83	-3.99	9.84	Cd (BO2) 2
Cd (OH) 2	-8.52	5.12	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-8.61	5.12	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.36	-16.65	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-23.21	-0.65	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-23.92	4.48	28.40	Cd4 (OH) 6SO4
CdCl2	-13.43	-14.09	-0.66	CdCl2
CdCl2:1H2O	-12.40	-14.09	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.18	-14.09	-1.91	CdCl2:2.5H2O
CdF2	-15.52	-16.74	-1.21	CdF2
Cdmetal (alpha)	-33.94	-20.42	13.51	Cd

Cdmetal (gamma)	-34.04	-20.42	13.62	Cd
CdMoO4	-0.78	-14.93	-14.15	CdMoO4
CdOHCl	-8.02	-4.48	3.54	CdOHCl
CdSb	-77.72	-78.07	-0.35	CdSb
CdSe	-20.44	-40.64	-20.20	CdSe
CdSeO4:2H2O	-17.78	-19.63	-1.85	CdSeO4:2H2O
CdSO4	-10.72	-10.89	-0.17	CdSO4
CdSO4:1H2O	-9.16	-10.89	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.02	-10.89	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.33	-11.08	-9.75	AgCl
Cerrusite	-2.27	-15.40	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.39	-9.03	-2.64	CuSO4:5H2O
Chalcocite	-55.82	-90.74	-34.92	Cu2S
Chalcopyrite	-123.36	-158.63	-35.27	CuFeS2
Cinnabar	-50.86	-96.55	-45.69	HgS
Claudetite	-77.52	-80.58	-3.06	As4O6
Clausthalite	-14.22	-41.32	-27.10	PbSe
Co (BO2) 2	-29.81	-2.74	27.07	Co (BO2) 2
Co (OH) 2	-6.72	6.38	13.09	Co (OH) 2
Co (OH) 3	-10.94	-13.25	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-20.90	-7.87	13.03	Co3 (AsO4) 2
Co3O4	-9.63	-20.12	-10.50	Co3O4
CoCl2	-21.10	-12.83	8.27	CoCl2
CoCl2:6H2O	-15.37	-12.84	2.54	CoCl2:6H2O
CoCO3	-3.48	-13.46	-9.98	CoCO3
CoF2	-13.88	-15.48	-1.60	CoF2
CoF3	-44.58	-46.04	-1.46	CoF3
CoFe2O4	16.29	12.76	-3.53	CoFe2O4
CoMoO4	-5.92	-13.68	-7.76	CoMoO4
CoO	-7.21	6.38	13.59	CoO
CoS (alpha)	-70.71	-78.15	-7.44	CoS
CoS (beta)	-67.08	-78.15	-11.07	CoS
CoSe	-23.18	-39.38	-16.20	CoSe
CoSeO3	-8.93	-7.61	1.32	CoSeO3
CoSeO4:6H2O	-16.84	-18.37	-1.53	CoSeO4:6H2O
CoSO4	-12.43	-9.63	2.80	CoSO4
CoSO4:6H2O	-7.16	-9.63	-2.47	CoSO4:6H2O
Cotunnite	-10.00	-14.78	-4.78	PbCl2
Covellite	-55.25	-77.55	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-44.31	-30.22	14.09	CrCl2
CrCl3	-45.11	-30.00	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.62	-42.46	-33.84	Na3AlF6
Cu (OH) 2	-1.70	6.98	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.81	19.40	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.84	-0.59	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.21	-92.10	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.17	-51.97	-45.80	Cu2Se
Cu2SO4	-20.27	-22.22	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.17	-6.07	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.69	-105.28	-42.59	Cu3Sb
Cu3Se2	-27.26	-90.75	-63.49	Cu3Se2
CuCO3	-1.36	-12.86	-11.50	CuCO3
CuCrO4	-17.82	-23.26	-5.44	CuCrO4
CuF	-9.13	-14.03	-4.91	CuF
CuF2	-15.99	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.12	-15.88	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-12.36	-2.06	10.30	CuOCuSO4

Cupricferrite	7.37	13.36	5.99	CuFe2O4
Cuprite	-4.80	-6.21	-1.41	Cu2O
Cuprousferrite	9.00	0.09	-8.92	CuFeO2
CuSe	-5.68	-38.78	-33.10	CuSe
CuSe2	-25.63	-58.99	-33.37	CuSe2
CuSeO3:2H2O	-7.52	-7.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.33	-17.77	-2.44	CuSeO4:5H2O
CuSO4	-11.97	-9.03	2.94	CuSO4
Diaspore	1.90	8.77	6.87	AlOOH
Djurleite	-55.95	-89.87	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.64	-17.18	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.09	-17.18	-17.09	CaMg(CO3)2
Epsomite	-2.75	-4.88	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.35	0.31	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.98	-8.70	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.15	-7.60	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-14.94	-35.57	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.91	-41.65	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.71	-10.31	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-6.51	-16.60	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-43.92	-62.52	-18.60	FeSe2
FeS(ppt)	-78.13	-81.08	-2.95	FeS
FeSe	-31.31	-42.31	-11.00	FeSe
Fix_pe	-5.86	-5.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.13	-80.10	-13.97	PbS
Gibbsite	0.48	8.77	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.32	-8.34	-2.01	ZnSO4:7H2O
Greenockite	-65.05	-79.41	-14.36	CdS
Greigite	-283.24	-328.28	-45.03	Fe3S4
Gummite	-6.24	1.43	7.67	UO3
Gypsum	-0.04	-4.65	-4.61	CaSO4:2H2O
H-Jarosite	-10.35	-22.45	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.18	-20.05	-12.88	H2MoO4
H2S(g)	-76.52	-84.53	-8.01	H2S
H2Se(g)	-40.80	-45.76	-4.96	H2Se
Halite	-6.43	-4.83	1.60	NaCl
Hausmannite	-7.93	53.10	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.90	20.99	22.89	FeAl2O4
Hg(CH3)2(g)	-182.35	-256.06	-73.71	Hg(CH3)2
Hg(g)	-8.10	-15.97	-7.87	Hg
Hg(OH)2	-8.53	-12.02	-3.50	Hg(OH)2
Hg2(g)	-16.99	-31.95	-14.96	Hg2
Hg2(OH)2	-11.67	-6.41	5.26	Hg2(OH)2
Hg2CO3	-10.19	-26.24	-16.05	Hg2CO3
Hg2CrO4	-27.94	-36.64	-8.70	Hg2CrO4
Hg2F2	-17.90	-28.26	-10.36	Hg2F2
Hg2S	-79.26	-90.93	-11.68	Hg2S
Hg2SeO3	-15.73	-20.39	-4.66	Hg2SeO3
Hg2SO4	-16.28	-22.41	-6.13	Hg2SO4
Hg3O2CO3	-26.22	-55.90	-29.68	Hg3O2CO3
HgCl(g)	-32.30	-12.81	19.50	HgCl
HgCl2	-9.97	-31.23	-21.26	HgCl2
HgF(g)	-46.81	-14.13	32.68	HgF
HgF2(g)	-46.44	-33.88	12.57	HgF2
Hgmetal(l)	-2.52	-15.97	-13.45	Hg
HgSe	-2.09	-57.78	-55.69	HgSe
HgSeO3	-13.58	-26.01	-12.43	HgSeO3
HgSO4	-18.61	-28.03	-9.42	HgSO4
Huntite	-4.62	-34.58	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.60	-26.37	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.91	-23.67	-8.77	Mg5(CO3)4(OH)2:4H2O

K-Alum	-13.78	-18.95	-5.17	KAl (SO ₄) ₂ ·12H ₂ O
K-Jarosite	-3.34	-18.14	-14.80	KFe ₃ (SO ₄) ₂ (OH) 6
K ₂ Cr ₂ O ₇	-34.62	-51.86	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-21.11	-21.62	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-14.70	-11.44	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-15.40	-16.13	-0.73	K ₂ SeO ₄
Langite	-5.59	11.90	17.49	Cu ₄ (OH) 6SO ₄ ·H ₂ O
Larnakite	-6.71	-7.14	-0.43	PbO:PbSO ₄
Laurionite	-5.80	-5.17	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-8.26	4.43	12.69	PbO
Mackinawite	-77.48	-81.08	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	0.66	17.52	16.86	Fe ₂ MgO ₄
Magnesite	-1.24	-8.70	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	-0.58	-5.88	-5.31	Cu ₂ (OH) 2CO ₃
Manganite	-3.38	21.96	25.34	MnOOH
Massicot	-8.46	4.43	12.89	PbO
Matlockite	-7.13	-16.10	-8.97	PbClF
Melanothallite	-18.49	-12.23	6.26	CuCl ₂
Melanterite	-10.35	-12.56	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.46	-96.55	-45.09	HgS
Mg (OH) 2 (active)	-7.66	11.14	18.79	Mg (OH) 2
Mg (VO ₃) 2	-12.29	-1.01	11.28	Mg (VO ₃) 2
Mg ₂ Sb ₃	-276.45	-201.77	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.24	10.12	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.42	8.78	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.48	-19.10	5.38	MgCrO ₄
MgF ₂	-2.59	-10.72	-8.13	MgF ₂
MgMoO ₄	-7.07	-8.92	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.90	-2.85	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-12.41	-13.61	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-34.68	38.84	73.52	Pb ₃ O ₄
Mirabilite	-5.34	-6.45	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn (VO ₃) 2	-7.86	-2.96	4.90	Mn (VO ₃) 2
Mn ₂ (SO ₄) 3	-49.10	-54.81	-5.71	Mn ₂ (SO ₄) 3
Mn ₂ Sb	-151.45	-90.37	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) 2·8H ₂ O	-11.94	0.56	12.50	Mn ₃ (AsO ₄) 2·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.74	-10.03	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.51	-75.34	0.17	MnS
MnS (pnk)	-78.68	-75.34	3.34	MnS
MnSb	-96.45	-99.36	-2.91	MnSb
MnSe	-40.07	-36.57	3.50	MnSe
MnSeO ₃	-5.93	-4.80	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.78	-4.80	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.51	-15.56	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.41	-6.82	2.58	MnSO ₄
Monteponite	-9.98	5.12	15.10	CdO
Montroydite	-8.38	-12.02	-3.64	HgO
MoO ₃	-12.05	-20.05	-8.00	MoO ₃
Morenosite	-7.32	-9.46	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-144.39	-214.65	-70.26	MoS ₂
Na-Jarosite	-6.46	-17.66	-11.20	NaFe ₃ (SO ₄) ₂ (OH) 6
Na ₂ Cr ₂ O ₇	-41.02	-50.91	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.61	-20.68	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-13.95	-30.54	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.98	-10.49	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.72	-10.49	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.72	-4.42	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-16.46	-15.18	1.28	Na ₂ SeO ₄
Na ₃ Sb	-176.08	-81.62	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.41	8.27	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-30.43	6.97	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.98	-12.71	-6.73	CuCl
NaSb	-88.81	-65.64	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na ₂ CO ₃ ·10H ₂ O

NaVO3	-5.15	-1.29	3.86	NaVO3
Nesquehonite	-4.03	-8.70	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.24	6.55	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.04	-7.34	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-21.80	10.20	32.00	Ni4 (OH) 6SO4
NiCO3	-6.41	-13.28	-6.87	NiCO3
NiMoO4	-2.36	-13.50	-11.14	NiMoO4
NiS (alpha)	-72.38	-77.98	-5.60	NiS
NiS (beta)	-66.88	-77.98	-11.10	NiS
NiS (gamma)	-65.18	-77.98	-12.80	NiS
NiSe	-21.50	-39.20	-17.70	NiSe
NiSeO3:2H2O	-10.25	-7.43	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.68	-18.20	-1.52	NiSeO4:6H2O
Nsutite	-8.12	9.38	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-232.81	-293.88	-61.07	As2S3
Otavite	-2.72	-14.72	-12.00	CdCO3
Pb (BO2) 2	-11.20	-4.68	6.52	Pb (BO2) 2
Pb (OH) 2	-3.72	4.43	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-65.93	-74.69	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-9.53	-0.74	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.32	8.87	26.19	Pb2O (OH) 2
Pb2O3	-26.63	34.41	61.04	Pb2O3
Pb2OCO3	-10.41	-10.97	-0.56	Pb2OCO3
Pb2V2O7	-1.38	-3.28	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.50	-13.70	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.99	1.15	6.14	Pb3 (VO4) 2
Pb3O2CO3	-17.56	-6.54	11.02	Pb3O2CO3
Pb3O2SO4	-13.40	-2.71	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-19.38	1.72	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-20.15	1.72	21.88	Pb4O3SO4
PbCrO4	-13.20	-25.80	-12.60	PbCrO4
PbF2	-9.98	-17.42	-7.44	PbF2
Pbmetal	-25.36	-21.11	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-8.55	4.43	12.98	PbO:0.33H2O
PbSeO4	-13.47	-20.31	-6.84	PbSeO4
Periclase	-10.45	11.14	21.58	MgO
Phosgenite	-10.37	-30.18	-19.81	PbCl2:PbCO3
Plattnerite	-19.62	29.98	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca (OH) 2
Pyrite	-121.55	-140.06	-18.51	FeS2
Pyrochroite	-6.01	9.19	15.19	Mn (OH) 2
Pyrolusite	-6.65	34.73	41.38	MnO2
Realgar	-97.70	-117.45	-19.75	AsS
Retgersite	-7.42	-9.46	-2.04	NiSO4:6H2O
Rhodochrosite	-0.07	-10.65	-10.58	MnCO3
Rutherfordine	-3.91	-18.41	-14.50	UO2CO3
Sb (OH) 3	-12.22	-19.33	-7.11	Sb (OH) 3
Sb2O4	-16.52	-13.12	3.40	Sb2O4
Sb2O5	-26.53	-36.20	-9.67	Sb2O5
Sb2Se3	-108.18	-175.94	-67.76	Sb2Se3
Sb4O6 (cubic)	-59.07	-77.33	-18.26	Sb4O6
Sb4O6 (orth)	-59.43	-77.33	-17.90	Sb4O6
SbCl3	-48.72	-48.15	0.57	SbCl3
SbF3	-41.89	-52.12	-10.23	SbF3
Sbmetal	-45.96	-57.65	-11.69	Sb
SbO2	-3.05	-30.87	-27.82	SbO2
Schoepite	-4.57	1.43	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.10	-20.21	-7.11	Se
Semetal (hex)	-12.50	-20.21	-7.71	Se
Senarmontite	-26.30	-38.67	-12.37	Sb2O3
SeO2	-14.11	-13.98	0.12	SeO2
SeO3	-45.79	-24.75	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-2.16	-12.16	-10.00	ZnCO3
Sphalerite	-65.40	-76.85	-11.45	ZnS
Spinel	-8.17	28.68	36.85	MgAl2O4

Stibnite	-241.79	-292.25	-50.46	Sb2S3
Sulfur	-56.84	-58.98	-2.14	S
Tenorite	-0.67	6.98	7.64	CuO
Thenardite	-6.77	-6.45	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3:H2O
Tyuyamunite	-2.01	2.07	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.69	6.39	21.08	U3O8
U3Sb4	-580.95	-428.57	152.38	U3Sb4
U4O9	-31.03	-34.05	-3.02	U4O9
UF4	-29.08	-58.61	-29.54	UF4
UF4:2.5H2O	-25.90	-58.61	-32.72	UF4:2.5H2O
UO2 (am)	-15.83	-14.90	0.93	UO2
UO2 (NO3) 2	-39.80	-27.65	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-32.50	-27.65	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.04	-27.65	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-29.70	-27.65	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.18	1.43	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.07	-23.32	-2.25	UO2SeO4:4H2O
UO3	-6.27	1.43	7.70	UO3
Uraninite	-10.23	-14.90	-4.67	UO2
USb2	-220.08	-190.51	29.58	USb2
V (OH) 3	-16.61	-9.02	7.59	V (OH) 3
V2O5	-10.79	-12.15	-1.36	V2O5
V3O5	-33.21	-31.38	1.84	V3O5
V4O7	-40.51	-33.32	7.19	V4O7
V6O13	-26.68	-87.54	-60.86	V6O13
Valentinite	-30.19	-38.67	-8.48	Sb2O3
VC12	-59.88	-41.00	18.87	VC12
VC13	-61.27	-37.84	23.43	VC13
VF4	-60.59	-45.66	14.93	VF4
Vmetal	-91.36	-47.34	44.03	V
VO	-36.55	-21.79	14.76	VO
VO (OH) 2	-7.10	-1.94	5.15	VO (OH) 2
VO2Cl	-18.52	-15.68	2.84	VO2Cl
VOC1	-29.78	-18.63	11.15	VOC1
VOC12	-33.92	-21.16	12.76	VOC12
VOSO4	-21.56	-17.95	3.61	VOSO4
Witherite	-5.24	-13.81	-8.57	BaCO3
Wurtzite	-67.90	-76.85	-8.95	ZnS
Zincite	-3.66	7.68	11.33	ZnO
Zincosite	-12.26	-8.33	3.93	ZnSO4
Zn (BO2) 2	-9.73	-1.44	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.72	-21.40	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-4.52	7.68	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.80	7.68	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.08	7.68	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.86	7.68	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.06	7.68	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.16	-0.66	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.44	5.75	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.62	-3.97	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-27.90	-8.99	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.70	14.70	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-19.33	19.17	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.58	-11.53	7.05	ZnCl2
ZnCO3:1H2O	-1.90	-12.16	-10.26	ZnCO3:1H2O
ZnF2	-13.65	-14.18	-0.53	ZnF2
Znmetal	-43.66	-17.87	25.79	Zn
ZnMoO4	-2.25	-12.38	-10.13	ZnMoO4
ZnO (active)	-3.51	7.68	11.19	ZnO
ZnS (am)	-67.80	-76.85	-9.05	ZnS
ZnSb	-86.53	-75.52	11.01	ZnSb
ZnSe	-23.68	-38.08	-14.40	ZnSe
ZnSeO4:6H2O	-15.55	-17.07	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.69	-8.33	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 16.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 101
Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
Hfo_wOH Ferrihydrite equilibrium_phase 0.2
donnan 1e-008
USE EQUILIBRIUM_PHASES 101
USE Surface 101
USE Solution 103
SAVE Solution 104 #Initial groundwater after Mineral Precipitation and
Sorption Loss
END

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 103. Solution after simulation 15.

Using surface 101.

Using pure phase assemblage 101. Pure-phase assemblage after simulation 15.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.866e-008	2.796e-008	-7.010e-010
Alunite	-0.00	-1.40	-1.40	3.769e-006	3.769e-006	-4.098e-012
Anhydrite	-0.29	-4.65	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	0.00	-8.91	-8.91	4.643e-008	1.408e-008	-3.235e-008
Barite	0.00	-9.98	-9.98	2.770e-006	2.867e-006	9.703e-008
Brochantite	-4.23	10.99	15.22	0.000e+000	0	0.000e+000
Brucite	-5.71	11.14	16.84	0.000e+000	0	0.000e+000
CO2(g)	-1.69	-19.84	-18.15	1.001e+001	1.001e+001	2.919e-007
CaMoO4	-0.56	-8.51	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-5.49	-2.67	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	1.145e-002	1.145e-002	-1.202e-008
Carnotite	-0.89	-0.66	0.23	0.000e+000	0	0.000e+000
Cd(BO2)2	-13.83	-3.99	9.84	0.000e+000	0	0.000e+000
CdMoO4	-0.60	-14.75	-14.15	0.000e+000	0	0.000e+000
Chrysotile		Element not present.		0.000e+000	0	0.000e+000
Cr2O3	0.00	-2.36	-2.36	5.626e-008	2.031e-009	-5.423e-008
Cu2Se(alpha)	-6.67	-52.47	-45.80	0.000e+000	0	0.000e+000
CuMoO4	-0.05	-13.12	-13.08	7.281e-007	0	-7.281e-007
Epsomite	-2.75	-4.88	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	0.00	3.19	3.19	2.697e-005	2.697e-005	-6.761e-013
Fluorite	0.00	-10.50	-10.50	8.168e-004	8.168e-004	-5.360e-010
Gummite	-6.24	1.43	7.67	0.000e+000	0	0.000e+000
Gypsum	-0.04	-4.65	-4.61	0.000e+000	0	0.000e+000
HgSe	-2.13	-57.82	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2		Element not present.		0.000e+000	0	0.000e+000
Mirabilite	-5.34	-6.45	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-5.97	-4.84	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-6.24	6.55	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2:8H2O	-23.05	-7.35	15.70	0.000e+000	0	0.000e+000

NiCO3	-6.42	-13.29	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-2.18	-13.32	-11.14	0.000e+000	0	0.000e+000
O2(g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-1.116e-009
Otavite	-2.72	-14.72	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	1.638e-008	1.297e-008	-3.414e-009
Rutherfordine	-3.91	-18.41	-14.50	0.000e+000	0	0.000e+000
SbO2	-3.05	-30.87	-27.82	0.000e+000	0	0.000e+000
Schoepite	-4.57	1.43	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2(am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-2.65	1.43	4.08	0.000e+000	0	0.000e+000
U3O8	-14.69	6.39	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-4.18	1.43	5.61	0.000e+000	0	0.000e+000
UO3	-6.27	1.43	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-2.07	-12.20	-10.13	0.000e+000	0	0.000e+000

-----Surface composition-----

Hfo

```

-3.636e-018  Surface + diffuse layer charge, eq
 3.313e-007  Surface charge, eq
 1.846e-002  sigma, C/m**2
 2.957e-002  psi, V
-1.151e+000  -F*psi/RT
 3.163e-001  exp(-F*psi/RT)
 6.420e+004  specific area, m**2/mol Ferrihydrite
 1.732e+000  m**2 for 2.697e-005 moles of Ferrihydrite

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Water in diffuse layer: 1.732e-005 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation

Element	Moles
Ag	4.9500e-013
Al	4.4122e-012
As	1.4573e-013
B	4.7600e-010
Ba	4.9892e-013
C	7.9236e-008
Ca	1.9594e-007
Cd	1.4313e-013
Cl	5.0645e-008
Co	2.5094e-012
Cr	2.2533e-013
Cu	1.3929e-011
F	2.9004e-009
Fe	9.9408e-014
H	9.4907e-008
Hg	7.0544e-015
K	4.8871e-008
Mg	1.0633e-007
Mn	1.4827e-009
Mo	5.0163e-011
N	1.2296e-009
Na	1.4356e-007
Ni	3.2156e-012
O	2.2612e-006
Pb	5.1098e-014
S	5.0513e-007
Sb	1.5192e-013
Se	2.2861e-012
U	8.4122e-012
V	4.7954e-012
Zn	4.5621e-011

Hfo_s

1.349e-007 moles [0.005 mol/(mol Ferrihydrite)]
Mole

Log

Species	Moles	Fraction	Molality	Molality
Hfo_sOCrOH+	1.085e-007	0.804	1.117e-007	-6.952
Hfo_sOCu+	1.623e-008	0.120	1.672e-008	-7.777
Hfo_sOHCa+2	3.025e-009	0.022	3.116e-009	-8.506
Hfo_sOPb+	2.966e-009	0.022	3.055e-009	-8.515
Hfo_sOMn+	2.274e-009	0.017	2.342e-009	-8.630
Hfo_sOZn+	1.710e-009	0.013	1.762e-009	-8.754
Hfo_sOH	9.701e-011	0.001	9.993e-011	-10.000
Hfo_sOH2+	7.245e-011	0.001	7.463e-011	-10.127
Hfo_sONi+	3.099e-011	0.000	3.193e-011	-10.496
Hfo_sOCu+	3.070e-012	0.000	3.163e-012	-11.500
Hfo_sO-	2.976e-012	0.000	3.065e-012	-11.514
Hfo_sOCd+	1.450e-012	0.000	1.494e-012	-11.826
Hfo_sOAg	6.575e-014	0.000	6.773e-014	-13.169
Hfo_sOFe+	5.269e-014	0.000	5.427e-014	-13.265
Hfo_sOHBa+2	4.397e-014	0.000	4.529e-014	-13.344
Hfo_sOHg+	3.144e-016	0.000	3.239e-016	-15.490

Hfo_w

5.395e-006 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH	1.496e-006	0.277	1.541e-006	-5.812
Hfo_wOCu+	1.283e-006	0.238	1.322e-006	-5.879
Hfo_wOH2+	1.117e-006	0.207	1.151e-006	-5.939
Hfo_wOHSO4-2	6.144e-007	0.114	6.329e-007	-6.199
Hfo_wOHVO4-3	2.520e-007	0.047	2.596e-007	-6.586
Hfo_wSO4-	2.302e-007	0.043	2.371e-007	-6.625
Hfo_wOMg+	1.968e-007	0.036	2.027e-007	-6.693
Hfo_wOHasO4-3	6.387e-008	0.012	6.580e-008	-7.182
Hfo_wO-	4.587e-008	0.009	4.725e-008	-7.326
Hfo_wOMn+	2.785e-008	0.005	2.868e-008	-7.542
Hfo_wOZn+	2.761e-008	0.005	2.844e-008	-7.546
Hfo_wOCa+	1.843e-008	0.003	1.898e-008	-7.722
Hfo_wSeO3-	7.143e-009	0.001	7.358e-009	-8.133
Hfo_wOHSeO3-2	5.627e-009	0.001	5.796e-009	-8.237
Hfo_wOHMoO4-2	3.437e-009	0.001	3.541e-009	-8.451
Hfo_wOPb+	2.042e-009	0.000	2.104e-009	-8.677
Hfo_wMoO4-	1.659e-009	0.000	1.709e-009	-8.767
Hfo_wHAsO4-	7.984e-010	0.000	8.224e-010	-9.085
Hfo_wONi+	6.446e-010	0.000	6.640e-010	-9.178
Hfo_wH2BO3	1.727e-010	0.000	1.779e-010	-9.750
Hfo_wOCu+	1.334e-010	0.000	1.374e-010	-9.862
Hfo_wH2AsO4	1.929e-011	0.000	1.988e-011	-10.702
Hfo_wOCd+	9.537e-012	0.000	9.824e-012	-11.008
Hfo_wOFe+	5.125e-013	0.000	5.279e-013	-12.277
Hfo_wOAg	2.666e-013	0.000	2.746e-013	-12.561
Hfo_wOHg+	2.374e-013	0.000	2.446e-013	-12.612
Hfo_wOBa+	3.872e-015	0.000	3.988e-015	-14.399
Hfo_wOHSeO4-2	1.040e-015	0.000	1.071e-015	-14.970
Hfo_wOHSbO(OH) 4-	6.194e-016	0.000	6.381e-016	-15.195
Hfo_wSeO4-	3.393e-016	0.000	3.495e-016	-15.457
Hfo_wSbO(OH) 4	2.990e-016	0.000	3.080e-016	-15.511
Hfo_wOHCrO4-2	4.679e-018	0.000	4.820e-018	-17.317
Hfo_wCrO4-	1.599e-018	0.000	1.647e-018	-17.783
Hfo_wH2AsO3	2.746e-021	0.000	2.829e-021	-20.548

-----Solution composition-----

Elements	Molality	Moles
Ag	2.851e-008	2.768e-008
Al	2.436e-007	2.365e-007
As	6.629e-009	6.435e-009
B	2.747e-005	2.666e-005
Ba	3.803e-008	3.692e-008

C	4.135e-003	4.014e-003
Ca	1.329e-002	1.290e-002
Cd	9.169e-009	8.901e-009
Cl	2.543e-003	2.469e-003
Co	1.750e-007	1.699e-007
Cr	1.509e-008	1.465e-008
Cu	8.573e-007	8.322e-007
F	1.535e-004	1.490e-004
Fe	6.544e-009	6.353e-009
Hg	4.073e-010	3.954e-010
K	3.199e-003	3.106e-003
Mg	7.322e-003	7.108e-003
Mn	1.044e-004	1.013e-004
Mo	2.191e-006	2.127e-006
N	7.044e-005	6.838e-005
Na	9.428e-003	9.152e-003
Ni	2.191e-007	2.127e-007
Pb	3.165e-009	3.073e-009
S	2.396e-002	2.326e-002
Sb	7.629e-009	7.406e-009
Se	1.135e-007	1.102e-007
U	3.037e-007	2.949e-007
V	2.391e-007	2.321e-007
Zn	2.985e-006	2.898e-006

-----Description of solution-----

	pH	=	6.917	Charge balance
	pe	=	5.856	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength	=	6.699e-002	
	Mass of water (kg)	=	9.708e-001	
	Total alkalinity (eq/kg)	=	3.449e-003	
	Total CO2 (mol/kg)	=	4.135e-003	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	1.664e-017	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.077740e+002	
	Total O	=	5.398977e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.506e-007	1.211e-007	-6.822	-6.917	-0.095	0.00
OH-	1.050e-007	8.307e-008	-6.979	-7.081	-0.102	(0)
H2O	5.551e+001	9.990e-001	1.744	-0.000	0.000	18.07
Ag	2.851e-008					
AgCl	1.799e-008	1.799e-008	-7.745	-7.745	0.000	(0)
Ag+	5.356e-009	4.308e-009	-8.271	-8.366	-0.095	(0)
AgCl2-	4.342e-009	3.204e-009	-8.362	-8.494	-0.132	(0)
AgSO4-	7.764e-010	5.729e-010	-9.110	-9.242	-0.132	(0)
AgNO2	2.279e-011	2.279e-011	-10.642	-10.642	0.000	(0)
AgCl3-2	1.970e-011	5.841e-012	-10.706	-11.234	-0.528	(0)
AgNH3+	1.554e-012	1.146e-012	-11.809	-11.941	-0.132	(0)
AgF	1.053e-012	1.053e-012	-11.978	-11.978	0.000	(0)
AgCl4-3	3.760e-013	2.439e-014	-12.425	-13.613	-1.188	(0)
AgOH	3.578e-014	3.578e-014	-13.446	-13.446	0.000	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
AgSeO3-	9.546e-015	7.044e-015	-14.020	-14.152	-0.132	(0)
AgH2BO3	9.060e-015	9.060e-015	-14.043	-14.043	0.000	(0)
Ag (NH3) 2+	1.646e-015	1.214e-015	-14.784	-14.916	-0.132	(0)
Ag (NO2) 2-	1.211e-015	8.935e-016	-14.917	-15.049	-0.132	(0)
AgNO3	8.173e-017	8.173e-017	-16.088	-16.088	0.000	(0)
Ag (OH) 2-	3.936e-019	2.905e-019	-18.405	-18.537	-0.132	(0)

	Ag (SeO3) 2-3	2.474e-021	1.605e-022	-20.607	-21.795	-1.188	(0)
	Ag2MoO4	6.429e-024	6.429e-024	-23.192	-23.192	0.000	(0)
	AgHS	0.000e+000	0.000e+000	-72.163	-72.163	0.000	(0)
	AgOH (Se) 2-4	0.000e+000	0.000e+000	-83.783	-85.895	-2.112	(0)
	Ag (HS) 2-	0.000e+000	0.000e+000	-145.543	-145.675	-0.132	(0)
	Ag (HS) S4-2	0.000e+000	0.000e+000	-146.009	-146.242	-0.232	(0)
	Ag (S4) 2-3	0.000e+000	0.000e+000	-148.351	-148.765	-0.414	(0)
	AgS4S5-3	0.000e+000	0.000e+000	-148.685	-149.076	-0.391	(0)
Al	2.436e-007						
	Al (OH) 4-	1.242e-007	9.971e-008	-6.906	-7.001	-0.095	(0)
	AlF2+	4.873e-008	3.957e-008	-7.312	-7.403	-0.090	(0)
	AlF3	4.847e-008	4.847e-008	-7.315	-7.315	0.000	(0)
	Al (OH) 3	9.535e-009	9.535e-009	-8.021	-8.021	0.000	(0)
	Al (OH) 2+	7.086e-009	5.753e-009	-8.150	-8.240	-0.090	(0)
	AlF4-	2.945e-009	2.364e-009	-8.531	-8.626	-0.095	(0)
	AlF+2	2.350e-009	1.021e-009	-8.629	-8.991	-0.362	(0)
	AlOH+2	2.006e-010	8.720e-011	-9.698	-10.059	-0.362	(0)
	AlSO4+	6.767e-011	5.431e-011	-10.170	-10.265	-0.095	(0)
	Al+3	7.458e-012	1.050e-012	-11.127	-11.979	-0.852	(0)
	Al (SO4) 2-	4.833e-012	3.879e-012	-11.316	-11.411	-0.095	(0)
	AlMo6O21-3	2.958e-034	1.919e-035	-33.529	-34.717	-1.188	(0)
As (3)	7.178e-021						
	H3AsO3	7.137e-021	7.137e-021	-20.146	-20.146	0.000	(0)
	H2AsO3-	4.096e-023	3.022e-023	-22.388	-22.520	-0.132	(0)
	HAsO3-2	7.677e-028	2.276e-028	-27.115	-27.643	-0.528	(0)
	H4AsO3+	5.804e-028	4.282e-028	-27.236	-27.368	-0.132	(0)
	AsO3-3	1.117e-033	7.245e-035	-32.952	-34.140	-1.188	(0)
As (5)	6.629e-009						
	HAsO4-2	4.591e-009	1.361e-009	-8.338	-8.866	-0.528	(0)
	H2AsO4-	2.037e-009	1.503e-009	-8.691	-8.823	-0.132	(0)
	AsO4-3	5.480e-013	3.554e-014	-12.261	-13.449	-1.188	(0)
	H3AsO4	3.115e-014	3.164e-014	-13.506	-13.500	0.007	(0)
B	2.747e-005						
	H3BO3	2.725e-005	2.767e-005	-4.565	-4.558	0.007	(0)
	H2BO3-	1.705e-007	1.327e-007	-6.768	-6.877	-0.109	(0)
	CaH2BO3+	3.277e-008	2.551e-008	-7.485	-7.593	-0.109	(0)
	MgH2BO3+	1.186e-008	9.229e-009	-7.926	-8.035	-0.109	(0)
	NaH2BO3	1.538e-009	1.538e-009	-8.813	-8.813	0.000	(0)
	BF (OH) 3-	1.381e-009	1.074e-009	-8.860	-8.969	-0.109	(0)
	H5 (BO3) 2-	4.016e-012	3.126e-012	-11.396	-11.505	-0.109	(0)
	BF2 (OH) 2-	1.741e-012	1.355e-012	-11.759	-11.868	-0.109	(0)
	BaH2BO3+	8.278e-014	6.443e-014	-13.082	-13.191	-0.109	(0)
	H8 (BO3) 3-	1.111e-014	8.649e-015	-13.954	-14.063	-0.109	(0)
	AgH2BO3	9.060e-015	9.060e-015	-14.043	-14.043	0.000	(0)
	BF3OH-	7.988e-018	6.217e-018	-17.098	-17.206	-0.109	(0)
	BF4-	4.636e-022	3.608e-022	-21.334	-21.443	-0.109	(0)
Ba	3.803e-008						
	Ba+2	3.755e-008	1.571e-008	-7.425	-7.804	-0.378	(0)
	BaHCO3+	4.699e-010	3.842e-010	-9.328	-9.415	-0.087	(0)
	BaCO3	7.988e-012	7.988e-012	-11.098	-11.098	0.000	(0)
	BaH2BO3+	8.278e-014	6.443e-014	-13.082	-13.191	-0.109	(0)
	BaOH+	7.051e-015	5.697e-015	-14.152	-14.244	-0.093	(0)
	BaNH3+2	4.358e-015	1.292e-015	-14.361	-14.889	-0.528	(0)
	BaNO3+	2.549e-015	1.881e-015	-14.594	-14.726	-0.132	(0)
C (4)	4.135e-003						
	HCO3-	3.154e-003	2.561e-003	-2.501	-2.592	-0.090	(0)
	H2CO3	6.976e-004	6.976e-004	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.948e-004	1.593e-004	-3.710	-3.798	-0.087	(0)
	MgHCO3+	6.594e-005	5.256e-005	-4.181	-4.279	-0.099	(0)
	NaHCO3	1.053e-005	1.053e-005	-4.977	-4.977	0.000	(0)
	CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CO3-2	2.370e-006	9.914e-007	-5.625	-6.004	-0.378	(0)
	MgCO3	1.654e-006	1.654e-006	-5.782	-5.782	0.000	(0)
	MnHCO3+	1.426e-006	1.152e-006	-5.846	-5.939	-0.093	(0)
	CuCO3	4.819e-007	4.819e-007	-6.317	-6.317	0.000	(0)
	UO2 (CO3) 3-4	1.982e-007	1.531e-009	-6.703	-8.815	-2.112	(0)
	NaCO3-	1.663e-007	1.350e-007	-6.779	-6.870	-0.090	(0)
	UO2 (CO3) 2-2	1.040e-007	3.082e-008	-6.983	-7.511	-0.528	(0)

	ZnHCO3+	7.581e-008	5.594e-008	-7.120	-7.252	-0.132	(0)
	ZnCO3	3.941e-008	3.941e-008	-7.404	-7.404	0.000	(0)
	NiHCO3+	2.233e-008	1.648e-008	-7.651	-7.783	-0.132	(0)
	CuHCO3+	1.808e-008	1.334e-008	-7.743	-7.875	-0.132	(0)
	CoHCO3+	9.436e-009	6.963e-009	-8.025	-8.157	-0.132	(0)
	Cu (CO3) 2-2	4.337e-009	1.286e-009	-8.363	-8.891	-0.528	(0)
	NiCO3	1.930e-009	1.930e-009	-8.714	-8.714	0.000	(0)
	UO2CO3	1.558e-009	1.558e-009	-8.807	-8.807	0.000	(0)
	PbCO3	7.811e-010	7.811e-010	-9.107	-9.107	0.000	(0)
	PbHCO3+	6.759e-010	4.988e-010	-9.170	-9.302	-0.132	(0)
	CoCO3	5.858e-010	5.858e-010	-9.232	-9.232	0.000	(0)
	BaHCO3+	4.699e-010	3.842e-010	-9.328	-9.415	-0.087	(0)
	CdCO3	4.383e-011	4.383e-011	-10.358	-10.358	0.000	(0)
	CdHCO3+	1.533e-011	1.131e-011	-10.815	-10.947	-0.132	(0)
	BaCO3	7.988e-012	7.988e-012	-11.098	-11.098	0.000	(0)
	Pb (CO3) 2-2	7.533e-012	2.233e-012	-11.123	-11.651	-0.528	(0)
	FeHCO3+	1.636e-012	1.338e-012	-11.786	-11.874	-0.087	(0)
	Cd (CO3) 2-2	1.087e-013	3.221e-014	-12.964	-13.492	-0.528	(0)
	HgCO3	2.583e-014	2.583e-014	-13.588	-13.588	0.000	(0)
	Hg (CO3) 2-2	2.731e-016	8.097e-017	-15.564	-16.092	-0.528	(0)
	HgHCO3+	7.893e-017	5.825e-017	-16.103	-16.235	-0.132	(0)
Ca		1.329e-002					
	Ca+2	7.984e-003	3.340e-003	-2.098	-2.476	-0.378	(0)
	CaSO4	5.100e-003	5.100e-003	-2.292	-2.292	0.000	(0)
	CaHCO3+	1.948e-004	1.593e-004	-3.710	-3.798	-0.087	(0)
	CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CaF+	4.390e-006	3.547e-006	-5.357	-5.450	-0.093	(0)
	CaH2BO3+	3.277e-008	2.551e-008	-7.485	-7.593	-0.109	(0)
	CaOH+	6.770e-009	5.536e-009	-8.169	-8.257	-0.087	(0)
	CaNH3+2	1.849e-009	5.480e-010	-8.733	-9.261	-0.528	(0)
	CaNO3+	3.419e-010	2.523e-010	-9.466	-9.598	-0.132	(0)
	Ca (NH3) 2+2	9.592e-017	2.844e-017	-16.018	-16.546	-0.528	(0)
Cd		9.169e-009					
	Cd+2	4.636e-009	1.940e-009	-8.334	-8.712	-0.378	(0)
	CdSO4	3.031e-009	3.031e-009	-8.518	-8.518	0.000	(0)
	Cd (SO4) 2-2	9.191e-010	2.725e-010	-9.037	-9.565	-0.528	(0)
	CdCl+	5.134e-010	3.788e-010	-9.290	-9.422	-0.132	(0)
	CdCO3	4.383e-011	4.383e-011	-10.358	-10.358	0.000	(0)
	CdHCO3+	1.533e-011	1.131e-011	-10.815	-10.947	-0.132	(0)
	CdF+	4.054e-012	2.991e-012	-11.392	-11.524	-0.132	(0)
	CdCl2	3.230e-012	3.230e-012	-11.491	-11.491	0.000	(0)
	CdOH+	1.734e-012	1.280e-012	-11.761	-11.893	-0.132	(0)
	CdOHC1	1.291e-012	1.291e-012	-11.889	-11.889	0.000	(0)
	Cd (CO3) 2-2	1.087e-013	3.221e-014	-12.964	-13.492	-0.528	(0)
	CdCl3-	5.648e-015	4.168e-015	-14.248	-14.380	-0.132	(0)
	Cd (OH) 2	6.708e-016	6.708e-016	-15.173	-15.173	0.000	(0)
	CdF2	5.807e-016	5.807e-016	-15.236	-15.236	0.000	(0)
	CdNO3+	1.985e-016	1.465e-016	-15.702	-15.834	-0.132	(0)
	CdSeO4	3.981e-018	3.981e-018	-17.400	-17.400	0.000	(0)
	Cd2OH+3	1.918e-019	1.244e-020	-18.717	-19.905	-1.188	(0)
	Cd (SeO3) 2-2	3.490e-020	1.035e-020	-19.457	-19.985	-0.528	(0)
	Cd (OH) 3-	4.613e-021	3.404e-021	-20.336	-20.468	-0.132	(0)
	Cd (NO3) 2	1.754e-024	1.754e-024	-23.756	-23.756	0.000	(0)
	Cd (OH) 4-2	1.561e-028	4.628e-029	-27.807	-28.335	-0.528	(0)
	CdHS+	0.000e+000	0.000e+000	-78.184	-78.316	-0.132	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-148.724	-148.724	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-224.304	-224.436	-0.132	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-299.324	-299.852	-0.528	(0)
Cl		2.543e-003					
	Cl-	2.543e-003	2.045e-003	-2.595	-2.689	-0.095	(0)
	MnCl+	7.185e-008	5.805e-008	-7.144	-7.236	-0.093	(0)
	AgCl	1.799e-008	1.799e-008	-7.745	-7.745	0.000	(0)
	ZnCl+	4.452e-009	3.548e-009	-8.351	-8.450	-0.099	(0)
	AgCl2-	4.342e-009	3.204e-009	-8.362	-8.494	-0.132	(0)
	CdCl+	5.134e-010	3.788e-010	-9.290	-9.422	-0.132	(0)
	ZnOHC1	3.859e-010	3.859e-010	-9.414	-9.414	0.000	(0)
	NiCl+	3.701e-010	2.731e-010	-9.432	-9.564	-0.132	(0)
	CuCl+	3.357e-010	2.676e-010	-9.474	-9.573	-0.099	(0)

CoCl+	3.351e-010	2.473e-010	-9.475	-9.607	-0.132	(0)
MnCl2	1.677e-010	1.677e-010	-9.775	-9.775	0.000	(0)
CuCl	1.451e-010	1.451e-010	-9.838	-9.838	0.000	(0)
CuCl2-	7.779e-011	6.201e-011	-10.109	-10.208	-0.099	(0)
PbCl+	2.578e-011	1.902e-011	-10.589	-10.721	-0.132	(0)
AgCl3-2	1.970e-011	5.841e-012	-10.706	-11.234	-0.528	(0)
ZnCl2	1.150e-011	1.150e-011	-10.939	-10.939	0.000	(0)
HgCl2	9.105e-012	9.105e-012	-11.041	-11.041	0.000	(0)
HgClOH	6.531e-012	6.531e-012	-11.185	-11.185	0.000	(0)
CdCl2	3.230e-012	3.230e-012	-11.491	-11.491	0.000	(0)
CdOHC1	1.291e-012	1.291e-012	-11.889	-11.889	0.000	(0)
AgCl4-3	3.760e-013	2.439e-014	-12.425	-13.613	-1.188	(0)
HgCl3-	2.524e-013	1.862e-013	-12.598	-12.730	-0.132	(0)
CuCl2	1.897e-013	1.897e-013	-12.722	-12.722	0.000	(0)
PbCl2	1.738e-013	1.738e-013	-12.760	-12.760	0.000	(0)
MnCl3-	1.169e-013	9.446e-014	-12.932	-13.025	-0.093	(0)
CuCl3-2	6.363e-014	2.711e-014	-13.196	-13.567	-0.371	(0)
ZnCl3-	2.344e-014	1.869e-014	-13.630	-13.729	-0.099	(0)
CdCl3-	5.648e-015	4.168e-015	-14.248	-14.380	-0.132	(0)
HgCl4-2	5.114e-015	1.516e-015	-14.291	-14.819	-0.528	(0)
CrCl+2	3.898e-015	1.156e-015	-14.409	-14.937	-0.528	(0)
NiCl2	2.812e-015	2.812e-015	-14.551	-14.551	0.000	(0)
UO2Cl+	1.774e-015	1.309e-015	-14.751	-14.883	-0.132	(0)
HgCl+	1.204e-015	8.883e-016	-14.919	-15.051	-0.132	(0)
PbCl3-	1.917e-016	1.415e-016	-15.717	-15.849	-0.132	(0)
ZnCl4-2	4.485e-017	1.911e-017	-16.348	-16.719	-0.371	(0)
CuCl3-	4.544e-018	3.621e-018	-17.343	-17.441	-0.099	(0)
CrOHC12	3.732e-018	3.732e-018	-17.428	-17.428	0.000	(0)
VOCl+	6.239e-019	4.604e-019	-18.205	-18.337	-0.132	(0)
PbCl4-2	4.461e-019	1.322e-019	-18.351	-18.879	-0.528	(0)
FeCl+2	4.009e-019	1.708e-019	-18.397	-18.768	-0.371	(0)
CrCl2+	3.039e-019	2.243e-019	-18.517	-18.649	-0.132	(0)
FeCl2+	1.931e-021	1.560e-021	-20.714	-20.807	-0.093	(0)
CuCl4-2	8.712e-023	3.712e-023	-22.060	-22.430	-0.371	(0)
FeCl3	3.191e-025	3.191e-025	-24.496	-24.496	0.000	(0)
CrO3Cl-	3.263e-026	2.408e-026	-25.486	-25.618	-0.132	(0)
CoCl+2	1.401e-034	4.154e-035	-33.854	-34.382	-0.528	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-41.729	-42.257	-0.528	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-42.325	-42.853	-0.528	(0)
UCl+3	0.000e+000	0.000e+000	-42.367	-43.555	-1.188	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-55.926	-56.454	-0.528	(0)
Co (2)	1.750e-007					
Co+2	1.179e-007	3.495e-008	-6.929	-7.457	-0.528	(0)
CoSO4	4.648e-008	4.648e-008	-7.333	-7.333	0.000	(0)
CoHCO3+	9.436e-009	6.963e-009	-8.025	-8.157	-0.132	(0)
CoCO3	5.858e-010	5.858e-010	-9.232	-9.232	0.000	(0)
CoCl+	3.351e-010	2.473e-010	-9.475	-9.607	-0.132	(0)
CoF+	1.457e-010	1.075e-010	-9.836	-9.968	-0.132	(0)
CoOH+	7.851e-011	5.793e-011	-10.105	-10.237	-0.132	(0)
CoNO2+	8.451e-012	6.236e-012	-11.073	-11.205	-0.132	(0)
Co (NH3) +2	1.847e-012	5.477e-013	-11.733	-12.261	-0.528	(0)
Co (OH) 2	3.822e-013	3.822e-013	-12.418	-12.418	0.000	(0)
CoNO3+	1.793e-015	1.323e-015	-14.746	-14.878	-0.132	(0)
CoSeO4	1.931e-016	1.931e-016	-15.714	-15.714	0.000	(0)
Co (NH3) 2+2	1.027e-017	3.045e-018	-16.988	-17.516	-0.528	(0)
Co2OH+3	1.565e-018	1.015e-019	-17.806	-18.994	-1.188	(0)
Co (OH) 3-	8.585e-019	6.335e-019	-18.066	-18.198	-0.132	(0)
CoOOH-	2.156e-019	1.591e-019	-18.666	-18.798	-0.132	(0)
Co (NO3) 2	6.430e-023	6.430e-023	-22.192	-22.192	0.000	(0)
Co (NH3) 3+2	1.685e-023	4.997e-024	-22.773	-23.301	-0.528	(0)
Co (OH) 4-2	2.813e-026	8.340e-027	-25.551	-26.079	-0.528	(0)
Co (NH3) 4+2	1.153e-029	3.418e-030	-28.938	-29.466	-0.528	(0)
Co4 (OH) 4+4	2.908e-031	2.247e-033	-30.536	-32.648	-2.112	(0)
Co (NH3) 5+2	2.494e-036	7.393e-037	-35.603	-36.131	-0.528	(0)
Co (3)	1.421e-028					
CoOH+2	1.421e-028	4.213e-029	-27.847	-28.375	-0.528	(0)
Co+3	7.091e-034	9.982e-035	-33.149	-34.001	-0.852	(0)
CoCl+2	1.401e-034	4.154e-035	-33.854	-34.382	-0.528	(0)

Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-42.325	-42.853	-0.528	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-50.883	-51.015	-0.132	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-55.926	-56.454	-0.528	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-56.117	-56.645	-0.528	(0)
Cr (2)	4.905e-025					
Cr+2	4.905e-025	1.454e-025	-24.309	-24.837	-0.528	(0)
Cr (3)	1.509e-008					
Cr (OH) 2+	1.087e-008	8.020e-009	-7.964	-8.096	-0.132	(0)
Cr (OH) +2	2.676e-009	7.935e-010	-8.572	-9.100	-0.528	(0)
CrOHSO4	1.255e-009	1.255e-009	-8.901	-8.901	0.000	(0)
Cr (OH) 3	2.503e-010	2.503e-010	-9.602	-9.602	0.000	(0)
CrF+2	2.271e-011	6.734e-012	-10.644	-11.172	-0.528	(0)
CrSO4+	9.210e-012	6.796e-012	-11.036	-11.168	-0.132	(0)
Cr+3	6.732e-012	4.366e-013	-11.172	-12.360	-1.188	(0)
CrO2-	1.331e-012	9.823e-013	-11.876	-12.008	-0.132	(0)
Cr (OH) 4-	1.122e-012	8.276e-013	-11.950	-12.082	-0.132	(0)
CrCl+2	3.898e-015	1.156e-015	-14.409	-14.937	-0.528	(0)
Cr2 (OH) 2SO4+2	3.036e-016	9.001e-017	-15.518	-16.046	-0.528	(0)
Cr2 (OH) 2 (SO4) 2	3.564e-017	3.564e-017	-16.448	-16.448	0.000	(0)
CrOHC12	3.732e-018	3.732e-018	-17.428	-17.428	0.000	(0)
CrCl2+	3.039e-019	2.243e-019	-18.517	-18.649	-0.132	(0)
CrNO3+2	1.538e-021	4.559e-022	-20.813	-21.341	-0.528	(0)
Cr (NH3) 5OH+2	1.084e-033	3.215e-034	-32.965	-33.493	-0.528	(0)
Cr (NH3) 6+3	3.300e-040	0.000e+000	-39.481	-40.669	-1.188	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-41.729	-42.257	-0.528	(0)
Cr (6)	1.175e-016					
CrO4-2	9.418e-017	3.940e-017	-16.026	-16.405	-0.378	(0)
HCrO4-	2.093e-017	1.544e-017	-16.679	-16.811	-0.132	(0)
NaCrO4-	1.941e-018	1.432e-018	-17.712	-17.844	-0.132	(0)
KCrO4-	4.877e-019	3.599e-019	-18.312	-18.444	-0.132	(0)
CrO3SO4-2	1.282e-023	3.800e-024	-22.892	-23.420	-0.528	(0)
H2CrO4	1.516e-024	1.516e-024	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.263e-026	2.408e-026	-25.486	-25.618	-0.132	(0)
Cr2O7-2	2.791e-032	8.275e-033	-31.554	-32.082	-0.528	(0)
Cu (1)	2.993e-010					
CuCl	1.451e-010	1.451e-010	-9.838	-9.838	0.000	(0)
CuCl2-	7.779e-011	6.201e-011	-10.109	-10.208	-0.099	(0)
Cu+	7.638e-011	5.636e-011	-10.117	-10.249	-0.132	(0)
CuCl3-2	6.363e-014	2.711e-014	-13.196	-13.567	-0.371	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.847	-148.249	-0.402	(0)
CuS4S5-3	0.000e+000	0.000e+000	-148.599	-148.979	-0.380	(0)
Cu (2)	8.570e-007					
CuCO3	4.819e-007	4.819e-007	-6.317	-6.317	0.000	(0)
Cu+2	1.973e-007	8.255e-008	-6.705	-7.083	-0.378	(0)
CuSO4	1.260e-007	1.260e-007	-6.899	-6.899	0.000	(0)
CuOH+	2.720e-008	2.168e-008	-7.565	-7.664	-0.099	(0)
CuHCO3+	1.808e-008	1.334e-008	-7.743	-7.875	-0.132	(0)
Cu (CO3) 2-2	4.337e-009	1.286e-009	-8.363	-8.891	-0.528	(0)
CuF+	6.868e-010	5.068e-010	-9.163	-9.295	-0.132	(0)
CuNH3+2	3.713e-010	1.101e-010	-9.430	-9.958	-0.528	(0)
Cu (OH) 2	3.594e-010	3.594e-010	-9.444	-9.444	0.000	(0)
CuCl+	3.357e-010	2.676e-010	-9.474	-9.573	-0.099	(0)
CuNO2+	2.966e-010	2.188e-010	-9.528	-9.660	-0.132	(0)
Cu2 (OH) 2+2	3.983e-011	1.181e-011	-10.400	-10.928	-0.528	(0)
CuCl2	1.897e-013	1.897e-013	-12.722	-12.722	0.000	(0)
Cu (OH) 3-	8.298e-014	6.123e-014	-13.081	-13.213	-0.132	(0)
Cu (NO2) 2	5.669e-014	5.669e-014	-13.246	-13.246	0.000	(0)
CuNO3+	8.449e-015	6.235e-015	-14.073	-14.205	-0.132	(0)
CuCl3-	4.544e-018	3.621e-018	-17.343	-17.441	-0.099	(0)
Cu (OH) 4-2	1.350e-019	4.003e-020	-18.870	-19.398	-0.528	(0)
CuCl4-2	8.712e-023	3.712e-023	-22.060	-22.430	-0.371	(0)
Cu (NO3) 2	1.875e-023	1.875e-023	-22.727	-22.727	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.888	-214.020	-0.132	(0)
F	1.535e-004					
F-	1.210e-004	9.730e-005	-3.917	-4.012	-0.095	(0)
MgF+	2.728e-005	2.190e-005	-4.564	-4.660	-0.095	(0)
CaF+	4.390e-006	3.547e-006	-5.357	-5.450	-0.093	(0)
NaF	4.490e-007	4.490e-007	-6.348	-6.348	0.000	(0)

MnF+	1.081e-007	8.734e-008	-6.966	-7.059	-0.093	(0)
AlF2+	4.873e-008	3.957e-008	-7.312	-7.403	-0.090	(0)
AlF3	4.847e-008	4.847e-008	-7.315	-7.315	0.000	(0)
HF	1.743e-008	1.743e-008	-7.759	-7.759	0.000	(0)
AlF4-	2.945e-009	2.364e-009	-8.531	-8.626	-0.095	(0)
AlF+2	2.350e-009	1.021e-009	-8.629	-8.991	-0.362	(0)
ZnF+	1.817e-009	1.341e-009	-8.741	-8.873	-0.132	(0)
BF(OH) 3-	1.381e-009	1.074e-009	-8.860	-8.969	-0.109	(0)
CuF+	6.868e-010	5.068e-010	-9.163	-9.295	-0.132	(0)
NiF+	1.729e-010	1.276e-010	-9.762	-9.894	-0.132	(0)
CoF+	1.457e-010	1.075e-010	-9.836	-9.968	-0.132	(0)
CrF+2	2.271e-011	6.734e-012	-10.644	-11.172	-0.528	(0)
HF2-	8.150e-012	6.448e-012	-11.089	-11.191	-0.102	(0)
UO2F+	7.186e-012	5.302e-012	-11.144	-11.276	-0.132	(0)
CdF+	4.054e-012	2.991e-012	-11.392	-11.524	-0.132	(0)
PbF+	2.436e-012	1.797e-012	-11.613	-11.745	-0.132	(0)
BF2(OH) 2-	1.741e-012	1.355e-012	-11.759	-11.868	-0.109	(0)
UO2F2	1.488e-012	1.488e-012	-11.827	-11.827	0.000	(0)
AgF	1.053e-012	1.053e-012	-11.978	-11.978	0.000	(0)
UO2F3-	4.928e-014	3.637e-014	-13.307	-13.439	-0.132	(0)
VO2F	8.365e-015	8.365e-015	-14.078	-14.078	0.000	(0)
PbF2	3.441e-015	3.441e-015	-14.463	-14.463	0.000	(0)
FeF2+	9.509e-016	7.682e-016	-15.022	-15.115	-0.093	(0)
H2F2	8.139e-016	8.139e-016	-15.089	-15.089	0.000	(0)
FeF+2	6.924e-016	2.950e-016	-15.160	-15.530	-0.371	(0)
CdF2	5.807e-016	5.807e-016	-15.236	-15.236	0.000	(0)
VO2F2-	4.005e-016	2.955e-016	-15.397	-15.529	-0.132	(0)
FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
UO2F4-2	9.481e-017	2.811e-017	-16.023	-16.551	-0.528	(0)
VOF+	6.346e-017	4.683e-017	-16.197	-16.329	-0.132	(0)
BF3OH-	7.988e-018	6.217e-018	-17.098	-17.206	-0.109	(0)
VOF2	1.709e-018	1.709e-018	-17.767	-17.767	0.000	(0)
VO2F3-2	1.210e-018	3.587e-019	-17.917	-18.445	-0.528	(0)
PbF3-	8.607e-019	6.351e-019	-18.065	-18.197	-0.132	(0)
VOF3-	7.994e-021	5.899e-021	-20.097	-20.229	-0.132	(0)
BF4-	4.636e-022	3.608e-022	-21.334	-21.443	-0.109	(0)
VO2F4-3	2.648e-022	1.717e-023	-21.577	-22.765	-1.188	(0)
HgF+	1.064e-022	7.852e-023	-21.973	-22.105	-0.132	(0)
PbF4-2	9.977e-023	2.958e-023	-22.001	-22.529	-0.528	(0)
VOF4-2	7.814e-024	2.317e-024	-23.107	-23.635	-0.528	(0)
Sb(OH) 2F	8.542e-025	8.542e-025	-24.068	-24.068	0.000	(0)
SbOF	8.407e-025	8.407e-025	-24.075	-24.075	0.000	(0)
UF3+	1.351e-033	9.971e-034	-32.869	-33.001	-0.132	(0)
UF2+2	2.181e-034	6.466e-035	-33.661	-34.189	-0.528	(0)
UF4	1.064e-035	1.064e-035	-34.973	-34.973	0.000	(0)
UF+3	8.138e-037	5.278e-038	-36.089	-37.277	-1.188	(0)
UF5-	5.559e-038	4.102e-038	-37.255	-37.387	-0.132	(0)
UF6-2	4.066e-039	1.205e-039	-38.391	-38.919	-0.528	(0)
Fe (2)	2.097e-010					
Fe+2	1.400e-010	4.150e-011	-9.854	-10.382	-0.528	(0)
FeSO4	6.789e-011	6.789e-011	-10.168	-10.168	0.000	(0)
FeHCO3+	1.636e-012	1.338e-012	-11.786	-11.874	-0.087	(0)
FeOH+	1.699e-013	1.372e-013	-12.770	-12.863	-0.093	(0)
Fe(OH) 2	9.054e-018	9.054e-018	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	2.944e-019	2.378e-019	-18.531	-18.624	-0.093	(0)
Fe(HS) 2	0.000e+000	0.000e+000	-156.656	-156.656	0.000	(0)
Fe(HS) 3-	0.000e+000	0.000e+000	-232.098	-232.230	-0.132	(0)
Fe (3)	6.335e-009					
Fe(OH) 2+	5.903e-009	4.793e-009	-8.229	-8.319	-0.090	(0)
Fe(OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	4.073e-012	3.307e-012	-11.390	-11.481	-0.090	(0)
FeOH+2	3.481e-013	1.483e-013	-12.458	-12.829	-0.371	(0)
FeF2+	9.509e-016	7.682e-016	-15.022	-15.115	-0.093	(0)
FeF+2	6.924e-016	2.950e-016	-15.160	-15.530	-0.371	(0)
FeSO4+	2.560e-016	2.068e-016	-15.592	-15.684	-0.093	(0)
FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
Fe(SO4) 2-	3.994e-017	2.947e-017	-16.399	-16.531	-0.132	(0)
Fe+3	1.965e-017	2.765e-018	-16.707	-17.558	-0.852	(0)

	FeCl+2	4.009e-019	1.708e-019	-18.397	-18.768	-0.371	(0)
	FeCl2+	1.931e-021	1.560e-021	-20.714	-20.807	-0.093	(0)
	FeHSeO3+2	1.908e-021	5.656e-022	-20.720	-21.248	-0.528	(0)
	Fe2(OH) 2+4	9.427e-023	7.283e-025	-22.026	-24.138	-2.112	(0)
	FeNO3+2	2.228e-024	6.605e-025	-23.652	-24.180	-0.528	(0)
	FeCl3	3.191e-025	3.191e-025	-24.496	-24.496	0.000	(0)
	Fe3(OH) 4+5	1.007e-028	5.046e-032	-27.997	-31.297	-3.300	(0)
H (0)	3.974e-029						
	H2	1.987e-029	2.018e-029	-28.702	-28.695	0.007	(0)
Hg (0)	3.905e-010						
	Hg	3.905e-010	3.905e-010	-9.408	-9.408	0.000	(0)
Hg (1)	3.893e-020						
	Hg2+2	1.946e-020	5.771e-021	-19.711	-20.239	-0.528	(0)
Hg (2)	1.686e-011						
	HgCl2	9.105e-012	9.105e-012	-11.041	-11.041	0.000	(0)
	HgClOH	6.531e-012	6.531e-012	-11.185	-11.185	0.000	(0)
	Hg(OH) 2	9.332e-013	9.477e-013	-12.030	-12.023	0.007	(0)
	HgCl3-	2.524e-013	1.862e-013	-12.598	-12.730	-0.132	(0)
	HgCO3	2.583e-014	2.583e-014	-13.588	-13.588	0.000	(0)
	HgCl4-2	5.114e-015	1.516e-015	-14.291	-14.819	-0.528	(0)
	HgCl+	1.204e-015	8.883e-016	-14.919	-15.051	-0.132	(0)
	Hg(NH3) 2+2	7.870e-016	2.333e-016	-15.104	-15.632	-0.528	(0)
	Hg(CO3) 2-2	2.731e-016	8.097e-017	-15.564	-16.092	-0.528	(0)
	HgOH+	9.756e-017	7.199e-017	-16.011	-16.143	-0.132	(0)
	HgHCO3+	7.893e-017	5.825e-017	-16.103	-16.235	-0.132	(0)
	HgNH3+2	6.038e-018	1.790e-018	-17.219	-17.747	-0.528	(0)
	Hg+2	7.343e-020	2.177e-020	-19.134	-19.662	-0.528	(0)
	HgSO4	3.799e-020	3.799e-020	-19.420	-19.420	0.000	(0)
	Hg(OH) 3-	1.343e-020	9.911e-021	-19.872	-20.004	-0.132	(0)
	Hg(NH3) 3+2	4.084e-022	1.211e-022	-21.389	-21.917	-0.528	(0)
	HgF+	1.064e-022	7.852e-023	-21.973	-22.105	-0.132	(0)
	Hg(NH3) 4+2	4.228e-028	1.253e-028	-27.374	-27.902	-0.528	(0)
	HgNO3+	2.602e-028	1.920e-028	-27.585	-27.717	-0.132	(0)
	Hg(NO3) 2	1.906e-036	1.906e-036	-35.720	-35.720	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-135.909	-136.041	-0.132	(0)
	Hg(HS) 2	0.000e+000	0.000e+000	-136.564	-136.564	0.000	(0)
	HgS2-2	0.000e+000	0.000e+000	-137.304	-137.832	-0.528	(0)
K	3.199e-003						
	K+	3.057e-003	2.458e-003	-2.515	-2.609	-0.095	(0)
	KSO4-	1.429e-004	1.160e-004	-3.845	-3.936	-0.090	(0)
	KCrO4-	4.877e-019	3.599e-019	-18.312	-18.444	-0.132	(0)
Mg	7.322e-003						
	Mg+2	4.794e-003	2.006e-003	-2.319	-2.698	-0.378	(0)
	MgSO4	2.433e-003	2.433e-003	-2.614	-2.614	0.000	(0)
	MgHCO3+	6.594e-005	5.256e-005	-4.181	-4.279	-0.099	(0)
	MgF+	2.728e-005	2.190e-005	-4.564	-4.660	-0.095	(0)
	MgCO3	1.654e-006	1.654e-006	-5.782	-5.782	0.000	(0)
	MgOH+	8.067e-008	6.632e-008	-7.093	-7.178	-0.085	(0)
	MgH2BO3+	1.186e-008	9.229e-009	-7.926	-8.035	-0.109	(0)
Mn (2)	1.044e-004						
	Mn+2	7.605e-005	2.255e-005	-4.119	-4.647	-0.528	(0)
	MnSO4	2.672e-005	2.672e-005	-4.573	-4.573	0.000	(0)
	MnHCO3+	1.426e-006	1.152e-006	-5.846	-5.939	-0.093	(0)
	MnF+	1.081e-007	8.734e-008	-6.966	-7.059	-0.093	(0)
	MnCl+	7.185e-008	5.805e-008	-7.144	-7.236	-0.093	(0)
	MnOH+	5.823e-009	4.704e-009	-8.235	-8.328	-0.093	(0)
	MnCl2	1.677e-010	1.677e-010	-9.775	-9.775	0.000	(0)
	MnNO3+	1.157e-012	8.534e-013	-11.937	-12.069	-0.132	(0)
	MnCl3-	1.169e-013	9.446e-014	-12.932	-13.025	-0.093	(0)
	MnSeO4	6.689e-014	6.689e-014	-13.175	-13.175	0.000	(0)
	Mn(OH) 3-	2.483e-019	2.006e-019	-18.605	-18.698	-0.093	(0)
	Mn(NO3) 2	5.120e-020	5.120e-020	-19.291	-19.291	0.000	(0)
	Mn(OH) 4-2	1.263e-025	5.379e-026	-24.899	-25.269	-0.371	(0)
	MnSe	0.000e+000	0.000e+000	-42.000	-42.000	0.000	(0)
Mn (3)	5.132e-024						
	Mn+3	5.132e-024	7.224e-025	-23.290	-24.141	-0.852	(0)
Mn (6)	0.000e+000						
	MnO4-2	0.000e+000	0.000e+000	-43.943	-44.313	-0.371	(0)

Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-47.724	-47.829	-0.105	(0)
Mo	2.191e-006					
MoO4-2	2.188e-006	9.152e-007	-5.660	-6.038	-0.378	(0)
HMoO4-	2.989e-009	2.205e-009	-8.524	-8.657	-0.132	(0)
H2MoO4	1.956e-012	1.956e-012	-11.709	-11.709	0.000	(0)
Ag2MoO4	6.429e-024	6.429e-024	-23.192	-23.192	0.000	(0)
AlMo6O21-3	2.958e-034	1.919e-035	-33.529	-34.717	-1.188	(0)
Mo7O24-6	1.380e-040	0.000e+000	-39.860	-44.612	-4.752	(0)
HMo7O24-5	0.000e+000	0.000e+000	-41.842	-45.142	-3.300	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-45.165	-47.277	-2.112	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-49.760	-50.948	-1.188	(0)
N (-3)	3.815e-005					
NH4+	3.557e-005	2.768e-005	-4.449	-4.558	-0.109	(0)
NH4SO4-	2.447e-006	1.977e-006	-5.611	-5.704	-0.093	(0)
NH3	1.303e-007	1.303e-007	-6.885	-6.885	0.000	(0)
CaNH3+2	1.849e-009	5.480e-010	-8.733	-9.261	-0.528	(0)
CuNH3+2	3.713e-010	1.101e-010	-9.430	-9.958	-0.528	(0)
NiNH3+2	1.232e-011	3.653e-012	-10.909	-11.437	-0.528	(0)
Co (NH3) +2	1.847e-012	5.477e-013	-11.733	-12.261	-0.528	(0)
AgNH3+	1.554e-012	1.146e-012	-11.809	-11.941	-0.132	(0)
BaNH3+2	4.358e-015	1.292e-015	-14.361	-14.889	-0.528	(0)
Ag (NH3) 2+	1.646e-015	1.214e-015	-14.784	-14.916	-0.132	(0)
Hg (NH3) 2+2	7.870e-016	2.333e-016	-15.104	-15.632	-0.528	(0)
Ni (NH3) 2+2	2.321e-016	6.882e-017	-15.634	-16.162	-0.528	(0)
Ca (NH3) 2+2	9.592e-017	2.844e-017	-16.018	-16.546	-0.528	(0)
Co (NH3) 2+2	1.027e-017	3.045e-018	-16.988	-17.516	-0.528	(0)
HgNH3+2	6.038e-018	1.790e-018	-17.219	-17.747	-0.528	(0)
Hg (NH3) 3+2	4.084e-022	1.211e-022	-21.389	-21.917	-0.528	(0)
Co (NH3) 3+2	1.685e-023	4.997e-024	-22.773	-23.301	-0.528	(0)
Hg (NH3) 4+2	4.228e-028	1.253e-028	-27.374	-27.902	-0.528	(0)
Co (NH3) 4+2	1.153e-029	3.418e-030	-28.938	-29.466	-0.528	(0)
Cr (NH3) 5OH+2	1.084e-033	3.215e-034	-32.965	-33.493	-0.528	(0)
Co (NH3) 5+2	2.494e-036	7.393e-037	-35.603	-36.131	-0.528	(0)
Cr (NH3) 6+3	3.300e-040	0.000e+000	-39.481	-40.669	-1.188	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-41.729	-42.257	-0.528	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-42.325	-42.853	-0.528	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-50.883	-51.015	-0.132	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-55.926	-56.454	-0.528	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-56.117	-56.645	-0.528	(0)
N (3)	3.225e-005					
NO2-	3.225e-005	2.532e-005	-4.491	-4.597	-0.105	(0)
CuNO2+	2.966e-010	2.188e-010	-9.528	-9.660	-0.132	(0)
AgNO2	2.279e-011	2.279e-011	-10.642	-10.642	0.000	(0)
CoNO2+	8.451e-012	6.236e-012	-11.073	-11.205	-0.132	(0)
Cu (NO2) 2	5.669e-014	5.669e-014	-13.246	-13.246	0.000	(0)
Ag (NO2) 2-	1.211e-015	8.935e-016	-14.917	-15.049	-0.132	(0)
N (5)	3.004e-008					
NO3-	2.970e-008	2.388e-008	-7.527	-7.622	-0.095	(0)
CaNO3+	3.419e-010	2.523e-010	-9.466	-9.598	-0.132	(0)
MnNO3+	1.157e-012	8.534e-013	-11.937	-12.069	-0.132	(0)
ZnNO3+	5.616e-014	4.144e-014	-13.251	-13.383	-0.132	(0)
CuNO3+	8.449e-015	6.235e-015	-14.073	-14.205	-0.132	(0)
NiNO3+	4.243e-015	3.131e-015	-14.372	-14.504	-0.132	(0)
BaNO3+	2.549e-015	1.881e-015	-14.594	-14.726	-0.132	(0)
CoNO3+	1.793e-015	1.323e-015	-14.746	-14.878	-0.132	(0)
CdNO3+	1.985e-016	1.465e-016	-15.702	-15.834	-0.132	(0)
PbNO3+	1.255e-016	9.259e-017	-15.901	-16.033	-0.132	(0)
AgNO3	8.173e-017	8.173e-017	-16.088	-16.088	0.000	(0)
Mn (NO3) 2	5.120e-020	5.120e-020	-19.291	-19.291	0.000	(0)
UO2NO3+	2.549e-020	1.881e-020	-19.594	-19.726	-0.132	(0)
CrNO3+2	1.538e-021	4.559e-022	-20.813	-21.341	-0.528	(0)
VO2NO3	5.922e-022	5.922e-022	-21.228	-21.228	0.000	(0)
Zn (NO3) 2	1.975e-022	1.975e-022	-21.704	-21.704	0.000	(0)
Co (NO3) 2	6.430e-023	6.430e-023	-22.192	-22.192	0.000	(0)
Cu (NO3) 2	1.875e-023	1.875e-023	-22.727	-22.727	0.000	(0)
Pb (NO3) 2	3.756e-024	3.756e-024	-23.425	-23.425	0.000	(0)
FeNO3+2	2.228e-024	6.605e-025	-23.652	-24.180	-0.528	(0)

	Cd(NO3)2	1.754e-024	1.754e-024	-23.756	-23.756	0.000	(0)
	HgNO3+	2.602e-028	1.920e-028	-27.585	-27.717	-0.132	(0)
	Hg(NO3)2	1.906e-036	1.906e-036	-35.720	-35.720	0.000	(0)
Na	9.428e-003						
	Na+	9.094e-003	7.314e-003	-2.041	-2.136	-0.095	(0)
	NaSO4-	3.224e-004	2.618e-004	-3.492	-3.582	-0.090	(0)
	NaHCO3	1.053e-005	1.053e-005	-4.977	-4.977	0.000	(0)
	NaF	4.490e-007	4.490e-007	-6.348	-6.348	0.000	(0)
	NaCO3-	1.663e-007	1.350e-007	-6.779	-6.870	-0.090	(0)
	NaH2BO3	1.538e-009	1.538e-009	-8.813	-8.813	0.000	(0)
	NaCrO4-	1.941e-018	1.432e-018	-17.712	-17.844	-0.132	(0)
Ni	2.191e-007						
	Ni+2	1.248e-007	5.219e-008	-6.904	-7.282	-0.378	(0)
	NiSO4	6.941e-008	6.941e-008	-7.159	-7.159	0.000	(0)
	NiHCO3+	2.233e-008	1.648e-008	-7.651	-7.783	-0.132	(0)
	NiCO3	1.930e-009	1.930e-009	-8.714	-8.714	0.000	(0)
	NiCl+	3.701e-010	2.731e-010	-9.432	-9.564	-0.132	(0)
	NiF+	1.729e-010	1.276e-010	-9.762	-9.894	-0.132	(0)
	NiOH+	7.396e-011	5.458e-011	-10.131	-10.263	-0.132	(0)
	Ni(SO4)2-2	5.167e-011	1.532e-011	-10.287	-10.815	-0.528	(0)
	NiNH3+2	1.232e-011	3.653e-012	-10.909	-11.437	-0.528	(0)
	Ni(OH)2	3.601e-013	3.601e-013	-12.444	-12.444	0.000	(0)
	NiNO3+	4.243e-015	3.131e-015	-14.372	-14.504	-0.132	(0)
	NiCl2	2.812e-015	2.812e-015	-14.551	-14.551	0.000	(0)
	NiSeO4	2.691e-016	2.691e-016	-15.570	-15.570	0.000	(0)
	Ni(NH3)2+2	2.321e-016	6.882e-017	-15.634	-16.162	-0.528	(0)
	Ni(OH)3-	4.054e-017	2.991e-017	-16.392	-16.524	-0.132	(0)
O(0)	2.447e-035						
	O2	1.224e-035	1.243e-035	-34.912	-34.906	0.007	(0)
Pb	3.165e-009						
	PbSO4	8.556e-010	8.556e-010	-9.068	-9.068	0.000	(0)
	PbCO3	7.811e-010	7.811e-010	-9.107	-9.107	0.000	(0)
	PbHCO3+	6.759e-010	4.988e-010	-9.170	-9.302	-0.132	(0)
	Pb+2	6.265e-010	2.621e-010	-9.203	-9.582	-0.378	(0)
	Pb(SO4)2-2	1.159e-010	3.436e-011	-9.936	-10.464	-0.528	(0)
	PbOH+	7.411e-011	5.469e-011	-10.130	-10.262	-0.132	(0)
	PbCl+	2.578e-011	1.902e-011	-10.589	-10.721	-0.132	(0)
	Pb(CO3)2-2	7.533e-012	2.233e-012	-11.123	-11.651	-0.528	(0)
	PbF+	2.436e-012	1.797e-012	-11.613	-11.745	-0.132	(0)
	PbCl2	1.738e-013	1.738e-013	-12.760	-12.760	0.000	(0)
	Pb(OH)2	1.437e-013	1.437e-013	-12.843	-12.843	0.000	(0)
	PbF2	3.441e-015	3.441e-015	-14.463	-14.463	0.000	(0)
	PbCl3-	1.917e-016	1.415e-016	-15.717	-15.849	-0.132	(0)
	PbNO3+	1.255e-016	9.259e-017	-15.901	-16.033	-0.132	(0)
	Pb(OH)3-	1.617e-017	1.193e-017	-16.791	-16.923	-0.132	(0)
	Pb2OH+3	3.503e-018	2.272e-019	-17.456	-18.644	-1.188	(0)
	PbF3-	8.607e-019	6.351e-019	-18.065	-18.197	-0.132	(0)
	PbCl4-2	4.461e-019	1.322e-019	-18.351	-18.879	-0.528	(0)
	Pb(OH)4-2	8.188e-022	2.427e-022	-21.087	-21.615	-0.528	(0)
	PbF4-2	9.977e-023	2.958e-023	-22.001	-22.529	-0.528	(0)
	Pb(NO3)2	3.756e-024	3.756e-024	-23.425	-23.425	0.000	(0)
	Pb3(OH)4+2	3.640e-025	1.079e-025	-24.439	-24.967	-0.528	(0)
	Pb4(OH)4+4	2.908e-029	2.247e-031	-28.536	-30.648	-2.112	(0)
	Pb(HS)2	0.000e+000	0.000e+000	-149.535	-149.535	0.000	(0)
	Pb(HS)3-	0.000e+000	0.000e+000	-225.715	-225.847	-0.132	(0)
S(-2)	0.000e+000						
	AgHS	0.000e+000	0.000e+000	-72.163	-72.163	0.000	(0)
	HS-	0.000e+000	0.000e+000	-77.480	-77.612	-0.132	(0)
	H2S	0.000e+000	0.000e+000	-77.509	-77.509	0.000	(0)
	CdHS+	0.000e+000	0.000e+000	-78.184	-78.316	-0.132	(0)
	S5-2	0.000e+000	0.000e+000	-79.532	-80.060	-0.528	(0)
	S6-2	0.000e+000	0.000e+000	-80.048	-80.576	-0.528	(0)
	S4-2	0.000e+000	0.000e+000	-80.128	-80.656	-0.528	(0)
	S3-2	0.000e+000	0.000e+000	-80.934	-81.462	-0.528	(0)
	S2-2	0.000e+000	0.000e+000	-81.950	-82.478	-0.528	(0)
	S-2	0.000e+000	0.000e+000	-87.624	-87.995	-0.371	(0)
	HgHS2-	0.000e+000	0.000e+000	-135.909	-136.041	-0.132	(0)
	Hg(HS)2	0.000e+000	0.000e+000	-136.564	-136.564	0.000	(0)

HgS2-2	0.000e+000	0.000e+000	-137.304	-137.832	-0.528	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-145.543	-145.675	-0.132	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-146.009	-146.242	-0.232	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.525	-147.658	-0.132	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.847	-148.249	-0.402	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.351	-148.765	-0.414	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.564	-148.564	0.000	(0)
CuS4S5-3	0.000e+000	0.000e+000	-148.599	-148.979	-0.380	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.685	-149.076	-0.391	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-148.724	-148.724	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-149.535	-149.535	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.656	-156.656	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.888	-214.020	-0.132	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.764	-222.896	-0.132	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-224.304	-224.436	-0.132	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.431	-225.959	-0.528	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-225.715	-225.847	-0.132	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-232.098	-232.230	-0.132	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-299.324	-299.852	-0.528	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.440	-301.968	-0.528	(0)
Sb2S4-2	0.000e+000	0.000e+000	-313.030	-313.558	-0.528	(0)
S (6)	2.396e-002					
SO4-2	1.593e-002	6.665e-003	-1.798	-2.176	-0.378	(0)
CaSO4	5.100e-003	5.100e-003	-2.292	-2.292	0.000	(0)
MgSO4	2.433e-003	2.433e-003	-2.614	-2.614	0.000	(0)
NaSO4-	3.224e-004	2.618e-004	-3.492	-3.582	-0.090	(0)
KSO4-	1.429e-004	1.160e-004	-3.845	-3.936	-0.090	(0)
MnSO4	2.672e-005	2.672e-005	-4.573	-4.573	0.000	(0)
NH4SO4-	2.447e-006	1.977e-006	-5.611	-5.704	-0.093	(0)
ZnSO4	1.007e-006	1.007e-006	-5.997	-5.997	0.000	(0)
Zn (SO4) 2-2	1.972e-007	5.847e-008	-6.705	-7.233	-0.528	(0)
CuSO4	1.260e-007	1.260e-007	-6.899	-6.899	0.000	(0)
HSO4-	9.828e-008	7.888e-008	-7.008	-7.103	-0.095	(0)
NiSO4	6.941e-008	6.941e-008	-7.159	-7.159	0.000	(0)
CoSO4	4.648e-008	4.648e-008	-7.333	-7.333	0.000	(0)
CdSO4	3.031e-009	3.031e-009	-8.518	-8.518	0.000	(0)
CrOHSO4	1.255e-009	1.255e-009	-8.901	-8.901	0.000	(0)
Cd (SO4) 2-2	9.191e-010	2.725e-010	-9.037	-9.565	-0.528	(0)
PbSO4	8.556e-010	8.556e-010	-9.068	-9.068	0.000	(0)
AgSO4-	7.764e-010	5.729e-010	-9.110	-9.242	-0.132	(0)
Pb (SO4) 2-2	1.159e-010	3.436e-011	-9.936	-10.464	-0.528	(0)
FeSO4	6.789e-011	6.789e-011	-10.168	-10.168	0.000	(0)
AlSO4+	6.767e-011	5.431e-011	-10.170	-10.265	-0.095	(0)
Ni (SO4) 2-2	5.167e-011	1.532e-011	-10.287	-10.815	-0.528	(0)
CrSO4+	9.210e-012	6.796e-012	-11.036	-11.168	-0.132	(0)
Al (SO4) 2-	4.833e-012	3.879e-012	-11.316	-11.411	-0.095	(0)
UO2SO4	3.982e-012	3.982e-012	-11.400	-11.400	0.000	(0)
UO2 (SO4) 2-2	1.180e-012	3.499e-013	-11.928	-12.456	-0.528	(0)
VO2SO4-	1.057e-014	7.801e-015	-13.976	-14.108	-0.132	(0)
Cr2 (OH) 2SO4+2	3.036e-016	9.001e-017	-15.518	-16.046	-0.528	(0)
FeSO4+	2.560e-016	2.068e-016	-15.592	-15.684	-0.093	(0)
VOSO4	1.473e-016	1.473e-016	-15.832	-15.832	0.000	(0)
Fe (SO4) 2-	3.994e-017	2.947e-017	-16.399	-16.531	-0.132	(0)
Cr2 (OH) 2 (SO4) 2	3.564e-017	3.564e-017	-16.448	-16.448	0.000	(0)
HgSO4	3.799e-020	3.799e-020	-19.420	-19.420	0.000	(0)
CrO3SO4-2	1.282e-023	3.800e-024	-22.892	-23.420	-0.528	(0)
VSO4+	3.477e-030	2.566e-030	-29.459	-29.591	-0.132	(0)
U (SO4) 2	3.819e-037	3.819e-037	-36.418	-36.418	0.000	(0)
USO4+2	2.433e-038	7.214e-039	-37.614	-38.142	-0.528	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-50.883	-51.015	-0.132	(0)
Sb (3)	9.166e-020					
Sb (OH) 3	4.636e-020	4.636e-020	-19.334	-19.334	0.000	(0)
HSbO2	4.529e-020	4.529e-020	-19.344	-19.344	0.000	(0)
Sb (OH) 2F	8.542e-025	8.542e-025	-24.068	-24.068	0.000	(0)
SbOF	8.407e-025	8.407e-025	-24.075	-24.075	0.000	(0)
SbO2-	8.209e-025	6.057e-025	-24.086	-24.218	-0.132	(0)
Sb (OH) 4-	4.695e-025	3.465e-025	-24.328	-24.460	-0.132	(0)
Sb (OH) 2+	1.849e-025	1.365e-025	-24.733	-24.865	-0.132	(0)

SbO+	6.382e-026	4.709e-026	-25.195	-25.327	-0.132	(0)
Sb2S4-2	0.000e+000	0.000e+000	-313.030	-313.558	-0.528	(0)
Sb (5)	7.629e-009					
SbO3-	7.620e-009	5.623e-009	-8.118	-8.250	-0.132	(0)
Sb(OH) 6-	8.155e-012	6.559e-012	-11.089	-11.183	-0.095	(0)
SbO2+	3.209e-023	2.368e-023	-22.494	-22.626	-0.132	(0)
Se (-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	1.765e-039	1.302e-039	-38.753	-38.885	-0.132	(0)
H2Se	0.000e+000	0.000e+000	-41.912	-41.912	0.000	(0)
MnSe	0.000e+000	0.000e+000	-42.000	-42.000	0.000	(0)
Se-2	0.000e+000	0.000e+000	-46.441	-46.969	-0.528	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-83.783	-85.895	-2.112	(0)
Se (4)	1.135e-007					
HSeO3-	1.049e-007	7.740e-008	-6.979	-7.111	-0.132	(0)
SeO3-2	8.582e-009	2.544e-009	-8.066	-8.594	-0.528	(0)
H2SeO3	3.999e-012	3.999e-012	-11.398	-11.398	0.000	(0)
AgSeO3-	9.546e-015	7.044e-015	-14.020	-14.152	-0.132	(0)
Cd (SeO3) 2-2	3.490e-020	1.035e-020	-19.457	-19.985	-0.528	(0)
Ag (SeO3) 2-3	2.474e-021	1.605e-022	-20.607	-21.795	-1.188	(0)
FeHSeO3+2	1.908e-021	5.656e-022	-20.720	-21.248	-0.528	(0)
Se (6)	2.642e-011					
SeO4-2	2.635e-011	1.102e-011	-10.579	-10.958	-0.378	(0)
MnSeO4	6.689e-014	6.689e-014	-13.175	-13.175	0.000	(0)
ZnSeO4	1.179e-015	1.179e-015	-14.928	-14.928	0.000	(0)
NiSeO4	2.691e-016	2.691e-016	-15.570	-15.570	0.000	(0)
CoSeO4	1.931e-016	1.931e-016	-15.714	-15.714	0.000	(0)
HSeO4-	9.067e-017	6.690e-017	-16.043	-16.175	-0.132	(0)
CdSeO4	3.981e-018	3.981e-018	-17.400	-17.400	0.000	(0)
Zn (SeO4) 2-2	4.445e-026	1.318e-026	-25.352	-25.880	-0.528	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-56.029	-57.217	-1.188	(0)
U (4)	1.072e-021					
U (OH) 5-	1.068e-021	7.879e-022	-20.972	-21.104	-0.132	(0)
U (OH) 4	4.000e-024	4.000e-024	-23.398	-23.398	0.000	(0)
U (OH) 3+	2.402e-027	1.773e-027	-26.619	-26.751	-0.132	(0)
U (OH) 2+2	3.351e-031	9.936e-032	-30.475	-31.003	-0.528	(0)
UF3+	1.351e-033	9.971e-034	-32.869	-33.001	-0.132	(0)
UF2+2	2.181e-034	6.466e-035	-33.661	-34.189	-0.528	(0)
UF4	1.064e-035	1.064e-035	-34.973	-34.973	0.000	(0)
UOH+3	8.746e-036	5.673e-037	-35.058	-36.246	-1.188	(0)
UF+3	8.138e-037	5.278e-038	-36.089	-37.277	-1.188	(0)
U (SO4) 2	3.819e-037	3.819e-037	-36.418	-36.418	0.000	(0)
UF5-	5.559e-038	4.102e-038	-37.255	-37.387	-0.132	(0)
USO4+2	2.433e-038	7.214e-039	-37.614	-38.142	-0.528	(0)
UF6-2	4.066e-039	1.205e-039	-38.391	-38.919	-0.528	(0)
U+4	0.000e+000	0.000e+000	-40.454	-42.566	-2.112	(0)
UCl+3	0.000e+000	0.000e+000	-42.367	-43.555	-1.188	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-158.110	-168.802	-10.692	(0)
U (5)	4.546e-016					
UO2+	4.546e-016	3.354e-016	-15.342	-15.474	-0.132	(0)
U (6)	3.037e-007					
UO2 (CO3) 3-4	1.982e-007	1.531e-009	-6.703	-8.815	-2.112	(0)
UO2 (CO3) 2-2	1.040e-007	3.082e-008	-6.983	-7.511	-0.528	(0)
UO2CO3	1.558e-009	1.558e-009	-8.807	-8.807	0.000	(0)
UO2F+	7.186e-012	5.302e-012	-11.144	-11.276	-0.132	(0)
UO2OH+	5.594e-012	4.128e-012	-11.252	-11.384	-0.132	(0)
UO2SO4	3.982e-012	3.982e-012	-11.400	-11.400	0.000	(0)
UO2F2	1.488e-012	1.488e-012	-11.827	-11.827	0.000	(0)
UO2 (SO4) 2-2	1.180e-012	3.499e-013	-11.928	-12.456	-0.528	(0)
UO2+2	9.436e-013	3.948e-013	-12.025	-12.404	-0.378	(0)
UO2F3-	4.928e-014	3.637e-014	-13.307	-13.439	-0.132	(0)
UO2C1+	1.774e-015	1.309e-015	-14.751	-14.883	-0.132	(0)
(UO2) 2 (OH) 2+2	9.539e-017	2.828e-017	-16.020	-16.549	-0.528	(0)
UO2F4-2	9.481e-017	2.811e-017	-16.023	-16.551	-0.528	(0)
(UO2) 3 (OH) 5+	8.281e-019	6.111e-019	-18.082	-18.214	-0.132	(0)
UO2NO3+	2.549e-020	1.881e-020	-19.594	-19.726	-0.132	(0)
V (2)	3.906e-040					

VOH+	2.028e-040	1.497e-040	-39.693	-39.825	-0.132	(0)
V+2	1.878e-040	0.000e+000	-39.726	-40.254	-0.528	(0)
V (3)	3.770e-013					
V (OH) 3	3.770e-013	3.770e-013	-12.424	-12.424	0.000	(0)
V (OH) 2+	4.002e-023	2.953e-023	-22.398	-22.530	-0.132	(0)
VOH+2	1.145e-025	3.395e-026	-24.941	-25.469	-0.528	(0)
V+3	1.257e-029	8.155e-031	-28.901	-30.089	-1.188	(0)
VSO4+	3.477e-030	2.566e-030	-29.459	-29.591	-0.132	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-48.026	-50.138	-2.112	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-48.359	-49.547	-1.188	(0)
V (4)	2.284e-015					
V (OH) 3+	1.800e-015	1.329e-015	-14.745	-14.877	-0.132	(0)
VO+2	2.706e-016	8.024e-017	-15.568	-16.096	-0.528	(0)
VOSO4	1.473e-016	1.473e-016	-15.832	-15.832	0.000	(0)
VOF+	6.346e-017	4.683e-017	-16.197	-16.329	-0.132	(0)
VOF2	1.709e-018	1.709e-018	-17.767	-17.767	0.000	(0)
VOC1+	6.239e-019	4.604e-019	-18.205	-18.337	-0.132	(0)
VOF3-	7.994e-021	5.899e-021	-20.097	-20.229	-0.132	(0)
VOF4-2	7.814e-024	2.317e-024	-23.107	-23.635	-0.528	(0)
H2V2O4+2	2.990e-025	8.863e-026	-24.524	-25.052	-0.528	(0)
V (5)	2.391e-007					
H2VO4-	2.266e-007	1.672e-007	-6.645	-6.777	-0.132	(0)
HVO4-2	1.170e-008	3.468e-009	-7.932	-8.460	-0.528	(0)
H3V2O7-	2.965e-010	2.188e-010	-9.528	-9.660	-0.132	(0)
H3VO4	2.025e-010	2.025e-010	-9.694	-9.694	0.000	(0)
HV2O7-3	3.031e-012	1.966e-013	-11.518	-12.706	-1.188	(0)
V3O9-3	7.566e-014	4.907e-015	-13.121	-14.309	-1.188	(0)
VO2+	6.095e-014	4.902e-014	-13.215	-13.310	-0.095	(0)
VO2SO4-	1.057e-014	7.801e-015	-13.976	-14.108	-0.132	(0)
VO2F	8.365e-015	8.365e-015	-14.078	-14.078	0.000	(0)
V2O7-4	5.656e-015	4.370e-017	-14.247	-16.360	-2.112	(0)
VO4-3	2.213e-015	1.435e-016	-14.655	-15.843	-1.188	(0)
VO2F2-	4.005e-016	2.955e-016	-15.397	-15.529	-0.132	(0)
V4O12-4	4.431e-017	3.423e-019	-16.354	-18.466	-2.112	(0)
VO2F3-2	1.210e-018	3.587e-019	-17.917	-18.445	-0.528	(0)
VO2NO3	5.922e-022	5.922e-022	-21.228	-21.228	0.000	(0)
VO2F4-3	2.648e-022	1.717e-023	-21.577	-22.765	-1.188	(0)
V10O28-6	0.000e+000	0.000e+000	-41.773	-46.525	-4.752	(0)
HV10O28-5	0.000e+000	0.000e+000	-41.955	-45.255	-3.300	(0)
H2V10O28-4	0.000e+000	0.000e+000	-44.852	-46.964	-2.112	(0)
Zn	2.985e-006					
Zn+2	1.651e-006	6.907e-007	-5.782	-6.161	-0.378	(0)
ZnSO4	1.007e-006	1.007e-006	-5.997	-5.997	0.000	(0)
Zn (SO4) 2-2	1.972e-007	5.847e-008	-6.705	-7.233	-0.528	(0)
ZnHCO3+	7.581e-008	5.594e-008	-7.120	-7.252	-0.132	(0)
ZnCO3	3.941e-008	3.941e-008	-7.404	-7.404	0.000	(0)
ZnOH+	7.776e-009	5.738e-009	-8.109	-8.241	-0.132	(0)
ZnCl+	4.452e-009	3.548e-009	-8.351	-8.450	-0.099	(0)
ZnF+	1.817e-009	1.341e-009	-8.741	-8.873	-0.132	(0)
ZnOHC1	3.859e-010	3.859e-010	-9.414	-9.414	0.000	(0)
Zn (OH) 2	7.554e-011	7.554e-011	-10.122	-10.122	0.000	(0)
ZnCl2	1.150e-011	1.150e-011	-10.939	-10.939	0.000	(0)
ZnNO3+	5.616e-014	4.144e-014	-13.251	-13.383	-0.132	(0)
Zn (OH) 3-	4.262e-014	3.145e-014	-13.370	-13.502	-0.132	(0)
ZnCl3-	2.344e-014	1.869e-014	-13.630	-13.729	-0.099	(0)
ZnSeO4	1.179e-015	1.179e-015	-14.928	-14.928	0.000	(0)
ZnCl4-2	4.485e-017	1.911e-017	-16.348	-16.719	-0.371	(0)
Zn (OH) 4-2	3.508e-019	1.040e-019	-18.455	-18.983	-0.528	(0)
Zn (NO3) 2	1.975e-022	1.975e-022	-21.704	-21.704	0.000	(0)
Zn (SeO4) 2-2	4.445e-026	1.318e-026	-25.352	-25.880	-0.528	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.525	-147.658	-0.132	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.564	-148.564	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.764	-222.896	-0.132	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.431	-225.959	-0.528	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.440	-301.968	-0.528	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-46.43	-40.14	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-34.78	-30.27	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-42.01	-30.27	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-60.65	-42.71	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-47.95	-27.91	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-25.92	-25.52	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-20.52	-20.07	0.45	(NH4) 2SeO4
Acanthite	-51.21	-87.43	-36.22	Ag2S
Ag2CO3	-11.65	-22.74	-11.09	Ag2CO3
Ag2CrO4	-21.55	-33.14	-11.59	Ag2CrO4
Ag2HVO4	-10.77	-9.29	1.48	Ag2HVO4
Ag2MoO4	-11.22	-22.77	-11.55	Ag2MoO4
Ag2O	-15.47	-2.90	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.09	-18.91	-4.82	Ag2SO4
Ag3AsO3	-26.65	-24.49	2.16	Ag3AsO3
Ag3AsO4	-15.06	-17.85	-2.79	Ag3AsO4
Ag3H2VO5	-15.92	-10.74	5.18	Ag3H2VO5
AgF:4H2O	-13.43	-12.38	1.05	AgF:4H2O
Agmetal	-0.71	-14.22	-13.51	Ag
AgVO3	-8.61	-7.84	0.77	AgVO3
Al (OH) 3 (am)	-2.03	8.77	10.80	Al (OH) 3
Al2 (MoO4) 3	-44.44	-42.07	2.37	Al2 (MoO4) 3
Al2O3	-2.11	17.54	19.65	Al2O3
Al4 (OH) 10SO4	-3.63	19.07	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.53	-4.73	4.80	AlAsO4:2H2O
AlOHSO4	-4.01	-7.24	-3.23	AlOHSO4
AlSb	-152.82	-87.20	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.97	-11.76	-7.79	PbSO4
Anhydrite	-0.29	-4.65	-4.36	CaSO4
Anilite	-55.96	-87.84	-31.88	Cu0.25Cu1.5S
Antlerite	-4.55	4.24	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-77.82	-80.58	-2.76	As4O6
Artinite	-7.17	2.43	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-33.70	-27.00	6.71	As2O5
Atacamite	-3.50	3.89	7.39	Cu2 (OH) 3Cl
Azurite	-2.52	-19.42	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-18.37	6.03	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.60	-0.73	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.64	5.30	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-14.54	-24.21	-9.67	BaCrO4
BaF2	-10.01	-15.83	-5.82	BaF2
BaMoO4	-6.88	-13.84	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.83	-8.00	1.83	BaSeO3
BaSeO4	-11.30	-18.76	-7.46	BaSeO4
Bianchite	-6.57	-8.34	-1.76	ZnSO4:6H2O
Birnessite	-8.71	9.38	18.09	MnO2
Bixbyite	-6.14	-6.78	-0.64	Mn2O3
BlaubleiI	-54.96	-79.12	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-55.87	-83.14	-27.28	Cu0.6Cu0.8S
Boehmite	0.19	8.77	8.58	AlOOH
Breithauptite	-58.12	-76.64	-18.52	NiSb
Brochantite	-4.23	10.99	15.22	Cu4 (OH) 6SO4
Brucite	-5.71	11.14	16.84	Mg (OH) 2
Bunsenite	-5.89	6.55	12.45	NiO
Ca (VO3) 2	-7.09	-1.43	5.66	Ca (VO3) 2
Ca2V2O7	-7.57	9.93	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.62	9.93	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.23	7.07	22.30	Ca3 (AsO4) 2:4H2O

Ca3 (VO4) 2	-17.68	21.28	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.58	21.28	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.84	-157.86	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-7.71	-25.62	-17.91	Hg2Cl2
CaMoO4	-0.56	-8.51	-7.95	CaMoO4
Carnotite	-0.89	-0.66	0.23	KUO2VO4
CaSeO3:2H2O	-5.49	-2.67	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.41	-13.43	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.83	-3.99	9.84	Cd (BO2) 2
Cd (OH) 2	-8.52	5.12	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-8.61	5.12	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.37	-16.66	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-23.21	-0.65	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-23.93	4.47	28.40	Cd4 (OH) 6SO4
CdCl2	-13.43	-14.09	-0.66	CdCl2
CdCl2:1H2O	-12.40	-14.09	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.18	-14.09	-1.91	CdCl2:2.5H2O
CdF2	-15.52	-16.74	-1.21	CdF2
Cdmetal (alpha)	-33.94	-20.42	13.51	Cd
Cdmetal (gamma)	-34.04	-20.42	13.62	Cd
CdMoO4	-0.60	-14.75	-14.15	CdMoO4
CdOHCl	-8.02	-4.49	3.54	CdOHCl
CdSb	-77.72	-78.07	-0.35	CdSb
CdSe	-20.48	-40.68	-20.20	CdSe
CdSeO4:2H2O	-17.82	-19.67	-1.85	CdSeO4:2H2O
CdSO4	-10.72	-10.89	-0.17	CdSO4
CdSO4:1H2O	-9.16	-10.89	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.02	-10.89	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.31	-11.06	-9.75	AgCl
Cerrusite	-2.46	-15.59	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.62	-9.26	-2.64	CuSO4:5H2O
Chalcocite	-56.27	-91.19	-34.92	Cu2S
Chalcopyrite	-123.59	-158.86	-35.27	CuFeS2
Cinnabar	-50.86	-96.55	-45.69	HgS
Claudetite	-77.52	-80.58	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co (BO2) 2	-29.81	-2.74	27.07	Co (BO2) 2
Co (OH) 2	-6.72	6.38	13.09	Co (OH) 2
Co (OH) 3	-10.94	-13.25	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-20.90	-7.87	13.03	Co3 (AsO4) 2
Co3O4	-9.63	-20.13	-10.50	Co3O4
CoCl2	-21.10	-12.84	8.27	CoCl2
CoCl2:6H2O	-15.37	-12.84	2.54	CoCl2:6H2O
CoCO3	-3.48	-13.46	-9.98	CoCO3
CoF2	-13.88	-15.48	-1.60	CoF2
CoF3	-44.58	-46.04	-1.46	CoF3
CoFe2O4	16.29	12.76	-3.53	CoFe2O4
CoMoO4	-5.73	-13.49	-7.76	CoMoO4
CoO	-7.21	6.38	13.59	CoO
CoS (alpha)	-70.71	-78.15	-7.44	CoS
CoS (beta)	-67.08	-78.15	-11.07	CoS
CoSe	-23.23	-39.43	-16.20	CoSe
CoSeO3	-8.97	-7.65	1.32	CoSeO3
CoSeO4:6H2O	-16.89	-18.42	-1.53	CoSeO4:6H2O
CoSO4	-12.44	-9.63	2.80	CoSO4
CoSO4:6H2O	-7.16	-9.64	-2.47	CoSO4:6H2O
Cotunnite	-10.18	-14.96	-4.78	PbCl2
Covellite	-55.48	-77.78	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-44.31	-30.22	14.09	CrCl2
CrCl3	-45.11	-30.00	15.11	CrCl3

CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.62	-42.46	-33.84	Na3AlF6
Cu(OH)2	-1.92	6.75	8.67	Cu(OH)2
Cu(SbO3)2	-26.04	19.17	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.29	-1.04	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.67	-92.55	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.67	-52.47	-45.80	Cu2Se
Cu2SO4	-20.72	-22.67	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.85	-6.75	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-63.37	-105.96	-42.59	Cu3Sb
Cu3Se2	-28.03	-91.52	-63.49	Cu3Se2
CuCO3	-1.59	-13.09	-11.50	CuCO3
CuCrO4	-18.05	-23.49	-5.44	CuCrO4
CuF	-9.36	-14.26	-4.91	CuF
CuF2	-16.22	-15.11	1.12	CuF2
CuF2:2H2O	-10.56	-15.11	-4.55	CuF2:2H2O
Cumetal	-7.35	-16.10	-8.76	Cu
CuMoO4	-0.05	-13.12	-13.08	CuMoO4
CuOCuSO4	-12.81	-2.51	10.30	CuOCuSO4
Cupricferrite	7.14	13.13	5.99	CuFe2O4
Cuprite	-5.26	-6.66	-1.41	Cu2O
Cuprousferrite	8.78	-0.14	-8.92	CuFeO2
CuSe	-5.95	-39.05	-33.10	CuSe
CuSe2	-25.94	-59.31	-33.37	CuSe2
CuSeO3:2H2O	-7.79	-7.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.60	-18.04	-2.44	CuSeO4:5H2O
CuSO4	-12.20	-9.26	2.94	CuSO4
Diaspore	1.90	8.77	6.87	AlOOH
Djurleite	-56.39	-90.31	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.64	-17.18	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.09	-17.18	-17.09	CaMg(CO3)2
Epsomite	-2.75	-4.88	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2:7Cl.3	3.35	0.31	-3.04	Fe(OH)2:7Cl.3
Fe(VO3)2	-5.61	-9.33	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.20	-7.65	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.07	-35.70	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.91	-41.65	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.71	-10.31	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-6.33	-16.42	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.01	-62.61	-18.60	FeSe2
FeS(ppt)	-78.13	-81.08	-2.95	FeS
FeSe	-31.35	-42.35	-11.00	FeSe
Fix_pe	-5.86	-5.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.31	-80.28	-13.97	PbS
Gibbsite	0.48	8.77	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.33	-8.34	-2.01	ZnSO4:7H2O
Greenockite	-65.05	-79.41	-14.36	CdS
Greigite	-283.24	-328.28	-45.03	Fe3S4
Gummite	-6.24	1.43	7.67	UO3
Gypsum	-0.04	-4.65	-4.61	CaSO4:2H2O
H-Jarosite	-10.35	-22.45	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.00	-19.87	-12.88	H2MoO4
H2S(g)	-76.52	-84.53	-8.01	H2S
H2Se(g)	-40.84	-45.80	-4.96	H2Se
Halite	-6.43	-4.83	1.60	NaCl
Hausmannite	-7.93	53.10	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.90	20.99	22.89	FeAl2O4
Hg(CH3)2(g)	-182.35	-256.06	-73.71	Hg(CH3)2
Hg(g)	-8.10	-15.98	-7.87	Hg

Hg (OH) 2	-8.53	-12.02	-3.50	Hg (OH) 2
Hg2 (g)	-16.99	-31.95	-14.96	Hg2
Hg2 (OH) 2	-11.67	-6.41	5.26	Hg2 (OH) 2
Hg2CO3	-10.19	-26.24	-16.05	Hg2CO3
Hg2CrO4	-27.94	-36.64	-8.70	Hg2CrO4
Hg2F2	-17.90	-28.26	-10.36	Hg2F2
Hg2S	-79.26	-90.93	-11.68	Hg2S
Hg2SeO3	-15.78	-20.43	-4.66	Hg2SeO3
Hg2SO4	-16.28	-22.41	-6.13	Hg2SO4
Hg3O2CO3	-26.22	-55.91	-29.68	Hg3O2CO3
HgCl (g)	-32.31	-12.81	19.50	HgCl
HgCl2	-9.97	-31.23	-21.26	HgCl2
HgF (g)	-46.81	-14.13	32.68	HgF
HgF2 (g)	-46.45	-33.88	12.57	HgF2
Hgmetal (l)	-2.52	-15.98	-13.45	Hg
HgSe	-2.13	-57.82	-55.69	HgSe
HgSeO3	-13.62	-26.05	-12.43	HgSeO3
HgSO4	-18.61	-28.03	-9.42	HgSO4
Huntite	-4.62	-34.58	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-8.15	-26.92	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.91	-23.67	-8.77	Mg5 (CO3) 4 (OH) 2: 4H2O
K-Alum	-13.78	-18.95	-5.17	KAl (SO4) 2: 12H2O
K-Jarosite	-3.34	-18.14	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.62	-51.86	-17.24	K2Cr2O7
K2CrO4	-21.11	-21.62	-0.51	K2CrO4
K2MoO4	-14.52	-11.26	3.26	K2MoO4
K2SeO4	-15.45	-16.18	-0.73	K2SeO4
Langite	-6.50	10.99	17.49	Cu4 (OH) 6SO4: H2O
Larnakite	-7.07	-7.51	-0.43	PbO: PbSO4
Laurionite	-5.98	-5.35	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-8.44	4.25	12.69	PbO
Mackinawite	-77.48	-81.08	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.66	17.52	16.86	Fe2MgO4
Magnesite	-1.24	-8.70	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-1.03	-6.34	-5.31	Cu2 (OH) 2CO3
Manganite	-3.38	21.96	25.34	MnOOH
Massicot	-8.64	4.25	12.89	PbO
Matlockite	-7.31	-16.28	-8.97	PbClF
Melanothallite	-18.72	-12.46	6.26	CuCl2
Melanterite	-10.35	-12.56	-2.21	FeSO4: 7H2O
Metacinnabar	-51.46	-96.55	-45.09	HgS
Mg (OH) 2 (active)	-7.66	11.14	18.79	Mg (OH) 2
Mg (VO3) 2	-12.93	-1.65	11.28	Mg (VO3) 2
Mg2Sb3	-276.45	-201.77	74.68	Mg2Sb3
Mg2V2O7	-16.88	9.48	26.36	Mg2V2O7
MgCr2O4	-7.42	8.78	16.20	MgCr2O4
MgCrO4	-24.48	-19.10	5.38	MgCrO4
MgF2	-2.59	-10.72	-8.13	MgF2
MgMoO4	-6.89	-8.74	-1.85	MgMoO4
MgSeO3: 6H2O	-5.95	-2.89	3.06	MgSeO3: 6H2O
MgSeO4: 6H2O	-12.46	-13.66	-1.20	MgSeO4: 6H2O
Minium	-35.22	38.30	73.52	Pb3O4
Mirabilite	-5.34	-6.45	-1.11	Na2SO4: 10H2O
Mn (VO3) 2	-8.50	-3.60	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.10	-54.81	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.45	-90.37	61.08	Mn2Sb
Mn3 (AsO4) 2: 8H2O	-11.94	0.56	12.50	Mn3 (AsO4) 2: 8H2O
MnCl2: 4H2O	-12.74	-10.03	2.72	MnCl2: 4H2O
MnS (grn)	-75.51	-75.34	0.17	MnS
MnS (pnk)	-78.68	-75.34	3.34	MnS
MnSb	-96.45	-99.36	-2.91	MnSb
MnSe	-40.12	-36.62	3.50	MnSe
MnSeO3	-5.97	-4.84	1.13	MnSeO3
MnSeO3: 2H2O	-5.82	-4.84	0.98	MnSeO3: 2H2O

MnSeO4:5H2O	-13.56	-15.61	-2.05	MnSeO4:5H2O
MnSO4	-9.41	-6.82	2.58	MnSO4
Monteponite	-9.98	5.12	15.10	CdO
Montroydite	-8.38	-12.02	-3.64	HgO
MoO3	-11.87	-19.87	-8.00	MoO3
Morenosite	-7.32	-9.46	-2.14	NiSO4:7H2O
MoS2	-144.21	-214.47	-70.26	MoS2
Na-Jarosite	-6.46	-17.66	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.68	2.93	Na2CrO4
Na2Mo2O7	-13.59	-30.18	-16.60	Na2Mo2O7
Na2MoO4	-11.80	-10.31	1.49	Na2MoO4
Na2MoO4:2H2O	-11.53	-10.31	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.77	-4.47	10.30	Na2SeO3:5H2O
Na2SeO4	-16.51	-15.23	1.28	Na2SeO4
Na3Sb	-176.08	-81.62	94.45	Na3Sb
Na3VO4	-28.73	7.95	36.68	Na3VO4
Na4V2O7	-31.06	6.34	37.40	Na4V2O7
Nantokite	-6.21	-12.94	-6.73	CuCl
NaSb	-88.81	-65.64	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-5.47	-1.61	3.86	NaVO3
Nesquehonite	-4.03	-8.70	-4.67	MgCO3:3H2O
Ni(OH)2	-6.24	6.55	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.05	-7.35	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.81	10.19	32.00	Ni4(OH)6SO4
NiCO3	-6.42	-13.29	-6.87	NiCO3
NiMoO4	-2.18	-13.32	-11.14	NiMoO4
NiS(alpha)	-72.38	-77.98	-5.60	NiS
NiS(beta)	-66.88	-77.98	-11.10	NiS
NiS(gamma)	-65.18	-77.98	-12.80	NiS
NiSe	-21.55	-39.25	-17.70	NiSe
NiSeO3:2H2O	-10.29	-7.48	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.72	-18.24	-1.52	NiSeO4:6H2O
Nsutite	-8.12	9.38	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-232.81	-293.88	-61.07	As2S3
Otavite	-2.72	-14.72	-12.00	CdCO3
Pb(BO2)2	-11.38	-4.86	6.52	Pb(BO2)2
Pb(OH)2	-3.90	4.25	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-67.75	-76.51	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.90	-1.10	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.68	8.50	26.19	Pb2O(OH)2
Pb2O3	-26.99	34.05	61.04	Pb2O3
Pb2OCO3	-10.78	-11.33	-0.56	Pb2OCO3
Pb2V2O7	-2.38	-4.28	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.04	-14.24	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.17	-0.03	6.14	Pb3(VO4)2
Pb3O2CO3	-18.10	-7.08	11.02	Pb3O2CO3
Pb3O2SO4	-13.94	-3.25	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.10	1.00	21.10	Pb4(OH)6SO4
Pb4O3SO4	-20.88	1.00	21.88	Pb4O3SO4
PbCrO4	-13.39	-25.99	-12.60	PbCrO4
PbF2	-10.17	-17.61	-7.44	PbF2
Pbmetal	-25.54	-21.29	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-8.73	4.25	12.98	PbO:0.33H2O
PbSeO4	-13.70	-20.54	-6.84	PbSeO4
Periclase	-10.45	11.14	21.58	MgO
Phosgenite	-10.74	-30.55	-19.81	PbCl2:PbCO3
Plattnerite	-19.80	29.80	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-121.55	-140.06	-18.51	FeS2
Pyrochroite	-6.01	9.19	15.19	Mn(OH)2
Pyrolusite	-6.65	34.73	41.38	MnO2
Realgar	-97.70	-117.45	-19.75	AsS
Retgersite	-7.42	-9.46	-2.04	NiSO4:6H2O
Rhodochrosite	-0.07	-10.65	-10.58	MnCO3

Rutherfordine	-3.91	-18.41	-14.50	UO2CO3
Sb(OH)3	-12.22	-19.33	-7.11	Sb(OH)3
Sb2O4	-16.52	-13.12	3.40	Sb2O4
Sb2O5	-26.53	-36.20	-9.67	Sb2O5
Sb2Se3	-108.31	-176.07	-67.76	Sb2Se3
Sb4O6(cubic)	-59.07	-77.33	-18.26	Sb4O6
Sb4O6(orth)	-59.43	-77.33	-17.90	Sb4O6
SbCl3	-48.72	-48.15	0.57	SbCl3
SbF3	-41.89	-52.12	-10.23	SbF3
Sbmetal	-45.96	-57.65	-11.69	Sb
SbO2	-3.05	-30.87	-27.82	SbO2
Schoepite	-4.57	1.43	5.99	UO2(OH)2·H2O
Semetal(am)	-13.15	-20.26	-7.11	Se
Semetal(hex)	-12.55	-20.26	-7.71	Se
Senarmontite	-26.30	-38.67	-12.37	Sb2O3
SeO2	-14.15	-14.03	0.12	SeO2
SeO3	-45.83	-24.79	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-2.16	-12.16	-10.00	ZnCO3
Sphalerite	-65.41	-76.86	-11.45	ZnS
Spinel	-8.17	28.68	36.85	MgAl2O4
Stibnite	-241.79	-292.25	-50.46	Sb2S3
Sulfur	-56.84	-58.98	-2.14	S
Tenorite	-0.89	6.75	7.64	CuO
Thenardite	-6.77	-6.45	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3·H2O
Tyuyamunite	-2.65	1.43	4.08	Ca(UO2)2(VO4)2
U3O8	-14.69	6.39	21.08	U3O8
U3Sb4	-580.95	-428.57	152.38	U3Sb4
U4O9	-31.03	-34.05	-3.02	U4O9
UF4	-29.08	-58.61	-29.54	UF4
UF4·2.5H2O	-25.90	-58.61	-32.72	UF4·2.5H2O
UO2(am)	-15.83	-14.90	0.93	UO2
UO2(NO3)2	-39.80	-27.65	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-32.50	-27.65	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-31.04	-27.65	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-29.70	-27.65	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-4.18	1.43	5.61	UO2(OH)2
UO2SeO4·4H2O	-21.11	-23.36	-2.25	UO2SeO4·4H2O
UO3	-6.27	1.43	7.70	UO3
Uraninite	-10.23	-14.90	-4.67	UO2
USb2	-220.08	-190.51	29.58	USb2
V(OH)3	-16.93	-9.34	7.59	V(OH)3
V2O5	-11.43	-12.79	-1.36	V2O5
V3O5	-34.17	-32.33	1.84	V3O5
V4O7	-41.78	-34.59	7.19	V4O7
V6O13	-28.59	-89.45	-60.86	V6O13
Valentinite	-30.19	-38.67	-8.48	Sb2O3
VC12	-60.20	-41.32	18.87	VC12
VC13	-61.59	-38.16	23.43	VC13
VF4	-60.91	-45.98	14.93	VF4
Vmetal	-91.68	-47.66	44.03	V
VO	-36.87	-22.11	14.76	VO
VO(OH)2	-7.41	-2.26	5.15	VO(OH)2
VO2Cl	-18.84	-16.00	2.84	VO2Cl
VOC1	-30.10	-18.94	11.15	VOC1
VOC12	-34.23	-21.47	12.76	VOC12
VOSO4	-21.88	-18.27	3.61	VOSO4
Witherite	-5.24	-13.81	-8.57	BaCO3
Wurtzite	-67.91	-76.86	-8.95	ZnS
Zincite	-3.66	7.67	11.33	ZnO
Zincosite	-12.27	-8.34	3.93	ZnSO4
Zn(BO2)2	-9.73	-1.44	8.29	Zn(BO2)2
Zn(NO3)2·6H2O	-24.72	-21.41	3.32	Zn(NO3)2·6H2O
Zn(OH)2	-4.53	7.67	12.20	Zn(OH)2
Zn(OH)2(am)	-4.80	7.67	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.08	7.67	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.86	7.67	11.53	Zn(OH)2

Zn(OH)2(gamma)	-4.06	7.67	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.16	-0.66	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.45	5.74	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.63	-3.98	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.91	-9.00	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.72	14.68	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.35	19.15	38.50	Zn5(OH)8Cl2
ZnCl2	-18.59	-11.54	7.05	ZnCl2
ZnCO3:1H2O	-1.90	-12.16	-10.26	ZnCO3:1H2O
ZnF2	-13.65	-14.18	-0.53	ZnF2
Znmetal	-43.66	-17.87	25.79	Zn
ZnMoO4	-2.07	-12.20	-10.13	ZnMoO4
ZnO(active)	-3.52	7.67	11.19	ZnO
ZnS(am)	-67.80	-76.86	-9.05	ZnS
ZnSb	-86.54	-75.52	11.01	ZnSb
ZnSe	-23.73	-38.13	-14.40	ZnSe
ZnSeO4:6H2O	-15.60	-17.12	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.70	-8.34	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 17.

```
Title Stage 1 Run-off mix
Mix 102
1      1
3      5.350500
4      7.185961
5      10.381291
6      17.683587
7      0.089890
8      4.409388
9      1.638334
10     5.989190
Save solution 105
end
```

TITLE

Stage 1 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 102.

Mixture 102.

1.000e+000 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

5.351e+000 Solution 3 Average HCT data for biotite breccia - oxide/transitional (waste) (cell SRK 0872)

7.186e+000 Solution 4 Average HCT data for biotite breccia - oxide/transitional (ore) (cells SRK 0854)

1.038e+001 Solution 5 Average HCT data for quartz monzonite - oxide/transitional (waste) (cell 604569)

1.768e+001 Solution 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

8.989e-002 Solution 7 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
4.409e+000 Solution 8 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604787, 604811, 604854, 604862, 604867 and 605033)
1.638e+000 Solution 9 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
5.989e+000 Solution 10 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)

-----Solution composition-----

Elements	Molality	Moles
Al	3.424e-006	1.840e-004
As	4.203e-009	2.258e-007
B	3.359e-007	1.805e-005
Ba	6.015e-008	3.232e-006
C	3.298e-004	1.772e-002
Ca	4.820e-004	2.590e-002
Cd	1.928e-009	1.036e-007
Cl	2.365e-005	1.270e-003
Co	5.540e-009	2.976e-007
Cr	9.291e-010	4.992e-008
Cu	3.857e-005	2.072e-003
F	3.096e-005	1.664e-003
Fe	2.446e-006	1.314e-004
Hg	5.211e-012	2.800e-010
K	4.797e-005	2.577e-003
Mg	9.412e-005	5.057e-003
Mn	4.418e-006	2.374e-004
Mo	1.141e-007	6.128e-006
N	1.681e-008	9.032e-007
Na	2.169e-004	1.166e-002
Ni	6.152e-009	3.305e-007
Pb	2.684e-009	1.442e-007
S	5.957e-004	3.201e-002
Sb	8.446e-009	4.538e-007
Se	3.185e-009	1.711e-007
U	4.689e-009	2.519e-007
V	1.018e-008	5.472e-007
Zn	2.150e-007	1.155e-005

-----Description of solution-----

	pH	=	6.786	Charge balance
	pe	=	3.774	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength	=	2.510e-003	
	Mass of water (kg)	=	5.373e+001	
	Total alkalinity (eq/kg)	=	2.701e-004	
	Total CO2 (mol/kg)	=	3.298e-004	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	1.142e-005	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.01	
	Iterations	=	10	
	Total H	=	5.964580e+003	
	Total O	=	2.982461e+003	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.728e-007	1.635e-007	-6.763	-6.786	-0.024	0.00
OH-	6.511e-008	6.158e-008	-7.186	-7.211	-0.024	(0)
H2O	5.551e+001	1.000e+000	1.744	-0.000	0.000	18.07
Al	3.424e-006					

Al (OH) 4-	2.467e-006	2.335e-006	-5.608	-5.632	-0.024	(0)
Al (OH) 3	3.012e-007	3.012e-007	-6.521	-6.521	0.000	(0)
AlF2+	2.704e-007	2.562e-007	-6.568	-6.591	-0.023	(0)
Al (OH) 2+	2.587e-007	2.451e-007	-6.587	-6.611	-0.023	(0)
AlF3	9.070e-008	9.070e-008	-7.042	-7.042	0.000	(0)
AlF+2	2.840e-008	2.288e-008	-7.547	-7.640	-0.094	(0)
AlOH+2	6.220e-009	5.011e-009	-8.206	-8.300	-0.094	(0)
AlF4-	1.350e-009	1.278e-009	-8.870	-8.893	-0.024	(0)
AlSO4+	2.948e-010	2.791e-010	-9.530	-9.554	-0.024	(0)
Al+3	1.337e-010	8.137e-011	-9.874	-10.090	-0.216	(0)
Al (SO4) 2-	1.396e-012	1.322e-012	-11.855	-11.879	-0.024	(0)
AlMo6O21-3	1.495e-038	8.806e-039	-37.825	-38.055	-0.230	(0)
As (3)	3.753e-016					
H3AsO3	3.740e-016	3.740e-016	-15.427	-15.427	0.000	(0)
H2AsO3-	1.244e-018	1.173e-018	-17.905	-17.931	-0.026	(0)
H4AsO3+	3.213e-023	3.030e-023	-22.493	-22.519	-0.026	(0)
HAsO3-2	8.281e-024	6.544e-024	-23.082	-23.184	-0.102	(0)
AsO3-3	2.620e-030	1.543e-030	-29.582	-29.812	-0.230	(0)
As (5)	4.203e-009					
H2AsO4-	2.335e-009	2.201e-009	-8.632	-8.657	-0.026	(0)
HAsO4-2	1.868e-009	1.476e-009	-8.729	-8.831	-0.102	(0)
H3AsO4	6.251e-014	6.255e-014	-13.204	-13.204	0.000	(0)
AsO4-3	4.848e-014	2.855e-014	-13.314	-13.544	-0.230	(0)
B	3.359e-007					
H3BO3	3.346e-007	3.348e-007	-6.475	-6.475	0.000	(0)
H2BO3-	1.259e-009	1.189e-009	-8.900	-8.925	-0.025	(0)
CaH2BO3+	2.580e-011	2.438e-011	-10.588	-10.613	-0.025	(0)
BF (OH) 3-	3.976e-012	3.757e-012	-11.401	-11.425	-0.025	(0)
MgH2BO3+	3.081e-012	2.912e-012	-11.511	-11.536	-0.025	(0)
NaH2BO3	3.860e-013	3.860e-013	-12.413	-12.413	0.000	(0)
BF2 (OH) 2-	1.954e-015	1.847e-015	-14.709	-14.734	-0.025	(0)
BaH2BO3+	1.873e-015	1.770e-015	-14.727	-14.752	-0.025	(0)
H5 (BO3) 2-	3.587e-016	3.390e-016	-15.445	-15.470	-0.025	(0)
H8 (BO3) 3-	1.201e-020	1.135e-020	-19.920	-19.945	-0.025	(0)
BF3OH-	3.496e-021	3.304e-021	-20.456	-20.481	-0.025	(0)
BF4-	7.911e-026	7.476e-026	-25.102	-25.126	-0.025	(0)
Ba	6.015e-008					
Ba+2	6.004e-008	4.816e-008	-7.222	-7.317	-0.096	(0)
BaHCO3+	1.093e-010	1.036e-010	-9.961	-9.985	-0.023	(0)
BaCO3	1.595e-012	1.595e-012	-11.797	-11.797	0.000	(0)
BaOH+	1.367e-014	1.295e-014	-13.864	-13.888	-0.024	(0)
BaH2BO3+	1.873e-015	1.770e-015	-14.727	-14.752	-0.025	(0)
BaNH3+2	2.111e-018	1.669e-018	-17.675	-17.778	-0.102	(0)
BaNO3+	3.860e-036	3.640e-036	-35.413	-35.439	-0.026	(0)
C (4)	3.298e-004					
HCO3-	2.377e-004	2.252e-004	-3.624	-3.647	-0.023	(0)
H2CO3	8.282e-005	8.282e-005	-4.082	-4.082	0.000	(0)
CuCO3	7.025e-006	7.025e-006	-5.153	-5.153	0.000	(0)
CaHCO3+	1.576e-006	1.494e-006	-5.802	-5.826	-0.023	(0)
CuHCO3+	2.784e-007	2.625e-007	-6.555	-6.581	-0.026	(0)
MgHCO3+	1.720e-007	1.627e-007	-6.765	-6.789	-0.024	(0)
CO3-2	8.052e-008	6.458e-008	-7.094	-7.190	-0.096	(0)
CaCO3	3.646e-008	3.646e-008	-7.438	-7.438	0.000	(0)
NaHCO3	2.594e-008	2.594e-008	-7.586	-7.586	0.000	(0)
MnHCO3+	1.553e-008	1.471e-008	-7.809	-7.833	-0.024	(0)
MgCO3	3.793e-009	3.793e-009	-8.421	-8.421	0.000	(0)
FeHCO3+	3.714e-009	3.521e-009	-8.430	-8.453	-0.023	(0)
UO2 (CO3) 2-2	2.833e-009	2.239e-009	-8.548	-8.650	-0.102	(0)
UO2CO3	1.738e-009	1.738e-009	-8.760	-8.760	0.000	(0)
Cu (CO3) 2-2	1.545e-009	1.221e-009	-8.811	-8.913	-0.102	(0)
ZnHCO3+	1.192e-009	1.124e-009	-8.924	-8.949	-0.026	(0)
ZnCO3	5.864e-010	5.864e-010	-9.232	-9.232	0.000	(0)
PbCO3	2.602e-010	2.602e-010	-9.585	-9.585	0.000	(0)
NaCO3-	2.599e-010	2.463e-010	-9.585	-9.609	-0.023	(0)
PbHCO3+	2.379e-010	2.243e-010	-9.624	-9.649	-0.026	(0)
NiHCO3+	1.324e-010	1.248e-010	-9.878	-9.904	-0.026	(0)
BaHCO3+	1.093e-010	1.036e-010	-9.961	-9.985	-0.023	(0)
CoHCO3+	7.483e-011	7.056e-011	-10.126	-10.151	-0.026	(0)

UO2 (CO3) 3-4	1.858e-011	7.247e-012	-10.731	-11.140	-0.409	(0)
NiCO3	1.083e-011	1.083e-011	-10.965	-10.965	0.000	(0)
CoCO3	4.397e-012	4.397e-012	-11.357	-11.357	0.000	(0)
CdCO3	2.093e-012	2.093e-012	-11.679	-11.679	0.000	(0)
BaCO3	1.595e-012	1.595e-012	-11.797	-11.797	0.000	(0)
CdHCO3+	7.731e-013	7.290e-013	-12.112	-12.137	-0.026	(0)
Pb (CO3) 2-2	6.131e-014	4.845e-014	-13.212	-13.315	-0.102	(0)
Cd (CO3) 2-2	1.268e-016	1.002e-016	-15.897	-15.999	-0.102	(0)
HgCO3	1.542e-021	1.542e-021	-20.812	-20.812	0.000	(0)
HgHCO3+	4.980e-024	4.696e-024	-23.303	-23.328	-0.026	(0)
Hg (CO3) 2-2	3.986e-025	3.150e-025	-24.400	-24.502	-0.102	(0)
Ca	4.820e-004					
Ca+2	4.442e-004	3.563e-004	-3.352	-3.448	-0.096	(0)
CaSO4	3.607e-005	3.607e-005	-4.443	-4.443	0.000	(0)
CaHCO3+	1.576e-006	1.494e-006	-5.802	-5.826	-0.023	(0)
CaF+	1.155e-007	1.094e-007	-6.938	-6.961	-0.024	(0)
CaCO3	3.646e-008	3.646e-008	-7.438	-7.438	0.000	(0)
CaOH+	4.619e-010	4.378e-010	-9.335	-9.359	-0.023	(0)
CaH2BO3+	2.580e-011	2.438e-011	-10.588	-10.613	-0.025	(0)
CaNH3+2	3.117e-014	2.463e-014	-13.506	-13.609	-0.102	(0)
Ca (NH3) 2+2	6.814e-025	5.385e-025	-24.167	-24.269	-0.102	(0)
CaNO3+	1.802e-032	1.699e-032	-31.744	-31.770	-0.026	(0)
Cd	1.928e-009					
Cd+2	1.773e-009	1.422e-009	-8.751	-8.847	-0.096	(0)
CdSO4	1.473e-010	1.473e-010	-9.832	-9.832	0.000	(0)
CdCl+	3.216e-012	3.033e-012	-11.493	-11.518	-0.026	(0)
CdCO3	2.093e-012	2.093e-012	-11.679	-11.679	0.000	(0)
Cd (SO4) 2-2	1.111e-012	8.780e-013	-11.954	-12.056	-0.102	(0)
CdHCO3+	7.731e-013	7.290e-013	-12.112	-12.137	-0.026	(0)
CdOH+	7.376e-013	6.955e-013	-12.132	-12.158	-0.026	(0)
CdF+	6.721e-013	6.337e-013	-12.173	-12.198	-0.026	(0)
CdOHC1	7.661e-015	7.661e-015	-14.116	-14.116	0.000	(0)
CdCl2	2.824e-016	2.824e-016	-15.549	-15.549	0.000	(0)
Cd (OH) 2	2.702e-016	2.702e-016	-15.568	-15.568	0.000	(0)
Cd (CO3) 2-2	1.268e-016	1.002e-016	-15.897	-15.999	-0.102	(0)
CdF2	3.556e-017	3.556e-017	-16.449	-16.449	0.000	(0)
Cd2OH+3	8.414e-021	4.955e-021	-20.075	-20.305	-0.230	(0)
CdCl3-	4.220e-021	3.979e-021	-20.375	-20.400	-0.026	(0)
Cd (OH) 3-	1.078e-021	1.017e-021	-20.967	-20.993	-0.026	(0)
Cd (SeO3) 2-2	7.485e-024	5.915e-024	-23.126	-23.228	-0.102	(0)
CdSeO4	3.074e-024	3.074e-024	-23.512	-23.512	0.000	(0)
Cd (OH) 4-2	1.297e-029	1.025e-029	-28.887	-28.989	-0.102	(0)
CdNO3+	7.191e-038	6.780e-038	-37.143	-37.169	-0.026	(0)
CdHS+	0.000e+000	0.000e+000	-61.780	-61.806	-0.026	(0)
Cd (NO3) 2	0.000e+000	0.000e+000	-66.290	-66.290	0.000	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-115.568	-115.568	0.000	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-174.609	-174.634	-0.026	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-233.302	-233.405	-0.102	(0)
Cl	2.365e-005					
Cl-	2.360e-005	2.234e-005	-4.627	-4.651	-0.024	(0)
CuCl	4.279e-008	4.279e-008	-7.369	-7.369	0.000	(0)
CuCl+	6.911e-010	6.540e-010	-9.160	-9.184	-0.024	(0)
CuCl2-	2.110e-010	1.997e-010	-9.676	-9.700	-0.024	(0)
MnCl+	9.716e-011	9.202e-011	-10.013	-10.036	-0.024	(0)
ZnCl+	9.356e-012	8.854e-012	-11.029	-11.053	-0.024	(0)
CdCl+	3.216e-012	3.033e-012	-11.493	-11.518	-0.026	(0)
PbCl+	1.126e-012	1.062e-012	-11.948	-11.974	-0.026	(0)
ZnOHC1	7.138e-013	7.138e-013	-12.146	-12.146	0.000	(0)
CoCl+	3.300e-013	3.112e-013	-12.481	-12.507	-0.026	(0)
NiCl+	2.725e-013	2.569e-013	-12.565	-12.590	-0.026	(0)
CdOHC1	7.661e-015	7.661e-015	-14.116	-14.116	0.000	(0)
CuCl2	5.065e-015	5.065e-015	-14.295	-14.295	0.000	(0)
MnCl2	2.903e-015	2.903e-015	-14.537	-14.537	0.000	(0)
CuCl3-2	1.185e-015	9.536e-016	-14.926	-15.021	-0.094	(0)
ZnCl2	3.134e-016	3.134e-016	-15.504	-15.504	0.000	(0)
CdCl2	2.824e-016	2.824e-016	-15.549	-15.549	0.000	(0)
UO2Cl+	2.597e-016	2.448e-016	-15.586	-15.611	-0.026	(0)
PbCl2	1.060e-016	1.060e-016	-15.975	-15.975	0.000	(0)

CrCl+2	2.656e-018	2.099e-018	-17.576	-17.678	-0.102	(0)
FeCl+2	5.749e-019	4.626e-019	-18.240	-18.335	-0.094	(0)
VOCl+	1.117e-019	1.053e-019	-18.952	-18.978	-0.026	(0)
HgClOH	4.848e-020	4.848e-020	-19.314	-19.314	0.000	(0)
NiCl2	2.889e-020	2.889e-020	-19.539	-19.539	0.000	(0)
MnCl3-	1.886e-020	1.786e-020	-19.725	-19.748	-0.024	(0)
ZnCl3-	5.876e-021	5.561e-021	-20.231	-20.255	-0.024	(0)
CdCl3-	4.220e-021	3.979e-021	-20.375	-20.400	-0.026	(0)
CuCl3-	1.116e-021	1.056e-021	-20.952	-20.976	-0.024	(0)
PbCl3-	9.993e-022	9.422e-022	-21.000	-21.026	-0.026	(0)
HgCl2	9.956e-022	9.956e-022	-21.002	-21.002	0.000	(0)
CrOHC12	5.487e-023	5.487e-023	-22.261	-22.261	0.000	(0)
FeCl2+	4.873e-023	4.615e-023	-22.312	-22.336	-0.024	(0)
HgCl+	9.433e-024	8.894e-024	-23.025	-23.051	-0.026	(0)
CrCl2+	4.717e-024	4.448e-024	-23.326	-23.352	-0.026	(0)
HgCl3-	2.359e-025	2.224e-025	-24.627	-24.653	-0.026	(0)
ZnCl4-2	7.719e-026	6.210e-026	-25.112	-25.207	-0.094	(0)
PbCl4-2	1.217e-026	9.619e-027	-25.915	-26.017	-0.102	(0)
CuCl4-2	1.469e-028	1.182e-028	-27.833	-27.927	-0.094	(0)
FeCl3	1.031e-028	1.031e-028	-27.987	-27.987	0.000	(0)
HgCl4-2	2.502e-029	1.977e-029	-28.602	-28.704	-0.102	(0)
CrO3Cl-	4.372e-036	4.122e-036	-35.359	-35.385	-0.026	(0)
CoCl+2	5.482e-040	4.332e-040	-39.261	-39.363	-0.102	(0)
UCl+3	4.271e-040	2.515e-040	-39.369	-39.599	-0.230	(0)
Co(NH3)5Cl+2	0.000e+000	0.000e+000	-64.610	-64.712	-0.102	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-65.148	-65.250	-0.102	(0)
Co(NH3)6Cl+2	0.000e+000	0.000e+000	-81.585	-81.688	-0.102	(0)
Co(2)	5.540e-009					
Co+2	5.096e-009	4.027e-009	-8.293	-8.395	-0.102	(0)
CoSO4	3.551e-010	3.551e-010	-9.450	-9.450	0.000	(0)
CoHCO3+	7.483e-011	7.056e-011	-10.126	-10.151	-0.026	(0)
CoOH+	5.249e-012	4.949e-012	-11.280	-11.306	-0.026	(0)
CoCO3	4.397e-012	4.397e-012	-11.357	-11.357	0.000	(0)
CoF+	3.799e-012	3.582e-012	-11.420	-11.446	-0.026	(0)
CoCl+	3.300e-013	3.112e-013	-12.481	-12.507	-0.026	(0)
Co(OH)2	2.421e-014	2.421e-014	-13.616	-13.616	0.000	(0)
Co(NH3)+2	3.364e-017	2.659e-017	-16.473	-16.575	-0.102	(0)
Co(OH)3-	3.155e-020	2.975e-020	-19.501	-19.527	-0.026	(0)
CoOOH-	7.916e-021	7.463e-021	-20.102	-20.127	-0.026	(0)
Co2OH+3	1.696e-021	9.989e-022	-20.771	-21.000	-0.230	(0)
CoSeO4	2.344e-023	2.344e-023	-22.630	-22.630	0.000	(0)
Co(NH3)2+2	7.882e-026	6.229e-026	-25.103	-25.206	-0.102	(0)
Co(OH)4-2	3.674e-028	2.903e-028	-27.435	-27.537	-0.102	(0)
CoNO2+	1.276e-029	1.203e-029	-28.894	-28.920	-0.026	(0)
Co(NH3)3+2	5.449e-035	4.306e-035	-34.264	-34.366	-0.102	(0)
Co4(OH)4+4	3.067e-037	1.197e-037	-36.513	-36.922	-0.409	(0)
CoNO3+	1.021e-037	9.626e-038	-36.991	-37.017	-0.026	(0)
Co(NH3)4+2	0.000e+000	0.000e+000	-43.804	-43.906	-0.102	(0)
Co(NH3)5+2	0.000e+000	0.000e+000	-53.844	-53.946	-0.102	(0)
Co(NO3)2	0.000e+000	0.000e+000	-65.530	-65.530	0.000	(0)
Co(3)	3.775e-032					
CoOH+2	3.775e-032	2.983e-032	-31.423	-31.525	-0.102	(0)
Co+3	1.566e-037	9.532e-038	-36.805	-37.021	-0.216	(0)
CoCl+2	5.482e-040	4.332e-040	-39.261	-39.363	-0.102	(0)
Co(NH3)5Cl+2	0.000e+000	0.000e+000	-64.610	-64.712	-0.102	(0)
Co(NH3)6SO4+	0.000e+000	0.000e+000	-75.440	-75.466	-0.026	(0)
Co(NH3)6OH+2	0.000e+000	0.000e+000	-79.945	-80.047	-0.102	(0)
Co(NH3)6Cl+2	0.000e+000	0.000e+000	-81.585	-81.688	-0.102	(0)
Cr(2)	3.691e-024					
Cr+2	3.691e-024	2.917e-024	-23.433	-23.535	-0.102	(0)
Cr(3)	9.291e-010					
Cr(OH)2+	7.774e-010	7.330e-010	-9.109	-9.135	-0.026	(0)
Cr(OH)+2	1.238e-010	9.782e-011	-9.907	-10.010	-0.102	(0)
Cr(OH)3	1.696e-011	1.696e-011	-10.771	-10.771	0.000	(0)
CrOHSO4	1.026e-011	1.026e-011	-10.989	-10.989	0.000	(0)
CrF+2	4.095e-013	3.236e-013	-12.388	-12.490	-0.102	(0)
Cr+3	1.233e-013	7.260e-014	-12.909	-13.139	-0.230	(0)
CrSO4+	7.946e-014	7.492e-014	-13.100	-13.125	-0.026	(0)

CrO2-	5.224e-014	4.925e-014	-13.282	-13.308	-0.026	(0)
Cr(OH)4-	4.409e-014	4.157e-014	-13.356	-13.381	-0.026	(0)
CrCl+2	2.656e-018	2.099e-018	-17.576	-17.678	-0.102	(0)
Cr2(OH)2SO4+2	1.148e-019	9.069e-020	-18.940	-19.042	-0.102	(0)
Cr2(OH)2(SO4)2	2.381e-021	2.381e-021	-20.623	-20.623	0.000	(0)
CrOHC12	5.487e-023	5.487e-023	-22.261	-22.261	0.000	(0)
CrCl2+	4.717e-024	4.448e-024	-23.326	-23.352	-0.026	(0)
CrNO3+2	0.000e+000	0.000e+000	-43.218	-43.320	-0.102	(0)
Cr(NH3)5OH+2	0.000e+000	0.000e+000	-51.177	-51.279	-0.102	(0)
Cr(NH3)6+3	0.000e+000	0.000e+000	-61.471	-61.701	-0.230	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-65.148	-65.250	-0.102	(0)
Cr(6)	6.137e-025					
CrO4-2	4.229e-025	3.392e-025	-24.374	-24.470	-0.096	(0)
HCrO4-	1.903e-025	1.795e-025	-24.720	-24.746	-0.026	(0)
NaCrO4-	3.661e-028	3.452e-028	-27.436	-27.462	-0.026	(0)
KCrO4-	6.049e-029	5.704e-029	-28.218	-28.244	-0.026	(0)
H2CrO4	2.379e-032	2.379e-032	-31.624	-31.624	0.000	(0)
CrO3SO4-2	4.998e-033	3.950e-033	-32.301	-32.403	-0.102	(0)
CrO3Cl-	4.372e-036	4.122e-036	-35.359	-35.385	-0.026	(0)
Cr2O7-2	0.000e+000	0.000e+000	-47.850	-47.952	-0.102	(0)
Cu(1)	1.657e-006					
Cu+	1.614e-006	1.522e-006	-5.792	-5.818	-0.026	(0)
CuCl	4.279e-008	4.279e-008	-7.369	-7.369	0.000	(0)
CuCl2-	2.110e-010	1.997e-010	-9.676	-9.700	-0.024	(0)
CuCl3-2	1.185e-015	9.536e-016	-14.926	-15.021	-0.094	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-110.621	-110.787	-0.167	(0)
CuS4S5-3	0.000e+000	0.000e+000	-111.354	-111.517	-0.163	(0)
Cu(2)	3.691e-005					
Cu+2	2.303e-005	1.847e-005	-4.638	-4.733	-0.096	(0)
CuCO3	7.025e-006	7.025e-006	-5.153	-5.153	0.000	(0)
CuOH+	3.802e-006	3.598e-006	-5.420	-5.444	-0.024	(0)
CuSO4	1.870e-006	1.870e-006	-5.728	-5.728	0.000	(0)
Cu2(OH)2+2	4.114e-007	3.251e-007	-6.386	-6.488	-0.102	(0)
CuHCO3+	2.784e-007	2.625e-007	-6.555	-6.581	-0.026	(0)
Cu(OH)2	4.421e-008	4.421e-008	-7.355	-7.355	0.000	(0)
CuF+	3.477e-008	3.278e-008	-7.459	-7.484	-0.026	(0)
Cu(CO3)2-2	1.545e-009	1.221e-009	-8.811	-8.913	-0.102	(0)
CuCl+	6.911e-010	6.540e-010	-9.160	-9.184	-0.024	(0)
CuNH3+2	1.314e-011	1.038e-011	-10.882	-10.984	-0.102	(0)
Cu(OH)3-	5.923e-012	5.584e-012	-11.227	-11.253	-0.026	(0)
CuCl2	5.065e-015	5.065e-015	-14.295	-14.295	0.000	(0)
Cu(OH)4-2	3.425e-018	2.707e-018	-17.465	-17.568	-0.102	(0)
CuCl3-	1.116e-021	1.056e-021	-20.952	-20.976	-0.024	(0)
CuNO2+	8.694e-025	8.197e-025	-24.061	-24.086	-0.026	(0)
CuCl4-2	1.469e-028	1.182e-028	-27.833	-27.927	-0.094	(0)
CuNO3+	9.344e-034	8.810e-034	-33.029	-33.055	-0.026	(0)
Cu(NO2)2	0.000e+000	0.000e+000	-44.449	-44.449	0.000	(0)
Cu(NO3)2	0.000e+000	0.000e+000	-62.777	-62.777	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-161.708	-161.734	-0.026	(0)
F	3.096e-005					
F-	2.972e-005	2.812e-005	-4.527	-4.551	-0.024	(0)
AlF2+	2.704e-007	2.562e-007	-6.568	-6.591	-0.023	(0)
MgF+	2.353e-007	2.228e-007	-6.628	-6.652	-0.024	(0)
CaF+	1.155e-007	1.094e-007	-6.938	-6.961	-0.024	(0)
AlF3	9.070e-008	9.070e-008	-7.042	-7.042	0.000	(0)
CuF+	3.477e-008	3.278e-008	-7.459	-7.484	-0.026	(0)
AlF+2	2.840e-008	2.288e-008	-7.547	-7.640	-0.094	(0)
HF	6.801e-009	6.801e-009	-8.167	-8.167	0.000	(0)
MnF+	3.869e-009	3.664e-009	-8.412	-8.436	-0.024	(0)
NaF	3.634e-009	3.634e-009	-8.440	-8.440	0.000	(0)
AlF4-	1.350e-009	1.278e-009	-8.870	-8.893	-0.024	(0)
ZnF+	9.391e-011	8.855e-011	-10.027	-10.053	-0.026	(0)
UO2F+	2.783e-011	2.624e-011	-10.556	-10.581	-0.026	(0)
BF(OH)3-	3.976e-012	3.757e-012	-11.401	-11.425	-0.025	(0)
CoF+	3.799e-012	3.582e-012	-11.420	-11.446	-0.026	(0)
NiF+	3.368e-012	3.176e-012	-11.473	-11.498	-0.026	(0)
PbF+	2.817e-012	2.656e-012	-11.550	-11.576	-0.026	(0)
UO2F2	2.128e-012	2.128e-012	-11.672	-11.672	0.000	(0)

HF2-	7.688e-013	7.272e-013	-12.114	-12.138	-0.024	(0)
CdF+	6.721e-013	6.337e-013	-12.173	-12.198	-0.026	(0)
CrF+2	4.095e-013	3.236e-013	-12.388	-12.490	-0.102	(0)
FeF+2	2.628e-014	2.115e-014	-13.580	-13.675	-0.094	(0)
FeF2+	1.680e-014	1.591e-014	-13.775	-13.798	-0.024	(0)
UO2F3-	1.594e-014	1.503e-014	-13.797	-13.823	-0.026	(0)
BF2(OH) 2-	1.954e-015	1.847e-015	-14.709	-14.734	-0.025	(0)
PbF2	1.470e-015	1.470e-015	-14.833	-14.833	0.000	(0)
FeF3	6.315e-016	6.315e-016	-15.200	-15.200	0.000	(0)
VOF+	3.006e-016	2.835e-016	-15.522	-15.548	-0.026	(0)
VO2F	2.305e-016	2.305e-016	-15.637	-15.637	0.000	(0)
H2F2	1.239e-016	1.239e-016	-15.907	-15.907	0.000	(0)
CdF2	3.556e-017	3.556e-017	-16.449	-16.449	0.000	(0)
UO2F4-2	4.249e-018	3.358e-018	-17.372	-17.474	-0.102	(0)
VOF2	2.989e-018	2.989e-018	-17.524	-17.524	0.000	(0)
VO2F2-	2.496e-018	2.353e-018	-17.603	-17.628	-0.026	(0)
PbF3-	8.315e-020	7.840e-020	-19.080	-19.106	-0.026	(0)
Sb(OH) 2F	1.687e-020	1.687e-020	-19.773	-19.773	0.000	(0)
SbOF	1.659e-020	1.659e-020	-19.780	-19.780	0.000	(0)
BF3OH-	3.496e-021	3.304e-021	-20.456	-20.481	-0.025	(0)
VOF3-	3.163e-021	2.983e-021	-20.500	-20.525	-0.026	(0)
VO2F3-2	1.045e-021	8.255e-022	-20.981	-21.083	-0.102	(0)
PbF4-2	1.335e-024	1.055e-024	-23.874	-23.977	-0.102	(0)
VOF4-2	4.284e-025	3.386e-025	-24.368	-24.470	-0.102	(0)
BF4-	7.911e-026	7.476e-026	-25.102	-25.126	-0.025	(0)
VO2F4-3	1.940e-026	1.142e-026	-25.712	-25.942	-0.230	(0)
HgF+	2.207e-029	2.080e-029	-28.656	-28.682	-0.026	(0)
UF3+	2.110e-029	1.990e-029	-28.676	-28.701	-0.026	(0)
UF2+2	5.648e-030	4.464e-030	-29.248	-29.350	-0.102	(0)
UF4	6.135e-032	6.135e-032	-31.212	-31.212	0.000	(0)
UF+3	2.141e-032	1.261e-032	-31.669	-31.899	-0.230	(0)
UF5-	7.252e-035	6.838e-035	-34.140	-34.165	-0.026	(0)
UF6-2	7.348e-037	5.807e-037	-36.134	-36.236	-0.102	(0)
Fe (2)	1.713e-006					
Fe+2	1.571e-006	1.242e-006	-5.804	-5.906	-0.102	(0)
FeSO4	1.347e-007	1.347e-007	-6.871	-6.871	0.000	(0)
FeHCO3+	3.714e-009	3.521e-009	-8.430	-8.453	-0.023	(0)
FeOH+	3.214e-009	3.044e-009	-8.493	-8.517	-0.024	(0)
Fe (OH) 2	1.489e-013	1.489e-013	-12.827	-12.827	0.000	(0)
Fe (OH) 3-	3.062e-015	2.900e-015	-14.514	-14.538	-0.024	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-118.889	-118.889	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-177.793	-177.818	-0.026	(0)
Fe (3)	7.331e-007					
Fe (OH) 2+	6.896e-007	6.533e-007	-6.161	-6.185	-0.023	(0)
Fe (OH) 3	4.321e-008	4.321e-008	-7.364	-7.364	0.000	(0)
Fe (OH) 4-	2.615e-010	2.478e-010	-9.582	-9.606	-0.023	(0)
FeOH+2	3.389e-011	2.727e-011	-10.470	-10.564	-0.094	(0)
FeF+2	2.628e-014	2.115e-014	-13.580	-13.675	-0.094	(0)
FeF2+	1.680e-014	1.591e-014	-13.775	-13.798	-0.024	(0)
FeSO4+	3.590e-015	3.400e-015	-14.445	-14.468	-0.024	(0)
Fe+3	1.126e-015	6.858e-016	-14.948	-15.164	-0.216	(0)
FeF3	6.315e-016	6.315e-016	-15.200	-15.200	0.000	(0)
Fe (SO4) 2-	3.408e-017	3.213e-017	-16.468	-16.493	-0.026	(0)
FeCl+2	5.749e-019	4.626e-019	-18.240	-18.335	-0.094	(0)
Fe2 (OH) 2+4	6.311e-020	2.462e-020	-19.200	-19.609	-0.409	(0)
FeHSeO3+2	6.691e-021	5.288e-021	-20.175	-20.277	-0.102	(0)
FeCl2+	4.873e-023	4.615e-023	-22.312	-22.336	-0.024	(0)
Fe3 (OH) 4+5	1.012e-024	2.325e-025	-23.995	-24.634	-0.639	(0)
FeCl3	1.031e-028	1.031e-028	-27.987	-27.987	0.000	(0)
FeNO3+2	0.000e+000	0.000e+000	-42.883	-42.985	-0.102	(0)
H (0)	1.070e-024					
H2	5.351e-025	5.354e-025	-24.272	-24.271	0.000	(0)
Hg (0)	5.211e-012					
Hg	5.211e-012	5.211e-012	-11.283	-11.283	0.000	(0)
Hg (1)	1.787e-028					
Hg2+2	8.934e-029	7.061e-029	-28.049	-28.151	-0.102	(0)
Hg (2)	5.284e-019					
Hg (OH) 2	4.773e-019	4.776e-019	-18.321	-18.321	0.000	(0)

	HgClOH	4.848e-020	4.848e-020	-19.314	-19.314	0.000	(0)
	HgCO3	1.542e-021	1.542e-021	-20.812	-20.812	0.000	(0)
	HgCl2	9.956e-022	9.956e-022	-21.002	-21.002	0.000	(0)
	HgOH+	5.189e-023	4.893e-023	-22.285	-22.310	-0.026	(0)
	HgCl+	9.433e-024	8.894e-024	-23.025	-23.051	-0.026	(0)
	HgHCO3+	4.980e-024	4.696e-024	-23.303	-23.328	-0.026	(0)
	Hg (CO3) 2-2	3.986e-025	3.150e-025	-24.400	-24.502	-0.102	(0)
	HgCl3-	2.359e-025	2.224e-025	-24.627	-24.653	-0.026	(0)
	Hg+2	2.525e-026	1.996e-026	-25.598	-25.700	-0.102	(0)
	Hg (OH) 3-	3.927e-027	3.703e-027	-26.406	-26.431	-0.026	(0)
	HgSO4	2.309e-027	2.309e-027	-26.637	-26.637	0.000	(0)
	HgNH3+2	8.750e-028	6.915e-028	-27.058	-27.160	-0.102	(0)
	Hg (NH3) 2+2	4.805e-029	3.798e-029	-28.318	-28.420	-0.102	(0)
	HgCl4-2	2.502e-029	1.977e-029	-28.602	-28.704	-0.102	(0)
	HgF+	2.207e-029	2.080e-029	-28.656	-28.682	-0.026	(0)
	Hg (NH3) 3+2	1.051e-038	8.302e-039	-37.979	-38.081	-0.102	(0)
	Hg (NH3) 4+2	0.000e+000	0.000e+000	-47.339	-47.441	-0.102	(0)
	HgNO3+	0.000e+000	0.000e+000	-54.929	-54.954	-0.026	(0)
	Hg (NO3) 2	0.000e+000	0.000e+000	-84.157	-84.157	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-108.893	-108.918	-0.026	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-109.311	-109.311	0.000	(0)
	HgS2-2	0.000e+000	0.000e+000	-110.737	-110.840	-0.102	(0)
K		4.797e-005					
	K+	4.782e-005	4.526e-005	-4.320	-4.344	-0.024	(0)
	KSO4-	1.494e-007	1.416e-007	-6.826	-6.849	-0.023	(0)
	KCrO4-	6.049e-029	5.704e-029	-28.218	-28.244	-0.026	(0)
Mg		9.412e-005					
	Mg+2	8.803e-005	7.061e-005	-4.055	-4.151	-0.096	(0)
	MgSO4	5.678e-006	5.678e-006	-5.246	-5.246	0.000	(0)
	MgF+	2.353e-007	2.228e-007	-6.628	-6.652	-0.024	(0)
	MgHCO3+	1.720e-007	1.627e-007	-6.765	-6.789	-0.024	(0)
	MgCO3	3.793e-009	3.793e-009	-8.421	-8.421	0.000	(0)
	MgOH+	1.826e-009	1.731e-009	-8.739	-8.762	-0.023	(0)
	MgH2BO3+	3.081e-012	2.912e-012	-11.511	-11.536	-0.025	(0)
Mn (2)		4.418e-006					
	Mn+2	4.141e-006	3.273e-006	-5.383	-5.485	-0.102	(0)
	MnSO4	2.572e-007	2.572e-007	-6.590	-6.590	0.000	(0)
	MnHCO3+	1.553e-008	1.471e-008	-7.809	-7.833	-0.024	(0)
	MnF+	3.869e-009	3.664e-009	-8.412	-8.436	-0.024	(0)
	MnOH+	5.345e-010	5.062e-010	-9.272	-9.296	-0.024	(0)
	MnCl+	9.716e-011	9.202e-011	-10.013	-10.036	-0.024	(0)
	MnCl2	2.903e-015	2.903e-015	-14.537	-14.537	0.000	(0)
	MnCl3-	1.886e-020	1.786e-020	-19.725	-19.748	-0.024	(0)
	Mn (OH) 3-	1.253e-020	1.187e-020	-19.902	-19.926	-0.024	(0)
	MnSeO4	1.023e-020	1.023e-020	-19.990	-19.990	0.000	(0)
	Mn (OH) 4-2	2.932e-027	2.359e-027	-26.533	-26.627	-0.094	(0)
	MnSe	7.543e-032	7.543e-032	-31.122	-31.122	0.000	(0)
	MnNO3+	8.296e-035	7.822e-035	-34.081	-34.107	-0.026	(0)
	Mn (NO3) 2	0.000e+000	0.000e+000	-62.528	-62.528	0.000	(0)
Mn (3)		1.428e-027					
	Mn+3	1.428e-027	8.691e-028	-26.845	-27.061	-0.216	(0)
Mn (6)		0.000e+000					
	MnO4-2	0.000e+000	0.000e+000	-54.424	-54.519	-0.094	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-60.092	-60.116	-0.024	(0)
Mo		1.141e-007					
	MoO4-2	1.137e-007	9.123e-008	-6.944	-7.040	-0.096	(0)
	HMoO4-	3.148e-010	2.968e-010	-9.502	-9.528	-0.026	(0)
	H2MoO4	3.554e-013	3.554e-013	-12.449	-12.449	0.000	(0)
	AlMo6O21-3	1.495e-038	8.806e-039	-37.825	-38.055	-0.230	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-49.661	-50.581	-0.920	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-50.342	-50.981	-0.639	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-52.576	-52.985	-0.409	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-56.295	-56.525	-0.230	(0)
N (-3)		1.681e-008					
	NH4+	1.666e-008	1.575e-008	-7.778	-7.803	-0.025	(0)
	NH4SO4-	7.874e-011	7.457e-011	-10.104	-10.127	-0.024	(0)
	NH3	5.492e-011	5.492e-011	-10.260	-10.260	0.000	(0)

CuNH3+2	1.314e-011	1.038e-011	-10.882	-10.984	-0.102	(0)
CaNH3+2	3.117e-014	2.463e-014	-13.506	-13.609	-0.102	(0)
NiNH3+2	1.677e-016	1.326e-016	-15.775	-15.878	-0.102	(0)
Co (NH3) +2	3.364e-017	2.659e-017	-16.473	-16.575	-0.102	(0)
BaNH3+2	2.111e-018	1.669e-018	-17.675	-17.778	-0.102	(0)
Ni (NH3) 2+2	1.332e-024	1.052e-024	-23.876	-23.978	-0.102	(0)
Ca (NH3) 2+2	6.814e-025	5.385e-025	-24.167	-24.269	-0.102	(0)
Co (NH3) 2+2	7.882e-026	6.229e-026	-25.103	-25.206	-0.102	(0)
HgNH3+2	8.750e-028	6.915e-028	-27.058	-27.160	-0.102	(0)
Hg (NH3) 2+2	4.805e-029	3.798e-029	-28.318	-28.420	-0.102	(0)
Co (NH3) 3+2	5.449e-035	4.306e-035	-34.264	-34.366	-0.102	(0)
Hg (NH3) 3+2	1.051e-038	8.302e-039	-37.979	-38.081	-0.102	(0)
Co (NH3) 4+2	0.000e+000	0.000e+000	-43.804	-43.906	-0.102	(0)
Hg (NH3) 4+2	0.000e+000	0.000e+000	-47.339	-47.441	-0.102	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-51.177	-51.279	-0.102	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-53.844	-53.946	-0.102	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-61.471	-61.701	-0.230	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-64.610	-64.712	-0.102	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-65.148	-65.250	-0.102	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-75.440	-75.466	-0.026	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-79.945	-80.047	-0.102	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-81.585	-81.688	-0.102	(0)
N (3)	4.491e-022					
NO2-	4.482e-022	4.238e-022	-21.349	-21.373	-0.024	(0)
CuNO2+	8.694e-025	8.197e-025	-24.061	-24.086	-0.026	(0)
CoNO2+	1.276e-029	1.203e-029	-28.894	-28.920	-0.026	(0)
Cu (NO2) 2	0.000e+000	0.000e+000	-44.449	-44.449	0.000	(0)
N (5)	1.595e-029					
NO3-	1.594e-029	1.508e-029	-28.798	-28.822	-0.024	(0)
CaNO3+	1.802e-032	1.699e-032	-31.744	-31.770	-0.026	(0)
CuNO3+	9.344e-034	8.810e-034	-33.029	-33.055	-0.026	(0)
MnNO3+	8.296e-035	7.822e-035	-34.081	-34.107	-0.026	(0)
ZnNO3+	6.340e-036	5.978e-036	-35.198	-35.223	-0.026	(0)
BaNO3+	3.860e-036	3.640e-036	-35.413	-35.439	-0.026	(0)
PbNO3+	3.171e-037	2.989e-037	-36.499	-36.524	-0.026	(0)
NiNO3+	1.806e-037	1.703e-037	-36.743	-36.769	-0.026	(0)
CoNO3+	1.021e-037	9.626e-038	-36.991	-37.017	-0.026	(0)
CdNO3+	7.191e-038	6.780e-038	-37.143	-37.169	-0.026	(0)
UO2NO3+	2.157e-040	2.034e-040	-39.666	-39.692	-0.026	(0)
FeNO3+2	0.000e+000	0.000e+000	-42.883	-42.985	-0.102	(0)
CrNO3+2	0.000e+000	0.000e+000	-43.218	-43.320	-0.102	(0)
VO2NO3	0.000e+000	0.000e+000	-43.448	-43.448	0.000	(0)
HgNO3+	0.000e+000	0.000e+000	-54.929	-54.954	-0.026	(0)
Mn (NO3) 2	0.000e+000	0.000e+000	-62.528	-62.528	0.000	(0)
Cu (NO3) 2	0.000e+000	0.000e+000	-62.777	-62.777	0.000	(0)
Zn (NO3) 2	0.000e+000	0.000e+000	-64.745	-64.745	0.000	(0)
Pb (NO3) 2	0.000e+000	0.000e+000	-65.116	-65.116	0.000	(0)
Co (NO3) 2	0.000e+000	0.000e+000	-65.530	-65.530	0.000	(0)
Cd (NO3) 2	0.000e+000	0.000e+000	-66.290	-66.290	0.000	(0)
Hg (NO3) 2	0.000e+000	0.000e+000	-84.157	-84.157	0.000	(0)
Na	2.169e-004					
Na+	2.164e-004	2.048e-004	-3.665	-3.689	-0.024	(0)
NaSO4-	5.130e-007	4.860e-007	-6.290	-6.313	-0.023	(0)
NaHCO3	2.594e-008	2.594e-008	-7.586	-7.586	0.000	(0)
NaF	3.634e-009	3.634e-009	-8.440	-8.440	0.000	(0)
NaCO3-	2.599e-010	2.463e-010	-9.585	-9.609	-0.023	(0)
NaH2BO3	3.860e-013	3.860e-013	-12.413	-12.413	0.000	(0)
NaCrO4-	3.661e-028	3.452e-028	-27.436	-27.462	-0.026	(0)
Ni	6.152e-009					
Ni+2	5.605e-009	4.495e-009	-8.251	-8.347	-0.096	(0)
NiSO4	3.964e-010	3.964e-010	-9.402	-9.402	0.000	(0)
NiHCO3+	1.324e-010	1.248e-010	-9.878	-9.904	-0.026	(0)
NiCO3	1.083e-011	1.083e-011	-10.965	-10.965	0.000	(0)
NiOH+	3.696e-012	3.485e-012	-11.432	-11.458	-0.026	(0)
NiF+	3.368e-012	3.176e-012	-11.473	-11.498	-0.026	(0)
NiCl+	2.725e-013	2.569e-013	-12.565	-12.590	-0.026	(0)
Ni (OH) 2	1.705e-014	1.705e-014	-13.768	-13.768	0.000	(0)
Ni (SO4) 2-2	7.340e-015	5.801e-015	-14.134	-14.237	-0.102	(0)

NiNH3+2	1.677e-016	1.326e-016	-15.775	-15.878	-0.102	(0)
Ni(OH) 3-	1.114e-018	1.050e-018	-17.953	-17.979	-0.026	(0)
NiCl2	2.889e-020	2.889e-020	-19.539	-19.539	0.000	(0)
NiSeO4	2.442e-023	2.442e-023	-22.612	-22.612	0.000	(0)
Ni(NH3) 2+2	1.332e-024	1.052e-024	-23.876	-23.978	-0.102	(0)
NiNO3+	1.806e-037	1.703e-037	-36.743	-36.769	-0.026	(0)
O(0)	0.000e+000					
O2	0.000e+000	0.000e+000	-43.753	-43.752	0.000	(0)
Pb	2.684e-009					
Pb+2	1.671e-009	1.340e-009	-8.777	-8.873	-0.096	(0)
PbSO4	2.901e-010	2.901e-010	-9.537	-9.537	0.000	(0)
PbCO3	2.602e-010	2.602e-010	-9.585	-9.585	0.000	(0)
PbHCO3+	2.379e-010	2.243e-010	-9.624	-9.649	-0.026	(0)
PbOH+	2.199e-010	2.073e-010	-9.658	-9.683	-0.026	(0)
PbF+	2.817e-012	2.656e-012	-11.550	-11.576	-0.026	(0)
PbCl+	1.126e-012	1.062e-012	-11.948	-11.974	-0.026	(0)
Pb(SO4) 2-2	9.774e-013	7.724e-013	-12.010	-12.112	-0.102	(0)
Pb(OH) 2	4.037e-013	4.037e-013	-12.394	-12.394	0.000	(0)
Pb(CO3) 2-2	6.131e-014	4.845e-014	-13.212	-13.315	-0.102	(0)
PbF2	1.470e-015	1.470e-015	-14.833	-14.833	0.000	(0)
PbCl2	1.060e-016	1.060e-016	-15.975	-15.975	0.000	(0)
Pb(OH) 3-	2.637e-017	2.486e-017	-16.579	-16.604	-0.026	(0)
Pb2OH+3	7.477e-018	4.403e-018	-17.126	-17.356	-0.230	(0)
PbF3-	8.315e-020	7.840e-020	-19.080	-19.106	-0.026	(0)
PbCl3-	9.993e-022	9.422e-022	-21.000	-21.026	-0.026	(0)
Pb(OH) 4-2	4.745e-022	3.750e-022	-21.324	-21.426	-0.102	(0)
Pb3(OH) 4+2	5.515e-024	4.358e-024	-23.258	-23.361	-0.102	(0)
PbF4-2	1.335e-024	1.055e-024	-23.874	-23.977	-0.102	(0)
PbCl4-2	1.217e-026	9.619e-027	-25.915	-26.017	-0.102	(0)
Pb4(OH) 4+4	1.189e-028	4.640e-029	-27.925	-28.334	-0.409	(0)
PbNO3+	3.171e-037	2.989e-037	-36.499	-36.524	-0.026	(0)
Pb(NO3) 2	0.000e+000	0.000e+000	-65.116	-65.116	0.000	(0)
Pb(HS) 2	0.000e+000	0.000e+000	-115.536	-115.536	0.000	(0)
Pb(HS) 3-	0.000e+000	0.000e+000	-175.176	-175.202	-0.026	(0)
S(-2)	0.000e+000					
H2S	0.000e+000	0.000e+000	-60.733	-60.733	0.000	(0)
HS-	0.000e+000	0.000e+000	-60.941	-60.966	-0.026	(0)
CdHS+	0.000e+000	0.000e+000	-61.780	-61.806	-0.026	(0)
S5-2	0.000e+000	0.000e+000	-63.443	-63.545	-0.102	(0)
S6-2	0.000e+000	0.000e+000	-63.959	-64.061	-0.102	(0)
S4-2	0.000e+000	0.000e+000	-64.038	-64.141	-0.102	(0)
S3-2	0.000e+000	0.000e+000	-64.844	-64.947	-0.102	(0)
S2-2	0.000e+000	0.000e+000	-65.860	-65.963	-0.102	(0)
S-2	0.000e+000	0.000e+000	-71.385	-71.480	-0.094	(0)
HgHS2-	0.000e+000	0.000e+000	-108.893	-108.918	-0.026	(0)
Hg(HS) 2	0.000e+000	0.000e+000	-109.311	-109.311	0.000	(0)
Cu(S4) 2-3	0.000e+000	0.000e+000	-110.621	-110.787	-0.167	(0)
HgS2-2	0.000e+000	0.000e+000	-110.737	-110.840	-0.102	(0)
CuS4S5-3	0.000e+000	0.000e+000	-111.354	-111.517	-0.163	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-115.113	-115.138	-0.026	(0)
Pb(HS) 2	0.000e+000	0.000e+000	-115.536	-115.536	0.000	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-115.568	-115.568	0.000	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-115.915	-115.915	0.000	(0)
Fe(HS) 2	0.000e+000	0.000e+000	-118.889	-118.889	0.000	(0)
Cu(HS) 3-	0.000e+000	0.000e+000	-161.708	-161.734	-0.026	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-173.575	-173.601	-0.026	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-174.609	-174.634	-0.026	(0)
Pb(HS) 3-	0.000e+000	0.000e+000	-175.176	-175.202	-0.026	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-176.692	-176.794	-0.102	(0)
Fe(HS) 3-	0.000e+000	0.000e+000	-177.793	-177.818	-0.026	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-233.302	-233.405	-0.102	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-235.925	-236.027	-0.102	(0)
Sb2S4-2	0.000e+000	0.000e+000	-237.206	-237.308	-0.102	(0)
S(6)	5.957e-004					
SO4-2	5.510e-004	4.419e-004	-3.259	-3.355	-0.096	(0)
CaSO4	3.607e-005	3.607e-005	-4.443	-4.443	0.000	(0)
MgSO4	5.678e-006	5.678e-006	-5.246	-5.246	0.000	(0)
CuSO4	1.870e-006	1.870e-006	-5.728	-5.728	0.000	(0)

NaSO4-	5.130e-007	4.860e-007	-6.290	-6.313	-0.023	(0)
MnSO4	2.572e-007	2.572e-007	-6.590	-6.590	0.000	(0)
KSO4-	1.494e-007	1.416e-007	-6.826	-6.849	-0.023	(0)
FeSO4	1.347e-007	1.347e-007	-6.871	-6.871	0.000	(0)
ZnSO4	1.526e-008	1.526e-008	-7.817	-7.817	0.000	(0)
HSO4-	7.459e-009	7.061e-009	-8.127	-8.151	-0.024	(0)
NiSO4	3.964e-010	3.964e-010	-9.402	-9.402	0.000	(0)
CoSO4	3.551e-010	3.551e-010	-9.450	-9.450	0.000	(0)
AlSO4+	2.948e-010	2.791e-010	-9.530	-9.554	-0.024	(0)
PbSO4	2.901e-010	2.901e-010	-9.537	-9.537	0.000	(0)
CdSO4	1.473e-010	1.473e-010	-9.832	-9.832	0.000	(0)
NH4SO4-	7.874e-011	7.457e-011	-10.104	-10.127	-0.024	(0)
Zn(SO4) 2-2	7.431e-011	5.873e-011	-10.129	-10.231	-0.102	(0)
CrOHSO4	1.026e-011	1.026e-011	-10.989	-10.989	0.000	(0)
UO2SO4	4.521e-012	4.521e-012	-11.345	-11.345	0.000	(0)
Al(SO4) 2-	1.396e-012	1.322e-012	-11.855	-11.879	-0.024	(0)
Cd(SO4) 2-2	1.111e-012	8.780e-013	-11.954	-12.056	-0.102	(0)
Pb(SO4) 2-2	9.774e-013	7.724e-013	-12.010	-12.112	-0.102	(0)
CrSO4+	7.946e-014	7.492e-014	-13.100	-13.125	-0.026	(0)
UO2(SO4) 2-2	3.333e-014	2.634e-014	-13.477	-13.579	-0.102	(0)
Ni(SO4) 2-2	7.340e-015	5.801e-015	-14.134	-14.237	-0.102	(0)
FeSO4+	3.590e-015	3.400e-015	-14.445	-14.468	-0.024	(0)
VOSO4	2.045e-016	2.045e-016	-15.689	-15.689	0.000	(0)
VO2SO4-	5.230e-017	4.931e-017	-16.282	-16.307	-0.026	(0)
Fe(SO4) 2-	3.408e-017	3.213e-017	-16.468	-16.493	-0.026	(0)
Cr2(OH) 2SO4+2	1.148e-019	9.069e-020	-18.940	-19.042	-0.102	(0)
Cr2(OH) 2(SO4) 2	2.381e-021	2.381e-021	-20.623	-20.623	0.000	(0)
HgSO4	2.309e-027	2.309e-027	-26.637	-26.637	0.000	(0)
VSO4+	8.303e-028	7.828e-028	-27.081	-27.106	-0.026	(0)
CrO3SO4-2	4.998e-033	3.950e-033	-32.301	-32.403	-0.102	(0)
U(SO4) 2	1.388e-033	1.388e-033	-32.858	-32.858	0.000	(0)
USO4+2	5.002e-034	3.953e-034	-33.301	-33.403	-0.102	(0)
Co(NH3) 6SO4+	0.000e+000	0.000e+000	-75.440	-75.466	-0.026	(0)
Sb(3)	4.642e-015					
Sb(OH) 3	2.349e-015	2.349e-015	-14.629	-14.629	0.000	(0)
HSbO2	2.293e-015	2.293e-015	-14.640	-14.640	0.000	(0)
SbO2-	2.409e-020	2.271e-020	-19.618	-19.644	-0.026	(0)
Sb(OH) 2F	1.687e-020	1.687e-020	-19.773	-19.773	0.000	(0)
SbOF	1.659e-020	1.659e-020	-19.780	-19.780	0.000	(0)
Sb(OH) 4-	1.380e-020	1.302e-020	-19.860	-19.886	-0.026	(0)
Sb(OH) 2+	9.892e-021	9.326e-021	-20.005	-20.030	-0.026	(0)
SbO+	3.410e-021	3.215e-021	-20.467	-20.493	-0.026	(0)
Sb2S4-2	0.000e+000	0.000e+000	-237.206	-237.308	-0.102	(0)
Sb(5)	8.446e-009					
SbO3-	8.436e-009	7.954e-009	-8.074	-8.099	-0.026	(0)
Sb(OH) 6-	9.831e-012	9.303e-012	-11.007	-11.031	-0.024	(0)
SbO2+	6.468e-023	6.099e-023	-22.189	-22.215	-0.026	(0)
Se(-2)	9.711e-028					
HSe-	9.699e-028	9.145e-028	-27.013	-27.039	-0.026	(0)
H2Se	1.161e-030	1.161e-030	-29.935	-29.935	0.000	(0)
MnSe	7.543e-032	7.543e-032	-31.122	-31.122	0.000	(0)
Se-2	7.077e-036	5.593e-036	-35.150	-35.252	-0.102	(0)
Se(4)	3.185e-009					
HSeO3-	3.095e-009	2.918e-009	-8.509	-8.535	-0.026	(0)
SeO3-2	8.991e-011	7.105e-011	-10.046	-10.148	-0.102	(0)
H2SeO3	2.035e-013	2.035e-013	-12.691	-12.691	0.000	(0)
FeHSeO3+2	6.691e-021	5.288e-021	-20.175	-20.277	-0.102	(0)
Cd(SeO3) 2-2	7.485e-024	5.915e-024	-23.126	-23.228	-0.102	(0)
Se(6)	1.449e-017					
SeO4-2	1.448e-017	1.161e-017	-16.839	-16.935	-0.096	(0)
MnSeO4	1.023e-020	1.023e-020	-19.990	-19.990	0.000	(0)
ZnSeO4	2.838e-022	2.838e-022	-21.547	-21.547	0.000	(0)
HSeO4-	1.009e-022	9.515e-023	-21.996	-22.022	-0.026	(0)
NiSeO4	2.442e-023	2.442e-023	-22.612	-22.612	0.000	(0)
CoSeO4	2.344e-023	2.344e-023	-22.630	-22.630	0.000	(0)
CdSeO4	3.074e-024	3.074e-024	-23.512	-23.512	0.000	(0)
Zn(SeO4) 2-2	4.228e-039	3.341e-039	-38.374	-38.476	-0.102	(0)
U(3)	0.000e+000					

U+3	0.000e+000	0.000e+000	-48.989	-49.219	-0.230	(0)
U(4)	1.557e-016					
U(OH) 5-	1.547e-016	1.459e-016	-15.811	-15.836	-0.026	(0)
U(OH) 4	9.988e-019	9.988e-019	-18.001	-18.001	0.000	(0)
U(OH) 3+	6.332e-022	5.971e-022	-21.198	-21.224	-0.026	(0)
U(OH) 2+2	5.711e-026	4.514e-026	-25.243	-25.345	-0.102	(0)
UF3+	2.110e-029	1.990e-029	-28.676	-28.701	-0.026	(0)
UF2+2	5.648e-030	4.464e-030	-29.248	-29.350	-0.102	(0)
UOH+3	5.902e-031	3.476e-031	-30.229	-30.459	-0.230	(0)
UF4	6.135e-032	6.135e-032	-31.212	-31.212	0.000	(0)
UF+3	2.141e-032	1.261e-032	-31.669	-31.899	-0.230	(0)
U(SO4) 2	1.388e-033	1.388e-033	-32.858	-32.858	0.000	(0)
USO4+2	5.002e-034	3.953e-034	-33.301	-33.403	-0.102	(0)
UF5-	7.252e-035	6.838e-035	-34.140	-34.165	-0.026	(0)
UF6-2	7.348e-037	5.807e-037	-36.134	-36.236	-0.102	(0)
U+4	5.760e-037	2.247e-037	-36.240	-36.648	-0.409	(0)
UC1+3	4.271e-040	2.515e-040	-39.369	-39.599	-0.230	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-133.179	-135.248	-2.070	(0)
U(5)	7.349e-013					
UO2+	7.349e-013	6.929e-013	-12.134	-12.159	-0.026	(0)
U(6)	4.688e-009					
UO2(CO3) 2-2	2.833e-009	2.239e-009	-8.548	-8.650	-0.102	(0)
UO2CO3	1.738e-009	1.738e-009	-8.760	-8.760	0.000	(0)
UO2OH+	5.558e-011	5.240e-011	-10.255	-10.281	-0.026	(0)
UO2F+	2.783e-011	2.624e-011	-10.556	-10.581	-0.026	(0)
UO2(CO3) 3-4	1.858e-011	7.247e-012	-10.731	-11.140	-0.409	(0)
UO2+2	8.427e-012	6.759e-012	-11.074	-11.170	-0.096	(0)
UO2SO4	4.521e-012	4.521e-012	-11.345	-11.345	0.000	(0)
UO2F2	2.128e-012	2.128e-012	-11.672	-11.672	0.000	(0)
UO2(SO4) 2-2	3.333e-014	2.634e-014	-13.477	-13.579	-0.102	(0)
UO2F3-	1.594e-014	1.503e-014	-13.797	-13.823	-0.026	(0)
(UO2) 2(OH) 2+2	5.766e-015	4.557e-015	-14.239	-14.341	-0.102	(0)
(UO2) 3(OH) 5+	7.286e-016	6.870e-016	-15.138	-15.163	-0.026	(0)
UO2Cl+	2.597e-016	2.448e-016	-15.586	-15.611	-0.026	(0)
UO2F4-2	4.249e-018	3.358e-018	-17.372	-17.474	-0.102	(0)
UO2NO3+	2.157e-040	2.034e-040	-39.666	-39.692	-0.026	(0)
V(2)	1.044e-034					
VOH+	6.533e-035	6.160e-035	-34.185	-34.210	-0.026	(0)
V+2	3.911e-035	3.091e-035	-34.408	-34.510	-0.102	(0)
V(3)	7.070e-010					
V(OH) 3	7.070e-010	7.070e-010	-9.151	-9.151	0.000	(0)
V(OH) 2+	7.921e-020	7.469e-020	-19.101	-19.127	-0.026	(0)
VOH+2	1.465e-022	1.158e-022	-21.834	-21.936	-0.102	(0)
V+3	6.372e-027	3.752e-027	-26.196	-26.426	-0.230	(0)
VSO4+	8.303e-028	7.828e-028	-27.081	-27.106	-0.026	(0)
V2(OH) 3+3	0.000e+000	0.000e+000	-42.381	-42.611	-0.230	(0)
V2(OH) 2+4	0.000e+000	0.000e+000	-42.664	-43.072	-0.409	(0)
V(4)	2.453e-014					
V(OH) 3+	2.190e-014	2.065e-014	-13.660	-13.685	-0.026	(0)
VO+2	2.126e-015	1.680e-015	-14.672	-14.775	-0.102	(0)
VOF+	3.006e-016	2.835e-016	-15.522	-15.548	-0.026	(0)
VOSO4	2.045e-016	2.045e-016	-15.689	-15.689	0.000	(0)
VOF2	2.989e-018	2.989e-018	-17.524	-17.524	0.000	(0)
VOC1+	1.117e-019	1.053e-019	-18.952	-18.978	-0.026	(0)
VOF3-	3.163e-021	2.983e-021	-20.500	-20.525	-0.026	(0)
H2V2O4+2	2.704e-023	2.137e-023	-22.568	-22.670	-0.102	(0)
VOF4-2	4.284e-025	3.386e-025	-24.368	-24.470	-0.102	(0)
V(5)	9.477e-009					
H2VO4-	9.291e-009	8.760e-009	-8.032	-8.058	-0.026	(0)
HVO4-2	1.703e-010	1.346e-010	-9.769	-9.871	-0.102	(0)
H3VO4	1.432e-011	1.432e-011	-10.844	-10.844	0.000	(0)
H3V2O7-	8.592e-013	8.101e-013	-12.066	-12.091	-0.026	(0)
VO2+	4.938e-015	4.673e-015	-14.306	-14.330	-0.024	(0)
HV2O7-3	6.783e-016	3.995e-016	-15.169	-15.399	-0.230	(0)
VO2F	2.305e-016	2.305e-016	-15.637	-15.637	0.000	(0)
VO2SO4-	5.230e-017	4.931e-017	-16.282	-16.307	-0.026	(0)
VO4-3	7.005e-018	4.125e-018	-17.155	-17.385	-0.230	(0)
VO2F2-	2.496e-018	2.353e-018	-17.603	-17.628	-0.026	(0)

V3O9-3	1.195e-018	7.039e-019	-17.923	-18.152	-0.230	(0)
V2O7-4	1.686e-019	6.576e-020	-18.773	-19.182	-0.409	(0)
VO2F3-2	1.045e-021	8.255e-022	-20.981	-21.083	-0.102	(0)
V4O12-4	6.589e-024	2.571e-024	-23.181	-23.590	-0.409	(0)
VO2F4-3	1.940e-026	1.142e-026	-25.712	-25.942	-0.230	(0)
VO2NO3	0.000e+000	0.000e+000	-43.448	-43.448	0.000	(0)
HV10O28-5	0.000e+000	0.000e+000	-56.776	-57.415	-0.639	(0)
V10O28-6	0.000e+000	0.000e+000	-57.895	-58.815	-0.920	(0)
H2V10O28-4	0.000e+000	0.000e+000	-58.585	-58.994	-0.409	(0)
Zn	2.150e-007					
Zn+2	1.967e-007	1.578e-007	-6.706	-6.802	-0.096	(0)
ZnSO4	1.526e-008	1.526e-008	-7.817	-7.817	0.000	(0)
ZnHCO3+	1.192e-009	1.124e-009	-8.924	-8.949	-0.026	(0)
ZnOH+	1.031e-009	9.718e-010	-8.987	-9.012	-0.026	(0)
ZnCO3	5.864e-010	5.864e-010	-9.232	-9.232	0.000	(0)
ZnF+	9.391e-011	8.855e-011	-10.027	-10.053	-0.026	(0)
Zn (SO4) 2-2	7.431e-011	5.873e-011	-10.129	-10.231	-0.102	(0)
Zn (OH) 2	9.485e-012	9.485e-012	-11.023	-11.023	0.000	(0)
ZnCl+	9.356e-012	8.854e-012	-11.029	-11.053	-0.024	(0)
ZnOHCl	7.138e-013	7.138e-013	-12.146	-12.146	0.000	(0)
Zn (OH) 3-	3.105e-015	2.928e-015	-14.508	-14.533	-0.026	(0)
ZnCl2	3.134e-016	3.134e-016	-15.504	-15.504	0.000	(0)
Zn (OH) 4-2	9.082e-021	7.178e-021	-20.042	-20.144	-0.102	(0)
ZnCl3-	5.876e-021	5.561e-021	-20.231	-20.255	-0.024	(0)
ZnSeO4	2.838e-022	2.838e-022	-21.547	-21.547	0.000	(0)
ZnCl4-2	7.719e-026	6.210e-026	-25.112	-25.207	-0.094	(0)
ZnNO3+	6.340e-036	5.978e-036	-35.198	-35.223	-0.026	(0)
Zn (SeO4) 2-2	4.228e-039	3.341e-039	-38.374	-38.476	-0.102	(0)
Zn (NO3) 2	0.000e+000	0.000e+000	-64.745	-64.745	0.000	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-115.113	-115.138	-0.026	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-115.915	-115.915	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-173.575	-173.601	-0.026	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-176.692	-176.794	-0.102	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-235.925	-236.027	-0.102	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-110.69	-104.40	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-60.57	-56.06	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-67.79	-56.06	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-147.52	-129.58	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-77.10	-57.07	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-40.48	-40.08	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-32.99	-32.54	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-0.53	10.27	10.80	Al (OH) 3
Al2 (MoO4) 3	-43.67	-41.30	2.37	Al2 (MoO4) 3
Al2O3	0.89	20.54	19.65	Al2O3
Al4 (OH) 10SO4	1.45	24.15	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-7.73	-2.93	4.80	AlAsO4:2H2O
AlOHSO4	-3.43	-6.66	-3.23	AlOHSO4
AlSb	-133.35	-67.72	65.62	AlSb
Alunite	0.80	-0.60	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.44	-12.23	-7.79	PbSO4
Anhydrite	-2.44	-6.80	-4.36	CaSO4
Anilite	-32.21	-64.09	-31.88	Cu0.25Cu1.5S
Antlerite	0.80	9.59	8.79	Cu3 (OH) 4SO4
Aragonite	-2.34	-10.64	-8.30	CaCO3
Arsenolite	-58.95	-61.71	-2.76	As4O6
Artinite	-11.52	-1.92	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-33.11	-26.41	6.71	As2O5
Atacamite	-1.15	6.24	7.39	Cu2 (OH) 3Cl
Azurite	1.90	-15.01	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-18.14	6.26	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.45	-2.58	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	1.27	-7.64	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-29.26	3.68	32.94	Ba3 (VO4) 2:4H2O

BaCrO4	-22.12	-31.79	-9.67	BaCrO4
BaF2	-10.60	-16.42	-5.82	BaF2
BaMoO4	-7.40	-14.36	-6.96	BaMoO4
Barite	-0.69	-10.67	-9.98	BaSO4
BaS	-77.68	-61.50	16.18	BaS
BaSeO3	-10.90	-9.07	1.83	BaSeO3
BaSeO4	-16.79	-24.25	-7.46	BaSeO4
Bianchite	-8.39	-10.16	-1.76	ZnSO4:6H2O
Birnessite	-14.23	3.86	18.09	MnO2
Bixbyite	-12.76	-13.40	-0.64	Mn2O3
BlaubleiI	-35.44	-59.60	-24.16	Cu0.9Cu0.2S
BlaubleiII	-34.40	-61.67	-27.28	Cu0.6Cu0.8S
Boehmite	1.69	10.27	8.58	AlOOH
Breithauptite	-43.68	-62.21	-18.52	NiSb
Brochantite	3.21	18.43	15.22	Cu4(OH)6SO4
Brucite	-7.42	9.42	16.84	Mg(OH)2
Bunsenite	-7.22	5.23	12.45	NiO
Ca(VO3)2	-10.62	-4.96	5.66	Ca(VO3)2
Ca2V2O7	-12.34	5.16	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.39	5.16	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-18.33	3.97	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-23.67	15.29	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-24.57	15.29	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-268.59	-125.61	142.97	Ca3Sb2
CaCrO4	-25.65	-27.92	-2.27	CaCrO4
Calcite	-2.16	-10.64	-8.48	CaCO3
Calomel	-19.54	-37.45	-17.91	Hg2Cl2
CaMoO4	-2.54	-10.49	-7.95	CaMoO4
Carnotite	-2.93	-2.70	0.23	KUO2VO4
CaSeO3:2H2O	-8.01	-5.20	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-17.36	-20.38	-3.02	CaSeO4:2H2O
Cd(BO2)2	-18.06	-8.22	9.84	Cd(BO2)2
Cd(OH)2	-8.92	4.73	13.64	Cd(OH)2
Cd(OH)2(am)	-9.00	4.73	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.39	-19.68	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-25.31	-2.75	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-26.42	1.98	28.40	Cd4(OH)6SO4
CdCl2	-17.49	-18.15	-0.66	CdCl2
CdCl2:1H2O	-16.46	-18.15	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.24	-18.15	-1.91	CdCl2:2.5H2O
CdF2	-16.74	-17.95	-1.21	CdF2
Cdmetal(alpha)	-29.91	-16.40	13.51	Cd
Cdmetal(gamma)	-30.01	-16.40	13.62	Cd
CdMoO4	-1.74	-15.89	-14.15	CdMoO4
CdOHCl	-10.25	-6.71	3.54	CdOHCl
CdSb	-62.36	-62.71	-0.35	CdSb
CdSe	-8.90	-29.10	-20.20	CdSe
CdSeO4:2H2O	-23.93	-25.78	-1.85	CdSeO4:2H2O
CdSO4	-12.03	-12.20	-0.17	CdSO4
CdSO4:1H2O	-10.48	-12.20	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.33	-12.20	-1.87	CdSO4:2.67H2O
Cerrusite	-2.93	-16.06	-13.13	PbCO3
CH4(g)	-64.20	-105.25	-41.05	CH4
Chalcanthite	-5.45	-8.09	-2.64	CuSO4:5H2O
Chalcocite	-30.90	-65.82	-34.92	Cu2S
Chalcopyrite	-83.73	-119.00	-35.27	CuFeS2
Cinnabar	-40.38	-86.07	-45.69	HgS
Claudetite	-58.64	-61.71	-3.06	As4O6
Clausthalite	-2.03	-29.13	-27.10	PbSe
Co(BO2)2	-34.84	-7.77	27.07	Co(BO2)2
Co(OH)2	-7.92	5.18	13.09	Co(OH)2
Co(OH)3	-14.35	-16.66	-2.31	Co(OH)3
CO2(g)	-2.62	-20.76	-18.15	CO2
Co3(AsO4)2	-23.91	-10.87	13.03	Co3(AsO4)2
Co3O4	-17.65	-28.14	-10.50	Co3O4
CoCl2	-25.96	-17.70	8.27	CoCl2
CoCl2:6H2O	-20.23	-17.70	2.54	CoCl2:6H2O
CoCO3	-5.60	-15.58	-9.98	CoCO3

CoF2	-15.90	-17.50	-1.60	CoF2
CoF3	-49.22	-50.67	-1.46	CoF3
CoFe2O4	19.10	15.57	-3.53	CoFe2O4
CoMoO4	-7.67	-15.43	-7.76	CoMoO4
CoO	-8.41	5.18	13.59	CoO
CoS (alpha)	-55.13	-62.57	-7.44	CoS
CoS (beta)	-51.50	-62.57	-11.07	CoS
CoSe	-12.45	-28.65	-16.20	CoSe
CoSeO3	-11.46	-10.14	1.32	CoSeO3
CoSeO4:6H2O	-23.80	-25.33	-1.53	CoSeO4:6H2O
CoSO4	-14.55	-11.75	2.80	CoSO4
CoSO4:6H2O	-9.28	-11.75	-2.47	CoSO4:6H2O
Cotunnite	-13.39	-18.17	-4.78	PbCl2
Covellite	-36.61	-58.91	-22.30	CuS
Cr (OH) 2	-20.78	-9.96	10.82	Cr (OH) 2
Cr (OH) 3	-3.68	-2.35	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-1.60	-2.35	-0.75	Cr (OH) 3
Cr2O3	-2.34	-4.70	-2.36	Cr2O3
CrCl2	-46.93	-32.84	14.09	CrCl2
CrCl3	-51.78	-36.66	15.11	CrCl3
CrF3	-25.02	-36.36	-11.34	CrF3
Crmetal	-61.57	-31.08	30.48	Cr
CrO3	-34.83	-38.04	-3.21	CrO3
Cryolite	-14.62	-48.46	-33.84	Na3AlF6
Cu (OH) 2	0.17	8.84	8.67	Cu (OH) 2
Cu (SbO3) 2	-23.39	21.82	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-27.18	-17.93	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-33.30	-68.18	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	13.91	-31.89	-45.80	Cu2Se
Cu2SO4	-13.04	-14.99	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-5.99	0.11	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-32.49	-75.09	-42.59	Cu3Sb
Cu3Se2	6.62	-56.87	-63.49	Cu3Se2
CuCO3	-0.42	-11.92	-11.50	CuCO3
CuCrO4	-23.76	-29.20	-5.44	CuCrO4
CuF	-5.46	-10.37	-4.91	CuF
CuF2	-14.95	-13.84	1.12	CuF2
CuF2:2H2O	-9.29	-13.84	-4.55	CuF2:2H2O
Cumetal	-0.84	-9.59	-8.76	Cu
CuMoO4	1.30	-11.77	-13.08	CuMoO4
CuOCuSO4	-9.55	0.75	10.30	CuOCuSO4
Cupricferrite	13.24	19.23	5.99	CuFe2O4
Cuprite	3.34	1.94	-1.41	Cu2O
Cuprousferrite	15.08	6.16	-8.92	CuFeO2
CuSe	8.11	-24.99	-33.10	CuSe
CuSe2	-4.32	-37.69	-33.37	CuSe2
CuSeO3:2H2O	-6.99	-6.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-19.23	-21.67	-2.44	CuSeO4:5H2O
CuSO4	-11.03	-8.09	2.94	CuSO4
Diaspore	3.40	10.27	6.87	AlOOH
Djurleite	-31.44	-65.36	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-5.44	-21.98	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-4.89	-21.98	-17.09	CaMg (CO3) 2
Epsomite	-5.38	-7.51	-2.13	MgSO4:7H2O
Fe (OH) 2	-5.90	7.67	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	4.80	1.76	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-3.70	-7.42	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-6.48	-4.93	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-14.95	-35.57	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-36.66	-40.39	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-2.16	18.06	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-8.41	-8.01	0.40	FeAsO4:2H2O
FeCr2O4	-4.23	2.97	7.20	FeCr2O4
FeMoO4	-2.85	-12.95	-10.09	FeMoO4
Ferrihydrite	2.00	5.20	3.19	Fe (OH) 3
Ferroselite	-20.27	-38.86	-18.60	FeSe2
FeS (ppt)	-57.14	-60.09	-2.95	FeS
FeSe	-15.16	-26.16	-11.00	FeSe

Fix_pe	-3.77	-3.77	0.00	e-
Fluorite	-2.05	-12.55	-10.50	CaF2
Galena	-49.08	-63.05	-13.97	PbS
Gibbsite	1.98	10.27	8.29	Al (OH) 3
Goethite	4.70	5.20	0.49	FeOOH
Goslarite	-8.15	-10.16	-2.01	ZnSO4:7H2O
Greenockite	-48.67	-63.03	-14.36	CdS
Greigite	-207.92	-252.95	-45.03	Fe3S4
Gummite	-5.27	2.40	7.67	UO3
Gypsum	-2.19	-6.80	-4.61	CaSO4:2H2O
H-Jarosite	-6.17	-18.27	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-7.74	-20.61	-12.88	H2MoO4
H2S (g)	-59.74	-67.75	-8.01	H2S
H2Se (g)	-28.87	-33.83	-4.96	H2Se
Halite	-9.94	-8.34	1.60	NaCl
Hausmannite	-15.65	45.38	61.03	Mn3O4
Hematite	11.81	10.39	-1.42	Fe2O3
Hercynite	5.31	28.21	22.89	FeAl2O4
Hg (CH3) 2 (g)	-155.11	-228.82	-73.71	Hg (CH3) 2
Hg (g)	-9.98	-17.85	-7.87	Hg
Hg (OH) 2	-14.82	-18.32	-3.50	Hg (OH) 2
Hg2 (g)	-20.74	-35.70	-14.96	Hg2
Hg2 (OH) 2	-19.84	-14.58	5.26	Hg2 (OH) 2
Hg2CO3	-19.29	-35.34	-16.05	Hg2CO3
Hg2CrO4	-43.92	-52.62	-8.70	Hg2CrO4
Hg2F2	-26.89	-37.25	-10.36	Hg2F2
Hg2S	-70.65	-82.33	-11.68	Hg2S
Hg2SeO3	-25.24	-29.90	-4.66	Hg2SeO3
Hg2SO4	-25.38	-31.51	-6.13	Hg2SO4
Hg3O2CO3	-46.04	-75.73	-29.68	Hg3O2CO3
HgCl (g)	-38.22	-18.73	19.50	HgCl
HgCl2	-19.93	-41.20	-21.26	HgCl2
HgF (g)	-51.30	-18.63	32.68	HgF
HgF2 (g)	-53.56	-41.00	12.57	HgF2
Hgmetal (l)	-4.40	-17.85	-13.45	Hg
HgSe	3.55	-52.15	-55.69	HgSe
HgSeO3	-21.21	-33.64	-12.43	HgSeO3
HgSO4	-25.83	-35.25	-9.42	HgSO4
Huntite	-14.69	-44.66	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-8.65	-27.43	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-27.18	-35.94	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.97	-21.14	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-1.03	-15.83	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-53.96	-71.20	-17.24	K2Cr2O7
K2CrO4	-32.64	-33.16	-0.51	K2CrO4
K2MoO4	-18.99	-15.73	3.26	K2MoO4
K2SeO4	-24.89	-25.62	-0.73	K2SeO4
Langite	0.94	18.43	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.09	-7.53	-0.43	PbO:PbSO4
Laurionite	-7.36	-6.74	0.62	PbOHCl
Lepidocrocite	3.82	5.20	1.37	FeOOH
Lime	-22.57	10.12	32.70	CaO
Litharge	-7.99	4.70	12.69	PbO
Mackinawite	-56.49	-60.09	-3.60	FeS
Maghemite	4.01	10.39	6.39	Fe2O3
Magnesioferrite	2.95	19.81	16.86	Fe2MgO4
Magnesite	-3.88	-11.34	-7.46	MgCO3
Magnetite	14.66	18.06	3.40	Fe3O4
Malachite	2.22	-3.08	-5.31	Cu2 (OH) 2CO3
Manganite	-6.69	18.65	25.34	MnOOH
Massicot	-8.19	4.70	12.89	PbO
Matlockite	-9.10	-18.07	-8.97	PbClF
Melanothallite	-20.29	-14.04	6.26	CuCl2
Melanterite	-7.05	-9.26	-2.21	FeSO4:7H2O
Metacinnabar	-40.98	-86.07	-45.09	HgS
Mg (OH) 2 (active)	-9.37	9.42	18.79	Mg (OH) 2
Mg (VO3) 2	-16.95	-5.67	11.28	Mg (VO3) 2
Mg2Sb3	-237.02	-162.33	74.68	Mg2Sb3

Mg2V2O7	-22.60	3.76	26.36	Mg2V2O7
MgCr2O4	-11.48	4.72	16.20	MgCr2O4
MgCrO4	-34.00	-28.62	5.38	MgCrO4
MgF2	-5.12	-13.25	-8.13	MgF2
MgMoO4	-9.34	-11.19	-1.85	MgMoO4
MgSeO3:6H2O	-8.96	-5.90	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-19.89	-21.09	-1.20	MgSeO4:6H2O
Minium	-38.30	35.22	73.52	Pb3O4
Mirabilite	-9.62	-10.73	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.90	-7.00	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-58.47	-64.19	-5.71	Mn2 (SO4) 3
Mn2Sb	-133.46	-72.38	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-14.64	-2.14	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-17.50	-14.79	2.72	MnCl2:4H2O
MnS (grn)	-59.83	-59.66	0.17	MnS
MnS (pnk)	-63.00	-59.66	3.34	MnS
MnSb	-81.78	-84.69	-2.91	MnSb
MnSe	-29.24	-25.74	3.50	MnSe
MnSeO3	-8.36	-7.23	1.13	MnSeO3
MnSeO3:2H2O	-8.22	-7.23	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-20.37	-22.42	-2.05	MnSeO4:5H2O
MnSO4	-11.42	-8.84	2.58	MnSO4
Monteponite	-10.38	4.73	15.10	CdO
Montroydite	-14.68	-18.32	-3.64	HgO
MoO3	-12.61	-20.61	-8.00	MoO3
Morenosite	-9.56	-11.70	-2.14	NiSO4:7H2O
MoS2	-106.98	-177.24	-70.26	MoS2
Na-Jarosite	-3.97	-15.17	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-59.99	-69.89	-9.90	Na2Cr2O7
Na2CrO4	-34.78	-31.85	2.93	Na2CrO4
Na2Mo2O7	-18.43	-35.03	-16.60	Na2Mo2O7
Na2MoO4	-15.91	-14.42	1.49	Na2MoO4
Na2MoO4:2H2O	-15.64	-14.42	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-19.43	-9.13	10.30	Na2SeO3:5H2O
Na2SeO4	-25.59	-24.31	1.28	Na2SeO4
Na3Sb	-163.15	-68.70	94.45	Na3Sb
Na3VO4	-34.93	1.75	36.68	Na3VO4
Na4V2O7	-40.10	-2.70	37.40	Na4V2O7
Nantokite	-3.74	-10.47	-6.73	CuCl
NaSb	-76.94	-53.77	23.17	NaSb
Natron	-13.26	-14.57	-1.31	Na2CO3:10H2O
NaVO3	-8.30	-4.45	3.86	NaVO3
Nesquehonite	-6.67	-11.34	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.57	5.23	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-26.43	-10.73	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-28.02	3.98	32.00	Ni4 (OH) 6SO4
NiCO3	-8.67	-15.54	-6.87	NiCO3
NiMoO4	-4.25	-15.39	-11.14	NiMoO4
NiS (alpha)	-56.93	-62.53	-5.60	NiS
NiS (beta)	-51.43	-62.53	-11.10	NiS
NiS (gamma)	-49.73	-62.53	-12.80	NiS
NiSe	-10.90	-28.60	-17.70	NiSe
NiSeO3:2H2O	-12.91	-10.10	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-23.76	-25.28	-1.52	NiSeO4:6H2O
Nsutite	-13.64	3.86	17.50	MnO2
O2 (g)	-40.85	42.24	83.09	O2
Orpiment	-173.05	-234.11	-61.07	As2S3
Otavite	-4.04	-16.04	-12.00	CdCO3
Pb (BO2) 2	-14.77	-8.25	6.52	Pb (BO2) 2
Pb (OH) 2	-3.45	4.70	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-68.82	-77.58	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-10.83	-2.04	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-16.79	9.40	26.19	Pb2O (OH) 2
Pb2O3	-30.52	30.52	61.04	Pb2O3
Pb2OCO3	-10.80	-11.36	-0.56	Pb2OCO3
Pb2V2O7	-3.79	-5.69	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-18.11	-12.31	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.13	-0.99	6.14	Pb3 (VO4) 2

Pb3O2CO3	-17.68	-6.66	11.02	Pb3O2CO3
Pb3O2SO4	-13.51	-2.83	10.69	Pb3O2SO4
Pb4(OH)6SO4	-19.23	1.87	21.10	Pb4(OH)6SO4
Pb4O3SO4	-20.00	1.87	21.88	Pb4O3SO4
PbCrO4	-20.74	-33.34	-12.60	PbCrO4
PbF2	-10.53	-17.97	-7.44	PbF2
Pbmetal	-20.67	-16.42	4.25	Pb
PbMoO4	-0.29	-15.91	-15.62	PbMoO4
PbO:0.3H2O	-8.28	4.70	12.98	PbO:0.33H2O
PbSeO4	-18.97	-25.81	-6.84	PbSeO4
Periclase	-12.16	9.42	21.58	MgO
Phosgenite	-14.43	-34.24	-19.81	PbCl2:PbCO3
Plattnerite	-23.78	25.82	49.60	PbO2
Portlandite	-12.68	10.12	22.80	Ca(OH)2
Pyrite	-88.21	-106.72	-18.51	FeS2
Pyrochroite	-7.11	8.09	15.19	Mn(OH)2
Pyrolusite	-12.17	29.21	41.38	MnO2
Realgar	-73.99	-93.74	-19.75	AsS
Retgersite	-9.66	-11.70	-2.04	NiSO4:6H2O
Rhodochrosite	-2.10	-12.68	-10.58	MnCO3
Rutherfordine	-3.86	-18.36	-14.50	UO2CO3
Sb(OH)3	-7.52	-14.63	-7.11	Sb(OH)3
Sb2O4	-11.54	-8.14	3.40	Sb2O4
Sb2O5	-25.97	-35.64	-9.67	Sb2O5
Sb2Se3	-62.98	-130.73	-67.76	Sb2Se3
Sb4O6(cubic)	-40.26	-58.52	-18.26	Sb4O6
Sb4O6(orth)	-40.62	-58.52	-17.90	Sb4O6
SbCl3	-49.51	-48.94	0.57	SbCl3
SbF3	-38.42	-48.64	-10.23	SbF3
Sbmetal	-34.62	-46.31	-11.69	Sb
SbO2	-0.55	-28.38	-27.82	SbO2
Schoepite	-3.59	2.40	5.99	UO2(OH)2:H2O
Semetal(am)	-5.59	-12.70	-7.11	Se
Semetal(hex)	-5.00	-12.70	-7.71	Se
Senarmontite	-16.89	-29.26	-12.37	Sb2O3
SeO2	-15.45	-15.32	0.12	SeO2
SeO3	-51.55	-30.51	21.04	SeO3
Siderite	-2.86	-13.10	-10.24	FeCO3
Smithsonite	-3.99	-13.99	-10.00	ZnCO3
Sphalerite	-49.53	-60.98	-11.45	ZnS
Spinel	-6.89	29.96	36.85	MgAl2O4
Stibnite	-182.06	-232.52	-50.46	Sb2S3
Sulfur	-44.49	-46.63	-2.14	S
Tenorite	1.20	8.84	7.64	CuO
Thenardite	-11.05	-10.73	0.32	Na2SO4
Thermonatrite	-15.20	-14.57	0.64	Na2CO3:H2O
Tyuyamunite	-4.24	-0.16	4.08	Ca(UO2)2(VO4)2
U3O8	-7.35	13.74	21.08	U3O8
U3Sb4	-492.86	-340.48	152.38	U3Sb4
U4O9	-13.87	-16.89	-3.02	U4O9
UF4	-25.32	-54.85	-29.54	UF4
UF4:2.5H2O	-22.13	-54.85	-32.72	UF4:2.5H2O
UO2(am)	-10.44	-9.50	0.93	UO2
UO2(NO3)2	-80.96	-68.81	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-73.66	-68.81	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-72.20	-68.81	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-70.86	-68.81	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.21	2.40	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.86	-28.11	-2.25	UO2SeO4:4H2O
UO3	-5.30	2.40	7.70	UO3
Uraninite	-4.83	-9.50	-4.67	UO2
USb2	-183.16	-153.58	29.58	USb2
V(OH)3	-13.66	-6.07	7.59	V(OH)3
V2O5	-13.73	-15.09	-1.36	V2O5
V3O5	-26.56	-24.73	1.84	V3O5
V4O7	-33.11	-25.93	7.19	V4O7
V6O13	-26.65	-87.51	-60.86	V6O13
Valentinite	-20.78	-29.26	-8.48	Sb2O3

VC12	-58.38	-39.50	18.87	VC12
VC13	-63.81	-40.38	23.43	VC13
VF4	-61.48	-46.55	14.93	VF4
Vmetal	-81.77	-37.75	44.03	V
VO	-31.38	-16.63	14.76	VO
VO(OH)2	-6.35	-1.20	5.15	VO(OH)2
VO2Cl	-21.82	-18.98	2.84	VO2Cl
VOC1	-28.66	-17.50	11.15	VOC1
VOC12	-36.84	-24.08	12.76	VOC12
VOSO4	-21.74	-18.13	3.61	VOSO4
Witherite	-5.94	-14.51	-8.57	BaCO3
Wurtzite	-52.03	-60.98	-8.95	ZnS
Zincite	-4.56	6.77	11.33	ZnO
Zincosite	-14.09	-10.16	3.93	ZnSO4
Zn(BO2)2	-14.47	-6.18	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-67.76	-64.45	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.43	6.77	12.20	Zn(OH)2
Zn(OH)2(am)	-5.70	6.77	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.98	6.77	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.76	6.77	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.96	6.77	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.89	-3.39	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-13.09	2.10	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.74	-6.09	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.46	-13.54	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-18.24	10.16	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-27.52	10.98	38.50	Zn5(OH)8Cl2
ZnCl2	-23.15	-16.10	7.05	ZnCl2
ZnCO3:1H2O	-3.73	-13.99	-10.26	ZnCO3:1H2O
ZnF2	-15.37	-15.90	-0.53	ZnF2
Znmetal	-40.14	-14.35	25.79	Zn
ZnMoO4	-3.72	-13.84	-10.13	ZnMoO4
ZnO(active)	-4.42	6.77	11.19	ZnO
ZnS(am)	-51.93	-60.98	-9.05	ZnS
ZnSb	-71.68	-60.66	11.01	ZnSb
ZnSe	-12.65	-27.05	-14.40	ZnSe
ZnSeO4:6H2O	-22.22	-23.74	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.52	-10.16	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 18.

```

REACTION 102
  H2O      -1
  2929.58 moles ###  Addition step. Removes HTC water but solute mass
remains
  USE solution 105
  SAVE Solution 106
  End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 105. Solution after simulation 17.
Using reaction 102.

Reaction 102.

2.930e+003 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	1.938e-004	1.840e-004
As	2.378e-007	2.258e-007
B	1.901e-005	1.805e-005
Ba	3.404e-006	3.232e-006
C	1.866e-002	1.772e-002
Ca	2.728e-002	2.590e-002
Cd	1.091e-007	1.036e-007
Cl	1.338e-003	1.270e-003
Co	3.135e-007	2.976e-007
Cr	5.258e-008	4.992e-008
Cu	2.183e-003	2.072e-003
F	1.752e-003	1.664e-003
Fe	1.384e-004	1.314e-004
Hg	2.949e-010	2.800e-010
K	2.715e-003	2.577e-003
Mg	5.326e-003	5.057e-003
Mn	2.500e-004	2.374e-004
Mo	6.454e-006	6.128e-006
N	9.513e-007	9.032e-007
Na	1.228e-002	1.166e-002
Ni	3.481e-007	3.305e-007
Pb	1.519e-007	1.442e-007
S	3.371e-002	3.201e-002
Sb	4.780e-007	4.538e-007
Se	1.802e-007	1.711e-007
U	2.653e-007	2.519e-007
V	5.763e-007	5.472e-007
Zn	1.217e-005	1.155e-005

-----Description of solution-----

	pH =	6.613	Charge balance
	pe =	3.554	Adjusted to redox
equilibrium	Activity of water =	0.998	
	Ionic strength =	9.517e-002	
	Mass of water (kg) =	9.494e-001	
	Total alkalinity (eq/kg) =	1.536e-002	
	Total CO2 (mol/kg) =	1.866e-002	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	1.142e-005	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.01	
	Iterations =	26	
	Total H =	1.054195e+002	
	Total O =	5.288057e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	3.112e-007	2.440e-007	-6.507	-6.613	-0.106	0.00
OH-	5.385e-008	4.121e-008	-7.269	-7.385	-0.116	(0)
H2O	5.551e+001	9.985e-001	1.744	-0.001	0.000	18.07

Al	1.938e-004					
AlF3	1.206e-004	1.206e-004	-3.919	-3.919	0.000	(0)
AlF4-	5.635e-005	4.394e-005	-4.249	-4.357	-0.108	(0)
AlF2+	1.665e-005	1.318e-005	-4.779	-4.880	-0.102	(0)
AlF+2	1.161e-007	4.552e-008	-6.935	-7.342	-0.407	(0)
Al (OH) 4-	4.621e-008	3.603e-008	-7.335	-7.443	-0.108	(0)
Al (OH) 2+	1.068e-008	8.447e-009	-7.972	-8.073	-0.102	(0)
Al (OH) 3	6.946e-009	6.946e-009	-8.158	-8.158	0.000	(0)
AlOH+2	6.584e-010	2.581e-010	-9.182	-9.588	-0.407	(0)
AlSO4+	4.837e-010	3.772e-010	-9.315	-9.423	-0.108	(0)
Al+3	5.596e-011	6.262e-012	-10.252	-11.203	-0.951	(0)
Al (SO4) 2-	4.022e-011	3.136e-011	-10.396	-10.504	-0.108	(0)
AlMo6O21-3	7.033e-029	2.698e-030	-28.153	-29.569	-1.416	(0)
As (3)	1.107e-013					
H3AsO3	1.104e-013	1.104e-013	-12.957	-12.957	0.000	(0)
H2AsO3-	3.333e-016	2.320e-016	-15.477	-15.634	-0.157	(0)
H4AsO3+	1.917e-020	1.334e-020	-19.717	-19.875	-0.157	(0)
HAsO3-2	3.695e-021	8.674e-022	-20.432	-21.062	-0.629	(0)
AsO3-3	3.572e-027	1.370e-028	-26.447	-27.863	-1.416	(0)
As (5)	2.378e-007					
HAsO4-2	1.359e-007	3.190e-008	-6.867	-7.496	-0.629	(0)
H2AsO4-	1.020e-007	7.097e-008	-6.992	-7.149	-0.157	(0)
AsO4-3	1.078e-011	4.134e-013	-10.968	-12.384	-1.416	(0)
H3AsO4	2.944e-012	3.009e-012	-11.531	-11.522	0.010	(0)
B	1.901e-005					
H3BO3	1.892e-005	1.934e-005	-4.723	-4.714	0.010	(0)
H2BO3-	6.146e-008	4.603e-008	-7.211	-7.337	-0.126	(0)
CaH2BO3+	2.079e-008	1.557e-008	-7.682	-7.808	-0.126	(0)
BF (OH) 3-	7.490e-009	5.609e-009	-8.126	-8.251	-0.126	(0)
MgH2BO3+	2.652e-009	1.986e-009	-8.576	-8.702	-0.126	(0)
NaH2BO3	6.716e-010	6.716e-010	-9.173	-9.173	0.000	(0)
BF2 (OH) 2-	1.422e-010	1.065e-010	-9.847	-9.973	-0.126	(0)
BaH2BO3+	2.349e-012	1.760e-012	-11.629	-11.755	-0.126	(0)
H5 (BO3) 2-	1.012e-012	7.576e-013	-11.995	-12.121	-0.126	(0)
BF3OH-	9.829e-015	7.362e-015	-14.007	-14.133	-0.126	(0)
H8 (BO3) 3-	1.956e-015	1.465e-015	-14.709	-14.834	-0.126	(0)
BF4-	8.591e-018	6.434e-018	-17.066	-17.191	-0.126	(0)
Ba	3.404e-006					
Ba+2	3.274e-006	1.237e-006	-5.485	-5.908	-0.423	(0)
BaHCO3+	1.288e-007	1.028e-007	-6.890	-6.988	-0.098	(0)
BaCO3	1.061e-009	1.061e-009	-8.974	-8.974	0.000	(0)
BaH2BO3+	2.349e-012	1.760e-012	-11.629	-11.755	-0.126	(0)
BaOH+	2.830e-013	2.225e-013	-12.548	-12.653	-0.104	(0)
BaNH3+2	5.073e-015	1.191e-015	-14.295	-14.924	-0.629	(0)
BaNO3+	1.769e-036	1.231e-036	-35.752	-35.910	-0.157	(0)
C (4)	1.866e-002					
HCO3-	1.100e-002	8.704e-003	-1.959	-2.060	-0.102	(0)
H2CO3	4.776e-003	4.776e-003	-2.321	-2.321	0.000	(0)
CuCO3	1.311e-003	1.311e-003	-2.882	-2.882	0.000	(0)
CaHCO3+	1.194e-003	9.528e-004	-2.923	-3.021	-0.098	(0)
MgHCO3+	1.434e-004	1.108e-004	-3.843	-3.955	-0.112	(0)
CuHCO3+	1.051e-004	7.312e-005	-3.979	-4.136	-0.157	(0)
NaHCO3	4.506e-005	4.506e-005	-4.346	-4.346	0.000	(0)
Cu (CO3) 2-2	2.515e-005	5.903e-006	-4.600	-5.229	-0.629	(0)
CaCO3	1.558e-005	1.558e-005	-4.807	-4.807	0.000	(0)
MnHCO3+	9.362e-006	7.361e-006	-5.029	-5.133	-0.104	(0)
CO3-2	4.427e-006	1.673e-006	-5.354	-5.777	-0.423	(0)
FeHCO3+	2.928e-006	2.337e-006	-5.533	-5.631	-0.098	(0)
MgCO3	1.731e-006	1.731e-006	-5.762	-5.762	0.000	(0)
ZnHCO3+	8.985e-007	6.254e-007	-6.046	-6.204	-0.157	(0)
NaCO3-	3.624e-007	2.867e-007	-6.441	-6.543	-0.102	(0)
UO2 (CO3) 3-4	2.296e-007	6.975e-010	-6.639	-9.156	-2.517	(0)
ZnCO3	2.187e-007	2.187e-007	-6.660	-6.660	0.000	(0)
BaHCO3+	1.288e-007	1.028e-007	-6.890	-6.988	-0.098	(0)
NiHCO3+	9.203e-008	6.406e-008	-7.036	-7.193	-0.157	(0)
PbHCO3+	6.444e-008	4.486e-008	-7.191	-7.348	-0.157	(0)
CoHCO3+	4.453e-008	3.100e-008	-7.351	-7.509	-0.157	(0)
UO2 (CO3) 2-2	3.544e-008	8.321e-009	-7.450	-8.080	-0.629	(0)

PbCO3	3.487e-008	3.487e-008	-7.458	-7.458	0.000	(0)
NiCO3	3.725e-009	3.725e-009	-8.429	-8.429	0.000	(0)
CoCO3	1.294e-009	1.294e-009	-8.888	-8.888	0.000	(0)
BaCO3	1.061e-009	1.061e-009	-8.974	-8.974	0.000	(0)
CdCO3	7.563e-010	7.563e-010	-9.121	-9.121	0.000	(0)
Pb (CO3) 2-2	7.165e-010	1.682e-010	-9.145	-9.774	-0.629	(0)
CdHCO3+	5.648e-010	3.931e-010	-9.248	-9.405	-0.157	(0)
UO2CO3	2.493e-010	2.493e-010	-9.603	-9.603	0.000	(0)
Cd (CO3) 2-2	3.994e-012	9.377e-013	-11.399	-12.028	-0.629	(0)
HgCO3	8.218e-019	8.218e-019	-18.085	-18.085	0.000	(0)
Hg (CO3) 2-2	1.851e-020	4.347e-021	-19.732	-20.362	-0.629	(0)
HgHCO3+	5.364e-021	3.733e-021	-20.271	-20.428	-0.157	(0)
Ca	2.728e-002					
Ca+2	1.556e-002	5.878e-003	-1.808	-2.231	-0.423	(0)
CaSO4	1.045e-002	1.045e-002	-1.981	-1.981	0.000	(0)
CaHCO3+	1.194e-003	9.528e-004	-2.923	-3.021	-0.098	(0)
CaF+	5.932e-005	4.664e-005	-4.227	-4.331	-0.104	(0)
CaCO3	1.558e-005	1.558e-005	-4.807	-4.807	0.000	(0)
CaH2BO3+	2.079e-008	1.557e-008	-7.682	-7.808	-0.126	(0)
CaOH+	6.055e-009	4.833e-009	-8.218	-8.316	-0.098	(0)
CaNH3+2	4.810e-011	1.129e-011	-10.318	-10.947	-0.629	(0)
Ca (NH3) 2+2	2.922e-020	6.860e-021	-19.534	-20.164	-0.629	(0)
CaNO3+	5.305e-033	3.692e-033	-32.275	-32.433	-0.157	(0)
Cd	1.091e-007					
Cd+2	5.251e-008	1.984e-008	-7.280	-7.703	-0.423	(0)
CdSO4	3.608e-008	3.608e-008	-7.443	-7.443	0.000	(0)
Cd (SO4) 2-2	1.609e-008	3.777e-009	-7.794	-8.423	-0.629	(0)
CdCl+	2.777e-009	1.933e-009	-8.556	-8.714	-0.157	(0)
CdCO3	7.563e-010	7.563e-010	-9.121	-9.121	0.000	(0)
CdHCO3+	5.648e-010	3.931e-010	-9.248	-9.405	-0.157	(0)
CdF+	3.284e-010	2.286e-010	-9.484	-9.641	-0.157	(0)
CdOH+	9.329e-012	6.494e-012	-11.030	-11.188	-0.157	(0)
CdCl2	8.223e-012	8.223e-012	-11.085	-11.085	0.000	(0)
Cd (CO3) 2-2	3.994e-012	9.377e-013	-11.399	-12.028	-0.629	(0)
CdOHC1	3.268e-012	3.268e-012	-11.486	-11.486	0.000	(0)
CdF2	3.316e-013	3.316e-013	-12.479	-12.479	0.000	(0)
CdCl3-	7.605e-015	5.294e-015	-14.119	-14.276	-0.157	(0)
Cd (OH) 2	1.688e-015	1.688e-015	-14.773	-14.773	0.000	(0)
Cd2OH+3	1.683e-017	6.456e-019	-16.774	-18.190	-1.416	(0)
Cd (SeO3) 2-2	2.655e-019	6.234e-020	-18.576	-19.205	-0.629	(0)
Cd (OH) 3-	6.107e-021	4.251e-021	-20.214	-20.372	-0.157	(0)
CdSeO4	1.922e-022	1.922e-022	-21.716	-21.716	0.000	(0)
Cd (OH) 4-2	1.221e-028	2.867e-029	-27.913	-28.543	-0.629	(0)
CdNO3+	1.790e-038	1.246e-038	-37.747	-37.904	-0.157	(0)
CdHS+	0.000e+000	0.000e+000	-55.934	-56.092	-0.157	(0)
Cd (NO3) 2	0.000e+000	0.000e+000	-68.906	-68.906	0.000	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-105.285	-105.285	0.000	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-159.624	-159.782	-0.157	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-213.353	-213.983	-0.629	(0)
Cl	1.338e-003					
Cl-	1.302e-003	1.020e-003	-2.886	-2.991	-0.106	(0)
CuCl	2.337e-005	2.337e-005	-4.631	-4.631	0.000	(0)
CuCl2-	6.447e-006	4.982e-006	-5.191	-5.303	-0.112	(0)
CuCl+	2.786e-007	2.153e-007	-6.555	-6.667	-0.112	(0)
MnCl+	6.925e-008	5.445e-008	-7.160	-7.264	-0.104	(0)
ZnCl+	7.536e-009	5.824e-009	-8.123	-8.235	-0.112	(0)
CuCl3-2	2.844e-009	1.087e-009	-8.546	-8.964	-0.418	(0)
CdCl+	2.777e-009	1.933e-009	-8.556	-8.714	-0.157	(0)
PbCl+	3.607e-010	2.511e-010	-9.443	-9.600	-0.157	(0)
ZnOHC1	3.142e-010	3.142e-010	-9.503	-9.503	0.000	(0)
CoCl+	2.322e-010	1.616e-010	-9.634	-9.792	-0.157	(0)
NiCl+	2.239e-010	1.559e-010	-9.650	-9.807	-0.157	(0)
MnCl2	7.848e-011	7.848e-011	-10.105	-10.105	0.000	(0)
CuCl2	7.618e-011	7.618e-011	-10.118	-10.118	0.000	(0)
ZnCl2	9.418e-012	9.418e-012	-11.026	-11.026	0.000	(0)
CdCl2	8.223e-012	8.223e-012	-11.085	-11.085	0.000	(0)
CdOHC1	3.268e-012	3.268e-012	-11.486	-11.486	0.000	(0)
PbCl2	1.144e-012	1.144e-012	-11.941	-11.941	0.000	(0)

MnCl3-	2.805e-014	2.205e-014	-13.552	-13.657	-0.104	(0)
CrCl+2	2.346e-014	5.507e-015	-13.630	-14.259	-0.629	(0)
ZnCl3-	9.878e-015	7.633e-015	-14.005	-14.117	-0.112	(0)
CdCl3-	7.605e-015	5.294e-015	-14.119	-14.276	-0.157	(0)
VOCl+	1.681e-015	1.170e-015	-14.774	-14.932	-0.157	(0)
CuCl3-	9.388e-016	7.255e-016	-15.027	-15.139	-0.112	(0)
NiCl2	8.007e-016	8.007e-016	-15.097	-15.097	0.000	(0)
PbCl3-	6.679e-016	4.649e-016	-15.175	-15.333	-0.157	(0)
FeCl+2	5.726e-016	2.189e-016	-15.242	-15.660	-0.418	(0)
UO2Cl+	8.902e-017	6.196e-017	-16.051	-16.208	-0.157	(0)
HgCl2	4.275e-017	4.275e-017	-16.369	-16.369	0.000	(0)
HgClOH	3.049e-017	3.049e-017	-16.516	-16.516	0.000	(0)
ZnCl4-2	1.019e-017	3.895e-018	-16.992	-17.410	-0.418	(0)
CrOHC12	4.401e-018	4.401e-018	-17.356	-17.356	0.000	(0)
FeCl2+	1.269e-018	9.975e-019	-17.897	-18.001	-0.104	(0)
PbCl4-2	9.236e-019	2.168e-019	-18.035	-18.664	-0.629	(0)
CrCl2+	7.660e-019	5.332e-019	-18.116	-18.273	-0.157	(0)
HgCl3-	6.266e-019	4.362e-019	-18.203	-18.360	-0.157	(0)
HgCl+	1.201e-020	8.359e-021	-19.921	-20.078	-0.157	(0)
CuCl4-2	9.707e-021	3.710e-021	-20.013	-20.431	-0.418	(0)
HgCl4-2	7.547e-021	1.772e-021	-20.122	-20.752	-0.629	(0)
FeCl3	1.018e-022	1.018e-022	-21.992	-21.992	0.000	(0)
CrO3Cl-	3.072e-034	2.138e-034	-33.513	-33.670	-0.157	(0)
CoCl+2	5.778e-037	1.356e-037	-36.238	-36.868	-0.629	(0)
UCl+3	2.270e-038	8.708e-040	-37.644	-39.060	-1.416	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-52.538	-53.168	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-54.367	-54.997	-0.629	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-69.899	-70.529	-0.629	(0)
Co (2)	3.135e-007					
Co+2	1.950e-007	4.578e-008	-6.710	-7.339	-0.629	(0)
CoSO4	7.087e-008	7.087e-008	-7.150	-7.150	0.000	(0)
CoHCO3+	4.453e-008	3.100e-008	-7.351	-7.509	-0.157	(0)
CoF+	1.512e-009	1.052e-009	-8.820	-8.978	-0.157	(0)
CoCO3	1.294e-009	1.294e-009	-8.888	-8.888	0.000	(0)
CoCl+	2.322e-010	1.616e-010	-9.634	-9.792	-0.157	(0)
CoOH+	5.408e-011	3.764e-011	-10.267	-10.424	-0.157	(0)
Co (OH) 2	1.232e-013	1.232e-013	-12.909	-12.909	0.000	(0)
Co (NH3) +2	3.577e-014	8.399e-015	-13.446	-14.076	-0.629	(0)
Co2OH+3	2.251e-018	8.637e-020	-17.648	-19.064	-1.416	(0)
Co (OH) 3-	1.456e-019	1.013e-019	-18.837	-18.994	-0.157	(0)
CoOOH-	3.657e-020	2.546e-020	-19.437	-19.594	-0.157	(0)
Co (NH3) 2+2	2.329e-021	5.467e-022	-20.633	-21.262	-0.629	(0)
CoSeO4	1.194e-021	1.194e-021	-20.923	-20.923	0.000	(0)
Co (OH) 4-2	2.819e-027	6.617e-028	-26.550	-27.179	-0.629	(0)
Co (NH3) 3+2	4.474e-029	1.050e-029	-28.349	-28.979	-0.629	(0)
CoNO2+	1.587e-029	1.105e-029	-28.799	-28.957	-0.157	(0)
Co4 (OH) 4+4	1.319e-031	4.006e-034	-30.880	-33.397	-2.517	(0)
Co (NH3) 4+2	3.583e-037	8.411e-038	-36.446	-37.075	-0.629	(0)
CoNO3+	2.070e-038	1.441e-038	-37.684	-37.841	-0.157	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-45.042	-45.672	-0.629	(0)
Co (NO3) 2	0.000e+000	0.000e+000	-68.235	-68.235	0.000	(0)
Co (3)	5.828e-031					
CoOH+2	5.827e-031	1.368e-031	-30.235	-30.864	-0.629	(0)
Co+3	5.838e-036	6.533e-037	-35.234	-36.185	-0.951	(0)
CoCl+2	5.778e-037	1.356e-037	-36.238	-36.868	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-54.367	-54.997	-0.629	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-64.565	-64.722	-0.157	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-69.899	-70.529	-0.629	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-70.093	-70.722	-0.629	(0)
Cr (2)	1.184e-021					
Cr+2	1.184e-021	2.779e-022	-20.927	-21.556	-0.629	(0)
Cr (3)	5.258e-008					
Cr (OH) 2+	2.708e-008	1.885e-008	-7.567	-7.725	-0.157	(0)
Cr (OH) +2	1.601e-008	3.760e-009	-7.795	-8.425	-0.629	(0)
CrOHSO4	6.922e-009	6.922e-009	-8.160	-8.160	0.000	(0)
CrF+2	2.047e-009	4.805e-010	-8.689	-9.318	-0.629	(0)
Cr (OH) 3	2.918e-010	2.918e-010	-9.535	-9.535	0.000	(0)
Cr+3	1.087e-010	4.170e-012	-9.964	-11.380	-1.416	(0)

CrSO4+	1.085e-010	7.555e-011	-9.964	-10.122	-0.157	(0)
CrO2-	8.173e-013	5.689e-013	-12.088	-12.245	-0.157	(0)
Cr (OH) 4-	6.878e-013	4.788e-013	-12.163	-12.320	-0.157	(0)
CrCl+2	2.346e-014	5.507e-015	-13.630	-14.259	-0.629	(0)
Cr2 (OH) 2SO4+2	1.002e-014	2.352e-015	-13.999	-14.629	-0.629	(0)
Cr2 (OH) 2 (SO4) 2	1.084e-015	1.084e-015	-14.965	-14.965	0.000	(0)
CrOHC12	4.401e-018	4.401e-018	-17.356	-17.356	0.000	(0)
CrCl2+	7.660e-019	5.332e-019	-18.116	-18.273	-0.157	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-41.845	-42.475	-0.629	(0)
CrNO3+2	0.000e+000	0.000e+000	-42.812	-43.441	-0.629	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-49.863	-51.279	-1.416	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-52.538	-53.168	-0.629	(0)
Cr (6)	6.662e-025					
CrO4-2	4.571e-025	1.727e-025	-24.340	-24.763	-0.423	(0)
HCrO4-	1.959e-025	1.364e-025	-24.708	-24.865	-0.157	(0)
NaCrO4-	1.135e-026	7.901e-027	-25.945	-26.102	-0.157	(0)
KCrO4-	1.861e-027	1.295e-027	-26.730	-26.888	-0.157	(0)
CrO3SO4-2	3.354e-031	7.873e-032	-30.474	-31.104	-0.629	(0)
H2CrO4	2.697e-032	2.697e-032	-31.569	-31.569	0.000	(0)
CrO3Cl-	3.072e-034	2.138e-034	-33.513	-33.670	-0.157	(0)
Cr2O7-2	0.000e+000	0.000e+000	-47.561	-48.190	-0.629	(0)
Cu (1)	5.595e-005					
Cu+	2.614e-005	1.819e-005	-4.583	-4.740	-0.157	(0)
CuCl	2.337e-005	2.337e-005	-4.631	-4.631	0.000	(0)
CuCl2-	6.447e-006	4.982e-006	-5.191	-5.303	-0.112	(0)
CuCl3-2	2.844e-009	1.087e-009	-8.546	-8.964	-0.418	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-100.494	-100.919	-0.425	(0)
CuS4S5-3	0.000e+000	0.000e+000	-101.248	-101.649	-0.401	(0)
Cu (2)	2.127e-003					
CuCO3	1.311e-003	1.311e-003	-2.882	-2.882	0.000	(0)
Cu+2	3.524e-004	1.331e-004	-3.453	-3.876	-0.423	(0)
CuSO4	2.367e-004	2.367e-004	-3.626	-3.626	0.000	(0)
CuHCO3+	1.051e-004	7.312e-005	-3.979	-4.136	-0.157	(0)
Cu2 (OH) 2+2	3.221e-005	7.563e-006	-4.492	-5.121	-0.629	(0)
Cu (CO3) 2-2	2.515e-005	5.903e-006	-4.600	-5.229	-0.629	(0)
CuOH+	2.245e-005	1.735e-005	-4.649	-4.761	-0.112	(0)
CuF+	8.774e-006	6.107e-006	-5.057	-5.214	-0.157	(0)
CuCl+	2.786e-007	2.153e-007	-6.555	-6.667	-0.112	(0)
Cu (OH) 2	1.427e-007	1.427e-007	-6.846	-6.846	0.000	(0)
CuNH3+2	8.856e-009	2.079e-009	-8.053	-8.682	-0.629	(0)
CuCl2	7.618e-011	7.618e-011	-10.118	-10.118	0.000	(0)
Cu (OH) 3-	1.733e-011	1.206e-011	-10.761	-10.919	-0.157	(0)
CuCl3-	9.388e-016	7.255e-016	-15.027	-15.139	-0.112	(0)
Cu (OH) 4-2	1.666e-017	3.911e-018	-16.778	-17.408	-0.629	(0)
CuCl4-2	9.707e-021	3.710e-021	-20.013	-20.431	-0.418	(0)
CuNO2+	6.858e-025	4.774e-025	-24.164	-24.321	-0.157	(0)
CuNO3+	1.202e-034	8.364e-035	-33.920	-34.078	-0.157	(0)
Cu (NO2) 2	0.000e+000	0.000e+000	-45.777	-45.777	0.000	(0)
Cu (NO3) 2	0.000e+000	0.000e+000	-65.680	-65.680	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-147.010	-147.168	-0.157	(0)
F	1.752e-003					
F-	9.273e-004	7.270e-004	-3.033	-3.138	-0.106	(0)
MgF+	1.302e-004	1.015e-004	-3.885	-3.993	-0.108	(0)
AlF3	1.206e-004	1.206e-004	-3.919	-3.919	0.000	(0)
CaF+	5.932e-005	4.664e-005	-4.227	-4.331	-0.104	(0)
AlF4-	5.635e-005	4.394e-005	-4.249	-4.357	-0.108	(0)
AlF2+	1.665e-005	1.318e-005	-4.779	-4.880	-0.102	(0)
CuF+	8.774e-006	6.107e-006	-5.057	-5.214	-0.157	(0)
NaF	4.223e-006	4.223e-006	-5.374	-5.374	0.000	(0)
MnF+	1.560e-006	1.227e-006	-5.807	-5.911	-0.104	(0)
HF	2.623e-007	2.623e-007	-6.581	-6.581	0.000	(0)
AlF+2	1.161e-007	4.552e-008	-6.935	-7.342	-0.407	(0)
ZnF+	4.735e-008	3.296e-008	-7.325	-7.482	-0.157	(0)
BF (OH) 3-	7.490e-009	5.609e-009	-8.126	-8.251	-0.126	(0)
CrF+2	2.047e-009	4.805e-010	-8.689	-9.318	-0.629	(0)
NiF+	1.566e-009	1.090e-009	-8.805	-8.963	-0.157	(0)
CoF+	1.512e-009	1.052e-009	-8.820	-8.978	-0.157	(0)
HF2-	9.474e-010	7.251e-010	-9.023	-9.140	-0.116	(0)

PbF+	5.105e-010	3.553e-010	-9.292	-9.449	-0.157	(0)
CdF+	3.284e-010	2.286e-010	-9.484	-9.641	-0.157	(0)
BF2 (OH) 2-	1.422e-010	1.065e-010	-9.847	-9.973	-0.126	(0)
FeF2+	1.401e-010	1.101e-010	-9.854	-9.958	-0.104	(0)
FeF3	1.130e-010	1.130e-010	-9.947	-9.947	0.000	(0)
FeF+2	1.481e-011	5.661e-012	-10.829	-11.247	-0.418	(0)
UO2F2	7.879e-012	7.879e-012	-11.104	-11.104	0.000	(0)
UO2F+	5.398e-012	3.758e-012	-11.268	-11.425	-0.157	(0)
PbF2	5.083e-012	5.083e-012	-11.294	-11.294	0.000	(0)
VOF+	2.561e-012	1.783e-012	-11.592	-11.749	-0.157	(0)
UO2F3-	2.067e-012	1.439e-012	-11.685	-11.842	-0.157	(0)
VOF2	4.860e-013	4.860e-013	-12.313	-12.313	0.000	(0)
VO2F	3.919e-013	3.919e-013	-12.407	-12.407	0.000	(0)
CdF2	3.316e-013	3.316e-013	-12.479	-12.479	0.000	(0)
H2F2	1.844e-013	1.844e-013	-12.734	-12.734	0.000	(0)
VO2F2-	1.486e-013	1.035e-013	-12.828	-12.985	-0.157	(0)
UO2F4-2	3.539e-014	8.308e-015	-13.451	-14.080	-0.629	(0)
VOF3-	1.801e-014	1.254e-014	-13.744	-13.902	-0.157	(0)
PbF3-	1.007e-014	7.009e-015	-13.997	-14.154	-0.157	(0)
BF3OH-	9.829e-015	7.362e-015	-14.007	-14.133	-0.126	(0)
VO2F3-2	3.996e-015	9.382e-016	-14.398	-15.028	-0.629	(0)
Sb (OH) 2F	2.489e-016	2.489e-016	-15.604	-15.604	0.000	(0)
SbOF	2.451e-016	2.451e-016	-15.611	-15.611	0.000	(0)
VOF4-2	1.567e-016	3.679e-017	-15.805	-16.434	-0.629	(0)
PbF4-2	1.039e-017	2.439e-018	-16.983	-17.613	-0.629	(0)
VO2F4-3	8.747e-018	3.356e-019	-17.058	-18.474	-1.416	(0)
BF4-	8.591e-018	6.434e-018	-17.066	-17.191	-0.126	(0)
UF3+	3.742e-026	2.605e-026	-25.427	-25.584	-0.157	(0)
HgF+	1.589e-026	1.106e-026	-25.799	-25.956	-0.157	(0)
UF4	2.076e-027	2.076e-027	-26.683	-26.683	0.000	(0)
UF2+2	9.629e-028	2.261e-028	-27.016	-27.646	-0.629	(0)
UF5-	8.593e-029	5.982e-029	-28.066	-28.223	-0.157	(0)
UF6-2	5.594e-029	1.313e-029	-28.252	-28.882	-0.629	(0)
UF+3	6.438e-031	2.470e-032	-30.191	-31.607	-1.416	(0)
Fe (2)	1.344e-004					
Fe+2	9.085e-005	2.133e-005	-4.042	-4.671	-0.629	(0)
FeSO4	4.062e-005	4.062e-005	-4.391	-4.391	0.000	(0)
FeHCO3+	2.928e-006	2.337e-006	-5.533	-5.631	-0.098	(0)
FeOH+	4.450e-008	3.499e-008	-7.352	-7.456	-0.104	(0)
Fe (OH) 2	1.145e-012	1.145e-012	-11.941	-11.941	0.000	(0)
Fe (OH) 3-	1.898e-014	1.493e-014	-13.722	-13.826	-0.104	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-108.515	-108.515	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-162.718	-162.875	-0.157	(0)
Fe (3)	3.965e-006					
Fe (OH) 2+	3.829e-006	3.030e-006	-5.417	-5.519	-0.102	(0)
Fe (OH) 3	1.341e-007	1.341e-007	-6.873	-6.873	0.000	(0)
Fe (OH) 4-	6.503e-010	5.145e-010	-9.187	-9.289	-0.102	(0)
FeOH+2	4.944e-010	1.890e-010	-9.306	-9.724	-0.418	(0)
FeF2+	1.401e-010	1.101e-010	-9.854	-9.958	-0.104	(0)
FeF3	1.130e-010	1.130e-010	-9.947	-9.947	0.000	(0)
FeF+2	1.481e-011	5.661e-012	-10.829	-11.247	-0.418	(0)
FeSO4+	7.864e-013	6.183e-013	-12.104	-12.209	-0.104	(0)
Fe (SO4) 2-	1.474e-013	1.026e-013	-12.832	-12.989	-0.157	(0)
Fe+3	6.347e-014	7.102e-015	-13.197	-14.149	-0.951	(0)
FeCl+2	5.726e-016	2.189e-016	-15.242	-15.660	-0.418	(0)
Fe2 (OH) 2+4	3.893e-016	1.182e-018	-15.410	-17.927	-2.517	(0)
FeHSeO3+2	9.566e-018	2.246e-018	-17.019	-17.649	-0.629	(0)
FeCl2+	1.269e-018	9.975e-019	-17.897	-18.001	-0.104	(0)
Fe3 (OH) 4+5	4.444e-019	5.178e-023	-18.352	-22.286	-3.934	(0)
FeCl3	1.018e-022	1.018e-022	-21.992	-21.992	0.000	(0)
FeNO3+2	0.000e+000	0.000e+000	-43.221	-43.851	-0.629	(0)
H (0)	6.417e-024					
H2	3.208e-024	3.279e-024	-23.494	-23.484	0.010	(0)
Hg (0)	2.949e-010					
Hg	2.949e-010	2.949e-010	-9.530	-9.530	0.000	(0)
Hg (1)	7.003e-025					
Hg2+2	3.501e-025	8.220e-026	-24.456	-25.085	-0.629	(0)
Hg (2)	7.903e-017					

	HgCl ₂	4.275e-017	4.275e-017	-16.369	-16.369	0.000	(0)
	HgClOH	3.049e-017	3.049e-017	-16.516	-16.516	0.000	(0)
	Hg (OH) 2	4.304e-018	4.399e-018	-17.366	-17.357	0.010	(0)
	HgCO ₃	8.218e-019	8.218e-019	-18.085	-18.085	0.000	(0)
	HgCl ₃ -	6.266e-019	4.362e-019	-18.203	-18.360	-0.157	(0)
	Hg (CO ₃) 2-2	1.851e-020	4.347e-021	-19.732	-20.362	-0.629	(0)
	HgCl+	1.201e-020	8.359e-021	-19.921	-20.078	-0.157	(0)
	HgCl ₄ -2	7.547e-021	1.772e-021	-20.122	-20.752	-0.629	(0)
	HgHCO ₃ +	5.364e-021	3.733e-021	-20.271	-20.428	-0.157	(0)
	HgOH+	9.677e-022	6.736e-022	-21.014	-21.172	-0.157	(0)
	Hg (NH ₃) 2+2	2.569e-024	6.032e-025	-23.590	-24.220	-0.629	(0)
	Hg+2	1.749e-024	4.106e-025	-23.757	-24.387	-0.629	(0)
	HgNH ₃ +2	1.684e-024	3.953e-025	-23.774	-24.403	-0.629	(0)
	HgSO ₄	8.340e-025	8.340e-025	-24.079	-24.079	0.000	(0)
	Hg (OH) 3-	3.279e-026	2.282e-026	-25.484	-25.642	-0.157	(0)
	HgF+	1.589e-026	1.106e-026	-25.799	-25.956	-0.157	(0)
	Hg (NH ₃) 3+2	1.561e-032	3.664e-033	-31.807	-32.436	-0.629	(0)
	Hg (NH ₃) 4+2	1.892e-040	0.000e+000	-39.723	-40.352	-0.629	(0)
	HgNO ₃ +	0.000e+000	0.000e+000	-55.364	-55.521	-0.157	(0)
	Hg (NO ₃) 2	0.000e+000	0.000e+000	-86.604	-86.604	0.000	(0)
	HgHS ₂ -	0.000e+000	0.000e+000	-98.483	-98.640	-0.157	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-98.859	-98.859	0.000	(0)
	HgS ₂ -2	0.000e+000	0.000e+000	-100.106	-100.735	-0.629	(0)
K		2.715e-003					
	K+	2.575e-003	2.018e-003	-2.589	-2.695	-0.106	(0)
	KSO ₄ -	1.401e-004	1.109e-004	-3.853	-3.955	-0.102	(0)
	KCrO ₄ -	1.861e-027	1.295e-027	-26.730	-26.888	-0.157	(0)
Mg		5.326e-003					
	Mg+2	3.294e-003	1.244e-003	-2.482	-2.905	-0.423	(0)
	MgSO ₄	1.757e-003	1.757e-003	-2.755	-2.755	0.000	(0)
	MgHCO ₃ +	1.434e-004	1.108e-004	-3.843	-3.955	-0.112	(0)
	MgF+	1.302e-004	1.015e-004	-3.885	-3.993	-0.108	(0)
	MgCO ₃	1.731e-006	1.731e-006	-5.762	-5.762	0.000	(0)
	MgOH+	2.540e-008	2.042e-008	-7.595	-7.690	-0.095	(0)
	MgH ₂ BO ₃ +	2.652e-009	1.986e-009	-8.576	-8.702	-0.126	(0)
Mn (2)		2.500e-004					
	Mn+2	1.805e-004	4.238e-005	-3.743	-4.373	-0.629	(0)
	MnSO ₄	5.848e-005	5.848e-005	-4.233	-4.233	0.000	(0)
	MnHCO ₃ +	9.362e-006	7.361e-006	-5.029	-5.133	-0.104	(0)
	MnF+	1.560e-006	1.227e-006	-5.807	-5.911	-0.104	(0)
	MnCl+	6.925e-008	5.445e-008	-7.160	-7.264	-0.104	(0)
	MnOH+	5.580e-009	4.387e-009	-8.253	-8.358	-0.104	(0)
	MnCl ₂	7.848e-011	7.848e-011	-10.105	-10.105	0.000	(0)
	MnCl ₃ -	2.805e-014	2.205e-014	-13.552	-13.657	-0.104	(0)
	MnSeO ₄	5.935e-019	5.935e-019	-18.227	-18.227	0.000	(0)
	Mn (OH) 3-	5.857e-020	4.605e-020	-19.232	-19.337	-0.104	(0)
	Mn (OH) 4-2	1.603e-026	6.127e-027	-25.795	-26.213	-0.418	(0)
	MnSe	6.197e-027	6.197e-027	-26.208	-26.208	0.000	(0)
	MnNO ₃ +	1.917e-035	1.334e-035	-34.717	-34.875	-0.157	(0)
	Mn (NO ₃) 2	0.000e+000	0.000e+000	-65.177	-65.177	0.000	(0)
Mn (3)		6.065e-026					
	Mn+3	6.065e-026	6.787e-027	-25.217	-26.168	-0.951	(0)
Mn (6)		0.000e+000					
	MnO ₄ -2	0.000e+000	0.000e+000	-55.261	-55.678	-0.418	(0)
Mn (7)		0.000e+000					
	MnO ₄ -	0.000e+000	0.000e+000	-61.375	-61.496	-0.121	(0)
Mo		6.454e-006					
	MoO ₄ -2	6.437e-006	2.432e-006	-5.191	-5.614	-0.423	(0)
	HMoO ₄ -	1.696e-008	1.181e-008	-7.771	-7.928	-0.157	(0)
	H ₂ MoO ₄	2.110e-011	2.110e-011	-10.676	-10.676	0.000	(0)
	AlMo ₆ O ₂₁ -3	7.033e-029	2.698e-030	-28.153	-29.569	-1.416	(0)
	Mo ₇ O ₂₄ -6	2.867e-034	6.211e-040	-33.543	-39.207	-5.664	(0)
	HMo ₇ O ₂₄ -5	3.168e-036	3.692e-040	-35.499	-39.433	-3.934	(0)
	H ₂ Mo ₇ O ₂₄ -4	1.796e-039	0.000e+000	-38.746	-41.263	-2.517	(0)
	H ₃ Mo ₇ O ₂₄ -3	0.000e+000	0.000e+000	-43.214	-44.630	-1.416	(0)
N (-3)		9.513e-007					
	NH ₄ +	8.718e-007	6.530e-007	-6.060	-6.185	-0.126	(0)
	NH ₄ SO ₄ -	6.904e-008	5.429e-008	-7.161	-7.265	-0.104	(0)

CuNH3+2	8.856e-009	2.079e-009	-8.053	-8.682	-0.629	(0)
NH3	1.526e-009	1.526e-009	-8.816	-8.816	0.000	(0)
CaNH3+2	4.810e-011	1.129e-011	-10.318	-10.947	-0.629	(0)
NiNH3+2	2.084e-013	4.892e-014	-12.681	-13.310	-0.629	(0)
Co (NH3) +2	3.577e-014	8.399e-015	-13.446	-14.076	-0.629	(0)
BaNH3+2	5.073e-015	1.191e-015	-14.295	-14.924	-0.629	(0)
Ni (NH3) 2+2	4.596e-020	1.079e-020	-19.338	-19.967	-0.629	(0)
Ca (NH3) 2+2	2.922e-020	6.860e-021	-19.534	-20.164	-0.629	(0)
Co (NH3) 2+2	2.329e-021	5.467e-022	-20.633	-21.262	-0.629	(0)
Hg (NH3) 2+2	2.569e-024	6.032e-025	-23.590	-24.220	-0.629	(0)
HgNH3+2	1.684e-024	3.953e-025	-23.774	-24.403	-0.629	(0)
Co (NH3) 3+2	4.474e-029	1.050e-029	-28.349	-28.979	-0.629	(0)
Hg (NH3) 3+2	1.561e-032	3.664e-033	-31.807	-32.436	-0.629	(0)
Co (NH3) 4+2	3.583e-037	8.411e-038	-36.446	-37.075	-0.629	(0)
Hg (NH3) 4+2	1.892e-040	0.000e+000	-39.723	-40.352	-0.629	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-41.845	-42.475	-0.629	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-45.042	-45.672	-0.629	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-49.863	-51.279	-1.416	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-52.538	-53.168	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-54.367	-54.997	-0.629	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-64.565	-64.722	-0.157	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-69.899	-70.529	-0.629	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-70.093	-70.722	-0.629	(0)
N (3)	4.589e-023					
NO2-	4.520e-023	3.424e-023	-22.345	-22.465	-0.121	(0)
CuNO2+	6.858e-025	4.774e-025	-24.164	-24.321	-0.157	(0)
CoNO2+	1.587e-029	1.105e-029	-28.799	-28.957	-0.157	(0)
Cu (NO2) 2	0.000e+000	0.000e+000	-45.777	-45.777	0.000	(0)
N (5)	2.588e-031					
NO3-	2.534e-031	1.986e-031	-30.596	-30.702	-0.106	(0)
CaNO3+	5.305e-033	3.692e-033	-32.275	-32.433	-0.157	(0)
CuNO3+	1.202e-034	8.364e-035	-33.920	-34.078	-0.157	(0)
MnNO3+	1.917e-035	1.334e-035	-34.717	-34.875	-0.157	(0)
BaNO3+	1.769e-036	1.231e-036	-35.752	-35.910	-0.157	(0)
ZnNO3+	1.629e-036	1.134e-036	-35.788	-35.946	-0.157	(0)
NiNO3+	4.279e-038	2.979e-038	-37.369	-37.526	-0.157	(0)
PbNO3+	2.927e-038	2.038e-038	-37.534	-37.691	-0.157	(0)
CoNO3+	2.070e-038	1.441e-038	-37.684	-37.841	-0.157	(0)
CdNO3+	1.790e-038	1.246e-038	-37.747	-37.904	-0.157	(0)
CrNO3+2	0.000e+000	0.000e+000	-42.812	-43.441	-0.629	(0)
FeNO3+2	0.000e+000	0.000e+000	-43.221	-43.851	-0.629	(0)
VO2NO3	0.000e+000	0.000e+000	-43.510	-43.510	0.000	(0)
UO2NO3+	0.000e+000	0.000e+000	-43.671	-43.829	-0.157	(0)
HgNO3+	0.000e+000	0.000e+000	-55.364	-55.521	-0.157	(0)
Mn (NO3) 2	0.000e+000	0.000e+000	-65.177	-65.177	0.000	(0)
Cu (NO3) 2	0.000e+000	0.000e+000	-65.680	-65.680	0.000	(0)
Zn (NO3) 2	0.000e+000	0.000e+000	-67.347	-67.347	0.000	(0)
Pb (NO3) 2	0.000e+000	0.000e+000	-68.163	-68.163	0.000	(0)
Co (NO3) 2	0.000e+000	0.000e+000	-68.235	-68.235	0.000	(0)
Cd (NO3) 2	0.000e+000	0.000e+000	-68.906	-68.906	0.000	(0)
Hg (NO3) 2	0.000e+000	0.000e+000	-86.604	-86.604	0.000	(0)
Na	1.228e-002					
Na+	1.174e-002	9.206e-003	-1.930	-2.036	-0.106	(0)
NaSO4-	4.848e-004	3.836e-004	-3.314	-3.416	-0.102	(0)
NaHCO3	4.506e-005	4.506e-005	-4.346	-4.346	0.000	(0)
NaF	4.223e-006	4.223e-006	-5.374	-5.374	0.000	(0)
NaCO3-	3.624e-007	2.867e-007	-6.441	-6.543	-0.102	(0)
NaH2BO3	6.716e-010	6.716e-010	-9.173	-9.173	0.000	(0)
NaCrO4-	1.135e-026	7.901e-027	-25.945	-26.102	-0.157	(0)
Ni	3.481e-007					
Ni+2	1.580e-007	5.970e-008	-6.801	-7.224	-0.423	(0)
NiSO4	9.242e-008	9.242e-008	-7.034	-7.034	0.000	(0)
NiHCO3+	9.203e-008	6.406e-008	-7.036	-7.193	-0.157	(0)
NiCO3	3.725e-009	3.725e-009	-8.429	-8.429	0.000	(0)
NiF+	1.566e-009	1.090e-009	-8.805	-8.963	-0.157	(0)
NiCl+	2.239e-010	1.559e-010	-9.650	-9.807	-0.157	(0)
Ni (SO4) 2-2	1.011e-010	2.375e-011	-9.995	-10.624	-0.629	(0)
NiOH+	4.449e-011	3.097e-011	-10.352	-10.509	-0.157	(0)

NiNH3+2	2.084e-013	4.892e-014	-12.681	-13.310	-0.629	(0)
Ni(OH)2	1.014e-013	1.014e-013	-12.994	-12.994	0.000	(0)
NiCl2	8.007e-016	8.007e-016	-15.097	-15.097	0.000	(0)
Ni(OH)3-	6.002e-018	4.178e-018	-17.222	-17.379	-0.157	(0)
Ni(NH3)2+2	4.596e-020	1.079e-020	-19.338	-19.967	-0.629	(0)
NiSeO4	1.453e-021	1.453e-021	-20.838	-20.838	0.000	(0)
NiNO3+	4.279e-038	2.979e-038	-37.369	-37.526	-0.157	(0)
O(0)	0.000e+000					
O2	0.000e+000	0.000e+000	-45.337	-45.328	0.010	(0)
Pb	1.519e-007					
PbHCO3+	6.444e-008	4.486e-008	-7.191	-7.348	-0.157	(0)
PbCO3	3.487e-008	3.487e-008	-7.458	-7.458	0.000	(0)
PbSO4	2.636e-008	2.636e-008	-7.579	-7.579	0.000	(0)
Pb+2	1.836e-008	6.936e-009	-7.736	-8.159	-0.423	(0)
Pb(SO4)2-2	5.249e-009	1.232e-009	-8.280	-8.909	-0.629	(0)
PbOH+	1.031e-009	7.179e-010	-8.987	-9.144	-0.157	(0)
Pb(CO3)2-2	7.165e-010	1.682e-010	-9.145	-9.774	-0.629	(0)
PbF+	5.105e-010	3.553e-010	-9.292	-9.449	-0.157	(0)
PbCl+	3.607e-010	2.511e-010	-9.443	-9.600	-0.157	(0)
PbF2	5.083e-012	5.083e-012	-11.294	-11.294	0.000	(0)
PbCl2	1.144e-012	1.144e-012	-11.941	-11.941	0.000	(0)
Pb(OH)2	9.356e-013	9.356e-013	-12.029	-12.029	0.000	(0)
PbF3-	1.007e-014	7.009e-015	-13.997	-14.154	-0.157	(0)
Pb2OH+3	2.057e-015	7.892e-017	-14.687	-16.103	-1.416	(0)
PbCl3-	6.679e-016	4.649e-016	-15.175	-15.333	-0.157	(0)
Pb(OH)3-	5.539e-017	3.856e-017	-16.257	-16.414	-0.157	(0)
PbF4-2	1.039e-017	2.439e-018	-16.983	-17.613	-0.629	(0)
PbCl4-2	9.236e-019	2.168e-019	-18.035	-18.664	-0.629	(0)
Pb(OH)4-2	1.658e-021	3.891e-022	-20.781	-21.410	-0.629	(0)
Pb3(OH)4+2	5.160e-022	1.211e-022	-21.287	-21.917	-0.629	(0)
Pb4(OH)4+4	2.197e-024	6.673e-027	-23.658	-26.176	-2.517	(0)
PbNO3+	2.927e-038	2.038e-038	-37.534	-37.691	-0.157	(0)
Pb(NO3)2	0.000e+000	0.000e+000	-68.163	-68.163	0.000	(0)
Pb(HS)2	0.000e+000	0.000e+000	-105.683	-105.683	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-160.623	-160.780	-0.157	(0)
S(-2)	0.000e+000					
CdHS+	0.000e+000	0.000e+000	-55.934	-56.092	-0.157	(0)
H2S	0.000e+000	0.000e+000	-55.990	-55.990	0.000	(0)
HS-	0.000e+000	0.000e+000	-56.240	-56.397	-0.157	(0)
S5-2	0.000e+000	0.000e+000	-58.520	-59.149	-0.629	(0)
S6-2	0.000e+000	0.000e+000	-59.036	-59.665	-0.629	(0)
S4-2	0.000e+000	0.000e+000	-59.116	-59.745	-0.629	(0)
S3-2	0.000e+000	0.000e+000	-59.922	-60.551	-0.629	(0)
S2-2	0.000e+000	0.000e+000	-60.938	-61.567	-0.629	(0)
S-2	0.000e+000	0.000e+000	-66.667	-67.084	-0.418	(0)
HgHS2-	0.000e+000	0.000e+000	-98.483	-98.640	-0.157	(0)
Hg(HS)2	0.000e+000	0.000e+000	-98.859	-98.859	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-100.106	-100.735	-0.629	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-100.494	-100.919	-0.425	(0)
CuS4S5-3	0.000e+000	0.000e+000	-101.248	-101.649	-0.401	(0)
ZnS(HS)-	0.000e+000	0.000e+000	-104.858	-105.015	-0.157	(0)
Cd(HS)2	0.000e+000	0.000e+000	-105.285	-105.285	0.000	(0)
Zn(HS)2	0.000e+000	0.000e+000	-105.618	-105.618	0.000	(0)
Pb(HS)2	0.000e+000	0.000e+000	-105.683	-105.683	0.000	(0)
Fe(HS)2	0.000e+000	0.000e+000	-108.515	-108.515	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-147.010	-147.168	-0.157	(0)
Zn(HS)3-	0.000e+000	0.000e+000	-158.577	-158.735	-0.157	(0)
Cd(HS)3-	0.000e+000	0.000e+000	-159.624	-159.782	-0.157	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-160.623	-160.780	-0.157	(0)
ZnS(HS)2-2	0.000e+000	0.000e+000	-161.473	-162.102	-0.629	(0)
Fe(HS)3-	0.000e+000	0.000e+000	-162.718	-162.875	-0.157	(0)
Sb2S4-2	0.000e+000	0.000e+000	-212.886	-213.515	-0.629	(0)
Cd(HS)4-2	0.000e+000	0.000e+000	-213.353	-213.983	-0.629	(0)
Zn(HS)4-2	0.000e+000	0.000e+000	-215.962	-216.592	-0.629	(0)
S(6)	3.371e-002					
SO4-2	2.054e-002	7.759e-003	-1.687	-2.110	-0.423	(0)
CaSO4	1.045e-002	1.045e-002	-1.981	-1.981	0.000	(0)
MgSO4	1.757e-003	1.757e-003	-2.755	-2.755	0.000	(0)

NaSO4-	4.848e-004	3.836e-004	-3.314	-3.416	-0.102	(0)
CuSO4	2.367e-004	2.367e-004	-3.626	-3.626	0.000	(0)
KSO4-	1.401e-004	1.109e-004	-3.853	-3.955	-0.102	(0)
MnSO4	5.848e-005	5.848e-005	-4.233	-4.233	0.000	(0)
FeSO4	4.062e-005	4.062e-005	-4.391	-4.391	0.000	(0)
ZnSO4	3.857e-006	3.857e-006	-5.414	-5.414	0.000	(0)
Zn (SO4) 2-2	1.110e-006	2.606e-007	-5.955	-6.584	-0.629	(0)
HSO4-	2.373e-007	1.850e-007	-6.625	-6.733	-0.108	(0)
NiSO4	9.242e-008	9.242e-008	-7.034	-7.034	0.000	(0)
CoSO4	7.087e-008	7.087e-008	-7.150	-7.150	0.000	(0)
NH4SO4-	6.904e-008	5.429e-008	-7.161	-7.265	-0.104	(0)
CdSO4	3.608e-008	3.608e-008	-7.443	-7.443	0.000	(0)
PbSO4	2.636e-008	2.636e-008	-7.579	-7.579	0.000	(0)
Cd (SO4) 2-2	1.609e-008	3.777e-009	-7.794	-8.423	-0.629	(0)
CrOHSO4	6.922e-009	6.922e-009	-8.160	-8.160	0.000	(0)
Pb (SO4) 2-2	5.249e-009	1.232e-009	-8.280	-8.909	-0.629	(0)
AlSO4+	4.837e-010	3.772e-010	-9.315	-9.423	-0.108	(0)
CrSO4+	1.085e-010	7.555e-011	-9.964	-10.122	-0.157	(0)
Ni (SO4) 2-2	1.011e-010	2.375e-011	-9.995	-10.624	-0.629	(0)
Al (SO4) 2-	4.022e-011	3.136e-011	-10.396	-10.504	-0.108	(0)
VO4	8.737e-013	8.737e-013	-12.059	-12.059	0.000	(0)
FeSO4+	7.864e-013	6.183e-013	-12.104	-12.209	-0.104	(0)
UO2SO4	4.397e-013	4.397e-013	-12.357	-12.357	0.000	(0)
UO2 (SO4) 2-2	1.916e-013	4.498e-014	-12.718	-13.347	-0.629	(0)
Fe (SO4) 2-	1.474e-013	1.026e-013	-12.832	-12.989	-0.157	(0)
VO2SO4-	8.181e-014	5.695e-014	-13.087	-13.245	-0.157	(0)
Cr2 (OH) 2SO4+2	1.002e-014	2.352e-015	-13.999	-14.629	-0.629	(0)
Cr2 (OH) 2 (SO4) 2	1.084e-015	1.084e-015	-14.965	-14.965	0.000	(0)
VSO4+	1.777e-023	1.237e-023	-22.750	-22.908	-0.157	(0)
HgSO4	8.340e-025	8.340e-025	-24.079	-24.079	0.000	(0)
CrO3SO4-2	3.354e-031	7.873e-032	-30.474	-31.104	-0.629	(0)
U (SO4) 2	3.242e-032	3.242e-032	-31.489	-31.489	0.000	(0)
USO4+2	2.241e-033	5.260e-034	-32.650	-33.279	-0.629	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-64.565	-64.722	-0.157	(0)
Sb (3)	1.775e-012					
Sb (OH) 3	8.971e-013	8.971e-013	-12.047	-12.047	0.000	(0)
HSbO2	8.770e-013	8.770e-013	-12.057	-12.057	0.000	(0)
Sb (OH) 2F	2.489e-016	2.489e-016	-15.604	-15.604	0.000	(0)
SbOF	2.451e-016	2.451e-016	-15.611	-15.611	0.000	(0)
SbO2-	8.363e-018	5.822e-018	-17.078	-17.235	-0.157	(0)
Sb (OH) 2+	7.647e-018	5.323e-018	-17.117	-17.274	-0.157	(0)
Sb (OH) 4-	4.778e-018	3.326e-018	-17.321	-17.478	-0.157	(0)
SbO+	2.640e-018	1.838e-018	-17.578	-17.736	-0.157	(0)
Sb2S4-2	0.000e+000	0.000e+000	-212.886	-213.515	-0.629	(0)
Sb (5)	4.780e-007					
SbO3-	4.775e-007	3.323e-007	-6.321	-6.478	-0.157	(0)
Sb (OH) 6-	4.936e-010	3.870e-010	-9.307	-9.412	-0.106	(0)
SbO2+	8.163e-021	5.682e-021	-20.088	-20.245	-0.157	(0)
Se (-2)	1.246e-023					
HSe-	1.244e-023	8.656e-024	-22.905	-23.063	-0.157	(0)
H2Se	1.639e-026	1.639e-026	-25.785	-25.785	0.000	(0)
MnSe	6.197e-027	6.197e-027	-26.208	-26.208	0.000	(0)
Se-2	1.511e-031	3.548e-032	-30.821	-31.450	-0.629	(0)
Se (4)	1.802e-007					
HSeO3-	1.719e-007	1.197e-007	-6.765	-6.922	-0.157	(0)
SeO3-2	8.318e-009	1.953e-009	-8.080	-8.709	-0.629	(0)
H2SeO3	1.245e-011	1.245e-011	-10.905	-10.905	0.000	(0)
FeHSeO3+2	9.566e-018	2.246e-018	-17.019	-17.649	-0.629	(0)
Cd (SeO3) 2-2	2.655e-019	6.234e-020	-18.576	-19.205	-0.629	(0)
Se (6)	1.383e-016					
SeO4-2	1.377e-016	5.202e-017	-15.861	-16.284	-0.423	(0)
MnSeO4	5.935e-019	5.935e-019	-18.227	-18.227	0.000	(0)
ZnSeO4	1.831e-020	1.831e-020	-19.737	-19.737	0.000	(0)
NiSeO4	1.453e-021	1.453e-021	-20.838	-20.838	0.000	(0)
CoSeO4	1.194e-021	1.194e-021	-20.923	-20.923	0.000	(0)
HSeO4-	9.138e-022	6.361e-022	-21.039	-21.196	-0.157	(0)
CdSeO4	1.922e-022	1.922e-022	-21.716	-21.716	0.000	(0)
Zn (SeO4) 2-2	4.113e-036	9.656e-037	-35.386	-36.015	-0.629	(0)

U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-48.703	-50.119	-1.416	(0)
U (4)	2.146e-018					
U (OH) 5-	2.131e-018	1.483e-018	-17.671	-17.829	-0.157	(0)
U (OH) 4	1.518e-020	1.518e-020	-19.819	-19.819	0.000	(0)
U (OH) 3+	1.948e-023	1.356e-023	-22.710	-22.868	-0.157	(0)
UF3+	3.742e-026	2.605e-026	-25.427	-25.584	-0.157	(0)
U (OH) 2+2	6.524e-027	1.532e-027	-26.185	-26.815	-0.629	(0)
UF4	2.076e-027	2.076e-027	-26.683	-26.683	0.000	(0)
UF2+2	9.629e-028	2.261e-028	-27.016	-27.646	-0.629	(0)
UF5-	8.593e-029	5.982e-029	-28.066	-28.223	-0.157	(0)
UF6-2	5.594e-029	1.313e-029	-28.252	-28.882	-0.629	(0)
UF+3	6.438e-031	2.470e-032	-30.191	-31.607	-1.416	(0)
UOH+3	4.595e-031	1.763e-032	-30.338	-31.754	-1.416	(0)
U (SO4) 2	3.242e-032	3.242e-032	-31.489	-31.489	0.000	(0)
USO4+2	2.241e-033	5.260e-034	-32.650	-33.279	-0.629	(0)
U+4	5.606e-036	1.703e-038	-35.251	-37.769	-2.517	(0)
UC1+3	2.270e-038	8.708e-040	-37.644	-39.060	-1.416	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-131.843	-144.588	-12.745	(0)
U (5)	9.147e-015					
UO2+	9.147e-015	6.367e-015	-14.039	-14.196	-0.157	(0)
U (6)	2.653e-007					
UO2 (CO3) 3-4	2.296e-007	6.975e-010	-6.639	-9.156	-2.517	(0)
UO2 (CO3) 2-2	3.544e-008	8.321e-009	-7.450	-8.080	-0.629	(0)
UO2CO3	2.493e-010	2.493e-010	-9.603	-9.603	0.000	(0)
UO2F2	7.879e-012	7.879e-012	-11.104	-11.104	0.000	(0)
UO2F+	5.398e-012	3.758e-012	-11.268	-11.425	-0.157	(0)
UO2F3-	2.067e-012	1.439e-012	-11.685	-11.842	-0.157	(0)
UO2SO4	4.397e-013	4.397e-013	-12.357	-12.357	0.000	(0)
UO2OH+	2.791e-013	1.943e-013	-12.554	-12.712	-0.157	(0)
UO2 (SO4) 2-2	1.916e-013	4.498e-014	-12.718	-13.347	-0.629	(0)
UO2+2	9.911e-014	3.744e-014	-13.004	-13.427	-0.423	(0)
UO2F4-2	3.539e-014	8.308e-015	-13.451	-14.080	-0.629	(0)
UO2C1+	8.902e-017	6.196e-017	-16.051	-16.208	-0.157	(0)
(UO2) 2 (OH) 2+2	2.668e-019	6.263e-020	-18.574	-19.203	-0.629	(0)
(UO2) 3 (OH) 5+	2.252e-023	1.567e-023	-22.647	-22.805	-0.157	(0)
UO2NO3+	0.000e+000	0.000e+000	-43.671	-43.829	-0.157	(0)
V (2)	2.849e-031					
V+2	1.965e-031	4.613e-032	-30.707	-31.336	-0.629	(0)
VOH+	8.838e-032	6.152e-032	-31.054	-31.211	-0.157	(0)
V (3)	1.906e-007					
V (OH) 3	1.906e-007	1.906e-007	-6.720	-6.720	0.000	(0)
V (OH) 2+	4.323e-017	3.009e-017	-16.364	-16.522	-0.157	(0)
VOH+2	2.971e-019	6.974e-020	-18.527	-19.157	-0.629	(0)
V+3	8.801e-023	3.377e-024	-22.055	-23.472	-1.416	(0)
VSO4+	1.777e-023	1.237e-023	-22.750	-22.908	-0.157	(0)
V2 (OH) 2+4	1.010e-035	3.069e-038	-34.996	-37.513	-2.517	(0)
V2 (OH) 3+3	1.549e-036	5.941e-038	-35.810	-37.226	-1.416	(0)
V (4)	1.050e-011					
V (OH) 3+	4.822e-012	3.357e-012	-11.317	-11.474	-0.157	(0)
VOF+	2.561e-012	1.783e-012	-11.592	-11.749	-0.157	(0)
VO+2	1.742e-012	4.089e-013	-11.759	-12.388	-0.629	(0)
VOSO4	8.737e-013	8.737e-013	-12.059	-12.059	0.000	(0)
VOF2	4.860e-013	4.860e-013	-12.313	-12.313	0.000	(0)
VOF3-	1.801e-014	1.254e-014	-13.744	-13.902	-0.157	(0)
VOC1+	1.681e-015	1.170e-015	-14.774	-14.932	-0.157	(0)
VOF4-2	1.567e-016	3.679e-017	-15.805	-16.434	-0.629	(0)
H2V2O4+2	2.413e-018	5.664e-019	-17.617	-18.247	-0.629	(0)
V (5)	3.857e-007					
H2VO4-	3.707e-007	2.580e-007	-6.431	-6.588	-0.157	(0)
HVO4-2	1.132e-008	2.657e-009	-7.946	-8.576	-0.629	(0)
H3V2O7-	1.509e-009	1.050e-009	-8.821	-8.979	-0.157	(0)
H3VO4	6.295e-010	6.295e-010	-9.201	-9.201	0.000	(0)
HV2O7-3	6.064e-012	2.326e-013	-11.217	-12.633	-1.416	(0)
V3O9-3	4.711e-013	1.807e-014	-12.327	-13.743	-1.416	(0)
VO2+	3.921e-013	3.074e-013	-12.407	-12.512	-0.106	(0)
VO2F	3.919e-013	3.919e-013	-12.407	-12.407	0.000	(0)
VO2F2-	1.486e-013	1.035e-013	-12.828	-12.985	-0.157	(0)

VO2SO4-	8.181e-014	5.695e-014	-13.087	-13.245	-0.157	(0)
V2O7-4	8.449e-015	2.567e-017	-14.073	-16.591	-2.517	(0)
VO2F3-2	3.996e-015	9.382e-016	-14.398	-15.028	-0.629	(0)
VO4-3	1.423e-015	5.458e-017	-14.847	-16.263	-1.416	(0)
V4O12-4	6.410e-016	1.947e-018	-15.193	-17.711	-2.517	(0)
VO2F4-3	8.747e-018	3.356e-019	-17.058	-18.474	-1.416	(0)
V10O28-6	1.754e-038	0.000e+000	-37.756	-43.420	-5.664	(0)
HV10O28-5	1.223e-038	0.000e+000	-37.913	-41.846	-3.934	(0)
H2V10O28-4	0.000e+000	0.000e+000	-40.734	-43.251	-2.517	(0)
VO2NO3	0.000e+000	0.000e+000	-43.510	-43.510	0.000	(0)
Zn	1.217e-005					
Zn+2	6.014e-006	2.272e-006	-5.221	-5.644	-0.423	(0)
ZnSO4	3.857e-006	3.857e-006	-5.414	-5.414	0.000	(0)
Zn(SO4) 2-2	1.110e-006	2.606e-007	-5.955	-6.584	-0.629	(0)
ZnHCO3+	8.985e-007	6.254e-007	-6.046	-6.204	-0.157	(0)
ZnCO3	2.187e-007	2.187e-007	-6.660	-6.660	0.000	(0)
ZnF+	4.735e-008	3.296e-008	-7.325	-7.482	-0.157	(0)
ZnOH+	1.345e-008	9.363e-009	-7.871	-8.029	-0.157	(0)
ZnCl+	7.536e-009	5.824e-009	-8.123	-8.235	-0.112	(0)
ZnOHCl	3.142e-010	3.142e-010	-9.503	-9.503	0.000	(0)
Zn(OH) 2	6.116e-011	6.116e-011	-10.214	-10.214	0.000	(0)
ZnCl2	9.418e-012	9.418e-012	-11.026	-11.026	0.000	(0)
Zn(OH) 3-	1.815e-014	1.263e-014	-13.741	-13.899	-0.157	(0)
ZnCl3-	9.878e-015	7.633e-015	-14.005	-14.117	-0.112	(0)
ZnCl4-2	1.019e-017	3.895e-018	-16.992	-17.410	-0.418	(0)
Zn(OH) 4-2	8.827e-020	2.072e-020	-19.054	-19.684	-0.629	(0)
ZnSeO4	1.831e-020	1.831e-020	-19.737	-19.737	0.000	(0)
Zn(SeO4) 2-2	4.113e-036	9.656e-037	-35.386	-36.015	-0.629	(0)
ZnNO3+	1.629e-036	1.134e-036	-35.788	-35.946	-0.157	(0)
Zn(NO3) 2	0.000e+000	0.000e+000	-67.347	-67.347	0.000	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-104.858	-105.015	-0.157	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-105.618	-105.618	0.000	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-158.577	-158.735	-0.157	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-161.473	-162.102	-0.629	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-215.962	-216.592	-0.629	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2-104.73	-98.44	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2 -47.53	-43.02	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3 -54.76	-43.02	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3-143.66	-125.73	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3 -62.63	-42.59	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4 -37.54	-37.13	0.40	(NH4)2CrO4	
(NH4)2SeO4 -29.10	-28.65	0.45	(NH4)2SeO4	
Al(OH) 3(am) -2.17	8.63	10.80	Al(OH) 3	
Al2(MoO4) 3 -41.62	-39.25	2.37	Al2(MoO4) 3	
Al2O3 -2.38	17.27	19.65	Al2O3	
Al4(OH)10SO4 -3.50	19.20	22.70	Al4(OH)10SO4	
AlAsO4:2H2O -7.69	-2.89	4.80	AlAsO4:2H2O	
AlOHSO4 -3.47	-6.70	-3.23	AlOHSO4	
AlSb -130.04	-64.41	65.62	AlSb	
Alunite 0.55	-0.85	-1.40	KAl3(SO4) 2(OH) 6	
Anglesite -2.48	-10.27	-7.79	PbSO4	
Anhydrite 0.02	-4.34	-4.36	CaSO4	
Anilite -25.99	-57.86	-31.88	Cu0.25Cu1.5S	
Antlerite 3.92	12.71	8.79	Cu3(OH) 4SO4	
Aragonite 0.29	-8.01	-8.30	CaCO3	
Arsenolite -49.06	-51.82	-2.76	As4O6	
Artinite -7.96	1.64	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5 -29.75	-23.04	6.71	As2O5	
Atacamite 1.70	9.09	7.39	Cu2(OH) 3Cl	
Azurite 6.95	-9.96	-16.91	Cu3(OH) 2(CO3) 2	
Ba(OH) 2:8H2O -17.08	7.31	24.39	Ba(OH) 2:8H2O	
Ba2V2O7:2H2O -13.04	2.83	15.87	Ba2V2O7:2H2O	
Ba3(AsO4) 2 7.82	-1.09	-8.91	Ba3(AsO4) 2	

Ba3(VO4)2·4H2O	-22.79	10.15	32.94	Ba3(VO4)2·4H2O
BaCrO4	-21.00	-30.67	-9.67	BaCrO4
BaF2	-6.36	-12.18	-5.82	BaF2
BaMoO4	-4.56	-11.52	-6.96	BaMoO4
Barite	1.96	-8.02	-9.98	BaSO4
BaS	-71.87	-55.69	16.18	BaS
BaSeO3	-8.05	-6.22	1.83	BaSeO3
BaSeO4	-14.73	-22.19	-7.46	BaSeO4
Bianchite	-5.99	-7.76	-1.76	ZnSO4·6H2O
Birnessite	-14.26	3.84	18.09	MnO2
Bixbyite	-12.02	-12.66	-0.64	Mn2O3
BlaubleiI	-30.06	-54.22	-24.16	Cu0.9Cu0.2S
BlaubleiII	-28.62	-55.90	-27.28	Cu0.6Cu0.8S
Boehmite	0.06	8.63	8.58	AlOOH
Breithauptite	-38.36	-56.88	-18.52	NiSb
Brochantite	6.84	22.06	15.22	Cu4(OH)6SO4
Brucite	-6.53	10.32	16.84	Mg(OH)2
Bunsenite	-6.44	6.00	12.45	NiO
Ca(VO3)2	-6.47	-0.81	5.66	Ca(VO3)2
Ca2V2O7	-7.31	10.19	17.50	Ca2V2O7
Ca2V2O7·2H2O	-11.37	10.19	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-12.36	9.94	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-17.78	21.18	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-18.68	21.18	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-256.09	-113.11	142.97	Ca3Sb2
CaCrO4	-24.73	-26.99	-2.27	CaCrO4
Calcite	0.47	-8.01	-8.48	CaCO3
Calomel	-13.16	-31.07	-17.91	Hg2Cl2
CaMoO4	0.11	-7.84	-7.95	CaMoO4
Carnotite	-2.41	-2.18	0.23	KUO2VO4
CaSeO3·2H2O	-5.36	-2.54	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-15.50	-18.52	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.74	-3.90	9.84	Cd(BO2)2
Cd(OH)2	-8.12	5.52	13.64	Cd(OH)2
Cd(OH)2(am)	-8.21	5.52	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.81	-14.10	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.33	1.23	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.65	6.75	28.40	Cd4(OH)6SO4
CdCl2	-13.03	-13.68	-0.66	CdCl2
CdCl2·1H2O	-11.99	-13.69	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.77	-13.69	-1.91	CdCl2·2.5H2O
CdF2	-12.77	-13.98	-1.21	CdF2
Cdmetal(alpha)	-28.33	-14.81	13.51	Cd
Cdmetal(gamma)	-28.43	-14.81	13.62	Cd
CdMoO4	0.83	-13.32	-14.15	CdMoO4
CdOHCl	-7.62	-4.08	3.54	CdOHCl
CdSb	-57.01	-57.36	-0.35	CdSb
CdSe	-3.95	-24.15	-20.20	CdSe
CdSeO4·2H2O	-22.14	-23.99	-1.85	CdSeO4·2H2O
CdSO4	-9.64	-9.81	-0.17	CdSO4
CdSO4·1H2O	-8.09	-9.81	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-7.94	-9.81	-1.87	CdSO4·2.67H2O
Cerrusite	-0.81	-13.94	-13.13	PbCO3
CH4(g)	-59.29	-100.34	-41.05	CH4
Chalcantite	-3.35	-5.99	-2.64	CuSO4·5H2O
Chalcocite	-24.34	-59.26	-34.92	Cu2S
Chalcopyrite	-72.85	-108.12	-35.27	CuFeS2
Cinnabar	-34.67	-80.37	-45.69	HgS
Claudetite	-48.76	-51.82	-3.06	As4O6
Clausthalite	2.49	-24.61	-27.10	PbSe
Co(BO2)2	-30.61	-3.54	27.07	Co(BO2)2
Co(OH)2	-7.21	5.88	13.09	Co(OH)2
Co(OH)3	-14.04	-16.35	-2.31	Co(OH)3
CO2(g)	-0.85	-19.00	-18.15	CO2
Co3(AsO4)2	-18.42	-5.39	13.03	Co3(AsO4)2
Co3O4	-16.31	-26.81	-10.50	Co3O4
CoCl2	-21.59	-13.32	8.27	CoCl2
CoCl2·6H2O	-15.86	-13.33	2.54	CoCl2·6H2O

CoCO3	-3.14	-13.12	-9.98	CoCO3
CoF2	-12.02	-13.62	-1.60	CoF2
CoF3	-44.14	-45.60	-1.46	CoF3
CoFe2O4	20.79	17.26	-3.53	CoFe2O4
CoMoO4	-5.19	-12.95	-7.76	CoMoO4
CoO	-7.70	5.89	13.59	CoO
CoS (alpha)	-49.68	-57.12	-7.44	CoS
CoS (beta)	-46.05	-57.12	-11.07	CoS
CoSe	-7.59	-23.79	-16.20	CoSe
CoSeO3	-8.97	-7.65	1.32	CoSeO3
CoSeO4:6H2O	-22.10	-23.63	-1.53	CoSeO4:6H2O
CoSO4	-12.25	-9.45	2.80	CoSO4
CoSO4:6H2O	-6.98	-9.45	-2.47	CoSO4:6H2O
Cotunnite	-9.36	-14.14	-4.78	PbCl2
Covellite	-31.36	-53.66	-22.30	CuS
Cr (OH) 2	-19.15	-8.33	10.82	Cr (OH) 2
Cr (OH) 3	-2.45	-1.11	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.36	-1.11	-0.75	Cr (OH) 3
Cr2O3	0.13	-2.22	-2.36	Cr2O3
CrCl2	-41.63	-27.54	14.09	CrCl2
CrCl3	-45.04	-29.92	15.11	CrCl3
CrF3	-19.03	-30.36	-11.34	CrF3
Crmetal	-59.15	-28.66	30.48	Cr
CrO3	-34.78	-37.99	-3.21	CrO3
Cryolite	-2.30	-36.14	-33.84	Na3AlF6
Cu (OH) 2	0.67	9.35	8.67	Cu (OH) 2
Cu (SbO3) 2	-19.29	25.92	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-27.87	-18.62	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-26.94	-61.83	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	19.87	-25.93	-45.80	Cu2Se
Cu2SO4	-9.64	-11.59	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-1.10	5.00	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-24.84	-67.43	-42.59	Cu3Sb
Cu3Se2	17.24	-46.26	-63.49	Cu3Se2
CuCO3	1.85	-9.65	-11.50	CuCO3
CuCrO4	-23.20	-28.64	-5.44	CuCrO4
CuF	-2.97	-7.88	-4.91	CuF
CuF2	-11.27	-10.15	1.12	CuF2
CuF2:2H2O	-5.60	-10.15	-4.55	CuF2:2H2O
Cumetal	0.46	-8.29	-8.76	Cu
CuMoO4	3.59	-9.49	-13.08	CuMoO4
CuOCuSO4	-6.94	3.36	10.30	CuOCuSO4
Cupricferrite	14.74	20.73	5.99	CuFe2O4
Cuprite	5.15	3.74	-1.41	Cu2O
Cuprousferrite	16.48	7.56	-8.92	CuFeO2
CuSe	12.77	-20.33	-33.10	CuSe
CuSe2	3.70	-29.67	-33.37	CuSe2
CuSeO3:2H2O	-4.70	-4.19	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.72	-20.16	-2.44	CuSeO4:5H2O
CuSO4	-8.93	-5.99	2.94	CuSO4
Diaspore	1.76	8.63	6.87	AlOOH
Djurleite	-24.97	-58.89	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.15	-16.69	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.40	-16.69	-17.09	CaMg (CO3) 2
Epsomite	-2.89	-5.02	-2.13	MgSO4:7H2O
Fe (OH) 2	-5.01	8.55	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	5.85	2.81	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	0.47	-3.25	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-3.71	-2.16	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-8.60	-29.23	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-30.89	-34.63	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-0.29	19.93	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.23	-5.83	0.40	FeAsO4:2H2O
FeCr2O4	-0.87	6.33	7.20	FeCr2O4
FeMoO4	-0.19	-10.29	-10.09	FeMoO4
Ferrihydrite	2.50	5.69	3.19	Fe (OH) 3
Ferroselite	-11.87	-30.46	-18.60	FeSe2
FeS (ppt)	-51.51	-54.46	-2.95	FeS

FeSe	-10.12	-21.12	-11.00	FeSe
Fix_pe	-3.55	-3.55	0.00	e-
Fluorite	1.99	-8.51	-10.50	CaF2
Galena	-43.97	-57.94	-13.97	PbS
Gibbsite	0.34	8.63	8.29	Al (OH) 3
Goethite	5.20	5.69	0.49	FeOOH
Goslarite	-5.75	-7.76	-2.01	ZnSO4:7H2O
Greenockite	-43.13	-57.49	-14.36	CdS
Greigite	-187.07	-232.11	-45.03	Fe3S4
Gummite	-7.87	-0.20	7.67	UO3
Gypsum	0.27	-4.34	-4.61	CaSO4:2H2O
H-Jarosite	-1.51	-13.61	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-5.96	-18.84	-12.88	H2MoO4
H2S (g)	-55.00	-63.01	-8.01	H2S
H2Se (g)	-24.72	-29.68	-4.96	H2Se
Halite	-6.63	-5.03	1.60	NaCl
Hausmannite	-14.14	46.89	61.03	Mn3O4
Hematite	12.79	11.38	-1.42	Fe2O3
Hercynite	2.93	25.82	22.89	FeAl2O4
Hg (CH3) 2 (g)	-144.32	-218.03	-73.71	Hg (CH3) 2
Hg (g)	-8.22	-16.10	-7.87	Hg
Hg (OH) 2	-13.86	-17.36	-3.50	Hg (OH) 2
Hg2 (g)	-17.24	-32.19	-14.96	Hg2
Hg2 (OH) 2	-17.12	-11.86	5.26	Hg2 (OH) 2
Hg2CO3	-14.81	-30.86	-16.05	Hg2CO3
Hg2CrO4	-41.15	-49.85	-8.70	Hg2CrO4
Hg2F2	-21.00	-31.36	-10.36	Hg2F2
Hg2S	-63.19	-74.87	-11.68	Hg2S
Hg2SeO3	-20.74	-25.39	-4.66	Hg2SeO3
Hg2SO4	-21.07	-27.20	-6.13	Hg2SO4
Hg3O2CO3	-41.39	-71.07	-29.68	Hg3O2CO3
HgCl (g)	-35.03	-15.53	19.50	HgCl
HgCl2	-15.30	-36.56	-21.26	HgCl2
HgF (g)	-48.36	-15.68	32.68	HgF
HgF2 (g)	-49.42	-36.86	12.57	HgF2
Hgmetal (l)	-2.65	-16.10	-13.45	Hg
HgSe	8.66	-47.03	-55.69	HgSe
HgSeO3	-18.46	-30.89	-12.43	HgSeO3
HgSO4	-23.27	-32.69	-9.42	HgSO4
Huntite	-4.08	-34.05	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.04	-22.81	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.64	-24.41	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-12.96	-18.13	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	5.11	-9.69	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-50.90	-68.14	-17.24	K2Cr2O7
K2CrO4	-29.64	-30.15	-0.51	K2CrO4
K2MoO4	-14.27	-11.00	3.26	K2MoO4
K2SeO4	-20.94	-21.67	-0.73	K2SeO4
Langite	4.57	22.06	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-4.77	-5.20	-0.43	PbO:PbSO4
Laurionite	-5.16	-4.54	0.62	PbOHCl
Lepidocrocite	4.32	5.69	1.37	FeOOH
Lime	-21.71	10.99	32.70	CaO
Litharge	-7.63	5.07	12.69	PbO
Mackinawite	-50.86	-54.46	-3.60	FeS
Maghemite	4.99	11.38	6.39	Fe2O3
Magnesioferrite	4.84	21.70	16.86	Fe2MgO4
Magnesite	-1.22	-8.68	-7.46	MgCO3
Magnetite	16.53	19.93	3.40	Fe3O4
Malachite	5.00	-0.30	-5.31	Cu2 (OH) 2CO3
Manganite	-6.32	19.02	25.34	MnOOH
Massicot	-7.83	5.07	12.89	PbO
Matlockite	-5.32	-14.29	-8.97	PbClF
Melanothallite	-16.12	-9.86	6.26	CuCl2
Melanterite	-4.58	-6.79	-2.21	FeSO4:7H2O
Metacinnabar	-35.27	-80.37	-45.09	HgS
Mg (OH) 2 (active)	-8.48	10.32	18.79	Mg (OH) 2
Mg (VO3) 2	-12.76	-1.48	11.28	Mg (VO3) 2

Mg2Sb3	-222.35	-147.67	74.68	Mg2Sb3
Mg2V2O7	-17.52	8.84	26.36	Mg2V2O7
MgCr2O4	-8.10	8.10	16.20	MgCr2O4
MgCrO4	-33.05	-27.67	5.38	MgCrO4
MgF2	-1.05	-9.18	-8.13	MgF2
MgMoO4	-6.67	-8.52	-1.85	MgMoO4
MgSeO3:6H2O	-6.27	-3.22	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-17.99	-19.19	-1.20	MgSeO4:6H2O
Minium	-37.99	35.53	73.52	Pb3O4
Mirabilite	-5.07	-6.19	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-7.85	-2.95	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.96	-58.67	-5.71	Mn2 (SO4) 3
Mn2Sb	-126.59	-65.51	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-8.99	3.51	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.07	-10.36	2.72	MnCl2:4H2O
MnS (grn)	-54.33	-54.16	0.17	MnS
MnS (pnk)	-57.50	-54.16	3.34	MnS
MnSb	-76.47	-79.38	-2.91	MnSb
MnSe	-24.32	-20.82	3.50	MnSe
MnSeO3	-5.81	-4.68	1.13	MnSeO3
MnSeO3:2H2O	-5.67	-4.68	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-18.61	-20.66	-2.05	MnSeO4:5H2O
MnSO4	-9.07	-6.48	2.58	MnSO4
Monteponite	-9.58	5.52	15.10	CdO
Montroydite	-13.72	-17.36	-3.64	HgO
MoO3	-10.84	-18.84	-8.00	MoO3
Morenosite	-7.19	-9.34	-2.14	NiSO4:7H2O
MoS2	-94.93	-165.19	-70.26	MoS2
Na-Jarosite	2.17	-9.03	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-56.93	-66.82	-9.90	Na2Cr2O7
Na2CrO4	-31.76	-28.83	2.93	Na2CrO4
Na2Mo2O7	-11.93	-28.52	-16.60	Na2Mo2O7
Na2MoO4	-11.18	-9.69	1.49	Na2MoO4
Na2MoO4:2H2O	-10.91	-9.69	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.68	-4.38	10.30	Na2SeO3:5H2O
Na2SeO4	-21.64	-20.36	1.28	Na2SeO4
Na3Sb	-153.77	-59.32	94.45	Na3Sb
Na3VO4	-28.85	7.83	36.68	Na3VO4
Na4V2O7	-30.89	6.51	37.40	Na4V2O7
Nantokite	-1.00	-7.73	-6.73	CuCl
NaSb	-71.30	-48.14	23.17	NaSb
Natron	-8.54	-9.86	-1.31	Na2CO3:10H2O
NaVO3	-5.18	-1.32	3.86	NaVO3
Nesquehonite	-4.01	-8.68	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.79	6.00	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-20.74	-5.04	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-23.33	8.67	32.00	Ni4 (OH) 6SO4
NiCO3	-6.13	-13.00	-6.87	NiCO3
NiMoO4	-1.70	-12.84	-11.14	NiMoO4
NiS (alpha)	-51.41	-57.01	-5.60	NiS
NiS (beta)	-45.91	-57.01	-11.10	NiS
NiS (gamma)	-44.21	-57.01	-12.80	NiS
NiSe	-5.97	-23.67	-17.70	NiSe
NiSeO3:2H2O	-10.35	-7.53	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-21.99	-23.51	-1.52	NiSeO4:6H2O
Nsutite	-13.67	3.84	17.50	MnO2
O2 (g)	-42.42	40.67	83.09	O2
Orpiment	-153.87	-214.94	-61.07	As2S3
Otavite	-1.48	-13.48	-12.00	CdCO3
Pb (BO2) 2	-10.88	-4.36	6.52	Pb (BO2) 2
Pb (OH) 2	-3.08	5.07	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-54.59	-63.35	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-8.27	0.53	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-16.06	10.13	26.19	Pb2O (OH) 2
Pb2O3	-30.57	30.47	61.04	Pb2O3
Pb2OCO3	-8.31	-8.87	-0.56	Pb2OCO3
Pb2V2O7	0.23	-1.67	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-13.64	-7.84	5.80	Pb3 (AsO4) 2

Pb3 (VO4) 2	-2.74	3.40	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.82	-3.80	11.02	Pb3O2CO3
Pb3O2SO4	-10.82	-0.14	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.17	4.93	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.95	4.93	21.88	Pb4O3SO4
PbCrO4	-20.32	-32.92	-12.60	PbCrO4
PbF2	-7.00	-14.44	-7.44	PbF2
Pbmetal	-19.51	-15.27	4.25	Pb
PbMoO4	1.85	-13.77	-15.62	PbMoO4
PbO:0.3H2O	-7.91	5.07	12.98	PbO:0.33H2O
PbSeO4	-17.60	-24.44	-6.84	PbSeO4
Periclase	-11.26	10.32	21.58	MgO
Phosgenite	-8.27	-28.08	-19.81	PbCl2:PbCO3
Plattnerite	-24.20	25.40	49.60	PbO2
Portlandite	-11.81	10.99	22.80	Ca (OH) 2
Pyrite	-78.62	-97.13	-18.51	FeS2
Pyrochroite	-6.34	8.85	15.19	Mn (OH) 2
Pyrolusite	-12.19	29.19	41.38	MnO2
Realgar	-66.38	-86.13	-19.75	AsS
Retgersite	-7.30	-9.34	-2.04	NiSO4:6H2O
Rhodochrosite	0.43	-10.15	-10.58	MnCO3
Rutherfordine	-4.70	-19.20	-14.50	UO2CO3
Sb (OH) 3	-4.94	-12.05	-7.11	Sb (OH) 3
Sb2O4	-7.16	-3.76	3.40	Sb2O4
Sb2O5	-22.38	-32.05	-9.67	Sb2O5
Sb2Se3	-45.36	-113.12	-67.76	Sb2Se3
Sb4O6 (cubic)	-29.92	-48.18	-18.26	Sb4O6
Sb4O6 (orth)	-30.28	-48.18	-17.90	Sb4O6
SbCl3	-41.43	-40.86	0.57	SbCl3
SbF3	-31.07	-41.30	-10.23	SbF3
Sbmetal	-30.86	-42.55	-11.69	Sb
SbO2	1.63	-26.19	-27.82	SbO2
Schoepite	-6.20	-0.20	5.99	UO2 (OH) 2:H2O
Semetal (am)	-2.23	-9.34	-7.11	Se
Semetal (hex)	-1.63	-9.34	-7.71	Se
Senarmontite	-11.73	-24.09	-12.37	Sb2O3
SeO2	-13.66	-13.53	0.12	SeO2
SeO3	-50.55	-29.51	21.04	SeO3
Siderite	-0.21	-10.45	-10.24	FeCO3
Smithsonite	-1.42	-11.42	-10.00	ZnCO3
Sphalerite	-43.98	-55.43	-11.45	ZnS
Spinel	-9.26	27.59	36.85	MgAl2O4
Stibnite	-162.66	-213.12	-50.46	Sb2S3
Sulfur	-40.53	-42.68	-2.14	S
Tenorite	1.70	9.35	7.64	CuO
Thenardite	-6.50	-6.18	0.32	Na2SO4
Thermonatrite	-10.49	-9.85	0.64	Na2CO3:H2O
Tyuyamunite	-5.29	-1.21	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.37	6.71	21.08	U3O8
U3Sb4	-478.53	-326.15	152.38	U3Sb4
U4O9	-21.92	-24.94	-3.02	U4O9
UF4	-20.79	-50.32	-29.54	UF4
UF4:2.5H2O	-17.61	-50.32	-32.72	UF4:2.5H2O
UO2 (am)	-12.25	-11.32	0.93	UO2
UO2 (NO3) 2	-86.98	-74.83	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-79.68	-74.83	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-78.22	-74.83	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-76.88	-74.83	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-5.81	-0.20	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-27.46	-29.71	-2.25	UO2SeO4:4H2O
UO3	-7.90	-0.20	7.70	UO3
Uraninite	-6.65	-11.32	-4.67	UO2
USb2	-175.87	-146.30	29.58	USb2
V (OH) 3	-11.23	-3.64	7.59	V (OH) 3
V2O5	-10.44	-11.80	-1.36	V2O5
V3O5	-19.66	-17.82	1.84	V3O5
V4O7	-24.18	-16.99	7.19	V4O7
V6O13	-15.21	-76.07	-60.86	V6O13

Valentinite	-15.61	-24.09	-8.48	Sb2O3
VC12	-51.88	-33.01	18.87	VC12
VC13	-55.88	-32.45	23.43	VC13
VF4	-53.10	-38.17	14.93	VF4
Vmetal	-78.16	-34.13	44.03	V
VO	-28.56	-13.80	14.76	VO
VO(OH)2	-4.32	0.84	5.15	VO(OH)2
VO2Cl	-18.34	-15.50	2.84	VO2Cl
VOC1	-24.39	-13.24	11.15	VOC1
VOC12	-31.13	-18.37	12.76	VOC12
VOSO4	-18.11	-14.50	3.61	VOSO4
Witherite	-3.11	-11.68	-8.57	BaCO3
Wurtzite	-46.48	-55.43	-8.95	ZnS
Zincite	-3.75	7.58	11.33	ZnO
Zincosite	-11.68	-7.75	3.93	ZnSO4
Zn(BO2)2	-10.13	-1.84	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-70.37	-67.05	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.62	7.58	12.20	Zn(OH)2
Zn(OH)2(am)	-4.89	7.58	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.17	7.58	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.95	7.58	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.15	7.58	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.67	-0.17	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.63	5.56	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-13.95	-0.30	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.84	-7.93	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.41	14.99	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.80	18.70	38.50	Zn5(OH)8Cl2
ZnCl2	-18.68	-11.63	7.05	ZnCl2
ZnCO3:1H2O	-1.16	-11.42	-10.26	ZnCO3:1H2O
ZnF2	-11.39	-11.92	-0.53	ZnF2
Znmetal	-38.54	-12.75	25.79	Zn
ZnMoO4	-1.13	-11.26	-10.13	ZnMoO4
ZnO(active)	-3.61	7.58	11.19	ZnO
ZnS(am)	-46.38	-55.43	-9.05	ZnS
ZnSb	-66.31	-55.30	11.01	ZnSb
ZnSe	-7.69	-22.09	-14.40	ZnSe
ZnSeO4:6H2O	-20.41	-21.93	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.12	-7.75	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 19.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
e-=e-
log_k      0
EQUILIBRIUM_PHASES 102
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0

```

```

Chrysotile 0 0
CO2(g)      -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum      0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g)       -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 106
SAVE Solution 107 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 102
END

```

```

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TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

Using solution 106. Solution after simulation 18.
Using pure phase assemblage 102.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+000	0	0.000e+000
Alunite	0.00	-1.40	-1.40	0.000e+000	6.125e-005	6.125e-005
Anhydrite	-0.25	-4.61	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+000	1.094e-007	1.094e-007
Barite	0.00	-9.98	-9.98	0.000e+000	2.869e-006	2.869e-006
Brochantite	0.00	15.22	15.22	0.000e+000	5.143e-004	5.143e-004
Brucite	-5.88	10.97	16.84	0.000e+000	0	0.000e+000
CO2(g)	-1.69	-19.84	-18.15	1.000e+001	1.001e+001	1.001e-002
CaMoO4	-1.57	-9.52	-7.95	0.000e+000	0	0.000e+000
CaSeO3·2H2O	-5.27	-2.46	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	0.000e+000	3.860e-003	3.860e-003
Carnotite	-0.62	-0.39	0.23	0.000e+000	0	0.000e+000
Cd(BO2)2	-13.10	-3.26	9.84	0.000e+000	0	0.000e+000

CdMoO4	-0.55	-14.70	-14.15	0.000e+000	0	0.000e+000
Chrysotile	Element not present.			0.000e+000	0	0.000e+000
Cr2O3	-0.00	-2.36	-2.36	0.000e+000	1.752e-008	1.752e-008
Cu2Se(alpha)	-4.36	-50.16	-45.80	0.000e+000	0	0.000e+000
CuMoO4	0.00	-13.08	-13.08	0.000e+000	5.818e-006	5.818e-006
Epsomite	-2.87	-5.00	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	0.00	3.19	3.19	0.000e+000	1.314e-004	1.314e-004
Fluorite	0.00	-10.50	-10.50	0.000e+000	7.641e-004	7.641e-004
Gummite	-6.27	1.40	7.67	0.000e+000	0	0.000e+000
Gypsum	0.00	-4.61	-4.61	0.000e+000	7.743e-003	7.743e-003
HgSe	-2.05	-57.74	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2	Element not present.			0.000e+000	0	0.000e+000
Mirabilite	-5.09	-6.20	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-5.41	-4.28	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-6.07	6.72	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2·8H2O	-22.40	-6.70	15.70	0.000e+000	0	0.000e+000
NiCO3	-6.24	-13.11	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-3.01	-14.15	-11.14	0.000e+000	0	0.000e+000
O2(g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-4.589e-005
Otavite	-1.66	-13.66	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	0.000e+000	1.126e-007	1.126e-007
Rutherfordine	-3.94	-18.44	-14.50	0.000e+000	0	0.000e+000
SbO2	-1.24	-29.06	-27.82	0.000e+000	0	0.000e+000
Schoepite	-4.59	1.40	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2(am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-1.93	2.15	4.08	0.000e+000	0	0.000e+000
U3O8	-14.78	6.30	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-4.21	1.40	5.61	0.000e+000	0	0.000e+000
UO3	-6.30	1.40	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-2.50	-12.62	-10.13	0.000e+000	0	0.000e+000

-----Solution composition-----

Elements	Molality	Moles
Al	2.435e-007	2.311e-007
As	7.407e-009	7.032e-009
B	1.901e-005	1.805e-005
Ba	3.625e-008	3.441e-008
C	4.054e-003	3.848e-003
Ca	1.425e-002	1.353e-002
Cd	1.091e-007	1.036e-007
Cl	1.338e-003	1.270e-003
Co	3.135e-007	2.976e-007
Cr	1.566e-008	1.487e-008
Cu	9.837e-006	9.338e-006
F	1.427e-004	1.355e-004
Fe	6.711e-009	6.371e-009
Hg	2.950e-010	2.800e-010
K	2.651e-003	2.516e-003
Mg	5.327e-003	5.057e-003
Mn	2.501e-004	2.374e-004
Mo	2.080e-007	1.975e-007
N	9.515e-007	9.032e-007
Na	1.228e-002	1.166e-002
Ni	3.482e-007	3.305e-007
Pb	3.330e-008	3.161e-008
S	2.489e-002	2.362e-002
Sb	4.780e-007	4.538e-007
Se	1.803e-007	1.711e-007
U	2.654e-007	2.519e-007
V	5.764e-007	5.472e-007
Zn	1.217e-005	1.155e-005

-----Description of solution-----

pH = 6.906 Charge balance

```

equilibrium
pe = 5.867 Adjusted to redox
Activity of water = 0.999
Ionic strength = 6.751e-002
Mass of water (kg) = 9.493e-001
Total alkalinity (eq/kg) = 3.373e-003
Total CO2 (mol/kg) = 4.054e-003
Temperature (deg C) = 25.00
Electrical balance (eq) = 1.142e-005
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.02
Iterations = 28
Total H = 1.053847e+002
Total O = 5.279617e+001

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.545e-007	1.242e-007	-6.811	-6.906	-0.095	0.00
OH-	1.025e-007	8.102e-008	-6.989	-7.091	-0.102	(0)
H2O	5.551e+001	9.990e-001	1.744	-0.000	0.000	18.07
Al	2.435e-007					
Al(OH) 4-	1.219e-007	9.780e-008	-6.914	-7.010	-0.096	(0)
AlF2+	5.026e-008	4.079e-008	-7.299	-7.389	-0.091	(0)
AlF3	4.874e-008	4.874e-008	-7.312	-7.312	0.000	(0)
Al(OH) 3	9.588e-009	9.588e-009	-8.018	-8.018	0.000	(0)
Al(OH) 2+	7.309e-009	5.931e-009	-8.136	-8.227	-0.091	(0)
AlF4-	2.890e-009	2.318e-009	-8.539	-8.635	-0.096	(0)
AlF+2	2.489e-009	1.079e-009	-8.604	-8.967	-0.363	(0)
AlOH+2	2.125e-010	9.215e-011	-9.673	-10.035	-0.363	(0)
AlSO4+	7.711e-011	6.186e-011	-10.113	-10.209	-0.096	(0)
Al+3	8.121e-012	1.137e-012	-11.090	-11.944	-0.854	(0)
Al(SO4) 2-	5.789e-012	4.644e-012	-11.237	-11.333	-0.096	(0)
AlMo6O21-3	2.721e-040	0.000e+000	-39.565	-40.758	-1.193	(0)
As (3)	8.334e-021					
H3AsO3	8.288e-021	8.288e-021	-20.082	-20.082	0.000	(0)
H2AsO3-	4.645e-023	3.423e-023	-22.333	-22.466	-0.133	(0)
HAsO3-2	8.522e-028	2.515e-028	-27.069	-27.599	-0.530	(0)
H4AsO3+	6.917e-028	5.098e-028	-27.160	-27.293	-0.133	(0)
AsO3-3	1.217e-033	7.808e-035	-32.915	-34.107	-1.193	(0)
As (5)	7.407e-009					
HAsO4-2	5.096e-009	1.504e-009	-8.293	-8.823	-0.530	(0)
H2AsO4-	2.310e-009	1.703e-009	-8.636	-8.769	-0.133	(0)
AsO4-3	5.969e-013	3.830e-014	-12.224	-13.417	-1.193	(0)
H3AsO4	3.617e-014	3.674e-014	-13.442	-13.435	0.007	(0)
B	1.901e-005					
H3BO3	1.887e-005	1.916e-005	-4.724	-4.718	0.007	(0)
H2BO3-	1.153e-007	8.964e-008	-6.938	-7.047	-0.109	(0)
CaH2BO3+	2.328e-008	1.811e-008	-7.633	-7.742	-0.109	(0)
MgH2BO3+	5.729e-009	4.455e-009	-8.242	-8.351	-0.109	(0)
NaH2BO3	1.350e-009	1.350e-009	-8.870	-8.870	0.000	(0)
BF(OH) 3-	9.333e-010	7.258e-010	-9.030	-9.139	-0.109	(0)
H5(BO3) 2-	1.880e-012	1.462e-012	-11.726	-11.835	-0.109	(0)
BF2(OH) 2-	1.177e-012	9.152e-013	-11.929	-12.038	-0.109	(0)
BaH2BO3+	5.324e-014	4.140e-014	-13.274	-13.383	-0.109	(0)
H8(BO3) 3-	3.603e-015	2.802e-015	-14.443	-14.553	-0.109	(0)
BF3OH-	5.400e-018	4.200e-018	-17.268	-17.377	-0.109	(0)
BF4-	3.134e-022	2.437e-022	-21.504	-21.613	-0.109	(0)
Ba	3.625e-008					
Ba+2	3.580e-008	1.495e-008	-7.446	-7.825	-0.379	(0)
BaHCO3+	4.363e-010	3.566e-010	-9.360	-9.448	-0.088	(0)
BaCO3	7.230e-012	7.230e-012	-11.141	-11.141	0.000	(0)
BaH2BO3+	5.324e-014	4.140e-014	-13.274	-13.383	-0.109	(0)
BaOH+	6.546e-015	5.286e-015	-14.184	-14.277	-0.093	(0)
BaNH3+2	5.598e-017	1.652e-017	-16.252	-16.782	-0.530	(0)
BaNO3+	3.182e-017	2.346e-017	-16.497	-16.630	-0.133	(0)
C (4)	4.054e-003					

HCO3-	3.078e-003	2.498e-003	-2.512	-2.602	-0.091	(0)
H2CO3	6.976e-004	6.976e-004	-3.156	-3.156	0.000	(0)
CaHCO3+	1.998e-004	1.633e-004	-3.699	-3.787	-0.088	(0)
MgHCO3+	4.600e-005	3.664e-005	-4.337	-4.436	-0.099	(0)
NaHCO3	1.335e-005	1.335e-005	-4.874	-4.874	0.000	(0)
CuCO3	5.375e-006	5.375e-006	-5.270	-5.270	0.000	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
MnHCO3+	3.282e-006	2.650e-006	-5.484	-5.577	-0.093	(0)
CO3-2	2.260e-006	9.433e-007	-5.646	-6.025	-0.379	(0)
MgCO3	1.125e-006	1.125e-006	-5.949	-5.949	0.000	(0)
ZnHCO3+	2.948e-007	2.173e-007	-6.530	-6.663	-0.133	(0)
CuHCO3+	2.069e-007	1.525e-007	-6.684	-6.817	-0.133	(0)
NaCO3-	2.057e-007	1.669e-007	-6.687	-6.777	-0.091	(0)
UO2 (CO3) 3-4	1.710e-007	1.296e-009	-6.767	-8.887	-2.120	(0)
ZnCO3	1.493e-007	1.493e-007	-6.826	-6.826	0.000	(0)
UO2 (CO3) 2-2	9.292e-008	2.742e-008	-7.032	-7.562	-0.530	(0)
Cu (CO3) 2-2	4.625e-008	1.365e-008	-7.335	-7.865	-0.530	(0)
NiHCO3+	3.418e-008	2.519e-008	-7.466	-7.599	-0.133	(0)
CoHCO3+	1.628e-008	1.200e-008	-7.788	-7.921	-0.133	(0)
PbCO3	7.844e-009	7.844e-009	-8.105	-8.105	0.000	(0)
PbHCO3+	6.967e-009	5.135e-009	-8.157	-8.289	-0.133	(0)
NiCO3	2.879e-009	2.879e-009	-8.541	-8.541	0.000	(0)
UO2CO3	1.457e-009	1.457e-009	-8.837	-8.837	0.000	(0)
CoCO3	9.846e-010	9.846e-010	-9.007	-9.007	0.000	(0)
CdCO3	4.955e-010	4.955e-010	-9.305	-9.305	0.000	(0)
BaHCO3+	4.363e-010	3.566e-010	-9.360	-9.448	-0.088	(0)
CdHCO3+	1.778e-010	1.311e-010	-9.750	-9.883	-0.133	(0)
Pb (CO3) 2-2	7.232e-011	2.134e-011	-10.141	-10.671	-0.530	(0)
BaCO3	7.230e-012	7.230e-012	-11.141	-11.141	0.000	(0)
FeHCO3+	1.678e-012	1.372e-012	-11.775	-11.863	-0.088	(0)
Cd (CO3) 2-2	1.174e-012	3.465e-013	-11.930	-12.460	-0.530	(0)
HgCO3	1.916e-014	1.916e-014	-13.718	-13.718	0.000	(0)
Hg (CO3) 2-2	1.937e-016	5.715e-017	-15.713	-16.243	-0.530	(0)
HgHCO3+	6.010e-017	4.429e-017	-16.221	-16.354	-0.133	(0)
Ca	1.425e-002					
Ca+2	8.410e-003	3.510e-003	-2.075	-2.455	-0.379	(0)
CaSO4	5.634e-003	5.634e-003	-2.249	-2.249	0.000	(0)
CaHCO3+	1.998e-004	1.633e-004	-3.699	-3.787	-0.088	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CaF+	4.504e-006	3.636e-006	-5.346	-5.439	-0.093	(0)
CaH2BO3+	2.328e-008	1.811e-008	-7.633	-7.742	-0.109	(0)
CaOH+	6.944e-009	5.675e-009	-8.158	-8.246	-0.088	(0)
CaNH3+2	2.624e-011	7.742e-012	-10.581	-11.111	-0.530	(0)
CaNO3+	4.716e-012	3.476e-012	-11.326	-11.459	-0.133	(0)
Ca (NH3) 2+2	1.830e-020	5.399e-021	-19.738	-20.268	-0.530	(0)
Cd	1.091e-007					
Cd+2	5.521e-008	2.304e-008	-7.258	-7.637	-0.379	(0)
CdSO4	3.785e-008	3.785e-008	-7.422	-7.422	0.000	(0)
Cd (SO4) 2-2	1.212e-008	3.577e-009	-7.916	-8.446	-0.530	(0)
CdCl+	3.212e-009	2.367e-009	-8.493	-8.626	-0.133	(0)
CdCO3	4.955e-010	4.955e-010	-9.305	-9.305	0.000	(0)
CdHCO3+	1.778e-010	1.311e-010	-9.750	-9.883	-0.133	(0)
CdF+	4.703e-011	3.466e-011	-10.328	-10.460	-0.133	(0)
CdOH+	2.012e-011	1.483e-011	-10.696	-10.829	-0.133	(0)
CdCl2	1.062e-011	1.062e-011	-10.974	-10.974	0.000	(0)
CdOHC1	7.868e-012	7.868e-012	-11.104	-11.104	0.000	(0)
Cd (CO3) 2-2	1.174e-012	3.465e-013	-11.930	-12.460	-0.530	(0)
CdCl3-	9.775e-015	7.205e-015	-14.010	-14.142	-0.133	(0)
Cd (OH) 2	7.582e-015	7.582e-015	-14.120	-14.120	0.000	(0)
CdF2	6.565e-015	6.565e-015	-14.183	-14.183	0.000	(0)
CdSeO4	7.331e-017	7.331e-017	-16.135	-16.135	0.000	(0)
CdNO3+	3.096e-017	2.282e-017	-16.509	-16.642	-0.133	(0)
Cd2OH+3	2.669e-017	1.713e-018	-16.574	-17.766	-1.193	(0)
Cd (SeO3) 2-2	1.001e-018	2.953e-019	-18.000	-18.530	-0.530	(0)
Cd (OH) 3-	5.092e-020	3.753e-020	-19.293	-19.426	-0.133	(0)
Cd (NO3) 2	3.581e-027	3.581e-027	-26.446	-26.446	0.000	(0)
Cd (OH) 4-2	1.687e-027	4.978e-028	-26.773	-27.303	-0.530	(0)
CdHS+	0.000e+000	0.000e+000	-77.076	-77.209	-0.133	(0)

	Cd (HS) 2	0.000e+000	0.000e+000	-147.584	-147.584	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-223.131	-223.263	-0.133	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-298.117	-298.647	-0.530	(0)
C1	1.338e-003						
	Cl-	1.338e-003	1.076e-003	-2.873	-2.968	-0.095	(0)
	MnCl+	8.917e-008	7.200e-008	-7.050	-7.143	-0.093	(0)
	ZnCl+	9.330e-009	7.432e-009	-8.030	-8.129	-0.099	(0)
	CdCl+	3.212e-009	2.367e-009	-8.493	-8.626	-0.133	(0)
	CuCl+	2.071e-009	1.650e-009	-8.684	-8.783	-0.099	(0)
	CuCl	8.727e-010	8.727e-010	-9.059	-9.059	0.000	(0)
	ZnOHCl	7.884e-010	7.884e-010	-9.103	-9.103	0.000	(0)
	CoCl+	3.118e-010	2.298e-010	-9.506	-9.639	-0.133	(0)
	NiCl+	3.055e-010	2.252e-010	-9.515	-9.648	-0.133	(0)
	CuCl2-	2.462e-010	1.961e-010	-9.609	-9.707	-0.099	(0)
	PbCl+	1.433e-010	1.056e-010	-9.844	-9.976	-0.133	(0)
	MnCl2	1.094e-010	1.094e-010	-9.961	-9.961	0.000	(0)
	ZnCl2	1.267e-011	1.267e-011	-10.897	-10.897	0.000	(0)
	CdCl2	1.062e-011	1.062e-011	-10.974	-10.974	0.000	(0)
	CdOHCl	7.868e-012	7.868e-012	-11.104	-11.104	0.000	(0)
	HgClOH	2.612e-012	2.612e-012	-11.583	-11.583	0.000	(0)
	HgCl2	1.964e-012	1.964e-012	-11.707	-11.707	0.000	(0)
	CuCl2	6.153e-013	6.153e-013	-12.211	-12.211	0.000	(0)
	PbCl2	5.073e-013	5.073e-013	-12.295	-12.295	0.000	(0)
	CuCl3-2	1.061e-013	4.511e-014	-12.974	-13.346	-0.372	(0)
	MnCl3-	4.014e-014	3.241e-014	-13.396	-13.489	-0.093	(0)
	HgCl3-	2.866e-014	2.112e-014	-13.543	-13.675	-0.133	(0)
	ZnCl3-	1.359e-014	1.083e-014	-13.867	-13.966	-0.099	(0)
	CdCl3-	9.775e-015	7.205e-015	-14.010	-14.142	-0.133	(0)
	CrCl+2	2.220e-015	6.549e-016	-14.654	-15.184	-0.530	(0)
	NiCl2	1.219e-015	1.219e-015	-14.914	-14.914	0.000	(0)
	UO2Cl+	9.182e-016	6.767e-016	-15.037	-15.170	-0.133	(0)
	HgCl+	4.942e-016	3.642e-016	-15.306	-15.439	-0.133	(0)
	HgCl4-2	3.066e-016	9.046e-017	-15.513	-16.044	-0.530	(0)
	PbCl3-	2.948e-016	2.172e-016	-15.531	-15.663	-0.133	(0)
	ZnCl4-2	1.370e-017	5.823e-018	-16.863	-17.235	-0.372	(0)
	CuCl3-	7.754e-018	6.177e-018	-17.110	-17.209	-0.099	(0)
	CrOHCl2	1.085e-018	1.085e-018	-17.965	-17.965	0.000	(0)
	VOCl+	8.502e-019	6.266e-019	-18.070	-18.203	-0.133	(0)
	PbCl4-2	3.620e-019	1.068e-019	-18.441	-18.971	-0.530	(0)
	FeCl+2	2.277e-019	9.679e-020	-18.643	-19.014	-0.372	(0)
	CrCl2+	9.070e-020	6.685e-020	-19.042	-19.175	-0.133	(0)
	FeCl2+	5.760e-022	4.651e-022	-21.240	-21.332	-0.093	(0)
	CuCl4-2	7.834e-023	3.330e-023	-22.106	-22.478	-0.372	(0)
	FeCl3	5.003e-026	5.003e-026	-25.301	-25.301	0.000	(0)
	CrO3Cl-	1.718e-026	1.266e-026	-25.765	-25.897	-0.133	(0)
	CoCl+2	1.341e-034	3.957e-035	-33.873	-34.403	-0.530	(0)
	UCl+3	0.000e+000	0.000e+000	-42.627	-43.820	-1.193	(0)
	Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-51.702	-52.232	-0.530	(0)
	Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-53.203	-53.733	-0.530	(0)
	Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-67.174	-67.704	-0.530	(0)
Co (2)	3.135e-007						
	Co+2	2.093e-007	6.175e-008	-6.679	-7.209	-0.530	(0)
	CoSO4	8.632e-008	8.632e-008	-7.064	-7.064	0.000	(0)
	CoHCO3+	1.628e-008	1.200e-008	-7.788	-7.921	-0.133	(0)
	CoCO3	9.846e-010	9.846e-010	-9.007	-9.007	0.000	(0)
	CoCl+	3.118e-010	2.298e-010	-9.506	-9.639	-0.133	(0)
	CoF+	2.515e-010	1.853e-010	-9.600	-9.732	-0.133	(0)
	CoOH+	1.354e-010	9.983e-011	-9.868	-10.001	-0.133	(0)
	Co (OH) 2	6.425e-013	6.425e-013	-12.192	-12.192	0.000	(0)
	CoNO2+	1.960e-013	1.444e-013	-12.708	-12.840	-0.133	(0)
	Co (NH3) +2	4.407e-014	1.300e-014	-13.356	-13.886	-0.530	(0)
	CoSeO4	5.287e-016	5.287e-016	-15.277	-15.277	0.000	(0)
	CoNO3+	4.158e-017	3.065e-017	-16.381	-16.514	-0.133	(0)
	Co2OH+3	4.814e-018	3.089e-019	-17.317	-18.510	-1.193	(0)
	Co (OH) 3-	1.409e-018	1.039e-018	-17.851	-17.984	-0.133	(0)
	CoOOH-	3.539e-019	2.609e-019	-18.451	-18.584	-0.133	(0)
	Co (NH3) 2+2	3.293e-021	9.718e-022	-20.482	-21.012	-0.530	(0)
	Co (OH) 4-2	4.520e-026	1.334e-026	-25.345	-25.875	-0.530	(0)

Co (NO3) 2	1.953e-026	1.953e-026	-25.709	-25.709	0.000	(0)
Co (NH3) 3+2	7.263e-029	2.143e-029	-28.139	-28.669	-0.530	(0)
Co4 (OH) 4+4	2.614e-030	1.981e-032	-29.583	-31.703	-2.120	(0)
Co (NH3) 4+2	6.677e-037	1.970e-037	-36.175	-36.705	-0.530	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-44.712	-45.242	-0.530	(0)
Co (3)	2.523e-028					
CoOH+2	2.523e-028	7.443e-029	-27.598	-28.128	-0.530	(0)
Co+3	1.291e-033	1.808e-034	-32.889	-33.743	-0.854	(0)
CoCl+2	1.341e-034	3.957e-035	-33.873	-34.403	-0.530	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-51.702	-52.232	-0.530	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-61.833	-61.965	-0.133	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-67.097	-67.627	-0.530	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-67.174	-67.704	-0.530	(0)
Cr (2)	5.179e-025					
Cr+2	5.179e-025	1.528e-025	-24.286	-24.816	-0.530	(0)
Cr (3)	1.566e-008					
Cr (OH) 2+	1.116e-008	8.222e-009	-7.953	-8.085	-0.133	(0)
Cr (OH) +2	2.826e-009	8.339e-010	-8.549	-9.079	-0.530	(0)
CrOHSO4	1.387e-009	1.387e-009	-8.858	-8.858	0.000	(0)
Cr (OH) 3	2.502e-010	2.502e-010	-9.602	-9.602	0.000	(0)
CrF+2	2.398e-011	7.077e-012	-10.620	-11.150	-0.530	(0)
CrSO4+	1.044e-011	7.697e-012	-10.981	-11.114	-0.133	(0)
Cr+3	7.331e-012	4.705e-013	-11.135	-12.327	-1.193	(0)
CrO2-	1.300e-012	9.581e-013	-11.886	-12.019	-0.133	(0)
Cr (OH) 4-	1.095e-012	8.072e-013	-11.960	-12.093	-0.133	(0)
CrCl+2	2.220e-015	6.549e-016	-14.654	-15.184	-0.530	(0)
Cr2 (OH) 2SO4+2	3.542e-016	1.045e-016	-15.451	-15.981	-0.530	(0)
Cr2 (OH) 2 (SO4) 2	4.350e-017	4.350e-017	-16.362	-16.362	0.000	(0)
CrOHC12	1.085e-018	1.085e-018	-17.965	-17.965	0.000	(0)
CrCl2+	9.070e-020	6.685e-020	-19.042	-19.175	-0.133	(0)
CrNO3+2	2.182e-023	6.440e-024	-22.661	-23.191	-0.530	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-42.299	-42.829	-0.530	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-50.674	-51.867	-1.193	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-53.203	-53.733	-0.530	(0)
Cr (6)	1.130e-016					
CrO4-2	8.981e-017	3.749e-017	-16.047	-16.426	-0.379	(0)
HCrO4-	2.044e-017	1.506e-017	-16.690	-16.822	-0.133	(0)
NaCrO4-	2.402e-018	1.771e-018	-17.619	-17.752	-0.133	(0)
KCrO4-	3.838e-019	2.829e-019	-18.416	-18.548	-0.133	(0)
CrO3SO4-2	1.354e-023	3.994e-024	-22.868	-23.399	-0.530	(0)
H2CrO4	1.516e-024	1.516e-024	-23.819	-23.819	0.000	(0)
CrO3Cl-	1.718e-026	1.266e-026	-25.765	-25.897	-0.133	(0)
Cr2O7-2	2.668e-032	7.873e-033	-31.574	-32.104	-0.530	(0)
Cu (1)	1.993e-009					
Cu+	8.744e-010	6.444e-010	-9.058	-9.191	-0.133	(0)
CuCl	8.727e-010	8.727e-010	-9.059	-9.059	0.000	(0)
CuCl2-	2.462e-010	1.961e-010	-9.609	-9.707	-0.099	(0)
CuCl3-2	1.061e-013	4.511e-014	-12.974	-13.346	-0.372	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.745	-147.147	-0.403	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.497	-147.877	-0.381	(0)
Cu (2)	9.835e-006					
CuCO3	5.375e-006	5.375e-006	-5.270	-5.270	0.000	(0)
Cu+2	2.318e-006	9.676e-007	-5.635	-6.014	-0.379	(0)
CuSO4	1.553e-006	1.553e-006	-5.809	-5.809	0.000	(0)
CuOH+	3.112e-007	2.479e-007	-6.507	-6.606	-0.099	(0)
CuHCO3+	2.069e-007	1.525e-007	-6.684	-6.817	-0.133	(0)
Cu (CO3) 2-2	4.625e-008	1.365e-008	-7.335	-7.865	-0.530	(0)
CuF+	7.862e-009	5.795e-009	-8.104	-8.237	-0.133	(0)
Cu2 (OH) 2+2	5.232e-009	1.544e-009	-8.281	-8.811	-0.530	(0)
Cu (OH) 2	4.008e-009	4.008e-009	-8.397	-8.397	0.000	(0)
CuCl+	2.071e-009	1.650e-009	-8.684	-8.783	-0.099	(0)
CuNH3+2	5.878e-011	1.735e-011	-10.231	-10.761	-0.530	(0)
CuNO2+	4.563e-011	3.363e-011	-10.341	-10.473	-0.133	(0)
Cu (OH) 3-	9.038e-013	6.661e-013	-12.044	-12.176	-0.133	(0)
CuCl2	6.153e-013	6.153e-013	-12.211	-12.211	0.000	(0)
CuNO3+	1.300e-015	9.582e-016	-14.886	-15.019	-0.133	(0)
Cu (NO2) 2	1.142e-016	1.142e-016	-15.942	-15.942	0.000	(0)
CuCl3-	7.754e-018	6.177e-018	-17.110	-17.209	-0.099	(0)

	Cu(OH) 4-2	1.440e-018	4.248e-019	-17.842	-18.372	-0.530	(0)
	CuCl4-2	7.834e-023	3.330e-023	-22.106	-22.478	-0.372	(0)
	Cu(NO3) 2	3.777e-026	3.777e-026	-25.423	-25.423	0.000	(0)
	Cu(HS) 3-	0.000e+000	0.000e+000	-212.721	-212.853	-0.133	(0)
F	1.427e-004						
	F-	1.181e-004	9.491e-005	-3.928	-4.023	-0.095	(0)
	MgF+	1.903e-005	1.526e-005	-4.721	-4.816	-0.096	(0)
	CaF+	4.504e-006	3.636e-006	-5.346	-5.439	-0.093	(0)
	NaF	5.692e-007	5.692e-007	-6.245	-6.245	0.000	(0)
	MnF+	2.488e-007	2.009e-007	-6.604	-6.697	-0.093	(0)
	AlF2+	5.026e-008	4.079e-008	-7.299	-7.389	-0.091	(0)
	AlF3	4.874e-008	4.874e-008	-7.312	-7.312	0.000	(0)
	HF	1.743e-008	1.743e-008	-7.759	-7.759	0.000	(0)
	CuF+	7.862e-009	5.795e-009	-8.104	-8.237	-0.133	(0)
	ZnF+	7.067e-009	5.209e-009	-8.151	-8.283	-0.133	(0)
	AlF4-	2.890e-009	2.318e-009	-8.539	-8.635	-0.096	(0)
	AlF+2	2.489e-009	1.079e-009	-8.604	-8.967	-0.363	(0)
	BF(OH) 3-	9.333e-010	7.258e-010	-9.030	-9.139	-0.109	(0)
	NiF+	2.646e-010	1.950e-010	-9.577	-9.710	-0.133	(0)
	CoF+	2.515e-010	1.853e-010	-9.600	-9.732	-0.133	(0)
	CdF+	4.703e-011	3.466e-011	-10.328	-10.460	-0.133	(0)
	PbF+	2.510e-011	1.850e-011	-10.600	-10.733	-0.133	(0)
	CrF+2	2.398e-011	7.077e-012	-10.620	-11.150	-0.530	(0)
	HF2-	7.955e-012	6.290e-012	-11.099	-11.201	-0.102	(0)
	UO2F+	6.896e-012	5.082e-012	-11.161	-11.294	-0.133	(0)
	UO2F2	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
	BF2(OH) 2-	1.177e-012	9.152e-013	-11.929	-12.038	-0.109	(0)
	UO2F3-	4.500e-014	3.317e-014	-13.347	-13.479	-0.133	(0)
	PbF2	3.456e-014	3.456e-014	-13.461	-13.461	0.000	(0)
	VO2F	2.060e-014	2.060e-014	-13.686	-13.686	0.000	(0)
	CdF2	6.565e-015	6.565e-015	-14.183	-14.183	0.000	(0)
	FeF2+	9.754e-016	7.876e-016	-15.011	-15.104	-0.093	(0)
	VO2F2-	9.631e-016	7.099e-016	-15.016	-15.149	-0.133	(0)
	H2F2	8.139e-016	8.139e-016	-15.089	-15.089	0.000	(0)
	FeF+2	7.295e-016	3.101e-016	-15.137	-15.509	-0.372	(0)
	VOF+	1.604e-016	1.182e-016	-15.795	-15.927	-0.133	(0)
	FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
	UO2F4-2	8.474e-017	2.501e-017	-16.072	-16.602	-0.530	(0)
	PbF3-	8.441e-018	6.221e-018	-17.074	-17.206	-0.133	(0)
	BF3OH-	5.400e-018	4.200e-018	-17.268	-17.377	-0.109	(0)
	VOF2	4.207e-018	4.207e-018	-17.376	-17.376	0.000	(0)
	VO2F3-2	2.848e-018	8.404e-019	-17.545	-18.076	-0.530	(0)
	VOF3-	1.922e-020	1.417e-020	-19.716	-19.849	-0.133	(0)
	PbF4-2	9.578e-022	2.826e-022	-21.019	-21.549	-0.530	(0)
	VO2F4-3	6.116e-022	3.925e-023	-21.214	-22.406	-1.193	(0)
	BF4-	3.134e-022	2.437e-022	-21.504	-21.613	-0.109	(0)
	HgF+	8.101e-023	5.971e-023	-22.091	-22.224	-0.133	(0)
	Sb(OH) 2F	5.481e-023	5.481e-023	-22.261	-22.261	0.000	(0)
	SbOF	5.395e-023	5.395e-023	-22.268	-22.268	0.000	(0)
	VOF4-2	1.840e-023	5.428e-024	-22.735	-23.265	-0.530	(0)
	UF3+	1.297e-033	9.558e-034	-32.887	-33.020	-0.133	(0)
	UF2+2	2.153e-034	6.354e-035	-33.667	-34.197	-0.530	(0)
	UF4	9.947e-036	9.947e-036	-35.002	-35.002	0.000	(0)
	UF+3	8.286e-037	5.317e-038	-36.082	-37.274	-1.193	(0)
	UF5-	5.076e-038	3.741e-038	-37.294	-37.427	-0.133	(0)
	UF6-2	3.634e-039	1.072e-039	-38.440	-38.970	-0.530	(0)
Fe(2)	2.247e-010						
	Fe+2	1.478e-010	4.361e-011	-9.830	-10.360	-0.530	(0)
	FeSO4	7.501e-011	7.501e-011	-10.125	-10.125	0.000	(0)
	FeHCO3+	1.678e-012	1.372e-012	-11.775	-11.863	-0.088	(0)
	FeOH+	1.742e-013	1.407e-013	-12.759	-12.852	-0.093	(0)
	Fe(OH) 2	9.054e-018	9.054e-018	-17.043	-17.043	0.000	(0)
	Fe(OH) 3-	2.873e-019	2.320e-019	-18.542	-18.635	-0.093	(0)
	Fe(HS) 2	0.000e+000	0.000e+000	-156.569	-156.569	0.000	(0)
	Fe(HS) 3-	0.000e+000	0.000e+000	-231.979	-232.111	-0.133	(0)
Fe(3)	6.487e-009						
	Fe(OH) 2+	6.055e-009	4.913e-009	-8.218	-8.309	-0.091	(0)
	Fe(OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)

Fe (OH) 4-	3.975e-012	3.226e-012	-11.401	-11.491	-0.091	(0)
FeOH+2	3.667e-013	1.559e-013	-12.436	-12.807	-0.372	(0)
FeF2+	9.754e-016	7.876e-016	-15.011	-15.104	-0.093	(0)
FeF+2	7.295e-016	3.101e-016	-15.137	-15.509	-0.372	(0)
FeSO4+	2.901e-016	2.342e-016	-15.537	-15.630	-0.093	(0)
FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
Fe (SO4) 2-	4.760e-017	3.509e-017	-16.322	-16.455	-0.133	(0)
Fe+3	2.127e-017	2.980e-018	-16.672	-17.526	-0.854	(0)
FeCl+2	2.277e-019	9.679e-020	-18.643	-19.014	-0.372	(0)
FeHSeO3+2	3.281e-021	9.683e-022	-20.484	-21.014	-0.530	(0)
FeCl2+	5.760e-022	4.651e-022	-21.240	-21.332	-0.093	(0)
Fe2 (OH) 2+4	1.061e-022	8.045e-025	-21.974	-24.094	-2.120	(0)
FeCl3	5.003e-026	5.003e-026	-25.301	-25.301	0.000	(0)
FeNO3+2	3.162e-026	9.330e-027	-25.500	-26.030	-0.530	(0)
Fe3 (OH) 4+5	1.174e-028	5.714e-032	-27.930	-31.243	-3.313	(0)
H (0)	3.973e-029					
H2	1.987e-029	2.018e-029	-28.702	-28.695	0.007	(0)
Hg (0)	2.896e-010					
Hg	2.896e-010	2.896e-010	-9.538	-9.538	0.000	(0)
Hg (1)	2.262e-020					
Hg2+2	1.131e-020	3.337e-021	-19.947	-20.477	-0.530	(0)
Hg (2)	5.317e-012					
HgClOH	2.612e-012	2.612e-012	-11.583	-11.583	0.000	(0)
HgCl2	1.964e-012	1.964e-012	-11.707	-11.707	0.000	(0)
Hg (OH) 2	6.921e-013	7.030e-013	-12.160	-12.153	0.007	(0)
HgCl3-	2.866e-014	2.112e-014	-13.543	-13.675	-0.133	(0)
HgCO3	1.916e-014	1.916e-014	-13.718	-13.718	0.000	(0)
HgCl+	4.942e-016	3.642e-016	-15.306	-15.439	-0.133	(0)
HgCl4-2	3.066e-016	9.046e-017	-15.513	-16.044	-0.530	(0)
Hg (CO3) 2-2	1.937e-016	5.715e-017	-15.713	-16.243	-0.530	(0)
HgOH+	7.428e-017	5.474e-017	-16.129	-16.262	-0.133	(0)
HgHCO3+	6.010e-017	4.429e-017	-16.221	-16.354	-0.133	(0)
Hg (NH3) 2+2	1.114e-019	3.286e-020	-18.953	-19.483	-0.530	(0)
HgNH3+2	6.357e-020	1.876e-020	-19.197	-19.727	-0.530	(0)
Hg+2	5.751e-020	1.697e-020	-19.240	-19.770	-0.530	(0)
HgSO4	3.113e-020	3.113e-020	-19.507	-19.507	0.000	(0)
Hg (OH) 3-	9.729e-021	7.171e-021	-20.012	-20.144	-0.133	(0)
HgF+	8.101e-023	5.971e-023	-22.091	-22.224	-0.133	(0)
Hg (NH3) 3+2	7.766e-028	2.292e-028	-27.110	-27.640	-0.530	(0)
HgNO3+	2.662e-030	1.962e-030	-29.575	-29.707	-0.133	(0)
Hg (NH3) 4+2	1.081e-035	3.189e-036	-34.966	-35.496	-0.530	(0)
Hg (NO3) 2	2.554e-040	2.554e-040	-39.593	-39.593	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-135.962	-136.095	-0.133	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.607	-136.607	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.367	-137.897	-0.530	(0)
K	2.651e-003					
K+	2.526e-003	2.031e-003	-2.597	-2.692	-0.095	(0)
KSO4-	1.241e-004	1.007e-004	-3.906	-3.997	-0.091	(0)
KCrO4-	3.838e-019	2.829e-019	-18.416	-18.548	-0.133	(0)
Mg	5.327e-003					
Mg+2	3.434e-003	1.433e-003	-2.464	-2.844	-0.379	(0)
MgSO4	1.827e-003	1.827e-003	-2.738	-2.738	0.000	(0)
MgHCO3+	4.600e-005	3.664e-005	-4.337	-4.436	-0.099	(0)
MgF+	1.903e-005	1.526e-005	-4.721	-4.816	-0.096	(0)
MgCO3	1.125e-006	1.125e-006	-5.949	-5.949	0.000	(0)
MgOH+	5.626e-008	4.623e-008	-7.250	-7.335	-0.085	(0)
MgH2BO3+	5.729e-009	4.455e-009	-8.242	-8.351	-0.109	(0)
Mn (2)	2.501e-004					
Mn+2	1.802e-004	5.317e-005	-3.744	-4.274	-0.530	(0)
MnSO4	6.624e-005	6.624e-005	-4.179	-4.179	0.000	(0)
MnHCO3+	3.282e-006	2.650e-006	-5.484	-5.577	-0.093	(0)
MnF+	2.488e-007	2.009e-007	-6.604	-6.697	-0.093	(0)
MnCl+	8.917e-008	7.200e-008	-7.050	-7.143	-0.093	(0)
MnOH+	1.340e-008	1.082e-008	-7.873	-7.966	-0.093	(0)
MnCl2	1.094e-010	1.094e-010	-9.961	-9.961	0.000	(0)
MnSeO4	2.445e-013	2.445e-013	-12.612	-12.612	0.000	(0)
MnCl3-	4.014e-014	3.241e-014	-13.396	-13.489	-0.093	(0)
MnNO3+	3.580e-014	2.639e-014	-13.446	-13.579	-0.133	(0)

Mn (OH) 3-	5.437e-019	4.390e-019	-18.265	-18.357	-0.093	(0)
Mn (NO3) 2	2.075e-023	2.075e-023	-22.683	-22.683	0.000	(0)
Mn (OH) 4-2	2.702e-025	1.148e-025	-24.568	-24.940	-0.372	(0)
MnSe	0.000e+000	0.000e+000	-41.438	-41.438	0.000	(0)
Mn (3)	1.247e-023					
Mn+3	1.247e-023	1.747e-024	-22.904	-23.758	-0.854	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-43.612	-43.984	-0.372	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-47.384	-47.489	-0.106	(0)
Mo	2.080e-007					
MoO4-2	2.077e-007	8.672e-008	-6.682	-7.062	-0.379	(0)
HMoO4-	2.907e-010	2.142e-010	-9.537	-9.669	-0.133	(0)
H2MoO4	1.948e-013	1.948e-013	-12.710	-12.710	0.000	(0)
AlMo6O21-3	2.721e-040	0.000e+000	-39.565	-40.758	-1.193	(0)
Mo7O24-6	0.000e+000	0.000e+000	-46.919	-51.690	-4.771	(0)
HMo7O24-5	0.000e+000	0.000e+000	-48.896	-52.209	-3.313	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-52.213	-54.333	-2.120	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-56.800	-57.993	-1.193	(0)
N (-3)	5.278e-007					
NH4+	4.905e-007	3.815e-007	-6.309	-6.419	-0.109	(0)
NH4SO4-	3.547e-008	2.864e-008	-7.450	-7.543	-0.093	(0)
NH3	1.752e-009	1.752e-009	-8.757	-8.757	0.000	(0)
CuNH3+2	5.878e-011	1.735e-011	-10.231	-10.761	-0.530	(0)
CaNH3+2	2.624e-011	7.742e-012	-10.581	-11.111	-0.530	(0)
NiNH3+2	2.608e-013	7.696e-014	-12.584	-13.114	-0.530	(0)
Co (NH3) +2	4.407e-014	1.300e-014	-13.356	-13.886	-0.530	(0)
BaNH3+2	5.598e-017	1.652e-017	-16.252	-16.782	-0.530	(0)
Hg (NH3) 2+2	1.114e-019	3.286e-020	-18.953	-19.483	-0.530	(0)
Ni (NH3) 2+2	6.604e-020	1.949e-020	-19.180	-19.710	-0.530	(0)
HgNH3+2	6.357e-020	1.876e-020	-19.197	-19.727	-0.530	(0)
Ca (NH3) 2+2	1.830e-020	5.399e-021	-19.738	-20.268	-0.530	(0)
Co (NH3) 2+2	3.293e-021	9.718e-022	-20.482	-21.012	-0.530	(0)
Hg (NH3) 3+2	7.766e-028	2.292e-028	-27.110	-27.640	-0.530	(0)
Co (NH3) 3+2	7.263e-029	2.143e-029	-28.139	-28.669	-0.530	(0)
Hg (NH3) 4+2	1.081e-035	3.189e-036	-34.966	-35.496	-0.530	(0)
Co (NH3) 4+2	6.677e-037	1.970e-037	-36.175	-36.705	-0.530	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-42.299	-42.829	-0.530	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-44.712	-45.242	-0.530	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-50.674	-51.867	-1.193	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-51.702	-52.232	-0.530	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-53.203	-53.733	-0.530	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-61.833	-61.965	-0.133	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-67.097	-67.627	-0.530	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-67.174	-67.704	-0.530	(0)
N (3)	4.232e-007					
NO2-	4.232e-007	3.319e-007	-6.373	-6.479	-0.106	(0)
CuNO2+	4.563e-011	3.363e-011	-10.341	-10.473	-0.133	(0)
CoNO2+	1.960e-013	1.444e-013	-12.708	-12.840	-0.133	(0)
Cu (NO2) 2	1.142e-016	1.142e-016	-15.942	-15.942	0.000	(0)
N (5)	3.943e-010					
NO3-	3.896e-010	3.131e-010	-9.409	-9.504	-0.095	(0)
CaNO3+	4.716e-012	3.476e-012	-11.326	-11.459	-0.133	(0)
MnNO3+	3.580e-014	2.639e-014	-13.446	-13.579	-0.133	(0)
ZnNO3+	2.935e-015	2.163e-015	-14.532	-14.665	-0.133	(0)
CuNO3+	1.300e-015	9.582e-016	-14.886	-15.019	-0.133	(0)
NiNO3+	8.731e-017	6.435e-017	-16.059	-16.191	-0.133	(0)
CoNO3+	4.158e-017	3.065e-017	-16.381	-16.514	-0.133	(0)
BaNO3+	3.182e-017	2.346e-017	-16.497	-16.630	-0.133	(0)
CdNO3+	3.096e-017	2.282e-017	-16.509	-16.642	-0.133	(0)
PbNO3+	1.738e-017	1.281e-017	-16.760	-16.892	-0.133	(0)
UO2NO3+	3.288e-022	2.424e-022	-21.483	-21.616	-0.133	(0)
CrNO3+2	2.182e-023	6.440e-024	-22.661	-23.191	-0.530	(0)
Mn (NO3) 2	2.075e-023	2.075e-023	-22.683	-22.683	0.000	(0)
VO2NO3	1.960e-023	1.960e-023	-22.708	-22.708	0.000	(0)
Zn (NO3) 2	1.352e-025	1.352e-025	-24.869	-24.869	0.000	(0)
Cu (NO3) 2	3.777e-026	3.777e-026	-25.423	-25.423	0.000	(0)
FeNO3+2	3.162e-026	9.330e-027	-25.500	-26.030	-0.530	(0)

Co(NO3)2	1.953e-026	1.953e-026	-25.709	-25.709	0.000	(0)
Pb(NO3)2	6.813e-027	6.813e-027	-26.167	-26.167	0.000	(0)
Cd(NO3)2	3.581e-027	3.581e-027	-26.446	-26.446	0.000	(0)
HgNO3+	2.662e-030	1.962e-030	-29.575	-29.707	-0.133	(0)
Hg(NO3)2	2.554e-040	2.554e-040	-39.593	-39.593	0.000	(0)
Na	1.228e-002					
Na+	1.182e-002	9.504e-003	-1.927	-2.022	-0.095	(0)
NaSO4-	4.407e-004	3.576e-004	-3.356	-3.447	-0.091	(0)
NaHCO3	1.335e-005	1.335e-005	-4.874	-4.874	0.000	(0)
NaF	5.692e-007	5.692e-007	-6.245	-6.245	0.000	(0)
NaCO3-	2.057e-007	1.669e-007	-6.687	-6.777	-0.091	(0)
NaH2BO3	1.350e-009	1.350e-009	-8.870	-8.870	0.000	(0)
NaCrO4-	2.402e-018	1.771e-018	-17.619	-17.752	-0.133	(0)
Ni	3.482e-007					
Ni+2	1.960e-007	8.181e-008	-6.708	-7.087	-0.379	(0)
NiSO4	1.144e-007	1.144e-007	-6.942	-6.942	0.000	(0)
NiHCO3+	3.418e-008	2.519e-008	-7.466	-7.599	-0.133	(0)
NiCO3	2.879e-009	2.879e-009	-8.541	-8.541	0.000	(0)
NiCl+	3.055e-010	2.252e-010	-9.515	-9.648	-0.133	(0)
NiF+	2.646e-010	1.950e-010	-9.577	-9.710	-0.133	(0)
NiOH+	1.132e-010	8.345e-011	-9.946	-10.079	-0.133	(0)
Ni(SO4)2-2	8.992e-011	2.653e-011	-10.046	-10.576	-0.530	(0)
Ni(OH)2	5.371e-013	5.371e-013	-12.270	-12.270	0.000	(0)
NiNH3+2	2.608e-013	7.696e-014	-12.584	-13.114	-0.530	(0)
NiCl2	1.219e-015	1.219e-015	-14.914	-14.914	0.000	(0)
NiSeO4	6.537e-016	6.537e-016	-15.185	-15.185	0.000	(0)
NiNO3+	8.731e-017	6.435e-017	-16.059	-16.191	-0.133	(0)
Ni(OH)3-	5.904e-017	4.352e-017	-16.229	-16.361	-0.133	(0)
Ni(NH3)2+2	6.604e-020	1.949e-020	-19.180	-19.710	-0.530	(0)
O(0)	2.447e-035					
O2	1.223e-035	1.243e-035	-34.912	-34.906	0.007	(0)
Pb	3.330e-008					
PbSO4	9.493e-009	9.493e-009	-8.023	-8.023	0.000	(0)
PbCO3	7.844e-009	7.844e-009	-8.105	-8.105	0.000	(0)
PbHCO3+	6.967e-009	5.135e-009	-8.157	-8.289	-0.133	(0)
Pb+2	6.627e-009	2.766e-009	-8.179	-8.558	-0.379	(0)
Pb(SO4)2-2	1.358e-009	4.008e-010	-8.867	-9.397	-0.530	(0)
PbOH+	7.639e-010	5.630e-010	-9.117	-9.249	-0.133	(0)
PbCl+	1.433e-010	1.056e-010	-9.844	-9.976	-0.133	(0)
Pb(CO3)2-2	7.232e-011	2.134e-011	-10.141	-10.671	-0.530	(0)
PbF+	2.510e-011	1.850e-011	-10.600	-10.733	-0.133	(0)
Pb(OH)2	1.443e-012	1.443e-012	-11.841	-11.841	0.000	(0)
PbCl2	5.073e-013	5.073e-013	-12.295	-12.295	0.000	(0)
PbF2	3.456e-014	3.456e-014	-13.461	-13.461	0.000	(0)
Pb2OH+3	3.847e-016	2.468e-017	-15.415	-16.608	-1.193	(0)
PbCl3-	2.948e-016	2.172e-016	-15.531	-15.663	-0.133	(0)
Pb(OH)3-	1.586e-016	1.169e-016	-15.800	-15.932	-0.133	(0)
PbNO3+	1.738e-017	1.281e-017	-16.760	-16.892	-0.133	(0)
PbF3-	8.441e-018	6.221e-018	-17.074	-17.206	-0.133	(0)
PbCl4-2	3.620e-019	1.068e-019	-18.441	-18.971	-0.530	(0)
Pb(OH)4-2	7.860e-021	2.319e-021	-20.105	-20.635	-0.530	(0)
PbF4-2	9.578e-022	2.826e-022	-21.019	-21.549	-0.530	(0)
Pb3(OH)4+2	3.893e-022	1.149e-022	-21.410	-21.940	-0.530	(0)
Pb4(OH)4+4	3.329e-025	2.524e-027	-24.478	-26.598	-2.120	(0)
Pb(NO3)2	6.813e-027	6.813e-027	-26.167	-26.167	0.000	(0)
Pb(HS)2	0.000e+000	0.000e+000	-148.447	-148.447	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-224.594	-224.726	-0.133	(0)
S(-2)	0.000e+000					
CdHS+	0.000e+000	0.000e+000	-77.076	-77.209	-0.133	(0)
HS-	0.000e+000	0.000e+000	-77.447	-77.579	-0.133	(0)
H2S	0.000e+000	0.000e+000	-77.465	-77.465	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.508	-80.038	-0.530	(0)
S6-2	0.000e+000	0.000e+000	-80.024	-80.554	-0.530	(0)
S4-2	0.000e+000	0.000e+000	-80.104	-80.634	-0.530	(0)
S3-2	0.000e+000	0.000e+000	-80.910	-81.440	-0.530	(0)
S2-2	0.000e+000	0.000e+000	-81.926	-82.456	-0.530	(0)
S-2	0.000e+000	0.000e+000	-87.602	-87.973	-0.372	(0)
HgHS2-	0.000e+000	0.000e+000	-135.962	-136.095	-0.133	(0)

Hg (HS) 2	0.000e+000	0.000e+000	-136.607	-136.607	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.367	-137.897	-0.530	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.745	-147.147	-0.403	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-146.871	-147.003	-0.133	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.497	-147.877	-0.381	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-147.584	-147.584	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-147.899	-147.899	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-148.447	-148.447	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.569	-156.569	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-212.721	-212.853	-0.133	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.066	-222.199	-0.133	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-223.131	-223.263	-0.133	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-224.594	-224.726	-0.133	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-224.743	-225.273	-0.530	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-231.979	-232.111	-0.133	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-298.117	-298.647	-0.530	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-300.708	-301.238	-0.530	(0)
Sb2S4-2	0.000e+000	0.000e+000	-309.261	-309.791	-0.530	(0)
S (6)	2.489e-002					
SO4-2	1.678e-002	7.006e-003	-1.775	-2.155	-0.379	(0)
CaSO4	5.634e-003	5.634e-003	-2.249	-2.249	0.000	(0)
MgSO4	1.827e-003	1.827e-003	-2.738	-2.738	0.000	(0)
NaSO4-	4.407e-004	3.576e-004	-3.356	-3.447	-0.091	(0)
KSO4-	1.241e-004	1.007e-004	-3.906	-3.997	-0.091	(0)
MnSO4	6.624e-005	6.624e-005	-4.179	-4.179	0.000	(0)
ZnSO4	4.216e-006	4.216e-006	-5.375	-5.375	0.000	(0)
CuSO4	1.553e-006	1.553e-006	-5.809	-5.809	0.000	(0)
Zn (SO4) 2-2	8.719e-007	2.573e-007	-6.060	-6.590	-0.530	(0)
NiSO4	1.144e-007	1.144e-007	-6.942	-6.942	0.000	(0)
HSO4-	1.060e-007	8.501e-008	-6.975	-7.071	-0.096	(0)
CoSO4	8.632e-008	8.632e-008	-7.064	-7.064	0.000	(0)
CdSO4	3.785e-008	3.785e-008	-7.422	-7.422	0.000	(0)
NH4SO4-	3.547e-008	2.864e-008	-7.450	-7.543	-0.093	(0)
Cd (SO4) 2-2	1.212e-008	3.577e-009	-7.916	-8.446	-0.530	(0)
PbSO4	9.493e-009	9.493e-009	-8.023	-8.023	0.000	(0)
CrOHSO4	1.387e-009	1.387e-009	-8.858	-8.858	0.000	(0)
Pb (SO4) 2-2	1.358e-009	4.008e-010	-8.867	-9.397	-0.530	(0)
Ni (SO4) 2-2	8.992e-011	2.653e-011	-10.046	-10.576	-0.530	(0)
AlSO4+	7.711e-011	6.186e-011	-10.113	-10.209	-0.096	(0)
FeSO4	7.501e-011	7.501e-011	-10.125	-10.125	0.000	(0)
CrSO4+	1.044e-011	7.697e-012	-10.981	-11.114	-0.133	(0)
Al (SO4) 2-	5.789e-012	4.644e-012	-11.237	-11.333	-0.096	(0)
UO2SO4	4.114e-012	4.114e-012	-11.386	-11.386	0.000	(0)
UO2 (SO4) 2-2	1.288e-012	3.799e-013	-11.890	-12.420	-0.530	(0)
VO2SO4-	2.809e-014	2.070e-014	-13.551	-13.684	-0.133	(0)
VOSO4	4.007e-016	4.007e-016	-15.397	-15.397	0.000	(0)
Cr2 (OH) 2SO4+2	3.542e-016	1.045e-016	-15.451	-15.981	-0.530	(0)
FeSO4+	2.901e-016	2.342e-016	-15.537	-15.630	-0.093	(0)
Fe (SO4) 2-	4.760e-017	3.509e-017	-16.322	-16.455	-0.133	(0)
Cr2 (OH) 2 (SO4) 2	4.350e-017	4.350e-017	-16.362	-16.362	0.000	(0)
HgSO4	3.113e-020	3.113e-020	-19.507	-19.507	0.000	(0)
CrO3SO4-2	1.354e-023	3.994e-024	-22.868	-23.399	-0.530	(0)
VSO4+	9.709e-030	7.156e-030	-29.013	-29.145	-0.133	(0)
U (SO4) 2	4.359e-037	4.359e-037	-36.361	-36.361	0.000	(0)
USO4+2	2.654e-038	7.832e-039	-37.576	-38.106	-0.530	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-61.833	-61.965	-0.133	(0)
Sb (3)	5.881e-018					
Sb (OH) 3	2.975e-018	2.975e-018	-17.527	-17.527	0.000	(0)
HSbO2	2.906e-018	2.906e-018	-17.537	-17.537	0.000	(0)
Sb (OH) 2F	5.481e-023	5.481e-023	-22.261	-22.261	0.000	(0)
SbOF	5.395e-023	5.395e-023	-22.268	-22.268	0.000	(0)
SbO2-	5.144e-023	3.791e-023	-22.289	-22.421	-0.133	(0)
Sb (OH) 4-	2.942e-023	2.168e-023	-22.531	-22.664	-0.133	(0)
Sb (OH) 2+	1.218e-023	8.977e-024	-22.914	-23.047	-0.133	(0)
SbO+	4.203e-024	3.098e-024	-23.376	-23.509	-0.133	(0)
Sb2S4-2	0.000e+000	0.000e+000	-309.261	-309.791	-0.530	(0)
Sb (5)	4.780e-007					
SbO3-	4.775e-007	3.519e-007	-6.321	-6.454	-0.133	(0)

Sb(OH) 6-	5.107e-010	4.105e-010	-9.292	-9.387	-0.095	(0)
SbO2+	2.113e-021	1.557e-021	-20.675	-20.808	-0.133	(0)
Se (-2)	2.807e-039					
HSe-	2.807e-039	2.069e-039	-38.552	-38.684	-0.133	(0)
MnSe	0.000e+000	0.000e+000	-41.438	-41.438	0.000	(0)
H2Se	0.000e+000	0.000e+000	-41.700	-41.700	0.000	(0)
Se-2	0.000e+000	0.000e+000	-46.248	-46.778	-0.530	(0)
Se (4)	1.802e-007					
HSeO3-	1.669e-007	1.230e-007	-6.778	-6.910	-0.133	(0)
SeO3-2	1.336e-008	3.944e-009	-7.874	-8.404	-0.530	(0)
H2SeO3	6.513e-012	6.513e-012	-11.186	-11.186	0.000	(0)
Cd(SeO3) 2-2	1.001e-018	2.953e-019	-18.000	-18.530	-0.530	(0)
FeHSeO3+2	3.281e-021	9.683e-022	-20.484	-21.014	-0.530	(0)
Se (6)	4.118e-011					
SeO4-2	4.093e-011	1.708e-011	-10.388	-10.767	-0.379	(0)
MnSeO4	2.445e-013	2.445e-013	-12.612	-12.612	0.000	(0)
ZnSeO4	7.278e-015	7.278e-015	-14.138	-14.138	0.000	(0)
NiSeO4	6.537e-016	6.537e-016	-15.185	-15.185	0.000	(0)
CoSeO4	5.287e-016	5.287e-016	-15.277	-15.277	0.000	(0)
HSeO4-	1.442e-016	1.063e-016	-15.841	-15.973	-0.133	(0)
CdSeO4	7.331e-017	7.331e-017	-16.135	-16.135	0.000	(0)
Zn(SeO4) 2-2	4.272e-025	1.261e-025	-24.369	-24.899	-0.530	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-56.022	-57.214	-1.193	(0)
U (4)	9.787e-022					
U(OH) 5-	9.749e-022	7.185e-022	-21.011	-21.144	-0.133	(0)
U(OH) 4	3.740e-024	3.740e-024	-23.427	-23.427	0.000	(0)
U(OH) 3+	2.305e-027	1.699e-027	-26.637	-26.770	-0.133	(0)
U(OH) 2+2	3.309e-031	9.764e-032	-30.480	-31.010	-0.530	(0)
UF3+	1.297e-033	9.558e-034	-32.887	-33.020	-0.133	(0)
UF2+2	2.153e-034	6.354e-035	-33.667	-34.197	-0.530	(0)
UF4	9.947e-036	9.947e-036	-35.002	-35.002	0.000	(0)
UOH+3	8.905e-036	5.715e-037	-35.050	-36.243	-1.193	(0)
UF+3	8.286e-037	5.317e-038	-36.082	-37.274	-1.193	(0)
U(SO4) 2	4.359e-037	4.359e-037	-36.361	-36.361	0.000	(0)
UF5-	5.076e-038	3.741e-038	-37.294	-37.427	-0.133	(0)
USO4+2	2.654e-038	7.832e-039	-37.576	-38.106	-0.530	(0)
UF6-2	3.634e-039	1.072e-039	-38.440	-38.970	-0.530	(0)
U+4	0.000e+000	0.000e+000	-40.431	-42.552	-2.120	(0)
UC1+3	0.000e+000	0.000e+000	-42.627	-43.820	-1.193	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-158.147	-168.881	-10.734	(0)
U (5)	4.362e-016					
UO2+	4.362e-016	3.215e-016	-15.360	-15.493	-0.133	(0)
U (6)	2.654e-007					
UO2(CO3) 3-4	1.710e-007	1.296e-009	-6.767	-8.887	-2.120	(0)
UO2(CO3) 2-2	9.292e-008	2.742e-008	-7.032	-7.562	-0.530	(0)
UO2CO3	1.457e-009	1.457e-009	-8.837	-8.837	0.000	(0)
UO2F+	6.896e-012	5.082e-012	-11.161	-11.294	-0.133	(0)
UO2OH+	5.369e-012	3.957e-012	-11.270	-11.403	-0.133	(0)
UO2SO4	4.114e-012	4.114e-012	-11.386	-11.386	0.000	(0)
UO2F2	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
UO2(SO4) 2-2	1.288e-012	3.799e-013	-11.890	-12.420	-0.530	(0)
UO2+2	9.293e-013	3.879e-013	-12.032	-12.411	-0.379	(0)
UO2F3-	4.500e-014	3.317e-014	-13.347	-13.479	-0.133	(0)
UO2Cl+	9.182e-016	6.767e-016	-15.037	-15.170	-0.133	(0)
(UO2) 2(OH) 2+2	8.805e-017	2.598e-017	-16.055	-16.585	-0.530	(0)
UO2F4-2	8.474e-017	2.501e-017	-16.072	-16.602	-0.530	(0)
(UO2) 3(OH) 5+	6.947e-019	5.120e-019	-18.158	-18.291	-0.133	(0)
UO2NO3+	3.288e-022	2.424e-022	-21.483	-21.616	-0.133	(0)
V (2)	1.001e-039					
VOH+	5.126e-040	3.778e-040	-39.290	-39.423	-0.133	(0)
V+2	4.883e-040	1.441e-040	-39.311	-39.841	-0.530	(0)
V (3)	9.284e-013					
V(OH) 3	9.284e-013	9.284e-013	-12.032	-12.032	0.000	(0)
V(OH) 2+	1.011e-022	7.454e-023	-21.995	-22.128	-0.133	(0)
VOH+2	2.977e-025	8.786e-026	-24.526	-25.056	-0.530	(0)
V+3	3.371e-029	2.164e-030	-28.472	-29.665	-1.193	(0)
VSO4+	9.709e-030	7.156e-030	-29.013	-29.145	-0.133	(0)

V2 (OH) 2+4	0.000e+000	0.000e+000	-47.192	-49.312	-2.120	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-47.539	-48.732	-1.193	(0)
V (4)	5.820e-015					
V (OH) 3+	4.550e-015	3.354e-015	-14.342	-14.474	-0.133	(0)
VO+2	7.037e-016	2.077e-016	-15.153	-15.683	-0.530	(0)
VOSO4	4.007e-016	4.007e-016	-15.397	-15.397	0.000	(0)
VOF+	1.604e-016	1.182e-016	-15.795	-15.927	-0.133	(0)
VOF2	4.207e-018	4.207e-018	-17.376	-17.376	0.000	(0)
VOC1+	8.502e-019	6.266e-019	-18.070	-18.203	-0.133	(0)
VOF3-	1.922e-020	1.417e-020	-19.716	-19.849	-0.133	(0)
VOF4-2	1.840e-023	5.428e-024	-22.735	-23.265	-0.530	(0)
H2V2O4+2	1.914e-024	5.648e-025	-23.718	-24.248	-0.530	(0)
V (5)	5.764e-007					
H2VO4-	5.448e-007	4.016e-007	-6.264	-6.396	-0.133	(0)
HVO4-2	2.753e-008	8.124e-009	-7.560	-8.090	-0.530	(0)
H3V2O7-	1.755e-009	1.294e-009	-8.756	-8.888	-0.133	(0)
H3VO4	4.986e-010	4.986e-010	-9.302	-9.302	0.000	(0)
HV2O7-3	1.724e-011	1.107e-012	-10.763	-11.956	-1.193	(0)
V3O9-3	1.060e-012	6.800e-014	-11.975	-13.167	-1.193	(0)
VO2+	1.539e-013	1.237e-013	-12.813	-12.907	-0.095	(0)
V2O7-4	3.164e-014	2.399e-016	-13.500	-15.620	-2.120	(0)
VO2SO4-	2.809e-014	2.070e-014	-13.551	-13.684	-0.133	(0)
VO2F	2.060e-014	2.060e-014	-13.686	-13.686	0.000	(0)
VO4-3	5.111e-015	3.280e-016	-14.292	-15.484	-1.193	(0)
V4O12-4	1.503e-015	1.139e-017	-14.823	-16.943	-2.120	(0)
VO2F2-	9.631e-016	7.099e-016	-15.016	-15.149	-0.133	(0)
VO2F3-2	2.848e-018	8.404e-019	-17.545	-18.076	-0.530	(0)
VO2F4-3	6.116e-022	3.925e-023	-21.214	-22.406	-1.193	(0)
VO2NO3	1.960e-023	1.960e-023	-22.708	-22.708	0.000	(0)
V10O28-6	1.244e-038	0.000e+000	-37.905	-42.676	-4.771	(0)
HV10O28-5	8.273e-039	0.000e+000	-38.082	-41.395	-3.313	(0)
H2V10O28-4	0.000e+000	0.000e+000	-40.973	-43.094	-2.120	(0)
Zn	1.217e-005					
Zn+2	6.589e-006	2.751e-006	-5.181	-5.561	-0.379	(0)
ZnSO4	4.216e-006	4.216e-006	-5.375	-5.375	0.000	(0)
Zn (SO4) 2-2	8.719e-007	2.573e-007	-6.060	-6.590	-0.530	(0)
ZnHCO3+	2.948e-007	2.173e-007	-6.530	-6.663	-0.133	(0)
ZnCO3	1.493e-007	1.493e-007	-6.826	-6.826	0.000	(0)
ZnOH+	3.024e-008	2.229e-008	-7.519	-7.652	-0.133	(0)
ZnCl+	9.330e-009	7.432e-009	-8.030	-8.129	-0.099	(0)
ZnF+	7.067e-009	5.209e-009	-8.151	-8.283	-0.133	(0)
ZnOHC1	7.884e-010	7.884e-010	-9.103	-9.103	0.000	(0)
Zn (OH) 2	2.862e-010	2.862e-010	-9.543	-9.543	0.000	(0)
ZnCl2	1.267e-011	1.267e-011	-10.897	-10.897	0.000	(0)
Zn (OH) 3-	1.577e-013	1.162e-013	-12.802	-12.935	-0.133	(0)
ZnCl3-	1.359e-014	1.083e-014	-13.867	-13.966	-0.099	(0)
ZnSeO4	7.278e-015	7.278e-015	-14.138	-14.138	0.000	(0)
ZnNO3+	2.935e-015	2.163e-015	-14.532	-14.665	-0.133	(0)
ZnCl4-2	1.370e-017	5.823e-018	-16.863	-17.235	-0.372	(0)
Zn (OH) 4-2	1.270e-018	3.749e-019	-17.896	-18.426	-0.530	(0)
Zn (SeO4) 2-2	4.272e-025	1.261e-025	-24.369	-24.899	-0.530	(0)
Zn (NO3) 2	1.352e-025	1.352e-025	-24.869	-24.869	0.000	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-146.871	-147.003	-0.133	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-147.899	-147.899	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.066	-222.199	-0.133	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-224.743	-225.273	-0.530	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-300.708	-301.238	-0.530	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-59.57	-53.28	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-44.72	-40.21	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-51.95	-40.21	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-77.27	-59.33	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-59.75	-39.72	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.67	-29.26	0.40	(NH4) 2CrO4

(NH4)2SeO4	-24.05	-23.60	0.45	(NH4)2SeO4
Al(OH)3(am)	-2.03	8.77	10.80	Al(OH)3
Al2(MoO4)3	-47.44	-45.07	2.37	Al2(MoO4)3
Al2O3	-2.11	17.55	19.65	Al2O3
Al4(OH)10SO4	-3.57	19.13	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-9.46	-4.66	4.80	AlAsO4:2H2O
AlOHSO4	-3.96	-7.19	-3.23	AlOHSO4
AlSb	-151.01	-85.39	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.92	-10.71	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-54.09	-85.96	-31.88	Cu0.25Cu1.5S
Antlerite	-1.36	7.43	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-77.56	-80.32	-2.76	As4O6
Artinite	-7.50	2.10	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-33.57	-26.87	6.71	As2O5
Atacamite	-1.67	5.72	7.39	Cu2(OH)3Cl
Azurite	0.62	-16.28	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-18.41	5.98	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.90	-0.03	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.99	5.95	32.94	Ba3(VO4)2:4H2O
BaCrO4	-14.58	-24.25	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-7.93	-14.89	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.66	-7.83	1.83	BaSeO3
BaSeO4	-11.13	-18.59	-7.46	BaSeO4
Bianchite	-5.95	-7.72	-1.76	ZnSO4:6H2O
Birnessite	-8.36	9.73	18.09	MnO2
Bixbyite	-5.44	-6.08	-0.64	Mn2O3
Blaubleil	-53.76	-77.92	-24.16	Cu0.9Cu0.2S
BlaubleilII	-54.36	-81.63	-27.28	Cu0.6Cu0.8S
Boehmite	0.20	8.77	8.58	AlOOH
Breithauptite	-56.14	-74.66	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-5.88	10.97	16.84	Mg(OH)2
Bunsenite	-5.72	6.72	12.45	NiO
Ca(VO3)2	-6.31	-0.65	5.66	Ca(VO3)2
Ca2V2O7	-6.79	10.71	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.84	10.71	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.89	22.07	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.79	22.07	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-297.22	-154.25	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.50	-26.41	-17.91	Hg2Cl2
CaMoO4	-1.57	-9.52	-7.95	CaMoO4
Carnotite	-0.62	-0.39	0.23	KUO2VO4
CaSeO3:2H2O	-5.27	-2.46	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.20	-13.22	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.10	-3.26	9.84	Cd(BO2)2
Cd(OH)2	-7.47	6.17	13.64	Cd(OH)2
Cd(OH)2(am)	-7.56	6.17	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.12	-13.41	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.00	2.56	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.67	8.73	28.40	Cd4(OH)6SO4
CdCl2	-12.92	-13.57	-0.66	CdCl2
CdCl2:1H2O	-11.88	-13.57	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.66	-13.58	-1.91	CdCl2:2.5H2O
CdF2	-14.47	-15.68	-1.21	CdF2
Cdmetal(alpha)	-32.89	-19.37	13.51	Cd
Cdmetal(gamma)	-32.99	-19.37	13.62	Cd
CdMoO4	-0.55	-14.70	-14.15	CdMoO4
CdOHCl	-7.24	-3.70	3.54	CdOHCl

CdSb	-74.86	-75.21	-0.35	CdSb
CdSe	-19.22	-39.42	-20.20	CdSe
CdSeO4:2H2O	-16.56	-18.41	-1.85	CdSeO4:2H2O
CdSO4	-9.62	-9.79	-0.17	CdSO4
CdSO4:1H2O	-8.07	-9.79	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.92	-9.79	-1.87	CdSO4:2.67H2O
Cerrusite	-1.45	-14.58	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-5.53	-8.17	-2.64	CuSO4:5H2O
Chalcocite	-54.13	-89.05	-34.92	Cu2S
Chalcopyrite	-122.45	-157.72	-35.27	CuFeS2
Cinnabar	-50.94	-96.64	-45.69	HgS
Claudetite	-77.26	-80.32	-3.06	As4O6
Clausthalite	-13.24	-40.34	-27.10	PbSe
Co (BO2)2	-29.90	-2.83	27.07	Co (BO2)2
Co (OH)2	-6.49	6.60	13.09	Co (OH)2
Co (OH)3	-10.72	-13.03	-2.31	Co (OH)3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4)2	-20.10	-7.06	13.03	Co3 (AsO4)2
Co3O4	-8.95	-19.45	-10.50	Co3O4
CoCl2	-21.41	-13.15	8.27	CoCl2
CoCl2:6H2O	-15.69	-13.15	2.54	CoCl2:6H2O
CoCO3	-3.25	-13.23	-9.98	CoCO3
CoF2	-13.66	-15.25	-1.60	CoF2
CoF3	-44.35	-45.81	-1.46	CoF3
CoFe2O4	16.51	12.99	-3.53	CoFe2O4
CoMoO4	-6.51	-14.27	-7.76	CoMoO4
CoO	-6.98	6.60	13.59	CoO
CoS (alpha)	-70.44	-77.88	-7.44	CoS
CoS (beta)	-66.81	-77.88	-11.07	CoS
CoSe	-22.79	-38.99	-16.20	CoSe
CoSeO3	-8.53	-7.21	1.32	CoSeO3
CoSeO4:6H2O	-16.45	-17.98	-1.53	CoSeO4:6H2O
CoSO4	-12.17	-9.36	2.80	CoSO4
CoSO4:6H2O	-6.89	-9.37	-2.47	CoSO4:6H2O
Cotunnite	-9.71	-14.49	-4.78	PbCl2
Covellite	-54.39	-76.69	-22.30	CuS
Cr (OH)2	-21.82	-11.00	10.82	Cr (OH)2
Cr (OH)3	-2.51	-1.18	1.34	Cr (OH)3
Cr (OH)3 (am)	-0.43	-1.18	-0.75	Cr (OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-44.84	-30.75	14.09	CrCl2
CrCl3	-45.92	-30.80	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.31	-42.15	-33.84	Na3AlF6
Cu (OH)2	-0.88	7.80	8.67	Cu (OH)2
Cu (SbO3)2	-21.38	23.83	45.21	Cu (SbO3)2
Cu2 (OH)3NO3	-10.07	-0.82	9.25	Cu2 (OH)3NO3
Cu2Sb:3H2O	-53.77	-88.65	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.36	-50.16	-45.80	Cu2Se
Cu2SO4	-18.59	-20.54	-1.95	Cu2SO4
Cu3 (AsO4)2:2H2O	-9.58	-3.48	6.10	Cu3 (AsO4)2:2H2O
Cu3Sb	-58.42	-101.02	-42.59	Cu3Sb
Cu3Se2	-24.46	-87.95	-63.49	Cu3Se2
CuCO3	-0.54	-12.04	-11.50	CuCO3
CuCrO4	-17.00	-22.44	-5.44	CuCrO4
CuF	-8.31	-13.21	-4.91	CuF
CuF2	-15.17	-14.06	1.12	CuF2
CuF2:2H2O	-9.51	-14.06	-4.55	CuF2:2H2O
Cumetal	-6.30	-15.06	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-10.67	-0.37	10.30	CuOCuSO4
Cupricferrite	8.19	14.18	5.99	CuFe2O4
Cuprite	-3.16	-4.57	-1.41	Cu2O
Cuprousferrite	9.82	0.91	-8.92	CuFeO2
CuSe	-4.69	-37.79	-33.10	CuSe

CuSe2	-24.47	-57.84	-33.37	CuSe2
CuSeO3:2H2O	-6.53	-6.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.34	-16.78	-2.44	CuSeO4:5H2O
CuSO4	-11.11	-8.17	2.94	CuSO4
Diaspore	1.90	8.77	6.87	AlOOH
Djurleite	-54.32	-88.24	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.81	-17.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.26	-17.35	-17.09	CaMg(CO3)2
Epsomite	-2.87	-5.00	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.27	0.23	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.83	-8.55	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-8.99	-7.43	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-14.44	-35.06	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.78	-41.52	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.64	-10.24	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.33	-17.42	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-43.59	-62.18	-18.60	FeSe2
FeS(ppt)	-78.08	-81.03	-2.95	FeS
FeSe	-31.14	-42.14	-11.00	FeSe
Fix_pe	-5.87	-5.87	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-65.26	-79.23	-13.97	PbS
Gibbsite	0.48	8.77	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.71	-7.72	-2.01	ZnSO4:7H2O
Greenockite	-63.95	-78.31	-14.36	CdS
Greigite	-283.07	-328.11	-45.03	Fe3S4
Gummite	-6.27	1.40	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-10.26	-22.36	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.00	-20.87	-12.88	H2MoO4
H2S(g)	-76.48	-84.49	-8.01	H2S
H2Se(g)	-40.63	-45.59	-4.96	H2Se
Halite	-6.59	-4.99	1.60	NaCl
Hausmannite	-6.87	54.16	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.89	21.00	22.89	FeAl2O4
Hg(CH3)2(g)	-182.48	-256.19	-73.71	Hg(CH3)2
Hg(g)	-8.23	-16.10	-7.87	Hg
Hg(OH)2	-8.66	-12.15	-3.50	Hg(OH)2
Hg2(g)	-17.25	-32.21	-14.96	Hg2
Hg2(OH)2	-11.93	-6.67	5.26	Hg2(OH)2
Hg2CO3	-10.45	-26.50	-16.05	Hg2CO3
Hg2CrO4	-28.20	-36.90	-8.70	Hg2CrO4
Hg2F2	-18.16	-28.52	-10.36	Hg2F2
Hg2S	-79.47	-91.15	-11.68	Hg2S
Hg2SeO3	-15.82	-20.48	-4.66	Hg2SeO3
Hg2SO4	-16.50	-22.63	-6.13	Hg2SO4
Hg3O2CO3	-26.61	-56.29	-29.68	Hg3O2CO3
HgCl(g)	-32.70	-13.21	19.50	HgCl
HgCl2	-10.64	-31.90	-21.26	HgCl2
HgF(g)	-46.94	-14.26	32.68	HgF
HgF2(g)	-46.57	-34.01	12.57	HgF2
Hgmetal(l)	-2.65	-16.10	-13.45	Hg
HgSe	-2.05	-57.74	-55.69	HgSe
HgSeO3	-13.54	-25.97	-12.43	HgSeO3
HgSO4	-18.70	-28.12	-9.42	HgSO4
Huntite	-5.12	-35.09	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.14	-23.91	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-15.74	-24.51	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-13.78	-18.95	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-3.35	-18.15	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-34.81	-52.05	-17.24	K2Cr2O7
K2CrO4	-21.30	-21.81	-0.51	K2CrO4

K2MoO4	-15.71	-12.45	3.26	K2MoO4
K2SeO4	-15.42	-16.15	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.02	-5.46	-0.43	PbO:PbSO4
Laurionite	-5.24	-4.62	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.44	5.25	12.69	PbO
Mackinawite	-77.43	-81.03	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.49	17.35	16.86	Fe2MgO4
Magnesite	-1.41	-8.87	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.06	-4.24	-5.31	Cu2 (OH) 2CO3
Manganite	-3.03	22.31	25.34	MnOOH
Massicot	-7.64	5.25	12.89	PbO
Matlockite	-6.58	-15.55	-8.97	PbClF
Melanothallite	-18.21	-11.95	6.26	CuCl2
Melanterite	-10.31	-12.52	-2.21	FeSO4:7H2O
Metacinnabar	-51.54	-96.64	-45.09	HgS
Mg (OH) 2 (active)	-7.83	10.97	18.79	Mg (OH) 2
Mg (VO3) 2	-12.32	-1.04	11.28	Mg (VO3) 2
Mg2Sb3	-271.37	-196.68	74.68	Mg2Sb3
Mg2V2O7	-16.43	9.93	26.36	Mg2V2O7
MgCr2O4	-7.59	8.61	16.20	MgCr2O4
MgCrO4	-24.65	-19.27	5.38	MgCrO4
MgF2	-2.76	-10.89	-8.13	MgF2
MgMoO4	-8.06	-9.91	-1.85	MgMoO4
MgSeO3:6H2O	-5.91	-2.85	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-12.41	-13.61	-1.20	MgSeO4:6H2O
Minium	-32.22	41.31	73.52	Pb3O4
Mirabilite	-5.09	-6.20	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-7.37	-2.47	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-48.27	-53.98	-5.71	Mn2 (SO4) 3
Mn2Sb	-148.94	-87.86	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.76	1.74	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.93	-10.21	2.72	MnCl2:4H2O
MnS (grn)	-75.12	-74.95	0.17	MnS
MnS (pnk)	-78.29	-74.95	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-39.55	-36.05	3.50	MnSe
MnSeO3	-5.41	-4.28	1.13	MnSeO3
MnSeO3:2H2O	-5.26	-4.28	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.99	-15.04	-2.05	MnSeO4:5H2O
MnSO4	-9.01	-6.43	2.58	MnSO4
Monteponite	-8.93	6.17	15.10	CdO
Montroydite	-8.51	-12.15	-3.64	HgO
MoO3	-12.87	-20.87	-8.00	MoO3
Morenosite	-7.10	-9.24	-2.14	NiSO4:7H2O
MoS2	-145.13	-215.39	-70.26	MoS2
Na-Jarosite	-6.27	-17.47	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.81	-50.71	-9.90	Na2Cr2O7
Na2CrO4	-23.40	-20.47	2.93	Na2CrO4
Na2Mo2O7	-15.38	-31.98	-16.60	Na2Mo2O7
Na2MoO4	-12.60	-11.11	1.49	Na2MoO4
Na2MoO4:2H2O	-12.33	-11.11	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.35	-4.05	10.30	Na2SeO3:5H2O
Na2SeO4	-16.09	-14.81	1.28	Na2SeO4
Na3Sb	-173.96	-79.51	94.45	Na3Sb
Na3VO4	-28.03	8.65	36.68	Na3VO4
Na4V2O7	-29.87	7.53	37.40	Na4V2O7
Nantokite	-5.43	-12.16	-6.73	CuCl
NaSb	-86.90	-63.73	23.17	NaSb
Natron	-8.76	-10.07	-1.31	Na2CO3:10H2O
NaVO3	-4.98	-1.12	3.86	NaVO3
Nesquehonite	-4.20	-8.87	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.07	6.72	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-22.40	-6.70	15.70	Ni3 (AsO4) 2:8H2O

Ni4(OH)6SO4	-21.07	10.93	32.00	Ni4(OH)6SO4
NiCO3	-6.24	-13.11	-6.87	NiCO3
NiMoO4	-3.01	-14.15	-11.14	NiMoO4
NiS(alpha)	-72.16	-77.76	-5.60	NiS
NiS(beta)	-66.66	-77.76	-11.10	NiS
NiS(gamma)	-64.96	-77.76	-12.80	NiS
NiSe	-21.17	-38.87	-17.70	NiSe
NiSeO3:2H2O	-9.91	-7.09	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.34	-17.86	-1.52	NiSeO4:6H2O
Nsutite	-7.77	9.73	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-232.55	-293.62	-61.07	As2S3
Otavite	-1.66	-13.66	-12.00	CdCO3
Pb(BO2)2	-10.70	-4.18	6.52	Pb(BO2)2
Pb(OH)2	-2.90	5.25	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.73	-66.49	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.16	0.63	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.68	10.51	26.19	Pb2O(OH)2
Pb2O3	-24.99	36.05	61.04	Pb2O3
Pb2OCO3	-8.77	-9.33	-0.56	Pb2OCO3
Pb2V2O7	0.40	-1.50	-1.90	Pb2V2O7
Pb3(AsO4)2	-16.91	-11.11	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.38	3.76	6.14	Pb3(VO4)2
Pb3O2CO3	-15.10	-4.08	11.02	Pb3O2CO3
Pb3O2SO4	-10.89	-0.21	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.05	5.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.83	5.05	21.88	Pb4O3SO4
PbCrO4	-12.38	-24.98	-12.60	PbCrO4
PbF2	-9.16	-16.60	-7.44	PbF2
Pbmetal	-24.54	-20.29	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.73	5.25	12.98	PbO:0.33H2O
PbSeO4	-12.49	-19.33	-6.84	PbSeO4
Periclase	-10.62	10.97	21.58	MgO
Phosgenite	-9.27	-29.08	-19.81	PbCl2:PbCO3
Plattnerite	-18.80	30.80	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-121.47	-139.97	-18.51	FeS2
Pyrochroite	-5.66	9.54	15.19	Mn(OH)2
Pyrolusite	-6.30	35.08	41.38	MnO2
Realgar	-97.59	-117.34	-19.75	AsS
Retgersite	-7.20	-9.24	-2.04	NiSO4:6H2O
Rhodochrosite	0.28	-10.30	-10.58	MnCO3
Rutherfordine	-3.94	-18.44	-14.50	UO2CO3
Sb(OH)3	-10.42	-17.53	-7.11	Sb(OH)3
Sb2O4	-12.91	-9.51	3.40	Sb2O4
Sb2O5	-22.92	-32.58	-9.67	Sb2O5
Sb2Se3	-104.06	-171.82	-67.76	Sb2Se3
Sb4O6(cubic)	-51.84	-70.10	-18.26	Sb4O6
Sb4O6(orth)	-52.20	-70.10	-17.90	Sb4O6
SbCl3	-47.72	-47.15	0.57	SbCl3
SbF3	-40.09	-50.31	-10.23	SbF3
Sbmetal	-44.15	-55.84	-11.69	Sb
SbO2	-1.24	-29.06	-27.82	SbO2
Schoepite	-4.59	1.40	5.99	UO2(OH)2:H2O
Semetal(am)	-12.94	-20.05	-7.11	Se
Semetal(hex)	-12.34	-20.05	-7.71	Se
Senarmontite	-22.69	-35.05	-12.37	Sb2O3
SeO2	-13.94	-13.82	0.12	SeO2
SeO3	-45.62	-24.58	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.59	-11.59	-10.00	ZnCO3
Sphalerite	-64.78	-76.23	-11.45	ZnS
Spinel	-8.33	28.51	36.85	MgAl2O4
Stibnite	-238.05	-288.51	-50.46	Sb2S3
Sulfur	-56.80	-58.94	-2.14	S
Tenorite	0.15	7.80	7.64	CuO
Thenardite	-6.52	-6.20	0.32	Na2SO4

Thermonatrite	-10.71	-10.07	0.64	Na2CO3:H2O
Tyuyamunite	-1.93	2.15	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.78	6.30	21.08	U3O8
U3Sb4	-573.81	-421.43	152.38	U3Sb4
U4O9	-31.15	-34.17	-3.02	U4O9
UF4	-29.11	-58.64	-29.54	UF4
UF4:2.5H2O	-25.93	-58.64	-32.72	UF4:2.5H2O
UO2 (am)	-15.86	-14.93	0.93	UO2
UO2 (NO3) 2	-43.57	-31.42	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-36.27	-31.42	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-34.81	-31.42	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-33.47	-31.42	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.21	1.40	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.93	-23.18	-2.25	UO2SeO4:4H2O
UO3	-6.30	1.40	7.70	UO3
Uraninite	-10.26	-14.93	-4.67	UO2
USb2	-216.50	-186.92	29.58	USb2
V (OH) 3	-16.54	-8.95	7.59	V (OH) 3
V2O5	-10.64	-12.00	-1.36	V2O5
V3O5	-32.99	-31.16	1.84	V3O5
V4O7	-40.22	-33.03	7.19	V4O7
V6O13	-26.24	-87.10	-60.86	V6O13
Valentinite	-26.57	-35.05	-8.48	Sb2O3
VC12	-60.34	-41.47	18.87	VC12
VC13	-62.00	-38.57	23.43	VC13
VF4	-60.52	-45.59	14.93	VF4
Vmetal	-91.29	-47.26	44.03	V
VO	-36.48	-21.72	14.76	VO
VO (OH) 2	-7.02	-1.87	5.15	VO (OH) 2
VO2Cl	-18.72	-15.88	2.84	VO2Cl
VOC1	-29.97	-18.82	11.15	VOC1
VOC12	-34.38	-21.62	12.76	VOC12
VOSO4	-21.45	-17.84	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.28	-76.23	-8.95	ZnS
Zincite	-3.08	8.25	11.33	ZnO
Zincosite	-11.64	-7.72	3.93	ZnSO4
Zn (BO2) 2	-9.47	-1.18	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-27.89	-24.57	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-3.95	8.25	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.22	8.25	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.50	8.25	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.28	8.25	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.48	8.25	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.96	0.54	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-8.56	6.63	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.77	-2.12	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.09	-7.18	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-11.36	17.04	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-16.99	21.51	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.55	-11.50	7.05	ZnCl2
ZnCO3:1H2O	-1.33	-11.59	-10.26	ZnCO3:1H2O
ZnF2	-13.07	-13.61	-0.53	ZnF2
Znmetal	-43.08	-17.29	25.79	Zn
ZnMoO4	-2.50	-12.62	-10.13	ZnMoO4
ZnO (active)	-2.94	8.25	11.19	ZnO
ZnS (am)	-67.18	-76.23	-9.05	ZnS
ZnSb	-84.15	-73.14	11.01	ZnSb
ZnSe	-22.94	-37.34	-14.40	ZnSe
ZnSeO4:6H2O	-14.81	-16.33	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.08	-7.72	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 20.

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 102
  Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 102
USE Surface 102
USE Solution 107
SAVE Solution 108 #Initial Run-off Water After Mineral Precipitation and
Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 107. Solution after simulation 19.

Using surface 102.

Using pure phase assemblage 102. Pure-phase assemblage after simulation 19.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+000	0	0.000e+000
Alunite	0.00	-1.40	-1.40	6.125e-005	6.125e-005	-9.081e-012
Anhydrite	-0.25	-4.61	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	-1.39	-10.30	-8.91	1.094e-007	0	-1.094e-007
Barite	0.00	-9.98	-9.98	2.869e-006	3.197e-006	3.282e-007
Brochantite	0.00	15.22	15.22	5.143e-004	5.105e-004	-3.800e-006
Brucite	-5.88	10.97	16.84	0.000e+000	0	0.000e+000
CO2(g)	-1.69	-19.84	-18.15	1.001e+001	1.001e+001	-4.300e-006
CaMoO4	-1.57	-9.52	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-5.50	-2.68	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	3.860e-003	3.863e-003	3.935e-006
Carnotite	-1.87	-1.64	0.23	0.000e+000	0	0.000e+000
Cd(BO2)2	-13.10	-3.26	9.84	0.000e+000	0	0.000e+000
CdMoO4	-0.55	-14.70	-14.15	0.000e+000	0	0.000e+000
Chrysotile		Element not present.		0.000e+000	0	0.000e+000
Cr2O3	-1.59	-3.94	-2.36	1.752e-008	0	-1.752e-008
Cu2Se(alpha)	-4.58	-50.38	-45.80	0.000e+000	0	0.000e+000
CuMoO4	0.00	-13.08	-13.08	5.818e-006	5.916e-006	9.860e-008
Epsomite	-2.87	-5.00	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	-0.00	3.19	3.19	1.314e-004	1.314e-004	-1.154e-012
Fluorite	0.00	-10.50	-10.50	7.641e-004	7.641e-004	-5.583e-009
Gummite	-6.27	1.40	7.67	0.000e+000	0	0.000e+000
Gypsum	0.00	-4.61	-4.61	7.743e-003	7.738e-003	-4.931e-006
HgSe	-2.27	-57.97	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2		Element not present.		0.000e+000	0	0.000e+000
Mirabilite	-5.09	-6.20	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-5.63	-4.50	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-6.07	6.72	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2:8H2O	-23.80	-8.10	15.70	0.000e+000	0	0.000e+000
NiCO3	-6.24	-13.11	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-3.01	-14.15	-11.14	0.000e+000	0	0.000e+000
O2(g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-3.180e-013
Otavite	-1.66	-13.66	-12.00	0.000e+000	0	0.000e+000

PbMoO4	0.00	-15.62	-15.62	1.126e-007	1.072e-008	-1.019e-007
Rutherfordine	-3.94	-18.44	-14.50	0.000e+000	0	0.000e+000
SbO2	-1.24	-29.06	-27.82	0.000e+000	0	0.000e+000
Schoepite	-4.59	1.40	5.99	0.000e+000	0	0.000e+000
Sepiolite		Element not present.		0.000e+000	0	0.000e+000
SiO2(am-ppt)		Element not present.		0.000e+000	0	0.000e+000
Tyuyamunite	-4.44	-0.36	4.08	0.000e+000	0	0.000e+000
U3O8	-14.78	6.30	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-4.21	1.40	5.61	0.000e+000	0	0.000e+000
UO3	-6.30	1.40	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-2.50	-12.63	-10.13	0.000e+000	0	0.000e+000

-----Surface composition-----

Hfo

-5.320e-017 Surface + diffuse layer charge, eq
 2.829e-006 Surface charge, eq
 3.235e-002 sigma, C/m**2
 4.749e-002 psi, V
 -1.848e+000 -F*psi/RT
 1.575e-001 exp(-F*psi/RT)
 6.420e+004 specific area, m**2/mol Ferrihydrite
 8.436e+000 m**2 for 1.314e-004 moles of Ferrihydrite

Water in diffuse layer: 8.436e-005 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation

Element	Moles
Al	2.2225e-011
As	1.8749e-013
B	1.6059e-009
Ba	1.9185e-012
C	4.0650e-007
Ca	9.3301e-007
Cd	8.0020e-012
Cl	1.4275e-007
Co	1.9520e-011
Cr	1.6666e-013
Cu	7.4923e-010
F	1.4254e-008
Fe	4.5467e-013
H	4.6895e-007
Hg	2.4865e-014
K	1.8177e-007
Mg	3.3970e-007
Mn	1.5330e-008
Mo	2.8055e-011
N	8.1840e-011
Na	8.3695e-007
Ni	2.2491e-011
O	1.3066e-005
Pb	2.5322e-012
S	2.9603e-006
Sb	5.0990e-011
Se	1.1693e-011
U	4.9533e-011
V	3.4325e-012
Zn	8.4718e-010

Hfo_s

6.570e-007 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	4.921e-007	0.749	5.184e-007	-6.285
Hfo_sOPb+	8.096e-008	0.123	8.529e-008	-7.069
Hfo_sOCrOH+	4.752e-008	0.072	5.006e-008	-7.301

Hfo_sOZn+	1.742e-008	0.027	1.835e-008	-7.736
Hfo_sOMn+	1.386e-008	0.021	1.460e-008	-7.836
Hfo_sOHCa+2	4.197e-009	0.006	4.422e-009	-8.354
Hfo_sOH	5.165e-010	0.001	5.441e-010	-9.264
Hfo_sOH2+	1.969e-010	0.000	2.074e-010	-9.683
Hfo_sONi+	1.252e-010	0.000	1.319e-010	-9.880
Hfo_sOCd+	4.449e-011	0.000	4.687e-011	-10.329
Hfo_sO-	3.103e-011	0.000	3.269e-011	-10.486
Hfo_sOCo+	1.402e-011	0.000	1.476e-011	-10.831
Hfo_sOFe+	1.432e-013	0.000	1.509e-013	-12.821
Hfo_sOHBa+2	5.522e-014	0.000	5.817e-014	-13.235
Hfo_sOHg+	6.335e-016	0.000	6.674e-016	-15.176

Hfo_w

2.628e-005 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	1.461e-005	0.556	1.539e-005	-4.813
Hfo_wOHSO4-2	5.206e-006	0.198	5.484e-006	-5.261
Hfo_wOH	2.989e-006	0.114	3.149e-006	-5.502
Hfo_wOH2+	1.140e-006	0.043	1.201e-006	-5.921
Hfo_wSO4-	9.958e-007	0.038	1.049e-006	-5.979
Hfo_wOHVO4-3	5.170e-007	0.020	5.446e-007	-6.264
Hfo_wOHASO4-3	2.237e-007	0.009	2.356e-007	-6.628
Hfo_wO-	1.796e-007	0.007	1.892e-007	-6.723
Hfo_wOMg+	1.365e-007	0.005	1.438e-007	-6.842
Hfo_wOZn+	1.056e-007	0.004	1.112e-007	-6.954
Hfo_wOMn+	6.374e-008	0.002	6.714e-008	-7.173
Hfo_wOHSeO3-2	4.191e-008	0.002	4.415e-008	-7.355
Hfo_wSeO3-	2.717e-008	0.001	2.862e-008	-7.543
Hfo_wOPb+	2.093e-008	0.001	2.205e-008	-7.657
Hfo_wOCa+	1.880e-008	0.001	1.981e-008	-7.703
Hfo_wOHMoO4-2	2.625e-009	0.000	2.765e-009	-8.558
Hfo_wONi+	9.777e-010	0.000	1.030e-009	-8.987
Hfo_wHASO4-	7.286e-010	0.000	7.676e-010	-9.115
Hfo_wMoO4-	6.468e-010	0.000	6.814e-010	-9.167
Hfo_wH2BO3	2.390e-010	0.000	2.518e-010	-9.599
Hfo_wOCo+	2.286e-010	0.000	2.409e-010	-9.618
Hfo_wOCd+	1.098e-010	0.000	1.157e-010	-9.937
Hfo_wH2AsO4	8.990e-012	0.000	9.470e-012	-11.024
Hfo_wOFe+	5.230e-013	0.000	5.510e-013	-12.259
Hfo_wOHg+	1.796e-013	0.000	1.892e-013	-12.723
Hfo_wOHSbO(OH) 4-	1.556e-013	0.000	1.639e-013	-12.785
Hfo_wSbO(OH) 4	3.834e-014	0.000	4.039e-014	-13.394
Hfo_wOHSeO4-2	7.746e-015	0.000	8.160e-015	-14.088
Hfo_wOBa+	3.576e-015	0.000	3.767e-015	-14.424
Hfo_wSeO4-	1.290e-015	0.000	1.359e-015	-14.867
Hfo_wOHCrO4-2	5.785e-018	0.000	6.094e-018	-17.215
Hfo_wCrO4-	1.009e-018	0.000	1.063e-018	-17.973
Hfo_wH2AsO3	1.280e-021	0.000	1.348e-021	-20.870

-----Solution composition-----

Elements	Molality	Moles
Al	2.435e-007	2.312e-007
As	1.487e-009	1.411e-009
B	1.901e-005	1.805e-005
Ba	3.625e-008	3.441e-008
C	4.054e-003	3.848e-003
Ca	1.425e-002	1.353e-002
Cd	1.090e-007	1.034e-007
Cl	1.338e-003	1.270e-003
Co	3.133e-007	2.974e-007
Cr	2.525e-009	2.397e-009
Cu	9.837e-006	9.338e-006
F	1.427e-004	1.355e-004

Fe	6.711e-009	6.371e-009
Hg	2.947e-010	2.798e-010
K	2.650e-003	2.516e-003
Mg	5.327e-003	5.056e-003
Mn	2.500e-004	2.373e-004
Mo	2.080e-007	1.975e-007
N	9.514e-007	9.031e-007
Na	1.228e-002	1.166e-002
Ni	3.470e-007	3.294e-007
Pb	3.330e-008	3.161e-008
S	2.488e-002	2.362e-002
Sb	4.780e-007	4.537e-007
Se	1.075e-007	1.020e-007
U	2.653e-007	2.519e-007
V	3.178e-008	3.017e-008
Zn	1.204e-005	1.143e-005

-----Description of solution-----

	pH =	6.906	Charge balance
	pe =	5.867	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength =	6.751e-002	
	Mass of water (kg) =	9.493e-001	
	Total alkalinity (eq/kg) =	3.373e-003	
	Total CO2 (mol/kg) =	4.054e-003	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	1.142e-005	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.02	
	Iterations =	1	
	Total H =	1.053848e+002	
	Total O =	5.279620e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.545e-007	1.242e-007	-6.811	-6.906	-0.095	0.00
OH-	1.025e-007	8.102e-008	-6.989	-7.091	-0.102	(0)
H2O	5.551e+001	9.990e-001	1.744	-0.000	0.000	18.07
Al	2.435e-007					
Al(OH) 4-	1.219e-007	9.780e-008	-6.914	-7.010	-0.096	(0)
AlF2+	5.026e-008	4.079e-008	-7.299	-7.389	-0.091	(0)
AlF3	4.874e-008	4.874e-008	-7.312	-7.312	0.000	(0)
Al(OH) 3	9.588e-009	9.588e-009	-8.018	-8.018	0.000	(0)
Al(OH) 2+	7.309e-009	5.931e-009	-8.136	-8.227	-0.091	(0)
AlF4-	2.890e-009	2.318e-009	-8.539	-8.635	-0.096	(0)
AlF+2	2.489e-009	1.080e-009	-8.604	-8.967	-0.363	(0)
AlOH+2	2.125e-010	9.216e-011	-9.673	-10.035	-0.363	(0)
AlSO4+	7.711e-011	6.186e-011	-10.113	-10.209	-0.096	(0)
Al+3	8.121e-012	1.137e-012	-11.090	-11.944	-0.854	(0)
Al(SO4) 2-	5.789e-012	4.644e-012	-11.237	-11.333	-0.096	(0)
AlMo6O21-3	2.720e-040	0.000e+000	-39.565	-40.758	-1.193	(0)
As (3)	1.673e-021					
H3AsO3	1.664e-021	1.664e-021	-20.779	-20.779	0.000	(0)
H2AsO3-	9.324e-024	6.872e-024	-23.030	-23.163	-0.133	(0)
HAsO3-2	1.711e-028	5.048e-029	-27.767	-28.297	-0.530	(0)
H4AsO3+	1.388e-028	1.023e-028	-27.857	-27.990	-0.133	(0)
AsO3-3	2.442e-034	1.567e-035	-33.612	-34.805	-1.193	(0)
As (5)	1.487e-009					
HAsO4-2	1.023e-009	3.019e-010	-8.990	-9.520	-0.530	(0)
H2AsO4-	4.638e-010	3.418e-010	-9.334	-9.466	-0.133	(0)
AsO4-3	1.198e-013	7.689e-015	-12.922	-14.114	-1.193	(0)
H3AsO4	7.261e-015	7.375e-015	-14.139	-14.132	0.007	(0)
B	1.901e-005					
H3BO3	1.887e-005	1.916e-005	-4.724	-4.718	0.007	(0)

	H2BO3-	1.153e-007	8.963e-008	-6.938	-7.048	-0.109	(0)
	CaH2BO3+	2.328e-008	1.811e-008	-7.633	-7.742	-0.109	(0)
	MgH2BO3+	5.728e-009	4.454e-009	-8.242	-8.351	-0.109	(0)
	Nah2BO3	1.350e-009	1.350e-009	-8.870	-8.870	0.000	(0)
	BF(OH) 3-	9.332e-010	7.257e-010	-9.030	-9.139	-0.109	(0)
	H5 (BO3) 2-	1.880e-012	1.462e-012	-11.726	-11.835	-0.109	(0)
	BF2 (OH) 2-	1.177e-012	9.151e-013	-11.929	-12.039	-0.109	(0)
	BaH2BO3+	5.323e-014	4.140e-014	-13.274	-13.383	-0.109	(0)
	H8 (BO3) 3-	3.602e-015	2.801e-015	-14.443	-14.553	-0.109	(0)
	BF3OH-	5.400e-018	4.199e-018	-17.268	-17.377	-0.109	(0)
	BF4-	3.134e-022	2.437e-022	-21.504	-21.613	-0.109	(0)
Ba	3.625e-008						
	Ba+2	3.580e-008	1.495e-008	-7.446	-7.825	-0.379	(0)
	BaHCO3+	4.363e-010	3.566e-010	-9.360	-9.448	-0.088	(0)
	BaCO3	7.230e-012	7.230e-012	-11.141	-11.141	0.000	(0)
	BaH2BO3+	5.323e-014	4.140e-014	-13.274	-13.383	-0.109	(0)
	BaOH+	6.546e-015	5.286e-015	-14.184	-14.277	-0.093	(0)
	BaNH3+2	5.598e-017	1.652e-017	-16.252	-16.782	-0.530	(0)
	BaNO3+	3.182e-017	2.345e-017	-16.497	-16.630	-0.133	(0)
C (4)	4.054e-003						
	HCO3-	3.078e-003	2.498e-003	-2.512	-2.602	-0.091	(0)
	H2CO3	6.976e-004	6.976e-004	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.998e-004	1.633e-004	-3.699	-3.787	-0.088	(0)
	MgHCO3+	4.599e-005	3.664e-005	-4.337	-4.436	-0.099	(0)
	NaHCO3	1.335e-005	1.335e-005	-4.874	-4.874	0.000	(0)
	CuCO3	5.375e-006	5.375e-006	-5.270	-5.270	0.000	(0)
	CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	MnHCO3+	3.281e-006	2.649e-006	-5.484	-5.577	-0.093	(0)
	CO3-2	2.260e-006	9.433e-007	-5.646	-6.025	-0.379	(0)
	MgCO3	1.124e-006	1.124e-006	-5.949	-5.949	0.000	(0)
	ZnHCO3+	2.917e-007	2.150e-007	-6.535	-6.668	-0.133	(0)
	CuHCO3+	2.069e-007	1.525e-007	-6.684	-6.817	-0.133	(0)
	NaCO3-	2.057e-007	1.669e-007	-6.687	-6.777	-0.091	(0)
	UO2 (CO3) 3-4	1.709e-007	1.296e-009	-6.767	-8.887	-2.120	(0)
	ZnCO3	1.477e-007	1.477e-007	-6.831	-6.831	0.000	(0)
	UO2 (CO3) 2-2	9.290e-008	2.741e-008	-7.032	-7.562	-0.530	(0)
	Cu (CO3) 2-2	4.624e-008	1.365e-008	-7.335	-7.865	-0.530	(0)
	NiHCO3+	3.407e-008	2.511e-008	-7.468	-7.600	-0.133	(0)
	CoHCO3+	1.627e-008	1.199e-008	-7.789	-7.921	-0.133	(0)
	PbCO3	7.844e-009	7.844e-009	-8.105	-8.105	0.000	(0)
	PbHCO3+	6.967e-009	5.135e-009	-8.157	-8.289	-0.133	(0)
	NiCO3	2.869e-009	2.869e-009	-8.542	-8.542	0.000	(0)
	UO2CO3	1.457e-009	1.457e-009	-8.837	-8.837	0.000	(0)
	CoCO3	9.838e-010	9.838e-010	-9.007	-9.007	0.000	(0)
	CdCO3	4.947e-010	4.947e-010	-9.306	-9.306	0.000	(0)
	BaHCO3+	4.363e-010	3.566e-010	-9.360	-9.448	-0.088	(0)
	CdHCO3+	1.775e-010	1.309e-010	-9.751	-9.883	-0.133	(0)
	Pb (CO3) 2-2	7.232e-011	2.134e-011	-10.141	-10.671	-0.530	(0)
	BaCO3	7.230e-012	7.230e-012	-11.141	-11.141	0.000	(0)
	FeHCO3+	1.678e-012	1.372e-012	-11.775	-11.863	-0.088	(0)
	Cd (CO3) 2-2	1.172e-012	3.459e-013	-11.931	-12.461	-0.530	(0)
	HgCO3	1.914e-014	1.914e-014	-13.718	-13.718	0.000	(0)
	Hg (CO3) 2-2	1.935e-016	5.711e-017	-15.713	-16.243	-0.530	(0)
	HgHCO3+	6.005e-017	4.426e-017	-16.221	-16.354	-0.133	(0)
Ca	1.425e-002						
	Ca+2	8.410e-003	3.510e-003	-2.075	-2.455	-0.379	(0)
	CaSO4	5.634e-003	5.634e-003	-2.249	-2.249	0.000	(0)
	CaHCO3+	1.998e-004	1.633e-004	-3.699	-3.787	-0.088	(0)
	CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CaF+	4.504e-006	3.636e-006	-5.346	-5.439	-0.093	(0)
	CaH2BO3+	2.328e-008	1.811e-008	-7.633	-7.742	-0.109	(0)
	CaOH+	6.944e-009	5.675e-009	-8.158	-8.246	-0.088	(0)
	CaNH3+2	2.623e-011	7.741e-012	-10.581	-11.111	-0.530	(0)
	CaNO3+	4.716e-012	3.476e-012	-11.326	-11.459	-0.133	(0)
	Ca (NH3) 2+2	1.829e-020	5.398e-021	-19.738	-20.268	-0.530	(0)
Cd	1.090e-007						
	Cd+2	5.512e-008	2.301e-008	-7.259	-7.638	-0.379	(0)
	CdSO4	3.779e-008	3.779e-008	-7.423	-7.423	0.000	(0)

Cd(SO4) 2-2	1.210e-008	3.572e-009	-7.917	-8.447	-0.530	(0)
CdCl+	3.207e-009	2.363e-009	-8.494	-8.626	-0.133	(0)
CdCO3	4.947e-010	4.947e-010	-9.306	-9.306	0.000	(0)
CdHCO3+	1.775e-010	1.309e-010	-9.751	-9.883	-0.133	(0)
CdF+	4.696e-011	3.461e-011	-10.328	-10.461	-0.133	(0)
CdOH+	2.009e-011	1.481e-011	-10.697	-10.830	-0.133	(0)
CdCl2	1.060e-011	1.060e-011	-10.975	-10.975	0.000	(0)
CdOHC1	7.855e-012	7.855e-012	-11.105	-11.105	0.000	(0)
Cd(CO3) 2-2	1.172e-012	3.459e-013	-11.931	-12.461	-0.530	(0)
CdCl3-	9.757e-015	7.191e-015	-14.011	-14.143	-0.133	(0)
Cd(OH) 2	7.570e-015	7.570e-015	-14.121	-14.121	0.000	(0)
CdF2	6.554e-015	6.554e-015	-14.183	-14.183	0.000	(0)
CdSeO4	4.364e-017	4.364e-017	-16.360	-16.360	0.000	(0)
CdNO3+	3.091e-017	2.278e-017	-16.510	-16.642	-0.133	(0)
Cd2OH+3	2.661e-017	1.708e-018	-16.575	-17.768	-1.193	(0)
Cd(SeO3) 2-2	3.553e-019	1.048e-019	-18.449	-18.979	-0.530	(0)
Cd(OH) 3-	5.084e-020	3.747e-020	-19.294	-19.426	-0.133	(0)
Cd(NO3) 2	3.575e-027	3.575e-027	-26.447	-26.447	0.000	(0)
Cd(OH) 4-2	1.684e-027	4.970e-028	-26.774	-27.304	-0.530	(0)
CdHS+	0.000e+000	0.000e+000	-77.077	-77.209	-0.133	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-147.585	-147.585	0.000	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-223.132	-223.264	-0.133	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-298.117	-298.648	-0.530	(0)
Cl1	1.338e-003					
Cl-	1.338e-003	1.076e-003	-2.874	-2.968	-0.095	(0)
MnCl+	8.913e-008	7.197e-008	-7.050	-7.143	-0.093	(0)
ZnCl+	9.229e-009	7.352e-009	-8.035	-8.134	-0.099	(0)
CdCl+	3.207e-009	2.363e-009	-8.494	-8.626	-0.133	(0)
CuCl+	2.071e-009	1.649e-009	-8.684	-8.783	-0.099	(0)
CuCl	8.726e-010	8.726e-010	-9.059	-9.059	0.000	(0)
ZnOHC1	7.798e-010	7.798e-010	-9.108	-9.108	0.000	(0)
CoCl+	3.115e-010	2.296e-010	-9.507	-9.639	-0.133	(0)
NiCl+	3.044e-010	2.244e-010	-9.517	-9.649	-0.133	(0)
CuCl2-	2.462e-010	1.961e-010	-9.609	-9.708	-0.099	(0)
PbCl+	1.432e-010	1.056e-010	-9.844	-9.976	-0.133	(0)
MnCl2	1.093e-010	1.093e-010	-9.961	-9.961	0.000	(0)
ZnCl2	1.253e-011	1.253e-011	-10.902	-10.902	0.000	(0)
CdCl2	1.060e-011	1.060e-011	-10.975	-10.975	0.000	(0)
CdOHC1	7.855e-012	7.855e-012	-11.105	-11.105	0.000	(0)
HgClOH	2.610e-012	2.610e-012	-11.583	-11.583	0.000	(0)
HgCl2	1.962e-012	1.962e-012	-11.707	-11.707	0.000	(0)
CuCl2	6.152e-013	6.152e-013	-12.211	-12.211	0.000	(0)
PbCl2	5.072e-013	5.072e-013	-12.295	-12.295	0.000	(0)
CuCl3-2	1.061e-013	4.509e-014	-12.974	-13.346	-0.372	(0)
MnCl3-	4.011e-014	3.239e-014	-13.397	-13.490	-0.093	(0)
HgCl3-	2.863e-014	2.110e-014	-13.543	-13.676	-0.133	(0)
ZnCl3-	1.344e-014	1.071e-014	-13.872	-13.970	-0.099	(0)
CdCl3-	9.757e-015	7.191e-015	-14.011	-14.143	-0.133	(0)
NiCl2	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)
UO2Cl+	9.180e-016	6.766e-016	-15.037	-15.170	-0.133	(0)
HgCl+	4.938e-016	3.639e-016	-15.306	-15.439	-0.133	(0)
CrCl+2	3.578e-016	1.056e-016	-15.446	-15.976	-0.530	(0)
HgCl4-2	3.062e-016	9.035e-017	-15.514	-16.044	-0.530	(0)
PbCl3-	2.947e-016	2.172e-016	-15.531	-15.663	-0.133	(0)
ZnCl4-2	1.355e-017	5.758e-018	-16.868	-17.240	-0.372	(0)
CuCl3-	7.752e-018	6.175e-018	-17.111	-17.209	-0.099	(0)
PbCl4-2	3.618e-019	1.068e-019	-18.441	-18.972	-0.530	(0)
FeCl+2	2.277e-019	9.678e-020	-18.643	-19.014	-0.372	(0)
CrOHC12	1.749e-019	1.749e-019	-18.757	-18.757	0.000	(0)
VOC1+	4.714e-020	3.475e-020	-19.327	-19.459	-0.133	(0)
CrCl2+	1.462e-020	1.077e-020	-19.835	-19.968	-0.133	(0)
FeCl2+	5.759e-022	4.650e-022	-21.240	-21.333	-0.093	(0)
CuCl4-2	7.830e-023	3.329e-023	-22.106	-22.478	-0.372	(0)
FeCl3	5.001e-026	5.001e-026	-25.301	-25.301	0.000	(0)
CrO3Cl-	2.769e-027	2.041e-027	-26.558	-26.690	-0.133	(0)
CoCl+2	1.340e-034	3.953e-035	-33.873	-34.403	-0.530	(0)
UCl+3	0.000e+000	0.000e+000	-42.627	-43.820	-1.193	(0)
Co(NH3) 5Cl+2	0.000e+000	0.000e+000	-51.703	-52.233	-0.530	(0)

Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-53.996	-54.526	-0.530	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-67.175	-67.705	-0.530	(0)
Co (2)	3.133e-007					
Co+2	2.091e-007	6.170e-008	-6.680	-7.210	-0.530	(0)
CoSO4	8.625e-008	8.625e-008	-7.064	-7.064	0.000	(0)
CoHCO3+	1.627e-008	1.199e-008	-7.789	-7.921	-0.133	(0)
CoCO3	9.838e-010	9.838e-010	-9.007	-9.007	0.000	(0)
CoCl+	3.115e-010	2.296e-010	-9.507	-9.639	-0.133	(0)
CoF+	2.512e-010	1.852e-010	-9.600	-9.732	-0.133	(0)
CoOH+	1.353e-010	9.974e-011	-9.869	-10.001	-0.133	(0)
Co (OH) 2	6.419e-013	6.419e-013	-12.193	-12.193	0.000	(0)
CoNO2+	1.958e-013	1.443e-013	-12.708	-12.841	-0.133	(0)
Co (NH3) +2	4.403e-014	1.299e-014	-13.356	-13.886	-0.530	(0)
CoSeO4	3.150e-016	3.150e-016	-15.502	-15.502	0.000	(0)
CoNO3+	4.154e-017	3.062e-017	-16.382	-16.514	-0.133	(0)
Co2OH+3	4.806e-018	3.084e-019	-17.318	-18.511	-1.193	(0)
Co (OH) 3-	1.408e-018	1.038e-018	-17.851	-17.984	-0.133	(0)
CoOH-	3.536e-019	2.606e-019	-18.451	-18.584	-0.133	(0)
Co (NH3) 2+2	3.290e-021	9.708e-022	-20.483	-21.013	-0.530	(0)
Co (OH) 4-2	4.516e-026	1.333e-026	-25.345	-25.875	-0.530	(0)
Co (NO3) 2	1.950e-026	1.950e-026	-25.710	-25.710	0.000	(0)
Co (NH3) 3+2	7.255e-029	2.141e-029	-28.139	-28.669	-0.530	(0)
Co4 (OH) 4+4	2.604e-030	1.975e-032	-29.584	-31.705	-2.120	(0)
Co (NH3) 4+2	6.669e-037	1.968e-037	-36.176	-36.706	-0.530	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-44.712	-45.243	-0.530	(0)
Co (3)	2.520e-028					
CoOH+2	2.520e-028	7.437e-029	-27.599	-28.129	-0.530	(0)
Co+3	1.290e-033	1.806e-034	-32.890	-33.743	-0.854	(0)
CoCl+2	1.340e-034	3.953e-035	-33.873	-34.403	-0.530	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-51.703	-52.233	-0.530	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-61.833	-61.966	-0.133	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-67.098	-67.628	-0.530	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-67.175	-67.705	-0.530	(0)
Cr (2)	8.349e-026					
Cr+2	8.349e-026	2.464e-026	-25.078	-25.608	-0.530	(0)
Cr (3)	2.525e-009					
Cr (OH) 2+	1.798e-009	1.325e-009	-8.745	-8.878	-0.133	(0)
Cr (OH) +2	4.556e-010	1.344e-010	-9.341	-9.871	-0.530	(0)
CrOHSO4	2.235e-010	2.235e-010	-9.651	-9.651	0.000	(0)
Cr (OH) 3	4.034e-011	4.034e-011	-10.394	-10.394	0.000	(0)
CrF+2	3.866e-012	1.141e-012	-11.413	-11.943	-0.530	(0)
CrSO4+	1.683e-012	1.241e-012	-11.774	-11.906	-0.133	(0)
Cr+3	1.182e-012	7.584e-014	-11.927	-13.120	-1.193	(0)
CrO2-	2.096e-013	1.545e-013	-12.679	-12.811	-0.133	(0)
Cr (OH) 4-	1.766e-013	1.301e-013	-12.753	-12.886	-0.133	(0)
CrCl+2	3.578e-016	1.056e-016	-15.446	-15.976	-0.530	(0)
Cr2 (OH) 2SO4+2	9.204e-018	2.716e-018	-17.036	-17.566	-0.530	(0)
Cr2 (OH) 2 (SO4) 2	1.130e-018	1.130e-018	-17.947	-17.947	0.000	(0)
CrOHC12	1.749e-019	1.749e-019	-18.757	-18.757	0.000	(0)
CrCl2+	1.462e-020	1.077e-020	-19.835	-19.968	-0.133	(0)
CrNO3+2	3.518e-024	1.038e-024	-23.454	-23.984	-0.530	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-43.092	-43.622	-0.530	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-51.467	-52.659	-1.193	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-53.996	-54.526	-0.530	(0)
Cr (6)	1.822e-017					
CrO4-2	1.448e-017	6.043e-018	-16.839	-17.219	-0.379	(0)
HCrO4-	3.294e-018	2.428e-018	-17.482	-17.615	-0.133	(0)
NaCrO4-	3.872e-019	2.854e-019	-18.412	-18.545	-0.133	(0)
KCrO4-	6.186e-020	4.559e-020	-19.209	-19.341	-0.133	(0)
CrO3SO4-2	2.182e-024	6.439e-025	-23.661	-24.191	-0.530	(0)
H2CrO4	2.443e-025	2.443e-025	-24.612	-24.612	0.000	(0)
CrO3Cl-	2.769e-027	2.041e-027	-26.558	-26.690	-0.133	(0)
Cr2O7-2	6.934e-034	2.046e-034	-33.159	-33.689	-0.530	(0)
Cu (1)	1.993e-009					
Cu+	8.744e-010	6.444e-010	-9.058	-9.191	-0.133	(0)
CuCl	8.726e-010	8.726e-010	-9.059	-9.059	0.000	(0)
CuCl2-	2.462e-010	1.961e-010	-9.609	-9.708	-0.099	(0)
CuCl3-2	1.061e-013	4.509e-014	-12.974	-13.346	-0.372	(0)

Cu (S4) 2-3	0.000e+000	0.000e+000	-146.745	-147.147	-0.403	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.497	-147.877	-0.381	(0)
Cu (2)	9.835e-006					
CuCO3	5.375e-006	5.375e-006	-5.270	-5.270	0.000	(0)
Cu+2	2.318e-006	9.676e-007	-5.635	-6.014	-0.379	(0)
CuSO4	1.553e-006	1.553e-006	-5.809	-5.809	0.000	(0)
CuOH+	3.113e-007	2.479e-007	-6.507	-6.606	-0.099	(0)
CuHCO3+	2.069e-007	1.525e-007	-6.684	-6.817	-0.133	(0)
Cu (CO3) 2-2	4.624e-008	1.365e-008	-7.335	-7.865	-0.530	(0)
CuF+	7.862e-009	5.795e-009	-8.104	-8.237	-0.133	(0)
Cu2 (OH) 2+2	5.232e-009	1.544e-009	-8.281	-8.811	-0.530	(0)
Cu (OH) 2	4.008e-009	4.008e-009	-8.397	-8.397	0.000	(0)
CuCl+	2.071e-009	1.649e-009	-8.684	-8.783	-0.099	(0)
CuNH3+2	5.878e-011	1.734e-011	-10.231	-10.761	-0.530	(0)
CuNO2+	4.563e-011	3.363e-011	-10.341	-10.473	-0.133	(0)
Cu (OH) 3-	9.038e-013	6.661e-013	-12.044	-12.176	-0.133	(0)
CuCl2	6.152e-013	6.152e-013	-12.211	-12.211	0.000	(0)
CuNO3+	1.300e-015	9.581e-016	-14.886	-15.019	-0.133	(0)
Cu (NO2) 2	1.142e-016	1.142e-016	-15.942	-15.942	0.000	(0)
CuCl3-	7.752e-018	6.175e-018	-17.111	-17.209	-0.099	(0)
Cu (OH) 4-2	1.440e-018	4.248e-019	-17.842	-18.372	-0.530	(0)
CuCl4-2	7.830e-023	3.329e-023	-22.106	-22.478	-0.372	(0)
Cu (NO3) 2	3.777e-026	3.777e-026	-25.423	-25.423	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-212.721	-212.853	-0.133	(0)
F	1.427e-004					
F-	1.181e-004	9.491e-005	-3.928	-4.023	-0.095	(0)
MgF+	1.903e-005	1.526e-005	-4.721	-4.816	-0.096	(0)
CaF+	4.504e-006	3.636e-006	-5.346	-5.439	-0.093	(0)
NaF	5.691e-007	5.691e-007	-6.245	-6.245	0.000	(0)
MnF+	2.487e-007	2.008e-007	-6.604	-6.697	-0.093	(0)
AlF2+	5.026e-008	4.079e-008	-7.299	-7.389	-0.091	(0)
AlF3	4.874e-008	4.874e-008	-7.312	-7.312	0.000	(0)
HF	1.743e-008	1.743e-008	-7.759	-7.759	0.000	(0)
CuF+	7.862e-009	5.795e-009	-8.104	-8.237	-0.133	(0)
ZnF+	6.992e-009	5.153e-009	-8.155	-8.288	-0.133	(0)
AlF4-	2.890e-009	2.318e-009	-8.539	-8.635	-0.096	(0)
AlF+2	2.489e-009	1.080e-009	-8.604	-8.967	-0.363	(0)
BF (OH) 3-	9.332e-010	7.257e-010	-9.030	-9.139	-0.109	(0)
NiF+	2.637e-010	1.944e-010	-9.579	-9.711	-0.133	(0)
CoF+	2.512e-010	1.852e-010	-9.600	-9.732	-0.133	(0)
CdF+	4.696e-011	3.461e-011	-10.328	-10.461	-0.133	(0)
PbF+	2.510e-011	1.850e-011	-10.600	-10.733	-0.133	(0)
HF2-	7.955e-012	6.289e-012	-11.099	-11.201	-0.102	(0)
UO2F+	6.895e-012	5.082e-012	-11.161	-11.294	-0.133	(0)
CrF+2	3.866e-012	1.141e-012	-11.413	-11.943	-0.530	(0)
UO2F2	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
BF2 (OH) 2-	1.177e-012	9.151e-013	-11.929	-12.039	-0.109	(0)
UO2F3-	4.500e-014	3.316e-014	-13.347	-13.479	-0.133	(0)
PbF2	3.456e-014	3.456e-014	-13.461	-13.461	0.000	(0)
CdF2	6.554e-015	6.554e-015	-14.183	-14.183	0.000	(0)
VO2F	1.142e-015	1.142e-015	-14.942	-14.942	0.000	(0)
FeF2+	9.754e-016	7.876e-016	-15.011	-15.104	-0.093	(0)
H2F2	8.139e-016	8.139e-016	-15.089	-15.089	0.000	(0)
FeF+2	7.295e-016	3.101e-016	-15.137	-15.509	-0.372	(0)
FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
UO2F4-2	8.473e-017	2.500e-017	-16.072	-16.602	-0.530	(0)
VO2F2-	5.341e-017	3.936e-017	-16.272	-16.405	-0.133	(0)
VOF+	8.894e-018	6.555e-018	-17.051	-17.183	-0.133	(0)
PbF3-	8.441e-018	6.221e-018	-17.074	-17.206	-0.133	(0)
BF3OH-	5.400e-018	4.199e-018	-17.268	-17.377	-0.109	(0)
VOF2	2.333e-019	2.333e-019	-18.632	-18.632	0.000	(0)
VO2F3-2	1.579e-019	4.660e-020	-18.802	-19.332	-0.530	(0)
VOF3-	1.066e-021	7.857e-022	-20.972	-21.105	-0.133	(0)
PbF4-2	9.578e-022	2.826e-022	-21.019	-21.549	-0.530	(0)
BF4-	3.134e-022	2.437e-022	-21.504	-21.613	-0.109	(0)
HgF+	8.095e-023	5.967e-023	-22.092	-22.224	-0.133	(0)
Sb (OH) 2F	5.480e-023	5.480e-023	-22.261	-22.261	0.000	(0)
SbOF	5.394e-023	5.394e-023	-22.268	-22.268	0.000	(0)

VO2F4-3	3.391e-023	2.176e-024	-22.470	-23.662	-1.193	(0)
VOF4-2	1.020e-024	3.010e-025	-23.991	-24.521	-0.530	(0)
UF3+	1.297e-033	9.557e-034	-32.887	-33.020	-0.133	(0)
UF2+2	2.153e-034	6.353e-035	-33.667	-34.197	-0.530	(0)
UF4	9.946e-036	9.946e-036	-35.002	-35.002	0.000	(0)
UF+3	8.285e-037	5.317e-038	-36.082	-37.274	-1.193	(0)
UF5-	5.075e-038	3.741e-038	-37.295	-37.427	-0.133	(0)
UF6-2	3.634e-039	1.072e-039	-38.440	-38.970	-0.530	(0)
Fe (2)	2.247e-010					
Fe+2	1.478e-010	4.361e-011	-9.830	-10.360	-0.530	(0)
FeSO4	7.501e-011	7.501e-011	-10.125	-10.125	0.000	(0)
FeHCO3+	1.678e-012	1.372e-012	-11.775	-11.863	-0.088	(0)
FeOH+	1.742e-013	1.407e-013	-12.759	-12.852	-0.093	(0)
Fe (OH) 2	9.054e-018	9.054e-018	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	2.873e-019	2.320e-019	-18.542	-18.635	-0.093	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.569	-156.569	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-231.979	-232.111	-0.133	(0)
Fe (3)	6.487e-009					
Fe (OH) 2+	6.055e-009	4.913e-009	-8.218	-8.309	-0.091	(0)
Fe (OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.975e-012	3.226e-012	-11.401	-11.491	-0.091	(0)
FeOH+2	3.667e-013	1.559e-013	-12.436	-12.807	-0.372	(0)
FeF2+	9.754e-016	7.876e-016	-15.011	-15.104	-0.093	(0)
FeF+2	7.295e-016	3.101e-016	-15.137	-15.509	-0.372	(0)
FeSO4+	2.901e-016	2.342e-016	-15.537	-15.630	-0.093	(0)
FeF3	1.055e-016	1.055e-016	-15.977	-15.977	0.000	(0)
Fe (SO4) 2-	4.760e-017	3.509e-017	-16.322	-16.455	-0.133	(0)
Fe+3	2.127e-017	2.980e-018	-16.672	-17.526	-0.854	(0)
FeCl+2	2.277e-019	9.678e-020	-18.643	-19.014	-0.372	(0)
FeHSeO3+2	1.957e-021	5.774e-022	-20.708	-21.239	-0.530	(0)
FeCl2+	5.759e-022	4.650e-022	-21.240	-21.333	-0.093	(0)
Fe2 (OH) 2+4	1.061e-022	8.045e-025	-21.974	-24.094	-2.120	(0)
FeCl3	5.001e-026	5.001e-026	-25.301	-25.301	0.000	(0)
FeNO3+2	3.162e-026	9.329e-027	-25.500	-26.030	-0.530	(0)
Fe3 (OH) 4+5	1.174e-028	5.714e-032	-27.930	-31.243	-3.313	(0)
H (0)	3.973e-029					
H2	1.987e-029	2.018e-029	-28.702	-28.695	0.007	(0)
Hg (0)	2.894e-010					
Hg	2.894e-010	2.894e-010	-9.538	-9.538	0.000	(0)
Hg (1)	2.259e-020					
Hg2+2	1.129e-020	3.332e-021	-19.947	-20.477	-0.530	(0)
Hg (2)	5.312e-012					
HgClOH	2.610e-012	2.610e-012	-11.583	-11.583	0.000	(0)
HgCl2	1.962e-012	1.962e-012	-11.707	-11.707	0.000	(0)
Hg (OH) 2	6.916e-013	7.025e-013	-12.160	-12.153	0.007	(0)
HgCl3-	2.863e-014	2.110e-014	-13.543	-13.676	-0.133	(0)
HgCO3	1.914e-014	1.914e-014	-13.718	-13.718	0.000	(0)
HgCl+	4.938e-016	3.639e-016	-15.306	-15.439	-0.133	(0)
HgCl4-2	3.062e-016	9.035e-017	-15.514	-16.044	-0.530	(0)
Hg (CO3) 2-2	1.935e-016	5.711e-017	-15.713	-16.243	-0.530	(0)
HgOH+	7.422e-017	5.470e-017	-16.129	-16.262	-0.133	(0)
HgHCO3+	6.005e-017	4.426e-017	-16.221	-16.354	-0.133	(0)
Hg (NH3) 2+2	1.113e-019	3.283e-020	-18.954	-19.484	-0.530	(0)
HgNH3+2	6.352e-020	1.874e-020	-19.197	-19.727	-0.530	(0)
Hg+2	5.747e-020	1.696e-020	-19.241	-19.771	-0.530	(0)
HgSO4	3.111e-020	3.111e-020	-19.507	-19.507	0.000	(0)
Hg (OH) 3-	9.722e-021	7.165e-021	-20.012	-20.145	-0.133	(0)
HgF+	8.095e-023	5.967e-023	-22.092	-22.224	-0.133	(0)
Hg (NH3) 3+2	7.758e-028	2.289e-028	-27.110	-27.640	-0.530	(0)
HgNO3+	2.660e-030	1.961e-030	-29.575	-29.708	-0.133	(0)
Hg (NH3) 4+2	1.079e-035	3.185e-036	-34.967	-35.497	-0.530	(0)
Hg (NO3) 2	2.551e-040	2.551e-040	-39.593	-39.593	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-135.963	-136.095	-0.133	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.607	-136.607	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.367	-137.897	-0.530	(0)
K	2.650e-003					
K+	2.526e-003	2.031e-003	-2.598	-2.692	-0.095	(0)
KSO4-	1.241e-004	1.007e-004	-3.906	-3.997	-0.091	(0)

KCrO4-	6.186e-020	4.559e-020	-19.209	-19.341	-0.133	(0)
Mg	5.327e-003					
Mg+2	3.433e-003	1.433e-003	-2.464	-2.844	-0.379	(0)
MgSO4	1.827e-003	1.827e-003	-2.738	-2.738	0.000	(0)
MgHCO3+	4.599e-005	3.664e-005	-4.337	-4.436	-0.099	(0)
MgF+	1.903e-005	1.526e-005	-4.721	-4.816	-0.096	(0)
MgCO3	1.124e-006	1.124e-006	-5.949	-5.949	0.000	(0)
MgOH+	5.625e-008	4.623e-008	-7.250	-7.335	-0.085	(0)
MgH2BO3+	5.728e-009	4.454e-009	-8.242	-8.351	-0.109	(0)
Mn (2)	2.500e-004					
Mn+2	1.801e-004	5.315e-005	-3.744	-4.275	-0.530	(0)
MnSO4	6.622e-005	6.622e-005	-4.179	-4.179	0.000	(0)
MnHCO3+	3.281e-006	2.649e-006	-5.484	-5.577	-0.093	(0)
MnF+	2.487e-007	2.008e-007	-6.604	-6.697	-0.093	(0)
MnCl+	8.913e-008	7.197e-008	-7.050	-7.143	-0.093	(0)
MnOH+	1.340e-008	1.082e-008	-7.873	-7.966	-0.093	(0)
MnCl2	1.093e-010	1.093e-010	-9.961	-9.961	0.000	(0)
MnSeO4	1.457e-013	1.457e-013	-12.836	-12.836	0.000	(0)
MnCl3-	4.011e-014	3.239e-014	-13.397	-13.490	-0.093	(0)
MnNO3+	3.578e-014	2.637e-014	-13.446	-13.579	-0.133	(0)
Mn (OH) 3-	5.435e-019	4.389e-019	-18.265	-18.358	-0.093	(0)
Mn (NO3) 2	2.074e-023	2.074e-023	-22.683	-22.683	0.000	(0)
Mn (OH) 4-2	2.701e-025	1.148e-025	-24.569	-24.940	-0.372	(0)
MnSe	0.000e+000	0.000e+000	-41.662	-41.662	0.000	(0)
Mn (3)	1.247e-023					
Mn+3	1.247e-023	1.746e-024	-22.904	-23.758	-0.854	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-43.612	-43.984	-0.372	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-47.384	-47.489	-0.106	(0)
Mo	2.080e-007					
MoO4-2	2.077e-007	8.671e-008	-6.682	-7.062	-0.379	(0)
HMoO4-	2.907e-010	2.142e-010	-9.537	-9.669	-0.133	(0)
H2MoO4	1.948e-013	1.948e-013	-12.710	-12.710	0.000	(0)
AlMo6O21-3	2.720e-040	0.000e+000	-39.565	-40.758	-1.193	(0)
Mo7O24-6	0.000e+000	0.000e+000	-46.919	-51.690	-4.770	(0)
HMo7O24-5	0.000e+000	0.000e+000	-48.896	-52.209	-3.313	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-52.213	-54.333	-2.120	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-56.800	-57.993	-1.193	(0)
N (-3)	5.278e-007					
NH4+	4.905e-007	3.814e-007	-6.309	-6.419	-0.109	(0)
NH4SO4-	3.546e-008	2.863e-008	-7.450	-7.543	-0.093	(0)
NH3	1.752e-009	1.752e-009	-8.757	-8.757	0.000	(0)
CuNH3+2	5.878e-011	1.734e-011	-10.231	-10.761	-0.530	(0)
CaNH3+2	2.623e-011	7.741e-012	-10.581	-11.111	-0.530	(0)
NiNH3+2	2.599e-013	7.669e-014	-12.585	-13.115	-0.530	(0)
Co (NH3) +2	4.403e-014	1.299e-014	-13.356	-13.886	-0.530	(0)
BaNH3+2	5.598e-017	1.652e-017	-16.252	-16.782	-0.530	(0)
Hg (NH3) 2+2	1.113e-019	3.283e-020	-18.954	-19.484	-0.530	(0)
Ni (NH3) 2+2	6.580e-020	1.942e-020	-19.182	-19.712	-0.530	(0)
HgNH3+2	6.352e-020	1.874e-020	-19.197	-19.727	-0.530	(0)
Ca (NH3) 2+2	1.829e-020	5.398e-021	-19.738	-20.268	-0.530	(0)
Co (NH3) 2+2	3.290e-021	9.708e-022	-20.483	-21.013	-0.530	(0)
Hg (NH3) 3+2	7.758e-028	2.289e-028	-27.110	-27.640	-0.530	(0)
Co (NH3) 3+2	7.255e-029	2.141e-029	-28.139	-28.669	-0.530	(0)
Hg (NH3) 4+2	1.079e-035	3.185e-036	-34.967	-35.497	-0.530	(0)
Co (NH3) 4+2	6.669e-037	1.968e-037	-36.176	-36.706	-0.530	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-43.092	-43.622	-0.530	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-44.712	-45.243	-0.530	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-51.467	-52.659	-1.193	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-51.703	-52.233	-0.530	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-53.996	-54.526	-0.530	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-61.833	-61.966	-0.133	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-67.098	-67.628	-0.530	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-67.175	-67.705	-0.530	(0)
N (3)	4.232e-007					
NO2-	4.231e-007	3.319e-007	-6.374	-6.479	-0.106	(0)
CuNO2+	4.563e-011	3.363e-011	-10.341	-10.473	-0.133	(0)

CoNO2+	1.958e-013	1.443e-013	-12.708	-12.841	-0.133	(0)
Cu (NO2) 2	1.142e-016	1.142e-016	-15.942	-15.942	0.000	(0)
N (5)	3.943e-010					
NO3-	3.895e-010	3.131e-010	-9.409	-9.504	-0.095	(0)
CaNO3+	4.716e-012	3.476e-012	-11.326	-11.459	-0.133	(0)
MnNO3+	3.578e-014	2.637e-014	-13.446	-13.579	-0.133	(0)
ZnNO3+	2.904e-015	2.140e-015	-14.537	-14.670	-0.133	(0)
CuNO3+	1.300e-015	9.581e-016	-14.886	-15.019	-0.133	(0)
NiNO3+	8.700e-017	6.412e-017	-16.060	-16.193	-0.133	(0)
CoNO3+	4.154e-017	3.062e-017	-16.382	-16.514	-0.133	(0)
BaNO3+	3.182e-017	2.345e-017	-16.497	-16.630	-0.133	(0)
CdNO3+	3.091e-017	2.278e-017	-16.510	-16.642	-0.133	(0)
PbNO3+	1.738e-017	1.281e-017	-16.760	-16.892	-0.133	(0)
UO2NO3+	3.288e-022	2.423e-022	-21.483	-21.616	-0.133	(0)
Mn (NO3) 2	2.074e-023	2.074e-023	-22.683	-22.683	0.000	(0)
CrNO3+2	3.518e-024	1.038e-024	-23.454	-23.984	-0.530	(0)
VO2NO3	1.087e-024	1.087e-024	-23.964	-23.964	0.000	(0)
Zn (NO3) 2	1.337e-025	1.337e-025	-24.874	-24.874	0.000	(0)
Cu (NO3) 2	3.777e-026	3.777e-026	-25.423	-25.423	0.000	(0)
FeNO3+2	3.162e-026	9.329e-027	-25.500	-26.030	-0.530	(0)
Co (NO3) 2	1.950e-026	1.950e-026	-25.710	-25.710	0.000	(0)
Pb (NO3) 2	6.812e-027	6.812e-027	-26.167	-26.167	0.000	(0)
Cd (NO3) 2	3.575e-027	3.575e-027	-26.447	-26.447	0.000	(0)
HgNO3+	2.660e-030	1.961e-030	-29.575	-29.708	-0.133	(0)
Hg (NO3) 2	2.551e-040	2.551e-040	-39.593	-39.593	0.000	(0)
Na	1.228e-002					
Na+	1.182e-002	9.504e-003	-1.927	-2.022	-0.095	(0)
NaSO4-	4.406e-004	3.576e-004	-3.356	-3.447	-0.091	(0)
NaHCO3	1.335e-005	1.335e-005	-4.874	-4.874	0.000	(0)
NaF	5.691e-007	5.691e-007	-6.245	-6.245	0.000	(0)
NaCO3-	2.057e-007	1.669e-007	-6.687	-6.777	-0.091	(0)
NaH2BO3	1.350e-009	1.350e-009	-8.870	-8.870	0.000	(0)
NaCrO4-	3.872e-019	2.854e-019	-18.412	-18.545	-0.133	(0)
Ni	3.470e-007					
Ni+2	1.953e-007	8.153e-008	-6.709	-7.089	-0.379	(0)
NiSO4	1.140e-007	1.140e-007	-6.943	-6.943	0.000	(0)
NiHCO3+	3.407e-008	2.511e-008	-7.468	-7.600	-0.133	(0)
NiCO3	2.869e-009	2.869e-009	-8.542	-8.542	0.000	(0)
NiCl+	3.044e-010	2.244e-010	-9.517	-9.649	-0.133	(0)
NiF+	2.637e-010	1.944e-010	-9.579	-9.711	-0.133	(0)
NiOH+	1.128e-010	8.316e-011	-9.948	-10.080	-0.133	(0)
Ni (SO4) 2-2	8.961e-011	2.644e-011	-10.048	-10.578	-0.530	(0)
Ni (OH) 2	5.352e-013	5.352e-013	-12.271	-12.271	0.000	(0)
NiNH3+2	2.599e-013	7.669e-014	-12.585	-13.115	-0.530	(0)
NiCl2	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)
NiSeO4	3.885e-016	3.885e-016	-15.411	-15.411	0.000	(0)
NiNO3+	8.700e-017	6.412e-017	-16.060	-16.193	-0.133	(0)
Ni (OH) 3-	5.884e-017	4.337e-017	-16.230	-16.363	-0.133	(0)
Ni (NH3) 2+2	6.580e-020	1.942e-020	-19.182	-19.712	-0.530	(0)
O (0)	2.447e-035					
O2	1.223e-035	1.243e-035	-34.912	-34.906	0.007	(0)
Pb	3.330e-008					
PbSO4	9.493e-009	9.493e-009	-8.023	-8.023	0.000	(0)
PbCO3	7.844e-009	7.844e-009	-8.105	-8.105	0.000	(0)
PbHCO3+	6.967e-009	5.135e-009	-8.157	-8.289	-0.133	(0)
Pb+2	6.627e-009	2.766e-009	-8.179	-8.558	-0.379	(0)
Pb (SO4) 2-2	1.358e-009	4.008e-010	-8.867	-9.397	-0.530	(0)
PbOH+	7.639e-010	5.630e-010	-9.117	-9.249	-0.133	(0)
PbCl+	1.432e-010	1.056e-010	-9.844	-9.976	-0.133	(0)
Pb (CO3) 2-2	7.232e-011	2.134e-011	-10.141	-10.671	-0.530	(0)
PbF+	2.510e-011	1.850e-011	-10.600	-10.733	-0.133	(0)
Pb (OH) 2	1.443e-012	1.443e-012	-11.841	-11.841	0.000	(0)
PbCl2	5.072e-013	5.072e-013	-12.295	-12.295	0.000	(0)
PbF2	3.456e-014	3.456e-014	-13.461	-13.461	0.000	(0)
Pb2OH+3	3.846e-016	2.468e-017	-15.415	-16.608	-1.193	(0)
PbCl3-	2.947e-016	2.172e-016	-15.531	-15.663	-0.133	(0)
Pb (OH) 3-	1.586e-016	1.169e-016	-15.800	-15.932	-0.133	(0)
PbNO3+	1.738e-017	1.281e-017	-16.760	-16.892	-0.133	(0)

PbF3-	8.441e-018	6.221e-018	-17.074	-17.206	-0.133	(0)
PbCl4-2	3.618e-019	1.068e-019	-18.441	-18.972	-0.530	(0)
Pb (OH) 4-2	7.860e-021	2.319e-021	-20.105	-20.635	-0.530	(0)
PbF4-2	9.578e-022	2.826e-022	-21.019	-21.549	-0.530	(0)
Pb3 (OH) 4+2	3.893e-022	1.149e-022	-21.410	-21.940	-0.530	(0)
Pb4 (OH) 4+4	3.329e-025	2.524e-027	-24.478	-26.598	-2.120	(0)
Pb (NO3) 2	6.812e-027	6.812e-027	-26.167	-26.167	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-148.447	-148.447	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-224.594	-224.726	-0.133	(0)
S (-2)	0.000e+000					
CdHS+	0.000e+000	0.000e+000	-77.077	-77.209	-0.133	(0)
HS-	0.000e+000	0.000e+000	-77.447	-77.579	-0.133	(0)
H2S	0.000e+000	0.000e+000	-77.465	-77.465	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.508	-80.038	-0.530	(0)
S6-2	0.000e+000	0.000e+000	-80.024	-80.554	-0.530	(0)
S4-2	0.000e+000	0.000e+000	-80.104	-80.634	-0.530	(0)
S3-2	0.000e+000	0.000e+000	-80.910	-81.440	-0.530	(0)
S2-2	0.000e+000	0.000e+000	-81.926	-82.456	-0.530	(0)
S-2	0.000e+000	0.000e+000	-87.602	-87.973	-0.372	(0)
HgHS2-	0.000e+000	0.000e+000	-135.963	-136.095	-0.133	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.607	-136.607	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.367	-137.897	-0.530	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.745	-147.147	-0.403	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-146.875	-147.008	-0.133	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.497	-147.877	-0.381	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-147.585	-147.585	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-147.904	-147.904	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-148.447	-148.447	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.569	-156.569	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-212.721	-212.853	-0.133	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.071	-222.203	-0.133	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-223.132	-223.264	-0.133	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-224.594	-224.726	-0.133	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-224.747	-225.277	-0.530	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-231.979	-232.111	-0.133	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-298.117	-298.648	-0.530	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-300.713	-301.243	-0.530	(0)
Sb2S4-2	0.000e+000	0.000e+000	-309.262	-309.792	-0.530	(0)
S (6)	2.488e-002					
SO4-2	1.678e-002	7.006e-003	-1.775	-2.155	-0.379	(0)
CaSO4	5.634e-003	5.634e-003	-2.249	-2.249	0.000	(0)
MgSO4	1.827e-003	1.827e-003	-2.738	-2.738	0.000	(0)
NaSO4-	4.406e-004	3.576e-004	-3.356	-3.447	-0.091	(0)
KSO4-	1.241e-004	1.007e-004	-3.906	-3.997	-0.091	(0)
MnSO4	6.622e-005	6.622e-005	-4.179	-4.179	0.000	(0)
ZnSO4	4.171e-006	4.171e-006	-5.380	-5.380	0.000	(0)
CuSO4	1.553e-006	1.553e-006	-5.809	-5.809	0.000	(0)
Zn (SO4) 2-2	8.625e-007	2.545e-007	-6.064	-6.594	-0.530	(0)
NiSO4	1.140e-007	1.140e-007	-6.943	-6.943	0.000	(0)
HSO4-	1.060e-007	8.501e-008	-6.975	-7.071	-0.096	(0)
CoSO4	8.625e-008	8.625e-008	-7.064	-7.064	0.000	(0)
CdSO4	3.779e-008	3.779e-008	-7.423	-7.423	0.000	(0)
NH4SO4-	3.546e-008	2.863e-008	-7.450	-7.543	-0.093	(0)
Cd (SO4) 2-2	1.210e-008	3.572e-009	-7.917	-8.447	-0.530	(0)
PbSO4	9.493e-009	9.493e-009	-8.023	-8.023	0.000	(0)
Pb (SO4) 2-2	1.358e-009	4.008e-010	-8.867	-9.397	-0.530	(0)
CrOHSO4	2.235e-010	2.235e-010	-9.651	-9.651	0.000	(0)
Ni (SO4) 2-2	8.961e-011	2.644e-011	-10.048	-10.578	-0.530	(0)
AlSO4+	7.711e-011	6.186e-011	-10.113	-10.209	-0.096	(0)
FeSO4	7.501e-011	7.501e-011	-10.125	-10.125	0.000	(0)
Al (SO4) 2-	5.789e-012	4.644e-012	-11.237	-11.333	-0.096	(0)
UO2SO4	4.113e-012	4.113e-012	-11.386	-11.386	0.000	(0)
CrSO4+	1.683e-012	1.241e-012	-11.774	-11.906	-0.133	(0)
UO2 (SO4) 2-2	1.287e-012	3.799e-013	-11.890	-12.420	-0.530	(0)
VO2SO4-	1.558e-015	1.148e-015	-14.808	-14.940	-0.133	(0)
FeSO4+	2.901e-016	2.342e-016	-15.537	-15.630	-0.093	(0)
Fe (SO4) 2-	4.760e-017	3.509e-017	-16.322	-16.455	-0.133	(0)
VO4SO4	2.222e-017	2.222e-017	-16.653	-16.653	0.000	(0)

Cr2(OH)2SO4+2	9.204e-018	2.716e-018	-17.036	-17.566	-0.530	(0)
Cr2(OH)2(SO4)2	1.130e-018	1.130e-018	-17.947	-17.947	0.000	(0)
HgSO4	3.111e-020	3.111e-020	-19.507	-19.507	0.000	(0)
CrO3SO4-2	2.182e-024	6.439e-025	-23.661	-24.191	-0.530	(0)
VSO4+	5.384e-031	3.968e-031	-30.269	-30.401	-0.133	(0)
U(SO4)2	4.358e-037	4.358e-037	-36.361	-36.361	0.000	(0)
USO4+2	2.654e-038	7.831e-039	-37.576	-38.106	-0.530	(0)
Co(NH3)6SO4+	0.000e+000	0.000e+000	-61.833	-61.966	-0.133	(0)
Sb(3)	5.881e-018					
Sb(OH)3	2.974e-018	2.974e-018	-17.527	-17.527	0.000	(0)
HSbO2	2.906e-018	2.906e-018	-17.537	-17.537	0.000	(0)
Sb(OH)2F	5.480e-023	5.480e-023	-22.261	-22.261	0.000	(0)
SbOF	5.394e-023	5.394e-023	-22.268	-22.268	0.000	(0)
SbO2-	5.143e-023	3.791e-023	-22.289	-22.421	-0.133	(0)
Sb(OH)4-	2.942e-023	2.168e-023	-22.531	-22.664	-0.133	(0)
Sb(OH)2+	1.218e-023	8.976e-024	-22.914	-23.047	-0.133	(0)
SbO+	4.202e-024	3.097e-024	-23.376	-23.509	-0.133	(0)
Sb2S4-2	0.000e+000	0.000e+000	-309.262	-309.792	-0.530	(0)
Sb(5)	4.780e-007					
SbO3-	4.775e-007	3.519e-007	-6.321	-6.454	-0.133	(0)
Sb(OH)6-	5.107e-010	4.105e-010	-9.292	-9.387	-0.095	(0)
SbO2+	2.113e-021	1.557e-021	-20.675	-20.808	-0.133	(0)
Se(-2)	1.674e-039					
HSe-	1.674e-039	1.234e-039	-38.776	-38.909	-0.133	(0)
MnSe	0.000e+000	0.000e+000	-41.662	-41.662	0.000	(0)
H2Se	0.000e+000	0.000e+000	-41.925	-41.925	0.000	(0)
Se-2	0.000e+000	0.000e+000	-46.473	-47.003	-0.530	(0)
Se(4)	1.075e-007					
HSeO3-	9.950e-008	7.333e-008	-7.002	-7.135	-0.133	(0)
SeO3-2	7.969e-009	2.351e-009	-8.099	-8.629	-0.530	(0)
H2SeO3	3.884e-012	3.884e-012	-11.411	-11.411	0.000	(0)
Cd(SeO3)2-2	3.553e-019	1.048e-019	-18.449	-18.979	-0.530	(0)
FeHSeO3+2	1.957e-021	5.774e-022	-20.708	-21.239	-0.530	(0)
Se(6)	2.455e-011					
SeO4-2	2.440e-011	1.019e-011	-10.613	-10.992	-0.379	(0)
MnSeO4	1.457e-013	1.457e-013	-12.836	-12.836	0.000	(0)
ZnSeO4	4.293e-015	4.293e-015	-14.367	-14.367	0.000	(0)
NiSeO4	3.885e-016	3.885e-016	-15.411	-15.411	0.000	(0)
CoSeO4	3.150e-016	3.150e-016	-15.502	-15.502	0.000	(0)
HSeO4-	8.600e-017	6.339e-017	-16.065	-16.198	-0.133	(0)
CdSeO4	4.364e-017	4.364e-017	-16.360	-16.360	0.000	(0)
Zn(SeO4)2-2	1.503e-025	4.434e-026	-24.823	-25.353	-0.530	(0)
U(3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-56.022	-57.214	-1.193	(0)
U(4)	9.786e-022					
U(OH)5-	9.748e-022	7.185e-022	-21.011	-21.144	-0.133	(0)
U(OH)4	3.739e-024	3.739e-024	-23.427	-23.427	0.000	(0)
U(OH)3+	2.305e-027	1.699e-027	-26.637	-26.770	-0.133	(0)
U(OH)2+2	3.308e-031	9.763e-032	-30.480	-31.010	-0.530	(0)
UF3+	1.297e-033	9.557e-034	-32.887	-33.020	-0.133	(0)
UF2+2	2.153e-034	6.353e-035	-33.667	-34.197	-0.530	(0)
UF4	9.946e-036	9.946e-036	-35.002	-35.002	0.000	(0)
UOH+3	8.904e-036	5.714e-037	-35.050	-36.243	-1.193	(0)
UF+3	8.285e-037	5.317e-038	-36.082	-37.274	-1.193	(0)
U(SO4)2	4.358e-037	4.358e-037	-36.361	-36.361	0.000	(0)
UF5-	5.075e-038	3.741e-038	-37.295	-37.427	-0.133	(0)
USO4+2	2.654e-038	7.831e-039	-37.576	-38.106	-0.530	(0)
UF6-2	3.634e-039	1.072e-039	-38.440	-38.970	-0.530	(0)
U+4	0.000e+000	0.000e+000	-40.431	-42.552	-2.120	(0)
UC1+3	0.000e+000	0.000e+000	-42.627	-43.820	-1.193	(0)
U6(OH)15+9	0.000e+000	0.000e+000	-158.147	-168.881	-10.734	(0)
U(5)	4.362e-016					
UO2+	4.362e-016	3.215e-016	-15.360	-15.493	-0.133	(0)
U(6)	2.653e-007					
UO2(CO3)3-4	1.709e-007	1.296e-009	-6.767	-8.887	-2.120	(0)
UO2(CO3)2-2	9.290e-008	2.741e-008	-7.032	-7.562	-0.530	(0)
UO2CO3	1.457e-009	1.457e-009	-8.837	-8.837	0.000	(0)
UO2F+	6.895e-012	5.082e-012	-11.161	-11.294	-0.133	(0)

UO2OH+	5.368e-012	3.956e-012	-11.270	-11.403	-0.133	(0)
UO2SO4	4.113e-012	4.113e-012	-11.386	-11.386	0.000	(0)
UO2F2	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
UO2 (SO4) 2-2	1.287e-012	3.799e-013	-11.890	-12.420	-0.530	(0)
UO2+2	9.292e-013	3.879e-013	-12.032	-12.411	-0.379	(0)
UO2F3-	4.500e-014	3.316e-014	-13.347	-13.479	-0.133	(0)
UO2Cl+	9.180e-016	6.766e-016	-15.037	-15.170	-0.133	(0)
(UO2) 2 (OH) 2+2	8.804e-017	2.598e-017	-16.055	-16.585	-0.530	(0)
UO2F4-2	8.473e-017	2.500e-017	-16.072	-16.602	-0.530	(0)
(UO2) 3 (OH) 5+	6.945e-019	5.119e-019	-18.158	-18.291	-0.133	(0)
UO2NO3+	3.288e-022	2.423e-022	-21.483	-21.616	-0.133	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-40.546	-40.679	-0.133	(0)
V+2	0.000e+000	0.000e+000	-40.567	-41.097	-0.530	(0)
V (3)	5.148e-014					
V (OH) 3	5.148e-014	5.148e-014	-13.288	-13.288	0.000	(0)
V (OH) 2+	5.608e-024	4.134e-024	-23.251	-23.384	-0.133	(0)
VOH+2	1.651e-026	4.872e-027	-25.782	-26.312	-0.530	(0)
V+3	1.870e-030	1.200e-031	-29.728	-30.921	-1.193	(0)
VSO4+	5.384e-031	3.968e-031	-30.269	-30.401	-0.133	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-49.704	-51.825	-2.120	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-50.051	-51.244	-1.193	(0)
V (4)	3.228e-016					
V (OH) 3+	2.523e-016	1.860e-016	-15.598	-15.731	-0.133	(0)
Vo+2	3.902e-017	1.152e-017	-16.409	-16.939	-0.530	(0)
VOSO4	2.222e-017	2.222e-017	-16.653	-16.653	0.000	(0)
VOF+	8.894e-018	6.555e-018	-17.051	-17.183	-0.133	(0)
VOF2	2.333e-019	2.333e-019	-18.632	-18.632	0.000	(0)
VOC1+	4.714e-020	3.475e-020	-19.327	-19.459	-0.133	(0)
VOF3-	1.066e-021	7.857e-022	-20.972	-21.105	-0.133	(0)
VOF4-2	1.020e-024	3.010e-025	-23.991	-24.521	-0.530	(0)
H2V2O4+2	5.886e-027	1.737e-027	-26.230	-26.760	-0.530	(0)
V (5)	3.178e-008					
H2VO4-	3.021e-008	2.227e-008	-7.520	-7.652	-0.133	(0)
HVO4-2	1.527e-009	4.505e-010	-8.816	-9.346	-0.530	(0)
H3VO4	2.765e-011	2.765e-011	-10.558	-10.558	0.000	(0)
H3V2O7-	5.398e-012	3.979e-012	-11.268	-11.400	-0.133	(0)
HV2O7-3	5.302e-014	3.403e-015	-13.276	-14.468	-1.193	(0)
VO2+	8.537e-015	6.862e-015	-14.069	-14.164	-0.095	(0)
VO2SO4-	1.558e-015	1.148e-015	-14.808	-14.940	-0.133	(0)
VO2F	1.142e-015	1.142e-015	-14.942	-14.942	0.000	(0)
VO4-3	2.834e-016	1.819e-017	-15.548	-16.740	-1.193	(0)
V3O9-3	1.807e-016	1.160e-017	-15.743	-16.936	-1.193	(0)
V2O7-4	9.729e-017	7.376e-019	-16.012	-18.132	-2.120	(0)
VO2F2-	5.341e-017	3.936e-017	-16.272	-16.405	-0.133	(0)
VO2F3-2	1.579e-019	4.660e-020	-18.802	-19.332	-0.530	(0)
V4O12-4	1.421e-020	1.077e-022	-19.847	-21.968	-2.120	(0)
VO2F4-3	3.391e-023	2.176e-024	-22.470	-23.662	-1.193	(0)
VO2NO3	1.087e-024	1.087e-024	-23.964	-23.964	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-50.466	-55.237	-4.770	(0)
HV10O28-5	0.000e+000	0.000e+000	-50.643	-53.956	-3.313	(0)
H2V10O28-4	0.000e+000	0.000e+000	-53.534	-55.654	-2.120	(0)
Zn	1.204e-005					
Zn+2	6.519e-006	2.721e-006	-5.186	-5.565	-0.379	(0)
ZnSO4	4.171e-006	4.171e-006	-5.380	-5.380	0.000	(0)
Zn (SO4) 2-2	8.625e-007	2.545e-007	-6.064	-6.594	-0.530	(0)
ZnHCO3+	2.917e-007	2.150e-007	-6.535	-6.668	-0.133	(0)
ZnCO3	1.477e-007	1.477e-007	-6.831	-6.831	0.000	(0)
ZnOH+	2.991e-008	2.205e-008	-7.524	-7.657	-0.133	(0)
ZnCl+	9.229e-009	7.352e-009	-8.035	-8.134	-0.099	(0)
ZnF+	6.992e-009	5.153e-009	-8.155	-8.288	-0.133	(0)
ZnOHCl	7.798e-010	7.798e-010	-9.108	-9.108	0.000	(0)
Zn (OH) 2	2.831e-010	2.831e-010	-9.548	-9.548	0.000	(0)
ZnCl2	1.253e-011	1.253e-011	-10.902	-10.902	0.000	(0)
Zn (OH) 3-	1.560e-013	1.150e-013	-12.807	-12.939	-0.133	(0)
ZnCl3-	1.344e-014	1.071e-014	-13.872	-13.970	-0.099	(0)
ZnSeO4	4.293e-015	4.293e-015	-14.367	-14.367	0.000	(0)
ZnNO3+	2.904e-015	2.140e-015	-14.537	-14.670	-0.133	(0)

ZnCl4-2	1.355e-017	5.758e-018	-16.868	-17.240	-0.372	(0)
Zn(OH) 4-2	1.257e-018	3.708e-019	-17.901	-18.431	-0.530	(0)
Zn(SeO4) 2-2	1.503e-025	4.434e-026	-24.823	-25.353	-0.530	(0)
Zn(NO3) 2	1.337e-025	1.337e-025	-24.874	-24.874	0.000	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-146.875	-147.008	-0.133	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-147.904	-147.904	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.071	-222.203	-0.133	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-224.747	-225.277	-0.530	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-300.713	-301.243	-0.530	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-59.57	-53.28	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-44.72	-40.21	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.95	-40.21	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-77.27	-59.33	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-59.76	-39.72	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.46	-30.06	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.28	-23.83	0.45	(NH4)2SeO4
Al(OH)3(am)	-2.03	8.77	10.80	Al(OH)3
Al2(MoO4)3	-47.44	-45.07	2.37	Al2(MoO4)3
Al2O3	-2.11	17.55	19.65	Al2O3
Al4(OH)10SO4	-3.57	19.13	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.16	-5.36	4.80	AlAsO4:2H2O
AlOHSO4	-3.96	-7.19	-3.23	AlOHSO4
AlSb	-151.01	-85.39	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.92	-10.71	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-54.09	-85.96	-31.88	Cu0.25Cu1.5S
Antlerite	-1.36	7.43	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-80.35	-83.11	-2.76	As4O6
Artinite	-7.50	2.10	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-34.97	-28.26	6.71	As2O5
Atacamite	-1.67	5.72	7.39	Cu2(OH)3Cl
Azurite	0.62	-16.28	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-18.41	5.98	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.42	-2.54	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-1.39	-10.30	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-29.50	3.44	32.94	Ba3(VO4)2:4H2O
BaCrO4	-15.37	-25.04	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-7.93	-14.89	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.88	-8.05	1.83	BaSeO3
BaSeO4	-11.36	-18.82	-7.46	BaSeO4
Bianchite	-5.96	-7.72	-1.76	ZnSO4:6H2O
Birnessite	-8.36	9.73	18.09	MnO2
Bixbyite	-5.44	-6.08	-0.64	Mn2O3
BlaubleiI	-53.76	-77.92	-24.16	Cu0.9Cu0.2S
BlaubleiII	-54.36	-81.63	-27.28	Cu0.6Cu0.8S
Boehmite	0.20	8.77	8.58	AlOOH
Breithauptite	-56.14	-74.66	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-5.88	10.97	16.84	Mg(OH)2
Bunsenite	-5.72	6.72	12.45	NiO
Ca(VO3)2	-8.82	-3.16	5.66	Ca(VO3)2
Ca2V2O7	-9.30	8.20	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.35	8.20	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.49	5.81	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.40	19.56	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.31	19.55	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-297.22	-154.25	142.97	Ca3Sb2
CaCrO4	-17.41	-19.67	-2.27	CaCrO4

Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.50	-26.41	-17.91	Hg2Cl2
CaMoO4	-1.57	-9.52	-7.95	CaMoO4
Carnotite	-1.87	-1.64	0.23	KUO2VO4
CaSeO3:2H2O	-5.50	-2.68	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.43	-13.45	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.10	-3.26	9.84	Cd(BO2)2
Cd(OH)2	-7.47	6.17	13.64	Cd(OH)2
Cd(OH)2(am)	-7.56	6.17	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.12	-13.41	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.01	2.55	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.67	8.73	28.40	Cd4(OH)6SO4
CdCl2	-12.92	-13.57	-0.66	CdCl2
CdCl2:1H2O	-11.88	-13.58	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.66	-13.58	-1.91	CdCl2:2.5H2O
CdF2	-14.47	-15.68	-1.21	CdF2
Cdmetal(alpha)	-32.89	-19.37	13.51	Cd
Cdmetal(gamma)	-32.99	-19.37	13.62	Cd
CdMoO4	-0.55	-14.70	-14.15	CdMoO4
CdOHCl	-7.24	-3.70	3.54	CdOHCl
CdSb	-74.86	-75.21	-0.35	CdSb
CdSe	-19.44	-39.64	-20.20	CdSe
CdSeO4:2H2O	-16.78	-18.63	-1.85	CdSeO4:2H2O
CdSO4	-9.62	-9.79	-0.17	CdSO4
CdSO4:1H2O	-8.07	-9.79	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.92	-9.79	-1.87	CdSO4:2.67H2O
Cerrusite	-1.45	-14.58	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-5.53	-8.17	-2.64	CuSO4:5H2O
Chalcocite	-54.13	-89.05	-34.92	Cu2S
Chalcopyrite	-122.45	-157.72	-35.27	CuFeS2
Cinnabar	-50.94	-96.64	-45.69	HgS
Claudetite	-80.05	-83.11	-3.06	As4O6
Clausthalite	-13.46	-40.56	-27.10	PbSe
Co(BO2)2	-29.90	-2.83	27.07	Co(BO2)2
Co(OH)2	-6.49	6.60	13.09	Co(OH)2
Co(OH)3	-10.72	-13.03	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-21.49	-8.46	13.03	Co3(AsO4)2
Co3O4	-8.95	-19.45	-10.50	Co3O4
CoCl2	-21.41	-13.15	8.27	CoCl2
CoCl2:6H2O	-15.69	-13.15	2.54	CoCl2:6H2O
CoCO3	-3.26	-13.24	-9.98	CoCO3
CoF2	-13.66	-15.26	-1.60	CoF2
CoF3	-44.35	-45.81	-1.46	CoF3
CoFe2O4	16.51	12.99	-3.53	CoFe2O4
CoMoO4	-6.51	-14.27	-7.76	CoMoO4
CoO	-6.98	6.60	13.59	CoO
CoS(alpha)	-70.44	-77.88	-7.44	CoS
CoS(beta)	-66.81	-77.88	-11.07	CoS
CoSe	-23.01	-39.21	-16.20	CoSe
CoSeO3	-8.76	-7.44	1.32	CoSeO3
CoSeO4:6H2O	-16.67	-18.20	-1.53	CoSeO4:6H2O
CoSO4	-12.17	-9.36	2.80	CoSO4
CoSO4:6H2O	-6.89	-9.37	-2.47	CoSO4:6H2O
Cotunnite	-9.71	-14.49	-4.78	PbCl2
Covellite	-54.39	-76.69	-22.30	CuS
Cr(OH)2	-22.62	-11.80	10.82	Cr(OH)2
Cr(OH)3	-3.31	-1.97	1.34	Cr(OH)3
Cr(OH)3(am)	-1.22	-1.97	-0.75	Cr(OH)3
Cr2O3	-1.59	-3.94	-2.36	Cr2O3
CrCl2	-45.64	-31.55	14.09	CrCl2
CrCl3	-46.71	-31.59	15.11	CrCl3
CrF3	-23.42	-34.76	-11.34	CrF3
Crmetal	-67.82	-37.34	30.48	Cr
CrO3	-27.82	-31.03	-3.21	CrO3
Cryolite	-8.31	-42.15	-33.84	Na3AlF6
Cu(OH)2	-0.88	7.80	8.67	Cu(OH)2

Cu (SbO3) 2	-21.38	23.83	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-10.07	-0.82	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-53.77	-88.65	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.58	-50.38	-45.80	Cu2Se
Cu2SO4	-18.59	-20.54	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.97	-4.87	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.42	-101.02	-42.59	Cu3Sb
Cu3Se2	-24.91	-88.40	-63.49	Cu3Se2
CuCO3	-0.54	-12.04	-11.50	CuCO3
CuCrO4	-17.79	-23.23	-5.44	CuCrO4
CuF	-8.31	-13.21	-4.91	CuF
CuF2	-15.17	-14.06	1.12	CuF2
CuF2:2H2O	-9.51	-14.06	-4.55	CuF2:2H2O
Cumetal	-6.30	-15.06	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-10.67	-0.37	10.30	CuOCuSO4
Cupricferrite	8.19	14.18	5.99	CuFe2O4
Cuprite	-3.16	-4.57	-1.41	Cu2O
Cuprousferrite	9.82	0.91	-8.92	CuFeO2
CuSe	-4.92	-38.02	-33.10	CuSe
CuSe2	-24.92	-58.29	-33.37	CuSe2
CuSeO3:2H2O	-6.76	-6.24	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.57	-17.01	-2.44	CuSeO4:5H2O
CuSO4	-11.11	-8.17	2.94	CuSO4
Diaspore	1.90	8.77	6.87	AlOOH
Djurleite	-54.32	-88.24	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.81	-17.35	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.26	-17.35	-17.09	CaMg (CO3) 2
Epsomite	-2.87	-5.00	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.27	0.23	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-7.34	-11.06	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.21	-7.66	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-15.11	-35.74	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-37.78	-41.52	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-11.34	-10.94	0.40	FeAsO4:2H2O
FeCr2O4	-7.69	-0.49	7.20	FeCr2O4
FeMoO4	-7.33	-17.42	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-44.04	-62.63	-18.60	FeSe2
FeS (ppt)	-78.08	-81.03	-2.95	FeS
FeSe	-31.36	-42.36	-11.00	FeSe
Fix_pe	-5.87	-5.87	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-65.26	-79.23	-13.97	PbS
Gibbsite	0.48	8.77	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.71	-7.72	-2.01	ZnSO4:7H2O
Greenockite	-63.95	-78.31	-14.36	CdS
Greigite	-283.07	-328.11	-45.03	Fe3S4
Gummite	-6.27	1.40	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-10.26	-22.36	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.00	-20.87	-12.88	H2MoO4
H2S (g)	-76.48	-84.49	-8.01	H2S
H2Se (g)	-40.85	-45.81	-4.96	H2Se
Halite	-6.59	-4.99	1.60	NaCl
Hausmannite	-6.87	54.16	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.89	21.00	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.48	-256.19	-73.71	Hg (CH3) 2
Hg (g)	-8.23	-16.11	-7.87	Hg
Hg (OH) 2	-8.66	-12.15	-3.50	Hg (OH) 2
Hg2 (g)	-17.25	-32.21	-14.96	Hg2
Hg2 (OH) 2	-11.93	-6.67	5.26	Hg2 (OH) 2
Hg2CO3	-10.45	-26.50	-16.05	Hg2CO3
Hg2CrO4	-29.00	-37.70	-8.70	Hg2CrO4

Hg2F2	-18.16	-28.52	-10.36	Hg2F2
Hg2S	-79.47	-91.15	-11.68	Hg2S
Hg2SeO3	-16.05	-20.71	-4.66	Hg2SeO3
Hg2SO4	-16.50	-22.63	-6.13	Hg2SO4
Hg3O2CO3	-26.61	-56.30	-29.68	Hg3O2CO3
HgCl (g)	-32.70	-13.21	19.50	HgCl
HgCl2	-10.64	-31.90	-21.26	HgCl2
HgF (g)	-46.94	-14.26	32.68	HgF
HgF2 (g)	-46.58	-34.01	12.57	HgF2
Hgmetal (l)	-2.65	-16.11	-13.45	Hg
HgSe	-2.27	-57.97	-55.69	HgSe
HgSeO3	-13.76	-26.19	-12.43	HgSeO3
HgSO4	-18.70	-28.12	-9.42	HgSO4
Huntite	-5.12	-35.09	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.14	-23.91	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.74	-24.51	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-13.78	-18.95	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-3.35	-18.15	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.39	-53.63	-17.24	K2Cr2O7
K2CrO4	-22.09	-22.60	-0.51	K2CrO4
K2MoO4	-15.71	-12.45	3.26	K2MoO4
K2SeO4	-15.65	-16.38	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.02	-5.46	-0.43	PbO : PbSO4
Laurionite	-5.24	-4.62	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.44	5.25	12.69	PbO
Mackinawite	-77.43	-81.03	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.49	17.35	16.86	Fe2MgO4
Magnesite	-1.41	-8.87	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.06	-4.24	-5.31	Cu2 (OH) 2CO3
Manganite	-3.03	22.31	25.34	MnOOH
Massicot	-7.64	5.25	12.89	PbO
Matlockite	-6.58	-15.55	-8.97	PbClF
Melanothallite	-18.21	-11.95	6.26	CuCl2
Melanterite	-10.31	-12.52	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.54	-96.64	-45.09	HgS
Mg (OH) 2 (active)	-7.83	10.97	18.79	Mg (OH) 2
Mg (VO3) 2	-14.83	-3.55	11.28	Mg (VO3) 2
Mg2Sb3	-271.37	-196.68	74.68	Mg2Sb3
Mg2V2O7	-18.94	7.42	26.36	Mg2V2O7
MgCr2O4	-9.18	7.03	16.20	MgCr2O4
MgCrO4	-25.44	-20.06	5.38	MgCrO4
MgF2	-2.76	-10.89	-8.13	MgF2
MgMoO4	-8.06	-9.91	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.13	-3.07	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.64	-13.84	-1.20	MgSeO4 : 6H2O
Minium	-32.22	41.31	73.52	Pb3O4
Mirabilite	-5.09	-6.20	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.88	-4.98	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-48.27	-53.98	-5.71	Mn2 (SO4) 3
Mn2Sb	-148.94	-87.86	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.16	0.34	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.93	-10.21	2.72	MnCl2 : 4H2O
MnS (grn)	-75.12	-74.95	0.17	MnS
MnS (pnk)	-78.29	-74.95	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-39.78	-36.28	3.50	MnSe
MnSeO3	-5.63	-4.50	1.13	MnSeO3
MnSeO3 : 2H2O	-5.49	-4.50	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.22	-15.27	-2.05	MnSeO4 : 5H2O
MnSO4	-9.01	-6.43	2.58	MnSO4
Monteponite	-8.93	6.17	15.10	CdO
Montroydite	-8.51	-12.15	-3.64	HgO
MoO3	-12.87	-20.87	-8.00	MoO3

Morenosite	-7.10	-9.25	-2.14	NiSO ₄ :7H ₂ O
MoS ₂	-145.13	-215.39	-70.26	MoS ₂
Na-Jarosite	-6.27	-17.47	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-42.40	-52.29	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-24.19	-21.26	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.38	-31.98	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.60	-11.11	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-12.33	-11.11	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-14.57	-4.27	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-16.32	-15.04	1.28	Na ₂ SeO ₄
Na ₃ Sb	-173.96	-79.51	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.29	7.39	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.38	5.02	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.43	-12.16	-6.73	CuCl
NaSb	-86.90	-63.73	23.17	NaSb
Natron	-8.76	-10.07	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-6.23	-2.37	3.86	NaVO ₃
Nesquehonite	-4.20	-8.87	-4.67	MgCO ₃ :3H ₂ O
Ni(OH) ₂	-6.07	6.72	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ :8H ₂ O	-23.80	-8.10	15.70	Ni ₃ (AsO ₄) ₂ :8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-21.08	10.92	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.24	-13.11	-6.87	NiCO ₃
NiMoO ₄	-3.01	-14.15	-11.14	NiMoO ₄
NiS(alpha)	-72.16	-77.76	-5.60	NiS
NiS(beta)	-66.66	-77.76	-11.10	NiS
NiS(gamma)	-64.96	-77.76	-12.80	NiS
NiSe	-21.39	-39.09	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-10.13	-7.32	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-16.56	-18.08	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-7.77	9.73	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-233.95	-295.01	-61.07	As ₂ S ₃
Otavite	-1.66	-13.66	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.70	-4.18	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.90	5.25	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-57.73	-66.49	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.16	0.63	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-15.68	10.51	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-24.99	36.05	61.04	Pb ₂ O ₃
Pb ₂ O ₂ CO ₃	-8.77	-9.33	-0.56	Pb ₂ O ₂ CO ₃
Pb ₂ V ₂ O ₇	-2.11	-4.01	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-18.30	-12.50	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-4.89	1.25	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-15.10	-4.08	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-10.89	-0.21	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-16.05	5.05	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-16.83	5.05	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-13.18	-25.78	-12.60	PbCrO ₄
PbF ₂	-9.16	-16.60	-7.44	PbF ₂
Pbmetal	-24.54	-20.29	4.25	Pb
PbMoO ₄	0.00	-15.62	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-7.73	5.25	12.98	PbO:0.33H ₂ O
PbSeO ₄	-12.71	-19.55	-6.84	PbSeO ₄
Periclase	-10.62	10.97	21.58	MgO
Phosgenite	-9.27	-29.08	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-18.80	30.80	49.60	PbO ₂
Portlandite	-11.45	11.36	22.80	Ca(OH) ₂
Pyrite	-121.47	-139.97	-18.51	FeS ₂
Pyrochroite	-5.66	9.54	15.19	Mn(OH) ₂
Pyrolusite	-6.30	35.08	41.38	MnO ₂
Realgar	-98.29	-118.04	-19.75	AsS
Retgersite	-7.21	-9.25	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.28	-10.30	-10.58	MnCO ₃
Rutherfordine	-3.94	-18.44	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-10.42	-17.53	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-12.91	-9.51	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-22.92	-32.58	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-104.74	-172.50	-67.76	Sb ₂ Se ₃

Sb4O6 (cubic)	-51.84	-70.10	-18.26	Sb4O6
Sb4O6 (orth)	-52.20	-70.10	-17.90	Sb4O6
SbCl3	-47.72	-47.15	0.57	SbCl3
SbF3	-40.09	-50.31	-10.23	SbF3
Sbmetal	-44.15	-55.84	-11.69	Sb
SbO2	-1.24	-29.06	-27.82	SbO2
Schoepite	-4.59	1.40	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.16	-20.27	-7.11	Se
Semetal (hex)	-12.56	-20.27	-7.71	Se
Senarmontite	-22.69	-35.05	-12.37	Sb2O3
SeO2	-14.16	-14.04	0.12	SeO2
SeO3	-45.85	-24.80	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.59	-11.59	-10.00	ZnCO3
Sphalerite	-64.79	-76.24	-11.45	ZnS
Spinel	-8.33	28.51	36.85	MgAl2O4
Stibnite	-238.05	-288.51	-50.46	Sb2S3
Sulfur	-56.80	-58.94	-2.14	S
Tenorite	0.15	7.80	7.64	CuO
Thenardite	-6.52	-6.20	0.32	Na2SO4
Thermonatrite	-10.71	-10.07	0.64	Na2CO3:H2O
Tyuyamunite	-4.44	-0.36	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.78	6.30	21.08	U3O8
U3Sb4	-573.81	-421.43	152.38	U3Sb4
U4O9	-31.15	-34.17	-3.02	U4O9
UF4	-29.11	-58.64	-29.54	UF4
UF4:2.5H2O	-25.93	-58.64	-32.72	UF4:2.5H2O
UO2 (am)	-15.86	-14.93	0.93	UO2
UO2 (NO3) 2	-43.57	-31.42	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-36.27	-31.42	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-34.81	-31.42	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-33.47	-31.42	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.21	1.40	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.15	-23.40	-2.25	UO2SeO4:4H2O
UO3	-6.30	1.40	7.70	UO3
Uraninite	-10.26	-14.93	-4.67	UO2
USb2	-216.50	-186.92	29.58	USb2
V (OH) 3	-17.80	-10.20	7.59	V (OH) 3
V2O5	-13.16	-14.52	-1.36	V2O5
V3O5	-36.76	-34.93	1.84	V3O5
V4O7	-45.24	-38.05	7.19	V4O7
V6O13	-33.78	-94.64	-60.86	V6O13
Valentinite	-26.57	-35.05	-8.48	Sb2O3
VC12	-61.60	-42.72	18.87	VC12
VC13	-63.26	-39.83	23.43	VC13
VF4	-61.77	-46.84	14.93	VF4
Vmetal	-92.55	-48.52	44.03	V
VO	-37.73	-22.98	14.76	VO
VO (OH) 2	-8.28	-3.13	5.15	VO (OH) 2
VO2Cl	-19.97	-17.13	2.84	VO2Cl
VOC1	-31.23	-20.08	11.15	VOC1
VOC12	-35.64	-22.88	12.76	VOC12
VOSO4	-22.70	-19.09	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.29	-76.24	-8.95	ZnS
Zincite	-3.09	8.25	11.33	ZnO
Zincosite	-11.65	-7.72	3.93	ZnSO4
Zn (BO2) 2	-9.48	-1.19	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-27.89	-24.58	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-3.95	8.25	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.23	8.25	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.51	8.25	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.29	8.25	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.49	8.25	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.97	0.53	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-8.57	6.62	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.18	-3.53	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.11	-7.19	18.91	Zn3O (SO4) 2

Zn4(OH)6SO4	-11.38	17.02	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-17.02	21.48	38.50	Zn5(OH)8Cl2
ZnCl2	-18.55	-11.50	7.05	ZnCl2
ZnCO3:1H2O	-1.33	-11.59	-10.26	ZnCO3:1H2O
ZnF2	-13.08	-13.61	-0.53	ZnF2
Znmetal	-43.09	-17.30	25.79	Zn
ZnMoO4	-2.50	-12.63	-10.13	ZnMoO4
ZnO(active)	-2.94	8.25	11.19	ZnO
ZnS(am)	-67.19	-76.24	-9.05	ZnS
ZnSb	-84.16	-73.14	11.01	ZnSb
ZnSe	-23.17	-37.57	-14.40	ZnSe
ZnSeO4:6H2O	-15.04	-16.56	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.08	-7.72	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 21.

Title Stage 1 Pit lake Mix
Mix 103
104 0.284082
108 0.520573
1 0.195345
Save solution 109
end

TITLE

Stage 1 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 103.

Mixture 103.

1.953e-001 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.

2.841e-001 Solution 104 Solution after simulation 16.

5.206e-001 Solution 108 Solution after simulation 20.

-----Solution composition-----

Elements	Molality	Moles
Ag	8.145e-009	7.862e-009
Al	1.943e-007	1.875e-007
As	2.655e-009	2.563e-009
B	1.758e-005	1.697e-005
Ba	2.942e-008	2.840e-008
C	3.257e-003	3.144e-003
Ca	1.109e-002	1.071e-002
Cd	5.841e-008	5.638e-008
Cl	1.412e-003	1.363e-003
Co	2.104e-007	2.031e-007
Cr	5.604e-009	5.410e-009
Cu	5.281e-006	5.097e-006

F	1.169e-004	1.129e-004
Fe	5.305e-009	5.121e-009
Hg	2.673e-010	2.580e-010
K	2.271e-003	2.192e-003
Mg	4.819e-003	4.651e-003
Mn	1.578e-004	1.523e-004
Mo	7.324e-007	7.069e-007
N	2.079e-005	2.007e-005
Na	8.979e-003	8.668e-003
Ni	2.402e-007	2.319e-007
Pb	1.795e-008	1.733e-008
S	1.958e-002	1.890e-002
Sb	2.469e-007	2.383e-007
Se	8.746e-008	8.442e-008
U	2.226e-007	2.149e-007
V	8.457e-008	8.163e-008
Zn	7.016e-006	6.772e-006

-----Description of solution-----

	pH	=	6.919	Charge balance
	pe	=	5.853	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength	=	5.505e-002	
	Mass of water (kg)	=	9.653e-001	
	Total alkalinity (eq/kg)	=	2.710e-003	
	Total CO2 (mol/kg)	=	3.257e-003	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	8.175e-006	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.01	
	Iterations	=	11	
	Total H	=	1.071631e+002	
	Total O	=	5.366478e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.478e-007	1.206e-007	-6.830	-6.919	-0.088	0.00
OH-	1.037e-007	8.345e-008	-6.984	-7.079	-0.094	(0)
H2O	5.551e+001	9.992e-001	1.744	-0.000	0.000	18.07
Ag	8.145e-009					
AgCl	4.731e-009	4.731e-009	-8.325	-8.325	0.000	(0)
Ag+	2.468e-009	2.013e-009	-8.608	-8.696	-0.088	(0)
AgCl2-	6.249e-010	4.744e-010	-9.204	-9.324	-0.120	(0)
AgSO4-	3.159e-010	2.399e-010	-9.500	-9.620	-0.120	(0)
AgNO2	3.219e-012	3.219e-012	-11.492	-11.492	0.000	(0)
AgCl3-2	1.466e-012	4.868e-013	-11.834	-12.313	-0.479	(0)
AgF	4.019e-013	4.019e-013	-12.396	-12.396	0.000	(0)
AgNH3+	2.137e-013	1.622e-013	-12.670	-12.790	-0.120	(0)
AgOH	1.680e-014	1.680e-014	-13.775	-13.775	0.000	(0)
AgCl4-3	1.366e-014	1.144e-015	-13.864	-14.941	-1.077	(0)
AgSeO3-	3.472e-015	2.636e-015	-14.459	-14.579	-0.120	(0)
Ag2Se	2.859e-015	2.859e-015	-14.544	-14.544	0.000	(0)
AgH2BO3	2.715e-015	2.715e-015	-14.566	-14.566	0.000	(0)
Ag (NH3) 2+	6.855e-017	5.204e-017	-16.164	-16.284	-0.120	(0)
Ag (NO2) 2-	5.027e-017	3.816e-017	-16.299	-16.418	-0.120	(0)
AgNO3	1.152e-017	1.152e-017	-16.938	-16.938	0.000	(0)
Ag (OH) 2-	1.804e-019	1.370e-019	-18.744	-18.863	-0.120	(0)
Ag (SeO3) 2-3	5.742e-022	4.810e-023	-21.241	-22.318	-1.077	(0)
Ag2MoO4	4.963e-025	4.963e-025	-24.304	-24.304	0.000	(0)
AgHS	0.000e+000	0.000e+000	-72.540	-72.540	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-84.497	-86.412	-1.915	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-145.978	-146.098	-0.120	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-146.440	-146.662	-0.222	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.784	-149.184	-0.400	(0)

	AgS4S5-3	0.000e+000	0.000e+000	-149.117	-149.495	-0.378	(0)
Al	1.943e-007						
	Al (OH) 4-	1.191e-007	9.709e-008	-6.924	-7.013	-0.089	(0)
	AlF2+	3.067e-008	2.525e-008	-7.513	-7.598	-0.084	(0)
	AlF3	2.527e-008	2.527e-008	-7.597	-7.597	0.000	(0)
	Al (OH) 3	9.241e-009	9.241e-009	-8.034	-8.034	0.000	(0)
	Al (OH) 2+	6.742e-009	5.550e-009	-8.171	-8.256	-0.084	(0)
	AlF+2	1.737e-009	7.977e-010	-8.760	-9.098	-0.338	(0)
	AlF4-	1.235e-009	1.007e-009	-8.908	-8.997	-0.089	(0)
	AlOH+2	1.823e-010	8.373e-011	-9.739	-10.077	-0.338	(0)
	AlSO4+	5.708e-011	4.652e-011	-10.244	-10.332	-0.089	(0)
	Al+3	6.280e-012	1.003e-012	-11.202	-11.999	-0.796	(0)
	Al (SO4) 2-	3.653e-012	2.977e-012	-11.437	-11.526	-0.089	(0)
	AlMo6O21-3	4.170e-037	3.493e-038	-36.380	-37.457	-1.077	(0)
As (3)	3.118e-021						
	H3AsO3	3.100e-021	3.100e-021	-20.509	-20.509	0.000	(0)
	H2AsO3-	1.737e-023	1.319e-023	-22.760	-22.880	-0.120	(0)
	HAsO3-2	3.003e-028	9.976e-029	-27.522	-28.001	-0.479	(0)
	H4AsO3+	2.440e-028	1.852e-028	-27.613	-27.732	-0.120	(0)
	AsO3-3	3.808e-034	3.189e-035	-33.419	-34.496	-1.077	(0)
As (5)	2.655e-009						
	HAsO4-2	1.792e-009	5.954e-010	-8.747	-9.225	-0.479	(0)
	H2AsO4-	8.624e-010	6.547e-010	-9.064	-9.184	-0.120	(0)
	AsO4-3	1.864e-013	1.562e-014	-12.729	-13.806	-1.077	(0)
	H3AsO4	1.354e-014	1.372e-014	-13.868	-13.863	0.006	(0)
B	1.758e-005						
	H3BO3	1.745e-005	1.767e-005	-4.758	-4.753	0.006	(0)
	H2BO3-	1.072e-007	8.511e-008	-6.970	-7.070	-0.100	(0)
	CaH2BO3+	1.862e-008	1.478e-008	-7.730	-7.830	-0.100	(0)
	MgH2BO3+	5.295e-009	4.202e-009	-8.276	-8.376	-0.100	(0)
	NaH2BO3	9.566e-010	9.566e-010	-9.019	-9.019	0.000	(0)
	BF (OH) 3-	7.062e-010	5.605e-010	-9.151	-9.251	-0.100	(0)
	H5 (BO3) 2-	1.613e-012	1.280e-012	-11.792	-11.893	-0.100	(0)
	BF2 (OH) 2-	7.242e-013	5.748e-013	-12.140	-12.240	-0.100	(0)
	BaH2BO3+	4.270e-014	3.389e-014	-13.370	-13.470	-0.100	(0)
	H8 (BO3) 3-	2.850e-015	2.262e-015	-14.545	-14.646	-0.100	(0)
	AgH2BO3	2.715e-015	2.715e-015	-14.566	-14.566	0.000	(0)
	BF3OH-	2.703e-018	2.145e-018	-17.568	-17.669	-0.100	(0)
	BF4-	1.276e-022	1.013e-022	-21.894	-21.995	-0.100	(0)
Ba	2.942e-008						
	Ba+2	2.911e-008	1.288e-008	-7.536	-7.890	-0.354	(0)
	BaHCO3+	3.059e-010	2.533e-010	-9.514	-9.596	-0.082	(0)
	BaCO3	5.290e-012	5.290e-012	-11.277	-11.277	0.000	(0)
	BaH2BO3+	4.270e-014	3.389e-014	-13.370	-13.470	-0.100	(0)
	BaOH+	5.726e-015	4.693e-015	-14.242	-14.329	-0.086	(0)
	BaNH3+2	9.661e-016	3.209e-016	-15.015	-15.494	-0.479	(0)
	BaNO3+	6.131e-016	4.654e-016	-15.213	-15.332	-0.120	(0)
C (4)	3.257e-003						
	HCO3-	2.501e-003	2.059e-003	-2.602	-2.686	-0.084	(0)
	H2CO3	5.583e-004	5.583e-004	-3.253	-3.253	0.000	(0)
	CaHCO3+	1.397e-004	1.157e-004	-3.855	-3.937	-0.082	(0)
	MgHCO3+	3.704e-005	3.000e-005	-4.431	-4.523	-0.091	(0)
	NaHCO3	8.211e-006	8.211e-006	-5.086	-5.086	0.000	(0)
	CaCO3	3.829e-006	3.829e-006	-5.417	-5.417	0.000	(0)
	CuCO3	2.799e-006	2.799e-006	-5.553	-5.553	0.000	(0)
	MnHCO3+	1.916e-006	1.570e-006	-5.718	-5.804	-0.086	(0)
	CO3-2	1.809e-006	8.006e-007	-5.743	-6.097	-0.354	(0)
	MgCO3	9.483e-007	9.483e-007	-6.023	-6.023	0.000	(0)
	ZnHCO3+	1.535e-007	1.165e-007	-6.814	-6.934	-0.120	(0)
	NaCO3-	1.284e-007	1.057e-007	-6.891	-6.976	-0.084	(0)
	UO2 (CO3) 3-4	1.152e-007	1.402e-009	-6.939	-8.853	-1.915	(0)
	UO2 (CO3) 2-2	1.052e-007	3.495e-008	-6.978	-7.457	-0.479	(0)
	CuHCO3+	1.016e-007	7.714e-008	-6.993	-7.113	-0.120	(0)
	ZnCO3	8.246e-008	8.246e-008	-7.084	-7.084	0.000	(0)
	NiHCO3+	2.101e-008	1.595e-008	-7.678	-7.797	-0.120	(0)
	Cu (CO3) 2-2	1.816e-008	6.032e-009	-7.741	-8.220	-0.479	(0)
	CoHCO3+	1.000e-008	7.592e-009	-8.000	-8.120	-0.120	(0)
	PbCO3	4.203e-009	4.203e-009	-8.376	-8.376	0.000	(0)

PbHCO3+	3.519e-009	2.672e-009	-8.454	-8.573	-0.120	(0)
UO2CO3	2.188e-009	2.188e-009	-8.660	-8.660	0.000	(0)
NiCO3	1.876e-009	1.876e-009	-8.727	-8.727	0.000	(0)
CoCO3	6.416e-010	6.416e-010	-9.193	-9.193	0.000	(0)
BaHCO3+	3.059e-010	2.533e-010	-9.514	-9.596	-0.082	(0)
CdCO3	2.555e-010	2.555e-010	-9.593	-9.593	0.000	(0)
CdHCO3+	8.645e-011	6.563e-011	-10.063	-10.183	-0.120	(0)
Pb(CO3) 2-2	2.921e-011	9.704e-012	-10.534	-11.013	-0.479	(0)
BaCO3	5.290e-012	5.290e-012	-11.277	-11.277	0.000	(0)
FeHCO3+	1.065e-012	8.825e-013	-11.972	-12.054	-0.082	(0)
Cd(CO3) 2-2	4.565e-013	1.516e-013	-12.341	-12.819	-0.479	(0)
HgCO3	1.385e-014	1.385e-014	-13.858	-13.858	0.000	(0)
Hg(CO3) 2-2	1.056e-016	3.507e-017	-15.976	-16.455	-0.479	(0)
HgHCO3+	4.097e-017	3.110e-017	-16.388	-16.507	-0.120	(0)
Ca	1.109e-002					
Ca+2	6.818e-003	3.017e-003	-2.166	-2.520	-0.354	(0)
CaSO4	4.129e-003	4.129e-003	-2.384	-2.384	0.000	(0)
CaHCO3+	1.397e-004	1.157e-004	-3.855	-3.937	-0.082	(0)
CaCO3	3.829e-006	3.829e-006	-5.417	-5.417	0.000	(0)
CaF+	3.194e-006	2.618e-006	-5.496	-5.582	-0.086	(0)
CaH2BO3+	1.862e-008	1.478e-008	-7.730	-7.830	-0.100	(0)
CaOH+	6.066e-009	5.024e-009	-8.217	-8.299	-0.082	(0)
CaNH3+2	4.514e-010	1.499e-010	-9.345	-9.824	-0.479	(0)
CaNO3+	9.059e-011	6.877e-011	-10.043	-10.163	-0.120	(0)
Ca(NH3) 2+2	7.094e-018	2.356e-018	-17.149	-17.628	-0.479	(0)
Cd	5.841e-008					
Cd+2	3.163e-008	1.400e-008	-7.500	-7.854	-0.354	(0)
CdSO4	1.960e-008	1.960e-008	-7.708	-7.708	0.000	(0)
Cd(SO4) 2-2	4.755e-009	1.579e-009	-8.323	-8.801	-0.479	(0)
CdCl+	2.028e-009	1.539e-009	-8.693	-8.813	-0.120	(0)
CdCO3	2.555e-010	2.555e-010	-9.593	-9.593	0.000	(0)
CdHCO3+	8.645e-011	6.563e-011	-10.063	-10.183	-0.120	(0)
CdF+	2.324e-011	1.764e-011	-10.634	-10.753	-0.120	(0)
CdOH+	1.222e-011	9.280e-012	-10.913	-11.032	-0.120	(0)
CdCl2	7.388e-012	7.388e-012	-11.131	-11.131	0.000	(0)
CdOHC1	5.269e-012	5.269e-012	-11.278	-11.278	0.000	(0)
Cd(CO3) 2-2	4.565e-013	1.516e-013	-12.341	-12.819	-0.479	(0)
CdCl3-	7.070e-015	5.367e-015	-14.151	-14.270	-0.120	(0)
Cd(OH) 2	4.886e-015	4.886e-015	-14.311	-14.311	0.000	(0)
CdF2	2.798e-015	2.798e-015	-14.553	-14.553	0.000	(0)
CdNO3+	4.203e-016	3.191e-016	-15.376	-15.496	-0.120	(0)
CdSeO4	2.297e-017	2.297e-017	-16.639	-16.639	0.000	(0)
Cd2OH+3	7.774e-018	6.512e-019	-17.109	-18.186	-1.077	(0)
Cd(SeO3) 2-2	1.443e-019	4.792e-020	-18.841	-19.319	-0.479	(0)
Cd(OH) 3-	3.282e-020	2.491e-020	-19.484	-19.604	-0.120	(0)
Cd(NO3) 2	1.153e-024	1.153e-024	-23.938	-23.938	0.000	(0)
Cd(OH) 4-2	1.024e-027	3.403e-028	-26.990	-27.468	-0.479	(0)
CdHS+	0.000e+000	0.000e+000	-77.384	-77.504	-0.120	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-147.958	-147.958	0.000	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-223.596	-223.716	-0.120	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-298.699	-299.178	-0.479	(0)
Cl	1.412e-003					
Cl-	1.412e-003	1.151e-003	-2.850	-2.939	-0.088	(0)
MnCl+	6.758e-008	5.539e-008	-7.170	-7.257	-0.086	(0)
ZnCl+	6.390e-009	5.176e-009	-8.195	-8.286	-0.091	(0)
AgCl	4.731e-009	4.731e-009	-8.325	-8.325	0.000	(0)
CdCl+	2.028e-009	1.539e-009	-8.693	-8.813	-0.120	(0)
CuCl+	1.337e-009	1.083e-009	-8.874	-8.965	-0.091	(0)
AgCl2-	6.249e-010	4.744e-010	-9.204	-9.324	-0.120	(0)
CuCl	5.909e-010	5.909e-010	-9.229	-9.229	0.000	(0)
ZnOHC1	5.655e-010	5.655e-010	-9.248	-9.248	0.000	(0)
CoCl+	2.487e-010	1.888e-010	-9.604	-9.724	-0.120	(0)
NiCl+	2.438e-010	1.851e-010	-9.613	-9.733	-0.120	(0)
CuCl2-	1.755e-010	1.421e-010	-9.756	-9.847	-0.091	(0)
PbCl+	9.397e-011	7.134e-011	-10.027	-10.147	-0.120	(0)
MnCl2	9.009e-011	9.009e-011	-10.045	-10.045	0.000	(0)
ZnCl2	9.446e-012	9.446e-012	-11.025	-11.025	0.000	(0)
CdCl2	7.388e-012	7.388e-012	-11.131	-11.131	0.000	(0)

CdOHCl	5.269e-012	5.269e-012	-11.278	-11.278	0.000	(0)
HgClOH	2.453e-012	2.453e-012	-11.610	-11.610	0.000	(0)
HgCl2	1.917e-012	1.917e-012	-11.717	-11.717	0.000	(0)
AgCl3-2	1.466e-012	4.868e-013	-11.834	-12.313	-0.479	(0)
CuCl2	4.325e-013	4.325e-013	-12.364	-12.364	0.000	(0)
PbCl2	3.669e-013	3.669e-013	-12.435	-12.435	0.000	(0)
CuCl3-2	7.752e-014	3.499e-014	-13.111	-13.456	-0.346	(0)
MnCl3-	3.485e-014	2.857e-014	-13.458	-13.544	-0.086	(0)
HgCl3-	2.907e-014	2.207e-014	-13.537	-13.656	-0.120	(0)
AgCl4-3	1.366e-014	1.144e-015	-13.864	-14.941	-1.077	(0)
ZnCl3-	1.066e-014	8.639e-015	-13.972	-14.064	-0.091	(0)
CdCl3-	7.070e-015	5.367e-015	-14.151	-14.270	-0.120	(0)
UO2Cl+	1.688e-015	1.282e-015	-14.773	-14.892	-0.120	(0)
NiCl2	1.073e-015	1.073e-015	-14.969	-14.969	0.000	(0)
CrCl+2	7.582e-016	2.518e-016	-15.120	-15.599	-0.479	(0)
HgCl+	4.375e-016	3.321e-016	-15.359	-15.479	-0.120	(0)
HgCl4-2	3.045e-016	1.011e-016	-15.516	-15.995	-0.479	(0)
PbCl3-	2.215e-016	1.682e-016	-15.655	-15.774	-0.120	(0)
ZnCl4-2	1.102e-017	4.973e-018	-16.958	-17.303	-0.346	(0)
CuCl3-	5.737e-018	4.648e-018	-17.241	-17.333	-0.091	(0)
CrOHCl2	4.599e-019	4.599e-019	-18.337	-18.337	0.000	(0)
PbCl4-2	2.664e-019	8.850e-020	-18.574	-19.053	-0.479	(0)
FeCl+2	1.738e-019	7.845e-020	-18.760	-19.105	-0.346	(0)
VOC1+	1.233e-019	9.363e-020	-18.909	-19.029	-0.120	(0)
CrCl2+	3.624e-020	2.751e-020	-19.441	-19.560	-0.120	(0)
FeCl2+	4.922e-022	4.035e-022	-21.308	-21.394	-0.086	(0)
CuCl4-2	5.942e-023	2.682e-023	-22.226	-22.572	-0.346	(0)
FeCl3	4.645e-026	4.645e-026	-25.333	-25.333	0.000	(0)
CrO3Cl-	6.985e-027	5.303e-027	-26.156	-26.276	-0.120	(0)
CoCl+2	9.495e-035	3.154e-035	-34.023	-34.501	-0.479	(0)
UCl+3	0.000e+000	0.000e+000	-42.490	-43.567	-1.077	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.088	-45.567	-0.479	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.552	-46.031	-0.479	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.207	-59.686	-0.479	(0)
Co (2)	2.104e-007					
Co+2	1.427e-007	4.740e-008	-6.846	-7.324	-0.479	(0)
CoSO4	5.649e-008	5.649e-008	-7.248	-7.248	0.000	(0)
CoHCO3+	1.000e-008	7.592e-009	-8.000	-8.120	-0.120	(0)
CoCO3	6.416e-010	6.416e-010	-9.193	-9.193	0.000	(0)
CoCl+	2.487e-010	1.888e-010	-9.604	-9.724	-0.120	(0)
CoF+	1.570e-010	1.192e-010	-9.804	-9.924	-0.120	(0)
CoOH+	1.040e-010	7.893e-011	-9.983	-10.103	-0.120	(0)
CoNO2+	3.368e-012	2.557e-012	-11.473	-11.592	-0.120	(0)
Co (NH3) +2	6.773e-013	2.250e-013	-12.169	-12.648	-0.479	(0)
Co (OH) 2	5.232e-013	5.232e-013	-12.281	-12.281	0.000	(0)
CoNO3+	7.133e-016	5.415e-016	-15.147	-15.266	-0.120	(0)
CoSeO4	2.093e-016	2.093e-016	-15.679	-15.679	0.000	(0)
Co2OH+3	2.239e-018	1.875e-019	-17.650	-18.727	-1.077	(0)
Co (OH) 3-	1.148e-018	8.712e-019	-17.940	-18.060	-0.120	(0)
Co (NH3) 2+2	1.140e-018	3.788e-019	-17.943	-18.422	-0.479	(0)
CoOOH-	2.881e-019	2.187e-019	-18.540	-18.660	-0.120	(0)
Co (NO3) 2	7.941e-024	7.941e-024	-23.100	-23.100	0.000	(0)
Co (NH3) 3+2	5.667e-025	1.882e-025	-24.247	-24.725	-0.479	(0)
Co (OH) 4-2	3.469e-026	1.152e-026	-25.460	-25.938	-0.479	(0)
Co4 (OH) 4+4	6.361e-031	7.744e-033	-30.196	-32.111	-1.915	(0)
Co (NH3) 4+2	1.174e-031	3.900e-032	-30.930	-31.409	-0.479	(0)
Co (NH3) 5+2	7.691e-039	2.555e-039	-38.114	-38.593	-0.479	(0)
Co (3)	1.719e-028					
CoOH+2	1.719e-028	5.709e-029	-27.765	-28.243	-0.479	(0)
Co+3	8.426e-034	1.346e-034	-33.074	-33.871	-0.796	(0)
CoCl+2	9.495e-035	3.154e-035	-34.023	-34.501	-0.479	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.088	-45.567	-0.479	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.926	-54.045	-0.120	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.147	-59.625	-0.479	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.207	-59.686	-0.479	(0)
Cr (2)	1.704e-025					
Cr+2	1.704e-025	5.660e-026	-24.769	-25.247	-0.479	(0)
Cr (3)	5.604e-009					

Cr (OH) 2+	4.127e-009	3.133e-009	-8.384	-8.504	-0.120	(0)
Cr (OH) +2	9.290e-010	3.086e-010	-9.032	-9.511	-0.479	(0)
CrOHSO4	4.374e-010	4.374e-010	-9.359	-9.359	0.000	(0)
Cr (OH) 3	9.822e-011	9.822e-011	-10.008	-10.008	0.000	(0)
CrF+2	6.411e-012	2.130e-012	-11.193	-11.672	-0.479	(0)
CrSO4+	3.105e-012	2.357e-012	-11.508	-11.628	-0.120	(0)
Cr+3	2.018e-012	1.690e-013	-11.695	-12.772	-1.077	(0)
CrO2-	5.100e-013	3.872e-013	-12.292	-12.412	-0.120	(0)
Cr (OH) 4-	4.298e-013	3.263e-013	-12.367	-12.486	-0.120	(0)
CrCl+2	7.582e-016	2.518e-016	-15.120	-15.599	-0.479	(0)
Cr2 (OH) 2SO4+2	3.672e-017	1.220e-017	-16.435	-16.914	-0.479	(0)
Cr2 (OH) 2 (SO4) 2	4.328e-018	4.328e-018	-17.364	-17.364	0.000	(0)
CrOHC12	4.599e-019	4.599e-019	-18.337	-18.337	0.000	(0)
CrCl2+	3.624e-020	2.751e-020	-19.441	-19.560	-0.120	(0)
CrNO3+2	1.603e-022	5.325e-023	-21.795	-22.274	-0.479	(0)
Cr (NH3) 5OH+2	9.589e-037	3.185e-037	-36.018	-36.497	-0.479	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-43.117	-44.194	-1.077	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.552	-46.031	-0.479	(0)
Cr (6)	4.400e-017					
CrO4-2	3.514e-017	1.555e-017	-16.454	-16.808	-0.354	(0)
HCrO4-	7.994e-018	6.069e-018	-17.097	-17.217	-0.120	(0)
NaCrO4-	7.220e-019	5.482e-019	-18.141	-18.261	-0.120	(0)
KCrO4-	1.353e-019	1.027e-019	-18.869	-18.988	-0.120	(0)
CrO3SO4-2	4.011e-024	1.332e-024	-23.397	-23.875	-0.479	(0)
H2CrO4	5.931e-025	5.931e-025	-24.227	-24.227	0.000	(0)
CrO3Cl-	6.985e-027	5.303e-027	-26.156	-26.276	-0.120	(0)
Cr2O7-2	3.848e-033	1.278e-033	-32.415	-32.893	-0.479	(0)
Cu (1)	1.303e-009					
CuCl	5.909e-010	5.909e-010	-9.229	-9.229	0.000	(0)
Cu+	5.370e-010	4.077e-010	-9.270	-9.390	-0.120	(0)
CuCl2-	1.755e-010	1.421e-010	-9.756	-9.847	-0.091	(0)
CuCl3-2	7.752e-014	3.499e-014	-13.111	-13.456	-0.346	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.090	-147.478	-0.388	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.840	-148.208	-0.368	(0)
Cu (2)	5.279e-006					
CuCO3	2.799e-006	2.799e-006	-5.553	-5.553	0.000	(0)
Cu+2	1.342e-006	5.938e-007	-5.872	-6.226	-0.354	(0)
CuSO4	8.125e-007	8.125e-007	-6.090	-6.090	0.000	(0)
CuOH+	1.934e-007	1.567e-007	-6.713	-6.805	-0.091	(0)
CuHCO3+	1.016e-007	7.714e-008	-6.993	-7.113	-0.120	(0)
Cu (CO3) 2-2	1.816e-008	6.032e-009	-7.741	-8.220	-0.479	(0)
CuF+	3.923e-009	2.978e-009	-8.406	-8.526	-0.120	(0)
Cu (OH) 2	2.609e-009	2.609e-009	-8.584	-8.584	0.000	(0)
Cu2 (OH) 2+2	1.857e-009	6.167e-010	-8.731	-9.210	-0.479	(0)
CuCl+	1.337e-009	1.083e-009	-8.874	-8.965	-0.091	(0)
CuNH3+2	7.220e-010	2.398e-010	-9.141	-9.620	-0.479	(0)
CuNO2+	6.269e-010	4.759e-010	-9.203	-9.322	-0.120	(0)
Cu (OH) 3-	5.882e-013	4.466e-013	-12.230	-12.350	-0.120	(0)
CuCl2	4.325e-013	4.325e-013	-12.364	-12.364	0.000	(0)
Cu (NO2) 2	3.728e-014	3.728e-014	-13.429	-13.429	0.000	(0)
CuNO3+	1.783e-014	1.353e-014	-13.749	-13.869	-0.120	(0)
CuCl3-	5.737e-018	4.648e-018	-17.241	-17.333	-0.091	(0)
Cu (OH) 4-2	8.830e-019	2.933e-019	-18.054	-18.533	-0.479	(0)
CuCl4-2	5.942e-023	2.682e-023	-22.226	-22.572	-0.346	(0)
Cu (NO3) 2	1.228e-023	1.228e-023	-22.911	-22.911	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.182	-213.301	-0.120	(0)
F	1.169e-004					
F-	9.747e-005	7.950e-005	-4.011	-4.100	-0.088	(0)
MgF+	1.559e-005	1.270e-005	-4.807	-4.896	-0.089	(0)
CaF+	3.194e-006	2.618e-006	-5.496	-5.582	-0.086	(0)
NaF	3.557e-007	3.557e-007	-6.449	-6.449	0.000	(0)
MnF+	1.476e-007	1.210e-007	-6.831	-6.917	-0.086	(0)
AlF2+	3.067e-008	2.525e-008	-7.513	-7.598	-0.084	(0)
AlF3	2.527e-008	2.527e-008	-7.597	-7.597	0.000	(0)
HF	1.418e-008	1.418e-008	-7.848	-7.848	0.000	(0)
CuF+	3.923e-009	2.978e-009	-8.406	-8.526	-0.120	(0)
ZnF+	3.740e-009	2.839e-009	-8.427	-8.547	-0.120	(0)
AlF+2	1.737e-009	7.977e-010	-8.760	-9.098	-0.338	(0)

AlF4-	1.235e-009	1.007e-009	-8.908	-8.997	-0.089	(0)
BF(OH) 3-	7.062e-010	5.605e-010	-9.151	-9.251	-0.100	(0)
NiF+	1.652e-010	1.255e-010	-9.782	-9.902	-0.120	(0)
CoF+	1.570e-010	1.192e-010	-9.804	-9.924	-0.120	(0)
CdF+	2.324e-011	1.764e-011	-10.634	-10.753	-0.120	(0)
PbF+	1.289e-011	9.783e-012	-10.890	-11.010	-0.120	(0)
UO2F+	9.922e-012	7.532e-012	-11.003	-11.123	-0.120	(0)
CrF+2	6.411e-012	2.130e-012	-11.193	-11.672	-0.479	(0)
HF2-	5.324e-012	4.285e-012	-11.274	-11.368	-0.094	(0)
UO2F2	1.727e-012	1.727e-012	-11.763	-11.763	0.000	(0)
BF2(OH) 2-	7.242e-013	5.748e-013	-12.140	-12.240	-0.100	(0)
AgF	4.019e-013	4.019e-013	-12.396	-12.396	0.000	(0)
UO2F3-	4.543e-014	3.449e-014	-13.343	-13.462	-0.120	(0)
PbF2	1.531e-014	1.531e-014	-13.815	-13.815	0.000	(0)
CdF2	2.798e-015	2.798e-015	-14.553	-14.553	0.000	(0)
VO2F	2.478e-015	2.478e-015	-14.606	-14.606	0.000	(0)
H2F2	5.385e-016	5.385e-016	-15.269	-15.269	0.000	(0)
FeF2+	5.105e-016	4.184e-016	-15.292	-15.378	-0.086	(0)
FeF+2	4.358e-016	1.967e-016	-15.361	-15.706	-0.346	(0)
VO2F2-	9.421e-017	7.152e-017	-16.026	-16.146	-0.120	(0)
UO2F4-2	6.556e-017	2.178e-017	-16.183	-16.662	-0.479	(0)
FeF3	4.693e-017	4.693e-017	-16.329	-16.329	0.000	(0)
VOF+	1.821e-017	1.382e-017	-16.740	-16.859	-0.120	(0)
PbF3-	3.040e-018	2.308e-018	-17.517	-17.637	-0.120	(0)
BF3OH-	2.703e-018	2.145e-018	-17.568	-17.669	-0.100	(0)
VOF2	4.120e-019	4.120e-019	-18.385	-18.385	0.000	(0)
VO2F3-2	2.135e-019	7.093e-020	-18.671	-19.149	-0.479	(0)
VOF3-	1.531e-021	1.162e-021	-20.815	-20.935	-0.120	(0)
PbF4-2	2.644e-022	8.782e-023	-21.578	-22.056	-0.479	(0)
BF4-	1.276e-022	1.013e-022	-21.894	-21.995	-0.100	(0)
HgF+	5.612e-023	4.261e-023	-22.251	-22.371	-0.120	(0)
VO2F4-3	3.312e-023	2.774e-024	-22.480	-23.557	-1.077	(0)
Sb(OH) 2F	2.307e-023	2.307e-023	-22.637	-22.637	0.000	(0)
SbOF	2.271e-023	2.271e-023	-22.644	-22.644	0.000	(0)
VOF4-2	1.123e-024	3.729e-025	-23.950	-24.428	-0.479	(0)
UF3+	1.237e-033	9.389e-034	-32.908	-33.027	-0.120	(0)
UF2+2	2.243e-034	7.452e-035	-33.649	-34.128	-0.479	(0)
UF4	8.184e-036	8.184e-036	-35.087	-35.087	0.000	(0)
UF+3	8.889e-037	7.445e-038	-36.051	-37.128	-1.077	(0)
UF5-	3.396e-038	2.578e-038	-37.469	-37.589	-0.120	(0)
UF6-2	1.864e-039	6.190e-040	-38.730	-39.208	-0.479	(0)
Fe (2)	1.536e-010					
Fe+2	1.025e-010	3.405e-011	-9.989	-10.468	-0.479	(0)
FeSO4	4.992e-011	4.992e-011	-10.302	-10.302	0.000	(0)
FeHCO3+	1.065e-012	8.825e-013	-11.972	-12.054	-0.082	(0)
FeOH+	1.380e-013	1.131e-013	-12.860	-12.947	-0.086	(0)
Fe(OH) 2	7.498e-018	7.498e-018	-17.125	-17.125	0.000	(0)
Fe(OH) 3-	2.414e-019	1.979e-019	-18.617	-18.704	-0.086	(0)
Fe(HS) 2	0.000e+000	0.000e+000	-156.834	-156.834	0.000	(0)
Fe(HS) 3-	0.000e+000	0.000e+000	-232.335	-232.455	-0.120	(0)
Fe (3)	5.152e-009					
Fe(OH) 2+	4.794e-009	3.947e-009	-8.319	-8.404	-0.084	(0)
Fe(OH) 3	3.537e-010	3.537e-010	-9.451	-9.451	0.000	(0)
Fe(OH) 4-	3.339e-012	2.749e-012	-11.476	-11.561	-0.084	(0)
FeOH+2	2.694e-013	1.216e-013	-12.570	-12.915	-0.346	(0)
FeF2+	5.105e-016	4.184e-016	-15.292	-15.378	-0.086	(0)
FeF+2	4.358e-016	1.967e-016	-15.361	-15.706	-0.346	(0)
FeSO4+	1.845e-016	1.512e-016	-15.734	-15.820	-0.086	(0)
FeF3	4.693e-017	4.693e-017	-16.329	-16.329	0.000	(0)
Fe(SO4) 2-	2.543e-017	1.931e-017	-16.595	-16.714	-0.120	(0)
Fe+3	1.412e-017	2.256e-018	-16.850	-17.647	-0.796	(0)
FeCl+2	1.738e-019	7.845e-020	-18.760	-19.105	-0.346	(0)
FeHSeO3+2	1.108e-021	3.680e-022	-20.956	-21.434	-0.479	(0)
FeCl2+	4.922e-022	4.035e-022	-21.308	-21.394	-0.086	(0)
Fe2(OH) 2+4	4.020e-023	4.894e-025	-22.396	-24.310	-1.915	(0)
FeNO3+2	4.896e-025	1.626e-025	-24.310	-24.789	-0.479	(0)
FeCl3	4.645e-026	4.645e-026	-25.333	-25.333	0.000	(0)
Fe3(OH) 4+5	2.738e-029	2.792e-032	-28.563	-31.554	-2.992	(0)

H (0)	3.993e-029					
H2	1.997e-029	2.022e-029	-28.700	-28.694	0.006	(0)
Hg (0)	2.622e-010					
Hg	2.622e-010	2.622e-010	-9.581	-9.581	0.000	(0)
Hg (1)	1.550e-020					
Hg2+2	7.749e-021	2.574e-021	-20.111	-20.589	-0.479	(0)
Hg (2)	5.041e-012					
HgClOH	2.453e-012	2.453e-012	-11.610	-11.610	0.000	(0)
HgCl2	1.917e-012	1.917e-012	-11.717	-11.717	0.000	(0)
Hg (OH) 2	6.273e-013	6.353e-013	-12.203	-12.197	0.006	(0)
HgCl3-	2.907e-014	2.207e-014	-13.537	-13.656	-0.120	(0)
HgCO3	1.385e-014	1.385e-014	-13.858	-13.858	0.000	(0)
HgCl+	4.375e-016	3.321e-016	-15.359	-15.479	-0.120	(0)
HgCl4-2	3.045e-016	1.011e-016	-15.516	-15.995	-0.479	(0)
Hg (CO3) 2-2	1.056e-016	3.507e-017	-15.976	-16.455	-0.479	(0)
HgOH+	6.327e-017	4.803e-017	-16.199	-16.318	-0.120	(0)
Hg (NH3) 2+2	4.279e-017	1.421e-017	-16.369	-16.847	-0.479	(0)
HgHCO3+	4.097e-017	3.110e-017	-16.388	-16.507	-0.120	(0)
HgNH3+2	1.084e-018	3.601e-019	-17.965	-18.444	-0.479	(0)
Hg+2	4.353e-020	1.446e-020	-19.361	-19.840	-0.479	(0)
HgSO4	2.261e-020	2.261e-020	-19.646	-19.646	0.000	(0)
Hg (OH) 3-	8.792e-021	6.674e-021	-20.056	-20.176	-0.120	(0)
HgF+	5.612e-023	4.261e-023	-22.251	-22.371	-0.120	(0)
Hg (NH3) 3+2	6.725e-024	2.234e-024	-23.172	-23.651	-0.479	(0)
HgNO3+	5.068e-029	3.848e-029	-28.295	-28.415	-0.120	(0)
Hg (NH3) 4+2	2.108e-030	7.004e-031	-29.676	-30.155	-0.479	(0)
Hg (NO3) 2	1.153e-037	1.153e-037	-36.938	-36.938	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-136.189	-136.309	-0.120	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.834	-136.834	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.620	-138.098	-0.479	(0)
K	2.271e-003					
K+	2.180e-003	1.778e-003	-2.662	-2.750	-0.088	(0)
KSO4-	9.132e-005	7.517e-005	-4.039	-4.124	-0.084	(0)
KCrO4-	1.353e-019	1.027e-019	-18.869	-18.988	-0.120	(0)
Mg	4.819e-003					
Mg+2	3.217e-003	1.424e-003	-2.492	-2.846	-0.354	(0)
MgSO4	1.548e-003	1.548e-003	-2.810	-2.810	0.000	(0)
MgHCO3+	3.704e-005	3.000e-005	-4.431	-4.523	-0.091	(0)
MgF+	1.559e-005	1.270e-005	-4.807	-4.896	-0.089	(0)
MgCO3	9.483e-007	9.483e-007	-6.023	-6.023	0.000	(0)
MgOH+	5.684e-008	4.731e-008	-7.245	-7.325	-0.080	(0)
MgH2BO3+	5.295e-009	4.202e-009	-8.276	-8.376	-0.100	(0)
Mn (2)	1.578e-004					
Mn+2	1.151e-004	3.822e-005	-3.939	-4.418	-0.479	(0)
MnSO4	4.059e-005	4.059e-005	-4.392	-4.392	0.000	(0)
MnHCO3+	1.916e-006	1.570e-006	-5.718	-5.804	-0.086	(0)
MnF+	1.476e-007	1.210e-007	-6.831	-6.917	-0.086	(0)
MnCl+	6.758e-008	5.539e-008	-7.170	-7.257	-0.086	(0)
MnOH+	9.774e-009	8.011e-009	-8.010	-8.096	-0.086	(0)
MnCl2	9.009e-011	9.009e-011	-10.045	-10.045	0.000	(0)
MnNO3+	5.750e-013	4.366e-013	-12.240	-12.360	-0.120	(0)
MnSeO4	9.063e-014	9.063e-014	-13.043	-13.043	0.000	(0)
MnCl3-	3.485e-014	2.857e-014	-13.458	-13.544	-0.086	(0)
Mn (OH) 3-	4.206e-019	3.448e-019	-18.376	-18.462	-0.086	(0)
Mn (NO3) 2	7.903e-021	7.903e-021	-20.102	-20.102	0.000	(0)
Mn (OH) 4-2	2.058e-025	9.289e-026	-24.687	-25.032	-0.346	(0)
MnSe	0.000e+000	0.000e+000	-41.865	-41.865	0.000	(0)
Mn (3)	7.622e-024					
Mn+3	7.622e-024	1.218e-024	-23.118	-23.914	-0.796	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-43.732	-44.078	-0.346	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-47.499	-47.596	-0.097	(0)
Mo	7.324e-007					
MoO4-2	7.313e-007	3.237e-007	-6.136	-6.490	-0.354	(0)
HMoO4-	1.023e-009	7.765e-010	-8.990	-9.110	-0.120	(0)
H2MoO4	6.858e-013	6.858e-013	-12.164	-12.164	0.000	(0)
Ag2MoO4	4.963e-025	4.963e-025	-24.304	-24.304	0.000	(0)

AlMo6O21-3	4.170e-037	3.493e-038	-36.380	-37.457	-1.077	(0)
Mo7O24-6	0.000e+000	0.000e+000	-43.480	-47.788	-4.308	(0)
HMo7O24-5	0.000e+000	0.000e+000	-45.328	-48.320	-2.992	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-48.542	-50.456	-1.915	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-53.052	-54.129	-1.077	(0)
N(-3)	1.121e-005					
NH4+	1.052e-005	8.347e-006	-4.978	-5.078	-0.100	(0)
NH4SO4-	6.518e-007	5.342e-007	-6.186	-6.272	-0.086	(0)
NH3	3.947e-008	3.947e-008	-7.404	-7.404	0.000	(0)
CuNH3+2	7.220e-010	2.398e-010	-9.141	-9.620	-0.479	(0)
CaNH3+2	4.514e-010	1.499e-010	-9.345	-9.824	-0.479	(0)
NiNH3+2	4.009e-012	1.332e-012	-11.397	-11.876	-0.479	(0)
Co (NH3) +2	6.773e-013	2.250e-013	-12.169	-12.648	-0.479	(0)
AgNH3+	2.137e-013	1.622e-013	-12.670	-12.790	-0.120	(0)
BaNH3+2	9.661e-016	3.209e-016	-15.015	-15.494	-0.479	(0)
Ag (NH3) 2+	6.855e-017	5.204e-017	-16.164	-16.284	-0.120	(0)
Hg (NH3) 2+2	4.279e-017	1.421e-017	-16.369	-16.847	-0.479	(0)
Ni (NH3) 2+2	2.287e-017	7.598e-018	-16.641	-17.119	-0.479	(0)
Ca (NH3) 2+2	7.094e-018	2.356e-018	-17.149	-17.628	-0.479	(0)
Co (NH3) 2+2	1.140e-018	3.788e-019	-17.943	-18.422	-0.479	(0)
HgNH3+2	1.084e-018	3.601e-019	-17.965	-18.444	-0.479	(0)
Hg (NH3) 3+2	6.725e-024	2.234e-024	-23.172	-23.651	-0.479	(0)
Co (NH3) 3+2	5.667e-025	1.882e-025	-24.247	-24.725	-0.479	(0)
Hg (NH3) 4+2	2.108e-030	7.004e-031	-29.676	-30.155	-0.479	(0)
Co (NH3) 4+2	1.174e-031	3.900e-032	-30.930	-31.409	-0.479	(0)
Cr (NH3) 5OH+2	9.589e-037	3.185e-037	-36.018	-36.497	-0.479	(0)
Co (NH3) 5+2	7.691e-039	2.555e-039	-38.114	-38.593	-0.479	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-43.117	-44.194	-1.077	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.088	-45.567	-0.479	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.552	-46.031	-0.479	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.926	-54.045	-0.120	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.147	-59.625	-0.479	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.207	-59.686	-0.479	(0)
N(3)	9.575e-006					
NO2-	9.575e-006	7.655e-006	-5.019	-5.116	-0.097	(0)
CuNO2+	6.269e-010	4.759e-010	-9.203	-9.322	-0.120	(0)
CoNO2+	3.368e-012	2.557e-012	-11.473	-11.592	-0.120	(0)
AgNO2	3.219e-012	3.219e-012	-11.492	-11.492	0.000	(0)
Cu (NO2) 2	3.728e-014	3.728e-014	-13.429	-13.429	0.000	(0)
Ag (NO2) 2-	5.027e-017	3.816e-017	-16.299	-16.418	-0.120	(0)
N(5)	8.928e-009					
NO3-	8.836e-009	7.207e-009	-8.054	-8.142	-0.088	(0)
CaNO3+	9.059e-011	6.877e-011	-10.043	-10.163	-0.120	(0)
MnNO3+	5.750e-013	4.366e-013	-12.240	-12.360	-0.120	(0)
ZnNO3+	4.268e-014	3.240e-014	-13.370	-13.489	-0.120	(0)
CuNO3+	1.783e-014	1.353e-014	-13.749	-13.869	-0.120	(0)
NiNO3+	1.498e-015	1.137e-015	-14.824	-14.944	-0.120	(0)
CoNO3+	7.133e-016	5.415e-016	-15.147	-15.266	-0.120	(0)
BaNO3+	6.131e-016	4.654e-016	-15.213	-15.332	-0.120	(0)
CdNO3+	4.203e-016	3.191e-016	-15.376	-15.496	-0.120	(0)
PbNO3+	2.452e-016	1.862e-016	-15.610	-15.730	-0.120	(0)
AgNO3	1.152e-017	1.152e-017	-16.938	-16.938	0.000	(0)
UO2NO3+	1.300e-020	9.871e-021	-19.886	-20.006	-0.120	(0)
Mn (NO3) 2	7.903e-021	7.903e-021	-20.102	-20.102	0.000	(0)
CrNO3+2	1.603e-022	5.325e-023	-21.795	-22.274	-0.479	(0)
VO2NO3	6.479e-023	6.479e-023	-22.189	-22.189	0.000	(0)
Zn (NO3) 2	4.660e-023	4.660e-023	-22.332	-22.332	0.000	(0)
Cu (NO3) 2	1.228e-023	1.228e-023	-22.911	-22.911	0.000	(0)
Co (NO3) 2	7.941e-024	7.941e-024	-23.100	-23.100	0.000	(0)
Pb (NO3) 2	2.279e-024	2.279e-024	-23.642	-23.642	0.000	(0)
Cd (NO3) 2	1.153e-024	1.153e-024	-23.938	-23.938	0.000	(0)
FeNO3+2	4.896e-025	1.626e-025	-24.310	-24.789	-0.479	(0)
HgNO3+	5.068e-029	3.848e-029	-28.295	-28.415	-0.120	(0)
Hg (NO3) 2	1.153e-037	1.153e-037	-36.938	-36.938	0.000	(0)
Na	8.979e-003					
Na+	8.694e-003	7.091e-003	-2.061	-2.149	-0.088	(0)
NaSO4-	2.763e-004	2.275e-004	-3.559	-3.643	-0.084	(0)
NaHCO3	8.211e-006	8.211e-006	-5.086	-5.086	0.000	(0)

	NaF	3.557e-007	3.557e-007	-6.449	-6.449	0.000	(0)
	NaCO3-	1.284e-007	1.057e-007	-6.891	-6.976	-0.084	(0)
	NaH2BO3	9.566e-010	9.566e-010	-9.019	-9.019	0.000	(0)
	NaCrO4-	7.220e-019	5.482e-019	-18.141	-18.261	-0.120	(0)
Ni		2.402e-007					
	Ni+2	1.419e-007	6.282e-008	-6.848	-7.202	-0.354	(0)
	NiSO4	7.487e-008	7.487e-008	-7.126	-7.126	0.000	(0)
	NiHCO3+	2.101e-008	1.595e-008	-7.678	-7.797	-0.120	(0)
	NiCO3	1.876e-009	1.876e-009	-8.727	-8.727	0.000	(0)
	NiCl+	2.438e-010	1.851e-010	-9.613	-9.733	-0.120	(0)
	NiF+	1.652e-010	1.255e-010	-9.782	-9.902	-0.120	(0)
	NiOH+	8.694e-011	6.600e-011	-10.061	-10.180	-0.120	(0)
	Ni (SO4) 2-2	4.458e-011	1.481e-011	-10.351	-10.830	-0.479	(0)
	NiNH3+2	4.009e-012	1.332e-012	-11.397	-11.876	-0.479	(0)
	Ni (OH) 2	4.375e-013	4.375e-013	-12.359	-12.359	0.000	(0)
	NiNO3+	1.498e-015	1.137e-015	-14.824	-14.944	-0.120	(0)
	NiCl2	1.073e-015	1.073e-015	-14.969	-14.969	0.000	(0)
	NiSeO4	2.589e-016	2.589e-016	-15.587	-15.587	0.000	(0)
	Ni (OH) 3-	4.809e-017	3.651e-017	-16.318	-16.438	-0.120	(0)
	Ni (NH3) 2+2	2.287e-017	7.598e-018	-16.641	-17.119	-0.479	(0)
O (0)		2.444e-035					
	O2	1.222e-035	1.238e-035	-34.913	-34.907	0.006	(0)
Pb		1.795e-008					
	PbSO4	5.109e-009	5.109e-009	-8.292	-8.292	0.000	(0)
	PbCO3	4.203e-009	4.203e-009	-8.376	-8.376	0.000	(0)
	Pb+2	3.946e-009	1.746e-009	-8.404	-8.758	-0.354	(0)
	PbHCO3+	3.519e-009	2.672e-009	-8.454	-8.573	-0.120	(0)
	Pb (SO4) 2-2	5.535e-010	1.839e-010	-9.257	-9.736	-0.479	(0)
	PbOH+	4.822e-010	3.661e-010	-9.317	-9.436	-0.120	(0)
	PbCl+	9.397e-011	7.134e-011	-10.027	-10.147	-0.120	(0)
	Pb (CO3) 2-2	2.921e-011	9.704e-012	-10.534	-11.013	-0.479	(0)
	PbF+	1.289e-011	9.783e-012	-10.890	-11.010	-0.120	(0)
	Pb (OH) 2	9.660e-013	9.660e-013	-12.015	-12.015	0.000	(0)
	PbCl2	3.669e-013	3.669e-013	-12.435	-12.435	0.000	(0)
	PbF2	1.531e-014	1.531e-014	-13.815	-13.815	0.000	(0)
	PbNO3+	2.452e-016	1.862e-016	-15.610	-15.730	-0.120	(0)
	PbCl3-	2.215e-016	1.682e-016	-15.655	-15.774	-0.120	(0)
	Pb2OH+3	1.210e-016	1.013e-017	-15.917	-16.994	-1.077	(0)
	Pb (OH) 3-	1.062e-016	8.061e-017	-15.974	-16.094	-0.120	(0)
	PbF3-	3.040e-018	2.308e-018	-17.517	-17.637	-0.120	(0)
	PbCl4-2	2.664e-019	8.850e-020	-18.574	-19.053	-0.479	(0)
	Pb (OH) 4-2	4.960e-021	1.648e-021	-20.305	-20.783	-0.479	(0)
	PbF4-2	2.644e-022	8.782e-023	-21.578	-22.056	-0.479	(0)
	Pb3 (OH) 4+2	9.789e-023	3.251e-023	-22.009	-22.488	-0.479	(0)
	Pb (NO3) 2	2.279e-024	2.279e-024	-23.642	-23.642	0.000	(0)
	Pb4 (OH) 4+4	3.705e-026	4.510e-028	-25.431	-27.346	-1.915	(0)
	Pb (HS) 2	0.000e+000	0.000e+000	-148.804	-148.804	0.000	(0)
	Pb (HS) 3-	0.000e+000	0.000e+000	-225.042	-225.162	-0.120	(0)
S (-2)		0.000e+000					
	AgHS	0.000e+000	0.000e+000	-72.540	-72.540	0.000	(0)
	CdHS+	0.000e+000	0.000e+000	-77.384	-77.504	-0.120	(0)
	HS-	0.000e+000	0.000e+000	-77.538	-77.658	-0.120	(0)
	H2S	0.000e+000	0.000e+000	-77.557	-77.557	0.000	(0)
	S5-2	0.000e+000	0.000e+000	-79.626	-80.104	-0.479	(0)
	S6-2	0.000e+000	0.000e+000	-80.142	-80.620	-0.479	(0)
	S4-2	0.000e+000	0.000e+000	-80.221	-80.700	-0.479	(0)
	S3-2	0.000e+000	0.000e+000	-81.027	-81.506	-0.479	(0)
	S2-2	0.000e+000	0.000e+000	-82.043	-82.522	-0.479	(0)
	S-2	0.000e+000	0.000e+000	-87.694	-88.039	-0.346	(0)
	HgHS2-	0.000e+000	0.000e+000	-136.189	-136.309	-0.120	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-136.834	-136.834	0.000	(0)
	HgS2-2	0.000e+000	0.000e+000	-137.620	-138.098	-0.479	(0)
	Ag (HS) 2-	0.000e+000	0.000e+000	-145.978	-146.098	-0.120	(0)
	Ag (HS) S4-2	0.000e+000	0.000e+000	-146.440	-146.662	-0.222	(0)
	Cu (S4) 2-3	0.000e+000	0.000e+000	-147.090	-147.478	-0.388	(0)
	ZnS (HS) -	0.000e+000	0.000e+000	-147.215	-147.334	-0.120	(0)
	CuS4S5-3	0.000e+000	0.000e+000	-147.840	-148.208	-0.368	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-147.958	-147.958	0.000	(0)

Zn (HS) 2	0.000e+000	0.000e+000	-148.243	-148.243	0.000	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.784	-149.184	-0.400	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-148.804	-148.804	0.000	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.117	-149.495	-0.378	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.834	-156.834	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.182	-213.301	-0.120	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.501	-222.621	-0.120	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-223.596	-223.716	-0.120	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-225.042	-225.162	-0.120	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.204	-225.682	-0.479	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-232.335	-232.455	-0.120	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-298.699	-299.178	-0.479	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.260	-301.739	-0.479	(0)
Sb2S4-2	0.000e+000	0.000e+000	-310.225	-310.704	-0.479	(0)
S (6)	1.958e-002					
SO4-2	1.350e-002	5.973e-003	-1.870	-2.224	-0.354	(0)
CaSO4	4.129e-003	4.129e-003	-2.384	-2.384	0.000	(0)
MgSO4	1.548e-003	1.548e-003	-2.810	-2.810	0.000	(0)
NaSO4-	2.763e-004	2.275e-004	-3.559	-3.643	-0.084	(0)
KSO4-	9.132e-005	7.517e-005	-4.039	-4.124	-0.084	(0)
MnSO4	4.059e-005	4.059e-005	-4.392	-4.392	0.000	(0)
ZnSO4	2.339e-006	2.339e-006	-5.631	-5.631	0.000	(0)
CuSO4	8.125e-007	8.125e-007	-6.090	-6.090	0.000	(0)
NH4SO4-	6.518e-007	5.342e-007	-6.186	-6.272	-0.086	(0)
Zn (SO4) 2-2	3.663e-007	1.217e-007	-6.436	-6.915	-0.479	(0)
HSO4-	8.635e-008	7.038e-008	-7.064	-7.153	-0.089	(0)
NiSO4	7.487e-008	7.487e-008	-7.126	-7.126	0.000	(0)
CoSO4	5.649e-008	5.649e-008	-7.248	-7.248	0.000	(0)
CdSO4	1.960e-008	1.960e-008	-7.708	-7.708	0.000	(0)
PbSO4	5.109e-009	5.109e-009	-8.292	-8.292	0.000	(0)
Cd (SO4) 2-2	4.755e-009	1.579e-009	-8.323	-8.801	-0.479	(0)
Pb (SO4) 2-2	5.535e-010	1.839e-010	-9.257	-9.736	-0.479	(0)
CrOHSO4	4.374e-010	4.374e-010	-9.359	-9.359	0.000	(0)
AgSO4-	3.159e-010	2.399e-010	-9.500	-9.620	-0.120	(0)
AlSO4+	5.708e-011	4.652e-011	-10.244	-10.332	-0.089	(0)
FeSO4	4.992e-011	4.992e-011	-10.302	-10.302	0.000	(0)
Ni (SO4) 2-2	4.458e-011	1.481e-011	-10.351	-10.830	-0.479	(0)
UO2SO4	6.205e-012	6.205e-012	-11.207	-11.207	0.000	(0)
Al (SO4) 2-	3.653e-012	2.977e-012	-11.437	-11.526	-0.089	(0)
CrSO4+	3.105e-012	2.357e-012	-11.508	-11.628	-0.120	(0)
UO2 (SO4) 2-2	1.471e-012	4.886e-013	-11.832	-12.311	-0.479	(0)
VO2SO4-	3.339e-015	2.535e-015	-14.476	-14.596	-0.120	(0)
FeSO4+	1.845e-016	1.512e-016	-15.734	-15.820	-0.086	(0)
VOSO4	4.769e-017	4.769e-017	-16.322	-16.322	0.000	(0)
Cr2 (OH) 2SO4+2	3.672e-017	1.220e-017	-16.435	-16.914	-0.479	(0)
Fe (SO4) 2-	2.543e-017	1.931e-017	-16.595	-16.714	-0.120	(0)
Cr2 (OH) 2 (SO4) 2	4.328e-018	4.328e-018	-17.364	-17.364	0.000	(0)
HgSO4	2.261e-020	2.261e-020	-19.646	-19.646	0.000	(0)
CrO3SO4-2	4.011e-024	1.332e-024	-23.397	-23.875	-0.479	(0)
VSO4+	1.090e-030	8.277e-031	-29.962	-30.082	-0.120	(0)
U (SO4) 2	5.295e-037	5.295e-037	-36.276	-36.276	0.000	(0)
USO4+2	3.360e-038	1.116e-038	-37.474	-37.952	-0.479	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.926	-54.045	-0.120	(0)
Sb (3)	3.044e-018					
Sb (OH) 3	1.540e-018	1.540e-018	-17.813	-17.813	0.000	(0)
HSbO2	1.504e-018	1.504e-018	-17.823	-17.823	0.000	(0)
SbO2-	2.662e-023	2.021e-023	-22.575	-22.695	-0.120	(0)
Sb (OH) 2F	2.307e-023	2.307e-023	-22.637	-22.637	0.000	(0)
SbOF	2.271e-023	2.271e-023	-22.644	-22.644	0.000	(0)
Sb (OH) 4-	1.523e-023	1.156e-023	-22.817	-22.937	-0.120	(0)
Sb (OH) 2+	5.943e-024	4.512e-024	-23.226	-23.346	-0.120	(0)
SbO+	2.051e-024	1.557e-024	-23.688	-23.808	-0.120	(0)
Sb2S4-2	0.000e+000	0.000e+000	-310.225	-310.704	-0.479	(0)
Sb (5)	2.469e-007					
SbO3-	2.466e-007	1.872e-007	-6.608	-6.728	-0.120	(0)
Sb (OH) 6-	2.679e-010	2.185e-010	-9.572	-9.661	-0.088	(0)
SbO2+	1.029e-021	7.812e-022	-20.988	-21.107	-0.120	(0)
Se (-2)	2.859e-015					

Ag ₂ Se	2.859e-015	2.859e-015	-14.544	-14.544	0.000	(0)
HSe-	1.376e-039	1.044e-039	-38.861	-38.981	-0.120	(0)
MnSe	0.000e+000	0.000e+000	-41.865	-41.865	0.000	(0)
H ₂ Se	0.000e+000	0.000e+000	-42.010	-42.010	0.000	(0)
Se-2	0.000e+000	0.000e+000	-46.584	-47.062	-0.479	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-84.497	-86.412	-1.915	(0)
Se (4)	8.744e-008					
HSeO ₃ -	8.130e-008	6.172e-008	-7.090	-7.210	-0.120	(0)
SeO ₃ -2	6.135e-009	2.038e-009	-8.212	-8.691	-0.479	(0)
H ₂ SeO ₃	3.174e-012	3.174e-012	-11.498	-11.498	0.000	(0)
AgSeO ₃ -	3.472e-015	2.636e-015	-14.459	-14.579	-0.120	(0)
Cd (SeO ₃) 2-2	1.443e-019	4.792e-020	-18.841	-19.319	-0.479	(0)
FeHSeO ₃ +2	1.108e-021	3.680e-022	-20.956	-21.434	-0.479	(0)
Ag (SeO ₃) 2-3	5.742e-022	4.810e-023	-21.241	-22.318	-1.077	(0)
Se (6)	2.000e-011					
SeO ₄ -2	1.991e-011	8.811e-012	-10.701	-11.055	-0.354	(0)
MnSeO ₄	9.063e-014	9.063e-014	-13.043	-13.043	0.000	(0)
ZnSeO ₄	2.443e-015	2.443e-015	-14.612	-14.612	0.000	(0)
NiSeO ₄	2.589e-016	2.589e-016	-15.587	-15.587	0.000	(0)
CoSeO ₄	2.093e-016	2.093e-016	-15.679	-15.679	0.000	(0)
HSeO ₄ -	7.013e-017	5.324e-017	-16.154	-16.274	-0.120	(0)
CdSeO ₄	2.297e-017	2.297e-017	-16.639	-16.639	0.000	(0)
Zn (SeO ₄) 2-2	6.570e-026	2.182e-026	-25.182	-25.661	-0.479	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-55.901	-56.978	-1.077	(0)
U (4)	1.841e-021					
U (OH) 5-	1.834e-021	1.392e-021	-20.737	-20.856	-0.120	(0)
U (OH) 4	7.034e-024	7.034e-024	-23.153	-23.153	0.000	(0)
U (OH) 3+	4.088e-027	3.103e-027	-26.389	-26.508	-0.120	(0)
U (OH) 2+2	5.212e-031	1.731e-031	-30.283	-30.762	-0.479	(0)
UF ₃ +	1.237e-033	9.389e-034	-32.908	-33.027	-0.120	(0)
UF ₂ +2	2.243e-034	7.452e-035	-33.649	-34.128	-0.479	(0)
UOH+3	1.175e-035	9.839e-037	-34.930	-36.007	-1.077	(0)
UF ₄	8.184e-036	8.184e-036	-35.087	-35.087	0.000	(0)
UF+3	8.889e-037	7.445e-038	-36.051	-37.128	-1.077	(0)
U (SO ₄) 2	5.295e-037	5.295e-037	-36.276	-36.276	0.000	(0)
UF ₅ -	3.396e-038	2.578e-038	-37.469	-37.589	-0.120	(0)
USO ₄ +2	3.360e-038	1.116e-038	-37.474	-37.952	-0.479	(0)
UF ₆ -2	1.864e-039	6.190e-040	-38.730	-39.208	-0.479	(0)
U+4	0.000e+000	0.000e+000	-40.414	-42.328	-1.915	(0)
UCl+3	0.000e+000	0.000e+000	-42.490	-43.567	-1.077	(0)
U ₆ (OH) 15+9	0.000e+000	0.000e+000	-157.657	-167.349	-9.692	(0)
U (5)	7.725e-016					
UO ₂ +	7.725e-016	5.865e-016	-15.112	-15.232	-0.120	(0)
U (6)	2.226e-007					
UO ₂ (CO ₃) 3-4	1.152e-007	1.402e-009	-6.939	-8.853	-1.915	(0)
UO ₂ (CO ₃) 2-2	1.052e-007	3.495e-008	-6.978	-7.457	-0.479	(0)
UO ₂ CO ₃	2.188e-009	2.188e-009	-8.660	-8.660	0.000	(0)
UO ₂ F+	9.922e-012	7.532e-012	-11.003	-11.123	-0.120	(0)
UO ₂ OH+	9.498e-012	7.211e-012	-11.022	-11.142	-0.120	(0)
UO ₂ SO ₄	6.205e-012	6.205e-012	-11.207	-11.207	0.000	(0)
UO ₂ F ₂	1.727e-012	1.727e-012	-11.763	-11.763	0.000	(0)
UO ₂ +2	1.551e-012	6.864e-013	-11.809	-12.163	-0.354	(0)
UO ₂ (SO ₄) 2-2	1.471e-012	4.886e-013	-11.832	-12.311	-0.479	(0)
UO ₂ F ₃ -	4.543e-014	3.449e-014	-13.343	-13.462	-0.120	(0)
UO ₂ Cl+	1.688e-015	1.282e-015	-14.773	-14.892	-0.120	(0)
(UO ₂) ₂ (OH) 2+2	2.598e-016	8.629e-017	-15.585	-16.064	-0.479	(0)
UO ₂ F ₄ -2	6.556e-017	2.178e-017	-16.183	-16.662	-0.479	(0)
(UO ₂) ₃ (OH) 5+	4.330e-018	3.287e-018	-17.364	-17.483	-0.120	(0)
UO ₂ NO ₃ +	1.300e-020	9.871e-021	-19.886	-20.006	-0.120	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-40.145	-40.264	-0.120	(0)
V+2	0.000e+000	0.000e+000	-40.217	-40.696	-0.479	(0)
V (3)	1.376e-013					
V (OH) 3	1.376e-013	1.376e-013	-12.861	-12.861	0.000	(0)
V (OH) 2+	1.413e-023	1.073e-023	-22.850	-22.969	-0.120	(0)
VOH+2	3.696e-026	1.228e-026	-25.432	-25.911	-0.479	(0)
V+3	3.505e-030	2.936e-031	-29.455	-30.532	-1.077	(0)

VSO4+	1.090e-030	8.277e-031	-29.962	-30.082	-0.120	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-49.107	-51.022	-1.915	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-49.352	-50.428	-1.077	(0)
V (4)	7.890e-016					
V (OH) 3+	6.353e-016	4.823e-016	-15.197	-15.317	-0.120	(0)
VO+2	8.727e-017	2.899e-017	-16.059	-16.538	-0.479	(0)
VOSO4	4.769e-017	4.769e-017	-16.322	-16.322	0.000	(0)
VOF+	1.821e-017	1.382e-017	-16.740	-16.859	-0.120	(0)
VOF2	4.120e-019	4.120e-019	-18.385	-18.385	0.000	(0)
VOC1+	1.233e-019	9.363e-020	-18.909	-19.029	-0.120	(0)
VOF3-	1.531e-021	1.162e-021	-20.815	-20.935	-0.120	(0)
VOF4-2	1.123e-024	3.729e-025	-23.950	-24.428	-0.479	(0)
H2V2O4+2	3.515e-026	1.167e-026	-25.454	-25.933	-0.479	(0)
V (5)	8.457e-008					
H2VO4-	8.058e-008	6.117e-008	-7.094	-7.213	-0.120	(0)
HVO4-2	3.837e-009	1.274e-009	-8.416	-8.895	-0.479	(0)
H3VO4	7.376e-011	7.376e-011	-10.132	-10.132	0.000	(0)
H3V2O7-	3.840e-011	2.915e-011	-10.416	-10.535	-0.120	(0)
HV2O7-3	3.156e-013	2.644e-014	-12.501	-13.578	-1.077	(0)
VO2+	2.179e-014	1.777e-014	-13.662	-13.750	-0.088	(0)
VO2SO4-	3.339e-015	2.535e-015	-14.476	-14.596	-0.120	(0)
V3O9-3	2.868e-015	2.403e-016	-14.542	-15.619	-1.077	(0)
VO2F	2.478e-015	2.478e-015	-14.606	-14.606	0.000	(0)
VO4-3	6.325e-016	5.298e-017	-15.199	-16.276	-1.077	(0)
V2O7-4	4.848e-016	5.902e-018	-15.314	-17.229	-1.915	(0)
VO2F2-	9.421e-017	7.152e-017	-16.026	-16.146	-0.120	(0)
V4O12-4	5.037e-019	6.132e-021	-18.298	-20.212	-1.915	(0)
VO2F3-2	2.135e-019	7.093e-020	-18.671	-19.149	-0.479	(0)
VO2NO3	6.479e-023	6.479e-023	-22.189	-22.189	0.000	(0)
VO2F4-3	3.312e-023	2.774e-024	-22.480	-23.557	-1.077	(0)
V10O28-6	0.000e+000	0.000e+000	-46.592	-50.900	-4.308	(0)
HV10O28-5	0.000e+000	0.000e+000	-46.640	-49.632	-2.992	(0)
H2V10O28-4	0.000e+000	0.000e+000	-49.428	-51.343	-1.915	(0)
Zn	7.016e-006					
Zn+2	4.044e-006	1.790e-006	-5.393	-5.747	-0.354	(0)
ZnSO4	2.339e-006	2.339e-006	-5.631	-5.631	0.000	(0)
Zn (SO4) 2-2	3.663e-007	1.217e-007	-6.436	-6.915	-0.479	(0)
ZnHCO3+	1.535e-007	1.165e-007	-6.814	-6.934	-0.120	(0)
ZnCO3	8.246e-008	8.246e-008	-7.084	-7.084	0.000	(0)
ZnOH+	1.968e-008	1.494e-008	-7.706	-7.826	-0.120	(0)
ZnCl+	6.390e-009	5.176e-009	-8.195	-8.286	-0.091	(0)
ZnF+	3.740e-009	2.839e-009	-8.427	-8.547	-0.120	(0)
ZnOHC1	5.655e-010	5.655e-010	-9.248	-9.248	0.000	(0)
Zn (OH) 2	1.976e-010	1.976e-010	-9.704	-9.704	0.000	(0)
ZnCl2	9.446e-012	9.446e-012	-11.025	-11.025	0.000	(0)
Zn (OH) 3-	1.088e-013	8.262e-014	-12.963	-13.083	-0.120	(0)
ZnNO3+	4.268e-014	3.240e-014	-13.370	-13.489	-0.120	(0)
ZnCl3-	1.066e-014	8.639e-015	-13.972	-14.064	-0.091	(0)
ZnSeO4	2.443e-015	2.443e-015	-14.612	-14.612	0.000	(0)
ZnCl4-2	1.102e-017	4.973e-018	-16.958	-17.303	-0.346	(0)
Zn (OH) 4-2	8.264e-019	2.745e-019	-18.083	-18.561	-0.479	(0)
Zn (NO3) 2	4.660e-023	4.660e-023	-22.332	-22.332	0.000	(0)
Zn (SeO4) 2-2	6.570e-026	2.182e-026	-25.182	-25.661	-0.479	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.215	-147.334	-0.120	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.243	-148.243	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.501	-222.621	-0.120	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.204	-225.682	-0.479	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.260	-301.739	-0.479	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-50.18	-43.89	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-38.00	-33.49	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-45.22	-33.49	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-65.19	-47.26	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-51.68	-31.65	20.03	(Co (NH3) 6) Cl3

(NH4)2CrO4	-27.37	-26.97	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.66	-21.21	0.45	(NH4)2SeO4
Acanthite	-51.91	-88.13	-36.22	Ag2S
Ag2CO3	-12.40	-23.49	-11.09	Ag2CO3
Ag2CrO4	-22.61	-34.20	-11.59	Ag2CrO4
Ag2HVO4	-11.87	-10.39	1.48	Ag2HVO4
Ag2MoO4	-12.33	-23.88	-11.55	Ag2MoO4
Ag2O	-16.13	-3.56	12.57	Ag2O
Ag2Se	-0.75	-49.45	-48.70	Ag2Se
Ag2SeO3	-10.53	-17.68	-7.15	Ag2SeO3
Ag2SeO4	-19.54	-28.45	-8.91	Ag2SeO4
Ag2SO4	-14.80	-19.62	-4.82	Ag2SO4
Ag3AsO3	-28.00	-25.84	2.16	Ag3AsO3
Ag3AsO4	-16.41	-19.20	-2.79	Ag3AsO4
Ag3H2VO5	-17.34	-12.16	5.18	Ag3H2VO5
AgF·4H2O	-13.85	-12.80	1.05	AgF·4H2O
Agmetal	-1.04	-14.55	-13.51	Ag
AgVO3	-9.38	-8.61	0.77	AgVO3
Al(OH)3(am)	-2.04	8.76	10.80	Al(OH)3
Al2(MoO4)3	-45.83	-43.47	2.37	Al2(MoO4)3
Al2O3	-2.14	17.51	19.65	Al2O3
Al4(OH)10SO4	-3.73	18.97	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-9.91	-5.11	4.80	AlAsO4·2H2O
AlOHSO4	-4.07	-7.30	-3.23	AlOHSO4
AlSb	-151.31	-85.69	65.62	AlSb
Alunite	-0.28	-1.68	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.19	-10.98	-7.79	PbSO4
Anhydrite	-0.38	-4.74	-4.36	CaSO4
Anilite	-54.50	-86.38	-31.88	Cu0.25Cu1.5S
Antlerite	-2.02	6.77	8.79	Cu3(OH)4SO4
Aragonite	-0.32	-8.62	-8.30	CaCO3
Arsenolite	-79.27	-82.03	-2.76	As4O6
Artinite	-7.55	2.05	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-34.43	-27.72	6.71	As2O5
Atacamite	-2.03	5.36	7.39	Cu2(OH)3Cl
Azurite	-0.13	-17.04	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-18.45	5.94	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-17.64	-1.77	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.97	-9.88	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-28.76	4.18	32.94	Ba3(VO4)2·4H2O
BaCrO4	-15.03	-24.70	-9.67	BaCrO4
BaF2	-10.27	-16.09	-5.82	BaF2
BaMoO4	-7.42	-14.38	-6.96	BaMoO4
Barite	-0.13	-10.11	-9.98	BaSO4
BaS	-94.81	-78.63	16.18	BaS
BaSeO3	-10.01	-8.18	1.83	BaSeO3
BaSeO4	-11.48	-18.94	-7.46	BaSeO4
Bianchite	-6.21	-7.97	-1.76	ZnSO4·6H2O
Birnessite	-8.48	9.61	18.09	MnO2
Bixbyite	-5.67	-6.32	-0.64	Mn2O3
Blaubleil	-54.06	-78.22	-24.16	Cu0.9Cu0.2S
BlaubleilII	-54.71	-81.99	-27.28	Cu0.6Cu0.8S
Boehmite	0.18	8.76	8.58	AlOOH
Breithauptite	-56.51	-75.04	-18.52	NiSb
Brochantite	-0.84	14.38	15.22	Cu4(OH)6SO4
Brucite	-5.85	10.99	16.84	Mg(OH)2
Bunsenite	-5.81	6.64	12.45	NiO
Ca(VO3)2	-8.01	-2.35	5.66	Ca(VO3)2
Ca2V2O7	-8.53	8.97	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.58	8.97	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-16.08	6.22	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-18.67	20.29	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-19.57	20.29	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-297.91	-154.94	142.97	Ca3Sb2
CaCrO4	-17.06	-19.33	-2.27	CaCrO4
Calcite	-0.14	-8.62	-8.48	CaCO3
Calomel	-8.56	-26.47	-17.91	Hg2Cl2
CaMoO4	-1.06	-9.01	-7.95	CaMoO4

Carnotite	-1.22	-0.99	0.23	KUO2VO4
CaSeO3:2H2O	-5.63	-2.81	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.56	-13.58	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.36	-3.52	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.98	13.64	Cd(OH)2
Cd(OH)2(am)	-7.75	5.98	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.88	-14.17	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.67	1.89	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.53	7.87	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.73	-0.66	CdCl2
CdCl2:1H2O	-12.04	-13.73	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.82	-13.73	-1.91	CdCl2:2.5H2O
CdF2	-14.84	-16.05	-1.21	CdF2
Cdmetal(alpha)	-33.08	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO4	-0.19	-14.34	-14.15	CdMoO4
CdOHCl	-7.41	-3.87	3.54	CdOHCl
CdSb	-75.34	-75.69	-0.35	CdSb
CdSe	-19.72	-39.92	-20.20	CdSe
CdSeO4:2H2O	-17.06	-18.91	-1.85	CdSeO4:2H2O
CdSO4	-9.91	-10.08	-0.17	CdSO4
CdSO4:1H2O	-8.35	-10.08	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.21	-10.08	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.89	-11.64	-9.75	AgCl
Cerrusite	-1.72	-14.85	-13.13	PbCO3
CH4(g)	-81.06	-122.11	-41.05	CH4
Chalcanthite	-5.81	-8.45	-2.64	CuSO4:5H2O
Chalcocite	-54.60	-89.52	-34.92	Cu2S
Chalcopyrite	-122.90	-158.17	-35.27	CuFeS2
Cinnabar	-51.08	-96.77	-45.69	HgS
Claudetite	-78.97	-82.03	-3.06	As4O6
Clausthalite	-13.72	-40.82	-27.10	PbSe
Co(BO2)2	-30.06	-2.99	27.07	Co(BO2)2
Co(OH)2	-6.58	6.51	13.09	Co(OH)2
Co(OH)3	-10.81	-13.12	-2.31	Co(OH)3
CO2(g)	-1.79	-19.93	-18.15	CO2
Co3(AsO4)2	-21.22	-8.19	13.03	Co3(AsO4)2
Co3O4	-9.22	-19.72	-10.50	Co3O4
CoCl2	-21.47	-13.20	8.27	CoCl2
CoCl2:6H2O	-15.74	-13.20	2.54	CoCl2:6H2O
CoCO3	-3.44	-13.42	-9.98	CoCO3
CoF2	-13.93	-15.52	-1.60	CoF2
CoF3	-44.71	-46.17	-1.46	CoF3
CoFe2O4	16.26	12.73	-3.53	CoFe2O4
CoMoO4	-6.05	-13.81	-7.76	CoMoO4
CoO	-7.07	6.51	13.59	CoO
CoS(alpha)	-70.62	-78.06	-7.44	CoS
CoS(beta)	-66.99	-78.06	-11.07	CoS
CoSe	-23.19	-39.39	-16.20	CoSe
CoSeO3	-8.93	-7.61	1.32	CoSeO3
CoSeO4:6H2O	-16.85	-18.38	-1.53	CoSeO4:6H2O
CoSO4	-12.35	-9.55	2.80	CoSO4
CoSO4:6H2O	-7.08	-9.55	-2.47	CoSO4:6H2O
Cotunnite	-9.86	-14.64	-4.78	PbCl2
Covellite	-54.67	-76.97	-22.30	CuS
Cr(OH)2	-22.23	-11.41	10.82	Cr(OH)2
Cr(OH)3	-2.92	-1.59	1.34	Cr(OH)3
Cr(OH)3(am)	-0.84	-1.59	-0.75	Cr(OH)3
Cr2O3	-0.81	-3.17	-2.36	Cr2O3
CrCl2	-45.22	-31.12	14.09	CrCl2
CrCl3	-46.27	-31.16	15.11	CrCl3
CrF3	-23.30	-34.64	-11.34	CrF3
Crmetal	-67.44	-36.95	30.48	Cr
CrO3	-27.43	-30.65	-3.21	CrO3
Cryolite	-9.20	-43.04	-33.84	Na3AlF6
Cu(OH)2	-1.06	7.61	8.67	Cu(OH)2
Cu(SbO3)2	-22.14	23.07	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.09	0.16	9.25	Cu2(OH)3NO3

Cu2Sb:3H2O	-54.42	-89.30	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.04	-50.84	-45.80	Cu2Se
Cu2SO4	-19.05	-21.00	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-10.99	-4.89	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.26	-101.86	-42.59	Cu3Sb
Cu3Se2	-25.64	-89.13	-63.49	Cu3Se2
CuCO3	-0.82	-12.32	-11.50	CuCO3
CuCrO4	-17.59	-23.03	-5.44	CuCrO4
CuF	-8.58	-13.49	-4.91	CuF
CuF2	-15.54	-14.43	1.12	CuF2
CuF2:2H2O	-9.88	-14.43	-4.55	CuF2:2H2O
Cumetal	-6.49	-15.24	-8.76	Cu
CuMoO4	0.36	-12.72	-13.08	CuMoO4
CuOCuSO4	-11.14	-0.84	10.30	CuOCuSO4
Cupricferrite	7.84	13.83	5.99	CuFe2O4
Cuprite	-3.54	-4.94	-1.41	Cu2O
Cuprousferrite	9.56	0.64	-8.92	CuFeO2
CuSe	-5.19	-38.29	-33.10	CuSe
CuSe2	-25.28	-58.64	-33.37	CuSe2
CuSeO3:2H2O	-7.03	-6.52	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.84	-17.28	-2.44	CuSeO4:5H2O
CuSO4	-11.39	-8.45	2.94	CuSO4
Diaspore	1.88	8.76	6.87	AlOOH
Djurleite	-54.77	-88.69	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-1.02	-17.56	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.47	-17.56	-17.09	CaMg(CO3)2
Epsomite	-2.95	-5.07	-2.13	MgSO4:7H2O
Fe(OH)2	-10.20	3.37	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.19	0.15	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.57	-10.29	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.46	-7.91	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.54	-36.17	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.23	-41.96	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.64	9.59	20.22	Fe3(OH)8
FeAsO4:2H2O	-11.15	-10.75	0.40	FeAsO4:2H2O
FeCr2O4	-7.00	0.20	7.20	FeCr2O4
FeMoO4	-6.87	-16.96	-10.09	FeMoO4
Ferrihydrite	-0.08	3.11	3.19	Fe(OH)3
Ferroselite	-44.29	-62.89	-18.60	FeSe2
FeS(ppt)	-78.26	-81.21	-2.95	FeS
FeSe	-31.53	-42.53	-11.00	FeSe
Fix_pe	-5.85	-5.85	0.00	e-
Fluorite	-0.22	-10.72	-10.50	CaF2
Galena	-65.53	-79.50	-13.97	PbS
Gibbsite	0.47	8.76	8.29	Al(OH)3
Goethite	2.62	3.11	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O
Greenockite	-64.23	-78.59	-14.36	CdS
Greigite	-283.68	-328.72	-45.03	Fe3S4
Gummite	-6.00	1.67	7.67	UO3
Gypsum	-0.13	-4.74	-4.61	CaSO4:2H2O
H-Jarosite	-10.70	-22.80	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.45	-20.33	-12.88	H2MoO4
H2S(g)	-76.57	-84.58	-8.01	H2S
H2Se(g)	-40.94	-45.90	-4.96	H2Se
Halite	-6.69	-5.09	1.60	NaCl
Hausmannite	-7.23	53.80	61.03	Mn3O4
Hematite	7.64	6.22	-1.42	Fe2O3
Hercynite	-2.01	20.88	22.89	FeAl2O4
Hg(CH3)2(g)	-182.71	-256.42	-73.71	Hg(CH3)2
Hg(g)	-8.27	-16.15	-7.87	Hg
Hg(OH)2	-8.70	-12.20	-3.50	Hg(OH)2
Hg2(g)	-17.34	-32.30	-14.96	Hg2
Hg2(OH)2	-12.01	-6.75	5.26	Hg2(OH)2
Hg2CO3	-10.64	-26.69	-16.05	Hg2CO3
Hg2CrO4	-28.70	-37.40	-8.70	Hg2CrO4
Hg2F2	-18.43	-28.79	-10.36	Hg2F2
Hg2S	-79.65	-91.33	-11.68	Hg2S

Hg2SeO3	-16.22	-20.88	-4.66	Hg2SeO3
Hg2SO4	-16.68	-22.81	-6.13	Hg2SO4
Hg3O2CO3	-26.84	-56.52	-29.68	Hg3O2CO3
HgCl (g)	-32.73	-13.23	19.50	HgCl
HgCl2	-10.65	-31.91	-21.26	HgCl2
HgF (g)	-47.07	-14.39	32.68	HgF
HgF2 (g)	-46.80	-34.23	12.57	HgF2
Hgmetal (l)	-2.70	-16.15	-13.45	Hg
HgSe	-2.40	-58.10	-55.69	HgSe
HgSeO3	-13.89	-26.32	-12.43	HgSeO3
HgSO4	-18.84	-28.26	-9.42	HgSO4
Huntite	-5.48	-35.45	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.86	-24.63	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-16.02	-24.78	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.03	-19.20	-5.17	KA1 (SO4) 2 : 12H2O
K-Jarosite	-3.83	-18.63	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.71	-52.95	-17.24	K2Cr2O7
K2CrO4	-21.79	-22.31	-0.51	K2CrO4
K2MoO4	-15.25	-11.99	3.26	K2MoO4
K2SeO4	-15.83	-16.56	-0.73	K2SeO4
Langite	-3.11	14.38	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.47	-5.90	-0.43	PbO : PbSO4
Laurionite	-5.40	-4.78	0.62	PbOHCl
Lepidocrocite	1.74	3.11	1.37	FeOOH
Lime	-21.38	11.32	32.70	CaO
Litharge	-7.61	5.08	12.69	PbO
Mackinawite	-77.61	-81.21	-3.60	FeS
Maghemite	-0.17	6.22	6.39	Fe2O3
Magnesioferrite	0.35	17.21	16.86	Fe2MgO4
Magnesite	-1.48	-8.94	-7.46	MgCO3
Magnetite	6.18	9.59	3.40	Fe3O4
Malachite	0.59	-4.71	-5.31	Cu2 (OH) 2CO3
Manganite	-3.15	22.19	25.34	MnOOH
Massicot	-7.81	5.08	12.89	PbO
Matlockite	-6.82	-15.80	-8.97	PbClF
Melanothallite	-18.36	-12.10	6.26	CuCl2
Melanterite	-10.49	-12.69	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.68	-96.77	-45.09	HgS
Mg (OH) 2 (active)	-7.80	10.99	18.79	Mg (OH) 2
Mg (VO3) 2	-13.95	-2.67	11.28	Mg (VO3) 2
Mg2Sb3	-272.17	-197.49	74.68	Mg2Sb3
Mg2V2O7	-18.04	8.32	26.36	Mg2V2O7
MgCr2O4	-8.38	7.82	16.20	MgCr2O4
MgCrO4	-25.03	-19.65	5.38	MgCrO4
MgF2	-2.92	-11.05	-8.13	MgF2
MgMoO4	-7.49	-9.34	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.19	-3.14	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.70	-13.90	-1.20	MgSeO4 : 6H2O
Minium	-32.74	40.78	73.52	Pb3O4
Mirabilite	-5.41	-6.53	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.14	-4.24	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-48.79	-54.50	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.46	-88.38	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.97	0.53	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.01	-10.30	2.72	MnCl2 : 4H2O
MnS (grn)	-75.33	-75.16	0.17	MnS
MnS (pnk)	-78.50	-75.16	3.34	MnS
MnSb	-94.69	-97.60	-2.91	MnSb
MnSe	-39.98	-36.48	3.50	MnSe
MnSeO3	-5.84	-4.71	1.13	MnSeO3
MnSeO3 : 2H2O	-5.69	-4.71	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.42	-15.47	-2.05	MnSeO4 : 5H2O
MnSO4	-9.22	-6.64	2.58	MnSO4
Monteponite	-9.12	5.98	15.10	CdO
Montroydite	-8.56	-12.20	-3.64	HgO
MoO3	-12.33	-20.33	-8.00	MoO3
Morenosite	-7.28	-9.43	-2.14	NiSO4 : 7H2O
MoS2	-144.76	-215.02	-70.26	MoS2

Na-Jarosite	-6.83	-18.03	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.86	-51.75	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-24.04	-21.11	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.52	-31.12	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.28	-10.79	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.01	-10.79	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.89	-4.59	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-16.63	-15.35	1.28	Na ₂ SeO ₄
Na ₃ Sb	-174.59	-80.14	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.20	7.48	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-31.99	5.41	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.60	-12.33	-6.73	CuCl
NaSb	-87.30	-64.13	23.17	NaSb
Natron	-9.09	-10.40	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-5.92	-2.06	3.86	NaVO ₃
Nesquehonite	-4.27	-8.94	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-6.16	6.63	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-23.52	-7.82	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-21.52	10.48	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.43	-13.30	-6.87	NiCO ₃
NiMoO ₄	-2.55	-13.69	-11.14	NiMoO ₄
NiS(alpha)	-72.34	-77.94	-5.60	NiS
NiS(beta)	-66.84	-77.94	-11.10	NiS
NiS(gamma)	-65.14	-77.94	-12.80	NiS
NiSe	-21.56	-39.26	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.31	-7.49	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-16.74	-18.26	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-7.89	9.61	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-233.68	-294.75	-61.07	As ₂ S ₃
Otavite	-1.95	-13.95	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.94	-4.43	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.07	5.08	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-60.05	-68.81	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.49	0.30	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-16.03	10.16	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-25.34	35.70	61.04	Pb ₂ O ₃
Pb ₂ OOC ₃	-9.22	-9.78	-0.56	Pb ₂ OOC ₃
Pb ₂ V ₂ O ₇	-1.60	-3.50	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-18.29	-12.49	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-4.57	1.57	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-15.72	-4.70	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-11.51	-0.82	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-16.84	4.26	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-17.62	4.26	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-12.97	-25.57	-12.60	PbCrO ₄
PbF ₂	-9.52	-16.96	-7.44	PbF ₂
Pbmetal	-24.71	-20.46	4.25	Pb
PbMoO ₄	0.37	-15.25	-15.62	PbMoO ₄
PbO·0.3H ₂ O	-7.90	5.08	12.98	PbO·0.33H ₂ O
PbSeO ₄	-12.97	-19.81	-6.84	PbSeO ₄
Periclase	-10.59	10.99	21.58	MgO
Phosgenite	-9.68	-29.49	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-18.98	30.62	49.60	PbO ₂
Portlandite	-11.49	11.32	22.80	Ca(OH) ₂
Pyrite	-121.73	-140.24	-18.51	FeS ₂
Pyrochroite	-5.77	9.42	15.19	Mn(OH) ₂
Pyrolusite	-6.42	34.96	41.38	MnO ₂
Realgar	-98.11	-117.86	-19.75	AsS
Retgersite	-7.39	-9.43	-2.04	NiSO ₄ ·6H ₂ O
Rhodochrosite	0.07	-10.51	-10.58	MnCO ₃
Rutherfordine	-3.76	-18.26	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-10.70	-17.81	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-13.48	-10.08	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-23.49	-33.16	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-105.57	-173.32	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-52.99	-71.25	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-53.35	-71.25	-17.90	Sb ₄ O ₆

SbCl3	-47.96	-47.38	0.57	SbCl3
SbF3	-40.64	-50.87	-10.23	SbF3
Sbmetal	-44.44	-56.13	-11.69	Sb
SbO2	-1.53	-29.35	-27.82	SbO2
Schoepite	-4.32	1.67	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.25	-20.36	-7.11	Se
Semetal (hex)	-12.65	-20.36	-7.71	Se
Senarmontite	-23.26	-35.62	-12.37	Sb2O3
SeO2	-14.25	-14.13	0.12	SeO2
SeO3	-45.94	-24.89	21.04	SeO3
Siderite	-6.32	-16.56	-10.24	FeCO3
Smithsonite	-1.84	-11.84	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS
Spinel	-8.34	28.51	36.85	MgAl2O4
Stibnite	-238.89	-289.35	-50.46	Sb2S3
Sulfur	-56.89	-59.03	-2.14	S
Tenorite	-0.03	7.61	7.64	CuO
Thenardite	-6.84	-6.52	0.32	Na2SO4
Thermonatrite	-11.03	-10.40	0.64	Na2CO3:H2O
Tyuyamunite	-3.08	1.00	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.96	7.13	21.08	U3O8
U3Sb4	-574.12	-421.74	152.38	U3Sb4
U4O9	-30.05	-33.07	-3.02	U4O9
UF4	-29.19	-58.73	-29.54	UF4
UF4:2.5H2O	-26.01	-58.73	-32.72	UF4:2.5H2O
UO2 (am)	-15.59	-14.65	0.93	UO2
UO2 (NO3) 2	-40.60	-28.45	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.30	-28.45	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.84	-28.45	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.50	-28.45	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.94	1.67	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.97	-23.22	-2.25	UO2SeO4:4H2O
UO3	-6.03	1.67	7.70	UO3
Uraninite	-9.98	-14.65	-4.67	UO2
USb2	-216.79	-187.21	29.58	USb2
V (OH) 3	-17.37	-9.78	7.59	V (OH) 3
V2O5	-12.30	-13.66	-1.36	V2O5
V3O5	-35.48	-33.65	1.84	V3O5
V4O7	-43.53	-36.35	7.19	V4O7
V6O13	-31.22	-92.08	-60.86	V6O13
Valentinite	-27.14	-35.62	-8.48	Sb2O3
VC12	-61.14	-42.26	18.87	VC12
VC13	-62.78	-39.35	23.43	VC13
VF4	-61.70	-46.77	14.93	VF4
Vmetal	-92.12	-48.09	44.03	V
VO	-37.30	-22.55	14.76	VO
VO (OH) 2	-7.85	-2.70	5.15	VO (OH) 2
VO2Cl	-19.53	-16.69	2.84	VO2Cl
VOC1	-30.79	-19.63	11.15	VOC1
VOC12	-35.18	-22.42	12.76	VOC12
VOSO4	-22.37	-18.76	3.61	VOSO4
Witherite	-5.42	-13.99	-8.57	BaCO3
Wurtzite	-67.54	-76.49	-8.95	ZnS
Zincite	-3.24	8.09	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO4
Zn (BO2) 2	-9.70	-1.41	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.35	-22.03	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-4.11	8.09	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.38	8.09	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.66	8.09	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.44	8.09	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.64	8.09	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-7.38	0.12	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-8.87	6.32	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.11	-3.46	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.77	-7.85	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-12.10	16.30	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-17.77	20.73	38.50	Zn5 (OH) 8Cl2

ZnCl2	-18.67	-11.62	7.05	ZnCl2
ZnCO3:1H2O	-1.58	-11.84	-10.26	ZnCO3:1H2O
ZnF2	-13.41	-13.95	-0.53	ZnF2
Znmetal	-43.24	-17.45	25.79	Zn
ZnMoO4	-2.11	-12.24	-10.13	ZnMoO4
ZnO(active)	-3.10	8.09	11.19	ZnO
ZnS(am)	-67.43	-76.49	-9.05	ZnS
ZnSb	-84.60	-73.58	11.01	ZnSb
ZnSe	-23.41	-37.81	-14.40	ZnSe
ZnSeO4:6H2O	-15.28	-16.80	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.33	-7.97	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 22.

```
Title Stage 1 Pit wall interaction mix calculator
MIX 104
109      1
3         0
4         0
5         0
6         0
7         0.00006
8         0.00142
9         0
10        0.00151
Save solution 110
end
```

TITLE

Stage 1 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 104.

Mixture 104.

```
0.000e+000 Solution 3      Average HCT data for biotite breccia -
oxide/transitional (waste) (cell SRK 0872)
0.000e+000 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (ore) (cells SRK 0854)
0.000e+000 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cell 604569)
0.000e+000 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
6.000e-005 Solution 7      Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.420e-003 Solution 8      Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604787, 604811, 604854, 604862, 604867 and 605033)
0.000e+000 Solution 9      Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
1.510e-003 Solution 10     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
1.000e+000 Solution 109    Solution after simulation 21.
```

-----Solution composition-----

Elements	Molality	Moles
Ag	8.120e-009	7.862e-009
Al	1.944e-007	1.882e-007
As	2.654e-009	2.569e-009
B	1.753e-005	1.697e-005
Ba	2.956e-008	2.862e-008
C	3.249e-003	3.146e-003
Ca	1.106e-002	1.071e-002
Cd	5.823e-008	5.638e-008
Cl	1.407e-003	1.363e-003
Co	2.097e-007	2.031e-007
Cr	5.587e-009	5.410e-009
Cu	5.265e-006	5.098e-006
F	1.167e-004	1.130e-004
Fe	5.332e-009	5.163e-009
Hg	2.665e-010	2.580e-010
K	2.264e-003	2.192e-003
Mg	4.804e-003	4.652e-003
Mn	1.573e-004	1.523e-004
Mo	7.303e-007	7.071e-007
N	2.073e-005	2.007e-005
Na	8.952e-003	8.668e-003
Ni	2.395e-007	2.319e-007
Pb	1.789e-008	1.733e-008
S	1.953e-002	1.891e-002
Sb	2.461e-007	2.383e-007
Se	8.720e-008	8.443e-008
U	2.219e-007	2.149e-007
V	8.435e-008	8.168e-008
Zn	6.994e-006	6.772e-006

-----Description of solution-----

	pH	=	6.919	Charge balance
	pe	=	5.853	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength	=	5.490e-002	
	Mass of water (kg)	=	9.683e-001	
	Total alkalinity (eq/kg)	=	2.703e-003	
	Total CO2 (mol/kg)	=	3.249e-003	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	8.175e-006	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.01	
	Iterations	=	9	
	Total H	=	1.074950e+002	
	Total O	=	5.383075e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.476e-007	1.204e-007	-6.831	-6.919	-0.088	0.00
OH-	1.038e-007	8.353e-008	-6.984	-7.078	-0.094	(0)
H2O	5.551e+001	9.992e-001	1.744	-0.000	0.000	18.07
Ag	8.120e-009					
AgCl	4.714e-009	4.714e-009	-8.327	-8.327	0.000	(0)
Ag+	2.465e-009	2.011e-009	-8.608	-8.697	-0.088	(0)
AgCl2-	6.207e-010	4.714e-010	-9.207	-9.327	-0.120	(0)
AgSO4-	3.150e-010	2.392e-010	-9.502	-9.621	-0.120	(0)
AgNO2	3.207e-012	3.207e-012	-11.494	-11.494	0.000	(0)
AgCl3-2	1.450e-012	4.824e-013	-11.839	-12.317	-0.478	(0)
AgF	4.011e-013	4.011e-013	-12.397	-12.397	0.000	(0)
AgNH3+	2.130e-013	1.618e-013	-12.672	-12.791	-0.120	(0)

	AgOH	1.680e-014	1.680e-014	-13.775	-13.775	0.000	(0)
	AgCl4-3	1.345e-014	1.131e-015	-13.871	-14.947	-1.076	(0)
	AgSeO3-	3.463e-015	2.630e-015	-14.461	-14.580	-0.120	(0)
	Ag2Se	2.856e-015	2.856e-015	-14.544	-14.544	0.000	(0)
	AgH2BO3	2.707e-015	2.707e-015	-14.567	-14.567	0.000	(0)
	Ag (NH3) 2+	6.824e-017	5.182e-017	-16.166	-16.285	-0.120	(0)
	Ag (NO2) 2-	4.992e-017	3.791e-017	-16.302	-16.421	-0.120	(0)
	AgNO3	1.147e-017	1.147e-017	-16.940	-16.940	0.000	(0)
	Ag (OH) 2-	1.806e-019	1.371e-019	-18.743	-18.863	-0.120	(0)
	Ag (SeO3) 2-3	5.701e-022	4.791e-023	-21.244	-22.320	-1.076	(0)
	Ag2MoO4	4.945e-025	4.945e-025	-24.306	-24.306	0.000	(0)
	AgHS	0.000e+000	0.000e+000	-72.540	-72.540	0.000	(0)
	AgOH (Se) 2-4	0.000e+000	0.000e+000	-84.499	-86.411	-1.912	(0)
	Ag (HS) 2-	0.000e+000	0.000e+000	-145.979	-146.098	-0.120	(0)
	Ag (HS) S4-2	0.000e+000	0.000e+000	-146.441	-146.662	-0.222	(0)
	Ag (S4) 2-3	0.000e+000	0.000e+000	-148.784	-149.183	-0.399	(0)
	AgS4S5-3	0.000e+000	0.000e+000	-149.116	-149.494	-0.378	(0)
Al	1.944e-007						
	Al (OH) 4-	1.195e-007	9.738e-008	-6.923	-7.012	-0.089	(0)
	AlF2+	3.055e-008	2.516e-008	-7.515	-7.599	-0.084	(0)
	AlF3	2.514e-008	2.514e-008	-7.600	-7.600	0.000	(0)
	Al (OH) 3	9.260e-009	9.260e-009	-8.033	-8.033	0.000	(0)
	Al (OH) 2+	6.748e-009	5.556e-009	-8.171	-8.255	-0.084	(0)
	AlF+2	1.732e-009	7.958e-010	-8.762	-9.099	-0.338	(0)
	AlF4-	1.227e-009	1.001e-009	-8.911	-9.000	-0.089	(0)
	AlOH+2	1.822e-010	8.373e-011	-9.739	-10.077	-0.338	(0)
	AlSO4+	5.690e-011	4.638e-011	-10.245	-10.334	-0.089	(0)
	Al+3	6.263e-012	1.002e-012	-11.203	-11.999	-0.796	(0)
	Al (SO4) 2-	3.635e-012	2.963e-012	-11.440	-11.528	-0.089	(0)
	AlMo6O21-3	4.076e-037	3.425e-038	-36.390	-37.465	-1.076	(0)
As (3)	3.117e-021						
	H3AsO3	3.099e-021	3.099e-021	-20.509	-20.509	0.000	(0)
	H2AsO3-	1.738e-023	1.320e-023	-22.760	-22.880	-0.120	(0)
	HAsO3-2	3.004e-028	9.992e-029	-27.522	-28.000	-0.478	(0)
	H4AsO3+	2.435e-028	1.850e-028	-27.613	-27.733	-0.120	(0)
	AsO3-3	3.805e-034	3.198e-035	-33.420	-34.495	-1.076	(0)
As (5)	2.654e-009						
	HAsO4-2	1.791e-009	5.959e-010	-8.747	-9.225	-0.478	(0)
	H2AsO4-	8.620e-010	6.546e-010	-9.064	-9.184	-0.120	(0)
	AsO4-3	1.862e-013	1.565e-014	-12.730	-13.806	-1.076	(0)
	H3AsO4	1.353e-014	1.370e-014	-13.869	-13.863	0.005	(0)
B	1.753e-005						
	H3BO3	1.740e-005	1.762e-005	-4.760	-4.754	0.005	(0)
	H2BO3-	1.070e-007	8.494e-008	-6.971	-7.071	-0.100	(0)
	CaH2BO3+	1.854e-008	1.472e-008	-7.732	-7.832	-0.100	(0)
	MgH2BO3+	5.273e-009	4.186e-009	-8.278	-8.378	-0.100	(0)
	NaH2BO3	9.520e-010	9.520e-010	-9.021	-9.021	0.000	(0)
	BF (OH) 3-	7.030e-010	5.581e-010	-9.153	-9.253	-0.100	(0)
	H5 (BO3) 2-	1.604e-012	1.274e-012	-11.795	-11.895	-0.100	(0)
	BF2 (OH) 2-	7.193e-013	5.710e-013	-12.143	-12.243	-0.100	(0)
	BaH2BO3+	4.283e-014	3.401e-014	-13.368	-13.468	-0.100	(0)
	H8 (BO3) 3-	2.826e-015	2.244e-015	-14.549	-14.649	-0.100	(0)
	AgH2BO3	2.707e-015	2.707e-015	-14.567	-14.567	0.000	(0)
	BF3OH-	2.678e-018	2.126e-018	-17.572	-17.672	-0.100	(0)
	BF4-	1.261e-022	1.001e-022	-21.899	-21.999	-0.100	(0)
Ba	2.956e-008						
	Ba+2	2.925e-008	1.296e-008	-7.534	-7.888	-0.354	(0)
	BaHCO3+	3.069e-010	2.542e-010	-9.513	-9.595	-0.082	(0)
	BaCO3	5.314e-012	5.314e-012	-11.275	-11.275	0.000	(0)
	BaH2BO3+	4.283e-014	3.401e-014	-13.368	-13.468	-0.100	(0)
	BaOH+	5.763e-015	4.724e-015	-14.239	-14.326	-0.086	(0)
	BaNH3+2	9.683e-016	3.221e-016	-15.014	-15.492	-0.478	(0)
	BaNO3+	6.140e-016	4.663e-016	-15.212	-15.331	-0.120	(0)
C (4)	3.249e-003						
	HCO3-	2.496e-003	2.055e-003	-2.603	-2.687	-0.084	(0)
	H2CO3	5.567e-004	5.567e-004	-3.254	-3.254	0.000	(0)
	CaHCO3+	1.391e-004	1.153e-004	-3.857	-3.938	-0.082	(0)
	MgHCO3+	3.689e-005	2.989e-005	-4.433	-4.525	-0.091	(0)

	NaHCO3	8.172e-006	8.172e-006	-5.088	-5.088	0.000	(0)
	CaCO3	3.818e-006	3.818e-006	-5.418	-5.418	0.000	(0)
	CuCO3	2.791e-006	2.791e-006	-5.554	-5.554	0.000	(0)
	MnHCO3+	1.909e-006	1.565e-006	-5.719	-5.806	-0.086	(0)
	CO3-2	1.806e-006	7.998e-007	-5.743	-6.097	-0.354	(0)
	MgCO3	9.456e-007	9.456e-007	-6.024	-6.024	0.000	(0)
	ZnHCO3+	1.529e-007	1.161e-007	-6.816	-6.935	-0.120	(0)
	NaCO3-	1.279e-007	1.053e-007	-6.893	-6.977	-0.084	(0)
	UO2 (CO3) 3-4	1.145e-007	1.403e-009	-6.941	-8.853	-1.912	(0)
	UO2 (CO3) 2-2	1.052e-007	3.499e-008	-6.978	-7.456	-0.478	(0)
	CuHCO3+	1.012e-007	7.683e-008	-6.995	-7.114	-0.120	(0)
	ZnCO3	8.224e-008	8.224e-008	-7.085	-7.085	0.000	(0)
	NiHCO3+	2.092e-008	1.589e-008	-7.679	-7.799	-0.120	(0)
	Cu (CO3) 2-2	1.806e-008	6.008e-009	-7.743	-8.221	-0.478	(0)
	CoHCO3+	9.963e-009	7.566e-009	-8.002	-8.121	-0.120	(0)
	PbCO3	4.193e-009	4.193e-009	-8.378	-8.378	0.000	(0)
	PbHCO3+	3.506e-009	2.662e-009	-8.455	-8.575	-0.120	(0)
	UO2CO3	2.193e-009	2.193e-009	-8.659	-8.659	0.000	(0)
	NiCO3	1.871e-009	1.871e-009	-8.728	-8.728	0.000	(0)
	CoCO3	6.400e-010	6.400e-010	-9.194	-9.194	0.000	(0)
	BaHCO3+	3.069e-010	2.542e-010	-9.513	-9.595	-0.082	(0)
	CdCO3	2.549e-010	2.549e-010	-9.594	-9.594	0.000	(0)
	CdHCO3+	8.612e-011	6.540e-011	-10.065	-10.184	-0.120	(0)
	Pb (CO3) 2-2	2.907e-011	9.671e-012	-10.537	-11.015	-0.478	(0)
	BaCO3	5.314e-012	5.314e-012	-11.275	-11.275	0.000	(0)
	FeHCO3+	1.068e-012	8.848e-013	-11.971	-12.053	-0.082	(0)
	Cd (CO3) 2-2	4.542e-013	1.511e-013	-12.343	-12.821	-0.478	(0)
	HgCO3	1.376e-014	1.376e-014	-13.861	-13.861	0.000	(0)
	Hg (CO3) 2-2	1.046e-016	3.481e-017	-15.980	-16.458	-0.478	(0)
	HgHCO3+	4.064e-017	3.087e-017	-16.391	-16.511	-0.120	(0)
Ca	1.106e-002						
	Ca+2	6.801e-003	3.012e-003	-2.167	-2.521	-0.354	(0)
	CaSO4	4.114e-003	4.114e-003	-2.386	-2.386	0.000	(0)
	CaHCO3+	1.391e-004	1.153e-004	-3.857	-3.938	-0.082	(0)
	CaCO3	3.818e-006	3.818e-006	-5.418	-5.418	0.000	(0)
	CaF+	3.184e-006	2.610e-006	-5.497	-5.583	-0.086	(0)
	CaH2BO3+	1.854e-008	1.472e-008	-7.732	-7.832	-0.100	(0)
	CaOH+	6.060e-009	5.021e-009	-8.217	-8.299	-0.082	(0)
	CaNH3+2	4.492e-010	1.494e-010	-9.348	-9.826	-0.478	(0)
	CaNO3+	9.008e-011	6.841e-011	-10.045	-10.165	-0.120	(0)
	Ca (NH3) 2+2	7.047e-018	2.344e-018	-17.152	-17.630	-0.478	(0)
Cd	5.823e-008						
	Cd+2	3.156e-008	1.398e-008	-7.501	-7.855	-0.354	(0)
	CdSO4	1.954e-008	1.954e-008	-7.709	-7.709	0.000	(0)
	Cd (SO4) 2-2	4.723e-009	1.571e-009	-8.326	-8.804	-0.478	(0)
	CdCl+	2.018e-009	1.533e-009	-8.695	-8.815	-0.120	(0)
	CdCO3	2.549e-010	2.549e-010	-9.594	-9.594	0.000	(0)
	CdHCO3+	8.612e-011	6.540e-011	-10.065	-10.184	-0.120	(0)
	CdF+	2.316e-011	1.759e-011	-10.635	-10.755	-0.120	(0)
	CdOH+	1.221e-011	9.276e-012	-10.913	-11.033	-0.120	(0)
	CdCl2	7.336e-012	7.336e-012	-11.135	-11.135	0.000	(0)
	CdOHC1	5.252e-012	5.252e-012	-11.280	-11.280	0.000	(0)
	Cd (CO3) 2-2	4.542e-013	1.511e-013	-12.343	-12.821	-0.478	(0)
	CdCl3-	6.998e-015	5.315e-015	-14.155	-14.275	-0.120	(0)
	Cd (OH) 2	4.889e-015	4.889e-015	-14.311	-14.311	0.000	(0)
	CdF2	2.787e-015	2.787e-015	-14.555	-14.555	0.000	(0)
	CdNO3+	4.181e-016	3.175e-016	-15.379	-15.498	-0.120	(0)
	CdSeO4	2.288e-017	2.288e-017	-16.640	-16.640	0.000	(0)
	Cd2OH+3	7.733e-018	6.499e-019	-17.112	-18.187	-1.076	(0)
	Cd (SeO3) 2-2	1.434e-019	4.770e-020	-18.843	-19.321	-0.478	(0)
	Cd (OH) 3-	3.285e-020	2.495e-020	-19.483	-19.603	-0.120	(0)
	Cd (NO3) 2	1.143e-024	1.143e-024	-23.942	-23.942	0.000	(0)
	Cd (OH) 4-2	1.026e-027	3.412e-028	-26.989	-27.467	-0.478	(0)
	CdHS+	0.000e+000	0.000e+000	-77.385	-77.505	-0.120	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-147.959	-147.959	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-223.597	-223.717	-0.120	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-298.700	-299.178	-0.478	(0)
Cl	1.407e-003						

Cl-	1.407e-003	1.148e-003	-2.852	-2.940	-0.088	(0)
MnCl+	6.728e-008	5.516e-008	-7.172	-7.258	-0.086	(0)
ZnCl+	6.360e-009	5.154e-009	-8.197	-8.288	-0.091	(0)
AgCl	4.714e-009	4.714e-009	-8.327	-8.327	0.000	(0)
CdCl+	2.018e-009	1.533e-009	-8.695	-8.815	-0.120	(0)
CuCl+	1.331e-009	1.078e-009	-8.876	-8.967	-0.091	(0)
AgCl2-	6.207e-010	4.714e-010	-9.207	-9.327	-0.120	(0)
CuCl	5.888e-010	5.888e-010	-9.230	-9.230	0.000	(0)
ZnOHC1	5.636e-010	5.636e-010	-9.249	-9.249	0.000	(0)
CoCl+	2.476e-010	1.880e-010	-9.606	-9.726	-0.120	(0)
NiCl+	2.426e-010	1.842e-010	-9.615	-9.735	-0.120	(0)
CuCl2-	1.743e-010	1.413e-010	-9.759	-9.850	-0.091	(0)
PbCl+	9.354e-011	7.104e-011	-10.029	-10.149	-0.120	(0)
MnCl2	8.945e-011	8.945e-011	-10.048	-10.048	0.000	(0)
ZnCl2	9.378e-012	9.378e-012	-11.028	-11.028	0.000	(0)
CdCl2	7.336e-012	7.336e-012	-11.135	-11.135	0.000	(0)
CdOHC1	5.252e-012	5.252e-012	-11.280	-11.280	0.000	(0)
HgClOH	2.435e-012	2.435e-012	-11.613	-11.613	0.000	(0)
HgCl2	1.895e-012	1.895e-012	-11.722	-11.722	0.000	(0)
AgCl3-2	1.450e-012	4.824e-013	-11.839	-12.317	-0.478	(0)
CuCl2	4.293e-013	4.293e-013	-12.367	-12.367	0.000	(0)
PbCl2	3.643e-013	3.643e-013	-12.439	-12.439	0.000	(0)
CuCl3-2	7.676e-014	3.467e-014	-13.115	-13.460	-0.345	(0)
MnCl3-	3.451e-014	2.829e-014	-13.462	-13.548	-0.086	(0)
HgCl3-	2.865e-014	2.176e-014	-13.543	-13.662	-0.120	(0)
AgCl4-3	1.345e-014	1.131e-015	-13.871	-14.947	-1.076	(0)
ZnCl3-	1.055e-014	8.552e-015	-13.977	-14.068	-0.091	(0)
CdCl3-	6.998e-015	5.315e-015	-14.155	-14.275	-0.120	(0)
UO2Cl+	1.688e-015	1.282e-015	-14.773	-14.892	-0.120	(0)
NiCl2	1.065e-015	1.065e-015	-14.973	-14.973	0.000	(0)
CrCl+2	7.518e-016	2.501e-016	-15.124	-15.602	-0.478	(0)
HgCl+	4.337e-016	3.294e-016	-15.363	-15.482	-0.120	(0)
HgCl4-2	2.990e-016	9.946e-017	-15.524	-16.002	-0.478	(0)
PbCl3-	2.193e-016	1.665e-016	-15.659	-15.779	-0.120	(0)
ZnCl4-2	1.087e-017	4.910e-018	-16.964	-17.309	-0.345	(0)
CuCl3-	5.677e-018	4.600e-018	-17.246	-17.337	-0.091	(0)
CrOHC12	4.559e-019	4.559e-019	-18.341	-18.341	0.000	(0)
PbCl4-2	2.627e-019	8.739e-020	-18.581	-19.059	-0.478	(0)
FeCl+2	1.738e-019	7.848e-020	-18.760	-19.105	-0.345	(0)
VOCl+	1.223e-019	9.291e-020	-18.912	-19.032	-0.120	(0)
CrCl2+	3.587e-020	2.724e-020	-19.445	-19.565	-0.120	(0)
FeCl2+	4.910e-022	4.025e-022	-21.309	-21.395	-0.086	(0)
CuCl4-2	5.860e-023	2.647e-023	-22.232	-22.577	-0.345	(0)
FeCl3	4.621e-026	4.621e-026	-25.335	-25.335	0.000	(0)
CrO3Cl-	6.947e-027	5.276e-027	-26.158	-26.278	-0.120	(0)
CoCl+2	9.428e-035	3.136e-035	-34.026	-34.504	-0.478	(0)
UCl+3	0.000e+000	0.000e+000	-42.492	-43.568	-1.076	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.095	-45.573	-0.478	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.561	-46.039	-0.478	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.215	-59.693	-0.478	(0)
Co (2)	2.097e-007					
Co+2	1.423e-007	4.734e-008	-6.847	-7.325	-0.478	(0)
CoSO4	5.630e-008	5.630e-008	-7.249	-7.249	0.000	(0)
CoHCO3+	9.963e-009	7.566e-009	-8.002	-8.121	-0.120	(0)
CoCO3	6.400e-010	6.400e-010	-9.194	-9.194	0.000	(0)
CoCl+	2.476e-010	1.880e-010	-9.606	-9.726	-0.120	(0)
CoF+	1.565e-010	1.188e-010	-9.806	-9.925	-0.120	(0)
CoOH+	1.039e-010	7.890e-011	-9.983	-10.103	-0.120	(0)
CoNO2+	3.353e-012	2.546e-012	-11.475	-11.594	-0.120	(0)
Co (NH3) +2	6.741e-013	2.243e-013	-12.171	-12.649	-0.478	(0)
Co (OH) 2	5.235e-013	5.235e-013	-12.281	-12.281	0.000	(0)
CoNO3+	7.094e-016	5.388e-016	-15.149	-15.269	-0.120	(0)
CoSeO4	2.086e-016	2.086e-016	-15.681	-15.681	0.000	(0)
Co2OH+3	2.227e-018	1.872e-019	-17.652	-18.728	-1.076	(0)
Co (OH) 3-	1.149e-018	8.725e-019	-17.940	-18.059	-0.120	(0)
Co (NH3) 2+2	1.133e-018	3.770e-019	-17.946	-18.424	-0.478	(0)
CoOOH-	2.885e-019	2.191e-019	-18.540	-18.659	-0.120	(0)
Co (NO3) 2	7.873e-024	7.873e-024	-23.104	-23.104	0.000	(0)

Co (NH3) 3+2	5.621e-025	1.870e-025	-24.250	-24.728	-0.478	(0)
Co (OH) 4-2	3.473e-026	1.155e-026	-25.459	-25.937	-0.478	(0)
Co4 (OH) 4+4	6.313e-031	7.730e-033	-30.200	-32.112	-1.912	(0)
Co (NH3) 4+2	1.163e-031	3.867e-032	-30.935	-31.413	-0.478	(0)
Co (NH3) 5+2	7.603e-039	2.529e-039	-38.119	-38.597	-0.478	(0)
Co (3)	1.713e-028					
CoOH+2	1.713e-028	5.699e-029	-27.766	-28.244	-0.478	(0)
Co+3	8.388e-034	1.343e-034	-33.076	-33.872	-0.796	(0)
CoCl+2	9.428e-035	3.136e-035	-34.026	-34.504	-0.478	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.095	-45.573	-0.478	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.933	-54.052	-0.120	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.153	-59.631	-0.478	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.215	-59.693	-0.478	(0)
Cr (2)	1.697e-025					
Cr+2	1.697e-025	5.644e-026	-24.770	-25.248	-0.478	(0)
Cr (3)	5.587e-009					
Cr (OH) 2+	4.117e-009	3.126e-009	-8.385	-8.505	-0.120	(0)
Cr (OH) +2	9.246e-010	3.076e-010	-9.034	-9.512	-0.478	(0)
CrOHSO4	4.351e-010	4.351e-010	-9.361	-9.361	0.000	(0)
Cr (OH) 3	9.811e-011	9.811e-011	-10.008	-10.008	0.000	(0)
CrF+2	6.367e-012	2.118e-012	-11.196	-11.674	-0.478	(0)
CrSO4+	3.085e-012	2.343e-012	-11.511	-11.630	-0.120	(0)
Cr+3	2.003e-012	1.683e-013	-11.698	-12.774	-1.076	(0)
CrO2-	5.097e-013	3.871e-013	-12.293	-12.412	-0.120	(0)
Cr (OH) 4-	4.296e-013	3.263e-013	-12.367	-12.486	-0.120	(0)
CrCl+2	7.518e-016	2.501e-016	-15.124	-15.602	-0.478	(0)
Cr2 (OH) 2SO4+2	3.636e-017	1.210e-017	-16.439	-16.917	-0.478	(0)
Cr2 (OH) 2 (SO4) 2	4.284e-018	4.284e-018	-17.368	-17.368	0.000	(0)
CrOHC12	4.559e-019	4.559e-019	-18.341	-18.341	0.000	(0)
CrCl2+	3.587e-020	2.724e-020	-19.445	-19.565	-0.120	(0)
CrNO3+2	1.588e-022	5.284e-023	-21.799	-22.277	-0.478	(0)
Cr (NH3) 5OH+2	9.463e-037	3.148e-037	-36.024	-36.502	-0.478	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-43.125	-44.201	-1.076	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.561	-46.039	-0.478	(0)
Cr (6)	4.395e-017					
CrO4-2	3.511e-017	1.555e-017	-16.455	-16.808	-0.354	(0)
HCrO4-	7.981e-018	6.061e-018	-17.098	-17.217	-0.120	(0)
NaCrO4-	7.196e-019	5.465e-019	-18.143	-18.262	-0.120	(0)
KCrO4-	1.349e-019	1.024e-019	-18.870	-18.990	-0.120	(0)
CrO3SO4-2	3.988e-024	1.327e-024	-23.399	-23.877	-0.478	(0)
H2CrO4	5.918e-025	5.918e-025	-24.228	-24.228	0.000	(0)
CrO3Cl-	6.947e-027	5.276e-027	-26.158	-26.278	-0.120	(0)
Cr2O7-2	3.832e-033	1.275e-033	-32.417	-32.895	-0.478	(0)
Cu (1)	1.300e-009					
CuCl	5.888e-010	5.888e-010	-9.230	-9.230	0.000	(0)
Cu+	5.364e-010	4.074e-010	-9.270	-9.390	-0.120	(0)
CuCl2-	1.743e-010	1.413e-010	-9.759	-9.850	-0.091	(0)
CuCl3-2	7.676e-014	3.467e-014	-13.115	-13.460	-0.345	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.089	-147.478	-0.388	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.840	-148.208	-0.368	(0)
Cu (2)	5.263e-006					
CuCO3	2.791e-006	2.791e-006	-5.554	-5.554	0.000	(0)
Cu+2	1.338e-006	5.926e-007	-5.874	-6.227	-0.354	(0)
CuSO4	8.093e-007	8.093e-007	-6.092	-6.092	0.000	(0)
CuOH+	1.932e-007	1.565e-007	-6.714	-6.805	-0.091	(0)
CuHCO3+	1.012e-007	7.683e-008	-6.995	-7.114	-0.120	(0)
Cu (CO3) 2-2	1.806e-008	6.008e-009	-7.743	-8.221	-0.478	(0)
CuF+	3.909e-009	2.969e-009	-8.408	-8.527	-0.120	(0)
Cu (OH) 2	2.609e-009	2.609e-009	-8.584	-8.584	0.000	(0)
Cu2 (OH) 2+2	1.850e-009	6.155e-010	-8.733	-9.211	-0.478	(0)
CuCl+	1.331e-009	1.078e-009	-8.876	-8.967	-0.091	(0)
CuNH3+2	7.183e-010	2.389e-010	-9.144	-9.622	-0.478	(0)
CuNO2+	6.237e-010	4.736e-010	-9.205	-9.325	-0.120	(0)
Cu (OH) 3-	5.886e-013	4.470e-013	-12.230	-12.350	-0.120	(0)
CuCl2	4.293e-013	4.293e-013	-12.367	-12.367	0.000	(0)
Cu (NO2) 2	3.699e-014	3.699e-014	-13.432	-13.432	0.000	(0)
CuNO3+	1.772e-014	1.346e-014	-13.752	-13.871	-0.120	(0)
CuCl3-	5.677e-018	4.600e-018	-17.246	-17.337	-0.091	(0)

	Cu (OH) 4-2	8.835e-019	2.939e-019	-18.054	-18.532	-0.478	(0)
	CuCl4-2	5.860e-023	2.647e-023	-22.232	-22.577	-0.345	(0)
	Cu (NO3) 2	1.217e-023	1.217e-023	-22.915	-22.915	0.000	(0)
	Cu (HS) 3-	0.000e+000	0.000e+000	-213.183	-213.302	-0.120	(0)
F	1.167e-004						
	F-	9.733e-005	7.940e-005	-4.012	-4.100	-0.088	(0)
	MgF+	1.553e-005	1.266e-005	-4.809	-4.897	-0.089	(0)
	CaF+	3.184e-006	2.610e-006	-5.497	-5.583	-0.086	(0)
	NaF	3.543e-007	3.543e-007	-6.451	-6.451	0.000	(0)
	MnF+	1.471e-007	1.206e-007	-6.832	-6.919	-0.086	(0)
	AlF2+	3.055e-008	2.516e-008	-7.515	-7.599	-0.084	(0)
	AlF3	2.514e-008	2.514e-008	-7.600	-7.600	0.000	(0)
	HF	1.415e-008	1.415e-008	-7.849	-7.849	0.000	(0)
	CuF+	3.909e-009	2.969e-009	-8.408	-8.527	-0.120	(0)
	ZnF+	3.728e-009	2.831e-009	-8.429	-8.548	-0.120	(0)
	AlF+2	1.732e-009	7.958e-010	-8.762	-9.099	-0.338	(0)
	AlF4-	1.227e-009	1.001e-009	-8.911	-9.000	-0.089	(0)
	BF (OH) 3-	7.030e-010	5.581e-010	-9.153	-9.253	-0.100	(0)
	NiF+	1.647e-010	1.251e-010	-9.783	-9.903	-0.120	(0)
	CoF+	1.565e-010	1.188e-010	-9.806	-9.925	-0.120	(0)
	CdF+	2.316e-011	1.759e-011	-10.635	-10.755	-0.120	(0)
	PbF+	1.285e-011	9.757e-012	-10.891	-11.011	-0.120	(0)
	UO2F+	9.937e-012	7.547e-012	-11.003	-11.122	-0.120	(0)
	CrF+2	6.367e-012	2.118e-012	-11.196	-11.674	-0.478	(0)
	HF2-	5.303e-012	4.270e-012	-11.275	-11.370	-0.094	(0)
	UO2F2	1.728e-012	1.728e-012	-11.762	-11.762	0.000	(0)
	BF2 (OH) 2-	7.193e-013	5.710e-013	-12.143	-12.243	-0.100	(0)
	AgF	4.011e-013	4.011e-013	-12.397	-12.397	0.000	(0)
	UO2F3-	4.538e-014	3.447e-014	-13.343	-13.463	-0.120	(0)
	PbF2	1.524e-014	1.524e-014	-13.817	-13.817	0.000	(0)
	CdF2	2.787e-015	2.787e-015	-14.555	-14.555	0.000	(0)
	VO2F	2.464e-015	2.464e-015	-14.608	-14.608	0.000	(0)
	H2F2	5.361e-016	5.361e-016	-15.271	-15.271	0.000	(0)
	FeF2+	5.107e-016	4.187e-016	-15.292	-15.378	-0.086	(0)
	FeF+2	4.363e-016	1.971e-016	-15.360	-15.705	-0.345	(0)
	VO2F2-	9.354e-017	7.104e-017	-16.029	-16.148	-0.120	(0)
	UO2F4-2	6.534e-017	2.174e-017	-16.185	-16.663	-0.478	(0)
	FeF3	4.690e-017	4.690e-017	-16.329	-16.329	0.000	(0)
	VOF+	1.809e-017	1.374e-017	-16.743	-16.862	-0.120	(0)
	PbF3-	3.023e-018	2.296e-018	-17.520	-17.639	-0.120	(0)
	BF3OH-	2.678e-018	2.126e-018	-17.572	-17.672	-0.100	(0)
	VOF2	4.090e-019	4.090e-019	-18.388	-18.388	0.000	(0)
	VO2F3-2	2.115e-019	7.036e-020	-18.675	-19.153	-0.478	(0)
	VOF3-	1.517e-021	1.152e-021	-20.819	-20.938	-0.120	(0)
	PbF4-2	2.623e-022	8.724e-023	-21.581	-22.059	-0.478	(0)
	BF4-	1.261e-022	1.001e-022	-21.899	-21.999	-0.100	(0)
	HgF+	5.572e-023	4.232e-023	-22.254	-22.373	-0.120	(0)
	VO2F4-3	3.271e-023	2.749e-024	-22.485	-23.561	-1.076	(0)
	Sb (OH) 2F	2.295e-023	2.295e-023	-22.639	-22.639	0.000	(0)
	SbOF	2.259e-023	2.259e-023	-22.646	-22.646	0.000	(0)
	VOF4-2	1.110e-024	3.693e-025	-23.955	-24.433	-0.478	(0)
	UF3+	1.234e-033	9.371e-034	-32.909	-33.028	-0.120	(0)
	UF2+2	2.239e-034	7.447e-035	-33.650	-34.128	-0.478	(0)
	UF4	8.158e-036	8.158e-036	-35.088	-35.088	0.000	(0)
	UF+3	8.865e-037	7.450e-038	-36.052	-37.128	-1.076	(0)
	UF5-	3.380e-038	2.567e-038	-37.471	-37.591	-0.120	(0)
	UF6-2	1.850e-039	6.155e-040	-38.733	-39.211	-0.478	(0)
Fe (2)	1.541e-010						
	Fe+2	1.028e-010	3.420e-011	-9.988	-10.466	-0.478	(0)
	FeSO4	5.005e-011	5.005e-011	-10.301	-10.301	0.000	(0)
	FeHCO3+	1.068e-012	8.848e-013	-11.971	-12.053	-0.082	(0)
	FeOH+	1.387e-013	1.137e-013	-12.858	-12.944	-0.086	(0)
	Fe (OH) 2	7.547e-018	7.547e-018	-17.122	-17.122	0.000	(0)
	Fe (OH) 3-	2.432e-019	1.994e-019	-18.614	-18.700	-0.086	(0)
	Fe (HS) 2	0.000e+000	0.000e+000	-156.832	-156.832	0.000	(0)
	Fe (HS) 3-	0.000e+000	0.000e+000	-232.333	-232.453	-0.120	(0)
Fe (3)	5.178e-009						
	Fe (OH) 2+	4.819e-009	3.967e-009	-8.317	-8.401	-0.084	(0)

	Fe (OH) 3	3.559e-010	3.559e-010	-9.449	-9.449	0.000	(0)
	Fe (OH) 4-	3.362e-012	2.768e-012	-11.473	-11.558	-0.084	(0)
	FeOH+2	2.703e-013	1.221e-013	-12.568	-12.913	-0.345	(0)
	FeF2+	5.107e-016	4.187e-016	-15.292	-15.378	-0.086	(0)
	FeF+2	4.363e-016	1.971e-016	-15.360	-15.705	-0.345	(0)
	FeSO4+	1.847e-016	1.514e-016	-15.734	-15.820	-0.086	(0)
	FeF3	4.690e-017	4.690e-017	-16.329	-16.329	0.000	(0)
	Fe (SO4) 2-	2.541e-017	1.930e-017	-16.595	-16.715	-0.120	(0)
	Fe+3	1.414e-017	2.263e-018	-16.849	-17.645	-0.796	(0)
	FeCl+2	1.738e-019	7.848e-020	-18.760	-19.105	-0.345	(0)
	FeHSeO3+2	1.107e-021	3.682e-022	-20.956	-21.434	-0.478	(0)
	FeCl2+	4.910e-022	4.025e-022	-21.309	-21.395	-0.086	(0)
	Fe2 (OH) 2+4	4.030e-023	4.935e-025	-22.395	-24.307	-1.912	(0)
	FeNO3+2	4.887e-025	1.626e-025	-24.311	-24.789	-0.478	(0)
	FeCl3	4.621e-026	4.621e-026	-25.335	-25.335	0.000	(0)
	Fe3 (OH) 4+5	2.750e-029	2.830e-032	-28.561	-31.548	-2.988	(0)
H (0)	3.996e-029						
	H2	1.998e-029	2.024e-029	-28.699	-28.694	0.005	(0)
Hg (0)	2.615e-010						
	Hg	2.615e-010	2.615e-010	-9.583	-9.583	0.000	(0)
Hg (1)	1.535e-020						
	Hg2+2	7.673e-021	2.552e-021	-20.115	-20.593	-0.478	(0)
Hg (2)	4.999e-012						
	HgClOH	2.435e-012	2.435e-012	-11.613	-11.613	0.000	(0)
	HgCl2	1.895e-012	1.895e-012	-11.722	-11.722	0.000	(0)
	Hg (OH) 2	6.251e-013	6.330e-013	-12.204	-12.199	0.005	(0)
	HgCl3-	2.865e-014	2.176e-014	-13.543	-13.662	-0.120	(0)
	HgCO3	1.376e-014	1.376e-014	-13.861	-13.861	0.000	(0)
	HgCl+	4.337e-016	3.294e-016	-15.363	-15.482	-0.120	(0)
	HgCl4-2	2.990e-016	9.946e-017	-15.524	-16.002	-0.478	(0)
	Hg (CO3) 2-2	1.046e-016	3.481e-017	-15.980	-16.458	-0.478	(0)
	HgOH+	6.296e-017	4.782e-017	-16.201	-16.320	-0.120	(0)
	Hg (NH3) 2+2	4.235e-017	1.409e-017	-16.373	-16.851	-0.478	(0)
	HgHCO3+	4.064e-017	3.087e-017	-16.391	-16.511	-0.120	(0)
	HgNH3+2	1.075e-018	3.575e-019	-17.969	-18.447	-0.478	(0)
	Hg+2	4.322e-020	1.438e-020	-19.364	-19.842	-0.478	(0)
	HgSO4	2.244e-020	2.244e-020	-19.649	-19.649	0.000	(0)
	Hg (OH) 3-	8.766e-021	6.657e-021	-20.057	-20.177	-0.120	(0)
	HgF+	5.572e-023	4.232e-023	-22.254	-22.373	-0.120	(0)
	Hg (NH3) 3+2	6.643e-024	2.210e-024	-23.178	-23.656	-0.478	(0)
	HgNO3+	5.020e-029	3.813e-029	-28.299	-28.419	-0.120	(0)
	Hg (NH3) 4+2	2.079e-030	6.917e-031	-29.682	-30.160	-0.478	(0)
	Hg (NO3) 2	1.138e-037	1.138e-037	-36.944	-36.944	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-136.192	-136.311	-0.120	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-136.836	-136.836	0.000	(0)
	HgS2-2	0.000e+000	0.000e+000	-137.622	-138.100	-0.478	(0)
K	2.264e-003						
	K+	2.173e-003	1.773e-003	-2.663	-2.751	-0.088	(0)
	KSO4-	9.088e-005	7.483e-005	-4.042	-4.126	-0.084	(0)
	KCrO4-	1.349e-019	1.024e-019	-18.870	-18.990	-0.120	(0)
Mg	4.804e-003						
	Mg+2	3.209e-003	1.421e-003	-2.494	-2.847	-0.354	(0)
	MgSO4	1.542e-003	1.542e-003	-2.812	-2.812	0.000	(0)
	MgHCO3+	3.689e-005	2.989e-005	-4.433	-4.525	-0.091	(0)
	MgF+	1.553e-005	1.266e-005	-4.809	-4.897	-0.089	(0)
	MgCO3	9.456e-007	9.456e-007	-6.024	-6.024	0.000	(0)
	MgOH+	5.678e-008	4.727e-008	-7.246	-7.325	-0.080	(0)
	MgH2BO3+	5.273e-009	4.186e-009	-8.278	-8.378	-0.100	(0)
Mn (2)	1.573e-004						
	Mn+2	1.147e-004	3.816e-005	-3.940	-4.418	-0.478	(0)
	MnSO4	4.045e-005	4.045e-005	-4.393	-4.393	0.000	(0)
	MnHCO3+	1.909e-006	1.565e-006	-5.719	-5.806	-0.086	(0)
	MnF+	1.471e-007	1.206e-007	-6.832	-6.919	-0.086	(0)
	MnCl+	6.728e-008	5.516e-008	-7.172	-7.258	-0.086	(0)
	MnOH+	9.767e-009	8.007e-009	-8.010	-8.097	-0.086	(0)
	MnCl2	8.945e-011	8.945e-011	-10.048	-10.048	0.000	(0)
	MnNO3+	5.719e-013	4.344e-013	-12.243	-12.362	-0.120	(0)
	MnSeO4	9.029e-014	9.029e-014	-13.044	-13.044	0.000	(0)

MnCl3-	3.451e-014	2.829e-014	-13.462	-13.548	-0.086	(0)
Mn (OH) 3-	4.212e-019	3.453e-019	-18.375	-18.462	-0.086	(0)
Mn (NO3) 2	7.836e-021	7.836e-021	-20.106	-20.106	0.000	(0)
Mn (OH) 4-2	2.062e-025	9.313e-026	-24.686	-25.031	-0.345	(0)
MnSe	0.000e+000	0.000e+000	-41.865	-41.865	0.000	(0)
Mn (3)	7.588e-024					
Mn+3	7.588e-024	1.214e-024	-23.120	-23.916	-0.796	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-43.732	-44.077	-0.345	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-47.499	-47.596	-0.097	(0)
Mo	7.303e-007					
MoO4-2	7.293e-007	3.230e-007	-6.137	-6.491	-0.354	(0)
HMoO4-	1.019e-009	7.742e-010	-8.992	-9.111	-0.120	(0)
H2MoO4	6.830e-013	6.830e-013	-12.166	-12.166	0.000	(0)
Ag2MoO4	4.945e-025	4.945e-025	-24.306	-24.306	0.000	(0)
AlMo6O21-3	4.076e-037	3.425e-038	-36.390	-37.465	-1.076	(0)
Mo7O24-6	0.000e+000	0.000e+000	-43.496	-47.798	-4.302	(0)
HMo7O24-5	0.000e+000	0.000e+000	-45.343	-48.330	-2.988	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-48.555	-50.467	-1.912	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-53.065	-54.140	-1.076	(0)
N (-3)	1.117e-005					
NH4+	1.049e-005	8.324e-006	-4.979	-5.080	-0.100	(0)
NH4SO4-	6.486e-007	5.317e-007	-6.188	-6.274	-0.086	(0)
NH3	3.941e-008	3.941e-008	-7.404	-7.404	0.000	(0)
CuNH3+2	7.183e-010	2.389e-010	-9.144	-9.622	-0.478	(0)
CaNH3+2	4.492e-010	1.494e-010	-9.348	-9.826	-0.478	(0)
NiNH3+2	3.989e-012	1.327e-012	-11.399	-11.877	-0.478	(0)
Co (NH3) +2	6.741e-013	2.243e-013	-12.171	-12.649	-0.478	(0)
AgNH3+	2.130e-013	1.618e-013	-12.672	-12.791	-0.120	(0)
BaNH3+2	9.683e-016	3.221e-016	-15.014	-15.492	-0.478	(0)
Ag (NH3) 2+	6.824e-017	5.182e-017	-16.166	-16.285	-0.120	(0)
Hg (NH3) 2+2	4.235e-017	1.409e-017	-16.373	-16.851	-0.478	(0)
Ni (NH3) 2+2	2.272e-017	7.558e-018	-16.644	-17.122	-0.478	(0)
Ca (NH3) 2+2	7.047e-018	2.344e-018	-17.152	-17.630	-0.478	(0)
Co (NH3) 2+2	1.133e-018	3.770e-019	-17.946	-18.424	-0.478	(0)
HgNH3+2	1.075e-018	3.575e-019	-17.969	-18.447	-0.478	(0)
Hg (NH3) 3+2	6.643e-024	2.210e-024	-23.178	-23.656	-0.478	(0)
Co (NH3) 3+2	5.621e-025	1.870e-025	-24.250	-24.728	-0.478	(0)
Hg (NH3) 4+2	2.079e-030	6.917e-031	-29.682	-30.160	-0.478	(0)
Co (NH3) 4+2	1.163e-031	3.867e-032	-30.935	-31.413	-0.478	(0)
Cr (NH3) 5OH+2	9.463e-037	3.148e-037	-36.024	-36.502	-0.478	(0)
Co (NH3) 5+2	7.603e-039	2.529e-039	-38.119	-38.597	-0.478	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-43.125	-44.201	-1.076	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.095	-45.573	-0.478	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.561	-46.039	-0.478	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.933	-54.052	-0.120	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.153	-59.631	-0.478	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.215	-59.693	-0.478	(0)
N (3)	9.546e-006					
NO2-	9.545e-006	7.633e-006	-5.020	-5.117	-0.097	(0)
CuNO2+	6.237e-010	4.736e-010	-9.205	-9.325	-0.120	(0)
CoNO2+	3.353e-012	2.546e-012	-11.475	-11.594	-0.120	(0)
AgNO2	3.207e-012	3.207e-012	-11.494	-11.494	0.000	(0)
Cu (NO2) 2	3.699e-014	3.699e-014	-13.432	-13.432	0.000	(0)
Ag (NO2) 2-	4.992e-017	3.791e-017	-16.302	-16.421	-0.120	(0)
N (5)	8.894e-009					
NO3-	8.803e-009	7.182e-009	-8.055	-8.144	-0.088	(0)
CaNO3+	9.008e-011	6.841e-011	-10.045	-10.165	-0.120	(0)
MnNO3+	5.719e-013	4.344e-013	-12.243	-12.362	-0.120	(0)
ZnNO3+	4.245e-014	3.224e-014	-13.372	-13.492	-0.120	(0)
CuNO3+	1.772e-014	1.346e-014	-13.752	-13.871	-0.120	(0)
NiNO3+	1.490e-015	1.131e-015	-14.827	-14.946	-0.120	(0)
CoNO3+	7.094e-016	5.388e-016	-15.149	-15.269	-0.120	(0)
BaNO3+	6.140e-016	4.663e-016	-15.212	-15.331	-0.120	(0)
CdNO3+	4.181e-016	3.175e-016	-15.379	-15.498	-0.120	(0)
PbNO3+	2.439e-016	1.852e-016	-15.613	-15.732	-0.120	(0)
AgNO3	1.147e-017	1.147e-017	-16.940	-16.940	0.000	(0)

UO2NO3+	1.299e-020	9.867e-021	-19.886	-20.006	-0.120	(0)
Mn(NO3)2	7.836e-021	7.836e-021	-20.106	-20.106	0.000	(0)
CrNO3+2	1.588e-022	5.284e-023	-21.799	-22.277	-0.478	(0)
VO2NO3	6.429e-023	6.429e-023	-22.192	-22.192	0.000	(0)
Zn(NO3)2	4.619e-023	4.619e-023	-22.335	-22.335	0.000	(0)
Cu(NO3)2	1.217e-023	1.217e-023	-22.915	-22.915	0.000	(0)
Co(NO3)2	7.873e-024	7.873e-024	-23.104	-23.104	0.000	(0)
Pb(NO3)2	2.259e-024	2.259e-024	-23.646	-23.646	0.000	(0)
Cd(NO3)2	1.143e-024	1.143e-024	-23.942	-23.942	0.000	(0)
FeNO3+2	4.887e-025	1.626e-025	-24.311	-24.789	-0.478	(0)
HgNO3+	5.020e-029	3.813e-029	-28.299	-28.419	-0.120	(0)
Hg(NO3)2	1.138e-037	1.138e-037	-36.944	-36.944	0.000	(0)
Na	8.952e-003					
Na+	8.668e-003	7.072e-003	-2.062	-2.150	-0.088	(0)
NaSO4-	2.750e-004	2.264e-004	-3.561	-3.645	-0.084	(0)
NaHCO3	8.172e-006	8.172e-006	-5.088	-5.088	0.000	(0)
NaF	3.543e-007	3.543e-007	-6.451	-6.451	0.000	(0)
NaCO3-	1.279e-007	1.053e-007	-6.893	-6.977	-0.084	(0)
NaH2BO3	9.520e-010	9.520e-010	-9.021	-9.021	0.000	(0)
NaCrO4-	7.196e-019	5.465e-019	-18.143	-18.262	-0.120	(0)
Ni	2.395e-007					
Ni+2	1.416e-007	6.271e-008	-6.849	-7.203	-0.354	(0)
NiSO4	7.459e-008	7.459e-008	-7.127	-7.127	0.000	(0)
NiHCO3+	2.092e-008	1.589e-008	-7.679	-7.799	-0.120	(0)
NiCO3	1.871e-009	1.871e-009	-8.728	-8.728	0.000	(0)
NiCl+	2.426e-010	1.842e-010	-9.615	-9.735	-0.120	(0)
NiF+	1.647e-010	1.251e-010	-9.783	-9.903	-0.120	(0)
NiOH+	8.683e-011	6.595e-011	-10.061	-10.181	-0.120	(0)
Ni(SO4)2-2	4.426e-011	1.472e-011	-10.354	-10.832	-0.478	(0)
NiNH3+2	3.989e-012	1.327e-012	-11.399	-11.877	-0.478	(0)
Ni(OH)2	4.376e-013	4.376e-013	-12.359	-12.359	0.000	(0)
NiNO3+	1.490e-015	1.131e-015	-14.827	-14.946	-0.120	(0)
NiCl2	1.065e-015	1.065e-015	-14.973	-14.973	0.000	(0)
NiSeO4	2.578e-016	2.578e-016	-15.589	-15.589	0.000	(0)
Ni(OH)3-	4.813e-017	3.655e-017	-16.318	-16.437	-0.120	(0)
Ni(NH3)2+2	2.272e-017	7.558e-018	-16.644	-17.122	-0.478	(0)
O(0)	2.441e-035					
O2	1.220e-035	1.236e-035	-34.913	-34.908	0.005	(0)
Pb	1.789e-008					
PbSO4	5.091e-009	5.091e-009	-8.293	-8.293	0.000	(0)
PbCO3	4.193e-009	4.193e-009	-8.378	-8.378	0.000	(0)
Pb+2	3.937e-009	1.744e-009	-8.405	-8.759	-0.354	(0)
PbHCO3+	3.506e-009	2.662e-009	-8.455	-8.575	-0.120	(0)
Pb(SO4)2-2	5.498e-010	1.829e-010	-9.260	-9.738	-0.478	(0)
PbOH+	4.818e-010	3.659e-010	-9.317	-9.437	-0.120	(0)
PbCl+	9.354e-011	7.104e-011	-10.029	-10.149	-0.120	(0)
Pb(CO3)2-2	2.907e-011	9.671e-012	-10.537	-11.015	-0.478	(0)
PbF+	1.285e-011	9.757e-012	-10.891	-11.011	-0.120	(0)
Pb(OH)2	9.666e-013	9.666e-013	-12.015	-12.015	0.000	(0)
PbCl2	3.643e-013	3.643e-013	-12.439	-12.439	0.000	(0)
PbF2	1.524e-014	1.524e-014	-13.817	-13.817	0.000	(0)
PbNO3+	2.439e-016	1.852e-016	-15.613	-15.732	-0.120	(0)
PbCl3-	2.193e-016	1.665e-016	-15.659	-15.779	-0.120	(0)
Pb2OH+3	1.203e-016	1.011e-017	-15.920	-16.995	-1.076	(0)
Pb(OH)3-	1.063e-016	8.074e-017	-15.973	-16.093	-0.120	(0)
PbF3-	3.023e-018	2.296e-018	-17.520	-17.639	-0.120	(0)
PbCl4-2	2.627e-019	8.739e-020	-18.581	-19.059	-0.478	(0)
Pb(OH)4-2	4.966e-021	1.652e-021	-20.304	-20.782	-0.478	(0)
PbF4-2	2.623e-022	8.724e-023	-21.581	-22.059	-0.478	(0)
Pb3(OH)4+2	9.771e-023	3.250e-023	-22.010	-22.488	-0.478	(0)
Pb(NO3)2	2.259e-024	2.259e-024	-23.646	-23.646	0.000	(0)
Pb4(OH)4+4	3.677e-026	4.502e-028	-25.435	-27.347	-1.912	(0)
Pb(HS)2	0.000e+000	0.000e+000	-148.805	-148.805	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-225.043	-225.163	-0.120	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-72.540	-72.540	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-77.385	-77.505	-0.120	(0)
HS-	0.000e+000	0.000e+000	-77.538	-77.658	-0.120	(0)

H2S	0.000e+000	0.000e+000	-77.557	-77.557	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.626	-80.104	-0.478	(0)
S6-2	0.000e+000	0.000e+000	-80.142	-80.620	-0.478	(0)
S4-2	0.000e+000	0.000e+000	-80.222	-80.700	-0.478	(0)
S3-2	0.000e+000	0.000e+000	-81.027	-81.505	-0.478	(0)
S2-2	0.000e+000	0.000e+000	-82.044	-82.522	-0.478	(0)
S-2	0.000e+000	0.000e+000	-87.694	-88.039	-0.345	(0)
HgHS2-	0.000e+000	0.000e+000	-136.192	-136.311	-0.120	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.836	-136.836	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.622	-138.100	-0.478	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-145.979	-146.098	-0.120	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-146.441	-146.662	-0.222	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.089	-147.478	-0.388	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.215	-147.335	-0.120	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.840	-148.208	-0.368	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-147.959	-147.959	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.244	-148.244	0.000	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.784	-149.183	-0.399	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-148.805	-148.805	0.000	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.116	-149.494	-0.378	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.832	-156.832	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.183	-213.302	-0.120	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.502	-222.622	-0.120	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-223.597	-223.717	-0.120	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-225.043	-225.163	-0.120	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.205	-225.683	-0.478	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-232.333	-232.453	-0.120	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-298.700	-299.178	-0.478	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.262	-301.740	-0.478	(0)
Sb2S4-2	0.000e+000	0.000e+000	-310.229	-310.707	-0.478	(0)
S (6)	1.953e-002					
SO4-2	1.346e-002	5.961e-003	-1.871	-2.225	-0.354	(0)
CaSO4	4.114e-003	4.114e-003	-2.386	-2.386	0.000	(0)
MgSO4	1.542e-003	1.542e-003	-2.812	-2.812	0.000	(0)
NaSO4-	2.750e-004	2.264e-004	-3.561	-3.645	-0.084	(0)
KSO4-	9.088e-005	7.483e-005	-4.042	-4.126	-0.084	(0)
MnSO4	4.045e-005	4.045e-005	-4.393	-4.393	0.000	(0)
ZnSO4	2.331e-006	2.331e-006	-5.633	-5.633	0.000	(0)
CuSO4	8.093e-007	8.093e-007	-6.092	-6.092	0.000	(0)
NH4SO4-	6.486e-007	5.317e-007	-6.188	-6.274	-0.086	(0)
Zn (SO4) 2-2	3.638e-007	1.210e-007	-6.439	-6.917	-0.478	(0)
HSO4-	8.608e-008	7.017e-008	-7.065	-7.154	-0.089	(0)
NiSO4	7.459e-008	7.459e-008	-7.127	-7.127	0.000	(0)
CoSO4	5.630e-008	5.630e-008	-7.249	-7.249	0.000	(0)
CdSO4	1.954e-008	1.954e-008	-7.709	-7.709	0.000	(0)
PbSO4	5.091e-009	5.091e-009	-8.293	-8.293	0.000	(0)
Cd (SO4) 2-2	4.723e-009	1.571e-009	-8.326	-8.804	-0.478	(0)
Pb (SO4) 2-2	5.498e-010	1.829e-010	-9.260	-9.738	-0.478	(0)
CrOHSO4	4.351e-010	4.351e-010	-9.361	-9.361	0.000	(0)
AgSO4-	3.150e-010	2.392e-010	-9.502	-9.621	-0.120	(0)
AlSO4+	5.690e-011	4.638e-011	-10.245	-10.334	-0.089	(0)
FeSO4	5.005e-011	5.005e-011	-10.301	-10.301	0.000	(0)
Ni (SO4) 2-2	4.426e-011	1.472e-011	-10.354	-10.832	-0.478	(0)
UO2SO4	6.213e-012	6.213e-012	-11.207	-11.207	0.000	(0)
Al (SO4) 2-	3.635e-012	2.963e-012	-11.440	-11.528	-0.089	(0)
CrSO4+	3.085e-012	2.343e-012	-11.511	-11.630	-0.120	(0)
UO2 (SO4) 2-2	1.468e-012	4.883e-013	-11.833	-12.311	-0.478	(0)
VO2SO4-	3.317e-015	2.519e-015	-14.479	-14.599	-0.120	(0)
FeSO4+	1.847e-016	1.514e-016	-15.734	-15.820	-0.086	(0)
VOSO4	4.736e-017	4.736e-017	-16.325	-16.325	0.000	(0)
Cr2 (OH) 2SO4+2	3.636e-017	1.210e-017	-16.439	-16.917	-0.478	(0)
Fe (SO4) 2-	2.541e-017	1.930e-017	-16.595	-16.715	-0.120	(0)
Cr2 (OH) 2 (SO4) 2	4.284e-018	4.284e-018	-17.368	-17.368	0.000	(0)
HgSO4	2.244e-020	2.244e-020	-19.649	-19.649	0.000	(0)
CrO3SO4-2	3.988e-024	1.327e-024	-23.399	-23.877	-0.478	(0)
VSO4+	1.082e-030	8.215e-031	-29.966	-30.085	-0.120	(0)
U (SO4) 2	5.285e-037	5.285e-037	-36.277	-36.277	0.000	(0)
USO4+2	3.355e-038	1.116e-038	-37.474	-37.952	-0.478	(0)

Co(NH3)6SO4+	0.000e+000	0.000e+000	-53.933	-54.052	-0.120	(0)
Sb(3)	3.035e-018					
Sb(OH)3	1.535e-018	1.535e-018	-17.814	-17.814	0.000	(0)
HSbO2	1.500e-018	1.500e-018	-17.824	-17.824	0.000	(0)
SbO2-	2.655e-023	2.017e-023	-22.576	-22.695	-0.120	(0)
Sb(OH)2F	2.295e-023	2.295e-023	-22.639	-22.639	0.000	(0)
SbOF	2.259e-023	2.259e-023	-22.646	-22.646	0.000	(0)
Sb(OH)4-	1.519e-023	1.154e-023	-22.818	-22.938	-0.120	(0)
Sb(OH)2+	5.917e-024	4.494e-024	-23.228	-23.347	-0.120	(0)
SbO+	2.042e-024	1.550e-024	-23.690	-23.810	-0.120	(0)
Sb2S4-2	0.000e+000	0.000e+000	-310.229	-310.707	-0.478	(0)
Sb(5)	2.461e-007					
SbO3-	2.458e-007	1.867e-007	-6.609	-6.729	-0.120	(0)
Sb(OH)6-	2.671e-010	2.179e-010	-9.573	-9.662	-0.088	(0)
SbO2+	1.024e-021	7.775e-022	-20.990	-21.109	-0.120	(0)
Se(-2)	2.856e-015					
Ag2Se	2.856e-015	2.856e-015	-14.544	-14.544	0.000	(0)
HSe-	1.375e-039	1.044e-039	-38.862	-38.981	-0.120	(0)
MnSe	0.000e+000	0.000e+000	-41.865	-41.865	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.011	-42.011	0.000	(0)
Se-2	0.000e+000	0.000e+000	-46.584	-47.062	-0.478	(0)
AgOH(Se)2-4	0.000e+000	0.000e+000	-84.499	-86.411	-1.912	(0)
Se(4)	8.718e-008					
HSeO3-	8.106e-008	6.156e-008	-7.091	-7.211	-0.120	(0)
SeO3-2	6.117e-009	2.035e-009	-8.213	-8.691	-0.478	(0)
H2SeO3	3.163e-012	3.163e-012	-11.500	-11.500	0.000	(0)
AgSeO3-	3.463e-015	2.630e-015	-14.461	-14.580	-0.120	(0)
Cd(SeO3)2-2	1.434e-019	4.770e-020	-18.843	-19.321	-0.478	(0)
FeHSeO3+2	1.107e-021	3.682e-022	-20.956	-21.434	-0.478	(0)
Ag(SeO3)2-3	5.701e-022	4.791e-023	-21.244	-22.320	-1.076	(0)
Se(6)	1.994e-011					
SeO4-2	1.985e-011	8.791e-012	-10.702	-11.056	-0.354	(0)
MnSeO4	9.029e-014	9.029e-014	-13.044	-13.044	0.000	(0)
ZnSeO4	2.433e-015	2.433e-015	-14.614	-14.614	0.000	(0)
NiSeO4	2.578e-016	2.578e-016	-15.589	-15.589	0.000	(0)
CoSeO4	2.086e-016	2.086e-016	-15.681	-15.681	0.000	(0)
HSeO4-	6.988e-017	5.307e-017	-16.156	-16.275	-0.120	(0)
CdSeO4	2.288e-017	2.288e-017	-16.640	-16.640	0.000	(0)
Zn(SeO4)2-2	6.519e-026	2.169e-026	-25.186	-25.664	-0.478	(0)
U(3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-55.901	-56.976	-1.076	(0)
U(4)	1.853e-021					
U(OH)5-	1.846e-021	1.402e-021	-20.734	-20.853	-0.120	(0)
U(OH)4	7.077e-024	7.077e-024	-23.150	-23.150	0.000	(0)
U(OH)3+	4.106e-027	3.119e-027	-26.387	-26.506	-0.120	(0)
U(OH)2+2	5.225e-031	1.738e-031	-30.282	-30.760	-0.478	(0)
UF3+	1.234e-033	9.371e-034	-32.909	-33.028	-0.120	(0)
UF2+2	2.239e-034	7.447e-035	-33.650	-34.128	-0.478	(0)
UOH+3	1.174e-035	9.868e-037	-34.930	-36.006	-1.076	(0)
UF4	8.158e-036	8.158e-036	-35.088	-35.088	0.000	(0)
UF+3	8.865e-037	7.450e-038	-36.052	-37.128	-1.076	(0)
U(SO4)2	5.285e-037	5.285e-037	-36.277	-36.277	0.000	(0)
UF5-	3.380e-038	2.567e-038	-37.471	-37.591	-0.120	(0)
USO4+2	3.355e-038	1.116e-038	-37.474	-37.952	-0.478	(0)
UF6-2	1.850e-039	6.155e-040	-38.733	-39.211	-0.478	(0)
U+4	0.000e+000	0.000e+000	-40.416	-42.328	-1.912	(0)
UCl+3	0.000e+000	0.000e+000	-42.492	-43.568	-1.076	(0)
U6(OH)15+9	0.000e+000	0.000e+000	-157.658	-167.338	-9.680	(0)
U(5)	7.758e-016					
UO2+	7.758e-016	5.892e-016	-15.110	-15.230	-0.120	(0)
U(6)	2.219e-007					
UO2(CO3)3-4	1.145e-007	1.403e-009	-6.941	-8.853	-1.912	(0)
UO2(CO3)2-2	1.052e-007	3.499e-008	-6.978	-7.456	-0.478	(0)
UO2CO3	2.193e-009	2.193e-009	-8.659	-8.659	0.000	(0)
UO2F+	9.937e-012	7.547e-012	-11.003	-11.122	-0.120	(0)
UO2OH+	9.535e-012	7.242e-012	-11.021	-11.140	-0.120	(0)
UO2SO4	6.213e-012	6.213e-012	-11.207	-11.207	0.000	(0)
UO2F2	1.728e-012	1.728e-012	-11.762	-11.762	0.000	(0)

UO2+2	1.555e-012	6.886e-013	-11.808	-12.162	-0.354	(0)
UO2(SO4) 2-2	1.468e-012	4.883e-013	-11.833	-12.311	-0.478	(0)
UO2F3-	4.538e-014	3.447e-014	-13.343	-13.463	-0.120	(0)
UO2Cl+	1.688e-015	1.282e-015	-14.773	-14.892	-0.120	(0)
(UO2) 2 (OH) 2+2	2.616e-016	8.703e-017	-15.582	-16.060	-0.478	(0)
UO2F4-2	6.534e-017	2.174e-017	-16.185	-16.663	-0.478	(0)
(UO2) 3 (OH) 5+	4.393e-018	3.336e-018	-17.357	-17.477	-0.120	(0)
UO2NO3+	1.299e-020	9.867e-021	-19.886	-20.006	-0.120	(0)
V(2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-40.146	-40.266	-0.120	(0)
V+2	0.000e+000	0.000e+000	-40.219	-40.697	-0.478	(0)
V(3)	1.373e-013					
V(OH) 3	1.373e-013	1.373e-013	-12.862	-12.862	0.000	(0)
V(OH) 2+	1.408e-023	1.069e-023	-22.851	-22.971	-0.120	(0)
VOH+2	3.674e-026	1.222e-026	-25.435	-25.913	-0.478	(0)
V+3	3.474e-030	2.919e-031	-29.459	-30.535	-1.076	(0)
VSO4+	1.082e-030	8.215e-031	-29.966	-30.085	-0.120	(0)
V2(OH) 2+4	0.000e+000	0.000e+000	-49.114	-51.026	-1.912	(0)
V2(OH) 3+3	0.000e+000	0.000e+000	-49.356	-50.432	-1.076	(0)
V(4)	7.853e-016					
V(OH) 3+	6.326e-016	4.804e-016	-15.199	-15.318	-0.120	(0)
VO+2	8.672e-017	2.885e-017	-16.062	-16.540	-0.478	(0)
VOSO4	4.736e-017	4.736e-017	-16.325	-16.325	0.000	(0)
VOF+	1.809e-017	1.374e-017	-16.743	-16.862	-0.120	(0)
VOF2	4.090e-019	4.090e-019	-18.388	-18.388	0.000	(0)
VOC1+	1.223e-019	9.291e-020	-18.912	-19.032	-0.120	(0)
VOF3-	1.517e-021	1.152e-021	-20.819	-20.938	-0.120	(0)
VOF4-2	1.110e-024	3.693e-025	-23.955	-24.433	-0.478	(0)
H2V2O4+2	3.483e-026	1.159e-026	-25.458	-25.936	-0.478	(0)
V(5)	8.435e-008					
H2VO4-	8.038e-008	6.104e-008	-7.095	-7.214	-0.120	(0)
HVO4-2	3.827e-009	1.273e-009	-8.417	-8.895	-0.478	(0)
H3VO4	7.352e-011	7.352e-011	-10.134	-10.134	0.000	(0)
H3V2O7-	3.818e-011	2.900e-011	-10.418	-10.538	-0.120	(0)
HV2O7-3	3.135e-013	2.635e-014	-12.504	-13.579	-1.076	(0)
VO2+	2.169e-014	1.770e-014	-13.664	-13.752	-0.088	(0)
VO2SO4-	3.317e-015	2.519e-015	-14.479	-14.599	-0.120	(0)
V3O9-3	2.841e-015	2.387e-016	-14.547	-15.622	-1.076	(0)
VO2F	2.464e-015	2.464e-015	-14.608	-14.608	0.000	(0)
VO4-3	6.303e-016	5.297e-017	-15.200	-16.276	-1.076	(0)
V2O7-4	4.809e-016	5.888e-018	-15.318	-17.230	-1.912	(0)
VO2F2-	9.354e-017	7.104e-017	-16.029	-16.148	-0.120	(0)
V4O12-4	4.964e-019	6.079e-021	-18.304	-20.216	-1.912	(0)
VO2F3-2	2.115e-019	7.036e-020	-18.675	-19.153	-0.478	(0)
VO2NO3	6.429e-023	6.429e-023	-22.192	-22.192	0.000	(0)
VO2F4-3	3.271e-023	2.749e-024	-22.485	-23.561	-1.076	(0)
V10O28-6	0.000e+000	0.000e+000	-46.609	-50.911	-4.302	(0)
HV10O28-5	0.000e+000	0.000e+000	-46.656	-49.643	-2.988	(0)
H2V10O28-4	0.000e+000	0.000e+000	-49.443	-51.355	-1.912	(0)
Zn	6.994e-006					
Zn+2	4.034e-006	1.787e-006	-5.394	-5.748	-0.354	(0)
ZnSO4	2.331e-006	2.331e-006	-5.633	-5.633	0.000	(0)
Zn(SO4) 2-2	3.638e-007	1.210e-007	-6.439	-6.917	-0.478	(0)
ZnHCO3+	1.529e-007	1.161e-007	-6.816	-6.935	-0.120	(0)
ZnCO3	8.224e-008	8.224e-008	-7.085	-7.085	0.000	(0)
ZnOH+	1.966e-008	1.493e-008	-7.707	-7.826	-0.120	(0)
ZnCl+	6.360e-009	5.154e-009	-8.197	-8.288	-0.091	(0)
ZnF+	3.728e-009	2.831e-009	-8.429	-8.548	-0.120	(0)
ZnOHCl	5.636e-010	5.636e-010	-9.249	-9.249	0.000	(0)
Zn(OH) 2	1.976e-010	1.976e-010	-9.704	-9.704	0.000	(0)
ZnCl2	9.378e-012	9.378e-012	-11.028	-11.028	0.000	(0)
Zn(OH) 3-	1.089e-013	8.274e-014	-12.963	-13.082	-0.120	(0)
ZnNO3+	4.245e-014	3.224e-014	-13.372	-13.492	-0.120	(0)
ZnCl3-	1.055e-014	8.552e-015	-13.977	-14.068	-0.091	(0)
ZnSeO4	2.433e-015	2.433e-015	-14.614	-14.614	0.000	(0)
ZnCl4-2	1.087e-017	4.910e-018	-16.964	-17.309	-0.345	(0)
Zn(OH) 4-2	8.272e-019	2.752e-019	-18.082	-18.560	-0.478	(0)
Zn(NO3) 2	4.619e-023	4.619e-023	-22.335	-22.335	0.000	(0)

Zn(SeO4) 2-2	6.519e-026	2.169e-026	-25.186	-25.664	-0.478	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.215	-147.335	-0.120	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.244	-148.244	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.502	-222.622	-0.120	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.205	-225.683	-0.478	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.262	-301.740	-0.478	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-50.19	-43.90	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-38.00	-33.49	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-45.23	-33.49	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-65.20	-47.27	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-51.69	-31.65	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-27.37	-26.97	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.67	-21.22	0.45	(NH4)2SeO4
Acanthite	-51.91	-88.13	-36.22	Ag2S
Ag2CO3	-12.40	-23.49	-11.09	Ag2CO3
Ag2CrO4	-22.61	-34.20	-11.59	Ag2CrO4
Ag2HVO4	-11.87	-10.39	1.48	Ag2HVO4
Ag2MoO4	-12.33	-23.88	-11.55	Ag2MoO4
Ag2O	-16.13	-3.56	12.57	Ag2O
Ag2Se	-0.76	-49.46	-48.70	Ag2Se
Ag2SeO3	-10.53	-17.68	-7.15	Ag2SeO3
Ag2SeO4	-19.54	-28.45	-8.91	Ag2SeO4
Ag2SO4	-14.80	-19.62	-4.82	Ag2SO4
Ag3AsO3	-28.00	-25.84	2.16	Ag3AsO3
Ag3AsO4	-16.41	-19.20	-2.79	Ag3AsO4
Ag3H2VO5	-17.35	-12.17	5.18	Ag3H2VO5
AgF·4H2O	-13.85	-12.80	1.05	AgF·4H2O
Agmetal	-1.04	-14.55	-13.51	Ag
AgVO3	-9.38	-8.61	0.77	AgVO3
Al(OH)3(am)	-2.04	8.76	10.80	Al(OH)3
Al2(MoO4)3	-45.84	-43.47	2.37	Al2(MoO4)3
Al2O3	-2.14	17.52	19.65	Al2O3
Al4(OH)10SO4	-3.73	18.97	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-9.91	-5.11	4.80	AlAsO4·2H2O
AlOHSO4	-4.07	-7.30	-3.23	AlOHSO4
AlSb	-151.31	-85.69	65.62	AlSb
Alunite	-0.28	-1.68	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.19	-10.98	-7.79	PbSO4
Anhydrite	-0.39	-4.75	-4.36	CaSO4
Anilite	-54.50	-86.38	-31.88	Cu0.25Cu1.5S
Antlerite	-2.02	6.77	8.79	Cu3(OH)4SO4
Aragonite	-0.32	-8.62	-8.30	CaCO3
Arsenolite	-79.27	-82.03	-2.76	As4O6
Artinite	-7.55	2.05	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-34.43	-27.73	6.71	As2O5
Atacamite	-2.03	5.36	7.39	Cu2(OH)3Cl
Azurite	-0.13	-17.04	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-18.45	5.95	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-17.64	-1.77	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.96	-9.87	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-28.76	4.18	32.94	Ba3(VO4)2·4H2O
BaCrO4	-15.03	-24.70	-9.67	BaCrO4
BaF2	-10.27	-16.09	-5.82	BaF2
BaMoO4	-7.42	-14.38	-6.96	BaMoO4
Barite	-0.13	-10.11	-9.98	BaSO4
BaS	-94.81	-78.63	16.18	BaS
BaSeO3	-10.01	-8.18	1.83	BaSeO3
BaSeO4	-11.48	-18.94	-7.46	BaSeO4
Bianchite	-6.21	-7.97	-1.76	ZnSO4·6H2O
Birnessite	-8.48	9.61	18.09	MnO2
Bixbyte	-5.67	-6.32	-0.64	Mn2O3
BlaubleiI	-54.06	-78.22	-24.16	Cu0.9Cu0.2S
BlaubleiII	-54.71	-81.99	-27.28	Cu0.6Cu0.8S

Boehmite	0.18	8.76	8.58	AlOOH
Breithauptite	-56.51	-75.04	-18.52	NiSb
Brochantite	-0.84	14.38	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-5.85	10.99	16.84	Mg(OH) 2
Bunsenite	-5.81	6.64	12.45	NiO
Ca(VO ₃) ₂	-8.01	-2.35	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.53	8.97	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.58	8.97	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-16.08	6.22	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-18.68	20.28	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-19.58	20.28	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-297.91	-154.94	142.97	Ca ₃ Sb ₂
CaCrO ₄	-17.06	-19.33	-2.27	CaCrO ₄
Calcite	-0.14	-8.62	-8.48	CaCO ₃
Calomel	-8.56	-26.47	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.06	-9.01	-7.95	CaMoO ₄
Carnotite	-1.22	-0.99	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.63	-2.81	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-10.56	-13.58	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.36	-3.52	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.66	5.98	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.75	5.98	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.89	-14.18	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.67	1.89	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.53	7.87	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.08	-13.73	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.04	-13.73	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.82	-13.74	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.84	-16.05	-1.21	CdF ₂
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO ₄	-0.20	-14.35	-14.15	CdMoO ₄
CdOHCl	-7.41	-3.88	3.54	CdOHCl
CdSb	-75.34	-75.69	-0.35	CdSb
CdSe	-19.72	-39.92	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-17.06	-18.91	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-9.91	-10.08	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.35	-10.08	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.21	-10.08	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.89	-11.64	-9.75	AgCl
Cerrusite	-1.73	-14.86	-13.13	PbCO ₃
CH ₄ (g)	-81.06	-122.11	-41.05	CH ₄
Chalcanthite	-5.81	-8.45	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-54.60	-89.52	-34.92	Cu ₂ S
Chalcopyrite	-122.90	-158.17	-35.27	CuFeS ₂
Cinnabar	-51.08	-96.78	-45.69	HgS
Claudetite	-78.97	-82.03	-3.06	As ₄ O ₆
Clausthalite	-13.72	-40.82	-27.10	PbSe
Co(BO ₂) ₂	-30.06	-2.99	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.58	6.51	13.09	Co(OH) ₂
Co(OH) ₃	-10.81	-13.12	-2.31	Co(OH) ₃
CO ₂ (g)	-1.79	-19.94	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-21.22	-8.19	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-9.22	-19.72	-10.50	Co ₃ O ₄
CoCl ₂	-21.47	-13.20	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.74	-13.21	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.44	-13.42	-9.98	CoCO ₃
CoF ₂	-13.93	-15.53	-1.60	CoF ₂
CoF ₃	-44.71	-46.17	-1.46	CoF ₃
CoFe ₂ O ₄	16.27	12.74	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.05	-13.82	-7.76	CoMoO ₄
CoO	-7.07	6.51	13.59	CoO
CoS(alpha)	-70.62	-78.06	-7.44	CoS
CoS(beta)	-66.99	-78.06	-11.07	CoS
CoSe	-23.19	-39.39	-16.20	CoSe
CoSeO ₃	-8.94	-7.62	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-16.85	-18.38	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.35	-9.55	2.80	CoSO ₄

CoSO4:6H2O	-7.08	-9.55	-2.47	CoSO4:6H2O
Cotunnite	-9.86	-14.64	-4.78	PbCl2
Covellite	-54.67	-76.97	-22.30	CuS
Cr(OH)2	-22.23	-11.41	10.82	Cr(OH)2
Cr(OH)3	-2.92	-1.59	1.34	Cr(OH)3
Cr(OH)3(am)	-0.84	-1.59	-0.75	Cr(OH)3
Cr2O3	-0.81	-3.17	-2.36	Cr2O3
CrCl2	-45.22	-31.13	14.09	CrCl2
CrCl3	-46.28	-31.16	15.11	CrCl3
CrF3	-23.31	-34.64	-11.34	CrF3
Crmetal	-67.44	-36.95	30.48	Cr
CrO3	-27.44	-30.65	-3.21	CrO3
Cryolite	-9.21	-43.05	-33.84	Na3AlF6
Cu(OH)2	-1.06	7.61	8.67	Cu(OH)2
Cu(SbO3)2	-22.14	23.07	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.09	0.16	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.42	-89.31	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.04	-50.84	-45.80	Cu2Se
Cu2SO4	-19.05	-21.00	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-10.99	-4.89	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.26	-101.86	-42.59	Cu3Sb
Cu3Se2	-25.64	-89.13	-63.49	Cu3Se2
CuCO3	-0.82	-12.32	-11.50	CuCO3
CuCrO4	-17.60	-23.04	-5.44	CuCrO4
CuF	-8.58	-13.49	-4.91	CuF
CuF2	-15.54	-14.43	1.12	CuF2
CuF2:2H2O	-9.88	-14.43	-4.55	CuF2:2H2O
Cumetal	-6.49	-15.24	-8.76	Cu
CuMoO4	0.36	-12.72	-13.08	CuMoO4
CuOCuSO4	-11.14	-0.84	10.30	CuOCuSO4
Cupricferrite	7.85	13.83	5.99	CuFe2O4
Cuprite	-3.54	-4.94	-1.41	Cu2O
Cuprousferrite	9.56	0.64	-8.92	CuFeO2
CuSe	-5.19	-38.29	-33.10	CuSe
CuSe2	-25.28	-58.65	-33.37	CuSe2
CuSeO3:2H2O	-7.03	-6.52	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.84	-17.28	-2.44	CuSeO4:5H2O
CuSO4	-11.39	-8.45	2.94	CuSO4
Diaspore	1.88	8.76	6.87	AlOOH
Djurleite	-54.77	-88.69	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-1.02	-17.56	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.47	-17.56	-17.09	CaMg(CO3)2
Epsomite	-2.95	-5.07	-2.13	MgSO4:7H2O
Fe(OH)2	-10.19	3.37	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.19	0.15	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.57	-10.29	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.46	-7.91	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.54	-36.17	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.23	-41.96	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.63	9.59	20.22	Fe3(OH)8
FeAsO4:2H2O	-11.15	-10.75	0.40	FeAsO4:2H2O
FeCr2O4	-7.00	0.20	7.20	FeCr2O4
FeMoO4	-6.87	-16.96	-10.09	FeMoO4
Ferrihydrite	-0.08	3.11	3.19	Fe(OH)3
Ferroselite	-44.29	-62.88	-18.60	FeSe2
FeS(ppt)	-78.25	-81.20	-2.95	FeS
FeSe	-31.53	-42.53	-11.00	FeSe
Fix_pe	-5.85	-5.85	0.00	e-
Fluorite	-0.22	-10.72	-10.50	CaF2
Galena	-65.53	-79.50	-13.97	PbS
Gibbsite	0.47	8.76	8.29	Al(OH)3
Goethite	2.62	3.11	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O
Greenockite	-64.23	-78.59	-14.36	CdS
Greigite	-283.68	-328.71	-45.03	Fe3S4
Gummite	-6.00	1.68	7.67	UO3
Gypsum	-0.14	-4.75	-4.61	CaSO4:2H2O
H-Jarosite	-10.69	-22.79	-12.10	(H3O)Fe3(SO4)2(OH)6

H2MoO4	-7.45	-20.33	-12.88	H2MoO4
H2S (g)	-76.57	-84.58	-8.01	H2S
H2Se (g)	-40.94	-45.90	-4.96	H2Se
Halite	-6.69	-5.09	1.60	NaCl
Hausmannite	-7.23	53.80	61.03	Mn3O4
Hematite	7.64	6.22	-1.42	Fe2O3
Hercynite	-2.00	20.89	22.89	FeAl2O4
Hg (CH3)2 (g)	-182.71	-256.42	-73.71	Hg (CH3)2
Hg (g)	-8.28	-16.15	-7.87	Hg
Hg (OH)2	-8.70	-12.20	-3.50	Hg (OH)2
Hg2 (g)	-17.34	-32.30	-14.96	Hg2
Hg2 (OH)2	-12.02	-6.76	5.26	Hg2 (OH)2
Hg2CO3	-10.64	-26.69	-16.05	Hg2CO3
Hg2CrO4	-28.70	-37.40	-8.70	Hg2CrO4
Hg2F2	-18.43	-28.79	-10.36	Hg2F2
Hg2S	-79.66	-91.33	-11.68	Hg2S
Hg2SeO3	-16.23	-20.88	-4.66	Hg2SeO3
Hg2SO4	-16.69	-22.82	-6.13	Hg2SO4
Hg3O2CO3	-26.85	-56.53	-29.68	Hg3O2CO3
HgCl (g)	-32.73	-13.24	19.50	HgCl
HgCl2	-10.65	-31.92	-21.26	HgCl2
HgF (g)	-47.07	-14.40	32.68	HgF
HgF2 (g)	-46.80	-34.24	12.57	HgF2
Hgmetal (l)	-2.70	-16.15	-13.45	Hg
HgSe	-2.40	-58.10	-55.69	HgSe
HgSeO3	-13.90	-26.33	-12.43	HgSeO3
HgSO4	-18.84	-28.26	-9.42	HgSO4
Huntite	-5.48	-35.45	-29.97	CaMg3 (CO3)4
Hydrocerrusite	-5.86	-24.63	-18.77	Pb3 (OH)2 (CO3)2
Hydromagnesite	-16.02	-24.79	-8.77	Mg5 (CO3)4 (OH)2 : 4H2O
K-Alum	-14.03	-19.20	-5.17	KAl (SO4)2 : 12H2O
K-Jarosite	-3.82	-18.62	-14.80	KFe3 (SO4)2 (OH)6
K2Cr2O7	-35.71	-52.96	-17.24	K2Cr2O7
K2CrO4	-21.80	-22.31	-0.51	K2CrO4
K2MoO4	-15.26	-11.99	3.26	K2MoO4
K2SeO4	-15.83	-16.56	-0.73	K2SeO4
Langite	-3.11	14.38	17.49	Cu4 (OH)6SO4 : H2O
Larnakite	-5.47	-5.90	-0.43	PbO : PbSO4
Laurionite	-5.40	-4.78	0.62	PbOHCl
Lepidocrocite	1.74	3.11	1.37	FeOOH
Lime	-21.38	11.32	32.70	CaO
Litharge	-7.61	5.08	12.69	PbO
Mackinawite	-77.60	-81.20	-3.60	FeS
Maghemite	-0.16	6.22	6.39	Fe2O3
Magnesioferrite	0.35	17.21	16.86	Fe2MgO4
Magnesite	-1.48	-8.94	-7.46	MgCO3
Magnetite	6.19	9.60	3.40	Fe3O4
Malachite	0.59	-4.71	-5.31	Cu2 (OH)2CO3
Manganite	-3.15	22.19	25.34	MnOOH
Massicot	-7.81	5.08	12.89	PbO
Matlockite	-6.83	-15.80	-8.97	PbClF
Melanothallite	-18.36	-12.11	6.26	CuCl2
Melanterite	-10.48	-12.69	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.68	-96.78	-45.09	HgS
Mg (OH)2 (active)	-7.80	10.99	18.79	Mg (OH)2
Mg (VO3)2	-13.96	-2.68	11.28	Mg (VO3)2
Mg2Sb3	-272.18	-197.49	74.68	Mg2Sb3
Mg2V2O7	-18.04	8.32	26.36	Mg2V2O7
MgCr2O4	-8.38	7.82	16.20	MgCr2O4
MgCrO4	-25.04	-19.66	5.38	MgCrO4
MgF2	-2.92	-11.05	-8.13	MgF2
MgMoO4	-7.49	-9.34	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.20	-3.14	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.71	-13.91	-1.20	MgSeO4 : 6H2O
Minium	-32.74	40.78	73.52	Pb3O4
Mirabilite	-5.41	-6.53	-1.11	Na2SO4 : 10H2O
Mn (VO3)2	-9.15	-4.25	4.90	Mn (VO3)2
Mn2 (SO4)3	-48.79	-54.51	-5.71	Mn2 (SO4)3

Mn2Sb	-149.46	-88.38	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-11.97	0.53	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.01	-10.30	2.72	MnCl2:4H2O
MnS (grn)	-75.33	-75.16	0.17	MnS
MnS (pnk)	-78.50	-75.16	3.34	MnS
MnSb	-94.69	-97.60	-2.91	MnSb
MnSe	-39.98	-36.48	3.50	MnSe
MnSeO3	-5.84	-4.71	1.13	MnSeO3
MnSeO3:2H2O	-5.69	-4.71	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.43	-15.48	-2.05	MnSeO4:5H2O
MnSO4	-9.23	-6.64	2.58	MnSO4
Monteponite	-9.12	5.98	15.10	CdO
Montroydite	-8.56	-12.20	-3.64	HgO
MoO3	-12.33	-20.33	-8.00	MoO3
Morenosite	-7.28	-9.43	-2.14	NiSO4:7H2O
MoS2	-144.77	-215.03	-70.26	MoS2
Na-Jarosite	-6.82	-18.02	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.86	-51.76	-9.90	Na2Cr2O7
Na2CrO4	-24.04	-21.11	2.93	Na2CrO4
Na2Mo2O7	-14.52	-31.12	-16.60	Na2Mo2O7
Na2MoO4	-12.28	-10.79	1.49	Na2MoO4
Na2MoO4:2H2O	-12.02	-10.79	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.89	-4.59	10.30	Na2SeO3:5H2O
Na2SeO4	-16.64	-15.36	1.28	Na2SeO4
Na3Sb	-174.59	-80.14	94.45	Na3Sb
Na3VO4	-29.21	7.47	36.68	Na3VO4
Na4V2O7	-31.99	5.41	37.40	Na4V2O7
Nantokite	-5.60	-12.33	-6.73	CuCl
NaSb	-87.30	-64.13	23.17	NaSb
Natron	-9.09	-10.40	-1.31	Na2CO3:10H2O
NaVO3	-5.92	-2.06	3.86	NaVO3
Nesquehonite	-4.28	-8.95	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.16	6.64	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.52	-7.82	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-21.52	10.48	32.00	Ni4 (OH) 6SO4
NiCO3	-6.43	-13.30	-6.87	NiCO3
NiMoO4	-2.55	-13.69	-11.14	NiMoO4
NiS (alpha)	-72.34	-77.94	-5.60	NiS
NiS (beta)	-66.84	-77.94	-11.10	NiS
NiS (gamma)	-65.14	-77.94	-12.80	NiS
NiSe	-21.56	-39.26	-17.70	NiSe
NiSeO3:2H2O	-10.31	-7.49	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.74	-18.26	-1.52	NiSeO4:6H2O
Nsutite	-7.89	9.61	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-233.68	-294.75	-61.07	As2S3
Otavite	-1.95	-13.95	-12.00	CdCO3
Pb (BO2) 2	-10.95	-4.43	6.52	Pb (BO2) 2
Pb (OH) 2	-3.07	5.08	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-60.06	-68.82	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.49	0.30	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-16.03	10.16	26.19	Pb2O (OH) 2
Pb2O3	-25.34	35.70	61.04	Pb2O3
Pb2OCO3	-9.22	-9.78	-0.56	Pb2OCO3
Pb2V2O7	-1.61	-3.51	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-18.29	-12.49	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.57	1.57	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.72	-4.70	11.02	Pb3O2CO3
Pb3O2SO4	-11.51	-0.82	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.85	4.25	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.62	4.26	21.88	Pb4O3SO4
PbCrO4	-12.97	-25.57	-12.60	PbCrO4
PbF2	-9.52	-16.96	-7.44	PbF2
Pbmetal	-24.71	-20.46	4.25	Pb
PbMoO4	0.37	-15.25	-15.62	PbMoO4
PbO:0.3H2O	-7.90	5.08	12.98	PbO:0.33H2O
PbSeO4	-12.97	-19.81	-6.84	PbSeO4
Periclase	-10.59	10.99	21.58	MgO

Phosgenite	-9.68	-29.49	-19.81	PbCl2:PbCO3
Plattnerite	-18.98	30.62	49.60	PbO2
Portlandite	-11.49	11.32	22.80	Ca (OH) 2
Pyrite	-121.73	-140.24	-18.51	FeS2
Pyrochroite	-5.77	9.42	15.19	Mn (OH) 2
Pyrolusite	-6.42	34.96	41.38	MnO2
Realgar	-98.11	-117.86	-19.75	AsS
Retgersite	-7.39	-9.43	-2.04	NiSO4:6H2O
Rhodochrosite	0.06	-10.52	-10.58	MnCO3
Rutherfordine	-3.76	-18.26	-14.50	UO2CO3
Sb (OH) 3	-10.70	-17.81	-7.11	Sb (OH) 3
Sb2O4	-13.49	-10.08	3.40	Sb2O4
Sb2O5	-23.49	-33.16	-9.67	Sb2O5
Sb2Se3	-105.57	-173.33	-67.76	Sb2Se3
Sb4O6 (cubic)	-52.99	-71.25	-18.26	Sb4O6
Sb4O6 (orth)	-53.35	-71.25	-17.90	Sb4O6
SbCl3	-47.96	-47.39	0.57	SbCl3
SbF3	-40.65	-50.87	-10.23	SbF3
Sbmetal	-44.44	-56.13	-11.69	Sb
SbO2	-1.53	-29.35	-27.82	SbO2
Schoepite	-4.32	1.68	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.25	-20.36	-7.11	Se
Semetal (hex)	-12.65	-20.36	-7.71	Se
Senarmontite	-23.26	-35.63	-12.37	Sb2O3
SeO2	-14.25	-14.13	0.12	SeO2
SeO3	-45.94	-24.89	21.04	SeO3
Siderite	-6.32	-16.56	-10.24	FeCO3
Smithsonite	-1.84	-11.84	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS
Spinel	-8.34	28.51	36.85	MgAl2O4
Stibnite	-238.90	-289.36	-50.46	Sb2S3
Sulfur	-56.89	-59.03	-2.14	S
Tenorite	-0.03	7.61	7.64	CuO
Thenardite	-6.85	-6.53	0.32	Na2SO4
Thermonatrite	-11.04	-10.40	0.64	Na2CO3:H2O
Tyuyamunite	-3.08	1.00	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.95	7.13	21.08	U3O8
U3Sb4	-574.11	-421.73	152.38	U3Sb4
U4O9	-30.04	-33.06	-3.02	U4O9
UF4	-29.19	-58.73	-29.54	UF4
UF4:2.5H2O	-26.01	-58.73	-32.72	UF4:2.5H2O
UO2 (am)	-15.59	-14.65	0.93	UO2
UO2 (NO3) 2	-40.60	-28.45	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.30	-28.45	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.84	-28.45	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.50	-28.45	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.94	1.68	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.97	-23.22	-2.25	UO2SeO4:4H2O
UO3	-6.02	1.68	7.70	UO3
Uraninite	-9.98	-14.65	-4.67	UO2
USb2	-216.79	-187.21	29.58	USb2
V (OH) 3	-17.37	-9.78	7.59	V (OH) 3
V2O5	-12.31	-13.67	-1.36	V2O5
V3O5	-35.49	-33.65	1.84	V3O5
V4O7	-43.54	-36.35	7.19	V4O7
V6O13	-31.23	-92.09	-60.86	V6O13
Valentinite	-27.15	-35.63	-8.48	Sb2O3
VC12	-61.14	-42.27	18.87	VC12
VC13	-62.79	-39.35	23.43	VC13
VF4	-61.71	-46.78	14.93	VF4
Vmetal	-92.12	-48.09	44.03	V
VO	-37.31	-22.55	14.76	VO
VO (OH) 2	-7.85	-2.70	5.15	VO (OH) 2
VO2Cl	-19.53	-16.69	2.84	VO2Cl
VOC1	-30.79	-19.64	11.15	VOC1
VOC12	-35.18	-22.42	12.76	VOC12
VOSO4	-22.37	-18.76	3.61	VOSO4
Witherite	-5.41	-13.98	-8.57	BaCO3

Wurtzite	-67.54	-76.49	-8.95	ZnS
Zincite	-3.24	8.09	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO4
Zn(BO2)2	-9.71	-1.42	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.35	-22.04	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.11	8.09	12.20	Zn(OH)2
Zn(OH)2(am)	-4.38	8.09	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.66	8.09	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.44	8.09	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.64	8.09	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.38	0.12	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.87	6.32	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.11	-3.46	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.77	-7.85	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-12.10	16.30	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-17.77	20.73	38.50	Zn5(OH)8Cl2
ZnCl2	-18.68	-11.63	7.05	ZnCl2
ZnCO3:1H2O	-1.59	-11.85	-10.26	ZnCO3:1H2O
ZnF2	-13.41	-13.95	-0.53	ZnF2
Znmetal	-43.24	-17.45	25.79	Zn
ZnMoO4	-2.11	-12.24	-10.13	ZnMoO4
ZnO(active)	-3.10	8.09	11.19	ZnO
ZnS(am)	-67.43	-76.49	-9.05	ZnS
ZnSb	-84.60	-73.58	11.01	ZnSb
ZnSe	-23.41	-37.81	-14.40	ZnSe
ZnSeO4:6H2O	-15.29	-16.81	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.33	-7.97	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 23.

```

REACTION 104
  H2O      -1
  0.166295301 moles ### Addition step. Removes HTC water but solute mass
remains
  USE solution 110
  SAVE Solution 111
  End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 110. Solution after simulation 22.
Using reaction 104.

Reaction 104.

1.663e-001 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.145e-009	7.862e-009
Al	1.950e-007	1.882e-007
As	2.662e-009	2.569e-009
B	1.758e-005	1.697e-005
Ba	2.965e-008	2.862e-008
C	3.259e-003	3.146e-003
Ca	1.109e-002	1.071e-002
Cd	5.841e-008	5.638e-008
Cl	1.412e-003	1.363e-003
Co	2.104e-007	2.031e-007
Cr	5.604e-009	5.410e-009
Cu	5.281e-006	5.098e-006
F	1.171e-004	1.130e-004
Fe	5.349e-009	5.163e-009
Hg	2.673e-010	2.580e-010
K	2.271e-003	2.192e-003
Mg	4.819e-003	4.652e-003
Mn	1.578e-004	1.523e-004
Mo	7.326e-007	7.071e-007
N	2.079e-005	2.007e-005
Na	8.980e-003	8.668e-003
Ni	2.402e-007	2.319e-007
Pb	1.795e-008	1.733e-008
S	1.959e-002	1.891e-002
Sb	2.469e-007	2.383e-007
Se	8.747e-008	8.443e-008
U	2.226e-007	2.149e-007
V	8.462e-008	8.168e-008
Zn	7.016e-006	6.772e-006

-----Description of solution-----

	pH	=	6.919	Charge balance
	pe	=	5.853	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength	=	5.505e-002	
	Mass of water (kg)	=	9.653e-001	
	Total alkalinity (eq/kg)	=	2.712e-003	
	Total CO2 (mol/kg)	=	3.259e-003	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	8.175e-006	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.01	
	Iterations	=	9	
	Total H	=	1.071624e+002	
	Total O	=	5.366446e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
H+	1.477e-007	1.205e-007	-6.831	-6.919	-0.089	0.00
OH-	1.037e-007	8.351e-008	-6.984	-7.078	-0.094	(0)
H2O	5.551e+001	9.992e-001	1.744	-0.000	0.000	18.07
Ag	8.145e-009					
AgCl	4.731e-009	4.731e-009	-8.325	-8.325	0.000	(0)
Ag+	2.467e-009	2.013e-009	-8.608	-8.696	-0.089	(0)
AgCl2-	6.250e-010	4.745e-010	-9.204	-9.324	-0.120	(0)
AgSO4-	3.159e-010	2.398e-010	-9.500	-9.620	-0.120	(0)
AgNO2	3.219e-012	3.219e-012	-11.492	-11.492	0.000	(0)
AgCl3-2	1.466e-012	4.870e-013	-11.834	-12.313	-0.479	(0)
AgF	4.024e-013	4.024e-013	-12.395	-12.395	0.000	(0)
AgNH3+	2.138e-013	1.623e-013	-12.670	-12.790	-0.120	(0)
AgOH	1.681e-014	1.681e-014	-13.775	-13.775	0.000	(0)

	AgCl4-3	1.367e-014	1.145e-015	-13.864	-14.941	-1.077	(0)
	AgSeO3-	3.475e-015	2.638e-015	-14.459	-14.579	-0.120	(0)
	Ag2Se	2.864e-015	2.864e-015	-14.543	-14.543	0.000	(0)
	AgH2BO3	2.717e-015	2.717e-015	-14.566	-14.566	0.000	(0)
	Ag (NH3) 2+	6.864e-017	5.211e-017	-16.163	-16.283	-0.120	(0)
	Ag (NO2) 2-	5.027e-017	3.816e-017	-16.299	-16.418	-0.120	(0)
	AgNO3	1.152e-017	1.152e-017	-16.939	-16.939	0.000	(0)
	Ag (OH) 2-	1.807e-019	1.371e-019	-18.743	-18.863	-0.120	(0)
	Ag (SeO3) 2-3	5.751e-022	4.817e-023	-21.240	-22.317	-1.077	(0)
	Ag2MoO4	4.964e-025	4.964e-025	-24.304	-24.304	0.000	(0)
	AgHS	0.000e+000	0.000e+000	-72.539	-72.539	0.000	(0)
	AgOH (Se) 2-4	0.000e+000	0.000e+000	-84.495	-86.409	-1.915	(0)
	Ag (HS) 2-	0.000e+000	0.000e+000	-145.977	-146.097	-0.120	(0)
	Ag (HS) S4-2	0.000e+000	0.000e+000	-146.439	-146.661	-0.222	(0)
	Ag (S4) 2-3	0.000e+000	0.000e+000	-148.783	-149.182	-0.400	(0)
	AgS4S5-3	0.000e+000	0.000e+000	-149.115	-149.493	-0.378	(0)
Al		1.950e-007					
	Al (OH) 4-	1.196e-007	9.744e-008	-6.922	-7.011	-0.089	(0)
	AlF2+	3.078e-008	2.533e-008	-7.512	-7.596	-0.084	(0)
	AlF3	2.539e-008	2.539e-008	-7.595	-7.595	0.000	(0)
	Al (OH) 3	9.268e-009	9.268e-009	-8.033	-8.033	0.000	(0)
	Al (OH) 2+	6.757e-009	5.563e-009	-8.170	-8.255	-0.084	(0)
	AlF+2	1.741e-009	7.994e-010	-8.759	-9.097	-0.338	(0)
	AlF4-	1.243e-009	1.013e-009	-8.906	-8.994	-0.089	(0)
	AlOH+2	1.826e-010	8.386e-011	-9.738	-10.076	-0.338	(0)
	AlSO4+	5.713e-011	4.656e-011	-10.243	-10.332	-0.089	(0)
	Al+3	6.286e-012	1.004e-012	-11.202	-11.998	-0.797	(0)
	Al (SO4) 2-	3.657e-012	2.980e-012	-11.437	-11.526	-0.089	(0)
	AlMo6O21-3	4.163e-037	3.487e-038	-36.381	-37.458	-1.077	(0)
As (3)		3.124e-021					
	H3AsO3	3.106e-021	3.106e-021	-20.508	-20.508	0.000	(0)
	H2AsO3-	1.742e-023	1.322e-023	-22.759	-22.879	-0.120	(0)
	HAsO3-2	3.013e-028	1.001e-028	-27.521	-28.000	-0.479	(0)
	H4AsO3+	2.443e-028	1.854e-028	-27.612	-27.732	-0.120	(0)
	AsO3-3	3.823e-034	3.202e-035	-33.418	-34.495	-1.077	(0)
As (5)		2.662e-009					
	HAsO4-2	1.797e-009	5.970e-010	-8.745	-9.224	-0.479	(0)
	H2AsO4-	8.642e-010	6.561e-010	-9.063	-9.183	-0.120	(0)
	AsO4-3	1.871e-013	1.567e-014	-12.728	-13.805	-1.077	(0)
	H3AsO4	1.356e-014	1.374e-014	-13.868	-13.862	0.006	(0)
B		1.758e-005					
	H3BO3	1.745e-005	1.767e-005	-4.758	-4.753	0.006	(0)
	H2BO3-	1.073e-007	8.518e-008	-6.969	-7.070	-0.100	(0)
	CaH2BO3+	1.864e-008	1.479e-008	-7.730	-7.830	-0.100	(0)
	MgH2BO3+	5.299e-009	4.206e-009	-8.276	-8.376	-0.100	(0)
	NaH2BO3	9.574e-010	9.574e-010	-9.019	-9.019	0.000	(0)
	BF (OH) 3-	7.072e-010	5.613e-010	-9.150	-9.251	-0.100	(0)
	H5 (BO3) 2-	1.614e-012	1.281e-012	-11.792	-11.892	-0.100	(0)
	BF2 (OH) 2-	7.257e-013	5.760e-013	-12.139	-12.240	-0.100	(0)
	BaH2BO3+	4.306e-014	3.418e-014	-13.366	-13.466	-0.100	(0)
	H8 (BO3) 3-	2.852e-015	2.264e-015	-14.545	-14.645	-0.100	(0)
	AgH2BO3	2.717e-015	2.717e-015	-14.566	-14.566	0.000	(0)
	BF3OH-	2.710e-018	2.151e-018	-17.567	-17.667	-0.100	(0)
	BF4-	1.280e-022	1.016e-022	-21.893	-21.993	-0.100	(0)
Ba		2.965e-008					
	Ba+2	2.934e-008	1.299e-008	-7.533	-7.887	-0.354	(0)
	BaHCO3+	3.085e-010	2.555e-010	-9.511	-9.593	-0.082	(0)
	BaCO3	5.339e-012	5.339e-012	-11.273	-11.273	0.000	(0)
	BaH2BO3+	4.306e-014	3.418e-014	-13.366	-13.466	-0.100	(0)
	BaOH+	5.775e-015	4.733e-015	-14.238	-14.325	-0.086	(0)
	BaNH3+2	9.743e-016	3.236e-016	-15.011	-15.490	-0.479	(0)
	BaNO3+	6.176e-016	4.689e-016	-15.209	-15.329	-0.120	(0)
C (4)		3.259e-003					
	HCO3-	2.503e-003	2.061e-003	-2.602	-2.686	-0.084	(0)
	H2CO3	5.584e-004	5.584e-004	-3.253	-3.253	0.000	(0)
	CaHCO3+	1.398e-004	1.158e-004	-3.854	-3.936	-0.082	(0)
	MgHCO3+	3.707e-005	3.003e-005	-4.431	-4.522	-0.091	(0)
	NaHCO3	8.218e-006	8.218e-006	-5.085	-5.085	0.000	(0)

	CaCO3	3.835e-006	3.835e-006	-5.416	-5.416	0.000	(0)
	CuCO3	2.801e-006	2.801e-006	-5.553	-5.553	0.000	(0)
	MnHCO3+	1.917e-006	1.571e-006	-5.717	-5.804	-0.086	(0)
	CO3-2	1.812e-006	8.018e-007	-5.742	-6.096	-0.354	(0)
	MgCO3	9.497e-007	9.497e-007	-6.022	-6.022	0.000	(0)
	ZnHCO3+	1.536e-007	1.166e-007	-6.814	-6.933	-0.120	(0)
	NaCO3-	1.286e-007	1.059e-007	-6.891	-6.975	-0.084	(0)
	UO2 (CO3) 3-4	1.153e-007	1.403e-009	-6.938	-8.853	-1.915	(0)
	UO2 (CO3) 2-2	1.051e-007	3.492e-008	-6.978	-7.457	-0.479	(0)
	CuHCO3+	1.016e-007	7.714e-008	-6.993	-7.113	-0.120	(0)
	ZnCO3	8.258e-008	8.258e-008	-7.083	-7.083	0.000	(0)
	NiHCO3+	2.102e-008	1.596e-008	-7.677	-7.797	-0.120	(0)
	Cu (CO3) 2-2	1.820e-008	6.045e-009	-7.740	-8.219	-0.479	(0)
	CoHCO3+	1.001e-008	7.598e-009	-8.000	-8.119	-0.120	(0)
	PbCO3	4.207e-009	4.207e-009	-8.376	-8.376	0.000	(0)
	PbHCO3+	3.520e-009	2.672e-009	-8.453	-8.573	-0.120	(0)
	UO2CO3	2.183e-009	2.183e-009	-8.661	-8.661	0.000	(0)
	NiCO3	1.879e-009	1.879e-009	-8.726	-8.726	0.000	(0)
	CoCO3	6.424e-010	6.424e-010	-9.192	-9.192	0.000	(0)
	BaHCO3+	3.085e-010	2.555e-010	-9.511	-9.593	-0.082	(0)
	CdCO3	2.558e-010	2.558e-010	-9.592	-9.592	0.000	(0)
	CdHCO3+	8.651e-011	6.568e-011	-10.063	-10.183	-0.120	(0)
	Pb (CO3) 2-2	2.929e-011	9.728e-012	-10.533	-11.012	-0.479	(0)
	BaCO3	5.339e-012	5.339e-012	-11.273	-11.273	0.000	(0)
	FeHCO3+	1.075e-012	8.900e-013	-11.969	-12.051	-0.082	(0)
	Cd (CO3) 2-2	4.578e-013	1.521e-013	-12.339	-12.818	-0.479	(0)
	HgCO3	1.385e-014	1.385e-014	-13.859	-13.859	0.000	(0)
	Hg (CO3) 2-2	1.057e-016	3.512e-017	-15.976	-16.454	-0.479	(0)
	HgHCO3+	4.093e-017	3.107e-017	-16.388	-16.508	-0.120	(0)
Ca	1.109e-002						
	Ca+2	6.819e-003	3.018e-003	-2.166	-2.520	-0.354	(0)
	CaSO4	4.129e-003	4.129e-003	-2.384	-2.384	0.000	(0)
	CaHCO3+	1.398e-004	1.158e-004	-3.854	-3.936	-0.082	(0)
	CaCO3	3.835e-006	3.835e-006	-5.416	-5.416	0.000	(0)
	CaF+	3.199e-006	2.622e-006	-5.495	-5.581	-0.086	(0)
	CaH2BO3+	1.864e-008	1.479e-008	-7.730	-7.830	-0.100	(0)
	CaOH+	6.071e-009	5.028e-009	-8.217	-8.299	-0.082	(0)
	CaNH3+2	4.518e-010	1.501e-010	-9.345	-9.824	-0.479	(0)
	CaNO3+	9.056e-011	6.875e-011	-10.043	-10.163	-0.120	(0)
	Ca (NH3) 2+2	7.105e-018	2.360e-018	-17.148	-17.627	-0.479	(0)
Cd	5.841e-008						
	Cd+2	3.163e-008	1.400e-008	-7.500	-7.854	-0.354	(0)
	CdSO4	1.960e-008	1.960e-008	-7.708	-7.708	0.000	(0)
	Cd (SO4) 2-2	4.755e-009	1.579e-009	-8.323	-8.801	-0.479	(0)
	CdCl+	2.028e-009	1.539e-009	-8.693	-8.813	-0.120	(0)
	CdCO3	2.558e-010	2.558e-010	-9.592	-9.592	0.000	(0)
	CdHCO3+	8.651e-011	6.568e-011	-10.063	-10.183	-0.120	(0)
	CdF+	2.327e-011	1.766e-011	-10.633	-10.753	-0.120	(0)
	CdOH+	1.223e-011	9.286e-012	-10.912	-11.032	-0.120	(0)
	CdCl2	7.390e-012	7.390e-012	-11.131	-11.131	0.000	(0)
	CdOHC1	5.273e-012	5.273e-012	-11.278	-11.278	0.000	(0)
	Cd (CO3) 2-2	4.578e-013	1.521e-013	-12.339	-12.818	-0.479	(0)
	CdCl3-	7.072e-015	5.369e-015	-14.150	-14.270	-0.120	(0)
	Cd (OH) 2	4.893e-015	4.893e-015	-14.310	-14.310	0.000	(0)
	CdF2	2.805e-015	2.805e-015	-14.552	-14.552	0.000	(0)
	CdNO3+	4.201e-016	3.189e-016	-15.377	-15.496	-0.120	(0)
	CdSeO4	2.298e-017	2.298e-017	-16.639	-16.639	0.000	(0)
	Cd2OH+3	7.780e-018	6.516e-019	-17.109	-18.186	-1.077	(0)
	Cd (SeO3) 2-2	1.445e-019	4.799e-020	-18.840	-19.319	-0.479	(0)
	Cd (OH) 3-	3.288e-020	2.496e-020	-19.483	-19.603	-0.120	(0)
	Cd (NO3) 2	1.152e-024	1.152e-024	-23.939	-23.939	0.000	(0)
	Cd (OH) 4-2	1.027e-027	3.412e-028	-26.988	-27.467	-0.479	(0)
	CdHS+	0.000e+000	0.000e+000	-77.384	-77.503	-0.120	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-147.957	-147.957	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-223.595	-223.714	-0.120	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-298.697	-299.176	-0.479	(0)
Cl	1.412e-003						
	Cl-	1.412e-003	1.151e-003	-2.850	-2.939	-0.089	(0)

MnCl+	6.759e-008	5.540e-008	-7.170	-7.256	-0.086	(0)
ZnCl+	6.390e-009	5.177e-009	-8.194	-8.286	-0.091	(0)
AgCl	4.731e-009	4.731e-009	-8.325	-8.325	0.000	(0)
CdCl+	2.028e-009	1.539e-009	-8.693	-8.813	-0.120	(0)
CuCl+	1.337e-009	1.083e-009	-8.874	-8.965	-0.091	(0)
AgCl2-	6.250e-010	4.745e-010	-9.204	-9.324	-0.120	(0)
CuCl	5.910e-010	5.910e-010	-9.228	-9.228	0.000	(0)
ZnOHC1	5.660e-010	5.660e-010	-9.247	-9.247	0.000	(0)
CoCl+	2.487e-010	1.888e-010	-9.604	-9.724	-0.120	(0)
NiCl+	2.438e-010	1.851e-010	-9.613	-9.733	-0.120	(0)
CuCl2-	1.755e-010	1.422e-010	-9.756	-9.847	-0.091	(0)
PbCl+	9.394e-011	7.131e-011	-10.027	-10.147	-0.120	(0)
MnCl2	9.011e-011	9.011e-011	-10.045	-10.045	0.000	(0)
ZnCl2	9.447e-012	9.447e-012	-11.025	-11.025	0.000	(0)
CdCl2	7.390e-012	7.390e-012	-11.131	-11.131	0.000	(0)
CdOHC1	5.273e-012	5.273e-012	-11.278	-11.278	0.000	(0)
HgClOH	2.451e-012	2.451e-012	-11.611	-11.611	0.000	(0)
HgCl2	1.914e-012	1.914e-012	-11.718	-11.718	0.000	(0)
AgCl3-2	1.466e-012	4.870e-013	-11.834	-12.313	-0.479	(0)
CuCl2	4.323e-013	4.323e-013	-12.364	-12.364	0.000	(0)
PbCl2	3.668e-013	3.668e-013	-12.436	-12.436	0.000	(0)
CuCl3-2	7.755e-014	3.500e-014	-13.110	-13.456	-0.346	(0)
MnCl3-	3.486e-014	2.858e-014	-13.458	-13.544	-0.086	(0)
HgCl3-	2.903e-014	2.204e-014	-13.537	-13.657	-0.120	(0)
AgCl4-3	1.367e-014	1.145e-015	-13.864	-14.941	-1.077	(0)
ZnCl3-	1.067e-014	8.641e-015	-13.972	-14.063	-0.091	(0)
CdCl3-	7.072e-015	5.369e-015	-14.150	-14.270	-0.120	(0)
UO2Cl+	1.682e-015	1.277e-015	-14.774	-14.894	-0.120	(0)
NiCl2	1.073e-015	1.073e-015	-14.969	-14.969	0.000	(0)
CrCl+2	7.574e-016	2.516e-016	-15.121	-15.599	-0.479	(0)
HgCl+	4.369e-016	3.316e-016	-15.360	-15.479	-0.120	(0)
HgCl4-2	3.041e-016	1.010e-016	-15.517	-15.996	-0.479	(0)
PbCl3-	2.215e-016	1.681e-016	-15.655	-15.774	-0.120	(0)
ZnCl4-2	1.102e-017	4.975e-018	-16.958	-17.303	-0.346	(0)
CuCl3-	5.735e-018	4.645e-018	-17.242	-17.333	-0.091	(0)
CrOHC12	4.597e-019	4.597e-019	-18.337	-18.337	0.000	(0)
PbCl4-2	2.664e-019	8.849e-020	-18.574	-19.053	-0.479	(0)
FeCl+2	1.750e-019	7.899e-020	-18.757	-19.102	-0.346	(0)
VOCl+	1.232e-019	9.352e-020	-18.909	-19.029	-0.120	(0)
CrCl2+	3.621e-020	2.749e-020	-19.441	-19.561	-0.120	(0)
FeCl2+	4.957e-022	4.063e-022	-21.305	-21.391	-0.086	(0)
CuCl4-2	5.940e-023	2.681e-023	-22.226	-22.572	-0.346	(0)
FeCl3	4.678e-026	4.678e-026	-25.330	-25.330	0.000	(0)
CrO3Cl-	6.986e-027	5.304e-027	-26.156	-26.275	-0.120	(0)
CoCl+2	9.487e-035	3.151e-035	-34.023	-34.502	-0.479	(0)
UCl+3	0.000e+000	0.000e+000	-42.492	-43.569	-1.077	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.087	-45.565	-0.479	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.551	-46.030	-0.479	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.206	-59.684	-0.479	(0)
Co (2)	2.104e-007					
Co+2	1.427e-007	4.740e-008	-6.846	-7.324	-0.479	(0)
CoSO4	5.649e-008	5.649e-008	-7.248	-7.248	0.000	(0)
CoHCO3+	1.001e-008	7.598e-009	-8.000	-8.119	-0.120	(0)
CoCO3	6.424e-010	6.424e-010	-9.192	-9.192	0.000	(0)
CoCl+	2.487e-010	1.888e-010	-9.604	-9.724	-0.120	(0)
CoF+	1.572e-010	1.193e-010	-9.804	-9.923	-0.120	(0)
CoOH+	1.040e-010	7.898e-011	-9.983	-10.102	-0.120	(0)
CoNO2+	3.368e-012	2.557e-012	-11.473	-11.592	-0.120	(0)
Co (NH3) +2	6.777e-013	2.251e-013	-12.169	-12.648	-0.479	(0)
Co (OH) 2	5.239e-013	5.239e-013	-12.281	-12.281	0.000	(0)
CoNO3+	7.129e-016	5.412e-016	-15.147	-15.267	-0.120	(0)
CoSeO4	2.094e-016	2.094e-016	-15.679	-15.679	0.000	(0)
Co2OH+3	2.240e-018	1.876e-019	-17.650	-18.727	-1.077	(0)
Co (OH) 3-	1.150e-018	8.728e-019	-17.939	-18.059	-0.120	(0)
Co (NH3) 2+2	1.142e-018	3.793e-019	-17.942	-18.421	-0.479	(0)
CoOOH-	2.887e-019	2.192e-019	-18.540	-18.659	-0.120	(0)
Co (NO3) 2	7.933e-024	7.933e-024	-23.101	-23.101	0.000	(0)
Co (NH3) 3+2	5.678e-025	1.886e-025	-24.246	-24.724	-0.479	(0)

Co (OH) 4-2	3.478e-026	1.155e-026	-25.459	-25.937	-0.479	(0)
Co4 (OH) 4+4	6.378e-031	7.763e-033	-30.195	-32.110	-1.915	(0)
Co (NH3) 4+2	1.177e-031	3.910e-032	-30.929	-31.408	-0.479	(0)
Co (NH3) 5+2	7.716e-039	2.563e-039	-38.113	-38.591	-0.479	(0)
Co (3)	1.718e-028					
CoOH+2	1.718e-028	5.707e-029	-27.765	-28.244	-0.479	(0)
Co+3	8.419e-034	1.345e-034	-33.075	-33.871	-0.797	(0)
CoCl+2	9.487e-035	3.151e-035	-34.023	-34.502	-0.479	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.087	-45.565	-0.479	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.924	-54.044	-0.120	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.145	-59.624	-0.479	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.206	-59.684	-0.479	(0)
Cr (2)	1.703e-025					
Cr+2	1.703e-025	5.658e-026	-24.769	-25.247	-0.479	(0)
Cr (3)	5.604e-009					
Cr (OH) 2+	4.128e-009	3.134e-009	-8.384	-8.504	-0.120	(0)
Cr (OH) +2	9.285e-010	3.084e-010	-9.032	-9.511	-0.479	(0)
CrOHSO4	4.371e-010	4.371e-010	-9.359	-9.359	0.000	(0)
Cr (OH) 3	9.830e-011	9.830e-011	-10.007	-10.007	0.000	(0)
CrF+2	6.412e-012	2.130e-012	-11.193	-11.672	-0.479	(0)
CrSO4+	3.101e-012	2.354e-012	-11.508	-11.628	-0.120	(0)
Cr+3	2.016e-012	1.688e-013	-11.696	-12.773	-1.077	(0)
CrO2-	5.108e-013	3.877e-013	-12.292	-12.411	-0.120	(0)
Cr (OH) 4-	4.305e-013	3.268e-013	-12.366	-12.486	-0.120	(0)
CrCl+2	7.574e-016	2.516e-016	-15.121	-15.599	-0.479	(0)
Cr2 (OH) 2SO4+2	3.669e-017	1.219e-017	-16.435	-16.914	-0.479	(0)
Cr2 (OH) 2 (SO4) 2	4.323e-018	4.323e-018	-17.364	-17.364	0.000	(0)
CrOHC12	4.597e-019	4.597e-019	-18.337	-18.337	0.000	(0)
CrCl2+	3.621e-020	2.749e-020	-19.441	-19.561	-0.120	(0)
CrNO3+2	1.600e-022	5.316e-023	-21.796	-22.274	-0.479	(0)
Cr (NH3) 5OH+2	9.617e-037	3.194e-037	-36.017	-36.496	-0.479	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-43.116	-44.193	-1.077	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.551	-46.030	-0.479	(0)
Cr (6)	4.406e-017					
CrO4-2	3.520e-017	1.558e-017	-16.453	-16.807	-0.354	(0)
HCrO4-	8.001e-018	6.074e-018	-17.097	-17.217	-0.120	(0)
NaCrO4-	7.232e-019	5.490e-019	-18.141	-18.260	-0.120	(0)
KCrO4-	1.356e-019	1.029e-019	-18.868	-18.988	-0.120	(0)
CrO3SO4-2	4.011e-024	1.332e-024	-23.397	-23.875	-0.479	(0)
H2CrO4	5.932e-025	5.932e-025	-24.227	-24.227	0.000	(0)
CrO3Cl-	6.986e-027	5.304e-027	-26.156	-26.275	-0.120	(0)
Cr2O7-2	3.854e-033	1.280e-033	-32.414	-32.893	-0.479	(0)
Cu (1)	1.304e-009					
CuCl	5.910e-010	5.910e-010	-9.228	-9.228	0.000	(0)
Cu+	5.370e-010	4.077e-010	-9.270	-9.390	-0.120	(0)
CuCl2-	1.755e-010	1.422e-010	-9.756	-9.847	-0.091	(0)
CuCl3-2	7.755e-014	3.500e-014	-13.110	-13.456	-0.346	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.088	-147.476	-0.388	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.839	-148.206	-0.368	(0)
Cu (2)	5.280e-006					
CuCO3	2.801e-006	2.801e-006	-5.553	-5.553	0.000	(0)
Cu+2	1.341e-006	5.933e-007	-5.873	-6.227	-0.354	(0)
CuSO4	8.118e-007	8.118e-007	-6.091	-6.091	0.000	(0)
CuOH+	1.934e-007	1.567e-007	-6.714	-6.805	-0.091	(0)
CuHCO3+	1.016e-007	7.714e-008	-6.993	-7.113	-0.120	(0)
Cu (CO3) 2-2	1.820e-008	6.045e-009	-7.740	-8.219	-0.479	(0)
CuF+	3.925e-009	2.980e-009	-8.406	-8.526	-0.120	(0)
Cu (OH) 2	2.610e-009	2.610e-009	-8.583	-8.583	0.000	(0)
Cu2 (OH) 2+2	1.856e-009	6.166e-010	-8.731	-9.210	-0.479	(0)
CuCl+	1.337e-009	1.083e-009	-8.874	-8.965	-0.091	(0)
CuNH3+2	7.220e-010	2.398e-010	-9.141	-9.620	-0.479	(0)
CuNO2+	6.264e-010	4.756e-010	-9.203	-9.323	-0.120	(0)
Cu (OH) 3-	5.890e-013	4.471e-013	-12.230	-12.350	-0.120	(0)
CuCl2	4.323e-013	4.323e-013	-12.364	-12.364	0.000	(0)
Cu (NO2) 2	3.725e-014	3.725e-014	-13.429	-13.429	0.000	(0)
CuNO3+	1.780e-014	1.352e-014	-13.749	-13.869	-0.120	(0)
CuCl3-	5.735e-018	4.645e-018	-17.242	-17.333	-0.091	(0)
Cu (OH) 4-2	8.848e-019	2.939e-019	-18.053	-18.532	-0.479	(0)

	CuCl4-2	5.940e-023	2.681e-023	-22.226	-22.572	-0.346	(0)
	Cu(NO3)2	1.226e-023	1.226e-023	-22.912	-22.912	0.000	(0)
	Cu(HS)3-	0.000e+000	0.000e+000	-213.180	-213.300	-0.120	(0)
F	1.171e-004						
	F-	9.760e-005	7.960e-005	-4.011	-4.099	-0.089	(0)
	MgF+	1.561e-005	1.272e-005	-4.807	-4.896	-0.089	(0)
	CaF+	3.199e-006	2.622e-006	-5.495	-5.581	-0.086	(0)
	NaF	3.562e-007	3.562e-007	-6.448	-6.448	0.000	(0)
	MnF+	1.478e-007	1.211e-007	-6.830	-6.917	-0.086	(0)
	AlF2+	3.078e-008	2.533e-008	-7.512	-7.596	-0.084	(0)
	AlF3	2.539e-008	2.539e-008	-7.595	-7.595	0.000	(0)
	HF	1.419e-008	1.419e-008	-7.848	-7.848	0.000	(0)
	CuF+	3.925e-009	2.980e-009	-8.406	-8.526	-0.120	(0)
	ZnF+	3.745e-009	2.843e-009	-8.427	-8.546	-0.120	(0)
	AlF+2	1.741e-009	7.994e-010	-8.759	-9.097	-0.338	(0)
	AlF4-	1.243e-009	1.013e-009	-8.906	-8.994	-0.089	(0)
	BF(OH)3-	7.072e-010	5.613e-010	-9.150	-9.251	-0.100	(0)
	NiF+	1.654e-010	1.256e-010	-9.781	-9.901	-0.120	(0)
	CoF+	1.572e-010	1.193e-010	-9.804	-9.923	-0.120	(0)
	CdF+	2.327e-011	1.766e-011	-10.633	-10.753	-0.120	(0)
	PbF+	1.290e-011	9.791e-012	-10.889	-11.009	-0.120	(0)
	UO2F+	9.899e-012	7.515e-012	-11.004	-11.124	-0.120	(0)
	CrF+2	6.412e-012	2.130e-012	-11.193	-11.672	-0.479	(0)
	HF2-	5.334e-012	4.293e-012	-11.273	-11.367	-0.094	(0)
	UO2F2	1.725e-012	1.725e-012	-11.763	-11.763	0.000	(0)
	BF2(OH)2-	7.257e-013	5.760e-013	-12.139	-12.240	-0.100	(0)
	AgF	4.024e-013	4.024e-013	-12.395	-12.395	0.000	(0)
	UO2F3-	4.544e-014	3.450e-014	-13.343	-13.462	-0.120	(0)
	PbF2	1.534e-014	1.534e-014	-13.814	-13.814	0.000	(0)
	CdF2	2.805e-015	2.805e-015	-14.552	-14.552	0.000	(0)
	VO2F	2.479e-015	2.479e-015	-14.606	-14.606	0.000	(0)
	H2F2	5.392e-016	5.392e-016	-15.268	-15.268	0.000	(0)
	FeF2+	5.153e-016	4.224e-016	-15.288	-15.374	-0.086	(0)
	FeF+2	4.393e-016	1.983e-016	-15.357	-15.703	-0.346	(0)
	VO2F2-	9.438e-017	7.165e-017	-16.025	-16.145	-0.120	(0)
	UO2F4-2	6.567e-017	2.181e-017	-16.183	-16.661	-0.479	(0)
	FeF3	4.744e-017	4.744e-017	-16.324	-16.324	0.000	(0)
	VOF+	1.821e-017	1.382e-017	-16.740	-16.859	-0.120	(0)
	PbF3-	3.051e-018	2.316e-018	-17.516	-17.635	-0.120	(0)
	BF3OH-	2.710e-018	2.151e-018	-17.567	-17.667	-0.100	(0)
	VOF2	4.126e-019	4.126e-019	-18.385	-18.385	0.000	(0)
	VO2F3-2	2.142e-019	7.114e-020	-18.669	-19.148	-0.479	(0)
	VOF3-	1.535e-021	1.165e-021	-20.814	-20.934	-0.120	(0)
	PbF4-2	2.656e-022	8.823e-023	-21.576	-22.054	-0.479	(0)
	BF4-	1.280e-022	1.016e-022	-21.893	-21.993	-0.100	(0)
	HgF+	5.611e-023	4.259e-023	-22.251	-22.371	-0.120	(0)
	VO2F4-3	3.327e-023	2.787e-024	-22.478	-23.555	-1.077	(0)
	Sb(OH)2F	2.308e-023	2.308e-023	-22.637	-22.637	0.000	(0)
	SbOF	2.272e-023	2.272e-023	-22.644	-22.644	0.000	(0)
	VOF4-2	1.127e-024	3.744e-025	-23.948	-24.427	-0.479	(0)
	UF3+	1.236e-033	9.383e-034	-32.908	-33.028	-0.120	(0)
	UF2+2	2.239e-034	7.437e-035	-33.650	-34.129	-0.479	(0)
	UF4	8.190e-036	8.190e-036	-35.087	-35.087	0.000	(0)
	UF+3	8.861e-037	7.421e-038	-36.053	-37.130	-1.077	(0)
	UF5-	3.403e-038	2.583e-038	-37.468	-37.588	-0.120	(0)
	UF6-2	1.870e-039	6.211e-040	-38.728	-39.207	-0.479	(0)
Fe(2)	1.548e-010						
	Fe+2	1.033e-010	3.431e-011	-9.986	-10.465	-0.479	(0)
	FeSO4	5.030e-011	5.030e-011	-10.298	-10.298	0.000	(0)
	FeHCO3+	1.075e-012	8.900e-013	-11.969	-12.051	-0.082	(0)
	FeOH+	1.392e-013	1.141e-013	-12.857	-12.943	-0.086	(0)
	Fe(OH)2	7.565e-018	7.565e-018	-17.121	-17.121	0.000	(0)
	Fe(OH)3-	2.437e-019	1.998e-019	-18.613	-18.699	-0.086	(0)
	Fe(HS)2	0.000e+000	0.000e+000	-156.830	-156.830	0.000	(0)
	Fe(HS)3-	0.000e+000	0.000e+000	-232.330	-232.450	-0.120	(0)
Fe(3)	5.194e-009						
	Fe(OH)2+	4.834e-009	3.979e-009	-8.316	-8.400	-0.084	(0)
	Fe(OH)3	3.569e-010	3.569e-010	-9.448	-9.448	0.000	(0)

Fe (OH) 4-	3.371e-012	2.775e-012	-11.472	-11.557	-0.084	(0)
FeOH+2	2.714e-013	1.225e-013	-12.566	-12.912	-0.346	(0)
FeF2+	5.153e-016	4.224e-016	-15.288	-15.374	-0.086	(0)
FeF+2	4.393e-016	1.983e-016	-15.357	-15.703	-0.346	(0)
FeSO4+	1.857e-016	1.522e-016	-15.731	-15.817	-0.086	(0)
FeF3	4.744e-017	4.744e-017	-16.324	-16.324	0.000	(0)
Fe (SO4) 2-	2.561e-017	1.944e-017	-16.592	-16.711	-0.120	(0)
Fe+3	1.422e-017	2.272e-018	-16.847	-17.644	-0.797	(0)
FeCl+2	1.750e-019	7.899e-020	-18.757	-19.102	-0.346	(0)
FeHSeO3+2	1.115e-021	3.705e-022	-20.953	-21.431	-0.479	(0)
FeCl2+	4.957e-022	4.063e-022	-21.305	-21.391	-0.086	(0)
Fe2 (OH) 2+4	4.081e-023	4.967e-025	-22.389	-24.304	-1.915	(0)
FeNO3+2	4.927e-025	1.636e-025	-24.307	-24.786	-0.479	(0)
FeCl3	4.678e-026	4.678e-026	-25.330	-25.330	0.000	(0)
Fe3 (OH) 4+5	2.802e-029	2.857e-032	-28.552	-31.544	-2.992	(0)
H (0)	3.995e-029					
H2	1.998e-029	2.023e-029	-28.699	-28.694	0.006	(0)
Hg (0)	2.623e-010					
Hg	2.623e-010	2.623e-010	-9.581	-9.581	0.000	(0)
Hg (1)	1.548e-020					
Hg2+2	7.738e-021	2.570e-021	-20.111	-20.590	-0.479	(0)
Hg (2)	5.036e-012					
HgClOH	2.451e-012	2.451e-012	-11.611	-11.611	0.000	(0)
HgCl2	1.914e-012	1.914e-012	-11.718	-11.718	0.000	(0)
Hg (OH) 2	6.271e-013	6.351e-013	-12.203	-12.197	0.006	(0)
HgCl3-	2.903e-014	2.204e-014	-13.537	-13.657	-0.120	(0)
HgCO3	1.385e-014	1.385e-014	-13.859	-13.859	0.000	(0)
HgCl+	4.369e-016	3.316e-016	-15.360	-15.479	-0.120	(0)
HgCl4-2	3.041e-016	1.010e-016	-15.517	-15.996	-0.479	(0)
Hg (CO3) 2-2	1.057e-016	3.512e-017	-15.976	-16.454	-0.479	(0)
HgOH+	6.321e-017	4.799e-017	-16.199	-16.319	-0.120	(0)
Hg (NH3) 2+2	4.278e-017	1.421e-017	-16.369	-16.847	-0.479	(0)
HgHCO3+	4.093e-017	3.107e-017	-16.388	-16.508	-0.120	(0)
HgNH3+2	1.083e-018	3.598e-019	-17.965	-18.444	-0.479	(0)
Hg+2	4.346e-020	1.444e-020	-19.362	-19.841	-0.479	(0)
HgSO4	2.257e-020	2.257e-020	-19.646	-19.646	0.000	(0)
Hg (OH) 3-	8.795e-021	6.677e-021	-20.056	-20.175	-0.120	(0)
HgF+	5.611e-023	4.259e-023	-22.251	-22.371	-0.120	(0)
Hg (NH3) 3+2	6.728e-024	2.235e-024	-23.172	-23.651	-0.479	(0)
HgNO3+	5.058e-029	3.840e-029	-28.296	-28.416	-0.120	(0)
Hg (NH3) 4+2	2.111e-030	7.011e-031	-29.676	-30.154	-0.479	(0)
Hg (NO3) 2	1.150e-037	1.150e-037	-36.939	-36.939	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-136.189	-136.308	-0.120	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.834	-136.834	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.619	-138.097	-0.479	(0)
K	2.271e-003					
K+	2.180e-003	1.778e-003	-2.662	-2.750	-0.089	(0)
KSO4-	9.133e-005	7.518e-005	-4.039	-4.124	-0.084	(0)
KCrO4-	1.356e-019	1.029e-019	-18.868	-18.988	-0.120	(0)
Mg	4.819e-003					
Mg+2	3.218e-003	1.424e-003	-2.492	-2.846	-0.354	(0)
MgSO4	1.548e-003	1.548e-003	-2.810	-2.810	0.000	(0)
MgHCO3+	3.707e-005	3.003e-005	-4.431	-4.522	-0.091	(0)
MgF+	1.561e-005	1.272e-005	-4.807	-4.896	-0.089	(0)
MgCO3	9.497e-007	9.497e-007	-6.022	-6.022	0.000	(0)
MgOH+	5.688e-008	4.734e-008	-7.245	-7.325	-0.080	(0)
MgH2BO3+	5.299e-009	4.206e-009	-8.276	-8.376	-0.100	(0)
Mn (2)	1.578e-004					
Mn+2	1.151e-004	3.822e-005	-3.939	-4.418	-0.479	(0)
MnSO4	4.059e-005	4.059e-005	-4.392	-4.392	0.000	(0)
MnHCO3+	1.917e-006	1.571e-006	-5.717	-5.804	-0.086	(0)
MnF+	1.478e-007	1.211e-007	-6.830	-6.917	-0.086	(0)
MnCl+	6.759e-008	5.540e-008	-7.170	-7.256	-0.086	(0)
MnOH+	9.780e-009	8.016e-009	-8.010	-8.096	-0.086	(0)
MnCl2	9.011e-011	9.011e-011	-10.045	-10.045	0.000	(0)
MnNO3+	5.748e-013	4.364e-013	-12.240	-12.360	-0.120	(0)
MnSeO4	9.066e-014	9.066e-014	-13.043	-13.043	0.000	(0)
MnCl3-	3.486e-014	2.858e-014	-13.458	-13.544	-0.086	(0)

Mn (OH) 3-	4.215e-019	3.455e-019	-18.375	-18.462	-0.086	(0)
Mn (NO3) 2	7.896e-021	7.896e-021	-20.103	-20.103	0.000	(0)
Mn (OH) 4-2	2.064e-025	9.314e-026	-24.685	-25.031	-0.346	(0)
MnSe	0.000e+000	0.000e+000	-41.864	-41.864	0.000	(0)
Mn (3)	7.616e-024					
Mn+3	7.616e-024	1.217e-024	-23.118	-23.915	-0.797	(0)
Mn (6)	0.000e+000					
MnO4-2	0.000e+000	0.000e+000	-43.731	-44.077	-0.346	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-47.499	-47.596	-0.097	(0)
Mo	7.326e-007					
MoO4-2	7.316e-007	3.238e-007	-6.136	-6.490	-0.354	(0)
HMoO4-	1.022e-009	7.762e-010	-8.990	-9.110	-0.120	(0)
H2MoO4	6.851e-013	6.851e-013	-12.164	-12.164	0.000	(0)
Ag2MoO4	4.964e-025	4.964e-025	-24.304	-24.304	0.000	(0)
AlMo6O21-3	4.163e-037	3.487e-038	-36.381	-37.458	-1.077	(0)
Mo7O24-6	0.000e+000	0.000e+000	-43.481	-47.789	-4.308	(0)
HMo7O24-5	0.000e+000	0.000e+000	-45.330	-48.322	-2.992	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-48.544	-50.459	-1.915	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-53.055	-54.132	-1.077	(0)
N (-3)	1.121e-005					
NH4+	1.052e-005	8.347e-006	-4.978	-5.078	-0.100	(0)
NH4SO4-	6.518e-007	5.342e-007	-6.186	-6.272	-0.086	(0)
NH3	3.950e-008	3.950e-008	-7.403	-7.403	0.000	(0)
CuNH3+2	7.220e-010	2.398e-010	-9.141	-9.620	-0.479	(0)
CaNH3+2	4.518e-010	1.501e-010	-9.345	-9.824	-0.479	(0)
NiNH3+2	4.012e-012	1.332e-012	-11.397	-11.875	-0.479	(0)
Co (NH3) +2	6.777e-013	2.251e-013	-12.169	-12.648	-0.479	(0)
AgNH3+	2.138e-013	1.623e-013	-12.670	-12.790	-0.120	(0)
BaNH3+2	9.743e-016	3.236e-016	-15.011	-15.490	-0.479	(0)
Ag (NH3) 2+	6.864e-017	5.211e-017	-16.163	-16.283	-0.120	(0)
Hg (NH3) 2+2	4.278e-017	1.421e-017	-16.369	-16.847	-0.479	(0)
Ni (NH3) 2+2	2.290e-017	7.608e-018	-16.640	-17.119	-0.479	(0)
Ca (NH3) 2+2	7.105e-018	2.360e-018	-17.148	-17.627	-0.479	(0)
Co (NH3) 2+2	1.142e-018	3.793e-019	-17.942	-18.421	-0.479	(0)
HgNH3+2	1.083e-018	3.598e-019	-17.965	-18.444	-0.479	(0)
Hg (NH3) 3+2	6.728e-024	2.235e-024	-23.172	-23.651	-0.479	(0)
Co (NH3) 3+2	5.678e-025	1.886e-025	-24.246	-24.724	-0.479	(0)
Hg (NH3) 4+2	2.111e-030	7.011e-031	-29.676	-30.154	-0.479	(0)
Co (NH3) 4+2	1.177e-031	3.910e-032	-30.929	-31.408	-0.479	(0)
Cr (NH3) 5OH+2	9.617e-037	3.194e-037	-36.017	-36.496	-0.479	(0)
Co (NH3) 5+2	7.716e-039	2.563e-039	-38.113	-38.591	-0.479	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-43.116	-44.193	-1.077	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.087	-45.565	-0.479	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-45.551	-46.030	-0.479	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.924	-54.044	-0.120	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.145	-59.624	-0.479	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.206	-59.684	-0.479	(0)
N (3)	9.575e-006					
NO2-	9.575e-006	7.655e-006	-5.019	-5.116	-0.097	(0)
CuNO2+	6.264e-010	4.756e-010	-9.203	-9.323	-0.120	(0)
CoNO2+	3.368e-012	2.557e-012	-11.473	-11.592	-0.120	(0)
AgNO2	3.219e-012	3.219e-012	-11.492	-11.492	0.000	(0)
Cu (NO2) 2	3.725e-014	3.725e-014	-13.429	-13.429	0.000	(0)
Ag (NO2) 2-	5.027e-017	3.816e-017	-16.299	-16.418	-0.120	(0)
N (5)	8.924e-009					
NO3-	8.833e-009	7.204e-009	-8.054	-8.142	-0.089	(0)
CaNO3+	9.056e-011	6.875e-011	-10.043	-10.163	-0.120	(0)
MnNO3+	5.748e-013	4.364e-013	-12.240	-12.360	-0.120	(0)
ZnNO3+	4.266e-014	3.239e-014	-13.370	-13.490	-0.120	(0)
CuNO3+	1.780e-014	1.352e-014	-13.749	-13.869	-0.120	(0)
NiNO3+	1.497e-015	1.137e-015	-14.825	-14.944	-0.120	(0)
CoNO3+	7.129e-016	5.412e-016	-15.147	-15.267	-0.120	(0)
BaNO3+	6.176e-016	4.689e-016	-15.209	-15.329	-0.120	(0)
CdNO3+	4.201e-016	3.189e-016	-15.377	-15.496	-0.120	(0)
PbNO3+	2.450e-016	1.860e-016	-15.611	-15.730	-0.120	(0)
AgNO3	1.152e-017	1.152e-017	-16.939	-16.939	0.000	(0)
UO2NO3+	1.295e-020	9.830e-021	-19.888	-20.007	-0.120	(0)

Mn(NO3)2	7.896e-021	7.896e-021	-20.103	-20.103	0.000	(0)
CrNO3+2	1.600e-022	5.316e-023	-21.796	-22.274	-0.479	(0)
VO2NO3	6.470e-023	6.470e-023	-22.189	-22.189	0.000	(0)
Zn(NO3)2	4.656e-023	4.656e-023	-22.332	-22.332	0.000	(0)
Cu(NO3)2	1.226e-023	1.226e-023	-22.912	-22.912	0.000	(0)
Co(NO3)2	7.933e-024	7.933e-024	-23.101	-23.101	0.000	(0)
Pb(NO3)2	2.276e-024	2.276e-024	-23.643	-23.643	0.000	(0)
Cd(NO3)2	1.152e-024	1.152e-024	-23.939	-23.939	0.000	(0)
FeNO3+2	4.927e-025	1.636e-025	-24.307	-24.786	-0.479	(0)
HgNO3+	5.058e-029	3.840e-029	-28.296	-28.416	-0.120	(0)
Hg(NO3)2	1.150e-037	1.150e-037	-36.939	-36.939	0.000	(0)
Na	8.980e-003					
Na+	8.695e-003	7.092e-003	-2.061	-2.149	-0.089	(0)
NaSO4-	2.763e-004	2.275e-004	-3.559	-3.643	-0.084	(0)
NaHCO3	8.218e-006	8.218e-006	-5.085	-5.085	0.000	(0)
NaF	3.562e-007	3.562e-007	-6.448	-6.448	0.000	(0)
NaCO3-	1.286e-007	1.059e-007	-6.891	-6.975	-0.084	(0)
NaH2BO3	9.574e-010	9.574e-010	-9.019	-9.019	0.000	(0)
NaCrO4-	7.232e-019	5.490e-019	-18.141	-18.260	-0.120	(0)
Ni	2.402e-007					
Ni+2	1.419e-007	6.282e-008	-6.848	-7.202	-0.354	(0)
NiSO4	7.486e-008	7.486e-008	-7.126	-7.126	0.000	(0)
NiHCO3+	2.102e-008	1.596e-008	-7.677	-7.797	-0.120	(0)
NiCO3	1.879e-009	1.879e-009	-8.726	-8.726	0.000	(0)
NiCl+	2.438e-010	1.851e-010	-9.613	-9.733	-0.120	(0)
NiF+	1.654e-010	1.256e-010	-9.781	-9.901	-0.120	(0)
NiOH+	8.699e-011	6.604e-011	-10.061	-10.180	-0.120	(0)
Ni(SO4)2-2	4.458e-011	1.481e-011	-10.351	-10.830	-0.479	(0)
NiNH3+2	4.012e-012	1.332e-012	-11.397	-11.875	-0.479	(0)
Ni(OH)2	4.380e-013	4.380e-013	-12.358	-12.358	0.000	(0)
NiNO3+	1.497e-015	1.137e-015	-14.825	-14.944	-0.120	(0)
NiCl2	1.073e-015	1.073e-015	-14.969	-14.969	0.000	(0)
NiSeO4	2.590e-016	2.590e-016	-15.587	-15.587	0.000	(0)
Ni(OH)3-	4.818e-017	3.658e-017	-16.317	-16.437	-0.120	(0)
Ni(NH3)2+2	2.290e-017	7.608e-018	-16.640	-17.119	-0.479	(0)
O(0)	2.442e-035					
O2	1.221e-035	1.237e-035	-34.913	-34.908	0.006	(0)
Pb	1.795e-008					
PbSO4	5.106e-009	5.106e-009	-8.292	-8.292	0.000	(0)
PbCO3	4.207e-009	4.207e-009	-8.376	-8.376	0.000	(0)
Pb+2	3.944e-009	1.745e-009	-8.404	-8.758	-0.354	(0)
PbHCO3+	3.520e-009	2.672e-009	-8.453	-8.573	-0.120	(0)
Pb(SO4)2-2	5.533e-010	1.838e-010	-9.257	-9.736	-0.479	(0)
PbOH+	4.823e-010	3.661e-010	-9.317	-9.436	-0.120	(0)
PbCl+	9.394e-011	7.131e-011	-10.027	-10.147	-0.120	(0)
Pb(CO3)2-2	2.929e-011	9.728e-012	-10.533	-11.012	-0.479	(0)
PbF+	1.290e-011	9.791e-012	-10.889	-11.009	-0.120	(0)
Pb(OH)2	9.668e-013	9.668e-013	-12.015	-12.015	0.000	(0)
PbCl2	3.668e-013	3.668e-013	-12.436	-12.436	0.000	(0)
PbF2	1.534e-014	1.534e-014	-13.814	-13.814	0.000	(0)
PbNO3+	2.450e-016	1.860e-016	-15.611	-15.730	-0.120	(0)
PbCl3-	2.215e-016	1.681e-016	-15.655	-15.774	-0.120	(0)
Pb2OH+3	1.209e-016	1.013e-017	-15.917	-16.994	-1.077	(0)
Pb(OH)3-	1.064e-016	8.074e-017	-15.973	-16.093	-0.120	(0)
PbF3-	3.051e-018	2.316e-018	-17.516	-17.635	-0.120	(0)
PbCl4-2	2.664e-019	8.849e-020	-18.574	-19.053	-0.479	(0)
Pb(OH)4-2	4.971e-021	1.651e-021	-20.304	-20.782	-0.479	(0)
PbF4-2	2.656e-022	8.823e-023	-21.576	-22.054	-0.479	(0)
Pb3(OH)4+2	9.802e-023	3.256e-023	-22.009	-22.487	-0.479	(0)
Pb(NO3)2	2.276e-024	2.276e-024	-23.643	-23.643	0.000	(0)
Pb4(OH)4+4	3.709e-026	4.514e-028	-25.431	-27.345	-1.915	(0)
Pb(HS)2	0.000e+000	0.000e+000	-148.803	-148.803	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-225.041	-225.160	-0.120	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-72.539	-72.539	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-77.384	-77.503	-0.120	(0)
HS-	0.000e+000	0.000e+000	-77.538	-77.657	-0.120	(0)
H2S	0.000e+000	0.000e+000	-77.557	-77.557	0.000	(0)

S5-2	0.000e+000	0.000e+000	-79.625	-80.104	-0.479	(0)
S6-2	0.000e+000	0.000e+000	-80.141	-80.619	-0.479	(0)
S4-2	0.000e+000	0.000e+000	-80.221	-80.699	-0.479	(0)
S3-2	0.000e+000	0.000e+000	-81.026	-81.505	-0.479	(0)
S2-2	0.000e+000	0.000e+000	-82.043	-82.521	-0.479	(0)
S-2	0.000e+000	0.000e+000	-87.693	-88.038	-0.346	(0)
HgHS2-	0.000e+000	0.000e+000	-136.189	-136.308	-0.120	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-136.834	-136.834	0.000	(0)
HgS2-2	0.000e+000	0.000e+000	-137.619	-138.097	-0.479	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-145.977	-146.097	-0.120	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-146.439	-146.661	-0.222	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.088	-147.476	-0.388	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.213	-147.333	-0.120	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.839	-148.206	-0.368	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-147.957	-147.957	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.242	-148.242	0.000	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.783	-149.182	-0.400	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-148.803	-148.803	0.000	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.115	-149.493	-0.378	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-156.830	-156.830	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-213.180	-213.300	-0.120	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.500	-222.620	-0.120	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-223.595	-223.714	-0.120	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-225.041	-225.160	-0.120	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.202	-225.681	-0.479	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-232.330	-232.450	-0.120	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-298.697	-299.176	-0.479	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.258	-301.737	-0.479	(0)
Sb2S4-2	0.000e+000	0.000e+000	-310.224	-310.703	-0.479	(0)
S (6)	1.959e-002					
SO4-2	1.350e-002	5.973e-003	-1.870	-2.224	-0.354	(0)
CaSO4	4.129e-003	4.129e-003	-2.384	-2.384	0.000	(0)
MgSO4	1.548e-003	1.548e-003	-2.810	-2.810	0.000	(0)
NaSO4-	2.763e-004	2.275e-004	-3.559	-3.643	-0.084	(0)
KSO4-	9.133e-005	7.518e-005	-4.039	-4.124	-0.084	(0)
MnSO4	4.059e-005	4.059e-005	-4.392	-4.392	0.000	(0)
ZnSO4	2.339e-006	2.339e-006	-5.631	-5.631	0.000	(0)
CuSO4	8.118e-007	8.118e-007	-6.091	-6.091	0.000	(0)
NH4SO4-	6.518e-007	5.342e-007	-6.186	-6.272	-0.086	(0)
Zn (SO4) 2-2	3.663e-007	1.217e-007	-6.436	-6.915	-0.479	(0)
HSO4-	8.630e-008	7.033e-008	-7.064	-7.153	-0.089	(0)
NiSO4	7.486e-008	7.486e-008	-7.126	-7.126	0.000	(0)
CoSO4	5.649e-008	5.649e-008	-7.248	-7.248	0.000	(0)
CdSO4	1.960e-008	1.960e-008	-7.708	-7.708	0.000	(0)
PbSO4	5.106e-009	5.106e-009	-8.292	-8.292	0.000	(0)
Cd (SO4) 2-2	4.755e-009	1.579e-009	-8.323	-8.801	-0.479	(0)
Pb (SO4) 2-2	5.533e-010	1.838e-010	-9.257	-9.736	-0.479	(0)
CrOHSO4	4.371e-010	4.371e-010	-9.359	-9.359	0.000	(0)
AgSO4-	3.159e-010	2.398e-010	-9.500	-9.620	-0.120	(0)
AlSO4+	5.713e-011	4.656e-011	-10.243	-10.332	-0.089	(0)
FeSO4	5.030e-011	5.030e-011	-10.298	-10.298	0.000	(0)
Ni (SO4) 2-2	4.458e-011	1.481e-011	-10.351	-10.830	-0.479	(0)
UO2SO4	6.183e-012	6.183e-012	-11.209	-11.209	0.000	(0)
Al (SO4) 2-	3.657e-012	2.980e-012	-11.437	-11.526	-0.089	(0)
CrSO4+	3.101e-012	2.354e-012	-11.508	-11.628	-0.120	(0)
UO2 (SO4) 2-2	1.466e-012	4.868e-013	-11.834	-12.313	-0.479	(0)
VO2SO4-	3.336e-015	2.532e-015	-14.477	-14.596	-0.120	(0)
FeSO4+	1.857e-016	1.522e-016	-15.731	-15.817	-0.086	(0)
VOSO4	4.762e-017	4.762e-017	-16.322	-16.322	0.000	(0)
Cr2 (OH) 2SO4+2	3.669e-017	1.219e-017	-16.435	-16.914	-0.479	(0)
Fe (SO4) 2-	2.561e-017	1.944e-017	-16.592	-16.711	-0.120	(0)
Cr2 (OH) 2 (SO4) 2	4.323e-018	4.323e-018	-17.364	-17.364	0.000	(0)
HgSO4	2.257e-020	2.257e-020	-19.646	-19.646	0.000	(0)
CrO3SO4-2	4.011e-024	1.332e-024	-23.397	-23.875	-0.479	(0)
VSO4+	1.088e-030	8.263e-031	-29.963	-30.083	-0.120	(0)
U (SO4) 2	5.272e-037	5.272e-037	-36.278	-36.278	0.000	(0)
USO4+2	3.345e-038	1.111e-038	-37.476	-37.954	-0.479	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-53.924	-54.044	-0.120	(0)

Sb (3)	3.044e-018					
Sb (OH) 3	1.540e-018	1.540e-018	-17.813	-17.813	0.000	(0)
HSbO2	1.504e-018	1.504e-018	-17.823	-17.823	0.000	(0)
SbO2-	2.663e-023	2.022e-023	-22.575	-22.694	-0.120	(0)
Sb (OH) 2F	2.308e-023	2.308e-023	-22.637	-22.637	0.000	(0)
SbOF	2.272e-023	2.272e-023	-22.644	-22.644	0.000	(0)
Sb (OH) 4-	1.524e-023	1.157e-023	-22.817	-22.937	-0.120	(0)
Sb (OH) 2+	5.938e-024	4.508e-024	-23.226	-23.346	-0.120	(0)
SbO+	2.049e-024	1.555e-024	-23.689	-23.808	-0.120	(0)
Sb2S4-2	0.000e+000	0.000e+000	-310.224	-310.703	-0.479	(0)
Sb (5)	2.469e-007					
SbO3-	2.466e-007	1.872e-007	-6.608	-6.728	-0.120	(0)
Sb (OH) 6-	2.679e-010	2.185e-010	-9.572	-9.661	-0.089	(0)
SbO2+	1.028e-021	7.801e-022	-20.988	-21.108	-0.120	(0)
Se (-2)	2.864e-015					
Ag2Se	2.864e-015	2.864e-015	-14.543	-14.543	0.000	(0)
HSe-	1.378e-039	1.046e-039	-38.861	-38.980	-0.120	(0)
MnSe	0.000e+000	0.000e+000	-41.864	-41.864	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.010	-42.010	0.000	(0)
Se-2	0.000e+000	0.000e+000	-46.583	-47.061	-0.479	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-84.495	-86.409	-1.915	(0)
Se (4)	8.745e-008					
HSeO3-	8.131e-008	6.172e-008	-7.090	-7.210	-0.120	(0)
SeO3-2	6.140e-009	2.039e-009	-8.212	-8.690	-0.479	(0)
H2SeO3	3.173e-012	3.173e-012	-11.499	-11.499	0.000	(0)
AgSeO3-	3.475e-015	2.638e-015	-14.459	-14.579	-0.120	(0)
Cd (SeO3) 2-2	1.445e-019	4.799e-020	-18.840	-19.319	-0.479	(0)
FeHSeO3+2	1.115e-021	3.705e-022	-20.953	-21.431	-0.479	(0)
Ag (SeO3) 2-3	5.751e-022	4.817e-023	-21.240	-22.317	-1.077	(0)
Se (6)	2.001e-011					
SeO4-2	1.991e-011	8.814e-012	-10.701	-11.055	-0.354	(0)
MnSeO4	9.066e-014	9.066e-014	-13.043	-13.043	0.000	(0)
ZnSeO4	2.443e-015	2.443e-015	-14.612	-14.612	0.000	(0)
NiSeO4	2.590e-016	2.590e-016	-15.587	-15.587	0.000	(0)
CoSeO4	2.094e-016	2.094e-016	-15.679	-15.679	0.000	(0)
HSeO4-	7.011e-017	5.322e-017	-16.154	-16.274	-0.120	(0)
CdSeO4	2.298e-017	2.298e-017	-16.639	-16.639	0.000	(0)
Zn (SeO4) 2-2	6.574e-026	2.183e-026	-25.182	-25.661	-0.479	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-55.902	-56.979	-1.077	(0)
U (4)	1.839e-021					
U (OH) 5-	1.832e-021	1.390e-021	-20.737	-20.857	-0.120	(0)
U (OH) 4	7.022e-024	7.022e-024	-23.154	-23.154	0.000	(0)
U (OH) 3+	4.077e-027	3.095e-027	-26.390	-26.509	-0.120	(0)
U (OH) 2+2	5.196e-031	1.726e-031	-30.284	-30.763	-0.479	(0)
UF3+	1.236e-033	9.383e-034	-32.908	-33.028	-0.120	(0)
UF2+2	2.239e-034	7.437e-035	-33.650	-34.129	-0.479	(0)
UOH+3	1.170e-035	9.801e-037	-34.932	-36.009	-1.077	(0)
UF4	8.190e-036	8.190e-036	-35.087	-35.087	0.000	(0)
UF+3	8.861e-037	7.421e-038	-36.053	-37.130	-1.077	(0)
U (SO4) 2	5.272e-037	5.272e-037	-36.278	-36.278	0.000	(0)
UF5-	3.403e-038	2.583e-038	-37.468	-37.588	-0.120	(0)
USO4+2	3.345e-038	1.111e-038	-37.476	-37.954	-0.479	(0)
UF6-2	1.870e-039	6.211e-040	-38.728	-39.207	-0.479	(0)
U+4	0.000e+000	0.000e+000	-40.416	-42.330	-1.915	(0)
UCl+3	0.000e+000	0.000e+000	-42.492	-43.569	-1.077	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-157.664	-167.357	-9.693	(0)
U (5)	7.704e-016					
UO2+	7.704e-016	5.849e-016	-15.113	-15.233	-0.120	(0)
U (6)	2.226e-007					
UO2 (CO3) 3-4	1.153e-007	1.403e-009	-6.938	-8.853	-1.915	(0)
UO2 (CO3) 2-2	1.051e-007	3.492e-008	-6.978	-7.457	-0.479	(0)
UO2CO3	2.183e-009	2.183e-009	-8.661	-8.661	0.000	(0)
UO2F+	9.899e-012	7.515e-012	-11.004	-11.124	-0.120	(0)
UO2OH+	9.470e-012	7.190e-012	-11.024	-11.143	-0.120	(0)
UO2SO4	6.183e-012	6.183e-012	-11.209	-11.209	0.000	(0)
UO2F2	1.725e-012	1.725e-012	-11.763	-11.763	0.000	(0)
UO2+2	1.545e-012	6.839e-013	-11.811	-12.165	-0.354	(0)

UO2 (SO4) 2-2	1.466e-012	4.868e-013	-11.834	-12.313	-0.479	(0)
UO2F3-	4.544e-014	3.450e-014	-13.343	-13.462	-0.120	(0)
UO2Cl+	1.682e-015	1.277e-015	-14.774	-14.894	-0.120	(0)
(UO2) 2 (OH) 2+2	2.583e-016	8.578e-017	-15.588	-16.067	-0.479	(0)
UO2F4-2	6.567e-017	2.181e-017	-16.183	-16.661	-0.479	(0)
(UO2) 3 (OH) 5+	4.298e-018	3.263e-018	-17.367	-17.486	-0.120	(0)
UO2NO3+	1.295e-020	9.830e-021	-19.888	-20.007	-0.120	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-40.145	-40.264	-0.120	(0)
V+2	0.000e+000	0.000e+000	-40.217	-40.696	-0.479	(0)
V (3)	1.377e-013					
V (OH) 3	1.377e-013	1.377e-013	-12.861	-12.861	0.000	(0)
V (OH) 2+	1.413e-023	1.072e-023	-22.850	-22.970	-0.120	(0)
VOH+2	3.692e-026	1.226e-026	-25.433	-25.911	-0.479	(0)
V+3	3.499e-030	2.930e-031	-29.456	-30.533	-1.077	(0)
VSO4+	1.088e-030	8.263e-031	-29.963	-30.083	-0.120	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-49.108	-51.023	-1.915	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-49.352	-50.429	-1.077	(0)
V (4)	7.884e-016					
V (OH) 3+	6.349e-016	4.820e-016	-15.197	-15.317	-0.120	(0)
VO+2	8.716e-017	2.895e-017	-16.060	-16.538	-0.479	(0)
VOSO4	4.762e-017	4.762e-017	-16.322	-16.322	0.000	(0)
VOF+	1.821e-017	1.382e-017	-16.740	-16.859	-0.120	(0)
VOF2	4.126e-019	4.126e-019	-18.385	-18.385	0.000	(0)
VOC1+	1.232e-019	9.352e-020	-18.909	-19.029	-0.120	(0)
VOF3-	1.535e-021	1.165e-021	-20.814	-20.934	-0.120	(0)
VOF4-2	1.127e-024	3.744e-025	-23.948	-24.427	-0.479	(0)
H2V2O4+2	3.511e-026	1.166e-026	-25.455	-25.933	-0.479	(0)
V (5)	8.462e-008					
H2VO4-	8.062e-008	6.121e-008	-7.094	-7.213	-0.120	(0)
HVO4-2	3.842e-009	1.276e-009	-8.415	-8.894	-0.479	(0)
H3VO4	7.375e-011	7.375e-011	-10.132	-10.132	0.000	(0)
H3V2O7-	3.842e-011	2.916e-011	-10.415	-10.535	-0.120	(0)
HV2O7-3	3.162e-013	2.648e-014	-12.500	-13.577	-1.077	(0)
VO2+	2.177e-014	1.776e-014	-13.662	-13.751	-0.089	(0)
VO2SO4-	3.336e-015	2.532e-015	-14.477	-14.596	-0.120	(0)
V3O9-3	2.873e-015	2.406e-016	-14.542	-15.619	-1.077	(0)
VO2F	2.479e-015	2.479e-015	-14.606	-14.606	0.000	(0)
VO4-3	6.337e-016	5.308e-017	-15.198	-16.275	-1.077	(0)
V2O7-4	4.861e-016	5.916e-018	-15.313	-17.228	-1.915	(0)
VO2F2-	9.438e-017	7.165e-017	-16.025	-16.145	-0.120	(0)
V4O12-4	5.049e-019	6.145e-021	-18.297	-20.211	-1.915	(0)
VO2F3-2	2.142e-019	7.114e-020	-18.669	-19.148	-0.479	(0)
VO2NO3	6.470e-023	6.470e-023	-22.189	-22.189	0.000	(0)
VO2F4-3	3.327e-023	2.787e-024	-22.478	-23.555	-1.077	(0)
V10O28-6	0.000e+000	0.000e+000	-46.591	-50.899	-4.308	(0)
HV10O28-5	0.000e+000	0.000e+000	-46.639	-49.631	-2.992	(0)
H2V10O28-4	0.000e+000	0.000e+000	-49.428	-51.342	-1.915	(0)
Zn	7.016e-006					
Zn+2	4.044e-006	1.790e-006	-5.393	-5.747	-0.354	(0)
ZnSO4	2.339e-006	2.339e-006	-5.631	-5.631	0.000	(0)
Zn (SO4) 2-2	3.663e-007	1.217e-007	-6.436	-6.915	-0.479	(0)
ZnHCO3+	1.536e-007	1.166e-007	-6.814	-6.933	-0.120	(0)
ZnCO3	8.258e-008	8.258e-008	-7.083	-7.083	0.000	(0)
ZnOH+	1.969e-008	1.495e-008	-7.706	-7.825	-0.120	(0)
ZnCl+	6.390e-009	5.177e-009	-8.194	-8.286	-0.091	(0)
ZnF+	3.745e-009	2.843e-009	-8.427	-8.546	-0.120	(0)
ZnOHCl	5.660e-010	5.660e-010	-9.247	-9.247	0.000	(0)
Zn (OH) 2	1.978e-010	1.978e-010	-9.704	-9.704	0.000	(0)
ZnCl2	9.447e-012	9.447e-012	-11.025	-11.025	0.000	(0)
Zn (OH) 3-	1.091e-013	8.279e-014	-12.962	-13.082	-0.120	(0)
ZnNO3+	4.266e-014	3.239e-014	-13.370	-13.490	-0.120	(0)
ZnCl3-	1.067e-014	8.641e-015	-13.972	-14.063	-0.091	(0)
ZnSeO4	2.443e-015	2.443e-015	-14.612	-14.612	0.000	(0)
ZnCl4-2	1.102e-017	4.975e-018	-16.958	-17.303	-0.346	(0)
Zn (OH) 4-2	8.286e-019	2.752e-019	-18.082	-18.560	-0.479	(0)
Zn (NO3) 2	4.656e-023	4.656e-023	-22.332	-22.332	0.000	(0)
Zn (SeO4) 2-2	6.574e-026	2.183e-026	-25.182	-25.661	-0.479	(0)

ZnS (HS) -	0.000e+000	0.000e+000	-147.213	-147.333	-0.120	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-148.242	-148.242	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-222.500	-222.620	-0.120	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.202	-225.681	-0.479	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-301.258	-301.737	-0.479	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-50.18	-43.89	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-37.99	-33.48	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-45.22	-33.48	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-65.19	-47.25	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-51.68	-31.64	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-27.37	-26.96	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-21.66	-21.21	0.45	(NH4) 2SeO4
Acanthite	-51.91	-88.13	-36.22	Ag2S
Ag2CO3	-12.40	-23.49	-11.09	Ag2CO3
Ag2CrO4	-22.61	-34.20	-11.59	Ag2CrO4
Ag2HVO4	-11.87	-10.39	1.48	Ag2HVO4
Ag2MoO4	-12.33	-23.88	-11.55	Ag2MoO4
Ag2O	-16.13	-3.55	12.57	Ag2O
Ag2Se	-0.75	-49.45	-48.70	Ag2Se
Ag2SeO3	-10.53	-17.68	-7.15	Ag2SeO3
Ag2SeO4	-19.54	-28.45	-8.91	Ag2SeO4
Ag2SO4	-14.80	-19.62	-4.82	Ag2SO4
Ag3AsO3	-28.00	-25.84	2.16	Ag3AsO3
Ag3AsO4	-16.41	-19.19	-2.79	Ag3AsO4
Ag3H2VO5	-17.34	-12.16	5.18	Ag3H2VO5
AgF:4H2O	-13.85	-12.80	1.05	AgF:4H2O
Agmetal	-1.04	-14.55	-13.51	Ag
AgVO3	-9.38	-8.61	0.77	AgVO3
Al (OH) 3 (am)	-2.04	8.76	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.83	-43.47	2.37	Al2 (MoO4) 3
Al2O3	-2.14	17.52	19.65	Al2O3
Al4 (OH) 10SO4	-3.73	18.97	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.90	-5.10	4.80	AlAsO4:2H2O
AlOHSO4	-4.07	-7.30	-3.23	AlOHSO4
AlSb	-151.31	-85.68	65.62	AlSb
Alunite	-0.28	-1.68	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.19	-10.98	-7.79	PbSO4
Anhydrite	-0.38	-4.74	-4.36	CaSO4
Anilite	-54.50	-86.38	-31.88	Cu0.25Cu1.5S
Antlerite	-2.02	6.77	8.79	Cu3 (OH) 4SO4
Aragonite	-0.32	-8.62	-8.30	CaCO3
Arsenolite	-79.27	-82.03	-2.76	As4O6
Artinite	-7.55	2.05	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-34.43	-27.72	6.71	As2O5
Atacamite	-2.03	5.36	7.39	Cu2 (OH) 3Cl
Azurite	-0.13	-17.03	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-18.45	5.95	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.63	-1.76	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.96	-9.87	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.75	4.19	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-15.02	-24.69	-9.67	BaCrO4
BaF2	-10.26	-16.08	-5.82	BaF2
BaMoO4	-7.42	-14.38	-6.96	BaMoO4
Barite	-0.13	-10.11	-9.98	BaSO4
BaS	-94.80	-78.62	16.18	BaS
BaSeO3	-10.01	-8.18	1.83	BaSeO3
BaSeO4	-11.48	-18.94	-7.46	BaSeO4
Bianchite	-6.21	-7.97	-1.76	ZnSO4:6H2O
Birnessite	-8.48	9.61	18.09	MnO2
Bixbyte	-5.67	-6.32	-0.64	Mn2O3
BlaubleiI	-54.06	-78.22	-24.16	Cu0.9Cu0.2S
BlaubleiII	-54.71	-81.99	-27.28	Cu0.6Cu0.8S
Boehmite	0.18	8.76	8.58	AlOOH

Breithauptite	-56.51	-75.04	-18.52	NiSb
Brochantite	-0.84	14.38	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-5.85	10.99	16.84	Mg(OH) 2
Bunsenite	-5.81	6.64	12.45	NiO
Ca(VO ₃) ₂	-8.01	-2.35	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.53	8.97	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.58	8.97	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-16.07	6.23	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-18.67	20.29	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-19.57	20.29	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-297.91	-154.93	142.97	Ca ₃ Sb ₂
CaCrO ₄	-17.06	-19.33	-2.27	CaCrO ₄
Calcite	-0.14	-8.62	-8.48	CaCO ₃
Calomel	-8.56	-26.47	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.06	-9.01	-7.95	CaMoO ₄
Carnotite	-1.22	-0.99	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.63	-2.81	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-10.56	-13.58	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.36	-3.52	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.66	5.98	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.75	5.98	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.88	-14.17	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.67	1.89	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.53	7.87	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.07	-13.73	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.04	-13.73	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.82	-13.73	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.84	-16.05	-1.21	CdF ₂
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO ₄	-0.19	-14.34	-14.15	CdMoO ₄
CdOHCl	-7.41	-3.87	3.54	CdOHCl
CdSb	-75.34	-75.69	-0.35	CdSb
CdSe	-19.72	-39.92	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-17.06	-18.91	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-9.91	-10.08	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.35	-10.08	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.21	-10.08	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.89	-11.64	-9.75	AgCl
Cerrusite	-1.72	-14.85	-13.13	PbCO ₃
CH ₄ (g)	-81.06	-122.11	-41.05	CH ₄
Chalcanthite	-5.81	-8.45	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-54.60	-89.52	-34.92	Cu ₂ S
Chalcopyrite	-122.90	-158.17	-35.27	CuFeS ₂
Cinnabar	-51.08	-96.77	-45.69	HgS
Claudetite	-78.96	-82.03	-3.06	As ₄ O ₆
Clausthalite	-13.72	-40.82	-27.10	PbSe
Co(BO ₂) ₂	-30.06	-2.99	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.58	6.51	13.09	Co(OH) ₂
Co(OH) ₃	-10.81	-13.12	-2.31	Co(OH) ₃
CO ₂ (g)	-1.79	-19.93	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-21.22	-8.18	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-9.22	-19.72	-10.50	Co ₃ O ₄
CoCl ₂	-21.47	-13.20	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.74	-13.20	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.44	-13.42	-9.98	CoCO ₃
CoF ₂	-13.93	-15.52	-1.60	CoF ₂
CoF ₃	-44.71	-46.17	-1.46	CoF ₃
CoFe ₂ O ₄	16.27	12.74	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.05	-13.81	-7.76	CoMoO ₄
CoO	-7.07	6.51	13.59	CoO
CoS(alpha)	-70.62	-78.06	-7.44	CoS
CoS(beta)	-66.99	-78.06	-11.07	CoS
CoSe	-23.19	-39.39	-16.20	CoSe
CoSeO ₃	-8.93	-7.61	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-16.85	-18.38	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.35	-9.55	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.08	-9.55	-2.47	CoSO ₄ :6H ₂ O

Cotunnite	-9.86	-14.64	-4.78	PbCl2
Covellite	-54.67	-76.97	-22.30	CuS
Cr(OH)2	-22.23	-11.41	10.82	Cr(OH)2
Cr(OH)3	-2.92	-1.59	1.34	Cr(OH)3
Cr(OH)3(am)	-0.84	-1.59	-0.75	Cr(OH)3
Cr2O3	-0.81	-3.17	-2.36	Cr2O3
CrCl2	-45.22	-31.12	14.09	CrCl2
CrCl3	-46.27	-31.16	15.11	CrCl3
CrF3	-23.30	-34.64	-11.34	CrF3
Crmetal	-67.44	-36.95	30.48	Cr
CrO3	-27.43	-30.65	-3.21	CrO3
Cryolite	-9.20	-43.04	-33.84	Na3AlF6
Cu(OH)2	-1.06	7.61	8.67	Cu(OH)2
Cu(SbO3)2	-22.14	23.07	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.09	0.16	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.42	-89.30	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.04	-50.84	-45.80	Cu2Se
Cu2SO4	-19.05	-21.00	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-10.99	-4.89	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.26	-101.86	-42.59	Cu3Sb
Cu3Se2	-25.64	-89.13	-63.49	Cu3Se2
CuCO3	-0.82	-12.32	-11.50	CuCO3
CuCrO4	-17.59	-23.03	-5.44	CuCrO4
CuF	-8.58	-13.49	-4.91	CuF
CuF2	-15.54	-14.42	1.12	CuF2
CuF2:2H2O	-9.88	-14.43	-4.55	CuF2:2H2O
Cumetal	-6.49	-15.24	-8.76	Cu
CuMoO4	0.36	-12.72	-13.08	CuMoO4
CuOCuSO4	-11.14	-0.84	10.30	CuOCuSO4
Cupricferrite	7.85	13.84	5.99	CuFe2O4
Cuprite	-3.54	-4.94	-1.41	Cu2O
Cuprousferrite	9.56	0.64	-8.92	CuFeO2
CuSe	-5.19	-38.29	-33.10	CuSe
CuSe2	-25.28	-58.64	-33.37	CuSe2
CuSeO3:2H2O	-7.03	-6.52	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.84	-17.28	-2.44	CuSeO4:5H2O
CuSO4	-11.39	-8.45	2.94	CuSO4
Diaspore	1.89	8.76	6.87	AlOOH
Djurleite	-54.77	-88.69	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-1.02	-17.56	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.47	-17.56	-17.09	CaMg(CO3)2
Epsomite	-2.95	-5.07	-2.13	MgSO4:7H2O
Fe(OH)2	-10.19	3.37	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.20	0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.57	-10.29	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.46	-7.90	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.53	-36.16	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.22	-41.96	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.62	9.60	20.22	Fe3(OH)8
FeAsO4:2H2O	-11.15	-10.75	0.40	FeAsO4:2H2O
FeCr2O4	-7.00	0.20	7.20	FeCr2O4
FeMoO4	-6.86	-16.95	-10.09	FeMoO4
Ferrihydrite	-0.08	3.11	3.19	Fe(OH)3
Ferroselite	-44.29	-62.88	-18.60	FeSe2
FeS(ppt)	-78.25	-81.20	-2.95	FeS
FeSe	-31.53	-42.53	-11.00	FeSe
Fix_pe	-5.85	-5.85	0.00	e-
Fluorite	-0.22	-10.72	-10.50	CaF2
Galena	-65.53	-79.50	-13.97	PbS
Gibbsite	0.47	8.76	8.29	Al(OH)3
Goethite	2.62	3.11	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O
Greenockite	-64.23	-78.59	-14.36	CdS
Greigite	-283.67	-328.71	-45.03	Fe3S4
Gummite	-6.00	1.67	7.67	UO3
Gypsum	-0.13	-4.74	-4.61	CaSO4:2H2O
H-Jarosite	-10.69	-22.79	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.45	-20.33	-12.88	H2MoO4

H2S (g)	-76.57	-84.58	-8.01	H2S
H2Se (g)	-40.94	-45.90	-4.96	H2Se
Halite	-6.69	-5.09	1.60	NaCl
Hausmannite	-7.23	53.80	61.03	Mn3O4
Hematite	7.64	6.23	-1.42	Fe2O3
Hercynite	-2.00	20.89	22.89	FeAl2O4
Hg (CH3)2 (g)	-182.71	-256.41	-73.71	Hg (CH3)2
Hg (g)	-8.27	-16.15	-7.87	Hg
Hg (OH)2	-8.70	-12.20	-3.50	Hg (OH)2
Hg2 (g)	-17.34	-32.30	-14.96	Hg2
Hg2 (OH)2	-12.01	-6.75	5.26	Hg2 (OH)2
Hg2CO3	-10.64	-26.69	-16.05	Hg2CO3
Hg2CrO4	-28.70	-37.40	-8.70	Hg2CrO4
Hg2F2	-18.43	-28.79	-10.36	Hg2F2
Hg2S	-79.65	-91.33	-11.68	Hg2S
Hg2SeO3	-16.22	-20.88	-4.66	Hg2SeO3
Hg2SO4	-16.68	-22.81	-6.13	Hg2SO4
Hg3O2CO3	-26.84	-56.52	-29.68	Hg3O2CO3
HgCl (g)	-32.73	-13.23	19.50	HgCl
HgCl2	-10.65	-31.91	-21.26	HgCl2
HgF (g)	-47.07	-14.39	32.68	HgF
HgF2 (g)	-46.80	-34.23	12.57	HgF2
Hgmetal (l)	-2.70	-16.15	-13.45	Hg
HgSe	-2.40	-58.10	-55.69	HgSe
HgSeO3	-13.90	-26.33	-12.43	HgSeO3
HgSO4	-18.84	-28.26	-9.42	HgSO4
Huntite	-5.48	-35.44	-29.97	CaMg3 (CO3)4
Hydrocerrusite	-5.86	-24.63	-18.77	Pb3 (OH)2 (CO3)2
Hydromagnesite	-16.01	-24.78	-8.77	Mg5 (CO3)4 (OH)2:4H2O
K-Alum	-14.03	-19.20	-5.17	KAl (SO4)2:12H2O
K-Jarosite	-3.82	-18.62	-14.80	KFe3 (SO4)2 (OH)6
K2Cr2O7	-35.71	-52.95	-17.24	K2Cr2O7
K2CrO4	-21.79	-22.31	-0.51	K2CrO4
K2MoO4	-15.25	-11.99	3.26	K2MoO4
K2SeO4	-15.82	-16.55	-0.73	K2SeO4
Langite	-3.11	14.38	17.49	Cu4 (OH)6SO4:H2O
Larnakite	-5.47	-5.90	-0.43	PbO:PbSO4
Laurionite	-5.40	-4.78	0.62	PbOHCl
Lepidocrocite	1.74	3.11	1.37	FeOOH
Lime	-21.38	11.32	32.70	CaO
Litharge	-7.61	5.08	12.69	PbO
Mackinawite	-77.60	-81.20	-3.60	FeS
Maghemite	-0.16	6.23	6.39	Fe2O3
Magnesioferrite	0.36	17.22	16.86	Fe2MgO4
Magnesite	-1.48	-8.94	-7.46	MgCO3
Magnetite	6.20	9.60	3.40	Fe3O4
Malachite	0.59	-4.71	-5.31	Cu2 (OH)2CO3
Manganite	-3.15	22.19	25.34	MnOOH
Massicot	-7.81	5.08	12.89	PbO
Matlockite	-6.82	-15.80	-8.97	PbClF
Melanothallite	-18.36	-12.10	6.26	CuCl2
Melanterite	-10.48	-12.69	-2.21	FeSO4:7H2O
Metacinnabar	-51.68	-96.77	-45.09	HgS
Mg (OH)2 (active)	-7.80	10.99	18.79	Mg (OH)2
Mg (VO3)2	-13.95	-2.67	11.28	Mg (VO3)2
Mg2Sb3	-272.17	-197.49	74.68	Mg2Sb3
Mg2V2O7	-18.04	8.32	26.36	Mg2V2O7
MgCr2O4	-8.38	7.82	16.20	MgCr2O4
MgCrO4	-25.03	-19.65	5.38	MgCrO4
MgF2	-2.91	-11.04	-8.13	MgF2
MgMoO4	-7.49	-9.34	-1.85	MgMoO4
MgSeO3:6H2O	-6.19	-3.14	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-12.70	-13.90	-1.20	MgSeO4:6H2O
Minium	-32.74	40.78	73.52	Pb3O4
Mirabilite	-5.41	-6.53	-1.11	Na2SO4:10H2O
Mn (VO3)2	-9.14	-4.24	4.90	Mn (VO3)2
Mn2 (SO4)3	-48.79	-54.50	-5.71	Mn2 (SO4)3
Mn2Sb	-149.45	-88.37	61.08	Mn2Sb

Mn3 (AsO4) 2:8H2O	-11.97	0.53	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.01	-10.30	2.72	MnCl2:4H2O
MnS (grn)	-75.33	-75.16	0.17	MnS
MnS (pnk)	-78.50	-75.16	3.34	MnS
MnSb	-94.69	-97.60	-2.91	MnSb
MnSe	-39.98	-36.48	3.50	MnSe
MnSeO3	-5.84	-4.71	1.13	MnSeO3
MnSeO3:2H2O	-5.69	-4.71	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.42	-15.47	-2.05	MnSeO4:5H2O
MnSO4	-9.22	-6.64	2.58	MnSO4
Monteponite	-9.12	5.98	15.10	CdO
Montroydite	-8.56	-12.20	-3.64	HgO
MoO3	-12.33	-20.33	-8.00	MoO3
Morenosite	-7.28	-9.43	-2.14	NiSO4:7H2O
MoS2	-144.76	-215.02	-70.26	MoS2
Na-Jarosite	-6.82	-18.02	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.86	-51.75	-9.90	Na2Cr2O7
Na2CrO4	-24.04	-21.11	2.93	Na2CrO4
Na2Mo2O7	-14.52	-31.12	-16.60	Na2Mo2O7
Na2MoO4	-12.28	-10.79	1.49	Na2MoO4
Na2MoO4:2H2O	-12.01	-10.79	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.89	-4.59	10.30	Na2SeO3:5H2O
Na2SeO4	-16.63	-15.35	1.28	Na2SeO4
Na3Sb	-174.59	-80.13	94.45	Na3Sb
Na3VO4	-29.20	7.48	36.68	Na3VO4
Na4V2O7	-31.98	5.42	37.40	Na4V2O7
Nantokite	-5.60	-12.33	-6.73	CuCl
NaSb	-87.30	-64.13	23.17	NaSb
Natron	-9.09	-10.40	-1.31	Na2CO3:10H2O
NaVO3	-5.92	-2.06	3.86	NaVO3
Nesquehonite	-4.27	-8.94	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.16	6.64	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.52	-7.82	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-21.52	10.48	32.00	Ni4 (OH) 6SO4
NiCO3	-6.43	-13.30	-6.87	NiCO3
NiMoO4	-2.55	-13.69	-11.14	NiMoO4
NiS (alpha)	-72.34	-77.94	-5.60	NiS
NiS (beta)	-66.84	-77.94	-11.10	NiS
NiS (gamma)	-65.14	-77.94	-12.80	NiS
NiSe	-21.56	-39.26	-17.70	NiSe
NiSeO3:2H2O	-10.31	-7.49	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.74	-18.26	-1.52	NiSeO4:6H2O
Nsutite	-7.89	9.61	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-233.68	-294.74	-61.07	As2S3
Otavite	-1.95	-13.95	-12.00	CdCO3
Pb (BO2) 2	-10.94	-4.42	6.52	Pb (BO2) 2
Pb (OH) 2	-3.07	5.08	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-60.05	-68.81	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-8.49	0.30	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-16.03	10.16	26.19	Pb2O (OH) 2
Pb2O3	-25.34	35.70	61.04	Pb2O3
Pb2OCO3	-9.22	-9.77	-0.56	Pb2OCO3
Pb2V2O7	-1.60	-3.50	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-18.28	-12.48	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.56	1.58	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.71	-4.69	11.02	Pb3O2CO3
Pb3O2SO4	-11.51	-0.82	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.84	4.26	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.62	4.26	21.88	Pb4O3SO4
PbCrO4	-12.97	-25.57	-12.60	PbCrO4
PbF2	-9.52	-16.96	-7.44	PbF2
Pbmetal	-24.71	-20.46	4.25	Pb
PbMoO4	0.37	-15.25	-15.62	PbMoO4
PbO:0.3H2O	-7.90	5.08	12.98	PbO:0.33H2O
PbSeO4	-12.97	-19.81	-6.84	PbSeO4
Periclase	-10.59	10.99	21.58	MgO
Phosgenite	-9.68	-29.49	-19.81	PbCl2:PbCO3

Plattnerite	-18.98	30.62	49.60	PbO2
Portlandite	-11.49	11.32	22.80	Ca (OH) 2
Pyrite	-121.73	-140.24	-18.51	FeS2
Pyrochroite	-5.77	9.42	15.19	Mn (OH) 2
Pyrolusite	-6.42	34.96	41.38	MnO2
Realgar	-98.11	-117.86	-19.75	AsS
Retgersite	-7.39	-9.43	-2.04	NiSO4:6H2O
Rhodochrosite	0.07	-10.51	-10.58	MnCO3
Rutherfordine	-3.76	-18.26	-14.50	UO2CO3
Sb (OH) 3	-10.70	-17.81	-7.11	Sb (OH) 3
Sb2O4	-13.48	-10.08	3.40	Sb2O4
Sb2O5	-23.49	-33.16	-9.67	Sb2O5
Sb2Se3	-105.56	-173.32	-67.76	Sb2Se3
Sb4O6 (cubic)	-52.99	-71.25	-18.26	Sb4O6
Sb4O6 (orth)	-53.35	-71.25	-17.90	Sb4O6
SbCl3	-47.96	-47.39	0.57	SbCl3
SbF3	-40.64	-50.87	-10.23	SbF3
Sbmetal	-44.44	-56.13	-11.69	Sb
SbO2	-1.53	-29.35	-27.82	SbO2
Schoepite	-4.32	1.67	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.25	-20.36	-7.11	Se
Semetal (hex)	-12.65	-20.36	-7.71	Se
Senarmontite	-23.26	-35.62	-12.37	Sb2O3
SeO2	-14.25	-14.13	0.12	SeO2
SeO3	-45.94	-24.89	21.04	SeO3
Siderite	-6.32	-16.56	-10.24	FeCO3
Smithsonite	-1.84	-11.84	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS
Spinel	-8.34	28.51	36.85	MgAl2O4
Stibnite	-238.89	-289.35	-50.46	Sb2S3
Sulfur	-56.89	-59.03	-2.14	S
Tenorite	-0.03	7.61	7.64	CuO
Thenardite	-6.84	-6.52	0.32	Na2SO4
Thermonatrite	-11.03	-10.39	0.64	Na2CO3:H2O
Tyuyamunite	-3.08	1.00	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.96	7.12	21.08	U3O8
U3Sb4	-574.12	-421.74	152.38	U3Sb4
U4O9	-30.06	-33.08	-3.02	U4O9
UF4	-29.19	-58.73	-29.54	UF4
UF4:2.5H2O	-26.01	-58.73	-32.72	UF4:2.5H2O
UO2 (am)	-15.59	-14.65	0.93	UO2
UO2 (NO3) 2	-40.60	-28.45	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.30	-28.45	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.84	-28.45	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.50	-28.45	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.94	1.67	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.97	-23.22	-2.25	UO2SeO4:4H2O
UO3	-6.03	1.67	7.70	UO3
Uraninite	-9.99	-14.65	-4.67	UO2
USb2	-216.79	-187.21	29.58	USb2
V (OH) 3	-17.37	-9.78	7.59	V (OH) 3
V2O5	-12.30	-13.66	-1.36	V2O5
V3O5	-35.48	-33.65	1.84	V3O5
V4O7	-43.53	-36.35	7.19	V4O7
V6O13	-31.22	-92.08	-60.86	V6O13
Valentinite	-27.14	-35.62	-8.48	Sb2O3
VC12	-61.14	-42.26	18.87	VC12
VC13	-62.78	-39.35	23.43	VC13
VF4	-61.70	-46.77	14.93	VF4
Vmetal	-92.12	-48.09	44.03	V
VO	-37.30	-22.55	14.76	VO
VO (OH) 2	-7.85	-2.70	5.15	VO (OH) 2
VO2Cl	-19.53	-16.69	2.84	VO2Cl
VOC1	-30.79	-19.63	11.15	VOC1
VOC12	-35.18	-22.42	12.76	VOC12
VOSO4	-22.37	-18.76	3.61	VOSO4
Witherite	-5.41	-13.98	-8.57	BaCO3
Wurtzite	-67.54	-76.49	-8.95	ZnS

Zincite	-3.24	8.09	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO4
Zn(BO2)2	-9.70	-1.41	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.35	-22.03	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.11	8.09	12.20	Zn(OH)2
Zn(OH)2(am)	-4.38	8.09	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.66	8.09	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.44	8.09	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.64	8.09	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.38	0.12	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.87	6.32	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.10	-3.45	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.76	-7.85	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-12.10	16.30	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-17.76	20.74	38.50	Zn5(OH)8Cl2
ZnCl2	-18.67	-11.62	7.05	ZnCl2
ZnCO3:1H2O	-1.58	-11.84	-10.26	ZnCO3:1H2O
ZnF2	-13.41	-13.95	-0.53	ZnF2
Znmetal	-43.24	-17.45	25.79	Zn
ZnMoO4	-2.11	-12.24	-10.13	ZnMoO4
ZnO(active)	-3.10	8.09	11.19	ZnO
ZnS(am)	-67.43	-76.49	-9.05	ZnS
ZnSb	-84.59	-73.58	11.01	ZnSb
ZnSe	-23.41	-37.81	-14.40	ZnSe
ZnSeO4:6H2O	-15.28	-16.80	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.33	-7.97	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 24.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 103

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

Carnotite 0 0

CaSeO3:2H2O 0 0

CdMoO4 0 0

Cd(BO2)2 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

```

MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 111
SAVE Solution 112 Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 103
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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Reaction step 1.

Using solution 111. Solution after simulation 23.
Using pure phase assemblage 103.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+000	6.161e-012	6.161e-012
Alunite	-5.30	-6.70	-1.40	0.000e+000	0	0.000e+000
Anhydrite	-0.41	-4.77	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+000	1.504e-009	1.504e-009
Barite	-0.16	-10.14	-9.98	0.000e+000	0	0.000e+000
Brochantite	-0.00	15.22	15.22	0.000e+000	1.150e-006	1.150e-006
Brucite	-3.96	12.88	16.84	0.000e+000	0	0.000e+000
CO2(g)	-3.50	-21.65	-18.15	1.000e+001	1.000e+001	1.622e-003
CaMoO4	-1.10	-9.05	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-4.91	-2.09	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	0.000e+000	1.063e-003	1.063e-003
Carnotite	0.00	0.23	0.23	0.000e+000	1.483e-008	1.483e-008
Cd(BO2)2	-11.52	-1.68	9.84	0.000e+000	0	0.000e+000
CdMoO4	-0.20	-14.35	-14.15	0.000e+000	0	0.000e+000
Chrysotile	Element not present.			0.000e+000	0	0.000e+000
Cr2O3	0.00	-2.36	-2.36	0.000e+000	1.981e-009	1.981e-009
Cu2Se(alpha)	-4.82	-50.62	-45.80	0.000e+000	0	0.000e+000
CuMoO4	-0.85	-13.93	-13.08	0.000e+000	0	0.000e+000
Epsomite	-2.93	-5.06	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	-0.00	3.19	3.19	0.000e+000	4.082e-009	4.082e-009
Fluorite	-0.26	-10.76	-10.50	0.000e+000	0	0.000e+000
Gummitite	-4.57	3.10	7.67	0.000e+000	0	0.000e+000
Gypsum	-0.17	-4.78	-4.61	0.000e+000	0	0.000e+000
HgSe	-3.53	-59.22	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2	Element not present.			0.000e+000	0	0.000e+000
Mirabilite	-5.40	-6.51	-1.11	0.000e+000	0	0.000e+000

MnSeO3	-5.07	-3.94	1.13	0.000e+000	0	0.000e+000
Ni (OH) 2	-4.24	8.56	12.79	0.000e+000	0	0.000e+000
Ni3 (AsO4) 2:8H2O	-22.34	-6.64	15.70	0.000e+000	0	0.000e+000
NiCO3	-6.22	-13.09	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-2.52	-13.66	-11.14	0.000e+000	0	0.000e+000
O2 (g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-1.578e-005
Otavite	-1.78	-13.78	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	0.000e+000	8.680e-009	8.680e-009
Rutherfordine	-4.04	-18.54	-14.50	0.000e+000	0	0.000e+000
SbO2	-2.47	-30.29	-27.82	0.000e+000	0	0.000e+000
Schoepite	-2.89	3.10	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2 (am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-0.68	3.40	4.08	0.000e+000	0	0.000e+000
U3O8	-9.67	11.42	21.08	0.000e+000	0	0.000e+000
UO2 (OH) 2 (beta)	-2.51	3.10	5.61	0.000e+000	0	0.000e+000
UO3	-4.60	3.10	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-2.12	-12.24	-10.13	0.000e+000	0	0.000e+000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.132e-009	7.850e-009
Al	1.950e-007	1.882e-007
As	7.427e-010	7.169e-010
B	1.758e-005	1.697e-005
Ba	2.620e-008	2.529e-008
C	4.777e-004	4.611e-004
Ca	9.994e-003	9.647e-003
Cd	5.841e-008	5.638e-008
Cl	1.412e-003	1.363e-003
Co	2.104e-007	2.031e-007
Cr	1.500e-009	1.448e-009
Cu	5.149e-007	4.971e-007
F	1.171e-004	1.130e-004
Fe	1.120e-009	1.081e-009
Hg	2.673e-010	2.580e-010
K	2.271e-003	2.192e-003
Mg	4.819e-003	4.652e-003
Mn	1.578e-004	1.523e-004
Mo	7.236e-007	6.985e-007
N	2.079e-005	2.007e-005
Na	8.980e-003	8.668e-003
Ni	2.402e-007	2.319e-007
Pb	8.977e-009	8.666e-009
S	1.958e-002	1.890e-002
Sb	2.469e-007	2.383e-007
Se	8.746e-008	8.443e-008
U	2.085e-007	2.012e-007
V	6.954e-008	6.713e-008
Zn	7.016e-006	6.772e-006

-----Description of solution-----

	pH =	7.865	Charge balance
	pe =	4.907	Adjusted to redox
equilibrium			
	Activity of water =	0.999	
	Ionic strength =	5.293e-002	
	Mass of water (kg) =	9.653e-001	
	Total alkalinity (eq/kg) =	4.812e-004	
	Total CO2 (mol/kg) =	4.777e-004	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	8.175e-006	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.01	
	Iterations =	48	
	Total H =	1.071624e+002	

Total O = 5.365805e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	9.131e-007	7.374e-007	-6.039	-6.132	-0.093	(0)
H+	1.668e-008	1.365e-008	-7.778	-7.865	-0.087	0.00
H2O	5.551e+001	9.993e-001	1.744	-0.000	0.000	18.07
Ag	8.132e-009					
AgCl	4.727e-009	4.727e-009	-8.325	-8.325	0.000	(0)
Ag+	2.452e-009	2.005e-009	-8.611	-8.698	-0.087	(0)
AgCl2-	6.228e-010	4.754e-010	-9.206	-9.323	-0.117	(0)
AgSO4-	3.217e-010	2.456e-010	-9.493	-9.610	-0.117	(0)
AgNO2	6.877e-012	6.877e-012	-11.163	-11.163	0.000	(0)
AgCl3-2	1.442e-012	4.892e-013	-11.841	-12.311	-0.469	(0)
AgF	4.034e-013	4.034e-013	-12.394	-12.394	0.000	(0)
AgOH	1.479e-013	1.479e-013	-12.830	-12.830	0.000	(0)
AgNH3+	5.108e-014	3.899e-014	-13.292	-13.409	-0.117	(0)
AgH2BO3	2.259e-014	2.259e-014	-13.646	-13.646	0.000	(0)
AgSeO3-	1.983e-014	1.513e-014	-13.703	-13.820	-0.117	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
AgCl4-3	1.312e-014	1.153e-015	-13.882	-14.938	-1.056	(0)
Ag (NO2) 2-	2.291e-016	1.748e-016	-15.640	-15.757	-0.117	(0)
AgNO3	2.467e-017	2.467e-017	-16.608	-16.608	0.000	(0)
Ag (OH) 2-	1.396e-017	1.066e-017	-16.855	-16.972	-0.117	(0)
Ag (NH3) 2+	3.955e-018	3.018e-018	-17.403	-17.520	-0.117	(0)
Ag (SeO3) 2-3	1.811e-020	1.591e-021	-19.742	-20.798	-1.056	(0)
Ag2MoO4	4.928e-025	4.928e-025	-24.307	-24.307	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.479	-73.479	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-82.073	-83.951	-1.877	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.373	-147.593	-0.220	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.858	-147.975	-0.117	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.772	-149.168	-0.397	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.104	-149.479	-0.375	(0)
Al	1.950e-007					
Al (OH) 4-	1.931e-007	1.579e-007	-6.714	-6.802	-0.088	(0)
Al (OH) 3	1.700e-009	1.700e-009	-8.769	-8.769	0.000	(0)
Al (OH) 2+	1.400e-010	1.156e-010	-9.854	-9.937	-0.083	(0)
AlF2+	8.276e-012	6.831e-012	-11.082	-11.165	-0.083	(0)
AlF3	6.888e-012	6.888e-012	-11.162	-11.162	0.000	(0)
AlF+2	4.616e-013	2.143e-013	-12.336	-12.669	-0.333	(0)
AlOH+2	4.251e-013	1.973e-013	-12.372	-12.705	-0.333	(0)
AlF4-	3.382e-013	2.764e-013	-12.471	-12.558	-0.088	(0)
AlSO4+	1.559e-014	1.275e-014	-13.807	-13.895	-0.088	(0)
Al+3	1.633e-015	2.676e-016	-14.787	-15.573	-0.786	(0)
Al (SO4) 2-	1.026e-015	8.384e-016	-14.989	-15.077	-0.088	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-45.652	-46.708	-1.056	(0)
As (3)	1.667e-023					
H3AsO3	1.588e-023	1.588e-023	-22.799	-22.799	0.000	(0)
H2AsO3-	7.822e-025	5.970e-025	-24.107	-24.224	-0.117	(0)
HAsO3-2	1.176e-028	3.990e-029	-27.930	-28.399	-0.469	(0)
H4AsO3+	1.407e-031	1.074e-031	-30.852	-30.969	-0.117	(0)
AsO3-3	1.282e-033	1.127e-034	-32.892	-33.948	-1.056	(0)
As (5)	7.427e-010					
HAsO4-2	7.031e-010	2.386e-010	-9.153	-9.622	-0.469	(0)
H2AsO4-	3.890e-011	2.969e-011	-10.410	-10.527	-0.117	(0)
AsO4-3	6.292e-013	5.530e-014	-12.201	-13.257	-1.056	(0)
H3AsO4	6.956e-017	7.041e-017	-16.158	-16.152	0.005	(0)
B	1.758e-005					
H3BO3	1.650e-005	1.670e-005	-4.783	-4.777	0.005	(0)
H2BO3-	8.920e-007	7.107e-007	-6.050	-6.148	-0.099	(0)
CaH2BO3+	1.405e-007	1.119e-007	-6.852	-6.951	-0.099	(0)
MgH2BO3+	4.425e-008	3.526e-008	-7.354	-7.453	-0.099	(0)
NaH2BO3	8.009e-009	8.009e-009	-8.096	-8.096	0.000	(0)
BF (OH) 3-	6.697e-010	5.336e-010	-9.174	-9.273	-0.099	(0)
H5 (BO3) 2-	1.268e-011	1.010e-011	-10.897	-10.996	-0.099	(0)

	BaH ₂ BO ₃ +	3.225e-013	2.570e-013	-12.491	-12.590	-0.099	(0)
	BF ₂ (OH) 2-	7.830e-014	6.238e-014	-13.106	-13.205	-0.099	(0)
	AgH ₂ BO ₃	2.259e-014	2.259e-014	-13.646	-13.646	0.000	(0)
	H ₈ (BO ₃) 3-	2.117e-014	1.687e-014	-13.674	-13.773	-0.099	(0)
	BF ₃ OH-	3.331e-020	2.654e-020	-19.477	-19.576	-0.099	(0)
	BF ₄ -	1.792e-025	1.428e-025	-24.747	-24.845	-0.099	(0)
Ba	2.620e-008						
	Ba+2	2.614e-008	1.170e-008	-7.583	-7.932	-0.349	(0)
	BaHCO ₃ +	4.738e-011	3.935e-011	-10.324	-10.405	-0.081	(0)
	BaCO ₃	7.260e-012	7.260e-012	-11.139	-11.139	0.000	(0)
	BaH ₂ BO ₃ +	3.225e-013	2.570e-013	-12.491	-12.590	-0.099	(0)
	BaOH+	4.582e-014	3.766e-014	-13.339	-13.424	-0.085	(0)
	BaNO ₃ +	1.190e-015	9.081e-016	-14.925	-15.042	-0.117	(0)
	BaNH ₃ +2	2.072e-016	7.031e-017	-15.684	-16.153	-0.469	(0)
C (4)	4.777e-004						
	HCO ₃ -	4.266e-004	3.521e-004	-3.370	-3.453	-0.083	(0)
	CaHCO ₃ +	2.161e-005	1.795e-005	-4.665	-4.746	-0.081	(0)
	H ₂ CO ₃	1.081e-005	1.081e-005	-4.966	-4.966	0.000	(0)
	MgHCO ₃ +	6.344e-006	5.156e-006	-5.198	-5.288	-0.090	(0)
	CaCO ₃	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CO ₃ -2	2.703e-006	1.210e-006	-5.568	-5.917	-0.349	(0)
	MgCO ₃	1.440e-006	1.440e-006	-5.842	-5.842	0.000	(0)
	NaHCO ₃	1.408e-006	1.408e-006	-5.851	-5.851	0.000	(0)
	MnHCO ₃ +	3.326e-007	2.734e-007	-6.478	-6.563	-0.085	(0)
	CuCO ₃	2.595e-007	2.595e-007	-6.586	-6.586	0.000	(0)
	NaCO ₃ -	1.941e-007	1.602e-007	-6.712	-6.795	-0.083	(0)
	UO ₂ (CO ₃) 3-4	1.261e-007	1.672e-009	-6.899	-8.777	-1.877	(0)
	ZnCO ₃	1.225e-007	1.225e-007	-6.912	-6.912	0.000	(0)
	UO ₂ (CO ₃) 2-2	8.124e-008	2.757e-008	-7.090	-7.560	-0.469	(0)
	ZnHCO ₃ +	2.568e-008	1.960e-008	-7.590	-7.708	-0.117	(0)
	NiHCO ₃ +	3.816e-009	2.912e-009	-8.418	-8.536	-0.117	(0)
	NiCO ₃	3.028e-009	3.028e-009	-8.519	-8.519	0.000	(0)
	PbCO ₃	2.695e-009	2.695e-009	-8.570	-8.570	0.000	(0)
	Cu (CO ₃) 2-2	2.490e-009	8.451e-010	-8.604	-9.073	-0.469	(0)
	CoHCO ₃ +	1.774e-009	1.354e-009	-8.751	-8.868	-0.117	(0)
	UO ₂ CO ₃	1.142e-009	1.142e-009	-8.942	-8.942	0.000	(0)
	CuHCO ₃ +	1.060e-009	8.094e-010	-8.975	-9.092	-0.117	(0)
	CoCO ₃	1.011e-009	1.011e-009	-8.995	-8.995	0.000	(0)
	CdCO ₃	3.825e-010	3.825e-010	-9.417	-9.417	0.000	(0)
	PbHCO ₃ +	2.540e-010	1.938e-010	-9.595	-9.713	-0.117	(0)
	BaHCO ₃ +	4.738e-011	3.935e-011	-10.324	-10.405	-0.081	(0)
	Pb (CO ₃) 2-2	2.771e-011	9.402e-012	-10.557	-11.027	-0.469	(0)
	CdHCO ₃ +	1.457e-011	1.112e-011	-10.837	-10.954	-0.117	(0)
	BaCO ₃	7.260e-012	7.260e-012	-11.139	-11.139	0.000	(0)
	Cd (CO ₃) 2-2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
	FeHCO ₃ +	2.811e-015	2.334e-015	-14.551	-14.632	-0.081	(0)
	HgCO ₃	2.729e-016	2.729e-016	-15.564	-15.564	0.000	(0)
	Hg (CO ₃) 2-2	3.076e-018	1.044e-018	-17.512	-17.981	-0.469	(0)
	HgHCO ₃ +	9.084e-020	6.933e-020	-19.042	-19.159	-0.117	(0)
Ca	9.994e-003						
	Ca+2	6.116e-003	2.737e-003	-2.214	-2.563	-0.349	(0)
	CaSO ₄	3.848e-003	3.848e-003	-2.415	-2.415	0.000	(0)
	CaHCO ₃ +	2.161e-005	1.795e-005	-4.665	-4.746	-0.081	(0)
	CaCO ₃	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CaF+	2.911e-006	2.392e-006	-5.536	-5.621	-0.085	(0)
	CaH ₂ BO ₃ +	1.405e-007	1.119e-007	-6.852	-6.951	-0.099	(0)
	CaOH+	4.850e-008	4.027e-008	-7.314	-7.395	-0.081	(0)
	CaNO ₃ +	1.756e-010	1.340e-010	-9.755	-9.873	-0.117	(0)
	CaNH ₃ +2	9.670e-011	3.282e-011	-10.015	-10.484	-0.469	(0)
	Ca (NH ₃) 2+2	3.666e-019	1.244e-019	-18.436	-18.905	-0.469	(0)
Cd	5.841e-008						
	Cd+2	3.099e-008	1.387e-008	-7.509	-7.858	-0.349	(0)
	CdSO ₄	1.996e-008	1.996e-008	-7.700	-7.700	0.000	(0)
	Cd (SO ₄) 2-2	4.869e-009	1.652e-009	-8.313	-8.782	-0.469	(0)
	CdCl+	2.004e-009	1.530e-009	-8.698	-8.815	-0.117	(0)
	CdCO ₃	3.825e-010	3.825e-010	-9.417	-9.417	0.000	(0)
	CdOH+	1.065e-010	8.125e-011	-9.973	-10.090	-0.117	(0)
	CdOHC1	4.627e-011	4.627e-011	-10.335	-10.335	0.000	(0)

CdF+	2.307e-011	1.761e-011	-10.637	-10.754	-0.117	(0)
CdHCO3+	1.457e-011	1.112e-011	-10.837	-10.954	-0.117	(0)
CdCl2	7.362e-012	7.362e-012	-11.133	-11.133	0.000	(0)
Cd(CO3) 2-2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
Cd(OH) 2	3.780e-013	3.780e-013	-12.422	-12.422	0.000	(0)
CdCl3-	7.027e-015	5.363e-015	-14.153	-14.271	-0.117	(0)
CdF2	2.813e-015	2.813e-015	-14.551	-14.551	0.000	(0)
CdNO3+	8.900e-016	6.793e-016	-15.051	-15.168	-0.117	(0)
CdSeO4	1.314e-016	1.314e-016	-15.881	-15.881	0.000	(0)
Cd2OH+3	6.427e-017	5.648e-018	-16.192	-17.248	-1.056	(0)
Cd(OH) 3-	2.231e-017	1.703e-017	-16.651	-16.769	-0.117	(0)
Cd(SeO3) 2-2	4.646e-018	1.577e-018	-17.333	-17.802	-0.469	(0)
Cd(OH) 4-2	6.058e-024	2.056e-024	-23.218	-23.687	-0.469	(0)
Cd(NO3) 2	5.272e-024	5.272e-024	-23.278	-23.278	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.328	-78.446	-0.117	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-149.838	-149.838	0.000	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-226.416	-226.533	-0.117	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-302.464	-302.933	-0.469	(0)
Cl	1.412e-003					
Cl-	1.412e-003	1.155e-003	-2.850	-2.938	-0.087	(0)
MnCl+	6.882e-008	5.657e-008	-7.162	-7.247	-0.085	(0)
ZnCl+	6.281e-009	5.104e-009	-8.202	-8.292	-0.090	(0)
ZnOHCl	4.927e-009	4.927e-009	-8.307	-8.307	0.000	(0)
AgCl	4.727e-009	4.727e-009	-8.325	-8.325	0.000	(0)
CdCl+	2.004e-009	1.530e-009	-8.698	-8.815	-0.117	(0)
AgCl2-	6.228e-010	4.754e-010	-9.206	-9.323	-0.117	(0)
CuCl	3.209e-010	3.209e-010	-9.494	-9.494	0.000	(0)
NiCl+	2.597e-010	1.982e-010	-9.586	-9.703	-0.117	(0)
CoCl+	2.586e-010	1.974e-010	-9.587	-9.705	-0.117	(0)
CuCl2-	9.527e-011	7.742e-011	-10.021	-10.111	-0.090	(0)
MnCl2	9.226e-011	9.226e-011	-10.035	-10.035	0.000	(0)
CuCl+	8.203e-011	6.666e-011	-10.086	-10.176	-0.090	(0)
CdOHCl	4.627e-011	4.627e-011	-10.335	-10.335	0.000	(0)
PbCl+	3.977e-011	3.035e-011	-10.400	-10.518	-0.117	(0)
ZnCl2	9.340e-012	9.340e-012	-11.030	-11.030	0.000	(0)
CdCl2	7.362e-012	7.362e-012	-11.133	-11.133	0.000	(0)
AgCl3-2	1.442e-012	4.892e-013	-11.841	-12.311	-0.469	(0)
HgClOH	2.834e-013	2.834e-013	-12.548	-12.548	0.000	(0)
PbCl2	1.565e-013	1.565e-013	-12.805	-12.805	0.000	(0)
CuCl3-2	4.187e-014	1.911e-014	-13.378	-13.719	-0.341	(0)
MnCl3-	3.569e-014	2.934e-014	-13.447	-13.533	-0.085	(0)
CuCl2	2.669e-014	2.669e-014	-13.574	-13.574	0.000	(0)
HgCl2	2.512e-014	2.512e-014	-13.600	-13.600	0.000	(0)
AgCl4-3	1.312e-014	1.153e-015	-13.882	-14.938	-1.056	(0)
ZnCl3-	1.054e-014	8.566e-015	-13.977	-14.067	-0.090	(0)
CdCl3-	7.027e-015	5.363e-015	-14.153	-14.271	-0.117	(0)
NiCl2	1.152e-015	1.152e-015	-14.938	-14.938	0.000	(0)
UO2Cl+	5.817e-016	4.440e-016	-15.235	-15.353	-0.117	(0)
HgCl3-	3.801e-016	2.901e-016	-15.420	-15.537	-0.117	(0)
PbCl3-	9.428e-017	7.196e-017	-16.026	-16.143	-0.117	(0)
ZnCl4-2	1.084e-017	4.946e-018	-16.965	-17.306	-0.341	(0)
HgCl+	5.688e-018	4.342e-018	-17.245	-17.362	-0.117	(0)
HgCl4-2	3.930e-018	1.333e-018	-17.406	-17.875	-0.469	(0)
CrCl+2	2.749e-018	9.329e-019	-17.561	-18.030	-0.469	(0)
CuCl3-	3.539e-019	2.876e-019	-18.451	-18.541	-0.090	(0)
PbCl4-2	1.119e-019	3.798e-020	-18.951	-19.420	-0.469	(0)
CrOHCl2	1.510e-020	1.510e-020	-19.821	-19.821	0.000	(0)
FeCl+2	3.020e-022	1.378e-022	-21.520	-21.861	-0.341	(0)
CrCl2+	1.339e-022	1.022e-022	-21.873	-21.991	-0.117	(0)
VOCl+	1.093e-022	8.340e-023	-21.961	-22.079	-0.117	(0)
CuCl4-2	3.646e-024	1.664e-024	-23.438	-23.779	-0.341	(0)
FeCl2+	8.648e-025	7.108e-025	-24.063	-24.148	-0.085	(0)
CrO3Cl-	1.781e-026	1.359e-026	-25.749	-25.867	-0.117	(0)
FeCl3	8.207e-029	8.207e-029	-28.086	-28.086	0.000	(0)
CoCl+2	1.101e-035	3.735e-036	-34.958	-35.428	-0.469	(0)
UCl+3	0.000e+000	0.000e+000	-44.865	-45.921	-1.056	(0)
Co(NH3) 5Cl+2	0.000e+000	0.000e+000	-49.111	-49.581	-0.469	(0)
Cr(NH3) 6Cl+2	0.000e+000	0.000e+000	-51.698	-52.167	-0.469	(0)

Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-63.848	-64.317	-0.469	(0)
Co (2)	2.104e-007					
Co+2	1.456e-007	4.942e-008	-6.837	-7.306	-0.469	(0)
CoSO4	6.052e-008	6.052e-008	-7.218	-7.218	0.000	(0)
CoHCO3+	1.774e-009	1.354e-009	-8.751	-8.868	-0.117	(0)
CoCO3	1.011e-009	1.011e-009	-8.995	-8.995	0.000	(0)
CoOH+	9.527e-010	7.271e-010	-9.021	-9.138	-0.117	(0)
CoCl+	2.586e-010	1.974e-010	-9.587	-9.705	-0.117	(0)
CoF+	1.640e-010	1.252e-010	-9.785	-9.903	-0.117	(0)
Co (OH) 2	4.259e-011	4.259e-011	-10.371	-10.371	0.000	(0)
CoNO2+	7.490e-012	5.716e-012	-11.126	-11.243	-0.117	(0)
Co (NH3) +2	1.667e-013	5.658e-014	-12.778	-13.247	-0.469	(0)
CoNO3+	1.589e-015	1.213e-015	-14.799	-14.916	-0.117	(0)
CoSeO4	1.260e-015	1.260e-015	-14.900	-14.900	0.000	(0)
Co (OH) 3-	8.210e-016	6.267e-016	-15.086	-15.203	-0.117	(0)
CoOOH-	2.061e-016	1.573e-016	-15.686	-15.803	-0.117	(0)
Co2OH+3	2.049e-017	1.801e-018	-16.688	-17.745	-1.056	(0)
Co (NH3) 2+2	6.774e-020	2.299e-020	-19.169	-19.638	-0.469	(0)
Co (OH) 4-2	2.158e-022	7.324e-023	-21.666	-22.135	-0.469	(0)
Co (NO3) 2	3.822e-023	3.822e-023	-22.418	-22.418	0.000	(0)
Co (NH3) 3+2	8.122e-027	2.756e-027	-26.090	-26.560	-0.469	(0)
Co4 (OH) 4+4	4.206e-027	5.577e-029	-26.376	-28.254	-1.877	(0)
Co (NH3) 4+2	4.060e-034	1.378e-034	-33.392	-33.861	-0.469	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-41.193	-41.662	-0.469	(0)
Co (3)	1.756e-028					
CoOH+2	1.756e-028	5.958e-029	-27.756	-28.225	-0.469	(0)
Co+3	9.705e-035	1.590e-035	-34.013	-34.799	-0.786	(0)
CoCl+2	1.101e-035	3.735e-036	-34.958	-35.428	-0.469	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-49.111	-49.581	-0.469	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-58.549	-58.666	-0.117	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-62.843	-63.312	-0.469	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-63.848	-64.317	-0.469	(0)
Cr (2)	5.438e-027					
Cr+2	5.438e-027	1.846e-027	-26.265	-26.734	-0.469	(0)
Cr (3)	1.500e-009					
Cr (OH) 2+	1.184e-009	9.037e-010	-8.927	-9.044	-0.117	(0)
Cr (OH) 3	2.503e-010	2.503e-010	-9.601	-9.601	0.000	(0)
Cr (OH) +2	2.968e-011	1.007e-011	-10.528	-10.997	-0.469	(0)
CrOHSO4	1.467e-011	1.467e-011	-10.834	-10.834	0.000	(0)
CrO2-	1.142e-011	8.719e-012	-10.942	-11.060	-0.117	(0)
Cr (OH) 4-	9.629e-012	7.349e-012	-11.016	-11.134	-0.117	(0)
CrF+2	2.335e-014	7.924e-015	-13.632	-14.101	-0.469	(0)
CrSO4+	1.172e-014	8.948e-015	-13.931	-14.048	-0.117	(0)
Cr+3	7.103e-015	6.243e-016	-14.149	-15.205	-1.056	(0)
CrCl+2	2.749e-018	9.329e-019	-17.561	-18.030	-0.469	(0)
Cr2 (OH) 2SO4+2	3.935e-020	1.335e-020	-19.405	-19.874	-0.469	(0)
CrOHC12	1.510e-020	1.510e-020	-19.821	-19.821	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.869e-021	4.869e-021	-20.313	-20.313	0.000	(0)
CrCl2+	1.339e-022	1.022e-022	-21.873	-21.991	-0.117	(0)
CrNO3+2	1.245e-024	4.226e-025	-23.905	-24.374	-0.469	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-40.601	-41.071	-0.469	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-49.276	-50.332	-1.056	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-51.698	-52.167	-0.469	(0)
Cr (6)	7.287e-015					
CrO4-2	6.937e-015	3.104e-015	-14.159	-14.508	-0.349	(0)
HCrO4-	1.796e-016	1.371e-016	-15.746	-15.863	-0.117	(0)
NaCrO4-	1.437e-016	1.097e-016	-15.842	-15.960	-0.117	(0)
KCrO4-	2.691e-017	2.054e-017	-16.570	-16.687	-0.117	(0)
CrO3SO4-2	1.031e-023	3.499e-024	-22.987	-23.456	-0.469	(0)
H2CrO4	1.516e-024	1.516e-024	-23.819	-23.819	0.000	(0)
CrO3Cl-	1.781e-026	1.359e-026	-25.749	-25.867	-0.117	(0)
Cr2O7-2	1.921e-030	6.520e-031	-29.716	-30.186	-0.469	(0)
Cu (1)	7.055e-010					
CuCl	3.209e-010	3.209e-010	-9.494	-9.494	0.000	(0)
Cu+	2.893e-010	2.208e-010	-9.539	-9.656	-0.117	(0)
CuCl2-	9.527e-011	7.742e-011	-10.021	-10.111	-0.090	(0)
CuCl3-2	4.187e-014	1.911e-014	-13.378	-13.719	-0.341	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.342	-147.728	-0.386	(0)

CuS4S5-3	0.000e+000	0.000e+000	-148.092	-148.458	-0.365	(0)
Cu (2)	5.142e-007					
CuCO3	2.595e-007	2.595e-007	-6.586	-6.586	0.000	(0)
CuOH+	1.045e-007	8.495e-008	-6.981	-7.071	-0.090	(0)
Cu+2	8.140e-008	3.643e-008	-7.089	-7.439	-0.349	(0)
CuSO4	5.122e-008	5.122e-008	-7.291	-7.291	0.000	(0)
Cu (OH) 2	1.250e-008	1.250e-008	-7.903	-7.903	0.000	(0)
Cu (CO3) 2-2	2.490e-009	8.451e-010	-8.604	-9.073	-0.469	(0)
CuHCO3+	1.060e-009	8.094e-010	-8.975	-9.092	-0.117	(0)
Cu2 (OH) 2+2	5.341e-010	1.813e-010	-9.272	-9.742	-0.469	(0)
CuF+	2.412e-010	1.841e-010	-9.618	-9.735	-0.117	(0)
CuNO2+	8.204e-011	6.261e-011	-10.086	-10.203	-0.117	(0)
CuCl+	8.203e-011	6.666e-011	-10.086	-10.176	-0.090	(0)
Cu (OH) 3-	2.477e-011	1.890e-011	-10.606	-10.723	-0.117	(0)
CuNH3+2	1.046e-011	3.550e-012	-10.980	-11.450	-0.469	(0)
CuCl2	2.669e-014	2.669e-014	-13.574	-13.574	0.000	(0)
Cu (NO2) 2	1.052e-014	1.052e-014	-13.978	-13.978	0.000	(0)
CuNO3+	2.337e-015	1.784e-015	-14.631	-14.749	-0.117	(0)
Cu (OH) 4-2	3.233e-016	1.097e-016	-15.490	-15.960	-0.469	(0)
CuCl3-	3.539e-019	2.876e-019	-18.451	-18.541	-0.090	(0)
CuCl4-2	3.646e-024	1.664e-024	-23.438	-23.779	-0.341	(0)
Cu (NO3) 2	3.478e-024	3.478e-024	-23.459	-23.459	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-217.210	-217.327	-0.117	(0)
F	1.171e-004					
F-	9.791e-005	8.008e-005	-4.009	-4.096	-0.087	(0)
MgF+	1.573e-005	1.286e-005	-4.803	-4.891	-0.088	(0)
CaF+	2.911e-006	2.392e-006	-5.536	-5.621	-0.085	(0)
NaF	3.593e-007	3.593e-007	-6.445	-6.445	0.000	(0)
MnF+	1.509e-007	1.241e-007	-6.821	-6.906	-0.085	(0)
ZnF+	3.684e-009	2.812e-009	-8.434	-8.551	-0.117	(0)
HF	1.616e-009	1.616e-009	-8.791	-8.791	0.000	(0)
BF (OH) 3-	6.697e-010	5.336e-010	-9.174	-9.273	-0.099	(0)
CuF+	2.412e-010	1.841e-010	-9.618	-9.735	-0.117	(0)
NiF+	1.768e-010	1.349e-010	-9.752	-9.870	-0.117	(0)
CoF+	1.640e-010	1.252e-010	-9.785	-9.903	-0.117	(0)
CdF+	2.307e-011	1.761e-011	-10.637	-10.754	-0.117	(0)
AlF2+	8.276e-012	6.831e-012	-11.082	-11.165	-0.083	(0)
AlF3	6.888e-012	6.888e-012	-11.162	-11.162	0.000	(0)
PbF+	5.478e-012	4.181e-012	-11.261	-11.379	-0.117	(0)
UO2F+	3.434e-012	2.621e-012	-11.464	-11.582	-0.117	(0)
HF2-	6.094e-013	4.921e-013	-12.215	-12.308	-0.093	(0)
UO2F2	6.054e-013	6.054e-013	-12.218	-12.218	0.000	(0)
AlF+2	4.616e-013	2.143e-013	-12.336	-12.669	-0.333	(0)
AgF	4.034e-013	4.034e-013	-12.394	-12.394	0.000	(0)
AlF4-	3.382e-013	2.764e-013	-12.471	-12.558	-0.088	(0)
BF2 (OH) 2-	7.830e-014	6.238e-014	-13.106	-13.205	-0.099	(0)
CrF+2	2.335e-014	7.924e-015	-13.632	-14.101	-0.469	(0)
UO2F3-	1.596e-014	1.218e-014	-13.797	-13.914	-0.117	(0)
PbF2	6.589e-015	6.589e-015	-14.181	-14.181	0.000	(0)
CdF2	2.813e-015	2.813e-015	-14.551	-14.551	0.000	(0)
UO2F4-2	2.283e-017	7.747e-018	-16.642	-17.111	-0.469	(0)
VO2F	1.961e-017	1.961e-017	-16.707	-16.707	0.000	(0)
H2F2	6.999e-018	6.999e-018	-17.155	-17.155	0.000	(0)
PbF3-	1.311e-018	1.001e-018	-17.882	-18.000	-0.117	(0)
FeF2+	9.049e-019	7.438e-019	-18.043	-18.129	-0.085	(0)
FeF+2	7.604e-019	3.471e-019	-18.119	-18.460	-0.341	(0)
VO2F2-	7.471e-019	5.702e-019	-18.127	-18.244	-0.117	(0)
FeF3	8.405e-020	8.405e-020	-19.075	-19.075	0.000	(0)
BF3OH-	3.331e-020	2.654e-020	-19.477	-19.576	-0.099	(0)
VOF+	1.620e-020	1.237e-020	-19.790	-19.908	-0.117	(0)
VO2F3-2	1.679e-021	5.696e-022	-20.775	-21.244	-0.469	(0)
VOF2	3.714e-022	3.714e-022	-21.430	-21.430	0.000	(0)
PbF4-2	1.131e-022	3.837e-023	-21.947	-22.416	-0.469	(0)
VOF3-	1.383e-024	1.055e-024	-23.859	-23.977	-0.117	(0)
HgF+	7.330e-025	5.595e-025	-24.135	-24.252	-0.117	(0)
Sb (OH) 2F	2.987e-025	2.987e-025	-24.525	-24.525	0.000	(0)
SbOF	2.939e-025	2.939e-025	-24.532	-24.532	0.000	(0)
VO2F4-3	2.554e-025	2.245e-026	-24.593	-25.649	-1.056	(0)

BF4-	1.792e-025	1.428e-025	-24.747	-24.845	-0.099	(0)
VOF4-2	1.005e-027	3.411e-028	-26.998	-27.467	-0.469	(0)
UF3+	5.553e-036	4.238e-036	-35.256	-35.373	-0.117	(0)
UF2+2	9.839e-037	3.339e-037	-36.007	-36.476	-0.469	(0)
UF4	3.721e-038	3.721e-038	-37.429	-37.429	0.000	(0)
UF+3	3.768e-039	3.312e-040	-38.424	-39.480	-1.056	(0)
UF5-	1.547e-040	1.181e-040	-39.810	-39.928	-0.117	(0)
UF6-2	0.000e+000	0.000e+000	-41.075	-41.544	-0.469	(0)
Fe (2)	2.366e-012					
Fe+2	1.551e-012	5.265e-013	-11.809	-12.279	-0.469	(0)
FeSO4	7.932e-013	7.932e-013	-12.101	-12.101	0.000	(0)
FeOH+	1.880e-014	1.546e-014	-13.726	-13.811	-0.085	(0)
FeHCO3+	2.811e-015	2.334e-015	-14.551	-14.632	-0.081	(0)
Fe (OH) 2	9.053e-018	9.053e-018	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	2.568e-018	2.111e-018	-17.590	-17.675	-0.085	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.520	-160.520	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.962	-237.079	-0.117	(0)
Fe (3)	1.117e-009					
Fe (OH) 2+	6.541e-010	5.399e-010	-9.184	-9.268	-0.083	(0)
Fe (OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.557e-011	2.936e-011	-10.449	-10.532	-0.083	(0)
FeOH+2	4.123e-015	1.882e-015	-14.385	-14.725	-0.341	(0)
FeF2+	9.049e-019	7.438e-019	-18.043	-18.129	-0.085	(0)
FeF+2	7.604e-019	3.471e-019	-18.119	-18.460	-0.341	(0)
FeSO4+	3.312e-019	2.722e-019	-18.480	-18.565	-0.085	(0)
FeF3	8.405e-020	8.405e-020	-19.075	-19.075	0.000	(0)
Fe (SO4) 2-	4.680e-020	3.572e-020	-19.330	-19.447	-0.117	(0)
Fe+3	2.413e-020	3.952e-021	-19.617	-20.403	-0.786	(0)
FeCl+2	3.020e-022	1.378e-022	-21.520	-21.861	-0.341	(0)
FeHSeO3+2	1.239e-024	4.204e-025	-23.907	-24.376	-0.469	(0)
FeCl2+	8.648e-025	7.108e-025	-24.063	-24.148	-0.085	(0)
Fe2 (OH) 2+4	8.842e-027	1.173e-028	-26.053	-27.931	-1.877	(0)
FeNO3+2	1.804e-027	6.121e-028	-26.744	-27.213	-0.469	(0)
FeCl3	8.207e-029	8.207e-029	-28.086	-28.086	0.000	(0)
Fe3 (OH) 4+5	7.851e-034	9.150e-037	-33.105	-36.039	-2.933	(0)
H (0)	3.988e-029					
H2	1.994e-029	2.018e-029	-28.700	-28.695	0.005	(0)
Hg (0)	2.663e-010					
Hg	2.663e-010	2.663e-010	-9.575	-9.575	0.000	(0)
Hg (1)	2.008e-022					
Hg2+2	1.004e-022	3.408e-023	-21.998	-22.468	-0.469	(0)
Hg (2)	9.479e-013					
Hg (OH) 2	6.388e-013	6.466e-013	-12.195	-12.189	0.005	(0)
HgClOH	2.834e-013	2.834e-013	-12.548	-12.548	0.000	(0)
HgCl2	2.512e-014	2.512e-014	-13.600	-13.600	0.000	(0)
HgCl3-	3.801e-016	2.901e-016	-15.420	-15.537	-0.117	(0)
HgCO3	2.729e-016	2.729e-016	-15.564	-15.564	0.000	(0)
HgOH+	7.249e-018	5.533e-018	-17.140	-17.257	-0.117	(0)
HgCl+	5.688e-018	4.342e-018	-17.245	-17.362	-0.117	(0)
HgCl4-2	3.930e-018	1.333e-018	-17.406	-17.875	-0.469	(0)
Hg (CO3) 2-2	3.076e-018	1.044e-018	-17.512	-17.981	-0.469	(0)
HgHCO3+	9.084e-020	6.933e-020	-19.042	-19.159	-0.117	(0)
Hg (OH) 3-	7.865e-020	6.003e-020	-19.104	-19.222	-0.117	(0)
Hg (NH3) 2+2	3.178e-020	1.079e-020	-19.498	-19.967	-0.469	(0)
HgNH3+2	3.337e-021	1.132e-021	-20.477	-20.946	-0.469	(0)
Hg+2	5.554e-022	1.885e-022	-21.255	-21.725	-0.469	(0)
HgSO4	3.028e-022	3.028e-022	-21.519	-21.519	0.000	(0)
HgF+	7.330e-025	5.595e-025	-24.135	-24.252	-0.117	(0)
Hg (NH3) 3+2	1.205e-027	4.089e-028	-26.919	-27.388	-0.469	(0)
HgNO3+	1.412e-030	1.078e-030	-29.850	-29.968	-0.117	(0)
Hg (NH3) 4+2	9.116e-035	3.094e-035	-34.040	-34.510	-0.469	(0)
Hg (NO3) 2	6.936e-039	6.936e-039	-38.159	-38.159	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-139.006	-139.123	-0.117	(0)
HgS2-2	0.000e+000	0.000e+000	-139.497	-139.966	-0.469	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-140.594	-140.594	0.000	(0)
K	2.271e-003					
K+	2.177e-003	1.781e-003	-2.662	-2.749	-0.087	(0)
KSO4-	9.375e-005	7.738e-005	-4.028	-4.111	-0.083	(0)

KCrO4-	2.691e-017	2.054e-017	-16.570	-16.687	-0.117	(0)
Mg	4.819e-003					
Mg+2	3.197e-003	1.431e-003	-2.495	-2.844	-0.349	(0)
MgSO4	1.598e-003	1.598e-003	-2.796	-2.796	0.000	(0)
MgF+	1.573e-005	1.286e-005	-4.803	-4.891	-0.088	(0)
MgHCO3+	6.344e-006	5.156e-006	-5.198	-5.288	-0.090	(0)
MgCO3	1.440e-006	1.440e-006	-5.842	-5.842	0.000	(0)
MgOH+	5.035e-007	4.200e-007	-6.298	-6.377	-0.079	(0)
MgH2BO3+	4.425e-008	3.526e-008	-7.354	-7.453	-0.099	(0)
Mn (2)	1.578e-004					
Mn+2	1.147e-004	3.891e-005	-3.941	-4.410	-0.469	(0)
MnSO4	4.247e-005	4.247e-005	-4.372	-4.372	0.000	(0)
MnHCO3+	3.326e-007	2.734e-007	-6.478	-6.563	-0.085	(0)
MnF+	1.509e-007	1.241e-007	-6.821	-6.906	-0.085	(0)
MnOH+	8.770e-008	7.208e-008	-7.057	-7.142	-0.085	(0)
MnCl+	6.882e-008	5.657e-008	-7.162	-7.247	-0.085	(0)
MnCl2	9.226e-011	9.226e-011	-10.035	-10.035	0.000	(0)
MnNO3+	1.251e-012	9.551e-013	-11.903	-12.020	-0.117	(0)
MnSeO4	5.329e-013	5.329e-013	-12.273	-12.273	0.000	(0)
MnCl3-	3.569e-014	2.934e-014	-13.447	-13.533	-0.085	(0)
Mn (OH) 3-	2.947e-016	2.422e-016	-15.531	-15.616	-0.085	(0)
Mn (NO3) 2	3.715e-020	3.715e-020	-19.430	-19.430	0.000	(0)
Mn (OH) 4-2	1.264e-021	5.767e-022	-20.898	-21.239	-0.341	(0)
MnSe	0.000e+000	0.000e+000	-41.099	-41.099	0.000	(0)
Mn (3)	8.575e-025					
Mn+3	8.575e-025	1.405e-025	-24.067	-24.852	-0.786	(0)
Mn (6)	1.142e-040					
MnO4-2	1.142e-040	0.000e+000	-39.942	-40.283	-0.341	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-44.652	-44.748	-0.096	(0)
Mo	7.236e-007					
MoO4-2	7.235e-007	3.238e-007	-6.141	-6.490	-0.349	(0)
HMoO4-	1.152e-010	8.791e-011	-9.939	-10.056	-0.117	(0)
H2MoO4	8.786e-015	8.786e-015	-14.056	-14.056	0.000	(0)
Ag2MoO4	4.928e-025	4.928e-025	-24.307	-24.307	0.000	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-45.652	-46.708	-1.056	(0)
Mo7O24-6	0.000e+000	0.000e+000	-51.133	-55.357	-4.224	(0)
HMo7O24-5	0.000e+000	0.000e+000	-53.902	-56.835	-2.933	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-58.041	-59.918	-1.877	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-63.481	-64.537	-1.056	(0)
N (-3)	3.139e-007					
NH4+	2.861e-007	2.279e-007	-6.544	-6.642	-0.099	(0)
NH4SO4-	1.824e-008	1.499e-008	-7.739	-7.824	-0.085	(0)
NH3	9.524e-009	9.524e-009	-8.021	-8.021	0.000	(0)
CaNH3+2	9.670e-011	3.282e-011	-10.015	-10.484	-0.469	(0)
CuNH3+2	1.046e-011	3.550e-012	-10.980	-11.450	-0.469	(0)
NiNH3+2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
Co (NH3) +2	1.667e-013	5.658e-014	-12.778	-13.247	-0.469	(0)
AgNH3+	5.108e-014	3.899e-014	-13.292	-13.409	-0.117	(0)
BaNH3+2	2.072e-016	7.031e-017	-15.684	-16.153	-0.469	(0)
Ag (NH3) 2+	3.955e-018	3.018e-018	-17.403	-17.520	-0.117	(0)
Ni (NH3) 2+2	1.392e-018	4.723e-019	-17.856	-18.326	-0.469	(0)
Ca (NH3) 2+2	3.666e-019	1.244e-019	-18.436	-18.905	-0.469	(0)
Co (NH3) 2+2	6.774e-020	2.299e-020	-19.169	-19.638	-0.469	(0)
Hg (NH3) 2+2	3.178e-020	1.079e-020	-19.498	-19.967	-0.469	(0)
HgNH3+2	3.337e-021	1.132e-021	-20.477	-20.946	-0.469	(0)
Co (NH3) 3+2	8.122e-027	2.756e-027	-26.090	-26.560	-0.469	(0)
Hg (NH3) 3+2	1.205e-027	4.089e-028	-26.919	-27.388	-0.469	(0)
Co (NH3) 4+2	4.060e-034	1.378e-034	-33.392	-33.861	-0.469	(0)
Hg (NH3) 4+2	9.116e-035	3.094e-035	-34.040	-34.510	-0.469	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-40.601	-41.071	-0.469	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-41.193	-41.662	-0.469	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-49.111	-49.581	-0.469	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-49.276	-50.332	-1.056	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-51.698	-52.167	-0.469	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-58.549	-58.666	-0.117	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-62.843	-63.312	-0.469	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-63.848	-64.317	-0.469	(0)

N (3)	2.046e-005					
NO2-	2.046e-005	1.642e-005	-4.689	-4.785	-0.096	(0)
CuNO2+	8.204e-011	6.261e-011	-10.086	-10.203	-0.117	(0)
CoNO2+	7.490e-012	5.716e-012	-11.126	-11.243	-0.117	(0)
AgNO2	6.877e-012	6.877e-012	-11.163	-11.163	0.000	(0)
Cu (NO2) 2	1.052e-014	1.052e-014	-13.978	-13.978	0.000	(0)
Ag (NO2) 2-	2.291e-016	1.748e-016	-15.640	-15.757	-0.117	(0)
N (5)	1.911e-008					
NO3-	1.893e-008	1.549e-008	-7.723	-7.810	-0.087	(0)
CaNO3+	1.756e-010	1.340e-010	-9.755	-9.873	-0.117	(0)
MnNO3+	1.251e-012	9.551e-013	-11.903	-12.020	-0.117	(0)
ZnNO3+	8.969e-014	6.846e-014	-13.047	-13.165	-0.117	(0)
NiNO3+	3.419e-015	2.609e-015	-14.466	-14.583	-0.117	(0)
CuNO3+	2.337e-015	1.784e-015	-14.631	-14.749	-0.117	(0)
CoNO3+	1.589e-015	1.213e-015	-14.799	-14.916	-0.117	(0)
BaNO3+	1.190e-015	9.081e-016	-14.925	-15.042	-0.117	(0)
CdNO3+	8.900e-016	6.793e-016	-15.051	-15.168	-0.117	(0)
PbNO3+	2.223e-016	1.697e-016	-15.653	-15.770	-0.117	(0)
AgNO3	2.467e-017	2.467e-017	-16.608	-16.608	0.000	(0)
Mn (NO3) 2	3.715e-020	3.715e-020	-19.430	-19.430	0.000	(0)
UO2NO3+	9.599e-021	7.326e-021	-20.018	-20.135	-0.117	(0)
Zn (NO3) 2	2.115e-022	2.115e-022	-21.675	-21.675	0.000	(0)
Co (NO3) 2	3.822e-023	3.822e-023	-22.418	-22.418	0.000	(0)
Cd (NO3) 2	5.272e-024	5.272e-024	-23.278	-23.278	0.000	(0)
Pb (NO3) 2	4.463e-024	4.463e-024	-23.350	-23.350	0.000	(0)
Cu (NO3) 2	3.478e-024	3.478e-024	-23.459	-23.459	0.000	(0)
CrNO3+2	1.245e-024	4.226e-025	-23.905	-24.374	-0.469	(0)
VO2NO3	1.094e-024	1.094e-024	-23.961	-23.961	0.000	(0)
FeNO3+2	1.804e-027	6.121e-028	-26.744	-27.213	-0.469	(0)
HgNO3+	1.412e-030	1.078e-030	-29.850	-29.968	-0.117	(0)
Hg (NO3) 2	6.936e-039	6.936e-039	-38.159	-38.159	0.000	(0)
Na	8.980e-003					
Na+	8.694e-003	7.111e-003	-2.061	-2.148	-0.087	(0)
NaSO4-	2.840e-004	2.344e-004	-3.547	-3.630	-0.083	(0)
NaHCO3	1.408e-006	1.408e-006	-5.851	-5.851	0.000	(0)
NaF	3.593e-007	3.593e-007	-6.445	-6.445	0.000	(0)
NaCO3-	1.941e-007	1.602e-007	-6.712	-6.795	-0.083	(0)
NaH2BO3	8.009e-009	8.009e-009	-8.096	-8.096	0.000	(0)
NaCrO4-	1.437e-016	1.097e-016	-15.842	-15.960	-0.117	(0)
Ni	2.402e-007					
Ni+2	1.499e-007	6.708e-008	-6.824	-7.173	-0.349	(0)
NiSO4	8.215e-008	8.215e-008	-7.085	-7.085	0.000	(0)
NiHCO3+	3.816e-009	2.912e-009	-8.418	-8.536	-0.117	(0)
NiCO3	3.028e-009	3.028e-009	-8.519	-8.519	0.000	(0)
NiOH+	8.160e-010	6.228e-010	-9.088	-9.206	-0.117	(0)
NiCl+	2.597e-010	1.982e-010	-9.586	-9.703	-0.117	(0)
NiF+	1.768e-010	1.349e-010	-9.752	-9.870	-0.117	(0)
Ni (SO4) 2-2	4.920e-011	1.670e-011	-10.308	-10.777	-0.469	(0)
Ni (OH) 2	3.648e-011	3.648e-011	-10.438	-10.438	0.000	(0)
NiNH3+2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
Ni (OH) 3-	3.524e-014	2.690e-014	-13.453	-13.570	-0.117	(0)
NiNO3+	3.419e-015	2.609e-015	-14.466	-14.583	-0.117	(0)
NiSeO4	1.596e-015	1.596e-015	-14.797	-14.797	0.000	(0)
NiCl2	1.152e-015	1.152e-015	-14.938	-14.938	0.000	(0)
Ni (NH3) 2+2	1.392e-018	4.723e-019	-17.856	-18.326	-0.469	(0)
O (0)	2.455e-035					
O2	1.228e-035	1.243e-035	-34.911	-34.906	0.005	(0)
Pb	8.977e-009					
PbCO3	2.695e-009	2.695e-009	-8.570	-8.570	0.000	(0)
PbSO4	2.227e-009	2.227e-009	-8.652	-8.652	0.000	(0)
PbOH+	1.798e-009	1.372e-009	-8.745	-8.863	-0.117	(0)
Pb+2	1.655e-009	7.409e-010	-8.781	-9.130	-0.349	(0)
PbHCO3+	2.540e-010	1.938e-010	-9.595	-9.713	-0.117	(0)
Pb (SO4) 2-2	2.427e-010	8.237e-011	-9.615	-10.084	-0.469	(0)
PbCl+	3.977e-011	3.035e-011	-10.400	-10.518	-0.117	(0)
Pb (OH) 2	3.200e-011	3.200e-011	-10.495	-10.495	0.000	(0)
Pb (CO3) 2-2	2.771e-011	9.402e-012	-10.557	-11.027	-0.469	(0)
PbF+	5.478e-012	4.181e-012	-11.261	-11.379	-0.117	(0)

PbCl2	1.565e-013	1.565e-013	-12.805	-12.805	0.000	(0)
Pb (OH) 3-	3.092e-014	2.360e-014	-13.510	-13.627	-0.117	(0)
PbF2	6.589e-015	6.589e-015	-14.181	-14.181	0.000	(0)
PbNO3+	2.223e-016	1.697e-016	-15.653	-15.770	-0.117	(0)
Pb2OH+3	1.833e-016	1.611e-017	-15.737	-16.793	-1.056	(0)
PbCl3-	9.428e-017	7.196e-017	-16.026	-16.143	-0.117	(0)
Pb (OH) 4-2	1.256e-017	4.262e-018	-16.901	-17.370	-0.469	(0)
PbF3-	1.311e-018	1.001e-018	-17.882	-18.000	-0.117	(0)
PbCl4-2	1.119e-019	3.798e-020	-18.951	-19.420	-0.469	(0)
Pb3 (OH) 4+2	4.461e-020	1.514e-020	-19.351	-19.820	-0.469	(0)
PbF4-2	1.131e-022	3.837e-023	-21.947	-22.416	-0.469	(0)
Pb4 (OH) 4+4	6.718e-024	8.909e-026	-23.173	-25.050	-1.877	(0)
Pb (NO3) 2	4.463e-024	4.463e-024	-23.350	-23.350	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.052	-151.052	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-228.230	-228.348	-0.117	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.479	-73.479	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.328	-78.446	-0.117	(0)
HS-	0.000e+000	0.000e+000	-78.478	-78.596	-0.117	(0)
H2S	0.000e+000	0.000e+000	-79.441	-79.441	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.627	-80.096	-0.469	(0)
S6-2	0.000e+000	0.000e+000	-80.142	-80.612	-0.469	(0)
S4-2	0.000e+000	0.000e+000	-80.222	-80.692	-0.469	(0)
S3-2	0.000e+000	0.000e+000	-81.028	-81.497	-0.469	(0)
S2-2	0.000e+000	0.000e+000	-82.044	-82.514	-0.469	(0)
S-2	0.000e+000	0.000e+000	-87.690	-88.031	-0.341	(0)
HgHS2-	0.000e+000	0.000e+000	-139.006	-139.123	-0.117	(0)
HgS2-2	0.000e+000	0.000e+000	-139.497	-139.966	-0.469	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-140.594	-140.594	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.342	-147.728	-0.386	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.373	-147.593	-0.220	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.858	-147.975	-0.117	(0)
CuS4S5-3	0.000e+000	0.000e+000	-148.092	-148.458	-0.365	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-148.154	-148.271	-0.117	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.772	-149.168	-0.397	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.104	-149.479	-0.375	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.838	-149.838	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-150.126	-150.126	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.052	-151.052	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.520	-160.520	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-217.210	-217.327	-0.117	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-225.325	-225.442	-0.117	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-226.416	-226.533	-0.117	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-227.088	-227.557	-0.469	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-228.230	-228.348	-0.117	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.962	-237.079	-0.117	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-302.464	-302.933	-0.469	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-305.028	-305.498	-0.469	(0)
Sb2S4-2	0.000e+000	0.000e+000	-317.768	-318.237	-0.469	(0)
S (6)	1.958e-002					
SO4-2	1.371e-002	6.138e-003	-1.863	-2.212	-0.349	(0)
CaSO4	3.848e-003	3.848e-003	-2.415	-2.415	0.000	(0)
MgSO4	1.598e-003	1.598e-003	-2.796	-2.796	0.000	(0)
NaSO4-	2.840e-004	2.344e-004	-3.547	-3.630	-0.083	(0)
KSO4-	9.375e-005	7.738e-005	-4.028	-4.111	-0.083	(0)
MnSO4	4.247e-005	4.247e-005	-4.372	-4.372	0.000	(0)
ZnSO4	2.363e-006	2.363e-006	-5.627	-5.627	0.000	(0)
Zn (SO4) 2-2	3.723e-007	1.263e-007	-6.429	-6.899	-0.469	(0)
NiSO4	8.215e-008	8.215e-008	-7.085	-7.085	0.000	(0)
CoSO4	6.052e-008	6.052e-008	-7.218	-7.218	0.000	(0)
CuSO4	5.122e-008	5.122e-008	-7.291	-7.291	0.000	(0)
CdSO4	1.996e-008	1.996e-008	-7.700	-7.700	0.000	(0)
NH4SO4-	1.824e-008	1.499e-008	-7.739	-7.824	-0.085	(0)
HSO4-	1.001e-008	8.184e-009	-7.999	-8.087	-0.088	(0)
Cd (SO4) 2-2	4.869e-009	1.652e-009	-8.313	-8.782	-0.469	(0)
PbSO4	2.227e-009	2.227e-009	-8.652	-8.652	0.000	(0)
AgSO4-	3.217e-010	2.456e-010	-9.493	-9.610	-0.117	(0)
Pb (SO4) 2-2	2.427e-010	8.237e-011	-9.615	-10.084	-0.469	(0)

Ni (SO4) 2-2	4.920e-011	1.670e-011	-10.308	-10.777	-0.469	(0)
CrOHSO4	1.467e-011	1.467e-011	-10.834	-10.834	0.000	(0)
UO2SO4	2.203e-012	2.203e-012	-11.657	-11.657	0.000	(0)
FeSO4	7.932e-013	7.932e-013	-12.101	-12.101	0.000	(0)
UO2 (SO4) 2-2	5.252e-013	1.782e-013	-12.280	-12.749	-0.469	(0)
AlSO4+	1.559e-014	1.275e-014	-13.807	-13.895	-0.088	(0)
CrSO4+	1.172e-014	8.948e-015	-13.931	-14.048	-0.117	(0)
Al (SO4) 2-	1.026e-015	8.384e-016	-14.989	-15.077	-0.088	(0)
VO2SO4-	2.681e-017	2.046e-017	-16.572	-16.689	-0.117	(0)
FeSO4+	3.312e-019	2.722e-019	-18.480	-18.565	-0.085	(0)
Fe (SO4) 2-	4.680e-020	3.572e-020	-19.330	-19.447	-0.117	(0)
VOSO4	4.353e-020	4.353e-020	-19.361	-19.361	0.000	(0)
Cr2 (OH) 2SO4+2	3.935e-020	1.335e-020	-19.405	-19.874	-0.469	(0)
Cr2 (OH) 2 (SO4) 2	4.869e-021	4.869e-021	-20.313	-20.313	0.000	(0)
HgSO4	3.028e-022	3.028e-022	-21.519	-21.519	0.000	(0)
CrO3SO4-2	1.031e-023	3.499e-024	-22.987	-23.456	-0.469	(0)
VSO4+	1.119e-034	8.541e-035	-33.951	-34.068	-0.117	(0)
U (SO4) 2	2.469e-039	2.469e-039	-38.607	-38.607	0.000	(0)
USO4+2	1.492e-040	0.000e+000	-39.826	-40.295	-0.469	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-58.549	-58.666	-0.117	(0)
Sb (3)	3.457e-019					
Sb (OH) 3	1.749e-019	1.749e-019	-18.757	-18.757	0.000	(0)
HSbO2	1.708e-019	1.708e-019	-18.767	-18.767	0.000	(0)
SbO2-	2.656e-023	2.027e-023	-22.576	-22.693	-0.117	(0)
Sb (OH) 4-	1.520e-023	1.160e-023	-22.818	-22.935	-0.117	(0)
Sb (OH) 2F	2.987e-025	2.987e-025	-24.525	-24.525	0.000	(0)
SbOF	2.939e-025	2.939e-025	-24.532	-24.532	0.000	(0)
Sb (OH) 2+	7.597e-026	5.798e-026	-25.119	-25.237	-0.117	(0)
SbO+	2.621e-026	2.000e-026	-25.582	-25.699	-0.117	(0)
Sb2S4-2	0.000e+000	0.000e+000	-317.768	-318.237	-0.469	(0)
Sb (5)	2.469e-007					
SbO3-	2.466e-007	1.882e-007	-6.608	-6.725	-0.117	(0)
Sb (OH) 6-	2.686e-010	2.197e-010	-9.571	-9.658	-0.087	(0)
SbO2+	1.318e-023	1.006e-023	-22.880	-22.997	-0.117	(0)
Se (-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	8.872e-040	6.772e-040	-39.052	-39.169	-0.117	(0)
MnSe	0.000e+000	0.000e+000	-41.099	-41.099	0.000	(0)
H2Se	0.000e+000	0.000e+000	-43.144	-43.144	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.835	-46.304	-0.469	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-82.073	-83.951	-1.877	(0)
Se (4)	8.735e-008					
HSeO3-	5.274e-008	4.025e-008	-7.278	-7.395	-0.117	(0)
SeO3-2	3.461e-008	1.174e-008	-7.461	-7.930	-0.469	(0)
H2SeO3	2.343e-013	2.343e-013	-12.630	-12.630	0.000	(0)
AgSeO3-	1.983e-014	1.513e-014	-13.703	-13.820	-0.117	(0)
Cd (SeO3) 2-2	4.646e-018	1.577e-018	-17.333	-17.802	-0.469	(0)
Ag (SeO3) 2-3	1.811e-020	1.591e-021	-19.742	-20.798	-1.056	(0)
FeHSeO3+2	1.239e-024	4.204e-025	-23.907	-24.376	-0.469	(0)
Se (6)	1.142e-010					
SeO4-2	1.137e-010	5.088e-011	-9.944	-10.293	-0.349	(0)
MnSeO4	5.329e-013	5.329e-013	-12.273	-12.273	0.000	(0)
ZnSeO4	1.387e-014	1.387e-014	-13.858	-13.858	0.000	(0)
NiSeO4	1.596e-015	1.596e-015	-14.797	-14.797	0.000	(0)
CoSeO4	1.260e-015	1.260e-015	-14.900	-14.900	0.000	(0)
CdSeO4	1.314e-016	1.314e-016	-15.881	-15.881	0.000	(0)
HSeO4-	4.559e-017	3.479e-017	-16.341	-16.459	-0.117	(0)
Zn (SeO4) 2-2	2.108e-024	7.153e-025	-23.676	-24.146	-0.469	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.331	-58.387	-1.056	(0)
U (4)	4.341e-019					
U (OH) 5-	4.339e-019	3.312e-019	-18.363	-18.480	-0.117	(0)
U (OH) 4	1.894e-022	1.894e-022	-21.723	-21.723	0.000	(0)
U (OH) 3+	1.239e-026	9.455e-027	-25.907	-26.024	-0.117	(0)
U (OH) 2+2	1.759e-031	5.969e-032	-30.755	-31.224	-0.469	(0)
UF3+	5.553e-036	4.238e-036	-35.256	-35.373	-0.117	(0)
UF2+2	9.839e-037	3.339e-037	-36.007	-36.476	-0.469	(0)
UOH+3	4.368e-037	3.839e-038	-36.360	-37.416	-1.056	(0)

UF4	3.721e-038	3.721e-038	-37.429	-37.429	0.000	(0)
UF+3	3.768e-039	3.312e-040	-38.424	-39.480	-1.056	(0)
U(SO4)2	2.469e-039	2.469e-039	-38.607	-38.607	0.000	(0)
UF5-	1.547e-040	1.181e-040	-39.810	-39.928	-0.117	(0)
USO4+2	1.492e-040	0.000e+000	-39.826	-40.295	-0.469	(0)
UF6-2	0.000e+000	0.000e+000	-41.075	-41.544	-0.469	(0)
U+4	0.000e+000	0.000e+000	-42.806	-44.683	-1.877	(0)
UC1+3	0.000e+000	0.000e+000	-44.865	-45.921	-1.056	(0)
U6(OH)15+9	0.000e+000	0.000e+000	-157.781	-167.285	-9.504	(0)
U(5)	2.343e-015					
UO2+	2.343e-015	1.788e-015	-14.630	-14.748	-0.117	(0)
U(6)	2.085e-007					
UO2(CO3)3-4	1.261e-007	1.672e-009	-6.899	-8.777	-1.877	(0)
UO2(CO3)2-2	8.124e-008	2.757e-008	-7.090	-7.560	-0.469	(0)
UO2CO3	1.142e-009	1.142e-009	-8.942	-8.942	0.000	(0)
UO2OH+	2.884e-011	2.201e-011	-10.540	-10.657	-0.117	(0)
UO2F+	3.434e-012	2.621e-012	-11.464	-11.582	-0.117	(0)
UO2SO4	2.203e-012	2.203e-012	-11.657	-11.657	0.000	(0)
UO2F2	6.054e-013	6.054e-013	-12.218	-12.218	0.000	(0)
UO2+2	5.298e-013	2.371e-013	-12.276	-12.625	-0.349	(0)
UO2(SO4)2-2	5.252e-013	1.782e-013	-12.280	-12.749	-0.469	(0)
UO2F3-	1.596e-014	1.218e-014	-13.797	-13.914	-0.117	(0)
(UO2)3(OH)5+	9.566e-015	7.301e-015	-14.019	-14.137	-0.117	(0)
(UO2)2(OH)2+2	2.370e-015	8.041e-016	-14.625	-15.095	-0.469	(0)
UO2Cl+	5.817e-016	4.440e-016	-15.235	-15.353	-0.117	(0)
UO2F4-2	2.283e-017	7.747e-018	-16.642	-17.111	-0.469	(0)
UO2NO3+	9.599e-021	7.326e-021	-20.018	-20.135	-0.117	(0)
V(2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-42.253	-42.370	-0.117	(0)
V+2	0.000e+000	0.000e+000	-43.279	-43.748	-0.469	(0)
V(3)	9.536e-015					
V(OH)3	9.536e-015	9.536e-015	-14.021	-14.021	0.000	(0)
V(OH)2+	1.102e-025	8.413e-026	-24.958	-25.075	-0.117	(0)
VOH+2	3.211e-029	1.090e-029	-28.493	-28.963	-0.469	(0)
V+3	3.354e-034	2.948e-035	-33.474	-34.530	-1.056	(0)
VSO4+	1.119e-034	8.541e-035	-33.951	-34.068	-0.117	(0)
V2(OH)3+3	0.000e+000	0.000e+000	-54.530	-55.586	-1.056	(0)
V2(OH)2+4	0.000e+000	0.000e+000	-55.248	-57.126	-1.877	(0)
V(4)	5.096e-018					
V(OH)3+	4.960e-018	3.786e-018	-17.305	-17.422	-0.117	(0)
VO+2	7.587e-020	2.575e-020	-19.120	-19.589	-0.469	(0)
VOSO4	4.353e-020	4.353e-020	-19.361	-19.361	0.000	(0)
VOF+	1.620e-020	1.237e-020	-19.790	-19.908	-0.117	(0)
VOF2	3.714e-022	3.714e-022	-21.430	-21.430	0.000	(0)
VOC1+	1.093e-022	8.340e-023	-21.961	-22.079	-0.117	(0)
VOF3-	1.383e-024	1.055e-024	-23.859	-23.977	-0.117	(0)
VOF4-2	1.005e-027	3.411e-028	-26.998	-27.467	-0.469	(0)
H2V2O4+2	2.120e-030	7.193e-031	-29.674	-30.143	-0.469	(0)
V(5)	6.954e-008					
H2VO4-	4.917e-008	3.753e-008	-7.308	-7.426	-0.117	(0)
HVO4-2	2.036e-008	6.909e-009	-7.691	-8.161	-0.469	(0)
H3VO4	5.121e-012	5.121e-012	-11.291	-11.291	0.000	(0)
H3V2O7-	1.627e-012	1.242e-012	-11.789	-11.906	-0.117	(0)
HV2O7-3	1.000e-012	8.792e-014	-12.000	-13.056	-1.056	(0)
VO4-3	2.887e-014	2.538e-015	-13.540	-14.596	-1.056	(0)
V2O7-4	1.308e-014	1.734e-016	-13.883	-15.761	-1.877	(0)
V3O9-3	6.311e-016	5.547e-017	-15.200	-16.256	-1.056	(0)
VO2+	1.707e-016	1.396e-016	-15.768	-15.855	-0.087	(0)
VO2SO4-	2.681e-017	2.046e-017	-16.572	-16.689	-0.117	(0)
VO2F	1.961e-017	1.961e-017	-16.707	-16.707	0.000	(0)
VO2F2-	7.471e-019	5.702e-019	-18.127	-18.244	-0.117	(0)
V4O12-4	6.549e-020	8.684e-022	-19.184	-21.061	-1.877	(0)
VO2F3-2	1.679e-021	5.696e-022	-20.775	-21.244	-0.469	(0)
VO2NO3	1.094e-024	1.094e-024	-23.961	-23.961	0.000	(0)
VO2F4-3	2.554e-025	2.245e-026	-24.593	-25.649	-1.056	(0)
V10O28-6	0.000e+000	0.000e+000	-52.583	-56.807	-4.224	(0)
HV10O28-5	0.000e+000	0.000e+000	-53.552	-56.485	-2.933	(0)
H2V10O28-4	0.000e+000	0.000e+000	-57.265	-59.143	-1.877	(0)

Zn	7.016e-006					
Zn+2	3.932e-006	1.760e-006	-5.405	-5.755	-0.349	(0)
ZnSO4	2.363e-006	2.363e-006	-5.627	-5.627	0.000	(0)
Zn(SO4) 2-2	3.723e-007	1.263e-007	-6.429	-6.899	-0.469	(0)
ZnOH+	1.700e-007	1.298e-007	-6.769	-6.887	-0.117	(0)
ZnCO3	1.225e-007	1.225e-007	-6.912	-6.912	0.000	(0)
ZnHCO3+	2.568e-008	1.960e-008	-7.590	-7.708	-0.117	(0)
Zn(OH) 2	1.517e-008	1.517e-008	-7.819	-7.819	0.000	(0)
ZnCl+	6.281e-009	5.104e-009	-8.202	-8.292	-0.090	(0)
ZnOHCl	4.927e-009	4.927e-009	-8.307	-8.307	0.000	(0)
ZnF+	3.684e-009	2.812e-009	-8.434	-8.551	-0.117	(0)
Zn(OH) 3-	7.344e-011	5.605e-011	-10.134	-10.251	-0.117	(0)
ZnCl2	9.340e-012	9.340e-012	-11.030	-11.030	0.000	(0)
ZnNO3+	8.969e-014	6.846e-014	-13.047	-13.165	-0.117	(0)
ZnSeO4	1.387e-014	1.387e-014	-13.858	-13.858	0.000	(0)
ZnCl3-	1.054e-014	8.566e-015	-13.977	-14.067	-0.090	(0)
Zn(OH) 4-2	4.849e-015	1.646e-015	-14.314	-14.784	-0.469	(0)
ZnCl4-2	1.084e-017	4.946e-018	-16.965	-17.306	-0.341	(0)
Zn(NO3) 2	2.115e-022	2.115e-022	-21.675	-21.675	0.000	(0)
Zn(SeO4) 2-2	2.108e-024	7.153e-025	-23.676	-24.146	-0.469	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-148.154	-148.271	-0.117	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-150.126	-150.126	0.000	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-225.325	-225.442	-0.117	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-227.088	-227.557	-0.469	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-305.028	-305.498	-0.469	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-53.53	-47.24	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-42.01	-37.50	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-49.23	-37.50	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-68.83	-50.89	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-56.31	-36.27	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-28.20	-27.79	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.03	-23.58	0.45	(NH4) 2SeO4
Acanthite	-51.91	-88.13	-36.22	Ag2S
Ag2CO3	-12.22	-23.31	-11.09	Ag2CO3
Ag2CrO4	-20.31	-31.90	-11.59	Ag2CrO4
Ag2HVO4	-11.14	-9.66	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.24	-1.67	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.79	-19.61	-4.82	Ag2SO4
Ag3AsO3	-27.45	-25.30	2.16	Ag3AsO3
Ag3AsO4	-15.86	-18.65	-2.79	Ag3AsO4
Ag3H2VO5	-15.67	-10.49	5.18	Ag3H2VO5
AgF: 4H2O	-13.84	-12.80	1.05	AgF: 4H2O
Agmetal	-0.10	-13.61	-13.51	Ag
AgVO3	-9.59	-8.82	0.77	AgVO3
Al(OH) 3 (am)	-2.78	8.02	10.80	Al(OH) 3
Al2(MoO4) 3	-52.98	-50.61	2.37	Al2(MoO4) 3
Al2O3	-3.61	16.04	19.65	Al2O3
Al4(OH) 10SO4	-8.56	14.14	22.70	Al4(OH) 10SO4
AlAsO4: 2H2O	-12.93	-8.13	4.80	AlAsO4: 2H2O
AlOHSO4	-6.69	-9.92	-3.23	AlOHSO4
AlSb	-152.99	-87.37	65.62	AlSb
Alunite	-5.30	-6.70	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-3.55	-11.34	-7.79	PbSO4
Anhydrite	-0.41	-4.77	-4.36	CaSO4
Anilite	-55.20	-87.07	-31.88	Cu0.25Cu1.5S
Antlerite	-1.86	6.93	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.43	-91.19	-2.76	As4O6
Artinite	-5.48	4.12	9.60	MgCO3: Mg(OH) 2: 3H2O

As2O5	-39.01	-32.30	6.71	As2O5
Atacamite	-1.61	5.78	7.39	Cu2(OH)3Cl
Azurite	-1.51	-18.42	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-16.60	7.80	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-16.26	-0.39	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-25.53	7.41	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.30	-16.12	-5.82	BaF2
BaMoO4	-7.46	-14.42	-6.96	BaMoO4
Barite	-0.16	-10.14	-9.98	BaSO4
BaS	-94.84	-78.66	16.18	BaS
BaSeO3	-9.29	-7.46	1.83	BaSeO3
BaSeO4	-10.77	-18.23	-7.46	BaSeO4
Bianchite	-6.20	-7.97	-1.76	ZnSO4·6H2O
Birnessite	-6.58	11.51	18.09	MnO2
Bixbyite	-1.87	-2.52	-0.64	Mn2O3
Blaubleil	-55.19	-79.36	-24.16	Cu0.9Cu0.2S
BlaubleilII	-55.64	-82.92	-27.28	Cu0.6Cu0.8S
Boehmite	-0.56	8.02	8.58	AlOOH
Breithauptite	-55.54	-74.06	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.96	12.88	16.84	Mg(OH)2
Bunsenite	-3.89	8.56	12.45	NiO
Ca(VO3)2	-8.47	-2.81	5.66	Ca(VO3)2
Ca2V2O7	-7.15	10.35	17.50	Ca2V2O7
Ca2V2O7·2H2O	-11.20	10.35	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-15.10	7.20	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-15.44	23.52	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-16.34	23.52	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-294.25	-151.28	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-10.43	-28.34	-17.91	Hg2Cl2
CaMoO4	-1.10	-9.05	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3·2H2O	-4.91	-2.09	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.84	-12.86	-3.02	CaSeO4·2H2O
Cd(BO2)2	-11.52	-1.68	9.84	Cd(BO2)2
Cd(OH)2	-5.77	7.87	13.64	Cd(OH)2
Cd(OH)2(am)	-5.86	7.87	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-18.98	-12.27	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.89	5.67	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-14.86	13.54	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.73	-0.66	CdCl2
CdCl2·1H2O	-12.04	-13.73	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.82	-13.73	-1.91	CdCl2·2.5H2O
CdF2	-14.84	-16.05	-1.21	CdF2
Cdmetal(alpha)	-31.19	-17.67	13.51	Cd
Cdmetal(gamma)	-31.29	-17.67	13.62	Cd
CdMoO4	-0.20	-14.35	-14.15	CdMoO4
CdOHCl	-6.47	-2.93	3.54	CdOHCl
CdSb	-74.40	-74.75	-0.35	CdSb
CdSe	-18.96	-39.16	-20.20	CdSe
CdSeO4·2H2O	-16.30	-18.15	-1.85	CdSeO4·2H2O
CdSO4	-9.90	-10.07	-0.17	CdSO4
CdSO4·1H2O	-8.34	-10.07	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-8.20	-10.07	-1.87	CdSO4·2.67H2O
Cerargyrite	-1.89	-11.64	-9.75	AgCl
Cerrusite	-1.92	-15.05	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.01	-9.65	-2.64	CuSO4·5H2O
Chalcocite	-55.12	-90.04	-34.92	Cu2S
Chalcopyrite	-125.91	-161.18	-35.27	CuFeS2
Cinnabar	-52.96	-98.65	-45.69	HgS
Claudetite	-88.13	-91.19	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe
Co(BO2)2	-28.20	-1.13	27.07	Co(BO2)2

Co (OH) 2	-4.67	8.42	13.09	Co (OH) 2
Co (OH) 3	-8.90	-11.20	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-20.07	-7.03	13.03	Co3 (AsO4) 2
Co3O4	-3.49	-13.98	-10.50	Co3O4
CoCl2	-21.45	-13.18	8.27	CoCl2
CoCl2:6H2O	-15.72	-13.18	2.54	CoCl2:6H2O
CoCO3	-3.24	-13.22	-9.98	CoCO3
CoF2	-13.90	-15.50	-1.60	CoF2
CoF3	-45.63	-47.09	-1.46	CoF3
CoFe2O4	18.33	14.81	-3.53	CoFe2O4
CoMoO4	-6.03	-13.80	-7.76	CoMoO4
CoO	-5.16	8.42	13.59	CoO
CoS (alpha)	-70.60	-78.04	-7.44	CoS
CoS (beta)	-66.97	-78.04	-11.07	CoS
CoSe	-22.41	-38.61	-16.20	CoSe
CoSeO3	-8.16	-6.84	1.32	CoSeO3
CoSeO4:6H2O	-16.07	-17.60	-1.53	CoSeO4:6H2O
CoSO4	-12.32	-9.52	2.80	CoSO4
CoSO4:6H2O	-7.05	-9.52	-2.47	CoSO4:6H2O
Cotunnite	-10.23	-15.01	-4.78	PbCl2
Covellite	-55.87	-78.17	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.70	-32.61	14.09	CrCl2
CrCl3	-48.70	-33.59	15.11	CrCl3
CrF3	-25.73	-37.06	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-12.76	-46.60	-33.84	Na3AlF6
Cu (OH) 2	-0.38	8.29	8.67	Cu (OH) 2
Cu (SbO3) 2	-23.34	21.87	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.34	0.91	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.01	-88.89	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.82	-50.62	-45.80	Cu2Se
Cu2SO4	-19.57	-21.52	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.53	-7.43	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.17	-100.76	-42.59	Cu3Sb
Cu3Se2	-25.87	-89.36	-63.49	Cu3Se2
CuCO3	-1.86	-13.36	-11.50	CuCO3
CuCrO4	-16.51	-21.95	-5.44	CuCrO4
CuF	-8.85	-13.75	-4.91	CuF
CuF2	-16.75	-15.63	1.12	CuF2
CuF2:2H2O	-11.08	-15.63	-4.55	CuF2:2H2O
Cumetal	-5.81	-14.56	-8.76	Cu
CuMoO4	-0.85	-13.93	-13.08	CuMoO4
CuOCuSO4	-11.66	-1.36	10.30	CuOCuSO4
Cupricferrite	8.69	14.67	5.99	CuFe2O4
Cuprite	-2.18	-3.58	-1.41	Cu2O
Cuprousferrite	10.32	1.40	-8.92	CuFeO2
CuSe	-5.64	-38.74	-33.10	CuSe
CuSe2	-26.87	-60.23	-33.37	CuSe2
CuSeO3:2H2O	-7.48	-6.97	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.29	-17.73	-2.44	CuSeO4:5H2O
CuSO4	-12.59	-9.65	2.94	CuSO4
Diaspore	1.15	8.02	6.87	AlOOH
Djurleite	-55.34	-89.26	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.70	-17.24	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.15	-17.24	-17.09	CaMg (CO3) 2
Epsomite	-2.93	-5.06	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	2.99	-0.05	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-8.81	-12.53	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.43	-8.88	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.77	-39.40	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.71	-47.44	-3.73	Fe2 (SO4) 3

Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.68	-18.77	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.48	-65.07	-18.60	FeSe2
FeS(ppt)	-80.06	-83.01	-2.95	FeS
FeSe	-32.58	-43.58	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	-0.26	-10.76	-10.50	CaF2
Galena	-65.89	-79.86	-13.97	PbS
Gibbsite	-0.27	8.02	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O
Greenockite	-64.23	-78.59	-14.36	CdS
Greigite	-290.97	-336.01	-45.03	Fe3S4
Gummite	-4.57	3.10	7.67	UO3
Gypsum	-0.17	-4.78	-4.61	CaSO4:2H2O
H-Jarosite	-14.21	-26.31	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.34	-22.22	-12.88	H2MoO4
H2S(g)	-78.45	-86.46	-8.01	H2S
H2Se(g)	-42.07	-47.03	-4.96	H2Se
Halite	-6.69	-5.09	1.60	NaCl
Hausmannite	-1.53	59.50	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-3.40	19.50	22.89	FeAl2O4
Hg(CH3)2(g)	-186.13	-259.84	-73.71	Hg(CH3)2
Hg(g)	-8.27	-16.14	-7.87	Hg
Hg(OH)2	-8.69	-12.19	-3.50	Hg(OH)2
Hg2(g)	-17.33	-32.28	-14.96	Hg2
Hg2(OH)2	-12.00	-6.74	5.26	Hg2(OH)2
Hg2CO3	-12.33	-28.38	-16.05	Hg2CO3
Hg2CrO4	-28.28	-36.98	-8.70	Hg2CrO4
Hg2F2	-20.30	-30.66	-10.36	Hg2F2
Hg2S	-81.52	-93.20	-11.68	Hg2S
Hg2SeO3	-17.34	-22.00	-4.66	Hg2SeO3
Hg2SO4	-18.55	-24.68	-6.13	Hg2SO4
Hg3O2CO3	-28.53	-58.21	-29.68	Hg3O2CO3
HgCl(g)	-33.67	-14.17	19.50	HgCl
HgCl2	-12.53	-33.79	-21.26	HgCl2
HgF(g)	-48.01	-15.33	32.68	HgF
HgF2(g)	-48.68	-36.11	12.57	HgF2
Hgmetal(l)	-2.69	-16.14	-13.45	Hg
HgSe	-3.53	-59.22	-55.69	HgSe
HgSeO3	-15.02	-27.45	-12.43	HgSeO3
HgSO4	-20.71	-30.13	-9.42	HgSO4
Huntite	-4.80	-34.77	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.73	-23.50	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.40	-22.16	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-17.58	-22.75	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.39	-21.19	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-33.00	-50.24	-17.24	K2Cr2O7
K2CrO4	-19.49	-20.01	-0.51	K2CrO4
K2MoO4	-15.25	-11.99	3.26	K2MoO4
K2SeO4	-15.06	-15.79	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-4.31	-4.74	-0.43	PbO:PbSO4
Laurionite	-4.83	-4.20	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.09	6.60	12.69	PbO
Mackinawite	-79.41	-83.01	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.41	19.27	16.86	Fe2MgO4
Magnesite	-1.30	-8.76	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.24	-5.06	-5.31	Cu2(OH)2CO3
Manganite	-1.25	24.09	25.34	MnOOH

Massicot	-6.29	6.60	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-19.57	-13.31	6.26	CuCl ₂
Melanterite	-12.28	-14.49	-2.21	FeSO ₄ :7H ₂ O
Metacinnabar	-53.56	-98.65	-45.09	HgS
Mg(OH) ₂ (active)	-5.91	12.88	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.38	-3.10	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-271.22	-196.54	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.57	9.79	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.67	10.53	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.73	-17.35	5.38	MgCrO ₄
MgF ₂	-2.91	-11.04	-8.13	MgF ₂
MgMoO ₄	-7.48	-9.33	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-5.43	-2.38	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-11.94	-13.14	-1.20	MgSeO ₄ :6H ₂ O
Minium	-28.18	45.34	73.52	Pb ₃ O ₄
Mirabilite	-5.40	-6.51	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn(VO ₃) ₂	-9.56	-4.66	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.63	-56.34	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.60	-85.52	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ :8H ₂ O	-10.85	1.65	12.50	Mn ₃ (AsO ₄) ₂ :8H ₂ O
MnCl ₂ :4H ₂ O	-13.00	-10.29	2.72	MnCl ₂ :4H ₂ O
MnS(grn)	-75.31	-75.14	0.17	MnS
MnS(pnk)	-78.48	-75.14	3.34	MnS
MnSb	-93.74	-96.65	-2.91	MnSb
MnSe	-39.21	-35.71	3.50	MnSe
MnSeO ₃	-5.07	-3.94	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-4.92	-3.94	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-12.65	-14.70	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-9.20	-6.62	2.58	MnSO ₄
Monteponite	-7.23	7.87	15.10	CdO
Montroydite	-8.55	-12.19	-3.64	HgO
MoO ₃	-14.22	-22.22	-8.00	MoO ₃
Morenosite	-7.24	-9.39	-2.14	NiSO ₄ :7H ₂ O
MoS ₂	-150.43	-220.69	-70.26	MoS ₂
Na-Jarosite	-9.39	-20.59	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.15	-49.04	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-21.73	-18.80	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-16.41	-33.01	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.28	-10.79	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-12.01	-10.79	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-14.13	-3.83	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-15.87	-14.59	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.69	-78.24	94.45	Na ₃ Sb
Na ₃ VO ₄	-27.52	9.16	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-30.51	6.89	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.86	-12.59	-6.73	CuCl
NaSb	-87.30	-64.13	23.17	NaSb
Natron	-8.91	-10.22	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-6.13	-2.27	3.86	NaVO ₃
Nesquehonite	-4.09	-8.76	-4.67	MgCO ₃ :3H ₂ O
Ni(OH) ₂	-4.24	8.56	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ :8H ₂ O	-22.34	-6.64	15.70	Ni ₃ (AsO ₄) ₂ :8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-15.72	16.28	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.22	-13.09	-6.87	NiCO ₃
NiMoO ₄	-2.52	-13.66	-11.14	NiMoO ₄
NiS(alpha)	-72.30	-77.90	-5.60	NiS
NiS(beta)	-66.80	-77.90	-11.10	NiS
NiS(gamma)	-65.10	-77.90	-12.80	NiS
NiSe	-20.78	-38.48	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-9.52	-6.70	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-15.95	-17.47	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-5.99	11.51	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-243.91	-304.98	-61.07	As ₂ S ₃
Otavite	-1.78	-13.78	-12.00	CdCO ₃
Pb(BO ₂) ₂	-9.47	-2.95	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-1.55	6.60	8.15	Pb(OH) ₂

Pb10 (OH) 60 (CO3) 6	-55.13	-63.89	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-6.40	2.40	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-12.99	13.20	26.19	Pb2O (OH) 2
Pb2O3	-22.30	38.74	61.04	Pb2O3
Pb2OCO3	-7.89	-8.45	-0.56	Pb2OCO3
Pb2V2O7	-0.88	-2.78	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-18.31	-12.51	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-2.32	3.82	6.14	Pb3 (VO4) 2
Pb3O2CO3	-12.87	-1.85	11.02	Pb3O2CO3
Pb3O2SO4	-8.83	1.86	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-12.64	8.46	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-13.42	8.46	21.88	Pb4O3SO4
PbCrO4	-11.04	-23.64	-12.60	PbCrO4
PbF2	-9.88	-17.32	-7.44	PbF2
Pbmetal	-23.19	-18.95	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.38	6.60	12.98	PbO:0.33H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.70	12.89	21.58	MgO
Phosgenite	-10.24	-30.05	-19.81	PbCl2:PbCO3
Plattnerite	-17.46	32.14	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.42	-143.93	-18.51	FeS2
Pyrochroite	-3.87	11.32	15.19	Mn (OH) 2
Pyrolusite	-4.52	36.86	41.38	MnO2
Realgar	-102.28	-122.03	-19.75	AsS
Retgersite	-7.35	-9.39	-2.04	NiSO4:6H2O
Rhodochrosite	0.25	-10.33	-10.58	MnCO3
Rutherfordine	-4.04	-18.54	-14.50	UO2CO3
Sb (OH) 3	-11.65	-18.76	-7.11	Sb (OH) 3
Sb2O4	-15.37	-11.97	3.40	Sb2O4
Sb2O5	-25.38	-35.04	-9.67	Sb2O5
Sb2Se3	-110.86	-178.62	-67.76	Sb2Se3
Sb4O6 (cubic)	-56.77	-75.03	-18.26	Sb4O6
Sb4O6 (orth)	-57.13	-75.03	-17.90	Sb4O6
SbCl3	-51.74	-51.16	0.57	SbCl3
SbF3	-44.42	-54.64	-10.23	SbF3
Sbmetal	-45.38	-57.07	-11.69	Sb
SbO2	-2.47	-30.29	-27.82	SbO2
Schoepite	-2.89	3.10	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.38	-21.49	-7.11	Se
Semetal (hex)	-13.78	-21.49	-7.71	Se
Senarmontite	-25.15	-37.51	-12.37	Sb2O3
SeO2	-15.38	-15.26	0.12	SeO2
SeO3	-47.07	-26.02	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.67	-11.67	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS
Spinel	-7.92	28.93	36.85	MgAl2O4
Stibnite	-246.44	-296.90	-50.46	Sb2S3
Sulfur	-58.77	-60.92	-2.14	S
Tenorite	0.65	8.29	7.64	CuO
Thenardite	-6.83	-6.51	0.32	Na2SO4
Thermonatrite	-10.85	-10.21	0.64	Na2CO3:H2O
Tyuyamunite	-0.68	3.40	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-9.67	11.42	21.08	U3O8
U3Sb4	-573.62	-421.24	152.38	U3Sb4
U4O9	-24.33	-27.35	-3.02	U4O9
UF4	-31.53	-61.07	-29.54	UF4
UF4:2.5H2O	-28.35	-61.07	-32.72	UF4:2.5H2O
UO2 (am)	-14.16	-13.22	0.93	UO2
UO2 (NO3) 2	-40.39	-28.25	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.10	-28.25	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.64	-28.25	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.29	-28.25	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.51	3.10	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.67	-22.92	-2.25	UO2SeO4:4H2O
UO3	-4.60	3.10	7.70	UO3

Uraninite	-8.55	-13.22	-4.67	UO2
USb2	-217.25	-187.68	29.58	USb2
V(OH)3	-18.53	-10.94	7.59	V(OH)3
V2O5	-14.62	-15.98	-1.36	V2O5
V3O5	-38.96	-37.12	1.84	V3O5
V4O7	-48.17	-40.98	7.19	V4O7
V6O13	-38.17	-99.03	-60.86	V6O13
Valentinite	-29.03	-37.51	-8.48	Sb2O3
VC12	-64.19	-45.31	18.87	VC12
VC13	-66.78	-43.34	23.43	VC13
VF4	-66.63	-51.70	14.93	VF4
Vmetal	-93.28	-49.25	44.03	V
VO	-38.46	-23.71	14.76	VO
VO(OH)2	-9.01	-3.86	5.15	VO(OH)2
VO2Cl	-21.63	-18.79	2.84	VO2Cl
VOC1	-32.89	-21.74	11.15	VOC1
VOC12	-38.22	-25.46	12.76	VOC12
VOSO4	-25.41	-21.80	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.54	-76.49	-8.95	ZnS
Zincite	-1.36	9.98	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO4
Zn(BO2)2	-7.87	0.42	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.69	-21.38	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.23	9.97	12.20	Zn(OH)2
Zn(OH)2(am)	-2.50	9.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.78	9.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.56	9.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.76	9.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.49	2.01	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.04	9.15	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.03	-2.38	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.87	-5.96	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-6.44	21.96	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.23	28.27	38.50	Zn5(OH)8Cl2
ZnCl2	-18.68	-11.63	7.05	ZnCl2
ZnCO3:1H2O	-1.41	-11.67	-10.26	ZnCO3:1H2O
ZnF2	-13.41	-13.95	-0.53	ZnF2
Znmetal	-41.36	-15.57	25.79	Zn
ZnMoO4	-2.12	-12.24	-10.13	ZnMoO4
ZnO(active)	-1.21	9.98	11.19	ZnO
ZnS(am)	-67.43	-76.49	-9.05	ZnS
ZnSb	-83.66	-72.64	11.01	ZnSb
ZnSe	-22.66	-37.06	-14.40	ZnSe
ZnSeO4:6H2O	-14.53	-16.05	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.33	-7.97	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 25.

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Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 103
      Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
      Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
      donnan 1e-008
USE EQUILIBRIUM_PHASES 103
USE Surface 103
USE Solution 112
SAVE Solution 113  #Pit Water After Mineral Precipitation and Sorption Loss
END

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TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 112. Solution after simulation 24.

Using surface 103.

Using pure phase assemblage 103. Pure-phase assemblage after simulation 24.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	6.161e-012	6.133e-012	-2.762e-014
Alunite	-5.30	-6.70	-1.40	0.000e+000	0	0.000e+000
Anhydrite	-0.41	-4.77	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	-0.00	-8.91	-8.91	1.504e-009	1.503e-009	-1.541e-012
Barite	-0.16	-10.14	-9.98	0.000e+000	0	0.000e+000
Brochantite	-0.00	15.22	15.22	1.150e-006	1.150e-006	-8.938e-011
Brucite	-3.96	12.88	16.84	0.000e+000	0	0.000e+000
CO2 (g)	-3.50	-21.65	-18.15	1.000e+001	1.000e+001	4.194e-011
CaMoO4	-1.10	-9.05	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-4.91	-2.09	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	1.063e-003	1.063e-003	-3.230e-010
Carnotite	-0.00	0.23	0.23	1.483e-008	1.472e-008	-1.102e-010
Cd(BO2)2	-11.52	-1.68	9.84	0.000e+000	0	0.000e+000
CdMoO4	-0.20	-14.35	-14.15	0.000e+000	0	0.000e+000
Chrysotile	Element not present.			0.000e+000	0	0.000e+000
Cr2O3	0.00	-2.36	-2.36	1.981e-009	1.980e-009	-5.486e-013
Cu2Se(alpha)	-4.82	-50.62	-45.80	0.000e+000	0	0.000e+000
CuMoO4	-0.85	-13.93	-13.08	0.000e+000	0	0.000e+000
Epsomite	-2.93	-5.06	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	-0.00	3.19	3.19	4.082e-009	4.082e-009	-1.695e-017
Fluorite	-0.26	-10.76	-10.50	0.000e+000	0	0.000e+000
Gummite	-4.57	3.10	7.67	0.000e+000	0	0.000e+000
Gypsum	-0.17	-4.78	-4.61	0.000e+000	0	0.000e+000
HgSe	-3.53	-59.22	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2	Element not present.			0.000e+000	0	0.000e+000
Mirabilite	-5.40	-6.51	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-5.07	-3.94	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-4.24	8.56	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2:8H2O	-22.34	-6.64	15.70	0.000e+000	0	0.000e+000
NiCO3	-6.22	-13.09	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-2.52	-13.66	-11.14	0.000e+000	0	0.000e+000
O2 (g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-2.487e-014
Otavite	-1.78	-13.78	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	8.680e-009	8.670e-009	-1.014e-011
Rutherfordine	-4.04	-18.54	-14.50	0.000e+000	0	0.000e+000
SbO2	-2.47	-30.29	-27.82	0.000e+000	0	0.000e+000
Schoepite	-2.89	3.10	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2(am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-0.68	3.40	4.08	0.000e+000	0	0.000e+000
U3O8	-9.67	11.42	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-2.51	3.10	5.61	0.000e+000	0	0.000e+000
UO3	-4.60	3.10	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-2.12	-12.24	-10.13	0.000e+000	0	0.000e+000

-----Surface composition-----

Hfo

3.644e-021 Surface + diffuse layer charge, eq

3.669e-011 Surface charge, eq
 1.351e-002 sigma, C/m**2
 2.475e-002 psi, V
 -9.632e-001 -F*psi/RT
 3.817e-001 exp(-F*psi/RT)
 6.420e+004 specific area, m**2/mol Ferrihydrite
 2.621e-004 m**2 for 4.082e-009 moles of Ferrihydrite

Water in diffuse layer: 2.621e-009 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation

Element	Moles
Ag	2.0878e-017
Al	5.8064e-016
As	2.5029e-018
B	4.6342e-014
Ba	5.3079e-017
C	1.3999e-012
Ca	2.2541e-011
Cd	1.3768e-016
Cl	4.2094e-012
Co	4.6354e-016
Cr	3.5452e-018
Cu	1.2687e-015
F	3.3619e-013
Fe	2.7387e-018
H	1.5444e-012
Hg	7.0055e-019
K	5.2957e-012
Mg	1.0718e-011
Mn	3.4501e-013
Mo	2.4545e-015
N	6.1800e-014
Na	2.0880e-011
Ni	5.3872e-016
O	2.5266e-010
Pb	2.2085e-017
S	6.2044e-011
Sb	7.3608e-016
Se	2.7503e-016
U	8.3255e-016
V	2.1559e-016
Zn	1.6266e-014

Hfo_s
 2.041e-011 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOPb+	6.682e-012	0.327	6.923e-012	-11.160
Hfo_sOCu+	5.710e-012	0.280	5.915e-012	-11.228
Hfo_sOZn+	3.473e-012	0.170	3.597e-012	-11.444
Hfo_sOMn+	3.128e-012	0.153	3.241e-012	-11.489
Hfo_sOCrOH+	1.097e-012	0.054	1.137e-012	-11.944
Hfo_sOHCa+2	2.686e-013	0.013	2.783e-013	-12.556
Hfo_sONi+	3.175e-014	0.002	3.290e-014	-13.483
Hfo_sOCd+	8.266e-015	0.000	8.563e-015	-14.067
Hfo_sOH	7.219e-015	0.000	7.479e-015	-14.126
Hfo_sOCo+	3.460e-015	0.000	3.584e-015	-14.446
Hfo_sO-	1.629e-015	0.000	1.687e-015	-14.773
Hfo_sOH2+	7.331e-016	0.000	7.594e-016	-15.120
Hfo_sOAg	2.021e-017	0.000	2.094e-017	-16.679
Hfo_sOHBa+2	3.549e-018	0.000	3.677e-018	-17.435
Hfo_sOFe+	5.328e-019	0.000	5.520e-019	-18.258
Hfo_sOHg+	2.170e-021	0.000	2.248e-021	-20.648

Hfo_w

8.165e-010 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	3.518e-010	0.431	3.644e-010	-9.438
Hfo_wOHVO4-3	1.470e-010	0.180	1.523e-010	-9.817
Hfo_wOMg+	8.718e-011	0.107	9.032e-011	-10.044
Hfo_wOH	8.673e-011	0.106	8.985e-011	-10.047
Hfo_wOZn+	4.368e-011	0.054	4.525e-011	-10.344
Hfo_wOMn+	2.985e-011	0.037	3.092e-011	-10.510
Hfo_wOHSO4-2	2.253e-011	0.028	2.334e-011	-10.632
Hfo_wO-	1.957e-011	0.024	2.027e-011	-10.693
Hfo_wOCa+	9.378e-012	0.011	9.715e-012	-11.013
Hfo_wOH2+	8.807e-012	0.011	9.123e-012	-11.040
Hfo_wOPb+	3.586e-012	0.004	3.715e-012	-11.430
Hfo_wOHAsO4-3	3.279e-012	0.004	3.397e-012	-11.469
Hfo_wSO4-	1.148e-012	0.001	1.189e-012	-11.925
Hfo_wOHSeO3-2	1.034e-012	0.001	1.071e-012	-11.970
Hfo_wONi+	5.146e-013	0.001	5.331e-013	-12.273
Hfo_wSeO3-	1.785e-013	0.000	1.849e-013	-12.733
Hfo_wOCO+	1.172e-013	0.000	1.214e-013	-12.916
Hfo_wOHMoO4-2	4.842e-014	0.000	5.016e-014	-13.300
Hfo_wOCd+	4.236e-014	0.000	4.388e-014	-13.358
Hfo_wH2BO3	6.041e-015	0.000	6.259e-015	-14.204
Hfo_wMoO4-	3.177e-015	0.000	3.291e-015	-14.483
Hfo_wHAsO4-	7.574e-016	0.000	7.846e-016	-15.105
Hfo_wOAg	6.387e-017	0.000	6.617e-017	-16.179
Hfo_wOFe+	4.039e-018	0.000	4.184e-018	-17.378
Hfo_wH2AsO4	2.489e-018	0.000	2.578e-018	-17.589
Hfo_wOBa+	1.791e-018	0.000	1.856e-018	-17.732
Hfo_wOHg+	1.277e-018	0.000	1.323e-018	-17.879
Hfo_wOHSbO(OH) 4-	9.968e-019	0.000	1.033e-018	-17.986
Hfo_wOHSeO4-2	1.911e-019	0.000	1.980e-019	-18.703
Hfo_wSbO(OH) 4	6.540e-020	0.000	6.775e-020	-19.169
Hfo_wOHCrO4-2	1.468e-020	0.000	1.521e-020	-19.818
Hfo_wSeO4-	8.478e-021	0.000	8.782e-021	-20.056
Hfo_wCrO4-	6.819e-022	0.000	7.065e-022	-21.151
Hfo_wH2AsO3	3.542e-028	0.000	3.670e-028	-27.435

-----Solution composition-----

Elements	Molality	Moles
Ag	8.132e-009	7.850e-009
Al	1.950e-007	1.882e-007
As	7.425e-010	7.167e-010
B	1.758e-005	1.697e-005
Ba	2.620e-008	2.529e-008
C	4.777e-004	4.611e-004
Ca	9.994e-003	9.647e-003
Cd	5.841e-008	5.638e-008
Cl	1.412e-003	1.363e-003
Co	2.104e-007	2.031e-007
Cr	1.500e-009	1.448e-009
Cu	5.149e-007	4.971e-007
F	1.171e-004	1.130e-004
Fe	1.120e-009	1.081e-009
Hg	2.673e-010	2.580e-010
K	2.271e-003	2.192e-003
Mg	4.819e-003	4.652e-003
Mn	1.578e-004	1.523e-004
Mo	7.236e-007	6.985e-007
N	2.079e-005	2.007e-005
Na	8.980e-003	8.668e-003
Ni	2.402e-007	2.319e-007
Pb	8.977e-009	8.666e-009
S	1.958e-002	1.890e-002
Sb	2.469e-007	2.383e-007

Se	8.746e-008	8.443e-008
U	2.086e-007	2.013e-007
V	6.950e-008	6.709e-008
Zn	7.016e-006	6.772e-006

-----Description of solution-----

	pH =	7.865	Charge balance
	pe =	4.907	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength =	5.293e-002	
	Mass of water (kg) =	9.653e-001	
	Total alkalinity (eq/kg) =	4.812e-004	
	Total CO2 (mol/kg) =	4.777e-004	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	8.175e-006	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.01	
	Iterations =	1	
	Total H =	1.071624e+002	
	Total O =	5.365805e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	9.131e-007	7.374e-007	-6.039	-6.132	-0.093	(0)
H+	1.668e-008	1.365e-008	-7.778	-7.865	-0.087	0.00
H2O	5.551e+001	9.993e-001	1.744	-0.000	0.000	18.07
Ag	8.132e-009					
AgCl	4.727e-009	4.727e-009	-8.325	-8.325	0.000	(0)
Ag+	2.452e-009	2.005e-009	-8.611	-8.698	-0.087	(0)
AgCl2-	6.228e-010	4.754e-010	-9.206	-9.323	-0.117	(0)
AgSO4-	3.217e-010	2.456e-010	-9.493	-9.610	-0.117	(0)
AgNO2	6.877e-012	6.877e-012	-11.163	-11.163	0.000	(0)
AgCl3-2	1.442e-012	4.892e-013	-11.841	-12.311	-0.469	(0)
AgF	4.034e-013	4.034e-013	-12.394	-12.394	0.000	(0)
AgOH	1.479e-013	1.479e-013	-12.830	-12.830	0.000	(0)
AgNH3+	5.109e-014	3.899e-014	-13.292	-13.409	-0.117	(0)
AgH2BO3	2.259e-014	2.259e-014	-13.646	-13.646	0.000	(0)
AgSeO3-	1.983e-014	1.513e-014	-13.703	-13.820	-0.117	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
AgCl4-3	1.312e-014	1.153e-015	-13.882	-14.938	-1.056	(0)
Ag (NO2) 2-	2.291e-016	1.748e-016	-15.640	-15.757	-0.117	(0)
AgNO3	2.467e-017	2.467e-017	-16.608	-16.608	0.000	(0)
Ag (OH) 2-	1.396e-017	1.066e-017	-16.855	-16.972	-0.117	(0)
Ag (NH3) 2+	3.955e-018	3.018e-018	-17.403	-17.520	-0.117	(0)
Ag (SeO3) 2-3	1.811e-020	1.591e-021	-19.742	-20.798	-1.056	(0)
Ag2MoO4	4.928e-025	4.928e-025	-24.307	-24.307	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.479	-73.479	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-82.073	-83.951	-1.877	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.373	-147.593	-0.220	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.858	-147.975	-0.117	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.772	-149.168	-0.397	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.104	-149.479	-0.375	(0)
Al	1.950e-007					
Al (OH) 4-	1.931e-007	1.579e-007	-6.714	-6.802	-0.088	(0)
Al (OH) 3	1.700e-009	1.700e-009	-8.769	-8.769	0.000	(0)
Al (OH) 2+	1.400e-010	1.156e-010	-9.854	-9.937	-0.083	(0)
AlF2+	8.276e-012	6.831e-012	-11.082	-11.165	-0.083	(0)
AlF3	6.888e-012	6.888e-012	-11.162	-11.162	0.000	(0)
AlF+2	4.616e-013	2.143e-013	-12.336	-12.669	-0.333	(0)
AlOH+2	4.251e-013	1.973e-013	-12.372	-12.705	-0.333	(0)
AlF4-	3.382e-013	2.764e-013	-12.471	-12.558	-0.088	(0)
AlSO4+	1.559e-014	1.275e-014	-13.807	-13.895	-0.088	(0)
Al+3	1.633e-015	2.676e-016	-14.787	-15.573	-0.786	(0)
Al (SO4) 2-	1.026e-015	8.384e-016	-14.989	-15.077	-0.088	(0)

AlMo6O21-3	0.000e+000	0.000e+000	-45.652	-46.708	-1.056	(0)
As (3)	1.666e-023					
H3AsO3	1.588e-023	1.588e-023	-22.799	-22.799	0.000	(0)
H2AsO3-	7.820e-025	5.968e-025	-24.107	-24.224	-0.117	(0)
HAsO3-2	1.176e-028	3.989e-029	-27.930	-28.399	-0.469	(0)
H4AsO3+	1.407e-031	1.074e-031	-30.852	-30.969	-0.117	(0)
AsO3-3	1.282e-033	1.127e-034	-32.892	-33.948	-1.056	(0)
As (5)	7.425e-010					
HAsO4-2	7.029e-010	2.385e-010	-9.153	-9.622	-0.469	(0)
H2AsO4-	3.889e-011	2.969e-011	-10.410	-10.527	-0.117	(0)
AsO4-3	6.290e-013	5.528e-014	-12.201	-13.257	-1.056	(0)
H3AsO4	6.954e-017	7.039e-017	-16.158	-16.152	0.005	(0)
B	1.758e-005					
H3BO3	1.650e-005	1.670e-005	-4.783	-4.777	0.005	(0)
H2BO3-	8.920e-007	7.107e-007	-6.050	-6.148	-0.099	(0)
CaH2BO3+	1.405e-007	1.119e-007	-6.852	-6.951	-0.099	(0)
MgH2BO3+	4.425e-008	3.526e-008	-7.354	-7.453	-0.099	(0)
NaH2BO3	8.009e-009	8.009e-009	-8.096	-8.096	0.000	(0)
BF(OH) 3-	6.697e-010	5.336e-010	-9.174	-9.273	-0.099	(0)
H5(BO3) 2-	1.268e-011	1.010e-011	-10.897	-10.996	-0.099	(0)
BaH2BO3+	3.226e-013	2.570e-013	-12.491	-12.590	-0.099	(0)
BF2(OH) 2-	7.830e-014	6.238e-014	-13.106	-13.205	-0.099	(0)
AgH2BO3	2.259e-014	2.259e-014	-13.646	-13.646	0.000	(0)
H8(BO3) 3-	2.117e-014	1.687e-014	-13.674	-13.773	-0.099	(0)
BF3OH-	3.331e-020	2.654e-020	-19.477	-19.576	-0.099	(0)
BF4-	1.792e-025	1.428e-025	-24.747	-24.845	-0.099	(0)
Ba	2.620e-008					
Ba+2	2.615e-008	1.170e-008	-7.583	-7.932	-0.349	(0)
BaHCO3+	4.739e-011	3.935e-011	-10.324	-10.405	-0.081	(0)
BaCO3	7.261e-012	7.261e-012	-11.139	-11.139	0.000	(0)
BaH2BO3+	3.226e-013	2.570e-013	-12.491	-12.590	-0.099	(0)
BaOH+	4.583e-014	3.767e-014	-13.339	-13.424	-0.085	(0)
BaNO3+	1.190e-015	9.083e-016	-14.924	-15.042	-0.117	(0)
BaNH3+2	2.072e-016	7.032e-017	-15.684	-16.153	-0.469	(0)
C (4)	4.777e-004					
HCO3-	4.266e-004	3.521e-004	-3.370	-3.453	-0.083	(0)
CaHCO3+	2.161e-005	1.795e-005	-4.665	-4.746	-0.081	(0)
H2CO3	1.081e-005	1.081e-005	-4.966	-4.966	0.000	(0)
MgHCO3+	6.344e-006	5.156e-006	-5.198	-5.288	-0.090	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CO3-2	2.703e-006	1.210e-006	-5.568	-5.917	-0.349	(0)
MgCO3	1.440e-006	1.440e-006	-5.842	-5.842	0.000	(0)
NaHCO3	1.408e-006	1.408e-006	-5.851	-5.851	0.000	(0)
MnHCO3+	3.326e-007	2.734e-007	-6.478	-6.563	-0.085	(0)
CuCO3	2.595e-007	2.595e-007	-6.586	-6.586	0.000	(0)
NaCO3-	1.941e-007	1.602e-007	-6.712	-6.795	-0.083	(0)
UO2(CO3) 3-4	1.261e-007	1.673e-009	-6.899	-8.777	-1.877	(0)
ZnCO3	1.225e-007	1.225e-007	-6.912	-6.912	0.000	(0)
UO2(CO3) 2-2	8.128e-008	2.758e-008	-7.090	-7.559	-0.469	(0)
ZnHCO3+	2.568e-008	1.960e-008	-7.590	-7.708	-0.117	(0)
NiHCO3+	3.816e-009	2.912e-009	-8.418	-8.536	-0.117	(0)
NiCO3	3.028e-009	3.028e-009	-8.519	-8.519	0.000	(0)
PbCO3	2.695e-009	2.695e-009	-8.570	-8.570	0.000	(0)
Cu(CO3) 2-2	2.490e-009	8.451e-010	-8.604	-9.073	-0.469	(0)
CoHCO3+	1.774e-009	1.354e-009	-8.751	-8.868	-0.117	(0)
UO2CO3	1.143e-009	1.143e-009	-8.942	-8.942	0.000	(0)
CuHCO3+	1.060e-009	8.094e-010	-8.975	-9.092	-0.117	(0)
CoCO3	1.011e-009	1.011e-009	-8.995	-8.995	0.000	(0)
CdCO3	3.825e-010	3.825e-010	-9.417	-9.417	0.000	(0)
PbHCO3+	2.540e-010	1.938e-010	-9.595	-9.713	-0.117	(0)
BaHCO3+	4.739e-011	3.935e-011	-10.324	-10.405	-0.081	(0)
Pb(CO3) 2-2	2.771e-011	9.402e-012	-10.557	-11.027	-0.469	(0)
CdHCO3+	1.457e-011	1.112e-011	-10.837	-10.954	-0.117	(0)
BaCO3	7.261e-012	7.261e-012	-11.139	-11.139	0.000	(0)
Cd(CO3) 2-2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
FeHCO3+	2.811e-015	2.334e-015	-14.551	-14.632	-0.081	(0)
HgCO3	2.729e-016	2.729e-016	-15.564	-15.564	0.000	(0)
Hg(CO3) 2-2	3.076e-018	1.044e-018	-17.512	-17.981	-0.469	(0)

	HgHCO ₃ ⁺	9.084e-020	6.933e-020	-19.042	-19.159	-0.117	(0)
Cd		9.994e-003					
	Ca+2	6.116e-003	2.737e-003	-2.214	-2.563	-0.349	(0)
	CaSO ₄	3.848e-003	3.848e-003	-2.415	-2.415	0.000	(0)
	CaHCO ₃ ⁺	2.161e-005	1.795e-005	-4.665	-4.746	-0.081	(0)
	CaCO ₃	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CaF ⁺	2.911e-006	2.392e-006	-5.536	-5.621	-0.085	(0)
	CaH ₂ BO ₃ ⁺	1.405e-007	1.119e-007	-6.852	-6.951	-0.099	(0)
	CaOH ⁺	4.850e-008	4.027e-008	-7.314	-7.395	-0.081	(0)
	CaNO ₃ ⁺	1.756e-010	1.340e-010	-9.755	-9.873	-0.117	(0)
	CaNH ₃ +2	9.670e-011	3.282e-011	-10.015	-10.484	-0.469	(0)
	Ca (NH ₃) 2+2	3.666e-019	1.244e-019	-18.436	-18.905	-0.469	(0)
Cd		5.841e-008					
	Cd+2	3.099e-008	1.387e-008	-7.509	-7.858	-0.349	(0)
	CdSO ₄	1.996e-008	1.996e-008	-7.700	-7.700	0.000	(0)
	Cd (SO ₄) 2-2	4.869e-009	1.652e-009	-8.313	-8.782	-0.469	(0)
	CdCl ⁺	2.004e-009	1.530e-009	-8.698	-8.815	-0.117	(0)
	CdCO ₃	3.825e-010	3.825e-010	-9.417	-9.417	0.000	(0)
	CdOH ⁺	1.065e-010	8.125e-011	-9.973	-10.090	-0.117	(0)
	CdOHC1	4.627e-011	4.627e-011	-10.335	-10.335	0.000	(0)
	CdF ⁺	2.307e-011	1.761e-011	-10.637	-10.754	-0.117	(0)
	CdHCO ₃ ⁺	1.457e-011	1.112e-011	-10.837	-10.954	-0.117	(0)
	CdCl ₂	7.362e-012	7.362e-012	-11.133	-11.133	0.000	(0)
	Cd (CO ₃) 2-2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
	Cd (OH) 2	3.780e-013	3.780e-013	-12.422	-12.422	0.000	(0)
	CdCl ₃ -	7.027e-015	5.363e-015	-14.153	-14.271	-0.117	(0)
	CdF ₂	2.813e-015	2.813e-015	-14.551	-14.551	0.000	(0)
	CdNO ₃ ⁺	8.900e-016	6.793e-016	-15.051	-15.168	-0.117	(0)
	CdSeO ₄	1.314e-016	1.314e-016	-15.881	-15.881	0.000	(0)
	Cd2OH+3	6.427e-017	5.648e-018	-16.192	-17.248	-1.056	(0)
	Cd (OH) 3-	2.231e-017	1.703e-017	-16.651	-16.769	-0.117	(0)
	Cd (SeO ₃) 2-2	4.646e-018	1.577e-018	-17.333	-17.802	-0.469	(0)
	Cd (OH) 4-2	6.058e-024	2.056e-024	-23.218	-23.687	-0.469	(0)
	Cd (NO ₃) 2	5.272e-024	5.272e-024	-23.278	-23.278	0.000	(0)
	CdHS ⁺	0.000e+000	0.000e+000	-78.328	-78.446	-0.117	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-149.838	-149.838	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-226.416	-226.533	-0.117	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-302.464	-302.933	-0.469	(0)
Cl		1.412e-003					
	Cl-	1.412e-003	1.155e-003	-2.850	-2.938	-0.087	(0)
	MnCl ⁺	6.882e-008	5.657e-008	-7.162	-7.247	-0.085	(0)
	ZnCl ⁺	6.281e-009	5.104e-009	-8.202	-8.292	-0.090	(0)
	ZnOHC1	4.927e-009	4.927e-009	-8.307	-8.307	0.000	(0)
	AgCl	4.727e-009	4.727e-009	-8.325	-8.325	0.000	(0)
	CdCl ⁺	2.004e-009	1.530e-009	-8.698	-8.815	-0.117	(0)
	AgCl ₂ -	6.228e-010	4.754e-010	-9.206	-9.323	-0.117	(0)
	CuCl	3.209e-010	3.209e-010	-9.494	-9.494	0.000	(0)
	NiCl ⁺	2.597e-010	1.982e-010	-9.586	-9.703	-0.117	(0)
	CoCl ⁺	2.586e-010	1.974e-010	-9.587	-9.705	-0.117	(0)
	CuCl ₂ -	9.527e-011	7.742e-011	-10.021	-10.111	-0.090	(0)
	MnCl ₂	9.226e-011	9.226e-011	-10.035	-10.035	0.000	(0)
	CuCl ⁺	8.203e-011	6.666e-011	-10.086	-10.176	-0.090	(0)
	CdOHC1	4.627e-011	4.627e-011	-10.335	-10.335	0.000	(0)
	PbCl ⁺	3.977e-011	3.035e-011	-10.400	-10.518	-0.117	(0)
	ZnCl ₂	9.340e-012	9.340e-012	-11.030	-11.030	0.000	(0)
	CdCl ₂	7.362e-012	7.362e-012	-11.133	-11.133	0.000	(0)
	AgCl ₃ -2	1.442e-012	4.892e-013	-11.841	-12.311	-0.469	(0)
	HgClOH	2.834e-013	2.834e-013	-12.548	-12.548	0.000	(0)
	PbCl ₂	1.565e-013	1.565e-013	-12.805	-12.805	0.000	(0)
	CuCl ₃ -2	4.187e-014	1.911e-014	-13.378	-13.719	-0.341	(0)
	MnCl ₃ -	3.569e-014	2.934e-014	-13.447	-13.533	-0.085	(0)
	CuCl ₂	2.669e-014	2.669e-014	-13.574	-13.574	0.000	(0)
	HgCl ₂	2.512e-014	2.512e-014	-13.600	-13.600	0.000	(0)
	AgCl ₄ -3	1.312e-014	1.153e-015	-13.882	-14.938	-1.056	(0)
	ZnCl ₃ -	1.054e-014	8.566e-015	-13.977	-14.067	-0.090	(0)
	CdCl ₃ -	7.027e-015	5.363e-015	-14.153	-14.271	-0.117	(0)
	NiCl ₂	1.152e-015	1.152e-015	-14.938	-14.938	0.000	(0)
	UO ₂ Cl ⁺	5.820e-016	4.442e-016	-15.235	-15.352	-0.117	(0)

HgCl3-	3.801e-016	2.901e-016	-15.420	-15.537	-0.117	(0)
PbCl3-	9.428e-017	7.196e-017	-16.026	-16.143	-0.117	(0)
ZnCl4-2	1.084e-017	4.946e-018	-16.965	-17.306	-0.341	(0)
HgCl+	5.688e-018	4.342e-018	-17.245	-17.362	-0.117	(0)
HgCl4-2	3.930e-018	1.333e-018	-17.406	-17.875	-0.469	(0)
CrCl+2	2.749e-018	9.329e-019	-17.561	-18.030	-0.469	(0)
CuCl3-	3.539e-019	2.876e-019	-18.451	-18.541	-0.090	(0)
PbCl4-2	1.119e-019	3.798e-020	-18.951	-19.420	-0.469	(0)
CrOHC12	1.510e-020	1.510e-020	-19.821	-19.821	0.000	(0)
FeCl+2	3.020e-022	1.378e-022	-21.520	-21.861	-0.341	(0)
CrCl2+	1.339e-022	1.022e-022	-21.873	-21.991	-0.117	(0)
VOCl+	1.092e-022	8.336e-023	-21.962	-22.079	-0.117	(0)
CuCl4-2	3.646e-024	1.664e-024	-23.438	-23.779	-0.341	(0)
FeCl2+	8.648e-025	7.108e-025	-24.063	-24.148	-0.085	(0)
CrO3Cl-	1.781e-026	1.359e-026	-25.749	-25.867	-0.117	(0)
FeCl3	8.207e-029	8.207e-029	-28.086	-28.086	0.000	(0)
CoCl+2	1.101e-035	3.735e-036	-34.958	-35.428	-0.469	(0)
UCl+3	0.000e+000	0.000e+000	-44.865	-45.921	-1.056	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-49.111	-49.581	-0.469	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-51.698	-52.167	-0.469	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-63.848	-64.317	-0.469	(0)
Co (2)	2.104e-007					
Co+2	1.456e-007	4.942e-008	-6.837	-7.306	-0.469	(0)
CoSO4	6.052e-008	6.052e-008	-7.218	-7.218	0.000	(0)
CoHCO3+	1.774e-009	1.354e-009	-8.751	-8.868	-0.117	(0)
CoCO3	1.011e-009	1.011e-009	-8.995	-8.995	0.000	(0)
CoOH+	9.527e-010	7.271e-010	-9.021	-9.138	-0.117	(0)
CoCl+	2.586e-010	1.974e-010	-9.587	-9.705	-0.117	(0)
CoF+	1.640e-010	1.252e-010	-9.785	-9.903	-0.117	(0)
Co (OH) 2	4.259e-011	4.259e-011	-10.371	-10.371	0.000	(0)
CoNO2+	7.490e-012	5.716e-012	-11.126	-11.243	-0.117	(0)
Co (NH3) +2	1.667e-013	5.658e-014	-12.778	-13.247	-0.469	(0)
CoNO3+	1.589e-015	1.213e-015	-14.799	-14.916	-0.117	(0)
CoSeO4	1.260e-015	1.260e-015	-14.900	-14.900	0.000	(0)
Co (OH) 3-	8.210e-016	6.266e-016	-15.086	-15.203	-0.117	(0)
CoOOH-	2.061e-016	1.573e-016	-15.686	-15.803	-0.117	(0)
Co2OH+3	2.049e-017	1.801e-018	-16.688	-17.745	-1.056	(0)
Co (NH3) 2+2	6.774e-020	2.299e-020	-19.169	-19.638	-0.469	(0)
Co (OH) 4-2	2.158e-022	7.324e-023	-21.666	-22.135	-0.469	(0)
Co (NO3) 2	3.822e-023	3.822e-023	-22.418	-22.418	0.000	(0)
Co (NH3) 3+2	8.122e-027	2.756e-027	-26.090	-26.560	-0.469	(0)
Co4 (OH) 4+4	4.206e-027	5.577e-029	-26.376	-28.254	-1.877	(0)
Co (NH3) 4+2	4.060e-034	1.378e-034	-33.392	-33.861	-0.469	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-41.193	-41.662	-0.469	(0)
Co (3)	1.756e-028					
CoOH+2	1.756e-028	5.958e-029	-27.756	-28.225	-0.469	(0)
Co+3	9.705e-035	1.590e-035	-34.013	-34.799	-0.786	(0)
CoCl+2	1.101e-035	3.735e-036	-34.958	-35.428	-0.469	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-49.111	-49.581	-0.469	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-58.549	-58.666	-0.117	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-62.843	-63.312	-0.469	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-63.848	-64.317	-0.469	(0)
Cr (2)	5.438e-027					
Cr+2	5.438e-027	1.846e-027	-26.265	-26.734	-0.469	(0)
Cr (3)	1.500e-009					
Cr (OH) 2+	1.184e-009	9.037e-010	-8.927	-9.044	-0.117	(0)
Cr (OH) 3	2.503e-010	2.503e-010	-9.601	-9.601	0.000	(0)
Cr (OH) +2	2.968e-011	1.007e-011	-10.528	-10.997	-0.469	(0)
CrOHSO4	1.467e-011	1.467e-011	-10.834	-10.834	0.000	(0)
CrO2-	1.142e-011	8.719e-012	-10.942	-11.060	-0.117	(0)
Cr (OH) 4-	9.629e-012	7.349e-012	-11.016	-11.134	-0.117	(0)
CrF+2	2.335e-014	7.924e-015	-13.632	-14.101	-0.469	(0)
CrSO4+	1.172e-014	8.948e-015	-13.931	-14.048	-0.117	(0)
Cr+3	7.103e-015	6.243e-016	-14.149	-15.205	-1.056	(0)
CrCl+2	2.749e-018	9.329e-019	-17.561	-18.030	-0.469	(0)
Cr2 (OH) 2SO4+2	3.935e-020	1.335e-020	-19.405	-19.874	-0.469	(0)
CrOHC12	1.510e-020	1.510e-020	-19.821	-19.821	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.869e-021	4.869e-021	-20.313	-20.313	0.000	(0)

CrCl2+	1.339e-022	1.022e-022	-21.873	-21.991	-0.117	(0)
CrNO3+2	1.245e-024	4.226e-025	-23.905	-24.374	-0.469	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-40.601	-41.071	-0.469	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-49.276	-50.332	-1.056	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-51.698	-52.167	-0.469	(0)
Cr (6)	7.287e-015					
CrO4-2	6.937e-015	3.104e-015	-14.159	-14.508	-0.349	(0)
HCrO4-	1.796e-016	1.371e-016	-15.746	-15.863	-0.117	(0)
NaCrO4-	1.437e-016	1.097e-016	-15.842	-15.960	-0.117	(0)
KCrO4-	2.691e-017	2.054e-017	-16.570	-16.687	-0.117	(0)
CrO3SO4-2	1.031e-023	3.499e-024	-22.987	-23.456	-0.469	(0)
H2CrO4	1.516e-024	1.516e-024	-23.819	-23.819	0.000	(0)
CrO3Cl-	1.781e-026	1.359e-026	-25.749	-25.867	-0.117	(0)
Cr2O7-2	1.921e-030	6.520e-031	-29.716	-30.186	-0.469	(0)
Cu (1)	7.055e-010					
CuCl	3.209e-010	3.209e-010	-9.494	-9.494	0.000	(0)
Cu+	2.893e-010	2.208e-010	-9.539	-9.656	-0.117	(0)
CuCl2-	9.527e-011	7.742e-011	-10.021	-10.111	-0.090	(0)
CuCl3-2	4.187e-014	1.911e-014	-13.378	-13.719	-0.341	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.342	-147.728	-0.386	(0)
CuS4S5-3	0.000e+000	0.000e+000	-148.092	-148.458	-0.365	(0)
Cu (2)	5.142e-007					
CuCO3	2.595e-007	2.595e-007	-6.586	-6.586	0.000	(0)
CuOH+	1.045e-007	8.495e-008	-6.981	-7.071	-0.090	(0)
Cu+2	8.140e-008	3.643e-008	-7.089	-7.439	-0.349	(0)
CuSO4	5.122e-008	5.122e-008	-7.291	-7.291	0.000	(0)
Cu (OH) 2	1.250e-008	1.250e-008	-7.903	-7.903	0.000	(0)
Cu (CO3) 2-2	2.490e-009	8.451e-010	-8.604	-9.073	-0.469	(0)
CuHCO3+	1.060e-009	8.094e-010	-8.975	-9.092	-0.117	(0)
Cu2 (OH) 2+2	5.341e-010	1.813e-010	-9.272	-9.742	-0.469	(0)
CuF+	2.412e-010	1.841e-010	-9.618	-9.735	-0.117	(0)
CuNO2+	8.204e-011	6.261e-011	-10.086	-10.203	-0.117	(0)
CuCl+	8.203e-011	6.666e-011	-10.086	-10.176	-0.090	(0)
Cu (OH) 3-	2.477e-011	1.890e-011	-10.606	-10.723	-0.117	(0)
CuNH3+2	1.046e-011	3.550e-012	-10.980	-11.450	-0.469	(0)
CuCl2	2.669e-014	2.669e-014	-13.574	-13.574	0.000	(0)
Cu (NO2) 2	1.052e-014	1.052e-014	-13.978	-13.978	0.000	(0)
CuNO3+	2.337e-015	1.784e-015	-14.631	-14.749	-0.117	(0)
Cu (OH) 4-2	3.233e-016	1.097e-016	-15.490	-15.960	-0.469	(0)
CuCl3-	3.539e-019	2.876e-019	-18.451	-18.541	-0.090	(0)
CuCl4-2	3.646e-024	1.664e-024	-23.438	-23.779	-0.341	(0)
Cu (NO3) 2	3.478e-024	3.478e-024	-23.459	-23.459	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-217.210	-217.327	-0.117	(0)
F	1.171e-004					
F-	9.791e-005	8.008e-005	-4.009	-4.096	-0.087	(0)
MgF+	1.573e-005	1.286e-005	-4.803	-4.891	-0.088	(0)
CaF+	2.911e-006	2.392e-006	-5.536	-5.621	-0.085	(0)
NaF	3.593e-007	3.593e-007	-6.445	-6.445	0.000	(0)
MnF+	1.509e-007	1.241e-007	-6.821	-6.906	-0.085	(0)
ZnF+	3.684e-009	2.812e-009	-8.434	-8.551	-0.117	(0)
HF	1.616e-009	1.616e-009	-8.791	-8.791	0.000	(0)
BF (OH) 3-	6.697e-010	5.336e-010	-9.174	-9.273	-0.099	(0)
CuF+	2.412e-010	1.841e-010	-9.618	-9.735	-0.117	(0)
NiF+	1.768e-010	1.349e-010	-9.752	-9.870	-0.117	(0)
CoF+	1.640e-010	1.252e-010	-9.785	-9.903	-0.117	(0)
CdF+	2.307e-011	1.761e-011	-10.637	-10.754	-0.117	(0)
AlF2+	8.276e-012	6.831e-012	-11.082	-11.165	-0.083	(0)
AlF3	6.888e-012	6.888e-012	-11.162	-11.162	0.000	(0)
PbF+	5.478e-012	4.181e-012	-11.261	-11.379	-0.117	(0)
UO2F+	3.436e-012	2.623e-012	-11.464	-11.581	-0.117	(0)
HF2-	6.094e-013	4.921e-013	-12.215	-12.308	-0.093	(0)
UO2F2	6.057e-013	6.057e-013	-12.218	-12.218	0.000	(0)
AlF+2	4.616e-013	2.143e-013	-12.336	-12.669	-0.333	(0)
AgF	4.034e-013	4.034e-013	-12.394	-12.394	0.000	(0)
AlF4-	3.382e-013	2.764e-013	-12.471	-12.558	-0.088	(0)
BF2 (OH) 2-	7.830e-014	6.238e-014	-13.106	-13.205	-0.099	(0)
CrF+2	2.335e-014	7.924e-015	-13.632	-14.101	-0.469	(0)
UO2F3-	1.596e-014	1.219e-014	-13.797	-13.914	-0.117	(0)

PbF2	6.589e-015	6.589e-015	-14.181	-14.181	0.000	(0)
CdF2	2.813e-015	2.813e-015	-14.551	-14.551	0.000	(0)
UO2F4-2	2.284e-017	7.751e-018	-16.641	-17.111	-0.469	(0)
VO2F	1.960e-017	1.960e-017	-16.708	-16.708	0.000	(0)
H2F2	6.999e-018	6.999e-018	-17.155	-17.155	0.000	(0)
PbF3-	1.311e-018	1.001e-018	-17.882	-18.000	-0.117	(0)
FeF2+	9.049e-019	7.438e-019	-18.043	-18.129	-0.085	(0)
FeF+2	7.604e-019	3.471e-019	-18.119	-18.460	-0.341	(0)
VO2F2-	7.467e-019	5.699e-019	-18.127	-18.244	-0.117	(0)
FeF3	8.405e-020	8.405e-020	-19.075	-19.075	0.000	(0)
BF3OH-	3.331e-020	2.654e-020	-19.477	-19.576	-0.099	(0)
VOF+	1.620e-020	1.236e-020	-19.791	-19.908	-0.117	(0)
VO2F3-2	1.678e-021	5.693e-022	-20.775	-21.245	-0.469	(0)
VOF2	3.712e-022	3.712e-022	-21.430	-21.430	0.000	(0)
PbF4-2	1.131e-022	3.837e-023	-21.947	-22.416	-0.469	(0)
VOF3-	1.382e-024	1.055e-024	-23.860	-23.977	-0.117	(0)
HgF+	7.330e-025	5.595e-025	-24.135	-24.252	-0.117	(0)
Sb(OH) 2F	2.987e-025	2.987e-025	-24.525	-24.525	0.000	(0)
SbOF	2.939e-025	2.939e-025	-24.532	-24.532	0.000	(0)
VO2F4-3	2.552e-025	2.243e-026	-24.593	-25.649	-1.056	(0)
BF4-	1.792e-025	1.428e-025	-24.747	-24.845	-0.099	(0)
VOF4-2	1.005e-027	3.410e-028	-26.998	-27.467	-0.469	(0)
UF3+	5.556e-036	4.240e-036	-35.255	-35.373	-0.117	(0)
UF2+2	9.845e-037	3.341e-037	-36.007	-36.476	-0.469	(0)
UF4	3.723e-038	3.723e-038	-37.429	-37.429	0.000	(0)
UF+3	3.770e-039	3.314e-040	-38.424	-39.480	-1.056	(0)
UF5-	1.548e-040	1.182e-040	-39.810	-39.928	-0.117	(0)
UF6-2	0.000e+000	0.000e+000	-41.075	-41.544	-0.469	(0)
Fe (2)	2.366e-012					
Fe+2	1.551e-012	5.265e-013	-11.809	-12.279	-0.469	(0)
FeSO4	7.932e-013	7.932e-013	-12.101	-12.101	0.000	(0)
FeOH+	1.880e-014	1.546e-014	-13.726	-13.811	-0.085	(0)
FeHCO3+	2.811e-015	2.334e-015	-14.551	-14.632	-0.081	(0)
Fe (OH) 2	9.053e-018	9.053e-018	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	2.568e-018	2.111e-018	-17.590	-17.675	-0.085	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.520	-160.520	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.962	-237.079	-0.117	(0)
Fe (3)	1.117e-009					
Fe (OH) 2+	6.541e-010	5.399e-010	-9.184	-9.268	-0.083	(0)
Fe (OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.557e-011	2.936e-011	-10.449	-10.532	-0.083	(0)
FeOH+2	4.123e-015	1.882e-015	-14.385	-14.725	-0.341	(0)
FeF2+	9.049e-019	7.438e-019	-18.043	-18.129	-0.085	(0)
FeF+2	7.604e-019	3.471e-019	-18.119	-18.460	-0.341	(0)
FeSO4+	3.312e-019	2.722e-019	-18.480	-18.565	-0.085	(0)
FeF3	8.405e-020	8.405e-020	-19.075	-19.075	0.000	(0)
Fe (SO4) 2-	4.680e-020	3.572e-020	-19.330	-19.447	-0.117	(0)
Fe+3	2.413e-020	3.952e-021	-19.617	-20.403	-0.786	(0)
FeCl+2	3.020e-022	1.378e-022	-21.520	-21.861	-0.341	(0)
FeHSeO3+2	1.239e-024	4.204e-025	-23.907	-24.376	-0.469	(0)
FeCl2+	8.648e-025	7.108e-025	-24.063	-24.148	-0.085	(0)
Fe2 (OH) 2+4	8.842e-027	1.173e-028	-26.053	-27.931	-1.877	(0)
FeNO3+2	1.804e-027	6.121e-028	-26.744	-27.213	-0.469	(0)
FeCl3	8.207e-029	8.207e-029	-28.086	-28.086	0.000	(0)
Fe3 (OH) 4+5	7.851e-034	9.150e-037	-33.105	-36.039	-2.933	(0)
H (0)	3.988e-029					
H2	1.994e-029	2.018e-029	-28.700	-28.695	0.005	(0)
Hg (0)	2.663e-010					
Hg	2.663e-010	2.663e-010	-9.575	-9.575	0.000	(0)
Hg (1)	2.008e-022					
Hg2+2	1.004e-022	3.408e-023	-21.998	-22.468	-0.469	(0)
Hg (2)	9.479e-013					
Hg (OH) 2	6.388e-013	6.466e-013	-12.195	-12.189	0.005	(0)
HgClOH	2.834e-013	2.834e-013	-12.548	-12.548	0.000	(0)
HgCl2	2.512e-014	2.512e-014	-13.600	-13.600	0.000	(0)
HgCl3-	3.801e-016	2.901e-016	-15.420	-15.537	-0.117	(0)
HgCO3	2.729e-016	2.729e-016	-15.564	-15.564	0.000	(0)
HgOH+	7.249e-018	5.533e-018	-17.140	-17.257	-0.117	(0)

	HgCl+	5.688e-018	4.342e-018	-17.245	-17.362	-0.117	(0)
	HgCl4-2	3.930e-018	1.333e-018	-17.406	-17.875	-0.469	(0)
	Hg (CO3) 2-2	3.076e-018	1.044e-018	-17.512	-17.981	-0.469	(0)
	HgHCO3+	9.084e-020	6.933e-020	-19.042	-19.159	-0.117	(0)
	Hg (OH) 3-	7.865e-020	6.003e-020	-19.104	-19.222	-0.117	(0)
	Hg (NH3) 2+2	3.178e-020	1.079e-020	-19.498	-19.967	-0.469	(0)
	HgNH3+2	3.337e-021	1.132e-021	-20.477	-20.946	-0.469	(0)
	Hg+2	5.554e-022	1.885e-022	-21.255	-21.725	-0.469	(0)
	HgSO4	3.028e-022	3.028e-022	-21.519	-21.519	0.000	(0)
	HgF+	7.330e-025	5.595e-025	-24.135	-24.252	-0.117	(0)
	Hg (NH3) 3+2	1.205e-027	4.089e-028	-26.919	-27.388	-0.469	(0)
	HgNO3+	1.412e-030	1.078e-030	-29.850	-29.968	-0.117	(0)
	Hg (NH3) 4+2	9.116e-035	3.094e-035	-34.040	-34.510	-0.469	(0)
	Hg (NO3) 2	6.936e-039	6.936e-039	-38.159	-38.159	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-139.006	-139.123	-0.117	(0)
	HgS2-2	0.000e+000	0.000e+000	-139.497	-139.966	-0.469	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-140.594	-140.594	0.000	(0)
K		2.271e-003					
	K+	2.177e-003	1.781e-003	-2.662	-2.749	-0.087	(0)
	KSO4-	9.375e-005	7.738e-005	-4.028	-4.111	-0.083	(0)
	KCrO4-	2.691e-017	2.054e-017	-16.570	-16.687	-0.117	(0)
Mg		4.819e-003					
	Mg+2	3.197e-003	1.431e-003	-2.495	-2.844	-0.349	(0)
	MgSO4	1.598e-003	1.598e-003	-2.796	-2.796	0.000	(0)
	MgF+	1.573e-005	1.286e-005	-4.803	-4.891	-0.088	(0)
	MgHCO3+	6.344e-006	5.156e-006	-5.198	-5.288	-0.090	(0)
	MgCO3	1.440e-006	1.440e-006	-5.842	-5.842	0.000	(0)
	MgOH+	5.035e-007	4.200e-007	-6.298	-6.377	-0.079	(0)
	MgH2BO3+	4.425e-008	3.526e-008	-7.354	-7.453	-0.099	(0)
Mn (2)		1.578e-004					
	Mn+2	1.147e-004	3.891e-005	-3.941	-4.410	-0.469	(0)
	MnSO4	4.247e-005	4.247e-005	-4.372	-4.372	0.000	(0)
	MnHCO3+	3.326e-007	2.734e-007	-6.478	-6.563	-0.085	(0)
	MnF+	1.509e-007	1.241e-007	-6.821	-6.906	-0.085	(0)
	MnOH+	8.770e-008	7.208e-008	-7.057	-7.142	-0.085	(0)
	MnCl+	6.882e-008	5.657e-008	-7.162	-7.247	-0.085	(0)
	MnCl2	9.226e-011	9.226e-011	-10.035	-10.035	0.000	(0)
	MnNO3+	1.251e-012	9.551e-013	-11.903	-12.020	-0.117	(0)
	MnSeO4	5.329e-013	5.329e-013	-12.273	-12.273	0.000	(0)
	MnCl3-	3.569e-014	2.934e-014	-13.447	-13.533	-0.085	(0)
	Mn (OH) 3-	2.947e-016	2.422e-016	-15.531	-15.616	-0.085	(0)
	Mn (NO3) 2	3.715e-020	3.715e-020	-19.430	-19.430	0.000	(0)
	Mn (OH) 4-2	1.264e-021	5.767e-022	-20.898	-21.239	-0.341	(0)
	MnSe	0.000e+000	0.000e+000	-41.099	-41.099	0.000	(0)
Mn (3)		8.575e-025					
	Mn+3	8.575e-025	1.405e-025	-24.067	-24.852	-0.786	(0)
Mn (6)		1.142e-040					
	MnO4-2	1.142e-040	0.000e+000	-39.942	-40.283	-0.341	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-44.652	-44.748	-0.096	(0)
Mo		7.236e-007					
	MoO4-2	7.235e-007	3.238e-007	-6.141	-6.490	-0.349	(0)
	HMoO4-	1.152e-010	8.791e-011	-9.939	-10.056	-0.117	(0)
	H2MoO4	8.786e-015	8.786e-015	-14.056	-14.056	0.000	(0)
	Ag2MoO4	4.928e-025	4.928e-025	-24.307	-24.307	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-45.652	-46.708	-1.056	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-51.133	-55.357	-4.224	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-53.902	-56.835	-2.933	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-58.041	-59.918	-1.877	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-63.481	-64.537	-1.056	(0)
N (-3)		3.139e-007					
	NH4+	2.861e-007	2.279e-007	-6.544	-6.642	-0.099	(0)
	NH4SO4-	1.824e-008	1.499e-008	-7.739	-7.824	-0.085	(0)
	NH3	9.524e-009	9.524e-009	-8.021	-8.021	0.000	(0)
	CaNH3+2	9.670e-011	3.282e-011	-10.015	-10.484	-0.469	(0)
	CuNH3+2	1.046e-011	3.550e-012	-10.980	-11.450	-0.469	(0)
	NiNH3+2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
	Co (NH3) +2	1.667e-013	5.658e-014	-12.778	-13.247	-0.469	(0)

AgNH3+	5.109e-014	3.899e-014	-13.292	-13.409	-0.117	(0)
BaNH3+2	2.072e-016	7.032e-017	-15.684	-16.153	-0.469	(0)
Ag (NH3) 2+	3.955e-018	3.018e-018	-17.403	-17.520	-0.117	(0)
Ni (NH3) 2+2	1.392e-018	4.723e-019	-17.856	-18.326	-0.469	(0)
Ca (NH3) 2+2	3.666e-019	1.244e-019	-18.436	-18.905	-0.469	(0)
Co (NH3) 2+2	6.774e-020	2.299e-020	-19.169	-19.638	-0.469	(0)
Hg (NH3) 2+2	3.178e-020	1.079e-020	-19.498	-19.967	-0.469	(0)
HgNH3+2	3.337e-021	1.132e-021	-20.477	-20.946	-0.469	(0)
Co (NH3) 3+2	8.122e-027	2.756e-027	-26.090	-26.560	-0.469	(0)
Hg (NH3) 3+2	1.205e-027	4.089e-028	-26.919	-27.388	-0.469	(0)
Co (NH3) 4+2	4.060e-034	1.378e-034	-33.392	-33.861	-0.469	(0)
Hg (NH3) 4+2	9.116e-035	3.094e-035	-34.040	-34.510	-0.469	(0)
Cr (NH3) 5OH+2	0.000e+000	0.000e+000	-40.601	-41.071	-0.469	(0)
Co (NH3) 5+2	0.000e+000	0.000e+000	-41.193	-41.662	-0.469	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-49.111	-49.581	-0.469	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-49.276	-50.332	-1.056	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-51.698	-52.167	-0.469	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-58.549	-58.666	-0.117	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-62.843	-63.312	-0.469	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-63.848	-64.317	-0.469	(0)
N (3)	2.046e-005					
NO2-	2.046e-005	1.642e-005	-4.689	-4.785	-0.096	(0)
CuNO2+	8.204e-011	6.261e-011	-10.086	-10.203	-0.117	(0)
CoNO2+	7.490e-012	5.716e-012	-11.126	-11.243	-0.117	(0)
AgNO2	6.877e-012	6.877e-012	-11.163	-11.163	0.000	(0)
Cu (NO2) 2	1.052e-014	1.052e-014	-13.978	-13.978	0.000	(0)
Ag (NO2) 2-	2.291e-016	1.748e-016	-15.640	-15.757	-0.117	(0)
N (5)	1.911e-008					
NO3-	1.893e-008	1.549e-008	-7.723	-7.810	-0.087	(0)
CaNO3+	1.756e-010	1.340e-010	-9.755	-9.873	-0.117	(0)
MnNO3+	1.251e-012	9.551e-013	-11.903	-12.020	-0.117	(0)
ZnNO3+	8.969e-014	6.845e-014	-13.047	-13.165	-0.117	(0)
NiNO3+	3.419e-015	2.609e-015	-14.466	-14.583	-0.117	(0)
CuNO3+	2.337e-015	1.784e-015	-14.631	-14.749	-0.117	(0)
CoNO3+	1.589e-015	1.213e-015	-14.799	-14.916	-0.117	(0)
BaNO3+	1.190e-015	9.083e-016	-14.924	-15.042	-0.117	(0)
CdNO3+	8.900e-016	6.793e-016	-15.051	-15.168	-0.117	(0)
PbNO3+	2.223e-016	1.697e-016	-15.653	-15.770	-0.117	(0)
AgNO3	2.467e-017	2.467e-017	-16.608	-16.608	0.000	(0)
Mn (NO3) 2	3.715e-020	3.715e-020	-19.430	-19.430	0.000	(0)
UO2NO3+	9.604e-021	7.330e-021	-20.018	-20.135	-0.117	(0)
Zn (NO3) 2	2.115e-022	2.115e-022	-21.675	-21.675	0.000	(0)
Co (NO3) 2	3.822e-023	3.822e-023	-22.418	-22.418	0.000	(0)
Cd (NO3) 2	5.272e-024	5.272e-024	-23.278	-23.278	0.000	(0)
Pb (NO3) 2	4.463e-024	4.463e-024	-23.350	-23.350	0.000	(0)
Cu (NO3) 2	3.478e-024	3.478e-024	-23.459	-23.459	0.000	(0)
CrNO3+2	1.245e-024	4.226e-025	-23.905	-24.374	-0.469	(0)
VO2NO3	1.093e-024	1.093e-024	-23.961	-23.961	0.000	(0)
FeNO3+2	1.804e-027	6.121e-028	-26.744	-27.213	-0.469	(0)
HgNO3+	1.412e-030	1.078e-030	-29.850	-29.968	-0.117	(0)
Hg (NO3) 2	6.936e-039	6.936e-039	-38.159	-38.159	0.000	(0)
Na	8.980e-003					
Na+	8.694e-003	7.111e-003	-2.061	-2.148	-0.087	(0)
NaSO4-	2.840e-004	2.344e-004	-3.547	-3.630	-0.083	(0)
NaHCO3	1.408e-006	1.408e-006	-5.851	-5.851	0.000	(0)
NaF	3.593e-007	3.593e-007	-6.445	-6.445	0.000	(0)
NaCO3-	1.941e-007	1.602e-007	-6.712	-6.795	-0.083	(0)
NaH2BO3	8.009e-009	8.009e-009	-8.096	-8.096	0.000	(0)
NaCrO4-	1.437e-016	1.097e-016	-15.842	-15.960	-0.117	(0)
Ni	2.402e-007					
Ni+2	1.499e-007	6.708e-008	-6.824	-7.173	-0.349	(0)
NiSO4	8.215e-008	8.215e-008	-7.085	-7.085	0.000	(0)
NiHCO3+	3.816e-009	2.912e-009	-8.418	-8.536	-0.117	(0)
NiCO3	3.028e-009	3.028e-009	-8.519	-8.519	0.000	(0)
NiOH+	8.159e-010	6.228e-010	-9.088	-9.206	-0.117	(0)
NiCl+	2.597e-010	1.982e-010	-9.586	-9.703	-0.117	(0)
NiF+	1.768e-010	1.349e-010	-9.752	-9.870	-0.117	(0)
Ni (SO4) 2-2	4.920e-011	1.670e-011	-10.308	-10.777	-0.469	(0)

Ni (OH) 2	3.648e-011	3.648e-011	-10.438	-10.438	0.000	(0)
NiNH3+2	1.011e-012	3.431e-013	-11.995	-12.465	-0.469	(0)
Ni (OH) 3-	3.524e-014	2.690e-014	-13.453	-13.570	-0.117	(0)
NiNO3+	3.419e-015	2.609e-015	-14.466	-14.583	-0.117	(0)
NiSeO4	1.596e-015	1.596e-015	-14.797	-14.797	0.000	(0)
NiCl2	1.152e-015	1.152e-015	-14.938	-14.938	0.000	(0)
Ni (NH3) 2+2	1.392e-018	4.723e-019	-17.856	-18.326	-0.469	(0)
O (0)	2.455e-035					
O2	1.228e-035	1.243e-035	-34.911	-34.906	0.005	(0)
Pb	8.977e-009					
PbCO3	2.695e-009	2.695e-009	-8.570	-8.570	0.000	(0)
PbSO4	2.227e-009	2.227e-009	-8.652	-8.652	0.000	(0)
PbOH+	1.798e-009	1.372e-009	-8.745	-8.863	-0.117	(0)
Pb+2	1.655e-009	7.409e-010	-8.781	-9.130	-0.349	(0)
PbHCO3+	2.540e-010	1.938e-010	-9.595	-9.713	-0.117	(0)
Pb (SO4) 2-2	2.427e-010	8.237e-011	-9.615	-10.084	-0.469	(0)
PbCl+	3.977e-011	3.035e-011	-10.400	-10.518	-0.117	(0)
Pb (OH) 2	3.200e-011	3.200e-011	-10.495	-10.495	0.000	(0)
Pb (CO3) 2-2	2.771e-011	9.402e-012	-10.557	-11.027	-0.469	(0)
PbF+	5.478e-012	4.181e-012	-11.261	-11.379	-0.117	(0)
PbCl2	1.565e-013	1.565e-013	-12.805	-12.805	0.000	(0)
Pb (OH) 3-	3.092e-014	2.360e-014	-13.510	-13.627	-0.117	(0)
PbF2	6.589e-015	6.589e-015	-14.181	-14.181	0.000	(0)
PbNO3+	2.223e-016	1.697e-016	-15.653	-15.770	-0.117	(0)
Pb2OH+3	1.833e-016	1.611e-017	-15.737	-16.793	-1.056	(0)
PbCl3-	9.428e-017	7.196e-017	-16.026	-16.143	-0.117	(0)
Pb (OH) 4-2	1.256e-017	4.262e-018	-16.901	-17.370	-0.469	(0)
PbF3-	1.311e-018	1.001e-018	-17.882	-18.000	-0.117	(0)
PbCl4-2	1.119e-019	3.798e-020	-18.951	-19.420	-0.469	(0)
Pb3 (OH) 4+2	4.461e-020	1.514e-020	-19.351	-19.820	-0.469	(0)
PbF4-2	1.131e-022	3.837e-023	-21.947	-22.416	-0.469	(0)
Pb4 (OH) 4+4	6.718e-024	8.909e-026	-23.173	-25.050	-1.877	(0)
Pb (NO3) 2	4.463e-024	4.463e-024	-23.350	-23.350	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.052	-151.052	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-228.230	-228.348	-0.117	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.479	-73.479	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.328	-78.446	-0.117	(0)
HS-	0.000e+000	0.000e+000	-78.478	-78.596	-0.117	(0)
H2S	0.000e+000	0.000e+000	-79.441	-79.441	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.627	-80.096	-0.469	(0)
S6-2	0.000e+000	0.000e+000	-80.142	-80.612	-0.469	(0)
S4-2	0.000e+000	0.000e+000	-80.222	-80.692	-0.469	(0)
S3-2	0.000e+000	0.000e+000	-81.028	-81.497	-0.469	(0)
S2-2	0.000e+000	0.000e+000	-82.044	-82.514	-0.469	(0)
S-2	0.000e+000	0.000e+000	-87.690	-88.031	-0.341	(0)
HgHS2-	0.000e+000	0.000e+000	-139.006	-139.123	-0.117	(0)
HgS2-2	0.000e+000	0.000e+000	-139.497	-139.966	-0.469	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-140.594	-140.594	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.342	-147.728	-0.386	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.373	-147.593	-0.220	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.858	-147.975	-0.117	(0)
CuS4S5-3	0.000e+000	0.000e+000	-148.092	-148.458	-0.365	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-148.154	-148.271	-0.117	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.772	-149.168	-0.397	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.104	-149.479	-0.375	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.838	-149.838	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-150.126	-150.126	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.052	-151.052	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.520	-160.520	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-217.210	-217.327	-0.117	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-225.325	-225.442	-0.117	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-226.416	-226.533	-0.117	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-227.088	-227.557	-0.469	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-228.230	-228.348	-0.117	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.962	-237.079	-0.117	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-302.464	-302.933	-0.469	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-305.028	-305.498	-0.469	(0)

Sb2S4-2	0.000e+000	0.000e+000	-317.768	-318.237	-0.469	(0)
S (6)	1.958e-002					
SO4-2	1.371e-002	6.138e-003	-1.863	-2.212	-0.349	(0)
CaSO4	3.848e-003	3.848e-003	-2.415	-2.415	0.000	(0)
MgSO4	1.598e-003	1.598e-003	-2.796	-2.796	0.000	(0)
NaSO4-	2.840e-004	2.344e-004	-3.547	-3.630	-0.083	(0)
KSO4-	9.375e-005	7.738e-005	-4.028	-4.111	-0.083	(0)
MnSO4	4.247e-005	4.247e-005	-4.372	-4.372	0.000	(0)
ZnSO4	2.363e-006	2.363e-006	-5.627	-5.627	0.000	(0)
Zn (SO4) 2-2	3.722e-007	1.263e-007	-6.429	-6.899	-0.469	(0)
NiSO4	8.215e-008	8.215e-008	-7.085	-7.085	0.000	(0)
CoSO4	6.052e-008	6.052e-008	-7.218	-7.218	0.000	(0)
CuSO4	5.122e-008	5.122e-008	-7.291	-7.291	0.000	(0)
CdSO4	1.996e-008	1.996e-008	-7.700	-7.700	0.000	(0)
NH4SO4-	1.824e-008	1.499e-008	-7.739	-7.824	-0.085	(0)
HSO4-	1.001e-008	8.184e-009	-7.999	-8.087	-0.088	(0)
Cd (SO4) 2-2	4.869e-009	1.652e-009	-8.313	-8.782	-0.469	(0)
PbSO4	2.227e-009	2.227e-009	-8.652	-8.652	0.000	(0)
AgSO4-	3.217e-010	2.456e-010	-9.493	-9.610	-0.117	(0)
Pb (SO4) 2-2	2.427e-010	8.237e-011	-9.615	-10.084	-0.469	(0)
Ni (SO4) 2-2	4.920e-011	1.670e-011	-10.308	-10.777	-0.469	(0)
CrOHSO4	1.467e-011	1.467e-011	-10.834	-10.834	0.000	(0)
UO2SO4	2.204e-012	2.204e-012	-11.657	-11.657	0.000	(0)
FeSO4	7.932e-013	7.932e-013	-12.101	-12.101	0.000	(0)
UO2 (SO4) 2-2	5.255e-013	1.783e-013	-12.279	-12.749	-0.469	(0)
AlSO4+	1.559e-014	1.275e-014	-13.807	-13.895	-0.088	(0)
CrSO4+	1.172e-014	8.948e-015	-13.931	-14.048	-0.117	(0)
Al (SO4) 2-	1.026e-015	8.384e-016	-14.989	-15.077	-0.088	(0)
VO2SO4-	2.680e-017	2.045e-017	-16.572	-16.689	-0.117	(0)
FeSO4+	3.312e-019	2.722e-019	-18.480	-18.565	-0.085	(0)
Fe (SO4) 2-	4.680e-020	3.572e-020	-19.330	-19.447	-0.117	(0)
VOSO4	4.350e-020	4.350e-020	-19.361	-19.361	0.000	(0)
Cr2 (OH) 2SO4+2	3.935e-020	1.335e-020	-19.405	-19.874	-0.469	(0)
Cr2 (OH) 2 (SO4) 2	4.869e-021	4.869e-021	-20.313	-20.313	0.000	(0)
HgSO4	3.028e-022	3.028e-022	-21.519	-21.519	0.000	(0)
CrO3SO4-2	1.031e-023	3.499e-024	-22.987	-23.456	-0.469	(0)
VSO4+	1.118e-034	8.537e-035	-33.951	-34.069	-0.117	(0)
U (SO4) 2	2.470e-039	2.470e-039	-38.607	-38.607	0.000	(0)
USO4+2	1.493e-040	0.000e+000	-39.826	-40.295	-0.469	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-58.549	-58.666	-0.117	(0)
Sb (3)	3.457e-019					
Sb (OH) 3	1.749e-019	1.749e-019	-18.757	-18.757	0.000	(0)
HSbO2	1.708e-019	1.708e-019	-18.767	-18.767	0.000	(0)
SbO2-	2.656e-023	2.027e-023	-22.576	-22.693	-0.117	(0)
Sb (OH) 4-	1.520e-023	1.160e-023	-22.818	-22.935	-0.117	(0)
Sb (OH) 2F	2.987e-025	2.987e-025	-24.525	-24.525	0.000	(0)
SbOF	2.939e-025	2.939e-025	-24.532	-24.532	0.000	(0)
Sb (OH) 2+	7.597e-026	5.798e-026	-25.119	-25.237	-0.117	(0)
SbO+	2.621e-026	2.000e-026	-25.582	-25.699	-0.117	(0)
Sb2S4-2	0.000e+000	0.000e+000	-317.768	-318.237	-0.469	(0)
Sb (5)	2.469e-007					
SbO3-	2.466e-007	1.882e-007	-6.608	-6.725	-0.117	(0)
Sb (OH) 6-	2.686e-010	2.197e-010	-9.571	-9.658	-0.087	(0)
SbO2+	1.318e-023	1.006e-023	-22.880	-22.997	-0.117	(0)
Se (-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	8.872e-040	6.772e-040	-39.052	-39.169	-0.117	(0)
MnSe	0.000e+000	0.000e+000	-41.099	-41.099	0.000	(0)
H2Se	0.000e+000	0.000e+000	-43.144	-43.144	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.835	-46.304	-0.469	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-82.073	-83.951	-1.877	(0)
Se (4)	8.735e-008					
HSeO3-	5.274e-008	4.025e-008	-7.278	-7.395	-0.117	(0)
SeO3-2	3.461e-008	1.174e-008	-7.461	-7.930	-0.469	(0)
H2SeO3	2.343e-013	2.343e-013	-12.630	-12.630	0.000	(0)
AgSeO3-	1.983e-014	1.513e-014	-13.703	-13.820	-0.117	(0)
Cd (SeO3) 2-2	4.646e-018	1.577e-018	-17.333	-17.802	-0.469	(0)
Ag (SeO3) 2-3	1.811e-020	1.591e-021	-19.742	-20.798	-1.056	(0)

FeHSeO3+2	1.239e-024	4.204e-025	-23.907	-24.376	-0.469	(0)
Se (6)	1.142e-010					
SeO4-2	1.137e-010	5.088e-011	-9.944	-10.293	-0.349	(0)
MnSeO4	5.329e-013	5.329e-013	-12.273	-12.273	0.000	(0)
ZnSeO4	1.387e-014	1.387e-014	-13.858	-13.858	0.000	(0)
NiSeO4	1.596e-015	1.596e-015	-14.797	-14.797	0.000	(0)
CoSeO4	1.260e-015	1.260e-015	-14.900	-14.900	0.000	(0)
CdSeO4	1.314e-016	1.314e-016	-15.881	-15.881	0.000	(0)
HSeO4-	4.559e-017	3.479e-017	-16.341	-16.459	-0.117	(0)
Zn (SeO4) 2-2	2.108e-024	7.153e-025	-23.676	-24.146	-0.469	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.331	-58.387	-1.056	(0)
U (4)	4.343e-019					
U (OH) 5-	4.342e-019	3.314e-019	-18.362	-18.480	-0.117	(0)
U (OH) 4	1.895e-022	1.895e-022	-21.722	-21.722	0.000	(0)
U (OH) 3+	1.239e-026	9.460e-027	-25.907	-26.024	-0.117	(0)
U (OH) 2+2	1.760e-031	5.973e-032	-30.754	-31.224	-0.469	(0)
UF3+	5.556e-036	4.240e-036	-35.255	-35.373	-0.117	(0)
UF2+2	9.845e-037	3.341e-037	-36.007	-36.476	-0.469	(0)
UOH+3	4.370e-037	3.841e-038	-36.359	-37.416	-1.056	(0)
UF4	3.723e-038	3.723e-038	-37.429	-37.429	0.000	(0)
UF+3	3.770e-039	3.314e-040	-38.424	-39.480	-1.056	(0)
U (SO4) 2	2.470e-039	2.470e-039	-38.607	-38.607	0.000	(0)
UF5-	1.548e-040	1.182e-040	-39.810	-39.928	-0.117	(0)
USO4+2	1.493e-040	0.000e+000	-39.826	-40.295	-0.469	(0)
UF6-2	0.000e+000	0.000e+000	-41.075	-41.544	-0.469	(0)
U+4	0.000e+000	0.000e+000	-42.806	-44.683	-1.877	(0)
UC1+3	0.000e+000	0.000e+000	-44.865	-45.921	-1.056	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-157.779	-167.284	-9.504	(0)
U (5)	2.344e-015					
UO2+	2.344e-015	1.789e-015	-14.630	-14.747	-0.117	(0)
U (6)	2.086e-007					
UO2 (CO3) 3-4	1.261e-007	1.673e-009	-6.899	-8.777	-1.877	(0)
UO2 (CO3) 2-2	8.128e-008	2.758e-008	-7.090	-7.559	-0.469	(0)
UO2CO3	1.143e-009	1.143e-009	-8.942	-8.942	0.000	(0)
UO2OH+	2.886e-011	2.202e-011	-10.540	-10.657	-0.117	(0)
UO2F+	3.436e-012	2.623e-012	-11.464	-11.581	-0.117	(0)
UO2SO4	2.204e-012	2.204e-012	-11.657	-11.657	0.000	(0)
UO2F2	6.057e-013	6.057e-013	-12.218	-12.218	0.000	(0)
UO2+2	5.301e-013	2.372e-013	-12.276	-12.625	-0.349	(0)
UO2 (SO4) 2-2	5.255e-013	1.783e-013	-12.279	-12.749	-0.469	(0)
UO2F3-	1.596e-014	1.219e-014	-13.797	-13.914	-0.117	(0)
(UO2) 3 (OH) 5+	9.581e-015	7.313e-015	-14.019	-14.136	-0.117	(0)
(UO2) 2 (OH) 2+2	2.372e-015	8.050e-016	-14.625	-15.094	-0.469	(0)
UO2Cl+	5.820e-016	4.442e-016	-15.235	-15.352	-0.117	(0)
UO2F4-2	2.284e-017	7.751e-018	-16.641	-17.111	-0.469	(0)
UO2NO3+	9.604e-021	7.330e-021	-20.018	-20.135	-0.117	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-42.253	-42.370	-0.117	(0)
V+2	0.000e+000	0.000e+000	-43.279	-43.748	-0.469	(0)
V (3)	9.530e-015					
V (OH) 3	9.530e-015	9.530e-015	-14.021	-14.021	0.000	(0)
V (OH) 2+	1.102e-025	8.408e-026	-24.958	-25.075	-0.117	(0)
VOH+2	3.209e-029	1.089e-029	-28.494	-28.963	-0.469	(0)
V+3	3.352e-034	2.946e-035	-33.475	-34.531	-1.056	(0)
VSO4+	1.118e-034	8.537e-035	-33.951	-34.069	-0.117	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-54.530	-55.586	-1.056	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-55.249	-57.126	-1.877	(0)
V (4)	5.093e-018					
V (OH) 3+	4.957e-018	3.784e-018	-17.305	-17.422	-0.117	(0)
VO+2	7.583e-020	2.573e-020	-19.120	-19.590	-0.469	(0)
VOSO4	4.350e-020	4.350e-020	-19.361	-19.361	0.000	(0)
VOF+	1.620e-020	1.236e-020	-19.791	-19.908	-0.117	(0)
VOF2	3.712e-022	3.712e-022	-21.430	-21.430	0.000	(0)
VOC1+	1.092e-022	8.336e-023	-21.962	-22.079	-0.117	(0)
VOF3-	1.382e-024	1.055e-024	-23.860	-23.977	-0.117	(0)
VOF4-2	1.005e-027	3.410e-028	-26.998	-27.467	-0.469	(0)
H2V2O4+2	2.117e-030	7.185e-031	-29.674	-30.144	-0.469	(0)

V(5)	6.950e-008					
H2VO4-	4.914e-008	3.751e-008	-7.309	-7.426	-0.117	(0)
HVO4-2	2.035e-008	6.905e-009	-7.691	-8.161	-0.469	(0)
H3VO4	5.118e-012	5.118e-012	-11.291	-11.291	0.000	(0)
H3V2O7-	1.625e-012	1.240e-012	-11.789	-11.906	-0.117	(0)
HV2O7-3	9.992e-013	8.782e-014	-12.000	-13.056	-1.056	(0)
VO4-3	2.886e-014	2.536e-015	-13.540	-14.596	-1.056	(0)
V2O7-4	1.306e-014	1.732e-016	-13.884	-15.761	-1.877	(0)
V3O9-3	6.301e-016	5.538e-017	-15.201	-16.257	-1.056	(0)
VO2+	1.706e-016	1.395e-016	-15.768	-15.855	-0.087	(0)
VO2SO4-	2.680e-017	2.045e-017	-16.572	-16.689	-0.117	(0)
VO2F	1.960e-017	1.960e-017	-16.708	-16.708	0.000	(0)
VO2F2-	7.467e-019	5.699e-019	-18.127	-18.244	-0.117	(0)
V4O12-4	6.534e-020	8.665e-022	-19.185	-21.062	-1.877	(0)
VO2F3-2	1.678e-021	5.693e-022	-20.775	-21.245	-0.469	(0)
VO2NO3	1.093e-024	1.093e-024	-23.961	-23.961	0.000	(0)
VO2F4-3	2.552e-025	2.243e-026	-24.593	-25.649	-1.056	(0)
V10O28-6	0.000e+000	0.000e+000	-52.585	-56.809	-4.224	(0)
HV10O28-5	0.000e+000	0.000e+000	-53.554	-56.488	-2.933	(0)
H2V10O28-4	0.000e+000	0.000e+000	-57.268	-59.145	-1.877	(0)
Zn	7.016e-006					
Zn+2	3.932e-006	1.760e-006	-5.405	-5.755	-0.349	(0)
ZnSO4	2.363e-006	2.363e-006	-5.627	-5.627	0.000	(0)
Zn(SO4) 2-2	3.722e-007	1.263e-007	-6.429	-6.899	-0.469	(0)
ZnOH+	1.700e-007	1.298e-007	-6.769	-6.887	-0.117	(0)
ZnCO3	1.225e-007	1.225e-007	-6.912	-6.912	0.000	(0)
ZnHCO3+	2.568e-008	1.960e-008	-7.590	-7.708	-0.117	(0)
Zn(OH) 2	1.517e-008	1.517e-008	-7.819	-7.819	0.000	(0)
ZnCl+	6.281e-009	5.104e-009	-8.202	-8.292	-0.090	(0)
ZnOHCl	4.927e-009	4.927e-009	-8.307	-8.307	0.000	(0)
ZnF+	3.684e-009	2.812e-009	-8.434	-8.551	-0.117	(0)
Zn(OH) 3-	7.344e-011	5.605e-011	-10.134	-10.251	-0.117	(0)
ZnCl2	9.340e-012	9.340e-012	-11.030	-11.030	0.000	(0)
ZnNO3+	8.969e-014	6.845e-014	-13.047	-13.165	-0.117	(0)
ZnSeO4	1.387e-014	1.387e-014	-13.858	-13.858	0.000	(0)
ZnCl3-	1.054e-014	8.566e-015	-13.977	-14.067	-0.090	(0)
Zn(OH) 4-2	4.849e-015	1.646e-015	-14.314	-14.784	-0.469	(0)
ZnCl4-2	1.084e-017	4.946e-018	-16.965	-17.306	-0.341	(0)
Zn(NO3) 2	2.115e-022	2.115e-022	-21.675	-21.675	0.000	(0)
Zn(SeO4) 2-2	2.108e-024	7.153e-025	-23.676	-24.146	-0.469	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-148.154	-148.271	-0.117	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-150.126	-150.126	0.000	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-225.325	-225.442	-0.117	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-227.088	-227.557	-0.469	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-305.028	-305.498	-0.469	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-53.53	-47.24	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-42.01	-37.50	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.23	-37.50	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-68.83	-50.89	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-56.31	-36.27	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.20	-27.79	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.03	-23.58	0.45	(NH4)2SeO4
Acanthite	-51.91	-88.13	-36.22	Ag2S
Ag2CO3	-12.22	-23.31	-11.09	Ag2CO3
Ag2CrO4	-20.31	-31.90	-11.59	Ag2CrO4
Ag2HVO4	-11.14	-9.66	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.24	-1.67	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.79	-19.61	-4.82	Ag2SO4
Ag3AsO3	-27.45	-25.30	2.16	Ag3AsO3

Ag3AsO4	-15.86	-18.65	-2.79	Ag3AsO4
Ag3H2VO5	-15.67	-10.49	5.18	Ag3H2VO5
AgF·4H2O	-13.84	-12.80	1.05	AgF·4H2O
Agmetal	-0.10	-13.61	-13.51	Ag
AgVO3	-9.59	-8.82	0.77	AgVO3
Al(OH)3(am)	-2.78	8.02	10.80	Al(OH)3
Al2(MoO4)3	-52.98	-50.61	2.37	Al2(MoO4)3
Al2O3	-3.61	16.04	19.65	Al2O3
Al4(OH)10SO4	-8.56	14.14	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-12.93	-8.13	4.80	AlAsO4·2H2O
AlOHSO4	-6.69	-9.92	-3.23	AlOHSO4
AlSb	-152.99	-87.37	65.62	AlSb
Alunite	-5.30	-6.70	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.55	-11.34	-7.79	PbSO4
Anhydrite	-0.41	-4.77	-4.36	CaSO4
Anilite	-55.20	-87.07	-31.88	Cu0.25Cu1.5S
Antlerite	-1.86	6.93	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.43	-91.19	-2.76	As4O6
Artinite	-5.48	4.12	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.01	-32.30	6.71	As2O5
Atacamite	-1.61	5.78	7.39	Cu2(OH)3Cl
Azurite	-1.51	-18.42	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-16.60	7.80	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-16.26	-0.39	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-25.53	7.41	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.30	-16.12	-5.82	BaF2
BaMoO4	-7.46	-14.42	-6.96	BaMoO4
Barite	-0.16	-10.14	-9.98	BaSO4
BaS	-94.84	-78.66	16.18	BaS
BaSeO3	-9.29	-7.46	1.83	BaSeO3
BaSeO4	-10.77	-18.23	-7.46	BaSeO4
Bianchite	-6.20	-7.97	-1.76	ZnSO4·6H2O
Birnessite	-6.58	11.51	18.09	MnO2
Bixbyite	-1.87	-2.52	-0.64	Mn2O3
Blaubleil	-55.19	-79.36	-24.16	Cu0.9Cu0.2S
BlaubleilII	-55.64	-82.92	-27.28	Cu0.6Cu0.8S
Boehmite	-0.56	8.02	8.58	AlOOH
Breithauptite	-55.54	-74.06	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.96	12.88	16.84	Mg(OH)2
Bunsenite	-3.89	8.56	12.45	NiO
Ca(VO3)2	-8.47	-2.81	5.66	Ca(VO3)2
Ca2V2O7	-7.15	10.35	17.50	Ca2V2O7
Ca2V2O7·2H2O	-11.20	10.35	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-15.10	7.20	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-15.44	23.52	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-16.34	23.52	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-294.25	-151.28	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-10.43	-28.34	-17.91	Hg2Cl2
CaMoO4	-1.10	-9.05	-7.95	CaMoO4
Carnotite	-0.00	0.23	0.23	KUO2VO4
CaSeO3·2H2O	-4.91	-2.09	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.84	-12.86	-3.02	CaSeO4·2H2O
Cd(BO2)2	-11.52	-1.68	9.84	Cd(BO2)2
Cd(OH)2	-5.77	7.87	13.64	Cd(OH)2
Cd(OH)2(am)	-5.86	7.87	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-18.98	-12.27	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.89	5.67	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-14.86	13.54	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.73	-0.66	CdCl2
CdCl2·1H2O	-12.04	-13.73	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.82	-13.73	-1.91	CdCl2·2.5H2O
CdF2	-14.84	-16.05	-1.21	CdF2

Cdmetal (alpha)	-31.19	-17.67	13.51	Cd
Cdmetal (gamma)	-31.29	-17.67	13.62	Cd
CdMoO4	-0.20	-14.35	-14.15	CdMoO4
CdOHCl	-6.47	-2.93	3.54	CdOHCl
CdSb	-74.40	-74.75	-0.35	CdSb
CdSe	-18.96	-39.16	-20.20	CdSe
CdSeO4:2H2O	-16.30	-18.15	-1.85	CdSeO4:2H2O
CdSO4	-9.90	-10.07	-0.17	CdSO4
CdSO4:1H2O	-8.34	-10.07	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.20	-10.07	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.89	-11.64	-9.75	AgCl
Cerrusite	-1.92	-15.05	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.01	-9.65	-2.64	CuSO4:5H2O
Chalcocite	-55.12	-90.04	-34.92	Cu2S
Chalcopyrite	-125.91	-161.18	-35.27	CuFeS2
Cinnabar	-52.96	-98.65	-45.69	HgS
Claudetite	-88.13	-91.19	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe
Co (BO2) 2	-28.20	-1.13	27.07	Co (BO2) 2
Co (OH) 2	-4.67	8.42	13.09	Co (OH) 2
Co (OH) 3	-8.90	-11.20	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-20.07	-7.03	13.03	Co3 (AsO4) 2
Co3O4	-3.49	-13.98	-10.50	Co3O4
CoCl2	-21.45	-13.18	8.27	CoCl2
CoCl2:6H2O	-15.72	-13.18	2.54	CoCl2:6H2O
CoCO3	-3.24	-13.22	-9.98	CoCO3
CoF2	-13.90	-15.50	-1.60	CoF2
CoF3	-45.63	-47.09	-1.46	CoF3
CoFe2O4	18.33	14.81	-3.53	CoFe2O4
CoMoO4	-6.03	-13.80	-7.76	CoMoO4
CoO	-5.16	8.42	13.59	CoO
CoS (alpha)	-70.60	-78.04	-7.44	CoS
CoS (beta)	-66.97	-78.04	-11.07	CoS
CoSe	-22.41	-38.61	-16.20	CoSe
CoSeO3	-8.16	-6.84	1.32	CoSeO3
CoSeO4:6H2O	-16.07	-17.60	-1.53	CoSeO4:6H2O
CoSO4	-12.32	-9.52	2.80	CoSO4
CoSO4:6H2O	-7.05	-9.52	-2.47	CoSO4:6H2O
Cotunnite	-10.23	-15.01	-4.78	PbCl2
Covellite	-55.87	-78.17	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.70	-32.61	14.09	CrCl2
CrCl3	-48.70	-33.59	15.11	CrCl3
CrF3	-25.73	-37.06	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-12.76	-46.60	-33.84	Na3AlF6
Cu (OH) 2	-0.38	8.29	8.67	Cu (OH) 2
Cu (SbO3) 2	-23.34	21.87	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.34	0.91	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.01	-88.89	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.82	-50.62	-45.80	Cu2Se
Cu2SO4	-19.57	-21.52	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.53	-7.43	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.17	-100.76	-42.59	Cu3Sb
Cu3Se2	-25.87	-89.36	-63.49	Cu3Se2
CuCO3	-1.86	-13.36	-11.50	CuCO3
CuCrO4	-16.51	-21.95	-5.44	CuCrO4
CuF	-8.85	-13.75	-4.91	CuF
CuF2	-16.75	-15.63	1.12	CuF2
CuF2:2H2O	-11.08	-15.63	-4.55	CuF2:2H2O
Cumetal	-5.81	-14.56	-8.76	Cu
CuMoO4	-0.85	-13.93	-13.08	CuMoO4

CuOCuSO4	-11.66	-1.36	10.30	CuOCuSO4
Cupricferrite	8.69	14.67	5.99	CuFe2O4
Cuprite	-2.18	-3.58	-1.41	Cu2O
Cuprousferrite	10.32	1.40	-8.92	CuFeO2
CuSe	-5.64	-38.74	-33.10	CuSe
CuSe2	-26.87	-60.23	-33.37	CuSe2
CuSeO3:2H2O	-7.48	-6.97	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.29	-17.73	-2.44	CuSeO4:5H2O
CuSO4	-12.59	-9.65	2.94	CuSO4
Diaspore	1.15	8.02	6.87	AlOOH
Djurleite	-55.34	-89.26	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.70	-17.24	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.15	-17.24	-17.09	CaMg(CO3)2
Epsomite	-2.93	-5.06	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.99	-0.05	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-8.81	-12.53	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.43	-8.88	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.77	-39.40	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.71	-47.44	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.68	-18.77	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.48	-65.07	-18.60	FeSe2
FeS(ppt)	-80.06	-83.01	-2.95	FeS
FeSe	-32.58	-43.58	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	-0.26	-10.76	-10.50	CaF2
Galena	-65.89	-79.86	-13.97	PbS
Gibbsite	-0.27	8.02	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O
Greenockite	-64.23	-78.59	-14.36	CdS
Greigite	-290.97	-336.01	-45.03	Fe3S4
Gummite	-4.57	3.10	7.67	UO3
Gypsum	-0.17	-4.78	-4.61	CaSO4:2H2O
H-Jarosite	-14.21	-26.31	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.34	-22.22	-12.88	H2MoO4
H2S(g)	-78.45	-86.46	-8.01	H2S
H2Se(g)	-42.07	-47.03	-4.96	H2Se
Halite	-6.69	-5.09	1.60	NaCl
Hausmannite	-1.53	59.50	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-3.40	19.50	22.89	FeAl2O4
Hg(CH3)2(g)	-186.13	-259.84	-73.71	Hg(CH3)2
Hg(g)	-8.27	-16.14	-7.87	Hg
Hg(OH)2	-8.69	-12.19	-3.50	Hg(OH)2
Hg2(g)	-17.33	-32.28	-14.96	Hg2
Hg2(OH)2	-12.00	-6.74	5.26	Hg2(OH)2
Hg2CO3	-12.33	-28.38	-16.05	Hg2CO3
Hg2CrO4	-28.28	-36.98	-8.70	Hg2CrO4
Hg2F2	-20.30	-30.66	-10.36	Hg2F2
Hg2S	-81.52	-93.20	-11.68	Hg2S
Hg2SeO3	-17.34	-22.00	-4.66	Hg2SeO3
Hg2SO4	-18.55	-24.68	-6.13	Hg2SO4
Hg3O2CO3	-28.53	-58.21	-29.68	Hg3O2CO3
HgCl(g)	-33.67	-14.17	19.50	HgCl
HgCl2	-12.53	-33.79	-21.26	HgCl2
HgF(g)	-48.01	-15.33	32.68	HgF
HgF2(g)	-48.68	-36.11	12.57	HgF2
Hgmetal(l)	-2.69	-16.14	-13.45	Hg
HgSe	-3.53	-59.22	-55.69	HgSe
HgSeO3	-15.02	-27.45	-12.43	HgSeO3
HgSO4	-20.71	-30.13	-9.42	HgSO4
Huntite	-4.80	-34.77	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.73	-23.50	-18.77	Pb3(OH)2(CO3)2

Hydromagnesite	-13.40	-22.16	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-17.58	-22.75	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-6.39	-21.19	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-33.00	-50.24	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-19.49	-20.01	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-15.25	-11.99	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-15.06	-15.79	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-4.31	-4.74	-0.43	PbO·PbSO ₄
Laurionite	-4.83	-4.20	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.09	6.60	12.69	PbO
Mackinawite	-79.41	-83.01	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.41	19.27	16.86	Fe ₂ MgO ₄
Magnesite	-1.30	-8.76	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	0.24	-5.06	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.25	24.09	25.34	MnOOH
Massicot	-6.29	6.60	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-19.57	-13.31	6.26	CuCl ₂
Melanterite	-12.28	-14.49	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-53.56	-98.65	-45.09	HgS
Mg(OH) ₂ (active)	-5.91	12.88	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.38	-3.10	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-271.22	-196.54	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.57	9.79	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.67	10.53	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.73	-17.35	5.38	MgCrO ₄
MgF ₂	-2.91	-11.04	-8.13	MgF ₂
MgMoO ₄	-7.48	-9.33	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.43	-2.38	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.94	-13.14	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-28.18	45.34	73.52	Pb ₃ O ₄
Mirabilite	-5.40	-6.51	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-9.56	-4.66	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.63	-56.34	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.60	-85.52	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.85	1.65	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.00	-10.29	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-75.31	-75.14	0.17	MnS
MnS(pnk)	-78.48	-75.14	3.34	MnS
MnSb	-93.74	-96.65	-2.91	MnSb
MnSe	-39.21	-35.71	3.50	MnSe
MnSeO ₃	-5.07	-3.94	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.92	-3.94	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.65	-14.70	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.20	-6.62	2.58	MnSO ₄
Monteponite	-7.23	7.87	15.10	CdO
Montroydite	-8.55	-12.19	-3.64	HgO
MoO ₃	-14.22	-22.22	-8.00	MoO ₃
Morenosite	-7.24	-9.39	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-150.43	-220.69	-70.26	MoS ₂
Na-Jarosite	-9.39	-20.59	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.15	-49.04	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-21.73	-18.80	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-16.41	-33.01	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.28	-10.79	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.01	-10.79	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.13	-3.83	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.87	-14.59	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.69	-78.24	94.45	Na ₃ Sb
Na ₃ VO ₄	-27.52	9.16	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-30.51	6.89	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.86	-12.59	-6.73	CuCl
NaSb	-87.30	-64.13	23.17	NaSb

Natron	-8.91	-10.22	-1.31	Na2CO3:10H2O
NaVO3	-6.13	-2.27	3.86	NaVO3
Nesquehonite	-4.09	-8.76	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.24	8.56	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-22.34	-6.64	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-15.72	16.28	32.00	Ni4 (OH) 6SO4
NiCO3	-6.22	-13.09	-6.87	NiCO3
NiMoO4	-2.52	-13.66	-11.14	NiMoO4
NiS (alpha)	-72.30	-77.90	-5.60	NiS
NiS (beta)	-66.80	-77.90	-11.10	NiS
NiS (gamma)	-65.10	-77.90	-12.80	NiS
NiSe	-20.78	-38.48	-17.70	NiSe
NiSeO3:2H2O	-9.52	-6.70	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.95	-17.47	-1.52	NiSeO4:6H2O
Nsutite	-5.99	11.51	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.91	-304.98	-61.07	As2S3
Otavite	-1.78	-13.78	-12.00	CdCO3
Pb (BO2) 2	-9.47	-2.95	6.52	Pb (BO2) 2
Pb (OH) 2	-1.55	6.60	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-55.13	-63.89	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-6.40	2.40	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-12.99	13.20	26.19	Pb2O (OH) 2
Pb2O3	-22.30	38.74	61.04	Pb2O3
Pb2OCO3	-7.89	-8.45	-0.56	Pb2OCO3
Pb2V2O7	-0.88	-2.78	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-18.31	-12.51	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-2.32	3.82	6.14	Pb3 (VO4) 2
Pb3O2CO3	-12.87	-1.85	11.02	Pb3O2CO3
Pb3O2SO4	-8.83	1.86	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-12.64	8.46	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-13.42	8.46	21.88	Pb4O3SO4
PbCrO4	-11.04	-23.64	-12.60	PbCrO4
PbF2	-9.88	-17.32	-7.44	PbF2
Pbmetal	-23.19	-18.95	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.38	6.60	12.98	PbO:0.33H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.70	12.89	21.58	MgO
Phosgenite	-10.24	-30.05	-19.81	PbCl2:PbCO3
Plattnerite	-17.46	32.14	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.42	-143.93	-18.51	FeS2
Pyrochroite	-3.87	11.32	15.19	Mn (OH) 2
Pyrolusite	-4.52	36.86	41.38	MnO2
Realgar	-102.28	-122.03	-19.75	AsS
Retgersite	-7.35	-9.39	-2.04	NiSO4:6H2O
Rhodochrosite	0.25	-10.33	-10.58	MnCO3
Rutherfordine	-4.04	-18.54	-14.50	UO2CO3
Sb (OH) 3	-11.65	-18.76	-7.11	Sb (OH) 3
Sb2O4	-15.37	-11.97	3.40	Sb2O4
Sb2O5	-25.38	-35.04	-9.67	Sb2O5
Sb2Se3	-110.86	-178.62	-67.76	Sb2Se3
Sb4O6 (cubic)	-56.77	-75.03	-18.26	Sb4O6
Sb4O6 (orth)	-57.13	-75.03	-17.90	Sb4O6
SbCl3	-51.74	-51.16	0.57	SbCl3
SbF3	-44.42	-54.64	-10.23	SbF3
Sbmetal	-45.38	-57.07	-11.69	Sb
SbO2	-2.47	-30.29	-27.82	SbO2
Schoepite	-2.89	3.10	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.38	-21.49	-7.11	Se
Semetal (hex)	-13.78	-21.49	-7.71	Se
Senarmontite	-25.15	-37.51	-12.37	Sb2O3
SeO2	-15.38	-15.26	0.12	SeO2
SeO3	-47.07	-26.02	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.67	-11.67	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS

Spinel	-7.92	28.93	36.85	MgAl ₂ O ₄
Stibnite	-246.44	-296.90	-50.46	Sb ₂ S ₃
Sulfur	-58.77	-60.92	-2.14	S
Tenorite	0.65	8.29	7.64	CuO
Thenardite	-6.83	-6.51	0.32	Na ₂ SO ₄
Thermonatrite	-10.85	-10.21	0.64	Na ₂ CO ₃ ·H ₂ O
Tyuyamunite	-0.68	3.40	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-9.67	11.42	21.08	U ₃ O ₈
U ₃ Sb ₄	-573.62	-421.24	152.38	U ₃ Sb ₄
U ₄ O ₉	-24.33	-27.35	-3.02	U ₄ O ₉
UF ₄	-31.53	-61.07	-29.54	UF ₄
UF ₄ ·2.5H ₂ O	-28.35	-61.07	-32.72	UF ₄ ·2.5H ₂ O
UO ₂ (am)	-14.16	-13.22	0.93	UO ₂
UO ₂ (NO ₃) ₂	-40.39	-28.24	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ ·2H ₂ O	-33.10	-28.25	4.85	UO ₂ (NO ₃) ₂ ·2H ₂ O
UO ₂ (NO ₃) ₂ ·3H ₂ O	-31.64	-28.25	3.39	UO ₂ (NO ₃) ₂ ·3H ₂ O
UO ₂ (NO ₃) ₂ ·6H ₂ O	-30.29	-28.25	2.05	UO ₂ (NO ₃) ₂ ·6H ₂ O
UO ₂ (OH) ₂ (beta)	-2.51	3.10	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ ·4H ₂ O	-20.67	-22.92	-2.25	UO ₂ SeO ₄ ·4H ₂ O
UO ₃	-4.60	3.10	7.70	UO ₃
Uraninite	-8.55	-13.22	-4.67	UO ₂
USb ₂	-217.25	-187.68	29.58	USb ₂
V (OH) ₃	-18.53	-10.94	7.59	V (OH) ₃
V ₂ O ₅	-14.62	-15.98	-1.36	V ₂ O ₅
V ₃ O ₅	-38.96	-37.12	1.84	V ₃ O ₅
V ₄ O ₇	-48.17	-40.98	7.19	V ₄ O ₇
V ₆ O ₁₃	-38.17	-99.03	-60.86	V ₆ O ₁₃
Valentinite	-29.03	-37.51	-8.48	Sb ₂ O ₃
VC ₁₂	-64.19	-45.31	18.87	VC ₁₂
VC ₁₃	-66.78	-43.34	23.43	VC ₁₃
VF ₄	-66.64	-51.71	14.93	VF ₄
Vmetal	-93.28	-49.25	44.03	V
VO	-38.46	-23.71	14.76	VO
VO (OH) ₂	-9.01	-3.86	5.15	VO (OH) ₂
VO ₂ Cl	-21.63	-18.79	2.84	VO ₂ Cl
VOC ₁	-32.89	-21.74	11.15	VOC ₁
VOC ₁₂	-38.22	-25.46	12.76	VOC ₁₂
VOSO ₄	-25.41	-21.80	3.61	VOSO ₄
Witherite	-5.28	-13.85	-8.57	BaCO ₃
Wurtzite	-67.54	-76.49	-8.95	ZnS
Zincite	-1.36	9.98	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO ₄
Zn (BO ₂) ₂	-7.87	0.42	8.29	Zn (BO ₂) ₂
Zn (NO ₃) ₂ ·6H ₂ O	-24.69	-21.38	3.32	Zn (NO ₃) ₂ ·6H ₂ O
Zn (OH) ₂	-2.23	9.97	12.20	Zn (OH) ₂
Zn (OH) ₂ (am)	-2.50	9.97	12.47	Zn (OH) ₂
Zn (OH) ₂ (beta)	-1.78	9.97	11.75	Zn (OH) ₂
Zn (OH) ₂ (epsilon)	-1.56	9.97	11.53	Zn (OH) ₂
Zn (OH) ₂ (gamma)	-1.76	9.97	11.73	Zn (OH) ₂
Zn ₂ (OH) ₂ SO ₄	-5.49	2.01	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-6.04	9.15	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O	-16.03	-2.38	13.65	Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O
Zn ₃ O (SO ₄) ₂	-24.87	-5.96	18.91	Zn ₃ O (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-6.44	21.96	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-10.23	28.27	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-18.68	-11.63	7.05	ZnCl ₂
ZnCO ₃ ·1H ₂ O	-1.41	-11.67	-10.26	ZnCO ₃ ·1H ₂ O
ZnF ₂	-13.41	-13.95	-0.53	ZnF ₂
Znmetal	-41.36	-15.57	25.79	Zn
ZnMoO ₄	-2.12	-12.24	-10.13	ZnMoO ₄
ZnO (active)	-1.21	9.98	11.19	ZnO
ZnS (am)	-67.43	-76.49	-9.05	ZnS
ZnSb	-83.66	-72.64	11.01	ZnSb
ZnSe	-22.66	-37.06	-14.40	ZnSe
ZnSeO ₄ ·6H ₂ O	-14.53	-16.05	-1.52	ZnSeO ₄ ·6H ₂ O
ZnSO ₄ ·1H ₂ O	-7.33	-7.97	-0.64	ZnSO ₄ ·1H ₂ O

End of simulation.

Reading input data for simulation 26.

Title Evaporate lake water
REACTION 105
H2O -1
27.72 moles ## Removes x m3 water, but solute mass remains the
same
USE solution 113
Save Solution 114
END

TITLE

Evaporate lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 113. Solution after simulation 25.
Using reaction 105.

Reaction 105.

2.772e+001 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000
Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.685e-008	7.850e-009
Al	4.040e-007	1.882e-007
As	1.538e-009	7.167e-010
B	3.643e-005	1.697e-005
Ba	5.429e-008	2.529e-008
C	9.897e-004	4.611e-004
Ca	2.071e-002	9.647e-003
Cd	1.210e-007	5.638e-008
Cl	2.925e-003	1.363e-003
Co	4.358e-007	2.031e-007
Cr	3.107e-009	1.448e-009
Cu	1.067e-006	4.971e-007
F	2.426e-004	1.130e-004
Fe	2.320e-009	1.081e-009
Hg	5.538e-010	2.580e-010
K	4.706e-003	2.192e-003
Mg	9.985e-003	4.652e-003
Mn	3.269e-004	1.523e-004
Mo	1.499e-006	6.985e-007

N	4.308e-005	2.007e-005
Na	1.860e-002	8.668e-003
Ni	4.977e-007	2.319e-007
Pb	1.860e-008	8.666e-009
S	4.058e-002	1.890e-002
Sb	5.115e-007	2.383e-007
Se	1.812e-007	8.443e-008
U	4.322e-007	2.013e-007
V	1.440e-007	6.709e-008
Zn	1.454e-005	6.772e-006

-----Description of solution-----

	pH =	7.799	Charge balance
	pe =	4.997	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength =	1.009e-001	
	Mass of water (kg) =	4.659e-001	
	Total alkalinity (eq/kg) =	9.970e-004	
	Total CO2 (mol/kg) =	9.897e-004	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	8.175e-006	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.02	
	Iterations =	8	
	Total H =	5.172241e+001	
	Total O =	2.593805e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	8.326e-007	6.336e-007	-6.080	-6.198	-0.119	(0)
H+	2.033e-008	1.587e-008	-7.692	-7.799	-0.108	0.00
H2O	5.551e+001	9.986e-001	1.744	-0.001	0.000	18.07
Ag	1.685e-008					
AgCl	1.036e-008	1.036e-008	-7.985	-7.985	0.000	(0)
AgCl2-	2.991e-009	2.059e-009	-8.524	-8.686	-0.162	(0)
Ag+	2.845e-009	2.221e-009	-8.546	-8.653	-0.108	(0)
AgSO4-	6.225e-010	4.287e-010	-9.206	-9.368	-0.162	(0)
AgCl3-2	1.864e-011	4.191e-012	-10.730	-11.378	-0.648	(0)
AgNO2	1.480e-011	1.480e-011	-10.830	-10.830	0.000	(0)
AgF	8.089e-013	8.089e-013	-12.092	-12.092	0.000	(0)
AgCl4-3	5.612e-013	1.954e-014	-12.251	-13.709	-1.458	(0)
AgOH	1.407e-013	1.407e-013	-12.852	-12.852	0.000	(0)
AgNH3+	1.019e-013	7.016e-014	-12.992	-13.154	-0.162	(0)
AgH2BO3	4.500e-014	4.500e-014	-13.347	-13.347	0.000	(0)
AgSeO3-	3.665e-014	2.524e-014	-13.436	-13.598	-0.162	(0)
Ag2Se	2.160e-014	2.160e-014	-13.666	-13.666	0.000	(0)
Ag (NO2) 2-	1.062e-015	7.315e-016	-14.974	-15.136	-0.162	(0)
AgNO3	5.927e-017	5.927e-017	-16.227	-16.227	0.000	(0)
Ag (NH3) 2+	1.281e-017	8.822e-018	-16.892	-17.054	-0.162	(0)
Ag (OH) 2-	1.265e-017	8.713e-018	-16.898	-17.060	-0.162	(0)
Ag (SeO3) 2-3	1.147e-019	3.995e-021	-18.940	-20.398	-1.458	(0)
Ag2MoO4	1.040e-024	1.040e-024	-23.983	-23.983	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.362	-73.362	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-81.311	-83.903	-2.592	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.218	-147.470	-0.253	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.624	-147.786	-0.162	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.668	-149.111	-0.442	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.006	-149.422	-0.416	(0)
Al	4.040e-007					
Al (OH) 4-	3.994e-007	3.099e-007	-6.399	-6.509	-0.110	(0)
Al (OH) 3	3.885e-009	3.885e-009	-8.411	-8.411	0.000	(0)
Al (OH) 2+	3.902e-010	3.073e-010	-9.409	-9.512	-0.104	(0)
AlF3	1.472e-010	1.472e-010	-9.832	-9.832	0.000	(0)
AlF2+	1.024e-010	8.066e-011	-9.990	-10.093	-0.104	(0)

AlF4-	1.379e-011	1.070e-011	-10.861	-10.971	-0.110	(0)
AlF+2	3.630e-012	1.397e-012	-11.440	-11.855	-0.415	(0)
AlOH+2	1.586e-012	6.107e-013	-11.800	-12.214	-0.415	(0)
AlSO4+	9.329e-014	7.238e-014	-13.030	-13.140	-0.110	(0)
Al (SO4) 2-	9.669e-015	7.501e-015	-14.015	-14.125	-0.110	(0)
Al+3	8.948e-015	9.639e-016	-14.048	-15.016	-0.968	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-42.886	-44.344	-1.458	(0)
As (3)	2.786e-023					
H3AsO3	2.662e-023	2.662e-023	-22.575	-22.575	0.000	(0)
H2AsO3-	1.249e-024	8.601e-025	-23.903	-24.065	-0.162	(0)
HAsO3-2	2.198e-028	4.942e-029	-27.658	-28.306	-0.648	(0)
H4AsO3+	3.039e-031	2.093e-031	-30.517	-30.679	-0.162	(0)
AsO3-3	3.448e-033	1.200e-034	-32.462	-33.921	-1.458	(0)
As (5)	1.538e-009					
HAsO4-2	1.467e-009	3.299e-010	-8.834	-9.482	-0.648	(0)
H2AsO4-	6.934e-011	4.775e-011	-10.159	-10.321	-0.162	(0)
AsO4-3	1.888e-012	6.573e-014	-11.724	-13.182	-1.458	(0)
H3AsO4	1.287e-016	1.317e-016	-15.891	-15.880	0.010	(0)
B	3.643e-005					
H3BO3	3.413e-005	3.493e-005	-4.467	-4.457	0.010	(0)
H2BO3-	1.718e-006	1.278e-006	-5.765	-5.893	-0.128	(0)
CaH2BO3+	4.154e-007	3.090e-007	-6.382	-6.510	-0.128	(0)
MgH2BO3+	1.327e-007	9.869e-008	-6.877	-7.006	-0.128	(0)
NaH2BO3	2.797e-008	2.797e-008	-7.553	-7.553	0.000	(0)
BF (OH) 3-	2.717e-009	2.021e-009	-8.566	-8.694	-0.128	(0)
H5 (BO3) 2-	5.109e-011	3.801e-011	-10.292	-10.420	-0.128	(0)
BaH2BO3+	1.067e-012	7.940e-013	-11.972	-12.100	-0.128	(0)
BF2 (OH) 2-	6.692e-013	4.978e-013	-12.174	-12.303	-0.128	(0)
H8 (BO3) 3-	1.785e-013	1.328e-013	-12.748	-12.877	-0.128	(0)
AgH2BO3	4.500e-014	4.500e-014	-13.347	-13.347	0.000	(0)
BF3OH-	5.998e-019	4.462e-019	-18.222	-18.350	-0.128	(0)
BF4-	6.801e-024	5.059e-024	-23.167	-23.296	-0.128	(0)
Ba	5.429e-008					
Ba+2	5.411e-008	2.010e-008	-7.267	-7.697	-0.430	(0)
BaHCO3+	1.615e-010	1.284e-010	-9.792	-9.892	-0.100	(0)
BaCO3	2.036e-011	2.036e-011	-10.691	-10.691	0.000	(0)
BaH2BO3+	1.067e-012	7.940e-013	-11.972	-12.100	-0.128	(0)
BaOH+	7.103e-014	5.559e-014	-13.149	-13.255	-0.106	(0)
BaNO3+	4.914e-015	3.384e-015	-14.309	-14.471	-0.162	(0)
BaNH3+2	8.725e-016	1.962e-016	-15.059	-15.707	-0.648	(0)
C (4)	9.897e-004					
HCO3-	8.490e-004	6.688e-004	-3.071	-3.175	-0.104	(0)
CaHCO3+	6.581e-005	5.232e-005	-4.182	-4.281	-0.100	(0)
H2CO3	2.387e-005	2.387e-005	-4.622	-4.622	0.000	(0)
MgHCO3+	1.983e-005	1.524e-005	-4.703	-4.817	-0.114	(0)
CaCO3	1.315e-005	1.315e-005	-4.881	-4.881	0.000	(0)
CO3-2	5.318e-006	1.976e-006	-5.274	-5.704	-0.430	(0)
NaHCO3	5.193e-006	5.193e-006	-5.285	-5.285	0.000	(0)
MgCO3	3.659e-006	3.659e-006	-5.437	-5.437	0.000	(0)
MnHCO3+	8.995e-007	7.039e-007	-6.046	-6.152	-0.106	(0)
NaCO3-	6.448e-007	5.080e-007	-6.191	-6.294	-0.104	(0)
CuCO3	6.256e-007	6.256e-007	-6.204	-6.204	0.000	(0)
UO2 (CO3) 3-4	3.874e-007	9.905e-010	-6.412	-9.004	-2.592	(0)
ZnCO3	2.820e-007	2.820e-007	-6.550	-6.550	0.000	(0)
ZnHCO3+	7.618e-008	5.246e-008	-7.118	-7.280	-0.162	(0)
UO2 (CO3) 2-2	4.449e-008	1.000e-008	-7.352	-8.000	-0.648	(0)
Cu (CO3) 2-2	1.479e-008	3.326e-009	-7.830	-8.478	-0.648	(0)
NiHCO3+	1.230e-008	8.472e-009	-7.910	-8.072	-0.162	(0)
NiCO3	7.573e-009	7.573e-009	-8.121	-8.121	0.000	(0)
PbCO3	6.156e-009	6.156e-009	-8.211	-8.211	0.000	(0)
CoHCO3+	5.047e-009	3.476e-009	-8.297	-8.459	-0.162	(0)
CuHCO3+	3.295e-009	2.269e-009	-8.482	-8.644	-0.162	(0)
CoCO3	2.231e-009	2.231e-009	-8.651	-8.651	0.000	(0)
CdCO3	8.185e-010	8.185e-010	-9.087	-9.087	0.000	(0)
PbHCO3+	7.480e-010	5.151e-010	-9.126	-9.288	-0.162	(0)
UO2CO3	2.538e-010	2.538e-010	-9.596	-9.596	0.000	(0)
BaHCO3+	1.615e-010	1.284e-010	-9.792	-9.892	-0.100	(0)
Pb (CO3) 2-2	1.560e-010	3.507e-011	-9.807	-10.455	-0.648	(0)

	CdHCO3+	4.019e-011	2.768e-011	-10.396	-10.558	-0.162	(0)
	BaCO3	2.036e-011	2.036e-011	-10.691	-10.691	0.000	(0)
	Cd (CO3) 2-2	5.331e-012	1.199e-012	-11.273	-11.921	-0.648	(0)
	FeHCO3+	1.315e-014	1.045e-014	-13.881	-13.981	-0.100	(0)
	HgCO3	1.392e-015	1.392e-015	-14.856	-14.856	0.000	(0)
	Hg (CO3) 2-2	3.866e-017	8.694e-018	-16.413	-17.061	-0.648	(0)
	HgHCO3+	5.972e-019	4.113e-019	-18.224	-18.386	-0.162	(0)
Ca	2.071e-002						
	Ca+2	1.131e-002	4.201e-003	-1.947	-2.377	-0.430	(0)
	CaSO4	9.309e-003	9.309e-003	-2.031	-2.031	0.000	(0)
	CaHCO3+	6.581e-005	5.232e-005	-4.182	-4.281	-0.100	(0)
	CaCO3	1.315e-005	1.315e-005	-4.881	-4.881	0.000	(0)
	CaF+	8.494e-006	6.647e-006	-5.071	-5.177	-0.106	(0)
	CaH2BO3+	4.154e-007	3.090e-007	-6.382	-6.510	-0.128	(0)
	CaOH+	6.680e-008	5.311e-008	-7.175	-7.275	-0.100	(0)
	CaNO3+	6.481e-010	4.463e-010	-9.188	-9.350	-0.162	(0)
	CaNH3+2	3.639e-010	8.182e-011	-9.439	-10.087	-0.648	(0)
	Ca (NH3) 2+2	2.241e-018	5.039e-019	-17.650	-18.298	-0.648	(0)
Cd	1.210e-007						
	Cd+2	4.893e-008	1.818e-008	-7.310	-7.740	-0.430	(0)
	CdSO4	4.121e-008	4.121e-008	-7.385	-7.385	0.000	(0)
	Cd (SO4) 2-2	2.391e-008	5.377e-009	-7.621	-8.269	-0.648	(0)
	CdCl+	5.756e-009	3.963e-009	-8.240	-8.402	-0.162	(0)
	CdCO3	8.185e-010	8.185e-010	-9.087	-9.087	0.000	(0)
	CdOH+	1.328e-010	9.147e-011	-9.877	-10.039	-0.162	(0)
	CdOHC1	1.030e-010	1.030e-010	-9.987	-9.987	0.000	(0)
	CdF+	6.065e-011	4.176e-011	-10.217	-10.379	-0.162	(0)
	CdHCO3+	4.019e-011	2.768e-011	-10.396	-10.558	-0.162	(0)
	CdCl2	3.773e-011	3.773e-011	-10.423	-10.423	0.000	(0)
	Cd (CO3) 2-2	5.331e-012	1.199e-012	-11.273	-11.921	-0.648	(0)
	Cd (OH) 2	3.657e-013	3.657e-013	-12.437	-12.437	0.000	(0)
	CdCl3-	7.893e-014	5.435e-014	-13.103	-13.265	-0.162	(0)
	CdF2	1.208e-014	1.208e-014	-13.918	-13.918	0.000	(0)
	CdNO3+	2.804e-015	1.931e-015	-14.552	-14.714	-0.162	(0)
	CdSeO4	2.893e-016	2.893e-016	-15.539	-15.539	0.000	(0)
	Cd2OH+3	2.393e-016	8.333e-018	-15.621	-17.079	-1.458	(0)
	Cd (SeO3) 2-2	2.082e-017	4.682e-018	-16.681	-17.330	-0.648	(0)
	Cd (OH) 3-	2.055e-017	1.415e-017	-16.687	-16.849	-0.162	(0)
	Cd (NO3) 2	3.251e-023	3.251e-023	-22.488	-22.488	0.000	(0)
	Cd (OH) 4-2	6.527e-024	1.468e-024	-23.185	-23.833	-0.648	(0)
	CdHS+	0.000e+000	0.000e+000	-78.094	-78.256	-0.162	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-149.576	-149.576	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-226.037	-226.199	-0.162	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-301.879	-302.527	-0.648	(0)
Cl	2.925e-003						
	Cl-	2.925e-003	2.283e-003	-2.534	-2.641	-0.108	(0)
	MnCl+	1.938e-007	1.516e-007	-6.713	-6.819	-0.106	(0)
	ZnCl+	1.851e-008	1.423e-008	-7.733	-7.847	-0.114	(0)
	ZnOHC1	1.180e-008	1.180e-008	-7.928	-7.928	0.000	(0)
	AgCl	1.036e-008	1.036e-008	-7.985	-7.985	0.000	(0)
	CdCl+	5.756e-009	3.963e-009	-8.240	-8.402	-0.162	(0)
	AgCl2-	2.991e-009	2.059e-009	-8.524	-8.686	-0.162	(0)
	NiCl+	8.718e-010	6.003e-010	-9.060	-9.222	-0.162	(0)
	CoCl+	7.664e-010	5.277e-010	-9.116	-9.278	-0.162	(0)
	CuCl	7.621e-010	7.621e-010	-9.118	-9.118	0.000	(0)
	MnCl2	4.891e-010	4.891e-010	-9.311	-9.311	0.000	(0)
	CuCl2-	4.731e-010	3.636e-010	-9.325	-9.439	-0.114	(0)
	CuCl+	2.532e-010	1.946e-010	-9.597	-9.711	-0.114	(0)
	PbCl+	1.219e-010	8.397e-011	-9.914	-10.076	-0.162	(0)
	CdOHC1	1.030e-010	1.030e-010	-9.987	-9.987	0.000	(0)
	ZnCl2	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
	CdCl2	3.773e-011	3.773e-011	-10.423	-10.423	0.000	(0)
	AgCl3-2	1.864e-011	4.191e-012	-10.730	-11.378	-0.648	(0)
	HgClOH	1.504e-012	1.504e-012	-11.823	-11.823	0.000	(0)
	PbCl2	8.565e-013	8.565e-013	-12.067	-12.067	0.000	(0)
	AgCl4-3	5.612e-013	1.954e-014	-12.251	-13.709	-1.458	(0)
	CuCl3-2	4.732e-013	1.775e-013	-12.325	-12.751	-0.426	(0)
	MnCl3-	3.930e-013	3.076e-013	-12.406	-12.512	-0.106	(0)

HgCl2	3.069e-013	3.069e-013	-12.513	-12.513	0.000	(0)
CuCl2	1.541e-013	1.541e-013	-12.812	-12.812	0.000	(0)
ZnCl3-	1.215e-013	9.338e-014	-12.915	-13.030	-0.114	(0)
CdCl3-	7.893e-014	5.435e-014	-13.103	-13.265	-0.162	(0)
HgCl3-	1.018e-014	7.007e-015	-13.992	-14.154	-0.162	(0)
NiCl2	6.902e-015	6.902e-015	-14.161	-14.161	0.000	(0)
PbCl3-	1.131e-015	7.786e-016	-14.947	-15.109	-0.162	(0)
ZnCl4-2	2.843e-016	1.066e-016	-15.546	-15.972	-0.426	(0)
HgCl4-2	2.833e-016	6.370e-017	-15.548	-16.196	-0.648	(0)
UO2Cl+	1.735e-016	1.195e-016	-15.761	-15.923	-0.162	(0)
HgCl+	3.894e-017	2.682e-017	-16.410	-16.572	-0.162	(0)
CrCl+2	2.127e-017	4.783e-018	-16.672	-17.320	-0.648	(0)
CuCl3-	4.272e-018	3.283e-018	-17.369	-17.484	-0.114	(0)
PbCl4-2	3.614e-018	8.126e-019	-17.442	-18.090	-0.648	(0)
CrOHC12	1.315e-019	1.315e-019	-18.881	-18.881	0.000	(0)
FeCl+2	2.106e-021	7.900e-022	-20.677	-21.102	-0.426	(0)
CrCl2+	1.505e-021	1.036e-021	-20.823	-20.985	-0.162	(0)
VOC1+	6.358e-022	4.378e-022	-21.197	-21.359	-0.162	(0)
CuCl4-2	1.002e-022	3.757e-023	-21.999	-22.425	-0.426	(0)
FeCl2+	1.030e-023	8.057e-024	-22.987	-23.094	-0.106	(0)
CrO3Cl-	7.576e-026	5.217e-026	-25.121	-25.283	-0.162	(0)
FeCl3	1.840e-027	1.840e-027	-26.735	-26.735	0.000	(0)
CoCl+2	5.459e-035	1.228e-035	-34.263	-34.911	-0.648	(0)
UCl+3	0.000e+000	0.000e+000	-44.949	-46.407	-1.458	(0)
Co(NH3)5Cl+2	0.000e+000	0.000e+000	-47.362	-48.010	-0.648	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-49.545	-50.193	-0.648	(0)
Co(NH3)6Cl+2	0.000e+000	0.000e+000	-61.888	-62.536	-0.648	(0)
Co(2)	4.358e-007					
Co+2	2.971e-007	6.681e-008	-6.527	-7.175	-0.648	(0)
CoSO4	1.289e-007	1.289e-007	-6.890	-6.890	0.000	(0)
CoHCO3+	5.047e-009	3.476e-009	-8.297	-8.459	-0.162	(0)
CoCO3	2.231e-009	2.231e-009	-8.651	-8.651	0.000	(0)
CoOH+	1.226e-009	8.445e-010	-8.911	-9.073	-0.162	(0)
CoCl+	7.664e-010	5.277e-010	-9.116	-9.278	-0.162	(0)
CoF+	4.448e-010	3.063e-010	-9.352	-9.514	-0.162	(0)
Co(OH)2	4.250e-011	4.250e-011	-10.372	-10.372	0.000	(0)
CoNO2+	2.181e-011	1.502e-011	-10.661	-10.823	-0.162	(0)
Co(NH3)+2	5.526e-013	1.243e-013	-12.258	-12.906	-0.648	(0)
CoNO3+	5.165e-015	3.557e-015	-14.287	-14.449	-0.162	(0)
CoSeO4	2.862e-015	2.862e-015	-14.543	-14.543	0.000	(0)
Co(OH)3-	7.802e-016	5.373e-016	-15.108	-15.270	-0.162	(0)
CoOOH-	1.960e-016	1.350e-016	-15.708	-15.870	-0.162	(0)
Co2OH+3	8.122e-017	2.828e-018	-16.090	-17.549	-1.458	(0)
Co(NH3)2+2	3.647e-019	8.200e-020	-18.438	-19.086	-0.648	(0)
Co(NO3)2	2.431e-022	2.431e-022	-21.614	-21.614	0.000	(0)
Co(OH)4-2	2.399e-022	5.395e-023	-21.620	-22.268	-0.648	(0)
Co(NH3)3+2	7.103e-026	1.597e-026	-25.149	-25.797	-0.648	(0)
Co4(OH)4+4	3.970e-026	1.015e-028	-25.401	-27.994	-2.592	(0)
Co(NH3)4+2	5.767e-033	1.297e-033	-32.239	-32.887	-0.648	(0)
Co(NH3)5+2	1.481e-040	0.000e+000	-39.830	-40.478	-0.648	(0)
Co(3)	3.783e-028					
CoOH+2	3.783e-028	8.506e-029	-27.422	-28.070	-0.648	(0)
Co+3	2.453e-034	2.642e-035	-33.610	-34.578	-0.968	(0)
CoCl+2	5.459e-035	1.228e-035	-34.263	-34.911	-0.648	(0)
Co(NH3)5Cl+2	0.000e+000	0.000e+000	-47.362	-48.010	-0.648	(0)
Co(NH3)6SO4+	0.000e+000	0.000e+000	-56.822	-56.984	-0.162	(0)
Co(NH3)6OH+2	0.000e+000	0.000e+000	-61.245	-61.893	-0.648	(0)
Co(NH3)6Cl+2	0.000e+000	0.000e+000	-61.888	-62.536	-0.648	(0)
Cr(2)	1.731e-026					
Cr+2	1.731e-026	3.892e-027	-25.762	-26.410	-0.648	(0)
Cr(3)	3.107e-009					
Cr(OH)2+	2.511e-009	1.729e-009	-8.600	-8.762	-0.162	(0)
Cr(OH)3	4.116e-010	4.116e-010	-9.386	-9.386	0.000	(0)
Cr(OH)+2	9.977e-011	2.243e-011	-10.001	-10.649	-0.648	(0)
CrOHSO4	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
CrO2-	1.791e-011	1.233e-011	-10.747	-10.909	-0.162	(0)
Cr(OH)4-	1.508e-011	1.038e-011	-10.822	-10.984	-0.162	(0)
CrF+2	1.654e-013	3.719e-014	-12.781	-13.430	-0.648	(0)

CrSO4+	5.309e-014	3.656e-014	-13.275	-13.437	-0.162	(0)
Cr+3	4.649e-014	1.619e-015	-13.333	-14.791	-1.458	(0)
CrCl+2	2.127e-017	4.783e-018	-16.672	-17.320	-0.648	(0)
Cr2(OH)2SO4+2	4.643e-019	1.044e-019	-18.333	-18.981	-0.648	(0)
CrOHCl2	1.315e-019	1.315e-019	-18.881	-18.881	0.000	(0)
Cr2(OH)2(SO4)2	5.999e-020	5.999e-020	-19.222	-19.222	0.000	(0)
CrCl2+	1.505e-021	1.036e-021	-20.823	-20.985	-0.162	(0)
CrNO3+2	1.057e-023	2.377e-024	-22.976	-23.624	-0.648	(0)
Cr(NH3)5OH+2	9.523e-040	2.141e-040	-39.021	-39.669	-0.648	(0)
Cr(NH3)6+3	0.000e+000	0.000e+000	-47.196	-48.654	-1.458	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-49.545	-50.193	-0.648	(0)
Cr(6)	1.284e-014					
CrO4-2	1.198e-014	4.451e-015	-13.921	-14.352	-0.430	(0)
NaCrO4-	4.435e-016	3.054e-016	-15.353	-15.515	-0.162	(0)
HCrO4-	3.319e-016	2.286e-016	-15.479	-15.641	-0.162	(0)
KCrO4-	8.261e-017	5.689e-017	-16.083	-16.245	-0.162	(0)
CrO3SO4-2	4.760e-023	1.070e-023	-22.322	-22.971	-0.648	(0)
H2CrO4	2.940e-024	2.940e-024	-23.532	-23.532	0.000	(0)
CrO3Cl-	7.576e-026	5.217e-026	-25.121	-25.283	-0.162	(0)
Cr2O7-2	8.068e-030	1.814e-030	-29.093	-29.741	-0.648	(0)
Cu(1)	1.621e-009					
CuCl	7.621e-010	7.621e-010	-9.118	-9.118	0.000	(0)
CuCl2-	4.731e-010	3.636e-010	-9.325	-9.439	-0.114	(0)
Cu+	3.850e-010	2.651e-010	-9.415	-9.577	-0.162	(0)
CuCl3-2	4.732e-013	1.775e-013	-12.325	-12.751	-0.426	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-147.206	-147.635	-0.429	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.961	-148.365	-0.404	(0)
Cu(2)	1.065e-006					
CuCO3	6.256e-007	6.256e-007	-6.204	-6.204	0.000	(0)
Cu+2	1.448e-007	5.377e-008	-6.839	-7.269	-0.430	(0)
CuOH+	1.402e-007	1.077e-007	-6.853	-6.968	-0.114	(0)
CuSO4	1.192e-007	1.192e-007	-6.924	-6.924	0.000	(0)
Cu(CO3)2-2	1.479e-008	3.326e-009	-7.830	-8.478	-0.648	(0)
Cu(OH)2	1.362e-008	1.362e-008	-7.866	-7.866	0.000	(0)
CuHCO3+	3.295e-009	2.269e-009	-8.482	-8.644	-0.162	(0)
Cu2(OH)2+2	1.297e-009	2.916e-010	-8.887	-9.535	-0.648	(0)
CuF+	7.143e-010	4.919e-010	-9.146	-9.308	-0.162	(0)
CuNO2+	2.609e-010	1.796e-010	-9.584	-9.746	-0.162	(0)
CuCl+	2.532e-010	1.946e-010	-9.597	-9.711	-0.114	(0)
CuNH3+2	3.786e-011	8.513e-012	-10.422	-11.070	-0.648	(0)
Cu(OH)3-	2.570e-011	1.770e-011	-10.590	-10.752	-0.162	(0)
CuCl2	1.541e-013	1.541e-013	-12.812	-12.812	0.000	(0)
Cu(NO2)2	5.864e-014	5.864e-014	-13.232	-13.232	0.000	(0)
CuNO3+	8.295e-015	5.712e-015	-14.081	-14.243	-0.162	(0)
Cu(OH)4-2	3.925e-016	8.825e-017	-15.406	-16.054	-0.648	(0)
CuCl3-	4.272e-018	3.283e-018	-17.369	-17.484	-0.114	(0)
CuCl4-2	1.002e-022	3.757e-023	-21.999	-22.425	-0.426	(0)
Cu(NO3)2	2.416e-023	2.416e-023	-22.617	-22.617	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-216.779	-216.941	-0.162	(0)
F	2.426e-004					
F-	1.857e-004	1.450e-004	-3.731	-3.839	-0.108	(0)
MgF+	4.669e-005	3.622e-005	-4.331	-4.441	-0.110	(0)
CaF+	8.494e-006	6.647e-006	-5.071	-5.177	-0.106	(0)
NaF	1.263e-006	1.263e-006	-5.899	-5.899	0.000	(0)
MnF+	3.890e-007	3.045e-007	-6.410	-6.516	-0.106	(0)
ZnF+	1.042e-008	7.175e-009	-7.982	-8.144	-0.162	(0)
HF	3.403e-009	3.403e-009	-8.468	-8.468	0.000	(0)
BF(OH)3-	2.717e-009	2.021e-009	-8.566	-8.694	-0.128	(0)
CuF+	7.143e-010	4.919e-010	-9.146	-9.308	-0.162	(0)
NiF+	5.434e-010	3.742e-010	-9.265	-9.427	-0.162	(0)
CoF+	4.448e-010	3.063e-010	-9.352	-9.514	-0.162	(0)
AlF3	1.472e-010	1.472e-010	-9.832	-9.832	0.000	(0)
AlF2+	1.024e-010	8.066e-011	-9.990	-10.093	-0.104	(0)
CdF+	6.065e-011	4.176e-011	-10.217	-10.379	-0.162	(0)
PbF+	1.538e-011	1.059e-011	-10.813	-10.975	-0.162	(0)
AlF4-	1.379e-011	1.070e-011	-10.861	-10.971	-0.110	(0)
AlF+2	3.630e-012	1.397e-012	-11.440	-11.855	-0.415	(0)
HF2-	2.465e-012	1.876e-012	-11.608	-11.727	-0.119	(0)

UO2F+	9.377e-013	6.457e-013	-12.028	-12.190	-0.162	(0)
AgF	8.089e-013	8.089e-013	-12.092	-12.092	0.000	(0)
BF2 (OH) 2-	6.692e-013	4.978e-013	-12.174	-12.303	-0.128	(0)
UO2F2	2.700e-013	2.700e-013	-12.569	-12.569	0.000	(0)
CrF+2	1.654e-013	3.719e-014	-12.781	-13.430	-0.648	(0)
PbF2	3.021e-014	3.021e-014	-13.520	-13.520	0.000	(0)
UO2F3-	1.428e-014	9.832e-015	-13.845	-14.007	-0.162	(0)
CdF2	1.208e-014	1.208e-014	-13.918	-13.918	0.000	(0)
VO2F	8.557e-017	8.557e-017	-16.068	-16.068	0.000	(0)
UO2F4-2	5.035e-017	1.132e-017	-16.298	-16.946	-0.648	(0)
H2F2	3.103e-017	3.103e-017	-16.508	-16.508	0.000	(0)
PbF3-	1.206e-017	8.307e-018	-16.919	-17.081	-0.162	(0)
FeF2+	9.028e-018	7.065e-018	-17.044	-17.151	-0.106	(0)
VO2F2-	6.541e-018	4.504e-018	-17.184	-17.346	-0.162	(0)
FeF+2	4.855e-018	1.821e-018	-17.314	-17.740	-0.426	(0)
FeF3	1.445e-018	1.445e-018	-17.840	-17.840	0.000	(0)
BF3OH-	5.998e-019	4.462e-019	-18.222	-18.350	-0.128	(0)
VOF+	8.631e-020	5.943e-020	-19.064	-19.226	-0.162	(0)
VO2F3-2	3.622e-020	8.145e-021	-19.441	-20.089	-0.648	(0)
VOF2	3.231e-021	3.231e-021	-20.491	-20.491	0.000	(0)
PbF4-2	2.563e-021	5.764e-022	-20.591	-21.239	-0.648	(0)
VOF3-	2.413e-023	1.662e-023	-22.617	-22.779	-0.162	(0)
VO2F4-3	1.669e-023	5.810e-025	-22.778	-24.236	-1.458	(0)
BF4-	6.801e-024	5.059e-024	-23.167	-23.296	-0.128	(0)
HgF+	4.593e-024	3.163e-024	-23.338	-23.500	-0.162	(0)
Sb (OH) 2F	1.225e-024	1.225e-024	-23.912	-23.912	0.000	(0)
SbOF	1.207e-024	1.207e-024	-23.918	-23.918	0.000	(0)
VOF4-2	4.325e-026	9.725e-027	-25.364	-26.012	-0.648	(0)
UF3+	6.026e-036	4.150e-036	-35.220	-35.382	-0.162	(0)
UF2+2	8.032e-037	1.806e-037	-36.095	-36.743	-0.648	(0)
UF4	6.596e-038	6.596e-038	-37.181	-37.181	0.000	(0)
UF+3	2.842e-039	0.000e+000	-38.546	-40.005	-1.458	(0)
UF5-	5.503e-040	3.790e-040	-39.259	-39.421	-0.162	(0)
UF6-2	0.000e+000	0.000e+000	-40.132	-40.780	-0.648	(0)
Fe (2)	8.521e-012					
Fe+2	5.521e-012	1.241e-012	-11.258	-11.906	-0.648	(0)
FeSO4	2.947e-012	2.947e-012	-11.531	-11.531	0.000	(0)
FeOH+	4.001e-014	3.131e-014	-13.398	-13.504	-0.106	(0)
FeHCO3+	1.315e-014	1.045e-014	-13.881	-13.981	-0.100	(0)
Fe (OH) 2	1.576e-017	1.576e-017	-16.803	-16.803	0.000	(0)
Fe (OH) 3-	4.034e-018	3.157e-018	-17.394	-17.501	-0.106	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.003	-160.003	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.328	-236.490	-0.162	(0)
Fe (3)	2.311e-009					
Fe (OH) 2+	1.466e-009	1.155e-009	-8.834	-8.937	-0.104	(0)
Fe (OH) 3	7.859e-010	7.859e-010	-9.105	-9.105	0.000	(0)
Fe (OH) 4-	5.886e-011	4.636e-011	-10.230	-10.334	-0.104	(0)
FeOH+2	1.249e-014	4.686e-015	-13.903	-14.329	-0.426	(0)
FeF2+	9.028e-018	7.065e-018	-17.044	-17.151	-0.106	(0)
FeF+2	4.855e-018	1.821e-018	-17.314	-17.740	-0.426	(0)
FeSO4+	1.589e-018	1.243e-018	-17.799	-17.905	-0.106	(0)
FeF3	1.445e-018	1.445e-018	-17.840	-17.840	0.000	(0)
Fe (SO4) 2-	3.734e-019	2.571e-019	-18.428	-18.590	-0.162	(0)
Fe+3	1.063e-019	1.146e-020	-18.973	-19.941	-0.968	(0)
FeCl+2	2.106e-021	7.900e-022	-20.677	-21.102	-0.426	(0)
FeCl2+	1.030e-023	8.057e-024	-22.987	-23.094	-0.106	(0)
FeHSeO3+2	9.488e-024	2.134e-024	-23.023	-23.671	-0.648	(0)
Fe2 (OH) 2+4	2.844e-025	7.272e-028	-24.546	-27.138	-2.592	(0)
FeNO3+2	1.711e-026	3.848e-027	-25.767	-26.415	-0.648	(0)
FeCl3	1.840e-027	1.840e-027	-26.735	-26.735	0.000	(0)
Fe3 (OH) 4+5	1.364e-031	1.214e-035	-30.865	-34.916	-4.051	(0)
H (0)	3.531e-029					
H2	1.765e-029	1.807e-029	-28.753	-28.743	0.010	(0)
Hg (0)	5.505e-010					
Hg	5.505e-010	5.505e-010	-9.259	-9.259	0.000	(0)
Hg (1)	1.957e-021					
Hg2+2	9.783e-022	2.200e-022	-21.010	-21.658	-0.648	(0)
Hg (2)	3.279e-012					

	HgClOH	1.504e-012	1.504e-012	-11.823	-11.823	0.000	(0)
	Hg (OH) 2	1.456e-012	1.491e-012	-11.837	-11.827	0.010	(0)
	HgCl2	3.069e-013	3.069e-013	-12.513	-12.513	0.000	(0)
	HgCl3-	1.018e-014	7.007e-015	-13.992	-14.154	-0.162	(0)
	HgCO3	1.392e-015	1.392e-015	-14.856	-14.856	0.000	(0)
	HgCl4-2	2.833e-016	6.370e-017	-15.548	-16.196	-0.648	(0)
	HgCl+	3.894e-017	2.682e-017	-16.410	-16.572	-0.162	(0)
	Hg (CO3) 2-2	3.866e-017	8.694e-018	-16.413	-17.061	-0.648	(0)
	HgOH+	2.156e-017	1.485e-017	-16.666	-16.828	-0.162	(0)
	HgHCO3+	5.972e-019	4.113e-019	-18.224	-18.386	-0.162	(0)
	Hg (NH3) 2+2	3.953e-019	8.888e-020	-18.403	-19.051	-0.648	(0)
	Hg (OH) 3-	1.727e-019	1.189e-019	-18.763	-18.925	-0.162	(0)
	HgNH3+2	2.555e-020	5.745e-021	-19.593	-20.241	-0.648	(0)
	Hg+2	2.618e-021	5.886e-022	-20.582	-21.230	-0.648	(0)
	HgSO4	1.491e-021	1.491e-021	-20.827	-20.827	0.000	(0)
	HgF+	4.593e-024	3.163e-024	-23.338	-23.500	-0.162	(0)
	Hg (NH3) 3+2	2.434e-026	5.474e-027	-25.614	-26.262	-0.648	(0)
	HgNO3+	1.060e-029	7.301e-030	-28.975	-29.137	-0.162	(0)
	Hg (NH3) 4+2	2.992e-033	6.727e-034	-32.524	-33.172	-0.648	(0)
	Hg (NO3) 2	1.019e-037	1.019e-037	-36.992	-36.992	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-138.388	-138.550	-0.162	(0)
	HgS2-2	0.000e+000	0.000e+000	-138.810	-139.459	-0.648	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-139.955	-139.955	0.000	(0)
K	4.706e-003						
	K+	4.406e-003	3.440e-003	-2.356	-2.463	-0.108	(0)
	KSO4-	2.990e-004	2.356e-004	-3.524	-3.628	-0.104	(0)
	KCrO4-	8.261e-017	5.689e-017	-16.083	-16.245	-0.162	(0)
Mg	9.985e-003						
	Mg+2	5.994e-003	2.227e-003	-2.222	-2.652	-0.430	(0)
	MgSO4	3.919e-003	3.919e-003	-2.407	-2.407	0.000	(0)
	MgF+	4.669e-005	3.622e-005	-4.331	-4.441	-0.110	(0)
	MgHCO3+	1.983e-005	1.524e-005	-4.703	-4.817	-0.114	(0)
	MgCO3	3.659e-006	3.659e-006	-5.437	-5.437	0.000	(0)
	MgOH+	7.014e-007	5.616e-007	-6.154	-6.251	-0.097	(0)
	MgH2BO3+	1.327e-007	9.869e-008	-6.877	-7.006	-0.128	(0)
Mn (2)	3.269e-004						
	Mn+2	2.346e-004	5.275e-005	-3.630	-4.278	-0.648	(0)
	MnSO4	9.073e-005	9.073e-005	-4.042	-4.042	0.000	(0)
	MnHCO3+	8.995e-007	7.039e-007	-6.046	-6.152	-0.106	(0)
	MnF+	3.890e-007	3.045e-007	-6.410	-6.516	-0.106	(0)
	MnCl+	1.938e-007	1.516e-007	-6.713	-6.819	-0.106	(0)
	MnOH+	1.073e-007	8.395e-008	-6.970	-7.076	-0.106	(0)
	MnCl2	4.891e-010	4.891e-010	-9.311	-9.311	0.000	(0)
	MnNO3+	4.078e-012	2.808e-012	-11.390	-11.552	-0.162	(0)
	MnSeO4	1.214e-012	1.214e-012	-11.916	-11.916	0.000	(0)
	MnCl3-	3.930e-013	3.076e-013	-12.406	-12.512	-0.106	(0)
	Mn (OH) 3-	2.661e-016	2.082e-016	-15.575	-15.681	-0.106	(0)
	Mn (NO3) 2	2.370e-019	2.370e-019	-18.625	-18.625	0.000	(0)
	Mn (OH) 4-2	1.136e-021	4.260e-022	-20.945	-21.371	-0.426	(0)
	MnSe	0.000e+000	0.000e+000	-40.933	-40.933	0.000	(0)
Mn (3)	2.173e-024						
	Mn+3	2.173e-024	2.341e-025	-23.663	-24.631	-0.968	(0)
Mn (6)	1.280e-040						
	MnO4-2	1.280e-040	0.000e+000	-39.893	-40.319	-0.426	(0)
Mn (7)	0.000e+000						
	MnO4-	0.000e+000	0.000e+000	-44.570	-44.693	-0.123	(0)
Mo	1.499e-006						
	MoO4-2	1.499e-006	5.568e-007	-5.824	-6.254	-0.430	(0)
	HMoO4-	2.553e-010	1.758e-010	-9.593	-9.755	-0.162	(0)
	H2MoO4	2.044e-014	2.044e-014	-13.689	-13.689	0.000	(0)
	Ag2MoO4	1.040e-024	1.040e-024	-23.983	-23.983	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-42.886	-44.344	-1.458	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-47.350	-53.183	-5.833	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-50.545	-54.595	-4.051	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-55.020	-57.613	-2.592	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-60.708	-62.166	-1.458	(0)
N (-3)	6.518e-007						
	NH4+	5.789e-007	4.306e-007	-6.237	-6.366	-0.128	(0)

NH4SO4-	5.703e-008	4.463e-008	-7.244	-7.350	-0.106	(0)
NH3	1.547e-008	1.547e-008	-7.811	-7.811	0.000	(0)
CaNH3+2	3.639e-010	8.182e-011	-9.439	-10.087	-0.648	(0)
CuNH3+2	3.786e-011	8.513e-012	-10.422	-11.070	-0.648	(0)
NiNH3+2	3.796e-012	8.537e-013	-11.421	-12.069	-0.648	(0)
Co (NH3) +2	5.526e-013	1.243e-013	-12.258	-12.906	-0.648	(0)
AgNH3+	1.019e-013	7.016e-014	-12.992	-13.154	-0.162	(0)
BaNH3+2	8.725e-016	1.962e-016	-15.059	-15.707	-0.648	(0)
Ag (NH3) 2+	1.281e-017	8.822e-018	-16.892	-17.054	-0.162	(0)
Ni (NH3) 2+2	8.490e-018	1.909e-018	-17.071	-17.719	-0.648	(0)
Ca (NH3) 2+2	2.241e-018	5.039e-019	-17.650	-18.298	-0.648	(0)
Hg (NH3) 2+2	3.953e-019	8.888e-020	-18.403	-19.051	-0.648	(0)
Co (NH3) 2+2	3.647e-019	8.200e-020	-18.438	-19.086	-0.648	(0)
HgNH3+2	2.555e-020	5.745e-021	-19.593	-20.241	-0.648	(0)
Co (NH3) 3+2	7.103e-026	1.597e-026	-25.149	-25.797	-0.648	(0)
Hg (NH3) 3+2	2.434e-026	5.474e-027	-25.614	-26.262	-0.648	(0)
Co (NH3) 4+2	5.767e-033	1.297e-033	-32.239	-32.887	-0.648	(0)
Hg (NH3) 4+2	2.992e-033	6.727e-034	-32.524	-33.172	-0.648	(0)
Cr (NH3) 5OH+2	9.523e-040	2.141e-040	-39.021	-39.669	-0.648	(0)
Co (NH3) 5+2	1.481e-040	0.000e+000	-39.830	-40.478	-0.648	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-47.196	-48.654	-1.458	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-47.362	-48.010	-0.648	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.545	-50.193	-0.648	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.822	-56.984	-0.162	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-61.245	-61.893	-0.648	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.888	-62.536	-0.648	(0)
N (3)	4.238e-005					
NO2-	4.238e-005	3.190e-005	-4.373	-4.496	-0.123	(0)
CuNO2+	2.609e-010	1.796e-010	-9.584	-9.746	-0.162	(0)
CoNO2+	2.181e-011	1.502e-011	-10.661	-10.823	-0.162	(0)
AgNO2	1.480e-011	1.480e-011	-10.830	-10.830	0.000	(0)
Cu (NO2) 2	5.864e-014	5.864e-014	-13.232	-13.232	0.000	(0)
Ag (NO2) 2-	1.062e-015	7.315e-016	-14.974	-15.136	-0.162	(0)
N (5)	4.368e-008					
NO3-	4.303e-008	3.359e-008	-7.366	-7.474	-0.108	(0)
CaNO3+	6.481e-010	4.463e-010	-9.188	-9.350	-0.162	(0)
MnNO3+	4.078e-012	2.808e-012	-11.390	-11.552	-0.162	(0)
ZnNO3+	3.039e-013	2.093e-013	-12.517	-12.679	-0.162	(0)
NiNO3+	1.259e-014	8.670e-015	-13.900	-14.062	-0.162	(0)
CuNO3+	8.295e-015	5.712e-015	-14.081	-14.243	-0.162	(0)
CoNO3+	5.165e-015	3.557e-015	-14.287	-14.449	-0.162	(0)
BaNO3+	4.914e-015	3.384e-015	-14.309	-14.471	-0.162	(0)
CdNO3+	2.804e-015	1.931e-015	-14.552	-14.714	-0.162	(0)
PbNO3+	7.479e-016	5.150e-016	-15.126	-15.288	-0.162	(0)
AgNO3	5.927e-017	5.927e-017	-16.227	-16.227	0.000	(0)
Mn (NO3) 2	2.370e-019	2.370e-019	-18.625	-18.625	0.000	(0)
UO2NO3+	3.141e-021	2.163e-021	-20.503	-20.665	-0.162	(0)
Zn (NO3) 2	1.403e-021	1.403e-021	-20.853	-20.853	0.000	(0)
Co (NO3) 2	2.431e-022	2.431e-022	-21.614	-21.614	0.000	(0)
Cd (NO3) 2	3.251e-023	3.251e-023	-22.488	-22.488	0.000	(0)
Pb (NO3) 2	2.938e-023	2.938e-023	-22.532	-22.532	0.000	(0)
Cu (NO3) 2	2.416e-023	2.416e-023	-22.617	-22.617	0.000	(0)
CrNO3+2	1.057e-023	2.377e-024	-22.976	-23.624	-0.648	(0)
VO2NO3	5.718e-024	5.718e-024	-23.243	-23.243	0.000	(0)
FeNO3+2	1.711e-026	3.848e-027	-25.767	-26.415	-0.648	(0)
HgNO3+	1.060e-029	7.301e-030	-28.975	-29.137	-0.162	(0)
Hg (NO3) 2	1.019e-037	1.019e-037	-36.992	-36.992	0.000	(0)
Na	1.860e-002					
Na+	1.769e-002	1.381e-002	-1.752	-1.860	-0.108	(0)
NaSO4-	9.105e-004	7.172e-004	-3.041	-3.144	-0.104	(0)
NaHCO3	5.193e-006	5.193e-006	-5.285	-5.285	0.000	(0)
NaF	1.263e-006	1.263e-006	-5.899	-5.899	0.000	(0)
NaCO3-	6.448e-007	5.080e-007	-6.191	-6.294	-0.104	(0)
NaH2BO3	2.797e-008	2.797e-008	-7.553	-7.553	0.000	(0)
NaCrO4-	4.435e-016	3.054e-016	-15.353	-15.515	-0.162	(0)
Ni	4.977e-007					
Ni+2	2.766e-007	1.028e-007	-6.558	-6.988	-0.430	(0)
NiSO4	1.983e-007	1.983e-007	-6.703	-6.703	0.000	(0)

NiHCO3+	1.230e-008	8.472e-009	-7.910	-8.072	-0.162	(0)
NiCO3	7.573e-009	7.573e-009	-8.121	-8.121	0.000	(0)
NiOH+	1.190e-009	8.196e-010	-8.924	-9.086	-0.162	(0)
NiCl+	8.718e-010	6.003e-010	-9.060	-9.222	-0.162	(0)
NiF+	5.434e-010	3.742e-010	-9.265	-9.427	-0.162	(0)
Ni (SO4) 2-2	2.825e-010	6.351e-011	-9.549	-10.197	-0.648	(0)
Ni (OH) 2	4.124e-011	4.124e-011	-10.385	-10.385	0.000	(0)
NiNH3+2	3.796e-012	8.537e-013	-11.421	-12.069	-0.648	(0)
Ni (OH) 3-	3.795e-014	2.613e-014	-13.421	-13.583	-0.162	(0)
NiNO3+	1.259e-014	8.670e-015	-13.900	-14.062	-0.162	(0)
NiCl2	6.902e-015	6.902e-015	-14.161	-14.161	0.000	(0)
NiSeO4	4.109e-015	4.109e-015	-14.386	-14.386	0.000	(0)
Ni (NH3) 2+2	8.490e-018	1.909e-018	-17.071	-17.719	-0.648	(0)
O (0)	3.025e-035					
O2	1.512e-035	1.548e-035	-34.820	-34.810	0.010	(0)
Pb	1.860e-008					
PbCO3	6.156e-009	6.156e-009	-8.211	-8.211	0.000	(0)
PbSO4	4.910e-009	4.910e-009	-8.309	-8.309	0.000	(0)
Pb+2	2.790e-009	1.036e-009	-8.554	-8.984	-0.430	(0)
PbOH+	2.395e-009	1.649e-009	-8.621	-8.783	-0.162	(0)
Pb (SO4) 2-2	1.273e-009	2.862e-010	-8.895	-9.543	-0.648	(0)
PbHCO3+	7.480e-010	5.151e-010	-9.126	-9.288	-0.162	(0)
Pb (CO3) 2-2	1.560e-010	3.507e-011	-9.807	-10.455	-0.648	(0)
PbCl+	1.219e-010	8.397e-011	-9.914	-10.076	-0.162	(0)
Pb (OH) 2	3.305e-011	3.305e-011	-10.481	-10.481	0.000	(0)
PbF+	1.538e-011	1.059e-011	-10.813	-10.975	-0.162	(0)
PbCl2	8.565e-013	8.565e-013	-12.067	-12.067	0.000	(0)
Pb (OH) 3-	3.040e-014	2.094e-014	-13.517	-13.679	-0.162	(0)
PbF2	3.021e-014	3.021e-014	-13.520	-13.520	0.000	(0)
PbCl3-	1.131e-015	7.786e-016	-14.947	-15.109	-0.162	(0)
Pb2OH+3	7.782e-016	2.710e-017	-15.109	-16.567	-1.458	(0)
PbNO3+	7.479e-016	5.150e-016	-15.126	-15.288	-0.162	(0)
Pb (OH) 4-2	1.445e-017	3.249e-018	-16.840	-17.488	-0.648	(0)
PbF3-	1.206e-017	8.307e-018	-16.919	-17.081	-0.162	(0)
PbCl4-2	3.614e-018	8.126e-019	-17.442	-18.090	-0.648	(0)
Pb3 (OH) 4+2	1.004e-019	2.259e-020	-18.998	-19.646	-0.648	(0)
PbF4-2	2.563e-021	5.764e-022	-20.591	-21.239	-0.648	(0)
Pb4 (OH) 4+4	7.273e-023	1.859e-025	-22.138	-24.731	-2.592	(0)
Pb (NO3) 2	2.938e-023	2.938e-023	-22.532	-22.532	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-150.762	-150.762	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.823	-227.985	-0.162	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.362	-73.362	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.094	-78.256	-0.162	(0)
HS-	0.000e+000	0.000e+000	-78.362	-78.524	-0.162	(0)
H2S	0.000e+000	0.000e+000	-79.303	-79.303	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.441	-80.089	-0.648	(0)
S6-2	0.000e+000	0.000e+000	-79.957	-80.605	-0.648	(0)
S4-2	0.000e+000	0.000e+000	-80.037	-80.685	-0.648	(0)
S3-2	0.000e+000	0.000e+000	-80.843	-81.491	-0.648	(0)
S2-2	0.000e+000	0.000e+000	-81.859	-82.507	-0.648	(0)
S-2	0.000e+000	0.000e+000	-87.598	-88.024	-0.426	(0)
HgHS2-	0.000e+000	0.000e+000	-138.388	-138.550	-0.162	(0)
HgS2-2	0.000e+000	0.000e+000	-138.810	-139.459	-0.648	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.955	-139.955	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.206	-147.635	-0.429	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.218	-147.470	-0.253	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.624	-147.786	-0.162	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.881	-148.043	-0.162	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.961	-148.365	-0.404	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.668	-149.111	-0.442	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.006	-149.422	-0.416	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.576	-149.576	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.833	-149.833	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-150.762	-150.762	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.003	-160.003	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.779	-216.941	-0.162	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.914	-225.076	-0.162	(0)

Cd (HS) 3-	0.000e+000	0.000e+000	-226.037	-226.199	-0.162	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-226.609	-227.257	-0.648	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.823	-227.985	-0.162	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.328	-236.490	-0.162	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-301.879	-302.527	-0.648	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-304.412	-305.060	-0.648	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.589	-317.237	-0.648	(0)
S (6)	4.058e-002					
SO4-2	2.604e-002	9.672e-003	-1.584	-2.014	-0.430	(0)
CaSO4	9.309e-003	9.309e-003	-2.031	-2.031	0.000	(0)
MgSO4	3.919e-003	3.919e-003	-2.407	-2.407	0.000	(0)
NaSO4-	9.105e-004	7.172e-004	-3.041	-3.144	-0.104	(0)
KSO4-	2.990e-004	2.356e-004	-3.524	-3.628	-0.104	(0)
MnSO4	9.073e-005	9.073e-005	-4.042	-4.042	0.000	(0)
ZnSO4	5.249e-006	5.249e-006	-5.280	-5.280	0.000	(0)
Zn (SO4) 2-2	1.967e-006	4.422e-007	-5.706	-6.354	-0.648	(0)
NiSO4	1.983e-007	1.983e-007	-6.703	-6.703	0.000	(0)
CoSO4	1.289e-007	1.289e-007	-6.890	-6.890	0.000	(0)
CuSO4	1.192e-007	1.192e-007	-6.924	-6.924	0.000	(0)
NH4SO4-	5.703e-008	4.463e-008	-7.244	-7.350	-0.106	(0)
CdSO4	4.121e-008	4.121e-008	-7.385	-7.385	0.000	(0)
Cd (SO4) 2-2	2.391e-008	5.377e-009	-7.621	-8.269	-0.648	(0)
HSO4-	1.934e-008	1.500e-008	-7.714	-7.824	-0.110	(0)
PbSO4	4.910e-009	4.910e-009	-8.309	-8.309	0.000	(0)
Pb (SO4) 2-2	1.273e-009	2.862e-010	-8.895	-9.543	-0.648	(0)
AgSO4-	6.225e-010	4.287e-010	-9.206	-9.368	-0.162	(0)
Ni (SO4) 2-2	2.825e-010	6.351e-011	-9.549	-10.197	-0.648	(0)
CrOHSO4	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
FeSO4	2.947e-012	2.947e-012	-11.531	-11.531	0.000	(0)
UO2SO4	4.724e-013	4.724e-013	-12.326	-12.326	0.000	(0)
UO2 (SO4) 2-2	2.679e-013	6.023e-014	-12.572	-13.220	-0.648	(0)
AlSO4+	9.329e-014	7.238e-014	-13.030	-13.140	-0.110	(0)
CrSO4+	5.309e-014	3.656e-014	-13.275	-13.437	-0.162	(0)
Al (SO4) 2-	9.669e-015	7.501e-015	-14.015	-14.125	-0.110	(0)
VO2SO4-	1.129e-016	7.773e-017	-15.947	-16.109	-0.162	(0)
FeSO4+	1.589e-018	1.243e-018	-17.799	-17.905	-0.106	(0)
Cr2 (OH) 2SO4+2	4.643e-019	1.044e-019	-18.333	-18.981	-0.648	(0)
Fe (SO4) 2-	3.734e-019	2.571e-019	-18.428	-18.590	-0.162	(0)
VOSO4	1.821e-019	1.821e-019	-18.740	-18.740	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.999e-020	5.999e-020	-19.222	-19.222	0.000	(0)
HgSO4	1.491e-021	1.491e-021	-20.827	-20.827	0.000	(0)
CrO3SO4-2	4.760e-023	1.070e-023	-22.322	-22.971	-0.648	(0)
VSO4+	5.714e-034	3.935e-034	-33.243	-33.405	-0.162	(0)
U (SO4) 2	1.012e-039	1.012e-039	-38.995	-38.995	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.232	-40.880	-0.648	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.822	-56.984	-0.162	(0)
Sb (3)	6.732e-019					
Sb (OH) 3	3.404e-019	3.404e-019	-18.468	-18.468	0.000	(0)
HSbO2	3.328e-019	3.328e-019	-18.478	-18.478	0.000	(0)
SbO2-	4.931e-023	3.396e-023	-22.307	-22.469	-0.162	(0)
Sb (OH) 4-	2.818e-023	1.940e-023	-22.550	-22.712	-0.162	(0)
Sb (OH) 2F	1.225e-024	1.225e-024	-23.912	-23.912	0.000	(0)
SbOF	1.207e-024	1.207e-024	-23.918	-23.918	0.000	(0)
Sb (OH) 2+	1.908e-025	1.314e-025	-24.719	-24.881	-0.162	(0)
SbO+	6.587e-026	4.536e-026	-25.181	-25.343	-0.162	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.589	-317.237	-0.648	(0)
Sb (5)	5.115e-007					
SbO3-	5.110e-007	3.519e-007	-6.292	-6.454	-0.162	(0)
Sb (OH) 6-	5.249e-010	4.098e-010	-9.280	-9.387	-0.108	(0)
SbO2+	3.697e-023	2.545e-023	-22.432	-22.594	-0.162	(0)
Se (-2)	2.160e-014					
Ag2Se	2.160e-014	2.160e-014	-13.666	-13.666	0.000	(0)
HSe-	1.238e-039	8.527e-040	-38.907	-39.069	-0.162	(0)
MnSe	0.000e+000	0.000e+000	-40.933	-40.933	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.979	-42.979	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.622	-46.270	-0.648	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-81.311	-83.903	-2.592	(0)
Se (4)	1.810e-007					

HSeO3-	1.024e-007	7.048e-008	-6.990	-7.152	-0.162	(0)
SeO3-2	7.862e-008	1.768e-008	-7.104	-7.753	-0.648	(0)
H2SeO3	4.772e-013	4.772e-013	-12.321	-12.321	0.000	(0)
AgSeO3-	3.665e-014	2.524e-014	-13.436	-13.598	-0.162	(0)
Cd (SeO3) 2-2	2.082e-017	4.682e-018	-16.681	-17.330	-0.648	(0)
Ag (SeO3) 2-3	1.147e-019	3.995e-021	-18.940	-20.398	-1.458	(0)
FeHSeO3+2	9.488e-024	2.134e-024	-23.023	-23.671	-0.648	(0)
Se (6)	2.314e-010					
SeO4-2	2.301e-010	8.549e-011	-9.638	-10.068	-0.430	(0)
MnSeO4	1.214e-012	1.214e-012	-11.916	-11.916	0.000	(0)
ZnSeO4	3.284e-014	3.284e-014	-13.484	-13.484	0.000	(0)
NiSeO4	4.109e-015	4.109e-015	-14.386	-14.386	0.000	(0)
CoSeO4	2.862e-015	2.862e-015	-14.543	-14.543	0.000	(0)
CdSeO4	2.893e-016	2.893e-016	-15.539	-15.539	0.000	(0)
HSeO4-	9.875e-017	6.800e-017	-16.005	-16.168	-0.162	(0)
Zn (SeO4) 2-2	1.266e-023	2.847e-024	-22.898	-23.546	-0.648	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.801	-59.259	-1.458	(0)
U (4)	3.718e-020					
U (OH) 5-	3.716e-020	2.559e-020	-19.430	-19.592	-0.162	(0)
U (OH) 4	1.703e-023	1.703e-023	-22.769	-22.769	0.000	(0)
U (OH) 3+	1.437e-027	9.896e-028	-26.843	-27.005	-0.162	(0)
U (OH) 2+2	3.234e-032	7.273e-033	-31.490	-32.138	-0.648	(0)
UF3+	6.026e-036	4.150e-036	-35.220	-35.382	-0.162	(0)
UF2+2	8.032e-037	1.806e-037	-36.095	-36.743	-0.648	(0)
UOH+3	1.564e-037	5.444e-039	-36.806	-38.264	-1.458	(0)
UF4	6.596e-038	6.596e-038	-37.181	-37.181	0.000	(0)
UF+3	2.842e-039	0.000e+000	-38.546	-40.005	-1.458	(0)
U (SO4) 2	1.012e-039	1.012e-039	-38.995	-38.995	0.000	(0)
UF5-	5.503e-040	3.790e-040	-39.259	-39.421	-0.162	(0)
UF6-2	0.000e+000	0.000e+000	-40.132	-40.780	-0.648	(0)
USO4+2	0.000e+000	0.000e+000	-40.232	-40.880	-0.648	(0)
U+4	0.000e+000	0.000e+000	-42.874	-45.466	-2.592	(0)
UCl+3	0.000e+000	0.000e+000	-44.949	-46.407	-1.458	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-159.845	-172.968	-13.124	(0)
U (5)	2.875e-016					
UO2+	2.875e-016	1.980e-016	-15.541	-15.703	-0.162	(0)
U (6)	4.322e-007					
UO2 (CO3) 3-4	3.874e-007	9.905e-010	-6.412	-9.004	-2.592	(0)
UO2 (CO3) 2-2	4.449e-008	1.000e-008	-7.352	-8.000	-0.648	(0)
UO2CO3	2.538e-010	2.538e-010	-9.596	-9.596	0.000	(0)
UO2OH+	3.737e-012	2.574e-012	-11.427	-11.589	-0.162	(0)
UO2F+	9.377e-013	6.457e-013	-12.028	-12.190	-0.162	(0)
UO2SO4	4.724e-013	4.724e-013	-12.326	-12.326	0.000	(0)
UO2F2	2.700e-013	2.700e-013	-12.569	-12.569	0.000	(0)
UO2 (SO4) 2-2	2.679e-013	6.023e-014	-12.572	-13.220	-0.648	(0)
UO2+2	8.686e-014	3.227e-014	-13.061	-13.491	-0.430	(0)
UO2F3-	1.428e-014	9.832e-015	-13.845	-14.007	-0.162	(0)
UO2Cl+	1.735e-016	1.195e-016	-15.761	-15.923	-0.162	(0)
UO2F4-2	5.035e-017	1.132e-017	-16.298	-16.946	-0.648	(0)
(UO2) 2 (OH) 2+2	4.888e-017	1.099e-017	-16.311	-16.959	-0.648	(0)
(UO2) 3 (OH) 5+	1.251e-017	8.613e-018	-16.903	-17.065	-0.162	(0)
UO2NO3+	3.141e-021	2.163e-021	-20.503	-20.665	-0.162	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-41.898	-42.060	-0.162	(0)
V+2	0.000e+000	0.000e+000	-42.724	-43.372	-0.648	(0)
V (3)	1.768e-014					
V (OH) 3	1.768e-014	1.768e-014	-13.753	-13.753	0.000	(0)
V (OH) 2+	2.636e-025	1.815e-025	-24.579	-24.741	-0.162	(0)
VOH+2	1.217e-028	2.736e-029	-27.915	-28.563	-0.648	(0)
V+3	2.475e-033	8.618e-035	-32.606	-34.065	-1.458	(0)
VSO4+	5.714e-034	3.935e-034	-33.243	-33.405	-0.162	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-53.394	-54.852	-1.458	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-53.733	-56.326	-2.592	(0)
V (4)	1.310e-017					
V (OH) 3+	1.253e-017	8.627e-018	-16.902	-17.064	-0.162	(0)
VO+2	3.040e-019	6.835e-020	-18.517	-19.165	-0.648	(0)
VOSO4	1.821e-019	1.821e-019	-18.740	-18.740	0.000	(0)

VOF+	8.631e-020	5.943e-020	-19.064	-19.226	-0.162	(0)
VOF2	3.231e-021	3.231e-021	-20.491	-20.491	0.000	(0)
VOC1+	6.358e-022	4.378e-022	-21.197	-21.359	-0.162	(0)
VOF3-	2.413e-023	1.662e-023	-22.617	-22.779	-0.162	(0)
VOF4-2	4.325e-026	9.725e-027	-25.364	-26.012	-0.648	(0)
H2V2O4+2	1.664e-029	3.741e-030	-28.779	-29.427	-0.648	(0)
V(5)	1.440e-007					
H2VO4-	9.696e-008	6.677e-008	-7.013	-7.175	-0.162	(0)
HVO4-2	4.700e-008	1.057e-008	-7.328	-7.976	-0.648	(0)
H3VO4	1.060e-011	1.060e-011	-10.975	-10.975	0.000	(0)
HV2O7-3	6.877e-012	2.394e-013	-11.163	-12.621	-1.458	(0)
H3V2O7-	6.644e-012	4.575e-012	-11.178	-11.340	-0.162	(0)
V2O7-4	1.588e-013	4.061e-016	-12.799	-15.391	-2.592	(0)
VO4-3	9.585e-014	3.337e-015	-13.018	-14.477	-1.458	(0)
V3O9-3	8.992e-015	3.131e-016	-14.046	-15.504	-1.458	(0)
VO2+	4.311e-016	3.365e-016	-15.365	-15.473	-0.108	(0)
VO2SO4-	1.129e-016	7.773e-017	-15.947	-16.109	-0.162	(0)
VO2F	8.557e-017	8.557e-017	-16.068	-16.068	0.000	(0)
VO2F2-	6.541e-018	4.504e-018	-17.184	-17.346	-0.162	(0)
V4O12-4	3.414e-018	8.727e-021	-17.467	-20.059	-2.592	(0)
VO2F3-2	3.622e-020	8.145e-021	-19.441	-20.089	-0.648	(0)
VO2F4-3	1.669e-023	5.810e-025	-22.778	-24.236	-1.458	(0)
VO2NO3	5.718e-024	5.718e-024	-23.243	-23.243	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-48.206	-54.039	-5.833	(0)
HV10O28-5	0.000e+000	0.000e+000	-49.601	-53.651	-4.051	(0)
H2V10O28-4	0.000e+000	0.000e+000	-53.651	-56.243	-2.592	(0)
Zn	1.454e-005					
Zn+2	6.678e-006	2.480e-006	-5.175	-5.605	-0.430	(0)
ZnSO4	5.249e-006	5.249e-006	-5.280	-5.280	0.000	(0)
Zn(SO4)2-2	1.967e-006	4.422e-007	-5.706	-6.354	-0.648	(0)
ZnCO3	2.820e-007	2.820e-007	-6.550	-6.550	0.000	(0)
ZnOH+	2.282e-007	1.572e-007	-6.642	-6.804	-0.162	(0)
ZnHCO3+	7.618e-008	5.246e-008	-7.118	-7.280	-0.162	(0)
ZnCl+	1.851e-008	1.423e-008	-7.733	-7.847	-0.114	(0)
Zn(OH)2	1.578e-008	1.578e-008	-7.802	-7.802	0.000	(0)
ZnOHCl	1.180e-008	1.180e-008	-7.928	-7.928	0.000	(0)
ZnF+	1.042e-008	7.175e-009	-7.982	-8.144	-0.162	(0)
Zn(OH)3-	7.276e-011	5.011e-011	-10.138	-10.300	-0.162	(0)
ZnCl2	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
ZnNO3+	3.039e-013	2.093e-013	-12.517	-12.679	-0.162	(0)
ZnCl3-	1.215e-013	9.338e-014	-12.915	-13.030	-0.114	(0)
ZnSeO4	3.284e-014	3.284e-014	-13.484	-13.484	0.000	(0)
Zn(OH)4-2	5.620e-015	1.264e-015	-14.250	-14.898	-0.648	(0)
ZnCl4-2	2.843e-016	1.066e-016	-15.546	-15.972	-0.426	(0)
Zn(NO3)2	1.403e-021	1.403e-021	-20.853	-20.853	0.000	(0)
Zn(SeO4)2-2	1.266e-023	2.847e-024	-22.898	-23.546	-0.648	(0)
ZnS(HS)-	0.000e+000	0.000e+000	-147.881	-148.043	-0.162	(0)
Zn(HS)2	0.000e+000	0.000e+000	-149.833	-149.833	0.000	(0)
Zn(HS)3-	0.000e+000	0.000e+000	-224.914	-225.076	-0.162	(0)
ZnS(HS)2-2	0.000e+000	0.000e+000	-226.609	-227.257	-0.648	(0)
Zn(HS)4-2	0.000e+000	0.000e+000	-304.412	-305.060	-0.648	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-51.29	-45.00	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-39.85	-35.33	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-47.07	-35.34	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-66.33	-48.40	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-53.93	-33.90	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-27.49	-27.08	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.25	-22.80	0.45	(NH4)2SeO4
Acanthite	-51.81	-88.03	-36.22	Ag2S
Ag2CO3	-11.92	-23.01	-11.09	Ag2CO3
Ag2CrO4	-20.07	-31.66	-11.59	Ag2CrO4
Ag2HVO4	-10.86	-9.38	1.48	Ag2HVO4
Ag2MoO4	-12.01	-23.56	-11.55	Ag2MoO4

Ag2O	-14.28	-1.71	12.57	Ag2O
Ag2Se	0.12	-48.58	-48.70	Ag2Se
Ag2SeO3	-9.51	-16.66	-7.15	Ag2SeO3
Ag2SeO4	-18.46	-27.37	-8.91	Ag2SeO4
Ag2SO4	-14.50	-19.32	-4.82	Ag2SO4
Ag3AsO3	-27.29	-25.14	2.16	Ag3AsO3
Ag3AsO4	-15.66	-18.44	-2.79	Ag3AsO4
Ag3H2VO5	-15.42	-10.24	5.18	Ag3H2VO5
AgF·4H2O	-13.54	-12.49	1.05	AgF·4H2O
Agmetal	-0.14	-13.65	-13.51	Ag
AgVO3	-9.30	-8.53	0.77	AgVO3
Al (OH) 3 (am)	-2.42	8.38	10.80	Al (OH) 3
Al2 (MoO4) 3	-51.16	-48.79	2.37	Al2 (MoO4) 3
Al2O3	-2.89	16.76	19.65	Al2O3
Al4 (OH) 10SO4	-6.79	15.91	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-12.30	-7.50	4.80	AlAsO4·2H2O
AlOHSO4	-6.00	-9.23	-3.23	AlOHSO4
AlSb	-152.49	-86.86	65.62	AlSb
Alunite	-3.35	-4.75	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.21	-11.00	-7.79	PbSO4
Anhydrite	-0.03	-4.39	-4.36	CaSO4
Anilite	-55.03	-86.91	-31.88	Cu0.25Cu1.5S
Antlerite	-1.42	7.37	8.79	Cu3 (OH) 4SO4
Aragonite	0.22	-8.08	-8.30	CaCO3
Arsenolite	-87.54	-90.30	-2.76	As4O6
Artinite	-5.01	4.59	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.47	-31.76	6.71	As2O5
Atacamite	-1.17	6.22	7.39	Cu2 (OH) 3Cl
Azurite	-0.71	-17.62	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.50	7.90	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-15.42	0.45	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.86	-8.05	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-24.59	8.35	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.38	-22.05	-9.67	BaCrO4
BaF2	-9.55	-15.37	-5.82	BaF2
BaMoO4	-6.99	-13.95	-6.96	BaMoO4
Barite	0.27	-9.71	-9.98	BaSO4
BaS	-94.60	-78.42	16.18	BaS
BaSeO3	-8.88	-7.05	1.83	BaSeO3
BaSeO4	-10.30	-17.76	-7.46	BaSeO4
Bianchite	-5.86	-7.62	-1.76	ZnSO4:6H2O
Birnessite	-6.53	11.56	18.09	MnO2
Bixbyite	-1.82	-2.47	-0.64	Mn2O3
BlaubleiI	-55.02	-79.18	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.47	-82.75	-27.28	Cu0.6Cu0.8S
Boehmite	-0.20	8.38	8.58	AlOOH
Breithauptite	-55.32	-73.84	-18.52	NiSb
Brochantite	0.48	15.70	15.22	Cu4 (OH) 6SO4
Brucite	-3.90	12.95	16.84	Mg (OH) 2
Bunsenite	-3.84	8.61	12.45	NiO
Ca (VO3) 2	-7.79	-2.13	5.66	Ca (VO3) 2
Ca2V2O7	-6.40	11.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.46	11.09	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.40	7.90	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-14.64	24.32	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-15.55	24.31	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-293.80	-150.82	142.97	Ca3Sb2
CaCrO4	-14.46	-16.73	-2.27	CaCrO4
Calcite	0.40	-8.08	-8.48	CaCO3
Calomel	-9.03	-26.94	-17.91	Hg2Cl2
CaMoO4	-0.68	-8.63	-7.95	CaMoO4
Carnotite	-0.46	-0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.54	-1.73	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.43	-12.45	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.89	-1.05	9.84	Cd (BO2) 2
Cd (OH) 2	-5.79	7.86	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-5.87	7.86	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-18.36	-11.65	6.71	Cd3 (OH) 2 (SO4) 2

Cd3(OH)4SO4	-16.60	5.96	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-14.58	13.82	28.40	Cd4(OH)6SO4
CdCl2	-12.36	-13.02	-0.66	CdCl2
CdCl2:1H2O	-11.33	-13.02	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.11	-13.02	-1.91	CdCl2:2.5H2O
CdF2	-14.21	-15.42	-1.21	CdF2
Cdmetal(alpha)	-31.25	-17.73	13.51	Cd
Cdmetal(gamma)	-31.35	-17.73	13.62	Cd
CdMoO4	0.15	-13.99	-14.15	CdMoO4
CdOHCl	-6.12	-2.58	3.54	CdOHCl
CdSb	-74.24	-74.59	-0.35	CdSb
CdSe	-18.81	-39.01	-20.20	CdSe
CdSeO4:2H2O	-15.96	-17.81	-1.85	CdSeO4:2H2O
CdSO4	-9.58	-9.75	-0.17	CdSO4
CdSO4:1H2O	-8.03	-9.76	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.88	-9.76	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.54	-11.29	-9.75	AgCl
Cerrusite	-1.56	-14.69	-13.13	PbCO3
CH4(g)	-82.63	-123.67	-41.05	CH4
Chalcanthite	-6.65	-9.29	-2.64	CuSO4:5H2O
Chalcocite	-54.96	-89.88	-34.92	Cu2S
Chalcopyrite	-125.35	-160.62	-35.27	CuFeS2
Cinnabar	-52.45	-98.15	-45.69	HgS
Claudetite	-87.23	-90.30	-3.06	As4O6
Clausthalite	-13.15	-40.25	-27.10	PbSe
Co(BO2)2	-27.56	-0.49	27.07	Co(BO2)2
Co(OH)2	-4.67	8.42	13.09	Co(OH)2
Co(OH)3	-8.87	-11.18	-2.31	Co(OH)3
CO2(g)	-3.16	-21.30	-18.15	CO2
Co3(AsO4)2	-19.52	-6.49	13.03	Co3(AsO4)2
Co3O4	-3.44	-13.94	-10.50	Co3O4
CoCl2	-20.73	-12.46	8.27	CoCl2
CoCl2:6H2O	-15.00	-12.46	2.54	CoCl2:6H2O
CoCO3	-2.90	-12.88	-9.98	CoCO3
CoF2	-13.26	-14.85	-1.60	CoF2
CoF3	-44.64	-46.09	-1.46	CoF3
CoFe2O4	18.86	15.34	-3.53	CoFe2O4
CoMoO4	-5.67	-13.43	-7.76	CoMoO4
CoO	-5.16	8.42	13.59	CoO
CoS(alpha)	-70.46	-77.90	-7.44	CoS
CoS(beta)	-66.83	-77.90	-11.07	CoS
CoSe	-22.24	-38.44	-16.20	CoSe
CoSeO3	-7.85	-6.53	1.32	CoSeO3
CoSeO4:6H2O	-15.72	-17.25	-1.53	CoSeO4:6H2O
CoSO4	-11.99	-9.19	2.80	CoSO4
CoSO4:6H2O	-6.72	-9.19	-2.47	CoSO4:6H2O
Cotunnite	-9.49	-14.27	-4.78	PbCl2
Covellite	-55.69	-77.99	-22.30	CuS
Cr(OH)2	-21.63	-10.81	10.82	Cr(OH)2
Cr(OH)3	-2.30	-0.96	1.34	Cr(OH)3
Cr(OH)3(am)	-0.21	-0.96	-0.75	Cr(OH)3
Cr2O3	0.43	-1.92	-2.36	Cr2O3
CrCl2	-45.78	-31.69	14.09	CrCl2
CrCl3	-47.40	-32.28	15.11	CrCl3
CrF3	-24.54	-35.88	-11.34	CrF3
Crmetal	-66.89	-36.40	30.48	Cr
CrO3	-26.74	-29.95	-3.21	CrO3
Cryolite	-9.79	-43.63	-33.84	Na3AlF6
Cu(OH)2	-0.35	8.33	8.67	Cu(OH)2
Cu(SbO3)2	-22.63	22.58	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-7.87	1.38	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-53.81	-88.69	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.62	-50.42	-45.80	Cu2Se
Cu2SO4	-19.22	-21.17	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.87	-6.77	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-57.98	-100.58	-42.59	Cu3Sb
Cu3Se2	-25.47	-88.96	-63.49	Cu3Se2
CuCO3	-1.47	-12.97	-11.50	CuCO3

CuCrO4	-16.18	-21.62	-5.44	CuCrO4
CuF	-8.51	-13.42	-4.91	CuF
CuF2	-16.06	-14.95	1.12	CuF2
CuF2:2H2O	-10.40	-14.95	-4.55	CuF2:2H2O
Cumetal	-5.82	-14.57	-8.76	Cu
CuMoO4	-0.45	-13.52	-13.08	CuMoO4
CuOCuSO4	-11.26	-0.96	10.30	CuOCuSO4
Cupricferrite	9.25	15.24	5.99	CuFe2O4
Cuprite	-2.15	-3.55	-1.41	Cu2O
Cuprousferrite	10.60	1.68	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe
CuSe2	-26.45	-59.81	-33.37	CuSe2
CuSeO3:2H2O	-7.13	-6.62	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.90	-17.34	-2.44	CuSeO4:5H2O
CuSO4	-12.22	-9.28	2.94	CuSO4
Diaspore	1.51	8.38	6.87	AlOOH
Djurleite	-55.17	-89.09	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.10	-16.44	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.65	-16.44	-17.09	CaMg(CO3)2
Epsomite	-2.54	-4.67	-2.13	MgSO4:7H2O
Fe(OH)2	-9.87	3.69	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.36	0.32	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-7.94	-11.66	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.59	-8.04	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.31	-37.94	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.19	-45.93	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.62	10.60	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.82	-12.42	0.40	FeAsO4:2H2O
FeCr2O4	-5.43	1.77	7.20	FeCr2O4
FeMoO4	-8.07	-18.16	-10.09	FeMoO4
Ferrihydrite	0.26	3.46	3.19	Fe(OH)3
Ferroselite	-45.86	-64.45	-18.60	FeSe2
FeS(ppt)	-79.68	-82.63	-2.95	FeS
FeSe	-32.18	-43.18	-11.00	FeSe
Fix_pe	-5.00	-5.00	0.00	e-
Fluorite	0.45	-10.05	-10.50	CaF2
Galena	-65.74	-79.71	-13.97	PbS
Gibbsite	0.09	8.38	8.29	Al(OH)3
Goethite	2.97	3.46	0.49	FeOOH
Goslarite	-5.61	-7.62	-2.01	ZnSO4:7H2O
Greenockite	-64.10	-78.46	-14.36	CdS
Greigite	-289.65	-334.68	-45.03	Fe3S4
Gummite	-5.56	2.11	7.67	UO3
Gypsum	0.22	-4.39	-4.61	CaSO4:2H2O
H-Jarosite	-12.76	-24.86	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.98	-21.85	-12.88	H2MoO4
H2S(g)	-78.31	-86.32	-8.01	H2S
H2Se(g)	-41.91	-46.87	-4.96	H2Se
Halite	-6.10	-4.50	1.60	NaCl
Hausmannite	-1.48	59.55	61.03	Mn3O4
Hematite	8.33	6.91	-1.42	Fe2O3
Hercynite	-2.44	20.45	22.89	FeAl2O4
Hg(CH3)2(g)	-185.47	-259.17	-73.71	Hg(CH3)2
Hg(g)	-7.95	-15.83	-7.87	Hg
Hg(OH)2	-8.33	-11.83	-3.50	Hg(OH)2
Hg2(g)	-16.70	-31.65	-14.96	Hg2
Hg2(OH)2	-11.32	-6.06	5.26	Hg2(OH)2
Hg2CO3	-11.31	-27.36	-16.05	Hg2CO3
Hg2CrO4	-27.31	-36.01	-8.70	Hg2CrO4
Hg2F2	-18.97	-29.34	-10.36	Hg2F2
Hg2S	-80.71	-92.38	-11.68	Hg2S
Hg2SeO3	-16.35	-21.01	-4.66	Hg2SeO3
Hg2SO4	-17.54	-23.67	-6.13	Hg2SO4
Hg3O2CO3	-27.10	-56.78	-29.68	Hg3O2CO3
HgCl(g)	-32.97	-13.47	19.50	HgCl
HgCl2	-11.44	-32.71	-21.26	HgCl2
HgF(g)	-47.34	-14.67	32.68	HgF
HgF2(g)	-47.67	-35.10	12.57	HgF2

Hgmetal(1)	-2.37	-15.83	-13.45	Hg
HgSe	-3.00	-58.69	-55.69	HgSe
HgSeO3	-14.35	-26.78	-12.43	HgSeO3
HgSO4	-20.02	-29.44	-9.42	HgSO4
Huntite	-3.18	-33.15	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-3.99	-22.76	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.72	-20.48	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.35	-21.52	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.72	-19.52	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.99	-49.23	-17.24	K2Cr2O7
K2CrO4	-18.77	-19.28	-0.51	K2CrO4
K2MoO4	-14.44	-11.18	3.26	K2MoO4
K2SeO4	-14.26	-14.99	-0.73	K2SeO4
Langite	-1.79	15.70	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-3.95	-4.39	-0.43	PbO : PbSO4
Laurionite	-4.45	-3.83	0.62	PbOHCl
Lepidocrocite	2.09	3.46	1.37	FeOOH
Lime	-19.48	13.22	32.70	CaO
Litharge	-6.08	6.61	12.69	PbO
Mackinawite	-79.03	-82.63	-3.60	FeS
Maghemite	0.53	6.91	6.39	Fe2O3
Magnesioferrite	3.00	19.86	16.86	Fe2MgO4
Magnesite	-0.90	-8.36	-7.46	MgCO3
Magnetite	7.20	10.60	3.40	Fe3O4
Malachite	0.66	-4.65	-5.31	Cu2 (OH) 2CO3
Manganite	-1.22	24.12	25.34	MnOOH
Massicot	-6.28	6.61	12.89	PbO
Matlockite	-6.49	-15.46	-8.97	PbClF
Melanothallite	-18.81	-12.55	6.26	CuCl2
Melanterite	-11.72	-13.92	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.05	-98.15	-45.09	HgS
Mg (OH) 2 (active)	-5.85	12.95	18.79	Mg (OH) 2
Mg (VO3) 2	-13.68	-2.40	11.28	Mg (VO3) 2
Mg2Sb3	-270.54	-195.86	74.68	Mg2Sb3
Mg2V2O7	-15.82	10.54	26.36	Mg2V2O7
MgCr2O4	-5.18	11.02	16.20	MgCr2O4
MgCrO4	-22.38	-17.00	5.38	MgCrO4
MgF2	-2.20	-10.33	-8.13	MgF2
MgMoO4	-7.06	-8.91	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.06	-2.01	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.52	-12.72	-1.20	MgSeO4 : 6H2O
Minium	-28.09	45.43	73.52	Pb3O4
Mirabilite	-4.63	-5.74	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-8.93	-4.03	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.59	-55.30	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.48	-85.40	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.30	2.20	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.28	-9.56	2.72	MnCl2 : 4H2O
MnS (grn)	-75.17	-75.00	0.17	MnS
MnS (pnk)	-78.34	-75.00	3.34	MnS
MnSb	-93.57	-96.48	-2.91	MnSb
MnSe	-39.05	-35.55	3.50	MnSe
MnSeO3	-4.76	-3.63	1.13	MnSeO3
MnSeO3 : 2H2O	-4.61	-3.63	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.30	-14.35	-2.05	MnSeO4 : 5H2O
MnSO4	-8.88	-6.29	2.58	MnSO4
Monteponite	-7.25	7.86	15.10	CdO
Montroydite	-8.19	-11.83	-3.64	HgO
MoO3	-13.85	-21.85	-8.00	MoO3
Morenosite	-6.86	-9.01	-2.14	NiSO4 : 7H2O
MoS2	-149.83	-220.09	-70.26	MoS2
Na-Jarosite	-7.72	-18.92	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.13	-48.02	-9.90	Na2Cr2O7
Na2CrO4	-21.00	-18.07	2.93	Na2CrO4
Na2Mo2O7	-15.23	-31.83	-16.60	Na2Mo2O7
Na2MoO4	-11.46	-9.97	1.49	Na2MoO4
Na2MoO4 : 2H2O	-11.20	-9.98	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-13.38	-3.08	10.30	Na2SeO3 : 5H2O

Na2SeO4	-15.07	-13.79	1.28	Na2SeO4
Na3Sb	-171.88	-77.43	94.45	Na3Sb
Na3VO4	-26.54	10.14	36.68	Na3VO4
Na4V2O7	-28.99	8.41	37.40	Na4V2O7
Nantokite	-5.49	-12.22	-6.73	CuCl
NaSb	-86.88	-63.71	23.17	NaSb
Natron	-8.12	-9.43	-1.31	Na2CO3:10H2O
NaVO3	-5.59	-1.73	3.86	NaVO3
Nesquehonite	-3.69	-8.36	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.18	8.61	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-21.63	-5.93	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-15.17	16.83	32.00	Ni4 (OH) 6SO4
NiCO3	-5.82	-12.69	-6.87	NiCO3
NiMoO4	-2.10	-13.24	-11.14	NiMoO4
NiS (alpha)	-72.11	-77.71	-5.60	NiS
NiS (beta)	-66.61	-77.71	-11.10	NiS
NiS (gamma)	-64.91	-77.71	-12.80	NiS
NiSe	-20.56	-38.26	-17.70	NiSe
NiSeO3:2H2O	-9.16	-6.34	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.54	-17.06	-1.52	NiSeO4:6H2O
Nsutite	-5.94	11.56	17.50	MnO2
O2 (g)	-31.90	51.18	83.09	O2
Orpiment	-243.05	-304.11	-61.07	As2S3
Otavite	-1.44	-13.44	-12.00	CdCO3
Pb (BO2) 2	-8.82	-2.30	6.52	Pb (BO2) 2
Pb (OH) 2	-1.54	6.61	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-52.92	-61.68	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-6.01	2.79	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-12.96	13.23	26.19	Pb2O (OH) 2
Pb2O3	-22.22	38.82	61.04	Pb2O3
Pb2OCO3	-7.52	-8.07	-0.56	Pb2OCO3
Pb2V2O7	-0.22	-2.12	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-17.72	-11.92	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-1.65	4.49	6.14	Pb3 (VO4) 2
Pb3O2CO3	-12.48	-1.46	11.02	Pb3O2CO3
Pb3O2SO4	-8.46	2.23	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-12.26	8.84	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-13.03	8.84	21.88	Pb4O3SO4
PbCrO4	-10.74	-23.34	-12.60	PbCrO4
PbF2	-9.22	-16.66	-7.44	PbF2
Pbmetal	-23.22	-18.98	4.25	Pb
PbMoO4	0.38	-15.24	-15.62	PbMoO4
PbO:0.3H2O	-6.37	6.61	12.98	PbO:0.33H2O
PbSeO4	-12.21	-19.05	-6.84	PbSeO4
Periclase	-8.64	12.95	21.58	MgO
Phosgenite	-9.15	-28.96	-19.81	PbCl2:PbCO3
Plattnerite	-17.39	32.21	49.60	PbO2
Portlandite	-9.58	13.22	22.80	Ca (OH) 2
Pyrite	-124.85	-143.36	-18.51	FeS2
Pyrochroite	-3.87	11.32	15.19	Mn (OH) 2
Pyrolusite	-4.47	36.91	41.38	MnO2
Realgar	-101.95	-121.69	-19.75	AsS
Retgersite	-6.97	-9.01	-2.04	NiSO4:6H2O
Rhodochrosite	0.60	-9.98	-10.58	MnCO3
Rutherfordine	-4.70	-19.20	-14.50	UO2CO3
Sb (OH) 3	-11.36	-18.47	-7.11	Sb (OH) 3
Sb2O4	-14.74	-11.34	3.40	Sb2O4
Sb2O5	-24.70	-34.37	-9.67	Sb2O5
Sb2Se3	-109.78	-177.54	-67.76	Sb2Se3
Sb4O6 (cubic)	-55.61	-73.87	-18.26	Sb4O6
Sb4O6 (orth)	-55.97	-73.87	-17.90	Sb4O6
SbCl3	-50.36	-49.79	0.57	SbCl3
SbF3	-43.16	-53.38	-10.23	SbF3
Sbmetal	-45.17	-56.86	-11.69	Sb
SbO2	-2.16	-29.98	-27.82	SbO2
Schoepite	-3.89	2.11	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.17	-21.28	-7.11	Se
Semetal (hex)	-13.57	-21.28	-7.71	Se

Senarmontite	-24.57	-36.93	-12.37	Sb2O3
SeO2	-15.08	-14.95	0.12	SeO2
SeO3	-46.71	-25.67	21.04	SeO3
Siderite	-7.37	-17.61	-10.24	FeCO3
Smithsonite	-1.31	-11.31	-10.00	ZnCO3
Sphalerite	-64.88	-76.33	-11.45	ZnS
Spinel	-7.14	29.71	36.85	MgAl2O4
Stibnite	-245.44	-295.90	-50.46	Sb2S3
Sulfur	-58.59	-60.73	-2.14	S
Tenorite	0.68	8.33	7.64	CuO
Thenardite	-6.06	-5.73	0.32	Na2SO4
Thermonatrite	-10.06	-9.42	0.64	Na2CO3:H2O
Tyuyamunite	-1.99	2.09	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.71	8.38	21.08	U3O8
U3Sb4	-576.17	-423.79	152.38	U3Sb4
U4O9	-28.47	-31.49	-3.02	U4O9
UF4	-31.28	-60.82	-29.54	UF4
UF4:2.5H2O	-28.10	-60.82	-32.72	UF4:2.5H2O
UO2 (am)	-15.20	-14.27	0.93	UO2
UO2 (NO3) 2	-40.59	-28.44	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.29	-28.44	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.83	-28.44	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.49	-28.44	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.51	2.11	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.31	-23.56	-2.25	UO2SeO4:4H2O
UO3	-5.59	2.11	7.70	UO3
Uraninite	-9.60	-14.27	-4.67	UO2
USb2	-217.96	-188.38	29.58	USb2
V (OH) 3	-18.26	-10.67	7.59	V (OH) 3
V2O5	-13.99	-15.35	-1.36	V2O5
V3O5	-38.13	-36.29	1.84	V3O5
V4O7	-47.05	-39.86	7.19	V4O7
V6O13	-36.37	-97.23	-60.86	V6O13
Valentinite	-28.45	-36.93	-8.48	Sb2O3
VC12	-63.22	-44.34	18.87	VC12
VC13	-65.42	-41.99	23.43	VC13
VF4	-65.05	-50.12	14.93	VF4
Vmetal	-93.08	-49.06	44.03	V
VO	-38.22	-23.46	14.76	VO
VO (OH) 2	-8.72	-3.57	5.15	VO (OH) 2
VO2Cl	-20.96	-18.11	2.84	VO2Cl
VOC1	-32.26	-21.11	11.15	VOC1
VOC12	-37.21	-24.45	12.76	VOC12
VOSO4	-24.79	-21.18	3.61	VOSO4
Witherite	-4.83	-13.40	-8.57	BaCO3
Wurtzite	-67.38	-76.33	-8.95	ZnS
Zincite	-1.34	9.99	11.33	ZnO
Zincosite	-11.55	-7.62	3.93	ZnSO4
Zn (BO2) 2	-7.21	1.08	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-23.87	-20.56	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.21	9.99	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.48	9.99	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.76	9.99	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.54	9.99	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.74	9.99	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-5.13	2.37	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.65	9.54	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.43	-1.78	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-24.16	-5.25	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-6.04	22.36	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-9.42	29.08	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.94	-10.89	7.05	ZnCl2
ZnCO3:1H2O	-1.05	-11.31	-10.26	ZnCO3:1H2O
ZnF2	-12.75	-13.28	-0.53	ZnF2
Znmetal	-41.39	-15.60	25.79	Zn
ZnMoO4	-1.73	-11.86	-10.13	ZnMoO4
ZnO (active)	-1.20	9.99	11.19	ZnO
ZnS (am)	-67.28	-76.33	-9.05	ZnS

ZnSb	-83.47	-72.46	11.01	ZnSb
ZnSe	-22.48	-36.88	-14.40	ZnSe
ZnSeO4:6H2O	-14.16	-15.68	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.98	-7.62	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 27.

```
Title Return solution back to 1L
Mix 105
      114  2.00
save solution 113
end
```

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 105.

Mixture 105.

2.000e+000 Solution 114 Solution after simulation 26.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.685e-008	1.570e-008
Al	4.040e-007	3.764e-007
As	1.538e-009	1.433e-009
B	3.643e-005	3.394e-005
Ba	5.429e-008	5.059e-008
C	9.897e-004	9.222e-004
Ca	2.071e-002	1.929e-002
Cd	1.210e-007	1.128e-007
Cl	2.925e-003	2.726e-003
Co	4.358e-007	4.061e-007
Cr	3.107e-009	2.896e-009
Cu	1.067e-006	9.941e-007
F	2.426e-004	2.260e-004
Fe	2.320e-009	2.161e-009
Hg	5.538e-010	5.160e-010
K	4.706e-003	4.385e-003
Mg	9.985e-003	9.304e-003
Mn	3.269e-004	3.046e-004
Mo	1.499e-006	1.397e-006
N	4.308e-005	4.014e-005
Na	1.860e-002	1.734e-002
Ni	4.977e-007	4.638e-007
Pb	1.860e-008	1.733e-008
S	4.058e-002	3.781e-002
Sb	5.115e-007	4.766e-007
Se	1.812e-007	1.689e-007
U	4.322e-007	4.027e-007

V	1.440e-007	1.342e-007
Zn	1.454e-005	1.354e-005

-----Description of solution-----

	pH =	7.799	Charge balance
	pe =	4.997	Adjusted to redox
equilibrium	Activity of water	=	0.999
	Ionic strength	=	1.009e-001
	Mass of water (kg)	=	9.318e-001
	Total alkalinity (eq/kg)	=	9.970e-004
	Total CO2 (mol/kg)	=	9.897e-004
	Temperature (deg C)	=	25.00
	Electrical balance (eq)	=	1.635e-005
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.02	
	Iterations	=	9
	Total H	=	1.034448e+002
	Total O	=	5.187609e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	8.326e-007	6.336e-007	-6.080	-6.198	-0.119	(0)
H+	2.033e-008	1.587e-008	-7.692	-7.799	-0.108	0.00
H2O	5.551e+001	9.986e-001	1.744	-0.001	0.000	18.07
Ag	1.685e-008					
AgCl	1.036e-008	1.036e-008	-7.985	-7.985	0.000	(0)
AgCl2-	2.991e-009	2.059e-009	-8.524	-8.686	-0.162	(0)
Ag+	2.845e-009	2.221e-009	-8.546	-8.653	-0.108	(0)
AgSO4-	6.225e-010	4.287e-010	-9.206	-9.368	-0.162	(0)
AgCl3-2	1.864e-011	4.191e-012	-10.730	-11.378	-0.648	(0)
AgNO2	1.480e-011	1.480e-011	-10.830	-10.830	0.000	(0)
AgF	8.089e-013	8.089e-013	-12.092	-12.092	0.000	(0)
AgCl4-3	5.612e-013	1.954e-014	-12.251	-13.709	-1.458	(0)
AgOH	1.407e-013	1.407e-013	-12.852	-12.852	0.000	(0)
AgNH3+	1.019e-013	7.016e-014	-12.992	-13.154	-0.162	(0)
AgH2BO3	4.500e-014	4.500e-014	-13.347	-13.347	0.000	(0)
AgSeO3-	3.665e-014	2.524e-014	-13.436	-13.598	-0.162	(0)
Ag2Se	2.160e-014	2.160e-014	-13.666	-13.666	0.000	(0)
Ag (NO2) 2-	1.062e-015	7.315e-016	-14.974	-15.136	-0.162	(0)
AgNO3	5.927e-017	5.927e-017	-16.227	-16.227	0.000	(0)
Ag (NH3) 2+	1.281e-017	8.822e-018	-16.892	-17.054	-0.162	(0)
Ag (OH) 2-	1.265e-017	8.713e-018	-16.898	-17.060	-0.162	(0)
Ag (SeO3) 2-3	1.147e-019	3.995e-021	-18.940	-20.398	-1.458	(0)
Ag2MoO4	1.040e-024	1.040e-024	-23.983	-23.983	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.362	-73.362	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-81.311	-83.903	-2.592	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.218	-147.470	-0.253	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.624	-147.786	-0.162	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.668	-149.111	-0.442	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.006	-149.422	-0.416	(0)
Al	4.040e-007					
Al (OH) 4-	3.994e-007	3.099e-007	-6.399	-6.509	-0.110	(0)
Al (OH) 3	3.885e-009	3.885e-009	-8.411	-8.411	0.000	(0)
Al (OH) 2+	3.902e-010	3.073e-010	-9.409	-9.512	-0.104	(0)
AlF3	1.472e-010	1.472e-010	-9.832	-9.832	0.000	(0)
AlF2+	1.024e-010	8.066e-011	-9.990	-10.093	-0.104	(0)
AlF4-	1.379e-011	1.070e-011	-10.861	-10.971	-0.110	(0)
AlF+2	3.630e-012	1.397e-012	-11.440	-11.855	-0.415	(0)
AlOH+2	1.586e-012	6.107e-013	-11.800	-12.214	-0.415	(0)
AlSO4+	9.329e-014	7.238e-014	-13.030	-13.140	-0.110	(0)
Al (SO4) 2-	9.669e-015	7.501e-015	-14.015	-14.125	-0.110	(0)
Al+3	8.948e-015	9.639e-016	-14.048	-15.016	-0.968	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-42.886	-44.344	-1.458	(0)
As (3)	2.786e-023					

	H3AsO3	2.662e-023	2.662e-023	-22.575	-22.575	0.000	(0)
	H2AsO3-	1.249e-024	8.601e-025	-23.903	-24.065	-0.162	(0)
	HAsO3-2	2.198e-028	4.942e-029	-27.658	-28.306	-0.648	(0)
	H4AsO3+	3.039e-031	2.093e-031	-30.517	-30.679	-0.162	(0)
	AsO3-3	3.448e-033	1.200e-034	-32.462	-33.921	-1.458	(0)
As (5)	1.538e-009						
	HAsO4-2	1.467e-009	3.299e-010	-8.834	-9.482	-0.648	(0)
	H2AsO4-	6.934e-011	4.775e-011	-10.159	-10.321	-0.162	(0)
	AsO4-3	1.888e-012	6.573e-014	-11.724	-13.182	-1.458	(0)
	H3AsO4	1.287e-016	1.317e-016	-15.891	-15.880	0.010	(0)
B	3.643e-005						
	H3BO3	3.413e-005	3.493e-005	-4.467	-4.457	0.010	(0)
	H2BO3-	1.718e-006	1.278e-006	-5.765	-5.893	-0.128	(0)
	CaH2BO3+	4.154e-007	3.090e-007	-6.382	-6.510	-0.128	(0)
	MgH2BO3+	1.327e-007	9.869e-008	-6.877	-7.006	-0.128	(0)
	NaH2BO3	2.797e-008	2.797e-008	-7.553	-7.553	0.000	(0)
	BF(OH) 3-	2.717e-009	2.021e-009	-8.566	-8.694	-0.128	(0)
	H5(BO3) 2-	5.109e-011	3.801e-011	-10.292	-10.420	-0.128	(0)
	BaH2BO3+	1.067e-012	7.940e-013	-11.972	-12.100	-0.128	(0)
	BF2(OH) 2-	6.692e-013	4.978e-013	-12.174	-12.303	-0.128	(0)
	H8(BO3) 3-	1.785e-013	1.328e-013	-12.748	-12.877	-0.128	(0)
	AgH2BO3	4.500e-014	4.500e-014	-13.347	-13.347	0.000	(0)
	BF3OH-	5.998e-019	4.462e-019	-18.222	-18.350	-0.128	(0)
	BF4-	6.801e-024	5.059e-024	-23.167	-23.296	-0.128	(0)
Ba	5.429e-008						
	Ba+2	5.411e-008	2.010e-008	-7.267	-7.697	-0.430	(0)
	BaHCO3+	1.615e-010	1.284e-010	-9.792	-9.892	-0.100	(0)
	BaCO3	2.036e-011	2.036e-011	-10.691	-10.691	0.000	(0)
	BaH2BO3+	1.067e-012	7.940e-013	-11.972	-12.100	-0.128	(0)
	BaOH+	7.103e-014	5.559e-014	-13.149	-13.255	-0.106	(0)
	BaNO3+	4.914e-015	3.384e-015	-14.309	-14.471	-0.162	(0)
	BaNH3+2	8.725e-016	1.962e-016	-15.059	-15.707	-0.648	(0)
C (4)	9.897e-004						
	HCO3-	8.490e-004	6.688e-004	-3.071	-3.175	-0.104	(0)
	CaHCO3+	6.581e-005	5.232e-005	-4.182	-4.281	-0.100	(0)
	H2CO3	2.387e-005	2.387e-005	-4.622	-4.622	0.000	(0)
	MgHCO3+	1.983e-005	1.524e-005	-4.703	-4.817	-0.114	(0)
	CaCO3	1.315e-005	1.315e-005	-4.881	-4.881	0.000	(0)
	CO3-2	5.318e-006	1.976e-006	-5.274	-5.704	-0.430	(0)
	NaHCO3	5.193e-006	5.193e-006	-5.285	-5.285	0.000	(0)
	MgCO3	3.659e-006	3.659e-006	-5.437	-5.437	0.000	(0)
	MnHCO3+	8.995e-007	7.039e-007	-6.046	-6.152	-0.106	(0)
	NaCO3-	6.448e-007	5.080e-007	-6.191	-6.294	-0.104	(0)
	CuCO3	6.256e-007	6.256e-007	-6.204	-6.204	0.000	(0)
	UO2(CO3) 3-4	3.874e-007	9.905e-010	-6.412	-9.004	-2.592	(0)
	ZnCO3	2.820e-007	2.820e-007	-6.550	-6.550	0.000	(0)
	ZnHCO3+	7.618e-008	5.246e-008	-7.118	-7.280	-0.162	(0)
	UO2(CO3) 2-2	4.449e-008	1.000e-008	-7.352	-8.000	-0.648	(0)
	Cu(CO3) 2-2	1.479e-008	3.326e-009	-7.830	-8.478	-0.648	(0)
	NiHCO3+	1.230e-008	8.472e-009	-7.910	-8.072	-0.162	(0)
	NiCO3	7.573e-009	7.573e-009	-8.121	-8.121	0.000	(0)
	PbCO3	6.156e-009	6.156e-009	-8.211	-8.211	0.000	(0)
	CoHCO3+	5.047e-009	3.476e-009	-8.297	-8.459	-0.162	(0)
	CuHCO3+	3.295e-009	2.269e-009	-8.482	-8.644	-0.162	(0)
	CoCO3	2.231e-009	2.231e-009	-8.651	-8.651	0.000	(0)
	CdCO3	8.185e-010	8.185e-010	-9.087	-9.087	0.000	(0)
	PbHCO3+	7.480e-010	5.151e-010	-9.126	-9.288	-0.162	(0)
	UO2CO3	2.538e-010	2.538e-010	-9.596	-9.596	0.000	(0)
	BaHCO3+	1.615e-010	1.284e-010	-9.792	-9.892	-0.100	(0)
	Pb(CO3) 2-2	1.560e-010	3.507e-011	-9.807	-10.455	-0.648	(0)
	CdHCO3+	4.019e-011	2.768e-011	-10.396	-10.558	-0.162	(0)
	BaCO3	2.036e-011	2.036e-011	-10.691	-10.691	0.000	(0)
	Cd(CO3) 2-2	5.331e-012	1.199e-012	-11.273	-11.921	-0.648	(0)
	FeHCO3+	1.315e-014	1.045e-014	-13.881	-13.981	-0.100	(0)
	HgCO3	1.392e-015	1.392e-015	-14.856	-14.856	0.000	(0)
	Hg(CO3) 2-2	3.866e-017	8.694e-018	-16.413	-17.061	-0.648	(0)
	HgHCO3+	5.972e-019	4.113e-019	-18.224	-18.386	-0.162	(0)
Ca	2.071e-002						

	Ca+2	1.131e-002	4.201e-003	-1.947	-2.377	-0.430	(0)
	CaSO4	9.309e-003	9.309e-003	-2.031	-2.031	0.000	(0)
	CaHCO3+	6.581e-005	5.232e-005	-4.182	-4.281	-0.100	(0)
	CaCO3	1.315e-005	1.315e-005	-4.881	-4.881	0.000	(0)
	CaF+	8.494e-006	6.647e-006	-5.071	-5.177	-0.106	(0)
	CaH2BO3+	4.154e-007	3.090e-007	-6.382	-6.510	-0.128	(0)
	CaOH+	6.680e-008	5.311e-008	-7.175	-7.275	-0.100	(0)
	CaNO3+	6.481e-010	4.463e-010	-9.188	-9.350	-0.162	(0)
	CaNH3+2	3.639e-010	8.182e-011	-9.439	-10.087	-0.648	(0)
	Ca (NH3) 2+2	2.241e-018	5.039e-019	-17.650	-18.298	-0.648	(0)
Cd	1.210e-007						
	Cd+2	4.893e-008	1.818e-008	-7.310	-7.740	-0.430	(0)
	CdSO4	4.121e-008	4.121e-008	-7.385	-7.385	0.000	(0)
	Cd (SO4) 2-2	2.391e-008	5.377e-009	-7.621	-8.269	-0.648	(0)
	CdCl+	5.756e-009	3.963e-009	-8.240	-8.402	-0.162	(0)
	CdCO3	8.185e-010	8.185e-010	-9.087	-9.087	0.000	(0)
	CdOH+	1.328e-010	9.147e-011	-9.877	-10.039	-0.162	(0)
	CdOHC1	1.030e-010	1.030e-010	-9.987	-9.987	0.000	(0)
	CdF+	6.065e-011	4.176e-011	-10.217	-10.379	-0.162	(0)
	CdHCO3+	4.019e-011	2.768e-011	-10.396	-10.558	-0.162	(0)
	CdCl2	3.773e-011	3.773e-011	-10.423	-10.423	0.000	(0)
	Cd (CO3) 2-2	5.331e-012	1.199e-012	-11.273	-11.921	-0.648	(0)
	Cd (OH) 2	3.657e-013	3.657e-013	-12.437	-12.437	0.000	(0)
	CdCl3-	7.893e-014	5.435e-014	-13.103	-13.265	-0.162	(0)
	CdF2	1.208e-014	1.208e-014	-13.918	-13.918	0.000	(0)
	CdNO3+	2.804e-015	1.931e-015	-14.552	-14.714	-0.162	(0)
	CdSeO4	2.893e-016	2.893e-016	-15.539	-15.539	0.000	(0)
	Cd2OH+3	2.393e-016	8.333e-018	-15.621	-17.079	-1.458	(0)
	Cd (SeO3) 2-2	2.082e-017	4.682e-018	-16.681	-17.330	-0.648	(0)
	Cd (OH) 3-	2.055e-017	1.415e-017	-16.687	-16.849	-0.162	(0)
	Cd (NO3) 2	3.251e-023	3.251e-023	-22.488	-22.488	0.000	(0)
	Cd (OH) 4-2	6.527e-024	1.468e-024	-23.185	-23.833	-0.648	(0)
	CdHS+	0.000e+000	0.000e+000	-78.094	-78.256	-0.162	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-149.576	-149.576	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-226.037	-226.199	-0.162	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-301.879	-302.527	-0.648	(0)
Cl	2.925e-003						
	Cl-	2.925e-003	2.283e-003	-2.534	-2.641	-0.108	(0)
	MnCl+	1.938e-007	1.516e-007	-6.713	-6.819	-0.106	(0)
	ZnCl+	1.851e-008	1.423e-008	-7.733	-7.847	-0.114	(0)
	ZnOHC1	1.180e-008	1.180e-008	-7.928	-7.928	0.000	(0)
	AgCl	1.036e-008	1.036e-008	-7.985	-7.985	0.000	(0)
	CdCl+	5.756e-009	3.963e-009	-8.240	-8.402	-0.162	(0)
	AgCl2-	2.991e-009	2.059e-009	-8.524	-8.686	-0.162	(0)
	NiCl+	8.718e-010	6.003e-010	-9.060	-9.222	-0.162	(0)
	CoCl+	7.664e-010	5.277e-010	-9.116	-9.278	-0.162	(0)
	CuCl	7.621e-010	7.621e-010	-9.118	-9.118	0.000	(0)
	MnCl2	4.891e-010	4.891e-010	-9.311	-9.311	0.000	(0)
	CuCl2-	4.731e-010	3.636e-010	-9.325	-9.439	-0.114	(0)
	CuCl+	2.532e-010	1.946e-010	-9.597	-9.711	-0.114	(0)
	PbCl+	1.219e-010	8.397e-011	-9.914	-10.076	-0.162	(0)
	CdOHC1	1.030e-010	1.030e-010	-9.987	-9.987	0.000	(0)
	ZnCl2	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
	CdCl2	3.773e-011	3.773e-011	-10.423	-10.423	0.000	(0)
	AgCl3-2	1.864e-011	4.191e-012	-10.730	-11.378	-0.648	(0)
	HgClOH	1.504e-012	1.504e-012	-11.823	-11.823	0.000	(0)
	PbCl2	8.565e-013	8.565e-013	-12.067	-12.067	0.000	(0)
	AgCl4-3	5.612e-013	1.954e-014	-12.251	-13.709	-1.458	(0)
	CuCl3-2	4.732e-013	1.775e-013	-12.325	-12.751	-0.426	(0)
	MnCl3-	3.930e-013	3.076e-013	-12.406	-12.512	-0.106	(0)
	HgCl2	3.069e-013	3.069e-013	-12.513	-12.513	0.000	(0)
	CuCl2	1.541e-013	1.541e-013	-12.812	-12.812	0.000	(0)
	ZnCl3-	1.215e-013	9.338e-014	-12.915	-13.030	-0.114	(0)
	CdCl3-	7.893e-014	5.435e-014	-13.103	-13.265	-0.162	(0)
	HgCl3-	1.018e-014	7.007e-015	-13.992	-14.154	-0.162	(0)
	NiCl2	6.902e-015	6.902e-015	-14.161	-14.161	0.000	(0)
	PbCl3-	1.131e-015	7.786e-016	-14.947	-15.109	-0.162	(0)
	ZnCl4-2	2.843e-016	1.066e-016	-15.546	-15.972	-0.426	(0)

HgCl4-2	2.833e-016	6.370e-017	-15.548	-16.196	-0.648	(0)
UO2Cl+	1.735e-016	1.195e-016	-15.761	-15.923	-0.162	(0)
HgCl+	3.894e-017	2.682e-017	-16.410	-16.572	-0.162	(0)
CrCl+2	2.127e-017	4.783e-018	-16.672	-17.320	-0.648	(0)
CuCl3-	4.272e-018	3.283e-018	-17.369	-17.484	-0.114	(0)
PbCl4-2	3.614e-018	8.126e-019	-17.442	-18.090	-0.648	(0)
CrOHC12	1.315e-019	1.315e-019	-18.881	-18.881	0.000	(0)
FeCl+2	2.106e-021	7.900e-022	-20.677	-21.102	-0.426	(0)
CrCl2+	1.505e-021	1.036e-021	-20.823	-20.985	-0.162	(0)
VOCl+	6.358e-022	4.378e-022	-21.197	-21.359	-0.162	(0)
CuCl4-2	1.002e-022	3.757e-023	-21.999	-22.425	-0.426	(0)
FeCl2+	1.030e-023	8.057e-024	-22.987	-23.094	-0.106	(0)
CrO3Cl-	7.576e-026	5.217e-026	-25.121	-25.283	-0.162	(0)
FeCl3	1.840e-027	1.840e-027	-26.735	-26.735	0.000	(0)
CoCl+2	5.459e-035	1.228e-035	-34.263	-34.911	-0.648	(0)
UCl+3	0.000e+000	0.000e+000	-44.949	-46.407	-1.458	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-47.362	-48.010	-0.648	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.545	-50.193	-0.648	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.888	-62.536	-0.648	(0)
Co (2)	4.358e-007					
Co+2	2.971e-007	6.681e-008	-6.527	-7.175	-0.648	(0)
CoSO4	1.289e-007	1.289e-007	-6.890	-6.890	0.000	(0)
CoHCO3+	5.047e-009	3.476e-009	-8.297	-8.459	-0.162	(0)
CoCO3	2.231e-009	2.231e-009	-8.651	-8.651	0.000	(0)
CoOH+	1.226e-009	8.445e-010	-8.911	-9.073	-0.162	(0)
CoCl+	7.664e-010	5.277e-010	-9.116	-9.278	-0.162	(0)
CoF+	4.448e-010	3.063e-010	-9.352	-9.514	-0.162	(0)
Co (OH) 2	4.250e-011	4.250e-011	-10.372	-10.372	0.000	(0)
CoNO2+	2.181e-011	1.502e-011	-10.661	-10.823	-0.162	(0)
Co (NH3) +2	5.526e-013	1.243e-013	-12.258	-12.906	-0.648	(0)
CoNO3+	5.165e-015	3.557e-015	-14.287	-14.449	-0.162	(0)
CoSeO4	2.862e-015	2.862e-015	-14.543	-14.543	0.000	(0)
Co (OH) 3-	7.802e-016	5.373e-016	-15.108	-15.270	-0.162	(0)
CoOOH-	1.960e-016	1.350e-016	-15.708	-15.870	-0.162	(0)
Co2OH+3	8.122e-017	2.828e-018	-16.090	-17.549	-1.458	(0)
Co (NH3) 2+2	3.647e-019	8.200e-020	-18.438	-19.086	-0.648	(0)
Co (NO3) 2	2.431e-022	2.431e-022	-21.614	-21.614	0.000	(0)
Co (OH) 4-2	2.399e-022	5.395e-023	-21.620	-22.268	-0.648	(0)
Co (NH3) 3+2	7.103e-026	1.597e-026	-25.149	-25.797	-0.648	(0)
Co4 (OH) 4+4	3.970e-026	1.015e-028	-25.401	-27.994	-2.592	(0)
Co (NH3) 4+2	5.767e-033	1.297e-033	-32.239	-32.887	-0.648	(0)
Co (NH3) 5+2	1.481e-040	0.000e+000	-39.830	-40.478	-0.648	(0)
Co (3)	3.783e-028					
CoOH+2	3.783e-028	8.506e-029	-27.422	-28.070	-0.648	(0)
Co+3	2.453e-034	2.642e-035	-33.610	-34.578	-0.968	(0)
CoCl+2	5.459e-035	1.228e-035	-34.263	-34.911	-0.648	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-47.362	-48.010	-0.648	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.822	-56.984	-0.162	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-61.245	-61.893	-0.648	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.888	-62.536	-0.648	(0)
Cr (2)	1.731e-026					
Cr+2	1.731e-026	3.892e-027	-25.762	-26.410	-0.648	(0)
Cr (3)	3.107e-009					
Cr (OH) 2+	2.511e-009	1.729e-009	-8.600	-8.762	-0.162	(0)
Cr (OH) 3	4.116e-010	4.116e-010	-9.386	-9.386	0.000	(0)
Cr (OH) +2	9.977e-011	2.243e-011	-10.001	-10.649	-0.648	(0)
CrOHSO4	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
CrO2-	1.791e-011	1.233e-011	-10.747	-10.909	-0.162	(0)
Cr (OH) 4-	1.508e-011	1.038e-011	-10.822	-10.984	-0.162	(0)
CrF+2	1.654e-013	3.719e-014	-12.781	-13.430	-0.648	(0)
CrSO4+	5.309e-014	3.656e-014	-13.275	-13.437	-0.162	(0)
Cr+3	4.649e-014	1.619e-015	-13.333	-14.791	-1.458	(0)
CrCl+2	2.127e-017	4.783e-018	-16.672	-17.320	-0.648	(0)
Cr2 (OH) 2SO4+2	4.643e-019	1.044e-019	-18.333	-18.981	-0.648	(0)
CrOHC12	1.315e-019	1.315e-019	-18.881	-18.881	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.999e-020	5.999e-020	-19.222	-19.222	0.000	(0)
CrCl2+	1.505e-021	1.036e-021	-20.823	-20.985	-0.162	(0)
CrNO3+2	1.057e-023	2.377e-024	-22.976	-23.624	-0.648	(0)

Cr (NH3) 5OH+2	9.523e-040	2.141e-040	-39.021	-39.669	-0.648	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-47.196	-48.654	-1.458	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.545	-50.193	-0.648	(0)
Cr (6)	1.284e-014					
CrO4-2	1.198e-014	4.451e-015	-13.921	-14.352	-0.430	(0)
NaCrO4-	4.435e-016	3.054e-016	-15.353	-15.515	-0.162	(0)
HCrO4-	3.319e-016	2.286e-016	-15.479	-15.641	-0.162	(0)
KCrO4-	8.261e-017	5.689e-017	-16.083	-16.245	-0.162	(0)
CrO3SO4-2	4.760e-023	1.070e-023	-22.322	-22.971	-0.648	(0)
H2CrO4	2.940e-024	2.940e-024	-23.532	-23.532	0.000	(0)
CrO3Cl-	7.576e-026	5.217e-026	-25.121	-25.283	-0.162	(0)
Cr2O7-2	8.068e-030	1.814e-030	-29.093	-29.741	-0.648	(0)
Cu (1)	1.621e-009					
CuCl	7.621e-010	7.621e-010	-9.118	-9.118	0.000	(0)
CuCl2-	4.731e-010	3.636e-010	-9.325	-9.439	-0.114	(0)
Cu+	3.850e-010	2.651e-010	-9.415	-9.577	-0.162	(0)
CuCl3-2	4.732e-013	1.775e-013	-12.325	-12.751	-0.426	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.206	-147.635	-0.429	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.961	-148.365	-0.404	(0)
Cu (2)	1.065e-006					
CuCO3	6.256e-007	6.256e-007	-6.204	-6.204	0.000	(0)
Cu+2	1.448e-007	5.377e-008	-6.839	-7.269	-0.430	(0)
CuOH+	1.402e-007	1.077e-007	-6.853	-6.968	-0.114	(0)
CuSO4	1.192e-007	1.192e-007	-6.924	-6.924	0.000	(0)
Cu (CO3) 2-2	1.479e-008	3.326e-009	-7.830	-8.478	-0.648	(0)
Cu (OH) 2	1.362e-008	1.362e-008	-7.866	-7.866	0.000	(0)
CuHCO3+	3.295e-009	2.269e-009	-8.482	-8.644	-0.162	(0)
Cu2 (OH) 2+2	1.297e-009	2.916e-010	-8.887	-9.535	-0.648	(0)
CuF+	7.143e-010	4.919e-010	-9.146	-9.308	-0.162	(0)
CuNO2+	2.609e-010	1.796e-010	-9.584	-9.746	-0.162	(0)
CuCl+	2.532e-010	1.946e-010	-9.597	-9.711	-0.114	(0)
CuNH3+2	3.786e-011	8.513e-012	-10.422	-11.070	-0.648	(0)
Cu (OH) 3-	2.570e-011	1.770e-011	-10.590	-10.752	-0.162	(0)
CuCl2	1.541e-013	1.541e-013	-12.812	-12.812	0.000	(0)
Cu (NO2) 2	5.864e-014	5.864e-014	-13.232	-13.232	0.000	(0)
CuNO3+	8.295e-015	5.712e-015	-14.081	-14.243	-0.162	(0)
Cu (OH) 4-2	3.925e-016	8.825e-017	-15.406	-16.054	-0.648	(0)
CuCl3-	4.272e-018	3.283e-018	-17.369	-17.484	-0.114	(0)
CuCl4-2	1.002e-022	3.757e-023	-21.999	-22.425	-0.426	(0)
Cu (NO3) 2	2.416e-023	2.416e-023	-22.617	-22.617	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.779	-216.941	-0.162	(0)
F	2.426e-004					
F-	1.857e-004	1.450e-004	-3.731	-3.839	-0.108	(0)
MgF+	4.669e-005	3.622e-005	-4.331	-4.441	-0.110	(0)
CaF+	8.494e-006	6.647e-006	-5.071	-5.177	-0.106	(0)
NaF	1.263e-006	1.263e-006	-5.899	-5.899	0.000	(0)
MnF+	3.890e-007	3.045e-007	-6.410	-6.516	-0.106	(0)
ZnF+	1.042e-008	7.175e-009	-7.982	-8.144	-0.162	(0)
HF	3.403e-009	3.403e-009	-8.468	-8.468	0.000	(0)
BF (OH) 3-	2.717e-009	2.021e-009	-8.566	-8.694	-0.128	(0)
CuF+	7.143e-010	4.919e-010	-9.146	-9.308	-0.162	(0)
NiF+	5.434e-010	3.742e-010	-9.265	-9.427	-0.162	(0)
CoF+	4.448e-010	3.063e-010	-9.352	-9.514	-0.162	(0)
AlF3	1.472e-010	1.472e-010	-9.832	-9.832	0.000	(0)
AlF2+	1.024e-010	8.066e-011	-9.990	-10.093	-0.104	(0)
CdF+	6.065e-011	4.176e-011	-10.217	-10.379	-0.162	(0)
PbF+	1.538e-011	1.059e-011	-10.813	-10.975	-0.162	(0)
AlF4-	1.379e-011	1.070e-011	-10.861	-10.971	-0.110	(0)
AlF+2	3.630e-012	1.397e-012	-11.440	-11.855	-0.415	(0)
HF2-	2.465e-012	1.876e-012	-11.608	-11.727	-0.119	(0)
UO2F+	9.377e-013	6.457e-013	-12.028	-12.190	-0.162	(0)
AgF	8.089e-013	8.089e-013	-12.092	-12.092	0.000	(0)
BF2 (OH) 2-	6.692e-013	4.978e-013	-12.174	-12.303	-0.128	(0)
UO2F2	2.700e-013	2.700e-013	-12.569	-12.569	0.000	(0)
CrF+2	1.654e-013	3.719e-014	-12.781	-13.430	-0.648	(0)
PbF2	3.021e-014	3.021e-014	-13.520	-13.520	0.000	(0)
UO2F3-	1.428e-014	9.832e-015	-13.845	-14.007	-0.162	(0)
CdF2	1.208e-014	1.208e-014	-13.918	-13.918	0.000	(0)

VO2F	8.557e-017	8.557e-017	-16.068	-16.068	0.000	(0)
UO2F4-2	5.035e-017	1.132e-017	-16.298	-16.946	-0.648	(0)
H2F2	3.103e-017	3.103e-017	-16.508	-16.508	0.000	(0)
PbF3-	1.206e-017	8.307e-018	-16.919	-17.081	-0.162	(0)
FeF2+	9.028e-018	7.065e-018	-17.044	-17.151	-0.106	(0)
VO2F2-	6.541e-018	4.504e-018	-17.184	-17.346	-0.162	(0)
FeF+2	4.855e-018	1.821e-018	-17.314	-17.740	-0.426	(0)
FeF3	1.445e-018	1.445e-018	-17.840	-17.840	0.000	(0)
BF3OH-	5.998e-019	4.462e-019	-18.222	-18.350	-0.128	(0)
VOF+	8.631e-020	5.943e-020	-19.064	-19.226	-0.162	(0)
VO2F3-2	3.622e-020	8.145e-021	-19.441	-20.089	-0.648	(0)
VOF2	3.231e-021	3.231e-021	-20.491	-20.491	0.000	(0)
PbF4-2	2.563e-021	5.764e-022	-20.591	-21.239	-0.648	(0)
VOF3-	2.413e-023	1.662e-023	-22.617	-22.779	-0.162	(0)
VO2F4-3	1.669e-023	5.810e-025	-22.778	-24.236	-1.458	(0)
BF4-	6.801e-024	5.059e-024	-23.167	-23.296	-0.128	(0)
HgF+	4.593e-024	3.163e-024	-23.338	-23.500	-0.162	(0)
Sb(OH) 2F	1.225e-024	1.225e-024	-23.912	-23.912	0.000	(0)
SbOF	1.207e-024	1.207e-024	-23.918	-23.918	0.000	(0)
VOF4-2	4.325e-026	9.725e-027	-25.364	-26.012	-0.648	(0)
UF3+	6.026e-036	4.150e-036	-35.220	-35.382	-0.162	(0)
UF2+2	8.032e-037	1.806e-037	-36.095	-36.743	-0.648	(0)
UF4	6.596e-038	6.596e-038	-37.181	-37.181	0.000	(0)
UF+3	2.842e-039	0.000e+000	-38.546	-40.005	-1.458	(0)
UF5-	5.503e-040	3.790e-040	-39.259	-39.421	-0.162	(0)
UF6-2	0.000e+000	0.000e+000	-40.132	-40.780	-0.648	(0)
Fe (2)	8.521e-012					
Fe+2	5.521e-012	1.241e-012	-11.258	-11.906	-0.648	(0)
FeSO4	2.947e-012	2.947e-012	-11.531	-11.531	0.000	(0)
FeOH+	4.001e-014	3.131e-014	-13.398	-13.504	-0.106	(0)
FeHCO3+	1.315e-014	1.045e-014	-13.881	-13.981	-0.100	(0)
Fe(OH) 2	1.576e-017	1.576e-017	-16.803	-16.803	0.000	(0)
Fe(OH) 3-	4.034e-018	3.157e-018	-17.394	-17.501	-0.106	(0)
Fe(HS) 2	0.000e+000	0.000e+000	-160.003	-160.003	0.000	(0)
Fe(HS) 3-	0.000e+000	0.000e+000	-236.328	-236.490	-0.162	(0)
Fe (3)	2.311e-009					
Fe(OH) 2+	1.466e-009	1.155e-009	-8.834	-8.937	-0.104	(0)
Fe(OH) 3	7.859e-010	7.859e-010	-9.105	-9.105	0.000	(0)
Fe(OH) 4-	5.886e-011	4.636e-011	-10.230	-10.334	-0.104	(0)
FeOH+2	1.249e-014	4.686e-015	-13.903	-14.329	-0.426	(0)
FeF2+	9.028e-018	7.065e-018	-17.044	-17.151	-0.106	(0)
FeF+2	4.855e-018	1.821e-018	-17.314	-17.740	-0.426	(0)
FeSO4+	1.589e-018	1.243e-018	-17.799	-17.905	-0.106	(0)
FeF3	1.445e-018	1.445e-018	-17.840	-17.840	0.000	(0)
Fe(SO4) 2-	3.734e-019	2.571e-019	-18.428	-18.590	-0.162	(0)
Fe+3	1.063e-019	1.146e-020	-18.973	-19.941	-0.968	(0)
FeCl+2	2.106e-021	7.900e-022	-20.677	-21.102	-0.426	(0)
FeCl2+	1.030e-023	8.057e-024	-22.987	-23.094	-0.106	(0)
FeHSeO3+2	9.488e-024	2.134e-024	-23.023	-23.671	-0.648	(0)
Fe2(OH) 2+4	2.844e-025	7.272e-028	-24.546	-27.138	-2.592	(0)
FeNO3+2	1.711e-026	3.848e-027	-25.767	-26.415	-0.648	(0)
FeCl3	1.840e-027	1.840e-027	-26.735	-26.735	0.000	(0)
Fe3(OH) 4+5	1.364e-031	1.214e-035	-30.865	-34.916	-4.051	(0)
H (0)	3.531e-029					
H2	1.765e-029	1.807e-029	-28.753	-28.743	0.010	(0)
Hg (0)	5.505e-010					
Hg	5.505e-010	5.505e-010	-9.259	-9.259	0.000	(0)
Hg (1)	1.957e-021					
Hg2+2	9.783e-022	2.200e-022	-21.010	-21.658	-0.648	(0)
Hg (2)	3.279e-012					
HgClOH	1.504e-012	1.504e-012	-11.823	-11.823	0.000	(0)
Hg(OH) 2	1.456e-012	1.491e-012	-11.837	-11.827	0.010	(0)
HgCl2	3.069e-013	3.069e-013	-12.513	-12.513	0.000	(0)
HgCl3-	1.018e-014	7.007e-015	-13.992	-14.154	-0.162	(0)
HgCO3	1.392e-015	1.392e-015	-14.856	-14.856	0.000	(0)
HgCl4-2	2.833e-016	6.370e-017	-15.548	-16.196	-0.648	(0)
HgCl+	3.894e-017	2.682e-017	-16.410	-16.572	-0.162	(0)
Hg(CO3) 2-2	3.866e-017	8.694e-018	-16.413	-17.061	-0.648	(0)

	HgOH+	2.156e-017	1.485e-017	-16.666	-16.828	-0.162	(0)
	HgHCO3+	5.972e-019	4.113e-019	-18.224	-18.386	-0.162	(0)
	Hg (NH3) 2+2	3.953e-019	8.888e-020	-18.403	-19.051	-0.648	(0)
	Hg (OH) 3-	1.727e-019	1.189e-019	-18.763	-18.925	-0.162	(0)
	HgNH3+2	2.555e-020	5.745e-021	-19.593	-20.241	-0.648	(0)
	Hg+2	2.618e-021	5.886e-022	-20.582	-21.230	-0.648	(0)
	HgSO4	1.491e-021	1.491e-021	-20.827	-20.827	0.000	(0)
	HgF+	4.593e-024	3.163e-024	-23.338	-23.500	-0.162	(0)
	Hg (NH3) 3+2	2.434e-026	5.474e-027	-25.614	-26.262	-0.648	(0)
	HgNO3+	1.060e-029	7.301e-030	-28.975	-29.137	-0.162	(0)
	Hg (NH3) 4+2	2.992e-033	6.727e-034	-32.524	-33.172	-0.648	(0)
	Hg (NO3) 2	1.019e-037	1.019e-037	-36.992	-36.992	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-138.388	-138.550	-0.162	(0)
	HgS2-2	0.000e+000	0.000e+000	-138.810	-139.459	-0.648	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-139.955	-139.955	0.000	(0)
K		4.706e-003					
	K+	4.406e-003	3.440e-003	-2.356	-2.463	-0.108	(0)
	KSO4-	2.990e-004	2.356e-004	-3.524	-3.628	-0.104	(0)
	KCrO4-	8.261e-017	5.689e-017	-16.083	-16.245	-0.162	(0)
Mg		9.985e-003					
	Mg+2	5.994e-003	2.227e-003	-2.222	-2.652	-0.430	(0)
	MgSO4	3.919e-003	3.919e-003	-2.407	-2.407	0.000	(0)
	MgF+	4.669e-005	3.622e-005	-4.331	-4.441	-0.110	(0)
	MgHCO3+	1.983e-005	1.524e-005	-4.703	-4.817	-0.114	(0)
	MgCO3	3.659e-006	3.659e-006	-5.437	-5.437	0.000	(0)
	MgOH+	7.014e-007	5.616e-007	-6.154	-6.251	-0.097	(0)
	MgH2BO3+	1.327e-007	9.869e-008	-6.877	-7.006	-0.128	(0)
Mn (2)		3.269e-004					
	Mn+2	2.346e-004	5.275e-005	-3.630	-4.278	-0.648	(0)
	MnSO4	9.073e-005	9.073e-005	-4.042	-4.042	0.000	(0)
	MnHCO3+	8.995e-007	7.039e-007	-6.046	-6.152	-0.106	(0)
	MnF+	3.890e-007	3.045e-007	-6.410	-6.516	-0.106	(0)
	MnCl+	1.938e-007	1.516e-007	-6.713	-6.819	-0.106	(0)
	MnOH+	1.073e-007	8.395e-008	-6.970	-7.076	-0.106	(0)
	MnCl2	4.891e-010	4.891e-010	-9.311	-9.311	0.000	(0)
	MnNO3+	4.078e-012	2.808e-012	-11.390	-11.552	-0.162	(0)
	MnSeO4	1.214e-012	1.214e-012	-11.916	-11.916	0.000	(0)
	MnCl3-	3.930e-013	3.076e-013	-12.406	-12.512	-0.106	(0)
	Mn (OH) 3-	2.661e-016	2.082e-016	-15.575	-15.681	-0.106	(0)
	Mn (NO3) 2	2.370e-019	2.370e-019	-18.625	-18.625	0.000	(0)
	Mn (OH) 4-2	1.136e-021	4.260e-022	-20.945	-21.371	-0.426	(0)
	MnSe	0.000e+000	0.000e+000	-40.933	-40.933	0.000	(0)
Mn (3)		2.173e-024					
	Mn+3	2.173e-024	2.341e-025	-23.663	-24.631	-0.968	(0)
Mn (6)		1.280e-040					
	MnO4-2	1.280e-040	0.000e+000	-39.893	-40.319	-0.426	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-44.570	-44.693	-0.123	(0)
Mo		1.499e-006					
	MoO4-2	1.499e-006	5.568e-007	-5.824	-6.254	-0.430	(0)
	HMoO4-	2.553e-010	1.758e-010	-9.593	-9.755	-0.162	(0)
	H2MoO4	2.044e-014	2.044e-014	-13.689	-13.689	0.000	(0)
	Ag2MoO4	1.040e-024	1.040e-024	-23.983	-23.983	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-42.886	-44.344	-1.458	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-47.350	-53.183	-5.833	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-50.545	-54.595	-4.051	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-55.020	-57.613	-2.592	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-60.708	-62.166	-1.458	(0)
N (-3)		6.518e-007					
	NH4+	5.789e-007	4.306e-007	-6.237	-6.366	-0.128	(0)
	NH4SO4-	5.703e-008	4.463e-008	-7.244	-7.350	-0.106	(0)
	NH3	1.547e-008	1.547e-008	-7.811	-7.811	0.000	(0)
	CaNH3+2	3.639e-010	8.182e-011	-9.439	-10.087	-0.648	(0)
	CuNH3+2	3.786e-011	8.513e-012	-10.422	-11.070	-0.648	(0)
	NiNH3+2	3.796e-012	8.537e-013	-11.421	-12.069	-0.648	(0)
	Co (NH3) +2	5.526e-013	1.243e-013	-12.258	-12.906	-0.648	(0)
	AgNH3+	1.019e-013	7.016e-014	-12.992	-13.154	-0.162	(0)
	BaNH3+2	8.725e-016	1.962e-016	-15.059	-15.707	-0.648	(0)

Ag (NH3) 2+	1.281e-017	8.822e-018	-16.892	-17.054	-0.162	(0)
Ni (NH3) 2+2	8.490e-018	1.909e-018	-17.071	-17.719	-0.648	(0)
Ca (NH3) 2+2	2.241e-018	5.039e-019	-17.650	-18.298	-0.648	(0)
Hg (NH3) 2+2	3.953e-019	8.888e-020	-18.403	-19.051	-0.648	(0)
Co (NH3) 2+2	3.647e-019	8.200e-020	-18.438	-19.086	-0.648	(0)
HgNH3+2	2.555e-020	5.745e-021	-19.593	-20.241	-0.648	(0)
Co (NH3) 3+2	7.103e-026	1.597e-026	-25.149	-25.797	-0.648	(0)
Hg (NH3) 3+2	2.434e-026	5.474e-027	-25.614	-26.262	-0.648	(0)
Co (NH3) 4+2	5.767e-033	1.297e-033	-32.239	-32.887	-0.648	(0)
Hg (NH3) 4+2	2.992e-033	6.727e-034	-32.524	-33.172	-0.648	(0)
Cr (NH3) 5OH+2	9.523e-040	2.141e-040	-39.021	-39.669	-0.648	(0)
Co (NH3) 5+2	1.481e-040	0.000e+000	-39.830	-40.478	-0.648	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-47.196	-48.654	-1.458	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-47.362	-48.010	-0.648	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.545	-50.193	-0.648	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.822	-56.984	-0.162	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-61.245	-61.893	-0.648	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.888	-62.536	-0.648	(0)
N (3)	4.238e-005					
NO2-	4.238e-005	3.190e-005	-4.373	-4.496	-0.123	(0)
CuNO2+	2.609e-010	1.796e-010	-9.584	-9.746	-0.162	(0)
CoNO2+	2.181e-011	1.502e-011	-10.661	-10.823	-0.162	(0)
AgNO2	1.480e-011	1.480e-011	-10.830	-10.830	0.000	(0)
Cu (NO2) 2	5.864e-014	5.864e-014	-13.232	-13.232	0.000	(0)
Ag (NO2) 2-	1.062e-015	7.315e-016	-14.974	-15.136	-0.162	(0)
N (5)	4.368e-008					
NO3-	4.303e-008	3.359e-008	-7.366	-7.474	-0.108	(0)
CaNO3+	6.481e-010	4.463e-010	-9.188	-9.350	-0.162	(0)
MnNO3+	4.078e-012	2.808e-012	-11.390	-11.552	-0.162	(0)
ZnNO3+	3.039e-013	2.093e-013	-12.517	-12.679	-0.162	(0)
NiNO3+	1.259e-014	8.670e-015	-13.900	-14.062	-0.162	(0)
CuNO3+	8.295e-015	5.712e-015	-14.081	-14.243	-0.162	(0)
CoNO3+	5.165e-015	3.557e-015	-14.287	-14.449	-0.162	(0)
BaNO3+	4.914e-015	3.384e-015	-14.309	-14.471	-0.162	(0)
CdNO3+	2.804e-015	1.931e-015	-14.552	-14.714	-0.162	(0)
PbNO3+	7.479e-016	5.150e-016	-15.126	-15.288	-0.162	(0)
AgNO3	5.927e-017	5.927e-017	-16.227	-16.227	0.000	(0)
Mn (NO3) 2	2.370e-019	2.370e-019	-18.625	-18.625	0.000	(0)
UO2NO3+	3.141e-021	2.163e-021	-20.503	-20.665	-0.162	(0)
Zn (NO3) 2	1.403e-021	1.403e-021	-20.853	-20.853	0.000	(0)
Co (NO3) 2	2.431e-022	2.431e-022	-21.614	-21.614	0.000	(0)
Cd (NO3) 2	3.251e-023	3.251e-023	-22.488	-22.488	0.000	(0)
Pb (NO3) 2	2.938e-023	2.938e-023	-22.532	-22.532	0.000	(0)
Cu (NO3) 2	2.416e-023	2.416e-023	-22.617	-22.617	0.000	(0)
CrNO3+2	1.057e-023	2.377e-024	-22.976	-23.624	-0.648	(0)
VO2NO3	5.718e-024	5.718e-024	-23.243	-23.243	0.000	(0)
FeNO3+2	1.711e-026	3.848e-027	-25.767	-26.415	-0.648	(0)
HgNO3+	1.060e-029	7.301e-030	-28.975	-29.137	-0.162	(0)
Hg (NO3) 2	1.019e-037	1.019e-037	-36.992	-36.992	0.000	(0)
Na	1.860e-002					
Na+	1.769e-002	1.381e-002	-1.752	-1.860	-0.108	(0)
NaSO4-	9.105e-004	7.172e-004	-3.041	-3.144	-0.104	(0)
NaHCO3	5.193e-006	5.193e-006	-5.285	-5.285	0.000	(0)
NaF	1.263e-006	1.263e-006	-5.899	-5.899	0.000	(0)
NaCO3-	6.448e-007	5.080e-007	-6.191	-6.294	-0.104	(0)
NaH2BO3	2.797e-008	2.797e-008	-7.553	-7.553	0.000	(0)
NaCrO4-	4.435e-016	3.054e-016	-15.353	-15.515	-0.162	(0)
Ni	4.977e-007					
Ni+2	2.766e-007	1.028e-007	-6.558	-6.988	-0.430	(0)
NiSO4	1.983e-007	1.983e-007	-6.703	-6.703	0.000	(0)
NiHCO3+	1.230e-008	8.472e-009	-7.910	-8.072	-0.162	(0)
NiCO3	7.573e-009	7.573e-009	-8.121	-8.121	0.000	(0)
NiOH+	1.190e-009	8.196e-010	-8.924	-9.086	-0.162	(0)
NiCl+	8.718e-010	6.003e-010	-9.060	-9.222	-0.162	(0)
NiF+	5.434e-010	3.742e-010	-9.265	-9.427	-0.162	(0)
Ni (SO4) 2-2	2.825e-010	6.351e-011	-9.549	-10.197	-0.648	(0)
Ni (OH) 2	4.124e-011	4.124e-011	-10.385	-10.385	0.000	(0)
NiNH3+2	3.796e-012	8.537e-013	-11.421	-12.069	-0.648	(0)

Ni (OH) 3-	3.795e-014	2.613e-014	-13.421	-13.583	-0.162	(0)
NiNO3+	1.259e-014	8.670e-015	-13.900	-14.062	-0.162	(0)
NiCl2	6.902e-015	6.902e-015	-14.161	-14.161	0.000	(0)
NiSeO4	4.109e-015	4.109e-015	-14.386	-14.386	0.000	(0)
Ni (NH3) 2+2	8.490e-018	1.909e-018	-17.071	-17.719	-0.648	(0)
O (0)	3.025e-035					
O2	1.512e-035	1.548e-035	-34.820	-34.810	0.010	(0)
Pb	1.860e-008					
PbCO3	6.156e-009	6.156e-009	-8.211	-8.211	0.000	(0)
PbSO4	4.910e-009	4.910e-009	-8.309	-8.309	0.000	(0)
Pb+2	2.790e-009	1.036e-009	-8.554	-8.984	-0.430	(0)
PbOH+	2.395e-009	1.649e-009	-8.621	-8.783	-0.162	(0)
Pb (SO4) 2-2	1.273e-009	2.862e-010	-8.895	-9.543	-0.648	(0)
PbHCO3+	7.480e-010	5.151e-010	-9.126	-9.288	-0.162	(0)
Pb (CO3) 2-2	1.560e-010	3.507e-011	-9.807	-10.455	-0.648	(0)
PbCl+	1.219e-010	8.397e-011	-9.914	-10.076	-0.162	(0)
Pb (OH) 2	3.305e-011	3.305e-011	-10.481	-10.481	0.000	(0)
PbF+	1.538e-011	1.059e-011	-10.813	-10.975	-0.162	(0)
PbCl2	8.565e-013	8.565e-013	-12.067	-12.067	0.000	(0)
Pb (OH) 3-	3.040e-014	2.094e-014	-13.517	-13.679	-0.162	(0)
PbF2	3.021e-014	3.021e-014	-13.520	-13.520	0.000	(0)
PbCl3-	1.131e-015	7.786e-016	-14.947	-15.109	-0.162	(0)
Pb2OH+3	7.782e-016	2.710e-017	-15.109	-16.567	-1.458	(0)
PbNO3+	7.479e-016	5.150e-016	-15.126	-15.288	-0.162	(0)
Pb (OH) 4-2	1.445e-017	3.249e-018	-16.840	-17.488	-0.648	(0)
PbF3-	1.206e-017	8.307e-018	-16.919	-17.081	-0.162	(0)
PbCl4-2	3.614e-018	8.126e-019	-17.442	-18.090	-0.648	(0)
Pb3 (OH) 4+2	1.004e-019	2.259e-020	-18.998	-19.646	-0.648	(0)
PbF4-2	2.563e-021	5.764e-022	-20.591	-21.239	-0.648	(0)
Pb4 (OH) 4+4	7.273e-023	1.859e-025	-22.138	-24.731	-2.592	(0)
Pb (NO3) 2	2.938e-023	2.938e-023	-22.532	-22.532	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-150.762	-150.762	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.823	-227.985	-0.162	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.362	-73.362	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.094	-78.256	-0.162	(0)
HS-	0.000e+000	0.000e+000	-78.362	-78.524	-0.162	(0)
H2S	0.000e+000	0.000e+000	-79.303	-79.303	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.441	-80.089	-0.648	(0)
S6-2	0.000e+000	0.000e+000	-79.957	-80.605	-0.648	(0)
S4-2	0.000e+000	0.000e+000	-80.037	-80.685	-0.648	(0)
S3-2	0.000e+000	0.000e+000	-80.843	-81.491	-0.648	(0)
S2-2	0.000e+000	0.000e+000	-81.859	-82.507	-0.648	(0)
S-2	0.000e+000	0.000e+000	-87.598	-88.024	-0.426	(0)
HgHS2-	0.000e+000	0.000e+000	-138.388	-138.550	-0.162	(0)
HgS2-2	0.000e+000	0.000e+000	-138.810	-139.459	-0.648	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.955	-139.955	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.206	-147.635	-0.429	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.218	-147.470	-0.253	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.624	-147.786	-0.162	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.881	-148.043	-0.162	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.961	-148.365	-0.404	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.668	-149.111	-0.442	(0)
AgS4S5-3	0.000e+000	0.000e+000	-149.006	-149.422	-0.416	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.576	-149.576	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.833	-149.833	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-150.762	-150.762	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.003	-160.003	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.779	-216.941	-0.162	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.914	-225.076	-0.162	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-226.037	-226.199	-0.162	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-226.609	-227.257	-0.648	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.823	-227.985	-0.162	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.328	-236.490	-0.162	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-301.879	-302.527	-0.648	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-304.412	-305.060	-0.648	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.589	-317.237	-0.648	(0)
S (6)	4.058e-002					

SO4-2	2.604e-002	9.672e-003	-1.584	-2.014	-0.430	(0)
CaSO4	9.309e-003	9.309e-003	-2.031	-2.031	0.000	(0)
MgSO4	3.919e-003	3.919e-003	-2.407	-2.407	0.000	(0)
NaSO4-	9.105e-004	7.172e-004	-3.041	-3.144	-0.104	(0)
KSO4-	2.990e-004	2.356e-004	-3.524	-3.628	-0.104	(0)
MnSO4	9.073e-005	9.073e-005	-4.042	-4.042	0.000	(0)
ZnSO4	5.249e-006	5.249e-006	-5.280	-5.280	0.000	(0)
Zn (SO4) 2-2	1.967e-006	4.422e-007	-5.706	-6.354	-0.648	(0)
NiSO4	1.983e-007	1.983e-007	-6.703	-6.703	0.000	(0)
CoSO4	1.289e-007	1.289e-007	-6.890	-6.890	0.000	(0)
CuSO4	1.192e-007	1.192e-007	-6.924	-6.924	0.000	(0)
NH4SO4-	5.703e-008	4.463e-008	-7.244	-7.350	-0.106	(0)
CdSO4	4.121e-008	4.121e-008	-7.385	-7.385	0.000	(0)
Cd (SO4) 2-2	2.391e-008	5.377e-009	-7.621	-8.269	-0.648	(0)
HSO4-	1.934e-008	1.500e-008	-7.714	-7.824	-0.110	(0)
PbSO4	4.910e-009	4.910e-009	-8.309	-8.309	0.000	(0)
Pb (SO4) 2-2	1.273e-009	2.862e-010	-8.895	-9.543	-0.648	(0)
AgSO4-	6.225e-010	4.287e-010	-9.206	-9.368	-0.162	(0)
Ni (SO4) 2-2	2.825e-010	6.351e-011	-9.549	-10.197	-0.648	(0)
CrOHSO4	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
FeSO4	2.947e-012	2.947e-012	-11.531	-11.531	0.000	(0)
UO2SO4	4.724e-013	4.724e-013	-12.326	-12.326	0.000	(0)
UO2 (SO4) 2-2	2.679e-013	6.023e-014	-12.572	-13.220	-0.648	(0)
AlSO4+	9.329e-014	7.238e-014	-13.030	-13.140	-0.110	(0)
CrSO4+	5.309e-014	3.656e-014	-13.275	-13.437	-0.162	(0)
Al (SO4) 2-	9.669e-015	7.501e-015	-14.015	-14.125	-0.110	(0)
VO2SO4-	1.129e-016	7.773e-017	-15.947	-16.109	-0.162	(0)
FeSO4+	1.589e-018	1.243e-018	-17.799	-17.905	-0.106	(0)
Cr2 (OH) 2SO4+2	4.643e-019	1.044e-019	-18.333	-18.981	-0.648	(0)
Fe (SO4) 2-	3.734e-019	2.571e-019	-18.428	-18.590	-0.162	(0)
VOSO4	1.821e-019	1.821e-019	-18.740	-18.740	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.999e-020	5.999e-020	-19.222	-19.222	0.000	(0)
HgSO4	1.491e-021	1.491e-021	-20.827	-20.827	0.000	(0)
CrO3SO4-2	4.760e-023	1.070e-023	-22.322	-22.971	-0.648	(0)
VSO4+	5.714e-034	3.935e-034	-33.243	-33.405	-0.162	(0)
U (SO4) 2	1.012e-039	1.012e-039	-38.995	-38.995	0.000	(0)
UO4+2	0.000e+000	0.000e+000	-40.232	-40.880	-0.648	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.822	-56.984	-0.162	(0)
Sb (3)	6.732e-019					
Sb (OH) 3	3.404e-019	3.404e-019	-18.468	-18.468	0.000	(0)
HSbO2	3.328e-019	3.328e-019	-18.478	-18.478	0.000	(0)
SbO2-	4.931e-023	3.396e-023	-22.307	-22.469	-0.162	(0)
Sb (OH) 4-	2.818e-023	1.940e-023	-22.550	-22.712	-0.162	(0)
Sb (OH) 2F	1.225e-024	1.225e-024	-23.912	-23.912	0.000	(0)
SbOF	1.207e-024	1.207e-024	-23.918	-23.918	0.000	(0)
Sb (OH) 2+	1.908e-025	1.314e-025	-24.719	-24.881	-0.162	(0)
SbO+	6.587e-026	4.536e-026	-25.181	-25.343	-0.162	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.589	-317.237	-0.648	(0)
Sb (5)	5.115e-007					
SbO3-	5.110e-007	3.519e-007	-6.292	-6.454	-0.162	(0)
Sb (OH) 6-	5.249e-010	4.098e-010	-9.280	-9.387	-0.108	(0)
SbO2+	3.697e-023	2.545e-023	-22.432	-22.594	-0.162	(0)
Se (-2)	2.160e-014					
Ag2Se	2.160e-014	2.160e-014	-13.666	-13.666	0.000	(0)
HSe-	1.238e-039	8.527e-040	-38.907	-39.069	-0.162	(0)
MnSe	0.000e+000	0.000e+000	-40.933	-40.933	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.979	-42.979	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.622	-46.270	-0.648	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-81.311	-83.903	-2.592	(0)
Se (4)	1.810e-007					
HSeO3-	1.024e-007	7.048e-008	-6.990	-7.152	-0.162	(0)
SeO3-2	7.862e-008	1.768e-008	-7.104	-7.753	-0.648	(0)
H2SeO3	4.772e-013	4.772e-013	-12.321	-12.321	0.000	(0)
AgSeO3-	3.665e-014	2.524e-014	-13.436	-13.598	-0.162	(0)
Cd (SeO3) 2-2	2.082e-017	4.682e-018	-16.681	-17.330	-0.648	(0)
Ag (SeO3) 2-3	1.147e-019	3.995e-021	-18.940	-20.398	-1.458	(0)
FeHSeO3+2	9.488e-024	2.134e-024	-23.023	-23.671	-0.648	(0)
Se (6)	2.314e-010					

SeO4-2	2.301e-010	8.549e-011	-9.638	-10.068	-0.430	(0)
MnSeO4	1.214e-012	1.214e-012	-11.916	-11.916	0.000	(0)
ZnSeO4	3.284e-014	3.284e-014	-13.484	-13.484	0.000	(0)
NiSeO4	4.109e-015	4.109e-015	-14.386	-14.386	0.000	(0)
CoSeO4	2.862e-015	2.862e-015	-14.543	-14.543	0.000	(0)
CdSeO4	2.893e-016	2.893e-016	-15.539	-15.539	0.000	(0)
HSeO4-	9.875e-017	6.800e-017	-16.005	-16.168	-0.162	(0)
Zn(SeO4) 2-2	1.266e-023	2.847e-024	-22.898	-23.546	-0.648	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.801	-59.259	-1.458	(0)
U (4)	3.718e-020					
U (OH) 5-	3.716e-020	2.559e-020	-19.430	-19.592	-0.162	(0)
U (OH) 4	1.703e-023	1.703e-023	-22.769	-22.769	0.000	(0)
U (OH) 3+	1.437e-027	9.896e-028	-26.843	-27.005	-0.162	(0)
U (OH) 2+2	3.234e-032	7.273e-033	-31.490	-32.138	-0.648	(0)
UF3+	6.026e-036	4.150e-036	-35.220	-35.382	-0.162	(0)
UF2+2	8.032e-037	1.806e-037	-36.095	-36.743	-0.648	(0)
UOH+3	1.564e-037	5.444e-039	-36.806	-38.264	-1.458	(0)
UF4	6.596e-038	6.596e-038	-37.181	-37.181	0.000	(0)
UF+3	2.842e-039	0.000e+000	-38.546	-40.005	-1.458	(0)
U (SO4) 2	1.012e-039	1.012e-039	-38.995	-38.995	0.000	(0)
UF5-	5.503e-040	3.790e-040	-39.259	-39.421	-0.162	(0)
UF6-2	0.000e+000	0.000e+000	-40.132	-40.780	-0.648	(0)
USO4+2	0.000e+000	0.000e+000	-40.232	-40.880	-0.648	(0)
U+4	0.000e+000	0.000e+000	-42.874	-45.466	-2.592	(0)
UCl+3	0.000e+000	0.000e+000	-44.949	-46.407	-1.458	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-159.845	-172.968	-13.124	(0)
U (5)	2.875e-016					
UO2+	2.875e-016	1.980e-016	-15.541	-15.703	-0.162	(0)
U (6)	4.322e-007					
UO2 (CO3) 3-4	3.874e-007	9.905e-010	-6.412	-9.004	-2.592	(0)
UO2 (CO3) 2-2	4.449e-008	1.000e-008	-7.352	-8.000	-0.648	(0)
UO2CO3	2.538e-010	2.538e-010	-9.596	-9.596	0.000	(0)
UO2OH+	3.737e-012	2.574e-012	-11.427	-11.589	-0.162	(0)
UO2F+	9.377e-013	6.457e-013	-12.028	-12.190	-0.162	(0)
UO2SO4	4.724e-013	4.724e-013	-12.326	-12.326	0.000	(0)
UO2F2	2.700e-013	2.700e-013	-12.569	-12.569	0.000	(0)
UO2 (SO4) 2-2	2.679e-013	6.023e-014	-12.572	-13.220	-0.648	(0)
UO2+2	8.686e-014	3.227e-014	-13.061	-13.491	-0.430	(0)
UO2F3-	1.428e-014	9.832e-015	-13.845	-14.007	-0.162	(0)
UO2Cl+	1.735e-016	1.195e-016	-15.761	-15.923	-0.162	(0)
UO2F4-2	5.035e-017	1.132e-017	-16.298	-16.946	-0.648	(0)
(UO2) 2 (OH) 2+2	4.888e-017	1.099e-017	-16.311	-16.959	-0.648	(0)
(UO2) 3 (OH) 5+	1.251e-017	8.613e-018	-16.903	-17.065	-0.162	(0)
UO2NO3+	3.141e-021	2.163e-021	-20.503	-20.665	-0.162	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-41.898	-42.060	-0.162	(0)
V+2	0.000e+000	0.000e+000	-42.724	-43.372	-0.648	(0)
V (3)	1.768e-014					
V (OH) 3	1.768e-014	1.768e-014	-13.753	-13.753	0.000	(0)
V (OH) 2+	2.636e-025	1.815e-025	-24.579	-24.741	-0.162	(0)
VOH+2	1.217e-028	2.736e-029	-27.915	-28.563	-0.648	(0)
V+3	2.475e-033	8.618e-035	-32.606	-34.065	-1.458	(0)
VSO4+	5.714e-034	3.935e-034	-33.243	-33.405	-0.162	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-53.394	-54.852	-1.458	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-53.733	-56.326	-2.592	(0)
V (4)	1.310e-017					
V (OH) 3+	1.253e-017	8.627e-018	-16.902	-17.064	-0.162	(0)
VO+2	3.040e-019	6.835e-020	-18.517	-19.165	-0.648	(0)
VOSO4	1.821e-019	1.821e-019	-18.740	-18.740	0.000	(0)
VOF+	8.631e-020	5.943e-020	-19.064	-19.226	-0.162	(0)
VOF2	3.231e-021	3.231e-021	-20.491	-20.491	0.000	(0)
VOC1+	6.358e-022	4.378e-022	-21.197	-21.359	-0.162	(0)
VOF3-	2.413e-023	1.662e-023	-22.617	-22.779	-0.162	(0)
VOF4-2	4.325e-026	9.725e-027	-25.364	-26.012	-0.648	(0)
H2V2O4+2	1.664e-029	3.741e-030	-28.779	-29.427	-0.648	(0)
V (5)	1.440e-007					
H2VO4-	9.696e-008	6.677e-008	-7.013	-7.175	-0.162	(0)

HVO4-2	4.700e-008	1.057e-008	-7.328	-7.976	-0.648	(0)
H3VO4	1.060e-011	1.060e-011	-10.975	-10.975	0.000	(0)
HV2O7-3	6.877e-012	2.394e-013	-11.163	-12.621	-1.458	(0)
H3V2O7-	6.644e-012	4.575e-012	-11.178	-11.340	-0.162	(0)
V2O7-4	1.588e-013	4.061e-016	-12.799	-15.391	-2.592	(0)
VO4-3	9.585e-014	3.337e-015	-13.018	-14.477	-1.458	(0)
V3O9-3	8.992e-015	3.131e-016	-14.046	-15.504	-1.458	(0)
VO2+	4.311e-016	3.365e-016	-15.365	-15.473	-0.108	(0)
VO2SO4-	1.129e-016	7.773e-017	-15.947	-16.109	-0.162	(0)
VO2F	8.557e-017	8.557e-017	-16.068	-16.068	0.000	(0)
VO2F2-	6.541e-018	4.504e-018	-17.184	-17.346	-0.162	(0)
V4O12-4	3.414e-018	8.727e-021	-17.467	-20.059	-2.592	(0)
VO2F3-2	3.622e-020	8.145e-021	-19.441	-20.089	-0.648	(0)
VO2F4-3	1.669e-023	5.810e-025	-22.778	-24.236	-1.458	(0)
VO2NO3	5.718e-024	5.718e-024	-23.243	-23.243	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-48.206	-54.039	-5.833	(0)
HV10O28-5	0.000e+000	0.000e+000	-49.601	-53.651	-4.051	(0)
H2V10O28-4	0.000e+000	0.000e+000	-53.651	-56.243	-2.592	(0)
Zn	1.454e-005					
Zn+2	6.678e-006	2.480e-006	-5.175	-5.605	-0.430	(0)
ZnSO4	5.249e-006	5.249e-006	-5.280	-5.280	0.000	(0)
Zn(SO4)2-2	1.967e-006	4.422e-007	-5.706	-6.354	-0.648	(0)
ZnCO3	2.820e-007	2.820e-007	-6.550	-6.550	0.000	(0)
ZnOH+	2.282e-007	1.572e-007	-6.642	-6.804	-0.162	(0)
ZnHCO3+	7.618e-008	5.246e-008	-7.118	-7.280	-0.162	(0)
ZnCl+	1.851e-008	1.423e-008	-7.733	-7.847	-0.114	(0)
Zn(OH)2	1.578e-008	1.578e-008	-7.802	-7.802	0.000	(0)
ZnOHCl	1.180e-008	1.180e-008	-7.928	-7.928	0.000	(0)
ZnF+	1.042e-008	7.175e-009	-7.982	-8.144	-0.162	(0)
Zn(OH)3-	7.276e-011	5.011e-011	-10.138	-10.300	-0.162	(0)
ZnCl2	5.149e-011	5.149e-011	-10.288	-10.288	0.000	(0)
ZnNO3+	3.039e-013	2.093e-013	-12.517	-12.679	-0.162	(0)
ZnCl3-	1.215e-013	9.338e-014	-12.915	-13.030	-0.114	(0)
ZnSeO4	3.284e-014	3.284e-014	-13.484	-13.484	0.000	(0)
Zn(OH)4-2	5.620e-015	1.264e-015	-14.250	-14.898	-0.648	(0)
ZnCl4-2	2.843e-016	1.066e-016	-15.546	-15.972	-0.426	(0)
Zn(NO3)2	1.403e-021	1.403e-021	-20.853	-20.853	0.000	(0)
Zn(SeO4)2-2	1.266e-023	2.847e-024	-22.898	-23.546	-0.648	(0)
ZnS(HS)-	0.000e+000	0.000e+000	-147.881	-148.043	-0.162	(0)
Zn(HS)2	0.000e+000	0.000e+000	-149.833	-149.833	0.000	(0)
Zn(HS)3-	0.000e+000	0.000e+000	-224.914	-225.076	-0.162	(0)
ZnS(HS)2-2	0.000e+000	0.000e+000	-226.609	-227.257	-0.648	(0)
Zn(HS)4-2	0.000e+000	0.000e+000	-304.412	-305.060	-0.648	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-51.29	-45.00	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-39.85	-35.33	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-47.07	-35.34	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-66.33	-48.40	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-53.93	-33.90	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-27.49	-27.08	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.25	-22.80	0.45	(NH4)2SeO4
Acanthite	-51.81	-88.03	-36.22	Ag2S
Ag2CO3	-11.92	-23.01	-11.09	Ag2CO3
Ag2CrO4	-20.07	-31.66	-11.59	Ag2CrO4
Ag2HVO4	-10.86	-9.38	1.48	Ag2HVO4
Ag2MoO4	-12.01	-23.56	-11.55	Ag2MoO4
Ag2O	-14.28	-1.71	12.57	Ag2O
Ag2Se	0.12	-48.58	-48.70	Ag2Se
Ag2SeO3	-9.51	-16.66	-7.15	Ag2SeO3
Ag2SeO4	-18.46	-27.37	-8.91	Ag2SeO4
Ag2SO4	-14.50	-19.32	-4.82	Ag2SO4
Ag3AsO3	-27.29	-25.14	2.16	Ag3AsO3
Ag3AsO4	-15.66	-18.44	-2.79	Ag3AsO4
Ag3H2VO5	-15.42	-10.24	5.18	Ag3H2VO5

AgF:4H2O	-13.54	-12.49	1.05	AgF:4H2O
Agmetal	-0.14	-13.65	-13.51	Ag
AgVO3	-9.30	-8.53	0.77	AgVO3
Al (OH) 3 (am)	-2.42	8.38	10.80	Al (OH) 3
Al2 (MoO4) 3	-51.16	-48.79	2.37	Al2 (MoO4) 3
Al2O3	-2.89	16.76	19.65	Al2O3
Al4 (OH) 10SO4	-6.79	15.91	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.30	-7.50	4.80	AlAsO4:2H2O
AlOHSO4	-6.00	-9.23	-3.23	AlOHSO4
AlSb	-152.49	-86.86	65.62	AlSb
Alunite	-3.35	-4.75	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.21	-11.00	-7.79	PbSO4
Anhydrite	-0.03	-4.39	-4.36	CaSO4
Anilite	-55.03	-86.91	-31.88	Cu0.25Cu1.5S
Antlerite	-1.42	7.37	8.79	Cu3 (OH) 4SO4
Aragonite	0.22	-8.08	-8.30	CaCO3
Arsenolite	-87.54	-90.30	-2.76	As4O6
Artinite	-5.01	4.59	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.47	-31.76	6.71	As2O5
Atacamite	-1.17	6.22	7.39	Cu2 (OH) 3Cl
Azurite	-0.71	-17.62	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.50	7.90	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-15.42	0.45	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.86	-8.05	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-24.59	8.35	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.38	-22.05	-9.67	BaCrO4
BaF2	-9.55	-15.37	-5.82	BaF2
BaMoO4	-6.99	-13.95	-6.96	BaMoO4
Barite	0.27	-9.71	-9.98	BaSO4
BaS	-94.60	-78.42	16.18	BaS
BaSeO3	-8.88	-7.05	1.83	BaSeO3
BaSeO4	-10.30	-17.76	-7.46	BaSeO4
Bianchite	-5.86	-7.62	-1.76	ZnSO4:6H2O
Birnessite	-6.53	11.56	18.09	MnO2
Bixbyite	-1.82	-2.47	-0.64	Mn2O3
BlaubleiI	-55.02	-79.18	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.47	-82.75	-27.28	Cu0.6Cu0.8S
Boehmite	-0.20	8.38	8.58	AlOOH
Breithauptite	-55.32	-73.84	-18.52	NiSb
Brochantite	0.48	15.70	15.22	Cu4 (OH) 6SO4
Brucite	-3.90	12.95	16.84	Mg (OH) 2
Bunsenite	-3.84	8.61	12.45	NiO
Ca (VO3) 2	-7.79	-2.13	5.66	Ca (VO3) 2
Ca2V2O7	-6.40	11.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.46	11.09	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.40	7.90	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-14.64	24.32	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-15.55	24.31	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-293.80	-150.82	142.97	Ca3Sb2
CaCrO4	-14.46	-16.73	-2.27	CaCrO4
Calcite	0.40	-8.08	-8.48	CaCO3
Calomel	-9.03	-26.94	-17.91	Hg2Cl2
CaMoO4	-0.68	-8.63	-7.95	CaMoO4
Carnotite	-0.46	-0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.54	-1.73	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.43	-12.45	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.89	-1.05	9.84	Cd (BO2) 2
Cd (OH) 2	-5.79	7.86	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-5.87	7.86	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-18.36	-11.65	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-16.60	5.96	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-14.58	13.82	28.40	Cd4 (OH) 6SO4
CdCl2	-12.36	-13.02	-0.66	CdCl2
CdCl2:1H2O	-11.33	-13.02	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.11	-13.02	-1.91	CdCl2:2.5H2O
CdF2	-14.21	-15.42	-1.21	CdF2
Cdmetal (alpha)	-31.25	-17.73	13.51	Cd
Cdmetal (gamma)	-31.35	-17.73	13.62	Cd

CdMoO4	0.15	-13.99	-14.15	CdMoO4
CdOHCl	-6.12	-2.58	3.54	CdOHCl
CdSb	-74.24	-74.59	-0.35	CdSb
CdSe	-18.81	-39.01	-20.20	CdSe
CdSeO4:2H2O	-15.96	-17.81	-1.85	CdSeO4:2H2O
CdSO4	-9.58	-9.75	-0.17	CdSO4
CdSO4:1H2O	-8.03	-9.76	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.88	-9.76	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.54	-11.29	-9.75	AgCl
Cerrusite	-1.56	-14.69	-13.13	PbCO3
CH4(g)	-82.63	-123.67	-41.05	CH4
Chalcanthite	-6.65	-9.29	-2.64	CuSO4:5H2O
Chalcocite	-54.96	-89.88	-34.92	Cu2S
Chalcopyrite	-125.35	-160.62	-35.27	CuFeS2
Cinnabar	-52.45	-98.15	-45.69	HgS
Claudetite	-87.23	-90.30	-3.06	As4O6
Clausthalite	-13.15	-40.25	-27.10	PbSe
Co(BO2)2	-27.56	-0.49	27.07	Co(BO2)2
Co(OH)2	-4.67	8.42	13.09	Co(OH)2
Co(OH)3	-8.87	-11.18	-2.31	Co(OH)3
CO2(g)	-3.16	-21.30	-18.15	CO2
Co3(AsO4)2	-19.52	-6.49	13.03	Co3(AsO4)2
Co3O4	-3.44	-13.94	-10.50	Co3O4
CoCl2	-20.73	-12.46	8.27	CoCl2
CoCl2:6H2O	-15.00	-12.46	2.54	CoCl2:6H2O
CoCO3	-2.90	-12.88	-9.98	CoCO3
CoF2	-13.26	-14.85	-1.60	CoF2
CoF3	-44.64	-46.09	-1.46	CoF3
CoFe2O4	18.86	15.34	-3.53	CoFe2O4
CoMoO4	-5.67	-13.43	-7.76	CoMoO4
CoO	-5.16	8.42	13.59	CoO
CoS(alpha)	-70.46	-77.90	-7.44	CoS
CoS(beta)	-66.83	-77.90	-11.07	CoS
CoSe	-22.24	-38.44	-16.20	CoSe
CoSeO3	-7.85	-6.53	1.32	CoSeO3
CoSeO4:6H2O	-15.72	-17.25	-1.53	CoSeO4:6H2O
CoSO4	-11.99	-9.19	2.80	CoSO4
CoSO4:6H2O	-6.72	-9.19	-2.47	CoSO4:6H2O
Cotunnite	-9.49	-14.27	-4.78	PbCl2
Covellite	-55.69	-77.99	-22.30	CuS
Cr(OH)2	-21.63	-10.81	10.82	Cr(OH)2
Cr(OH)3	-2.30	-0.96	1.34	Cr(OH)3
Cr(OH)3(am)	-0.21	-0.96	-0.75	Cr(OH)3
Cr2O3	0.43	-1.92	-2.36	Cr2O3
CrCl2	-45.78	-31.69	14.09	CrCl2
CrCl3	-47.40	-32.28	15.11	CrCl3
CrF3	-24.54	-35.88	-11.34	CrF3
Crmetal	-66.89	-36.40	30.48	Cr
CrO3	-26.74	-29.95	-3.21	CrO3
Cryolite	-9.79	-43.63	-33.84	Na3AlF6
Cu(OH)2	-0.35	8.33	8.67	Cu(OH)2
Cu(SbO3)2	-22.63	22.58	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-7.87	1.38	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-53.81	-88.69	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.62	-50.42	-45.80	Cu2Se
Cu2SO4	-19.22	-21.17	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.87	-6.77	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-57.98	-100.58	-42.59	Cu3Sb
Cu3Se2	-25.47	-88.96	-63.49	Cu3Se2
CuCO3	-1.47	-12.97	-11.50	CuCO3
CuCrO4	-16.18	-21.62	-5.44	CuCrO4
CuF	-8.51	-13.42	-4.91	CuF
CuF2	-16.06	-14.95	1.12	CuF2
CuF2:2H2O	-10.40	-14.95	-4.55	CuF2:2H2O
Cumetal	-5.82	-14.57	-8.76	Cu
CuMoO4	-0.45	-13.52	-13.08	CuMoO4
CuOCuSO4	-11.26	-0.96	10.30	CuOCuSO4
Cupricferrite	9.25	15.24	5.99	CuFe2O4

Cuprite	-2.15	-3.55	-1.41	Cu2O
Cuprousferrite	10.60	1.68	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe
CuSe2	-26.45	-59.81	-33.37	CuSe2
CuSeO3:2H2O	-7.13	-6.62	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.90	-17.34	-2.44	CuSeO4:5H2O
CuSO4	-12.22	-9.28	2.94	CuSO4
Diaspore	1.51	8.38	6.87	AlOOH
Djurleite	-55.17	-89.09	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.10	-16.44	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.65	-16.44	-17.09	CaMg(CO3)2
Epsomite	-2.54	-4.67	-2.13	MgSO4:7H2O
Fe(OH)2	-9.87	3.69	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	3.36	0.32	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-7.94	-11.66	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.59	-8.04	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.31	-37.94	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.19	-45.93	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.62	10.60	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.82	-12.42	0.40	FeAsO4:2H2O
FeCr2O4	-5.43	1.77	7.20	FeCr2O4
FeMoO4	-8.07	-18.16	-10.09	FeMoO4
Ferrihydrite	0.26	3.46	3.19	Fe(OH)3
Ferroselite	-45.86	-64.45	-18.60	FeSe2
FeS(ppt)	-79.68	-82.63	-2.95	FeS
FeSe	-32.18	-43.18	-11.00	FeSe
Fix_pe	-5.00	-5.00	0.00	e-
Fluorite	0.45	-10.05	-10.50	CaF2
Galena	-65.74	-79.71	-13.97	PbS
Gibbsite	0.09	8.38	8.29	Al(OH)3
Goethite	2.97	3.46	0.49	FeOOH
Goslarite	-5.61	-7.62	-2.01	ZnSO4:7H2O
Greenockite	-64.10	-78.46	-14.36	CdS
Greigite	-289.65	-334.68	-45.03	Fe3S4
Gummite	-5.56	2.11	7.67	UO3
Gypsum	0.22	-4.39	-4.61	CaSO4:2H2O
H-Jarosite	-12.76	-24.86	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.98	-21.85	-12.88	H2MoO4
H2S(g)	-78.31	-86.32	-8.01	H2S
H2Se(g)	-41.91	-46.87	-4.96	H2Se
Halite	-6.10	-4.50	1.60	NaCl
Hausmannite	-1.48	59.55	61.03	Mn3O4
Hematite	8.33	6.91	-1.42	Fe2O3
Hercynite	-2.44	20.45	22.89	FeAl2O4
Hg(CH3)2(g)	-185.47	-259.17	-73.71	Hg(CH3)2
Hg(g)	-7.95	-15.83	-7.87	Hg
Hg(OH)2	-8.33	-11.83	-3.50	Hg(OH)2
Hg2(g)	-16.70	-31.65	-14.96	Hg2
Hg2(OH)2	-11.32	-6.06	5.26	Hg2(OH)2
Hg2CO3	-11.31	-27.36	-16.05	Hg2CO3
Hg2CrO4	-27.31	-36.01	-8.70	Hg2CrO4
Hg2F2	-18.97	-29.34	-10.36	Hg2F2
Hg2S	-80.71	-92.38	-11.68	Hg2S
Hg2SeO3	-16.35	-21.01	-4.66	Hg2SeO3
Hg2SO4	-17.54	-23.67	-6.13	Hg2SO4
Hg3O2CO3	-27.10	-56.78	-29.68	Hg3O2CO3
HgCl(g)	-32.97	-13.47	19.50	HgCl
HgCl2	-11.44	-32.71	-21.26	HgCl2
HgF(g)	-47.34	-14.67	32.68	HgF
HgF2(g)	-47.67	-35.10	12.57	HgF2
Hgmetal(l)	-2.37	-15.83	-13.45	Hg
HgSe	-3.00	-58.69	-55.69	HgSe
HgSeO3	-14.35	-26.78	-12.43	HgSeO3
HgSO4	-20.02	-29.44	-9.42	HgSO4
Huntite	-3.18	-33.15	-29.97	CaMg3(CO3)4
Hydrocerrusite	-3.99	-22.76	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.72	-20.48	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.35	-21.52	-5.17	KAl(SO4)2:12H2O

K-Jarosite	-4.72	-19.52	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-31.99	-49.23	-17.24	K2Cr2O7
K2CrO4	-18.77	-19.28	-0.51	K2CrO4
K2MoO4	-14.44	-11.18	3.26	K2MoO4
K2SeO4	-14.26	-14.99	-0.73	K2SeO4
Langite	-1.79	15.70	17.49	Cu4(OH)6SO4·H2O
Larnakite	-3.95	-4.39	-0.43	PbO:PbSO4
Laurionite	-4.45	-3.83	0.62	PbOHCl
Lepidocrocite	2.09	3.46	1.37	FeOOH
Lime	-19.48	13.22	32.70	CaO
Litharge	-6.08	6.61	12.69	PbO
Mackinawite	-79.03	-82.63	-3.60	FeS
Maghemite	0.53	6.91	6.39	Fe2O3
Magnesioferrite	3.00	19.86	16.86	Fe2MgO4
Magnesite	-0.90	-8.36	-7.46	MgCO3
Magnetite	7.20	10.60	3.40	Fe3O4
Malachite	0.66	-4.65	-5.31	Cu2(OH)2CO3
Manganite	-1.22	24.12	25.34	MnOOH
Massicot	-6.28	6.61	12.89	PbO
Matlockite	-6.49	-15.46	-8.97	PbClF
Melanothallite	-18.81	-12.55	6.26	CuCl2
Melanterite	-11.72	-13.92	-2.21	FeSO4·7H2O
Metacinnabar	-53.05	-98.15	-45.09	HgS
Mg(OH)2(active)	-5.85	12.95	18.79	Mg(OH)2
Mg(VO3)2	-13.68	-2.40	11.28	Mg(VO3)2
Mg2Sb3	-270.54	-195.86	74.68	Mg2Sb3
Mg2V2O7	-15.82	10.54	26.36	Mg2V2O7
MgCr2O4	-5.18	11.02	16.20	MgCr2O4
MgCrO4	-22.38	-17.00	5.38	MgCrO4
MgF2	-2.20	-10.33	-8.13	MgF2
MgMoO4	-7.06	-8.91	-1.85	MgMoO4
MgSeO3·6H2O	-5.06	-2.01	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.52	-12.72	-1.20	MgSeO4·6H2O
Minium	-28.09	45.43	73.52	Pb3O4
Mirabilite	-4.63	-5.74	-1.11	Na2SO4·10H2O
Mn(VO3)2	-8.93	-4.03	4.90	Mn(VO3)2
Mn2(SO4)3	-49.59	-55.30	-5.71	Mn2(SO4)3
Mn2Sb	-146.48	-85.40	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-10.30	2.20	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.28	-9.56	2.72	MnCl2·4H2O
MnS(grn)	-75.17	-75.00	0.17	MnS
MnS(pnk)	-78.34	-75.00	3.34	MnS
MnSb	-93.57	-96.48	-2.91	MnSb
MnSe	-39.05	-35.55	3.50	MnSe
MnSeO3	-4.76	-3.63	1.13	MnSeO3
MnSeO3·2H2O	-4.61	-3.63	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.30	-14.35	-2.05	MnSeO4·5H2O
MnSO4	-8.88	-6.29	2.58	MnSO4
Monteponite	-7.25	7.86	15.10	CdO
Montroydite	-8.19	-11.83	-3.64	HgO
MoO3	-13.85	-21.85	-8.00	MoO3
Morenosite	-6.86	-9.01	-2.14	NiSO4·7H2O
MoS2	-149.83	-220.09	-70.26	MoS2
Na-Jarosite	-7.72	-18.92	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.13	-48.02	-9.90	Na2Cr2O7
Na2CrO4	-21.00	-18.07	2.93	Na2CrO4
Na2Mo2O7	-15.23	-31.83	-16.60	Na2Mo2O7
Na2MoO4	-11.46	-9.97	1.49	Na2MoO4
Na2MoO4·2H2O	-11.20	-9.98	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.38	-3.08	10.30	Na2SeO3·5H2O
Na2SeO4	-15.07	-13.79	1.28	Na2SeO4
Na3Sb	-171.88	-77.43	94.45	Na3Sb
Na3VO4	-26.54	10.14	36.68	Na3VO4
Na4V2O7	-28.99	8.41	37.40	Na4V2O7
Nantokite	-5.49	-12.22	-6.73	CuCl
NaSb	-86.88	-63.71	23.17	NaSb
Natron	-8.12	-9.43	-1.31	Na2CO3·10H2O
NaVO3	-5.59	-1.73	3.86	NaVO3

Nesquehonite	-3.69	-8.36	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.18	8.61	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-21.63	-5.93	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-15.17	16.83	32.00	Ni4 (OH) 6SO4
NiCO3	-5.82	-12.69	-6.87	NiCO3
NiMoO4	-2.10	-13.24	-11.14	NiMoO4
NiS (alpha)	-72.11	-77.71	-5.60	NiS
NiS (beta)	-66.61	-77.71	-11.10	NiS
NiS (gamma)	-64.91	-77.71	-12.80	NiS
NiSe	-20.56	-38.26	-17.70	NiSe
NiSeO3:2H2O	-9.16	-6.34	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.54	-17.06	-1.52	NiSeO4:6H2O
Nsutite	-5.94	11.56	17.50	MnO2
O2 (g)	-31.90	51.18	83.09	O2
Orpiment	-243.05	-304.11	-61.07	As2S3
Otavite	-1.44	-13.44	-12.00	CdCO3
Pb (BO2) 2	-8.82	-2.30	6.52	Pb (BO2) 2
Pb (OH) 2	-1.54	6.61	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-52.92	-61.68	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-6.01	2.79	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-12.96	13.23	26.19	Pb2O (OH) 2
Pb2O3	-22.22	38.82	61.04	Pb2O3
Pb2OCO3	-7.52	-8.07	-0.56	Pb2OCO3
Pb2V2O7	-0.22	-2.12	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-17.72	-11.92	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-1.65	4.49	6.14	Pb3 (VO4) 2
Pb3O2CO3	-12.48	-1.46	11.02	Pb3O2CO3
Pb3O2SO4	-8.46	2.23	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-12.26	8.84	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-13.03	8.84	21.88	Pb4O3SO4
PbCrO4	-10.74	-23.34	-12.60	PbCrO4
PbF2	-9.22	-16.66	-7.44	PbF2
Pbmetal	-23.22	-18.98	4.25	Pb
PbMoO4	0.38	-15.24	-15.62	PbMoO4
PbO:0.3H2O	-6.37	6.61	12.98	PbO:0.33H2O
PbSeO4	-12.21	-19.05	-6.84	PbSeO4
Periclase	-8.64	12.95	21.58	MgO
Phosgenite	-9.15	-28.96	-19.81	PbCl2:PbCO3
Plattnerite	-17.39	32.21	49.60	PbO2
Portlandite	-9.58	13.22	22.80	Ca (OH) 2
Pyrite	-124.85	-143.36	-18.51	FeS2
Pyrochroite	-3.87	11.32	15.19	Mn (OH) 2
Pyrolusite	-4.47	36.91	41.38	MnO2
Realgar	-101.95	-121.69	-19.75	AsS
Retgersite	-6.97	-9.01	-2.04	NiSO4:6H2O
Rhodochrosite	0.60	-9.98	-10.58	MnCO3
Rutherfordine	-4.70	-19.20	-14.50	UO2CO3
Sb (OH) 3	-11.36	-18.47	-7.11	Sb (OH) 3
Sb2O4	-14.74	-11.34	3.40	Sb2O4
Sb2O5	-24.70	-34.37	-9.67	Sb2O5
Sb2Se3	-109.78	-177.54	-67.76	Sb2Se3
Sb4O6 (cubic)	-55.61	-73.87	-18.26	Sb4O6
Sb4O6 (orth)	-55.97	-73.87	-17.90	Sb4O6
SbCl3	-50.36	-49.79	0.57	SbCl3
SbF3	-43.16	-53.38	-10.23	SbF3
Sbmetal	-45.17	-56.86	-11.69	Sb
SbO2	-2.16	-29.98	-27.82	SbO2
Schoepite	-3.89	2.11	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.17	-21.28	-7.11	Se
Semetal (hex)	-13.57	-21.28	-7.71	Se
Senarmontite	-24.57	-36.93	-12.37	Sb2O3
SeO2	-15.08	-14.95	0.12	SeO2
SeO3	-46.71	-25.67	21.04	SeO3
Siderite	-7.37	-17.61	-10.24	FeCO3
Smithsonite	-1.31	-11.31	-10.00	ZnCO3
Sphalerite	-64.88	-76.33	-11.45	ZnS
Spinel	-7.14	29.71	36.85	MgAl2O4
Stibnite	-245.44	-295.90	-50.46	Sb2S3

Sulfur	-58.59	-60.73	-2.14	S
Tenorite	0.68	8.33	7.64	CuO
Thenardite	-6.06	-5.73	0.32	Na2SO4
Thermonatrite	-10.06	-9.42	0.64	Na2CO3:H2O
Tyuyamunite	-1.99	2.09	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.71	8.38	21.08	U3O8
U3Sb4	-576.17	-423.79	152.38	U3Sb4
U4O9	-28.47	-31.49	-3.02	U4O9
UF4	-31.28	-60.82	-29.54	UF4
UF4:2.5H2O	-28.10	-60.82	-32.72	UF4:2.5H2O
UO2 (am)	-15.20	-14.27	0.93	UO2
UO2 (NO3) 2	-40.59	-28.44	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.29	-28.44	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.83	-28.44	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.49	-28.44	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.51	2.11	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.31	-23.56	-2.25	UO2SeO4:4H2O
UO3	-5.59	2.11	7.70	UO3
Uraninite	-9.60	-14.27	-4.67	UO2
USb2	-217.96	-188.38	29.58	USb2
V (OH) 3	-18.26	-10.67	7.59	V (OH) 3
V2O5	-13.99	-15.35	-1.36	V2O5
V3O5	-38.13	-36.29	1.84	V3O5
V4O7	-47.05	-39.86	7.19	V4O7
V6O13	-36.37	-97.23	-60.86	V6O13
Valentinite	-28.45	-36.93	-8.48	Sb2O3
VC12	-63.22	-44.34	18.87	VC12
VC13	-65.42	-41.99	23.43	VC13
VF4	-65.05	-50.12	14.93	VF4
Vmetal	-93.08	-49.06	44.03	V
VO	-38.22	-23.46	14.76	VO
VO (OH) 2	-8.72	-3.57	5.15	VO (OH) 2
VO2Cl	-20.96	-18.11	2.84	VO2Cl
VOC1	-32.26	-21.11	11.15	VOC1
VOC12	-37.21	-24.45	12.76	VOC12
VOSO4	-24.79	-21.18	3.61	VOSO4
Witherite	-4.83	-13.40	-8.57	BaCO3
Wurtzite	-67.38	-76.33	-8.95	ZnS
Zincite	-1.34	9.99	11.33	ZnO
Zincosite	-11.55	-7.62	3.93	ZnSO4
Zn (BO2) 2	-7.21	1.08	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-23.87	-20.56	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.21	9.99	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.48	9.99	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.76	9.99	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.54	9.99	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.74	9.99	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-5.13	2.37	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.65	9.54	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.43	-1.78	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-24.16	-5.25	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-6.04	22.36	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-9.42	29.08	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.94	-10.89	7.05	ZnCl2
ZnCO3:1H2O	-1.05	-11.31	-10.26	ZnCO3:1H2O
ZnF2	-12.75	-13.28	-0.53	ZnF2
Znmetal	-41.39	-15.60	25.79	Zn
ZnMoO4	-1.73	-11.86	-10.13	ZnMoO4
ZnO (active)	-1.20	9.99	11.19	ZnO
ZnS (am)	-67.28	-76.33	-9.05	ZnS
ZnSb	-83.47	-72.46	11.01	ZnSb
ZnSe	-22.48	-36.88	-14.40	ZnSe
ZnSeO4:6H2O	-14.16	-15.68	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.98	-7.62	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 28.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 104

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

Carnotite 0 0

CaSeO3:2H2O 0 0

CdMoO4 0 0

Cd(BO2)2 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 113

SAVE Solution 114 Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 104

END

TITLE

Precipitate oversaturated phases

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 113. Solution after simulation 27.

Using pure phase assemblage 104.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+000	2.442e-009	2.442e-009
Alunite	-3.76	-5.16	-1.40	0.000e+000	0	0.000e+000
Anhydrite	-0.25	-4.61	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+000	2.674e-010	2.674e-010
Barite	0.00	-9.98	-9.98	0.000e+000	2.108e-008	2.108e-008
Brochantite	0.00	15.22	15.22	0.000e+000	1.296e-007	1.296e-007
Brucite	-3.75	13.10	16.84	0.000e+000	0	0.000e+000
CO2 (g)	-3.50	-21.65	-18.15	1.000e+001	1.000e+001	2.314e-004
CaMoO4	-0.85	-8.80	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-4.66	-1.85	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	0.000e+000	2.297e-004	2.297e-004
Carnotite	-0.00	0.23	0.23	0.000e+000	8.052e-008	8.052e-008
Cd(BO2)2	-10.94	-1.10	9.84	0.000e+000	0	0.000e+000
CdMoO4	0.00	-14.15	-14.15	0.000e+000	4.311e-008	4.311e-008
Chrysotile	Element not present.			0.000e+000	0	0.000e+000
Cr2O3	0.00	-2.36	-2.36	0.000e+000	6.900e-010	6.900e-010
Cu2Se(alpha)	-4.65	-50.45	-45.80	0.000e+000	0	0.000e+000
CuMoO4	-0.64	-13.72	-13.08	0.000e+000	0	0.000e+000
Epsomite	-2.56	-4.68	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	0.00	3.19	3.19	0.000e+000	1.086e-009	1.086e-009
Fluorite	0.00	-10.50	-10.50	0.000e+000	3.121e-005	3.121e-005
Gummite	-4.72	2.95	7.67	0.000e+000	0	0.000e+000
Gypsum	0.00	-4.61	-4.61	0.000e+000	7.018e-003	7.018e-003
HgSe	-2.97	-58.66	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2	Element not present.			0.000e+000	0	0.000e+000
Mirabilite	-4.65	-5.77	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-4.65	-3.52	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-4.03	8.77	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2:8H2O	-21.70	-6.00	15.70	0.000e+000	0	0.000e+000
NiCO3	-6.01	-12.88	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-2.06	-13.20	-11.14	0.000e+000	0	0.000e+000
O2 (g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	5.211e-008
Otavite	-1.83	-13.83	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	0.000e+000	1.159e-008	1.159e-008
Rutherfordine	-4.19	-18.69	-14.50	0.000e+000	0	0.000e+000
SbO2	-2.18	-30.00	-27.82	0.000e+000	0	0.000e+000
Schoepite	-3.04	2.95	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2(am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-1.26	2.82	4.08	0.000e+000	0	0.000e+000
U3O8	-10.12	10.96	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-2.66	2.95	5.61	0.000e+000	0	0.000e+000
UO3	-4.75	2.95	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-1.68	-11.81	-10.13	0.000e+000	0	0.000e+000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.161e-008	1.082e-008
Al	4.041e-007	3.764e-007
As	9.646e-010	8.986e-010
B	3.644e-005	3.394e-005
Ba	3.082e-008	2.871e-008
C	4.951e-004	4.612e-004
Ca	1.290e-002	1.202e-002

Cd	7.477e-008	6.966e-008
Cl	2.926e-003	2.726e-003
Co	4.360e-007	4.061e-007
Cr	1.627e-009	1.515e-009
Cu	5.106e-007	4.757e-007
F	1.756e-004	1.636e-004
Fe	1.154e-009	1.075e-009
Hg	5.540e-010	5.160e-010
K	4.707e-003	4.385e-003
Mg	9.987e-003	9.304e-003
Mn	3.270e-004	3.046e-004
Mo	1.441e-006	1.342e-006
N	4.309e-005	4.014e-005
Na	1.861e-002	1.734e-002
Ni	4.979e-007	4.638e-007
Pb	6.162e-009	5.740e-009
S	3.305e-002	3.079e-002
Sb	5.116e-007	4.766e-007
Se	1.786e-007	1.664e-007
U	3.458e-007	3.222e-007
V	5.760e-008	5.366e-008
Zn	1.454e-005	1.354e-005

-----Description of solution-----

	pH	=	7.859	Charge balance
	pe	=	4.914	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength	=	8.553e-002	
	Mass of water (kg)	=	9.316e-001	
	Total alkalinity (eq/kg)	=	5.032e-004	
	Total CO2 (mol/kg)	=	4.951e-004	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	1.635e-005	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.02	
	Iterations	=	19	
	Total H	=	1.034167e+002	
	Total O	=	5.183283e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	9.397e-007	7.267e-007	-6.027	-6.139	-0.112	(0)
H+	1.752e-008	1.384e-008	-7.757	-7.859	-0.102	0.00
H2O	5.551e+001	9.988e-001	1.744	-0.001	0.000	18.07
Ag	1.161e-008					
AgCl	7.223e-009	7.223e-009	-8.141	-8.141	0.000	(0)
AgCl2-	2.050e-009	1.454e-009	-8.688	-8.837	-0.149	(0)
Ag+	1.937e-009	1.531e-009	-8.713	-8.815	-0.102	(0)
AgSO4-	3.761e-010	2.668e-010	-9.425	-9.574	-0.149	(0)
AgCl3-2	1.183e-011	2.996e-012	-10.927	-11.523	-0.597	(0)
AgNO2	1.038e-011	1.038e-011	-10.984	-10.984	0.000	(0)
AgF	4.073e-013	4.073e-013	-12.390	-12.390	0.000	(0)
AgCl4-3	3.110e-013	1.414e-014	-12.507	-13.850	-1.342	(0)
AgOH	1.112e-013	1.112e-013	-12.954	-12.954	0.000	(0)
AgNH3+	8.409e-014	5.964e-014	-13.075	-13.224	-0.149	(0)
AgH2BO3	3.531e-014	3.531e-014	-13.452	-13.452	0.000	(0)
AgSeO3-	2.795e-014	1.983e-014	-13.554	-13.703	-0.149	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	7.353e-016	5.216e-016	-15.134	-15.283	-0.149	(0)
AgNO3	3.722e-017	3.722e-017	-16.429	-16.429	0.000	(0)
Ag (NH3) 2+	1.305e-017	9.253e-018	-16.885	-17.034	-0.149	(0)
Ag (OH) 2-	1.113e-017	7.898e-018	-16.953	-17.102	-0.149	(0)
Ag (SeO3) 2-3	7.872e-020	3.578e-021	-19.104	-20.446	-1.342	(0)
Ag2MoO4	4.978e-025	4.978e-025	-24.303	-24.303	0.000	(0)

AgHS	0.000e+000	0.000e+000	-73.437	-73.437	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-81.219	-83.605	-2.386	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.154	-147.398	-0.244	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.624	-147.773	-0.149	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.548	-148.979	-0.431	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.884	-149.290	-0.406	(0)
Al	4.041e-007					
Al (OH) 4-	4.003e-007	3.149e-007	-6.398	-6.502	-0.104	(0)
Al (OH) 3	3.442e-009	3.442e-009	-8.463	-8.463	0.000	(0)
Al (OH) 2+	2.977e-010	2.374e-010	-9.526	-9.624	-0.098	(0)
AlF3	3.374e-011	3.374e-011	-10.472	-10.472	0.000	(0)
AlF2+	3.172e-011	2.530e-011	-10.499	-10.597	-0.098	(0)
AlF4-	2.277e-012	1.792e-012	-11.643	-11.747	-0.104	(0)
AlF+2	1.482e-012	5.997e-013	-11.829	-12.222	-0.393	(0)
AlOH+2	1.016e-012	4.113e-013	-11.993	-12.386	-0.393	(0)
AlSO4+	4.878e-014	3.838e-014	-13.312	-13.416	-0.104	(0)
Al+3	4.717e-015	5.660e-016	-14.326	-15.247	-0.921	(0)
Al (SO4) 2-	4.566e-015	3.593e-015	-14.340	-14.445	-0.104	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-43.568	-44.911	-1.342	(0)
As (3)	1.682e-023					
H3AsO3	1.598e-023	1.598e-023	-22.796	-22.796	0.000	(0)
H2AsO3-	8.349e-025	5.922e-025	-24.078	-24.228	-0.149	(0)
HAsO3-2	1.542e-028	3.903e-029	-27.812	-28.409	-0.597	(0)
H4AsO3+	1.545e-031	1.096e-031	-30.811	-30.960	-0.149	(0)
AsO3-3	2.391e-033	1.087e-034	-32.621	-33.964	-1.342	(0)
As (5)	9.646e-010					
HAsO4-2	9.219e-010	2.334e-010	-9.035	-9.632	-0.597	(0)
H2AsO4-	4.153e-011	2.946e-011	-10.382	-10.531	-0.149	(0)
AsO4-3	1.173e-012	5.333e-014	-11.931	-13.273	-1.342	(0)
H3AsO4	6.946e-017	7.084e-017	-16.158	-16.150	0.009	(0)
B	3.644e-005					
H3BO3	3.401e-005	3.469e-005	-4.468	-4.460	0.009	(0)
H2BO3-	1.920e-006	1.456e-006	-5.717	-5.837	-0.120	(0)
CaH2BO3+	3.112e-007	2.360e-007	-6.507	-6.627	-0.120	(0)
MgH2BO3+	1.592e-007	1.207e-007	-6.798	-6.918	-0.120	(0)
NaH2BO3	3.241e-008	3.241e-008	-7.489	-7.489	0.000	(0)
BF (OH) 3-	1.934e-009	1.467e-009	-8.713	-8.834	-0.120	(0)
H5 (BO3) 2-	5.669e-011	4.298e-011	-10.246	-10.367	-0.120	(0)
BaH2BO3+	7.113e-013	5.392e-013	-12.148	-12.268	-0.120	(0)
BF2 (OH) 2-	3.036e-013	2.302e-013	-12.518	-12.638	-0.120	(0)
H8 (BO3) 3-	1.966e-013	1.491e-013	-12.706	-12.827	-0.120	(0)
AgH2BO3	3.531e-014	3.531e-014	-13.452	-13.452	0.000	(0)
BF3OH-	1.734e-019	1.315e-019	-18.761	-18.881	-0.120	(0)
BF4-	1.253e-024	9.497e-025	-23.902	-24.022	-0.120	(0)
Ba	3.082e-008					
Ba+2	3.076e-008	1.199e-008	-7.512	-7.921	-0.409	(0)
BaHCO3+	4.939e-011	3.972e-011	-10.306	-10.401	-0.095	(0)
BaCO3	7.227e-012	7.227e-012	-11.141	-11.141	0.000	(0)
BaH2BO3+	7.113e-013	5.392e-013	-12.148	-12.268	-0.120	(0)
BaOH+	4.795e-014	3.802e-014	-13.319	-13.420	-0.101	(0)
BaNO3+	2.593e-015	1.839e-015	-14.586	-14.735	-0.149	(0)
BaNH3+2	5.702e-016	1.444e-016	-15.244	-15.841	-0.597	(0)
C (4)	4.951e-004					
HCO3-	4.351e-004	3.470e-004	-3.361	-3.460	-0.098	(0)
CaHCO3+	2.263e-005	1.820e-005	-4.645	-4.740	-0.095	(0)
MgHCO3+	1.088e-005	8.491e-006	-4.963	-5.071	-0.108	(0)
H2CO3	1.080e-005	1.080e-005	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CO3-2	3.016e-006	1.176e-006	-5.520	-5.930	-0.409	(0)
NaHCO3	2.741e-006	2.741e-006	-5.562	-5.562	0.000	(0)
MgCO3	2.338e-006	2.338e-006	-5.631	-5.631	0.000	(0)
MnHCO3+	5.169e-007	4.099e-007	-6.287	-6.387	-0.101	(0)
NaCO3-	3.855e-007	3.075e-007	-6.414	-6.512	-0.098	(0)
UO2 (CO3) 3-4	2.705e-007	1.111e-009	-6.568	-8.954	-2.386	(0)
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
ZnCO3	1.869e-007	1.869e-007	-6.728	-6.728	0.000	(0)
UO2 (CO3) 2-2	7.449e-008	1.886e-008	-7.128	-7.725	-0.597	(0)
ZnHCO3+	4.275e-008	3.032e-008	-7.369	-7.518	-0.149	(0)

	NiHCO3+	6.762e-009	4.796e-009	-8.170	-8.319	-0.149	(0)
	NiCO3	4.917e-009	4.917e-009	-8.308	-8.308	0.000	(0)
	Cu (CO3) 2-2	2.949e-009	7.466e-010	-8.530	-9.127	-0.597	(0)
	CoHCO3+	2.866e-009	2.033e-009	-8.543	-8.692	-0.149	(0)
	PbCO3	1.510e-009	1.510e-009	-8.821	-8.821	0.000	(0)
	CoCO3	1.496e-009	1.496e-009	-8.825	-8.825	0.000	(0)
	CuHCO3+	1.052e-009	7.465e-010	-8.978	-9.127	-0.149	(0)
	UO2CO3	8.040e-010	8.040e-010	-9.095	-9.095	0.000	(0)
	CdCO3	3.381e-010	3.381e-010	-9.471	-9.471	0.000	(0)
	PbHCO3+	1.553e-010	1.102e-010	-9.809	-9.958	-0.149	(0)
	BaHCO3+	4.939e-011	3.972e-011	-10.306	-10.401	-0.095	(0)
	Pb (CO3) 2-2	2.022e-011	5.119e-012	-10.694	-11.291	-0.597	(0)
	CdHCO3+	1.405e-011	9.969e-012	-10.852	-11.001	-0.149	(0)
	BaCO3	7.227e-012	7.227e-012	-11.141	-11.141	0.000	(0)
	Cd (CO3) 2-2	1.164e-012	2.946e-013	-11.934	-12.531	-0.597	(0)
	FeHCO3+	2.946e-015	2.369e-015	-14.531	-14.625	-0.095	(0)
	HgCO3	5.647e-016	5.647e-016	-15.248	-15.248	0.000	(0)
	Hg (CO3) 2-2	8.292e-018	2.099e-018	-17.081	-17.678	-0.597	(0)
	HgHCO3+	2.052e-019	1.455e-019	-18.688	-18.837	-0.149	(0)
Ca		1.290e-002					
	Ca+2	7.229e-003	2.817e-003	-2.141	-2.550	-0.409	(0)
	CaSO4	5.637e-003	5.637e-003	-2.249	-2.249	0.000	(0)
	CaHCO3+	2.263e-005	1.820e-005	-4.645	-4.740	-0.095	(0)
	CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CaF+	4.108e-006	3.258e-006	-5.386	-5.487	-0.101	(0)
	CaH2BO3+	3.112e-007	2.360e-007	-6.507	-6.627	-0.120	(0)
	CaOH+	5.079e-008	4.084e-008	-7.294	-7.389	-0.095	(0)
	CaNO3+	3.845e-010	2.727e-010	-9.415	-9.564	-0.149	(0)
	CaNH3+2	2.674e-010	6.769e-011	-9.573	-10.169	-0.597	(0)
	Ca (NH3) 2+2	2.032e-018	5.143e-019	-17.692	-18.289	-0.597	(0)
Cd		7.477e-008					
	Cd+2	3.238e-008	1.262e-008	-7.490	-7.899	-0.409	(0)
	CdSO4	2.584e-008	2.584e-008	-7.588	-7.588	0.000	(0)
	Cd (SO4) 2-2	1.203e-008	3.045e-009	-7.920	-8.516	-0.597	(0)
	CdCl+	3.927e-009	2.785e-009	-8.406	-8.555	-0.149	(0)
	CdCO3	3.381e-010	3.381e-010	-9.471	-9.471	0.000	(0)
	CdOH+	1.027e-010	7.284e-011	-9.988	-10.138	-0.149	(0)
	CdOHC1	8.303e-011	8.303e-011	-10.081	-10.081	0.000	(0)
	CdF+	2.987e-011	2.119e-011	-10.525	-10.674	-0.149	(0)
	CdCl2	2.684e-011	2.684e-011	-10.571	-10.571	0.000	(0)
	CdHCO3+	1.405e-011	9.969e-012	-10.852	-11.001	-0.149	(0)
	Cd (CO3) 2-2	1.164e-012	2.946e-013	-11.934	-12.531	-0.597	(0)
	Cd (OH) 2	3.340e-013	3.340e-013	-12.476	-12.476	0.000	(0)
	CdCl3-	5.519e-014	3.914e-014	-13.258	-13.407	-0.149	(0)
	CdF2	4.480e-015	4.480e-015	-14.349	-14.349	0.000	(0)
	CdNO3+	1.722e-015	1.222e-015	-14.764	-14.913	-0.149	(0)
	CdSeO4	2.052e-016	2.052e-016	-15.688	-15.688	0.000	(0)
	Cd2OH+3	1.013e-016	4.606e-018	-15.994	-17.337	-1.342	(0)
	Cd (OH) 3-	2.090e-017	1.483e-017	-16.680	-16.829	-0.149	(0)
	Cd (SeO3) 2-2	1.669e-017	4.225e-018	-16.778	-17.374	-0.597	(0)
	Cd (NO3) 2	1.875e-023	1.875e-023	-22.727	-22.727	0.000	(0)
	Cd (OH) 4-2	6.966e-024	1.764e-024	-23.157	-23.754	-0.597	(0)
	CdHS+	0.000e+000	0.000e+000	-78.178	-78.327	-0.149	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-149.560	-149.560	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-225.947	-226.096	-0.149	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-301.740	-302.337	-0.597	(0)
Cl		2.926e-003					
	Cl-	2.926e-003	2.311e-003	-2.534	-2.636	-0.102	(0)
	MnCl+	2.173e-007	1.723e-007	-6.663	-6.764	-0.101	(0)
	ZnCl+	2.056e-008	1.604e-008	-7.687	-7.795	-0.108	(0)
	ZnOHC1	1.526e-008	1.526e-008	-7.816	-7.816	0.000	(0)
	AgCl	7.223e-009	7.223e-009	-8.141	-8.141	0.000	(0)
	CdCl+	3.927e-009	2.785e-009	-8.406	-8.555	-0.149	(0)
	AgCl2-	2.050e-009	1.454e-009	-8.688	-8.837	-0.149	(0)
	NiCl+	9.347e-010	6.630e-010	-9.029	-9.178	-0.149	(0)
	CoCl+	8.490e-010	6.022e-010	-9.071	-9.220	-0.149	(0)
	CuCl	5.927e-010	5.927e-010	-9.227	-9.227	0.000	(0)
	MnCl2	5.625e-010	5.625e-010	-9.250	-9.250	0.000	(0)

CuCl2-	3.668e-010	2.862e-010	-9.436	-9.543	-0.108	(0)
CuCl+	1.601e-010	1.249e-010	-9.796	-9.903	-0.108	(0)
CdOHCl	8.303e-011	8.303e-011	-10.081	-10.081	0.000	(0)
ZnCl2	5.878e-011	5.878e-011	-10.231	-10.231	0.000	(0)
PbCl+	4.940e-011	3.504e-011	-10.306	-10.455	-0.149	(0)
CdCl2	2.684e-011	2.684e-011	-10.571	-10.571	0.000	(0)
AgCl3-2	1.183e-011	2.996e-012	-10.927	-11.523	-0.597	(0)
HgClOH	1.191e-012	1.191e-012	-11.924	-11.924	0.000	(0)
MnCl3-	4.516e-013	3.581e-013	-12.345	-12.446	-0.101	(0)
PbCl2	3.618e-013	3.618e-013	-12.442	-12.442	0.000	(0)
CuCl3-2	3.578e-013	1.414e-013	-12.446	-12.849	-0.403	(0)
AgCl4-3	3.110e-013	1.414e-014	-12.507	-13.850	-1.342	(0)
HgCl2	2.145e-013	2.145e-013	-12.669	-12.669	0.000	(0)
ZnCl3-	1.383e-013	1.079e-013	-12.859	-12.967	-0.108	(0)
CuCl2	1.001e-013	1.001e-013	-13.000	-13.000	0.000	(0)
CdCl3-	5.519e-014	3.914e-014	-13.258	-13.407	-0.149	(0)
NiCl2	7.716e-015	7.716e-015	-14.113	-14.113	0.000	(0)
HgCl3-	6.989e-015	4.958e-015	-14.156	-14.305	-0.149	(0)
UO2Cl+	9.080e-016	6.440e-016	-15.042	-15.191	-0.149	(0)
PbCl3-	4.694e-016	3.329e-016	-15.328	-15.478	-0.149	(0)
ZnCl4-2	3.155e-016	1.247e-016	-15.501	-15.904	-0.403	(0)
HgCl4-2	1.802e-016	4.562e-017	-15.744	-16.341	-0.597	(0)
HgCl+	2.610e-017	1.851e-017	-16.583	-16.733	-0.149	(0)
CrCl+2	7.703e-018	1.950e-018	-17.113	-17.710	-0.597	(0)
CuCl3-	2.767e-018	2.159e-018	-17.558	-17.666	-0.108	(0)
PbCl4-2	1.390e-018	3.518e-019	-17.857	-18.454	-0.597	(0)
CrOHCl2	6.226e-020	6.226e-020	-19.206	-19.206	0.000	(0)
FeCl+2	7.293e-022	2.883e-022	-21.137	-21.540	-0.403	(0)
CrCl2+	6.030e-022	4.277e-022	-21.220	-21.369	-0.149	(0)
VOCl+	1.774e-022	1.259e-022	-21.751	-21.900	-0.149	(0)
CuCl4-2	6.328e-023	2.502e-023	-22.199	-22.602	-0.403	(0)
FeCl2+	3.754e-024	2.977e-024	-23.425	-23.526	-0.101	(0)
CrO3Cl-	3.836e-026	2.721e-026	-25.416	-25.565	-0.149	(0)
FeCl3	6.881e-028	6.881e-028	-27.162	-27.162	0.000	(0)
CoCl+2	4.567e-035	1.156e-035	-34.340	-34.937	-0.597	(0)
UCl+3	0.000e+000	0.000e+000	-44.405	-45.747	-1.342	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-46.984	-47.580	-0.597	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.439	-50.036	-0.597	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.418	-62.015	-0.597	(0)
Co (2)	4.360e-007					
Co+2	2.975e-007	7.531e-008	-6.527	-7.123	-0.597	(0)
CoSO4	1.313e-007	1.313e-007	-6.882	-6.882	0.000	(0)
CoHCO3+	2.866e-009	2.033e-009	-8.543	-8.692	-0.149	(0)
CoOH+	1.539e-009	1.092e-009	-8.813	-8.962	-0.149	(0)
CoCO3	1.496e-009	1.496e-009	-8.825	-8.825	0.000	(0)
CoCl+	8.490e-010	6.022e-010	-9.071	-9.220	-0.149	(0)
CoF+	3.557e-010	2.523e-010	-9.449	-9.598	-0.149	(0)
Co (OH) 2	6.303e-011	6.303e-011	-10.200	-10.200	0.000	(0)
CoNO2+	2.428e-011	1.722e-011	-10.615	-10.764	-0.149	(0)
Co (NH3) +2	6.827e-013	1.728e-013	-12.166	-12.762	-0.597	(0)
CoNO3+	5.152e-015	3.654e-015	-14.288	-14.437	-0.149	(0)
CoSeO4	3.296e-015	3.296e-015	-14.482	-14.482	0.000	(0)
Co (OH) 3-	1.288e-015	9.139e-016	-14.890	-15.039	-0.149	(0)
CoOOH-	3.236e-016	2.296e-016	-15.490	-15.639	-0.149	(0)
Co2OH+3	9.067e-017	4.121e-018	-16.043	-17.385	-1.342	(0)
Co (NH3) 2+2	5.558e-019	1.407e-019	-18.255	-18.852	-0.597	(0)
Co (OH) 4-2	4.158e-022	1.053e-022	-21.381	-21.978	-0.597	(0)
Co (NO3) 2	2.276e-022	2.276e-022	-21.643	-21.643	0.000	(0)
Co (NH3) 3+2	1.336e-025	3.381e-026	-24.874	-25.471	-0.597	(0)
Co4 (OH) 4+4	6.907e-026	2.836e-028	-25.161	-27.547	-2.386	(0)
Co (NH3) 4+2	1.338e-032	3.386e-033	-31.874	-32.470	-0.597	(0)
Co (NH3) 5+2	4.237e-040	1.073e-040	-39.373	-39.970	-0.597	(0)
Co (3)	3.586e-028					
CoOH+2	3.586e-028	9.077e-029	-27.445	-28.042	-0.597	(0)
Co+3	2.049e-034	2.458e-035	-33.689	-34.609	-0.921	(0)
CoCl+2	4.567e-035	1.156e-035	-34.340	-34.937	-0.597	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-46.984	-47.580	-0.597	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.363	-56.512	-0.149	(0)

Co (NH3) 6OH+2	0.000e+000	0.000e+000	-60.721	-61.318	-0.597	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.418	-62.015	-0.597	(0)
Cr (2)	7.503e-027					
Cr+2	7.503e-027	1.899e-027	-26.125	-26.721	-0.597	(0)
Cr (3)	1.627e-009					
Cr (OH) 2+	1.292e-009	9.163e-010	-8.889	-9.038	-0.149	(0)
Cr (OH) 3	2.501e-010	2.501e-010	-9.602	-9.602	0.000	(0)
Cr (OH) +2	4.094e-011	1.036e-011	-10.388	-10.984	-0.597	(0)
CrOHSO4	2.148e-011	2.148e-011	-10.668	-10.668	0.000	(0)
CrO2-	1.212e-011	8.594e-012	-10.917	-11.066	-0.149	(0)
Cr (OH) 4-	1.020e-011	7.237e-012	-10.991	-11.140	-0.149	(0)
CrF+2	4.324e-014	1.095e-014	-13.364	-13.961	-0.597	(0)
CrSO4+	1.875e-014	1.330e-014	-13.727	-13.876	-0.149	(0)
Cr+3	1.434e-014	6.519e-016	-13.843	-15.186	-1.342	(0)
CrCl+2	7.703e-018	1.950e-018	-17.113	-17.710	-0.597	(0)
Cr2 (OH) 2SO4+2	7.949e-020	2.012e-020	-19.100	-19.696	-0.597	(0)
CrOHC12	6.226e-020	6.226e-020	-19.206	-19.206	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.044e-020	1.044e-020	-19.981	-19.981	0.000	(0)
CrCl2+	6.030e-022	4.277e-022	-21.220	-21.369	-0.149	(0)
CrNO3+2	3.446e-024	8.724e-025	-23.463	-24.059	-0.597	(0)
Cr (NH3) 5OH+2	1.117e-039	2.828e-040	-38.952	-39.549	-0.597	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-47.159	-48.501	-1.342	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.439	-50.036	-0.597	(0)
Cr (6)	8.283e-015					
CrO4-2	7.740e-015	3.016e-015	-14.111	-14.521	-0.409	(0)
NaCrO4-	2.968e-016	2.106e-016	-15.527	-15.677	-0.149	(0)
HCrO4-	1.904e-016	1.351e-016	-15.720	-15.869	-0.149	(0)
KCrO4-	5.536e-017	3.927e-017	-16.257	-16.406	-0.149	(0)
CrO3SO4-2	1.967e-023	4.980e-024	-22.706	-23.303	-0.597	(0)
H2CrO4	1.515e-024	1.515e-024	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.836e-026	2.721e-026	-25.416	-25.565	-0.149	(0)
Cr2O7-2	2.502e-030	6.335e-031	-29.602	-30.198	-0.597	(0)
Cu (1)	1.247e-009					
CuCl	5.927e-010	5.927e-010	-9.227	-9.227	0.000	(0)
CuCl2-	3.668e-010	2.862e-010	-9.436	-9.543	-0.108	(0)
Cu+	2.871e-010	2.037e-010	-9.542	-9.691	-0.149	(0)
CuCl3-2	3.578e-013	1.414e-013	-12.446	-12.849	-0.403	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.038	-147.456	-0.418	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.791	-148.186	-0.395	(0)
Cu (2)	5.094e-007					
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
CuOH+	1.004e-007	7.834e-008	-6.998	-7.106	-0.108	(0)
Cu+2	8.749e-008	3.409e-008	-7.058	-7.467	-0.409	(0)
CuSO4	6.823e-008	6.823e-008	-7.166	-7.166	0.000	(0)
Cu (OH) 2	1.136e-008	1.136e-008	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	2.949e-009	7.466e-010	-8.530	-9.127	-0.597	(0)
CuHCO3+	1.052e-009	7.465e-010	-8.978	-9.127	-0.149	(0)
Cu2 (OH) 2+2	6.090e-010	1.542e-010	-9.215	-9.812	-0.597	(0)
CuF+	3.213e-010	2.279e-010	-9.493	-9.642	-0.149	(0)
CuNO2+	1.633e-010	1.159e-010	-9.787	-9.936	-0.149	(0)
CuCl+	1.601e-010	1.249e-010	-9.796	-9.903	-0.108	(0)
CuNH3+2	2.630e-011	6.659e-012	-10.580	-11.177	-0.597	(0)
Cu (OH) 3-	2.387e-011	1.693e-011	-10.622	-10.771	-0.149	(0)
CuCl2	1.001e-013	1.001e-013	-13.000	-13.000	0.000	(0)
Cu (NO2) 2	3.847e-014	3.847e-014	-13.415	-13.415	0.000	(0)
CuNO3+	4.653e-015	3.301e-015	-14.332	-14.481	-0.149	(0)
Cu (OH) 4-2	3.825e-016	9.684e-017	-15.417	-16.014	-0.597	(0)
CuCl3-	2.767e-018	2.159e-018	-17.558	-17.666	-0.108	(0)
CuCl4-2	6.328e-023	2.502e-023	-22.199	-22.602	-0.403	(0)
Cu (NO3) 2	1.272e-023	1.272e-023	-22.895	-22.895	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.728	-216.877	-0.149	(0)
F	1.756e-004					
F-	1.341e-004	1.060e-004	-3.873	-3.975	-0.102	(0)
MgF+	3.613e-005	2.843e-005	-4.442	-4.546	-0.104	(0)
CaF+	4.108e-006	3.258e-006	-5.386	-5.487	-0.101	(0)
NaF	9.391e-007	9.391e-007	-6.027	-6.027	0.000	(0)
MnF+	3.149e-007	2.497e-007	-6.502	-6.603	-0.101	(0)
ZnF+	8.236e-009	5.842e-009	-8.084	-8.233	-0.149	(0)

HF	2.169e-009	2.169e-009	-8.664	-8.664	0.000	(0)
BF(OH) 3-	1.934e-009	1.467e-009	-8.713	-8.834	-0.120	(0)
NiF+	4.206e-010	2.984e-010	-9.376	-9.525	-0.149	(0)
CoF+	3.557e-010	2.523e-010	-9.449	-9.598	-0.149	(0)
CuF+	3.213e-010	2.279e-010	-9.493	-9.642	-0.149	(0)
AlF3	3.374e-011	3.374e-011	-10.472	-10.472	0.000	(0)
AlF2+	3.172e-011	2.530e-011	-10.499	-10.597	-0.098	(0)
CdF+	2.987e-011	2.119e-011	-10.525	-10.674	-0.149	(0)
PbF+	4.498e-012	3.190e-012	-11.347	-11.496	-0.149	(0)
UO2F+	3.542e-012	2.513e-012	-11.451	-11.600	-0.149	(0)
AlF4-	2.277e-012	1.792e-012	-11.643	-11.747	-0.104	(0)
AlF+2	1.482e-012	5.997e-013	-11.829	-12.222	-0.393	(0)
HF2-	1.130e-012	8.737e-013	-11.947	-12.059	-0.112	(0)
UO2F2	7.678e-013	7.678e-013	-12.115	-12.115	0.000	(0)
AgF	4.073e-013	4.073e-013	-12.390	-12.390	0.000	(0)
BF2(OH) 2-	3.036e-013	2.302e-013	-12.518	-12.638	-0.120	(0)
CrF+2	4.324e-014	1.095e-014	-13.364	-13.961	-0.597	(0)
UO2F3-	2.881e-014	2.043e-014	-13.540	-13.690	-0.149	(0)
PbF2	6.652e-015	6.652e-015	-14.177	-14.177	0.000	(0)
CdF2	4.480e-015	4.480e-015	-14.349	-14.349	0.000	(0)
UO2F4-2	6.794e-017	1.720e-017	-16.168	-16.765	-0.597	(0)
VO2F	1.928e-017	1.928e-017	-16.715	-16.715	0.000	(0)
H2F2	1.260e-017	1.260e-017	-16.900	-16.900	0.000	(0)
PbF3-	1.885e-018	1.337e-018	-17.725	-17.874	-0.149	(0)
FeF2+	1.716e-018	1.360e-018	-17.766	-17.866	-0.101	(0)
FeF+2	1.214e-018	4.798e-019	-17.916	-18.319	-0.403	(0)
VO2F2-	1.046e-018	7.416e-019	-17.981	-18.130	-0.149	(0)
FeF3	2.034e-019	2.034e-019	-18.692	-18.692	0.000	(0)
BF3OH-	1.734e-019	1.315e-019	-18.761	-18.881	-0.120	(0)
VOF+	1.739e-020	1.233e-020	-19.760	-19.909	-0.149	(0)
VO2F3-2	3.872e-021	9.801e-022	-20.412	-21.009	-0.597	(0)
VOF2	4.900e-022	4.900e-022	-21.310	-21.310	0.000	(0)
PbF4-2	2.678e-022	6.779e-023	-21.572	-22.169	-0.597	(0)
VOF3-	2.597e-024	1.842e-024	-23.586	-23.735	-0.149	(0)
HgF+	2.223e-024	1.577e-024	-23.653	-23.802	-0.149	(0)
BF4-	1.253e-024	9.497e-025	-23.902	-24.022	-0.120	(0)
VO2F4-3	1.124e-024	5.110e-026	-23.949	-25.292	-1.342	(0)
Sb(OH) 2F	7.830e-025	7.830e-025	-24.106	-24.106	0.000	(0)
SbOF	7.709e-025	7.709e-025	-24.113	-24.113	0.000	(0)
VOF4-2	3.112e-027	7.878e-028	-26.507	-27.104	-0.597	(0)
UF3+	1.032e-035	7.319e-036	-34.986	-35.136	-0.149	(0)
UF2+2	1.722e-036	4.358e-037	-35.764	-36.361	-0.597	(0)
UF4	8.503e-038	8.503e-038	-37.070	-37.070	0.000	(0)
UF+3	7.188e-039	3.268e-040	-38.143	-39.486	-1.342	(0)
UF5-	5.033e-040	3.570e-040	-39.298	-39.447	-0.149	(0)
UF6-2	0.000e+000	0.000e+000	-40.346	-40.942	-0.597	(0)
Fe (2)	3.328e-012					
Fe+2	2.142e-012	5.423e-013	-11.669	-12.266	-0.597	(0)
FeSO4	1.163e-012	1.163e-012	-11.934	-11.934	0.000	(0)
FeOH+	1.978e-014	1.569e-014	-13.704	-13.804	-0.101	(0)
FeHCO3+	2.946e-015	2.369e-015	-14.531	-14.625	-0.095	(0)
Fe(OH) 2	9.056e-018	9.056e-018	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	2.624e-018	2.081e-018	-17.581	-17.682	-0.101	(0)
Fe(HS) 2	0.000e+000	0.000e+000	-160.189	-160.189	0.000	(0)
Fe(HS) 3-	0.000e+000	0.000e+000	-236.439	-236.588	-0.149	(0)
Fe (3)	1.151e-009					
Fe(OH) 2+	6.869e-010	5.478e-010	-9.163	-9.261	-0.098	(0)
Fe(OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	3.627e-011	2.893e-011	-10.440	-10.539	-0.098	(0)
FeOH+2	4.902e-015	1.938e-015	-14.310	-14.713	-0.403	(0)
FeF2+	1.716e-018	1.360e-018	-17.766	-17.866	-0.101	(0)
FeF+2	1.214e-018	4.798e-019	-17.916	-18.319	-0.403	(0)
FeSO4+	5.105e-019	4.048e-019	-18.292	-18.393	-0.101	(0)
FeF3	2.034e-019	2.034e-019	-18.692	-18.692	0.000	(0)
Fe(SO4) 2-	1.066e-019	7.561e-020	-18.972	-19.121	-0.149	(0)
Fe+3	3.442e-020	4.130e-021	-19.463	-20.384	-0.921	(0)
FeCl+2	7.293e-022	2.883e-022	-21.137	-21.540	-0.403	(0)
FeCl2+	3.754e-024	2.977e-024	-23.425	-23.526	-0.101	(0)

	FeHSeO3+2	3.021e-024	7.647e-025	-23.520	-24.116	-0.597	(0)
	Fe2(OH)2+4	3.028e-026	1.243e-028	-25.519	-27.905	-2.386	(0)
	FeNO3+2	4.995e-027	1.264e-027	-26.301	-26.898	-0.597	(0)
	FeCl3	6.881e-028	6.881e-028	-27.162	-27.162	0.000	(0)
	Fe3(OH)4+5	5.275e-033	9.847e-037	-32.278	-36.007	-3.729	(0)
H(0)		3.956e-029					
	H2	1.978e-029	2.017e-029	-28.704	-28.695	0.009	(0)
Hg(0)		5.512e-010					
	Hg	5.512e-010	5.512e-010	-9.259	-9.259	0.000	(0)
Hg(1)		1.187e-021					
	Hg2+2	5.934e-022	1.502e-022	-21.227	-21.823	-0.597	(0)
Hg(2)		2.724e-012					
	Hg(OH)2	1.311e-012	1.338e-012	-11.882	-11.874	0.009	(0)
	HgClOH	1.191e-012	1.191e-012	-11.924	-11.924	0.000	(0)
	HgCl2	2.145e-013	2.145e-013	-12.669	-12.669	0.000	(0)
	HgCl3-	6.989e-015	4.958e-015	-14.156	-14.305	-0.149	(0)
	HgCO3	5.647e-016	5.647e-016	-15.248	-15.248	0.000	(0)
	HgCl4-2	1.802e-016	4.562e-017	-15.744	-16.341	-0.597	(0)
	HgCl+	2.610e-017	1.851e-017	-16.583	-16.733	-0.149	(0)
	HgOH+	1.637e-017	1.161e-017	-16.786	-16.935	-0.149	(0)
	Hg(CO3)2-2	8.292e-018	2.099e-018	-17.081	-17.678	-0.597	(0)
	Hg(NH3)2+2	3.645e-019	9.227e-020	-18.438	-19.035	-0.597	(0)
	HgHCO3+	2.052e-019	1.455e-019	-18.688	-18.837	-0.149	(0)
	Hg(OH)3-	1.725e-019	1.224e-019	-18.763	-18.912	-0.149	(0)
	HgNH3+2	1.910e-020	4.834e-021	-19.719	-20.316	-0.597	(0)
	Hg+2	1.586e-021	4.014e-022	-20.800	-21.396	-0.597	(0)
	HgSO4	9.181e-022	9.181e-022	-21.037	-21.037	0.000	(0)
	HgF+	2.223e-024	1.577e-024	-23.653	-23.802	-0.149	(0)
	Hg(NH3)3+2	2.770e-026	7.011e-027	-25.558	-26.154	-0.597	(0)
	HgNO3+	6.397e-030	4.538e-030	-29.194	-29.343	-0.149	(0)
	Hg(NH3)4+2	4.199e-033	1.063e-033	-32.377	-32.973	-0.597	(0)
	Hg(NO3)2	5.774e-038	5.774e-038	-37.239	-37.239	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-138.333	-138.482	-0.149	(0)
	HgS2-2	0.000e+000	0.000e+000	-138.735	-139.331	-0.597	(0)
	Hg(HS)2	0.000e+000	0.000e+000	-139.947	-139.947	0.000	(0)
K		4.707e-003					
	K+	4.435e-003	3.504e-003	-2.353	-2.455	-0.102	(0)
	KSO4-	2.717e-004	2.167e-004	-3.566	-3.664	-0.098	(0)
	KCrO4-	5.536e-017	3.927e-017	-16.257	-16.406	-0.149	(0)
Mg		9.987e-003					
	Mg+2	6.136e-003	2.391e-003	-2.212	-2.621	-0.409	(0)
	MgSO4	3.801e-003	3.801e-003	-2.420	-2.420	0.000	(0)
	MgF+	3.613e-005	2.843e-005	-4.442	-4.546	-0.104	(0)
	MgHCO3+	1.088e-005	8.491e-006	-4.963	-5.071	-0.108	(0)
	MgCO3	2.338e-006	2.338e-006	-5.631	-5.631	0.000	(0)
	MgOH+	8.546e-007	6.917e-007	-6.068	-6.160	-0.092	(0)
	MgH2BO3+	1.592e-007	1.207e-007	-6.798	-6.918	-0.120	(0)
Mn(2)		3.270e-004					
	Mn+2	2.339e-004	5.920e-005	-3.631	-4.228	-0.597	(0)
	MnSO4	9.196e-005	9.196e-005	-4.036	-4.036	0.000	(0)
	MnHCO3+	5.169e-007	4.099e-007	-6.287	-6.387	-0.101	(0)
	MnF+	3.149e-007	2.497e-007	-6.502	-6.603	-0.101	(0)
	MnCl+	2.173e-007	1.723e-007	-6.663	-6.764	-0.101	(0)
	MnOH+	1.363e-007	1.081e-007	-6.866	-6.966	-0.101	(0)
	MnCl2	5.625e-010	5.625e-010	-9.250	-9.250	0.000	(0)
	MnNO3+	4.050e-012	2.873e-012	-11.393	-11.542	-0.149	(0)
	MnSeO4	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
	MnCl3-	4.516e-013	3.581e-013	-12.345	-12.446	-0.101	(0)
	Mn(OH)3-	4.447e-016	3.527e-016	-15.352	-15.453	-0.101	(0)
	Mn(NO3)2	2.209e-019	2.209e-019	-18.656	-18.656	0.000	(0)
	Mn(OH)4-2	2.093e-021	8.274e-022	-20.679	-21.082	-0.403	(0)
	MnSe	0.000e+000	0.000e+000	-40.682	-40.682	0.000	(0)
Mn(3)		1.807e-024					
	Mn+3	1.807e-024	2.168e-025	-23.743	-24.664	-0.921	(0)
Mn(6)		1.893e-040					
	MnO4-2	1.893e-040	0.000e+000	-39.723	-40.126	-0.403	(0)
Mn(7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-44.468	-44.584	-0.116	(0)

Mo	1.441e-006						
MoO4-2	1.441e-006	5.614e-007	-5.841	-6.251	-0.409	(0)	
HMoO4-	2.180e-010	1.546e-010	-9.662	-9.811	-0.149	(0)	
H2MoO4	1.567e-014	1.567e-014	-13.805	-13.805	0.000	(0)	
Ag2MoO4	4.978e-025	4.978e-025	-24.303	-24.303	0.000	(0)	
AlMo6O21-3	0.000e+000	0.000e+000	-43.568	-44.911	-1.342	(0)	
Mo7O24-6	0.000e+000	0.000e+000	-48.264	-53.634	-5.370	(0)	
HMo7O24-5	0.000e+000	0.000e+000	-51.377	-55.106	-3.729	(0)	
H2Mo7O24-4	0.000e+000	0.000e+000	-55.796	-58.183	-2.386	(0)	
H3Mo7O24-3	0.000e+000	0.000e+000	-61.453	-62.795	-1.342	(0)	
N (-3)	6.852e-007						
NH4+	6.111e-007	4.633e-007	-6.214	-6.334	-0.120	(0)	
NH4SO4-	5.469e-008	4.337e-008	-7.262	-7.363	-0.101	(0)	
NH3	1.909e-008	1.909e-008	-7.719	-7.719	0.000	(0)	
CaNH3+2	2.674e-010	6.769e-011	-9.573	-10.169	-0.597	(0)	
CuNH3+2	2.630e-011	6.659e-012	-10.580	-11.177	-0.597	(0)	
NiNH3+2	4.539e-012	1.149e-012	-11.343	-11.940	-0.597	(0)	
Co (NH3) +2	6.827e-013	1.728e-013	-12.166	-12.762	-0.597	(0)	
AgNH3+	8.409e-014	5.964e-014	-13.075	-13.224	-0.149	(0)	
BaNH3+2	5.702e-016	1.444e-016	-15.244	-15.841	-0.597	(0)	
Ag (NH3) 2+	1.305e-017	9.253e-018	-16.885	-17.034	-0.149	(0)	
Ni (NH3) 2+2	1.252e-017	3.170e-018	-16.902	-17.499	-0.597	(0)	
Ca (NH3) 2+2	2.032e-018	5.143e-019	-17.692	-18.289	-0.597	(0)	
Co (NH3) 2+2	5.558e-019	1.407e-019	-18.255	-18.852	-0.597	(0)	
Hg (NH3) 2+2	3.645e-019	9.227e-020	-18.438	-19.035	-0.597	(0)	
HgNH3+2	1.910e-020	4.834e-021	-19.719	-20.316	-0.597	(0)	
Co (NH3) 3+2	1.336e-025	3.381e-026	-24.874	-25.471	-0.597	(0)	
Hg (NH3) 3+2	2.770e-026	7.011e-027	-25.558	-26.154	-0.597	(0)	
Co (NH3) 4+2	1.338e-032	3.386e-033	-31.874	-32.470	-0.597	(0)	
Hg (NH3) 4+2	4.199e-033	1.063e-033	-32.377	-32.973	-0.597	(0)	
Cr (NH3) 5OH+2	1.117e-039	2.828e-040	-38.952	-39.549	-0.597	(0)	
Co (NH3) 5+2	4.237e-040	1.073e-040	-39.373	-39.970	-0.597	(0)	
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-46.984	-47.580	-0.597	(0)	
Cr (NH3) 6+3	0.000e+000	0.000e+000	-47.159	-48.501	-1.342	(0)	
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.439	-50.036	-0.597	(0)	
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.363	-56.512	-0.149	(0)	
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-60.721	-61.318	-0.597	(0)	
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.418	-62.015	-0.597	(0)	
N (3)	4.237e-005						
NO2-	4.237e-005	3.245e-005	-4.373	-4.489	-0.116	(0)	
CuNO2+	1.633e-010	1.159e-010	-9.787	-9.936	-0.149	(0)	
CoNO2+	2.428e-011	1.722e-011	-10.615	-10.764	-0.149	(0)	
AgNO2	1.038e-011	1.038e-011	-10.984	-10.984	0.000	(0)	
Cu (NO2) 2	3.847e-014	3.847e-014	-13.415	-13.415	0.000	(0)	
Ag (NO2) 2-	7.353e-016	5.216e-016	-15.134	-15.283	-0.149	(0)	
N (5)	3.914e-008						
NO3-	3.875e-008	3.062e-008	-7.412	-7.514	-0.102	(0)	
CaNO3+	3.845e-010	2.727e-010	-9.415	-9.564	-0.149	(0)	
MnNO3+	4.050e-012	2.873e-012	-11.393	-11.542	-0.149	(0)	
ZnNO3+	2.996e-013	2.125e-013	-12.523	-12.673	-0.149	(0)	
NiNO3+	1.215e-014	8.622e-015	-13.915	-14.064	-0.149	(0)	
CoNO3+	5.152e-015	3.654e-015	-14.288	-14.437	-0.149	(0)	
CuNO3+	4.653e-015	3.301e-015	-14.332	-14.481	-0.149	(0)	
BaNO3+	2.593e-015	1.839e-015	-14.586	-14.735	-0.149	(0)	
CdNO3+	1.722e-015	1.222e-015	-14.764	-14.913	-0.149	(0)	
PbNO3+	2.728e-016	1.935e-016	-15.564	-15.713	-0.149	(0)	
AgNO3	3.722e-017	3.722e-017	-16.429	-16.429	0.000	(0)	
Mn (NO3) 2	2.209e-019	2.209e-019	-18.656	-18.656	0.000	(0)	
UO2NO3+	1.480e-020	1.049e-020	-19.830	-19.979	-0.149	(0)	
Zn (NO3) 2	1.298e-021	1.298e-021	-20.887	-20.887	0.000	(0)	
Co (NO3) 2	2.276e-022	2.276e-022	-21.643	-21.643	0.000	(0)	
Cd (NO3) 2	1.875e-023	1.875e-023	-22.727	-22.727	0.000	(0)	
Cu (NO3) 2	1.272e-023	1.272e-023	-22.895	-22.895	0.000	(0)	
Pb (NO3) 2	1.006e-023	1.006e-023	-22.997	-22.997	0.000	(0)	
CrNO3+2	3.446e-024	8.724e-025	-23.463	-24.059	-0.597	(0)	
VO2NO3	1.607e-024	1.607e-024	-23.794	-23.794	0.000	(0)	
FeNO3+2	4.995e-027	1.264e-027	-26.301	-26.898	-0.597	(0)	
HgNO3+	6.397e-030	4.538e-030	-29.194	-29.343	-0.149	(0)	

Hg (NO3) 2	5.774e-038	5.774e-038	-37.239	-37.239	0.000	(0)
Na	1.861e-002					
Na+	1.778e-002	1.405e-002	-1.750	-1.852	-0.102	(0)
NaSO4-	8.262e-004	6.590e-004	-3.083	-3.181	-0.098	(0)
NaHCO3	2.741e-006	2.741e-006	-5.562	-5.562	0.000	(0)
NaF	9.391e-007	9.391e-007	-6.027	-6.027	0.000	(0)
NaCO3-	3.855e-007	3.075e-007	-6.414	-6.512	-0.098	(0)
NaH2BO3	3.241e-008	3.241e-008	-7.489	-7.489	0.000	(0)
NaCrO4-	2.968e-016	2.106e-016	-15.527	-15.677	-0.149	(0)
Ni	4.979e-007					
Ni+2	2.877e-007	1.121e-007	-6.541	-6.950	-0.409	(0)
NiSO4	1.954e-007	1.954e-007	-6.709	-6.709	0.000	(0)
NiHCO3+	6.762e-009	4.796e-009	-8.170	-8.319	-0.149	(0)
NiCO3	4.917e-009	4.917e-009	-8.308	-8.308	0.000	(0)
NiOH+	1.446e-009	1.026e-009	-8.840	-8.989	-0.149	(0)
NiCl+	9.347e-010	6.630e-010	-9.029	-9.178	-0.149	(0)
NiF+	4.206e-010	2.984e-010	-9.376	-9.525	-0.149	(0)
Ni (SO4) 2-2	2.233e-010	5.652e-011	-9.651	-10.248	-0.597	(0)
Ni (OH) 2	5.920e-011	5.920e-011	-10.228	-10.228	0.000	(0)
NiNH3+2	4.539e-012	1.149e-012	-11.343	-11.940	-0.597	(0)
Ni (OH) 3-	6.065e-014	4.302e-014	-13.217	-13.366	-0.149	(0)
NiNO3+	1.215e-014	8.622e-015	-13.915	-14.064	-0.149	(0)
NiCl2	7.716e-015	7.716e-015	-14.113	-14.113	0.000	(0)
NiSeO4	4.579e-015	4.579e-015	-14.339	-14.339	0.000	(0)
Ni (NH3) 2+2	1.252e-017	3.170e-018	-16.902	-17.499	-0.597	(0)
O (0)	2.437e-035					
O2	1.218e-035	1.243e-035	-34.914	-34.906	0.009	(0)
Pb	6.162e-009					
PbSO4	1.828e-009	1.828e-009	-8.738	-8.738	0.000	(0)
PbCO3	1.510e-009	1.510e-009	-8.821	-8.821	0.000	(0)
PbOH+	1.100e-009	7.799e-010	-8.959	-9.108	-0.149	(0)
Pb+2	1.096e-009	4.273e-010	-8.960	-9.369	-0.409	(0)
Pb (SO4) 2-2	3.801e-010	9.623e-011	-9.420	-10.017	-0.597	(0)
PbHCO3+	1.553e-010	1.102e-010	-9.809	-9.958	-0.149	(0)
PbCl+	4.940e-011	3.504e-011	-10.306	-10.455	-0.149	(0)
Pb (CO3) 2-2	2.022e-011	5.119e-012	-10.694	-11.291	-0.597	(0)
Pb (OH) 2	1.792e-011	1.792e-011	-10.747	-10.747	0.000	(0)
PbF+	4.498e-012	3.190e-012	-11.347	-11.496	-0.149	(0)
PbCl2	3.618e-013	3.618e-013	-12.442	-12.442	0.000	(0)
Pb (OH) 3-	1.836e-014	1.302e-014	-13.736	-13.885	-0.149	(0)
PbF2	6.652e-015	6.652e-015	-14.177	-14.177	0.000	(0)
PbCl3-	4.694e-016	3.329e-016	-15.328	-15.478	-0.149	(0)
PbNO3+	2.728e-016	1.935e-016	-15.564	-15.713	-0.149	(0)
Pb2OH+3	1.162e-016	5.282e-018	-15.935	-17.277	-1.342	(0)
Pb (OH) 4-2	9.156e-018	2.318e-018	-17.038	-17.635	-0.597	(0)
PbF3-	1.885e-018	1.337e-018	-17.725	-17.874	-0.149	(0)
PbCl4-2	1.390e-018	3.518e-019	-17.857	-18.454	-0.597	(0)
Pb3 (OH) 4+2	1.082e-020	2.738e-021	-19.966	-20.562	-0.597	(0)
PbF4-2	2.678e-022	6.779e-023	-21.572	-22.169	-0.597	(0)
Pb (NO3) 2	1.006e-023	1.006e-023	-22.997	-22.997	0.000	(0)
Pb4 (OH) 4+4	2.263e-024	9.294e-027	-23.645	-26.032	-2.386	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-150.972	-150.972	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.959	-228.108	-0.149	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.437	-73.437	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.178	-78.327	-0.149	(0)
HS-	0.000e+000	0.000e+000	-78.287	-78.436	-0.149	(0)
H2S	0.000e+000	0.000e+000	-79.275	-79.275	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.346	-79.943	-0.597	(0)
S6-2	0.000e+000	0.000e+000	-79.862	-80.459	-0.597	(0)
S4-2	0.000e+000	0.000e+000	-79.942	-80.538	-0.597	(0)
S3-2	0.000e+000	0.000e+000	-80.748	-81.344	-0.597	(0)
S2-2	0.000e+000	0.000e+000	-81.764	-82.360	-0.597	(0)
S-2	0.000e+000	0.000e+000	-87.474	-87.878	-0.403	(0)
HgHS2-	0.000e+000	0.000e+000	-138.333	-138.482	-0.149	(0)
HgS2-2	0.000e+000	0.000e+000	-138.735	-139.331	-0.597	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.947	-139.947	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-147.038	-147.456	-0.418	(0)

Ag (HS) S4-2	0.000e+000	0.000e+000	-147.154	-147.398	-0.244	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.613	-147.762	-0.149	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.624	-147.773	-0.149	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.791	-148.186	-0.395	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.548	-148.979	-0.431	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.884	-149.290	-0.406	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.560	-149.560	0.000	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.611	-149.611	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-150.972	-150.972	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.189	-160.189	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.728	-216.877	-0.149	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.619	-224.768	-0.149	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-225.947	-226.096	-0.149	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-226.292	-226.889	-0.597	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.959	-228.108	-0.149	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.439	-236.588	-0.149	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-301.740	-302.337	-0.597	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-304.067	-304.664	-0.597	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.408	-317.005	-0.597	(0)
S (6)	3.305e-002					
SO4-2	2.242e-002	8.736e-003	-1.649	-2.059	-0.409	(0)
CaSO4	5.637e-003	5.637e-003	-2.249	-2.249	0.000	(0)
MgSO4	3.801e-003	3.801e-003	-2.420	-2.420	0.000	(0)
NaSO4-	8.262e-004	6.590e-004	-3.083	-3.181	-0.098	(0)
KSO4-	2.717e-004	2.167e-004	-3.566	-3.664	-0.098	(0)
MnSO4	9.196e-005	9.196e-005	-4.036	-4.036	0.000	(0)
ZnSO4	5.281e-006	5.281e-006	-5.277	-5.277	0.000	(0)
Zn (SO4) 2-2	1.587e-006	4.018e-007	-5.799	-6.396	-0.597	(0)
NiSO4	1.954e-007	1.954e-007	-6.709	-6.709	0.000	(0)
CoSO4	1.313e-007	1.313e-007	-6.882	-6.882	0.000	(0)
CuSO4	6.823e-008	6.823e-008	-7.166	-7.166	0.000	(0)
NH4SO4-	5.469e-008	4.337e-008	-7.262	-7.363	-0.101	(0)
CdSO4	2.584e-008	2.584e-008	-7.588	-7.588	0.000	(0)
HSO4-	1.502e-008	1.181e-008	-7.823	-7.928	-0.104	(0)
Cd (SO4) 2-2	1.203e-008	3.045e-009	-7.920	-8.516	-0.597	(0)
PbSO4	1.828e-009	1.828e-009	-8.738	-8.738	0.000	(0)
Pb (SO4) 2-2	3.801e-010	9.623e-011	-9.420	-10.017	-0.597	(0)
AgSO4-	3.761e-010	2.668e-010	-9.425	-9.574	-0.149	(0)
Ni (SO4) 2-2	2.233e-010	5.652e-011	-9.651	-10.248	-0.597	(0)
CrOHSO4	2.148e-011	2.148e-011	-10.668	-10.668	0.000	(0)
UO2SO4	2.272e-012	2.272e-012	-11.644	-11.644	0.000	(0)
FeSO4	1.163e-012	1.163e-012	-11.934	-11.934	0.000	(0)
UO2 (SO4) 2-2	1.033e-012	2.616e-013	-11.986	-12.582	-0.597	(0)
AlSO4+	4.878e-014	3.838e-014	-13.312	-13.416	-0.104	(0)
CrSO4+	1.875e-014	1.330e-014	-13.727	-13.876	-0.149	(0)
Al (SO4) 2-	4.566e-015	3.593e-015	-14.340	-14.445	-0.104	(0)
VO2SO4-	3.051e-017	2.164e-017	-16.516	-16.665	-0.149	(0)
FeSO4+	5.105e-019	4.048e-019	-18.292	-18.393	-0.101	(0)
Fe (SO4) 2-	1.066e-019	7.561e-020	-18.972	-19.121	-0.149	(0)
Cr2 (OH) 2SO4+2	7.949e-020	2.012e-020	-19.100	-19.696	-0.597	(0)
VOSO4	4.670e-020	4.670e-020	-19.331	-19.331	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.044e-020	1.044e-020	-19.981	-19.981	0.000	(0)
HgSO4	9.181e-022	9.181e-022	-21.037	-21.037	0.000	(0)
CrO3SO4-2	1.967e-023	4.980e-024	-22.706	-23.303	-0.597	(0)
VSO4+	1.311e-034	9.297e-035	-33.883	-34.032	-0.149	(0)
U (SO4) 2	3.730e-039	3.730e-039	-38.428	-38.428	0.000	(0)
USO4+2	2.123e-040	0.000e+000	-39.673	-40.270	-0.597	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.363	-56.512	-0.149	(0)
Sb (3)	6.752e-019					
Sb (OH) 3	3.414e-019	3.414e-019	-18.467	-18.467	0.000	(0)
HSbO2	3.337e-019	3.337e-019	-18.477	-18.477	0.000	(0)
SbO2-	5.505e-023	3.905e-023	-22.259	-22.408	-0.149	(0)
Sb (OH) 4-	3.147e-023	2.232e-023	-22.502	-22.651	-0.149	(0)
Sb (OH) 2F	7.830e-025	7.830e-025	-24.106	-24.106	0.000	(0)
SbOF	7.709e-025	7.709e-025	-24.113	-24.113	0.000	(0)
Sb (OH) 2+	1.620e-025	1.149e-025	-24.791	-24.940	-0.149	(0)
SbO+	5.591e-026	3.966e-026	-25.253	-25.402	-0.149	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.408	-317.005	-0.597	(0)

Sb (5)	5.116e-007					
SbO3-	5.111e-007	3.625e-007	-6.292	-6.441	-0.149	(0)
Sb (OH) 6-	5.347e-010	4.225e-010	-9.272	-9.374	-0.102	(0)
SbO2+	2.811e-023	1.994e-023	-22.551	-22.700	-0.149	(0)
Se (-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	1.662e-039	1.179e-039	-38.779	-38.929	-0.149	(0)
MnSe	0.000e+000	0.000e+000	-40.682	-40.682	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.897	-42.897	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.473	-46.070	-0.597	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-81.219	-83.605	-2.386	(0)
Se (4)	1.784e-007					
HSeO3-	9.878e-008	7.007e-008	-7.005	-7.154	-0.149	(0)
SeO3-2	7.962e-008	2.016e-008	-7.099	-7.696	-0.597	(0)
H2SeO3	4.137e-013	4.137e-013	-12.383	-12.383	0.000	(0)
AgSeO3-	2.795e-014	1.983e-014	-13.554	-13.703	-0.149	(0)
Cd (SeO3) 2-2	1.669e-017	4.225e-018	-16.778	-17.374	-0.597	(0)
Ag (SeO3) 2-3	7.872e-020	3.578e-021	-19.104	-20.446	-1.342	(0)
FeHSeO3+2	3.021e-024	7.647e-025	-23.520	-24.116	-0.597	(0)
Se (6)	2.255e-010					
SeO4-2	2.241e-010	8.732e-011	-9.650	-10.059	-0.409	(0)
MnSeO4	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
ZnSeO4	3.737e-014	3.737e-014	-13.427	-13.427	0.000	(0)
NiSeO4	4.579e-015	4.579e-015	-14.339	-14.339	0.000	(0)
CoSeO4	3.296e-015	3.296e-015	-14.482	-14.482	0.000	(0)
CdSeO4	2.052e-016	2.052e-016	-15.688	-15.688	0.000	(0)
HSeO4-	8.539e-017	6.057e-017	-16.069	-16.218	-0.149	(0)
Zn (SeO4) 2-2	1.307e-023	3.309e-024	-22.884	-23.480	-0.597	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.178	-58.521	-1.342	(0)
U (4)	3.237e-019					
U (OH) 5-	3.236e-019	2.295e-019	-18.490	-18.639	-0.149	(0)
U (OH) 4	1.332e-022	1.332e-022	-21.876	-21.876	0.000	(0)
U (OH) 3+	9.512e-027	6.747e-027	-26.022	-26.171	-0.149	(0)
U (OH) 2+2	1.708e-031	4.323e-032	-30.768	-31.364	-0.597	(0)
UF3+	1.032e-035	7.319e-036	-34.986	-35.136	-0.149	(0)
UF2+2	1.722e-036	4.358e-037	-35.764	-36.361	-0.597	(0)
UOH+3	6.207e-037	2.821e-038	-36.207	-37.550	-1.342	(0)
UF4	8.503e-038	8.503e-038	-37.070	-37.070	0.000	(0)
UF+3	7.188e-039	3.268e-040	-38.143	-39.486	-1.342	(0)
U (SO4) 2	3.730e-039	3.730e-039	-38.428	-38.428	0.000	(0)
UF5-	5.033e-040	3.570e-040	-39.298	-39.447	-0.149	(0)
USO4+2	2.123e-040	0.000e+000	-39.673	-40.270	-0.597	(0)
UF6-2	0.000e+000	0.000e+000	-40.346	-40.942	-0.597	(0)
U+4	0.000e+000	0.000e+000	-42.424	-44.811	-2.386	(0)
UCl+3	0.000e+000	0.000e+000	-44.405	-45.747	-1.342	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-156.064	-168.145	-12.082	(0)
U (5)	1.801e-015					
UO2+	1.801e-015	1.277e-015	-14.745	-14.894	-0.149	(0)
U (6)	3.458e-007					
UO2 (CO3) 3-4	2.705e-007	1.111e-009	-6.568	-8.954	-2.386	(0)
UO2 (CO3) 2-2	7.449e-008	1.886e-008	-7.128	-7.725	-0.597	(0)
UO2CO3	8.040e-010	8.040e-010	-9.095	-9.095	0.000	(0)
UO2OH+	2.216e-011	1.572e-011	-10.654	-10.804	-0.149	(0)
UO2F+	3.542e-012	2.513e-012	-11.451	-11.600	-0.149	(0)
UO2SO4	2.272e-012	2.272e-012	-11.644	-11.644	0.000	(0)
UO2 (SO4) 2-2	1.033e-012	2.616e-013	-11.986	-12.582	-0.597	(0)
UO2F2	7.678e-013	7.678e-013	-12.115	-12.115	0.000	(0)
UO2+2	4.409e-013	1.718e-013	-12.356	-12.765	-0.409	(0)
UO2F3-	2.881e-014	2.043e-014	-13.540	-13.690	-0.149	(0)
(UO2) 3 (OH) 5+	3.639e-015	2.581e-015	-14.439	-14.588	-0.149	(0)
(UO2) 2 (OH) 2+2	1.619e-015	4.100e-016	-14.791	-15.387	-0.597	(0)
UO2C1+	9.080e-016	6.440e-016	-15.042	-15.191	-0.149	(0)
UO2F4-2	6.794e-017	1.720e-017	-16.168	-16.765	-0.597	(0)
UO2NO3+	1.480e-020	1.049e-020	-19.830	-19.979	-0.149	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-42.350	-42.499	-0.149	(0)
V+2	0.000e+000	0.000e+000	-43.274	-43.871	-0.597	(0)

V (3)	6.978e-015					
V (OH) 3	6.978e-015	6.978e-015	-14.156	-14.156	0.000	(0)
V (OH) 2+	8.808e-026	6.248e-026	-25.055	-25.204	-0.149	(0)
VOH+2	3.243e-029	8.211e-030	-28.489	-29.086	-0.597	(0)
V+3	4.959e-034	2.254e-035	-33.305	-34.647	-1.342	(0)
VSO4+	1.311e-034	9.297e-035	-33.883	-34.032	-0.149	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-54.496	-55.838	-1.342	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-54.985	-57.371	-2.386	(0)
V (4)	4.104e-018					
V (OH) 3+	3.962e-018	2.811e-018	-17.402	-17.551	-0.149	(0)
VO+2	7.667e-020	1.941e-020	-19.115	-19.712	-0.597	(0)
VOSO4	4.670e-020	4.670e-020	-19.331	-19.331	0.000	(0)
VOF+	1.739e-020	1.233e-020	-19.760	-19.909	-0.149	(0)
VOF2	4.900e-022	4.900e-022	-21.310	-21.310	0.000	(0)
VOC1+	1.774e-022	1.259e-022	-21.751	-21.900	-0.149	(0)
VOF3-	2.597e-024	1.842e-024	-23.586	-23.735	-0.149	(0)
VOF4-2	3.112e-027	7.878e-028	-26.507	-27.104	-0.597	(0)
H2V2O4+2	1.568e-030	3.969e-031	-29.805	-30.401	-0.597	(0)
V (5)	5.760e-008					
H2VO4-	3.818e-008	2.708e-008	-7.418	-7.567	-0.149	(0)
HVO4-2	1.942e-008	4.915e-009	-7.712	-8.308	-0.597	(0)
H3VO4	3.748e-012	3.748e-012	-11.426	-11.426	0.000	(0)
HV2O7-3	9.933e-013	4.515e-014	-12.003	-13.345	-1.342	(0)
H3V2O7-	9.249e-013	6.560e-013	-12.034	-12.183	-0.149	(0)
VO4-3	3.916e-014	1.780e-015	-13.407	-14.750	-1.342	(0)
V2O7-4	2.138e-014	8.782e-017	-13.670	-16.056	-2.386	(0)
V3O9-3	4.591e-016	2.087e-017	-15.338	-16.680	-1.342	(0)
VO2+	1.313e-016	1.037e-016	-15.882	-15.984	-0.102	(0)
VO2SO4-	3.051e-017	2.164e-017	-16.516	-16.665	-0.149	(0)
VO2F	1.928e-017	1.928e-017	-16.715	-16.715	0.000	(0)
VO2F2-	1.046e-018	7.416e-019	-17.981	-18.130	-0.149	(0)
V4O12-4	5.744e-020	2.359e-022	-19.241	-21.627	-2.386	(0)
VO2F3-2	3.872e-021	9.801e-022	-20.412	-21.009	-0.597	(0)
VO2NO3	1.607e-024	1.607e-024	-23.794	-23.794	0.000	(0)
VO2F4-3	1.124e-024	5.110e-026	-23.949	-25.292	-1.342	(0)
V10O28-6	0.000e+000	0.000e+000	-52.827	-58.197	-5.370	(0)
HV10O28-5	0.000e+000	0.000e+000	-54.140	-57.869	-3.729	(0)
H2V10O28-4	0.000e+000	0.000e+000	-58.134	-60.520	-2.386	(0)
Zn	1.454e-005					
Zn+2	7.091e-006	2.763e-006	-5.149	-5.559	-0.409	(0)
ZnSO4	5.281e-006	5.281e-006	-5.277	-5.277	0.000	(0)
Zn (SO4) 2-2	1.587e-006	4.018e-007	-5.799	-6.396	-0.597	(0)
ZnOH+	2.831e-007	2.008e-007	-6.548	-6.697	-0.149	(0)
ZnCO3	1.869e-007	1.869e-007	-6.728	-6.728	0.000	(0)
ZnHCO3+	4.275e-008	3.032e-008	-7.369	-7.518	-0.149	(0)
Zn (OH) 2	2.313e-008	2.313e-008	-7.636	-7.636	0.000	(0)
ZnCl+	2.056e-008	1.604e-008	-7.687	-7.795	-0.108	(0)
ZnOHCl	1.526e-008	1.526e-008	-7.816	-7.816	0.000	(0)
ZnF+	8.236e-009	5.842e-009	-8.084	-8.233	-0.149	(0)
Zn (OH) 3-	1.187e-010	8.423e-011	-9.925	-10.075	-0.149	(0)
ZnCl2	5.878e-011	5.878e-011	-10.231	-10.231	0.000	(0)
ZnNO3+	2.996e-013	2.125e-013	-12.523	-12.673	-0.149	(0)
ZnCl3-	1.383e-013	1.079e-013	-12.859	-12.967	-0.108	(0)
ZnSeO4	3.737e-014	3.737e-014	-13.427	-13.427	0.000	(0)
Zn (OH) 4-2	9.626e-015	2.437e-015	-14.017	-14.613	-0.597	(0)
ZnCl4-2	3.155e-016	1.247e-016	-15.501	-15.904	-0.403	(0)
Zn (NO3) 2	1.298e-021	1.298e-021	-20.887	-20.887	0.000	(0)
Zn (SeO4) 2-2	1.307e-023	3.309e-024	-22.884	-23.480	-0.597	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.613	-147.762	-0.149	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.611	-149.611	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.619	-224.768	-0.149	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-226.292	-226.889	-0.597	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-304.067	-304.664	-0.597	(0)

-----Saturation indices-----

Phase SI log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-50.94	-44.65	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-39.40	-34.89	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-46.63	-34.89	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-65.94	-48.00	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-53.40	-33.37	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-27.59	-27.19	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.18	-22.73	0.45	(NH4) 2SeO4
Acanthite	-51.99	-88.21	-36.22	Ag2S
Ag2CO3	-12.47	-23.56	-11.09	Ag2CO3
Ag2CrO4	-20.56	-32.15	-11.59	Ag2CrO4
Ag2HVO4	-11.52	-10.04	1.48	Ag2HVO4
Ag2MoO4	-12.33	-23.88	-11.55	Ag2MoO4
Ag2O	-14.49	-1.91	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.87	-19.69	-4.82	Ag2SO4
Ag3AsO3	-27.82	-25.67	2.16	Ag3AsO3
Ag3AsO4	-16.23	-19.02	-2.79	Ag3AsO4
Ag3H2VO5	-16.18	-11.00	5.18	Ag3H2VO5
AgF:4H2O	-13.84	-12.79	1.05	AgF:4H2O
Agmetal	-0.22	-13.73	-13.51	Ag
AgVO3	-9.85	-9.08	0.77	AgVO3
Al (OH) 3 (am)	-2.47	8.33	10.80	Al (OH) 3
Al2 (MoO4) 3	-51.61	-49.25	2.37	Al2 (MoO4) 3
Al2O3	-3.00	16.66	19.65	Al2O3
Al4 (OH) 10SO4	-7.16	15.54	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.62	-7.82	4.80	AlAsO4:2H2O
AlOHSO4	-6.22	-9.45	-3.23	AlOHSO4
AlSb	-152.40	-86.77	65.62	AlSb
Alunite	-3.76	-5.16	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.64	-11.43	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-5.06	4.54	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.39	6.00	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.60	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.53	-0.66	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.81	7.13	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-7.21	-14.17	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.05	-7.22	1.83	BaSeO3
BaSeO4	-10.52	-17.98	-7.46	BaSeO4
Bianchite	-5.86	-7.62	-1.76	ZnSO4:6H2O
Birnessite	-6.41	11.68	18.09	MnO2
Bixbyite	-1.53	-2.18	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	-0.25	8.33	8.58	AlOOH
Breithauptite	-55.04	-73.56	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.75	13.10	16.84	Mg (OH) 2
Bunsenite	-3.68	8.77	12.45	NiO
Ca (VO3) 2	-8.74	-3.08	5.66	Ca (VO3) 2
Ca2V2O7	-7.42	10.08	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.47	10.08	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-15.71	23.25	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-16.61	23.25	39.86	Ca3 (VO4) 2:4H2O

Ca3Sb2	-293.67	-150.70	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-9.19	-27.10	-17.91	Hg2Cl2
CaMoO4	-0.85	-8.80	-7.95	CaMoO4
Carnotite	-0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.66	-1.85	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.59	-12.61	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.94	-1.10	9.84	Cd(BO2)2
Cd(OH)2	-5.83	7.82	13.64	Cd(OH)2
Cd(OH)2(am)	-5.91	7.82	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-18.81	-12.10	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.88	5.68	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-14.90	13.50	28.40	Cd4(OH)6SO4
CdCl2	-12.51	-13.17	-0.66	CdCl2
CdCl2:1H2O	-11.48	-13.17	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.26	-13.17	-1.91	CdCl2:2.5H2O
CdF2	-14.64	-15.85	-1.21	CdF2
Cdmetal(alpha)	-31.24	-17.73	13.51	Cd
Cdmetal(gamma)	-31.34	-17.73	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.21	-2.68	3.54	CdOHCl
CdSb	-74.16	-74.51	-0.35	CdSb
CdSe	-18.77	-38.97	-20.20	CdSe
CdSeO4:2H2O	-16.11	-17.96	-1.85	CdSeO4:2H2O
CdSO4	-9.79	-9.96	-0.17	CdSO4
CdSO4:1H2O	-8.23	-9.96	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.09	-9.96	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.70	-11.45	-9.75	AgCl
Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-52.47	-98.17	-45.69	HgS
Claudetite	-88.12	-91.18	-3.06	As4O6
Clausthalite	-13.34	-40.44	-27.10	PbSe
Co(BO2)2	-27.39	-0.32	27.07	Co(BO2)2
Co(OH)2	-4.50	8.59	13.09	Co(OH)2
Co(OH)3	-8.73	-11.03	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-19.55	-6.52	13.03	Co3(AsO4)2
Co3O4	-2.98	-13.47	-10.50	Co3O4
CoCl2	-20.66	-12.40	8.27	CoCl2
CoCl2:6H2O	-14.94	-12.40	2.54	CoCl2:6H2O
CoCO3	-3.07	-13.05	-9.98	CoCO3
CoF2	-13.48	-15.07	-1.60	CoF2
CoF3	-45.08	-46.53	-1.46	CoF3
CoFe2O4	18.51	14.98	-3.53	CoFe2O4
CoMoO4	-5.61	-13.37	-7.76	CoMoO4
CoO	-4.99	8.59	13.59	CoO
CoS(alpha)	-70.26	-77.70	-7.44	CoS
CoS(beta)	-66.63	-77.70	-11.07	CoS
CoSe	-21.99	-38.19	-16.20	CoSe
CoSeO3	-7.74	-6.42	1.32	CoSeO3
CoSeO4:6H2O	-15.66	-17.19	-1.53	CoSeO4:6H2O
CoSO4	-11.98	-9.18	2.80	CoSO4
CoSO4:6H2O	-6.71	-9.19	-2.47	CoSO4:6H2O
Cotunnite	-9.86	-14.64	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.52	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.09	-31.99	14.09	CrCl2
CrCl3	-47.78	-32.66	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr

CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-10.81	-44.65	-33.84	Na3AlF6
Cu(OH)2	-0.42	8.25	8.67	Cu(OH)2
Cu(SbO3)2	-22.80	22.41	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.12	1.13	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-53.80	-88.68	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.65	-50.45	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.65	-7.55	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.00	-100.60	-42.59	Cu3Sb
Cu3Se2	-25.50	-88.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.64	-13.72	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe
CuSe2	-26.41	-59.78	-33.37	CuSe2
CuSeO3:2H2O	-7.28	-6.76	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.09	-17.53	-2.44	CuSeO4:5H2O
CuSO4	-12.47	-9.53	2.94	CuSO4
Diaspore	1.46	8.33	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.49	-17.03	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.06	-17.03	-17.09	CaMg(CO3)2
Epsomite	-2.56	-4.68	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.08	0.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.08	-12.80	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.18	-8.63	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.03	-38.66	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.43	-18.52	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.98	-64.58	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-32.34	-43.34	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-65.98	-79.95	-13.97	PbS
Gibbsite	0.04	8.33	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.61	-7.62	-2.01	ZnSO4:7H2O
Greenockite	-64.12	-78.48	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.72	2.95	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.09	-21.97	-12.88	H2MoO4
H2S(g)	-78.29	-86.30	-8.01	H2S
H2Se(g)	-41.83	-46.79	-4.96	H2Se
Halite	-6.09	-4.49	1.60	NaCl
Hausmannite	-1.02	60.01	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-2.78	20.11	22.89	FeAl2O4
Hg(CH3)2(g)	-185.82	-259.53	-73.71	Hg(CH3)2
Hg(g)	-7.95	-15.83	-7.87	Hg
Hg(OH)2	-8.38	-11.87	-3.50	Hg(OH)2
Hg2(g)	-16.70	-31.65	-14.96	Hg2

Hg2 (OH) 2	-11.37	-6.11	5.26	Hg2 (OH) 2
Hg2CO3	-11.70	-27.75	-16.05	Hg2CO3
Hg2CrO4	-27.64	-36.34	-8.70	Hg2CrO4
Hg2F2	-19.41	-29.77	-10.36	Hg2F2
Hg2S	-80.72	-92.40	-11.68	Hg2S
Hg2SeO3	-16.46	-21.12	-4.66	Hg2SeO3
Hg2SO4	-17.75	-23.88	-6.13	Hg2SO4
Hg3O2CO3	-27.58	-57.27	-29.68	Hg3O2CO3
HgCl (g)	-33.04	-13.55	19.50	HgCl
HgCl2	-11.60	-32.86	-21.26	HgCl2
HgF (g)	-47.56	-14.89	32.68	HgF
HgF2 (g)	-48.11	-35.54	12.57	HgF2
Hgmetal (l)	-2.37	-15.83	-13.45	Hg
HgSe	-2.97	-58.66	-55.69	HgSe
HgSeO3	-14.46	-26.89	-12.43	HgSeO3
HgSO4	-20.23	-29.65	-9.42	HgSO4
Huntite	-4.17	-34.13	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.48	-24.25	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.35	-21.11	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.66	-21.83	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.77	-20.57	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.43	-49.67	-17.24	K2Cr2O7
K2CrO4	-18.92	-19.43	-0.51	K2CrO4
K2MoO4	-14.42	-11.16	3.26	K2MoO4
K2SeO4	-14.24	-14.97	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-4.65	-5.08	-0.43	PbO : PbSO4
Laurionite	-4.77	-4.15	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.35	6.35	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.62	19.48	16.86	Fe2MgO4
Magnesite	-1.09	-8.55	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.08	24.26	25.34	MnOOH
Massicot	-6.55	6.35	12.89	PbO
Matlockite	-7.01	-15.98	-8.97	PbClF
Melanothallite	-19.00	-12.74	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.07	-98.17	-45.09	HgS
Mg (OH) 2 (active)	-5.70	13.10	18.79	Mg (OH) 2
Mg (VO3) 2	-14.44	-3.16	11.28	Mg (VO3) 2
Mg2Sb3	-269.93	-195.25	74.68	Mg2Sb3
Mg2V2O7	-16.42	9.94	26.36	Mg2V2O7
MgCr2O4	-5.46	10.74	16.20	MgCr2O4
MgCrO4	-22.52	-17.14	5.38	MgCrO4
MgF2	-2.44	-10.57	-8.13	MgF2
MgMoO4	-7.02	-8.87	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.98	-1.92	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.48	-12.68	-1.20	MgSeO4 : 6H2O
Minium	-28.93	44.59	73.52	Pb3O4
Mirabilite	-4.65	-5.77	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.66	-4.76	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.79	-55.50	-5.71	Mn2 (SO4) 3
Mn2Sb	-145.97	-84.89	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.33	2.17	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.22	-9.50	2.72	MnCl2 : 4H2O
MnS (grn)	-74.98	-74.81	0.17	MnS
MnS (pnk)	-78.15	-74.81	3.34	MnS
MnSb	-93.28	-96.19	-2.91	MnSb
MnSe	-38.80	-35.30	3.50	MnSe
MnSeO3	-4.65	-3.52	1.13	MnSeO3
MnSeO3 : 2H2O	-4.51	-3.52	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.24	-14.29	-2.05	MnSeO4 : 5H2O
MnSO4	-8.87	-6.29	2.58	MnSO4

Monteponite	-7.29	7.82	15.10	CdO
Montroydite	-8.23	-11.87	-3.64	HgO
MoO3	-13.97	-21.97	-8.00	MoO3
Morenosite	-6.87	-9.01	-2.14	NiSO4:7H2O
MoS2	-149.84	-220.10	-70.26	MoS2
Na-Jarosite	-8.77	-19.97	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.57	-48.46	-9.90	Na2Cr2O7
Na2CrO4	-21.16	-18.23	2.93	Na2CrO4
Na2Mo2O7	-15.33	-31.92	-16.60	Na2Mo2O7
Na2MoO4	-11.45	-9.96	1.49	Na2MoO4
Na2MoO4:2H2O	-11.18	-9.96	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.30	-3.00	10.30	Na2SeO3:5H2O
Na2SeO4	-15.04	-13.76	1.28	Na2SeO4
Na3Sb	-171.53	-77.08	94.45	Na3Sb
Na3VO4	-26.79	9.89	36.68	Na3VO4
Na4V2O7	-29.63	7.77	37.40	Na4V2O7
Nantokite	-5.60	-12.33	-6.73	CuCl
NaSb	-86.71	-63.55	23.17	NaSb
Natron	-8.33	-9.64	-1.31	Na2CO3:10H2O
NaVO3	-5.98	-2.12	3.86	NaVO3
Nesquehonite	-3.88	-8.55	-4.67	MgCO3:3H2O
Ni(OH)2	-4.03	8.77	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-21.70	-6.00	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.71	17.29	32.00	Ni4(OH)6SO4
NiCO3	-6.01	-12.88	-6.87	NiCO3
NiMoO4	-2.06	-13.20	-11.14	NiMoO4
NiS(alpha)	-71.93	-77.53	-5.60	NiS
NiS(beta)	-66.43	-77.53	-11.10	NiS
NiS(gamma)	-64.73	-77.53	-12.80	NiS
NiSe	-20.32	-38.02	-17.70	NiSe
NiSeO3:2H2O	-9.06	-6.25	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.49	-17.01	-1.52	NiSeO4:6H2O
Nsutite	-5.82	11.68	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.48	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb(BO2)2	-9.09	-2.57	6.52	Pb(BO2)2
Pb(OH)2	-1.80	6.35	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.64	-66.40	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.59	2.20	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.49	12.70	26.19	Pb2O(OH)2
Pb2O3	-22.80	38.24	61.04	Pb2O3
Pb2OCO3	-8.39	-8.95	-0.56	Pb2OCO3
Pb2V2O7	-1.66	-3.56	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.05	-13.25	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.35	2.79	6.14	Pb3(VO4)2
Pb3O2CO3	-13.62	-2.60	11.02	Pb3O2CO3
Pb3O2SO4	-9.42	1.27	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.49	7.61	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.26	7.62	21.88	Pb4O3SO4
PbCrO4	-11.29	-23.89	-12.60	PbCrO4
PbF2	-9.88	-17.32	-7.44	PbF2
Pbmetal	-23.44	-19.20	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.63	6.35	12.98	PbO:0.33H2O
PbSeO4	-12.59	-19.43	-6.84	PbSeO4
Periclase	-8.49	13.10	21.58	MgO
Phosgenite	-10.13	-29.94	-19.81	PbCl2:PbCO3
Plattnerite	-17.71	31.89	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.09	-143.59	-18.51	FeS2
Pyrochroite	-3.70	11.49	15.19	Mn(OH)2
Pyrolusite	-4.35	37.03	41.38	MnO2
Realgar	-102.12	-121.86	-19.75	AsS
Retgersite	-6.97	-9.01	-2.04	NiSO4:6H2O
Rhodochrosite	0.42	-10.16	-10.58	MnCO3
Rutherfordine	-4.19	-18.69	-14.50	UO2CO3
Sb(OH)3	-11.36	-18.47	-7.11	Sb(OH)3

Sb2O4	-14.79	-11.39	3.40	Sb2O4
Sb2O5	-24.79	-34.46	-9.67	Sb2O5
Sb2Se3	-109.54	-177.29	-67.76	Sb2Se3
Sb4O6 (cubic)	-55.60	-73.86	-18.26	Sb4O6
Sb4O6 (orth)	-55.96	-73.86	-17.90	Sb4O6
SbCl3	-50.52	-49.95	0.57	SbCl3
SbF3	-43.74	-53.97	-10.23	SbF3
Sbmetal	-45.09	-56.78	-11.69	Sb
SbO2	-2.18	-30.00	-27.82	SbO2
Schoepite	-3.04	2.95	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.13	-21.24	-7.11	Se
Semetal (hex)	-13.53	-21.24	-7.71	Se
Senarmontite	-24.57	-36.93	-12.37	Sb2O3
SeO2	-15.14	-15.01	0.12	SeO2
SeO3	-46.82	-25.78	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.49	-11.49	-10.00	ZnCO3
Sphalerite	-64.69	-76.14	-11.45	ZnS
Spinel	-7.09	29.75	36.85	MgAl2O4
Stibnite	-245.36	-295.82	-50.46	Sb2S3
Sulfur	-58.61	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.09	-5.76	0.32	Na2SO4
Thermonatrite	-10.27	-9.64	0.64	Na2CO3:H2O
Tyuyamunite	-1.26	2.82	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.12	10.96	21.08	U3O8
U3Sb4	-572.91	-420.53	152.38	U3Sb4
U4O9	-24.94	-27.96	-3.02	U4O9
UF4	-31.17	-60.71	-29.54	UF4
UF4:2.5H2O	-27.99	-60.71	-32.72	UF4:2.5H2O
UO2 (am)	-14.31	-13.38	0.93	UO2
UO2 (NO3) 2	-39.94	-27.79	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-32.65	-27.79	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.18	-27.79	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-29.84	-27.80	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.66	2.95	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.58	-22.83	-2.25	UO2SeO4:4H2O
UO3	-4.75	2.95	7.70	UO3
Uraninite	-8.71	-13.38	-4.67	UO2
USb2	-216.82	-187.25	29.58	USb2
V (OH) 3	-18.66	-11.07	7.59	V (OH) 3
V2O5	-14.89	-16.25	-1.36	V2O5
V3O5	-39.37	-37.53	1.84	V3O5
V4O7	-48.71	-41.52	7.19	V4O7
V6O13	-38.98	-99.84	-60.86	V6O13
Valentinite	-28.45	-36.93	-8.48	Sb2O3
VC12	-63.71	-44.83	18.87	VC12
VC13	-65.99	-42.56	23.43	VC13
VF4	-66.26	-51.33	14.93	VF4
Vmetal	-93.41	-49.39	44.03	V
VO	-38.60	-23.84	14.76	VO
VO (OH) 2	-9.15	-4.00	5.15	VO (OH) 2
VO2Cl	-21.46	-18.62	2.84	VO2Cl
VOC1	-32.72	-21.57	11.15	VOC1
VOC12	-37.74	-24.98	12.76	VOC12
VOSO4	-25.38	-21.77	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.19	-76.14	-8.95	ZnS
Zincite	-1.18	10.16	11.33	ZnO
Zincosite	-11.55	-7.62	3.93	ZnSO4
Zn (BO2) 2	-7.05	1.24	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-23.91	-20.59	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.04	10.16	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.32	10.16	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.60	10.16	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.38	10.16	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.58	10.16	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.96	2.54	7.50	Zn2 (OH) 2SO4

Zn2(OH)3Cl	-5.37	9.82	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.47	-1.82	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.99	-5.08	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.54	22.86	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.70	29.80	38.50	Zn5(OH)8Cl2
ZnCl2	-17.88	-10.83	7.05	ZnCl2
ZnCO3:1H2O	-1.23	-11.49	-10.26	ZnCO3:1H2O
ZnF2	-12.97	-13.51	-0.53	ZnF2
Znmetal	-41.17	-15.39	25.79	Zn
ZnMoO4	-1.68	-11.81	-10.13	ZnMoO4
ZnO(active)	-1.03	10.16	11.19	ZnO
ZnS(am)	-67.08	-76.14	-9.05	ZnS
ZnSb	-83.18	-72.17	11.01	ZnSb
ZnSe	-22.23	-36.63	-14.40	ZnSe
ZnSeO4:6H2O	-14.10	-15.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.98	-7.62	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 29.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 104
      Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
      Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
      donnan 1e-008
USE EQUILIBRIUM_PHASES 104
USE Surface 104
USE Solution 114
SAVE Solution 115  #Pit Water After Mineral Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 114. Solution after simulation 28.

Using surface 104.

Using pure phase assemblage 104. Pure-phase assemblage after simulation 28.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.442e-009	2.442e-009	-1.017e-014
Alunite	-3.76	-5.16	-1.40	0.000e+000	0	0.000e+000
Anhydrite	-0.25	-4.61	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	0.00	-8.91	-8.91	2.674e-010	2.669e-010	-5.329e-013
Barite	0.00	-9.98	-9.98	2.108e-008	2.108e-008	1.599e-012
Brochantite	0.00	15.22	15.22	1.296e-007	1.296e-007	-1.956e-011
Brucite	-3.75	13.10	16.84	0.000e+000	0	0.000e+000
CO2(g)	-3.50	-21.65	-18.15	1.000e+001	1.000e+001	1.948e-011
CaMoO4	-0.85	-8.80	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-4.66	-1.85	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	2.297e-004	2.297e-004	-1.018e-010

Carnotite	0.00	0.23	0.23	8.052e-008	8.050e-008	-2.979e-011
Cd(BO2)2	-10.94	-1.10	9.84	0.000e+000	0	0.000e+000
CdMoO4	0.00	-14.15	-14.15	4.311e-008	4.311e-008	8.183e-014
Chrysotile	Element not present.			0.000e+000	0	0.000e+000
Cr2O3	0.00	-2.36	-2.36	6.900e-010	6.899e-010	-1.469e-013
Cu2Se(alpha)	-4.65	-50.45	-45.80	0.000e+000	0	0.000e+000
CuMoO4	-0.64	-13.72	-13.08	0.000e+000	0	0.000e+000
Epsomite	-2.56	-4.68	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	0.00	3.19	3.19	1.086e-009	1.086e-009	-2.756e-018
Fluorite	0.00	-10.50	-10.50	3.121e-005	3.121e-005	1.059e-013
Gummite	-4.72	2.95	7.67	0.000e+000	0	0.000e+000
Gypsum	0.00	-4.61	-4.61	7.018e-003	7.018e-003	7.120e-011
HgSe	-2.97	-58.66	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2	Element not present.			0.000e+000	0	0.000e+000
Mirabilite	-4.65	-5.77	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-4.65	-3.52	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-4.03	8.77	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2·8H2O	-21.70	-6.00	15.70	0.000e+000	0	0.000e+000
NiCO3	-6.01	-12.88	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-2.06	-13.20	-11.14	0.000e+000	0	0.000e+000
O2(g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-2.292e-013
Otavite	-1.83	-13.83	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	1.159e-008	1.159e-008	-1.480e-012
Rutherfordine	-4.19	-18.69	-14.50	0.000e+000	0	0.000e+000
SbO2	-2.18	-30.00	-27.82	0.000e+000	0	0.000e+000
Schoepite	-3.04	2.95	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2(am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-1.26	2.82	4.08	0.000e+000	0	0.000e+000
U3O8	-10.12	10.96	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-2.66	2.95	5.61	0.000e+000	0	0.000e+000
UO3	-4.75	2.95	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-1.68	-11.81	-10.13	0.000e+000	0	0.000e+000

-----Surface composition-----

Hfo

2.475e-022	Surface + diffuse layer charge, eq
1.365e-011	Surface charge, eq
1.888e-002	sigma, C/m**2
2.701e-002	psi, V
-1.051e+000	-F*psi/RT
3.494e-001	exp(-F*psi/RT)
6.420e+004	specific area, m**2/mol Ferrihydrite
6.975e-005	m**2 for 1.086e-009 moles of Ferrihydrite

Water in diffuse layer: 6.975e-010 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation

Element	Moles
Ag	8.1568e-018
Al	3.1480e-016
As	8.3753e-019
B	2.5537e-014
Ba	1.7194e-017
C	3.7956e-013
Ca	7.9845e-012
Cd	4.9430e-017
Cl	2.2818e-012
Co	2.6209e-016
Cr	1.0355e-018
Cu	3.3675e-016
F	1.3054e-013
Fe	7.5693e-019
H	4.5721e-013
Hg	3.8636e-019
K	2.9782e-012

Mg	6.1052e-012
Mn	1.9532e-013
Mo	1.2566e-015
N	3.3510e-014
Na	1.1737e-011
Ni	3.0639e-016
O	1.0953e-010
Pb	4.1179e-018
S	2.7060e-011
Sb	3.9902e-016
Se	1.4668e-016
U	3.6057e-016
V	4.6708e-017
Zn	9.4017e-015

Hfo_s

5.432e-012 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	1.419e-012	0.261	1.523e-012	-11.817
Hfo_sOCu+	1.391e-012	0.256	1.493e-012	-11.826
Hfo_sOMn+	1.239e-012	0.228	1.330e-012	-11.876
Hfo_sOPb+	1.003e-012	0.185	1.077e-012	-11.968
Hfo_sOCrOH+	2.938e-013	0.054	3.154e-013	-12.501
Hfo_sOHCa+2	6.681e-014	0.012	7.172e-014	-13.144
Hfo_sONi+	1.381e-014	0.003	1.483e-014	-13.829
Hfo_sOH	2.081e-015	0.000	2.234e-015	-14.651
Hfo_sOCd+	1.957e-015	0.000	2.101e-015	-14.678
Hfo_sOCu+	1.372e-015	0.000	1.473e-015	-14.832
Hfo_sO-	5.057e-016	0.000	5.429e-016	-15.265
Hfo_sOH2+	1.963e-016	0.000	2.107e-016	-15.676
Hfo_sOAg	4.386e-018	0.000	4.708e-018	-17.327
Hfo_sOHBa+2	8.785e-019	0.000	9.431e-019	-18.025
Hfo_sOFe+	1.428e-019	0.000	1.533e-019	-18.814
Hfo_sOHg+	1.203e-021	0.000	1.291e-021	-20.889

Hfo_w

2.173e-010 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	7.684e-011	0.354	8.249e-011	-10.084
Hfo_wOHVO4-3	3.476e-011	0.160	3.731e-011	-10.428
Hfo_wOMg+	3.400e-011	0.157	3.650e-011	-10.438
Hfo_wOH	2.242e-011	0.103	2.407e-011	-10.618
Hfo_wOZn+	1.601e-011	0.074	1.719e-011	-10.765
Hfo_wOMn+	1.060e-011	0.049	1.138e-011	-10.944
Hfo_wOHSO4-2	9.893e-012	0.046	1.062e-011	-10.974
Hfo_wO-	5.448e-012	0.025	5.848e-012	-11.233
Hfo_wOCa+	2.253e-012	0.010	2.418e-012	-11.616
Hfo_wOH2+	2.114e-012	0.010	2.270e-012	-11.644
Hfo_wOHAsO4-3	1.066e-012	0.005	1.144e-012	-11.942
Hfo_wOHSeO3-2	5.476e-013	0.003	5.878e-013	-12.231
Hfo_wOPb+	4.827e-013	0.002	5.181e-013	-12.286
Hfo_wSO4-	4.681e-013	0.002	5.025e-013	-12.299
Hfo_wONi+	2.007e-013	0.001	2.155e-013	-12.667
Hfo_wSeO3-	8.779e-014	0.000	9.424e-014	-13.026
Hfo_wOCu+	4.167e-014	0.000	4.473e-014	-13.349
Hfo_wOHMoO4-2	2.590e-014	0.000	2.780e-014	-13.556
Hfo_wOCd+	8.994e-015	0.000	9.655e-015	-14.015
Hfo_wH2BO3	3.247e-015	0.000	3.485e-015	-14.458
Hfo_wMoO4-	1.579e-015	0.000	1.695e-015	-14.771
Hfo_wHAsO4-	2.124e-016	0.000	2.280e-016	-15.642
Hfo_wOAg	1.243e-017	0.000	1.334e-017	-16.875
Hfo_wOFe+	9.709e-019	0.000	1.042e-018	-17.982
Hfo_wH2AsO4	6.480e-019	0.000	6.956e-019	-18.158
Hfo_wOHg+	6.347e-019	0.000	6.813e-019	-18.167

Hfo_wOHSbO(OH) 4-	5.417e-019	0.000	5.815e-019	-18.235
Hfo_wOBa+	4.282e-019	0.000	4.597e-019	-18.338
Hfo_wOHSeO4-2	1.012e-019	0.000	1.086e-019	-18.964
Hfo_wSbO(OH) 4	3.302e-020	0.000	3.544e-020	-19.450
Hfo_wOHCrO4-2	4.400e-021	0.000	4.724e-021	-20.326
Hfo_wSeO4-	4.170e-021	0.000	4.476e-021	-20.349
Hfo_wCrO4-	1.899e-022	0.000	2.038e-022	-21.691
Hfo_wH2AsO3	9.223e-029	0.000	9.900e-029	-28.004

-----Solution composition-----

Elements	Molality	Moles
Ag	1.161e-008	1.082e-008
Al	4.041e-007	3.764e-007
As	9.646e-010	8.986e-010
B	3.644e-005	3.394e-005
Ba	3.082e-008	2.871e-008
C	4.951e-004	4.612e-004
Ca	1.290e-002	1.202e-002
Cd	7.477e-008	6.966e-008
Cl	2.926e-003	2.726e-003
Co	4.360e-007	4.061e-007
Cr	1.627e-009	1.515e-009
Cu	5.106e-007	4.757e-007
F	1.756e-004	1.636e-004
Fe	1.154e-009	1.075e-009
Hg	5.540e-010	5.160e-010
K	4.707e-003	4.385e-003
Mg	9.987e-003	9.304e-003
Mn	3.270e-004	3.046e-004
Mo	1.441e-006	1.342e-006
N	4.309e-005	4.014e-005
Na	1.861e-002	1.734e-002
Ni	4.979e-007	4.638e-007
Pb	6.162e-009	5.740e-009
S	3.305e-002	3.079e-002
Sb	5.116e-007	4.766e-007
Se	1.786e-007	1.664e-007
U	3.459e-007	3.222e-007
V	5.759e-008	5.365e-008
Zn	1.454e-005	1.354e-005

-----Description of solution-----

	pH =	7.859	Charge balance
	pe =	4.914	Adjusted to redox
equilibrium	Activity of water	=	0.999
	Ionic strength	=	8.553e-002
	Mass of water (kg)	=	9.316e-001
	Total alkalinity (eq/kg)	=	5.032e-004
	Total CO2 (mol/kg)	=	4.951e-004
	Temperature (deg C)	=	25.00
	Electrical balance (eq)	=	1.635e-005
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.02
	Iterations	=	1
	Total H	=	1.034167e+002
	Total O	=	5.183283e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	9.397e-007	7.267e-007	-6.027	-6.139	-0.112	(0)
H+	1.752e-008	1.384e-008	-7.757	-7.859	-0.102	0.00
H2O	5.551e+001	9.988e-001	1.744	-0.001	0.000	18.07

Ag	1.161e-008					
AgCl	7.223e-009	7.223e-009	-8.141	-8.141	0.000	(0)
AgCl2-	2.050e-009	1.454e-009	-8.688	-8.837	-0.149	(0)
Ag+	1.937e-009	1.531e-009	-8.713	-8.815	-0.102	(0)
AgSO4-	3.761e-010	2.668e-010	-9.425	-9.574	-0.149	(0)
AgCl3-2	1.183e-011	2.996e-012	-10.927	-11.523	-0.597	(0)
AgNO2	1.038e-011	1.038e-011	-10.984	-10.984	0.000	(0)
AgF	4.073e-013	4.073e-013	-12.390	-12.390	0.000	(0)
AgCl4-3	3.110e-013	1.414e-014	-12.507	-13.850	-1.342	(0)
AgOH	1.112e-013	1.112e-013	-12.954	-12.954	0.000	(0)
AgNH3+	8.409e-014	5.964e-014	-13.075	-13.224	-0.149	(0)
AgH2BO3	3.531e-014	3.531e-014	-13.452	-13.452	0.000	(0)
AgSeO3-	2.795e-014	1.983e-014	-13.554	-13.703	-0.149	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
Ag(NO2)2-	7.353e-016	5.216e-016	-15.134	-15.283	-0.149	(0)
AgNO3	3.722e-017	3.722e-017	-16.429	-16.429	0.000	(0)
Ag(NH3)2+	1.305e-017	9.253e-018	-16.885	-17.034	-0.149	(0)
Ag(OH)2-	1.113e-017	7.898e-018	-16.953	-17.102	-0.149	(0)
Ag(SeO3)2-3	7.872e-020	3.578e-021	-19.104	-20.446	-1.342	(0)
Ag2MoO4	4.978e-025	4.978e-025	-24.303	-24.303	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.437	-73.437	0.000	(0)
AgOH(Se)2-4	0.000e+000	0.000e+000	-81.219	-83.605	-2.386	(0)
Ag(HS)S4-2	0.000e+000	0.000e+000	-147.154	-147.398	-0.244	(0)
Ag(HS)2-	0.000e+000	0.000e+000	-147.624	-147.773	-0.149	(0)
Ag(S4)2-3	0.000e+000	0.000e+000	-148.548	-148.979	-0.431	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.884	-149.290	-0.406	(0)
Al	4.041e-007					
Al(OH)4-	4.003e-007	3.149e-007	-6.398	-6.502	-0.104	(0)
Al(OH)3	3.442e-009	3.442e-009	-8.463	-8.463	0.000	(0)
Al(OH)2+	2.977e-010	2.374e-010	-9.526	-9.624	-0.098	(0)
AlF3	3.374e-011	3.374e-011	-10.472	-10.472	0.000	(0)
AlF2+	3.172e-011	2.530e-011	-10.499	-10.597	-0.098	(0)
AlF4-	2.277e-012	1.792e-012	-11.643	-11.747	-0.104	(0)
AlF+2	1.482e-012	5.997e-013	-11.829	-12.222	-0.393	(0)
AlOH+2	1.016e-012	4.113e-013	-11.993	-12.386	-0.393	(0)
AlSO4+	4.878e-014	3.838e-014	-13.312	-13.416	-0.104	(0)
Al+3	4.717e-015	5.660e-016	-14.326	-15.247	-0.921	(0)
Al(SO4)2-	4.566e-015	3.593e-015	-14.340	-14.445	-0.104	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-43.568	-44.911	-1.342	(0)
As (3)	1.682e-023					
H3AsO3	1.598e-023	1.598e-023	-22.796	-22.796	0.000	(0)
H2AsO3-	8.349e-025	5.922e-025	-24.078	-24.228	-0.149	(0)
HAsO3-2	1.542e-028	3.903e-029	-27.812	-28.409	-0.597	(0)
H4AsO3+	1.545e-031	1.096e-031	-30.811	-30.960	-0.149	(0)
AsO3-3	2.391e-033	1.087e-034	-32.621	-33.964	-1.342	(0)
As (5)	9.646e-010					
HAsO4-2	9.219e-010	2.334e-010	-9.035	-9.632	-0.597	(0)
H2AsO4-	4.153e-011	2.946e-011	-10.382	-10.531	-0.149	(0)
AsO4-3	1.173e-012	5.333e-014	-11.931	-13.273	-1.342	(0)
H3AsO4	6.946e-017	7.084e-017	-16.158	-16.150	0.009	(0)
B	3.644e-005					
H3BO3	3.401e-005	3.469e-005	-4.468	-4.460	0.009	(0)
H2BO3-	1.920e-006	1.456e-006	-5.717	-5.837	-0.120	(0)
CaH2BO3+	3.112e-007	2.360e-007	-6.507	-6.627	-0.120	(0)
MgH2BO3+	1.592e-007	1.207e-007	-6.798	-6.918	-0.120	(0)
NaH2BO3	3.241e-008	3.241e-008	-7.489	-7.489	0.000	(0)
BF(OH)3-	1.934e-009	1.467e-009	-8.713	-8.834	-0.120	(0)
H5(BO3)2-	5.669e-011	4.298e-011	-10.246	-10.367	-0.120	(0)
BaH2BO3+	7.113e-013	5.392e-013	-12.148	-12.268	-0.120	(0)
BF2(OH)2-	3.036e-013	2.302e-013	-12.518	-12.638	-0.120	(0)
H8(BO3)3-	1.966e-013	1.491e-013	-12.706	-12.827	-0.120	(0)
AgH2BO3	3.531e-014	3.531e-014	-13.452	-13.452	0.000	(0)
BF3OH-	1.734e-019	1.315e-019	-18.761	-18.881	-0.120	(0)
BF4-	1.253e-024	9.497e-025	-23.902	-24.022	-0.120	(0)
Ba	3.082e-008					
Ba+2	3.076e-008	1.199e-008	-7.512	-7.921	-0.409	(0)
BaHCO3+	4.939e-011	3.972e-011	-10.306	-10.401	-0.095	(0)
BaCO3	7.227e-012	7.227e-012	-11.141	-11.141	0.000	(0)

BaH2BO3+	7.113e-013	5.392e-013	-12.148	-12.268	-0.120	(0)
BaOH+	4.795e-014	3.802e-014	-13.319	-13.420	-0.101	(0)
BaNO3+	2.593e-015	1.839e-015	-14.586	-14.735	-0.149	(0)
BaNH3+2	5.702e-016	1.444e-016	-15.244	-15.841	-0.597	(0)
C (4)	4.951e-004					
HCO3-	4.351e-004	3.470e-004	-3.361	-3.460	-0.098	(0)
CaHCO3+	2.263e-005	1.820e-005	-4.645	-4.740	-0.095	(0)
MgHCO3+	1.088e-005	8.491e-006	-4.963	-5.071	-0.108	(0)
H2CO3	1.080e-005	1.080e-005	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CO3-2	3.016e-006	1.176e-006	-5.520	-5.930	-0.409	(0)
NaHCO3	2.741e-006	2.741e-006	-5.562	-5.562	0.000	(0)
MgCO3	2.338e-006	2.338e-006	-5.631	-5.631	0.000	(0)
MnHCO3+	5.169e-007	4.099e-007	-6.287	-6.387	-0.101	(0)
NaCO3-	3.855e-007	3.075e-007	-6.414	-6.512	-0.098	(0)
UO2 (CO3) 3-4	2.705e-007	1.111e-009	-6.568	-8.954	-2.386	(0)
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
ZnCO3	1.869e-007	1.869e-007	-6.728	-6.728	0.000	(0)
UO2 (CO3) 2-2	7.450e-008	1.886e-008	-7.128	-7.724	-0.597	(0)
ZnHCO3+	4.275e-008	3.032e-008	-7.369	-7.518	-0.149	(0)
NiHCO3+	6.762e-009	4.796e-009	-8.170	-8.319	-0.149	(0)
NiCO3	4.917e-009	4.917e-009	-8.308	-8.308	0.000	(0)
Cu (CO3) 2-2	2.949e-009	7.466e-010	-8.530	-9.127	-0.597	(0)
CoHCO3+	2.866e-009	2.033e-009	-8.543	-8.692	-0.149	(0)
PbCO3	1.510e-009	1.510e-009	-8.821	-8.821	0.000	(0)
CoCO3	1.496e-009	1.496e-009	-8.825	-8.825	0.000	(0)
CuHCO3+	1.052e-009	7.465e-010	-8.978	-9.127	-0.149	(0)
UO2CO3	8.041e-010	8.041e-010	-9.095	-9.095	0.000	(0)
CdCO3	3.381e-010	3.381e-010	-9.471	-9.471	0.000	(0)
PbHCO3+	1.553e-010	1.102e-010	-9.809	-9.958	-0.149	(0)
BaHCO3+	4.939e-011	3.972e-011	-10.306	-10.401	-0.095	(0)
Pb (CO3) 2-2	2.022e-011	5.119e-012	-10.694	-11.291	-0.597	(0)
CdHCO3+	1.405e-011	9.969e-012	-10.852	-11.001	-0.149	(0)
BaCO3	7.227e-012	7.227e-012	-11.141	-11.141	0.000	(0)
Cd (CO3) 2-2	1.164e-012	2.946e-013	-11.934	-12.531	-0.597	(0)
FeHCO3+	2.946e-015	2.369e-015	-14.531	-14.625	-0.095	(0)
HgCO3	5.647e-016	5.647e-016	-15.248	-15.248	0.000	(0)
Hg (CO3) 2-2	8.292e-018	2.099e-018	-17.081	-17.678	-0.597	(0)
HgHCO3+	2.052e-019	1.455e-019	-18.688	-18.837	-0.149	(0)
Ca	1.290e-002					
Ca+2	7.229e-003	2.817e-003	-2.141	-2.550	-0.409	(0)
CaSO4	5.637e-003	5.637e-003	-2.249	-2.249	0.000	(0)
CaHCO3+	2.263e-005	1.820e-005	-4.645	-4.740	-0.095	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CaF+	4.108e-006	3.258e-006	-5.386	-5.487	-0.101	(0)
CaH2BO3+	3.112e-007	2.360e-007	-6.507	-6.627	-0.120	(0)
CaOH+	5.079e-008	4.084e-008	-7.294	-7.389	-0.095	(0)
CaNO3+	3.845e-010	2.727e-010	-9.415	-9.564	-0.149	(0)
CaNH3+2	2.674e-010	6.769e-011	-9.573	-10.169	-0.597	(0)
Ca (NH3) 2+2	2.032e-018	5.143e-019	-17.692	-18.289	-0.597	(0)
Cd	7.477e-008					
Cd+2	3.238e-008	1.262e-008	-7.490	-7.899	-0.409	(0)
CdSO4	2.584e-008	2.584e-008	-7.588	-7.588	0.000	(0)
Cd (SO4) 2-2	1.203e-008	3.045e-009	-7.920	-8.516	-0.597	(0)
CdCl+	3.927e-009	2.785e-009	-8.406	-8.555	-0.149	(0)
CdCO3	3.381e-010	3.381e-010	-9.471	-9.471	0.000	(0)
CdOH+	1.027e-010	7.284e-011	-9.988	-10.138	-0.149	(0)
CdOHC1	8.303e-011	8.303e-011	-10.081	-10.081	0.000	(0)
CdF+	2.987e-011	2.119e-011	-10.525	-10.674	-0.149	(0)
CdCl2	2.684e-011	2.684e-011	-10.571	-10.571	0.000	(0)
CdHCO3+	1.405e-011	9.969e-012	-10.852	-11.001	-0.149	(0)
Cd (CO3) 2-2	1.164e-012	2.946e-013	-11.934	-12.531	-0.597	(0)
Cd (OH) 2	3.340e-013	3.340e-013	-12.476	-12.476	0.000	(0)
CdCl3-	5.519e-014	3.914e-014	-13.258	-13.407	-0.149	(0)
CdF2	4.480e-015	4.480e-015	-14.349	-14.349	0.000	(0)
CdNO3+	1.722e-015	1.222e-015	-14.764	-14.913	-0.149	(0)
CdSeO4	2.052e-016	2.052e-016	-15.688	-15.688	0.000	(0)
Cd2OH+3	1.013e-016	4.606e-018	-15.994	-17.337	-1.342	(0)

Cd(OH) 3-	2.090e-017	1.483e-017	-16.680	-16.829	-0.149	(0)
Cd(SeO3) 2-2	1.669e-017	4.225e-018	-16.778	-17.374	-0.597	(0)
Cd(NO3) 2	1.875e-023	1.875e-023	-22.727	-22.727	0.000	(0)
Cd(OH) 4-2	6.966e-024	1.764e-024	-23.157	-23.754	-0.597	(0)
CdHS+	0.000e+000	0.000e+000	-78.178	-78.327	-0.149	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-149.560	-149.560	0.000	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-225.947	-226.096	-0.149	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-301.740	-302.337	-0.597	(0)
Cl	2.926e-003					
Cl-	2.926e-003	2.311e-003	-2.534	-2.636	-0.102	(0)
MnCl+	2.173e-007	1.723e-007	-6.663	-6.764	-0.101	(0)
ZnCl+	2.056e-008	1.604e-008	-7.687	-7.795	-0.108	(0)
ZnOHCl	1.526e-008	1.526e-008	-7.816	-7.816	0.000	(0)
AgCl	7.223e-009	7.223e-009	-8.141	-8.141	0.000	(0)
CdCl+	3.927e-009	2.785e-009	-8.406	-8.555	-0.149	(0)
AgCl2-	2.050e-009	1.454e-009	-8.688	-8.837	-0.149	(0)
NiCl+	9.347e-010	6.630e-010	-9.029	-9.178	-0.149	(0)
CoCl+	8.490e-010	6.022e-010	-9.071	-9.220	-0.149	(0)
CuCl	5.927e-010	5.927e-010	-9.227	-9.227	0.000	(0)
MnCl2	5.625e-010	5.625e-010	-9.250	-9.250	0.000	(0)
CuCl2-	3.668e-010	2.862e-010	-9.436	-9.543	-0.108	(0)
CuCl+	1.601e-010	1.249e-010	-9.796	-9.903	-0.108	(0)
CdOHCl	8.303e-011	8.303e-011	-10.081	-10.081	0.000	(0)
ZnCl2	5.878e-011	5.878e-011	-10.231	-10.231	0.000	(0)
PbCl+	4.940e-011	3.504e-011	-10.306	-10.455	-0.149	(0)
CdCl2	2.684e-011	2.684e-011	-10.571	-10.571	0.000	(0)
AgCl3-2	1.183e-011	2.996e-012	-10.927	-11.523	-0.597	(0)
HgClOH	1.191e-012	1.191e-012	-11.924	-11.924	0.000	(0)
MnCl3-	4.516e-013	3.581e-013	-12.345	-12.446	-0.101	(0)
PbCl2	3.618e-013	3.618e-013	-12.442	-12.442	0.000	(0)
CuCl3-2	3.578e-013	1.414e-013	-12.446	-12.849	-0.403	(0)
AgCl4-3	3.110e-013	1.414e-014	-12.507	-13.850	-1.342	(0)
HgCl2	2.145e-013	2.145e-013	-12.669	-12.669	0.000	(0)
ZnCl3-	1.383e-013	1.079e-013	-12.859	-12.967	-0.108	(0)
CuCl2	1.001e-013	1.001e-013	-13.000	-13.000	0.000	(0)
CdCl3-	5.519e-014	3.914e-014	-13.258	-13.407	-0.149	(0)
NiCl2	7.716e-015	7.716e-015	-14.113	-14.113	0.000	(0)
HgCl3-	6.989e-015	4.958e-015	-14.156	-14.305	-0.149	(0)
UO2Cl+	9.081e-016	6.441e-016	-15.042	-15.191	-0.149	(0)
PbCl3-	4.694e-016	3.329e-016	-15.328	-15.478	-0.149	(0)
ZnCl4-2	3.155e-016	1.247e-016	-15.501	-15.904	-0.403	(0)
HgCl4-2	1.802e-016	4.562e-017	-15.744	-16.341	-0.597	(0)
HgCl+	2.610e-017	1.851e-017	-16.583	-16.733	-0.149	(0)
CrCl+2	7.703e-018	1.950e-018	-17.113	-17.710	-0.597	(0)
CuCl3-	2.767e-018	2.159e-018	-17.558	-17.666	-0.108	(0)
PbCl4-2	1.390e-018	3.518e-019	-17.857	-18.454	-0.597	(0)
CrOHCl2	6.226e-020	6.226e-020	-19.206	-19.206	0.000	(0)
FeCl+2	7.293e-022	2.883e-022	-21.137	-21.540	-0.403	(0)
CrCl2+	6.030e-022	4.277e-022	-21.220	-21.369	-0.149	(0)
VOCl+	1.774e-022	1.258e-022	-21.751	-21.900	-0.149	(0)
CuCl4-2	6.328e-023	2.502e-023	-22.199	-22.602	-0.403	(0)
FeCl2+	3.754e-024	2.977e-024	-23.425	-23.526	-0.101	(0)
CrO3Cl-	3.836e-026	2.721e-026	-25.416	-25.565	-0.149	(0)
FeCl3	6.881e-028	6.881e-028	-27.162	-27.162	0.000	(0)
CoCl+2	4.567e-035	1.156e-035	-34.340	-34.937	-0.597	(0)
UCl+3	0.000e+000	0.000e+000	-44.405	-45.747	-1.342	(0)
Co(NH3) 5Cl+2	0.000e+000	0.000e+000	-46.984	-47.580	-0.597	(0)
Cr(NH3) 6Cl+2	0.000e+000	0.000e+000	-49.439	-50.036	-0.597	(0)
Co(NH3) 6Cl+2	0.000e+000	0.000e+000	-61.418	-62.015	-0.597	(0)
Co(2)	4.360e-007					
Co+2	2.975e-007	7.531e-008	-6.527	-7.123	-0.597	(0)
CoSO4	1.313e-007	1.313e-007	-6.882	-6.882	0.000	(0)
CoHCO3+	2.866e-009	2.033e-009	-8.543	-8.692	-0.149	(0)
CoOH+	1.539e-009	1.092e-009	-8.813	-8.962	-0.149	(0)
CoCO3	1.496e-009	1.496e-009	-8.825	-8.825	0.000	(0)
CoCl+	8.490e-010	6.022e-010	-9.071	-9.220	-0.149	(0)
CoF+	3.557e-010	2.523e-010	-9.449	-9.598	-0.149	(0)
Co(OH) 2	6.303e-011	6.303e-011	-10.200	-10.200	0.000	(0)

CoNO2+	2.428e-011	1.722e-011	-10.615	-10.764	-0.149	(0)
Co(NH3)+2	6.827e-013	1.728e-013	-12.166	-12.762	-0.597	(0)
CoNO3+	5.152e-015	3.654e-015	-14.288	-14.437	-0.149	(0)
CoSeO4	3.296e-015	3.296e-015	-14.482	-14.482	0.000	(0)
Co(OH)3-	1.288e-015	9.139e-016	-14.890	-15.039	-0.149	(0)
CoOOH-	3.236e-016	2.296e-016	-15.490	-15.639	-0.149	(0)
Co2OH+3	9.067e-017	4.121e-018	-16.043	-17.385	-1.342	(0)
Co(NH3)2+2	5.558e-019	1.407e-019	-18.255	-18.852	-0.597	(0)
Co(OH)4-2	4.158e-022	1.053e-022	-21.381	-21.978	-0.597	(0)
Co(NO3)2	2.276e-022	2.276e-022	-21.643	-21.643	0.000	(0)
Co(NH3)3+2	1.336e-025	3.381e-026	-24.874	-25.471	-0.597	(0)
Co4(OH)4+4	6.907e-026	2.836e-028	-25.161	-27.547	-2.386	(0)
Co(NH3)4+2	1.338e-032	3.386e-033	-31.874	-32.470	-0.597	(0)
Co(NH3)5+2	4.237e-040	1.073e-040	-39.373	-39.970	-0.597	(0)
Co(3)	3.586e-028					
CoOH+2	3.586e-028	9.077e-029	-27.445	-28.042	-0.597	(0)
Co+3	2.049e-034	2.458e-035	-33.689	-34.609	-0.921	(0)
CoCl+2	4.567e-035	1.156e-035	-34.340	-34.937	-0.597	(0)
Co(NH3)5Cl+2	0.000e+000	0.000e+000	-46.984	-47.580	-0.597	(0)
Co(NH3)6SO4+	0.000e+000	0.000e+000	-56.363	-56.512	-0.149	(0)
Co(NH3)6OH+2	0.000e+000	0.000e+000	-60.721	-61.318	-0.597	(0)
Co(NH3)6Cl+2	0.000e+000	0.000e+000	-61.418	-62.015	-0.597	(0)
Cr(2)	7.503e-027					
Cr+2	7.503e-027	1.899e-027	-26.125	-26.721	-0.597	(0)
Cr(3)	1.627e-009					
Cr(OH)2+	1.292e-009	9.163e-010	-8.889	-9.038	-0.149	(0)
Cr(OH)3	2.501e-010	2.501e-010	-9.602	-9.602	0.000	(0)
Cr(OH)+2	4.094e-011	1.036e-011	-10.388	-10.984	-0.597	(0)
CrOHSO4	2.148e-011	2.148e-011	-10.668	-10.668	0.000	(0)
CrO2-	1.212e-011	8.594e-012	-10.917	-11.066	-0.149	(0)
Cr(OH)4-	1.020e-011	7.237e-012	-10.991	-11.140	-0.149	(0)
CrF+2	4.324e-014	1.095e-014	-13.364	-13.961	-0.597	(0)
CrSO4+	1.875e-014	1.330e-014	-13.727	-13.876	-0.149	(0)
Cr+3	1.434e-014	6.519e-016	-13.843	-15.186	-1.342	(0)
CrCl+2	7.703e-018	1.950e-018	-17.113	-17.710	-0.597	(0)
Cr2(OH)2SO4+2	7.949e-020	2.012e-020	-19.100	-19.696	-0.597	(0)
CrOHC12	6.226e-020	6.226e-020	-19.206	-19.206	0.000	(0)
Cr2(OH)2(SO4)2	1.044e-020	1.044e-020	-19.981	-19.981	0.000	(0)
CrCl2+	6.030e-022	4.277e-022	-21.220	-21.369	-0.149	(0)
CrNO3+2	3.446e-024	8.724e-025	-23.463	-24.059	-0.597	(0)
Cr(NH3)5OH+2	1.117e-039	2.828e-040	-38.952	-39.549	-0.597	(0)
Cr(NH3)6+3	0.000e+000	0.000e+000	-47.159	-48.501	-1.342	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-49.439	-50.036	-0.597	(0)
Cr(6)	8.283e-015					
CrO4-2	7.740e-015	3.016e-015	-14.111	-14.521	-0.409	(0)
NaCrO4-	2.968e-016	2.106e-016	-15.527	-15.677	-0.149	(0)
HCrO4-	1.904e-016	1.351e-016	-15.720	-15.869	-0.149	(0)
KCrO4-	5.536e-017	3.927e-017	-16.257	-16.406	-0.149	(0)
CrO3SO4-2	1.967e-023	4.980e-024	-22.706	-23.303	-0.597	(0)
H2CrO4	1.515e-024	1.515e-024	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.836e-026	2.721e-026	-25.416	-25.565	-0.149	(0)
Cr2O7-2	2.502e-030	6.335e-031	-29.602	-30.198	-0.597	(0)
Cu(1)	1.247e-009					
CuCl	5.927e-010	5.927e-010	-9.227	-9.227	0.000	(0)
CuCl2-	3.668e-010	2.862e-010	-9.436	-9.543	-0.108	(0)
Cu+	2.871e-010	2.037e-010	-9.542	-9.691	-0.149	(0)
CuCl3-2	3.578e-013	1.414e-013	-12.446	-12.849	-0.403	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-147.038	-147.456	-0.418	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.791	-148.186	-0.395	(0)
Cu(2)	5.094e-007					
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
CuOH+	1.004e-007	7.834e-008	-6.998	-7.106	-0.108	(0)
Cu+2	8.749e-008	3.409e-008	-7.058	-7.467	-0.409	(0)
CuSO4	6.823e-008	6.823e-008	-7.166	-7.166	0.000	(0)
Cu(OH)2	1.136e-008	1.136e-008	-7.945	-7.945	0.000	(0)
Cu(CO3)2-2	2.949e-009	7.466e-010	-8.530	-9.127	-0.597	(0)
CuHCO3+	1.052e-009	7.465e-010	-8.978	-9.127	-0.149	(0)
Cu2(OH)2+2	6.090e-010	1.542e-010	-9.215	-9.812	-0.597	(0)

	CuF+	3.213e-010	2.279e-010	-9.493	-9.642	-0.149	(0)
	CuNO2+	1.633e-010	1.159e-010	-9.787	-9.936	-0.149	(0)
	CuCl+	1.601e-010	1.249e-010	-9.796	-9.903	-0.108	(0)
	CuNH3+2	2.630e-011	6.659e-012	-10.580	-11.177	-0.597	(0)
	Cu (OH) 3-	2.387e-011	1.693e-011	-10.622	-10.771	-0.149	(0)
	CuCl2	1.001e-013	1.001e-013	-13.000	-13.000	0.000	(0)
	Cu (NO2) 2	3.847e-014	3.847e-014	-13.415	-13.415	0.000	(0)
	CuNO3+	4.653e-015	3.301e-015	-14.332	-14.481	-0.149	(0)
	Cu (OH) 4-2	3.825e-016	9.684e-017	-15.417	-16.014	-0.597	(0)
	CuCl3-	2.767e-018	2.159e-018	-17.558	-17.666	-0.108	(0)
	CuCl4-2	6.328e-023	2.502e-023	-22.199	-22.602	-0.403	(0)
	Cu (NO3) 2	1.272e-023	1.272e-023	-22.895	-22.895	0.000	(0)
	Cu (HS) 3-	0.000e+000	0.000e+000	-216.728	-216.877	-0.149	(0)
F		1.756e-004					
	F-	1.341e-004	1.060e-004	-3.873	-3.975	-0.102	(0)
	MgF+	3.613e-005	2.843e-005	-4.442	-4.546	-0.104	(0)
	CaF+	4.108e-006	3.258e-006	-5.386	-5.487	-0.101	(0)
	NaF	9.391e-007	9.391e-007	-6.027	-6.027	0.000	(0)
	MnF+	3.149e-007	2.497e-007	-6.502	-6.603	-0.101	(0)
	ZnF+	8.236e-009	5.842e-009	-8.084	-8.233	-0.149	(0)
	HF	2.169e-009	2.169e-009	-8.664	-8.664	0.000	(0)
	BF (OH) 3-	1.934e-009	1.467e-009	-8.713	-8.834	-0.120	(0)
	NiF+	4.206e-010	2.984e-010	-9.376	-9.525	-0.149	(0)
	CoF+	3.557e-010	2.523e-010	-9.449	-9.598	-0.149	(0)
	CuF+	3.213e-010	2.279e-010	-9.493	-9.642	-0.149	(0)
	AlF3	3.374e-011	3.374e-011	-10.472	-10.472	0.000	(0)
	AlF2+	3.172e-011	2.530e-011	-10.499	-10.597	-0.098	(0)
	CdF+	2.987e-011	2.119e-011	-10.525	-10.674	-0.149	(0)
	PbF+	4.498e-012	3.190e-012	-11.347	-11.496	-0.149	(0)
	UO2F+	3.543e-012	2.513e-012	-11.451	-11.600	-0.149	(0)
	AlF4-	2.277e-012	1.792e-012	-11.643	-11.747	-0.104	(0)
	AlF+2	1.482e-012	5.997e-013	-11.829	-12.222	-0.393	(0)
	HF2-	1.130e-012	8.737e-013	-11.947	-12.059	-0.112	(0)
	UO2F2	7.679e-013	7.679e-013	-12.115	-12.115	0.000	(0)
	AgF	4.073e-013	4.073e-013	-12.390	-12.390	0.000	(0)
	BF2 (OH) 2-	3.036e-013	2.302e-013	-12.518	-12.638	-0.120	(0)
	CrF+2	4.324e-014	1.095e-014	-13.364	-13.961	-0.597	(0)
	UO2F3-	2.881e-014	2.044e-014	-13.540	-13.690	-0.149	(0)
	PbF2	6.652e-015	6.652e-015	-14.177	-14.177	0.000	(0)
	CdF2	4.480e-015	4.480e-015	-14.349	-14.349	0.000	(0)
	UO2F4-2	6.794e-017	1.720e-017	-16.168	-16.764	-0.597	(0)
	VO2F	1.928e-017	1.928e-017	-16.715	-16.715	0.000	(0)
	H2F2	1.260e-017	1.260e-017	-16.900	-16.900	0.000	(0)
	PbF3-	1.885e-018	1.337e-018	-17.725	-17.874	-0.149	(0)
	FeF2+	1.716e-018	1.360e-018	-17.766	-17.866	-0.101	(0)
	FeF+2	1.214e-018	4.798e-019	-17.916	-18.319	-0.403	(0)
	VO2F2-	1.045e-018	7.415e-019	-17.981	-18.130	-0.149	(0)
	FeF3	2.034e-019	2.034e-019	-18.692	-18.692	0.000	(0)
	BF3OH-	1.734e-019	1.315e-019	-18.761	-18.881	-0.120	(0)
	VOF+	1.739e-020	1.233e-020	-19.760	-19.909	-0.149	(0)
	VO2F3-2	3.871e-021	9.800e-022	-20.412	-21.009	-0.597	(0)
	VOF2	4.900e-022	4.900e-022	-21.310	-21.310	0.000	(0)
	PbF4-2	2.678e-022	6.779e-023	-21.572	-22.169	-0.597	(0)
	VOF3-	2.597e-024	1.842e-024	-23.586	-23.735	-0.149	(0)
	HgF+	2.223e-024	1.577e-024	-23.653	-23.802	-0.149	(0)
	BF4-	1.253e-024	9.497e-025	-23.902	-24.022	-0.120	(0)
	VO2F4-3	1.124e-024	5.109e-026	-23.949	-25.292	-1.342	(0)
	Sb (OH) 2F	7.830e-025	7.830e-025	-24.106	-24.106	0.000	(0)
	SbOF	7.709e-025	7.709e-025	-24.113	-24.113	0.000	(0)
	VOF4-2	3.112e-027	7.878e-028	-26.507	-27.104	-0.597	(0)
	UF3+	1.032e-035	7.319e-036	-34.986	-35.136	-0.149	(0)
	UF2+2	1.722e-036	4.359e-037	-35.764	-36.361	-0.597	(0)
	UF4	8.503e-038	8.503e-038	-37.070	-37.070	0.000	(0)
	UF+3	7.189e-039	3.268e-040	-38.143	-39.486	-1.342	(0)
	UF5-	5.033e-040	3.570e-040	-39.298	-39.447	-0.149	(0)
	UF6-2	0.000e+000	0.000e+000	-40.346	-40.942	-0.597	(0)
Fe (2)		3.328e-012					
	Fe+2	2.142e-012	5.423e-013	-11.669	-12.266	-0.597	(0)

FeSO4	1.163e-012	1.163e-012	-11.934	-11.934	0.000	(0)
FeOH+	1.978e-014	1.569e-014	-13.704	-13.804	-0.101	(0)
FeHCO3+	2.946e-015	2.369e-015	-14.531	-14.625	-0.095	(0)
Fe (OH) 2	9.056e-018	9.056e-018	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	2.624e-018	2.081e-018	-17.581	-17.682	-0.101	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.189	-160.189	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.439	-236.588	-0.149	(0)
Fe (3)	1.151e-009					
Fe (OH) 2+	6.869e-010	5.478e-010	-9.163	-9.261	-0.098	(0)
Fe (OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.627e-011	2.893e-011	-10.440	-10.539	-0.098	(0)
FeOH+2	4.902e-015	1.938e-015	-14.310	-14.713	-0.403	(0)
FeF2+	1.716e-018	1.360e-018	-17.766	-17.866	-0.101	(0)
FeF+2	1.214e-018	4.798e-019	-17.916	-18.319	-0.403	(0)
FeSO4+	5.105e-019	4.048e-019	-18.292	-18.393	-0.101	(0)
FeF3	2.034e-019	2.034e-019	-18.692	-18.692	0.000	(0)
Fe (SO4) 2-	1.066e-019	7.561e-020	-18.972	-19.121	-0.149	(0)
Fe+3	3.442e-020	4.130e-021	-19.463	-20.384	-0.921	(0)
FeCl+2	7.293e-022	2.883e-022	-21.137	-21.540	-0.403	(0)
FeCl2+	3.754e-024	2.977e-024	-23.425	-23.526	-0.101	(0)
FeHSeO3+2	3.021e-024	7.647e-025	-23.520	-24.116	-0.597	(0)
Fe2 (OH) 2+4	3.028e-026	1.243e-028	-25.519	-27.905	-2.386	(0)
FeNO3+2	4.995e-027	1.264e-027	-26.301	-26.898	-0.597	(0)
FeCl3	6.881e-028	6.881e-028	-27.162	-27.162	0.000	(0)
Fe3 (OH) 4+5	5.275e-033	9.847e-037	-32.278	-36.007	-3.729	(0)
H (0)	3.956e-029					
H2	1.978e-029	2.017e-029	-28.704	-28.695	0.009	(0)
Hg (0)	5.512e-010					
Hg	5.512e-010	5.512e-010	-9.259	-9.259	0.000	(0)
Hg (1)	1.187e-021					
Hg2+2	5.934e-022	1.502e-022	-21.227	-21.823	-0.597	(0)
Hg (2)	2.724e-012					
Hg (OH) 2	1.311e-012	1.338e-012	-11.882	-11.874	0.009	(0)
HgClOH	1.191e-012	1.191e-012	-11.924	-11.924	0.000	(0)
HgCl2	2.145e-013	2.145e-013	-12.669	-12.669	0.000	(0)
HgCl3-	6.989e-015	4.958e-015	-14.156	-14.305	-0.149	(0)
HgCO3	5.647e-016	5.647e-016	-15.248	-15.248	0.000	(0)
HgCl4-2	1.802e-016	4.562e-017	-15.744	-16.341	-0.597	(0)
HgCl+	2.610e-017	1.851e-017	-16.583	-16.733	-0.149	(0)
HgOH+	1.637e-017	1.161e-017	-16.786	-16.935	-0.149	(0)
Hg (CO3) 2-2	8.292e-018	2.099e-018	-17.081	-17.678	-0.597	(0)
Hg (NH3) 2+2	3.645e-019	9.227e-020	-18.438	-19.035	-0.597	(0)
HgHCO3+	2.052e-019	1.455e-019	-18.688	-18.837	-0.149	(0)
Hg (OH) 3-	1.725e-019	1.224e-019	-18.763	-18.912	-0.149	(0)
HgNH3+2	1.910e-020	4.834e-021	-19.719	-20.316	-0.597	(0)
Hg+2	1.586e-021	4.014e-022	-20.800	-21.396	-0.597	(0)
HgSO4	9.181e-022	9.181e-022	-21.037	-21.037	0.000	(0)
HgF+	2.223e-024	1.577e-024	-23.653	-23.802	-0.149	(0)
Hg (NH3) 3+2	2.770e-026	7.011e-027	-25.558	-26.154	-0.597	(0)
HgNO3+	6.397e-030	4.538e-030	-29.194	-29.343	-0.149	(0)
Hg (NH3) 4+2	4.199e-033	1.063e-033	-32.377	-32.973	-0.597	(0)
Hg (NO3) 2	5.774e-038	5.774e-038	-37.239	-37.239	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-138.333	-138.482	-0.149	(0)
HgS2-2	0.000e+000	0.000e+000	-138.735	-139.331	-0.597	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.947	-139.947	0.000	(0)
K	4.707e-003					
K+	4.435e-003	3.504e-003	-2.353	-2.455	-0.102	(0)
KSO4-	2.717e-004	2.167e-004	-3.566	-3.664	-0.098	(0)
KCrO4-	5.536e-017	3.927e-017	-16.257	-16.406	-0.149	(0)
Mg	9.987e-003					
Mg+2	6.136e-003	2.391e-003	-2.212	-2.621	-0.409	(0)
MgSO4	3.801e-003	3.801e-003	-2.420	-2.420	0.000	(0)
MgF+	3.613e-005	2.843e-005	-4.442	-4.546	-0.104	(0)
MgHCO3+	1.088e-005	8.491e-006	-4.963	-5.071	-0.108	(0)
MgCO3	2.338e-006	2.338e-006	-5.631	-5.631	0.000	(0)
MgOH+	8.546e-007	6.917e-007	-6.068	-6.160	-0.092	(0)
MgH2BO3+	1.592e-007	1.207e-007	-6.798	-6.918	-0.120	(0)
Mn (2)	3.270e-004					

Mn+2	2.339e-004	5.920e-005	-3.631	-4.228	-0.597	(0)
MnSO4	9.196e-005	9.196e-005	-4.036	-4.036	0.000	(0)
MnHCO3+	5.169e-007	4.099e-007	-6.287	-6.387	-0.101	(0)
MnF+	3.149e-007	2.497e-007	-6.502	-6.603	-0.101	(0)
MnCl+	2.173e-007	1.723e-007	-6.663	-6.764	-0.101	(0)
MnOH+	1.363e-007	1.081e-007	-6.866	-6.966	-0.101	(0)
MnCl2	5.625e-010	5.625e-010	-9.250	-9.250	0.000	(0)
MnNO3+	4.050e-012	2.873e-012	-11.393	-11.542	-0.149	(0)
MnSeO4	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
MnCl3-	4.516e-013	3.581e-013	-12.345	-12.446	-0.101	(0)
Mn (OH) 3-	4.447e-016	3.527e-016	-15.352	-15.453	-0.101	(0)
Mn (NO3) 2	2.209e-019	2.209e-019	-18.656	-18.656	0.000	(0)
Mn (OH) 4-2	2.093e-021	8.274e-022	-20.679	-21.082	-0.403	(0)
MnSe	0.000e+000	0.000e+000	-40.682	-40.682	0.000	(0)
Mn (3)	1.807e-024					
Mn+3	1.807e-024	2.168e-025	-23.743	-24.664	-0.921	(0)
Mn (6)	1.893e-040					
MnO4-2	1.893e-040	0.000e+000	-39.723	-40.126	-0.403	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-44.468	-44.584	-0.116	(0)
Mo	1.441e-006					
MoO4-2	1.441e-006	5.614e-007	-5.841	-6.251	-0.409	(0)
HMoO4-	2.180e-010	1.546e-010	-9.662	-9.811	-0.149	(0)
H2MoO4	1.567e-014	1.567e-014	-13.805	-13.805	0.000	(0)
Ag2MoO4	4.978e-025	4.978e-025	-24.303	-24.303	0.000	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-43.568	-44.911	-1.342	(0)
Mo7O24-6	0.000e+000	0.000e+000	-48.264	-53.634	-5.370	(0)
HMo7O24-5	0.000e+000	0.000e+000	-51.377	-55.106	-3.729	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-55.796	-58.183	-2.386	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-61.453	-62.795	-1.342	(0)
N (-3)	6.852e-007					
NH4+	6.111e-007	4.633e-007	-6.214	-6.334	-0.120	(0)
NH4SO4-	5.469e-008	4.337e-008	-7.262	-7.363	-0.101	(0)
NH3	1.909e-008	1.909e-008	-7.719	-7.719	0.000	(0)
CaNH3+2	2.674e-010	6.769e-011	-9.573	-10.169	-0.597	(0)
CuNH3+2	2.630e-011	6.659e-012	-10.580	-11.177	-0.597	(0)
NiNH3+2	4.539e-012	1.149e-012	-11.343	-11.940	-0.597	(0)
Co (NH3) +2	6.827e-013	1.728e-013	-12.166	-12.762	-0.597	(0)
AgNH3+	8.409e-014	5.964e-014	-13.075	-13.224	-0.149	(0)
BaNH3+2	5.702e-016	1.444e-016	-15.244	-15.841	-0.597	(0)
Ag (NH3) 2+	1.305e-017	9.253e-018	-16.885	-17.034	-0.149	(0)
Ni (NH3) 2+2	1.252e-017	3.170e-018	-16.902	-17.499	-0.597	(0)
Ca (NH3) 2+2	2.032e-018	5.143e-019	-17.692	-18.289	-0.597	(0)
Co (NH3) 2+2	5.558e-019	1.407e-019	-18.255	-18.852	-0.597	(0)
Hg (NH3) 2+2	3.645e-019	9.227e-020	-18.438	-19.035	-0.597	(0)
HgNH3+2	1.910e-020	4.834e-021	-19.719	-20.316	-0.597	(0)
Co (NH3) 3+2	1.336e-025	3.381e-026	-24.874	-25.471	-0.597	(0)
Hg (NH3) 3+2	2.770e-026	7.011e-027	-25.558	-26.154	-0.597	(0)
Co (NH3) 4+2	1.338e-032	3.386e-033	-31.874	-32.470	-0.597	(0)
Hg (NH3) 4+2	4.199e-033	1.063e-033	-32.377	-32.973	-0.597	(0)
Cr (NH3) 5OH+2	1.117e-039	2.828e-040	-38.952	-39.549	-0.597	(0)
Co (NH3) 5+2	4.237e-040	1.073e-040	-39.373	-39.970	-0.597	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-46.984	-47.580	-0.597	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-47.159	-48.501	-1.342	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-49.439	-50.036	-0.597	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.363	-56.512	-0.149	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-60.721	-61.318	-0.597	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-61.418	-62.015	-0.597	(0)
N (3)	4.237e-005					
NO2-	4.237e-005	3.245e-005	-4.373	-4.489	-0.116	(0)
CuNO2+	1.633e-010	1.159e-010	-9.787	-9.936	-0.149	(0)
CoNO2+	2.428e-011	1.722e-011	-10.615	-10.764	-0.149	(0)
AgNO2	1.038e-011	1.038e-011	-10.984	-10.984	0.000	(0)
Cu (NO2) 2	3.847e-014	3.847e-014	-13.415	-13.415	0.000	(0)
Ag (NO2) 2-	7.353e-016	5.216e-016	-15.134	-15.283	-0.149	(0)
N (5)	3.914e-008					
NO3-	3.875e-008	3.062e-008	-7.412	-7.514	-0.102	(0)
CaNO3+	3.845e-010	2.727e-010	-9.415	-9.564	-0.149	(0)

MnNO3+	4.050e-012	2.873e-012	-11.393	-11.542	-0.149	(0)
ZnNO3+	2.996e-013	2.125e-013	-12.523	-12.673	-0.149	(0)
NiNO3+	1.215e-014	8.622e-015	-13.915	-14.064	-0.149	(0)
CoNO3+	5.152e-015	3.654e-015	-14.288	-14.437	-0.149	(0)
CuNO3+	4.653e-015	3.301e-015	-14.332	-14.481	-0.149	(0)
BaNO3+	2.593e-015	1.839e-015	-14.586	-14.735	-0.149	(0)
CdNO3+	1.722e-015	1.222e-015	-14.764	-14.913	-0.149	(0)
PbNO3+	2.728e-016	1.935e-016	-15.564	-15.713	-0.149	(0)
AgNO3	3.722e-017	3.722e-017	-16.429	-16.429	0.000	(0)
Mn (NO3) 2	2.209e-019	2.209e-019	-18.656	-18.656	0.000	(0)
UO2NO3+	1.480e-020	1.050e-020	-19.830	-19.979	-0.149	(0)
Zn (NO3) 2	1.298e-021	1.298e-021	-20.887	-20.887	0.000	(0)
Co (NO3) 2	2.276e-022	2.276e-022	-21.643	-21.643	0.000	(0)
Cd (NO3) 2	1.875e-023	1.875e-023	-22.727	-22.727	0.000	(0)
Cu (NO3) 2	1.272e-023	1.272e-023	-22.895	-22.895	0.000	(0)
Pb (NO3) 2	1.006e-023	1.006e-023	-22.997	-22.997	0.000	(0)
CrNO3+2	3.446e-024	8.724e-025	-23.463	-24.059	-0.597	(0)
VO2NO3	1.606e-024	1.606e-024	-23.794	-23.794	0.000	(0)
FeNO3+2	4.995e-027	1.264e-027	-26.301	-26.898	-0.597	(0)
HgNO3+	6.397e-030	4.538e-030	-29.194	-29.343	-0.149	(0)
Hg (NO3) 2	5.774e-038	5.774e-038	-37.239	-37.239	0.000	(0)
Na	1.861e-002					
Na+	1.778e-002	1.405e-002	-1.750	-1.852	-0.102	(0)
NaSO4-	8.262e-004	6.590e-004	-3.083	-3.181	-0.098	(0)
NaHCO3	2.741e-006	2.741e-006	-5.562	-5.562	0.000	(0)
NaF	9.391e-007	9.391e-007	-6.027	-6.027	0.000	(0)
NaCO3-	3.855e-007	3.075e-007	-6.414	-6.512	-0.098	(0)
NaH2BO3	3.241e-008	3.241e-008	-7.489	-7.489	0.000	(0)
NaCrO4-	2.968e-016	2.106e-016	-15.527	-15.677	-0.149	(0)
Ni	4.979e-007					
Ni+2	2.877e-007	1.121e-007	-6.541	-6.950	-0.409	(0)
NiSO4	1.954e-007	1.954e-007	-6.709	-6.709	0.000	(0)
NiHCO3+	6.762e-009	4.796e-009	-8.170	-8.319	-0.149	(0)
NiCO3	4.917e-009	4.917e-009	-8.308	-8.308	0.000	(0)
NiOH+	1.446e-009	1.026e-009	-8.840	-8.989	-0.149	(0)
NiCl+	9.347e-010	6.630e-010	-9.029	-9.178	-0.149	(0)
NiF+	4.206e-010	2.984e-010	-9.376	-9.525	-0.149	(0)
Ni (SO4) 2-2	2.233e-010	5.652e-011	-9.651	-10.248	-0.597	(0)
Ni (OH) 2	5.920e-011	5.920e-011	-10.228	-10.228	0.000	(0)
NiNH3+2	4.539e-012	1.149e-012	-11.343	-11.940	-0.597	(0)
Ni (OH) 3-	6.065e-014	4.302e-014	-13.217	-13.366	-0.149	(0)
NiNO3+	1.215e-014	8.622e-015	-13.915	-14.064	-0.149	(0)
NiCl2	7.716e-015	7.716e-015	-14.113	-14.113	0.000	(0)
NiSeO4	4.579e-015	4.579e-015	-14.339	-14.339	0.000	(0)
Ni (NH3) 2+2	1.252e-017	3.170e-018	-16.902	-17.499	-0.597	(0)
O (0)	2.437e-035					
O2	1.218e-035	1.243e-035	-34.914	-34.906	0.009	(0)
Pb	6.162e-009					
PbSO4	1.828e-009	1.828e-009	-8.738	-8.738	0.000	(0)
PbCO3	1.510e-009	1.510e-009	-8.821	-8.821	0.000	(0)
PbOH+	1.100e-009	7.799e-010	-8.959	-9.108	-0.149	(0)
Pb+2	1.096e-009	4.273e-010	-8.960	-9.369	-0.409	(0)
Pb (SO4) 2-2	3.801e-010	9.623e-011	-9.420	-10.017	-0.597	(0)
PbHCO3+	1.553e-010	1.102e-010	-9.809	-9.958	-0.149	(0)
PbCl+	4.940e-011	3.504e-011	-10.306	-10.455	-0.149	(0)
Pb (CO3) 2-2	2.022e-011	5.119e-012	-10.694	-11.291	-0.597	(0)
Pb (OH) 2	1.792e-011	1.792e-011	-10.747	-10.747	0.000	(0)
PbF+	4.498e-012	3.190e-012	-11.347	-11.496	-0.149	(0)
PbCl2	3.618e-013	3.618e-013	-12.442	-12.442	0.000	(0)
Pb (OH) 3-	1.836e-014	1.302e-014	-13.736	-13.885	-0.149	(0)
PbF2	6.652e-015	6.652e-015	-14.177	-14.177	0.000	(0)
PbCl3-	4.694e-016	3.329e-016	-15.328	-15.478	-0.149	(0)
PbNO3+	2.728e-016	1.935e-016	-15.564	-15.713	-0.149	(0)
Pb2OH+3	1.162e-016	5.282e-018	-15.935	-17.277	-1.342	(0)
Pb (OH) 4-2	9.156e-018	2.318e-018	-17.038	-17.635	-0.597	(0)
PbF3-	1.885e-018	1.337e-018	-17.725	-17.874	-0.149	(0)
PbCl4-2	1.390e-018	3.518e-019	-17.857	-18.454	-0.597	(0)
Pb3 (OH) 4+2	1.082e-020	2.738e-021	-19.966	-20.562	-0.597	(0)

PbF4-2	2.678e-022	6.779e-023	-21.572	-22.169	-0.597	(0)
Pb(NO3)2	1.006e-023	1.006e-023	-22.997	-22.997	0.000	(0)
Pb4(OH)4+4	2.263e-024	9.294e-027	-23.645	-26.032	-2.386	(0)
Pb(HS)2	0.000e+000	0.000e+000	-150.972	-150.972	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-227.959	-228.108	-0.149	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.437	-73.437	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.178	-78.327	-0.149	(0)
HS-	0.000e+000	0.000e+000	-78.287	-78.436	-0.149	(0)
H2S	0.000e+000	0.000e+000	-79.275	-79.275	0.000	(0)
S5-2	0.000e+000	0.000e+000	-79.346	-79.943	-0.597	(0)
S6-2	0.000e+000	0.000e+000	-79.862	-80.459	-0.597	(0)
S4-2	0.000e+000	0.000e+000	-79.942	-80.538	-0.597	(0)
S3-2	0.000e+000	0.000e+000	-80.748	-81.344	-0.597	(0)
S2-2	0.000e+000	0.000e+000	-81.764	-82.360	-0.597	(0)
S-2	0.000e+000	0.000e+000	-87.474	-87.878	-0.403	(0)
HgHS2-	0.000e+000	0.000e+000	-138.333	-138.482	-0.149	(0)
HgS2-2	0.000e+000	0.000e+000	-138.735	-139.331	-0.597	(0)
Hg(HS)2	0.000e+000	0.000e+000	-139.947	-139.947	0.000	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-147.038	-147.456	-0.418	(0)
Ag(HS)S4-2	0.000e+000	0.000e+000	-147.154	-147.398	-0.244	(0)
ZnS(HS)-	0.000e+000	0.000e+000	-147.613	-147.762	-0.149	(0)
Ag(HS)2-	0.000e+000	0.000e+000	-147.624	-147.773	-0.149	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.791	-148.186	-0.395	(0)
Ag(S4)2-3	0.000e+000	0.000e+000	-148.548	-148.979	-0.431	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.884	-149.290	-0.406	(0)
Cd(HS)2	0.000e+000	0.000e+000	-149.560	-149.560	0.000	(0)
Zn(HS)2	0.000e+000	0.000e+000	-149.611	-149.611	0.000	(0)
Pb(HS)2	0.000e+000	0.000e+000	-150.972	-150.972	0.000	(0)
Fe(HS)2	0.000e+000	0.000e+000	-160.189	-160.189	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-216.728	-216.877	-0.149	(0)
Zn(HS)3-	0.000e+000	0.000e+000	-224.619	-224.768	-0.149	(0)
Cd(HS)3-	0.000e+000	0.000e+000	-225.947	-226.096	-0.149	(0)
ZnS(HS)2-2	0.000e+000	0.000e+000	-226.292	-226.889	-0.597	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-227.959	-228.108	-0.149	(0)
Fe(HS)3-	0.000e+000	0.000e+000	-236.439	-236.588	-0.149	(0)
Cd(HS)4-2	0.000e+000	0.000e+000	-301.740	-302.337	-0.597	(0)
Zn(HS)4-2	0.000e+000	0.000e+000	-304.067	-304.664	-0.597	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.408	-317.005	-0.597	(0)
S(6)	3.305e-002					
SO4-2	2.242e-002	8.736e-003	-1.649	-2.059	-0.409	(0)
CaSO4	5.637e-003	5.637e-003	-2.249	-2.249	0.000	(0)
MgSO4	3.801e-003	3.801e-003	-2.420	-2.420	0.000	(0)
NaSO4-	8.262e-004	6.590e-004	-3.083	-3.181	-0.098	(0)
KSO4-	2.717e-004	2.167e-004	-3.566	-3.664	-0.098	(0)
MnSO4	9.196e-005	9.196e-005	-4.036	-4.036	0.000	(0)
ZnSO4	5.281e-006	5.281e-006	-5.277	-5.277	0.000	(0)
Zn(SO4)2-2	1.587e-006	4.018e-007	-5.799	-6.396	-0.597	(0)
NiSO4	1.954e-007	1.954e-007	-6.709	-6.709	0.000	(0)
CoSO4	1.313e-007	1.313e-007	-6.882	-6.882	0.000	(0)
CuSO4	6.823e-008	6.823e-008	-7.166	-7.166	0.000	(0)
NH4SO4-	5.469e-008	4.337e-008	-7.262	-7.363	-0.101	(0)
CdSO4	2.584e-008	2.584e-008	-7.588	-7.588	0.000	(0)
HSO4-	1.502e-008	1.181e-008	-7.823	-7.928	-0.104	(0)
Cd(SO4)2-2	1.203e-008	3.045e-009	-7.920	-8.516	-0.597	(0)
PbSO4	1.828e-009	1.828e-009	-8.738	-8.738	0.000	(0)
Pb(SO4)2-2	3.801e-010	9.623e-011	-9.420	-10.017	-0.597	(0)
AgSO4-	3.761e-010	2.668e-010	-9.425	-9.574	-0.149	(0)
Ni(SO4)2-2	2.233e-010	5.652e-011	-9.651	-10.248	-0.597	(0)
CrOHSO4	2.148e-011	2.148e-011	-10.668	-10.668	0.000	(0)
UO2SO4	2.272e-012	2.272e-012	-11.644	-11.644	0.000	(0)
FeSO4	1.163e-012	1.163e-012	-11.934	-11.934	0.000	(0)
UO2(SO4)2-2	1.033e-012	2.616e-013	-11.986	-12.582	-0.597	(0)
AlSO4+	4.878e-014	3.838e-014	-13.312	-13.416	-0.104	(0)
CrSO4+	1.875e-014	1.330e-014	-13.727	-13.876	-0.149	(0)
Al(SO4)2-	4.566e-015	3.593e-015	-14.340	-14.445	-0.104	(0)
VO2SO4-	3.050e-017	2.164e-017	-16.516	-16.665	-0.149	(0)
FeSO4+	5.105e-019	4.048e-019	-18.292	-18.393	-0.101	(0)

Fe (SO4) 2-	1.066e-019	7.561e-020	-18.972	-19.121	-0.149	(0)
Cr2 (OH) 2SO4+2	7.949e-020	2.012e-020	-19.100	-19.696	-0.597	(0)
VOSO4	4.669e-020	4.669e-020	-19.331	-19.331	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.044e-020	1.044e-020	-19.981	-19.981	0.000	(0)
HgSO4	9.181e-022	9.181e-022	-21.037	-21.037	0.000	(0)
CrO3SO4-2	1.967e-023	4.980e-024	-22.706	-23.303	-0.597	(0)
VSO4+	1.311e-034	9.296e-035	-33.883	-34.032	-0.149	(0)
U (SO4) 2	3.730e-039	3.730e-039	-38.428	-38.428	0.000	(0)
USO4+2	2.124e-040	0.000e+000	-39.673	-40.270	-0.597	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-56.363	-56.512	-0.149	(0)
Sb (3)	6.752e-019					
Sb (OH) 3	3.414e-019	3.414e-019	-18.467	-18.467	0.000	(0)
HSbO2	3.337e-019	3.337e-019	-18.477	-18.477	0.000	(0)
SbO2-	5.505e-023	3.905e-023	-22.259	-22.408	-0.149	(0)
Sb (OH) 4-	3.147e-023	2.232e-023	-22.502	-22.651	-0.149	(0)
Sb (OH) 2F	7.830e-025	7.830e-025	-24.106	-24.106	0.000	(0)
SbOF	7.709e-025	7.709e-025	-24.113	-24.113	0.000	(0)
Sb (OH) 2+	1.620e-025	1.149e-025	-24.791	-24.940	-0.149	(0)
SbO+	5.591e-026	3.966e-026	-25.253	-25.402	-0.149	(0)
Sb2S4-2	0.000e+000	0.000e+000	-316.408	-317.005	-0.597	(0)
Sb (5)	5.116e-007					
SbO3-	5.111e-007	3.625e-007	-6.292	-6.441	-0.149	(0)
Sb (OH) 6-	5.347e-010	4.225e-010	-9.272	-9.374	-0.102	(0)
SbO2+	2.811e-023	1.994e-023	-22.551	-22.700	-0.149	(0)
Se (-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	1.662e-039	1.179e-039	-38.779	-38.929	-0.149	(0)
MnSe	0.000e+000	0.000e+000	-40.682	-40.682	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.897	-42.897	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.473	-46.070	-0.597	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-81.219	-83.605	-2.386	(0)
Se (4)	1.784e-007					
HSeO3-	9.878e-008	7.007e-008	-7.005	-7.154	-0.149	(0)
SeO3-2	7.962e-008	2.016e-008	-7.099	-7.696	-0.597	(0)
H2SeO3	4.137e-013	4.137e-013	-12.383	-12.383	0.000	(0)
AgSeO3-	2.795e-014	1.983e-014	-13.554	-13.703	-0.149	(0)
Cd (SeO3) 2-2	1.669e-017	4.225e-018	-16.778	-17.374	-0.597	(0)
Ag (SeO3) 2-3	7.872e-020	3.578e-021	-19.104	-20.446	-1.342	(0)
FeHSeO3+2	3.021e-024	7.647e-025	-23.520	-24.116	-0.597	(0)
Se (6)	2.255e-010					
SeO4-2	2.241e-010	8.732e-011	-9.650	-10.059	-0.409	(0)
MnSeO4	1.391e-012	1.391e-012	-11.857	-11.857	0.000	(0)
ZnSeO4	3.737e-014	3.737e-014	-13.427	-13.427	0.000	(0)
NiSeO4	4.579e-015	4.579e-015	-14.339	-14.339	0.000	(0)
CoSeO4	3.296e-015	3.296e-015	-14.482	-14.482	0.000	(0)
CdSeO4	2.052e-016	2.052e-016	-15.688	-15.688	0.000	(0)
HSeO4-	8.539e-017	6.057e-017	-16.069	-16.218	-0.149	(0)
Zn (SeO4) 2-2	1.307e-023	3.309e-024	-22.884	-23.480	-0.597	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.178	-58.521	-1.342	(0)
U (4)	3.237e-019					
U (OH) 5-	3.236e-019	2.295e-019	-18.490	-18.639	-0.149	(0)
U (OH) 4	1.332e-022	1.332e-022	-21.875	-21.875	0.000	(0)
U (OH) 3+	9.513e-027	6.748e-027	-26.022	-26.171	-0.149	(0)
U (OH) 2+2	1.708e-031	4.323e-032	-30.768	-31.364	-0.597	(0)
UF3+	1.032e-035	7.319e-036	-34.986	-35.136	-0.149	(0)
UF2+2	1.722e-036	4.359e-037	-35.764	-36.361	-0.597	(0)
UOH+3	6.207e-037	2.822e-038	-36.207	-37.550	-1.342	(0)
UF4	8.503e-038	8.503e-038	-37.070	-37.070	0.000	(0)
UF+3	7.189e-039	3.268e-040	-38.143	-39.486	-1.342	(0)
U (SO4) 2	3.730e-039	3.730e-039	-38.428	-38.428	0.000	(0)
UF5-	5.033e-040	3.570e-040	-39.298	-39.447	-0.149	(0)
USO4+2	2.124e-040	0.000e+000	-39.673	-40.270	-0.597	(0)
UF6-2	0.000e+000	0.000e+000	-40.346	-40.942	-0.597	(0)
U+4	0.000e+000	0.000e+000	-42.424	-44.811	-2.386	(0)
UCl+3	0.000e+000	0.000e+000	-44.405	-45.747	-1.342	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-156.063	-168.145	-12.082	(0)
U (5)	1.801e-015					

UO2+	1.801e-015	1.277e-015	-14.745	-14.894	-0.149	(0)
U(6)	3.459e-007					
UO2 (CO3) 3-4	2.705e-007	1.111e-009	-6.568	-8.954	-2.386	(0)
UO2 (CO3) 2-2	7.450e-008	1.886e-008	-7.128	-7.724	-0.597	(0)
UO2CO3	8.041e-010	8.041e-010	-9.095	-9.095	0.000	(0)
UO2OH+	2.216e-011	1.572e-011	-10.654	-10.804	-0.149	(0)
UO2F+	3.543e-012	2.513e-012	-11.451	-11.600	-0.149	(0)
UO2SO4	2.272e-012	2.272e-012	-11.644	-11.644	0.000	(0)
UO2 (SO4) 2-2	1.033e-012	2.616e-013	-11.986	-12.582	-0.597	(0)
UO2F2	7.679e-013	7.679e-013	-12.115	-12.115	0.000	(0)
UO2+2	4.409e-013	1.718e-013	-12.356	-12.765	-0.409	(0)
UO2F3-	2.881e-014	2.044e-014	-13.540	-13.690	-0.149	(0)
(UO2) 3 (OH) 5+	3.640e-015	2.582e-015	-14.439	-14.588	-0.149	(0)
(UO2) 2 (OH) 2+2	1.620e-015	4.100e-016	-14.791	-15.387	-0.597	(0)
UO2Cl+	9.081e-016	6.441e-016	-15.042	-15.191	-0.149	(0)
UO2F4-2	6.794e-017	1.720e-017	-16.168	-16.764	-0.597	(0)
UO2NO3+	1.480e-020	1.050e-020	-19.830	-19.979	-0.149	(0)
V(2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-42.350	-42.499	-0.149	(0)
V+2	0.000e+000	0.000e+000	-43.274	-43.871	-0.597	(0)
V(3)	6.978e-015					
V (OH) 3	6.978e-015	6.978e-015	-14.156	-14.156	0.000	(0)
V (OH) 2+	8.807e-026	6.247e-026	-25.055	-25.204	-0.149	(0)
VOH+2	3.243e-029	8.210e-030	-28.489	-29.086	-0.597	(0)
V+3	4.959e-034	2.254e-035	-33.305	-34.647	-1.342	(0)
VSO4+	1.311e-034	9.296e-035	-33.883	-34.032	-0.149	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-54.496	-55.838	-1.342	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-54.985	-57.371	-2.386	(0)
V(4)	4.103e-018					
V (OH) 3+	3.962e-018	2.810e-018	-17.402	-17.551	-0.149	(0)
VO+2	7.666e-020	1.941e-020	-19.115	-19.712	-0.597	(0)
VOSO4	4.669e-020	4.669e-020	-19.331	-19.331	0.000	(0)
VOF+	1.739e-020	1.233e-020	-19.760	-19.909	-0.149	(0)
VOF2	4.900e-022	4.900e-022	-21.310	-21.310	0.000	(0)
VOC1+	1.774e-022	1.258e-022	-21.751	-21.900	-0.149	(0)
VOF3-	2.597e-024	1.842e-024	-23.586	-23.735	-0.149	(0)
VOF4-2	3.112e-027	7.878e-028	-26.507	-27.104	-0.597	(0)
H2V2O4+2	1.568e-030	3.968e-031	-29.805	-30.401	-0.597	(0)
V(5)	5.759e-008					
H2VO4-	3.817e-008	2.708e-008	-7.418	-7.567	-0.149	(0)
HVO4-2	1.941e-008	4.914e-009	-7.712	-8.309	-0.597	(0)
H3VO4	3.747e-012	3.747e-012	-11.426	-11.426	0.000	(0)
HV2O7-3	9.931e-013	4.515e-014	-12.003	-13.345	-1.342	(0)
H3V2O7-	9.247e-013	6.559e-013	-12.034	-12.183	-0.149	(0)
VO4-3	3.915e-014	1.780e-015	-13.407	-14.750	-1.342	(0)
V2O7-4	2.138e-014	8.780e-017	-13.670	-16.057	-2.386	(0)
V3O9-3	4.590e-016	2.086e-017	-15.338	-16.681	-1.342	(0)
VO2+	1.313e-016	1.037e-016	-15.882	-15.984	-0.102	(0)
VO2SO4-	3.050e-017	2.164e-017	-16.516	-16.665	-0.149	(0)
VO2F	1.928e-017	1.928e-017	-16.715	-16.715	0.000	(0)
VO2F2-	1.045e-018	7.415e-019	-17.981	-18.130	-0.149	(0)
V4O12-4	5.742e-020	2.358e-022	-19.241	-21.627	-2.386	(0)
VO2F3-2	3.871e-021	9.800e-022	-20.412	-21.009	-0.597	(0)
VO2NO3	1.606e-024	1.606e-024	-23.794	-23.794	0.000	(0)
VO2F4-3	1.124e-024	5.109e-026	-23.949	-25.292	-1.342	(0)
V10O28-6	0.000e+000	0.000e+000	-52.828	-58.197	-5.370	(0)
HV10O28-5	0.000e+000	0.000e+000	-54.141	-57.870	-3.729	(0)
H2V10O28-4	0.000e+000	0.000e+000	-58.134	-60.521	-2.386	(0)
Zn	1.454e-005					
Zn+2	7.091e-006	2.763e-006	-5.149	-5.559	-0.409	(0)
ZnSO4	5.281e-006	5.281e-006	-5.277	-5.277	0.000	(0)
Zn (SO4) 2-2	1.587e-006	4.018e-007	-5.799	-6.396	-0.597	(0)
ZnOH+	2.831e-007	2.008e-007	-6.548	-6.697	-0.149	(0)
ZnCO3	1.869e-007	1.869e-007	-6.728	-6.728	0.000	(0)
ZnHCO3+	4.275e-008	3.032e-008	-7.369	-7.518	-0.149	(0)
Zn (OH) 2	2.313e-008	2.313e-008	-7.636	-7.636	0.000	(0)
ZnCl+	2.056e-008	1.604e-008	-7.687	-7.795	-0.108	(0)
ZnOHCl	1.526e-008	1.526e-008	-7.816	-7.816	0.000	(0)

ZnF+	8.236e-009	5.842e-009	-8.084	-8.233	-0.149	(0)
Zn(OH) 3-	1.187e-010	8.423e-011	-9.925	-10.075	-0.149	(0)
ZnCl2	5.878e-011	5.878e-011	-10.231	-10.231	0.000	(0)
ZnNO3+	2.996e-013	2.125e-013	-12.523	-12.673	-0.149	(0)
ZnCl3-	1.383e-013	1.079e-013	-12.859	-12.967	-0.108	(0)
ZnSeO4	3.737e-014	3.737e-014	-13.427	-13.427	0.000	(0)
Zn(OH) 4-2	9.626e-015	2.437e-015	-14.017	-14.613	-0.597	(0)
ZnCl4-2	3.155e-016	1.247e-016	-15.501	-15.904	-0.403	(0)
Zn(NO3) 2	1.298e-021	1.298e-021	-20.887	-20.887	0.000	(0)
Zn(SeO4) 2-2	1.307e-023	3.309e-024	-22.884	-23.480	-0.597	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-147.613	-147.762	-0.149	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-149.611	-149.611	0.000	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-224.619	-224.768	-0.149	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-226.292	-226.889	-0.597	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-304.067	-304.664	-0.597	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-50.94	-44.65	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-39.40	-34.89	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-46.63	-34.89	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-65.94	-48.00	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-53.40	-33.37	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-27.59	-27.19	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.18	-22.73	0.45	(NH4) 2SeO4
Acanthite	-51.99	-88.21	-36.22	Ag2S
Ag2CO3	-12.47	-23.56	-11.09	Ag2CO3
Ag2CrO4	-20.56	-32.15	-11.59	Ag2CrO4
Ag2HVO4	-11.52	-10.04	1.48	Ag2HVO4
Ag2MoO4	-12.33	-23.88	-11.55	Ag2MoO4
Ag2O	-14.49	-1.91	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.87	-19.69	-4.82	Ag2SO4
Ag3AsO3	-27.82	-25.67	2.16	Ag3AsO3
Ag3AsO4	-16.23	-19.02	-2.79	Ag3AsO4
Ag3H2VO5	-16.18	-11.00	5.18	Ag3H2VO5
AgF: 4H2O	-13.84	-12.79	1.05	AgF: 4H2O
Agmetal	-0.22	-13.73	-13.51	Ag
AgVO3	-9.85	-9.08	0.77	AgVO3
Al(OH) 3 (am)	-2.47	8.33	10.80	Al(OH) 3
Al2(MoO4) 3	-51.61	-49.25	2.37	Al2(MoO4) 3
Al2O3	-3.00	16.66	19.65	Al2O3
Al4(OH) 10SO4	-7.16	15.54	22.70	Al4(OH) 10SO4
AlAsO4: 2H2O	-12.62	-7.82	4.80	AlAsO4: 2H2O
AlOHSO4	-6.22	-9.45	-3.23	AlOHSO4
AlSb	-152.40	-86.77	65.62	AlSb
Alunite	-3.76	-5.16	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-3.64	-11.43	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-5.06	4.54	9.60	MgCO3:Mg(OH) 2: 3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.39	6.00	7.39	Cu2(OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2: 8H2O	-16.60	7.79	24.39	Ba(OH) 2: 8H2O
Ba2V2O7: 2H2O	-16.53	-0.66	15.87	Ba2V2O7: 2H2O
Ba3(AsO4) 2	0.00	-8.91	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2: 4H2O	-25.81	7.13	32.94	Ba3(VO4) 2: 4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-7.21	-14.17	-6.96	BaMoO4

Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.05	-7.22	1.83	BaSeO3
BaSeO4	-10.52	-17.98	-7.46	BaSeO4
Bianchite	-5.86	-7.62	-1.76	ZnSO4:6H2O
Birnessite	-6.41	11.68	18.09	MnO2
Bixbyite	-1.53	-2.18	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	-0.25	8.33	8.58	AlOOH
Breithauptite	-55.04	-73.56	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.75	13.10	16.84	Mg(OH)2
Bunsenite	-3.68	8.77	12.45	NiO
Ca(VO3)2	-8.74	-3.08	5.66	Ca(VO3)2
Ca2V2O7	-7.42	10.08	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.47	10.08	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-15.71	23.25	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-16.61	23.25	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-293.67	-150.70	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-9.19	-27.10	-17.91	Hg2Cl2
CaMoO4	-0.85	-8.80	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.66	-1.85	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.59	-12.61	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.94	-1.10	9.84	Cd(BO2)2
Cd(OH)2	-5.83	7.82	13.64	Cd(OH)2
Cd(OH)2(am)	-5.91	7.82	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-18.81	-12.10	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.88	5.68	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-14.90	13.50	28.40	Cd4(OH)6SO4
CdCl2	-12.51	-13.17	-0.66	CdCl2
CdCl2:1H2O	-11.48	-13.17	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.26	-13.17	-1.91	CdCl2:2.5H2O
CdF2	-14.64	-15.85	-1.21	CdF2
Cdmetal(alpha)	-31.24	-17.73	13.51	Cd
Cdmetal(gamma)	-31.34	-17.73	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.21	-2.68	3.54	CdOHCl
CdSb	-74.16	-74.51	-0.35	CdSb
CdSe	-18.77	-38.97	-20.20	CdSe
CdSeO4:2H2O	-16.11	-17.96	-1.85	CdSeO4:2H2O
CdSO4	-9.79	-9.96	-0.17	CdSO4
CdSO4:1H2O	-8.23	-9.96	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.09	-9.96	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.70	-11.45	-9.75	AgCl
Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-52.47	-98.17	-45.69	HgS
Claudetite	-88.12	-91.18	-3.06	As4O6
Clausthalite	-13.34	-40.44	-27.10	PbSe
Co(BO2)2	-27.39	-0.32	27.07	Co(BO2)2
Co(OH)2	-4.50	8.59	13.09	Co(OH)2
Co(OH)3	-8.73	-11.03	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-19.55	-6.52	13.03	Co3(AsO4)2
Co3O4	-2.98	-13.47	-10.50	Co3O4
CoCl2	-20.66	-12.40	8.27	CoCl2
CoCl2:6H2O	-14.94	-12.40	2.54	CoCl2:6H2O
CoCO3	-3.07	-13.05	-9.98	CoCO3
CoF2	-13.48	-15.07	-1.60	CoF2
CoF3	-45.08	-46.53	-1.46	CoF3

CoFe2O4	18.51	14.98	-3.53	CoFe2O4
CoMoO4	-5.61	-13.37	-7.76	CoMoO4
CoO	-4.99	8.59	13.59	CoO
CoS (alpha)	-70.26	-77.70	-7.44	CoS
CoS (beta)	-66.63	-77.70	-11.07	CoS
CoSe	-21.99	-38.19	-16.20	CoSe
CoSeO3	-7.74	-6.42	1.32	CoSeO3
CoSeO4:6H2O	-15.66	-17.19	-1.53	CoSeO4:6H2O
CoSO4	-11.98	-9.18	2.80	CoSO4
CoSO4:6H2O	-6.71	-9.19	-2.47	CoSO4:6H2O
Cotunnite	-9.86	-14.64	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.09	-31.99	14.09	CrCl2
CrCl3	-47.78	-32.66	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-10.81	-44.65	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.80	22.41	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.12	1.13	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-53.80	-88.68	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.65	-50.45	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.00	-100.60	-42.59	Cu3Sb
Cu3Se2	-25.50	-88.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.64	-13.72	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe
CuSe2	-26.41	-59.78	-33.37	CuSe2
CuSeO3:2H2O	-7.28	-6.76	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.09	-17.53	-2.44	CuSeO4:5H2O
CuSO4	-12.47	-9.53	2.94	CuSO4
Diaspore	1.46	8.33	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.49	-17.03	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.06	-17.03	-17.09	CaMg (CO3) 2
Epsomite	-2.56	-4.68	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.08	0.04	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.08	-12.80	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.18	-8.63	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.03	-38.66	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.43	-18.52	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.98	-64.58	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-32.34	-43.34	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2

Galena	-65.98	-79.95	-13.97	PbS
Gibbsite	0.04	8.33	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.61	-7.62	-2.01	ZnSO4:7H2O
Greenockite	-64.12	-78.48	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.72	2.95	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.09	-21.97	-12.88	H2MoO4
H2S (g)	-78.29	-86.30	-8.01	H2S
H2Se (g)	-41.83	-46.79	-4.96	H2Se
Halite	-6.09	-4.49	1.60	NaCl
Hausmannite	-1.02	60.01	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-2.78	20.11	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.82	-259.53	-73.71	Hg (CH3) 2
Hg (g)	-7.95	-15.83	-7.87	Hg
Hg (OH) 2	-8.38	-11.87	-3.50	Hg (OH) 2
Hg2 (g)	-16.70	-31.65	-14.96	Hg2
Hg2 (OH) 2	-11.37	-6.11	5.26	Hg2 (OH) 2
Hg2CO3	-11.70	-27.75	-16.05	Hg2CO3
Hg2CrO4	-27.64	-36.34	-8.70	Hg2CrO4
Hg2F2	-19.41	-29.77	-10.36	Hg2F2
Hg2S	-80.72	-92.40	-11.68	Hg2S
Hg2SeO3	-16.46	-21.12	-4.66	Hg2SeO3
Hg2SO4	-17.75	-23.88	-6.13	Hg2SO4
Hg3O2CO3	-27.58	-57.27	-29.68	Hg3O2CO3
HgCl (g)	-33.04	-13.55	19.50	HgCl
HgCl2	-11.60	-32.86	-21.26	HgCl2
HgF (g)	-47.56	-14.89	32.68	HgF
HgF2 (g)	-48.11	-35.54	12.57	HgF2
Hgmetal (l)	-2.37	-15.83	-13.45	Hg
HgSe	-2.97	-58.66	-55.69	HgSe
HgSeO3	-14.46	-26.89	-12.43	HgSeO3
HgSO4	-20.23	-29.65	-9.42	HgSO4
Huntite	-4.17	-34.13	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.48	-24.25	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.35	-21.11	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.66	-21.83	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.77	-20.57	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.43	-49.67	-17.24	K2Cr2O7
K2CrO4	-18.92	-19.43	-0.51	K2CrO4
K2MoO4	-14.42	-11.16	3.26	K2MoO4
K2SeO4	-14.24	-14.97	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-4.65	-5.08	-0.43	PbO:PbSO4
Laurionite	-4.77	-4.15	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.35	6.35	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.62	19.48	16.86	Fe2MgO4
Magnesite	-1.09	-8.55	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.08	24.26	25.34	MnOOH
Massicot	-6.55	6.35	12.89	PbO
Matlockite	-7.01	-15.98	-8.97	PbClF
Melanothallite	-19.00	-12.74	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-53.07	-98.17	-45.09	HgS
Mg (OH) 2 (active)	-5.70	13.10	18.79	Mg (OH) 2
Mg (VO3) 2	-14.44	-3.16	11.28	Mg (VO3) 2
Mg2Sb3	-269.93	-195.25	74.68	Mg2Sb3
Mg2V2O7	-16.42	9.94	26.36	Mg2V2O7
MgCr2O4	-5.46	10.74	16.20	MgCr2O4

MgCrO4	-22.52	-17.14	5.38	MgCrO4
MgF2	-2.44	-10.57	-8.13	MgF2
MgMoO4	-7.02	-8.87	-1.85	MgMoO4
MgSeO3:6H2O	-4.98	-1.92	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.48	-12.68	-1.20	MgSeO4:6H2O
Minium	-28.93	44.59	73.52	Pb3O4
Mirabilite	-4.65	-5.77	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-9.66	-4.76	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.79	-55.50	-5.71	Mn2 (SO4) 3
Mn2Sb	-145.97	-84.89	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.33	2.17	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.22	-9.50	2.72	MnCl2:4H2O
MnS (grn)	-74.98	-74.81	0.17	MnS
MnS (pnk)	-78.15	-74.81	3.34	MnS
MnSb	-93.28	-96.19	-2.91	MnSb
MnSe	-38.80	-35.30	3.50	MnSe
MnSeO3	-4.65	-3.52	1.13	MnSeO3
MnSeO3:2H2O	-4.51	-3.52	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.24	-14.29	-2.05	MnSeO4:5H2O
MnSO4	-8.87	-6.29	2.58	MnSO4
Monteponite	-7.29	7.82	15.10	CdO
Montroydite	-8.23	-11.87	-3.64	HgO
MoO3	-13.97	-21.97	-8.00	MoO3
Morenosite	-6.87	-9.01	-2.14	NiSO4:7H2O
MoS2	-149.84	-220.10	-70.26	MoS2
Na-Jarosite	-8.77	-19.97	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.57	-48.46	-9.90	Na2Cr2O7
Na2CrO4	-21.16	-18.23	2.93	Na2CrO4
Na2Mo2O7	-15.33	-31.92	-16.60	Na2Mo2O7
Na2MoO4	-11.45	-9.96	1.49	Na2MoO4
Na2MoO4:2H2O	-11.18	-9.96	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.30	-3.00	10.30	Na2SeO3:5H2O
Na2SeO4	-15.04	-13.76	1.28	Na2SeO4
Na3Sb	-171.53	-77.08	94.45	Na3Sb
Na3VO4	-26.79	9.89	36.68	Na3VO4
Na4V2O7	-29.63	7.77	37.40	Na4V2O7
Nantokite	-5.60	-12.33	-6.73	CuCl
NaSb	-86.71	-63.55	23.17	NaSb
Natron	-8.33	-9.64	-1.31	Na2CO3:10H2O
NaVO3	-5.98	-2.12	3.86	NaVO3
Nesquehonite	-3.88	-8.55	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.03	8.77	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-21.70	-6.00	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.71	17.29	32.00	Ni4 (OH) 6SO4
NiCO3	-6.01	-12.88	-6.87	NiCO3
NiMoO4	-2.06	-13.20	-11.14	NiMoO4
NiS (alpha)	-71.93	-77.53	-5.60	NiS
NiS (beta)	-66.43	-77.53	-11.10	NiS
NiS (gamma)	-64.73	-77.53	-12.80	NiS
NiSe	-20.32	-38.02	-17.70	NiSe
NiSeO3:2H2O	-9.06	-6.25	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.49	-17.01	-1.52	NiSeO4:6H2O
Nsutite	-5.82	11.68	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.48	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb (BO2) 2	-9.09	-2.57	6.52	Pb (BO2) 2
Pb (OH) 2	-1.80	6.35	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-57.64	-66.40	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-6.59	2.20	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.49	12.70	26.19	Pb2O (OH) 2
Pb2O3	-22.80	38.24	61.04	Pb2O3
Pb2OCO3	-8.39	-8.95	-0.56	Pb2OCO3
Pb2V2O7	-1.66	-3.56	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.05	-13.25	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-3.35	2.79	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.62	-2.60	11.02	Pb3O2CO3
Pb3O2SO4	-9.42	1.27	10.69	Pb3O2SO4

Pb4 (OH) 6SO4	-13.49	7.61	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-14.26	7.62	21.88	Pb4O3SO4
PbCrO4	-11.29	-23.89	-12.60	PbCrO4
PbF2	-9.88	-17.32	-7.44	PbF2
Pbmetal	-23.44	-19.20	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.63	6.35	12.98	PbO:0.33H2O
PbSeO4	-12.59	-19.43	-6.84	PbSeO4
Periclase	-8.49	13.10	21.58	MgO
Phosgenite	-10.13	-29.94	-19.81	PbCl2:PbCO3
Plattnerite	-17.71	31.89	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.09	-143.59	-18.51	FeS2
Pyrochroite	-3.70	11.49	15.19	Mn (OH) 2
Pyrolusite	-4.35	37.03	41.38	MnO2
Realgar	-102.12	-121.86	-19.75	AsS
Retgersite	-6.97	-9.01	-2.04	NiSO4:6H2O
Rhodochrosite	0.42	-10.16	-10.58	MnCO3
Rutherfordine	-4.19	-18.69	-14.50	UO2CO3
Sb (OH) 3	-11.36	-18.47	-7.11	Sb (OH) 3
Sb2O4	-14.79	-11.39	3.40	Sb2O4
Sb2O5	-24.79	-34.46	-9.67	Sb2O5
Sb2Se3	-109.54	-177.29	-67.76	Sb2Se3
Sb4O6 (cubic)	-55.60	-73.86	-18.26	Sb4O6
Sb4O6 (orth)	-55.96	-73.86	-17.90	Sb4O6
SbCl3	-50.52	-49.95	0.57	SbCl3
SbF3	-43.74	-53.97	-10.23	SbF3
Sbmetal	-45.09	-56.78	-11.69	Sb
SbO2	-2.18	-30.00	-27.82	SbO2
Schoepite	-3.04	2.95	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.13	-21.24	-7.11	Se
Semetal (hex)	-13.53	-21.24	-7.71	Se
Senarmontite	-24.57	-36.93	-12.37	Sb2O3
SeO2	-15.14	-15.01	0.12	SeO2
SeO3	-46.82	-25.78	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.49	-11.49	-10.00	ZnCO3
Sphalerite	-64.69	-76.14	-11.45	ZnS
Spinel	-7.09	29.75	36.85	MgAl2O4
Stibnite	-245.36	-295.82	-50.46	Sb2S3
Sulfur	-58.61	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.09	-5.76	0.32	Na2SO4
Thermonatrite	-10.27	-9.64	0.64	Na2CO3:H2O
Tyuyamunite	-1.26	2.82	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.12	10.96	21.08	U3O8
U3Sb4	-572.91	-420.53	152.38	U3Sb4
U4O9	-24.94	-27.96	-3.02	U4O9
UF4	-31.17	-60.71	-29.54	UF4
UF4:2.5H2O	-27.99	-60.71	-32.72	UF4:2.5H2O
UO2 (am)	-14.31	-13.38	0.93	UO2
UO2 (NO3) 2	-39.94	-27.79	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-32.65	-27.79	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.18	-27.79	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-29.84	-27.80	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.66	2.95	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.58	-22.83	-2.25	UO2SeO4:4H2O
UO3	-4.75	2.95	7.70	UO3
Uraninite	-8.71	-13.38	-4.67	UO2
USb2	-216.82	-187.25	29.58	USb2
V (OH) 3	-18.66	-11.07	7.59	V (OH) 3
V2O5	-14.89	-16.25	-1.36	V2O5
V3O5	-39.37	-37.53	1.84	V3O5
V4O7	-48.71	-41.52	7.19	V4O7
V6O13	-38.98	-99.84	-60.86	V6O13
Valentinite	-28.45	-36.93	-8.48	Sb2O3
VC12	-63.71	-44.83	18.87	VC12
VC13	-65.99	-42.56	23.43	VC13

VF4	-66.26	-51.33	14.93	VF4
Vmetal	-93.41	-49.39	44.03	V
VO	-38.60	-23.84	14.76	VO
VO(OH)2	-9.15	-4.00	5.15	VO(OH)2
VO2Cl	-21.46	-18.62	2.84	VO2Cl
VOC1	-32.72	-21.57	11.15	VOC1
VOC12	-37.74	-24.98	12.76	VOC12
VOSO4	-25.38	-21.77	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.19	-76.14	-8.95	ZnS
Zincite	-1.18	10.16	11.33	ZnO
Zincosite	-11.55	-7.62	3.93	ZnSO4
Zn(BO2)2	-7.05	1.24	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-23.91	-20.59	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.04	10.16	12.20	Zn(OH)2
Zn(OH)2(am)	-2.32	10.16	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.60	10.16	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.38	10.16	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.58	10.16	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.96	2.54	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.37	9.82	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.47	-1.82	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.99	-5.08	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.54	22.86	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.70	29.80	38.50	Zn5(OH)8Cl2
ZnCl2	-17.88	-10.83	7.05	ZnCl2
ZnCO3:1H2O	-1.23	-11.49	-10.26	ZnCO3:1H2O
ZnF2	-12.97	-13.51	-0.53	ZnF2
Znmetal	-41.17	-15.39	25.79	Zn
ZnMoO4	-1.68	-11.81	-10.13	ZnMoO4
ZnO(active)	-1.03	10.16	11.19	ZnO
ZnS(am)	-67.08	-76.14	-9.05	ZnS
ZnSb	-83.18	-72.17	11.01	ZnSb
ZnSe	-22.23	-36.63	-14.40	ZnSe
ZnSeO4:6H2O	-14.10	-15.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.98	-7.62	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 30.

```

      REACTION 106
          H2O      -1
      27.72 moles      ## Removes x m3 water, but solute mass remains the
same
      USE solution 115
      Save Solution 116
      END

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 115. Solution after simulation 29.
Using reaction 106.

Reaction 106.

2.772e+001 moles of the following reaction have been added:

Reactant	Relative moles
----------	----------------

H2O -1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.503e-008	1.082e-008
Al	8.710e-007	3.764e-007
As	2.079e-009	8.986e-010
B	7.854e-005	3.394e-005
Ba	6.643e-008	2.871e-008
C	1.067e-003	4.612e-004
Ca	2.780e-002	1.202e-002
Cd	1.612e-007	6.966e-008
Cl	6.307e-003	2.726e-003
Co	9.397e-007	4.061e-007
Cr	3.507e-009	1.515e-009
Cu	1.101e-006	4.757e-007
F	3.785e-004	1.636e-004
Fe	2.488e-009	1.075e-009
Hg	1.194e-009	5.160e-010
K	1.015e-002	4.385e-003
Mg	2.153e-002	9.304e-003
Mn	7.049e-004	3.046e-004
Mo	3.106e-006	1.342e-006
N	9.289e-005	4.014e-005
Na	4.011e-002	1.734e-002
Ni	1.073e-006	4.638e-007
Pb	1.328e-008	5.740e-009
S	7.125e-002	3.079e-002
Sb	1.103e-006	4.766e-007
Se	3.851e-007	1.664e-007
U	7.456e-007	3.222e-007
V	1.241e-007	5.365e-008
Zn	3.134e-005	1.354e-005

-----Description of solution-----

	pH	=	7.788	Charge balance
	pe	=	5.011	Adjusted to redox
equilibrium	Activity of water	=	0.997	
	Ionic strength	=	1.676e-001	
	Mass of water (kg)	=	4.322e-001	
	Total alkalinity (eq/kg)	=	1.085e-003	
	Total CO2 (mol/kg)	=	1.067e-003	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	1.635e-005	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.02	
	Iterations	=	8	
	Total H	=	4.797675e+001	
	Total O	=	2.411283e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	8.556e-007	6.170e-007	-6.068	-6.210	-0.142	(0)
H+	2.158e-008	1.628e-008	-7.666	-7.788	-0.122	0.00
H2O	5.551e+001	9.974e-001	1.744	-0.001	0.000	18.07
Ag	2.503e-008					

AgCl	1.340e-008	1.340e-008	-7.873	-7.873	0.000	(0)
AgCl2-	8.975e-009	5.550e-009	-8.047	-8.256	-0.209	(0)
Ag+	1.829e-009	1.380e-009	-8.738	-8.860	-0.122	(0)
AgSO4-	6.264e-010	3.873e-010	-9.203	-9.412	-0.209	(0)
AgCl3-2	1.609e-010	2.352e-011	-9.793	-10.628	-0.835	(0)
AgNO2	1.869e-011	1.869e-011	-10.728	-10.728	0.000	(0)
AgCl4-3	1.729e-011	2.284e-013	-10.762	-12.641	-1.879	(0)
AgF	6.611e-013	6.611e-013	-12.180	-12.180	0.000	(0)
AgNH3+	1.413e-013	8.740e-014	-12.850	-13.059	-0.209	(0)
AgOH	8.512e-014	8.512e-014	-13.070	-13.070	0.000	(0)
AgH2BO3	5.922e-014	5.922e-014	-13.228	-13.228	0.000	(0)
AgSeO3-	4.099e-014	2.535e-014	-13.387	-13.596	-0.209	(0)
Ag2Se	1.298e-014	1.298e-014	-13.887	-13.887	0.000	(0)
Ag (NO2) 2-	3.034e-015	1.876e-015	-14.518	-14.727	-0.209	(0)
AgNO3	7.574e-017	7.574e-017	-16.121	-16.121	0.000	(0)
Ag (NH3) 2+	3.565e-017	2.204e-017	-16.448	-16.657	-0.209	(0)
Ag (OH) 2-	8.301e-018	5.133e-018	-17.081	-17.290	-0.209	(0)
Ag (SeO3) 2-3	4.911e-019	6.488e-021	-18.309	-20.188	-1.879	(0)
Ag2MoO4	7.240e-025	7.240e-025	-24.140	-24.140	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.417	-73.417	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-80.396	-83.737	-3.341	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.107	-147.384	-0.277	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.480	-147.689	-0.209	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.561	-149.035	-0.475	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.902	-149.346	-0.445	(0)
Al	8.710e-007					
Al (OH) 4-	8.606e-007	6.379e-007	-6.065	-6.195	-0.130	(0)
Al (OH) 3	8.212e-009	8.212e-009	-8.086	-8.086	0.000	(0)
Al (OH) 2+	8.812e-010	6.670e-010	-9.055	-9.176	-0.121	(0)
AlF3	7.674e-010	7.674e-010	-9.115	-9.115	0.000	(0)
AlF2+	4.222e-010	3.195e-010	-9.375	-9.495	-0.121	(0)
AlF4-	9.899e-011	7.337e-011	-10.004	-10.135	-0.130	(0)
AlF+2	1.282e-011	4.208e-012	-10.892	-11.376	-0.484	(0)
AlOH+2	4.146e-012	1.361e-012	-11.382	-11.866	-0.484	(0)
AlSO4+	3.250e-013	2.409e-013	-12.488	-12.618	-0.130	(0)
Al (SO4) 2-	4.900e-014	3.632e-014	-13.310	-13.440	-0.130	(0)
Al+3	2.793e-014	2.206e-015	-13.554	-14.656	-1.102	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-40.499	-42.378	-1.879	(0)
As (3)	2.581e-023					
H3AsO3	2.456e-023	2.456e-023	-22.610	-22.610	0.000	(0)
H2AsO3-	1.252e-024	7.739e-025	-23.903	-24.111	-0.209	(0)
HAsO3-2	2.966e-028	4.336e-029	-27.528	-28.363	-0.835	(0)
H4AsO3+	3.203e-031	1.981e-031	-30.494	-30.703	-0.209	(0)
AsO3-3	7.772e-033	1.027e-034	-32.109	-33.989	-1.879	(0)
As (5)	2.079e-009					
HAsO4-2	2.005e-009	2.930e-010	-8.698	-9.533	-0.835	(0)
H2AsO4-	7.035e-011	4.350e-011	-10.153	-10.362	-0.209	(0)
AsO4-3	4.309e-012	5.693e-014	-11.366	-13.245	-1.879	(0)
H3AsO4	1.184e-016	1.230e-016	-15.927	-15.910	0.017	(0)
B	7.854e-005					
H3BO3	7.304e-005	7.591e-005	-4.136	-4.120	0.017	(0)
H2BO3-	3.881e-006	2.709e-006	-5.411	-5.567	-0.156	(0)
CaH2BO3+	9.801e-007	6.839e-007	-6.009	-6.165	-0.156	(0)
MgH2BO3+	5.091e-007	3.553e-007	-6.293	-6.449	-0.156	(0)
NaH2BO3	1.207e-007	1.207e-007	-6.918	-6.918	0.000	(0)
BF (OH) 3-	8.281e-009	5.778e-009	-8.082	-8.238	-0.156	(0)
H5 (BO3) 2-	2.508e-010	1.750e-010	-9.601	-9.757	-0.156	(0)
BF2 (OH) 2-	2.756e-012	1.923e-012	-11.560	-11.716	-0.156	(0)
BaH2BO3+	2.570e-012	1.794e-012	-11.590	-11.746	-0.156	(0)
H8 (BO3) 3-	1.904e-012	1.329e-012	-11.720	-11.877	-0.156	(0)
AgH2BO3	5.922e-014	5.922e-014	-13.228	-13.228	0.000	(0)
BF3OH-	3.338e-018	2.329e-018	-17.477	-17.633	-0.156	(0)
BF4-	5.113e-023	3.568e-023	-22.291	-22.448	-0.156	(0)
Ba	6.643e-008					
Ba+2	6.622e-008	2.143e-008	-7.179	-7.669	-0.490	(0)
BaHCO3+	1.803e-010	1.382e-010	-9.744	-9.859	-0.116	(0)
BaCO3	2.138e-011	2.138e-011	-10.670	-10.670	0.000	(0)
BaH2BO3+	2.570e-012	1.794e-012	-11.590	-11.746	-0.156	(0)

BaOH+	7.694e-014	5.772e-014	-13.114	-13.239	-0.125	(0)
BaNO3+	1.201e-014	7.424e-015	-13.921	-14.129	-0.209	(0)
BaNH3+2	2.870e-015	4.195e-016	-14.542	-15.377	-0.835	(0)
C (4)	1.067e-003					
HCO3-	8.923e-004	6.754e-004	-3.050	-3.170	-0.121	(0)
CaHCO3+	7.201e-005	5.518e-005	-4.143	-4.258	-0.116	(0)
MgHCO3+	3.574e-005	2.614e-005	-4.447	-4.583	-0.136	(0)
H2CO3	2.472e-005	2.472e-005	-4.607	-4.607	0.000	(0)
CaCO3	1.353e-005	1.353e-005	-4.869	-4.869	0.000	(0)
NaHCO3	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
MgCO3	6.120e-006	6.120e-006	-5.213	-5.213	0.000	(0)
CO3-2	6.011e-006	1.945e-006	-5.221	-5.711	-0.490	(0)
MnHCO3+	1.350e-006	1.013e-006	-5.870	-5.995	-0.125	(0)
NaCO3-	1.346e-006	1.019e-006	-5.871	-5.992	-0.121	(0)
UO2 (CO3) 3-4	7.223e-007	3.298e-010	-6.141	-9.482	-3.341	(0)
CuCO3	5.908e-007	5.908e-007	-6.229	-6.229	0.000	(0)
ZnCO3	3.884e-007	3.884e-007	-6.411	-6.411	0.000	(0)
ZnHCO3+	1.198e-007	7.410e-008	-6.921	-7.130	-0.209	(0)
NiHCO3+	2.348e-008	1.452e-008	-7.629	-7.838	-0.209	(0)
UO2 (CO3) 2-2	2.314e-008	3.383e-009	-7.636	-8.471	-0.835	(0)
Cu (CO3) 2-2	2.116e-008	3.093e-009	-7.674	-8.510	-0.835	(0)
NiCO3	1.265e-008	1.265e-008	-7.898	-7.898	0.000	(0)
CoHCO3+	8.127e-009	5.025e-009	-8.090	-8.299	-0.209	(0)
CuHCO3+	3.555e-009	2.198e-009	-8.449	-8.658	-0.209	(0)
PbCO3	3.277e-009	3.277e-009	-8.484	-8.484	0.000	(0)
CoCO3	3.145e-009	3.145e-009	-8.502	-8.502	0.000	(0)
CdCO3	6.221e-010	6.221e-010	-9.206	-9.206	0.000	(0)
PbHCO3+	4.549e-010	2.813e-010	-9.342	-9.551	-0.209	(0)
BaHCO3+	1.803e-010	1.382e-010	-9.744	-9.859	-0.116	(0)
Pb (CO3) 2-2	1.258e-010	1.839e-011	-9.900	-10.736	-0.835	(0)
UO2CO3	8.716e-011	8.716e-011	-10.060	-10.060	0.000	(0)
CdHCO3+	3.489e-011	2.158e-011	-10.457	-10.666	-0.209	(0)
BaCO3	2.138e-011	2.138e-011	-10.670	-10.670	0.000	(0)
Cd (CO3) 2-2	6.137e-012	8.971e-013	-11.212	-12.047	-0.835	(0)
FeHCO3+	1.481e-014	1.135e-014	-13.830	-13.945	-0.116	(0)
HgCO3	3.133e-015	3.133e-015	-14.504	-14.504	0.000	(0)
Hg (CO3) 2-2	1.319e-016	1.927e-017	-15.880	-16.715	-0.835	(0)
HgHCO3+	1.536e-018	9.497e-019	-17.814	-18.022	-0.209	(0)
Ca	2.780e-002					
CaSO4	1.414e-002	1.414e-002	-1.849	-1.849	0.000	(0)
Ca+2	1.356e-002	4.388e-003	-1.868	-2.358	-0.490	(0)
CaHCO3+	7.201e-005	5.518e-005	-4.143	-4.258	-0.116	(0)
CaCO3	1.353e-005	1.353e-005	-4.869	-4.869	0.000	(0)
CaF+	1.218e-005	9.136e-006	-4.914	-5.039	-0.125	(0)
CaH2BO3+	9.801e-007	6.839e-007	-6.009	-6.165	-0.156	(0)
CaOH+	7.049e-008	5.402e-008	-7.152	-7.267	-0.116	(0)
CaNO3+	1.551e-009	9.591e-010	-8.809	-9.018	-0.209	(0)
CaNH3+2	1.173e-009	1.714e-010	-8.931	-9.766	-0.835	(0)
Ca (NH3) 2+2	1.448e-017	2.117e-018	-16.839	-17.674	-0.835	(0)
Cd	1.612e-007					
Cd (SO4) 2-2	6.009e-008	8.784e-009	-7.221	-8.056	-0.835	(0)
CdSO4	4.628e-008	4.628e-008	-7.335	-7.335	0.000	(0)
Cd+2	4.336e-008	1.403e-008	-7.363	-7.853	-0.490	(0)
CdCl+	1.031e-008	6.374e-009	-7.987	-8.196	-0.209	(0)
CdCO3	6.221e-010	6.221e-010	-9.206	-9.206	0.000	(0)
CdOHC1	1.613e-010	1.613e-010	-9.792	-9.792	0.000	(0)
CdCl2	1.264e-010	1.264e-010	-9.898	-9.898	0.000	(0)
CdOH+	1.112e-010	6.877e-011	-9.954	-10.163	-0.209	(0)
CdF+	6.861e-011	4.242e-011	-10.164	-10.372	-0.209	(0)
CdHCO3+	3.489e-011	2.158e-011	-10.457	-10.666	-0.209	(0)
Cd (CO3) 2-2	6.137e-012	8.971e-013	-11.212	-12.047	-0.835	(0)
CdCl3-	6.133e-013	3.792e-013	-12.212	-12.421	-0.209	(0)
Cd (OH) 2	2.677e-013	2.677e-013	-12.572	-12.572	0.000	(0)
CdF2	1.615e-014	1.615e-014	-13.792	-13.792	0.000	(0)
CdNO3+	4.960e-015	3.067e-015	-14.304	-14.513	-0.209	(0)
Cd2OH+3	3.661e-016	4.837e-018	-15.436	-17.315	-1.879	(0)
CdSeO4	3.657e-016	3.657e-016	-15.437	-15.437	0.000	(0)
Cd (SeO3) 2-2	6.466e-017	9.452e-018	-16.189	-17.024	-0.835	(0)

Cd(OH) 3-	1.632e-017	1.009e-017	-16.787	-16.996	-0.209	(0)
Cd(NO3) 2	1.062e-022	1.062e-022	-21.974	-21.974	0.000	(0)
Cd(OH) 4-2	6.973e-024	1.019e-024	-23.157	-23.992	-0.835	(0)
CdHS+	0.000e+000	0.000e+000	-78.008	-78.216	-0.209	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-149.384	-149.384	0.000	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-225.646	-225.855	-0.209	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-301.196	-302.031	-0.835	(0)
C1	6.307e-003					
Cl-	6.306e-003	4.756e-003	-2.200	-2.323	-0.122	(0)
MnCl+	5.997e-007	4.499e-007	-6.222	-6.347	-0.125	(0)
ZnCl+	5.666e-008	4.145e-008	-7.247	-7.382	-0.136	(0)
ZnOHC1	3.348e-008	3.348e-008	-7.475	-7.475	0.000	(0)
AgCl	1.340e-008	1.340e-008	-7.873	-7.873	0.000	(0)
CdCl+	1.031e-008	6.374e-009	-7.987	-8.196	-0.209	(0)
AgCl2-	8.975e-009	5.550e-009	-8.047	-8.256	-0.209	(0)
NiCl+	3.432e-009	2.122e-009	-8.464	-8.673	-0.209	(0)
MnCl2	3.023e-009	3.023e-009	-8.520	-8.520	0.000	(0)
CoCl+	2.545e-009	1.574e-009	-8.594	-8.803	-0.209	(0)
CuCl2-	2.003e-009	1.465e-009	-8.698	-8.834	-0.136	(0)
CuCl	1.475e-009	1.475e-009	-8.831	-8.831	0.000	(0)
CuCl+	5.315e-010	3.888e-010	-9.275	-9.410	-0.136	(0)
ZnCl2	3.125e-010	3.125e-010	-9.505	-9.505	0.000	(0)
CdOHC1	1.613e-010	1.613e-010	-9.792	-9.792	0.000	(0)
AgCl3-2	1.609e-010	2.352e-011	-9.793	-10.628	-0.835	(0)
PbCl+	1.530e-010	9.459e-011	-9.815	-10.024	-0.209	(0)
CdCl2	1.264e-010	1.264e-010	-9.898	-9.898	0.000	(0)
AgCl4-3	1.729e-011	2.284e-013	-10.762	-12.641	-1.879	(0)
HgClOH	6.976e-012	6.976e-012	-11.156	-11.156	0.000	(0)
MnCl3-	5.278e-012	3.959e-012	-11.278	-11.402	-0.125	(0)
CuCl3-2	4.705e-012	1.490e-012	-11.327	-11.827	-0.499	(0)
HgCl2	3.045e-012	3.045e-012	-11.516	-11.516	0.000	(0)
PbCl2	2.010e-012	2.010e-012	-11.697	-11.697	0.000	(0)
ZnCl3-	1.614e-012	1.180e-012	-11.792	-11.928	-0.136	(0)
CuCl2	6.412e-013	6.412e-013	-12.193	-12.193	0.000	(0)
CdCl3-	6.133e-013	3.792e-013	-12.212	-12.421	-0.209	(0)
HgCl3-	2.342e-013	1.448e-013	-12.630	-12.839	-0.209	(0)
NiCl2	5.082e-014	5.082e-014	-13.294	-13.294	0.000	(0)
HgCl4-2	1.876e-014	2.742e-015	-13.727	-14.562	-0.835	(0)
ZnCl4-2	8.865e-015	2.807e-015	-14.052	-14.552	-0.499	(0)
PbCl3-	6.154e-015	3.805e-015	-14.211	-14.420	-0.209	(0)
HgCl+	2.066e-016	1.277e-016	-15.685	-15.894	-0.209	(0)
UO2Cl+	1.404e-016	8.682e-017	-15.853	-16.061	-0.209	(0)
CrCl+2	7.267e-017	1.062e-017	-16.139	-16.974	-0.835	(0)
PbCl4-2	5.659e-017	8.272e-018	-16.247	-17.082	-0.835	(0)
CuCl3-	3.890e-017	2.846e-017	-16.410	-16.546	-0.136	(0)
CrOHC12	5.925e-019	5.925e-019	-18.227	-18.227	0.000	(0)
CrCl2+	7.753e-021	4.794e-021	-20.111	-20.319	-0.209	(0)
FeCl+2	5.768e-021	1.827e-021	-20.239	-20.738	-0.499	(0)
CuCl4-2	2.142e-021	6.784e-022	-20.669	-21.169	-0.499	(0)
VOCl+	1.103e-021	6.819e-022	-20.957	-21.166	-0.209	(0)
FeCl2+	5.173e-023	3.881e-023	-22.286	-22.411	-0.125	(0)
CrO3Cl-	1.766e-025	1.092e-025	-24.753	-24.962	-0.209	(0)
FeCl3	1.846e-026	1.846e-026	-25.734	-25.734	0.000	(0)
CoCl+2	2.586e-034	3.780e-035	-33.587	-34.422	-0.835	(0)
UCl+3	0.000e+000	0.000e+000	-44.650	-46.529	-1.879	(0)
Co(NH3) 5Cl+2	0.000e+000	0.000e+000	-45.176	-46.011	-0.835	(0)
Cr(NH3) 6Cl+2	0.000e+000	0.000e+000	-47.198	-48.033	-0.835	(0)
Co(NH3) 6Cl+2	0.000e+000	0.000e+000	-59.399	-60.234	-0.835	(0)
Co(2)	9.397e-007					
Co+2	6.544e-007	9.566e-008	-6.184	-7.019	-0.835	(0)
CoSO4	2.685e-007	2.685e-007	-6.571	-6.571	0.000	(0)
CoHCO3+	8.127e-009	5.025e-009	-8.090	-8.299	-0.209	(0)
CoCO3	3.145e-009	3.145e-009	-8.502	-8.502	0.000	(0)
CoCl+	2.545e-009	1.574e-009	-8.594	-8.803	-0.209	(0)
CoOH+	1.905e-009	1.178e-009	-8.720	-8.929	-0.209	(0)
CoF+	9.332e-010	5.770e-010	-9.030	-9.239	-0.209	(0)
CoNO2+	7.067e-011	4.370e-011	-10.151	-10.360	-0.209	(0)
Co(OH) 2	5.772e-011	5.772e-011	-10.239	-10.239	0.000	(0)

Co (NH3) +2	2.441e-012	3.568e-013	-11.612	-12.448	-0.835	(0)
CoNO3+	1.695e-014	1.048e-014	-13.771	-13.980	-0.209	(0)
CoSeO4	6.710e-015	6.710e-015	-14.173	-14.173	0.000	(0)
Co (OH) 3-	1.149e-015	7.106e-016	-14.940	-15.148	-0.209	(0)
Co2OH+3	4.273e-016	5.646e-018	-15.369	-17.248	-1.879	(0)
CoOOH-	2.891e-016	1.787e-016	-15.539	-15.748	-0.209	(0)
Co (NH3) 2+2	3.231e-018	4.723e-019	-17.491	-18.326	-0.835	(0)
Co (NO3) 2	1.474e-021	1.474e-021	-20.832	-20.832	0.000	(0)
Co (OH) 4-2	4.754e-022	6.949e-023	-21.323	-22.158	-0.835	(0)
Co (NH3) 3+2	1.262e-024	1.845e-025	-23.899	-24.734	-0.835	(0)
Co4 (OH) 4+4	8.405e-025	3.838e-028	-24.075	-27.416	-3.341	(0)
Co (NH3) 4+2	2.055e-031	3.004e-032	-30.687	-31.522	-0.835	(0)
Co (NH3) 5+2	1.058e-038	1.547e-039	-37.975	-38.811	-0.835	(0)
Co (3)	8.379e-028					
CoOH+2	8.379e-028	1.225e-028	-27.077	-27.912	-0.835	(0)
Co+3	4.946e-034	3.906e-035	-33.306	-34.408	-1.102	(0)
CoCl+2	2.586e-034	3.780e-035	-33.587	-34.422	-0.835	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.176	-46.011	-0.835	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.629	-54.838	-0.209	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.086	-59.921	-0.835	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.399	-60.234	-0.835	(0)
Cr (2)	2.749e-026					
Cr+2	2.749e-026	4.019e-027	-25.561	-26.396	-0.835	(0)
Cr (3)	3.507e-009					
Cr (OH) 2+	2.828e-009	1.749e-009	-8.548	-8.757	-0.209	(0)
Cr (OH) 3	4.054e-010	4.054e-010	-9.392	-9.392	0.000	(0)
Cr (OH) +2	1.594e-010	2.329e-011	-9.798	-10.633	-0.835	(0)
CrOHSO4	7.777e-011	7.777e-011	-10.109	-10.109	0.000	(0)
CrO2-	1.918e-011	1.186e-011	-10.717	-10.926	-0.209	(0)
Cr (OH) 4-	1.610e-011	9.957e-012	-10.793	-11.002	-0.209	(0)
CrF+2	3.569e-013	5.217e-014	-12.447	-13.283	-0.835	(0)
Cr+3	1.306e-013	1.726e-015	-12.884	-14.763	-1.879	(0)
CrSO4+	9.169e-014	5.669e-014	-13.038	-13.246	-0.209	(0)
CrCl+2	7.267e-017	1.062e-017	-16.139	-16.974	-0.835	(0)
Cr2 (OH) 2SO4+2	1.120e-018	1.638e-019	-17.951	-18.786	-0.835	(0)
CrOHC12	5.925e-019	5.925e-019	-18.227	-18.227	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.369e-019	1.369e-019	-18.864	-18.864	0.000	(0)
CrCl2+	7.753e-021	4.794e-021	-20.111	-20.319	-0.209	(0)
CrNO3+2	3.567e-023	5.214e-024	-22.448	-23.283	-0.835	(0)
Cr (NH3) 5OH+2	4.936e-038	7.215e-039	-37.307	-38.142	-0.835	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-44.934	-46.813	-1.879	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.198	-48.033	-0.835	(0)
Cr (6)	1.463e-014					
CrO4-2	1.313e-014	4.248e-015	-13.882	-14.372	-0.490	(0)
NaCrO4-	9.602e-016	5.937e-016	-15.018	-15.226	-0.209	(0)
HCrO4-	3.619e-016	2.238e-016	-15.441	-15.650	-0.209	(0)
KCrO4-	1.777e-016	1.099e-016	-15.750	-15.959	-0.209	(0)
CrO3SO4-2	1.070e-022	1.565e-023	-21.970	-22.806	-0.835	(0)
H2CrO4	2.952e-024	2.952e-024	-23.530	-23.530	0.000	(0)
CrO3Cl-	1.766e-025	1.092e-025	-24.753	-24.962	-0.209	(0)
Cr2O7-2	1.191e-029	1.740e-030	-28.924	-29.759	-0.835	(0)
Cu (1)	3.881e-009					
CuCl2-	2.003e-009	1.465e-009	-8.698	-8.834	-0.136	(0)
CuCl	1.475e-009	1.475e-009	-8.831	-8.831	0.000	(0)
Cu+	3.983e-010	2.463e-010	-9.400	-9.609	-0.209	(0)
CuCl3-2	4.705e-012	1.490e-012	-11.327	-11.827	-0.499	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.926	-147.385	-0.459	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.684	-148.115	-0.431	(0)
Cu (2)	1.097e-006					
CuCO3	5.908e-007	5.908e-007	-6.229	-6.229	0.000	(0)
CuSO4	1.662e-007	1.662e-007	-6.779	-6.779	0.000	(0)
Cu+2	1.594e-007	5.158e-008	-6.798	-7.288	-0.490	(0)
CuOH+	1.376e-007	1.006e-007	-6.861	-6.997	-0.136	(0)
Cu (CO3) 2-2	2.116e-008	3.093e-009	-7.674	-8.510	-0.835	(0)
Cu (OH) 2	1.239e-008	1.239e-008	-7.907	-7.907	0.000	(0)
CuHCO3+	3.555e-009	2.198e-009	-8.449	-8.658	-0.209	(0)
Cu2 (OH) 2+2	1.740e-009	2.544e-010	-8.759	-9.594	-0.835	(0)
CuF+	1.004e-009	6.208e-010	-8.998	-9.207	-0.209	(0)

	CuNO2+	5.663e-010	3.501e-010	-9.247	-9.456	-0.209	(0)
	CuCl+	5.315e-010	3.888e-010	-9.275	-9.410	-0.136	(0)
	CuNH3+2	1.120e-010	1.638e-011	-9.951	-10.786	-0.835	(0)
	Cu(OH) 3-	2.536e-011	1.568e-011	-10.596	-10.805	-0.209	(0)
	CuCl2	6.412e-013	6.412e-013	-12.193	-12.193	0.000	(0)
	Cu(NO2) 2	2.323e-013	2.323e-013	-12.634	-12.634	0.000	(0)
	CuNO3+	1.823e-014	1.127e-014	-13.739	-13.948	-0.209	(0)
	Cu(OH) 4-2	5.209e-016	7.615e-017	-15.283	-16.118	-0.835	(0)
	CuCl3-	3.890e-017	2.846e-017	-16.410	-16.546	-0.136	(0)
	CuCl4-2	2.142e-021	6.784e-022	-20.669	-21.169	-0.499	(0)
	Cu(NO3) 2	9.810e-023	9.810e-023	-22.008	-22.008	0.000	(0)
	Cu(HS) 3-	0.000e+000	0.000e+000	-216.294	-216.503	-0.209	(0)
F		3.785e-004					
	F-	2.529e-004	1.908e-004	-3.597	-3.720	-0.122	(0)
	MgF+	1.092e-004	8.097e-005	-3.962	-4.092	-0.130	(0)
	CaF+	1.218e-005	9.136e-006	-4.914	-5.039	-0.125	(0)
	NaF	3.385e-006	3.385e-006	-5.470	-5.470	0.000	(0)
	MnF+	7.607e-007	5.706e-007	-6.119	-6.244	-0.125	(0)
	ZnF+	2.136e-008	1.321e-008	-7.670	-7.879	-0.209	(0)
	BF(OH) 3-	8.281e-009	5.778e-009	-8.082	-8.238	-0.156	(0)
	HF	4.593e-009	4.593e-009	-8.338	-8.338	0.000	(0)
	NiF+	1.351e-009	8.356e-010	-8.869	-9.078	-0.209	(0)
	CuF+	1.004e-009	6.208e-010	-8.998	-9.207	-0.209	(0)
	CoF+	9.332e-010	5.770e-010	-9.030	-9.239	-0.209	(0)
	AlF3	7.674e-010	7.674e-010	-9.115	-9.115	0.000	(0)
	AlF2+	4.222e-010	3.195e-010	-9.375	-9.495	-0.121	(0)
	AlF4-	9.899e-011	7.337e-011	-10.004	-10.135	-0.130	(0)
	CdF+	6.861e-011	4.242e-011	-10.164	-10.372	-0.209	(0)
	AlF+2	1.282e-011	4.208e-012	-10.892	-11.376	-0.484	(0)
	PbF+	1.219e-011	7.535e-012	-10.914	-11.123	-0.209	(0)
	HF2-	4.619e-012	3.331e-012	-11.335	-11.477	-0.142	(0)
	BF2(OH) 2-	2.756e-012	1.923e-012	-11.560	-11.716	-0.156	(0)
	AgF	6.611e-013	6.611e-013	-12.180	-12.180	0.000	(0)
	UO2F+	4.793e-013	2.964e-013	-12.319	-12.528	-0.209	(0)
	CrF+2	3.569e-013	5.217e-014	-12.447	-13.283	-0.835	(0)
	UO2F2	1.631e-013	1.631e-013	-12.788	-12.788	0.000	(0)
	PbF2	2.829e-014	2.829e-014	-13.548	-13.548	0.000	(0)
	CdF2	1.615e-014	1.615e-014	-13.792	-13.792	0.000	(0)
	UO2F3-	1.264e-014	7.813e-015	-13.898	-14.107	-0.209	(0)
	VO2F	8.255e-017	8.255e-017	-16.083	-16.083	0.000	(0)
	UO2F4-2	8.099e-017	1.184e-017	-16.092	-16.927	-0.835	(0)
	H2F2	5.651e-017	5.651e-017	-16.248	-16.248	0.000	(0)
	FeF2+	1.810e-017	1.358e-017	-16.742	-16.867	-0.125	(0)
	PbF3-	1.655e-017	1.023e-017	-16.781	-16.990	-0.209	(0)
	VO2F2-	9.247e-018	5.718e-018	-17.034	-17.243	-0.209	(0)
	FeF+2	8.399e-018	2.660e-018	-17.076	-17.575	-0.499	(0)
	FeF3	3.655e-018	3.655e-018	-17.437	-17.437	0.000	(0)
	BF3OH-	3.338e-018	2.329e-018	-17.477	-17.633	-0.156	(0)
	VOF+	9.457e-020	5.847e-020	-19.024	-19.233	-0.209	(0)
	VO2F3-2	9.307e-020	1.361e-020	-19.031	-19.866	-0.835	(0)
	PbF4-2	6.392e-021	9.344e-022	-20.194	-21.029	-0.835	(0)
	VOF2	4.183e-021	4.183e-021	-20.379	-20.379	0.000	(0)
	VO2F4-3	9.665e-023	1.277e-024	-22.015	-23.894	-1.879	(0)
	BF4-	5.113e-023	3.568e-023	-22.291	-22.448	-0.156	(0)
	VOF3-	4.578e-023	2.831e-023	-22.339	-22.548	-0.209	(0)
	HgF+	1.539e-023	9.518e-024	-22.813	-23.021	-0.209	(0)
	Sb(OH) 2F	3.243e-024	3.243e-024	-23.489	-23.489	0.000	(0)
	SbOF	3.197e-024	3.197e-024	-23.495	-23.495	0.000	(0)
	VOF4-2	1.491e-025	2.180e-026	-24.826	-25.662	-0.835	(0)
	UF3+	5.547e-036	3.430e-036	-35.256	-35.465	-0.209	(0)
	UF2+2	7.761e-037	1.134e-037	-36.110	-36.945	-0.835	(0)
	UF4	7.174e-038	7.174e-038	-37.144	-37.144	0.000	(0)
	UF+3	3.576e-039	0.000e+000	-38.447	-40.326	-1.879	(0)
	UF5-	8.771e-040	5.423e-040	-39.057	-39.266	-0.209	(0)
	UF6-2	2.137e-040	0.000e+000	-39.670	-40.505	-0.835	(0)
Fe (2)		1.380e-011					
	Fe+2	9.130e-012	1.335e-012	-11.040	-11.875	-0.835	(0)
	FeSO4	4.609e-012	4.609e-012	-11.336	-11.336	0.000	(0)

FeOH+	4.370e-014	3.278e-014	-13.360	-13.484	-0.125	(0)
FeHCO3+	1.481e-014	1.135e-014	-13.830	-13.945	-0.116	(0)
Fe (OH) 2	1.607e-017	1.607e-017	-16.794	-16.794	0.000	(0)
Fe (OH) 3-	4.179e-018	3.135e-018	-17.379	-17.504	-0.125	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-159.668	-159.668	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-235.793	-236.002	-0.209	(0)
Fe (3)	2.474e-009					
Fe (OH) 2+	1.607e-009	1.216e-009	-8.794	-8.915	-0.121	(0)
Fe (OH) 3	8.059e-010	8.059e-010	-9.094	-9.094	0.000	(0)
Fe (OH) 4-	6.117e-011	4.630e-011	-10.213	-10.334	-0.121	(0)
FeOH+2	1.600e-014	5.066e-015	-13.796	-14.295	-0.499	(0)
FeF2+	1.810e-017	1.358e-017	-16.742	-16.867	-0.125	(0)
FeF+2	8.399e-018	2.660e-018	-17.076	-17.575	-0.499	(0)
FeF3	3.655e-018	3.655e-018	-17.437	-17.437	0.000	(0)
FeSO4+	2.676e-018	2.008e-018	-17.572	-17.697	-0.125	(0)
Fe (SO4) 2-	9.767e-019	6.039e-019	-18.010	-18.219	-0.209	(0)
Fe+3	1.610e-019	1.272e-020	-18.793	-19.896	-1.102	(0)
FeCl+2	5.768e-021	1.827e-021	-20.239	-20.738	-0.499	(0)
FeCl2+	5.173e-023	3.881e-023	-22.286	-22.411	-0.125	(0)
FeHSeO3+2	2.687e-023	3.928e-024	-22.571	-23.406	-0.835	(0)
Fe2 (OH) 2+4	1.862e-024	8.499e-028	-23.730	-27.071	-3.341	(0)
FeNO3+2	6.013e-026	8.790e-027	-25.221	-26.056	-0.835	(0)
FeCl3	1.846e-026	1.846e-026	-25.734	-25.734	0.000	(0)
Fe3 (OH) 4+5	2.477e-030	1.494e-035	-29.606	-34.826	-5.220	(0)
H (0)	3.430e-029					
H2	1.715e-029	1.783e-029	-28.766	-28.749	0.017	(0)
Hg (0)	1.181e-009					
Hg	1.181e-009	1.181e-009	-8.928	-8.928	0.000	(0)
Hg (1)	1.476e-020					
Hg2+2	7.381e-021	1.079e-021	-20.132	-20.967	-0.835	(0)
Hg (2)	1.339e-011					
HgClOH	6.976e-012	6.976e-012	-11.156	-11.156	0.000	(0)
Hg (OH) 2	3.111e-012	3.233e-012	-11.507	-11.490	0.017	(0)
HgCl2	3.045e-012	3.045e-012	-11.516	-11.516	0.000	(0)
HgCl3-	2.342e-013	1.448e-013	-12.630	-12.839	-0.209	(0)
HgCl4-2	1.876e-014	2.742e-015	-13.727	-14.562	-0.835	(0)
HgCO3	3.133e-015	3.133e-015	-14.504	-14.504	0.000	(0)
HgCl+	2.066e-016	1.277e-016	-15.685	-15.894	-0.209	(0)
Hg (CO3) 2-2	1.319e-016	1.927e-017	-15.880	-16.715	-0.835	(0)
HgOH+	5.347e-017	3.306e-017	-16.272	-16.481	-0.209	(0)
Hg (NH3) 2+2	5.593e-018	8.176e-019	-17.252	-18.087	-0.835	(0)
HgHCO3+	1.536e-018	9.497e-019	-17.814	-18.022	-0.209	(0)
Hg (OH) 3-	4.062e-019	2.512e-019	-18.391	-18.600	-0.209	(0)
HgNH3+2	1.803e-019	2.635e-020	-18.744	-19.579	-0.835	(0)
Hg+2	9.208e-021	1.346e-021	-20.036	-20.871	-0.835	(0)
HgSO4	4.958e-021	4.958e-021	-20.305	-20.305	0.000	(0)
HgF+	1.539e-023	9.518e-024	-22.813	-23.021	-0.209	(0)
Hg (NH3) 3+2	6.909e-025	1.010e-025	-24.161	-24.996	-0.835	(0)
HgNO3+	5.556e-029	3.435e-029	-28.255	-28.464	-0.209	(0)
Hg (NH3) 4+2	1.703e-031	2.489e-032	-30.769	-31.604	-0.835	(0)
Hg (NO3) 2	9.868e-037	9.868e-037	-36.006	-36.006	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-137.689	-137.897	-0.209	(0)
HgS2-2	0.000e+000	0.000e+000	-137.982	-138.817	-0.835	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.292	-139.292	0.000	(0)
K	1.015e-002					
K+	9.230e-003	6.961e-003	-2.035	-2.157	-0.122	(0)
KSO4-	9.161e-004	6.934e-004	-3.038	-3.159	-0.121	(0)
KCrO4-	1.777e-016	1.099e-016	-15.750	-15.959	-0.209	(0)
Mg	2.153e-002					
Mg+2	1.169e-002	3.783e-003	-1.932	-2.422	-0.490	(0)
MgSO4	9.685e-003	9.685e-003	-2.014	-2.014	0.000	(0)
MgF+	1.092e-004	8.097e-005	-3.962	-4.092	-0.130	(0)
MgHCO3+	3.574e-005	2.614e-005	-4.447	-4.583	-0.136	(0)
MgCO3	6.120e-006	6.120e-006	-5.213	-5.213	0.000	(0)
MgOH+	1.201e-006	9.292e-007	-5.920	-6.032	-0.111	(0)
MgH2BO3+	5.091e-007	3.553e-007	-6.293	-6.449	-0.156	(0)
Mn (2)	7.049e-004					
Mn+2	5.140e-004	7.514e-005	-3.289	-4.124	-0.835	(0)

MnSO4	1.880e-004	1.880e-004	-3.726	-3.726	0.000	(0)
MnHCO3+	1.350e-006	1.013e-006	-5.870	-5.995	-0.125	(0)
MnF+	7.607e-007	5.706e-007	-6.119	-6.244	-0.125	(0)
MnCl+	5.997e-007	4.499e-007	-6.222	-6.347	-0.125	(0)
MnOH+	1.552e-007	1.165e-007	-6.809	-6.934	-0.125	(0)
MnCl2	3.023e-009	3.023e-009	-8.520	-8.520	0.000	(0)
MnNO3+	1.331e-011	8.231e-012	-10.876	-11.085	-0.209	(0)
MnCl3-	5.278e-012	3.959e-012	-11.278	-11.402	-0.125	(0)
MnSeO4	2.831e-012	2.831e-012	-11.548	-11.548	0.000	(0)
Mn (OH) 3-	3.652e-016	2.740e-016	-15.437	-15.562	-0.125	(0)
Mn (NO3) 2	1.429e-018	1.429e-018	-17.845	-17.845	0.000	(0)
Mn (OH) 4-2	1.724e-021	5.458e-022	-20.764	-21.263	-0.499	(0)
MnSe	0.000e+000	0.000e+000	-40.586	-40.586	0.000	(0)
Mn (3)	4.359e-024					
Mn+3	4.359e-024	3.443e-025	-23.361	-24.463	-1.102	(0)
Mn (6)	1.997e-040					
MnO4-2	1.997e-040	0.000e+000	-39.700	-40.199	-0.499	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-44.411	-44.560	-0.149	(0)
Mo	3.106e-006					
MoO4-2	3.105e-006	1.005e-006	-5.508	-5.998	-0.490	(0)
HMoO4-	5.264e-010	3.255e-010	-9.279	-9.487	-0.209	(0)
H2MoO4	3.881e-014	3.881e-014	-13.411	-13.411	0.000	(0)
Ag2MoO4	7.240e-025	7.240e-025	-24.140	-24.140	0.000	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-40.499	-42.378	-1.879	(0)
Mo7O24-6	0.000e+000	0.000e+000	-43.782	-51.298	-7.516	(0)
HMo7O24-5	0.000e+000	0.000e+000	-47.480	-52.700	-5.220	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-52.365	-55.706	-3.341	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-58.369	-60.248	-1.879	(0)
N (-3)	1.480e-006					
NH4+	1.269e-006	8.858e-007	-5.896	-6.053	-0.156	(0)
NH4SO4-	1.780e-007	1.335e-007	-6.750	-6.874	-0.125	(0)
NH3	3.103e-008	3.103e-008	-7.508	-7.508	0.000	(0)
CaNH3+2	1.173e-009	1.714e-010	-8.931	-9.766	-0.835	(0)
CuNH3+2	1.120e-010	1.638e-011	-9.951	-10.786	-0.835	(0)
NiNH3+2	1.988e-011	2.906e-012	-10.702	-11.537	-0.835	(0)
Co (NH3) +2	2.441e-012	3.568e-013	-11.612	-12.448	-0.835	(0)
AgNH3+	1.413e-013	8.740e-014	-12.850	-13.059	-0.209	(0)
BaNH3+2	2.870e-015	4.195e-016	-14.542	-15.377	-0.835	(0)
Ni (NH3) 2+2	8.915e-017	1.303e-017	-16.050	-16.885	-0.835	(0)
Ag (NH3) 2+	3.565e-017	2.204e-017	-16.448	-16.657	-0.209	(0)
Ca (NH3) 2+2	1.448e-017	2.117e-018	-16.839	-17.674	-0.835	(0)
Hg (NH3) 2+2	5.593e-018	8.176e-019	-17.252	-18.087	-0.835	(0)
Co (NH3) 2+2	3.231e-018	4.723e-019	-17.491	-18.326	-0.835	(0)
HgNH3+2	1.803e-019	2.635e-020	-18.744	-19.579	-0.835	(0)
Co (NH3) 3+2	1.262e-024	1.845e-025	-23.899	-24.734	-0.835	(0)
Hg (NH3) 3+2	6.909e-025	1.010e-025	-24.161	-24.996	-0.835	(0)
Co (NH3) 4+2	2.055e-031	3.004e-032	-30.687	-31.522	-0.835	(0)
Hg (NH3) 4+2	1.703e-031	2.489e-032	-30.769	-31.604	-0.835	(0)
Cr (NH3) 5OH+2	4.936e-038	7.215e-039	-37.307	-38.142	-0.835	(0)
Co (NH3) 5+2	1.058e-038	1.547e-039	-37.975	-38.811	-0.835	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-44.934	-46.813	-1.879	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.176	-46.011	-0.835	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.198	-48.033	-0.835	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.629	-54.838	-0.209	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.086	-59.921	-0.835	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.399	-60.234	-0.835	(0)
N (3)	9.131e-005					
NO2-	9.131e-005	6.483e-005	-4.039	-4.188	-0.149	(0)
CuNO2+	5.663e-010	3.501e-010	-9.247	-9.456	-0.209	(0)
CoNO2+	7.067e-011	4.370e-011	-10.151	-10.360	-0.209	(0)
AgNO2	1.869e-011	1.869e-011	-10.728	-10.728	0.000	(0)
Cu (NO2) 2	2.323e-013	2.323e-013	-12.634	-12.634	0.000	(0)
Ag (NO2) 2-	3.034e-015	1.876e-015	-14.518	-14.727	-0.209	(0)
N (5)	9.321e-008					
NO3-	9.164e-008	6.912e-008	-7.038	-7.160	-0.122	(0)
CaNO3+	1.551e-009	9.591e-010	-8.809	-9.018	-0.209	(0)
MnNO3+	1.331e-011	8.231e-012	-10.876	-11.085	-0.209	(0)

ZnNO3+	9.742e-013	6.024e-013	-12.011	-12.220	-0.209	(0)
NiNO3+	4.896e-014	3.028e-014	-13.310	-13.519	-0.209	(0)
CuNO3+	1.823e-014	1.127e-014	-13.739	-13.948	-0.209	(0)
CoNO3+	1.695e-014	1.048e-014	-13.771	-13.980	-0.209	(0)
BaNO3+	1.201e-014	7.424e-015	-13.921	-14.129	-0.209	(0)
CdNO3+	4.960e-015	3.067e-015	-14.304	-14.513	-0.209	(0)
PbNO3+	9.268e-016	5.730e-016	-15.033	-15.242	-0.209	(0)
AgNO3	7.574e-017	7.574e-017	-16.121	-16.121	0.000	(0)
Mn(NO3)2	1.429e-018	1.429e-018	-17.845	-17.845	0.000	(0)
Zn(NO3)2	8.307e-021	8.307e-021	-20.081	-20.081	0.000	(0)
UO2NO3+	2.510e-021	1.552e-021	-20.600	-20.809	-0.209	(0)
Co(NO3)2	1.474e-021	1.474e-021	-20.832	-20.832	0.000	(0)
Cd(NO3)2	1.062e-022	1.062e-022	-21.974	-21.974	0.000	(0)
Cu(NO3)2	9.810e-023	9.810e-023	-22.008	-22.008	0.000	(0)
Pb(NO3)2	6.726e-023	6.726e-023	-22.172	-22.172	0.000	(0)
CrNO3+2	3.567e-023	5.214e-024	-22.448	-23.283	-0.835	(0)
VO2NO3	8.626e-024	8.626e-024	-23.064	-23.064	0.000	(0)
FeNO3+2	6.013e-026	8.790e-027	-25.221	-26.056	-0.835	(0)
HgNO3+	5.556e-029	3.435e-029	-28.255	-28.464	-0.209	(0)
Hg(NO3)2	9.868e-037	9.868e-037	-36.006	-36.006	0.000	(0)
Na	4.011e-002					
Na+	3.729e-002	2.813e-002	-1.428	-1.551	-0.122	(0)
NaSO4-	2.808e-003	2.125e-003	-2.552	-2.673	-0.121	(0)
NaHCO3	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
NaF	3.385e-006	3.385e-006	-5.470	-5.470	0.000	(0)
NaCO3-	1.346e-006	1.019e-006	-5.871	-5.992	-0.121	(0)
NaH2BO3	1.207e-007	1.207e-007	-6.918	-6.918	0.000	(0)
NaCrO4-	9.602e-016	5.937e-016	-15.018	-15.226	-0.209	(0)
Ni	1.073e-006					
Ni+2	5.389e-007	1.744e-007	-6.269	-6.759	-0.490	(0)
NiSO4	4.895e-007	4.895e-007	-6.310	-6.310	0.000	(0)
NiHCO3+	2.348e-008	1.452e-008	-7.629	-7.838	-0.209	(0)
NiCO3	1.265e-008	1.265e-008	-7.898	-7.898	0.000	(0)
NiCl+	3.432e-009	2.122e-009	-8.464	-8.673	-0.209	(0)
NiOH+	2.191e-009	1.355e-009	-8.659	-8.868	-0.209	(0)
Ni(SO4)2-2	1.560e-009	2.281e-010	-8.807	-9.642	-0.835	(0)
NiF+	1.351e-009	8.356e-010	-8.869	-9.078	-0.209	(0)
Ni(OH)2	6.639e-011	6.639e-011	-10.178	-10.178	0.000	(0)
NiNH3+2	1.988e-011	2.906e-012	-10.702	-11.537	-0.835	(0)
Ni(OH)3-	6.625e-014	4.096e-014	-13.179	-13.388	-0.209	(0)
NiCl2	5.082e-014	5.082e-014	-13.294	-13.294	0.000	(0)
NiNO3+	4.896e-014	3.028e-014	-13.310	-13.519	-0.209	(0)
NiSeO4	1.142e-014	1.142e-014	-13.942	-13.942	0.000	(0)
Ni(NH3)2+2	8.915e-017	1.303e-017	-16.050	-16.885	-0.835	(0)
O(0)	3.054e-035					
O2	1.527e-035	1.587e-035	-34.816	-34.799	0.017	(0)
Pb	1.328e-008					
PbSO4	3.863e-009	3.863e-009	-8.413	-8.413	0.000	(0)
PbCO3	3.277e-009	3.277e-009	-8.484	-8.484	0.000	(0)
Pb(SO4)2-2	2.240e-009	3.275e-010	-8.650	-9.485	-0.835	(0)
Pb+2	1.732e-009	5.605e-010	-8.761	-9.251	-0.490	(0)
PbOH+	1.405e-009	8.687e-010	-8.852	-9.061	-0.209	(0)
PbHCO3+	4.549e-010	2.813e-010	-9.342	-9.551	-0.209	(0)
PbCl+	1.530e-010	9.459e-011	-9.815	-10.024	-0.209	(0)
Pb(CO3)2-2	1.258e-010	1.839e-011	-9.900	-10.736	-0.835	(0)
Pb(OH)2	1.695e-011	1.695e-011	-10.771	-10.771	0.000	(0)
PbF+	1.219e-011	7.535e-012	-10.914	-11.123	-0.209	(0)
PbCl2	2.010e-012	2.010e-012	-11.697	-11.697	0.000	(0)
PbF2	2.829e-014	2.829e-014	-13.548	-13.548	0.000	(0)
Pb(OH)3-	1.691e-014	1.046e-014	-13.772	-13.981	-0.209	(0)
PbCl3-	6.154e-015	3.805e-015	-14.211	-14.420	-0.209	(0)
PbNO3+	9.268e-016	5.730e-016	-15.033	-15.242	-0.209	(0)
Pb2OH+3	5.841e-016	7.717e-018	-15.233	-17.113	-1.879	(0)
PbCl4-2	5.659e-017	8.272e-018	-16.247	-17.082	-0.835	(0)
PbF3-	1.655e-017	1.023e-017	-16.781	-16.990	-0.209	(0)
Pb(OH)4-2	1.081e-017	1.580e-018	-16.966	-17.801	-0.835	(0)
Pb3(OH)4+2	2.198e-020	3.213e-021	-19.658	-20.493	-0.835	(0)
PbF4-2	6.392e-021	9.344e-022	-20.194	-21.029	-0.835	(0)

Pb(NO3)2	6.726e-023	6.726e-023	-22.172	-22.172	0.000	(0)
Pb4(OH)4+4	3.134e-023	1.431e-026	-22.504	-25.844	-3.341	(0)
Pb(HS)2	0.000e+000	0.000e+000	-150.724	-150.724	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-227.587	-227.796	-0.209	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.417	-73.417	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.008	-78.216	-0.209	(0)
HS-	0.000e+000	0.000e+000	-78.163	-78.371	-0.209	(0)
S5-2	0.000e+000	0.000e+000	-79.113	-79.948	-0.835	(0)
H2S	0.000e+000	0.000e+000	-79.140	-79.140	0.000	(0)
S6-2	0.000e+000	0.000e+000	-79.629	-80.464	-0.835	(0)
S4-2	0.000e+000	0.000e+000	-79.709	-80.544	-0.835	(0)
S3-2	0.000e+000	0.000e+000	-80.515	-81.350	-0.835	(0)
S2-2	0.000e+000	0.000e+000	-81.531	-82.366	-0.835	(0)
S-2	0.000e+000	0.000e+000	-87.384	-87.883	-0.499	(0)
HgHS2-	0.000e+000	0.000e+000	-137.689	-137.897	-0.209	(0)
HgS2-2	0.000e+000	0.000e+000	-137.982	-138.817	-0.835	(0)
Hg(HS)2	0.000e+000	0.000e+000	-139.292	-139.292	0.000	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-146.926	-147.385	-0.459	(0)
Ag(HS)S4-2	0.000e+000	0.000e+000	-147.107	-147.384	-0.277	(0)
ZnS(HS)-	0.000e+000	0.000e+000	-147.395	-147.604	-0.209	(0)
Ag(HS)2-	0.000e+000	0.000e+000	-147.480	-147.689	-0.209	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.684	-148.115	-0.431	(0)
Ag(S4)2-3	0.000e+000	0.000e+000	-148.561	-149.035	-0.475	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.902	-149.346	-0.445	(0)
Zn(HS)2	0.000e+000	0.000e+000	-149.383	-149.383	0.000	(0)
Cd(HS)2	0.000e+000	0.000e+000	-149.384	-149.384	0.000	(0)
Pb(HS)2	0.000e+000	0.000e+000	-150.724	-150.724	0.000	(0)
Fe(HS)2	0.000e+000	0.000e+000	-159.668	-159.668	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-216.294	-216.503	-0.209	(0)
Zn(HS)3-	0.000e+000	0.000e+000	-224.265	-224.474	-0.209	(0)
Cd(HS)3-	0.000e+000	0.000e+000	-225.646	-225.855	-0.209	(0)
ZnS(HS)2-2	0.000e+000	0.000e+000	-225.831	-226.666	-0.835	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-227.587	-227.796	-0.209	(0)
Fe(HS)3-	0.000e+000	0.000e+000	-235.793	-236.002	-0.209	(0)
Cd(HS)4-2	0.000e+000	0.000e+000	-301.196	-302.031	-0.835	(0)
Zn(HS)4-2	0.000e+000	0.000e+000	-303.470	-304.306	-0.835	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.184	-316.019	-0.835	(0)
S(6)	7.125e-002					
SO4-2	4.348e-002	1.407e-002	-1.362	-1.852	-0.490	(0)
CaSO4	1.414e-002	1.414e-002	-1.849	-1.849	0.000	(0)
MgSO4	9.685e-003	9.685e-003	-2.014	-2.014	0.000	(0)
NaSO4-	2.808e-003	2.125e-003	-2.552	-2.673	-0.121	(0)
KSO4-	9.161e-004	6.934e-004	-3.038	-3.159	-0.121	(0)
MnSO4	1.880e-004	1.880e-004	-3.726	-3.726	0.000	(0)
ZnSO4	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
Zn(SO4)2-2	8.953e-006	1.309e-006	-5.048	-5.883	-0.835	(0)
NiSO4	4.895e-007	4.895e-007	-6.310	-6.310	0.000	(0)
CoSO4	2.685e-007	2.685e-007	-6.571	-6.571	0.000	(0)
NH4SO4-	1.780e-007	1.335e-007	-6.750	-6.874	-0.125	(0)
CuSO4	1.662e-007	1.662e-007	-6.779	-6.779	0.000	(0)
Cd(SO4)2-2	6.009e-008	8.784e-009	-7.221	-8.056	-0.835	(0)
CdSO4	4.628e-008	4.628e-008	-7.335	-7.335	0.000	(0)
HSO4-	3.020e-008	2.238e-008	-7.520	-7.650	-0.130	(0)
PbSO4	3.863e-009	3.863e-009	-8.413	-8.413	0.000	(0)
Pb(SO4)2-2	2.240e-009	3.275e-010	-8.650	-9.485	-0.835	(0)
Ni(SO4)2-2	1.560e-009	2.281e-010	-8.807	-9.642	-0.835	(0)
AgSO4-	6.264e-010	3.873e-010	-9.203	-9.412	-0.209	(0)
CrOHSO4	7.777e-011	7.777e-011	-10.109	-10.109	0.000	(0)
FeSO4	4.609e-012	4.609e-012	-11.336	-11.336	0.000	(0)
AlSO4+	3.250e-013	2.409e-013	-12.488	-12.618	-0.130	(0)
UO2(SO4)2-2	3.041e-013	4.446e-014	-12.517	-13.352	-0.835	(0)
UO2SO4	2.397e-013	2.397e-013	-12.620	-12.620	0.000	(0)
CrSO4+	9.169e-014	5.669e-014	-13.038	-13.246	-0.209	(0)
Al(SO4)2-	4.900e-014	3.632e-014	-13.310	-13.440	-0.130	(0)
VO2SO4-	1.341e-016	8.289e-017	-15.873	-16.081	-0.209	(0)
FeSO4+	2.676e-018	2.008e-018	-17.572	-17.697	-0.125	(0)
Cr2(OH)2SO4+2	1.120e-018	1.638e-019	-17.951	-18.786	-0.835	(0)

Fe (SO4) 2-	9.767e-019	6.039e-019	-18.010	-18.219	-0.209	(0)
VOsO4	1.980e-019	1.980e-019	-18.703	-18.703	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.369e-019	1.369e-019	-18.864	-18.864	0.000	(0)
HgSO4	4.958e-021	4.958e-021	-20.305	-20.305	0.000	(0)
CrO3SO4-2	1.070e-022	1.565e-023	-21.970	-22.806	-0.835	(0)
VSO4+	7.059e-034	4.365e-034	-33.151	-33.360	-0.209	(0)
U (SO4) 2	7.769e-040	7.769e-040	-39.110	-39.110	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.323	-41.158	-0.835	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.629	-54.838	-0.209	(0)
Sb (3)	1.320e-018					
Sb (OH) 3	6.669e-019	6.669e-019	-18.176	-18.176	0.000	(0)
HSbO2	6.526e-019	6.526e-019	-18.185	-18.185	0.000	(0)
SbO2-	1.050e-022	6.494e-023	-21.979	-22.188	-0.209	(0)
Sb (OH) 4-	5.987e-023	3.702e-023	-22.223	-22.432	-0.209	(0)
Sb (OH) 2F	3.243e-024	3.243e-024	-23.489	-23.489	0.000	(0)
SbOF	3.197e-024	3.197e-024	-23.495	-23.495	0.000	(0)
Sb (OH) 2+	4.274e-025	2.643e-025	-24.369	-24.578	-0.209	(0)
SbO+	1.477e-025	9.134e-026	-24.831	-25.039	-0.209	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.184	-316.019	-0.835	(0)
Sb (5)	1.103e-006					
SbO3-	1.102e-006	6.813e-007	-5.958	-6.167	-0.209	(0)
Sb (OH) 6-	1.048e-009	7.908e-010	-8.979	-9.102	-0.122	(0)
SbO2+	8.394e-023	5.190e-023	-22.076	-22.285	-0.209	(0)
Se (-2)	1.298e-014					
Ag2Se	1.298e-014	1.298e-014	-13.887	-13.887	0.000	(0)
HSe-	2.203e-039	1.362e-039	-38.657	-38.866	-0.209	(0)
MnSe	0.000e+000	0.000e+000	-40.586	-40.586	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.764	-42.764	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.242	-46.077	-0.835	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-80.396	-83.737	-3.341	(0)
Se (4)	3.846e-007					
SeO3-2	1.956e-007	2.859e-008	-6.709	-7.544	-0.835	(0)
HSeO3-	1.890e-007	1.169e-007	-6.723	-6.932	-0.209	(0)
H2SeO3	8.116e-013	8.116e-013	-12.091	-12.091	0.000	(0)
AgSeO3-	4.099e-014	2.535e-014	-13.387	-13.596	-0.209	(0)
Cd (SeO3) 2-2	6.466e-017	9.452e-018	-16.189	-17.024	-0.835	(0)
Ag (SeO3) 2-3	4.911e-019	6.488e-021	-18.309	-20.188	-1.879	(0)
FeHSeO3+2	2.687e-023	3.928e-024	-22.571	-23.406	-0.835	(0)
Se (6)	4.355e-010					
SeO4-2	4.325e-010	1.400e-010	-9.364	-9.854	-0.490	(0)
MnSeO4	2.831e-012	2.831e-012	-11.548	-11.548	0.000	(0)
ZnSeO4	7.521e-014	7.521e-014	-13.124	-13.124	0.000	(0)
NiSeO4	1.142e-014	1.142e-014	-13.942	-13.942	0.000	(0)
CoSeO4	6.710e-015	6.710e-015	-14.173	-14.173	0.000	(0)
CdSeO4	3.657e-016	3.657e-016	-15.437	-15.437	0.000	(0)
HSeO4-	1.847e-016	1.142e-016	-15.734	-15.942	-0.209	(0)
Zn (SeO4) 2-2	7.302e-023	1.067e-023	-22.137	-22.972	-0.835	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.834	-59.713	-1.879	(0)
U (4)	1.316e-020					
U (OH) 5-	1.315e-020	8.134e-021	-19.881	-20.090	-0.209	(0)
U (OH) 4	5.559e-024	5.559e-024	-23.255	-23.255	0.000	(0)
U (OH) 3+	5.364e-028	3.317e-028	-27.271	-27.479	-0.209	(0)
U (OH) 2+2	1.712e-032	2.503e-033	-31.766	-32.602	-0.835	(0)
UF3+	5.547e-036	3.430e-036	-35.256	-35.465	-0.209	(0)
UF2+2	7.761e-037	1.134e-037	-36.110	-36.945	-0.835	(0)
UOH+3	1.456e-037	1.924e-039	-36.837	-38.716	-1.879	(0)
UF4	7.174e-038	7.174e-038	-37.144	-37.144	0.000	(0)
UF+3	3.576e-039	0.000e+000	-38.447	-40.326	-1.879	(0)
UF5-	8.771e-040	5.423e-040	-39.057	-39.266	-0.209	(0)
U (SO4) 2	7.769e-040	7.769e-040	-39.110	-39.110	0.000	(0)
UF6-2	2.137e-040	0.000e+000	-39.670	-40.505	-0.835	(0)
USO4+2	0.000e+000	0.000e+000	-40.323	-41.158	-0.835	(0)
U+4	0.000e+000	0.000e+000	-42.566	-45.906	-3.341	(0)
UCl+3	0.000e+000	0.000e+000	-44.650	-46.529	-1.879	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-158.871	-175.783	-16.911	(0)
U (5)	1.082e-016					
UO2+	1.082e-016	6.688e-017	-15.966	-16.175	-0.209	(0)

U (6)	7.456e-007					
UO2 (CO3) 3-4	7.223e-007	3.298e-010	-6.141	-9.482	-3.341	(0)
UO2 (CO3) 2-2	2.314e-008	3.383e-009	-7.636	-8.471	-0.835	(0)
UO2CO3	8.716e-011	8.716e-011	-10.060	-10.060	0.000	(0)
UO2OH+	1.414e-012	8.743e-013	-11.850	-12.058	-0.209	(0)
UO2F+	4.793e-013	2.964e-013	-12.319	-12.528	-0.209	(0)
UO2 (SO4) 2-2	3.041e-013	4.446e-014	-12.517	-13.352	-0.835	(0)
UO2SO4	2.397e-013	2.397e-013	-12.620	-12.620	0.000	(0)
UO2F2	1.631e-013	1.631e-013	-12.788	-12.788	0.000	(0)
UO2+2	3.478e-014	1.126e-014	-13.459	-13.949	-0.490	(0)
UO2F3-	1.264e-014	7.813e-015	-13.898	-14.107	-0.209	(0)
UO2Cl+	1.404e-016	8.682e-017	-15.853	-16.061	-0.209	(0)
UO2F4-2	8.099e-017	1.184e-017	-16.092	-16.927	-0.835	(0)
(UO2) 2 (OH) 2+2	8.678e-018	1.269e-018	-17.062	-17.897	-0.835	(0)
(UO2) 3 (OH) 5+	5.180e-019	3.203e-019	-18.286	-18.494	-0.209	(0)
UO2NO3+	2.510e-021	1.552e-021	-20.600	-20.809	-0.209	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-41.994	-42.203	-0.209	(0)
V+2	0.000e+000	0.000e+000	-42.668	-43.503	-0.835	(0)
V (3)	1.245e-014					
V (OH) 3	1.245e-014	1.245e-014	-13.905	-13.905	0.000	(0)
V (OH) 2+	2.124e-025	1.313e-025	-24.673	-24.882	-0.209	(0)
VOH+2	1.390e-028	2.032e-029	-27.857	-28.692	-0.835	(0)
V+3	4.974e-033	6.572e-035	-32.303	-34.182	-1.879	(0)
VSO4+	7.059e-034	4.365e-034	-33.151	-33.360	-0.209	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-53.243	-55.122	-1.879	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-53.244	-56.584	-3.341	(0)
V (4)	1.080e-017					
V (OH) 3+	1.015e-017	6.275e-018	-16.994	-17.202	-0.209	(0)
VO+2	3.496e-019	5.111e-020	-18.456	-19.292	-0.835	(0)
VOSO4	1.980e-019	1.980e-019	-18.703	-18.703	0.000	(0)
VOF+	9.457e-020	5.847e-020	-19.024	-19.233	-0.209	(0)
VOF2	4.183e-021	4.183e-021	-20.379	-20.379	0.000	(0)
VOC1+	1.103e-021	6.819e-022	-20.957	-21.166	-0.209	(0)
VOF3-	4.578e-023	2.831e-023	-22.339	-22.548	-0.209	(0)
VOF4-2	1.491e-025	2.180e-026	-24.826	-25.662	-0.835	(0)
H2V2O4+2	1.357e-029	1.984e-030	-28.867	-29.702	-0.835	(0)
V (5)	1.241e-007					
H2VO4-	7.509e-008	4.643e-008	-7.124	-7.333	-0.209	(0)
HVO4-2	4.902e-008	7.165e-009	-7.310	-8.145	-0.835	(0)
HV2O7-3	8.555e-012	1.130e-013	-11.068	-12.947	-1.879	(0)
H3VO4	7.558e-012	7.558e-012	-11.122	-11.122	0.000	(0)
H3V2O7-	3.674e-012	2.272e-012	-11.435	-11.644	-0.209	(0)
V2O7-4	4.094e-013	1.869e-016	-12.388	-15.728	-3.341	(0)
VO4-3	1.670e-013	2.206e-015	-12.777	-14.656	-1.879	(0)
V3O9-3	7.996e-015	1.056e-016	-14.097	-15.976	-1.879	(0)
VO2+	3.271e-016	2.467e-016	-15.485	-15.608	-0.122	(0)
VO2SO4-	1.341e-016	8.289e-017	-15.873	-16.081	-0.209	(0)
VO2F	8.255e-017	8.255e-017	-16.083	-16.083	0.000	(0)
VO2F2-	9.247e-018	5.718e-018	-17.034	-17.243	-0.209	(0)
V4O12-4	4.491e-018	2.050e-021	-17.348	-20.688	-3.341	(0)
VO2F3-2	9.307e-020	1.361e-020	-19.031	-19.866	-0.835	(0)
VO2F4-3	9.665e-023	1.277e-024	-22.015	-23.894	-1.879	(0)
VO2NO3	8.626e-024	8.626e-024	-23.064	-23.064	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-48.050	-55.566	-7.516	(0)
HV10O28-5	0.000e+000	0.000e+000	-49.948	-55.168	-5.220	(0)
H2V10O28-4	0.000e+000	0.000e+000	-54.408	-57.749	-3.341	(0)
Zn	3.134e-005					
Zn+2	1.072e-005	3.470e-006	-4.970	-5.460	-0.490	(0)
ZnSO4	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
Zn (SO4) 2-2	8.953e-006	1.309e-006	-5.048	-5.883	-0.835	(0)
ZnCO3	3.884e-007	3.884e-007	-6.411	-6.411	0.000	(0)
ZnOH+	3.462e-007	2.141e-007	-6.461	-6.669	-0.209	(0)
ZnHCO3+	1.198e-007	7.410e-008	-6.921	-7.130	-0.209	(0)
ZnCl+	5.666e-008	4.145e-008	-7.247	-7.382	-0.136	(0)
ZnOHCl	3.348e-008	3.348e-008	-7.475	-7.475	0.000	(0)
ZnF+	2.136e-008	1.321e-008	-7.670	-7.879	-0.209	(0)
Zn (OH) 2	2.093e-008	2.093e-008	-7.679	-7.679	0.000	(0)

ZnCl2	3.125e-010	3.125e-010	-9.505	-9.505	0.000	(0)
Zn(OH) 3-	1.047e-010	6.474e-011	-9.980	-10.189	-0.209	(0)
ZnCl3-	1.614e-012	1.180e-012	-11.792	-11.928	-0.136	(0)
ZnNO3+	9.742e-013	6.024e-013	-12.011	-12.220	-0.209	(0)
ZnSeO4	7.521e-014	7.521e-014	-13.124	-13.124	0.000	(0)
Zn(OH) 4-2	1.088e-014	1.590e-015	-13.963	-14.799	-0.835	(0)
ZnCl4-2	8.865e-015	2.807e-015	-14.052	-14.552	-0.499	(0)
Zn(NO3) 2	8.307e-021	8.307e-021	-20.081	-20.081	0.000	(0)
Zn(SeO4) 2-2	7.302e-023	1.067e-023	-22.137	-22.972	-0.835	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.395	-147.604	-0.209	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.383	-149.383	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.265	-224.474	-0.209	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.831	-226.666	-0.835	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-303.470	-304.306	-0.835	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-48.66	-42.37	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-37.21	-32.70	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-44.43	-32.70	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-63.41	-45.47	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-50.99	-30.96	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-26.88	-26.48	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-22.41	-21.96	0.45	(NH4) 2SeO4
Acanthite	-52.08	-88.30	-36.22	Ag2S
Ag2CO3	-12.34	-23.43	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-11.45	-9.97	1.48	Ag2HVO4
Ag2MoO4	-12.17	-23.72	-11.55	Ag2MoO4
Ag2O	-14.72	-2.14	12.57	Ag2O
Ag2Se	-0.10	-48.80	-48.70	Ag2Se
Ag2SeO3	-9.71	-16.86	-7.15	Ag2SeO3
Ag2SeO4	-18.66	-27.57	-8.91	Ag2SeO4
Ag2SO4	-14.75	-19.57	-4.82	Ag2SO4
Ag3AsO3	-27.98	-25.83	2.16	Ag3AsO3
Ag3AsO4	-16.34	-19.13	-2.79	Ag3AsO4
Ag3H2VO5	-16.22	-11.04	5.18	Ag3H2VO5
AgF:4H2O	-13.63	-12.58	1.05	AgF:4H2O
Agmetal	-0.36	-13.87	-13.51	Ag
AgVO3	-9.66	-8.89	0.77	AgVO3
Al(OH) 3 (am)	-2.09	8.71	10.80	Al(OH) 3
Al2(MoO4) 3	-49.67	-47.31	2.37	Al2(MoO4) 3
Al2O3	-2.24	17.41	19.65	Al2O3
Al4(OH) 10SO4	-5.30	17.40	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-12.00	-7.20	4.80	AlAsO4:2H2O
AlOHSO4	-5.49	-8.72	-3.23	AlOHSO4
AlSb	-151.88	-86.26	65.62	AlSb
Alunite	-1.71	-3.11	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-3.31	-11.10	-7.79	PbSO4
Anhydrite	0.15	-4.21	-4.36	CaSO4
Anilite	-54.94	-86.82	-31.88	Cu0.25Cu1.5S
Antlerite	-1.35	7.43	8.79	Cu3(OH) 4SO4
Aragonite	0.23	-8.07	-8.30	CaCO3
Arsenolite	-87.67	-90.43	-2.76	As4O6
Artinite	-4.58	5.02	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-38.52	-31.82	6.71	As2O5
Atacamite	-0.93	6.46	7.39	Cu2(OH) 3Cl
Azurite	-0.80	-17.71	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-16.50	7.90	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-15.70	0.17	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	0.81	-8.10	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-24.86	8.08	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-12.37	-22.04	-9.67	BaCrO4
BaF2	-9.29	-15.11	-5.82	BaF2
BaMoO4	-6.71	-13.67	-6.96	BaMoO4
Barite	0.46	-9.52	-9.98	BaSO4

BaS	-94.43	-78.25	16.18	BaS
BaSeO3	-8.64	-6.81	1.83	BaSeO3
BaSeO4	-10.06	-17.52	-7.46	BaSeO4
Bianchite	-5.55	-7.32	-1.76	ZnSO4:6H2O
Birnessite	-6.39	11.70	18.09	MnO2
Bixbyite	-1.55	-2.20	-0.64	Mn2O3
BlaubleiI	-54.90	-79.06	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.36	-82.64	-27.28	Cu0.6Cu0.8S
Boehmite	0.13	8.71	8.58	AlOOH
Breithauptite	-54.83	-73.35	-18.52	NiSb
Brochantite	0.50	15.72	15.22	Cu4(OH)6SO4
Brucite	-3.69	13.15	16.84	Mg(OH)2
Bunsenite	-3.63	8.82	12.45	NiO
Ca(VO3)2	-8.08	-2.42	5.66	Ca(VO3)2
Ca2V2O7	-6.70	10.80	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.76	10.79	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.47	7.83	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-14.95	24.01	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-15.85	24.01	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-293.26	-150.28	142.97	Ca3Sb2
CaCrO4	-14.46	-16.73	-2.27	CaCrO4
Calcite	0.41	-8.07	-8.48	CaCO3
Calomel	-7.70	-25.61	-17.91	Hg2Cl2
CaMoO4	-0.41	-8.36	-7.95	CaMoO4
Carnotite	-0.79	-0.56	0.23	KUO2VO4
CaSeO3:2H2O	-4.32	-1.50	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.19	-12.21	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.35	-0.51	9.84	Cd(BO2)2
Cd(OH)2	-5.92	7.72	13.64	Cd(OH)2
Cd(OH)2(am)	-6.01	7.72	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-18.40	-11.69	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-16.82	5.74	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-14.94	13.46	28.40	Cd4(OH)6SO4
CdCl2	-11.84	-12.50	-0.66	CdCl2
CdCl2:1H2O	-10.81	-12.50	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.59	-12.50	-1.91	CdCl2:2.5H2O
CdF2	-14.08	-15.29	-1.21	CdF2
Cdmetal(alpha)	-31.39	-17.87	13.51	Cd
Cdmetal(gamma)	-31.49	-17.87	13.62	Cd
CdMoO4	0.30	-13.85	-14.15	CdMoO4
CdOHCl	-5.93	-2.39	3.54	CdOHCl
CdSb	-74.10	-74.45	-0.35	CdSb
CdSe	-18.73	-38.93	-20.20	CdSe
CdSeO4:2H2O	-15.86	-17.71	-1.85	CdSeO4:2H2O
CdSO4	-9.53	-9.70	-0.17	CdSO4
CdSO4:1H2O	-7.98	-9.71	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.83	-9.71	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.43	-11.18	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO3
CH4(g)	-82.64	-123.68	-41.05	CH4
Chalcanthite	-6.50	-9.14	-2.64	CuSO4:5H2O
Chalcocite	-54.88	-89.80	-34.92	Cu2S
Chalcopyrite	-125.06	-160.33	-35.27	CuFeS2
Cinnabar	-51.95	-97.65	-45.69	HgS
Claudetite	-87.37	-90.43	-3.06	As4O6
Clausthalite	-13.23	-40.33	-27.10	PbSe
Co(BO2)2	-26.75	0.32	27.07	Co(BO2)2
Co(OH)2	-4.54	8.56	13.09	Co(OH)2
Co(OH)3	-8.74	-11.05	-2.31	Co(OH)3
CO2(g)	-3.14	-21.29	-18.15	CO2
Co3(AsO4)2	-19.18	-6.15	13.03	Co3(AsO4)2
Co3O4	-3.04	-13.53	-10.50	Co3O4
CoCl2	-19.93	-11.66	8.27	CoCl2
CoCl2:6H2O	-14.21	-11.67	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-12.86	-14.46	-1.60	CoF2
CoF3	-44.11	-45.57	-1.46	CoF3
CoFe2O4	19.02	15.49	-3.53	CoFe2O4

CoMoO4	-5.26	-13.02	-7.76	CoMoO4
CoO	-5.03	8.56	13.59	CoO
CoS (alpha)	-70.16	-77.60	-7.44	CoS
CoS (beta)	-66.53	-77.60	-11.07	CoS
CoSe	-21.90	-38.10	-16.20	CoSe
CoSeO3	-7.48	-6.16	1.32	CoSeO3
CoSeO4:6H2O	-15.35	-16.88	-1.53	CoSeO4:6H2O
CoSO4	-11.67	-8.87	2.80	CoSO4
CoSO4:6H2O	-6.41	-8.88	-2.47	CoSO4:6H2O
Cotunnite	-9.12	-13.90	-4.78	PbCl2
Covellite	-55.57	-77.87	-22.30	CuS
Cr (OH) 2	-21.64	-10.82	10.82	Cr (OH) 2
Cr (OH) 3	-2.31	-0.97	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.22	-0.97	-0.75	Cr (OH) 3
Cr2O3	0.42	-1.94	-2.36	Cr2O3
CrCl2	-45.13	-31.04	14.09	CrCl2
CrCl3	-46.41	-31.30	15.11	CrCl3
CrF3	-24.15	-35.49	-11.34	CrF3
Crmetal	-66.90	-36.42	30.48	Cr
CrO3	-26.74	-29.95	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu (OH) 2	-0.39	8.29	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.08	23.14	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.62	1.63	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-53.62	-88.50	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.49	-50.29	-45.80	Cu2Se
Cu2SO4	-19.12	-21.07	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.05	-6.95	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-57.84	-100.43	-42.59	Cu3Sb
Cu3Se2	-25.17	-88.66	-63.49	Cu3Se2
CuCO3	-1.50	-13.00	-11.50	CuCO3
CuCrO4	-16.22	-21.66	-5.44	CuCrO4
CuF	-8.42	-13.33	-4.91	CuF
CuF2	-15.84	-14.73	1.12	CuF2
CuF2:2H2O	-10.18	-14.73	-4.55	CuF2:2H2O
Cumetal	-5.86	-14.62	-8.76	Cu
CuMoO4	-0.21	-13.29	-13.08	CuMoO4
CuOCuSO4	-11.15	-0.85	10.30	CuOCuSO4
Cupricferrite	9.24	15.22	5.99	CuFe2O4
Cuprite	-2.24	-3.64	-1.41	Cu2O
Cuprousferrite	10.56	1.65	-8.92	CuFeO2
CuSe	-5.26	-38.36	-33.10	CuSe
CuSe2	-26.05	-59.42	-33.37	CuSe2
CuSeO3:2H2O	-6.95	-6.43	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.71	-17.15	-2.44	CuSeO4:5H2O
CuSO4	-12.08	-9.14	2.94	CuSO4
Diaspore	1.83	8.71	6.87	AlOOH
Djurleite	-55.09	-89.01	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.34	-16.20	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.89	-16.20	-17.09	CaMg (CO3) 2
Epsomite	-2.16	-4.28	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.86	3.70	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.47	0.43	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-8.22	-11.94	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.34	-7.79	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.60	-37.22	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.61	-45.35	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.59	10.63	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.84	-12.44	0.40	FeAsO4:2H2O
FeCr2O4	-5.44	1.76	7.20	FeCr2O4
FeMoO4	-7.78	-17.87	-10.09	FeMoO4
Ferrihydrite	0.28	3.47	3.19	Fe (OH) 3
Ferroselite	-45.41	-64.01	-18.60	FeSe2
FeS (ppt)	-79.51	-82.46	-2.95	FeS
FeSe	-31.95	-42.95	-11.00	FeSe
Fix_pe	-5.01	-5.01	0.00	e-
Fluorite	0.70	-9.80	-10.50	CaF2
Galena	-65.86	-79.83	-13.97	PbS

Gibbsite	0.41	8.71	8.29	Al (OH) 3
Goethite	2.98	3.47	0.49	FeOOH
Goslarite	-5.31	-7.32	-2.01	ZnSO4:7H2O
Greenockite	-64.08	-78.44	-14.36	CdS
Greigite	-288.96	-334.00	-45.03	Fe3S4
Gummite	-6.04	1.63	7.67	UO3
Gypsum	0.40	-4.21	-4.61	CaSO4:2H2O
H-Jarosite	-12.36	-24.46	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.70	-21.57	-12.88	H2MoO4
H2S (g)	-78.15	-86.16	-8.01	H2S
H2Se (g)	-41.69	-46.65	-4.96	H2Se
Halite	-5.48	-3.87	1.60	NaCl
Hausmannite	-1.08	59.95	61.03	Mn3O4
Hematite	8.35	6.94	-1.42	Fe2O3
Hercynite	-1.78	21.12	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.14	-258.85	-73.71	Hg (CH3) 2
Hg (g)	-7.62	-15.49	-7.87	Hg
Hg (OH) 2	-7.99	-11.49	-3.50	Hg (OH) 2
Hg2 (g)	-16.03	-30.99	-14.96	Hg2
Hg2 (OH) 2	-10.65	-5.39	5.26	Hg2 (OH) 2
Hg2CO3	-10.63	-26.68	-16.05	Hg2CO3
Hg2CrO4	-26.64	-35.34	-8.70	Hg2CrO4
Hg2F2	-18.04	-28.41	-10.36	Hg2F2
Hg2S	-79.87	-91.55	-11.68	Hg2S
Hg2SeO3	-15.45	-20.11	-4.66	Hg2SeO3
Hg2SO4	-16.69	-22.82	-6.13	Hg2SO4
Hg3O2CO3	-26.07	-55.75	-29.68	Hg3O2CO3
HgCl (g)	-32.30	-12.81	19.50	HgCl
HgCl2	-10.45	-31.71	-21.26	HgCl2
HgF (g)	-46.88	-14.20	32.68	HgF
HgF2 (g)	-47.07	-34.50	12.57	HgF2
Hgmetal (l)	-2.04	-15.49	-13.45	Hg
HgSe	-2.45	-58.14	-55.69	HgSe
HgSeO3	-13.78	-26.21	-12.43	HgSeO3
HgSO4	-19.50	-28.92	-9.42	HgSO4
Huntite	-2.50	-32.47	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.83	-23.60	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.62	-19.38	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.36	-20.53	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-4.02	-18.82	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.39	-48.63	-17.24	K2Cr2O7
K2CrO4	-18.17	-18.69	-0.51	K2CrO4
K2MoO4	-13.57	-10.31	3.26	K2MoO4
K2SeO4	-13.44	-14.17	-0.73	K2SeO4
Langite	-1.77	15.72	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-4.34	-4.78	-0.43	PbO:PbSO4
Laurionite	-4.41	-3.79	0.62	PbOHCl
Lepidocrocite	2.10	3.47	1.37	FeOOH
Lime	-19.48	13.22	32.70	CaO
Litharge	-6.37	6.32	12.69	PbO
Mackinawite	-78.86	-82.46	-3.60	FeS
Maghemite	0.55	6.94	6.39	Fe2O3
Magnesioferrite	3.23	20.09	16.86	Fe2MgO4
Magnesite	-0.67	-8.13	-7.46	MgCO3
Magnetite	7.23	10.64	3.40	Fe3O4
Malachite	0.59	-4.71	-5.31	Cu2 (OH) 2CO3
Manganite	-1.09	24.25	25.34	MnOOH
Massicot	-6.57	6.32	12.89	PbO
Matlockite	-6.32	-15.29	-8.97	PbClF
Melanothallite	-18.19	-11.93	6.26	CuCl2
Melanterite	-11.53	-13.73	-2.21	FeSO4:7H2O
Metacinnabar	-52.55	-97.65	-45.09	HgS
Mg (OH) 2 (active)	-5.64	13.15	18.79	Mg (OH) 2
Mg (VO3) 2	-13.77	-2.49	11.28	Mg (VO3) 2
Mg2Sb3	-269.29	-194.60	74.68	Mg2Sb3
Mg2V2O7	-15.69	10.67	26.36	Mg2V2O7
MgCr2O4	-4.98	11.22	16.20	MgCr2O4
MgCrO4	-22.17	-16.79	5.38	MgCrO4

MgF2	-1.73	-9.86	-8.13	MgF2
MgMoO4	-6.57	-8.42	-1.85	MgMoO4
MgSeO3:6H2O	-4.63	-1.57	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.08	-12.28	-1.20	MgSeO4:6H2O
Minium	-28.95	44.57	73.52	Pb3O4
Mirabilite	-3.85	-4.96	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-9.09	-4.19	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-48.77	-54.48	-5.71	Mn2 (SO4) 3
Mn2Sb	-145.94	-84.86	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-9.97	2.53	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-11.49	-8.77	2.72	MnCl2:4H2O
MnS (grn)	-74.88	-74.71	0.17	MnS
MnS (pnk)	-78.05	-74.71	3.34	MnS
MnSb	-93.16	-96.07	-2.91	MnSb
MnSe	-38.70	-35.20	3.50	MnSe
MnSeO3	-4.40	-3.27	1.13	MnSeO3
MnSeO3:2H2O	-4.25	-3.27	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.93	-13.98	-2.05	MnSeO4:5H2O
MnSO4	-8.56	-5.98	2.58	MnSO4
Monteponite	-7.38	7.72	15.10	CdO
Montroydite	-7.85	-11.49	-3.64	HgO
MoO3	-13.57	-21.57	-8.00	MoO3
Morenosite	-6.47	-8.62	-2.14	NiSO4:7H2O
MoS2	-149.23	-219.49	-70.26	MoS2
Na-Jarosite	-7.02	-18.22	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-37.53	-47.42	-9.90	Na2Cr2O7
Na2CrO4	-20.40	-17.47	2.93	Na2CrO4
Na2Mo2O7	-14.08	-30.67	-16.60	Na2Mo2O7
Na2MoO4	-10.59	-9.10	1.49	Na2MoO4
Na2MoO4:2H2O	-10.33	-9.10	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.55	-2.25	10.30	Na2SeO3:5H2O
Na2SeO4	-14.24	-12.96	1.28	Na2SeO4
Na3Sb	-170.71	-76.26	94.45	Na3Sb
Na3VO4	-25.79	10.89	36.68	Na3VO4
Na4V2O7	-28.09	9.31	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-86.30	-63.13	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-5.44	-1.58	3.86	NaVO3
Nesquehonite	-3.47	-8.14	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.98	8.82	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-21.07	-5.37	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.16	17.84	32.00	Ni4 (OH) 6SO4
NiCO3	-5.60	-12.47	-6.87	NiCO3
NiMoO4	-1.61	-12.76	-11.14	NiMoO4
NiS (alpha)	-71.74	-77.34	-5.60	NiS
NiS (beta)	-66.24	-77.34	-11.10	NiS
NiS (gamma)	-64.54	-77.34	-12.80	NiS
NiSe	-20.14	-37.84	-17.70	NiSe
NiSeO3:2H2O	-8.72	-5.90	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.10	-16.62	-1.52	NiSeO4:6H2O
Nsutite	-5.80	11.70	17.50	MnO2
O2 (g)	-31.89	51.20	83.09	O2
Orpiment	-242.63	-303.69	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb (BO2) 2	-8.43	-1.91	6.52	Pb (BO2) 2
Pb (OH) 2	-1.83	6.32	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-55.72	-64.48	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-6.26	2.54	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.54	12.65	26.19	Pb2O (OH) 2
Pb2O3	-22.79	38.25	61.04	Pb2O3
Pb2OCO3	-8.08	-8.64	-0.56	Pb2OCO3
Pb2V2O7	-1.09	-2.99	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-18.64	-12.84	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-2.81	3.33	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.33	-2.31	11.02	Pb3O2CO3
Pb3O2SO4	-9.14	1.55	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-13.23	7.87	21.10	Pb4 (OH) 6SO4

Pb4O3SO4	-14.01	7.87	21.88	Pb4O3SO4
PbCrO4	-11.02	-23.62	-12.60	PbCrO4
PbF2	-9.25	-16.69	-7.44	PbF2
Pbmetal	-23.52	-19.27	4.25	Pb
PbMoO4	0.37	-15.25	-15.62	PbMoO4
PbO:0.3H2O	-6.66	6.32	12.98	PbO:0.33H2O
PbSeO4	-12.27	-19.11	-6.84	PbSeO4
Periclase	-8.43	13.15	21.58	MgO
Phosgenite	-9.05	-28.86	-19.81	PbCl2:PbCO3
Plattnerite	-17.68	31.92	49.60	PbO2
Portlandite	-9.59	13.22	22.80	Ca (OH) 2
Pyrite	-124.51	-143.02	-18.51	FeS2
Pyrochroite	-3.74	11.45	15.19	Mn (OH) 2
Pyrolusite	-4.33	37.05	41.38	MnO2
Realgar	-101.82	-121.57	-19.75	AsS
Retgersite	-6.58	-8.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.74	-9.84	-10.58	MnCO3
Rutherfordine	-5.16	-19.66	-14.50	UO2CO3
Sb (OH) 3	-11.07	-18.18	-7.11	Sb (OH) 3
Sb2O4	-14.15	-10.75	3.40	Sb2O4
Sb2O5	-24.11	-33.77	-9.67	Sb2O5
Sb2Se3	-108.55	-176.31	-67.76	Sb2Se3
Sb4O6 (cubic)	-54.44	-72.70	-18.26	Sb4O6
Sb4O6 (orth)	-54.80	-72.70	-17.90	Sb4O6
SbCl3	-49.08	-48.51	0.57	SbCl3
SbF3	-42.47	-52.70	-10.23	SbF3
Sbmetal	-44.88	-56.57	-11.69	Sb
SbO2	-1.86	-29.69	-27.82	SbO2
Schoepite	-4.37	1.62	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.95	-21.06	-7.11	Se
Semetal (hex)	-13.35	-21.06	-7.71	Se
Senarmontite	-23.98	-36.35	-12.37	Sb2O3
SeO2	-14.84	-14.72	0.12	SeO2
SeO3	-46.47	-25.43	21.04	SeO3
Siderite	-7.35	-17.59	-10.24	FeCO3
Smithsonite	-1.17	-11.17	-10.00	ZnCO3
Sphalerite	-64.59	-76.04	-11.45	ZnS
Spinel	-6.28	30.57	36.85	MgAl2O4
Stibnite	-244.36	-294.82	-50.46	Sb2S3
Sulfur	-58.42	-60.56	-2.14	S
Tenorite	0.64	8.29	7.64	CuO
Thenardite	-5.28	-4.95	0.32	Na2SO4
Thermonatrite	-9.45	-8.81	0.64	Na2CO3:H2O
Tyuyamunite	-3.25	0.83	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.15	6.93	21.08	U3O8
U3Sb4	-576.52	-424.14	152.38	U3Sb4
U4O9	-30.40	-33.42	-3.02	U4O9
UF4	-31.25	-60.78	-29.54	UF4
UF4:2.5H2O	-28.07	-60.79	-32.72	UF4:2.5H2O
UO2 (am)	-15.69	-14.75	0.93	UO2
UO2 (NO3) 2	-40.42	-28.27	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.12	-28.27	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.66	-28.27	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.32	-28.28	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.99	1.63	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.56	-23.81	-2.25	UO2SeO4:4H2O
UO3	-6.07	1.63	7.70	UO3
Uraninite	-10.09	-14.75	-4.67	UO2
USb2	-217.89	-188.31	29.58	USb2
V (OH) 3	-18.41	-10.82	7.59	V (OH) 3
V2O5	-14.28	-15.64	-1.36	V2O5
V3O5	-38.58	-36.75	1.84	V3O5
V4O7	-47.65	-40.46	7.19	V4O7
V6O13	-37.26	-98.12	-60.86	V6O13
Valentinite	-27.87	-36.35	-8.48	Sb2O3
VC12	-62.71	-43.84	18.87	VC12
VC13	-64.58	-41.15	23.43	VC13
VF4	-64.68	-49.75	14.93	VF4

Vmetal	-93.24	-49.22	44.03	V
VO	-38.37	-23.62	14.76	VO
VO(OH)2	-8.87	-3.72	5.15	VO(OH)2
VO2Cl	-20.77	-17.93	2.84	VO2Cl
VOC1	-32.08	-20.93	11.15	VOC1
VOC12	-36.70	-23.94	12.76	VOC12
VOSO4	-24.75	-21.14	3.61	VOSO4
Witherite	-4.81	-13.38	-8.57	BaCO3
Wurtzite	-67.09	-76.04	-8.95	ZnS
Zincite	-1.22	10.12	11.33	ZnO
Zincosite	-11.24	-7.31	3.93	ZnSO4
Zn(BO2)2	-6.41	1.88	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-23.10	-19.79	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.09	10.11	12.20	Zn(OH)2
Zn(OH)2(am)	-2.36	10.11	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.64	10.11	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.42	10.11	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.62	10.11	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.70	2.80	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.07	10.12	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.12	-1.47	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.42	-4.51	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.37	23.03	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.15	30.35	38.50	Zn5(OH)8Cl2
ZnCl2	-17.16	-10.11	7.05	ZnCl2
ZnCO3:1H2O	-0.91	-11.17	-10.26	ZnCO3:1H2O
ZnF2	-12.36	-12.90	-0.53	ZnF2
Znmetal	-41.27	-15.48	25.79	Zn
ZnMoO4	-1.33	-11.46	-10.13	ZnMoO4
ZnO(active)	-1.07	10.12	11.19	ZnO
ZnS(am)	-66.99	-76.04	-9.05	ZnS
ZnSb	-83.07	-72.05	11.01	ZnSb
ZnSe	-22.14	-36.54	-14.40	ZnSe
ZnSeO4:6H2O	-13.80	-15.32	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.67	-7.31	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 31.

```

Title Return solution back to 1L
Mix 106
      116  2.00
save solution 115
end

```

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 106.

Mixture 106.

2.000e+000 Solution 116 Solution after simulation 30.

-----Solution composition-----

Elements	Molality	Moles
Ag	2.503e-008	2.163e-008
Al	8.710e-007	7.528e-007
As	2.079e-009	1.797e-009
B	7.854e-005	6.789e-005
Ba	6.643e-008	5.742e-008
C	1.067e-003	9.224e-004
Ca	2.780e-002	2.403e-002
Cd	1.612e-007	1.393e-007
Cl	6.307e-003	5.451e-003
Co	9.397e-007	8.122e-007
Cr	3.507e-009	3.031e-009
Cu	1.101e-006	9.514e-007
F	3.785e-004	3.272e-004
Fe	2.488e-009	2.150e-009
Hg	1.194e-009	1.032e-009
K	1.015e-002	8.769e-003
Mg	2.153e-002	1.861e-002
Mn	7.049e-004	6.093e-004
Mo	3.106e-006	2.685e-006
N	9.289e-005	8.028e-005
Na	4.011e-002	3.467e-002
Ni	1.073e-006	9.276e-007
Pb	1.328e-008	1.148e-008
S	7.125e-002	6.158e-002
Sb	1.103e-006	9.532e-007
Se	3.851e-007	3.328e-007
U	7.456e-007	6.444e-007
V	1.241e-007	1.073e-007
Zn	3.134e-005	2.709e-005

-----Description of solution-----

	pH =	7.788	Charge balance
	pe =	5.011	Adjusted to redox
equilibrium	Activity of water =	0.997	
	Ionic strength =	1.676e-001	
	Mass of water (kg) =	8.643e-001	
	Total alkalinity (eq/kg) =	1.085e-003	
	Total CO2 (mol/kg) =	1.067e-003	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	3.270e-005	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.02	
	Iterations =	9	
	Total H =	9.595349e+001	
	Total O =	4.822567e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	8.556e-007	6.170e-007	-6.068	-6.210	-0.142	(0)
H+	2.158e-008	1.628e-008	-7.666	-7.788	-0.122	0.00
H2O	5.551e+001	9.974e-001	1.744	-0.001	0.000	18.07
Ag	2.503e-008					
AgCl	1.340e-008	1.340e-008	-7.873	-7.873	0.000	(0)
AgCl2-	8.975e-009	5.550e-009	-8.047	-8.256	-0.209	(0)
Ag+	1.829e-009	1.380e-009	-8.738	-8.860	-0.122	(0)
AgSO4-	6.264e-010	3.873e-010	-9.203	-9.412	-0.209	(0)
AgCl3-2	1.609e-010	2.352e-011	-9.793	-10.628	-0.835	(0)
AgNO2	1.869e-011	1.869e-011	-10.728	-10.728	0.000	(0)
AgCl4-3	1.729e-011	2.284e-013	-10.762	-12.641	-1.879	(0)
AgF	6.611e-013	6.611e-013	-12.180	-12.180	0.000	(0)

	AgNH3+	1.413e-013	8.740e-014	-12.850	-13.059	-0.209	(0)
	AgOH	8.512e-014	8.512e-014	-13.070	-13.070	0.000	(0)
	AgH2BO3	5.922e-014	5.922e-014	-13.228	-13.228	0.000	(0)
	AgSeO3-	4.099e-014	2.535e-014	-13.387	-13.596	-0.209	(0)
	Ag2Se	1.298e-014	1.298e-014	-13.887	-13.887	0.000	(0)
	Ag(NO2) 2-	3.034e-015	1.876e-015	-14.518	-14.727	-0.209	(0)
	AgNO3	7.574e-017	7.574e-017	-16.121	-16.121	0.000	(0)
	Ag(NH3) 2+	3.565e-017	2.204e-017	-16.448	-16.657	-0.209	(0)
	Ag(OH) 2-	8.301e-018	5.133e-018	-17.081	-17.290	-0.209	(0)
	Ag(SeO3) 2-3	4.911e-019	6.488e-021	-18.309	-20.188	-1.879	(0)
	Ag2MoO4	7.240e-025	7.240e-025	-24.140	-24.140	0.000	(0)
	AgHS	0.000e+000	0.000e+000	-73.417	-73.417	0.000	(0)
	AgOH(Se) 2-4	0.000e+000	0.000e+000	-80.396	-83.737	-3.341	(0)
	Ag(HS) S4-2	0.000e+000	0.000e+000	-147.107	-147.384	-0.277	(0)
	Ag(HS) 2-	0.000e+000	0.000e+000	-147.480	-147.689	-0.209	(0)
	Ag(S4) 2-3	0.000e+000	0.000e+000	-148.561	-149.035	-0.475	(0)
	AgS4S5-3	0.000e+000	0.000e+000	-148.902	-149.346	-0.445	(0)
Al	8.710e-007						
	Al(OH) 4-	8.606e-007	6.379e-007	-6.065	-6.195	-0.130	(0)
	Al(OH) 3	8.212e-009	8.212e-009	-8.086	-8.086	0.000	(0)
	Al(OH) 2+	8.812e-010	6.670e-010	-9.055	-9.176	-0.121	(0)
	AlF3	7.674e-010	7.674e-010	-9.115	-9.115	0.000	(0)
	AlF2+	4.222e-010	3.195e-010	-9.375	-9.495	-0.121	(0)
	AlF4-	9.899e-011	7.337e-011	-10.004	-10.135	-0.130	(0)
	AlF+2	1.282e-011	4.208e-012	-10.892	-11.376	-0.484	(0)
	AlOH+2	4.146e-012	1.361e-012	-11.382	-11.866	-0.484	(0)
	AlSO4+	3.250e-013	2.409e-013	-12.488	-12.618	-0.130	(0)
	Al(SO4) 2-	4.900e-014	3.632e-014	-13.310	-13.440	-0.130	(0)
	Al+3	2.793e-014	2.206e-015	-13.554	-14.656	-1.102	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-40.499	-42.378	-1.879	(0)
As (3)	2.581e-023						
	H3AsO3	2.456e-023	2.456e-023	-22.610	-22.610	0.000	(0)
	H2AsO3-	1.252e-024	7.739e-025	-23.903	-24.111	-0.209	(0)
	HAsO3-2	2.966e-028	4.336e-029	-27.528	-28.363	-0.835	(0)
	H4AsO3+	3.203e-031	1.981e-031	-30.494	-30.703	-0.209	(0)
	AsO3-3	7.772e-033	1.027e-034	-32.109	-33.989	-1.879	(0)
As (5)	2.079e-009						
	HAsO4-2	2.005e-009	2.930e-010	-8.698	-9.533	-0.835	(0)
	H2AsO4-	7.035e-011	4.350e-011	-10.153	-10.362	-0.209	(0)
	AsO4-3	4.309e-012	5.693e-014	-11.366	-13.245	-1.879	(0)
	H3AsO4	1.184e-016	1.230e-016	-15.927	-15.910	0.017	(0)
B	7.854e-005						
	H3BO3	7.304e-005	7.591e-005	-4.136	-4.120	0.017	(0)
	H2BO3-	3.881e-006	2.709e-006	-5.411	-5.567	-0.156	(0)
	CaH2BO3+	9.801e-007	6.839e-007	-6.009	-6.165	-0.156	(0)
	MgH2BO3+	5.091e-007	3.553e-007	-6.293	-6.449	-0.156	(0)
	NaH2BO3	1.207e-007	1.207e-007	-6.918	-6.918	0.000	(0)
	BF(OH) 3-	8.281e-009	5.778e-009	-8.082	-8.238	-0.156	(0)
	H5(BO3) 2-	2.508e-010	1.750e-010	-9.601	-9.757	-0.156	(0)
	BF2(OH) 2-	2.756e-012	1.923e-012	-11.560	-11.716	-0.156	(0)
	BaH2BO3+	2.570e-012	1.794e-012	-11.590	-11.746	-0.156	(0)
	H8(BO3) 3-	1.904e-012	1.329e-012	-11.720	-11.877	-0.156	(0)
	AgH2BO3	5.922e-014	5.922e-014	-13.228	-13.228	0.000	(0)
	BF3OH-	3.338e-018	2.329e-018	-17.477	-17.633	-0.156	(0)
	BF4-	5.113e-023	3.568e-023	-22.291	-22.448	-0.156	(0)
Ba	6.643e-008						
	Ba+2	6.622e-008	2.143e-008	-7.179	-7.669	-0.490	(0)
	BaHCO3+	1.803e-010	1.382e-010	-9.744	-9.859	-0.116	(0)
	BaCO3	2.138e-011	2.138e-011	-10.670	-10.670	0.000	(0)
	BaH2BO3+	2.570e-012	1.794e-012	-11.590	-11.746	-0.156	(0)
	BaOH+	7.694e-014	5.772e-014	-13.114	-13.239	-0.125	(0)
	BaNO3+	1.201e-014	7.424e-015	-13.921	-14.129	-0.209	(0)
	BaNH3+2	2.870e-015	4.195e-016	-14.542	-15.377	-0.835	(0)
C (4)	1.067e-003						
	HCO3-	8.923e-004	6.754e-004	-3.050	-3.170	-0.121	(0)
	CaHCO3+	7.201e-005	5.518e-005	-4.143	-4.258	-0.116	(0)
	MgHCO3+	3.574e-005	2.614e-005	-4.447	-4.583	-0.136	(0)
	H2CO3	2.472e-005	2.472e-005	-4.607	-4.607	0.000	(0)

	CaCO3	1.353e-005	1.353e-005	-4.869	-4.869	0.000	(0)
	NaHCO3	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
	MgCO3	6.120e-006	6.120e-006	-5.213	-5.213	0.000	(0)
	CO3-2	6.011e-006	1.945e-006	-5.221	-5.711	-0.490	(0)
	MnHCO3+	1.350e-006	1.013e-006	-5.870	-5.995	-0.125	(0)
	NaCO3-	1.346e-006	1.019e-006	-5.871	-5.992	-0.121	(0)
	UO2 (CO3) 3-4	7.223e-007	3.298e-010	-6.141	-9.482	-3.341	(0)
	CuCO3	5.908e-007	5.908e-007	-6.229	-6.229	0.000	(0)
	ZnCO3	3.884e-007	3.884e-007	-6.411	-6.411	0.000	(0)
	ZnHCO3+	1.198e-007	7.410e-008	-6.921	-7.130	-0.209	(0)
	NiHCO3+	2.348e-008	1.452e-008	-7.629	-7.838	-0.209	(0)
	UO2 (CO3) 2-2	2.314e-008	3.383e-009	-7.636	-8.471	-0.835	(0)
	Cu (CO3) 2-2	2.116e-008	3.093e-009	-7.674	-8.510	-0.835	(0)
	NiCO3	1.265e-008	1.265e-008	-7.898	-7.898	0.000	(0)
	CoHCO3+	8.127e-009	5.025e-009	-8.090	-8.299	-0.209	(0)
	CuHCO3+	3.555e-009	2.198e-009	-8.449	-8.658	-0.209	(0)
	PbCO3	3.277e-009	3.277e-009	-8.484	-8.484	0.000	(0)
	CoCO3	3.145e-009	3.145e-009	-8.502	-8.502	0.000	(0)
	CdCO3	6.221e-010	6.221e-010	-9.206	-9.206	0.000	(0)
	PbHCO3+	4.549e-010	2.813e-010	-9.342	-9.551	-0.209	(0)
	BaHCO3+	1.803e-010	1.382e-010	-9.744	-9.859	-0.116	(0)
	Pb (CO3) 2-2	1.258e-010	1.839e-011	-9.900	-10.736	-0.835	(0)
	UO2CO3	8.716e-011	8.716e-011	-10.060	-10.060	0.000	(0)
	CdHCO3+	3.489e-011	2.158e-011	-10.457	-10.666	-0.209	(0)
	BaCO3	2.138e-011	2.138e-011	-10.670	-10.670	0.000	(0)
	Cd (CO3) 2-2	6.137e-012	8.971e-013	-11.212	-12.047	-0.835	(0)
	FeHCO3+	1.481e-014	1.135e-014	-13.830	-13.945	-0.116	(0)
	HgCO3	3.133e-015	3.133e-015	-14.504	-14.504	0.000	(0)
	Hg (CO3) 2-2	1.319e-016	1.927e-017	-15.880	-16.715	-0.835	(0)
	HgHCO3+	1.536e-018	9.497e-019	-17.814	-18.022	-0.209	(0)
Ca	2.780e-002						
	CaSO4	1.414e-002	1.414e-002	-1.849	-1.849	0.000	(0)
	Ca+2	1.356e-002	4.388e-003	-1.868	-2.358	-0.490	(0)
	CaHCO3+	7.201e-005	5.518e-005	-4.143	-4.258	-0.116	(0)
	CaCO3	1.353e-005	1.353e-005	-4.869	-4.869	0.000	(0)
	CaF+	1.218e-005	9.136e-006	-4.914	-5.039	-0.125	(0)
	CaH2BO3+	9.801e-007	6.839e-007	-6.009	-6.165	-0.156	(0)
	CaOH+	7.049e-008	5.402e-008	-7.152	-7.267	-0.116	(0)
	CaNO3+	1.551e-009	9.591e-010	-8.809	-9.018	-0.209	(0)
	CaNH3+2	1.173e-009	1.714e-010	-8.931	-9.766	-0.835	(0)
	Ca (NH3) 2+2	1.448e-017	2.117e-018	-16.839	-17.674	-0.835	(0)
Cd	1.612e-007						
	Cd (SO4) 2-2	6.009e-008	8.784e-009	-7.221	-8.056	-0.835	(0)
	CdSO4	4.628e-008	4.628e-008	-7.335	-7.335	0.000	(0)
	Cd+2	4.336e-008	1.403e-008	-7.363	-7.853	-0.490	(0)
	CdCl+	1.031e-008	6.374e-009	-7.987	-8.196	-0.209	(0)
	CdCO3	6.221e-010	6.221e-010	-9.206	-9.206	0.000	(0)
	CdOHC1	1.613e-010	1.613e-010	-9.792	-9.792	0.000	(0)
	CdCl2	1.264e-010	1.264e-010	-9.898	-9.898	0.000	(0)
	CdOH+	1.112e-010	6.877e-011	-9.954	-10.163	-0.209	(0)
	CdF+	6.861e-011	4.242e-011	-10.164	-10.372	-0.209	(0)
	CdHCO3+	3.489e-011	2.158e-011	-10.457	-10.666	-0.209	(0)
	Cd (CO3) 2-2	6.137e-012	8.971e-013	-11.212	-12.047	-0.835	(0)
	CdCl3-	6.133e-013	3.792e-013	-12.212	-12.421	-0.209	(0)
	Cd (OH) 2	2.677e-013	2.677e-013	-12.572	-12.572	0.000	(0)
	CdF2	1.615e-014	1.615e-014	-13.792	-13.792	0.000	(0)
	CdNO3+	4.960e-015	3.067e-015	-14.304	-14.513	-0.209	(0)
	Cd2OH+3	3.661e-016	4.837e-018	-15.436	-17.315	-1.879	(0)
	CdSeO4	3.657e-016	3.657e-016	-15.437	-15.437	0.000	(0)
	Cd (SeO3) 2-2	6.466e-017	9.452e-018	-16.189	-17.024	-0.835	(0)
	Cd (OH) 3-	1.632e-017	1.009e-017	-16.787	-16.996	-0.209	(0)
	Cd (NO3) 2	1.062e-022	1.062e-022	-21.974	-21.974	0.000	(0)
	Cd (OH) 4-2	6.973e-024	1.019e-024	-23.157	-23.992	-0.835	(0)
	CdHS+	0.000e+000	0.000e+000	-78.008	-78.216	-0.209	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-149.384	-149.384	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-225.646	-225.855	-0.209	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-301.196	-302.031	-0.835	(0)
C1	6.307e-003						

Cl-	6.306e-003	4.756e-003	-2.200	-2.323	-0.122	(0)
MnCl+	5.997e-007	4.499e-007	-6.222	-6.347	-0.125	(0)
ZnCl+	5.666e-008	4.145e-008	-7.247	-7.382	-0.136	(0)
ZnOHC1	3.348e-008	3.348e-008	-7.475	-7.475	0.000	(0)
AgCl	1.340e-008	1.340e-008	-7.873	-7.873	0.000	(0)
CdCl+	1.031e-008	6.374e-009	-7.987	-8.196	-0.209	(0)
AgCl2-	8.975e-009	5.550e-009	-8.047	-8.256	-0.209	(0)
NiCl+	3.432e-009	2.122e-009	-8.464	-8.673	-0.209	(0)
MnCl2	3.023e-009	3.023e-009	-8.520	-8.520	0.000	(0)
CoCl+	2.545e-009	1.574e-009	-8.594	-8.803	-0.209	(0)
CuCl2-	2.003e-009	1.465e-009	-8.698	-8.834	-0.136	(0)
CuCl	1.475e-009	1.475e-009	-8.831	-8.831	0.000	(0)
CuCl+	5.315e-010	3.888e-010	-9.275	-9.410	-0.136	(0)
ZnCl2	3.125e-010	3.125e-010	-9.505	-9.505	0.000	(0)
CdOHC1	1.613e-010	1.613e-010	-9.792	-9.792	0.000	(0)
AgCl3-2	1.609e-010	2.352e-011	-9.793	-10.628	-0.835	(0)
PbCl+	1.530e-010	9.459e-011	-9.815	-10.024	-0.209	(0)
CdCl2	1.264e-010	1.264e-010	-9.898	-9.898	0.000	(0)
AgCl4-3	1.729e-011	2.284e-013	-10.762	-12.641	-1.879	(0)
HgClOH	6.976e-012	6.976e-012	-11.156	-11.156	0.000	(0)
MnCl3-	5.278e-012	3.959e-012	-11.278	-11.402	-0.125	(0)
CuCl3-2	4.705e-012	1.490e-012	-11.327	-11.827	-0.499	(0)
HgCl2	3.045e-012	3.045e-012	-11.516	-11.516	0.000	(0)
PbCl2	2.010e-012	2.010e-012	-11.697	-11.697	0.000	(0)
ZnCl3-	1.614e-012	1.180e-012	-11.792	-11.928	-0.136	(0)
CuCl2	6.412e-013	6.412e-013	-12.193	-12.193	0.000	(0)
CdCl3-	6.133e-013	3.792e-013	-12.212	-12.421	-0.209	(0)
HgCl3-	2.342e-013	1.448e-013	-12.630	-12.839	-0.209	(0)
NiCl2	5.082e-014	5.082e-014	-13.294	-13.294	0.000	(0)
HgCl4-2	1.876e-014	2.742e-015	-13.727	-14.562	-0.835	(0)
ZnCl4-2	8.865e-015	2.807e-015	-14.052	-14.552	-0.499	(0)
PbCl3-	6.154e-015	3.805e-015	-14.211	-14.420	-0.209	(0)
HgCl+	2.066e-016	1.277e-016	-15.685	-15.894	-0.209	(0)
UO2Cl+	1.404e-016	8.682e-017	-15.853	-16.061	-0.209	(0)
CrCl+2	7.267e-017	1.062e-017	-16.139	-16.974	-0.835	(0)
PbCl4-2	5.659e-017	8.272e-018	-16.247	-17.082	-0.835	(0)
CuCl3-	3.890e-017	2.846e-017	-16.410	-16.546	-0.136	(0)
CrOHC12	5.925e-019	5.925e-019	-18.227	-18.227	0.000	(0)
CrCl2+	7.753e-021	4.794e-021	-20.111	-20.319	-0.209	(0)
FeCl+2	5.768e-021	1.827e-021	-20.239	-20.738	-0.499	(0)
CuCl4-2	2.142e-021	6.784e-022	-20.669	-21.169	-0.499	(0)
VOCl+	1.103e-021	6.819e-022	-20.957	-21.166	-0.209	(0)
FeCl2+	5.173e-023	3.881e-023	-22.286	-22.411	-0.125	(0)
CrO3Cl-	1.766e-025	1.092e-025	-24.753	-24.962	-0.209	(0)
FeCl3	1.846e-026	1.846e-026	-25.734	-25.734	0.000	(0)
CoCl+2	2.586e-034	3.780e-035	-33.587	-34.422	-0.835	(0)
UCl+3	0.000e+000	0.000e+000	-44.650	-46.529	-1.879	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.176	-46.011	-0.835	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.198	-48.033	-0.835	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.399	-60.234	-0.835	(0)
Co (2)	9.397e-007					
Co+2	6.544e-007	9.566e-008	-6.184	-7.019	-0.835	(0)
CoSO4	2.685e-007	2.685e-007	-6.571	-6.571	0.000	(0)
CoHCO3+	8.127e-009	5.025e-009	-8.090	-8.299	-0.209	(0)
CoCO3	3.145e-009	3.145e-009	-8.502	-8.502	0.000	(0)
CoCl+	2.545e-009	1.574e-009	-8.594	-8.803	-0.209	(0)
CoOH+	1.905e-009	1.178e-009	-8.720	-8.929	-0.209	(0)
CoF+	9.332e-010	5.770e-010	-9.030	-9.239	-0.209	(0)
CoNO2+	7.067e-011	4.370e-011	-10.151	-10.360	-0.209	(0)
Co (OH) 2	5.772e-011	5.772e-011	-10.239	-10.239	0.000	(0)
Co (NH3) +2	2.441e-012	3.568e-013	-11.612	-12.448	-0.835	(0)
CoNO3+	1.695e-014	1.048e-014	-13.771	-13.980	-0.209	(0)
CoSeO4	6.710e-015	6.710e-015	-14.173	-14.173	0.000	(0)
Co (OH) 3-	1.149e-015	7.106e-016	-14.940	-15.148	-0.209	(0)
Co2OH+3	4.273e-016	5.646e-018	-15.369	-17.248	-1.879	(0)
CoOOH-	2.891e-016	1.787e-016	-15.539	-15.748	-0.209	(0)
Co (NH3) 2+2	3.231e-018	4.723e-019	-17.491	-18.326	-0.835	(0)
Co (NO3) 2	1.474e-021	1.474e-021	-20.832	-20.832	0.000	(0)

Co (OH) 4-2	4.754e-022	6.949e-023	-21.323	-22.158	-0.835	(0)
Co (NH3) 3+2	1.262e-024	1.845e-025	-23.899	-24.734	-0.835	(0)
Co4 (OH) 4+4	8.405e-025	3.838e-028	-24.075	-27.416	-3.341	(0)
Co (NH3) 4+2	2.055e-031	3.004e-032	-30.687	-31.522	-0.835	(0)
Co (NH3) 5+2	1.058e-038	1.547e-039	-37.975	-38.811	-0.835	(0)
Co (3)	8.379e-028					
CoOH+2	8.379e-028	1.225e-028	-27.077	-27.912	-0.835	(0)
Co+3	4.946e-034	3.906e-035	-33.306	-34.408	-1.102	(0)
CoCl+2	2.586e-034	3.780e-035	-33.587	-34.422	-0.835	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.176	-46.011	-0.835	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.629	-54.838	-0.209	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.086	-59.921	-0.835	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.399	-60.234	-0.835	(0)
Cr (2)	2.749e-026					
Cr+2	2.749e-026	4.019e-027	-25.561	-26.396	-0.835	(0)
Cr (3)	3.507e-009					
Cr (OH) 2+	2.828e-009	1.749e-009	-8.548	-8.757	-0.209	(0)
Cr (OH) 3	4.054e-010	4.054e-010	-9.392	-9.392	0.000	(0)
Cr (OH) +2	1.594e-010	2.329e-011	-9.798	-10.633	-0.835	(0)
CrOHSO4	7.777e-011	7.777e-011	-10.109	-10.109	0.000	(0)
CrO2-	1.918e-011	1.186e-011	-10.717	-10.926	-0.209	(0)
Cr (OH) 4-	1.610e-011	9.957e-012	-10.793	-11.002	-0.209	(0)
CrF+2	3.569e-013	5.217e-014	-12.447	-13.283	-0.835	(0)
Cr+3	1.306e-013	1.726e-015	-12.884	-14.763	-1.879	(0)
CrSO4+	9.169e-014	5.669e-014	-13.038	-13.246	-0.209	(0)
CrCl+2	7.267e-017	1.062e-017	-16.139	-16.974	-0.835	(0)
Cr2 (OH) 2SO4+2	1.120e-018	1.638e-019	-17.951	-18.786	-0.835	(0)
CrOHC12	5.925e-019	5.925e-019	-18.227	-18.227	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.369e-019	1.369e-019	-18.864	-18.864	0.000	(0)
CrCl2+	7.753e-021	4.794e-021	-20.111	-20.319	-0.209	(0)
CrNO3+2	3.567e-023	5.214e-024	-22.448	-23.283	-0.835	(0)
Cr (NH3) 5OH+2	4.936e-038	7.215e-039	-37.307	-38.142	-0.835	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-44.934	-46.813	-1.879	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.198	-48.033	-0.835	(0)
Cr (6)	1.463e-014					
CrO4-2	1.313e-014	4.248e-015	-13.882	-14.372	-0.490	(0)
NaCrO4-	9.602e-016	5.937e-016	-15.018	-15.226	-0.209	(0)
HCrO4-	3.619e-016	2.238e-016	-15.441	-15.650	-0.209	(0)
KCrO4-	1.777e-016	1.099e-016	-15.750	-15.959	-0.209	(0)
CrO3SO4-2	1.070e-022	1.565e-023	-21.970	-22.806	-0.835	(0)
H2CrO4	2.952e-024	2.952e-024	-23.530	-23.530	0.000	(0)
CrO3Cl-	1.766e-025	1.092e-025	-24.753	-24.962	-0.209	(0)
Cr2O7-2	1.191e-029	1.740e-030	-28.924	-29.759	-0.835	(0)
Cu (1)	3.881e-009					
CuCl2-	2.003e-009	1.465e-009	-8.698	-8.834	-0.136	(0)
CuCl	1.475e-009	1.475e-009	-8.831	-8.831	0.000	(0)
Cu+	3.983e-010	2.463e-010	-9.400	-9.609	-0.209	(0)
CuCl3-2	4.705e-012	1.490e-012	-11.327	-11.827	-0.499	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.926	-147.385	-0.459	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.684	-148.115	-0.431	(0)
Cu (2)	1.097e-006					
CuCO3	5.908e-007	5.908e-007	-6.229	-6.229	0.000	(0)
CuSO4	1.662e-007	1.662e-007	-6.779	-6.779	0.000	(0)
Cu+2	1.594e-007	5.158e-008	-6.798	-7.288	-0.490	(0)
CuOH+	1.376e-007	1.006e-007	-6.861	-6.997	-0.136	(0)
Cu (CO3) 2-2	2.116e-008	3.093e-009	-7.674	-8.510	-0.835	(0)
Cu (OH) 2	1.239e-008	1.239e-008	-7.907	-7.907	0.000	(0)
CuHCO3+	3.555e-009	2.198e-009	-8.449	-8.658	-0.209	(0)
Cu2 (OH) 2+2	1.740e-009	2.544e-010	-8.759	-9.594	-0.835	(0)
CuF+	1.004e-009	6.208e-010	-8.998	-9.207	-0.209	(0)
CuNO2+	5.663e-010	3.501e-010	-9.247	-9.456	-0.209	(0)
CuCl+	5.315e-010	3.888e-010	-9.275	-9.410	-0.136	(0)
CuNH3+2	1.120e-010	1.638e-011	-9.951	-10.786	-0.835	(0)
Cu (OH) 3-	2.536e-011	1.568e-011	-10.596	-10.805	-0.209	(0)
CuCl2	6.412e-013	6.412e-013	-12.193	-12.193	0.000	(0)
Cu (NO2) 2	2.323e-013	2.323e-013	-12.634	-12.634	0.000	(0)
CuNO3+	1.823e-014	1.127e-014	-13.739	-13.948	-0.209	(0)
Cu (OH) 4-2	5.209e-016	7.615e-017	-15.283	-16.118	-0.835	(0)

	CuCl3-	3.890e-017	2.846e-017	-16.410	-16.546	-0.136	(0)
	CuCl4-2	2.142e-021	6.784e-022	-20.669	-21.169	-0.499	(0)
	Cu (NO3) 2	9.810e-023	9.810e-023	-22.008	-22.008	0.000	(0)
	Cu (HS) 3-	0.000e+000	0.000e+000	-216.294	-216.503	-0.209	(0)
F	3.785e-004						
	F-	2.529e-004	1.908e-004	-3.597	-3.720	-0.122	(0)
	MgF+	1.092e-004	8.097e-005	-3.962	-4.092	-0.130	(0)
	CaF+	1.218e-005	9.136e-006	-4.914	-5.039	-0.125	(0)
	NaF	3.385e-006	3.385e-006	-5.470	-5.470	0.000	(0)
	MnF+	7.607e-007	5.706e-007	-6.119	-6.244	-0.125	(0)
	ZnF+	2.136e-008	1.321e-008	-7.670	-7.879	-0.209	(0)
	BF (OH) 3-	8.281e-009	5.778e-009	-8.082	-8.238	-0.156	(0)
	HF	4.593e-009	4.593e-009	-8.338	-8.338	0.000	(0)
	NiF+	1.351e-009	8.356e-010	-8.869	-9.078	-0.209	(0)
	CuF+	1.004e-009	6.208e-010	-8.998	-9.207	-0.209	(0)
	CoF+	9.332e-010	5.770e-010	-9.030	-9.239	-0.209	(0)
	AlF3	7.674e-010	7.674e-010	-9.115	-9.115	0.000	(0)
	AlF2+	4.222e-010	3.195e-010	-9.375	-9.495	-0.121	(0)
	AlF4-	9.899e-011	7.337e-011	-10.004	-10.135	-0.130	(0)
	CdF+	6.861e-011	4.242e-011	-10.164	-10.372	-0.209	(0)
	AlF+2	1.282e-011	4.208e-012	-10.892	-11.376	-0.484	(0)
	PbF+	1.219e-011	7.535e-012	-10.914	-11.123	-0.209	(0)
	HF2-	4.619e-012	3.331e-012	-11.335	-11.477	-0.142	(0)
	BF2 (OH) 2-	2.756e-012	1.923e-012	-11.560	-11.716	-0.156	(0)
	AgF	6.611e-013	6.611e-013	-12.180	-12.180	0.000	(0)
	UO2F+	4.793e-013	2.964e-013	-12.319	-12.528	-0.209	(0)
	CrF+2	3.569e-013	5.217e-014	-12.447	-13.283	-0.835	(0)
	UO2F2	1.631e-013	1.631e-013	-12.788	-12.788	0.000	(0)
	PbF2	2.829e-014	2.829e-014	-13.548	-13.548	0.000	(0)
	CdF2	1.615e-014	1.615e-014	-13.792	-13.792	0.000	(0)
	UO2F3-	1.264e-014	7.813e-015	-13.898	-14.107	-0.209	(0)
	VO2F	8.255e-017	8.255e-017	-16.083	-16.083	0.000	(0)
	UO2F4-2	8.099e-017	1.184e-017	-16.092	-16.927	-0.835	(0)
	H2F2	5.651e-017	5.651e-017	-16.248	-16.248	0.000	(0)
	FeF2+	1.810e-017	1.358e-017	-16.742	-16.867	-0.125	(0)
	PbF3-	1.655e-017	1.023e-017	-16.781	-16.990	-0.209	(0)
	VO2F2-	9.247e-018	5.718e-018	-17.034	-17.243	-0.209	(0)
	FeF+2	8.399e-018	2.660e-018	-17.076	-17.575	-0.499	(0)
	FeF3	3.655e-018	3.655e-018	-17.437	-17.437	0.000	(0)
	BF3OH-	3.338e-018	2.329e-018	-17.477	-17.633	-0.156	(0)
	VOF+	9.457e-020	5.847e-020	-19.024	-19.233	-0.209	(0)
	VO2F3-2	9.307e-020	1.361e-020	-19.031	-19.866	-0.835	(0)
	PbF4-2	6.392e-021	9.344e-022	-20.194	-21.029	-0.835	(0)
	VOF2	4.183e-021	4.183e-021	-20.379	-20.379	0.000	(0)
	VO2F4-3	9.665e-023	1.277e-024	-22.015	-23.894	-1.879	(0)
	BF4-	5.113e-023	3.568e-023	-22.291	-22.448	-0.156	(0)
	VOF3-	4.578e-023	2.831e-023	-22.339	-22.548	-0.209	(0)
	HgF+	1.539e-023	9.518e-024	-22.813	-23.021	-0.209	(0)
	Sb (OH) 2F	3.243e-024	3.243e-024	-23.489	-23.489	0.000	(0)
	SbOF	3.197e-024	3.197e-024	-23.495	-23.495	0.000	(0)
	VOF4-2	1.491e-025	2.180e-026	-24.826	-25.662	-0.835	(0)
	UF3+	5.547e-036	3.430e-036	-35.256	-35.465	-0.209	(0)
	UF2+2	7.761e-037	1.134e-037	-36.110	-36.945	-0.835	(0)
	UF4	7.174e-038	7.174e-038	-37.144	-37.144	0.000	(0)
	UF+3	3.576e-039	0.000e+000	-38.447	-40.326	-1.879	(0)
	UF5-	8.771e-040	5.423e-040	-39.057	-39.266	-0.209	(0)
	UF6-2	2.137e-040	0.000e+000	-39.670	-40.505	-0.835	(0)
Fe (2)	1.380e-011						
	Fe+2	9.130e-012	1.335e-012	-11.040	-11.875	-0.835	(0)
	FeSO4	4.609e-012	4.609e-012	-11.336	-11.336	0.000	(0)
	FeOH+	4.370e-014	3.278e-014	-13.360	-13.484	-0.125	(0)
	FeHCO3+	1.481e-014	1.135e-014	-13.830	-13.945	-0.116	(0)
	Fe (OH) 2	1.607e-017	1.607e-017	-16.794	-16.794	0.000	(0)
	Fe (OH) 3-	4.179e-018	3.135e-018	-17.379	-17.504	-0.125	(0)
	Fe (HS) 2	0.000e+000	0.000e+000	-159.668	-159.668	0.000	(0)
	Fe (HS) 3-	0.000e+000	0.000e+000	-235.793	-236.002	-0.209	(0)
Fe (3)	2.474e-009						
	Fe (OH) 2+	1.607e-009	1.216e-009	-8.794	-8.915	-0.121	(0)

Fe (OH) 3	8.059e-010	8.059e-010	-9.094	-9.094	0.000	(0)
Fe (OH) 4-	6.117e-011	4.630e-011	-10.213	-10.334	-0.121	(0)
FeOH+2	1.600e-014	5.066e-015	-13.796	-14.295	-0.499	(0)
FeF2+	1.810e-017	1.358e-017	-16.742	-16.867	-0.125	(0)
FeF+2	8.399e-018	2.660e-018	-17.076	-17.575	-0.499	(0)
FeF3	3.655e-018	3.655e-018	-17.437	-17.437	0.000	(0)
FeSO4+	2.676e-018	2.008e-018	-17.572	-17.697	-0.125	(0)
Fe (SO4) 2-	9.767e-019	6.039e-019	-18.010	-18.219	-0.209	(0)
Fe+3	1.610e-019	1.272e-020	-18.793	-19.896	-1.102	(0)
FeCl+2	5.768e-021	1.827e-021	-20.239	-20.738	-0.499	(0)
FeCl2+	5.173e-023	3.881e-023	-22.286	-22.411	-0.125	(0)
FeHSeO3+2	2.687e-023	3.928e-024	-22.571	-23.406	-0.835	(0)
Fe2 (OH) 2+4	1.862e-024	8.499e-028	-23.730	-27.071	-3.341	(0)
FeNO3+2	6.013e-026	8.790e-027	-25.221	-26.056	-0.835	(0)
FeCl3	1.846e-026	1.846e-026	-25.734	-25.734	0.000	(0)
Fe3 (OH) 4+5	2.477e-030	1.494e-035	-29.606	-34.826	-5.220	(0)
H (0)	3.430e-029					
H2	1.715e-029	1.783e-029	-28.766	-28.749	0.017	(0)
Hg (0)	1.181e-009					
Hg	1.181e-009	1.181e-009	-8.928	-8.928	0.000	(0)
Hg (1)	1.476e-020					
Hg2+2	7.381e-021	1.079e-021	-20.132	-20.967	-0.835	(0)
Hg (2)	1.339e-011					
HgClOH	6.976e-012	6.976e-012	-11.156	-11.156	0.000	(0)
Hg (OH) 2	3.111e-012	3.233e-012	-11.507	-11.490	0.017	(0)
HgCl2	3.045e-012	3.045e-012	-11.516	-11.516	0.000	(0)
HgCl3-	2.342e-013	1.448e-013	-12.630	-12.839	-0.209	(0)
HgCl4-2	1.876e-014	2.742e-015	-13.727	-14.562	-0.835	(0)
HgCO3	3.133e-015	3.133e-015	-14.504	-14.504	0.000	(0)
HgCl+	2.066e-016	1.277e-016	-15.685	-15.894	-0.209	(0)
Hg (CO3) 2-2	1.319e-016	1.927e-017	-15.880	-16.715	-0.835	(0)
HgOH+	5.347e-017	3.306e-017	-16.272	-16.481	-0.209	(0)
Hg (NH3) 2+2	5.593e-018	8.176e-019	-17.252	-18.087	-0.835	(0)
HgHCO3+	1.536e-018	9.497e-019	-17.814	-18.022	-0.209	(0)
Hg (OH) 3-	4.062e-019	2.512e-019	-18.391	-18.600	-0.209	(0)
HgNH3+2	1.803e-019	2.635e-020	-18.744	-19.579	-0.835	(0)
Hg+2	9.208e-021	1.346e-021	-20.036	-20.871	-0.835	(0)
HgSO4	4.958e-021	4.958e-021	-20.305	-20.305	0.000	(0)
HgF+	1.539e-023	9.518e-024	-22.813	-23.021	-0.209	(0)
Hg (NH3) 3+2	6.909e-025	1.010e-025	-24.161	-24.996	-0.835	(0)
HgNO3+	5.556e-029	3.435e-029	-28.255	-28.464	-0.209	(0)
Hg (NH3) 4+2	1.703e-031	2.489e-032	-30.769	-31.604	-0.835	(0)
Hg (NO3) 2	9.868e-037	9.868e-037	-36.006	-36.006	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-137.689	-137.897	-0.209	(0)
HgS2-2	0.000e+000	0.000e+000	-137.982	-138.817	-0.835	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.292	-139.292	0.000	(0)
K	1.015e-002					
K+	9.230e-003	6.961e-003	-2.035	-2.157	-0.122	(0)
KSO4-	9.161e-004	6.934e-004	-3.038	-3.159	-0.121	(0)
KCrO4-	1.777e-016	1.099e-016	-15.750	-15.959	-0.209	(0)
Mg	2.153e-002					
Mg+2	1.169e-002	3.783e-003	-1.932	-2.422	-0.490	(0)
MgSO4	9.685e-003	9.685e-003	-2.014	-2.014	0.000	(0)
MgF+	1.092e-004	8.097e-005	-3.962	-4.092	-0.130	(0)
MgHCO3+	3.574e-005	2.614e-005	-4.447	-4.583	-0.136	(0)
MgCO3	6.120e-006	6.120e-006	-5.213	-5.213	0.000	(0)
MgOH+	1.201e-006	9.292e-007	-5.920	-6.032	-0.111	(0)
MgH2BO3+	5.091e-007	3.553e-007	-6.293	-6.449	-0.156	(0)
Mn (2)	7.049e-004					
Mn+2	5.140e-004	7.514e-005	-3.289	-4.124	-0.835	(0)
MnSO4	1.880e-004	1.880e-004	-3.726	-3.726	0.000	(0)
MnHCO3+	1.350e-006	1.013e-006	-5.870	-5.995	-0.125	(0)
MnF+	7.607e-007	5.706e-007	-6.119	-6.244	-0.125	(0)
MnCl+	5.997e-007	4.499e-007	-6.222	-6.347	-0.125	(0)
MnOH+	1.552e-007	1.165e-007	-6.809	-6.934	-0.125	(0)
MnCl2	3.023e-009	3.023e-009	-8.520	-8.520	0.000	(0)
MnNO3+	1.331e-011	8.231e-012	-10.876	-11.085	-0.209	(0)
MnCl3-	5.278e-012	3.959e-012	-11.278	-11.402	-0.125	(0)

MnSeO4	2.831e-012	2.831e-012	-11.548	-11.548	0.000	(0)
Mn (OH) 3-	3.652e-016	2.740e-016	-15.437	-15.562	-0.125	(0)
Mn (NO3) 2	1.429e-018	1.429e-018	-17.845	-17.845	0.000	(0)
Mn (OH) 4-2	1.724e-021	5.458e-022	-20.764	-21.263	-0.499	(0)
MnSe	0.000e+000	0.000e+000	-40.586	-40.586	0.000	(0)
Mn (3)	4.359e-024					
Mn+3	4.359e-024	3.443e-025	-23.361	-24.463	-1.102	(0)
Mn (6)	1.997e-040					
MnO4-2	1.997e-040	0.000e+000	-39.700	-40.199	-0.499	(0)
Mn (7)	0.000e+000					
MnO4-	0.000e+000	0.000e+000	-44.411	-44.560	-0.149	(0)
Mo	3.106e-006					
MoO4-2	3.105e-006	1.005e-006	-5.508	-5.998	-0.490	(0)
HMoO4-	5.264e-010	3.255e-010	-9.279	-9.487	-0.209	(0)
H2MoO4	3.881e-014	3.881e-014	-13.411	-13.411	0.000	(0)
Ag2MoO4	7.240e-025	7.240e-025	-24.140	-24.140	0.000	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-40.499	-42.378	-1.879	(0)
Mo7O24-6	0.000e+000	0.000e+000	-43.782	-51.298	-7.516	(0)
HMo7O24-5	0.000e+000	0.000e+000	-47.480	-52.700	-5.220	(0)
H2Mo7O24-4	0.000e+000	0.000e+000	-52.365	-55.706	-3.341	(0)
H3Mo7O24-3	0.000e+000	0.000e+000	-58.369	-60.248	-1.879	(0)
N (-3)	1.480e-006					
NH4+	1.269e-006	8.858e-007	-5.896	-6.053	-0.156	(0)
NH4SO4-	1.780e-007	1.335e-007	-6.750	-6.874	-0.125	(0)
NH3	3.103e-008	3.103e-008	-7.508	-7.508	0.000	(0)
CaNH3+2	1.173e-009	1.714e-010	-8.931	-9.766	-0.835	(0)
CuNH3+2	1.120e-010	1.638e-011	-9.951	-10.786	-0.835	(0)
NiNH3+2	1.988e-011	2.906e-012	-10.702	-11.537	-0.835	(0)
Co (NH3) +2	2.441e-012	3.568e-013	-11.612	-12.448	-0.835	(0)
AgNH3+	1.413e-013	8.740e-014	-12.850	-13.059	-0.209	(0)
BaNH3+2	2.870e-015	4.195e-016	-14.542	-15.377	-0.835	(0)
Ni (NH3) 2+2	8.915e-017	1.303e-017	-16.050	-16.885	-0.835	(0)
Ag (NH3) 2+	3.565e-017	2.204e-017	-16.448	-16.657	-0.209	(0)
Ca (NH3) 2+2	1.448e-017	2.117e-018	-16.839	-17.674	-0.835	(0)
Hg (NH3) 2+2	5.593e-018	8.176e-019	-17.252	-18.087	-0.835	(0)
Co (NH3) 2+2	3.231e-018	4.723e-019	-17.491	-18.326	-0.835	(0)
HgNH3+2	1.803e-019	2.635e-020	-18.744	-19.579	-0.835	(0)
Co (NH3) 3+2	1.262e-024	1.845e-025	-23.899	-24.734	-0.835	(0)
Hg (NH3) 3+2	6.909e-025	1.010e-025	-24.161	-24.996	-0.835	(0)
Co (NH3) 4+2	2.055e-031	3.004e-032	-30.687	-31.522	-0.835	(0)
Hg (NH3) 4+2	1.703e-031	2.489e-032	-30.769	-31.604	-0.835	(0)
Cr (NH3) 5OH+2	4.936e-038	7.215e-039	-37.307	-38.142	-0.835	(0)
Co (NH3) 5+2	1.058e-038	1.547e-039	-37.975	-38.811	-0.835	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-44.934	-46.813	-1.879	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.176	-46.011	-0.835	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.198	-48.033	-0.835	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.629	-54.838	-0.209	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-59.086	-59.921	-0.835	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.399	-60.234	-0.835	(0)
N (3)	9.131e-005					
NO2-	9.131e-005	6.483e-005	-4.039	-4.188	-0.149	(0)
CuNO2+	5.663e-010	3.501e-010	-9.247	-9.456	-0.209	(0)
CoNO2+	7.067e-011	4.370e-011	-10.151	-10.360	-0.209	(0)
AgNO2	1.869e-011	1.869e-011	-10.728	-10.728	0.000	(0)
Cu (NO2) 2	2.323e-013	2.323e-013	-12.634	-12.634	0.000	(0)
Ag (NO2) 2-	3.034e-015	1.876e-015	-14.518	-14.727	-0.209	(0)
N (5)	9.321e-008					
NO3-	9.164e-008	6.912e-008	-7.038	-7.160	-0.122	(0)
CaNO3+	1.551e-009	9.591e-010	-8.809	-9.018	-0.209	(0)
MnNO3+	1.331e-011	8.231e-012	-10.876	-11.085	-0.209	(0)
ZnNO3+	9.742e-013	6.024e-013	-12.011	-12.220	-0.209	(0)
NiNO3+	4.896e-014	3.028e-014	-13.310	-13.519	-0.209	(0)
CuNO3+	1.823e-014	1.127e-014	-13.739	-13.948	-0.209	(0)
CoNO3+	1.695e-014	1.048e-014	-13.771	-13.980	-0.209	(0)
BaNO3+	1.201e-014	7.424e-015	-13.921	-14.129	-0.209	(0)
CdNO3+	4.960e-015	3.067e-015	-14.304	-14.513	-0.209	(0)
PbNO3+	9.268e-016	5.730e-016	-15.033	-15.242	-0.209	(0)
AgNO3	7.574e-017	7.574e-017	-16.121	-16.121	0.000	(0)

Mn(NO3)2	1.429e-018	1.429e-018	-17.845	-17.845	0.000	(0)
Zn(NO3)2	8.307e-021	8.307e-021	-20.081	-20.081	0.000	(0)
UO2NO3+	2.510e-021	1.552e-021	-20.600	-20.809	-0.209	(0)
Co(NO3)2	1.474e-021	1.474e-021	-20.832	-20.832	0.000	(0)
Cd(NO3)2	1.062e-022	1.062e-022	-21.974	-21.974	0.000	(0)
Cu(NO3)2	9.810e-023	9.810e-023	-22.008	-22.008	0.000	(0)
Pb(NO3)2	6.726e-023	6.726e-023	-22.172	-22.172	0.000	(0)
CrNO3+2	3.567e-023	5.214e-024	-22.448	-23.283	-0.835	(0)
VO2NO3	8.626e-024	8.626e-024	-23.064	-23.064	0.000	(0)
FeNO3+2	6.013e-026	8.790e-027	-25.221	-26.056	-0.835	(0)
HgNO3+	5.556e-029	3.435e-029	-28.255	-28.464	-0.209	(0)
Hg(NO3)2	9.868e-037	9.868e-037	-36.006	-36.006	0.000	(0)
Na	4.011e-002					
Na+	3.729e-002	2.813e-002	-1.428	-1.551	-0.122	(0)
NaSO4-	2.808e-003	2.125e-003	-2.552	-2.673	-0.121	(0)
NaHCO3	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
NaF	3.385e-006	3.385e-006	-5.470	-5.470	0.000	(0)
NaCO3-	1.346e-006	1.019e-006	-5.871	-5.992	-0.121	(0)
NaH2BO3	1.207e-007	1.207e-007	-6.918	-6.918	0.000	(0)
NaCrO4-	9.602e-016	5.937e-016	-15.018	-15.226	-0.209	(0)
Ni	1.073e-006					
Ni+2	5.389e-007	1.744e-007	-6.269	-6.759	-0.490	(0)
NiSO4	4.895e-007	4.895e-007	-6.310	-6.310	0.000	(0)
NiHCO3+	2.348e-008	1.452e-008	-7.629	-7.838	-0.209	(0)
NiCO3	1.265e-008	1.265e-008	-7.898	-7.898	0.000	(0)
NiCl+	3.432e-009	2.122e-009	-8.464	-8.673	-0.209	(0)
NiOH+	2.191e-009	1.355e-009	-8.659	-8.868	-0.209	(0)
Ni(SO4)2-2	1.560e-009	2.281e-010	-8.807	-9.642	-0.835	(0)
NiF+	1.351e-009	8.356e-010	-8.869	-9.078	-0.209	(0)
Ni(OH)2	6.639e-011	6.639e-011	-10.178	-10.178	0.000	(0)
NiNH3+2	1.988e-011	2.906e-012	-10.702	-11.537	-0.835	(0)
Ni(OH)3-	6.625e-014	4.096e-014	-13.179	-13.388	-0.209	(0)
NiCl2	5.082e-014	5.082e-014	-13.294	-13.294	0.000	(0)
NiNO3+	4.896e-014	3.028e-014	-13.310	-13.519	-0.209	(0)
NiSeO4	1.142e-014	1.142e-014	-13.942	-13.942	0.000	(0)
Ni(NH3)2+2	8.915e-017	1.303e-017	-16.050	-16.885	-0.835	(0)
O(0)	3.054e-035					
O2	1.527e-035	1.587e-035	-34.816	-34.799	0.017	(0)
Pb	1.328e-008					
PbSO4	3.863e-009	3.863e-009	-8.413	-8.413	0.000	(0)
PbCO3	3.277e-009	3.277e-009	-8.484	-8.484	0.000	(0)
Pb(SO4)2-2	2.240e-009	3.275e-010	-8.650	-9.485	-0.835	(0)
Pb+2	1.732e-009	5.605e-010	-8.761	-9.251	-0.490	(0)
PbOH+	1.405e-009	8.687e-010	-8.852	-9.061	-0.209	(0)
PbHCO3+	4.549e-010	2.813e-010	-9.342	-9.551	-0.209	(0)
PbCl+	1.530e-010	9.459e-011	-9.815	-10.024	-0.209	(0)
Pb(CO3)2-2	1.258e-010	1.839e-011	-9.900	-10.736	-0.835	(0)
Pb(OH)2	1.695e-011	1.695e-011	-10.771	-10.771	0.000	(0)
PbF+	1.219e-011	7.535e-012	-10.914	-11.123	-0.209	(0)
PbCl2	2.010e-012	2.010e-012	-11.697	-11.697	0.000	(0)
PbF2	2.829e-014	2.829e-014	-13.548	-13.548	0.000	(0)
Pb(OH)3-	1.691e-014	1.046e-014	-13.772	-13.981	-0.209	(0)
PbCl3-	6.154e-015	3.805e-015	-14.211	-14.420	-0.209	(0)
PbNO3+	9.268e-016	5.730e-016	-15.033	-15.242	-0.209	(0)
Pb2OH+3	5.841e-016	7.717e-018	-15.233	-17.113	-1.879	(0)
PbCl4-2	5.659e-017	8.272e-018	-16.247	-17.082	-0.835	(0)
PbF3-	1.655e-017	1.023e-017	-16.781	-16.990	-0.209	(0)
Pb(OH)4-2	1.081e-017	1.580e-018	-16.966	-17.801	-0.835	(0)
Pb3(OH)4+2	2.198e-020	3.213e-021	-19.658	-20.493	-0.835	(0)
PbF4-2	6.392e-021	9.344e-022	-20.194	-21.029	-0.835	(0)
Pb(NO3)2	6.726e-023	6.726e-023	-22.172	-22.172	0.000	(0)
Pb4(OH)4+4	3.134e-023	1.431e-026	-22.504	-25.844	-3.341	(0)
Pb(HS)2	0.000e+000	0.000e+000	-150.724	-150.724	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-227.587	-227.796	-0.209	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.417	-73.417	0.000	(0)
CdHS+	0.000e+000	0.000e+000	-78.008	-78.216	-0.209	(0)
HS-	0.000e+000	0.000e+000	-78.163	-78.371	-0.209	(0)

S5-2	0.000e+000	0.000e+000	-79.113	-79.948	-0.835	(0)
H2S	0.000e+000	0.000e+000	-79.140	-79.140	0.000	(0)
S6-2	0.000e+000	0.000e+000	-79.629	-80.464	-0.835	(0)
S4-2	0.000e+000	0.000e+000	-79.709	-80.544	-0.835	(0)
S3-2	0.000e+000	0.000e+000	-80.515	-81.350	-0.835	(0)
S2-2	0.000e+000	0.000e+000	-81.531	-82.366	-0.835	(0)
S-2	0.000e+000	0.000e+000	-87.384	-87.883	-0.499	(0)
HgHS2-	0.000e+000	0.000e+000	-137.689	-137.897	-0.209	(0)
HgS2-2	0.000e+000	0.000e+000	-137.982	-138.817	-0.835	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.292	-139.292	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.926	-147.385	-0.459	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.107	-147.384	-0.277	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.395	-147.604	-0.209	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.480	-147.689	-0.209	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.684	-148.115	-0.431	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.561	-149.035	-0.475	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.902	-149.346	-0.445	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.383	-149.383	0.000	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.384	-149.384	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-150.724	-150.724	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-159.668	-159.668	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.294	-216.503	-0.209	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.265	-224.474	-0.209	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-225.646	-225.855	-0.209	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.831	-226.666	-0.835	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.587	-227.796	-0.209	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-235.793	-236.002	-0.209	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-301.196	-302.031	-0.835	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-303.470	-304.306	-0.835	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.184	-316.019	-0.835	(0)
S (6)	7.125e-002					
SO4-2	4.348e-002	1.407e-002	-1.362	-1.852	-0.490	(0)
CaSO4	1.414e-002	1.414e-002	-1.849	-1.849	0.000	(0)
MgSO4	9.685e-003	9.685e-003	-2.014	-2.014	0.000	(0)
NaSO4-	2.808e-003	2.125e-003	-2.552	-2.673	-0.121	(0)
KSO4-	9.161e-004	6.934e-004	-3.038	-3.159	-0.121	(0)
MnSO4	1.880e-004	1.880e-004	-3.726	-3.726	0.000	(0)
ZnSO4	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
Zn (SO4) 2-2	8.953e-006	1.309e-006	-5.048	-5.883	-0.835	(0)
NiSO4	4.895e-007	4.895e-007	-6.310	-6.310	0.000	(0)
CoSO4	2.685e-007	2.685e-007	-6.571	-6.571	0.000	(0)
NH4SO4-	1.780e-007	1.335e-007	-6.750	-6.874	-0.125	(0)
CuSO4	1.662e-007	1.662e-007	-6.779	-6.779	0.000	(0)
Cd (SO4) 2-2	6.009e-008	8.784e-009	-7.221	-8.056	-0.835	(0)
CdSO4	4.628e-008	4.628e-008	-7.335	-7.335	0.000	(0)
HSO4-	3.020e-008	2.238e-008	-7.520	-7.650	-0.130	(0)
PbSO4	3.863e-009	3.863e-009	-8.413	-8.413	0.000	(0)
Pb (SO4) 2-2	2.240e-009	3.275e-010	-8.650	-9.485	-0.835	(0)
Ni (SO4) 2-2	1.560e-009	2.281e-010	-8.807	-9.642	-0.835	(0)
AgSO4-	6.264e-010	3.873e-010	-9.203	-9.412	-0.209	(0)
CrOHSO4	7.777e-011	7.777e-011	-10.109	-10.109	0.000	(0)
FeSO4	4.609e-012	4.609e-012	-11.336	-11.336	0.000	(0)
AlSO4+	3.250e-013	2.409e-013	-12.488	-12.618	-0.130	(0)
UO2 (SO4) 2-2	3.041e-013	4.446e-014	-12.517	-13.352	-0.835	(0)
UO2SO4	2.397e-013	2.397e-013	-12.620	-12.620	0.000	(0)
CrSO4+	9.169e-014	5.669e-014	-13.038	-13.246	-0.209	(0)
Al (SO4) 2-	4.900e-014	3.632e-014	-13.310	-13.440	-0.130	(0)
VO2SO4-	1.341e-016	8.289e-017	-15.873	-16.081	-0.209	(0)
FeSO4+	2.676e-018	2.008e-018	-17.572	-17.697	-0.125	(0)
Cr2 (OH) 2SO4+2	1.120e-018	1.638e-019	-17.951	-18.786	-0.835	(0)
Fe (SO4) 2-	9.767e-019	6.039e-019	-18.010	-18.219	-0.209	(0)
VOSO4	1.980e-019	1.980e-019	-18.703	-18.703	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.369e-019	1.369e-019	-18.864	-18.864	0.000	(0)
HgSO4	4.958e-021	4.958e-021	-20.305	-20.305	0.000	(0)
CrO3SO4-2	1.070e-022	1.565e-023	-21.970	-22.806	-0.835	(0)
VSO4+	7.059e-034	4.365e-034	-33.151	-33.360	-0.209	(0)
U (SO4) 2	7.769e-040	7.769e-040	-39.110	-39.110	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.323	-41.158	-0.835	(0)

Co(NH3)6SO4+	0.000e+000	0.000e+000	-54.629	-54.838	-0.209	(0)
Sb(3)	1.320e-018					
Sb(OH)3	6.669e-019	6.669e-019	-18.176	-18.176	0.000	(0)
HSbO2	6.526e-019	6.526e-019	-18.185	-18.185	0.000	(0)
SbO2-	1.050e-022	6.494e-023	-21.979	-22.188	-0.209	(0)
Sb(OH)4-	5.987e-023	3.702e-023	-22.223	-22.432	-0.209	(0)
Sb(OH)2F	3.243e-024	3.243e-024	-23.489	-23.489	0.000	(0)
SbOF	3.197e-024	3.197e-024	-23.495	-23.495	0.000	(0)
Sb(OH)2+	4.274e-025	2.643e-025	-24.369	-24.578	-0.209	(0)
SbO+	1.477e-025	9.134e-026	-24.831	-25.039	-0.209	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.184	-316.019	-0.835	(0)
Sb(5)	1.103e-006					
SbO3-	1.102e-006	6.813e-007	-5.958	-6.167	-0.209	(0)
Sb(OH)6-	1.048e-009	7.908e-010	-8.979	-9.102	-0.122	(0)
SbO2+	8.394e-023	5.190e-023	-22.076	-22.285	-0.209	(0)
Se(-2)	1.298e-014					
Ag2Se	1.298e-014	1.298e-014	-13.887	-13.887	0.000	(0)
HSe-	2.203e-039	1.362e-039	-38.657	-38.866	-0.209	(0)
MnSe	0.000e+000	0.000e+000	-40.586	-40.586	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.764	-42.764	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.242	-46.077	-0.835	(0)
AgOH(Se)2-4	0.000e+000	0.000e+000	-80.396	-83.737	-3.341	(0)
Se(4)	3.846e-007					
SeO3-2	1.956e-007	2.859e-008	-6.709	-7.544	-0.835	(0)
HSeO3-	1.890e-007	1.169e-007	-6.723	-6.932	-0.209	(0)
H2SeO3	8.116e-013	8.116e-013	-12.091	-12.091	0.000	(0)
AgSeO3-	4.099e-014	2.535e-014	-13.387	-13.596	-0.209	(0)
Cd(SeO3)2-2	6.466e-017	9.452e-018	-16.189	-17.024	-0.835	(0)
Ag(SeO3)2-3	4.911e-019	6.488e-021	-18.309	-20.188	-1.879	(0)
FeHSeO3+2	2.687e-023	3.928e-024	-22.571	-23.406	-0.835	(0)
Se(6)	4.355e-010					
SeO4-2	4.325e-010	1.400e-010	-9.364	-9.854	-0.490	(0)
MnSeO4	2.831e-012	2.831e-012	-11.548	-11.548	0.000	(0)
ZnSeO4	7.521e-014	7.521e-014	-13.124	-13.124	0.000	(0)
NiSeO4	1.142e-014	1.142e-014	-13.942	-13.942	0.000	(0)
CoSeO4	6.710e-015	6.710e-015	-14.173	-14.173	0.000	(0)
CdSeO4	3.657e-016	3.657e-016	-15.437	-15.437	0.000	(0)
HSeO4-	1.847e-016	1.142e-016	-15.734	-15.942	-0.209	(0)
Zn(SeO4)2-2	7.302e-023	1.067e-023	-22.137	-22.972	-0.835	(0)
U(3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.834	-59.713	-1.879	(0)
U(4)	1.316e-020					
U(OH)5-	1.315e-020	8.134e-021	-19.881	-20.090	-0.209	(0)
U(OH)4	5.559e-024	5.559e-024	-23.255	-23.255	0.000	(0)
U(OH)3+	5.364e-028	3.317e-028	-27.271	-27.479	-0.209	(0)
U(OH)2+2	1.712e-032	2.503e-033	-31.766	-32.602	-0.835	(0)
UF3+	5.547e-036	3.430e-036	-35.256	-35.465	-0.209	(0)
UF2+2	7.761e-037	1.134e-037	-36.110	-36.945	-0.835	(0)
UOH+3	1.456e-037	1.924e-039	-36.837	-38.716	-1.879	(0)
UF4	7.174e-038	7.174e-038	-37.144	-37.144	0.000	(0)
UF+3	3.576e-039	0.000e+000	-38.447	-40.326	-1.879	(0)
UF5-	8.771e-040	5.423e-040	-39.057	-39.266	-0.209	(0)
U(SO4)2	7.769e-040	7.769e-040	-39.110	-39.110	0.000	(0)
UF6-2	2.137e-040	0.000e+000	-39.670	-40.505	-0.835	(0)
USO4+2	0.000e+000	0.000e+000	-40.323	-41.158	-0.835	(0)
U+4	0.000e+000	0.000e+000	-42.566	-45.906	-3.341	(0)
UCl+3	0.000e+000	0.000e+000	-44.650	-46.529	-1.879	(0)
U6(OH)15+9	0.000e+000	0.000e+000	-158.871	-175.783	-16.911	(0)
U(5)	1.082e-016					
UO2+	1.082e-016	6.688e-017	-15.966	-16.175	-0.209	(0)
U(6)	7.456e-007					
UO2(CO3)3-4	7.223e-007	3.298e-010	-6.141	-9.482	-3.341	(0)
UO2(CO3)2-2	2.314e-008	3.383e-009	-7.636	-8.471	-0.835	(0)
UO2CO3	8.716e-011	8.716e-011	-10.060	-10.060	0.000	(0)
UO2OH+	1.414e-012	8.743e-013	-11.850	-12.058	-0.209	(0)
UO2F+	4.793e-013	2.964e-013	-12.319	-12.528	-0.209	(0)
UO2(SO4)2-2	3.041e-013	4.446e-014	-12.517	-13.352	-0.835	(0)
UO2SO4	2.397e-013	2.397e-013	-12.620	-12.620	0.000	(0)

UO2F2	1.631e-013	1.631e-013	-12.788	-12.788	0.000	(0)
UO2+2	3.478e-014	1.126e-014	-13.459	-13.949	-0.490	(0)
UO2F3-	1.264e-014	7.813e-015	-13.898	-14.107	-0.209	(0)
UO2Cl+	1.404e-016	8.682e-017	-15.853	-16.061	-0.209	(0)
UO2F4-2	8.099e-017	1.184e-017	-16.092	-16.927	-0.835	(0)
(UO2) 2 (OH) 2+2	8.678e-018	1.269e-018	-17.062	-17.897	-0.835	(0)
(UO2) 3 (OH) 5+	5.180e-019	3.203e-019	-18.286	-18.494	-0.209	(0)
UO2NO3+	2.510e-021	1.552e-021	-20.600	-20.809	-0.209	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-41.994	-42.203	-0.209	(0)
V+2	0.000e+000	0.000e+000	-42.668	-43.503	-0.835	(0)
V (3)	1.245e-014					
V (OH) 3	1.245e-014	1.245e-014	-13.905	-13.905	0.000	(0)
V (OH) 2+	2.124e-025	1.313e-025	-24.673	-24.882	-0.209	(0)
VOH+2	1.390e-028	2.032e-029	-27.857	-28.692	-0.835	(0)
V+3	4.974e-033	6.572e-035	-32.303	-34.182	-1.879	(0)
VSO4+	7.059e-034	4.365e-034	-33.151	-33.360	-0.209	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-53.243	-55.122	-1.879	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-53.244	-56.584	-3.341	(0)
V (4)	1.080e-017					
V (OH) 3+	1.015e-017	6.275e-018	-16.994	-17.202	-0.209	(0)
VO+2	3.496e-019	5.111e-020	-18.456	-19.292	-0.835	(0)
VOSO4	1.980e-019	1.980e-019	-18.703	-18.703	0.000	(0)
VOF+	9.457e-020	5.847e-020	-19.024	-19.233	-0.209	(0)
VOF2	4.183e-021	4.183e-021	-20.379	-20.379	0.000	(0)
VOC1+	1.103e-021	6.819e-022	-20.957	-21.166	-0.209	(0)
VOF3-	4.578e-023	2.831e-023	-22.339	-22.548	-0.209	(0)
VOF4-2	1.491e-025	2.180e-026	-24.826	-25.662	-0.835	(0)
H2V2O4+2	1.357e-029	1.984e-030	-28.867	-29.702	-0.835	(0)
V (5)	1.241e-007					
H2VO4-	7.509e-008	4.643e-008	-7.124	-7.333	-0.209	(0)
HVO4-2	4.902e-008	7.165e-009	-7.310	-8.145	-0.835	(0)
HV2O7-3	8.555e-012	1.130e-013	-11.068	-12.947	-1.879	(0)
H3VO4	7.558e-012	7.558e-012	-11.122	-11.122	0.000	(0)
H3V2O7-	3.674e-012	2.272e-012	-11.435	-11.644	-0.209	(0)
V2O7-4	4.094e-013	1.869e-016	-12.388	-15.728	-3.341	(0)
VO4-3	1.670e-013	2.206e-015	-12.777	-14.656	-1.879	(0)
V3O9-3	7.996e-015	1.056e-016	-14.097	-15.976	-1.879	(0)
VO2+	3.271e-016	2.467e-016	-15.485	-15.608	-0.122	(0)
VO2SO4-	1.341e-016	8.289e-017	-15.873	-16.081	-0.209	(0)
VO2F	8.255e-017	8.255e-017	-16.083	-16.083	0.000	(0)
VO2F2-	9.247e-018	5.718e-018	-17.034	-17.243	-0.209	(0)
V4O12-4	4.491e-018	2.050e-021	-17.348	-20.688	-3.341	(0)
VO2F3-2	9.307e-020	1.361e-020	-19.031	-19.866	-0.835	(0)
VO2F4-3	9.665e-023	1.277e-024	-22.015	-23.894	-1.879	(0)
VO2NO3	8.626e-024	8.626e-024	-23.064	-23.064	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-48.050	-55.566	-7.516	(0)
HV10O28-5	0.000e+000	0.000e+000	-49.948	-55.168	-5.220	(0)
H2V10O28-4	0.000e+000	0.000e+000	-54.408	-57.749	-3.341	(0)
Zn	3.134e-005					
Zn+2	1.072e-005	3.470e-006	-4.970	-5.460	-0.490	(0)
ZnSO4	1.068e-005	1.068e-005	-4.971	-4.971	0.000	(0)
Zn (SO4) 2-2	8.953e-006	1.309e-006	-5.048	-5.883	-0.835	(0)
ZnCO3	3.884e-007	3.884e-007	-6.411	-6.411	0.000	(0)
ZnOH+	3.462e-007	2.141e-007	-6.461	-6.669	-0.209	(0)
ZnHCO3+	1.198e-007	7.410e-008	-6.921	-7.130	-0.209	(0)
ZnCl+	5.666e-008	4.145e-008	-7.247	-7.382	-0.136	(0)
ZnOHCl	3.348e-008	3.348e-008	-7.475	-7.475	0.000	(0)
ZnF+	2.136e-008	1.321e-008	-7.670	-7.879	-0.209	(0)
Zn (OH) 2	2.093e-008	2.093e-008	-7.679	-7.679	0.000	(0)
ZnCl2	3.125e-010	3.125e-010	-9.505	-9.505	0.000	(0)
Zn (OH) 3-	1.047e-010	6.474e-011	-9.980	-10.189	-0.209	(0)
ZnCl3-	1.614e-012	1.180e-012	-11.792	-11.928	-0.136	(0)
ZnNO3+	9.742e-013	6.024e-013	-12.011	-12.220	-0.209	(0)
ZnSeO4	7.521e-014	7.521e-014	-13.124	-13.124	0.000	(0)
Zn (OH) 4-2	1.088e-014	1.590e-015	-13.963	-14.799	-0.835	(0)
ZnCl4-2	8.865e-015	2.807e-015	-14.052	-14.552	-0.499	(0)
Zn (NO3) 2	8.307e-021	8.307e-021	-20.081	-20.081	0.000	(0)

Zn(SeO4) 2-2	7.302e-023	1.067e-023	-22.137	-22.972	-0.835	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.395	-147.604	-0.209	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.383	-149.383	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.265	-224.474	-0.209	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.831	-226.666	-0.835	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-303.470	-304.306	-0.835	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-48.66	-42.37	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-37.21	-32.70	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-44.43	-32.70	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-63.41	-45.47	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-50.99	-30.96	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-26.88	-26.48	0.40	(NH4)2CrO4
(NH4)2SeO4	-22.41	-21.96	0.45	(NH4)2SeO4
Acanthite	-52.08	-88.30	-36.22	Ag2S
Ag2CO3	-12.34	-23.43	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-11.45	-9.97	1.48	Ag2HVO4
Ag2MoO4	-12.17	-23.72	-11.55	Ag2MoO4
Ag2O	-14.72	-2.14	12.57	Ag2O
Ag2Se	-0.10	-48.80	-48.70	Ag2Se
Ag2SeO3	-9.71	-16.86	-7.15	Ag2SeO3
Ag2SeO4	-18.66	-27.57	-8.91	Ag2SeO4
Ag2SO4	-14.75	-19.57	-4.82	Ag2SO4
Ag3AsO3	-27.98	-25.83	2.16	Ag3AsO3
Ag3AsO4	-16.34	-19.13	-2.79	Ag3AsO4
Ag3H2VO5	-16.22	-11.04	5.18	Ag3H2VO5
AgF:4H2O	-13.63	-12.58	1.05	AgF:4H2O
Agmetal	-0.36	-13.87	-13.51	Ag
AgVO3	-9.66	-8.89	0.77	AgVO3
Al(OH)3(am)	-2.09	8.71	10.80	Al(OH)3
Al2(MoO4)3	-49.67	-47.31	2.37	Al2(MoO4)3
Al2O3	-2.24	17.41	19.65	Al2O3
Al4(OH)10SO4	-5.30	17.40	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.00	-7.20	4.80	AlAsO4:2H2O
AlOHSO4	-5.49	-8.72	-3.23	AlOHSO4
AlSb	-151.88	-86.26	65.62	AlSb
Alunite	-1.71	-3.11	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.31	-11.10	-7.79	PbSO4
Anhydrite	0.15	-4.21	-4.36	CaSO4
Anilite	-54.94	-86.82	-31.88	Cu0.25Cu1.5S
Antlerite	-1.35	7.43	8.79	Cu3(OH)4SO4
Aragonite	0.23	-8.07	-8.30	CaCO3
Arsenolite	-87.67	-90.43	-2.76	As4O6
Artinite	-4.58	5.02	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.52	-31.82	6.71	As2O5
Atacamite	-0.93	6.46	7.39	Cu2(OH)3Cl
Azurite	-0.80	-17.71	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.50	7.90	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.70	0.17	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.81	-8.10	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-24.86	8.08	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.37	-22.04	-9.67	BaCrO4
BaF2	-9.29	-15.11	-5.82	BaF2
BaMoO4	-6.71	-13.67	-6.96	BaMoO4
Barite	0.46	-9.52	-9.98	BaSO4
BaS	-94.43	-78.25	16.18	BaS
BaSeO3	-8.64	-6.81	1.83	BaSeO3
BaSeO4	-10.06	-17.52	-7.46	BaSeO4
Bianchite	-5.55	-7.32	-1.76	ZnSO4:6H2O
Birnessite	-6.39	11.70	18.09	MnO2
Bixbyte	-1.55	-2.20	-0.64	Mn2O3
BlaubleiI	-54.90	-79.06	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.36	-82.64	-27.28	Cu0.6Cu0.8S

Boehmite	0.13	8.71	8.58	AlOOH
Breithauptite	-54.83	-73.35	-18.52	NiSb
Brochantite	0.50	15.72	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-3.69	13.15	16.84	Mg(OH) 2
Bunsenite	-3.63	8.82	12.45	NiO
Ca(VO ₃) ₂	-8.08	-2.42	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-6.70	10.80	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-10.76	10.79	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-14.47	7.83	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-14.95	24.01	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-15.85	24.01	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-293.26	-150.28	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.46	-16.73	-2.27	CaCrO ₄
Calcite	0.41	-8.07	-8.48	CaCO ₃
Calomel	-7.70	-25.61	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.41	-8.36	-7.95	CaMoO ₄
Carnotite	-0.79	-0.56	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.32	-1.50	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.19	-12.21	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-10.35	-0.51	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-5.92	7.72	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.01	7.72	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-18.40	-11.69	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-16.82	5.74	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-14.94	13.46	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-11.84	-12.50	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-10.81	-12.50	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-10.59	-12.50	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.08	-15.29	-1.21	CdF ₂
Cdmetal(alpha)	-31.39	-17.87	13.51	Cd
Cdmetal(gamma)	-31.49	-17.87	13.62	Cd
CdMoO ₄	0.30	-13.85	-14.15	CdMoO ₄
CdOHCl	-5.93	-2.39	3.54	CdOHCl
CdSb	-74.10	-74.45	-0.35	CdSb
CdSe	-18.73	-38.93	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-15.86	-17.71	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-9.53	-9.70	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-7.98	-9.71	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-7.83	-9.71	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.43	-11.18	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO ₃
CH ₄ (g)	-82.64	-123.68	-41.05	CH ₄
Chalcanthite	-6.50	-9.14	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-54.88	-89.80	-34.92	Cu ₂ S
Chalcopyrite	-125.06	-160.33	-35.27	CuFeS ₂
Cinnabar	-51.95	-97.65	-45.69	HgS
Claudetite	-87.37	-90.43	-3.06	As ₄ O ₆
Clausthalite	-13.23	-40.33	-27.10	PbSe
Co(BO ₂) ₂	-26.75	0.32	27.07	Co(BO ₂) ₂
Co(OH) ₂	-4.54	8.56	13.09	Co(OH) ₂
Co(OH) ₃	-8.74	-11.05	-2.31	Co(OH) ₃
CO ₂ (g)	-3.14	-21.29	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-19.18	-6.15	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-3.04	-13.53	-10.50	Co ₃ O ₄
CoCl ₂	-19.93	-11.66	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-14.21	-11.67	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.75	-12.73	-9.98	CoCO ₃
CoF ₂	-12.86	-14.46	-1.60	CoF ₂
CoF ₃	-44.11	-45.57	-1.46	CoF ₃
CoFe ₂ O ₄	19.02	15.49	-3.53	CoFe ₂ O ₄
CoMoO ₄	-5.26	-13.02	-7.76	CoMoO ₄
CoO	-5.03	8.56	13.59	CoO
CoS(alpha)	-70.16	-77.60	-7.44	CoS
CoS(beta)	-66.53	-77.60	-11.07	CoS
CoSe	-21.90	-38.10	-16.20	CoSe
CoSeO ₃	-7.48	-6.16	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-15.35	-16.88	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-11.67	-8.87	2.80	CoSO ₄

CoSO4:6H2O	-6.41	-8.88	-2.47	CoSO4:6H2O
Cotunnite	-9.12	-13.90	-4.78	PbCl2
Covellite	-55.57	-77.87	-22.30	CuS
Cr (OH) 2	-21.64	-10.82	10.82	Cr (OH) 2
Cr (OH) 3	-2.31	-0.97	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.22	-0.97	-0.75	Cr (OH) 3
Cr2O3	0.42	-1.94	-2.36	Cr2O3
CrCl2	-45.13	-31.04	14.09	CrCl2
CrCl3	-46.41	-31.30	15.11	CrCl3
CrF3	-24.15	-35.49	-11.34	CrF3
Crmetal	-66.90	-36.42	30.48	Cr
CrO3	-26.74	-29.95	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu (OH) 2	-0.39	8.29	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.08	23.14	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.62	1.63	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-53.62	-88.50	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.49	-50.29	-45.80	Cu2Se
Cu2SO4	-19.12	-21.07	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.05	-6.95	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-57.84	-100.43	-42.59	Cu3Sb
Cu3Se2	-25.17	-88.66	-63.49	Cu3Se2
CuCO3	-1.50	-13.00	-11.50	CuCO3
CuCrO4	-16.22	-21.66	-5.44	CuCrO4
CuF	-8.42	-13.33	-4.91	CuF
CuF2	-15.84	-14.73	1.12	CuF2
CuF2:2H2O	-10.18	-14.73	-4.55	CuF2:2H2O
Cumetal	-5.86	-14.62	-8.76	Cu
CuMoO4	-0.21	-13.29	-13.08	CuMoO4
CuOCuSO4	-11.15	-0.85	10.30	CuOCuSO4
Cupricferrite	9.24	15.22	5.99	CuFe2O4
Cuprite	-2.24	-3.64	-1.41	Cu2O
Cuprousferrite	10.56	1.65	-8.92	CuFeO2
CuSe	-5.26	-38.36	-33.10	CuSe
CuSe2	-26.05	-59.42	-33.37	CuSe2
CuSeO3:2H2O	-6.95	-6.43	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.71	-17.15	-2.44	CuSeO4:5H2O
CuSO4	-12.08	-9.14	2.94	CuSO4
Diaspore	1.83	8.71	6.87	AlOOH
Djurleite	-55.09	-89.01	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.34	-16.20	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.89	-16.20	-17.09	CaMg (CO3) 2
Epsomite	-2.16	-4.28	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.86	3.70	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.47	0.43	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-8.22	-11.94	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.34	-7.79	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.60	-37.22	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.61	-45.35	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.59	10.63	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.84	-12.44	0.40	FeAsO4:2H2O
FeCr2O4	-5.44	1.76	7.20	FeCr2O4
FeMoO4	-7.78	-17.87	-10.09	FeMoO4
Ferrihydrite	0.28	3.47	3.19	Fe (OH) 3
Ferroselite	-45.41	-64.01	-18.60	FeSe2
FeS (ppt)	-79.51	-82.46	-2.95	FeS
FeSe	-31.95	-42.95	-11.00	FeSe
Fix_pe	-5.01	-5.01	0.00	e-
Fluorite	0.70	-9.80	-10.50	CaF2
Galena	-65.86	-79.83	-13.97	PbS
Gibbsite	0.41	8.71	8.29	Al (OH) 3
Goethite	2.98	3.47	0.49	FeOOH
Goslarite	-5.31	-7.32	-2.01	ZnSO4:7H2O
Greenockite	-64.08	-78.44	-14.36	CdS
Greigite	-288.96	-334.00	-45.03	Fe3S4
Gummite	-6.04	1.63	7.67	UO3
Gypsum	0.40	-4.21	-4.61	CaSO4:2H2O
H-Jarosite	-12.36	-24.46	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6

H2MoO4	-8.70	-21.57	-12.88	H2MoO4
H2S (g)	-78.15	-86.16	-8.01	H2S
H2Se (g)	-41.69	-46.65	-4.96	H2Se
Halite	-5.48	-3.87	1.60	NaCl
Hausmannite	-1.08	59.95	61.03	Mn3O4
Hematite	8.35	6.94	-1.42	Fe2O3
Hercynite	-1.78	21.12	22.89	FeAl2O4
Hg (CH3)2 (g)	-185.14	-258.85	-73.71	Hg (CH3)2
Hg (g)	-7.62	-15.49	-7.87	Hg
Hg (OH)2	-7.99	-11.49	-3.50	Hg (OH)2
Hg2 (g)	-16.03	-30.99	-14.96	Hg2
Hg2 (OH)2	-10.65	-5.39	5.26	Hg2 (OH)2
Hg2CO3	-10.63	-26.68	-16.05	Hg2CO3
Hg2CrO4	-26.64	-35.34	-8.70	Hg2CrO4
Hg2F2	-18.04	-28.41	-10.36	Hg2F2
Hg2S	-79.87	-91.55	-11.68	Hg2S
Hg2SeO3	-15.45	-20.11	-4.66	Hg2SeO3
Hg2SO4	-16.69	-22.82	-6.13	Hg2SO4
Hg3O2CO3	-26.07	-55.75	-29.68	Hg3O2CO3
HgCl (g)	-32.30	-12.81	19.50	HgCl
HgCl2	-10.45	-31.71	-21.26	HgCl2
HgF (g)	-46.88	-14.20	32.68	HgF
HgF2 (g)	-47.07	-34.50	12.57	HgF2
Hgmetal (l)	-2.04	-15.49	-13.45	Hg
HgSe	-2.45	-58.14	-55.69	HgSe
HgSeO3	-13.78	-26.21	-12.43	HgSeO3
HgSO4	-19.50	-28.92	-9.42	HgSO4
Huntite	-2.50	-32.47	-29.97	CaMg3 (CO3)4
Hydrocerrusite	-4.83	-23.60	-18.77	Pb3 (OH)2 (CO3)2
Hydromagnesite	-10.62	-19.38	-8.77	Mg5 (CO3)4 (OH)2:4H2O
K-Alum	-15.36	-20.53	-5.17	KAl (SO4)2:12H2O
K-Jarosite	-4.02	-18.82	-14.80	KFe3 (SO4)2 (OH)6
K2Cr2O7	-31.39	-48.63	-17.24	K2Cr2O7
K2CrO4	-18.17	-18.69	-0.51	K2CrO4
K2MoO4	-13.57	-10.31	3.26	K2MoO4
K2SeO4	-13.44	-14.17	-0.73	K2SeO4
Langite	-1.77	15.72	17.49	Cu4 (OH)6SO4:H2O
Larnakite	-4.34	-4.78	-0.43	PbO:PbSO4
Laurionite	-4.41	-3.79	0.62	PbOHCl
Lepidocrocite	2.10	3.47	1.37	FeOOH
Lime	-19.48	13.22	32.70	CaO
Litharge	-6.37	6.32	12.69	PbO
Mackinawite	-78.86	-82.46	-3.60	FeS
Maghemite	0.55	6.94	6.39	Fe2O3
Magnesioferrite	3.23	20.09	16.86	Fe2MgO4
Magnesite	-0.67	-8.13	-7.46	MgCO3
Magnetite	7.23	10.64	3.40	Fe3O4
Malachite	0.59	-4.71	-5.31	Cu2 (OH)2CO3
Manganite	-1.09	24.25	25.34	MnOOH
Massicot	-6.57	6.32	12.89	PbO
Matlockite	-6.32	-15.29	-8.97	PbClF
Melanothallite	-18.19	-11.93	6.26	CuCl2
Melanterite	-11.53	-13.73	-2.21	FeSO4:7H2O
Metacinnabar	-52.55	-97.65	-45.09	HgS
Mg (OH)2 (active)	-5.64	13.15	18.79	Mg (OH)2
Mg (VO3)2	-13.77	-2.49	11.28	Mg (VO3)2
Mg2Sb3	-269.29	-194.60	74.68	Mg2Sb3
Mg2V2O7	-15.69	10.67	26.36	Mg2V2O7
MgCr2O4	-4.98	11.22	16.20	MgCr2O4
MgCrO4	-22.17	-16.79	5.38	MgCrO4
MgF2	-1.73	-9.86	-8.13	MgF2
MgMoO4	-6.57	-8.42	-1.85	MgMoO4
MgSeO3:6H2O	-4.63	-1.57	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.08	-12.28	-1.20	MgSeO4:6H2O
Minium	-28.95	44.57	73.52	Pb3O4
Mirabilite	-3.85	-4.96	-1.11	Na2SO4:10H2O
Mn (VO3)2	-9.09	-4.19	4.90	Mn (VO3)2
Mn2 (SO4)3	-48.77	-54.48	-5.71	Mn2 (SO4)3

Mn2Sb	-145.94	-84.86	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-9.97	2.53	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-11.49	-8.77	2.72	MnCl2:4H2O
MnS (grn)	-74.88	-74.71	0.17	MnS
MnS (pnk)	-78.05	-74.71	3.34	MnS
MnSb	-93.16	-96.07	-2.91	MnSb
MnSe	-38.70	-35.20	3.50	MnSe
MnSeO3	-4.40	-3.27	1.13	MnSeO3
MnSeO3:2H2O	-4.25	-3.27	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.93	-13.98	-2.05	MnSeO4:5H2O
MnSO4	-8.56	-5.98	2.58	MnSO4
Monteponite	-7.38	7.72	15.10	CdO
Montroydite	-7.85	-11.49	-3.64	HgO
MoO3	-13.57	-21.57	-8.00	MoO3
Morenosite	-6.47	-8.62	-2.14	NiSO4:7H2O
MoS2	-149.23	-219.49	-70.26	MoS2
Na-Jarosite	-7.02	-18.22	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-37.53	-47.42	-9.90	Na2Cr2O7
Na2CrO4	-20.40	-17.47	2.93	Na2CrO4
Na2Mo2O7	-14.08	-30.67	-16.60	Na2Mo2O7
Na2MoO4	-10.59	-9.10	1.49	Na2MoO4
Na2MoO4:2H2O	-10.33	-9.10	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.55	-2.25	10.30	Na2SeO3:5H2O
Na2SeO4	-14.24	-12.96	1.28	Na2SeO4
Na3Sb	-170.71	-76.26	94.45	Na3Sb
Na3VO4	-25.79	10.89	36.68	Na3VO4
Na4V2O7	-28.09	9.31	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-86.30	-63.13	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-5.44	-1.58	3.86	NaVO3
Nesquehonite	-3.47	-8.14	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.98	8.82	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-21.07	-5.37	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.16	17.84	32.00	Ni4 (OH) 6SO4
NiCO3	-5.60	-12.47	-6.87	NiCO3
NiMoO4	-1.61	-12.76	-11.14	NiMoO4
NiS (alpha)	-71.74	-77.34	-5.60	NiS
NiS (beta)	-66.24	-77.34	-11.10	NiS
NiS (gamma)	-64.54	-77.34	-12.80	NiS
NiSe	-20.14	-37.84	-17.70	NiSe
NiSeO3:2H2O	-8.72	-5.90	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.10	-16.62	-1.52	NiSeO4:6H2O
Nsutite	-5.80	11.70	17.50	MnO2
O2 (g)	-31.89	51.20	83.09	O2
Orpiment	-242.63	-303.69	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb (BO2) 2	-8.43	-1.91	6.52	Pb (BO2) 2
Pb (OH) 2	-1.83	6.32	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-55.72	-64.48	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-6.26	2.54	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.54	12.65	26.19	Pb2O (OH) 2
Pb2O3	-22.79	38.25	61.04	Pb2O3
Pb2OCO3	-8.08	-8.64	-0.56	Pb2OCO3
Pb2V2O7	-1.09	-2.99	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-18.64	-12.84	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-2.81	3.33	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.33	-2.31	11.02	Pb3O2CO3
Pb3O2SO4	-9.14	1.55	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-13.23	7.87	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-14.01	7.87	21.88	Pb4O3SO4
PbCrO4	-11.02	-23.62	-12.60	PbCrO4
PbF2	-9.25	-16.69	-7.44	PbF2
Pbmetal	-23.52	-19.27	4.25	Pb
PbMoO4	0.37	-15.25	-15.62	PbMoO4
PbO:0.3H2O	-6.66	6.32	12.98	PbO:0.33H2O
PbSeO4	-12.27	-19.11	-6.84	PbSeO4
Periclase	-8.43	13.15	21.58	MgO

Phosgenite	-9.05	-28.86	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-17.68	31.92	49.60	PbO ₂
Portlandite	-9.59	13.22	22.80	Ca (OH) 2
Pyrite	-124.51	-143.02	-18.51	FeS ₂
Pyrochroite	-3.74	11.45	15.19	Mn (OH) 2
Pyrolusite	-4.33	37.05	41.38	MnO ₂
Realgar	-101.82	-121.57	-19.75	AsS
Retgersite	-6.58	-8.62	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.74	-9.84	-10.58	MnCO ₃
Rutherfordine	-5.16	-19.66	-14.50	UO ₂ CO ₃
Sb (OH) 3	-11.07	-18.18	-7.11	Sb (OH) 3
Sb ₂ O ₄	-14.15	-10.75	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-24.11	-33.77	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-108.55	-176.31	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-54.44	-72.70	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-54.80	-72.70	-17.90	Sb ₄ O ₆
SbCl ₃	-49.08	-48.51	0.57	SbCl ₃
SbF ₃	-42.47	-52.70	-10.23	SbF ₃
Sbmetal	-44.88	-56.57	-11.69	Sb
SbO ₂	-1.86	-29.69	-27.82	SbO ₂
Schoepite	-4.37	1.62	5.99	UO ₂ (OH) 2:H ₂ O
Semetal (am)	-13.95	-21.06	-7.11	Se
Semetal (hex)	-13.35	-21.06	-7.71	Se
Senarmontite	-23.98	-36.35	-12.37	Sb ₂ O ₃
SeO ₂	-14.84	-14.72	0.12	SeO ₂
SeO ₃	-46.47	-25.43	21.04	SeO ₃
Siderite	-7.35	-17.59	-10.24	FeCO ₃
Smithsonite	-1.17	-11.17	-10.00	ZnCO ₃
Sphalerite	-64.59	-76.04	-11.45	ZnS
Spinel	-6.28	30.57	36.85	MgAl ₂ O ₄
Stibnite	-244.36	-294.82	-50.46	Sb ₂ S ₃
Sulfur	-58.42	-60.56	-2.14	S
Tenorite	0.64	8.29	7.64	CuO
Thenardite	-5.28	-4.95	0.32	Na ₂ SO ₄
Thermonatrite	-9.45	-8.81	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-3.25	0.83	4.08	Ca (UO ₂) 2 (VO ₄) 2
U ₃ O ₈	-14.15	6.93	21.08	U ₃ O ₈
U ₃ Sb ₄	-576.52	-424.14	152.38	U ₃ Sb ₄
U ₄ O ₉	-30.40	-33.42	-3.02	U ₄ O ₉
UF ₄	-31.25	-60.78	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.07	-60.79	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-15.69	-14.75	0.93	UO ₂
UO ₂ (NO ₃) 2	-40.42	-28.27	12.15	UO ₂ (NO ₃) 2
UO ₂ (NO ₃) 2:2H ₂ O	-33.12	-28.27	4.85	UO ₂ (NO ₃) 2:2H ₂ O
UO ₂ (NO ₃) 2:3H ₂ O	-31.66	-28.27	3.39	UO ₂ (NO ₃) 2:3H ₂ O
UO ₂ (NO ₃) 2:6H ₂ O	-30.32	-28.28	2.05	UO ₂ (NO ₃) 2:6H ₂ O
UO ₂ (OH) 2 (beta)	-3.99	1.63	5.61	UO ₂ (OH) 2
UO ₂ SeO ₄ :4H ₂ O	-21.56	-23.81	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.07	1.63	7.70	UO ₃
Uraninite	-10.09	-14.75	-4.67	UO ₂
USb ₂	-217.89	-188.31	29.58	USb ₂
V (OH) 3	-18.41	-10.82	7.59	V (OH) 3
V ₂ O ₅	-14.28	-15.64	-1.36	V ₂ O ₅
V ₃ O ₅	-38.58	-36.75	1.84	V ₃ O ₅
V ₄ O ₇	-47.65	-40.46	7.19	V ₄ O ₇
V ₆ O ₁₃	-37.26	-98.12	-60.86	V ₆ O ₁₃
Valentinite	-27.87	-36.35	-8.48	Sb ₂ O ₃
VC ₁₂	-62.71	-43.84	18.87	VC ₁₂
VC ₁₃	-64.58	-41.15	23.43	VC ₁₃
VF ₄	-64.68	-49.75	14.93	VF ₄
Vmetal	-93.24	-49.22	44.03	V
VO	-38.37	-23.62	14.76	VO
VO (OH) 2	-8.87	-3.72	5.15	VO (OH) 2
VO ₂ Cl	-20.77	-17.93	2.84	VO ₂ Cl
VOC ₁	-32.08	-20.93	11.15	VOC ₁
VOC ₁₂	-36.70	-23.94	12.76	VOC ₁₂
VOSO ₄	-24.75	-21.14	3.61	VOSO ₄
Witherite	-4.81	-13.38	-8.57	BaCO ₃

Wurtzite	-67.09	-76.04	-8.95	ZnS
Zincite	-1.22	10.12	11.33	ZnO
Zincosite	-11.24	-7.31	3.93	ZnSO4
Zn(BO2)2	-6.41	1.88	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-23.10	-19.79	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.09	10.11	12.20	Zn(OH)2
Zn(OH)2(am)	-2.36	10.11	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.64	10.11	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.42	10.11	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.62	10.11	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.70	2.80	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.07	10.12	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.12	-1.47	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.42	-4.51	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.37	23.03	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.15	30.35	38.50	Zn5(OH)8Cl2
ZnCl2	-17.16	-10.11	7.05	ZnCl2
ZnCO3:1H2O	-0.91	-11.17	-10.26	ZnCO3:1H2O
ZnF2	-12.36	-12.90	-0.53	ZnF2
Znmetal	-41.27	-15.48	25.79	Zn
ZnMoO4	-1.33	-11.46	-10.13	ZnMoO4
ZnO(active)	-1.07	10.12	11.19	ZnO
ZnS(am)	-66.99	-76.04	-9.05	ZnS
ZnSb	-83.07	-72.05	11.01	ZnSb
ZnSe	-22.14	-36.54	-14.40	ZnSe
ZnSeO4:6H2O	-13.80	-15.32	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.67	-7.31	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 32.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e==e-

log_k 0

EQUILIBRIUM_PHASES 105

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

Carnotite 0 0

CaSeO3:2H2O 0 0

CdMoO4 0 0

Cd(BO2)2 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

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Mirabilite 0 0
MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 115
SAVE Solution 116 Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 105
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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Reaction step 1.

Using solution 115. Solution after simulation 31.
Using pure phase assemblage 105.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+000	2.034e-009	2.034e-009
Alunite	-2.66	-4.06	-1.40	0.000e+000	0	0.000e+000
Anhydrite	-0.25	-4.61	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+000	4.240e-011	4.240e-011
Barite	0.00	-9.98	-9.98	0.000e+000	3.589e-008	3.589e-008
Brochantite	0.00	15.22	15.22	0.000e+000	1.328e-007	1.328e-007
Brucite	-3.36	13.48	16.84	0.000e+000	0	0.000e+000
CO2(g)	-3.50	-21.65	-18.15	1.000e+001	1.000e+001	1.966e-004
CaMoO4	-0.75	-8.70	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-4.55	-1.74	2.81	0.000e+000	0	0.000e+000
Calcite	-0.00	-8.48	-8.48	0.000e+000	1.899e-004	1.899e-004
Carnotite	-0.03	0.20	0.23	0.000e+000	0	0.000e+000
Cd(BO2)2	-10.38	-0.54	9.84	0.000e+000	0	0.000e+000
CdMoO4	0.00	-14.15	-14.15	0.000e+000	8.232e-008	8.232e-008
Chrysotile	Element not present.			0.000e+000	0	0.000e+000
Cr2O3	0.00	-2.36	-2.36	0.000e+000	8.542e-010	8.542e-010
Cu2Se(alpha)	-4.54	-50.34	-45.80	0.000e+000	0	0.000e+000
CuMoO4	-0.54	-13.61	-13.08	0.000e+000	0	0.000e+000
Epsomite	-2.17	-4.30	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	-0.00	3.19	3.19	0.000e+000	1.223e-009	1.223e-009
Fluorite	0.00	-10.50	-10.50	0.000e+000	5.581e-005	5.581e-005
Gummite	-5.27	2.40	7.67	0.000e+000	0	0.000e+000
Gypsum	0.00	-4.61	-4.61	0.000e+000	1.385e-002	1.385e-002
HgSe	-2.52	-58.21	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2	Element not present.			0.000e+000	0	0.000e+000

Mirabilite	-3.88	-5.00	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-4.21	-3.08	1.13	0.000e+000	0	0.000e+000
Ni (OH) 2	-3.64	9.15	12.79	0.000e+000	0	0.000e+000
Ni3 (AsO4) 2:8H2O	-20.55	-4.85	15.70	0.000e+000	0	0.000e+000
NiCO3	-5.62	-12.49	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-1.57	-12.71	-11.14	0.000e+000	0	0.000e+000
O2 (g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-5.097e-007
Otavite	-1.93	-13.93	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	0.000e+000	7.199e-009	7.199e-009
Rutherfordine	-4.75	-19.25	-14.50	0.000e+000	0	0.000e+000
SbO2	-1.96	-29.79	-27.82	0.000e+000	0	0.000e+000
Schoepite	-3.59	2.40	5.99	0.000e+000	0	0.000e+000
Sepiolite	Element not present.			0.000e+000	0	0.000e+000
SiO2 (am-ppt)	Element not present.			0.000e+000	0	0.000e+000
Tyuyamunite	-2.09	1.99	4.08	0.000e+000	0	0.000e+000
U3O8	-11.78	9.31	21.08	0.000e+000	0	0.000e+000
UO2 (OH) 2 (beta)	-3.21	2.40	5.61	0.000e+000	0	0.000e+000
UO3	-5.30	2.40	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-1.26	-11.38	-10.13	0.000e+000	0	0.000e+000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.033e-008	1.756e-008
Al	8.715e-007	7.528e-007
As	1.982e-009	1.712e-009
B	7.859e-005	6.789e-005
Ba	2.478e-008	2.140e-008
C	6.204e-004	5.359e-004
Ca	1.150e-002	9.933e-003
Cd	6.598e-008	5.700e-008
Cl	6.310e-003	5.451e-003
Co	9.403e-007	8.122e-007
Cr	1.531e-009	1.323e-009
Cu	4.862e-007	4.200e-007
F	2.495e-004	2.156e-004
Fe	1.074e-009	9.273e-010
Hg	1.195e-009	1.032e-009
K	1.015e-002	8.769e-003
Mg	2.154e-002	1.861e-002
Mn	7.053e-004	6.093e-004
Mo	3.004e-006	2.595e-006
N	9.294e-005	8.028e-005
Na	4.014e-002	3.467e-002
Ni	1.074e-006	9.276e-007
Pb	4.956e-009	4.282e-009
S	5.525e-002	4.773e-002
Sb	1.103e-006	9.532e-007
Se	3.829e-007	3.308e-007
U	7.460e-007	6.444e-007
V	1.242e-007	1.073e-007
Zn	3.136e-005	2.709e-005

-----Description of solution-----

	pH	=	7.936	Charge balance
	pe	=	4.837	Adjusted to redox
equilibrium	Activity of water	=	0.998	
	Ionic strength	=	1.392e-001	
	Mass of water (kg)	=	8.638e-001	
	Total alkalinity (eq/kg)	=	6.441e-004	
	Total CO2 (mol/kg)	=	6.204e-004	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	3.270e-005	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.02	
	Iterations	=	23	

Total H = 9.589808e+001
Total O = 4.814159e+001

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	1.178e-006	8.671e-007	-5.929	-6.062	-0.133	(0)
H+	1.518e-008	1.159e-008	-7.819	-7.936	-0.117	0.00
H2O	5.551e+001	9.978e-001	1.744	-0.001	0.000	18.07
Ag	2.033e-008					
AgCl	1.108e-008	1.108e-008	-7.956	-7.956	0.000	(0)
AgCl2-	7.202e-009	4.647e-009	-8.143	-8.333	-0.190	(0)
Ag+	1.476e-009	1.127e-009	-8.831	-8.948	-0.117	(0)
AgSO4-	4.345e-010	2.804e-010	-9.362	-9.552	-0.190	(0)
AgCl3-2	1.151e-010	1.995e-011	-9.939	-10.700	-0.761	(0)
AgNO2	1.568e-011	1.568e-011	-10.805	-10.805	0.000	(0)
AgCl4-3	1.012e-011	1.962e-013	-10.995	-12.707	-1.712	(0)
AgF	3.579e-013	3.579e-013	-12.446	-12.446	0.000	(0)
AgNH3+	1.168e-013	7.539e-014	-12.932	-13.123	-0.190	(0)
AgOH	9.768e-014	9.768e-014	-13.010	-13.010	0.000	(0)
AgH2BO3	6.641e-014	6.641e-014	-13.178	-13.178	0.000	(0)
AgSeO3-	4.175e-014	2.694e-014	-13.379	-13.570	-0.190	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	2.507e-015	1.618e-015	-14.601	-14.791	-0.190	(0)
AgNO3	5.624e-017	5.624e-017	-16.250	-16.250	0.000	(0)
Ag (NH3) 2+	3.112e-017	2.008e-017	-16.507	-16.697	-0.190	(0)
Ag (OH) 2-	1.283e-017	8.277e-018	-16.892	-17.082	-0.190	(0)
Ag (SeO3) 2-3	4.627e-019	8.974e-021	-18.335	-20.047	-1.712	(0)
Ag2MoO4	4.899e-025	4.899e-025	-24.310	-24.310	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.493	-73.493	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-80.085	-83.129	-3.044	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.031	-147.299	-0.268	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.561	-147.751	-0.190	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.340	-148.803	-0.463	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.679	-149.114	-0.434	(0)
Al	8.715e-007					
Al (OH) 4-	8.650e-007	6.522e-007	-6.063	-6.186	-0.123	(0)
Al (OH) 3	5.974e-009	5.974e-009	-8.224	-8.224	0.000	(0)
Al (OH) 2+	4.495e-010	3.453e-010	-9.347	-9.462	-0.114	(0)
AlF3	5.864e-011	5.864e-011	-10.232	-10.232	0.000	(0)
AlF2+	4.794e-011	3.683e-011	-10.319	-10.434	-0.114	(0)
AlF4-	4.931e-012	3.718e-012	-11.307	-11.430	-0.123	(0)
AlF+2	2.100e-012	7.314e-013	-11.678	-12.136	-0.458	(0)
AlOH+2	1.439e-012	5.014e-013	-11.842	-12.300	-0.458	(0)
AlSO4+	7.425e-014	5.599e-014	-13.129	-13.252	-0.123	(0)
Al (SO4) 2-	9.924e-015	7.482e-015	-14.003	-14.126	-0.123	(0)
Al+3	6.570e-015	5.782e-016	-14.182	-15.238	-1.055	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-42.095	-43.807	-1.712	(0)
As (3)	1.710e-023					
H3AsO3	1.600e-023	1.600e-023	-22.796	-22.796	0.000	(0)
H2AsO3-	1.098e-024	7.083e-025	-23.960	-24.150	-0.190	(0)
HAsO3-2	3.216e-028	5.575e-029	-27.493	-28.254	-0.761	(0)
H4AsO3+	1.424e-031	9.188e-032	-30.847	-31.037	-0.190	(0)
AsO3-3	9.563e-033	1.855e-034	-32.019	-33.732	-1.712	(0)
As (5)	1.982e-009					
HAsO4-2	1.923e-009	3.334e-010	-8.716	-9.477	-0.761	(0)
H2AsO4-	5.460e-011	3.523e-011	-10.263	-10.453	-0.190	(0)
AsO4-3	4.691e-012	9.098e-014	-11.329	-13.041	-1.712	(0)
H3AsO4	6.871e-017	7.094e-017	-16.163	-16.149	0.014	(0)
B	7.859e-005					
H3BO3	7.188e-005	7.422e-005	-4.143	-4.129	0.014	(0)
H2BO3-	5.202e-006	3.720e-006	-5.284	-5.429	-0.146	(0)
MgH2BO3+	7.413e-007	5.301e-007	-6.130	-6.276	-0.146	(0)
CaH2BO3+	5.917e-007	4.231e-007	-6.228	-6.374	-0.146	(0)
NaH2BO3	1.693e-007	1.693e-007	-6.771	-6.771	0.000	(0)
BF (OH) 3-	5.238e-009	3.746e-009	-8.281	-8.426	-0.146	(0)

	H5 (BO3) 2-	3.286e-010	2.350e-010	-9.483	-9.629	-0.146	(0)
	H8 (BO3) 3-	2.439e-012	1.744e-012	-11.613	-11.758	-0.146	(0)
	BaH2BO3+	1.350e-012	9.650e-013	-11.870	-12.015	-0.146	(0)
	BF2 (OH) 2-	8.225e-013	5.882e-013	-12.085	-12.230	-0.146	(0)
	AgH2BO3	6.641e-014	6.641e-014	-13.178	-13.178	0.000	(0)
	BF3OH-	4.700e-019	3.361e-019	-18.328	-18.474	-0.146	(0)
	BF4-	3.397e-024	2.429e-024	-23.469	-23.615	-0.146	(0)
Ba	2.478e-008						
	Ba+2	2.472e-008	8.395e-009	-7.607	-8.076	-0.469	(0)
	BaHCO3+	4.273e-011	3.320e-011	-10.369	-10.479	-0.110	(0)
	BaCO3	7.213e-012	7.213e-012	-11.142	-11.142	0.000	(0)
	BaH2BO3+	1.350e-012	9.650e-013	-11.870	-12.015	-0.146	(0)
	BaOH+	4.169e-014	3.178e-014	-13.380	-13.498	-0.118	(0)
	BaNO3+	4.098e-015	2.644e-015	-14.387	-14.578	-0.190	(0)
	BaNH3+2	1.001e-015	1.736e-016	-14.999	-15.760	-0.761	(0)
C (4)	6.204e-004						
	HCO3-	5.390e-004	4.141e-004	-3.268	-3.383	-0.114	(0)
	MgHCO3+	2.336e-005	1.741e-005	-4.631	-4.759	-0.128	(0)
	CaHCO3+	1.962e-005	1.524e-005	-4.707	-4.817	-0.110	(0)
	H2CO3	1.079e-005	1.079e-005	-4.967	-4.967	0.000	(0)
	NaHCO3	6.687e-006	6.687e-006	-5.175	-5.175	0.000	(0)
	MgCO3	5.727e-006	5.727e-006	-5.242	-5.242	0.000	(0)
	CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CO3-2	4.934e-006	1.675e-006	-5.307	-5.776	-0.469	(0)
	NaCO3-	1.166e-006	8.959e-007	-5.933	-6.048	-0.114	(0)
	MnHCO3+	9.540e-007	7.270e-007	-6.020	-6.138	-0.118	(0)
	UO2 (CO3) 3-4	7.022e-007	6.343e-010	-6.154	-9.198	-3.044	(0)
	ZnCO3	3.936e-007	3.936e-007	-6.405	-6.405	0.000	(0)
	CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
	ZnHCO3+	8.285e-008	5.346e-008	-7.082	-7.272	-0.190	(0)
	UO2 (CO3) 2-2	4.358e-008	7.554e-009	-7.361	-8.122	-0.761	(0)
	NiHCO3+	1.511e-008	9.748e-009	-7.821	-8.011	-0.190	(0)
	NiCO3	1.193e-008	1.193e-008	-7.923	-7.923	0.000	(0)
	Cu (CO3) 2-2	6.139e-009	1.064e-009	-8.212	-8.973	-0.761	(0)
	CoHCO3+	5.590e-009	3.607e-009	-8.253	-8.443	-0.190	(0)
	CoCO3	3.171e-009	3.171e-009	-8.499	-8.499	0.000	(0)
	PbCO3	1.184e-009	1.184e-009	-8.926	-8.926	0.000	(0)
	CuHCO3+	9.688e-010	6.251e-010	-9.014	-9.204	-0.190	(0)
	CdCO3	2.652e-010	2.652e-010	-9.576	-9.576	0.000	(0)
	UO2CO3	2.260e-010	2.260e-010	-9.646	-9.646	0.000	(0)
	PbHCO3+	1.121e-010	7.236e-011	-9.950	-10.140	-0.190	(0)
	BaHCO3+	4.273e-011	3.320e-011	-10.369	-10.479	-0.110	(0)
	Pb (CO3) 2-2	3.301e-011	5.723e-012	-10.481	-11.242	-0.761	(0)
	CdHCO3+	1.015e-011	6.548e-012	-10.994	-11.184	-0.190	(0)
	BaCO3	7.213e-012	7.213e-012	-11.142	-11.142	0.000	(0)
	Cd (CO3) 2-2	1.900e-012	3.294e-013	-11.721	-12.482	-0.761	(0)
	FeHCO3+	2.557e-015	1.986e-015	-14.592	-14.702	-0.110	(0)
	HgCO3	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)
	Hg (CO3) 2-2	3.713e-017	6.437e-018	-16.430	-17.191	-0.761	(0)
	HgHCO3+	4.063e-019	2.622e-019	-18.391	-18.581	-0.190	(0)
Ca	1.150e-002						
	Ca+2	5.821e-003	1.977e-003	-2.235	-2.704	-0.469	(0)
	CaSO4	5.648e-003	5.648e-003	-2.248	-2.248	0.000	(0)
	CaHCO3+	1.962e-005	1.524e-005	-4.707	-4.817	-0.110	(0)
	CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CaF+	3.580e-006	2.729e-006	-5.446	-5.564	-0.118	(0)
	CaH2BO3+	5.917e-007	4.231e-007	-6.228	-6.374	-0.146	(0)
	CaOH+	4.402e-008	3.420e-008	-7.356	-7.466	-0.110	(0)
	CaNO3+	6.088e-010	3.929e-010	-9.216	-9.406	-0.190	(0)
	CaNH3+2	4.704e-010	8.156e-011	-9.327	-10.089	-0.761	(0)
	Ca (NH3) 2+2	6.138e-018	1.064e-018	-17.212	-17.973	-0.761	(0)
Cd	6.598e-008						
	Cd+2	2.046e-008	6.946e-009	-7.689	-8.158	-0.469	(0)
	CdSO4	2.031e-008	2.031e-008	-7.692	-7.692	0.000	(0)
	Cd (SO4) 2-2	1.971e-008	3.417e-009	-7.705	-8.466	-0.761	(0)
	CdCl+	4.951e-009	3.195e-009	-8.305	-8.496	-0.190	(0)
	CdCO3	2.652e-010	2.652e-010	-9.576	-9.576	0.000	(0)
	CdOHC1	1.136e-010	1.136e-010	-9.944	-9.944	0.000	(0)

CdOH+	7.414e-011	4.784e-011	-10.130	-10.320	-0.190	(0)
CdCl2	6.415e-011	6.415e-011	-10.193	-10.193	0.000	(0)
CdF+	2.158e-011	1.392e-011	-10.666	-10.856	-0.190	(0)
CdHCO3+	1.015e-011	6.548e-012	-10.994	-11.184	-0.190	(0)
Cd(CO3) 2-2	1.900e-012	3.294e-013	-11.721	-12.482	-0.761	(0)
CdCl3-	3.021e-013	1.949e-013	-12.520	-12.710	-0.190	(0)
Cd(OH) 2	2.617e-013	2.617e-013	-12.582	-12.582	0.000	(0)
CdF2	3.514e-015	3.514e-015	-14.454	-14.454	0.000	(0)
CdNO3+	2.139e-015	1.381e-015	-14.670	-14.860	-0.190	(0)
CdSeO4	2.085e-016	2.085e-016	-15.681	-15.681	0.000	(0)
Cd2OH+3	8.588e-017	1.665e-018	-16.066	-17.778	-1.712	(0)
Cd(SeO3) 2-2	4.571e-017	7.924e-018	-16.340	-17.101	-0.761	(0)
Cd(OH) 3-	2.149e-017	1.387e-017	-16.668	-16.858	-0.190	(0)
Cd(NO3) 2	4.349e-023	4.349e-023	-22.362	-22.362	0.000	(0)
Cd(OH) 4-2	1.135e-023	1.968e-024	-22.945	-23.706	-0.761	(0)
CdHS+	0.000e+000	0.000e+000	-78.319	-78.509	-0.190	(0)
Cd(HS) 2	0.000e+000	0.000e+000	-149.664	-149.664	0.000	(0)
Cd(HS) 3-	0.000e+000	0.000e+000	-225.933	-226.123	-0.190	(0)
Cd(HS) 4-2	0.000e+000	0.000e+000	-301.525	-302.286	-0.761	(0)
Cl	6.310e-003					
Cl-	6.310e-003	4.816e-003	-2.200	-2.317	-0.117	(0)
MnCl+	7.001e-007	5.336e-007	-6.155	-6.273	-0.118	(0)
ZnCl+	6.628e-008	4.940e-008	-7.179	-7.306	-0.128	(0)
ZnOHC1	5.607e-008	5.607e-008	-7.251	-7.251	0.000	(0)
AgCl	1.108e-008	1.108e-008	-7.956	-7.956	0.000	(0)
AgCl2-	7.202e-009	4.647e-009	-8.143	-8.333	-0.190	(0)
CdCl+	4.951e-009	3.195e-009	-8.305	-8.496	-0.190	(0)
NiCl+	3.647e-009	2.353e-009	-8.438	-8.628	-0.190	(0)
MnCl2	3.630e-009	3.630e-009	-8.440	-8.440	0.000	(0)
CoCl+	2.892e-009	1.866e-009	-8.539	-8.729	-0.190	(0)
CuCl2-	1.397e-009	1.041e-009	-8.855	-8.982	-0.128	(0)
CuCl	1.035e-009	1.035e-009	-8.985	-8.985	0.000	(0)
ZnCl2	3.771e-010	3.771e-010	-9.424	-9.424	0.000	(0)
CuCl+	2.451e-010	1.827e-010	-9.611	-9.738	-0.128	(0)
AgCl3-2	1.151e-010	1.995e-011	-9.939	-10.700	-0.761	(0)
CdOHC1	1.136e-010	1.136e-010	-9.944	-9.944	0.000	(0)
CdCl2	6.415e-011	6.415e-011	-10.193	-10.193	0.000	(0)
PbCl+	6.229e-011	4.019e-011	-10.206	-10.396	-0.190	(0)
AgCl4-3	1.012e-011	1.962e-013	-10.995	-12.707	-1.712	(0)
MnCl3-	6.319e-012	4.816e-012	-11.199	-11.317	-0.118	(0)
HgClOH	4.470e-012	4.470e-012	-11.350	-11.350	0.000	(0)
CuCl3-2	3.178e-012	1.072e-012	-11.498	-11.970	-0.472	(0)
ZnCl3-	1.936e-012	1.443e-012	-11.713	-11.841	-0.128	(0)
HgCl2	1.406e-012	1.406e-012	-11.852	-11.852	0.000	(0)
PbCl2	8.647e-013	8.647e-013	-12.063	-12.063	0.000	(0)
CuCl2	3.050e-013	3.050e-013	-12.516	-12.516	0.000	(0)
CdCl3-	3.021e-013	1.949e-013	-12.520	-12.710	-0.190	(0)
HgCl3-	1.049e-013	6.771e-014	-12.979	-13.169	-0.190	(0)
NiCl2	5.707e-014	5.707e-014	-13.244	-13.244	0.000	(0)
ZnCl4-2	1.030e-014	3.474e-015	-13.987	-14.459	-0.472	(0)
HgCl4-2	7.489e-015	1.298e-015	-14.126	-14.887	-0.761	(0)
PbCl3-	2.570e-015	1.658e-015	-14.590	-14.780	-0.190	(0)
UO2Cl+	4.102e-016	2.647e-016	-15.387	-15.577	-0.190	(0)
HgCl+	9.026e-017	5.824e-017	-16.045	-16.235	-0.190	(0)
PbCl4-2	2.106e-017	3.650e-018	-16.677	-17.438	-0.761	(0)
CuCl3-	1.840e-017	1.371e-017	-16.735	-16.863	-0.128	(0)
CrCl+2	1.378e-017	2.388e-018	-16.861	-17.622	-0.761	(0)
CrOHC12	1.896e-019	1.896e-019	-18.722	-18.722	0.000	(0)
CrCl2+	1.692e-021	1.092e-021	-20.772	-20.962	-0.190	(0)
FeCl+2	1.048e-021	3.536e-022	-20.980	-21.451	-0.472	(0)
CuCl4-2	9.811e-022	3.310e-022	-21.008	-21.480	-0.472	(0)
VOCl+	3.916e-022	2.527e-022	-21.407	-21.597	-0.190	(0)
FeCl2+	9.982e-024	7.608e-024	-23.001	-23.119	-0.118	(0)
CrO3Cl-	8.787e-026	5.670e-026	-25.056	-25.246	-0.190	(0)
FeCl3	3.664e-027	3.664e-027	-26.436	-26.436	0.000	(0)
CoCl+2	1.731e-034	3.001e-035	-33.762	-34.523	-0.761	(0)
UCl+3	0.000e+000	0.000e+000	-44.575	-46.287	-1.712	(0)
Co(NH3) 5Cl+2	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)

Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
Co (2)	9.403e-007					
Co+2	6.460e-007	1.120e-007	-6.190	-6.951	-0.761	(0)
CoSO4	2.787e-007	2.787e-007	-6.555	-6.555	0.000	(0)
CoHCO3+	5.590e-009	3.607e-009	-8.253	-8.443	-0.190	(0)
CoCO3	3.171e-009	3.171e-009	-8.499	-8.499	0.000	(0)
CoOH+	3.003e-009	1.938e-009	-8.522	-8.713	-0.190	(0)
CoCl+	2.892e-009	1.866e-009	-8.539	-8.729	-0.190	(0)
CoF+	6.942e-010	4.479e-010	-9.159	-9.349	-0.190	(0)
Co (OH) 2	1.334e-010	1.334e-010	-9.875	-9.875	0.000	(0)
CoNO2+	8.148e-011	5.258e-011	-10.089	-10.279	-0.190	(0)
Co (NH3) +2	2.545e-012	4.413e-013	-11.594	-12.355	-0.761	(0)
CoNO3+	1.729e-014	1.116e-014	-13.762	-13.953	-0.190	(0)
CoSeO4	9.047e-015	9.047e-015	-14.044	-14.044	0.000	(0)
Co (OH) 3-	3.578e-015	2.309e-015	-14.446	-14.637	-0.190	(0)
CoOOH-	8.997e-016	5.805e-016	-15.046	-15.236	-0.190	(0)
Co2OH+3	5.608e-016	1.087e-017	-15.251	-16.964	-1.712	(0)
Co (NH3) 2+2	3.559e-018	6.170e-019	-17.449	-18.210	-0.761	(0)
Co (OH) 4-2	1.830e-021	3.173e-022	-20.738	-21.499	-0.761	(0)
Co (NO3) 2	1.427e-021	1.427e-021	-20.846	-20.846	0.000	(0)
Co4 (OH) 4+4	3.113e-024	2.812e-027	-23.507	-26.551	-3.044	(0)
Co (NH3) 3+2	1.468e-024	2.546e-025	-23.833	-24.594	-0.761	(0)
Co (NH3) 4+2	2.526e-031	4.379e-032	-30.598	-31.359	-0.761	(0)
Co (NH3) 5+2	1.374e-038	2.382e-039	-37.862	-38.623	-0.761	(0)
Co (3)	7.782e-028					
CoOH+2	7.782e-028	1.349e-028	-27.109	-27.870	-0.761	(0)
Co+3	3.479e-034	3.062e-035	-33.459	-34.514	-1.055	(0)
CoCl+2	1.731e-034	3.001e-035	-33.762	-34.523	-0.761	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-58.975	-59.736	-0.761	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
Cr (2)	7.688e-027					
Cr+2	7.688e-027	1.333e-027	-26.114	-26.875	-0.761	(0)
Cr (3)	1.531e-009					
Cr (OH) 2+	1.188e-009	7.669e-010	-8.925	-9.115	-0.190	(0)
Cr (OH) 3	2.498e-010	2.498e-010	-9.602	-9.602	0.000	(0)
Cr (OH) +2	4.193e-011	7.269e-012	-10.378	-11.139	-0.761	(0)
CrOHSO4	2.151e-011	2.151e-011	-10.667	-10.667	0.000	(0)
CrO2-	1.590e-011	1.026e-011	-10.799	-10.989	-0.190	(0)
Cr (OH) 4-	1.336e-011	8.623e-012	-10.874	-11.064	-0.190	(0)
CrF+2	4.431e-014	7.681e-015	-13.354	-14.115	-0.761	(0)
Cr+3	1.976e-014	3.832e-016	-13.704	-15.417	-1.712	(0)
CrSO4+	1.729e-014	1.116e-014	-13.762	-13.952	-0.190	(0)
CrCl+2	1.378e-017	2.388e-018	-16.861	-17.622	-0.761	(0)
CrOHCl2	1.896e-019	1.896e-019	-18.722	-18.722	0.000	(0)
Cr2 (OH) 2SO4+2	8.153e-020	1.413e-020	-19.089	-19.850	-0.761	(0)
Cr2 (OH) 2 (SO4) 2	1.047e-020	1.047e-020	-19.980	-19.980	0.000	(0)
CrCl2+	1.692e-021	1.092e-021	-20.772	-20.962	-0.190	(0)
CrNO3+2	6.072e-024	1.053e-024	-23.217	-23.978	-0.761	(0)
Cr (NH3) 5OH+2	1.708e-038	2.961e-039	-37.767	-38.529	-0.761	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-45.611	-47.323	-1.712	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Cr (6)	1.404e-014					
CrO4-2	1.266e-014	4.299e-015	-13.898	-14.367	-0.469	(0)
NaCrO4-	9.507e-016	6.135e-016	-15.022	-15.212	-0.190	(0)
HCrO4-	2.498e-016	1.612e-016	-15.602	-15.793	-0.190	(0)
KCrO4-	1.763e-016	1.138e-016	-15.754	-15.944	-0.190	(0)
CrO3SO4-2	4.102e-023	7.111e-024	-22.387	-23.148	-0.761	(0)
H2CrO4	1.514e-024	1.514e-024	-23.820	-23.820	0.000	(0)
CrO3Cl-	8.787e-026	5.670e-026	-25.056	-25.246	-0.190	(0)
Cr2O7-2	5.207e-030	9.028e-031	-29.283	-30.044	-0.761	(0)
Cu (1)	2.699e-009					
CuCl2-	1.397e-009	1.041e-009	-8.855	-8.982	-0.128	(0)
CuCl	1.035e-009	1.035e-009	-8.985	-8.985	0.000	(0)
Cu+	2.645e-010	1.706e-010	-9.578	-9.768	-0.190	(0)
CuCl3-2	3.178e-012	1.072e-012	-11.498	-11.970	-0.472	(0)

Cu (S4) 2-3	0.000e+000	0.000e+000	-146.775	-147.224	-0.448	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.532	-147.954	-0.421	(0)
Cu (2)	4.835e-007					
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
CuOH+	8.803e-008	6.561e-008	-7.055	-7.183	-0.128	(0)
Cu+2	7.047e-008	2.393e-008	-7.152	-7.621	-0.469	(0)
CuSO4	6.837e-008	6.837e-008	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-008	1.135e-008	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	6.139e-009	1.064e-009	-8.212	-8.973	-0.761	(0)
CuHCO3+	9.688e-010	6.251e-010	-9.014	-9.204	-0.190	(0)
Cu2 (OH) 2+2	6.237e-010	1.081e-010	-9.205	-9.966	-0.761	(0)
CuF+	2.959e-010	1.910e-010	-9.529	-9.719	-0.190	(0)
CuNO2+	2.587e-010	1.669e-010	-9.587	-9.777	-0.190	(0)
CuCl+	2.451e-010	1.827e-010	-9.611	-9.738	-0.128	(0)
CuNH3+2	4.629e-011	8.025e-012	-10.335	-11.096	-0.761	(0)
Cu (OH) 3-	3.129e-011	2.019e-011	-10.505	-10.695	-0.190	(0)
CuCl2	3.050e-013	3.050e-013	-12.516	-12.516	0.000	(0)
Cu (NO2) 2	1.138e-013	1.138e-013	-12.944	-12.944	0.000	(0)
CuNO3+	7.370e-015	4.756e-015	-14.133	-14.323	-0.190	(0)
Cu (OH) 4-2	7.947e-016	1.378e-016	-15.100	-15.861	-0.761	(0)
CuCl3-	1.840e-017	1.371e-017	-16.735	-16.863	-0.128	(0)
CuCl4-2	9.811e-022	3.310e-022	-21.008	-21.480	-0.472	(0)
Cu (NO3) 2	3.763e-023	3.763e-023	-22.424	-22.424	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.608	-216.799	-0.190	(0)
F	2.495e-004					
F-	1.657e-004	1.265e-004	-3.781	-3.898	-0.117	(0)
MgF+	7.735e-005	5.832e-005	-4.112	-4.234	-0.123	(0)
CaF+	3.580e-006	2.729e-006	-5.446	-5.564	-0.118	(0)
NaF	2.292e-006	2.292e-006	-5.640	-5.640	0.000	(0)
MnF+	5.814e-007	4.431e-007	-6.235	-6.353	-0.118	(0)
ZnF+	1.597e-008	1.030e-008	-7.797	-7.987	-0.190	(0)
BF (OH) 3-	5.238e-009	3.746e-009	-8.281	-8.426	-0.146	(0)
HF	2.168e-009	2.168e-009	-8.664	-8.664	0.000	(0)
NiF+	9.402e-010	6.067e-010	-9.027	-9.217	-0.190	(0)
CoF+	6.942e-010	4.479e-010	-9.159	-9.349	-0.190	(0)
CuF+	2.959e-010	1.910e-010	-9.529	-9.719	-0.190	(0)
AlF3	5.864e-011	5.864e-011	-10.232	-10.232	0.000	(0)
AlF2+	4.794e-011	3.683e-011	-10.319	-10.434	-0.114	(0)
CdF+	2.158e-011	1.392e-011	-10.666	-10.856	-0.190	(0)
AlF4-	4.931e-012	3.718e-012	-11.307	-11.430	-0.123	(0)
PbF+	3.249e-012	2.096e-012	-11.488	-11.679	-0.190	(0)
AlF+2	2.100e-012	7.314e-013	-11.678	-12.136	-0.458	(0)
HF2-	1.417e-012	1.042e-012	-11.849	-11.982	-0.133	(0)
UO2F+	9.169e-013	5.917e-013	-12.038	-12.228	-0.190	(0)
BF2 (OH) 2-	8.225e-013	5.882e-013	-12.085	-12.230	-0.146	(0)
AgF	3.579e-013	3.579e-013	-12.446	-12.446	0.000	(0)
UO2F2	2.158e-013	2.158e-013	-12.666	-12.666	0.000	(0)
CrF+2	4.431e-014	7.681e-015	-13.354	-14.115	-0.761	(0)
UO2F3-	1.063e-014	6.857e-015	-13.974	-14.164	-0.190	(0)
PbF2	5.218e-015	5.218e-015	-14.282	-14.282	0.000	(0)
CdF2	3.514e-015	3.514e-015	-14.454	-14.454	0.000	(0)
UO2F4-2	3.974e-017	6.890e-018	-16.401	-17.162	-0.761	(0)
VO2F	2.647e-017	2.647e-017	-16.577	-16.577	0.000	(0)
H2F2	1.259e-017	1.259e-017	-16.900	-16.900	0.000	(0)
PbF3-	1.940e-018	1.252e-018	-17.712	-17.902	-0.190	(0)
VO2F2-	1.884e-018	1.216e-018	-17.725	-17.915	-0.190	(0)
FeF2+	1.497e-018	1.141e-018	-17.825	-17.943	-0.118	(0)
FeF+2	9.994e-019	3.372e-019	-18.000	-18.472	-0.472	(0)
BF3OH-	4.700e-019	3.361e-019	-18.328	-18.474	-0.146	(0)
FeF3	2.037e-019	2.037e-019	-18.691	-18.691	0.000	(0)
VOF+	2.199e-020	1.419e-020	-19.658	-19.848	-0.190	(0)
VO2F3-2	1.106e-020	1.918e-021	-19.956	-20.717	-0.761	(0)
VOF2	6.729e-022	6.729e-022	-21.172	-21.172	0.000	(0)
PbF4-2	4.372e-022	7.579e-023	-21.359	-22.120	-0.761	(0)
VO2F4-3	6.156e-024	1.194e-025	-23.211	-24.923	-1.712	(0)
VOF3-	4.680e-024	3.020e-024	-23.330	-23.520	-0.190	(0)
HgF+	4.404e-024	2.841e-024	-23.356	-23.546	-0.190	(0)
BF4-	3.397e-024	2.429e-024	-23.469	-23.615	-0.146	(0)

Sb(OH) 2F	1.286e-024	1.286e-024	-23.891	-23.891	0.000	(0)
SbOF	1.267e-024	1.267e-024	-23.897	-23.897	0.000	(0)
VOF4-2	8.894e-027	1.542e-027	-26.051	-26.812	-0.761	(0)
UF3+	2.671e-036	1.723e-036	-35.573	-35.764	-0.190	(0)
UF2+2	4.959e-037	8.597e-038	-36.305	-37.066	-0.761	(0)
UF4	2.390e-038	2.390e-038	-37.622	-37.622	0.000	(0)
UF+3	2.784e-039	0.000e+000	-38.555	-40.268	-1.712	(0)
UF5-	1.857e-040	1.198e-040	-39.731	-39.922	-0.190	(0)
UF6-2	0.000e+000	0.000e+000	-40.578	-41.340	-0.761	(0)
Fe (2)	3.385e-012					
Fe+2	2.198e-012	3.811e-013	-11.658	-12.419	-0.761	(0)
FeSO4	1.167e-012	1.167e-012	-11.933	-11.933	0.000	(0)
FeOH+	1.726e-014	1.315e-014	-13.763	-13.881	-0.118	(0)
FeHCO3+	2.557e-015	1.986e-015	-14.592	-14.702	-0.110	(0)
Fe (OH) 2	9.060e-018	9.060e-018	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.260e-018	2.484e-018	-17.487	-17.605	-0.118	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.318	-236.509	-0.190	(0)
Fe (3)	1.070e-009					
Fe (OH) 2+	5.976e-010	4.591e-010	-9.224	-9.338	-0.114	(0)
Fe (OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.493e-011	3.452e-011	-10.347	-10.462	-0.114	(0)
FeOH+2	4.034e-015	1.361e-015	-14.394	-14.866	-0.472	(0)
FeF2+	1.497e-018	1.141e-018	-17.825	-17.943	-0.118	(0)
FeF+2	9.994e-019	3.372e-019	-18.000	-18.472	-0.472	(0)
FeSO4+	4.464e-019	3.402e-019	-18.350	-18.468	-0.118	(0)
FeF3	2.037e-019	2.037e-019	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.406e-019	9.073e-020	-18.852	-19.042	-0.190	(0)
Fe+3	2.762e-020	2.431e-021	-19.559	-20.614	-1.055	(0)
FeCl+2	1.048e-021	3.536e-022	-20.980	-21.451	-0.472	(0)
FeCl2+	9.982e-024	7.608e-024	-23.001	-23.119	-0.118	(0)
FeHSeO3+2	4.013e-024	6.957e-025	-23.397	-24.158	-0.761	(0)
Fe2 (OH) 2+4	6.791e-026	6.134e-029	-25.168	-28.212	-3.044	(0)
FeNO3+2	8.814e-027	1.528e-027	-26.055	-26.816	-0.761	(0)
FeCl3	3.664e-027	3.664e-027	-26.436	-26.436	0.000	(0)
Fe3 (OH) 4+5	2.324e-032	4.071e-037	-31.634	-36.390	-4.757	(0)
H (0)	3.904e-029					
H2	1.952e-029	2.015e-029	-28.710	-28.696	0.014	(0)
Hg (0)	1.186e-009					
Hg	1.186e-009	1.186e-009	-8.926	-8.926	0.000	(0)
Hg (1)	5.629e-021					
Hg2+2	2.815e-021	4.880e-022	-20.551	-21.312	-0.761	(0)
Hg (2)	8.774e-012					
HgClOH	4.470e-012	4.470e-012	-11.350	-11.350	0.000	(0)
Hg (OH) 2	2.784e-012	2.875e-012	-11.555	-11.541	0.014	(0)
HgCl2	1.406e-012	1.406e-012	-11.852	-11.852	0.000	(0)
HgCl3-	1.049e-013	6.771e-014	-12.979	-13.169	-0.190	(0)
HgCl4-2	7.489e-015	1.298e-015	-14.126	-14.887	-0.761	(0)
HgCO3	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)
HgCl+	9.026e-017	5.824e-017	-16.045	-16.235	-0.190	(0)
Hg (CO3) 2-2	3.713e-017	6.437e-018	-16.430	-17.191	-0.761	(0)
HgOH+	3.242e-017	2.092e-017	-16.489	-16.679	-0.190	(0)
Hg (NH3) 2+2	2.369e-018	4.108e-019	-17.625	-18.386	-0.761	(0)
Hg (OH) 3-	4.864e-019	3.138e-019	-18.313	-18.503	-0.190	(0)
HgHCO3+	4.063e-019	2.622e-019	-18.391	-18.581	-0.190	(0)
HgNH3+2	7.229e-020	1.253e-020	-19.141	-19.902	-0.761	(0)
Hg+2	3.496e-021	6.060e-022	-20.456	-21.217	-0.761	(0)
HgSO4	1.979e-021	1.979e-021	-20.704	-20.704	0.000	(0)
HgF+	4.404e-024	2.841e-024	-23.356	-23.546	-0.190	(0)
Hg (NH3) 3+2	3.092e-025	5.360e-026	-24.510	-25.271	-0.761	(0)
HgNO3+	2.180e-029	1.406e-029	-28.662	-28.852	-0.190	(0)
Hg (NH3) 4+2	8.049e-032	1.395e-032	-31.094	-31.855	-0.761	(0)
Hg (NO3) 2	3.674e-037	3.674e-037	-36.435	-36.435	0.000	(0)
HgHS2-	0.000e+000	0.000e+000	-137.881	-138.071	-0.190	(0)
HgS2-2	0.000e+000	0.000e+000	-138.082	-138.843	-0.761	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.613	-139.613	0.000	(0)
K	1.015e-002					
K+	9.333e-003	7.124e-003	-2.030	-2.147	-0.117	(0)

	KSO4-	8.188e-004	6.291e-004	-3.087	-3.201	-0.114	(0)
	KCrO4-	1.763e-016	1.138e-016	-15.754	-15.944	-0.190	(0)
Mg		2.154e-002					
	Mg+2	1.210e-002	4.110e-003	-1.917	-2.386	-0.469	(0)
	MgSO4	9.328e-003	9.328e-003	-2.030	-2.030	0.000	(0)
	MgF+	7.735e-005	5.832e-005	-4.112	-4.234	-0.123	(0)
	MgHCO3+	2.336e-005	1.741e-005	-4.631	-4.759	-0.128	(0)
	MgCO3	5.727e-006	5.727e-006	-5.242	-5.242	0.000	(0)
	MgOH+	1.810e-006	1.419e-006	-5.742	-5.848	-0.106	(0)
	MgH2BO3+	7.413e-007	5.301e-007	-6.130	-6.276	-0.146	(0)
Mn (2)		7.053e-004					
	Mn+2	5.076e-004	8.800e-005	-3.294	-4.056	-0.761	(0)
	MnSO4	1.952e-004	1.952e-004	-3.710	-3.710	0.000	(0)
	MnHCO3+	9.540e-007	7.270e-007	-6.020	-6.138	-0.118	(0)
	MnCl+	7.001e-007	5.336e-007	-6.155	-6.273	-0.118	(0)
	MnF+	5.814e-007	4.431e-007	-6.235	-6.353	-0.118	(0)
	MnOH+	2.515e-007	1.917e-007	-6.599	-6.717	-0.118	(0)
	MnCl2	3.630e-009	3.630e-009	-8.440	-8.440	0.000	(0)
	MnNO3+	1.358e-011	8.766e-012	-10.867	-11.057	-0.190	(0)
	MnCl3-	6.319e-012	4.816e-012	-11.199	-11.317	-0.118	(0)
	MnSeO4	3.818e-012	3.818e-012	-11.418	-11.418	0.000	(0)
	Mn (OH) 3-	1.169e-015	8.906e-016	-14.932	-15.050	-0.118	(0)
	Mn (NO3) 2	1.384e-018	1.384e-018	-17.859	-17.859	0.000	(0)
	Mn (OH) 4-2	7.390e-021	2.493e-021	-20.131	-20.603	-0.472	(0)
	MnSe	0.000e+000	0.000e+000	-40.244	-40.244	0.000	(0)
Mn (3)		3.067e-024					
	Mn+3	3.067e-024	2.700e-025	-23.513	-24.569	-1.055	(0)
Mn (6)		6.698e-040					
	MnO4-2	6.698e-040	2.260e-040	-39.174	-39.646	-0.472	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-44.042	-44.181	-0.139	(0)
Mo		3.004e-006					
	MoO4-2	3.004e-006	1.020e-006	-5.522	-5.991	-0.469	(0)
	HMoO4-	3.644e-010	2.352e-010	-9.438	-9.629	-0.190	(0)
	H2MoO4	1.996e-014	1.996e-014	-13.700	-13.700	0.000	(0)
	Ag2MoO4	4.899e-025	4.899e-025	-24.310	-24.310	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-42.095	-43.807	-1.712	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-45.585	-52.434	-6.849	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-49.227	-53.984	-4.757	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-54.093	-57.137	-3.044	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-60.115	-61.827	-1.712	(0)
N (-3)		1.082e-006					
	NH4+	9.315e-007	6.661e-007	-6.031	-6.176	-0.146	(0)
	NH4SO4-	1.168e-007	8.902e-008	-6.933	-7.050	-0.118	(0)
	NH3	3.278e-008	3.278e-008	-7.484	-7.484	0.000	(0)
	CaNH3+2	4.704e-010	8.156e-011	-9.327	-10.089	-0.761	(0)
	CuNH3+2	4.629e-011	8.025e-012	-10.335	-11.096	-0.761	(0)
	NiNH3+2	1.939e-011	3.361e-012	-10.712	-11.474	-0.761	(0)
	Co (NH3) +2	2.545e-012	4.413e-013	-11.594	-12.355	-0.761	(0)
	AgNH3+	1.168e-013	7.539e-014	-12.932	-13.123	-0.190	(0)
	BaNH3+2	1.001e-015	1.736e-016	-14.999	-15.760	-0.761	(0)
	Ni (NH3) 2+2	9.185e-017	1.592e-017	-16.037	-16.798	-0.761	(0)
	Ag (NH3) 2+	3.112e-017	2.008e-017	-16.507	-16.697	-0.190	(0)
	Ca (NH3) 2+2	6.138e-018	1.064e-018	-17.212	-17.973	-0.761	(0)
	Co (NH3) 2+2	3.559e-018	6.170e-019	-17.449	-18.210	-0.761	(0)
	Hg (NH3) 2+2	2.369e-018	4.108e-019	-17.625	-18.386	-0.761	(0)
	HgNH3+2	7.229e-020	1.253e-020	-19.141	-19.902	-0.761	(0)
	Co (NH3) 3+2	1.468e-024	2.546e-025	-23.833	-24.594	-0.761	(0)
	Hg (NH3) 3+2	3.092e-025	5.360e-026	-24.510	-25.271	-0.761	(0)
	Co (NH3) 4+2	2.526e-031	4.379e-032	-30.598	-31.359	-0.761	(0)
	Hg (NH3) 4+2	8.049e-032	1.395e-032	-31.094	-31.855	-0.761	(0)
	Cr (NH3) 5OH+2	1.708e-038	2.961e-039	-37.767	-38.529	-0.761	(0)
	Co (NH3) 5+2	1.374e-038	2.382e-039	-37.862	-38.623	-0.761	(0)
	Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
	Cr (NH3) 6+3	0.000e+000	0.000e+000	-45.611	-47.323	-1.712	(0)
	Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
	Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
	Co (NH3) 6OH+2	0.000e+000	0.000e+000	-58.975	-59.736	-0.761	(0)

Co(NH3)6Cl+2	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
N(3)	9.178e-005					
NO2-	9.177e-005	6.662e-005	-4.037	-4.176	-0.139	(0)
CuNO2+	2.587e-010	1.669e-010	-9.587	-9.777	-0.190	(0)
CoNO2+	8.148e-011	5.258e-011	-10.089	-10.279	-0.190	(0)
AgNO2	1.568e-011	1.568e-011	-10.805	-10.805	0.000	(0)
Cu(NO2)2	1.138e-013	1.138e-013	-12.944	-12.944	0.000	(0)
Ag(NO2)2-	2.507e-015	1.618e-015	-14.601	-14.791	-0.190	(0)
N(5)	8.296e-008					
NO3-	8.233e-008	6.285e-008	-7.084	-7.202	-0.117	(0)
CaNO3+	6.088e-010	3.929e-010	-9.216	-9.406	-0.190	(0)
MnNO3+	1.358e-011	8.766e-012	-10.867	-11.057	-0.190	(0)
ZnNO3+	9.989e-013	6.446e-013	-12.000	-12.191	-0.190	(0)
NiNO3+	4.672e-014	3.015e-014	-13.330	-13.521	-0.190	(0)
CoNO3+	1.729e-014	1.116e-014	-13.762	-13.953	-0.190	(0)
CuNO3+	7.370e-015	4.756e-015	-14.133	-14.323	-0.190	(0)
BaNO3+	4.098e-015	2.644e-015	-14.387	-14.578	-0.190	(0)
CdNO3+	2.139e-015	1.381e-015	-14.670	-14.860	-0.190	(0)
PbNO3+	3.388e-016	2.186e-016	-15.470	-15.660	-0.190	(0)
AgNO3	5.624e-017	5.624e-017	-16.250	-16.250	0.000	(0)
Mn(NO3)2	1.384e-018	1.384e-018	-17.859	-17.859	0.000	(0)
Zn(NO3)2	8.083e-021	8.083e-021	-20.092	-20.092	0.000	(0)
UO2NO3+	6.586e-021	4.250e-021	-20.181	-20.372	-0.190	(0)
Co(NO3)2	1.427e-021	1.427e-021	-20.846	-20.846	0.000	(0)
Cd(NO3)2	4.349e-023	4.349e-023	-22.362	-22.362	0.000	(0)
Cu(NO3)2	3.763e-023	3.763e-023	-22.424	-22.424	0.000	(0)
Pb(NO3)2	2.334e-023	2.334e-023	-22.632	-22.632	0.000	(0)
CrNO3+2	6.072e-024	1.053e-024	-23.217	-23.978	-0.761	(0)
VO2NO3	3.794e-024	3.794e-024	-23.421	-23.421	0.000	(0)
FeNO3+2	8.814e-027	1.528e-027	-26.055	-26.816	-0.761	(0)
HgNO3+	2.180e-029	1.406e-029	-28.662	-28.852	-0.190	(0)
Hg(NO3)2	3.674e-037	3.674e-037	-36.435	-36.435	0.000	(0)
Na	4.014e-002					
Na+	3.762e-002	2.872e-002	-1.425	-1.542	-0.117	(0)
NaSO4-	2.504e-003	1.924e-003	-2.601	-2.716	-0.114	(0)
NaHCO3	6.687e-006	6.687e-006	-5.175	-5.175	0.000	(0)
NaF	2.292e-006	2.292e-006	-5.640	-5.640	0.000	(0)
NaCO3-	1.166e-006	8.959e-007	-5.933	-6.048	-0.114	(0)
NaH2BO3	1.693e-007	1.693e-007	-6.771	-6.771	0.000	(0)
NaCrO4-	9.507e-016	6.135e-016	-15.022	-15.212	-0.190	(0)
Ni	1.074e-006					
Ni+2	5.624e-007	1.910e-007	-6.250	-6.719	-0.469	(0)
NiSO4	4.752e-007	4.752e-007	-6.323	-6.323	0.000	(0)
NiHCO3+	1.511e-008	9.748e-009	-7.821	-8.011	-0.190	(0)
NiCO3	1.193e-008	1.193e-008	-7.923	-7.923	0.000	(0)
NiCl+	3.647e-009	2.353e-009	-8.438	-8.628	-0.190	(0)
NiOH+	3.230e-009	2.085e-009	-8.491	-8.681	-0.190	(0)
Ni(SO4)2-2	1.132e-009	1.963e-010	-8.946	-9.707	-0.761	(0)
NiF+	9.402e-010	6.067e-010	-9.027	-9.217	-0.190	(0)
Ni(OH)2	1.436e-010	1.436e-010	-9.843	-9.843	0.000	(0)
NiNH3+2	1.939e-011	3.361e-012	-10.712	-11.474	-0.761	(0)
Ni(OH)3-	1.929e-013	1.245e-013	-12.715	-12.905	-0.190	(0)
NiCl2	5.707e-014	5.707e-014	-13.244	-13.244	0.000	(0)
NiNO3+	4.672e-014	3.015e-014	-13.330	-13.521	-0.190	(0)
NiSeO4	1.440e-014	1.440e-014	-13.842	-13.842	0.000	(0)
Ni(NH3)2+2	9.185e-017	1.592e-017	-16.037	-16.798	-0.761	(0)
O(0)	2.407e-035					
O2	1.203e-035	1.243e-035	-34.920	-34.906	0.014	(0)
Pb	4.956e-009					
PbSO4	1.437e-009	1.437e-009	-8.843	-8.843	0.000	(0)
PbCO3	1.184e-009	1.184e-009	-8.926	-8.926	0.000	(0)
PbOH+	7.939e-010	5.123e-010	-9.100	-9.290	-0.190	(0)
Pb+2	6.927e-010	2.352e-010	-9.159	-9.629	-0.469	(0)
Pb(SO4)2-2	6.229e-010	1.080e-010	-9.206	-9.967	-0.761	(0)
PbHCO3+	1.121e-010	7.236e-011	-9.950	-10.140	-0.190	(0)
PbCl+	6.229e-011	4.019e-011	-10.206	-10.396	-0.190	(0)
Pb(CO3)2-2	3.301e-011	5.723e-012	-10.481	-11.242	-0.761	(0)
Pb(OH)2	1.405e-011	1.405e-011	-10.852	-10.852	0.000	(0)

PbF+	3.249e-012	2.096e-012	-11.488	-11.679	-0.190	(0)
PbCl2	8.647e-013	8.647e-013	-12.063	-12.063	0.000	(0)
Pb (OH) 3-	1.888e-014	1.218e-014	-13.724	-13.914	-0.190	(0)
PbF2	5.218e-015	5.218e-015	-14.282	-14.282	0.000	(0)
PbCl3-	2.570e-015	1.658e-015	-14.590	-14.780	-0.190	(0)
PbNO3+	3.388e-016	2.186e-016	-15.470	-15.660	-0.190	(0)
Pb2OH+3	9.847e-017	1.910e-018	-16.007	-17.719	-1.712	(0)
PbCl4-2	2.106e-017	3.650e-018	-16.677	-17.438	-0.761	(0)
Pb (OH) 4-2	1.492e-017	2.586e-018	-16.826	-17.587	-0.761	(0)
PbF3-	1.940e-018	1.252e-018	-17.712	-17.902	-0.190	(0)
Pb3 (OH) 4+2	5.341e-021	9.259e-022	-20.272	-21.033	-0.761	(0)
PbF4-2	4.372e-022	7.579e-023	-21.359	-22.120	-0.761	(0)
Pb (NO3) 2	2.334e-023	2.334e-023	-22.632	-22.632	0.000	(0)
Pb4 (OH) 4+4	1.915e-024	1.730e-027	-23.718	-26.762	-3.044	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.076	-151.076	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.945	-228.135	-0.190	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.493	-73.493	0.000	(0)
HS-	0.000e+000	0.000e+000	-78.169	-78.359	-0.190	(0)
CdHS+	0.000e+000	0.000e+000	-78.319	-78.509	-0.190	(0)
S5-2	0.000e+000	0.000e+000	-79.027	-79.788	-0.761	(0)
H2S	0.000e+000	0.000e+000	-79.275	-79.275	0.000	(0)
S6-2	0.000e+000	0.000e+000	-79.543	-80.304	-0.761	(0)
S4-2	0.000e+000	0.000e+000	-79.623	-80.384	-0.761	(0)
S3-2	0.000e+000	0.000e+000	-80.428	-81.190	-0.761	(0)
S2-2	0.000e+000	0.000e+000	-81.445	-82.206	-0.761	(0)
S-2	0.000e+000	0.000e+000	-87.251	-87.723	-0.472	(0)
HgHS2-	0.000e+000	0.000e+000	-137.881	-138.071	-0.190	(0)
HgS2-2	0.000e+000	0.000e+000	-138.082	-138.843	-0.761	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.613	-139.613	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.775	-147.224	-0.448	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.031	-147.299	-0.268	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.170	-147.361	-0.190	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.532	-147.954	-0.421	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.561	-147.751	-0.190	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.340	-148.803	-0.463	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.679	-149.114	-0.434	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.287	-149.287	0.000	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.664	-149.664	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.076	-151.076	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.608	-216.799	-0.190	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.175	-224.366	-0.190	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.649	-226.410	-0.761	(0)
Cd (HS) 3-	0.000e+000	0.000e+000	-225.933	-226.123	-0.190	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.945	-228.135	-0.190	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.318	-236.509	-0.190	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-301.525	-302.286	-0.761	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-303.423	-304.184	-0.761	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.655	-316.416	-0.761	(0)
S (6)	5.525e-002					
SO4-2	3.673e-002	1.247e-002	-1.435	-1.904	-0.469	(0)
MgSO4	9.328e-003	9.328e-003	-2.030	-2.030	0.000	(0)
CaSO4	5.648e-003	5.648e-003	-2.248	-2.248	0.000	(0)
NaSO4-	2.504e-003	1.924e-003	-2.601	-2.716	-0.114	(0)
KSO4-	8.188e-004	6.291e-004	-3.087	-3.201	-0.114	(0)
MnSO4	1.952e-004	1.952e-004	-3.710	-3.710	0.000	(0)
ZnSO4	1.114e-005	1.114e-005	-4.953	-4.953	0.000	(0)
Zn (SO4) 2-2	6.981e-006	1.210e-006	-5.156	-5.917	-0.761	(0)
NiSO4	4.752e-007	4.752e-007	-6.323	-6.323	0.000	(0)
CoSO4	2.787e-007	2.787e-007	-6.555	-6.555	0.000	(0)
NH4SO4-	1.168e-007	8.902e-008	-6.933	-7.050	-0.118	(0)
CuSO4	6.837e-008	6.837e-008	-7.165	-7.165	0.000	(0)
CdSO4	2.031e-008	2.031e-008	-7.692	-7.692	0.000	(0)
Cd (SO4) 2-2	1.971e-008	3.417e-009	-7.705	-8.466	-0.761	(0)
HSO4-	1.873e-008	1.412e-008	-7.727	-7.850	-0.123	(0)
PbSO4	1.437e-009	1.437e-009	-8.843	-8.843	0.000	(0)
Ni (SO4) 2-2	1.132e-009	1.963e-010	-8.946	-9.707	-0.761	(0)

Pb(SO4) 2-2	6.229e-010	1.080e-010	-9.206	-9.967	-0.761	(0)
AgSO4-	4.345e-010	2.804e-010	-9.362	-9.552	-0.190	(0)
CrOHSO4	2.151e-011	2.151e-011	-10.667	-10.667	0.000	(0)
FeSO4	1.167e-012	1.167e-012	-11.933	-11.933	0.000	(0)
UO2SO4	6.398e-013	6.398e-013	-12.194	-12.194	0.000	(0)
UO2(SO4) 2-2	6.068e-013	1.052e-013	-12.217	-12.978	-0.761	(0)
AlSO4+	7.425e-014	5.599e-014	-13.129	-13.252	-0.123	(0)
CrSO4+	1.729e-014	1.116e-014	-13.762	-13.952	-0.190	(0)
Al(SO4) 2-	9.924e-015	7.482e-015	-14.003	-14.126	-0.123	(0)
VO2SO4-	5.508e-017	3.554e-017	-16.259	-16.449	-0.190	(0)
FeSO4+	4.464e-019	3.402e-019	-18.350	-18.468	-0.118	(0)
Fe(SO4) 2-	1.406e-019	9.073e-020	-18.852	-19.042	-0.190	(0)
Cr2(OH) 2SO4+2	8.153e-020	1.413e-020	-19.089	-19.850	-0.761	(0)
VOSO4	6.425e-020	6.425e-020	-19.192	-19.192	0.000	(0)
Cr2(OH) 2(SO4) 2	1.047e-020	1.047e-020	-19.980	-19.980	0.000	(0)
HgSO4	1.979e-021	1.979e-021	-20.704	-20.704	0.000	(0)
CrO3SO4-2	4.102e-023	7.111e-024	-22.387	-23.148	-0.761	(0)
VSO4+	1.660e-034	1.071e-034	-33.780	-33.970	-0.190	(0)
U(SO4) 2	1.052e-039	1.052e-039	-38.978	-38.978	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.213	-40.974	-0.761	(0)
Co(NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Sb(3)	1.109e-018					
Sb(OH) 3	5.604e-019	5.604e-019	-18.251	-18.251	0.000	(0)
HSbO2	5.482e-019	5.482e-019	-18.261	-18.261	0.000	(0)
SbO2-	1.187e-022	7.662e-023	-21.925	-22.116	-0.190	(0)
Sb(OH) 4-	6.775e-023	4.372e-023	-22.169	-22.359	-0.190	(0)
Sb(OH) 2F	1.286e-024	1.286e-024	-23.891	-23.891	0.000	(0)
SbOF	1.267e-024	1.267e-024	-23.897	-23.897	0.000	(0)
Sb(OH) 2+	2.449e-025	1.580e-025	-24.611	-24.801	-0.190	(0)
SbO+	8.462e-026	5.460e-026	-25.073	-25.263	-0.190	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.655	-316.416	-0.761	(0)
Sb(5)	1.103e-006					
SbO3-	1.102e-006	7.113e-007	-5.958	-6.148	-0.190	(0)
Sb(OH) 6-	1.083e-009	8.267e-010	-8.965	-9.083	-0.117	(0)
SbO2+	4.255e-023	2.745e-023	-22.371	-22.561	-0.190	(0)
Se(-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	2.823e-039	1.822e-039	-38.549	-38.739	-0.190	(0)
MnSe	0.000e+000	0.000e+000	-40.244	-40.244	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.786	-42.786	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.042	-45.803	-0.761	(0)
AgOH(Se) 2-4	0.000e+000	0.000e+000	-80.085	-83.129	-3.044	(0)
Se(4)	3.824e-007					
SeO3-2	2.146e-007	3.721e-008	-6.668	-7.429	-0.761	(0)
HSeO3-	1.678e-007	1.083e-007	-6.775	-6.965	-0.190	(0)
H2SeO3	5.353e-013	5.353e-013	-12.271	-12.271	0.000	(0)
AgSeO3-	4.175e-014	2.694e-014	-13.379	-13.570	-0.190	(0)
Cd(SeO3) 2-2	4.571e-017	7.924e-018	-16.340	-17.101	-0.761	(0)
Ag(SeO3) 2-3	4.627e-019	8.974e-021	-18.335	-20.047	-1.712	(0)
FeHSeO3+2	4.013e-024	6.957e-025	-23.397	-24.158	-0.761	(0)
Se(6)	4.786e-010					
SeO4-2	4.747e-010	1.612e-010	-9.324	-9.793	-0.469	(0)
MnSeO4	3.818e-012	3.818e-012	-11.418	-11.418	0.000	(0)
ZnSeO4	1.019e-013	1.019e-013	-12.992	-12.992	0.000	(0)
NiSeO4	1.440e-014	1.440e-014	-13.842	-13.842	0.000	(0)
CoSeO4	9.047e-015	9.047e-015	-14.044	-14.044	0.000	(0)
CdSeO4	2.085e-016	2.085e-016	-15.681	-15.681	0.000	(0)
HSeO4-	1.451e-016	9.361e-017	-15.838	-16.029	-0.190	(0)
Zn(SeO4) 2-2	9.608e-023	1.666e-023	-22.017	-22.778	-0.761	(0)
U(3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.590	-59.303	-1.712	(0)
U(4)	1.191e-019					
U(OH) 5-	1.191e-019	7.684e-020	-18.924	-19.114	-0.190	(0)
U(OH) 4	3.737e-023	3.737e-023	-22.427	-22.427	0.000	(0)
U(OH) 3+	2.459e-027	1.587e-027	-26.609	-26.800	-0.190	(0)
U(OH) 2+2	4.914e-032	8.519e-033	-31.309	-32.070	-0.761	(0)
UF3+	2.671e-036	1.723e-036	-35.573	-35.764	-0.190	(0)
UF2+2	4.959e-037	8.597e-038	-36.305	-37.066	-0.761	(0)

UOH+3	2.403e-037	4.659e-039	-36.619	-38.332	-1.712	(0)
UF4	2.390e-038	2.390e-038	-37.622	-37.622	0.000	(0)
UF+3	2.784e-039	0.000e+000	-38.555	-40.268	-1.712	(0)
U(SO4) 2	1.052e-039	1.052e-039	-38.978	-38.978	0.000	(0)
UF5-	1.857e-040	1.198e-040	-39.731	-39.922	-0.190	(0)
USO4+2	0.000e+000	0.000e+000	-40.213	-40.974	-0.761	(0)
UF6-2	0.000e+000	0.000e+000	-40.578	-41.340	-0.761	(0)
U+4	0.000e+000	0.000e+000	-42.626	-45.670	-3.044	(0)
UC1+3	0.000e+000	0.000e+000	-44.575	-46.287	-1.712	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-156.736	-172.147	-15.411	(0)
U(5)	4.661e-016					
UO2+	4.661e-016	3.008e-016	-15.332	-15.522	-0.190	(0)
U(6)	7.460e-007					
UO2(CO3) 3-4	7.022e-007	6.343e-010	-6.154	-9.198	-3.044	(0)
UO2(CO3) 2-2	4.358e-008	7.554e-009	-7.361	-8.122	-0.761	(0)
UO2CO3	2.260e-010	2.260e-010	-9.646	-9.646	0.000	(0)
UO2OH+	5.733e-012	3.699e-012	-11.242	-11.432	-0.190	(0)
UO2F+	9.169e-013	5.917e-013	-12.038	-12.228	-0.190	(0)
UO2SO4	6.398e-013	6.398e-013	-12.194	-12.194	0.000	(0)
UO2(SO4) 2-2	6.068e-013	1.052e-013	-12.217	-12.978	-0.761	(0)
UO2F2	2.158e-013	2.158e-013	-12.666	-12.666	0.000	(0)
UO2+2	9.980e-014	3.389e-014	-13.001	-13.470	-0.469	(0)
UO2F3-	1.063e-014	6.857e-015	-13.974	-14.164	-0.190	(0)
UO2Cl+	4.102e-016	2.647e-016	-15.387	-15.577	-0.190	(0)
(UO2) 2(OH) 2+2	1.310e-016	2.271e-017	-15.883	-16.644	-0.761	(0)
(UO2) 3(OH) 5+	7.425e-017	4.791e-017	-16.129	-16.320	-0.190	(0)
UO2F4-2	3.974e-017	6.890e-018	-16.401	-17.162	-0.761	(0)
UO2NO3+	6.586e-021	4.250e-021	-20.181	-20.372	-0.190	(0)
V(2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-42.248	-42.439	-0.190	(0)
V+2	0.000e+000	0.000e+000	-43.126	-43.887	-0.761	(0)
V(3)	9.570e-015					
V(OH) 3	9.570e-015	9.570e-015	-14.019	-14.019	0.000	(0)
V(OH) 2+	1.113e-025	7.180e-026	-24.954	-25.144	-0.190	(0)
VOH+2	4.562e-029	7.908e-030	-28.341	-29.102	-0.761	(0)
V+3	9.383e-034	1.820e-035	-33.028	-34.740	-1.712	(0)
VSO4+	1.660e-034	1.071e-034	-33.780	-33.970	-0.190	(0)
V2(OH) 3+3	0.000e+000	0.000e+000	-54.082	-55.794	-1.712	(0)
V2(OH) 2+4	0.000e+000	0.000e+000	-54.360	-57.404	-3.044	(0)
V(4)	5.199e-018					
V(OH) 3+	5.004e-018	3.229e-018	-17.301	-17.491	-0.190	(0)
VO+2	1.079e-019	1.870e-020	-18.967	-19.728	-0.761	(0)
VOSO4	6.425e-020	6.425e-020	-19.192	-19.192	0.000	(0)
VOF+	2.199e-020	1.419e-020	-19.658	-19.848	-0.190	(0)
VOF2	6.729e-022	6.729e-022	-21.172	-21.172	0.000	(0)
VOC1+	3.916e-022	2.527e-022	-21.407	-21.597	-0.190	(0)
VOF3-	4.680e-024	3.020e-024	-23.330	-23.520	-0.190	(0)
VOF4-2	8.894e-027	1.542e-027	-26.051	-26.812	-0.761	(0)
H2V2O4+2	3.027e-030	5.247e-031	-29.519	-30.280	-0.761	(0)
V(5)	1.242e-007					
H2VO4-	6.873e-008	4.435e-008	-7.163	-7.353	-0.190	(0)
HVO4-2	5.546e-008	9.614e-009	-7.256	-8.017	-0.761	(0)
HV2O7-3	7.467e-012	1.448e-013	-11.127	-12.839	-1.712	(0)
H3VO4	5.139e-012	5.139e-012	-11.289	-11.289	0.000	(0)
H3V2O7-	2.286e-012	1.475e-012	-11.641	-11.831	-0.190	(0)
V2O7-4	3.724e-013	3.364e-016	-12.429	-15.473	-3.044	(0)
VO4-3	2.144e-013	4.159e-015	-12.669	-14.381	-1.712	(0)
V3O9-3	4.742e-015	9.196e-017	-14.324	-16.036	-1.712	(0)
VO2+	1.563e-016	1.193e-016	-15.806	-15.923	-0.117	(0)
VO2SO4-	5.508e-017	3.554e-017	-16.259	-16.449	-0.190	(0)
VO2F	2.647e-017	2.647e-017	-16.577	-16.577	0.000	(0)
V4O12-4	1.886e-018	1.704e-021	-17.724	-20.769	-3.044	(0)
VO2F2-	1.884e-018	1.216e-018	-17.725	-17.915	-0.190	(0)
VO2F3-2	1.106e-020	1.918e-021	-19.956	-20.717	-0.761	(0)
VO2F4-3	6.156e-024	1.194e-025	-23.211	-24.923	-1.712	(0)
VO2NO3	3.794e-024	3.794e-024	-23.421	-23.421	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-49.508	-56.358	-6.849	(0)
HV10O28-5	0.000e+000	0.000e+000	-51.351	-56.107	-4.757	(0)

H2V10028-4	0.000e+000	0.000e+000	-55.791	-58.836	-3.044	(0)
Zn	3.136e-005					
Zn+2	1.202e-005	4.083e-006	-4.920	-5.389	-0.469	(0)
ZnSO4	1.114e-005	1.114e-005	-4.953	-4.953	0.000	(0)
Zn(SO4) 2-2	6.981e-006	1.210e-006	-5.156	-5.917	-0.761	(0)
ZnOH+	5.486e-007	3.540e-007	-6.261	-6.451	-0.190	(0)
ZnCO3	3.936e-007	3.936e-007	-6.405	-6.405	0.000	(0)
ZnHCO3+	8.285e-008	5.346e-008	-7.082	-7.272	-0.190	(0)
ZnCl+	6.628e-008	4.940e-008	-7.179	-7.306	-0.128	(0)
ZnOHCl	5.607e-008	5.607e-008	-7.251	-7.251	0.000	(0)
Zn(OH) 2	4.865e-008	4.865e-008	-7.313	-7.313	0.000	(0)
ZnF+	1.597e-008	1.030e-008	-7.797	-7.987	-0.190	(0)
ZnCl2	3.771e-010	3.771e-010	-9.424	-9.424	0.000	(0)
Zn(OH) 3-	3.277e-010	2.114e-010	-9.485	-9.675	-0.190	(0)
ZnCl3-	1.936e-012	1.443e-012	-11.713	-11.841	-0.128	(0)
ZnNO3+	9.989e-013	6.446e-013	-12.000	-12.191	-0.190	(0)
ZnSeO4	1.019e-013	1.019e-013	-12.992	-12.992	0.000	(0)
Zn(OH) 4-2	4.210e-014	7.298e-015	-13.376	-14.137	-0.761	(0)
ZnCl4-2	1.030e-014	3.474e-015	-13.987	-14.459	-0.472	(0)
Zn(NO3) 2	8.083e-021	8.083e-021	-20.092	-20.092	0.000	(0)
Zn(SeO4) 2-2	9.608e-023	1.666e-023	-22.017	-22.778	-0.761	(0)
ZnS(HS) -	0.000e+000	0.000e+000	-147.170	-147.361	-0.190	(0)
Zn(HS) 2	0.000e+000	0.000e+000	-149.287	-149.287	0.000	(0)
Zn(HS) 3-	0.000e+000	0.000e+000	-224.175	-224.366	-0.190	(0)
ZnS(HS) 2-2	0.000e+000	0.000e+000	-225.649	-226.410	-0.761	(0)
Zn(HS) 4-2	0.000e+000	0.000e+000	-303.423	-304.184	-0.761	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-48.73	-42.44	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-37.18	-32.67	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-44.40	-32.67	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-63.50	-45.56	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-50.94	-30.91	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-27.12	-26.72	0.40	(NH4)2CrO4
(NH4)2SeO4	-22.60	-22.15	0.45	(NH4)2SeO4
Acanthite	-52.10	-88.32	-36.22	Ag2S
Ag2CO3	-12.58	-23.67	-11.09	Ag2CO3
Ag2CrO4	-20.67	-32.26	-11.59	Ag2CrO4
Ag2HVO4	-11.49	-10.01	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.60	-2.03	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.98	-19.80	-4.82	Ag2SO4
Ag3AsO3	-27.99	-25.83	2.16	Ag3AsO3
Ag3AsO4	-16.40	-19.19	-2.79	Ag3AsO4
Ag3H2VO5	-16.21	-11.03	5.18	Ag3H2VO5
AgF:4H2O	-13.90	-12.85	1.05	AgF:4H2O
Agmetal	-0.28	-13.79	-13.51	Ag
AgVO3	-9.77	-9.00	0.77	AgVO3
Al(OH) 3(am)	-2.23	8.57	10.80	Al(OH) 3
Al2(MoO4) 3	-50.82	-48.45	2.37	Al2(MoO4) 3
Al2O3	-2.51	17.14	19.65	Al2O3
Al4(OH)10SO4	-6.20	16.50	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.38	-7.58	4.80	AlAsO4:2H2O
AlOHSO4	-5.98	-9.21	-3.23	AlOHSO4
AlSb	-151.94	-86.32	65.62	AlSb
Alunite	-2.66	-4.06	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-3.74	-11.53	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6

Artinite	-4.28	5.32	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.15	6.25	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.26	-0.39	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.53	7.41	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-7.11	-14.07	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.94	-7.11	1.83	BaSeO3
BaSeO4	-10.41	-17.87	-7.46	BaSeO4
Bianchite	-5.53	-7.30	-1.76	ZnSO4:6H2O
Birnessite	-6.08	12.01	18.09	MnO2
Bixbyite	-0.88	-1.52	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	-0.01	8.57	8.58	AlOOH
Breithauptite	-54.44	-72.96	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.36	13.48	16.84	Mg (OH) 2
Bunsenite	-3.29	9.15	12.45	NiO
Ca (VO3) 2	-8.47	-2.81	5.66	Ca (VO3) 2
Ca2V2O7	-7.14	10.36	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.20	10.36	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-15.43	23.53	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-16.34	23.52	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-293.24	-150.27	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	-0.00	-8.48	-8.48	CaCO3
Calomel	-8.04	-25.95	-17.91	Hg2Cl2
CaMoO4	-0.75	-8.70	-7.95	CaMoO4
Carnotite	-0.03	0.20	0.23	KUO2VO4
CaSeO3:2H2O	-4.55	-1.74	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.48	-12.50	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.38	-0.54	9.84	Cd (BO2) 2
Cd (OH) 2	-5.93	7.71	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.02	7.71	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-19.12	-12.41	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-17.20	5.36	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-15.33	13.07	28.40	Cd4 (OH) 6SO4
CdCl2	-12.13	-12.79	-0.66	CdCl2
CdCl2:1H2O	-11.10	-12.79	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.88	-12.80	-1.91	CdCl2:2.5H2O
CdF2	-14.74	-15.95	-1.21	CdF2
Cdmetal (alpha)	-31.35	-17.83	13.51	Cd
Cdmetal (gamma)	-31.45	-17.83	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.08	-2.54	3.54	CdOHCl
CdSb	-74.05	-74.40	-0.35	CdSb
CdSe	-18.76	-38.96	-20.20	CdSe
CdSeO4:2H2O	-16.10	-17.95	-1.85	CdSeO4:2H2O
CdSO4	-9.89	-10.06	-0.17	CdSO4
CdSO4:1H2O	-8.34	-10.06	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.19	-10.06	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.52	-11.27	-9.75	AgCl
Cerrusite	-2.27	-15.40	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-52.14	-97.83	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe

Co (BO2) 2	-26.41	0.66	27.07	Co (BO2) 2
Co (OH) 2	-4.17	8.92	13.09	Co (OH) 2
Co (OH) 3	-8.40	-10.71	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-18.57	-5.53	13.03	Co3 (AsO4) 2
Co3O4	-2.00	-12.49	-10.50	Co3O4
CoCl2	-19.85	-11.59	8.27	CoCl2
CoCl2:6H2O	-14.13	-11.59	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-13.15	-14.75	-1.60	CoF2
CoF3	-44.75	-46.21	-1.46	CoF3
CoFe2O4	18.83	15.31	-3.53	CoFe2O4
CoMoO4	-5.18	-12.94	-7.76	CoMoO4
CoO	-4.67	8.92	13.59	CoO
CoS (alpha)	-69.93	-77.37	-7.44	CoS
CoS (beta)	-66.30	-77.37	-11.07	CoS
CoSe	-21.55	-37.75	-16.20	CoSe
CoSeO3	-7.30	-5.98	1.32	CoSeO3
CoSeO4:6H2O	-15.22	-16.75	-1.53	CoSeO4:6H2O
CoSO4	-11.66	-8.85	2.80	CoSO4
CoSO4:6H2O	-6.39	-8.86	-2.47	CoSO4:6H2O
Cotunnite	-9.48	-14.26	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.01	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.60	-31.51	14.09	CrCl2
CrCl3	-47.05	-31.94	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.41	-43.25	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.37	22.84	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.89	1.36	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-53.59	-88.47	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.54	-50.34	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-57.79	-100.38	-42.59	Cu3Sb
Cu3Se2	-25.27	-88.76	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.54	-13.61	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.32	-38.42	-33.10	CuSe
CuSe2	-26.19	-59.55	-33.37	CuSe2
CuSeO3:2H2O	-7.16	-6.65	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.98	-17.42	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	1.70	8.57	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.10	-16.64	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.45	-16.64	-17.09	CaMg (CO3) 2
Epsomite	-2.17	-4.30	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.16	0.12	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-8.80	-12.52	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.07	-8.52	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.69	-38.32	-20.63	Fe2 (SeO3) 3:2H2O

Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.32	-18.41	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.76	-64.35	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-4.84	-4.84	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.08	-80.05	-13.97	PbS
Gibbsite	0.28	8.57	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.29	-7.30	-2.01	ZnSO4:7H2O
Greenockite	-64.22	-78.58	-14.36	CdS
Greigite	-290.30	-335.34	-45.03	Fe3S4
Gummite	-5.27	2.40	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.99	-21.86	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.72	-46.68	-4.96	H2Se
Halite	-5.46	-3.86	1.60	NaCl
Hausmannite	-0.04	60.99	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-2.30	20.59	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.49	-259.19	-73.71	Hg (CH3) 2
Hg (g)	-7.62	-15.49	-7.87	Hg
Hg (OH) 2	-8.05	-11.54	-3.50	Hg (OH) 2
Hg2 (g)	-16.03	-30.99	-14.96	Hg2
Hg2 (OH) 2	-10.70	-5.44	5.26	Hg2 (OH) 2
Hg2CO3	-11.04	-27.09	-16.05	Hg2CO3
Hg2CrO4	-26.98	-35.68	-8.70	Hg2CrO4
Hg2F2	-18.75	-29.11	-10.36	Hg2F2
Hg2S	-80.06	-91.73	-11.68	Hg2S
Hg2SeO3	-15.68	-20.34	-4.66	Hg2SeO3
Hg2SO4	-17.09	-23.22	-6.13	Hg2SO4
Hg3O2CO3	-26.59	-56.27	-29.68	Hg3O2CO3
HgCl (g)	-32.47	-12.97	19.50	HgCl
HgCl2	-10.78	-32.05	-21.26	HgCl2
HgF (g)	-47.23	-14.55	32.68	HgF
HgF2 (g)	-47.77	-35.21	12.57	HgF2
Hgmetal (l)	-2.04	-15.49	-13.45	Hg
HgSe	-2.52	-58.21	-55.69	HgSe
HgSeO3	-14.01	-26.44	-12.43	HgSeO3
HgSO4	-19.90	-29.32	-9.42	HgSO4
Huntite	-3.00	-32.97	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.80	-24.57	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.40	-19.17	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.03	-21.20	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.39	-20.19	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.66	-48.90	-17.24	K2Cr2O7
K2CrO4	-18.15	-18.66	-0.51	K2CrO4
K2MoO4	-13.55	-10.29	3.26	K2MoO4
K2SeO4	-13.36	-14.09	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-4.86	-5.29	-0.43	PbO:PbSO4
Laurionite	-4.63	-4.01	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.45	6.24	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.01	19.87	16.86	Fe2MgO4
Magnesite	-0.70	-8.16	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3

Manganite	-0.75	24.59	25.34	MnOOH
Massicot	-6.65	6.24	12.89	PbO
Matlockite	-6.87	-15.84	-8.97	PbClF
Melanothallite	-18.51	-12.26	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-52.74	-97.83	-45.09	HgS
Mg(OH)2(active)	-5.31	13.48	18.79	Mg(OH)2
Mg(VO3)2	-13.77	-2.49	11.28	Mg(VO3)2
Mg2Sb3	-268.50	-193.82	74.68	Mg2Sb3
Mg2V2O7	-15.37	10.99	26.36	Mg2V2O7
MgCr2O4	-5.07	11.13	16.20	MgCr2O4
MgCrO4	-22.13	-16.75	5.38	MgCrO4
MgF2	-2.05	-10.18	-8.13	MgF2
MgMoO4	-6.53	-8.38	-1.85	MgMoO4
MgSeO3:6H2O	-4.48	-1.42	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.98	-12.18	-1.20	MgSeO4:6H2O
Minium	-29.25	44.27	73.52	Pb3O4
Mirabilite	-3.88	-5.00	-1.11	Na2SO4:10H2O
Mn(VO3)2	-9.06	-4.16	4.90	Mn(VO3)2
Mn2(SO4)3	-49.14	-54.85	-5.71	Mn2(SO4)3
Mn2Sb	-145.10	-84.03	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-9.36	3.14	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.41	-8.69	2.72	MnCl2:4H2O
MnS(grn)	-74.65	-74.48	0.17	MnS
MnS(pnk)	-77.82	-74.48	3.34	MnS
MnSb	-92.74	-95.65	-2.91	MnSb
MnSe	-38.36	-34.86	3.50	MnSe
MnSeO3	-4.21	-3.08	1.13	MnSeO3
MnSeO3:2H2O	-4.07	-3.09	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.80	-13.85	-2.05	MnSeO4:5H2O
MnSO4	-8.54	-5.96	2.58	MnSO4
Monteponite	-7.39	7.71	15.10	CdO
Montroydite	-7.90	-11.54	-3.64	HgO
MoO3	-13.86	-21.86	-8.00	MoO3
Morenosite	-6.48	-8.63	-2.14	NiSO4:7H2O
MoS2	-149.74	-220.00	-70.26	MoS2
Na-Jarosite	-8.38	-19.58	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-37.79	-47.69	-9.90	Na2Cr2O7
Na2CrO4	-20.38	-17.45	2.93	Na2CrO4
Na2Mo2O7	-14.34	-30.94	-16.60	Na2Mo2O7
Na2MoO4	-10.57	-9.08	1.49	Na2MoO4
Na2MoO4:2H2O	-10.30	-9.08	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.42	-2.12	10.30	Na2SeO3:5H2O
Na2SeO4	-14.16	-12.88	1.28	Na2SeO4
Na3Sb	-170.15	-75.70	94.45	Na3Sb
Na3VO4	-25.49	11.19	36.68	Na3VO4
Na4V2O7	-27.80	9.60	37.40	Na4V2O7
Nantokite	-5.36	-12.09	-6.73	CuCl
NaSb	-86.11	-62.95	23.17	NaSb
Natron	-7.56	-8.87	-1.31	Na2CO3:10H2O
NaVO3	-5.45	-1.59	3.86	NaVO3
Nesquehonite	-3.49	-8.16	-4.67	MgCO3:3H2O
Ni(OH)2	-3.64	9.15	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.55	-4.85	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-13.17	18.83	32.00	Ni4(OH)6SO4
NiCO3	-5.62	-12.49	-6.87	NiCO3
NiMoO4	-1.57	-12.71	-11.14	NiMoO4
NiS(alpha)	-71.54	-77.14	-5.60	NiS
NiS(beta)	-66.04	-77.14	-11.10	NiS
NiS(gamma)	-64.34	-77.14	-12.80	NiS
NiSe	-19.82	-37.52	-17.70	NiSe
NiSeO3:2H2O	-8.57	-5.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.00	-16.52	-1.52	NiSeO4:6H2O
Nsutite	-5.49	12.01	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.40	-304.47	-61.07	As2S3
Otavite	-1.93	-13.93	-12.00	CdCO3
Pb(BO2)2	-8.53	-2.01	6.52	Pb(BO2)2

Pb(OH)2	-1.91	6.24	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.70	-67.46	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.56	2.23	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.70	12.48	26.19	Pb2O(OH)2
Pb2O3	-23.01	38.03	61.04	Pb2O3
Pb2OCO3	-8.60	-9.16	-0.56	Pb2OCO3
Pb2V2O7	-1.59	-3.49	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.37	-13.57	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.39	2.75	6.14	Pb3(VO4)2
Pb3O2CO3	-13.94	-2.92	11.02	Pb3O2CO3
Pb3O2SO4	-9.73	0.95	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.91	7.19	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.68	7.19	21.88	Pb4O3SO4
PbCrO4	-11.40	-24.00	-12.60	PbCrO4
PbF2	-9.98	-17.42	-7.44	PbF2
Pbmetal	-23.55	-19.30	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.74	6.24	12.98	PbO:0.3H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.10	13.48	21.58	MgO
Phosgenite	-9.86	-29.67	-19.81	PbCl2:PbCO3
Plattnerite	-17.81	31.79	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.38	11.81	15.19	Mn(OH)2
Pyrolusite	-4.02	37.36	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-6.59	-8.63	-2.04	NiSO4:6H2O
Rhodochrosite	0.75	-9.83	-10.58	MnCO3
Rutherfordine	-4.75	-19.25	-14.50	UO2CO3
Sb(OH)3	-11.14	-18.25	-7.11	Sb(OH)3
Sb2O4	-14.36	-10.96	3.40	Sb2O4
Sb2O5	-24.36	-34.03	-9.67	Sb2O5
Sb2Se3	-108.77	-176.52	-67.76	Sb2Se3
Sb4O6(cubic)	-54.74	-73.00	-18.26	Sb4O6
Sb4O6(orth)	-55.10	-73.00	-17.90	Sb4O6
SbCl3	-49.58	-49.01	0.57	SbCl3
SbF3	-43.53	-53.75	-10.23	SbF3
Sbmetal	-44.88	-56.57	-11.69	Sb
SbO2	-1.96	-29.79	-27.82	SbO2
Schoepite	-3.59	2.40	5.99	UO2(OH)2:H2O
Semetal(am)	-14.02	-21.13	-7.11	Se
Semetal(hex)	-13.42	-21.13	-7.71	Se
Senarmontite	-24.13	-36.50	-12.37	Sb2O3
SeO2	-15.03	-14.90	0.12	SeO2
SeO3	-46.71	-25.66	21.04	SeO3
Siderite	-7.95	-18.19	-10.24	FeCO3
Smithsonite	-1.16	-11.16	-10.00	ZnCO3
Sphalerite	-64.36	-75.81	-11.45	ZnS
Spinel	-6.23	30.62	36.85	MgAl2O4
Stibnite	-244.92	-295.38	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.31	-4.99	0.32	Na2SO4
Thermonatrite	-9.50	-8.86	0.64	Na2CO3:H2O
Tyuyamunite	-2.09	1.99	4.08	Ca(UO2)2(VO4)2
U3O8	-11.78	9.31	21.08	U3O8
U3Sb4	-573.70	-421.32	152.38	U3Sb4
U4O9	-27.15	-30.17	-3.02	U4O9
UF4	-31.72	-61.26	-29.54	UF4
UF4:2.5H2O	-28.55	-61.26	-32.72	UF4:2.5H2O
UO2(am)	-14.86	-13.93	0.93	UO2
UO2(NO3)2	-40.02	-27.87	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-32.73	-27.88	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-31.27	-27.88	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-29.93	-27.88	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.21	2.40	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.02	-23.27	-2.25	UO2SeO4:4H2O

UO3	-5.30	2.40	7.70	UO3
Uraninite	-9.26	-13.93	-4.67	UO2
USb2	-216.94	-187.37	29.58	USb2
V(OH)3	-18.53	-10.93	7.59	V(OH)3
V2O5	-14.62	-15.98	-1.36	V2O5
V3O5	-38.95	-37.12	1.84	V3O5
V4O7	-48.16	-40.97	7.19	V4O7
V6O13	-38.16	-99.02	-60.86	V6O13
Valentinite	-28.02	-36.50	-8.48	Sb2O3
VC12	-63.09	-44.21	18.87	VC12
VC13	-65.12	-41.69	23.43	VC13
VF4	-66.12	-51.19	14.93	VF4
Vmetal	-93.28	-49.25	44.03	V
VO	-38.46	-23.71	14.76	VO
VO(OH)2	-9.01	-3.86	5.15	VO(OH)2
VO2Cl	-21.08	-18.24	2.84	VO2Cl
VOC1	-32.34	-21.19	11.15	VOC1
VOC12	-37.12	-24.36	12.76	VOC12
VOSO4	-25.24	-21.63	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.86	-75.81	-8.95	ZnS
Zincite	-0.85	10.48	11.33	ZnO
Zincosite	-11.22	-7.29	3.93	ZnSO4
Zn(BO2)2	-6.06	2.23	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-23.11	-19.80	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.72	10.48	12.20	Zn(OH)2
Zn(OH)2(am)	-1.99	10.48	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.27	10.48	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.05	10.48	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.25	10.48	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.31	3.19	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.48	10.71	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.50	-0.85	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.02	-4.10	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.25	24.15	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.60	31.90	38.50	Zn5(OH)8Cl2
ZnCl2	-17.07	-10.02	7.05	ZnCl2
ZnCO3:1H2O	-0.91	-11.17	-10.26	ZnCO3:1H2O
ZnF2	-12.65	-13.18	-0.53	ZnF2
Znmetal	-40.85	-15.06	25.79	Zn
ZnMoO4	-1.26	-11.38	-10.13	ZnMoO4
ZnO(active)	-0.71	10.48	11.19	ZnO
ZnS(am)	-66.76	-75.81	-9.05	ZnS
ZnSb	-82.64	-71.63	11.01	ZnSb
ZnSe	-21.79	-36.19	-14.40	ZnSe
ZnSeO4:6H2O	-13.67	-15.19	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.66	-7.29	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 33.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 105
      Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
      Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
      donnan 1e-008
USE EQUILIBRIUM_PHASES 105
USE Surface 105
USE Solution 116
SAVE Solution 117  #Pit Water After Mineral Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 116. Solution after simulation 32.

Using surface 105.

Using pure phase assemblage 105. Pure-phase assemblage after simulation 32.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-0.00	-48.70	-48.70	2.034e-009	2.034e-009	-9.332e-015
Alunite	-2.66	-4.06	-1.40	0.000e+000	0	0.000e+000
Anhydrite	-0.25	-4.61	-4.36	0.000e+000	0	0.000e+000
Ba3(AsO4)2	0.00	-8.91	-8.91	4.240e-011	4.191e-011	-4.877e-013
Barite	0.00	-9.98	-9.98	3.589e-008	3.589e-008	1.463e-012
Brochantite	-0.00	15.22	15.22	1.328e-007	1.328e-007	-1.482e-011
Brucite	-3.36	13.48	16.84	0.000e+000	0	0.000e+000
CO2(g)	-3.50	-21.65	-18.15	1.000e+001	1.000e+001	7.636e-011
CaMoO4	-0.75	-8.70	-7.95	0.000e+000	0	0.000e+000
CaSeO3:2H2O	-4.55	-1.74	2.81	0.000e+000	0	0.000e+000
Calcite	0.00	-8.48	-8.48	1.899e-004	1.899e-004	-7.606e-011
Carnotite	-0.03	0.20	0.23	0.000e+000	0	0.000e+000
Cd(BO2)2	-10.38	-0.54	9.84	0.000e+000	0	0.000e+000
CdMoO4	0.00	-14.15	-14.15	8.232e-008	8.232e-008	1.178e-014
Chrysotile		Element not present.		0.000e+000	0	0.000e+000
Cr2O3	0.00	-2.36	-2.36	8.542e-010	8.541e-010	-1.096e-013
Cu2Se(alpha)	-4.54	-50.34	-45.80	0.000e+000	0	0.000e+000
CuMoO4	-0.54	-13.61	-13.08	0.000e+000	0	0.000e+000
Epsomite	-2.17	-4.30	-2.13	0.000e+000	0	0.000e+000
Ferrihydrite	-0.00	3.19	3.19	1.223e-009	1.223e-009	-1.698e-018
Fluorite	0.00	-10.50	-10.50	5.581e-005	5.581e-005	8.896e-014
Gummite	-5.27	2.40	7.67	0.000e+000	0	0.000e+000
Gypsum	0.00	-4.61	-4.61	1.385e-002	1.385e-002	6.598e-011
HgSe	-2.52	-58.21	-55.69	0.000e+000	0	0.000e+000
Mg3(PO4)2		Element not present.		0.000e+000	0	0.000e+000
Mirabilite	-3.88	-5.00	-1.11	0.000e+000	0	0.000e+000
MnSeO3	-4.21	-3.08	1.13	0.000e+000	0	0.000e+000
Ni(OH)2	-3.64	9.15	12.79	0.000e+000	0	0.000e+000
Ni3(AsO4)2:8H2O	-20.55	-4.85	15.70	0.000e+000	0	0.000e+000
NiCO3	-5.62	-12.49	-6.87	0.000e+000	0	0.000e+000
NiMoO4	-1.57	-12.71	-11.14	0.000e+000	0	0.000e+000
O2(g)	-32.00	51.09	83.09	1.000e+001	1.000e+001	-4.619e-014
Otavite	-1.93	-13.93	-12.00	0.000e+000	0	0.000e+000
PbMoO4	0.00	-15.62	-15.62	7.199e-009	7.198e-009	-8.730e-013
Rutherfordine	-4.75	-19.25	-14.50	0.000e+000	0	0.000e+000
SbO2	-1.96	-29.79	-27.82	0.000e+000	0	0.000e+000
Schoepite	-3.59	2.40	5.99	0.000e+000	0	0.000e+000
Sepiolite		Element not present.		0.000e+000	0	0.000e+000
SiO2(am-ppt)		Element not present.		0.000e+000	0	0.000e+000
Tyuyamunite	-2.09	1.99	4.08	0.000e+000	0	0.000e+000
U3O8	-11.78	9.31	21.08	0.000e+000	0	0.000e+000
UO2(OH)2(beta)	-3.21	2.40	5.61	0.000e+000	0	0.000e+000
UO3	-5.30	2.40	7.70	0.000e+000	0	0.000e+000
ZnMoO4	-1.26	-11.38	-10.13	0.000e+000	0	0.000e+000

-----Surface composition-----

Hfo

-6.753e-022 Surface + diffuse layer charge, eq
 1.698e-011 Surface charge, eq
 2.087e-002 sigma, C/m**2
 2.366e-002 psi, V
 -9.209e-001 -F*psi/RT
 3.981e-001 exp(-F*psi/RT)
 6.420e+004 specific area, m**2/mol Ferrihydrite
 7.850e-005 m**2 for 1.223e-009 moles of Ferrihydrite

Water in diffuse layer: 7.850e-010 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation

Element	Moles
Ag	1.6369e-017
Al	7.3806e-016
As	1.8099e-018
B	6.1938e-014
Ba	1.6695e-017
C	5.1941e-013
Ca	8.3771e-012
Cd	5.1783e-017
Cl	5.3472e-012
Co	6.6551e-016
Cr	1.1304e-018
Cu	3.6937e-016
F	2.0151e-013
Fe	8.1074e-019
H	7.0085e-013
Hg	9.3791e-019
K	7.4809e-012
Mg	1.5556e-011
Mn	4.9702e-013
Mo	2.7478e-015
N	7.8640e-014
Na	2.9491e-011
Ni	7.7916e-016
O	1.9532e-010
Pb	3.8426e-018
S	4.8348e-011
Sb	9.3504e-016
Se	3.3896e-016
U	7.8842e-016
V	1.0895e-016
Zn	2.4144e-014

Hfo_s

6.114e-012 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.231e-012	0.365	2.583e-012	-11.588
Hfo_sOMn+	1.959e-012	0.320	2.268e-012	-11.644
Hfo_sOCu+	1.039e-012	0.170	1.202e-012	-11.920
Hfo_sOPb+	5.875e-013	0.096	6.801e-013	-12.167
Hfo_sOCrOH+	2.193e-013	0.036	2.539e-013	-12.595
Hfo_sOHCa+2	4.759e-014	0.008	5.509e-014	-13.259
Hfo_sONi+	2.503e-014	0.004	2.898e-014	-13.538
Hfo_sOCu+	2.171e-015	0.000	2.514e-015	-14.600
Hfo_sOH	1.627e-015	0.000	1.884e-015	-14.725
Hfo_sOCd+	1.146e-015	0.000	1.327e-015	-14.877
Hfo_sO-	4.145e-016	0.000	4.798e-016	-15.319
Hfo_sOH2+	1.464e-016	0.000	1.695e-016	-15.771
Hfo_sOAg	3.015e-018	0.000	3.490e-018	-17.457
Hfo_sOHBa+2	6.246e-019	0.000	7.231e-019	-18.141
Hfo_sOFe+	1.068e-019	0.000	1.236e-019	-18.908
Hfo_sOHg+	1.932e-021	0.000	2.237e-021	-20.650

Hfo_w

2.446e-010 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOMg+	6.311e-011	0.258	7.306e-011	-10.136
Hfo_wOCu+	5.824e-011	0.238	6.742e-011	-10.171
Hfo_wOHVO4-3	4.354e-011	0.178	5.040e-011	-10.298
Hfo_wOZn+	2.554e-011	0.104	2.957e-011	-10.529
Hfo_wOH	1.779e-011	0.073	2.060e-011	-10.686
Hfo_wOMn+	1.701e-011	0.070	1.969e-011	-10.706
Hfo_wOHSO4-2	8.632e-012	0.035	9.993e-012	-11.000
Hfo_wO-	4.531e-012	0.019	5.245e-012	-11.280
Hfo_wOCa+	1.707e-012	0.007	1.976e-012	-11.704
Hfo_wOH2+	1.601e-012	0.007	1.853e-012	-11.732
Hfo_wOHAsO4-3	9.752e-013	0.004	1.129e-012	-11.947
Hfo_wOHSeO3-2	6.177e-013	0.003	7.151e-013	-12.146
Hfo_wSO4-	3.900e-013	0.002	4.515e-013	-12.345
Hfo_wONi+	3.692e-013	0.002	4.274e-013	-12.369
Hfo_wOPb+	2.869e-013	0.001	3.321e-013	-12.479
Hfo_wSeO3-	9.457e-014	0.000	1.095e-013	-12.961
Hfo_wOCO+	6.691e-014	0.000	7.745e-014	-13.111
Hfo_wOHMoO4-2	2.876e-014	0.000	3.329e-014	-13.478
Hfo_wH2BO3	5.517e-015	0.000	6.386e-015	-14.195
Hfo_wOCd+	5.346e-015	0.000	6.189e-015	-14.208
Hfo_wMoO4-	1.674e-015	0.000	1.938e-015	-14.713
Hfo_wHAsO4-	1.770e-016	0.000	2.050e-016	-15.688
Hfo_wOAg	8.670e-018	0.000	1.004e-017	-16.998
Hfo_wOHg+	1.035e-018	0.000	1.198e-018	-17.922
Hfo_wOHSbO(OH) 4-	7.387e-019	0.000	8.552e-019	-18.068
Hfo_wOFe+	7.367e-019	0.000	8.528e-019	-18.069
Hfo_wH2AsO4	5.154e-019	0.000	5.966e-019	-18.224
Hfo_wOBa+	3.238e-019	0.000	3.749e-019	-18.426
Hfo_wOHSeO4-2	1.142e-019	0.000	1.321e-019	-18.879
Hfo_wSbO(OH) 4	4.300e-020	0.000	4.978e-020	-19.303
Hfo_wSeO4-	4.492e-021	0.000	5.200e-021	-20.284
Hfo_wOHCrO4-2	3.833e-021	0.000	4.437e-021	-20.353
Hfo_wCrO4-	1.579e-022	0.000	1.828e-022	-21.738
Hfo_wH2AsO3	7.335e-029	0.000	8.491e-029	-28.071

-----Solution composition-----

Elements	Molality	Moles
Ag	2.033e-008	1.756e-008
Al	8.715e-007	7.528e-007
As	1.982e-009	1.712e-009
B	7.859e-005	6.789e-005
Ba	2.478e-008	2.140e-008
C	6.204e-004	5.359e-004
Ca	1.150e-002	9.933e-003
Cd	6.598e-008	5.700e-008
Cl	6.310e-003	5.451e-003
Co	9.403e-007	8.122e-007
Cr	1.531e-009	1.323e-009
Cu	4.862e-007	4.200e-007
F	2.495e-004	2.156e-004
Fe	1.074e-009	9.273e-010
Hg	1.195e-009	1.032e-009
K	1.015e-002	8.769e-003
Mg	2.154e-002	1.861e-002
Mn	7.053e-004	6.093e-004
Mo	3.004e-006	2.595e-006
N	9.294e-005	8.028e-005
Na	4.014e-002	3.467e-002
Ni	1.074e-006	9.276e-007
Pb	4.956e-009	4.282e-009
S	5.525e-002	4.773e-002

Sb	1.103e-006	9.532e-007
Se	3.829e-007	3.308e-007
U	7.460e-007	6.444e-007
V	1.242e-007	1.073e-007
Zn	3.136e-005	2.709e-005

-----Description of solution-----

	pH =	7.936	Charge balance
	pe =	4.837	Adjusted to redox
equilibrium	Activity of water =	0.998	
	Ionic strength =	1.392e-001	
	Mass of water (kg) =	8.638e-001	
	Total alkalinity (eq/kg) =	6.441e-004	
	Total CO2 (mol/kg) =	6.204e-004	
	Temperature (deg C) =	25.00	
	Electrical balance (eq) =	3.270e-005	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.02	
	Iterations =	1	
	Total H =	9.589808e+001	
	Total O =	4.814159e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	1.178e-006	8.671e-007	-5.929	-6.062	-0.133	(0)
H+	1.518e-008	1.159e-008	-7.819	-7.936	-0.117	0.00
H2O	5.551e+001	9.978e-001	1.744	-0.001	0.000	18.07
Ag	2.033e-008					
AgCl	1.108e-008	1.108e-008	-7.956	-7.956	0.000	(0)
AgCl2-	7.202e-009	4.647e-009	-8.143	-8.333	-0.190	(0)
Ag+	1.476e-009	1.127e-009	-8.831	-8.948	-0.117	(0)
AgSO4-	4.345e-010	2.804e-010	-9.362	-9.552	-0.190	(0)
AgCl3-2	1.151e-010	1.995e-011	-9.939	-10.700	-0.761	(0)
AgNO2	1.568e-011	1.568e-011	-10.805	-10.805	0.000	(0)
AgCl4-3	1.012e-011	1.962e-013	-10.995	-12.707	-1.712	(0)
AgF	3.579e-013	3.579e-013	-12.446	-12.446	0.000	(0)
AgNH3+	1.168e-013	7.539e-014	-12.932	-13.123	-0.190	(0)
AgOH	9.768e-014	9.768e-014	-13.010	-13.010	0.000	(0)
AgH2BO3	6.641e-014	6.641e-014	-13.178	-13.178	0.000	(0)
AgSeO3-	4.175e-014	2.694e-014	-13.379	-13.570	-0.190	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	2.507e-015	1.618e-015	-14.601	-14.791	-0.190	(0)
AgNO3	5.624e-017	5.624e-017	-16.250	-16.250	0.000	(0)
Ag (NH3) 2+	3.112e-017	2.008e-017	-16.507	-16.697	-0.190	(0)
Ag (OH) 2-	1.283e-017	8.277e-018	-16.892	-17.082	-0.190	(0)
Ag (SeO3) 2-3	4.627e-019	8.974e-021	-18.335	-20.047	-1.712	(0)
Ag2MoO4	4.899e-025	4.899e-025	-24.310	-24.310	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.493	-73.493	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-80.085	-83.129	-3.044	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.031	-147.299	-0.268	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.561	-147.751	-0.190	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.340	-148.803	-0.463	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.679	-149.114	-0.434	(0)
Al	8.715e-007					
Al (OH) 4-	8.650e-007	6.522e-007	-6.063	-6.186	-0.123	(0)
Al (OH) 3	5.974e-009	5.974e-009	-8.224	-8.224	0.000	(0)
Al (OH) 2+	4.495e-010	3.453e-010	-9.347	-9.462	-0.114	(0)
AlF3	5.864e-011	5.864e-011	-10.232	-10.232	0.000	(0)
AlF2+	4.794e-011	3.683e-011	-10.319	-10.434	-0.114	(0)
AlF4-	4.931e-012	3.718e-012	-11.307	-11.430	-0.123	(0)
AlF+2	2.100e-012	7.314e-013	-11.678	-12.136	-0.458	(0)
AlOH+2	1.439e-012	5.014e-013	-11.842	-12.300	-0.458	(0)
AlSO4+	7.425e-014	5.599e-014	-13.129	-13.252	-0.123	(0)
Al (SO4) 2-	9.924e-015	7.482e-015	-14.003	-14.126	-0.123	(0)

Al+3	6.570e-015	5.782e-016	-14.182	-15.238	-1.055	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-42.095	-43.807	-1.712	(0)
As (3)	1.710e-023					
H3AsO3	1.600e-023	1.600e-023	-22.796	-22.796	0.000	(0)
H2AsO3-	1.098e-024	7.083e-025	-23.960	-24.150	-0.190	(0)
HAsO3-2	3.216e-028	5.575e-029	-27.493	-28.254	-0.761	(0)
H4AsO3+	1.424e-031	9.188e-032	-30.847	-31.037	-0.190	(0)
AsO3-3	9.563e-033	1.855e-034	-32.019	-33.732	-1.712	(0)
As (5)	1.982e-009					
HAsO4-2	1.923e-009	3.334e-010	-8.716	-9.477	-0.761	(0)
H2AsO4-	5.460e-011	3.523e-011	-10.263	-10.453	-0.190	(0)
AsO4-3	4.691e-012	9.098e-014	-11.329	-13.041	-1.712	(0)
H3AsO4	6.871e-017	7.094e-017	-16.163	-16.149	0.014	(0)
B	7.859e-005					
H3BO3	7.188e-005	7.422e-005	-4.143	-4.129	0.014	(0)
H2BO3-	5.202e-006	3.720e-006	-5.284	-5.429	-0.146	(0)
MgH2BO3+	7.413e-007	5.301e-007	-6.130	-6.276	-0.146	(0)
CaH2BO3+	5.917e-007	4.231e-007	-6.228	-6.374	-0.146	(0)
NaH2BO3	1.693e-007	1.693e-007	-6.771	-6.771	0.000	(0)
BF(OH) 3-	5.238e-009	3.746e-009	-8.281	-8.426	-0.146	(0)
H5(BO3) 2-	3.286e-010	2.350e-010	-9.483	-9.629	-0.146	(0)
H8(BO3) 3-	2.439e-012	1.744e-012	-11.613	-11.758	-0.146	(0)
BaH2BO3+	1.350e-012	9.650e-013	-11.870	-12.015	-0.146	(0)
BF2(OH) 2-	8.225e-013	5.882e-013	-12.085	-12.230	-0.146	(0)
AgH2BO3	6.641e-014	6.641e-014	-13.178	-13.178	0.000	(0)
BF3OH-	4.700e-019	3.361e-019	-18.328	-18.474	-0.146	(0)
BF4-	3.397e-024	2.429e-024	-23.469	-23.615	-0.146	(0)
Ba	2.478e-008					
Ba+2	2.472e-008	8.395e-009	-7.607	-8.076	-0.469	(0)
BaHCO3+	4.273e-011	3.320e-011	-10.369	-10.479	-0.110	(0)
BaCO3	7.213e-012	7.213e-012	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.350e-012	9.650e-013	-11.870	-12.015	-0.146	(0)
BaOH+	4.169e-014	3.178e-014	-13.380	-13.498	-0.118	(0)
BaNO3+	4.098e-015	2.644e-015	-14.387	-14.578	-0.190	(0)
BaNH3+2	1.001e-015	1.736e-016	-14.999	-15.760	-0.761	(0)
C (4)	6.204e-004					
HCO3-	5.390e-004	4.141e-004	-3.268	-3.383	-0.114	(0)
MgHCO3+	2.336e-005	1.741e-005	-4.631	-4.759	-0.128	(0)
CaHCO3+	1.962e-005	1.524e-005	-4.707	-4.817	-0.110	(0)
H2CO3	1.079e-005	1.079e-005	-4.967	-4.967	0.000	(0)
NaHCO3	6.687e-006	6.687e-006	-5.175	-5.175	0.000	(0)
MgCO3	5.727e-006	5.727e-006	-5.242	-5.242	0.000	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CO3-2	4.934e-006	1.675e-006	-5.307	-5.776	-0.469	(0)
NaCO3-	1.166e-006	8.959e-007	-5.933	-6.048	-0.114	(0)
MnHCO3+	9.540e-007	7.270e-007	-6.020	-6.138	-0.118	(0)
UO2(CO3) 3-4	7.022e-007	6.343e-010	-6.154	-9.198	-3.044	(0)
ZnCO3	3.936e-007	3.936e-007	-6.405	-6.405	0.000	(0)
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
ZnHCO3+	8.285e-008	5.346e-008	-7.082	-7.272	-0.190	(0)
UO2(CO3) 2-2	4.358e-008	7.554e-009	-7.361	-8.122	-0.761	(0)
NiHCO3+	1.511e-008	9.748e-009	-7.821	-8.011	-0.190	(0)
NiCO3	1.193e-008	1.193e-008	-7.923	-7.923	0.000	(0)
Cu(CO3) 2-2	6.139e-009	1.064e-009	-8.212	-8.973	-0.761	(0)
CoHCO3+	5.590e-009	3.607e-009	-8.253	-8.443	-0.190	(0)
CoCO3	3.171e-009	3.171e-009	-8.499	-8.499	0.000	(0)
PbCO3	1.184e-009	1.184e-009	-8.926	-8.926	0.000	(0)
CuHCO3+	9.688e-010	6.251e-010	-9.014	-9.204	-0.190	(0)
CdCO3	2.652e-010	2.652e-010	-9.576	-9.576	0.000	(0)
UO2CO3	2.260e-010	2.260e-010	-9.646	-9.646	0.000	(0)
PbHCO3+	1.121e-010	7.236e-011	-9.950	-10.140	-0.190	(0)
BaHCO3+	4.273e-011	3.320e-011	-10.369	-10.479	-0.110	(0)
Pb(CO3) 2-2	3.301e-011	5.723e-012	-10.481	-11.242	-0.761	(0)
CdHCO3+	1.015e-011	6.548e-012	-10.994	-11.184	-0.190	(0)
BaCO3	7.213e-012	7.213e-012	-11.142	-11.142	0.000	(0)
Cd(CO3) 2-2	1.900e-012	3.294e-013	-11.721	-12.482	-0.761	(0)
FeHCO3+	2.557e-015	1.986e-015	-14.592	-14.702	-0.110	(0)
HgCO3	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)

	Hg (CO ₃) 2-2	3.713e-017	6.437e-018	-16.430	-17.191	-0.761	(0)
	HgHCO ₃ +	4.063e-019	2.622e-019	-18.391	-18.581	-0.190	(0)
Ca	1.150e-002						
	Ca+2	5.821e-003	1.977e-003	-2.235	-2.704	-0.469	(0)
	CaSO ₄	5.648e-003	5.648e-003	-2.248	-2.248	0.000	(0)
	CaHCO ₃ +	1.962e-005	1.524e-005	-4.707	-4.817	-0.110	(0)
	CaCO ₃	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
	CaF+	3.580e-006	2.729e-006	-5.446	-5.564	-0.118	(0)
	CaH ₂ BO ₃ +	5.917e-007	4.231e-007	-6.228	-6.374	-0.146	(0)
	CaOH+	4.402e-008	3.420e-008	-7.356	-7.466	-0.110	(0)
	CaNO ₃ +	6.088e-010	3.929e-010	-9.216	-9.406	-0.190	(0)
	CaNH ₃ +2	4.704e-010	8.156e-011	-9.327	-10.089	-0.761	(0)
	Ca (NH ₃) 2+2	6.138e-018	1.064e-018	-17.212	-17.973	-0.761	(0)
Cd	6.598e-008						
	Cd+2	2.046e-008	6.946e-009	-7.689	-8.158	-0.469	(0)
	CdSO ₄	2.031e-008	2.031e-008	-7.692	-7.692	0.000	(0)
	Cd (SO ₄) 2-2	1.971e-008	3.417e-009	-7.705	-8.466	-0.761	(0)
	CdCl+	4.951e-009	3.195e-009	-8.305	-8.496	-0.190	(0)
	CdCO ₃	2.652e-010	2.652e-010	-9.576	-9.576	0.000	(0)
	CdOHC1	1.136e-010	1.136e-010	-9.944	-9.944	0.000	(0)
	CdOH+	7.414e-011	4.784e-011	-10.130	-10.320	-0.190	(0)
	CdCl ₂	6.415e-011	6.415e-011	-10.193	-10.193	0.000	(0)
	CdF+	2.158e-011	1.392e-011	-10.666	-10.856	-0.190	(0)
	CdHCO ₃ +	1.015e-011	6.548e-012	-10.994	-11.184	-0.190	(0)
	Cd (CO ₃) 2-2	1.900e-012	3.294e-013	-11.721	-12.482	-0.761	(0)
	CdCl ₃ -	3.021e-013	1.949e-013	-12.520	-12.710	-0.190	(0)
	Cd (OH) 2	2.617e-013	2.617e-013	-12.582	-12.582	0.000	(0)
	CdF ₂	3.514e-015	3.514e-015	-14.454	-14.454	0.000	(0)
	CdNO ₃ +	2.139e-015	1.381e-015	-14.670	-14.860	-0.190	(0)
	CdSeO ₄	2.085e-016	2.085e-016	-15.681	-15.681	0.000	(0)
	Cd ₂ OH+3	8.588e-017	1.665e-018	-16.066	-17.778	-1.712	(0)
	Cd (SeO ₃) 2-2	4.571e-017	7.924e-018	-16.340	-17.101	-0.761	(0)
	Cd (OH) 3-	2.149e-017	1.387e-017	-16.668	-16.858	-0.190	(0)
	Cd (NO ₃) 2	4.349e-023	4.349e-023	-22.362	-22.362	0.000	(0)
	Cd (OH) 4-2	1.135e-023	1.968e-024	-22.945	-23.706	-0.761	(0)
	CdHS+	0.000e+000	0.000e+000	-78.319	-78.509	-0.190	(0)
	Cd (HS) 2	0.000e+000	0.000e+000	-149.664	-149.664	0.000	(0)
	Cd (HS) 3-	0.000e+000	0.000e+000	-225.933	-226.123	-0.190	(0)
	Cd (HS) 4-2	0.000e+000	0.000e+000	-301.525	-302.286	-0.761	(0)
Cl	6.310e-003						
	Cl-	6.310e-003	4.816e-003	-2.200	-2.317	-0.117	(0)
	MnCl+	7.001e-007	5.336e-007	-6.155	-6.273	-0.118	(0)
	ZnCl+	6.628e-008	4.940e-008	-7.179	-7.306	-0.128	(0)
	ZnOHC1	5.607e-008	5.607e-008	-7.251	-7.251	0.000	(0)
	AgCl	1.108e-008	1.108e-008	-7.956	-7.956	0.000	(0)
	AgCl ₂ -	7.202e-009	4.647e-009	-8.143	-8.333	-0.190	(0)
	CdCl+	4.951e-009	3.195e-009	-8.305	-8.496	-0.190	(0)
	NiCl+	3.647e-009	2.353e-009	-8.438	-8.628	-0.190	(0)
	MnCl ₂	3.630e-009	3.630e-009	-8.440	-8.440	0.000	(0)
	CoCl+	2.892e-009	1.866e-009	-8.539	-8.729	-0.190	(0)
	CuCl ₂ -	1.397e-009	1.041e-009	-8.855	-8.982	-0.128	(0)
	CuCl	1.035e-009	1.035e-009	-8.985	-8.985	0.000	(0)
	ZnCl ₂	3.771e-010	3.771e-010	-9.424	-9.424	0.000	(0)
	CuCl+	2.451e-010	1.827e-010	-9.611	-9.738	-0.128	(0)
	AgCl ₃ -2	1.151e-010	1.995e-011	-9.939	-10.700	-0.761	(0)
	CdOHC1	1.136e-010	1.136e-010	-9.944	-9.944	0.000	(0)
	CdCl ₂	6.415e-011	6.415e-011	-10.193	-10.193	0.000	(0)
	PbCl+	6.229e-011	4.019e-011	-10.206	-10.396	-0.190	(0)
	AgCl ₄ -3	1.012e-011	1.962e-013	-10.995	-12.707	-1.712	(0)
	MnCl ₃ -	6.319e-012	4.816e-012	-11.199	-11.317	-0.118	(0)
	HgClOH	4.470e-012	4.470e-012	-11.350	-11.350	0.000	(0)
	CuCl ₃ -2	3.178e-012	1.072e-012	-11.498	-11.970	-0.472	(0)
	ZnCl ₃ -	1.936e-012	1.443e-012	-11.713	-11.841	-0.128	(0)
	HgCl ₂	1.406e-012	1.406e-012	-11.852	-11.852	0.000	(0)
	PbCl ₂	8.647e-013	8.647e-013	-12.063	-12.063	0.000	(0)
	CuCl ₂	3.050e-013	3.050e-013	-12.516	-12.516	0.000	(0)
	CdCl ₃ -	3.021e-013	1.949e-013	-12.520	-12.710	-0.190	(0)
	HgCl ₃ -	1.049e-013	6.771e-014	-12.979	-13.169	-0.190	(0)

NiCl ₂	5.707e-014	5.707e-014	-13.244	-13.244	0.000	(0)
ZnCl ₄ -2	1.030e-014	3.474e-015	-13.987	-14.459	-0.472	(0)
HgCl ₄ -2	7.489e-015	1.298e-015	-14.126	-14.887	-0.761	(0)
PbCl ₃ -	2.570e-015	1.658e-015	-14.590	-14.780	-0.190	(0)
UO ₂ Cl ⁺	4.102e-016	2.647e-016	-15.387	-15.577	-0.190	(0)
HgCl ⁺	9.026e-017	5.824e-017	-16.045	-16.235	-0.190	(0)
PbCl ₄ -2	2.106e-017	3.650e-018	-16.677	-17.438	-0.761	(0)
CuCl ₃ -	1.840e-017	1.371e-017	-16.735	-16.863	-0.128	(0)
CrCl ₂ +2	1.378e-017	2.388e-018	-16.861	-17.622	-0.761	(0)
CrOHC12	1.896e-019	1.896e-019	-18.722	-18.722	0.000	(0)
CrCl ₂ +2	1.692e-021	1.092e-021	-20.772	-20.962	-0.190	(0)
FeCl ₂ +2	1.048e-021	3.536e-022	-20.980	-21.451	-0.472	(0)
CuCl ₄ -2	9.811e-022	3.310e-022	-21.008	-21.480	-0.472	(0)
VOCl ⁺	3.915e-022	2.526e-022	-21.407	-21.598	-0.190	(0)
FeCl ₂ +2	9.982e-024	7.608e-024	-23.001	-23.119	-0.118	(0)
CrO ₃ Cl ⁻	8.787e-026	5.670e-026	-25.056	-25.246	-0.190	(0)
FeCl ₃	3.664e-027	3.664e-027	-26.436	-26.436	0.000	(0)
CoCl ₂ +2	1.731e-034	3.001e-035	-33.762	-34.523	-0.761	(0)
UCl ₃	0.000e+000	0.000e+000	-44.575	-46.287	-1.712	(0)
Co (NH ₃) ₅ Cl ₂	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
Cr (NH ₃) ₆ Cl ₂	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Co (NH ₃) ₆ Cl ₂	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
Co (2)	9.403e-007					
Co+2	6.460e-007	1.120e-007	-6.190	-6.951	-0.761	(0)
CoSO ₄	2.787e-007	2.787e-007	-6.555	-6.555	0.000	(0)
CoHCO ₃ ⁺	5.590e-009	3.607e-009	-8.253	-8.443	-0.190	(0)
CoCO ₃	3.171e-009	3.171e-009	-8.499	-8.499	0.000	(0)
CoOH ⁺	3.003e-009	1.938e-009	-8.522	-8.713	-0.190	(0)
CoCl ⁺	2.892e-009	1.866e-009	-8.539	-8.729	-0.190	(0)
CoF ⁺	6.942e-010	4.479e-010	-9.159	-9.349	-0.190	(0)
Co (OH) ₂	1.334e-010	1.334e-010	-9.875	-9.875	0.000	(0)
CoNO ₂ ⁺	8.148e-011	5.258e-011	-10.089	-10.279	-0.190	(0)
Co (NH ₃) ₂	2.545e-012	4.413e-013	-11.594	-12.355	-0.761	(0)
CoNO ₃ ⁺	1.729e-014	1.116e-014	-13.762	-13.953	-0.190	(0)
CoSeO ₄	9.047e-015	9.047e-015	-14.044	-14.044	0.000	(0)
Co (OH) ₃ -	3.578e-015	2.309e-015	-14.446	-14.637	-0.190	(0)
CoOOH ⁻	8.997e-016	5.805e-016	-15.046	-15.236	-0.190	(0)
Co ₂ OH+3	5.608e-016	1.087e-017	-15.251	-16.964	-1.712	(0)
Co (NH ₃) ₂ +2	3.559e-018	6.170e-019	-17.449	-18.210	-0.761	(0)
Co (OH) ₄ -2	1.830e-021	3.173e-022	-20.738	-21.499	-0.761	(0)
Co (NO ₃) ₂	1.427e-021	1.427e-021	-20.846	-20.846	0.000	(0)
Co ₄ (OH) ₄ +4	3.113e-024	2.812e-027	-23.507	-26.551	-3.044	(0)
Co (NH ₃) ₃ +2	1.468e-024	2.546e-025	-23.833	-24.594	-0.761	(0)
Co (NH ₃) ₄ +2	2.526e-031	4.379e-032	-30.598	-31.359	-0.761	(0)
Co (NH ₃) ₅ +2	1.374e-038	2.382e-039	-37.862	-38.623	-0.761	(0)
Co (3)	7.782e-028					
CoOH+2	7.782e-028	1.349e-028	-27.109	-27.870	-0.761	(0)
Co+3	3.479e-034	3.062e-035	-33.459	-34.514	-1.055	(0)
CoCl ₂ +2	1.731e-034	3.001e-035	-33.762	-34.523	-0.761	(0)
Co (NH ₃) ₅ Cl ₂	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
Co (NH ₃) ₆ SO ₄ ⁺	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Co (NH ₃) ₆ OH+2	0.000e+000	0.000e+000	-58.975	-59.736	-0.761	(0)
Co (NH ₃) ₆ Cl ₂	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
Cr (2)	7.688e-027					
Cr+2	7.688e-027	1.333e-027	-26.114	-26.875	-0.761	(0)
Cr (3)	1.531e-009					
Cr (OH) ₂ ⁺	1.188e-009	7.669e-010	-8.925	-9.115	-0.190	(0)
Cr (OH) ₃	2.498e-010	2.498e-010	-9.602	-9.602	0.000	(0)
Cr (OH) ₂ ⁺	4.193e-011	7.269e-012	-10.378	-11.139	-0.761	(0)
CrOHSO ₄	2.151e-011	2.151e-011	-10.667	-10.667	0.000	(0)
CrO ₂ ⁻	1.590e-011	1.026e-011	-10.799	-10.989	-0.190	(0)
Cr (OH) ₄ -	1.336e-011	8.623e-012	-10.874	-11.064	-0.190	(0)
CrF ₂ ⁺	4.431e-014	7.681e-015	-13.354	-14.115	-0.761	(0)
Cr+3	1.976e-014	3.832e-016	-13.704	-15.417	-1.712	(0)
CrSO ₄ ⁺	1.729e-014	1.116e-014	-13.762	-13.952	-0.190	(0)
CrCl ₂ +2	1.378e-017	2.388e-018	-16.861	-17.622	-0.761	(0)
CrOHC12	1.896e-019	1.896e-019	-18.722	-18.722	0.000	(0)
Cr ₂ (OH) ₂ SO ₄ +2	8.153e-020	1.413e-020	-19.089	-19.850	-0.761	(0)

Cr2(OH)2(SO4)2	1.047e-020	1.047e-020	-19.980	-19.980	0.000	(0)
CrCl2+	1.692e-021	1.092e-021	-20.772	-20.962	-0.190	(0)
CrNO3+2	6.072e-024	1.053e-024	-23.217	-23.978	-0.761	(0)
Cr(NH3)5OH+2	1.708e-038	2.961e-039	-37.767	-38.529	-0.761	(0)
Cr(NH3)6+3	0.000e+000	0.000e+000	-45.611	-47.323	-1.712	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Cr(6)	1.404e-014					
CrO4-2	1.266e-014	4.299e-015	-13.898	-14.367	-0.469	(0)
NaCrO4-	9.507e-016	6.135e-016	-15.022	-15.212	-0.190	(0)
HCrO4-	2.498e-016	1.612e-016	-15.602	-15.793	-0.190	(0)
KCrO4-	1.763e-016	1.138e-016	-15.754	-15.944	-0.190	(0)
CrO3SO4-2	4.102e-023	7.111e-024	-22.387	-23.148	-0.761	(0)
H2CrO4	1.514e-024	1.514e-024	-23.820	-23.820	0.000	(0)
CrO3Cl-	8.787e-026	5.670e-026	-25.056	-25.246	-0.190	(0)
Cr2O7-2	5.207e-030	9.028e-031	-29.283	-30.044	-0.761	(0)
Cu(1)	2.699e-009					
CuCl2-	1.397e-009	1.041e-009	-8.855	-8.982	-0.128	(0)
CuCl	1.035e-009	1.035e-009	-8.985	-8.985	0.000	(0)
Cu+	2.645e-010	1.706e-010	-9.578	-9.768	-0.190	(0)
CuCl3-2	3.178e-012	1.072e-012	-11.498	-11.970	-0.472	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-146.775	-147.224	-0.448	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.532	-147.954	-0.421	(0)
Cu(2)	4.835e-007					
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
CuOH+	8.803e-008	6.561e-008	-7.055	-7.183	-0.128	(0)
Cu+2	7.047e-008	2.393e-008	-7.152	-7.621	-0.469	(0)
CuSO4	6.837e-008	6.837e-008	-7.165	-7.165	0.000	(0)
Cu(OH)2	1.135e-008	1.135e-008	-7.945	-7.945	0.000	(0)
Cu(CO3)2-2	6.139e-009	1.064e-009	-8.212	-8.973	-0.761	(0)
CuHCO3+	9.688e-010	6.251e-010	-9.014	-9.204	-0.190	(0)
Cu2(OH)2+2	6.237e-010	1.081e-010	-9.205	-9.966	-0.761	(0)
CuF+	2.959e-010	1.910e-010	-9.529	-9.719	-0.190	(0)
CuNO2+	2.587e-010	1.669e-010	-9.587	-9.777	-0.190	(0)
CuCl+	2.451e-010	1.827e-010	-9.611	-9.738	-0.128	(0)
CuNH3+2	4.629e-011	8.025e-012	-10.335	-11.096	-0.761	(0)
Cu(OH)3-	3.129e-011	2.019e-011	-10.505	-10.695	-0.190	(0)
CuCl2	3.050e-013	3.050e-013	-12.516	-12.516	0.000	(0)
Cu(NO2)2	1.138e-013	1.138e-013	-12.944	-12.944	0.000	(0)
CuNO3+	7.370e-015	4.756e-015	-14.133	-14.323	-0.190	(0)
Cu(OH)4-2	7.947e-016	1.378e-016	-15.100	-15.861	-0.761	(0)
CuCl3-	1.840e-017	1.371e-017	-16.735	-16.863	-0.128	(0)
CuCl4-2	9.811e-022	3.310e-022	-21.008	-21.480	-0.472	(0)
Cu(NO3)2	3.763e-023	3.763e-023	-22.424	-22.424	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-216.608	-216.799	-0.190	(0)
F	2.495e-004					
F-	1.657e-004	1.265e-004	-3.781	-3.898	-0.117	(0)
MgF+	7.735e-005	5.832e-005	-4.112	-4.234	-0.123	(0)
CaF+	3.580e-006	2.729e-006	-5.446	-5.564	-0.118	(0)
NaF	2.292e-006	2.292e-006	-5.640	-5.640	0.000	(0)
MnF+	5.814e-007	4.431e-007	-6.235	-6.353	-0.118	(0)
ZnF+	1.597e-008	1.030e-008	-7.797	-7.987	-0.190	(0)
BF(OH)3-	5.238e-009	3.746e-009	-8.281	-8.426	-0.146	(0)
HF	2.168e-009	2.168e-009	-8.664	-8.664	0.000	(0)
NiF+	9.402e-010	6.067e-010	-9.027	-9.217	-0.190	(0)
CoF+	6.942e-010	4.479e-010	-9.159	-9.349	-0.190	(0)
CuF+	2.959e-010	1.910e-010	-9.529	-9.719	-0.190	(0)
AlF3	5.864e-011	5.864e-011	-10.232	-10.232	0.000	(0)
AlF2+	4.794e-011	3.683e-011	-10.319	-10.434	-0.114	(0)
CdF+	2.158e-011	1.392e-011	-10.666	-10.856	-0.190	(0)
AlF4-	4.931e-012	3.718e-012	-11.307	-11.430	-0.123	(0)
PbF+	3.249e-012	2.096e-012	-11.488	-11.679	-0.190	(0)
AlF+2	2.100e-012	7.314e-013	-11.678	-12.136	-0.458	(0)
HF2-	1.417e-012	1.042e-012	-11.849	-11.982	-0.133	(0)
UO2F+	9.169e-013	5.917e-013	-12.038	-12.228	-0.190	(0)
BF2(OH)2-	8.225e-013	5.882e-013	-12.085	-12.230	-0.146	(0)
AgF	3.579e-013	3.579e-013	-12.446	-12.446	0.000	(0)
UO2F2	2.158e-013	2.158e-013	-12.666	-12.666	0.000	(0)
CrF+2	4.431e-014	7.681e-015	-13.354	-14.115	-0.761	(0)

UO2F3-	1.063e-014	6.857e-015	-13.974	-14.164	-0.190	(0)
PbF2	5.218e-015	5.218e-015	-14.282	-14.282	0.000	(0)
CdF2	3.514e-015	3.514e-015	-14.454	-14.454	0.000	(0)
UO2F4-2	3.974e-017	6.890e-018	-16.401	-17.162	-0.761	(0)
VO2F	2.646e-017	2.646e-017	-16.577	-16.577	0.000	(0)
H2F2	1.259e-017	1.259e-017	-16.900	-16.900	0.000	(0)
PbF3-	1.940e-018	1.252e-018	-17.712	-17.902	-0.190	(0)
VO2F2-	1.883e-018	1.215e-018	-17.725	-17.915	-0.190	(0)
FeF2+	1.497e-018	1.141e-018	-17.825	-17.943	-0.118	(0)
FeF+2	9.994e-019	3.372e-019	-18.000	-18.472	-0.472	(0)
BF3OH-	4.700e-019	3.361e-019	-18.328	-18.474	-0.146	(0)
FeF3	2.037e-019	2.037e-019	-18.691	-18.691	0.000	(0)
VOF+	2.198e-020	1.418e-020	-19.658	-19.848	-0.190	(0)
VO2F3-2	1.106e-020	1.917e-021	-19.956	-20.717	-0.761	(0)
VOF2	6.727e-022	6.727e-022	-21.172	-21.172	0.000	(0)
PbF4-2	4.372e-022	7.579e-023	-21.359	-22.120	-0.761	(0)
VO2F4-3	6.153e-024	1.193e-025	-23.211	-24.923	-1.712	(0)
VOF3-	4.678e-024	3.019e-024	-23.330	-23.520	-0.190	(0)
HgF+	4.404e-024	2.841e-024	-23.356	-23.546	-0.190	(0)
BF4-	3.397e-024	2.429e-024	-23.469	-23.615	-0.146	(0)
Sb(OH) 2F	1.286e-024	1.286e-024	-23.891	-23.891	0.000	(0)
SbOF	1.267e-024	1.267e-024	-23.897	-23.897	0.000	(0)
VOF4-2	8.890e-027	1.541e-027	-26.051	-26.812	-0.761	(0)
UF3+	2.671e-036	1.723e-036	-35.573	-35.764	-0.190	(0)
UF2+2	4.959e-037	8.597e-038	-36.305	-37.066	-0.761	(0)
UF4	2.390e-038	2.390e-038	-37.622	-37.622	0.000	(0)
UF+3	2.784e-039	0.000e+000	-38.555	-40.268	-1.712	(0)
UF5-	1.857e-040	1.198e-040	-39.731	-39.922	-0.190	(0)
UF6-2	0.000e+000	0.000e+000	-40.578	-41.340	-0.761	(0)
Fe (2)	3.385e-012					
Fe+2	2.198e-012	3.811e-013	-11.658	-12.419	-0.761	(0)
FeSO4	1.167e-012	1.167e-012	-11.933	-11.933	0.000	(0)
FeOH+	1.726e-014	1.315e-014	-13.763	-13.881	-0.118	(0)
FeHCO3+	2.557e-015	1.986e-015	-14.592	-14.702	-0.110	(0)
Fe (OH) 2	9.060e-018	9.060e-018	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.260e-018	2.484e-018	-17.487	-17.605	-0.118	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.318	-236.509	-0.190	(0)
Fe (3)	1.070e-009					
Fe (OH) 2+	5.976e-010	4.591e-010	-9.224	-9.338	-0.114	(0)
Fe (OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.493e-011	3.452e-011	-10.347	-10.462	-0.114	(0)
FeOH+2	4.034e-015	1.361e-015	-14.394	-14.866	-0.472	(0)
FeF2+	1.497e-018	1.141e-018	-17.825	-17.943	-0.118	(0)
FeF+2	9.994e-019	3.372e-019	-18.000	-18.472	-0.472	(0)
FeSO4+	4.464e-019	3.402e-019	-18.350	-18.468	-0.118	(0)
FeF3	2.037e-019	2.037e-019	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.406e-019	9.073e-020	-18.852	-19.042	-0.190	(0)
Fe+3	2.762e-020	2.431e-021	-19.559	-20.614	-1.055	(0)
FeCl+2	1.048e-021	3.536e-022	-20.980	-21.451	-0.472	(0)
FeCl2+	9.982e-024	7.608e-024	-23.001	-23.119	-0.118	(0)
FeHSeO3+2	4.013e-024	6.957e-025	-23.397	-24.158	-0.761	(0)
Fe2 (OH) 2+4	6.791e-026	6.134e-029	-25.168	-28.212	-3.044	(0)
FeNO3+2	8.814e-027	1.528e-027	-26.055	-26.816	-0.761	(0)
FeCl3	3.664e-027	3.664e-027	-26.436	-26.436	0.000	(0)
Fe3 (OH) 4+5	2.324e-032	4.071e-037	-31.634	-36.390	-4.757	(0)
H (0)	3.904e-029					
H2	1.952e-029	2.015e-029	-28.710	-28.696	0.014	(0)
Hg (0)	1.186e-009					
Hg	1.186e-009	1.186e-009	-8.926	-8.926	0.000	(0)
Hg (1)	5.629e-021					
Hg2+2	2.815e-021	4.880e-022	-20.551	-21.312	-0.761	(0)
Hg (2)	8.774e-012					
HgClOH	4.470e-012	4.470e-012	-11.350	-11.350	0.000	(0)
Hg (OH) 2	2.784e-012	2.875e-012	-11.555	-11.541	0.014	(0)
HgCl2	1.406e-012	1.406e-012	-11.852	-11.852	0.000	(0)
HgCl3-	1.049e-013	6.771e-014	-12.979	-13.169	-0.190	(0)
HgCl4-2	7.489e-015	1.298e-015	-14.126	-14.887	-0.761	(0)

	HgCO3	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)
	HgCl+	9.026e-017	5.824e-017	-16.045	-16.235	-0.190	(0)
	Hg (CO3) 2-2	3.713e-017	6.437e-018	-16.430	-17.191	-0.761	(0)
	HgOH+	3.242e-017	2.092e-017	-16.489	-16.679	-0.190	(0)
	Hg (NH3) 2+2	2.369e-018	4.108e-019	-17.625	-18.386	-0.761	(0)
	Hg (OH) 3-	4.864e-019	3.138e-019	-18.313	-18.503	-0.190	(0)
	HgHCO3+	4.063e-019	2.622e-019	-18.391	-18.581	-0.190	(0)
	HgNH3+2	7.229e-020	1.253e-020	-19.141	-19.902	-0.761	(0)
	Hg+2	3.496e-021	6.060e-022	-20.456	-21.217	-0.761	(0)
	HgSO4	1.979e-021	1.979e-021	-20.704	-20.704	0.000	(0)
	HgF+	4.404e-024	2.841e-024	-23.356	-23.546	-0.190	(0)
	Hg (NH3) 3+2	3.092e-025	5.360e-026	-24.510	-25.271	-0.761	(0)
	HgNO3+	2.180e-029	1.406e-029	-28.662	-28.852	-0.190	(0)
	Hg (NH3) 4+2	8.049e-032	1.395e-032	-31.094	-31.855	-0.761	(0)
	Hg (NO3) 2	3.674e-037	3.674e-037	-36.435	-36.435	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-137.881	-138.071	-0.190	(0)
	HgS2-2	0.000e+000	0.000e+000	-138.082	-138.843	-0.761	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-139.613	-139.613	0.000	(0)
K		1.015e-002					
	K+	9.333e-003	7.124e-003	-2.030	-2.147	-0.117	(0)
	KSO4-	8.188e-004	6.291e-004	-3.087	-3.201	-0.114	(0)
	KCrO4-	1.763e-016	1.138e-016	-15.754	-15.944	-0.190	(0)
Mg		2.154e-002					
	Mg+2	1.210e-002	4.110e-003	-1.917	-2.386	-0.469	(0)
	MgSO4	9.328e-003	9.328e-003	-2.030	-2.030	0.000	(0)
	MgF+	7.735e-005	5.832e-005	-4.112	-4.234	-0.123	(0)
	MgHCO3+	2.336e-005	1.741e-005	-4.631	-4.759	-0.128	(0)
	MgCO3	5.727e-006	5.727e-006	-5.242	-5.242	0.000	(0)
	MgOH+	1.810e-006	1.419e-006	-5.742	-5.848	-0.106	(0)
	MgH2BO3+	7.413e-007	5.301e-007	-6.130	-6.276	-0.146	(0)
Mn (2)		7.053e-004					
	Mn+2	5.076e-004	8.800e-005	-3.294	-4.056	-0.761	(0)
	MnSO4	1.952e-004	1.952e-004	-3.710	-3.710	0.000	(0)
	MnHCO3+	9.540e-007	7.270e-007	-6.020	-6.138	-0.118	(0)
	MnCl+	7.001e-007	5.336e-007	-6.155	-6.273	-0.118	(0)
	MnF+	5.814e-007	4.431e-007	-6.235	-6.353	-0.118	(0)
	MnOH+	2.515e-007	1.917e-007	-6.599	-6.717	-0.118	(0)
	MnCl2	3.630e-009	3.630e-009	-8.440	-8.440	0.000	(0)
	MnNO3+	1.358e-011	8.766e-012	-10.867	-11.057	-0.190	(0)
	MnCl3-	6.319e-012	4.816e-012	-11.199	-11.317	-0.118	(0)
	MnSeO4	3.818e-012	3.818e-012	-11.418	-11.418	0.000	(0)
	Mn (OH) 3-	1.169e-015	8.906e-016	-14.932	-15.050	-0.118	(0)
	Mn (NO3) 2	1.384e-018	1.384e-018	-17.859	-17.859	0.000	(0)
	Mn (OH) 4-2	7.390e-021	2.493e-021	-20.131	-20.603	-0.472	(0)
	MnSe	0.000e+000	0.000e+000	-40.244	-40.244	0.000	(0)
Mn (3)		3.067e-024					
	Mn+3	3.067e-024	2.700e-025	-23.513	-24.569	-1.055	(0)
Mn (6)		6.698e-040					
	MnO4-2	6.698e-040	2.260e-040	-39.174	-39.646	-0.472	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-44.042	-44.181	-0.139	(0)
Mo		3.004e-006					
	MoO4-2	3.004e-006	1.020e-006	-5.522	-5.991	-0.469	(0)
	HMoO4-	3.644e-010	2.352e-010	-9.438	-9.629	-0.190	(0)
	H2MoO4	1.996e-014	1.996e-014	-13.700	-13.700	0.000	(0)
	Ag2MoO4	4.899e-025	4.899e-025	-24.310	-24.310	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-42.095	-43.807	-1.712	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-45.585	-52.434	-6.849	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-49.227	-53.984	-4.757	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-54.093	-57.137	-3.044	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-60.115	-61.827	-1.712	(0)
N (-3)		1.082e-006					
	NH4+	9.315e-007	6.661e-007	-6.031	-6.176	-0.146	(0)
	NH4SO4-	1.168e-007	8.902e-008	-6.933	-7.050	-0.118	(0)
	NH3	3.278e-008	3.278e-008	-7.484	-7.484	0.000	(0)
	CaNH3+2	4.704e-010	8.156e-011	-9.327	-10.089	-0.761	(0)
	CuNH3+2	4.629e-011	8.025e-012	-10.335	-11.096	-0.761	(0)
	NiNH3+2	1.939e-011	3.361e-012	-10.712	-11.474	-0.761	(0)

Co (NH3) +2	2.545e-012	4.413e-013	-11.594	-12.355	-0.761	(0)
AgNH3+	1.168e-013	7.539e-014	-12.932	-13.123	-0.190	(0)
BaNH3+2	1.001e-015	1.736e-016	-14.999	-15.760	-0.761	(0)
Ni (NH3) 2+2	9.185e-017	1.592e-017	-16.037	-16.798	-0.761	(0)
Ag (NH3) 2+	3.112e-017	2.008e-017	-16.507	-16.697	-0.190	(0)
Ca (NH3) 2+2	6.138e-018	1.064e-018	-17.212	-17.973	-0.761	(0)
Co (NH3) 2+2	3.559e-018	6.170e-019	-17.449	-18.210	-0.761	(0)
Hg (NH3) 2+2	2.369e-018	4.108e-019	-17.625	-18.386	-0.761	(0)
HgNH3+2	7.229e-020	1.253e-020	-19.141	-19.902	-0.761	(0)
Co (NH3) 3+2	1.468e-024	2.546e-025	-23.833	-24.594	-0.761	(0)
Hg (NH3) 3+2	3.092e-025	5.360e-026	-24.510	-25.271	-0.761	(0)
Co (NH3) 4+2	2.526e-031	4.379e-032	-30.598	-31.359	-0.761	(0)
Hg (NH3) 4+2	8.049e-032	1.395e-032	-31.094	-31.855	-0.761	(0)
Cr (NH3) 5OH+2	1.708e-038	2.961e-039	-37.767	-38.529	-0.761	(0)
Co (NH3) 5+2	1.374e-038	2.382e-039	-37.862	-38.623	-0.761	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-45.611	-47.323	-1.712	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-58.975	-59.736	-0.761	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
N (3)	9.178e-005					
NO2-	9.177e-005	6.662e-005	-4.037	-4.176	-0.139	(0)
CuNO2+	2.587e-010	1.669e-010	-9.587	-9.777	-0.190	(0)
CoNO2+	8.148e-011	5.258e-011	-10.089	-10.279	-0.190	(0)
AgNO2	1.568e-011	1.568e-011	-10.805	-10.805	0.000	(0)
Cu (NO2) 2	1.138e-013	1.138e-013	-12.944	-12.944	0.000	(0)
Ag (NO2) 2-	2.507e-015	1.618e-015	-14.601	-14.791	-0.190	(0)
N (5)	8.296e-008					
NO3-	8.233e-008	6.285e-008	-7.084	-7.202	-0.117	(0)
CaNO3+	6.088e-010	3.929e-010	-9.216	-9.406	-0.190	(0)
MnNO3+	1.358e-011	8.766e-012	-10.867	-11.057	-0.190	(0)
ZnNO3+	9.989e-013	6.446e-013	-12.000	-12.191	-0.190	(0)
NiNO3+	4.672e-014	3.015e-014	-13.330	-13.521	-0.190	(0)
CoNO3+	1.729e-014	1.116e-014	-13.762	-13.953	-0.190	(0)
CuNO3+	7.370e-015	4.756e-015	-14.133	-14.323	-0.190	(0)
BaNO3+	4.098e-015	2.644e-015	-14.387	-14.578	-0.190	(0)
CdNO3+	2.139e-015	1.381e-015	-14.670	-14.860	-0.190	(0)
PbNO3+	3.388e-016	2.186e-016	-15.470	-15.660	-0.190	(0)
AgNO3	5.624e-017	5.624e-017	-16.250	-16.250	0.000	(0)
Mn (NO3) 2	1.384e-018	1.384e-018	-17.859	-17.859	0.000	(0)
Zn (NO3) 2	8.083e-021	8.083e-021	-20.092	-20.092	0.000	(0)
UO2NO3+	6.586e-021	4.250e-021	-20.181	-20.372	-0.190	(0)
Co (NO3) 2	1.427e-021	1.427e-021	-20.846	-20.846	0.000	(0)
Cd (NO3) 2	4.349e-023	4.349e-023	-22.362	-22.362	0.000	(0)
Cu (NO3) 2	3.763e-023	3.763e-023	-22.424	-22.424	0.000	(0)
Pb (NO3) 2	2.334e-023	2.334e-023	-22.632	-22.632	0.000	(0)
CrNO3+2	6.072e-024	1.053e-024	-23.217	-23.978	-0.761	(0)
VO2NO3	3.792e-024	3.792e-024	-23.421	-23.421	0.000	(0)
FeNO3+2	8.814e-027	1.528e-027	-26.055	-26.816	-0.761	(0)
HgNO3+	2.180e-029	1.406e-029	-28.662	-28.852	-0.190	(0)
Hg (NO3) 2	3.674e-037	3.674e-037	-36.435	-36.435	0.000	(0)
Na	4.014e-002					
Na+	3.762e-002	2.872e-002	-1.425	-1.542	-0.117	(0)
NaSO4-	2.504e-003	1.924e-003	-2.601	-2.716	-0.114	(0)
NaHCO3	6.687e-006	6.687e-006	-5.175	-5.175	0.000	(0)
NaF	2.292e-006	2.292e-006	-5.640	-5.640	0.000	(0)
NaCO3-	1.166e-006	8.959e-007	-5.933	-6.048	-0.114	(0)
NaH2BO3	1.693e-007	1.693e-007	-6.771	-6.771	0.000	(0)
NaCrO4-	9.507e-016	6.135e-016	-15.022	-15.212	-0.190	(0)
Ni	1.074e-006					
Ni+2	5.624e-007	1.910e-007	-6.250	-6.719	-0.469	(0)
NiSO4	4.752e-007	4.752e-007	-6.323	-6.323	0.000	(0)
NiHCO3+	1.511e-008	9.748e-009	-7.821	-8.011	-0.190	(0)
NiCO3	1.193e-008	1.193e-008	-7.923	-7.923	0.000	(0)
NiCl+	3.647e-009	2.353e-009	-8.438	-8.628	-0.190	(0)
NiOH+	3.230e-009	2.085e-009	-8.491	-8.681	-0.190	(0)
Ni (SO4) 2-2	1.132e-009	1.963e-010	-8.946	-9.707	-0.761	(0)

NiF+	9.402e-010	6.067e-010	-9.027	-9.217	-0.190	(0)
Ni(OH)2	1.436e-010	1.436e-010	-9.843	-9.843	0.000	(0)
NiNH3+2	1.939e-011	3.361e-012	-10.712	-11.474	-0.761	(0)
Ni(OH)3-	1.929e-013	1.245e-013	-12.715	-12.905	-0.190	(0)
NiCl2	5.707e-014	5.707e-014	-13.244	-13.244	0.000	(0)
NiNO3+	4.672e-014	3.015e-014	-13.330	-13.521	-0.190	(0)
NiSeO4	1.440e-014	1.440e-014	-13.842	-13.842	0.000	(0)
Ni(NH3)2+2	9.185e-017	1.592e-017	-16.037	-16.798	-0.761	(0)
O(0)	2.407e-035					
O2	1.203e-035	1.243e-035	-34.920	-34.906	0.014	(0)
Pb	4.956e-009					
PbSO4	1.437e-009	1.437e-009	-8.843	-8.843	0.000	(0)
PbCO3	1.184e-009	1.184e-009	-8.926	-8.926	0.000	(0)
PbOH+	7.939e-010	5.123e-010	-9.100	-9.290	-0.190	(0)
Pb+2	6.927e-010	2.352e-010	-9.159	-9.629	-0.469	(0)
Pb(SO4)2-2	6.229e-010	1.080e-010	-9.206	-9.967	-0.761	(0)
PbHCO3+	1.121e-010	7.236e-011	-9.950	-10.140	-0.190	(0)
PbCl+	6.229e-011	4.019e-011	-10.206	-10.396	-0.190	(0)
Pb(CO3)2-2	3.301e-011	5.723e-012	-10.481	-11.242	-0.761	(0)
Pb(OH)2	1.405e-011	1.405e-011	-10.852	-10.852	0.000	(0)
PbF+	3.249e-012	2.096e-012	-11.488	-11.679	-0.190	(0)
PbCl2	8.647e-013	8.647e-013	-12.063	-12.063	0.000	(0)
Pb(OH)3-	1.888e-014	1.218e-014	-13.724	-13.914	-0.190	(0)
PbF2	5.218e-015	5.218e-015	-14.282	-14.282	0.000	(0)
PbCl3-	2.570e-015	1.658e-015	-14.590	-14.780	-0.190	(0)
PbNO3+	3.388e-016	2.186e-016	-15.470	-15.660	-0.190	(0)
Pb2OH+3	9.847e-017	1.910e-018	-16.007	-17.719	-1.712	(0)
PbCl4-2	2.106e-017	3.650e-018	-16.677	-17.438	-0.761	(0)
Pb(OH)4-2	1.492e-017	2.586e-018	-16.826	-17.587	-0.761	(0)
PbF3-	1.940e-018	1.252e-018	-17.712	-17.902	-0.190	(0)
Pb3(OH)4+2	5.341e-021	9.259e-022	-20.272	-21.033	-0.761	(0)
PbF4-2	4.372e-022	7.579e-023	-21.359	-22.120	-0.761	(0)
Pb(NO3)2	2.334e-023	2.334e-023	-22.632	-22.632	0.000	(0)
Pb4(OH)4+4	1.915e-024	1.730e-027	-23.718	-26.762	-3.044	(0)
Pb(HS)2	0.000e+000	0.000e+000	-151.076	-151.076	0.000	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-227.945	-228.135	-0.190	(0)
S(-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.493	-73.493	0.000	(0)
HS-	0.000e+000	0.000e+000	-78.169	-78.359	-0.190	(0)
CdHS+	0.000e+000	0.000e+000	-78.319	-78.509	-0.190	(0)
S5-2	0.000e+000	0.000e+000	-79.027	-79.788	-0.761	(0)
H2S	0.000e+000	0.000e+000	-79.275	-79.275	0.000	(0)
S6-2	0.000e+000	0.000e+000	-79.543	-80.304	-0.761	(0)
S4-2	0.000e+000	0.000e+000	-79.623	-80.384	-0.761	(0)
S3-2	0.000e+000	0.000e+000	-80.428	-81.190	-0.761	(0)
S2-2	0.000e+000	0.000e+000	-81.445	-82.206	-0.761	(0)
S-2	0.000e+000	0.000e+000	-87.251	-87.723	-0.472	(0)
HgHS2-	0.000e+000	0.000e+000	-137.881	-138.071	-0.190	(0)
HgS2-2	0.000e+000	0.000e+000	-138.082	-138.843	-0.761	(0)
Hg(HS)2	0.000e+000	0.000e+000	-139.613	-139.613	0.000	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-146.775	-147.224	-0.448	(0)
Ag(HS)S4-2	0.000e+000	0.000e+000	-147.031	-147.299	-0.268	(0)
ZnS(HS)-	0.000e+000	0.000e+000	-147.170	-147.361	-0.190	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.532	-147.954	-0.421	(0)
Ag(HS)2-	0.000e+000	0.000e+000	-147.561	-147.751	-0.190	(0)
Ag(S4)2-3	0.000e+000	0.000e+000	-148.340	-148.803	-0.463	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.679	-149.114	-0.434	(0)
Zn(HS)2	0.000e+000	0.000e+000	-149.287	-149.287	0.000	(0)
Cd(HS)2	0.000e+000	0.000e+000	-149.664	-149.664	0.000	(0)
Pb(HS)2	0.000e+000	0.000e+000	-151.076	-151.076	0.000	(0)
Fe(HS)2	0.000e+000	0.000e+000	-160.187	-160.187	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-216.608	-216.799	-0.190	(0)
Zn(HS)3-	0.000e+000	0.000e+000	-224.175	-224.366	-0.190	(0)
ZnS(HS)2-2	0.000e+000	0.000e+000	-225.649	-226.410	-0.761	(0)
Cd(HS)3-	0.000e+000	0.000e+000	-225.933	-226.123	-0.190	(0)
Pb(HS)3-	0.000e+000	0.000e+000	-227.945	-228.135	-0.190	(0)
Fe(HS)3-	0.000e+000	0.000e+000	-236.318	-236.509	-0.190	(0)
Cd(HS)4-2	0.000e+000	0.000e+000	-301.525	-302.286	-0.761	(0)

Zn (HS) 4-2	0.000e+000	0.000e+000	-303.423	-304.184	-0.761	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.655	-316.416	-0.761	(0)
S (6)	5.525e-002					
SO4-2	3.673e-002	1.247e-002	-1.435	-1.904	-0.469	(0)
MgSO4	9.328e-003	9.328e-003	-2.030	-2.030	0.000	(0)
CaSO4	5.648e-003	5.648e-003	-2.248	-2.248	0.000	(0)
NaSO4-	2.504e-003	1.924e-003	-2.601	-2.716	-0.114	(0)
KSO4-	8.188e-004	6.291e-004	-3.087	-3.201	-0.114	(0)
MnSO4	1.952e-004	1.952e-004	-3.710	-3.710	0.000	(0)
ZnSO4	1.114e-005	1.114e-005	-4.953	-4.953	0.000	(0)
Zn (SO4) 2-2	6.981e-006	1.210e-006	-5.156	-5.917	-0.761	(0)
NiSO4	4.752e-007	4.752e-007	-6.323	-6.323	0.000	(0)
CoSO4	2.787e-007	2.787e-007	-6.555	-6.555	0.000	(0)
NH4SO4-	1.168e-007	8.902e-008	-6.933	-7.050	-0.118	(0)
CuSO4	6.837e-008	6.837e-008	-7.165	-7.165	0.000	(0)
CdSO4	2.031e-008	2.031e-008	-7.692	-7.692	0.000	(0)
Cd (SO4) 2-2	1.971e-008	3.417e-009	-7.705	-8.466	-0.761	(0)
HSO4-	1.873e-008	1.412e-008	-7.727	-7.850	-0.123	(0)
PbSO4	1.437e-009	1.437e-009	-8.843	-8.843	0.000	(0)
Ni (SO4) 2-2	1.132e-009	1.963e-010	-8.946	-9.707	-0.761	(0)
Pb (SO4) 2-2	6.229e-010	1.080e-010	-9.206	-9.967	-0.761	(0)
AgSO4-	4.345e-010	2.804e-010	-9.362	-9.552	-0.190	(0)
CrOHSO4	2.151e-011	2.151e-011	-10.667	-10.667	0.000	(0)
FeSO4	1.167e-012	1.167e-012	-11.933	-11.933	0.000	(0)
UO2SO4	6.398e-013	6.398e-013	-12.194	-12.194	0.000	(0)
UO2 (SO4) 2-2	6.068e-013	1.052e-013	-12.217	-12.978	-0.761	(0)
AlSO4+	7.425e-014	5.599e-014	-13.129	-13.252	-0.123	(0)
CrSO4+	1.729e-014	1.116e-014	-13.762	-13.952	-0.190	(0)
Al (SO4) 2-	9.924e-015	7.482e-015	-14.003	-14.126	-0.123	(0)
VO2SO4-	5.506e-017	3.553e-017	-16.259	-16.449	-0.190	(0)
FeSO4+	4.464e-019	3.402e-019	-18.350	-18.468	-0.118	(0)
Fe (SO4) 2-	1.406e-019	9.073e-020	-18.852	-19.042	-0.190	(0)
Cr2 (OH) 2SO4+2	8.153e-020	1.413e-020	-19.089	-19.850	-0.761	(0)
VOSO4	6.422e-020	6.422e-020	-19.192	-19.192	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.047e-020	1.047e-020	-19.980	-19.980	0.000	(0)
HgSO4	1.979e-021	1.979e-021	-20.704	-20.704	0.000	(0)
CrO3SO4-2	4.102e-023	7.111e-024	-22.387	-23.148	-0.761	(0)
VSO4+	1.660e-034	1.071e-034	-33.780	-33.970	-0.190	(0)
U (SO4) 2	1.052e-039	1.052e-039	-38.978	-38.978	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.213	-40.974	-0.761	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Sb (3)	1.109e-018					
Sb (OH) 3	5.604e-019	5.604e-019	-18.251	-18.251	0.000	(0)
HSbO2	5.482e-019	5.482e-019	-18.261	-18.261	0.000	(0)
SbO2-	1.187e-022	7.662e-023	-21.925	-22.116	-0.190	(0)
Sb (OH) 4-	6.775e-023	4.372e-023	-22.169	-22.359	-0.190	(0)
Sb (OH) 2F	1.286e-024	1.286e-024	-23.891	-23.891	0.000	(0)
SbOF	1.267e-024	1.267e-024	-23.897	-23.897	0.000	(0)
Sb (OH) 2+	2.449e-025	1.580e-025	-24.611	-24.801	-0.190	(0)
SbO+	8.462e-026	5.460e-026	-25.073	-25.263	-0.190	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.655	-316.416	-0.761	(0)
Sb (5)	1.103e-006					
SbO3-	1.102e-006	7.113e-007	-5.958	-6.148	-0.190	(0)
Sb (OH) 6-	1.083e-009	8.267e-010	-8.965	-9.083	-0.117	(0)
SbO2+	4.255e-023	2.745e-023	-22.371	-22.561	-0.190	(0)
Se (-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	2.823e-039	1.822e-039	-38.549	-38.739	-0.190	(0)
MnSe	0.000e+000	0.000e+000	-40.244	-40.244	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.786	-42.786	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.042	-45.803	-0.761	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-80.085	-83.129	-3.044	(0)
Se (4)	3.824e-007					
SeO3-2	2.146e-007	3.721e-008	-6.668	-7.429	-0.761	(0)
HSeO3-	1.678e-007	1.083e-007	-6.775	-6.965	-0.190	(0)
H2SeO3	5.353e-013	5.353e-013	-12.271	-12.271	0.000	(0)
AgSeO3-	4.175e-014	2.694e-014	-13.379	-13.570	-0.190	(0)
Cd (SeO3) 2-2	4.571e-017	7.924e-018	-16.340	-17.101	-0.761	(0)

Ag (SeO3) 2-3	4.627e-019	8.974e-021	-18.335	-20.047	-1.712	(0)
FeHSeO3+2	4.013e-024	6.957e-025	-23.397	-24.158	-0.761	(0)
Se (6)	4.786e-010					
SeO4-2	4.747e-010	1.612e-010	-9.324	-9.793	-0.469	(0)
MnSeO4	3.818e-012	3.818e-012	-11.418	-11.418	0.000	(0)
ZnSeO4	1.019e-013	1.019e-013	-12.992	-12.992	0.000	(0)
NiSeO4	1.440e-014	1.440e-014	-13.842	-13.842	0.000	(0)
CoSeO4	9.047e-015	9.047e-015	-14.044	-14.044	0.000	(0)
CdSeO4	2.085e-016	2.085e-016	-15.681	-15.681	0.000	(0)
HSeO4-	1.451e-016	9.361e-017	-15.838	-16.029	-0.190	(0)
Zn (SeO4) 2-2	9.608e-023	1.666e-023	-22.017	-22.778	-0.761	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.590	-59.303	-1.712	(0)
U (4)	1.191e-019					
U (OH) 5-	1.191e-019	7.684e-020	-18.924	-19.114	-0.190	(0)
U (OH) 4	3.737e-023	3.737e-023	-22.427	-22.427	0.000	(0)
U (OH) 3+	2.459e-027	1.587e-027	-26.609	-26.800	-0.190	(0)
U (OH) 2+2	4.914e-032	8.519e-033	-31.309	-32.070	-0.761	(0)
UF3+	2.671e-036	1.723e-036	-35.573	-35.764	-0.190	(0)
UF2+2	4.959e-037	8.597e-038	-36.305	-37.066	-0.761	(0)
UOH+3	2.403e-037	4.659e-039	-36.619	-38.332	-1.712	(0)
UF4	2.390e-038	2.390e-038	-37.622	-37.622	0.000	(0)
UF+3	2.784e-039	0.000e+000	-38.555	-40.268	-1.712	(0)
U (SO4) 2	1.052e-039	1.052e-039	-38.978	-38.978	0.000	(0)
UF5-	1.857e-040	1.198e-040	-39.731	-39.922	-0.190	(0)
USO4+2	0.000e+000	0.000e+000	-40.213	-40.974	-0.761	(0)
UF6-2	0.000e+000	0.000e+000	-40.578	-41.340	-0.761	(0)
U+4	0.000e+000	0.000e+000	-42.626	-45.670	-3.044	(0)
UCl+3	0.000e+000	0.000e+000	-44.575	-46.287	-1.712	(0)
U6 (OH) 15+9	0.000e+000	0.000e+000	-156.736	-172.147	-15.411	(0)
U (5)	4.661e-016					
UO2+	4.661e-016	3.008e-016	-15.332	-15.522	-0.190	(0)
U (6)	7.460e-007					
UO2 (CO3) 3-4	7.022e-007	6.343e-010	-6.154	-9.198	-3.044	(0)
UO2 (CO3) 2-2	4.358e-008	7.554e-009	-7.361	-8.122	-0.761	(0)
UO2CO3	2.260e-010	2.260e-010	-9.646	-9.646	0.000	(0)
UO2OH+	5.733e-012	3.699e-012	-11.242	-11.432	-0.190	(0)
UO2F+	9.169e-013	5.917e-013	-12.038	-12.228	-0.190	(0)
UO2SO4	6.398e-013	6.398e-013	-12.194	-12.194	0.000	(0)
UO2 (SO4) 2-2	6.068e-013	1.052e-013	-12.217	-12.978	-0.761	(0)
UO2F2	2.158e-013	2.158e-013	-12.666	-12.666	0.000	(0)
UO2+2	9.980e-014	3.389e-014	-13.001	-13.470	-0.469	(0)
UO2F3-	1.063e-014	6.857e-015	-13.974	-14.164	-0.190	(0)
UO2Cl+	4.102e-016	2.647e-016	-15.387	-15.577	-0.190	(0)
(UO2) 2 (OH) 2+2	1.310e-016	2.271e-017	-15.883	-16.644	-0.761	(0)
(UO2) 3 (OH) 5+	7.425e-017	4.791e-017	-16.129	-16.320	-0.190	(0)
UO2F4-2	3.974e-017	6.890e-018	-16.401	-17.162	-0.761	(0)
UO2NO3+	6.586e-021	4.250e-021	-20.181	-20.372	-0.190	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-42.249	-42.439	-0.190	(0)
V+2	0.000e+000	0.000e+000	-43.126	-43.887	-0.761	(0)
V (3)	9.566e-015					
V (OH) 3	9.566e-015	9.566e-015	-14.019	-14.019	0.000	(0)
V (OH) 2+	1.112e-025	7.177e-026	-24.954	-25.144	-0.190	(0)
VOH+2	4.560e-029	7.905e-030	-28.341	-29.102	-0.761	(0)
V+3	9.379e-034	1.819e-035	-33.028	-34.740	-1.712	(0)
VSO4+	1.660e-034	1.071e-034	-33.780	-33.970	-0.190	(0)
V2 (OH) 3+3	0.000e+000	0.000e+000	-54.082	-55.794	-1.712	(0)
V2 (OH) 2+4	0.000e+000	0.000e+000	-54.360	-57.404	-3.044	(0)
V (4)	5.197e-018					
V (OH) 3+	5.001e-018	3.227e-018	-17.301	-17.491	-0.190	(0)
VO+2	1.078e-019	1.869e-020	-18.967	-19.728	-0.761	(0)
VOSO4	6.422e-020	6.422e-020	-19.192	-19.192	0.000	(0)
VOF+	2.198e-020	1.418e-020	-19.658	-19.848	-0.190	(0)
VOF2	6.727e-022	6.727e-022	-21.172	-21.172	0.000	(0)
VOC1+	3.915e-022	2.526e-022	-21.407	-21.598	-0.190	(0)
VOF3-	4.678e-024	3.019e-024	-23.330	-23.520	-0.190	(0)
VOF4-2	8.890e-027	1.541e-027	-26.051	-26.812	-0.761	(0)

H2V2O4+2	3.024e-030	5.243e-031	-29.519	-30.280	-0.761	(0)
V(5)	1.242e-007					
H2VO4-	6.871e-008	4.433e-008	-7.163	-7.353	-0.190	(0)
HVO4-2	5.544e-008	9.611e-009	-7.256	-8.017	-0.761	(0)
HV2O7-3	7.461e-012	1.447e-013	-11.127	-12.840	-1.712	(0)
H3VO4	5.137e-012	5.137e-012	-11.289	-11.289	0.000	(0)
H3V2O7-	2.284e-012	1.474e-012	-11.641	-11.832	-0.190	(0)
V2O7-4	3.721e-013	3.361e-016	-12.429	-15.474	-3.044	(0)
VO4-3	2.143e-013	4.157e-015	-12.669	-14.381	-1.712	(0)
V3O9-3	4.736e-015	9.184e-017	-14.325	-16.037	-1.712	(0)
VO2+	1.563e-016	1.193e-016	-15.806	-15.923	-0.117	(0)
VO2SO4-	5.506e-017	3.553e-017	-16.259	-16.449	-0.190	(0)
VO2F	2.646e-017	2.646e-017	-16.577	-16.577	0.000	(0)
VO2F2-	1.883e-018	1.215e-018	-17.725	-17.915	-0.190	(0)
V4O12-4	1.883e-018	1.701e-021	-17.725	-20.769	-3.044	(0)
VO2F3-2	1.106e-020	1.917e-021	-19.956	-20.717	-0.761	(0)
VO2F4-3	6.153e-024	1.193e-025	-23.211	-24.923	-1.712	(0)
VO2NO3	3.792e-024	3.792e-024	-23.421	-23.421	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-49.510	-56.360	-6.849	(0)
HV10O28-5	0.000e+000	0.000e+000	-51.352	-56.109	-4.757	(0)
H2V10O28-4	0.000e+000	0.000e+000	-55.793	-58.837	-3.044	(0)
Zn	3.136e-005					
Zn+2	1.202e-005	4.083e-006	-4.920	-5.389	-0.469	(0)
ZnSO4	1.114e-005	1.114e-005	-4.953	-4.953	0.000	(0)
Zn(SO4)2-2	6.981e-006	1.210e-006	-5.156	-5.917	-0.761	(0)
ZnOH+	5.486e-007	3.540e-007	-6.261	-6.451	-0.190	(0)
ZnCO3	3.936e-007	3.936e-007	-6.405	-6.405	0.000	(0)
ZnHCO3+	8.285e-008	5.346e-008	-7.082	-7.272	-0.190	(0)
ZnCl+	6.628e-008	4.940e-008	-7.179	-7.306	-0.128	(0)
ZnOHCl	5.607e-008	5.607e-008	-7.251	-7.251	0.000	(0)
Zn(OH)2	4.865e-008	4.865e-008	-7.313	-7.313	0.000	(0)
ZnF+	1.597e-008	1.030e-008	-7.797	-7.987	-0.190	(0)
ZnCl2	3.771e-010	3.771e-010	-9.424	-9.424	0.000	(0)
Zn(OH)3-	3.277e-010	2.114e-010	-9.485	-9.675	-0.190	(0)
ZnCl3-	1.936e-012	1.443e-012	-11.713	-11.841	-0.128	(0)
ZnNO3+	9.989e-013	6.446e-013	-12.000	-12.191	-0.190	(0)
ZnSeO4	1.019e-013	1.019e-013	-12.992	-12.992	0.000	(0)
Zn(OH)4-2	4.210e-014	7.298e-015	-13.376	-14.137	-0.761	(0)
ZnCl4-2	1.030e-014	3.474e-015	-13.987	-14.459	-0.472	(0)
Zn(NO3)2	8.083e-021	8.083e-021	-20.092	-20.092	0.000	(0)
Zn(SeO4)2-2	9.608e-023	1.666e-023	-22.017	-22.778	-0.761	(0)
ZnS(HS)-	0.000e+000	0.000e+000	-147.170	-147.361	-0.190	(0)
Zn(HS)2	0.000e+000	0.000e+000	-149.287	-149.287	0.000	(0)
Zn(HS)3-	0.000e+000	0.000e+000	-224.175	-224.366	-0.190	(0)
ZnS(HS)2-2	0.000e+000	0.000e+000	-225.649	-226.410	-0.761	(0)
Zn(HS)4-2	0.000e+000	0.000e+000	-303.423	-304.184	-0.761	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-48.73	-42.44	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-37.18	-32.67	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-44.40	-32.67	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-63.50	-45.56	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-50.94	-30.91	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-27.12	-26.72	0.40	(NH4)2CrO4
(NH4)2SeO4	-22.60	-22.15	0.45	(NH4)2SeO4
Acanthite	-52.10	-88.32	-36.22	Ag2S
Ag2CO3	-12.58	-23.67	-11.09	Ag2CO3
Ag2CrO4	-20.67	-32.26	-11.59	Ag2CrO4
Ag2HVO4	-11.49	-10.01	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.60	-2.03	12.57	Ag2O
Ag2Se	-0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.98	-19.80	-4.82	Ag2SO4

Ag3AsO3	-27.99	-25.83	2.16	Ag3AsO3
Ag3AsO4	-16.40	-19.19	-2.79	Ag3AsO4
Ag3H2VO5	-16.21	-11.03	5.18	Ag3H2VO5
AgF·4H2O	-13.90	-12.85	1.05	AgF·4H2O
Agmetal	-0.28	-13.79	-13.51	Ag
AgVO3	-9.77	-9.00	0.77	AgVO3
Al (OH) 3 (am)	-2.23	8.57	10.80	Al (OH) 3
Al2 (MoO4) 3	-50.82	-48.45	2.37	Al2 (MoO4) 3
Al2O3	-2.51	17.14	19.65	Al2O3
Al4 (OH) 10SO4	-6.20	16.50	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-12.38	-7.58	4.80	AlAsO4·2H2O
AlOHSO4	-5.98	-9.21	-3.23	AlOHSO4
AlSb	-151.94	-86.32	65.62	AlSb
Alunite	-2.66	-4.06	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.74	-11.53	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.28	5.32	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.15	6.25	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.26	-0.39	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.53	7.41	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-7.11	-14.07	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.94	-7.11	1.83	BaSeO3
BaSeO4	-10.41	-17.87	-7.46	BaSeO4
Bianchite	-5.53	-7.30	-1.76	ZnSO4:6H2O
Birnessite	-6.08	12.01	18.09	MnO2
Bixbyite	-0.88	-1.52	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	-0.01	8.57	8.58	AlOOH
Breithauptite	-54.44	-72.96	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.36	13.48	16.84	Mg (OH) 2
Bunsenite	-3.29	9.15	12.45	NiO
Ca (VO3) 2	-8.47	-2.81	5.66	Ca (VO3) 2
Ca2V2O7	-7.14	10.36	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.20	10.36	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-15.43	23.53	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-16.34	23.52	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-293.24	-150.27	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.04	-25.95	-17.91	Hg2Cl2
CaMoO4	-0.75	-8.70	-7.95	CaMoO4
Carnotite	-0.03	0.20	0.23	KUO2VO4
CaSeO3:2H2O	-4.55	-1.74	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.48	-12.50	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.38	-0.54	9.84	Cd (BO2) 2
Cd (OH) 2	-5.93	7.71	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.02	7.71	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-19.12	-12.41	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-17.20	5.36	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-15.33	13.07	28.40	Cd4 (OH) 6SO4
CdCl2	-12.13	-12.79	-0.66	CdCl2
CdCl2:1H2O	-11.10	-12.79	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.88	-12.80	-1.91	CdCl2:2.5H2O

CdF2	-14.74	-15.95	-1.21	CdF2
Cdmetal (alpha)	-31.35	-17.83	13.51	Cd
Cdmetal (gamma)	-31.45	-17.83	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.08	-2.54	3.54	CdOHCl
CdSb	-74.05	-74.40	-0.35	CdSb
CdSe	-18.76	-38.96	-20.20	CdSe
CdSeO4:2H2O	-16.10	-17.95	-1.85	CdSeO4:2H2O
CdSO4	-9.89	-10.06	-0.17	CdSO4
CdSO4:1H2O	-8.34	-10.06	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.19	-10.06	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.52	-11.27	-9.75	AgCl
Cerrusite	-2.27	-15.40	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-52.14	-97.83	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe
Co (BO2) 2	-26.41	0.66	27.07	Co (BO2) 2
Co (OH) 2	-4.17	8.92	13.09	Co (OH) 2
Co (OH) 3	-8.40	-10.71	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-18.57	-5.53	13.03	Co3 (AsO4) 2
Co3O4	-2.00	-12.49	-10.50	Co3O4
CoCl2	-19.85	-11.59	8.27	CoCl2
CoCl2:6H2O	-14.13	-11.59	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-13.15	-14.75	-1.60	CoF2
CoF3	-44.75	-46.21	-1.46	CoF3
CoFe2O4	18.83	15.31	-3.53	CoFe2O4
CoMoO4	-5.18	-12.94	-7.76	CoMoO4
CoO	-4.67	8.92	13.59	CoO
CoS (alpha)	-69.93	-77.37	-7.44	CoS
CoS (beta)	-66.30	-77.37	-11.07	CoS
CoSe	-21.55	-37.75	-16.20	CoSe
CoSeO3	-7.30	-5.98	1.32	CoSeO3
CoSeO4:6H2O	-15.22	-16.75	-1.53	CoSeO4:6H2O
CoSO4	-11.66	-8.85	2.80	CoSO4
CoSO4:6H2O	-6.39	-8.86	-2.47	CoSO4:6H2O
Cotunnite	-9.48	-14.26	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.01	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.60	-31.51	14.09	CrCl2
CrCl3	-47.05	-31.94	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.41	-43.25	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.37	22.84	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.89	1.36	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-53.59	-88.47	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.54	-50.34	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-57.79	-100.38	-42.59	Cu3Sb
Cu3Se2	-25.27	-88.76	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu

CuMoO4	-0.54	-13.61	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.32	-38.42	-33.10	CuSe
CuSe2	-26.19	-59.55	-33.37	CuSe2
CuSeO3:2H2O	-7.16	-6.65	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.98	-17.42	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	1.70	8.57	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.10	-16.64	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.45	-16.64	-17.09	CaMg(CO3)2
Epsomite	-2.17	-4.30	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.16	0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-8.80	-12.52	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.07	-8.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.69	-38.32	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.32	-18.41	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.76	-64.35	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-4.84	-4.84	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.08	-80.05	-13.97	PbS
Gibbsite	0.28	8.57	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.29	-7.30	-2.01	ZnSO4:7H2O
Greenockite	-64.22	-78.58	-14.36	CdS
Greigite	-290.30	-335.34	-45.03	Fe3S4
Gummite	-5.27	2.40	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.99	-21.86	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.72	-46.68	-4.96	H2Se
Halite	-5.46	-3.86	1.60	NaCl
Hausmannite	-0.04	60.99	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-2.30	20.59	22.89	FeAl2O4
Hg(CH3)2(g)	-185.49	-259.19	-73.71	Hg(CH3)2
Hg(g)	-7.62	-15.49	-7.87	Hg
Hg(OH)2	-8.05	-11.54	-3.50	Hg(OH)2
Hg2(g)	-16.03	-30.99	-14.96	Hg2
Hg2(OH)2	-10.70	-5.44	5.26	Hg2(OH)2
Hg2CO3	-11.04	-27.09	-16.05	Hg2CO3
Hg2CrO4	-26.98	-35.68	-8.70	Hg2CrO4
Hg2F2	-18.75	-29.11	-10.36	Hg2F2
Hg2S	-80.06	-91.73	-11.68	Hg2S
Hg2SeO3	-15.68	-20.34	-4.66	Hg2SeO3
Hg2SO4	-17.09	-23.22	-6.13	Hg2SO4
Hg3O2CO3	-26.59	-56.27	-29.68	Hg3O2CO3
HgCl(g)	-32.47	-12.97	19.50	HgCl
HgCl2	-10.78	-32.05	-21.26	HgCl2
HgF(g)	-47.23	-14.55	32.68	HgF
HgF2(g)	-47.77	-35.21	12.57	HgF2
Hgmetal(l)	-2.04	-15.49	-13.45	Hg
HgSe	-2.52	-58.21	-55.69	HgSe
HgSeO3	-14.01	-26.44	-12.43	HgSeO3
HgSO4	-19.90	-29.32	-9.42	HgSO4
Huntite	-3.00	-32.97	-29.97	CaMg3(CO3)4

Hydrocerrusite	-5.80	-24.57	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.40	-19.17	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.03	-21.20	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.39	-20.19	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.66	-48.90	-17.24	K2Cr2O7
K2CrO4	-18.15	-18.66	-0.51	K2CrO4
K2MoO4	-13.55	-10.29	3.26	K2MoO4
K2SeO4	-13.36	-14.09	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-4.86	-5.29	-0.43	PbO : PbSO4
Laurionite	-4.63	-4.01	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.45	6.24	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.01	19.87	16.86	Fe2MgO4
Magnesite	-0.70	-8.16	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-0.75	24.59	25.34	MnOOH
Massicot	-6.65	6.24	12.89	PbO
Matlockite	-6.87	-15.84	-8.97	PbClF
Melanothallite	-18.51	-12.26	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.74	-97.83	-45.09	HgS
Mg (OH) 2 (active)	-5.31	13.48	18.79	Mg (OH) 2
Mg (VO3) 2	-13.77	-2.49	11.28	Mg (VO3) 2
Mg2Sb3	-268.50	-193.82	74.68	Mg2Sb3
Mg2V2O7	-15.37	10.99	26.36	Mg2V2O7
MgCr2O4	-5.07	11.13	16.20	MgCr2O4
MgCrO4	-22.13	-16.75	5.38	MgCrO4
MgF2	-2.05	-10.18	-8.13	MgF2
MgMoO4	-6.53	-8.38	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.48	-1.42	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.98	-12.18	-1.20	MgSeO4 : 6H2O
Minium	-29.25	44.27	73.52	Pb3O4
Mirabilite	-3.88	-5.00	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.06	-4.16	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.14	-54.85	-5.71	Mn2 (SO4) 3
Mn2Sb	-145.10	-84.03	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-9.36	3.14	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.41	-8.69	2.72	MnCl2 : 4H2O
MnS (grn)	-74.65	-74.48	0.17	MnS
MnS (pnk)	-77.82	-74.48	3.34	MnS
MnSb	-92.74	-95.65	-2.91	MnSb
MnSe	-38.36	-34.86	3.50	MnSe
MnSeO3	-4.21	-3.08	1.13	MnSeO3
MnSeO3 : 2H2O	-4.07	-3.09	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-11.80	-13.85	-2.05	MnSeO4 : 5H2O
MnSO4	-8.54	-5.96	2.58	MnSO4
Monteponite	-7.39	7.71	15.10	CdO
Montroydite	-7.90	-11.54	-3.64	HgO
MoO3	-13.86	-21.86	-8.00	MoO3
Morenosite	-6.48	-8.63	-2.14	NiSO4 : 7H2O
MoS2	-149.74	-220.00	-70.26	MoS2
Na-Jarosite	-8.38	-19.58	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-37.79	-47.69	-9.90	Na2Cr2O7
Na2CrO4	-20.38	-17.45	2.93	Na2CrO4
Na2Mo2O7	-14.34	-30.94	-16.60	Na2Mo2O7
Na2MoO4	-10.57	-9.08	1.49	Na2MoO4
Na2MoO4 : 2H2O	-10.30	-9.08	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-12.42	-2.12	10.30	Na2SeO3 : 5H2O
Na2SeO4	-14.16	-12.88	1.28	Na2SeO4
Na3Sb	-170.15	-75.70	94.45	Na3Sb
Na3VO4	-25.49	11.19	36.68	Na3VO4
Na4V2O7	-27.80	9.60	37.40	Na4V2O7
Nantokite	-5.36	-12.09	-6.73	CuCl

NaSb	-86.11	-62.95	23.17	NaSb
Natron	-7.56	-8.87	-1.31	Na2CO3:10H2O
NaVO3	-5.45	-1.59	3.86	NaVO3
Nesquehonite	-3.49	-8.16	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.64	9.15	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-20.55	-4.85	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-13.17	18.83	32.00	Ni4 (OH) 6SO4
NiCO3	-5.62	-12.49	-6.87	NiCO3
NiMoO4	-1.57	-12.71	-11.14	NiMoO4
NiS (alpha)	-71.54	-77.14	-5.60	NiS
NiS (beta)	-66.04	-77.14	-11.10	NiS
NiS (gamma)	-64.34	-77.14	-12.80	NiS
NiSe	-19.82	-37.52	-17.70	NiSe
NiSeO3:2H2O	-8.57	-5.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.00	-16.52	-1.52	NiSeO4:6H2O
Nsutite	-5.49	12.01	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.40	-304.47	-61.07	As2S3
Otavite	-1.93	-13.93	-12.00	CdCO3
Pb (BO2) 2	-8.53	-2.01	6.52	Pb (BO2) 2
Pb (OH) 2	-1.91	6.24	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-58.70	-67.46	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-6.56	2.23	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.70	12.48	26.19	Pb2O (OH) 2
Pb2O3	-23.01	38.03	61.04	Pb2O3
Pb2OCO3	-8.60	-9.16	-0.56	Pb2OCO3
Pb2V2O7	-1.59	-3.49	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.37	-13.57	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-3.39	2.75	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.94	-2.92	11.02	Pb3O2CO3
Pb3O2SO4	-9.73	0.95	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-13.91	7.19	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-14.68	7.19	21.88	Pb4O3SO4
PbCrO4	-11.40	-24.00	-12.60	PbCrO4
PbF2	-9.98	-17.42	-7.44	PbF2
Pbmetal	-23.55	-19.30	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.74	6.24	12.98	PbO:0.33H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.10	13.48	21.58	MgO
Phosgenite	-9.86	-29.67	-19.81	PbCl2:PbCO3
Plattnerite	-17.81	31.79	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.38	11.81	15.19	Mn (OH) 2
Pyrolusite	-4.02	37.36	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-6.59	-8.63	-2.04	NiSO4:6H2O
Rhodochrosite	0.75	-9.83	-10.58	MnCO3
Rutherfordine	-4.75	-19.25	-14.50	UO2CO3
Sb (OH) 3	-11.14	-18.25	-7.11	Sb (OH) 3
Sb2O4	-14.36	-10.96	3.40	Sb2O4
Sb2O5	-24.36	-34.03	-9.67	Sb2O5
Sb2Se3	-108.77	-176.52	-67.76	Sb2Se3
Sb4O6 (cubic)	-54.74	-73.00	-18.26	Sb4O6
Sb4O6 (orth)	-55.10	-73.00	-17.90	Sb4O6
SbCl3	-49.58	-49.01	0.57	SbCl3
SbF3	-43.53	-53.75	-10.23	SbF3
Sbmetal	-44.88	-56.57	-11.69	Sb
SbO2	-1.96	-29.79	-27.82	SbO2
Schoepite	-3.59	2.40	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.02	-21.13	-7.11	Se
Semetal (hex)	-13.42	-21.13	-7.71	Se
Senarmontite	-24.13	-36.50	-12.37	Sb2O3
SeO2	-15.03	-14.90	0.12	SeO2
SeO3	-46.71	-25.66	21.04	SeO3
Siderite	-7.95	-18.19	-10.24	FeCO3
Smithsonite	-1.16	-11.16	-10.00	ZnCO3

Sphalerite	-64.36	-75.81	-11.45	ZnS
Spinel	-6.23	30.62	36.85	MgAl2O4
Stibnite	-244.92	-295.38	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.31	-4.99	0.32	Na2SO4
Thermonatrite	-9.50	-8.86	0.64	Na2CO3:H2O
Tyuyamunite	-2.09	1.99	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.78	9.31	21.08	U3O8
U3Sb4	-573.70	-421.32	152.38	U3Sb4
U4O9	-27.15	-30.17	-3.02	U4O9
UF4	-31.72	-61.26	-29.54	UF4
UF4:2.5H2O	-28.55	-61.26	-32.72	UF4:2.5H2O
UO2 (am)	-14.86	-13.93	0.93	UO2
UO2 (NO3) 2	-40.02	-27.87	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-32.73	-27.88	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.27	-27.88	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-29.93	-27.88	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.21	2.40	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.02	-23.27	-2.25	UO2SeO4:4H2O
UO3	-5.30	2.40	7.70	UO3
Uraninite	-9.26	-13.93	-4.67	UO2
Usb2	-216.94	-187.37	29.58	Usb2
V (OH) 3	-18.53	-10.93	7.59	V (OH) 3
V2O5	-14.62	-15.98	-1.36	V2O5
V3O5	-38.95	-37.12	1.84	V3O5
V4O7	-48.16	-40.97	7.19	V4O7
V6O13	-38.16	-99.02	-60.86	V6O13
Valentinite	-28.02	-36.50	-8.48	Sb2O3
VC12	-63.09	-44.21	18.87	VC12
VC13	-65.12	-41.69	23.43	VC13
VF4	-66.12	-51.19	14.93	VF4
Vmetal	-93.28	-49.25	44.03	V
VO	-38.46	-23.71	14.76	VO
VO (OH) 2	-9.01	-3.86	5.15	VO (OH) 2
VO2Cl	-21.08	-18.24	2.84	VO2Cl
VOC1	-32.34	-21.19	11.15	VOC1
VOC12	-37.12	-24.36	12.76	VOC12
VOSO4	-25.24	-21.63	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.86	-75.81	-8.95	ZnS
Zincite	-0.85	10.48	11.33	ZnO
Zincosite	-11.22	-7.29	3.93	ZnSO4
Zn (BO2) 2	-6.06	2.23	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-23.11	-19.80	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.72	10.48	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-1.99	10.48	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.27	10.48	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.05	10.48	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.25	10.48	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.31	3.19	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.48	10.71	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.50	-0.85	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.02	-4.10	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.25	24.15	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.60	31.90	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.07	-10.02	7.05	ZnCl2
ZnCO3:1H2O	-0.91	-11.17	-10.26	ZnCO3:1H2O
ZnF2	-12.65	-13.18	-0.53	ZnF2
Znmetal	-40.85	-15.06	25.79	Zn
ZnMoO4	-1.26	-11.38	-10.13	ZnMoO4
ZnO (active)	-0.71	10.48	11.19	ZnO
ZnS (am)	-66.76	-75.81	-9.05	ZnS
ZnSb	-82.64	-71.63	11.01	ZnSb
ZnSe	-21.79	-36.19	-14.40	ZnSe
ZnSeO4:6H2O	-13.67	-15.19	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.66	-7.29	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 34.

Title Use solution to allow model output
REACTION 107
H2O -0.0
0 moles
USE solution 117
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 117. Solution after simulation 33.
Using reaction 107.

Reaction 107.

0.000e+000 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.033e-008	1.756e-008
Al	8.715e-007	7.528e-007
As	1.982e-009	1.712e-009
B	7.859e-005	6.789e-005
Ba	2.478e-008	2.140e-008
C	6.204e-004	5.359e-004
Ca	1.150e-002	9.933e-003
Cd	6.598e-008	5.700e-008
Cl	6.310e-003	5.451e-003
Co	9.403e-007	8.122e-007
Cr	1.531e-009	1.323e-009
Cu	4.862e-007	4.200e-007
F	2.495e-004	2.156e-004
Fe	1.074e-009	9.273e-010
Hg	1.195e-009	1.032e-009
K	1.015e-002	8.769e-003
Mg	2.154e-002	1.861e-002
Mn	7.053e-004	6.093e-004
Mo	3.004e-006	2.595e-006
N	9.294e-005	8.028e-005

Na	4.014e-002	3.467e-002
Ni	1.074e-006	9.276e-007
Pb	4.956e-009	4.282e-009
S	5.525e-002	4.773e-002
Sb	1.103e-006	9.532e-007
Se	3.829e-007	3.308e-007
U	7.460e-007	6.444e-007
V	1.242e-007	1.073e-007
Zn	3.136e-005	2.709e-005

-----Description of solution-----

	pH	=	7.936	Charge balance
	pe	=	4.837	Adjusted to redox
equilibrium	Activity of water	=	0.998	
	Ionic strength	=	1.392e-001	
	Mass of water (kg)	=	8.638e-001	
	Total alkalinity (eq/kg)	=	6.441e-004	
	Total CO2 (mol/kg)	=	6.204e-004	
	Temperature (deg C)	=	25.00	
	Electrical balance (eq)	=	3.270e-005	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.02	
	Iterations	=	8	
	Total H	=	9.589808e+001	
	Total O	=	4.814159e+001	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm3/mol
OH-	1.178e-006	8.671e-007	-5.929	-6.062	-0.133	(0)
H+	1.518e-008	1.159e-008	-7.819	-7.936	-0.117	0.00
H2O	5.551e+001	9.978e-001	1.744	-0.001	0.000	18.07
Ag	2.033e-008					
AgCl	1.108e-008	1.108e-008	-7.956	-7.956	0.000	(0)
AgCl2-	7.202e-009	4.647e-009	-8.143	-8.333	-0.190	(0)
Ag+	1.476e-009	1.127e-009	-8.831	-8.948	-0.117	(0)
AgSO4-	4.345e-010	2.804e-010	-9.362	-9.552	-0.190	(0)
AgCl3-2	1.151e-010	1.995e-011	-9.939	-10.700	-0.761	(0)
AgNO2	1.568e-011	1.568e-011	-10.805	-10.805	0.000	(0)
AgCl4-3	1.012e-011	1.962e-013	-10.995	-12.707	-1.712	(0)
AgF	3.579e-013	3.579e-013	-12.446	-12.446	0.000	(0)
AgNH3+	1.168e-013	7.539e-014	-12.932	-13.123	-0.190	(0)
AgOH	9.768e-014	9.768e-014	-13.010	-13.010	0.000	(0)
AgH2BO3	6.641e-014	6.641e-014	-13.178	-13.178	0.000	(0)
AgSeO3-	4.175e-014	2.694e-014	-13.379	-13.570	-0.190	(0)
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	2.507e-015	1.618e-015	-14.601	-14.791	-0.190	(0)
AgNO3	5.624e-017	5.624e-017	-16.250	-16.250	0.000	(0)
Ag (NH3) 2+	3.112e-017	2.008e-017	-16.507	-16.697	-0.190	(0)
Ag (OH) 2-	1.283e-017	8.277e-018	-16.892	-17.082	-0.190	(0)
Ag (SeO3) 2-3	4.627e-019	8.974e-021	-18.335	-20.047	-1.712	(0)
Ag2MoO4	4.899e-025	4.899e-025	-24.310	-24.310	0.000	(0)
AgHS	0.000e+000	0.000e+000	-73.493	-73.493	0.000	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-80.085	-83.129	-3.044	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.031	-147.299	-0.268	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.561	-147.751	-0.190	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.340	-148.803	-0.463	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.679	-149.114	-0.434	(0)
Al	8.715e-007					
Al (OH) 4-	8.650e-007	6.522e-007	-6.063	-6.186	-0.123	(0)
Al (OH) 3	5.974e-009	5.974e-009	-8.224	-8.224	0.000	(0)
Al (OH) 2+	4.495e-010	3.453e-010	-9.347	-9.462	-0.114	(0)
AlF3	5.864e-011	5.864e-011	-10.232	-10.232	0.000	(0)
AlF2+	4.794e-011	3.683e-011	-10.319	-10.434	-0.114	(0)
AlF4-	4.931e-012	3.718e-012	-11.307	-11.430	-0.123	(0)

AlF+2	2.100e-012	7.314e-013	-11.678	-12.136	-0.458	(0)
AlOH+2	1.439e-012	5.014e-013	-11.842	-12.300	-0.458	(0)
AlSO4+	7.425e-014	5.599e-014	-13.129	-13.252	-0.123	(0)
Al(SO4)2-	9.924e-015	7.482e-015	-14.003	-14.126	-0.123	(0)
Al+3	6.570e-015	5.782e-016	-14.182	-15.238	-1.055	(0)
AlMo6O21-3	0.000e+000	0.000e+000	-42.095	-43.807	-1.712	(0)
As (3)	1.710e-023					
H3AsO3	1.600e-023	1.600e-023	-22.796	-22.796	0.000	(0)
H2AsO3-	1.098e-024	7.083e-025	-23.960	-24.150	-0.190	(0)
HAsO3-2	3.216e-028	5.575e-029	-27.493	-28.254	-0.761	(0)
H4AsO3+	1.424e-031	9.188e-032	-30.847	-31.037	-0.190	(0)
AsO3-3	9.563e-033	1.855e-034	-32.019	-33.732	-1.712	(0)
As (5)	1.982e-009					
HAsO4-2	1.923e-009	3.334e-010	-8.716	-9.477	-0.761	(0)
H2AsO4-	5.460e-011	3.523e-011	-10.263	-10.453	-0.190	(0)
AsO4-3	4.691e-012	9.098e-014	-11.329	-13.041	-1.712	(0)
H3AsO4	6.871e-017	7.094e-017	-16.163	-16.149	0.014	(0)
B	7.859e-005					
H3BO3	7.188e-005	7.422e-005	-4.143	-4.129	0.014	(0)
H2BO3-	5.202e-006	3.720e-006	-5.284	-5.429	-0.146	(0)
MgH2BO3+	7.413e-007	5.301e-007	-6.130	-6.276	-0.146	(0)
CaH2BO3+	5.917e-007	4.231e-007	-6.228	-6.374	-0.146	(0)
NaH2BO3	1.693e-007	1.693e-007	-6.771	-6.771	0.000	(0)
BF(OH)3-	5.238e-009	3.746e-009	-8.281	-8.426	-0.146	(0)
H5(BO3)2-	3.286e-010	2.350e-010	-9.483	-9.629	-0.146	(0)
H8(BO3)3-	2.439e-012	1.744e-012	-11.613	-11.758	-0.146	(0)
BaH2BO3+	1.350e-012	9.650e-013	-11.870	-12.015	-0.146	(0)
BF2(OH)2-	8.225e-013	5.882e-013	-12.085	-12.230	-0.146	(0)
AgH2BO3	6.641e-014	6.641e-014	-13.178	-13.178	0.000	(0)
BF3OH-	4.700e-019	3.361e-019	-18.328	-18.474	-0.146	(0)
BF4-	3.397e-024	2.429e-024	-23.469	-23.615	-0.146	(0)
Ba	2.478e-008					
Ba+2	2.472e-008	8.395e-009	-7.607	-8.076	-0.469	(0)
BaHCO3+	4.273e-011	3.320e-011	-10.369	-10.479	-0.110	(0)
BaCO3	7.213e-012	7.213e-012	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.350e-012	9.650e-013	-11.870	-12.015	-0.146	(0)
BaOH+	4.169e-014	3.178e-014	-13.380	-13.498	-0.118	(0)
BaNO3+	4.098e-015	2.644e-015	-14.387	-14.578	-0.190	(0)
BaNH3+2	1.001e-015	1.736e-016	-14.999	-15.760	-0.761	(0)
C (4)	6.204e-004					
HCO3-	5.390e-004	4.141e-004	-3.268	-3.383	-0.114	(0)
MgHCO3+	2.336e-005	1.741e-005	-4.631	-4.759	-0.128	(0)
CaHCO3+	1.962e-005	1.524e-005	-4.707	-4.817	-0.110	(0)
H2CO3	1.079e-005	1.079e-005	-4.967	-4.967	0.000	(0)
NaHCO3	6.687e-006	6.687e-006	-5.175	-5.175	0.000	(0)
MgCO3	5.727e-006	5.727e-006	-5.242	-5.242	0.000	(0)
CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
CO3-2	4.934e-006	1.675e-006	-5.307	-5.776	-0.469	(0)
NaCO3-	1.166e-006	8.959e-007	-5.933	-6.048	-0.114	(0)
MnHCO3+	9.540e-007	7.270e-007	-6.020	-6.138	-0.118	(0)
UO2(CO3)3-4	7.022e-007	6.343e-010	-6.154	-9.198	-3.044	(0)
ZnCO3	3.936e-007	3.936e-007	-6.405	-6.405	0.000	(0)
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
ZnHCO3+	8.285e-008	5.346e-008	-7.082	-7.272	-0.190	(0)
UO2(CO3)2-2	4.358e-008	7.554e-009	-7.361	-8.122	-0.761	(0)
NiHCO3+	1.511e-008	9.748e-009	-7.821	-8.011	-0.190	(0)
NiCO3	1.193e-008	1.193e-008	-7.923	-7.923	0.000	(0)
Cu(CO3)2-2	6.139e-009	1.064e-009	-8.212	-8.973	-0.761	(0)
CoHCO3+	5.590e-009	3.607e-009	-8.253	-8.443	-0.190	(0)
CoCO3	3.171e-009	3.171e-009	-8.499	-8.499	0.000	(0)
PbCO3	1.184e-009	1.184e-009	-8.926	-8.926	0.000	(0)
CuHCO3+	9.688e-010	6.251e-010	-9.014	-9.204	-0.190	(0)
CdCO3	2.652e-010	2.652e-010	-9.576	-9.576	0.000	(0)
UO2CO3	2.260e-010	2.260e-010	-9.646	-9.646	0.000	(0)
PbHCO3+	1.121e-010	7.236e-011	-9.950	-10.140	-0.190	(0)
BaHCO3+	4.273e-011	3.320e-011	-10.369	-10.479	-0.110	(0)
Pb(CO3)2-2	3.301e-011	5.723e-012	-10.481	-11.242	-0.761	(0)
CdHCO3+	1.015e-011	6.548e-012	-10.994	-11.184	-0.190	(0)

		BaCO3	7.213e-012	7.213e-012	-11.142	-11.142	0.000	(0)
		Cd (CO3) 2-2	1.900e-012	3.294e-013	-11.721	-12.482	-0.761	(0)
		FeHCO3+	2.557e-015	1.986e-015	-14.592	-14.702	-0.110	(0)
		HgCO3	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)
		Hg (CO3) 2-2	3.713e-017	6.437e-018	-16.430	-17.191	-0.761	(0)
		HgHCO3+	4.063e-019	2.622e-019	-18.391	-18.581	-0.190	(0)
Ca	1.150e-002							
		Ca+2	5.821e-003	1.977e-003	-2.235	-2.704	-0.469	(0)
		CaSO4	5.648e-003	5.648e-003	-2.248	-2.248	0.000	(0)
		CaHCO3+	1.962e-005	1.524e-005	-4.707	-4.817	-0.110	(0)
		CaCO3	5.248e-006	5.248e-006	-5.280	-5.280	0.000	(0)
		CaF+	3.580e-006	2.729e-006	-5.446	-5.564	-0.118	(0)
		CaH2BO3+	5.917e-007	4.231e-007	-6.228	-6.374	-0.146	(0)
		CaOH+	4.402e-008	3.420e-008	-7.356	-7.466	-0.110	(0)
		CaNO3+	6.088e-010	3.929e-010	-9.216	-9.406	-0.190	(0)
		CaNH3+2	4.704e-010	8.156e-011	-9.327	-10.089	-0.761	(0)
		Ca (NH3) 2+2	6.138e-018	1.064e-018	-17.212	-17.973	-0.761	(0)
Cd	6.598e-008							
		Cd+2	2.046e-008	6.946e-009	-7.689	-8.158	-0.469	(0)
		CdSO4	2.031e-008	2.031e-008	-7.692	-7.692	0.000	(0)
		Cd (SO4) 2-2	1.971e-008	3.417e-009	-7.705	-8.466	-0.761	(0)
		CdCl+	4.951e-009	3.195e-009	-8.305	-8.496	-0.190	(0)
		CdCO3	2.652e-010	2.652e-010	-9.576	-9.576	0.000	(0)
		CdOHC1	1.136e-010	1.136e-010	-9.944	-9.944	0.000	(0)
		CdOH+	7.414e-011	4.784e-011	-10.130	-10.320	-0.190	(0)
		CdCl2	6.415e-011	6.415e-011	-10.193	-10.193	0.000	(0)
		CdF+	2.158e-011	1.392e-011	-10.666	-10.856	-0.190	(0)
		CdHCO3+	1.015e-011	6.548e-012	-10.994	-11.184	-0.190	(0)
		Cd (CO3) 2-2	1.900e-012	3.294e-013	-11.721	-12.482	-0.761	(0)
		CdCl3-	3.021e-013	1.949e-013	-12.520	-12.710	-0.190	(0)
		Cd (OH) 2	2.617e-013	2.617e-013	-12.582	-12.582	0.000	(0)
		CdF2	3.514e-015	3.514e-015	-14.454	-14.454	0.000	(0)
		CdNO3+	2.139e-015	1.381e-015	-14.670	-14.860	-0.190	(0)
		CdSeO4	2.085e-016	2.085e-016	-15.681	-15.681	0.000	(0)
		Cd2OH+3	8.588e-017	1.665e-018	-16.066	-17.778	-1.712	(0)
		Cd (SeO3) 2-2	4.571e-017	7.924e-018	-16.340	-17.101	-0.761	(0)
		Cd (OH) 3-	2.149e-017	1.387e-017	-16.668	-16.858	-0.190	(0)
		Cd (NO3) 2	4.349e-023	4.349e-023	-22.362	-22.362	0.000	(0)
		Cd (OH) 4-2	1.135e-023	1.968e-024	-22.945	-23.706	-0.761	(0)
		CdHS+	0.000e+000	0.000e+000	-78.319	-78.509	-0.190	(0)
		Cd (HS) 2	0.000e+000	0.000e+000	-149.664	-149.664	0.000	(0)
		Cd (HS) 3-	0.000e+000	0.000e+000	-225.933	-226.123	-0.190	(0)
		Cd (HS) 4-2	0.000e+000	0.000e+000	-301.525	-302.286	-0.761	(0)
Cl	6.310e-003							
		Cl-	6.310e-003	4.816e-003	-2.200	-2.317	-0.117	(0)
		MnCl+	7.001e-007	5.336e-007	-6.155	-6.273	-0.118	(0)
		ZnCl+	6.628e-008	4.940e-008	-7.179	-7.306	-0.128	(0)
		ZnOHC1	5.607e-008	5.607e-008	-7.251	-7.251	0.000	(0)
		AgCl	1.108e-008	1.108e-008	-7.956	-7.956	0.000	(0)
		AgCl2-	7.202e-009	4.647e-009	-8.143	-8.333	-0.190	(0)
		CdCl+	4.951e-009	3.195e-009	-8.305	-8.496	-0.190	(0)
		NiCl+	3.647e-009	2.353e-009	-8.438	-8.628	-0.190	(0)
		MnCl2	3.630e-009	3.630e-009	-8.440	-8.440	0.000	(0)
		CoCl+	2.892e-009	1.866e-009	-8.539	-8.729	-0.190	(0)
		CuCl2-	1.397e-009	1.041e-009	-8.855	-8.982	-0.128	(0)
		CuCl	1.035e-009	1.035e-009	-8.985	-8.985	0.000	(0)
		ZnCl2	3.771e-010	3.771e-010	-9.424	-9.424	0.000	(0)
		CuCl+	2.451e-010	1.827e-010	-9.611	-9.738	-0.128	(0)
		AgCl3-2	1.151e-010	1.995e-011	-9.939	-10.700	-0.761	(0)
		CdOHC1	1.136e-010	1.136e-010	-9.944	-9.944	0.000	(0)
		CdCl2	6.415e-011	6.415e-011	-10.193	-10.193	0.000	(0)
		PbCl+	6.229e-011	4.019e-011	-10.206	-10.396	-0.190	(0)
		AgCl4-3	1.012e-011	1.962e-013	-10.995	-12.707	-1.712	(0)
		MnCl3-	6.319e-012	4.816e-012	-11.199	-11.317	-0.118	(0)
		HgClOH	4.470e-012	4.470e-012	-11.350	-11.350	0.000	(0)
		CuCl3-2	3.178e-012	1.072e-012	-11.498	-11.970	-0.472	(0)
		ZnCl3-	1.936e-012	1.443e-012	-11.713	-11.841	-0.128	(0)
		HgCl2	1.406e-012	1.406e-012	-11.852	-11.852	0.000	(0)

PbCl2	8.647e-013	8.647e-013	-12.063	-12.063	0.000	(0)
CuCl2	3.050e-013	3.050e-013	-12.516	-12.516	0.000	(0)
CdCl3-	3.021e-013	1.949e-013	-12.520	-12.710	-0.190	(0)
HgCl3-	1.049e-013	6.771e-014	-12.979	-13.169	-0.190	(0)
NiCl2	5.707e-014	5.707e-014	-13.244	-13.244	0.000	(0)
ZnCl4-2	1.030e-014	3.474e-015	-13.987	-14.459	-0.472	(0)
HgCl4-2	7.489e-015	1.298e-015	-14.126	-14.887	-0.761	(0)
PbCl3-	2.570e-015	1.658e-015	-14.590	-14.780	-0.190	(0)
UO2Cl+	4.102e-016	2.647e-016	-15.387	-15.577	-0.190	(0)
HgCl+	9.026e-017	5.824e-017	-16.045	-16.235	-0.190	(0)
PbCl4-2	2.106e-017	3.650e-018	-16.677	-17.438	-0.761	(0)
CuCl3-	1.840e-017	1.371e-017	-16.735	-16.863	-0.128	(0)
CrCl+2	1.378e-017	2.388e-018	-16.861	-17.622	-0.761	(0)
CrOHC12	1.896e-019	1.896e-019	-18.722	-18.722	0.000	(0)
CrCl2+	1.692e-021	1.092e-021	-20.772	-20.962	-0.190	(0)
FeCl+2	1.048e-021	3.536e-022	-20.980	-21.451	-0.472	(0)
CuCl4-2	9.811e-022	3.310e-022	-21.008	-21.480	-0.472	(0)
VOCl+	3.915e-022	2.526e-022	-21.407	-21.598	-0.190	(0)
FeCl2+	9.982e-024	7.608e-024	-23.001	-23.119	-0.118	(0)
CrO3Cl-	8.787e-026	5.670e-026	-25.056	-25.246	-0.190	(0)
FeCl3	3.664e-027	3.664e-027	-26.436	-26.436	0.000	(0)
CoCl+2	1.731e-034	3.001e-035	-33.762	-34.523	-0.761	(0)
UCl+3	0.000e+000	0.000e+000	-44.575	-46.287	-1.712	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
Co (2)	9.403e-007					
Co+2	6.460e-007	1.120e-007	-6.190	-6.951	-0.761	(0)
CoSO4	2.787e-007	2.787e-007	-6.555	-6.555	0.000	(0)
CoHCO3+	5.590e-009	3.607e-009	-8.253	-8.443	-0.190	(0)
CoCO3	3.171e-009	3.171e-009	-8.499	-8.499	0.000	(0)
CoOH+	3.003e-009	1.938e-009	-8.522	-8.713	-0.190	(0)
CoCl+	2.892e-009	1.866e-009	-8.539	-8.729	-0.190	(0)
CoF+	6.942e-010	4.479e-010	-9.159	-9.349	-0.190	(0)
Co (OH) 2	1.334e-010	1.334e-010	-9.875	-9.875	0.000	(0)
CoNO2+	8.148e-011	5.258e-011	-10.089	-10.279	-0.190	(0)
Co (NH3) +2	2.545e-012	4.413e-013	-11.594	-12.355	-0.761	(0)
CoNO3+	1.729e-014	1.116e-014	-13.762	-13.953	-0.190	(0)
CoSeO4	9.047e-015	9.047e-015	-14.044	-14.044	0.000	(0)
Co (OH) 3-	3.578e-015	2.309e-015	-14.446	-14.637	-0.190	(0)
CoOOH-	8.997e-016	5.805e-016	-15.046	-15.236	-0.190	(0)
Co2OH+3	5.608e-016	1.087e-017	-15.251	-16.964	-1.712	(0)
Co (NH3) 2+2	3.559e-018	6.170e-019	-17.449	-18.210	-0.761	(0)
Co (OH) 4-2	1.830e-021	3.173e-022	-20.738	-21.499	-0.761	(0)
Co (NO3) 2	1.427e-021	1.427e-021	-20.846	-20.846	0.000	(0)
Co4 (OH) 4+4	3.113e-024	2.812e-027	-23.507	-26.551	-3.044	(0)
Co (NH3) 3+2	1.468e-024	2.546e-025	-23.833	-24.594	-0.761	(0)
Co (NH3) 4+2	2.526e-031	4.379e-032	-30.598	-31.359	-0.761	(0)
Co (NH3) 5+2	1.374e-038	2.382e-039	-37.862	-38.623	-0.761	(0)
Co (3)	7.782e-028					
CoOH+2	7.782e-028	1.349e-028	-27.109	-27.870	-0.761	(0)
Co+3	3.479e-034	3.062e-035	-33.459	-34.514	-1.055	(0)
CoCl+2	1.731e-034	3.001e-035	-33.762	-34.523	-0.761	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-58.975	-59.736	-0.761	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
Cr (2)	7.688e-027					
Cr+2	7.688e-027	1.333e-027	-26.114	-26.875	-0.761	(0)
Cr (3)	1.531e-009					
Cr (OH) 2+	1.188e-009	7.669e-010	-8.925	-9.115	-0.190	(0)
Cr (OH) 3	2.498e-010	2.498e-010	-9.602	-9.602	0.000	(0)
Cr (OH) +2	4.193e-011	7.269e-012	-10.378	-11.139	-0.761	(0)
CrOHSO4	2.151e-011	2.151e-011	-10.667	-10.667	0.000	(0)
CrO2-	1.590e-011	1.026e-011	-10.799	-10.989	-0.190	(0)
Cr (OH) 4-	1.336e-011	8.623e-012	-10.874	-11.064	-0.190	(0)
CrF+2	4.431e-014	7.681e-015	-13.354	-14.115	-0.761	(0)
Cr+3	1.976e-014	3.832e-016	-13.704	-15.417	-1.712	(0)

CrSO4+	1.729e-014	1.116e-014	-13.762	-13.952	-0.190	(0)
CrCl+2	1.378e-017	2.388e-018	-16.861	-17.622	-0.761	(0)
CrOHC12	1.896e-019	1.896e-019	-18.722	-18.722	0.000	(0)
Cr2(OH)2SO4+2	8.153e-020	1.413e-020	-19.089	-19.850	-0.761	(0)
Cr2(OH)2(SO4)2	1.047e-020	1.047e-020	-19.980	-19.980	0.000	(0)
CrCl2+	1.692e-021	1.092e-021	-20.772	-20.962	-0.190	(0)
CrNO3+2	6.072e-024	1.053e-024	-23.217	-23.978	-0.761	(0)
Cr(NH3)5OH+2	1.708e-038	2.961e-039	-37.767	-38.529	-0.761	(0)
Cr(NH3)6+3	0.000e+000	0.000e+000	-45.611	-47.323	-1.712	(0)
Cr(NH3)6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Cr(6)	1.404e-014					
CrO4-2	1.266e-014	4.299e-015	-13.898	-14.367	-0.469	(0)
NaCrO4-	9.507e-016	6.135e-016	-15.022	-15.212	-0.190	(0)
HCrO4-	2.498e-016	1.612e-016	-15.602	-15.793	-0.190	(0)
KCrO4-	1.763e-016	1.138e-016	-15.754	-15.944	-0.190	(0)
CrO3SO4-2	4.102e-023	7.111e-024	-22.387	-23.148	-0.761	(0)
H2CrO4	1.514e-024	1.514e-024	-23.820	-23.820	0.000	(0)
CrO3Cl-	8.787e-026	5.670e-026	-25.056	-25.246	-0.190	(0)
Cr2O7-2	5.207e-030	9.028e-031	-29.283	-30.044	-0.761	(0)
Cu(1)	2.699e-009					
CuCl2-	1.397e-009	1.041e-009	-8.855	-8.982	-0.128	(0)
CuCl	1.035e-009	1.035e-009	-8.985	-8.985	0.000	(0)
Cu+	2.645e-010	1.706e-010	-9.578	-9.768	-0.190	(0)
CuCl3-2	3.178e-012	1.072e-012	-11.498	-11.970	-0.472	(0)
Cu(S4)2-3	0.000e+000	0.000e+000	-146.775	-147.224	-0.448	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.532	-147.954	-0.421	(0)
Cu(2)	4.835e-007					
CuCO3	2.360e-007	2.360e-007	-6.627	-6.627	0.000	(0)
CuOH+	8.803e-008	6.561e-008	-7.055	-7.183	-0.128	(0)
Cu+2	7.047e-008	2.393e-008	-7.152	-7.621	-0.469	(0)
CuSO4	6.837e-008	6.837e-008	-7.165	-7.165	0.000	(0)
Cu(OH)2	1.135e-008	1.135e-008	-7.945	-7.945	0.000	(0)
Cu(CO3)2-2	6.139e-009	1.064e-009	-8.212	-8.973	-0.761	(0)
CuHCO3+	9.688e-010	6.251e-010	-9.014	-9.204	-0.190	(0)
Cu2(OH)2+2	6.237e-010	1.081e-010	-9.205	-9.966	-0.761	(0)
CuF+	2.959e-010	1.910e-010	-9.529	-9.719	-0.190	(0)
CuNO2+	2.587e-010	1.669e-010	-9.587	-9.777	-0.190	(0)
CuCl+	2.451e-010	1.827e-010	-9.611	-9.738	-0.128	(0)
CuNH3+2	4.629e-011	8.025e-012	-10.335	-11.096	-0.761	(0)
Cu(OH)3-	3.129e-011	2.019e-011	-10.505	-10.695	-0.190	(0)
CuCl2	3.050e-013	3.050e-013	-12.516	-12.516	0.000	(0)
Cu(NO2)2	1.138e-013	1.138e-013	-12.944	-12.944	0.000	(0)
CuNO3+	7.370e-015	4.756e-015	-14.133	-14.323	-0.190	(0)
Cu(OH)4-2	7.947e-016	1.378e-016	-15.100	-15.861	-0.761	(0)
CuCl3-	1.840e-017	1.371e-017	-16.735	-16.863	-0.128	(0)
CuCl4-2	9.811e-022	3.310e-022	-21.008	-21.480	-0.472	(0)
Cu(NO3)2	3.763e-023	3.763e-023	-22.424	-22.424	0.000	(0)
Cu(HS)3-	0.000e+000	0.000e+000	-216.608	-216.799	-0.190	(0)
F	2.495e-004					
F-	1.657e-004	1.265e-004	-3.781	-3.898	-0.117	(0)
MgF+	7.735e-005	5.832e-005	-4.112	-4.234	-0.123	(0)
CaF+	3.580e-006	2.729e-006	-5.446	-5.564	-0.118	(0)
NaF	2.292e-006	2.292e-006	-5.640	-5.640	0.000	(0)
MnF+	5.814e-007	4.431e-007	-6.235	-6.353	-0.118	(0)
ZnF+	1.597e-008	1.030e-008	-7.797	-7.987	-0.190	(0)
BF(OH)3-	5.238e-009	3.746e-009	-8.281	-8.426	-0.146	(0)
HF	2.168e-009	2.168e-009	-8.664	-8.664	0.000	(0)
NiF+	9.402e-010	6.067e-010	-9.027	-9.217	-0.190	(0)
CoF+	6.942e-010	4.479e-010	-9.159	-9.349	-0.190	(0)
CuF+	2.959e-010	1.910e-010	-9.529	-9.719	-0.190	(0)
AlF3	5.864e-011	5.864e-011	-10.232	-10.232	0.000	(0)
AlF2+	4.794e-011	3.683e-011	-10.319	-10.434	-0.114	(0)
CdF+	2.158e-011	1.392e-011	-10.666	-10.856	-0.190	(0)
AlF4-	4.931e-012	3.718e-012	-11.307	-11.430	-0.123	(0)
PbF+	3.249e-012	2.096e-012	-11.488	-11.679	-0.190	(0)
AlF+2	2.100e-012	7.314e-013	-11.678	-12.136	-0.458	(0)
HF2-	1.417e-012	1.042e-012	-11.849	-11.982	-0.133	(0)
UO2F+	9.169e-013	5.917e-013	-12.038	-12.228	-0.190	(0)

BF2 (OH) 2-	8.225e-013	5.882e-013	-12.085	-12.230	-0.146	(0)
AgF	3.579e-013	3.579e-013	-12.446	-12.446	0.000	(0)
UO2F2	2.158e-013	2.158e-013	-12.666	-12.666	0.000	(0)
CrF+2	4.431e-014	7.681e-015	-13.354	-14.115	-0.761	(0)
UO2F3-	1.063e-014	6.857e-015	-13.974	-14.164	-0.190	(0)
PbF2	5.218e-015	5.218e-015	-14.282	-14.282	0.000	(0)
CdF2	3.514e-015	3.514e-015	-14.454	-14.454	0.000	(0)
UO2F4-2	3.974e-017	6.890e-018	-16.401	-17.162	-0.761	(0)
VO2F	2.646e-017	2.646e-017	-16.577	-16.577	0.000	(0)
H2F2	1.259e-017	1.259e-017	-16.900	-16.900	0.000	(0)
PbF3-	1.940e-018	1.252e-018	-17.712	-17.902	-0.190	(0)
VO2F2-	1.883e-018	1.215e-018	-17.725	-17.915	-0.190	(0)
FeF2+	1.497e-018	1.141e-018	-17.825	-17.943	-0.118	(0)
FeF+2	9.994e-019	3.372e-019	-18.000	-18.472	-0.472	(0)
BF3OH-	4.700e-019	3.361e-019	-18.328	-18.474	-0.146	(0)
FeF3	2.037e-019	2.037e-019	-18.691	-18.691	0.000	(0)
VOF+	2.198e-020	1.418e-020	-19.658	-19.848	-0.190	(0)
VO2F3-2	1.106e-020	1.917e-021	-19.956	-20.717	-0.761	(0)
VOF2	6.727e-022	6.727e-022	-21.172	-21.172	0.000	(0)
PbF4-2	4.372e-022	7.579e-023	-21.359	-22.120	-0.761	(0)
VO2F4-3	6.153e-024	1.193e-025	-23.211	-24.923	-1.712	(0)
VOF3-	4.678e-024	3.019e-024	-23.330	-23.520	-0.190	(0)
HgF+	4.404e-024	2.841e-024	-23.356	-23.546	-0.190	(0)
BF4-	3.397e-024	2.429e-024	-23.469	-23.615	-0.146	(0)
Sb (OH) 2F	1.286e-024	1.286e-024	-23.891	-23.891	0.000	(0)
SbOF	1.267e-024	1.267e-024	-23.897	-23.897	0.000	(0)
VOF4-2	8.890e-027	1.541e-027	-26.051	-26.812	-0.761	(0)
UF3+	2.671e-036	1.723e-036	-35.573	-35.764	-0.190	(0)
UF2+2	4.959e-037	8.597e-038	-36.305	-37.066	-0.761	(0)
UF4	2.390e-038	2.390e-038	-37.622	-37.622	0.000	(0)
UF+3	2.784e-039	0.000e+000	-38.555	-40.268	-1.712	(0)
UF5-	1.857e-040	1.198e-040	-39.731	-39.922	-0.190	(0)
UF6-2	0.000e+000	0.000e+000	-40.578	-41.340	-0.761	(0)
Fe (2)	3.385e-012					
Fe+2	2.198e-012	3.811e-013	-11.658	-12.419	-0.761	(0)
FeSO4	1.167e-012	1.167e-012	-11.933	-11.933	0.000	(0)
FeOH+	1.726e-014	1.315e-014	-13.763	-13.881	-0.118	(0)
FeHCO3+	2.557e-015	1.986e-015	-14.592	-14.702	-0.110	(0)
Fe (OH) 2	9.060e-018	9.060e-018	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.260e-018	2.484e-018	-17.487	-17.605	-0.118	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.318	-236.509	-0.190	(0)
Fe (3)	1.070e-009					
Fe (OH) 2+	5.976e-010	4.591e-010	-9.224	-9.338	-0.114	(0)
Fe (OH) 3	4.276e-010	4.276e-010	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.493e-011	3.452e-011	-10.347	-10.462	-0.114	(0)
FeOH+2	4.034e-015	1.361e-015	-14.394	-14.866	-0.472	(0)
FeF2+	1.497e-018	1.141e-018	-17.825	-17.943	-0.118	(0)
FeF+2	9.994e-019	3.372e-019	-18.000	-18.472	-0.472	(0)
FeSO4+	4.464e-019	3.402e-019	-18.350	-18.468	-0.118	(0)
FeF3	2.037e-019	2.037e-019	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.406e-019	9.073e-020	-18.852	-19.042	-0.190	(0)
Fe+3	2.762e-020	2.431e-021	-19.559	-20.614	-1.055	(0)
FeCl+2	1.048e-021	3.536e-022	-20.980	-21.451	-0.472	(0)
FeCl2+	9.982e-024	7.608e-024	-23.001	-23.119	-0.118	(0)
FeHSeO3+2	4.013e-024	6.957e-025	-23.397	-24.158	-0.761	(0)
Fe2 (OH) 2+4	6.791e-026	6.134e-029	-25.168	-28.212	-3.044	(0)
FeNO3+2	8.814e-027	1.528e-027	-26.055	-26.816	-0.761	(0)
FeCl3	3.664e-027	3.664e-027	-26.436	-26.436	0.000	(0)
Fe3 (OH) 4+5	2.324e-032	4.071e-037	-31.634	-36.390	-4.757	(0)
H (0)	3.904e-029					
H2	1.952e-029	2.015e-029	-28.710	-28.696	0.014	(0)
Hg (0)	1.186e-009					
Hg	1.186e-009	1.186e-009	-8.926	-8.926	0.000	(0)
Hg (1)	5.629e-021					
Hg2+2	2.815e-021	4.880e-022	-20.551	-21.312	-0.761	(0)
Hg (2)	8.774e-012					
HgClOH	4.470e-012	4.470e-012	-11.350	-11.350	0.000	(0)

	Hg (OH) 2	2.784e-012	2.875e-012	-11.555	-11.541	0.014	(0)
	HgCl2	1.406e-012	1.406e-012	-11.852	-11.852	0.000	(0)
	HgCl3-	1.049e-013	6.771e-014	-12.979	-13.169	-0.190	(0)
	HgCl4-2	7.489e-015	1.298e-015	-14.126	-14.887	-0.761	(0)
	HgCO3	1.215e-015	1.215e-015	-14.915	-14.915	0.000	(0)
	HgCl+	9.026e-017	5.824e-017	-16.045	-16.235	-0.190	(0)
	Hg (CO3) 2-2	3.713e-017	6.437e-018	-16.430	-17.191	-0.761	(0)
	HgOH+	3.242e-017	2.092e-017	-16.489	-16.679	-0.190	(0)
	Hg (NH3) 2+2	2.369e-018	4.108e-019	-17.625	-18.386	-0.761	(0)
	Hg (OH) 3-	4.864e-019	3.138e-019	-18.313	-18.503	-0.190	(0)
	HgHCO3+	4.063e-019	2.622e-019	-18.391	-18.581	-0.190	(0)
	HgNH3+2	7.229e-020	1.253e-020	-19.141	-19.902	-0.761	(0)
	Hg+2	3.496e-021	6.060e-022	-20.456	-21.217	-0.761	(0)
	HgSO4	1.979e-021	1.979e-021	-20.704	-20.704	0.000	(0)
	HgF+	4.404e-024	2.841e-024	-23.356	-23.546	-0.190	(0)
	Hg (NH3) 3+2	3.092e-025	5.360e-026	-24.510	-25.271	-0.761	(0)
	HgNO3+	2.180e-029	1.406e-029	-28.662	-28.852	-0.190	(0)
	Hg (NH3) 4+2	8.049e-032	1.395e-032	-31.094	-31.855	-0.761	(0)
	Hg (NO3) 2	3.674e-037	3.674e-037	-36.435	-36.435	0.000	(0)
	HgHS2-	0.000e+000	0.000e+000	-137.881	-138.071	-0.190	(0)
	HgS2-2	0.000e+000	0.000e+000	-138.082	-138.843	-0.761	(0)
	Hg (HS) 2	0.000e+000	0.000e+000	-139.613	-139.613	0.000	(0)
K		1.015e-002					
	K+	9.333e-003	7.124e-003	-2.030	-2.147	-0.117	(0)
	KSO4-	8.188e-004	6.291e-004	-3.087	-3.201	-0.114	(0)
	KCrO4-	1.763e-016	1.138e-016	-15.754	-15.944	-0.190	(0)
Mg		2.154e-002					
	Mg+2	1.210e-002	4.110e-003	-1.917	-2.386	-0.469	(0)
	MgSO4	9.328e-003	9.328e-003	-2.030	-2.030	0.000	(0)
	MgF+	7.735e-005	5.832e-005	-4.112	-4.234	-0.123	(0)
	MgHCO3+	2.336e-005	1.741e-005	-4.631	-4.759	-0.128	(0)
	MgCO3	5.727e-006	5.727e-006	-5.242	-5.242	0.000	(0)
	MgOH+	1.810e-006	1.419e-006	-5.742	-5.848	-0.106	(0)
	MgH2BO3+	7.413e-007	5.301e-007	-6.130	-6.276	-0.146	(0)
Mn (2)		7.053e-004					
	Mn+2	5.076e-004	8.800e-005	-3.294	-4.056	-0.761	(0)
	MnSO4	1.952e-004	1.952e-004	-3.710	-3.710	0.000	(0)
	MnHCO3+	9.540e-007	7.270e-007	-6.020	-6.138	-0.118	(0)
	MnCl+	7.001e-007	5.336e-007	-6.155	-6.273	-0.118	(0)
	MnF+	5.814e-007	4.431e-007	-6.235	-6.353	-0.118	(0)
	MnOH+	2.515e-007	1.917e-007	-6.599	-6.717	-0.118	(0)
	MnCl2	3.630e-009	3.630e-009	-8.440	-8.440	0.000	(0)
	MnNO3+	1.358e-011	8.766e-012	-10.867	-11.057	-0.190	(0)
	MnCl3-	6.319e-012	4.816e-012	-11.199	-11.317	-0.118	(0)
	MnSeO4	3.818e-012	3.818e-012	-11.418	-11.418	0.000	(0)
	Mn (OH) 3-	1.169e-015	8.906e-016	-14.932	-15.050	-0.118	(0)
	Mn (NO3) 2	1.384e-018	1.384e-018	-17.859	-17.859	0.000	(0)
	Mn (OH) 4-2	7.390e-021	2.493e-021	-20.131	-20.603	-0.472	(0)
	MnSe	0.000e+000	0.000e+000	-40.244	-40.244	0.000	(0)
Mn (3)		3.067e-024					
	Mn+3	3.067e-024	2.700e-025	-23.513	-24.569	-1.055	(0)
Mn (6)		6.698e-040					
	MnO4-2	6.698e-040	2.260e-040	-39.174	-39.646	-0.472	(0)
Mn (7)		0.000e+000					
	MnO4-	0.000e+000	0.000e+000	-44.042	-44.181	-0.139	(0)
Mo		3.004e-006					
	MoO4-2	3.004e-006	1.020e-006	-5.522	-5.991	-0.469	(0)
	HMoO4-	3.644e-010	2.352e-010	-9.438	-9.629	-0.190	(0)
	H2MoO4	1.996e-014	1.996e-014	-13.700	-13.700	0.000	(0)
	Ag2MoO4	4.899e-025	4.899e-025	-24.310	-24.310	0.000	(0)
	AlMo6O21-3	0.000e+000	0.000e+000	-42.095	-43.807	-1.712	(0)
	Mo7O24-6	0.000e+000	0.000e+000	-45.585	-52.434	-6.849	(0)
	HMo7O24-5	0.000e+000	0.000e+000	-49.227	-53.984	-4.757	(0)
	H2Mo7O24-4	0.000e+000	0.000e+000	-54.093	-57.137	-3.044	(0)
	H3Mo7O24-3	0.000e+000	0.000e+000	-60.115	-61.827	-1.712	(0)
N (-3)		1.082e-006					
	NH4+	9.315e-007	6.661e-007	-6.031	-6.176	-0.146	(0)
	NH4SO4-	1.168e-007	8.902e-008	-6.933	-7.050	-0.118	(0)

NH3	3.278e-008	3.278e-008	-7.484	-7.484	0.000	(0)
CaNH3+2	4.704e-010	8.156e-011	-9.327	-10.089	-0.761	(0)
CuNH3+2	4.629e-011	8.025e-012	-10.335	-11.096	-0.761	(0)
NiNH3+2	1.939e-011	3.361e-012	-10.712	-11.474	-0.761	(0)
Co (NH3) +2	2.545e-012	4.413e-013	-11.594	-12.355	-0.761	(0)
AgNH3+	1.168e-013	7.539e-014	-12.932	-13.123	-0.190	(0)
BaNH3+2	1.001e-015	1.736e-016	-14.999	-15.760	-0.761	(0)
Ni (NH3) 2+2	9.185e-017	1.592e-017	-16.037	-16.798	-0.761	(0)
Ag (NH3) 2+	3.112e-017	2.008e-017	-16.507	-16.697	-0.190	(0)
Ca (NH3) 2+2	6.138e-018	1.064e-018	-17.212	-17.973	-0.761	(0)
Co (NH3) 2+2	3.559e-018	6.170e-019	-17.449	-18.210	-0.761	(0)
Hg (NH3) 2+2	2.369e-018	4.108e-019	-17.625	-18.386	-0.761	(0)
HgNH3+2	7.229e-020	1.253e-020	-19.141	-19.902	-0.761	(0)
Co (NH3) 3+2	1.468e-024	2.546e-025	-23.833	-24.594	-0.761	(0)
Hg (NH3) 3+2	3.092e-025	5.360e-026	-24.510	-25.271	-0.761	(0)
Co (NH3) 4+2	2.526e-031	4.379e-032	-30.598	-31.359	-0.761	(0)
Hg (NH3) 4+2	8.049e-032	1.395e-032	-31.094	-31.855	-0.761	(0)
Cr (NH3) 5OH+2	1.708e-038	2.961e-039	-37.767	-38.529	-0.761	(0)
Co (NH3) 5+2	1.374e-038	2.382e-039	-37.862	-38.623	-0.761	(0)
Co (NH3) 5Cl+2	0.000e+000	0.000e+000	-45.231	-45.992	-0.761	(0)
Cr (NH3) 6+3	0.000e+000	0.000e+000	-45.611	-47.323	-1.712	(0)
Cr (NH3) 6Cl+2	0.000e+000	0.000e+000	-47.778	-48.539	-0.761	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Co (NH3) 6OH+2	0.000e+000	0.000e+000	-58.975	-59.736	-0.761	(0)
Co (NH3) 6Cl+2	0.000e+000	0.000e+000	-59.431	-60.192	-0.761	(0)
N (3)	9.178e-005					
NO2-	9.177e-005	6.662e-005	-4.037	-4.176	-0.139	(0)
CuNO2+	2.587e-010	1.669e-010	-9.587	-9.777	-0.190	(0)
CoNO2+	8.148e-011	5.258e-011	-10.089	-10.279	-0.190	(0)
AgNO2	1.568e-011	1.568e-011	-10.805	-10.805	0.000	(0)
Cu (NO2) 2	1.138e-013	1.138e-013	-12.944	-12.944	0.000	(0)
Ag (NO2) 2-	2.507e-015	1.618e-015	-14.601	-14.791	-0.190	(0)
N (5)	8.296e-008					
NO3-	8.233e-008	6.285e-008	-7.084	-7.202	-0.117	(0)
CaNO3+	6.088e-010	3.929e-010	-9.216	-9.406	-0.190	(0)
MnNO3+	1.358e-011	8.766e-012	-10.867	-11.057	-0.190	(0)
ZnNO3+	9.989e-013	6.446e-013	-12.000	-12.191	-0.190	(0)
NiNO3+	4.672e-014	3.015e-014	-13.330	-13.521	-0.190	(0)
CoNO3+	1.729e-014	1.116e-014	-13.762	-13.953	-0.190	(0)
CuNO3+	7.370e-015	4.756e-015	-14.133	-14.323	-0.190	(0)
BaNO3+	4.098e-015	2.644e-015	-14.387	-14.578	-0.190	(0)
CdNO3+	2.139e-015	1.381e-015	-14.670	-14.860	-0.190	(0)
PbNO3+	3.388e-016	2.186e-016	-15.470	-15.660	-0.190	(0)
AgNO3	5.624e-017	5.624e-017	-16.250	-16.250	0.000	(0)
Mn (NO3) 2	1.384e-018	1.384e-018	-17.859	-17.859	0.000	(0)
Zn (NO3) 2	8.083e-021	8.083e-021	-20.092	-20.092	0.000	(0)
UO2NO3+	6.586e-021	4.250e-021	-20.181	-20.372	-0.190	(0)
Co (NO3) 2	1.427e-021	1.427e-021	-20.846	-20.846	0.000	(0)
Cd (NO3) 2	4.349e-023	4.349e-023	-22.362	-22.362	0.000	(0)
Cu (NO3) 2	3.763e-023	3.763e-023	-22.424	-22.424	0.000	(0)
Pb (NO3) 2	2.334e-023	2.334e-023	-22.632	-22.632	0.000	(0)
CrNO3+2	6.072e-024	1.053e-024	-23.217	-23.978	-0.761	(0)
VO2NO3	3.792e-024	3.792e-024	-23.421	-23.421	0.000	(0)
FeNO3+2	8.814e-027	1.528e-027	-26.055	-26.816	-0.761	(0)
HgNO3+	2.180e-029	1.406e-029	-28.662	-28.852	-0.190	(0)
Hg (NO3) 2	3.674e-037	3.674e-037	-36.435	-36.435	0.000	(0)
Na	4.014e-002					
Na+	3.762e-002	2.872e-002	-1.425	-1.542	-0.117	(0)
NaSO4-	2.504e-003	1.924e-003	-2.601	-2.716	-0.114	(0)
NaHCO3	6.687e-006	6.687e-006	-5.175	-5.175	0.000	(0)
NaF	2.292e-006	2.292e-006	-5.640	-5.640	0.000	(0)
NaCO3-	1.166e-006	8.959e-007	-5.933	-6.048	-0.114	(0)
NaH2BO3	1.693e-007	1.693e-007	-6.771	-6.771	0.000	(0)
NaCrO4-	9.507e-016	6.135e-016	-15.022	-15.212	-0.190	(0)
Ni	1.074e-006					
Ni+2	5.624e-007	1.910e-007	-6.250	-6.719	-0.469	(0)
NiSO4	4.752e-007	4.752e-007	-6.323	-6.323	0.000	(0)
NiHCO3+	1.511e-008	9.748e-009	-7.821	-8.011	-0.190	(0)

NiCO3	1.193e-008	1.193e-008	-7.923	-7.923	0.000	(0)
NiCl+	3.647e-009	2.353e-009	-8.438	-8.628	-0.190	(0)
NiOH+	3.230e-009	2.085e-009	-8.491	-8.681	-0.190	(0)
Ni (SO4) 2-2	1.132e-009	1.963e-010	-8.946	-9.707	-0.761	(0)
NiF+	9.402e-010	6.067e-010	-9.027	-9.217	-0.190	(0)
Ni (OH) 2	1.436e-010	1.436e-010	-9.843	-9.843	0.000	(0)
NiNH3+2	1.939e-011	3.361e-012	-10.712	-11.474	-0.761	(0)
Ni (OH) 3-	1.929e-013	1.245e-013	-12.715	-12.905	-0.190	(0)
NiCl2	5.707e-014	5.707e-014	-13.244	-13.244	0.000	(0)
NiNO3+	4.672e-014	3.015e-014	-13.330	-13.521	-0.190	(0)
NiSeO4	1.440e-014	1.440e-014	-13.842	-13.842	0.000	(0)
Ni (NH3) 2+2	9.185e-017	1.592e-017	-16.037	-16.798	-0.761	(0)
O (0)	2.407e-035					
O2	1.203e-035	1.243e-035	-34.920	-34.906	0.014	(0)
Pb	4.956e-009					
PbSO4	1.437e-009	1.437e-009	-8.843	-8.843	0.000	(0)
PbCO3	1.184e-009	1.184e-009	-8.926	-8.926	0.000	(0)
PbOH+	7.939e-010	5.123e-010	-9.100	-9.290	-0.190	(0)
Pb+2	6.927e-010	2.352e-010	-9.159	-9.629	-0.469	(0)
Pb (SO4) 2-2	6.229e-010	1.080e-010	-9.206	-9.967	-0.761	(0)
PbHCO3+	1.121e-010	7.236e-011	-9.950	-10.140	-0.190	(0)
PbCl+	6.229e-011	4.019e-011	-10.206	-10.396	-0.190	(0)
Pb (CO3) 2-2	3.301e-011	5.723e-012	-10.481	-11.242	-0.761	(0)
Pb (OH) 2	1.405e-011	1.405e-011	-10.852	-10.852	0.000	(0)
PbF+	3.249e-012	2.096e-012	-11.488	-11.679	-0.190	(0)
PbCl2	8.647e-013	8.647e-013	-12.063	-12.063	0.000	(0)
Pb (OH) 3-	1.888e-014	1.218e-014	-13.724	-13.914	-0.190	(0)
PbF2	5.218e-015	5.218e-015	-14.282	-14.282	0.000	(0)
PbCl3-	2.570e-015	1.658e-015	-14.590	-14.780	-0.190	(0)
PbNO3+	3.388e-016	2.186e-016	-15.470	-15.660	-0.190	(0)
Pb2OH+3	9.847e-017	1.910e-018	-16.007	-17.719	-1.712	(0)
PbCl4-2	2.106e-017	3.650e-018	-16.677	-17.438	-0.761	(0)
Pb (OH) 4-2	1.492e-017	2.586e-018	-16.826	-17.587	-0.761	(0)
PbF3-	1.940e-018	1.252e-018	-17.712	-17.902	-0.190	(0)
Pb3 (OH) 4+2	5.341e-021	9.259e-022	-20.272	-21.033	-0.761	(0)
PbF4-2	4.372e-022	7.579e-023	-21.359	-22.120	-0.761	(0)
Pb (NO3) 2	2.334e-023	2.334e-023	-22.632	-22.632	0.000	(0)
Pb4 (OH) 4+4	1.915e-024	1.730e-027	-23.718	-26.762	-3.044	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.076	-151.076	0.000	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.945	-228.135	-0.190	(0)
S (-2)	0.000e+000					
AgHS	0.000e+000	0.000e+000	-73.493	-73.493	0.000	(0)
HS-	0.000e+000	0.000e+000	-78.169	-78.359	-0.190	(0)
CdHS+	0.000e+000	0.000e+000	-78.319	-78.509	-0.190	(0)
S5-2	0.000e+000	0.000e+000	-79.027	-79.788	-0.761	(0)
H2S	0.000e+000	0.000e+000	-79.275	-79.275	0.000	(0)
S6-2	0.000e+000	0.000e+000	-79.543	-80.304	-0.761	(0)
S4-2	0.000e+000	0.000e+000	-79.623	-80.384	-0.761	(0)
S3-2	0.000e+000	0.000e+000	-80.428	-81.190	-0.761	(0)
S2-2	0.000e+000	0.000e+000	-81.445	-82.206	-0.761	(0)
S-2	0.000e+000	0.000e+000	-87.251	-87.723	-0.472	(0)
HgHS2-	0.000e+000	0.000e+000	-137.881	-138.071	-0.190	(0)
HgS2-2	0.000e+000	0.000e+000	-138.082	-138.843	-0.761	(0)
Hg (HS) 2	0.000e+000	0.000e+000	-139.613	-139.613	0.000	(0)
Cu (S4) 2-3	0.000e+000	0.000e+000	-146.775	-147.224	-0.448	(0)
Ag (HS) S4-2	0.000e+000	0.000e+000	-147.031	-147.299	-0.268	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.170	-147.361	-0.190	(0)
CuS4S5-3	0.000e+000	0.000e+000	-147.532	-147.954	-0.421	(0)
Ag (HS) 2-	0.000e+000	0.000e+000	-147.561	-147.751	-0.190	(0)
Ag (S4) 2-3	0.000e+000	0.000e+000	-148.340	-148.803	-0.463	(0)
AgS4S5-3	0.000e+000	0.000e+000	-148.679	-149.114	-0.434	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.287	-149.287	0.000	(0)
Cd (HS) 2	0.000e+000	0.000e+000	-149.664	-149.664	0.000	(0)
Pb (HS) 2	0.000e+000	0.000e+000	-151.076	-151.076	0.000	(0)
Fe (HS) 2	0.000e+000	0.000e+000	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+000	0.000e+000	-216.608	-216.799	-0.190	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.175	-224.366	-0.190	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.649	-226.410	-0.761	(0)

Cd (HS) 3-	0.000e+000	0.000e+000	-225.933	-226.123	-0.190	(0)
Pb (HS) 3-	0.000e+000	0.000e+000	-227.945	-228.135	-0.190	(0)
Fe (HS) 3-	0.000e+000	0.000e+000	-236.318	-236.509	-0.190	(0)
Cd (HS) 4-2	0.000e+000	0.000e+000	-301.525	-302.286	-0.761	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-303.423	-304.184	-0.761	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.655	-316.416	-0.761	(0)
S (6)	5.525e-002					
SO4-2	3.673e-002	1.247e-002	-1.435	-1.904	-0.469	(0)
MgSO4	9.328e-003	9.328e-003	-2.030	-2.030	0.000	(0)
CaSO4	5.648e-003	5.648e-003	-2.248	-2.248	0.000	(0)
NaSO4-	2.504e-003	1.924e-003	-2.601	-2.716	-0.114	(0)
KSO4-	8.188e-004	6.291e-004	-3.087	-3.201	-0.114	(0)
MnSO4	1.952e-004	1.952e-004	-3.710	-3.710	0.000	(0)
ZnSO4	1.114e-005	1.114e-005	-4.953	-4.953	0.000	(0)
Zn (SO4) 2-2	6.981e-006	1.210e-006	-5.156	-5.917	-0.761	(0)
NiSO4	4.752e-007	4.752e-007	-6.323	-6.323	0.000	(0)
CoSO4	2.787e-007	2.787e-007	-6.555	-6.555	0.000	(0)
NH4SO4-	1.168e-007	8.902e-008	-6.933	-7.050	-0.118	(0)
CuSO4	6.837e-008	6.837e-008	-7.165	-7.165	0.000	(0)
CdSO4	2.031e-008	2.031e-008	-7.692	-7.692	0.000	(0)
Cd (SO4) 2-2	1.971e-008	3.417e-009	-7.705	-8.466	-0.761	(0)
HSO4-	1.873e-008	1.412e-008	-7.727	-7.850	-0.123	(0)
PbSO4	1.437e-009	1.437e-009	-8.843	-8.843	0.000	(0)
Ni (SO4) 2-2	1.132e-009	1.963e-010	-8.946	-9.707	-0.761	(0)
Pb (SO4) 2-2	6.229e-010	1.080e-010	-9.206	-9.967	-0.761	(0)
AgSO4-	4.345e-010	2.804e-010	-9.362	-9.552	-0.190	(0)
CrOHSO4	2.151e-011	2.151e-011	-10.667	-10.667	0.000	(0)
FeSO4	1.167e-012	1.167e-012	-11.933	-11.933	0.000	(0)
UO2SO4	6.398e-013	6.398e-013	-12.194	-12.194	0.000	(0)
UO2 (SO4) 2-2	6.068e-013	1.052e-013	-12.217	-12.978	-0.761	(0)
AlSO4+	7.425e-014	5.599e-014	-13.129	-13.252	-0.123	(0)
CrSO4+	1.729e-014	1.116e-014	-13.762	-13.952	-0.190	(0)
Al (SO4) 2-	9.924e-015	7.482e-015	-14.003	-14.126	-0.123	(0)
VO2SO4-	5.506e-017	3.553e-017	-16.259	-16.449	-0.190	(0)
FeSO4+	4.464e-019	3.402e-019	-18.350	-18.468	-0.118	(0)
Fe (SO4) 2-	1.406e-019	9.073e-020	-18.852	-19.042	-0.190	(0)
Cr2 (OH) 2SO4+2	8.153e-020	1.413e-020	-19.089	-19.850	-0.761	(0)
VOSO4	6.422e-020	6.422e-020	-19.192	-19.192	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.047e-020	1.047e-020	-19.980	-19.980	0.000	(0)
HgSO4	1.979e-021	1.979e-021	-20.704	-20.704	0.000	(0)
CrO3SO4-2	4.102e-023	7.111e-024	-22.387	-23.148	-0.761	(0)
VSO4+	1.660e-034	1.071e-034	-33.780	-33.970	-0.190	(0)
U (SO4) 2	1.052e-039	1.052e-039	-38.978	-38.978	0.000	(0)
USO4+2	0.000e+000	0.000e+000	-40.213	-40.974	-0.761	(0)
Co (NH3) 6SO4+	0.000e+000	0.000e+000	-54.663	-54.853	-0.190	(0)
Sb (3)	1.109e-018					
Sb (OH) 3	5.604e-019	5.604e-019	-18.251	-18.251	0.000	(0)
HSbO2	5.482e-019	5.482e-019	-18.261	-18.261	0.000	(0)
SbO2-	1.187e-022	7.662e-023	-21.925	-22.116	-0.190	(0)
Sb (OH) 4-	6.775e-023	4.372e-023	-22.169	-22.359	-0.190	(0)
Sb (OH) 2F	1.286e-024	1.286e-024	-23.891	-23.891	0.000	(0)
SbOF	1.267e-024	1.267e-024	-23.897	-23.897	0.000	(0)
Sb (OH) 2+	2.449e-025	1.580e-025	-24.611	-24.801	-0.190	(0)
SbO+	8.462e-026	5.460e-026	-25.073	-25.263	-0.190	(0)
Sb2S4-2	0.000e+000	0.000e+000	-315.655	-316.416	-0.761	(0)
Sb (5)	1.103e-006					
SbO3-	1.102e-006	7.113e-007	-5.958	-6.148	-0.190	(0)
Sb (OH) 6-	1.083e-009	8.267e-010	-8.965	-9.083	-0.117	(0)
SbO2+	4.255e-023	2.745e-023	-22.371	-22.561	-0.190	(0)
Se (-2)	1.626e-014					
Ag2Se	1.626e-014	1.626e-014	-13.789	-13.789	0.000	(0)
HSe-	2.823e-039	1.822e-039	-38.549	-38.739	-0.190	(0)
MnSe	0.000e+000	0.000e+000	-40.244	-40.244	0.000	(0)
H2Se	0.000e+000	0.000e+000	-42.786	-42.786	0.000	(0)
Se-2	0.000e+000	0.000e+000	-45.042	-45.803	-0.761	(0)
AgOH (Se) 2-4	0.000e+000	0.000e+000	-80.085	-83.129	-3.044	(0)
Se (4)	3.824e-007					
SeO3-2	2.146e-007	3.721e-008	-6.668	-7.429	-0.761	(0)

HSeO3-	1.678e-007	1.083e-007	-6.775	-6.965	-0.190	(0)
H2SeO3	5.353e-013	5.353e-013	-12.271	-12.271	0.000	(0)
AgSeO3-	4.175e-014	2.694e-014	-13.379	-13.570	-0.190	(0)
Cd(SeO3) 2-2	4.571e-017	7.924e-018	-16.340	-17.101	-0.761	(0)
Ag(SeO3) 2-3	4.627e-019	8.974e-021	-18.335	-20.047	-1.712	(0)
FeHSeO3+2	4.013e-024	6.957e-025	-23.397	-24.158	-0.761	(0)
Se (6)	4.786e-010					
SeO4-2	4.747e-010	1.612e-010	-9.324	-9.793	-0.469	(0)
MnSeO4	3.818e-012	3.818e-012	-11.418	-11.418	0.000	(0)
ZnSeO4	1.019e-013	1.019e-013	-12.992	-12.992	0.000	(0)
NiSeO4	1.440e-014	1.440e-014	-13.842	-13.842	0.000	(0)
CoSeO4	9.047e-015	9.047e-015	-14.044	-14.044	0.000	(0)
CdSeO4	2.085e-016	2.085e-016	-15.681	-15.681	0.000	(0)
HSeO4-	1.451e-016	9.361e-017	-15.838	-16.029	-0.190	(0)
Zn(SeO4) 2-2	9.608e-023	1.666e-023	-22.017	-22.778	-0.761	(0)
U (3)	0.000e+000					
U+3	0.000e+000	0.000e+000	-57.590	-59.303	-1.712	(0)
U (4)	1.191e-019					
U(OH) 5-	1.191e-019	7.684e-020	-18.924	-19.114	-0.190	(0)
U(OH) 4	3.737e-023	3.737e-023	-22.427	-22.427	0.000	(0)
U(OH) 3+	2.459e-027	1.587e-027	-26.609	-26.800	-0.190	(0)
U(OH) 2+2	4.914e-032	8.519e-033	-31.309	-32.070	-0.761	(0)
UF3+	2.671e-036	1.723e-036	-35.573	-35.764	-0.190	(0)
UF2+2	4.959e-037	8.597e-038	-36.305	-37.066	-0.761	(0)
UOH+3	2.403e-037	4.659e-039	-36.619	-38.332	-1.712	(0)
UF4	2.390e-038	2.390e-038	-37.622	-37.622	0.000	(0)
UF+3	2.784e-039	0.000e+000	-38.555	-40.268	-1.712	(0)
U(SO4) 2	1.052e-039	1.052e-039	-38.978	-38.978	0.000	(0)
UF5-	1.857e-040	1.198e-040	-39.731	-39.922	-0.190	(0)
USO4+2	0.000e+000	0.000e+000	-40.213	-40.974	-0.761	(0)
UF6-2	0.000e+000	0.000e+000	-40.578	-41.340	-0.761	(0)
U+4	0.000e+000	0.000e+000	-42.626	-45.670	-3.044	(0)
UCl+3	0.000e+000	0.000e+000	-44.575	-46.287	-1.712	(0)
U6(OH) 15+9	0.000e+000	0.000e+000	-156.736	-172.147	-15.411	(0)
U (5)	4.661e-016					
UO2+	4.661e-016	3.008e-016	-15.332	-15.522	-0.190	(0)
U (6)	7.460e-007					
UO2(CO3) 3-4	7.022e-007	6.343e-010	-6.154	-9.198	-3.044	(0)
UO2(CO3) 2-2	4.358e-008	7.554e-009	-7.361	-8.122	-0.761	(0)
UO2CO3	2.260e-010	2.260e-010	-9.646	-9.646	0.000	(0)
UO2OH+	5.733e-012	3.699e-012	-11.242	-11.432	-0.190	(0)
UO2F+	9.169e-013	5.917e-013	-12.038	-12.228	-0.190	(0)
UO2SO4	6.398e-013	6.398e-013	-12.194	-12.194	0.000	(0)
UO2(SO4) 2-2	6.068e-013	1.052e-013	-12.217	-12.978	-0.761	(0)
UO2F2	2.158e-013	2.158e-013	-12.666	-12.666	0.000	(0)
UO2+2	9.980e-014	3.389e-014	-13.001	-13.470	-0.469	(0)
UO2F3-	1.063e-014	6.857e-015	-13.974	-14.164	-0.190	(0)
UO2Cl+	4.102e-016	2.647e-016	-15.387	-15.577	-0.190	(0)
(UO2) 2(OH) 2+2	1.310e-016	2.271e-017	-15.883	-16.644	-0.761	(0)
(UO2) 3(OH) 5+	7.425e-017	4.791e-017	-16.129	-16.320	-0.190	(0)
UO2F4-2	3.974e-017	6.890e-018	-16.401	-17.162	-0.761	(0)
UO2NO3+	6.586e-021	4.250e-021	-20.181	-20.372	-0.190	(0)
V (2)	0.000e+000					
VOH+	0.000e+000	0.000e+000	-42.249	-42.439	-0.190	(0)
V+2	0.000e+000	0.000e+000	-43.126	-43.887	-0.761	(0)
V (3)	9.566e-015					
V(OH) 3	9.566e-015	9.566e-015	-14.019	-14.019	0.000	(0)
V(OH) 2+	1.112e-025	7.177e-026	-24.954	-25.144	-0.190	(0)
VOH+2	4.560e-029	7.905e-030	-28.341	-29.102	-0.761	(0)
V+3	9.379e-034	1.819e-035	-33.028	-34.740	-1.712	(0)
VSO4+	1.660e-034	1.071e-034	-33.780	-33.970	-0.190	(0)
V2(OH) 3+3	0.000e+000	0.000e+000	-54.082	-55.794	-1.712	(0)
V2(OH) 2+4	0.000e+000	0.000e+000	-54.360	-57.404	-3.044	(0)
V (4)	5.197e-018					
V(OH) 3+	5.001e-018	3.227e-018	-17.301	-17.491	-0.190	(0)
VO+2	1.078e-019	1.869e-020	-18.967	-19.728	-0.761	(0)
VOSO4	6.422e-020	6.422e-020	-19.192	-19.192	0.000	(0)
VOF+	2.198e-020	1.418e-020	-19.658	-19.848	-0.190	(0)

VOF2	6.727e-022	6.727e-022	-21.172	-21.172	0.000	(0)
VOC1+	3.915e-022	2.526e-022	-21.407	-21.598	-0.190	(0)
VOF3-	4.678e-024	3.019e-024	-23.330	-23.520	-0.190	(0)
VOF4-2	8.890e-027	1.541e-027	-26.051	-26.812	-0.761	(0)
H2V2O4+2	3.024e-030	5.243e-031	-29.519	-30.280	-0.761	(0)
V (5)	1.242e-007					
H2VO4-	6.871e-008	4.433e-008	-7.163	-7.353	-0.190	(0)
HVO4-2	5.544e-008	9.611e-009	-7.256	-8.017	-0.761	(0)
HV2O7-3	7.461e-012	1.447e-013	-11.127	-12.840	-1.712	(0)
H3VO4	5.137e-012	5.137e-012	-11.289	-11.289	0.000	(0)
H3V2O7-	2.284e-012	1.474e-012	-11.641	-11.832	-0.190	(0)
V2O7-4	3.721e-013	3.361e-016	-12.429	-15.474	-3.044	(0)
VO4-3	2.143e-013	4.157e-015	-12.669	-14.381	-1.712	(0)
V3O9-3	4.736e-015	9.184e-017	-14.325	-16.037	-1.712	(0)
VO2+	1.563e-016	1.193e-016	-15.806	-15.923	-0.117	(0)
VO2SO4-	5.506e-017	3.553e-017	-16.259	-16.449	-0.190	(0)
VO2F	2.646e-017	2.646e-017	-16.577	-16.577	0.000	(0)
VO2F2-	1.883e-018	1.215e-018	-17.725	-17.915	-0.190	(0)
V4O12-4	1.883e-018	1.701e-021	-17.725	-20.769	-3.044	(0)
VO2F3-2	1.106e-020	1.917e-021	-19.956	-20.717	-0.761	(0)
VO2F4-3	6.153e-024	1.193e-025	-23.211	-24.923	-1.712	(0)
VO2NO3	3.792e-024	3.792e-024	-23.421	-23.421	0.000	(0)
V10O28-6	0.000e+000	0.000e+000	-49.510	-56.360	-6.849	(0)
HV10O28-5	0.000e+000	0.000e+000	-51.352	-56.109	-4.757	(0)
H2V10O28-4	0.000e+000	0.000e+000	-55.793	-58.837	-3.044	(0)
Zn	3.136e-005					
Zn+2	1.202e-005	4.083e-006	-4.920	-5.389	-0.469	(0)
ZnSO4	1.114e-005	1.114e-005	-4.953	-4.953	0.000	(0)
Zn (SO4) 2-2	6.981e-006	1.210e-006	-5.156	-5.917	-0.761	(0)
ZnOH+	5.486e-007	3.540e-007	-6.261	-6.451	-0.190	(0)
ZnCO3	3.936e-007	3.936e-007	-6.405	-6.405	0.000	(0)
ZnHCO3+	8.285e-008	5.346e-008	-7.082	-7.272	-0.190	(0)
ZnCl+	6.628e-008	4.940e-008	-7.179	-7.306	-0.128	(0)
ZnOHCl	5.607e-008	5.607e-008	-7.251	-7.251	0.000	(0)
Zn (OH) 2	4.865e-008	4.865e-008	-7.313	-7.313	0.000	(0)
ZnF+	1.597e-008	1.030e-008	-7.797	-7.987	-0.190	(0)
ZnCl2	3.771e-010	3.771e-010	-9.424	-9.424	0.000	(0)
Zn (OH) 3-	3.277e-010	2.114e-010	-9.485	-9.675	-0.190	(0)
ZnCl3-	1.936e-012	1.443e-012	-11.713	-11.841	-0.128	(0)
ZnNO3+	9.989e-013	6.446e-013	-12.000	-12.191	-0.190	(0)
ZnSeO4	1.019e-013	1.019e-013	-12.992	-12.992	0.000	(0)
Zn (OH) 4-2	4.210e-014	7.298e-015	-13.376	-14.137	-0.761	(0)
ZnCl4-2	1.030e-014	3.474e-015	-13.987	-14.459	-0.472	(0)
Zn (NO3) 2	8.083e-021	8.083e-021	-20.092	-20.092	0.000	(0)
Zn (SeO4) 2-2	9.608e-023	1.666e-023	-22.017	-22.778	-0.761	(0)
ZnS (HS) -	0.000e+000	0.000e+000	-147.170	-147.361	-0.190	(0)
Zn (HS) 2	0.000e+000	0.000e+000	-149.287	-149.287	0.000	(0)
Zn (HS) 3-	0.000e+000	0.000e+000	-224.175	-224.366	-0.190	(0)
ZnS (HS) 2-2	0.000e+000	0.000e+000	-225.649	-226.410	-0.761	(0)
Zn (HS) 4-2	0.000e+000	0.000e+000	-303.423	-304.184	-0.761	(0)

-----Saturation indices-----

Phase	SI	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-48.73	-42.44	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-37.18	-32.67	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-44.40	-32.67	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-63.50	-45.56	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-50.94	-30.91	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-27.12	-26.72	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-22.60	-22.15	0.45	(NH4) 2SeO4
Acanthite	-52.10	-88.32	-36.22	Ag2S
Ag2CO3	-12.58	-23.67	-11.09	Ag2CO3
Ag2CrO4	-20.67	-32.26	-11.59	Ag2CrO4
Ag2HVO4	-11.49	-10.01	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.60	-2.03	12.57	Ag2O

Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.98	-19.80	-4.82	Ag2SO4
Ag3AsO3	-27.99	-25.83	2.16	Ag3AsO3
Ag3AsO4	-16.40	-19.19	-2.79	Ag3AsO4
Ag3H2VO5	-16.21	-11.03	5.18	Ag3H2VO5
AgF:4H2O	-13.90	-12.85	1.05	AgF:4H2O
Agmetal	-0.28	-13.79	-13.51	Ag
AgVO3	-9.77	-9.00	0.77	AgVO3
Al(OH)3(am)	-2.23	8.57	10.80	Al(OH)3
Al2(MoO4)3	-50.82	-48.45	2.37	Al2(MoO4)3
Al2O3	-2.51	17.14	19.65	Al2O3
Al4(OH)10SO4	-6.20	16.50	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.38	-7.58	4.80	AlAsO4:2H2O
AlOHSO4	-5.98	-9.21	-3.23	AlOHSO4
AlSb	-151.94	-86.32	65.62	AlSb
Alunite	-2.66	-4.06	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.74	-11.53	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.28	5.32	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.15	6.25	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.61	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.26	-0.39	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.53	7.41	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-7.11	-14.07	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.94	-7.11	1.83	BaSeO3
BaSeO4	-10.41	-17.87	-7.46	BaSeO4
Bianchite	-5.53	-7.30	-1.76	ZnSO4:6H2O
Birnessite	-6.08	12.01	18.09	MnO2
Bixbyite	-0.88	-1.52	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	-0.01	8.57	8.58	AlOOH
Breithauptite	-54.44	-72.96	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.36	13.48	16.84	Mg(OH)2
Bunsenite	-3.29	9.15	12.45	NiO
Ca(VO3)2	-8.47	-2.81	5.66	Ca(VO3)2
Ca2V2O7	-7.14	10.36	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.20	10.36	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-15.43	23.53	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-16.34	23.52	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-293.24	-150.27	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.04	-25.95	-17.91	Hg2Cl2
CaMoO4	-0.75	-8.70	-7.95	CaMoO4
Carnotite	-0.03	0.20	0.23	KUO2VO4
CaSeO3:2H2O	-4.55	-1.74	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.48	-12.50	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.38	-0.54	9.84	Cd(BO2)2
Cd(OH)2	-5.93	7.71	13.64	Cd(OH)2
Cd(OH)2(am)	-6.02	7.71	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-19.12	-12.41	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.20	5.36	22.56	Cd3(OH)4SO4

Cd4 (OH) 6SO4	-15.33	13.07	28.40	Cd4 (OH) 6SO4
CdCl2	-12.13	-12.79	-0.66	CdCl2
CdCl2:1H2O	-11.10	-12.79	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.88	-12.80	-1.91	CdCl2:2.5H2O
CdF2	-14.74	-15.95	-1.21	CdF2
Cdmetal (alpha)	-31.35	-17.83	13.51	Cd
Cdmetal (gamma)	-31.45	-17.83	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.08	-2.54	3.54	CdOHCl
CdSb	-74.05	-74.40	-0.35	CdSb
CdSe	-18.76	-38.96	-20.20	CdSe
CdSeO4:2H2O	-16.10	-17.95	-1.85	CdSeO4:2H2O
CdSO4	-9.89	-10.06	-0.17	CdSO4
CdSO4:1H2O	-8.34	-10.06	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.19	-10.06	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.52	-11.27	-9.75	AgCl
Cerrusite	-2.27	-15.40	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-52.14	-97.83	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe
Co (BO2) 2	-26.41	0.66	27.07	Co (BO2) 2
Co (OH) 2	-4.17	8.92	13.09	Co (OH) 2
Co (OH) 3	-8.40	-10.71	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-18.57	-5.53	13.03	Co3 (AsO4) 2
Co3O4	-2.00	-12.49	-10.50	Co3O4
CoCl2	-19.85	-11.59	8.27	CoCl2
CoCl2:6H2O	-14.13	-11.59	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-13.15	-14.75	-1.60	CoF2
CoF3	-44.75	-46.21	-1.46	CoF3
CoFe2O4	18.83	15.31	-3.53	CoFe2O4
CoMoO4	-5.18	-12.94	-7.76	CoMoO4
CoO	-4.67	8.92	13.59	CoO
CoS (alpha)	-69.93	-77.37	-7.44	CoS
CoS (beta)	-66.30	-77.37	-11.07	CoS
CoSe	-21.55	-37.75	-16.20	CoSe
CoSeO3	-7.30	-5.98	1.32	CoSeO3
CoSeO4:6H2O	-15.22	-16.75	-1.53	CoSeO4:6H2O
CoSO4	-11.66	-8.85	2.80	CoSO4
CoSO4:6H2O	-6.39	-8.86	-2.47	CoSO4:6H2O
Cotunnite	-9.48	-14.26	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.01	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.60	-31.51	14.09	CrCl2
CrCl3	-47.05	-31.94	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.41	-43.25	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.37	22.84	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.89	1.36	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-53.59	-88.47	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.54	-50.34	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-57.79	-100.38	-42.59	Cu3Sb
Cu3Se2	-25.27	-88.76	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4

CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.54	-13.61	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.32	-38.42	-33.10	CuSe
CuSe2	-26.19	-59.55	-33.37	CuSe2
CuSeO3:2H2O	-7.16	-6.65	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.98	-17.42	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	1.70	8.57	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.10	-16.64	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.45	-16.64	-17.09	CaMg(CO3)2
Epsomite	-2.17	-4.30	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.16	0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-8.80	-12.52	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.07	-8.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.69	-38.32	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.32	-18.41	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.76	-64.35	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-4.84	-4.84	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.08	-80.05	-13.97	PbS
Gibbsite	0.28	8.57	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.29	-7.30	-2.01	ZnSO4:7H2O
Greenockite	-64.22	-78.58	-14.36	CdS
Greigite	-290.30	-335.34	-45.03	Fe3S4
Gummite	-5.27	2.40	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.99	-21.86	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.72	-46.68	-4.96	H2Se
Halite	-5.46	-3.86	1.60	NaCl
Hausmannite	-0.04	60.99	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-2.30	20.59	22.89	FeAl2O4
Hg(CH3)2(g)	-185.49	-259.19	-73.71	Hg(CH3)2
Hg(g)	-7.62	-15.49	-7.87	Hg
Hg(OH)2	-8.05	-11.54	-3.50	Hg(OH)2
Hg2(g)	-16.03	-30.99	-14.96	Hg2
Hg2(OH)2	-10.70	-5.44	5.26	Hg2(OH)2
Hg2CO3	-11.04	-27.09	-16.05	Hg2CO3
Hg2CrO4	-26.98	-35.68	-8.70	Hg2CrO4
Hg2F2	-18.75	-29.11	-10.36	Hg2F2
Hg2S	-80.06	-91.73	-11.68	Hg2S
Hg2SeO3	-15.68	-20.34	-4.66	Hg2SeO3
Hg2SO4	-17.09	-23.22	-6.13	Hg2SO4
Hg3O2CO3	-26.59	-56.27	-29.68	Hg3O2CO3
HgCl(g)	-32.47	-12.97	19.50	HgCl
HgCl2	-10.78	-32.05	-21.26	HgCl2
HgF(g)	-47.23	-14.55	32.68	HgF
HgF2(g)	-47.77	-35.21	12.57	HgF2
Hgmetal(l)	-2.04	-15.49	-13.45	Hg

HgSe	-2.52	-58.21	-55.69	HgSe
HgSeO3	-14.01	-26.44	-12.43	HgSeO3
HgSO4	-19.90	-29.32	-9.42	HgSO4
Huntite	-3.00	-32.97	-29.97	CaMg3(CO3)4
Hydrocerussite	-5.80	-24.57	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.40	-19.17	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-16.03	-21.20	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.39	-20.19	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-31.66	-48.90	-17.24	K2Cr2O7
K2CrO4	-18.15	-18.66	-0.51	K2CrO4
K2MoO4	-13.55	-10.29	3.26	K2MoO4
K2SeO4	-13.36	-14.09	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4·H2O
Larnakite	-4.86	-5.29	-0.43	PbO·PbSO4
Laurionite	-4.63	-4.01	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.45	6.24	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.01	19.87	16.86	Fe2MgO4
Magnesite	-0.70	-8.16	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2(OH)2CO3
Manganite	-0.75	24.59	25.34	MnOOH
Massicot	-6.65	6.24	12.89	PbO
Matlockite	-6.87	-15.84	-8.97	PbClF
Melanothallite	-18.51	-12.26	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4·7H2O
Metacinnabar	-52.74	-97.83	-45.09	HgS
Mg(OH)2 (active)	-5.31	13.48	18.79	Mg(OH)2
Mg(VO3)2	-13.77	-2.49	11.28	Mg(VO3)2
Mg2Sb3	-268.50	-193.82	74.68	Mg2Sb3
Mg2V2O7	-15.37	10.99	26.36	Mg2V2O7
MgCr2O4	-5.07	11.13	16.20	MgCr2O4
MgCrO4	-22.13	-16.75	5.38	MgCrO4
MgF2	-2.05	-10.18	-8.13	MgF2
MgMoO4	-6.53	-8.38	-1.85	MgMoO4
MgSeO3·6H2O	-4.48	-1.42	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-10.98	-12.18	-1.20	MgSeO4·6H2O
Minium	-29.25	44.27	73.52	Pb3O4
Mirabilite	-3.88	-5.00	-1.11	Na2SO4·10H2O
Mn(VO3)2	-9.06	-4.16	4.90	Mn(VO3)2
Mn2(SO4)3	-49.14	-54.85	-5.71	Mn2(SO4)3
Mn2Sb	-145.10	-84.03	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-9.36	3.14	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-11.41	-8.69	2.72	MnCl2·4H2O
MnS (grn)	-74.65	-74.48	0.17	MnS
MnS (pnk)	-77.82	-74.48	3.34	MnS
MnSb	-92.74	-95.65	-2.91	MnSb
MnSe	-38.36	-34.86	3.50	MnSe
MnSeO3	-4.21	-3.08	1.13	MnSeO3
MnSeO3·2H2O	-4.07	-3.09	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-11.80	-13.85	-2.05	MnSeO4·5H2O
MnSO4	-8.54	-5.96	2.58	MnSO4
Monteponite	-7.39	7.71	15.10	CdO
Montroydite	-7.90	-11.54	-3.64	HgO
MoO3	-13.86	-21.86	-8.00	MoO3
Morenosite	-6.48	-8.63	-2.14	NiSO4·7H2O
MoS2	-149.74	-220.00	-70.26	MoS2
Na-Jarosite	-8.38	-19.58	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-37.79	-47.69	-9.90	Na2Cr2O7
Na2CrO4	-20.38	-17.45	2.93	Na2CrO4
Na2Mo2O7	-14.34	-30.94	-16.60	Na2Mo2O7
Na2MoO4	-10.57	-9.08	1.49	Na2MoO4
Na2MoO4·2H2O	-10.30	-9.08	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-12.42	-2.12	10.30	Na2SeO3·5H2O
Na2SeO4	-14.16	-12.88	1.28	Na2SeO4

Na3Sb	-170.15	-75.70	94.45	Na3Sb
Na3VO4	-25.49	11.19	36.68	Na3VO4
Na4V2O7	-27.80	9.60	37.40	Na4V2O7
Nantokite	-5.36	-12.09	-6.73	CuCl
NaSb	-86.11	-62.95	23.17	NaSb
Natron	-7.56	-8.87	-1.31	Na2CO3:10H2O
NaVO3	-5.45	-1.59	3.86	NaVO3
Nesquehonite	-3.49	-8.16	-4.67	MgCO3:3H2O
Ni(OH)2	-3.64	9.15	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.55	-4.85	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-13.17	18.83	32.00	Ni4(OH)6SO4
NiCO3	-5.62	-12.49	-6.87	NiCO3
NiMoO4	-1.57	-12.71	-11.14	NiMoO4
NiS(alpha)	-71.54	-77.14	-5.60	NiS
NiS(beta)	-66.04	-77.14	-11.10	NiS
NiS(gamma)	-64.34	-77.14	-12.80	NiS
NiSe	-19.82	-37.52	-17.70	NiSe
NiSeO3:2H2O	-8.57	-5.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.00	-16.52	-1.52	NiSeO4:6H2O
Nsutite	-5.49	12.01	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.40	-304.47	-61.07	As2S3
Otavite	-1.93	-13.93	-12.00	CdCO3
Pb(BO2)2	-8.53	-2.01	6.52	Pb(BO2)2
Pb(OH)2	-1.91	6.24	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.70	-67.46	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.56	2.23	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.70	12.48	26.19	Pb2O(OH)2
Pb2O3	-23.01	38.03	61.04	Pb2O3
Pb2OCO3	-8.60	-9.16	-0.56	Pb2OCO3
Pb2V2O7	-1.59	-3.49	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.37	-13.57	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.39	2.75	6.14	Pb3(VO4)2
Pb3O2CO3	-13.94	-2.92	11.02	Pb3O2CO3
Pb3O2SO4	-9.73	0.95	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.91	7.19	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.68	7.19	21.88	Pb4O3SO4
PbCrO4	-11.40	-24.00	-12.60	PbCrO4
PbF2	-9.98	-17.42	-7.44	PbF2
Pbmetal	-23.55	-19.30	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.74	6.24	12.98	PbO:0.33H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.10	13.48	21.58	MgO
Phosgenite	-9.86	-29.67	-19.81	PbCl2:PbCO3
Plattnerite	-17.81	31.79	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.38	11.81	15.19	Mn(OH)2
Pyrolusite	-4.02	37.36	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-6.59	-8.63	-2.04	NiSO4:6H2O
Rhodochrosite	0.75	-9.83	-10.58	MnCO3
Rutherfordine	-4.75	-19.25	-14.50	UO2CO3
Sb(OH)3	-11.14	-18.25	-7.11	Sb(OH)3
Sb2O4	-14.36	-10.96	3.40	Sb2O4
Sb2O5	-24.36	-34.03	-9.67	Sb2O5
Sb2Se3	-108.77	-176.52	-67.76	Sb2Se3
Sb4O6(cubic)	-54.74	-73.00	-18.26	Sb4O6
Sb4O6(orth)	-55.10	-73.00	-17.90	Sb4O6
SbCl3	-49.58	-49.01	0.57	SbCl3
SbF3	-43.53	-53.75	-10.23	SbF3
Sbmetal	-44.88	-56.57	-11.69	Sb
SbO2	-1.96	-29.79	-27.82	SbO2
Schoepite	-3.59	2.40	5.99	UO2(OH)2:H2O
Semetal(am)	-14.02	-21.13	-7.11	Se
Semetal(hex)	-13.42	-21.13	-7.71	Se
Senarmontite	-24.13	-36.50	-12.37	Sb2O3

SeO2	-15.03	-14.90	0.12	SeO2
SeO3	-46.71	-25.66	21.04	SeO3
Siderite	-7.95	-18.19	-10.24	FeCO3
Smithsonite	-1.16	-11.16	-10.00	ZnCO3
Sphalerite	-64.36	-75.81	-11.45	ZnS
Spinel	-6.23	30.62	36.85	MgAl2O4
Stibnite	-244.92	-295.38	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.31	-4.99	0.32	Na2SO4
Thermonatrite	-9.50	-8.86	0.64	Na2CO3:H2O
Tyuyamunite	-2.09	1.99	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.78	9.31	21.08	U3O8
U3Sb4	-573.70	-421.32	152.38	U3Sb4
U4O9	-27.15	-30.17	-3.02	U4O9
UF4	-31.72	-61.26	-29.54	UF4
UF4:2.5H2O	-28.55	-61.26	-32.72	UF4:2.5H2O
UO2 (am)	-14.86	-13.93	0.93	UO2
UO2 (NO3) 2	-40.02	-27.87	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-32.73	-27.88	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.27	-27.88	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-29.93	-27.88	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.21	2.40	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.02	-23.27	-2.25	UO2SeO4:4H2O
UO3	-5.30	2.40	7.70	UO3
Uraninite	-9.26	-13.93	-4.67	UO2
USb2	-216.94	-187.37	29.58	USb2
V (OH) 3	-18.53	-10.93	7.59	V (OH) 3
V2O5	-14.62	-15.98	-1.36	V2O5
V3O5	-38.95	-37.12	1.84	V3O5
V4O7	-48.16	-40.97	7.19	V4O7
V6O13	-38.16	-99.02	-60.86	V6O13
Valentinite	-28.02	-36.50	-8.48	Sb2O3
VC12	-63.09	-44.21	18.87	VC12
VC13	-65.12	-41.69	23.43	VC13
VF4	-66.12	-51.19	14.93	VF4
Vmetal	-93.28	-49.25	44.03	V
VO	-38.46	-23.71	14.76	VO
VO (OH) 2	-9.01	-3.86	5.15	VO (OH) 2
VO2Cl	-21.08	-18.24	2.84	VO2Cl
VOC1	-32.34	-21.19	11.15	VOC1
VOC12	-37.12	-24.36	12.76	VOC12
VOSO4	-25.24	-21.63	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.86	-75.81	-8.95	ZnS
Zincite	-0.85	10.48	11.33	ZnO
Zincosite	-11.22	-7.29	3.93	ZnSO4
Zn (BO2) 2	-6.06	2.23	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-23.11	-19.80	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.72	10.48	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-1.99	10.48	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.27	10.48	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.05	10.48	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.25	10.48	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.31	3.19	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.48	10.71	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.50	-0.85	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.02	-4.10	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.25	24.15	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.60	31.90	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.07	-10.02	7.05	ZnCl2
ZnCO3:1H2O	-0.91	-11.17	-10.26	ZnCO3:1H2O
ZnF2	-12.65	-13.18	-0.53	ZnF2
Znmetal	-40.85	-15.06	25.79	Zn
ZnMoO4	-1.26	-11.38	-10.13	ZnMoO4
ZnO (active)	-0.71	10.48	11.19	ZnO
ZnS (am)	-66.76	-75.81	-9.05	ZnS
ZnSb	-82.64	-71.63	11.01	ZnSb

ZnSe	-21.79	-36.19	-14.40	ZnSe
ZnSeO4:6H2O	-13.67	-15.19	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.66	-7.29	-0.64	ZnSO4:1H2O

End of simulation.

Reading input data for simulation 35.

End of Run after 8.901 Seconds.

Appendix I(ii) – Un-reclaimed Pit Model with Natural Fill

Input file: C:\Users\rwarrender\Desktop\Copper
Flat_natural_refill_July2017_Rev02_unreclaimed.pqi
Output file: C:\Users\rwarrender\Desktop\Copper
Flat_natural_refill_July2017_Rev02_unreclaimed.pqi
Database file: C:\Program Files (x86)\USGS\Phreeqc Interactive 3.3.12-
12704\database\minteq.v8.dat

Reading data base.

SOLUTION_MASTER_SPECIES
SOLUTION_SPECIES
SOLUTION_SPECIES
PHASES
PHASES
SURFACE_MASTER_SPECIES
SURFACE_SPECIES
END

Reading input data for simulation 1.

DATABASE C:\Program Files (x86)\USGS\Phreeqc Interactive 3.3.12-
12704\database\minteq.v8.dat
Title Copper_Flat_natural_refill_July2017_Rev02_unreclaimed
KNOBS
 iterations 10000
 convergence_tolerance 1e-007
 tolerance 1e-016
 step_size 100
 pe_step_size 5
end

TITLE

Copper_Flat_natural_refill_July2017_Rev02_unreclaimed

End of simulation.

Reading input data for simulation 2.

SELECTED_OUTPUT
file
Copper_Flat_natural_refill_July2017_Rev02_unreclaimed.xls
 selected_out true
 high_precision true
 simulation true
 state true
 solution true
 distance false
 time false
 step false
 ph true
 pe true
 alkalinity true
 ionic_strength false
 water false
 charge_balance false
 totals C(4) Ag Al As B Ba Ca Cd Co Cr
 Cu F Fe Hg K Mg Mn Mo
 Na Ni Pb Sb Se U V
 Zn S(6) Cl N(3) N(5)

```
saturation_indices  Gypsum
end
```

```
-----
End of simulation.
-----
```

```
-----
Reading input data for simulation 3.
-----
```

SOLUTION 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

```
temp      25
pH         4.93
pe         4
redox      N(-3)/N(5)
units      mg/l
density    1
Ca         0.209
Mg 0.021
Na 0.075
K          0.030
Cl 0.117
S(6)       0.862 as SO4
N(-3)      0.167 as NH4
N(5)       0.826 as NO3
C(4)       0.1
water      1 # kg
```

```
end
```

```
-----
Beginning of initial solution calculations.
-----
```

Initial solution 1. Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

```
-----Solution composition-----
```

Elements	Molality	Moles
C(4)	1.666e-06	1.666e-06
Ca	5.215e-06	5.215e-06
Cl	3.300e-06	3.300e-06
K	7.673e-07	7.673e-07
Mg	8.640e-07	8.640e-07
N(-3)	9.258e-06	9.258e-06
N(5)	1.332e-05	1.332e-05
Na	3.262e-06	3.262e-06
S(6)	8.973e-06	8.973e-06

```
-----Description of solution-----
```

```

pH = 4.930
pe = 4.000
Activity of water = 1.000
Ionic strength (mol/kgw) = 5.095e-05
Mass of water (kg) = 1.000e+00
Total alkalinity (eq/kg) = -1.179e-05
Total CO2 (mol/kg) = 1.666e-06
Temperature (°C) = 25.00
Electrical balance (eq) = 2.673e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 3.72
Iterations = 8
Total H = 1.110137e+02
Total O = 5.550691e+01
```

-----Redox couples-----

Redox couple	pe	Eh (volts)
N(-3)/N(5)	8.7419	0.5171

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.185e-05	1.175e-05	-4.926	-4.930	-0.004	0.00
OH-	8.642e-10	8.570e-10	-9.063	-9.067	-0.004	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
C(4)	1.666e-06					
H2CO3	1.605e-06	1.605e-06	-5.794	-5.794	0.000	(0)
HCO3-	6.125e-08	6.074e-08	-7.213	-7.216	-0.004	(0)
CaHCO3+	5.742e-12	5.695e-12	-11.241	-11.245	-0.004	(0)
MgHCO3+	5.231e-13	5.187e-13	-12.281	-12.285	-0.004	(0)
CO3-2	2.506e-13	2.424e-13	-12.601	-12.615	-0.014	(0)
NaHCO3	1.105e-13	1.105e-13	-12.957	-12.957	0.000	(0)
CaCO3	1.934e-15	1.934e-15	-14.714	-14.714	0.000	(0)
MgCO3	1.682e-16	1.682e-16	-15.774	-15.774	0.000	(0)
NaCO3-	1.472e-17	1.460e-17	-16.832	-16.836	-0.004	(0)
Ca	5.215e-06					
Ca+2	5.205e-06	5.035e-06	-5.284	-5.298	-0.014	(0)
CaSO4	9.986e-09	9.986e-09	-8.001	-8.001	0.000	(0)
CaNO3+	2.121e-10	2.103e-10	-9.673	-9.677	-0.004	(0)
CaHCO3+	5.742e-12	5.695e-12	-11.241	-11.245	-0.004	(0)
CaOH+	8.681e-14	8.609e-14	-13.061	-13.065	-0.004	(0)
CaNH3+2	2.920e-15	2.824e-15	-14.535	-14.549	-0.015	(0)
CaCO3	1.934e-15	1.934e-15	-14.714	-14.714	0.000	(0)
Ca (NH3) 2+2	5.179e-25	5.008e-25	-24.286	-24.300	-0.015	(0)
Cl	3.300e-06					
Cl-	3.300e-06	3.273e-06	-5.481	-5.485	-0.004	(0)
H(0)	6.416e-31					
H2	3.208e-31	3.208e-31	-30.494	-30.494	0.000	(0)
K	7.673e-07					
K+	7.673e-07	7.609e-07	-6.115	-6.119	-0.004	(0)
KSO4-	4.703e-11	4.664e-11	-10.328	-10.331	-0.004	(0)
Mg	8.640e-07					
Mg+2	8.627e-07	8.345e-07	-6.064	-6.079	-0.014	(0)
MgSO4	1.315e-09	1.315e-09	-8.881	-8.881	0.000	(0)
MgHCO3+	5.231e-13	5.187e-13	-12.281	-12.285	-0.004	(0)
MgOH+	2.871e-13	2.847e-13	-12.542	-12.546	-0.004	(0)
MgCO3	1.682e-16	1.682e-16	-15.774	-15.774	0.000	(0)
N(-3)	9.258e-06					
NH4+	9.257e-06	9.180e-06	-5.034	-5.037	-0.004	(0)
NH4SO4-	8.587e-10	8.517e-10	-9.066	-9.070	-0.004	(0)
NH3	4.455e-10	4.455e-10	-9.351	-9.351	0.000	(0)
CaNH3+2	2.920e-15	2.824e-15	-14.535	-14.549	-0.015	(0)
Ca (NH3) 2+2	5.179e-25	5.008e-25	-24.286	-24.300	-0.015	(0)
N(5)	1.332e-05					
NO3-	1.332e-05	1.321e-05	-4.875	-4.879	-0.004	(0)
CaNO3+	2.121e-10	2.103e-10	-9.673	-9.677	-0.004	(0)
Na	3.262e-06					
Na+	3.262e-06	3.235e-06	-5.486	-5.490	-0.004	(0)
NaSO4-	1.517e-10	1.504e-10	-9.819	-9.823	-0.004	(0)
NaHCO3	1.105e-13	1.105e-13	-12.957	-12.957	0.000	(0)
NaCO3-	1.472e-17	1.460e-17	-16.832	-16.836	-0.004	(0)
O(0)	9.851e-32					
O2	4.926e-32	4.926e-32	-31.308	-31.308	0.000	(0)
S(6)	8.973e-06					
SO4-2	8.951e-06	8.658e-06	-5.048	-5.063	-0.014	(0)
HSO4-	1.002e-08	9.941e-09	-7.999	-8.003	-0.004	(0)
CaSO4	9.986e-09	9.986e-09	-8.001	-8.001	0.000	(0)
MgSO4	1.315e-09	1.315e-09	-8.881	-8.881	0.000	(0)
NH4SO4-	8.587e-10	8.517e-10	-9.066	-9.070	-0.004	(0)

NaSO4-	1.517e-10	1.504e-10	-9.819	-9.823	-0.004	(0)
KSO4-	4.703e-11	4.664e-11	-10.328	-10.331	-0.004	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
Anhydrite	-6.00	-10.36	-4.36		CaSO4
Aragonite	-9.61	-17.91	-8.30		CaCO3
Artinite	-24.51	-14.91	9.60		MgCO3:Mg(OH)2:3H2O
Brucite	-13.06	3.78	16.84		Mg(OH)2
Calcite	-9.43	-17.91	-8.48		CaCO3
CH4(g)	-90.81	-131.85	-41.05		CH4
CO2(g)	-4.33	-22.48	-18.15		CO2
Dolomite(disordered)	-20.07	-36.61	-16.54		CaMg(CO3)2
Dolomite(ordered)	-19.52	-36.61	-17.09		CaMg(CO3)2
Epsomite	-9.01	-11.14	-2.13		MgSO4:7H2O
Gypsum	-5.75	-10.36	-4.61		CaSO4:2H2O
Halite	-12.58	-10.98	1.60		NaCl
Huntite	-44.03	-74.00	-29.97		CaMg3(CO3)4
Hydromagnesite	-62.23	-70.99	-8.77		Mg5(CO3)4(OH)2:4H2O
Lime	-28.14	4.56	32.70		CaO
Magnesite	-11.23	-18.69	-7.46		MgCO3
Mg(OH)2(active)	-15.01	3.78	18.79		Mg(OH)2
Mirabilite	-14.93	-16.04	-1.11		Na2SO4:10H2O
Natron	-22.28	-23.60	-1.31		Na2CO3:10H2O
Nesquehonite	-14.02	-18.69	-4.67		MgCO3:3H2O
O2(g)	-28.40	54.69	83.09		O2
Periclase	-17.80	3.78	21.58		MgO
Portlandite	-18.24	4.56	22.80		Ca(OH)2
Thenardite	-16.36	-16.04	0.32		Na2SO4
Thermonatrite	-24.23	-23.60	0.64		Na2CO3:H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 4.

SOLUTION 2 JSAI September 2015 average groundwater chemistry for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected between 1996 and 2013

```

temp      25
pH        7.85
units     mg/l
density   1
Alkalinity 408 as HCO3
Ag 0.009
Al 0.029
As 0.0023
B         0.136
Ba 0.089
Ca 85.8
Cd 0.0008
Cl 49
Co 0.008
Cr 0.0066
Cu 0.0061
F         2.1
Fe 1.48
Hg 0.000002
K         2.96
Mg 19.3

```

```

Mn 0.66
Mo 0.012
Na 119 charge
Ni 0.0125
Pb 0.0025
S(6)      84 as SO4
Sb 0.0009
Se 0.0015
U         0.0015
V         0.0009
Zn 0.03
water     1 # kg
end

```

Beginning of initial solution calculations.

Initial solution 2. JSAI September 2015 average groundwater chemistry for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected between 1996 and 2013

-----Solution composition-----

Elements	Molality	Moles	
Ag	8.350e-08	8.350e-08	
Al	1.076e-06	1.076e-06	
Alkalinity	6.692e-03	6.692e-03	
As	3.072e-08	3.072e-08	
B	1.259e-05	1.259e-05	
Ba	6.486e-07	6.486e-07	
Ca	2.142e-03	2.142e-03	
Cd	7.122e-09	7.122e-09	
Cl	1.383e-03	1.383e-03	
Co	1.359e-07	1.359e-07	
Cr	1.270e-07	1.270e-07	
Cu	9.607e-08	9.607e-08	
F	1.106e-04	1.106e-04	
Fe	2.652e-05	2.652e-05	
Hg	9.978e-12	9.978e-12	
K	7.577e-05	7.577e-05	
Mg	7.947e-04	7.947e-04	
Mn	1.202e-05	1.202e-05	
Mo	1.252e-07	1.252e-07	
Na	3.928e-03	3.928e-03	Charge balance
Ni	2.131e-07	2.131e-07	
Pb	1.207e-08	1.207e-08	
S(6)	8.751e-04	8.751e-04	
Sb	7.398e-09	7.398e-09	
Se	1.901e-08	1.901e-08	
U	6.307e-09	6.307e-09	
V	1.768e-08	1.768e-08	
Zn	4.591e-07	4.591e-07	

-----Description of solution-----

pH	=	7.850
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.264e-02
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	6.781e-03
Total CO2 (mol/kg)	=	6.781e-03
Temperature (°C)	=	25.00
Electrical balance (eq)	=	1.173e-17
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	11
Total H	=	1.110207e+02

Total O = 5.553078e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.010e-07	7.127e-07	-6.096	-6.147	-0.051	(0)
H+	1.583e-08	1.413e-08	-7.800	-7.850	-0.050	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	8.350e-08					
AgCl	3.403e-08	3.403e-08	-7.468	-7.468	0.000	(0)
Ag+	1.514e-08	1.351e-08	-7.820	-7.869	-0.050	(0)
Ag2Se	1.500e-08	1.500e-08	-7.824	-7.824	0.000	(0)
AgCl2-	4.173e-09	3.657e-09	-8.380	-8.437	-0.057	(0)
AgSO4-	1.379e-10	1.208e-10	-9.861	-9.918	-0.057	(0)
AgCl3-2	6.818e-12	4.021e-12	-11.166	-11.396	-0.229	(0)
AgF	3.142e-12	3.142e-12	-11.503	-11.503	0.000	(0)
AgOH	9.627e-13	9.627e-13	-12.017	-12.017	0.000	(0)
AgH2BO3	1.058e-13	1.058e-13	-12.976	-12.976	0.000	(0)
AgCl4-3	3.324e-14	1.013e-14	-13.478	-13.994	-0.516	(0)
AgSeO3-	6.912e-15	6.057e-15	-14.160	-14.218	-0.057	(0)
Ag (OH) 2-	7.650e-17	6.704e-17	-16.116	-16.174	-0.057	(0)
Ag (SeO3) 2-3	1.241e-22	3.784e-23	-21.906	-22.422	-0.516	(0)
Ag2MoO4	5.474e-24	5.474e-24	-23.262	-23.262	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-73.603	-74.520	-0.917	(0)
Al	1.076e-06					
Al (OH) 4-	1.064e-06	9.502e-07	-5.973	-6.022	-0.049	(0)
Al (OH) 3	1.059e-08	1.059e-08	-7.975	-7.975	0.000	(0)
Al (OH) 2+	8.315e-10	7.448e-10	-9.080	-9.128	-0.048	(0)
AlF3	7.345e-11	7.345e-11	-10.134	-10.134	0.000	(0)
AlF2+	7.034e-11	6.301e-11	-10.153	-10.201	-0.048	(0)
AlF4-	3.817e-12	3.408e-12	-11.418	-11.467	-0.049	(0)
AlF+2	2.655e-12	1.709e-12	-11.576	-11.767	-0.191	(0)
AlOH+2	2.043e-12	1.316e-12	-11.690	-11.881	-0.191	(0)
AlSO4+	7.193e-15	6.423e-15	-14.143	-14.192	-0.049	(0)
Al+3	5.161e-15	1.846e-15	-14.287	-14.734	-0.446	(0)
Al (SO4) 2-	3.455e-17	3.085e-17	-16.462	-16.511	-0.049	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-48.931	-49.447	-0.516	(0)
As (3)	8.661e-20					
H3AsO3	8.317e-20	8.317e-20	-19.080	-19.080	0.000	(0)
H2AsO3-	3.446e-21	3.020e-21	-20.463	-20.520	-0.057	(0)
HAsO3-2	3.306e-25	1.950e-25	-24.481	-24.710	-0.229	(0)
H4AsO3+	6.642e-28	5.820e-28	-27.178	-27.235	-0.057	(0)
AsO3-3	1.746e-30	5.321e-31	-29.758	-30.274	-0.516	(0)
As (5)	3.072e-08					
HAsO4-2	2.826e-08	1.667e-08	-7.549	-7.778	-0.229	(0)
H2AsO4-	2.450e-09	2.147e-09	-8.611	-8.668	-0.057	(0)
AsO4-3	1.224e-11	3.731e-12	-10.912	-11.428	-0.516	(0)
H3AsO4	5.255e-15	5.270e-15	-14.279	-14.278	0.001	(0)
B	1.259e-05					
H3BO3	1.198e-05	1.202e-05	-4.921	-4.920	0.001	(0)
H2BO3-	5.576e-07	4.941e-07	-6.254	-6.306	-0.052	(0)
CaH2BO3+	3.755e-08	3.327e-08	-7.425	-7.478	-0.052	(0)
MgH2BO3+	8.762e-09	7.764e-09	-8.057	-8.110	-0.052	(0)
NaH2BO3	2.729e-09	2.729e-09	-8.564	-8.564	0.000	(0)
BF (OH) 3-	5.011e-10	4.440e-10	-9.300	-9.353	-0.052	(0)
BaH2BO3+	6.776e-12	6.005e-12	-11.169	-11.222	-0.052	(0)
H5 (BO3) 2-	5.704e-12	5.055e-12	-11.244	-11.296	-0.052	(0)
AgH2BO3	1.058e-13	1.058e-13	-12.976	-12.976	0.000	(0)
BF2 (OH) 2-	7.008e-14	6.210e-14	-13.154	-13.207	-0.052	(0)
H8 (BO3) 3-	6.855e-15	6.075e-15	-14.164	-14.216	-0.052	(0)
BF3OH-	3.567e-20	3.161e-20	-19.448	-19.500	-0.052	(0)
BF4-	2.296e-25	2.035e-25	-24.639	-24.692	-0.052	(0)
Ba	6.486e-07					
Ba+2	6.210e-07	3.932e-07	-6.207	-6.405	-0.198	(0)
BaHCO3+	2.379e-08	2.135e-08	-7.624	-7.671	-0.047	(0)
BaCO3	3.805e-09	3.805e-09	-8.420	-8.420	0.000	(0)

BaH2BO3+	6.776e-12	6.005e-12	-11.169	-11.222	-0.052	(0)
BaOH+	1.368e-12	1.223e-12	-11.864	-11.912	-0.048	(0)
C (4)	6.781e-03					
HCO3-	6.347e-03	5.685e-03	-2.197	-2.245	-0.048	(0)
H2CO3	1.806e-04	1.806e-04	-3.743	-3.743	0.000	(0)
CaHCO3+	1.380e-04	1.239e-04	-3.860	-3.907	-0.047	(0)
CaCO3	3.500e-05	3.500e-05	-4.456	-4.456	0.000	(0)
CO3-2	2.980e-05	1.887e-05	-4.526	-4.724	-0.198	(0)
MgHCO3+	2.958e-05	2.636e-05	-4.529	-4.579	-0.050	(0)
NaHCO3	1.114e-05	1.114e-05	-4.953	-4.953	0.000	(0)
MgCO3	7.112e-06	7.112e-06	-5.148	-5.148	0.000	(0)
NaCO3-	1.367e-06	1.224e-06	-5.864	-5.912	-0.048	(0)
MnHCO3+	7.982e-07	7.140e-07	-6.098	-6.146	-0.048	(0)
ZnCO3	1.626e-07	1.626e-07	-6.789	-6.789	0.000	(0)
CuCO3	8.486e-08	8.486e-08	-7.071	-7.071	0.000	(0)
NiHCO3+	5.345e-08	4.684e-08	-7.272	-7.329	-0.057	(0)
NiCO3	4.705e-08	4.705e-08	-7.327	-7.327	0.000	(0)
ZnHCO3+	3.072e-08	2.692e-08	-7.513	-7.570	-0.057	(0)
CoHCO3+	2.603e-08	2.281e-08	-7.585	-7.642	-0.057	(0)
BaHCO3+	2.379e-08	2.135e-08	-7.624	-7.671	-0.047	(0)
CoCO3	1.645e-08	1.645e-08	-7.784	-7.784	0.000	(0)
PbCO3	9.685e-09	9.685e-09	-8.014	-8.014	0.000	(0)
FeHCO3+	9.130e-09	8.194e-09	-8.040	-8.086	-0.047	(0)
Cu (CO3) 2-2	7.308e-09	4.310e-09	-8.136	-8.366	-0.229	(0)
UO2 (CO3) 3-4	5.181e-09	6.267e-10	-8.286	-9.203	-0.917	(0)
BaCO3	3.805e-09	3.805e-09	-8.420	-8.420	0.000	(0)
CdCO3	1.339e-09	1.339e-09	-8.873	-8.873	0.000	(0)
UO2 (CO3) 2-2	1.124e-09	6.627e-10	-8.949	-9.179	-0.229	(0)
Pb (CO3) 2-2	8.937e-10	5.271e-10	-9.049	-9.278	-0.229	(0)
PbHCO3+	8.231e-10	7.213e-10	-9.085	-9.142	-0.057	(0)
CuHCO3+	3.126e-10	2.740e-10	-9.505	-9.562	-0.057	(0)
CdHCO3+	4.600e-11	4.031e-11	-10.337	-10.395	-0.057	(0)
Cd (CO3) 2-2	3.177e-11	1.874e-11	-10.498	-10.727	-0.229	(0)
UO2CO3	1.760e-12	1.760e-12	-11.754	-11.754	0.000	(0)
HgCO3	2.441e-18	2.441e-18	-17.612	-17.612	0.000	(0)
Hg (CO3) 2-2	2.470e-19	1.457e-19	-18.607	-18.837	-0.229	(0)
HgHCO3+	7.327e-22	6.421e-22	-21.135	-21.192	-0.057	(0)
Ca	2.142e-03					
Ca+2	1.848e-03	1.170e-03	-2.733	-2.932	-0.198	(0)
CaHCO3+	1.380e-04	1.239e-04	-3.860	-3.907	-0.047	(0)
CaSO4	1.202e-04	1.202e-04	-3.920	-3.920	0.000	(0)
CaCO3	3.500e-05	3.500e-05	-4.456	-4.456	0.000	(0)
CaF+	1.322e-06	1.183e-06	-5.879	-5.927	-0.048	(0)
CaH2BO3+	3.755e-08	3.327e-08	-7.425	-7.478	-0.052	(0)
CaOH+	1.854e-08	1.664e-08	-7.732	-7.779	-0.047	(0)
Cd	7.122e-09					
Cd+2	4.918e-09	3.114e-09	-8.308	-8.507	-0.198	(0)
CdCO3	1.339e-09	1.339e-09	-8.873	-8.873	0.000	(0)
CdCl+	4.187e-10	3.669e-10	-9.378	-9.435	-0.057	(0)
CdSO4	3.272e-10	3.272e-10	-9.485	-9.485	0.000	(0)
CdHCO3+	4.600e-11	4.031e-11	-10.337	-10.395	-0.057	(0)
Cd (CO3) 2-2	3.177e-11	1.874e-11	-10.498	-10.727	-0.229	(0)
CdOH+	2.012e-11	1.763e-11	-10.696	-10.754	-0.057	(0)
CdOHC1	1.073e-11	1.073e-11	-10.970	-10.970	0.000	(0)
CdF+	5.215e-12	4.570e-12	-11.283	-11.340	-0.057	(0)
Cd (SO4) 2-2	3.355e-12	1.978e-12	-11.474	-11.704	-0.229	(0)
CdCl2	1.887e-12	1.887e-12	-11.724	-11.724	0.000	(0)
Cd (OH) 2	7.927e-14	7.927e-14	-13.101	-13.101	0.000	(0)
CdCl3-	1.677e-15	1.469e-15	-14.776	-14.833	-0.057	(0)
CdF2	8.443e-16	8.443e-16	-15.074	-15.074	0.000	(0)
Cd (OH) 3-	3.939e-18	3.451e-18	-17.405	-17.462	-0.057	(0)
Cd2OH+3	9.028e-19	2.752e-19	-18.044	-18.560	-0.516	(0)
CdSeO4	2.506e-20	2.506e-20	-19.601	-19.601	0.000	(0)
Cd (SeO3) 2-2	2.118e-21	1.249e-21	-20.674	-20.903	-0.229	(0)
Cd (OH) 4-2	6.827e-25	4.026e-25	-24.166	-24.395	-0.229	(0)
Cl	1.383e-03					
Cl-	1.383e-03	1.234e-03	-2.859	-2.909	-0.050	(0)
AgCl	3.403e-08	3.403e-08	-7.468	-7.468	0.000	(0)

MnCl+	1.093e-08	9.777e-09	-7.961	-8.010	-0.048	(0)
AgCl2-	4.173e-09	3.657e-09	-8.380	-8.437	-0.057	(0)
ZnCl+	5.206e-10	4.640e-10	-9.284	-9.333	-0.050	(0)
ZnOHC1	4.329e-10	4.329e-10	-9.364	-9.364	0.000	(0)
CdCl+	4.187e-10	3.669e-10	-9.378	-9.435	-0.057	(0)
CoCl+	2.512e-10	2.201e-10	-9.600	-9.657	-0.057	(0)
NiCl+	2.407e-10	2.110e-10	-9.618	-9.676	-0.057	(0)
CuCl	5.811e-11	5.811e-11	-10.236	-10.236	0.000	(0)
MnCl2	1.704e-11	1.704e-11	-10.769	-10.769	0.000	(0)
CuCl2-	1.680e-11	1.498e-11	-10.775	-10.825	-0.050	(0)
CdOHC1	1.073e-11	1.073e-11	-10.970	-10.970	0.000	(0)
PbCl+	8.530e-12	7.475e-12	-11.069	-11.126	-0.057	(0)
AgCl3-2	6.818e-12	4.021e-12	-11.166	-11.396	-0.229	(0)
CdCl2	1.887e-12	1.887e-12	-11.724	-11.724	0.000	(0)
CuCl+	1.676e-12	1.494e-12	-11.776	-11.826	-0.050	(0)
ZnCl2	9.074e-13	9.074e-13	-12.042	-12.042	0.000	(0)
PbCl2	4.120e-14	4.120e-14	-13.385	-13.385	0.000	(0)
AgCl4-3	3.324e-14	1.013e-14	-13.478	-13.994	-0.516	(0)
MnCl3-	6.473e-15	5.791e-15	-14.189	-14.237	-0.048	(0)
CuCl3-2	6.170e-15	3.951e-15	-14.210	-14.403	-0.194	(0)
CdCl3-	1.677e-15	1.469e-15	-14.776	-14.833	-0.057	(0)
NiCl2	1.311e-15	1.311e-15	-14.883	-14.883	0.000	(0)
ZnCl3-	9.977e-16	8.893e-16	-15.001	-15.051	-0.050	(0)
CuCl2	6.390e-16	6.390e-16	-15.195	-15.195	0.000	(0)
CrCl+2	1.756e-16	1.036e-16	-15.755	-15.985	-0.229	(0)
HgClOH	1.679e-16	1.679e-16	-15.775	-15.775	0.000	(0)
PbCl3-	2.309e-17	2.024e-17	-16.637	-16.694	-0.057	(0)
HgCl2	1.646e-17	1.646e-17	-16.784	-16.784	0.000	(0)
FeCl+2	6.189e-18	3.963e-18	-17.208	-17.402	-0.194	(0)
CrOHC12	1.731e-18	1.731e-18	-17.762	-17.762	0.000	(0)
ZnCl4-2	8.568e-19	5.486e-19	-18.067	-18.261	-0.194	(0)
HgCl3-	2.317e-19	2.030e-19	-18.635	-18.692	-0.057	(0)
UO2Cl+	5.351e-20	4.689e-20	-19.272	-19.329	-0.057	(0)
FeCl2+	2.442e-20	2.184e-20	-19.612	-19.661	-0.048	(0)
PbCl4-2	1.935e-20	1.141e-20	-19.713	-19.943	-0.229	(0)
CrCl2+	1.384e-20	1.213e-20	-19.859	-19.916	-0.057	(0)
CuCl3-	8.254e-21	7.357e-21	-20.083	-20.133	-0.050	(0)
HgCl+	3.037e-21	2.661e-21	-20.518	-20.575	-0.057	(0)
HgCl4-2	1.691e-21	9.974e-22	-20.772	-21.001	-0.229	(0)
VOCl+	3.078e-22	2.697e-22	-21.512	-21.569	-0.057	(0)
FeCl3	2.695e-24	2.695e-24	-23.569	-23.569	0.000	(0)
CuCl4-2	7.105e-26	4.550e-26	-25.148	-25.342	-0.194	(0)
CrO3Cl-	2.655e-27	2.326e-27	-26.576	-26.633	-0.057	(0)
CoCl+2	8.741e-37	5.155e-37	-36.058	-36.288	-0.229	(0)
UCl+3	0.000e+00	0.000e+00	-47.507	-48.023	-0.516	(0)
Co (2)	1.359e-07					
Co+2	8.746e-08	5.158e-08	-7.058	-7.288	-0.229	(0)
CoHCO3+	2.603e-08	2.281e-08	-7.585	-7.642	-0.057	(0)
CoCO3	1.645e-08	1.645e-08	-7.784	-7.784	0.000	(0)
CoSO4	4.613e-09	4.613e-09	-8.336	-8.336	0.000	(0)
CoOH+	8.369e-10	7.334e-10	-9.077	-9.135	-0.057	(0)
CoCl+	2.512e-10	2.201e-10	-9.600	-9.657	-0.057	(0)
CoF+	1.723e-10	1.510e-10	-9.764	-9.821	-0.057	(0)
Co (OH) 2	4.152e-11	4.152e-11	-10.382	-10.382	0.000	(0)
Co (OH) 3-	6.737e-16	5.904e-16	-15.172	-15.229	-0.057	(0)
CoOOH-	1.691e-16	1.482e-16	-15.772	-15.829	-0.057	(0)
Co2OH+3	6.220e-18	1.896e-18	-17.206	-17.722	-0.516	(0)
CoSeO4	1.117e-18	1.117e-18	-17.952	-17.952	0.000	(0)
Co (OH) 4-2	1.131e-22	6.668e-23	-21.947	-22.176	-0.229	(0)
Co4 (OH) 4+4	4.772e-28	5.773e-29	-27.321	-28.239	-0.917	(0)
Co (3)	1.261e-29					
CoOH+2	1.261e-29	7.436e-30	-28.899	-29.129	-0.229	(0)
Co+3	5.740e-36	2.053e-36	-35.241	-35.688	-0.446	(0)
CoCl+2	8.741e-37	5.155e-37	-36.058	-36.288	-0.229	(0)
Cr (2)	2.627e-24					
Cr+2	2.627e-24	1.550e-24	-23.580	-23.810	-0.229	(0)
Cr (3)	1.270e-07					
Cr (OH) 2+	1.001e-07	8.769e-08	-7.000	-7.057	-0.057	(0)

Cr (OH) 3	2.348e-08	2.348e-08	-7.629	-7.629	0.000	(0)
Cr (OH) +2	1.715e-09	1.011e-09	-8.766	-8.995	-0.229	(0)
CrO2-	9.009e-10	7.895e-10	-9.045	-9.103	-0.057	(0)
Cr (OH) 4-	7.601e-10	6.661e-10	-9.119	-9.176	-0.057	(0)
CrHSO4	1.076e-10	1.076e-10	-9.968	-9.968	0.000	(0)
CrF+2	1.614e-12	9.518e-13	-11.792	-12.021	-0.229	(0)
Cr+3	2.128e-13	6.486e-14	-12.672	-13.188	-0.516	(0)
CrSO4+	7.747e-14	6.789e-14	-13.111	-13.168	-0.057	(0)
CrCl+2	1.756e-16	1.036e-16	-15.755	-15.985	-0.229	(0)
Cr2 (OH) 2SO4+2	1.667e-17	9.832e-18	-16.778	-17.007	-0.229	(0)
CrOHC12	1.731e-18	1.731e-18	-17.762	-17.762	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.618e-19	2.618e-19	-18.582	-18.582	0.000	(0)
CrCl2+	1.384e-20	1.213e-20	-19.859	-19.916	-0.057	(0)
Cr (6)	7.666e-16					
CrO4-2	7.331e-16	4.642e-16	-15.135	-15.333	-0.198	(0)
HCrO4-	2.421e-17	2.122e-17	-16.616	-16.673	-0.057	(0)
NaCrO4-	9.173e-18	8.039e-18	-17.037	-17.095	-0.057	(0)
KCrO4-	1.326e-19	1.162e-19	-18.877	-18.935	-0.057	(0)
H2CrO4	2.430e-25	2.430e-25	-24.614	-24.614	0.000	(0)
CrO3SO4-2	6.940e-26	4.093e-26	-25.159	-25.388	-0.229	(0)
CrO3Cl-	2.655e-27	2.326e-27	-26.576	-26.633	-0.057	(0)
Cr2O7-2	2.648e-32	1.562e-32	-31.577	-31.806	-0.229	(0)
Cu (1)	1.176e-10					
CuCl	5.811e-11	5.811e-11	-10.236	-10.236	0.000	(0)
Cu+	4.269e-11	3.741e-11	-10.370	-10.427	-0.057	(0)
CuCl2-	1.680e-11	1.498e-11	-10.775	-10.825	-0.050	(0)
CuCl3-2	6.170e-15	3.951e-15	-14.210	-14.403	-0.194	(0)
Cu (2)	9.595e-08					
CuCO3	8.486e-08	8.486e-08	-7.071	-7.071	0.000	(0)
Cu (CO3) 2-2	7.308e-09	4.310e-09	-8.136	-8.366	-0.229	(0)
CuOH+	1.931e-09	1.721e-09	-8.714	-8.764	-0.050	(0)
Cu+2	1.206e-09	7.638e-10	-8.919	-9.117	-0.198	(0)
CuHCO3+	3.126e-10	2.740e-10	-9.505	-9.562	-0.057	(0)
Cu (OH) 2	2.448e-10	2.448e-10	-9.611	-9.611	0.000	(0)
CuSO4	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)
CuF+	5.092e-12	4.462e-12	-11.293	-11.350	-0.057	(0)
CuCl+	1.676e-12	1.494e-12	-11.776	-11.826	-0.050	(0)
Cu (OH) 3-	4.083e-13	3.578e-13	-12.389	-12.446	-0.057	(0)
Cu2 (OH) 2+2	1.262e-13	7.442e-14	-12.899	-13.128	-0.229	(0)
CuCl2	6.390e-16	6.390e-16	-15.195	-15.195	0.000	(0)
Cu (OH) 4-2	3.403e-18	2.007e-18	-17.468	-17.698	-0.229	(0)
CuCl3-	8.254e-21	7.357e-21	-20.083	-20.133	-0.050	(0)
CuCl4-2	7.105e-26	4.550e-26	-25.148	-25.342	-0.194	(0)
F	1.106e-04					
F-	1.038e-04	9.259e-05	-3.984	-4.033	-0.050	(0)
MgF+	5.272e-06	4.708e-06	-5.278	-5.327	-0.049	(0)
CaF+	1.322e-06	1.183e-06	-5.879	-5.927	-0.048	(0)
NaF	2.036e-07	2.036e-07	-6.691	-6.691	0.000	(0)
MnF+	2.594e-08	2.320e-08	-7.586	-7.634	-0.048	(0)
HF	1.934e-09	1.934e-09	-8.713	-8.713	0.000	(0)
BF (OH) 3-	5.011e-10	4.440e-10	-9.300	-9.353	-0.052	(0)
ZnF+	3.156e-10	2.766e-10	-9.501	-9.558	-0.057	(0)
NiF+	1.774e-10	1.554e-10	-9.751	-9.808	-0.057	(0)
CoF+	1.723e-10	1.510e-10	-9.764	-9.821	-0.057	(0)
AlF3	7.345e-11	7.345e-11	-10.134	-10.134	0.000	(0)
AlF2+	7.034e-11	6.301e-11	-10.153	-10.201	-0.048	(0)
CdF+	5.215e-12	4.570e-12	-11.283	-11.340	-0.057	(0)
CuF+	5.092e-12	4.462e-12	-11.293	-11.350	-0.057	(0)
AlF4-	3.817e-12	3.408e-12	-11.418	-11.467	-0.049	(0)
AgF	3.142e-12	3.142e-12	-11.503	-11.503	0.000	(0)
AlF+2	2.655e-12	1.709e-12	-11.576	-11.767	-0.191	(0)
CrF+2	1.614e-12	9.518e-13	-11.792	-12.021	-0.229	(0)
PbF+	1.271e-12	1.114e-12	-11.896	-11.953	-0.057	(0)
HF2-	7.654e-13	6.810e-13	-12.116	-12.167	-0.051	(0)
BF2 (OH) 2-	7.008e-14	6.210e-14	-13.154	-13.207	-0.052	(0)
FeF2+	2.991e-14	2.675e-14	-13.524	-13.573	-0.048	(0)
FeF+2	1.686e-14	1.080e-14	-13.773	-13.967	-0.194	(0)
FeF3	3.495e-15	3.495e-15	-14.457	-14.457	0.000	(0)

PbF2	2.030e-15	2.030e-15	-14.693	-14.693	0.000	(0)
CdF2	8.443e-16	8.443e-16	-15.074	-15.074	0.000	(0)
UO2F+	3.418e-16	2.995e-16	-15.466	-15.524	-0.057	(0)
UO2F2	7.998e-17	7.998e-17	-16.097	-16.097	0.000	(0)
H2F2	1.003e-17	1.003e-17	-16.999	-16.999	0.000	(0)
VO2F	7.927e-18	7.927e-18	-17.101	-17.101	0.000	(0)
UO2F3-	2.123e-18	1.860e-18	-17.673	-17.730	-0.057	(0)
PbF3-	4.068e-19	3.565e-19	-18.391	-18.448	-0.057	(0)
VO2F2-	3.041e-19	2.665e-19	-18.517	-18.574	-0.057	(0)
VOF+	4.938e-20	4.327e-20	-19.306	-19.364	-0.057	(0)
BF3OH-	3.567e-20	3.161e-20	-19.448	-19.500	-0.052	(0)
UO2F4-2	2.320e-21	1.368e-21	-20.635	-20.864	-0.229	(0)
VOF2	1.502e-21	1.502e-21	-20.823	-20.823	0.000	(0)
VO2F3-2	5.219e-22	3.078e-22	-21.282	-21.512	-0.229	(0)
PbF4-2	2.679e-23	1.580e-23	-22.572	-22.801	-0.229	(0)
VOF3-	5.632e-24	4.936e-24	-23.249	-23.307	-0.057	(0)
Sb(OH) 2F	8.908e-25	8.908e-25	-24.050	-24.050	0.000	(0)
SbOF	8.761e-25	8.761e-25	-24.057	-24.057	0.000	(0)
BF4-	2.296e-25	2.035e-25	-24.639	-24.692	-0.052	(0)
VO2F4-3	4.600e-26	1.402e-26	-25.337	-25.853	-0.516	(0)
VOF4-2	3.128e-27	1.845e-27	-26.505	-26.734	-0.229	(0)
HgF+	4.234e-28	3.710e-28	-27.373	-27.431	-0.057	(0)
UF3+	5.535e-38	4.850e-38	-37.257	-37.314	-0.057	(0)
UF2+2	5.604e-39	3.305e-39	-38.251	-38.481	-0.229	(0)
UF4	4.924e-40	4.924e-40	-39.308	-39.308	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.031	-41.547	-0.516	(0)
UF5-	0.000e+00	0.000e+00	-41.686	-41.743	-0.057	(0)
UF6-2	0.000e+00	0.000e+00	-43.067	-43.297	-0.229	(0)
Fe (2)	2.195e-07					
Fe+2	1.941e-07	1.145e-07	-6.712	-6.941	-0.229	(0)
FeSO4	1.260e-08	1.260e-08	-7.900	-7.900	0.000	(0)
FeHCO3+	9.130e-09	8.194e-09	-8.040	-8.086	-0.047	(0)
FeOH+	3.631e-09	3.248e-09	-8.440	-8.488	-0.048	(0)
Fe(OH) 2	1.839e-12	1.839e-12	-11.735	-11.735	0.000	(0)
Fe(OH) 3-	4.633e-13	4.144e-13	-12.334	-12.383	-0.048	(0)
Fe (3)	2.630e-05					
Fe(OH) 2+	1.515e-05	1.357e-05	-4.820	-4.867	-0.048	(0)
Fe(OH) 3	1.039e-05	1.039e-05	-4.984	-4.984	0.000	(0)
Fe(OH) 4-	7.693e-07	6.891e-07	-6.114	-6.162	-0.048	(0)
FeOH+2	7.643e-11	4.894e-11	-10.117	-10.310	-0.194	(0)
FeF2+	2.991e-14	2.675e-14	-13.524	-13.573	-0.048	(0)
FeF+2	1.686e-14	1.080e-14	-13.773	-13.967	-0.194	(0)
FeF3	3.495e-15	3.495e-15	-14.457	-14.457	0.000	(0)
FeSO4+	5.979e-16	5.349e-16	-15.223	-15.272	-0.048	(0)
Fe+3	2.973e-16	1.064e-16	-15.527	-15.973	-0.446	(0)
FeCl+2	6.189e-18	3.963e-18	-17.208	-17.402	-0.194	(0)
Fe(SO4) 2-	5.849e-18	5.126e-18	-17.233	-17.290	-0.057	(0)
Fe2(OH) 2+4	6.556e-19	7.930e-20	-18.183	-19.101	-0.917	(0)
FeCl2+	2.442e-20	2.184e-20	-19.612	-19.661	-0.048	(0)
FeHSeO3+2	1.180e-21	6.957e-22	-20.928	-21.158	-0.229	(0)
Fe3(OH) 4+5	4.219e-22	1.555e-23	-21.375	-22.808	-1.433	(0)
FeCl3	2.695e-24	2.695e-24	-23.569	-23.569	0.000	(0)
H (0)	2.817e-27					
H2	1.408e-27	1.413e-27	-26.851	-26.850	0.001	(0)
Hg (0)	9.978e-12					
Hg	9.978e-12	9.978e-12	-11.001	-11.001	0.000	(0)
Hg (1)	2.483e-27					
Hg2+2	1.242e-27	7.323e-28	-26.906	-27.135	-0.229	(0)
Hg (2)	5.327e-16					
Hg(OH) 2	3.454e-16	3.464e-16	-15.462	-15.460	0.001	(0)
HgClOH	1.679e-16	1.679e-16	-15.775	-15.775	0.000	(0)
HgCl2	1.646e-17	1.646e-17	-16.784	-16.784	0.000	(0)
HgCO3	2.441e-18	2.441e-18	-17.612	-17.612	0.000	(0)
Hg(CO3) 2-2	2.470e-19	1.457e-19	-18.607	-18.837	-0.229	(0)
HgCl3-	2.317e-19	2.030e-19	-18.635	-18.692	-0.057	(0)
HgOH+	3.500e-21	3.067e-21	-20.456	-20.513	-0.057	(0)
HgCl+	3.037e-21	2.661e-21	-20.518	-20.575	-0.057	(0)
HgCl4-2	1.691e-21	9.974e-22	-20.772	-21.001	-0.229	(0)

	HgHCO3+	7.327e-22	6.421e-22	-21.135	-21.192	-0.057	(0)
	Hg (OH) 3-	3.547e-23	3.108e-23	-22.450	-22.508	-0.057	(0)
	Hg+2	1.833e-25	1.081e-25	-24.737	-24.966	-0.229	(0)
	HgSO4	1.269e-26	1.269e-26	-25.897	-25.897	0.000	(0)
	HgF+	4.234e-28	3.710e-28	-27.373	-27.431	-0.057	(0)
K		7.577e-05					
	K+	7.553e-05	6.737e-05	-4.122	-4.172	-0.050	(0)
	KSO4-	2.387e-07	2.138e-07	-6.622	-6.670	-0.048	(0)
	KCrO4-	1.326e-19	1.162e-19	-18.877	-18.935	-0.057	(0)
Mg		7.947e-04					
	Mg+2	7.156e-04	4.532e-04	-3.145	-3.344	-0.198	(0)
	MgSO4	3.696e-05	3.696e-05	-4.432	-4.432	0.000	(0)
	MgHCO3+	2.958e-05	2.636e-05	-4.529	-4.579	-0.050	(0)
	MgCO3	7.112e-06	7.112e-06	-5.148	-5.148	0.000	(0)
	MgF+	5.272e-06	4.708e-06	-5.278	-5.327	-0.049	(0)
	MgOH+	1.430e-07	1.286e-07	-6.845	-6.891	-0.046	(0)
	MgH2BO3+	8.762e-09	7.764e-09	-8.057	-8.110	-0.052	(0)
Mn (2)		1.202e-05					
	Mn+2	1.067e-05	6.295e-06	-4.972	-5.201	-0.229	(0)
	MnHCO3+	7.982e-07	7.140e-07	-6.098	-6.146	-0.048	(0)
	MnSO4	5.017e-07	5.017e-07	-6.300	-6.300	0.000	(0)
	MnF+	2.594e-08	2.320e-08	-7.586	-7.634	-0.048	(0)
	MnOH+	1.260e-08	1.127e-08	-7.900	-7.948	-0.048	(0)
	MnCl+	1.093e-08	9.777e-09	-7.961	-8.010	-0.048	(0)
	MnCl2	1.704e-11	1.704e-11	-10.769	-10.769	0.000	(0)
	MnCl3-	6.473e-15	5.791e-15	-14.189	-14.237	-0.048	(0)
	MnSeO4	7.320e-17	7.320e-17	-16.135	-16.135	0.000	(0)
	Mn (OH) 3-	3.954e-17	3.537e-17	-16.403	-16.451	-0.048	(0)
	Mn (OH) 4-2	1.271e-22	8.138e-23	-21.896	-22.089	-0.194	(0)
	MnSe	2.618e-38	2.618e-38	-37.582	-37.582	0.000	(0)
Mn (3)		7.860e-27					
	Mn+3	7.860e-27	2.812e-27	-26.105	-26.551	-0.446	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-44.630	-44.823	-0.194	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-50.144	-50.195	-0.052	(0)
Mo		1.252e-07					
	MoO4-2	1.251e-07	7.925e-08	-6.903	-7.101	-0.198	(0)
	HMoO4-	2.542e-11	2.227e-11	-10.595	-10.652	-0.057	(0)
	H2MoO4	2.305e-15	2.305e-15	-14.637	-14.637	0.000	(0)
	Ag2MoO4	5.474e-24	5.474e-24	-23.262	-23.262	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-48.931	-49.447	-0.516	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-57.452	-59.517	-2.064	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-59.546	-60.980	-1.433	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-63.130	-64.048	-0.917	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-68.136	-68.652	-0.516	(0)
Na		3.928e-03					
	Na+	3.906e-03	3.485e-03	-2.408	-2.458	-0.050	(0)
	NaHCO3	1.114e-05	1.114e-05	-4.953	-4.953	0.000	(0)
	NaSO4-	9.364e-06	8.388e-06	-5.029	-5.076	-0.048	(0)
	NaCO3-	1.367e-06	1.224e-06	-5.864	-5.912	-0.048	(0)
	NaF	2.036e-07	2.036e-07	-6.691	-6.691	0.000	(0)
	NaH2BO3	2.729e-09	2.729e-09	-8.564	-8.564	0.000	(0)
	NaCrO4-	9.173e-18	8.039e-18	-17.037	-17.095	-0.057	(0)
Ni		2.131e-07					
	Ni+2	1.055e-07	6.683e-08	-6.977	-7.175	-0.198	(0)
	NiHCO3+	5.345e-08	4.684e-08	-7.272	-7.329	-0.057	(0)
	NiCO3	4.705e-08	4.705e-08	-7.327	-7.327	0.000	(0)
	NiSO4	5.977e-09	5.977e-09	-8.224	-8.224	0.000	(0)
	NiOH+	6.842e-10	5.996e-10	-9.165	-9.222	-0.057	(0)
	NiCl+	2.407e-10	2.110e-10	-9.618	-9.676	-0.057	(0)
	NiF+	1.774e-10	1.554e-10	-9.751	-9.808	-0.057	(0)
	Ni (OH) 2	3.394e-11	3.394e-11	-10.469	-10.469	0.000	(0)
	Ni (SO4) 2-2	1.504e-13	8.871e-14	-12.823	-13.052	-0.229	(0)
	Ni (OH) 3-	2.760e-14	2.419e-14	-13.559	-13.616	-0.057	(0)
	NiCl2	1.311e-15	1.311e-15	-14.883	-14.883	0.000	(0)
	NiSeO4	1.351e-18	1.351e-18	-17.869	-17.869	0.000	(0)
O (0)		5.064e-39					

O2	2.532e-39	2.539e-39	-38.597	-38.595	0.001	(0)
Pb	1.207e-08					
PbCO3	9.685e-09	9.685e-09	-8.014	-8.014	0.000	(0)
Pb (CO3) 2-2	8.937e-10	5.271e-10	-9.049	-9.278	-0.229	(0)
PbHCO3+	8.231e-10	7.213e-10	-9.085	-9.142	-0.057	(0)
PbOH+	3.488e-10	3.057e-10	-9.457	-9.515	-0.057	(0)
Pb+2	2.696e-10	1.708e-10	-9.569	-9.768	-0.198	(0)
PbSO4	3.748e-11	3.748e-11	-10.426	-10.426	0.000	(0)
PbCl+	8.530e-12	7.475e-12	-11.069	-11.126	-0.057	(0)
Pb (OH) 2	6.889e-12	6.889e-12	-11.162	-11.162	0.000	(0)
PbF+	1.271e-12	1.114e-12	-11.896	-11.953	-0.057	(0)
Pb (SO4) 2-2	1.717e-13	1.012e-13	-12.765	-12.995	-0.229	(0)
PbCl2	4.120e-14	4.120e-14	-13.385	-13.385	0.000	(0)
Pb (OH) 3-	5.602e-15	4.909e-15	-14.252	-14.309	-0.057	(0)
PbF2	2.030e-15	2.030e-15	-14.693	-14.693	0.000	(0)
PbCl3-	2.309e-17	2.024e-17	-16.637	-16.694	-0.057	(0)
Pb2OH+3	2.714e-18	8.272e-19	-17.566	-18.082	-0.516	(0)
Pb (OH) 4-2	1.453e-18	8.568e-19	-17.838	-18.067	-0.229	(0)
PbF3-	4.068e-19	3.565e-19	-18.391	-18.448	-0.057	(0)
PbCl4-2	1.935e-20	1.141e-20	-19.713	-19.943	-0.229	(0)
Pb3 (OH) 4+2	2.741e-22	1.617e-22	-21.562	-21.791	-0.229	(0)
PbF4-2	2.679e-23	1.580e-23	-22.572	-22.801	-0.229	(0)
Pb4 (OH) 4+4	1.813e-27	2.193e-28	-26.742	-27.659	-0.917	(0)
S (6)	8.751e-04					
SO4-2	7.078e-04	4.482e-04	-3.150	-3.349	-0.198	(0)
CaSO4	1.202e-04	1.202e-04	-3.920	-3.920	0.000	(0)
MgSO4	3.696e-05	3.696e-05	-4.432	-4.432	0.000	(0)
NaSO4-	9.364e-06	8.388e-06	-5.029	-5.076	-0.048	(0)
MnSO4	5.017e-07	5.017e-07	-6.300	-6.300	0.000	(0)
KSO4-	2.387e-07	2.138e-07	-6.622	-6.670	-0.048	(0)
ZnSO4	1.468e-08	1.468e-08	-7.833	-7.833	0.000	(0)
FeSO4	1.260e-08	1.260e-08	-7.900	-7.900	0.000	(0)
NiSO4	5.977e-09	5.977e-09	-8.224	-8.224	0.000	(0)
CoSO4	4.613e-09	4.613e-09	-8.336	-8.336	0.000	(0)
HSO4-	6.929e-10	6.187e-10	-9.159	-9.209	-0.049	(0)
CdSO4	3.272e-10	3.272e-10	-9.485	-9.485	0.000	(0)
AgSO4-	1.379e-10	1.208e-10	-9.861	-9.918	-0.057	(0)
CrOHSO4	1.076e-10	1.076e-10	-9.968	-9.968	0.000	(0)
Zn (SO4) 2-2	9.718e-11	5.731e-11	-10.012	-10.242	-0.229	(0)
CuSO4	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)
PbSO4	3.748e-11	3.748e-11	-10.426	-10.426	0.000	(0)
Cd (SO4) 2-2	3.355e-12	1.978e-12	-11.474	-11.704	-0.229	(0)
Pb (SO4) 2-2	1.717e-13	1.012e-13	-12.765	-12.995	-0.229	(0)
Ni (SO4) 2-2	1.504e-13	8.871e-14	-12.823	-13.052	-0.229	(0)
CrSO4+	7.747e-14	6.789e-14	-13.111	-13.168	-0.057	(0)
AlSO4+	7.193e-15	6.423e-15	-14.143	-14.192	-0.049	(0)
FeSO4+	5.979e-16	5.349e-16	-15.223	-15.272	-0.048	(0)
Al (SO4) 2-	3.455e-17	3.085e-17	-16.462	-16.511	-0.049	(0)
Cr2 (OH) 2SO4+2	1.667e-17	9.832e-18	-16.778	-17.007	-0.229	(0)
UO2SO4	1.590e-17	1.590e-17	-16.799	-16.799	0.000	(0)
Fe (SO4) 2-	5.849e-18	5.126e-18	-17.233	-17.290	-0.057	(0)
VO2SO4-	5.962e-19	5.224e-19	-18.225	-18.282	-0.057	(0)
Cr2 (OH) 2 (SO4) 2	2.618e-19	2.618e-19	-18.582	-18.582	0.000	(0)
UO2 (SO4) 2-2	1.593e-19	9.393e-20	-18.798	-19.027	-0.229	(0)
VOSO4	9.619e-21	9.619e-21	-20.017	-20.017	0.000	(0)
CrO3SO4-2	6.940e-26	4.093e-26	-25.159	-25.388	-0.229	(0)
HgSO4	1.269e-26	1.269e-26	-25.897	-25.897	0.000	(0)
VSO4+	1.865e-34	1.634e-34	-33.729	-33.787	-0.057	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.011	-43.011	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.333	-43.562	-0.229	(0)
Sb (3)	8.616e-19					
Sb (OH) 3	4.359e-19	4.359e-19	-18.361	-18.361	0.000	(0)
HSbO2	4.256e-19	4.256e-19	-18.371	-18.371	0.000	(0)
SbO2-	5.568e-23	4.880e-23	-22.254	-22.312	-0.057	(0)
Sb (OH) 4-	3.189e-23	2.795e-23	-22.496	-22.554	-0.057	(0)
Sb (OH) 2F	8.908e-25	8.908e-25	-24.050	-24.050	0.000	(0)
SbOF	8.761e-25	8.761e-25	-24.057	-24.057	0.000	(0)
Sb (OH) 2+	1.707e-25	1.496e-25	-24.768	-24.825	-0.057	(0)

SbO+	5.885e-26	5.157e-26	-25.230	-25.288	-0.057	(0)
Sb (5)	7.398e-09					
SbO3-	7.389e-09	6.476e-09	-8.131	-8.189	-0.057	(0)
Sb (OH) 6-	8.485e-12	7.569e-12	-11.071	-11.121	-0.050	(0)
SbO2+	4.230e-25	3.707e-25	-24.374	-24.431	-0.057	(0)
Se (-2)	1.500e-08					
Ag2Se	1.500e-08	1.500e-08	-7.824	-7.824	0.000	(0)
HSe-	1.627e-35	1.426e-35	-34.789	-34.846	-0.057	(0)
MnSe	2.618e-38	2.618e-38	-37.582	-37.582	0.000	(0)
H2Se	1.563e-39	1.563e-39	-38.806	-38.806	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.767	-41.996	-0.229	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-73.603	-74.520	-0.917	(0)
Se (4)	4.008e-09					
HSeO3-	2.825e-09	2.476e-09	-8.549	-8.606	-0.057	(0)
SeO3-2	1.183e-09	6.977e-10	-8.927	-9.156	-0.229	(0)
H2SeO3	1.492e-14	1.492e-14	-13.826	-13.826	0.000	(0)
AgSeO3-	6.912e-15	6.057e-15	-14.160	-14.218	-0.057	(0)
Cd (SeO3) 2-2	2.118e-21	1.249e-21	-20.674	-20.903	-0.229	(0)
FeHSeO3+2	1.180e-21	6.957e-22	-20.928	-21.158	-0.229	(0)
Ag (SeO3) 2-3	1.241e-22	3.784e-23	-21.906	-22.422	-0.516	(0)
Se (6)	6.831e-14					
SeO4-2	6.823e-14	4.321e-14	-13.166	-13.364	-0.198	(0)
MnSeO4	7.320e-17	7.320e-17	-16.135	-16.135	0.000	(0)
NiSeO4	1.351e-18	1.351e-18	-17.869	-17.869	0.000	(0)
CoSeO4	1.117e-18	1.117e-18	-17.952	-17.952	0.000	(0)
ZnSeO4	1.002e-18	1.002e-18	-17.999	-17.999	0.000	(0)
HSeO4-	3.491e-20	3.059e-20	-19.457	-19.514	-0.057	(0)
CdSeO4	2.506e-20	2.506e-20	-19.601	-19.601	0.000	(0)
Zn (SeO4) 2-2	7.442e-32	4.389e-32	-31.128	-31.358	-0.229	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.094	-59.610	-0.516	(0)
U (4)	2.361e-21					
U (OH) 5-	2.359e-21	2.068e-21	-20.627	-20.685	-0.057	(0)
U (OH) 4	1.223e-24	1.223e-24	-23.912	-23.912	0.000	(0)
U (OH) 3+	7.212e-29	6.320e-29	-28.142	-28.199	-0.057	(0)
U (OH) 2+2	7.001e-34	4.129e-34	-33.155	-33.384	-0.229	(0)
UF3+	5.535e-38	4.850e-38	-37.257	-37.314	-0.057	(0)
UF2+2	5.604e-39	3.305e-39	-38.251	-38.481	-0.229	(0)
UOH+3	9.015e-40	2.748e-40	-39.045	-39.561	-0.516	(0)
UF4	4.924e-40	4.924e-40	-39.308	-39.308	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.031	-41.547	-0.516	(0)
UF5-	0.000e+00	0.000e+00	-41.686	-41.743	-0.057	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.011	-43.011	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-43.067	-43.297	-0.229	(0)
USO4+2	0.000e+00	0.000e+00	-43.333	-43.562	-0.229	(0)
U+4	0.000e+00	0.000e+00	-45.897	-46.814	-0.917	(0)
UCl+3	0.000e+00	0.000e+00	-47.507	-48.023	-0.516	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-175.646	-180.290	-4.644	(0)
U (5)	1.630e-18					
UO2+	1.630e-18	1.428e-18	-17.788	-17.845	-0.057	(0)
U (6)	6.307e-09					
UO2 (CO3) 3-4	5.181e-09	6.267e-10	-8.286	-9.203	-0.917	(0)
UO2 (CO3) 2-2	1.124e-09	6.627e-10	-8.949	-9.179	-0.229	(0)
UO2CO3	1.760e-12	1.760e-12	-11.754	-11.754	0.000	(0)
UO2OH+	2.399e-15	2.102e-15	-14.620	-14.677	-0.057	(0)
UO2F+	3.418e-16	2.995e-16	-15.466	-15.524	-0.057	(0)
UO2F2	7.998e-17	7.998e-17	-16.097	-16.097	0.000	(0)
UO2+2	3.700e-17	2.343e-17	-16.432	-16.630	-0.198	(0)
UO2SO4	1.590e-17	1.590e-17	-16.799	-16.799	0.000	(0)
UO2F3-	2.123e-18	1.860e-18	-17.673	-17.730	-0.057	(0)
UO2 (SO4) 2-2	1.593e-19	9.393e-20	-18.798	-19.027	-0.229	(0)
UO2Cl+	5.351e-20	4.689e-20	-19.272	-19.329	-0.057	(0)
UO2F4-2	2.320e-21	1.368e-21	-20.635	-20.864	-0.229	(0)
(UO2) 2 (OH) 2+2	1.244e-23	7.335e-24	-22.905	-23.135	-0.229	(0)
(UO2) 3 (OH) 5+	6.780e-27	5.942e-27	-26.169	-26.226	-0.057	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.002	-40.059	-0.057	(0)
V+2	0.000e+00	0.000e+00	-41.193	-41.422	-0.229	(0)

V (3)	2.255e-13					
V (OH) 3	2.255e-13	2.255e-13	-12.647	-12.647	0.000	(0)
V (OH) 2+	2.349e-24	2.058e-24	-23.629	-23.686	-0.057	(0)
VOH+2	4.677e-28	2.758e-28	-27.330	-27.559	-0.229	(0)
V+3	2.534e-33	7.723e-34	-32.596	-33.112	-0.516	(0)
VSO4+	1.865e-34	1.634e-34	-33.729	-33.787	-0.057	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-52.278	-52.794	-0.516	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.401	-54.319	-0.917	(0)
V (4)	1.283e-17					
V (OH) 3+	1.264e-17	1.108e-17	-16.898	-16.956	-0.057	(0)
VO+2	1.321e-19	7.792e-20	-18.879	-19.108	-0.229	(0)
VOF+	4.938e-20	4.327e-20	-19.306	-19.364	-0.057	(0)
VOSO4	9.619e-21	9.619e-21	-20.017	-20.017	0.000	(0)
VOF2	1.502e-21	1.502e-21	-20.823	-20.823	0.000	(0)
VOC1+	3.078e-22	2.697e-22	-21.512	-21.569	-0.057	(0)
VOF3-	5.632e-24	4.936e-24	-23.249	-23.307	-0.057	(0)
VOF4-2	3.128e-27	1.845e-27	-26.505	-26.734	-0.229	(0)
H2V2O4+2	1.043e-29	6.153e-30	-28.982	-29.211	-0.229	(0)
V (5)	1.768e-08					
H2VO4-	1.398e-08	1.225e-08	-7.854	-7.912	-0.057	(0)
HVO4-2	3.695e-09	2.179e-09	-8.432	-8.662	-0.229	(0)
H3VO4	1.731e-12	1.731e-12	-11.762	-11.762	0.000	(0)
H3V2O7-	1.563e-13	1.370e-13	-12.806	-12.863	-0.057	(0)
HV2O7-3	2.970e-14	9.051e-15	-13.527	-14.043	-0.516	(0)
VO4-3	2.537e-15	7.732e-16	-14.596	-15.112	-0.516	(0)
V2O7-4	1.426e-16	1.725e-17	-15.846	-16.763	-0.917	(0)
VO2+	5.472e-17	4.881e-17	-16.262	-16.311	-0.050	(0)
VO2F	7.927e-18	7.927e-18	-17.101	-17.101	0.000	(0)
V3O9-3	6.328e-18	1.929e-18	-17.199	-17.715	-0.516	(0)
VO2SO4-	5.962e-19	5.224e-19	-18.225	-18.282	-0.057	(0)
VO2F2-	3.041e-19	2.665e-19	-18.517	-18.574	-0.057	(0)
VO2F3-2	5.219e-22	3.078e-22	-21.282	-21.512	-0.229	(0)
V4O12-4	8.147e-23	9.855e-24	-22.089	-23.006	-0.917	(0)
VO2F4-3	4.600e-26	1.402e-26	-25.337	-25.853	-0.516	(0)
V10O28-6	0.000e+00	0.000e+00	-59.546	-61.610	-2.064	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.840	-61.273	-1.433	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.998	-63.916	-0.917	(0)
Zn	4.591e-07					
Zn+2	2.364e-07	1.497e-07	-6.626	-6.825	-0.198	(0)
ZnCO3	1.626e-07	1.626e-07	-6.789	-6.789	0.000	(0)
ZnHCO3+	3.072e-08	2.692e-08	-7.513	-7.570	-0.057	(0)
ZnSO4	1.468e-08	1.468e-08	-7.833	-7.833	0.000	(0)
ZnOH+	1.218e-08	1.067e-08	-7.915	-7.972	-0.057	(0)
Zn (OH) 2	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
ZnCl+	5.206e-10	4.640e-10	-9.284	-9.333	-0.050	(0)
ZnOHCl	4.329e-10	4.329e-10	-9.364	-9.364	0.000	(0)
ZnF+	3.156e-10	2.766e-10	-9.501	-9.558	-0.057	(0)
Zn (SO4) 2-2	9.718e-11	5.731e-11	-10.012	-10.242	-0.229	(0)
Zn (OH) 3-	4.912e-12	4.305e-12	-11.309	-11.366	-0.057	(0)
ZnCl2	9.074e-13	9.074e-13	-12.042	-12.042	0.000	(0)
ZnCl3-	9.977e-16	8.893e-16	-15.001	-15.051	-0.050	(0)
Zn (OH) 4-2	2.071e-16	1.221e-16	-15.684	-15.913	-0.229	(0)
ZnSeO4	1.002e-18	1.002e-18	-17.999	-17.999	0.000	(0)
ZnCl4-2	8.568e-19	5.486e-19	-18.067	-18.261	-0.194	(0)
Zn (SeO4) 2-2	7.442e-32	4.389e-32	-31.128	-31.358	-0.229	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Ag2CO3	-9.37	-20.46	-11.09	Ag2CO3
Ag2CrO4	-19.48	-31.07	-11.59	Ag2CrO4
Ag2HVO4	-9.98	-8.50	1.48	Ag2HVO4
Ag2MoO4	-11.29	-22.84	-11.55	Ag2MoO4
Ag2O	-12.61	-0.04	12.57	Ag2O
Ag2Se	5.97	-42.73	-48.70	Ag2Se
Ag2SeO3	-9.35	-16.50	-7.15	Ag2SeO3
Ag2SeO4	-20.19	-29.10	-8.91	Ag2SeO4

Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-21.30	-19.14	2.16	Ag3AsO3
Ag3AsO4	-11.55	-14.34	-2.79	Ag3AsO4
Ag3H2VO5	-13.70	-8.52	5.18	Ag3H2VO5
AgF·4H2O	-12.95	-11.90	1.05	AgF·4H2O
Agmetal	1.64	-11.87	-13.51	Ag
AgVO3	-9.25	-8.48	0.77	AgVO3
Al(OH)3(am)	-1.98	8.82	10.80	Al(OH)3
Al2(MoO4)3	-53.14	-50.77	2.37	Al2(MoO4)3
Al2O3	-2.02	17.63	19.65	Al2O3
Al4(OH)10SO4	-6.48	16.22	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-10.26	-5.46	4.80	AlAsO4·2H2O
AlOHSO4	-7.00	-10.23	-3.23	AlOHSO4
AlSb	-146.27	-80.64	65.62	AlSb
Alunite	-6.57	-7.97	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.33	-13.12	-7.79	PbSO4
Anhydrite	-1.92	-6.28	-4.36	CaSO4
Antlerite	-8.09	0.70	8.79	Cu3(OH)4SO4
Aragonite	0.64	-7.66	-8.30	CaCO3
Arsenolite	-73.56	-76.32	-2.76	As4O6
Artinite	-5.31	4.29	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-35.26	-28.56	6.71	As2O5
Atacamite	-4.98	2.41	7.39	Cu2(OH)3Cl
Azurite	-4.19	-21.10	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-15.10	9.29	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-14.21	1.67	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	8.24	-0.67	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-21.98	10.96	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.07	-21.74	-9.67	BaCrO4
BaF2	-8.65	-14.47	-5.82	BaF2
BaMoO4	-6.55	-13.51	-6.96	BaMoO4
Barite	0.23	-9.75	-9.98	BaSO4
BaSeO3	-8.99	-7.16	1.83	BaSeO3
BaSeO4	-12.31	-19.77	-7.46	BaSeO4
Bianchite	-8.41	-10.17	-1.76	ZnSO4·6H2O
Birnessite	-9.24	8.85	18.09	MnO2
Bixbyite	-5.36	-6.00	-0.64	Mn2O3
Boehmite	0.24	8.82	8.58	AlOOH
Breithauptite	-50.56	-69.09	-18.52	NiSb
Brochantite	-7.94	7.28	15.22	Cu4(OH)6SO4
Brucite	-4.49	12.36	16.84	Mg(OH)2
Bunsenite	-3.92	8.52	12.45	NiO
Ca(VO3)2	-9.81	-4.15	5.66	Ca(VO3)2
Ca2V2O7	-8.89	8.61	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.94	8.61	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-12.55	9.75	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-17.58	21.38	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-18.48	21.38	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-283.59	-140.62	142.97	Ca3Sb2
CaCrO4	-16.00	-18.27	-2.27	CaCrO4
Calcite	0.82	-7.66	-8.48	CaCO3
Calomel	-15.04	-32.95	-17.91	Hg2Cl2
CaMoO4	-2.08	-10.03	-7.95	CaMoO4
Carnotite	-5.94	-5.71	0.23	KUO2VO4
CaSeO3·2H2O	-6.50	-3.69	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-13.28	-16.30	-3.02	CaSeO4·2H2O
Cd(BO2)2	-12.49	-2.65	9.84	Cd(BO2)2
Cd(OH)2	-6.45	7.19	13.64	Cd(OH)2
Cd(OH)2(am)	-6.54	7.19	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.23	-16.52	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.03	2.53	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-18.68	9.72	28.40	Cd4(OH)6SO4
CdCl2	-13.67	-14.32	-0.66	CdCl2
CdCl2·1H2O	-12.63	-14.32	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.41	-14.32	-1.91	CdCl2·2.5H2O
CdF2	-15.36	-16.57	-1.21	CdF2
Cdmetal(alpha)	-30.02	-16.51	13.51	Cd
Cdmetal(gamma)	-30.12	-16.51	13.62	Cd

CdMoO4	-1.46	-15.61	-14.15	CdMoO4
CdOHC1	-7.10	-3.57	3.54	CdOHC1
CdSb	-70.07	-70.42	-0.35	CdSb
CdSe	-15.30	-35.50	-20.20	CdSe
CdSeO4:2H2O	-20.02	-21.87	-1.85	CdSeO4:2H2O
CdSO4	-11.68	-11.86	-0.17	CdSO4
CdSO4:1H2O	-10.13	-11.86	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.98	-11.86	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.03	-10.78	-9.75	AgCl
Cerrusite	-1.36	-14.49	-13.13	PbCO3
CH4(g)	-74.18	-115.22	-41.05	CH4
Chalcanthite	-9.83	-12.47	-2.64	CuSO4:5H2O
Claudetite	-73.25	-76.32	-3.06	As4O6
Clausthalite	-9.66	-36.76	-27.10	PbSe
Co(BO2)2	-28.50	-1.43	27.07	Co(BO2)2
Co(OH)2	-4.68	8.41	13.09	Co(OH)2
Co(OH)3	-9.83	-12.14	-2.31	Co(OH)3
CO2(g)	-2.28	-20.42	-18.15	CO2
Co3(AsO4)2	-16.35	-3.32	13.03	Co3(AsO4)2
Co3O4	-5.37	-15.86	-10.50	Co3O4
CoCl2	-21.37	-13.11	8.27	CoCl2
CoCl2:6H2O	-15.64	-13.11	2.54	CoCl2:6H2O
CoCO3	-2.03	-12.01	-9.98	CoCO3
CoF2	-13.76	-15.35	-1.60	CoF2
CoF3	-46.33	-47.79	-1.46	CoF3
CoFe2O4	27.09	23.57	-3.53	CoFe2O4
CoMoO4	-6.63	-14.39	-7.76	CoMoO4
CoO	-5.17	8.41	13.59	CoO
CoSe	-18.08	-34.28	-16.20	CoSe
CoSeO3	-9.36	-8.04	1.32	CoSeO3
CoSeO4:6H2O	-19.12	-20.65	-1.53	CoSeO4:6H2O
CoSO4	-13.44	-10.64	2.80	CoSO4
CoSO4:6H2O	-8.16	-10.64	-2.47	CoSO4:6H2O
Cotunnite	-10.81	-15.59	-4.78	PbCl2
Cr(OH)2	-18.93	-8.11	10.82	Cr(OH)2
Cr(OH)3	-0.54	0.79	1.34	Cr(OH)3
Cr(OH)3(am)	1.54	0.79	-0.75	Cr(OH)3
Cr2O3	3.94	1.59	-2.36	Cr2O3
CrCl2	-43.72	-29.63	14.09	CrCl2
CrCl3	-46.60	-31.48	15.11	CrCl3
CrF3	-23.52	-34.86	-11.34	CrF3
Crmetal	-62.29	-31.81	30.48	Cr
CrO3	-27.82	-31.03	-3.21	CrO3
Cryolite	-12.47	-46.31	-33.84	Na3AlF6
Cu(OH)2	-2.09	6.58	8.67	Cu(OH)2
Cu(SbO3)2	-27.95	17.26	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-50.57	-85.45	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-2.05	-47.85	-45.80	Cu2Se
Cu2SO4	-22.25	-24.20	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.91	-8.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-54.60	-97.19	-42.59	Cu3Sb
Cu3Se2	-20.47	-83.96	-63.49	Cu3Se2
CuCO3	-2.34	-13.84	-11.50	CuCO3
CuCrO4	-19.01	-24.45	-5.44	CuCrO4
CuF	-9.55	-14.46	-4.91	CuF
CuF2	-18.30	-17.18	1.12	CuF2
CuF2:2H2O	-12.63	-17.18	-4.55	CuF2:2H2O
Cumetal	-5.67	-14.43	-8.76	Cu
CuMoO4	-3.14	-16.22	-13.08	CuMoO4
CuOCuSO4	-16.19	-5.88	10.30	CuOCuSO4
Cupricferrite	15.75	21.74	5.99	CuFe2O4
Cuprite	-3.75	-5.15	-1.41	Cu2O
Cuprousferrite	13.92	5.00	-8.92	CuFeO2
CuSe	-3.01	-36.11	-33.10	CuSe
CuSe2	-21.74	-55.11	-33.37	CuSe2
CuSeO3:2H2O	-10.39	-9.87	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-20.04	-22.48	-2.44	CuSeO4:5H2O
CuSO4	-15.41	-12.47	2.94	CuSO4

Diaspore	1.94	8.82	6.87	AlOOH
Dolomite (disordered)	0.82	-15.72	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	1.37	-15.72	-17.09	CaMg (CO ₃) ₂
Epsomite	-4.57	-6.69	-2.13	MgSO ₄ :7H ₂ O
Fe (OH) 2	-4.81	8.76	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	7.39	4.35	-3.04	Fe (OH) 2.7Cl.3
Fe (VO ₃) 2	-4.44	-8.16	-3.72	Fe (VO ₃) 2
Fe ₂ (OH) 4SeO ₃	-2.86	-1.30	1.55	Fe ₂ (OH) 4SeO ₃
Fe ₂ (SeO ₃) 3:2H ₂ O	-13.59	-34.22	-20.63	Fe ₂ (SeO ₃) 3:2H ₂ O
Fe ₂ (SO ₄) 3	-38.26	-41.99	-3.73	Fe ₂ (SO ₄) 3
Fe ₃ (OH) 8	3.69	23.91	20.22	Fe ₃ (OH) 8
FeAsO ₄ :2H ₂ O	-7.10	-6.70	0.40	FeAsO ₄ :2H ₂ O
FeCr ₂ O ₄	3.14	10.34	7.20	FeCr ₂ O ₄
FeMoO ₄	-3.95	-14.04	-10.09	FeMoO ₄
Ferrihydrite	4.39	7.58	3.19	Fe (OH) 3
Ferroselite	-34.34	-52.93	-18.60	FeSe ₂
FeSe	-22.94	-33.94	-11.00	FeSe
Fluorite	-0.50	-11.00	-10.50	CaF ₂
Gibbsite	0.52	8.82	8.29	Al (OH) 3
Goethite	7.09	7.58	0.49	FeOOH
Goslarite	-8.16	-10.17	-2.01	ZnSO ₄ :7H ₂ O
Gummite	-8.60	-0.93	7.67	UO ₃
Gypsum	-1.67	-6.28	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-3.27	-15.37	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) 6
H ₂ MoO ₄	-9.92	-22.80	-12.88	H ₂ MoO ₄
H ₂ Se (g)	-37.74	-42.70	-4.96	H ₂ Se
Halite	-6.97	-5.37	1.60	NaCl
Hausmannite	-5.83	55.20	61.03	Mn ₃ O ₄
Hematite	16.57	15.15	-1.42	Fe ₂ O ₃
Hercynite	3.50	26.39	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-172.20	-245.91	-73.71	Hg (CH ₃) ₂
Hg (g)	-9.69	-17.57	-7.87	Hg
Hg (OH) 2	-11.96	-15.46	-3.50	Hg (OH) 2
Hg ₂ (g)	-20.18	-35.14	-14.96	Hg ₂
Hg ₂ (OH) 2	-16.70	-11.44	5.26	Hg ₂ (OH) 2
Hg ₂ CO ₃	-15.81	-31.86	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-33.77	-42.47	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-24.84	-35.20	-10.36	Hg ₂ F ₂
Hg ₂ SeO ₃	-23.23	-27.89	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-24.35	-30.48	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-37.12	-66.80	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-35.97	-16.48	19.50	HgCl
HgCl ₂	-15.72	-36.98	-21.26	HgCl ₂
HgF (g)	-50.28	-17.60	32.68	HgF
HgF ₂ (g)	-51.79	-39.23	12.57	HgF ₂
Hgmetal (l)	-4.12	-17.57	-13.45	Hg
HgSe	-2.46	-58.16	-55.69	HgSe
HgSeO ₃	-19.49	-31.92	-12.43	HgSeO ₃
HgSO ₄	-25.09	-34.51	-9.42	HgSO ₄
Huntite	-1.89	-31.86	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerussite	-4.28	-23.05	-18.77	Pb ₃ (OH) 2 (CO ₃) ₂
Hydromagnesite	-11.15	-19.92	-8.77	Mg ₅ (CO ₃) ₄ (OH) 2:4H ₂ O
K-Alum	-20.43	-25.60	-5.17	KAl (SO ₄) ₂ :12H ₂ O
K-Jarosite	3.11	-11.69	-14.80	KFe ₃ (SO ₄) ₂ (OH) 6
K ₂ Cr ₂ O ₇	-37.47	-54.71	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-23.16	-23.68	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-18.71	-15.44	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-20.98	-21.71	-0.73	K ₂ SeO ₄
Langite	-10.21	7.28	17.49	Cu ₄ (OH) 6SO ₄ :H ₂ O
Larnakite	-6.75	-7.18	-0.43	PbO:PbSO ₄
Laurionite	-5.45	-4.83	0.62	PbOHCl
Lepidocrocite	6.21	7.58	1.37	FeOOH
Lime	-19.93	12.77	32.70	CaO
Litharge	-6.76	5.93	12.69	PbO
Maghemite	8.77	15.15	6.39	Fe ₂ O ₃
Magnesioferrite	10.65	27.51	16.86	Fe ₂ MgO ₄
Magnesite	-0.61	-8.07	-7.46	MgCO ₃
Magnetite	20.51	23.91	3.40	Fe ₃ O ₄

Malachite	-1.95	-7.26	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.99	22.35	25.34	MnOOH
Massicot	-6.96	5.93	12.89	PbO
Matlockite	-7.74	-16.71	-8.97	PbClF
Melanothallite	-21.19	-14.93	6.26	CuCl ₂
Melanterite	-8.08	-10.29	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-6.44	12.36	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-15.85	-4.57	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-259.10	-184.42	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.57	7.79	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-2.26	13.94	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.06	-18.68	5.38	MgCrO ₄
MgF ₂	-3.28	-11.41	-8.13	MgF ₂
MgMoO ₄	-8.59	-10.44	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-7.16	-4.10	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-15.51	-16.71	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.03	41.50	73.52	Pb ₃ O ₄
Mirabilite	-7.15	-8.27	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.32	-6.42	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.44	-63.15	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-141.39	-80.31	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-9.56	2.94	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.73	-11.02	2.72	MnCl ₂ ·4H ₂ O
MnSb	-89.55	-92.46	-2.91	MnSb
MnSe	-35.70	-32.20	3.50	MnSe
MnSeO ₃	-7.09	-5.96	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.94	-5.96	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.52	-18.57	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.13	-8.55	2.58	MnSO ₄
Monteponite	-7.91	7.19	15.10	CdO
Montroydite	-11.82	-15.46	-3.64	HgO
MoO ₃	-14.80	-22.80	-8.00	MoO ₃
Morenosite	-8.38	-10.52	-2.14	NiSO ₄ ·7H ₂ O
Na-Jarosite	1.22	-9.98	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.39	-51.28	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.18	-20.25	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-18.22	-34.82	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-13.51	-12.02	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-13.24	-12.02	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.97	-5.67	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-19.56	-18.28	1.28	Na ₂ SeO ₄
Na ₃ Sb	-167.74	-73.28	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.97	7.71	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.75	4.65	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.61	-13.34	-6.73	CuCl
NaSb	-83.53	-60.37	23.17	NaSb
Natron	-8.33	-9.64	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.93	-3.07	3.86	NaVO ₃
Nesquehonite	-3.40	-8.07	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-4.27	8.52	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-18.68	-2.98	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-16.95	15.05	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.03	-11.90	-6.87	NiCO ₃
NiMoO ₄	-3.13	-14.28	-11.14	NiMoO ₄
NiSe	-16.47	-34.17	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.75	-7.93	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-19.02	-20.54	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-8.66	8.85	17.50	MnO ₂
O ₂ (g)	-35.69	47.40	83.09	O ₂
Otavite	-1.23	-13.23	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.43	-3.91	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.22	5.93	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-54.46	-63.22	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-7.69	1.11	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂₀ (OH) ₂	-14.32	11.86	26.19	Pb ₂₀ (OH) ₂
Pb ₂ O ₃	-25.48	35.56	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-8.00	-8.56	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-3.16	-5.06	-1.90	Pb ₂ V ₂ O ₇

Pb3(AsO4)2	-16.56	-10.76	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.27	0.87	6.14	Pb3(VO4)2
Pb3O2CO3	-13.65	-2.63	11.02	Pb3O2CO3
Pb3O2SO4	-11.94	-1.25	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.42	4.68	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.20	4.68	21.88	Pb4O3SO4
PbCrO4	-12.50	-25.10	-12.60	PbCrO4
PbF2	-10.39	-17.83	-7.44	PbF2
Pbmetal	-22.01	-17.77	4.25	Pb
PbMoO4	-1.25	-16.87	-15.62	PbMoO4
PbO:0.3H2O	-7.05	5.93	12.98	PbO:0.33H2O
PbSeO4	-16.29	-23.13	-6.84	PbSeO4
Periclase	-9.23	12.36	21.58	MgO
Phosgenite	-10.27	-30.08	-19.81	PbCl2:PbCO3
Plattnerite	-19.97	29.63	49.60	PbO2
Portlandite	-10.04	12.77	22.80	Ca(OH)2
Pyrochroite	-4.70	10.50	15.19	Mn(OH)2
Pyrolusite	-7.18	34.20	41.38	MnO2
Retgersite	-8.48	-10.52	-2.04	NiSO4:6H2O
Rhodochrosite	0.65	-9.93	-10.58	MnCO3
Rutherfordine	-6.85	-21.35	-14.50	UO2CO3
Sb(OH)3	-11.25	-18.36	-7.11	Sb(OH)3
Sb2O4	-16.42	-13.02	3.40	Sb2O4
Sb2O5	-28.27	-37.94	-9.67	Sb2O5
Sb2Se3	-97.05	-164.81	-67.76	Sb2Se3
Sb4O6(cubic)	-55.18	-73.44	-18.26	Sb4O6
Sb4O6(orth)	-55.54	-73.44	-17.90	Sb4O6
SbCl3	-51.21	-50.64	0.57	SbCl3
SbF3	-43.79	-54.01	-10.23	SbF3
Sbmetal	-42.22	-53.91	-11.69	Sb
SbO2	-3.00	-30.82	-27.82	SbO2
Schoepite	-6.92	-0.93	5.99	UO2(OH)2:H2O
Semetal(am)	-11.89	-19.00	-7.11	Se
Semetal(hex)	-11.29	-19.00	-7.71	Se
Senarmontite	-24.36	-36.72	-12.37	Sb2O3
SeO2	-16.58	-16.46	0.12	SeO2
SeO3	-50.11	-29.06	21.04	SeO3
Siderite	-1.43	-11.67	-10.24	FeCO3
Smithsonite	-1.55	-11.55	-10.00	ZnCO3
Spinel	-6.86	29.99	36.85	MgAl2O4
Tenorite	-1.06	6.58	7.64	CuO
Thenardite	-8.59	-8.26	0.32	Na2SO4
Thermonatrite	-10.28	-9.64	0.64	Na2CO3:H2O
Tyuyamunite	-10.10	-6.02	4.08	Ca(UO2)2(VO4)2
U3O8	-19.93	1.16	21.08	U3O8
U3Sb4	-556.47	-404.08	152.38	U3Sb4
U4O9	-34.94	-37.96	-3.02	U4O9
UF4	-33.41	-62.95	-29.54	UF4
UF4:2.5H2O	-30.23	-62.95	-32.72	UF4:2.5H2O
UO2(am)	-16.35	-15.41	0.93	UO2
UO2(OH)2(beta)	-6.54	-0.93	5.61	UO2(OH)2
UO2SeO4:4H2O	-27.75	-30.00	-2.25	UO2SeO4:4H2O
UO3	-8.63	-0.93	7.70	UO3
Uraninite	-10.74	-15.41	-4.67	UO2
USb2	-209.43	-179.85	29.58	USb2
V(OH)3	-17.15	-9.56	7.59	V(OH)3
V2O5	-15.56	-16.92	-1.36	V2O5
V3O5	-35.76	-33.93	1.84	V3O5
V4O7	-44.52	-37.33	7.19	V4O7
V6O13	-37.31	-98.17	-60.86	V6O13
Valentinite	-28.24	-36.72	-8.48	Sb2O3
VC12	-61.80	-42.93	18.87	VC12
VC13	-65.27	-41.84	23.43	VC13
VF4	-65.87	-50.94	14.93	VF4
Vmetal	-89.14	-45.11	44.03	V
VO	-36.17	-21.41	14.76	VO
VO(OH)2	-8.56	-3.41	5.15	VO(OH)2
VO2Cl	-22.06	-19.22	2.84	VO2Cl

VOC1	-31.47	-20.32	11.15	VOC1
VOC12	-37.69	-24.93	12.76	VOC12
VOSO4	-26.07	-22.46	3.61	VOSO4
Witherite	-2.56	-11.13	-8.57	BaCO3
Zincite	-2.46	8.88	11.33	ZnO
Zincosite	-14.10	-10.17	3.93	ZnSO4
Zn(BO2)2	-9.25	-0.96	8.29	Zn(BO2)2
Zn(OH)2	-3.32	8.88	12.20	Zn(OH)2
Zn(OH)2(am)	-3.60	8.88	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.88	8.88	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.66	8.88	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.86	8.88	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.80	-1.30	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.20	6.99	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.58	-1.93	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.38	-11.47	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-11.95	16.45	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-15.64	22.86	38.50	Zn5(OH)8Cl2
ZnCl2	-19.69	-12.64	7.05	ZnCl2
ZnCO3:1H2O	-1.29	-11.55	-10.26	ZnCO3:1H2O
ZnF2	-14.36	-14.89	-0.53	ZnF2
Znmetal	-40.61	-14.82	25.79	Zn
ZnMoO4	-3.80	-13.93	-10.13	ZnMoO4
ZnO(active)	-2.31	8.88	11.19	ZnO
ZnSb	-79.75	-68.74	11.01	ZnSb
ZnSe	-19.42	-33.82	-14.40	ZnSe
ZnSeO4:6H2O	-18.67	-20.19	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.54	-10.17	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 5.

TITLE Average HCT data
SOLUTION 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

```

temp      25
pH        7.31754
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F         0.42526
Fe 0.00138
K         0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge
S(6)     20.27695 as SO4
Se 0.00023
V         0.00046
water    1 # kg

```

END

TITLE

Average HCT data

Beginning of initial solution calculations.

Initial solution 3. Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

-----Solution composition-----

Elements	Molality	Moles	
Al	3.343e-07	3.343e-07	
Alkalinity	1.740e-04	1.740e-04	
Ba	2.439e-08	2.439e-08	
Ca	2.085e-04	2.085e-04	
Cl	1.996e-05	1.996e-05	
F	2.238e-05	2.238e-05	
Fe	2.471e-08	2.471e-08	
K	2.491e-05	2.491e-05	
Mg	5.243e-05	5.243e-05	
Mn	1.727e-07	1.727e-07	
Mo	4.795e-09	4.795e-09	
Na	9.030e-05	9.030e-05	Charge balance
S(6)	2.111e-04	2.111e-04	
Se	2.913e-09	2.913e-09	
V	9.031e-09	9.031e-09	

-----Description of solution-----

pH	=	7.318
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.075e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	1.902e-04
Total CO2 (mol/kg)	=	1.902e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	-1.213e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110139e+02
Total O	=	5.550825e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.171e-07	2.092e-07	-6.663	-6.679	-0.016	(0)
H+	4.994e-08	4.813e-08	-7.302	-7.318	-0.016	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	3.343e-07					
Al(OH)4-	3.195e-07	3.080e-07	-6.496	-6.511	-0.016	(0)
Al(OH)3	1.169e-08	1.169e-08	-7.932	-7.932	0.000	(0)
Al(OH)2+	2.906e-09	2.802e-09	-8.537	-8.553	-0.016	(0)
AlF2+	1.528e-10	1.473e-10	-9.816	-9.832	-0.016	(0)
AlF3	3.973e-11	3.973e-11	-10.401	-10.401	0.000	(0)
AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
AlOH+2	1.950e-11	1.686e-11	-10.710	-10.773	-0.063	(0)
AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
Al+3	1.124e-13	8.061e-14	-12.949	-13.094	-0.144	(0)
Al(SO4)2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)

Ba	2.439e-08					
Ba+2	2.436e-08	2.102e-08	-7.613	-7.677	-0.064	(0)
BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
BaOH+	1.990e-14	1.919e-14	-13.701	-13.717	-0.016	(0)
C (4)	1.902e-04					
HCO3-	1.714e-04	1.653e-04	-3.766	-3.782	-0.016	(0)
H2CO3	1.790e-05	1.790e-05	-4.747	-4.747	0.000	(0)
CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
CO3-2	1.866e-07	1.610e-07	-6.729	-6.793	-0.064	(0)
MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)
BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
Ca	2.085e-04					
Ca+2	2.010e-04	1.734e-04	-3.697	-3.761	-0.064	(0)
CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
CaOH+	7.503e-10	7.237e-10	-9.125	-9.140	-0.016	(0)
Cl	1.996e-05					
Cl-	1.996e-05	1.924e-05	-4.700	-4.716	-0.016	(0)
MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
VOCl+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
F	2.238e-05					
F-	2.223e-05	2.142e-05	-4.653	-4.669	-0.016	(0)
MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
HF	1.525e-09	1.525e-09	-8.817	-8.817	0.000	(0)
NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
AlF2+	1.528e-10	1.473e-10	-9.816	-9.832	-0.016	(0)
MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
AlF3	3.973e-11	3.973e-11	-10.401	-10.401	0.000	(0)
AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
HF2-	1.289e-13	1.243e-13	-12.890	-12.906	-0.016	(0)
FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
H2F2	6.234e-18	6.234e-18	-17.205	-17.205	0.000	(0)
VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
Fe (2)	2.131e-09					
Fe+2	2.037e-09	1.746e-09	-8.691	-8.758	-0.067	(0)
FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
FeOH+	1.508e-11	1.454e-11	-10.821	-10.837	-0.016	(0)
FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
Fe (OH) 2	2.417e-15	2.417e-15	-14.617	-14.617	0.000	(0)
Fe (OH) 3-	1.658e-16	1.599e-16	-15.780	-15.796	-0.016	(0)
Fe (3)	2.258e-08					
Fe (OH) 2+	1.849e-08	1.783e-08	-7.733	-7.749	-0.016	(0)

	Fe (OH) 3	4.006e-09	4.006e-09	-8.397	-8.397	0.000	(0)
	Fe (OH) 4-	8.092e-11	7.803e-11	-10.092	-10.108	-0.016	(0)
	FeOH+2	2.536e-13	2.191e-13	-12.596	-12.659	-0.063	(0)
	FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
	FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
	FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
	Fe+3	2.261e-18	1.622e-18	-17.646	-17.790	-0.144	(0)
	FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
	Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
	FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
	FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)
	Fe2 (OH) 2+4	2.944e-24	1.590e-24	-23.531	-23.799	-0.268	(0)
	FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
	Fe3 (OH) 4+5	1.073e-30	4.098e-31	-29.969	-30.387	-0.418	(0)
	FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
H (0)	3.280e-26						
	H2	1.640e-26	1.640e-26	-25.785	-25.785	0.000	(0)
K	2.491e-05						
	K+	2.488e-05	2.398e-05	-4.604	-4.620	-0.016	(0)
	KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
Mg	5.243e-05						
	Mg+2	5.084e-05	4.386e-05	-4.294	-4.358	-0.064	(0)
	MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
	MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
	MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
	MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
	MgOH+	3.787e-09	3.653e-09	-8.422	-8.437	-0.016	(0)
Mn (2)	1.727e-07						
	Mn+2	1.676e-07	1.437e-07	-6.776	-6.843	-0.067	(0)
	MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
	MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
	MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
	MnOH+	7.830e-11	7.549e-11	-10.106	-10.122	-0.016	(0)
	MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
	MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
	MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
	Mn (OH) 3-	2.117e-20	2.041e-20	-19.674	-19.690	-0.016	(0)
	MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
	Mn (OH) 4-2	1.596e-26	1.379e-26	-25.797	-25.861	-0.063	(0)
	MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Mn (3)	8.945e-29						
	Mn+3	8.945e-29	6.417e-29	-28.048	-28.193	-0.144	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-50.661	-50.724	-0.063	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-56.080	-56.096	-0.016	(0)
Mo	4.795e-09						
	MoO4-2	4.791e-09	4.133e-09	-8.320	-8.384	-0.064	(0)
	HMoO4-	4.114e-12	3.959e-12	-11.386	-11.402	-0.017	(0)
	H2MoO4	1.396e-15	1.396e-15	-14.855	-14.855	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-63.634	-64.236	-0.602	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-64.749	-65.167	-0.418	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-67.435	-67.702	-0.268	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-71.623	-71.774	-0.150	(0)
Na	9.030e-05						
	Na+	9.020e-05	8.694e-05	-4.045	-4.061	-0.016	(0)
	NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)
	NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
	NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
	NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)
O (0)	0.000e+00						
	O2	0.000e+00	0.000e+00	-40.725	-40.725	0.000	(0)
S (6)	2.111e-04						
	SO4-2	2.026e-04	1.748e-04	-3.693	-3.757	-0.064	(0)
	CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
	MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
	NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)

KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
HSO4-	8.531e-10	8.223e-10	-9.069	-9.085	-0.016	(0)
FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
Al (SO4) 2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
Se (-2)	2.403e-32					
HSe-	2.402e-32	2.311e-32	-31.619	-31.636	-0.017	(0)
H2Se	8.636e-36	8.636e-36	-35.064	-35.064	0.000	(0)
MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Se-2	5.601e-40	4.801e-40	-39.252	-39.319	-0.067	(0)
Se (4)	2.913e-09					
HSeO3-	2.665e-09	2.565e-09	-8.574	-8.591	-0.017	(0)
SeO3-2	2.474e-10	2.121e-10	-9.607	-9.673	-0.067	(0)
H2SeO3	5.266e-14	5.266e-14	-13.278	-13.278	0.000	(0)
FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)
Se (6)	1.312e-15					
SeO4-2	1.312e-15	1.132e-15	-14.882	-14.946	-0.064	(0)
MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
HSeO4-	2.837e-21	2.730e-21	-20.547	-20.564	-0.017	(0)
V (2)	3.247e-38					
VOH+	2.785e-38	2.680e-38	-37.555	-37.572	-0.017	(0)
V+2	4.618e-39	3.959e-39	-38.336	-38.402	-0.067	(0)
V (3)	5.968e-12					
V (OH) 3	5.968e-12	5.968e-12	-11.224	-11.224	0.000	(0)
V (OH) 2+	1.929e-22	1.856e-22	-21.715	-21.731	-0.017	(0)
VOH+2	9.885e-26	8.474e-26	-25.005	-25.072	-0.067	(0)
V+3	1.143e-30	8.083e-31	-29.942	-30.092	-0.150	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.201	-48.351	-0.150	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-49.076	-49.344	-0.268	(0)
V (4)	3.142e-16					
V (OH) 3+	3.047e-16	2.932e-16	-15.516	-15.533	-0.017	(0)
VO+2	8.194e-18	7.025e-18	-17.086	-17.153	-0.067	(0)
VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
VOC1+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
H2V2O4+2	5.026e-27	4.309e-27	-26.299	-26.366	-0.067	(0)
VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
V (5)	9.025e-09					
H2VO4-	8.521e-09	8.199e-09	-8.070	-8.086	-0.017	(0)
HVO4-2	4.991e-10	4.279e-10	-9.302	-9.369	-0.067	(0)
H3VO4	3.947e-12	3.947e-12	-11.404	-11.404	0.000	(0)
H3V2O7-	2.171e-13	2.089e-13	-12.663	-12.680	-0.017	(0)
HV2O7-3	1.681e-15	1.189e-15	-14.774	-14.925	-0.150	(0)
VO2+	3.933e-16	3.791e-16	-15.405	-15.421	-0.016	(0)
VO4-3	6.300e-17	4.455e-17	-16.201	-16.351	-0.150	(0)
VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
V2O7-4	1.231e-18	6.647e-19	-17.910	-18.177	-0.268	(0)
V3O9-3	8.163e-19	5.772e-19	-18.088	-18.239	-0.150	(0)
VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
V4O12-4	3.653e-24	1.973e-24	-23.437	-23.705	-0.268	(0)
VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.939	-60.357	-0.418	(0)
V10O28-6	0.000e+00	0.000e+00	-60.625	-61.227	-0.602	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.200	-62.467	-0.268	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-1.94	8.86	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.71	-51.34	2.37	Al2 (MoO4) 3
Al2O3	-1.93	17.72	19.65	Al2O3
Al4 (OH) 10SO4	-5.66	17.04	22.70	Al4 (OH) 10SO4
AlOHSO4	-6.30	-9.53	-3.23	AlOHSO4
Alunite	-6.11	-7.51	-1.40	KAl3 (SO4) 2 (OH) 6
Anhydrite	-3.16	-7.52	-4.36	CaSO4
Aragonite	-2.25	-10.55	-8.30	CaCO3
Artinite	-10.47	-0.87	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.44	6.96	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.16	-2.29	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.27	4.67	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.20	-17.02	-5.82	BaF2
BaMoO4	-9.10	-16.06	-6.96	BaMoO4
Barite	-1.45	-11.43	-9.98	BaSO4
BaSeO3	-10.78	-8.95	1.83	BaSeO3
BaSeO4	-15.16	-22.62	-7.46	BaSeO4
Birnessite	-13.01	5.08	18.09	MnO2
Bixbyite	-11.84	-12.48	-0.64	Mn2O3
Boehmite	0.28	8.86	8.58	AlOOH
Brucite	-6.57	10.28	16.84	Mg (OH) 2
Ca (VO3) 2	-10.99	-5.33	5.66	Ca (VO3) 2
Ca2V2O7	-11.96	5.54	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.01	5.54	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-22.55	16.41	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.45	16.41	39.86	Ca3 (VO4) 2:4H2O
Calcite	-2.07	-10.55	-8.48	CaCO3
CaMoO4	-4.19	-12.14	-7.95	CaMoO4
CaSeO3:2H2O	-7.85	-5.03	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-15.69	-18.71	-3.02	CaSeO4:2H2O
CH4 (g)	-70.92	-111.97	-41.05	CH4
CO2 (g)	-3.28	-21.43	-18.15	CO2
Cryolite	-19.45	-53.29	-33.84	Na3AlF6
Diaspore	1.99	8.86	6.87	AlOOH
Dolomite (disordered)	-5.17	-21.71	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-4.62	-21.71	-17.09	CaMg (CO3) 2
Epsomite	-5.99	-8.12	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.69	5.88	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.59	0.55	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-6.61	-10.33	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.14	-7.58	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.77	-39.40	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.12	-46.85	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-6.02	14.20	20.22	Fe3 (OH) 8
FeMoO4	-7.05	-17.14	-10.09	FeMoO4
Ferrihydrite	0.97	4.16	3.19	Fe (OH) 3
Ferroselite	-30.80	-49.40	-18.60	FeSe2
FeSe	-22.08	-33.08	-11.00	FeSe
Fluorite	-2.60	-13.10	-10.50	CaF2
Gibbsite	0.57	8.86	8.29	Al (OH) 3
Goethite	3.67	4.16	0.49	FeOOH
Gypsum	-2.91	-7.52	-4.61	CaSO4:2H2O
H-Jarosite	-12.20	-24.30	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.14	-23.02	-12.88	H2MoO4
H2Se (g)	-33.99	-38.95	-4.96	H2Se
Halite	-10.38	-8.78	1.60	NaCl
Hausmannite	-15.02	46.01	61.03	Mn3O4
Hematite	9.74	8.33	-1.42	Fe2O3
Hercynite	0.70	23.60	22.89	FeAl2O4
Huntite	-14.04	-44.01	-29.97	CaMg3 (CO3) 4
Hydromagnesite	-25.56	-34.33	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-20.06	-25.23	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.80	-21.60	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-20.89	-17.62	3.26	K2MoO4
K2SeO4	-23.46	-24.19	-0.73	K2SeO4
Lepidocrocite	2.79	4.16	1.37	FeOOH

Lime	-21.83	10.87	32.70	CaO
Maghemite	1.94	8.33	6.39	Fe ₂ O ₃
Magnesioferrite	1.74	18.60	16.86	Fe ₂ MgO ₄
Magnesite	-3.69	-11.15	-7.46	MgCO ₃
Magnetite	10.80	14.20	3.40	Fe ₃ O ₄
Manganite	-6.23	19.11	25.34	MnOOH
Melanterite	-10.31	-12.52	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-8.52	10.28	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.21	-5.93	11.28	Mg(VO ₃) ₂
Mg ₂ V ₂ O ₇	-22.01	4.35	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-5.57	-13.70	-8.13	MgF ₂
MgMoO ₄	-10.89	-12.74	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-8.69	-5.63	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-18.10	-19.30	-1.20	MgSeO ₄ ·6H ₂ O
Mirabilite	-10.77	-11.88	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-13.32	-8.42	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-61.95	-67.66	-5.71	Mn ₂ (SO ₄) ₃
MnCl ₂ ·4H ₂ O	-18.99	-16.27	2.72	MnCl ₂ ·4H ₂ O
MnSe	-34.66	-31.16	3.50	MnSe
MnSeO ₃	-9.25	-8.12	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-9.10	-8.12	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-19.74	-21.79	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-13.18	-10.60	2.58	MnSO ₄
MoO ₃	-15.02	-23.02	-8.00	MoO ₃
Na-Jarosite	-9.84	-21.04	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-22.93	-39.52	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-18.00	-16.51	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-17.73	-16.51	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-19.70	-9.40	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-24.35	-23.07	1.28	Na ₂ SeO ₄
Na ₃ VO ₄	-35.01	1.67	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-40.58	-3.18	37.40	Na ₄ V ₂ O ₇
Natron	-13.60	-14.91	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.71	-4.85	3.86	NaVO ₃
Nesquehonite	-6.48	-11.15	-4.67	MgCO ₃ ·3H ₂ O
Nsutite	-12.43	5.08	17.50	MnO ₂
O ₂ (g)	-37.82	45.27	83.09	O ₂
Periclase	-11.31	10.28	21.58	MgO
Portlandite	-11.93	10.87	22.80	Ca(OH) ₂
Pyrochroite	-7.40	7.79	15.19	Mn(OH) ₂
Pyrolusite	-10.95	30.43	41.38	MnO ₂
Rhodochrosite	-3.06	-13.64	-10.58	MnCO ₃
Semetal (am)	-9.21	-16.32	-7.11	Se
Semetal (hex)	-8.61	-16.32	-7.71	Se
SeO ₂	-16.03	-15.91	0.12	SeO ₂
SeO ₃	-50.63	-29.58	21.04	SeO ₃
Siderite	-5.31	-15.55	-10.24	FeCO ₃
Spinel	-8.85	28.00	36.85	MgAl ₂ O ₄
Thenardite	-12.20	-11.88	0.32	Na ₂ SO ₄
Thermonatrite	-15.55	-14.91	0.64	Na ₂ CO ₃ ·H ₂ O
V(OH) ₃	-15.73	-8.14	7.59	V(OH) ₃
V ₂ O ₅	-14.85	-16.21	-1.36	V ₂ O ₅
V ₃ O ₅	-32.03	-30.19	1.84	V ₃ O ₅
V ₄ O ₇	-39.89	-32.71	7.19	V ₄ O ₇
V ₆ O ₁₃	-33.03	-93.89	-60.86	V ₆ O ₁₃
VC ₁₂	-62.40	-43.52	18.87	VC ₁₂
VC ₁₃	-67.67	-44.24	23.43	VC ₁₃
VF ₄	-65.39	-50.46	14.93	VF ₄
Vmetal	-86.12	-42.09	44.03	V
VO	-34.21	-19.46	14.76	VO
VO(OH) ₂	-7.67	-2.52	5.15	VO(OH) ₂
VO ₂ Cl	-22.98	-20.14	2.84	VO ₂ Cl
VOC ₁	-31.33	-20.17	11.15	VOC ₁
VOC ₁₂	-39.35	-26.58	12.76	VOC ₁₂
VOSO ₄	-24.52	-20.91	3.61	VOSO ₄
Witherite	-5.90	-14.47	-8.57	BaCO ₃

**For a gas, SI = log₁₀(fugacity). Fugacity = pressure * phi / 1 atm.

For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 6.

SOLUTION 4 Average HCT data for biotite breccia - oxide/transitional (cells
SRK 0854 and SRK 0872)

temp 25
pH 5.50170
pe 4
redox pe
units mg/l
density 1
Alkalinity 3.43795 as HCO3
Al 0.23659
As 0.00101
Ba 0.01096
Ca 20.93261
Cd 0.00068
Cl 0.64738
Co 0.00070
Cu 9.10668
F 0.28887
Fe 0.39994
K 0.95011
Mg 1.29789
Mn 0.24814
Mo 0.03969
Na 0.52994 charge
Ni 0.00047
Pb 0.00207
S(6) 87.02664 as SO4
Sb 0.00040
Se 0.00024
U 0.00133
V 0.00047
Zn 0.04452
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 4. Average HCT data for biotite breccia - oxide/transitional
(cells SRK 0854 and SRK 0872)

-----Solution composition-----

Elements	Molality	Moles
Al	8.770e-06	8.770e-06
Alkalinity	5.635e-05	5.635e-05
As	1.348e-08	1.348e-08
Ba	7.982e-08	7.982e-08
Ca	5.224e-04	5.224e-04
Cd	6.050e-09	6.050e-09
Cl	1.826e-05	1.826e-05
Co	1.188e-08	1.188e-08
Cu	1.433e-04	1.433e-04
F	1.521e-05	1.521e-05
Fe	7.162e-06	7.162e-06
K	2.430e-05	2.430e-05
Mg	5.341e-05	5.341e-05

Mn	4.517e-06	4.517e-06	
Mo	4.137e-07	4.137e-07	
Na	3.940e-04	3.940e-04	Charge balance
Ni	8.009e-09	8.009e-09	
Pb	9.992e-09	9.992e-09	
S (6)	9.060e-04	9.060e-04	
Sb	3.286e-09	3.286e-09	
Se	3.040e-09	3.040e-09	
U	5.588e-09	5.588e-09	
V	9.228e-09	9.228e-09	
Zn	6.809e-07	6.809e-07	

-----Description of solution-----

pH	=	5.502
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	3.224e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	4.266e-04
Total CO2 (mol/kg)	=	4.266e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	2.099e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	12
Total H	=	1.110145e+02
Total O	=	5.551174e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.351e-06	3.150e-06	-5.475	-5.502	-0.027	0.00
OH-	3.403e-09	3.197e-09	-8.468	-8.495	-0.027	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	8.770e-06					
AlF2+	3.822e-06	3.597e-06	-5.418	-5.444	-0.026	(0)
AlF+2	3.280e-06	2.574e-06	-5.484	-5.589	-0.105	(0)
Al (OH) 2+	6.326e-07	5.954e-07	-6.199	-6.225	-0.026	(0)
AlSO4+	3.922e-07	3.688e-07	-6.406	-6.433	-0.027	(0)
AlOH+2	2.988e-07	2.345e-07	-6.525	-6.630	-0.105	(0)
AlF3	1.589e-07	1.589e-07	-6.799	-6.799	0.000	(0)
Al+3	1.281e-07	7.335e-08	-6.892	-7.135	-0.242	(0)
Al (OH) 3	3.797e-08	3.797e-08	-7.421	-7.421	0.000	(0)
Al (OH) 4-	1.625e-08	1.528e-08	-7.789	-7.816	-0.027	(0)
Al (SO4) 2-	2.722e-09	2.560e-09	-8.565	-8.592	-0.027	(0)
AlF4-	2.973e-10	2.795e-10	-9.527	-9.554	-0.027	(0)
AlMo6O21-3	1.065e-24	5.844e-25	-23.973	-24.233	-0.261	(0)
As (3)	5.192e-12					
H3AsO3	5.191e-12	5.191e-12	-11.285	-11.285	0.000	(0)
H2AsO3-	9.035e-16	8.452e-16	-15.044	-15.073	-0.029	(0)
H4AsO3+	8.660e-18	8.101e-18	-17.062	-17.091	-0.029	(0)
HAsO3-2	3.195e-22	2.447e-22	-21.495	-21.611	-0.116	(0)
AsO3-3	5.458e-30	2.995e-30	-29.263	-29.524	-0.261	(0)
As (5)	1.348e-08					
H2AsO4-	1.292e-08	1.209e-08	-7.889	-7.918	-0.029	(0)
HAsO4-2	5.494e-10	4.208e-10	-9.260	-9.376	-0.116	(0)
H3AsO4	6.612e-12	6.617e-12	-11.180	-11.179	0.000	(0)
AsO4-3	7.698e-16	4.224e-16	-15.114	-15.374	-0.261	(0)
Ba	7.982e-08					
Ba+2	7.978e-08	6.227e-08	-7.098	-7.206	-0.108	(0)
BaHCO3+	3.297e-11	3.105e-11	-10.482	-10.508	-0.026	(0)
BaCO3	2.482e-14	2.482e-14	-13.605	-13.605	0.000	(0)
BaOH+	9.235e-16	8.689e-16	-15.035	-15.061	-0.026	(0)
C (4)	4.266e-04					
H2CO3	3.699e-04	3.699e-04	-3.432	-3.432	0.000	(0)
HCO3-	5.548e-05	5.222e-05	-4.256	-4.282	-0.026	(0)

		CuCO3	4.365e-07	4.365e-07	-6.360	-6.360	0.000	(0)
		CaHCO3+	3.769e-07	3.550e-07	-6.424	-6.450	-0.026	(0)
		CuHCO3+	3.359e-07	3.142e-07	-6.474	-6.503	-0.029	(0)
		MgHCO3+	2.169e-08	2.038e-08	-7.664	-7.691	-0.027	(0)
		NaHCO3	1.084e-08	1.084e-08	-7.965	-7.965	0.000	(0)
		MnHCO3+	3.518e-09	3.309e-09	-8.454	-8.480	-0.026	(0)
		FeHCO3+	3.405e-09	3.207e-09	-8.468	-8.494	-0.026	(0)
		UO2CO3	2.681e-09	2.681e-09	-8.572	-8.572	0.000	(0)
		CO3-2	9.958e-10	7.772e-10	-9.002	-9.109	-0.108	(0)
		ZnHCO3+	8.427e-10	7.883e-10	-9.074	-9.103	-0.029	(0)
		CaCO3	4.497e-10	4.497e-10	-9.347	-9.347	0.000	(0)
		PbHCO3+	2.506e-10	2.345e-10	-9.601	-9.630	-0.029	(0)
		UO2 (CO3) 2-2	5.429e-11	4.158e-11	-10.265	-10.381	-0.116	(0)
		NiHCO3+	3.888e-11	3.637e-11	-10.410	-10.439	-0.029	(0)
		CoHCO3+	3.583e-11	3.352e-11	-10.446	-10.475	-0.029	(0)
		BaHCO3+	3.297e-11	3.105e-11	-10.482	-10.508	-0.026	(0)
		MgCO3	2.466e-11	2.466e-11	-10.608	-10.608	0.000	(0)
		ZnCO3	2.135e-11	2.135e-11	-10.671	-10.671	0.000	(0)
		PbCO3	1.412e-11	1.412e-11	-10.850	-10.850	0.000	(0)
		NaCO3-	5.675e-12	5.341e-12	-11.246	-11.272	-0.026	(0)
		Cu (CO3) 2-2	1.192e-12	9.130e-13	-11.924	-12.040	-0.116	(0)
		CdHCO3+	5.351e-13	5.006e-13	-12.272	-12.301	-0.029	(0)
		NiCO3	1.638e-13	1.638e-13	-12.786	-12.786	0.000	(0)
		CoCO3	1.084e-13	1.084e-13	-12.965	-12.965	0.000	(0)
		CdCO3	7.459e-14	7.459e-14	-13.127	-13.127	0.000	(0)
		BaCO3	2.482e-14	2.482e-14	-13.605	-13.605	0.000	(0)
		UO2 (CO3) 3-4	4.707e-15	1.620e-15	-14.327	-14.791	-0.463	(0)
		Pb (CO3) 2-2	4.132e-17	3.164e-17	-16.384	-16.500	-0.116	(0)
		Cd (CO3) 2-2	5.611e-20	4.297e-20	-19.251	-19.367	-0.116	(0)
Ca	5.224e-04							
		Ca+2	4.678e-04	3.651e-04	-3.330	-3.438	-0.108	(0)
		CaSO4	5.417e-05	5.417e-05	-4.266	-4.266	0.000	(0)
		CaHCO3+	3.769e-07	3.550e-07	-6.424	-6.450	-0.026	(0)
		CaF+	1.486e-08	1.399e-08	-7.828	-7.854	-0.026	(0)
		CaCO3	4.497e-10	4.497e-10	-9.347	-9.347	0.000	(0)
		CaOH+	2.473e-11	2.329e-11	-10.607	-10.633	-0.026	(0)
Cd	6.050e-09							
		Cd+2	5.395e-09	4.211e-09	-8.268	-8.376	-0.108	(0)
		CdSO4	6.393e-10	6.393e-10	-9.194	-9.194	0.000	(0)
		CdCl+	7.336e-12	6.863e-12	-11.135	-11.163	-0.029	(0)
		Cd (SO4) 2-2	7.294e-12	5.586e-12	-11.137	-11.253	-0.116	(0)
		CdHCO3+	5.351e-13	5.006e-13	-12.272	-12.301	-0.029	(0)
		CdF+	2.504e-13	2.342e-13	-12.601	-12.630	-0.029	(0)
		CdOH+	1.143e-13	1.069e-13	-12.942	-12.971	-0.029	(0)
		CdCO3	7.459e-14	7.459e-14	-13.127	-13.127	0.000	(0)
		CdOHC1	8.999e-16	8.999e-16	-15.046	-15.046	0.000	(0)
		CdCl2	4.883e-16	4.883e-16	-15.311	-15.311	0.000	(0)
		Cd (OH) 2	2.156e-18	2.156e-18	-17.666	-17.666	0.000	(0)
		CdF2	1.640e-18	1.640e-18	-17.785	-17.785	0.000	(0)
		Cd (CO3) 2-2	5.611e-20	4.297e-20	-19.251	-19.367	-0.116	(0)
		CdCl3-	5.621e-21	5.259e-21	-20.250	-20.279	-0.029	(0)
		Cd2OH+3	4.112e-21	2.256e-21	-20.386	-20.647	-0.261	(0)
		Cd (OH) 3-	4.502e-25	4.211e-25	-24.347	-24.376	-0.029	(0)
		Cd (SeO3) 2-2	5.821e-26	4.458e-26	-25.235	-25.351	-0.116	(0)
		CdSeO4	3.500e-27	3.500e-27	-26.456	-26.456	0.000	(0)
		Cd (OH) 4-2	2.877e-34	2.203e-34	-33.541	-33.657	-0.116	(0)
Cl	1.826e-05							
		Cl-	1.816e-05	1.707e-05	-4.741	-4.768	-0.027	(0)
		CuCl	1.004e-07	1.004e-07	-6.998	-6.998	0.000	(0)
		CuCl+	2.745e-09	2.580e-09	-8.561	-8.588	-0.027	(0)
		CuCl2-	3.808e-10	3.579e-10	-9.419	-9.446	-0.027	(0)
		MnCl+	7.254e-11	6.825e-11	-10.139	-10.166	-0.026	(0)
		ZnCl+	2.178e-11	2.047e-11	-10.662	-10.689	-0.027	(0)
		CdCl+	7.336e-12	6.863e-12	-11.135	-11.163	-0.029	(0)
		PbCl+	3.912e-12	3.659e-12	-11.408	-11.437	-0.029	(0)
		CoCl+	5.208e-13	4.872e-13	-12.283	-12.312	-0.029	(0)
		NiCl+	2.637e-13	2.467e-13	-12.579	-12.608	-0.029	(0)
		ZnOHC1	8.565e-14	8.565e-14	-13.067	-13.067	0.000	(0)

UO2Cl+	2.564e-14	2.399e-14	-13.591	-13.620	-0.029	(0)
CuCl2	1.527e-14	1.527e-14	-13.816	-13.816	0.000	(0)
CuCl3-2	1.667e-15	1.306e-15	-14.778	-14.884	-0.106	(0)
MnCl2	1.645e-15	1.645e-15	-14.784	-14.784	0.000	(0)
CdOHC1	8.999e-16	8.999e-16	-15.046	-15.046	0.000	(0)
ZnCl2	5.536e-16	5.536e-16	-15.257	-15.257	0.000	(0)
CdCl2	4.883e-16	4.883e-16	-15.311	-15.311	0.000	(0)
PbCl2	2.790e-16	2.790e-16	-15.554	-15.554	0.000	(0)
VOCl+	3.618e-17	3.384e-17	-16.442	-16.471	-0.029	(0)
FeCl+2	2.981e-18	2.336e-18	-17.526	-17.632	-0.106	(0)
NiCl2	2.120e-20	2.120e-20	-19.674	-19.674	0.000	(0)
MnCl3-	8.221e-21	7.735e-21	-20.085	-20.112	-0.026	(0)
ZnCl3-	7.986e-21	7.506e-21	-20.098	-20.125	-0.027	(0)
CdCl3-	5.621e-21	5.259e-21	-20.250	-20.279	-0.029	(0)
CuCl3-	2.587e-21	2.432e-21	-20.587	-20.614	-0.027	(0)
PbCl3-	2.026e-21	1.896e-21	-20.693	-20.722	-0.029	(0)
FeCl2+	1.893e-22	1.781e-22	-21.723	-21.749	-0.026	(0)
ZnCl4-2	8.176e-26	6.406e-26	-25.087	-25.193	-0.106	(0)
PbCl4-2	1.931e-26	1.479e-26	-25.714	-25.830	-0.116	(0)
FeCl3	3.040e-28	3.040e-28	-27.517	-27.517	0.000	(0)
CuCl4-2	2.655e-28	2.080e-28	-27.576	-27.682	-0.106	(0)
UCl+3	2.187e-33	1.200e-33	-32.660	-32.921	-0.261	(0)
CoCl+2	1.490e-39	1.141e-39	-38.827	-38.943	-0.116	(0)
Co (2)	1.188e-08					
Co+2	1.077e-08	8.252e-09	-7.968	-8.083	-0.116	(0)
CoSO4	1.066e-09	1.066e-09	-8.972	-8.972	0.000	(0)
CoHCO3+	3.583e-11	3.352e-11	-10.446	-10.475	-0.029	(0)
CoF+	9.790e-13	9.159e-13	-12.009	-12.038	-0.029	(0)
CoOH+	5.626e-13	5.263e-13	-12.250	-12.279	-0.029	(0)
CoCl+	5.208e-13	4.872e-13	-12.283	-12.312	-0.029	(0)
CoCO3	1.084e-13	1.084e-13	-12.965	-12.965	0.000	(0)
Co (OH) 2	1.336e-16	1.336e-16	-15.874	-15.874	0.000	(0)
Co2OH+3	3.967e-22	2.177e-22	-21.402	-21.662	-0.261	(0)
Co (OH) 3-	9.111e-24	8.524e-24	-23.040	-23.069	-0.029	(0)
CoOOH-	2.286e-24	2.139e-24	-23.641	-23.670	-0.029	(0)
CoSeO4	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)
Co (OH) 4-2	5.638e-33	4.318e-33	-32.249	-32.365	-0.116	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.352	-40.815	-0.463	(0)
Co (3)	6.968e-33					
CoOH+2	6.968e-33	5.336e-33	-32.157	-32.273	-0.116	(0)
Co+3	5.738e-37	3.285e-37	-36.241	-36.483	-0.242	(0)
CoCl+2	1.490e-39	1.141e-39	-38.827	-38.943	-0.116	(0)
Cu (1)	5.094e-06					
Cu+	4.993e-06	4.671e-06	-5.302	-5.331	-0.029	(0)
CuCl	1.004e-07	1.004e-07	-6.998	-6.998	0.000	(0)
CuCl2-	3.808e-10	3.579e-10	-9.419	-9.446	-0.027	(0)
CuCl3-2	1.667e-15	1.306e-15	-14.778	-14.884	-0.106	(0)
Cu (2)	1.382e-04					
Cu+2	1.222e-04	9.537e-05	-3.913	-4.021	-0.108	(0)
CuSO4	1.415e-05	1.415e-05	-4.849	-4.849	0.000	(0)
CuOH+	1.026e-06	9.640e-07	-5.989	-6.016	-0.027	(0)
CuCO3	4.365e-07	4.365e-07	-6.360	-6.360	0.000	(0)
CuHCO3+	3.359e-07	3.142e-07	-6.474	-6.503	-0.029	(0)
Cu2 (OH) 2+2	3.048e-08	2.335e-08	-7.516	-7.632	-0.116	(0)
CuF+	2.258e-08	2.112e-08	-7.646	-7.675	-0.029	(0)
CuCl+	2.745e-09	2.580e-09	-8.561	-8.588	-0.027	(0)
Cu (OH) 2	6.149e-10	6.149e-10	-9.211	-9.211	0.000	(0)
Cu (CO3) 2-2	1.192e-12	9.130e-13	-11.924	-12.040	-0.116	(0)
CuCl2	1.527e-14	1.527e-14	-13.816	-13.816	0.000	(0)
Cu (OH) 3-	4.309e-15	4.031e-15	-14.366	-14.395	-0.029	(0)
CuCl3-	2.587e-21	2.432e-21	-20.587	-20.614	-0.027	(0)
Cu (OH) 4-2	1.324e-22	1.014e-22	-21.878	-21.994	-0.116	(0)
CuCl4-2	2.655e-28	2.080e-28	-27.576	-27.682	-0.106	(0)
F	1.521e-05					
AlF2+	3.822e-06	3.597e-06	-5.418	-5.444	-0.026	(0)
F-	3.734e-06	3.510e-06	-5.428	-5.455	-0.027	(0)
AlF+2	3.280e-06	2.574e-06	-5.484	-5.589	-0.105	(0)
AlF3	1.589e-07	1.589e-07	-6.799	-6.799	0.000	(0)

CuF+	2.258e-08	2.112e-08	-7.646	-7.675	-0.029	(0)
HF	1.635e-08	1.635e-08	-7.786	-7.786	0.000	(0)
MgF+	1.597e-08	1.502e-08	-7.797	-7.823	-0.027	(0)
CaF+	1.486e-08	1.399e-08	-7.828	-7.854	-0.026	(0)
NaF	8.173e-10	8.173e-10	-9.088	-9.088	0.000	(0)
MnF+	4.717e-10	4.438e-10	-9.326	-9.353	-0.026	(0)
UO2F+	4.488e-10	4.199e-10	-9.348	-9.377	-0.029	(0)
AlF4-	2.973e-10	2.795e-10	-9.527	-9.554	-0.027	(0)
ZnF+	3.574e-11	3.343e-11	-10.447	-10.476	-0.029	(0)
UO2F2	4.250e-12	4.250e-12	-11.372	-11.372	0.000	(0)
PbF+	1.598e-12	1.495e-12	-11.797	-11.825	-0.029	(0)
CoF+	9.790e-13	9.159e-13	-12.009	-12.038	-0.029	(0)
NiF+	5.324e-13	4.981e-13	-12.274	-12.303	-0.029	(0)
CdF+	2.504e-13	2.342e-13	-12.601	-12.630	-0.029	(0)
HF2-	2.323e-13	2.182e-13	-12.634	-12.661	-0.027	(0)
FeF+2	2.226e-14	1.744e-14	-13.652	-13.758	-0.106	(0)
VOF+	1.590e-14	1.488e-14	-13.798	-13.827	-0.029	(0)
UO2F3-	4.005e-15	3.746e-15	-14.397	-14.426	-0.029	(0)
FeF2+	1.741e-15	1.638e-15	-14.759	-14.786	-0.026	(0)
H2F2	7.163e-16	7.163e-16	-15.145	-15.145	0.000	(0)
PbF2	1.032e-16	1.032e-16	-15.986	-15.986	0.000	(0)
VO2F	5.482e-17	5.482e-17	-16.261	-16.261	0.000	(0)
Sb(OH)2F	3.952e-17	3.952e-17	-16.403	-16.403	0.000	(0)
SbOF	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
VOF2	1.958e-17	1.958e-17	-16.708	-16.708	0.000	(0)
FeF3	8.111e-18	8.111e-18	-17.091	-17.091	0.000	(0)
CdF2	1.640e-18	1.640e-18	-17.785	-17.785	0.000	(0)
UO2F4-2	1.364e-19	1.044e-19	-18.865	-18.981	-0.116	(0)
VO2F2-	7.467e-20	6.986e-20	-19.127	-19.156	-0.029	(0)
VOF3-	2.606e-21	2.438e-21	-20.584	-20.613	-0.029	(0)
PbF3-	7.345e-22	6.871e-22	-21.134	-21.163	-0.029	(0)
VO2F3-2	3.993e-24	3.058e-24	-23.399	-23.515	-0.116	(0)
UF2+2	5.668e-25	4.341e-25	-24.247	-24.362	-0.116	(0)
UF3+	2.581e-25	2.415e-25	-24.588	-24.617	-0.029	(0)
VOF4-2	4.510e-26	3.454e-26	-25.346	-25.462	-0.116	(0)
UF+3	1.791e-26	9.825e-27	-25.747	-26.008	-0.261	(0)
PbF4-2	1.507e-27	1.154e-27	-26.822	-26.938	-0.116	(0)
UF4	9.292e-29	9.292e-29	-28.032	-28.032	0.000	(0)
VO2F4-3	9.624e-30	5.281e-30	-29.017	-29.277	-0.261	(0)
UF5-	1.381e-32	1.292e-32	-31.860	-31.889	-0.029	(0)
UF6-2	1.788e-35	1.370e-35	-34.748	-34.863	-0.116	(0)
Fe(2)	7.150e-06					
Fe+2	6.370e-06	4.879e-06	-5.196	-5.312	-0.116	(0)
FeSO4	7.757e-07	7.757e-07	-6.110	-6.110	0.000	(0)
FeHCO3+	3.405e-09	3.207e-09	-8.468	-8.494	-0.026	(0)
FeOH+	6.599e-10	6.209e-10	-9.181	-9.207	-0.026	(0)
Fe(OH)2	1.576e-15	1.576e-15	-14.802	-14.802	0.000	(0)
Fe(OH)3-	1.694e-18	1.593e-18	-17.771	-17.798	-0.026	(0)
Fe(3)	1.241e-08					
Fe(OH)2+	1.236e-08	1.163e-08	-7.908	-7.934	-0.026	(0)
Fe(OH)3	3.993e-11	3.993e-11	-10.399	-10.399	0.000	(0)
FeOH+2	1.194e-11	9.354e-12	-10.923	-11.029	-0.106	(0)
FeSO4+	3.501e-14	3.294e-14	-13.456	-13.482	-0.026	(0)
FeF+2	2.226e-14	1.744e-14	-13.652	-13.758	-0.106	(0)
Fe(OH)4-	1.263e-14	1.189e-14	-13.899	-13.925	-0.026	(0)
Fe+3	7.916e-15	4.532e-15	-14.102	-14.344	-0.242	(0)
FeF2+	1.741e-15	1.638e-15	-14.759	-14.786	-0.026	(0)
Fe(SO4)2-	4.876e-16	4.561e-16	-15.312	-15.341	-0.029	(0)
FeF3	8.111e-18	8.111e-18	-17.091	-17.091	0.000	(0)
FeCl+2	2.981e-18	2.336e-18	-17.526	-17.632	-0.106	(0)
FeHSeO3+2	4.434e-20	3.396e-20	-19.353	-19.469	-0.116	(0)
Fe2(OH)2+4	8.420e-21	2.897e-21	-20.075	-20.538	-0.463	(0)
FeCl2+	1.893e-22	1.781e-22	-21.723	-21.749	-0.026	(0)
Fe3(OH)4+5	2.580e-27	4.871e-28	-26.588	-27.312	-0.724	(0)
FeCl3	3.040e-28	3.040e-28	-27.517	-27.517	0.000	(0)
H(0)	1.404e-22					
H2	7.019e-23	7.024e-23	-22.154	-22.153	0.000	(0)
K	2.430e-05					

K+	2.419e-05	2.274e-05	-4.616	-4.643	-0.027	(0)
KSO4-	1.108e-07	1.043e-07	-6.956	-6.982	-0.026	(0)
Mg	5.341e-05					
Mg+2	4.887e-05	3.814e-05	-4.311	-4.419	-0.108	(0)
MgSO4	4.496e-06	4.496e-06	-5.347	-5.347	0.000	(0)
MgHCO3+	2.169e-08	2.038e-08	-7.664	-7.691	-0.027	(0)
MgF+	1.597e-08	1.502e-08	-7.797	-7.823	-0.027	(0)
MgOH+	5.152e-11	4.854e-11	-10.288	-10.314	-0.026	(0)
MgCO3	2.466e-11	2.466e-11	-10.608	-10.608	0.000	(0)
Mn (2)	4.517e-06					
Mn+2	4.147e-06	3.176e-06	-5.382	-5.498	-0.116	(0)
MnSO4	3.659e-07	3.659e-07	-6.437	-6.437	0.000	(0)
MnHCO3+	3.518e-09	3.309e-09	-8.454	-8.480	-0.026	(0)
MnF+	4.717e-10	4.438e-10	-9.326	-9.353	-0.026	(0)
MnCl+	7.254e-11	6.825e-11	-10.139	-10.166	-0.026	(0)
MnOH+	2.711e-11	2.550e-11	-10.567	-10.593	-0.026	(0)
MnCl2	1.645e-15	1.645e-15	-14.784	-14.784	0.000	(0)
MnCl3-	8.221e-21	7.735e-21	-20.085	-20.112	-0.026	(0)
MnSeO4	3.817e-24	3.817e-24	-23.418	-23.418	0.000	(0)
Mn (OH) 3-	1.712e-24	1.611e-24	-23.767	-23.793	-0.026	(0)
MnSe	8.340e-27	8.340e-27	-26.079	-26.079	0.000	(0)
Mn (OH) 4-2	2.121e-32	1.662e-32	-31.673	-31.779	-0.106	(0)
Mn (3)	2.478e-27					
Mn+3	2.478e-27	1.419e-27	-26.606	-26.848	-0.242	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-63.801	-63.907	-0.106	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-69.251	-69.279	-0.027	(0)
Mo	4.137e-07					
MoO4-2	3.928e-07	3.065e-07	-6.406	-6.514	-0.108	(0)
HMoO4-	2.054e-08	1.921e-08	-7.687	-7.716	-0.029	(0)
H2MoO4	4.433e-10	4.433e-10	-9.353	-9.353	0.000	(0)
AlMo6O21-3	1.065e-24	5.844e-25	-23.973	-24.233	-0.261	(0)
HMo7O24-5	9.795e-36	1.849e-36	-35.009	-35.733	-0.724	(0)
Mo7O24-6	2.658e-36	2.409e-37	-35.576	-36.618	-1.043	(0)
H2Mo7O24-4	1.025e-36	3.528e-37	-35.989	-36.452	-0.463	(0)
H3Mo7O24-3	3.568e-39	1.958e-39	-38.448	-38.708	-0.261	(0)
Na	3.940e-04					
Na+	3.927e-04	3.691e-04	-3.406	-3.433	-0.027	(0)
NaSO4-	1.364e-06	1.284e-06	-5.865	-5.892	-0.026	(0)
NaHCO3	1.084e-08	1.084e-08	-7.965	-7.965	0.000	(0)
NaF	8.173e-10	8.173e-10	-9.088	-9.088	0.000	(0)
NaCO3-	5.675e-12	5.341e-12	-11.246	-11.272	-0.026	(0)
Ni	8.009e-09					
Ni+2	7.239e-09	5.650e-09	-8.140	-8.248	-0.108	(0)
NiSO4	7.302e-10	7.302e-10	-9.137	-9.137	0.000	(0)
NiHCO3+	3.888e-11	3.637e-11	-10.410	-10.439	-0.029	(0)
NiF+	5.324e-13	4.981e-13	-12.274	-12.303	-0.029	(0)
NiCl+	2.637e-13	2.467e-13	-12.579	-12.608	-0.029	(0)
NiOH+	2.430e-13	2.274e-13	-12.614	-12.643	-0.029	(0)
NiCO3	1.638e-13	1.638e-13	-12.786	-12.786	0.000	(0)
Ni (SO4) 2-2	2.045e-14	1.566e-14	-13.689	-13.805	-0.116	(0)
Ni (OH) 2	5.773e-17	5.773e-17	-16.239	-16.239	0.000	(0)
NiCl2	2.120e-20	2.120e-20	-19.674	-19.674	0.000	(0)
Ni (OH) 3-	1.973e-22	1.845e-22	-21.705	-21.734	-0.029	(0)
NiSeO4	1.180e-26	1.180e-26	-25.928	-25.928	0.000	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-47.989	-47.988	0.000	(0)
Pb	9.992e-09					
Pb+2	7.743e-09	6.043e-09	-8.111	-8.219	-0.108	(0)
PbSO4	1.917e-09	1.917e-09	-8.717	-8.717	0.000	(0)
PbHCO3+	2.506e-10	2.345e-10	-9.601	-9.630	-0.029	(0)
PbOH+	5.187e-11	4.852e-11	-10.285	-10.314	-0.029	(0)
PbCO3	1.412e-11	1.412e-11	-10.850	-10.850	0.000	(0)
Pb (SO4) 2-2	9.769e-12	7.482e-12	-11.010	-11.126	-0.116	(0)
PbCl+	3.912e-12	3.659e-12	-11.408	-11.437	-0.029	(0)
PbF+	1.598e-12	1.495e-12	-11.797	-11.825	-0.029	(0)
Pb (OH) 2	4.905e-15	4.905e-15	-14.309	-14.309	0.000	(0)

PbCl2	2.790e-16	2.790e-16	-15.554	-15.554	0.000	(0)
PbF2	1.032e-16	1.032e-16	-15.986	-15.986	0.000	(0)
Pb (CO3) 2-2	4.132e-17	3.164e-17	-16.384	-16.500	-0.116	(0)
Pb2OH+3	8.469e-18	4.647e-18	-17.072	-17.333	-0.261	(0)
Pb (OH) 3-	1.676e-20	1.568e-20	-19.776	-19.805	-0.029	(0)
PbCl3-	2.026e-21	1.896e-21	-20.693	-20.722	-0.029	(0)
PbF3-	7.345e-22	6.871e-22	-21.134	-21.163	-0.029	(0)
PbCl4-2	1.931e-26	1.479e-26	-25.714	-25.830	-0.116	(0)
Pb (OH) 4-2	1.603e-26	1.227e-26	-25.795	-25.911	-0.116	(0)
Pb3 (OH) 4+2	3.787e-27	2.901e-27	-26.422	-26.538	-0.116	(0)
PbF4-2	1.507e-27	1.154e-27	-26.822	-26.938	-0.116	(0)
Pb4 (OH) 4+4	4.046e-31	1.392e-31	-30.393	-30.856	-0.463	(0)
S (6)	9.060e-04					
SO4-2	8.299e-04	6.477e-04	-3.081	-3.189	-0.108	(0)
CaSO4	5.417e-05	5.417e-05	-4.266	-4.266	0.000	(0)
CuSO4	1.415e-05	1.415e-05	-4.849	-4.849	0.000	(0)
MgSO4	4.496e-06	4.496e-06	-5.347	-5.347	0.000	(0)
NaSO4-	1.364e-06	1.284e-06	-5.865	-5.892	-0.026	(0)
FeSO4	7.757e-07	7.757e-07	-6.110	-6.110	0.000	(0)
AlSO4+	3.922e-07	3.688e-07	-6.406	-6.433	-0.027	(0)
MnSO4	3.659e-07	3.659e-07	-6.437	-6.437	0.000	(0)
HSO4-	2.120e-07	1.994e-07	-6.674	-6.700	-0.027	(0)
KSO4-	1.108e-07	1.043e-07	-6.956	-6.982	-0.026	(0)
ZnSO4	6.765e-08	6.765e-08	-7.170	-7.170	0.000	(0)
Al (SO4) 2-	2.722e-09	2.560e-09	-8.565	-8.592	-0.027	(0)
PbSO4	1.917e-09	1.917e-09	-8.717	-8.717	0.000	(0)
CoSO4	1.066e-09	1.066e-09	-8.972	-8.972	0.000	(0)
UO2SO4	8.496e-10	8.496e-10	-9.071	-9.071	0.000	(0)
NiSO4	7.302e-10	7.302e-10	-9.137	-9.137	0.000	(0)
CdSO4	6.393e-10	6.393e-10	-9.194	-9.194	0.000	(0)
Zn (SO4) 2-2	4.983e-10	3.816e-10	-9.303	-9.418	-0.116	(0)
Pb (SO4) 2-2	9.769e-12	7.482e-12	-11.010	-11.126	-0.116	(0)
UO2 (SO4) 2-2	9.472e-12	7.255e-12	-11.024	-11.139	-0.116	(0)
Cd (SO4) 2-2	7.294e-12	5.586e-12	-11.137	-11.253	-0.116	(0)
VOSO4	1.261e-13	1.261e-13	-12.899	-12.899	0.000	(0)
FeSO4+	3.501e-14	3.294e-14	-13.456	-13.482	-0.026	(0)
Ni (SO4) 2-2	2.045e-14	1.566e-14	-13.689	-13.805	-0.116	(0)
Fe (SO4) 2-	4.876e-16	4.561e-16	-15.312	-15.341	-0.029	(0)
VO2SO4-	1.472e-16	1.377e-16	-15.832	-15.861	-0.029	(0)
VSO4+	1.138e-22	1.065e-22	-21.944	-21.973	-0.029	(0)
U (SO4) 2	1.861e-26	1.861e-26	-25.730	-25.730	0.000	(0)
USO4+2	4.724e-27	3.618e-27	-26.326	-26.442	-0.116	(0)
Sb (3)	4.523e-12					
Sb (OH) 3	2.289e-12	2.289e-12	-11.640	-11.640	0.000	(0)
HSbO2	2.234e-12	2.234e-12	-11.651	-11.651	0.000	(0)
Sb (OH) 2+	1.871e-16	1.751e-16	-15.728	-15.757	-0.029	(0)
SbO+	6.452e-17	6.036e-17	-16.190	-16.219	-0.029	(0)
Sb (OH) 2F	3.952e-17	3.952e-17	-16.403	-16.403	0.000	(0)
SbOF	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
SbO2-	1.228e-18	1.149e-18	-17.911	-17.940	-0.029	(0)
Sb (OH) 4-	7.036e-19	6.582e-19	-18.153	-18.182	-0.029	(0)
Sb (5)	3.281e-09					
SbO3-	3.277e-09	3.066e-09	-8.484	-8.513	-0.029	(0)
Sb (OH) 6-	3.815e-12	3.586e-12	-11.418	-11.445	-0.027	(0)
SbO2+	9.327e-21	8.726e-21	-20.030	-20.059	-0.029	(0)
Se (-2)	2.194e-21					
HSe-	2.145e-21	2.007e-21	-20.669	-20.697	-0.029	(0)
H2Se	4.907e-23	4.907e-23	-22.309	-22.309	0.000	(0)
MnSe	8.340e-27	8.340e-27	-26.079	-26.079	0.000	(0)
Se-2	8.319e-31	6.371e-31	-30.080	-30.196	-0.116	(0)
Se (4)	3.040e-09					
HSeO3-	3.031e-09	2.836e-09	-8.518	-8.547	-0.029	(0)
SeO3-2	4.680e-12	3.584e-12	-11.330	-11.446	-0.116	(0)
H2SeO3	3.811e-12	3.811e-12	-11.419	-11.419	0.000	(0)
FeHSeO3+2	4.434e-20	3.396e-20	-19.353	-19.469	-0.116	(0)
Cd (SeO3) 2-2	5.821e-26	4.458e-26	-25.235	-25.351	-0.116	(0)
Se (6)	5.725e-21					
SeO4-2	5.720e-21	4.464e-21	-20.243	-20.350	-0.108	(0)

MnSeO4	3.817e-24	3.817e-24	-23.418	-23.418	0.000	(0)
HSeO4-	7.534e-25	7.048e-25	-24.123	-24.152	-0.029	(0)
ZnSeO4	3.301e-25	3.301e-25	-24.481	-24.481	0.000	(0)
CoSeO4	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)
NiSeO4	1.180e-26	1.180e-26	-25.928	-25.928	0.000	(0)
CdSeO4	3.500e-27	3.500e-27	-26.456	-26.456	0.000	(0)
Zn (SeO4) 2-2	0.000e+00	0.000e+00	-44.710	-44.826	-0.116	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-42.388	-42.649	-0.261	(0)
U (4)	4.127e-16					
U (OH) 5-	3.668e-16	3.432e-16	-15.436	-15.464	-0.029	(0)
U (OH) 4	4.527e-17	4.527e-17	-16.344	-16.344	0.000	(0)
U (OH) 3+	5.573e-19	5.214e-19	-18.254	-18.283	-0.029	(0)
U (OH) 2+2	9.915e-22	7.594e-22	-21.004	-21.120	-0.116	(0)
UF2+2	5.668e-25	4.341e-25	-24.247	-24.362	-0.116	(0)
UF3+	2.581e-25	2.415e-25	-24.588	-24.617	-0.029	(0)
UOH+3	2.053e-25	1.127e-25	-24.688	-24.948	-0.261	(0)
U (SO4) 2	1.861e-26	1.861e-26	-25.730	-25.730	0.000	(0)
UF+3	1.791e-26	9.825e-27	-25.747	-26.008	-0.261	(0)
USO4+2	4.724e-27	3.618e-27	-26.326	-26.442	-0.116	(0)
UF4	9.292e-29	9.292e-29	-28.032	-28.032	0.000	(0)
U+4	4.078e-30	1.403e-30	-29.390	-29.853	-0.463	(0)
UF5-	1.381e-32	1.292e-32	-31.860	-31.889	-0.029	(0)
UC1+3	2.187e-33	1.200e-33	-32.660	-32.921	-0.261	(0)
UF6-2	1.788e-35	1.370e-35	-34.748	-34.863	-0.116	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-111.401	-113.747	-2.346	(0)
U (5)	5.647e-11					
UO2+	5.647e-11	5.283e-11	-10.248	-10.277	-0.029	(0)
U (6)	5.532e-09					
UO2CO3	2.681e-09	2.681e-09	-8.572	-8.572	0.000	(0)
UO2+2	1.110e-09	8.667e-10	-8.955	-9.062	-0.108	(0)
UO2SO4	8.496e-10	8.496e-10	-9.071	-9.071	0.000	(0)
UO2F+	4.488e-10	4.199e-10	-9.348	-9.377	-0.029	(0)
UO2OH+	3.728e-10	3.488e-10	-9.429	-9.457	-0.029	(0)
UO2 (CO3) 2-2	5.429e-11	4.158e-11	-10.265	-10.381	-0.116	(0)
UO2 (SO4) 2-2	9.472e-12	7.255e-12	-11.024	-11.139	-0.116	(0)
UO2F2	4.250e-12	4.250e-12	-11.372	-11.372	0.000	(0)
(UO2) 2 (OH) 2+2	2.636e-13	2.019e-13	-12.579	-12.695	-0.116	(0)
UO2Cl+	2.564e-14	2.399e-14	-13.591	-13.620	-0.029	(0)
UO2 (CO3) 3-4	4.707e-15	1.620e-15	-14.327	-14.791	-0.463	(0)
UO2F3-	4.005e-15	3.746e-15	-14.397	-14.426	-0.029	(0)
(UO2) 3 (OH) 5+	5.834e-16	5.457e-16	-15.234	-15.263	-0.029	(0)
UO2F4-2	1.364e-19	1.044e-19	-18.865	-18.981	-0.116	(0)
V (2)	2.416e-30					
V+2	2.227e-30	1.706e-30	-29.652	-29.768	-0.116	(0)
VOH+	1.886e-31	1.764e-31	-30.724	-30.753	-0.029	(0)
V (3)	9.177e-09					
V (OH) 3	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
V (OH) 2+	1.996e-17	1.868e-17	-16.700	-16.729	-0.029	(0)
VOH+2	7.285e-19	5.580e-19	-18.138	-18.253	-0.116	(0)
V+3	6.347e-22	3.483e-22	-21.197	-21.458	-0.261	(0)
VSO4+	1.138e-22	1.065e-22	-21.944	-21.973	-0.029	(0)
V2 (OH) 2+4	5.709e-36	1.964e-36	-35.243	-35.707	-0.463	(0)
V2 (OH) 3+3	5.376e-37	2.950e-37	-36.270	-36.530	-0.261	(0)
V (4)	1.547e-12					
VO+2	9.229e-13	7.068e-13	-12.035	-12.151	-0.116	(0)
V (OH) 3+	4.819e-13	4.508e-13	-12.317	-12.346	-0.029	(0)
VOSO4	1.261e-13	1.261e-13	-12.899	-12.899	0.000	(0)
VOF+	1.590e-14	1.488e-14	-13.798	-13.827	-0.029	(0)
VOC1+	3.618e-17	3.384e-17	-16.442	-16.471	-0.029	(0)
VOF2	1.958e-17	1.958e-17	-16.708	-16.708	0.000	(0)
H2V2O4+2	1.330e-20	1.019e-20	-19.876	-19.992	-0.116	(0)
VOF3-	2.606e-21	2.438e-21	-20.584	-20.613	-0.029	(0)
VOF4-2	4.510e-26	3.454e-26	-25.346	-25.462	-0.116	(0)
V (5)	4.956e-11					
H2VO4-	4.809e-11	4.498e-11	-10.318	-10.347	-0.029	(0)
H3VO4	1.417e-12	1.417e-12	-11.849	-11.849	0.000	(0)
HVO4-2	4.684e-14	3.587e-14	-13.329	-13.445	-0.116	(0)

VO2+	9.476e-15	8.906e-15	-14.023	-14.050	-0.027	(0)
H3V2O7-	4.400e-16	4.116e-16	-15.357	-15.386	-0.029	(0)
VO2SO4-	1.472e-16	1.377e-16	-15.832	-15.861	-0.029	(0)
VO2F	5.482e-17	5.482e-17	-16.261	-16.261	0.000	(0)
VO2F2-	7.467e-20	6.986e-20	-19.127	-19.156	-0.029	(0)
HV2O7-3	9.965e-22	5.468e-22	-21.002	-21.262	-0.261	(0)
VO4-3	1.040e-22	5.708e-23	-21.983	-22.244	-0.261	(0)
VO2F3-2	3.993e-24	3.058e-24	-23.399	-23.515	-0.116	(0)
V3O9-3	1.737e-25	9.533e-26	-24.760	-25.021	-0.261	(0)
V2O7-4	1.358e-26	4.672e-27	-25.867	-26.330	-0.463	(0)
VO2F4-3	9.624e-30	5.281e-30	-29.017	-29.277	-0.261	(0)
V4O12-4	5.196e-33	1.788e-33	-32.284	-32.748	-0.463	(0)
HV10O28-5	0.000e+00	0.000e+00	-73.161	-73.885	-0.724	(0)
H2V10O28-4	0.000e+00	0.000e+00	-73.716	-74.179	-0.463	(0)
V10O28-6	0.000e+00	0.000e+00	-75.528	-76.570	-1.043	(0)
Zn	6.809e-07					
Zn+2	6.117e-07	4.774e-07	-6.213	-6.321	-0.108	(0)
ZnSO4	6.765e-08	6.765e-08	-7.170	-7.170	0.000	(0)
ZnHCO3+	8.427e-10	7.883e-10	-9.074	-9.103	-0.029	(0)
Zn(SO4) 2-2	4.983e-10	3.816e-10	-9.303	-9.418	-0.116	(0)
ZnOH+	1.631e-10	1.526e-10	-9.787	-9.816	-0.029	(0)
ZnF+	3.574e-11	3.343e-11	-10.447	-10.476	-0.029	(0)
ZnCl+	2.178e-11	2.047e-11	-10.662	-10.689	-0.027	(0)
ZnCO3	2.135e-11	2.135e-11	-10.671	-10.671	0.000	(0)
ZnOHCl	8.565e-14	8.565e-14	-13.067	-13.067	0.000	(0)
Zn(OH) 2	7.731e-14	7.731e-14	-13.112	-13.112	0.000	(0)
ZnCl2	5.536e-16	5.536e-16	-15.257	-15.257	0.000	(0)
Zn(OH) 3-	1.324e-18	1.239e-18	-17.878	-17.907	-0.029	(0)
ZnCl3-	7.986e-21	7.506e-21	-20.098	-20.125	-0.027	(0)
ZnSeO4	3.301e-25	3.301e-25	-24.481	-24.481	0.000	(0)
Zn(OH) 4-2	2.058e-25	1.576e-25	-24.687	-24.802	-0.116	(0)
ZnCl4-2	8.176e-26	6.406e-26	-25.087	-25.193	-0.106	(0)
Zn(SeO4) 2-2	0.000e+00	0.000e+00	-44.710	-44.826	-0.116	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH) 3 (am)	-1.43	9.37	10.80	Al(OH) 3
Al2(MoO4) 3	-36.18	-33.81	2.37	Al2(MoO4) 3
Al2O3	-0.91	18.74	19.65	Al2O3
Al4(OH) 10SO4	0.59	23.29	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-6.61	-1.81	4.80	AlAsO4:2H2O
AlOHSO4	-1.59	-4.82	-3.23	AlOHSO4
AlSb	-124.90	-59.28	65.62	AlSb
Alunite	1.99	0.59	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-3.62	-11.41	-7.79	PbSO4
Anhydrite	-2.27	-6.63	-4.36	CaSO4
Antlerite	-2.03	6.76	8.79	Cu3(OH) 4SO4
Aragonite	-4.25	-12.55	-8.30	CaCO3
Arsenolite	-42.38	-45.14	-2.76	As4O6
Artinite	-16.54	-6.94	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-29.06	-22.36	6.71	As2O5
Atacamite	-3.69	3.70	7.39	Cu2(OH) 3Cl
Azurite	-2.37	-19.28	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-20.60	3.80	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-25.37	-9.50	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-2.06	-10.97	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-38.64	-5.70	32.94	Ba3(VO4) 2:4H2O
BaF2	-12.30	-18.12	-5.82	BaF2
BaMoO4	-6.76	-13.72	-6.96	BaMoO4
Barite	-0.41	-10.39	-9.98	BaSO4
BaSeO3	-12.08	-10.25	1.83	BaSeO3
BaSeO4	-20.10	-27.56	-7.46	BaSeO4
Bianchite	-7.74	-9.51	-1.76	ZnSO4:6H2O
Birnessite	-18.93	-0.84	18.09	MnO2
Bixbyite	-20.04	-20.69	-0.64	Mn2O3
Boehmite	0.79	9.37	8.58	AlOOH

Breithauptite	-37.87	-56.39	-18.52	NiSb
Brochantite	-1.48	13.74	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-10.26	6.58	16.84	Mg(OH) 2
Bunsenite	-9.69	2.76	12.45	NiO
Ca(VO ₃) 2	-15.19	-9.53	5.66	Ca(VO ₃) 2
Ca ₂ V ₂ O ₇	-19.47	-1.97	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-23.52	-1.97	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-21.96	0.34	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-33.36	5.60	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-34.26	5.60	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-257.58	-114.60	142.97	Ca ₃ Sb ₂
Calcite	-4.07	-12.55	-8.48	CaCO ₃
CaMoO ₄	-2.00	-9.95	-7.95	CaMoO ₄
Carnotite	-5.98	-5.75	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-9.30	-6.48	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-20.77	-23.79	-3.02	CaSeO ₄ :2H ₂ O
Cd(OH) 2	-11.02	2.63	13.64	Cd(OH) 2
Cd(OH) 2 (am)	-11.10	2.63	13.73	Cd(OH) 2
Cd ₃ (OH) 2 (SO ₄) 2	-27.21	-20.50	6.71	Cd ₃ (OH) 2 (SO ₄) 2
Cd ₃ (OH) 4SO ₄	-28.87	-6.31	22.56	Cd ₃ (OH) 4SO ₄
Cd ₄ (OH) 6SO ₄	-32.08	-3.68	28.40	Cd ₄ (OH) 6SO ₄
CdCl ₂	-17.25	-17.91	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-16.22	-17.91	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-16.00	-17.91	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-18.07	-19.29	-1.21	CdF ₂
Cdmetal (alpha)	-29.89	-16.38	13.51	Cd
Cdmetal (gamma)	-29.99	-16.38	13.62	Cd
CdMoO ₄	-0.74	-14.89	-14.15	CdMoO ₄
CdOHCl	-11.18	-7.64	3.54	CdOHCl
CdSb	-56.17	-56.52	-0.35	CdSb
CdSe	-3.37	-23.57	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-26.88	-28.73	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-11.39	-11.56	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.84	-11.56	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.69	-11.56	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-4.20	-17.33	-13.13	PbCO ₃
CH ₄ (g)	-55.08	-96.13	-41.05	CH ₄
Chalcanthite	-4.57	-7.21	-2.64	CuSO ₄ :5H ₂ O
Claudetite	-42.07	-45.14	-3.06	As ₄ O ₆
Clausthalite	3.69	-23.41	-27.10	PbSe
Co(OH) 2	-10.17	2.92	13.09	Co(OH) 2
Co(OH) 3	-17.67	-19.98	-2.31	Co(OH) 3
CO ₂ (g)	-1.97	-20.11	-18.15	CO ₂
Co ₃ (AsO ₄) 2	-26.63	-13.60	13.03	Co ₃ (AsO ₄) 2
Co ₃ O ₄	-26.54	-37.04	-10.50	Co ₃ O ₄
CoCl ₂	-25.89	-17.62	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-20.16	-17.62	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-7.21	-17.19	-9.98	CoCO ₃
CoF ₂	-17.40	-18.99	-1.60	CoF ₂
CoF ₃	-51.39	-52.85	-1.46	CoF ₃
CoFe ₂ O ₄	10.77	7.24	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.84	-14.60	-7.76	CoMoO ₄
CoO	-10.67	2.92	13.59	CoO
CoSe	-7.08	-23.28	-16.20	CoSe
CoSeO ₃	-12.45	-11.13	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-26.90	-28.43	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-14.07	-11.27	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-8.80	-11.27	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-12.97	-17.75	-4.78	PbCl ₂
Cryolite	-16.32	-50.16	-33.84	Na ₃ AlF ₆
Cu(OH) 2	-1.69	6.98	8.67	Cu(OH) 2
Cu(SbO ₃) 2	-23.50	21.71	45.21	Cu(SbO ₃) 2
Cu ₂ Sb:3H ₂ O	-26.61	-61.50	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se (alpha)	19.94	-25.86	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-11.90	-13.85	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) 2:2H ₂ O	-7.51	-1.41	6.10	Cu ₃ (AsO ₄) 2:2H ₂ O
Cu ₃ Sb	-25.54	-68.14	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	18.42	-45.07	-63.49	Cu ₃ Se ₂

CuCO3	-1.63	-13.13	-11.50	CuCO3
CuF	-5.88	-10.79	-4.91	CuF
CuF2	-16.05	-14.93	1.12	CuF2
CuF2:2H2O	-10.38	-14.93	-4.55	CuF2:2H2O
Cumetal	-0.57	-9.33	-8.76	Cu
CuMoO4	2.54	-10.53	-13.08	CuMoO4
CuOCuSO4	-10.53	-0.23	10.30	CuOCuSO4
Cupricferrite	5.32	11.31	5.99	CuFe2O4
Cuprite	1.75	0.34	-1.41	Cu2O
Cuprousferrite	11.25	2.33	-8.92	CuFeO2
CuSe	13.88	-19.22	-33.10	CuSe
CuSe2	6.95	-26.41	-33.37	CuSe2
CuSeO3:2H2O	-7.58	-7.07	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-21.93	-24.37	-2.44	CuSeO4:5H2O
CuSO4	-10.15	-7.21	2.94	CuSO4
Diaspore	2.50	9.37	6.87	AlOOH
Dolomite(disordered)	-9.54	-26.08	-16.54	CaMg(CO3)2
Dolomite(ordered)	-8.99	-26.08	-17.09	CaMg(CO3)2
Epsomite	-5.48	-7.61	-2.13	MgSO4:7H2O
Fe(OH)2	-7.87	5.69	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.12	-0.92	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-7.69	-11.41	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.28	-9.73	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.20	-37.82	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-34.52	-38.25	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.21	10.01	20.22	Fe3(OH)8
FeAsO4:2H2O	-9.42	-9.02	0.40	FeAsO4:2H2O
FeMoO4	-1.73	-11.83	-10.09	FeMoO4
Ferrihydrite	-1.03	2.16	3.19	Fe(OH)3
Ferroselite	-9.11	-27.70	-18.60	FeSe2
FeSe	-9.51	-20.51	-11.00	FeSe
Fluorite	-3.85	-14.35	-10.50	CaF2
Gibbsite	1.08	9.37	8.29	Al(OH)3
Goethite	1.67	2.16	0.49	FeOOH
Goslarite	-7.50	-9.51	-2.01	ZnSO4:7H2O
Gummite	-5.73	1.94	7.67	UO3
Gypsum	-2.02	-6.63	-4.61	CaSO4:2H2O
H-Jarosite	-9.80	-21.90	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-4.64	-17.52	-12.88	H2MoO4
H2Se(g)	-21.24	-26.20	-4.96	H2Se
Halite	-9.80	-8.20	1.60	NaCl
Hausmannite	-25.51	35.52	61.03	Mn3O4
Hematite	5.74	4.32	-1.42	Fe2O3
Hercynite	1.54	24.43	22.89	FeAl2O4
Huntite	-23.16	-53.13	-29.97	CaMg3(CO3)4
Hydrocerrusite	-13.10	-31.87	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-38.76	-47.53	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-12.99	-18.16	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.24	-21.04	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-19.06	-15.80	3.26	K2MoO4
K2SeO4	-28.91	-29.64	-0.73	K2SeO4
Langite	-3.75	13.74	17.49	Cu4(OH)6SO4:H2O
Larnakite	-8.19	-8.62	-0.43	PbO:PbSO4
Laurionite	-8.11	-7.48	0.62	PbOHCl
Lepidocrocite	0.79	2.16	1.37	FeOOH
Lime	-25.13	7.57	32.70	CaO
Litharge	-9.91	2.78	12.69	PbO
Maghemite	-2.06	4.32	6.39	Fe2O3
Magnesioferrite	-5.95	10.91	16.86	Fe2MgO4
Magnesite	-6.07	-13.53	-7.46	MgCO3
Magnetite	6.61	10.01	3.40	Fe3O4
Malachite	-0.84	-6.15	-5.31	Cu2(OH)2CO3
Manganite	-10.33	15.01	25.34	MnOOH
Massicot	-10.11	2.78	12.89	PbO
Matlockite	-9.47	-18.44	-8.97	PbClF
Melanothallite	-19.81	-13.56	6.26	CuCl2
Melanterite	-6.29	-8.50	-2.21	FeSO4:7H2O
Mg(OH)2(active)	-12.21	6.58	18.79	Mg(OH)2

Mg (VO3) 2	-21.79	-10.51	11.28	Mg (VO3) 2
Mg2Sb3	-219.96	-145.27	74.68	Mg2Sb3
Mg2V2O7	-30.29	-3.93	26.36	Mg2V2O7
MgF2	-7.20	-15.33	-8.13	MgF2
MgMoO4	-9.08	-10.93	-1.85	MgMoO4
MgSeO3:6H2O	-10.52	-7.46	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-23.57	-24.77	-1.20	MgSeO4:6H2O
Minium	-46.16	27.36	73.52	Pb3O4
Mirabilite	-8.94	-10.05	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-16.49	-11.59	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.55	-63.26	-5.71	Mn2 (SO4) 3
Mn2Sb	-128.22	-67.14	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-18.34	-5.84	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-17.75	-15.03	2.72	MnCl2:4H2O
MnSb	-76.08	-78.99	-2.91	MnSb
MnSe	-24.19	-20.69	3.50	MnSe
MnSeO3	-9.67	-8.54	1.13	MnSeO3
MnSeO3:2H2O	-9.53	-8.54	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-23.80	-25.85	-2.05	MnSeO4:5H2O
MnSO4	-11.27	-8.69	2.58	MnSO4
Monteponite	-12.48	2.63	15.10	CdO
MoO3	-9.52	-17.52	-8.00	MoO3
Morenosite	-9.29	-11.44	-2.14	NiSO4:7H2O
Na-Jarosite	-8.63	-19.83	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-14.30	-30.90	-16.60	Na2Mo2O7
Na2MoO4	-14.87	-13.38	1.49	Na2MoO4
Na2MoO4:2H2O	-14.60	-13.38	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.21	-9.91	10.30	Na2SeO3:5H2O
Na2SeO4	-28.50	-27.22	1.28	Na2SeO4
Na3Sb	-156.90	-62.44	94.45	Na3Sb
Na3VO4	-39.02	-2.34	36.68	Na3VO4
Na4V2O7	-46.22	-8.82	37.40	Na4V2O7
Nantokite	-3.37	-10.10	-6.73	CuCl
NaSb	-70.74	-47.58	23.17	NaSb
Natron	-14.66	-15.98	-1.31	Na2CO3:10H2O
NaVO3	-10.34	-6.48	3.86	NaVO3
Nesquehonite	-8.86	-13.53	-4.67	MgCO3:3H2O
Ni (OH) 2	-10.04	2.76	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-29.79	-14.09	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-35.17	-3.17	32.00	Ni4 (OH) 6SO4
NiCO3	-10.49	-17.36	-6.87	NiCO3
NiMoO4	-3.62	-14.76	-11.14	NiMoO4
NiSe	-5.74	-23.44	-17.70	NiSe
NiSeO3:2H2O	-14.11	-11.29	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-27.08	-28.60	-1.52	NiSeO4:6H2O
Nsutite	-18.35	-0.84	17.50	MnO2
O2 (g)	-45.08	38.01	83.09	O2
Otavite	-5.49	-17.49	-12.00	CdCO3
Pb (OH) 2	-5.37	2.78	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-84.07	-92.83	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-13.49	-4.70	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-20.62	5.57	26.19	Pb2O (OH) 2
Pb2O3	-36.47	24.57	61.04	Pb2O3
Pb2OCO3	-13.99	-14.54	-0.56	Pb2OCO3
Pb2V2O7	-9.63	-11.53	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.80	-14.00	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-14.88	-8.74	6.14	Pb3 (VO4) 2
Pb3O2CO3	-22.78	-11.76	11.02	Pb3O2CO3
Pb3O2SO4	-16.52	-5.84	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-24.15	-3.05	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-24.93	-3.05	21.88	Pb4O3SO4
PbF2	-11.69	-19.13	-7.44	PbF2
Pbmetal	-20.46	-16.22	4.25	Pb
PbMoO4	0.89	-14.73	-15.62	PbMoO4
PbO:0.3H2O	-10.20	2.78	12.98	PbO:0.33H2O
PbSeO4	-21.73	-28.57	-6.84	PbSeO4
Periclase	-15.00	6.58	21.58	MgO
Phosgenite	-15.27	-35.08	-19.81	PbCl2:PbCO3

Plattnerite	-27.81	21.79	49.60	PbO2
Portlandite	-15.24	7.57	22.80	Ca(OH)2
Pyrochroite	-9.69	5.51	15.19	Mn(OH)2
Pyrolusite	-16.87	24.51	41.38	MnO2
Retgersite	-9.40	-11.44	-2.04	NiSO4·6H2O
Rhodochrosite	-4.03	-14.61	-10.58	MnCO3
Rutherfordine	-3.67	-18.17	-14.50	UO2CO3
Sb(OH)3	-4.53	-11.64	-7.11	Sb(OH)3
Sb2O4	-7.68	-4.28	3.40	Sb2O4
Sb2O5	-24.23	-33.89	-9.67	Sb2O5
Sb2Se3	-34.12	-101.88	-67.76	Sb2Se3
Sb4O6(cubic)	-28.30	-46.56	-18.26	Sb4O6
Sb4O6(orth)	-28.66	-46.56	-17.90	Sb4O6
SbCl3	-43.02	-42.45	0.57	SbCl3
SbF3	-34.28	-44.51	-10.23	SbF3
Sbmetal	-28.46	-40.15	-11.69	Sb
SbO2	1.38	-26.45	-27.82	SbO2
Schoepite	-4.05	1.94	5.99	UO2(OH)2·H2O
Semetal(am)	-0.09	-7.20	-7.11	Se
Semetal(hex)	0.51	-7.20	-7.71	Se
Senarmontite	-10.92	-23.28	-12.37	Sb2O3
SeO2	-14.17	-14.05	0.12	SeO2
SeO3	-52.40	-31.35	21.04	SeO3
Siderite	-4.18	-14.42	-10.24	FeCO3
Smithsonite	-5.43	-15.43	-10.00	ZnCO3
Spinel	-11.52	25.33	36.85	MgAl2O4
Tenorite	-0.66	6.98	7.64	CuO
Thenardite	-10.38	-10.05	0.32	Na2SO4
Thermonatrite	-16.61	-15.98	0.64	Na2CO3·H2O
Tyuyamunite	-9.73	-5.65	4.08	Ca(UO2)2(VO4)2
U3O8	-6.62	14.47	21.08	U3O8
U3Sb4	-450.52	-298.14	152.38	U3Sb4
U4O9	-9.36	-12.38	-3.02	U4O9
UF4	-22.13	-51.67	-29.54	UF4
UF4·2.5H2O	-18.95	-51.67	-32.72	UF4·2.5H2O
UO2(am)	-8.78	-7.85	0.93	UO2
UO2(OH)2(beta)	-3.67	1.94	5.61	UO2(OH)2
UO2SeO4·4H2O	-27.16	-29.41	-2.25	UO2SeO4·4H2O
UO3	-5.76	1.94	7.70	UO3
Uraninite	-3.18	-7.85	-4.67	UO2
USb2	-164.94	-135.36	29.58	USb2
V(OH)3	-12.54	-4.95	7.59	V(OH)3
V2O5	-15.74	-17.10	-1.36	V2O5
V3O5	-24.28	-22.45	1.84	V3O5
V4O7	-30.78	-23.59	7.19	V4O7
V6O13	-28.44	-89.30	-60.86	V6O13
Valentinite	-14.80	-23.28	-8.48	Sb2O3
VC12	-53.87	-34.99	18.87	VC12
VC13	-59.19	-35.76	23.43	VC13
VF4	-59.90	-44.97	14.93	VF4
Vmetal	-77.48	-33.46	44.03	V
VO	-29.21	-14.45	14.76	VO
VO(OH)2	-6.30	-1.15	5.15	VO(OH)2
VO2Cl	-21.66	-18.82	2.84	VO2Cl
VOC1	-26.37	-15.22	11.15	VOC1
VOC12	-34.45	-21.69	12.76	VOC12
VOSO4	-18.95	-15.34	3.61	VOSO4
Witherite	-7.75	-16.32	-8.57	BaCO3
Zincite	-6.65	4.68	11.33	ZnO
Zincosite	-13.44	-9.51	3.93	ZnSO4
Zn(OH)2	-7.52	4.68	12.20	Zn(OH)2
Zn(OH)2(am)	-7.79	4.68	12.47	Zn(OH)2
Zn(OH)2(beta)	-7.07	4.68	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-6.85	4.68	11.53	Zn(OH)2
Zn(OH)2(gamma)	-7.05	4.68	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.33	-4.83	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-16.10	-0.91	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-21.96	-8.31	13.65	Zn3(AsO4)2·2.5H2O

Zn3O(SO4)2	-33.25	-14.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-23.86	4.54	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-35.63	2.87	38.50	Zn5(OH)8Cl2
ZnCl2	-22.91	-15.86	7.05	ZnCl2
ZnCO3:1H2O	-5.17	-15.43	-10.26	ZnCO3:1H2O
ZnF2	-16.70	-17.23	-0.53	ZnF2
Znmetal	-40.11	-14.32	25.79	Zn
ZnMoO4	-2.71	-12.83	-10.13	ZnMoO4
ZnO(active)	-6.51	4.68	11.19	ZnO
ZnSb	-65.48	-54.47	11.01	ZnSb
ZnSe	-7.12	-21.52	-14.40	ZnSe
ZnSeO4:6H2O	-25.15	-26.67	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.87	-9.51	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 7.

SOLUTION 5 Average HCT data for quartz monzonite - oxide/transitional
(waste) (cells SRK 0858 and 604569)

temp 25
pH 2.99113
pe 4
redox pe
units mg/l
density 1
Al 2.96315
As 0.00036
B 0.01802
Ba 0.00214
Ca 9.58689
Cd 0.00139
Cl 1.26131 charge
Cr 0.00558
Co 0.01515
Cu 2.40842
F 1.98157
Fe 6.75362
K 1.66188
Mg 1.63786
Mn 0.12532
Mo 0.00180
Na 1.97851
Ni 0.00180
Pb 0.00187
S(6) 89.14415 as SO4
Se 0.00023
U 0.00512
V 0.00180
Zn 0.01701
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 5. Average HCT data for quartz monzonite - oxide/transitional
(waste) (cells SRK 0858 and 604569)

-----Solution composition-----

Elements	Molality	Moles	
Al	1.098e-04	1.098e-04	
As	4.806e-09	4.806e-09	
B	1.667e-06	1.667e-06	
Ba	1.558e-08	1.558e-08	
Ca	2.392e-04	2.392e-04	
Cd	1.237e-08	1.237e-08	
Cl	5.882e-04	5.882e-04	Charge balance
Co	2.571e-07	2.571e-07	
Cr	1.073e-07	1.073e-07	
Cu	3.790e-05	3.790e-05	
F	1.043e-04	1.043e-04	
Fe	1.209e-04	1.209e-04	
K	4.251e-05	4.251e-05	
Mg	6.740e-05	6.740e-05	
Mn	2.281e-06	2.281e-06	
Mo	1.876e-08	1.876e-08	
Na	8.607e-05	8.607e-05	
Ni	3.067e-08	3.067e-08	
Pb	9.026e-09	9.026e-09	
S (6)	9.281e-04	9.281e-04	
Se	2.913e-09	2.913e-09	
U	2.151e-08	2.151e-08	
V	3.534e-08	3.534e-08	
Zn	2.602e-07	2.602e-07	

-----Description of solution-----

pH	=	2.991
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	3.544e-03
Mass of water (kg)	=	1.000e+00
Total alkalinity (eq/kg)	=	-1.156e-03
Total carbon (mol/kg)	=	0.000e+00
Total CO2 (mol/kg)	=	0.000e+00
Temperature (°C)	=	25.00
Electrical balance (eq)	=	1.604e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	13
Total H	=	1.110148e+02
Total O	=	5.551055e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.089e-03	1.021e-03	-2.963	-2.991	-0.028	0.00
OH-	1.053e-11	9.865e-12	-10.977	-11.006	-0.028	(0)
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Al	1.098e-04					
AlF+2	5.909e-05	4.588e-05	-4.229	-4.338	-0.110	(0)
AlSO4+	2.178e-05	2.042e-05	-4.662	-4.690	-0.028	(0)
AlF2+	2.083e-05	1.955e-05	-4.681	-4.709	-0.027	(0)
Al+3	7.675e-06	4.286e-06	-5.115	-5.368	-0.253	(0)
AlF3	2.635e-07	2.635e-07	-6.579	-6.579	0.000	(0)
Al (SO4) 2-	1.433e-07	1.344e-07	-6.844	-6.872	-0.028	(0)
AlOH+2	5.445e-08	4.228e-08	-7.264	-7.374	-0.110	(0)
Al (OH) 2+	3.530e-10	3.313e-10	-9.452	-9.480	-0.027	(0)
AlF4-	1.508e-10	1.414e-10	-9.822	-9.850	-0.028	(0)
Al (OH) 3	6.522e-14	6.522e-14	-13.186	-13.186	0.000	(0)
Al (OH) 4-	8.638e-17	8.100e-17	-16.064	-16.092	-0.028	(0)
AlMo6O21-3	1.363e-28	7.263e-29	-27.866	-28.139	-0.273	(0)
As (3)	4.805e-09					
H3AsO3	4.803e-09	4.803e-09	-8.319	-8.319	0.000	(0)
H4AsO3+	2.604e-12	2.429e-12	-11.584	-11.615	-0.030	(0)

		H2AsO3-	2.588e-15	2.413e-15	-14.587	-14.617	-0.030	(0)
		HAsO3-2	2.852e-24	2.156e-24	-23.545	-23.666	-0.121	(0)
		AsO3-3	1.528e-34	8.145e-35	-33.816	-34.089	-0.273	(0)
As	(5)		4.108e-13					
		H2AsO4-	3.525e-13	3.287e-13	-12.453	-12.483	-0.030	(0)
		H3AsO4	5.826e-14	5.831e-14	-13.235	-13.234	0.000	(0)
		HAsO4-2	4.671e-17	3.532e-17	-16.331	-16.452	-0.121	(0)
		AsO4-3	2.053e-25	1.094e-25	-24.688	-24.961	-0.273	(0)
B			1.667e-06					
		H3BO3	1.667e-06	1.669e-06	-5.778	-5.778	0.000	(0)
		H2BO3-	1.015e-12	9.494e-13	-11.994	-12.023	-0.029	(0)
		BF(OH) 3-	7.618e-13	7.127e-13	-12.118	-12.147	-0.029	(0)
		BF2(OH) 2-	8.899e-14	8.325e-14	-13.051	-13.080	-0.029	(0)
		CaH2BO3+	9.728e-15	9.101e-15	-14.012	-14.041	-0.029	(0)
		MgH2BO3+	1.685e-15	1.576e-15	-14.773	-14.802	-0.029	(0)
		NaH2BO3	1.210e-16	1.210e-16	-15.917	-15.917	0.000	(0)
		BF3OH-	3.783e-17	3.539e-17	-16.422	-16.451	-0.029	(0)
		H5(BO3) 2-	1.441e-18	1.348e-18	-17.841	-17.870	-0.029	(0)
		BaH2BO3+	3.773e-19	3.529e-19	-18.423	-18.452	-0.029	(0)
		BF4-	2.034e-19	1.903e-19	-18.692	-18.721	-0.029	(0)
		H8(BO3) 3-	2.405e-22	2.250e-22	-21.619	-21.648	-0.029	(0)
Ba			1.558e-08					
		Ba+2	1.558e-08	1.203e-08	-7.807	-7.920	-0.112	(0)
		BaOH+	5.521e-19	5.180e-19	-18.258	-18.286	-0.028	(0)
		BaH2BO3+	3.773e-19	3.529e-19	-18.423	-18.452	-0.029	(0)
Ca			2.392e-04					
		Ca+2	2.158e-04	1.666e-04	-3.666	-3.778	-0.112	(0)
		CaSO4	2.343e-05	2.343e-05	-4.630	-4.630	0.000	(0)
		CaF+	2.074e-09	1.946e-09	-8.683	-8.711	-0.028	(0)
		CaOH+	3.491e-14	3.279e-14	-13.457	-13.484	-0.027	(0)
		CaH2BO3+	9.728e-15	9.101e-15	-14.012	-14.041	-0.029	(0)
Cd			1.237e-08					
		Cd+2	1.070e-08	8.258e-09	-7.971	-8.083	-0.112	(0)
		CdSO4	1.188e-09	1.188e-09	-8.925	-8.925	0.000	(0)
		CdCl+	4.654e-10	4.340e-10	-9.332	-9.362	-0.030	(0)
		Cd(SO4) 2-2	1.302e-11	9.842e-12	-10.885	-11.007	-0.121	(0)
		CdCl2	9.957e-13	9.957e-13	-12.002	-12.002	0.000	(0)
		CdF+	1.503e-13	1.401e-13	-12.823	-12.854	-0.030	(0)
		CdOH+	6.940e-16	6.471e-16	-15.159	-15.189	-0.030	(0)
		CdCl3-	3.708e-16	3.457e-16	-15.431	-15.461	-0.030	(0)
		CdOHC1	1.756e-16	1.756e-16	-15.755	-15.755	0.000	(0)
		CdF2	2.993e-19	2.993e-19	-18.524	-18.524	0.000	(0)
		Cd2OH+3	5.025e-23	2.678e-23	-22.299	-22.572	-0.273	(0)
		Cd(OH) 2	4.028e-23	4.028e-23	-22.395	-22.395	0.000	(0)
		Cd(OH) 3-	2.604e-32	2.428e-32	-31.584	-31.615	-0.030	(0)
		CdSeO4	2.813e-38	2.813e-38	-37.551	-37.551	0.000	(0)
		Cd(SeO3) 2-2	2.141e-38	1.619e-38	-37.669	-37.791	-0.121	(0)
		Cd(OH) 4-2	0.000e+00	0.000e+00	-43.285	-43.407	-0.121	(0)
Cl			5.882e-04					
		Cl-	5.871e-04	5.503e-04	-3.231	-3.259	-0.028	(0)
		CuCl	8.418e-07	8.418e-07	-6.075	-6.075	0.000	(0)
		CuCl2-	1.033e-07	9.679e-08	-6.986	-7.014	-0.028	(0)
		CuCl+	2.309e-08	2.164e-08	-7.637	-7.665	-0.028	(0)
		MnCl+	1.176e-09	1.103e-09	-8.930	-8.957	-0.028	(0)
		CdCl+	4.654e-10	4.340e-10	-9.332	-9.362	-0.030	(0)
		CoCl+	3.627e-10	3.382e-10	-9.440	-9.471	-0.030	(0)
		ZnCl+	2.679e-10	2.511e-10	-9.572	-9.600	-0.028	(0)
		PbCl+	1.168e-10	1.089e-10	-9.933	-9.963	-0.030	(0)
		NiCl+	3.263e-11	3.042e-11	-10.486	-10.517	-0.030	(0)
		CrCl+2	2.556e-11	1.932e-11	-10.592	-10.714	-0.121	(0)
		CuCl3-2	1.469e-11	1.139e-11	-10.833	-10.944	-0.111	(0)
		UO2Cl+	8.366e-12	7.801e-12	-11.077	-11.108	-0.030	(0)
		CuCl2	4.129e-12	4.129e-12	-11.384	-11.384	0.000	(0)
		VOCl+	1.408e-12	1.313e-12	-11.852	-11.882	-0.030	(0)
		CdCl2	9.957e-13	9.957e-13	-12.002	-12.002	0.000	(0)
		MnCl2	8.576e-13	8.576e-13	-12.067	-12.067	0.000	(0)
		PbCl2	2.676e-13	2.676e-13	-12.572	-12.572	0.000	(0)
		ZnCl2	2.190e-13	2.190e-13	-12.660	-12.660	0.000	(0)

ZnOHCl	3.243e-15	3.243e-15	-14.489	-14.489	0.000	(0)
FeCl+2	1.635e-15	1.267e-15	-14.786	-14.897	-0.111	(0)
CrCl2+	1.082e-15	1.009e-15	-14.966	-14.996	-0.030	(0)
CdCl3-	3.708e-16	3.457e-16	-15.431	-15.461	-0.030	(0)
CdOHCl	1.756e-16	1.756e-16	-15.755	-15.755	0.000	(0)
MnCl3-	1.385e-16	1.300e-16	-15.858	-15.886	-0.028	(0)
ZnCl3-	1.021e-16	9.573e-17	-15.991	-16.019	-0.028	(0)
NiCl2	8.430e-17	8.430e-17	-16.074	-16.074	0.000	(0)
PbCl3-	6.288e-17	5.864e-17	-16.201	-16.232	-0.030	(0)
CuCl3-	2.263e-17	2.121e-17	-16.645	-16.674	-0.028	(0)
FeCl2+	3.320e-18	3.115e-18	-17.479	-17.506	-0.028	(0)
CrOHCl2	1.994e-18	1.994e-18	-17.700	-17.700	0.000	(0)
ZnCl4-2	3.399e-20	2.634e-20	-19.469	-19.579	-0.111	(0)
PbCl4-2	1.951e-20	1.475e-20	-19.710	-19.831	-0.121	(0)
UCl+3	8.071e-21	4.302e-21	-20.093	-20.366	-0.273	(0)
FeCl3	1.714e-22	1.714e-22	-21.766	-21.766	0.000	(0)
CuCl4-2	7.546e-23	5.849e-23	-22.122	-22.233	-0.111	(0)
CoCl+2	1.047e-36	7.919e-37	-35.980	-36.101	-0.121	(0)
CrO3Cl-	0.000e+00	0.000e+00	-50.485	-50.515	-0.030	(0)
Co (2)	2.571e-07					
Co+2	2.350e-07	1.777e-07	-6.629	-6.750	-0.121	(0)
CoSO4	2.176e-08	2.176e-08	-7.662	-7.662	0.000	(0)
CoCl+	3.627e-10	3.382e-10	-9.440	-9.471	-0.030	(0)
CoF+	6.449e-12	6.014e-12	-11.190	-11.221	-0.030	(0)
CoOH+	3.750e-14	3.497e-14	-13.426	-13.456	-0.030	(0)
Co (OH) 2	2.740e-20	2.740e-20	-19.562	-19.562	0.000	(0)
Co2OH+3	5.841e-22	3.113e-22	-21.233	-21.507	-0.273	(0)
Co (OH) 3-	5.784e-30	5.394e-30	-29.238	-29.268	-0.030	(0)
CoOOH-	1.451e-30	1.353e-30	-29.838	-29.869	-0.030	(0)
CoSeO4	1.629e-36	1.629e-36	-35.788	-35.788	0.000	(0)
Co (OH) 4-2	0.000e+00	0.000e+00	-40.953	-41.074	-0.121	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-45.040	-45.525	-0.486	(0)
Co (3)	4.827e-34					
CoOH+2	4.689e-34	3.545e-34	-33.329	-33.450	-0.121	(0)
Co+3	1.266e-35	7.072e-36	-34.897	-35.150	-0.253	(0)
CoCl+2	1.047e-36	7.919e-37	-35.980	-36.101	-0.121	(0)
Cr (2)	8.573e-19					
Cr+2	8.573e-19	6.481e-19	-18.067	-18.188	-0.121	(0)
Cr (3)	1.073e-07					
Cr+3	5.090e-08	2.713e-08	-7.293	-7.567	-0.273	(0)
CrSO4+	4.171e-08	3.889e-08	-7.380	-7.410	-0.030	(0)
Cr (OH) +2	7.745e-09	5.856e-09	-8.111	-8.232	-0.121	(0)
CrF+2	6.088e-09	4.603e-09	-8.216	-8.337	-0.121	(0)
CrOHSO4	8.530e-10	8.530e-10	-9.069	-9.069	0.000	(0)
CrCl+2	2.556e-11	1.932e-11	-10.592	-10.714	-0.121	(0)
Cr (OH) 2+	7.538e-12	7.029e-12	-11.123	-11.153	-0.030	(0)
CrCl2+	1.082e-15	1.009e-15	-14.966	-14.996	-0.030	(0)
Cr2 (OH) 2SO4+2	5.972e-16	4.515e-16	-15.224	-15.345	-0.121	(0)
Cr (OH) 3	2.605e-17	2.605e-17	-16.584	-16.584	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.646e-17	1.646e-17	-16.783	-16.783	0.000	(0)
CrOHCl2	1.994e-18	1.994e-18	-17.700	-17.700	0.000	(0)
CrO2-	1.300e-23	1.212e-23	-22.886	-22.916	-0.030	(0)
Cr (OH) 4-	1.097e-23	1.023e-23	-22.960	-22.990	-0.030	(0)
Cr (6)	0.000e+00					
HCrO4-	0.000e+00	0.000e+00	-45.033	-45.064	-0.030	(0)
H2CrO4	0.000e+00	0.000e+00	-48.146	-48.146	0.000	(0)
CrO4-2	0.000e+00	0.000e+00	-48.470	-48.582	-0.112	(0)
CrO3SO4-2	0.000e+00	0.000e+00	-48.661	-48.783	-0.121	(0)
CrO3Cl-	0.000e+00	0.000e+00	-50.485	-50.515	-0.030	(0)
NaCrO4-	0.000e+00	0.000e+00	-51.950	-51.981	-0.030	(0)
KCrO4-	0.000e+00	0.000e+00	-52.384	-52.414	-0.030	(0)
Cr2O7-2	0.000e+00	0.000e+00	-88.466	-88.587	-0.121	(0)
Cu (1)	2.248e-06					
Cu+	1.303e-06	1.215e-06	-5.885	-5.915	-0.030	(0)
CuCl	8.418e-07	8.418e-07	-6.075	-6.075	0.000	(0)
CuCl2-	1.033e-07	9.679e-08	-6.986	-7.014	-0.028	(0)
CuCl3-2	1.469e-11	1.139e-11	-10.833	-10.944	-0.111	(0)
Cu (2)	3.566e-05					

	Cu+2	3.214e-05	2.481e-05	-4.493	-4.605	-0.112	(0)
	CuSO4	3.489e-06	3.489e-06	-5.457	-5.457	0.000	(0)
	CuCl+	2.309e-08	2.164e-08	-7.637	-7.665	-0.028	(0)
	CuF+	1.797e-09	1.676e-09	-8.745	-8.776	-0.030	(0)
	CuOH+	8.258e-10	7.740e-10	-9.083	-9.111	-0.028	(0)
	CuCl2	4.129e-12	4.129e-12	-11.384	-11.384	0.000	(0)
	Cu2(OH) 2+2	1.990e-14	1.505e-14	-13.701	-13.823	-0.121	(0)
	Cu(OH) 2	1.523e-15	1.523e-15	-14.817	-14.817	0.000	(0)
	CuCl3-	2.263e-17	2.121e-17	-16.645	-16.674	-0.028	(0)
	CuCl4-2	7.546e-23	5.849e-23	-22.122	-22.233	-0.111	(0)
	Cu(OH) 3-	3.306e-23	3.083e-23	-22.481	-22.511	-0.030	(0)
	Cu(OH) 4-2	3.166e-33	2.394e-33	-32.500	-32.621	-0.121	(0)
F		1.043e-04					
	AlF+2	5.909e-05	4.588e-05	-4.229	-4.338	-0.110	(0)
	AlF2+	2.083e-05	1.955e-05	-4.681	-4.709	-0.027	(0)
	HF	1.616e-06	1.616e-06	-5.792	-5.792	0.000	(0)
	F-	1.142e-06	1.070e-06	-5.942	-5.970	-0.028	(0)
	AlF3	2.635e-07	2.635e-07	-6.579	-6.579	0.000	(0)
	MgF+	6.133e-09	5.752e-09	-8.212	-8.240	-0.028	(0)
	CrF+2	6.088e-09	4.603e-09	-8.216	-8.337	-0.121	(0)
	CaF+	2.074e-09	1.946e-09	-8.683	-8.711	-0.028	(0)
	CuF+	1.797e-09	1.676e-09	-8.745	-8.776	-0.030	(0)
	UO2F+	1.385e-09	1.292e-09	-8.859	-8.889	-0.030	(0)
	AlF4-	1.508e-10	1.414e-10	-9.822	-9.850	-0.028	(0)
	MnF+	7.233e-11	6.787e-11	-10.141	-10.168	-0.028	(0)
	NaF	5.431e-11	5.431e-11	-10.265	-10.265	0.000	(0)
	HF2-	7.022e-12	6.577e-12	-11.154	-11.182	-0.028	(0)
	H2F2	6.997e-12	6.997e-12	-11.155	-11.155	0.000	(0)
	CoF+	6.449e-12	6.014e-12	-11.190	-11.221	-0.030	(0)
	VOF+	5.854e-12	5.458e-12	-11.233	-11.263	-0.030	(0)
	ZnF+	4.161e-12	3.880e-12	-11.381	-11.411	-0.030	(0)
	UO2F2	3.987e-12	3.987e-12	-11.399	-11.399	0.000	(0)
	BF(OH) 3-	7.618e-13	7.127e-13	-12.118	-12.147	-0.029	(0)
	NiF+	6.231e-13	5.810e-13	-12.205	-12.236	-0.030	(0)
	PbF+	4.511e-13	4.206e-13	-12.346	-12.376	-0.030	(0)
	CdF+	1.503e-13	1.401e-13	-12.823	-12.854	-0.030	(0)
	FeF+2	1.155e-13	8.951e-14	-12.938	-13.048	-0.111	(0)
	BF2(OH) 2-	8.899e-14	8.325e-14	-13.051	-13.080	-0.029	(0)
	UF2+2	5.938e-15	4.490e-15	-14.226	-14.348	-0.121	(0)
	FeF2+	2.733e-15	2.564e-15	-14.563	-14.591	-0.028	(0)
	VOF2	2.191e-15	2.191e-15	-14.659	-14.659	0.000	(0)
	UO2F3-	1.150e-15	1.072e-15	-14.939	-14.970	-0.030	(0)
	UF3+	8.169e-16	7.617e-16	-15.088	-15.118	-0.030	(0)
	UF+3	6.250e-16	3.332e-16	-15.204	-15.477	-0.273	(0)
	BF3OH-	3.783e-17	3.539e-17	-16.422	-16.451	-0.029	(0)
	PbF2	8.861e-18	8.861e-18	-17.053	-17.053	0.000	(0)
	FeF3	3.873e-18	3.873e-18	-17.412	-17.412	0.000	(0)
	CdF2	2.993e-19	2.993e-19	-18.524	-18.524	0.000	(0)
	BF4-	2.034e-19	1.903e-19	-18.692	-18.721	-0.029	(0)
	VO2F	1.916e-19	1.916e-19	-18.718	-18.718	0.000	(0)
	UF4	8.941e-20	8.941e-20	-19.049	-19.049	0.000	(0)
	VOF3-	8.925e-20	8.322e-20	-19.049	-19.080	-0.030	(0)
	UO2F4-2	1.206e-20	9.117e-21	-19.919	-20.040	-0.121	(0)
	VO2F2-	7.985e-23	7.445e-23	-22.098	-22.128	-0.030	(0)
	PbF3-	1.929e-23	1.799e-23	-22.715	-22.745	-0.030	(0)
	UF5-	4.068e-24	3.793e-24	-23.391	-23.421	-0.030	(0)
	VOF4-2	4.756e-25	3.596e-25	-24.323	-24.444	-0.121	(0)
	UF6-2	1.622e-27	1.226e-27	-26.790	-26.911	-0.121	(0)
	VO2F3-2	1.315e-27	9.942e-28	-26.881	-27.003	-0.121	(0)
	PbF4-2	1.219e-29	9.218e-30	-28.914	-29.035	-0.121	(0)
	VO2F4-3	9.824e-34	5.237e-34	-33.008	-33.281	-0.273	(0)
Fe (2)		1.209e-04					
	Fe+2	1.086e-04	8.209e-05	-3.964	-4.086	-0.121	(0)
	FeSO4	1.237e-05	1.237e-05	-4.908	-4.908	0.000	(0)
	FeOH+	3.436e-11	3.224e-11	-10.464	-10.492	-0.028	(0)
	Fe(OH) 2	2.526e-19	2.526e-19	-18.598	-18.598	0.000	(0)
	Fe(OH) 3-	8.400e-25	7.881e-25	-24.076	-24.103	-0.028	(0)
Fe (3)		3.436e-12					

	Fe (OH) 2+	1.986e-12	1.864e-12	-11.702	-11.730	-0.027	(0)
	FeOH+2	6.266e-13	4.857e-13	-12.203	-12.314	-0.111	(0)
	FeSO4+	5.598e-13	5.253e-13	-12.252	-12.280	-0.028	(0)
	Fe+3	1.366e-13	7.626e-14	-12.865	-13.118	-0.253	(0)
	FeF+2	1.155e-13	8.951e-14	-12.938	-13.048	-0.111	(0)
	Fe (SO4) 2-	7.393e-15	6.894e-15	-14.131	-14.162	-0.030	(0)
	FeF2+	2.733e-15	2.564e-15	-14.563	-14.591	-0.028	(0)
	FeCl+2	1.635e-15	1.267e-15	-14.786	-14.897	-0.111	(0)
	Fe (OH) 3	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
	FeF3	3.873e-18	3.873e-18	-17.412	-17.412	0.000	(0)
	FeCl2+	3.320e-18	3.115e-18	-17.479	-17.506	-0.028	(0)
	FeCl3	1.714e-22	1.714e-22	-21.766	-21.766	0.000	(0)
	FeHSeO3+2	1.054e-22	7.967e-23	-21.977	-22.099	-0.121	(0)
	Fe2 (OH) 2+4	2.391e-23	7.812e-24	-22.621	-23.107	-0.486	(0)
	Fe (OH) 4-	1.933e-23	1.814e-23	-22.714	-22.741	-0.027	(0)
	Fe3 (OH) 4+5	1.209e-33	2.105e-34	-32.918	-33.677	-0.759	(0)
H (0)	1.474e-17						
	H2	7.369e-18	7.375e-18	-17.133	-17.132	0.000	(0)
K	4.251e-05						
	K+	4.233e-05	3.967e-05	-4.373	-4.401	-0.028	(0)
	KSO4-	1.837e-07	1.724e-07	-6.736	-6.763	-0.027	(0)
	KCrO4-	0.000e+00	0.000e+00	-52.384	-52.414	-0.030	(0)
Mg	6.740e-05						
	Mg+2	6.204e-05	4.789e-05	-4.207	-4.320	-0.112	(0)
	MgSO4	5.349e-06	5.349e-06	-5.272	-5.272	0.000	(0)
	MgF+	6.133e-09	5.752e-09	-8.212	-8.240	-0.028	(0)
	MgOH+	2.001e-13	1.881e-13	-12.699	-12.726	-0.027	(0)
	MgH2BO3+	1.685e-15	1.576e-15	-14.773	-14.802	-0.029	(0)
Mn (2)	2.281e-06						
	Mn+2	2.106e-06	1.592e-06	-5.676	-5.798	-0.121	(0)
	MnSO4	1.738e-07	1.738e-07	-6.760	-6.760	0.000	(0)
	MnCl+	1.176e-09	1.103e-09	-8.930	-8.957	-0.028	(0)
	MnF+	7.233e-11	6.787e-11	-10.141	-10.168	-0.028	(0)
	MnCl2	8.576e-13	8.576e-13	-12.067	-12.067	0.000	(0)
	MnOH+	4.206e-14	3.946e-14	-13.376	-13.404	-0.028	(0)
	MnCl3-	1.385e-16	1.300e-16	-15.858	-15.886	-0.028	(0)
	MnSe	2.082e-18	2.082e-18	-17.682	-17.682	0.000	(0)
	Mn (OH) 3-	2.530e-32	2.374e-32	-31.597	-31.625	-0.028	(0)
	MnSeO4	7.842e-36	7.842e-36	-35.106	-35.106	0.000	(0)
	Mn (OH) 4-2	0.000e+00	0.000e+00	-42.011	-42.122	-0.111	(0)
Mn (3)	1.274e-27						
	Mn+3	1.274e-27	7.113e-28	-26.895	-27.148	-0.253	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-84.180	-84.291	-0.111	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-89.634	-89.663	-0.029	(0)
Mo	1.876e-08						
	H2MoO4	1.629e-08	1.629e-08	-7.788	-7.788	0.000	(0)
	HMoO4-	2.337e-09	2.179e-09	-8.631	-8.662	-0.030	(0)
	MoO4-2	1.390e-10	1.073e-10	-9.857	-9.969	-0.112	(0)
	AlMo6O21-3	1.363e-28	7.263e-29	-27.866	-28.139	-0.273	(0)
	H3Mo7O24-3	9.766e-36	5.205e-36	-35.010	-35.284	-0.273	(0)
	H2Mo7O24-4	8.859e-36	2.895e-36	-35.053	-35.538	-0.486	(0)
	HMo7O24-5	2.689e-37	4.683e-38	-36.570	-37.329	-0.759	(0)
	Mo7O24-6	2.333e-40	0.000e+00	-39.632	-40.725	-1.093	(0)
Na	8.607e-05						
	Na+	8.579e-05	8.041e-05	-4.067	-4.095	-0.028	(0)
	NaSO4-	2.824e-07	2.651e-07	-6.549	-6.577	-0.027	(0)
	NaF	5.431e-11	5.431e-11	-10.265	-10.265	0.000	(0)
	NaH2BO3	1.210e-16	1.210e-16	-15.917	-15.917	0.000	(0)
	NaCrO4-	0.000e+00	0.000e+00	-51.950	-51.981	-0.030	(0)
Ni	3.067e-08						
	Ni+2	2.799e-08	2.161e-08	-7.553	-7.665	-0.112	(0)
	NiSO4	2.647e-09	2.647e-09	-8.577	-8.577	0.000	(0)
	NiCl+	3.263e-11	3.042e-11	-10.486	-10.517	-0.030	(0)
	NiF+	6.231e-13	5.810e-13	-12.205	-12.236	-0.030	(0)
	Ni (SO4) 2-2	7.116e-14	5.380e-14	-13.148	-13.269	-0.121	(0)
	NiOH+	2.878e-15	2.684e-15	-14.541	-14.571	-0.030	(0)

NiCl2	8.430e-17	8.430e-17	-16.074	-16.074	0.000	(0)
Ni (OH) 2	2.103e-21	2.103e-21	-20.677	-20.677	0.000	(0)
Ni (OH) 3-	2.225e-29	2.075e-29	-28.653	-28.683	-0.030	(0)
NiSeO4	1.849e-37	1.849e-37	-36.733	-36.733	0.000	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-58.031	-58.031	0.000	(0)
Pb	9.026e-09					
Pb+2	7.224e-09	5.576e-09	-8.141	-8.254	-0.112	(0)
PbSO4	1.677e-09	1.677e-09	-8.776	-8.776	0.000	(0)
PbCl+	1.168e-10	1.089e-10	-9.933	-9.963	-0.030	(0)
Pb (SO4) 2-2	8.202e-12	6.201e-12	-11.086	-11.208	-0.121	(0)
PbF+	4.511e-13	4.206e-13	-12.346	-12.376	-0.030	(0)
PbCl2	2.676e-13	2.676e-13	-12.572	-12.572	0.000	(0)
PbOH+	1.482e-13	1.382e-13	-12.829	-12.860	-0.030	(0)
PbCl3-	6.288e-17	5.864e-17	-16.201	-16.232	-0.030	(0)
PbF2	8.861e-18	8.861e-18	-17.053	-17.053	0.000	(0)
Pb (OH) 2	4.310e-20	4.310e-20	-19.365	-19.365	0.000	(0)
Pb2OH+3	2.291e-20	1.221e-20	-19.640	-19.913	-0.273	(0)
PbCl4-2	1.951e-20	1.475e-20	-19.710	-19.831	-0.121	(0)
PbF3-	1.929e-23	1.799e-23	-22.715	-22.745	-0.030	(0)
Pb (OH) 3-	4.560e-28	4.252e-28	-27.341	-27.371	-0.030	(0)
PbF4-2	1.219e-29	9.218e-30	-28.914	-29.035	-0.121	(0)
Pb (OH) 4-2	1.359e-36	1.027e-36	-35.867	-35.988	-0.121	(0)
Pb3 (OH) 4+2	2.734e-37	2.067e-37	-36.563	-36.685	-0.121	(0)
Pb4 (OH) 4+4	0.000e+00	0.000e+00	-40.553	-41.038	-0.486	(0)
S (6)	9.281e-04					
SO4-2	7.953e-04	6.139e-04	-3.099	-3.212	-0.112	(0)
HSO4-	6.529e-05	6.123e-05	-4.185	-4.213	-0.028	(0)
CaSO4	2.343e-05	2.343e-05	-4.630	-4.630	0.000	(0)
AlSO4+	2.178e-05	2.042e-05	-4.662	-4.690	-0.028	(0)
FeSO4	1.237e-05	1.237e-05	-4.908	-4.908	0.000	(0)
MgSO4	5.349e-06	5.349e-06	-5.272	-5.272	0.000	(0)
CuSO4	3.489e-06	3.489e-06	-5.457	-5.457	0.000	(0)
NaSO4-	2.824e-07	2.651e-07	-6.549	-6.577	-0.027	(0)
KSO4-	1.837e-07	1.724e-07	-6.736	-6.763	-0.027	(0)
MnSO4	1.738e-07	1.738e-07	-6.760	-6.760	0.000	(0)
Al (SO4) 2-	1.433e-07	1.344e-07	-6.844	-6.872	-0.028	(0)
CrSO4+	4.171e-08	3.889e-08	-7.380	-7.410	-0.030	(0)
ZnSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
CoSO4	2.176e-08	2.176e-08	-7.662	-7.662	0.000	(0)
UO2SO4	8.121e-09	8.121e-09	-8.090	-8.090	0.000	(0)
NiSO4	2.647e-09	2.647e-09	-8.577	-8.577	0.000	(0)
PbSO4	1.677e-09	1.677e-09	-8.776	-8.776	0.000	(0)
CdSO4	1.188e-09	1.188e-09	-8.925	-8.925	0.000	(0)
CrOHSO4	8.530e-10	8.530e-10	-9.069	-9.069	0.000	(0)
Zn (SO4) 2-2	1.725e-10	1.304e-10	-9.763	-9.885	-0.121	(0)
VOSO4	1.437e-10	1.437e-10	-9.842	-9.842	0.000	(0)
UO2 (SO4) 2-2	8.693e-11	6.572e-11	-10.061	-10.182	-0.121	(0)
Cd (SO4) 2-2	1.302e-11	9.842e-12	-10.885	-11.007	-0.121	(0)
Pb (SO4) 2-2	8.202e-12	6.201e-12	-11.086	-11.208	-0.121	(0)
FeSO4+	5.598e-13	5.253e-13	-12.252	-12.280	-0.028	(0)
Ni (SO4) 2-2	7.116e-14	5.380e-14	-13.148	-13.269	-0.121	(0)
VSO4+	1.367e-14	1.275e-14	-13.864	-13.895	-0.030	(0)
Fe (SO4) 2-	7.393e-15	6.894e-15	-14.131	-14.162	-0.030	(0)
U (SO4) 2	1.859e-15	1.859e-15	-14.731	-14.731	0.000	(0)
Cr2 (OH) 2SO4+2	5.972e-16	4.515e-16	-15.224	-15.345	-0.121	(0)
USO4+2	5.042e-16	3.812e-16	-15.297	-15.419	-0.121	(0)
Cr2 (OH) 2 (SO4) 2	1.646e-17	1.646e-17	-16.783	-16.783	0.000	(0)
VO2SO4-	1.604e-18	1.496e-18	-17.795	-17.825	-0.030	(0)
CrO3SO4-2	0.000e+00	0.000e+00	-48.661	-48.783	-0.121	(0)
Se (-2)	2.913e-09					
H2Se	2.565e-09	2.565e-09	-8.591	-8.591	0.000	(0)
HSe-	3.472e-10	3.238e-10	-9.459	-9.490	-0.030	(0)
MnSe	2.082e-18	2.082e-18	-17.682	-17.682	0.000	(0)
Se-2	4.196e-22	3.173e-22	-21.377	-21.499	-0.121	(0)
Se (4)	5.961e-13					
HSeO3-	4.240e-13	3.954e-13	-12.373	-12.403	-0.030	(0)
H2SeO3	1.721e-13	1.721e-13	-12.764	-12.764	0.000	(0)

SeO3-2	2.040e-18	1.542e-18	-17.690	-17.812	-0.121	(0)
FeHSeO3+2	1.054e-22	7.967e-23	-21.977	-22.099	-0.121	(0)
Cd (SeO3) 2-2	2.141e-38	1.619e-38	-37.669	-37.791	-0.121	(0)
Se (6)	2.472e-32					
SeO4-2	2.370e-32	1.830e-32	-31.625	-31.738	-0.112	(0)
HSeO4-	1.004e-33	9.359e-34	-32.998	-33.029	-0.030	(0)
MnSeO4	7.842e-36	7.842e-36	-35.106	-35.106	0.000	(0)
CoSeO4	1.629e-36	1.629e-36	-35.788	-35.788	0.000	(0)
ZnSeO4	5.147e-37	5.147e-37	-36.288	-36.288	0.000	(0)
NiSeO4	1.849e-37	1.849e-37	-36.733	-36.733	0.000	(0)
CdSeO4	2.813e-38	2.813e-38	-37.551	-37.551	0.000	(0)
Zn (SeO4) 2-2	0.000e+00	0.000e+00	-67.899	-68.020	-0.121	(0)
U (3)	4.681e-32					
U+3	4.681e-32	2.495e-32	-31.330	-31.603	-0.273	(0)
U (4)	1.318e-14					
UF2+2	5.938e-15	4.490e-15	-14.226	-14.348	-0.121	(0)
U (SO4) 2	1.859e-15	1.859e-15	-14.731	-14.731	0.000	(0)
U (OH) 3+	1.827e-15	1.704e-15	-14.738	-14.769	-0.030	(0)
U (OH) 2+2	1.063e-15	8.040e-16	-14.973	-15.095	-0.121	(0)
UF3+	8.169e-16	7.617e-16	-15.088	-15.118	-0.030	(0)
UF+3	6.250e-16	3.332e-16	-15.204	-15.477	-0.273	(0)
USO4+2	5.042e-16	3.812e-16	-15.297	-15.419	-0.121	(0)
U (OH) 4	4.566e-16	4.566e-16	-15.341	-15.341	0.000	(0)
UOH+3	7.252e-17	3.865e-17	-16.140	-16.413	-0.273	(0)
U (OH) 5-	1.145e-17	1.068e-17	-16.941	-16.971	-0.030	(0)
U+4	4.774e-19	1.560e-19	-18.321	-18.807	-0.486	(0)
UF4	8.941e-20	8.941e-20	-19.049	-19.049	0.000	(0)
UC1+3	8.071e-21	4.302e-21	-20.093	-20.366	-0.273	(0)
UF5-	4.068e-24	3.793e-24	-23.391	-23.421	-0.030	(0)
UF6-2	1.622e-27	1.226e-27	-26.790	-26.911	-0.121	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-82.671	-85.130	-2.459	(0)
U (5)	5.713e-10					
UO2+	5.713e-10	5.328e-10	-9.243	-9.273	-0.030	(0)
U (6)	2.094e-08					
UO2+2	1.132e-08	8.741e-09	-7.946	-8.058	-0.112	(0)
UO2SO4	8.121e-09	8.121e-09	-8.090	-8.090	0.000	(0)
UO2F+	1.385e-09	1.292e-09	-8.859	-8.889	-0.030	(0)
UO2 (SO4) 2-2	8.693e-11	6.572e-11	-10.061	-10.182	-0.121	(0)
UO2OH+	1.164e-11	1.086e-11	-10.934	-10.964	-0.030	(0)
UO2C1+	8.366e-12	7.801e-12	-11.077	-11.108	-0.030	(0)
UO2F2	3.987e-12	3.987e-12	-11.399	-11.399	0.000	(0)
UO2F3-	1.150e-15	1.072e-15	-14.939	-14.970	-0.030	(0)
(UO2) 2 (OH) 2+2	2.587e-16	1.956e-16	-15.587	-15.709	-0.121	(0)
UO2F4-2	1.206e-20	9.117e-21	-19.919	-20.040	-0.121	(0)
(UO2) 3 (OH) 5+	1.681e-25	1.567e-25	-24.774	-24.805	-0.030	(0)
V (2)	2.850e-22					
V+2	2.849e-22	2.154e-22	-21.545	-21.667	-0.121	(0)
VOH+	7.374e-26	6.876e-26	-25.132	-25.163	-0.030	(0)
V (3)	3.406e-08					
V (OH) 3	3.406e-08	3.406e-08	-7.468	-7.468	0.000	(0)
VOH+2	2.876e-13	2.175e-13	-12.541	-12.663	-0.121	(0)
V+3	8.251e-14	4.398e-14	-13.083	-13.357	-0.273	(0)
V (OH) 2+	2.409e-14	2.246e-14	-13.618	-13.649	-0.030	(0)
VSO4+	1.367e-14	1.275e-14	-13.864	-13.895	-0.030	(0)
V2 (OH) 2+4	9.131e-25	2.983e-25	-24.039	-24.525	-0.486	(0)
V2 (OH) 3+3	2.594e-28	1.383e-28	-27.586	-27.859	-0.273	(0)
V (4)	1.277e-09					
VO+2	1.124e-09	8.501e-10	-8.949	-9.071	-0.121	(0)
VOSO4	1.437e-10	1.437e-10	-9.842	-9.842	0.000	(0)
VOF+	5.854e-12	5.458e-12	-11.233	-11.263	-0.030	(0)
V (OH) 3+	1.794e-12	1.673e-12	-11.746	-11.776	-0.030	(0)
VOC1+	1.408e-12	1.313e-12	-11.852	-11.882	-0.030	(0)
VOF2	2.191e-15	2.191e-15	-14.659	-14.659	0.000	(0)
H2V2O4+2	1.856e-19	1.403e-19	-18.731	-18.853	-0.121	(0)
VOF3-	8.925e-20	8.322e-20	-19.049	-19.080	-0.030	(0)
VOF4-2	4.756e-25	3.596e-25	-24.323	-24.444	-0.121	(0)
V (5)	1.660e-16					
VO2+	1.089e-16	1.020e-16	-15.963	-15.991	-0.028	(0)

H3VO4	5.010e-17	5.010e-17	-16.300	-16.300	0.000	(0)
H2VO4-	5.264e-18	4.908e-18	-17.279	-17.309	-0.030	(0)
VO2SO4-	1.604e-18	1.496e-18	-17.795	-17.825	-0.030	(0)
VO2F	1.916e-19	1.916e-19	-18.718	-18.718	0.000	(0)
VO2F2-	7.985e-23	7.445e-23	-22.098	-22.128	-0.030	(0)
HVO4-2	1.598e-23	1.208e-23	-22.796	-22.918	-0.121	(0)
H3V2O7-	1.703e-27	1.588e-27	-26.769	-26.799	-0.030	(0)
VO2F3-2	1.315e-27	9.942e-28	-26.881	-27.003	-0.121	(0)
VO2F4-3	9.824e-34	5.237e-34	-33.008	-33.281	-0.273	(0)
VO4-3	1.113e-34	5.932e-35	-33.954	-34.227	-0.273	(0)
HV2O7-3	3.770e-38	2.009e-38	-37.424	-37.697	-0.273	(0)
V2O7-4	0.000e+00	0.000e+00	-44.790	-45.276	-0.486	(0)
V3O9-3	0.000e+00	0.000e+00	-45.634	-45.907	-0.273	(0)
V4O12-4	0.000e+00	0.000e+00	-60.110	-60.596	-0.486	(0)
H2V10O28-4	0.000e+00	0.000e+00	-128.251	-128.737	-0.486	(0)
HV10O28-5	0.000e+00	0.000e+00	-130.195	-130.954	-0.759	(0)
V10O28-6	0.000e+00	0.000e+00	-135.056	-136.149	-1.093	(0)
Zn	2.602e-07					
Zn+2	2.353e-07	1.816e-07	-6.628	-6.741	-0.112	(0)
ZnSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
ZnCl+	2.679e-10	2.511e-10	-9.572	-9.600	-0.028	(0)
Zn(SO4) 2-2	1.725e-10	1.304e-10	-9.763	-9.885	-0.121	(0)
ZnF+	4.161e-12	3.880e-12	-11.381	-11.411	-0.030	(0)
ZnCl2	2.190e-13	2.190e-13	-12.660	-12.660	0.000	(0)
ZnOH+	1.922e-13	1.792e-13	-12.716	-12.747	-0.030	(0)
ZnOHCl	3.243e-15	3.243e-15	-14.489	-14.489	0.000	(0)
ZnCl3-	1.021e-16	9.573e-17	-15.991	-16.019	-0.028	(0)
Zn(OH) 2	2.802e-19	2.802e-19	-18.553	-18.553	0.000	(0)
ZnCl4-2	3.399e-20	2.634e-20	-19.469	-19.579	-0.111	(0)
Zn(OH) 3-	1.486e-26	1.385e-26	-25.828	-25.858	-0.030	(0)
Zn(OH) 4-2	7.196e-36	5.440e-36	-35.143	-35.264	-0.121	(0)
ZnSeO4	5.147e-37	5.147e-37	-36.288	-36.288	0.000	(0)
Zn(SeO4) 2-2	0.000e+00	0.000e+00	-67.899	-68.020	-0.121	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH) 3 (am)	-7.19	3.61	10.80	Al(OH) 3
Al2(MoO4) 3	-43.01	-40.64	2.37	Al2(MoO4) 3
Al2O3	-12.44	7.21	19.65	Al2O3
Al4(OH) 10SO4	-17.47	5.23	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-14.43	-9.63	4.80	AlAsO4:2H2O
AlOHSO4	-2.36	-5.59	-3.23	AlOHSO4
Alunite	-7.58	-8.98	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-3.68	-11.47	-7.79	PbSO4
Anhydrite	-2.63	-6.99	-4.36	CaSO4
Antlerite	-13.85	-5.06	8.79	Cu3(OH) 4SO4
Arsenolite	-30.51	-33.27	-2.76	As4O6
As2O5	-33.17	-26.47	6.71	As2O5
Atacamite	-10.89	-3.50	7.39	Cu2(OH) 3Cl
Ba(OH) 2:8H2O	-26.33	-1.94	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-45.75	-29.88	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-23.37	-32.28	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-64.75	-31.81	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-46.83	-56.50	-9.67	BaCrO4
BaF2	-14.04	-19.86	-5.82	BaF2
BaMoO4	-10.93	-17.89	-6.96	BaMoO4
Barite	-1.15	-11.13	-9.98	BaSO4
BaSeO3	-19.16	-17.33	1.83	BaSeO3
BaSeO4	-32.20	-39.66	-7.46	BaSeO4
Bianchite	-8.19	-9.95	-1.76	ZnSO4:6H2O
Birnessite	-29.27	-11.18	18.09	MnO2
Bixbyite	-35.70	-36.35	-0.64	Mn2O3
Boehmite	-4.97	3.61	8.58	AlOOH
Brochantite	-18.91	-3.69	15.22	Cu4(OH) 6SO4
Brucite	-15.18	1.66	16.84	Mg(OH) 2
Bunsenite	-14.13	-1.68	12.45	NiO

Ca (VO3) 2	-29.46	-23.80	5.66	Ca (VO3) 2
Ca2V2O7	-39.09	-21.59	17.50	Ca2V2O7
Ca2V2O7:2H2O	-43.14	-21.59	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-42.16	-19.86	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-58.35	-19.39	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-59.25	-19.39	39.86	Ca3 (VO4) 2:4H2O
CaCrO4	-50.10	-52.36	-2.27	CaCrO4
CaMoO4	-5.80	-13.75	-7.95	CaMoO4
Carnotite	-16.72	-16.49	0.23	KUO2VO4
CaSeO3:2H2O	-16.00	-13.19	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-32.50	-35.52	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-23.50	-13.66	9.84	Cd (BO2) 2
Cd (OH) 2	-15.74	-2.10	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-15.83	-2.10	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-31.40	-24.69	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-38.06	-15.50	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-46.00	-17.60	28.40	Cd4 (OH) 6SO4
CdCl2	-13.94	-14.60	-0.66	CdCl2
CdCl2:1H2O	-12.91	-14.60	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.69	-14.60	-1.91	CdCl2:2.5H2O
CdF2	-18.81	-20.02	-1.21	CdF2
Cdmetal (alpha)	-29.60	-16.08	13.51	Cd
Cdmetal (gamma)	-29.70	-16.08	13.62	Cd
CdMoO4	-3.90	-18.05	-14.15	CdMoO4
CdOHCl	-11.89	-8.35	3.54	CdOHCl
CdSe	5.62	-14.58	-20.20	CdSe
CdSeO4:2H2O	-37.97	-39.82	-1.85	CdSeO4:2H2O
CdSO4	-11.12	-11.30	-0.17	CdSO4
CdSO4:1H2O	-9.57	-11.30	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.42	-11.30	-1.87	CdSO4:2.67H2O
Chalcantite	-5.18	-7.82	-2.64	CuSO4:5H2O
Claudetite	-30.21	-33.27	-3.06	As4O6
Clausthalite	12.35	-14.75	-27.10	PbSe
Co (BO2) 2	-39.39	-12.32	27.07	Co (BO2) 2
Co (OH) 2	-13.86	-0.77	13.09	Co (OH) 2
Co (OH) 3	-23.87	-26.18	-2.31	Co (OH) 3
Co3 (AsO4) 2	-41.81	-28.77	13.03	Co3 (AsO4) 2
Co3O4	-42.63	-53.12	-10.50	Co3O4
CoCl2	-21.54	-13.27	8.27	CoCl2
CoCl2:6H2O	-15.81	-13.27	2.54	CoCl2:6H2O
CoF2	-17.09	-18.69	-1.60	CoF2
CoF3	-51.60	-53.06	-1.46	CoF3
CoFe2O4	-5.53	-9.06	-3.53	CoFe2O4
CoMoO4	-8.96	-16.72	-7.76	CoMoO4
CoO	-14.35	-0.77	13.59	CoO
CoSe	2.95	-13.25	-16.20	CoSe
CoSeO3	-17.48	-16.16	1.32	CoSeO3
CoSeO4:6H2O	-36.96	-38.49	-1.53	CoSeO4:6H2O
CoSO4	-12.76	-9.96	2.80	CoSO4
CoSO4:6H2O	-7.49	-9.96	-2.47	CoSO4:6H2O
Cotunnite	-9.99	-14.77	-4.78	PbCl2
Cr (OH) 2	-23.03	-12.21	10.82	Cr (OH) 2
Cr (OH) 3	-9.50	-8.16	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-7.41	-8.16	-0.75	Cr (OH) 3
Cr2O3	-13.97	-16.32	-2.36	Cr2O3
CrCl2	-38.80	-24.71	14.09	CrCl2
CrCl3	-42.03	-26.91	15.11	CrCl3
CrF3	-23.71	-35.05	-11.34	CrF3
Crmetal	-56.67	-26.19	30.48	Cr
CrO3	-51.35	-54.56	-3.21	CrO3
Cryolite	-19.63	-53.47	-33.84	Na3AlF6
Cu (OH) 2	-7.30	1.38	8.67	Cu (OH) 2
Cu2Se (alpha)	27.47	-18.33	-45.80	Cu2Se
Cu2SO4	-13.09	-15.04	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-28.44	-22.34	6.10	Cu3 (AsO4) 2:2H2O
Cu3Se2	34.06	-29.43	-63.49	Cu3Se2
CuCrO4	-47.75	-53.19	-5.44	CuCrO4
CuF	-6.98	-11.89	-4.91	CuF

CuF2	-17.66	-16.55	1.12	CuF2
CuF2:2H2O	-12.00	-16.55	-4.55	CuF2:2H2O
Cumetal	-1.16	-9.92	-8.76	Cu
CuMoO4	-1.50	-14.57	-13.08	CuMoO4
CuOCuSO4	-16.74	-6.44	10.30	CuOCuSO4
Cupricferrite	-12.90	-6.91	5.99	CuFe2O4
Cuprite	-4.44	-5.85	-1.41	Cu2O
Cuprousferrite	1.85	-7.07	-8.92	CuFeO2
CuSe	22.00	-11.10	-33.10	CuSe
CuSe2	23.76	-9.60	-33.37	CuSe2
CuSeO3:2H2O	-14.53	-14.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-33.90	-36.34	-2.44	CuSeO4:5H2O
CuSO4	-10.76	-7.82	2.94	CuSO4
Diaspore	-3.27	3.61	6.87	AlOOH
Epsomite	-5.41	-7.53	-2.13	MgSO4:7H2O
Fe (OH) 2	-11.67	1.90	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	-2.98	-6.02	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-20.38	-24.10	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-25.24	-23.68	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-33.84	-54.47	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-32.14	-35.87	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-26.61	-6.39	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-17.78	-17.38	0.40	FeAsO4:2H2O
FeCr2O4	-21.63	-14.43	7.20	FeCr2O4
FeMoO4	-3.96	-14.06	-10.09	FeMoO4
Ferrihydrite	-7.34	-4.14	3.19	Fe (OH) 3
Ferroselite	9.51	-9.08	-18.60	FeSe2
FeSe	0.42	-10.58	-11.00	FeSe
Fluorite	-5.22	-15.72	-10.50	CaF2
Gibbsite	-4.69	3.61	8.29	Al (OH) 3
Goethite	-4.64	-4.14	0.49	FeOOH
Goslarite	-7.94	-9.95	-2.01	ZnSO4:7H2O
Gummite	-9.75	-2.08	7.67	UO3
Gypsum	-2.38	-6.99	-4.61	CaSO4:2H2O
H-Jarosite	-18.72	-30.82	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-3.08	-15.95	-12.88	H2MoO4
H2Se (g)	-7.52	-12.48	-4.96	H2Se
Halite	-8.96	-7.35	1.60	NaCl
Hausmannite	-46.49	14.54	61.03	Mn3O4
Hematite	-6.87	-8.29	-1.42	Fe2O3
Hercynite	-13.79	9.11	22.89	FeAl2O4
K-Alum	-11.02	-16.19	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-17.43	-32.23	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-94.71	-111.95	-17.24	K2Cr2O7
K2CrO4	-56.87	-57.39	-0.51	K2CrO4
K2MoO4	-22.03	-18.77	3.26	K2MoO4
K2SeO4	-39.81	-40.54	-0.73	K2SeO4
Langite	-21.18	-3.69	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-13.30	-13.74	-0.43	PbO:PbSO4
Laurionite	-9.14	-8.52	0.62	PbOHCl
Lepidocrocite	-5.52	-4.14	1.37	FeOOH
Lime	-30.50	2.20	32.70	CaO
Litharge	-14.97	-2.27	12.69	PbO
Maghemite	-14.67	-8.29	6.39	Fe2O3
Magnesioferrite	-23.49	-6.63	16.86	Fe2MgO4
Magnetite	-9.80	-6.39	3.40	Fe3O4
Manganite	-18.16	7.18	25.34	MnOOH
Massicot	-15.17	-2.27	12.89	PbO
Matlockite	-8.51	-17.48	-8.97	PbClF
Melanothallite	-17.38	-11.12	6.26	CuCl2
Melanterite	-5.09	-7.30	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-17.13	1.66	18.79	Mg (OH) 2
Mg (VO3) 2	-35.62	-24.34	11.28	Mg (VO3) 2
Mg2V2O7	-49.04	-22.68	26.36	Mg2V2O7
MgCr2O4	-30.86	-14.66	16.20	MgCr2O4
MgCrO4	-58.28	-52.90	5.38	MgCrO4
MgF2	-8.13	-16.26	-8.13	MgF2
MgMoO4	-12.44	-14.29	-1.85	MgMoO4

MgSeO3:6H2O	-16.79	-13.73	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-34.86	-36.06	-1.20	MgSeO4:6H2O
Minium	-66.35	7.17	73.52	Pb3O4
Mirabilite	-10.29	-11.40	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-30.72	-25.82	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-58.22	-63.93	-5.71	Mn2 (SO4) 3
Mn3 (AsO4) 2:8H2O	-38.42	-25.92	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-15.03	-12.32	2.72	MnCl2:4H2O
MnSe	-15.80	-12.30	3.50	MnSe
MnSeO3	-16.34	-15.21	1.13	MnSeO3
MnSeO3:2H2O	-16.19	-15.21	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-35.49	-37.54	-2.05	MnSeO4:5H2O
MnSO4	-11.59	-9.01	2.58	MnSO4
Monteponite	-17.20	-2.10	15.10	CdO
MoO3	-7.95	-15.95	-8.00	MoO3
Morenosite	-8.73	-10.88	-2.14	NiSO4:7H2O
Na-Jarosite	-20.73	-31.93	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-101.44	-111.34	-9.90	Na2Cr2O7
Na2CrO4	-59.70	-56.77	2.93	Na2CrO4
Na2Mo2O7	-17.51	-34.11	-16.60	Na2Mo2O7
Na2MoO4	-19.65	-18.16	1.49	Na2MoO4
Na2MoO4:2H2O	-19.38	-18.16	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-27.90	-17.60	10.30	Na2SeO3:5H2O
Na2SeO4	-41.21	-39.93	1.28	Na2SeO4
Na3VO4	-52.99	-16.31	36.68	Na3VO4
Na4V2O7	-67.81	-30.41	37.40	Na4V2O7
Nantokite	-2.44	-9.17	-6.73	CuCl
NaVO3	-17.96	-14.10	3.86	NaVO3
Ni (OH) 2	-14.48	-1.68	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-47.22	-31.52	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-47.93	-15.93	32.00	Ni4 (OH) 6SO4
NiMoO4	-6.49	-17.63	-11.14	NiMoO4
NiSe	3.54	-14.16	-17.70	NiSe
NiSeO3:2H2O	-19.89	-17.08	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-37.88	-39.40	-1.52	NiSeO4:6H2O
Nsutite	-28.69	-11.18	17.50	MnO2
O2 (g)	-55.12	27.96	83.09	O2
Pb (BO2) 2	-20.35	-13.83	6.52	Pb (BO2) 2
Pb (OH) 2	-10.42	-2.27	8.15	Pb (OH) 2
Pb2 (OH) 3Cl	-19.59	-10.79	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-30.73	-4.54	26.19	Pb2O (OH) 2
Pb2O3	-51.60	9.44	61.04	Pb2O3
Pb2V2O7	-28.64	-30.54	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-39.08	-33.28	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-38.95	-32.81	6.14	Pb3 (VO4) 2
Pb3O2SO4	-26.69	-16.01	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-39.38	-18.28	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-40.16	-18.28	21.88	Pb4O3SO4
PbCrO4	-44.24	-56.84	-12.60	PbCrO4
PbF2	-12.75	-20.19	-7.44	PbF2
Pbmetal	-20.50	-16.25	4.25	Pb
PbMoO4	-2.60	-18.22	-15.62	PbMoO4
PbO:0.3H2O	-15.25	-2.27	12.98	PbO:0.33H2O
PbSeO4	-33.15	-39.99	-6.84	PbSeO4
Periclase	-19.92	1.66	21.58	MgO
Plattnerite	-37.89	11.71	49.60	PbO2
Portlandite	-20.60	2.20	22.80	Ca (OH) 2
Pyrochroite	-15.01	0.18	15.19	Mn (OH) 2
Pyrolusite	-27.21	14.17	41.38	MnO2
Retgersite	-8.84	-10.88	-2.04	NiSO4:6H2O
Schoepite	-8.07	-2.08	5.99	UO2 (OH) 2:H2O
Semetal (am)	8.61	1.50	-7.11	Se
Semetal (hex)	9.21	1.50	-7.71	Se
SeO2	-15.52	-15.39	0.12	SeO2
SeO3	-58.76	-37.72	21.04	SeO3
Spinel	-27.97	8.87	36.85	MgAl2O4
Tenorite	-6.27	1.38	7.64	CuO
Thenardite	-11.72	-11.40	0.32	Na2SO4

Tyuyamunite	-32.03	-27.95	4.08	Ca(UO2)2(VO4)2
U3O8	-13.65	7.44	21.08	U3O8
U4O9	-10.37	-13.39	-3.02	U4O9
UF4	-13.15	-42.69	-29.54	UF4
UF4:2.5H2O	-9.97	-42.69	-32.72	UF4:2.5H2O
UO2(am)	-7.78	-6.84	0.93	UO2
UO2(OH)2(beta)	-7.69	-2.08	5.61	UO2(OH)2
UO2SeO4:4H2O	-37.55	-39.80	-2.25	UO2SeO4:4H2O
UO3	-9.78	-2.08	7.70	UO3
Uraninite	-2.17	-6.84	-4.67	UO2
V(OH)3	-11.97	-4.38	7.59	V(OH)3
V2O5	-24.64	-26.00	-1.36	V2O5
V3O5	-25.08	-23.25	1.84	V3O5
V4O7	-33.52	-26.34	7.19	V4O7
V6O13	-45.11	-105.97	-60.86	V6O13
VC12	-42.75	-23.88	18.87	VC12
VC13	-46.57	-23.13	23.43	VC13
VF4	-53.86	-38.93	14.93	VF4
Vmetal	-69.38	-25.36	44.03	V
VO	-26.13	-11.37	14.76	VO
VO(OH)2	-8.24	-3.09	5.15	VO(OH)2
VO2Cl	-22.09	-19.25	2.84	VO2Cl
VOC1	-21.79	-10.63	11.15	VOC1
VOC12	-28.35	-15.59	12.76	VOC12
VOSO4	-15.89	-12.28	3.61	VOSO4
Zincite	-12.09	-0.76	11.33	ZnO
Zincosite	-13.88	-9.95	3.93	ZnSO4
Zn(BO2)2	-20.60	-12.31	8.29	Zn(BO2)2
Zn(OH)2	-12.96	-0.76	12.20	Zn(OH)2
Zn(OH)2(am)	-13.23	-0.76	12.47	Zn(OH)2
Zn(OH)2(beta)	-12.51	-0.76	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-12.29	-0.76	11.53	Zn(OH)2
Zn(OH)2(gamma)	-12.49	-0.76	11.73	Zn(OH)2
Zn2(OH)2SO4	-18.21	-10.71	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-22.96	-7.77	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-42.39	-28.74	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-39.58	-20.66	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-40.63	-12.23	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-54.79	-16.29	38.50	Zn5(OH)8Cl2
ZnCl2	-20.31	-13.26	7.05	ZnCl2
ZnF2	-18.15	-18.68	-0.53	ZnF2
Znmetal	-40.53	-14.74	25.79	Zn
ZnMoO4	-6.58	-16.71	-10.13	ZnMoO4
ZnO(active)	-11.95	-0.76	11.19	ZnO
ZnSe	1.16	-13.24	-14.40	ZnSe
ZnSeO4:6H2O	-36.96	-38.48	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.31	-9.95	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 8.

SOLUTION 6 Average HCT data for quartz monzonite - oxide/transitional (ore)
(cell SRK 0867)

temp	25
pH	6.90391
pe	4
redox	pe
units	mg/l
density	1
Alkalinity	9.27214 as HCO3

Al 0.06988
 B 0.00472
 Ba 0.00751
 Ca 25.90591
 Cd 0.00005
 Cl 0.73852
 Co 0.00047
 Cu 0.00563
 F 0.55791
 Fe 0.09893
 K 1.07782
 Mg 2.23925
 Mn 0.46844
 Mo 0.00506
 Na 0.93238 charge
 Ni 0.00047
 S(6) 72.31791 as SO4
 Sb 0.00297
 Se 0.00024
 U 0.00047
 V 0.00047
 Zn 0.00163
 water 1 # kg

END

 Beginning of initial solution calculations.

Initial solution 6. Average HCT data for quartz monzonite - oxide/transitional
 (ore) (cell SRK 0867)

-----Solution composition-----

Elements	Molality	Moles
Al	2.590e-06	2.590e-06
Alkalinity	1.520e-04	1.520e-04
B	4.367e-07	4.367e-07
Ba	5.469e-08	5.469e-08
Ca	6.465e-04	6.465e-04
Cd	4.449e-10	4.449e-10
Cl	2.083e-05	2.083e-05
Co	7.976e-09	7.976e-09
Cu	8.861e-08	8.861e-08
F	2.937e-05	2.937e-05
Fe	1.772e-06	1.772e-06
K	2.757e-05	2.757e-05
Mg	9.214e-05	9.214e-05
Mn	8.528e-06	8.528e-06
Mo	5.275e-08	5.275e-08
Na	1.755e-04	1.755e-04
Ni	8.009e-09	8.009e-09
S(6)	7.529e-04	7.529e-04
Sb	2.440e-08	2.440e-08
Se	3.040e-09	3.040e-09
U	1.975e-09	1.975e-09
V	9.228e-09	9.228e-09
Zn	2.493e-08	2.493e-08

Charge balance

-----Description of solution-----

pH	=	6.904
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	2.937e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	1.797e-04
Total CO2 (mol/kg)	=	1.797e-04

Temperature (°C) = 25.00
 Electrical balance (eq) = -2.055e-18
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
 Iterations = 11
 Total H = 1.110139e+02
 Total O = 5.551040e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.324e-07	1.248e-07	-6.878	-6.904	-0.026	0.00
OH-	8.569e-08	8.070e-08	-7.067	-7.093	-0.026	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	2.590e-06					
Al (OH) 4-	2.150e-06	2.027e-06	-5.668	-5.693	-0.026	(0)
Al (OH) 3	1.995e-07	1.995e-07	-6.700	-6.700	0.000	(0)
Al (OH) 2+	1.313e-07	1.239e-07	-6.882	-6.907	-0.025	(0)
AlF2+	7.424e-08	7.005e-08	-7.129	-7.155	-0.025	(0)
AlF3	2.390e-08	2.390e-08	-7.622	-7.622	0.000	(0)
AlF+2	8.189e-09	6.492e-09	-8.087	-8.188	-0.101	(0)
AlOH+2	2.438e-09	1.933e-09	-8.613	-8.714	-0.101	(0)
AlF4-	3.444e-10	3.247e-10	-9.463	-9.488	-0.026	(0)
AlSO4+	1.069e-10	1.008e-10	-9.971	-9.997	-0.026	(0)
Al+3	4.085e-11	2.395e-11	-10.389	-10.621	-0.232	(0)
Al (SO4) 2-	6.211e-13	5.855e-13	-12.207	-12.232	-0.026	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.094	-41.342	-0.249	(0)
B	4.367e-07					
H3BO3	4.345e-07	4.348e-07	-6.362	-6.362	0.000	(0)
H2BO3-	2.151e-09	2.024e-09	-8.667	-8.694	-0.026	(0)
CaH2BO3+	5.735e-11	5.396e-11	-10.241	-10.268	-0.026	(0)
MgH2BO3+	5.011e-12	4.715e-12	-11.300	-11.327	-0.026	(0)
BF (OH) 3-	4.998e-12	4.702e-12	-11.301	-11.328	-0.026	(0)
NaH2BO3	5.290e-13	5.290e-13	-12.277	-12.277	0.000	(0)
BaH2BO3+	2.864e-15	2.695e-15	-14.543	-14.569	-0.026	(0)
BF2 (OH) 2-	1.807e-15	1.700e-15	-14.743	-14.770	-0.026	(0)
H5 (BO3) 2-	7.959e-16	7.489e-16	-15.099	-15.126	-0.026	(0)
H8 (BO3) 3-	3.460e-20	3.256e-20	-19.461	-19.487	-0.026	(0)
BF3OH-	2.377e-21	2.237e-21	-20.624	-20.650	-0.026	(0)
BF4-	3.956e-26	3.722e-26	-25.403	-25.429	-0.026	(0)
Ba	5.469e-08					
Ba+2	5.463e-08	4.309e-08	-7.263	-7.366	-0.103	(0)
BaHCO3+	5.794e-11	5.471e-11	-10.237	-10.262	-0.025	(0)
BaCO3	1.104e-12	1.104e-12	-11.957	-11.957	0.000	(0)
BaOH+	1.609e-14	1.518e-14	-13.793	-13.819	-0.025	(0)
BaH2BO3+	2.864e-15	2.695e-15	-14.543	-14.569	-0.026	(0)
C (4)	1.797e-04					
HCO3-	1.409e-04	1.329e-04	-3.851	-3.876	-0.025	(0)
H2CO3	3.730e-05	3.730e-05	-4.428	-4.428	0.000	(0)
CaHCO3+	1.215e-06	1.147e-06	-5.915	-5.940	-0.025	(0)
MgHCO3+	9.700e-08	9.141e-08	-7.013	-7.039	-0.026	(0)
CO3-2	6.334e-08	4.995e-08	-7.198	-7.301	-0.103	(0)
CaCO3	3.669e-08	3.669e-08	-7.435	-7.435	0.000	(0)
MnHCO3+	1.725e-08	1.627e-08	-7.763	-7.789	-0.025	(0)
CuCO3	1.287e-08	1.287e-08	-7.891	-7.891	0.000	(0)
NaHCO3	1.233e-08	1.233e-08	-7.909	-7.909	0.000	(0)
MgCO3	2.792e-09	2.792e-09	-8.554	-8.554	0.000	(0)
UO2 (CO3) 2-2	1.067e-09	8.272e-10	-8.972	-9.082	-0.111	(0)
FeHCO3+	9.902e-10	9.349e-10	-9.004	-9.029	-0.025	(0)
UO2CO3	8.299e-10	8.299e-10	-9.081	-9.081	0.000	(0)
CuHCO3+	3.910e-10	3.669e-10	-9.408	-9.435	-0.028	(0)
NaCO3-	1.626e-10	1.534e-10	-9.789	-9.814	-0.025	(0)
NiHCO3+	1.001e-10	9.394e-11	-9.999	-10.027	-0.028	(0)
ZnHCO3+	7.956e-11	7.465e-11	-10.099	-10.127	-0.028	(0)
CoHCO3+	6.222e-11	5.839e-11	-10.206	-10.234	-0.028	(0)
BaHCO3+	5.794e-11	5.471e-11	-10.237	-10.262	-0.025	(0)
ZnCO3	5.104e-11	5.104e-11	-10.292	-10.292	0.000	(0)

	NiCO3	1.068e-11	1.068e-11	-10.971	-10.971	0.000	(0)
	UO2 (CO3) 3-4	5.734e-12	2.071e-12	-11.242	-11.684	-0.442	(0)
	CoCO3	4.768e-12	4.768e-12	-11.322	-11.322	0.000	(0)
	Cu (CO3) 2-2	2.232e-12	1.730e-12	-11.651	-11.762	-0.111	(0)
	BaCO3	1.104e-12	1.104e-12	-11.957	-11.957	0.000	(0)
	CdCO3	3.616e-13	3.616e-13	-12.442	-12.442	0.000	(0)
	CdHCO3+	1.024e-13	9.612e-14	-12.990	-13.017	-0.028	(0)
	Cd (CO3) 2-2	1.727e-17	1.339e-17	-16.763	-16.873	-0.111	(0)
Ca	6.465e-04						
	Ca+2	5.875e-04	4.634e-04	-3.231	-3.334	-0.103	(0)
	CaSO4	5.755e-05	5.755e-05	-4.240	-4.240	0.000	(0)
	CaHCO3+	1.215e-06	1.147e-06	-5.915	-5.940	-0.025	(0)
	CaF+	1.453e-07	1.371e-07	-6.838	-6.863	-0.025	(0)
	CaCO3	3.669e-08	3.669e-08	-7.435	-7.435	0.000	(0)
	CaOH+	7.903e-10	7.461e-10	-9.102	-9.127	-0.025	(0)
	CaH2BO3+	5.735e-11	5.396e-11	-10.241	-10.268	-0.026	(0)
Cd	4.449e-10						
	Cd+2	4.026e-10	3.176e-10	-9.395	-9.498	-0.103	(0)
	CdSO4	4.036e-11	4.036e-11	-10.394	-10.394	0.000	(0)
	CdCl+	6.345e-13	5.954e-13	-12.198	-12.225	-0.028	(0)
	Cd (SO4) 2-2	3.808e-13	2.952e-13	-12.419	-12.530	-0.111	(0)
	CdCO3	3.616e-13	3.616e-13	-12.442	-12.442	0.000	(0)
	CdOH+	2.170e-13	2.036e-13	-12.664	-12.691	-0.028	(0)
	CdF+	1.454e-13	1.364e-13	-12.837	-12.865	-0.028	(0)
	CdHCO3+	1.024e-13	9.612e-14	-12.990	-13.017	-0.028	(0)
	CdOHCl	1.971e-15	1.971e-15	-14.705	-14.705	0.000	(0)
	Cd (OH) 2	1.037e-16	1.037e-16	-15.984	-15.984	0.000	(0)
	CdCl2	4.873e-17	4.873e-17	-16.312	-16.312	0.000	(0)
	Cd (CO3) 2-2	1.727e-17	1.339e-17	-16.763	-16.873	-0.111	(0)
	CdF2	7.378e-18	7.378e-18	-17.132	-17.132	0.000	(0)
	CdCl3-	6.433e-22	6.036e-22	-21.192	-21.219	-0.028	(0)
	Cd2OH+3	5.746e-22	3.240e-22	-21.241	-21.489	-0.249	(0)
	Cd (OH) 3-	5.447e-22	5.111e-22	-21.264	-21.291	-0.028	(0)
	CdSeO4	4.114e-24	4.114e-24	-23.386	-23.386	0.000	(0)
	Cd (SeO3) 2-2	2.592e-24	2.010e-24	-23.586	-23.697	-0.111	(0)
	Cd (OH) 4-2	8.709e-30	6.752e-30	-29.060	-29.171	-0.111	(0)
Cl	2.083e-05						
	Cl-	2.083e-05	1.963e-05	-4.681	-4.707	-0.026	(0)
	MnCl+	1.607e-10	1.516e-10	-9.794	-9.819	-0.025	(0)
	CuCl	5.295e-11	5.295e-11	-10.276	-10.276	0.000	(0)
	CuCl+	1.444e-12	1.361e-12	-11.840	-11.866	-0.026	(0)
	ZnCl+	9.293e-13	8.757e-13	-12.032	-12.058	-0.026	(0)
	CdCl+	6.345e-13	5.954e-13	-12.198	-12.225	-0.028	(0)
	CoCl+	4.087e-13	3.835e-13	-12.389	-12.416	-0.028	(0)
	NiCl+	3.068e-13	2.879e-13	-12.513	-12.541	-0.028	(0)
	CuCl2-	2.305e-13	2.172e-13	-12.637	-12.663	-0.026	(0)
	ZnOHCl	9.252e-14	9.252e-14	-13.034	-13.034	0.000	(0)
	MnCl2	4.203e-15	4.203e-15	-14.376	-14.376	0.000	(0)
	CdOHCl	1.971e-15	1.971e-15	-14.705	-14.705	0.000	(0)
	UO2Cl+	1.416e-16	1.329e-16	-15.849	-15.877	-0.028	(0)
	CdCl2	4.873e-17	4.873e-17	-16.312	-16.312	0.000	(0)
	ZnCl2	2.725e-17	2.725e-17	-16.565	-16.565	0.000	(0)
	CuCl2	9.266e-18	9.266e-18	-17.033	-17.033	0.000	(0)
	CuCl3-2	1.152e-18	9.117e-19	-17.939	-18.040	-0.102	(0)
	FeCl+2	3.887e-19	3.077e-19	-18.410	-18.512	-0.102	(0)
	NiCl2	2.846e-20	2.846e-20	-19.546	-19.546	0.000	(0)
	MnCl3-	2.410e-20	2.273e-20	-19.618	-19.643	-0.025	(0)
	VOCl+	1.894e-20	1.778e-20	-19.723	-19.750	-0.028	(0)
	CdCl3-	6.433e-22	6.036e-22	-21.192	-21.219	-0.028	(0)
	ZnCl3-	4.510e-22	4.249e-22	-21.346	-21.372	-0.026	(0)
	FeCl2+	2.860e-23	2.698e-23	-22.544	-22.569	-0.025	(0)
	CuCl3-	1.802e-24	1.698e-24	-23.744	-23.770	-0.026	(0)
	ZnCl4-2	5.270e-27	4.172e-27	-26.278	-26.380	-0.102	(0)
	FeCl3	5.297e-29	5.297e-29	-28.276	-28.276	0.000	(0)
	CuCl4-2	2.110e-31	1.670e-31	-30.676	-30.777	-0.102	(0)
	CoCl+2	1.158e-39	8.979e-40	-38.936	-39.047	-0.111	(0)
	UCl+3	0.000e+00	0.000e+00	-40.537	-40.786	-0.249	(0)
Co (2)	7.976e-09						

Co+2	7.283e-09	5.646e-09	-8.138	-8.248	-0.111	(0)
CoSO4	6.108e-10	6.108e-10	-9.214	-9.214	0.000	(0)
CoHCO3+	6.222e-11	5.839e-11	-10.206	-10.234	-0.028	(0)
CoOH+	9.689e-12	9.092e-12	-11.014	-11.041	-0.028	(0)
CoF+	5.158e-12	4.839e-12	-11.288	-11.315	-0.028	(0)
CoCO3	4.768e-12	4.768e-12	-11.322	-11.322	0.000	(0)
CoCl+	4.087e-13	3.835e-13	-12.389	-12.416	-0.028	(0)
Co (OH) 2	5.828e-14	5.828e-14	-13.234	-13.234	0.000	(0)
Co (OH) 3-	1.000e-19	9.385e-20	-19.000	-19.028	-0.028	(0)
CoOOH-	2.509e-20	2.355e-20	-19.600	-19.628	-0.028	(0)
Co2OH+3	4.562e-21	2.573e-21	-20.341	-20.590	-0.249	(0)
CoSeO4	1.969e-22	1.969e-22	-21.706	-21.706	0.000	(0)
Co (OH) 4-2	1.548e-27	1.200e-27	-26.810	-26.921	-0.111	(0)
Co4 (OH) 4+4	3.774e-36	1.363e-36	-35.423	-35.865	-0.442	(0)
Co (3)	1.189e-31					
CoOH+2	1.189e-31	9.218e-32	-30.925	-31.035	-0.111	(0)
Co+3	3.834e-37	2.248e-37	-36.416	-36.648	-0.232	(0)
CoCl+2	1.158e-39	8.979e-40	-38.936	-39.047	-0.111	(0)
Cu (1)	2.336e-09					
Cu+	2.283e-09	2.142e-09	-8.641	-8.669	-0.028	(0)
CuCl	5.295e-11	5.295e-11	-10.276	-10.276	0.000	(0)
CuCl2-	2.305e-13	2.172e-13	-12.637	-12.663	-0.026	(0)
CuCl3-2	1.152e-18	9.117e-19	-17.939	-18.040	-0.102	(0)
Cu (2)	8.627e-08					
Cu+2	5.546e-08	4.374e-08	-7.256	-7.359	-0.103	(0)
CuCO3	1.287e-08	1.287e-08	-7.891	-7.891	0.000	(0)
CuOH+	1.185e-08	1.116e-08	-7.926	-7.952	-0.026	(0)
CuSO4	5.433e-09	5.433e-09	-8.265	-8.265	0.000	(0)
CuHCO3+	3.910e-10	3.669e-10	-9.408	-9.435	-0.028	(0)
Cu (OH) 2	1.798e-10	1.798e-10	-9.745	-9.745	0.000	(0)
CuF+	7.973e-11	7.481e-11	-10.098	-10.126	-0.028	(0)
Cu2 (OH) 2+2	4.038e-12	3.130e-12	-11.394	-11.504	-0.111	(0)
Cu (CO3) 2-2	2.232e-12	1.730e-12	-11.651	-11.762	-0.111	(0)
CuCl+	1.444e-12	1.361e-12	-11.840	-11.866	-0.026	(0)
Cu (OH) 3-	3.171e-14	2.976e-14	-13.499	-13.526	-0.028	(0)
CuCl2	9.266e-18	9.266e-18	-17.033	-17.033	0.000	(0)
Cu (OH) 4-2	2.438e-20	1.890e-20	-19.613	-19.724	-0.111	(0)
CuCl3-	1.802e-24	1.698e-24	-23.744	-23.770	-0.026	(0)
CuCl4-2	2.110e-31	1.670e-31	-30.676	-30.777	-0.102	(0)
F	2.937e-05					
F-	2.876e-05	2.711e-05	-4.541	-4.567	-0.026	(0)
MgF+	2.168e-07	2.044e-07	-6.664	-6.690	-0.026	(0)
CaF+	1.453e-07	1.371e-07	-6.838	-6.863	-0.025	(0)
AlF2+	7.424e-08	7.005e-08	-7.129	-7.155	-0.025	(0)
AlF3	2.390e-08	2.390e-08	-7.622	-7.622	0.000	(0)
AlF+2	8.189e-09	6.492e-09	-8.087	-8.188	-0.101	(0)
MnF+	7.016e-09	6.618e-09	-8.154	-8.179	-0.025	(0)
HF	5.002e-09	5.002e-09	-8.301	-8.301	0.000	(0)
NaF	2.821e-09	2.821e-09	-8.550	-8.550	0.000	(0)
AlF4-	3.444e-10	3.247e-10	-9.463	-9.488	-0.026	(0)
CuF+	7.973e-11	7.481e-11	-10.098	-10.126	-0.028	(0)
UO2F+	1.664e-11	1.561e-11	-10.779	-10.806	-0.028	(0)
ZnF+	1.023e-11	9.604e-12	-10.990	-11.018	-0.028	(0)
CoF+	5.158e-12	4.839e-12	-11.288	-11.315	-0.028	(0)
BF (OH) 3-	4.998e-12	4.702e-12	-11.301	-11.328	-0.026	(0)
NiF+	4.159e-12	3.903e-12	-11.381	-11.409	-0.028	(0)
UO2F2	1.221e-12	1.221e-12	-11.913	-11.913	0.000	(0)
HF2-	5.473e-13	5.155e-13	-12.262	-12.288	-0.026	(0)
CdF+	1.454e-13	1.364e-13	-12.837	-12.865	-0.028	(0)
FeF+2	1.948e-14	1.542e-14	-13.710	-13.812	-0.102	(0)
FeF2+	1.186e-14	1.119e-14	-13.926	-13.951	-0.025	(0)
UO2F3-	8.857e-15	8.311e-15	-14.053	-14.080	-0.028	(0)
BF2 (OH) 2-	1.807e-15	1.700e-15	-14.743	-14.770	-0.026	(0)
FeF3	4.278e-16	4.278e-16	-15.369	-15.369	0.000	(0)
VO2F	1.232e-16	1.232e-16	-15.909	-15.909	0.000	(0)
H2F2	6.703e-17	6.703e-17	-16.174	-16.174	0.000	(0)
VOF+	5.592e-17	5.247e-17	-16.252	-16.280	-0.028	(0)
CdF2	7.378e-18	7.378e-18	-17.132	-17.132	0.000	(0)

UO2F4-2	2.308e-18	1.789e-18	-17.637	-17.747	-0.111	(0)
VO2F2-	1.292e-18	1.213e-18	-17.889	-17.916	-0.028	(0)
VOF2	5.333e-19	5.333e-19	-18.273	-18.273	0.000	(0)
Sb(OH) 2F	5.603e-21	5.603e-21	-20.252	-20.252	0.000	(0)
SbOF	5.510e-21	5.510e-21	-20.259	-20.259	0.000	(0)
BF3OH-	2.377e-21	2.237e-21	-20.624	-20.650	-0.026	(0)
VOF3-	5.466e-22	5.129e-22	-21.262	-21.290	-0.028	(0)
VO2F3-2	5.289e-22	4.100e-22	-21.277	-21.387	-0.111	(0)
VOF4-2	7.238e-26	5.611e-26	-25.140	-25.251	-0.111	(0)
BF4-	3.956e-26	3.722e-26	-25.403	-25.429	-0.026	(0)
VO2F4-3	9.697e-27	5.468e-27	-26.013	-26.262	-0.249	(0)
UF3+	1.405e-30	1.318e-30	-29.852	-29.880	-0.028	(0)
UF2+2	3.959e-31	3.069e-31	-30.402	-30.513	-0.111	(0)
UF4	3.918e-33	3.918e-33	-32.407	-32.407	0.000	(0)
UF+3	1.595e-33	8.993e-34	-32.797	-33.046	-0.249	(0)
UF5-	4.485e-36	4.209e-36	-35.348	-35.376	-0.028	(0)
UF6-2	4.444e-38	3.445e-38	-37.352	-37.463	-0.111	(0)
Fe (2)	7.978e-07					
Fe+2	7.205e-07	5.586e-07	-6.142	-6.253	-0.111	(0)
FeSO4	7.434e-08	7.434e-08	-7.129	-7.129	0.000	(0)
FeOH+	1.903e-09	1.795e-09	-8.721	-8.746	-0.025	(0)
FeHCO3+	9.902e-10	9.349e-10	-9.004	-9.029	-0.025	(0)
Fe (OH) 2	1.150e-13	1.150e-13	-12.939	-12.939	0.000	(0)
Fe (OH) 3-	3.113e-15	2.936e-15	-14.507	-14.532	-0.025	(0)
Fe (3)	9.739e-07					
Fe (OH) 2+	8.997e-07	8.489e-07	-6.046	-6.071	-0.025	(0)
Fe (OH) 3	7.358e-08	7.358e-08	-7.133	-7.133	0.000	(0)
Fe (OH) 4-	5.860e-10	5.529e-10	-9.232	-9.257	-0.025	(0)
FeOH+2	3.416e-11	2.704e-11	-10.466	-10.568	-0.102	(0)
FeF+2	1.948e-14	1.542e-14	-13.710	-13.812	-0.102	(0)
FeF2+	1.186e-14	1.119e-14	-13.926	-13.951	-0.025	(0)
FeSO4+	3.346e-15	3.157e-15	-14.475	-14.501	-0.025	(0)
Fe+3	8.852e-16	5.189e-16	-15.053	-15.285	-0.232	(0)
FeF3	4.278e-16	4.278e-16	-15.369	-15.369	0.000	(0)
Fe (SO4) 2-	3.899e-17	3.659e-17	-16.409	-16.437	-0.028	(0)
FeCl+2	3.887e-19	3.077e-19	-18.410	-18.512	-0.102	(0)
Fe2 (OH) 2+4	6.702e-20	2.421e-20	-19.174	-19.616	-0.442	(0)
FeHSeO3+2	4.857e-21	3.765e-21	-20.314	-20.424	-0.111	(0)
FeCl2+	2.860e-23	2.698e-23	-22.544	-22.569	-0.025	(0)
Fe3 (OH) 4+5	1.458e-24	2.970e-25	-23.836	-24.527	-0.691	(0)
FeCl3	5.297e-29	5.297e-29	-28.276	-28.276	0.000	(0)
H (0)	2.203e-25					
H2	1.101e-25	1.102e-25	-24.958	-24.958	0.000	(0)
K	2.757e-05					
K+	2.746e-05	2.588e-05	-4.561	-4.587	-0.026	(0)
KSO4-	1.053e-07	9.934e-08	-6.978	-7.003	-0.025	(0)
Mg	9.214e-05					
Mg+2	8.519e-05	6.719e-05	-4.070	-4.173	-0.103	(0)
MgSO4	6.629e-06	6.629e-06	-5.179	-5.179	0.000	(0)
MgF+	2.168e-07	2.044e-07	-6.664	-6.690	-0.026	(0)
MgHCO3+	9.700e-08	9.141e-08	-7.013	-7.039	-0.026	(0)
MgCO3	2.792e-09	2.792e-09	-8.554	-8.554	0.000	(0)
MgOH+	2.286e-09	2.159e-09	-8.641	-8.666	-0.025	(0)
MgH2BO3+	5.011e-12	4.715e-12	-11.300	-11.327	-0.026	(0)
Mn (2)	8.528e-06					
Mn+2	7.911e-06	6.133e-06	-5.102	-5.212	-0.111	(0)
MnSO4	5.912e-07	5.912e-07	-6.228	-6.228	0.000	(0)
MnHCO3+	1.725e-08	1.627e-08	-7.763	-7.789	-0.025	(0)
MnF+	7.016e-09	6.618e-09	-8.154	-8.179	-0.025	(0)
MnOH+	1.318e-09	1.243e-09	-8.880	-8.905	-0.025	(0)
MnCl+	1.607e-10	1.516e-10	-9.794	-9.819	-0.025	(0)
MnCl2	4.203e-15	4.203e-15	-14.376	-14.376	0.000	(0)
MnSeO4	1.148e-19	1.148e-19	-18.940	-18.940	0.000	(0)
Mn (OH) 3-	5.305e-20	5.004e-20	-19.275	-19.301	-0.025	(0)
MnCl3-	2.410e-20	2.273e-20	-19.618	-19.643	-0.025	(0)
Mn (OH) 4-2	1.647e-26	1.304e-26	-25.783	-25.885	-0.102	(0)
MnSe	1.520e-33	1.520e-33	-32.818	-32.818	0.000	(0)
Mn (3)	4.673e-27					

Mn+3	4.673e-27	2.739e-27	-26.330	-26.562	-0.232	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-52.302	-52.403	-0.102	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-57.749	-57.775	-0.026	(0)
Mo	5.275e-08					
MoO4-2	5.264e-08	4.152e-08	-7.279	-7.382	-0.103	(0)
HMoO4-	1.098e-10	1.031e-10	-9.959	-9.987	-0.028	(0)
H2MoO4	9.419e-14	9.419e-14	-13.026	-13.026	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.094	-41.342	-0.249	(0)
Mo7O24-6	0.000e+00	0.000e+00	-52.919	-53.914	-0.995	(0)
HMo7O24-5	0.000e+00	0.000e+00	-53.740	-54.431	-0.691	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.110	-56.553	-0.442	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-59.962	-60.211	-0.249	(0)
Na	1.755e-04					
Na+	1.750e-04	1.649e-04	-3.757	-3.783	-0.026	(0)
NaSO4-	5.089e-07	4.802e-07	-6.293	-6.319	-0.025	(0)
NaHCO3	1.233e-08	1.233e-08	-7.909	-7.909	0.000	(0)
NaF	2.821e-09	2.821e-09	-8.550	-8.550	0.000	(0)
NaCO3-	1.626e-10	1.534e-10	-9.789	-9.814	-0.025	(0)
NaH2BO3	5.290e-13	5.290e-13	-12.277	-12.277	0.000	(0)
Ni	8.009e-09					
Ni+2	7.268e-09	5.732e-09	-8.139	-8.242	-0.103	(0)
NiSO4	6.200e-10	6.200e-10	-9.208	-9.208	0.000	(0)
NiHCO3+	1.001e-10	9.394e-11	-9.999	-10.027	-0.028	(0)
NiCO3	1.068e-11	1.068e-11	-10.971	-10.971	0.000	(0)
NiOH+	6.206e-12	5.824e-12	-11.207	-11.235	-0.028	(0)
NiF+	4.159e-12	3.903e-12	-11.381	-11.409	-0.028	(0)
NiCl+	3.068e-13	2.879e-13	-12.513	-12.541	-0.028	(0)
Ni (OH) 2	3.733e-14	3.733e-14	-13.428	-13.428	0.000	(0)
Ni (SO4) 2-2	1.436e-14	1.113e-14	-13.843	-13.953	-0.111	(0)
Ni (OH) 3-	3.211e-18	3.013e-18	-17.493	-17.521	-0.028	(0)
NiCl2	2.846e-20	2.846e-20	-19.546	-19.546	0.000	(0)
NiSeO4	1.865e-22	1.865e-22	-21.729	-21.729	0.000	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-42.380	-42.379	0.000	(0)
S (6)	7.529e-04					
SO4-2	6.874e-04	5.422e-04	-3.163	-3.266	-0.103	(0)
CaSO4	5.755e-05	5.755e-05	-4.240	-4.240	0.000	(0)
MgSO4	6.629e-06	6.629e-06	-5.179	-5.179	0.000	(0)
MnSO4	5.912e-07	5.912e-07	-6.228	-6.228	0.000	(0)
NaSO4-	5.089e-07	4.802e-07	-6.293	-6.319	-0.025	(0)
KSO4-	1.053e-07	9.934e-08	-6.978	-7.003	-0.025	(0)
FeSO4	7.434e-08	7.434e-08	-7.129	-7.129	0.000	(0)
HSO4-	7.011e-09	6.610e-09	-8.154	-8.180	-0.026	(0)
CuSO4	5.433e-09	5.433e-09	-8.265	-8.265	0.000	(0)
ZnSO4	2.106e-09	2.106e-09	-8.676	-8.676	0.000	(0)
NiSO4	6.200e-10	6.200e-10	-9.208	-9.208	0.000	(0)
CoSO4	6.108e-10	6.108e-10	-9.214	-9.214	0.000	(0)
AlSO4+	1.069e-10	1.008e-10	-9.971	-9.997	-0.026	(0)
CdSO4	4.036e-11	4.036e-11	-10.394	-10.394	0.000	(0)
Zn (SO4) 2-2	1.283e-11	9.946e-12	-10.892	-11.002	-0.111	(0)
UO2SO4	3.424e-12	3.424e-12	-11.465	-11.465	0.000	(0)
Al (SO4) 2-	6.211e-13	5.855e-13	-12.207	-12.232	-0.026	(0)
Cd (SO4) 2-2	3.808e-13	2.952e-13	-12.419	-12.530	-0.111	(0)
UO2 (SO4) 2-2	3.157e-14	2.447e-14	-13.501	-13.611	-0.111	(0)
Ni (SO4) 2-2	1.436e-14	1.113e-14	-13.843	-13.953	-0.111	(0)
FeSO4+	3.346e-15	3.157e-15	-14.475	-14.501	-0.025	(0)
VOSO4	4.819e-17	4.819e-17	-16.317	-16.317	0.000	(0)
Fe (SO4) 2-	3.899e-17	3.659e-17	-16.409	-16.437	-0.028	(0)
VO2SO4-	3.576e-17	3.356e-17	-16.447	-16.474	-0.028	(0)
VSO4+	6.804e-29	6.385e-29	-28.167	-28.195	-0.028	(0)
U (SO4) 2	1.546e-34	1.546e-34	-33.811	-33.811	0.000	(0)
USO4+2	4.630e-35	3.589e-35	-34.334	-34.445	-0.111	(0)
Sb (3)	2.096e-15					
Sb (OH) 3	1.061e-15	1.061e-15	-14.974	-14.974	0.000	(0)
HSbO2	1.035e-15	1.035e-15	-14.985	-14.985	0.000	(0)
SbO2-	1.432e-20	1.344e-20	-19.844	-19.872	-0.028	(0)

Sb(OH) 4-	8.207e-21	7.701e-21	-20.086	-20.113	-0.028	(0)
Sb(OH) 2F	5.603e-21	5.603e-21	-20.252	-20.252	0.000	(0)
SbOF	5.510e-21	5.510e-21	-20.259	-20.259	0.000	(0)
Sb(OH) 2+	3.425e-21	3.213e-21	-20.465	-20.493	-0.028	(0)
SbO+	1.181e-21	1.108e-21	-20.928	-20.956	-0.028	(0)
Sb (5)	2.440e-08					
SbO3-	2.437e-08	2.287e-08	-7.613	-7.641	-0.028	(0)
Sb(OH) 6-	2.838e-11	2.675e-11	-10.547	-10.573	-0.026	(0)
SbO2+	1.088e-22	1.021e-22	-21.963	-21.991	-0.028	(0)
Se (-2)	8.006e-30					
HSe-	7.998e-30	7.504e-30	-29.097	-29.125	-0.028	(0)
H2Se	7.268e-33	7.268e-33	-32.139	-32.139	0.000	(0)
MnSe	1.520e-33	1.520e-33	-32.818	-32.818	0.000	(0)
Se-2	7.759e-38	6.015e-38	-37.110	-37.221	-0.111	(0)
Se (4)	3.040e-09					
HSeO3-	2.927e-09	2.746e-09	-8.534	-8.561	-0.028	(0)
SeO3-2	1.130e-10	8.763e-11	-9.947	-10.057	-0.111	(0)
H2SeO3	1.462e-13	1.462e-13	-12.835	-12.835	0.000	(0)
FeHSeO3+2	4.857e-21	3.765e-21	-20.314	-20.424	-0.111	(0)
Cd(SeO3) 2-2	2.592e-24	2.010e-24	-23.586	-23.697	-0.111	(0)
Se (6)	8.833e-17					
SeO4-2	8.821e-17	6.957e-17	-16.054	-16.158	-0.103	(0)
MnSeO4	1.148e-19	1.148e-19	-18.940	-18.940	0.000	(0)
HSeO4-	4.636e-22	4.350e-22	-21.334	-21.361	-0.028	(0)
CoSeO4	1.969e-22	1.969e-22	-21.706	-21.706	0.000	(0)
ZnSeO4	1.913e-22	1.913e-22	-21.718	-21.718	0.000	(0)
NiSeO4	1.865e-22	1.865e-22	-21.729	-21.729	0.000	(0)
CdSeO4	4.114e-24	4.114e-24	-23.386	-23.386	0.000	(0)
Zn(SeO4) 2-2	1.741e-38	1.350e-38	-37.759	-37.870	-0.111	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-50.326	-50.575	-0.249	(0)
U (4)	4.468e-17					
U(OH) 5-	4.446e-17	4.172e-17	-16.352	-16.380	-0.028	(0)
U(OH) 4	2.180e-19	2.180e-19	-18.662	-18.662	0.000	(0)
U(OH) 3+	1.060e-22	9.944e-23	-21.975	-22.002	-0.028	(0)
U(OH) 2+2	7.400e-27	5.736e-27	-26.131	-26.241	-0.111	(0)
UF3+	1.405e-30	1.318e-30	-29.852	-29.880	-0.028	(0)
UF2+2	3.959e-31	3.069e-31	-30.402	-30.513	-0.111	(0)
UOH+3	5.978e-32	3.371e-32	-31.223	-31.472	-0.249	(0)
UF4	3.918e-33	3.918e-33	-32.407	-32.407	0.000	(0)
UF+3	1.595e-33	8.993e-34	-32.797	-33.046	-0.249	(0)
U(SO4) 2	1.546e-34	1.546e-34	-33.811	-33.811	0.000	(0)
USO4+2	4.630e-35	3.589e-35	-34.334	-34.445	-0.111	(0)
UF5-	4.485e-36	4.209e-36	-35.348	-35.376	-0.028	(0)
U+4	4.604e-38	1.663e-38	-37.337	-37.779	-0.442	(0)
UF6-2	4.444e-38	3.445e-38	-37.352	-37.463	-0.111	(0)
UCl+3	0.000e+00	0.000e+00	-40.537	-40.786	-0.249	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-138.032	-140.271	-2.239	(0)
U (5)	2.711e-13					
UO2+	2.711e-13	2.544e-13	-12.567	-12.595	-0.028	(0)
U (6)	1.975e-09					
UO2(CO3) 2-2	1.067e-09	8.272e-10	-8.972	-9.082	-0.111	(0)
UO2CO3	8.299e-10	8.299e-10	-9.081	-9.081	0.000	(0)
UO2OH+	4.519e-11	4.240e-11	-10.345	-10.373	-0.028	(0)
UO2F+	1.664e-11	1.561e-11	-10.779	-10.806	-0.028	(0)
UO2(CO3) 3-4	5.734e-12	2.071e-12	-11.242	-11.684	-0.442	(0)
UO2+2	5.291e-12	4.173e-12	-11.276	-11.380	-0.103	(0)
UO2SO4	3.424e-12	3.424e-12	-11.465	-11.465	0.000	(0)
UO2F2	1.221e-12	1.221e-12	-11.913	-11.913	0.000	(0)
UO2(SO4) 2-2	3.157e-14	2.447e-14	-13.501	-13.611	-0.111	(0)
UO2F3-	8.857e-15	8.311e-15	-14.053	-14.080	-0.028	(0)
(UO2) 2(OH) 2+2	3.849e-15	2.983e-15	-14.415	-14.525	-0.111	(0)
(UO2) 3(OH) 5+	6.661e-16	6.250e-16	-15.176	-15.204	-0.028	(0)
UO2Cl+	1.416e-16	1.329e-16	-15.849	-15.877	-0.028	(0)
UO2F4-2	2.308e-18	1.789e-18	-17.637	-17.747	-0.111	(0)
V (2)	4.977e-36					
VOH+	3.401e-36	3.191e-36	-35.468	-35.496	-0.028	(0)
V+2	1.576e-36	1.222e-36	-35.802	-35.913	-0.111	(0)

V (3)	1.058e-10					
V (OH) 3	1.058e-10	1.058e-10	-9.976	-9.976	0.000	(0)
V (OH) 2+	9.088e-21	8.527e-21	-20.042	-20.069	-0.028	(0)
VOH+2	1.302e-23	1.009e-23	-22.886	-22.996	-0.111	(0)
V+3	4.424e-28	2.495e-28	-27.354	-27.603	-0.249	(0)
VSO4+	6.804e-29	6.385e-29	-28.167	-28.195	-0.028	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-44.365	-44.613	-0.249	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-44.750	-45.192	-0.442	(0)
V (4)	6.059e-15					
V (OH) 3+	5.538e-15	5.197e-15	-14.257	-14.284	-0.028	(0)
VO+2	4.163e-16	3.227e-16	-15.381	-15.491	-0.111	(0)
VOF+	5.592e-17	5.247e-17	-16.252	-16.280	-0.028	(0)
VOSO4	4.819e-17	4.819e-17	-16.317	-16.317	0.000	(0)
VOF2	5.333e-19	5.333e-19	-18.273	-18.273	0.000	(0)
VOC1+	1.894e-20	1.778e-20	-19.723	-19.750	-0.028	(0)
VOF3-	5.466e-22	5.129e-22	-21.262	-21.290	-0.028	(0)
H2V2O4+2	1.746e-24	1.353e-24	-23.758	-23.869	-0.111	(0)
VOF4-2	7.238e-26	5.611e-26	-25.140	-25.251	-0.111	(0)
V (5)	9.122e-09					
H2VO4-	8.893e-09	8.345e-09	-8.051	-8.079	-0.028	(0)
HVO4-2	2.167e-10	1.680e-10	-9.664	-9.775	-0.111	(0)
H3VO4	1.041e-11	1.041e-11	-10.982	-10.982	0.000	(0)
H3V2O7-	5.979e-13	5.610e-13	-12.223	-12.251	-0.028	(0)
VO2+	2.750e-15	2.592e-15	-14.561	-14.586	-0.026	(0)
HV2O7-3	8.425e-16	4.751e-16	-15.074	-15.323	-0.249	(0)
VO2F	1.232e-16	1.232e-16	-15.909	-15.909	0.000	(0)
VO2SO4-	3.576e-17	3.356e-17	-16.447	-16.474	-0.028	(0)
VO4-3	1.197e-17	6.749e-18	-16.922	-17.171	-0.249	(0)
VO2F2-	1.292e-18	1.213e-18	-17.889	-17.916	-0.028	(0)
V3O9-3	1.079e-18	6.086e-19	-17.967	-18.216	-0.249	(0)
V2O7-4	2.838e-19	1.025e-19	-18.547	-18.989	-0.442	(0)
VO2F3-2	5.289e-22	4.100e-22	-21.277	-21.387	-0.111	(0)
V4O12-4	5.862e-24	2.117e-24	-23.232	-23.674	-0.442	(0)
VO2F4-3	9.697e-27	5.468e-27	-26.013	-26.262	-0.249	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.522	-58.213	-0.691	(0)
V10O28-6	0.000e+00	0.000e+00	-58.500	-59.495	-0.995	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.467	-59.909	-0.442	(0)
Zn	2.493e-08					
Zn+2	2.251e-08	1.776e-08	-7.648	-7.751	-0.103	(0)
ZnSO4	2.106e-09	2.106e-09	-8.676	-8.676	0.000	(0)
ZnOH+	1.527e-10	1.433e-10	-9.816	-9.844	-0.028	(0)
ZnHCO3+	7.956e-11	7.465e-11	-10.099	-10.127	-0.028	(0)
ZnCO3	5.104e-11	5.104e-11	-10.292	-10.292	0.000	(0)
Zn (SO4) 2-2	1.283e-11	9.946e-12	-10.892	-11.002	-0.111	(0)
ZnF+	1.023e-11	9.604e-12	-10.990	-11.018	-0.028	(0)
Zn (OH) 2	1.833e-12	1.833e-12	-11.737	-11.737	0.000	(0)
ZnCl+	9.293e-13	8.757e-13	-12.032	-12.058	-0.026	(0)
ZnOHCl	9.252e-14	9.252e-14	-13.034	-13.034	0.000	(0)
Zn (OH) 3-	7.902e-16	7.414e-16	-15.102	-15.130	-0.028	(0)
ZnCl2	2.725e-17	2.725e-17	-16.565	-16.565	0.000	(0)
Zn (OH) 4-2	3.073e-21	2.382e-21	-20.512	-20.623	-0.111	(0)
ZnCl3-	4.510e-22	4.249e-22	-21.346	-21.372	-0.026	(0)
ZnSeO4	1.913e-22	1.913e-22	-21.718	-21.718	0.000	(0)
ZnCl4-2	5.270e-27	4.172e-27	-26.278	-26.380	-0.102	(0)
Zn (SeO4) 2-2	1.741e-38	1.350e-38	-37.759	-37.870	-0.111	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-0.71	10.09	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.75	-43.39	2.37	Al2 (MoO4) 3
Al2O3	0.53	20.18	19.65	Al2O3
Al4 (OH) 10SO4	0.59	23.29	22.70	Al4 (OH) 10SO4
AlOHSO4	-3.75	-6.98	-3.23	AlOHSO4
AlSb	-135.93	-70.31	65.62	AlSb
Alunite	-0.16	-1.56	-1.40	KAl3 (SO4) 2 (OH) 6
Anhydrite	-2.24	-6.60	-4.36	CaSO4

Antlerite	-6.52	2.27	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-2.34	-10.64	-8.30	CaCO ₃
Artinite	-11.44	-1.84	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
Atacamite	-6.10	1.29	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-5.97	-22.87	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.95	6.44	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-18.35	-2.48	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (VO ₄) ₂ :4H ₂ O	-28.98	3.96	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaF ₂	-10.68	-16.50	-5.82	BaF ₂
BaMoO ₄	-7.79	-14.75	-6.96	BaMoO ₄
Barite	-0.65	-10.63	-9.98	BaSO ₄
BaSeO ₃	-10.85	-9.02	1.83	BaSeO ₃
BaSeO ₄	-16.06	-23.52	-7.46	BaSeO ₄
Bianchite	-9.25	-11.02	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-13.04	5.05	18.09	MnO ₂
Bixbyite	-11.06	-11.70	-0.64	Mn ₂ O ₃
Boehmite	1.51	10.09	8.58	AlOOH
Breithauptite	-45.41	-63.93	-18.52	NiSb
Brochantite	-6.50	8.72	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-7.21	9.64	16.84	Mg(OH) ₂
Bunsenite	-6.88	5.57	12.45	NiO
Ca(VO ₃) ₂	-10.55	-4.89	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-11.92	5.58	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-15.97	5.58	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (VO ₄) ₂	-22.90	16.06	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-23.80	16.06	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-272.35	-129.37	142.97	Ca ₃ Sb ₂
Calcite	-2.16	-10.64	-8.48	CaCO ₃
CaMoO ₄	-2.77	-10.72	-7.95	CaMoO ₄
Carnotite	-3.17	-2.94	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.81	-4.99	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-16.47	-19.49	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-18.25	-8.41	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-9.33	4.31	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-9.42	4.31	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-27.93	-21.22	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-26.70	-4.14	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-28.24	0.16	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-18.25	-18.91	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-17.22	-18.91	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-17.00	-18.91	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-17.42	-18.63	-1.21	CdF ₂
Cdmetal(alpha)	-31.01	-17.50	13.51	Cd
Cdmetal(gamma)	-31.12	-17.50	13.62	Cd
CdMoO ₄	-2.73	-16.88	-14.15	CdMoO ₄
CdOHCl	-10.84	-7.30	3.54	CdOHCl
CdSb	-64.83	-65.18	-0.35	CdSb
CdSe	-11.52	-31.72	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-23.81	-25.66	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-12.59	-12.76	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.04	-12.76	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-10.89	-12.76	-1.87	CdSO ₄ :2.67H ₂ O
CH ₄ (g)	-67.30	-108.34	-41.05	CH ₄
Chalcanthite	-7.99	-10.63	-2.64	CuSO ₄ :5H ₂ O
Co(BO ₂) ₂	-34.23	-7.16	27.07	Co(BO ₂) ₂
Co(OH) ₂	-7.53	5.56	13.09	Co(OH) ₂
Co(OH) ₃	-13.63	-15.94	-2.31	Co(OH) ₃
CO ₂ (g)	-2.96	-21.11	-18.15	CO ₂
Co ₃ O ₄	-15.82	-26.31	-10.50	Co ₃ O ₄
CoCl ₂	-25.93	-17.66	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-20.20	-17.66	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-5.57	-15.55	-9.98	CoCO ₃
CoF ₂	-15.79	-17.38	-1.60	CoF ₂
CoF ₃	-48.89	-50.35	-1.46	CoF ₃
CoFe ₂ O ₄	19.94	16.41	-3.53	CoFe ₂ O ₄
CoMoO ₄	-7.87	-15.63	-7.76	CoMoO ₄
CoO	-8.03	5.56	13.59	CoO
CoSe	-14.27	-30.47	-16.20	CoSe

CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-22.88	-24.41	-1.53	CoSeO4:6H2O
CoSO4	-14.32	-11.51	2.80	CoSO4
CoSO4:6H2O	-9.04	-11.51	-2.47	CoSO4:6H2O
Cryolite	-15.53	-49.37	-33.84	Na3AlF6
Cu(OH)2	-2.23	6.45	8.67	Cu(OH)2
Cu(SbO3)2	-25.10	20.12	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-40.83	-75.71	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	6.24	-39.56	-45.80	Cu2Se
Cu2SO4	-18.65	-20.60	-1.95	Cu2SO4
Cu3Sb	-43.10	-85.69	-42.59	Cu3Sb
Cu3Se2	-5.65	-69.14	-63.49	Cu3Se2
CuCO3	-3.16	-14.66	-11.50	CuCO3
CuF	-8.33	-13.24	-4.91	CuF
CuF2	-17.61	-16.49	1.12	CuF2
CuF2:2H2O	-11.94	-16.49	-4.55	CuF2:2H2O
Cumetal	-3.91	-12.67	-8.76	Cu
CuMoO4	-1.66	-14.74	-13.08	CuMoO4
CuOCuSO4	-14.48	-4.18	10.30	CuOCuSO4
Cupricferrite	11.31	17.30	5.99	CuFe2O4
Cuprite	-2.12	-3.53	-1.41	Cu2O
Cuprousferrite	12.58	3.66	-8.92	CuFeO2
CuSe	3.52	-29.58	-33.10	CuSe
CuSe2	-10.44	-43.80	-33.37	CuSe2
CuSeO3:2H2O	-9.53	-9.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-21.08	-23.52	-2.44	CuSeO4:5H2O
CuSO4	-13.56	-10.62	2.94	CuSO4
Diaspore	3.22	10.09	6.87	AlOOH
Dolomite(disordered)	-5.57	-22.11	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.02	-22.11	-17.09	CaMg(CO3)2
Epsomite	-5.31	-7.44	-2.13	MgSO4:7H2O
Fe(OH)2	-6.01	7.55	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	4.98	1.94	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.09	-7.81	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-6.17	-4.61	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-14.92	-35.54	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-36.63	-40.37	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.81	18.41	20.22	Fe3(OH)8
FeMoO4	-3.54	-13.63	-10.09	FeMoO4
Ferrihydrite	2.24	5.43	3.19	Fe(OH)3
Ferroselite	-24.10	-42.69	-18.60	FeSe2
FeSe	-17.47	-28.47	-11.00	FeSe
Fluorite	-1.97	-12.47	-10.50	CaF2
Gibbsite	1.80	10.09	8.29	Al(OH)3
Goethite	4.94	5.43	0.49	FeOOH
Goslarite	-9.01	-11.02	-2.01	ZnSO4:7H2O
Gummite	-5.24	2.43	7.67	UO3
Gypsum	-1.99	-6.60	-4.61	CaSO4:2H2O
H-Jarosite	-5.77	-17.87	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.31	-21.19	-12.88	H2MoO4
H2Se(g)	-31.07	-36.03	-4.96	H2Se
Halite	-10.09	-8.49	1.60	NaCl
Hausmannite	-13.44	47.59	61.03	Mn3O4
Hematite	12.27	10.85	-1.42	Fe2O3
Hercynite	4.84	27.74	22.89	FeAl2O4
Huntite	-15.09	-45.06	-29.97	CaMg3(CO3)4
Hydromagnesite	-27.50	-36.26	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.57	-21.74	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-0.75	-15.55	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-19.82	-16.56	3.26	K2MoO4
K2SeO4	-24.60	-25.33	-0.73	K2SeO4
Langite	-8.77	8.72	17.49	Cu4(OH)6SO4:H2O
Lepidocrocite	4.06	5.43	1.37	FeOOH
Lime	-22.23	10.47	32.70	CaO
Maghemite	4.47	10.85	6.39	Fe2O3
Magnesioferrite	3.63	20.49	16.86	Fe2MgO4
Magnesite	-4.01	-11.47	-7.46	MgCO3
Magnetite	15.01	18.41	3.40	Fe3O4

Malachite	-2.91	-8.21	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-5.84	19.50	25.34	MnOOH
Melanothallite	-23.03	-16.77	6.26	CuCl ₂
Melanterite	-7.31	-9.52	-2.21	FeSO ₄ :7H ₂ O
Mg (OH) ₂ (active)	-9.16	9.64	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-17.01	-5.73	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-242.09	-167.40	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-22.45	3.91	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-5.18	-13.31	-8.13	MgF ₂
MgMoO ₄	-9.70	-11.55	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-8.89	-5.83	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-19.13	-20.33	-1.20	MgSeO ₄ :6H ₂ O
Mirabilite	-9.72	-10.83	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn (VO ₃) ₂	-11.67	-6.77	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.21	-62.92	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-135.19	-74.11	61.08	Mn ₂ Sb
MnCl ₂ :4H ₂ O	-17.34	-14.63	2.72	MnCl ₂ :4H ₂ O
MnSb	-83.34	-86.25	-2.91	MnSb
MnSe	-30.93	-27.43	3.50	MnSe
MnSeO ₃	-8.00	-6.87	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-7.85	-6.87	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-19.32	-21.37	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-11.06	-8.48	2.58	MnSO ₄
Monteponite	-10.79	4.31	15.10	CdO
MoO ₃	-13.19	-21.19	-8.00	MoO ₃
Morenosite	-9.36	-11.51	-2.14	NiSO ₄ :7H ₂ O
Na-Jarosite	-3.55	-14.75	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-19.54	-36.14	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.44	-14.95	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-16.17	-14.95	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-19.52	-9.22	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-25.00	-23.72	1.28	Na ₂ SeO ₄
Na ₃ Sb	-165.49	-71.03	94.45	Na ₃ Sb
Na ₃ VO ₄	-35.00	1.68	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-40.28	-2.88	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.65	-13.38	-6.73	CuCl
NaSb	-78.63	-55.47	23.17	NaSb
Natron	-13.56	-14.87	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-8.42	-4.56	3.86	NaVO ₃
Nesquehonite	-6.80	-11.47	-4.67	MgCO ₃ :3H ₂ O
Ni (OH) ₂	-7.23	5.57	12.79	Ni (OH) ₂
Ni ₄ (OH) ₆ SO ₄	-26.81	5.19	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-8.67	-15.54	-6.87	NiCO ₃
NiMoO ₄	-4.48	-15.62	-11.14	NiMoO ₄
NiSe	-12.76	-30.46	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-12.71	-9.90	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-22.88	-24.40	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-12.45	5.05	17.50	MnO ₂
O ₂ (g)	-39.47	43.62	83.09	O ₂
Otavite	-4.80	-16.80	-12.00	CdCO ₃
Periclase	-11.95	9.64	21.58	MgO
Portlandite	-12.33	10.47	22.80	Ca (OH) ₂
Pyrochroite	-6.60	8.60	15.19	Mn (OH) ₂
Pyrolusite	-10.98	30.40	41.38	MnO ₂
Retgersite	-9.47	-11.51	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	-1.93	-12.51	-10.58	MnCO ₃
Rutherfordine	-4.18	-18.68	-14.50	UO ₂ CO ₃
Sb (OH) ₃	-7.86	-14.97	-7.11	Sb (OH) ₃
Sb ₂ O ₄	-11.54	-8.14	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-25.29	-34.95	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-70.28	-138.03	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-41.64	-59.90	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-42.00	-59.90	-17.90	Sb ₄ O ₆
SbCl ₃	-50.38	-49.81	0.57	SbCl ₃
SbF ₃	-39.16	-49.39	-10.23	SbF ₃
Sbmetal	-36.00	-47.69	-11.69	Sb
SbO ₂	-0.56	-28.38	-27.82	SbO ₂
Schoepite	-3.57	2.43	5.99	UO ₂ (OH) ₂ :H ₂ O

Semetal (am)	-7.11	-14.22	-7.11	Se
Semetal (hex)	-6.51	-14.22	-7.71	Se
Senarmontite	-17.58	-29.95	-12.37	Sb2O3
SeO2	-15.59	-15.47	0.12	SeO2
SeO3	-51.01	-29.97	21.04	SeO3
Siderite	-3.31	-13.55	-10.24	FeCO3
Smithsonite	-5.05	-15.05	-10.00	ZnCO3
Spinel	-7.03	29.82	36.85	MgAl2O4
Tenorite	-1.20	6.45	7.64	CuO
Thenardite	-11.15	-10.83	0.32	Na2SO4
Thermonatrite	-15.50	-14.87	0.64	Na2CO3:H2O
Tyuyamunite	-4.11	-0.03	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-7.96	13.13	21.08	U3O8
U3Sb4	-504.46	-352.08	152.38	U3Sb4
U4O9	-15.83	-18.85	-3.02	U4O9
UF4	-26.51	-56.05	-29.54	UF4
UF4:2.5H2O	-23.33	-56.05	-32.72	UF4:2.5H2O
UO2 (am)	-11.10	-10.16	0.93	UO2
UO2 (OH) 2 (beta)	-3.18	2.43	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.29	-27.54	-2.25	UO2SeO4:4H2O
UO3	-5.27	2.43	7.70	UO3
Uraninite	-5.49	-10.16	-4.67	UO2
USb2	-187.94	-158.37	29.58	USb2
V (OH) 3	-14.48	-6.89	7.59	V (OH) 3
V2O5	-14.00	-15.36	-1.36	V2O5
V3O5	-28.69	-26.86	1.84	V3O5
V4O7	-35.73	-28.54	7.19	V4O7
V6O13	-28.85	-89.71	-60.86	V6O13
Valentinite	-21.47	-29.95	-8.48	Sb2O3
VC12	-59.89	-41.02	18.87	VC12
VC13	-65.16	-41.72	23.43	VC13
VF4	-62.50	-47.57	14.93	VF4
Vmetal	-83.63	-39.60	44.03	V
VO	-32.55	-17.80	14.76	VO
VO (OH) 2	-6.83	-1.68	5.15	VO (OH) 2
VO2Cl	-22.13	-19.29	2.84	VO2Cl
VOC1	-29.65	-18.50	11.15	VOC1
VOC12	-37.67	-24.91	12.76	VOC12
VOSO4	-22.37	-18.76	3.61	VOSO4
Witherite	-6.10	-14.67	-8.57	BaCO3
Zincite	-5.28	6.06	11.33	ZnO
Zincosite	-14.95	-11.02	3.93	ZnSO4
Zn (BO2) 2	-14.96	-6.67	8.29	Zn (BO2) 2
Zn (OH) 2	-6.14	6.06	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-6.42	6.06	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-5.70	6.06	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-5.48	6.06	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-5.68	6.06	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-12.46	-4.96	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-14.69	0.50	15.19	Zn2 (OH) 3Cl
Zn3O (SO4) 2	-34.89	-15.98	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-21.24	7.16	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-31.44	7.06	38.50	Zn5 (OH) 8Cl2
ZnCl2	-24.21	-17.16	7.05	ZnCl2
ZnCO3:1H2O	-4.79	-15.05	-10.26	ZnCO3:1H2O
ZnF2	-16.35	-16.88	-0.53	ZnF2
Znmetal	-41.54	-15.75	25.79	Zn
ZnMoO4	-5.01	-15.13	-10.13	ZnMoO4
ZnO (active)	-5.13	6.06	11.19	ZnO
ZnSb	-74.45	-63.44	11.01	ZnSb
ZnSe	-15.57	-29.97	-14.40	ZnSe
ZnSeO4:6H2O	-22.39	-23.91	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.38	-11.02	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 9.

SOLUTION 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

temp 25
pH 7.91874
pe 4
redox pe
units mg/l
density 1
Alkalinity 30.14978 as HCO3
Al 0.01854
B 0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939
F 0.81954
Fe 0.00248
Hg 0.000010
K 2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049
Na 2.31042 charge
Pb 0.00012
S(6) 12.05373 as SO4
Se 0.00024
U 0.00243
V 0.00049
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 7. Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

-----Solution composition-----

Elements	Molality	Moles	
Al	6.872e-07	6.872e-07	
Alkalinity	4.941e-04	4.941e-04	
B	4.496e-07	4.496e-07	
Ba	3.568e-09	3.568e-09	
Ca	2.482e-04	2.482e-04	
Cl	2.819e-05	2.819e-05	
F	4.314e-05	4.314e-05	
Fe	4.441e-08	4.441e-08	
Hg	4.986e-11	4.986e-11	
K	5.578e-05	5.578e-05	
Mg	7.149e-05	7.149e-05	
Mn	3.470e-07	3.470e-07	
Mo	5.108e-09	5.108e-09	
Na	1.185e-04	1.185e-04	Charge balance
Pb	5.792e-10	5.792e-10	
S(6)	1.255e-04	1.255e-04	
Se	3.040e-09	3.040e-09	
U	1.021e-08	1.021e-08	
V	9.620e-09	9.620e-09	

-----Description of solution-----

pH = 7.919
 pe = 4.000
 Activity of water = 1.000
 Ionic strength (mol/kgw) = 1.231e-03
 Mass of water (kg) = 1.000e+00
 Total carbon (mol/kg) = 5.002e-04
 Total CO2 (mol/kg) = 5.002e-04
 Temperature (°C) = 25.00
 Electrical balance (eq) = 7.330e-20
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 11
 Total H = 1.110142e+02
 Total O = 5.550884e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.688e-07	8.351e-07	-6.061	-6.078	-0.017	(0)
H+	1.254e-08	1.206e-08	-7.902	-7.919	-0.017	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	6.872e-07					
Al(OH) 4-	6.806e-07	6.544e-07	-6.167	-6.184	-0.017	(0)
Al(OH) 3	6.225e-09	6.225e-09	-8.206	-8.206	0.000	(0)
Al(OH) 2+	3.884e-10	3.736e-10	-9.411	-9.428	-0.017	(0)
AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)
AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
AlOH+2	6.577e-13	5.632e-13	-12.182	-12.249	-0.067	(0)
AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
Al+3	9.612e-16	6.744e-16	-15.017	-15.171	-0.154	(0)
AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
Al(SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
B	4.496e-07					
H3BO3	4.278e-07	4.280e-07	-6.369	-6.369	0.000	(0)
H2BO3-	2.146e-08	2.061e-08	-7.668	-7.686	-0.017	(0)
CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
BF(OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
H5(BO3) 2-	7.815e-15	7.509e-15	-14.107	-14.124	-0.017	(0)
BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
BF2(OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
H8(BO3) 3-	3.345e-19	3.213e-19	-18.476	-18.493	-0.017	(0)
BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)
BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
Ba	3.568e-09					
Ba+2	3.551e-09	3.034e-09	-8.450	-8.518	-0.068	(0)
BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
BaOH+	1.150e-14	1.106e-14	-13.939	-13.956	-0.017	(0)
BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
C(4)	5.002e-04					
HCO3-	4.827e-04	4.643e-04	-3.316	-3.333	-0.017	(0)
H2CO3	1.259e-05	1.259e-05	-4.900	-4.900	0.000	(0)
CO3-2	2.113e-06	1.805e-06	-5.675	-5.743	-0.068	(0)
CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)
MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
UO2(CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
UO2(CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)

	PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
	UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
	PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
	BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
	BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
	Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
	FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
	HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
	Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
	HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
Ca	2.482e-04						
	Ca+2	2.409e-04	2.058e-04	-3.618	-3.687	-0.068	(0)
	CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
	CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
	CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)
	CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
	CaOH+	3.563e-09	3.428e-09	-8.448	-8.465	-0.017	(0)
	CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
Cl	2.819e-05						
	Cl-	2.819e-05	2.710e-05	-4.550	-4.567	-0.017	(0)
	MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)
	PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
	MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
	HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
	PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
	UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
	HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
	MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)
	HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
	FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
	PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
	HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
	VOC1+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
	FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
	HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
	PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
	FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
	UCl+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
F	4.314e-05						
	F-	4.275e-05	4.110e-05	-4.369	-4.386	-0.017	(0)
	MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
	CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
	NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
	HF	7.331e-10	7.331e-10	-9.135	-9.135	0.000	(0)
	MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
	BF (OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
	AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)
	AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
	AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
	PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
	UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
	HF2-	1.192e-13	1.146e-13	-12.924	-12.941	-0.017	(0)
	AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
	UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
	BF2 (OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
	UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
	PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
	FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
	FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
	VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)
	H2F2	1.440e-18	1.440e-18	-17.842	-17.842	0.000	(0)
	FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)
	UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
	VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
	PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
	VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
	VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
	BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)

VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
Fe (2)	1.685e-10					
Fe+2	1.596e-10	1.353e-10	-9.797	-9.869	-0.072	(0)
FeOH+	4.678e-12	4.499e-12	-11.330	-11.347	-0.017	(0)
FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
Fe (OH) 2	2.984e-15	2.984e-15	-14.525	-14.525	0.000	(0)
Fe (OH) 3-	8.194e-16	7.881e-16	-15.086	-15.103	-0.017	(0)
Fe (3)	4.424e-08					
Fe (OH) 2+	2.289e-08	2.202e-08	-7.640	-7.657	-0.017	(0)
Fe (OH) 3	1.975e-08	1.975e-08	-7.704	-7.704	0.000	(0)
Fe (OH) 4-	1.597e-09	1.536e-09	-8.797	-8.814	-0.017	(0)
FeOH+2	7.922e-14	6.778e-14	-13.101	-13.169	-0.068	(0)
FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)
Fe+3	1.792e-19	1.257e-19	-18.747	-18.901	-0.154	(0)
FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
Fe (SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
Fe2 (OH) 2+4	2.942e-25	1.521e-25	-24.531	-24.818	-0.286	(0)
FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
Fe3 (OH) 4+5	1.357e-31	4.843e-32	-30.868	-31.315	-0.447	(0)
FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
H (0)	2.058e-27					
H2	1.029e-27	1.029e-27	-26.988	-26.987	0.000	(0)
Hg (0)	4.985e-11					
Hg	4.985e-11	4.985e-11	-10.302	-10.302	0.000	(0)
Hg (1)	4.311e-26					
Hg2+2	2.156e-26	1.828e-26	-25.666	-25.738	-0.072	(0)
Hg (2)	2.399e-15					
Hg (OH) 2	2.376e-15	2.377e-15	-14.624	-14.624	0.000	(0)
HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
HgOH+	1.871e-20	1.796e-20	-19.728	-19.746	-0.018	(0)
Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
Hg (OH) 3-	2.604e-22	2.499e-22	-21.584	-21.602	-0.018	(0)
HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
Hg+2	6.369e-25	5.401e-25	-24.196	-24.268	-0.072	(0)
HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
K	5.578e-05					
K+	5.574e-05	5.358e-05	-4.254	-4.271	-0.017	(0)
KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)
Mg	7.149e-05					
Mg+2	6.969e-05	5.954e-05	-4.157	-4.225	-0.068	(0)
MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
MgOH+	2.057e-08	1.979e-08	-7.687	-7.703	-0.017	(0)

MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
Mn (2)	3.470e-07					
Mn+2	3.379e-07	2.865e-07	-6.471	-6.543	-0.072	(0)
MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
MnOH+	6.249e-10	6.011e-10	-9.204	-9.221	-0.017	(0)
MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)
MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)
Mn (OH) 3-	2.693e-18	2.590e-18	-17.570	-17.587	-0.017	(0)
MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)
Mn (OH) 4-2	8.162e-24	6.984e-24	-23.088	-23.156	-0.068	(0)
MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
Mn (3)	1.824e-28					
Mn+3	1.824e-28	1.280e-28	-27.739	-27.893	-0.154	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.547	-45.615	-0.068	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.970	-50.987	-0.017	(0)
Mo	5.108e-09					
MoO4-2	5.107e-09	4.362e-09	-8.292	-8.360	-0.068	(0)
HMoO4-	1.091e-12	1.047e-12	-11.962	-11.980	-0.018	(0)
H2MoO4	9.244e-17	9.244e-17	-16.034	-16.034	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
Mo7O24-6	0.000e+00	0.000e+00	-68.238	-68.882	-0.644	(0)
HMo7O24-5	0.000e+00	0.000e+00	-69.966	-70.414	-0.447	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-73.264	-73.550	-0.286	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-78.062	-78.223	-0.161	(0)
Na	1.185e-04					
Na+	1.184e-04	1.138e-04	-3.927	-3.944	-0.017	(0)
NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
O (0)	9.567e-39					
O2	4.783e-39	4.785e-39	-38.320	-38.320	0.000	(0)
Pb	5.792e-10					
PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
PbOH+	1.363e-10	1.308e-10	-9.865	-9.883	-0.018	(0)
Pb+2	7.302e-11	6.238e-11	-10.137	-10.205	-0.068	(0)
PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
Pb (OH) 2	3.455e-12	3.455e-12	-11.462	-11.462	0.000	(0)
PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
Pb (OH) 3-	3.007e-15	2.885e-15	-14.522	-14.540	-0.018	(0)
Pb (SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
Pb (OH) 4-2	6.959e-19	5.901e-19	-18.157	-18.229	-0.072	(0)
Pb2OH+3	1.874e-19	1.294e-19	-18.727	-18.888	-0.161	(0)
PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
Pb3 (OH) 4+2	1.752e-23	1.486e-23	-22.756	-22.828	-0.072	(0)
PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
Pb4 (OH) 4+4	1.423e-29	7.362e-30	-28.847	-29.133	-0.286	(0)
S (6)	1.255e-04					
SO4-2	1.195e-04	1.020e-04	-3.923	-3.991	-0.068	(0)
CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)
MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
HSO4-	1.250e-10	1.202e-10	-9.903	-9.920	-0.017	(0)

FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
Pb (SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
UO2 (SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
Al (SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
Fe (SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
Se (-2)	4.927e-36					
HSe-	4.927e-36	4.728e-36	-35.307	-35.325	-0.018	(0)
MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
H2Se	4.425e-40	4.425e-40	-39.354	-39.354	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.335	-42.407	-0.072	(0)
Se (4)	3.040e-09					
HSeO3-	2.213e-09	2.124e-09	-8.655	-8.673	-0.018	(0)
SeO3-2	8.268e-10	7.011e-10	-9.083	-9.154	-0.072	(0)
H2SeO3	1.092e-14	1.092e-14	-13.962	-13.962	0.000	(0)
FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
Se (6)	6.977e-14					
SeO4-2	6.977e-14	5.960e-14	-13.156	-13.225	-0.068	(0)
MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)
HSeO4-	3.753e-20	3.602e-20	-19.426	-19.443	-0.018	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.639	-56.800	-0.161	(0)
U (4)	3.077e-18					
U (OH) 5-	3.076e-18	2.952e-18	-17.512	-17.530	-0.018	(0)
U (OH) 4	1.490e-21	1.490e-21	-20.827	-20.827	0.000	(0)
U (OH) 3+	6.847e-26	6.570e-26	-25.165	-25.182	-0.018	(0)
U (OH) 2+2	4.319e-31	3.663e-31	-30.365	-30.436	-0.072	(0)
UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
UOH+3	3.014e-37	2.080e-37	-36.521	-36.682	-0.161	(0)
UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
U+4	0.000e+00	0.000e+00	-43.717	-44.004	-0.286	(0)
UC1+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-160.946	-162.396	-1.449	(0)
U (5)	1.812e-15					
UO2+	1.812e-15	1.739e-15	-14.742	-14.760	-0.018	(0)
U (6)	1.021e-08					
UO2 (CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
UO2 (CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)
UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
UO2OH+	3.126e-12	3.000e-12	-11.505	-11.523	-0.018	(0)
UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
UO2+2	3.340e-14	2.853e-14	-13.476	-13.545	-0.068	(0)
UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
(UO2) 3 (OH) 5+	2.469e-17	2.370e-17	-16.607	-16.625	-0.018	(0)
(UO2) 2 (OH) 2+2	1.761e-17	1.493e-17	-16.754	-16.826	-0.072	(0)
UO2 (SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.600	-40.618	-0.018	(0)
V+2	0.000e+00	0.000e+00	-41.979	-42.050	-0.072	(0)

V (3)	8.546e-14					
V (OH) 3	8.546e-14	8.546e-14	-13.068	-13.068	0.000	(0)
V (OH) 2+	6.938e-25	6.658e-25	-24.159	-24.177	-0.018	(0)
VOH+2	8.978e-29	7.614e-29	-28.047	-28.118	-0.072	(0)
V+3	2.636e-34	1.819e-34	-33.579	-33.740	-0.161	(0)
VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.682	-53.843	-0.161	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.150	-55.437	-0.286	(0)
V (4)	4.412e-18					
V (OH) 3+	4.375e-18	4.198e-18	-17.359	-17.377	-0.018	(0)
VO+2	2.971e-20	2.520e-20	-19.527	-19.599	-0.072	(0)
VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
VOC1+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
H2V2O4+2	1.042e-30	8.835e-31	-29.982	-30.054	-0.072	(0)
V (5)	9.620e-09					
H2VO4-	7.784e-09	7.470e-09	-8.109	-8.127	-0.018	(0)
HVO4-2	1.835e-09	1.556e-09	-8.736	-8.808	-0.072	(0)
H3VO4	9.006e-13	9.006e-13	-12.045	-12.045	0.000	(0)
H3V2O7-	4.526e-14	4.344e-14	-13.344	-13.362	-0.018	(0)
HV2O7-3	5.707e-15	3.939e-15	-14.244	-14.405	-0.161	(0)
VO4-3	9.372e-16	6.468e-16	-15.028	-15.189	-0.161	(0)
VO2+	2.254e-17	2.167e-17	-16.647	-16.664	-0.017	(0)
V2O7-4	1.700e-17	8.792e-18	-16.770	-17.056	-0.286	(0)
VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)
V3O9-3	6.324e-19	4.364e-19	-18.199	-18.360	-0.161	(0)
VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
V4O12-4	2.627e-24	1.359e-24	-23.580	-23.867	-0.286	(0)
VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.321	-63.768	-0.447	(0)
V10O28-6	0.000e+00	0.000e+00	-63.392	-64.036	-0.644	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.193	-66.479	-0.286	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-2.21	8.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-57.79	-55.42	2.37	Al2 (MoO4) 3
Al2O3	-2.48	17.17	19.65	Al2O3
Al4 (OH) 10SO4	-8.19	14.51	22.70	Al4 (OH) 10SO4
AlOHSO4	-8.01	-11.24	-3.23	AlOHSO4
Alunite	-8.85	-10.25	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-6.41	-14.20	-7.79	PbSO4
Anhydrite	-3.32	-7.68	-4.36	CaSO4
Aragonite	-1.13	-9.43	-8.30	CaCO3
Artinite	-7.96	1.64	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.07	7.32	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.72	-2.85	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.47	4.47	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.47	-17.29	-5.82	BaF2
BaMoO4	-9.92	-16.88	-6.96	BaMoO4
Barite	-2.53	-12.51	-9.98	BaSO4
BaSeO3	-11.10	-9.27	1.83	BaSeO3
BaSeO4	-14.28	-21.74	-7.46	BaSeO4
Birnessite	-10.31	7.78	18.09	MnO2
Bixbyite	-7.63	-8.27	-0.64	Mn2O3
Boehmite	0.01	8.59	8.58	AlOOH
Brucite	-5.23	11.61	16.84	Mg (OH) 2
Ca (VO3) 2	-11.00	-5.34	5.66	Ca (VO3) 2
Ca2V2O7	-10.69	6.81	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.74	6.81	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-20.00	18.96	38.96	Ca3 (VO4) 2

Ca3(VO4)2·4H2O	-20.90	18.96	39.86	Ca3(VO4)2·4H2O
Calcite	-0.95	-9.43	-8.48	CaCO3
Calomel	-16.96	-34.87	-17.91	Hg2Cl2
CaMoO4	-4.10	-12.05	-7.95	CaMoO4
Carnotite	-3.03	-2.80	0.23	KUO2VO4
CaSeO3·2H2O	-7.25	-4.44	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-13.89	-16.91	-3.02	CaSeO4·2H2O
Cerrusite	-2.82	-15.95	-13.13	PbCO3
CH4(g)	-75.89	-116.93	-41.05	CH4
Clausthalite	-10.51	-37.61	-27.10	PbSe
CO2(g)	-3.43	-21.58	-18.15	CO2
Cotunnite	-14.56	-19.34	-4.78	PbCl2
Cryolite	-19.48	-53.32	-33.84	Na3AlF6
Diaspore	1.71	8.59	6.87	AlOOH
Dolomite(disordered)	-2.86	-19.40	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.31	-19.40	-17.09	CaMg(CO3)2
Epsomite	-6.09	-8.22	-2.13	MgSO4·7H2O
Fe(OH)2	-7.60	5.97	13.56	Fe(OH)2
Fe(OH)2·7Cl.3	4.15	1.11	-3.04	Fe(OH)2·7Cl.3
Fe(VO3)2	-7.80	-11.52	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-8.43	-6.88	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3·2H2O	-19.44	-40.06	-20.63	Fe2(SeO3)3·2H2O
Fe2(SO4)3	-46.04	-49.77	-3.73	Fe2(SO4)3
Fe3(OH)8	-4.54	15.68	20.22	Fe3(OH)8
FeMoO4	-8.14	-18.23	-10.09	FeMoO4
Ferrihydrite	1.66	4.86	3.19	Fe(OH)3
Ferroselite	-38.09	-56.68	-18.60	FeSe2
FeSe	-26.28	-37.28	-11.00	FeSe
Fluorite	-1.96	-12.46	-10.50	CaF2
Gibbsite	0.29	8.59	8.29	Al(OH)3
Goethite	4.36	4.86	0.49	FeOOH
Gummite	-5.38	2.29	7.67	UO3
Gypsum	-3.07	-7.68	-4.61	CaSO4·2H2O
H-Jarosite	-12.99	-25.09	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.32	-24.20	-12.88	H2MoO4
H2Se(g)	-38.28	-43.24	-4.96	H2Se
Halite	-10.11	-8.51	1.60	NaCl
Hausmannite	-9.31	51.72	61.03	Mn3O4
Hematite	11.13	9.71	-1.42	Fe2O3
Hercynite	0.25	23.14	22.89	FeAl2O4
Hg(CH3)2(g)	-174.78	-248.49	-73.71	Hg(CH3)2
Hg(g)	-9.00	-16.87	-7.87	Hg
Hg(OH)2	-11.13	-14.62	-3.50	Hg(OH)2
Hg2(g)	-18.78	-33.74	-14.96	Hg2
Hg2(OH)2	-15.16	-9.90	5.26	Hg2(OH)2
Hg2CO3	-15.43	-31.48	-16.05	Hg2CO3
Hg2F2	-24.15	-34.51	-10.36	Hg2F2
Hg2SeO3	-21.84	-26.49	-4.66	Hg2SeO3
Hg2SO4	-23.60	-29.73	-6.13	Hg2SO4
Hg3O2CO3	-35.77	-65.45	-29.68	Hg3O2CO3
HgCl(g)	-36.93	-17.44	19.50	HgCl
HgCl2	-18.33	-39.60	-21.26	HgCl2
HgF(g)	-49.93	-17.26	32.68	HgF
HgF2(g)	-51.80	-39.23	12.57	HgF2
Hgmetal(l)	-3.42	-16.87	-13.45	Hg
HgSe	-2.17	-57.87	-55.69	HgSe
HgSeO3	-18.79	-31.22	-12.43	HgSeO3
HgSO4	-25.03	-34.45	-9.42	HgSO4
Huntite	-9.37	-39.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.49	-26.26	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-19.50	-28.26	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-22.25	-27.42	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-6.64	-21.44	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-20.16	-16.90	3.26	K2MoO4
K2SeO4	-21.04	-21.77	-0.73	K2SeO4
Larnakite	-8.13	-8.56	-0.43	PbO:PbSO4
Laurionite	-7.48	-6.85	0.62	PbOHCl
Lepidocrocite	3.48	4.86	1.37	FeOOH

Lime	-20.55	12.15	32.70	CaO
Litharge	-7.06	5.63	12.69	PbO
Maghemite	3.33	9.71	6.39	Fe2O3
Magnesioferrite	4.46	21.32	16.86	Fe2MgO4
Magnesite	-2.51	-9.97	-7.46	MgCO3
Magnetite	12.28	15.68	3.40	Fe3O4
Manganite	-4.13	21.21	25.34	MnOOH
Massicot	-7.26	5.63	12.89	PbO
Matlockite	-10.18	-19.16	-8.97	PbClF
Melanterite	-11.65	-13.86	-2.21	FeSO4:7H2O
Mg(OH)2 (active)	-7.18	11.61	18.79	Mg(OH)2
Mg(VO3)2	-17.16	-5.88	11.28	Mg(VO3)2
Mg2V2O7	-20.63	5.73	26.36	Mg2V2O7
MgF2	-4.87	-13.00	-8.13	MgF2
MgMoO4	-10.74	-12.59	-1.85	MgMoO4
MgSeO3:6H2O	-8.03	-4.98	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.25	-17.45	-1.20	MgSeO4:6H2O
Minium	-32.79	40.73	73.52	Pb3O4
Mirabilite	-10.77	-11.88	-1.11	Na2SO4:10H2O
Mn(VO3)2	-13.10	-8.20	4.90	Mn(VO3)2
Mn2(SO4)3	-62.05	-67.76	-5.71	Mn2(SO4)3
MnCl2:4H2O	-18.39	-15.68	2.72	MnCl2:4H2O
MnSe	-37.45	-33.95	3.50	MnSe
MnSeO3	-8.43	-7.30	1.13	MnSeO3
MnSeO3:2H2O	-8.28	-7.30	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.72	-19.77	-2.05	MnSeO4:5H2O
MnSO4	-13.12	-10.53	2.58	MnSO4
Montroydite	-10.98	-14.62	-3.64	HgO
MoO3	-16.20	-24.20	-8.00	MoO3
Na-Jarosite	-9.92	-21.12	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-23.85	-40.45	-16.60	Na2Mo2O7
Na2MoO4	-17.74	-16.25	1.49	Na2MoO4
Na2MoO4:2H2O	-17.47	-16.25	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.94	-8.64	10.30	Na2SeO3:5H2O
Na2SeO4	-22.39	-21.11	1.28	Na2SeO4
Na3VO4	-33.50	3.18	36.68	Na3VO4
Na4V2O7	-38.99	-1.59	37.40	Na4V2O7
Natron	-12.32	-13.63	-1.31	Na2CO3:10H2O
NaVO3	-8.63	-4.77	3.86	NaVO3
Nesquehonite	-5.30	-9.97	-4.67	MgCO3:3H2O
Nsutite	-9.72	7.78	17.50	MnO2
O2(g)	-35.41	47.67	83.09	O2
Pb(BO2)2	-13.62	-7.10	6.52	Pb(BO2)2
Pb(OH)2	-2.52	5.63	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.40	-73.16	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-10.01	-1.22	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.92	11.26	26.19	Pb2O(OH)2
Pb2O3	-25.94	35.10	61.04	Pb2O3
Pb2OCO3	-9.76	-10.32	-0.56	Pb2OCO3
Pb2V2O7	-4.33	-6.23	-1.90	Pb2V2O7
Pb3(VO4)2	-6.73	-0.59	6.14	Pb3(VO4)2
Pb3O2CO3	-15.70	-4.68	11.02	Pb3O2CO3
Pb3O2SO4	-13.62	-2.93	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.40	2.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.18	2.70	21.88	Pb4O3SO4
PbF2	-11.54	-18.98	-7.44	PbF2
Pbmetal	-22.45	-18.20	4.25	Pb
PbMoO4	-2.95	-18.57	-15.62	PbMoO4
PbO:0.3H2O	-7.35	5.63	12.98	PbO:0.33H2O
PbSeO4	-16.59	-23.43	-6.84	PbSeO4
Periclase	-9.97	11.61	21.58	MgO
Phosgenite	-15.48	-35.29	-19.81	PbCl2:PbCO3
Plattnerite	-20.13	29.47	49.60	PbO2
Portlandite	-10.65	12.15	22.80	Ca(OH)2
Pyrochroite	-5.90	9.29	15.19	Mn(OH)2
Pyrolusite	-8.25	33.13	41.38	MnO2
Rhodochrosite	-1.71	-12.29	-10.58	MnCO3
Rutherfordine	-4.79	-19.29	-14.50	UO2CO3

Schoepite	-3.70	2.29	5.99	UO2 (OH) 2:H2O
Semetal (am)	-12.30	-19.41	-7.11	Se
Semetal (hex)	-11.70	-19.41	-7.71	Se
SeO2	-16.72	-16.59	0.12	SeO2
SeO3	-50.11	-29.06	21.04	SeO3
Siderite	-5.37	-15.61	-10.24	FeCO3
Spinel	-8.07	28.78	36.85	MgAl2O4
Thenardite	-12.20	-11.88	0.32	Na2SO4
Thermonatrite	-14.27	-13.63	0.64	Na2CO3:H2O
Tyuyamunite	-4.83	-0.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.39	10.69	21.08	U3O8
U4O9	-22.46	-25.48	-3.02	U4O9
UF4	-32.01	-61.55	-29.54	UF4
UF4:2.5H2O	-28.83	-61.55	-32.72	UF4:2.5H2O
UO2 (am)	-13.26	-12.33	0.93	UO2
UO2 (OH) 2 (beta)	-3.32	2.29	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.52	-26.77	-2.25	UO2SeO4:4H2O
UO3	-5.41	2.29	7.70	UO3
Uraninite	-7.66	-12.33	-4.67	UO2
V (OH) 3	-17.57	-9.98	7.59	V (OH) 3
V2O5	-16.13	-17.49	-1.36	V2O5
V3O5	-36.96	-35.12	1.84	V3O5
V4O7	-46.07	-38.88	7.19	V4O7
V6O13	-39.29	-100.15	-60.86	V6O13
VC12	-65.75	-46.87	18.87	VC12
VC13	-70.87	-47.44	23.43	VC13
VF4	-67.91	-52.98	14.93	VF4
Vmetal	-89.77	-45.74	44.03	V
VO	-36.66	-21.90	14.76	VO
VO (OH) 2	-8.91	-3.76	5.15	VO (OH) 2
VO2Cl	-24.07	-21.23	2.84	VO2Cl
VOC1	-33.62	-22.47	11.15	VOC1
VOC12	-41.49	-28.73	12.76	VOC12
VOSO4	-27.20	-23.59	3.61	VOSO4
Witherite	-5.69	-14.26	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 10.

SOLUTION 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

temp 25
pH 7.91874
pe 4
redox pe
units mg/l
density 1
Alkalinity 30.14978 as HCO3
Al 0.01854
B 0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939
F 0.81954
Fe 0.00248
Hg 0.000010
K 2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049

Na 2.31042 charge
Pb 0.00012
S(6) 12.05373 as SO4
Se 0.00024
U 0.00243
V 0.00049
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 8. Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

-----Solution composition-----

Elements	Molality	Moles	
Al	6.872e-07	6.872e-07	
Alkalinity	4.941e-04	4.941e-04	
B	4.496e-07	4.496e-07	
Ba	3.568e-09	3.568e-09	
Ca	2.482e-04	2.482e-04	
Cl	2.819e-05	2.819e-05	
F	4.314e-05	4.314e-05	
Fe	4.441e-08	4.441e-08	
Hg	4.986e-11	4.986e-11	
K	5.578e-05	5.578e-05	
Mg	7.149e-05	7.149e-05	
Mn	3.470e-07	3.470e-07	
Mo	5.108e-09	5.108e-09	
Na	1.185e-04	1.185e-04	Charge balance
Pb	5.792e-10	5.792e-10	
S(6)	1.255e-04	1.255e-04	
Se	3.040e-09	3.040e-09	
U	1.021e-08	1.021e-08	
V	9.620e-09	9.620e-09	

-----Description of solution-----

pH	=	7.919
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.231e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	5.002e-04
Total CO2 (mol/kg)	=	5.002e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	7.330e-20
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	11
Total H	=	1.110142e+02
Total O	=	5.550884e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.688e-07	8.351e-07	-6.061	-6.078	-0.017	(0)
H+	1.254e-08	1.206e-08	-7.902	-7.919	-0.017	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	6.872e-07					
Al(OH) 4-	6.806e-07	6.544e-07	-6.167	-6.184	-0.017	(0)
Al(OH) 3	6.225e-09	6.225e-09	-8.206	-8.206	0.000	(0)
Al(OH) 2+	3.884e-10	3.736e-10	-9.411	-9.428	-0.017	(0)
AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)

	AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
	AlOH+2	6.577e-13	5.632e-13	-12.182	-12.249	-0.067	(0)
	AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
	AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
	Al+3	9.612e-16	6.744e-16	-15.017	-15.171	-0.154	(0)
	AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
	Al (SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
B		4.496e-07					
	H3BO3	4.278e-07	4.280e-07	-6.369	-6.369	0.000	(0)
	H2BO3-	2.146e-08	2.061e-08	-7.668	-7.686	-0.017	(0)
	CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
	MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
	BF (OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
	NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
	H5 (BO3) 2-	7.815e-15	7.509e-15	-14.107	-14.124	-0.017	(0)
	BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
	BF2 (OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
	H8 (BO3) 3-	3.345e-19	3.213e-19	-18.476	-18.493	-0.017	(0)
	BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)
	BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
Ba		3.568e-09					
	Ba+2	3.551e-09	3.034e-09	-8.450	-8.518	-0.068	(0)
	BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
	BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
	BaOH+	1.150e-14	1.106e-14	-13.939	-13.956	-0.017	(0)
	BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
C (4)		5.002e-04					
	HCO3-	4.827e-04	4.643e-04	-3.316	-3.333	-0.017	(0)
	H2CO3	1.259e-05	1.259e-05	-4.900	-4.900	0.000	(0)
	CO3-2	2.113e-06	1.805e-06	-5.675	-5.743	-0.068	(0)
	CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
	CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)
	MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
	MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
	NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
	UO2 (CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
	NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
	MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
	UO2 (CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)
	PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
	UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
	PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
	BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
	BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
	Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
	FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
	HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
	Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
	HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
Ca		2.482e-04					
	Ca+2	2.409e-04	2.058e-04	-3.618	-3.687	-0.068	(0)
	CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
	CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
	CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)
	CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
	CaOH+	3.563e-09	3.428e-09	-8.448	-8.465	-0.017	(0)
	CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
Cl		2.819e-05					
	Cl-	2.819e-05	2.710e-05	-4.550	-4.567	-0.017	(0)
	MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)
	PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
	MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
	HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
	PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
	UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
	HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
	MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)

	HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
	FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
	PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
	HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
	VOCl+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
	FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
	HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
	PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
	FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
	UCl+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
F		4.314e-05					
	F-	4.275e-05	4.110e-05	-4.369	-4.386	-0.017	(0)
	MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
	CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
	NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
	HF	7.331e-10	7.331e-10	-9.135	-9.135	0.000	(0)
	MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
	BF(OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
	AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)
	AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
	AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
	PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
	UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
	HF2-	1.192e-13	1.146e-13	-12.924	-12.941	-0.017	(0)
	AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
	UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
	BF2(OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
	UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
	PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
	FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
	FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
	VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)
	H2F2	1.440e-18	1.440e-18	-17.842	-17.842	0.000	(0)
	FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)
	UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
	VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
	PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
	VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
	VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
	BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)
	VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
	PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
	VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
	HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
	VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
	BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
	VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
	UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
	UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
	UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
	UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
	UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
	UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
Fe (2)		1.685e-10					
	Fe+2	1.596e-10	1.353e-10	-9.797	-9.869	-0.072	(0)
	FeOH+	4.678e-12	4.499e-12	-11.330	-11.347	-0.017	(0)
	FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
	FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
	Fe (OH) 2	2.984e-15	2.984e-15	-14.525	-14.525	0.000	(0)
	Fe (OH) 3-	8.194e-16	7.881e-16	-15.086	-15.103	-0.017	(0)
Fe (3)		4.424e-08					
	Fe (OH) 2+	2.289e-08	2.202e-08	-7.640	-7.657	-0.017	(0)
	Fe (OH) 3	1.975e-08	1.975e-08	-7.704	-7.704	0.000	(0)
	Fe (OH) 4-	1.597e-09	1.536e-09	-8.797	-8.814	-0.017	(0)
	FeOH+2	7.922e-14	6.778e-14	-13.101	-13.169	-0.068	(0)
	FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
	FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
	FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)

	Fe+3	1.792e-19	1.257e-19	-18.747	-18.901	-0.154	(0)
	FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
	Fe (SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
	FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
	FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
	Fe2 (OH) 2+4	2.942e-25	1.521e-25	-24.531	-24.818	-0.286	(0)
	FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
	Fe3 (OH) 4+5	1.357e-31	4.843e-32	-30.868	-31.315	-0.447	(0)
	FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
H (0)	2.058e-27						
	H2	1.029e-27	1.029e-27	-26.988	-26.987	0.000	(0)
Hg (0)	4.985e-11						
	Hg	4.985e-11	4.985e-11	-10.302	-10.302	0.000	(0)
Hg (1)	4.311e-26						
	Hg2+2	2.156e-26	1.828e-26	-25.666	-25.738	-0.072	(0)
Hg (2)	2.399e-15						
	Hg (OH) 2	2.376e-15	2.377e-15	-14.624	-14.624	0.000	(0)
	HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
	HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
	HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
	HgOH+	1.871e-20	1.796e-20	-19.728	-19.746	-0.018	(0)
	Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
	HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
	HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
	Hg (OH) 3-	2.604e-22	2.499e-22	-21.584	-21.602	-0.018	(0)
	HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
	Hg+2	6.369e-25	5.401e-25	-24.196	-24.268	-0.072	(0)
	HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
	HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
	HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
K	5.578e-05						
	K+	5.574e-05	5.358e-05	-4.254	-4.271	-0.017	(0)
	KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)
Mg	7.149e-05						
	Mg+2	6.969e-05	5.954e-05	-4.157	-4.225	-0.068	(0)
	MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
	MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
	MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
	MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
	MgOH+	2.057e-08	1.979e-08	-7.687	-7.703	-0.017	(0)
	MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
Mn (2)	3.470e-07						
	Mn+2	3.379e-07	2.865e-07	-6.471	-6.543	-0.072	(0)
	MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
	MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
	MnOH+	6.249e-10	6.011e-10	-9.204	-9.221	-0.017	(0)
	MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
	MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)
	MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
	MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)
	Mn (OH) 3-	2.693e-18	2.590e-18	-17.570	-17.587	-0.017	(0)
	MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)
	Mn (OH) 4-2	8.162e-24	6.984e-24	-23.088	-23.156	-0.068	(0)
	MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
Mn (3)	1.824e-28						
	Mn+3	1.824e-28	1.280e-28	-27.739	-27.893	-0.154	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-45.547	-45.615	-0.068	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-50.970	-50.987	-0.017	(0)
Mo	5.108e-09						
	MoO4-2	5.107e-09	4.362e-09	-8.292	-8.360	-0.068	(0)
	HMoO4-	1.091e-12	1.047e-12	-11.962	-11.980	-0.018	(0)
	H2MoO4	9.244e-17	9.244e-17	-16.034	-16.034	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-68.238	-68.882	-0.644	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-69.966	-70.414	-0.447	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-73.264	-73.550	-0.286	(0)

	H3Mo7O24-3	0.000e+00	0.000e+00	-78.062	-78.223	-0.161	(0)
Na	1.185e-04						
	Na+	1.184e-04	1.138e-04	-3.927	-3.944	-0.017	(0)
	NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
	NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
	NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
	NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
	NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
O (0)	9.567e-39						
	O2	4.783e-39	4.785e-39	-38.320	-38.320	0.000	(0)
Pb	5.792e-10						
	PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
	PbOH+	1.363e-10	1.308e-10	-9.865	-9.883	-0.018	(0)
	Pb+2	7.302e-11	6.238e-11	-10.137	-10.205	-0.068	(0)
	PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
	Pb (OH) 2	3.455e-12	3.455e-12	-11.462	-11.462	0.000	(0)
	PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
	Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
	PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
	PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
	Pb (OH) 3-	3.007e-15	2.885e-15	-14.522	-14.540	-0.018	(0)
	Pb (SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
	PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
	PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
	Pb (OH) 4-2	6.959e-19	5.901e-19	-18.157	-18.229	-0.072	(0)
	Pb2OH+3	1.874e-19	1.294e-19	-18.727	-18.888	-0.161	(0)
	PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
	PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
	Pb3 (OH) 4+2	1.752e-23	1.486e-23	-22.756	-22.828	-0.072	(0)
	PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
	PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
	Pb4 (OH) 4+4	1.423e-29	7.362e-30	-28.847	-29.133	-0.286	(0)
S (6)	1.255e-04						
	SO4-2	1.195e-04	1.020e-04	-3.923	-3.991	-0.068	(0)
	CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
	MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
	NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
	KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)
	MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
	HSO4-	1.250e-10	1.202e-10	-9.903	-9.920	-0.017	(0)
	FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
	PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
	UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
	Pb (SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
	AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
	UO2 (SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
	Al (SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
	FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
	VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
	VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
	Fe (SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
	HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
	VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
	USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
Se (-2)	4.927e-36						
	HSe-	4.927e-36	4.728e-36	-35.307	-35.325	-0.018	(0)
	MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
	H2Se	4.425e-40	4.425e-40	-39.354	-39.354	0.000	(0)
	Se-2	0.000e+00	0.000e+00	-42.335	-42.407	-0.072	(0)
Se (4)	3.040e-09						
	HSeO3-	2.213e-09	2.124e-09	-8.655	-8.673	-0.018	(0)
	SeO3-2	8.268e-10	7.011e-10	-9.083	-9.154	-0.072	(0)
	H2SeO3	1.092e-14	1.092e-14	-13.962	-13.962	0.000	(0)
	FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
Se (6)	6.977e-14						
	SeO4-2	6.977e-14	5.960e-14	-13.156	-13.225	-0.068	(0)
	MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)

HSeO4-	3.753e-20	3.602e-20	-19.426	-19.443	-0.018	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.639	-56.800	-0.161	(0)
U (4)	3.077e-18					
U (OH) 5-	3.076e-18	2.952e-18	-17.512	-17.530	-0.018	(0)
U (OH) 4	1.490e-21	1.490e-21	-20.827	-20.827	0.000	(0)
U (OH) 3+	6.847e-26	6.570e-26	-25.165	-25.182	-0.018	(0)
U (OH) 2+2	4.319e-31	3.663e-31	-30.365	-30.436	-0.072	(0)
UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
UOH+3	3.014e-37	2.080e-37	-36.521	-36.682	-0.161	(0)
UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
U+4	0.000e+00	0.000e+00	-43.717	-44.004	-0.286	(0)
UCl+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-160.946	-162.396	-1.449	(0)
U (5)	1.812e-15					
UO2+	1.812e-15	1.739e-15	-14.742	-14.760	-0.018	(0)
U (6)	1.021e-08					
UO2 (CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
UO2 (CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)
UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
UO2OH+	3.126e-12	3.000e-12	-11.505	-11.523	-0.018	(0)
UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
UO2+2	3.340e-14	2.853e-14	-13.476	-13.545	-0.068	(0)
UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
(UO2) 3 (OH) 5+	2.469e-17	2.370e-17	-16.607	-16.625	-0.018	(0)
(UO2) 2 (OH) 2+2	1.761e-17	1.493e-17	-16.754	-16.826	-0.072	(0)
UO2 (SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.600	-40.618	-0.018	(0)
V+2	0.000e+00	0.000e+00	-41.979	-42.050	-0.072	(0)
V (3)	8.546e-14					
V (OH) 3	8.546e-14	8.546e-14	-13.068	-13.068	0.000	(0)
V (OH) 2+	6.938e-25	6.658e-25	-24.159	-24.177	-0.018	(0)
VOH+2	8.978e-29	7.614e-29	-28.047	-28.118	-0.072	(0)
V+3	2.636e-34	1.819e-34	-33.579	-33.740	-0.161	(0)
VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.682	-53.843	-0.161	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.150	-55.437	-0.286	(0)
V (4)	4.412e-18					
V (OH) 3+	4.375e-18	4.198e-18	-17.359	-17.377	-0.018	(0)
VO+2	2.971e-20	2.520e-20	-19.527	-19.599	-0.072	(0)
VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
VOC1+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
H2V2O4+2	1.042e-30	8.835e-31	-29.982	-30.054	-0.072	(0)
V (5)	9.620e-09					
H2VO4-	7.784e-09	7.470e-09	-8.109	-8.127	-0.018	(0)
HVO4-2	1.835e-09	1.556e-09	-8.736	-8.808	-0.072	(0)
H3VO4	9.006e-13	9.006e-13	-12.045	-12.045	0.000	(0)
H3V2O7-	4.526e-14	4.344e-14	-13.344	-13.362	-0.018	(0)
HV2O7-3	5.707e-15	3.939e-15	-14.244	-14.405	-0.161	(0)
VO4-3	9.372e-16	6.468e-16	-15.028	-15.189	-0.161	(0)
VO2+	2.254e-17	2.167e-17	-16.647	-16.664	-0.017	(0)
V2O7-4	1.700e-17	8.792e-18	-16.770	-17.056	-0.286	(0)
VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)

V3O9-3	6.324e-19	4.364e-19	-18.199	-18.360	-0.161	(0)
VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
V4O12-4	2.627e-24	1.359e-24	-23.580	-23.867	-0.286	(0)
VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.321	-63.768	-0.447	(0)
V10O28-6	0.000e+00	0.000e+00	-63.392	-64.036	-0.644	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.193	-66.479	-0.286	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-2.21	8.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-57.79	-55.42	2.37	Al2 (MoO4) 3
Al2O3	-2.48	17.17	19.65	Al2O3
Al4 (OH) 10SO4	-8.19	14.51	22.70	Al4 (OH) 10SO4
AlOHSO4	-8.01	-11.24	-3.23	AlOHSO4
Alunite	-8.85	-10.25	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-6.41	-14.20	-7.79	PbSO4
Anhydrite	-3.32	-7.68	-4.36	CaSO4
Aragonite	-1.13	-9.43	-8.30	CaCO3
Artinite	-7.96	1.64	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.07	7.32	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.72	-2.85	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.47	4.47	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.47	-17.29	-5.82	BaF2
BaMoO4	-9.92	-16.88	-6.96	BaMoO4
Barite	-2.53	-12.51	-9.98	BaSO4
BaSeO3	-11.10	-9.27	1.83	BaSeO3
BaSeO4	-14.28	-21.74	-7.46	BaSeO4
Birnessite	-10.31	7.78	18.09	MnO2
Bixbyite	-7.63	-8.27	-0.64	Mn2O3
Boehmite	0.01	8.59	8.58	AlOOH
Brucite	-5.23	11.61	16.84	Mg (OH) 2
Ca (VO3) 2	-11.00	-5.34	5.66	Ca (VO3) 2
Ca2V2O7	-10.69	6.81	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.74	6.81	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-20.00	18.96	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.90	18.96	39.86	Ca3 (VO4) 2:4H2O
Calcite	-0.95	-9.43	-8.48	CaCO3
Calomel	-16.96	-34.87	-17.91	Hg2Cl2
CaMoO4	-4.10	-12.05	-7.95	CaMoO4
Carnotite	-3.03	-2.80	0.23	KUO2VO4
CaSeO3:2H2O	-7.25	-4.44	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.89	-16.91	-3.02	CaSeO4:2H2O
Cerrusite	-2.82	-15.95	-13.13	PbCO3
CH4 (g)	-75.89	-116.93	-41.05	CH4
Clausthalite	-10.51	-37.61	-27.10	PbSe
CO2 (g)	-3.43	-21.58	-18.15	CO2
Cotunnite	-14.56	-19.34	-4.78	PbCl2
Cryolite	-19.48	-53.32	-33.84	Na3AlF6
Diaspore	1.71	8.59	6.87	AlOOH
Dolomite (disordered)	-2.86	-19.40	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-2.31	-19.40	-17.09	CaMg (CO3) 2
Epsomite	-6.09	-8.22	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.60	5.97	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	4.15	1.11	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-7.80	-11.52	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-8.43	-6.88	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.44	-40.06	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-46.04	-49.77	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-4.54	15.68	20.22	Fe3 (OH) 8
FeMoO4	-8.14	-18.23	-10.09	FeMoO4
Ferrihydrite	1.66	4.86	3.19	Fe (OH) 3
Ferroselite	-38.09	-56.68	-18.60	FeSe2
FeSe	-26.28	-37.28	-11.00	FeSe

Fluorite	-1.96	-12.46	-10.50	CaF2
Gibbsite	0.29	8.59	8.29	Al (OH) 3
Goethite	4.36	4.86	0.49	FeOOH
Gummite	-5.38	2.29	7.67	UO3
Gypsum	-3.07	-7.68	-4.61	CaSO4:2H2O
H-Jarosite	-12.99	-25.09	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-11.32	-24.20	-12.88	H2MoO4
H2Se (g)	-38.28	-43.24	-4.96	H2Se
Halite	-10.11	-8.51	1.60	NaCl
Hausmannite	-9.31	51.72	61.03	Mn3O4
Hematite	11.13	9.71	-1.42	Fe2O3
Hercynite	0.25	23.14	22.89	FeAl2O4
Hg (CH3) 2 (g)	-174.78	-248.49	-73.71	Hg (CH3) 2
Hg (g)	-9.00	-16.87	-7.87	Hg
Hg (OH) 2	-11.13	-14.62	-3.50	Hg (OH) 2
Hg2 (g)	-18.78	-33.74	-14.96	Hg2
Hg2 (OH) 2	-15.16	-9.90	5.26	Hg2 (OH) 2
Hg2CO3	-15.43	-31.48	-16.05	Hg2CO3
Hg2F2	-24.15	-34.51	-10.36	Hg2F2
Hg2SeO3	-21.84	-26.49	-4.66	Hg2SeO3
Hg2SO4	-23.60	-29.73	-6.13	Hg2SO4
Hg3O2CO3	-35.77	-65.45	-29.68	Hg3O2CO3
HgCl (g)	-36.93	-17.44	19.50	HgCl
HgCl2	-18.33	-39.60	-21.26	HgCl2
HgF (g)	-49.93	-17.26	32.68	HgF
HgF2 (g)	-51.80	-39.23	12.57	HgF2
Hgmetal (l)	-3.42	-16.87	-13.45	Hg
HgSe	-2.17	-57.87	-55.69	HgSe
HgSeO3	-18.79	-31.22	-12.43	HgSeO3
HgSO4	-25.03	-34.45	-9.42	HgSO4
Huntite	-9.37	-39.34	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.49	-26.26	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-19.50	-28.26	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-22.25	-27.42	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.64	-21.44	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-20.16	-16.90	3.26	K2MoO4
K2SeO4	-21.04	-21.77	-0.73	K2SeO4
Larnakite	-8.13	-8.56	-0.43	PbO:PbSO4
Laurionite	-7.48	-6.85	0.62	PbOHCl
Lepidocrocite	3.48	4.86	1.37	FeOOH
Lime	-20.55	12.15	32.70	CaO
Litharge	-7.06	5.63	12.69	PbO
Maghemite	3.33	9.71	6.39	Fe2O3
Magnesioferrite	4.46	21.32	16.86	Fe2MgO4
Magnesite	-2.51	-9.97	-7.46	MgCO3
Magnetite	12.28	15.68	3.40	Fe3O4
Manganite	-4.13	21.21	25.34	MnOOH
Massicot	-7.26	5.63	12.89	PbO
Matlockite	-10.18	-19.16	-8.97	PbClF
Melanterite	-11.65	-13.86	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-7.18	11.61	18.79	Mg (OH) 2
Mg (VO3) 2	-17.16	-5.88	11.28	Mg (VO3) 2
Mg2V2O7	-20.63	5.73	26.36	Mg2V2O7
MgF2	-4.87	-13.00	-8.13	MgF2
MgMoO4	-10.74	-12.59	-1.85	MgMoO4
MgSeO3:6H2O	-8.03	-4.98	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.25	-17.45	-1.20	MgSeO4:6H2O
Minium	-32.79	40.73	73.52	Pb3O4
Mirabilite	-10.77	-11.88	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-13.10	-8.20	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-62.05	-67.76	-5.71	Mn2 (SO4) 3
MnCl2:4H2O	-18.39	-15.68	2.72	MnCl2:4H2O
MnSe	-37.45	-33.95	3.50	MnSe
MnSeO3	-8.43	-7.30	1.13	MnSeO3
MnSeO3:2H2O	-8.28	-7.30	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.72	-19.77	-2.05	MnSeO4:5H2O
MnSO4	-13.12	-10.53	2.58	MnSO4
Montroydite	-10.98	-14.62	-3.64	HgO

MoO3	-16.20	-24.20	-8.00	MoO3
Na-Jarosite	-9.92	-21.12	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-23.85	-40.45	-16.60	Na2Mo2O7
Na2MoO4	-17.74	-16.25	1.49	Na2MoO4
Na2MoO4:2H2O	-17.47	-16.25	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.94	-8.64	10.30	Na2SeO3:5H2O
Na2SeO4	-22.39	-21.11	1.28	Na2SeO4
Na3VO4	-33.50	3.18	36.68	Na3VO4
Na4V2O7	-38.99	-1.59	37.40	Na4V2O7
Natron	-12.32	-13.63	-1.31	Na2CO3:10H2O
NaVO3	-8.63	-4.77	3.86	NaVO3
Nesquehonite	-5.30	-9.97	-4.67	MgCO3:3H2O
Nsutite	-9.72	7.78	17.50	MnO2
O2(g)	-35.41	47.67	83.09	O2
Pb(BO2)2	-13.62	-7.10	6.52	Pb(BO2)2
Pb(OH)2	-2.52	5.63	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.40	-73.16	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-10.01	-1.22	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.92	11.26	26.19	Pb2O(OH)2
Pb2O3	-25.94	35.10	61.04	Pb2O3
Pb2OCO3	-9.76	-10.32	-0.56	Pb2OCO3
Pb2V2O7	-4.33	-6.23	-1.90	Pb2V2O7
Pb3(VO4)2	-6.73	-0.59	6.14	Pb3(VO4)2
Pb3O2CO3	-15.70	-4.68	11.02	Pb3O2CO3
Pb3O2SO4	-13.62	-2.93	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.40	2.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.18	2.70	21.88	Pb4O3SO4
PbF2	-11.54	-18.98	-7.44	PbF2
Pbmetal	-22.45	-18.20	4.25	Pb
PbMoO4	-2.95	-18.57	-15.62	PbMoO4
PbO:0.3H2O	-7.35	5.63	12.98	PbO:0.33H2O
PbSeO4	-16.59	-23.43	-6.84	PbSeO4
Periclase	-9.97	11.61	21.58	MgO
Phosgenite	-15.48	-35.29	-19.81	PbCl2:PbCO3
Plattnerite	-20.13	29.47	49.60	PbO2
Portlandite	-10.65	12.15	22.80	Ca(OH)2
Pyrochroite	-5.90	9.29	15.19	Mn(OH)2
Pyrolusite	-8.25	33.13	41.38	MnO2
Rhodochrosite	-1.71	-12.29	-10.58	MnCO3
Rutherfordine	-4.79	-19.29	-14.50	UO2CO3
Schoepite	-3.70	2.29	5.99	UO2(OH)2:H2O
Semetal(am)	-12.30	-19.41	-7.11	Se
Semetal(hex)	-11.70	-19.41	-7.71	Se
SeO2	-16.72	-16.59	0.12	SeO2
SeO3	-50.11	-29.06	21.04	SeO3
Siderite	-5.37	-15.61	-10.24	FeCO3
Spinel	-8.07	28.78	36.85	MgAl2O4
Thenardite	-12.20	-11.88	0.32	Na2SO4
Thermonatrite	-14.27	-13.63	0.64	Na2CO3:H2O
Tyuyamunite	-4.83	-0.75	4.08	Ca(UO2)2(VO4)2
U3O8	-10.39	10.69	21.08	U3O8
U4O9	-22.46	-25.48	-3.02	U4O9
UF4	-32.01	-61.55	-29.54	UF4
UF4:2.5H2O	-28.83	-61.55	-32.72	UF4:2.5H2O
UO2(am)	-13.26	-12.33	0.93	UO2
UO2(OH)2(beta)	-3.32	2.29	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.52	-26.77	-2.25	UO2SeO4:4H2O
UO3	-5.41	2.29	7.70	UO3
Uraninite	-7.66	-12.33	-4.67	UO2
V(OH)3	-17.57	-9.98	7.59	V(OH)3
V2O5	-16.13	-17.49	-1.36	V2O5
V3O5	-36.96	-35.12	1.84	V3O5
V4O7	-46.07	-38.88	7.19	V4O7
V6O13	-39.29	-100.15	-60.86	V6O13
VC12	-65.75	-46.87	18.87	VC12
VC13	-70.87	-47.44	23.43	VC13
VF4	-67.91	-52.98	14.93	VF4
Vmetal	-89.77	-45.74	44.03	V

VO	-36.66	-21.90	14.76	VO
VO(OH)2	-8.91	-3.76	5.15	VO(OH)2
VO2Cl	-24.07	-21.23	2.84	VO2Cl
VOC1	-33.62	-22.47	11.15	VOC1
VOC12	-41.49	-28.73	12.76	VOC12
VOSO4	-27.20	-23.59	3.61	VOSO4
Witherite	-5.69	-14.26	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 11.

SOLUTION 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

```

temp      25
pH        7.31754
pe         4
redox     pe
units     mg/l
density   1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F         0.42526
Fe 0.00138
K         0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge
S(6)      20.27695 as SO4
Se 0.00023
V         0.00046
water     1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 9. Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

-----Solution composition-----

Elements	Molality	Moles	
Al	3.343e-07	3.343e-07	
Alkalinity	1.740e-04	1.740e-04	
Ba	2.439e-08	2.439e-08	
Ca	2.085e-04	2.085e-04	
Cl	1.996e-05	1.996e-05	
F	2.238e-05	2.238e-05	
Fe	2.471e-08	2.471e-08	
K	2.491e-05	2.491e-05	
Mg	5.243e-05	5.243e-05	
Mn	1.727e-07	1.727e-07	
Mo	4.795e-09	4.795e-09	
Na	9.030e-05	9.030e-05	Charge balance
S(6)	2.111e-04	2.111e-04	

Se	2.913e-09	2.913e-09
V	9.031e-09	9.031e-09

-----Description of solution-----

pH	=	7.318
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.075e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	1.902e-04
Total CO2 (mol/kg)	=	1.902e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	-1.213e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110139e+02
Total O	=	5.550825e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.171e-07	2.092e-07	-6.663	-6.679	-0.016	(0)
H+	4.994e-08	4.813e-08	-7.302	-7.318	-0.016	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	3.343e-07					
Al (OH) 4-	3.195e-07	3.080e-07	-6.496	-6.511	-0.016	(0)
Al (OH) 3	1.169e-08	1.169e-08	-7.932	-7.932	0.000	(0)
Al (OH) 2+	2.906e-09	2.802e-09	-8.537	-8.553	-0.016	(0)
AlF2+	1.528e-10	1.473e-10	-9.816	-9.832	-0.016	(0)
AlF3	3.973e-11	3.973e-11	-10.401	-10.401	0.000	(0)
AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
AlOH+2	1.950e-11	1.686e-11	-10.710	-10.773	-0.063	(0)
AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
Al+3	1.124e-13	8.061e-14	-12.949	-13.094	-0.144	(0)
Al (SO4) 2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)
Ba	2.439e-08					
Ba+2	2.436e-08	2.102e-08	-7.613	-7.677	-0.064	(0)
BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
BaOH+	1.990e-14	1.919e-14	-13.701	-13.717	-0.016	(0)
C (4)	1.902e-04					
HCO3-	1.714e-04	1.653e-04	-3.766	-3.782	-0.016	(0)
H2CO3	1.790e-05	1.790e-05	-4.747	-4.747	0.000	(0)
CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
CO3-2	1.866e-07	1.610e-07	-6.729	-6.793	-0.064	(0)
MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)
BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
Ca	2.085e-04					
Ca+2	2.010e-04	1.734e-04	-3.697	-3.761	-0.064	(0)
CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
CaOH+	7.503e-10	7.237e-10	-9.125	-9.140	-0.016	(0)
Cl	1.996e-05					
Cl-	1.996e-05	1.924e-05	-4.700	-4.716	-0.016	(0)

	MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
	MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
	FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
	MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
	VOCl+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
	FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
	FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
F		2.238e-05					
	F-	2.223e-05	2.142e-05	-4.653	-4.669	-0.016	(0)
	MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
	CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
	HF	1.525e-09	1.525e-09	-8.817	-8.817	0.000	(0)
	NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
	AlF2+	1.528e-10	1.473e-10	-9.816	-9.832	-0.016	(0)
	MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
	AlF3	3.973e-11	3.973e-11	-10.401	-10.401	0.000	(0)
	AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
	AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
	HF2-	1.289e-13	1.243e-13	-12.890	-12.906	-0.016	(0)
	FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
	FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
	VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
	H2F2	6.234e-18	6.234e-18	-17.205	-17.205	0.000	(0)
	VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
	FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
	VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
	VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
	VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
	VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
	VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
	VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
Fe (2)		2.131e-09					
	Fe+2	2.037e-09	1.746e-09	-8.691	-8.758	-0.067	(0)
	FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
	FeOH+	1.508e-11	1.454e-11	-10.821	-10.837	-0.016	(0)
	FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
	Fe (OH) 2	2.417e-15	2.417e-15	-14.617	-14.617	0.000	(0)
	Fe (OH) 3-	1.658e-16	1.599e-16	-15.780	-15.796	-0.016	(0)
Fe (3)		2.258e-08					
	Fe (OH) 2+	1.849e-08	1.783e-08	-7.733	-7.749	-0.016	(0)
	Fe (OH) 3	4.006e-09	4.006e-09	-8.397	-8.397	0.000	(0)
	Fe (OH) 4-	8.092e-11	7.803e-11	-10.092	-10.108	-0.016	(0)
	FeOH+2	2.536e-13	2.191e-13	-12.596	-12.659	-0.063	(0)
	FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
	FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
	FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
	Fe+3	2.261e-18	1.622e-18	-17.646	-17.790	-0.144	(0)
	FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
	Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
	FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
	FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)
	Fe2 (OH) 2+4	2.944e-24	1.590e-24	-23.531	-23.799	-0.268	(0)
	FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
	Fe3 (OH) 4+5	1.073e-30	4.098e-31	-29.969	-30.387	-0.418	(0)
	FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
H (0)		3.280e-26					
	H2	1.640e-26	1.640e-26	-25.785	-25.785	0.000	(0)
K		2.491e-05					
	K+	2.488e-05	2.398e-05	-4.604	-4.620	-0.016	(0)
	KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
Mg		5.243e-05					
	Mg+2	5.084e-05	4.386e-05	-4.294	-4.358	-0.064	(0)
	MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
	MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
	MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
	MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
	MgOH+	3.787e-09	3.653e-09	-8.422	-8.437	-0.016	(0)
Mn (2)		1.727e-07					

Mn+2	1.676e-07	1.437e-07	-6.776	-6.843	-0.067	(0)
MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
MnOH+	7.830e-11	7.549e-11	-10.106	-10.122	-0.016	(0)
MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
Mn (OH) 3-	2.117e-20	2.041e-20	-19.674	-19.690	-0.016	(0)
MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
Mn (OH) 4-2	1.596e-26	1.379e-26	-25.797	-25.861	-0.063	(0)
MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Mn (3)	8.945e-29					
Mn+3	8.945e-29	6.417e-29	-28.048	-28.193	-0.144	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-50.661	-50.724	-0.063	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-56.080	-56.096	-0.016	(0)
Mo	4.795e-09					
MoO4-2	4.791e-09	4.133e-09	-8.320	-8.384	-0.064	(0)
HMoO4-	4.114e-12	3.959e-12	-11.386	-11.402	-0.017	(0)
H2MoO4	1.396e-15	1.396e-15	-14.855	-14.855	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)
Mo7O24-6	0.000e+00	0.000e+00	-63.634	-64.236	-0.602	(0)
HMo7O24-5	0.000e+00	0.000e+00	-64.749	-65.167	-0.418	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-67.435	-67.702	-0.268	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-71.623	-71.774	-0.150	(0)
Na	9.030e-05					
Na+	9.020e-05	8.694e-05	-4.045	-4.061	-0.016	(0)
NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)
NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-40.725	-40.725	0.000	(0)
S (6)	2.111e-04					
SO4-2	2.026e-04	1.748e-04	-3.693	-3.757	-0.064	(0)
CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)
KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
HSO4-	8.531e-10	8.223e-10	-9.069	-9.085	-0.016	(0)
FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
Al (SO4) 2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
Se (-2)	2.403e-32					
HSe-	2.402e-32	2.311e-32	-31.619	-31.636	-0.017	(0)
H2Se	8.636e-36	8.636e-36	-35.064	-35.064	0.000	(0)
MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Se-2	5.601e-40	4.801e-40	-39.252	-39.319	-0.067	(0)
Se (4)	2.913e-09					
HSeO3-	2.665e-09	2.565e-09	-8.574	-8.591	-0.017	(0)
SeO3-2	2.474e-10	2.121e-10	-9.607	-9.673	-0.067	(0)
H2SeO3	5.266e-14	5.266e-14	-13.278	-13.278	0.000	(0)
FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)
Se (6)	1.312e-15					
SeO4-2	1.312e-15	1.132e-15	-14.882	-14.946	-0.064	(0)
MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
HSeO4-	2.837e-21	2.730e-21	-20.547	-20.564	-0.017	(0)
V (2)	3.247e-38					
VOH+	2.785e-38	2.680e-38	-37.555	-37.572	-0.017	(0)
V+2	4.618e-39	3.959e-39	-38.336	-38.402	-0.067	(0)

V (3)	5.968e-12					
V (OH) 3	5.968e-12	5.968e-12	-11.224	-11.224	0.000	(0)
V (OH) 2+	1.929e-22	1.856e-22	-21.715	-21.731	-0.017	(0)
VOH+2	9.885e-26	8.474e-26	-25.005	-25.072	-0.067	(0)
V+3	1.143e-30	8.083e-31	-29.942	-30.092	-0.150	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.201	-48.351	-0.150	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-49.076	-49.344	-0.268	(0)
V (4)	3.142e-16					
V (OH) 3+	3.047e-16	2.932e-16	-15.516	-15.533	-0.017	(0)
VO+2	8.194e-18	7.025e-18	-17.086	-17.153	-0.067	(0)
VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
VOC1+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
H2V2O4+2	5.026e-27	4.309e-27	-26.299	-26.366	-0.067	(0)
VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
V (5)	9.025e-09					
H2VO4-	8.521e-09	8.199e-09	-8.070	-8.086	-0.017	(0)
HVO4-2	4.991e-10	4.279e-10	-9.302	-9.369	-0.067	(0)
H3VO4	3.947e-12	3.947e-12	-11.404	-11.404	0.000	(0)
H3V2O7-	2.171e-13	2.089e-13	-12.663	-12.680	-0.017	(0)
HV2O7-3	1.681e-15	1.189e-15	-14.774	-14.925	-0.150	(0)
VO2+	3.933e-16	3.791e-16	-15.405	-15.421	-0.016	(0)
VO4-3	6.300e-17	4.455e-17	-16.201	-16.351	-0.150	(0)
VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
V2O7-4	1.231e-18	6.647e-19	-17.910	-18.177	-0.268	(0)
V3O9-3	8.163e-19	5.772e-19	-18.088	-18.239	-0.150	(0)
VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
V4O12-4	3.653e-24	1.973e-24	-23.437	-23.705	-0.268	(0)
VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.939	-60.357	-0.418	(0)
V10O28-6	0.000e+00	0.000e+00	-60.625	-61.227	-0.602	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.200	-62.467	-0.268	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-1.94	8.86	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.71	-51.34	2.37	Al2 (MoO4) 3
Al2O3	-1.93	17.72	19.65	Al2O3
Al4 (OH) 10SO4	-5.66	17.04	22.70	Al4 (OH) 10SO4
AlOHSO4	-6.30	-9.53	-3.23	AlOHSO4
Alunite	-6.11	-7.51	-1.40	KAl3 (SO4) 2 (OH) 6
Anhydrite	-3.16	-7.52	-4.36	CaSO4
Aragonite	-2.25	-10.55	-8.30	CaCO3
Artinite	-10.47	-0.87	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.44	6.96	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.16	-2.29	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.27	4.67	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.20	-17.02	-5.82	BaF2
BaMoO4	-9.10	-16.06	-6.96	BaMoO4
Barite	-1.45	-11.43	-9.98	BaSO4
BaSeO3	-10.78	-8.95	1.83	BaSeO3
BaSeO4	-15.16	-22.62	-7.46	BaSeO4
Birnessite	-13.01	5.08	18.09	MnO2
Bixbyite	-11.84	-12.48	-0.64	Mn2O3
Boehmite	0.28	8.86	8.58	AlOOH
Brucite	-6.57	10.28	16.84	Mg (OH) 2
Ca (VO3) 2	-10.99	-5.33	5.66	Ca (VO3) 2
Ca2V2O7	-11.96	5.54	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.01	5.54	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-22.55	16.41	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.45	16.41	39.86	Ca3 (VO4) 2:4H2O

Calcite	-2.07	-10.55	-8.48	CaCO3
CaMoO4	-4.19	-12.14	-7.95	CaMoO4
CaSeO3:2H2O	-7.85	-5.03	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-15.69	-18.71	-3.02	CaSeO4:2H2O
CH4 (g)	-70.92	-111.97	-41.05	CH4
CO2 (g)	-3.28	-21.43	-18.15	CO2
Cryolite	-19.45	-53.29	-33.84	Na3AlF6
Diaspore	1.99	8.86	6.87	AlOOH
Dolomite (disordered)	-5.17	-21.71	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-4.62	-21.71	-17.09	CaMg (CO3) 2
Epsomite	-5.99	-8.12	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.69	5.88	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.59	0.55	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-6.61	-10.33	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.14	-7.58	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.77	-39.40	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.12	-46.85	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-6.02	14.20	20.22	Fe3 (OH) 8
FeMoO4	-7.05	-17.14	-10.09	FeMoO4
Ferrihydrite	0.97	4.16	3.19	Fe (OH) 3
Ferroselite	-30.80	-49.40	-18.60	FeSe2
FeSe	-22.08	-33.08	-11.00	FeSe
Fluorite	-2.60	-13.10	-10.50	CaF2
Gibbsite	0.57	8.86	8.29	Al (OH) 3
Goethite	3.67	4.16	0.49	FeOOH
Gypsum	-2.91	-7.52	-4.61	CaSO4:2H2O
H-Jarosite	-12.20	-24.30	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.14	-23.02	-12.88	H2MoO4
H2Se (g)	-33.99	-38.95	-4.96	H2Se
Halite	-10.38	-8.78	1.60	NaCl
Hausmannite	-15.02	46.01	61.03	Mn3O4
Hematite	9.74	8.33	-1.42	Fe2O3
Hercynite	0.70	23.60	22.89	FeAl2O4
Huntite	-14.04	-44.01	-29.97	CaMg3 (CO3) 4
Hydromagnesite	-25.56	-34.33	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-20.06	-25.23	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.80	-21.60	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-20.89	-17.62	3.26	K2MoO4
K2SeO4	-23.46	-24.19	-0.73	K2SeO4
Lepidocrocite	2.79	4.16	1.37	FeOOH
Lime	-21.83	10.87	32.70	CaO
Maghemite	1.94	8.33	6.39	Fe2O3
Magnesioferrite	1.74	18.60	16.86	Fe2MgO4
Magnetite	-3.69	-11.15	-7.46	MgCO3
Magnetite	10.80	14.20	3.40	Fe3O4
Manganite	-6.23	19.11	25.34	MnOOH
Melanterite	-10.31	-12.52	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-8.52	10.28	18.79	Mg (OH) 2
Mg (VO3) 2	-17.21	-5.93	11.28	Mg (VO3) 2
Mg2V2O7	-22.01	4.35	26.36	Mg2V2O7
MgF2	-5.57	-13.70	-8.13	MgF2
MgMoO4	-10.89	-12.74	-1.85	MgMoO4
MgSeO3:6H2O	-8.69	-5.63	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-18.10	-19.30	-1.20	MgSeO4:6H2O
Mirabilite	-10.77	-11.88	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-13.32	-8.42	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-61.95	-67.66	-5.71	Mn2 (SO4) 3
MnCl2:4H2O	-18.99	-16.27	2.72	MnCl2:4H2O
MnSe	-34.66	-31.16	3.50	MnSe
MnSeO3	-9.25	-8.12	1.13	MnSeO3
MnSeO3:2H2O	-9.10	-8.12	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-19.74	-21.79	-2.05	MnSeO4:5H2O
MnSO4	-13.18	-10.60	2.58	MnSO4
MoO3	-15.02	-23.02	-8.00	MoO3
Na-Jarosite	-9.84	-21.04	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-22.93	-39.52	-16.60	Na2Mo2O7
Na2MoO4	-18.00	-16.51	1.49	Na2MoO4
Na2MoO4:2H2O	-17.73	-16.51	1.22	Na2MoO4:2H2O

Na2SeO3:5H2O	-19.70	-9.40	10.30	Na2SeO3:5H2O
Na2SeO4	-24.35	-23.07	1.28	Na2SeO4
Na3VO4	-35.01	1.67	36.68	Na3VO4
Na4V2O7	-40.58	-3.18	37.40	Na4V2O7
Natron	-13.60	-14.91	-1.31	Na2CO3:10H2O
NaVO3	-8.71	-4.85	3.86	NaVO3
Nesquehonite	-6.48	-11.15	-4.67	MgCO3:3H2O
Nsutite	-12.43	5.08	17.50	MnO2
O2(g)	-37.82	45.27	83.09	O2
Periclase	-11.31	10.28	21.58	MgO
Portlandite	-11.93	10.87	22.80	Ca(OH)2
Pyrochroite	-7.40	7.79	15.19	Mn(OH)2
Pyrolusite	-10.95	30.43	41.38	MnO2
Rhodochrosite	-3.06	-13.64	-10.58	MnCO3
Semetal(am)	-9.21	-16.32	-7.11	Se
Semetal(hex)	-8.61	-16.32	-7.71	Se
SeO2	-16.03	-15.91	0.12	SeO2
SeO3	-50.63	-29.58	21.04	SeO3
Siderite	-5.31	-15.55	-10.24	FeCO3
Spinel	-8.85	28.00	36.85	MgAl2O4
Thenardite	-12.20	-11.88	0.32	Na2SO4
Thermonatrite	-15.55	-14.91	0.64	Na2CO3:H2O
V(OH)3	-15.73	-8.14	7.59	V(OH)3
V2O5	-14.85	-16.21	-1.36	V2O5
V3O5	-32.03	-30.19	1.84	V3O5
V4O7	-39.89	-32.71	7.19	V4O7
V6O13	-33.03	-93.89	-60.86	V6O13
VC12	-62.40	-43.52	18.87	VC12
VC13	-67.67	-44.24	23.43	VC13
VF4	-65.39	-50.46	14.93	VF4
Vmetal	-86.12	-42.09	44.03	V
VO	-34.21	-19.46	14.76	VO
VO(OH)2	-7.67	-2.52	5.15	VO(OH)2
VO2Cl	-22.98	-20.14	2.84	VO2Cl
VOC1	-31.33	-20.17	11.15	VOC1
VOC12	-39.35	-26.58	12.76	VOC12
VOSO4	-24.52	-20.91	3.61	VOSO4
Witherite	-5.90	-14.47	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 12.

SOLUTION 10 Average HCT data for biotite breccia - sulfide (waste) (cells
604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.90750
pe 4
redox pe
units mg/l
density 1
Alkalinity 54.86006 as HCO3
Al 0.00593
As 0.00025
B 0.00493
Ba 0.00624
Ca 28.03913
Cl 1.33518
Cu 0.01261
F 1.19649
Fe 0.00074

K 4.43350
Mg 3.99652
Mn 0.04279
Mo 0.00556
Na 2.60160 charge
S(6) 47.33747 as SO4
Sb 0.00012
Se 0.00035
U 0.00169
V 0.00149
Zn 0.00145
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 10. Average HCT data for biotite breccia - sulfide (waste)
(cells 604811, 604854, 604862, 604867 and 605033)

-----Solution composition-----

Elements	Molality	Moles
Al	2.198e-07	2.198e-07
Alkalinity	8.992e-04	8.992e-04
As	3.337e-09	3.337e-09
B	4.561e-07	4.561e-07
Ba	4.544e-08	4.544e-08
Ca	6.997e-04	6.997e-04
Cl	3.767e-05	3.767e-05
Cu	1.985e-07	1.985e-07
F	6.299e-05	6.299e-05
Fe	1.325e-08	1.325e-08
K	1.134e-04	1.134e-04
Mg	1.645e-04	1.645e-04
Mn	7.790e-07	7.790e-07
Mo	5.796e-08	5.796e-08
Na	1.411e-04	1.411e-04
S(6)	4.928e-04	4.928e-04
Sb	9.858e-10	9.858e-10
Se	4.433e-09	4.433e-09
U	7.101e-09	7.101e-09
V	2.925e-08	2.925e-08
Zn	2.218e-08	2.218e-08

Charge balance

-----Description of solution-----

pH = 7.907
pe = 4.000
Activity of water = 1.000
Ionic strength (mol/kgw) = 3.123e-03
Mass of water (kg) = 1.000e+00
Total carbon (mol/kg) = 9.133e-04
Total CO2 (mol/kg) = 9.133e-04
Temperature (°C) = 25.00
Electrical balance (eq) = -5.028e-18
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
Iterations = 11
Total H = 1.110146e+02
Total O = 5.551155e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.655e-07	8.137e-07	-6.063	-6.090	-0.027	(0)

	H+	1.315e-08	1.237e-08	-7.881	-7.907	-0.027	0.00
	H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al		2.198e-07					
	Al (OH) 4-	2.177e-07	2.049e-07	-6.662	-6.689	-0.026	(0)
	Al (OH) 3	2.000e-09	2.000e-09	-8.699	-8.699	0.000	(0)
	Al (OH) 2+	1.308e-10	1.232e-10	-9.884	-9.909	-0.026	(0)
	AlF2+	3.345e-12	3.151e-12	-11.476	-11.502	-0.026	(0)
	AlF3	2.307e-12	2.307e-12	-11.637	-11.637	0.000	(0)
	AlOH+2	2.420e-13	1.906e-13	-12.616	-12.720	-0.104	(0)
	AlF+2	1.729e-13	1.362e-13	-12.762	-12.866	-0.104	(0)
	AlF4-	7.141e-14	6.721e-14	-13.146	-13.173	-0.026	(0)
	AlSO4+	6.719e-16	6.324e-16	-15.173	-15.199	-0.026	(0)
	Al+3	4.057e-16	2.342e-16	-15.392	-15.630	-0.239	(0)
	Al (SO4) 2-	2.505e-18	2.357e-18	-17.601	-17.628	-0.026	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-51.884	-52.141	-0.257	(0)
As (3)		7.204e-21					
	H3AsO3	6.899e-21	6.899e-21	-20.161	-20.161	0.000	(0)
	H2AsO3-	3.053e-22	2.859e-22	-21.515	-21.544	-0.029	(0)
	HAsO3-2	2.740e-26	2.108e-26	-25.562	-25.676	-0.114	(0)
	H4AsO3+	4.516e-29	4.229e-29	-28.345	-28.374	-0.029	(0)
	AsO3-3	1.185e-31	6.566e-32	-30.926	-31.183	-0.257	(0)
As (5)		3.337e-09					
	HAsO4-2	3.053e-09	2.348e-09	-8.515	-8.629	-0.114	(0)
	H2AsO4-	2.830e-10	2.650e-10	-9.548	-9.577	-0.029	(0)
	AsO4-3	1.083e-12	6.001e-13	-11.965	-12.222	-0.257	(0)
	H3AsO4	5.694e-16	5.698e-16	-15.245	-15.244	0.000	(0)
B		4.561e-07					
	H3BO3	4.337e-07	4.340e-07	-6.363	-6.363	0.000	(0)
	H2BO3-	2.169e-08	2.037e-08	-7.664	-7.691	-0.027	(0)
	CaH2BO3+	6.337e-10	5.951e-10	-9.198	-9.225	-0.027	(0)
	MgH2BO3+	9.102e-11	8.549e-11	-10.041	-10.068	-0.027	(0)
	BF (OH) 3-	1.072e-11	1.007e-11	-10.970	-10.997	-0.027	(0)
	NaH2BO3	4.276e-12	4.276e-12	-11.369	-11.369	0.000	(0)
	BaH2BO3+	2.368e-14	2.224e-14	-13.626	-13.653	-0.027	(0)
	H5 (BO3) 2-	8.012e-15	7.525e-15	-14.096	-14.124	-0.027	(0)
	BF2 (OH) 2-	8.245e-16	7.744e-16	-15.084	-15.111	-0.027	(0)
	H8 (BO3) 3-	3.477e-19	3.266e-19	-18.459	-18.486	-0.027	(0)
	BF3OH-	2.308e-22	2.167e-22	-21.637	-21.664	-0.027	(0)
	BF4-	8.169e-28	7.672e-28	-27.088	-27.115	-0.027	(0)
Ba		4.544e-08					
	Ba+2	4.509e-08	3.532e-08	-7.346	-7.452	-0.106	(0)
	BaHCO3+	2.946e-10	2.777e-10	-9.531	-9.556	-0.026	(0)
	BaCO3	5.651e-11	5.651e-11	-10.248	-10.248	0.000	(0)
	BaOH+	1.332e-13	1.255e-13	-12.875	-12.901	-0.026	(0)
	BaH2BO3+	2.368e-14	2.224e-14	-13.626	-13.653	-0.027	(0)
C (4)		9.133e-04					
	HCO3-	8.739e-04	8.233e-04	-3.059	-3.084	-0.026	(0)
	H2CO3	2.291e-05	2.291e-05	-4.640	-4.640	0.000	(0)
	CaHCO3+	8.257e-06	7.783e-06	-5.083	-5.109	-0.026	(0)
	CO3-2	3.982e-06	3.119e-06	-5.400	-5.506	-0.106	(0)
	CaCO3	2.510e-06	2.510e-06	-5.600	-5.600	0.000	(0)
	MgHCO3+	1.084e-06	1.020e-06	-5.965	-5.992	-0.027	(0)
	MgCO3	3.140e-07	3.140e-07	-6.503	-6.503	0.000	(0)
	CuCO3	1.572e-07	1.572e-07	-6.804	-6.804	0.000	(0)
	NaHCO3	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
	MnHCO3+	9.817e-09	9.245e-09	-8.008	-8.034	-0.026	(0)
	NaCO3-	8.167e-09	7.694e-09	-8.088	-8.114	-0.026	(0)
	UO2 (CO3) 2-2	5.236e-09	4.027e-09	-8.281	-8.395	-0.114	(0)
	ZnCO3	2.399e-09	2.399e-09	-8.620	-8.620	0.000	(0)
	UO2 (CO3) 3-4	1.799e-09	6.296e-10	-8.745	-9.201	-0.456	(0)
	Cu (CO3) 2-2	1.715e-09	1.319e-09	-8.766	-8.880	-0.114	(0)
	CuHCO3+	4.746e-10	4.445e-10	-9.324	-9.352	-0.029	(0)
	ZnHCO3+	3.716e-10	3.480e-10	-9.430	-9.458	-0.029	(0)
	BaHCO3+	2.946e-10	2.777e-10	-9.531	-9.556	-0.026	(0)
	UO2CO3	6.471e-11	6.471e-11	-10.189	-10.189	0.000	(0)
	BaCO3	5.651e-11	5.651e-11	-10.248	-10.248	0.000	(0)
	FeHCO3+	4.680e-13	4.412e-13	-12.330	-12.355	-0.026	(0)
Ca		6.997e-04					

	Ca+2	6.481e-04	5.077e-04	-3.188	-3.294	-0.106	(0)
	CaSO4	4.046e-05	4.046e-05	-4.393	-4.393	0.000	(0)
	CaHCO3+	8.257e-06	7.783e-06	-5.083	-5.109	-0.026	(0)
	CaCO3	2.510e-06	2.510e-06	-5.600	-5.600	0.000	(0)
	CaF+	3.421e-07	3.222e-07	-6.466	-6.492	-0.026	(0)
	CaOH+	8.745e-09	8.243e-09	-8.058	-8.084	-0.026	(0)
	CaH2BO3+	6.337e-10	5.951e-10	-9.198	-9.225	-0.027	(0)
Cl		3.767e-05					
	Cl-	3.767e-05	3.544e-05	-4.424	-4.451	-0.027	(0)
	MnCl+	2.666e-11	2.511e-11	-10.574	-10.600	-0.026	(0)
	CuCl	1.869e-11	1.869e-11	-10.728	-10.728	0.000	(0)
	ZnOHCl	1.267e-12	1.267e-12	-11.897	-11.897	0.000	(0)
	ZnCl+	1.265e-12	1.190e-12	-11.898	-11.925	-0.027	(0)
	CuCl+	5.108e-13	4.805e-13	-12.292	-12.318	-0.027	(0)
	CuCl2-	1.471e-13	1.384e-13	-12.832	-12.859	-0.027	(0)
	MnCl2	1.257e-15	1.257e-15	-14.901	-14.901	0.000	(0)
	ZnCl2	6.682e-17	6.682e-17	-16.175	-16.175	0.000	(0)
	CuCl2	5.904e-18	5.904e-18	-17.229	-17.229	0.000	(0)
	CuCl3-2	1.334e-18	1.049e-18	-17.875	-17.979	-0.104	(0)
	UO2Cl+	3.198e-19	2.995e-19	-18.495	-18.524	-0.029	(0)
	MnCl3-	1.302e-20	1.226e-20	-19.885	-19.911	-0.026	(0)
	ZnCl3-	1.999e-21	1.881e-21	-20.699	-20.726	-0.027	(0)
	FeCl+2	5.382e-23	4.231e-23	-22.269	-22.374	-0.104	(0)
	VOCl+	8.724e-24	8.169e-24	-23.059	-23.088	-0.029	(0)
	CuCl3-	2.076e-24	1.952e-24	-23.683	-23.709	-0.027	(0)
	ZnCl4-2	4.238e-26	3.332e-26	-25.373	-25.477	-0.104	(0)
	FeCl2+	7.113e-27	6.698e-27	-26.148	-26.174	-0.026	(0)
	CuCl4-2	4.410e-31	3.467e-31	-30.356	-30.460	-0.104	(0)
	FeCl3	2.373e-32	2.373e-32	-31.625	-31.625	0.000	(0)
	UCl+3	0.000e+00	0.000e+00	-47.191	-47.448	-0.257	(0)
Cu (1)		4.663e-10					
	Cu+	4.475e-10	4.191e-10	-9.349	-9.378	-0.029	(0)
	CuCl	1.869e-11	1.869e-11	-10.728	-10.728	0.000	(0)
	CuCl2-	1.471e-13	1.384e-13	-12.832	-12.859	-0.027	(0)
	CuCl3-2	1.334e-18	1.049e-18	-17.875	-17.979	-0.104	(0)
Cu (2)		1.980e-07					
	CuCO3	1.572e-07	1.572e-07	-6.804	-6.804	0.000	(0)
	CuOH+	2.341e-08	2.202e-08	-7.631	-7.657	-0.027	(0)
	Cu+2	1.092e-08	8.556e-09	-7.962	-8.068	-0.106	(0)
	Cu (OH) 2	3.575e-09	3.575e-09	-8.447	-8.447	0.000	(0)
	Cu (CO3) 2-2	1.715e-09	1.319e-09	-8.766	-8.880	-0.114	(0)
	CuSO4	6.819e-10	6.819e-10	-9.166	-9.166	0.000	(0)
	CuHCO3+	4.746e-10	4.445e-10	-9.324	-9.352	-0.029	(0)
	CuF+	3.352e-11	3.139e-11	-10.475	-10.503	-0.029	(0)
	Cu2 (OH) 2+2	1.583e-11	1.218e-11	-10.800	-10.914	-0.114	(0)
	Cu (OH) 3-	6.371e-12	5.966e-12	-11.196	-11.224	-0.029	(0)
	CuCl+	5.108e-13	4.805e-13	-12.292	-12.318	-0.027	(0)
	Cu (OH) 4-2	4.968e-17	3.821e-17	-16.304	-16.418	-0.114	(0)
	CuCl2	5.904e-18	5.904e-18	-17.229	-17.229	0.000	(0)
	CuCl3-	2.076e-24	1.952e-24	-23.683	-23.709	-0.027	(0)
	CuCl4-2	4.410e-31	3.467e-31	-30.356	-30.460	-0.104	(0)
F		6.299e-05					
	F-	6.180e-05	5.814e-05	-4.209	-4.236	-0.027	(0)
	MgF+	8.389e-07	7.895e-07	-6.076	-6.103	-0.026	(0)
	CaF+	3.421e-07	3.222e-07	-6.466	-6.492	-0.026	(0)
	NaF	4.859e-09	4.859e-09	-8.313	-8.313	0.000	(0)
	MnF+	1.383e-09	1.303e-09	-8.859	-8.885	-0.026	(0)
	HF	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
	CuF+	3.352e-11	3.139e-11	-10.475	-10.503	-0.029	(0)
	ZnF+	1.656e-11	1.551e-11	-10.781	-10.810	-0.029	(0)
	BF (OH) 3-	1.072e-11	1.007e-11	-10.970	-10.997	-0.027	(0)
	AlF2+	3.345e-12	3.151e-12	-11.476	-11.502	-0.026	(0)
	AlF3	2.307e-12	2.307e-12	-11.637	-11.637	0.000	(0)
	HF2-	2.502e-13	2.352e-13	-12.602	-12.629	-0.027	(0)
	AlF+2	1.729e-13	1.362e-13	-12.762	-12.866	-0.104	(0)
	AlF4-	7.141e-14	6.721e-14	-13.146	-13.173	-0.026	(0)
	UO2F+	4.466e-14	4.182e-14	-13.350	-13.379	-0.029	(0)
	UO2F2	7.012e-15	7.012e-15	-14.154	-14.154	0.000	(0)

BF2 (OH) 2-	8.245e-16	7.744e-16	-15.084	-15.111	-0.027	(0)
UO2F3-	1.093e-16	1.024e-16	-15.961	-15.990	-0.029	(0)
VO2F	6.842e-18	6.842e-18	-17.165	-17.165	0.000	(0)
FeF2+	4.165e-18	3.922e-18	-17.380	-17.407	-0.026	(0)
FeF+2	3.206e-18	2.521e-18	-17.494	-17.598	-0.104	(0)
H2F2	3.033e-18	3.033e-18	-17.518	-17.518	0.000	(0)
FeF3	3.217e-19	3.217e-19	-18.493	-18.493	0.000	(0)
VO2F2-	1.542e-19	1.444e-19	-18.812	-18.840	-0.029	(0)
UO2F4-2	6.149e-20	4.729e-20	-19.211	-19.325	-0.114	(0)
VOF+	3.060e-20	2.866e-20	-19.514	-19.543	-0.029	(0)
VOF2	6.247e-22	6.247e-22	-21.204	-21.204	0.000	(0)
BF3OH-	2.308e-22	2.167e-22	-21.637	-21.664	-0.027	(0)
VO2F3-2	1.362e-22	1.047e-22	-21.866	-21.980	-0.114	(0)
VOF3-	1.376e-24	1.289e-24	-23.861	-23.890	-0.029	(0)
Sb (OH) 2F	4.689e-26	4.689e-26	-25.329	-25.329	0.000	(0)
SbOF	4.611e-26	4.611e-26	-25.336	-25.336	0.000	(0)
VO2F4-3	5.409e-27	2.996e-27	-26.267	-26.523	-0.257	(0)
BF4-	8.169e-28	7.672e-28	-27.088	-27.115	-0.027	(0)
VOF4-2	3.932e-28	3.024e-28	-27.405	-27.519	-0.114	(0)
UF3+	1.678e-36	1.572e-36	-35.775	-35.804	-0.029	(0)
UF2+2	2.218e-37	1.706e-37	-36.654	-36.768	-0.114	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	4.207e-40	2.330e-40	-39.376	-39.633	-0.257	(0)
UF5-	0.000e+00	0.000e+00	-40.608	-40.637	-0.029	(0)
UF6-2	0.000e+00	0.000e+00	-42.278	-42.392	-0.114	(0)
Fe (2)	6.091e-11					
Fe+2	5.534e-11	4.256e-11	-10.257	-10.371	-0.114	(0)
FeSO4	3.635e-12	3.635e-12	-11.440	-11.440	0.000	(0)
FeOH+	1.464e-12	1.379e-12	-11.834	-11.860	-0.026	(0)
FeHCO3+	4.680e-13	4.412e-13	-12.330	-12.355	-0.026	(0)
Fe (OH) 2	8.913e-16	8.913e-16	-15.050	-15.050	0.000	(0)
Fe (OH) 3-	2.436e-16	2.293e-16	-15.613	-15.640	-0.026	(0)
Fe (3)	1.319e-08					
Fe (OH) 2+	6.981e-09	6.577e-09	-8.156	-8.182	-0.026	(0)
Fe (OH) 3	5.748e-09	5.748e-09	-8.241	-8.241	0.000	(0)
Fe (OH) 4-	4.623e-10	4.355e-10	-9.335	-9.361	-0.026	(0)
FeOH+2	2.642e-14	2.077e-14	-13.578	-13.682	-0.104	(0)
FeF2+	4.165e-18	3.922e-18	-17.380	-17.407	-0.026	(0)
FeF+2	3.206e-18	2.521e-18	-17.494	-17.598	-0.104	(0)
FeF3	3.217e-19	3.217e-19	-18.493	-18.493	0.000	(0)
FeSO4+	1.639e-19	1.543e-19	-18.785	-18.812	-0.026	(0)
Fe+3	6.850e-20	3.954e-20	-19.164	-19.403	-0.239	(0)
Fe (SO4) 2-	1.226e-21	1.148e-21	-20.912	-20.940	-0.029	(0)
FeCl+2	5.382e-23	4.231e-23	-22.269	-22.374	-0.104	(0)
FeHSeO3+2	4.052e-25	3.117e-25	-24.392	-24.506	-0.114	(0)
Fe2 (OH) 2+4	4.084e-26	1.429e-26	-25.389	-25.845	-0.456	(0)
FeCl2+	7.113e-27	6.698e-27	-26.148	-26.174	-0.026	(0)
FeCl3	2.373e-32	2.373e-32	-31.625	-31.625	0.000	(0)
Fe3 (OH) 4+5	7.009e-33	1.359e-33	-32.154	-32.867	-0.713	(0)
H (0)	2.166e-27					
H2	1.083e-27	1.084e-27	-26.965	-26.965	0.000	(0)
K	1.134e-04					
K+	1.131e-04	1.064e-04	-3.946	-3.973	-0.027	(0)
KSO4-	2.783e-07	2.621e-07	-6.556	-6.581	-0.026	(0)
Mg	1.645e-04					
Mg+2	1.545e-04	1.210e-04	-3.811	-3.917	-0.106	(0)
MgSO4	7.662e-06	7.662e-06	-5.116	-5.116	0.000	(0)
MgHCO3+	1.084e-06	1.020e-06	-5.965	-5.992	-0.027	(0)
MgF+	8.389e-07	7.895e-07	-6.076	-6.103	-0.026	(0)
MgCO3	3.140e-07	3.140e-07	-6.503	-6.503	0.000	(0)
MgOH+	4.158e-08	3.921e-08	-7.381	-7.407	-0.025	(0)
MgH2BO3+	9.102e-11	8.549e-11	-10.041	-10.068	-0.027	(0)
Mn (2)	7.790e-07					
Mn+2	7.317e-07	5.628e-07	-6.136	-6.250	-0.114	(0)
MnSO4	3.482e-08	3.482e-08	-7.458	-7.458	0.000	(0)
MnHCO3+	9.817e-09	9.245e-09	-8.008	-8.034	-0.026	(0)
MnF+	1.383e-09	1.303e-09	-8.859	-8.885	-0.026	(0)
MnOH+	1.222e-09	1.150e-09	-8.913	-8.939	-0.026	(0)

MnCl+	2.666e-11	2.511e-11	-10.574	-10.600	-0.026	(0)
MnCl2	1.257e-15	1.257e-15	-14.901	-14.901	0.000	(0)
MnSeO4	1.173e-17	1.173e-17	-16.931	-16.931	0.000	(0)
Mn (OH) 3-	4.999e-18	4.707e-18	-17.301	-17.327	-0.026	(0)
MnCl3-	1.302e-20	1.226e-20	-19.885	-19.911	-0.026	(0)
Mn (OH) 4-2	1.573e-23	1.237e-23	-22.803	-22.908	-0.104	(0)
MnSe	1.454e-39	1.454e-39	-38.837	-38.837	0.000	(0)
Mn (3)	4.355e-28					
Mn+3	4.355e-28	2.514e-28	-27.361	-27.600	-0.239	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.307	-45.412	-0.104	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.757	-50.784	-0.027	(0)
Mo	5.796e-08					
MoO4-2	5.795e-08	4.539e-08	-7.237	-7.343	-0.106	(0)
HMoO4-	1.193e-11	1.118e-11	-10.923	-10.952	-0.029	(0)
H2MoO4	1.013e-15	1.013e-15	-14.994	-14.994	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.884	-52.141	-0.257	(0)
Mo7O24-6	0.000e+00	0.000e+00	-60.645	-61.671	-1.026	(0)
HMo7O24-5	0.000e+00	0.000e+00	-62.479	-63.192	-0.713	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-65.861	-66.317	-0.456	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-70.722	-70.979	-0.257	(0)
Na	1.411e-04					
Na+	1.408e-04	1.325e-04	-3.851	-3.878	-0.027	(0)
NaSO4-	2.627e-07	2.475e-07	-6.581	-6.606	-0.026	(0)
NaHCO3	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
NaCO3-	8.167e-09	7.694e-09	-8.088	-8.114	-0.026	(0)
NaF	4.859e-09	4.859e-09	-8.313	-8.313	0.000	(0)
NaH2BO3	4.276e-12	4.276e-12	-11.369	-11.369	0.000	(0)
O (0)	8.622e-39					
O2	4.311e-39	4.314e-39	-38.365	-38.365	0.000	(0)
S (6)	4.928e-04					
SO4-2	4.441e-04	3.479e-04	-3.352	-3.459	-0.106	(0)
CaSO4	4.046e-05	4.046e-05	-4.393	-4.393	0.000	(0)
MgSO4	7.662e-06	7.662e-06	-5.116	-5.116	0.000	(0)
KSO4-	2.783e-07	2.621e-07	-6.556	-6.581	-0.026	(0)
NaSO4-	2.627e-07	2.475e-07	-6.581	-6.606	-0.026	(0)
MnSO4	3.482e-08	3.482e-08	-7.458	-7.458	0.000	(0)
ZnSO4	1.017e-09	1.017e-09	-8.993	-8.993	0.000	(0)
CuSO4	6.819e-10	6.819e-10	-9.166	-9.166	0.000	(0)
HSO4-	4.470e-10	4.207e-10	-9.350	-9.376	-0.026	(0)
Zn (SO4) 2-2	4.008e-12	3.083e-12	-11.397	-11.511	-0.114	(0)
FeSO4	3.635e-12	3.635e-12	-11.440	-11.440	0.000	(0)
UO2SO4	2.744e-15	2.744e-15	-14.562	-14.562	0.000	(0)
AlSO4+	6.719e-16	6.324e-16	-15.173	-15.199	-0.026	(0)
UO2 (SO4) 2-2	1.636e-17	1.258e-17	-16.786	-16.900	-0.114	(0)
Al (SO4) 2-	2.505e-18	2.357e-18	-17.601	-17.628	-0.026	(0)
VO2SO4-	5.952e-19	5.574e-19	-18.225	-18.254	-0.029	(0)
FeSO4+	1.639e-19	1.543e-19	-18.785	-18.812	-0.026	(0)
VOSO4	7.874e-21	7.874e-21	-20.104	-20.104	0.000	(0)
Fe (SO4) 2-	1.226e-21	1.148e-21	-20.912	-20.940	-0.029	(0)
VSO4+	1.096e-34	1.026e-34	-33.960	-33.989	-0.029	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.114	-41.114	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.442	-41.556	-0.114	(0)
Sb (3)	8.246e-20					
Sb (OH) 3	4.172e-20	4.172e-20	-19.380	-19.380	0.000	(0)
HSbO2	4.073e-20	4.073e-20	-19.390	-19.390	0.000	(0)
SbO2-	5.692e-24	5.331e-24	-23.245	-23.273	-0.029	(0)
Sb (OH) 4-	3.262e-24	3.055e-24	-23.487	-23.515	-0.029	(0)
Sb (OH) 2F	4.689e-26	4.689e-26	-25.329	-25.329	0.000	(0)
SbOF	4.611e-26	4.611e-26	-25.336	-25.336	0.000	(0)
Sb (OH) 2+	1.339e-26	1.254e-26	-25.873	-25.902	-0.029	(0)
SbO+	4.615e-27	4.322e-27	-26.336	-26.364	-0.029	(0)
Sb (5)	9.858e-10					
SbO3-	9.846e-10	9.221e-10	-9.007	-9.035	-0.029	(0)
Sb (OH) 6-	1.146e-12	1.078e-12	-11.941	-11.967	-0.027	(0)
SbO2+	4.324e-26	4.049e-26	-25.364	-25.393	-0.029	(0)
Se (-2)	8.286e-36					

HSe-	8.283e-36	7.757e-36	-35.082	-35.110	-0.029	(0)
MnSe	1.454e-39	1.454e-39	-38.837	-38.837	0.000	(0)
H2Se	7.451e-40	7.451e-40	-39.128	-39.128	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.089	-42.203	-0.114	(0)
Se (4)	4.433e-09					
HSeO3-	3.185e-09	2.983e-09	-8.497	-8.525	-0.029	(0)
SeO3-2	1.248e-09	9.597e-10	-8.904	-9.018	-0.114	(0)
H2SeO3	1.575e-14	1.575e-14	-13.803	-13.803	0.000	(0)
FeHSeO3+2	4.052e-25	3.117e-25	-24.392	-24.506	-0.114	(0)
Se (6)	9.891e-14					
SeO4-2	9.890e-14	7.747e-14	-13.005	-13.111	-0.106	(0)
MnSeO4	1.173e-17	1.173e-17	-16.931	-16.931	0.000	(0)
ZnSeO4	1.604e-19	1.604e-19	-18.795	-18.795	0.000	(0)
HSeO4-	5.130e-20	4.804e-20	-19.290	-19.318	-0.029	(0)
Zn (SeO4) 2-2	1.638e-32	1.260e-32	-31.786	-31.900	-0.114	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.237	-57.493	-0.257	(0)
U (4)	5.611e-19					
U (OH) 5-	5.609e-19	5.252e-19	-18.251	-18.280	-0.029	(0)
U (OH) 4	2.722e-22	2.722e-22	-21.565	-21.565	0.000	(0)
U (OH) 3+	1.315e-26	1.231e-26	-25.881	-25.910	-0.029	(0)
U (OH) 2+2	9.161e-32	7.046e-32	-31.038	-31.152	-0.114	(0)
UF3+	1.678e-36	1.572e-36	-35.775	-35.804	-0.029	(0)
UF2+2	2.218e-37	1.706e-37	-36.654	-36.768	-0.114	(0)
UOH+3	7.412e-38	4.106e-38	-37.130	-37.387	-0.257	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	4.207e-40	2.330e-40	-39.376	-39.633	-0.257	(0)
UF5-	0.000e+00	0.000e+00	-40.608	-40.637	-0.029	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.114	-41.114	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.442	-41.556	-0.114	(0)
UF6-2	0.000e+00	0.000e+00	-42.278	-42.392	-0.114	(0)
U+4	0.000e+00	0.000e+00	-44.241	-44.697	-0.456	(0)
UCl+3	0.000e+00	0.000e+00	-47.191	-47.448	-0.257	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.416	-166.725	-2.309	(0)
U (5)	3.392e-16					
UO2+	3.392e-16	3.176e-16	-15.470	-15.498	-0.029	(0)
U (6)	7.101e-09					
UO2 (CO3) 2-2	5.236e-09	4.027e-09	-8.281	-8.395	-0.114	(0)
UO2 (CO3) 3-4	1.799e-09	6.296e-10	-8.745	-9.201	-0.456	(0)
UO2CO3	6.471e-11	6.471e-11	-10.189	-10.189	0.000	(0)
UO2OH+	5.700e-13	5.338e-13	-12.244	-12.273	-0.029	(0)
UO2F+	4.466e-14	4.182e-14	-13.350	-13.379	-0.029	(0)
UO2F2	7.012e-15	7.012e-15	-14.154	-14.154	0.000	(0)
UO2+2	6.652e-15	5.211e-15	-14.177	-14.283	-0.106	(0)
UO2SO4	2.744e-15	2.744e-15	-14.562	-14.562	0.000	(0)
UO2F3-	1.093e-16	1.024e-16	-15.961	-15.990	-0.029	(0)
UO2 (SO4) 2-2	1.636e-17	1.258e-17	-16.786	-16.900	-0.114	(0)
(UO2) 2 (OH) 2+2	6.149e-19	4.729e-19	-18.211	-18.325	-0.114	(0)
UO2Cl+	3.198e-19	2.995e-19	-18.495	-18.524	-0.029	(0)
(UO2) 3 (OH) 5+	1.354e-19	1.268e-19	-18.868	-18.897	-0.029	(0)
UO2F4-2	6.149e-20	4.729e-20	-19.211	-19.325	-0.114	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.065	-40.094	-0.029	(0)
V+2	0.000e+00	0.000e+00	-41.400	-41.514	-0.114	(0)
V (3)	2.716e-13					
V (OH) 3	2.716e-13	2.716e-13	-12.566	-12.566	0.000	(0)
V (OH) 2+	2.319e-24	2.171e-24	-23.635	-23.663	-0.029	(0)
VOH+2	3.313e-28	2.548e-28	-27.480	-27.594	-0.114	(0)
V+3	1.128e-33	6.249e-34	-32.948	-33.204	-0.257	(0)
VSO4+	1.096e-34	1.026e-34	-33.960	-33.989	-0.029	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-52.549	-52.805	-0.257	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.931	-54.387	-0.456	(0)
V (4)	1.439e-17					
V (OH) 3+	1.425e-17	1.334e-17	-16.846	-16.875	-0.029	(0)
VO+2	1.068e-19	8.218e-20	-18.971	-19.085	-0.114	(0)
VOF+	3.060e-20	2.866e-20	-19.514	-19.543	-0.029	(0)
VOSO4	7.874e-21	7.874e-21	-20.104	-20.104	0.000	(0)
VOF2	6.247e-22	6.247e-22	-21.204	-21.204	0.000	(0)

VOC1+	8.724e-24	8.169e-24	-23.059	-23.088	-0.029	(0)
VOF3-	1.376e-24	1.289e-24	-23.861	-23.890	-0.029	(0)
VOF4-2	3.932e-28	3.024e-28	-27.405	-27.519	-0.114	(0)
H2V2O4+2	1.160e-29	8.922e-30	-28.936	-29.050	-0.114	(0)
V(5)	2.925e-08					
H2VO4-	2.345e-08	2.196e-08	-7.630	-7.658	-0.029	(0)
HVO4-2	5.797e-09	4.459e-09	-8.237	-8.351	-0.114	(0)
H3VO4	2.718e-12	2.718e-12	-11.566	-11.566	0.000	(0)
H3V2O7-	4.116e-13	3.854e-13	-12.386	-12.414	-0.029	(0)
HV2O7-3	5.990e-14	3.318e-14	-13.223	-13.479	-0.257	(0)
VO4-3	3.260e-15	1.806e-15	-14.487	-14.743	-0.257	(0)
V2O7-4	2.063e-16	7.218e-17	-15.686	-16.142	-0.456	(0)
VO2+	7.133e-17	6.710e-17	-16.147	-16.173	-0.027	(0)
V3O9-3	2.003e-17	1.110e-17	-16.698	-16.955	-0.257	(0)
VO2F	6.842e-18	6.842e-18	-17.165	-17.165	0.000	(0)
VO2SO4-	5.952e-19	5.574e-19	-18.225	-18.254	-0.029	(0)
VO2F2-	1.542e-19	1.444e-19	-18.812	-18.840	-0.029	(0)
V4O12-4	2.903e-22	1.016e-22	-21.537	-21.993	-0.456	(0)
VO2F3-2	1.362e-22	1.047e-22	-21.866	-21.980	-0.114	(0)
VO2F4-3	5.409e-27	2.996e-27	-26.267	-26.523	-0.257	(0)
V10O28-6	0.000e+00	0.000e+00	-58.281	-59.307	-1.026	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.315	-59.028	-0.713	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.272	-61.728	-0.456	(0)
Zn	2.218e-08					
Zn+2	1.706e-08	1.337e-08	-7.768	-7.874	-0.106	(0)
ZnCO3	2.399e-09	2.399e-09	-8.620	-8.620	0.000	(0)
ZnOH+	1.161e-09	1.088e-09	-8.935	-8.963	-0.029	(0)
ZnSO4	1.017e-09	1.017e-09	-8.993	-8.993	0.000	(0)
ZnHCO3+	3.716e-10	3.480e-10	-9.430	-9.458	-0.029	(0)
Zn(OH)2	1.403e-10	1.403e-10	-9.853	-9.853	0.000	(0)
ZnF+	1.656e-11	1.551e-11	-10.781	-10.810	-0.029	(0)
Zn(SO4)2-2	4.008e-12	3.083e-12	-11.397	-11.511	-0.114	(0)
ZnOHCl	1.267e-12	1.267e-12	-11.897	-11.897	0.000	(0)
ZnCl+	1.265e-12	1.190e-12	-11.898	-11.925	-0.027	(0)
Zn(OH)3-	6.109e-13	5.721e-13	-12.214	-12.243	-0.029	(0)
ZnCl2	6.682e-17	6.682e-17	-16.175	-16.175	0.000	(0)
Zn(OH)4-2	2.410e-17	1.853e-17	-16.618	-16.732	-0.114	(0)
ZnSeO4	1.604e-19	1.604e-19	-18.795	-18.795	0.000	(0)
ZnCl3-	1.999e-21	1.881e-21	-20.699	-20.726	-0.027	(0)
ZnCl4-2	4.238e-26	3.332e-26	-25.373	-25.477	-0.104	(0)
Zn(SeO4)2-2	1.638e-32	1.260e-32	-31.786	-31.900	-0.114	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH)3(am)	-2.71	8.09	10.80	Al(OH)3
Al2(MoO4)3	-55.66	-53.29	2.37	Al2(MoO4)3
Al2O3	-3.47	16.18	19.65	Al2O3
Al4(OH)10SO4	-9.61	13.09	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.95	-7.15	4.80	AlAsO4:2H2O
AlOHSO4	-7.95	-11.18	-3.23	AlOHSO4
AlSb	-148.36	-82.73	65.62	AlSb
Alunite	-8.94	-10.34	-1.40	KAl3(SO4)2(OH)6
Anhydrite	-2.39	-6.75	-4.36	CaSO4
Antlerite	-4.82	3.97	8.79	Cu3(OH)4SO4
Aragonite	-0.50	-8.80	-8.30	CaCO3
Arsenolite	-77.88	-80.64	-2.76	As4O6
Artinite	-7.13	2.47	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-37.19	-30.49	6.71	As2O5
Atacamite	-4.25	3.14	7.39	Cu2(OH)3Cl
Azurite	-2.49	-19.40	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.03	8.36	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.68	0.19	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	3.51	-5.40	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-24.38	8.56	32.94	Ba3(VO4)2:4H2O
BaF2	-10.10	-15.92	-5.82	BaF2
BaMoO4	-7.83	-14.79	-6.96	BaMoO4

Barite	-0.93	-10.91	-9.98	BaSO ₄
BaSeO ₃	-9.90	-8.07	1.83	BaSeO ₃
BaSeO ₄	-13.10	-20.56	-7.46	BaSeO ₄
Bianchite	-9.57	-11.33	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-10.06	8.03	18.09	MnO ₂
Bixbyite	-7.11	-7.75	-0.64	Mn ₂ O ₃
Boehmite	-0.49	8.09	8.58	AlOOH
Brochantite	-3.51	11.72	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.95	11.90	16.84	Mg(OH) ₂
Ca(VO ₃) ₂	-9.67	-4.01	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.99	8.51	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-13.04	8.51	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-15.23	7.07	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-17.93	21.03	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-18.83	21.03	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-287.06	-144.09	142.97	Ca ₃ Sb ₂
Calcite	-0.32	-8.80	-8.48	CaCO ₃
CaMoO ₄	-2.69	-10.64	-7.95	CaMoO ₄
Carnotite	-3.03	-2.80	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.73	-3.91	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-13.39	-16.41	-3.02	CaSeO ₄ :2H ₂ O
CH ₄ (g)	-75.54	-116.58	-41.05	CH ₄
Chalcanthite	-8.89	-11.53	-2.64	CuSO ₄ :5H ₂ O
Claudetite	-77.58	-80.64	-3.06	As ₄ O ₆
CO ₂ (g)	-3.17	-21.32	-18.15	CO ₂
Cryolite	-18.84	-52.68	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.93	7.75	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-28.59	16.62	45.21	Cu(SbO ₃) ₂
Cu ₂ Sb:3H ₂ O	-49.66	-84.55	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se(alpha)	-0.16	-45.96	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-20.26	-22.21	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ :2H ₂ O	-13.35	-7.25	6.10	Cu ₃ (AsO ₄) ₂ :2H ₂ O
Cu ₃ Sb	-52.64	-95.24	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-17.74	-81.23	-63.49	Cu ₃ Se ₂
CuCO ₃	-2.07	-13.57	-11.50	CuCO ₃
CuF	-8.71	-13.61	-4.91	CuF
CuF ₂	-17.65	-16.54	1.12	CuF ₂
CuF ₂ :2H ₂ O	-11.99	-16.54	-4.55	CuF ₂ :2H ₂ O
Cumetal	-4.62	-13.38	-8.76	Cu
CuMoO ₄	-2.33	-15.41	-13.08	CuMoO ₄
CuOCuSO ₄	-14.08	-3.78	10.30	CuOCuSO ₄
Cupricferrite	10.40	16.39	5.99	CuFe ₂ O ₄
Cuprite	-1.53	-2.94	-1.41	Cu ₂ O
Cuprousferrite	11.77	2.85	-8.92	CuFeO ₂
CuSe	-2.17	-35.27	-33.10	CuSe
CuSe ₂	-21.11	-54.47	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-9.20	-8.69	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-18.74	-21.18	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-14.47	-11.53	2.94	CuSO ₄
Diaspore	1.22	8.09	6.87	AlOOH
Dolomite(disordered)	-1.68	-18.22	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	-1.13	-18.22	-17.09	CaMg(CO ₃) ₂
Epsomite	-5.25	-7.38	-2.13	MgSO ₄ :7H ₂ O
Fe(OH) ₂	-8.12	5.44	13.56	Fe(OH) ₂
Fe(OH) ₂ .7Cl.3	3.65	0.61	-3.04	Fe(OH) ₂ .7Cl.3
Fe(VO ₃) ₂	-7.37	-11.09	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.35	-7.79	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ :2H ₂ O	-20.03	-40.66	-20.63	Fe ₂ (SeO ₃) ₃ :2H ₂ O
Fe ₂ (SO ₄) ₃	-45.45	-49.18	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-6.14	14.08	20.22	Fe ₃ (OH) ₈
FeAsO ₄ :2H ₂ O	-11.32	-10.92	0.40	FeAsO ₄ :2H ₂ O
FeMoO ₄	-7.62	-17.71	-10.09	FeMoO ₄
Ferrihydrite	1.13	4.32	3.19	Fe(OH) ₃
Ferroselite	-38.18	-56.78	-18.60	FeSe ₂
FeSe	-26.57	-37.57	-11.00	FeSe
Fluorite	-1.27	-11.77	-10.50	CaF ₂
Gibbsite	-0.20	8.09	8.29	Al(OH) ₃
Goethite	3.83	4.32	0.49	FeOOH

Goslarite	-9.32	-11.33	-2.01	ZnSO4:7H2O
Gummite	-6.14	1.53	7.67	UO3
Gypsum	-2.14	-6.75	-4.61	CaSO4:2H2O
H-Jarosite	-13.49	-25.59	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.28	-23.16	-12.88	H2MoO4
H2Se(g)	-38.06	-43.02	-4.96	H2Se
Halite	-9.93	-8.33	1.60	NaCl
Hausmannite	-8.52	52.51	61.03	Mn3O4
Hematite	10.06	8.64	-1.42	Fe2O3
Hercynite	-1.26	21.63	22.89	FeAl2O4
Huntite	-7.10	-37.07	-29.97	CaMg3(CO3) 4
Hydromagnesite	-17.03	-25.79	-8.77	Mg5(CO3) 4 (OH) 2:4H2O
K-Alum	-21.35	-26.52	-5.17	KAl(SO4) 2:12H2O
K-Jarosite	-6.85	-21.65	-14.80	KFe3(SO4) 2 (OH) 6
K2MoO4	-18.55	-15.29	3.26	K2MoO4
K2SeO4	-20.33	-21.06	-0.73	K2SeO4
Langite	-5.77	11.72	17.49	Cu4(OH) 6SO4:H2O
Lepidocrocite	2.95	4.32	1.37	FeOOH
Lime	-20.18	12.52	32.70	CaO
Maghemite	2.25	8.64	6.39	Fe2O3
Magnesioferrite	3.68	20.54	16.86	Fe2MgO4
Magnesite	-1.96	-9.42	-7.46	MgCO3
Magnetite	10.68	14.08	3.40	Fe3O4
Malachite	-0.52	-5.83	-5.31	Cu2(OH) 2CO3
Manganite	-3.87	21.47	25.34	MnOOH
Melanothallite	-23.23	-16.97	6.26	CuCl2
Melanterite	-11.62	-13.83	-2.21	FeSO4:7H2O
Mg(OH) 2 (active)	-6.90	11.90	18.79	Mg(OH) 2
Mg(VO3) 2	-15.91	-4.63	11.28	Mg(VO3) 2
Mg2Sb3	-263.82	-189.14	74.68	Mg2Sb3
Mg2V2O7	-19.10	7.26	26.36	Mg2V2O7
MgF2	-4.26	-12.39	-8.13	MgF2
MgMoO4	-9.41	-11.26	-1.85	MgMoO4
MgSeO3:6H2O	-7.59	-4.54	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.83	-17.03	-1.20	MgSeO4:6H2O
Mirabilite	-10.10	-11.21	-1.11	Na2SO4:10H2O
Mn(VO3) 2	-11.87	-6.97	4.90	Mn(VO3) 2
Mn2(SO4) 3	-59.86	-65.57	-5.71	Mn2(SO4) 3
Mn2Sb	-144.68	-83.60	61.08	Mn2Sb
Mn3(AsO4) 2:8H2O	-14.29	-1.79	12.50	Mn3(AsO4) 2:8H2O
MnCl2:4H2O	-17.87	-15.15	2.72	MnCl2:4H2O
MnSb	-91.79	-94.70	-2.91	MnSb
MnSe	-36.95	-33.45	3.50	MnSe
MnSeO3	-8.00	-6.87	1.13	MnSeO3
MnSeO3:2H2O	-7.85	-6.87	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.31	-19.36	-2.05	MnSeO4:5H2O
MnSO4	-12.29	-9.71	2.58	MnSO4
MoO3	-15.16	-23.16	-8.00	MoO3
Na-Jarosite	-10.36	-21.56	-11.20	NaFe3(SO4) 2 (OH) 6
Na2Mo2O7	-21.66	-38.26	-16.60	Na2Mo2O7
Na2MoO4	-16.59	-15.10	1.49	Na2MoO4
Na2MoO4:2H2O	-16.32	-15.10	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.67	-8.37	10.30	Na2SeO3:5H2O
Na2SeO4	-22.15	-20.87	1.28	Na2SeO4
Na3Sb	-173.19	-78.74	94.45	Na3Sb
Na3VO4	-32.86	3.82	36.68	Na3VO4
Na4V2O7	-37.81	-0.41	37.40	Na4V2O7
Nantokite	-7.10	-13.83	-6.73	CuCl
NaSb	-86.15	-62.98	23.17	NaSb
Natron	-11.95	-13.26	-1.31	Na2CO3:10H2O
NaVO3	-8.09	-4.24	3.86	NaVO3
Nesquehonite	-4.75	-9.42	-4.67	MgCO3:3H2O
Nsutite	-9.47	8.03	17.50	MnO2
O2(g)	-35.46	47.63	83.09	O2
Periclase	-9.69	11.90	21.58	MgO
Portlandite	-10.28	12.52	22.80	Ca(OH) 2
Pyrochroite	-5.63	9.57	15.19	Mn(OH) 2
Pyrolusite	-8.00	33.38	41.38	MnO2

Rhodochrosite	-1.18	-11.76	-10.58	MnCO3
Rutherfordine	-5.29	-19.79	-14.50	UO2CO3
Sb(OH)3	-12.27	-19.38	-7.11	Sb(OH)3
Sb2O4	-18.35	-14.94	3.40	Sb2O4
Sb2O5	-30.08	-39.75	-9.67	Sb2O5
Sb2Se3	-100.06	-167.81	-67.76	Sb2Se3
Sb4O6(cubic)	-59.26	-77.52	-18.26	Sb4O6
Sb4O6(orth)	-59.62	-77.52	-17.90	Sb4O6
SbCl3	-57.03	-56.45	0.57	SbCl3
SbF3	-45.58	-55.81	-10.23	SbF3
Sbmetal	-43.41	-55.10	-11.69	Sb
SbO2	-3.96	-31.78	-27.82	SbO2
Schoepite	-4.46	1.53	5.99	UO2(OH)2·H2O
Semetal(am)	-12.09	-19.20	-7.11	Se
Semetal(hex)	-11.49	-19.20	-7.71	Se
Senarmontite	-26.39	-38.76	-12.37	Sb2O3
SeO2	-16.56	-16.43	0.12	SeO2
SeO3	-49.97	-28.93	21.04	SeO3
Siderite	-5.64	-15.88	-10.24	FeCO3
Smithsonite	-3.38	-13.38	-10.00	ZnCO3
Spinel	-8.77	28.08	36.85	MgAl2O4
Tenorite	0.10	7.75	7.64	CuO
Thenardite	-11.54	-11.21	0.32	Na2SO4
Thermonatrite	-13.90	-13.26	0.64	Na2CO3·H2O
Tyuyamunite	-5.03	-0.95	4.08	Ca(UO2)2(VO4)2
U3O8	-12.65	8.43	21.08	U3O8
U3Sb4	-554.88	-402.50	152.38	U3Sb4
U4O9	-25.43	-28.45	-3.02	U4O9
UF4	-32.10	-61.64	-29.54	UF4
UF4·2.5H2O	-28.92	-61.64	-32.72	UF4·2.5H2O
UO2(am)	-14.00	-13.07	0.93	UO2
UO2(OH)2(beta)	-4.08	1.53	5.61	UO2(OH)2
UO2SeO4·4H2O	-25.14	-27.39	-2.25	UO2SeO4·4H2O
UO3	-6.17	1.53	7.70	UO3
Uraninite	-8.40	-13.07	-4.67	UO2
USb2	-209.69	-180.12	29.58	USb2
V(OH)3	-17.07	-9.48	7.59	V(OH)3
V2O5	-15.17	-16.53	-1.36	V2O5
V3O5	-35.46	-33.63	1.84	V3O5
V4O7	-44.08	-36.90	7.19	V4O7
V6O13	-36.36	-97.22	-60.86	V6O13
Valentinite	-30.28	-38.76	-8.48	Sb2O3
VC12	-64.98	-46.11	18.87	VC12
VC13	-69.99	-46.56	23.43	VC13
VF4	-66.77	-51.84	14.93	VF4
Vmetal	-89.23	-45.20	44.03	V
VO	-36.15	-21.39	14.76	VO
VO(OH)2	-8.42	-3.27	5.15	VO(OH)2
VO2Cl	-23.47	-20.62	2.84	VO2Cl
VOC1	-32.99	-21.84	11.15	VOC1
VOC12	-40.75	-27.99	12.76	VOC12
VOSO4	-26.15	-22.54	3.61	VOSO4
Witherite	-4.39	-12.96	-8.57	BaCO3
Zincite	-3.39	7.94	11.33	ZnO
Zincosite	-15.26	-11.33	3.93	ZnSO4
Zn(BO2)2	-13.07	-4.78	8.29	Zn(BO2)2
Zn(OH)2	-4.26	7.94	12.20	Zn(OH)2
Zn(OH)2(am)	-4.53	7.94	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.81	7.94	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.59	7.94	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.79	7.94	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.89	-3.39	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.67	3.52	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-20.32	-6.67	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-33.64	-14.72	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.91	12.49	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-23.51	14.99	38.50	Zn5(OH)8Cl2
ZnCl2	-23.83	-16.78	7.05	ZnCl2

ZnCO3:1H2O	-3.12	-13.38	-10.26	ZnCO3:1H2O
ZnF2	-15.81	-16.35	-0.53	ZnF2
Znmetal	-41.66	-15.87	25.79	Zn
ZnMoO4	-5.09	-15.22	-10.13	ZnMoO4
ZnO(active)	-3.25	7.94	11.19	ZnO
ZnSb	-81.99	-70.98	11.01	ZnSb
ZnSe	-20.68	-35.08	-14.40	ZnSe
ZnSeO4:6H2O	-19.46	-20.98	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.69	-11.33	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 13.

SOLUTION 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.86290
pe 4
redox pe
units mg/l
density 1
Alkalinity 44.99190 as HCO3
Al 0.00457
As 0.00034
B 0.00498
Ba 0.00905
Ca 24.11789
Cl 1.30010
Cu 0.00845
F 1.09342
Fe 0.00069
K 3.75232
Mg 3.96764
Mn 0.07221
Mo 0.00520
Na 2.41114 charge
S(6) 44.45388 as SO4
Sb 0.00012
Se 0.00031
U 0.00331
V 0.00104
Zn 0.00272
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 11. Average HCT data for biotite breccia - sulfide (ore)
(cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

-----Solution composition-----

Elements	Molality	Moles
Al	1.694e-07	1.694e-07
Alkalinity	7.374e-04	7.374e-04
As	4.539e-09	4.539e-09
B	4.607e-07	4.607e-07
Ba	6.591e-08	6.591e-08

Ca	6.018e-04	6.018e-04	
Cl	3.668e-05	3.668e-05	
Cu	1.330e-07	1.330e-07	
F	5.756e-05	5.756e-05	
Fe	1.236e-08	1.236e-08	
K	9.598e-05	9.598e-05	
Mg	1.633e-04	1.633e-04	
Mn	1.315e-06	1.315e-06	
Mo	5.421e-08	5.421e-08	
Na	1.275e-04	1.275e-04	Charge balance
S (6)	4.628e-04	4.628e-04	
Sb	9.858e-10	9.858e-10	
Se	3.927e-09	3.927e-09	
U	1.391e-08	1.391e-08	
V	2.042e-08	2.042e-08	
Zn	4.160e-08	4.160e-08	

-----Description of solution-----

pH	=	7.863
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	2.801e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	7.519e-04
Total CO2 (mol/kg)	=	7.519e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	-8.708e-19
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110144e+02
Total O	=	5.551094e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	7.786e-07	7.343e-07	-6.109	-6.134	-0.025	(0)
H+	1.453e-08	1.371e-08	-7.838	-7.863	-0.025	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.694e-07					
Al (OH) 4-	1.676e-07	1.582e-07	-6.776	-6.801	-0.025	(0)
Al (OH) 3	1.711e-09	1.711e-09	-8.767	-8.767	0.000	(0)
Al (OH) 2+	1.236e-10	1.168e-10	-9.908	-9.933	-0.025	(0)
AlF2+	3.266e-12	3.086e-12	-11.486	-11.511	-0.025	(0)
AlF3	2.071e-12	2.071e-12	-11.684	-11.684	0.000	(0)
AlOH+2	2.513e-13	2.002e-13	-12.600	-12.699	-0.099	(0)
AlF+2	1.825e-13	1.454e-13	-12.739	-12.838	-0.099	(0)
AlF4-	5.864e-14	5.535e-14	-13.232	-13.257	-0.025	(0)
AlSO4+	7.482e-16	7.063e-16	-15.126	-15.151	-0.025	(0)
Al+3	4.597e-16	2.726e-16	-15.338	-15.564	-0.227	(0)
Al (SO4) 2-	2.675e-18	2.526e-18	-17.573	-17.598	-0.025	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.708	-51.950	-0.243	(0)
As (3)	1.477e-20					
H3AsO3	1.420e-20	1.420e-20	-19.848	-19.848	0.000	(0)
H2AsO3-	5.653e-22	5.312e-22	-21.248	-21.275	-0.027	(0)
HAsO3-2	4.530e-26	3.533e-26	-25.344	-25.452	-0.108	(0)
H4AsO3+	1.027e-28	9.649e-29	-27.989	-28.016	-0.027	(0)
AsO3-3	1.738e-31	9.933e-32	-30.760	-31.003	-0.243	(0)
As (5)	4.539e-09					
HAsO4-2	4.111e-09	3.206e-09	-8.386	-8.494	-0.108	(0)
H2AsO4-	4.266e-10	4.009e-10	-9.370	-9.397	-0.027	(0)
AsO4-3	1.294e-12	7.394e-13	-11.888	-12.131	-0.243	(0)
H3AsO4	9.547e-16	9.553e-16	-15.020	-15.020	0.000	(0)
B	4.607e-07					
H3BO3	4.403e-07	4.406e-07	-6.356	-6.356	0.000	(0)
H2BO3-	1.981e-08	1.866e-08	-7.703	-7.729	-0.026	(0)

Ba	CaH2BO3+	5.061e-10	4.768e-10	-9.296	-9.322	-0.026	(0)
	MgH2BO3+	8.380e-11	7.896e-11	-10.077	-10.103	-0.026	(0)
	BF(OH) 3-	9.950e-12	9.375e-12	-11.002	-11.028	-0.026	(0)
	NaH2BO3	3.552e-12	3.552e-12	-11.450	-11.450	0.000	(0)
	BaH2BO3+	3.178e-14	2.994e-14	-13.498	-13.524	-0.026	(0)
	H5 (BO3) 2-	7.428e-15	6.999e-15	-14.129	-14.155	-0.026	(0)
	BF2 (OH) 2-	7.777e-16	7.327e-16	-15.109	-15.135	-0.026	(0)
	H8 (BO3) 3-	3.273e-19	3.084e-19	-18.485	-18.511	-0.026	(0)
	BF3OH-	2.212e-22	2.084e-22	-21.655	-21.681	-0.026	(0)
BF4-	7.959e-28	7.498e-28	-27.099	-27.125	-0.026	(0)	
Ba	6.591e-08						
	Ba+2	6.549e-08	5.192e-08	-7.184	-7.285	-0.101	(0)
	BaHCO3+	3.564e-10	3.369e-10	-9.448	-9.473	-0.024	(0)
	BaCO3	6.185e-11	6.185e-11	-10.209	-10.209	0.000	(0)
	BaOH+	1.762e-13	1.664e-13	-12.754	-12.779	-0.025	(0)
BaH2BO3+	3.178e-14	2.994e-14	-13.498	-13.524	-0.026	(0)	
C (4)	7.519e-04						
	HCO3-	7.191e-04	6.794e-04	-3.143	-3.168	-0.025	(0)
	H2CO3	2.095e-05	2.095e-05	-4.679	-4.679	0.000	(0)
	CaHCO3+	5.942e-06	5.617e-06	-5.226	-5.250	-0.024	(0)
	CO3-2	2.930e-06	2.323e-06	-5.533	-5.634	-0.101	(0)
	CaCO3	1.635e-06	1.635e-06	-5.787	-5.787	0.000	(0)
	MgHCO3+	8.991e-07	8.483e-07	-6.046	-6.071	-0.025	(0)
	MgCO3	2.357e-07	2.357e-07	-6.628	-6.628	0.000	(0)
	CuCO3	1.009e-07	1.009e-07	-6.996	-6.996	0.000	(0)
	NaHCO3	4.588e-08	4.588e-08	-7.338	-7.338	0.000	(0)
	MnHCO3+	1.387e-08	1.310e-08	-7.858	-7.883	-0.025	(0)
	UO2 (CO3) 2-2	1.102e-08	8.592e-09	-7.958	-8.066	-0.108	(0)
	NaCO3-	5.498e-09	5.194e-09	-8.260	-8.284	-0.025	(0)
	ZnCO3	3.521e-09	3.521e-09	-8.453	-8.453	0.000	(0)
	UO2 (CO3) 3-4	2.704e-09	1.000e-09	-8.568	-9.000	-0.432	(0)
	Cu (CO3) 2-2	8.086e-10	6.306e-10	-9.092	-9.200	-0.108	(0)
	ZnHCO3+	6.023e-10	5.660e-10	-9.220	-9.247	-0.027	(0)
	BaHCO3+	3.564e-10	3.369e-10	-9.448	-9.473	-0.024	(0)
	CuHCO3+	3.364e-10	3.161e-10	-9.473	-9.500	-0.027	(0)
UO2CO3	1.854e-10	1.854e-10	-9.732	-9.732	0.000	(0)	
BaCO3	6.185e-11	6.185e-11	-10.209	-10.209	0.000	(0)	
FeHCO3+	4.639e-13	4.385e-13	-12.334	-12.358	-0.024	(0)	
Ca	6.018e-04						
	Ca+2	5.600e-04	4.440e-04	-3.252	-3.353	-0.101	(0)
	CaSO4	3.395e-05	3.395e-05	-4.469	-4.469	0.000	(0)
	CaHCO3+	5.942e-06	5.617e-06	-5.226	-5.250	-0.024	(0)
	CaCO3	1.635e-06	1.635e-06	-5.787	-5.787	0.000	(0)
	CaF+	2.736e-07	2.584e-07	-6.563	-6.588	-0.025	(0)
	CaOH+	6.882e-09	6.505e-09	-8.162	-8.187	-0.024	(0)
CaH2BO3+	5.061e-10	4.768e-10	-9.296	-9.322	-0.026	(0)	
Cl	3.668e-05						
	Cl-	3.668e-05	3.461e-05	-4.436	-4.461	-0.025	(0)
	MnCl+	4.458e-11	4.211e-11	-10.351	-10.376	-0.025	(0)
	CuCl	1.574e-11	1.574e-11	-10.803	-10.803	0.000	(0)
	ZnCl+	2.427e-12	2.290e-12	-11.615	-11.640	-0.025	(0)
	ZnOHC1	2.202e-12	2.202e-12	-11.657	-11.657	0.000	(0)
	CuCl+	4.287e-13	4.045e-13	-12.368	-12.393	-0.025	(0)
	CuCl2-	1.206e-13	1.138e-13	-12.919	-12.944	-0.025	(0)
	MnCl2	2.058e-15	2.058e-15	-14.686	-14.686	0.000	(0)
	ZnCl2	1.256e-16	1.256e-16	-15.901	-15.901	0.000	(0)
	CuCl2	4.854e-18	4.854e-18	-17.314	-17.314	0.000	(0)
	UO2Cl+	1.197e-18	1.125e-18	-17.922	-17.949	-0.027	(0)
	CuCl3-2	1.058e-18	8.419e-19	-17.975	-18.075	-0.099	(0)
	MnCl3-	2.077e-20	1.962e-20	-19.682	-19.707	-0.025	(0)
	ZnCl3-	3.660e-21	3.453e-21	-20.437	-20.462	-0.025	(0)
	FeCl+2	6.257e-23	4.978e-23	-22.204	-22.303	-0.099	(0)
	VOCl+	9.161e-24	8.609e-24	-23.038	-23.065	-0.027	(0)
	CuCl3-	1.662e-24	1.568e-24	-23.779	-23.805	-0.025	(0)
	ZnCl4-2	7.511e-26	5.975e-26	-25.124	-25.224	-0.099	(0)
	FeCl2+	8.148e-27	7.695e-27	-26.089	-26.114	-0.025	(0)
	CuCl4-2	3.418e-31	2.719e-31	-30.466	-30.566	-0.099	(0)
	FeCl3	2.663e-32	2.663e-32	-31.575	-31.575	0.000	(0)

UCl+3	0.000e+00	0.000e+00	-46.451	-46.694	-0.243	(0)
Cu (1)	4.002e-10					
Cu+	3.844e-10	3.612e-10	-9.415	-9.442	-0.027	(0)
CuCl	1.574e-11	1.574e-11	-10.803	-10.803	0.000	(0)
CuCl2-	1.206e-13	1.138e-13	-12.919	-12.944	-0.025	(0)
CuCl3-2	1.058e-18	8.419e-19	-17.975	-18.075	-0.099	(0)
Cu (2)	1.326e-07					
CuCO3	1.009e-07	1.009e-07	-6.996	-6.996	0.000	(0)
CuOH+	1.815e-08	1.713e-08	-7.741	-7.766	-0.025	(0)
Cu+2	9.302e-09	7.375e-09	-8.031	-8.132	-0.101	(0)
Cu (OH) 2	2.509e-09	2.509e-09	-8.600	-8.600	0.000	(0)
Cu (CO3) 2-2	8.086e-10	6.306e-10	-9.092	-9.200	-0.108	(0)
CuSO4	5.638e-10	5.638e-10	-9.249	-9.249	0.000	(0)
CuHCO3+	3.364e-10	3.161e-10	-9.473	-9.500	-0.027	(0)
CuF+	2.640e-11	2.481e-11	-10.578	-10.605	-0.027	(0)
Cu2 (OH) 2+2	9.446e-12	7.367e-12	-11.025	-11.133	-0.108	(0)
Cu (OH) 3-	4.022e-12	3.779e-12	-11.396	-11.423	-0.027	(0)
CuCl+	4.287e-13	4.045e-13	-12.368	-12.393	-0.025	(0)
Cu (OH) 4-2	2.801e-17	2.184e-17	-16.553	-16.661	-0.108	(0)
CuCl2	4.854e-18	4.854e-18	-17.314	-17.314	0.000	(0)
CuCl3-	1.662e-24	1.568e-24	-23.779	-23.805	-0.025	(0)
CuCl4-2	3.418e-31	2.719e-31	-30.466	-30.566	-0.099	(0)
F	5.756e-05					
F-	5.651e-05	5.332e-05	-4.248	-4.273	-0.025	(0)
MgF+	7.733e-07	7.300e-07	-6.112	-6.137	-0.025	(0)
CaF+	2.736e-07	2.584e-07	-6.563	-6.588	-0.025	(0)
NaF	4.040e-09	4.040e-09	-8.394	-8.394	0.000	(0)
MnF+	2.172e-09	2.051e-09	-8.663	-8.688	-0.025	(0)
HF	1.081e-09	1.081e-09	-8.966	-8.966	0.000	(0)
ZnF+	2.982e-11	2.803e-11	-10.525	-10.552	-0.027	(0)
CuF+	2.640e-11	2.481e-11	-10.578	-10.605	-0.027	(0)
BF (OH) 3-	9.950e-12	9.375e-12	-11.002	-11.028	-0.026	(0)
AlF2+	3.266e-12	3.086e-12	-11.486	-11.511	-0.025	(0)
AlF3	2.071e-12	2.071e-12	-11.684	-11.684	0.000	(0)
HF2-	2.324e-13	2.192e-13	-12.634	-12.659	-0.025	(0)
AlF+2	1.825e-13	1.454e-13	-12.739	-12.838	-0.099	(0)
UO2F+	1.570e-13	1.475e-13	-12.804	-12.831	-0.027	(0)
AlF4-	5.864e-14	5.535e-14	-13.232	-13.257	-0.025	(0)
UO2F2	2.269e-14	2.269e-14	-13.644	-13.644	0.000	(0)
BF2 (OH) 2-	7.777e-16	7.327e-16	-15.109	-15.135	-0.026	(0)
UO2F3-	3.234e-16	3.039e-16	-15.490	-15.517	-0.027	(0)
VO2F	5.514e-18	5.514e-18	-17.259	-17.259	0.000	(0)
FeF2+	4.207e-18	3.973e-18	-17.376	-17.401	-0.025	(0)
FeF+2	3.500e-18	2.785e-18	-17.456	-17.555	-0.099	(0)
H2F2	3.133e-18	3.133e-18	-17.504	-17.504	0.000	(0)
FeF3	2.989e-19	2.989e-19	-18.524	-18.524	0.000	(0)
UO2F4-2	1.650e-19	1.287e-19	-18.782	-18.890	-0.108	(0)
VO2F2-	1.136e-19	1.067e-19	-18.945	-18.972	-0.027	(0)
VOF+	3.018e-20	2.836e-20	-19.520	-19.547	-0.027	(0)
VOF2	5.670e-22	5.670e-22	-21.246	-21.246	0.000	(0)
BF3OH-	2.212e-22	2.084e-22	-21.655	-21.681	-0.026	(0)
VO2F3-2	9.104e-23	7.100e-23	-22.041	-22.149	-0.108	(0)
VOF3-	1.141e-24	1.073e-24	-23.943	-23.970	-0.027	(0)
Sb (OH) 2F	6.507e-26	6.507e-26	-25.187	-25.187	0.000	(0)
SbOF	6.399e-26	6.399e-26	-25.194	-25.194	0.000	(0)
VO2F4-3	3.259e-27	1.863e-27	-26.487	-26.730	-0.243	(0)
BF4-	7.959e-28	7.498e-28	-27.099	-27.125	-0.026	(0)
VOF4-2	2.960e-28	2.309e-28	-27.529	-27.637	-0.108	(0)
UF3+	7.484e-36	7.033e-36	-35.126	-35.153	-0.027	(0)
UF2+2	1.067e-36	8.322e-37	-35.972	-36.080	-0.108	(0)
UF4	4.112e-38	4.112e-38	-37.386	-37.386	0.000	(0)
UF+3	2.169e-39	1.240e-39	-38.664	-38.907	-0.243	(0)
UF5-	0.000e+00	0.000e+00	-40.034	-40.061	-0.027	(0)
UF6-2	0.000e+00	0.000e+00	-41.746	-41.854	-0.108	(0)
Fe (2)	7.200e-11					
Fe+2	6.574e-11	5.127e-11	-10.182	-10.290	-0.108	(0)
FeSO4	4.200e-12	4.200e-12	-11.377	-11.377	0.000	(0)
FeOH+	1.587e-12	1.499e-12	-11.799	-11.824	-0.025	(0)

FeHCO3+	4.639e-13	4.385e-13	-12.334	-12.358	-0.024	(0)
Fe (OH) 2	8.743e-16	8.743e-16	-15.058	-15.058	0.000	(0)
Fe (OH) 3-	2.150e-16	2.030e-16	-15.668	-15.692	-0.025	(0)
Fe (3)	1.228e-08					
Fe (OH) 2+	6.829e-09	6.451e-09	-8.166	-8.190	-0.025	(0)
Fe (OH) 3	5.088e-09	5.088e-09	-8.293	-8.293	0.000	(0)
Fe (OH) 4-	3.682e-10	3.479e-10	-9.434	-9.459	-0.025	(0)
FeOH+2	2.839e-14	2.258e-14	-13.547	-13.646	-0.099	(0)
FeF2+	4.207e-18	3.973e-18	-17.376	-17.401	-0.025	(0)
FeF+2	3.500e-18	2.785e-18	-17.456	-17.555	-0.099	(0)
FeF3	2.989e-19	2.989e-19	-18.524	-18.524	0.000	(0)
FeSO4+	1.888e-19	1.784e-19	-18.724	-18.749	-0.025	(0)
Fe+3	8.031e-20	4.763e-20	-19.095	-19.322	-0.227	(0)
Fe (SO4) 2-	1.354e-21	1.272e-21	-20.868	-20.895	-0.027	(0)
FeCl+2	6.257e-23	4.978e-23	-22.204	-22.303	-0.099	(0)
FeHSeO3+2	4.411e-25	3.440e-25	-24.355	-24.463	-0.108	(0)
Fe2 (OH) 2+4	4.565e-26	1.689e-26	-25.341	-25.772	-0.432	(0)
FeCl2+	8.148e-27	7.695e-27	-26.089	-26.114	-0.025	(0)
FeCl3	2.663e-32	2.663e-32	-31.575	-31.575	0.000	(0)
Fe3 (OH) 4+5	7.447e-33	1.575e-33	-32.128	-32.803	-0.675	(0)
H (0)	2.660e-27					
H2	1.330e-27	1.331e-27	-26.876	-26.876	0.000	(0)
K	9.598e-05					
K+	9.576e-05	9.036e-05	-4.019	-4.044	-0.025	(0)
KSO4-	2.260e-07	2.135e-07	-6.646	-6.671	-0.025	(0)
Mg	1.633e-04					
Mg+2	1.539e-04	1.220e-04	-3.813	-3.914	-0.101	(0)
MgSO4	7.410e-06	7.410e-06	-5.130	-5.130	0.000	(0)
MgHCO3+	8.991e-07	8.483e-07	-6.046	-6.071	-0.025	(0)
MgF+	7.733e-07	7.300e-07	-6.112	-6.137	-0.025	(0)
MgCO3	2.357e-07	2.357e-07	-6.628	-6.628	0.000	(0)
MgOH+	3.772e-08	3.567e-08	-7.423	-7.448	-0.024	(0)
MgH2BO3+	8.380e-11	7.896e-11	-10.077	-10.103	-0.026	(0)
Mn (2)	1.315e-06					
Mn+2	1.239e-06	9.665e-07	-5.907	-6.015	-0.108	(0)
MnSO4	5.735e-08	5.735e-08	-7.241	-7.241	0.000	(0)
MnHCO3+	1.387e-08	1.310e-08	-7.858	-7.883	-0.025	(0)
MnF+	2.172e-09	2.051e-09	-8.663	-8.688	-0.025	(0)
MnOH+	1.888e-09	1.783e-09	-8.724	-8.749	-0.025	(0)
MnCl+	4.458e-11	4.211e-11	-10.351	-10.376	-0.025	(0)
MnCl2	2.058e-15	2.058e-15	-14.686	-14.686	0.000	(0)
MnSeO4	1.357e-17	1.357e-17	-16.867	-16.867	0.000	(0)
Mn (OH) 3-	6.290e-18	5.941e-18	-17.201	-17.226	-0.025	(0)
MnCl3-	2.077e-20	1.962e-20	-19.682	-19.707	-0.025	(0)
Mn (OH) 4-2	1.770e-23	1.408e-23	-22.752	-22.851	-0.099	(0)
MnSe	3.823e-39	3.823e-39	-38.418	-38.418	0.000	(0)
Mn (3)	7.279e-28					
Mn+3	7.279e-28	4.317e-28	-27.138	-27.365	-0.227	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.434	-45.534	-0.099	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.880	-50.906	-0.026	(0)
Mo	5.421e-08					
MoO4-2	5.419e-08	4.297e-08	-7.266	-7.367	-0.101	(0)
HMoO4-	1.247e-11	1.172e-11	-10.904	-10.931	-0.027	(0)
H2MoO4	1.177e-15	1.177e-15	-14.929	-14.929	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.708	-51.950	-0.243	(0)
Mo7O24-6	0.000e+00	0.000e+00	-60.509	-61.481	-0.972	(0)
HMo7O24-5	0.000e+00	0.000e+00	-62.283	-62.957	-0.675	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-65.606	-66.038	-0.432	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-70.412	-70.655	-0.243	(0)
Na	1.275e-04					
Na+	1.273e-04	1.201e-04	-3.895	-3.921	-0.025	(0)
NaSO4-	2.278e-07	2.152e-07	-6.642	-6.667	-0.025	(0)
NaHCO3	4.588e-08	4.588e-08	-7.338	-7.338	0.000	(0)
NaCO3-	5.498e-09	5.194e-09	-8.260	-8.284	-0.025	(0)
NaF	4.040e-09	4.040e-09	-8.394	-8.394	0.000	(0)
NaH2BO3	3.552e-12	3.552e-12	-11.450	-11.450	0.000	(0)

O (0)	5.718e-39					
O2	2.859e-39	2.861e-39	-38.544	-38.544	0.000	(0)
S (6)	4.628e-04					
SO4-2	4.209e-04	3.337e-04	-3.376	-3.477	-0.101	(0)
CaSO4	3.395e-05	3.395e-05	-4.469	-4.469	0.000	(0)
MgSO4	7.410e-06	7.410e-06	-5.130	-5.130	0.000	(0)
NaSO4-	2.278e-07	2.152e-07	-6.642	-6.667	-0.025	(0)
KSO4-	2.260e-07	2.135e-07	-6.646	-6.671	-0.025	(0)
MnSO4	5.735e-08	5.735e-08	-7.241	-7.241	0.000	(0)
ZnSO4	1.923e-09	1.923e-09	-8.716	-8.716	0.000	(0)
CuSO4	5.638e-10	5.638e-10	-9.249	-9.249	0.000	(0)
HSO4-	4.737e-10	4.472e-10	-9.324	-9.350	-0.025	(0)
Zn (SO4) 2-2	7.168e-12	5.591e-12	-11.145	-11.253	-0.108	(0)
FeSO4	4.200e-12	4.200e-12	-11.377	-11.377	0.000	(0)
UO2SO4	1.013e-14	1.013e-14	-13.995	-13.995	0.000	(0)
AlSO4+	7.482e-16	7.063e-16	-15.126	-15.151	-0.025	(0)
UO2 (SO4) 2-2	5.712e-17	4.455e-17	-16.243	-16.351	-0.108	(0)
Al (SO4) 2-	2.675e-18	2.526e-18	-17.573	-17.598	-0.025	(0)
VO2SO4-	5.000e-19	4.699e-19	-18.301	-18.328	-0.027	(0)
FeSO4+	1.888e-19	1.784e-19	-18.724	-18.749	-0.025	(0)
VOSO4	8.151e-21	8.151e-21	-20.089	-20.089	0.000	(0)
Fe (SO4) 2-	1.354e-21	1.272e-21	-20.868	-20.895	-0.027	(0)
VSO4+	1.388e-34	1.304e-34	-33.858	-33.885	-0.027	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.387	-40.387	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.702	-40.810	-0.108	(0)
Sb (3)	1.126e-19					
Sb (OH) 3	5.697e-20	5.697e-20	-19.244	-19.244	0.000	(0)
HSbO2	5.561e-20	5.561e-20	-19.255	-19.255	0.000	(0)
SbO2-	6.990e-24	6.569e-24	-23.156	-23.183	-0.027	(0)
Sb (OH) 4-	4.005e-24	3.764e-24	-23.397	-23.424	-0.027	(0)
Sb (OH) 2F	6.507e-26	6.507e-26	-25.187	-25.187	0.000	(0)
SbOF	6.399e-26	6.399e-26	-25.194	-25.194	0.000	(0)
Sb (OH) 2+	2.019e-26	1.897e-26	-25.695	-25.722	-0.027	(0)
SbO+	6.960e-27	6.540e-27	-26.157	-26.184	-0.027	(0)
Sb (5)	9.858e-10					
SbO3-	9.846e-10	9.253e-10	-9.007	-9.034	-0.027	(0)
Sb (OH) 6-	1.147e-12	1.082e-12	-11.940	-11.966	-0.025	(0)
SbO2+	5.310e-26	4.990e-26	-25.275	-25.302	-0.027	(0)
Se (-2)	1.401e-35					
HSe-	1.401e-35	1.316e-35	-34.854	-34.881	-0.027	(0)
MnSe	3.823e-39	3.823e-39	-38.418	-38.418	0.000	(0)
H2Se	1.401e-39	1.401e-39	-38.854	-38.854	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.910	-42.018	-0.108	(0)
Se (4)	3.926e-09					
HSeO3-	2.909e-09	2.734e-09	-8.536	-8.563	-0.027	(0)
SeO3-2	1.018e-09	7.936e-10	-8.992	-9.100	-0.108	(0)
H2SeO3	1.599e-14	1.599e-14	-13.796	-13.796	0.000	(0)
FeHSeO3+2	4.411e-25	3.440e-25	-24.355	-24.463	-0.108	(0)
Se (6)	6.582e-14					
SeO4-2	6.580e-14	5.217e-14	-13.182	-13.283	-0.101	(0)
MnSeO4	1.357e-17	1.357e-17	-16.867	-16.867	0.000	(0)
ZnSeO4	2.129e-19	2.129e-19	-18.672	-18.672	0.000	(0)
HSeO4-	3.815e-20	3.585e-20	-19.419	-19.445	-0.027	(0)
Zn (SeO4) 2-2	1.444e-32	1.126e-32	-31.841	-31.948	-0.108	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.487	-56.730	-0.243	(0)
U (4)	1.941e-18					
U (OH) 5-	1.940e-18	1.823e-18	-17.712	-17.739	-0.027	(0)
U (OH) 4	1.047e-21	1.047e-21	-20.980	-20.980	0.000	(0)
U (OH) 3+	5.586e-26	5.250e-26	-25.253	-25.280	-0.027	(0)
U (OH) 2+2	4.268e-31	3.328e-31	-30.370	-30.478	-0.108	(0)
UF3+	7.484e-36	7.033e-36	-35.126	-35.153	-0.027	(0)
UF2+2	1.067e-36	8.322e-37	-35.972	-36.080	-0.108	(0)
UOH+3	3.761e-37	2.150e-37	-36.425	-36.668	-0.243	(0)
UF4	4.112e-38	4.112e-38	-37.386	-37.386	0.000	(0)
UF+3	2.169e-39	1.240e-39	-38.664	-38.907	-0.243	(0)
UF5-	0.000e+00	0.000e+00	-40.034	-40.061	-0.027	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.387	-40.387	0.000	(0)

USO4+2	0.000e+00	0.000e+00	-40.702	-40.810	-0.108	(0)
UF6-2	0.000e+00	0.000e+00	-41.746	-41.854	-0.108	(0)
U+4	0.000e+00	0.000e+00	-43.502	-43.934	-0.432	(0)
UC1+3	0.000e+00	0.000e+00	-46.451	-46.694	-0.243	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-160.627	-162.813	-2.186	(0)
U(5)	1.300e-15					
UO2+	1.300e-15	1.222e-15	-14.886	-14.913	-0.027	(0)
U(6)	1.391e-08					
UO2(CO3) 2-2	1.102e-08	8.592e-09	-7.958	-8.066	-0.108	(0)
UO2(CO3) 3-4	2.704e-09	1.000e-09	-8.568	-9.000	-0.432	(0)
UO2CO3	1.854e-10	1.854e-10	-9.732	-9.732	0.000	(0)
UO2OH+	1.972e-12	1.853e-12	-11.705	-11.732	-0.027	(0)
UO2F+	1.570e-13	1.475e-13	-12.804	-12.831	-0.027	(0)
UO2+2	2.529e-14	2.005e-14	-13.597	-13.698	-0.101	(0)
UO2F2	2.269e-14	2.269e-14	-13.644	-13.644	0.000	(0)
UO2SO4	1.013e-14	1.013e-14	-13.995	-13.995	0.000	(0)
UO2F3-	3.234e-16	3.039e-16	-15.490	-15.517	-0.027	(0)
UO2(SO4) 2-2	5.712e-17	4.455e-17	-16.243	-16.351	-0.108	(0)
(UO2) 2(OH) 2+2	7.308e-18	5.700e-18	-17.136	-17.244	-0.108	(0)
(UO2) 3(OH) 5+	4.598e-18	4.320e-18	-17.337	-17.364	-0.027	(0)
UO2Cl+	1.197e-18	1.125e-18	-17.922	-17.949	-0.027	(0)
UO2F4-2	1.650e-19	1.287e-19	-18.782	-18.890	-0.108	(0)
V(2)	1.025e-40					
VOH+	1.025e-40	0.000e+00	-39.989	-40.016	-0.027	(0)
V+2	0.000e+00	0.000e+00	-41.284	-41.392	-0.108	(0)
V(3)	2.645e-13					
V(OH) 3	2.645e-13	2.645e-13	-12.578	-12.578	0.000	(0)
V(OH) 2+	2.493e-24	2.343e-24	-23.603	-23.630	-0.027	(0)
VOH+2	3.907e-28	3.047e-28	-27.408	-27.516	-0.108	(0)
V+3	1.449e-33	8.280e-34	-32.839	-33.082	-0.243	(0)
VSO4+	1.388e-34	1.304e-34	-33.858	-33.885	-0.027	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-52.451	-52.694	-0.243	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-53.800	-54.232	-0.432	(0)
V(4)	1.398e-17					
V(OH) 3+	1.382e-17	1.299e-17	-16.859	-16.886	-0.027	(0)
VO+2	1.137e-19	8.868e-20	-18.944	-19.052	-0.108	(0)
VOF+	3.018e-20	2.836e-20	-19.520	-19.547	-0.027	(0)
VOSO4	8.151e-21	8.151e-21	-20.089	-20.089	0.000	(0)
VOF2	5.670e-22	5.670e-22	-21.246	-21.246	0.000	(0)
VOC1+	9.161e-24	8.609e-24	-23.038	-23.065	-0.027	(0)
VOF3-	1.141e-24	1.073e-24	-23.943	-23.970	-0.027	(0)
VOF4-2	2.960e-28	2.309e-28	-27.529	-27.637	-0.108	(0)
H2V2O4+2	1.085e-29	8.460e-30	-28.965	-29.073	-0.108	(0)
V(5)	2.042e-08					
H2VO4-	1.672e-08	1.572e-08	-7.777	-7.804	-0.027	(0)
HVO4-2	3.692e-09	2.879e-09	-8.433	-8.541	-0.108	(0)
H3VO4	2.155e-12	2.155e-12	-11.667	-11.667	0.000	(0)
H3V2O7-	2.327e-13	2.187e-13	-12.633	-12.660	-0.027	(0)
HV2O7-3	2.683e-14	1.533e-14	-13.571	-13.814	-0.243	(0)
VO4-3	1.841e-15	1.052e-15	-14.735	-14.978	-0.243	(0)
V2O7-4	8.136e-17	3.010e-17	-16.090	-16.521	-0.432	(0)
VO2+	6.249e-17	5.896e-17	-16.204	-16.229	-0.025	(0)
V3O9-3	7.113e-18	4.065e-18	-17.148	-17.391	-0.243	(0)
VO2F	5.514e-18	5.514e-18	-17.259	-17.259	0.000	(0)
VO2SO4-	5.000e-19	4.699e-19	-18.301	-18.328	-0.027	(0)
VO2F2-	1.136e-19	1.067e-19	-18.945	-18.972	-0.027	(0)
VO2F3-2	9.104e-23	7.100e-23	-22.041	-22.149	-0.108	(0)
V4O12-4	7.200e-23	2.664e-23	-22.143	-22.575	-0.432	(0)
VO2F4-3	3.259e-27	1.863e-27	-26.487	-26.730	-0.243	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.584	-60.258	-0.675	(0)
V10O28-6	0.000e+00	0.000e+00	-59.610	-60.582	-0.972	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.482	-62.914	-0.432	(0)
Zn	4.160e-08					
Zn+2	3.323e-08	2.634e-08	-7.478	-7.579	-0.101	(0)
ZnCO3	3.521e-09	3.521e-09	-8.453	-8.453	0.000	(0)
ZnOH+	2.059e-09	1.935e-09	-8.686	-8.713	-0.027	(0)
ZnSO4	1.923e-09	1.923e-09	-8.716	-8.716	0.000	(0)
ZnHCO3+	6.023e-10	5.660e-10	-9.220	-9.247	-0.027	(0)

Zn(OH) 2	2.251e-10	2.251e-10	-9.648	-9.648	0.000	(0)
ZnF+	2.982e-11	2.803e-11	-10.525	-10.552	-0.027	(0)
Zn(SO4) 2-2	7.168e-12	5.591e-12	-11.145	-11.253	-0.108	(0)
ZnCl+	2.427e-12	2.290e-12	-11.615	-11.640	-0.025	(0)
ZnOHCl	2.202e-12	2.202e-12	-11.657	-11.657	0.000	(0)
Zn(OH) 3-	8.817e-13	8.286e-13	-12.055	-12.082	-0.027	(0)
ZnCl2	1.256e-16	1.256e-16	-15.901	-15.901	0.000	(0)
Zn(OH) 4-2	3.106e-17	2.422e-17	-16.508	-16.616	-0.108	(0)
ZnSeO4	2.129e-19	2.129e-19	-18.672	-18.672	0.000	(0)
ZnCl3-	3.660e-21	3.453e-21	-20.437	-20.462	-0.025	(0)
ZnCl4-2	7.511e-26	5.975e-26	-25.124	-25.224	-0.099	(0)
Zn(SeO4) 2-2	1.444e-32	1.126e-32	-31.841	-31.948	-0.108	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH) 3 (am)	-2.78	8.02	10.80	Al(OH) 3
Al2(MoO4) 3	-55.60	-53.23	2.37	Al2(MoO4) 3
Al2O3	-3.60	16.05	19.65	Al2O3
Al4(OH) 10SO4	-9.81	12.89	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-11.80	-7.00	4.80	AlAsO4:2H2O
AlOHSO4	-7.95	-11.18	-3.23	AlOHSO4
AlSb	-148.02	-82.40	65.62	AlSb
Alunite	-9.11	-10.51	-1.40	KAl3(SO4) 2 (OH) 6
Anhydrite	-2.47	-6.83	-4.36	CaSO4
Antlerite	-5.21	3.58	8.79	Cu3(OH) 4SO4
Aragonite	-0.69	-8.99	-8.30	CaCO3
Arsenolite	-76.63	-79.39	-2.76	As4O6
Artinite	-7.34	2.26	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-36.75	-30.04	6.71	As2O5
Atacamite	-4.53	2.86	7.39	Cu2(OH) 3Cl
Azurite	-3.03	-19.94	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-15.95	8.44	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-15.72	0.15	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	4.19	-4.72	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-24.35	8.59	32.94	Ba3(VO4) 2:4H2O
BaF2	-10.01	-15.83	-5.82	BaF2
BaMoO4	-7.69	-14.65	-6.96	BaMoO4
Barite	-0.78	-10.76	-9.98	BaSO4
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-13.11	-20.57	-7.46	BaSeO4
Bianchite	-9.29	-11.06	-1.76	ZnSO4:6H2O
Birnessite	-10.00	8.09	18.09	MnO2
Bixbyite	-6.91	-7.55	-0.64	Mn2O3
Boehmite	-0.55	8.02	8.58	AlOOH
Brochantite	-4.05	11.17	15.22	Cu4(OH) 6SO4
Brucite	-5.03	11.81	16.84	Mg(OH) 2
Ca(VO3) 2	-10.02	-4.36	5.66	Ca(VO3) 2
Ca2V2O7	-9.49	8.01	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.54	8.01	21.55	Ca2V2O7:2H2O
Ca3(AsO4) 2:4H2O	-15.22	7.08	22.30	Ca3(AsO4) 2:4H2O
Ca3(VO4) 2	-18.57	20.39	38.96	Ca3(VO4) 2
Ca3(VO4) 2:4H2O	-19.47	20.39	39.86	Ca3(VO4) 2:4H2O
Ca3Sb2	-286.70	-143.72	142.97	Ca3Sb2
Calcite	-0.51	-8.99	-8.48	CaCO3
CaMoO4	-2.77	-10.72	-7.95	CaMoO4
Carnotite	-2.75	-2.52	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.05	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.62	-16.64	-3.02	CaSeO4:2H2O
CH4(g)	-75.22	-116.26	-41.05	CH4
Chalcanthite	-8.97	-11.61	-2.64	CuSO4:5H2O
Claudetite	-76.33	-79.39	-3.06	As4O6
CO2(g)	-3.21	-21.36	-18.15	CO2
Cryolite	-19.12	-52.96	-33.84	Na3AlF6
Cu(OH) 2	-1.08	7.59	8.67	Cu(OH) 2
Cu(SbO3) 2	-28.65	16.56	45.21	Cu(SbO3) 2
Cu2Sb:3H2O	-49.52	-84.41	-34.88	Cu2Sb:3H2O

Cu ₂ Se (alpha)	-0.10	-45.90	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-20.41	-22.36	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-13.36	-7.26	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-52.57	-95.16	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-17.56	-81.05	-63.49	Cu ₃ Se ₂
CuCO ₃	-2.27	-13.77	-11.50	CuCO ₃
CuF	-8.81	-13.72	-4.91	CuF
CuF ₂	-17.79	-16.68	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-12.13	-16.68	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-4.69	-13.44	-8.76	Cu
CuMoO ₄	-2.42	-15.50	-13.08	CuMoO ₄
CuOCuSO ₄	-14.32	-4.02	10.30	CuOCuSO ₄
Cupricferrite	10.14	16.13	5.99	CuFe ₂ O ₄
Cuprite	-1.75	-3.16	-1.41	Cu ₂ O
Cuprousferrite	11.60	2.69	-8.92	CuFeO ₂
CuSe	-2.05	-35.15	-33.10	CuSe
CuSe ₂	-20.80	-54.17	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-9.34	-8.83	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-18.97	-21.41	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-14.55	-11.61	2.94	CuSO ₄
Diaspore	1.15	8.02	6.87	AlOOH
Dolomite (disordered)	-1.99	-18.53	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	-1.44	-18.53	-17.09	CaMg (CO ₃) ₂
Epsomite	-5.26	-7.39	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-8.13	5.44	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl ₂ ·3	3.61	0.57	-3.04	Fe (OH) ₂ ·7Cl ₂ ·3
Fe (VO ₃) ₂	-7.58	-11.30	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.45	-7.89	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-20.12	-40.75	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-45.34	-49.07	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-6.25	13.97	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-11.15	-10.75	0.40	FeAsO ₄ ·2H ₂ O
FeMoO ₄	-7.57	-17.66	-10.09	FeMoO ₄
Ferrihydrite	1.08	4.27	3.19	Fe (OH) ₃
Ferroselite	-37.73	-56.33	-18.60	FeSe ₂
FeSe	-26.31	-37.31	-11.00	FeSe
Fluorite	-1.40	-11.90	-10.50	CaF ₂
Gibbsite	-0.27	8.02	8.29	Al (OH) ₃
Goethite	3.78	4.27	0.49	FeOOH
Goslarite	-9.04	-11.06	-2.01	ZnSO ₄ ·7H ₂ O
Gummite	-5.64	2.03	7.67	UO ₃
Gypsum	-2.22	-6.83	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-13.51	-25.61	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-10.22	-23.09	-12.88	H ₂ MoO ₄
H ₂ Se (g)	-37.78	-42.74	-4.96	H ₂ Se
Halite	-9.98	-8.38	1.60	NaCl
Hausmannite	-8.17	52.86	61.03	Mn ₃ O ₄
Hematite	9.95	8.53	-1.42	Fe ₂ O ₃
Hercynite	-1.41	21.48	22.89	FeAl ₂ O ₄
Huntite	-7.66	-37.63	-29.97	CaMg ₃ (CO ₃) ₄
Hydromagnesite	-17.61	-26.38	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-21.39	-26.56	-5.17	KAl (SO ₄) ₂ ·12H ₂ O
K-Jarosite	-6.99	-21.79	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ MoO ₄	-18.72	-15.45	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-20.64	-21.37	-0.73	K ₂ SeO ₄
Langite	-6.32	11.17	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Lepidocrocite	2.90	4.27	1.37	FeOOH
Lime	-20.33	12.37	32.70	CaO
Maghemite	2.15	8.53	6.39	Fe ₂ O ₃
Magnesioferrite	3.49	20.35	16.86	Fe ₂ MgO ₄
Magnesite	-2.09	-9.55	-7.46	MgCO ₃
Magnetite	10.57	13.97	3.40	Fe ₃ O ₄
Malachite	-0.87	-6.17	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-3.77	21.57	25.34	MnOOH
Melanothallite	-23.31	-17.05	6.26	CuCl ₂
Melanterite	-11.56	-13.77	-2.21	FeSO ₄ ·7H ₂ O
Mg (OH) ₂ (active)	-6.98	11.81	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-16.20	-4.92	11.28	Mg (VO ₃) ₂

Mg2Sb3	-263.01	-188.33	74.68	Mg2Sb3
Mg2V2O7	-19.47	6.89	26.36	Mg2V2O7
MgF2	-4.33	-12.46	-8.13	MgF2
MgMoO4	-9.43	-11.28	-1.85	MgMoO4
MgSeO3:6H2O	-7.67	-4.61	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.00	-17.20	-1.20	MgSeO4:6H2O
Mirabilite	-10.20	-11.32	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.92	-7.02	4.90	Mn(VO3)2
Mn2(SO4)3	-59.45	-65.16	-5.71	Mn2(SO4)3
Mn2Sb	-143.94	-82.86	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.41	-0.91	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.65	-14.94	2.72	MnCl2:4H2O
MnSb	-91.29	-94.20	-2.91	MnSb
MnSe	-36.53	-33.03	3.50	MnSe
MnSeO3	-7.85	-6.72	1.13	MnSeO3
MnSeO3:2H2O	-7.70	-6.72	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.25	-19.30	-2.05	MnSeO4:5H2O
MnSO4	-12.07	-9.49	2.58	MnSO4
MoO3	-15.09	-23.09	-8.00	MoO3
Na-Jarosite	-10.46	-21.66	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-21.70	-38.30	-16.60	Na2Mo2O7
Na2MoO4	-16.70	-15.21	1.49	Na2MoO4
Na2MoO4:2H2O	-16.43	-15.21	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.84	-8.54	10.30	Na2SeO3:5H2O
Na2SeO4	-22.40	-21.12	1.28	Na2SeO4
Na3Sb	-173.05	-78.59	94.45	Na3Sb
Na3VO4	-33.22	3.46	36.68	Na3VO4
Na4V2O7	-38.36	-0.96	37.40	Na4V2O7
Nantokite	-7.17	-13.90	-6.73	CuCl
NaSb	-85.92	-62.75	23.17	NaSb
Natron	-12.16	-13.48	-1.31	Na2CO3:10H2O
NaVO3	-8.28	-4.42	3.86	NaVO3
Nesquehonite	-4.88	-9.55	-4.67	MgCO3:3H2O
Nsutite	-9.42	8.09	17.50	MnO2
O2(g)	-35.64	47.45	83.09	O2
Periclase	-9.77	11.81	21.58	MgO
Portlandite	-10.43	12.37	22.80	Ca(OH)2
Pyrochroite	-5.48	9.71	15.19	Mn(OH)2
Pyrolusite	-7.94	33.44	41.38	MnO2
Rhodochrosite	-1.07	-11.65	-10.58	MnCO3
Rutherfordine	-4.83	-19.33	-14.50	UO2CO3
Sb(OH)3	-12.13	-19.24	-7.11	Sb(OH)3
Sb2O4	-18.16	-14.76	3.40	Sb2O4
Sb2O5	-29.99	-39.66	-9.67	Sb2O5
Sb2Se3	-98.96	-166.72	-67.76	Sb2Se3
Sb4O6(cubic)	-58.72	-76.98	-18.26	Sb4O6
Sb4O6(orth)	-59.08	-76.98	-17.90	Sb4O6
SbCl3	-56.79	-56.22	0.57	SbCl3
SbF3	-45.43	-55.65	-10.23	SbF3
Sbmetal	-43.14	-54.83	-11.69	Sb
SbO2	-3.87	-31.69	-27.82	SbO2
Schoepite	-3.97	2.03	5.99	UO2(OH)2:H2O
Semetal(am)	-11.91	-19.02	-7.11	Se
Semetal(hex)	-11.31	-19.02	-7.71	Se
Senarmontite	-26.12	-38.49	-12.37	Sb2O3
SeO2	-16.55	-16.43	0.12	SeO2
SeO3	-50.05	-29.01	21.04	SeO3
Siderite	-5.68	-15.92	-10.24	FeCO3
Smithsonite	-3.21	-13.21	-10.00	ZnCO3
Spinel	-8.99	27.86	36.85	MgAl2O4
Tenorite	-0.05	7.59	7.64	CuO
Thenardite	-11.64	-11.32	0.32	Na2SO4
Thermonatrite	-14.11	-13.48	0.64	Na2CO3:H2O
Tyuyamunite	-4.38	-0.30	4.08	Ca(UO2)2(VO4)2
U3O8	-11.08	10.01	21.08	U3O8
U3Sb4	-551.52	-399.13	152.38	U3Sb4
U4O9	-23.18	-26.20	-3.02	U4O9
UF4	-31.49	-61.03	-29.54	UF4

UF4:2.5H2O	-28.31	-61.03	-32.72	UF4:2.5H2O
UO2 (am)	-13.42	-12.48	0.93	UO2
UO2 (OH) 2 (beta)	-3.58	2.03	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.73	-26.98	-2.25	UO2SeO4:4H2O
UO3	-5.67	2.03	7.70	UO3
Uraninite	-7.81	-12.48	-4.67	UO2
USb2	-208.39	-178.82	29.58	USb2
V (OH) 3	-17.08	-9.49	7.59	V (OH) 3
V2O5	-15.37	-16.73	-1.36	V2O5
V3O5	-35.54	-33.71	1.84	V3O5
V4O7	-44.22	-37.03	7.19	V4O7
V6O13	-36.79	-97.65	-60.86	V6O13
Valentinite	-30.01	-38.49	-8.48	Sb2O3
VC12	-64.88	-46.00	18.87	VC12
VC13	-69.90	-46.46	23.43	VC13
VF4	-66.80	-51.87	14.93	VF4
Vmetal	-89.11	-45.08	44.03	V
VO	-36.11	-21.36	14.76	VO
VO (OH) 2	-8.48	-3.33	5.15	VO (OH) 2
VO2Cl	-23.53	-20.69	2.84	VO2Cl
VOC1	-32.97	-21.82	11.15	VOC1
VOC12	-40.73	-27.97	12.76	VOC12
VOSO4	-26.14	-22.53	3.61	VOSO4
Witherite	-4.35	-12.92	-8.57	BaCO3
Zincite	-3.19	8.15	11.33	ZnO
Zincosite	-14.99	-11.06	3.93	ZnSO4
Zn (BO2) 2	-12.86	-4.57	8.29	Zn (BO2) 2
Zn (OH) 2	-4.05	8.15	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.33	8.15	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.61	8.15	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.39	8.15	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.59	8.15	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.41	-2.91	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.22	3.97	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.25	-5.60	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-32.88	-13.97	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.02	13.38	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-22.42	16.08	38.50	Zn5 (OH) 8Cl2
ZnCl2	-23.55	-16.50	7.05	ZnCl2
ZnCO3:1H2O	-2.95	-13.21	-10.26	ZnCO3:1H2O
ZnF2	-15.59	-16.13	-0.53	ZnF2
Znmetal	-41.37	-15.58	25.79	Zn
ZnMoO4	-4.82	-14.95	-10.13	ZnMoO4
ZnO (active)	-3.04	8.15	11.19	ZnO
ZnSb	-81.43	-70.41	11.01	ZnSb
ZnSe	-20.20	-34.60	-14.40	ZnSe
ZnSeO4:6H2O	-19.34	-20.86	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.42	-11.06	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 14.

SOLUTION 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

temp	25
pH	5.74453
pe	4
redox	pe
units	mg/l
density	1

Alkalinity 12.24514 as HCO3
 Al 0.03731
 B 0.00502
 Ba 0.03480
 Ca 6.31963
 Cd 0.00034
 Cl 0.71113
 Cu 0.38402
 F 0.43171
 Fe 0.00394
 Hg 0.000016
 K 1.83523
 Mg 0.97828
 Mn 0.01787
 Mo 0.00203
 Na 1.69417 charge
 Pb 0.00164
 S(6) 14.90873 as SO4
 Se 0.00025
 U 0.00462
 V 0.00050
 Zn 0.01538
 water 1 # kg

END

 Beginning of initial solution calculations.

Initial solution 12. Average HCT data for quartz monzonite - sulfide (waste)
 (cells 604673 and 605153)

-----Solution composition-----

Elements	Molality	Moles
Al	1.383e-06	1.383e-06
Alkalinity	2.007e-04	2.007e-04
B	4.644e-07	4.644e-07
Ba	2.534e-07	2.534e-07
Ca	1.577e-04	1.577e-04
Cd	3.025e-09	3.025e-09
Cl	2.006e-05	2.006e-05
Cu	6.043e-06	6.043e-06
F	2.272e-05	2.272e-05
Fe	7.055e-08	7.055e-08
Hg	7.977e-11	7.977e-11
K	4.694e-05	4.694e-05
Mg	4.025e-05	4.025e-05
Mn	3.253e-07	3.253e-07
Mo	2.116e-08	2.116e-08
Na	9.327e-05	9.327e-05
Pb	7.915e-09	7.915e-09
S(6)	1.552e-04	1.552e-04
Se	3.166e-09	3.166e-09
U	1.941e-08	1.941e-08
V	9.816e-09	9.816e-09
Zn	2.352e-07	2.352e-07
		Charge balance

-----Description of solution-----

pH	=	5.745
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	8.906e-04
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	9.917e-04
Total CO2 (mol/kg)	=	9.917e-04
Temperature (°C)	=	25.00

Electrical balance (eq) = -3.346e-19
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
Iterations = 14
Total H = 1.110155e+02
Total O = 5.551043e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.863e-06	1.801e-06	-5.730	-5.745	-0.015	0.00
OH-	5.784e-09	5.591e-09	-8.238	-8.252	-0.015	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.383e-06					
AlF2+	9.833e-07	9.511e-07	-6.007	-6.022	-0.014	(0)
AlF3	2.287e-07	2.287e-07	-6.641	-6.641	0.000	(0)
AlF+2	1.429e-07	1.251e-07	-6.845	-6.903	-0.058	(0)
Al (OH) 2+	1.681e-08	1.626e-08	-7.774	-7.789	-0.014	(0)
AlOH+2	4.183e-09	3.662e-09	-8.378	-8.436	-0.058	(0)
AlF4-	2.264e-09	2.189e-09	-8.645	-8.660	-0.015	(0)
Al (OH) 3	1.814e-09	1.814e-09	-8.741	-8.741	0.000	(0)
Al (OH) 4-	1.321e-09	1.277e-09	-8.879	-8.894	-0.015	(0)
Al+3	8.871e-10	6.549e-10	-9.052	-9.184	-0.132	(0)
AlSO4+	6.894e-10	6.667e-10	-9.162	-9.176	-0.015	(0)
Al (SO4) 2-	9.687e-13	9.367e-13	-12.014	-12.028	-0.015	(0)
AlMo6O21-3	9.907e-36	7.227e-36	-35.004	-35.141	-0.137	(0)
B	4.644e-07					
H3BO3	4.642e-07	4.643e-07	-6.333	-6.333	0.000	(0)
H2BO3-	1.550e-10	1.497e-10	-9.810	-9.825	-0.015	(0)
BF (OH) 3-	3.662e-12	3.539e-12	-11.436	-11.451	-0.015	(0)
CaH2BO3+	1.193e-12	1.153e-12	-11.923	-11.938	-0.015	(0)
MgH2BO3+	1.845e-13	1.782e-13	-12.734	-12.749	-0.015	(0)
NaH2BO3	2.138e-14	2.138e-14	-13.670	-13.670	0.000	(0)
BF2 (OH) 2-	1.347e-14	1.301e-14	-13.871	-13.886	-0.015	(0)
BaH2BO3+	1.059e-15	1.023e-15	-14.975	-14.990	-0.015	(0)
H5 (BO3) 2-	6.124e-17	5.918e-17	-16.213	-16.228	-0.015	(0)
BF3OH-	1.802e-19	1.741e-19	-18.744	-18.759	-0.015	(0)
H8 (BO3) 3-	2.844e-21	2.748e-21	-20.546	-20.561	-0.015	(0)
BF4-	3.050e-23	2.947e-23	-22.516	-22.531	-0.015	(0)
Ba	2.534e-07					
Ba+2	2.530e-07	2.211e-07	-6.597	-6.655	-0.059	(0)
BaHCO3+	4.253e-10	4.115e-10	-9.371	-9.386	-0.014	(0)
BaCO3	5.753e-13	5.753e-13	-12.240	-12.240	0.000	(0)
BaOH+	5.579e-15	5.396e-15	-14.253	-14.268	-0.015	(0)
BaH2BO3+	1.059e-15	1.023e-15	-14.975	-14.990	-0.015	(0)
C (4)	9.917e-04					
H2CO3	7.894e-04	7.894e-04	-3.103	-3.103	0.000	(0)
HCO3-	2.015e-04	1.949e-04	-3.696	-3.710	-0.014	(0)
CaHCO3+	5.020e-07	4.857e-07	-6.299	-6.314	-0.014	(0)
CuCO3	1.401e-07	1.401e-07	-6.853	-6.853	0.000	(0)
MgHCO3+	7.082e-08	6.847e-08	-7.150	-7.165	-0.015	(0)
CuHCO3+	5.973e-08	5.767e-08	-7.224	-7.239	-0.015	(0)
UO2CO3	1.422e-08	1.422e-08	-7.847	-7.847	0.000	(0)
NaHCO3	9.876e-09	9.876e-09	-8.005	-8.005	0.000	(0)
CO3-2	5.807e-09	5.074e-09	-8.236	-8.295	-0.059	(0)
UO2 (CO3) 2-2	1.657e-09	1.440e-09	-8.781	-8.842	-0.061	(0)
ZnHCO3+	1.272e-09	1.228e-09	-8.896	-8.911	-0.015	(0)
MnHCO3+	1.110e-09	1.073e-09	-8.955	-8.969	-0.015	(0)
CaCO3	1.076e-09	1.076e-09	-8.968	-8.968	0.000	(0)
PbHCO3+	8.538e-10	8.244e-10	-9.069	-9.084	-0.015	(0)
BaHCO3+	4.253e-10	4.115e-10	-9.371	-9.386	-0.014	(0)
FeHCO3+	1.500e-10	1.451e-10	-9.824	-9.838	-0.014	(0)
MgCO3	1.449e-10	1.449e-10	-9.839	-9.839	0.000	(0)
PbCO3	8.682e-11	8.682e-11	-10.061	-10.061	0.000	(0)
ZnCO3	5.816e-11	5.816e-11	-10.235	-10.235	0.000	(0)
NaCO3-	8.801e-12	8.513e-12	-11.055	-11.070	-0.014	(0)
Cu (CO3) 2-2	2.202e-12	1.914e-12	-11.657	-11.718	-0.061	(0)

	CdHCO3+	1.180e-12	1.139e-12	-11.928	-11.943	-0.015	(0)
	UO2 (CO3) 3-4	6.416e-13	3.662e-13	-12.193	-12.436	-0.244	(0)
	BaCO3	5.753e-13	5.753e-13	-12.240	-12.240	0.000	(0)
	CdCO3	2.970e-13	2.970e-13	-12.527	-12.527	0.000	(0)
	Pb (CO3) 2-2	1.462e-15	1.271e-15	-14.835	-14.896	-0.061	(0)
	Cd (CO3) 2-2	1.285e-18	1.117e-18	-17.891	-17.952	-0.061	(0)
	HgCO3	5.248e-21	5.248e-21	-20.280	-20.280	0.000	(0)
	HgHCO3+	1.823e-22	1.760e-22	-21.739	-21.755	-0.015	(0)
	Hg (CO3) 2-2	9.688e-26	8.421e-26	-25.014	-25.075	-0.061	(0)
Ca		1.577e-04					
	Ca+2	1.531e-04	1.338e-04	-3.815	-3.873	-0.059	(0)
	CaSO4	4.020e-06	4.020e-06	-5.396	-5.396	0.000	(0)
	CaHCO3+	5.020e-07	4.857e-07	-6.299	-6.314	-0.014	(0)
	CaF+	2.884e-08	2.790e-08	-7.540	-7.554	-0.015	(0)
	CaCO3	1.076e-09	1.076e-09	-8.968	-8.968	0.000	(0)
	CaOH+	1.543e-11	1.493e-11	-10.812	-10.826	-0.014	(0)
	CaH2BO3+	1.193e-12	1.153e-12	-11.923	-11.938	-0.015	(0)
Cd		3.025e-09					
	Cd+2	2.938e-09	2.568e-09	-8.532	-8.590	-0.059	(0)
	CdSO4	7.893e-11	7.893e-11	-10.103	-10.103	0.000	(0)
	CdCl+	4.924e-12	4.754e-12	-11.308	-11.323	-0.015	(0)
	CdHCO3+	1.180e-12	1.139e-12	-11.928	-11.943	-0.015	(0)
	CdF+	8.050e-13	7.772e-13	-12.094	-12.109	-0.015	(0)
	CdCO3	2.970e-13	2.970e-13	-12.527	-12.527	0.000	(0)
	Cd (SO4) 2-2	1.606e-13	1.396e-13	-12.794	-12.855	-0.061	(0)
	CdOH+	1.181e-13	1.140e-13	-12.928	-12.943	-0.015	(0)
	CdOHC1	1.090e-15	1.090e-15	-14.962	-14.962	0.000	(0)
	CdCl2	3.843e-16	3.843e-16	-15.415	-15.415	0.000	(0)
	CdF2	2.962e-17	2.962e-17	-16.528	-16.528	0.000	(0)
	Cd (OH) 2	4.023e-18	4.023e-18	-17.395	-17.395	0.000	(0)
	Cd (CO3) 2-2	1.285e-18	1.117e-18	-17.891	-17.952	-0.061	(0)
	CdCl3-	4.868e-21	4.701e-21	-20.313	-20.328	-0.015	(0)
	Cd2OH+3	2.012e-21	1.468e-21	-20.696	-20.833	-0.137	(0)
	Cd (OH) 3-	1.423e-24	1.374e-24	-23.847	-23.862	-0.015	(0)
	Cd (SeO3) 2-2	1.105e-25	9.605e-26	-24.957	-25.018	-0.061	(0)
	CdSeO4	1.228e-26	1.228e-26	-25.911	-25.911	0.000	(0)
	Cd (OH) 4-2	1.447e-33	1.258e-33	-32.840	-32.900	-0.061	(0)
Cl		2.006e-05					
	Cl-	2.005e-05	1.939e-05	-4.698	-4.712	-0.015	(0)
	CuCl	5.607e-09	5.607e-09	-8.251	-8.251	0.000	(0)
	CuCl+	1.491e-10	1.441e-10	-9.827	-9.841	-0.015	(0)
	CuCl2-	2.349e-11	2.271e-11	-10.629	-10.644	-0.015	(0)
	ZnCl+	1.003e-11	9.701e-12	-10.999	-11.013	-0.015	(0)
	MnCl+	6.965e-12	6.736e-12	-11.157	-11.172	-0.015	(0)
	CdCl+	4.924e-12	4.754e-12	-11.308	-11.323	-0.015	(0)
	PbCl+	4.055e-12	3.916e-12	-11.392	-11.407	-0.015	(0)
	ZnOHC1	7.101e-14	7.101e-14	-13.149	-13.149	0.000	(0)
	UO2Cl+	2.293e-14	2.214e-14	-13.640	-13.655	-0.015	(0)
	CdOHC1	1.090e-15	1.090e-15	-14.962	-14.962	0.000	(0)
	CuCl2	9.688e-16	9.688e-16	-15.014	-15.014	0.000	(0)
	CdCl2	3.843e-16	3.843e-16	-15.415	-15.415	0.000	(0)
	PbCl2	3.391e-16	3.391e-16	-15.470	-15.470	0.000	(0)
	ZnCl2	2.981e-16	2.981e-16	-15.526	-15.526	0.000	(0)
	MnCl2	1.845e-16	1.845e-16	-15.734	-15.734	0.000	(0)
	CuCl3-2	1.076e-16	9.414e-17	-15.968	-16.026	-0.058	(0)
	VOCl+	2.369e-17	2.287e-17	-16.625	-16.641	-0.015	(0)
	HgClOH	1.655e-19	1.655e-19	-18.781	-18.781	0.000	(0)
	FeCl+2	3.677e-20	3.217e-20	-19.435	-19.493	-0.058	(0)
	HgCl2	3.249e-20	3.249e-20	-19.488	-19.488	0.000	(0)
	CdCl3-	4.868e-21	4.701e-21	-20.313	-20.328	-0.015	(0)
	ZnCl3-	4.749e-21	4.591e-21	-20.323	-20.338	-0.015	(0)
	PbCl3-	2.711e-21	2.618e-21	-20.567	-20.582	-0.015	(0)
	MnCl3-	1.019e-21	9.852e-22	-20.992	-21.006	-0.015	(0)
	HgCl+	3.463e-22	3.343e-22	-21.461	-21.476	-0.015	(0)
	CuCl3-	1.813e-22	1.753e-22	-21.742	-21.756	-0.015	(0)
	HgCl3-	6.523e-24	6.299e-24	-23.186	-23.201	-0.015	(0)
	FeCl2+	2.880e-24	2.786e-24	-23.541	-23.555	-0.015	(0)
	ZnCl4-2	5.087e-26	4.451e-26	-25.294	-25.352	-0.058	(0)

PbCl4-2	2.669e-26	2.320e-26	-25.574	-25.635	-0.061	(0)
HgCl4-2	5.594e-28	4.862e-28	-27.252	-27.313	-0.061	(0)
CuCl4-2	1.947e-29	1.703e-29	-28.711	-28.769	-0.058	(0)
FeCl3	5.401e-30	5.401e-30	-29.268	-29.268	0.000	(0)
UCl+3	1.622e-34	1.183e-34	-33.790	-33.927	-0.137	(0)
Cu (1)	2.435e-07					
Cu+	2.379e-07	2.297e-07	-6.624	-6.639	-0.015	(0)
CuCl	5.607e-09	5.607e-09	-8.251	-8.251	0.000	(0)
CuCl2-	2.349e-11	2.271e-11	-10.629	-10.644	-0.015	(0)
CuCl3-2	1.076e-16	9.414e-17	-15.968	-16.026	-0.058	(0)
Cu (2)	5.800e-06					
Cu+2	5.367e-06	4.690e-06	-5.270	-5.329	-0.059	(0)
CuSO4	1.409e-07	1.409e-07	-6.851	-6.851	0.000	(0)
CuCO3	1.401e-07	1.401e-07	-6.853	-6.853	0.000	(0)
CuOH+	8.577e-08	8.292e-08	-7.067	-7.081	-0.015	(0)
CuHCO3+	5.973e-08	5.767e-08	-7.224	-7.239	-0.015	(0)
CuF+	5.853e-09	5.652e-09	-8.233	-8.248	-0.015	(0)
Cu2 (OH) 2+2	1.987e-10	1.727e-10	-9.702	-9.763	-0.061	(0)
CuCl+	1.491e-10	1.441e-10	-9.827	-9.841	-0.015	(0)
Cu (OH) 2	9.251e-11	9.251e-11	-10.034	-10.034	0.000	(0)
Cu (CO3) 2-2	2.202e-12	1.914e-12	-11.657	-11.718	-0.061	(0)
Cu (OH) 3-	1.099e-15	1.061e-15	-14.959	-14.974	-0.015	(0)
CuCl2	9.688e-16	9.688e-16	-15.014	-15.014	0.000	(0)
CuCl3-	1.813e-22	1.753e-22	-21.742	-21.756	-0.015	(0)
Cu (OH) 4-2	5.372e-23	4.669e-23	-22.270	-22.331	-0.061	(0)
CuCl4-2	1.947e-29	1.703e-29	-28.711	-28.769	-0.058	(0)
F	2.272e-05					
F-	1.975e-05	1.910e-05	-4.704	-4.719	-0.015	(0)
AlF2+	9.833e-07	9.511e-07	-6.007	-6.022	-0.014	(0)
AlF3	2.287e-07	2.287e-07	-6.641	-6.641	0.000	(0)
AlF+2	1.429e-07	1.251e-07	-6.845	-6.903	-0.058	(0)
MgF+	7.608e-08	7.357e-08	-7.119	-7.133	-0.015	(0)
HF	5.087e-08	5.087e-08	-7.294	-7.294	0.000	(0)
CaF+	2.884e-08	2.790e-08	-7.540	-7.554	-0.015	(0)
CuF+	5.853e-09	5.652e-09	-8.233	-8.248	-0.015	(0)
AlF4-	2.264e-09	2.189e-09	-8.645	-8.660	-0.015	(0)
UO2F+	1.923e-09	1.856e-09	-8.716	-8.731	-0.015	(0)
NaF	1.086e-09	1.086e-09	-8.964	-8.964	0.000	(0)
MnF+	2.170e-10	2.098e-10	-9.664	-9.678	-0.015	(0)
UO2F2	1.023e-10	1.023e-10	-9.990	-9.990	0.000	(0)
ZnF+	7.862e-11	7.591e-11	-10.104	-10.120	-0.015	(0)
PbF+	7.935e-12	7.661e-12	-11.100	-11.116	-0.015	(0)
HF2-	3.822e-12	3.694e-12	-11.418	-11.432	-0.015	(0)
BF (OH) 3-	3.662e-12	3.539e-12	-11.436	-11.451	-0.015	(0)
CdF+	8.050e-13	7.772e-13	-12.094	-12.109	-0.015	(0)
UO2F3-	5.081e-13	4.906e-13	-12.294	-12.309	-0.015	(0)
VOF+	4.990e-14	4.818e-14	-13.302	-13.317	-0.015	(0)
BF2 (OH) 2-	1.347e-14	1.301e-14	-13.871	-13.886	-0.015	(0)
H2F2	6.934e-15	6.934e-15	-14.159	-14.159	0.000	(0)
PbF2	2.880e-15	2.880e-15	-14.541	-14.541	0.000	(0)
FeF+2	1.315e-15	1.150e-15	-14.881	-14.939	-0.058	(0)
FeF2+	6.080e-16	5.880e-16	-15.216	-15.231	-0.015	(0)
VO2F	5.431e-16	5.431e-16	-15.265	-15.265	0.000	(0)
VOF2	3.450e-16	3.450e-16	-15.462	-15.462	0.000	(0)
UO2F4-2	8.563e-17	7.443e-17	-16.067	-16.128	-0.061	(0)
CdF2	2.962e-17	2.962e-17	-16.528	-16.528	0.000	(0)
FeF3	1.585e-17	1.585e-17	-16.800	-16.800	0.000	(0)
VO2F2-	3.901e-18	3.766e-18	-17.409	-17.424	-0.015	(0)
VOF3-	2.422e-19	2.338e-19	-18.616	-18.631	-0.015	(0)
BF3OH-	1.802e-19	1.741e-19	-18.744	-18.759	-0.015	(0)
PbF3-	1.080e-19	1.043e-19	-18.966	-18.982	-0.015	(0)
VO2F3-2	1.032e-21	8.973e-22	-20.986	-21.047	-0.061	(0)
BF4-	3.050e-23	2.947e-23	-22.516	-22.531	-0.015	(0)
VOF4-2	2.074e-23	1.803e-23	-22.683	-22.744	-0.061	(0)
UF3+	3.498e-24	3.378e-24	-23.456	-23.471	-0.015	(0)
UF2+2	1.284e-24	1.116e-24	-23.892	-23.952	-0.061	(0)
PbF4-2	1.097e-24	9.536e-25	-23.960	-24.021	-0.061	(0)
VO2F4-3	1.156e-26	8.433e-27	-25.937	-26.074	-0.137	(0)

UF4	7.073e-27	7.073e-27	-26.150	-26.150	0.000	(0)
UF+3	6.361e-27	4.640e-27	-26.196	-26.333	-0.137	(0)
HgF+	6.337e-28	6.119e-28	-27.198	-27.213	-0.015	(0)
UF5-	5.545e-30	5.354e-30	-29.256	-29.271	-0.015	(0)
UF6-2	3.553e-32	3.088e-32	-31.449	-31.510	-0.061	(0)
Fe (2)	7.010e-08					
Fe+2	6.804e-08	5.914e-08	-7.167	-7.228	-0.061	(0)
FeSO4	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
FeHCO3+	1.500e-10	1.451e-10	-9.824	-9.838	-0.014	(0)
FeOH+	1.361e-11	1.316e-11	-10.866	-10.881	-0.015	(0)
Fe (OH) 2	5.847e-17	5.847e-17	-16.233	-16.233	0.000	(0)
Fe (OH) 3-	1.069e-19	1.034e-19	-18.971	-18.986	-0.015	(0)
Fe (3)	4.488e-10					
Fe (OH) 2+	4.460e-10	4.314e-10	-9.351	-9.365	-0.014	(0)
Fe (OH) 3	2.591e-12	2.591e-12	-11.587	-11.587	0.000	(0)
FeOH+2	2.267e-13	1.983e-13	-12.645	-12.703	-0.058	(0)
Fe (OH) 4-	1.394e-15	1.349e-15	-14.856	-14.870	-0.014	(0)
FeF+2	1.315e-15	1.150e-15	-14.881	-14.939	-0.058	(0)
FeF2+	6.080e-16	5.880e-16	-15.216	-15.231	-0.015	(0)
FeSO4+	8.358e-17	8.083e-17	-16.078	-16.092	-0.015	(0)
Fe+3	7.441e-17	5.494e-17	-16.128	-16.260	-0.132	(0)
FeF3	1.585e-17	1.585e-17	-16.800	-16.800	0.000	(0)
Fe (SO4) 2-	2.347e-19	2.266e-19	-18.629	-18.645	-0.015	(0)
FeCl+2	3.677e-20	3.217e-20	-19.435	-19.493	-0.058	(0)
FeHSeO3+2	5.090e-22	4.424e-22	-21.293	-21.354	-0.061	(0)
FeCl2+	2.880e-24	2.786e-24	-23.541	-23.555	-0.015	(0)
Fe2 (OH) 2+4	2.282e-24	1.302e-24	-23.642	-23.885	-0.244	(0)
FeCl3	5.401e-30	5.401e-30	-29.268	-29.268	0.000	(0)
Fe3 (OH) 4+5	1.951e-32	8.122e-33	-31.710	-32.090	-0.381	(0)
H (0)	4.591e-23					
H2	2.295e-23	2.296e-23	-22.639	-22.639	0.000	(0)
Hg (0)	7.977e-11					
Hg	7.977e-11	7.977e-11	-10.098	-10.098	0.000	(0)
Hg (1)	1.077e-25					
Hg2+2	5.384e-26	4.680e-26	-25.269	-25.330	-0.061	(0)
Hg (2)	3.744e-19					
Hg (OH) 2	1.704e-19	1.705e-19	-18.768	-18.768	0.000	(0)
HgClOH	1.655e-19	1.655e-19	-18.781	-18.781	0.000	(0)
HgCl2	3.249e-20	3.249e-20	-19.488	-19.488	0.000	(0)
HgCO3	5.248e-21	5.248e-21	-20.280	-20.280	0.000	(0)
HgCl+	3.463e-22	3.343e-22	-21.461	-21.476	-0.015	(0)
HgOH+	1.992e-22	1.924e-22	-21.701	-21.716	-0.015	(0)
HgHCO3+	1.823e-22	1.760e-22	-21.739	-21.755	-0.015	(0)
HgCl3-	6.523e-24	6.299e-24	-23.186	-23.201	-0.015	(0)
Hg+2	9.943e-25	8.642e-25	-24.002	-24.063	-0.061	(0)
Hg (CO3) 2-2	9.688e-26	8.421e-26	-25.014	-25.075	-0.061	(0)
HgSO4	2.967e-26	2.967e-26	-25.528	-25.528	0.000	(0)
HgF+	6.337e-28	6.119e-28	-27.198	-27.213	-0.015	(0)
HgCl4-2	5.594e-28	4.862e-28	-27.252	-27.313	-0.061	(0)
Hg (OH) 3-	1.243e-28	1.200e-28	-27.906	-27.921	-0.015	(0)
K	4.694e-05					
K+	4.690e-05	4.534e-05	-4.329	-4.343	-0.015	(0)
KSO4-	4.352e-08	4.209e-08	-7.361	-7.376	-0.014	(0)
Mg	4.025e-05					
Mg+2	3.929e-05	3.433e-05	-4.406	-4.464	-0.059	(0)
MgSO4	8.192e-07	8.192e-07	-6.087	-6.087	0.000	(0)
MgF+	7.608e-08	7.357e-08	-7.119	-7.133	-0.015	(0)
MgHCO3+	7.082e-08	6.847e-08	-7.150	-7.165	-0.015	(0)
MgCO3	1.449e-10	1.449e-10	-9.839	-9.839	0.000	(0)
MgOH+	7.897e-11	7.641e-11	-10.103	-10.117	-0.014	(0)
MgH2BO3+	1.845e-13	1.782e-13	-12.734	-12.749	-0.015	(0)
Mn (2)	3.253e-07					
Mn+2	3.175e-07	2.760e-07	-6.498	-6.559	-0.061	(0)
MnSO4	6.436e-09	6.436e-09	-8.191	-8.191	0.000	(0)
MnHCO3+	1.110e-09	1.073e-09	-8.955	-8.969	-0.015	(0)
MnF+	2.170e-10	2.098e-10	-9.664	-9.678	-0.015	(0)
MnCl+	6.965e-12	6.736e-12	-11.157	-11.172	-0.015	(0)
MnOH+	4.008e-12	3.876e-12	-11.397	-11.412	-0.015	(0)

MnCl2	1.845e-16	1.845e-16	-15.734	-15.734	0.000	(0)
MnCl3-	1.019e-21	9.852e-22	-20.992	-21.006	-0.015	(0)
MnSeO4	1.907e-24	1.907e-24	-23.720	-23.720	0.000	(0)
Mn (OH) 3-	7.744e-25	7.489e-25	-24.111	-24.126	-0.015	(0)
MnSe	4.756e-29	4.756e-29	-28.323	-28.323	0.000	(0)
Mn (OH) 4-2	1.545e-32	1.352e-32	-31.811	-31.869	-0.058	(0)
Mn (3)	1.670e-28					
Mn+3	1.670e-28	1.233e-28	-27.777	-27.909	-0.132	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-62.967	-63.025	-0.058	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-68.382	-68.397	-0.015	(0)
Mo	2.116e-08					
MoO4-2	2.049e-08	1.790e-08	-7.689	-7.747	-0.059	(0)
HMoO4-	6.644e-10	6.415e-10	-9.178	-9.193	-0.015	(0)
H2MoO4	8.462e-12	8.462e-12	-11.073	-11.073	0.000	(0)
AlMo6O21-3	9.907e-36	7.227e-36	-35.004	-35.141	-0.137	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.173	-46.554	-0.381	(0)
Mo7O24-6	0.000e+00	0.000e+00	-46.648	-47.196	-0.548	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-47.272	-47.516	-0.244	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-49.877	-50.014	-0.137	(0)
Na	9.327e-05					
Na+	9.319e-05	9.010e-05	-4.031	-4.045	-0.015	(0)
NaSO4-	6.560e-08	6.345e-08	-7.183	-7.198	-0.014	(0)
NaHCO3	9.876e-09	9.876e-09	-8.005	-8.005	0.000	(0)
NaF	1.086e-09	1.086e-09	-8.964	-8.964	0.000	(0)
NaCO3-	8.801e-12	8.513e-12	-11.055	-11.070	-0.014	(0)
NaH2BO3	2.138e-14	2.138e-14	-13.670	-13.670	0.000	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-47.017	-47.017	0.000	(0)
Pb	7.915e-09					
Pb+2	6.514e-09	5.692e-09	-8.186	-8.245	-0.059	(0)
PbHCO3+	8.538e-10	8.244e-10	-9.069	-9.084	-0.015	(0)
PbSO4	3.656e-10	3.656e-10	-9.437	-9.437	0.000	(0)
PbCO3	8.682e-11	8.682e-11	-10.061	-10.061	0.000	(0)
PbOH+	8.280e-11	7.995e-11	-10.082	-10.097	-0.015	(0)
PbF+	7.935e-12	7.661e-12	-11.100	-11.116	-0.015	(0)
PbCl+	4.055e-12	3.916e-12	-11.392	-11.407	-0.015	(0)
Pb (SO4) 2-2	3.324e-13	2.889e-13	-12.478	-12.539	-0.061	(0)
Pb (OH) 2	1.414e-14	1.414e-14	-13.850	-13.850	0.000	(0)
PbF2	2.880e-15	2.880e-15	-14.541	-14.541	0.000	(0)
Pb (CO3) 2-2	1.462e-15	1.271e-15	-14.835	-14.896	-0.061	(0)
PbCl2	3.391e-16	3.391e-16	-15.470	-15.470	0.000	(0)
Pb2OH+3	9.887e-18	7.212e-18	-17.005	-17.142	-0.137	(0)
PbF3-	1.080e-19	1.043e-19	-18.966	-18.982	-0.015	(0)
Pb (OH) 3-	8.186e-20	7.904e-20	-19.087	-19.102	-0.015	(0)
PbCl3-	2.711e-21	2.618e-21	-20.567	-20.582	-0.015	(0)
PbF4-2	1.097e-24	9.536e-25	-23.960	-24.021	-0.061	(0)
Pb (OH) 4-2	1.245e-25	1.082e-25	-24.905	-24.966	-0.061	(0)
PbCl4-2	2.669e-26	2.320e-26	-25.574	-25.635	-0.061	(0)
Pb3 (OH) 4+2	2.611e-26	2.269e-26	-25.583	-25.644	-0.061	(0)
Pb4 (OH) 4+4	1.798e-30	1.026e-30	-29.745	-29.989	-0.244	(0)
S (6)	1.552e-04					
SO4-2	1.501e-04	1.311e-04	-3.824	-3.882	-0.059	(0)
CaSO4	4.020e-06	4.020e-06	-5.396	-5.396	0.000	(0)
MgSO4	8.192e-07	8.192e-07	-6.087	-6.087	0.000	(0)
CuSO4	1.409e-07	1.409e-07	-6.851	-6.851	0.000	(0)
NaSO4-	6.560e-08	6.345e-08	-7.183	-7.198	-0.014	(0)
KSO4-	4.352e-08	4.209e-08	-7.361	-7.376	-0.014	(0)
HSO4-	2.387e-08	2.308e-08	-7.622	-7.637	-0.015	(0)
MnSO4	6.436e-09	6.436e-09	-8.191	-8.191	0.000	(0)
ZnSO4	5.715e-09	5.715e-09	-8.243	-8.243	0.000	(0)
FeSO4	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
AlSO4+	6.894e-10	6.667e-10	-9.162	-9.176	-0.015	(0)
PbSO4	3.656e-10	3.656e-10	-9.437	-9.437	0.000	(0)
UO2SO4	1.398e-10	1.398e-10	-9.855	-9.855	0.000	(0)
CdSO4	7.893e-11	7.893e-11	-10.103	-10.103	0.000	(0)
Zn (SO4) 2-2	7.509e-12	6.527e-12	-11.124	-11.185	-0.061	(0)

Al (SO4) 2-	9.687e-13	9.367e-13	-12.014	-12.028	-0.015	(0)
Pb (SO4) 2-2	3.324e-13	2.889e-13	-12.478	-12.539	-0.061	(0)
UO2 (SO4) 2-2	2.779e-13	2.416e-13	-12.556	-12.617	-0.061	(0)
Cd (SO4) 2-2	1.606e-13	1.396e-13	-12.794	-12.855	-0.061	(0)
VOSO4	1.519e-14	1.519e-14	-13.818	-13.818	0.000	(0)
FeSO4+	8.358e-17	8.083e-17	-16.078	-16.092	-0.015	(0)
VO2SO4-	5.258e-17	5.077e-17	-16.279	-16.294	-0.015	(0)
Fe (SO4) 2-	2.347e-19	2.266e-19	-18.629	-18.645	-0.015	(0)
VSO4+	4.342e-24	4.193e-24	-23.362	-23.378	-0.015	(0)
HgSO4	2.967e-26	2.967e-26	-25.528	-25.528	0.000	(0)
USO4+2	7.314e-29	6.357e-29	-28.136	-28.197	-0.061	(0)
U (SO4) 2	6.622e-29	6.622e-29	-28.179	-28.179	0.000	(0)
Se (-2)	7.904e-23					
HSe-	7.799e-23	7.530e-23	-22.108	-22.123	-0.015	(0)
H2Se	1.053e-24	1.053e-24	-23.978	-23.978	0.000	(0)
MnSe	4.756e-29	4.756e-29	-28.323	-28.323	0.000	(0)
Se-2	4.811e-32	4.181e-32	-31.318	-31.379	-0.061	(0)
Se (4)	3.166e-09					
HSeO3-	3.156e-09	3.047e-09	-8.501	-8.516	-0.015	(0)
SeO3-2	7.751e-12	6.737e-12	-11.111	-11.172	-0.061	(0)
H2SeO3	2.341e-12	2.341e-12	-11.631	-11.631	0.000	(0)
FeHSeO3+2	5.090e-22	4.424e-22	-21.293	-21.354	-0.061	(0)
Cd (SeO3) 2-2	1.105e-25	9.605e-26	-24.957	-25.018	-0.061	(0)
Se (6)	2.939e-20					
SeO4-2	2.938e-20	2.568e-20	-19.532	-19.590	-0.059	(0)
HSeO4-	2.400e-24	2.317e-24	-23.620	-23.635	-0.015	(0)
MnSeO4	1.907e-24	1.907e-24	-23.720	-23.720	0.000	(0)
ZnSeO4	7.921e-25	7.921e-25	-24.101	-24.101	0.000	(0)
CdSeO4	1.228e-26	1.228e-26	-25.911	-25.911	0.000	(0)
Zn (SeO4) 2-2	0.000e+00	0.000e+00	-43.625	-43.686	-0.061	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-43.573	-43.710	-0.137	(0)
U (4)	5.421e-16					
U (OH) 5-	5.051e-16	4.877e-16	-15.297	-15.312	-0.015	(0)
U (OH) 4	3.678e-17	3.678e-17	-16.434	-16.434	0.000	(0)
U (OH) 3+	2.508e-19	2.422e-19	-18.601	-18.616	-0.015	(0)
U (OH) 2+2	2.320e-22	2.016e-22	-21.635	-21.695	-0.061	(0)
UF3+	3.498e-24	3.378e-24	-23.456	-23.471	-0.015	(0)
UF2+2	1.284e-24	1.116e-24	-23.892	-23.952	-0.061	(0)
UOH+3	2.344e-26	1.710e-26	-25.630	-25.767	-0.137	(0)
UF4	7.073e-27	7.073e-27	-26.150	-26.150	0.000	(0)
UF+3	6.361e-27	4.640e-27	-26.196	-26.333	-0.137	(0)
USO4+2	7.314e-29	6.357e-29	-28.136	-28.197	-0.061	(0)
U (SO4) 2	6.622e-29	6.622e-29	-28.179	-28.179	0.000	(0)
UF5-	5.545e-30	5.354e-30	-29.256	-29.271	-0.015	(0)
U+4	2.133e-31	1.218e-31	-30.671	-30.914	-0.244	(0)
UF6-2	3.553e-32	3.088e-32	-31.449	-31.510	-0.061	(0)
UCl+3	1.622e-34	1.183e-34	-33.790	-33.927	-0.137	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-115.241	-116.474	-1.233	(0)
U (5)	4.445e-11					
UO2+	4.445e-11	4.292e-11	-10.352	-10.367	-0.015	(0)
U (6)	1.937e-08					
UO2CO3	1.422e-08	1.422e-08	-7.847	-7.847	0.000	(0)
UO2F+	1.923e-09	1.856e-09	-8.716	-8.731	-0.015	(0)
UO2 (CO3) 2-2	1.657e-09	1.440e-09	-8.781	-8.842	-0.061	(0)
UO2+2	8.058e-10	7.041e-10	-9.094	-9.152	-0.059	(0)
UO2OH+	5.133e-10	4.956e-10	-9.290	-9.305	-0.015	(0)
UO2SO4	1.398e-10	1.398e-10	-9.855	-9.855	0.000	(0)
UO2F2	1.023e-10	1.023e-10	-9.990	-9.990	0.000	(0)
UO2 (CO3) 3-4	6.416e-13	3.662e-13	-12.193	-12.436	-0.244	(0)
UO2F3-	5.081e-13	4.906e-13	-12.294	-12.309	-0.015	(0)
(UO2) 2 (OH) 2+2	4.690e-13	4.077e-13	-12.329	-12.390	-0.061	(0)
UO2 (SO4) 2-2	2.779e-13	2.416e-13	-12.556	-12.617	-0.061	(0)
UO2Cl+	2.293e-14	2.214e-14	-13.640	-13.655	-0.015	(0)
(UO2) 3 (OH) 5+	4.963e-15	4.792e-15	-14.304	-14.320	-0.015	(0)
UO2F4-2	8.563e-17	7.443e-17	-16.067	-16.128	-0.061	(0)
V (2)	4.438e-31					
V+2	3.816e-31	3.317e-31	-30.418	-30.479	-0.061	(0)

VOH+	6.216e-32	6.002e-32	-31.206	-31.222	-0.015	(0)
V(3)	9.550e-09					
V(OH) 3	9.550e-09	9.550e-09	-8.020	-8.020	0.000	(0)
V(OH) 2+	1.151e-17	1.111e-17	-16.939	-16.954	-0.015	(0)
VOH+2	2.184e-19	1.898e-19	-18.661	-18.722	-0.061	(0)
V+3	9.284e-23	6.773e-23	-22.032	-22.169	-0.137	(0)
VSO4+	4.342e-24	4.193e-24	-23.362	-23.378	-0.015	(0)
V2(OH) 2+4	3.982e-37	2.273e-37	-36.400	-36.643	-0.244	(0)
V2(OH) 3+3	8.184e-38	5.970e-38	-37.087	-37.224	-0.137	(0)
V(4)	1.035e-12					
V(OH) 3+	4.859e-13	4.692e-13	-12.313	-12.329	-0.015	(0)
VO+2	4.838e-13	4.205e-13	-12.315	-12.376	-0.061	(0)
VOF+	4.990e-14	4.818e-14	-13.302	-13.317	-0.015	(0)
VOSO4	1.519e-14	1.519e-14	-13.818	-13.818	0.000	(0)
VOF2	3.450e-16	3.450e-16	-15.462	-15.462	0.000	(0)
VOC1+	2.369e-17	2.287e-17	-16.625	-16.641	-0.015	(0)
VOF3-	2.422e-19	2.338e-19	-18.616	-18.631	-0.015	(0)
H2V2O4+2	1.269e-20	1.103e-20	-19.896	-19.957	-0.061	(0)
VOF4-2	2.074e-23	1.803e-23	-22.683	-22.744	-0.061	(0)
V(5)	2.644e-10					
H2VO4-	2.595e-10	2.506e-10	-9.586	-9.601	-0.015	(0)
H3VO4	4.512e-12	4.512e-12	-11.346	-11.346	0.000	(0)
HVO4-2	4.021e-13	3.495e-13	-12.396	-12.457	-0.061	(0)
VO2+	1.677e-14	1.621e-14	-13.775	-13.790	-0.015	(0)
H3V2O7-	7.560e-15	7.299e-15	-14.121	-14.137	-0.015	(0)
VO2F	5.431e-16	5.431e-16	-15.265	-15.265	0.000	(0)
VO2SO4-	5.258e-17	5.077e-17	-16.279	-16.294	-0.015	(0)
VO2F2-	3.901e-18	3.766e-18	-17.409	-17.424	-0.015	(0)
HV2O7-3	4.067e-20	2.967e-20	-19.391	-19.528	-0.137	(0)
VO4-3	1.333e-21	9.727e-22	-20.875	-21.012	-0.137	(0)
VO2F3-2	1.032e-21	8.973e-22	-20.986	-21.047	-0.061	(0)
V3O9-3	2.258e-23	1.647e-23	-22.646	-22.783	-0.137	(0)
V2O7-4	7.770e-25	4.435e-25	-24.110	-24.353	-0.244	(0)
VO2F4-3	1.156e-26	8.433e-27	-25.937	-26.074	-0.137	(0)
V4O12-4	3.014e-30	1.720e-30	-29.521	-29.764	-0.244	(0)
HV10O28-5	0.000e+00	0.000e+00	-67.261	-67.641	-0.381	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.935	-68.178	-0.244	(0)
V10O28-6	0.000e+00	0.000e+00	-69.535	-70.083	-0.548	(0)
Zn	2.352e-07					
Zn+2	2.280e-07	1.992e-07	-6.642	-6.701	-0.059	(0)
ZnSO4	5.715e-09	5.715e-09	-8.243	-8.243	0.000	(0)
ZnHCO3+	1.272e-09	1.228e-09	-8.896	-8.911	-0.015	(0)
ZnOH+	1.154e-10	1.114e-10	-9.938	-9.953	-0.015	(0)
ZnF+	7.862e-11	7.591e-11	-10.104	-10.120	-0.015	(0)
ZnCO3	5.816e-11	5.816e-11	-10.235	-10.235	0.000	(0)
ZnCl+	1.003e-11	9.701e-12	-10.999	-11.013	-0.015	(0)
Zn(SO4) 2-2	7.509e-12	6.527e-12	-11.124	-11.185	-0.061	(0)
Zn(OH) 2	9.870e-14	9.870e-14	-13.006	-13.006	0.000	(0)
ZnOHCl	7.101e-14	7.101e-14	-13.149	-13.149	0.000	(0)
ZnCl2	2.981e-16	2.981e-16	-15.526	-15.526	0.000	(0)
Zn(OH) 3-	2.865e-18	2.766e-18	-17.543	-17.558	-0.015	(0)
ZnCl3-	4.749e-21	4.591e-21	-20.323	-20.338	-0.015	(0)
ZnSeO4	7.921e-25	7.921e-25	-24.101	-24.101	0.000	(0)
Zn(OH) 4-2	7.083e-25	6.157e-25	-24.150	-24.211	-0.061	(0)
ZnCl4-2	5.087e-26	4.451e-26	-25.294	-25.352	-0.058	(0)
Zn(SeO4) 2-2	0.000e+00	0.000e+00	-43.625	-43.686	-0.061	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH) 3(am)	-2.75	8.05	10.80	Al(OH) 3
Al2(MoO4) 3	-43.98	-41.61	2.37	Al2(MoO4) 3
Al2O3	-3.55	16.10	19.65	Al2O3
Al4(OH) 10SO4	-5.87	16.83	22.70	Al4(OH) 10SO4
AlOHSO4	-4.09	-7.32	-3.23	AlOHSO4
Alunite	-3.79	-5.19	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.34	-12.13	-7.79	PbSO4

Anhydrite	-3.40	-7.76	-4.36	CaSO4
Antlerite	-5.68	3.11	8.79	Cu3(OH)4SO4
Aragonite	-3.87	-12.17	-8.30	CaCO3
Artinite	-15.33	-5.73	9.60	MgCO3:Mg(OH)2:3H2O
Atacamite	-5.53	1.86	7.39	Cu2(OH)3Cl
Azurite	-4.18	-21.09	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-19.56	4.83	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-22.30	-6.42	15.87	Ba2V2O7:2H2O
Ba3(VO4)2:4H2O	-34.53	-1.59	32.94	Ba3(VO4)2:4H2O
BaF2	-10.27	-16.09	-5.82	BaF2
BaMoO4	-7.44	-14.40	-6.96	BaMoO4
Barite	-0.56	-10.54	-9.98	BaSO4
BaSeO3	-11.26	-9.43	1.83	BaSeO3
BaSeO4	-18.79	-26.25	-7.46	BaSeO4
Bianchite	-8.82	-10.58	-1.76	ZnSO4:6H2O
Birnessite	-19.02	-0.93	18.09	MnO2
Bixbyite	-20.71	-21.35	-0.64	Mn2O3
Boehmite	-0.53	8.05	8.58	AlOOH
Brochantite	-5.95	9.27	15.22	Cu4(OH)6SO4
Brucite	-9.82	7.02	16.84	Mg(OH)2
Ca(VO3)2	-14.14	-8.48	5.66	Ca(VO3)2
Ca2V2O7	-18.36	-0.86	17.50	Ca2V2O7
Ca2V2O7:2H2O	-22.41	-0.86	21.55	Ca2V2O7:2H2O
Ca3(VO4)2	-32.20	6.76	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-33.10	6.76	39.86	Ca3(VO4)2:4H2O
Calcite	-3.69	-12.17	-8.48	CaCO3
Calomel	-16.84	-34.75	-17.91	Hg2Cl2
CaMoO4	-3.67	-11.62	-7.95	CaMoO4
Carnotite	-4.54	-4.31	0.23	KUO2VO4
CaSeO3:2H2O	-9.46	-6.65	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-20.44	-23.46	-3.02	CaSeO4:2H2O
Cd(BO2)2	-19.61	-9.77	9.84	Cd(BO2)2
Cd(OH)2	-10.75	2.90	13.64	Cd(OH)2
Cd(OH)2(am)	-10.83	2.90	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.76	-22.05	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-29.24	-6.68	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-32.18	-3.78	28.40	Cd4(OH)6SO4
CdCl2	-17.36	-18.02	-0.66	CdCl2
CdCl2:1H2O	-16.32	-18.02	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.10	-18.02	-1.91	CdCl2:2.5H2O
CdF2	-16.82	-18.03	-1.21	CdF2
Cdmetal(alpha)	-30.11	-16.59	13.51	Cd
Cdmetal(gamma)	-30.21	-16.59	13.62	Cd
CdMoO4	-2.19	-16.34	-14.15	CdMoO4
CdOHCl	-11.10	-7.56	3.54	CdOHCl
CdSe	-4.77	-24.97	-20.20	CdSe
CdSeO4:2H2O	-26.33	-28.18	-1.85	CdSeO4:2H2O
CdSO4	-12.30	-12.47	-0.17	CdSO4
CdSO4:1H2O	-10.75	-12.47	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.60	-12.47	-1.87	CdSO4:2.67H2O
Cerrusite	-3.41	-16.54	-13.13	PbCO3
CH4(g)	-56.69	-97.74	-41.05	CH4
Chalcanthite	-6.57	-9.21	-2.64	CuSO4:5H2O
Clausthalite	2.48	-24.62	-27.10	PbSe
CO2(g)	-1.64	-19.78	-18.15	CO2
Cotunnite	-12.89	-17.67	-4.78	PbCl2
Cryolite	-15.79	-49.63	-33.84	Na3AlF6
Cu(OH)2	-2.51	6.16	8.67	Cu(OH)2
Cu2Se(alpha)	16.14	-29.66	-45.80	Cu2Se
Cu2SO4	-15.21	-17.16	-1.95	Cu2SO4
Cu3Se2	12.13	-51.36	-63.49	Cu3Se2
CuCO3	-2.12	-13.62	-11.50	CuCO3
CuF	-6.45	-11.36	-4.91	CuF
CuF2	-15.88	-14.77	1.12	CuF2
CuF2:2H2O	-10.22	-14.77	-4.55	CuF2:2H2O
Cumetal	-1.88	-10.64	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-13.35	-3.05	10.30	CuOCuSO4

Cupricferrite	2.12	8.11	5.99	CuFe2O4
Cuprite	-0.38	-1.79	-1.41	Cu2O
Cuprousferrite	9.00	0.08	-8.92	CuFeO2
CuSe	11.39	-21.71	-33.10	CuSe
CuSe2	3.28	-30.09	-33.37	CuSe2
CuSeO3:2H2O	-8.61	-8.10	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-22.48	-24.92	-2.44	CuSeO4:5H2O
CuSO4	-12.15	-9.21	2.94	CuSO4
Diaspore	1.18	8.05	6.87	AlOOH
Dolomite (disordered)	-8.39	-24.93	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-7.84	-24.93	-17.09	CaMg (CO3) 2
Epsomite	-6.22	-8.35	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.30	4.26	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	0.88	-2.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-8.11	-11.83	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-13.87	-12.31	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-20.21	-40.83	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-40.43	-44.17	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-14.01	6.21	20.22	Fe3 (OH) 8
FeMoO4	-4.88	-14.98	-10.09	FeMoO4
Ferrihydrite	-2.22	0.97	3.19	Fe (OH) 3
Ferroselite	-13.39	-31.99	-18.60	FeSe2
FeSe	-12.61	-23.61	-11.00	FeSe
Fluorite	-2.81	-13.31	-10.50	CaF2
Gibbsite	-0.24	8.05	8.29	Al (OH) 3
Goethite	0.48	0.97	0.49	FeOOH
Goslarite	-8.57	-10.58	-2.01	ZnSO4:7H2O
Gummite	-5.34	2.34	7.67	UO3
Gypsum	-3.15	-7.76	-4.61	CaSO4:2H2O
H-Jarosite	-15.72	-27.82	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-6.36	-19.24	-12.88	H2MoO4
H2Se (g)	-22.91	-27.87	-4.96	H2Se
Halite	-10.36	-8.76	1.60	NaCl
Hausmannite	-26.75	34.28	61.03	Mn3O4
Hematite	3.36	1.95	-1.42	Fe2O3
Hercynite	-2.53	20.36	22.89	FeAl2O4
Hg (CH3) 2 (g)	-140.54	-214.25	-73.71	Hg (CH3) 2
Hg (g)	-8.79	-16.66	-7.87	Hg
Hg (OH) 2	-15.27	-18.77	-3.50	Hg (OH) 2
Hg2 (g)	-18.37	-33.33	-14.96	Hg2
Hg2 (OH) 2	-19.10	-13.84	5.26	Hg2 (OH) 2
Hg2CO3	-17.57	-33.62	-16.05	Hg2CO3
Hg2F2	-24.41	-34.77	-10.36	Hg2F2
Hg2SeO3	-23.44	-28.10	-4.66	Hg2SeO3
Hg2SO4	-23.08	-29.21	-6.13	Hg2SO4
Hg3O2CO3	-46.41	-76.09	-29.68	Hg3O2CO3
HgCl (g)	-36.87	-17.38	19.50	HgCl
HgCl2	-18.42	-39.68	-21.26	HgCl2
HgF (g)	-50.06	-17.38	32.68	HgF
HgF2 (g)	-52.26	-39.70	12.57	HgF2
Hgmetal (l)	-3.21	-16.66	-13.45	Hg
HgSe	9.06	-46.64	-55.69	HgSe
HgSeO3	-20.60	-33.03	-12.43	HgSeO3
HgSO4	-24.72	-34.14	-9.42	HgSO4
Huntite	-20.48	-50.45	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-11.06	-29.83	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-35.25	-44.01	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.12	-21.29	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-11.62	-26.42	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-19.70	-16.43	3.26	K2MoO4
K2SeO4	-27.55	-28.28	-0.73	K2SeO4
Langite	-8.22	9.27	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-8.45	-8.88	-0.43	PbO:PbSO4
Laurionite	-7.84	-7.21	0.62	PbOHCl
Lepidocrocite	-0.40	0.97	1.37	FeOOH
Lime	-25.08	7.62	32.70	CaO
Litharge	-9.45	3.24	12.69	PbO
Maghemite	-4.44	1.95	6.39	Fe2O3

Magnesioferrite	-7.89	8.97	16.86	Fe2MgO4
Magnesite	-5.30	-12.76	-7.46	MgCO3
Magnetite	2.80	6.21	3.40	Fe3O4
Malachite	-2.16	-7.46	-5.31	Cu2 (OH) 2CO3
Manganite	-10.67	14.67	25.34	MnOOH
Massicot	-9.65	3.24	12.89	PbO
Matlockite	-8.70	-17.68	-8.97	PbClF
Melanothallite	-21.01	-14.75	6.26	CuCl2
Melanterite	-8.90	-11.11	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-11.77	7.02	18.79	Mg (OH) 2
Mg (VO3) 2	-20.35	-9.07	11.28	Mg (VO3) 2
Mg2V2O7	-28.40	-2.04	26.36	Mg2V2O7
MgF2	-5.77	-13.90	-8.13	MgF2
MgMoO4	-10.36	-12.21	-1.85	MgMoO4
MgSeO3:6H2O	-10.29	-7.24	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-22.85	-24.05	-1.20	MgSeO4:6H2O
Minium	-44.30	29.22	73.52	Pb3O4
Mirabilite	-10.86	-11.97	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-16.06	-11.16	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-61.75	-67.47	-5.71	Mn2 (SO4) 3
MnCl2:4H2O	-18.70	-15.98	2.72	MnCl2:4H2O
MnSe	-26.44	-22.94	3.50	MnSe
MnSeO3	-10.46	-9.33	1.13	MnSeO3
MnSeO3:2H2O	-10.31	-9.33	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-24.10	-26.15	-2.05	MnSeO4:5H2O
MnSO4	-13.02	-10.44	2.58	MnSO4
Monteponite	-12.20	2.90	15.10	CdO
Montroydite	-15.13	-18.77	-3.64	HgO
MoO3	-11.24	-19.24	-8.00	MoO3
Na-Jarosite	-14.92	-26.12	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-18.48	-35.07	-16.60	Na2Mo2O7
Na2MoO4	-17.33	-15.84	1.49	Na2MoO4
Na2MoO4:2H2O	-17.06	-15.84	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-21.16	-10.86	10.30	Na2SeO3:5H2O
Na2SeO4	-28.96	-27.68	1.28	Na2SeO4
Na3VO4	-39.63	-2.95	36.68	Na3VO4
Na4V2O7	-46.69	-9.29	37.40	Na4V2O7
Nantokite	-4.62	-11.35	-6.73	CuCl
Natron	-15.07	-16.39	-1.31	Na2CO3:10H2O
NaVO3	-10.20	-6.35	3.86	NaVO3
Nesquehonite	-8.09	-12.76	-4.67	MgCO3:3H2O
Nsutite	-18.44	-0.93	17.50	MnO2
O2 (g)	-44.11	38.98	83.09	O2
Otavite	-4.89	-16.89	-12.00	CdCO3
Pb (BO2) 2	-15.94	-9.42	6.52	Pb (BO2) 2
Pb (OH) 2	-4.91	3.24	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-77.50	-86.26	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-12.76	-3.97	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-19.70	6.49	26.19	Pb2O (OH) 2
Pb2O3	-35.06	25.98	61.04	Pb2O3
Pb2OCO3	-12.74	-13.30	-0.56	Pb2OCO3
Pb2V2O7	-7.70	-9.60	-1.90	Pb2V2O7
Pb3 (VO4) 2	-12.50	-6.36	6.14	Pb3 (VO4) 2
Pb3O2CO3	-21.07	-10.05	11.02	Pb3O2CO3
Pb3O2SO4	-16.32	-5.64	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-23.49	-2.39	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-24.27	-2.39	21.88	Pb4O3SO4
PbF2	-10.24	-17.68	-7.44	PbF2
Pbmetal	-20.49	-16.24	4.25	Pb
PbMoO4	-0.37	-15.99	-15.62	PbMoO4
PbO:0.3H2O	-9.74	3.24	12.98	PbO:0.33H2O
PbSeO4	-21.00	-27.84	-6.84	PbSeO4
Periclase	-14.56	7.02	21.58	MgO
Phosgenite	-14.40	-34.21	-19.81	PbCl2:PbCO3
Plattnerite	-26.87	22.73	49.60	PbO2
Portlandite	-15.19	7.62	22.80	Ca (OH) 2
Pyrochroite	-10.26	4.93	15.19	Mn (OH) 2
Pyrolusite	-16.96	24.42	41.38	MnO2

Rhodochrosite	-4.27	-14.85	-10.58	MnCO3
Rutherfordine	-2.95	-17.45	-14.50	UO2CO3
Schoepite	-3.66	2.34	5.99	UO2 (OH) 2:H2O
Semetal (am)	-1.27	-8.38	-7.11	Se
Semetal (hex)	-0.67	-8.38	-7.71	Se
SeO2	-14.39	-14.26	0.12	SeO2
SeO3	-52.12	-31.08	21.04	SeO3
Siderite	-5.28	-15.52	-10.24	FeCO3
Smithsonite	-5.00	-15.00	-10.00	ZnCO3
Spinel	-13.72	23.12	36.85	MgAl2O4
Tenorite	-1.48	6.16	7.64	CuO
Thenardite	-12.29	-11.97	0.32	Na2SO4
Thermonatrite	-17.02	-16.39	0.64	Na2CO3:H2O
Tyuyamunite	-7.88	-3.80	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-5.91	15.17	21.08	U3O8
U4O9	-9.24	-12.26	-3.02	U4O9
UF4	-20.25	-49.79	-29.54	UF4
UF4:2.5H2O	-17.07	-49.79	-32.72	UF4:2.5H2O
UO2 (am)	-8.87	-7.94	0.93	UO2
UO2 (OH) 2 (beta)	-3.27	2.34	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-26.49	-28.74	-2.25	UO2SeO4:4H2O
UO3	-5.36	2.34	7.70	UO3
Uraninite	-3.27	-7.94	-4.67	UO2
V (OH) 3	-12.53	-4.94	7.59	V (OH) 3
V2O5	-14.73	-16.09	-1.36	V2O5
V3O5	-23.99	-22.15	1.84	V3O5
V4O7	-30.22	-23.04	7.19	V4O7
V6O13	-26.39	-87.25	-60.86	V6O13
VC12	-54.47	-35.59	18.87	VC12
VC13	-59.74	-36.31	23.43	VC13
VF4	-57.67	-42.74	14.93	VF4
Vmetal	-78.19	-34.17	44.03	V
VO	-29.44	-14.68	14.76	VO
VO (OH) 2	-6.04	-0.89	5.15	VO (OH) 2
VO2Cl	-21.34	-18.50	2.84	VO2Cl
VOC1	-26.55	-15.39	11.15	VOC1
VOC12	-34.56	-21.80	12.76	VOC12
VOSO4	-19.87	-16.26	3.61	VOSO4
Witherite	-6.38	-14.95	-8.57	BaCO3
Zincite	-6.55	4.79	11.33	ZnO
Zincosite	-14.51	-10.58	3.93	ZnSO4
Zn (BO2) 2	-16.17	-7.88	8.29	Zn (BO2) 2
Zn (OH) 2	-7.41	4.79	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-7.69	4.79	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-6.97	4.79	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-6.75	4.79	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-6.95	4.79	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-13.29	-5.79	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-16.07	-0.88	15.19	Zn2 (OH) 3Cl
Zn3O (SO4) 2	-35.29	-16.38	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-24.62	3.78	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-35.47	3.03	38.50	Zn5 (OH) 8Cl2
ZnCl2	-23.18	-16.13	7.05	ZnCl2
ZnCO3:1H2O	-4.74	-15.00	-10.26	ZnCO3:1H2O
ZnF2	-15.60	-16.14	-0.53	ZnF2
Znmetal	-40.49	-14.70	25.79	Zn
ZnMoO4	-4.32	-14.45	-10.13	ZnMoO4
ZnO (active)	-6.40	4.79	11.19	ZnO
ZnSe	-8.68	-23.08	-14.40	ZnSe
ZnSeO4:6H2O	-24.77	-26.29	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.95	-10.58	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 15.

SOLUTION 13 Average HCT data for quartz monzonite - sulfide (ore) (cells
604562, 604606, 604653, 604656 and 604669)

temp 25
pH 7.95176
pe 4
redox pe
units mg/l
density 1
Alkalinity 38.19771 as HCO3
Al 0.00779
B 0.00491
Ba 0.01157
Ca 19.46534
Cl 2.17054
F 0.80723
Fe 0.00087
Hg 0.000005
K 3.84048
Mg 3.50503
Mn 0.12993
Mo 0.00738
Na 3.46033 charge
Pb 0.00012
S(6) 38.71501 as SO4
Sb 0.00012
Se 0.00032
U 0.00124
V 0.00049
Zn 0.00456
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 13. Average HCT data for quartz monzonite - sulfide (ore)
(cells 604562, 604606, 604653, 604656 and 604669)

-----Solution composition-----

Elements	Molality	Moles	
Al	2.887e-07	2.887e-07	
Alkalinity	6.261e-04	6.261e-04	
B	4.543e-07	4.543e-07	
Ba	8.426e-08	8.426e-08	
Ca	4.857e-04	4.857e-04	
Cl	6.123e-05	6.123e-05	
F	4.249e-05	4.249e-05	
Fe	1.558e-08	1.558e-08	
Hg	2.493e-11	2.493e-11	
K	9.824e-05	9.824e-05	
Mg	1.442e-04	1.442e-04	
Mn	2.365e-06	2.365e-06	
Mo	7.693e-08	7.693e-08	
Na	1.720e-04	1.720e-04	Charge balance
Pb	5.792e-10	5.792e-10	
S(6)	4.030e-04	4.030e-04	
Sb	9.857e-10	9.857e-10	
Se	4.053e-09	4.053e-09	
U	5.210e-09	5.210e-09	
V	9.620e-09	9.620e-09	
Zn	6.974e-08	6.974e-08	

-----Description of solution-----

pH = 7.952
 pe = 4.000
 Activity of water = 1.000
 Ionic strength (mol/kgw) = 2.432e-03
 Mass of water (kg) = 1.000e+00
 Total carbon (mol/kg) = 6.337e-04
 Total CO2 (mol/kg) = 6.337e-04
 Temperature (°C) = 25.00
 Electrical balance (eq) = 1.602e-18
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 10
 Total H = 1.110143e+02
 Total O = 5.551035e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.518e-07	9.010e-07	-6.021	-6.045	-0.024	(0)
H+	1.180e-08	1.117e-08	-7.928	-7.952	-0.024	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	2.887e-07					
Al(OH)4-	2.862e-07	2.712e-07	-6.543	-6.567	-0.023	(0)
Al(OH)3	2.391e-09	2.391e-09	-8.621	-8.621	0.000	(0)
Al(OH)2+	1.402e-10	1.330e-10	-9.853	-9.876	-0.023	(0)
AlF2+	1.357e-12	1.287e-12	-11.867	-11.891	-0.023	(0)
AlF3	6.414e-13	6.414e-13	-12.193	-12.193	0.000	(0)
AlOH+2	2.299e-13	1.858e-13	-12.638	-12.731	-0.093	(0)
AlF+2	1.010e-13	8.164e-14	-12.996	-13.088	-0.093	(0)
AlF4-	1.343e-14	1.273e-14	-13.872	-13.895	-0.023	(0)
AlSO4+	5.049e-16	4.783e-16	-15.297	-15.320	-0.023	(0)
Al+3	3.362e-16	2.062e-16	-15.473	-15.686	-0.212	(0)
Al(SO4)2-	1.617e-18	1.532e-18	-17.791	-17.815	-0.023	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.428	-51.654	-0.226	(0)
B	4.543e-07					
H3BO3	4.300e-07	4.303e-07	-6.367	-6.366	0.000	(0)
H2BO3-	2.364e-08	2.236e-08	-7.626	-7.651	-0.024	(0)
CaH2BO3+	4.980e-10	4.710e-10	-9.303	-9.327	-0.024	(0)
MgH2BO3+	9.021e-11	8.533e-11	-10.045	-10.069	-0.024	(0)
BF(OH)3-	7.186e-12	6.797e-12	-11.143	-11.168	-0.024	(0)
NaH2BO3	5.760e-12	5.760e-12	-11.240	-11.240	0.000	(0)
BaH2BO3+	4.925e-14	4.659e-14	-13.308	-13.332	-0.024	(0)
H5(BO3)2-	8.657e-15	8.189e-15	-14.063	-14.087	-0.024	(0)
BF2(OH)2-	3.399e-16	3.215e-16	-15.469	-15.493	-0.024	(0)
H8(BO3)3-	3.725e-19	3.523e-19	-18.429	-18.453	-0.024	(0)
BF3OH-	5.851e-23	5.535e-23	-22.233	-22.257	-0.024	(0)
BF4-	1.274e-28	1.205e-28	-27.895	-27.919	-0.024	(0)
Ba	8.426e-08					
Ba+2	8.378e-08	6.742e-08	-7.077	-7.171	-0.094	(0)
BaHCO3+	3.923e-10	3.721e-10	-9.406	-9.429	-0.023	(0)
BaCO3	8.384e-11	8.384e-11	-10.077	-10.077	0.000	(0)
BaOH+	2.798e-13	2.652e-13	-12.553	-12.576	-0.023	(0)
BaH2BO3+	4.925e-14	4.659e-14	-13.308	-13.332	-0.024	(0)
C(4)	6.337e-04					
HCO3-	6.096e-04	5.780e-04	-3.215	-3.238	-0.023	(0)
H2CO3	1.453e-05	1.453e-05	-4.838	-4.838	0.000	(0)
CaHCO3+	4.154e-06	3.940e-06	-5.382	-5.405	-0.023	(0)
CO3-2	3.014e-06	2.425e-06	-5.521	-5.615	-0.094	(0)
CaCO3	1.407e-06	1.407e-06	-5.852	-5.852	0.000	(0)
MgHCO3+	6.873e-07	6.509e-07	-6.163	-6.186	-0.024	(0)
MgCO3	2.220e-07	2.220e-07	-6.654	-6.654	0.000	(0)
NaHCO3	5.283e-08	5.283e-08	-7.277	-7.277	0.000	(0)
MnHCO3+	2.164e-08	2.051e-08	-7.665	-7.688	-0.023	(0)
NaCO3-	7.741e-09	7.339e-09	-8.111	-8.134	-0.023	(0)

	ZnCO3	6.172e-09	6.172e-09	-8.210	-8.210	0.000	(0)
	UO2 (CO3) 2-2	4.135e-09	3.280e-09	-8.384	-8.484	-0.101	(0)
	UO2 (CO3) 3-4	1.007e-09	3.986e-10	-8.997	-9.399	-0.402	(0)
	ZnHCO3+	8.566e-10	8.084e-10	-9.067	-9.092	-0.025	(0)
	BaHCO3+	3.923e-10	3.721e-10	-9.406	-9.429	-0.023	(0)
	PbCO3	3.619e-10	3.619e-10	-9.441	-9.441	0.000	(0)
	BaCO3	8.384e-11	8.384e-11	-10.077	-10.077	0.000	(0)
	UO2CO3	6.778e-11	6.778e-11	-10.169	-10.169	0.000	(0)
	PbHCO3+	2.259e-11	2.132e-11	-10.646	-10.671	-0.025	(0)
	Pb (CO3) 2-2	3.191e-12	2.531e-12	-11.496	-11.597	-0.101	(0)
	FeHCO3+	2.982e-13	2.829e-13	-12.525	-12.548	-0.023	(0)
	HgCO3	7.838e-19	7.838e-19	-18.106	-18.106	0.000	(0)
	Hg (CO3) 2-2	7.577e-21	6.010e-21	-20.121	-20.221	-0.101	(0)
	HgHCO3+	1.728e-22	1.631e-22	-21.762	-21.788	-0.025	(0)
Ca	4.857e-04						
	Ca+2	4.549e-04	3.661e-04	-3.342	-3.436	-0.094	(0)
	CaSO4	2.506e-05	2.506e-05	-4.601	-4.601	0.000	(0)
	CaHCO3+	4.154e-06	3.940e-06	-5.382	-5.405	-0.023	(0)
	CaCO3	1.407e-06	1.407e-06	-5.852	-5.852	0.000	(0)
	CaF+	1.669e-07	1.582e-07	-6.778	-6.801	-0.023	(0)
	CaOH+	6.938e-09	6.581e-09	-8.159	-8.182	-0.023	(0)
	CaH2BO3+	4.980e-10	4.710e-10	-9.303	-9.327	-0.024	(0)
Cl	6.123e-05						
	Cl-	6.123e-05	5.799e-05	-4.213	-4.237	-0.024	(0)
	MnCl+	1.370e-10	1.298e-10	-9.863	-9.887	-0.023	(0)
	ZnOHCl	7.600e-12	7.600e-12	-11.119	-11.119	0.000	(0)
	ZnCl+	6.803e-12	6.443e-12	-11.167	-11.191	-0.024	(0)
	PbCl+	1.082e-13	1.022e-13	-12.966	-12.991	-0.025	(0)
	MnCl2	1.063e-14	1.063e-14	-13.973	-13.973	0.000	(0)
	ZnCl2	5.922e-16	5.922e-16	-15.228	-15.228	0.000	(0)
	PbCl2	2.646e-17	2.646e-17	-16.577	-16.577	0.000	(0)
	HgClOH	2.492e-17	2.492e-17	-16.603	-16.603	0.000	(0)
	UO2Cl+	6.997e-19	6.604e-19	-18.155	-18.180	-0.025	(0)
	MnCl3-	1.792e-19	1.699e-19	-18.747	-18.770	-0.023	(0)
	HgCl2	9.083e-20	9.083e-20	-19.042	-19.042	0.000	(0)
	ZnCl3-	2.880e-20	2.728e-20	-19.541	-19.564	-0.024	(0)
	PbCl3-	6.474e-22	6.109e-22	-21.189	-21.214	-0.025	(0)
	HgCl+	3.311e-22	3.125e-22	-21.480	-21.505	-0.025	(0)
	FeCl+2	7.837e-23	6.325e-23	-22.106	-22.199	-0.093	(0)
	HgCl3-	5.581e-23	5.267e-23	-22.253	-22.278	-0.025	(0)
	VOCl+	3.073e-24	2.900e-24	-23.512	-23.538	-0.025	(0)
	ZnCl4-2	9.800e-25	7.910e-25	-24.009	-24.102	-0.093	(0)
	PbCl4-2	2.042e-26	1.619e-26	-25.690	-25.791	-0.101	(0)
	FeCl2+	1.729e-26	1.638e-26	-25.762	-25.786	-0.023	(0)
	HgCl4-2	1.533e-26	1.216e-26	-25.814	-25.915	-0.101	(0)
	FeCl3	9.501e-32	9.501e-32	-31.022	-31.022	0.000	(0)
	UCl+3	0.000e+00	0.000e+00	-47.055	-47.281	-0.226	(0)
F	4.249e-05						
	F-	4.180e-05	3.959e-05	-4.379	-4.402	-0.024	(0)
	MgF+	5.160e-07	4.889e-07	-6.287	-6.311	-0.023	(0)
	CaF+	1.669e-07	1.582e-07	-6.778	-6.801	-0.023	(0)
	NaF	4.060e-09	4.060e-09	-8.391	-8.391	0.000	(0)
	MnF+	2.957e-09	2.803e-09	-8.529	-8.552	-0.023	(0)
	HF	6.544e-10	6.544e-10	-9.184	-9.184	0.000	(0)
	ZnF+	3.702e-11	3.494e-11	-10.432	-10.457	-0.025	(0)
	BF (OH) 3-	7.186e-12	6.797e-12	-11.143	-11.168	-0.024	(0)
	AlF2+	1.357e-12	1.287e-12	-11.867	-11.891	-0.023	(0)
	AlF3	6.414e-13	6.414e-13	-12.193	-12.193	0.000	(0)
	PbF+	1.468e-13	1.385e-13	-12.833	-12.858	-0.025	(0)
	HF2-	1.041e-13	9.851e-14	-12.983	-13.007	-0.024	(0)
	AlF+2	1.010e-13	8.164e-14	-12.996	-13.088	-0.093	(0)
	UO2F+	4.066e-14	3.837e-14	-13.391	-13.416	-0.025	(0)
	AlF4-	1.343e-14	1.273e-14	-13.872	-13.895	-0.023	(0)
	UO2F2	4.382e-15	4.382e-15	-14.358	-14.358	0.000	(0)
	BF2 (OH) 2-	3.399e-16	3.215e-16	-15.469	-15.493	-0.024	(0)
	PbF2	1.079e-16	1.079e-16	-15.967	-15.967	0.000	(0)
	UO2F3-	4.618e-17	4.358e-17	-16.336	-16.361	-0.025	(0)
	FeF+2	1.943e-18	1.568e-18	-17.712	-17.805	-0.093	(0)

FeF2+	1.753e-18	1.661e-18	-17.756	-17.780	-0.023	(0)
VO2F	1.239e-18	1.239e-18	-17.907	-17.907	0.000	(0)
H2F2	1.147e-18	1.147e-18	-17.940	-17.940	0.000	(0)
FeF3	9.280e-20	9.280e-20	-19.032	-19.032	0.000	(0)
VO2F2-	1.888e-20	1.782e-20	-19.724	-19.749	-0.025	(0)
UO2F4-2	1.728e-20	1.370e-20	-19.763	-19.863	-0.101	(0)
PbF3-	8.588e-21	8.105e-21	-20.066	-20.091	-0.025	(0)
VOF+	4.486e-21	4.233e-21	-20.348	-20.373	-0.025	(0)
VOF2	6.285e-23	6.285e-23	-22.202	-22.202	0.000	(0)
BF3OH-	5.851e-23	5.535e-23	-22.233	-22.257	-0.024	(0)
VO2F3-2	1.109e-23	8.799e-24	-22.955	-23.056	-0.101	(0)
PbF4-2	1.936e-25	1.536e-25	-24.713	-24.814	-0.101	(0)
VOF3-	9.355e-26	8.829e-26	-25.029	-25.054	-0.025	(0)
Sb(OH) 2F	2.140e-26	2.140e-26	-25.670	-25.670	0.000	(0)
SbOF	2.105e-26	2.105e-26	-25.677	-25.677	0.000	(0)
HgF+	4.200e-28	3.964e-28	-27.377	-27.402	-0.025	(0)
VO2F4-3	2.887e-28	1.714e-28	-27.540	-27.766	-0.226	(0)
BF4-	1.274e-28	1.205e-28	-27.895	-27.919	-0.024	(0)
VOF4-2	1.779e-29	1.411e-29	-28.750	-28.850	-0.101	(0)
UF3+	4.714e-37	4.449e-37	-36.327	-36.352	-0.025	(0)
UF2+2	8.938e-38	7.090e-38	-37.049	-37.149	-0.101	(0)
UF4	1.931e-39	1.931e-39	-38.714	-38.714	0.000	(0)
UF+3	2.396e-40	1.422e-40	-39.621	-39.847	-0.226	(0)
UF5-	0.000e+00	0.000e+00	-41.493	-41.519	-0.025	(0)
UF6-2	0.000e+00	0.000e+00	-43.340	-43.441	-0.101	(0)
Fe (2)	5.364e-11					
Fe+2	4.901e-11	3.888e-11	-10.310	-10.410	-0.101	(0)
FeSO4	2.852e-12	2.852e-12	-11.545	-11.545	0.000	(0)
FeOH+	1.471e-12	1.395e-12	-11.832	-11.856	-0.023	(0)
FeHCO3+	2.982e-13	2.829e-13	-12.525	-12.548	-0.023	(0)
Fe (OH) 2	9.981e-16	9.981e-16	-15.001	-15.001	0.000	(0)
Fe (OH) 3-	3.001e-16	2.844e-16	-15.523	-15.546	-0.023	(0)
Fe (3)	1.553e-08					
Fe (OH) 2+	7.768e-09	7.365e-09	-8.110	-8.133	-0.023	(0)
Fe (OH) 3	7.127e-09	7.127e-09	-8.147	-8.147	0.000	(0)
Fe (OH) 4-	6.307e-10	5.980e-10	-9.200	-9.223	-0.023	(0)
FeOH+2	2.603e-14	2.101e-14	-13.584	-13.678	-0.093	(0)
FeF+2	1.943e-18	1.568e-18	-17.712	-17.805	-0.093	(0)
FeF2+	1.753e-18	1.661e-18	-17.756	-17.780	-0.023	(0)
FeSO4+	1.278e-19	1.211e-19	-18.894	-18.917	-0.023	(0)
FeF3	9.280e-20	9.280e-20	-19.032	-19.032	0.000	(0)
Fe+3	5.890e-20	3.612e-20	-19.230	-19.442	-0.212	(0)
Fe (SO4) 2-	8.200e-22	7.738e-22	-21.086	-21.111	-0.025	(0)
FeCl+2	7.837e-23	6.325e-23	-22.106	-22.199	-0.093	(0)
FeHSeO3+2	3.232e-25	2.564e-25	-24.491	-24.591	-0.101	(0)
Fe2 (OH) 2+4	3.693e-26	1.462e-26	-25.433	-25.835	-0.402	(0)
FeCl2+	1.729e-26	1.638e-26	-25.762	-25.786	-0.023	(0)
FeCl3	9.501e-32	9.501e-32	-31.022	-31.022	0.000	(0)
Fe3 (OH) 4+5	6.621e-33	1.556e-33	-32.179	-32.808	-0.629	(0)
H (0)	1.767e-27					
H2	8.836e-28	8.841e-28	-27.054	-27.054	0.000	(0)
Hg (0)	2.493e-11					
Hg	2.493e-11	2.493e-11	-10.603	-10.603	0.000	(0)
Hg (1)	1.152e-26					
Hg2+2	5.762e-27	4.571e-27	-26.239	-26.340	-0.101	(0)
Hg (2)	1.409e-15					
Hg (OH) 2	1.383e-15	1.383e-15	-14.859	-14.859	0.000	(0)
HgClOH	2.492e-17	2.492e-17	-16.603	-16.603	0.000	(0)
HgCO3	7.838e-19	7.838e-19	-18.106	-18.106	0.000	(0)
HgCl2	9.083e-20	9.083e-20	-19.042	-19.042	0.000	(0)
HgOH+	1.027e-20	9.688e-21	-19.989	-20.014	-0.025	(0)
Hg (CO3) 2-2	7.577e-21	6.010e-21	-20.121	-20.221	-0.101	(0)
HgCl+	3.311e-22	3.125e-22	-21.480	-21.505	-0.025	(0)
HgHCO3+	1.728e-22	1.631e-22	-21.762	-21.788	-0.025	(0)
Hg (OH) 3-	1.663e-22	1.569e-22	-21.779	-21.804	-0.025	(0)
HgCl3-	5.581e-23	5.267e-23	-22.253	-22.278	-0.025	(0)
Hg+2	3.405e-25	2.701e-25	-24.468	-24.569	-0.101	(0)
HgSO4	2.113e-26	2.113e-26	-25.675	-25.675	0.000	(0)

	HgCl4-2	1.533e-26	1.216e-26	-25.814	-25.915	-0.101	(0)
	HgF+	4.200e-28	3.964e-28	-27.377	-27.402	-0.025	(0)
K		9.824e-05					
	K+	9.803e-05	9.285e-05	-4.009	-4.032	-0.024	(0)
	KSO4-	2.072e-07	1.964e-07	-6.684	-6.707	-0.023	(0)
Mg		1.442e-04					
	Mg+2	1.368e-04	1.101e-04	-3.864	-3.958	-0.094	(0)
	MgSO4	5.985e-06	5.985e-06	-5.223	-5.223	0.000	(0)
	MgHCO3+	6.873e-07	6.509e-07	-6.163	-6.186	-0.024	(0)
	MgF+	5.160e-07	4.889e-07	-6.287	-6.311	-0.023	(0)
	MgCO3	2.220e-07	2.220e-07	-6.654	-6.654	0.000	(0)
	MgOH+	4.160e-08	3.948e-08	-7.381	-7.404	-0.023	(0)
	MgH2BO3+	9.021e-11	8.533e-11	-10.045	-10.069	-0.024	(0)
Mn (2)		2.365e-06					
	Mn+2	2.242e-06	1.778e-06	-5.649	-5.750	-0.101	(0)
	MnSO4	9.451e-08	9.451e-08	-7.025	-7.025	0.000	(0)
	MnHCO3+	2.164e-08	2.051e-08	-7.665	-7.688	-0.023	(0)
	MnOH+	4.246e-09	4.025e-09	-8.372	-8.395	-0.023	(0)
	MnF+	2.957e-09	2.803e-09	-8.529	-8.552	-0.023	(0)
	MnCl+	1.370e-10	1.298e-10	-9.863	-9.887	-0.023	(0)
	MnCl2	1.063e-14	1.063e-14	-13.973	-13.973	0.000	(0)
	MnSeO4	4.533e-17	4.533e-17	-16.344	-16.344	0.000	(0)
	Mn (OH) 3-	2.131e-17	2.019e-17	-16.672	-16.695	-0.023	(0)
	MnCl3-	1.792e-19	1.699e-19	-18.747	-18.770	-0.023	(0)
	Mn (OH) 4-2	7.278e-23	5.874e-23	-22.138	-22.231	-0.093	(0)
	MnSe	2.485e-39	2.485e-39	-38.605	-38.605	0.000	(0)
Mn (3)		1.295e-27					
	Mn+3	1.295e-27	7.943e-28	-26.888	-27.100	-0.212	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-44.465	-44.558	-0.093	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-49.906	-49.930	-0.024	(0)
Mo		7.693e-08					
	MoO4-2	7.692e-08	6.189e-08	-7.114	-7.208	-0.094	(0)
	HMoO4-	1.458e-11	1.376e-11	-10.836	-10.861	-0.025	(0)
	H2MoO4	1.126e-15	1.126e-15	-14.948	-14.948	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-51.428	-51.654	-0.226	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-60.177	-61.083	-0.905	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-62.019	-62.648	-0.629	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-65.415	-65.817	-0.402	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-70.297	-70.523	-0.226	(0)
Na		1.720e-04					
	Na+	1.716e-04	1.625e-04	-3.765	-3.789	-0.024	(0)
	NaSO4-	2.751e-07	2.609e-07	-6.560	-6.584	-0.023	(0)
	NaHCO3	5.283e-08	5.283e-08	-7.277	-7.277	0.000	(0)
	NaCO3-	7.741e-09	7.339e-09	-8.111	-8.134	-0.023	(0)
	NaF	4.060e-09	4.060e-09	-8.391	-8.391	0.000	(0)
	NaH2BO3	5.760e-12	5.760e-12	-11.240	-11.240	0.000	(0)
O (0)		1.296e-38					
	O2	6.482e-39	6.485e-39	-38.188	-38.188	0.000	(0)
Pb		5.792e-10					
	PbCO3	3.619e-10	3.619e-10	-9.441	-9.441	0.000	(0)
	PbOH+	1.191e-10	1.124e-10	-9.924	-9.949	-0.025	(0)
	Pb+2	6.170e-11	4.965e-11	-10.210	-10.304	-0.094	(0)
	PbHCO3+	2.259e-11	2.132e-11	-10.646	-10.671	-0.025	(0)
	PbSO4	7.267e-12	7.267e-12	-11.139	-11.139	0.000	(0)
	Pb (OH) 2	3.202e-12	3.202e-12	-11.495	-11.495	0.000	(0)
	Pb (CO3) 2-2	3.191e-12	2.531e-12	-11.496	-11.597	-0.101	(0)
	PbF+	1.468e-13	1.385e-13	-12.833	-12.858	-0.025	(0)
	PbCl+	1.082e-13	1.022e-13	-12.966	-12.991	-0.025	(0)
	Pb (SO4) 2-2	1.650e-14	1.309e-14	-13.783	-13.883	-0.101	(0)
	Pb (OH) 3-	3.057e-15	2.885e-15	-14.515	-14.540	-0.025	(0)
	PbF2	1.079e-16	1.079e-16	-15.967	-15.967	0.000	(0)
	PbCl2	2.646e-17	2.646e-17	-16.577	-16.577	0.000	(0)
	Pb (OH) 4-2	8.026e-19	6.366e-19	-18.096	-18.196	-0.101	(0)
	Pb2OH+3	1.489e-19	8.842e-20	-18.827	-19.053	-0.226	(0)
	PbF3-	8.588e-21	8.105e-21	-20.066	-20.091	-0.025	(0)
	PbCl3-	6.474e-22	6.109e-22	-21.189	-21.214	-0.025	(0)

Pb3(OH) 4+2	1.280e-23	1.016e-23	-22.893	-22.993	-0.101	(0)
PbF4-2	1.936e-25	1.536e-25	-24.713	-24.814	-0.101	(0)
PbCl4-2	2.042e-26	1.619e-26	-25.690	-25.791	-0.101	(0)
Pb4(OH) 4+4	1.012e-29	4.005e-30	-28.995	-29.397	-0.402	(0)
S (6)	4.030e-04					
SO4-2	3.714e-04	2.989e-04	-3.430	-3.525	-0.094	(0)
CaSO4	2.506e-05	2.506e-05	-4.601	-4.601	0.000	(0)
MgSO4	5.985e-06	5.985e-06	-5.223	-5.223	0.000	(0)
NaSO4-	2.751e-07	2.609e-07	-6.560	-6.584	-0.023	(0)
KSO4-	2.072e-07	1.964e-07	-6.684	-6.707	-0.023	(0)
MnSO4	9.451e-08	9.451e-08	-7.025	-7.025	0.000	(0)
ZnSO4	2.892e-09	2.892e-09	-8.539	-8.539	0.000	(0)
HSO4-	3.445e-10	3.264e-10	-9.463	-9.486	-0.023	(0)
Zn(SO4) 2-2	9.490e-12	7.528e-12	-11.023	-11.123	-0.101	(0)
PbSO4	7.267e-12	7.267e-12	-11.139	-11.139	0.000	(0)
FeSO4	2.852e-12	2.852e-12	-11.545	-11.545	0.000	(0)
Pb(SO4) 2-2	1.650e-14	1.309e-14	-13.783	-13.883	-0.101	(0)
UO2SO4	3.176e-15	3.176e-15	-14.498	-14.498	0.000	(0)
AlSO4+	5.049e-16	4.783e-16	-15.297	-15.320	-0.023	(0)
UO2(SO4) 2-2	1.578e-17	1.251e-17	-16.802	-16.903	-0.101	(0)
Al(SO4) 2-	1.617e-18	1.532e-18	-17.791	-17.815	-0.023	(0)
VO2SO4-	1.350e-19	1.274e-19	-18.870	-18.895	-0.025	(0)
FeSO4+	1.278e-19	1.211e-19	-18.894	-18.917	-0.023	(0)
VOSO4	1.467e-21	1.467e-21	-20.833	-20.833	0.000	(0)
Fe(SO4) 2-	8.200e-22	7.738e-22	-21.086	-21.111	-0.025	(0)
HgSO4	2.113e-26	2.113e-26	-25.675	-25.675	0.000	(0)
VSO4+	1.653e-35	1.560e-35	-34.782	-34.807	-0.025	(0)
U(SO4) 2	0.000e+00	0.000e+00	-41.294	-41.294	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.569	-41.669	-0.101	(0)
Sb (3)	6.121e-20					
Sb(OH) 3	3.097e-20	3.097e-20	-19.509	-19.509	0.000	(0)
HSbO2	3.023e-20	3.023e-20	-19.520	-19.520	0.000	(0)
SbO2-	4.642e-24	4.381e-24	-23.333	-23.358	-0.025	(0)
Sb(OH) 4-	2.660e-24	2.511e-24	-23.575	-23.600	-0.025	(0)
Sb(OH) 2F	2.140e-26	2.140e-26	-25.670	-25.670	0.000	(0)
SbOF	2.105e-26	2.105e-26	-25.677	-25.677	0.000	(0)
Sb(OH) 2+	8.905e-27	8.404e-27	-26.050	-26.076	-0.025	(0)
SbO+	3.070e-27	2.897e-27	-26.513	-26.538	-0.025	(0)
Sb (5)	9.857e-10					
SbO3-	9.846e-10	9.292e-10	-9.007	-9.032	-0.025	(0)
Sb(OH) 6-	1.148e-12	1.087e-12	-11.940	-11.964	-0.024	(0)
SbO2+	3.527e-26	3.328e-26	-25.453	-25.478	-0.025	(0)
Se (-2)	4.019e-36					
HSe-	4.016e-36	3.790e-36	-35.396	-35.421	-0.025	(0)
MnSe	2.485e-39	2.485e-39	-38.605	-38.605	0.000	(0)
H2Se	3.288e-40	3.288e-40	-39.483	-39.483	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.369	-42.470	-0.101	(0)
Se (4)	4.053e-09					
HSeO3-	2.846e-09	2.686e-09	-8.546	-8.571	-0.025	(0)
SeO3-2	1.207e-09	9.570e-10	-8.918	-9.019	-0.101	(0)
H2SeO3	1.281e-14	1.281e-14	-13.893	-13.893	0.000	(0)
FeHSeO3+2	3.232e-25	2.564e-25	-24.491	-24.591	-0.101	(0)
Se (6)	1.178e-13					
SeO4-2	1.177e-13	9.472e-14	-12.929	-13.024	-0.094	(0)
MnSeO4	4.533e-17	4.533e-17	-16.344	-16.344	0.000	(0)
ZnSeO4	6.488e-19	6.488e-19	-18.188	-18.188	0.000	(0)
HSeO4-	5.621e-20	5.305e-20	-19.250	-19.275	-0.025	(0)
Zn(SeO4) 2-2	7.855e-32	6.231e-32	-31.105	-31.205	-0.101	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.314	-57.541	-0.226	(0)
U (4)	8.308e-19					
U(OH) 5-	8.304e-19	7.837e-19	-18.081	-18.106	-0.025	(0)
U(OH) 4	3.668e-22	3.668e-22	-21.436	-21.436	0.000	(0)
U(OH) 3+	1.588e-26	1.498e-26	-25.799	-25.824	-0.025	(0)
U(OH) 2+2	9.761e-32	7.743e-32	-31.010	-31.111	-0.101	(0)
UF3+	4.714e-37	4.449e-37	-36.327	-36.352	-0.025	(0)
UF2+2	8.938e-38	7.090e-38	-37.049	-37.149	-0.101	(0)
UOH+3	6.863e-38	4.075e-38	-37.163	-37.390	-0.226	(0)

UF4	1.931e-39	1.931e-39	-38.714	-38.714	0.000	(0)
UF+3	2.396e-40	1.422e-40	-39.621	-39.847	-0.226	(0)
U(SO4)2	0.000e+00	0.000e+00	-41.294	-41.294	0.000	(0)
UF5-	0.000e+00	0.000e+00	-41.493	-41.519	-0.025	(0)
USO4+2	0.000e+00	0.000e+00	-41.569	-41.669	-0.101	(0)
UF6-2	0.000e+00	0.000e+00	-43.340	-43.441	-0.101	(0)
U+4	0.000e+00	0.000e+00	-44.342	-44.745	-0.402	(0)
UC1+3	0.000e+00	0.000e+00	-47.055	-47.281	-0.226	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-164.309	-166.346	-2.037	(0)
U(5)	4.535e-16					
UO2+	4.535e-16	4.280e-16	-15.343	-15.369	-0.025	(0)
U(6)	5.210e-09					
UO2(CO3)2-2	4.135e-09	3.280e-09	-8.384	-8.484	-0.101	(0)
UO2(CO3)3-4	1.007e-09	3.986e-10	-8.997	-9.399	-0.402	(0)
UO2CO3	6.778e-11	6.778e-11	-10.169	-10.169	0.000	(0)
UO2OH+	8.440e-13	7.965e-13	-12.074	-12.099	-0.025	(0)
UO2F+	4.066e-14	3.837e-14	-13.391	-13.416	-0.025	(0)
UO2+2	8.726e-15	7.021e-15	-14.059	-14.154	-0.094	(0)
UO2F2	4.382e-15	4.382e-15	-14.358	-14.358	0.000	(0)
UO2SO4	3.176e-15	3.176e-15	-14.498	-14.498	0.000	(0)
UO2F3-	4.618e-17	4.358e-17	-16.336	-16.361	-0.025	(0)
UO2(SO4)2-2	1.578e-17	1.251e-17	-16.802	-16.903	-0.101	(0)
(UO2)2(OH)2+2	1.327e-18	1.053e-18	-17.877	-17.978	-0.101	(0)
UO2Cl+	6.997e-19	6.604e-19	-18.155	-18.180	-0.025	(0)
(UO2)3(OH)5+	5.472e-19	5.164e-19	-18.262	-18.287	-0.025	(0)
UO2F4-2	1.728e-20	1.370e-20	-19.763	-19.863	-0.101	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.777	-40.802	-0.025	(0)
V+2	0.000e+00	0.000e+00	-42.166	-42.266	-0.101	(0)
V(3)	6.524e-14					
V(OH)3	6.524e-14	6.524e-14	-13.186	-13.186	0.000	(0)
V(OH)2+	4.991e-25	4.710e-25	-24.302	-24.327	-0.025	(0)
VOH+2	6.294e-29	4.992e-29	-28.201	-28.302	-0.101	(0)
V+3	1.862e-34	1.106e-34	-33.730	-33.956	-0.226	(0)
VSO4+	1.653e-35	1.560e-35	-34.782	-34.807	-0.025	(0)
V2(OH)3+3	0.000e+00	0.000e+00	-53.950	-54.177	-0.226	(0)
V2(OH)2+4	0.000e+00	0.000e+00	-55.401	-55.803	-0.402	(0)
V(4)	3.424e-18					
V(OH)3+	3.396e-18	3.205e-18	-17.469	-17.494	-0.025	(0)
VO+2	2.247e-20	1.783e-20	-19.648	-19.749	-0.101	(0)
VOF+	4.486e-21	4.233e-21	-20.348	-20.373	-0.025	(0)
VOSO4	1.467e-21	1.467e-21	-20.833	-20.833	0.000	(0)
VOF2	6.285e-23	6.285e-23	-22.202	-22.202	0.000	(0)
VOCl+	3.073e-24	2.900e-24	-23.512	-23.538	-0.025	(0)
VOF3-	9.355e-26	8.829e-26	-25.029	-25.054	-0.025	(0)
VOF4-2	1.779e-29	1.411e-29	-28.750	-28.850	-0.101	(0)
H2V2O4+2	6.490e-31	5.148e-31	-30.188	-30.288	-0.101	(0)
V(5)	9.620e-09					
H2VO4-	7.590e-09	7.162e-09	-8.120	-8.145	-0.025	(0)
HVO4-2	2.030e-09	1.610e-09	-8.693	-8.793	-0.101	(0)
H3VO4	8.004e-13	8.004e-13	-12.097	-12.097	0.000	(0)
H3V2O7-	3.922e-14	3.702e-14	-13.406	-13.432	-0.025	(0)
HV2O7-3	6.581e-15	3.908e-15	-14.182	-14.408	-0.226	(0)
VO4-3	1.216e-15	7.221e-16	-14.915	-15.141	-0.226	(0)
V2O7-4	2.377e-17	9.412e-18	-16.624	-17.026	-0.402	(0)
VO2+	1.884e-17	1.785e-17	-16.725	-16.748	-0.024	(0)
VO2F	1.239e-18	1.239e-18	-17.907	-17.907	0.000	(0)
V3O9-3	6.480e-19	3.848e-19	-18.188	-18.415	-0.226	(0)
VO2SO4-	1.350e-19	1.274e-19	-18.870	-18.895	-0.025	(0)
VO2F2-	1.888e-20	1.782e-20	-19.724	-19.749	-0.025	(0)
VO2F3-2	1.109e-23	8.799e-24	-22.955	-23.056	-0.101	(0)
V4O12-4	2.902e-24	1.149e-24	-23.537	-23.940	-0.402	(0)
VO2F4-3	2.887e-28	1.714e-28	-27.540	-27.766	-0.226	(0)
V10O28-6	0.000e+00	0.000e+00	-63.445	-64.351	-0.905	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.487	-64.116	-0.629	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.457	-66.860	-0.402	(0)
Zn	6.974e-08					
Zn+2	5.497e-08	4.423e-08	-7.260	-7.354	-0.094	(0)

ZnCO3	6.172e-09	6.172e-09	-8.210	-8.210	0.000	(0)
ZnOH+	4.223e-09	3.985e-09	-8.374	-8.400	-0.025	(0)
ZnSO4	2.892e-09	2.892e-09	-8.539	-8.539	0.000	(0)
ZnHCO3+	8.566e-10	8.084e-10	-9.067	-9.092	-0.025	(0)
Zn(OH)2	5.691e-10	5.691e-10	-9.245	-9.245	0.000	(0)
ZnF+	3.702e-11	3.494e-11	-10.432	-10.457	-0.025	(0)
Zn(SO4)2-2	9.490e-12	7.528e-12	-11.023	-11.123	-0.101	(0)
ZnOHCl	7.600e-12	7.600e-12	-11.119	-11.119	0.000	(0)
ZnCl+	6.803e-12	6.443e-12	-11.167	-11.191	-0.024	(0)
Zn(OH)3-	2.723e-12	2.570e-12	-11.565	-11.590	-0.025	(0)
ZnCl2	5.922e-16	5.922e-16	-15.228	-15.228	0.000	(0)
Zn(OH)4-2	1.162e-16	9.219e-17	-15.935	-16.035	-0.101	(0)
ZnSeO4	6.488e-19	6.488e-19	-18.188	-18.188	0.000	(0)
ZnCl3-	2.880e-20	2.728e-20	-19.541	-19.564	-0.024	(0)
ZnCl4-2	9.800e-25	7.910e-25	-24.009	-24.102	-0.093	(0)
Zn(SeO4)2-2	7.855e-32	6.231e-32	-31.105	-31.205	-0.101	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH)3(am)	-2.63	8.17	10.80	Al(OH)3
Al2(MoO4)3	-55.36	-53.00	2.37	Al2(MoO4)3
Al2O3	-3.31	16.34	19.65	Al2O3
Al4(OH)10SO4	-9.45	13.25	22.70	Al4(OH)10SO4
AlOHSO4	-8.03	-11.26	-3.23	AlOHSO4
AlSb	-148.67	-83.05	65.62	AlSb
Alunite	-9.03	-10.43	-1.40	KAl3(SO4)2(OH)6
Anglesite	-6.04	-13.83	-7.79	PbSO4
Anhydrite	-2.60	-6.96	-4.36	CaSO4
Aragonite	-0.75	-9.05	-8.30	CaCO3
Artinite	-7.23	2.37	9.60	MgCO3:Mg(OH)2:3H2O
Ba(OH)2:8H2O	-15.66	8.73	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.00	-0.13	15.87	Ba2V2O7:2H2O
Ba3(VO4)2:4H2O	-24.34	8.60	32.94	Ba3(VO4)2:4H2O
BaF2	-10.16	-15.98	-5.82	BaF2
BaMoO4	-7.42	-14.38	-6.96	BaMoO4
Barite	-0.72	-10.70	-9.98	BaSO4
BaSeO3	-9.62	-7.79	1.83	BaSeO3
BaSeO4	-12.73	-20.19	-7.46	BaSeO4
Bianchite	-9.11	-10.88	-1.76	ZnSO4:6H2O
Birnessite	-9.38	8.71	18.09	MnO2
Bixbyite	-5.85	-6.49	-0.64	Mn2O3
Boehmite	-0.41	8.17	8.58	AlOOH
Brucite	-4.90	11.95	16.84	Mg(OH)2
Ca(VO3)2	-10.79	-5.13	5.66	Ca(VO3)2
Ca2V2O7	-10.16	7.34	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.21	7.34	21.55	Ca2V2O7:2H2O
Ca3(VO4)2	-19.15	19.81	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.05	19.81	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-288.01	-145.04	142.97	Ca3Sb2
Calcite	-0.57	-9.05	-8.48	CaCO3
Calomel	-16.90	-34.81	-17.91	Hg2Cl2
CaMoO4	-2.69	-10.64	-7.95	CaMoO4
Carnotite	-3.36	-3.13	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.06	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.44	-16.46	-3.02	CaSeO4:2H2O
Cerrusite	-2.79	-15.92	-13.13	PbCO3
CH4(g)	-76.09	-117.13	-41.05	CH4
Clausthalite	-10.67	-37.77	-27.10	PbSe
CO2(g)	-3.37	-21.52	-18.15	CO2
Cotunnite	-14.00	-18.78	-4.78	PbCl2
Cryolite	-19.63	-53.47	-33.84	Na3AlF6
Diaspore	1.30	8.17	6.87	AlOOH
Dolomite(disordered)	-2.09	-18.63	-16.54	CaMg(CO3)2
Dolomite(ordered)	-1.54	-18.63	-17.09	CaMg(CO3)2
Epsomite	-5.36	-7.48	-2.13	MgSO4:7H2O
Fe(OH)2	-8.07	5.49	13.56	Fe(OH)2

Fe (OH) 2.7Cl.3	3.80	0.76	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-8.38	-12.10	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.25	-7.70	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-20.12	-40.74	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.72	-49.46	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-5.90	14.32	20.22	Fe3 (OH) 8
FeMoO4	-7.53	-17.62	-10.09	FeMoO4
Ferrihydrite	1.22	4.41	3.19	Fe (OH) 3
Ferroselite	-38.75	-57.35	-18.60	FeSe2
FeSe	-26.88	-37.88	-11.00	FeSe
Fluorite	-1.74	-12.24	-10.50	CaF2
Gibbsite	-0.12	8.17	8.29	Al (OH) 3
Goethite	3.92	4.41	0.49	FeOOH
Goslarite	-8.87	-10.88	-2.01	ZnSO4:7H2O
Gummite	-5.92	1.75	7.67	UO3
Gypsum	-2.35	-6.96	-4.61	CaSO4:2H2O
H-Jarosite	-13.52	-25.62	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.24	-23.11	-12.88	H2MoO4
H2Se (g)	-38.41	-43.37	-4.96	H2Se
Halite	-9.63	-8.03	1.60	NaCl
Hausmannite	-6.67	54.36	61.03	Mn3O4
Hematite	10.24	8.83	-1.42	Fe2O3
Hercynite	-1.06	21.83	22.89	FeAl2O4
Hg (CH3) 2 (g)	-175.42	-249.12	-73.71	Hg (CH3) 2
Hg (g)	-9.30	-17.17	-7.87	Hg
Hg (OH) 2	-11.36	-14.86	-3.50	Hg (OH) 2
Hg2 (g)	-19.38	-34.34	-14.96	Hg2
Hg2 (OH) 2	-15.70	-10.44	5.26	Hg2 (OH) 2
Hg2CO3	-15.91	-31.96	-16.05	Hg2CO3
Hg2F2	-24.78	-35.14	-10.36	Hg2F2
Hg2SeO3	-22.30	-26.96	-4.66	Hg2SeO3
Hg2SO4	-23.73	-29.86	-6.13	Hg2SO4
Hg3O2CO3	-36.41	-66.10	-29.68	Hg3O2CO3
HgCl (g)	-36.90	-17.41	19.50	HgCl
HgCl2	-17.97	-39.24	-21.26	HgCl2
HgF (g)	-50.25	-17.57	32.68	HgF
HgF2 (g)	-52.13	-39.57	12.57	HgF2
Hgmetal (l)	-3.72	-17.17	-13.45	Hg
HgSe	-2.54	-58.23	-55.69	HgSe
HgSeO3	-18.95	-31.38	-12.43	HgSeO3
HgSO4	-24.87	-34.29	-9.42	HgSO4
Huntite	-7.80	-37.77	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.47	-26.24	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-17.58	-26.35	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-21.60	-26.77	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.90	-21.70	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-18.53	-15.27	3.26	K2MoO4
K2SeO4	-20.36	-21.09	-0.73	K2SeO4
Larnakite	-7.79	-8.23	-0.43	PbO:PbSO4
Laurionite	-7.21	-6.59	0.62	PbOHCl
Lepidocrocite	3.04	4.41	1.37	FeOOH
Lime	-20.23	12.47	32.70	CaO
Litharge	-7.09	5.60	12.69	PbO
Maghemite	2.44	8.83	6.39	Fe2O3
Magnesioferrite	3.91	20.77	16.86	Fe2MgO4
Magnesite	-2.11	-9.57	-7.46	MgCO3
Magnetite	10.92	14.32	3.40	Fe3O4
Manganite	-3.23	22.11	25.34	MnOOH
Massicot	-7.29	5.60	12.89	PbO
Matlockite	-9.97	-18.94	-8.97	PbClF
Melanterite	-11.73	-13.93	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-6.85	11.95	18.79	Mg (OH) 2
Mg (VO3) 2	-16.93	-5.65	11.28	Mg (VO3) 2
Mg2Sb3	-264.69	-190.01	74.68	Mg2Sb3
Mg2V2O7	-20.06	6.30	26.36	Mg2V2O7
MgF2	-4.63	-12.76	-8.13	MgF2
MgMoO4	-9.32	-11.17	-1.85	MgMoO4
MgSeO3:6H2O	-7.63	-4.58	3.06	MgSeO3:6H2O

MgSeO4:6H2O	-15.78	-16.98	-1.20	MgSeO4:6H2O
Minium	-32.82	40.70	73.52	Pb3O4
Mirabilite	-9.99	-11.10	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.34	-7.44	4.90	Mn(VO3)2
Mn2(SO4)3	-59.06	-64.77	-5.71	Mn2(SO4)3
Mn2Sb	-143.94	-82.86	61.08	Mn2Sb
MnCl2:4H2O	-16.94	-14.22	2.72	MnCl2:4H2O
MnSb	-91.55	-94.46	-2.91	MnSb
MnSe	-36.72	-33.22	3.50	MnSe
MnSeO3	-7.50	-6.37	1.13	MnSeO3
MnSeO3:2H2O	-7.35	-6.37	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.72	-18.77	-2.05	MnSeO4:5H2O
MnSO4	-11.86	-9.27	2.58	MnSO4
Montroydite	-11.22	-14.86	-3.64	HgO
MoO3	-15.11	-23.11	-8.00	MoO3
Na-Jarosite	-10.25	-21.45	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-21.30	-37.90	-16.60	Na2Mo2O7
Na2MoO4	-16.28	-14.79	1.49	Na2MoO4
Na2MoO4:2H2O	-16.01	-14.79	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.50	-8.20	10.30	Na2SeO3:5H2O
Na2SeO4	-21.88	-20.60	1.28	Na2SeO4
Na3Sb	-173.18	-78.73	94.45	Na3Sb
Na3VO4	-32.99	3.69	36.68	Na3VO4
Na4V2O7	-38.34	-0.94	37.40	Na4V2O7
NaSb	-86.32	-63.15	23.17	NaSb
Natron	-11.88	-13.19	-1.31	Na2CO3:10H2O
NaVO3	-8.49	-4.63	3.86	NaVO3
Nesquehonite	-4.90	-9.57	-4.67	MgCO3:3H2O
Nsutite	-8.80	8.71	17.50	MnO2
O2(g)	-35.28	47.81	83.09	O2
Pb(BO2)2	-13.65	-7.13	6.52	Pb(BO2)2
Pb(OH)2	-2.55	5.60	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.36	-73.12	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.78	-0.99	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.99	11.20	26.19	Pb2O(OH)2
Pb2O3	-25.94	35.10	61.04	Pb2O3
Pb2OCO3	-9.76	-10.32	-0.56	Pb2OCO3
Pb2V2O7	-4.49	-6.39	-1.90	Pb2V2O7
Pb3(VO4)2	-6.94	-0.80	6.14	Pb3(VO4)2
Pb3O2CO3	-15.74	-4.72	11.02	Pb3O2CO3
Pb3O2SO4	-13.32	-2.63	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.13	2.97	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.97	21.88	Pb4O3SO4
PbF2	-11.67	-19.11	-7.44	PbF2
Pbmetal	-22.55	-18.30	4.25	Pb
PbMoO4	-1.89	-17.51	-15.62	PbMoO4
PbO:0.3H2O	-7.38	5.60	12.98	PbO:0.33H2O
PbSeO4	-16.49	-23.33	-6.84	PbSeO4
Periclase	-9.64	11.95	21.58	MgO
Phosgenite	-14.89	-34.70	-19.81	PbCl2:PbCO3
Plattnerite	-20.10	29.50	49.60	PbO2
Portlandite	-10.34	12.47	22.80	Ca(OH)2
Pyrochroite	-5.04	10.15	15.19	Mn(OH)2
Pyrolusite	-7.32	34.06	41.38	MnO2
Rhodochrosite	-0.79	-11.37	-10.58	MnCO3
Rutherfordine	-5.27	-19.77	-14.50	UO2CO3
Sb(OH)3	-12.40	-19.51	-7.11	Sb(OH)3
Sb2O4	-18.52	-15.11	3.40	Sb2O4
Sb2O5	-30.16	-39.83	-9.67	Sb2O5
Sb2Se3	-101.38	-169.14	-67.76	Sb2Se3
Sb4O6(cubic)	-59.78	-78.04	-18.26	Sb4O6
Sb4O6(orth)	-60.14	-78.04	-17.90	Sb4O6
SbCl3	-56.65	-56.07	0.57	SbCl3
SbF3	-46.35	-56.57	-10.23	SbF3
Sbmetal	-43.68	-55.36	-11.69	Sb
SbO2	-4.04	-31.87	-27.82	SbO2
Schoepite	-4.24	1.75	5.99	UO2(OH)2:H2O
Semetal(am)	-12.36	-19.47	-7.11	Se

Semetal(hex	-11.76	-19.47	-7.71	Se
Senarmontite	-26.65	-39.02	-12.37	Sb2O3
SeO2	-16.65	-16.52	0.12	SeO2
SeO3	-49.97	-28.93	21.04	SeO3
Siderite	-5.79	-16.03	-10.24	FeCO3
Smithsonite	-2.97	-12.97	-10.00	ZnCO3
Spinel	-8.56	28.28	36.85	MgAl2O4
Thenardite	-11.42	-11.10	0.32	Na2SO4
Thermonatrite	-13.83	-13.19	0.64	Na2CO3:H2O
Tyuyamunite	-5.71	-1.63	4.08	Ca(UO2)2(VO4)2
U3O8	-12.09	8.99	21.08	U3O8
U3Sb4	-556.07	-403.69	152.38	U3Sb4
U4O9	-24.83	-27.85	-3.02	U4O9
UF4	-32.82	-62.35	-29.54	UF4
UF4:2.5H2O	-29.64	-62.35	-32.72	UF4:2.5H2O
UO2(am)	-13.87	-12.94	0.93	UO2
UO2(OH)2(beta)	-3.86	1.75	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.93	-27.18	-2.25	UO2SeO4:4H2O
UO3	-5.95	1.75	7.70	UO3
Uraninite	-8.27	-12.94	-4.67	UO2
USb2	-210.27	-180.69	29.58	USb2
V(OH)3	-17.69	-10.10	7.59	V(OH)3
V2O5	-16.23	-17.59	-1.36	V2O5
V3O5	-37.28	-35.44	1.84	V3O5
V4O7	-46.47	-39.29	7.19	V4O7
V6O13	-39.73	-100.59	-60.86	V6O13
Valentinite	-30.54	-39.02	-8.48	Sb2O3
VC12	-65.30	-46.43	18.87	VC12
VC13	-70.10	-46.67	23.43	VC13
VF4	-68.19	-53.26	14.93	VF4
Vmetal	-89.98	-45.96	44.03	V
VO	-36.81	-22.05	14.76	VO
VO(OH)2	-9.00	-3.85	5.15	VO(OH)2
VO2Cl	-23.83	-20.99	2.84	VO2Cl
VOC1	-33.44	-22.29	11.15	VOC1
VOC12	-40.98	-28.22	12.76	VOC12
VOSO4	-26.88	-23.27	3.61	VOSO4
Witherite	-4.22	-12.79	-8.57	BaCO3
Zincite	-2.78	8.55	11.33	ZnO
Zincosite	-14.81	-10.88	3.93	ZnSO4
Zn(BO2)2	-12.47	-4.18	8.29	Zn(BO2)2
Zn(OH)2	-3.65	8.55	12.20	Zn(OH)2
Zn(OH)2(am)	-3.92	8.55	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.20	8.55	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.98	8.55	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.18	8.55	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.83	-2.33	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.28	4.91	15.19	Zn2(OH)3Cl
Zn3O(SO4)2	-32.12	-13.21	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.63	14.77	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.13	18.37	38.50	Zn5(OH)8Cl2
ZnCl2	-22.88	-15.83	7.05	ZnCl2
ZnCO3:1H2O	-2.71	-12.97	-10.26	ZnCO3:1H2O
ZnF2	-15.62	-16.16	-0.53	ZnF2
Znmetal	-41.14	-15.35	25.79	Zn
ZnMoO4	-4.44	-14.56	-10.13	ZnMoO4
ZnO(active)	-2.64	8.55	11.19	ZnO
ZnSb	-81.73	-70.72	11.01	ZnSb
ZnSe	-20.42	-34.82	-14.40	ZnSe
ZnSeO4:6H2O	-18.86	-20.38	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.24	-10.88	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 16.

SOLUTION 14 Average HCT data for coarse crystalline porphyry - sulfide
(waste) (cell CF-11-02, 367-408)

temp 25
pH 7.74339
pe 4
redox pe
units mg/l
density 1
Alkalinity 19.90015 as HCO3
Al 0.04951
B 0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495
F 0.54795
Fe 0.00225
Hg 0.000005
K 1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6) 7.66320 as SO4
Se 0.00024
U 0.00242
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 14. Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	1.835e-06	1.835e-06
Alkalinity	3.261e-04	3.261e-04
B	4.468e-07	4.468e-07
Ba	2.003e-08	2.003e-08
Ca	1.836e-04	1.836e-04
Cl	3.872e-05	3.872e-05
Cu	7.790e-08	7.790e-08
F	2.884e-05	2.884e-05
Fe	4.029e-08	4.029e-08
Hg	2.493e-11	2.493e-11
K	4.343e-05	4.343e-05
Mg	2.345e-05	2.345e-05
Mn	1.707e-07	1.707e-07
Mo	5.003e-09	5.003e-09
Na	8.965e-05	8.965e-05
Pb	5.792e-10	5.792e-10
S(6)	7.977e-05	7.977e-05
Se	3.040e-09	3.040e-09
U	1.017e-08	1.017e-08

Charge balance

-----Description of solution-----

pH = 7.743

```

pe = 4.000
Activity of water = 1.000
Ionic strength (mol/kgw) = 8.218e-04
Mass of water (kg) = 1.000e+00
Total carbon (mol/kg) = 3.294e-04
Total CO2 (mol/kg) = 3.294e-04
Temperature (°C) = 25.00
Electrical balance (eq) = -1.403e-17
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
Iterations = 10
Total H = 1.110140e+02
Total O = 5.550815e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.762e-07	5.577e-07	-6.239	-6.254	-0.014	(0)
H+	1.865e-08	1.806e-08	-7.729	-7.743	-0.014	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.835e-06					
Al(OH) 4-	1.808e-06	1.750e-06	-5.743	-5.757	-0.014	(0)
Al(OH) 3	2.493e-08	2.493e-08	-7.603	-7.603	0.000	(0)
Al(OH) 2+	2.313e-09	2.240e-09	-8.636	-8.650	-0.014	(0)
AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
AlOH+2	5.749e-12	5.058e-12	-11.240	-11.296	-0.056	(0)
AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
Al+3	1.214e-14	9.069e-15	-13.916	-14.042	-0.127	(0)
AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
Al(SO4) 2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
B	4.468e-07					
H3BO3	4.323e-07	4.324e-07	-6.364	-6.364	0.000	(0)
H2BO3-	1.437e-08	1.391e-08	-7.842	-7.857	-0.014	(0)
CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
MgH2BO3+	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
BF(OH) 3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
NaH2BO3	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
H5(BO3) 2-	5.290e-15	5.118e-15	-14.277	-14.291	-0.014	(0)
BF2(OH) 2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
H8(BO3) 3-	2.287e-19	2.213e-19	-18.641	-18.655	-0.014	(0)
BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)
BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)
Ba	2.003e-08					
Ba+2	1.997e-08	1.754e-08	-7.700	-7.756	-0.056	(0)
BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)
BaOH+	4.408e-14	4.269e-14	-13.356	-13.370	-0.014	(0)
BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
C(4)	3.294e-04					
HCO3-	3.148e-04	3.049e-04	-3.502	-3.516	-0.014	(0)
H2CO3	1.238e-05	1.238e-05	-4.907	-4.907	0.000	(0)
CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
CO3-2	9.014e-07	7.917e-07	-6.045	-6.101	-0.056	(0)
CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
MgHCO3+	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
NaHCO3	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
MgCO3	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
UO2(CO3) 2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
NaCO3-	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
MnHCO3+	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
UO2(CO3) 3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)

	PbCO3	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
	CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
	Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
	BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
	PbHCO3+	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
	BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)
	FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)
	Pb (CO3) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
	HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)
	Hg (CO3) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
	HgHCO3+	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
Ca		1.836e-04					
	Ca+2	1.800e-04	1.581e-04	-3.745	-3.801	-0.056	(0)
	CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
	CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
	CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
	CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
	CaOH+	1.816e-09	1.759e-09	-8.741	-8.755	-0.014	(0)
	CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
Cl		3.872e-05					
	Cl-	3.872e-05	3.748e-05	-4.412	-4.426	-0.014	(0)
	CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
	MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
	CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
	CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
	PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
	MnCl2	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
	PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
	UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
	HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
	CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
	CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
	HgCl2	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
	MnCl3-	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
	FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)
	PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
	HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
	HgCl3-	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
	CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
	FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)
	PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
	HgCl4-2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
	CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)
	FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)
	UCl+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
Cu (1)		5.210e-10					
	Cu+	4.981e-10	4.816e-10	-9.303	-9.317	-0.015	(0)
	CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
	CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
	CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
Cu (2)		7.738e-08					
	CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
	CuOH+	1.791e-08	1.734e-08	-7.747	-7.761	-0.014	(0)
	Cu+2	1.120e-08	9.833e-09	-7.951	-8.007	-0.056	(0)
	Cu (OH) 2	1.930e-09	1.930e-09	-8.715	-8.715	0.000	(0)
	CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
	CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
	Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
	CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
	Cu2 (OH) 2+2	8.642e-12	7.554e-12	-11.063	-11.122	-0.058	(0)
	Cu (OH) 3-	2.283e-12	2.207e-12	-11.642	-11.656	-0.015	(0)
	CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
	Cu (OH) 4-2	1.108e-17	9.688e-18	-16.955	-17.014	-0.058	(0)
	CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
	CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
	CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)
F		2.884e-05					
	F-	2.873e-05	2.781e-05	-4.542	-4.556	-0.014	(0)

MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
HF	7.427e-10	7.427e-10	-9.129	-9.129	0.000	(0)
MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
BF(OH) 3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)
AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
HF2-	8.112e-14	7.852e-14	-13.091	-13.105	-0.014	(0)
UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
BF2(OH) 2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)
FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)
H2F2	1.478e-18	1.478e-18	-17.830	-17.830	0.000	(0)
FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)
UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)
PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)
PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)
HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)
BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)
UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)
UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)
UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)
UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)
UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)
UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)
Fe (2)	3.925e-10					
Fe+2	3.781e-10	3.305e-10	-9.422	-9.481	-0.058	(0)
FeOH+	7.577e-12	7.337e-12	-11.121	-11.134	-0.014	(0)
FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)
FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)
Fe (OH) 2	3.250e-15	3.250e-15	-14.488	-14.488	0.000	(0)
Fe (OH) 3-	5.919e-16	5.732e-16	-15.228	-15.242	-0.014	(0)
Fe (3)	3.990e-08					
Fe (OH) 2+	2.476e-08	2.398e-08	-7.606	-7.620	-0.014	(0)
Fe (OH) 3	1.436e-08	1.436e-08	-7.843	-7.843	0.000	(0)
Fe (OH) 4-	7.702e-10	7.459e-10	-9.113	-9.127	-0.014	(0)
FeOH+2	1.257e-13	1.105e-13	-12.901	-12.956	-0.056	(0)
FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)
FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)
Fe+3	4.111e-19	3.070e-19	-18.386	-18.513	-0.127	(0)
FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)
FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)
FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)
Fe (SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)
FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)
Fe2 (OH) 2+4	6.934e-25	4.046e-25	-24.159	-24.393	-0.234	(0)
FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)
Fe3 (OH) 4+5	3.254e-31	1.403e-31	-30.488	-30.853	-0.366	(0)
FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)
H (0)	4.615e-27					
H2	2.307e-27	2.308e-27	-26.637	-26.637	0.000	(0)
Hg (0)	2.493e-11					
Hg	2.493e-11	2.493e-11	-10.603	-10.603	0.000	(0)
Hg (1)	1.046e-26					
Hg2+2	5.229e-27	4.570e-27	-26.282	-26.340	-0.058	(0)
Hg (2)	5.401e-16					
Hg (OH) 2	5.299e-16	5.300e-16	-15.276	-15.276	0.000	(0)
HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)

	HgCl ₂	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
	HgOH+	6.201e-21	5.996e-21	-20.208	-20.222	-0.015	(0)
	Hg (CO ₃) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
	HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
	HgHCO ₃ +	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
	Hg (OH) 3-	3.848e-23	3.721e-23	-22.415	-22.429	-0.015	(0)
	HgCl ₃ -	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
	Hg+2	3.090e-25	2.701e-25	-24.510	-24.569	-0.058	(0)
	HgSO ₄	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
	HgCl ₄ -2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
	HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)
K	4.343e-05						
	K+	4.341e-05	4.202e-05	-4.362	-4.376	-0.014	(0)
	KSO ₄ -	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
Mg	2.345e-05						
	Mg+2	2.305e-05	2.025e-05	-4.637	-4.694	-0.056	(0)
	MgSO ₄	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
	MgHCO ₃ +	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
	MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
	MgCO ₃	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
	MgOH+	4.640e-09	4.496e-09	-8.333	-8.347	-0.014	(0)
	MgH ₂ BO ₃ +	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
Mn (2)	1.707e-07						
	Mn+2	1.677e-07	1.465e-07	-6.776	-6.834	-0.058	(0)
	MnSO ₄	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
	MnHCO ₃ +	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
	MnOH+	2.120e-10	2.053e-10	-9.674	-9.688	-0.014	(0)
	MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
	MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
	MnCl ₂	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
	MnSeO ₄	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
	Mn (OH) 3-	4.075e-19	3.946e-19	-18.390	-18.404	-0.014	(0)
	MnCl ₃ -	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
	Mn (OH) 4-2	8.079e-25	7.104e-25	-24.093	-24.148	-0.056	(0)
	MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
Mn (3)	8.765e-29						
	Mn+3	8.765e-29	6.546e-29	-28.057	-28.184	-0.127	(0)
Mn (6)	0.000e+00						
	MnO ₄ -2	0.000e+00	0.000e+00	-47.253	-47.309	-0.056	(0)
Mn (7)	0.000e+00						
	MnO ₄ -	0.000e+00	0.000e+00	-52.667	-52.681	-0.014	(0)
Mo	5.003e-09						
	MoO ₄ -2	5.002e-09	4.393e-09	-8.301	-8.357	-0.056	(0)
	HMoO ₄ -	1.632e-12	1.578e-12	-11.787	-11.802	-0.015	(0)
	H ₂ MoO ₄	2.087e-16	2.087e-16	-15.680	-15.680	0.000	(0)
	AlMo ₆ O ₂₁ -3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
	Mo ₇ O ₂₄ -6	0.000e+00	0.000e+00	-66.931	-67.458	-0.526	(0)
	HMo ₇ O ₂₄ -5	0.000e+00	0.000e+00	-68.449	-68.814	-0.366	(0)
	H ₂ Mo ₇ O ₂₄ -4	0.000e+00	0.000e+00	-71.542	-71.776	-0.234	(0)
	H ₃ Mo ₇ O ₂₄ -3	0.000e+00	0.000e+00	-76.141	-76.273	-0.132	(0)
Na	8.965e-05						
	Na+	8.960e-05	8.674e-05	-4.048	-4.062	-0.014	(0)
	NaSO ₄ -	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
	NaHCO ₃	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
	NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
	NaCO ₃ -	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
	NaH ₂ BO ₃	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
O (0)	1.903e-39						
	O ₂	9.515e-40	9.516e-40	-39.022	-39.022	0.000	(0)
Pb	5.792e-10						
	PbCO ₃	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
	PbOH+	1.592e-10	1.540e-10	-9.798	-9.813	-0.015	(0)
	Pb+2	1.251e-10	1.099e-10	-9.903	-9.959	-0.056	(0)
	PbHCO ₃ +	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
	PbSO ₄	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
	Pb (OH) 2	2.715e-12	2.715e-12	-11.566	-11.566	0.000	(0)
	Pb (CO ₃) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
	PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)

PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
Pb(SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
Pb(OH) 3-	1.566e-15	1.514e-15	-14.805	-14.820	-0.015	(0)
PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
Pb2OH+3	3.632e-19	2.682e-19	-18.440	-18.571	-0.132	(0)
Pb(OH) 4-2	2.366e-19	2.068e-19	-18.626	-18.684	-0.058	(0)
PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
Pb3(OH) 4+2	1.850e-23	1.617e-23	-22.733	-22.791	-0.058	(0)
PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)
PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
Pb4(OH) 4+4	2.420e-29	1.412e-29	-28.616	-28.850	-0.234	(0)
S (6)	7.977e-05					
SO4-2	7.702e-05	6.765e-05	-4.113	-4.170	-0.056	(0)
CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
MgSO4	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
NaSO4-	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
KSO4-	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
MnSO4	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
HSO4-	1.233e-10	1.194e-10	-9.909	-9.923	-0.014	(0)
FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)
PbSO4	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
Pb(SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
UO2(SO4) 2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
Al(SO4) 2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)
Fe(SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)
HgSO4	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
Se (-2)	6.134e-35					
HSe-	6.133e-35	5.930e-35	-34.212	-34.227	-0.015	(0)
H2Se	8.312e-39	8.312e-39	-38.080	-38.080	0.000	(0)
MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.425	-41.484	-0.058	(0)
Se (4)	3.040e-09					
HSeO3-	2.444e-09	2.363e-09	-8.612	-8.627	-0.015	(0)
SeO3-2	5.960e-10	5.209e-10	-9.225	-9.283	-0.058	(0)
H2SeO3	1.820e-14	1.820e-14	-13.740	-13.740	0.000	(0)
FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)
Se (6)	2.249e-14					
SeO4-2	2.249e-14	1.975e-14	-13.648	-13.704	-0.056	(0)
MnSeO4	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
HSeO4-	1.848e-20	1.787e-20	-19.733	-19.748	-0.015	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.218	-55.350	-0.132	(0)
U (4)	1.143e-17					
U(OH) 5-	1.142e-17	1.105e-17	-16.942	-16.957	-0.015	(0)
U(OH) 4	8.353e-21	8.353e-21	-20.078	-20.078	0.000	(0)
U(OH) 3+	5.703e-25	5.514e-25	-24.244	-24.259	-0.015	(0)
U(OH) 2+2	5.267e-30	4.603e-30	-29.278	-29.337	-0.058	(0)
UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)
UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)
UOH+3	5.300e-36	3.915e-36	-35.276	-35.407	-0.132	(0)
UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)
UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)
USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)
U+4	0.000e+00	0.000e+00	-42.320	-42.554	-0.234	(0)
UCl+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-155.142	-156.326	-1.184	(0)
U (5)	1.008e-14					

UO2+	1.008e-14	9.747e-15	-13.997	-14.011	-0.015	(0)
U(6)	1.017e-08					
UO2 (CO3) 2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
UO2 (CO3) 3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
UO2OH+	1.161e-11	1.123e-11	-10.935	-10.950	-0.015	(0)
UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
UO2+2	1.821e-13	1.599e-13	-12.740	-12.796	-0.056	(0)
UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
(UO2) 3 (OH) 5+	5.729e-16	5.540e-16	-15.242	-15.257	-0.015	(0)
UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
(UO2) 2 (OH) 2+2	2.393e-16	2.092e-16	-15.621	-15.680	-0.058	(0)
UO2 (SO4) 2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-1.61	9.19	10.80	Al (OH) 3
Al2 (MoO4) 3	-55.52	-53.16	2.37	Al2 (MoO4) 3
Al2O3	-1.28	18.38	19.65	Al2O3
Al4 (OH) 10SO4	-5.61	17.09	22.70	Al4 (OH) 10SO4
AlOHSO4	-7.24	-10.47	-3.23	AlOHSO4
Alunite	-6.98	-8.38	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-6.34	-14.13	-7.79	PbSO4
Anhydrite	-3.61	-7.97	-4.36	CaSO4
Antlerite	-6.01	2.78	8.79	Cu3 (OH) 4SO4
Aragonite	-1.60	-9.90	-8.30	CaCO3
Artinite	-9.60	-0.00	9.60	MgCO3:Mg (OH) 2:3H2O
Atacamite	-4.60	2.79	7.39	Cu2 (OH) 3Cl
Azurite	-3.83	-20.74	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.66	7.73	24.39	Ba (OH) 2:8H2O
BaF2	-11.05	-16.87	-5.82	BaF2
BaMoO4	-9.15	-16.11	-6.96	BaMoO4
Barite	-1.95	-11.93	-9.98	BaSO4
BaSeO3	-10.47	-8.64	1.83	BaSeO3
BaSeO4	-14.00	-21.46	-7.46	BaSeO4
Birnessite	-11.30	6.79	18.09	MnO2
Bixbyite	-9.26	-9.91	-0.64	Mn2O3
Boehmite	0.61	9.19	8.58	AlOOH
Brochantite	-4.96	10.26	15.22	Cu4 (OH) 6SO4
Brucite	-6.05	10.79	16.84	Mg (OH) 2
Calcite	-1.42	-9.90	-8.48	CaCO3
Calomel	-17.28	-35.19	-17.91	Hg2Cl2
CaMoO4	-4.21	-12.16	-7.95	CaMoO4
CaSeO3:2H2O	-7.50	-4.68	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-14.49	-17.51	-3.02	CaSeO4:2H2O
Cerrusite	-2.93	-16.06	-13.13	PbCO3
CH4 (g)	-74.49	-115.54	-41.05	CH4
Chalcanthite	-9.54	-12.18	-2.64	CuSO4:5H2O
Clausthalite	-9.34	-36.44	-27.10	PbSe
CO2 (g)	-3.44	-21.59	-18.15	CO2
Cotunnite	-14.03	-18.81	-4.78	PbCl2
Cryolite	-19.72	-53.56	-33.84	Na3AlF6
Cu (OH) 2	-1.19	7.48	8.67	Cu (OH) 2
Cu2Se (alpha)	0.68	-45.12	-45.80	Cu2Se
Cu2SO4	-20.85	-22.80	-1.95	Cu2SO4
Cu3Se2	-16.12	-79.61	-63.49	Cu3Se2
CuCO3	-2.61	-14.11	-11.50	CuCO3
CuF	-8.97	-13.87	-4.91	CuF
CuF2	-18.23	-17.12	1.12	CuF2
CuF2:2H2O	-12.57	-17.12	-4.55	CuF2:2H2O
Cumetal	-4.56	-13.32	-8.76	Cu
CuMoO4	-3.29	-16.36	-13.08	CuMoO4
CuOCuSO4	-15.00	-4.70	10.30	CuOCuSO4

Cupricferrite	10.93	16.91	5.99	CuFe2O4
Cuprite	-1.74	-3.15	-1.41	Cu2O
Cuprousferrite	12.06	3.14	-8.92	CuFeO2
CuSe	-1.39	-34.49	-33.10	CuSe
CuSe2	-19.61	-52.97	-33.37	CuSe2
CuSeO3:2H2O	-9.40	-8.89	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-19.27	-21.71	-2.44	CuSeO4:5H2O
CuSO4	-15.12	-12.18	2.94	CuSO4
Diaspore	2.31	9.19	6.87	AlOOH
Dolomite (disordered)	-4.16	-20.70	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-3.61	-20.70	-17.09	CaMg (CO3) 2
Epsomite	-6.74	-8.86	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.56	6.01	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	4.11	1.07	-3.04	Fe (OH) 2.7Cl.3
Fe2 (OH) 4SeO3	-8.49	-6.94	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.05	-39.68	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.80	-49.53	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-4.78	15.44	20.22	Fe3 (OH) 8
FeMoO4	-7.75	-17.84	-10.09	FeMoO4
Ferrihydrite	1.53	4.72	3.19	Fe (OH) 3
Ferroselite	-35.85	-54.45	-18.60	FeSe2
FeSe	-24.96	-35.96	-11.00	FeSe
Fluorite	-2.41	-12.91	-10.50	CaF2
Gibbsite	0.90	9.19	8.29	Al (OH) 3
Goethite	4.23	4.72	0.49	FeOOH
Gummite	-4.98	2.69	7.67	UO3
Gypsum	-3.36	-7.97	-4.61	CaSO4:2H2O
H-Jarosite	-13.06	-25.16	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.97	-23.84	-12.88	H2MoO4
H2Se (g)	-37.01	-41.97	-4.96	H2Se
Halite	-10.09	-8.49	1.60	NaCl
Hausmannite	-11.58	49.45	61.03	Mn3O4
Hematite	10.85	9.43	-1.42	Fe2O3
Hercynite	1.49	24.38	22.89	FeAl2O4
Hg (CH3) 2 (g)	-172.64	-246.35	-73.71	Hg (CH3) 2
Hg (g)	-9.30	-17.17	-7.87	Hg
Hg (OH) 2	-11.78	-15.28	-3.50	Hg (OH) 2
Hg2 (g)	-19.38	-34.34	-14.96	Hg2
Hg2 (OH) 2	-16.11	-10.85	5.26	Hg2 (OH) 2
Hg2CO3	-16.39	-32.44	-16.05	Hg2CO3
Hg2F2	-25.09	-35.45	-10.36	Hg2F2
Hg2SeO3	-22.57	-27.22	-4.66	Hg2SeO3
Hg2SO4	-24.38	-30.51	-6.13	Hg2SO4
Hg3O2CO3	-37.73	-67.42	-29.68	Hg3O2CO3
HgCl (g)	-37.09	-17.60	19.50	HgCl
HgCl2	-18.35	-39.61	-21.26	HgCl2
HgF (g)	-50.40	-17.73	32.68	HgF
HgF2 (g)	-52.44	-39.87	12.57	HgF2
Hgmetal (l)	-3.72	-17.17	-13.45	Hg
HgSe	-1.55	-57.25	-55.69	HgSe
HgSeO3	-19.22	-31.65	-12.43	HgSeO3
HgSO4	-25.51	-34.93	-9.42	HgSO4
Huntite	-12.32	-42.29	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.82	-26.59	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-23.62	-32.39	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-21.59	-26.76	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.99	-21.79	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-20.37	-17.11	3.26	K2MoO4
K2SeO4	-21.73	-22.46	-0.73	K2SeO4
Langite	-7.23	10.26	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-8.17	-8.60	-0.43	PbO:PbSO4
Laurionite	-7.26	-6.64	0.62	PbOHCl
Lepidocrocite	3.35	4.72	1.37	FeOOH
Lime	-21.01	11.69	32.70	CaO
Litharge	-7.17	5.53	12.69	PbO
Maghemite	3.05	9.43	6.39	Fe2O3
Magnesioferrite	3.37	20.23	16.86	Fe2MgO4
Magnesite	-3.34	-10.80	-7.46	MgCO3

Magnetite	12.04	15.44	3.40	Fe3O4
Malachite	-1.32	-6.63	-5.31	Cu2(OH)2CO3
Manganite	-4.94	20.40	25.34	MnOOH
Massicot	-7.37	5.53	12.89	PbO
Matlockite	-9.97	-18.94	-8.97	PbClF
Melanothallite	-23.12	-16.86	6.26	CuCl2
Melanterite	-11.44	-13.65	-2.21	FeSO4·7H2O
Mg(OH)2 (active)	-8.00	10.79	18.79	Mg(OH)2
MgF2	-5.68	-13.81	-8.13	MgF2
MgMoO4	-11.20	-13.05	-1.85	MgMoO4
MgSeO3·6H2O	-8.63	-5.58	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-17.20	-18.40	-1.20	MgSeO4·6H2O
Minium	-33.45	40.07	73.52	Pb3O4
Mirabilite	-11.18	-12.29	-1.11	Na2SO4·10H2O
Mn2(SO4)3	-63.17	-68.88	-5.71	Mn2(SO4)3
MnCl2·4H2O	-18.40	-15.69	2.72	MnCl2·4H2O
MnSe	-36.82	-33.32	3.50	MnSe
MnSeO3	-8.85	-7.72	1.13	MnSeO3
MnSeO3·2H2O	-8.70	-7.72	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-18.49	-20.54	-2.05	MnSeO4·5H2O
MnSO4	-13.59	-11.00	2.58	MnSO4
Montroydite	-11.64	-15.28	-3.64	HgO
MoO3	-15.84	-23.84	-8.00	MoO3
Na-Jarosite	-10.28	-21.48	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-23.73	-40.32	-16.60	Na2Mo2O7
Na2MoO4	-17.97	-16.48	1.49	Na2MoO4
Na2MoO4·2H2O	-17.70	-16.48	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-19.31	-9.01	10.30	Na2SeO3·5H2O
Na2SeO4	-23.11	-21.83	1.28	Na2SeO4
Nantokite	-7.01	-13.74	-6.73	CuCl
Natron	-12.91	-14.23	-1.31	Na2CO3·10H2O
Nesquehonite	-6.13	-10.80	-4.67	MgCO3·3H2O
Nsutite	-10.71	6.79	17.50	MnO2
O2(g)	-36.12	46.97	83.09	O2
Pb(BO2)2	-13.72	-7.20	6.52	Pb(BO2)2
Pb(OH)2	-2.62	5.53	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-65.49	-74.25	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.91	-1.11	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.13	11.06	26.19	Pb2O(OH)2
Pb2O3	-26.50	34.54	61.04	Pb2O3
Pb2OCO3	-9.97	-10.53	-0.56	Pb2OCO3
Pb3O2CO3	-16.02	-5.00	11.02	Pb3O2CO3
Pb3O2SO4	-13.76	-3.07	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.65	2.45	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.42	2.45	21.88	Pb4O3SO4
PbF2	-11.63	-19.07	-7.44	PbF2
Pbmetal	-22.21	-17.96	4.25	Pb
PbMoO4	-2.70	-18.32	-15.62	PbMoO4
PbO·0.3H2O	-7.45	5.53	12.98	PbO·0.3H2O
PbSeO4	-16.82	-23.66	-6.84	PbSeO4
Periclase	-10.79	10.79	21.58	MgO
Phosgenite	-15.06	-34.87	-19.81	PbCl2:PbCO3
Plattnerite	-20.59	29.01	49.60	PbO2
Portlandite	-11.12	11.69	22.80	Ca(OH)2
Pyrochroite	-6.54	8.65	15.19	Mn(OH)2
Pyrolusite	-9.24	32.14	41.38	MnO2
Rhodochrosite	-2.36	-12.94	-10.58	MnCO3
Rutherfordine	-4.40	-18.90	-14.50	UO2CO3
Schoepite	-3.30	2.69	5.99	UO2(OH)2·H2O
Semetal(am)	-11.37	-18.48	-7.11	Se
Semetal(hex)	-10.78	-18.48	-7.71	Se
SeO2	-16.49	-16.37	0.12	SeO2
SeO3	-50.24	-29.19	21.04	SeO3
Siderite	-5.34	-15.58	-10.24	FeCO3
Spinel	-7.68	29.17	36.85	MgAl2O4
Tenorite	-0.16	7.48	7.64	CuO
Thenardite	-12.61	-12.29	0.32	Na2SO4
Thermonatrite	-14.86	-14.22	0.64	Na2CO3·H2O

U3O8	-8.85	12.23	21.08	U3O8
U4O9	-19.81	-22.83	-3.02	U4O9
UF4	-31.24	-60.78	-29.54	UF4
UF4:2.5H2O	-28.06	-60.78	-32.72	UF4:2.5H2O
UO2(am)	-12.51	-11.58	0.93	UO2
UO2(OH)2(beta)	-2.92	2.69	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.25	-26.50	-2.25	UO2SeO4:4H2O
UO3	-5.01	2.69	7.70	UO3
Uraninite	-6.91	-11.58	-4.67	UO2
Witherite	-5.29	-13.86	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 17.

SOLUTION 15 Average HCT data for coarse crystalline porphyry - sulfide (ore)
(cell CF-11-02, 367-408)

temp 25
pH 7.74339
pe 4
redox pe
units mg/l
density 1
Alkalinity 19.90015 as HCO3
Al 0.04951
B 0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495
F 0.54795
Fe 0.00225
Hg 0.000005
K 1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6) 7.66320 as SO4
Se 0.00024
U 0.00242
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 15. Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	1.835e-06	1.835e-06
Alkalinity	3.261e-04	3.261e-04
B	4.468e-07	4.468e-07
Ba	2.003e-08	2.003e-08
Ca	1.836e-04	1.836e-04
Cl	3.872e-05	3.872e-05

Cu	7.790e-08	7.790e-08	
F	2.884e-05	2.884e-05	
Fe	4.029e-08	4.029e-08	
Hg	2.493e-11	2.493e-11	
K	4.343e-05	4.343e-05	
Mg	2.345e-05	2.345e-05	
Mn	1.707e-07	1.707e-07	
Mo	5.003e-09	5.003e-09	
Na	8.965e-05	8.965e-05	Charge balance
Pb	5.792e-10	5.792e-10	
S (6)	7.977e-05	7.977e-05	
Se	3.040e-09	3.040e-09	
U	1.017e-08	1.017e-08	

-----Description of solution-----

pH	=	7.743
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	8.218e-04
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	3.294e-04
Total CO2 (mol/kg)	=	3.294e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	-1.403e-17
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110140e+02
Total O	=	5.550815e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.762e-07	5.577e-07	-6.239	-6.254	-0.014	(0)
H+	1.865e-08	1.806e-08	-7.729	-7.743	-0.014	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.835e-06					
Al (OH) 4-	1.808e-06	1.750e-06	-5.743	-5.757	-0.014	(0)
Al (OH) 3	2.493e-08	2.493e-08	-7.603	-7.603	0.000	(0)
Al (OH) 2+	2.313e-09	2.240e-09	-8.636	-8.650	-0.014	(0)
AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
AlOH+2	5.749e-12	5.058e-12	-11.240	-11.296	-0.056	(0)
AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
Al+3	1.214e-14	9.069e-15	-13.916	-14.042	-0.127	(0)
AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
Al (SO4) 2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
B	4.468e-07					
H3BO3	4.323e-07	4.324e-07	-6.364	-6.364	0.000	(0)
H2BO3-	1.437e-08	1.391e-08	-7.842	-7.857	-0.014	(0)
CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
MgH2BO3+	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
BF (OH) 3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
NaH2BO3	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
H5 (BO3) 2-	5.290e-15	5.118e-15	-14.277	-14.291	-0.014	(0)
BF2 (OH) 2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
H8 (BO3) 3-	2.287e-19	2.213e-19	-18.641	-18.655	-0.014	(0)
BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)
BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)
Ba	2.003e-08					
Ba+2	1.997e-08	1.754e-08	-7.700	-7.756	-0.056	(0)
BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)

BaOH+	4.408e-14	4.269e-14	-13.356	-13.370	-0.014	(0)
BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
C (4)	3.294e-04					
HCO3-	3.148e-04	3.049e-04	-3.502	-3.516	-0.014	(0)
H2CO3	1.238e-05	1.238e-05	-4.907	-4.907	0.000	(0)
CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
CO3-2	9.014e-07	7.917e-07	-6.045	-6.101	-0.056	(0)
CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
MgHCO3+	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
NaHCO3	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
MgCO3	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
UO2 (CO3) 2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
NaCO3-	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
MnHCO3+	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
UO2 (CO3) 3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
PbCO3	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
PbHCO3+	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)
FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)
Pb (CO3) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)
Hg (CO3) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
HgHCO3+	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
Ca	1.836e-04					
Ca+2	1.800e-04	1.581e-04	-3.745	-3.801	-0.056	(0)
CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
CaOH+	1.816e-09	1.759e-09	-8.741	-8.755	-0.014	(0)
CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
Cl	3.872e-05					
Cl-	3.872e-05	3.748e-05	-4.412	-4.426	-0.014	(0)
CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
MnCl2	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
HgCl2	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
MnCl3-	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)
PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
HgCl3-	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)
PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
HgCl4-2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)
FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)
UCl+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
Cu (1)	5.210e-10					
Cu+	4.981e-10	4.816e-10	-9.303	-9.317	-0.015	(0)
CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
Cu (2)	7.738e-08					

	CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
	CuOH+	1.791e-08	1.734e-08	-7.747	-7.761	-0.014	(0)
	Cu+2	1.120e-08	9.833e-09	-7.951	-8.007	-0.056	(0)
	Cu (OH) 2	1.930e-09	1.930e-09	-8.715	-8.715	0.000	(0)
	CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
	CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
	Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
	CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
	Cu2 (OH) 2+2	8.642e-12	7.554e-12	-11.063	-11.122	-0.058	(0)
	Cu (OH) 3-	2.283e-12	2.207e-12	-11.642	-11.656	-0.015	(0)
	CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
	Cu (OH) 4-2	1.108e-17	9.688e-18	-16.955	-17.014	-0.058	(0)
	CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
	CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
	CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)
F		2.884e-05					
	F-	2.873e-05	2.781e-05	-4.542	-4.556	-0.014	(0)
	MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
	CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
	NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
	HF	7.427e-10	7.427e-10	-9.129	-9.129	0.000	(0)
	MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
	AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
	CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
	AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
	BF (OH) 3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
	AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
	UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
	PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)
	AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
	HF2-	8.112e-14	7.852e-14	-13.091	-13.105	-0.014	(0)
	UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
	UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
	BF2 (OH) 2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
	PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
	FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)
	FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)
	H2F2	1.478e-18	1.478e-18	-17.830	-17.830	0.000	(0)
	FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)
	UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)
	PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
	BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)
	PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)
	HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)
	BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)
	UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)
	UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)
	UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)
	UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)
	UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)
	UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)
Fe (2)		3.925e-10					
	Fe+2	3.781e-10	3.305e-10	-9.422	-9.481	-0.058	(0)
	FeOH+	7.577e-12	7.337e-12	-11.121	-11.134	-0.014	(0)
	FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)
	FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)
	Fe (OH) 2	3.250e-15	3.250e-15	-14.488	-14.488	0.000	(0)
	Fe (OH) 3-	5.919e-16	5.732e-16	-15.228	-15.242	-0.014	(0)
Fe (3)		3.990e-08					
	Fe (OH) 2+	2.476e-08	2.398e-08	-7.606	-7.620	-0.014	(0)
	Fe (OH) 3	1.436e-08	1.436e-08	-7.843	-7.843	0.000	(0)
	Fe (OH) 4-	7.702e-10	7.459e-10	-9.113	-9.127	-0.014	(0)
	FeOH+2	1.257e-13	1.105e-13	-12.901	-12.956	-0.056	(0)
	FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)
	FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)
	Fe+3	4.111e-19	3.070e-19	-18.386	-18.513	-0.127	(0)
	FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)
	FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)

	FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)
	Fe (SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)
	FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)
	Fe2 (OH) 2+4	6.934e-25	4.046e-25	-24.159	-24.393	-0.234	(0)
	FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)
	Fe3 (OH) 4+5	3.254e-31	1.403e-31	-30.488	-30.853	-0.366	(0)
	FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)
H (0)	4.615e-27						
	H2	2.307e-27	2.308e-27	-26.637	-26.637	0.000	(0)
Hg (0)	2.493e-11						
	Hg	2.493e-11	2.493e-11	-10.603	-10.603	0.000	(0)
Hg (1)	1.046e-26						
	Hg2+2	5.229e-27	4.570e-27	-26.282	-26.340	-0.058	(0)
Hg (2)	5.401e-16						
	Hg (OH) 2	5.299e-16	5.300e-16	-15.276	-15.276	0.000	(0)
	HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
	HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)
	HgCl2	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
	HgOH+	6.201e-21	5.996e-21	-20.208	-20.222	-0.015	(0)
	Hg (CO3) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
	HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
	HgHCO3+	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
	Hg (OH) 3-	3.848e-23	3.721e-23	-22.415	-22.429	-0.015	(0)
	HgCl3-	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
	Hg+2	3.090e-25	2.701e-25	-24.510	-24.569	-0.058	(0)
	HgSO4	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
	HgCl4-2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
	HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)
K	4.343e-05						
	K+	4.341e-05	4.202e-05	-4.362	-4.376	-0.014	(0)
	KSO4-	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
Mg	2.345e-05						
	Mg+2	2.305e-05	2.025e-05	-4.637	-4.694	-0.056	(0)
	MgSO4	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
	MgHCO3+	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
	MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
	MgCO3	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
	MgOH+	4.640e-09	4.496e-09	-8.333	-8.347	-0.014	(0)
	MgH2BO3+	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
Mn (2)	1.707e-07						
	Mn+2	1.677e-07	1.465e-07	-6.776	-6.834	-0.058	(0)
	MnSO4	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
	MnHCO3+	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
	MnOH+	2.120e-10	2.053e-10	-9.674	-9.688	-0.014	(0)
	MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
	MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
	MnCl2	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
	MnSeO4	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
	Mn (OH) 3-	4.075e-19	3.946e-19	-18.390	-18.404	-0.014	(0)
	MnCl3-	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
	Mn (OH) 4-2	8.079e-25	7.104e-25	-24.093	-24.148	-0.056	(0)
	MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
Mn (3)	8.765e-29						
	Mn+3	8.765e-29	6.546e-29	-28.057	-28.184	-0.127	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-47.253	-47.309	-0.056	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-52.667	-52.681	-0.014	(0)
Mo	5.003e-09						
	MoO4-2	5.002e-09	4.393e-09	-8.301	-8.357	-0.056	(0)
	HMoO4-	1.632e-12	1.578e-12	-11.787	-11.802	-0.015	(0)
	H2MoO4	2.087e-16	2.087e-16	-15.680	-15.680	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-66.931	-67.458	-0.526	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-68.449	-68.814	-0.366	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-71.542	-71.776	-0.234	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-76.141	-76.273	-0.132	(0)
Na	8.965e-05						

Na+	8.960e-05	8.674e-05	-4.048	-4.062	-0.014	(0)
NaSO4-	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
NaHCO3	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
NaCO3-	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
NaH2BO3	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
O (0)	1.903e-39					
O2	9.515e-40	9.516e-40	-39.022	-39.022	0.000	(0)
Pb	5.792e-10					
PbCO3	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
PbOH+	1.592e-10	1.540e-10	-9.798	-9.813	-0.015	(0)
Pb+2	1.251e-10	1.099e-10	-9.903	-9.959	-0.056	(0)
PbHCO3+	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
PbSO4	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
Pb (OH) 2	2.715e-12	2.715e-12	-11.566	-11.566	0.000	(0)
Pb (CO3) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)
PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
Pb (SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
Pb (OH) 3-	1.566e-15	1.514e-15	-14.805	-14.820	-0.015	(0)
PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
Pb2OH+3	3.632e-19	2.682e-19	-18.440	-18.571	-0.132	(0)
Pb (OH) 4-2	2.366e-19	2.068e-19	-18.626	-18.684	-0.058	(0)
PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
Pb3 (OH) 4+2	1.850e-23	1.617e-23	-22.733	-22.791	-0.058	(0)
PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)
PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
Pb4 (OH) 4+4	2.420e-29	1.412e-29	-28.616	-28.850	-0.234	(0)
S (6)	7.977e-05					
SO4-2	7.702e-05	6.765e-05	-4.113	-4.170	-0.056	(0)
CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
MgSO4	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
NaSO4-	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
KSO4-	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
MnSO4	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
HSO4-	1.233e-10	1.194e-10	-9.909	-9.923	-0.014	(0)
FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)
PbSO4	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
Pb (SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
UO2 (SO4) 2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
Al (SO4) 2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)
Fe (SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)
HgSO4	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
Se (-2)	6.134e-35					
HSe-	6.133e-35	5.930e-35	-34.212	-34.227	-0.015	(0)
H2Se	8.312e-39	8.312e-39	-38.080	-38.080	0.000	(0)
MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.425	-41.484	-0.058	(0)
Se (4)	3.040e-09					
HSeO3-	2.444e-09	2.363e-09	-8.612	-8.627	-0.015	(0)
SeO3-2	5.960e-10	5.209e-10	-9.225	-9.283	-0.058	(0)
H2SeO3	1.820e-14	1.820e-14	-13.740	-13.740	0.000	(0)
FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)
Se (6)	2.249e-14					
SeO4-2	2.249e-14	1.975e-14	-13.648	-13.704	-0.056	(0)
MnSeO4	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
HSeO4-	1.848e-20	1.787e-20	-19.733	-19.748	-0.015	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.218	-55.350	-0.132	(0)
U (4)	1.143e-17					

U(OH) 5-	1.142e-17	1.105e-17	-16.942	-16.957	-0.015	(0)
U(OH) 4	8.353e-21	8.353e-21	-20.078	-20.078	0.000	(0)
U(OH) 3+	5.703e-25	5.514e-25	-24.244	-24.259	-0.015	(0)
U(OH) 2+2	5.267e-30	4.603e-30	-29.278	-29.337	-0.058	(0)
UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)
UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)
UOH+3	5.300e-36	3.915e-36	-35.276	-35.407	-0.132	(0)
UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)
UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)
USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)
U+4	0.000e+00	0.000e+00	-42.320	-42.554	-0.234	(0)
UC1+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-155.142	-156.326	-1.184	(0)
U(5)	1.008e-14					
UO2+	1.008e-14	9.747e-15	-13.997	-14.011	-0.015	(0)
U(6)	1.017e-08					
UO2(CO3) 2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
UO2(CO3) 3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
UO2OH+	1.161e-11	1.123e-11	-10.935	-10.950	-0.015	(0)
UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
UO2+2	1.821e-13	1.599e-13	-12.740	-12.796	-0.056	(0)
UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
(UO2) 3(OH) 5+	5.729e-16	5.540e-16	-15.242	-15.257	-0.015	(0)
UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
(UO2) 2(OH) 2+2	2.393e-16	2.092e-16	-15.621	-15.680	-0.058	(0)
UO2(SO4) 2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH) 3(am)	-1.61	9.19	10.80	Al(OH) 3
Al2(MoO4) 3	-55.52	-53.16	2.37	Al2(MoO4) 3
Al2O3	-1.28	18.38	19.65	Al2O3
Al4(OH) 10SO4	-5.61	17.09	22.70	Al4(OH) 10SO4
AlOHSO4	-7.24	-10.47	-3.23	AlOHSO4
Alunite	-6.98	-8.38	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-6.34	-14.13	-7.79	PbSO4
Anhydrite	-3.61	-7.97	-4.36	CaSO4
Antlerite	-6.01	2.78	8.79	Cu3(OH) 4SO4
Aragonite	-1.60	-9.90	-8.30	CaCO3
Artinite	-9.60	-0.00	9.60	MgCO3:Mg(OH) 2:3H2O
Atacamite	-4.60	2.79	7.39	Cu2(OH) 3Cl
Azurite	-3.83	-20.74	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-16.66	7.73	24.39	Ba(OH) 2:8H2O
BaF2	-11.05	-16.87	-5.82	BaF2
BaMoO4	-9.15	-16.11	-6.96	BaMoO4
Barite	-1.95	-11.93	-9.98	BaSO4
BaSeO3	-10.47	-8.64	1.83	BaSeO3
BaSeO4	-14.00	-21.46	-7.46	BaSeO4
Birnessite	-11.30	6.79	18.09	MnO2
Bixbyite	-9.26	-9.91	-0.64	Mn2O3
Boehmite	0.61	9.19	8.58	AlOOH
Brochantite	-4.96	10.26	15.22	Cu4(OH) 6SO4
Brucite	-6.05	10.79	16.84	Mg(OH) 2
Calcite	-1.42	-9.90	-8.48	CaCO3
Calomel	-17.28	-35.19	-17.91	Hg2Cl2
CaMoO4	-4.21	-12.16	-7.95	CaMoO4
CaSeO3:2H2O	-7.50	-4.68	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-14.49	-17.51	-3.02	CaSeO4:2H2O
Cerrusite	-2.93	-16.06	-13.13	PbCO3

CH4(g)	-74.49	-115.54	-41.05	CH4
Chalcanthite	-9.54	-12.18	-2.64	CuSO4:5H2O
Clausthalite	-9.34	-36.44	-27.10	PbSe
CO2(g)	-3.44	-21.59	-18.15	CO2
Cotunnite	-14.03	-18.81	-4.78	PbCl2
Cryolite	-19.72	-53.56	-33.84	Na3AlF6
Cu(OH)2	-1.19	7.48	8.67	Cu(OH)2
Cu2Se(alpha)	0.68	-45.12	-45.80	Cu2Se
Cu2SO4	-20.85	-22.80	-1.95	Cu2SO4
Cu3Se2	-16.12	-79.61	-63.49	Cu3Se2
CuCO3	-2.61	-14.11	-11.50	CuCO3
CuF	-8.97	-13.87	-4.91	CuF
CuF2	-18.23	-17.12	1.12	CuF2
CuF2:2H2O	-12.57	-17.12	-4.55	CuF2:2H2O
Cumetal	-4.56	-13.32	-8.76	Cu
CuMoO4	-3.29	-16.36	-13.08	CuMoO4
CuOCuSO4	-15.00	-4.70	10.30	CuOCuSO4
Cupricferrite	10.93	16.91	5.99	CuFe2O4
Cuprite	-1.74	-3.15	-1.41	Cu2O
Cuprousferrite	12.06	3.14	-8.92	CuFeO2
CuSe	-1.39	-34.49	-33.10	CuSe
CuSe2	-19.61	-52.97	-33.37	CuSe2
CuSeO3:2H2O	-9.40	-8.89	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-19.27	-21.71	-2.44	CuSeO4:5H2O
CuSO4	-15.12	-12.18	2.94	CuSO4
Diaspore	2.31	9.19	6.87	AlOOH
Dolomite(disordered)	-4.16	-20.70	-16.54	CaMg(CO3)2
Dolomite(ordered)	-3.61	-20.70	-17.09	CaMg(CO3)2
Epsomite	-6.74	-8.86	-2.13	MgSO4:7H2O
Fe(OH)2	-7.56	6.01	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	4.11	1.07	-3.04	Fe(OH)2.7Cl.3
Fe2(OH)4SeO3	-8.49	-6.94	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.05	-39.68	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.80	-49.53	-3.73	Fe2(SO4)3
Fe3(OH)8	-4.78	15.44	20.22	Fe3(OH)8
FeMoO4	-7.75	-17.84	-10.09	FeMoO4
Ferrihydrite	1.53	4.72	3.19	Fe(OH)3
Ferroselite	-35.85	-54.45	-18.60	FeSe2
FeSe	-24.96	-35.96	-11.00	FeSe
Fluorite	-2.41	-12.91	-10.50	CaF2
Gibbsite	0.90	9.19	8.29	Al(OH)3
Goethite	4.23	4.72	0.49	FeOOH
Gummite	-4.98	2.69	7.67	UO3
Gypsum	-3.36	-7.97	-4.61	CaSO4:2H2O
H-Jarosite	-13.06	-25.16	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.97	-23.84	-12.88	H2MoO4
H2Se(g)	-37.01	-41.97	-4.96	H2Se
Halite	-10.09	-8.49	1.60	NaCl
Hausmannite	-11.58	49.45	61.03	Mn3O4
Hematite	10.85	9.43	-1.42	Fe2O3
Hercynite	1.49	24.38	22.89	FeAl2O4
Hg(CH3)2(g)	-172.64	-246.35	-73.71	Hg(CH3)2
Hg(g)	-9.30	-17.17	-7.87	Hg
Hg(OH)2	-11.78	-15.28	-3.50	Hg(OH)2
Hg2(g)	-19.38	-34.34	-14.96	Hg2
Hg2(OH)2	-16.11	-10.85	5.26	Hg2(OH)2
Hg2CO3	-16.39	-32.44	-16.05	Hg2CO3
Hg2F2	-25.09	-35.45	-10.36	Hg2F2
Hg2SeO3	-22.57	-27.22	-4.66	Hg2SeO3
Hg2SO4	-24.38	-30.51	-6.13	Hg2SO4
Hg3O2CO3	-37.73	-67.42	-29.68	Hg3O2CO3
HgCl(g)	-37.09	-17.60	19.50	HgCl
HgCl2	-18.35	-39.61	-21.26	HgCl2
HgF(g)	-50.40	-17.73	32.68	HgF
HgF2(g)	-52.44	-39.87	12.57	HgF2
Hgmetal(1)	-3.72	-17.17	-13.45	Hg
HgSe	-1.55	-57.25	-55.69	HgSe
HgSeO3	-19.22	-31.65	-12.43	HgSeO3

HgSO4	-25.51	-34.93	-9.42	HgSO4
Huntite	-12.32	-42.29	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.82	-26.59	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-23.62	-32.39	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-21.59	-26.76	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-6.99	-21.79	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-20.37	-17.11	3.26	K2MoO4
K2SeO4	-21.73	-22.46	-0.73	K2SeO4
Langite	-7.23	10.26	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-8.17	-8.60	-0.43	PbO : PbSO4
Laurionite	-7.26	-6.64	0.62	PbOHCl
Lepidocrocite	3.35	4.72	1.37	FeOOH
Lime	-21.01	11.69	32.70	CaO
Litharge	-7.17	5.53	12.69	PbO
Maghemite	3.05	9.43	6.39	Fe2O3
Magnesioferrite	3.37	20.23	16.86	Fe2MgO4
Magnesite	-3.34	-10.80	-7.46	MgCO3
Magnetite	12.04	15.44	3.40	Fe3O4
Malachite	-1.32	-6.63	-5.31	Cu2 (OH) 2CO3
Manganite	-4.94	20.40	25.34	MnOOH
Massicot	-7.37	5.53	12.89	PbO
Matlockite	-9.97	-18.94	-8.97	PbClF
Melanothallite	-23.12	-16.86	6.26	CuCl2
Melanterite	-11.44	-13.65	-2.21	FeSO4 : 7H2O
Mg (OH) 2 (active)	-8.00	10.79	18.79	Mg (OH) 2
MgF2	-5.68	-13.81	-8.13	MgF2
MgMoO4	-11.20	-13.05	-1.85	MgMoO4
MgSeO3 : 6H2O	-8.63	-5.58	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-17.20	-18.40	-1.20	MgSeO4 : 6H2O
Minium	-33.45	40.07	73.52	Pb3O4
Mirabilite	-11.18	-12.29	-1.11	Na2SO4 : 10H2O
Mn2 (SO4) 3	-63.17	-68.88	-5.71	Mn2 (SO4) 3
MnCl2 : 4H2O	-18.40	-15.69	2.72	MnCl2 : 4H2O
MnSe	-36.82	-33.32	3.50	MnSe
MnSeO3	-8.85	-7.72	1.13	MnSeO3
MnSeO3 : 2H2O	-8.70	-7.72	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-18.49	-20.54	-2.05	MnSeO4 : 5H2O
MnSO4	-13.59	-11.00	2.58	MnSO4
Montroydite	-11.64	-15.28	-3.64	HgO
MoO3	-15.84	-23.84	-8.00	MoO3
Na-Jarosite	-10.28	-21.48	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-23.73	-40.32	-16.60	Na2Mo2O7
Na2MoO4	-17.97	-16.48	1.49	Na2MoO4
Na2MoO4 : 2H2O	-17.70	-16.48	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-19.31	-9.01	10.30	Na2SeO3 : 5H2O
Na2SeO4	-23.11	-21.83	1.28	Na2SeO4
Nantokite	-7.01	-13.74	-6.73	CuCl
Natron	-12.91	-14.23	-1.31	Na2CO3 : 10H2O
Nesquehonite	-6.13	-10.80	-4.67	MgCO3 : 3H2O
Nsutite	-10.71	6.79	17.50	MnO2
O2 (g)	-36.12	46.97	83.09	O2
Pb (BO2) 2	-13.72	-7.20	6.52	Pb (BO2) 2
Pb (OH) 2	-2.62	5.53	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-65.49	-74.25	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.91	-1.11	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.13	11.06	26.19	Pb2O (OH) 2
Pb2O3	-26.50	34.54	61.04	Pb2O3
Pb2OCO3	-9.97	-10.53	-0.56	Pb2OCO3
Pb3O2CO3	-16.02	-5.00	11.02	Pb3O2CO3
Pb3O2SO4	-13.76	-3.07	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-18.65	2.45	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-19.42	2.45	21.88	Pb4O3SO4
PbF2	-11.63	-19.07	-7.44	PbF2
Pbmetal	-22.21	-17.96	4.25	Pb
PbMoO4	-2.70	-18.32	-15.62	PbMoO4
PbO : 0.3H2O	-7.45	5.53	12.98	PbO : 0.33H2O
PbSeO4	-16.82	-23.66	-6.84	PbSeO4
Periclase	-10.79	10.79	21.58	MgO

Phosgenite	-15.06	-34.87	-19.81	PbCl2:PbCO3
Plattnerite	-20.59	29.01	49.60	PbO2
Portlandite	-11.12	11.69	22.80	Ca (OH) 2
Pyrochroite	-6.54	8.65	15.19	Mn (OH) 2
Pyrolusite	-9.24	32.14	41.38	MnO2
Rhodochrosite	-2.36	-12.94	-10.58	MnCO3
Rutherfordine	-4.40	-18.90	-14.50	UO2CO3
Schoepite	-3.30	2.69	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.37	-18.48	-7.11	Se
Semetal (hex)	-10.78	-18.48	-7.71	Se
SeO2	-16.49	-16.37	0.12	SeO2
SeO3	-50.24	-29.19	21.04	SeO3
Siderite	-5.34	-15.58	-10.24	FeCO3
Spinel	-7.68	29.17	36.85	MgAl2O4
Tenorite	-0.16	7.48	7.64	CuO
Thenardite	-12.61	-12.29	0.32	Na2SO4
Thermonatrite	-14.86	-14.22	0.64	Na2CO3:H2O
U3O8	-8.85	12.23	21.08	U3O8
U4O9	-19.81	-22.83	-3.02	U4O9
UF4	-31.24	-60.78	-29.54	UF4
UF4:2.5H2O	-28.06	-60.78	-32.72	UF4:2.5H2O
UO2 (am)	-12.51	-11.58	0.93	UO2
UO2 (OH) 2 (beta)	-2.92	2.69	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.25	-26.50	-2.25	UO2SeO4:4H2O
UO3	-5.01	2.69	7.70	UO3
Uraninite	-6.91	-11.58	-4.67	UO2
Witherite	-5.29	-13.86	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 18.

SOLUTION 16 Average water quality for Water Supply Wells PW-1 and PW-3
(representative of water used to rapidly re-fill pit)

temp 25
pH 7.89
pe 4
redox pe
units mg/l
density 1
Alkalinity 140 as HCO3
Al 0.0109
As 0.002
B 0.071
Ba 0.013
Ca 26
Cl 25 charge
Cu 0.00033
Cr 0.0025
F 0.78
Fe 0.081
Hg 0.00002
K 2.9
Mg 2.2
Mn 0.17
Mo 0.002
Na 52
Ni 0.00022
Pb 0.000024
S(6) 18 as SO4
Si 16

U 0.0025
V 0.008
Tl 0.000012
Zn 0.02
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 16. Average water quality for Water Supply Wells PW-1 and PW-3 (representative of water used to rapidly re-fill pit)

-----Solution composition-----

Elements	Molality	Moles	
Al	4.041e-07	4.041e-07	
Alkalinity	2.295e-03	2.295e-03	
As	2.670e-08	2.670e-08	
B	6.570e-06	6.570e-06	
Ba	9.469e-08	9.469e-08	
Ca	6.489e-04	6.489e-04	
Cl	1.114e-03	1.114e-03	Charge balance
Cr	4.809e-08	4.809e-08	
Cu	5.195e-09	5.195e-09	
F	4.107e-05	4.107e-05	
Fe	1.451e-06	1.451e-06	
Hg	9.973e-11	9.973e-11	
K	7.419e-05	7.419e-05	
Mg	9.054e-05	9.054e-05	
Mn	3.095e-06	3.095e-06	
Mo	2.085e-08	2.085e-08	
Na	2.263e-03	2.263e-03	
Ni	3.750e-09	3.750e-09	
Pb	1.159e-10	1.159e-10	
S (6)	1.874e-04	1.874e-04	
Si	2.664e-04	2.664e-04	
Tl	5.873e-11	5.873e-11	
U	1.051e-08	1.051e-08	
V	1.571e-07	1.571e-07	
Zn	3.059e-07	3.059e-07	

-----Description of solution-----

pH	=	7.890
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	4.639e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	2.332e-03
Total CO2 (mol/kg)	=	2.332e-03
Temperature (°C)	=	25.00
Electrical balance (eq)	=	1.652e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	11
Total H	=	1.110171e+02
Total O	=	5.551567e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.417e-07	7.815e-07	-6.075	-6.107	-0.032	(0)
H+	1.386e-08	1.288e-08	-7.858	-7.890	-0.032	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Al	4.041e-07					

Al (OH) 4-	4.000e-07	3.720e-07	-6.398	-6.429	-0.032	(0)
Al (OH) 3	3.781e-09	3.781e-09	-8.422	-8.422	0.000	(0)
Al (OH) 2+	2.604e-10	2.425e-10	-9.584	-9.615	-0.031	(0)
AlF2+	3.030e-12	2.821e-12	-11.519	-11.550	-0.031	(0)
AlF3	1.337e-12	1.337e-12	-11.874	-11.874	0.000	(0)
AlOH+2	5.196e-13	3.906e-13	-12.284	-12.408	-0.124	(0)
AlF+2	2.504e-13	1.882e-13	-12.601	-12.725	-0.124	(0)
AlF4-	2.714e-14	2.524e-14	-13.566	-13.598	-0.032	(0)
Al+3	9.662e-16	4.998e-16	-15.015	-15.301	-0.286	(0)
AlSO4+	5.320e-16	4.947e-16	-15.274	-15.306	-0.032	(0)
Al (SO4) 2-	7.270e-19	6.760e-19	-18.138	-18.170	-0.032	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-54.185	-54.498	-0.313	(0)
As (3)	6.389e-20					
H3AsO3	6.125e-20	6.125e-20	-19.213	-19.213	0.000	(0)
H2AsO3-	2.642e-21	2.438e-21	-20.578	-20.613	-0.035	(0)
HAsO3-2	2.377e-25	1.726e-25	-24.624	-24.763	-0.139	(0)
H4AsO3+	4.235e-28	3.909e-28	-27.373	-27.408	-0.035	(0)
AsO3-3	1.061e-30	5.166e-31	-29.974	-30.287	-0.313	(0)
As (5)	2.670e-08					
HAsO4-2	2.443e-08	1.774e-08	-7.612	-7.751	-0.139	(0)
H2AsO4-	2.258e-09	2.085e-09	-8.646	-8.681	-0.035	(0)
AsO4-3	8.947e-12	4.356e-12	-11.048	-11.361	-0.313	(0)
H3AsO4	4.662e-15	4.667e-15	-14.331	-14.331	0.000	(0)
B	6.570e-06					
H3BO3	6.256e-06	6.262e-06	-5.204	-5.203	0.000	(0)
H2BO3-	3.045e-07	2.823e-07	-6.516	-6.549	-0.033	(0)
CaH2BO3+	7.988e-09	7.405e-09	-8.098	-8.130	-0.033	(0)
NaH2BO3	9.390e-10	9.390e-10	-9.027	-9.027	0.000	(0)
MgH2BO3+	6.840e-10	6.341e-10	-9.165	-9.198	-0.033	(0)
BF (OH) 3-	1.015e-10	9.410e-11	-9.994	-10.026	-0.033	(0)
H5 (BO3) 2-	1.623e-12	1.505e-12	-11.790	-11.823	-0.033	(0)
BaH2BO3+	6.525e-13	6.049e-13	-12.185	-12.218	-0.033	(0)
BF2 (OH) 2-	5.264e-15	4.880e-15	-14.279	-14.312	-0.033	(0)
H8 (BO3) 3-	1.016e-15	9.423e-16	-14.993	-15.026	-0.033	(0)
BF3OH-	9.937e-22	9.212e-22	-21.003	-21.036	-0.033	(0)
BF4-	2.372e-27	2.199e-27	-26.625	-26.658	-0.033	(0)
Ba	9.469e-08					
Ba+2	9.294e-08	6.934e-08	-7.032	-7.159	-0.127	(0)
BaHCO3+	1.477e-09	1.376e-09	-8.831	-8.861	-0.031	(0)
BaCO3	2.690e-10	2.690e-10	-9.570	-9.570	0.000	(0)
BaH2BO3+	6.525e-13	6.049e-13	-12.185	-12.218	-0.033	(0)
BaOH+	2.542e-13	2.365e-13	-12.595	-12.626	-0.031	(0)
C (4)	2.332e-03					
HCO3-	2.232e-03	2.079e-03	-2.651	-2.682	-0.031	(0)
H2CO3	6.023e-05	6.023e-05	-4.220	-4.220	0.000	(0)
CaHCO3+	1.893e-05	1.764e-05	-4.723	-4.753	-0.031	(0)
CO3-2	1.014e-05	7.565e-06	-4.994	-5.121	-0.127	(0)
CaCO3	5.465e-06	5.465e-06	-5.262	-5.262	0.000	(0)
NaHCO3	2.453e-06	2.453e-06	-5.610	-5.610	0.000	(0)
MgHCO3+	1.483e-06	1.378e-06	-5.829	-5.861	-0.032	(0)
MgCO3	4.076e-07	4.076e-07	-6.390	-6.390	0.000	(0)
NaCO3-	3.175e-07	2.956e-07	-6.498	-6.529	-0.031	(0)
MnHCO3+	9.518e-08	8.857e-08	-7.021	-7.053	-0.031	(0)
ZnCO3	6.741e-08	6.741e-08	-7.171	-7.171	0.000	(0)
ZnHCO3+	1.103e-08	1.018e-08	-7.958	-7.992	-0.035	(0)
UO2 (CO3) 2-2	5.267e-09	3.825e-09	-8.278	-8.417	-0.139	(0)
UO2 (CO3) 3-4	5.214e-09	1.450e-09	-8.283	-8.839	-0.556	(0)
CuCO3	4.583e-09	4.583e-09	-8.339	-8.339	0.000	(0)
BaHCO3+	1.477e-09	1.376e-09	-8.831	-8.861	-0.031	(0)
NiCO3	5.452e-10	5.452e-10	-9.263	-9.263	0.000	(0)
NiHCO3+	5.363e-10	4.951e-10	-9.271	-9.305	-0.035	(0)
BaCO3	2.690e-10	2.690e-10	-9.570	-9.570	0.000	(0)
FeHCO3+	1.437e-10	1.339e-10	-9.843	-9.873	-0.031	(0)
Cu (CO3) 2-2	1.285e-10	9.331e-11	-9.891	-10.030	-0.139	(0)
PbCO3	9.175e-11	9.175e-11	-10.037	-10.037	0.000	(0)
UO2CO3	2.534e-11	2.534e-11	-10.596	-10.596	0.000	(0)
CuHCO3+	1.462e-11	1.349e-11	-10.835	-10.870	-0.035	(0)
PbHCO3+	6.750e-12	6.231e-12	-11.171	-11.205	-0.035	(0)

	Pb(CO3) 2-2	2.756e-12	2.002e-12	-11.560	-11.699	-0.139	(0)
	HgCO3	9.781e-18	9.781e-18	-17.010	-17.010	0.000	(0)
	Hg(CO3) 2-2	3.222e-19	2.340e-19	-18.492	-18.631	-0.139	(0)
	HgHCO3+	2.542e-21	2.346e-21	-20.595	-20.630	-0.035	(0)
Ca	6.489e-04						
	Ca+2	6.110e-04	4.558e-04	-3.214	-3.341	-0.127	(0)
	CaHCO3+	1.893e-05	1.764e-05	-4.723	-4.753	-0.031	(0)
	CaSO4	1.332e-05	1.332e-05	-4.876	-4.876	0.000	(0)
	CaCO3	5.465e-06	5.465e-06	-5.262	-5.262	0.000	(0)
	CaF+	2.013e-07	1.873e-07	-6.696	-6.727	-0.031	(0)
	CaH2BO3+	7.988e-09	7.405e-09	-8.098	-8.130	-0.033	(0)
	CaOH+	7.627e-09	7.108e-09	-8.118	-8.148	-0.031	(0)
Cl	1.114e-03						
	Cl-	1.114e-03	1.036e-03	-2.953	-2.985	-0.032	(0)
	MnCl+	2.992e-09	2.784e-09	-8.524	-8.555	-0.031	(0)
	ZnCl+	4.335e-10	4.028e-10	-9.363	-9.395	-0.032	(0)
	ZnOHC1	4.122e-10	4.122e-10	-9.385	-9.385	0.000	(0)
	CuCl	6.570e-12	6.570e-12	-11.182	-11.182	0.000	(0)
	NiCl+	5.545e-12	5.119e-12	-11.256	-11.291	-0.035	(0)
	MnCl2	4.072e-12	4.072e-12	-11.390	-11.390	0.000	(0)
	CuCl2-	1.530e-12	1.421e-12	-11.815	-11.847	-0.032	(0)
	ZnCl2	6.611e-13	6.611e-13	-12.180	-12.180	0.000	(0)
	CuCl+	1.817e-13	1.689e-13	-12.741	-12.772	-0.032	(0)
	TlCl	1.806e-13	1.806e-13	-12.743	-12.743	0.000	(0)
	PbCl+	1.606e-13	1.482e-13	-12.794	-12.829	-0.035	(0)
	HgClOH	1.544e-15	1.544e-15	-14.811	-14.811	0.000	(0)
	MnCl3-	1.248e-15	1.161e-15	-14.904	-14.935	-0.031	(0)
	PbCl2	6.857e-16	6.857e-16	-15.164	-15.164	0.000	(0)
	ZnCl3-	5.852e-16	5.438e-16	-15.233	-15.265	-0.032	(0)
	CuCl3-2	4.196e-16	3.147e-16	-15.377	-15.502	-0.125	(0)
	TlCl2-	1.193e-16	1.101e-16	-15.923	-15.958	-0.035	(0)
	HgCl2	1.159e-16	1.159e-16	-15.936	-15.936	0.000	(0)
	CuCl2	6.063e-17	6.063e-17	-16.217	-16.217	0.000	(0)
	CrCl+2	3.862e-17	2.805e-17	-16.413	-16.552	-0.139	(0)
	NiCl2	2.669e-17	2.669e-17	-16.574	-16.574	0.000	(0)
	UO2Cl+	1.531e-18	1.413e-18	-17.815	-17.850	-0.035	(0)
	HgCl3-	1.300e-18	1.200e-18	-17.886	-17.921	-0.035	(0)
	CrOHC12	4.314e-19	4.314e-19	-18.365	-18.365	0.000	(0)
	ZnCl4-2	3.754e-19	2.816e-19	-18.425	-18.550	-0.125	(0)
	PbCl3-	3.062e-19	2.827e-19	-18.514	-18.549	-0.035	(0)
	FeCl+2	1.982e-19	1.487e-19	-18.703	-18.828	-0.125	(0)
	HgCl+	2.418e-20	2.232e-20	-19.616	-19.651	-0.035	(0)
	HgCl4-2	6.811e-21	4.946e-21	-20.167	-20.306	-0.139	(0)
	CrCl2+	2.985e-21	2.756e-21	-20.525	-20.560	-0.035	(0)
	VOCl+	1.608e-21	1.484e-21	-20.794	-20.829	-0.035	(0)
	FeCl2+	7.389e-22	6.876e-22	-21.131	-21.163	-0.031	(0)
	CuCl3-	6.306e-22	5.859e-22	-21.200	-21.232	-0.032	(0)
	PbCl4-2	1.842e-22	1.338e-22	-21.735	-21.874	-0.139	(0)
	FeCl3	7.120e-26	7.120e-26	-25.148	-25.148	0.000	(0)
	CuCl4-2	4.055e-27	3.041e-27	-26.392	-26.517	-0.125	(0)
	CrO3Cl-	1.187e-27	1.095e-27	-26.926	-26.960	-0.035	(0)
	TlOHC1+	5.627e-33	5.195e-33	-32.250	-32.284	-0.035	(0)
	TlCl3	1.042e-37	1.042e-37	-36.982	-36.982	0.000	(0)
	TlCl2+	1.041e-37	9.611e-38	-36.982	-37.017	-0.035	(0)
	TlCl4-	7.376e-39	6.809e-39	-38.132	-38.167	-0.035	(0)
	TlCl+2	2.221e-40	1.613e-40	-39.653	-39.792	-0.139	(0)
	UCl+3	0.000e+00	0.000e+00	-46.391	-46.704	-0.313	(0)
Cr (2)	6.885e-25						
	Cr+2	6.885e-25	5.000e-25	-24.162	-24.301	-0.139	(0)
Cr (3)	4.809e-08						
	Cr(OH) 2+	3.686e-08	3.403e-08	-7.433	-7.468	-0.035	(0)
	Cr(OH) 3	9.991e-09	9.991e-09	-8.000	-8.000	0.000	(0)
	Cr(OH) +2	4.928e-10	3.579e-10	-9.307	-9.446	-0.139	(0)
	CrO2-	3.990e-10	3.684e-10	-9.399	-9.434	-0.035	(0)
	Cr(OH) 4-	3.367e-10	3.109e-10	-9.473	-9.507	-0.035	(0)
	CrOHSO4	1.083e-11	1.083e-11	-10.965	-10.965	0.000	(0)
	CrF+2	1.720e-13	1.249e-13	-12.764	-12.903	-0.139	(0)
	Cr+3	4.299e-14	2.093e-14	-13.367	-13.679	-0.313	(0)

CrSO4+	6.752e-15	6.233e-15	-14.171	-14.205	-0.035	(0)
CrCl+2	3.862e-17	2.805e-17	-16.413	-16.552	-0.139	(0)
Cr2 (OH) 2SO4+2	4.824e-19	3.503e-19	-18.317	-18.456	-0.139	(0)
CrOHC12	4.314e-19	4.314e-19	-18.365	-18.365	0.000	(0)
CrCl2+	2.985e-21	2.756e-21	-20.525	-20.560	-0.035	(0)
Cr2 (OH) 2 (SO4) 2	2.654e-21	2.654e-21	-20.576	-20.576	0.000	(0)
Cr (6)	4.375e-16					
CrO4-2	4.198e-16	3.132e-16	-15.377	-15.504	-0.127	(0)
HCrO4-	1.414e-17	1.305e-17	-16.850	-16.884	-0.035	(0)
NaCrO4-	3.538e-18	3.266e-18	-17.451	-17.486	-0.035	(0)
KCrO4-	8.683e-20	8.015e-20	-19.061	-19.096	-0.035	(0)
H2CrO4	1.363e-25	1.363e-25	-24.865	-24.865	0.000	(0)
CrO3SO4-2	8.996e-27	6.533e-27	-26.046	-26.185	-0.139	(0)
CrO3Cl-	1.187e-27	1.095e-27	-26.926	-26.960	-0.035	(0)
Cr2O7-2	8.138e-33	5.910e-33	-32.089	-32.228	-0.139	(0)
Cu (1)	1.356e-11					
CuCl	6.570e-12	6.570e-12	-11.182	-11.182	0.000	(0)
Cu+	5.459e-12	5.039e-12	-11.263	-11.298	-0.035	(0)
CuCl2-	1.530e-12	1.421e-12	-11.815	-11.847	-0.032	(0)
CuCl3-2	4.196e-16	3.147e-16	-15.377	-15.502	-0.125	(0)
Cu (2)	5.181e-09					
CuCO3	4.583e-09	4.583e-09	-8.339	-8.339	0.000	(0)
CuOH+	2.737e-10	2.543e-10	-9.563	-9.595	-0.032	(0)
Cu+2	1.379e-10	1.029e-10	-9.860	-9.988	-0.127	(0)
Cu (CO3) 2-2	1.285e-10	9.331e-11	-9.891	-10.030	-0.139	(0)
Cu (OH) 2	3.965e-11	3.965e-11	-10.402	-10.402	0.000	(0)
CuHCO3+	1.462e-11	1.349e-11	-10.835	-10.870	-0.035	(0)
CuSO4	3.006e-12	3.006e-12	-11.522	-11.522	0.000	(0)
CuF+	2.648e-13	2.445e-13	-12.577	-12.612	-0.035	(0)
CuCl+	1.817e-13	1.689e-13	-12.741	-12.772	-0.032	(0)
Cu (OH) 3-	6.886e-14	6.357e-14	-13.162	-13.197	-0.035	(0)
Cu2 (OH) 2+2	2.237e-15	1.624e-15	-14.650	-14.789	-0.139	(0)
CuCl2	6.063e-17	6.063e-17	-16.217	-16.217	0.000	(0)
Cu (OH) 4-2	5.384e-19	3.910e-19	-18.269	-18.408	-0.139	(0)
CuCl3-	6.306e-22	5.859e-22	-21.200	-21.232	-0.032	(0)
CuCl4-2	4.055e-27	3.041e-27	-26.392	-26.517	-0.125	(0)
F	4.107e-05					
F-	4.052e-05	3.766e-05	-4.392	-4.424	-0.032	(0)
MgF+	2.943e-07	2.737e-07	-6.531	-6.563	-0.032	(0)
CaF+	2.013e-07	1.873e-07	-6.696	-6.727	-0.031	(0)
NaF	4.986e-08	4.986e-08	-7.302	-7.302	0.000	(0)
MnF+	3.440e-09	3.201e-09	-8.463	-8.495	-0.031	(0)
HF	7.175e-10	7.175e-10	-9.144	-9.144	0.000	(0)
ZnF+	1.260e-10	1.164e-10	-9.899	-9.934	-0.035	(0)
BF (OH) 3-	1.015e-10	9.410e-11	-9.994	-10.026	-0.033	(0)
AlF2+	3.030e-12	2.821e-12	-11.519	-11.550	-0.031	(0)
NiF+	1.980e-12	1.827e-12	-11.703	-11.738	-0.035	(0)
AlF3	1.337e-12	1.337e-12	-11.874	-11.874	0.000	(0)
CuF+	2.648e-13	2.445e-13	-12.577	-12.612	-0.035	(0)
AlF+2	2.504e-13	1.882e-13	-12.601	-12.725	-0.124	(0)
CrF+2	1.720e-13	1.249e-13	-12.764	-12.903	-0.139	(0)
HF2-	1.106e-13	1.027e-13	-12.956	-12.988	-0.032	(0)
AlF4-	2.714e-14	2.524e-14	-13.566	-13.598	-0.032	(0)
PbF+	1.160e-14	1.071e-14	-13.936	-13.970	-0.035	(0)
BF2 (OH) 2-	5.264e-15	4.880e-15	-14.279	-14.312	-0.033	(0)
UO2F+	4.738e-15	4.374e-15	-14.324	-14.359	-0.035	(0)
TlF	2.554e-15	2.554e-15	-14.593	-14.593	0.000	(0)
UO2F2	4.750e-16	4.750e-16	-15.323	-15.323	0.000	(0)
FeF+2	2.617e-16	1.963e-16	-15.582	-15.707	-0.125	(0)
FeF2+	2.125e-16	1.978e-16	-15.673	-15.704	-0.031	(0)
VO2F	2.541e-17	2.541e-17	-16.595	-16.595	0.000	(0)
FeF3	1.051e-17	1.051e-17	-16.978	-16.978	0.000	(0)
PbF2	7.934e-18	7.934e-18	-17.101	-17.101	0.000	(0)
UO2F3-	4.867e-18	4.493e-18	-17.313	-17.347	-0.035	(0)
H2F2	1.379e-18	1.379e-18	-17.860	-17.860	0.000	(0)
VO2F2-	3.764e-19	3.475e-19	-18.424	-18.459	-0.035	(0)
VOF+	1.250e-19	1.154e-19	-18.903	-18.938	-0.035	(0)
UO2F4-2	1.851e-21	1.344e-21	-20.733	-20.872	-0.139	(0)

VOF2	1.629e-21	1.629e-21	-20.788	-20.788	0.000	(0)
BF3OH-	9.937e-22	9.212e-22	-21.003	-21.036	-0.033	(0)
PbF3-	6.138e-22	5.666e-22	-21.212	-21.247	-0.035	(0)
VO2F3-2	2.247e-22	1.632e-22	-21.648	-21.787	-0.139	(0)
VOF3-	2.358e-24	2.177e-24	-23.627	-23.662	-0.035	(0)
PbF4-2	1.406e-26	1.021e-26	-25.852	-25.991	-0.139	(0)
VO2F4-3	6.211e-27	3.024e-27	-26.207	-26.519	-0.313	(0)
BF4-	2.372e-27	2.199e-27	-26.625	-26.658	-0.033	(0)
HgF+	1.634e-27	1.508e-27	-26.787	-26.822	-0.035	(0)
VOF4-2	4.556e-28	3.308e-28	-27.341	-27.480	-0.139	(0)
SiF6-2	4.177e-32	3.133e-32	-31.379	-31.504	-0.125	(0)
UF3+	8.777e-38	8.102e-38	-37.057	-37.091	-0.035	(0)
UF2+2	1.870e-38	1.358e-38	-37.728	-37.867	-0.139	(0)
UF4	3.345e-40	3.345e-40	-39.476	-39.476	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.230	-40.543	-0.313	(0)
UF5-	0.000e+00	0.000e+00	-42.267	-42.302	-0.035	(0)
UF6-2	0.000e+00	0.000e+00	-44.107	-44.246	-0.139	(0)
Fe (2)	7.522e-09					
Fe+2	7.046e-09	5.117e-09	-8.152	-8.291	-0.139	(0)
FeOH+	1.711e-10	1.592e-10	-9.767	-9.798	-0.031	(0)
FeSO4	1.602e-10	1.602e-10	-9.795	-9.795	0.000	(0)
FeHCO3+	1.437e-10	1.339e-10	-9.843	-9.873	-0.031	(0)
Fe (OH) 2	9.884e-14	9.884e-14	-13.005	-13.005	0.000	(0)
Fe (OH) 3-	2.625e-14	2.443e-14	-13.581	-13.612	-0.031	(0)
Fe (3)	1.443e-06					
Fe (OH) 2+	7.833e-07	7.293e-07	-6.106	-6.137	-0.031	(0)
Fe (OH) 3	6.122e-07	6.122e-07	-6.213	-6.213	0.000	(0)
Fe (OH) 4-	4.784e-08	4.455e-08	-7.320	-7.351	-0.031	(0)
FeOH+2	3.198e-12	2.399e-12	-11.495	-11.620	-0.125	(0)
FeF+2	2.617e-16	1.963e-16	-15.582	-15.707	-0.125	(0)
FeF2+	2.125e-16	1.978e-16	-15.673	-15.704	-0.031	(0)
FeF3	1.051e-17	1.051e-17	-16.978	-16.978	0.000	(0)
Fe+3	9.190e-18	4.754e-18	-17.037	-17.323	-0.286	(0)
FeSO4+	7.309e-18	6.802e-18	-17.136	-17.167	-0.031	(0)
FeCl+2	1.982e-19	1.487e-19	-18.703	-18.828	-0.125	(0)
Fe (SO4) 2-	2.009e-20	1.854e-20	-19.697	-19.732	-0.035	(0)
FeCl2+	7.389e-22	6.876e-22	-21.131	-21.163	-0.031	(0)
Fe2 (OH) 2+4	6.851e-22	1.905e-22	-21.164	-21.720	-0.556	(0)
FeCl3	7.120e-26	7.120e-26	-25.148	-25.148	0.000	(0)
Fe3 (OH) 4+5	1.483e-26	2.008e-27	-25.829	-26.697	-0.868	(0)
H (0)	2.347e-27					
H2	1.174e-27	1.175e-27	-26.930	-26.930	0.000	(0)
Hg (0)	9.973e-11					
Hg	9.973e-11	9.973e-11	-10.001	-10.001	0.000	(0)
Hg (1)	2.015e-25					
Hg2+2	1.007e-25	7.315e-26	-24.997	-25.136	-0.139	(0)
Hg (2)	5.831e-15					
Hg (OH) 2	4.160e-15	4.164e-15	-14.381	-14.380	0.000	(0)
HgClOH	1.544e-15	1.544e-15	-14.811	-14.811	0.000	(0)
HgCl2	1.159e-16	1.159e-16	-15.936	-15.936	0.000	(0)
HgCO3	9.781e-18	9.781e-18	-17.010	-17.010	0.000	(0)
HgCl3-	1.300e-18	1.200e-18	-17.886	-17.921	-0.035	(0)
Hg (CO3) 2-2	3.222e-19	2.340e-19	-18.492	-18.631	-0.139	(0)
HgOH+	3.642e-20	3.362e-20	-19.439	-19.473	-0.035	(0)
HgCl+	2.418e-20	2.232e-20	-19.616	-19.651	-0.035	(0)
HgCl4-2	6.811e-21	4.946e-21	-20.167	-20.306	-0.139	(0)
HgHCO3+	2.542e-21	2.346e-21	-20.595	-20.630	-0.035	(0)
Hg (OH) 3-	4.438e-22	4.097e-22	-21.353	-21.388	-0.035	(0)
Hg+2	1.488e-24	1.080e-24	-23.827	-23.966	-0.139	(0)
HgSO4	3.608e-26	3.608e-26	-25.443	-25.443	0.000	(0)
HgF+	1.634e-27	1.508e-27	-26.787	-26.822	-0.035	(0)
K	7.419e-05					
K+	7.413e-05	6.889e-05	-4.130	-4.162	-0.032	(0)
KSO4-	6.680e-08	6.220e-08	-7.175	-7.206	-0.031	(0)
KCrO4-	8.683e-20	8.015e-20	-19.061	-19.096	-0.035	(0)
Mg	9.054e-05					
Mg+2	8.683e-05	6.478e-05	-4.061	-4.189	-0.127	(0)
MgSO4	1.503e-06	1.503e-06	-5.823	-5.823	0.000	(0)

MgHCO3+	1.483e-06	1.378e-06	-5.829	-5.861	-0.032	(0)
MgCO3	4.076e-07	4.076e-07	-6.390	-6.390	0.000	(0)
MgF+	2.943e-07	2.737e-07	-6.531	-6.563	-0.032	(0)
MgOH+	2.161e-08	2.015e-08	-7.665	-7.696	-0.030	(0)
MgH2BO3+	6.840e-10	6.341e-10	-9.165	-9.198	-0.033	(0)
Mn (2)	3.095e-06					
Mn+2	2.941e-06	2.136e-06	-5.532	-5.670	-0.139	(0)
MnHCO3+	9.518e-08	8.857e-08	-7.021	-7.053	-0.031	(0)
MnSO4	4.843e-08	4.843e-08	-7.315	-7.315	0.000	(0)
MnOH+	4.505e-09	4.192e-09	-8.346	-8.378	-0.031	(0)
MnF+	3.440e-09	3.201e-09	-8.463	-8.495	-0.031	(0)
MnCl+	2.992e-09	2.784e-09	-8.524	-8.555	-0.031	(0)
MnCl2	4.072e-12	4.072e-12	-11.390	-11.390	0.000	(0)
MnCl3-	1.248e-15	1.161e-15	-14.904	-14.935	-0.031	(0)
Mn (OH) 3-	1.701e-17	1.583e-17	-16.769	-16.801	-0.031	(0)
Mn (OH) 4-2	5.324e-23	3.993e-23	-22.274	-22.399	-0.125	(0)
Mn (3)	1.844e-27					
Mn+3	1.844e-27	9.539e-28	-26.734	-27.020	-0.286	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-44.848	-44.973	-0.125	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.312	-50.345	-0.033	(0)
Mo	2.085e-08					
MoO4-2	2.085e-08	1.555e-08	-7.681	-7.808	-0.127	(0)
HMoO4-	4.319e-12	3.987e-12	-11.365	-11.399	-0.035	(0)
H2MoO4	3.762e-16	3.762e-16	-15.425	-15.425	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-54.185	-54.498	-0.313	(0)
Mo7O24-6	0.000e+00	0.000e+00	-63.537	-64.787	-1.251	(0)
HMo7O24-5	0.000e+00	0.000e+00	-65.422	-66.290	-0.868	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-68.842	-69.398	-0.556	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-73.729	-74.042	-0.313	(0)
Na	2.263e-03					
Na+	2.258e-03	2.099e-03	-2.646	-2.678	-0.032	(0)
NaHCO3	2.453e-06	2.453e-06	-5.610	-5.610	0.000	(0)
NaSO4-	1.544e-06	1.437e-06	-5.811	-5.842	-0.031	(0)
NaCO3-	3.175e-07	2.956e-07	-6.498	-6.529	-0.031	(0)
NaF	4.986e-08	4.986e-08	-7.302	-7.302	0.000	(0)
NaH2BO3	9.390e-10	9.390e-10	-9.027	-9.027	0.000	(0)
NaCrO4-	3.538e-18	3.266e-18	-17.451	-17.486	-0.035	(0)
Ni	3.750e-09					
Ni+2	2.590e-09	1.932e-09	-8.587	-8.714	-0.127	(0)
NiCO3	5.452e-10	5.452e-10	-9.263	-9.263	0.000	(0)
NiHCO3+	5.363e-10	4.951e-10	-9.271	-9.305	-0.035	(0)
NiSO4	4.916e-11	4.916e-11	-10.308	-10.308	0.000	(0)
NiOH+	2.059e-11	1.901e-11	-10.686	-10.721	-0.035	(0)
NiCl+	5.545e-12	5.119e-12	-11.256	-11.291	-0.035	(0)
NiF+	1.980e-12	1.827e-12	-11.703	-11.738	-0.035	(0)
Ni (OH) 2	1.180e-12	1.180e-12	-11.928	-11.928	0.000	(0)
Ni (OH) 3-	9.990e-16	9.222e-16	-15.000	-15.035	-0.035	(0)
Ni (SO4) 2-2	2.858e-16	2.076e-16	-15.544	-15.683	-0.139	(0)
NiCl2	2.669e-17	2.669e-17	-16.574	-16.574	0.000	(0)
O (0)	7.335e-39					
O2	3.667e-39	3.671e-39	-38.436	-38.435	0.000	(0)
Pb	1.159e-10					
PbCO3	9.175e-11	9.175e-11	-10.037	-10.037	0.000	(0)
PbOH+	8.580e-12	7.921e-12	-11.067	-11.101	-0.035	(0)
PbHCO3+	6.750e-12	6.231e-12	-11.171	-11.205	-0.035	(0)
Pb+2	5.408e-12	4.035e-12	-11.267	-11.394	-0.127	(0)
Pb (CO3) 2-2	2.756e-12	2.002e-12	-11.560	-11.699	-0.139	(0)
PbSO4	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
Pb (OH) 2	1.958e-13	1.958e-13	-12.708	-12.708	0.000	(0)
PbCl+	1.606e-13	1.482e-13	-12.794	-12.829	-0.035	(0)
PbF+	1.160e-14	1.071e-14	-13.936	-13.970	-0.035	(0)
PbCl2	6.857e-16	6.857e-16	-15.164	-15.164	0.000	(0)
Pb (SO4) 2-2	2.667e-16	1.936e-16	-15.574	-15.713	-0.139	(0)
Pb (OH) 3-	1.657e-16	1.530e-16	-15.781	-15.815	-0.035	(0)
PbF2	7.934e-18	7.934e-18	-17.101	-17.101	0.000	(0)
PbCl3-	3.062e-19	2.827e-19	-18.514	-18.549	-0.035	(0)

Pb(OH) 4-2	4.032e-20	2.928e-20	-19.394	-19.533	-0.139	(0)
Pb2OH+3	1.040e-21	5.065e-22	-20.983	-21.295	-0.313	(0)
PbF3-	6.138e-22	5.666e-22	-21.212	-21.247	-0.035	(0)
PbCl4-2	1.842e-22	1.338e-22	-21.735	-21.874	-0.139	(0)
PbF4-2	1.406e-26	1.021e-26	-25.852	-25.991	-0.139	(0)
Pb3(OH) 4+2	4.248e-27	3.085e-27	-26.372	-26.511	-0.139	(0)
Pb4(OH) 4+4	3.555e-34	9.886e-35	-33.449	-34.005	-0.556	(0)
S(6)	1.874e-04					
SO4-2	1.709e-04	1.275e-04	-3.767	-3.894	-0.127	(0)
CaSO4	1.332e-05	1.332e-05	-4.876	-4.876	0.000	(0)
NaSO4-	1.544e-06	1.437e-06	-5.811	-5.842	-0.031	(0)
MgSO4	1.503e-06	1.503e-06	-5.823	-5.823	0.000	(0)
KSO4-	6.680e-08	6.220e-08	-7.175	-7.206	-0.031	(0)
MnSO4	4.843e-08	4.843e-08	-7.315	-7.315	0.000	(0)
ZnSO4	4.321e-09	4.321e-09	-8.364	-8.364	0.000	(0)
HSO4-	1.726e-10	1.605e-10	-9.763	-9.794	-0.032	(0)
FeSO4	1.602e-10	1.602e-10	-9.795	-9.795	0.000	(0)
NiSO4	4.916e-11	4.916e-11	-10.308	-10.308	0.000	(0)
CrOHSO4	1.083e-11	1.083e-11	-10.965	-10.965	0.000	(0)
Zn(SO4) 2-2	6.608e-12	4.799e-12	-11.180	-11.319	-0.139	(0)
CuSO4	3.006e-12	3.006e-12	-11.522	-11.522	0.000	(0)
PbSO4	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
TlSO4-	1.745e-13	1.611e-13	-12.758	-12.793	-0.035	(0)
CrSO4+	6.752e-15	6.233e-15	-14.171	-14.205	-0.035	(0)
AlSO4+	5.320e-16	4.947e-16	-15.274	-15.306	-0.032	(0)
Ni(SO4) 2-2	2.858e-16	2.076e-16	-15.544	-15.683	-0.139	(0)
Pb(SO4) 2-2	2.667e-16	1.936e-16	-15.574	-15.713	-0.139	(0)
UO2SO4	1.624e-16	1.624e-16	-15.789	-15.789	0.000	(0)
FeSO4+	7.309e-18	6.802e-18	-17.136	-17.167	-0.031	(0)
VO2SO4-	1.269e-18	1.172e-18	-17.896	-17.931	-0.035	(0)
Al(SO4) 2-	7.270e-19	6.760e-19	-18.138	-18.170	-0.032	(0)
Cr2(OH) 2SO4+2	4.824e-19	3.503e-19	-18.317	-18.456	-0.139	(0)
UO2(SO4) 2-2	3.760e-19	2.730e-19	-18.425	-18.564	-0.139	(0)
Fe(SO4) 2-	2.009e-20	1.854e-20	-19.697	-19.732	-0.035	(0)
VOSO4	1.794e-20	1.794e-20	-19.746	-19.746	0.000	(0)
Cr2(OH) 2(SO4) 2	2.654e-21	2.654e-21	-20.576	-20.576	0.000	(0)
HgSO4	3.608e-26	3.608e-26	-25.443	-25.443	0.000	(0)
CrO3SO4-2	8.996e-27	6.533e-27	-26.046	-26.185	-0.139	(0)
VSO4+	2.746e-34	2.535e-34	-33.561	-33.596	-0.035	(0)
USO4+2	0.000e+00	0.000e+00	-42.574	-42.713	-0.139	(0)
U(SO4) 2	0.000e+00	0.000e+00	-42.708	-42.708	0.000	(0)
Si	2.664e-04					
H4SiO4	2.632e-04	2.635e-04	-3.580	-3.579	0.000	(0)
H3SiO4-	3.181e-06	2.956e-06	-5.497	-5.529	-0.032	(0)
H2SiO4-2	1.926e-11	1.448e-11	-10.715	-10.839	-0.124	(0)
UO2H3SiO4+	2.288e-13	2.112e-13	-12.641	-12.675	-0.035	(0)
SiF6-2	4.177e-32	3.133e-32	-31.379	-31.504	-0.125	(0)
Tl(1)	5.873e-11					
Tl+	5.837e-11	5.388e-11	-10.234	-10.269	-0.035	(0)
TlCl	1.806e-13	1.806e-13	-12.743	-12.743	0.000	(0)
TlSO4-	1.745e-13	1.611e-13	-12.758	-12.793	-0.035	(0)
TlF	2.554e-15	2.554e-15	-14.593	-14.593	0.000	(0)
TlOH	2.597e-16	2.597e-16	-15.586	-15.586	0.000	(0)
TlCl2-	1.193e-16	1.101e-16	-15.923	-15.958	-0.035	(0)
Tl(3)	7.095e-25					
Tl(OH) 3	7.093e-25	7.101e-25	-24.149	-24.149	0.000	(0)
Tl(OH) 4-	1.199e-28	1.107e-28	-27.921	-27.956	-0.035	(0)
Tl(OH) 2+	7.818e-31	7.217e-31	-30.107	-30.142	-0.035	(0)
TlOHCl+	5.627e-33	5.195e-33	-32.250	-32.284	-0.035	(0)
TlCl3	1.042e-37	1.042e-37	-36.982	-36.982	0.000	(0)
TlCl2+	1.041e-37	9.611e-38	-36.982	-37.017	-0.035	(0)
TlOH+2	8.023e-38	5.827e-38	-37.096	-37.235	-0.139	(0)
TlCl4-	7.376e-39	6.809e-39	-38.132	-38.167	-0.035	(0)
TlCl+2	2.221e-40	1.613e-40	-39.653	-39.792	-0.139	(0)
Tl+3	0.000e+00	0.000e+00	-44.215	-44.528	-0.313	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.902	-58.215	-0.313	(0)
U(4)	8.827e-20					

U(OH) 5-	8.823e-20	8.144e-20	-19.054	-19.089	-0.035	(0)
U(OH) 4	4.394e-23	4.394e-23	-22.357	-22.357	0.000	(0)
U(OH) 3+	2.242e-27	2.070e-27	-26.649	-26.684	-0.035	(0)
U(OH) 2+2	1.698e-32	1.233e-32	-31.770	-31.909	-0.139	(0)
UF3+	8.777e-38	8.102e-38	-37.057	-37.091	-0.035	(0)
UF2+2	1.870e-38	1.358e-38	-37.728	-37.867	-0.139	(0)
UOH+3	1.537e-38	7.483e-39	-37.813	-38.126	-0.313	(0)
UF4	3.345e-40	3.345e-40	-39.476	-39.476	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.230	-40.543	-0.313	(0)
UF5-	0.000e+00	0.000e+00	-42.267	-42.302	-0.035	(0)
USO4+2	0.000e+00	0.000e+00	-42.574	-42.713	-0.139	(0)
U(SO4) 2	0.000e+00	0.000e+00	-42.708	-42.708	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-44.107	-44.246	-0.139	(0)
U+4	0.000e+00	0.000e+00	-44.863	-45.419	-0.556	(0)
UC1+3	0.000e+00	0.000e+00	-46.391	-46.704	-0.313	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-168.505	-171.319	-2.814	(0)
U(5)	5.556e-17					
UO2+	5.556e-17	5.129e-17	-16.255	-16.290	-0.035	(0)
U(6)	1.051e-08					
UO2(CO3) 2-2	5.267e-09	3.825e-09	-8.278	-8.417	-0.139	(0)
UO2(CO3) 3-4	5.214e-09	1.450e-09	-8.283	-8.839	-0.556	(0)
UO2CO3	2.534e-11	2.534e-11	-10.596	-10.596	0.000	(0)
UO2H3SiO4+	2.288e-13	2.112e-13	-12.641	-12.675	-0.035	(0)
UO2OH+	8.968e-14	8.279e-14	-13.047	-13.082	-0.035	(0)
UO2F+	4.738e-15	4.374e-15	-14.324	-14.359	-0.035	(0)
UO2+2	1.128e-15	8.414e-16	-14.948	-15.075	-0.127	(0)
UO2F2	4.750e-16	4.750e-16	-15.323	-15.323	0.000	(0)
UO2SO4	1.624e-16	1.624e-16	-15.789	-15.789	0.000	(0)
UO2F3-	4.867e-18	4.493e-18	-17.313	-17.347	-0.035	(0)
UO2C1+	1.531e-18	1.413e-18	-17.815	-17.850	-0.035	(0)
UO2(SO4) 2-2	3.760e-19	2.730e-19	-18.425	-18.564	-0.139	(0)
(UO2) 2(OH) 2+2	1.566e-20	1.137e-20	-19.805	-19.944	-0.139	(0)
UO2F4-2	1.851e-21	1.344e-21	-20.733	-20.872	-0.139	(0)
(UO2) 3(OH) 5+	4.726e-22	4.363e-22	-21.325	-21.360	-0.035	(0)
V(2)	5.650e-40					
VOH+	5.650e-40	5.215e-40	-39.248	-39.283	-0.035	(0)
V+2	0.000e+00	0.000e+00	-40.547	-40.686	-0.139	(0)
V(3)	1.621e-12					
V(OH) 3	1.621e-12	1.621e-12	-11.790	-11.790	0.000	(0)
V(OH) 2+	1.462e-23	1.350e-23	-22.835	-22.870	-0.035	(0)
VOH+2	2.271e-27	1.649e-27	-26.644	-26.783	-0.139	(0)
V+3	8.649e-33	4.211e-33	-32.063	-32.376	-0.313	(0)
VSO4+	2.746e-34	2.535e-34	-33.561	-33.596	-0.035	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-50.888	-51.201	-0.313	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-52.210	-52.765	-0.556	(0)
V(4)	8.713e-17					
V(OH) 3+	8.628e-17	7.965e-17	-16.064	-16.099	-0.035	(0)
VO+2	7.034e-19	5.108e-19	-18.153	-18.292	-0.139	(0)
VOF+	1.250e-19	1.154e-19	-18.903	-18.938	-0.035	(0)
VOSO4	1.794e-20	1.794e-20	-19.746	-19.746	0.000	(0)
VOF2	1.629e-21	1.629e-21	-20.788	-20.788	0.000	(0)
VOC1+	1.608e-21	1.484e-21	-20.794	-20.829	-0.035	(0)
VOF3-	2.358e-24	2.177e-24	-23.627	-23.662	-0.035	(0)
VOF4-2	4.556e-28	3.308e-28	-27.341	-27.480	-0.139	(0)
H2V2O4+2	4.379e-28	3.180e-28	-27.359	-27.498	-0.139	(0)
V(5)	1.571e-07					
H2VO4-	1.259e-07	1.162e-07	-6.900	-6.935	-0.035	(0)
HVO4-2	3.119e-08	2.265e-08	-7.506	-7.645	-0.139	(0)
H3VO4	1.497e-11	1.497e-11	-10.825	-10.825	0.000	(0)
H3V2O7-	1.216e-11	1.123e-11	-10.915	-10.950	-0.035	(0)
HV2O7-3	1.832e-12	8.919e-13	-11.737	-12.050	-0.313	(0)
VO4-3	1.810e-14	8.813e-15	-13.742	-14.055	-0.313	(0)
V2O7-4	6.700e-15	1.863e-15	-14.174	-14.730	-0.556	(0)
V3O9-3	3.374e-15	1.643e-15	-14.472	-14.784	-0.313	(0)
VO2+	4.140e-16	3.848e-16	-15.383	-15.415	-0.032	(0)
VO2F	2.541e-17	2.541e-17	-16.595	-16.595	0.000	(0)
VO2SO4-	1.269e-18	1.172e-18	-17.896	-17.931	-0.035	(0)
VO2F2-	3.764e-19	3.475e-19	-18.424	-18.459	-0.035	(0)

V4O12-4	2.861e-19	7.956e-20	-18.543	-19.099	-0.556	(0)
VO2F3-2	2.247e-22	1.632e-22	-21.648	-21.787	-0.139	(0)
VO2F4-3	6.211e-27	3.024e-27	-26.207	-26.519	-0.313	(0)
V10O28-6	0.000e+00	0.000e+00	-50.752	-52.002	-1.251	(0)
HV10O28-5	0.000e+00	0.000e+00	-50.837	-51.706	-0.868	(0)
H2V10O28-4	0.000e+00	0.000e+00	-53.832	-54.388	-0.556	(0)
Zn	3.059e-07					
Zn+2	2.076e-07	1.549e-07	-6.683	-6.810	-0.127	(0)
ZnCO3	6.741e-08	6.741e-08	-7.171	-7.171	0.000	(0)
ZnOH+	1.311e-08	1.210e-08	-7.882	-7.917	-0.035	(0)
ZnHCO3+	1.103e-08	1.018e-08	-7.958	-7.992	-0.035	(0)
ZnSO4	4.321e-09	4.321e-09	-8.364	-8.364	0.000	(0)
Zn(OH)2	1.499e-09	1.499e-09	-8.824	-8.824	0.000	(0)
ZnCl+	4.335e-10	4.028e-10	-9.363	-9.395	-0.032	(0)
ZnOHCl	4.122e-10	4.122e-10	-9.385	-9.385	0.000	(0)
ZnF+	1.260e-10	1.164e-10	-9.899	-9.934	-0.035	(0)
Zn(SO4)2-2	6.608e-12	4.799e-12	-11.180	-11.319	-0.139	(0)
Zn(OH)3-	6.361e-12	5.872e-12	-11.196	-11.231	-0.035	(0)
ZnCl2	6.611e-13	6.611e-13	-12.180	-12.180	0.000	(0)
ZnCl3-	5.852e-16	5.438e-16	-15.233	-15.265	-0.032	(0)
Zn(OH)4-2	2.516e-16	1.827e-16	-15.599	-15.738	-0.139	(0)
ZnCl4-2	3.754e-19	2.816e-19	-18.425	-18.550	-0.125	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH)3(am)	-2.43	8.37	10.80	Al(OH)3
Al2(MoO4)3	-56.39	-54.03	2.37	Al2(MoO4)3
Al2O3	-2.92	16.74	19.65	Al2O3
Al4(OH)10SO4	-8.90	13.80	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.76	-5.96	4.80	AlAsO4:2H2O
AlOHSO4	-8.08	-11.31	-3.23	AlOHSO4
Alunite	-9.11	-10.51	-1.40	KA13(SO4)2(OH)6
Anglesite	-7.50	-15.29	-7.79	PbSO4
Anhydrite	-2.88	-7.24	-4.36	CaSO4
Antlerite	-11.09	-2.30	8.79	Cu3(OH)4SO4
Aragonite	-0.16	-8.46	-8.30	CaCO3
Arsenolite	-74.09	-76.85	-2.76	As4O6
Artinite	-7.32	2.28	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-35.37	-28.66	6.71	As2O5
Atacamite	-6.68	0.71	7.39	Cu2(OH)3Cl
Avicennite	-35.30	-48.30	-13.00	Tl2O3
Azurite	-7.52	-24.43	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.77	8.62	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-13.68	2.19	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	6.11	-2.80	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-22.13	10.81	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.99	-22.66	-9.67	BaCrO4
BaF2	-10.19	-16.01	-5.82	BaF2
BaMoO4	-8.01	-14.97	-6.96	BaMoO4
Barite	-1.07	-11.05	-9.98	BaSO4
Bianchite	-8.94	-10.70	-1.76	ZnSO4:6H2O
Birnessite	-9.55	8.54	18.09	MnO2
Bixbyite	-6.06	-6.70	-0.64	Mn2O3
Boehmite	-0.21	8.37	8.58	AlOOH
Brochantite	-11.73	3.49	15.22	Cu4(OH)6SO4
Brucite	-5.25	11.59	16.84	Mg(OH)2
Bunsenite	-5.38	7.07	12.45	NiO
Ca(VO3)2	-8.27	-2.61	5.66	Ca(VO3)2
Ca2V2O7	-7.67	9.83	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.72	9.83	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.65	8.65	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.69	22.27	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.59	22.27	39.86	Ca3(VO4)2:4H2O
CaCrO4	-16.58	-18.85	-2.27	CaCrO4
Calcite	0.02	-8.46	-8.48	CaCO3
Calomel	-13.20	-31.11	-17.91	Hg2Cl2

CaMoO4	-3.20	-11.15	-7.95	CaMoO4
Carnotite	-3.32	-3.09	0.23	KUO2VO4
Cerrusite	-3.39	-16.52	-13.13	PbCO3
CH4 (g)	-74.98	-116.02	-41.05	CH4
Chalcanthite	-11.24	-13.88	-2.64	CuSO4:5H2O
Chalcedony	-0.03	-3.58	-3.55	SiO2
Chrysotile	-4.58	27.62	32.20	Mg3Si2O5 (OH) 4
Claudetite	-73.79	-76.85	-3.06	As4O6
CO2 (g)	-2.75	-20.90	-18.15	CO2
Cotunnite	-12.58	-17.36	-4.78	PbCl2
Cr (OH) 2	-19.34	-8.52	10.82	Cr (OH) 2
Cr (OH) 3	-0.91	0.42	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.17	0.42	-0.75	Cr (OH) 3
Cr2O3	3.20	0.84	-2.36	Cr2O3
CrCl2	-44.36	-30.27	14.09	CrCl2
CrCl3	-47.32	-32.20	15.11	CrCl3
CrF3	-25.18	-36.52	-11.34	CrF3
Cristobalite	-0.23	-3.58	-3.35	SiO2
Crmetal	-62.78	-32.30	30.48	Cr
CrO3	-28.07	-31.28	-3.21	CrO3
Cryolite	-16.04	-49.88	-33.84	Na3AlF6
Cu (OH) 2	-2.88	5.79	8.67	Cu (OH) 2
Cu2SO4	-24.54	-26.49	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-17.38	-11.28	6.10	Cu3 (AsO4) 2:2H2O
CuCO3	-3.61	-15.11	-11.50	CuCO3
CuCrO4	-20.05	-25.49	-5.44	CuCrO4
CuF	-10.82	-15.72	-4.91	CuF
CuF2	-19.95	-18.84	1.12	CuF2
CuF2:2H2O	-14.29	-18.84	-4.55	CuF2:2H2O
Cumetal	-6.54	-15.30	-8.76	Cu
CuMoO4	-4.72	-17.80	-13.08	CuMoO4
CuOCuSO4	-18.39	-8.09	10.30	CuOCuSO4
Cupricferrite	12.50	18.49	5.99	CuFe2O4
Cuprite	-5.41	-6.82	-1.41	Cu2O
Cuprousferrite	11.86	2.94	-8.92	CuFeO2
CuSO4	-16.82	-13.88	2.94	CuSO4
Diaspore	1.50	8.37	6.87	AlOOH
Dolomite (disordered)	-1.23	-17.77	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.68	-17.77	-17.09	CaMg (CO3) 2
Epsomite	-5.96	-8.08	-2.13	MgSO4:7H2O
Fe (OH) 2	-6.08	7.49	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.12	3.08	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-3.84	-7.56	-3.72	Fe (VO3) 2
Fe2 (SO4) 3	-42.59	-46.33	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-0.04	20.18	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-8.38	-7.98	0.40	FeAsO4:2H2O
FeCr2O4	1.13	8.33	7.20	FeCr2O4
FeMoO4	-6.01	-16.10	-10.09	FeMoO4
Ferrihydrite	3.16	6.35	3.19	Fe (OH) 3
Fluorite	-1.69	-12.19	-10.50	CaF2
Gibbsite	0.08	8.37	8.29	Al (OH) 3
Goethite	5.86	6.35	0.49	FeOOH
Goslarite	-8.69	-10.70	-2.01	ZnSO4:7H2O
Greenalite	-5.50	15.31	20.81	Fe3Si2O5 (OH) 4
Gummite	-6.97	0.70	7.67	UO3
Gypsum	-2.63	-7.24	-4.61	CaSO4:2H2O
H-Jarosite	-8.21	-20.31	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.71	-23.59	-12.88	H2MoO4
Halite	-7.27	-5.66	1.60	NaCl
Halloysite	0.00	9.58	9.57	Al2Si2O5 (OH) 4
Hausmannite	-6.92	54.11	61.03	Mn3O4
Hematite	14.11	12.69	-1.42	Fe2O3
Hercynite	1.33	24.23	22.89	FeAl2O4
Hg (CH3) 2 (g)	-172.72	-246.42	-73.71	Hg (CH3) 2
Hg (g)	-8.69	-16.57	-7.87	Hg
Hg (OH) 2	-10.88	-14.38	-3.50	Hg (OH) 2
Hg2 (g)	-18.18	-33.14	-14.96	Hg2
Hg2 (OH) 2	-14.62	-9.36	5.26	Hg2 (OH) 2

Hg2CO3	-14.21	-30.26	-16.05	Hg2CO3
Hg2CrO4	-31.94	-40.64	-8.70	Hg2CrO4
Hg2F2	-23.62	-33.98	-10.36	Hg2F2
Hg2SO4	-22.90	-29.03	-6.13	Hg2SO4
Hg3O2CO3	-34.36	-64.04	-29.68	Hg3O2CO3
HgCl (g)	-35.05	-15.55	19.50	HgCl
HgCl2	-14.87	-36.13	-21.26	HgCl2
HgF (g)	-49.67	-16.99	32.68	HgF
HgF2 (g)	-51.57	-39.01	12.57	HgF2
Hgmetal (l)	-3.12	-16.57	-13.45	Hg
HgSO4	-24.64	-34.05	-9.42	HgSO4
Huntite	-6.42	-36.39	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-9.87	-28.65	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-16.88	-25.65	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-22.08	-27.25	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-1.78	-16.58	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-37.87	-55.11	-17.24	K2Cr2O7
K2CrO4	-23.31	-23.83	-0.51	K2CrO4
K2MoO4	-19.39	-16.13	3.26	K2MoO4
Kaolinite	2.14	9.58	7.43	Al2Si2O5 (OH) 4
Langite	-13.99	3.49	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-10.47	-10.90	-0.43	PbO : PbSO4
Laurionite	-7.11	-6.49	0.62	PbOHCl
Lepidocrocite	4.98	6.35	1.37	FeOOH
Lime	-20.26	12.44	32.70	CaO
Litharge	-8.31	4.39	12.69	PbO
Maghemite	6.31	12.69	6.39	Fe2O3
Magnesioferrite	7.43	24.29	16.86	Fe2MgO4
Magnesite	-1.85	-9.31	-7.46	MgCO3
Magnetite	16.78	20.18	3.40	Fe3O4
Malachite	-4.01	-9.32	-5.31	Cu2 (OH) 2CO3
Manganite	-3.34	22.00	25.34	MnOOH
Massicot	-8.51	4.39	12.89	PbO
Matlockite	-9.83	-18.80	-8.97	PbClF
Melanothallite	-22.21	-15.96	6.26	CuCl2
Melanterite	-9.98	-12.19	-2.21	FeSO4 : 7H2O
Mg (OH) 2 (active)	-7.20	11.59	18.79	Mg (OH) 2
Mg (VO3) 2	-14.74	-3.46	11.28	Mg (VO3) 2
Mg2V2O7	-18.23	8.13	26.36	Mg2V2O7
MgCr2O4	-3.77	12.44	16.20	MgCr2O4
MgCrO4	-25.07	-19.69	5.38	MgCrO4
MgF2	-4.91	-13.04	-8.13	MgF2
MgMoO4	-10.15	-12.00	-1.85	MgMoO4
Minium	-36.58	36.94	73.52	Pb3O4
Mirabilite	-8.14	-9.25	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.84	-4.94	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-60.01	-65.72	-5.71	Mn2 (SO4) 3
Mn3 (AsO4) 2 : 8H2O	-10.83	1.67	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-14.36	-11.64	2.72	MnCl2 : 4H2O
MnSO4	-12.15	-9.56	2.58	MnSO4
Montroydite	-10.74	-14.38	-3.64	HgO
MoO3	-15.59	-23.59	-8.00	MoO3
Morenosite	-10.46	-12.61	-2.14	NiSO4 : 7H2O
Na-Jarosite	-3.90	-15.10	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-42.25	-52.14	-9.90	Na2Cr2O7
Na2CrO4	-23.79	-20.86	2.93	Na2CrO4
Na2Mo2O7	-20.16	-36.75	-16.60	Na2Mo2O7
Na2MoO4	-14.65	-13.16	1.49	Na2MoO4
Na2MoO4 : 2H2O	-14.39	-13.16	1.22	Na2MoO4 : 2H2O
Na3VO4	-28.57	8.11	36.68	Na3VO4
Na4V2O7	-31.60	5.80	37.40	Na4V2O7
Nantokite	-7.55	-14.28	-6.73	CuCl
Natron	-9.17	-10.48	-1.31	Na2CO3 : 10H2O
NaVO3	-6.17	-2.31	3.86	NaVO3
Nesquehonite	-4.64	-9.31	-4.67	MgCO3 : 3H2O
Ni (OH) 2	-5.73	7.07	12.79	Ni (OH) 2
Ni3 (AsO4) 2 : 8H2O	-23.16	-7.46	15.70	Ni3 (AsO4) 2 : 8H2O
Ni4 (OH) 6SO4	-23.41	8.59	32.00	Ni4 (OH) 6SO4

NiCO3	-6.97	-13.84	-6.87	NiCO3
NiMoO4	-5.38	-16.52	-11.14	NiMoO4
Nsutite	-8.96	8.54	17.50	MnO2
O2 (g)	-35.53	47.56	83.09	O2
Pb (BO2) 2	-12.54	-6.02	6.52	Pb (BO2) 2
Pb (OH) 2	-3.76	4.39	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-72.79	-81.55	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-10.90	-2.10	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.42	8.77	26.19	Pb2O (OH) 2
Pb2O3	-28.49	32.55	61.04	Pb2O3
Pb2OCO3	-11.57	-12.13	-0.56	Pb2OCO3
Pb2V2O7	-4.38	-6.28	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.30	-15.50	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-8.03	-1.89	6.14	Pb3 (VO4) 2
Pb3O2CO3	-18.76	-7.74	11.02	Pb3O2CO3
Pb3O2SO4	-17.20	-6.52	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-23.23	-2.13	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-24.01	-2.13	21.88	Pb4O3SO4
PbCrO4	-14.30	-26.90	-12.60	PbCrO4
PbF2	-12.80	-20.24	-7.44	PbF2
Pbmetal	-23.64	-19.39	4.25	Pb
PbMoO4	-3.58	-19.20	-15.62	PbMoO4
PbO:0.3H2O	-8.59	4.39	12.98	PbO:0.33H2O
Periclase	-9.99	11.59	21.58	MgO
Phosgenite	-14.07	-33.88	-19.81	PbCl2:PbCO3
Plattnerite	-21.43	28.17	49.60	PbO2
Portlandite	-10.37	12.44	22.80	Ca (OH) 2
Pyrochroite	-5.08	10.11	15.19	Mn (OH) 2
Pyrolusite	-7.49	33.89	41.38	MnO2
Quartz	0.42	-3.58	-4.00	SiO2
Retgersite	-10.57	-12.61	-2.04	NiSO4:6H2O
Rhodochrosite	-0.21	-10.79	-10.58	MnCO3
Rutherfordine	-5.70	-20.20	-14.50	UO2CO3
Schoepite	-5.29	0.70	5.99	UO2 (OH) 2:H2O
Sepiolite	-3.31	12.45	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-6.33	12.45	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-3.17	-13.41	-10.24	FeCO3
SiO2 (am-gel)	-0.87	-3.58	-2.71	SiO2
SiO2 (am-ppt)	-0.84	-3.58	-2.74	SiO2
Smithsonite	-1.93	-11.93	-10.00	ZnCO3
Spinel	-8.52	28.33	36.85	MgAl2O4
Tenorite	-1.85	5.79	7.64	CuO
Thenardite	-9.57	-9.25	0.32	Na2SO4
Thermonatrite	-11.11	-10.48	0.64	Na2CO3:H2O
Tl (OH) 3	-18.71	-24.15	-5.44	Tl (OH) 3
Tl2CO3	-21.82	-25.66	-3.84	Tl2CO3
Tl2CrO4	-24.03	-36.04	-12.01	Tl2CrO4
Tl2MoO4	-20.36	-28.35	-7.99	Tl2MoO4
Tl2O	-31.85	-4.76	27.09	Tl2O
Tl2SO4	-20.64	-24.43	-3.79	Tl2SO4
TlCl	-9.51	-13.25	-3.74	TlCl
Tlmetal	-19.94	-14.27	5.68	Tl
TlOH	-15.30	-2.38	12.92	TlOH
Tyuyamunite	-5.28	-1.20	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.10	5.98	21.08	U3O8
U4O9	-28.64	-31.66	-3.02	U4O9
UF4	-33.58	-63.12	-29.54	UF4
UF4:2.5H2O	-30.40	-63.12	-32.72	UF4:2.5H2O
UO2 (am)	-14.79	-13.86	0.93	UO2
UO2 (OH) 2 (beta)	-4.91	0.70	5.61	UO2 (OH) 2
UO3	-7.00	0.70	7.70	UO3
Uraninite	-9.19	-13.86	-4.67	UO2
V (OH) 3	-16.30	-8.71	7.59	V (OH) 3
V2O5	-13.69	-15.05	-1.36	V2O5
V3O5	-33.15	-31.32	1.84	V3O5
V4O7	-41.01	-33.83	7.19	V4O7
V6O13	-31.85	-92.71	-60.86	V6O13
VCl2	-61.22	-42.35	18.87	VCl2

VC13	-64.76	-41.33	23.43	VC13
VF4	-66.70	-51.77	14.93	VF4
Vmetal	-88.40	-44.38	44.03	V
VO	-35.35	-20.60	14.76	VO
VO(OH)2	-7.66	-2.51	5.15	VO(OH)2
VO2Cl	-21.24	-18.40	2.84	VO2Cl
VOC1	-30.73	-19.58	11.15	VOC1
VOC12	-37.02	-24.26	12.76	VOC12
VOSO4	-25.80	-22.19	3.61	VOSO4
Witherite	-3.71	-12.28	-8.57	BaCO3
Zincite	-2.36	8.97	11.33	ZnO
Zincosite	-14.63	-10.70	3.93	ZnSO4
Zn(BO2)2	-9.73	-1.44	8.29	Zn(BO2)2
Zn(OH)2	-3.23	8.97	12.20	Zn(OH)2
Zn(OH)2(am)	-3.50	8.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.78	8.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.56	8.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.76	8.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.23	-1.73	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.13	7.06	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.40	-1.75	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-31.35	-12.44	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-12.19	16.21	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-15.40	23.10	38.50	Zn5(OH)8Cl2
ZnCl2	-19.83	-12.78	7.05	ZnCl2
ZnCO3:1H2O	-1.67	-11.93	-10.26	ZnCO3:1H2O
ZnF2	-15.12	-15.66	-0.53	ZnF2
Znmetal	-40.60	-14.81	25.79	Zn
ZnMoO4	-4.49	-14.62	-10.13	ZnMoO4
ZnO(active)	-2.22	8.97	11.19	ZnO
ZnSO4:1H2O	-10.07	-10.70	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 19.

SOLUTION 17 Average water quality for Background Surface Water SWQ-1
(representative of haul road and watershed run-off)

temp	25
pH	8.3
pe	4
redox	pe
units	mg/l
density	1
Alkalinity	430 as HCO3
B	0.02
Ca	109
Cl	30 charge
F	0.3
K	1.8
Mg	36
Na	107
S(6)	261 as SO4
water	1 # kg

END

Beginning of initial solution calculations.

Initial solution 17. Average water quality for Background Surface Water SWQ-1
(representative of haul road and watershed run-off)

-----Solution composition-----

Elements	Molality	Moles	
Alkalinity	7.054e-03	7.054e-03	
B	1.852e-06	1.852e-06	
Ca	2.722e-03	2.722e-03	
Cl	6.061e-04	6.061e-04	Charge balance
F	1.581e-05	1.581e-05	
K	4.608e-05	4.608e-05	
Mg	1.483e-03	1.483e-03	
Na	4.659e-03	4.659e-03	
S (6)	2.720e-03	2.720e-03	

-----Description of solution-----

pH	=	8.300
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.709e-02
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	6.884e-03
Total CO2 (mol/kg)	=	6.884e-03
Temperature (°C)	=	25.00
Electrical balance (eq)	=	5.204e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	9
Total H	=	1.110204e+02
Total O	=	5.553837e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.295e-06	2.008e-06	-5.639	-5.697	-0.058	(0)
H+	5.706e-09	5.012e-09	-8.244	-8.300	-0.056	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
B	1.852e-06					
H3BO3	1.614e-06	1.620e-06	-5.792	-5.790	0.002	(0)
H2BO3-	2.157e-07	1.878e-07	-6.666	-6.726	-0.060	(0)
CaH2BO3+	1.553e-08	1.352e-08	-7.809	-7.869	-0.060	(0)
MgH2BO3+	5.475e-09	4.766e-09	-8.262	-8.322	-0.060	(0)
NaH2BO3	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
BF(OH)3-	9.392e-12	8.176e-12	-11.027	-11.087	-0.060	(0)
H5(BO3)2-	2.975e-13	2.590e-13	-12.527	-12.587	-0.060	(0)
BF2(OH)2-	6.365e-17	5.541e-17	-16.196	-16.256	-0.060	(0)
H8(BO3)3-	4.820e-17	4.196e-17	-16.317	-16.377	-0.060	(0)
BF3OH-	1.570e-24	1.367e-24	-23.804	-23.864	-0.060	(0)
BF4-	4.896e-31	4.263e-31	-30.310	-30.370	-0.060	(0)
C (4)	6.884e-03					
HCO3-	6.382e-03	5.634e-03	-2.195	-2.249	-0.054	(0)
CaHCO3+	1.483e-04	1.313e-04	-3.829	-3.882	-0.053	(0)
CaCO3	1.045e-04	1.045e-04	-3.981	-3.981	0.000	(0)
CO3-2	8.856e-05	5.270e-05	-4.053	-4.278	-0.225	(0)
H2CO3	6.351e-05	6.351e-05	-4.197	-4.197	0.000	(0)
MgHCO3+	4.811e-05	4.221e-05	-4.318	-4.375	-0.057	(0)
MgCO3	3.209e-05	3.209e-05	-4.494	-4.494	0.000	(0)
NaHCO3	1.283e-05	1.283e-05	-4.892	-4.892	0.000	(0)
NaCO3-	4.501e-06	3.974e-06	-5.347	-5.401	-0.054	(0)
Ca	2.722e-03					
Ca+2	2.102e-03	1.251e-03	-2.677	-2.903	-0.225	(0)
CaSO4	3.668e-04	3.668e-04	-3.436	-3.436	0.000	(0)
CaHCO3+	1.483e-04	1.313e-04	-3.829	-3.882	-0.053	(0)
CaCO3	1.045e-04	1.045e-04	-3.981	-3.981	0.000	(0)
CaF+	1.959e-07	1.727e-07	-6.708	-6.763	-0.055	(0)
CaOH+	5.665e-08	5.014e-08	-7.247	-7.300	-0.053	(0)

	CaH2BO3+	1.553e-08	1.352e-08	-7.809	-7.869	-0.060	(0)
Cl		6.061e-04					
	Cl-	6.061e-04	5.323e-04	-3.217	-3.274	-0.056	(0)
F		1.581e-05					
	F-	1.440e-05	1.264e-05	-4.842	-4.898	-0.056	(0)
	MgF+	1.181e-06	1.039e-06	-5.928	-5.984	-0.056	(0)
	CaF+	1.959e-07	1.727e-07	-6.708	-6.763	-0.055	(0)
	NaF	3.230e-08	3.230e-08	-7.491	-7.491	0.000	(0)
	HF	9.374e-11	9.374e-11	-10.028	-10.028	0.000	(0)
	BF(OH) 3-	9.392e-12	8.176e-12	-11.027	-11.087	-0.060	(0)
	HF2-	5.150e-15	4.506e-15	-14.288	-14.346	-0.058	(0)
	BF2(OH) 2-	6.365e-17	5.541e-17	-16.196	-16.256	-0.060	(0)
	H2F2	2.354e-20	2.354e-20	-19.628	-19.628	0.000	(0)
	BF3OH-	1.570e-24	1.367e-24	-23.804	-23.864	-0.060	(0)
	BF4-	4.896e-31	4.263e-31	-30.310	-30.370	-0.060	(0)
H(0)		3.543e-28					
	H2	1.771e-28	1.778e-28	-27.752	-27.750	0.002	(0)
K		4.608e-05					
	K+	4.567e-05	4.011e-05	-4.340	-4.397	-0.056	(0)
	KSO4-	4.116e-07	3.634e-07	-6.385	-6.440	-0.054	(0)
Mg		1.483e-03					
	Mg+2	1.230e-03	7.320e-04	-2.910	-3.135	-0.225	(0)
	MgSO4	1.705e-04	1.705e-04	-3.768	-3.768	0.000	(0)
	MgHCO3+	4.811e-05	4.221e-05	-4.318	-4.375	-0.057	(0)
	MgCO3	3.209e-05	3.209e-05	-4.494	-4.494	0.000	(0)
	MgF+	1.181e-06	1.039e-06	-5.928	-5.984	-0.056	(0)
	MgOH+	6.600e-07	5.853e-07	-6.180	-6.233	-0.052	(0)
	MgH2BO3+	5.475e-09	4.766e-09	-8.262	-8.322	-0.060	(0)
Na		4.659e-03					
	Na+	4.610e-03	4.049e-03	-2.336	-2.393	-0.056	(0)
	NaSO4-	3.152e-05	2.783e-05	-4.501	-4.556	-0.054	(0)
	NaHCO3	1.283e-05	1.283e-05	-4.892	-4.892	0.000	(0)
	NaCO3-	4.501e-06	3.974e-06	-5.347	-5.401	-0.054	(0)
	NaF	3.230e-08	3.230e-08	-7.491	-7.491	0.000	(0)
	NaH2BO3	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
O(0)		3.191e-37					
	O2	1.596e-37	1.602e-37	-36.797	-36.795	0.002	(0)
S(6)		2.720e-03					
	SO4-2	2.150e-03	1.280e-03	-2.667	-2.893	-0.225	(0)
	CaSO4	3.668e-04	3.668e-04	-3.436	-3.436	0.000	(0)
	MgSO4	1.705e-04	1.705e-04	-3.768	-3.768	0.000	(0)
	NaSO4-	3.152e-05	2.783e-05	-4.501	-4.556	-0.054	(0)
	KSO4-	4.116e-07	3.634e-07	-6.385	-6.440	-0.054	(0)
	HSO4-	7.128e-10	6.268e-10	-9.147	-9.203	-0.056	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Anhydrite	-1.44	-5.80	-4.36	CaSO4
Aragonite	1.12	-7.18	-8.30	CaCO3
Artinite	-3.55	6.05	9.60	MgCO3:Mg(OH) 2:3H2O
Brucite	-3.38	13.46	16.84	Mg(OH) 2
Calcite	1.30	-7.18	-8.48	CaCO3
CH4(g)	-78.23	-119.28	-41.05	CH4
CO2(g)	-2.73	-20.88	-18.15	CO2
Dolomite(disordered)	1.95	-14.59	-16.54	CaMg(CO3) 2
Dolomite(ordered)	2.50	-14.59	-17.09	CaMg(CO3) 2
Epsomite	-3.90	-6.03	-2.13	MgSO4:7H2O
Fluorite	-2.20	-12.70	-10.50	CaF2
Gypsum	-1.19	-5.80	-4.61	CaSO4:2H2O
Halite	-7.27	-5.67	1.60	NaCl
Huntite	0.55	-29.42	-29.97	CaMg3(CO3) 4
Hydromagnesite	-7.42	-16.19	-8.77	Mg5(CO3) 4(OH) 2:4H2O
Lime	-19.00	13.70	32.70	CaO
Magnesite	0.05	-7.41	-7.46	MgCO3
Mg(OH) 2(active)	-5.33	13.46	18.79	Mg(OH) 2
MgF2	-4.80	-12.93	-8.13	MgF2

Mirabilite	-6.57	-7.68	-1.11	Na2SO4:10H2O
Natron	-7.75	-9.06	-1.31	Na2CO3:10H2O
Nesquehonite	-2.74	-7.41	-4.67	MgCO3:3H2O
O2(g)	-33.89	49.20	83.09	O2
Periclase	-8.12	13.46	21.58	MgO
Portlandite	-9.11	13.70	22.80	Ca(OH)2
Thenardite	-8.00	-7.68	0.32	Na2SO4
Thermonatrite	-9.70	-9.06	0.64	Na2CO3:H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 20.

WARNING: Unknown input, no keyword has been specified.

Title Stage 1 Groundwater mix

MIX 101

2	1
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0.015340
11	0.311733
12	0.015648
13	0.369157
14	0
15	0

Save solution 101

end

TITLE

Stage 1 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 101.

Mixture 101.

1.000e+00 Solution 2 JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)

0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)

0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
1.534e-02 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
3.117e-01 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.565e-02 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.692e-01 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	4.878e-08	8.350e-08
Al	7.361e-07	1.260e-06
As	1.880e-08	3.219e-08
B	7.545e-06	1.292e-05
Ba	4.118e-07	7.049e-07
C	4.252e-03	7.279e-03
Ca	1.474e-03	2.523e-03
Cd	4.188e-09	7.170e-09
Cl	8.284e-04	1.418e-03
Co	7.936e-08	1.359e-07
Cr	7.421e-08	1.270e-07
Cu	1.374e-07	2.351e-07
F	8.504e-05	1.456e-04
Fe	1.550e-05	2.653e-05
Hg	1.193e-11	2.043e-11
K	8.437e-05	1.444e-04
Mg	5.269e-04	9.020e-04
Mn	7.783e-06	1.332e-05
Mo	1.003e-07	1.717e-07
Na	2.357e-03	4.035e-03
Ni	1.245e-07	2.131e-07
Pb	7.251e-09	1.241e-08
S	6.882e-04	1.178e-03
Sb	4.722e-09	8.084e-09
Se	1.276e-08	2.185e-08
U	7.581e-09	1.298e-08
V	1.647e-08	2.820e-08
Zn	2.932e-07	5.019e-07

-----Description of solution-----

	pH	=	7.856	Charge balance
	pe	=	3.961	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	8.521e-03	
	Mass of water (kg)	=	1.712e+00	
	Total alkalinity (eq/kg)	=	4.188e-03	
	Total CO2 (mol/kg)	=	4.252e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.308e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	11	
	Total H	=	1.900494e+02	
	Total O	=	9.504759e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	7.964e-07	7.221e-07	-6.099	-6.141	-0.043	(0)
H+	1.535e-08	1.394e-08	-7.814	-7.856	-0.042	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	4.878e-08					
AgCl	1.596e-08	1.596e-08	-7.797	-7.797	0.000	(0)
Ag+	1.144e-08	1.039e-08	-7.942	-7.984	-0.042	(0)
Ag2Se	1.006e-08	1.006e-08	-7.997	-7.997	0.000	(0)
AgCl2-	1.165e-09	1.046e-09	-8.934	-8.981	-0.047	(0)
AgSO4-	9.097e-11	8.162e-11	-10.041	-10.088	-0.047	(0)
AgF	1.923e-12	1.923e-12	-11.716	-11.716	0.000	(0)
AgCl3-2	1.082e-12	7.011e-13	-11.966	-12.154	-0.188	(0)
AgOH	7.500e-13	7.500e-13	-12.125	-12.125	0.000	(0)
AgH2BO3	4.941e-14	4.941e-14	-13.306	-13.306	0.000	(0)
AgSeO3-	3.690e-15	3.311e-15	-14.433	-14.480	-0.047	(0)
AgCl4-3	2.857e-15	1.077e-15	-14.544	-14.968	-0.424	(0)
Ag (OH) 2-	5.898e-17	5.292e-17	-16.229	-16.276	-0.047	(0)
Ag (SeO3) 2-3	3.901e-23	1.470e-23	-22.409	-22.833	-0.424	(0)
Ag2MoO4	2.787e-24	2.787e-24	-23.555	-23.555	0.000	(0)
AgHS	0.000e+00	0.000e+00	-66.298	-66.298	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-73.766	-74.520	-0.753	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-133.826	-133.956	-0.129	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-134.281	-134.328	-0.047	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-135.286	-135.540	-0.254	(0)
AgS4S5-3	0.000e+00	0.000e+00	-135.606	-135.851	-0.245	(0)
Al	7.361e-07					
Al (OH) 4-	7.282e-07	6.619e-07	-6.138	-6.179	-0.041	(0)
Al (OH) 3	7.282e-09	7.282e-09	-8.138	-8.138	0.000	(0)
Al (OH) 2+	5.548e-10	5.054e-10	-9.256	-9.296	-0.040	(0)
AlF2+	2.897e-11	2.639e-11	-10.538	-10.579	-0.040	(0)
AlF3	2.448e-11	2.448e-11	-10.611	-10.611	0.000	(0)
AlF+2	1.306e-12	8.995e-13	-11.884	-12.046	-0.162	(0)
AlOH+2	1.279e-12	8.813e-13	-11.893	-12.055	-0.162	(0)
AlF4-	9.949e-13	9.043e-13	-12.002	-12.044	-0.041	(0)
AlSO4+	4.105e-15	3.731e-15	-14.387	-14.428	-0.041	(0)
Al+3	2.902e-15	1.220e-15	-14.537	-14.913	-0.376	(0)
Al (SO4) 2-	1.732e-17	1.575e-17	-16.761	-16.803	-0.041	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-49.627	-50.051	-0.424	(0)
As (3)	6.599e-20					
H3AsO3	6.339e-20	6.339e-20	-19.198	-19.198	0.000	(0)
H2AsO3-	2.599e-21	2.332e-21	-20.585	-20.632	-0.047	(0)
HAsO3-2	2.353e-25	1.525e-25	-24.628	-24.817	-0.188	(0)
H4AsO3+	4.881e-28	4.379e-28	-27.312	-27.359	-0.047	(0)
AsO3-3	1.119e-30	4.217e-31	-29.951	-30.375	-0.424	(0)
As (5)	1.880e-08					
HAsO4-2	1.722e-08	1.116e-08	-7.764	-7.952	-0.188	(0)
H2AsO4-	1.581e-09	1.419e-09	-8.801	-8.848	-0.047	(0)
AsO4-3	6.714e-12	2.531e-12	-11.173	-11.597	-0.424	(0)
H3AsO4	3.431e-15	3.438e-15	-14.465	-14.464	0.001	(0)
B	7.545e-06					
H3BO3	7.191e-06	7.205e-06	-5.143	-5.142	0.001	(0)
H2BO3-	3.319e-07	3.001e-07	-6.479	-6.523	-0.044	(0)
CaH2BO3+	1.701e-08	1.538e-08	-7.769	-7.813	-0.044	(0)
MgH2BO3+	3.785e-09	3.422e-09	-8.422	-8.466	-0.044	(0)
NaH2BO3	1.014e-09	1.014e-09	-8.994	-8.994	0.000	(0)
BF (OH) 3-	2.343e-10	2.119e-10	-9.630	-9.674	-0.044	(0)
BaH2BO3+	2.790e-12	2.522e-12	-11.554	-11.598	-0.044	(0)
H5 (BO3) 2-	2.036e-12	1.841e-12	-11.691	-11.735	-0.044	(0)
AgH2BO3	4.941e-14	4.941e-14	-13.306	-13.306	0.000	(0)
BF2 (OH) 2-	2.575e-14	2.328e-14	-13.589	-13.633	-0.044	(0)
H8 (BO3) 3-	1.467e-15	1.326e-15	-14.834	-14.877	-0.044	(0)
BF3OH-	1.029e-20	9.308e-21	-19.987	-20.031	-0.044	(0)
BF4-	5.206e-26	4.707e-26	-25.283	-25.327	-0.044	(0)

Ba	4.118e-07					
Ba+2	3.996e-07	2.719e-07	-6.398	-6.566	-0.167	(0)
BaHCO3+	1.041e-08	9.494e-09	-7.983	-8.023	-0.040	(0)
BaCO3	1.714e-09	1.714e-09	-8.766	-8.766	0.000	(0)
BaH2BO3+	2.790e-12	2.522e-12	-11.554	-11.598	-0.044	(0)
BaOH+	9.417e-13	8.571e-13	-12.026	-12.067	-0.041	(0)
C (4)	4.252e-03					
HCO3-	4.013e-03	3.656e-03	-2.397	-2.437	-0.040	(0)
H2CO3	1.146e-04	1.146e-04	-3.941	-3.941	0.000	(0)
CaHCO3+	6.644e-05	6.062e-05	-4.178	-4.217	-0.040	(0)
CO3-2	1.806e-05	1.229e-05	-4.743	-4.910	-0.167	(0)
CaCO3	1.735e-05	1.735e-05	-4.761	-4.761	0.000	(0)
MgHCO3+	1.355e-05	1.230e-05	-4.868	-4.910	-0.042	(0)
NaHCO3	4.383e-06	4.383e-06	-5.358	-5.358	0.000	(0)
MgCO3	3.363e-06	3.363e-06	-5.473	-5.473	0.000	(0)
NaCO3-	5.356e-07	4.880e-07	-6.271	-6.312	-0.040	(0)
MnHCO3+	3.671e-07	3.341e-07	-6.435	-6.476	-0.041	(0)
CuCO3	1.229e-07	1.229e-07	-6.910	-6.910	0.000	(0)
ZnCO3	8.339e-08	8.339e-08	-7.079	-7.079	0.000	(0)
NiHCO3+	2.478e-08	2.223e-08	-7.606	-7.653	-0.047	(0)
NiCO3	2.262e-08	2.262e-08	-7.645	-7.645	0.000	(0)
ZnHCO3+	1.519e-08	1.363e-08	-7.818	-7.866	-0.047	(0)
CoHCO3+	1.160e-08	1.041e-08	-7.936	-7.983	-0.047	(0)
BaHCO3+	1.041e-08	9.494e-09	-7.983	-8.023	-0.040	(0)
CoCO3	7.604e-09	7.604e-09	-8.119	-8.119	0.000	(0)
Cu (CO3) 2-2	6.276e-09	4.068e-09	-8.202	-8.391	-0.188	(0)
PbCO3	5.855e-09	5.855e-09	-8.232	-8.232	0.000	(0)
UO2 (CO3) 3-4	5.253e-09	9.271e-10	-8.280	-9.033	-0.753	(0)
FeHCO3+	3.617e-09	3.300e-09	-8.442	-8.481	-0.040	(0)
UO2 (CO3) 2-2	2.322e-09	1.505e-09	-8.634	-8.822	-0.188	(0)
BaCO3	1.714e-09	1.714e-09	-8.766	-8.766	0.000	(0)
CdCO3	6.029e-10	6.029e-10	-9.220	-9.220	0.000	(0)
PbHCO3+	4.797e-10	4.304e-10	-9.319	-9.366	-0.047	(0)
CuHCO3+	4.367e-10	3.918e-10	-9.360	-9.407	-0.047	(0)
Pb (CO3) 2-2	3.202e-10	2.076e-10	-9.495	-9.683	-0.188	(0)
CdHCO3+	1.996e-11	1.791e-11	-10.700	-10.747	-0.047	(0)
Cd (CO3) 2-2	8.477e-12	5.494e-12	-11.072	-11.260	-0.188	(0)
UO2CO3	6.136e-12	6.136e-12	-11.212	-11.212	0.000	(0)
HgCO3	1.586e-18	1.586e-18	-17.800	-17.800	0.000	(0)
Hg (CO3) 2-2	9.510e-20	6.164e-20	-19.022	-19.210	-0.188	(0)
HgHCO3+	4.589e-22	4.117e-22	-21.338	-21.385	-0.047	(0)
Ca	1.474e-03					
Ca+2	1.309e-03	8.905e-04	-2.883	-3.050	-0.167	(0)
CaSO4	8.034e-05	8.034e-05	-4.095	-4.095	0.000	(0)
CaHCO3+	6.644e-05	6.062e-05	-4.178	-4.217	-0.040	(0)
CaCO3	1.735e-05	1.735e-05	-4.761	-4.761	0.000	(0)
CaF+	7.870e-07	7.163e-07	-6.104	-6.145	-0.041	(0)
CaH2BO3+	1.701e-08	1.538e-08	-7.769	-7.813	-0.044	(0)
CaOH+	1.406e-08	1.283e-08	-7.852	-7.892	-0.040	(0)
Cd	4.188e-09					
Cd+2	3.162e-09	2.152e-09	-8.500	-8.667	-0.167	(0)
CdCO3	6.029e-10	6.029e-10	-9.220	-9.220	0.000	(0)
CdSO4	1.987e-10	1.987e-10	-9.702	-9.702	0.000	(0)
CdCl+	1.723e-10	1.546e-10	-9.764	-9.811	-0.047	(0)
CdHCO3+	1.996e-11	1.791e-11	-10.700	-10.747	-0.047	(0)
CdOH+	1.376e-11	1.234e-11	-10.862	-10.909	-0.047	(0)
Cd (CO3) 2-2	8.477e-12	5.494e-12	-11.072	-11.260	-0.188	(0)
CdOHCl	4.580e-12	4.580e-12	-11.339	-11.339	0.000	(0)
CdF+	2.801e-12	2.514e-12	-11.553	-11.600	-0.047	(0)
Cd (SO4) 2-2	1.628e-12	1.056e-12	-11.788	-11.977	-0.188	(0)
CdCl2	4.849e-13	4.849e-13	-12.314	-12.314	0.000	(0)
Cd (OH) 2	5.623e-14	5.623e-14	-13.250	-13.250	0.000	(0)
CdF2	3.696e-16	3.696e-16	-15.432	-15.432	0.000	(0)
CdCl3-	2.566e-16	2.302e-16	-15.591	-15.638	-0.047	(0)
Cd (OH) 3-	2.765e-18	2.481e-18	-17.558	-17.605	-0.047	(0)
Cd2OH+3	3.532e-19	1.331e-19	-18.452	-18.876	-0.424	(0)
CdSeO4	1.053e-20	1.053e-20	-19.977	-19.977	0.000	(0)
Cd (SeO3) 2-2	6.731e-22	4.363e-22	-21.172	-21.360	-0.188	(0)

	Cd(OH) 4-2	4.523e-25	2.932e-25	-24.345	-24.533	-0.188	(0)
	CdHS+	0.000e+00	0.000e+00	-72.741	-72.789	-0.047	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-137.714	-137.714	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-207.896	-207.943	-0.047	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-277.688	-277.877	-0.188	(0)
C1		8.284e-04					
	Cl-	8.284e-04	7.524e-04	-3.082	-3.124	-0.042	(0)
	AgCl	1.596e-08	1.596e-08	-7.797	-7.797	0.000	(0)
	MnCl+	4.766e-09	4.338e-09	-8.322	-8.363	-0.041	(0)
	AgCl2-	1.165e-09	1.046e-09	-8.934	-8.981	-0.047	(0)
	ZnCl+	2.454e-10	2.228e-10	-9.610	-9.652	-0.042	(0)
	ZnOHCl	2.106e-10	2.106e-10	-9.676	-9.676	0.000	(0)
	CdCl+	1.723e-10	1.546e-10	-9.764	-9.811	-0.047	(0)
	CoCl+	1.062e-10	9.525e-11	-9.974	-10.021	-0.047	(0)
	NiCl+	1.058e-10	9.496e-11	-9.975	-10.022	-0.047	(0)
	CuCl	8.630e-11	8.630e-11	-10.064	-10.064	0.000	(0)
	CuCl2-	1.494e-11	1.356e-11	-10.826	-10.868	-0.042	(0)
	PbCl+	4.714e-12	4.230e-12	-11.327	-11.374	-0.047	(0)
	MnCl2	4.610e-12	4.610e-12	-11.336	-11.336	0.000	(0)
	CdOHCl	4.580e-12	4.580e-12	-11.339	-11.339	0.000	(0)
	CuCl+	2.231e-12	2.025e-12	-11.651	-11.693	-0.042	(0)
	AgCl3-2	1.082e-12	7.011e-13	-11.966	-12.154	-0.188	(0)
	CdCl2	4.849e-13	4.849e-13	-12.314	-12.314	0.000	(0)
	ZnCl2	2.657e-13	2.657e-13	-12.576	-12.576	0.000	(0)
	PbCl2	1.421e-14	1.421e-14	-13.847	-13.847	0.000	(0)
	CuCl3-2	3.180e-15	2.182e-15	-14.498	-14.661	-0.164	(0)
	AgCl4-3	2.857e-15	1.077e-15	-14.544	-14.968	-0.424	(0)
	MnCl3-	1.050e-15	9.553e-16	-14.979	-15.020	-0.041	(0)
	CuCl2	5.284e-16	5.284e-16	-15.277	-15.277	0.000	(0)
	NiCl2	3.597e-16	3.597e-16	-15.444	-15.444	0.000	(0)
	CdCl3-	2.566e-16	2.302e-16	-15.591	-15.638	-0.047	(0)
	ZnCl3-	1.749e-16	1.588e-16	-15.757	-15.799	-0.042	(0)
	HgClOH	1.034e-16	1.034e-16	-15.985	-15.985	0.000	(0)
	CrCl+2	5.643e-17	3.658e-17	-16.248	-16.437	-0.188	(0)
	HgCl2	6.102e-18	6.102e-18	-17.215	-17.215	0.000	(0)
	PbCl3-	4.745e-18	4.258e-18	-17.324	-17.371	-0.047	(0)
	FeCl+2	2.014e-18	1.382e-18	-17.696	-17.860	-0.164	(0)
	CrOHCl2	3.777e-19	3.777e-19	-18.423	-18.423	0.000	(0)
	UO2Cl+	1.705e-19	1.530e-19	-18.768	-18.815	-0.047	(0)
	ZnCl4-2	8.704e-20	5.973e-20	-19.060	-19.224	-0.164	(0)
	HgCl3-	5.116e-20	4.591e-20	-19.291	-19.338	-0.047	(0)
	FeCl2+	5.103e-21	4.644e-21	-20.292	-20.333	-0.041	(0)
	CuCl3-	4.087e-21	3.710e-21	-20.389	-20.431	-0.042	(0)
	CrCl2+	2.910e-21	2.611e-21	-20.536	-20.583	-0.047	(0)
	PbCl4-2	2.259e-21	1.464e-21	-20.646	-20.834	-0.188	(0)
	HgCl+	1.804e-21	1.618e-21	-20.744	-20.791	-0.047	(0)
	HgCl4-2	2.121e-22	1.375e-22	-21.673	-21.862	-0.188	(0)
	VOC1+	1.839e-22	1.650e-22	-21.735	-21.783	-0.047	(0)
	FeCl3	3.494e-25	3.494e-25	-24.457	-24.457	0.000	(0)
	CuCl4-2	2.039e-26	1.399e-26	-25.691	-25.854	-0.164	(0)
	CrO3Cl-	7.539e-28	6.764e-28	-27.123	-27.170	-0.047	(0)
	CoCl+2	3.142e-37	2.036e-37	-36.503	-36.691	-0.188	(0)
	UCl+3	0.000e+00	0.000e+00	-47.029	-47.453	-0.424	(0)
Co (2)		7.936e-08					
	Co+2	5.646e-08	3.660e-08	-7.248	-7.437	-0.188	(0)
	CoHCO3+	1.160e-08	1.041e-08	-7.936	-7.983	-0.047	(0)
	CoCO3	7.604e-09	7.604e-09	-8.119	-8.119	0.000	(0)
	CoSO4	2.876e-09	2.876e-09	-8.541	-8.541	0.000	(0)
	CoOH+	5.876e-10	5.272e-10	-9.231	-9.278	-0.047	(0)
	CoCl+	1.062e-10	9.525e-11	-9.974	-10.021	-0.047	(0)
	CoF+	9.505e-11	8.529e-11	-10.022	-10.069	-0.047	(0)
	Co (OH) 2	3.024e-11	3.024e-11	-10.519	-10.519	0.000	(0)
	Co (OH) 3-	4.855e-16	4.356e-16	-15.314	-15.361	-0.047	(0)
	CoOOH-	1.218e-16	1.093e-16	-15.914	-15.961	-0.047	(0)
	Co2OH+3	2.565e-18	9.670e-19	-17.591	-18.015	-0.424	(0)
	CoSeO4	4.821e-19	4.821e-19	-18.317	-18.317	0.000	(0)
	Co (OH) 4-2	7.692e-23	4.985e-23	-22.114	-22.302	-0.188	(0)
	Co4 (OH) 4+4	8.735e-29	1.542e-29	-28.059	-28.812	-0.753	(0)

Co (3)	7.531e-30					
CoOH+2	7.531e-30	4.881e-30	-29.123	-29.311	-0.188	(0)
Co+3	3.163e-36	1.330e-36	-35.500	-35.876	-0.376	(0)
CoCl+2	3.142e-37	2.036e-37	-36.503	-36.691	-0.188	(0)
Cr (2)	1.516e-24					
Cr+2	1.516e-24	9.828e-25	-23.819	-24.008	-0.188	(0)
Cr (3)	7.421e-08					
Cr (OH) 2+	5.810e-08	5.213e-08	-7.236	-7.283	-0.047	(0)
Cr (OH) 3	1.414e-08	1.414e-08	-7.850	-7.850	0.000	(0)
Cr (OH) +2	9.155e-10	5.934e-10	-9.038	-9.227	-0.188	(0)
CrO2-	5.369e-10	4.817e-10	-9.270	-9.317	-0.047	(0)
Cr (OH) 4-	4.530e-10	4.065e-10	-9.344	-9.391	-0.047	(0)
CrOHSO4	5.546e-11	5.546e-11	-10.256	-10.256	0.000	(0)
CrF+2	6.769e-13	4.388e-13	-12.169	-12.358	-0.188	(0)
Cr+3	9.966e-14	3.756e-14	-13.001	-13.425	-0.424	(0)
CrSO4+	3.850e-14	3.455e-14	-13.415	-13.462	-0.047	(0)
CrCl+2	5.643e-17	3.658e-17	-16.248	-16.437	-0.188	(0)
Cr2 (OH) 2SO4+2	4.589e-18	2.974e-18	-17.338	-17.527	-0.188	(0)
CrOHC12	3.777e-19	3.777e-19	-18.423	-18.423	0.000	(0)
Cr2 (OH) 2 (SO4) 2	6.959e-20	6.959e-20	-19.157	-19.157	0.000	(0)
CrCl2+	2.910e-21	2.611e-21	-20.536	-20.583	-0.047	(0)
Cr (6)	3.481e-16					
CrO4-2	3.339e-16	2.272e-16	-15.476	-15.644	-0.167	(0)
HCrO4-	1.142e-17	1.025e-17	-16.942	-16.989	-0.047	(0)
NaCrO4-	2.682e-18	2.407e-18	-17.571	-17.619	-0.047	(0)
KCrO4-	7.189e-20	6.450e-20	-19.143	-19.190	-0.047	(0)
H2CrO4	1.159e-25	1.159e-25	-24.936	-24.936	0.000	(0)
CrO3SO4-2	2.646e-26	1.715e-26	-25.577	-25.766	-0.188	(0)
CrO3Cl-	7.539e-28	6.764e-28	-27.123	-27.170	-0.047	(0)
Cr2O7-2	5.622e-33	3.644e-33	-32.250	-32.438	-0.188	(0)
Cu (1)	2.028e-10					
Cu+	1.015e-10	9.111e-11	-9.993	-10.040	-0.047	(0)
CuCl	8.630e-11	8.630e-11	-10.064	-10.064	0.000	(0)
CuCl2-	1.494e-11	1.356e-11	-10.826	-10.868	-0.042	(0)
CuCl3-2	3.180e-15	2.182e-15	-14.498	-14.661	-0.164	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-134.948	-135.198	-0.250	(0)
CuS4S5-3	0.000e+00	0.000e+00	-135.687	-135.928	-0.241	(0)
Cu (2)	1.372e-07					
CuCO3	1.229e-07	1.229e-07	-6.910	-6.910	0.000	(0)
Cu (CO3) 2-2	6.276e-09	4.068e-09	-8.202	-8.391	-0.188	(0)
CuOH+	4.272e-09	3.878e-09	-8.369	-8.411	-0.042	(0)
Cu+2	2.496e-09	1.699e-09	-8.603	-8.770	-0.167	(0)
Cu (OH) 2	5.588e-10	5.588e-10	-9.253	-9.253	0.000	(0)
CuHCO3+	4.367e-10	3.918e-10	-9.360	-9.407	-0.047	(0)
CuSO4	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)
CuF+	8.803e-12	7.898e-12	-11.055	-11.102	-0.047	(0)
CuCl+	2.231e-12	2.025e-12	-11.651	-11.693	-0.042	(0)
Cu (OH) 3-	9.223e-13	8.275e-13	-12.035	-12.082	-0.047	(0)
Cu2 (OH) 2+2	5.830e-13	3.778e-13	-12.234	-12.423	-0.188	(0)
CuCl2	5.284e-16	5.284e-16	-15.277	-15.277	0.000	(0)
Cu (OH) 4-2	7.256e-18	4.703e-18	-17.139	-17.328	-0.188	(0)
CuCl3-	4.087e-21	3.710e-21	-20.389	-20.431	-0.042	(0)
CuCl4-2	2.039e-26	1.399e-26	-25.691	-25.854	-0.164	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.212	-199.259	-0.047	(0)
F	8.504e-05					
F-	8.114e-05	7.370e-05	-4.091	-4.133	-0.042	(0)
MgF+	2.992e-06	2.719e-06	-5.524	-5.566	-0.041	(0)
CaF+	7.870e-07	7.163e-07	-6.104	-6.145	-0.041	(0)
NaF	9.913e-08	9.913e-08	-7.004	-7.004	0.000	(0)
MnF+	1.476e-08	1.344e-08	-7.831	-7.872	-0.041	(0)
HF	1.520e-09	1.520e-09	-8.818	-8.818	0.000	(0)
BF (OH) 3-	2.343e-10	2.119e-10	-9.630	-9.674	-0.044	(0)
ZnF+	1.932e-10	1.734e-10	-9.714	-9.761	-0.047	(0)
NiF+	1.018e-10	9.132e-11	-9.992	-10.039	-0.047	(0)
CoF+	9.505e-11	8.529e-11	-10.022	-10.069	-0.047	(0)
AlF2+	2.897e-11	2.639e-11	-10.538	-10.579	-0.040	(0)
AlF3	2.448e-11	2.448e-11	-10.611	-10.611	0.000	(0)
CuF+	8.803e-12	7.898e-12	-11.055	-11.102	-0.047	(0)

CdF+	2.801e-12	2.514e-12	-11.553	-11.600	-0.047	(0)
AgF	1.923e-12	1.923e-12	-11.716	-11.716	0.000	(0)
AlF+2	1.306e-12	8.995e-13	-11.884	-12.046	-0.162	(0)
AlF4-	9.949e-13	9.043e-13	-12.002	-12.044	-0.041	(0)
PbF+	9.171e-13	8.229e-13	-12.038	-12.085	-0.047	(0)
CrF+2	6.769e-13	4.388e-13	-12.169	-12.358	-0.188	(0)
HF2-	4.697e-13	4.259e-13	-12.328	-12.371	-0.043	(0)
BF2 (OH) 2-	2.575e-14	2.328e-14	-13.589	-13.633	-0.044	(0)
FeF2+	1.065e-14	9.693e-15	-13.973	-14.014	-0.041	(0)
FeF+2	7.162e-15	4.915e-15	-14.145	-14.308	-0.164	(0)
UO2F+	1.422e-15	1.276e-15	-14.847	-14.894	-0.047	(0)
PbF2	1.193e-15	1.193e-15	-14.923	-14.923	0.000	(0)
FeF3	1.008e-15	1.008e-15	-14.997	-14.997	0.000	(0)
CdF2	3.696e-16	3.696e-16	-15.432	-15.432	0.000	(0)
UO2F2	2.711e-16	2.711e-16	-15.567	-15.567	0.000	(0)
H2F2	6.189e-18	6.189e-18	-17.208	-17.208	0.000	(0)
VO2F	5.933e-18	5.933e-18	-17.227	-17.227	0.000	(0)
UO2F3-	5.593e-18	5.019e-18	-17.252	-17.299	-0.047	(0)
PbF3-	1.859e-19	1.668e-19	-18.731	-18.778	-0.047	(0)
VO2F2-	1.769e-19	1.587e-19	-18.752	-18.799	-0.047	(0)
VOF+	3.851e-20	3.456e-20	-19.414	-19.461	-0.047	(0)
BF3OH-	1.029e-20	9.308e-21	-19.987	-20.031	-0.044	(0)
UO2F4-2	4.533e-21	2.938e-21	-20.344	-20.532	-0.188	(0)
VOF2	9.549e-22	9.549e-22	-21.020	-21.020	0.000	(0)
VO2F3-2	2.252e-22	1.459e-22	-21.648	-21.836	-0.188	(0)
PbF4-2	9.078e-24	5.884e-24	-23.042	-23.230	-0.188	(0)
VOF3-	2.783e-24	2.497e-24	-23.555	-23.603	-0.047	(0)
Sb (OH) 2F	5.276e-25	5.276e-25	-24.278	-24.278	0.000	(0)
SbOF	5.189e-25	5.189e-25	-24.285	-24.285	0.000	(0)
BF4-	5.206e-26	4.707e-26	-25.283	-25.327	-0.044	(0)
VO2F4-3	1.404e-26	5.292e-27	-25.853	-26.276	-0.424	(0)
VOF4-2	1.146e-27	7.428e-28	-26.941	-27.129	-0.188	(0)
HgF+	3.282e-28	2.945e-28	-27.484	-27.531	-0.047	(0)
UF3+	1.660e-37	1.490e-37	-36.780	-36.827	-0.047	(0)
UF2+2	1.968e-38	1.275e-38	-37.706	-37.894	-0.188	(0)
UF4	1.204e-39	1.204e-39	-38.919	-38.919	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.438	-40.862	-0.424	(0)
UF5-	0.000e+00	0.000e+00	-41.407	-41.454	-0.047	(0)
UF6-2	0.000e+00	0.000e+00	-42.918	-43.107	-0.188	(0)
Fe (2)	1.234e-07					
Fe+2	1.106e-07	7.170e-08	-6.956	-7.144	-0.188	(0)
FeSO4	6.932e-09	6.932e-09	-8.159	-8.159	0.000	(0)
FeHCO3+	3.617e-09	3.300e-09	-8.442	-8.481	-0.040	(0)
FeOH+	2.265e-09	2.061e-09	-8.645	-8.686	-0.041	(0)
Fe (OH) 2	1.182e-12	1.182e-12	-11.927	-11.927	0.000	(0)
Fe (OH) 3-	2.966e-13	2.699e-13	-12.528	-12.569	-0.041	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-142.453	-142.453	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-212.498	-212.546	-0.047	(0)
Fe (3)	1.538e-05					
Fe (OH) 2+	8.743e-06	7.965e-06	-5.058	-5.099	-0.040	(0)
Fe (OH) 3	6.177e-06	6.177e-06	-5.209	-5.209	0.000	(0)
Fe (OH) 4-	4.558e-07	4.153e-07	-6.341	-6.382	-0.040	(0)
FeOH+2	4.132e-11	2.835e-11	-10.384	-10.547	-0.164	(0)
FeF2+	1.065e-14	9.693e-15	-13.973	-14.014	-0.041	(0)
FeF+2	7.162e-15	4.915e-15	-14.145	-14.308	-0.164	(0)
FeF3	1.008e-15	1.008e-15	-14.997	-14.997	0.000	(0)
FeSO4+	2.953e-16	2.688e-16	-15.530	-15.571	-0.041	(0)
Fe+3	1.446e-16	6.082e-17	-15.840	-16.216	-0.376	(0)
Fe (SO4) 2-	2.522e-18	2.263e-18	-17.598	-17.645	-0.047	(0)
FeCl+2	2.014e-18	1.382e-18	-17.696	-17.860	-0.164	(0)
Fe2 (OH) 2+4	1.508e-19	2.662e-20	-18.821	-19.575	-0.753	(0)
FeCl2+	5.103e-21	4.644e-21	-20.292	-20.333	-0.041	(0)
FeHSeO3+2	4.307e-22	2.792e-22	-21.366	-21.554	-0.188	(0)
Fe3 (OH) 4+5	4.607e-23	3.065e-24	-22.337	-23.514	-1.177	(0)
FeCl3	3.494e-25	3.494e-25	-24.457	-24.457	0.000	(0)
H (0)	3.295e-27					
H2	1.647e-27	1.651e-27	-26.783	-26.782	0.001	(0)
Hg (0)	1.193e-11					

Hg	1.193e-11	1.193e-11	-10.923	-10.923	0.000	(0)
Hg (1)	2.695e-27					
Hg2+2	1.347e-27	8.733e-28	-26.871	-27.059	-0.188	(0)
Hg (2)	4.652e-16					
Hg (OH) 2	3.539e-16	3.546e-16	-15.451	-15.450	0.001	(0)
HgClOH	1.034e-16	1.034e-16	-15.985	-15.985	0.000	(0)
HgCl2	6.102e-18	6.102e-18	-17.215	-17.215	0.000	(0)
HgCO3	1.586e-18	1.586e-18	-17.800	-17.800	0.000	(0)
Hg (CO3) 2-2	9.510e-20	6.164e-20	-19.022	-19.210	-0.188	(0)
HgCl3-	5.116e-20	4.591e-20	-19.291	-19.338	-0.047	(0)
HgOH+	3.453e-21	3.099e-21	-20.462	-20.509	-0.047	(0)
HgCl+	1.804e-21	1.618e-21	-20.744	-20.791	-0.047	(0)
HgHCO3+	4.589e-22	4.117e-22	-21.338	-21.385	-0.047	(0)
HgCl4-2	2.121e-22	1.375e-22	-21.673	-21.862	-0.188	(0)
Hg (OH) 3-	3.592e-23	3.223e-23	-22.445	-22.492	-0.047	(0)
Hg+2	1.663e-25	1.078e-25	-24.779	-24.967	-0.188	(0)
HgSO4	1.112e-26	1.112e-26	-25.954	-25.954	0.000	(0)
HgF+	3.282e-28	2.945e-28	-27.484	-27.531	-0.047	(0)
HgHS2-	0.000e+00	0.000e+00	-129.395	-129.442	-0.047	(0)
HgS2-2	0.000e+00	0.000e+00	-130.107	-130.295	-0.188	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.904	-130.904	0.000	(0)
K	8.437e-05					
K+	8.413e-05	7.641e-05	-4.075	-4.117	-0.042	(0)
KSO4-	2.338e-07	2.130e-07	-6.631	-6.672	-0.040	(0)
KCrO4-	7.189e-20	6.450e-20	-19.143	-19.190	-0.047	(0)
Mg	5.269e-04					
Mg+2	4.833e-04	3.289e-04	-3.316	-3.483	-0.167	(0)
MgSO4	2.357e-05	2.357e-05	-4.628	-4.628	0.000	(0)
MgHCO3+	1.355e-05	1.230e-05	-4.868	-4.910	-0.042	(0)
MgCO3	3.363e-06	3.363e-06	-5.473	-5.473	0.000	(0)
MgF+	2.992e-06	2.719e-06	-5.524	-5.566	-0.041	(0)
MgOH+	1.035e-07	9.454e-08	-6.985	-7.024	-0.039	(0)
MgH2BO3+	3.785e-09	3.422e-09	-8.422	-8.466	-0.044	(0)
Mn (2)	7.783e-06					
Mn+2	7.066e-06	4.580e-06	-5.151	-5.339	-0.188	(0)
MnHCO3+	3.671e-07	3.341e-07	-6.435	-6.476	-0.041	(0)
MnSO4	3.208e-07	3.208e-07	-6.494	-6.494	0.000	(0)
MnF+	1.476e-08	1.344e-08	-7.831	-7.872	-0.041	(0)
MnOH+	9.127e-09	8.307e-09	-8.040	-8.081	-0.041	(0)
MnCl+	4.766e-09	4.338e-09	-8.322	-8.363	-0.041	(0)
MnCl2	4.610e-12	4.610e-12	-11.336	-11.336	0.000	(0)
MnCl3-	1.050e-15	9.553e-16	-14.979	-15.020	-0.041	(0)
MnSeO4	3.240e-17	3.240e-17	-16.489	-16.489	0.000	(0)
Mn (OH) 3-	2.941e-17	2.676e-17	-16.532	-16.572	-0.041	(0)
Mn (OH) 4-2	9.092e-23	6.239e-23	-22.041	-22.205	-0.164	(0)
MnSe	2.161e-38	2.161e-38	-37.665	-37.665	0.000	(0)
Mn (3)	4.442e-27					
Mn+3	4.442e-27	1.868e-27	-26.352	-26.729	-0.376	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-44.911	-45.074	-0.164	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.443	-50.486	-0.043	(0)
Mo	1.003e-07					
MoO4-2	1.003e-07	6.823e-08	-6.999	-7.166	-0.167	(0)
HMoO4-	2.110e-11	1.893e-11	-10.676	-10.723	-0.047	(0)
H2MoO4	1.933e-15	1.933e-15	-14.714	-14.714	0.000	(0)
Ag2MoO4	2.787e-24	2.787e-24	-23.555	-23.555	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-49.627	-50.051	-0.424	(0)
Mo7O24-6	0.000e+00	0.000e+00	-58.322	-60.017	-1.695	(0)
HMo7O24-5	0.000e+00	0.000e+00	-60.309	-61.486	-1.177	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-63.806	-64.559	-0.753	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-68.745	-69.169	-0.424	(0)
Na	2.357e-03					
Na+	2.347e-03	2.132e-03	-2.629	-2.671	-0.042	(0)
NaSO4-	4.949e-06	4.509e-06	-5.305	-5.346	-0.040	(0)
NaHCO3	4.383e-06	4.383e-06	-5.358	-5.358	0.000	(0)
NaCO3-	5.356e-07	4.880e-07	-6.271	-6.312	-0.040	(0)
NaF	9.913e-08	9.913e-08	-7.004	-7.004	0.000	(0)

	NaH2BO3	1.014e-09	1.014e-09	-8.994	-8.994	0.000	(0)
	NaCrO4-	2.682e-18	2.407e-18	-17.571	-17.619	-0.047	(0)
Ni		1.245e-07					
	Ni+2	7.250e-08	4.933e-08	-7.140	-7.307	-0.167	(0)
	NiHCO3+	2.478e-08	2.223e-08	-7.606	-7.653	-0.047	(0)
	NiCO3	2.262e-08	2.262e-08	-7.645	-7.645	0.000	(0)
	NiSO4	3.877e-09	3.877e-09	-8.412	-8.412	0.000	(0)
	NiOH+	4.998e-10	4.484e-10	-9.301	-9.348	-0.047	(0)
	NiCl+	1.058e-10	9.496e-11	-9.975	-10.022	-0.047	(0)
	NiF+	1.018e-10	9.132e-11	-9.992	-10.039	-0.047	(0)
	Ni (OH) 2	2.572e-11	2.572e-11	-10.590	-10.590	0.000	(0)
	Ni (SO4) 2-2	7.800e-14	5.055e-14	-13.108	-13.296	-0.188	(0)
	Ni (OH) 3-	2.070e-14	1.857e-14	-13.684	-13.731	-0.047	(0)
	NiCl2	3.597e-16	3.597e-16	-15.444	-15.444	0.000	(0)
	NiSeO4	6.065e-19	6.065e-19	-18.217	-18.217	0.000	(0)
O (0)		3.712e-39					
	O2	1.856e-39	1.860e-39	-38.731	-38.731	0.001	(0)
Pb		7.251e-09					
	PbCO3	5.855e-09	5.855e-09	-8.232	-8.232	0.000	(0)
	PbHCO3+	4.797e-10	4.304e-10	-9.319	-9.366	-0.047	(0)
	PbOH+	3.203e-10	2.874e-10	-9.494	-9.542	-0.047	(0)
	Pb (CO3) 2-2	3.202e-10	2.076e-10	-9.495	-9.683	-0.188	(0)
	Pb+2	2.329e-10	1.584e-10	-9.633	-9.800	-0.167	(0)
	PbSO4	3.056e-11	3.056e-11	-10.515	-10.515	0.000	(0)
	Pb (OH) 2	6.562e-12	6.562e-12	-11.183	-11.183	0.000	(0)
	PbCl+	4.714e-12	4.230e-12	-11.327	-11.374	-0.047	(0)
	PbF+	9.171e-13	8.229e-13	-12.038	-12.085	-0.047	(0)
	Pb (SO4) 2-2	1.119e-13	7.253e-14	-12.951	-13.139	-0.188	(0)
	PbCl2	1.421e-14	1.421e-14	-13.847	-13.847	0.000	(0)
	Pb (OH) 3-	5.281e-15	4.738e-15	-14.277	-14.324	-0.047	(0)
	PbF2	1.193e-15	1.193e-15	-14.923	-14.923	0.000	(0)
	PbCl3-	4.745e-18	4.258e-18	-17.324	-17.371	-0.047	(0)
	Pb2OH+3	1.915e-18	7.217e-19	-17.718	-18.142	-0.424	(0)
	Pb (OH) 4-2	1.293e-18	8.378e-19	-17.889	-18.077	-0.188	(0)
	PbF3-	1.859e-19	1.668e-19	-18.731	-18.778	-0.047	(0)
	PbCl4-2	2.259e-21	1.464e-21	-20.646	-20.834	-0.188	(0)
	Pb3 (OH) 4+2	2.100e-22	1.361e-22	-21.678	-21.866	-0.188	(0)
	PbF4-2	9.078e-24	5.884e-24	-23.042	-23.230	-0.188	(0)
	Pb4 (OH) 4+4	9.708e-28	1.713e-28	-27.013	-27.766	-0.753	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-138.789	-138.789	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-209.571	-209.618	-0.047	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-66.298	-66.298	0.000	(0)
	HS-	0.000e+00	0.000e+00	-72.082	-72.129	-0.047	(0)
	CdHS+	0.000e+00	0.000e+00	-72.741	-72.789	-0.047	(0)
	H2S	0.000e+00	0.000e+00	-72.965	-72.965	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-73.450	-73.639	-0.188	(0)
	S6-2	0.000e+00	0.000e+00	-73.966	-74.155	-0.188	(0)
	S4-2	0.000e+00	0.000e+00	-74.046	-74.235	-0.188	(0)
	S3-2	0.000e+00	0.000e+00	-74.852	-75.040	-0.188	(0)
	S2-2	0.000e+00	0.000e+00	-75.868	-76.057	-0.188	(0)
	S-2	0.000e+00	0.000e+00	-81.410	-81.574	-0.164	(0)
	HgHS2-	0.000e+00	0.000e+00	-129.395	-129.442	-0.047	(0)
	HgS2-2	0.000e+00	0.000e+00	-130.107	-130.295	-0.188	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-130.904	-130.904	0.000	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-133.826	-133.956	-0.129	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-134.281	-134.328	-0.047	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-134.948	-135.198	-0.250	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-135.286	-135.540	-0.254	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-135.606	-135.851	-0.245	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-135.687	-135.928	-0.241	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-136.474	-136.522	-0.047	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-137.714	-137.714	0.000	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-138.367	-138.367	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-138.789	-138.789	0.000	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-142.453	-142.453	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-199.212	-199.259	-0.047	(0)
	Zn (HS) 3-	0.000e+00	0.000e+00	-207.170	-207.217	-0.047	(0)

Cd (HS) 3-	0.000e+00	0.000e+00	-207.896	-207.943	-0.047	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-209.153	-209.341	-0.188	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-209.571	-209.618	-0.047	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-212.498	-212.546	-0.047	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-277.688	-277.877	-0.188	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-280.618	-280.806	-0.188	(0)
Sb2S4-2	0.000e+00	0.000e+00	-291.618	-291.806	-0.188	(0)
S (6)	6.882e-04					
SO4-2	5.788e-04	3.938e-04	-3.237	-3.405	-0.167	(0)
CaSO4	8.034e-05	8.034e-05	-4.095	-4.095	0.000	(0)
MgSO4	2.357e-05	2.357e-05	-4.628	-4.628	0.000	(0)
NaSO4-	4.949e-06	4.509e-06	-5.305	-5.346	-0.040	(0)
MnSO4	3.208e-07	3.208e-07	-6.494	-6.494	0.000	(0)
KSO4-	2.338e-07	2.130e-07	-6.631	-6.672	-0.040	(0)
ZnSO4	1.016e-08	1.016e-08	-7.993	-7.993	0.000	(0)
FeSO4	6.932e-09	6.932e-09	-8.159	-8.159	0.000	(0)
NiSO4	3.877e-09	3.877e-09	-8.412	-8.412	0.000	(0)
CoSO4	2.876e-09	2.876e-09	-8.541	-8.541	0.000	(0)
HSO4-	5.903e-10	5.366e-10	-9.229	-9.270	-0.041	(0)
CdSO4	1.987e-10	1.987e-10	-9.702	-9.702	0.000	(0)
CuSO4	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)
AgSO4-	9.097e-11	8.162e-11	-10.041	-10.088	-0.047	(0)
CrOHSO4	5.546e-11	5.546e-11	-10.256	-10.256	0.000	(0)
Zn (SO4) 2-2	5.376e-11	3.484e-11	-10.270	-10.458	-0.188	(0)
PbSO4	3.056e-11	3.056e-11	-10.515	-10.515	0.000	(0)
Cd (SO4) 2-2	1.628e-12	1.056e-12	-11.788	-11.977	-0.188	(0)
Pb (SO4) 2-2	1.119e-13	7.253e-14	-12.951	-13.139	-0.188	(0)
Ni (SO4) 2-2	7.800e-14	5.055e-14	-13.108	-13.296	-0.188	(0)
CrSO4+	3.850e-14	3.455e-14	-13.415	-13.462	-0.047	(0)
AlSO4+	4.105e-15	3.731e-15	-14.387	-14.428	-0.041	(0)
FeSO4+	2.953e-16	2.688e-16	-15.530	-15.571	-0.041	(0)
UO2SO4	7.474e-17	7.474e-17	-16.126	-16.126	0.000	(0)
Al (SO4) 2-	1.732e-17	1.575e-17	-16.761	-16.803	-0.041	(0)
Cr2 (OH) 2SO4+2	4.589e-18	2.974e-18	-17.338	-17.527	-0.188	(0)
Fe (SO4) 2-	2.522e-18	2.263e-18	-17.598	-17.645	-0.047	(0)
UO2 (SO4) 2-2	5.987e-19	3.880e-19	-18.223	-18.411	-0.188	(0)
VO2SO4-	4.811e-19	4.316e-19	-18.318	-18.365	-0.047	(0)
Cr2 (OH) 2 (SO4) 2	6.959e-20	6.959e-20	-19.157	-19.157	0.000	(0)
VOSO4	8.480e-21	8.480e-21	-20.072	-20.072	0.000	(0)
CrO3SO4-2	2.646e-26	1.715e-26	-25.577	-25.766	-0.188	(0)
HgSO4	1.112e-26	1.112e-26	-25.954	-25.954	0.000	(0)
VSO4+	1.713e-34	1.537e-34	-33.766	-33.813	-0.047	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.339	-42.339	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.646	-42.834	-0.188	(0)
Sb (3)	6.495e-19					
Sb (OH) 3	3.286e-19	3.286e-19	-18.483	-18.483	0.000	(0)
HSbO2	3.208e-19	3.208e-19	-18.494	-18.494	0.000	(0)
SbO2-	4.153e-23	3.727e-23	-22.382	-22.429	-0.047	(0)
Sb (OH) 4-	2.379e-23	2.135e-23	-22.624	-22.671	-0.047	(0)
Sb (OH) 2F	5.276e-25	5.276e-25	-24.278	-24.278	0.000	(0)
SbOF	5.189e-25	5.189e-25	-24.285	-24.285	0.000	(0)
Sb (OH) 2+	1.240e-25	1.113e-25	-24.906	-24.954	-0.047	(0)
SbO+	4.277e-26	3.837e-26	-25.369	-25.416	-0.047	(0)
Sb2S4-2	0.000e+00	0.000e+00	-291.618	-291.806	-0.188	(0)
Sb (5)	4.722e-09					
SbO3-	4.717e-09	4.232e-09	-8.326	-8.373	-0.047	(0)
Sb (OH) 6-	5.448e-12	4.948e-12	-11.264	-11.306	-0.042	(0)
SbO2+	2.631e-25	2.360e-25	-24.580	-24.627	-0.047	(0)
Se (-2)	1.006e-08					
Ag2Se	1.006e-08	1.006e-08	-7.997	-7.997	0.000	(0)
HSe-	1.779e-35	1.596e-35	-34.750	-34.797	-0.047	(0)
MnSe	2.161e-38	2.161e-38	-37.665	-37.665	0.000	(0)
H2Se	1.727e-39	1.727e-39	-38.763	-38.763	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.753	-41.941	-0.188	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-73.766	-74.520	-0.753	(0)
Se (4)	2.701e-09					
HSeO3-	1.936e-09	1.737e-09	-8.713	-8.760	-0.047	(0)
SeO3-2	7.652e-10	4.960e-10	-9.116	-9.305	-0.188	(0)

H2SeO3	1.033e-14	1.033e-14	-13.986	-13.986	0.000	(0)
AgSeO3-	3.690e-15	3.311e-15	-14.433	-14.480	-0.047	(0)
Cd (SeO3) 2-2	6.731e-22	4.363e-22	-21.172	-21.360	-0.188	(0)
FeHSeO3+2	4.307e-22	2.792e-22	-21.366	-21.554	-0.188	(0)
Ag (SeO3) 2-3	3.901e-23	1.470e-23	-22.409	-22.833	-0.424	(0)
Se (6)	3.866e-14					
SeO4-2	3.863e-14	2.629e-14	-13.413	-13.580	-0.167	(0)
MnSeO4	3.240e-17	3.240e-17	-16.489	-16.489	0.000	(0)
NiSeO4	6.065e-19	6.065e-19	-18.217	-18.217	0.000	(0)
CoSeO4	4.821e-19	4.821e-19	-18.317	-18.317	0.000	(0)
ZnSeO4	4.800e-19	4.800e-19	-18.319	-18.319	0.000	(0)
HSeO4-	2.047e-20	1.837e-20	-19.689	-19.736	-0.047	(0)
CdSeO4	1.053e-20	1.053e-20	-19.977	-19.977	0.000	(0)
Zn (SeO4) 2-2	1.974e-32	1.279e-32	-31.705	-31.893	-0.188	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.362	-58.786	-0.424	(0)
U (4)	1.499e-20					
U (OH) 5-	1.499e-20	1.345e-20	-19.824	-19.871	-0.047	(0)
U (OH) 4	7.853e-24	7.853e-24	-23.105	-23.105	0.000	(0)
U (OH) 3+	4.462e-28	4.004e-28	-27.350	-27.398	-0.047	(0)
U (OH) 2+2	3.983e-33	2.582e-33	-32.400	-32.588	-0.188	(0)
UF3+	1.660e-37	1.490e-37	-36.780	-36.827	-0.047	(0)
UF2+2	1.968e-38	1.275e-38	-37.706	-37.894	-0.188	(0)
UOH+3	4.498e-39	1.696e-39	-38.347	-38.771	-0.424	(0)
UF4	1.204e-39	1.204e-39	-38.919	-38.919	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.438	-40.862	-0.424	(0)
UF5-	0.000e+00	0.000e+00	-41.407	-41.454	-0.047	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.339	-42.339	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.646	-42.834	-0.188	(0)
UF6-2	0.000e+00	0.000e+00	-42.918	-43.107	-0.188	(0)
U+4	0.000e+00	0.000e+00	-45.276	-46.029	-0.753	(0)
UCl+3	0.000e+00	0.000e+00	-47.029	-47.453	-0.424	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-171.683	-175.497	-3.814	(0)
U (5)	9.328e-18					
UO2+	9.328e-18	8.370e-18	-17.030	-17.077	-0.047	(0)
U (6)	7.581e-09					
UO2 (CO3) 3-4	5.253e-09	9.271e-10	-8.280	-9.033	-0.753	(0)
UO2 (CO3) 2-2	2.322e-09	1.505e-09	-8.634	-8.822	-0.188	(0)
UO2CO3	6.136e-12	6.136e-12	-11.212	-11.212	0.000	(0)
UO2OH+	1.270e-14	1.140e-14	-13.896	-13.943	-0.047	(0)
UO2F+	1.422e-15	1.276e-15	-14.847	-14.894	-0.047	(0)
UO2F2	2.711e-16	2.711e-16	-15.567	-15.567	0.000	(0)
UO2+2	1.843e-16	1.254e-16	-15.735	-15.902	-0.167	(0)
UO2SO4	7.474e-17	7.474e-17	-16.126	-16.126	0.000	(0)
UO2F3-	5.593e-18	5.019e-18	-17.252	-17.299	-0.047	(0)
UO2 (SO4) 2-2	5.987e-19	3.880e-19	-18.223	-18.411	-0.188	(0)
UO2Cl+	1.705e-19	1.530e-19	-18.768	-18.815	-0.047	(0)
UO2F4-2	4.533e-21	2.938e-21	-20.344	-20.532	-0.188	(0)
(UO2) 2 (OH) 2+2	3.326e-22	2.156e-22	-21.478	-21.666	-0.188	(0)
(UO2) 3 (OH) 5+	1.083e-24	9.718e-25	-23.965	-24.012	-0.047	(0)
V (2)	1.155e-40					
VOH+	1.155e-40	1.036e-40	-39.938	-39.985	-0.047	(0)
V+2	0.000e+00	0.000e+00	-41.165	-41.353	-0.188	(0)
V (3)	2.510e-13					
V (OH) 3	2.510e-13	2.510e-13	-12.600	-12.600	0.000	(0)
V (OH) 2+	2.521e-24	2.262e-24	-23.598	-23.646	-0.047	(0)
VOH+2	4.616e-28	2.992e-28	-27.336	-27.524	-0.188	(0)
V+3	2.193e-33	8.267e-34	-32.659	-33.083	-0.424	(0)
VSO4+	1.713e-34	1.537e-34	-33.766	-33.813	-0.047	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-52.294	-52.718	-0.424	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.495	-54.248	-0.753	(0)
V (4)	1.272e-17					
V (OH) 3+	1.255e-17	1.126e-17	-16.901	-16.948	-0.047	(0)
VO+2	1.206e-19	7.818e-20	-18.919	-19.107	-0.188	(0)
VOF+	3.851e-20	3.456e-20	-19.414	-19.461	-0.047	(0)
VOSO4	8.480e-21	8.480e-21	-20.072	-20.072	0.000	(0)
VOF2	9.549e-22	9.549e-22	-21.020	-21.020	0.000	(0)
VOC1+	1.839e-22	1.650e-22	-21.735	-21.783	-0.047	(0)

VOF3-	2.783e-24	2.497e-24	-23.555	-23.603	-0.047	(0)
VOF4-2	1.146e-27	7.428e-28	-26.941	-27.129	-0.188	(0)
H2V2O4+2	9.809e-30	6.357e-30	-29.008	-29.197	-0.188	(0)
V (5)	1.647e-08					
H2VO4-	1.318e-08	1.183e-08	-7.880	-7.927	-0.047	(0)
HVO4-2	3.288e-09	2.131e-09	-8.483	-8.671	-0.188	(0)
H3VO4	1.649e-12	1.649e-12	-11.783	-11.783	0.000	(0)
H3V2O7-	1.404e-13	1.260e-13	-12.853	-12.900	-0.047	(0)
HV2O7-3	2.266e-14	8.543e-15	-13.645	-14.068	-0.424	(0)
VO4-3	2.032e-15	7.660e-16	-14.692	-15.116	-0.424	(0)
V2O7-4	9.344e-17	1.649e-17	-16.029	-16.783	-0.753	(0)
VO2+	5.054e-17	4.590e-17	-16.296	-16.338	-0.042	(0)
VO2F	5.933e-18	5.933e-18	-17.227	-17.227	0.000	(0)
V3O9-3	4.600e-18	1.734e-18	-17.337	-17.761	-0.424	(0)
VO2SO4-	4.811e-19	4.316e-19	-18.318	-18.365	-0.047	(0)
VO2F2-	1.769e-19	1.587e-19	-18.752	-18.799	-0.047	(0)
VO2F3-2	2.252e-22	1.459e-22	-21.648	-21.836	-0.188	(0)
V4O12-4	4.846e-23	8.552e-24	-22.315	-23.068	-0.753	(0)
VO2F4-3	1.404e-26	5.292e-27	-25.853	-26.276	-0.424	(0)
V10O28-6	0.000e+00	0.000e+00	-60.092	-61.787	-1.695	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.278	-61.455	-1.177	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.350	-64.104	-0.753	(0)
Zn	2.932e-07					
Zn+2	1.733e-07	1.179e-07	-6.761	-6.928	-0.167	(0)
ZnCO3	8.339e-08	8.339e-08	-7.079	-7.079	0.000	(0)
ZnHCO3+	1.519e-08	1.363e-08	-7.818	-7.866	-0.047	(0)
ZnSO4	1.016e-08	1.016e-08	-7.993	-7.993	0.000	(0)
ZnOH+	9.488e-09	8.513e-09	-8.023	-8.070	-0.047	(0)
Zn (OH) 2	9.742e-10	9.742e-10	-9.011	-9.011	0.000	(0)
ZnCl+	2.454e-10	2.228e-10	-9.610	-9.652	-0.042	(0)
ZnOHC1	2.106e-10	2.106e-10	-9.676	-9.676	0.000	(0)
ZnF+	1.932e-10	1.734e-10	-9.714	-9.761	-0.047	(0)
Zn (SO4) 2-2	5.376e-11	3.484e-11	-10.270	-10.458	-0.188	(0)
Zn (OH) 3-	3.929e-12	3.525e-12	-11.406	-11.453	-0.047	(0)
ZnCl2	2.657e-13	2.657e-13	-12.576	-12.576	0.000	(0)
ZnCl3-	1.749e-16	1.588e-16	-15.757	-15.799	-0.042	(0)
Zn (OH) 4-2	1.564e-16	1.013e-16	-15.806	-15.994	-0.188	(0)
ZnSeO4	4.800e-19	4.800e-19	-18.319	-18.319	0.000	(0)
ZnCl4-2	8.704e-20	5.973e-20	-19.060	-19.224	-0.164	(0)
Zn (SeO4) 2-2	1.974e-32	1.279e-32	-31.705	-31.893	-0.188	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-136.474	-136.522	-0.047	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-138.367	-138.367	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-207.170	-207.217	-0.047	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-209.153	-209.341	-0.188	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-280.618	-280.806	-0.188	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-44.02	-80.24	-36.22	Ag2S
Ag2CO3	-9.79	-20.88	-11.09	Ag2CO3
Ag2CrO4	-20.02	-31.61	-11.59	Ag2CrO4
Ag2HVO4	-10.22	-8.74	1.48	Ag2HVO4
Ag2MoO4	-11.58	-23.13	-11.55	Ag2MoO4
Ag2O	-12.83	-0.26	12.57	Ag2O
Ag2Se	5.79	-42.91	-48.70	Ag2Se
Ag2SeO3	-9.72	-16.87	-7.15	Ag2SeO3
Ag2SeO4	-20.64	-29.55	-8.91	Ag2SeO4
Ag2SO4	-14.55	-19.37	-4.82	Ag2SO4
Ag3AsO3	-21.74	-19.58	2.16	Ag3AsO3
Ag3AsO4	-12.06	-14.85	-2.79	Ag3AsO4
Ag3H2VO5	-14.05	-8.87	5.18	Ag3H2VO5
AgF:4H2O	-13.17	-12.12	1.05	AgF:4H2O
Agmetal	1.56	-11.94	-13.51	Ag
AgVO3	-9.38	-8.61	0.77	AgVO3
Al (OH) 3 (am)	-2.15	8.65	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.69	-51.32	2.37	Al2 (MoO4) 3

Al2O3	-2.35	17.31	19.65	Al2O3
Al4(OH)10SO4	-7.20	15.50	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.61	-5.81	4.80	AlAsO4:2H2O
AlOHSO4	-7.23	-10.46	-3.23	AlOHSO4
AlSb	-146.35	-80.73	65.62	AlSb
Alunite	-7.13	-8.53	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.41	-13.20	-7.79	PbSO4
Anhydrite	-2.10	-6.46	-4.36	CaSO4
Anilite	-49.65	-81.53	-31.88	Cu0.25Cu1.5S
Antlerite	-7.08	1.71	8.79	Cu3(OH)4SO4
Aragonite	0.34	-7.96	-8.30	CaCO3
Arsenolite	-74.03	-76.79	-2.76	As4O6
Artinite	-5.77	3.83	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-35.63	-28.93	6.71	As2O5
Atacamite	-4.49	2.90	7.39	Cu2(OH)3Cl
Azurite	-3.51	-20.42	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.25	9.15	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-14.55	1.33	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	7.42	-1.49	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-22.47	10.47	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.54	-22.21	-9.67	BaCrO4
BaF2	-9.01	-14.83	-5.82	BaF2
BaMoO4	-6.77	-13.73	-6.96	BaMoO4
Barite	0.01	-9.97	-9.98	BaSO4
BaS	-87.02	-70.84	16.18	BaS
BaSeO3	-9.30	-7.47	1.83	BaSeO3
BaSeO4	-12.69	-20.15	-7.46	BaSeO4
Bianchite	-8.57	-10.33	-1.76	ZnSO4:6H2O
Birnessite	-9.44	8.65	18.09	MnO2
Bixbyite	-5.68	-6.32	-0.64	Mn2O3
BlaubleiI	-50.01	-74.17	-24.16	Cu0.9Cu0.2S
BlaubleiII	-50.29	-77.57	-27.28	Cu0.6Cu0.8S
Boehmite	0.08	8.65	8.58	AlOOH
Breithauptite	-50.64	-69.16	-18.52	NiSb
Brochantite	-6.57	8.65	15.22	Cu4(OH)6SO4
Brucite	-4.62	12.23	16.84	Mg(OH)2
Bunsenite	-4.04	8.40	12.45	NiO
Ca(VO3)2	-9.96	-4.30	5.66	Ca(VO3)2
Ca2V2O7	-9.14	8.36	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.20	8.36	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.24	9.06	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.94	21.02	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.84	21.02	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-283.75	-140.78	142.97	Ca3Sb2
CaCrO4	-16.43	-18.69	-2.27	CaCrO4
Calcite	0.52	-7.96	-8.48	CaCO3
Calomel	-15.40	-33.31	-17.91	Hg2Cl2
CaMoO4	-2.27	-10.22	-7.95	CaMoO4
Carnotite	-5.16	-4.93	0.23	KUO2VO4
CaSeO3:2H2O	-6.77	-3.96	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.61	-16.63	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.08	-3.24	9.84	Cd(BO2)2
Cd(OH)2	-6.60	7.04	13.64	Cd(OH)2
Cd(OH)2(am)	-6.69	7.04	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.81	-17.10	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.54	2.02	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.34	9.06	28.40	Cd4(OH)6SO4
CdCl2	-14.26	-14.91	-0.66	CdCl2
CdCl2:1H2O	-13.22	-14.91	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.00	-14.91	-1.91	CdCl2:2.5H2O
CdF2	-15.72	-16.93	-1.21	CdF2
Cdmetal(alpha)	-30.10	-16.59	13.51	Cd
Cdmetal(gamma)	-30.21	-16.59	13.62	Cd
CdMoO4	-1.68	-15.83	-14.15	CdMoO4
CdOHCl	-7.47	-3.94	3.54	CdOHCl
CdSb	-70.17	-70.52	-0.35	CdSb
CdSe	-15.41	-35.61	-20.20	CdSe
CdSeO4:2H2O	-20.40	-22.25	-1.85	CdSeO4:2H2O

CdSO4	-11.90	-12.07	-0.17	CdSO4
CdSO4:1H2O	-10.35	-12.07	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.20	-12.07	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.36	-11.11	-9.75	AgCl
Cerrusite	-1.58	-14.71	-13.13	PbCO3
CH4 (g)	-74.11	-115.15	-41.05	CH4
Chalcanthite	-9.53	-12.17	-2.64	CuSO4:5H2O
Chalcocite	-49.43	-84.35	-34.92	Cu2S
Chalcopyrite	-109.19	-144.46	-35.27	CuFeS2
Cinnabar	-49.74	-95.44	-45.69	HgS
Claudetite	-73.73	-76.79	-3.06	As4O6
Clausthalite	-9.64	-36.74	-27.10	PbSe
Co (BO2) 2	-29.08	-2.01	27.07	Co (BO2) 2
Co (OH) 2	-4.82	8.27	13.09	Co (OH) 2
Co (OH) 3	-10.00	-12.31	-2.31	Co (OH) 3
CO2 (g)	-2.47	-20.62	-18.15	CO2
Co3 (AsO4) 2	-17.14	-4.10	13.03	Co3 (AsO4) 2
Co3O4	-5.85	-16.34	-10.50	Co3O4
CoCl2	-21.95	-13.68	8.27	CoCl2
CoCl2:6H2O	-16.22	-13.68	2.54	CoCl2:6H2O
CoCO3	-2.37	-12.35	-9.98	CoCO3
CoF2	-14.10	-15.70	-1.60	CoF2
CoF3	-46.82	-48.27	-1.46	CoF3
CoFe2O4	26.50	22.98	-3.53	CoFe2O4
CoMoO4	-6.84	-14.60	-7.76	CoMoO4
CoO	-5.31	8.27	13.59	CoO
CoS (alpha)	-64.27	-71.71	-7.44	CoS
CoS (beta)	-60.64	-71.71	-11.07	CoS
CoSe	-18.18	-34.38	-16.20	CoSe
CoSeO3	-9.66	-8.34	1.32	CoSeO3
CoSeO4:6H2O	-19.49	-21.02	-1.53	CoSeO4:6H2O
CoSO4	-13.64	-10.84	2.80	CoSO4
CoSO4:6H2O	-8.37	-10.84	-2.47	CoSO4:6H2O
Cotunnite	-11.27	-16.05	-4.78	PbCl2
Covellite	-50.74	-73.04	-22.30	CuS
Cr (OH) 2	-19.12	-8.30	10.82	Cr (OH) 2
Cr (OH) 3	-0.76	0.57	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.32	0.57	-0.75	Cr (OH) 3
Cr2O3	3.50	1.15	-2.36	Cr2O3
CrCl2	-44.35	-30.25	14.09	CrCl2
CrCl3	-47.48	-32.36	15.11	CrCl3
CrF3	-24.05	-35.39	-11.34	CrF3
Crmetal	-62.41	-31.93	30.48	Cr
CrO3	-28.14	-31.35	-3.21	CrO3
Cryolite	-13.88	-47.72	-33.84	Na3AlF6
Cu (OH) 2	-1.73	6.94	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.97	17.24	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.74	-84.62	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.22	-47.02	-45.80	Cu2Se
Cu2SO4	-21.54	-23.49	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.20	-8.10	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.34	-95.93	-42.59	Cu3Sb
Cu3Se2	-19.24	-82.73	-63.49	Cu3Se2
CuCO3	-2.18	-13.68	-11.50	CuCO3
CuCrO4	-18.97	-24.41	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-18.15	-17.04	1.12	CuF2
CuF2:2H2O	-12.49	-17.04	-4.55	CuF2:2H2O
Cumetal	-5.24	-14.00	-8.76	Cu
CuMoO4	-2.86	-15.94	-13.08	CuMoO4
CuOCuSO4	-15.54	-5.23	10.30	CuOCuSO4
Cupricferrite	15.65	21.64	5.99	CuFe2O4
Cuprite	-2.96	-4.37	-1.41	Cu2O
Cuprousferrite	14.08	5.17	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.37	-54.73	-33.37	CuSe2
CuSeO3:2H2O	-10.19	-9.67	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-19.91	-22.35	-2.44	CuSeO4:5H2O

CuSO4	-15.11	-12.17	2.94	CuSO4
Diaspore	1.78	8.65	6.87	AlOOH
Djurleite	-49.69	-83.61	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.19	-16.35	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.74	-16.35	-17.09	CaMg (CO3) 2
Epsomite	-4.76	-6.89	-2.13	MgSO4:7H2O
Fe (OH) 2	-5.00	8.57	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	7.10	4.06	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-4.68	-8.40	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-3.47	-1.91	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-14.52	-35.15	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-38.91	-42.65	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	3.05	23.27	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-7.51	-7.11	0.40	FeAsO4:2H2O
FeCr2O4	2.51	9.71	7.20	FeCr2O4
FeMoO4	-4.22	-14.31	-10.09	FeMoO4
Ferrihydrite	4.16	7.35	3.19	Fe (OH) 3
Ferroselite	-34.51	-53.11	-18.60	FeSe2
FeS (ppt)	-68.47	-71.42	-2.95	FeS
FeSe	-23.09	-34.09	-11.00	FeSe
Fluorite	-0.82	-11.32	-10.50	CaF2
Galena	-60.10	-74.07	-13.97	PbS
Gibbsite	0.36	8.65	8.29	Al (OH) 3
Goethite	6.86	7.35	0.49	FeOOH
Goslarite	-8.32	-10.33	-2.01	ZnSO4:7H2O
Greenockite	-58.58	-72.94	-14.36	CdS
Greigite	-251.64	-296.67	-45.03	Fe3S4
Gummite	-7.86	-0.19	7.67	UO3
Gypsum	-1.85	-6.46	-4.61	CaSO4:2H2O
H-Jarosite	-4.08	-16.18	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.00	-22.88	-12.88	H2MoO4
H2S (g)	-71.98	-79.99	-8.01	H2S
H2Se (g)	-37.69	-42.65	-4.96	H2Se
Halite	-7.40	-5.79	1.60	NaCl
Hausmannite	-6.28	54.75	61.03	Mn3O4
Hematite	16.12	14.70	-1.42	Fe2O3
Hercynite	2.98	25.87	22.89	FeAl2O4
Hg (CH3) 2 (g)	-172.05	-245.75	-73.71	Hg (CH3) 2
Hg (g)	-9.62	-17.49	-7.87	Hg
Hg (OH) 2	-11.95	-15.45	-3.50	Hg (OH) 2
Hg2 (g)	-20.02	-34.98	-14.96	Hg2
Hg2 (OH) 2	-16.61	-11.35	5.26	Hg2 (OH) 2
Hg2CO3	-15.92	-31.97	-16.05	Hg2CO3
Hg2CrO4	-34.00	-42.70	-8.70	Hg2CrO4
Hg2F2	-24.96	-35.32	-10.36	Hg2F2
Hg2S	-79.66	-91.33	-11.68	Hg2S
Hg2SeO3	-23.31	-27.96	-4.66	Hg2SeO3
Hg2SO4	-24.33	-30.46	-6.13	Hg2SO4
Hg3O2CO3	-37.29	-66.97	-29.68	Hg3O2CO3
HgCl (g)	-36.15	-16.65	19.50	HgCl
HgCl2	-16.15	-37.41	-21.26	HgCl2
HgF (g)	-50.34	-17.66	32.68	HgF
HgF2 (g)	-51.99	-39.43	12.57	HgF2
Hgmetal (l)	-4.04	-17.49	-13.45	Hg
HgSe	-2.41	-58.10	-55.69	HgSe
HgSeO3	-19.64	-32.07	-12.43	HgSeO3
HgSO4	-25.15	-34.57	-9.42	HgSO4
Huntite	-3.17	-33.14	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.74	-23.51	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.58	-21.35	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-20.67	-25.84	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	2.36	-12.44	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-37.99	-55.23	-17.24	K2Cr2O7
K2CrO4	-23.36	-23.88	-0.51	K2CrO4
K2MoO4	-18.66	-15.40	3.26	K2MoO4
K2SeO4	-21.08	-21.81	-0.73	K2SeO4
Langite	-8.84	8.65	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.86	-7.29	-0.43	PbO:PbSO4

Laurionite	-5.69	-5.07	0.62	PbOHCl
Lepidocrocite	5.98	7.35	1.37	FeOOH
Lime	-20.04	12.66	32.70	CaO
Litharge	-6.78	5.91	12.69	PbO
Mackinawite	-67.82	-71.42	-3.60	FeS
Maghemite	8.32	14.70	6.39	Fe ₂ O ₃
Magnesioferrite	10.07	26.93	16.86	Fe ₂ MgO ₄
Magnetite	-0.93	-8.39	-7.46	MgCO ₃
Malachite	19.87	23.27	3.40	Fe ₃ O ₄
Manganite	-1.43	-6.74	-5.31	Cu ₂ (OH) ₂ CO ₃
Massicot	-3.15	22.19	25.34	MnOOH
Matlockite	-6.98	5.91	12.89	PbO
Melanothallite	-8.08	-17.06	-8.97	PbClF
Melanterite	-21.27	-15.02	6.26	CuCl ₂
Metacinnabar	-8.34	-10.55	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-50.34	-95.44	-45.09	HgS
Mg(VO ₃) ₂	-6.57	12.23	18.79	Mg(OH) ₂
Mg ₂ Sb ₃	-16.02	-4.74	11.28	Mg(VO ₃) ₂
Mg ₂ V ₂ O ₇	-259.29	-184.60	74.68	Mg ₂ Sb ₃
MgCr ₂ O ₄	-18.87	7.49	26.36	Mg ₂ V ₂ O ₇
MgCrO ₄	-2.83	13.37	16.20	MgCr ₂ O ₄
MgF ₂	-24.51	-19.13	5.38	MgCrO ₄
MgMoO ₄	-3.62	-11.75	-8.13	MgF ₂
MgSeO ₃ ·6H ₂ O	-8.80	-10.65	-1.85	MgMoO ₄
MgSeO ₄ ·6H ₂ O	-7.44	-4.39	3.06	MgSeO ₃ ·6H ₂ O
Minium	-15.86	-17.06	-1.20	MgSeO ₄ ·6H ₂ O
Mirabilite	-32.16	41.37	73.52	Pb ₃ O ₄
Mn(VO ₃) ₂	-7.63	-8.75	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn ₂ (SO ₄) ₃	-11.49	-6.59	4.90	Mn(VO ₃) ₂
Mn ₂ Sb	-57.96	-63.67	-5.71	Mn ₂ (SO ₄) ₃
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-141.53	-80.45	61.08	Mn ₂ Sb
MnCl ₂ ·4H ₂ O	-10.31	2.19	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnS(grn)	-14.30	-11.59	2.72	MnCl ₂ ·4H ₂ O
MnS(pnk)	-69.78	-69.61	0.17	MnS
MnSb	-72.95	-69.61	3.34	MnS
MnSe	-89.63	-92.54	-2.91	MnSb
MnSeO ₃	-35.78	-32.28	3.50	MnSe
MnSeO ₃ ·2H ₂ O	-7.37	-6.24	1.13	MnSeO ₃
MnSeO ₄ ·5H ₂ O	-7.23	-6.24	0.98	MnSeO ₃ ·2H ₂ O
MnSO ₄	-16.87	-18.92	-2.05	MnSeO ₄ ·5H ₂ O
Monteponite	-11.33	-8.74	2.58	MnSO ₄
Montroydite	-8.06	7.04	15.10	CdO
MoO ₃	-11.81	-15.45	-3.64	HgO
Morenosite	-14.88	-22.88	-8.00	MoO ₃
MoS ₂	-8.57	-10.71	-2.14	NiSO ₄ ·7H ₂ O
Na-Jarosite	-136.22	-206.48	-70.26	MoS ₂
Na ₂ Cr ₂ O ₇	0.20	-11.00	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ CrO ₄	-42.45	-52.34	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ Mo ₂ O ₇	-23.92	-20.99	2.93	Na ₂ CrO ₄
Na ₂ MoO ₄	-18.79	-35.39	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄ ·2H ₂ O	-14.00	-12.51	1.49	Na ₂ MoO ₄
Na ₂ SeO ₃ ·5H ₂ O	-13.73	-12.51	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₄	-16.55	-6.25	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₃ Sb	-20.20	-18.92	1.28	Na ₂ SeO ₄
Na ₃ VO ₄	-168.28	-73.83	94.45	Na ₃ Sb
Na ₄ V ₂ O ₇	-29.61	7.07	36.68	Na ₃ VO ₄
Nantokite	-33.63	3.77	37.40	Na ₄ V ₂ O ₇
NaSb	-6.43	-13.16	-6.73	CuCl
Natron	-83.73	-60.56	23.17	NaSb
NaVO ₃	-8.94	-10.25	-1.31	Na ₂ CO ₃ ·10H ₂ O
Nesquehonite	-7.16	-3.30	3.86	NaVO ₃
Ni(OH) ₂	-3.72	-8.39	-4.67	MgCO ₃ ·3H ₂ O
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-4.39	8.40	12.79	Ni(OH) ₂
Ni ₄ (OH) ₆ SO ₄	-19.41	-3.71	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
NiCO ₃	-17.50	14.50	32.00	Ni ₄ (OH) ₆ SO ₄
NiMoO ₄	-5.35	-12.22	-6.87	NiCO ₃
NiS(alpha)	-3.33	-14.47	-11.14	NiMoO ₄
	-65.98	-71.58	-5.60	NiS

NiS (beta)	-60.48	-71.58	-11.10	NiS
NiS (gamma)	-58.78	-71.58	-12.80	NiS
NiSe	-16.55	-34.25	-17.70	NiSe
NiSeO3:2H2O	-11.03	-8.21	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.37	-20.89	-1.52	NiSeO4:6H2O
Nsutite	-8.85	8.65	17.50	MnO2
O2 (g)	-35.82	47.26	83.09	O2
Orpiment	-217.28	-278.35	-61.07	As2S3
Otavite	-1.58	-13.58	-12.00	CdCO3
Pb (BO2) 2	-10.89	-4.37	6.52	Pb (BO2) 2
Pb (OH) 2	-2.24	5.91	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-55.86	-64.62	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-7.95	0.84	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.37	11.82	26.19	Pb2O (OH) 2
Pb2O3	-25.59	35.45	61.04	Pb2O3
Pb2OCO3	-8.24	-8.80	-0.56	Pb2OCO3
Pb2V2O7	-3.24	-5.14	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-16.99	-11.19	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.37	0.77	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.91	-2.89	11.02	Pb3O2CO3
Pb3O2SO4	-12.07	-1.38	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.57	4.53	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.35	4.53	21.88	Pb4O3SO4
PbCrO4	-12.84	-25.44	-12.60	PbCrO4
PbF2	-10.63	-18.07	-7.44	PbF2
Pbmetal	-21.97	-17.72	4.25	Pb
PbMoO4	-1.35	-16.97	-15.62	PbMoO4
PbO:0.3H2O	-7.07	5.91	12.98	PbO:0.33H2O
PbSeO4	-16.54	-23.38	-6.84	PbSeO4
Periclase	-9.36	12.23	21.58	MgO
Phosgenite	-10.95	-30.76	-19.81	PbCl2:PbCO3
Plattnerite	-20.06	29.54	49.60	PbO2
Portlandite	-10.14	12.66	22.80	Ca (OH) 2
Pyrite	-109.26	-127.77	-18.51	FeS2
Pyrochroite	-4.82	10.37	15.19	Mn (OH) 2
Pyrolusite	-7.38	34.00	41.38	MnO2
Realgar	-91.25	-111.00	-19.75	AsS
Retgersite	-8.67	-10.71	-2.04	NiSO4:6H2O
Rhodochrosite	0.33	-10.25	-10.58	MnCO3
Rutherfordine	-6.31	-20.81	-14.50	UO2CO3
Sb (OH) 3	-11.37	-18.48	-7.11	Sb (OH) 3
Sb2O4	-16.74	-13.33	3.40	Sb2O4
Sb2O5	-28.65	-38.32	-9.67	Sb2O5
Sb2Se3	-97.17	-164.92	-67.76	Sb2Se3
Sb4O6 (cubic)	-55.67	-73.93	-18.26	Sb4O6
Sb4O6 (orth)	-56.03	-73.93	-17.90	Sb4O6
SbCl3	-51.99	-51.42	0.57	SbCl3
SbF3	-44.22	-54.45	-10.23	SbF3
Sbmetal	-42.24	-53.93	-11.69	Sb
SbO2	-3.15	-30.98	-27.82	SbO2
Schoepite	-6.18	-0.19	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.91	-19.02	-7.11	Se
Semetal (hex)	-11.31	-19.02	-7.71	Se
Senarmontite	-24.60	-36.97	-12.37	Sb2O3
SeO2	-16.74	-16.62	0.12	SeO2
SeO3	-50.34	-29.29	21.04	SeO3
Siderite	-1.81	-12.05	-10.24	FeCO3
Smithsonite	-1.84	-11.84	-10.00	ZnCO3
Sphalerite	-59.75	-71.20	-11.45	ZnS
Spinel	-7.31	29.53	36.85	MgAl2O4
Stibnite	-226.46	-276.92	-50.46	Sb2S3
Sulfur	-54.21	-56.35	-2.14	S
Tenorite	-0.70	6.94	7.64	CuO
Thenardite	-9.07	-8.75	0.32	Na2SO4
Thermonatrite	-10.89	-10.25	0.64	Na2CO3:H2O
Tyuyamunite	-8.77	-4.69	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-17.64	3.44	21.08	U3O8
U3Sb4	-553.72	-401.34	152.38	U3Sb4

U4O9	-31.78	-34.79	-3.02	U4O9
UF4	-33.02	-62.56	-29.54	UF4
UF4:2.5H2O	-29.84	-62.56	-32.72	UF4:2.5H2O
UO2 (am)	-15.54	-14.61	0.93	UO2
UO2 (OH) 2 (beta)	-5.80	-0.19	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-27.23	-29.48	-2.25	UO2SeO4:4H2O
UO3	-7.89	-0.19	7.70	UO3
Uraninite	-9.94	-14.61	-4.67	UO2
USb2	-208.53	-178.95	29.58	USb2
V(OH) 3	-17.11	-9.52	7.59	V(OH) 3
V2O5	-15.61	-16.97	-1.36	V2O5
V3O5	-35.66	-33.82	1.84	V3O5
V4O7	-44.40	-37.22	7.19	V4O7
V6O13	-37.30	-98.16	-60.86	V6O13
Valentinite	-28.49	-36.97	-8.48	Sb2O3
VC12	-62.16	-43.29	18.87	VC12
VC13	-65.89	-42.45	23.43	VC13
VF4	-66.28	-51.35	14.93	VF4
Vmetal	-88.99	-44.96	44.03	V
VO	-36.09	-21.33	14.76	VO
VO(OH) 2	-8.55	-3.40	5.15	VO(OH) 2
VO2Cl	-22.30	-19.46	2.84	VO2Cl
VOC1	-31.65	-20.50	11.15	VOC1
VOC12	-38.11	-25.35	12.76	VOC12
VOSO4	-26.12	-22.51	3.61	VOSO4
Witherite	-2.91	-11.48	-8.57	BaCO3
Wurtzite	-62.25	-71.20	-8.95	ZnS
Zincite	-2.55	8.78	11.33	ZnO
Zincosite	-14.26	-10.33	3.93	ZnSO4
Zn(BO2) 2	-9.79	-1.50	8.29	Zn(BO2) 2
Zn(OH) 2	-3.42	8.78	12.20	Zn(OH) 2
Zn(OH) 2 (am)	-3.69	8.78	12.47	Zn(OH) 2
Zn(OH) 2 (beta)	-2.97	8.78	11.75	Zn(OH) 2
Zn(OH) 2 (epsilon)	-2.75	8.78	11.53	Zn(OH) 2
Zn(OH) 2 (gamma)	-2.95	8.78	11.73	Zn(OH) 2
Zn2 (OH) 2SO4	-9.05	-1.55	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-8.60	6.59	15.19	Zn2 (OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-16.23	-2.58	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-30.80	-11.88	18.91	Zn3O(SO4) 2
Zn4 (OH) 6SO4	-12.39	16.01	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-16.55	21.95	38.50	Zn5 (OH) 8Cl2
ZnCl2	-20.23	-13.18	7.05	ZnCl2
ZnCO3:1H2O	-1.58	-11.84	-10.26	ZnCO3:1H2O
ZnF2	-14.66	-15.19	-0.53	ZnF2
Znmetal	-40.64	-14.85	25.79	Zn
ZnMoO4	-3.97	-14.09	-10.13	ZnMoO4
ZnO(active)	-2.41	8.78	11.19	ZnO
ZnS(am)	-62.15	-71.20	-9.05	ZnS
ZnSb	-79.79	-68.78	11.01	ZnSb
ZnSe	-19.47	-33.87	-14.40	ZnSe
ZnSeO4:6H2O	-18.99	-20.51	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.70	-10.33	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 21.

REACTION 101
H2O -1
39.5230 moles ### Addition step. Removes HTC water but solute mass
remains

```

USE solution 101
SAVE Solution 102
End

```

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

Using solution 101. Solution after simulation 20.
Using reaction 101.

Reaction 101.

3.952e+01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

```

-----Solution composition-----

```

Elements	Molality	Moles
Ag	8.351e-08	8.350e-08
Al	1.260e-06	1.260e-06
As	3.219e-08	3.219e-08
B	1.292e-05	1.292e-05
Ba	7.050e-07	7.049e-07
C	7.280e-03	7.279e-03
Ca	2.523e-03	2.523e-03
Cd	7.171e-09	7.170e-09
Cl	1.418e-03	1.418e-03
Co	1.359e-07	1.359e-07
Cr	1.271e-07	1.270e-07
Cu	2.352e-07	2.351e-07
F	1.456e-04	1.456e-04
Fe	2.654e-05	2.653e-05
Hg	2.043e-11	2.043e-11
K	1.444e-04	1.444e-04
Mg	9.021e-04	9.020e-04
Mn	1.332e-05	1.332e-05
Mo	1.717e-07	1.717e-07
Na	4.036e-03	4.035e-03
Ni	2.132e-07	2.131e-07
Pb	1.241e-08	1.241e-08
S	1.178e-03	1.178e-03
Sb	8.086e-09	8.084e-09
Se	2.185e-08	2.185e-08
U	1.298e-08	1.298e-08
V	2.820e-08	2.820e-08
Zn	5.020e-07	5.019e-07

```

-----Description of solution-----

```

	pH =	7.819	Charge balance
	pe =	4.076	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.421e-02	
	Mass of water (kg) =	9.998e-01	
	Total alkalinity (eq/kg) =	7.171e-03	

Total CO2 (mol/kg) = 7.280e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 2.146e-15
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 6
 Total H = 1.110034e+02
 Total O = 5.552459e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	7.509e-07	6.639e-07	-6.124	-6.178	-0.053	(0)
H+	1.710e-08	1.516e-08	-7.767	-7.819	-0.052	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	8.351e-08					
AgCl	3.492e-08	3.492e-08	-7.457	-7.457	0.000	(0)
Ag+	1.533e-08	1.360e-08	-7.814	-7.867	-0.052	(0)
Ag2Se	1.434e-08	1.434e-08	-7.844	-7.844	0.000	(0)
AgCl2-	4.400e-09	3.825e-09	-8.357	-8.417	-0.061	(0)
AgSO4-	1.808e-10	1.572e-10	-9.743	-9.804	-0.061	(0)
AgCl3-2	7.506e-12	4.288e-12	-11.125	-11.368	-0.243	(0)
AgF	4.113e-12	4.113e-12	-11.386	-11.386	0.000	(0)
AgOH	9.026e-13	9.026e-13	-12.044	-12.044	0.000	(0)
AgH2BO3	1.021e-13	1.021e-13	-12.991	-12.991	0.000	(0)
AgCl4-3	3.881e-14	1.101e-14	-13.411	-13.958	-0.547	(0)
AgSeO3-	1.232e-14	1.071e-14	-13.909	-13.970	-0.061	(0)
Ag (OH) 2-	6.736e-17	5.856e-17	-16.172	-16.232	-0.061	(0)
Ag (SeO3) 2-3	4.143e-22	1.176e-22	-21.383	-21.930	-0.547	(0)
Ag2MoO4	7.431e-24	7.431e-24	-23.129	-23.129	0.000	(0)
AgHS	0.000e+00	0.000e+00	-66.608	-66.608	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-73.627	-74.599	-0.973	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-134.575	-134.728	-0.153	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-135.003	-135.064	-0.061	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-136.055	-136.349	-0.294	(0)
AgS4S5-3	0.000e+00	0.000e+00	-136.378	-136.660	-0.282	(0)
Al	1.260e-06					
Al (OH) 4-	1.245e-06	1.106e-06	-5.905	-5.956	-0.052	(0)
Al (OH) 3	1.323e-08	1.323e-08	-7.878	-7.878	0.000	(0)
Al (OH) 2+	1.121e-09	9.986e-10	-8.950	-9.001	-0.050	(0)
AlF3	2.497e-10	2.497e-10	-9.603	-9.603	0.000	(0)
AlF2+	1.849e-10	1.647e-10	-9.733	-9.783	-0.050	(0)
AlF4-	1.698e-11	1.507e-11	-10.770	-10.822	-0.052	(0)
AlF+2	5.453e-12	3.435e-12	-11.263	-11.464	-0.201	(0)
AlOH+2	3.006e-12	1.894e-12	-11.522	-11.723	-0.201	(0)
AlSO4+	1.445e-14	1.283e-14	-13.840	-13.892	-0.052	(0)
Al+3	8.403e-15	2.852e-15	-14.076	-14.545	-0.469	(0)
Al (SO4) 2-	8.973e-17	7.966e-17	-16.047	-16.099	-0.052	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.763	-48.310	-0.547	(0)
As (3)	8.182e-20					
H3AsO3	7.875e-20	7.875e-20	-19.104	-19.104	0.000	(0)
H2AsO3-	3.064e-21	2.664e-21	-20.514	-20.574	-0.061	(0)
HAsO3-2	2.805e-25	1.602e-25	-24.552	-24.795	-0.243	(0)
H4AsO3+	6.805e-28	5.916e-28	-27.167	-27.228	-0.061	(0)
AsO3-3	1.436e-30	4.074e-31	-29.843	-30.390	-0.547	(0)
As (5)	3.219e-08					
HAsO4-2	2.950e-08	1.685e-08	-7.530	-7.773	-0.243	(0)
H2AsO4-	2.681e-09	2.330e-09	-8.572	-8.633	-0.061	(0)
AsO4-3	1.239e-11	3.515e-12	-10.907	-11.454	-0.547	(0)
H3AsO4	6.120e-15	6.140e-15	-14.213	-14.212	0.001	(0)
B	1.292e-05					
H3BO3	1.233e-05	1.237e-05	-4.909	-4.908	0.001	(0)
H2BO3-	5.381e-07	4.737e-07	-6.269	-6.324	-0.055	(0)
CaH2BO3+	4.098e-08	3.608e-08	-7.387	-7.443	-0.055	(0)
MgH2BO3+	9.235e-09	8.129e-09	-8.035	-8.090	-0.055	(0)
NaH2BO3	2.670e-09	2.670e-09	-8.574	-8.574	0.000	(0)
BF (OH) 3-	6.751e-10	5.943e-10	-9.171	-9.226	-0.055	(0)

	BaH ₂ BO ₃ +	6.934e-12	6.104e-12	-11.159	-11.214	-0.055	(0)
	H ₅ (BO ₃) 2-	5.664e-12	4.986e-12	-11.247	-11.302	-0.055	(0)
	BF ₂ (OH) 2-	1.318e-13	1.160e-13	-12.880	-12.935	-0.055	(0)
	AgH ₂ BO ₃	1.021e-13	1.021e-13	-12.991	-12.991	0.000	(0)
	H ₈ (BO ₃) 3-	7.005e-15	6.166e-15	-14.155	-14.210	-0.055	(0)
	BF ₃ OH-	9.368e-20	8.247e-20	-19.028	-19.084	-0.055	(0)
	BF ₄ -	8.419e-25	7.411e-25	-24.075	-24.130	-0.055	(0)
Ba	7.050e-07						
	Ba+2	6.741e-07	4.170e-07	-6.171	-6.380	-0.209	(0)
	BaHCO ₃ +	2.694e-08	2.405e-08	-7.570	-7.619	-0.049	(0)
	BaCO ₃	3.994e-09	3.994e-09	-8.399	-8.399	0.000	(0)
	BaH ₂ BO ₃ +	6.934e-12	6.104e-12	-11.159	-11.214	-0.055	(0)
	BaOH+	1.359e-12	1.208e-12	-11.867	-11.918	-0.051	(0)
C (4)	7.280e-03						
	HCO ₃ -	6.780e-03	6.041e-03	-2.169	-2.219	-0.050	(0)
	H ₂ CO ₃	2.060e-04	2.060e-04	-3.686	-3.686	0.000	(0)
	CaHCO ₃ +	1.667e-04	1.489e-04	-3.778	-3.827	-0.049	(0)
	CaCO ₃	3.918e-05	3.918e-05	-4.407	-4.407	0.000	(0)
	MgHCO ₃ +	3.453e-05	3.059e-05	-4.462	-4.514	-0.053	(0)
	CO ₃ -2	3.019e-05	1.868e-05	-4.520	-4.729	-0.209	(0)
	NaHCO ₃	1.208e-05	1.208e-05	-4.918	-4.918	0.000	(0)
	MgCO ₃	7.689e-06	7.689e-06	-5.114	-5.114	0.000	(0)
	NaCO ₃ -	1.388e-06	1.237e-06	-5.858	-5.908	-0.050	(0)
	MnHCO ₃ +	9.036e-07	8.038e-07	-6.044	-6.095	-0.051	(0)
	CuCO ₃	2.075e-07	2.075e-07	-6.683	-6.683	0.000	(0)
	ZnCO ₃	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
	NiHCO ₃ +	5.529e-08	4.807e-08	-7.257	-7.318	-0.061	(0)
	NiCO ₃	4.498e-08	4.498e-08	-7.347	-7.347	0.000	(0)
	ZnHCO ₃ +	3.522e-08	3.062e-08	-7.453	-7.514	-0.061	(0)
	BaHCO ₃ +	2.694e-08	2.405e-08	-7.570	-7.619	-0.049	(0)
	CoHCO ₃ +	2.673e-08	2.324e-08	-7.573	-7.634	-0.061	(0)
	Cu (CO ₃) 2-2	1.826e-08	1.043e-08	-7.738	-7.982	-0.243	(0)
	CoCO ₃	1.561e-08	1.561e-08	-7.807	-7.807	0.000	(0)
	UO ₂ (CO ₃) 3-4	1.082e-08	1.153e-09	-7.966	-8.938	-0.973	(0)
	PbCO ₃	9.884e-09	9.884e-09	-8.005	-8.005	0.000	(0)
	FeHCO ₃ +	9.706e-09	8.666e-09	-8.013	-8.062	-0.049	(0)
	BaCO ₃	3.994e-09	3.994e-09	-8.399	-8.399	0.000	(0)
	UO ₂ (CO ₃) 2-2	2.155e-09	1.231e-09	-8.666	-8.910	-0.243	(0)
	CdCO ₃	1.296e-09	1.296e-09	-8.888	-8.888	0.000	(0)
	Pb (CO ₃) 2-2	9.320e-10	5.324e-10	-9.031	-9.274	-0.243	(0)
	PbHCO ₃ +	9.088e-10	7.901e-10	-9.042	-9.102	-0.061	(0)
	CuHCO ₃ +	8.272e-10	7.191e-10	-9.082	-9.143	-0.061	(0)
	CdHCO ₃ +	4.814e-11	4.185e-11	-10.318	-10.378	-0.061	(0)
	Cd (CO ₃) 2-2	3.140e-11	1.794e-11	-10.503	-10.746	-0.243	(0)
	UO ₂ CO ₃	3.304e-12	3.304e-12	-11.481	-11.481	0.000	(0)
	HgCO ₃	7.014e-18	7.014e-18	-17.154	-17.154	0.000	(0)
	Hg (CO ₃) 2-2	7.252e-19	4.143e-19	-18.140	-18.383	-0.243	(0)
	HgHCO ₃ +	2.278e-21	1.980e-21	-20.642	-20.703	-0.061	(0)
Ca	2.523e-03						
	Ca+2	2.139e-03	1.324e-03	-2.670	-2.878	-0.209	(0)
	CaSO ₄	1.757e-04	1.757e-04	-3.755	-3.755	0.000	(0)
	CaHCO ₃ +	1.667e-04	1.489e-04	-3.778	-3.827	-0.049	(0)
	CaCO ₃	3.918e-05	3.918e-05	-4.407	-4.407	0.000	(0)
	CaF+	1.956e-06	1.740e-06	-5.709	-5.760	-0.051	(0)
	CaH ₂ BO ₃ +	4.098e-08	3.608e-08	-7.387	-7.443	-0.055	(0)
	CaOH+	1.964e-08	1.753e-08	-7.707	-7.756	-0.049	(0)
Cd	7.171e-09						
	Cd+2	4.919e-09	3.043e-09	-8.308	-8.517	-0.209	(0)
	CdCO ₃	1.296e-09	1.296e-09	-8.888	-8.888	0.000	(0)
	CdCl+	4.205e-10	3.655e-10	-9.376	-9.437	-0.061	(0)
	CdSO ₄	4.134e-10	4.134e-10	-9.384	-9.384	0.000	(0)
	CdHCO ₃ +	4.814e-11	4.185e-11	-10.318	-10.378	-0.061	(0)
	Cd (CO ₃) 2-2	3.140e-11	1.794e-11	-10.503	-10.746	-0.243	(0)
	CdOH+	1.846e-11	1.605e-11	-10.734	-10.795	-0.061	(0)
	CdOHC1	9.955e-12	9.955e-12	-11.002	-11.002	0.000	(0)
	CdF+	6.681e-12	5.809e-12	-11.175	-11.236	-0.061	(0)
	Cd (SO ₄) 2-2	5.656e-12	3.231e-12	-11.247	-11.491	-0.243	(0)
	CdCl ₂	1.917e-12	1.917e-12	-11.717	-11.717	0.000	(0)

	Cd(OH) 2	6.723e-14	6.723e-14	-13.172	-13.172	0.000	(0)
	CdCl3-	1.750e-15	1.521e-15	-14.757	-14.818	-0.061	(0)
	CdF2	1.396e-15	1.396e-15	-14.855	-14.855	0.000	(0)
	Cd(OH) 3-	3.137e-18	2.727e-18	-17.504	-17.564	-0.061	(0)
	Cd2OH+3	8.627e-19	2.448e-19	-18.064	-18.611	-0.547	(0)
	CdSeO4	5.292e-20	5.292e-20	-19.276	-19.276	0.000	(0)
	Cd(SeO3) 2-2	6.596e-21	3.768e-21	-20.181	-20.424	-0.243	(0)
	Cd(OH) 4-2	5.187e-25	2.963e-25	-24.285	-24.528	-0.243	(0)
	CdHS+	0.000e+00	0.000e+00	-73.004	-73.065	-0.061	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-138.416	-138.416	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-209.012	-209.072	-0.061	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-279.189	-279.432	-0.243	(0)
C1		1.418e-03					
	Cl-	1.418e-03	1.258e-03	-2.848	-2.900	-0.052	(0)
	AgCl	3.492e-08	3.492e-08	-7.457	-7.457	0.000	(0)
	MnCl+	1.187e-08	1.056e-08	-7.925	-7.976	-0.051	(0)
	AgCl2-	4.400e-09	3.825e-09	-8.357	-8.417	-0.061	(0)
	ZnCl+	5.716e-10	5.065e-10	-9.243	-9.295	-0.053	(0)
	ZnOHCl	4.402e-10	4.402e-10	-9.356	-9.356	0.000	(0)
	CdCl+	4.205e-10	3.655e-10	-9.376	-9.437	-0.061	(0)
	CoCl+	2.475e-10	2.152e-10	-9.606	-9.667	-0.061	(0)
	NiCl+	2.389e-10	2.077e-10	-9.622	-9.683	-0.061	(0)
	CuCl	1.229e-10	1.229e-10	-9.910	-9.910	0.000	(0)
	CuCl2-	3.646e-11	3.230e-11	-10.438	-10.491	-0.053	(0)
	MnCl2	1.876e-11	1.876e-11	-10.727	-10.727	0.000	(0)
	CdOHCl	9.955e-12	9.955e-12	-11.002	-11.002	0.000	(0)
	PbCl+	9.037e-12	7.857e-12	-11.044	-11.105	-0.061	(0)
	AgCl3-2	7.506e-12	4.288e-12	-11.125	-11.368	-0.243	(0)
	CuCl+	4.245e-12	3.761e-12	-11.372	-11.425	-0.053	(0)
	CdCl2	1.917e-12	1.917e-12	-11.717	-11.717	0.000	(0)
	ZnCl2	1.010e-12	1.010e-12	-11.996	-11.996	0.000	(0)
	PbCl2	4.414e-14	4.414e-14	-13.355	-13.355	0.000	(0)
	AgCl4-3	3.881e-14	1.101e-14	-13.411	-13.958	-0.547	(0)
	CuCl3-2	1.387e-14	8.686e-15	-13.858	-14.061	-0.203	(0)
	MnCl3-	7.307e-15	6.500e-15	-14.136	-14.187	-0.051	(0)
	CdCl3-	1.750e-15	1.521e-15	-14.757	-14.818	-0.061	(0)
	CuCl2	1.641e-15	1.641e-15	-14.785	-14.785	0.000	(0)
	NiCl2	1.316e-15	1.316e-15	-14.881	-14.881	0.000	(0)
	ZnCl3-	1.139e-15	1.009e-15	-14.944	-14.996	-0.053	(0)
	HgClOH	4.628e-16	4.628e-16	-15.335	-15.335	0.000	(0)
	CrCl+2	2.143e-16	1.224e-16	-15.669	-15.912	-0.243	(0)
	HgCl2	4.965e-17	4.965e-17	-16.304	-16.304	0.000	(0)
	PbCl3-	2.543e-17	2.210e-17	-16.595	-16.656	-0.061	(0)
	FeCl+2	7.647e-18	4.788e-18	-17.116	-17.320	-0.203	(0)
	CrOHCl2	1.943e-18	1.943e-18	-17.711	-17.711	0.000	(0)
	ZnCl4-2	1.013e-18	6.345e-19	-17.994	-18.198	-0.203	(0)
	HgCl3-	7.183e-19	6.245e-19	-18.144	-18.204	-0.061	(0)
	UO2Cl+	1.043e-19	9.064e-20	-18.982	-19.043	-0.061	(0)
	FeCl2+	3.024e-20	2.690e-20	-19.519	-19.570	-0.051	(0)
	PbCl4-2	2.225e-20	1.271e-20	-19.653	-19.896	-0.243	(0)
	CuCl3-	2.173e-20	1.926e-20	-19.663	-19.715	-0.053	(0)
	CrCl2+	1.681e-20	1.461e-20	-19.774	-19.835	-0.061	(0)
	HgCl+	9.059e-21	7.875e-21	-20.043	-20.104	-0.061	(0)
	HgCl4-2	5.474e-21	3.127e-21	-20.262	-20.505	-0.243	(0)
	VOCl+	5.635e-22	4.899e-22	-21.249	-21.310	-0.061	(0)
	FeCl3	3.384e-24	3.384e-24	-23.471	-23.471	0.000	(0)
	CuCl4-2	1.939e-25	1.214e-25	-24.712	-24.916	-0.203	(0)
	CrO3Cl-	3.491e-27	3.035e-27	-26.457	-26.518	-0.061	(0)
	CoCl+2	1.050e-36	5.999e-37	-35.979	-36.222	-0.243	(0)
	UCl+3	0.000e+00	0.000e+00	-47.218	-47.765	-0.547	(0)
Co(2)		1.359e-07					
	Co+2	8.656e-08	4.945e-08	-7.063	-7.306	-0.243	(0)
	CoHCO3+	2.673e-08	2.324e-08	-7.573	-7.634	-0.061	(0)
	CoCO3	1.561e-08	1.561e-08	-7.807	-7.807	0.000	(0)
	CoSO4	5.717e-09	5.717e-09	-8.243	-8.243	0.000	(0)
	CoOH+	7.535e-10	6.551e-10	-9.123	-9.184	-0.061	(0)
	CoCl+	2.475e-10	2.152e-10	-9.606	-9.667	-0.061	(0)
	CoF+	2.166e-10	1.883e-10	-9.664	-9.725	-0.061	(0)

Co (OH) 2	3.455e-11	3.455e-11	-10.462	-10.462	0.000	(0)
Co (OH) 3-	5.264e-16	4.576e-16	-15.279	-15.339	-0.061	(0)
CoOOH-	1.321e-16	1.149e-16	-15.879	-15.940	-0.061	(0)
Co2OH+3	5.722e-18	1.624e-18	-17.242	-17.790	-0.547	(0)
CoSeO4	2.315e-18	2.315e-18	-17.635	-17.635	0.000	(0)
Co (OH) 4-2	8.429e-23	4.815e-23	-22.074	-22.317	-0.243	(0)
Co4 (OH) 4+4	3.450e-28	3.674e-29	-27.462	-28.435	-0.973	(0)
Co (3)	1.384e-29					
CoOH+2	1.384e-29	7.908e-30	-28.859	-29.102	-0.243	(0)
Co+3	6.906e-36	2.344e-36	-35.161	-35.630	-0.469	(0)
CoCl+2	1.050e-36	5.999e-37	-35.979	-36.222	-0.243	(0)
Cr (2)	2.642e-24					
Cr+2	2.642e-24	1.509e-24	-23.578	-23.821	-0.243	(0)
Cr (3)	1.271e-07					
Cr (OH) 2+	1.015e-07	8.825e-08	-6.993	-7.054	-0.061	(0)
Cr (OH) 3	2.201e-08	2.201e-08	-7.657	-7.657	0.000	(0)
Cr (OH) +2	1.912e-09	1.092e-09	-8.718	-8.962	-0.243	(0)
CrO2-	7.932e-10	6.896e-10	-9.101	-9.161	-0.061	(0)
Cr (OH) 4-	6.692e-10	5.818e-10	-9.174	-9.235	-0.061	(0)
CrOHSO4	1.502e-10	1.502e-10	-9.823	-9.823	0.000	(0)
CrF+2	2.513e-12	1.436e-12	-11.600	-11.843	-0.243	(0)
Cr+3	2.651e-13	7.521e-14	-12.577	-13.124	-0.547	(0)
CrSO4+	1.171e-13	1.018e-13	-12.932	-12.992	-0.061	(0)
CrCl+2	2.143e-16	1.224e-16	-15.669	-15.912	-0.243	(0)
Cr2 (OH) 2SO4+2	2.597e-17	1.483e-17	-16.586	-16.829	-0.243	(0)
CrOHC12	1.943e-18	1.943e-18	-17.711	-17.711	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.106e-19	5.106e-19	-18.292	-18.292	0.000	(0)
CrCl2+	1.681e-20	1.461e-20	-19.774	-19.835	-0.061	(0)
Cr (6)	8.732e-16					
CrO4-2	8.334e-16	5.155e-16	-15.079	-15.288	-0.209	(0)
HCro4-	2.909e-17	2.529e-17	-16.536	-16.597	-0.061	(0)
NaCrO4-	1.048e-17	9.111e-18	-16.980	-17.040	-0.061	(0)
KCrO4-	2.811e-19	2.444e-19	-18.551	-18.612	-0.061	(0)
H2CrO4	3.109e-25	3.109e-25	-24.507	-24.507	0.000	(0)
CrO3SO4-2	1.185e-25	6.771e-26	-24.926	-25.169	-0.243	(0)
CrO3Cl-	3.491e-27	3.035e-27	-26.457	-26.518	-0.061	(0)
Cr2O7-2	3.884e-32	2.219e-32	-31.411	-31.654	-0.243	(0)
Cu (1)	2.487e-10					
CuCl	1.229e-10	1.229e-10	-9.910	-9.910	0.000	(0)
Cu+	8.928e-11	7.762e-11	-10.049	-10.110	-0.061	(0)
CuCl2-	3.646e-11	3.230e-11	-10.438	-10.491	-0.053	(0)
CuCl3-2	1.387e-14	8.686e-15	-13.858	-14.061	-0.203	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-135.905	-136.193	-0.288	(0)
CuS4S5-3	0.000e+00	0.000e+00	-136.647	-136.923	-0.276	(0)
Cu (2)	2.349e-07					
CuCO3	2.075e-07	2.075e-07	-6.683	-6.683	0.000	(0)
Cu (CO3) 2-2	1.826e-08	1.043e-08	-7.738	-7.982	-0.243	(0)
CuOH+	4.471e-09	3.961e-09	-8.350	-8.402	-0.053	(0)
Cu+2	3.050e-09	1.887e-09	-8.516	-8.724	-0.209	(0)
CuHCO3+	8.272e-10	7.191e-10	-9.082	-9.143	-0.061	(0)
Cu (OH) 2	5.248e-10	5.248e-10	-9.280	-9.280	0.000	(0)
CuSO4	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CuF+	1.649e-11	1.434e-11	-10.783	-10.844	-0.061	(0)
CuCl+	4.245e-12	3.761e-12	-11.372	-11.425	-0.053	(0)
Cu (OH) 3-	8.220e-13	7.146e-13	-12.085	-12.146	-0.061	(0)
Cu2 (OH) 2+2	6.900e-13	3.942e-13	-12.161	-12.404	-0.243	(0)
CuCl2	1.641e-15	1.641e-15	-14.785	-14.785	0.000	(0)
Cu (OH) 4-2	6.537e-18	3.734e-18	-17.185	-17.428	-0.243	(0)
CuCl3-	2.173e-20	1.926e-20	-19.663	-19.715	-0.053	(0)
CuCl4-2	1.939e-25	1.214e-25	-24.712	-24.916	-0.203	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-200.432	-200.493	-0.061	(0)
F	1.456e-04					
F-	1.358e-04	1.204e-04	-3.867	-3.919	-0.052	(0)
MgF+	7.533e-06	6.688e-06	-5.123	-5.175	-0.052	(0)
CaF+	1.956e-06	1.740e-06	-5.709	-5.760	-0.051	(0)
NaF	2.702e-07	2.702e-07	-6.568	-6.568	0.000	(0)
MnF+	3.595e-08	3.197e-08	-7.444	-7.495	-0.051	(0)
HF	2.701e-09	2.701e-09	-8.568	-8.568	0.000	(0)

BF(OH) 3-	6.751e-10	5.943e-10	-9.171	-9.226	-0.055	(0)
ZnF+	4.431e-10	3.852e-10	-9.354	-9.414	-0.061	(0)
AlF3	2.497e-10	2.497e-10	-9.603	-9.603	0.000	(0)
NiF+	2.246e-10	1.953e-10	-9.649	-9.709	-0.061	(0)
CoF+	2.166e-10	1.883e-10	-9.664	-9.725	-0.061	(0)
AlF2+	1.849e-10	1.647e-10	-9.733	-9.783	-0.050	(0)
AlF4-	1.698e-11	1.507e-11	-10.770	-10.822	-0.052	(0)
CuF+	1.649e-11	1.434e-11	-10.783	-10.844	-0.061	(0)
CdF+	6.681e-12	5.809e-12	-11.175	-11.236	-0.061	(0)
AlF+2	5.453e-12	3.435e-12	-11.263	-11.464	-0.201	(0)
AgF	4.113e-12	4.113e-12	-11.386	-11.386	0.000	(0)
CrF+2	2.513e-12	1.436e-12	-11.600	-11.843	-0.243	(0)
PbF+	1.719e-12	1.494e-12	-11.765	-11.826	-0.061	(0)
HF2-	1.399e-12	1.237e-12	-11.854	-11.908	-0.053	(0)
BF2(OH) 2-	1.318e-13	1.160e-13	-12.880	-12.935	-0.055	(0)
FeF2+	6.031e-14	5.365e-14	-13.220	-13.270	-0.051	(0)
FeF+2	2.658e-14	1.665e-14	-13.575	-13.779	-0.203	(0)
FeF3	9.115e-15	9.115e-15	-14.040	-14.040	0.000	(0)
PbF2	3.541e-15	3.541e-15	-14.451	-14.451	0.000	(0)
CdF2	1.396e-15	1.396e-15	-14.855	-14.855	0.000	(0)
UO2F+	8.497e-16	7.387e-16	-15.071	-15.132	-0.061	(0)
UO2F2	2.566e-16	2.566e-16	-15.591	-15.591	0.000	(0)
H2F2	1.954e-17	1.954e-17	-16.709	-16.709	0.000	(0)
VO2F	1.898e-17	1.898e-17	-16.722	-16.722	0.000	(0)
UO2F3-	8.928e-18	7.762e-18	-17.049	-17.110	-0.061	(0)
VO2F2-	9.547e-19	8.300e-19	-18.020	-18.081	-0.061	(0)
PbF3-	9.304e-19	8.088e-19	-18.031	-18.092	-0.061	(0)
VOF+	1.153e-19	1.003e-19	-18.938	-18.999	-0.061	(0)
BF3OH-	9.368e-20	8.247e-20	-19.028	-19.084	-0.055	(0)
UO2F4-2	1.300e-20	7.425e-21	-19.886	-20.129	-0.243	(0)
VOF2	4.528e-21	4.528e-21	-20.344	-20.344	0.000	(0)
VO2F3-2	2.183e-21	1.247e-21	-20.661	-20.904	-0.243	(0)
PbF4-2	8.161e-23	4.662e-23	-22.088	-22.331	-0.243	(0)
VOF3-	2.226e-23	1.935e-23	-22.653	-22.713	-0.061	(0)
Sb(OH) 2F	1.176e-24	1.176e-24	-23.929	-23.929	0.000	(0)
SbOF	1.157e-24	1.157e-24	-23.937	-23.937	0.000	(0)
BF4-	8.419e-25	7.411e-25	-24.075	-24.130	-0.055	(0)
VO2F4-3	2.604e-25	7.389e-26	-24.584	-25.131	-0.547	(0)
VOF4-2	1.647e-26	9.407e-27	-25.783	-26.027	-0.243	(0)
HgF+	1.611e-27	1.401e-27	-26.793	-26.854	-0.061	(0)
UF3+	2.180e-37	1.895e-37	-36.662	-36.722	-0.061	(0)
UF2+2	1.738e-38	9.930e-39	-37.760	-38.003	-0.243	(0)
UF4	2.503e-39	2.503e-39	-38.602	-38.602	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.637	-41.184	-0.547	(0)
UF5-	0.000e+00	0.000e+00	-40.862	-40.923	-0.061	(0)
UF6-2	0.000e+00	0.000e+00	-42.119	-42.362	-0.243	(0)
Fe (2)	2.288e-07					
Fe+2	1.995e-07	1.140e-07	-6.700	-6.943	-0.243	(0)
FeSO4	1.621e-08	1.621e-08	-7.790	-7.790	0.000	(0)
FeHCO3+	9.706e-09	8.666e-09	-8.013	-8.062	-0.049	(0)
FeOH+	3.386e-09	3.012e-09	-8.470	-8.521	-0.051	(0)
Fe(OH) 2	1.589e-12	1.589e-12	-11.799	-11.799	0.000	(0)
Fe(OH) 3-	3.749e-13	3.335e-13	-12.426	-12.477	-0.051	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-143.105	-143.105	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-213.563	-213.624	-0.061	(0)
Fe (3)	2.631e-05					
Fe(OH) 2+	1.567e-05	1.396e-05	-4.805	-4.855	-0.050	(0)
Fe(OH) 3	9.951e-06	9.951e-06	-5.002	-5.002	0.000	(0)
Fe(OH) 4-	6.905e-07	6.152e-07	-6.161	-6.211	-0.050	(0)
FeOH+2	8.630e-11	5.403e-11	-10.064	-10.267	-0.203	(0)
FeF2+	6.031e-14	5.365e-14	-13.220	-13.270	-0.051	(0)
FeF+2	2.658e-14	1.665e-14	-13.575	-13.779	-0.203	(0)
FeF3	9.115e-15	9.115e-15	-14.040	-14.040	0.000	(0)
FeSO4+	9.213e-16	8.195e-16	-15.036	-15.086	-0.051	(0)
Fe+3	3.714e-16	1.260e-16	-15.430	-15.899	-0.469	(0)
Fe(SO4) 2-	1.168e-17	1.015e-17	-16.933	-16.993	-0.061	(0)
FeCl+2	7.647e-18	4.788e-18	-17.116	-17.320	-0.203	(0)
Fe2(OH) 2+4	9.077e-19	9.667e-20	-18.042	-19.015	-0.973	(0)

	FeCl2+	3.024e-20	2.690e-20	-19.519	-19.570	-0.051	(0)
	FeHSeO3+2	2.722e-21	1.555e-21	-20.565	-20.808	-0.243	(0)
	Fe3 (OH) 4+5	6.454e-22	1.950e-23	-21.190	-22.710	-1.520	(0)
	FeCl3	3.384e-24	3.384e-24	-23.471	-23.471	0.000	(0)
H (0)	2.289e-27						
	H2	1.144e-27	1.148e-27	-26.941	-26.940	0.001	(0)
Hg (0)	2.043e-11						
	Hg	2.043e-11	2.043e-11	-10.690	-10.690	0.000	(0)
Hg (1)	1.524e-26						
	Hg2+2	7.619e-27	4.353e-27	-26.118	-26.361	-0.243	(0)
Hg (2)	1.391e-15						
	Hg (OH) 2	8.699e-16	8.727e-16	-15.061	-15.059	0.001	(0)
	HgClOH	4.628e-16	4.628e-16	-15.335	-15.335	0.000	(0)
	HgCl2	4.965e-17	4.965e-17	-16.304	-16.304	0.000	(0)
	HgCO3	7.014e-18	7.014e-18	-17.154	-17.154	0.000	(0)
	Hg (CO3) 2-2	7.252e-19	4.143e-19	-18.140	-18.383	-0.243	(0)
	HgCl3-	7.183e-19	6.245e-19	-18.144	-18.204	-0.061	(0)
	HgOH+	9.540e-21	8.294e-21	-20.020	-20.081	-0.061	(0)
	HgCl+	9.059e-21	7.875e-21	-20.043	-20.104	-0.061	(0)
	HgCl4-2	5.474e-21	3.127e-21	-20.262	-20.505	-0.243	(0)
	HgHCO3+	2.278e-21	1.980e-21	-20.642	-20.703	-0.061	(0)
	Hg (OH) 3-	8.391e-23	7.295e-23	-22.076	-22.137	-0.061	(0)
	Hg+2	5.493e-25	3.138e-25	-24.260	-24.503	-0.243	(0)
	HgSO4	4.761e-26	4.761e-26	-25.322	-25.322	0.000	(0)
	HgF+	1.611e-27	1.401e-27	-26.793	-26.854	-0.061	(0)
	HgHS2-	0.000e+00	0.000e+00	-129.807	-129.868	-0.061	(0)
	HgS2-2	0.000e+00	0.000e+00	-130.513	-130.757	-0.243	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-131.293	-131.293	0.000	(0)
K	1.444e-04						
	K+	1.439e-04	1.276e-04	-3.842	-3.894	-0.052	(0)
	KSO4-	5.875e-07	5.234e-07	-6.231	-6.281	-0.050	(0)
	KCrO4-	2.811e-19	2.444e-19	-18.551	-18.612	-0.061	(0)
Mg	9.021e-04						
	Mg+2	8.000e-04	4.949e-04	-3.097	-3.305	-0.209	(0)
	MgSO4	5.219e-05	5.219e-05	-4.282	-4.282	0.000	(0)
	MgHCO3+	3.453e-05	3.059e-05	-4.462	-4.514	-0.053	(0)
	MgCO3	7.689e-06	7.689e-06	-5.114	-5.114	0.000	(0)
	MgF+	7.533e-06	6.688e-06	-5.123	-5.175	-0.052	(0)
	MgOH+	1.463e-07	1.308e-07	-6.835	-6.883	-0.048	(0)
	MgH2BO3+	9.235e-09	8.129e-09	-8.035	-8.090	-0.055	(0)
Mn (2)	1.332e-05						
	Mn+2	1.167e-05	6.669e-06	-4.933	-5.176	-0.243	(0)
	MnHCO3+	9.036e-07	8.038e-07	-6.044	-6.095	-0.051	(0)
	MnSO4	6.872e-07	6.872e-07	-6.163	-6.163	0.000	(0)
	MnF+	3.595e-08	3.197e-08	-7.444	-7.495	-0.051	(0)
	MnOH+	1.250e-08	1.112e-08	-7.903	-7.954	-0.051	(0)
	MnCl+	1.187e-08	1.056e-08	-7.925	-7.976	-0.051	(0)
	MnCl2	1.876e-11	1.876e-11	-10.727	-10.727	0.000	(0)
	MnCl3-	7.307e-15	6.500e-15	-14.136	-14.187	-0.051	(0)
	MnSeO4	1.676e-16	1.676e-16	-15.776	-15.776	0.000	(0)
	Mn (OH) 3-	3.406e-17	3.030e-17	-16.468	-16.519	-0.051	(0)
	Mn (OH) 4-2	1.037e-22	6.494e-23	-21.984	-22.187	-0.203	(0)
	MnSe	2.617e-38	2.617e-38	-37.582	-37.582	0.000	(0)
Mn (3)	1.045e-26						
	Mn+3	1.045e-26	3.547e-27	-25.981	-26.450	-0.469	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-44.538	-44.741	-0.203	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-49.983	-50.038	-0.054	(0)
Mo	1.717e-07						
	MoO4-2	1.717e-07	1.062e-07	-6.765	-6.974	-0.209	(0)
	HMoO4-	3.686e-11	3.204e-11	-10.433	-10.494	-0.061	(0)
	H2MoO4	3.559e-15	3.559e-15	-14.449	-14.449	0.000	(0)
	Ag2MoO4	7.431e-24	7.431e-24	-23.129	-23.129	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-47.763	-48.310	-0.547	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-56.192	-58.380	-2.188	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-58.293	-59.813	-1.520	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-61.877	-62.850	-0.973	(0)

	H3Mo7O24-3	0.000e+00	0.000e+00	-66.876	-67.423	-0.547	(0)
Na	4.036e-03						
	Na+	4.010e-03	3.556e-03	-2.397	-2.449	-0.052	(0)
	NaSO4-	1.242e-05	1.107e-05	-4.906	-4.956	-0.050	(0)
	NaHCO3	1.208e-05	1.208e-05	-4.918	-4.918	0.000	(0)
	NaCO3-	1.388e-06	1.237e-06	-5.858	-5.908	-0.050	(0)
	NaF	2.702e-07	2.702e-07	-6.568	-6.568	0.000	(0)
	NaH2BO3	2.670e-09	2.670e-09	-8.574	-8.574	0.000	(0)
	NaCrO4-	1.048e-17	9.111e-18	-16.980	-17.040	-0.061	(0)
Ni	2.132e-07						
	Ni+2	1.043e-07	6.455e-08	-6.982	-7.190	-0.209	(0)
	NiHCO3+	5.529e-08	4.807e-08	-7.257	-7.318	-0.061	(0)
	NiCO3	4.498e-08	4.498e-08	-7.347	-7.347	0.000	(0)
	NiSO4	7.463e-09	7.463e-09	-8.127	-8.127	0.000	(0)
	NiOH+	6.206e-10	5.395e-10	-9.207	-9.268	-0.061	(0)
	NiCl+	2.389e-10	2.077e-10	-9.622	-9.683	-0.061	(0)
	NiF+	2.246e-10	1.953e-10	-9.649	-9.709	-0.061	(0)
	Ni (OH) 2	2.845e-11	2.845e-11	-10.546	-10.546	0.000	(0)
	Ni (SO4) 2-2	2.507e-13	1.432e-13	-12.601	-12.844	-0.243	(0)
	Ni (OH) 3-	2.173e-14	1.889e-14	-13.663	-13.724	-0.061	(0)
	NiCl2	1.316e-15	1.316e-15	-14.881	-14.881	0.000	(0)
	NiSeO4	2.820e-18	2.820e-18	-17.550	-17.550	0.000	(0)
O (0)	7.662e-39						
	O2	3.831e-39	3.844e-39	-38.417	-38.415	0.001	(0)
Pb	1.241e-08						
	PbCO3	9.884e-09	9.884e-09	-8.005	-8.005	0.000	(0)
	Pb (CO3) 2-2	9.320e-10	5.324e-10	-9.031	-9.274	-0.243	(0)
	PbHCO3+	9.088e-10	7.901e-10	-9.042	-9.102	-0.061	(0)
	PbOH+	3.377e-10	2.936e-10	-9.471	-9.532	-0.061	(0)
	Pb+2	2.846e-10	1.760e-10	-9.546	-9.754	-0.209	(0)
	PbSO4	4.996e-11	4.996e-11	-10.301	-10.301	0.000	(0)
	PbCl+	9.037e-12	7.857e-12	-11.044	-11.105	-0.061	(0)
	Pb (OH) 2	6.164e-12	6.164e-12	-11.210	-11.210	0.000	(0)
	PbF+	1.719e-12	1.494e-12	-11.765	-11.826	-0.061	(0)
	Pb (SO4) 2-2	3.054e-13	1.745e-13	-12.515	-12.758	-0.243	(0)
	PbCl2	4.414e-14	4.414e-14	-13.355	-13.355	0.000	(0)
	Pb (OH) 3-	4.707e-15	4.092e-15	-14.327	-14.388	-0.061	(0)
	PbF2	3.541e-15	3.541e-15	-14.451	-14.451	0.000	(0)
	PbCl3-	2.543e-17	2.210e-17	-16.595	-16.656	-0.061	(0)
	Pb2OH+3	2.887e-18	8.192e-19	-17.540	-18.087	-0.547	(0)
	Pb (OH) 4-2	1.165e-18	6.654e-19	-17.934	-18.177	-0.243	(0)
	PbF3-	9.304e-19	8.088e-19	-18.031	-18.092	-0.061	(0)
	PbCl4-2	2.225e-20	1.271e-20	-19.653	-19.896	-0.243	(0)
	Pb3 (OH) 4+2	2.336e-22	1.335e-22	-21.631	-21.875	-0.243	(0)
	PbF4-2	8.161e-23	4.662e-23	-22.088	-22.331	-0.243	(0)
	Pb4 (OH) 4+4	1.752e-27	1.866e-28	-26.756	-27.729	-0.973	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-139.596	-139.596	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-210.791	-210.852	-0.061	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-66.608	-66.608	0.000	(0)
	HS-	0.000e+00	0.000e+00	-72.495	-72.556	-0.061	(0)
	CdHS+	0.000e+00	0.000e+00	-73.004	-73.065	-0.061	(0)
	H2S	0.000e+00	0.000e+00	-73.355	-73.355	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-73.859	-74.102	-0.243	(0)
	S6-2	0.000e+00	0.000e+00	-74.374	-74.618	-0.243	(0)
	S4-2	0.000e+00	0.000e+00	-74.454	-74.697	-0.243	(0)
	S3-2	0.000e+00	0.000e+00	-75.260	-75.503	-0.243	(0)
	S2-2	0.000e+00	0.000e+00	-76.276	-76.519	-0.243	(0)
	S-2	0.000e+00	0.000e+00	-81.833	-82.037	-0.203	(0)
	HgHS2-	0.000e+00	0.000e+00	-129.807	-129.868	-0.061	(0)
	HgS2-2	0.000e+00	0.000e+00	-130.513	-130.757	-0.243	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-131.293	-131.293	0.000	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-134.575	-134.728	-0.153	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-135.003	-135.064	-0.061	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-135.905	-136.193	-0.288	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-136.055	-136.349	-0.294	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-136.378	-136.660	-0.282	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-136.647	-136.923	-0.276	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-137.217	-137.278	-0.061	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-138.416	-138.416	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-139.087	-139.087	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.596	-139.596	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-143.105	-143.105	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-200.432	-200.493	-0.061	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-208.302	-208.363	-0.061	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-209.012	-209.072	-0.061	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-210.280	-210.523	-0.243	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-210.791	-210.852	-0.061	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-213.563	-213.624	-0.061	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-279.189	-279.432	-0.243	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-282.135	-282.379	-0.243	(0)
Sb2S4-2	0.000e+00	0.000e+00	-292.999	-293.242	-0.243	(0)
S (6)	1.178e-03					
SO4-2	9.367e-04	5.795e-04	-3.028	-3.237	-0.209	(0)
CaSO4	1.757e-04	1.757e-04	-3.755	-3.755	0.000	(0)
MgSO4	5.219e-05	5.219e-05	-4.282	-4.282	0.000	(0)
NaSO4-	1.242e-05	1.107e-05	-4.906	-4.956	-0.050	(0)
MnSO4	6.872e-07	6.872e-07	-6.163	-6.163	0.000	(0)
KSO4-	5.875e-07	5.234e-07	-6.231	-6.281	-0.050	(0)
ZnSO4	2.032e-08	2.032e-08	-7.692	-7.692	0.000	(0)
FeSO4	1.621e-08	1.621e-08	-7.790	-7.790	0.000	(0)
NiSO4	7.463e-09	7.463e-09	-8.127	-8.127	0.000	(0)
CoSO4	5.717e-09	5.717e-09	-8.243	-8.243	0.000	(0)
HSO4-	9.671e-10	8.586e-10	-9.015	-9.066	-0.052	(0)
CdSO4	4.134e-10	4.134e-10	-9.384	-9.384	0.000	(0)
CuSO4	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
AgSO4-	1.808e-10	1.572e-10	-9.743	-9.804	-0.061	(0)
Zn (SO4) 2-2	1.795e-10	1.026e-10	-9.746	-9.989	-0.243	(0)
CrOHSO4	1.502e-10	1.502e-10	-9.823	-9.823	0.000	(0)
PbSO4	4.996e-11	4.996e-11	-10.301	-10.301	0.000	(0)
Cd (SO4) 2-2	5.656e-12	3.231e-12	-11.247	-11.491	-0.243	(0)
Pb (SO4) 2-2	3.054e-13	1.745e-13	-12.515	-12.758	-0.243	(0)
Ni (SO4) 2-2	2.507e-13	1.432e-13	-12.601	-12.844	-0.243	(0)
CrSO4+	1.171e-13	1.018e-13	-12.932	-12.992	-0.061	(0)
AlSO4+	1.445e-14	1.283e-14	-13.840	-13.892	-0.052	(0)
FeSO4+	9.213e-16	8.195e-16	-15.036	-15.086	-0.051	(0)
Al (SO4) 2-	8.973e-17	7.966e-17	-16.047	-16.099	-0.052	(0)
UO2SO4	3.897e-17	3.897e-17	-16.409	-16.409	0.000	(0)
Cr2 (OH) 2SO4+2	2.597e-17	1.483e-17	-16.586	-16.829	-0.243	(0)
Fe (SO4) 2-	1.168e-17	1.015e-17	-16.933	-16.993	-0.061	(0)
VO2SO4-	1.430e-18	1.243e-18	-17.845	-17.905	-0.061	(0)
UO2 (SO4) 2-2	5.211e-19	2.977e-19	-18.283	-18.526	-0.243	(0)
Cr2 (OH) 2 (SO4) 2	5.106e-19	5.106e-19	-18.292	-18.292	0.000	(0)
VOSO4	2.216e-20	2.216e-20	-19.655	-19.655	0.000	(0)
CrO3SO4-2	1.185e-25	6.771e-26	-24.926	-25.169	-0.243	(0)
HgSO4	4.761e-26	4.761e-26	-25.322	-25.322	0.000	(0)
VSO4+	4.189e-34	3.642e-34	-33.378	-33.439	-0.061	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.539	-42.539	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.958	-43.202	-0.243	(0)
Sb (3)	8.150e-19					
Sb (OH) 3	4.123e-19	4.123e-19	-18.385	-18.385	0.000	(0)
HSbO2	4.026e-19	4.026e-19	-18.395	-18.395	0.000	(0)
SbO2-	4.946e-23	4.300e-23	-22.306	-22.366	-0.061	(0)
Sb (OH) 4-	2.833e-23	2.463e-23	-22.548	-22.609	-0.061	(0)
Sb (OH) 2F	1.176e-24	1.176e-24	-23.929	-23.929	0.000	(0)
SbOF	1.157e-24	1.157e-24	-23.937	-23.937	0.000	(0)
Sb (OH) 2+	1.747e-25	1.519e-25	-24.758	-24.819	-0.061	(0)
SbO+	6.023e-26	5.237e-26	-25.220	-25.281	-0.061	(0)
Sb2S4-2	0.000e+00	0.000e+00	-292.999	-293.242	-0.243	(0)
Sb (5)	8.086e-09					
SbO3-	8.076e-09	7.021e-09	-8.093	-8.154	-0.061	(0)
Sb (OH) 6-	9.253e-12	8.206e-12	-11.034	-11.086	-0.052	(0)
SbO2+	5.327e-25	4.631e-25	-24.274	-24.334	-0.061	(0)
Se (-2)	1.434e-08					
Ag2Se	1.434e-08	1.434e-08	-7.844	-7.844	0.000	(0)
HSe-	1.660e-35	1.444e-35	-34.780	-34.841	-0.061	(0)

MnSe	2.617e-38	2.617e-38	-37.582	-37.582	0.000	(0)
H2Se	1.699e-39	1.699e-39	-38.770	-38.770	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.778	-42.021	-0.243	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-73.627	-74.599	-0.973	(0)
Se (4)	7.516e-09					
HSeO3-	5.370e-09	4.668e-09	-8.270	-8.331	-0.061	(0)
SeO3-2	2.146e-09	1.226e-09	-8.668	-8.912	-0.243	(0)
H2SeO3	3.019e-14	3.019e-14	-13.520	-13.520	0.000	(0)
AgSeO3-	1.232e-14	1.071e-14	-13.909	-13.970	-0.061	(0)
Cd (SeO3) 2-2	6.596e-21	3.768e-21	-20.181	-20.424	-0.243	(0)
FeHSeO3+2	2.722e-21	1.555e-21	-20.565	-20.808	-0.243	(0)
Ag (SeO3) 2-3	4.143e-22	1.176e-22	-21.383	-21.930	-0.547	(0)
Se (6)	1.511e-13					
SeO4-2	1.510e-13	9.340e-14	-12.821	-13.030	-0.209	(0)
MnSeO4	1.676e-16	1.676e-16	-15.776	-15.776	0.000	(0)
NiSeO4	2.820e-18	2.820e-18	-17.550	-17.550	0.000	(0)
ZnSeO4	2.319e-18	2.319e-18	-17.635	-17.635	0.000	(0)
CoSeO4	2.315e-18	2.315e-18	-17.635	-17.635	0.000	(0)
HSeO4-	8.164e-20	7.097e-20	-19.088	-19.149	-0.061	(0)
CdSeO4	5.292e-20	5.292e-20	-19.276	-19.276	0.000	(0)
Zn (SeO4) 2-2	3.844e-31	2.196e-31	-30.415	-30.658	-0.243	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.889	-59.436	-0.547	(0)
U (4)	2.965e-21					
U (OH) 5-	2.963e-21	2.576e-21	-20.528	-20.589	-0.061	(0)
U (OH) 4	1.636e-24	1.636e-24	-23.786	-23.786	0.000	(0)
U (OH) 3+	1.044e-28	9.074e-29	-27.981	-28.042	-0.061	(0)
U (OH) 2+2	1.114e-33	6.363e-34	-32.953	-33.196	-0.243	(0)
UF3+	2.180e-37	1.895e-37	-36.662	-36.722	-0.061	(0)
UF2+2	1.738e-38	9.930e-39	-37.760	-38.003	-0.243	(0)
UF4	2.503e-39	2.503e-39	-38.602	-38.602	0.000	(0)
UOH+3	1.602e-39	4.545e-40	-38.795	-39.342	-0.547	(0)
UF+3	0.000e+00	0.000e+00	-40.637	-41.184	-0.547	(0)
UF5-	0.000e+00	0.000e+00	-40.862	-40.923	-0.061	(0)
UF6-2	0.000e+00	0.000e+00	-42.119	-42.362	-0.243	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.539	-42.539	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.958	-43.202	-0.243	(0)
U+4	0.000e+00	0.000e+00	-45.592	-46.565	-0.973	(0)
UCl+3	0.000e+00	0.000e+00	-47.218	-47.765	-0.547	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-174.332	-179.256	-4.924	(0)
U (5)	2.616e-18					
UO2+	2.616e-18	2.275e-18	-17.582	-17.643	-0.061	(0)
U (6)	1.298e-08					
UO2 (CO3) 3-4	1.082e-08	1.153e-09	-7.966	-8.938	-0.973	(0)
UO2 (CO3) 2-2	2.155e-09	1.231e-09	-8.666	-8.910	-0.243	(0)
UO2CO3	3.304e-12	3.304e-12	-11.481	-11.481	0.000	(0)
UO2OH+	4.272e-15	3.714e-15	-14.369	-14.430	-0.061	(0)
UO2F+	8.497e-16	7.387e-16	-15.071	-15.132	-0.061	(0)
UO2F2	2.566e-16	2.566e-16	-15.591	-15.591	0.000	(0)
UO2+2	7.183e-17	4.443e-17	-16.144	-16.352	-0.209	(0)
UO2SO4	3.897e-17	3.897e-17	-16.409	-16.409	0.000	(0)
UO2F3-	8.928e-18	7.762e-18	-17.049	-17.110	-0.061	(0)
UO2 (SO4) 2-2	5.211e-19	2.977e-19	-18.283	-18.526	-0.243	(0)
UO2Cl+	1.043e-19	9.064e-20	-18.982	-19.043	-0.061	(0)
UO2F4-2	1.300e-20	7.425e-21	-19.886	-20.129	-0.243	(0)
(UO2) 2 (OH) 2+2	4.007e-23	2.289e-23	-22.397	-22.640	-0.243	(0)
(UO2) 3 (OH) 5+	3.270e-26	2.843e-26	-25.486	-25.546	-0.061	(0)
V (2)	1.353e-40					
VOH+	1.353e-40	1.177e-40	-39.869	-39.929	-0.061	(0)
V+2	0.000e+00	0.000e+00	-41.018	-41.261	-0.243	(0)
V (3)	3.143e-13					
V (OH) 3	3.143e-13	3.143e-13	-12.503	-12.503	0.000	(0)
V (OH) 2+	3.543e-24	3.080e-24	-23.451	-23.511	-0.061	(0)
VOH+2	7.755e-28	4.430e-28	-27.110	-27.354	-0.243	(0)
V+3	4.693e-33	1.331e-33	-32.329	-32.876	-0.547	(0)
VSO4+	4.189e-34	3.642e-34	-33.378	-33.439	-0.061	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-51.866	-52.413	-0.547	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-52.935	-53.907	-0.973	(0)

V(4)	2.153e-17					
V(OH) 3+	2.115e-17	1.838e-17	-16.675	-16.736	-0.061	(0)
VO+2	2.430e-19	1.388e-19	-18.614	-18.858	-0.243	(0)
VOF+	1.153e-19	1.003e-19	-18.938	-18.999	-0.061	(0)
VOSO4	2.216e-20	2.216e-20	-19.655	-19.655	0.000	(0)
VOF2	4.528e-21	4.528e-21	-20.344	-20.344	0.000	(0)
VOC1+	5.635e-22	4.899e-22	-21.249	-21.310	-0.061	(0)
VOF3-	2.226e-23	1.935e-23	-22.653	-22.713	-0.061	(0)
VOF4-2	1.647e-26	9.407e-27	-25.783	-26.027	-0.243	(0)
H2V2O4+2	2.967e-29	1.695e-29	-28.528	-28.771	-0.243	(0)
V(5)	2.820e-08					
H2VO4-	2.252e-08	1.958e-08	-7.647	-7.708	-0.061	(0)
HVO4-2	5.678e-09	3.244e-09	-8.246	-8.489	-0.243	(0)
H3VO4	2.969e-12	2.969e-12	-11.527	-11.527	0.000	(0)
H3V2O7-	4.318e-13	3.754e-13	-12.365	-12.425	-0.061	(0)
HV2O7-3	7.588e-14	2.153e-14	-13.120	-13.667	-0.547	(0)
VO4-3	3.779e-15	1.072e-15	-14.423	-14.970	-0.547	(0)
V2O7-4	3.588e-16	3.822e-17	-15.445	-16.418	-0.973	(0)
VO2+	1.013e-16	8.987e-17	-15.994	-16.046	-0.052	(0)
V3O9-3	2.773e-17	7.868e-18	-16.557	-17.104	-0.547	(0)
VO2F	1.898e-17	1.898e-17	-16.722	-16.722	0.000	(0)
VO2SO4-	1.430e-18	1.243e-18	-17.845	-17.905	-0.061	(0)
VO2F2-	9.547e-19	8.300e-19	-18.020	-18.081	-0.061	(0)
VO2F3-2	2.183e-21	1.247e-21	-20.661	-20.904	-0.243	(0)
V4O12-4	6.032e-22	6.424e-23	-21.220	-22.192	-0.973	(0)
VO2F4-3	2.604e-25	7.389e-26	-24.584	-25.131	-0.547	(0)
V10O28-6	0.000e+00	0.000e+00	-57.263	-59.452	-2.188	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.564	-59.084	-1.520	(0)
H2V10O28-4	0.000e+00	0.000e+00	-60.723	-61.696	-0.973	(0)
Zn	5.020e-07					
Zn+2	2.591e-07	1.603e-07	-6.586	-6.795	-0.209	(0)
ZnCO3	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
ZnHCO3+	3.522e-08	3.062e-08	-7.453	-7.514	-0.061	(0)
ZnSO4	2.032e-08	2.032e-08	-7.692	-7.692	0.000	(0)
ZnOH+	1.224e-08	1.064e-08	-7.912	-7.973	-0.061	(0)
Zn(OH) 2	1.120e-09	1.120e-09	-8.951	-8.951	0.000	(0)
ZnCl+	5.716e-10	5.065e-10	-9.243	-9.295	-0.053	(0)
ZnF+	4.431e-10	3.852e-10	-9.354	-9.414	-0.061	(0)
ZnOHCl	4.402e-10	4.402e-10	-9.356	-9.356	0.000	(0)
Zn(SO4) 2-2	1.795e-10	1.026e-10	-9.746	-9.989	-0.243	(0)
Zn(OH) 3-	4.286e-12	3.726e-12	-11.368	-11.429	-0.061	(0)
ZnCl2	1.010e-12	1.010e-12	-11.996	-11.996	0.000	(0)
ZnCl3-	1.139e-15	1.009e-15	-14.944	-14.996	-0.053	(0)
Zn(OH) 4-2	1.724e-16	9.849e-17	-15.763	-16.007	-0.243	(0)
ZnSeO4	2.319e-18	2.319e-18	-17.635	-17.635	0.000	(0)
ZnCl4-2	1.013e-18	6.345e-19	-17.994	-18.198	-0.203	(0)
Zn(SeO4) 2-2	3.844e-31	2.196e-31	-30.415	-30.658	-0.243	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-137.217	-137.278	-0.061	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-139.087	-139.087	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-208.302	-208.363	-0.061	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-210.280	-210.523	-0.243	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-282.135	-282.379	-0.243	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-44.25	-80.47	-36.22	Ag2S
Ag2CO3	-9.37	-20.46	-11.09	Ag2CO3
Ag2CrO4	-19.43	-31.02	-11.59	Ag2CrO4
Ag2HVO4	-9.80	-8.32	1.48	Ag2HVO4
Ag2MoO4	-11.16	-22.71	-11.55	Ag2MoO4
Ag2O	-12.67	-0.09	12.57	Ag2O
Ag2Se	5.95	-42.75	-48.70	Ag2Se
Ag2SeO3	-9.09	-16.24	-7.15	Ag2SeO3
Ag2SeO4	-19.85	-28.76	-8.91	Ag2SeO4
Ag2SO4	-14.15	-18.97	-4.82	Ag2SO4
Ag3AsO3	-21.40	-19.25	2.16	Ag3AsO3

Ag3AsO4	-11.57	-14.35	-2.79	Ag3AsO4
Ag3H2VO5	-13.55	-8.37	5.18	Ag3H2VO5
AgF·4H2O	-12.84	-11.79	1.05	AgF·4H2O
Agmetal	1.56	-11.94	-13.51	Ag
AgVO3	-9.04	-8.27	0.77	AgVO3
Al (OH) 3 (am)	-1.89	8.91	10.80	Al (OH) 3
Al2 (MoO4) 3	-52.38	-50.01	2.37	Al2 (MoO4) 3
Al2O3	-1.83	17.83	19.65	Al2O3
Al4 (OH) 10SO4	-5.93	16.77	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.10	-5.30	4.80	AlAsO4:2H2O
AlOHSO4	-6.73	-9.96	-3.23	AlOHSO4
AlSb	-146.47	-80.84	65.62	AlSb
Alunite	-5.69	-7.09	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-5.20	-12.99	-7.79	PbSO4
Anhydrite	-1.76	-6.12	-4.36	CaSO4
Anilite	-50.20	-82.08	-31.88	Cu0.25Cu1.5S
Antlerite	-6.92	1.87	8.79	Cu3 (OH) 4SO4
Aragonite	0.69	-7.61	-8.30	CaCO3
Arsenolite	-73.65	-76.41	-2.76	As4O6
Artinite	-5.30	4.30	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-35.13	-28.42	6.71	As2O5
Atacamite	-4.28	3.11	7.39	Cu2 (OH) 3Cl
Azurite	-3.09	-19.99	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.14	9.26	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-13.81	2.06	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	8.26	-0.65	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-21.62	11.32	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.00	-21.67	-9.67	BaCrO4
BaF2	-8.40	-14.22	-5.82	BaF2
BaMoO4	-6.39	-13.35	-6.96	BaMoO4
Barite	0.36	-9.62	-9.98	BaSO4
BaS	-87.30	-71.12	16.18	BaS
BaSeO3	-8.72	-6.89	1.83	BaSeO3
BaSeO4	-11.95	-19.41	-7.46	BaSeO4
Bianchite	-8.27	-10.03	-1.76	ZnSO4:6H2O
Birnessite	-9.19	8.90	18.09	MnO2
Bixbyite	-5.34	-5.99	-0.64	Mn2O3
BlaubleiI	-50.45	-74.61	-24.16	Cu0.9Cu0.2S
BlaubleiII	-50.78	-78.06	-27.28	Cu0.6Cu0.8S
Boehmite	0.33	8.91	8.58	AlOOH
Breithauptite	-50.89	-69.41	-18.52	NiSb
Brochantite	-6.44	8.78	15.22	Cu4 (OH) 6SO4
Brucite	-4.51	12.33	16.84	Mg (OH) 2
Bunsenite	-4.00	8.45	12.45	NiO
Ca (VO3) 2	-9.35	-3.69	5.66	Ca (VO3) 2
Ca2V2O7	-8.43	9.07	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.49	9.07	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-12.44	9.86	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.13	21.83	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.03	21.83	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-284.20	-141.23	142.97	Ca3Sb2
CaCrO4	-15.90	-18.17	-2.27	CaCrO4
Calcite	0.87	-7.61	-8.48	CaCO3
Calomel	-14.25	-32.16	-17.91	Hg2Cl2
CaMoO4	-1.90	-9.85	-7.95	CaMoO4
Carnotite	-5.25	-5.02	0.23	KUO2VO4
CaSeO3:2H2O	-6.20	-3.39	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.89	-15.91	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-12.53	-2.69	9.84	Cd (BO2) 2
Cd (OH) 2	-6.52	7.12	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.61	7.12	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.10	-16.39	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.07	2.49	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-18.79	9.61	28.40	Cd4 (OH) 6SO4
CdCl2	-13.66	-14.32	-0.66	CdCl2
CdCl2:1H2O	-12.62	-14.32	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.40	-14.32	-1.91	CdCl2:2.5H2O
CdF2	-15.14	-16.36	-1.21	CdF2

Cdmetal (alpha)	-30.18	-16.67	13.51	Cd
Cdmetal (gamma)	-30.29	-16.67	13.62	Cd
CdMoO4	-1.34	-15.49	-14.15	CdMoO4
CdOHCl	-7.14	-3.60	3.54	CdOHCl
CdSb	-70.39	-70.74	-0.35	CdSb
CdSe	-15.34	-35.54	-20.20	CdSe
CdSeO4:2H2O	-19.70	-21.55	-1.85	CdSeO4:2H2O
CdSO4	-11.58	-11.75	-0.17	CdSO4
CdSO4:1H2O	-10.03	-11.75	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.88	-11.75	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.02	-10.77	-9.75	AgCl
Cerrusite	-1.35	-14.48	-13.13	PbCO3
CH4 (g)	-74.48	-115.53	-41.05	CH4
Chalcanthite	-9.32	-11.96	-2.64	CuSO4:5H2O
Chalcocite	-50.04	-84.96	-34.92	Cu2S
Chalcopyrite	-109.87	-145.14	-35.27	CuFeS2
Cinnabar	-49.74	-95.43	-45.69	HgS
Claudetite	-73.35	-76.41	-3.06	As4O6
Clausthalite	-9.68	-36.78	-27.10	PbSe
Co (BO2) 2	-28.55	-1.48	27.07	Co (BO2) 2
Co (OH) 2	-4.76	8.33	13.09	Co (OH) 2
Co (OH) 3	-9.86	-12.17	-2.31	Co (OH) 3
CO2 (g)	-2.22	-20.37	-18.15	CO2
Co3 (AsO4) 2	-16.46	-3.43	13.03	Co3 (AsO4) 2
Co3O4	-5.52	-16.01	-10.50	Co3O4
CoCl2	-21.37	-13.11	8.27	CoCl2
CoCl2:6H2O	-15.64	-13.11	2.54	CoCl2:6H2O
CoCO3	-2.05	-12.03	-9.98	CoCO3
CoF2	-13.55	-15.14	-1.60	CoF2
CoF3	-45.93	-47.39	-1.46	CoF3
CoFe2O4	26.98	23.45	-3.53	CoFe2O4
CoMoO4	-6.52	-14.28	-7.76	CoMoO4
CoO	-5.25	8.33	13.59	CoO
CoS (alpha)	-64.60	-72.04	-7.44	CoS
CoS (beta)	-60.97	-72.04	-11.07	CoS
CoSe	-18.13	-34.33	-16.20	CoSe
CoSeO3	-9.14	-7.82	1.32	CoSeO3
CoSeO4:6H2O	-18.81	-20.34	-1.53	CoSeO4:6H2O
CoSO4	-13.35	-10.54	2.80	CoSO4
CoSO4:6H2O	-8.07	-10.54	-2.47	CoSO4:6H2O
Cotunnite	-10.78	-15.56	-4.78	PbCl2
Covellite	-51.16	-73.46	-22.30	CuS
Cr (OH) 2	-19.00	-8.18	10.82	Cr (OH) 2
Cr (OH) 3	-0.57	0.76	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.51	0.76	-0.75	Cr (OH) 3
Cr2O3	3.89	1.53	-2.36	Cr2O3
CrCl2	-43.71	-29.62	14.09	CrCl2
CrCl3	-46.51	-31.39	15.11	CrCl3
CrF3	-23.11	-34.45	-11.34	CrF3
Crmetal	-62.46	-31.97	30.48	Cr
CrO3	-27.72	-30.93	-3.21	CrO3
Cryolite	-11.57	-45.41	-33.84	Na3AlF6
Cu (OH) 2	-1.76	6.91	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.49	17.72	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-50.25	-85.13	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.44	-47.24	-45.80	Cu2Se
Cu2SO4	-21.51	-23.46	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.78	-7.68	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-54.03	-96.63	-42.59	Cu3Sb
Cu3Se2	-19.50	-82.99	-63.49	Cu3Se2
CuCO3	-1.95	-13.45	-11.50	CuCO3
CuCrO4	-18.57	-24.01	-5.44	CuCrO4
CuF	-9.12	-14.03	-4.91	CuF
CuF2	-17.68	-16.56	1.12	CuF2
CuF2:2H2O	-12.01	-16.56	-4.55	CuF2:2H2O
Cumetal	-5.43	-14.19	-8.76	Cu
CuMoO4	-2.62	-15.70	-13.08	CuMoO4
CuOCuSO4	-15.35	-5.05	10.30	CuOCuSO4

Cupricferrite	16.04	22.03	5.99	CuFe2O4
Cuprite	-3.18	-4.58	-1.41	Cu2O
Cuprousferrite	14.18	5.27	-8.92	CuFeO2
CuSe	-2.65	-35.75	-33.10	CuSe
CuSe2	-21.25	-54.62	-33.37	CuSe2
CuSeO3:2H2O	-9.75	-9.24	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-19.31	-21.75	-2.44	CuSeO4:5H2O
CuSO4	-14.90	-11.96	2.94	CuSO4
Diaspore	2.04	8.91	6.87	AlOOH
Djurleite	-50.28	-84.20	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.90	-15.64	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.45	-15.64	-17.09	CaMg(CO3)2
Epsomite	-4.42	-6.54	-2.13	MgSO4:7H2O
Fe(OH)2	-4.87	8.69	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.38	4.34	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.04	-7.76	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.59	-1.03	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-12.71	-33.33	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.78	-41.51	-3.73	Fe2(SO4)3
Fe3(OH)8	3.59	23.81	20.22	Fe3(OH)8
FeAsO4:2H2O	-7.05	-6.65	0.40	FeAsO4:2H2O
FeCr2O4	3.02	10.23	7.20	FeCr2O4
FeMoO4	-3.83	-13.92	-10.09	FeMoO4
Ferrihydrite	4.37	7.56	3.19	Fe(OH)3
Ferroselite	-34.24	-52.83	-18.60	FeSe2
FeS(ppt)	-68.73	-71.68	-2.95	FeS
FeSe	-22.96	-33.96	-11.00	FeSe
Fluorite	-0.22	-10.72	-10.50	CaF2
Galena	-60.52	-74.49	-13.97	PbS
Gibbsite	0.62	8.91	8.29	Al(OH)3
Goethite	7.07	7.56	0.49	FeOOH
Goslarite	-8.02	-10.03	-2.01	ZnSO4:7H2O
Greenockite	-58.89	-73.25	-14.36	CdS
Greigite	-252.65	-297.69	-45.03	Fe3S4
Gummite	-8.39	-0.71	7.67	UO3
Gypsum	-1.51	-6.12	-4.61	CaSO4:2H2O
H-Jarosite	-2.98	-15.08	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.74	-22.61	-12.88	H2MoO4
H2S(g)	-72.37	-80.38	-8.01	H2S
H2Se(g)	-37.70	-42.66	-4.96	H2Se
Halite	-6.95	-5.35	1.60	NaCl
Hausmannite	-5.85	55.18	61.03	Mn3O4
Hematite	16.53	15.12	-1.42	Fe2O3
Hercynite	3.63	26.52	22.89	FeAl2O4
Hg(CH3)2(g)	-172.41	-246.11	-73.71	Hg(CH3)2
Hg(g)	-9.38	-17.26	-7.87	Hg
Hg(OH)2	-11.56	-15.06	-3.50	Hg(OH)2
Hg2(g)	-19.56	-34.51	-14.96	Hg2
Hg2(OH)2	-15.98	-10.72	5.26	Hg2(OH)2
Hg2CO3	-15.04	-31.09	-16.05	Hg2CO3
Hg2CrO4	-32.95	-41.65	-8.70	Hg2CrO4
Hg2F2	-23.84	-34.20	-10.36	Hg2F2
Hg2S	-79.42	-91.10	-11.68	Hg2S
Hg2SeO3	-22.22	-26.87	-4.66	Hg2SeO3
Hg2SO4	-23.47	-29.60	-6.13	Hg2SO4
Hg3O2CO3	-35.86	-65.54	-29.68	Hg3O2CO3
HgCl(g)	-35.58	-16.08	19.50	HgCl
HgCl2	-15.24	-36.50	-21.26	HgCl2
HgF(g)	-49.78	-17.10	32.68	HgF
HgF2(g)	-51.10	-38.54	12.57	HgF2
Hgmetal(l)	-3.80	-17.26	-13.45	Hg
HgSe	-2.02	-57.72	-55.69	HgSe
HgSeO3	-18.78	-31.21	-12.43	HgSeO3
HgSO4	-24.52	-33.93	-9.42	HgSO4
Huntite	-1.74	-31.71	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.31	-23.08	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.04	-19.80	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-19.74	-24.91	-5.17	KAl(SO4)2:12H2O

K-Jarosite	3.65	-11.15	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-36.76	-54.00	-17.24	K2Cr2O7
K2CrO4	-22.56	-23.08	-0.51	K2CrO4
K2MoO4	-18.02	-14.76	3.26	K2MoO4
K2SeO4	-20.09	-20.82	-0.73	K2SeO4
Langite	-8.71	8.78	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.67	-7.11	-0.43	PbO:PbSO4
Laurionite	-5.46	-4.84	0.62	PbOHCl
Lepidocrocite	6.19	7.56	1.37	FeOOH
Lime	-19.94	12.76	32.70	CaO
Litharge	-6.81	5.88	12.69	PbO
Mackinawite	-68.08	-71.68	-3.60	FeS
Maghemite	8.73	15.12	6.39	Fe2O3
Magnesioferrite	10.59	27.45	16.86	Fe2MgO4
Magnesite	-0.57	-8.03	-7.46	MgCO3
Magnetite	20.41	23.81	3.40	Fe3O4
Malachite	-1.23	-6.54	-5.31	Cu2(OH)2CO3
Manganite	-2.98	22.36	25.34	MnOOH
Massicot	-7.01	5.88	12.89	PbO
Matlockite	-7.60	-16.57	-8.97	PbClF
Melanothallite	-20.78	-14.53	6.26	CuCl2
Melanterite	-7.97	-10.18	-2.21	FeSO4:7H2O
Metacinnabar	-50.34	-95.43	-45.09	HgS
Mg(OH)2(active)	-6.46	12.33	18.79	Mg(OH)2
Mg(VO3)2	-15.40	-4.12	11.28	Mg(VO3)2
Mg2Sb3	-259.81	-185.12	74.68	Mg2Sb3
Mg2V2O7	-18.15	8.21	26.36	Mg2V2O7
MgCr2O4	-2.34	13.86	16.20	MgCr2O4
MgCrO4	-23.97	-18.59	5.38	MgCrO4
MgF2	-3.01	-11.14	-8.13	MgF2
MgMoO4	-8.43	-10.28	-1.85	MgMoO4
MgSeO3:6H2O	-6.87	-3.82	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.14	-16.34	-1.20	MgSeO4:6H2O
Minium	-32.08	41.44	73.52	Pb3O4
Mirabilite	-7.02	-8.14	-1.11	Na2SO4:10H2O
Mn(VO3)2	-10.89	-5.99	4.90	Mn(VO3)2
Mn2(SO4)3	-56.90	-62.61	-5.71	Mn2(SO4)3
Mn2Sb	-141.80	-80.72	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-9.54	2.96	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.69	-10.98	2.72	MnCl2:4H2O
MnS(grn)	-70.08	-69.91	0.17	MnS
MnS(pnk)	-73.25	-69.91	3.34	MnS
MnSb	-89.84	-92.75	-2.91	MnSb
MnSe	-35.70	-32.20	3.50	MnSe
MnSeO3	-6.82	-5.69	1.13	MnSeO3
MnSeO3:2H2O	-6.67	-5.69	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.16	-18.21	-2.05	MnSeO4:5H2O
MnSO4	-11.00	-8.41	2.58	MnSO4
Monteponite	-7.98	7.12	15.10	CdO
Montroydite	-11.42	-15.06	-3.64	HgO
MoO3	-14.61	-22.61	-8.00	MoO3
Morenosite	-8.28	-10.43	-2.14	NiSO4:7H2O
MoS2	-136.89	-207.15	-70.26	MoS2
Na-Jarosite	1.49	-9.71	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.22	-51.11	-9.90	Na2Cr2O7
Na2CrO4	-23.12	-20.19	2.93	Na2CrO4
Na2Mo2O7	-17.89	-34.48	-16.60	Na2Mo2O7
Na2MoO4	-13.36	-11.87	1.49	Na2MoO4
Na2MoO4:2H2O	-13.10	-11.87	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.71	-5.41	10.30	Na2SeO3:5H2O
Na2SeO4	-19.21	-17.93	1.28	Na2SeO4
Na3Sb	-168.10	-73.64	94.45	Na3Sb
Na3VO4	-28.80	7.88	36.68	Na3VO4
Na4V2O7	-32.37	5.03	37.40	Na4V2O7
Nantokite	-6.28	-13.01	-6.73	CuCl
NaSb	-83.76	-60.59	23.17	NaSb
Natron	-8.32	-9.63	-1.31	Na2CO3:10H2O
NaVO3	-6.72	-2.86	3.86	NaVO3

Nesquehonite	-3.36	-8.03	-4.67	MgCO3:3H2O
Ni(OH)2	-4.35	8.45	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-18.78	-3.08	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.08	14.92	32.00	Ni4(OH)6SO4
NiCO3	-5.05	-11.92	-6.87	NiCO3
NiMoO4	-3.02	-14.16	-11.14	NiMoO4
NiS(alpha)	-66.33	-71.93	-5.60	NiS
NiS(beta)	-60.83	-71.93	-11.10	NiS
NiS(gamma)	-59.13	-71.93	-12.80	NiS
NiSe	-16.51	-34.21	-17.70	NiSe
NiSeO3:2H2O	-10.52	-7.70	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.70	-20.22	-1.52	NiSeO4:6H2O
Nsutite	-8.60	8.90	17.50	MnO2
O2(g)	-35.51	47.58	83.09	O2
Orpiment	-218.27	-279.33	-61.07	As2S3
Otavite	-1.25	-13.25	-12.00	CdCO3
Pb(BO2)2	-10.45	-3.93	6.52	Pb(BO2)2
Pb(OH)2	-2.27	5.88	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-54.60	-63.36	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.74	1.05	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.42	11.77	26.19	Pb2O(OH)2
Pb2O3	-25.48	35.56	61.04	Pb2O3
Pb2OCO3	-8.04	-8.60	-0.56	Pb2OCO3
Pb2V2O7	-2.79	-4.69	-1.90	Pb2V2O7
Pb3(AsO4)2	-16.57	-10.77	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.94	1.20	6.14	Pb3(VO4)2
Pb3O2CO3	-13.74	-2.72	11.02	Pb3O2CO3
Pb3O2SO4	-11.91	-1.22	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.44	4.66	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.22	4.66	21.88	Pb4O3SO4
PbCrO4	-12.44	-25.04	-12.60	PbCrO4
PbF2	-10.15	-17.59	-7.44	PbF2
Pbmetal	-22.15	-17.91	4.25	Pb
PbMoO4	-1.11	-16.73	-15.62	PbMoO4
PbO:0.3H2O	-7.10	5.88	12.98	PbO:0.33H2O
PbSeO4	-15.94	-22.78	-6.84	PbSeO4
Periclase	-9.25	12.33	21.58	MgO
Phosgenite	-10.23	-30.04	-19.81	PbCl2:PbCO3
Plattnerite	-19.93	29.67	49.60	PbO2
Portlandite	-10.04	12.76	22.80	Ca(OH)2
Pyrite	-109.76	-128.26	-18.51	FeS2
Pyrochroite	-4.73	10.46	15.19	Mn(OH)2
Pyrolusite	-7.13	34.25	41.38	MnO2
Realgar	-91.63	-111.37	-19.75	AsS
Retgersite	-8.39	-10.43	-2.04	NiSO4:6H2O
Rhodochrosite	0.68	-9.90	-10.58	MnCO3
Rutherfordine	-6.58	-21.08	-14.50	UO2CO3
Sb(OH)3	-11.27	-18.38	-7.11	Sb(OH)3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-28.14	-37.81	-9.67	Sb2O5
Sb2Se3	-96.99	-164.75	-67.76	Sb2Se3
Sb4O6(cubic)	-55.28	-73.54	-18.26	Sb4O6
Sb4O6(orth)	-55.64	-73.54	-17.90	Sb4O6
SbCl3	-51.12	-50.54	0.57	SbCl3
SbF3	-43.37	-53.60	-10.23	SbF3
Sbmetal	-42.38	-54.07	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-6.71	-0.71	5.99	UO2(OH)2:H2O
Semetal(am)	-11.76	-18.87	-7.11	Se
Semetal(hex)	-11.16	-18.87	-7.71	Se
Senarmontite	-24.40	-36.77	-12.37	Sb2O3
SeO2	-16.27	-16.15	0.12	SeO2
SeO3	-49.71	-28.67	21.04	SeO3
Siderite	-1.43	-11.67	-10.24	FeCO3
Smithsonite	-1.52	-11.52	-10.00	ZnCO3
Sphalerite	-60.08	-71.53	-11.45	ZnS
Spinel	-6.69	30.16	36.85	MgAl2O4
Stibnite	-227.43	-277.89	-50.46	Sb2S3

Sulfur	-54.44	-56.59	-2.14	S
Tenorite	-0.73	6.91	7.64	CuO
Thenardite	-8.46	-8.14	0.32	Na2SO4
Thermonatrite	-10.26	-9.63	0.64	Na2CO3:H2O
Tyuyamunite	-9.20	-5.12	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-19.37	1.72	21.08	U3O8
U3Sb4	-557.26	-404.88	152.38	U3Sb4
U4O9	-34.34	-37.36	-3.02	U4O9
UF4	-32.70	-62.24	-29.54	UF4
UF4:2.5H2O	-29.52	-62.24	-32.72	UF4:2.5H2O
UO2 (am)	-16.22	-15.29	0.93	UO2
UO2 (OH) 2 (beta)	-6.33	-0.71	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-27.13	-29.38	-2.25	UO2SeO4:4H2O
UO3	-8.41	-0.71	7.70	UO3
Uraninite	-10.62	-15.29	-4.67	UO2
USb2	-209.80	-180.22	29.58	USb2
V (OH) 3	-17.01	-9.42	7.59	V (OH) 3
V2O5	-15.09	-16.45	-1.36	V2O5
V3O5	-35.28	-33.45	1.84	V3O5
V4O7	-43.85	-36.67	7.19	V4O7
V6O13	-36.08	-96.94	-60.86	V6O13
Valentinite	-28.29	-36.77	-8.48	Sb2O3
VC12	-61.63	-42.75	18.87	VC12
VC13	-65.01	-41.58	23.43	VC13
VF4	-65.10	-50.17	14.93	VF4
Vmetal	-89.13	-45.10	44.03	V
VO	-36.07	-21.31	14.76	VO
VO (OH) 2	-8.37	-3.22	5.15	VO (OH) 2
VO2Cl	-21.79	-18.95	2.84	VO2Cl
VOC1	-31.29	-20.14	11.15	VOC1
VOC12	-37.42	-24.66	12.76	VOC12
VOSO4	-25.70	-22.09	3.61	VOSO4
Witherite	-2.54	-11.11	-8.57	BaCO3
Wurtzite	-62.58	-71.53	-8.95	ZnS
Zincite	-2.49	8.84	11.33	ZnO
Zincosite	-13.96	-10.03	3.93	ZnSO4
Zn (BO2) 2	-9.26	-0.97	8.29	Zn (BO2) 2
Zn (OH) 2	-3.36	8.84	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.63	8.84	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.91	8.84	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.69	8.84	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.89	8.84	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.69	-1.19	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-8.22	6.97	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.54	-1.89	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-30.13	-11.22	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-11.90	16.50	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-15.72	22.78	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.65	-12.60	7.05	ZnCl2
ZnCO3:1H2O	-1.26	-11.52	-10.26	ZnCO3:1H2O
ZnF2	-14.10	-14.63	-0.53	ZnF2
Znmetal	-40.74	-14.95	25.79	Zn
ZnMoO4	-3.64	-13.77	-10.13	ZnMoO4
ZnO (active)	-2.35	8.84	11.19	ZnO
ZnS (am)	-62.48	-71.53	-9.05	ZnS
ZnSb	-80.03	-69.02	11.01	ZnSb
ZnSe	-19.42	-33.82	-14.40	ZnSe
ZnSeO4:6H2O	-18.31	-19.83	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.39	-10.03	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 22.

```
-----
Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e-=e-
  log_k      0
EQUILIBRIUM_PHASES 101
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0
  MnSeO3 0 0
  O2(g) -32 10
  Otavite 0 0
  NiCO3 0 0
  NiMoO4 0 0
  Ni(OH)2 0 0
  Ni3(AsO4)2:8H2O 0 0
  PbMoO4 0 0
  Rutherfordine 0 0
  SbO2 0 0
  Schoepite 0 0
  Sepiolite 0 0
  SiO2(am-ppt) 0 0
  Tyuyamunite 0 0
  U3O8 0 0
  UO3 0 0
  UO2(OH)2(beta) 0 0
  ZnMoO4 0 0
USE solution 102
SAVE Solution 103 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 101
END
-----
TITLE
-----

Precipitate oversaturated phases in groundwater

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Beginning of batch-reaction calculations.
-----
```

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 102. Solution after simulation 21.
Using pure phase assemblage 101.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	1.599e-08	1.599e-08
Alunite	-2.05	-3.45	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.87	-6.23	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	1.607e-08	1.607e-08
Barite	0.00	-9.98	-9.98	0.000e+00	3.828e-07	3.828e-07
Brochantite	-7.29	7.93	15.22	0.000e+00	0	0.000e+00
Brucite	-5.75	11.09	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	2.619e-04
CaMoO4	-2.04	-9.99	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.97	-4.16	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	8.063e-04	8.063e-04
Carnotite	-4.44	-4.21	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.68	-3.84	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.25	-15.40	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	0.000e+00	6.075e-08	6.075e-08
Cu2Se(alpha)	-8.90	-54.70	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.89	-14.96	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.37	-6.50	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	2.653e-05	2.653e-05
Fluorite	-0.36	-10.86	-10.50	0.000e+00	0	0.000e+00
Gummite	-7.66	0.02	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.62	-6.23	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.91	-60.60	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.99	-8.10	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.42	-6.29	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.48	7.31	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.51	-9.81	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.66	-12.53	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.89	-14.03	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-5.475e-08
Otavite	-1.89	-13.89	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.48	-16.10	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.32	-19.82	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.22	-31.04	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.98	0.02	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-7.73	-3.65	4.08	0.000e+00	0	0.000e+00
U3O8	-18.93	2.15	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-5.60	0.02	5.61	0.000e+00	0	0.000e+00
UO3	-7.68	0.02	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.46	-13.58	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	5.152e-08	5.152e-08
Al	1.260e-06	1.260e-06
As	4.819e-11	4.818e-11
B	1.292e-05	1.292e-05
Ba	2.739e-07	2.739e-07
C	6.211e-03	6.210e-03
Ca	1.717e-03	1.716e-03
Cd	7.171e-09	7.170e-09
Cl	1.418e-03	1.418e-03
Co	1.359e-07	1.359e-07
Cr	5.526e-09	5.526e-09
Cu	2.352e-07	2.351e-07
F	1.456e-04	1.456e-04
Fe	3.297e-09	3.297e-09
Hg	2.043e-11	2.043e-11
K	1.444e-04	1.444e-04
Mg	9.021e-04	9.020e-04
Mn	1.332e-05	1.332e-05
Mo	1.717e-07	1.717e-07
Na	4.036e-03	4.035e-03
Ni	2.132e-07	2.131e-07
Pb	1.241e-08	1.241e-08
S	1.178e-03	1.178e-03
Sb	8.085e-09	8.084e-09
Se	5.859e-09	5.858e-09
U	1.298e-08	1.298e-08
V	2.820e-08	2.820e-08
Zn	5.020e-07	5.019e-07

-----Description of solution-----

	pH	=	7.191	Charge balance
	pe	=	5.582	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.217e-02	
	Mass of water (kg)	=	9.998e-01	
	Total alkalinity (eq/kg)	=	5.531e-03	
	Total CO2 (mol/kg)	=	6.211e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.373e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	5	
	Total H	=	1.110033e+02	
	Total O	=	5.552156e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.752e-07	1.562e-07	-6.756	-6.806	-0.050	(0)
H+	7.211e-08	6.444e-08	-7.142	-7.191	-0.049	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	5.152e-08					
AgCl	3.295e-08	3.295e-08	-7.482	-7.482	0.000	(0)
Ag+	1.425e-08	1.273e-08	-7.846	-7.895	-0.049	(0)
AgCl2-	4.140e-09	3.637e-09	-8.383	-8.439	-0.056	(0)
AgSO4-	1.791e-10	1.574e-10	-9.747	-9.803	-0.056	(0)
AgCl3-2	6.899e-12	4.109e-12	-11.161	-11.386	-0.225	(0)
AgF	3.879e-12	3.879e-12	-11.411	-11.411	0.000	(0)
AgOH	1.989e-13	1.989e-13	-12.701	-12.701	0.000	(0)
AgCl4-3	3.412e-14	1.063e-14	-13.467	-13.973	-0.506	(0)

	AgH2BO3	2.330e-14	2.330e-14	-13.633	-13.633	0.000	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgSeO3-	2.713e-15	2.384e-15	-14.567	-14.623	-0.056	(0)
	Ag (OH) 2-	3.456e-18	3.036e-18	-17.461	-17.518	-0.056	(0)
	Ag (SeO3) 2-3	1.995e-23	6.217e-24	-22.700	-23.206	-0.506	(0)
	Ag2MoO4	6.715e-24	6.715e-24	-23.173	-23.173	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.998	-72.998	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.133	-87.033	-0.900	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.760	-147.816	-0.056	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.963	-148.109	-0.146	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.076	-150.358	-0.282	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.398	-150.669	-0.271	(0)
Al		1.260e-06					
	Al (OH) 4-	1.064e-06	9.519e-07	-5.973	-6.021	-0.048	(0)
	AlF3	7.164e-08	7.164e-08	-7.145	-7.145	0.000	(0)
	AlF2+	5.229e-08	4.692e-08	-7.282	-7.329	-0.047	(0)
	Al (OH) 3	4.840e-08	4.840e-08	-7.315	-7.315	0.000	(0)
	Al (OH) 2+	1.731e-08	1.553e-08	-7.762	-7.809	-0.047	(0)
	AlF4-	4.868e-09	4.355e-09	-8.313	-8.361	-0.048	(0)
	AlF+2	1.499e-09	9.718e-10	-8.824	-9.012	-0.188	(0)
	AlOH+2	1.931e-10	1.252e-10	-9.714	-9.903	-0.188	(0)
	AlSO4+	4.307e-12	3.853e-12	-11.366	-11.414	-0.048	(0)
	Al+3	2.203e-12	8.013e-13	-11.657	-12.096	-0.439	(0)
	Al (SO4) 2-	2.859e-14	2.557e-14	-13.544	-13.592	-0.048	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-41.507	-42.013	-0.506	(0)
As (3)		3.075e-23					
	H3AsO3	3.047e-23	3.047e-23	-22.516	-22.516	0.000	(0)
	H2AsO3-	2.760e-25	2.425e-25	-24.559	-24.615	-0.056	(0)
	HAsO3-2	5.762e-30	3.432e-30	-29.239	-29.464	-0.225	(0)
	H4AsO3+	1.107e-30	9.729e-31	-29.956	-30.012	-0.056	(0)
	AsO3-3	6.587e-36	2.053e-36	-35.181	-35.688	-0.506	(0)
As (5)		4.819e-11					
	HAsO4-2	3.445e-11	2.052e-11	-10.463	-10.688	-0.225	(0)
	H2AsO4-	1.373e-11	1.206e-11	-10.862	-10.919	-0.056	(0)
	AsO4-3	3.231e-15	1.007e-15	-14.491	-14.997	-0.506	(0)
	H3AsO4	1.347e-16	1.351e-16	-15.871	-15.869	0.001	(0)
B		1.292e-05					
	H3BO3	1.278e-05	1.281e-05	-4.894	-4.892	0.001	(0)
	H2BO3-	1.300e-07	1.155e-07	-6.886	-6.938	-0.052	(0)
	CaH2BO3+	7.072e-09	6.280e-09	-8.150	-8.202	-0.052	(0)
	MgH2BO3+	2.319e-09	2.060e-09	-8.635	-8.686	-0.052	(0)
	BF (OH) 3-	6.983e-10	6.201e-10	-9.156	-9.208	-0.052	(0)
	NaH2BO3	6.562e-10	6.562e-10	-9.183	-9.183	0.000	(0)
	H5 (BO3) 2-	1.418e-12	1.259e-12	-11.848	-11.900	-0.052	(0)
	BaH2BO3+	6.793e-13	6.032e-13	-12.168	-12.220	-0.052	(0)
	BF2 (OH) 2-	5.836e-13	5.183e-13	-12.234	-12.285	-0.052	(0)
	AgH2BO3	2.330e-14	2.330e-14	-13.633	-13.633	0.000	(0)
	H8 (BO3) 3-	1.817e-15	1.614e-15	-14.741	-14.792	-0.052	(0)
	BF3OH-	1.775e-18	1.576e-18	-17.751	-17.802	-0.052	(0)
	BF4-	6.829e-23	6.064e-23	-22.166	-22.217	-0.052	(0)
Ba		2.739e-07					
	Ba+2	2.650e-07	1.690e-07	-6.577	-6.772	-0.195	(0)
	BaHCO3+	8.648e-09	7.775e-09	-8.063	-8.109	-0.046	(0)
	BaCO3	3.037e-10	3.037e-10	-9.517	-9.517	0.000	(0)
	BaH2BO3+	6.793e-13	6.032e-13	-12.168	-12.220	-0.052	(0)
	BaOH+	1.286e-13	1.153e-13	-12.891	-12.938	-0.048	(0)
C (4)		6.211e-03					
	HCO3-	5.367e-03	4.816e-03	-2.270	-2.317	-0.047	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	9.428e-05	8.476e-05	-4.026	-4.072	-0.046	(0)
	MgHCO3+	2.839e-05	2.535e-05	-4.547	-4.596	-0.049	(0)
	NaHCO3	9.712e-06	9.712e-06	-5.013	-5.013	0.000	(0)
	CO3-2	5.492e-06	3.504e-06	-5.260	-5.455	-0.195	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	1.499e-06	1.499e-06	-5.824	-5.824	0.000	(0)
	MnHCO3+	7.505e-07	6.725e-07	-6.125	-6.172	-0.048	(0)
	NaCO3-	2.607e-07	2.339e-07	-6.584	-6.631	-0.047	(0)
	CuCO3	2.056e-07	2.056e-07	-6.687	-6.687	0.000	(0)

		NiHCO3+	5.747e-08	5.048e-08	-7.241	-7.297	-0.056	(0)
		ZnCO3	4.809e-08	4.809e-08	-7.318	-7.318	0.000	(0)
		ZnHCO3+	4.135e-08	3.633e-08	-7.384	-7.440	-0.056	(0)
		CoHCO3+	2.518e-08	2.212e-08	-7.599	-7.655	-0.056	(0)
		NiCO3	1.111e-08	1.111e-08	-7.954	-7.954	0.000	(0)
		BaHCO3+	8.648e-09	7.775e-09	-8.063	-8.109	-0.046	(0)
		PbCO3	7.617e-09	7.617e-09	-8.118	-8.118	0.000	(0)
		UO2 (CO3) 2-2	7.056e-09	4.203e-09	-8.151	-8.376	-0.225	(0)
		UO2 (CO3) 3-4	5.864e-09	7.380e-10	-8.232	-9.132	-0.900	(0)
		CoCO3	3.497e-09	3.497e-09	-8.456	-8.456	0.000	(0)
		CuHCO3+	3.447e-09	3.029e-09	-8.463	-8.519	-0.056	(0)
		Cu (CO3) 2-2	3.255e-09	1.939e-09	-8.487	-8.712	-0.225	(0)
		PbHCO3+	2.946e-09	2.588e-09	-8.531	-8.587	-0.056	(0)
		BaCO3	3.037e-10	3.037e-10	-9.517	-9.517	0.000	(0)
		CdCO3	2.936e-10	2.936e-10	-9.532	-9.532	0.000	(0)
		Pb (CO3) 2-2	1.292e-10	7.696e-11	-9.889	-10.114	-0.225	(0)
		UO2CO3	6.012e-11	6.012e-11	-10.221	-10.221	0.000	(0)
		CdHCO3+	4.589e-11	4.031e-11	-10.338	-10.395	-0.056	(0)
		Cd (CO3) 2-2	1.280e-12	7.626e-13	-11.893	-12.118	-0.225	(0)
		FeHCO3+	7.911e-13	7.112e-13	-12.102	-12.148	-0.046	(0)
		HgCO3	1.337e-15	1.337e-15	-14.874	-14.874	0.000	(0)
		Hg (CO3) 2-2	2.488e-17	1.482e-17	-16.604	-16.829	-0.225	(0)
		HgHCO3+	1.827e-18	1.605e-18	-17.738	-17.795	-0.056	(0)
Ca	1.717e-03							
		Ca+2	1.482e-03	9.451e-04	-2.829	-3.025	-0.195	(0)
		CaSO4	1.341e-04	1.341e-04	-3.873	-3.873	0.000	(0)
		CaHCO3+	9.428e-05	8.476e-05	-4.026	-4.072	-0.046	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	1.396e-06	1.251e-06	-5.855	-5.903	-0.048	(0)
		CaH2BO3+	7.072e-09	6.280e-09	-8.150	-8.202	-0.052	(0)
		CaOH+	3.276e-09	2.946e-09	-8.485	-8.531	-0.046	(0)
Cd	7.171e-09							
		Cd+2	5.764e-09	3.677e-09	-8.239	-8.435	-0.195	(0)
		CdSO4	5.339e-10	5.339e-10	-9.273	-9.273	0.000	(0)
		CdCl+	5.066e-10	4.450e-10	-9.295	-9.352	-0.056	(0)
		CdCO3	2.936e-10	2.936e-10	-9.532	-9.532	0.000	(0)
		CdHCO3+	4.589e-11	4.031e-11	-10.338	-10.395	-0.056	(0)
		CdF+	8.045e-12	7.067e-12	-11.094	-11.151	-0.056	(0)
		Cd (SO4) 2-2	7.491e-12	4.462e-12	-11.125	-11.351	-0.225	(0)
		CdOH+	5.193e-12	4.562e-12	-11.285	-11.341	-0.056	(0)
		CdOHC1	2.852e-12	2.852e-12	-11.545	-11.545	0.000	(0)
		CdCl2	2.352e-12	2.352e-12	-11.629	-11.629	0.000	(0)
		Cd (CO3) 2-2	1.280e-12	7.626e-13	-11.893	-12.118	-0.225	(0)
		Cd (OH) 2	4.496e-15	4.496e-15	-14.347	-14.347	0.000	(0)
		CdCl3-	2.141e-15	1.881e-15	-14.669	-14.726	-0.056	(0)
		CdF2	1.710e-15	1.710e-15	-14.767	-14.767	0.000	(0)
		CdSeO4	8.640e-19	8.640e-19	-18.064	-18.064	0.000	(0)
		Cd2OH+3	2.697e-19	8.406e-20	-18.569	-19.075	-0.506	(0)
		Cd (OH) 3-	4.884e-20	4.291e-20	-19.311	-19.367	-0.056	(0)
		Cd (SeO3) 2-2	4.317e-22	2.571e-22	-21.365	-21.590	-0.225	(0)
		Cd (OH) 4-2	1.842e-27	1.097e-27	-26.735	-26.960	-0.225	(0)
		CdHS+	0.000e+00	0.000e+00	-79.288	-79.344	-0.056	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.058	-151.058	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-228.019	-228.075	-0.056	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-304.572	-304.797	-0.225	(0)
Cl	1.418e-03							
		Cl-	1.418e-03	1.268e-03	-2.848	-2.897	-0.049	(0)
		AgCl	3.295e-08	3.295e-08	-7.482	-7.482	0.000	(0)
		MnCl+	1.246e-08	1.117e-08	-7.904	-7.952	-0.048	(0)
		AgCl2-	4.140e-09	3.637e-09	-8.383	-8.439	-0.056	(0)
		ZnCl+	8.504e-10	7.594e-10	-9.070	-9.120	-0.049	(0)
		CdCl+	5.066e-10	4.450e-10	-9.295	-9.352	-0.056	(0)
		NiCl+	3.139e-10	2.757e-10	-9.503	-9.559	-0.056	(0)
		CoCl+	2.947e-10	2.589e-10	-9.531	-9.587	-0.056	(0)
		ZnOHC1	1.553e-10	1.553e-10	-9.809	-9.809	0.000	(0)
		PbCl+	3.702e-11	3.252e-11	-10.432	-10.488	-0.056	(0)
		CuCl+	2.242e-11	2.002e-11	-10.649	-10.699	-0.049	(0)
		CuCl	2.041e-11	2.041e-11	-10.690	-10.690	0.000	(0)

MnCl2	1.999e-11	1.999e-11	-10.699	-10.699	0.000	(0)
AgCl3-2	6.899e-12	4.109e-12	-11.161	-11.386	-0.225	(0)
CuCl2-	6.053e-12	5.406e-12	-11.218	-11.267	-0.049	(0)
CdOHC1	2.852e-12	2.852e-12	-11.545	-11.545	0.000	(0)
CdCl2	2.352e-12	2.352e-12	-11.629	-11.629	0.000	(0)
ZnCl2	1.526e-12	1.526e-12	-11.817	-11.817	0.000	(0)
PbCl2	1.841e-13	1.841e-13	-12.735	-12.735	0.000	(0)
HgClOH	1.115e-13	1.115e-13	-12.953	-12.953	0.000	(0)
HgCl2	5.124e-14	5.124e-14	-13.290	-13.290	0.000	(0)
AgCl4-3	3.412e-14	1.063e-14	-13.467	-13.973	-0.506	(0)
CuCl2	8.799e-15	8.799e-15	-14.056	-14.056	0.000	(0)
MnCl3-	7.789e-15	6.980e-15	-14.109	-14.156	-0.048	(0)
CuCl3-2	2.272e-15	1.465e-15	-14.644	-14.834	-0.191	(0)
CdCl3-	2.141e-15	1.881e-15	-14.669	-14.726	-0.056	(0)
NiCl2	1.760e-15	1.760e-15	-14.755	-14.755	0.000	(0)
ZnCl3-	1.720e-15	1.536e-15	-14.764	-14.814	-0.049	(0)
HgCl3-	7.393e-16	6.495e-16	-15.131	-15.187	-0.056	(0)
CrCl+2	1.810e-16	1.078e-16	-15.742	-15.967	-0.225	(0)
PbCl3-	1.058e-16	9.292e-17	-15.976	-16.032	-0.056	(0)
UO2Cl+	1.009e-17	8.860e-18	-16.996	-17.053	-0.056	(0)
HgCl+	9.182e-18	8.067e-18	-17.037	-17.093	-0.056	(0)
HgCl4-2	5.503e-18	3.277e-18	-17.259	-17.484	-0.225	(0)
ZnCl4-2	1.510e-18	9.735e-19	-17.821	-18.012	-0.191	(0)
CrOHC12	4.057e-19	4.057e-19	-18.392	-18.392	0.000	(0)
CuCl3-	1.166e-19	1.041e-19	-18.933	-18.983	-0.049	(0)
PbCl4-2	9.038e-20	5.383e-20	-19.044	-19.269	-0.225	(0)
FeCl+2	2.468e-20	1.592e-20	-19.608	-19.798	-0.191	(0)
CrCl2+	1.476e-20	1.297e-20	-19.831	-19.887	-0.056	(0)
VOCl+	6.842e-21	6.011e-21	-20.165	-20.221	-0.056	(0)
FeCl2+	1.006e-22	9.012e-23	-21.998	-22.045	-0.048	(0)
CuCl4-2	1.025e-24	6.612e-25	-23.989	-24.180	-0.191	(0)
CrO3Cl-	1.698e-26	1.492e-26	-25.770	-25.826	-0.056	(0)
FeCl3	1.142e-26	1.142e-26	-25.942	-25.942	0.000	(0)
CoCl+2	3.884e-35	2.313e-35	-34.411	-34.636	-0.225	(0)
UCl+3	0.000e+00	0.000e+00	-45.766	-46.273	-0.506	(0)
Co (2)	1.359e-07					
Co+2	9.913e-08	5.905e-08	-7.004	-7.229	-0.225	(0)
CoHCO3+	2.518e-08	2.212e-08	-7.599	-7.655	-0.056	(0)
CoSO4	7.298e-09	7.298e-09	-8.137	-8.137	0.000	(0)
CoCO3	3.497e-09	3.497e-09	-8.456	-8.456	0.000	(0)
CoCl+	2.947e-10	2.589e-10	-9.531	-9.587	-0.056	(0)
CoF+	2.578e-10	2.265e-10	-9.589	-9.645	-0.056	(0)
CoOH+	2.095e-10	1.840e-10	-9.679	-9.735	-0.056	(0)
Co (OH) 2	2.283e-12	2.283e-12	-11.641	-11.641	0.000	(0)
CoSeO4	3.734e-17	3.734e-17	-16.428	-16.428	0.000	(0)
Co (OH) 3-	8.101e-18	7.117e-18	-17.091	-17.148	-0.056	(0)
CoOOH-	2.033e-18	1.786e-18	-17.692	-17.748	-0.056	(0)
Co2OH+3	1.747e-18	5.446e-19	-17.758	-18.264	-0.506	(0)
Co (OH) 4-2	2.958e-25	1.762e-25	-24.529	-24.754	-0.225	(0)
Co4 (OH) 4+4	1.818e-30	2.288e-31	-29.740	-30.640	-0.900	(0)
Co (3)	1.195e-28					
CoOH+2	1.195e-28	7.120e-29	-27.922	-28.148	-0.225	(0)
Co+3	2.466e-34	8.970e-35	-33.608	-34.047	-0.439	(0)
CoCl+2	3.884e-35	2.313e-35	-34.411	-34.636	-0.225	(0)
Cr (2)	6.908e-26					
Cr+2	6.908e-26	4.115e-26	-25.161	-25.386	-0.225	(0)
Cr (3)	5.526e-09					
Cr (OH) 2+	4.859e-09	4.269e-09	-8.313	-8.370	-0.056	(0)
Cr (OH) +2	3.771e-10	2.246e-10	-9.424	-9.649	-0.225	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	3.302e-11	3.302e-11	-10.481	-10.481	0.000	(0)
CrF+2	2.121e-12	1.263e-12	-11.673	-11.898	-0.225	(0)
CrO2-	2.102e-12	1.847e-12	-11.677	-11.734	-0.056	(0)
Cr (OH) 4-	1.773e-12	1.558e-12	-11.751	-11.807	-0.056	(0)
Cr+3	2.109e-13	6.572e-14	-12.676	-13.182	-0.506	(0)
CrSO4+	1.082e-13	9.507e-14	-12.966	-13.022	-0.056	(0)
CrCl+2	1.810e-16	1.078e-16	-15.742	-15.967	-0.225	(0)
Cr2 (OH) 2SO4+2	1.125e-18	6.703e-19	-17.949	-18.174	-0.225	(0)

	CrOHC12	4.057e-19	4.057e-19	-18.392	-18.392	0.000	(0)
	Cr2(OH)2(SO4)2	2.466e-20	2.466e-20	-19.608	-19.608	0.000	(0)
	CrCl2+	1.476e-20	1.297e-20	-19.831	-19.887	-0.056	(0)
Cr (6)	2.542e-16						
	CrO4-2	2.183e-16	1.392e-16	-15.661	-15.856	-0.195	(0)
	HCrO4-	3.305e-17	2.904e-17	-16.481	-16.537	-0.056	(0)
	NaCrO4-	2.824e-18	2.481e-18	-17.549	-17.605	-0.056	(0)
	KCrO4-	7.569e-20	6.649e-20	-19.121	-19.177	-0.056	(0)
	H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
	CrO3SO4-2	5.929e-25	3.532e-25	-24.227	-24.452	-0.225	(0)
	CrO3Cl-	1.698e-26	1.492e-26	-25.770	-25.826	-0.056	(0)
	Cr2O7-2	4.910e-32	2.924e-32	-31.309	-31.534	-0.225	(0)
Cu (1)	4.103e-11						
	CuCl	2.041e-11	2.041e-11	-10.690	-10.690	0.000	(0)
	Cu+	1.456e-11	1.279e-11	-10.837	-10.893	-0.056	(0)
	CuCl2-	6.053e-12	5.406e-12	-11.218	-11.267	-0.049	(0)
	CuCl3-2	2.272e-15	1.465e-15	-14.644	-14.834	-0.191	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-150.680	-150.957	-0.276	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-151.421	-151.687	-0.266	(0)
Cu (2)	2.351e-07						
	CuCO3	2.056e-07	2.056e-07	-6.687	-6.687	0.000	(0)
	Cu+2	1.562e-08	9.966e-09	-7.806	-8.001	-0.195	(0)
	CuOH+	5.513e-09	4.923e-09	-8.259	-8.308	-0.049	(0)
	CuHCO3+	3.447e-09	3.029e-09	-8.463	-8.519	-0.056	(0)
	Cu(CO3)2-2	3.255e-09	1.939e-09	-8.487	-8.712	-0.225	(0)
	CuSO4	1.414e-09	1.414e-09	-8.849	-8.849	0.000	(0)
	Cu(OH)2	1.534e-10	1.534e-10	-9.814	-9.814	0.000	(0)
	CuF+	8.682e-11	7.627e-11	-10.061	-10.118	-0.056	(0)
	CuCl+	2.242e-11	2.002e-11	-10.649	-10.699	-0.049	(0)
	Cu2(OH)2+2	1.022e-12	6.088e-13	-11.990	-12.216	-0.225	(0)
	Cu(OH)3-	5.596e-14	4.916e-14	-13.252	-13.308	-0.056	(0)
	CuCl2	8.799e-15	8.799e-15	-14.056	-14.056	0.000	(0)
	CuCl3-	1.166e-19	1.041e-19	-18.933	-18.983	-0.049	(0)
	Cu(OH)4-2	1.015e-19	6.044e-20	-18.994	-19.219	-0.225	(0)
	CuCl4-2	1.025e-24	6.612e-25	-23.989	-24.180	-0.191	(0)
	Cu(HS)3-	0.000e+00	0.000e+00	-218.799	-218.855	-0.056	(0)
F	1.456e-04						
	F-	1.357e-04	1.213e-04	-3.867	-3.916	-0.049	(0)
	MgF+	7.825e-06	7.000e-06	-5.107	-5.155	-0.048	(0)
	CaF+	1.396e-06	1.251e-06	-5.855	-5.903	-0.048	(0)
	NaF	2.744e-07	2.744e-07	-6.562	-6.562	0.000	(0)
	AlF3	7.164e-08	7.164e-08	-7.145	-7.145	0.000	(0)
	AlF2+	5.229e-08	4.692e-08	-7.282	-7.329	-0.047	(0)
	MnF+	3.771e-08	3.379e-08	-7.424	-7.471	-0.048	(0)
	HF	1.156e-08	1.156e-08	-7.937	-7.937	0.000	(0)
	AlF4-	4.868e-09	4.355e-09	-8.313	-8.361	-0.048	(0)
	AlF+2	1.499e-09	9.718e-10	-8.824	-9.012	-0.188	(0)
	BF(OH)3-	6.983e-10	6.201e-10	-9.156	-9.208	-0.052	(0)
	ZnF+	6.570e-10	5.772e-10	-9.182	-9.239	-0.056	(0)
	NiF+	2.949e-10	2.590e-10	-9.530	-9.587	-0.056	(0)
	CoF+	2.578e-10	2.265e-10	-9.589	-9.645	-0.056	(0)
	CuF+	8.682e-11	7.627e-11	-10.061	-10.118	-0.056	(0)
	CdF+	8.045e-12	7.067e-12	-11.094	-11.151	-0.056	(0)
	PbF+	7.036e-12	6.181e-12	-11.153	-11.209	-0.056	(0)
	HF2-	5.980e-12	5.331e-12	-11.223	-11.273	-0.050	(0)
	AgF	3.879e-12	3.879e-12	-11.411	-11.411	0.000	(0)
	CrF+2	2.121e-12	1.263e-12	-11.673	-11.898	-0.225	(0)
	BF2(OH)2-	5.836e-13	5.183e-13	-12.234	-12.285	-0.052	(0)
	UO2F+	8.214e-14	7.216e-14	-13.085	-13.142	-0.056	(0)
	UO2F2	2.524e-14	2.524e-14	-13.598	-13.598	0.000	(0)
	PbF2	1.475e-14	1.475e-14	-13.831	-13.831	0.000	(0)
	CdF2	1.710e-15	1.710e-15	-14.767	-14.767	0.000	(0)
	UO2F3-	8.753e-16	7.689e-16	-15.058	-15.114	-0.056	(0)
	VO2F	4.129e-16	4.129e-16	-15.384	-15.384	0.000	(0)
	H2F2	3.581e-16	3.581e-16	-15.446	-15.446	0.000	(0)
	FeF2+	2.003e-16	1.795e-16	-15.698	-15.746	-0.048	(0)
	FeF+2	8.575e-17	5.530e-17	-16.067	-16.257	-0.191	(0)
	FeF3	3.071e-17	3.071e-17	-16.513	-16.513	0.000	(0)

VO2F2-	2.070e-17	1.818e-17	-16.684	-16.740	-0.056	(0)
PbF3-	3.863e-18	3.393e-18	-17.413	-17.469	-0.056	(0)
BF3OH-	1.775e-18	1.576e-18	-17.751	-17.802	-0.052	(0)
VOF+	1.400e-18	1.230e-18	-17.854	-17.910	-0.056	(0)
UO2F4-2	1.244e-18	7.408e-19	-17.905	-18.130	-0.225	(0)
VOF2	5.592e-20	5.592e-20	-19.252	-19.252	0.000	(0)
VO2F3-2	4.619e-20	2.751e-20	-19.335	-19.561	-0.225	(0)
PbF4-2	3.307e-22	1.970e-22	-21.481	-21.706	-0.225	(0)
VOF3-	2.739e-22	2.406e-22	-21.562	-21.619	-0.056	(0)
BF4-	6.829e-23	6.064e-23	-22.166	-22.217	-0.052	(0)
VO2F4-3	5.268e-24	1.642e-24	-23.278	-23.785	-0.506	(0)
HgF+	1.632e-24	1.434e-24	-23.787	-23.843	-0.056	(0)
Sb(OH)2F	3.804e-25	3.804e-25	-24.420	-24.420	0.000	(0)
SbOF	3.741e-25	3.741e-25	-24.427	-24.427	0.000	(0)
VOF4-2	1.978e-25	1.178e-25	-24.704	-24.929	-0.225	(0)
UF3+	6.791e-36	5.966e-36	-35.168	-35.224	-0.056	(0)
UF2+2	5.211e-37	3.104e-37	-36.283	-36.508	-0.225	(0)
UF4	7.933e-38	7.933e-38	-37.101	-37.101	0.000	(0)
UF+3	6.522e-40	2.033e-40	-39.186	-39.692	-0.506	(0)
UF5-	4.340e-40	3.813e-40	-39.362	-39.419	-0.056	(0)
UF6-2	0.000e+00	0.000e+00	-40.630	-40.855	-0.225	(0)
Fe(2)	2.235e-11					
Fe+2	1.969e-11	1.173e-11	-10.706	-10.931	-0.225	(0)
FeSO4	1.784e-12	1.784e-12	-11.749	-11.749	0.000	(0)
FeHCO3+	7.911e-13	7.112e-13	-12.102	-12.148	-0.046	(0)
FeOH+	8.140e-14	7.295e-14	-13.089	-13.137	-0.048	(0)
Fe(OH)2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe(OH)3-	4.989e-19	4.471e-19	-18.302	-18.350	-0.048	(0)
Fe(HS)2	0.000e+00	0.000e+00	-159.816	-159.816	0.000	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-236.640	-236.697	-0.056	(0)
Fe(3)	3.275e-09					
Fe(OH)2+	2.840e-09	2.549e-09	-8.547	-8.594	-0.047	(0)
Fe(OH)3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH)4-	6.930e-12	6.219e-12	-11.159	-11.206	-0.047	(0)
FeOH+2	6.503e-14	4.194e-14	-13.187	-13.377	-0.191	(0)
FeF2+	2.003e-16	1.795e-16	-15.698	-15.746	-0.048	(0)
FeF+2	8.575e-17	5.530e-17	-16.067	-16.257	-0.191	(0)
FeF3	3.071e-17	3.071e-17	-16.513	-16.513	0.000	(0)
FeSO4+	3.225e-18	2.890e-18	-17.491	-17.539	-0.048	(0)
Fe+3	1.143e-18	4.158e-19	-17.942	-18.381	-0.439	(0)
Fe(SO4)2-	4.357e-20	3.828e-20	-19.361	-19.417	-0.056	(0)
FeCl+2	2.468e-20	1.592e-20	-19.608	-19.798	-0.191	(0)
FeCl2+	1.006e-22	9.012e-23	-21.998	-22.045	-0.048	(0)
FeHSeO3+2	8.699e-24	5.181e-24	-23.061	-23.286	-0.225	(0)
Fe2(OH)2+4	4.627e-25	5.824e-26	-24.335	-25.235	-0.900	(0)
FeCl3	1.142e-26	1.142e-26	-25.942	-25.942	0.000	(0)
Fe3(OH)4+5	5.470e-32	2.145e-33	-31.262	-32.669	-1.406	(0)
H(0)	4.027e-29					
H2	2.014e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg(0)	2.022e-11					
Hg	2.022e-11	2.022e-11	-10.694	-10.694	0.000	(0)
Hg(1)	1.470e-23					
Hg2+2	7.351e-24	4.378e-24	-23.134	-23.359	-0.225	(0)
Hg(2)	2.139e-13					
HgClOH	1.115e-13	1.115e-13	-12.953	-12.953	0.000	(0)
HgCl2	5.124e-14	5.124e-14	-13.290	-13.290	0.000	(0)
Hg(OH)2	4.897e-14	4.911e-14	-13.310	-13.309	0.001	(0)
HgCO3	1.337e-15	1.337e-15	-14.874	-14.874	0.000	(0)
HgCl3-	7.393e-16	6.495e-16	-15.131	-15.187	-0.056	(0)
Hg(CO3)2-2	2.488e-17	1.482e-17	-16.604	-16.829	-0.225	(0)
HgCl+	9.182e-18	8.067e-18	-17.037	-17.093	-0.056	(0)
HgCl4-2	5.503e-18	3.277e-18	-17.259	-17.484	-0.225	(0)
HgOH+	2.258e-18	1.984e-18	-17.646	-17.703	-0.056	(0)
HgHCO3+	1.827e-18	1.605e-18	-17.738	-17.795	-0.056	(0)
Hg(OH)3-	1.099e-21	9.657e-22	-20.959	-21.015	-0.056	(0)
Hg+2	5.355e-22	3.190e-22	-21.271	-21.496	-0.225	(0)
HgSO4	5.173e-23	5.173e-23	-22.286	-22.286	0.000	(0)
HgF+	1.632e-24	1.434e-24	-23.787	-23.843	-0.056	(0)

	HgHS2-	0.000e+00	0.000e+00	-140.156	-140.213	-0.056	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.009	-141.009	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-141.505	-141.730	-0.225	(0)
K	1.444e-04						
	K+	1.438e-04	1.285e-04	-3.842	-3.891	-0.049	(0)
	KSO4-	6.282e-07	5.637e-07	-6.202	-6.249	-0.047	(0)
	KCrO4-	7.569e-20	6.649e-20	-19.121	-19.177	-0.056	(0)
Mg	9.021e-04						
	Mg+2	8.064e-04	5.144e-04	-3.093	-3.289	-0.195	(0)
	MgSO4	5.799e-05	5.799e-05	-4.237	-4.237	0.000	(0)
	MgHCO3+	2.839e-05	2.535e-05	-4.547	-4.596	-0.049	(0)
	MgF+	7.825e-06	7.000e-06	-5.107	-5.155	-0.048	(0)
	MgCO3	1.499e-06	1.499e-06	-5.824	-5.824	0.000	(0)
	MgOH+	3.553e-08	3.199e-08	-7.449	-7.495	-0.046	(0)
	MgH2BO3+	2.319e-09	2.060e-09	-8.635	-8.686	-0.052	(0)
Mn (2)	1.332e-05						
	Mn+2	1.175e-05	6.999e-06	-4.930	-5.155	-0.225	(0)
	MnSO4	7.709e-07	7.709e-07	-6.113	-6.113	0.000	(0)
	MnHCO3+	7.505e-07	6.725e-07	-6.125	-6.172	-0.048	(0)
	MnF+	3.771e-08	3.379e-08	-7.424	-7.471	-0.048	(0)
	MnCl+	1.246e-08	1.117e-08	-7.904	-7.952	-0.048	(0)
	MnOH+	3.064e-09	2.746e-09	-8.514	-8.561	-0.048	(0)
	MnCl2	1.999e-11	1.999e-11	-10.699	-10.699	0.000	(0)
	MnCl3-	7.789e-15	6.980e-15	-14.109	-14.156	-0.048	(0)
	MnSeO4	2.377e-15	2.377e-15	-14.624	-14.624	0.000	(0)
	Mn (OH) 3-	4.621e-19	4.141e-19	-18.335	-18.383	-0.048	(0)
	Mn (OH) 4-2	3.238e-25	2.088e-25	-24.490	-24.680	-0.191	(0)
	MnSe	0.000e+00	0.000e+00	-43.450	-43.450	0.000	(0)
Mn (3)	3.280e-25						
	Mn+3	3.280e-25	1.193e-25	-24.484	-24.923	-0.439	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-43.534	-43.725	-0.191	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.464	-47.515	-0.051	(0)
Mo	1.717e-07						
	MoO4-2	1.716e-07	1.094e-07	-6.766	-6.961	-0.195	(0)
	HMoO4-	1.597e-10	1.403e-10	-9.797	-9.853	-0.056	(0)
	H2MoO4	6.624e-14	6.624e-14	-13.179	-13.179	0.000	(0)
	Ag2MoO4	6.715e-24	6.715e-24	-23.173	-23.173	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-41.507	-42.013	-0.506	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-51.236	-53.262	-2.025	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-52.659	-54.066	-1.406	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-55.574	-56.474	-0.900	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-59.913	-60.419	-0.506	(0)
Na	4.036e-03						
	Na+	4.012e-03	3.586e-03	-2.397	-2.445	-0.049	(0)
	NaSO4-	1.329e-05	1.193e-05	-4.876	-4.923	-0.047	(0)
	NaHCO3	9.712e-06	9.712e-06	-5.013	-5.013	0.000	(0)
	NaF	2.744e-07	2.744e-07	-6.562	-6.562	0.000	(0)
	NaCO3-	2.607e-07	2.339e-07	-6.584	-6.631	-0.047	(0)
	NaH2BO3	6.562e-10	6.562e-10	-9.183	-9.183	0.000	(0)
	NaCrO4-	2.824e-18	2.481e-18	-17.549	-17.605	-0.056	(0)
Ni	2.132e-07						
	Ni+2	1.333e-07	8.503e-08	-6.875	-7.070	-0.195	(0)
	NiHCO3+	5.747e-08	5.048e-08	-7.241	-7.297	-0.056	(0)
	NiCO3	1.111e-08	1.111e-08	-7.954	-7.954	0.000	(0)
	NiSO4	1.051e-08	1.051e-08	-7.978	-7.978	0.000	(0)
	NiCl+	3.139e-10	2.757e-10	-9.503	-9.559	-0.056	(0)
	NiF+	2.949e-10	2.590e-10	-9.530	-9.587	-0.056	(0)
	NiOH+	1.903e-10	1.672e-10	-9.720	-9.777	-0.056	(0)
	Ni (OH) 2	2.075e-12	2.075e-12	-11.683	-11.683	0.000	(0)
	Ni (SO4) 2-2	3.619e-13	2.156e-13	-12.441	-12.666	-0.225	(0)
	NiCl2	1.760e-15	1.760e-15	-14.755	-14.755	0.000	(0)
	Ni (OH) 3-	3.689e-16	3.241e-16	-15.433	-15.489	-0.056	(0)
	NiSeO4	5.019e-17	5.019e-17	-16.299	-16.299	0.000	(0)
O (0)	2.478e-35						
	O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	1.241e-08						

PbCO3	7.617e-09	7.617e-09	-8.118	-8.118	0.000	(0)
PbHCO3+	2.946e-09	2.588e-09	-8.531	-8.587	-0.056	(0)
Pb+2	1.134e-09	7.232e-10	-8.946	-9.141	-0.195	(0)
PbOH+	3.230e-10	2.838e-10	-9.491	-9.547	-0.056	(0)
PbSO4	2.194e-10	2.194e-10	-9.659	-9.659	0.000	(0)
Pb (CO3) 2-2	1.292e-10	7.696e-11	-9.889	-10.114	-0.225	(0)
PbCl+	3.702e-11	3.252e-11	-10.432	-10.488	-0.056	(0)
PbF+	7.036e-12	6.181e-12	-11.153	-11.209	-0.056	(0)
Pb (OH) 2	1.402e-12	1.402e-12	-11.853	-11.853	0.000	(0)
Pb (SO4) 2-2	1.375e-12	8.190e-13	-11.862	-12.087	-0.225	(0)
PbCl2	1.841e-13	1.841e-13	-12.735	-12.735	0.000	(0)
PbF2	1.475e-14	1.475e-14	-13.831	-13.831	0.000	(0)
Pb (OH) 3-	2.492e-16	2.189e-16	-15.603	-15.660	-0.056	(0)
PbCl3-	1.058e-16	9.292e-17	-15.976	-16.032	-0.056	(0)
Pb2OH+3	1.044e-17	3.252e-18	-16.981	-17.488	-0.506	(0)
PbF3-	3.863e-18	3.393e-18	-17.413	-17.469	-0.056	(0)
PbCl4-2	9.038e-20	5.383e-20	-19.044	-19.269	-0.225	(0)
Pb (OH) 4-2	1.406e-20	8.376e-21	-19.852	-20.077	-0.225	(0)
PbF4-2	3.307e-22	1.970e-22	-21.481	-21.706	-0.225	(0)
Pb3 (OH) 4+2	4.760e-23	2.835e-23	-22.322	-22.547	-0.225	(0)
Pb4 (OH) 4+4	1.294e-27	1.628e-28	-26.888	-27.788	-0.900	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.706	-151.706	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.267	-229.324	-0.056	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.998	-72.998	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.861	-78.918	-0.056	(0)
H2S	0.000e+00	0.000e+00	-79.088	-79.088	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.288	-79.344	-0.056	(0)
S5-2	0.000e+00	0.000e+00	-80.867	-81.092	-0.225	(0)
S6-2	0.000e+00	0.000e+00	-81.383	-81.608	-0.225	(0)
S4-2	0.000e+00	0.000e+00	-81.463	-81.688	-0.225	(0)
S3-2	0.000e+00	0.000e+00	-82.268	-82.493	-0.225	(0)
S2-2	0.000e+00	0.000e+00	-83.285	-83.510	-0.225	(0)
S-2	0.000e+00	0.000e+00	-88.836	-89.027	-0.191	(0)
HgHS2-	0.000e+00	0.000e+00	-140.156	-140.213	-0.056	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.009	-141.009	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-141.505	-141.730	-0.225	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.760	-147.816	-0.056	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.963	-148.109	-0.146	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.076	-150.358	-0.282	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.398	-150.669	-0.271	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.401	-150.457	-0.056	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.680	-150.957	-0.276	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.058	-151.058	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.421	-151.687	-0.266	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.638	-151.638	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.706	-151.706	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.816	-159.816	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.799	-218.855	-0.056	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.219	-227.275	-0.056	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.019	-228.075	-0.056	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.267	-229.324	-0.056	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.839	-230.064	-0.225	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.640	-236.697	-0.056	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.572	-304.797	-0.225	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.428	-307.653	-0.225	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.451	-319.676	-0.225	(0)
S (6)	1.178e-03					
SO4-2	9.711e-04	6.195e-04	-3.013	-3.208	-0.195	(0)
CaSO4	1.341e-04	1.341e-04	-3.873	-3.873	0.000	(0)
MgSO4	5.799e-05	5.799e-05	-4.237	-4.237	0.000	(0)
NaSO4-	1.329e-05	1.193e-05	-4.876	-4.923	-0.047	(0)
MnSO4	7.709e-07	7.709e-07	-6.113	-6.113	0.000	(0)
KSO4-	6.282e-07	5.637e-07	-6.202	-6.249	-0.047	(0)
ZnSO4	3.232e-08	3.232e-08	-7.490	-7.490	0.000	(0)
NiSO4	1.051e-08	1.051e-08	-7.978	-7.978	0.000	(0)
CoSO4	7.298e-09	7.298e-09	-8.137	-8.137	0.000	(0)
HSO4-	4.361e-09	3.901e-09	-8.360	-8.409	-0.048	(0)

CuSO4	1.414e-09	1.414e-09	-8.849	-8.849	0.000	(0)
CdSO4	5.339e-10	5.339e-10	-9.273	-9.273	0.000	(0)
Zn (SO4) 2-2	2.928e-10	1.744e-10	-9.533	-9.758	-0.225	(0)
PbSO4	2.194e-10	2.194e-10	-9.659	-9.659	0.000	(0)
AgSO4-	1.791e-10	1.574e-10	-9.747	-9.803	-0.056	(0)
CrOHSO4	3.302e-11	3.302e-11	-10.481	-10.481	0.000	(0)
Cd (SO4) 2-2	7.491e-12	4.462e-12	-11.125	-11.351	-0.225	(0)
AlSO4+	4.307e-12	3.853e-12	-11.366	-11.414	-0.048	(0)
FeSO4	1.784e-12	1.784e-12	-11.749	-11.749	0.000	(0)
Pb (SO4) 2-2	1.375e-12	8.190e-13	-11.862	-12.087	-0.225	(0)
Ni (SO4) 2-2	3.619e-13	2.156e-13	-12.441	-12.666	-0.225	(0)
CrSO4+	1.082e-13	9.507e-14	-12.966	-13.022	-0.056	(0)
Al (SO4) 2-	2.859e-14	2.557e-14	-13.544	-13.592	-0.048	(0)
UO2SO4	4.041e-15	4.041e-15	-14.394	-14.394	0.000	(0)
UO2 (SO4) 2-2	5.540e-17	3.300e-17	-16.256	-16.481	-0.225	(0)
VO2SO4-	3.268e-17	2.871e-17	-16.486	-16.542	-0.056	(0)
FeSO4+	3.225e-18	2.890e-18	-17.491	-17.539	-0.048	(0)
Cr2 (OH) 2SO4+2	1.125e-18	6.703e-19	-17.949	-18.174	-0.225	(0)
VOSO4	2.884e-19	2.884e-19	-18.540	-18.540	0.000	(0)
Fe (SO4) 2-	4.357e-20	3.828e-20	-19.361	-19.417	-0.056	(0)
Cr2 (OH) 2 (SO4) 2	2.466e-20	2.466e-20	-19.608	-19.608	0.000	(0)
HgSO4	5.173e-23	5.173e-23	-22.286	-22.286	0.000	(0)
CrO3SO4-2	5.929e-25	3.532e-25	-24.227	-24.452	-0.225	(0)
VSO4+	3.042e-33	2.672e-33	-32.517	-32.573	-0.056	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.992	-40.992	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.459	-41.684	-0.225	(0)
Sb (3)	6.156e-20					
Sb (OH) 3	3.115e-20	3.115e-20	-19.507	-19.507	0.000	(0)
HSbO2	3.041e-20	3.041e-20	-19.517	-19.517	0.000	(0)
SbO2-	8.700e-25	7.643e-25	-24.060	-24.117	-0.056	(0)
Sb (OH) 4-	4.983e-25	4.377e-25	-24.303	-24.359	-0.056	(0)
Sb (OH) 2F	3.804e-25	3.804e-25	-24.420	-24.420	0.000	(0)
SbOF	3.741e-25	3.741e-25	-24.427	-24.427	0.000	(0)
Sb (OH) 2+	5.550e-26	4.875e-26	-25.256	-25.312	-0.056	(0)
SbO+	1.914e-26	1.681e-26	-25.718	-25.774	-0.056	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.451	-319.676	-0.225	(0)
Sb (5)	8.085e-09					
SbO3-	8.076e-09	7.095e-09	-8.093	-8.149	-0.056	(0)
Sb (OH) 6-	9.279e-12	8.293e-12	-11.032	-11.081	-0.049	(0)
SbO2+	9.623e-24	8.453e-24	-23.017	-23.073	-0.056	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.044	-40.101	-0.056	(0)
H2Se	0.000e+00	0.000e+00	-43.401	-43.401	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.450	-43.450	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.685	-47.910	-0.225	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.133	-87.033	-0.900	(0)
Se (4)	5.857e-09					
HSeO3-	5.368e-09	4.715e-09	-8.270	-8.326	-0.056	(0)
SeO3-2	4.891e-10	2.913e-10	-9.311	-9.536	-0.225	(0)
H2SeO3	1.296e-13	1.296e-13	-12.887	-12.887	0.000	(0)
AgSeO3-	2.713e-15	2.384e-15	-14.567	-14.623	-0.056	(0)
Cd (SeO3) 2-2	4.317e-22	2.571e-22	-21.365	-21.590	-0.225	(0)
Ag (SeO3) 2-3	1.995e-23	6.217e-24	-22.700	-23.206	-0.506	(0)
FeHSeO3+2	8.699e-24	5.181e-24	-23.061	-23.286	-0.225	(0)
Se (6)	1.981e-12					
SeO4-2	1.978e-12	1.262e-12	-11.704	-11.899	-0.195	(0)
MnSeO4	2.377e-15	2.377e-15	-14.624	-14.624	0.000	(0)
NiSeO4	5.019e-17	5.019e-17	-16.299	-16.299	0.000	(0)
ZnSeO4	4.662e-17	4.662e-17	-16.331	-16.331	0.000	(0)
CoSeO4	3.734e-17	3.734e-17	-16.428	-16.428	0.000	(0)
HSeO4-	4.640e-18	4.076e-18	-17.334	-17.390	-0.056	(0)
CdSeO4	8.640e-19	8.640e-19	-18.064	-18.064	0.000	(0)
Zn (SeO4) 2-2	1.001e-28	5.965e-29	-27.999	-28.224	-0.225	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.947	-59.453	-0.506	(0)
U (4)	6.532e-23					
U (OH) 5-	6.517e-23	5.725e-23	-22.186	-22.242	-0.056	(0)

U (OH) 4	1.545e-25	1.545e-25	-24.811	-24.811	0.000	(0)
U (OH) 3+	4.146e-29	3.642e-29	-28.382	-28.439	-0.056	(0)
U (OH) 2+2	1.823e-33	1.086e-33	-32.739	-32.964	-0.225	(0)
UF3+	6.791e-36	5.966e-36	-35.168	-35.224	-0.056	(0)
UF2+2	5.211e-37	3.104e-37	-36.283	-36.508	-0.225	(0)
UF4	7.933e-38	7.933e-38	-37.101	-37.101	0.000	(0)
UOH+3	1.058e-38	3.296e-39	-37.976	-38.482	-0.506	(0)
UF+3	6.522e-40	2.033e-40	-39.186	-39.692	-0.506	(0)
UF5-	4.340e-40	3.813e-40	-39.362	-39.419	-0.056	(0)
UF6-2	0.000e+00	0.000e+00	-40.630	-40.855	-0.225	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.992	-40.992	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.459	-41.684	-0.225	(0)
U+4	0.000e+00	0.000e+00	-44.176	-45.076	-0.900	(0)
UC1+3	0.000e+00	0.000e+00	-45.766	-46.273	-0.506	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-175.192	-179.749	-4.557	(0)
U (5)	7.837e-18					
UO2+	7.837e-18	6.885e-18	-17.106	-17.162	-0.056	(0)
U (6)	1.298e-08					
UO2 (CO3) 2-2	7.056e-09	4.203e-09	-8.151	-8.376	-0.225	(0)
UO2 (CO3) 3-4	5.864e-09	7.380e-10	-8.232	-9.132	-0.900	(0)
UO2CO3	6.012e-11	6.012e-11	-10.221	-10.221	0.000	(0)
UO2OH+	9.648e-14	8.476e-14	-13.016	-13.072	-0.056	(0)
UO2F+	8.214e-14	7.216e-14	-13.085	-13.142	-0.056	(0)
UO2F2	2.524e-14	2.524e-14	-13.598	-13.598	0.000	(0)
UO2+2	6.756e-15	4.310e-15	-14.170	-14.366	-0.195	(0)
UO2SO4	4.041e-15	4.041e-15	-14.394	-14.394	0.000	(0)
UO2F3-	8.753e-16	7.689e-16	-15.058	-15.114	-0.056	(0)
UO2 (SO4) 2-2	5.540e-17	3.300e-17	-16.256	-16.481	-0.225	(0)
UO2Cl+	1.009e-17	8.860e-18	-16.996	-17.053	-0.056	(0)
UO2F4-2	1.244e-18	7.408e-19	-17.905	-18.130	-0.225	(0)
(UO2) 2 (OH) 2+2	2.002e-20	1.192e-20	-19.699	-19.924	-0.225	(0)
(UO2) 3 (OH) 5+	2.129e-23	1.870e-23	-22.672	-22.728	-0.056	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-41.171	-41.227	-0.056	(0)
V+2	0.000e+00	0.000e+00	-41.706	-41.931	-0.225	(0)
V (3)	2.810e-14					
V (OH) 3	2.810e-14	2.810e-14	-13.551	-13.551	0.000	(0)
V (OH) 2+	1.332e-24	1.170e-24	-23.875	-23.932	-0.056	(0)
VOH+2	1.201e-27	7.154e-28	-26.920	-27.145	-0.225	(0)
V+3	2.932e-32	9.138e-33	-31.533	-32.039	-0.506	(0)
VSO4+	3.042e-33	2.672e-33	-32.517	-32.573	-0.056	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-52.119	-52.625	-0.506	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-52.591	-53.491	-0.900	(0)
V (4)	6.454e-17					
V (OH) 3+	5.995e-17	5.267e-17	-16.222	-16.278	-0.056	(0)
VO+2	2.838e-18	1.690e-18	-17.547	-17.772	-0.225	(0)
VOF+	1.400e-18	1.230e-18	-17.854	-17.910	-0.056	(0)
VOSO4	2.884e-19	2.884e-19	-18.540	-18.540	0.000	(0)
VOF2	5.592e-20	5.592e-20	-19.252	-19.252	0.000	(0)
VOC1+	6.842e-21	6.011e-21	-20.165	-20.221	-0.056	(0)
VOF3-	2.739e-22	2.406e-22	-21.562	-21.619	-0.056	(0)
VOF4-2	1.978e-25	1.178e-25	-24.704	-24.929	-0.225	(0)
H2V2O4+2	2.335e-28	1.391e-28	-27.632	-27.857	-0.225	(0)
V (5)	2.820e-08					
H2VO4-	2.665e-08	2.341e-08	-7.574	-7.631	-0.056	(0)
HVO4-2	1.532e-09	9.126e-10	-8.815	-9.040	-0.225	(0)
H3VO4	1.509e-11	1.509e-11	-10.821	-10.821	0.000	(0)
H3V2O7-	2.597e-12	2.282e-12	-11.585	-11.642	-0.056	(0)
HV2O7-3	2.324e-14	7.242e-15	-13.634	-14.140	-0.506	(0)
VO2+	2.172e-15	1.941e-15	-14.663	-14.712	-0.049	(0)
VO2F	4.129e-16	4.129e-16	-15.384	-15.384	0.000	(0)
VO4-3	2.277e-16	7.098e-17	-15.643	-16.149	-0.506	(0)
V3O9-3	4.316e-17	1.345e-17	-16.365	-16.871	-0.506	(0)
VO2SO4-	3.268e-17	2.871e-17	-16.486	-16.542	-0.056	(0)
V2O7-4	2.404e-17	3.025e-18	-16.619	-17.519	-0.900	(0)
VO2F2-	2.070e-17	1.818e-17	-16.684	-16.740	-0.056	(0)
VO2F3-2	4.619e-20	2.751e-20	-19.335	-19.561	-0.225	(0)
V4O12-4	1.044e-21	1.313e-22	-20.981	-21.882	-0.900	(0)

VO2F4-3	5.268e-24	1.642e-24	-23.278	-23.785	-0.506	(0)
HV10028-5	0.000e+00	0.000e+00	-53.759	-55.166	-1.406	(0)
V10028-6	0.000e+00	0.000e+00	-54.136	-56.161	-2.025	(0)
H2V10028-4	0.000e+00	0.000e+00	-56.249	-57.149	-0.900	(0)
Zn	5.020e-07					
Zn+2	3.739e-07	2.385e-07	-6.427	-6.622	-0.195	(0)
ZnCO3	4.809e-08	4.809e-08	-7.318	-7.318	0.000	(0)
ZnHCO3+	4.135e-08	3.633e-08	-7.384	-7.440	-0.056	(0)
ZnSO4	3.232e-08	3.232e-08	-7.490	-7.490	0.000	(0)
ZnOH+	4.241e-09	3.726e-09	-8.373	-8.429	-0.056	(0)
ZnCl+	8.504e-10	7.594e-10	-9.070	-9.120	-0.049	(0)
ZnF+	6.570e-10	5.772e-10	-9.182	-9.239	-0.056	(0)
Zn(SO4) 2-2	2.928e-10	1.744e-10	-9.533	-9.758	-0.225	(0)
ZnOHCl	1.553e-10	1.553e-10	-9.809	-9.809	0.000	(0)
Zn(OH) 2	9.224e-11	9.224e-11	-10.035	-10.035	0.000	(0)
ZnCl2	1.526e-12	1.526e-12	-11.817	-11.817	0.000	(0)
Zn(OH) 3-	8.220e-14	7.222e-14	-13.085	-13.141	-0.056	(0)
ZnCl3-	1.720e-15	1.536e-15	-14.764	-14.814	-0.049	(0)
ZnSeO4	4.662e-17	4.662e-17	-16.331	-16.331	0.000	(0)
ZnCl4-2	1.510e-18	9.735e-19	-17.821	-18.012	-0.191	(0)
Zn(OH) 4-2	7.540e-19	4.491e-19	-18.123	-18.348	-0.225	(0)
Zn(SeO4) 2-2	1.001e-28	5.965e-29	-27.999	-28.224	-0.225	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.401	-150.457	-0.056	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.638	-151.638	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.219	-227.275	-0.056	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.839	-230.064	-0.225	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.428	-307.653	-0.225	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.30	-87.52	-36.22	Ag2S
Ag2CO3	-10.16	-21.25	-11.09	Ag2CO3
Ag2CrO4	-20.06	-31.65	-11.59	Ag2CrO4
Ag2HVO4	-10.41	-8.93	1.48	Ag2HVO4
Ag2MoO4	-11.20	-22.75	-11.55	Ag2MoO4
Ag2O	-13.98	-1.41	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.18	-19.00	-4.82	Ag2SO4
Ag3AsO3	-26.79	-24.63	2.16	Ag3AsO3
Ag3AsO4	-15.20	-17.98	-2.79	Ag3AsO4
Ag3H2VO5	-14.81	-9.63	5.18	Ag3H2VO5
AgF:4H2O	-12.86	-11.81	1.05	AgF:4H2O
Agmetal	0.03	-13.48	-13.51	Ag
AgVO3	-9.00	-8.23	0.77	AgVO3
Al (OH) 3 (am)	-1.32	9.48	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.44	-45.07	2.37	Al2 (MoO4) 3
Al2O3	-0.70	18.95	19.65	Al2O3
Al4 (OH) 10SO4	-2.39	20.31	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.19	-6.39	4.80	AlAsO4:2H2O
AlOHSO4	-4.88	-8.11	-3.23	AlOHSO4
AlSb	-152.29	-86.66	65.62	AlSb
Alunite	-2.05	-3.45	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.56	-12.35	-7.79	PbSO4
Anhydrite	-1.87	-6.23	-4.36	CaSO4
Anilite	-58.19	-90.07	-31.88	Cu0.25Cu1.5S
Antlerite	-7.24	1.55	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-87.30	-90.06	-2.76	As4O6
Artinite	-7.25	2.35	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.44	-31.74	6.71	As2O5
Atacamite	-4.72	2.67	7.39	Cu2 (OH) 3Cl
Azurite	-3.63	-20.53	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.79	7.61	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-15.70	0.18	15.87	Ba2V2O7:2H2O

Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-25.15	7.79	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.96	-22.63	-9.67	BaCrO4
BaF2	-8.78	-14.60	-5.82	BaF2
BaMoO4	-6.77	-13.73	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.74	-7.91	1.83	BaSeO3
BaSeO4	-11.21	-18.67	-7.46	BaSeO4
Bianchite	-8.07	-9.83	-1.76	ZnSO4·6H2O
Birnessite	-8.67	9.42	18.09	MnO2
Bixbyite	-6.06	-6.70	-0.64	Mn2O3
BlaubleiI	-56.94	-81.11	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.96	-85.24	-27.28	Cu0.6Cu0.8S
Boehmite	0.90	9.48	8.58	AlOOH
Breithauptite	-57.53	-76.06	-18.52	NiSb
Brochantite	-7.29	7.93	15.22	Cu4(OH)6SO4
Brucite	-5.75	11.09	16.84	Mg(OH)2
Bunsenite	-5.13	7.31	12.45	NiO
Ca(VO3)2	-9.35	-3.69	5.66	Ca(VO3)2
Ca2V2O7	-9.83	7.67	17.50	Ca2V2O7
Ca2V2O7·2H2O	-13.88	7.67	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-19.97	2.33	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-19.93	19.03	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-20.83	19.03	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-301.18	-158.21	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-11.24	-29.15	-17.91	Hg2Cl2
CaMoO4	-2.04	-9.99	-7.95	CaMoO4
Carnotite	-4.44	-4.21	0.23	KUO2VO4
CaSeO3·2H2O	-6.97	-4.16	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.90	-14.92	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.68	-3.84	9.84	Cd(BO2)2
Cd(OH)2	-7.70	5.95	13.64	Cd(OH)2
Cd(OH)2(am)	-7.78	5.95	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-24.05	-17.34	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.31	0.25	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-22.20	6.20	28.40	Cd4(OH)6SO4
CdCl2	-13.57	-14.23	-0.66	CdCl2
CdCl2·1H2O	-12.54	-14.23	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.32	-14.23	-1.91	CdCl2·2.5H2O
CdF2	-15.05	-16.27	-1.21	CdF2
Cdmetal(alpha)	-33.11	-19.60	13.51	Cd
Cdmetal(gamma)	-33.22	-19.60	13.62	Cd
CdMoO4	-1.25	-15.40	-14.15	CdMoO4
CdOHCl	-7.68	-4.14	3.54	CdOHCl
CdSb	-77.07	-77.42	-0.35	CdSb
CdSe	-21.14	-41.34	-20.20	CdSe
CdSeO4·2H2O	-18.48	-20.33	-1.85	CdSeO4·2H2O
CdSO4	-11.47	-11.64	-0.17	CdSO4
CdSO4·1H2O	-9.92	-11.64	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-9.77	-11.64	-1.87	CdSO4·2.67H2O
Cerargyrite	-1.04	-10.79	-9.75	AgCl
Cerrusite	-1.47	-14.60	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-8.57	-11.21	-2.64	CuSO4·5H2O
Chalcocite	-58.59	-93.51	-34.92	Cu2S
Chalcopyrite	-127.12	-162.39	-35.27	CuFeS2
Cinnabar	-53.72	-99.42	-45.69	HgS
Claudetite	-87.00	-90.06	-3.06	As4O6
Clausthalite	-14.95	-42.05	-27.10	PbSe
Co(BO2)2	-29.70	-2.63	27.07	Co(BO2)2
Co(OH)2	-5.94	7.15	13.09	Co(OH)2
Co(OH)3	-10.17	-12.48	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-23.31	-10.28	13.03	Co3(AsO4)2
Co3O4	-7.30	-17.80	-10.50	Co3O4

CoCl2	-21.29	-13.02	8.27	CoCl2
CoCl2:6H2O	-15.56	-13.02	2.54	CoCl2:6H2O
CoCO3	-2.70	-12.68	-9.98	CoCO3
CoF2	-13.46	-15.06	-1.60	CoF2
CoF3	-44.34	-45.80	-1.46	CoF3
CoFe2O4	17.06	13.54	-3.53	CoFe2O4
CoMoO4	-6.43	-14.19	-7.76	CoMoO4
CoO	-6.43	7.15	13.59	CoO
CoS (alpha)	-71.52	-78.96	-7.44	CoS
CoS (beta)	-67.89	-78.96	-11.07	CoS
CoSe	-23.94	-40.14	-16.20	CoSe
CoSeO3	-9.68	-8.36	1.32	CoSeO3
CoSeO4:6H2O	-17.60	-19.13	-1.53	CoSeO4:6H2O
CoSO4	-13.24	-10.44	2.80	CoSO4
CoSO4:6H2O	-7.96	-10.44	-2.47	CoSO4:6H2O
Cotunnite	-10.15	-14.93	-4.78	PbCl2
Covellite	-57.43	-79.73	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.27	-31.18	14.09	CrCl2
CrCl3	-46.56	-31.44	15.11	CrCl3
CrF3	-23.16	-34.50	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.09	-42.93	-33.84	Na3AlF6
Cu (OH) 2	-2.29	6.38	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.75	18.46	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-58.58	-93.46	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.90	-54.70	-45.80	Cu2Se
Cu2SO4	-23.04	-24.99	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-18.70	-12.60	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-64.65	-107.25	-42.59	Cu3Sb
Cu3Se2	-32.12	-95.61	-63.49	Cu3Se2
CuCO3	-1.96	-13.46	-11.50	CuCO3
CuCrO4	-18.42	-23.86	-5.44	CuCrO4
CuF	-9.90	-14.81	-4.91	CuF
CuF2	-16.95	-15.83	1.12	CuF2
CuF2:2H2O	-11.28	-15.83	-4.55	CuF2:2H2O
Cumetal	-7.72	-16.47	-8.76	Cu
CuMoO4	-1.89	-14.96	-13.08	CuMoO4
CuOCuSO4	-15.13	-4.83	10.30	CuOCuSO4
Cupricferrite	6.77	12.76	5.99	CuFe2O4
Cuprite	-6.00	-7.40	-1.41	Cu2O
Cuprousferrite	8.41	-0.51	-8.92	CuFeO2
CuSe	-7.81	-40.91	-33.10	CuSe
CuSe2	-29.29	-62.66	-33.37	CuSe2
CuSeO3:2H2O	-9.65	-9.14	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.46	-19.90	-2.44	CuSeO4:5H2O
CuSO4	-14.15	-11.21	2.94	CuSO4
Diaspore	2.60	9.48	6.87	AlOOH
Djurleite	-58.68	-92.60	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.68	-17.22	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.13	-17.22	-17.09	CaMg (CO3) 2
Epsomite	-4.37	-6.50	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-7.87	-11.59	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.69	-9.14	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.54	-40.17	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-42.65	-46.39	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.08	-12.68	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.80	-17.89	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.99	-65.59	-18.60	FeSe2

FeS (ppt)	-79.71	-82.66	-2.95	FeS
FeSe	-32.84	-43.84	-11.00	FeSe
Fix_pe	-5.58	-5.58	0.00	e-
Fluorite	-0.36	-10.86	-10.50	CaF2
Galena	-66.90	-80.87	-13.97	PbS
Gibbsite	1.18	9.48	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.82	-9.83	-2.01	ZnSO4:7H2O
Greenockite	-65.80	-80.16	-14.36	CdS
Greigite	-289.57	-334.60	-45.03	Fe3S4
Gummite	-7.66	0.02	7.67	UO3
Gypsum	-1.62	-6.23	-4.61	CaSO4:2H2O
H-Jarosite	-13.51	-25.61	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.47	-21.34	-12.88	H2MoO4
H2S (g)	-78.10	-86.11	-8.01	H2S
H2Se (g)	-42.33	-47.29	-4.96	H2Se
Halite	-6.94	-5.34	1.60	NaCl
Hausmannite	-7.81	53.22	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.49	22.40	22.89	FeAl2O4
Hg (CH3) 2 (g)	-183.63	-257.34	-73.71	Hg (CH3) 2
Hg (g)	-9.39	-17.26	-7.87	Hg
Hg (OH) 2	-9.81	-13.31	-3.50	Hg (OH) 2
Hg2 (g)	-19.57	-34.52	-14.96	Hg2
Hg2 (OH) 2	-14.24	-8.98	5.26	Hg2 (OH) 2
Hg2CO3	-12.76	-28.81	-16.05	Hg2CO3
Hg2CrO4	-30.51	-39.21	-8.70	Hg2CrO4
Hg2F2	-20.83	-31.19	-10.36	Hg2F2
Hg2S	-83.41	-95.09	-11.68	Hg2S
Hg2SeO3	-19.84	-24.49	-4.66	Hg2SeO3
Hg2SO4	-20.44	-26.57	-6.13	Hg2SO4
Hg3O2CO3	-30.08	-59.76	-29.68	Hg3O2CO3
HgCl (g)	-34.07	-14.58	19.50	HgCl
HgCl2	-12.22	-33.48	-21.26	HgCl2
HgF (g)	-48.27	-15.60	32.68	HgF
HgF2 (g)	-48.09	-35.52	12.57	HgF2
Hgmetal (l)	-3.81	-17.26	-13.45	Hg
HgSe	-4.91	-60.60	-55.69	HgSe
HgSeO3	-16.40	-28.83	-12.43	HgSeO3
HgSO4	-21.48	-30.90	-9.42	HgSO4
Huntite	-4.74	-34.71	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.18	-23.95	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.12	-23.88	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-17.23	-22.40	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-7.51	-22.31	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.63	-53.88	-17.24	K2Cr2O7
K2CrO4	-23.12	-23.64	-0.51	K2CrO4
K2MoO4	-18.00	-14.74	3.26	K2MoO4
K2SeO4	-18.95	-19.68	-0.73	K2SeO4
Langite	-9.56	7.93	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.67	-7.11	-0.43	PbO:PbSO4
Laurionite	-5.47	-4.85	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.45	5.24	12.69	PbO
Mackinawite	-79.06	-82.66	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.62	17.48	16.86	Fe2MgO4
Magnesite	-1.28	-8.74	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-1.77	-7.08	-5.31	Cu2 (OH) 2CO3
Manganite	-3.34	22.00	25.34	MnOOH
Massicot	-7.65	5.24	12.89	PbO
Matlockite	-6.98	-15.95	-8.97	PbClF
Melanothallite	-20.05	-13.80	6.26	CuCl2
Melanterite	-11.93	-14.14	-2.21	FeSO4:7H2O
Metacinnabar	-54.32	-99.42	-45.09	HgS
Mg (OH) 2 (active)	-7.70	11.09	18.79	Mg (OH) 2

Mg (VO3) 2	-15.23	-3.95	11.28	Mg (VO3) 2
Mg2Sb3	-277.06	-202.37	74.68	Mg2Sb3
Mg2V2O7	-19.22	7.14	26.36	Mg2V2O7
MgCr2O4	-7.47	8.74	16.20	MgCr2O4
MgCrO4	-24.53	-19.14	5.38	MgCrO4
MgF2	-2.99	-11.12	-8.13	MgF2
MgMoO4	-8.40	-10.25	-1.85	MgMoO4
MgSeO3:6H2O	-7.48	-4.43	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.99	-15.19	-1.20	MgSeO4:6H2O
Minium	-32.25	41.27	73.52	Pb3O4
Mirabilite	-6.99	-8.10	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-10.72	-5.82	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-53.76	-59.47	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.54	-90.46	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-16.56	-4.06	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.66	-10.95	2.72	MnCl2:4H2O
MnS (grn)	-77.05	-76.88	0.17	MnS
MnS (pnk)	-80.22	-76.88	3.34	MnS
MnSb	-96.58	-99.49	-2.91	MnSb
MnSe	-41.56	-38.06	3.50	MnSe
MnSeO3	-7.42	-6.29	1.13	MnSeO3
MnSeO3:2H2O	-7.27	-6.29	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.00	-17.05	-2.05	MnSeO4:5H2O
MnSO4	-10.95	-8.36	2.58	MnSO4
Monteponite	-9.16	5.95	15.10	CdO
Montroydite	-9.67	-13.31	-3.64	HgO
MoO3	-13.34	-21.34	-8.00	MoO3
Morenosite	-8.13	-10.28	-2.14	NiSO4:7H2O
MoS2	-148.84	-219.10	-70.26	MoS2
Na-Jarosite	-9.66	-20.86	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.09	-50.98	-9.90	Na2Cr2O7
Na2CrO4	-23.68	-20.75	2.93	Na2CrO4
Na2Mo2O7	-16.60	-33.19	-16.60	Na2Mo2O7
Na2MoO4	-13.34	-11.85	1.49	Na2MoO4
Na2MoO4:2H2O	-13.08	-11.85	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.33	-6.03	10.30	Na2SeO3:5H2O
Na2SeO4	-18.07	-16.79	1.28	Na2SeO4
Na3Sb	-176.36	-81.90	94.45	Na3Sb
Na3VO4	-29.97	6.71	36.68	Na3VO4
Na4V2O7	-33.46	3.94	37.40	Na4V2O7
Nantokite	-7.06	-13.79	-6.73	CuCl
NaSb	-89.02	-65.85	23.17	NaSb
Natron	-9.04	-10.35	-1.31	Na2CO3:10H2O
NaVO3	-6.63	-2.78	3.86	NaVO3
Nesquehonite	-4.07	-8.74	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.48	7.31	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-25.51	-9.81	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-20.35	11.65	32.00	Ni4 (OH) 6SO4
NiCO3	-5.66	-12.53	-6.87	NiCO3
NiMoO4	-2.89	-14.03	-11.14	NiMoO4
NiS (alpha)	-73.20	-78.80	-5.60	NiS
NiS (beta)	-67.70	-78.80	-11.10	NiS
NiS (gamma)	-66.00	-78.80	-12.80	NiS
NiSe	-22.28	-39.98	-17.70	NiSe
NiSeO3:2H2O	-11.02	-8.21	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.45	-18.97	-1.52	NiSeO4:6H2O
Nsutite	-8.08	9.42	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-242.29	-303.36	-61.07	As2S3
Otavite	-1.89	-13.89	-12.00	CdCO3
Pb (BO2) 2	-11.06	-4.54	6.52	Pb (BO2) 2
Pb (OH) 2	-2.91	5.24	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-57.85	-66.61	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.40	0.39	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.71	10.48	26.19	Pb2O (OH) 2
Pb2O3	-25.01	36.03	61.04	Pb2O3
Pb2OCO3	-8.80	-9.36	-0.56	Pb2OCO3
Pb2V2O7	-2.66	-4.56	-1.90	Pb2V2O7

Pb3(AsO4)2	-21.82	-16.02	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.46	0.68	6.14	Pb3(VO4)2
Pb3O2CO3	-15.13	-4.11	11.02	Pb3O2CO3
Pb3O2SO4	-12.55	-1.87	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.73	3.37	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.50	3.37	21.88	Pb4O3SO4
PbCrO4	-12.40	-25.00	-12.60	PbCrO4
PbF2	-9.53	-16.97	-7.44	PbF2
Pbmetal	-24.55	-20.30	4.25	Pb
PbMoO4	-0.48	-16.10	-15.62	PbMoO4
PbO:0.3H2O	-7.74	5.24	12.98	PbO:0.33H2O
PbSeO4	-14.20	-21.04	-6.84	PbSeO4
Periclase	-10.49	11.09	21.58	MgO
Phosgenite	-9.72	-29.53	-19.81	PbCl2:PbCO3
Plattnerite	-18.81	30.79	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.71	-143.22	-18.51	FeS2
Pyrochroite	-5.97	9.23	15.19	Mn(OH)2
Pyrolusite	-6.61	34.77	41.38	MnO2
Realgar	-101.65	-121.40	-19.75	AsS
Retgersite	-8.24	-10.28	-2.04	NiSO4:6H2O
Rhodochrosite	-0.03	-10.61	-10.58	MnCO3
Rutherfordine	-5.32	-19.82	-14.50	UO2CO3
Sb(OH)3	-12.40	-19.51	-7.11	Sb(OH)3
Sb2O4	-16.87	-13.47	3.40	Sb2O4
Sb2O5	-26.88	-36.54	-9.67	Sb2O5
Sb2Se3	-113.13	-180.89	-67.76	Sb2Se3
Sb4O6(cubic)	-59.76	-78.03	-18.26	Sb4O6
Sb4O6(orth)	-60.12	-78.03	-17.90	Sb4O6
SbCl3	-50.34	-49.77	0.57	SbCl3
SbF3	-42.60	-52.83	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.22	-31.04	-27.82	SbO2
Schoepite	-5.98	0.02	5.99	UO2(OH)2:H2O
Semetal(am)	-14.64	-21.75	-7.11	Se
Semetal(hex)	-14.04	-21.75	-7.71	Se
Senarmontite	-26.65	-39.01	-12.37	Sb2O3
SeO2	-15.64	-15.52	0.12	SeO2
SeO3	-47.32	-26.28	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-2.08	-12.08	-10.00	ZnCO3
Sphalerite	-66.90	-78.35	-11.45	ZnS
Spinel	-6.80	30.04	36.85	MgAl2O4
Stibnite	-246.88	-297.34	-50.46	Sb2S3
Sulfur	-58.42	-60.56	-2.14	S
Tenorite	-1.26	6.38	7.64	CuO
Thenardite	-8.42	-8.10	0.32	Na2SO4
Thermonatrite	-10.98	-10.35	0.64	Na2CO3:H2O
Tyuyamunite	-7.73	-3.65	4.08	Ca(UO2)2(VO4)2
U3O8	-18.93	2.15	21.08	U3O8
U3Sb4	-585.88	-433.50	152.38	U3Sb4
U4O9	-36.69	-39.71	-3.02	U4O9
UF4	-31.20	-60.74	-29.54	UF4
UF4:2.5H2O	-28.02	-60.74	-32.72	UF4:2.5H2O
UO2(am)	-17.25	-16.31	0.93	UO2
UO2(OH)2(beta)	-5.60	0.02	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.01	-26.26	-2.25	UO2SeO4:4H2O
UO3	-7.68	0.02	7.70	UO3
Uraninite	-11.64	-16.31	-4.67	UO2
USb2	-221.84	-192.27	29.58	USb2
V(OH)3	-18.06	-10.47	7.59	V(OH)3
V2O5	-13.68	-15.04	-1.36	V2O5
V3O5	-37.55	-35.72	1.84	V3O5
V4O7	-46.29	-39.11	7.19	V4O7
V6O13	-35.36	-96.22	-60.86	V6O13
Valentinite	-30.53	-39.01	-8.48	Sb2O3
VC12	-62.29	-43.41	18.87	VC12
VC13	-64.16	-40.73	23.43	VC13

VF4	-62.75	-47.82	14.93	VF4
Vmetal	-92.81	-48.78	44.03	V
VO	-38.00	-23.24	14.76	VO
VO(OH)2	-8.54	-3.39	5.15	VO(OH)2
VO2Cl	-20.45	-17.61	2.84	VO2Cl
VOC1	-31.71	-20.55	11.15	VOC1
VOC12	-36.33	-23.57	12.76	VOC12
VOSO4	-24.59	-20.98	3.61	VOSO4
Witherite	-3.66	-12.23	-8.57	BaCO3
Wurtzite	-69.40	-78.35	-8.95	ZnS
Zincite	-3.57	7.76	11.33	ZnO
Zincosite	-13.76	-9.83	3.93	ZnSO4
Zn(BO2)2	-10.32	-2.03	8.29	Zn(BO2)2
Zn(OH)2	-4.44	7.76	12.20	Zn(OH)2
Zn(OH)2(am)	-4.72	7.76	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.00	7.76	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.78	7.76	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.98	7.76	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.57	-2.07	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.76	5.43	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-22.11	-8.46	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.82	-11.90	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-14.95	13.45	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.88	18.62	38.50	Zn5(OH)8Cl2
ZnCl2	-19.47	-12.42	7.05	ZnCl2
ZnCO3:1H2O	-1.82	-12.08	-10.26	ZnCO3:1H2O
ZnF2	-13.92	-14.45	-0.53	ZnF2
Znmetal	-43.57	-17.79	25.79	Zn
ZnMoO4	-3.46	-13.58	-10.13	ZnMoO4
ZnO(active)	-3.43	7.76	11.19	ZnO
ZnS(am)	-69.30	-78.35	-9.05	ZnS
ZnSb	-86.62	-75.61	11.01	ZnSb
ZnSe	-25.13	-39.53	-14.40	ZnSe
ZnSeO4:6H2O	-17.00	-18.52	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.19	-9.83	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 23.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 101
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 101
USE Surface 101
USE Solution 103
SAVE Solution 104  #Initial Stage 1 groundwater after Mineral Precipitation
and Sorption Loss
END
-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 101.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.271e-15 Surface + diffuse layer charge, eq
7.764e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.703e+00 m² for 2.653e-05 moles of Ferrihydrite

Water in diffuse layer: 1.703e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is

+1).

Element	Moles
C	4.3509e-11
Ca	5.3923e-13
Cl	8.7128e-10
H	1.2835e-10
K	8.5542e-13
Mg	8.3544e-14
N	3.5273e-09
Na	3.6243e-12
O	1.5721e-07
S	3.6633e-08

Hfo_s

1.326e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.867e-08	0.668	8.867e-08	-7.052
Hfo_sOH	4.349e-08	0.328	4.349e-08	-7.362
Hfo_sO-	4.886e-10	0.004	4.886e-10	-9.311
Hfo_sOHCa+2	1.619e-12	0.000	1.619e-12	-11.791

Hfo_w

5.306e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.452e-06	0.462	2.452e-06	-5.611
Hfo_wOH	1.202e-06	0.227	1.202e-06	-5.920
Hfo_wSO4-	8.280e-07	0.156	8.280e-07	-6.082
Hfo_wOHSO4-2	8.103e-07	0.153	8.103e-07	-6.091
Hfo_wO-	1.351e-08	0.003	1.351e-08	-7.869
Hfo_wOMg+	1.909e-14	0.000	1.909e-14	-13.719
Hfo_wOCa+	6.478e-15	0.000	6.478e-15	-14.189

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.

WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),

but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 103. Solution after simulation 22.
 Using surface 101.
 Using pure phase assemblage 101. Pure-phase assemblage after simulation 22.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	1.599e-08	1.299e-08	-2.998e-09
Alunite	-2.05	-3.45	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.87	-6.23	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	1.607e-08	8.014e-09	-8.056e-09
Barite	0.00	-9.98	-9.98	3.828e-07	4.072e-07	2.443e-08
Brochantite	-9.08	6.14	15.22	0.000e+00	0	0.000e+00
Brucite	-5.75	11.09	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	1.990e-06
CaMoO4	-2.04	-9.99	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-7.07	-4.26	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	8.063e-04	8.054e-04	-9.159e-07
Carnotite	-6.04	-5.81	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.68	-3.84	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.26	-15.41	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.075e-08	2.322e-09	-5.843e-08
Cu2Se(alpha)	-9.89	-55.69	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-2.34	-15.42	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.37	-6.50	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.653e-05	2.653e-05	-1.117e-12
Fluorite	-0.36	-10.86	-10.50	0.000e+00	0	0.000e+00
Gummite	-7.66	0.02	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.62	-6.23	-4.61	0.000e+00	0	0.000e+00
HgSe	-5.00	-60.70	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.99	-8.10	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.52	-6.39	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.49	7.30	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.52	-9.82	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.66	-12.53	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.90	-14.04	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.495e-09
Otavite	-1.89	-13.89	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-1.16	-16.78	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.32	-19.82	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.22	-31.04	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.98	0.02	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-10.94	-6.86	4.08	0.000e+00	0	0.000e+00
U3O8	-18.93	2.15	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-5.60	0.02	5.61	0.000e+00	0	0.000e+00
UO3	-7.68	0.02	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.49	-13.61	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

3.708e-19 Surface + diffuse layer charge, eq
 2.040e-07 Surface charge, eq
 1.156e-02 sigma, C/m²
 4.129e-02 psi, V
 -1.607e+00 -F*psi/RT
 2.005e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.703e+00 m² for 2.653e-05 moles of Ferrihydrite

Water in diffuse layer: 1.703e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.240e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.171e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	9.2704e-13
Al	3.2287e-11
As	1.9236e-15
B	2.2133e-10
Ba	1.8129e-12
C	1.6183e-07
Ca	1.2996e-08
Cd	5.7431e-14
Cl	3.9144e-08
Co	1.0945e-12
Cr	5.8484e-14
Cu	1.3793e-12
F	3.8530e-09
Fe	3.7499e-14
H	1.7414e-07
Hg	3.4784e-16
K	1.5289e-09
Mg	6.6236e-09
Mn	9.7602e-11
Mo	7.5588e-12
N	8.3068e-14
Na	4.2714e-08
Ni	1.8194e-12
O	6.7492e-07
Pb	3.8353e-14
S	4.7151e-08
Sb	2.2315e-13
Se	1.3654e-13
U	1.0052e-12
V	1.9999e-14
Zn	4.0801e-12

Hfo_s

1.326e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCrOH+	1.169e-07	0.881	1.169e-07	-6.932
Hfo_sOPb+	6.582e-09	0.050	6.583e-09	-8.182
Hfo_sOMn+	2.680e-09	0.020	2.681e-09	-8.572
Hfo_sOCu+	2.658e-09	0.020	2.658e-09	-8.575
Hfo_sOZn+	2.128e-09	0.016	2.129e-09	-8.672
Hfo_sOHCa+2	1.099e-09	0.008	1.099e-09	-8.959
Hfo_sOH	3.099e-10	0.002	3.100e-10	-9.509
Hfo_sONi+	1.895e-10	0.001	1.895e-10	-9.722
Hfo_sOH2+	7.809e-11	0.001	7.810e-11	-10.107
Hfo_sO-	2.818e-11	0.000	2.818e-11	-10.550
Hfo_sOCu+	1.964e-11	0.000	1.965e-11	-10.707
Hfo_sOCd+	1.037e-11	0.000	1.037e-11	-10.984
Hfo_sOAg	1.302e-12	0.000	1.302e-12	-11.885
Hfo_sOHBa+2	6.067e-13	0.000	6.068e-13	-12.217

Hfo_sOFe+	5.669e-14	0.000	5.670e-14	-13.246
Hfo_sOHg+	1.753e-17	0.000	1.753e-17	-16.756

Hfo_w

	5.306e-06	moles	[0.2 mol/(mol Ferrihydrite)]	
Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH	3.381e-06	0.637	3.381e-06	-5.471
Hfo_wOH2+	8.519e-07	0.161	8.520e-07	-6.070
Hfo_wOHSO4-2	3.216e-07	0.061	3.217e-07	-6.493
Hfo_wO-	3.074e-07	0.058	3.074e-07	-6.512
Hfo_wOCu+	1.487e-07	0.028	1.487e-07	-6.828
Hfo_wOMg+	1.358e-07	0.026	1.359e-07	-6.867
Hfo_wSO4-	4.063e-08	0.008	4.063e-08	-7.391
Hfo_wOHVO4-3	2.750e-08	0.005	2.750e-08	-7.561
Hfo_wOZn+	2.431e-08	0.005	2.432e-08	-7.614
Hfo_wOMn+	2.322e-08	0.004	2.323e-08	-7.634
Hfo_wOHAsO4-3	1.609e-08	0.003	1.609e-08	-7.793
Hfo_wOCa+	1.404e-08	0.003	1.405e-08	-7.852
Hfo_wOPb+	3.207e-09	0.001	3.208e-09	-8.494
Hfo_wOHSeO3-2	2.909e-09	0.001	2.909e-09	-8.536
Hfo_wONi+	2.788e-09	0.001	2.788e-09	-8.555
Hfo_wOHMoO4-2	2.277e-09	0.000	2.277e-09	-8.643
Hfo_wSeO3-	1.245e-09	0.000	1.245e-09	-8.905
Hfo_wOCu+	6.039e-10	0.000	6.040e-10	-9.219
Hfo_wMoO4-	3.705e-10	0.000	3.705e-10	-9.431
Hfo_wH2BO3	1.806e-10	0.000	1.807e-10	-9.743
Hfo_wOCd+	4.827e-11	0.000	4.828e-11	-10.316
Hfo_wHAsO4-	2.287e-11	0.000	2.288e-11	-10.641
Hfo_wOAg	3.736e-12	0.000	3.737e-12	-11.428
Hfo_wOFe+	3.902e-13	0.000	3.903e-13	-12.409
Hfo_wH2AsO4	1.865e-13	0.000	1.865e-13	-12.729
Hfo_wOBa+	1.120e-13	0.000	1.121e-13	-12.951
Hfo_wOHg+	9.366e-15	0.000	9.367e-15	-14.028
Hfo_wOHSbO(OH) 4-	2.791e-15	0.000	2.792e-15	-14.554
Hfo_wOHSeO4-2	5.375e-16	0.000	5.376e-16	-15.270
Hfo_wSbO(OH) 4	4.542e-16	0.000	4.543e-16	-15.343
Hfo_wOHCrO4-2	9.300e-17	0.000	9.302e-17	-16.031
Hfo_wSeO4-	5.914e-17	0.000	5.914e-17	-16.228
Hfo_wCrO4-	1.071e-17	0.000	1.072e-17	-16.970
Hfo_wH2AsO3	2.654e-23	0.000	2.655e-23	-22.576

-----Solution composition-----

Elements	Molality	Moles
Ag	5.752e-08	5.751e-08
Al	1.260e-06	1.260e-06
As	4.827e-11	4.827e-11
B	1.292e-05	1.292e-05
Ba	2.737e-07	2.736e-07
C	6.210e-03	6.209e-03
Ca	1.717e-03	1.717e-03
Cd	7.112e-09	7.111e-09
Cl	1.418e-03	1.418e-03
Co	1.352e-07	1.352e-07
Cr	5.528e-09	5.527e-09
Cu	8.379e-08	8.378e-08
F	1.456e-04	1.456e-04
Fe	3.298e-09	3.297e-09
Hg	2.042e-11	2.042e-11
K	1.444e-04	1.444e-04
Mg	9.020e-04	9.018e-04
Mn	1.330e-05	1.330e-05
Mo	1.691e-07	1.690e-07
N	3.528e-09	3.527e-09
Na	4.036e-03	4.035e-03

Ni	2.102e-07	2.102e-07
Pb	2.623e-09	2.623e-09
S	1.179e-03	1.179e-03
Sb	8.085e-09	8.084e-09
Se	4.703e-09	4.702e-09
U	1.298e-08	1.298e-08
V	7.011e-10	7.010e-10
Zn	4.755e-07	4.754e-07

-----Description of solution-----

	pH	=	7.191	Charge balance
	pe	=	5.582	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.217e-02	
	Mass of water (kg)	=	9.998e-01	
	Total alkalinity (eq/kg)	=	5.530e-03	
	Total CO2 (mol/kg)	=	6.210e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	3.647e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.110033e+02	
	Total O	=	5.552156e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.752e-07	1.562e-07	-6.756	-6.806	-0.050	(0)
H+	7.213e-08	6.446e-08	-7.142	-7.191	-0.049	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	5.752e-08					
AgCl	3.678e-08	3.678e-08	-7.434	-7.434	0.000	(0)
Ag+	1.590e-08	1.421e-08	-7.799	-7.847	-0.049	(0)
AgCl2-	4.622e-09	4.060e-09	-8.335	-8.391	-0.056	(0)
AgSO4-	2.002e-10	1.758e-10	-9.699	-9.755	-0.056	(0)
AgCl3-2	7.701e-12	4.586e-12	-11.113	-11.339	-0.225	(0)
AgF	4.330e-12	4.330e-12	-11.364	-11.364	0.000	(0)
AgOH	2.220e-13	2.220e-13	-12.654	-12.654	0.000	(0)
AgCl4-3	3.809e-14	1.187e-14	-13.419	-13.926	-0.506	(0)
AgH2BO3	2.600e-14	2.600e-14	-13.585	-13.585	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNO2	7.082e-15	7.082e-15	-14.150	-14.150	0.000	(0)
AgSeO3-	2.431e-15	2.135e-15	-14.614	-14.671	-0.056	(0)
AgNH3+	2.160e-16	1.898e-16	-15.666	-15.722	-0.056	(0)
Ag (OH) 2-	3.856e-18	3.388e-18	-17.414	-17.470	-0.056	(0)
AgNO3	2.540e-20	2.540e-20	-19.595	-19.595	0.000	(0)
Ag (NO2) 2-	2.978e-23	2.616e-23	-22.526	-22.582	-0.056	(0)
Ag (SeO3) 2-3	1.434e-23	4.469e-24	-22.843	-23.350	-0.506	(0)
Ag (NH3) 2+	1.148e-23	1.009e-23	-22.940	-22.996	-0.056	(0)
Ag2MoO4	8.238e-24	8.238e-24	-23.084	-23.084	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.950	-72.950	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.276	-87.176	-0.900	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.711	-147.767	-0.056	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.914	-148.060	-0.146	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.027	-150.309	-0.282	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.349	-150.620	-0.271	(0)
Al	1.260e-06					
Al (OH) 4-	1.064e-06	9.518e-07	-5.973	-6.021	-0.048	(0)
AlF3	7.169e-08	7.169e-08	-7.145	-7.145	0.000	(0)
AlF2+	5.233e-08	4.695e-08	-7.281	-7.328	-0.047	(0)
Al (OH) 3	4.841e-08	4.841e-08	-7.315	-7.315	0.000	(0)
Al (OH) 2+	1.731e-08	1.553e-08	-7.762	-7.809	-0.047	(0)
AlF4-	4.871e-09	4.358e-09	-8.312	-8.361	-0.048	(0)
AlF+2	1.500e-09	9.725e-10	-8.824	-9.012	-0.188	(0)

AlOH+2	1.932e-10	1.252e-10	-9.714	-9.902	-0.188	(0)
AlSO4+	4.314e-12	3.860e-12	-11.365	-11.413	-0.048	(0)
Al+3	2.205e-12	8.018e-13	-11.657	-12.096	-0.439	(0)
Al (SO4) 2-	2.867e-14	2.564e-14	-13.543	-13.591	-0.048	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.547	-42.053	-0.506	(0)
As (3)	3.081e-23					
H3AsO3	3.053e-23	3.053e-23	-22.515	-22.515	0.000	(0)
H2AsO3-	2.766e-25	2.430e-25	-24.558	-24.614	-0.056	(0)
HAsO3-2	5.772e-30	3.438e-30	-29.239	-29.464	-0.225	(0)
H4AsO3+	1.110e-30	9.751e-31	-29.955	-30.011	-0.056	(0)
AsO3-3	6.597e-36	2.056e-36	-35.181	-35.687	-0.506	(0)
As (5)	4.827e-11					
HAsO4-2	3.451e-11	2.056e-11	-10.462	-10.687	-0.225	(0)
H2AsO4-	1.376e-11	1.208e-11	-10.862	-10.918	-0.056	(0)
AsO4-3	3.236e-15	1.008e-15	-14.490	-14.996	-0.506	(0)
H3AsO4	1.350e-16	1.354e-16	-15.870	-15.869	0.001	(0)
B	1.292e-05					
H3BO3	1.278e-05	1.281e-05	-4.894	-4.892	0.001	(0)
H2BO3-	1.300e-07	1.154e-07	-6.886	-6.938	-0.052	(0)
CaH2BO3+	7.073e-09	6.281e-09	-8.150	-8.202	-0.052	(0)
MgH2BO3+	2.318e-09	2.059e-09	-8.635	-8.686	-0.052	(0)
BF (OH) 3-	6.983e-10	6.201e-10	-9.156	-9.208	-0.052	(0)
NaH2BO3	6.561e-10	6.561e-10	-9.183	-9.183	0.000	(0)
H5 (BO3) 2-	1.418e-12	1.259e-12	-11.848	-11.900	-0.052	(0)
BaH2BO3+	6.785e-13	6.025e-13	-12.168	-12.220	-0.052	(0)
BF2 (OH) 2-	5.837e-13	5.183e-13	-12.234	-12.285	-0.052	(0)
AgH2BO3	2.600e-14	2.600e-14	-13.585	-13.585	0.000	(0)
H8 (BO3) 3-	1.817e-15	1.613e-15	-14.741	-14.792	-0.052	(0)
BF3OH-	1.776e-18	1.577e-18	-17.751	-17.802	-0.052	(0)
BF4-	6.832e-23	6.067e-23	-22.165	-22.217	-0.052	(0)
Ba	2.737e-07					
Ba+2	2.647e-07	1.689e-07	-6.577	-6.772	-0.195	(0)
BaHCO3+	8.637e-09	7.765e-09	-8.064	-8.110	-0.046	(0)
BaCO3	3.033e-10	3.033e-10	-9.518	-9.518	0.000	(0)
BaH2BO3+	6.785e-13	6.025e-13	-12.168	-12.220	-0.052	(0)
BaOH+	1.285e-13	1.151e-13	-12.891	-12.939	-0.048	(0)
BaNO3+	2.168e-18	1.904e-18	-17.664	-17.720	-0.056	(0)
BaNH3+2	1.170e-18	6.968e-19	-17.932	-18.157	-0.225	(0)
C (4)	6.210e-03					
HCO3-	5.366e-03	4.815e-03	-2.270	-2.317	-0.047	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	9.430e-05	8.478e-05	-4.026	-4.072	-0.046	(0)
MgHCO3+	2.838e-05	2.534e-05	-4.547	-4.596	-0.049	(0)
NaHCO3	9.709e-06	9.709e-06	-5.013	-5.013	0.000	(0)
CO3-2	5.490e-06	3.502e-06	-5.260	-5.456	-0.195	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	1.498e-06	1.498e-06	-5.824	-5.824	0.000	(0)
MnHCO3+	7.488e-07	6.710e-07	-6.126	-6.173	-0.048	(0)
NaCO3-	2.606e-07	2.338e-07	-6.584	-6.631	-0.047	(0)
CuCO3	7.325e-08	7.325e-08	-7.135	-7.135	0.000	(0)
NiHCO3+	5.665e-08	4.977e-08	-7.247	-7.303	-0.056	(0)
ZnCO3	4.553e-08	4.553e-08	-7.342	-7.342	0.000	(0)
ZnHCO3+	3.916e-08	3.440e-08	-7.407	-7.463	-0.056	(0)
CoHCO3+	2.506e-08	2.201e-08	-7.601	-7.657	-0.056	(0)
NiCO3	1.095e-08	1.095e-08	-7.960	-7.960	0.000	(0)
BaHCO3+	8.637e-09	7.765e-09	-8.064	-8.110	-0.046	(0)
UO2 (CO3) 2-2	7.056e-09	4.203e-09	-8.151	-8.376	-0.225	(0)
UO2 (CO3) 3-4	5.863e-09	7.376e-10	-8.232	-9.132	-0.900	(0)
CoCO3	3.479e-09	3.479e-09	-8.458	-8.458	0.000	(0)
PbCO3	1.609e-09	1.609e-09	-8.793	-8.793	0.000	(0)
CuHCO3+	1.228e-09	1.079e-09	-8.911	-8.967	-0.056	(0)
Cu (CO3) 2-2	1.159e-09	6.905e-10	-8.936	-9.161	-0.225	(0)
PbHCO3+	6.226e-10	5.469e-10	-9.206	-9.262	-0.056	(0)
BaCO3	3.033e-10	3.033e-10	-9.518	-9.518	0.000	(0)
CdCO3	2.911e-10	2.911e-10	-9.536	-9.536	0.000	(0)
UO2CO3	6.014e-11	6.014e-11	-10.221	-10.221	0.000	(0)
CdHCO3+	4.550e-11	3.997e-11	-10.342	-10.398	-0.056	(0)
Pb (CO3) 2-2	2.729e-11	1.625e-11	-10.564	-10.789	-0.225	(0)

	Cd (CO ₃) 2-2	1.269e-12	7.556e-13	-11.897	-12.122	-0.225	(0)
	FeHCO ₃ +	7.912e-13	7.114e-13	-12.102	-12.148	-0.046	(0)
	HgCO ₃	1.337e-15	1.337e-15	-14.874	-14.874	0.000	(0)
	Hg (CO ₃) 2-2	2.486e-17	1.480e-17	-16.605	-16.830	-0.225	(0)
	HgHCO ₃ +	1.826e-18	1.604e-18	-17.738	-17.795	-0.056	(0)
Ca	1.717e-03						
	Ca+2	1.482e-03	9.455e-04	-2.829	-3.024	-0.195	(0)
	CaSO ₄	1.343e-04	1.343e-04	-3.872	-3.872	0.000	(0)
	CaHCO ₃ +	9.430e-05	8.478e-05	-4.026	-4.072	-0.046	(0)
	CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.397e-06	1.252e-06	-5.855	-5.903	-0.048	(0)
	CaH ₂ BO ₃ +	7.073e-09	6.281e-09	-8.150	-8.202	-0.052	(0)
	CaOH+	3.277e-09	2.946e-09	-8.485	-8.531	-0.046	(0)
	CaNH ₃ +2	1.307e-14	7.784e-15	-13.884	-14.109	-0.225	(0)
	CaNO ₃ +	7.658e-15	6.727e-15	-14.116	-14.172	-0.056	(0)
	Ca (NH ₃) 2+2	3.403e-26	2.027e-26	-25.468	-25.693	-0.225	(0)
Cd	7.112e-09						
	Cd+2	5.716e-09	3.646e-09	-8.243	-8.438	-0.195	(0)
	CdSO ₄	5.300e-10	5.300e-10	-9.276	-9.276	0.000	(0)
	CdCl+	5.024e-10	4.413e-10	-9.299	-9.355	-0.056	(0)
	CdCO ₃	2.911e-10	2.911e-10	-9.536	-9.536	0.000	(0)
	CdHCO ₃ +	4.550e-11	3.997e-11	-10.342	-10.398	-0.056	(0)
	CdF+	7.978e-12	7.009e-12	-11.098	-11.154	-0.056	(0)
	Cd (SO ₄) 2-2	7.444e-12	4.433e-12	-11.128	-11.353	-0.225	(0)
	CdOH+	5.149e-12	4.523e-12	-11.288	-11.345	-0.056	(0)
	CdOHC1	2.827e-12	2.827e-12	-11.549	-11.549	0.000	(0)
	CdCl ₂	2.332e-12	2.332e-12	-11.632	-11.632	0.000	(0)
	Cd (CO ₃) 2-2	1.269e-12	7.556e-13	-11.897	-12.122	-0.225	(0)
	Cd (OH) 2	4.457e-15	4.457e-15	-14.351	-14.351	0.000	(0)
	CdCl ₃ -	2.123e-15	1.865e-15	-14.673	-14.729	-0.056	(0)
	CdF ₂	1.696e-15	1.696e-15	-14.771	-14.771	0.000	(0)
	CdSeO ₄	6.876e-19	6.876e-19	-18.163	-18.163	0.000	(0)
	Cd2OH+3	2.653e-19	8.266e-20	-18.576	-19.083	-0.506	(0)
	Cd (OH) 3-	4.841e-20	4.253e-20	-19.315	-19.371	-0.056	(0)
	CdNO ₃ +	2.953e-20	2.594e-20	-19.530	-19.586	-0.056	(0)
	Cd (SeO ₃) 2-2	2.757e-22	1.642e-22	-21.560	-21.785	-0.225	(0)
	Cd (OH) 4-2	1.825e-27	1.087e-27	-26.739	-26.964	-0.225	(0)
	Cd (NO ₃) 2	2.926e-32	2.926e-32	-31.534	-31.534	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.291	-79.347	-0.056	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.060	-151.060	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.021	-228.077	-0.056	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.573	-304.798	-0.225	(0)
Cl	1.418e-03						
	Cl-	1.418e-03	1.267e-03	-2.848	-2.897	-0.049	(0)
	AgCl	3.678e-08	3.678e-08	-7.434	-7.434	0.000	(0)
	MnCl+	1.244e-08	1.114e-08	-7.905	-7.953	-0.048	(0)
	AgCl ₂ -	4.622e-09	4.060e-09	-8.335	-8.391	-0.056	(0)
	ZnCl+	8.055e-10	7.193e-10	-9.094	-9.143	-0.049	(0)
	CdCl+	5.024e-10	4.413e-10	-9.299	-9.355	-0.056	(0)
	NiCl+	3.095e-10	2.719e-10	-9.509	-9.566	-0.056	(0)
	CoCl+	2.933e-10	2.577e-10	-9.533	-9.589	-0.056	(0)
	ZnOHC1	1.471e-10	1.471e-10	-9.832	-9.832	0.000	(0)
	MnCl ₂	1.995e-11	1.995e-11	-10.700	-10.700	0.000	(0)
	CuCl+	7.990e-12	7.136e-12	-11.097	-11.147	-0.049	(0)
	PbCl+	7.826e-12	6.875e-12	-11.106	-11.163	-0.056	(0)
	AgCl ₃ -2	7.701e-12	4.586e-12	-11.113	-11.339	-0.225	(0)
	CuCl	7.274e-12	7.274e-12	-11.138	-11.138	0.000	(0)
	CdOHC1	2.827e-12	2.827e-12	-11.549	-11.549	0.000	(0)
	CdCl ₂	2.332e-12	2.332e-12	-11.632	-11.632	0.000	(0)
	CuCl ₂ -	2.157e-12	1.926e-12	-11.666	-11.715	-0.049	(0)
	ZnCl ₂	1.445e-12	1.445e-12	-11.840	-11.840	0.000	(0)
	HgClOH	1.115e-13	1.115e-13	-12.953	-12.953	0.000	(0)
	HgCl ₂	5.124e-14	5.124e-14	-13.290	-13.290	0.000	(0)
	PbCl ₂	3.892e-14	3.892e-14	-13.410	-13.410	0.000	(0)
	AgCl ₄ -3	3.809e-14	1.187e-14	-13.419	-13.926	-0.506	(0)
	MnCl ₃ -	7.772e-15	6.965e-15	-14.109	-14.157	-0.048	(0)
	CuCl ₂	3.136e-15	3.136e-15	-14.504	-14.504	0.000	(0)
	CdCl ₃ -	2.123e-15	1.865e-15	-14.673	-14.729	-0.056	(0)

NiCl ₂	1.735e-15	1.735e-15	-14.761	-14.761	0.000	(0)
ZnCl ₃ -	1.629e-15	1.455e-15	-14.788	-14.837	-0.049	(0)
CuCl ₃ -2	8.094e-16	5.219e-16	-15.092	-15.282	-0.191	(0)
HgCl ₃ -	7.392e-16	6.494e-16	-15.131	-15.187	-0.056	(0)
CrCl+2	1.811e-16	1.079e-16	-15.742	-15.967	-0.225	(0)
PbCl ₃ -	2.236e-17	1.964e-17	-16.651	-16.707	-0.056	(0)
UO ₂ Cl+	1.009e-17	8.867e-18	-16.996	-17.052	-0.056	(0)
HgCl+	9.181e-18	8.066e-18	-17.037	-17.093	-0.056	(0)
HgCl ₄ -2	5.502e-18	3.277e-18	-17.259	-17.485	-0.225	(0)
ZnCl ₄ -2	1.430e-18	9.220e-19	-17.845	-18.035	-0.191	(0)
CrOHC12	4.059e-19	4.059e-19	-18.392	-18.392	0.000	(0)
CuCl ₃ -	4.154e-20	3.709e-20	-19.382	-19.431	-0.049	(0)
FeCl+2	2.470e-20	1.593e-20	-19.607	-19.798	-0.191	(0)
PbCl ₄ -2	1.910e-20	1.138e-20	-19.719	-19.944	-0.225	(0)
CrCl ₂ +	1.477e-20	1.297e-20	-19.831	-19.887	-0.056	(0)
VOCl+	1.702e-22	1.495e-22	-21.769	-21.825	-0.056	(0)
FeCl ₂ +	1.006e-22	9.016e-23	-21.997	-22.045	-0.048	(0)
CuCl ₄ -2	3.654e-25	2.356e-25	-24.437	-24.628	-0.191	(0)
CrO ₃ Cl-	1.698e-26	1.492e-26	-25.770	-25.826	-0.056	(0)
FeCl ₃	1.143e-26	1.143e-26	-25.942	-25.942	0.000	(0)
CoCl+2	3.867e-35	2.303e-35	-34.413	-34.638	-0.225	(0)
UCl+3	0.000e+00	0.000e+00	-45.766	-46.272	-0.506	(0)
Co (NH ₃) ₅ Cl+2	0.000e+00	0.000e+00	-64.382	-64.607	-0.225	(0)
Cr (NH ₃) ₆ Cl+2	0.000e+00	0.000e+00	-68.859	-69.084	-0.225	(0)
Co (NH ₃) ₆ Cl+2	0.000e+00	0.000e+00	-82.282	-82.507	-0.225	(0)
Co (2)	1.352e-07					
Co+2	9.868e-08	5.877e-08	-7.006	-7.231	-0.225	(0)
CoHCO ₃ +	2.506e-08	2.201e-08	-7.601	-7.657	-0.056	(0)
CoSO ₄	7.271e-09	7.271e-09	-8.138	-8.138	0.000	(0)
CoCO ₃	3.479e-09	3.479e-09	-8.458	-8.458	0.000	(0)
CoCl+	2.933e-10	2.577e-10	-9.533	-9.589	-0.056	(0)
CoF+	2.566e-10	2.254e-10	-9.591	-9.647	-0.056	(0)
CoOH+	2.085e-10	1.831e-10	-9.681	-9.737	-0.056	(0)
Co (OH) ₂	2.272e-12	2.272e-12	-11.644	-11.644	0.000	(0)
CoNO ₂ +	1.124e-15	9.878e-16	-14.949	-15.005	-0.056	(0)
Co (NH ₃) ₂	7.758e-17	4.621e-17	-16.110	-16.335	-0.225	(0)
CoSeO ₄	2.983e-17	2.983e-17	-16.525	-16.525	0.000	(0)
Co (OH) ₃ -	8.059e-18	7.079e-18	-17.094	-17.150	-0.056	(0)
CoOOH-	2.022e-18	1.777e-18	-17.694	-17.750	-0.056	(0)
Co ₂ OH+3	1.731e-18	5.394e-19	-17.762	-18.268	-0.506	(0)
CoNO ₃ +	2.386e-19	2.096e-19	-18.622	-18.679	-0.056	(0)
Co (OH) ₄ -2	2.942e-25	1.752e-25	-24.531	-24.756	-0.225	(0)
Co (NH ₃) ₂ +2	2.164e-26	1.289e-26	-25.665	-25.890	-0.225	(0)
Co ₄ (OH) ₄ +4	1.784e-30	2.244e-31	-29.749	-30.649	-0.900	(0)
Co (NO ₃) ₂	9.595e-31	9.595e-31	-30.018	-30.018	0.000	(0)
Co (NH ₃) ₃ +2	1.782e-36	1.061e-36	-35.749	-35.974	-0.225	(0)
Co (NH ₃) ₄ +2	0.000e+00	0.000e+00	-46.214	-46.439	-0.225	(0)
Co (NH ₃) ₅ +2	0.000e+00	0.000e+00	-57.178	-57.403	-0.225	(0)
Co (3)	1.190e-28					
CoOH+2	1.190e-28	7.087e-29	-27.924	-28.150	-0.225	(0)
Co+3	2.456e-34	8.930e-35	-33.610	-34.049	-0.439	(0)
CoCl+2	3.867e-35	2.303e-35	-34.413	-34.638	-0.225	(0)
Co (NH ₃) ₅ Cl+2	0.000e+00	0.000e+00	-64.382	-64.607	-0.225	(0)
Co (NH ₃) ₆ SO ₄ +	0.000e+00	0.000e+00	-77.836	-77.892	-0.056	(0)
Co (NH ₃) ₆ OH+2	0.000e+00	0.000e+00	-81.991	-82.216	-0.225	(0)
Co (NH ₃) ₆ Cl+2	0.000e+00	0.000e+00	-82.282	-82.507	-0.225	(0)
Cr (2)	6.912e-26					
Cr+2	6.912e-26	4.116e-26	-25.160	-25.385	-0.225	(0)
Cr (3)	5.528e-09					
Cr (OH) ₂ +	4.861e-09	4.270e-09	-8.313	-8.370	-0.056	(0)
Cr (OH) ₂	3.773e-10	2.247e-10	-9.423	-9.648	-0.225	(0)
Cr (OH) ₃	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO ₄	3.306e-11	3.306e-11	-10.481	-10.481	0.000	(0)
CrF+2	2.122e-12	1.264e-12	-11.673	-11.898	-0.225	(0)
CrO ₂ -	2.102e-12	1.846e-12	-11.677	-11.734	-0.056	(0)
Cr (OH) ₄ -	1.773e-12	1.558e-12	-11.751	-11.808	-0.056	(0)
Cr+3	2.110e-13	6.577e-14	-12.676	-13.182	-0.506	(0)
CrSO ₄ +	1.084e-13	9.522e-14	-12.965	-13.021	-0.056	(0)

CrCl+2	1.811e-16	1.079e-16	-15.742	-15.967	-0.225	(0)
Cr2(OH)2SO4+2	1.128e-18	6.715e-19	-17.948	-18.173	-0.225	(0)
CrOHC12	4.059e-19	4.059e-19	-18.392	-18.392	0.000	(0)
Cr2(OH)2(SO4)2	2.473e-20	2.473e-20	-19.607	-19.607	0.000	(0)
CrCl2+	1.477e-20	1.297e-20	-19.831	-19.887	-0.056	(0)
CrNO3+2	1.086e-26	6.468e-27	-25.964	-26.189	-0.225	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-55.313	-55.538	-0.225	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-66.782	-67.289	-0.506	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-68.859	-69.084	-0.225	(0)
Cr(6)	2.541e-16					
CrO4-2	2.182e-16	1.392e-16	-15.661	-15.856	-0.195	(0)
HCrO4-	3.305e-17	2.903e-17	-16.481	-16.537	-0.056	(0)
NaCrO4-	2.823e-18	2.480e-18	-17.549	-17.606	-0.056	(0)
KCrO4-	7.566e-20	6.646e-20	-19.121	-19.177	-0.056	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	5.935e-25	3.535e-25	-24.227	-24.452	-0.225	(0)
CrO3Cl-	1.698e-26	1.492e-26	-25.770	-25.826	-0.056	(0)
Cr2O7-2	4.908e-32	2.923e-32	-31.309	-31.534	-0.225	(0)
Cu(1)	1.462e-11					
CuCl	7.274e-12	7.274e-12	-11.138	-11.138	0.000	(0)
Cu+	5.189e-12	4.558e-12	-11.285	-11.341	-0.056	(0)
CuCl2-	2.157e-12	1.926e-12	-11.666	-11.715	-0.049	(0)
CuCl3-2	8.094e-16	5.219e-16	-15.092	-15.282	-0.191	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-151.128	-151.404	-0.276	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.868	-152.134	-0.266	(0)
Cu(2)	8.377e-08					
CuCO3	7.325e-08	7.325e-08	-7.135	-7.135	0.000	(0)
Cu+2	5.569e-09	3.552e-09	-8.254	-8.450	-0.195	(0)
CuOH+	1.964e-09	1.754e-09	-8.707	-8.756	-0.049	(0)
CuHCO3+	1.228e-09	1.079e-09	-8.911	-8.967	-0.056	(0)
Cu(CO3)2-2	1.159e-09	6.905e-10	-8.936	-9.161	-0.225	(0)
CuSO4	5.046e-10	5.046e-10	-9.297	-9.297	0.000	(0)
Cu(OH)2	5.467e-11	5.467e-11	-10.262	-10.262	0.000	(0)
CuF+	3.094e-11	2.718e-11	-10.509	-10.566	-0.056	(0)
CuCl+	7.990e-12	7.136e-12	-11.097	-11.147	-0.049	(0)
Cu2(OH)2+2	1.298e-13	7.731e-14	-12.887	-13.112	-0.225	(0)
Cu(OH)3-	1.993e-14	1.751e-14	-13.700	-13.757	-0.056	(0)
CuCl2	3.136e-15	3.136e-15	-14.504	-14.504	0.000	(0)
CuNO2+	1.010e-15	8.871e-16	-14.996	-15.052	-0.056	(0)
CuNH3+2	3.991e-16	2.377e-16	-15.399	-15.624	-0.225	(0)
CuCl3-	4.154e-20	3.709e-20	-19.382	-19.431	-0.049	(0)
Cu(OH)4-2	3.614e-20	2.152e-20	-19.442	-19.667	-0.225	(0)
CuNO3+	2.877e-20	2.527e-20	-19.541	-19.597	-0.056	(0)
Cu(NO2)2	2.165e-23	2.165e-23	-22.665	-22.665	0.000	(0)
CuCl4-2	3.654e-25	2.356e-25	-24.437	-24.628	-0.191	(0)
Cu(NO3)2	7.159e-33	7.159e-33	-32.145	-32.145	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-219.245	-219.302	-0.056	(0)
F	1.456e-04					
F-	1.357e-04	1.213e-04	-3.867	-3.916	-0.049	(0)
MgF+	7.823e-06	6.998e-06	-5.107	-5.155	-0.048	(0)
CaF+	1.397e-06	1.252e-06	-5.855	-5.903	-0.048	(0)
NaF	2.744e-07	2.744e-07	-6.562	-6.562	0.000	(0)
AlF3	7.169e-08	7.169e-08	-7.145	-7.145	0.000	(0)
AlF2+	5.233e-08	4.695e-08	-7.281	-7.328	-0.047	(0)
MnF+	3.763e-08	3.372e-08	-7.424	-7.472	-0.048	(0)
HF	1.156e-08	1.156e-08	-7.937	-7.937	0.000	(0)
AlF4-	4.871e-09	4.358e-09	-8.312	-8.361	-0.048	(0)
AlF+2	1.500e-09	9.725e-10	-8.824	-9.012	-0.188	(0)
BF(OH)3-	6.983e-10	6.201e-10	-9.156	-9.208	-0.052	(0)
ZnF+	6.224e-10	5.467e-10	-9.206	-9.262	-0.056	(0)
NiF+	2.907e-10	2.554e-10	-9.536	-9.593	-0.056	(0)
CoF+	2.566e-10	2.254e-10	-9.591	-9.647	-0.056	(0)
CuF+	3.094e-11	2.718e-11	-10.509	-10.566	-0.056	(0)
CdF+	7.978e-12	7.009e-12	-11.098	-11.154	-0.056	(0)
HF2-	5.981e-12	5.332e-12	-11.223	-11.273	-0.050	(0)
AgF	4.330e-12	4.330e-12	-11.364	-11.364	0.000	(0)
CrF+2	2.122e-12	1.264e-12	-11.673	-11.898	-0.225	(0)
PbF+	1.487e-12	1.306e-12	-11.828	-11.884	-0.056	(0)

BF2 (OH) 2-	5.837e-13	5.183e-13	-12.234	-12.285	-0.052	(0)
UO2F+	8.220e-14	7.222e-14	-13.085	-13.141	-0.056	(0)
UO2F2	2.526e-14	2.526e-14	-13.598	-13.598	0.000	(0)
PbF2	3.118e-15	3.118e-15	-14.506	-14.506	0.000	(0)
CdF2	1.696e-15	1.696e-15	-14.771	-14.771	0.000	(0)
UO2F3-	8.759e-16	7.695e-16	-15.058	-15.114	-0.056	(0)
H2F2	3.582e-16	3.582e-16	-15.446	-15.446	0.000	(0)
FeF2+	2.004e-16	1.796e-16	-15.698	-15.746	-0.048	(0)
FeF+2	8.580e-17	5.533e-17	-16.067	-16.257	-0.191	(0)
FeF3	3.073e-17	3.073e-17	-16.512	-16.512	0.000	(0)
VO2F	1.027e-17	1.027e-17	-16.988	-16.988	0.000	(0)
BF3OH-	1.776e-18	1.577e-18	-17.751	-17.802	-0.052	(0)
UO2F4-2	1.245e-18	7.413e-19	-17.905	-18.130	-0.225	(0)
PbF3-	8.165e-19	7.173e-19	-18.088	-18.144	-0.056	(0)
VO2F2-	5.148e-19	4.523e-19	-18.288	-18.345	-0.056	(0)
VOF+	3.482e-20	3.059e-20	-19.458	-19.514	-0.056	(0)
VOF2	1.391e-21	1.391e-21	-20.857	-20.857	0.000	(0)
VO2F3-2	1.149e-21	6.842e-22	-20.940	-21.165	-0.225	(0)
PbF4-2	6.991e-23	4.164e-23	-22.155	-22.381	-0.225	(0)
BF4-	6.832e-23	6.067e-23	-22.165	-22.217	-0.052	(0)
VOF3-	6.814e-24	5.986e-24	-23.167	-23.223	-0.056	(0)
HgF+	1.632e-24	1.434e-24	-23.787	-23.844	-0.056	(0)
Sb (OH) 2F	3.805e-25	3.805e-25	-24.420	-24.420	0.000	(0)
SbOF	3.743e-25	3.743e-25	-24.427	-24.427	0.000	(0)
VO2F4-3	1.310e-25	4.083e-26	-24.883	-25.389	-0.506	(0)
VOF4-2	4.920e-27	2.930e-27	-26.308	-26.533	-0.225	(0)
UF3+	6.799e-36	5.973e-36	-35.168	-35.224	-0.056	(0)
UF2+2	5.217e-37	3.107e-37	-36.283	-36.508	-0.225	(0)
UF4	7.943e-38	7.943e-38	-37.100	-37.100	0.000	(0)
UF+3	6.531e-40	2.035e-40	-39.185	-39.691	-0.506	(0)
UF5-	4.345e-40	3.817e-40	-39.362	-39.418	-0.056	(0)
UF6-2	0.000e+00	0.000e+00	-40.629	-40.854	-0.225	(0)
Fe (2)	2.236e-11					
Fe+2	1.970e-11	1.174e-11	-10.705	-10.931	-0.225	(0)
FeSO4	1.786e-12	1.786e-12	-11.748	-11.748	0.000	(0)
FeHCO3+	7.912e-13	7.114e-13	-12.102	-12.148	-0.046	(0)
FeOH+	8.142e-14	7.296e-14	-13.089	-13.137	-0.048	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.988e-19	4.470e-19	-18.302	-18.350	-0.048	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.815	-159.815	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.638	-236.695	-0.056	(0)
Fe (3)	3.275e-09					
Fe (OH) 2+	2.841e-09	2.549e-09	-8.547	-8.594	-0.047	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.929e-12	6.217e-12	-11.159	-11.206	-0.047	(0)
FeOH+2	6.506e-14	4.195e-14	-13.187	-13.377	-0.191	(0)
FeF2+	2.004e-16	1.796e-16	-15.698	-15.746	-0.048	(0)
FeF+2	8.580e-17	5.533e-17	-16.067	-16.257	-0.191	(0)
FeF3	3.073e-17	3.073e-17	-16.512	-16.512	0.000	(0)
FeSO4+	3.230e-18	2.895e-18	-17.491	-17.538	-0.048	(0)
Fe+3	1.144e-18	4.161e-19	-17.942	-18.381	-0.439	(0)
Fe (SO4) 2-	4.368e-20	3.838e-20	-19.360	-19.416	-0.056	(0)
FeCl+2	2.470e-20	1.593e-20	-19.607	-19.798	-0.191	(0)
FeCl2+	1.006e-22	9.016e-23	-21.997	-22.045	-0.048	(0)
FeHSeO3+2	6.987e-24	4.161e-24	-23.156	-23.381	-0.225	(0)
Fe2 (OH) 2+4	4.632e-25	5.829e-26	-24.334	-25.234	-0.900	(0)
FeCl3	1.143e-26	1.143e-26	-25.942	-25.942	0.000	(0)
FeNO3+2	1.572e-29	9.362e-30	-28.804	-29.029	-0.225	(0)
Fe3 (OH) 4+5	5.477e-32	2.148e-33	-31.261	-32.668	-1.407	(0)
H (0)	4.027e-29					
H2	2.014e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	2.021e-11					
Hg	2.021e-11	2.021e-11	-10.694	-10.694	0.000	(0)
Hg (1)	1.469e-23					
Hg2+2	7.347e-24	4.376e-24	-23.134	-23.359	-0.225	(0)
Hg (2)	2.138e-13					
HgClOH	1.115e-13	1.115e-13	-12.953	-12.953	0.000	(0)
HgCl2	5.124e-14	5.124e-14	-13.290	-13.290	0.000	(0)

	Hg (OH) 2	4.895e-14	4.908e-14	-13.310	-13.309	0.001	(0)
	HgCO3	1.337e-15	1.337e-15	-14.874	-14.874	0.000	(0)
	HgCl3-	7.392e-16	6.494e-16	-15.131	-15.187	-0.056	(0)
	Hg (CO3) 2-2	2.486e-17	1.480e-17	-16.605	-16.830	-0.225	(0)
	HgCl+	9.181e-18	8.066e-18	-17.037	-17.093	-0.056	(0)
	HgCl4-2	5.502e-18	3.277e-18	-17.259	-17.485	-0.225	(0)
	HgOH+	2.257e-18	1.983e-18	-17.646	-17.703	-0.056	(0)
	HgHCO3+	1.826e-18	1.604e-18	-17.738	-17.795	-0.056	(0)
	Hg (OH) 3-	1.099e-21	9.650e-22	-20.959	-21.015	-0.056	(0)
	Hg+2	5.355e-22	3.189e-22	-21.271	-21.496	-0.225	(0)
	HgSO4	5.178e-23	5.178e-23	-22.286	-22.286	0.000	(0)
	HgNH3+2	2.210e-24	1.316e-24	-23.656	-23.881	-0.225	(0)
	HgF+	1.632e-24	1.434e-24	-23.787	-23.844	-0.056	(0)
	Hg (NH3) 2+2	1.445e-26	8.606e-27	-25.840	-26.065	-0.225	(0)
	HgNO3+	3.016e-34	2.650e-34	-33.521	-33.577	-0.056	(0)
	Hg (NH3) 3+2	3.762e-37	2.241e-37	-36.425	-36.650	-0.225	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.606	-45.606	0.000	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-46.709	-46.934	-0.225	(0)
	HgHS2-	0.000e+00	0.000e+00	-140.155	-140.212	-0.056	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.008	-141.008	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-141.504	-141.729	-0.225	(0)
K		1.444e-04					
	K+	1.438e-04	1.285e-04	-3.842	-3.891	-0.049	(0)
	KSO4-	6.288e-07	5.642e-07	-6.201	-6.249	-0.047	(0)
	KCrO4-	7.566e-20	6.646e-20	-19.121	-19.177	-0.056	(0)
Mg		9.020e-04					
	Mg+2	8.062e-04	5.143e-04	-3.094	-3.289	-0.195	(0)
	MgSO4	5.803e-05	5.803e-05	-4.236	-4.236	0.000	(0)
	MgHCO3+	2.838e-05	2.534e-05	-4.547	-4.596	-0.049	(0)
	MgF+	7.823e-06	6.998e-06	-5.107	-5.155	-0.048	(0)
	MgCO3	1.498e-06	1.498e-06	-5.824	-5.824	0.000	(0)
	MgOH+	3.551e-08	3.198e-08	-7.450	-7.495	-0.046	(0)
	MgH2BO3+	2.318e-09	2.059e-09	-8.635	-8.686	-0.052	(0)
Mn (2)		1.330e-05					
	Mn+2	1.173e-05	6.984e-06	-4.931	-5.156	-0.225	(0)
	MnSO4	7.701e-07	7.701e-07	-6.113	-6.113	0.000	(0)
	MnHCO3+	7.488e-07	6.710e-07	-6.126	-6.173	-0.048	(0)
	MnF+	3.763e-08	3.372e-08	-7.424	-7.472	-0.048	(0)
	MnCl+	1.244e-08	1.114e-08	-7.905	-7.953	-0.048	(0)
	MnOH+	3.057e-09	2.740e-09	-8.515	-8.562	-0.048	(0)
	MnCl2	1.995e-11	1.995e-11	-10.700	-10.700	0.000	(0)
	MnCl3-	7.772e-15	6.965e-15	-14.109	-14.157	-0.048	(0)
	MnSeO4	1.904e-15	1.904e-15	-14.720	-14.720	0.000	(0)
	MnNO3+	2.835e-17	2.491e-17	-16.547	-16.604	-0.056	(0)
	Mn (OH) 3-	4.609e-19	4.130e-19	-18.336	-18.384	-0.048	(0)
	Mn (OH) 4-2	3.229e-25	2.082e-25	-24.491	-24.681	-0.191	(0)
	Mn (NO3) 2	1.408e-28	1.408e-28	-27.852	-27.852	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-43.546	-43.546	0.000	(0)
Mn (3)		3.274e-25					
	Mn+3	3.274e-25	1.191e-25	-24.485	-24.924	-0.439	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-43.535	-43.726	-0.191	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-47.465	-47.516	-0.051	(0)
Mo		1.691e-07					
	MoO4-2	1.689e-07	1.077e-07	-6.772	-6.968	-0.195	(0)
	HMoO4-	1.573e-10	1.382e-10	-9.803	-9.860	-0.056	(0)
	H2MoO4	6.525e-14	6.525e-14	-13.185	-13.185	0.000	(0)
	Ag2MoO4	8.238e-24	8.238e-24	-23.084	-23.084	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-41.547	-42.053	-0.506	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-51.283	-53.309	-2.026	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-52.706	-54.112	-1.407	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-55.621	-56.521	-0.900	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-59.959	-60.466	-0.506	(0)
N (-3)		8.446e-10					
	NH4+	8.326e-10	7.393e-10	-9.080	-9.131	-0.052	(0)
	NH3	6.540e-12	6.540e-12	-11.184	-11.184	0.000	(0)
	NH4SO4-	5.482e-12	4.912e-12	-11.261	-11.309	-0.048	(0)

CaNH3+2	1.307e-14	7.784e-15	-13.884	-14.109	-0.225	(0)
NiNH3+2	4.944e-16	2.944e-16	-15.306	-15.531	-0.225	(0)
CuNH3+2	3.991e-16	2.377e-16	-15.399	-15.624	-0.225	(0)
AgNH3+	2.160e-16	1.898e-16	-15.666	-15.722	-0.056	(0)
Co (NH3) +2	7.758e-17	4.621e-17	-16.110	-16.335	-0.225	(0)
BaNH3+2	1.170e-18	6.968e-19	-17.932	-18.157	-0.225	(0)
Ag (NH3) 2+	1.148e-23	1.009e-23	-22.940	-22.996	-0.056	(0)
HgNH3+2	2.210e-24	1.316e-24	-23.656	-23.881	-0.225	(0)
Ni (NH3) 2+2	4.673e-25	2.783e-25	-24.330	-24.555	-0.225	(0)
Ca (NH3) 2+2	3.403e-26	2.027e-26	-25.468	-25.693	-0.225	(0)
Co (NH3) 2+2	2.164e-26	1.289e-26	-25.665	-25.890	-0.225	(0)
Hg (NH3) 2+2	1.445e-26	8.606e-27	-25.840	-26.065	-0.225	(0)
Co (NH3) 3+2	1.782e-36	1.061e-36	-35.749	-35.974	-0.225	(0)
Hg (NH3) 3+2	3.762e-37	2.241e-37	-36.425	-36.650	-0.225	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.214	-46.439	-0.225	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-46.709	-46.934	-0.225	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.313	-55.538	-0.225	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.178	-57.403	-0.225	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.382	-64.607	-0.225	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.782	-67.289	-0.506	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.859	-69.084	-0.225	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.836	-77.892	-0.056	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.991	-82.216	-0.225	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.282	-82.507	-0.225	(0)
N (3)	2.681e-09					
NO2-	2.681e-09	2.385e-09	-8.572	-8.623	-0.051	(0)
AgNO2	7.082e-15	7.082e-15	-14.150	-14.150	0.000	(0)
CoNO2+	1.124e-15	9.878e-16	-14.949	-15.005	-0.056	(0)
CuNO2+	1.010e-15	8.871e-16	-14.996	-15.052	-0.056	(0)
Ag (NO2) 2-	2.978e-23	2.616e-23	-22.526	-22.582	-0.056	(0)
Cu (NO2) 2	2.165e-23	2.165e-23	-22.665	-22.665	0.000	(0)
N (5)	2.525e-12					
NO3-	2.518e-12	2.250e-12	-11.599	-11.648	-0.049	(0)
CaNO3+	7.658e-15	6.727e-15	-14.116	-14.172	-0.056	(0)
MnNO3+	2.835e-17	2.491e-17	-16.547	-16.604	-0.056	(0)
BaNO3+	2.168e-18	1.904e-18	-17.664	-17.720	-0.056	(0)
ZnNO3+	1.454e-18	1.277e-18	-17.838	-17.894	-0.056	(0)
NiNO3+	5.394e-19	4.738e-19	-18.268	-18.324	-0.056	(0)
CoNO3+	2.386e-19	2.096e-19	-18.622	-18.679	-0.056	(0)
CdNO3+	2.953e-20	2.594e-20	-19.530	-19.586	-0.056	(0)
CuNO3+	2.877e-20	2.527e-20	-19.541	-19.597	-0.056	(0)
AgNO3	2.540e-20	2.540e-20	-19.595	-19.595	0.000	(0)
PbNO3+	5.791e-21	5.087e-21	-20.237	-20.293	-0.056	(0)
UO2NO3+	2.204e-26	1.937e-26	-25.657	-25.713	-0.056	(0)
CrNO3+2	1.086e-26	6.468e-27	-25.964	-26.189	-0.225	(0)
Mn (NO3) 2	1.408e-28	1.408e-28	-27.852	-27.852	0.000	(0)
VO2NO3	5.495e-29	5.495e-29	-28.260	-28.260	0.000	(0)
FeNO3+2	1.572e-29	9.362e-30	-28.804	-29.029	-0.225	(0)
Co (NO3) 2	9.595e-31	9.595e-31	-30.018	-30.018	0.000	(0)
Zn (NO3) 2	5.733e-31	5.733e-31	-30.242	-30.242	0.000	(0)
Cd (NO3) 2	2.926e-32	2.926e-32	-31.534	-31.534	0.000	(0)
Pb (NO3) 2	1.944e-32	1.944e-32	-31.711	-31.711	0.000	(0)
Cu (NO3) 2	7.159e-33	7.159e-33	-32.145	-32.145	0.000	(0)
HgNO3+	3.016e-34	2.650e-34	-33.521	-33.577	-0.056	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.606	-45.606	0.000	(0)
Na	4.036e-03					
Na+	4.012e-03	3.586e-03	-2.397	-2.445	-0.049	(0)
NaSO4-	1.331e-05	1.194e-05	-4.876	-4.923	-0.047	(0)
NaHCO3	9.709e-06	9.709e-06	-5.013	-5.013	0.000	(0)
NaF	2.744e-07	2.744e-07	-6.562	-6.562	0.000	(0)
NaCO3-	2.606e-07	2.338e-07	-6.584	-6.631	-0.047	(0)
NaH2BO3	6.561e-10	6.561e-10	-9.183	-9.183	0.000	(0)
NaCrO4-	2.823e-18	2.480e-18	-17.549	-17.606	-0.056	(0)
Ni	2.102e-07					
Ni+2	1.314e-07	8.384e-08	-6.881	-7.077	-0.195	(0)
NiHCO3+	5.665e-08	4.977e-08	-7.247	-7.303	-0.056	(0)
NiCO3	1.095e-08	1.095e-08	-7.960	-7.960	0.000	(0)
NiSO4	1.037e-08	1.037e-08	-7.984	-7.984	0.000	(0)

NiCl+	3.095e-10	2.719e-10	-9.509	-9.566	-0.056	(0)
NiF+	2.907e-10	2.554e-10	-9.536	-9.593	-0.056	(0)
NiOH+	1.876e-10	1.648e-10	-9.727	-9.783	-0.056	(0)
Ni(OH) 2	2.045e-12	2.045e-12	-11.689	-11.689	0.000	(0)
Ni(SO4) 2-2	3.576e-13	2.130e-13	-12.447	-12.672	-0.225	(0)
NiCl2	1.735e-15	1.735e-15	-14.761	-14.761	0.000	(0)
NiNH3+2	4.944e-16	2.944e-16	-15.306	-15.531	-0.225	(0)
Ni(OH) 3-	3.635e-16	3.194e-16	-15.439	-15.496	-0.056	(0)
NiSeO4	3.971e-17	3.971e-17	-16.401	-16.401	0.000	(0)
NiNO3+	5.394e-19	4.738e-19	-18.268	-18.324	-0.056	(0)
Ni(NH3) 2+2	4.673e-25	2.783e-25	-24.330	-24.555	-0.225	(0)
O(0)	2.478e-35					
O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	2.623e-09					
PbCO3	1.609e-09	1.609e-09	-8.793	-8.793	0.000	(0)
PbHCO3+	6.226e-10	5.469e-10	-9.206	-9.262	-0.056	(0)
Pb+2	2.396e-10	1.529e-10	-9.620	-9.816	-0.195	(0)
PbOH+	6.826e-11	5.997e-11	-10.166	-10.222	-0.056	(0)
PbSO4	4.643e-11	4.643e-11	-10.333	-10.333	0.000	(0)
Pb(CO3) 2-2	2.729e-11	1.625e-11	-10.564	-10.789	-0.225	(0)
PbCl+	7.826e-12	6.875e-12	-11.106	-11.163	-0.056	(0)
PbF+	1.487e-12	1.306e-12	-11.828	-11.884	-0.056	(0)
Pb(OH) 2	2.962e-13	2.962e-13	-12.528	-12.528	0.000	(0)
Pb(SO4) 2-2	2.913e-13	1.735e-13	-12.536	-12.761	-0.225	(0)
PbCl2	3.892e-14	3.892e-14	-13.410	-13.410	0.000	(0)
PbF2	3.118e-15	3.118e-15	-14.506	-14.506	0.000	(0)
Pb(OH) 3-	5.265e-17	4.625e-17	-16.279	-16.335	-0.056	(0)
PbCl3-	2.236e-17	1.964e-17	-16.651	-16.707	-0.056	(0)
PbF3-	8.165e-19	7.173e-19	-18.088	-18.144	-0.056	(0)
Pb2OH+3	4.663e-19	1.453e-19	-18.331	-18.838	-0.506	(0)
PbCl4-2	1.910e-20	1.138e-20	-19.719	-19.944	-0.225	(0)
PbNO3+	5.791e-21	5.087e-21	-20.237	-20.293	-0.056	(0)
Pb(OH) 4-2	2.970e-21	1.769e-21	-20.527	-20.752	-0.225	(0)
PbF4-2	6.991e-23	4.164e-23	-22.155	-22.381	-0.225	(0)
Pb3(OH) 4+2	4.492e-25	2.675e-25	-24.348	-24.573	-0.225	(0)
Pb4(OH) 4+4	2.582e-30	3.249e-31	-29.588	-30.488	-0.900	(0)
Pb(NO3) 2	1.944e-32	1.944e-32	-31.711	-31.711	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.380	-152.380	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-229.941	-229.997	-0.056	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.950	-72.950	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.861	-78.917	-0.056	(0)
H2S	0.000e+00	0.000e+00	-79.088	-79.088	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.291	-79.347	-0.056	(0)
S5-2	0.000e+00	0.000e+00	-80.866	-81.091	-0.225	(0)
S6-2	0.000e+00	0.000e+00	-81.382	-81.607	-0.225	(0)
S4-2	0.000e+00	0.000e+00	-81.462	-81.687	-0.225	(0)
S3-2	0.000e+00	0.000e+00	-82.268	-82.493	-0.225	(0)
S2-2	0.000e+00	0.000e+00	-83.284	-83.509	-0.225	(0)
S-2	0.000e+00	0.000e+00	-88.836	-89.026	-0.191	(0)
HgHS2-	0.000e+00	0.000e+00	-140.155	-140.212	-0.056	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-141.008	-141.008	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-141.504	-141.729	-0.225	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.711	-147.767	-0.056	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.914	-148.060	-0.146	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-150.027	-150.309	-0.282	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.349	-150.620	-0.271	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.423	-150.479	-0.056	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.060	-151.060	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-151.128	-151.404	-0.276	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.660	-151.660	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.868	-152.134	-0.266	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.380	-152.380	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.815	-159.815	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-219.245	-219.302	-0.056	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.241	-227.297	-0.056	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-228.021	-228.077	-0.056	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.861	-230.087	-0.225	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-229.941	-229.997	-0.056	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.638	-236.695	-0.056	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.573	-304.798	-0.225	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.449	-307.674	-0.225	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.448	-319.673	-0.225	(0)
S (6)	1.179e-03					
SO4-2	9.721e-04	6.201e-04	-3.012	-3.208	-0.195	(0)
CaSO4	1.343e-04	1.343e-04	-3.872	-3.872	0.000	(0)
MgSO4	5.803e-05	5.803e-05	-4.236	-4.236	0.000	(0)
NaSO4-	1.331e-05	1.194e-05	-4.876	-4.923	-0.047	(0)
MnSO4	7.701e-07	7.701e-07	-6.113	-6.113	0.000	(0)
KSO4-	6.288e-07	5.642e-07	-6.201	-6.249	-0.047	(0)
ZnSO4	3.065e-08	3.065e-08	-7.514	-7.514	0.000	(0)
NiSO4	1.037e-08	1.037e-08	-7.984	-7.984	0.000	(0)
CoSO4	7.271e-09	7.271e-09	-8.138	-8.138	0.000	(0)
HSO4-	4.366e-09	3.906e-09	-8.360	-8.408	-0.048	(0)
CdSO4	5.300e-10	5.300e-10	-9.276	-9.276	0.000	(0)
CuSO4	5.046e-10	5.046e-10	-9.297	-9.297	0.000	(0)
Zn (SO4) 2-2	2.779e-10	1.655e-10	-9.556	-9.781	-0.225	(0)
AgSO4-	2.002e-10	1.758e-10	-9.699	-9.755	-0.056	(0)
PbSO4	4.643e-11	4.643e-11	-10.333	-10.333	0.000	(0)
CrOHSO4	3.306e-11	3.306e-11	-10.481	-10.481	0.000	(0)
Cd (SO4) 2-2	7.444e-12	4.433e-12	-11.128	-11.353	-0.225	(0)
NH4SO4-	5.482e-12	4.912e-12	-11.261	-11.309	-0.048	(0)
AlSO4+	4.314e-12	3.860e-12	-11.365	-11.413	-0.048	(0)
FeSO4	1.786e-12	1.786e-12	-11.748	-11.748	0.000	(0)
Ni (SO4) 2-2	3.576e-13	2.130e-13	-12.447	-12.672	-0.225	(0)
Pb (SO4) 2-2	2.913e-13	1.735e-13	-12.536	-12.761	-0.225	(0)
CrSO4+	1.084e-13	9.522e-14	-12.965	-13.021	-0.056	(0)
Al (SO4) 2-	2.867e-14	2.564e-14	-13.543	-13.591	-0.048	(0)
UO2SO4	4.048e-15	4.048e-15	-14.393	-14.393	0.000	(0)
UO2 (SO4) 2-2	5.556e-17	3.309e-17	-16.255	-16.480	-0.225	(0)
FeSO4+	3.230e-18	2.895e-18	-17.491	-17.538	-0.048	(0)
Cr2 (OH) 2SO4+2	1.128e-18	6.715e-19	-17.948	-18.173	-0.225	(0)
VO2SO4-	8.138e-19	7.149e-19	-18.089	-18.146	-0.056	(0)
Fe (SO4) 2-	4.368e-20	3.838e-20	-19.360	-19.416	-0.056	(0)
Cr2 (OH) 2 (SO4) 2	2.473e-20	2.473e-20	-19.607	-19.607	0.000	(0)
VOSO4	7.182e-21	7.182e-21	-20.144	-20.144	0.000	(0)
HgSO4	5.178e-23	5.178e-23	-22.286	-22.286	0.000	(0)
CrO3SO4-2	5.935e-25	3.535e-25	-24.227	-24.452	-0.225	(0)
VSO4+	7.577e-35	6.656e-35	-34.121	-34.177	-0.056	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.990	-40.990	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.458	-41.683	-0.225	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.836	-77.892	-0.056	(0)
Sb (3)	6.157e-20					
Sb (OH) 3	3.115e-20	3.115e-20	-19.507	-19.507	0.000	(0)
HSbO2	3.042e-20	3.042e-20	-19.517	-19.517	0.000	(0)
SbO2-	8.700e-25	7.642e-25	-24.061	-24.117	-0.056	(0)
Sb (OH) 4-	4.983e-25	4.377e-25	-24.303	-24.359	-0.056	(0)
Sb (OH) 2F	3.805e-25	3.805e-25	-24.420	-24.420	0.000	(0)
SbOF	3.743e-25	3.743e-25	-24.427	-24.427	0.000	(0)
Sb (OH) 2+	5.552e-26	4.877e-26	-25.256	-25.312	-0.056	(0)
SbO+	1.915e-26	1.682e-26	-25.718	-25.774	-0.056	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.448	-319.673	-0.225	(0)
Sb (5)	8.085e-09					
SbO3-	8.076e-09	7.095e-09	-8.093	-8.149	-0.056	(0)
Sb (OH) 6-	9.279e-12	8.293e-12	-11.032	-11.081	-0.049	(0)
SbO2+	9.626e-24	8.457e-24	-23.017	-23.073	-0.056	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.140	-40.196	-0.056	(0)
H2Se	0.000e+00	0.000e+00	-43.497	-43.497	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.546	-43.546	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.780	-48.005	-0.225	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.276	-87.176	-0.900	(0)
Se (4)	4.701e-09					
HSeO3-	4.308e-09	3.785e-09	-8.366	-8.422	-0.056	(0)
SeO3-2	3.925e-10	2.338e-10	-9.406	-9.631	-0.225	(0)

H2SeO3	1.041e-13	1.041e-13	-12.983	-12.983	0.000	(0)
AgSeO3-	2.431e-15	2.135e-15	-14.614	-14.671	-0.056	(0)
Cd (SeO3) 2-2	2.757e-22	1.642e-22	-21.560	-21.785	-0.225	(0)
Ag (SeO3) 2-3	1.434e-23	4.469e-24	-22.843	-23.350	-0.506	(0)
FeHSeO3+2	6.987e-24	4.161e-24	-23.156	-23.381	-0.225	(0)
Se (6)	1.590e-12					
SeO4-2	1.588e-12	1.013e-12	-11.799	-11.995	-0.195	(0)
MnSeO4	1.904e-15	1.904e-15	-14.720	-14.720	0.000	(0)
NiSeO4	3.971e-17	3.971e-17	-16.401	-16.401	0.000	(0)
ZnSeO4	3.544e-17	3.544e-17	-16.451	-16.451	0.000	(0)
CoSeO4	2.983e-17	2.983e-17	-16.525	-16.525	0.000	(0)
HSeO4-	3.724e-18	3.272e-18	-17.429	-17.485	-0.056	(0)
CdSeO4	6.876e-19	6.876e-19	-18.163	-18.163	0.000	(0)
Zn (SeO4) 2-2	6.110e-29	3.639e-29	-28.214	-28.439	-0.225	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.946	-59.453	-0.506	(0)
U (4)	6.534e-23					
U (OH) 5-	6.518e-23	5.726e-23	-22.186	-22.242	-0.056	(0)
U (OH) 4	1.546e-25	1.546e-25	-24.811	-24.811	0.000	(0)
U (OH) 3+	4.149e-29	3.645e-29	-28.382	-28.438	-0.056	(0)
U (OH) 2+2	1.824e-33	1.086e-33	-32.739	-32.964	-0.225	(0)
UF3+	6.799e-36	5.973e-36	-35.168	-35.224	-0.056	(0)
UF2+2	5.217e-37	3.107e-37	-36.283	-36.508	-0.225	(0)
UF4	7.943e-38	7.943e-38	-37.100	-37.100	0.000	(0)
UOH+3	1.059e-38	3.299e-39	-37.975	-38.482	-0.506	(0)
UF+3	6.531e-40	2.035e-40	-39.185	-39.691	-0.506	(0)
UF5-	4.345e-40	3.817e-40	-39.362	-39.418	-0.056	(0)
UF6-2	0.000e+00	0.000e+00	-40.629	-40.854	-0.225	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.990	-40.990	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.458	-41.683	-0.225	(0)
U+4	0.000e+00	0.000e+00	-44.175	-45.075	-0.900	(0)
UCl+3	0.000e+00	0.000e+00	-45.766	-46.272	-0.506	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-175.190	-179.747	-4.557	(0)
U (5)	7.842e-18					
UO2+	7.842e-18	6.889e-18	-17.106	-17.162	-0.056	(0)
U (6)	1.298e-08					
UO2 (CO3) 2-2	7.056e-09	4.203e-09	-8.151	-8.376	-0.225	(0)
UO2 (CO3) 3-4	5.863e-09	7.376e-10	-8.232	-9.132	-0.900	(0)
UO2CO3	6.014e-11	6.014e-11	-10.221	-10.221	0.000	(0)
UO2OH+	9.654e-14	8.481e-14	-13.015	-13.072	-0.056	(0)
UO2F+	8.220e-14	7.222e-14	-13.085	-13.141	-0.056	(0)
UO2F2	2.526e-14	2.526e-14	-13.598	-13.598	0.000	(0)
UO2+2	6.762e-15	4.314e-15	-14.170	-14.365	-0.195	(0)
UO2SO4	4.048e-15	4.048e-15	-14.393	-14.393	0.000	(0)
UO2F3-	8.759e-16	7.695e-16	-15.058	-15.114	-0.056	(0)
UO2 (SO4) 2-2	5.556e-17	3.309e-17	-16.255	-16.480	-0.225	(0)
UO2Cl+	1.009e-17	8.867e-18	-16.996	-17.052	-0.056	(0)
UO2F4-2	1.245e-18	7.413e-19	-17.905	-18.130	-0.225	(0)
(UO2) 2 (OH) 2+2	2.004e-20	1.194e-20	-19.698	-19.923	-0.225	(0)
(UO2) 3 (OH) 5+	2.132e-23	1.873e-23	-22.671	-22.727	-0.056	(0)
UO2NO3+	2.204e-26	1.937e-26	-25.657	-25.713	-0.056	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.775	-42.831	-0.056	(0)
V+2	0.000e+00	0.000e+00	-43.310	-43.535	-0.225	(0)
V (3)	6.987e-16					
V (OH) 3	6.987e-16	6.987e-16	-15.156	-15.156	0.000	(0)
V (OH) 2+	3.313e-26	2.911e-26	-25.480	-25.536	-0.056	(0)
VOH+2	2.988e-29	1.780e-29	-28.525	-28.750	-0.225	(0)
V+3	7.297e-34	2.274e-34	-33.137	-33.643	-0.506	(0)
VSO4+	7.577e-35	6.656e-35	-34.121	-34.177	-0.056	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.327	-55.834	-0.506	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.799	-56.699	-0.900	(0)
V (4)	1.605e-18					
V (OH) 3+	1.491e-18	1.310e-18	-17.826	-17.883	-0.056	(0)
VO+2	7.061e-20	4.205e-20	-19.151	-19.376	-0.225	(0)
VOF+	3.482e-20	3.059e-20	-19.458	-19.514	-0.056	(0)
VOSO4	7.182e-21	7.182e-21	-20.144	-20.144	0.000	(0)
VOF2	1.391e-21	1.391e-21	-20.857	-20.857	0.000	(0)

VOC1+	1.702e-22	1.495e-22	-21.769	-21.825	-0.056	(0)
VOF3-	6.814e-24	5.986e-24	-23.167	-23.223	-0.056	(0)
VOF4-2	4.920e-27	2.930e-27	-26.308	-26.533	-0.225	(0)
H2V2O4+2	1.445e-31	8.606e-32	-30.840	-31.065	-0.225	(0)
V(5)	7.011e-10					
H2VO4-	6.627e-10	5.821e-10	-9.179	-9.235	-0.056	(0)
HVO4-2	3.809e-11	2.269e-11	-10.419	-10.644	-0.225	(0)
H3VO4	3.752e-13	3.752e-13	-12.426	-12.426	0.000	(0)
H3V2O7-	1.606e-15	1.411e-15	-14.794	-14.851	-0.056	(0)
VO2+	5.403e-17	4.828e-17	-16.267	-16.316	-0.049	(0)
HV2O7-3	1.436e-17	4.476e-18	-16.843	-17.349	-0.506	(0)
VO2F	1.027e-17	1.027e-17	-16.988	-16.988	0.000	(0)
VO4-3	5.661e-18	1.764e-18	-17.247	-17.754	-0.506	(0)
VO2SO4-	8.138e-19	7.149e-19	-18.089	-18.146	-0.056	(0)
VO2F2-	5.148e-19	4.523e-19	-18.288	-18.345	-0.056	(0)
V2O7-4	1.485e-20	1.869e-21	-19.828	-20.728	-0.900	(0)
VO2F3-2	1.149e-21	6.842e-22	-20.940	-21.165	-0.225	(0)
V3O9-3	6.634e-22	2.067e-22	-21.178	-21.685	-0.506	(0)
VO2F4-3	1.310e-25	4.083e-26	-24.883	-25.389	-0.506	(0)
V4O12-4	3.988e-28	5.018e-29	-27.399	-28.299	-0.900	(0)
VO2NO3	5.495e-29	5.495e-29	-28.260	-28.260	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-69.803	-71.210	-1.407	(0)
V10O28-6	0.000e+00	0.000e+00	-70.180	-72.206	-2.026	(0)
H2V10O28-4	0.000e+00	0.000e+00	-72.292	-73.193	-0.900	(0)
Zn	4.755e-07					
Zn+2	3.542e-07	2.259e-07	-6.451	-6.646	-0.195	(0)
ZnCO3	4.553e-08	4.553e-08	-7.342	-7.342	0.000	(0)
ZnHCO3+	3.916e-08	3.440e-08	-7.407	-7.463	-0.056	(0)
ZnSO4	3.065e-08	3.065e-08	-7.514	-7.514	0.000	(0)
ZnOH+	4.017e-09	3.529e-09	-8.396	-8.452	-0.056	(0)
ZnCl+	8.055e-10	7.193e-10	-9.094	-9.143	-0.049	(0)
ZnF+	6.224e-10	5.467e-10	-9.206	-9.262	-0.056	(0)
Zn(SO4)2-2	2.779e-10	1.655e-10	-9.556	-9.781	-0.225	(0)
ZnOHCl	1.471e-10	1.471e-10	-9.832	-9.832	0.000	(0)
Zn(OH)2	8.734e-11	8.734e-11	-10.059	-10.059	0.000	(0)
ZnCl2	1.445e-12	1.445e-12	-11.840	-11.840	0.000	(0)
Zn(OH)3-	7.782e-14	6.836e-14	-13.109	-13.165	-0.056	(0)
ZnCl3-	1.629e-15	1.455e-15	-14.788	-14.837	-0.049	(0)
ZnSeO4	3.544e-17	3.544e-17	-16.451	-16.451	0.000	(0)
ZnNO3+	1.454e-18	1.277e-18	-17.838	-17.894	-0.056	(0)
ZnCl4-2	1.430e-18	9.220e-19	-17.845	-18.035	-0.191	(0)
Zn(OH)4-2	7.137e-19	4.251e-19	-18.146	-18.372	-0.225	(0)
Zn(SeO4)2-2	6.110e-29	3.639e-29	-28.214	-28.439	-0.225	(0)
Zn(NO3)2	5.733e-31	5.733e-31	-30.242	-30.242	0.000	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-150.423	-150.479	-0.056	(0)
Zn(HS)2	0.000e+00	0.000e+00	-151.660	-151.660	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-227.241	-227.297	-0.056	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-229.861	-230.087	-0.225	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-307.449	-307.674	-0.225	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-76.23	-69.94	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-56.95	-52.44	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-64.18	-52.44	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-98.57	-80.64	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-74.41	-54.38	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.52	-34.12	0.40	(NH4)2CrO4
(NH4)2SeO4	-30.71	-30.26	0.45	(NH4)2SeO4
Acanthite	-51.20	-87.42	-36.22	Ag2S
Ag2CO3	-10.06	-21.15	-11.09	Ag2CO3
Ag2CrO4	-19.96	-31.55	-11.59	Ag2CrO4
Ag2HVO4	-11.92	-10.44	1.48	Ag2HVO4
Ag2MoO4	-11.11	-22.66	-11.55	Ag2MoO4
Ag2O	-13.89	-1.31	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se

Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.08	-18.90	-4.82	Ag2SO4
Ag3AsO3	-26.64	-24.49	2.16	Ag3AsO3
Ag3AsO4	-15.05	-17.84	-2.79	Ag3AsO4
Ag3H2VO5	-16.28	-11.10	5.18	Ag3H2VO5
AgF:4H2O	-12.81	-11.76	1.05	AgF:4H2O
Agmetal	0.08	-13.43	-13.51	Ag
AgVO3	-10.55	-9.78	0.77	AgVO3
Al(OH)3(am)	-1.32	9.48	10.80	Al(OH)3
Al2(MoO4)3	-47.46	-45.09	2.37	Al2(MoO4)3
Al2O3	-0.70	18.95	19.65	Al2O3
Al4(OH)10SO4	-2.39	20.31	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.19	-6.39	4.80	AlAsO4:2H2O
AlOHSO4	-4.88	-8.11	-3.23	AlOHSO4
AlSb	-152.29	-86.66	65.62	AlSb
Alunite	-2.05	-3.45	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.23	-13.02	-7.79	PbSO4
Anhydrite	-1.87	-6.23	-4.36	CaSO4
Anilite	-58.97	-90.85	-31.88	Cu0.25Cu1.5S
Antlerite	-8.58	0.21	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-87.30	-90.06	-2.76	As4O6
Artinite	-7.25	2.35	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.44	-31.74	6.71	As2O5
Atacamite	-5.62	1.78	7.39	Cu2(OH)3Cl
Azurite	-4.97	-21.88	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.79	7.61	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.91	-3.03	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-28.36	4.58	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.96	-22.63	-9.67	BaCrO4
BaF2	-8.78	-14.60	-5.82	BaF2
BaMoO4	-6.78	-13.74	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.83	-8.00	1.83	BaSeO3
BaSeO4	-11.31	-18.77	-7.46	BaSeO4
Bianchite	-8.09	-9.85	-1.76	ZnSO4:6H2O
Birnessite	-8.67	9.42	18.09	MnO2
Bixbyite	-6.06	-6.70	-0.64	Mn2O3
BlaubleiI	-57.44	-81.60	-24.16	Cu0.9Cu0.2S
BlaubleiII	-58.59	-85.87	-27.28	Cu0.6Cu0.8S
Boehmite	0.90	9.48	8.58	AlOOH
Breithauptite	-57.54	-76.06	-18.52	NiSb
Brochantite	-9.08	6.14	15.22	Cu4(OH)6SO4
Brucite	-5.75	11.09	16.84	Mg(OH)2
Bunsenite	-5.14	7.30	12.45	NiO
Ca(VO3)2	-12.55	-6.89	5.66	Ca(VO3)2
Ca2V2O7	-13.04	4.46	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.09	4.46	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-19.97	2.33	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-23.14	15.82	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-24.04	15.82	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-301.18	-158.21	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-11.24	-29.15	-17.91	Hg2Cl2
CaMoO4	-2.04	-9.99	-7.95	CaMoO4
Carnotite	-6.04	-5.81	0.23	KUO2VO4
CaSeO3:2H2O	-7.07	-4.26	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.00	-15.02	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.68	-3.84	9.84	Cd(BO2)2
Cd(OH)2	-7.70	5.94	13.64	Cd(OH)2
Cd(OH)2(am)	-7.79	5.94	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-24.06	-17.35	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.32	0.24	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-22.22	6.18	28.40	Cd4(OH)6SO4

CdCl ₂	-13.57	-14.23	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.54	-14.23	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.32	-14.23	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.06	-16.27	-1.21	CdF ₂
Cdmetal (alpha)	-33.12	-19.60	13.51	Cd
Cdmetal (gamma)	-33.22	-19.60	13.62	Cd
CdMoO ₄	-1.26	-15.41	-14.15	CdMoO ₄
CdOHCl	-7.68	-4.14	3.54	CdOHCl
CdSb	-77.07	-77.42	-0.35	CdSb
CdSe	-21.24	-41.44	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.58	-20.43	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-11.47	-11.65	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.92	-11.65	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.77	-11.65	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-0.99	-10.74	-9.75	AgCl
Cerrusite	-2.14	-15.27	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-9.02	-11.66	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-59.49	-94.41	-34.92	Cu ₂ S
Chalcopyrite	-127.56	-162.83	-35.27	CuFeS ₂
Cinnabar	-53.72	-99.42	-45.69	HgS
Claudetite	-87.00	-90.06	-3.06	As ₄ O ₆
Clausthalite	-15.72	-42.82	-27.10	PbSe
Co (BO ₂) ₂	-29.70	-2.63	27.07	Co (BO ₂) ₂
Co (OH) ₂	-5.94	7.15	13.09	Co (OH) ₂
Co (OH) ₃	-10.17	-12.48	-2.31	Co (OH) ₃
CO ₂ (g)	-1.69	-19.84	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-23.32	-10.29	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.31	-17.80	-10.50	Co ₃ O ₄
CoCl ₂	-21.29	-13.02	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.56	-13.03	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.71	-12.69	-9.98	CoCO ₃
CoF ₂	-13.47	-15.06	-1.60	CoF ₂
CoF ₃	-44.34	-45.80	-1.46	CoF ₃
CoFe ₂ O ₄	17.06	13.53	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.44	-14.20	-7.76	CoMoO ₄
CoO	-6.44	7.15	13.59	CoO
CoS (alpha)	-71.52	-78.96	-7.44	CoS
CoS (beta)	-67.89	-78.96	-11.07	CoS
CoSe	-24.04	-40.24	-16.20	CoSe
CoSeO ₃	-9.78	-8.46	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-17.70	-19.23	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-13.24	-10.44	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.97	-10.44	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-10.83	-15.61	-4.78	PbCl ₂
Covellite	-57.88	-80.18	-22.30	CuS
Cr (OH) ₂	-21.82	-11.00	10.82	Cr (OH) ₂
Cr (OH) ₃	-2.51	-1.18	1.34	Cr (OH) ₃
Cr (OH) ₃ (am)	-0.43	-1.18	-0.75	Cr (OH) ₃
Cr ₂ O ₃	0.00	-2.36	-2.36	Cr ₂ O ₃
CrCl ₂	-45.27	-31.18	14.09	CrCl ₂
CrCl ₃	-46.56	-31.44	15.11	CrCl ₃
CrF ₃	-23.16	-34.50	-11.34	CrF ₃
Crmetal	-67.03	-36.55	30.48	Cr
CrO ₃	-27.03	-30.24	-3.21	CrO ₃
Cryolite	-9.09	-42.93	-33.84	Na ₃ AlF ₆
Cu (OH) ₂	-2.74	5.93	8.67	Cu (OH) ₂
Cu (SbO ₃) ₂	-27.20	18.01	45.21	Cu (SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-16.23	-6.97	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb:3H ₂ O	-59.48	-94.36	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se (alpha)	-9.89	-55.69	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-23.94	-25.89	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ :2H ₂ O	-20.04	-13.94	6.10	Cu ₃ (AsO ₄) ₂ :2H ₂ O
Cu ₃ Sb	-66.00	-108.59	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-33.65	-97.14	-63.49	Cu ₃ Se ₂
CuCO ₃	-2.41	-13.91	-11.50	CuCO ₃
CuCrO ₄	-18.87	-24.31	-5.44	CuCrO ₄
CuF	-10.35	-15.26	-4.91	CuF

CuF2	-17.40	-16.28	1.12	CuF2
CuF2:2H2O	-11.73	-16.28	-4.55	CuF2:2H2O
Cumetal	-8.17	-16.92	-8.76	Cu
CuMoO4	-2.34	-15.42	-13.08	CuMoO4
CuOCuSO4	-16.03	-5.73	10.30	CuOCuSO4
Cupricferrite	6.33	12.31	5.99	CuFe2O4
Cuprite	-6.90	-8.30	-1.41	Cu2O
Cuprousferrite	7.96	-0.96	-8.92	CuFeO2
CuSe	-8.35	-41.45	-33.10	CuSe
CuSe2	-29.93	-63.30	-33.37	CuSe2
CuSeO3:2H2O	-10.19	-9.68	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.00	-20.44	-2.44	CuSeO4:5H2O
CuSO4	-14.60	-11.66	2.94	CuSO4
Diaspore	2.60	9.48	6.87	AlOOH
Djurleite	-59.55	-93.47	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.68	-17.22	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.13	-17.22	-17.09	CaMg(CO3)2
Epsomite	-4.37	-6.50	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.20	0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.08	-14.80	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.78	-9.23	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.83	-40.46	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.65	-46.38	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.08	-12.68	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.81	-17.90	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-47.18	-65.78	-18.60	FeSe2
FeS(ppt)	-79.71	-82.66	-2.95	FeS
FeSe	-32.94	-43.94	-11.00	FeSe
Fix_pe	-5.58	-5.58	0.00	e-
Fluorite	-0.36	-10.86	-10.50	CaF2
Galena	-67.57	-81.54	-13.97	PbS
Gibbsite	1.18	9.48	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.84	-9.85	-2.01	ZnSO4:7H2O
Greenockite	-65.80	-80.16	-14.36	CdS
Greigite	-289.56	-334.60	-45.03	Fe3S4
Gummite	-7.66	0.02	7.67	UO3
Gypsum	-1.62	-6.23	-4.61	CaSO4:2H2O
H-Jarosite	-13.50	-25.60	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.47	-21.35	-12.88	H2MoO4
H2S(g)	-78.10	-86.11	-8.01	H2S
H2Se(g)	-42.43	-47.39	-4.96	H2Se
Halite	-6.94	-5.34	1.60	NaCl
Hausmannite	-7.81	53.22	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.49	22.40	22.89	FeAl2O4
Hg(CH3)2(g)	-183.63	-257.34	-73.71	Hg(CH3)2
Hg(g)	-9.39	-17.26	-7.87	Hg
Hg(OH)2	-9.81	-13.31	-3.50	Hg(OH)2
Hg2(g)	-19.57	-34.52	-14.96	Hg2
Hg2(OH)2	-14.24	-8.98	5.26	Hg2(OH)2
Hg2CO3	-12.76	-28.81	-16.05	Hg2CO3
Hg2CrO4	-30.52	-39.22	-8.70	Hg2CrO4
Hg2F2	-20.83	-31.19	-10.36	Hg2F2
Hg2S	-83.41	-95.09	-11.68	Hg2S
Hg2SeO3	-19.93	-24.59	-4.66	Hg2SeO3
Hg2SO4	-20.44	-26.57	-6.13	Hg2SO4
Hg3O2CO3	-30.08	-59.76	-29.68	Hg3O2CO3
HgCl(g)	-34.07	-14.58	19.50	HgCl
HgCl2	-12.22	-33.48	-21.26	HgCl2
HgF(g)	-48.27	-15.60	32.68	HgF
HgF2(g)	-48.09	-35.52	12.57	HgF2
Hgmetal(1)	-3.81	-17.26	-13.45	Hg
HgSe	-5.00	-60.70	-55.69	HgSe

HgSeO3	-16.49	-28.92	-12.43	HgSeO3
HgSO4	-21.48	-30.90	-9.42	HgSO4
Huntite	-4.75	-34.71	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-7.21	-25.98	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.12	-23.89	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.23	-22.40	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.50	-22.30	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.63	-53.88	-17.24	K2Cr2O7
K2CrO4	-23.13	-23.64	-0.51	K2CrO4
K2MoO4	-18.01	-14.75	3.26	K2MoO4
K2SeO4	-19.05	-19.78	-0.73	K2SeO4
Langite	-11.35	6.14	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-8.02	-8.46	-0.43	PbO : PbSO4
Laurionite	-6.15	-5.52	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-8.13	4.57	12.69	PbO
Mackinawite	-79.06	-82.66	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.62	17.47	16.86	Fe2MgO4
Magnesite	-1.28	-8.74	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-2.67	-7.97	-5.31	Cu2 (OH) 2CO3
Manganite	-3.34	22.00	25.34	MnOOH
Massicot	-8.33	4.57	12.89	PbO
Matlockite	-7.66	-16.63	-8.97	PbClF
Melanothallite	-20.50	-14.24	6.26	CuCl2
Melanterite	-11.93	-14.14	-2.21	FeSO4 : 7H2O
Metacinnabar	-54.32	-99.42	-45.09	HgS
Mg (OH) 2 (active)	-7.70	11.09	18.79	Mg (OH) 2
Mg (VO3) 2	-18.44	-7.16	11.28	Mg (VO3) 2
Mg2Sb3	-277.06	-202.37	74.68	Mg2Sb3
Mg2V2O7	-22.43	3.93	26.36	Mg2V2O7
MgCr2O4	-7.47	8.73	16.20	MgCr2O4
MgCrO4	-24.53	-19.15	5.38	MgCrO4
MgF2	-2.99	-11.12	-8.13	MgF2
MgMoO4	-8.41	-10.26	-1.85	MgMoO4
MgSeO3 : 6H2O	-7.58	-4.52	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-14.08	-15.28	-1.20	MgSeO4 : 6H2O
Minium	-34.28	39.24	73.52	Pb3O4
Mirabilite	-6.99	-8.10	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-13.93	-9.03	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-53.76	-59.47	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.54	-90.46	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-16.56	-4.06	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.67	-10.95	2.72	MnCl2 : 4H2O
MnS (grn)	-77.05	-76.88	0.17	MnS
MnS (pnk)	-80.22	-76.88	3.34	MnS
MnSb	-96.58	-99.49	-2.91	MnSb
MnSe	-41.66	-38.16	3.50	MnSe
MnSeO3	-7.52	-6.39	1.13	MnSeO3
MnSeO3 : 2H2O	-7.37	-6.39	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-15.10	-17.15	-2.05	MnSeO4 : 5H2O
MnSO4	-10.95	-8.36	2.58	MnSO4
Monteponite	-9.16	5.94	15.10	CdO
Montroydite	-9.67	-13.31	-3.64	HgO
MoO3	-13.35	-21.35	-8.00	MoO3
Morenosite	-8.14	-10.28	-2.14	NiSO4 : 7H2O
MoS2	-148.85	-219.11	-70.26	MoS2
Na-Jarosite	-9.66	-20.86	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.09	-50.99	-9.90	Na2Cr2O7
Na2CrO4	-23.68	-20.75	2.93	Na2CrO4
Na2Mo2O7	-16.61	-33.21	-16.60	Na2Mo2O7
Na2MoO4	-13.35	-11.86	1.49	Na2MoO4
Na2MoO4 : 2H2O	-13.08	-11.86	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-16.42	-6.12	10.30	Na2SeO3 : 5H2O
Na2SeO4	-18.17	-16.89	1.28	Na2SeO4
Na3Sb	-176.36	-81.90	94.45	Na3Sb

Na3VO4	-31.57	5.11	36.68	Na3VO4
Na4V2O7	-36.67	0.73	37.40	Na4V2O7
Nantokite	-7.51	-14.24	-6.73	CuCl
NaSb	-89.02	-65.85	23.17	NaSb
Natron	-9.04	-10.35	-1.31	Na2CO3:10H2O
NaVO3	-8.24	-4.38	3.86	NaVO3
Nesquehonite	-4.07	-8.74	-4.67	MgCO3:3H2O
Ni(OH)2	-5.49	7.30	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.52	-9.82	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.66	-12.53	-6.87	NiCO3
NiMoO4	-2.90	-14.04	-11.14	NiMoO4
NiS(alpha)	-73.20	-78.80	-5.60	NiS
NiS(beta)	-67.70	-78.80	-11.10	NiS
NiS(gamma)	-66.00	-78.80	-12.80	NiS
NiSe	-22.38	-40.08	-17.70	NiSe
NiSeO3:2H2O	-11.12	-8.31	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.55	-19.07	-1.52	NiSeO4:6H2O
Nsutite	-8.08	9.42	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-242.29	-303.35	-61.07	As2S3
Otavite	-1.89	-13.89	-12.00	CdCO3
Pb(BO2)2	-11.74	-5.22	6.52	Pb(BO2)2
Pb(OH)2	-3.58	4.57	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.61	-73.37	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.75	-0.96	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.06	9.13	26.19	Pb2O(OH)2
Pb2O3	-26.36	34.68	61.04	Pb2O3
Pb2OCO3	-10.15	-10.71	-0.56	Pb2OCO3
Pb2V2O7	-7.22	-9.12	-1.90	Pb2V2O7
Pb3(AsO4)2	-23.84	-18.04	5.80	Pb3(AsO4)2
Pb3(VO4)2	-10.69	-4.55	6.14	Pb3(VO4)2
Pb3O2CO3	-17.16	-6.14	11.02	Pb3O2CO3
Pb3O2SO4	-14.58	-3.89	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.43	0.67	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.20	0.67	21.88	Pb4O3SO4
PbCrO4	-13.07	-25.67	-12.60	PbCrO4
PbF2	-10.21	-17.65	-7.44	PbF2
Pbmetal	-25.23	-20.98	4.25	Pb
PbMoO4	-1.16	-16.78	-15.62	PbMoO4
PbO:0.3H2O	-8.41	4.57	12.98	PbO:0.33H2O
PbSeO4	-14.97	-21.81	-6.84	PbSeO4
Periclase	-10.49	11.09	21.58	MgO
Phosgenite	-11.07	-30.88	-19.81	PbCl2:PbCO3
Plattnerite	-19.49	30.11	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.71	-143.22	-18.51	FeS2
Pyrochroite	-5.97	9.23	15.19	Mn(OH)2
Pyrolusite	-6.61	34.77	41.38	MnO2
Realgar	-101.65	-121.40	-19.75	AsS
Retgersite	-8.24	-10.28	-2.04	NiSO4:6H2O
Rhodochrosite	-0.03	-10.61	-10.58	MnCO3
Rutherfordine	-5.32	-19.82	-14.50	UO2CO3
Sb(OH)3	-12.40	-19.51	-7.11	Sb(OH)3
Sb2O4	-16.87	-13.47	3.40	Sb2O4
Sb2O5	-26.88	-36.54	-9.67	Sb2O5
Sb2Se3	-113.42	-181.17	-67.76	Sb2Se3
Sb4O6(cubic)	-59.76	-78.03	-18.26	Sb4O6
Sb4O6(orth)	-60.12	-78.03	-17.90	Sb4O6
SbCl3	-50.34	-49.77	0.57	SbCl3
SbF3	-42.60	-52.83	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.22	-31.04	-27.82	SbO2
Schoepite	-5.98	0.02	5.99	UO2(OH)2:H2O
Semetal(am)	-14.73	-21.84	-7.11	Se
Semetal(hex)	-14.13	-21.84	-7.71	Se
Senarmontite	-26.65	-39.01	-12.37	Sb2O3
SeO2	-15.74	-15.61	0.12	SeO2

SeO3	-47.42	-26.38	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-2.10	-12.10	-10.00	ZnCO3
Sphalerite	-66.92	-78.37	-11.45	ZnS
Spinel	-6.80	30.04	36.85	MgAl2O4
Stibnite	-246.88	-297.34	-50.46	Sb2S3
Sulfur	-58.42	-60.56	-2.14	S
Tenorite	-1.71	5.93	7.64	CuO
Thenardite	-8.42	-8.10	0.32	Na2SO4
Thermonatrite	-10.98	-10.35	0.64	Na2CO3:H2O
Tyuyamunite	-10.94	-6.86	4.08	Ca(UO2)2(VO4)2
U3O8	-18.93	2.15	21.08	U3O8
U3Sb4	-585.88	-433.50	152.38	U3Sb4
U4O9	-36.69	-39.71	-3.02	U4O9
UF4	-31.20	-60.74	-29.54	UF4
UF4:2.5H2O	-28.02	-60.74	-32.72	UF4:2.5H2O
UO2(am)	-17.25	-16.31	0.93	UO2
UO2(NO3)2	-49.81	-37.66	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-42.51	-37.66	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-41.05	-37.66	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-39.71	-37.66	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-5.60	0.02	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.11	-26.36	-2.25	UO2SeO4:4H2O
UO3	-7.68	0.02	7.70	UO3
Uraninite	-11.64	-16.31	-4.67	UO2
USb2	-221.84	-192.26	29.58	USb2
V(OH)3	-19.66	-12.07	7.59	V(OH)3
V2O5	-16.89	-18.25	-1.36	V2O5
V3O5	-42.37	-40.53	1.84	V3O5
V4O7	-52.71	-45.52	7.19	V4O7
V6O13	-44.98	-105.84	-60.86	V6O13
Valentinite	-30.53	-39.01	-8.48	Sb2O3
VC12	-63.89	-45.02	18.87	VC12
VC13	-65.77	-42.33	23.43	VC13
VF4	-64.35	-49.42	14.93	VF4
Vmetal	-94.41	-50.39	44.03	V
VO	-39.60	-24.84	14.76	VO
VO(OH)2	-10.15	-4.99	5.15	VO(OH)2
VO2Cl	-22.05	-19.21	2.84	VO2Cl
VOC1	-33.31	-22.16	11.15	VOC1
VOC12	-37.93	-25.17	12.76	VOC12
VOSO4	-26.19	-22.58	3.61	VOSO4
Witherite	-3.66	-12.23	-8.57	BaCO3
Wurtzite	-69.42	-78.37	-8.95	ZnS
Zincite	-3.60	7.74	11.33	ZnO
Zincosite	-13.78	-9.85	3.93	ZnSO4
Zn(BO2)2	-10.34	-2.05	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.26	-29.94	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.46	7.74	12.20	Zn(OH)2
Zn(OH)2(am)	-4.74	7.74	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.02	7.74	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.80	7.74	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.00	7.74	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.62	-2.12	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.81	5.38	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-22.18	-8.53	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.89	-11.97	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.05	13.35	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.00	18.50	38.50	Zn5(OH)8Cl2
ZnCl2	-19.49	-12.44	7.05	ZnCl2
ZnCO3:1H2O	-1.84	-12.10	-10.26	ZnCO3:1H2O
ZnF2	-13.94	-14.48	-0.53	ZnF2
Znmetal	-43.60	-17.81	25.79	Zn
ZnMoO4	-3.49	-13.61	-10.13	ZnMoO4
ZnO(active)	-3.45	7.74	11.19	ZnO
ZnS(am)	-69.32	-78.37	-9.05	ZnS
ZnSb	-86.65	-75.63	11.01	ZnSb
ZnSe	-25.25	-39.65	-14.40	ZnSe

ZnSeO4:6H2O	-17.12	-18.64	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.22	-9.85	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 24.

```

Title Stage 1 Run-off mix
Mix 102
1      1
3      0.144320
4      0.481830
5      0.446008
6      0.061492
7      0.308570
8      0.002666
9      5.952461
10     11.796791
11     27.416625
12     98.122405
13     87.410481
14     24.534002
15     11.650734
Save solution 105
end

```

TITLE

Stage 1 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 102.

Mixture 102.

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1.000e+00 Solution 1      Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
1.443e-01 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
4.818e-01 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
4.460e-01 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
6.149e-02 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
3.086e-01 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
2.666e-03 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
5.952e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
1.180e+01 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)

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2.742e+01 Solution 11 Average HCT data for biotite breccia - sulfide
 (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
 9.812e+01 Solution 12 Average HCT data for quartz monzonite - sulfide
 (waste) (cells 604673 and 605153)
 8.741e+01 Solution 13 Average HCT data for quartz monzonite - sulfide
 (ore) (cells 604562, 604606, 604653, 604656 and 604669)
 2.453e+01 Solution 14 Average HCT data for coarse crystalline porphyry -
 sulfide (waste) (cell CF-11-02, 367-408)
 1.165e+01 Solution 15 Average HCT data for coarse crystalline porphyry -
 sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	1.077e-06	2.902e-04
As	6.403e-10	1.724e-07
B	4.469e-07	1.204e-04
Ba	1.318e-07	3.550e-05
C	7.335e-04	1.975e-01
Ca	3.382e-04	9.108e-02
Cd	1.133e-09	3.053e-07
Cl	3.927e-05	1.058e-02
Co	4.488e-10	1.209e-07
Cr	1.777e-10	4.787e-08
Cu	2.554e-06	6.878e-04
F	3.533e-05	9.515e-03
Fe	2.521e-07	6.790e-05
Hg	4.056e-11	1.092e-08
K	7.031e-05	1.894e-02
Mg	8.995e-05	2.423e-02
Mn	1.095e-06	2.950e-04
Mo	4.230e-08	1.139e-05
N	8.384e-08	2.258e-05
Na	1.241e-04	3.342e-02
Ni	6.695e-11	1.803e-08
Pb	3.183e-09	8.573e-07
S	2.751e-04	7.408e-02
Sb	4.749e-10	1.279e-07
Se	3.552e-09	9.566e-07
U	1.191e-08	3.209e-06
V	1.035e-08	2.788e-06
Zn	1.152e-07	3.102e-05

-----Description of solution-----

equilibrium

pH	=	6.494	Charge balance
pe	=	6.274	Adjusted to redox
Activity of water	=	1.000	
Ionic strength (mol/kgw)	=	1.694e-03	
Mass of water (kg)	=	2.693e+02	
Total alkalinity (eq/kg)	=	4.372e-04	
Total CO2 (mol/kg)	=	7.335e-04	
Temperature (°C)	=	25.00	
Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
Iterations	=	11	
Total H	=	2.989941e+04	
Total O	=	1.495046e+04	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.357e-07	3.207e-07	-6.474	-6.494	-0.020	0.00
OH-	3.288e-08	3.140e-08	-7.483	-7.503	-0.020	(0)

	H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al		1.077e-06					
	AlF2+	4.729e-07	4.521e-07	-6.325	-6.345	-0.020	(0)
	Al (OH) 4-	2.266e-07	2.165e-07	-6.645	-6.665	-0.020	(0)
	AlF3	1.815e-07	1.815e-07	-6.741	-6.741	0.000	(0)
	Al (OH) 2+	9.144e-08	8.742e-08	-7.039	-7.058	-0.020	(0)
	Al (OH) 3	5.477e-08	5.477e-08	-7.261	-7.261	0.000	(0)
	AlF+2	4.263e-08	3.560e-08	-7.370	-7.449	-0.078	(0)
	AlOH+2	4.197e-09	3.505e-09	-8.377	-8.455	-0.078	(0)
	AlF4-	3.037e-09	2.902e-09	-8.518	-8.537	-0.020	(0)
	AlSO4+	1.952e-10	1.865e-10	-9.709	-9.729	-0.020	(0)
	Al+3	1.686e-10	1.116e-10	-9.773	-9.952	-0.179	(0)
	Al (SO4) 2-	4.504e-13	4.303e-13	-12.346	-12.366	-0.020	(0)
	AlMo6O21-3	3.401e-39	2.201e-39	-38.468	-38.657	-0.189	(0)
As (3)		5.610e-21					
	H3AsO3	5.601e-21	5.601e-21	-20.252	-20.252	0.000	(0)
	H2AsO3-	9.401e-24	8.958e-24	-23.027	-23.048	-0.021	(0)
	H4AsO3+	9.339e-28	8.898e-28	-27.030	-27.051	-0.021	(0)
	HAsO3-2	3.091e-29	2.548e-29	-28.510	-28.594	-0.084	(0)
	AsO3-3	4.732e-36	3.063e-36	-35.325	-35.514	-0.189	(0)
As (5)		6.403e-10					
	H2AsO4-	4.589e-10	4.372e-10	-9.338	-9.359	-0.021	(0)
	HAsO4-2	1.814e-10	1.495e-10	-9.741	-9.825	-0.084	(0)
	H3AsO4	2.435e-14	2.436e-14	-13.613	-13.613	0.000	(0)
	AsO4-3	2.278e-15	1.474e-15	-14.642	-14.831	-0.189	(0)
B		4.469e-07					
	H3BO3	4.460e-07	4.462e-07	-6.351	-6.350	0.000	(0)
	H2BO3-	8.468e-10	8.082e-10	-9.072	-9.092	-0.020	(0)
	CaH2BO3+	1.309e-11	1.249e-11	-10.883	-10.903	-0.020	(0)
	BF (OH) 3-	5.951e-12	5.679e-12	-11.225	-11.246	-0.020	(0)
	MgH2BO3+	2.115e-12	2.019e-12	-11.675	-11.695	-0.020	(0)
	NaH2BO3	1.516e-13	1.516e-13	-12.819	-12.819	0.000	(0)
	BF2 (OH) 2-	6.507e-15	6.210e-15	-14.187	-14.207	-0.020	(0)
	BaH2BO3+	2.862e-15	2.731e-15	-14.543	-14.564	-0.020	(0)
	H5 (BO3) 2-	3.216e-16	3.069e-16	-15.493	-15.513	-0.020	(0)
	BF3OH-	2.589e-20	2.471e-20	-19.587	-19.607	-0.020	(0)
	H8 (BO3) 3-	1.435e-20	1.370e-20	-19.843	-19.863	-0.020	(0)
	BF4-	1.303e-24	1.244e-24	-23.885	-23.905	-0.020	(0)
Ba		1.318e-07					
	Ba+2	1.313e-07	1.093e-07	-6.882	-6.961	-0.080	(0)
	BaHCO3+	4.512e-10	4.315e-10	-9.346	-9.365	-0.019	(0)
	BaCO3	3.388e-12	3.388e-12	-11.470	-11.470	0.000	(0)
	BaOH+	1.568e-14	1.499e-14	-13.805	-13.824	-0.020	(0)
	BaH2BO3+	2.862e-15	2.731e-15	-14.543	-14.564	-0.020	(0)
	BaNH3+2	1.056e-17	8.707e-18	-16.976	-17.060	-0.084	(0)
	BaNO3+	4.653e-18	4.434e-18	-17.332	-17.353	-0.021	(0)
C (4)		7.335e-04					
	HCO3-	4.323e-04	4.132e-04	-3.364	-3.384	-0.020	(0)
	H2CO3	2.980e-04	2.980e-04	-3.526	-3.526	0.000	(0)
	CaHCO3+	2.161e-06	2.067e-06	-5.665	-5.685	-0.019	(0)
	CuCO3	5.216e-07	5.216e-07	-6.283	-6.283	0.000	(0)
	MgHCO3+	3.189e-07	3.046e-07	-6.496	-6.516	-0.020	(0)
	CO3-2	7.257e-08	6.041e-08	-7.139	-7.219	-0.080	(0)
	CuHCO3+	4.012e-08	3.823e-08	-7.397	-7.418	-0.021	(0)
	NaHCO3	2.750e-08	2.750e-08	-7.561	-7.561	0.000	(0)
	CaCO3	2.572e-08	2.572e-08	-7.590	-7.590	0.000	(0)
	MnHCO3+	7.488e-09	7.157e-09	-8.126	-8.145	-0.020	(0)
	UO2 (CO3) 2-2	6.928e-09	5.710e-09	-8.159	-8.243	-0.084	(0)
	UO2CO3	4.737e-09	4.737e-09	-8.325	-8.325	0.000	(0)
	MgCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)
	ZnHCO3+	1.244e-09	1.186e-09	-8.905	-8.926	-0.021	(0)
	PbHCO3+	5.406e-10	5.151e-10	-9.267	-9.288	-0.021	(0)
	BaHCO3+	4.512e-10	4.315e-10	-9.346	-9.365	-0.019	(0)
	ZnCO3	3.154e-10	3.154e-10	-9.501	-9.501	0.000	(0)
	PbCO3	3.047e-10	3.047e-10	-9.516	-9.516	0.000	(0)
	NaCO3-	1.393e-10	1.331e-10	-9.856	-9.876	-0.020	(0)
	Cu (CO3) 2-2	1.029e-10	8.482e-11	-9.988	-10.072	-0.084	(0)
	UO2 (CO3) 3-4	3.747e-11	1.729e-11	-10.426	-10.762	-0.336	(0)

	FeHCO3+	2.857e-11	2.732e-11	-10.544	-10.563	-0.019	(0)
	CoHCO3+	1.171e-11	1.116e-11	-10.931	-10.952	-0.021	(0)
	BaCO3	3.388e-12	3.388e-12	-11.470	-11.470	0.000	(0)
	NiHCO3+	2.751e-12	2.621e-12	-11.561	-11.581	-0.021	(0)
	CdCO3	1.240e-12	1.240e-12	-11.907	-11.907	0.000	(0)
	CdHCO3+	8.890e-13	8.471e-13	-12.051	-12.072	-0.021	(0)
	CoCO3	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
	NiCO3	1.160e-13	1.160e-13	-12.936	-12.936	0.000	(0)
	Pb(CO3) 2-2	6.441e-14	5.309e-14	-13.191	-13.275	-0.084	(0)
	HgCO3	1.120e-15	1.120e-15	-14.951	-14.951	0.000	(0)
	Cd(CO3) 2-2	6.737e-17	5.553e-17	-16.172	-16.255	-0.084	(0)
	HgHCO3+	7.019e-18	6.687e-18	-17.154	-17.175	-0.021	(0)
	Hg(CO3) 2-2	2.596e-19	2.140e-19	-18.586	-18.670	-0.084	(0)
Ca	3.382e-04						
	Ca+2	3.226e-04	2.686e-04	-3.491	-3.571	-0.080	(0)
	CaSO4	1.325e-05	1.325e-05	-4.878	-4.878	0.000	(0)
	CaHCO3+	2.161e-06	2.067e-06	-5.665	-5.685	-0.019	(0)
	CaF+	9.784e-08	9.351e-08	-7.009	-7.029	-0.020	(0)
	CaCO3	2.572e-08	2.572e-08	-7.590	-7.590	0.000	(0)
	CaOH+	1.760e-10	1.683e-10	-9.755	-9.774	-0.019	(0)
	CaH2BO3+	1.309e-11	1.249e-11	-10.883	-10.903	-0.020	(0)
	CaNH3+2	5.178e-14	4.267e-14	-13.286	-13.370	-0.084	(0)
	CaNO3+	7.212e-15	6.872e-15	-14.142	-14.163	-0.021	(0)
	Ca(NH3) 2+2	2.601e-24	2.144e-24	-23.585	-23.669	-0.084	(0)
Cd	1.133e-09						
	Cd+2	1.082e-09	9.004e-10	-8.966	-9.046	-0.080	(0)
	CdSO4	4.544e-11	4.544e-11	-10.343	-10.343	0.000	(0)
	CdCl+	3.386e-12	3.226e-12	-11.470	-11.491	-0.021	(0)
	CdCO3	1.240e-12	1.240e-12	-11.907	-11.907	0.000	(0)
	CdHCO3+	8.890e-13	8.471e-13	-12.051	-12.072	-0.021	(0)
	CdF+	4.777e-13	4.552e-13	-12.321	-12.342	-0.021	(0)
	CdOH+	2.357e-13	2.246e-13	-12.628	-12.649	-0.021	(0)
	Cd(SO4) 2-2	1.601e-13	1.320e-13	-12.796	-12.879	-0.084	(0)
	CdOHC1	4.155e-15	4.155e-15	-14.381	-14.381	0.000	(0)
	CdCl2	5.045e-16	5.045e-16	-15.297	-15.297	0.000	(0)
	Cd(CO3) 2-2	6.737e-17	5.553e-17	-16.172	-16.255	-0.084	(0)
	Cd(OH) 2	4.450e-17	4.450e-17	-16.352	-16.352	0.000	(0)
	CdF2	2.897e-17	2.897e-17	-16.538	-16.538	0.000	(0)
	CdSeO4	2.952e-20	2.952e-20	-19.530	-19.530	0.000	(0)
	CdNO3+	2.418e-20	2.304e-20	-19.617	-19.638	-0.021	(0)
	CdCl3-	1.253e-20	1.194e-20	-19.902	-19.923	-0.021	(0)
	Cd2OH+3	1.566e-21	1.013e-21	-20.805	-20.994	-0.189	(0)
	Cd(OH) 3-	8.959e-23	8.536e-23	-22.048	-22.069	-0.021	(0)
	Cd(SeO3) 2-2	1.544e-24	1.273e-24	-23.811	-23.895	-0.084	(0)
	Cd(OH) 4-2	5.323e-31	4.387e-31	-30.274	-30.358	-0.084	(0)
	Cd(NO3) 2	9.341e-32	9.341e-32	-31.030	-31.030	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.663	-79.684	-0.021	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-151.127	-151.127	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-227.853	-227.874	-0.021	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-304.241	-304.325	-0.084	(0)
Cl	3.927e-05						
	Cl-	3.927e-05	3.751e-05	-4.406	-4.426	-0.020	(0)
	CuCl+	9.127e-11	8.718e-11	-10.040	-10.060	-0.020	(0)
	MnCl+	4.289e-11	4.099e-11	-10.368	-10.387	-0.020	(0)
	CuCl	1.803e-11	1.803e-11	-10.744	-10.744	0.000	(0)
	ZnCl+	8.950e-12	8.549e-12	-11.048	-11.068	-0.020	(0)
	CdCl+	3.386e-12	3.226e-12	-11.470	-11.491	-0.021	(0)
	PbCl+	2.344e-12	2.233e-12	-11.630	-11.651	-0.021	(0)
	ZnOHC1	3.514e-13	3.514e-13	-12.454	-12.454	0.000	(0)
	CuCl2-	1.480e-13	1.414e-13	-12.830	-12.850	-0.020	(0)
	CoCl+	4.728e-14	4.505e-14	-13.325	-13.346	-0.021	(0)
	HgClOH	3.223e-14	3.223e-14	-13.492	-13.492	0.000	(0)
	NiCl+	5.183e-15	4.939e-15	-14.285	-14.306	-0.021	(0)
	CdOHC1	4.155e-15	4.155e-15	-14.381	-14.381	0.000	(0)
	HgCl2	2.180e-15	2.180e-15	-14.662	-14.662	0.000	(0)
	MnCl2	2.172e-15	2.172e-15	-14.663	-14.663	0.000	(0)
	UO2Cl+	1.258e-15	1.198e-15	-14.900	-14.921	-0.021	(0)
	CuCl2	1.134e-15	1.134e-15	-14.945	-14.945	0.000	(0)

ZnCl2	5.083e-16	5.083e-16	-15.294	-15.294	0.000	(0)
CdCl2	5.045e-16	5.045e-16	-15.297	-15.297	0.000	(0)
PbCl2	3.742e-16	3.742e-16	-15.427	-15.427	0.000	(0)
HgCl+	1.217e-17	1.159e-17	-16.915	-16.936	-0.021	(0)
CrCl+2	2.859e-18	2.356e-18	-17.544	-17.628	-0.084	(0)
CuCl3-2	1.359e-18	1.134e-18	-17.867	-17.946	-0.079	(0)
FeCl+2	1.246e-18	1.040e-18	-17.905	-17.983	-0.079	(0)
HgCl3-	8.583e-19	8.178e-19	-18.066	-18.087	-0.021	(0)
MnCl3-	2.348e-20	2.245e-20	-19.629	-19.649	-0.020	(0)
ZnCl3-	1.586e-20	1.515e-20	-19.800	-19.820	-0.020	(0)
CdCl3-	1.253e-20	1.194e-20	-19.902	-19.923	-0.021	(0)
VOC1+	9.654e-21	9.198e-21	-20.015	-20.036	-0.021	(0)
PbCl3-	5.865e-21	5.588e-21	-20.232	-20.253	-0.021	(0)
NiCl2	9.328e-22	9.328e-22	-21.030	-21.030	0.000	(0)
CuCl3-	4.156e-22	3.970e-22	-21.381	-21.401	-0.020	(0)
FeCl2+	1.823e-22	1.742e-22	-21.739	-21.759	-0.020	(0)
HgCl4-2	1.482e-22	1.221e-22	-21.829	-21.913	-0.084	(0)
CrOHC12	5.275e-23	5.275e-23	-22.278	-22.278	0.000	(0)
CrCl2+	8.802e-24	8.387e-24	-23.055	-23.076	-0.021	(0)
ZnCl4-2	3.405e-25	2.841e-25	-24.468	-24.546	-0.079	(0)
PbCl4-2	1.163e-25	9.583e-26	-24.935	-25.019	-0.084	(0)
FeCl3	6.535e-28	6.535e-28	-27.185	-27.185	0.000	(0)
CuCl4-2	8.946e-29	7.464e-29	-28.048	-28.127	-0.079	(0)
CrO3Cl-	2.701e-30	2.574e-30	-29.568	-29.589	-0.021	(0)
CoCl+2	2.407e-38	1.984e-38	-37.619	-37.702	-0.084	(0)
UCl+3	0.000e+00	0.000e+00	-42.551	-42.740	-0.189	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-61.160	-61.244	-0.084	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.948	-63.032	-0.084	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.775	-77.859	-0.084	(0)
Co (2)	4.488e-10					
Co+2	4.212e-10	3.472e-10	-9.376	-9.459	-0.084	(0)
CoSO4	1.491e-11	1.491e-11	-10.826	-10.826	0.000	(0)
CoHCO3+	1.171e-11	1.116e-11	-10.931	-10.952	-0.021	(0)
CoF+	3.675e-13	3.502e-13	-12.435	-12.456	-0.021	(0)
CoCO3	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
CoOH+	2.283e-13	2.175e-13	-12.642	-12.663	-0.021	(0)
CoCl+	4.728e-14	4.505e-14	-13.325	-13.346	-0.021	(0)
Co (OH) 2	5.425e-16	5.425e-16	-15.266	-15.266	0.000	(0)
CoNO2+	2.244e-17	2.138e-17	-16.649	-16.670	-0.021	(0)
Co (NH3) +2	6.391e-18	5.267e-18	-17.194	-17.278	-0.084	(0)
CoSeO4	3.063e-20	3.063e-20	-19.514	-19.514	0.000	(0)
CoNO3+	4.672e-21	4.451e-21	-20.331	-20.351	-0.021	(0)
Co (OH) 3-	3.567e-22	3.399e-22	-21.448	-21.469	-0.021	(0)
CoOOH-	8.951e-23	8.528e-23	-22.048	-22.069	-0.021	(0)
Co2OH+3	5.847e-24	3.784e-24	-23.233	-23.422	-0.189	(0)
Co (NH3) 2+2	3.440e-26	2.835e-26	-25.463	-25.547	-0.084	(0)
Co (OH) 4-2	2.052e-30	1.692e-30	-29.688	-29.772	-0.084	(0)
Co (NO3) 2	7.328e-32	7.328e-32	-31.135	-31.135	0.000	(0)
Co (NH3) 3+2	5.466e-35	4.505e-35	-34.262	-34.346	-0.084	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-42.014	-42.350	-0.336	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-43.441	-43.525	-0.084	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-53.120	-53.204	-0.084	(0)
Co (3)	5.032e-31					
CoOH+2	5.032e-31	4.147e-31	-30.298	-30.382	-0.084	(0)
Co+3	3.926e-36	2.599e-36	-35.406	-35.585	-0.179	(0)
CoCl+2	2.407e-38	1.984e-38	-37.619	-37.702	-0.084	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-61.160	-61.244	-0.084	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-72.153	-72.174	-0.021	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.652	-76.736	-0.084	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.775	-77.859	-0.084	(0)
Cr (2)	7.479e-27					
Cr+2	7.479e-27	6.164e-27	-26.126	-26.210	-0.084	(0)
Cr (3)	1.777e-10					
Cr (OH) 2+	1.337e-10	1.274e-10	-9.874	-9.895	-0.021	(0)
Cr (OH) +2	4.045e-11	3.334e-11	-10.393	-10.477	-0.084	(0)
CrOHSO4	1.703e-12	1.703e-12	-11.769	-11.769	0.000	(0)
Cr (OH) 3	1.502e-12	1.502e-12	-11.823	-11.823	0.000	(0)
CrF+2	2.977e-13	2.453e-13	-12.526	-12.610	-0.084	(0)

Cr+3	7.498e-14	4.853e-14	-13.125	-13.314	-0.189	(0)
CrSO4+	2.561e-14	2.440e-14	-13.592	-13.613	-0.021	(0)
CrO2-	2.335e-15	2.225e-15	-14.632	-14.653	-0.021	(0)
Cr(OH) 4-	1.971e-15	1.878e-15	-14.705	-14.726	-0.021	(0)
CrCl+2	2.859e-18	2.356e-18	-17.544	-17.628	-0.084	(0)
Cr2(OH) 2SO4+2	6.227e-21	5.132e-21	-20.206	-20.290	-0.084	(0)
Cr2(OH) 2(SO4) 2	6.564e-23	6.564e-23	-22.183	-22.183	0.000	(0)
CrOHC12	5.275e-23	5.275e-23	-22.278	-22.278	0.000	(0)
CrCl2+	8.802e-24	8.387e-24	-23.055	-23.076	-0.021	(0)
CrNO3+2	2.082e-26	1.716e-26	-25.681	-25.765	-0.084	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-49.856	-49.940	-0.084	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-59.519	-59.708	-0.189	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-62.948	-63.032	-0.084	(0)
Cr(6)	7.511e-20					
CrO4-2	3.938e-20	3.278e-20	-19.405	-19.484	-0.080	(0)
HCrO4-	3.570e-20	3.402e-20	-19.447	-19.468	-0.021	(0)
NaCrO4-	2.024e-23	1.928e-23	-22.694	-22.715	-0.021	(0)
KCrO4-	8.572e-24	8.168e-24	-23.067	-23.088	-0.021	(0)
H2CrO4	8.842e-27	8.842e-27	-26.053	-26.053	0.000	(0)
CrO3SO4-2	8.679e-28	7.153e-28	-27.062	-27.145	-0.084	(0)
CrO3Cl-	2.701e-30	2.574e-30	-29.568	-29.589	-0.021	(0)
Cr2O7-2	4.868e-38	4.013e-38	-37.313	-37.397	-0.084	(0)
Cu(1)	4.190e-10					
Cu+	4.008e-10	3.819e-10	-9.397	-9.418	-0.021	(0)
CuCl	1.803e-11	1.803e-11	-10.744	-10.744	0.000	(0)
CuCl2-	1.480e-13	1.414e-13	-12.830	-12.850	-0.020	(0)
CuCl3-2	1.359e-18	1.134e-18	-17.867	-17.946	-0.079	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-150.190	-150.334	-0.144	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.923	-151.064	-0.141	(0)
Cu(2)	2.553e-06					
Cu+2	1.761e-06	1.466e-06	-5.754	-5.834	-0.080	(0)
CuCO3	5.216e-07	5.216e-07	-6.283	-6.283	0.000	(0)
CuOH+	1.524e-07	1.456e-07	-6.817	-6.837	-0.020	(0)
CuSO4	7.232e-08	7.232e-08	-7.141	-7.141	0.000	(0)
CuHCO3+	4.012e-08	3.823e-08	-7.397	-7.418	-0.021	(0)
CuF+	3.097e-09	2.951e-09	-8.509	-8.530	-0.021	(0)
Cu(OH) 2	9.122e-10	9.122e-10	-9.040	-9.040	0.000	(0)
Cu2(OH) 2+2	6.460e-10	5.325e-10	-9.190	-9.274	-0.084	(0)
Cu(CO3) 2-2	1.029e-10	8.482e-11	-9.988	-10.072	-0.084	(0)
CuCl+	9.127e-11	8.718e-11	-10.040	-10.060	-0.020	(0)
CuNH3+2	2.297e-12	1.893e-12	-11.639	-11.723	-0.084	(0)
CuNO2+	1.408e-12	1.342e-12	-11.851	-11.872	-0.021	(0)
Cu(OH) 3-	6.166e-14	5.875e-14	-13.210	-13.231	-0.021	(0)
CuCl2	1.134e-15	1.134e-15	-14.945	-14.945	0.000	(0)
CuNO3+	3.937e-17	3.751e-17	-16.405	-16.426	-0.021	(0)
Cu(NO2) 2	1.200e-19	1.200e-19	-18.921	-18.921	0.000	(0)
Cu(OH) 4-2	1.762e-20	1.452e-20	-19.754	-19.838	-0.084	(0)
CuCl3-	4.156e-22	3.970e-22	-21.381	-21.401	-0.020	(0)
CuCl4-2	8.946e-29	7.464e-29	-28.048	-28.127	-0.079	(0)
Cu(NO3) 2	3.821e-29	3.821e-29	-28.418	-28.418	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.854	-215.875	-0.021	(0)
F	3.533e-05					
F-	3.339e-05	3.190e-05	-4.476	-4.496	-0.020	(0)
AlF2+	4.729e-07	4.521e-07	-6.325	-6.345	-0.020	(0)
MgF+	2.698e-07	2.578e-07	-6.569	-6.589	-0.020	(0)
AlF3	1.815e-07	1.815e-07	-6.741	-6.741	0.000	(0)
CaF+	9.784e-08	9.351e-08	-7.009	-7.029	-0.020	(0)
AlF+2	4.263e-08	3.560e-08	-7.370	-7.449	-0.078	(0)
HF	1.513e-08	1.513e-08	-7.820	-7.820	0.000	(0)
CuF+	3.097e-09	2.951e-09	-8.509	-8.530	-0.021	(0)
AlF4-	3.037e-09	2.902e-09	-8.518	-8.537	-0.020	(0)
NaF	2.382e-09	2.382e-09	-8.623	-8.623	0.000	(0)
MnF+	1.153e-09	1.102e-09	-8.938	-8.958	-0.020	(0)
UO2F+	9.101e-11	8.672e-11	-10.041	-10.062	-0.021	(0)
ZnF+	6.060e-11	5.774e-11	-10.218	-10.239	-0.021	(0)
UO2F2	7.977e-12	7.977e-12	-11.098	-11.098	0.000	(0)
BF(OH) 3-	5.951e-12	5.679e-12	-11.225	-11.246	-0.020	(0)
PbF+	3.958e-12	3.771e-12	-11.403	-11.424	-0.021	(0)

HF2-	1.921e-12	1.835e-12	-11.716	-11.736	-0.020	(0)
CdF+	4.777e-13	4.552e-13	-12.321	-12.342	-0.021	(0)
CoF+	3.675e-13	3.502e-13	-12.435	-12.456	-0.021	(0)
CrF+2	2.977e-13	2.453e-13	-12.526	-12.610	-0.084	(0)
UO2F3-	6.708e-14	6.391e-14	-13.173	-13.194	-0.021	(0)
NiF+	4.327e-14	4.122e-14	-13.364	-13.385	-0.021	(0)
FeF+2	3.846e-14	3.209e-14	-13.415	-13.494	-0.079	(0)
FeF2+	2.866e-14	2.739e-14	-13.543	-13.562	-0.020	(0)
BF2(OH) 2-	6.507e-15	6.210e-15	-14.187	-14.207	-0.020	(0)
PbF2	2.367e-15	2.367e-15	-14.626	-14.626	0.000	(0)
FeF3	1.233e-15	1.233e-15	-14.909	-14.909	0.000	(0)
VO2F	1.118e-15	1.118e-15	-14.952	-14.952	0.000	(0)
H2F2	6.132e-16	6.132e-16	-15.212	-15.212	0.000	(0)
CdF2	2.897e-17	2.897e-17	-16.538	-16.538	0.000	(0)
UO2F4-2	1.965e-17	1.619e-17	-16.707	-16.791	-0.084	(0)
VOF+	1.755e-17	1.672e-17	-16.756	-16.777	-0.021	(0)
VO2F2-	1.359e-17	1.295e-17	-16.867	-16.888	-0.021	(0)
VOF2	2.000e-19	2.000e-19	-18.699	-18.699	0.000	(0)
PbF3-	1.503e-19	1.432e-19	-18.823	-18.844	-0.021	(0)
BF3OH-	2.589e-20	2.471e-20	-19.587	-19.607	-0.020	(0)
VO2F3-2	6.250e-21	5.152e-21	-20.204	-20.288	-0.084	(0)
VOF3-	2.375e-22	2.263e-22	-21.624	-21.645	-0.021	(0)
HgF+	1.922e-23	1.832e-23	-22.716	-22.737	-0.021	(0)
PbF4-2	2.652e-24	2.186e-24	-23.576	-23.660	-0.084	(0)
BF4-	1.303e-24	1.244e-24	-23.885	-23.905	-0.020	(0)
Sb(OH) 2F	1.608e-25	1.608e-25	-24.794	-24.794	0.000	(0)
SbOF	1.581e-25	1.581e-25	-24.801	-24.801	0.000	(0)
VO2F4-3	1.249e-25	8.085e-26	-24.903	-25.092	-0.189	(0)
VOF4-2	3.536e-26	2.914e-26	-25.452	-25.536	-0.084	(0)
UF3+	1.313e-32	1.251e-32	-31.882	-31.903	-0.021	(0)
UF2+2	3.002e-33	2.474e-33	-32.523	-32.607	-0.084	(0)
UF4	4.375e-35	4.375e-35	-34.359	-34.359	0.000	(0)
UF+3	9.520e-36	6.162e-36	-35.021	-35.210	-0.189	(0)
UF5-	5.804e-38	5.530e-38	-37.236	-37.257	-0.021	(0)
UF6-2	6.463e-40	5.327e-40	-39.190	-39.274	-0.084	(0)
Fe (2)	6.686e-09					
Fe+2	6.373e-09	5.252e-09	-8.196	-8.280	-0.084	(0)
FeSO4	2.776e-10	2.776e-10	-9.557	-9.557	0.000	(0)
FeHCO3+	2.857e-11	2.732e-11	-10.544	-10.563	-0.019	(0)
FeOH+	6.870e-12	6.566e-12	-11.163	-11.183	-0.020	(0)
Fe(OH) 2	1.638e-16	1.638e-16	-15.786	-15.786	0.000	(0)
Fe(OH) 3-	1.701e-18	1.626e-18	-17.769	-17.789	-0.020	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-156.623	-156.623	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-233.212	-233.233	-0.021	(0)
Fe (3)	2.454e-07					
Fe(OH) 2+	2.377e-07	2.273e-07	-6.624	-6.643	-0.020	(0)
Fe(OH) 3	7.664e-09	7.664e-09	-8.116	-8.116	0.000	(0)
Fe(OH) 4-	2.344e-11	2.241e-11	-10.630	-10.650	-0.020	(0)
FeOH+2	2.230e-11	1.860e-11	-10.652	-10.730	-0.079	(0)
FeF+2	3.846e-14	3.209e-14	-13.415	-13.494	-0.079	(0)
FeF2+	2.866e-14	2.739e-14	-13.543	-13.562	-0.020	(0)
FeSO4+	2.319e-15	2.217e-15	-14.635	-14.654	-0.020	(0)
Fe+3	1.386e-15	9.176e-16	-14.858	-15.037	-0.179	(0)
FeF3	1.233e-15	1.233e-15	-14.909	-14.909	0.000	(0)
Fe(SO4) 2-	1.071e-17	1.020e-17	-16.970	-16.991	-0.021	(0)
FeCl+2	1.246e-18	1.040e-18	-17.905	-17.983	-0.079	(0)
Fe2(OH) 2+4	2.483e-20	1.146e-20	-19.605	-19.941	-0.336	(0)
FeHSeO3+2	9.813e-21	8.088e-21	-20.008	-20.092	-0.084	(0)
FeCl2+	1.823e-22	1.742e-22	-21.739	-21.759	-0.020	(0)
Fe3(OH) 4+5	1.260e-25	3.764e-26	-24.900	-25.424	-0.525	(0)
FeNO3+2	9.007e-26	7.424e-26	-25.045	-25.129	-0.084	(0)
FeCl3	6.535e-28	6.535e-28	-27.185	-27.185	0.000	(0)
H (0)	4.115e-29					
H2	2.057e-29	2.058e-29	-28.687	-28.687	0.000	(0)
Hg (0)	4.043e-11					
Hg	4.043e-11	4.043e-11	-10.393	-10.393	0.000	(0)
Hg (1)	1.032e-21					
Hg2+2	5.158e-22	4.251e-22	-21.287	-21.371	-0.084	(0)

Hg (2)	1.319e-13					
Hg (OH) 2	9.633e-14	9.637e-14	-13.016	-13.016	0.000	(0)
HgClOH	3.223e-14	3.223e-14	-13.492	-13.492	0.000	(0)
HgCl2	2.180e-15	2.180e-15	-14.662	-14.662	0.000	(0)
HgCO3	1.120e-15	1.120e-15	-14.951	-14.951	0.000	(0)
HgOH+	2.032e-17	1.936e-17	-16.692	-16.713	-0.021	(0)
HgCl+	1.217e-17	1.159e-17	-16.915	-16.936	-0.021	(0)
HgHCO3+	7.019e-18	6.687e-18	-17.154	-17.175	-0.021	(0)
HgCl3-	8.583e-19	8.178e-19	-18.066	-18.087	-0.021	(0)
Hg (CO3) 2-2	2.596e-19	2.140e-19	-18.586	-18.670	-0.084	(0)
Hg+2	1.879e-20	1.549e-20	-19.726	-19.810	-0.084	(0)
HgNH3+2	1.497e-21	1.233e-21	-20.825	-20.909	-0.084	(0)
HgSO4	8.732e-22	8.732e-22	-21.059	-21.059	0.000	(0)
Hg (OH) 3-	3.998e-22	3.810e-22	-21.398	-21.419	-0.021	(0)
Hg (NH3) 2+2	1.889e-22	1.557e-22	-21.724	-21.808	-0.084	(0)
HgCl4-2	1.482e-22	1.221e-22	-21.829	-21.913	-0.084	(0)
HgF+	1.922e-23	1.832e-23	-22.716	-22.737	-0.021	(0)
Hg (NH3) 3+2	9.488e-32	7.820e-32	-31.023	-31.107	-0.084	(0)
HgNO3+	4.857e-32	4.627e-32	-31.314	-31.335	-0.021	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.022	-40.106	-0.084	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.808	-42.808	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.661	-138.682	-0.021	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.782	-138.782	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.812	-140.896	-0.084	(0)
K	7.031e-05					
K+	7.020e-05	6.706e-05	-4.154	-4.174	-0.020	(0)
KSO4-	1.069e-07	1.022e-07	-6.971	-6.991	-0.020	(0)
KCrO4-	8.572e-24	8.168e-24	-23.067	-23.088	-0.021	(0)
Mg	8.995e-05					
Mg+2	8.653e-05	7.204e-05	-4.063	-4.142	-0.080	(0)
MgSO4	2.822e-06	2.822e-06	-5.549	-5.549	0.000	(0)
MgHCO3+	3.189e-07	3.046e-07	-6.496	-6.516	-0.020	(0)
MgF+	2.698e-07	2.578e-07	-6.569	-6.589	-0.020	(0)
MgCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)
MgOH+	9.415e-10	9.005e-10	-9.026	-9.045	-0.019	(0)
MgH2BO3+	2.115e-12	2.019e-12	-11.675	-11.695	-0.020	(0)
Mn (2)	1.095e-06					
Mn+2	1.053e-06	8.680e-07	-5.978	-6.061	-0.084	(0)
MnSO4	3.323e-08	3.323e-08	-7.478	-7.478	0.000	(0)
MnHCO3+	7.488e-09	7.157e-09	-8.126	-8.145	-0.020	(0)
MnF+	1.153e-09	1.102e-09	-8.938	-8.958	-0.020	(0)
MnOH+	7.164e-11	6.847e-11	-10.145	-10.165	-0.020	(0)
MnCl+	4.289e-11	4.099e-11	-10.368	-10.387	-0.020	(0)
MnCl2	2.172e-15	2.172e-15	-14.663	-14.663	0.000	(0)
MnSeO4	4.113e-17	4.113e-17	-16.386	-16.386	0.000	(0)
MnNO3+	1.168e-17	1.113e-17	-16.933	-16.953	-0.021	(0)
MnCl3-	2.348e-20	2.245e-20	-19.629	-19.649	-0.020	(0)
Mn (OH) 3-	4.365e-22	4.172e-22	-21.360	-21.380	-0.020	(0)
Mn (NO3) 2	2.262e-28	2.262e-28	-27.646	-27.646	0.000	(0)
Mn (OH) 4-2	5.069e-29	4.229e-29	-28.295	-28.374	-0.079	(0)
MnSe	0.000e+00	0.000e+00	-45.179	-45.179	0.000	(0)
Mn (3)	1.101e-25					
Mn+3	1.101e-25	7.292e-26	-24.958	-25.137	-0.179	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.356	-47.435	-0.079	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.512	-50.532	-0.020	(0)
Mo	4.230e-08					
MoO4-2	4.207e-08	3.502e-08	-7.376	-7.456	-0.080	(0)
HMoO4-	2.345e-10	2.235e-10	-9.630	-9.651	-0.021	(0)
H2MoO4	5.249e-13	5.249e-13	-12.280	-12.280	0.000	(0)
AlMo6O21-3	3.401e-39	2.201e-39	-38.468	-38.657	-0.189	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.395	-51.151	-0.756	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.733	-51.258	-0.525	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.634	-52.970	-0.336	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.029	-56.218	-0.189	(0)
N (-3)	7.467e-08					
NH4+	7.437e-08	7.097e-08	-7.129	-7.149	-0.020	(0)

NH4SO4-	1.713e-10	1.637e-10	-9.766	-9.786	-0.020	(0)
NH3	1.262e-10	1.262e-10	-9.899	-9.899	0.000	(0)
CuNH3+2	2.297e-12	1.893e-12	-11.639	-11.723	-0.084	(0)
CaNH3+2	5.178e-14	4.267e-14	-13.286	-13.370	-0.084	(0)
BaNH3+2	1.056e-17	8.707e-18	-16.976	-17.060	-0.084	(0)
Co (NH3) +2	6.391e-18	5.267e-18	-17.194	-17.278	-0.084	(0)
NiNH3+2	4.231e-18	3.487e-18	-17.374	-17.458	-0.084	(0)
HgNH3+2	1.497e-21	1.233e-21	-20.825	-20.909	-0.084	(0)
Hg (NH3) 2+2	1.889e-22	1.557e-22	-21.724	-21.808	-0.084	(0)
Ca (NH3) 2+2	2.601e-24	2.144e-24	-23.585	-23.669	-0.084	(0)
Ni (NH3) 2+2	7.717e-26	6.361e-26	-25.113	-25.196	-0.084	(0)
Co (NH3) 2+2	3.440e-26	2.835e-26	-25.463	-25.547	-0.084	(0)
Hg (NH3) 3+2	9.488e-32	7.820e-32	-31.023	-31.107	-0.084	(0)
Co (NH3) 3+2	5.466e-35	4.505e-35	-34.262	-34.346	-0.084	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.022	-40.106	-0.084	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-43.441	-43.525	-0.084	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.856	-49.940	-0.084	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-53.120	-53.204	-0.084	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-59.519	-59.708	-0.189	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-61.160	-61.244	-0.084	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.948	-63.032	-0.084	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-72.153	-72.174	-0.021	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.652	-76.736	-0.084	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.775	-77.859	-0.084	(0)
N (3)	9.156e-09					
NO2-	9.155e-09	8.739e-09	-8.038	-8.059	-0.020	(0)
CuNO2+	1.408e-12	1.342e-12	-11.851	-11.872	-0.021	(0)
CoNO2+	2.244e-17	2.138e-17	-16.649	-16.670	-0.021	(0)
Cu (NO2) 2	1.200e-19	1.200e-19	-18.921	-18.921	0.000	(0)
N (5)	8.477e-12					
NO3-	8.470e-12	8.090e-12	-11.072	-11.092	-0.020	(0)
CaNO3+	7.212e-15	6.872e-15	-14.142	-14.163	-0.021	(0)
CuNO3+	3.937e-17	3.751e-17	-16.405	-16.426	-0.021	(0)
MnNO3+	1.168e-17	1.113e-17	-16.933	-16.953	-0.021	(0)
BaNO3+	4.653e-18	4.434e-18	-17.332	-17.353	-0.021	(0)
ZnNO3+	1.935e-18	1.844e-18	-17.713	-17.734	-0.021	(0)
PbNO3+	2.107e-19	2.008e-19	-18.676	-18.697	-0.021	(0)
CdNO3+	2.418e-20	2.304e-20	-19.617	-19.638	-0.021	(0)
CoNO3+	4.672e-21	4.451e-21	-20.331	-20.351	-0.021	(0)
NiNO3+	1.097e-21	1.046e-21	-20.960	-20.981	-0.021	(0)
UO2NO3+	3.337e-22	3.179e-22	-21.477	-21.498	-0.021	(0)
FeNO3+2	9.007e-26	7.424e-26	-25.045	-25.129	-0.084	(0)
VO2NO3	8.179e-26	8.179e-26	-25.087	-25.087	0.000	(0)
CrNO3+2	2.082e-26	1.716e-26	-25.681	-25.765	-0.084	(0)
Mn (NO3) 2	2.262e-28	2.262e-28	-27.646	-27.646	0.000	(0)
Cu (NO3) 2	3.821e-29	3.821e-29	-28.418	-28.418	0.000	(0)
Zn (NO3) 2	2.976e-30	2.976e-30	-29.526	-29.526	0.000	(0)
Pb (NO3) 2	2.758e-30	2.758e-30	-29.559	-29.559	0.000	(0)
Cd (NO3) 2	9.341e-32	9.341e-32	-31.030	-31.030	0.000	(0)
Co (NO3) 2	7.328e-32	7.328e-32	-31.135	-31.135	0.000	(0)
HgNO3+	4.857e-32	4.627e-32	-31.314	-31.335	-0.021	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.808	-42.808	0.000	(0)
Na	1.241e-04					
Na+	1.239e-04	1.184e-04	-3.907	-3.927	-0.020	(0)
NaSO4-	1.432e-07	1.368e-07	-6.844	-6.864	-0.020	(0)
NaHCO3	2.750e-08	2.750e-08	-7.561	-7.561	0.000	(0)
NaF	2.382e-09	2.382e-09	-8.623	-8.623	0.000	(0)
NaCO3-	1.393e-10	1.331e-10	-9.856	-9.876	-0.020	(0)
NaH2BO3	1.516e-13	1.516e-13	-12.819	-12.819	0.000	(0)
NaCrO4-	2.024e-23	1.928e-23	-22.694	-22.715	-0.021	(0)
Ni	6.695e-11					
Ni+2	6.180e-11	5.145e-11	-10.209	-10.289	-0.080	(0)
NiHCO3+	2.751e-12	2.621e-12	-11.561	-11.581	-0.021	(0)
NiSO4	2.210e-12	2.210e-12	-11.656	-11.656	0.000	(0)
NiCO3	1.160e-13	1.160e-13	-12.936	-12.936	0.000	(0)
NiF+	4.327e-14	4.122e-14	-13.364	-13.385	-0.021	(0)
NiOH+	2.135e-14	2.034e-14	-13.671	-13.692	-0.021	(0)
NiCl+	5.183e-15	4.939e-15	-14.285	-14.306	-0.021	(0)

Ni (OH) 2	5.073e-17	5.073e-17	-16.295	-16.295	0.000	(0)
Ni (SO4) 2-2	1.912e-17	1.576e-17	-16.719	-16.803	-0.084	(0)
NiNH3+2	4.231e-18	3.487e-18	-17.374	-17.458	-0.084	(0)
NiSeO4	4.237e-21	4.237e-21	-20.373	-20.373	0.000	(0)
Ni (OH) 3-	1.672e-21	1.593e-21	-20.777	-20.798	-0.021	(0)
NiNO3+	1.097e-21	1.046e-21	-20.960	-20.981	-0.021	(0)
NiCl2	9.328e-22	9.328e-22	-21.030	-21.030	0.000	(0)
Ni (NH3) 2+2	7.717e-26	6.361e-26	-25.113	-25.196	-0.084	(0)
O (0)	2.392e-35					
O2	1.196e-35	1.196e-35	-34.922	-34.922	0.000	(0)
Pb	3.183e-09					
Pb+2	2.015e-09	1.678e-09	-8.696	-8.775	-0.080	(0)
PbHCO3+	5.406e-10	5.151e-10	-9.267	-9.288	-0.021	(0)
PbCO3	3.047e-10	3.047e-10	-9.516	-9.516	0.000	(0)
PbSO4	1.769e-10	1.769e-10	-9.752	-9.752	0.000	(0)
PbOH+	1.389e-10	1.323e-10	-9.857	-9.878	-0.021	(0)
PbF+	3.958e-12	3.771e-12	-11.403	-11.424	-0.021	(0)
PbCl+	2.344e-12	2.233e-12	-11.630	-11.651	-0.021	(0)
Pb (SO4) 2-2	2.785e-13	2.295e-13	-12.555	-12.639	-0.084	(0)
Pb (OH) 2	1.314e-13	1.314e-13	-12.881	-12.881	0.000	(0)
Pb (CO3) 2-2	6.441e-14	5.309e-14	-13.191	-13.275	-0.084	(0)
PbF2	2.367e-15	2.367e-15	-14.626	-14.626	0.000	(0)
PbCl2	3.742e-16	3.742e-16	-15.427	-15.427	0.000	(0)
Pb2OH+3	5.436e-18	3.518e-18	-17.265	-17.454	-0.189	(0)
Pb (OH) 3-	4.330e-18	4.126e-18	-17.363	-17.384	-0.021	(0)
PbNO3+	2.107e-19	2.008e-19	-18.676	-18.697	-0.021	(0)
PbF3-	1.503e-19	1.432e-19	-18.823	-18.844	-0.021	(0)
PbCl3-	5.865e-21	5.588e-21	-20.232	-20.253	-0.021	(0)
Pb (OH) 4-2	3.850e-23	3.173e-23	-22.415	-22.499	-0.084	(0)
PbF4-2	2.652e-24	2.186e-24	-23.576	-23.660	-0.084	(0)
Pb3 (OH) 4+2	7.012e-25	5.779e-25	-24.154	-24.238	-0.084	(0)
PbCl4-2	1.163e-25	9.583e-26	-24.935	-25.019	-0.084	(0)
Pb4 (OH) 4+4	1.669e-29	7.701e-30	-28.778	-29.113	-0.336	(0)
Pb (NO3) 2	2.758e-30	2.758e-30	-29.559	-29.559	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.799	-150.799	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.125	-228.146	-0.021	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.121	-78.121	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.626	-78.647	-0.021	(0)
CdHS+	0.000e+00	0.000e+00	-79.663	-79.684	-0.021	(0)
S5-2	0.000e+00	0.000e+00	-81.434	-81.518	-0.084	(0)
S6-2	0.000e+00	0.000e+00	-81.950	-82.034	-0.084	(0)
S4-2	0.000e+00	0.000e+00	-82.030	-82.114	-0.084	(0)
S3-2	0.000e+00	0.000e+00	-82.836	-82.920	-0.084	(0)
S2-2	0.000e+00	0.000e+00	-83.852	-83.936	-0.084	(0)
S-2	0.000e+00	0.000e+00	-89.374	-89.453	-0.079	(0)
HgHS2-	0.000e+00	0.000e+00	-138.661	-138.682	-0.021	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.782	-138.782	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.812	-140.896	-0.084	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.190	-150.334	-0.144	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.799	-150.799	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.923	-151.064	-0.141	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-151.011	-151.032	-0.021	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.127	-151.127	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.516	-151.516	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-156.623	-156.623	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.854	-215.875	-0.021	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.862	-226.883	-0.021	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.853	-227.874	-0.021	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.125	-228.146	-0.021	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.285	-230.369	-0.084	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.212	-233.233	-0.021	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.241	-304.325	-0.084	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.906	-306.990	-0.084	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.097	-318.181	-0.084	(0)
S (6)	2.751e-04					
SO4-2	2.586e-04	2.153e-04	-3.587	-3.667	-0.080	(0)
CaSO4	1.325e-05	1.325e-05	-4.878	-4.878	0.000	(0)

MgSO4	2.822e-06	2.822e-06	-5.549	-5.549	0.000	(0)
NaSO4-	1.432e-07	1.368e-07	-6.844	-6.864	-0.020	(0)
KSO4-	1.069e-07	1.022e-07	-6.971	-6.991	-0.020	(0)
CuSO4	7.232e-08	7.232e-08	-7.141	-7.141	0.000	(0)
MnSO4	3.323e-08	3.323e-08	-7.478	-7.478	0.000	(0)
HSO4-	7.061e-09	6.747e-09	-8.151	-8.171	-0.020	(0)
ZnSO4	4.273e-09	4.273e-09	-8.369	-8.369	0.000	(0)
FeSO4	2.776e-10	2.776e-10	-9.557	-9.557	0.000	(0)
AlSO4+	1.952e-10	1.865e-10	-9.709	-9.729	-0.020	(0)
PbSO4	1.769e-10	1.769e-10	-9.752	-9.752	0.000	(0)
NH4SO4-	1.713e-10	1.637e-10	-9.766	-9.786	-0.020	(0)
CdSO4	4.544e-11	4.544e-11	-10.343	-10.343	0.000	(0)
CoSO4	1.491e-11	1.491e-11	-10.826	-10.826	0.000	(0)
Zn(SO4) 2-2	9.722e-12	8.013e-12	-11.012	-11.096	-0.084	(0)
UO2SO4	6.418e-12	6.418e-12	-11.193	-11.193	0.000	(0)
NiSO4	2.210e-12	2.210e-12	-11.656	-11.656	0.000	(0)
CrOHSO4	1.703e-12	1.703e-12	-11.769	-11.769	0.000	(0)
Al(SO4) 2-	4.504e-13	4.303e-13	-12.346	-12.366	-0.020	(0)
Pb(SO4) 2-2	2.785e-13	2.295e-13	-12.555	-12.639	-0.084	(0)
Cd(SO4) 2-2	1.601e-13	1.320e-13	-12.796	-12.879	-0.084	(0)
CrSO4+	2.561e-14	2.440e-14	-13.592	-13.613	-0.021	(0)
UO2(SO4) 2-2	2.210e-14	1.822e-14	-13.656	-13.740	-0.084	(0)
FeSO4+	2.319e-15	2.217e-15	-14.635	-14.654	-0.020	(0)
VO2SO4-	1.078e-16	1.027e-16	-15.967	-15.988	-0.021	(0)
Ni(SO4) 2-2	1.912e-17	1.576e-17	-16.719	-16.803	-0.084	(0)
Fe(SO4) 2-	1.071e-17	1.020e-17	-16.970	-16.991	-0.021	(0)
VOSO4	5.183e-18	5.183e-18	-17.285	-17.285	0.000	(0)
Cr2(OH) 2SO4+2	6.227e-21	5.132e-21	-20.206	-20.290	-0.084	(0)
HgSO4	8.732e-22	8.732e-22	-21.059	-21.059	0.000	(0)
Cr2(OH) 2(SO4) 2	6.564e-23	6.564e-23	-22.183	-22.183	0.000	(0)
CrO3SO4-2	8.679e-28	7.153e-28	-27.062	-27.145	-0.084	(0)
VSO4+	2.531e-31	2.412e-31	-30.597	-30.618	-0.021	(0)
U(SO4) 2	1.419e-37	1.419e-37	-36.848	-36.848	0.000	(0)
USO4+2	1.007e-37	8.299e-38	-36.997	-37.081	-0.084	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-72.153	-72.174	-0.021	(0)
Sb(3)	1.989e-20					
Sb(OH) 3	1.006e-20	1.006e-20	-19.997	-19.997	0.000	(0)
HSbO2	9.823e-21	9.823e-21	-20.008	-20.008	0.000	(0)
Sb(OH) 2F	1.608e-25	1.608e-25	-24.794	-24.794	0.000	(0)
SbOF	1.581e-25	1.581e-25	-24.801	-24.801	0.000	(0)
Sb(OH) 2+	8.224e-26	7.836e-26	-25.085	-25.106	-0.021	(0)
SbO2-	5.207e-26	4.961e-26	-25.283	-25.304	-0.021	(0)
Sb(OH) 4-	2.984e-26	2.843e-26	-25.525	-25.546	-0.021	(0)
SbO+	2.835e-26	2.702e-26	-25.547	-25.568	-0.021	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.097	-318.181	-0.084	(0)
Sb(5)	4.749e-10					
SbO3-	4.743e-10	4.520e-10	-9.324	-9.345	-0.021	(0)
Sb(OH) 6-	5.534e-13	5.286e-13	-12.257	-12.277	-0.020	(0)
SbO2+	1.399e-23	1.333e-23	-22.854	-22.875	-0.021	(0)
Se(-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-40.205	-40.226	-0.021	(0)
H2Se	0.000e+00	0.000e+00	-42.830	-42.830	0.000	(0)
MnSe	0.000e+00	0.000e+00	-45.179	-45.179	0.000	(0)
Se-2	0.000e+00	0.000e+00	-48.648	-48.732	-0.084	(0)
Se(4)	3.551e-09					
HSeO3-	3.501e-09	3.336e-09	-8.456	-8.477	-0.021	(0)
SeO3-2	5.024e-11	4.141e-11	-10.299	-10.383	-0.084	(0)
H2SeO3	4.563e-13	4.563e-13	-12.341	-12.341	0.000	(0)
FeHSeO3+2	9.813e-21	8.088e-21	-20.008	-20.092	-0.084	(0)
Cd(SeO3) 2-2	1.544e-24	1.273e-24	-23.811	-23.895	-0.084	(0)
Se(6)	2.115e-13					
SeO4-2	2.115e-13	1.760e-13	-12.675	-12.754	-0.080	(0)
MnSeO4	4.113e-17	4.113e-17	-16.386	-16.386	0.000	(0)
HSeO4-	2.969e-18	2.829e-18	-17.527	-17.548	-0.021	(0)
ZnSeO4	2.474e-18	2.474e-18	-17.607	-17.607	0.000	(0)
CoSeO4	3.063e-20	3.063e-20	-19.514	-19.514	0.000	(0)
CdSeO4	2.952e-20	2.952e-20	-19.530	-19.530	0.000	(0)
NiSeO4	4.237e-21	4.237e-21	-20.373	-20.373	0.000	(0)

Zn(SeO4) 2-2	5.357e-31	4.415e-31	-30.271	-30.355	-0.084	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-54.895	-55.084	-0.189	(0)
U (4)	2.302e-21					
U (OH) 5-	2.273e-21	2.166e-21	-20.643	-20.664	-0.021	(0)
U (OH) 4	2.909e-23	2.909e-23	-22.536	-22.536	0.000	(0)
U (OH) 3+	3.579e-26	3.410e-26	-25.446	-25.467	-0.021	(0)
U (OH) 2+2	6.135e-30	5.057e-30	-29.212	-29.296	-0.084	(0)
UF3+	1.313e-32	1.251e-32	-31.882	-31.903	-0.021	(0)
UF2+2	3.002e-33	2.474e-33	-32.523	-32.607	-0.084	(0)
UOH+3	1.180e-34	7.637e-35	-33.928	-34.117	-0.189	(0)
UF4	4.375e-35	4.375e-35	-34.359	-34.359	0.000	(0)
UF+3	9.520e-36	6.162e-36	-35.021	-35.210	-0.189	(0)
U (SO4) 2	1.419e-37	1.419e-37	-36.848	-36.848	0.000	(0)
USO4+2	1.007e-37	8.299e-38	-36.997	-37.081	-0.084	(0)
UF5-	5.804e-38	5.530e-38	-37.236	-37.257	-0.021	(0)
UF6-2	6.463e-40	5.327e-40	-39.190	-39.274	-0.084	(0)
U+4	2.098e-40	0.000e+00	-39.678	-40.014	-0.336	(0)
UCl+3	0.000e+00	0.000e+00	-42.551	-42.740	-0.189	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-158.130	-159.830	-1.700	(0)
U (5)	6.700e-15					
UO2+	6.700e-15	6.383e-15	-14.174	-14.195	-0.021	(0)
U (6)	1.191e-08					
UO2 (CO3) 2-2	6.928e-09	5.710e-09	-8.159	-8.243	-0.084	(0)
UO2CO3	4.737e-09	4.737e-09	-8.325	-8.325	0.000	(0)
UO2F+	9.101e-11	8.672e-11	-10.041	-10.062	-0.021	(0)
UO2OH+	8.171e-11	7.786e-11	-10.088	-10.109	-0.021	(0)
UO2 (CO3) 3-4	3.747e-11	1.729e-11	-10.426	-10.762	-0.336	(0)
UO2+2	2.366e-11	1.969e-11	-10.626	-10.706	-0.080	(0)
UO2F2	7.977e-12	7.977e-12	-11.098	-11.098	0.000	(0)
UO2SO4	6.418e-12	6.418e-12	-11.193	-11.193	0.000	(0)
UO2F3-	6.708e-14	6.391e-14	-13.173	-13.194	-0.021	(0)
UO2 (SO4) 2-2	2.210e-14	1.822e-14	-13.656	-13.740	-0.084	(0)
(UO2) 2 (OH) 2+2	1.221e-14	1.006e-14	-13.913	-13.997	-0.084	(0)
UO2Cl+	1.258e-15	1.198e-15	-14.900	-14.921	-0.021	(0)
(UO2) 3 (OH) 5+	6.148e-16	5.858e-16	-15.211	-15.232	-0.021	(0)
UO2F4-2	1.965e-17	1.619e-17	-16.707	-16.791	-0.084	(0)
UO2NO3+	3.337e-22	3.179e-22	-21.477	-21.498	-0.021	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.125	-40.209	-0.084	(0)
VOH+	0.000e+00	0.000e+00	-40.181	-40.202	-0.021	(0)
V (3)	5.927e-14					
V (OH) 3	5.927e-14	5.927e-14	-13.227	-13.227	0.000	(0)
V (OH) 2+	1.289e-23	1.228e-23	-22.890	-22.911	-0.021	(0)
VOH+2	4.531e-26	3.735e-26	-25.344	-25.428	-0.084	(0)
V+3	3.667e-30	2.373e-30	-29.436	-29.625	-0.189	(0)
VSO4+	2.531e-31	2.412e-31	-30.597	-30.618	-0.021	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.698	-49.887	-0.189	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-49.720	-50.055	-0.336	(0)
V (4)	7.037e-16					
V (OH) 3+	5.747e-16	5.476e-16	-15.241	-15.262	-0.021	(0)
VO+2	1.060e-16	8.740e-17	-15.975	-16.058	-0.084	(0)
VOF+	1.755e-17	1.672e-17	-16.756	-16.777	-0.021	(0)
VOSO4	5.183e-18	5.183e-18	-17.285	-17.285	0.000	(0)
VOF2	2.000e-19	2.000e-19	-18.699	-18.699	0.000	(0)
VOC1+	9.654e-21	9.198e-21	-20.015	-20.036	-0.021	(0)
VOF3-	2.375e-22	2.263e-22	-21.624	-21.645	-0.021	(0)
VOF4-2	3.536e-26	2.914e-26	-25.452	-25.536	-0.084	(0)
H2V2O4+2	1.823e-26	1.503e-26	-25.739	-25.823	-0.084	(0)
V (5)	1.035e-08					
H2VO4-	1.022e-08	9.741e-09	-7.990	-8.011	-0.021	(0)
HVO4-2	9.258e-11	7.630e-11	-10.033	-10.117	-0.084	(0)
H3VO4	3.123e-11	3.123e-11	-10.505	-10.505	0.000	(0)
H3V2O7-	2.062e-12	1.964e-12	-11.686	-11.707	-0.021	(0)
VO2+	2.092e-14	1.999e-14	-13.679	-13.699	-0.020	(0)
VO2F	1.118e-15	1.118e-15	-14.952	-14.952	0.000	(0)
HV2O7-3	3.891e-16	2.518e-16	-15.410	-15.599	-0.189	(0)
VO2SO4-	1.078e-16	1.027e-16	-15.967	-15.988	-0.021	(0)

VO2F2-	1.359e-17	1.295e-17	-16.867	-16.888	-0.021	(0)
VO4-3	1.843e-18	1.193e-18	-17.735	-17.924	-0.189	(0)
V3O9-3	1.495e-18	9.678e-19	-17.825	-18.014	-0.189	(0)
V2O7-4	4.581e-20	2.114e-20	-19.339	-19.675	-0.336	(0)
VO2F3-2	6.250e-21	5.152e-21	-20.204	-20.288	-0.084	(0)
V4O12-4	8.516e-24	3.930e-24	-23.070	-23.406	-0.336	(0)
VO2F4-3	1.249e-25	8.085e-26	-24.903	-25.092	-0.189	(0)
VO2NO3	8.179e-26	8.179e-26	-25.087	-25.087	0.000	(0)
HV10028-5	0.000e+00	0.000e+00	-54.967	-55.491	-0.525	(0)
V10028-6	0.000e+00	0.000e+00	-56.428	-57.184	-0.756	(0)
H2V10028-4	0.000e+00	0.000e+00	-56.442	-56.778	-0.336	(0)
Zn	1.152e-07					
Zn+2	1.090e-07	9.072e-08	-6.963	-7.042	-0.080	(0)
ZnSO4	4.273e-09	4.273e-09	-8.369	-8.369	0.000	(0)
ZnHCO3+	1.244e-09	1.186e-09	-8.905	-8.926	-0.021	(0)
ZnCO3	3.154e-10	3.154e-10	-9.501	-9.501	0.000	(0)
ZnOH+	2.990e-10	2.849e-10	-9.524	-9.545	-0.021	(0)
ZnF+	6.060e-11	5.774e-11	-10.218	-10.239	-0.021	(0)
Zn(SO4)2-2	9.722e-12	8.013e-12	-11.012	-11.096	-0.084	(0)
ZnCl+	8.950e-12	8.549e-12	-11.048	-11.068	-0.020	(0)
Zn(OH)2	1.418e-12	1.418e-12	-11.848	-11.848	0.000	(0)
ZnOHC1	3.514e-13	3.514e-13	-12.454	-12.454	0.000	(0)
ZnCl2	5.083e-16	5.083e-16	-15.294	-15.294	0.000	(0)
Zn(OH)3-	2.342e-16	2.231e-16	-15.630	-15.651	-0.021	(0)
ZnSeO4	2.474e-18	2.474e-18	-17.607	-17.607	0.000	(0)
ZnNO3+	1.935e-18	1.844e-18	-17.713	-17.734	-0.021	(0)
ZnCl3-	1.586e-20	1.515e-20	-19.800	-19.820	-0.020	(0)
Zn(OH)4-2	3.384e-22	2.789e-22	-21.471	-21.555	-0.084	(0)
ZnCl4-2	3.405e-25	2.841e-25	-24.468	-24.546	-0.079	(0)
Zn(NO3)2	2.976e-30	2.976e-30	-29.526	-29.526	0.000	(0)
Zn(SeO4)2-2	5.357e-31	4.415e-31	-30.271	-30.355	-0.084	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-151.011	-151.032	-0.021	(0)
Zn(HS)2	0.000e+00	0.000e+00	-151.516	-151.516	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-226.862	-226.883	-0.021	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-230.285	-230.369	-0.084	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-306.906	-306.990	-0.084	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-71.76	-65.47	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-56.65	-52.14	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-63.87	-52.14	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-90.73	-72.79	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-72.82	-52.79	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.19	-33.78	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.50	-27.05	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.27	9.53	10.80	Al(OH)3
Al2(MoO4)3	-44.64	-42.27	2.37	Al2(MoO4)3
Al2O3	-0.59	19.06	19.65	Al2O3
Al4(OH)10SO4	-1.24	21.46	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-8.88	-4.08	4.80	AlAsO4:2H2O
AlOHSO4	-3.90	-7.13	-3.23	AlOHSO4
AlSb	-152.70	-87.08	65.62	AlSb
Alunite	-1.00	-2.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.65	-12.44	-7.79	PbSO4
Anhydrite	-2.88	-7.24	-4.36	CaSO4
Anilite	-55.86	-87.74	-31.88	Cu0.25Cu1.5S
Antlerite	-3.98	4.81	8.79	Cu3(OH)4SO4
Aragonite	-2.49	-10.79	-8.30	CaCO3
Arsenolite	-78.25	-81.01	-2.76	As4O6
Artinite	-12.12	-2.52	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-33.93	-27.23	6.71	As2O5
Atacamite	-4.00	3.39	7.39	Cu2(OH)3Cl
Azurite	-2.05	-18.95	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-18.37	6.03	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.23	-2.36	15.87	Ba2V2O7:2H2O

Ba3(AsO4)2	-0.24	-9.15	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-29.27	3.67	32.94	Ba3(VO4)2·4H2O
BaCrO4	-16.78	-26.45	-9.67	BaCrO4
BaF2	-10.13	-15.95	-5.82	BaF2
BaMoO4	-7.46	-14.42	-6.96	BaMoO4
Barite	-0.65	-10.63	-9.98	BaSO4
BaS	-95.29	-79.11	16.18	BaS
BaSeO3	-10.77	-8.94	1.83	BaSeO3
BaSeO4	-12.26	-19.72	-7.46	BaSeO4
Bianchite	-8.94	-10.71	-1.76	ZnSO4·6H2O
Birnessite	-10.98	7.11	18.09	MnO2
Bixbyite	-10.67	-11.31	-0.64	Mn2O3
BlaubleiI	-55.12	-79.29	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.91	-83.19	-27.28	Cu0.6Cu0.8S
Boehmite	0.95	9.53	8.58	AlOOH
Breithauptite	-62.62	-81.14	-18.52	NiSb
Brochantite	-3.26	11.96	15.22	Cu4(OH)6SO4
Brucite	-8.00	8.85	16.84	Mg(OH)2
Bunsenite	-9.75	2.70	12.45	NiO
Ca(VO3)2	-10.65	-4.99	5.66	Ca(VO3)2
Ca2V2O7	-13.08	4.42	17.50	Ca2V2O7
Ca2V2O7·2H2O	-17.13	4.42	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-21.28	1.02	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-25.12	13.84	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-26.02	13.84	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-307.94	-164.96	142.97	Ca3Sb2
CaCrO4	-20.79	-23.06	-2.27	CaCrO4
Calcite	-2.31	-10.79	-8.48	CaCO3
Calomel	-12.31	-30.22	-17.91	Hg2Cl2
CaMoO4	-3.08	-11.03	-7.95	CaMoO4
Carnotite	-2.83	-2.60	0.23	KUO2VO4
CaSeO3·2H2O	-8.37	-5.55	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-13.31	-16.33	-3.02	CaSeO4·2H2O
Cd(BO2)2	-18.60	-8.76	9.84	Cd(BO2)2
Cd(OH)2	-9.70	3.94	13.64	Cd(OH)2
Cd(OH)2(am)	-9.79	3.94	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.19	-21.48	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.39	-4.83	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.29	-0.89	28.40	Cd4(OH)6SO4
CdCl2	-17.24	-17.90	-0.66	CdCl2
CdCl2·1H2O	-16.20	-17.90	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-15.98	-17.90	-1.91	CdCl2·2.5H2O
CdF2	-16.83	-18.04	-1.21	CdF2
Cdmetal(alpha)	-35.11	-21.59	13.51	Cd
Cdmetal(gamma)	-35.21	-21.59	13.62	Cd
CdMoO4	-2.35	-16.50	-14.15	CdMoO4
CdOHCl	-10.51	-6.98	3.54	CdOHCl
CdSb	-79.55	-79.90	-0.35	CdSb
CdSe	-22.58	-42.78	-20.20	CdSe
CdSeO4·2H2O	-19.95	-21.80	-1.85	CdSeO4·2H2O
CdSO4	-12.54	-12.71	-0.17	CdSO4
CdSO4·1H2O	-10.99	-12.71	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-10.84	-12.71	-1.87	CdSO4·2.67H2O
Cerrusite	-2.86	-15.99	-13.13	PbCO3
CH4(g)	-81.31	-122.35	-41.05	CH4
Chalcanthite	-6.86	-9.50	-2.64	CuSO4·5H2O
Chalcocite	-56.07	-90.99	-34.92	Cu2S
Chalcopyrite	-123.15	-158.42	-35.27	CuFeS2
Cinnabar	-52.46	-98.16	-45.69	HgS
Claudetite	-77.94	-81.01	-3.06	As4O6
Clausthalite	-15.41	-42.51	-27.10	PbSe
Co(BO2)2	-36.24	-9.17	27.07	Co(BO2)2
Co(OH)2	-9.57	3.53	13.09	Co(OH)2
Co(OH)3	-13.79	-16.10	-2.31	Co(OH)3
CO2(g)	-2.06	-20.21	-18.15	CO2
Co3(AsO4)2	-29.68	-16.64	13.03	Co3(AsO4)2
Co3O4	-18.18	-28.68	-10.50	Co3O4
CoCl2	-26.58	-18.31	8.27	CoCl2

CoCl2:6H2O	-20.85	-18.31	2.54	CoCl2:6H2O
CoCO3	-6.70	-16.68	-9.98	CoCO3
CoF2	-16.86	-18.45	-1.60	CoF2
CoF3	-47.62	-49.07	-1.46	CoF3
CoFe2O4	15.95	12.42	-3.53	CoFe2O4
CoMoO4	-9.15	-16.92	-7.76	CoMoO4
CoO	-10.06	3.53	13.59	CoO
CoS (alpha)	-74.17	-81.61	-7.44	CoS
CoS (beta)	-70.54	-81.61	-11.07	CoS
CoSe	-26.99	-43.19	-16.20	CoSe
CoSeO3	-12.76	-11.44	1.32	CoSeO3
CoSeO4:6H2O	-20.68	-22.21	-1.53	CoSeO4:6H2O
CoSO4	-15.93	-13.13	2.80	CoSO4
CoSO4:6H2O	-10.65	-13.13	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-55.69	-77.99	-22.30	CuS
Cr (OH) 2	-24.04	-13.22	10.82	Cr (OH) 2
Cr (OH) 3	-4.74	-3.40	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-2.65	-3.40	-0.75	Cr (OH) 3
Cr2O3	-4.44	-6.80	-2.36	Cr2O3
CrCl2	-49.15	-35.06	14.09	CrCl2
CrCl3	-51.27	-36.16	15.11	CrCl3
CrF3	-25.03	-36.37	-11.34	CrF3
Crmetal	-69.24	-38.76	30.48	Cr
CrO3	-29.26	-32.47	-3.21	CrO3
Cryolite	-14.87	-48.71	-33.84	Na3AlF6
Cu (OH) 2	-1.52	7.15	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.98	18.23	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.53	-3.28	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.49	-92.38	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.77	-52.57	-45.80	Cu2Se
Cu2SO4	-20.55	-22.50	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-11.86	-5.76	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.79	-105.38	-42.59	Cu3Sb
Cu3Se2	-28.64	-92.13	-63.49	Cu3Se2
CuCO3	-1.55	-13.05	-11.50	CuCO3
CuCrO4	-19.88	-25.32	-5.44	CuCrO4
CuF	-9.01	-13.91	-4.91	CuF
CuF2	-15.94	-14.83	1.12	CuF2
CuF2:2H2O	-10.28	-14.83	-4.55	CuF2:2H2O
Cumetal	-6.94	-15.69	-8.76	Cu
CuMoO4	-0.21	-13.29	-13.08	CuMoO4
CuOCuSO4	-12.65	-2.35	10.30	CuOCuSO4
Cupricferrite	10.05	16.04	5.99	CuFe2O4
Cuprite	-4.44	-5.85	-1.41	Cu2O
Cuprousferrite	10.44	1.52	-8.92	CuFeO2
CuSe	-6.47	-39.57	-33.10	CuSe
CuSe2	-27.38	-60.75	-33.37	CuSe2
CuSeO3:2H2O	-8.33	-7.82	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.15	-18.59	-2.44	CuSeO4:5H2O
CuSO4	-12.44	-9.50	2.94	CuSO4
Diaspore	2.66	9.53	6.87	AlOOH
Djurleite	-56.21	-90.13	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-5.61	-22.15	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-5.06	-22.15	-17.09	CaMg (CO3) 2
Epsomite	-5.68	-7.81	-2.13	MgSO4:7H2O
Fe (OH) 2	-8.86	4.71	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	4.21	1.17	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-5.98	-9.70	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-7.64	-6.08	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-15.40	-36.02	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-37.34	-41.08	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-6.62	13.60	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-9.57	-9.17	0.40	FeAsO4:2H2O
FeCr2O4	-9.29	-2.09	7.20	FeCr2O4
FeMoO4	-5.64	-15.74	-10.09	FeMoO4
Ferrihydrite	1.25	4.44	3.19	Fe (OH) 3
Ferroselite	-44.60	-63.20	-18.60	FeSe2

FeS (ppt)	-77.48	-80.43	-2.95	FeS
FeSe	-31.01	-42.01	-11.00	FeSe
Fix_pe	-6.27	-6.27	0.00	e-
Fluorite	-2.06	-12.56	-10.50	CaF2
Galena	-66.96	-80.93	-13.97	PbS
Gibbsite	1.24	9.53	8.29	Al (OH) 3
Goethite	3.95	4.44	0.49	FeOOH
Goslarite	-8.70	-10.71	-2.01	ZnSO4:7H2O
Greenockite	-66.84	-81.20	-14.36	CdS
Greigite	-281.93	-326.97	-45.03	Fe3S4
Gummite	-5.39	2.28	7.67	UO3
Gypsum	-2.63	-7.24	-4.61	CaSO4:2H2O
H-Jarosite	-7.88	-19.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-7.57	-20.44	-12.88	H2MoO4
H2S (g)	-77.13	-85.14	-8.01	H2S
H2Se (g)	-41.76	-46.72	-4.96	H2Se
Halite	-9.96	-8.35	1.60	NaCl
Hausmannite	-14.71	46.32	61.03	Mn3O4
Hematite	10.31	8.89	-1.42	Fe2O3
Hercynite	0.87	23.77	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.01	-257.72	-73.71	Hg (CH3) 2
Hg (g)	-9.09	-16.96	-7.87	Hg
Hg (OH) 2	-9.52	-13.02	-3.50	Hg (OH) 2
Hg2 (g)	-18.96	-33.92	-14.96	Hg2
Hg2 (OH) 2	-13.64	-8.38	5.26	Hg2 (OH) 2
Hg2CO3	-12.54	-28.59	-16.05	Hg2CO3
Hg2CrO4	-32.16	-40.86	-8.70	Hg2CrO4
Hg2F2	-20.00	-30.36	-10.36	Hg2F2
Hg2S	-81.85	-93.52	-11.68	Hg2S
Hg2SeO3	-18.70	-23.35	-4.66	Hg2SeO3
Hg2SO4	-18.91	-25.04	-6.13	Hg2SO4
Hg3O2CO3	-29.57	-59.25	-29.68	Hg3O2CO3
HgCl (g)	-34.61	-15.11	19.50	HgCl
HgCl2	-13.59	-34.86	-21.26	HgCl2
HgF (g)	-47.86	-15.18	32.68	HgF
HgF2 (g)	-47.56	-35.00	12.57	HgF2
Hgmetal (l)	-3.51	-16.96	-13.45	Hg
HgSe	-4.04	-59.74	-55.69	HgSe
HgSeO3	-15.56	-27.99	-12.43	HgSeO3
HgSO4	-20.25	-29.67	-9.42	HgSO4
Huntite	-14.91	-44.87	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-9.01	-27.78	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-27.83	-36.60	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.29	-21.46	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-2.86	-17.66	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-43.06	-60.30	-17.24	K2Cr2O7
K2CrO4	-27.32	-27.83	-0.51	K2CrO4
K2MoO4	-19.06	-15.80	3.26	K2MoO4
K2SeO4	-20.37	-21.10	-0.73	K2SeO4
Langite	-5.53	11.96	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.80	-8.23	-0.43	PbO:PbSO4
Laurionite	-7.33	-6.71	0.62	PbOHCl
Lepidocrocite	3.07	4.44	1.37	FeOOH
Lime	-23.28	9.42	32.70	CaO
Litharge	-8.48	4.21	12.69	PbO
Mackinawite	-76.83	-80.43	-3.60	FeS
Maghemite	2.50	8.89	6.39	Fe2O3
Magnesioferrite	0.87	17.73	16.86	Fe2MgO4
Magnesite	-3.90	-11.36	-7.46	MgCO3
Magnetite	10.19	13.60	3.40	Fe3O4
Malachite	-0.59	-5.90	-5.31	Cu2 (OH) 2CO3
Manganite	-5.65	19.69	25.34	MnOOH
Massicot	-8.68	4.21	12.89	PbO
Matlockite	-8.72	-17.70	-8.97	PbClF
Melanothallite	-20.94	-14.69	6.26	CuCl2
Melanterite	-9.74	-11.95	-2.21	FeSO4:7H2O
Metacinnabar	-53.06	-98.16	-45.09	HgS
Mg (OH) 2 (active)	-9.95	8.85	18.79	Mg (OH) 2

Mg (VO3) 2	-16.85	-5.57	11.28	Mg (VO3) 2
Mg2Sb3	-282.97	-208.29	74.68	Mg2Sb3
Mg2V2O7	-23.08	3.28	26.36	Mg2V2O7
MgCr2O4	-14.16	2.04	16.20	MgCr2O4
MgCrO4	-29.01	-23.63	5.38	MgCrO4
MgF2	-5.00	-13.13	-8.13	MgF2
MgMoO4	-9.75	-11.60	-1.85	MgMoO4
MgSeO3:6H2O	-9.18	-6.13	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.70	-16.90	-1.20	MgSeO4:6H2O
Minium	-35.35	38.17	73.52	Pb3O4
Mirabilite	-10.41	-11.52	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-12.38	-7.48	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-55.56	-61.28	-5.71	Mn2 (SO4) 3
Mn2Sb	-156.60	-95.52	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-18.95	-6.45	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-17.63	-14.91	2.72	MnCl2:4H2O
MnS (grn)	-78.38	-78.21	0.17	MnS
MnS (pnk)	-81.55	-78.21	3.34	MnS
MnSb	-99.35	-102.26	-2.91	MnSb
MnSe	-43.29	-39.79	3.50	MnSe
MnSeO3	-9.17	-8.04	1.13	MnSeO3
MnSeO3:2H2O	-9.03	-8.04	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.77	-18.82	-2.05	MnSeO4:5H2O
MnSO4	-12.31	-9.73	2.58	MnSO4
Monteponite	-11.16	3.94	15.10	CdO
Montroydite	-9.38	-13.02	-3.64	HgO
MoO3	-12.44	-20.44	-8.00	MoO3
Morenosite	-11.81	-13.96	-2.14	NiSO4:7H2O
MoS2	-146.00	-216.26	-70.26	MoS2
Na-Jarosite	-6.21	-17.41	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-49.91	-59.81	-9.90	Na2Cr2O7
Na2CrO4	-30.27	-27.34	2.93	Na2CrO4
Na2Mo2O7	-19.16	-35.75	-16.60	Na2Mo2O7
Na2MoO4	-16.80	-15.31	1.49	Na2MoO4
Na2MoO4:2H2O	-16.53	-15.31	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.14	-9.84	10.30	Na2SeO3:5H2O
Na2SeO4	-21.89	-20.61	1.28	Na2SeO4
Na3Sb	-183.36	-88.91	94.45	Na3Sb
Na3VO4	-36.19	0.50	36.68	Na3VO4
Na4V2O7	-41.54	-4.14	37.40	Na4V2O7
Nantokite	-7.11	-13.84	-6.73	CuCl
NaSb	-91.67	-68.50	23.17	NaSb
Natron	-13.76	-15.07	-1.31	Na2CO3:10H2O
NaVO3	-8.50	-4.64	3.86	NaVO3
Nesquehonite	-6.69	-11.36	-4.67	MgCO3:3H2O
Ni (OH) 2	-10.09	2.70	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-34.83	-19.13	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-37.86	-5.86	32.00	Ni4 (OH) 6SO4
NiCO3	-10.64	-17.51	-6.87	NiCO3
NiMoO4	-6.60	-17.74	-11.14	NiMoO4
NiS (alpha)	-76.84	-82.44	-5.60	NiS
NiS (beta)	-71.34	-82.44	-11.10	NiS
NiS (gamma)	-69.64	-82.44	-12.80	NiS
NiSe	-26.32	-44.02	-17.70	NiSe
NiSeO3:2H2O	-15.09	-12.27	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-21.52	-23.04	-1.52	NiSeO4:6H2O
Nsutite	-10.39	7.11	17.50	MnO2
O2 (g)	-32.02	51.07	83.09	O2
Orpiment	-234.86	-295.93	-61.07	As2S3
Otavite	-4.26	-16.26	-12.00	CdCO3
Pb (BO2) 2	-15.01	-8.49	6.52	Pb (BO2) 2
Pb (OH) 2	-3.94	4.21	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-70.35	-79.11	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-11.29	-2.49	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.76	8.43	26.19	Pb2O (OH) 2
Pb2O3	-27.08	33.96	61.04	Pb2O3
Pb2OCO3	-11.22	-11.78	-0.56	Pb2OCO3
Pb2V2O7	-4.09	-5.99	-1.90	Pb2V2O7

Pb3(AsO4)2	-20.39	-14.59	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.91	-1.77	6.14	Pb3(VO4)2
Pb3O2CO3	-18.59	-7.57	11.02	Pb3O2CO3
Pb3O2SO4	-14.70	-4.02	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.90	0.20	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.68	0.20	21.88	Pb4O3SO4
PbCrO4	-15.66	-28.26	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.57	-21.32	4.25	Pb
PbMoO4	-0.61	-16.23	-15.62	PbMoO4
PbO:0.3H2O	-8.77	4.21	12.98	PbO:0.33H2O
PbSeO4	-14.69	-21.53	-6.84	PbSeO4
Periclase	-12.74	8.85	21.58	MgO
Phosgenite	-13.81	-33.62	-19.81	PbCl2:PbCO3
Plattnerite	-19.85	29.75	49.60	PbO2
Portlandite	-13.39	9.42	22.80	Ca(OH)2
Pyrite	-121.53	-140.04	-18.51	FeS2
Pyrochroite	-8.27	6.93	15.19	Mn(OH)2
Pyrolusite	-8.92	32.46	41.38	MnO2
Realgar	-98.41	-118.16	-19.75	AsS
Retgersite	-11.92	-13.96	-2.04	NiSO4:6H2O
Rhodochrosite	-2.70	-13.28	-10.58	MnCO3
Rutherfordine	-3.42	-17.92	-14.50	UO2CO3
Sb(OH)3	-12.89	-20.00	-7.11	Sb(OH)3
Sb2O4	-17.86	-14.46	3.40	Sb2O4
Sb2O5	-27.87	-37.54	-9.67	Sb2O5
Sb2Se3	-112.40	-180.16	-67.76	Sb2Se3
Sb4O6(cubic)	-61.73	-79.99	-18.26	Sb4O6
Sb4O6(orth)	-62.09	-79.99	-17.90	Sb4O6
SbCl3	-53.33	-52.76	0.57	SbCl3
SbF3	-42.74	-52.97	-10.23	SbF3
Sbmetal	-46.61	-58.30	-11.69	Sb
SbO2	-3.71	-31.54	-27.82	SbO2
Schoepite	-3.71	2.28	5.99	UO2(OH)2:H2O
Semetal(am)	-14.07	-21.18	-7.11	Se
Semetal(hex)	-13.48	-21.18	-7.71	Se
Senarmontite	-27.63	-39.99	-12.37	Sb2O3
SeO2	-15.10	-14.97	0.12	SeO2
SeO3	-46.79	-25.74	21.04	SeO3
Siderite	-5.26	-15.50	-10.24	FeCO3
Smithsonite	-4.26	-14.26	-10.00	ZnCO3
Sphalerite	-67.75	-79.20	-11.45	ZnS
Spinel	-8.94	27.90	36.85	MgAl2O4
Stibnite	-244.96	-295.42	-50.46	Sb2S3
Sulfur	-57.46	-59.60	-2.14	S
Tenorite	-0.49	7.15	7.64	CuO
Thenardite	-11.84	-11.52	0.32	Na2SO4
Thermonatrite	-15.71	-15.07	0.64	Na2CO3:H2O
Tyuyamunite	-4.51	-0.43	4.08	Ca(UO2)2(VO4)2
U3O8	-12.13	8.96	21.08	U3O8
U3Sb4	-580.92	-428.54	152.38	U3Sb4
U4O9	-27.60	-30.62	-3.02	U4O9
UF4	-28.46	-58.00	-29.54	UF4
UF4:2.5H2O	-25.28	-58.00	-32.72	UF4:2.5H2O
UO2(am)	-14.97	-14.04	0.93	UO2
UO2(NO3)2	-45.04	-32.89	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-37.74	-32.89	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-36.28	-32.89	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.94	-32.89	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.33	2.28	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.21	-23.46	-2.25	UO2SeO4:4H2O
UO3	-5.42	2.28	7.70	UO3
Uraninite	-9.37	-14.04	-4.67	UO2
USb2	-220.51	-190.93	29.58	USb2
V(OH)3	-17.73	-10.14	7.59	V(OH)3
V2O5	-13.05	-14.41	-1.36	V2O5
V3O5	-36.58	-34.75	1.84	V3O5
V4O7	-45.01	-37.82	7.19	V4O7

V6O13	-33.45	-94.31	-60.86	V6O13
Valentinite	-31.51	-39.99	-8.48	Sb2O3
VCl2	-63.62	-44.75	18.87	VCl2
VCl3	-66.33	-42.90	23.43	VCl3
VF4	-61.96	-47.03	14.93	VF4
Vmetal	-92.47	-48.45	44.03	V
VO	-37.67	-22.91	14.76	VO
VO(OH)2	-8.22	-3.07	5.15	VO(OH)2
VO2Cl	-20.97	-18.13	2.84	VO2Cl
VOC1	-32.21	-21.06	11.15	VOC1
VOC12	-37.67	-24.91	12.76	VOC12
VOSO4	-23.34	-19.73	3.61	VOSO4
Witherite	-5.61	-14.18	-8.57	BaCO3
Wurtzite	-70.25	-79.20	-8.95	ZnS
Zincite	-5.39	5.95	11.33	ZnO
Zincosite	-14.64	-10.71	3.93	ZnSO4
Zn(BO2)2	-15.05	-6.76	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-32.54	-29.23	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-6.25	5.95	12.20	Zn(OH)2
Zn(OH)2(am)	-6.53	5.95	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.81	5.95	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.59	5.95	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.79	5.95	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.26	-4.76	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.22	0.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.04	-9.39	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.39	-15.47	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.27	7.13	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.61	7.89	38.50	Zn5(OH)8Cl2
ZnCl2	-22.94	-15.89	7.05	ZnCl2
ZnCO3:1H2O	-4.00	-14.26	-10.26	ZnCO3:1H2O
ZnF2	-15.50	-16.03	-0.53	ZnF2
Znmetal	-45.38	-19.59	25.79	Zn
ZnMoO4	-4.37	-14.50	-10.13	ZnMoO4
ZnO(active)	-5.24	5.95	11.19	ZnO
ZnS(am)	-70.14	-79.20	-9.05	ZnS
ZnSb	-88.91	-77.89	11.01	ZnSb
ZnSe	-26.37	-40.77	-14.40	ZnSe
ZnSeO4:6H2O	-18.28	-19.80	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.07	-10.71	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 25.

```

      REACTION 102
      H2O      -1
      14894.0 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 105
      SAVE Solution 106
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 105. Solution after simulation 24.
Using reaction 102.

Reaction 102.

1.489e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.899e-04	2.902e-04
As	1.723e-07	1.724e-07
B	1.202e-04	1.204e-04
Ba	3.546e-05	3.550e-05
C	1.973e-01	1.975e-01
Ca	9.098e-02	9.108e-02
Cd	3.049e-07	3.053e-07
Cl	1.057e-02	1.058e-02
Co	1.208e-07	1.209e-07
Cr	4.782e-08	4.787e-08
Cu	6.870e-04	6.878e-04
F	9.504e-03	9.515e-03
Fe	6.783e-05	6.790e-05
Hg	1.091e-08	1.092e-08
K	1.892e-02	1.894e-02
Mg	2.420e-02	2.423e-02
Mn	2.946e-04	2.950e-04
Mo	1.138e-05	1.139e-05
N	2.256e-05	2.258e-05
Na	3.338e-02	3.342e-02
Ni	1.801e-08	1.803e-08
Pb	8.564e-07	8.573e-07
S	7.400e-02	7.408e-02
Sb	1.278e-07	1.279e-07
Se	9.555e-07	9.566e-07
U	3.205e-06	3.209e-06
V	2.785e-06	2.788e-06
Zn	3.099e-05	3.102e-05

-----Description of solution-----

	pH =	6.270	Charge balance
	pe =	6.639	Adjusted to redox
equilibrium	Activity of water =	0.993	
	Ionic strength (mol/kgw) =	2.709e-01	
	Mass of water (kg) =	1.001e+00	
	Total alkalinity (eq/kg) =	1.176e-01	
	Total CO2 (mol/kg) =	1.973e-01	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	34	
	Total H =	1.114102e+02	
	Total O =	5.645566e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
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	H+	7.300e-07	5.372e-07	-6.137	-6.270	-0.133	0.00
	OH-	2.729e-08	1.862e-08	-7.564	-7.730	-0.166	(0)
	H2O	5.551e+01	9.933e-01	1.744	-0.003	0.000	18.07
Al		2.899e-04					
	AlF4-	2.125e-04	1.504e-04	-3.673	-3.823	-0.150	(0)
	AlF3	7.535e-05	7.535e-05	-4.123	-4.123	0.000	(0)
	AlF2+	2.065e-06	1.503e-06	-5.685	-5.823	-0.138	(0)
	AlF+2	3.379e-09	9.477e-10	-8.471	-9.023	-0.552	(0)
	Al (OH) 2+	9.003e-12	6.552e-12	-11.046	-11.184	-0.138	(0)
	Al (OH) 4-	8.058e-12	5.705e-12	-11.094	-11.244	-0.150	(0)
	AlSO4+	2.715e-12	1.922e-12	-11.566	-11.716	-0.150	(0)
	Al (OH) 3	2.434e-12	2.434e-12	-11.614	-11.614	0.000	(0)
	AlOH+2	1.579e-12	4.430e-13	-11.801	-12.354	-0.552	(0)
	Al+3	3.756e-13	2.380e-14	-12.425	-13.624	-1.198	(0)
	Al (SO4) 2-	3.027e-13	2.143e-13	-12.519	-12.669	-0.150	(0)
	AlMo6O21-3	1.882e-27	7.682e-30	-26.725	-29.115	-2.389	(0)
As (3)		4.650e-19					
	H3AsO3	4.642e-19	4.642e-19	-18.333	-18.333	0.000	(0)
	H2AsO3-	8.165e-22	4.431e-22	-21.088	-21.353	-0.265	(0)
	H4AsO3+	2.277e-25	1.235e-25	-24.643	-24.908	-0.265	(0)
	HAsO3-2	8.673e-27	7.522e-28	-26.062	-27.124	-1.062	(0)
	AsO3-3	1.322e-32	5.397e-35	-31.879	-34.268	-2.389	(0)
As (5)		1.723e-07					
	HAsO4-2	9.660e-08	8.378e-09	-7.015	-8.077	-1.062	(0)
	H2AsO4-	7.564e-08	4.105e-08	-7.121	-7.387	-0.265	(0)
	AsO4-3	1.208e-11	4.932e-14	-10.918	-13.307	-2.389	(0)
	H3AsO4	3.601e-12	3.832e-12	-11.444	-11.417	0.027	(0)
B		1.202e-04					
	H3BO3	1.195e-04	1.272e-04	-3.923	-3.896	0.027	(0)
	BF (OH) 3-	3.101e-07	2.021e-07	-6.508	-6.694	-0.186	(0)
	H2BO3-	2.109e-07	1.375e-07	-6.676	-6.862	-0.186	(0)
	CaH2BO3+	1.465e-07	9.547e-08	-6.834	-7.020	-0.186	(0)
	BF2 (OH) 2-	7.141e-08	4.654e-08	-7.146	-7.332	-0.186	(0)
	MgH2BO3+	2.559e-08	1.667e-08	-7.592	-7.778	-0.186	(0)
	NaH2BO3	4.929e-09	4.929e-09	-8.307	-8.307	0.000	(0)
	BF3OH-	5.984e-11	3.900e-11	-10.223	-10.409	-0.186	(0)
	BaH2BO3+	5.412e-11	3.527e-11	-10.267	-10.453	-0.186	(0)
	H5 (BO3) 2-	2.283e-11	1.488e-11	-10.642	-10.827	-0.186	(0)
	BF4-	6.343e-13	4.133e-13	-12.198	-12.384	-0.186	(0)
	H8 (BO3) 3-	2.903e-13	1.892e-13	-12.537	-12.723	-0.186	(0)
Ba		3.546e-05					
	Ba+2	2.830e-05	8.302e-06	-4.548	-5.081	-0.533	(0)
	BaHCO3+	7.138e-06	5.279e-06	-5.146	-5.277	-0.131	(0)
	BaCO3	2.474e-08	2.474e-08	-7.607	-7.607	0.000	(0)
	BaH2BO3+	5.412e-11	3.527e-11	-10.267	-10.453	-0.186	(0)
	BaOH+	9.381e-13	6.747e-13	-12.028	-12.171	-0.143	(0)
	BaNH3+2	6.736e-13	5.843e-14	-12.172	-13.233	-1.062	(0)
	BaNO3+	4.276e-13	2.321e-13	-12.369	-12.634	-0.265	(0)
C (4)		1.973e-01					
	HCO3-	9.149e-02	6.658e-02	-1.039	-1.177	-0.138	(0)
	H2CO3	8.044e-02	8.044e-02	-1.095	-1.095	0.000	(0)
	CaHCO3+	2.023e-02	1.496e-02	-1.694	-1.825	-0.131	(0)
	MgHCO3+	3.426e-03	2.383e-03	-2.465	-2.623	-0.158	(0)
	NaHCO3	8.470e-04	8.470e-04	-3.072	-3.072	0.000	(0)
	CuCO3	4.312e-04	4.312e-04	-3.365	-3.365	0.000	(0)
	CaCO3	1.111e-04	1.111e-04	-3.954	-3.954	0.000	(0)
	CuHCO3+	9.756e-05	5.295e-05	-4.011	-4.276	-0.265	(0)
	Cu (CO3) 2-2	7.775e-05	6.743e-06	-4.109	-5.171	-1.062	(0)
	MnHCO3+	3.520e-05	2.532e-05	-4.454	-4.597	-0.143	(0)
	CO3-2	1.980e-05	5.810e-06	-4.703	-5.236	-0.533	(0)
	MgCO3	1.691e-05	1.691e-05	-4.772	-4.772	0.000	(0)
	ZnHCO3+	9.652e-06	5.238e-06	-5.015	-5.281	-0.265	(0)
	BaHCO3+	7.138e-06	5.279e-06	-5.146	-5.277	-0.131	(0)
	NaCO3-	3.363e-06	2.447e-06	-5.473	-5.611	-0.138	(0)
	UO2 (CO3) 3-4	3.198e-06	1.810e-10	-5.495	-9.742	-4.247	(0)
	FeHCO3+	1.171e-06	8.657e-07	-5.932	-6.063	-0.131	(0)
	ZnCO3	8.318e-07	8.318e-07	-6.080	-6.080	0.000	(0)

		PbHCO3+	6.229e-07	3.380e-07	-6.206	-6.471	-0.265	(0)
		PbCO3	1.193e-07	1.193e-07	-6.923	-6.923	0.000	(0)
		CoHCO3+	4.898e-08	2.658e-08	-7.310	-7.575	-0.265	(0)
		BaCO3	2.474e-08	2.474e-08	-7.607	-7.607	0.000	(0)
		Pb (CO3) 2-2	2.306e-08	2.000e-09	-7.637	-8.699	-1.062	(0)
		NiHCO3+	1.294e-08	7.022e-09	-7.888	-8.154	-0.265	(0)
		CdHCO3+	7.264e-09	3.942e-09	-8.139	-8.404	-0.265	(0)
		UO2 (CO3) 2-2	7.165e-09	6.215e-10	-8.145	-9.207	-1.062	(0)
		CdCO3	3.444e-09	3.444e-09	-8.463	-8.463	0.000	(0)
		CoCO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
		NiCO3	1.854e-10	1.854e-10	-9.732	-9.732	0.000	(0)
		Cd (CO3) 2-2	1.710e-10	1.483e-11	-9.767	-10.829	-1.062	(0)
		HgCO3	9.685e-12	9.685e-12	-11.014	-11.014	0.000	(0)
		UO2CO3	5.361e-12	5.361e-12	-11.271	-11.271	0.000	(0)
		Hg (CO3) 2-2	2.052e-12	1.779e-13	-11.688	-12.750	-1.062	(0)
		HgHCO3+	1.785e-13	9.689e-14	-12.748	-13.014	-0.265	(0)
Ca	9.098e-02							
		Ca+2	4.114e-02	1.207e-02	-1.386	-1.918	-0.533	(0)
		CaSO4	2.877e-02	2.877e-02	-1.541	-1.541	0.000	(0)
		CaHCO3+	2.023e-02	1.496e-02	-1.694	-1.825	-0.131	(0)
		CaF+	7.295e-04	5.247e-04	-3.137	-3.280	-0.143	(0)
		CaCO3	1.111e-04	1.111e-04	-3.954	-3.954	0.000	(0)
		CaH2BO3+	1.465e-07	9.547e-08	-6.834	-7.020	-0.186	(0)
		CaOH+	6.063e-09	4.484e-09	-8.217	-8.348	-0.131	(0)
		CaNH3+2	1.954e-09	1.695e-10	-8.709	-9.771	-1.062	(0)
		CaNO3+	3.922e-10	2.129e-10	-9.406	-9.672	-0.265	(0)
		Ca (NH3) 2+2	8.677e-18	7.525e-19	-17.062	-18.123	-1.062	(0)
Cd	3.049e-07							
		Cd (SO4) 2-2	1.027e-07	8.906e-09	-6.989	-8.050	-1.062	(0)
		Cd+2	8.865e-08	2.601e-08	-7.052	-7.585	-0.533	(0)
		CdSO4	6.344e-08	6.344e-08	-7.198	-7.198	0.000	(0)
		CdCl+	3.559e-08	1.931e-08	-7.449	-7.714	-0.265	(0)
		CdHCO3+	7.264e-09	3.942e-09	-8.139	-8.404	-0.265	(0)
		CdCO3	3.444e-09	3.444e-09	-8.463	-8.463	0.000	(0)
		CdF+	3.025e-09	1.642e-09	-8.519	-8.785	-0.265	(0)
		CdCl2	6.261e-10	6.261e-10	-9.203	-9.203	0.000	(0)
		Cd (CO3) 2-2	1.710e-10	1.483e-11	-9.767	-10.829	-1.062	(0)
		CdOHC1	1.475e-11	1.475e-11	-10.831	-10.831	0.000	(0)
		CdF2	1.305e-11	1.305e-11	-10.885	-10.885	0.000	(0)
		CdOH+	7.088e-12	3.846e-12	-11.150	-11.415	-0.265	(0)
		CdCl3-	5.660e-12	3.072e-12	-11.247	-11.513	-0.265	(0)
		CdNO3+	8.452e-16	4.587e-16	-15.073	-15.338	-0.265	(0)
		Cd (OH) 2	4.518e-16	4.518e-16	-15.345	-15.345	0.000	(0)
		CdSeO4	1.435e-16	1.435e-16	-15.843	-15.843	0.000	(0)
		Cd2OH+3	1.228e-16	5.014e-19	-15.911	-18.300	-2.389	(0)
		Cd (SeO3) 2-2	3.332e-18	2.889e-19	-17.477	-18.539	-1.062	(0)
		Cd (OH) 3-	9.470e-22	5.139e-22	-21.024	-21.289	-0.265	(0)
		Cd (NO3) 2	1.282e-24	1.282e-24	-23.892	-23.892	0.000	(0)
		Cd (OH) 4-2	1.806e-29	1.566e-30	-28.743	-29.805	-1.062	(0)
		CdHS+	0.000e+00	0.000e+00	-77.163	-77.429	-0.265	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-148.077	-148.077	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-223.763	-224.028	-0.265	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-298.622	-299.684	-1.062	(0)
Cl	1.057e-02							
		Cl-	1.057e-02	7.776e-03	-1.976	-2.109	-0.133	(0)
		MnCl+	2.594e-07	1.866e-07	-6.586	-6.729	-0.143	(0)
		CuCl+	2.233e-07	1.553e-07	-6.651	-6.809	-0.158	(0)
		ZnCl+	6.986e-08	4.859e-08	-7.156	-7.313	-0.158	(0)
		CdCl+	3.559e-08	1.931e-08	-7.449	-7.714	-0.265	(0)
		CuCl2-	3.241e-08	2.254e-08	-7.489	-7.647	-0.158	(0)
		CuCl	1.388e-08	1.388e-08	-7.858	-7.858	0.000	(0)
		HgCl2	8.422e-09	8.422e-09	-8.075	-8.075	0.000	(0)
		PbCl+	3.474e-09	1.885e-09	-8.459	-8.725	-0.265	(0)
		MnCl2	2.049e-09	2.049e-09	-8.688	-8.688	0.000	(0)
		HgCl3-	1.207e-09	6.549e-10	-8.918	-9.184	-0.265	(0)
		ZnOHC1	1.184e-09	1.184e-09	-8.926	-8.926	0.000	(0)
		CdCl2	6.261e-10	6.261e-10	-9.203	-9.203	0.000	(0)
		ZnCl2	5.989e-10	5.989e-10	-9.223	-9.223	0.000	(0)

CuCl2	4.188e-10	4.188e-10	-9.378	-9.378	0.000	(0)
HgClOH	3.561e-10	3.561e-10	-9.448	-9.448	0.000	(0)
CoCl+	2.544e-10	1.381e-10	-9.595	-9.860	-0.265	(0)
HgCl4-2	2.338e-10	2.027e-11	-9.631	-10.693	-1.062	(0)
CuCl3-2	1.400e-10	3.748e-11	-9.854	-10.426	-0.572	(0)
PbCl2	6.548e-11	6.548e-11	-10.184	-10.184	0.000	(0)
NiCl+	3.136e-11	1.702e-11	-10.504	-10.769	-0.265	(0)
CdOHC1	1.475e-11	1.475e-11	-10.831	-10.831	0.000	(0)
MnCl3-	6.101e-12	4.388e-12	-11.215	-11.358	-0.143	(0)
CdCl3-	5.660e-12	3.072e-12	-11.247	-11.513	-0.265	(0)
ZnCl3-	5.318e-12	3.699e-12	-11.274	-11.432	-0.158	(0)
HgCl+	3.982e-13	2.161e-13	-12.400	-12.665	-0.265	(0)
PbCl3-	3.735e-13	2.027e-13	-12.428	-12.693	-0.265	(0)
CrCl+2	3.705e-13	3.213e-14	-12.431	-13.493	-1.062	(0)
FeCl+2	3.666e-13	9.813e-14	-12.436	-13.008	-0.572	(0)
ZnCl4-2	5.374e-14	1.438e-14	-13.270	-13.842	-0.572	(0)
CuCl3-	4.369e-14	3.039e-14	-13.360	-13.517	-0.158	(0)
PbCl4-2	8.307e-15	7.205e-16	-14.081	-15.142	-1.062	(0)
FeCl2+	4.739e-15	3.408e-15	-14.324	-14.467	-0.143	(0)
VOCl+	1.678e-15	9.108e-16	-14.775	-15.041	-0.265	(0)
NiCl2	6.664e-16	6.664e-16	-15.176	-15.176	0.000	(0)
CrOHC12	8.841e-17	8.841e-17	-16.053	-16.053	0.000	(0)
CrCl2+	4.369e-17	2.371e-17	-16.360	-16.625	-0.265	(0)
UO2Cl+	5.386e-18	2.923e-18	-17.269	-17.534	-0.265	(0)
CuCl4-2	4.426e-18	1.184e-18	-17.354	-17.926	-0.572	(0)
FeCl3	2.650e-18	2.650e-18	-17.577	-17.577	0.000	(0)
CrO3Cl-	3.561e-26	1.932e-26	-25.448	-25.714	-0.265	(0)
CoCl+2	1.623e-33	1.408e-34	-32.790	-33.851	-1.062	(0)
UCl+3	0.000e+00	0.000e+00	-42.791	-45.180	-2.389	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-46.157	-47.219	-1.062	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.599	-47.661	-1.062	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.268	-62.329	-1.062	(0)
Co (2)	1.208e-07					
Co+2	5.917e-08	5.132e-09	-7.228	-8.290	-1.062	(0)
CoHCO3+	4.898e-08	2.658e-08	-7.310	-7.575	-0.265	(0)
CoSO4	1.066e-08	1.066e-08	-7.972	-7.972	0.000	(0)
CoF+	1.191e-09	6.464e-10	-8.924	-9.190	-0.265	(0)
CoCO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
CoCl+	2.544e-10	1.381e-10	-9.595	-9.860	-0.265	(0)
CoOH+	3.513e-12	1.906e-12	-11.454	-11.720	-0.265	(0)
CoNO2+	2.115e-13	1.148e-13	-12.675	-12.940	-0.265	(0)
Co (NH3) +2	7.935e-14	6.882e-15	-13.100	-14.162	-1.062	(0)
Co (OH) 2	2.819e-15	2.819e-15	-14.550	-14.550	0.000	(0)
CoNO3+	8.359e-17	4.536e-17	-16.078	-16.343	-0.265	(0)
CoSeO4	7.620e-17	7.620e-17	-16.118	-16.118	0.000	(0)
Co2OH+3	1.201e-19	4.904e-22	-18.920	-21.309	-2.389	(0)
Co (NH3) 2+2	3.775e-20	3.274e-21	-19.423	-20.485	-1.062	(0)
Co (OH) 3-	1.930e-21	1.047e-21	-20.714	-20.980	-0.265	(0)
CoOOH-	4.875e-22	2.645e-22	-21.312	-21.578	-0.265	(0)
Co (NO3) 2	5.148e-25	5.148e-25	-24.288	-24.288	0.000	(0)
Co (NH3) 3+2	5.301e-27	4.598e-28	-26.276	-27.337	-1.062	(0)
Co (OH) 4-2	3.563e-29	3.090e-30	-28.448	-29.510	-1.062	(0)
Co (NH3) 4+2	3.103e-34	2.691e-35	-33.508	-34.570	-1.062	(0)
Co4 (OH) 4+4	4.658e-35	2.636e-39	-34.332	-38.579	-4.247	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.241	-42.303	-1.062	(0)
Co (3)	9.707e-29					
CoOH+2	9.706e-29	8.419e-30	-28.013	-29.075	-1.062	(0)
CoCl+2	1.623e-33	1.408e-34	-32.790	-33.851	-1.062	(0)
Co+3	1.405e-33	8.898e-35	-32.852	-34.051	-1.198	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.599	-47.661	-1.062	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-57.012	-57.278	-0.265	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.268	-62.329	-1.062	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.688	-63.750	-1.062	(0)
Cr (2)	2.019e-24					
Cr+2	2.019e-24	1.751e-25	-23.695	-24.757	-1.062	(0)
Cr (3)	4.782e-08					
CrF+2	2.324e-08	2.015e-09	-7.634	-8.696	-1.062	(0)
Cr (OH) +2	1.499e-08	1.301e-09	-7.824	-8.886	-1.062	(0)

Cr (OH) 2+	5.429e-09	2.946e-09	-8.265	-8.531	-0.265	(0)
CrOHSO4	3.211e-09	3.211e-09	-8.493	-8.493	0.000	(0)
Cr+3	7.821e-10	3.193e-12	-9.107	-11.496	-2.389	(0)
CrSO4+	1.430e-10	7.758e-11	-9.845	-10.110	-0.265	(0)
Cr (OH) 3	2.061e-11	2.061e-11	-10.686	-10.686	0.000	(0)
CrCl+2	3.705e-13	3.213e-14	-12.431	-13.493	-1.062	(0)
CrO2-	3.379e-14	1.834e-14	-13.471	-13.737	-0.265	(0)
Cr (OH) 4-	2.814e-14	1.527e-14	-13.551	-13.816	-0.265	(0)
Cr2 (OH) 2SO4+2	4.352e-15	3.775e-16	-14.361	-15.423	-1.062	(0)
Cr2 (OH) 2 (SO4) 2	2.333e-16	2.333e-16	-15.632	-15.632	0.000	(0)
CrOHC12	8.841e-17	8.841e-17	-16.053	-16.053	0.000	(0)
CrCl2+	4.369e-17	2.371e-17	-16.360	-16.625	-0.265	(0)
CrNO3+2	8.974e-21	7.784e-22	-20.047	-21.109	-1.062	(0)
Cr (NH3) 5OH+2	2.788e-38	2.418e-39	-37.555	-38.617	-1.062	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-43.822	-46.211	-2.389	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-46.157	-47.219	-1.062	(0)
Cr (6)	2.903e-18					
CrO4-2	1.432e-18	4.203e-19	-17.844	-18.376	-0.533	(0)
HCrO4-	1.346e-18	7.306e-19	-17.871	-18.136	-0.265	(0)
NaCrO4-	8.706e-20	4.725e-20	-19.060	-19.326	-0.265	(0)
KCrO4-	3.728e-20	2.023e-20	-19.429	-19.694	-0.265	(0)
CrO3SO4-2	1.444e-23	1.252e-24	-22.840	-23.902	-1.062	(0)
H2CrO4	3.182e-25	3.182e-25	-24.497	-24.497	0.000	(0)
CrO3Cl-	3.561e-26	1.932e-26	-25.448	-25.714	-0.265	(0)
Cr2O7-2	2.148e-34	1.863e-35	-33.668	-34.730	-1.062	(0)
Cu (1)	4.903e-08					
CuCl2-	3.241e-08	2.254e-08	-7.489	-7.647	-0.158	(0)
CuCl	1.388e-08	1.388e-08	-7.858	-7.858	0.000	(0)
Cu+	2.612e-09	1.417e-09	-8.583	-8.849	-0.265	(0)
CuCl3-2	1.400e-10	3.748e-11	-9.854	-10.426	-0.572	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.138	-148.622	-0.484	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.899	-149.352	-0.453	(0)
Cu (2)	6.870e-04					
CuCO3	4.312e-04	4.312e-04	-3.365	-3.365	0.000	(0)
CuHCO3+	9.756e-05	5.295e-05	-4.011	-4.276	-0.265	(0)
Cu (CO3) 2-2	7.775e-05	6.743e-06	-4.109	-5.171	-1.062	(0)
Cu+2	4.296e-05	1.260e-05	-4.367	-4.899	-0.533	(0)
CuSO4	3.005e-05	3.005e-05	-4.522	-4.522	0.000	(0)
CuF+	5.837e-06	3.167e-06	-5.234	-5.499	-0.265	(0)
CuOH+	1.067e-06	7.421e-07	-5.972	-6.130	-0.158	(0)
CuCl+	2.233e-07	1.553e-07	-6.651	-6.809	-0.158	(0)
Cu2 (OH) 2+2	1.595e-07	1.383e-08	-6.797	-7.859	-1.062	(0)
CuNH3+2	1.659e-08	1.439e-09	-7.780	-8.842	-1.062	(0)
CuNO2+	7.719e-09	4.189e-09	-8.112	-8.378	-0.265	(0)
Cu (OH) 2	2.757e-09	2.757e-09	-8.560	-8.560	0.000	(0)
CuCl2	4.188e-10	4.188e-10	-9.378	-9.378	0.000	(0)
CuNO3+	4.096e-13	2.223e-13	-12.388	-12.653	-0.265	(0)
Cu (OH) 3-	1.940e-13	1.053e-13	-12.712	-12.978	-0.265	(0)
Cu (NO2) 2	1.360e-13	1.360e-13	-12.866	-12.866	0.000	(0)
CuCl3-	4.369e-14	3.039e-14	-13.360	-13.517	-0.158	(0)
CuCl4-2	4.426e-18	1.184e-18	-17.354	-17.926	-0.572	(0)
Cu (OH) 4-2	1.779e-19	1.543e-20	-18.750	-19.812	-1.062	(0)
Cu (NO3) 2	1.561e-22	1.561e-22	-21.807	-21.807	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-212.290	-212.556	-0.265	(0)
F	9.504e-03					
F-	5.412e-03	3.983e-03	-2.267	-2.400	-0.133	(0)
MgF+	2.208e-03	1.563e-03	-2.656	-2.806	-0.150	(0)
CaF+	7.295e-04	5.247e-04	-3.137	-3.280	-0.143	(0)
AlF4-	2.125e-04	1.504e-04	-3.673	-3.823	-0.150	(0)
AlF3	7.535e-05	7.535e-05	-4.123	-4.123	0.000	(0)
NaF	5.685e-05	5.685e-05	-4.245	-4.245	0.000	(0)
CuF+	5.837e-06	3.167e-06	-5.234	-5.499	-0.265	(0)
MnF+	4.201e-06	3.022e-06	-5.377	-5.520	-0.143	(0)
HF	3.165e-06	3.165e-06	-5.500	-5.500	0.000	(0)
AlF2+	2.065e-06	1.503e-06	-5.685	-5.823	-0.138	(0)
FeF3	1.093e-06	1.093e-06	-5.961	-5.961	0.000	(0)
ZnF+	3.643e-07	1.977e-07	-6.439	-6.704	-0.265	(0)
BF (OH) 3-	3.101e-07	2.021e-07	-6.508	-6.694	-0.186	(0)

FeF2+	2.704e-07	1.945e-07	-6.568	-6.711	-0.143	(0)
BF2(OH) 2-	7.141e-08	4.654e-08	-7.146	-7.332	-0.186	(0)
HF2-	7.025e-08	4.792e-08	-7.153	-7.319	-0.166	(0)
CrF+2	2.324e-08	2.015e-09	-7.634	-8.696	-1.062	(0)
FeF+2	6.819e-09	1.825e-09	-8.166	-8.739	-0.572	(0)
PbF+	3.534e-09	1.918e-09	-8.452	-8.717	-0.265	(0)
AlF+2	3.379e-09	9.477e-10	-8.471	-9.023	-0.552	(0)
CdF+	3.025e-09	1.642e-09	-8.519	-8.785	-0.265	(0)
CoF+	1.191e-09	6.464e-10	-8.924	-9.190	-0.265	(0)
NiF+	1.577e-10	8.559e-11	-9.802	-10.068	-0.265	(0)
PbF2	1.503e-10	1.503e-10	-9.823	-9.823	0.000	(0)
VO2F2-	1.456e-10	7.904e-11	-9.837	-10.102	-0.265	(0)
BF3OH-	5.984e-11	3.900e-11	-10.223	-10.409	-0.186	(0)
VO2F	5.466e-11	5.466e-11	-10.262	-10.262	0.000	(0)
VO2F3-2	4.527e-11	3.927e-12	-10.344	-11.406	-1.062	(0)
H2F2	2.684e-11	2.684e-11	-10.571	-10.571	0.000	(0)
CdF2	1.305e-11	1.305e-11	-10.885	-10.885	0.000	(0)
UO2F3-	2.698e-12	1.464e-12	-11.569	-11.834	-0.265	(0)
PbF3-	2.092e-12	1.136e-12	-11.679	-11.945	-0.265	(0)
VO2F4-3	1.885e-12	7.695e-15	-11.725	-14.114	-2.389	(0)
VOF+	1.838e-12	9.973e-13	-11.736	-12.001	-0.265	(0)
VOF2	1.489e-12	1.489e-12	-11.827	-11.827	0.000	(0)
UO2F2	1.464e-12	1.464e-12	-11.835	-11.835	0.000	(0)
BF4-	6.343e-13	4.133e-13	-12.198	-12.384	-0.186	(0)
UO2F4-2	5.341e-13	4.633e-14	-12.272	-13.334	-1.062	(0)
VOF3-	3.879e-13	2.105e-13	-12.411	-12.677	-0.265	(0)
UO2F+	2.348e-13	1.274e-13	-12.629	-12.895	-0.265	(0)
VOF4-2	3.902e-14	3.384e-15	-13.409	-14.471	-1.062	(0)
PbF4-2	2.496e-14	2.165e-15	-13.603	-14.665	-1.062	(0)
HgF+	3.789e-19	2.056e-19	-18.421	-18.687	-0.265	(0)
Sb(OH) 2F	4.551e-21	4.551e-21	-20.342	-20.342	0.000	(0)
SbOF	4.505e-21	4.505e-21	-20.346	-20.346	0.000	(0)
UF3+	7.862e-31	4.266e-31	-30.104	-30.370	-0.265	(0)
UF6-2	4.078e-31	3.537e-32	-30.390	-31.451	-1.062	(0)
UF4	1.863e-31	1.863e-31	-30.730	-30.730	0.000	(0)
UF5-	5.419e-32	2.941e-32	-31.266	-31.532	-0.265	(0)
UF2+2	7.793e-33	6.759e-34	-32.108	-33.170	-1.062	(0)
UF+3	3.302e-36	1.348e-38	-35.481	-37.870	-2.389	(0)
Fe (2)	1.572e-05					
Fe+2	1.191e-05	1.033e-06	-4.924	-5.986	-1.062	(0)
FeSO4	2.638e-06	2.638e-06	-5.579	-5.579	0.000	(0)
FeHCO3+	1.171e-06	8.657e-07	-5.932	-6.063	-0.131	(0)
FeOH+	1.064e-09	7.655e-10	-8.973	-9.116	-0.143	(0)
Fe(OH) 2	1.132e-14	1.132e-14	-13.946	-13.946	0.000	(0)
Fe(OH) 3-	9.267e-17	6.665e-17	-16.033	-16.176	-0.143	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-152.740	-152.740	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-228.289	-228.554	-0.265	(0)
Fe (3)	5.211e-05					
Fe(OH) 2+	5.000e-05	3.638e-05	-4.301	-4.439	-0.138	(0)
FeF3	1.093e-06	1.093e-06	-5.961	-5.961	0.000	(0)
Fe(OH) 3	7.275e-07	7.275e-07	-6.138	-6.138	0.000	(0)
FeF2+	2.704e-07	1.945e-07	-6.568	-6.711	-0.143	(0)
FeOH+2	1.877e-08	5.023e-09	-7.727	-8.299	-0.572	(0)
FeF+2	6.819e-09	1.825e-09	-8.166	-8.739	-0.572	(0)
Fe(OH) 4-	1.733e-09	1.261e-09	-8.761	-8.899	-0.138	(0)
FeSO4+	6.783e-11	4.879e-11	-10.169	-10.312	-0.143	(0)
Fe(SO4) 2-	2.000e-11	1.085e-11	-10.699	-10.964	-0.265	(0)
Fe2(OH) 2+4	1.477e-11	8.355e-16	-10.831	-15.078	-4.247	(0)
Fe+3	6.596e-12	4.179e-13	-11.181	-12.379	-1.198	(0)
Fe3(OH) 4+5	1.902e-12	4.394e-19	-11.721	-18.357	-6.636	(0)
FeCl+2	3.666e-13	9.813e-14	-12.436	-13.008	-0.572	(0)
FeHSeO3+2	6.308e-15	5.471e-16	-14.200	-15.262	-1.062	(0)
FeCl2+	4.739e-15	3.408e-15	-14.324	-14.467	-0.143	(0)
FeCl3	2.650e-18	2.650e-18	-17.577	-17.577	0.000	(0)
FeNO3+2	2.687e-19	2.330e-20	-18.571	-19.633	-1.062	(0)
H (0)	2.024e-29					
H2	1.012e-29	1.077e-29	-28.995	-28.968	0.027	(0)
Hg (0)	6.778e-10					

Hg	6.778e-10	6.778e-10	-9.169	-9.169	0.000	(0)
Hg (1)	1.478e-17					
Hg2+2	7.390e-18	6.409e-19	-17.131	-18.193	-1.062	(0)
Hg (2)	1.023e-08					
HgCl2	8.422e-09	8.422e-09	-8.075	-8.075	0.000	(0)
HgCl3-	1.207e-09	6.549e-10	-8.918	-9.184	-0.265	(0)
HgClOH	3.561e-10	3.561e-10	-9.448	-9.448	0.000	(0)
HgCl4-2	2.338e-10	2.027e-11	-9.631	-10.693	-1.062	(0)
HgCO3	9.685e-12	9.685e-12	-11.014	-11.014	0.000	(0)
Hg (OH) 2	2.862e-12	3.046e-12	-11.543	-11.516	0.027	(0)
Hg (CO3) 2-2	2.052e-12	1.779e-13	-11.688	-12.750	-1.062	(0)
HgCl+	3.982e-13	2.161e-13	-12.400	-12.665	-0.265	(0)
HgHCO3+	1.785e-13	9.689e-14	-12.748	-13.014	-0.265	(0)
HgOH+	1.902e-15	1.032e-15	-14.721	-14.986	-0.265	(0)
Hg (NH3) 2+2	1.261e-15	1.093e-16	-14.899	-15.961	-1.062	(0)
HgNH3+2	1.130e-16	9.803e-18	-15.947	-17.009	-1.062	(0)
Hg+2	1.606e-17	1.393e-18	-16.794	-17.856	-1.062	(0)
HgSO4	3.795e-18	3.795e-18	-17.421	-17.421	0.000	(0)
HgF+	3.789e-19	2.056e-19	-18.421	-18.687	-0.265	(0)
Hg (OH) 3-	1.316e-20	7.140e-21	-19.881	-20.146	-0.265	(0)
Hg (NH3) 3+2	5.598e-23	4.855e-24	-22.252	-23.314	-1.062	(0)
HgNO3+	5.286e-27	2.868e-27	-26.277	-26.542	-0.265	(0)
Hg (NH3) 4+2	4.959e-30	4.301e-31	-29.305	-30.366	-1.062	(0)
Hg (NO3) 2	6.649e-36	6.649e-36	-35.177	-35.177	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-135.096	-135.362	-0.265	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-135.238	-135.238	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-136.738	-137.800	-1.062	(0)
K	1.892e-02					
K+	1.760e-02	1.296e-02	-1.754	-1.888	-0.133	(0)
KSO4-	1.312e-03	9.545e-04	-2.882	-3.020	-0.138	(0)
KCrO4-	3.728e-20	2.023e-20	-19.429	-19.694	-0.265	(0)
Mg	2.420e-02					
Mg+2	1.192e-02	3.498e-03	-1.924	-2.456	-0.533	(0)
MgSO4	6.624e-03	6.624e-03	-2.179	-2.179	0.000	(0)
MgHCO3+	3.426e-03	2.383e-03	-2.465	-2.623	-0.158	(0)
MgF+	2.208e-03	1.563e-03	-2.656	-2.806	-0.150	(0)
MgCO3	1.691e-05	1.691e-05	-4.772	-4.772	0.000	(0)
MgOH+	3.464e-08	2.593e-08	-7.460	-7.586	-0.126	(0)
MgH2BO3+	2.559e-08	1.667e-08	-7.592	-7.778	-0.186	(0)
Mn (2)	2.946e-04					
Mn+2	2.197e-04	1.906e-05	-3.658	-4.720	-1.062	(0)
MnSO4	3.526e-05	3.526e-05	-4.453	-4.453	0.000	(0)
MnHCO3+	3.520e-05	2.532e-05	-4.454	-4.597	-0.143	(0)
MnF+	4.201e-06	3.022e-06	-5.377	-5.520	-0.143	(0)
MnCl+	2.594e-07	1.866e-07	-6.586	-6.729	-0.143	(0)
MnCl2	2.049e-09	2.049e-09	-8.688	-8.688	0.000	(0)
MnOH+	1.239e-09	8.912e-10	-8.907	-9.050	-0.143	(0)
MnCl3-	6.101e-12	4.388e-12	-11.215	-11.358	-0.143	(0)
MnNO3+	3.104e-13	1.684e-13	-12.508	-12.774	-0.265	(0)
MnSeO4	1.520e-13	1.520e-13	-12.818	-12.818	0.000	(0)
Mn (OH) 3-	2.654e-21	1.909e-21	-20.576	-20.719	-0.143	(0)
Mn (NO3) 2	2.360e-21	2.360e-21	-20.627	-20.627	0.000	(0)
Mn (OH) 4-2	4.288e-28	1.148e-28	-27.368	-27.940	-0.572	(0)
MnSe	0.000e+00	0.000e+00	-42.725	-42.725	0.000	(0)
Mn (3)	5.852e-23					
Mn+3	5.852e-23	3.707e-24	-22.233	-23.431	-1.198	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.866	-46.439	-0.572	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.996	-49.172	-0.175	(0)
Mo	1.138e-05					
MoO4-2	1.132e-05	3.320e-06	-4.946	-5.479	-0.533	(0)
HMoO4-	6.540e-08	3.549e-08	-7.184	-7.450	-0.265	(0)
H2MoO4	1.397e-10	1.397e-10	-9.855	-9.855	0.000	(0)
Mo7O24-6	1.115e-26	3.096e-36	-25.953	-35.509	-9.556	(0)
AlMo6O21-3	1.882e-27	7.682e-30	-26.725	-29.115	-2.389	(0)
HMo7O24-5	1.755e-29	4.053e-36	-28.756	-35.392	-6.636	(0)
H2Mo7O24-4	2.331e-33	1.319e-37	-32.633	-36.880	-4.247	(0)

H3Mo7O24-3	3.058e-38	1.248e-40	-37.515	-39.904	-2.389	(0)
N(-3)	1.779e-05					
NH4+	1.613e-05	1.051e-05	-4.792	-4.978	-0.186	(0)
NH4SO4-	1.629e-06	1.172e-06	-5.788	-5.931	-0.143	(0)
CuNH3+2	1.659e-08	1.439e-09	-7.780	-8.842	-1.062	(0)
NH3	1.115e-08	1.115e-08	-7.953	-7.953	0.000	(0)
CaNH3+2	1.954e-09	1.695e-10	-8.709	-9.771	-1.062	(0)
BaNH3+2	6.736e-13	5.843e-14	-12.172	-13.233	-1.062	(0)
Co(NH3)+2	7.935e-14	6.882e-15	-13.100	-14.162	-1.062	(0)
NiNH3+2	5.908e-14	5.124e-15	-13.229	-14.290	-1.062	(0)
Hg(NH3)2+2	1.261e-15	1.093e-16	-14.899	-15.961	-1.062	(0)
HgNH3+2	1.130e-16	9.803e-18	-15.947	-17.009	-1.062	(0)
Ca(NH3)2+2	8.677e-18	7.525e-19	-17.062	-18.123	-1.062	(0)
Ni(NH3)2+2	9.525e-20	8.261e-21	-19.021	-20.083	-1.062	(0)
Co(NH3)2+2	3.775e-20	3.274e-21	-19.423	-20.485	-1.062	(0)
Hg(NH3)3+2	5.598e-23	4.855e-24	-22.252	-23.314	-1.062	(0)
Co(NH3)3+2	5.301e-27	4.598e-28	-26.276	-27.337	-1.062	(0)
Hg(NH3)4+2	4.959e-30	4.301e-31	-29.305	-30.366	-1.062	(0)
Co(NH3)4+2	3.103e-34	2.691e-35	-33.508	-34.570	-1.062	(0)
Cr(NH3)5OH+2	2.788e-38	2.418e-39	-37.555	-38.617	-1.062	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-41.241	-42.303	-1.062	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-43.822	-46.211	-2.389	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-46.157	-47.219	-1.062	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-46.599	-47.661	-1.062	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-57.012	-57.278	-0.265	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-61.268	-62.329	-1.062	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-62.688	-63.750	-1.062	(0)
N(3)	4.762e-06					
NO2-	4.754e-06	3.174e-06	-5.323	-5.498	-0.175	(0)
CuNO2+	7.719e-09	4.189e-09	-8.112	-8.378	-0.265	(0)
CoNO2+	2.115e-13	1.148e-13	-12.675	-12.940	-0.265	(0)
Cu(NO2)2	1.360e-13	1.360e-13	-12.866	-12.866	0.000	(0)
N(5)	7.971e-09					
NO3-	7.578e-09	5.577e-09	-8.120	-8.254	-0.133	(0)
CaNO3+	3.922e-10	2.129e-10	-9.406	-9.672	-0.265	(0)
BaNO3+	4.276e-13	2.321e-13	-12.369	-12.634	-0.265	(0)
CuNO3+	4.096e-13	2.223e-13	-12.388	-12.653	-0.265	(0)
MnNO3+	3.104e-13	1.684e-13	-12.508	-12.774	-0.265	(0)
ZnNO3+	6.422e-14	3.485e-14	-13.192	-13.458	-0.265	(0)
PbNO3+	1.039e-15	5.637e-16	-14.984	-15.249	-0.265	(0)
CdNO3+	8.452e-16	4.587e-16	-15.073	-15.338	-0.265	(0)
CoNO3+	8.359e-17	4.536e-17	-16.078	-16.343	-0.265	(0)
NiNO3+	2.208e-17	1.198e-17	-16.656	-16.921	-0.265	(0)
FeNO3+2	2.687e-19	2.330e-20	-18.571	-19.633	-1.062	(0)
VO2NO3	2.207e-20	2.207e-20	-19.656	-19.656	0.000	(0)
CrNO3+2	8.974e-21	7.784e-22	-20.047	-21.109	-1.062	(0)
Mn(NO3)2	2.360e-21	2.360e-21	-20.627	-20.627	0.000	(0)
Cu(NO3)2	1.561e-22	1.561e-22	-21.807	-21.807	0.000	(0)
Zn(NO3)2	3.878e-23	3.878e-23	-22.411	-22.411	0.000	(0)
Pb(NO3)2	5.338e-24	5.338e-24	-23.273	-23.273	0.000	(0)
UO2NO3+	4.752e-24	2.579e-24	-23.323	-23.589	-0.265	(0)
Cd(NO3)2	1.282e-24	1.282e-24	-23.892	-23.892	0.000	(0)
Co(NO3)2	5.148e-25	5.148e-25	-24.288	-24.288	0.000	(0)
HgNO3+	5.286e-27	2.868e-27	-26.277	-26.542	-0.265	(0)
Hg(NO3)2	6.649e-36	6.649e-36	-35.177	-35.177	0.000	(0)
Na	3.338e-02					
Na+	3.074e-02	2.262e-02	-1.512	-1.645	-0.133	(0)
NaSO4-	1.737e-03	1.264e-03	-2.760	-2.898	-0.138	(0)
NaHCO3	8.470e-04	8.470e-04	-3.072	-3.072	0.000	(0)
NaF	5.685e-05	5.685e-05	-4.245	-4.245	0.000	(0)
NaCO3-	3.363e-06	2.447e-06	-5.473	-5.611	-0.138	(0)
NaH2BO3	4.929e-09	4.929e-09	-8.307	-8.307	0.000	(0)
NaCrO4-	8.706e-20	4.725e-20	-19.060	-19.326	-0.265	(0)
Ni	1.801e-08					
NiHCO3+	1.294e-08	7.022e-09	-7.888	-8.154	-0.265	(0)
Ni+2	2.916e-09	8.555e-10	-8.535	-9.068	-0.533	(0)
NiSO4	1.776e-09	1.776e-09	-8.751	-8.751	0.000	(0)
NiCO3	1.854e-10	1.854e-10	-9.732	-9.732	0.000	(0)

NiF+	1.577e-10	8.559e-11	-9.802	-10.068	-0.265	(0)
NiCl+	3.136e-11	1.702e-11	-10.504	-10.769	-0.265	(0)
Ni (SO4) 2-2	7.056e-12	6.120e-13	-11.151	-12.213	-1.062	(0)
NiOH+	3.695e-13	2.005e-13	-12.432	-12.698	-0.265	(0)
NiNH3+2	5.908e-14	5.124e-15	-13.229	-14.290	-1.062	(0)
NiCl2	6.664e-16	6.664e-16	-15.176	-15.176	0.000	(0)
Ni (OH) 2	2.965e-16	2.965e-16	-15.528	-15.528	0.000	(0)
NiNO3+	2.208e-17	1.198e-17	-16.656	-16.921	-0.265	(0)
NiSeO4	1.185e-17	1.185e-17	-16.926	-16.926	0.000	(0)
Ni (NH3) 2+2	9.525e-20	8.261e-21	-19.021	-20.083	-1.062	(0)
Ni (OH) 3-	1.017e-20	5.521e-21	-19.993	-20.258	-0.265	(0)
O (0)	8.100e-35					
O2	4.050e-35	4.311e-35	-34.393	-34.365	0.027	(0)
Pb	8.564e-07					
PbHCO3+	6.229e-07	3.380e-07	-6.206	-6.471	-0.265	(0)
PbCO3	1.193e-07	1.193e-07	-6.923	-6.923	0.000	(0)
PbSO4	3.482e-08	3.482e-08	-7.458	-7.458	0.000	(0)
Pb (SO4) 2-2	2.518e-08	2.184e-09	-7.599	-8.661	-1.062	(0)
Pb+2	2.329e-08	6.833e-09	-7.633	-8.165	-0.533	(0)
Pb (CO3) 2-2	2.306e-08	2.000e-09	-7.637	-8.699	-1.062	(0)
PbF+	3.534e-09	1.918e-09	-8.452	-8.717	-0.265	(0)
PbCl+	3.474e-09	1.885e-09	-8.459	-8.725	-0.265	(0)
PbOH+	5.888e-10	3.196e-10	-9.230	-9.495	-0.265	(0)
PbF2	1.503e-10	1.503e-10	-9.823	-9.823	0.000	(0)
PbCl2	6.548e-11	6.548e-11	-10.184	-10.184	0.000	(0)
PbF3-	2.092e-12	1.136e-12	-11.679	-11.945	-0.265	(0)
PbCl3-	3.735e-13	2.027e-13	-12.428	-12.693	-0.265	(0)
Pb (OH) 2	1.881e-13	1.881e-13	-12.726	-12.726	0.000	(0)
PbF4-2	2.496e-14	2.165e-15	-13.603	-14.665	-1.062	(0)
Pb2OH+3	8.477e-15	3.461e-17	-14.072	-16.461	-2.389	(0)
PbCl4-2	8.307e-15	7.205e-16	-14.081	-15.142	-1.062	(0)
PbNO3+	1.039e-15	5.637e-16	-14.984	-15.249	-0.265	(0)
Pb (OH) 3-	6.455e-18	3.503e-18	-17.190	-17.456	-0.265	(0)
Pb (OH) 4-2	1.841e-22	1.597e-23	-21.735	-22.797	-1.062	(0)
Pb3 (OH) 4+2	5.564e-23	4.826e-24	-22.255	-23.316	-1.062	(0)
Pb (NO3) 2	5.338e-24	5.338e-24	-23.273	-23.273	0.000	(0)
Pb4 (OH) 4+4	4.629e-24	2.619e-28	-23.335	-27.582	-4.247	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-148.599	-148.599	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-224.885	-225.151	-0.265	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-77.102	-77.102	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-77.163	-77.429	-0.265	(0)
HS-	0.000e+00	0.000e+00	-77.586	-77.852	-0.265	(0)
S5-2	0.000e+00	0.000e+00	-79.885	-80.947	-1.062	(0)
S6-2	0.000e+00	0.000e+00	-80.401	-81.463	-1.062	(0)
S4-2	0.000e+00	0.000e+00	-80.481	-81.543	-1.062	(0)
S3-2	0.000e+00	0.000e+00	-81.287	-82.349	-1.062	(0)
S2-2	0.000e+00	0.000e+00	-82.303	-83.365	-1.062	(0)
S-2	0.000e+00	0.000e+00	-88.310	-88.882	-0.572	(0)
HgHS2-	0.000e+00	0.000e+00	-135.096	-135.362	-0.265	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-135.238	-135.238	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-136.738	-137.800	-1.062	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.962	-148.228	-0.265	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-148.077	-148.077	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.138	-148.622	-0.484	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-148.488	-148.488	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-148.599	-148.599	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.899	-149.352	-0.453	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-152.740	-152.740	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-212.290	-212.556	-0.265	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-222.794	-223.060	-0.265	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-223.763	-224.028	-0.265	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-224.885	-225.151	-0.265	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.708	-226.770	-1.062	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-228.289	-228.554	-0.265	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-298.622	-299.684	-1.062	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-301.310	-302.371	-1.062	(0)
Sb2S4-2	0.000e+00	0.000e+00	-309.217	-310.279	-1.062	(0)

S (6)	7.400e-02					
SO4-2	3.547e-02	1.041e-02	-1.450	-1.983	-0.533	(0)
CaSO4	2.877e-02	2.877e-02	-1.541	-1.541	0.000	(0)
MgSO4	6.624e-03	6.624e-03	-2.179	-2.179	0.000	(0)
NaSO4-	1.737e-03	1.264e-03	-2.760	-2.898	-0.138	(0)
KSO4-	1.312e-03	9.545e-04	-2.882	-3.020	-0.138	(0)
MnSO4	3.526e-05	3.526e-05	-4.453	-4.453	0.000	(0)
CuSO4	3.005e-05	3.005e-05	-4.522	-4.522	0.000	(0)
Zn (SO4) 2-2	5.919e-06	5.133e-07	-5.228	-6.290	-1.062	(0)
ZnSO4	5.664e-06	5.664e-06	-5.247	-5.247	0.000	(0)
FeSO4	2.638e-06	2.638e-06	-5.579	-5.579	0.000	(0)
NH4SO4-	1.629e-06	1.172e-06	-5.788	-5.931	-0.143	(0)
HSO4-	7.717e-07	5.463e-07	-6.113	-6.263	-0.150	(0)
Cd (SO4) 2-2	1.027e-07	8.906e-09	-6.989	-8.050	-1.062	(0)
CdSO4	6.344e-08	6.344e-08	-7.198	-7.198	0.000	(0)
PbSO4	3.482e-08	3.482e-08	-7.458	-7.458	0.000	(0)
Pb (SO4) 2-2	2.518e-08	2.184e-09	-7.599	-8.661	-1.062	(0)
CoSO4	1.066e-08	1.066e-08	-7.972	-7.972	0.000	(0)
CrOHSO4	3.211e-09	3.211e-09	-8.493	-8.493	0.000	(0)
NiSO4	1.776e-09	1.776e-09	-8.751	-8.751	0.000	(0)
CrSO4+	1.430e-10	7.758e-11	-9.845	-10.110	-0.265	(0)
FeSO4+	6.783e-11	4.879e-11	-10.169	-10.312	-0.143	(0)
Fe (SO4) 2-	2.000e-11	1.085e-11	-10.699	-10.964	-0.265	(0)
Ni (SO4) 2-2	7.056e-12	6.120e-13	-11.151	-12.213	-1.062	(0)
VO2SO4-	3.582e-12	1.944e-12	-11.446	-11.711	-0.265	(0)
AlSO4+	2.715e-12	1.922e-12	-11.566	-11.716	-0.150	(0)
Al (SO4) 2-	3.027e-13	2.143e-13	-12.519	-12.669	-0.150	(0)
VOSO4	1.197e-13	1.197e-13	-12.922	-12.922	0.000	(0)
UO2 (SO4) 2-2	5.773e-15	5.007e-16	-14.239	-15.300	-1.062	(0)
Cr2 (OH) 2SO4+2	4.352e-15	3.775e-16	-14.361	-15.423	-1.062	(0)
UO2SO4	3.650e-15	3.650e-15	-14.438	-14.438	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.333e-16	2.333e-16	-15.632	-15.632	0.000	(0)
HgSO4	3.795e-18	3.795e-18	-17.421	-17.421	0.000	(0)
CrO3SO4-2	1.444e-23	1.252e-24	-22.840	-23.902	-1.062	(0)
VSO4+	1.252e-26	6.794e-27	-25.902	-26.168	-0.265	(0)
U (SO4) 2	5.808e-39	5.808e-39	-38.236	-38.236	0.000	(0)
USO4+2	8.102e-40	0.000e+00	-39.091	-40.153	-1.062	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-57.012	-57.278	-0.265	(0)
Sb (3)	2.691e-18					
Sb (OH) 3	1.352e-18	1.352e-18	-17.869	-17.869	0.000	(0)
HSbO2	1.329e-18	1.329e-18	-17.876	-17.876	0.000	(0)
Sb (OH) 2F	4.551e-21	4.551e-21	-20.342	-20.342	0.000	(0)
SbOF	4.505e-21	4.505e-21	-20.346	-20.346	0.000	(0)
Sb (OH) 2+	3.273e-23	1.776e-23	-22.485	-22.751	-0.265	(0)
SbO+	1.136e-23	6.165e-24	-22.945	-23.210	-0.265	(0)
SbO2-	7.383e-24	4.007e-24	-23.132	-23.397	-0.265	(0)
Sb (OH) 4-	4.175e-24	2.266e-24	-23.379	-23.645	-0.265	(0)
Sb2S4-2	0.000e+00	0.000e+00	-309.217	-310.279	-1.062	(0)
Sb (5)	1.278e-07					
SbO3-	1.277e-07	6.928e-08	-6.894	-7.159	-0.265	(0)
Sb (OH) 6-	1.079e-10	7.943e-11	-9.967	-10.100	-0.133	(0)
SbO2+	1.064e-20	5.773e-21	-19.973	-20.239	-0.265	(0)
Se (-2)	2.377e-39					
HSe-	2.377e-39	1.290e-39	-38.624	-38.889	-0.265	(0)
H2Se	0.000e+00	0.000e+00	-41.269	-41.269	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.725	-42.725	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.558	-47.620	-1.062	(0)
Se (4)	9.554e-07					
HSeO3-	9.130e-07	4.955e-07	-6.040	-6.305	-0.265	(0)
SeO3-2	4.233e-08	3.672e-09	-7.373	-8.435	-1.062	(0)
H2SeO3	1.135e-10	1.135e-10	-9.945	-9.945	0.000	(0)
FeHSeO3+2	6.308e-15	5.471e-16	-14.200	-15.262	-1.062	(0)
Cd (SeO3) 2-2	3.332e-18	2.889e-19	-17.477	-18.539	-1.062	(0)
Se (6)	1.011e-10					
SeO4-2	1.010e-10	2.963e-11	-9.996	-10.528	-0.533	(0)
MnSeO4	1.520e-13	1.520e-13	-12.818	-12.818	0.000	(0)
ZnSeO4	1.142e-14	1.142e-14	-13.942	-13.942	0.000	(0)
HSeO4-	1.470e-15	7.977e-16	-14.833	-15.098	-0.265	(0)

CdSeO4	1.435e-16	1.435e-16	-15.843	-15.843	0.000	(0)
CoSeO4	7.620e-17	7.620e-17	-16.118	-16.118	0.000	(0)
NiSeO4	1.185e-17	1.185e-17	-16.926	-16.926	0.000	(0)
Zn (SeO4) 2-2	3.954e-24	3.429e-25	-23.403	-24.465	-1.062	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.816	-60.206	-2.389	(0)
U (4)	5.189e-27					
U (OH) 5-	5.124e-27	2.781e-27	-26.290	-26.556	-0.265	(0)
U (OH) 4	6.298e-29	6.298e-29	-28.201	-28.201	0.000	(0)
UF3+	7.862e-31	4.266e-31	-30.104	-30.370	-0.265	(0)
UF6-2	4.078e-31	3.537e-32	-30.390	-31.451	-1.062	(0)
U (OH) 3+	2.295e-31	1.245e-31	-30.639	-30.905	-0.265	(0)
UF4	1.863e-31	1.863e-31	-30.730	-30.730	0.000	(0)
UF5-	5.419e-32	2.941e-32	-31.266	-31.532	-0.265	(0)
UF2+2	7.793e-33	6.759e-34	-32.108	-33.170	-1.062	(0)
U (OH) 2+2	3.591e-34	3.114e-35	-33.445	-34.507	-1.062	(0)
UF+3	3.302e-36	1.348e-38	-35.481	-37.870	-2.389	(0)
UOH+3	1.943e-37	7.932e-40	-36.711	-39.101	-2.389	(0)
U (SO4) 2	5.808e-39	5.808e-39	-38.236	-38.236	0.000	(0)
USO4+2	8.102e-40	0.000e+00	-39.091	-40.153	-1.062	(0)
U+4	0.000e+00	0.000e+00	-40.523	-44.771	-4.247	(0)
UCl+3	0.000e+00	0.000e+00	-42.791	-45.180	-2.389	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-170.272	-191.774	-21.502	(0)
U (5)	5.977e-20					
UO2+	5.977e-20	3.244e-20	-19.224	-19.489	-0.265	(0)
U (6)	3.205e-06					
UO2 (CO3) 3-4	3.198e-06	1.810e-10	-5.495	-9.742	-4.247	(0)
UO2 (CO3) 2-2	7.165e-09	6.215e-10	-8.145	-9.207	-1.062	(0)
UO2CO3	5.361e-12	5.361e-12	-11.271	-11.271	0.000	(0)
UO2F3-	2.698e-12	1.464e-12	-11.569	-11.834	-0.265	(0)
UO2F2	1.464e-12	1.464e-12	-11.835	-11.835	0.000	(0)
UO2F4-2	5.341e-13	4.633e-14	-12.272	-13.334	-1.062	(0)
UO2F+	2.348e-13	1.274e-13	-12.629	-12.895	-0.265	(0)
UO2 (SO4) 2-2	5.773e-15	5.007e-16	-14.239	-15.300	-1.062	(0)
UO2SO4	3.650e-15	3.650e-15	-14.438	-14.438	0.000	(0)
UO2OH+	1.001e-15	5.432e-16	-15.000	-15.265	-0.265	(0)
UO2+2	7.900e-16	2.318e-16	-15.102	-15.635	-0.533	(0)
UO2Cl+	5.386e-18	2.923e-18	-17.269	-17.534	-0.265	(0)
(UO2) 2 (OH) 2+2	5.647e-24	4.898e-25	-23.248	-24.310	-1.062	(0)
UO2NO3+	4.752e-24	2.579e-24	-23.323	-23.589	-0.265	(0)
(UO2) 3 (OH) 5+	1.289e-31	6.996e-32	-30.890	-31.155	-0.265	(0)
V (2)	1.966e-37					
V+2	1.793e-37	1.555e-38	-36.746	-37.808	-1.062	(0)
VOH+	1.727e-38	9.371e-39	-37.763	-38.028	-0.265	(0)
V (3)	7.200e-12					
V (OH) 3	7.200e-12	7.200e-12	-11.143	-11.143	0.000	(0)
V (OH) 2+	4.636e-21	2.516e-21	-20.334	-20.599	-0.265	(0)
VOH+2	1.488e-22	1.291e-23	-21.827	-22.889	-1.062	(0)
V+3	3.388e-25	1.383e-27	-24.470	-26.859	-2.389	(0)
VSO4+	1.252e-26	6.794e-27	-25.902	-26.168	-0.265	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-40.731	-44.978	-4.247	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-42.647	-45.037	-2.389	(0)
V (4)	4.641e-12					
VOF+	1.838e-12	9.973e-13	-11.736	-12.001	-0.265	(0)
VOF2	1.489e-12	1.489e-12	-11.827	-11.827	0.000	(0)
VO+2	4.814e-13	4.175e-14	-12.318	-13.379	-1.062	(0)
VOF3-	3.879e-13	2.105e-13	-12.411	-12.677	-0.265	(0)
V (OH) 3+	2.839e-13	1.541e-13	-12.547	-12.812	-0.265	(0)
VOSO4	1.197e-13	1.197e-13	-12.922	-12.922	0.000	(0)
VOF4-2	3.902e-14	3.384e-15	-13.409	-14.471	-1.062	(0)
VOC1+	1.678e-15	9.108e-16	-14.775	-15.041	-0.265	(0)
H2V2O4+2	1.390e-20	1.205e-21	-19.857	-20.919	-1.062	(0)
V (5)	2.785e-06					
H2VO4-	2.470e-06	1.341e-06	-5.607	-5.873	-0.265	(0)
H3V2O7-	1.156e-07	6.276e-08	-6.937	-7.202	-0.265	(0)
HVO4-2	7.227e-08	6.268e-09	-7.141	-8.203	-1.062	(0)
H3VO4	7.202e-09	7.202e-09	-8.143	-8.143	0.000	(0)
HV2O7-3	7.022e-10	2.867e-12	-9.154	-11.543	-2.389	(0)

V3O9-3	6.306e-10	2.574e-12	-9.200	-11.589	-2.389	(0)
VO2F2-	1.456e-10	7.904e-11	-9.837	-10.102	-0.265	(0)
VO2F	5.466e-11	5.466e-11	-10.262	-10.262	0.000	(0)
VO2F3-2	4.527e-11	3.927e-12	-10.344	-11.406	-1.062	(0)
V4O12-4	2.559e-11	1.448e-15	-10.592	-14.839	-4.247	(0)
VO2+	1.063e-11	7.824e-12	-10.973	-11.107	-0.133	(0)
VO2SO4-	3.582e-12	1.944e-12	-11.446	-11.711	-0.265	(0)
V2O7-4	2.538e-12	1.436e-16	-11.596	-15.843	-4.247	(0)
VO2F4-3	1.885e-12	7.695e-15	-11.725	-14.114	-2.389	(0)
VO4-3	1.432e-14	5.848e-17	-13.844	-16.233	-2.389	(0)
VO2NO3	2.207e-20	2.207e-20	-19.656	-19.656	0.000	(0)
V10O28-6	4.906e-26	1.362e-35	-25.309	-34.866	-9.556	(0)
HV10O28-5	4.870e-27	1.125e-33	-26.312	-32.949	-6.636	(0)
H2V10O28-4	1.723e-30	9.748e-35	-29.764	-34.011	-4.247	(0)
Zn	3.099e-05					
ZnHCO3+	9.652e-06	5.238e-06	-5.015	-5.281	-0.265	(0)
Zn+2	8.480e-06	2.488e-06	-5.072	-5.604	-0.533	(0)
Zn(SO4) 2-2	5.919e-06	5.133e-07	-5.228	-6.290	-1.062	(0)
ZnSO4	5.664e-06	5.664e-06	-5.247	-5.247	0.000	(0)
ZnCO3	8.318e-07	8.318e-07	-6.080	-6.080	0.000	(0)
ZnF+	3.643e-07	1.977e-07	-6.439	-6.704	-0.265	(0)
ZnCl+	6.986e-08	4.859e-08	-7.156	-7.313	-0.158	(0)
ZnOH+	8.535e-09	4.632e-09	-8.069	-8.334	-0.265	(0)
ZnOHC1	1.184e-09	1.184e-09	-8.926	-8.926	0.000	(0)
ZnCl2	5.989e-10	5.989e-10	-9.223	-9.223	0.000	(0)
Zn(OH) 2	1.367e-11	1.367e-11	-10.864	-10.864	0.000	(0)
ZnCl3-	5.318e-12	3.699e-12	-11.274	-11.432	-0.158	(0)
ZnNO3+	6.422e-14	3.485e-14	-13.192	-13.458	-0.265	(0)
ZnCl4-2	5.374e-14	1.438e-14	-13.270	-13.842	-0.572	(0)
ZnSeO4	1.142e-14	1.142e-14	-13.942	-13.942	0.000	(0)
Zn(OH) 3-	2.350e-15	1.275e-15	-14.629	-14.894	-0.265	(0)
Zn(OH) 4-2	1.090e-20	9.453e-22	-19.963	-21.024	-1.062	(0)
Zn(NO3) 2	3.878e-23	3.878e-23	-22.411	-22.411	0.000	(0)
Zn(SeO4) 2-2	3.954e-24	3.429e-25	-23.403	-24.465	-1.062	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.962	-148.228	-0.265	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-148.488	-148.488	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-222.794	-223.060	-0.265	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.708	-226.770	-1.062	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-301.310	-302.371	-1.062	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-52.50	-46.21	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-38.43	-33.92	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-45.66	-33.92	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.00	-51.06	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-52.66	-32.63	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.74	-28.33	0.40	(NH4)2CrO4
(NH4)2SeO4	-20.94	-20.49	0.45	(NH4)2SeO4
Al(OH)3(am)	-5.62	5.18	10.80	Al(OH)3
Al2(MoO4)3	-46.05	-43.68	2.37	Al2(MoO4)3
Al2O3	-9.29	10.36	19.65	Al2O3
Al4(OH)10SO4	-16.51	6.19	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.04	-6.24	4.80	AlAsO4:2H2O
AlOHSO4	-6.11	-9.34	-3.23	AlOHSO4
AlSb	-155.75	-90.13	65.62	AlSb
Alunite	-7.72	-9.12	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.36	-10.15	-7.79	PbSO4
Anhydrite	0.46	-3.90	-4.36	CaSO4
Anilite	-54.20	-86.08	-31.88	Cu0.25Cu1.5S
Antlerite	-0.40	8.39	8.79	Cu3(OH)4SO4
Aragonite	1.15	-7.15	-8.30	CaCO3
Arsenolite	-70.56	-73.32	-2.76	As4O6
Artinite	-7.22	2.38	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-29.53	-22.82	6.71	As2O5
Atacamite	-0.50	6.89	7.39	Cu2(OH)3Cl

Azurite	4.27	-12.64	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-16.96	7.43	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-10.64	5.23	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	8.45	-0.46	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-20.26	12.68	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-13.79	-23.46	-9.67	BaCrO ₄
BaF ₂	-4.06	-9.88	-5.82	BaF ₂
BaMoO ₄	-3.60	-10.56	-6.96	BaMoO ₄
Barite	2.92	-7.06	-9.98	BaSO ₄
BaS	-92.84	-76.66	16.18	BaS
BaSeO ₃	-6.95	-5.12	1.83	BaSeO ₃
BaSeO ₄	-8.15	-15.61	-7.46	BaSeO ₄
Bianchite	-5.84	-7.60	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-9.81	8.28	18.09	MnO ₂
Bixbyite	-8.61	-9.25	-0.64	Mn ₂ O ₃
BlaubleiI	-53.60	-77.76	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiIII	-54.32	-81.60	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-3.40	5.18	8.58	AlOOH
Breithauptite	-60.41	-78.93	-18.52	NiSb
Brochantite	0.80	16.02	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.77	10.08	16.84	Mg(OH) ₂
Bunsenite	-8.98	3.47	12.45	NiO
Ca(VO ₃) ₂	-4.72	0.94	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-5.94	11.56	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-10.00	11.55	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-13.28	9.02	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-16.78	22.18	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-17.69	22.17	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-301.74	-158.76	142.97	Ca ₃ Sb ₂
CaCrO ₄	-18.03	-20.29	-2.27	CaCrO ₄
Calcite	1.33	-7.15	-8.48	CaCO ₃
Calomel	-4.50	-22.41	-17.91	Hg ₂ Cl ₂
CaMoO ₄	0.55	-7.40	-7.95	CaMoO ₄
Carnotite	-3.79	-3.56	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-4.77	-1.96	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-9.43	-12.45	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-12.67	-2.83	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.70	4.95	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.78	4.95	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.90	-14.19	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.23	0.33	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-23.12	5.28	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-11.14	-11.80	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-10.11	-11.81	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-9.90	-11.81	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-11.17	-12.38	-1.21	CdF ₂
Cdmetal(alpha)	-34.38	-20.86	13.51	Cd
Cdmetal(gamma)	-34.48	-20.86	13.62	Cd
CdMoO ₄	1.09	-13.06	-14.15	CdMoO ₄
CdOHCl	-6.96	-3.43	3.54	CdOHCl
CdSb	-77.10	-77.45	-0.35	CdSb
CdSe	-20.00	-40.20	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.27	-18.12	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-9.40	-9.57	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-7.84	-9.57	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-7.70	-9.58	-1.87	CdSO ₄ ·2.67H ₂ O
Cerrusite	-0.27	-13.40	-13.13	PbCO ₃
CH ₄ (g)	-79.99	-121.04	-41.05	CH ₄
Chalcanthite	-4.26	-6.90	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-54.36	-89.28	-34.92	Cu ₂ S
Chalcopyrite	-118.78	-154.05	-35.27	CuFeS ₂
Cinnabar	-49.94	-95.63	-45.69	HgS
Claudetite	-70.25	-73.32	-3.06	As ₄ O ₆
Clausthalite	-13.68	-40.78	-27.10	PbSe
Co(BO ₂) ₂	-30.61	-3.54	27.07	Co(BO ₂) ₂
Co(OH) ₂	-8.85	4.24	13.09	Co(OH) ₂
Co(OH) ₃	-12.94	-15.25	-2.31	Co(OH) ₃
CO ₂ (g)	0.37	-17.77	-18.15	CO ₂

Co3(AsO4)2	-23.12	-10.08	13.03	Co3(AsO4)2
Co3O4	-15.75	-26.24	-10.50	Co3O4
CoCl2	-20.78	-12.51	8.27	CoCl2
CoCl2:6H2O	-15.06	-12.53	2.54	CoCl2:6H2O
CoCO3	-3.55	-13.53	-9.98	CoCO3
CoF2	-11.49	-13.09	-1.60	CoF2
CoF3	-39.79	-41.25	-1.46	CoF3
CoFe2O4	20.63	17.10	-3.53	CoFe2O4
CoMoO4	-6.01	-13.77	-7.76	CoMoO4
CoO	-9.34	4.25	13.59	CoO
CoS(alpha)	-72.43	-79.87	-7.44	CoS
CoS(beta)	-68.80	-79.87	-11.07	CoS
CoSe	-24.71	-40.91	-16.20	CoSe
CoSeO3	-9.64	-8.32	1.32	CoSeO3
CoSeO4:6H2O	-17.31	-18.84	-1.53	CoSeO4:6H2O
CoSO4	-13.07	-10.27	2.80	CoSO4
CoSO4:6H2O	-7.82	-10.29	-2.47	CoSO4:6H2O
Cotunnite	-7.60	-12.38	-4.78	PbCl2
Covellite	-54.18	-76.48	-22.30	CuS
Cr(OH)2	-23.04	-12.22	10.82	Cr(OH)2
Cr(OH)3	-3.60	-2.26	1.34	Cr(OH)3
Cr(OH)3(am)	-1.51	-2.26	-0.75	Cr(OH)3
Cr2O3	-2.16	-4.52	-2.36	Cr2O3
CrCl2	-43.07	-28.98	14.09	CrCl2
CrCl3	-42.51	-27.39	15.11	CrCl3
CrF3	-16.93	-28.26	-11.34	CrF3
Crmetal	-68.52	-38.03	30.48	Cr
CrO3	-27.70	-30.91	-3.21	CrO3
Cryolite	0.88	-32.96	-33.84	Na3AlF6
Cu(OH)2	-1.04	7.63	8.67	Cu(OH)2
Cu(SbO3)2	-21.67	23.54	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.50	0.75	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.38	-90.26	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.52	-50.32	-45.80	Cu2Se
Cu2SO4	-17.73	-19.68	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-6.02	0.08	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-60.46	-103.05	-42.59	Cu3Sb
Cu3Se2	-24.34	-87.84	-63.49	Cu3Se2
CuCO3	1.36	-10.14	-11.50	CuCO3
CuCrO4	-17.84	-23.28	-5.44	CuCrO4
CuF	-6.34	-11.25	-4.91	CuF
CuF2	-10.81	-9.70	1.12	CuF2
CuF2:2H2O	-5.15	-9.70	-4.55	CuF2:2H2O
Cumetal	-6.73	-15.49	-8.76	Cu
CuMoO4	2.70	-10.38	-13.08	CuMoO4
CuOCuSO4	-9.55	0.76	10.30	CuOCuSO4
Cupricferrite	14.50	20.49	5.99	CuFe2O4
Cuprite	-3.75	-5.16	-1.41	Cu2O
Cuprousferrite	12.76	3.85	-8.92	CuFeO2
CuSe	-4.42	-37.52	-33.10	CuSe
CuSe2	-23.50	-56.86	-33.37	CuSe2
CuSeO3:2H2O	-5.45	-4.94	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-13.00	-15.44	-2.44	CuSeO4:5H2O
CuSO4	-9.82	-6.88	2.94	CuSO4
Diaspore	-1.69	5.18	6.87	AlOOH
Djurleite	-54.51	-88.43	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	1.69	-14.85	-16.54	CaMg(CO3)2
Dolomite(ordered)	2.24	-14.85	-17.09	CaMg(CO3)2
Epsomite	-2.33	-4.46	-2.13	MgSO4:7H2O
Fe(OH)2	-7.02	6.55	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.95	3.91	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	0.59	-3.13	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-1.28	0.27	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-4.24	-24.87	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-26.97	-30.71	-3.73	Fe2(SO4)3
Fe3(OH)8	-0.83	19.39	20.22	Fe3(OH)8
FeAsO4:2H2O	-5.39	-4.99	0.40	FeAsO4:2H2O
FeCr2O4	-5.17	2.03	7.20	FeCr2O4

FeMoO4	-1.37	-11.46	-10.09	FeMoO4
Ferrihydrite	3.23	6.42	3.19	Fe(OH)3
Ferroselite	-39.35	-57.95	-18.60	FeSe2
FeS(ppt)	-74.62	-77.57	-2.95	FeS
FeSe	-27.61	-38.61	-11.00	FeSe
Fix_pe	-6.64	-6.64	0.00	e-
Fluorite	3.78	-6.72	-10.50	CaF2
Galena	-65.78	-79.75	-13.97	PbS
Gibbsite	-3.11	5.18	8.29	Al(OH)3
Goethite	5.93	6.42	0.49	FeOOH
Goslarite	-5.60	-7.61	-2.01	ZnSO4·7H2O
Greenockite	-64.81	-79.17	-14.36	CdS
Greigite	-272.04	-317.07	-45.03	Fe3S4
Gummite	-10.77	-3.10	7.67	UO3
Gypsum	0.70	-3.91	-4.61	CaSO4·2H2O
H-Jarosite	2.33	-9.77	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-5.14	-18.02	-12.88	H2MoO4
H2S(g)	-76.11	-84.12	-8.01	H2S
H2Se(g)	-40.20	-45.16	-4.96	H2Se
Halite	-5.36	-3.75	1.60	NaCl
Hausmannite	-11.76	49.27	61.03	Mn3O4
Hematite	14.27	12.85	-1.42	Fe2O3
Hercynite	-5.98	16.91	22.89	FeAl2O4
Hg(CH3)2(g)	-179.88	-253.59	-73.71	Hg(CH3)2
Hg(g)	-7.86	-15.74	-7.87	Hg
Hg(OH)2	-8.02	-11.52	-3.50	Hg(OH)2
Hg2(g)	-16.52	-31.47	-14.96	Hg2
Hg2(OH)2	-10.92	-5.66	5.26	Hg2(OH)2
Hg2CO3	-7.38	-23.43	-16.05	Hg2CO3
Hg2CrO4	-27.87	-36.57	-8.70	Hg2CrO4
Hg2F2	-12.63	-22.99	-10.36	Hg2F2
Hg2S	-78.10	-89.78	-11.68	Hg2S
Hg2SeO3	-13.57	-18.23	-4.66	Hg2SeO3
Hg2SO4	-14.05	-20.18	-6.13	Hg2SO4
Hg3O2CO3	-22.63	-52.31	-29.68	Hg3O2CO3
HgCl(g)	-30.70	-11.21	19.50	HgCl
HgCl2	-7.01	-28.27	-21.26	HgCl2
HgF(g)	-44.17	-11.50	32.68	HgF
HgF2(g)	-41.41	-28.85	12.57	HgF2
Hgmetal(l)	-2.28	-15.74	-13.45	Hg
HgSe	-0.98	-56.67	-55.69	HgSe
HgSeO3	-11.66	-24.09	-12.43	HgSeO3
HgSO4	-16.61	-26.03	-9.42	HgSO4
Huntite	-0.26	-30.23	-29.97	CaMg3(CO3)4
Hydrocerrusite	-3.66	-22.43	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.94	-20.70	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-14.34	-19.51	-5.17	KAl(SO4)2·12H2O
K-Jarosite	9.41	-5.39	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.82	-53.06	-17.24	K2Cr2O7
K2CrO4	-21.64	-22.15	-0.51	K2CrO4
K2MoO4	-12.52	-9.25	3.26	K2MoO4
K2SeO4	-13.57	-14.30	-0.73	K2SeO4
Langite	-1.47	16.02	17.49	Cu4(OH)6SO4·H2O
Larnakite	-5.34	-5.78	-0.43	PbO·PbSO4
Laurionite	-4.63	-4.01	0.62	PbOHCl
Lepidocrocite	5.05	6.42	1.37	FeOOH
Lime	-22.08	10.62	32.70	CaO
Litharge	-8.32	4.37	12.69	PbO
Mackinawite	-73.97	-77.57	-3.60	FeS
Maghemite	6.47	12.85	6.39	Fe2O3
Magnesioferrite	6.07	22.93	16.86	Fe2MgO4
Magnesite	-0.23	-7.69	-7.46	MgCO3
Magnetite	16.00	19.40	3.40	Fe3O4
Malachite	2.81	-2.50	-5.31	Cu2(OH)2CO3
Manganite	-4.62	20.72	25.34	MnOOH
Massicot	-8.52	4.37	12.89	PbO
Matlockite	-3.70	-12.67	-8.97	PbClF
Melanothallite	-15.38	-9.12	6.26	CuCl2

Melanterite	-5.78	-7.99	-2.21	FeSO4:7H2O
Metacinnabar	-50.54	-95.63	-45.09	HgS
Mg(OH)2(active)	-8.72	10.08	18.79	Mg(OH)2
Mg(VO3)2	-10.88	0.40	11.28	Mg(VO3)2
Mg2Sb3	-275.91	-201.23	74.68	Mg2Sb3
Mg2V2O7	-15.88	10.48	26.36	Mg2V2O7
MgCr2O4	-10.64	5.56	16.20	MgCr2O4
MgCrO4	-26.21	-20.83	5.38	MgCrO4
MgF2	0.87	-7.26	-8.13	MgF2
MgMoO4	-6.09	-7.94	-1.85	MgMoO4
MgSeO3:6H2O	-5.56	-2.51	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.80	-13.00	-1.20	MgSeO4:6H2O
Minium	-34.59	38.93	73.52	Pb3O4
Mirabilite	-4.19	-5.30	-1.11	Na2SO4:10H2O
Mn(VO3)2	-6.76	-1.86	4.90	Mn(VO3)2
Mn2(SO4)3	-47.10	-52.81	-5.71	Mn2(SO4)3
Mn2Sb	-153.66	-92.58	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.90	0.60	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.67	-8.95	2.72	MnCl2:4H2O
MnS(grn)	-76.47	-76.30	0.17	MnS
MnS(pnk)	-79.64	-76.30	3.34	MnS
MnSb	-97.02	-99.93	-2.91	MnSb
MnSe	-40.84	-37.34	3.50	MnSe
MnSeO3	-5.89	-4.76	1.13	MnSeO3
MnSeO3:2H2O	-5.74	-4.76	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.21	-15.26	-2.05	MnSeO4:5H2O
MnSO4	-9.29	-6.70	2.58	MnSO4
Monteponite	-10.15	4.95	15.10	CdO
Montroydite	-7.87	-11.51	-3.64	HgO
MoO3	-10.02	-18.02	-8.00	MoO3
Morenosite	-8.93	-11.07	-2.14	NiSO4:7H2O
MoS2	-141.81	-212.07	-70.26	MoS2
Na-Jarosite	6.05	-5.15	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-42.69	-52.58	-9.90	Na2Cr2O7
Na2CrO4	-24.60	-21.67	2.93	Na2CrO4
Na2Mo2O7	-10.19	-26.79	-16.60	Na2Mo2O7
Na2MoO4	-10.26	-8.77	1.49	Na2MoO4
Na2MoO4:2H2O	-10.00	-8.78	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.64	-3.34	10.30	Na2SeO3:5H2O
Na2SeO4	-15.10	-13.82	1.28	Na2SeO4
Na3Sb	-175.89	-81.44	94.45	Na3Sb
Na3VO4	-27.65	9.03	36.68	Na3VO4
Na4V2O7	-28.58	8.82	37.40	Na4V2O7
Nantokite	-4.23	-10.96	-6.73	CuCl
NaSb	-88.04	-64.87	23.17	NaSb
Natron	-7.24	-8.56	-1.31	Na2CO3:10H2O
NaVO3	-4.07	-0.22	3.86	NaVO3
Nesquehonite	-3.03	-7.70	-4.67	MgCO3:3H2O
Ni(OH)2	-9.33	3.47	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-28.14	-12.44	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-32.65	-0.65	32.00	Ni4(OH)6SO4
NiCO3	-7.43	-14.30	-6.87	NiCO3
NiMoO4	-3.40	-14.55	-11.14	NiMoO4
NiS(alpha)	-75.05	-80.65	-5.60	NiS
NiS(beta)	-69.55	-80.65	-11.10	NiS
NiS(gamma)	-67.85	-80.65	-12.80	NiS
NiSe	-23.99	-41.69	-17.70	NiSe
NiSeO3:2H2O	-11.92	-9.11	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.09	-19.61	-1.52	NiSeO4:6H2O
Nsutite	-9.22	8.28	17.50	MnO2
O2(g)	-31.46	51.63	83.09	O2
Orpiment	-227.95	-289.01	-61.07	As2S3
Otavite	-0.82	-12.82	-12.00	CdCO3
Pb(BO2)2	-9.93	-3.41	6.52	Pb(BO2)2
Pb(OH)2	-3.78	4.37	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-54.17	-62.93	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.43	0.36	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.45	8.74	26.19	Pb2O(OH)2

Pb2O3	-26.48	34.56	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	0.97	-0.93	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.51	-9.71	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.70	3.44	6.14	Pb3(VO4)2
Pb3O2CO3	-15.68	-4.66	11.02	Pb3O2CO3
Pb3O2SO4	-12.09	-1.41	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.14	2.96	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.97	21.88	Pb4O3SO4
PbCrO4	-13.94	-26.54	-12.60	PbCrO4
PbF2	-5.53	-12.97	-7.44	PbF2
Pbmetal	-25.69	-21.44	4.25	Pb
PbMoO4	1.98	-13.64	-15.62	PbMoO4
PbO:0.3H2O	-8.61	4.37	12.98	PbO:0.33H2O
PbSeO4	-11.85	-18.69	-6.84	PbSeO4
Periclase	-11.50	10.08	21.58	MgO
Phosgenite	-5.98	-25.79	-19.81	PbCl2:PbCO3
Plattnerite	-19.41	30.19	49.60	PbO2
Portlandite	-12.19	10.62	22.80	Ca(OH)2
Pyrite	-117.36	-135.87	-18.51	FeS2
Pyrochroite	-7.38	7.81	15.19	Mn(OH)2
Pyrolusite	-7.75	33.63	41.38	MnO2
Realgar	-95.61	-115.36	-19.75	AsS
Retgersite	-9.03	-11.07	-2.04	NiSO4:6H2O
Rhodochrosite	0.62	-9.96	-10.58	MnCO3
Rutherfordine	-6.37	-20.87	-14.50	UO2CO3
Sb(OH)3	-10.76	-17.87	-7.11	Sb(OH)3
Sb2O4	-13.32	-9.91	3.40	Sb2O4
Sb2O5	-23.05	-32.72	-9.67	Sb2O5
Sb2Se3	-103.44	-171.20	-67.76	Sb2Se3
Sb4O6(cubic)	-53.20	-71.46	-18.26	Sb4O6
Sb4O6(orth)	-53.56	-71.46	-17.90	Sb4O6
SbCl3	-43.57	-43.00	0.57	SbCl3
SbF3	-33.64	-43.87	-10.23	SbF3
Sbmetal	-44.90	-56.59	-11.69	Sb
SbO2	-1.44	-29.27	-27.82	SbO2
Schoepite	-9.10	-3.10	5.99	UO2(OH)2:H2O
Semetal(am)	-12.23	-19.34	-7.11	Se
Semetal(hex)	-11.63	-19.34	-7.71	Se
Senarmontite	-23.36	-35.73	-12.37	Sb2O3
SeO2	-12.70	-12.57	0.12	SeO2
SeO3	-44.11	-23.07	21.04	SeO3
Siderite	-0.98	-11.22	-10.24	FeCO3
Smithsonite	-0.84	-10.84	-10.00	ZnCO3
Sphalerite	-65.74	-77.19	-11.45	ZnS
Spinel	-16.40	20.44	36.85	MgAl2O4
Stibnite	-237.63	-288.09	-50.46	Sb2S3
Sulfur	-56.16	-58.30	-2.14	S
Tenorite	-0.01	7.64	7.64	CuO
Thenardite	-5.60	-5.27	0.32	Na2SO4
Thermonatrite	-9.17	-8.53	0.64	Na2CO3:H2O
Tyuyamunite	-9.33	-5.25	4.08	Ca(UO2)2(VO4)2
U3O8	-28.54	-7.46	21.08	U3O8
U3Sb4	-592.71	-440.33	152.38	U3Sb4
U4O9	-49.95	-52.97	-3.02	U4O9
UF4	-24.83	-54.37	-29.54	UF4
UF4:2.5H2O	-21.66	-54.38	-32.72	UF4:2.5H2O
UO2(am)	-20.63	-19.70	0.93	UO2
UO2(NO3)2	-44.29	-32.14	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-37.00	-32.15	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-35.54	-32.15	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.21	-32.16	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-8.71	-3.10	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.92	-26.17	-2.25	UO2SeO4:4H2O
UO3	-10.80	-3.10	7.70	UO3
Uraninite	-15.03	-19.70	-4.67	UO2
USb2	-223.29	-193.72	29.58	USb2
V(OH)3	-15.65	-8.06	7.59	V(OH)3

V2O5	-8.32	-9.68	-1.36	V2O5
V3O5	-30.18	-28.34	1.84	V3O5
V4O7	-36.37	-29.19	7.19	V4O7
V6O13	-19.80	-80.66	-60.86	V6O13
Valentinite	-27.25	-35.73	-8.48	Sb2O3
VC12	-56.59	-37.72	18.87	VC12
VC13	-56.62	-33.19	23.43	VC13
VF4	-50.45	-35.52	14.93	VF4
Vmetal	-90.80	-46.78	44.03	V
VO	-35.72	-20.96	14.76	VO
VO(OH)2	-6.00	-0.85	5.15	VO(OH)2
VO2Cl	-16.06	-13.22	2.84	VO2Cl
VOC1	-27.58	-16.43	11.15	VOC1
VOC12	-30.36	-17.60	12.76	VOC12
VOSO4	-18.97	-15.36	3.61	VOSO4
Witherite	-1.75	-10.32	-8.57	BaCO3
Wurtzite	-68.24	-77.19	-8.95	ZnS
Zincite	-4.40	6.93	11.33	ZnO
Zincosite	-11.52	-7.59	3.93	ZnSO4
Zn(BO2)2	-9.14	-0.85	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.44	-22.13	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.27	6.93	12.20	Zn(OH)2
Zn(OH)2(am)	-5.54	6.93	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.82	6.93	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.60	6.93	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.80	6.93	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.16	-0.66	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.71	5.48	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.68	-2.03	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.15	-8.24	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.20	13.20	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.60	17.90	38.50	Zn5(OH)8Cl2
ZnCl2	-16.87	-9.82	7.05	ZnCl2
ZnCO3:1H2O	-0.58	-10.84	-10.26	ZnCO3:1H2O
ZnF2	-9.87	-10.40	-0.53	ZnF2
Znmetal	-44.67	-18.88	25.79	Zn
ZnMoO4	-0.96	-11.08	-10.13	ZnMoO4
ZnO(active)	-4.26	6.93	11.19	ZnO
ZnS(am)	-68.13	-77.19	-9.05	ZnS
ZnSb	-86.48	-75.47	11.01	ZnSb
ZnSe	-23.82	-38.22	-14.40	ZnSe
ZnSeO4:6H2O	-14.63	-16.15	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.95	-7.59	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 26.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0
EQUILIBRIUM_PHASES 102
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0

```

```

Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 106
SAVE Solution 107 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 102
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.

```

WARNING: Element in phase, Ag2Se, is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 106. Solution after simulation 25.
 Using pure phase assemblage 102.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	9.490e-05	9.490e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	8.520e-08	8.520e-08
Barite	0.00	-9.98	-9.98	0.000e+00	3.522e-05	3.522e-05
Brochantite	0.00	15.22	15.22	0.000e+00	1.718e-04	1.718e-04
Brucite	-3.32	13.53	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.014e+01	1.392e-01
CaMoO4	-0.21	-8.16	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	-0.00	-8.48	-8.48	0.000e+00	5.768e-02	5.768e-02
Carnotite	0.00	0.23	0.23	0.000e+00	2.672e-06	2.672e-06
Cd(BO2)2	-10.55	-0.71	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	2.844e-07	2.844e-07
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	2.316e-08	2.316e-08
Cu2Se (alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.00	-13.08	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.13	-4.25	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	6.790e-05	6.790e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	4.628e-03	4.628e-03
Gummite	-5.47	2.20	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	1.711e-02	1.711e-02
HgSe	-1.17	-56.87	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.05	-5.17	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.22	-3.09	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.43	7.37	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.89	-10.19	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.41	-14.28	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.82	-13.96	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-3.025e-05
Otavite	-2.47	-14.47	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	8.558e-07	8.558e-07
Rutherfordine	-4.94	-19.44	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.90	-30.73	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.79	2.20	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2 (am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-2.56	1.52	4.08	0.000e+00	0	0.000e+00
U3O8	-12.37	8.72	21.08	0.000e+00	0	0.000e+00
UO2(OH)2 (beta)	-3.41	2.20	5.61	0.000e+00	0	0.000e+00
UO3	-5.50	2.20	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.74	-10.86	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.466e-06	5.482e-06
As	2.035e-09	2.041e-09
B	1.200e-04	1.204e-04
Ba	2.531e-08	2.539e-08
C	6.202e-04	6.220e-04
Ca	1.163e-02	1.166e-02
Cd	2.077e-08	2.083e-08

Cl	1.055e-02	1.058e-02
Co	1.205e-07	1.209e-07
Cr	1.550e-09	1.555e-09
Cu	4.920e-07	4.935e-07
F	2.575e-04	2.583e-04
Fe	1.079e-09	1.082e-09
Hg	1.089e-08	1.092e-08
K	1.878e-02	1.884e-02
Mg	2.415e-02	2.423e-02
Mn	2.941e-04	2.950e-04
Mo	1.022e-05	1.025e-05
N	2.251e-05	2.258e-05
Na	3.332e-02	3.342e-02
Ni	1.798e-08	1.803e-08
Pb	1.484e-09	1.489e-09
S	5.641e-02	5.658e-02
Sb	1.275e-07	1.279e-07
Se	9.538e-07	9.566e-07
U	5.347e-07	5.363e-07
V	1.152e-07	1.156e-07
Zn	3.093e-05	3.102e-05

-----Description of solution-----

	pH	=	7.934	Charge balance
	pe	=	4.839	Adjusted to redox
equilibrium	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.451e-01	
	Mass of water (kg)	=	1.003e+00	
	Total alkalinity (eq/kg)	=	6.660e-04	
	Total CO2 (mol/kg)	=	6.202e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	19	
	Total H	=	1.113400e+02	
	Total O	=	5.589814e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.177e-06	8.624e-07	-5.929	-6.064	-0.135	(0)
H+	1.530e-08	1.165e-08	-7.815	-7.934	-0.118	0.00
H2O	5.551e+01	9.977e-01	1.744	-0.001	0.000	18.07
Al	5.466e-06					
Al(OH) 4-	5.425e-06	4.075e-06	-5.266	-5.390	-0.124	(0)
Al(OH) 3	3.753e-08	3.753e-08	-7.426	-7.426	0.000	(0)
Al(OH) 2+	2.848e-09	2.181e-09	-8.545	-8.661	-0.116	(0)
AlF3	3.685e-10	3.685e-10	-9.434	-9.434	0.000	(0)
AlF2+	3.038e-10	2.326e-10	-9.517	-9.633	-0.116	(0)
AlF4-	3.093e-11	2.323e-11	-10.510	-10.634	-0.124	(0)
AlF+2	1.351e-11	4.644e-12	-10.869	-11.333	-0.464	(0)
AlOH+2	9.261e-12	3.184e-12	-11.033	-11.497	-0.464	(0)
AlSO4+	4.709e-13	3.537e-13	-12.327	-12.451	-0.124	(0)
Al(SO4) 2-	6.229e-14	4.679e-14	-13.206	-13.330	-0.124	(0)
Al+3	4.301e-14	3.691e-15	-13.366	-14.433	-1.066	(0)
AlMo6O21-3	8.363e-39	1.493e-40	-38.078	-39.826	-1.748	(0)
As (3)	1.711e-23					
H3AsO3	1.601e-23	1.601e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.102e-24	7.048e-25	-23.958	-24.152	-0.194	(0)
HAsO3-2	3.303e-28	5.518e-29	-27.481	-28.258	-0.777	(0)
H4AsO3+	1.445e-31	9.238e-32	-30.840	-31.034	-0.194	(0)
AsO3-3	1.023e-32	1.826e-34	-31.990	-33.738	-1.748	(0)
As (5)	2.035e-09					
HAsO4-2	1.975e-09	3.300e-10	-8.704	-9.482	-0.777	(0)

		H2AsO4-	5.483e-11	3.505e-11	-10.261	-10.455	-0.194	(0)
		AsO4-3	5.020e-12	8.958e-14	-11.299	-13.048	-1.748	(0)
		H3AsO4	6.863e-17	7.096e-17	-16.163	-16.149	0.015	(0)
B	1.200e-04							
		H3BO3	1.097e-04	1.134e-04	-3.960	-3.945	0.015	(0)
		H2BO3-	7.949e-06	5.653e-06	-5.100	-5.248	-0.148	(0)
		MgH2BO3+	1.268e-06	9.017e-07	-5.897	-6.045	-0.148	(0)
		CaH2BO3+	9.137e-07	6.499e-07	-6.039	-6.187	-0.148	(0)
		NaH2BO3	2.132e-07	2.132e-07	-6.671	-6.671	0.000	(0)
		BF(OH) 3-	8.004e-09	5.692e-09	-8.097	-8.245	-0.148	(0)
		H5(BO3) 2-	7.671e-10	5.456e-10	-9.115	-9.263	-0.148	(0)
		H8(BO3) 3-	8.698e-12	6.186e-12	-11.061	-11.209	-0.148	(0)
		BaH2BO3+	2.084e-12	1.482e-12	-11.681	-11.829	-0.148	(0)
		BF2(OH) 2-	1.257e-12	8.939e-13	-11.901	-12.049	-0.148	(0)
		BF3OH-	7.183e-19	5.109e-19	-18.144	-18.292	-0.148	(0)
		BF4-	5.192e-24	3.692e-24	-23.285	-23.433	-0.148	(0)
Ba	2.531e-08							
		Ba+2	2.526e-08	8.482e-09	-7.598	-8.071	-0.474	(0)
		BaHCO3+	4.307e-11	3.336e-11	-10.366	-10.477	-0.111	(0)
		BaCO3	7.211e-12	7.211e-12	-11.142	-11.142	0.000	(0)
		BaH2BO3+	2.084e-12	1.482e-12	-11.681	-11.829	-0.148	(0)
		BaOH+	4.205e-14	3.193e-14	-13.376	-13.496	-0.120	(0)
		BaNO3+	1.007e-15	6.440e-16	-14.997	-15.191	-0.194	(0)
		BaNH3+2	2.543e-16	4.249e-17	-15.595	-16.372	-0.777	(0)
C(4)	6.202e-04							
		HCO3-	5.379e-04	4.118e-04	-3.269	-3.385	-0.116	(0)
		MgHCO3+	2.612e-05	1.939e-05	-4.583	-4.713	-0.129	(0)
		CaHCO3+	1.978e-05	1.532e-05	-4.704	-4.815	-0.111	(0)
		H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
		MgCO3	6.342e-06	6.342e-06	-5.198	-5.198	0.000	(0)
		NaHCO3	5.510e-06	5.510e-06	-5.259	-5.259	0.000	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CO3-2	4.936e-06	1.658e-06	-5.307	-5.781	-0.474	(0)
		NaCO3-	9.589e-07	7.343e-07	-6.018	-6.134	-0.116	(0)
		UO2(CO3) 3-4	5.062e-07	3.944e-10	-6.296	-9.404	-3.108	(0)
		MnHCO3+	3.874e-07	2.942e-07	-6.412	-6.531	-0.120	(0)
		ZnCO3	3.815e-07	3.815e-07	-6.418	-6.418	0.000	(0)
		CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
		ZnHCO3+	8.148e-08	5.209e-08	-7.089	-7.283	-0.194	(0)
		UO2(CO3) 2-2	2.842e-08	4.748e-09	-7.546	-8.324	-0.777	(0)
		Cu(CO3) 2-2	6.303e-09	1.053e-09	-8.200	-8.978	-0.777	(0)
		CuHCO3+	9.830e-10	6.284e-10	-9.007	-9.202	-0.194	(0)
		CoHCO3+	7.019e-10	4.487e-10	-9.154	-9.348	-0.194	(0)
		CoCO3	3.925e-10	3.925e-10	-9.406	-9.406	0.000	(0)
		PbCO3	3.482e-10	3.482e-10	-9.458	-9.458	0.000	(0)
		NiHCO3+	2.530e-10	1.618e-10	-9.597	-9.791	-0.194	(0)
		NiCO3	1.970e-10	1.970e-10	-9.705	-9.705	0.000	(0)
		UO2CO3	1.436e-10	1.436e-10	-9.843	-9.843	0.000	(0)
		CdCO3	7.798e-11	7.798e-11	-10.108	-10.108	0.000	(0)
		BaHCO3+	4.307e-11	3.336e-11	-10.366	-10.477	-0.111	(0)
		PbHCO3+	3.345e-11	2.139e-11	-10.476	-10.670	-0.194	(0)
		Pb(CO3) 2-2	9.963e-12	1.665e-12	-11.002	-11.779	-0.777	(0)
		BaCO3	7.211e-12	7.211e-12	-11.142	-11.142	0.000	(0)
		CdHCO3+	3.027e-12	1.935e-12	-11.519	-11.713	-0.194	(0)
		Cd(CO3) 2-2	5.735e-13	9.581e-14	-12.241	-13.019	-0.777	(0)
		HgCO3	1.102e-14	1.102e-14	-13.958	-13.958	0.000	(0)
		FeHCO3+	2.579e-15	1.997e-15	-14.589	-14.700	-0.111	(0)
		Hg(CO3) 2-2	3.458e-16	5.777e-17	-15.461	-16.238	-0.777	(0)
		HgHCO3+	3.739e-18	2.390e-18	-17.427	-17.622	-0.194	(0)
Ca	1.163e-02							
		Ca+2	5.949e-03	1.998e-03	-2.226	-2.699	-0.474	(0)
		CaSO4	5.650e-03	5.650e-03	-2.248	-2.248	0.000	(0)
		CaHCO3+	1.978e-05	1.532e-05	-4.704	-4.815	-0.111	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.612e-06	2.743e-06	-5.442	-5.562	-0.120	(0)
		CaH2BO3+	9.137e-07	6.499e-07	-6.039	-6.187	-0.148	(0)
		CaOH+	4.438e-08	3.438e-08	-7.353	-7.464	-0.111	(0)
		CaNO3+	1.497e-10	9.570e-11	-9.825	-10.019	-0.194	(0)

	CaNH3+2	1.195e-10	1.997e-11	-9.923	-10.700	-0.777	(0)
	Ca (NH3) 2+2	3.778e-19	6.312e-20	-18.423	-19.200	-0.777	(0)
Cd	2.077e-08						
	Cd+2	6.147e-09	2.064e-09	-8.211	-8.685	-0.474	(0)
	CdSO4	5.973e-09	5.973e-09	-8.224	-8.224	0.000	(0)
	Cd (SO4) 2-2	5.953e-09	9.946e-10	-8.225	-9.002	-0.777	(0)
	CdCl+	2.475e-09	1.582e-09	-8.606	-8.801	-0.194	(0)
	CdCO3	7.798e-11	7.798e-11	-10.108	-10.108	0.000	(0)
	CdOHC1	5.598e-11	5.598e-11	-10.252	-10.252	0.000	(0)
	CdCl2	5.295e-11	5.295e-11	-10.276	-10.276	0.000	(0)
	CdOH+	2.212e-11	1.414e-11	-10.655	-10.850	-0.194	(0)
	CdF+	6.437e-12	4.116e-12	-11.191	-11.386	-0.194	(0)
	CdHCO3+	3.027e-12	1.935e-12	-11.519	-11.713	-0.194	(0)
	Cd (CO3) 2-2	5.735e-13	9.581e-14	-12.241	-13.019	-0.777	(0)
	CdCl3-	4.195e-13	2.682e-13	-12.377	-12.572	-0.194	(0)
	Cd (OH) 2	7.694e-14	7.694e-14	-13.114	-13.114	0.000	(0)
	CdF2	1.033e-15	1.033e-15	-14.986	-14.986	0.000	(0)
	CdNO3+	1.546e-16	9.887e-17	-15.811	-16.005	-0.194	(0)
	CdSeO4	1.502e-16	1.502e-16	-15.823	-15.823	0.000	(0)
	Cd (SeO3) 2-2	8.282e-17	1.384e-17	-16.082	-16.859	-0.777	(0)
	Cd2OH+3	8.195e-18	1.463e-19	-17.086	-18.835	-1.748	(0)
	Cd (OH) 3-	6.341e-18	4.054e-18	-17.198	-17.392	-0.194	(0)
	Cd (OH) 4-2	3.425e-24	5.723e-25	-23.465	-24.242	-0.777	(0)
	Cd (NO3) 2	7.506e-25	7.506e-25	-24.125	-24.125	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.844	-79.038	-0.194	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.195	-150.195	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.462	-226.656	-0.194	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.044	-302.822	-0.777	(0)
Cl	1.055e-02						
	Cl-	1.055e-02	8.028e-03	-1.977	-2.095	-0.118	(0)
	MnCl+	4.765e-07	3.618e-07	-6.322	-6.441	-0.120	(0)
	ZnCl+	1.087e-07	8.066e-08	-6.964	-7.093	-0.129	(0)
	ZnOHC1	9.107e-08	9.107e-08	-7.041	-7.041	0.000	(0)
	MnCl2	4.103e-09	4.103e-09	-8.387	-8.387	0.000	(0)
	CuCl2-	3.918e-09	2.908e-09	-8.407	-8.536	-0.129	(0)
	CdCl+	2.475e-09	1.582e-09	-8.606	-8.801	-0.194	(0)
	CuCl	1.734e-09	1.734e-09	-8.761	-8.761	0.000	(0)
	ZnCl2	1.026e-09	1.026e-09	-8.989	-8.989	0.000	(0)
	CoCl+	6.085e-10	3.890e-10	-9.216	-9.410	-0.194	(0)
	CuCl+	4.146e-10	3.077e-10	-9.382	-9.512	-0.129	(0)
	NiCl+	1.024e-10	6.544e-11	-9.990	-10.184	-0.194	(0)
	HgClOH	6.793e-11	6.793e-11	-10.168	-10.168	0.000	(0)
	CdOHC1	5.598e-11	5.598e-11	-10.252	-10.252	0.000	(0)
	CdCl2	5.295e-11	5.295e-11	-10.276	-10.276	0.000	(0)
	HgCl2	3.581e-11	3.581e-11	-10.446	-10.446	0.000	(0)
	PbCl+	3.114e-11	1.991e-11	-10.507	-10.701	-0.194	(0)
	CuCl3-2	1.501e-11	4.991e-12	-10.824	-11.302	-0.478	(0)
	MnCl3-	1.195e-11	9.072e-12	-10.923	-11.042	-0.120	(0)
	ZnCl3-	8.817e-12	6.544e-12	-11.055	-11.184	-0.129	(0)
	HgCl3-	4.496e-12	2.874e-12	-11.347	-11.541	-0.194	(0)
	CuCl2	8.565e-13	8.565e-13	-12.067	-12.067	0.000	(0)
	PbCl2	7.138e-13	7.138e-13	-12.146	-12.146	0.000	(0)
	HgCl4-2	5.498e-13	9.186e-14	-12.260	-13.037	-0.777	(0)
	CdCl3-	4.195e-13	2.682e-13	-12.377	-12.572	-0.194	(0)
	ZnCl4-2	7.897e-14	2.627e-14	-13.103	-13.581	-0.478	(0)
	PbCl3-	3.568e-15	2.281e-15	-14.448	-14.642	-0.194	(0)
	NiCl2	2.645e-15	2.645e-15	-14.578	-14.578	0.000	(0)
	HgCl+	1.392e-15	8.899e-16	-14.856	-15.051	-0.194	(0)
	UO2Cl+	4.430e-16	2.832e-16	-15.354	-15.548	-0.194	(0)
	CuCl3-	8.646e-17	6.417e-17	-16.063	-16.193	-0.129	(0)
	PbCl4-2	5.010e-17	8.371e-18	-16.300	-17.077	-0.777	(0)
	CrCl+2	2.421e-17	4.045e-18	-16.616	-17.393	-0.777	(0)
	CrOHC12	5.323e-19	5.323e-19	-18.274	-18.274	0.000	(0)
	CuCl4-2	7.762e-21	2.582e-21	-20.110	-20.588	-0.478	(0)
	CrCl2+	4.819e-21	3.081e-21	-20.317	-20.511	-0.194	(0)
	FeCl+2	1.801e-21	5.990e-22	-20.745	-21.223	-0.478	(0)
	VOCl+	6.091e-22	3.894e-22	-21.215	-21.410	-0.194	(0)
	FeCl2+	2.828e-23	2.148e-23	-22.548	-22.668	-0.120	(0)

CrO3Cl-	1.478e-25	9.450e-26	-24.830	-25.025	-0.194	(0)
FeCl3	1.724e-26	1.724e-26	-25.763	-25.763	0.000	(0)
CoCl+2	3.764e-35	6.289e-36	-34.424	-35.201	-0.777	(0)
UCl+3	0.000e+00	0.000e+00	-44.505	-46.253	-1.748	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.972	-49.749	-0.777	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.227	-52.004	-0.777	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.788	-64.565	-0.777	(0)
Co (2)	1.205e-07					
Co+2	8.384e-08	1.401e-08	-7.077	-7.854	-0.777	(0)
CoSO4	3.450e-08	3.450e-08	-7.462	-7.462	0.000	(0)
CoHCO3+	7.019e-10	4.487e-10	-9.154	-9.348	-0.194	(0)
CoCl+	6.085e-10	3.890e-10	-9.216	-9.410	-0.194	(0)
CoCO3	3.925e-10	3.925e-10	-9.406	-9.406	0.000	(0)
CoOH+	3.770e-10	2.410e-10	-9.424	-9.618	-0.194	(0)
CoF+	8.717e-11	5.573e-11	-10.060	-10.254	-0.194	(0)
Co (OH) 2	1.651e-11	1.651e-11	-10.782	-10.782	0.000	(0)
CoNO2+	2.479e-12	1.585e-12	-11.606	-11.800	-0.194	(0)
Co (NH3) +2	8.003e-14	1.337e-14	-13.097	-13.874	-0.777	(0)
CoSeO4	2.743e-15	2.743e-15	-14.562	-14.562	0.000	(0)
CoNO3+	5.260e-16	3.363e-16	-15.279	-15.473	-0.194	(0)
Co (OH) 3-	4.445e-16	2.842e-16	-15.352	-15.546	-0.194	(0)
CoOOH-	1.118e-16	7.146e-17	-15.952	-16.146	-0.194	(0)
Co2OH+3	9.482e-18	1.692e-19	-17.023	-18.772	-1.748	(0)
Co (NH3) 2+2	2.711e-20	4.529e-21	-19.567	-20.344	-0.777	(0)
Co (OH) 4-2	2.325e-22	3.884e-23	-21.634	-22.411	-0.777	(0)
Co (NO3) 2	1.037e-23	1.037e-23	-22.984	-22.984	0.000	(0)
Co (NH3) 3+2	2.710e-27	4.527e-28	-26.567	-27.344	-0.777	(0)
Co4 (OH) 4+4	8.645e-28	6.736e-31	-27.063	-30.172	-3.108	(0)
Co (NH3) 4+2	1.129e-34	1.886e-35	-33.947	-34.724	-0.777	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.827	-42.605	-0.777	(0)
Co (3)	1.010e-28					
CoOH+2	1.010e-28	1.687e-29	-27.996	-28.773	-0.777	(0)
Co+3	4.486e-35	3.850e-36	-34.348	-35.415	-1.066	(0)
CoCl+2	3.764e-35	6.289e-36	-34.424	-35.201	-0.777	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.972	-49.749	-0.777	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.258	-59.453	-0.194	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.557	-64.334	-0.777	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.788	-64.565	-0.777	(0)
Cr (2)	8.063e-27					
Cr+2	8.063e-27	1.347e-27	-26.094	-26.871	-0.777	(0)
Cr (3)	1.550e-09					
Cr (OH) 2+	1.206e-09	7.708e-10	-8.919	-9.113	-0.194	(0)
Cr (OH) 3	2.497e-10	2.497e-10	-9.603	-9.603	0.000	(0)
Cr (OH) +2	4.397e-11	7.346e-12	-10.357	-11.134	-0.777	(0)
CrOHSO4	2.152e-11	2.152e-11	-10.667	-10.667	0.000	(0)
CrO2-	1.596e-11	1.021e-11	-10.797	-10.991	-0.194	(0)
Cr (OH) 4-	1.341e-11	8.575e-12	-10.873	-11.067	-0.194	(0)
CrF+2	4.646e-14	7.763e-15	-13.333	-14.110	-0.777	(0)
Cr+3	2.181e-14	3.893e-16	-13.661	-15.410	-1.748	(0)
CrSO4+	1.755e-14	1.122e-14	-13.756	-13.950	-0.194	(0)
CrCl+2	2.421e-17	4.045e-18	-16.616	-17.393	-0.777	(0)
CrOHC12	5.323e-19	5.323e-19	-18.274	-18.274	0.000	(0)
Cr2 (OH) 2SO4+2	8.551e-20	1.429e-20	-19.068	-19.845	-0.777	(0)
Cr2 (OH) 2 (SO4) 2	1.048e-20	1.048e-20	-19.980	-19.980	0.000	(0)
CrCl2+	4.819e-21	3.081e-21	-20.317	-20.511	-0.194	(0)
CrNO3+2	1.543e-24	2.578e-25	-23.812	-24.589	-0.777	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.825	-41.603	-0.777	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.262	-51.011	-1.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.227	-52.004	-0.777	(0)
Cr (6)	1.403e-14					
CrO4-2	1.267e-14	4.253e-15	-13.897	-14.371	-0.474	(0)
NaCrO4-	7.865e-16	5.028e-16	-15.104	-15.299	-0.194	(0)
KCrO4-	3.252e-16	2.079e-16	-15.488	-15.682	-0.194	(0)
HCrO4-	2.508e-16	1.603e-16	-15.601	-15.795	-0.194	(0)
CrO3SO4-2	4.212e-23	7.038e-24	-22.375	-23.153	-0.777	(0)
H2CrO4	1.514e-24	1.514e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	1.478e-25	9.450e-26	-24.830	-25.025	-0.194	(0)
Cr2O7-2	5.346e-30	8.932e-31	-29.272	-30.049	-0.777	(0)

Cu (1)	5.935e-09					
CuCl2-	3.918e-09	2.908e-09	-8.407	-8.536	-0.129	(0)
CuCl	1.734e-09	1.734e-09	-8.761	-8.761	0.000	(0)
Cu+	2.683e-10	1.716e-10	-9.571	-9.766	-0.194	(0)
CuCl3-2	1.501e-11	4.991e-12	-10.824	-11.302	-0.478	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.779	-147.230	-0.451	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.537	-147.960	-0.424	(0)
Cu (2)	4.861e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	8.887e-08	6.596e-08	-7.051	-7.181	-0.129	(0)
Cu+2	7.202e-08	2.418e-08	-7.143	-7.616	-0.474	(0)
CuSO4	6.839e-08	6.839e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	6.303e-09	1.053e-09	-8.200	-8.978	-0.777	(0)
CuHCO3+	9.830e-10	6.284e-10	-9.007	-9.202	-0.194	(0)
Cu2 (OH) 2+2	6.541e-10	1.093e-10	-9.184	-9.961	-0.777	(0)
CuCl+	4.146e-10	3.077e-10	-9.382	-9.512	-0.129	(0)
CuF+	3.003e-10	1.920e-10	-9.522	-9.717	-0.194	(0)
CuNO2+	6.360e-11	4.066e-11	-10.197	-10.391	-0.194	(0)
Cu (OH) 3-	3.140e-11	2.008e-11	-10.503	-10.697	-0.194	(0)
CuNH3+2	1.176e-11	1.965e-12	-10.930	-11.707	-0.777	(0)
CuCl2	8.565e-13	8.565e-13	-12.067	-12.067	0.000	(0)
Cu (NO2) 2	6.681e-15	6.681e-15	-14.175	-14.175	0.000	(0)
CuNO3+	1.812e-15	1.159e-15	-14.742	-14.936	-0.194	(0)
Cu (OH) 4-2	8.157e-16	1.363e-16	-15.088	-15.866	-0.777	(0)
CuCl3-	8.646e-17	6.417e-17	-16.063	-16.193	-0.129	(0)
CuCl4-2	7.762e-21	2.582e-21	-20.110	-20.588	-0.478	(0)
Cu (NO3) 2	2.209e-24	2.209e-24	-23.656	-23.656	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.606	-216.801	-0.194	(0)
F	2.575e-04					
F-	1.653e-04	1.258e-04	-3.782	-3.900	-0.118	(0)
MgF+	8.645e-05	6.494e-05	-4.063	-4.188	-0.124	(0)
CaF+	3.612e-06	2.743e-06	-5.442	-5.562	-0.120	(0)
NaF	1.889e-06	1.889e-06	-5.724	-5.724	0.000	(0)
MnF+	2.361e-07	1.793e-07	-6.627	-6.746	-0.120	(0)
ZnF+	1.571e-08	1.004e-08	-7.804	-7.998	-0.194	(0)
BF (OH) 3-	8.004e-09	5.692e-09	-8.097	-8.245	-0.148	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	3.685e-10	3.685e-10	-9.434	-9.434	0.000	(0)
AlF2+	3.038e-10	2.326e-10	-9.517	-9.633	-0.116	(0)
CuF+	3.003e-10	1.920e-10	-9.522	-9.717	-0.194	(0)
CoF+	8.717e-11	5.573e-11	-10.060	-10.254	-0.194	(0)
AlF4-	3.093e-11	2.323e-11	-10.510	-10.634	-0.124	(0)
NiF+	1.575e-11	1.007e-11	-10.803	-10.997	-0.194	(0)
AlF+2	1.351e-11	4.644e-12	-10.869	-11.333	-0.464	(0)
CdF+	6.437e-12	4.116e-12	-11.191	-11.386	-0.194	(0)
HF2-	1.415e-12	1.037e-12	-11.849	-11.984	-0.135	(0)
BF2 (OH) 2-	1.257e-12	8.939e-13	-11.901	-12.049	-0.148	(0)
PbF+	9.692e-13	6.196e-13	-12.014	-12.208	-0.194	(0)
UO2F+	5.909e-13	3.778e-13	-12.228	-12.423	-0.194	(0)
UO2F2	1.371e-13	1.371e-13	-12.863	-12.863	0.000	(0)
CrF+2	4.646e-14	7.763e-15	-13.333	-14.110	-0.777	(0)
UO2F3-	6.777e-15	4.332e-15	-14.169	-14.363	-0.194	(0)
PbF2	1.534e-15	1.534e-15	-14.814	-14.814	0.000	(0)
CdF2	1.033e-15	1.033e-15	-14.986	-14.986	0.000	(0)
UO2F4-2	2.592e-17	4.330e-18	-16.586	-17.364	-0.777	(0)
VO2F	2.422e-17	2.422e-17	-16.616	-16.616	0.000	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F2-	1.730e-18	1.106e-18	-17.762	-17.956	-0.194	(0)
FeF2+	1.511e-18	1.148e-18	-17.821	-17.940	-0.120	(0)
FeF+2	1.025e-18	3.408e-19	-17.989	-18.467	-0.478	(0)
BF3OH-	7.183e-19	5.109e-19	-18.144	-18.292	-0.148	(0)
PbF3-	5.726e-19	3.661e-19	-18.242	-18.436	-0.194	(0)
FeF3	2.037e-19	2.037e-19	-18.691	-18.691	0.000	(0)
VOF+	2.041e-20	1.305e-20	-19.690	-19.884	-0.194	(0)
VO2F3-2	1.039e-20	1.736e-21	-19.983	-20.760	-0.777	(0)
VOF2	6.156e-22	6.156e-22	-21.211	-21.211	0.000	(0)
PbF4-2	1.320e-22	2.205e-23	-21.880	-22.657	-0.777	(0)

HgF+	4.053e-23	2.591e-23	-22.392	-22.587	-0.194	(0)
VO2F4-3	6.023e-24	1.075e-25	-23.220	-24.969	-1.748	(0)
BF4-	5.192e-24	3.692e-24	-23.285	-23.433	-0.148	(0)
VOF3-	4.298e-24	2.748e-24	-23.367	-23.561	-0.194	(0)
Sb(OH) 2F	1.480e-25	1.480e-25	-24.830	-24.830	0.000	(0)
SbOF	1.459e-25	1.459e-25	-24.836	-24.836	0.000	(0)
VOF4-2	8.353e-27	1.396e-27	-26.078	-26.855	-0.777	(0)
UF3+	1.721e-36	1.100e-36	-35.764	-35.958	-0.194	(0)
UF2+2	3.303e-37	5.519e-38	-36.481	-37.258	-0.777	(0)
UF4	1.518e-38	1.518e-38	-37.819	-37.819	0.000	(0)
UF+3	1.952e-39	0.000e+00	-38.709	-40.458	-1.748	(0)
UF5-	1.184e-40	0.000e+00	-39.927	-40.121	-0.194	(0)
UF6-2	0.000e+00	0.000e+00	-40.764	-41.541	-0.777	(0)
Fe (2)	3.493e-12					
Fe+2	2.306e-12	3.852e-13	-11.637	-12.414	-0.777	(0)
FeSO4	1.167e-12	1.167e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.742e-14	1.323e-14	-13.759	-13.879	-0.120	(0)
FeHCO3+	2.579e-15	1.997e-15	-14.589	-14.700	-0.111	(0)
Fe (OH) 2	9.061e-18	9.061e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.254e-18	2.471e-18	-17.488	-17.607	-0.120	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.186	-160.186	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.316	-236.510	-0.194	(0)
Fe (3)	1.075e-09					
Fe (OH) 2+	6.028e-10	4.616e-10	-9.220	-9.336	-0.116	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.484e-11	3.433e-11	-10.348	-10.464	-0.116	(0)
FeOH+2	4.136e-15	1.376e-15	-14.383	-14.861	-0.478	(0)
FeF2+	1.511e-18	1.148e-18	-17.821	-17.940	-0.120	(0)
FeF+2	1.025e-18	3.408e-19	-17.989	-18.467	-0.478	(0)
FeSO4+	4.506e-19	3.422e-19	-18.346	-18.466	-0.120	(0)
FeF3	2.037e-19	2.037e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.413e-19	9.032e-20	-18.850	-19.044	-0.194	(0)
Fe+3	2.879e-20	2.471e-21	-19.541	-20.607	-1.066	(0)
FeCl+2	1.801e-21	5.990e-22	-20.745	-21.223	-0.478	(0)
FeCl2+	2.828e-23	2.148e-23	-22.548	-22.668	-0.120	(0)
FeHSeO3+2	1.031e-23	1.723e-24	-22.987	-23.764	-0.777	(0)
Fe2 (OH) 2+4	8.043e-26	6.267e-29	-25.095	-28.203	-3.108	(0)
FeCl3	1.724e-26	1.724e-26	-25.763	-25.763	0.000	(0)
FeNO3+2	2.240e-27	3.743e-28	-26.650	-27.427	-0.777	(0)
Fe3 (OH) 4+5	3.007e-32	4.182e-37	-31.522	-36.379	-4.857	(0)
H (0)	3.898e-29					
H2	1.949e-29	2.015e-29	-28.710	-28.696	0.015	(0)
Hg (0)	1.076e-08					
Hg	1.076e-08	1.076e-08	-7.968	-7.968	0.000	(0)
Hg (1)	4.857e-19					
Hg2+2	2.429e-19	4.058e-20	-18.615	-19.392	-0.777	(0)
Hg (2)	1.340e-10					
HgClOH	6.793e-11	6.793e-11	-10.168	-10.168	0.000	(0)
HgCl2	3.581e-11	3.581e-11	-10.446	-10.446	0.000	(0)
Hg (OH) 2	2.522e-11	2.607e-11	-10.598	-10.584	0.015	(0)
HgCl3-	4.496e-12	2.874e-12	-11.347	-11.541	-0.194	(0)
HgCl4-2	5.498e-13	9.186e-14	-12.260	-13.037	-0.777	(0)
HgCO3	1.102e-14	1.102e-14	-13.958	-13.958	0.000	(0)
HgCl+	1.392e-15	8.899e-16	-14.856	-15.051	-0.194	(0)
Hg (CO3) 2-2	3.458e-16	5.777e-17	-15.461	-16.238	-0.777	(0)
HgOH+	2.984e-16	1.908e-16	-15.525	-15.720	-0.194	(0)
Hg (OH) 3-	4.428e-18	2.831e-18	-17.354	-17.548	-0.194	(0)
HgHCO3+	3.739e-18	2.390e-18	-17.427	-17.622	-0.194	(0)
Hg (NH3) 2+2	1.323e-18	2.210e-19	-17.879	-18.656	-0.777	(0)
HgNH3+2	1.666e-19	2.783e-20	-18.778	-19.555	-0.777	(0)
Hg+2	3.325e-20	5.556e-21	-19.478	-20.255	-0.777	(0)
HgSO4	1.796e-20	1.796e-20	-19.746	-19.746	0.000	(0)
HgF+	4.053e-23	2.591e-23	-22.392	-22.587	-0.194	(0)
Hg (NH3) 3+2	4.181e-26	6.986e-27	-25.379	-26.156	-0.777	(0)
HgNO3+	4.861e-29	3.108e-29	-28.313	-28.508	-0.194	(0)
Hg (NH3) 4+2	2.637e-33	4.406e-34	-32.579	-33.356	-0.777	(0)
Hg (NO3) 2	1.957e-37	1.957e-37	-36.709	-36.709	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-136.921	-137.116	-0.194	(0)

	HgS2-2	0.000e+00	0.000e+00	-137.113	-137.890	-0.777	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.655	-138.655	0.000	(0)
K		1.878e-02					
	K+	1.728e-02	1.316e-02	-1.762	-1.881	-0.118	(0)
	KSO4-	1.502e-03	1.150e-03	-2.823	-2.939	-0.116	(0)
	KCrO4-	3.252e-16	2.079e-16	-15.488	-15.682	-0.194	(0)
Mg		2.415e-02					
	Mg+2	1.370e-02	4.600e-03	-1.863	-2.337	-0.474	(0)
	MgSO4	1.033e-02	1.033e-02	-1.986	-1.986	0.000	(0)
	MgF+	8.645e-05	6.494e-05	-4.063	-4.188	-0.124	(0)
	MgHCO3+	2.612e-05	1.939e-05	-4.583	-4.713	-0.129	(0)
	MgCO3	6.342e-06	6.342e-06	-5.198	-5.198	0.000	(0)
	MgOH+	2.021e-06	1.579e-06	-5.694	-5.802	-0.107	(0)
	MgH2BO3+	1.268e-06	9.017e-07	-5.897	-6.045	-0.148	(0)
Mn (2)		2.941e-04					
	Mn+2	2.143e-04	3.580e-05	-3.669	-4.446	-0.777	(0)
	MnSO4	7.860e-05	7.860e-05	-4.105	-4.105	0.000	(0)
	MnCl+	4.765e-07	3.618e-07	-6.322	-6.441	-0.120	(0)
	MnHCO3+	3.874e-07	2.942e-07	-6.412	-6.531	-0.120	(0)
	MnF+	2.361e-07	1.793e-07	-6.627	-6.746	-0.120	(0)
	MnOH+	1.021e-07	7.756e-08	-6.991	-7.110	-0.120	(0)
	MnCl2	4.103e-09	4.103e-09	-8.387	-8.387	0.000	(0)
	MnCl3-	1.195e-11	9.072e-12	-10.923	-11.042	-0.120	(0)
	MnSeO4	3.765e-12	3.765e-12	-11.424	-11.424	0.000	(0)
	MnNO3+	1.344e-12	8.596e-13	-11.871	-12.066	-0.194	(0)
	Mn (OH) 3-	4.695e-16	3.565e-16	-15.328	-15.448	-0.120	(0)
	Mn (NO3) 2	3.271e-20	3.271e-20	-19.485	-19.485	0.000	(0)
	Mn (OH) 4-2	2.984e-21	9.927e-22	-20.525	-21.003	-0.478	(0)
	MnSe	0.000e+00	0.000e+00	-40.250	-40.250	0.000	(0)
Mn (3)		1.286e-24					
	Mn+3	1.286e-24	1.104e-25	-23.891	-24.957	-1.066	(0)
Mn (6)		2.706e-40					
	MnO4-2	2.706e-40	0.000e+00	-39.568	-40.046	-0.478	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.437	-44.579	-0.141	(0)
Mo		1.022e-05					
	MoO4-2	1.022e-05	3.432e-06	-4.990	-5.464	-0.474	(0)
	HMoO4-	1.244e-09	7.956e-10	-8.905	-9.099	-0.194	(0)
	H2MoO4	6.788e-14	6.788e-14	-13.168	-13.168	0.000	(0)
	AlMo6O21-3	8.363e-39	1.493e-40	-38.078	-39.826	-1.748	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-41.733	-48.727	-6.994	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-45.417	-50.274	-4.857	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-50.317	-53.425	-3.108	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.364	-58.113	-1.748	(0)
N (-3)		2.644e-07					
	NH4+	2.281e-07	1.622e-07	-6.642	-6.790	-0.148	(0)
	NH4SO4-	2.825e-08	2.146e-08	-7.549	-7.668	-0.120	(0)
	NH3	7.940e-09	7.940e-09	-8.100	-8.100	0.000	(0)
	CaNH3+2	1.195e-10	1.997e-11	-9.923	-10.700	-0.777	(0)
	CuNH3+2	1.176e-11	1.965e-12	-10.930	-11.707	-0.777	(0)
	NiNH3+2	8.131e-14	1.359e-14	-13.090	-13.867	-0.777	(0)
	Co (NH3) +2	8.003e-14	1.337e-14	-13.097	-13.874	-0.777	(0)
	BaNH3+2	2.543e-16	4.249e-17	-15.595	-16.372	-0.777	(0)
	Hg (NH3) 2+2	1.323e-18	2.210e-19	-17.879	-18.656	-0.777	(0)
	Ca (NH3) 2+2	3.778e-19	6.312e-20	-18.423	-19.200	-0.777	(0)
	HgNH3+2	1.666e-19	2.783e-20	-18.778	-19.555	-0.777	(0)
	Ni (NH3) 2+2	9.332e-20	1.559e-20	-19.030	-19.807	-0.777	(0)
	Co (NH3) 2+2	2.711e-20	4.529e-21	-19.567	-20.344	-0.777	(0)
	Hg (NH3) 3+2	4.181e-26	6.986e-27	-25.379	-26.156	-0.777	(0)
	Co (NH3) 3+2	2.710e-27	4.527e-28	-26.567	-27.344	-0.777	(0)
	Hg (NH3) 4+2	2.637e-33	4.406e-34	-32.579	-33.356	-0.777	(0)
	Co (NH3) 4+2	1.129e-34	1.886e-35	-33.947	-34.724	-0.777	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.825	-41.603	-0.777	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-41.827	-42.605	-0.777	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.972	-49.749	-0.777	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.262	-51.011	-1.748	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.227	-52.004	-0.777	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.258	-59.453	-0.194	(0)

	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.557	-64.334	-0.777	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.788	-64.565	-0.777	(0)
N (3)	2.223e-05						
	NO2-	2.223e-05	1.606e-05	-4.653	-4.794	-0.141	(0)
	CuNO2+	6.360e-11	4.066e-11	-10.197	-10.391	-0.194	(0)
	CoNO2+	2.479e-12	1.585e-12	-11.606	-11.800	-0.194	(0)
	Cu (NO2) 2	6.681e-15	6.681e-15	-14.175	-14.175	0.000	(0)
N (5)	2.005e-08						
	NO3-	1.990e-08	1.515e-08	-7.701	-7.820	-0.118	(0)
	CaNO3+	1.497e-10	9.570e-11	-9.825	-10.019	-0.194	(0)
	MnNO3+	1.344e-12	8.596e-13	-11.871	-12.066	-0.194	(0)
	ZnNO3+	2.381e-13	1.522e-13	-12.623	-12.818	-0.194	(0)
	CuNO3+	1.812e-15	1.159e-15	-14.742	-14.936	-0.194	(0)
	BaNO3+	1.007e-15	6.440e-16	-14.997	-15.191	-0.194	(0)
	CoNO3+	5.260e-16	3.363e-16	-15.279	-15.473	-0.194	(0)
	NiNO3+	1.896e-16	1.212e-16	-15.722	-15.916	-0.194	(0)
	CdNO3+	1.546e-16	9.887e-17	-15.811	-16.005	-0.194	(0)
	PbNO3+	2.449e-17	1.566e-17	-16.611	-16.805	-0.194	(0)
	Mn (NO3) 2	3.271e-20	3.271e-20	-19.485	-19.485	0.000	(0)
	UO2NO3+	1.028e-21	6.575e-22	-20.988	-21.182	-0.194	(0)
	Zn (NO3) 2	4.600e-22	4.600e-22	-21.337	-21.337	0.000	(0)
	Co (NO3) 2	1.037e-23	1.037e-23	-22.984	-22.984	0.000	(0)
	Cu (NO3) 2	2.209e-24	2.209e-24	-23.656	-23.656	0.000	(0)
	CrNO3+2	1.543e-24	2.578e-25	-23.812	-24.589	-0.777	(0)
	VO2NO3	8.410e-25	8.410e-25	-24.075	-24.075	0.000	(0)
	Cd (NO3) 2	7.506e-25	7.506e-25	-24.125	-24.125	0.000	(0)
	Pb (NO3) 2	4.028e-25	4.028e-25	-24.395	-24.395	0.000	(0)
	FeNO3+2	2.240e-27	3.743e-28	-26.650	-27.427	-0.777	(0)
	HgNO3+	4.861e-29	3.108e-29	-28.313	-28.508	-0.194	(0)
	Hg (NO3) 2	1.957e-37	1.957e-37	-36.709	-36.709	0.000	(0)
Na	3.332e-02						
	Na+	3.125e-02	2.379e-02	-1.505	-1.624	-0.118	(0)
	NaSO4-	2.060e-03	1.577e-03	-2.686	-2.802	-0.116	(0)
	NaHCO3	5.510e-06	5.510e-06	-5.259	-5.259	0.000	(0)
	NaF	1.889e-06	1.889e-06	-5.724	-5.724	0.000	(0)
	NaCO3-	9.589e-07	7.343e-07	-6.018	-6.134	-0.116	(0)
	NaH2BO3	2.132e-07	2.132e-07	-6.671	-6.671	0.000	(0)
	NaCrO4-	7.865e-16	5.028e-16	-15.104	-15.299	-0.194	(0)
Ni	1.798e-08						
	Ni+2	9.488e-09	3.186e-09	-8.023	-8.497	-0.474	(0)
	NiSO4	7.847e-09	7.847e-09	-8.105	-8.105	0.000	(0)
	NiHCO3+	2.530e-10	1.618e-10	-9.597	-9.791	-0.194	(0)
	NiCO3	1.970e-10	1.970e-10	-9.705	-9.705	0.000	(0)
	NiCl+	1.024e-10	6.544e-11	-9.990	-10.184	-0.194	(0)
	NiOH+	5.411e-11	3.459e-11	-10.267	-10.461	-0.194	(0)
	Ni (SO4) 2-2	1.920e-11	3.208e-12	-10.717	-11.494	-0.777	(0)
	NiF+	1.575e-11	1.007e-11	-10.803	-10.997	-0.194	(0)
	Ni (OH) 2	2.370e-12	2.370e-12	-11.625	-11.625	0.000	(0)
	NiNH3+2	8.131e-14	1.359e-14	-13.090	-13.867	-0.777	(0)
	Ni (OH) 3-	3.197e-15	2.044e-15	-14.495	-14.690	-0.194	(0)
	NiCl2	2.645e-15	2.645e-15	-14.578	-14.578	0.000	(0)
	NiSeO4	5.823e-16	5.823e-16	-15.235	-15.235	0.000	(0)
	NiNO3+	1.896e-16	1.212e-16	-15.722	-15.916	-0.194	(0)
	Ni (NH3) 2+2	9.332e-20	1.559e-20	-19.030	-19.807	-0.777	(0)
O (0)	2.404e-35						
	O2	1.202e-35	1.243e-35	-34.920	-34.906	0.015	(0)
Pb	1.484e-09						
	PbSO4	4.225e-10	4.225e-10	-9.374	-9.374	0.000	(0)
	PbCO3	3.482e-10	3.482e-10	-9.458	-9.458	0.000	(0)
	PbOH+	2.368e-10	1.514e-10	-9.626	-9.820	-0.194	(0)
	Pb+2	2.081e-10	6.989e-11	-9.682	-10.156	-0.474	(0)
	Pb (SO4) 2-2	1.881e-10	3.143e-11	-9.726	-10.503	-0.777	(0)
	PbHCO3+	3.345e-11	2.139e-11	-10.476	-10.670	-0.194	(0)
	PbCl+	3.114e-11	1.991e-11	-10.507	-10.701	-0.194	(0)
	Pb (CO3) 2-2	9.963e-12	1.665e-12	-11.002	-11.779	-0.777	(0)
	Pb (OH) 2	4.129e-12	4.129e-12	-11.384	-11.384	0.000	(0)
	PbF+	9.692e-13	6.196e-13	-12.014	-12.208	-0.194	(0)
	PbCl2	7.138e-13	7.138e-13	-12.146	-12.146	0.000	(0)

Pb(OH) 3-	5.570e-15	3.561e-15	-14.254	-14.448	-0.194	(0)
PbCl3-	3.568e-15	2.281e-15	-14.448	-14.642	-0.194	(0)
PbF2	1.534e-15	1.534e-15	-14.814	-14.814	0.000	(0)
PbCl4-2	5.010e-17	8.371e-18	-16.300	-17.077	-0.777	(0)
PbNO3+	2.449e-17	1.566e-17	-16.611	-16.805	-0.194	(0)
Pb2OH+3	9.396e-18	1.677e-19	-17.027	-18.775	-1.748	(0)
Pb(OH) 4-2	4.502e-18	7.522e-19	-17.347	-18.124	-0.777	(0)
PbF3-	5.726e-19	3.661e-19	-18.242	-18.436	-0.194	(0)
Pb3(OH) 4+2	1.423e-22	2.377e-23	-21.847	-22.624	-0.777	(0)
PbF4-2	1.320e-22	2.205e-23	-21.880	-22.657	-0.777	(0)
Pb(NO3) 2	4.028e-25	4.028e-25	-24.395	-24.395	0.000	(0)
Pb4(OH) 4+4	1.694e-26	1.320e-29	-25.771	-28.880	-3.108	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.608	-151.608	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.475	-228.669	-0.194	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.167	-78.361	-0.194	(0)
CdHS+	0.000e+00	0.000e+00	-78.844	-79.038	-0.194	(0)
S5-2	0.000e+00	0.000e+00	-79.015	-79.792	-0.777	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.531	-80.308	-0.777	(0)
S4-2	0.000e+00	0.000e+00	-79.611	-80.388	-0.777	(0)
S3-2	0.000e+00	0.000e+00	-80.417	-81.194	-0.777	(0)
S2-2	0.000e+00	0.000e+00	-81.433	-82.210	-0.777	(0)
S-2	0.000e+00	0.000e+00	-87.249	-87.727	-0.478	(0)
HgHS2-	0.000e+00	0.000e+00	-136.921	-137.116	-0.194	(0)
HgS2-2	0.000e+00	0.000e+00	-137.113	-137.890	-0.777	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.655	-138.655	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.779	-147.230	-0.451	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.182	-147.376	-0.194	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.537	-147.960	-0.424	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.300	-149.300	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.195	-150.195	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.608	-151.608	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.186	-160.186	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.606	-216.801	-0.194	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.187	-224.381	-0.194	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.650	-226.427	-0.777	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.462	-226.656	-0.194	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.475	-228.669	-0.194	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.316	-236.510	-0.194	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.044	-302.822	-0.777	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.425	-304.202	-0.777	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.521	-318.298	-0.777	(0)
S(6)	5.641e-02					
SO4-2	3.676e-02	1.234e-02	-1.435	-1.909	-0.474	(0)
MgSO4	1.033e-02	1.033e-02	-1.986	-1.986	0.000	(0)
CaSO4	5.650e-03	5.650e-03	-2.248	-2.248	0.000	(0)
NaSO4-	2.060e-03	1.577e-03	-2.686	-2.802	-0.116	(0)
KSO4-	1.502e-03	1.150e-03	-2.823	-2.939	-0.116	(0)
MnSO4	7.860e-05	7.860e-05	-4.105	-4.105	0.000	(0)
ZnSO4	1.080e-05	1.080e-05	-4.966	-4.966	0.000	(0)
Zn(SO4) 2-2	6.952e-06	1.161e-06	-5.158	-5.935	-0.777	(0)
CuSO4	6.839e-08	6.839e-08	-7.165	-7.165	0.000	(0)
CoSO4	3.450e-08	3.450e-08	-7.462	-7.462	0.000	(0)
NH4SO4-	2.825e-08	2.146e-08	-7.549	-7.668	-0.120	(0)
HSO4-	1.871e-08	1.405e-08	-7.728	-7.852	-0.124	(0)
NiSO4	7.847e-09	7.847e-09	-8.105	-8.105	0.000	(0)
CdSO4	5.973e-09	5.973e-09	-8.224	-8.224	0.000	(0)
Cd(SO4) 2-2	5.953e-09	9.946e-10	-8.225	-9.002	-0.777	(0)
PbSO4	4.225e-10	4.225e-10	-9.374	-9.374	0.000	(0)
Pb(SO4) 2-2	1.881e-10	3.143e-11	-9.726	-10.503	-0.777	(0)
CrOHSO4	2.152e-11	2.152e-11	-10.667	-10.667	0.000	(0)
Ni(HSO4) 2-2	1.920e-11	3.208e-12	-10.717	-11.494	-0.777	(0)
FeSO4	1.167e-12	1.167e-12	-11.933	-11.933	0.000	(0)
AlSO4+	4.709e-13	3.537e-13	-12.327	-12.451	-0.124	(0)
UO2SO4	4.065e-13	4.065e-13	-12.391	-12.391	0.000	(0)
UO2(SO4) 2-2	3.959e-13	6.615e-14	-12.402	-13.179	-0.777	(0)
Al(SO4) 2-	6.229e-14	4.679e-14	-13.206	-13.330	-0.124	(0)

CrSO4+	1.755e-14	1.122e-14	-13.756	-13.950	-0.194	(0)
VO2SO4-	5.060e-17	3.235e-17	-16.296	-16.490	-0.194	(0)
FeSO4+	4.506e-19	3.422e-19	-18.346	-18.466	-0.120	(0)
Fe (SO4) 2-	1.413e-19	9.032e-20	-18.850	-19.044	-0.194	(0)
Cr2 (OH) 2SO4+2	8.551e-20	1.429e-20	-19.068	-19.845	-0.777	(0)
VOSO4	5.879e-20	5.879e-20	-19.231	-19.231	0.000	(0)
HgSO4	1.796e-20	1.796e-20	-19.746	-19.746	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.048e-20	1.048e-20	-19.980	-19.980	0.000	(0)
CrO3SO4-2	4.212e-23	7.038e-24	-22.375	-23.153	-0.777	(0)
VSO4+	1.542e-34	9.857e-35	-33.812	-34.006	-0.194	(0)
U (SO4) 2	6.689e-40	6.689e-40	-39.175	-39.175	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.389	-41.166	-0.777	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.258	-59.453	-0.194	(0)
Sb (3)	1.276e-19					
Sb (OH) 3	6.450e-20	6.450e-20	-19.190	-19.190	0.000	(0)
HSbO2	6.311e-20	6.311e-20	-19.200	-19.200	0.000	(0)
SbO2-	1.372e-23	8.774e-24	-22.863	-23.057	-0.194	(0)
Sb (OH) 4-	7.828e-24	5.005e-24	-23.106	-23.301	-0.194	(0)
Sb (OH) 2F	1.480e-25	1.480e-25	-24.830	-24.830	0.000	(0)
SbOF	1.459e-25	1.459e-25	-24.836	-24.836	0.000	(0)
Sb (OH) 2+	2.860e-26	1.829e-26	-25.544	-25.738	-0.194	(0)
SbO+	9.884e-27	6.319e-27	-26.005	-26.199	-0.194	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.521	-318.298	-0.777	(0)
Sb (5)	1.275e-07					
SbO3-	1.274e-07	8.145e-08	-6.895	-7.089	-0.194	(0)
Sb (OH) 6-	1.243e-10	9.462e-11	-9.906	-10.024	-0.118	(0)
SbO2+	4.970e-24	3.177e-24	-23.304	-23.498	-0.194	(0)
Se (-2)	6.944e-39					
HSe-	6.944e-39	4.440e-39	-38.158	-38.353	-0.194	(0)
MnSe	0.000e+00	0.000e+00	-40.250	-40.250	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.396	-42.396	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.642	-45.419	-0.777	(0)
Se (4)	9.526e-07					
SeO3-2	5.398e-07	9.019e-08	-6.268	-7.045	-0.777	(0)
HSeO3-	4.128e-07	2.639e-07	-6.384	-6.579	-0.194	(0)
H2SeO3	1.311e-12	1.311e-12	-11.882	-11.882	0.000	(0)
Cd (SeO3) 2-2	8.282e-17	1.384e-17	-16.082	-16.859	-0.777	(0)
FeHSeO3+2	1.031e-23	1.723e-24	-22.987	-23.764	-0.777	(0)
Se (6)	1.168e-09					
SeO4-2	1.164e-09	3.907e-10	-8.934	-9.408	-0.474	(0)
MnSeO4	3.765e-12	3.765e-12	-11.424	-11.424	0.000	(0)
ZnSeO4	2.421e-13	2.421e-13	-12.616	-12.616	0.000	(0)
CoSeO4	2.743e-15	2.743e-15	-14.562	-14.562	0.000	(0)
NiSeO4	5.823e-16	5.823e-16	-15.235	-15.235	0.000	(0)
HSeO4-	3.568e-16	2.281e-16	-15.448	-15.642	-0.194	(0)
CdSeO4	1.502e-16	1.502e-16	-15.823	-15.823	0.000	(0)
Zn (SeO4) 2-2	5.740e-22	9.589e-23	-21.241	-22.018	-0.777	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.744	-59.493	-1.748	(0)
U (4)	7.593e-20					
U (OH) 5-	7.591e-20	4.853e-20	-19.120	-19.314	-0.194	(0)
U (OH) 4	2.373e-23	2.373e-23	-22.625	-22.625	0.000	(0)
U (OH) 3+	1.584e-27	1.013e-27	-26.800	-26.994	-0.194	(0)
U (OH) 2+2	3.273e-32	5.468e-33	-31.485	-32.262	-0.777	(0)
UF3+	1.721e-36	1.100e-36	-35.764	-35.958	-0.194	(0)
UF2+2	3.303e-37	5.519e-38	-36.481	-37.258	-0.777	(0)
UOH+3	1.685e-37	3.007e-39	-36.773	-38.522	-1.748	(0)
UF4	1.518e-38	1.518e-38	-37.819	-37.819	0.000	(0)
UF+3	1.952e-39	0.000e+00	-38.709	-40.458	-1.748	(0)
U (SO4) 2	6.689e-40	6.689e-40	-39.175	-39.175	0.000	(0)
UF5-	1.184e-40	0.000e+00	-39.927	-40.121	-0.194	(0)
USO4+2	0.000e+00	0.000e+00	-40.389	-41.166	-0.777	(0)
UF6-2	0.000e+00	0.000e+00	-40.764	-41.541	-0.777	(0)
U+4	0.000e+00	0.000e+00	-42.749	-45.858	-3.108	(0)
UCl+3	0.000e+00	0.000e+00	-44.505	-46.253	-1.748	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-157.574	-173.310	-15.736	(0)
U (5)	3.004e-16					
UO2+	3.004e-16	1.921e-16	-15.522	-15.717	-0.194	(0)

U (6)	5.347e-07					
UO2 (CO3) 3-4	5.062e-07	3.944e-10	-6.296	-9.404	-3.108	(0)
UO2 (CO3) 2-2	2.842e-08	4.748e-09	-7.546	-8.324	-0.777	(0)
UO2CO3	1.436e-10	1.436e-10	-9.843	-9.843	0.000	(0)
UO2OH+	3.694e-12	2.362e-12	-11.432	-11.627	-0.194	(0)
UO2F+	5.909e-13	3.778e-13	-12.228	-12.423	-0.194	(0)
UO2SO4	4.065e-13	4.065e-13	-12.391	-12.391	0.000	(0)
UO2 (SO4) 2-2	3.959e-13	6.615e-14	-12.402	-13.179	-0.777	(0)
UO2F2	1.371e-13	1.371e-13	-12.863	-12.863	0.000	(0)
UO2+2	6.479e-14	2.175e-14	-13.189	-13.662	-0.474	(0)
UO2F3-	6.777e-15	4.332e-15	-14.169	-14.363	-0.194	(0)
UO2Cl+	4.430e-16	2.832e-16	-15.354	-15.548	-0.194	(0)
(UO2) 2 (OH) 2+2	5.541e-17	9.258e-18	-16.256	-17.033	-0.777	(0)
UO2F4-2	2.592e-17	4.330e-18	-16.586	-17.364	-0.777	(0)
(UO2) 3 (OH) 5+	1.930e-17	1.234e-17	-16.714	-16.909	-0.194	(0)
UO2NO3+	1.028e-21	6.575e-22	-20.988	-21.182	-0.194	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.281	-42.475	-0.194	(0)
V+2	0.000e+00	0.000e+00	-43.144	-43.921	-0.777	(0)
V (3)	8.753e-15					
V (OH) 3	8.753e-15	8.753e-15	-14.058	-14.058	0.000	(0)
V (OH) 2+	1.033e-25	6.603e-26	-24.986	-25.180	-0.194	(0)
VOH+2	4.376e-29	7.311e-30	-28.359	-29.136	-0.777	(0)
V+3	9.478e-34	1.691e-35	-33.023	-34.772	-1.748	(0)
VSO4+	1.542e-34	9.857e-35	-33.812	-34.006	-0.194	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.116	-55.864	-1.748	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.364	-57.472	-3.108	(0)
V (4)	4.827e-18					
V (OH) 3+	4.643e-18	2.969e-18	-17.333	-17.527	-0.194	(0)
VO+2	1.035e-19	1.729e-20	-18.985	-19.762	-0.777	(0)
VOSO4	5.879e-20	5.879e-20	-19.231	-19.231	0.000	(0)
VOF+	2.041e-20	1.305e-20	-19.690	-19.884	-0.194	(0)
VOF2	6.156e-22	6.156e-22	-21.211	-21.211	0.000	(0)
VOC1+	6.091e-22	3.894e-22	-21.215	-21.410	-0.194	(0)
VOF3-	4.298e-24	2.748e-24	-23.367	-23.561	-0.194	(0)
VOF4-2	8.353e-27	1.396e-27	-26.078	-26.855	-0.777	(0)
H2V2O4+2	2.656e-30	4.437e-31	-29.576	-30.353	-0.777	(0)
V (5)	1.152e-07					
H2VO4-	6.312e-08	4.035e-08	-7.200	-7.394	-0.194	(0)
HVO4-2	5.208e-08	8.702e-09	-7.283	-8.060	-0.777	(0)
HV2O7-3	6.683e-12	1.193e-13	-11.175	-12.924	-1.748	(0)
H3VO4	4.700e-12	4.700e-12	-11.328	-11.328	0.000	(0)
H3V2O7-	1.920e-12	1.228e-12	-11.717	-11.911	-0.194	(0)
V2O7-4	3.537e-13	2.756e-16	-12.451	-15.560	-3.108	(0)
VO4-3	2.098e-13	3.744e-15	-12.678	-14.427	-1.748	(0)
V3O9-3	3.882e-15	6.929e-17	-14.411	-16.159	-1.748	(0)
VO2+	1.442e-16	1.098e-16	-15.841	-15.960	-0.118	(0)
VO2SO4-	5.060e-17	3.235e-17	-16.296	-16.490	-0.194	(0)
VO2F	2.422e-17	2.422e-17	-16.616	-16.616	0.000	(0)
VO2F2-	1.730e-18	1.106e-18	-17.762	-17.956	-0.194	(0)
V4O12-4	1.499e-18	1.168e-21	-17.824	-20.932	-3.108	(0)
VO2F3-2	1.039e-20	1.736e-21	-19.983	-20.760	-0.777	(0)
VO2F4-3	6.023e-24	1.075e-25	-23.220	-24.969	-1.748	(0)
VO2NO3	8.410e-25	8.410e-25	-24.075	-24.075	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-49.765	-56.758	-6.994	(0)
HV10O28-5	0.000e+00	0.000e+00	-51.649	-56.505	-4.857	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.123	-59.232	-3.108	(0)
Zn	3.093e-05					
Zn+2	1.191e-05	4.000e-06	-4.924	-5.398	-0.474	(0)
ZnSO4	1.080e-05	1.080e-05	-4.966	-4.966	0.000	(0)
Zn (SO4) 2-2	6.952e-06	1.161e-06	-5.158	-5.935	-0.777	(0)
ZnOH+	5.396e-07	3.450e-07	-6.268	-6.462	-0.194	(0)
ZnCO3	3.815e-07	3.815e-07	-6.418	-6.418	0.000	(0)
ZnCl+	1.087e-07	8.066e-08	-6.964	-7.093	-0.129	(0)
ZnOHC1	9.107e-08	9.107e-08	-7.041	-7.041	0.000	(0)
ZnHCO3+	8.148e-08	5.209e-08	-7.089	-7.283	-0.194	(0)
Zn (OH) 2	4.715e-08	4.715e-08	-7.326	-7.326	0.000	(0)
ZnF+	1.571e-08	1.004e-08	-7.804	-7.998	-0.194	(0)

ZnCl2	1.026e-09	1.026e-09	-8.989	-8.989	0.000	(0)
Zn(OH) 3-	3.188e-10	2.038e-10	-9.496	-9.691	-0.194	(0)
ZnCl3-	8.817e-12	6.544e-12	-11.055	-11.184	-0.129	(0)
ZnSeO4	2.421e-13	2.421e-13	-12.616	-12.616	0.000	(0)
ZnNO3+	2.381e-13	1.522e-13	-12.623	-12.818	-0.194	(0)
ZnCl4-2	7.897e-14	2.627e-14	-13.103	-13.581	-0.478	(0)
Zn(OH) 4-2	4.188e-14	6.998e-15	-13.378	-14.155	-0.777	(0)
Zn(SeO4) 2-2	5.740e-22	9.589e-23	-21.241	-22.018	-0.777	(0)
Zn(NO3) 2	4.600e-22	4.600e-22	-21.337	-21.337	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.182	-147.376	-0.194	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.300	-149.300	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.187	-224.381	-0.194	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.650	-226.427	-0.777	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.425	-304.202	-0.777	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-53.72	-47.43	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-40.49	-35.98	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-47.72	-35.98	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-69.94	-52.01	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-54.87	-34.84	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.36	-27.95	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.44	-22.99	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.43	9.37	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.63	-45.26	2.37	Al2 (MoO4) 3
Al2O3	-0.92	18.73	19.65	Al2O3
Al4 (OH) 10SO4	-3.01	19.69	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.58	-6.78	4.80	AlAsO4:2H2O
AlOHSO4	-5.18	-8.41	-3.23	AlOHSO4
AlSb	-152.08	-86.46	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.27	-12.06	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.81	6.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.19	5.41	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.29	6.71	As2O5
Atacamite	-0.92	6.47	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.55	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.34	-0.46	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.61	7.33	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.58	-13.54	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.55	-6.72	1.83	BaSeO3
BaSeO4	-10.02	-17.48	-7.46	BaSeO4
Bianchite	-5.55	-7.31	-1.76	ZnSO4:6H2O
Birnessite	-6.48	11.62	18.09	MnO2
Bixbyite	-1.67	-2.31	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.79	9.37	8.58	AlOOH
Breithauptite	-57.16	-75.68	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.32	13.53	16.84	Mg (OH) 2
Bunsenite	-5.08	7.37	12.45	NiO
Ca (VO3) 2	-8.55	-2.89	5.66	Ca (VO3) 2
Ca2V2O7	-7.22	10.28	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.27	10.28	21.55	Ca2V2O7:2H2O

Ca3(AsO4)2·4H2O	-15.10	7.20	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-15.51	23.45	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-16.42	23.44	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-295.12	-152.15	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	-0.00	-8.48	-8.48	CaCO3
Calomel	-5.67	-23.58	-17.91	Hg2Cl2
CaMoO4	-0.21	-8.16	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3·2H2O	-4.16	-1.35	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.09	-12.11	-3.02	CaSeO4·2H2O
Cd(BO2)2	-10.55	-0.71	9.84	Cd(BO2)2
Cd(OH)2	-6.46	7.18	13.64	Cd(OH)2
Cd(OH)2(am)	-6.55	7.18	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.72	-14.01	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.79	3.77	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.45	10.95	28.40	Cd4(OH)6SO4
CdCl2	-12.22	-12.88	-0.66	CdCl2
CdCl2·1H2O	-11.18	-12.88	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-10.97	-12.88	-1.91	CdCl2·2.5H2O
CdF2	-15.27	-16.49	-1.21	CdF2
Cdmetal(alpha)	-31.88	-18.36	13.51	Cd
Cdmetal(gamma)	-31.98	-18.36	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.85	3.54	CdOHCl
CdSb	-75.52	-75.87	-0.35	CdSb
CdSe	-18.90	-39.10	-20.20	CdSe
CdSeO4·2H2O	-16.25	-18.10	-1.85	CdSeO4·2H2O
CdSO4	-10.42	-10.59	-0.17	CdSO4
CdSO4·1H2O	-8.87	-10.59	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-8.72	-10.60	-1.87	CdSO4·2.67H2O
Cerrusite	-2.81	-15.94	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4·5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.18	-96.88	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.47	-40.57	-27.10	PbSe
Co(BO2)2	-26.95	0.12	27.07	Co(BO2)2
Co(OH)2	-5.08	8.01	13.09	Co(OH)2
Co(OH)3	-9.31	-11.62	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.29	-8.26	13.03	Co3(AsO4)2
Co3O4	-4.72	-15.22	-10.50	Co3O4
CoCl2	-20.31	-12.04	8.27	CoCl2
CoCl2·6H2O	-14.59	-12.05	2.54	CoCl2·6H2O
CoCO3	-3.65	-13.63	-9.98	CoCO3
CoF2	-14.06	-15.65	-1.60	CoF2
CoF3	-45.66	-47.12	-1.46	CoF3
CoFe2O4	17.93	14.40	-3.53	CoFe2O4
CoMoO4	-5.56	-13.32	-7.76	CoMoO4
CoO	-5.57	8.01	13.59	CoO
CoS(alpha)	-70.84	-78.28	-7.44	CoS
CoS(beta)	-67.21	-78.28	-11.07	CoS
CoSe	-22.07	-38.27	-16.20	CoSe
CoSeO3	-7.82	-6.50	1.32	CoSeO3
CoSeO4·6H2O	-15.74	-17.27	-1.53	CoSeO4·6H2O
CoSO4	-12.56	-9.76	2.80	CoSO4
CoSO4·6H2O	-7.30	-9.77	-2.47	CoSO4·6H2O
Cotunnite	-9.57	-14.35	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-21.82	-11.01	10.82	Cr(OH)2
Cr(OH)3	-2.52	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.15	-31.06	14.09	CrCl2
CrCl3	-46.38	-31.26	15.11	CrCl3

CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.87	-42.71	-33.84	Na3AlF6
Cu(OH)2	-0.43	8.25	8.67	Cu(OH)2
Cu(SbO3)2	-24.25	20.96	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.51	0.75	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.53	-89.41	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.65	-7.55	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.73	-101.32	-42.59	Cu3Sb
Cu3Se2	-24.49	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.27	10.30	CuOCuSO4
Cupricferrite	8.65	14.64	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.41	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.77	-6.26	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.52	2.94	CuSO4
Diaspore	2.49	9.37	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.06	-16.60	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.49	-16.60	-17.09	CaMg(CO3)2
Epsomite	-2.13	-4.25	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.22	0.18	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-8.88	-12.60	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.68	-8.13	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.52	-37.15	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.79	-17.88	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.98	-63.57	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.83	-42.83	-11.00	FeSe
Fix_pe	-4.84	-4.84	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.61	-80.58	-13.97	PbS
Gibbsite	1.07	9.37	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.30	-7.31	-2.01	ZnSO4:7H2O
Greenockite	-64.75	-79.11	-14.36	CdS
Greigite	-290.30	-335.34	-45.03	Fe3S4
Gummite	-5.47	2.20	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.46	-21.33	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.32	-3.72	1.60	NaCl
Hausmannite	-1.22	59.81	61.03	Mn3O4
Hematite	7.80	6.39	-1.42	Fe2O3
Hercynite	-0.71	22.19	22.89	FeAl2O4
Hg(CH3)2(g)	-184.53	-258.24	-73.71	Hg(CH3)2
Hg(g)	-6.66	-14.53	-7.87	Hg

Hg(OH) 2	-7.09	-10.58	-3.50	Hg(OH) 2
Hg2(g)	-14.11	-29.07	-14.96	Hg2
Hg2(OH) 2	-8.79	-3.53	5.26	Hg2(OH) 2
Hg2CO3	-9.12	-25.17	-16.05	Hg2CO3
Hg2CrO4	-25.06	-33.76	-8.70	Hg2CrO4
Hg2F2	-16.83	-27.19	-10.36	Hg2F2
Hg2S	-78.14	-89.82	-11.68	Hg2S
Hg2SeO3	-13.38	-18.04	-4.66	Hg2SeO3
Hg2SO4	-15.17	-21.30	-6.13	Hg2SO4
Hg3O2CO3	-23.71	-53.40	-29.68	Hg3O2CO3
HgCl(g)	-31.29	-11.79	19.50	HgCl
HgCl2	-9.38	-30.64	-21.26	HgCl2
HgF(g)	-46.27	-13.60	32.68	HgF
HgF2(g)	-46.81	-34.25	12.57	HgF2
Hgmetal(l)	-1.08	-14.53	-13.45	Hg
HgSe	-1.17	-56.87	-55.69	HgSe
HgSeO3	-12.66	-25.09	-12.43	HgSeO3
HgSO4	-18.94	-28.36	-9.42	HgSO4
Huntite	-2.87	-32.83	-29.97	CaMg3(CO3) 4
Hydrocerrusite	-7.39	-26.16	-18.77	Pb3(OH) 2(CO3) 2
Hydromagnesite	-10.18	-18.95	-8.77	Mg5(CO3) 4(OH) 2:4H2O
K-Alum	-14.97	-20.14	-5.17	KAl(SO4) 2:12H2O
K-Jarosite	-5.12	-19.92	-14.80	KFe3(SO4) 2(OH) 6
K2Cr2O7	-31.13	-48.37	-17.24	K2Cr2O7
K2CrO4	-17.62	-18.13	-0.51	K2CrO4
K2MoO4	-12.49	-9.23	3.26	K2MoO4
K2SeO4	-12.44	-13.17	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH) 6SO4:H2O
Larnakite	-5.92	-6.35	-0.43	PbO:PbSO4
Laurionite	-4.94	-4.32	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.98	5.71	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.39	6.39	Fe2O3
Magnesioferrite	3.05	19.91	16.86	Fe2MgO4
Magnesite	-0.66	-8.12	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2(OH) 2CO3
Manganite	-1.15	24.19	25.34	MnOOH
Massicot	-7.18	5.71	12.89	PbO
Matlockite	-7.18	-16.15	-8.97	PbClF
Melanothallite	-18.06	-11.81	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-51.78	-96.88	-45.09	HgS
Mg(OH) 2(active)	-5.27	13.53	18.79	Mg(OH) 2
Mg(VO3) 2	-13.80	-2.52	11.28	Mg(VO3) 2
Mg2Sb3	-271.23	-196.55	74.68	Mg2Sb3
Mg2V2O7	-15.35	11.01	26.36	Mg2V2O7
MgCr2O4	-5.03	11.17	16.20	MgCr2O4
MgCrO4	-22.09	-16.71	5.38	MgCrO4
MgF2	-2.01	-10.14	-8.13	MgF2
MgMoO4	-5.95	-7.80	-1.85	MgMoO4
MgSeO3:6H2O	-4.04	-0.99	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.55	-11.75	-1.20	MgSeO4:6H2O
Minium	-30.84	42.68	73.52	Pb3O4
Mirabilite	-4.05	-5.17	-1.11	Na2SO4:10H2O
Mn(VO3) 2	-9.53	-4.63	4.90	Mn(VO3) 2
Mn2(SO4) 3	-49.93	-55.64	-5.71	Mn2(SO4) 3
Mn2Sb	-146.83	-85.75	61.08	Mn2Sb
Mn3(AsO4) 2:8H2O	-10.54	1.96	12.50	Mn3(AsO4) 2:8H2O
MnCl2:4H2O	-11.36	-8.64	2.72	MnCl2:4H2O
MnS(grn)	-75.04	-74.87	0.17	MnS
MnS(pnk)	-78.21	-74.87	3.34	MnS
MnSb	-94.07	-96.98	-2.91	MnSb
MnSe	-38.37	-34.87	3.50	MnSe
MnSeO3	-4.22	-3.09	1.13	MnSeO3
MnSeO3:2H2O	-4.08	-3.09	0.98	MnSeO3:2H2O

MnSeO4:5H2O	-11.81	-13.86	-2.05	MnSeO4:5H2O
MnSO4	-8.94	-6.35	2.58	MnSO4
Monteponite	-7.92	7.18	15.10	CdO
Montroydite	-6.94	-10.58	-3.64	HgO
MoO3	-13.33	-21.33	-8.00	MoO3
Morenosite	-8.27	-10.41	-2.14	NiSO4:7H2O
MoS2	-149.20	-219.46	-70.26	MoS2
Na-Jarosite	-8.47	-19.67	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-37.96	-47.86	-9.90	Na2Cr2O7
Na2CrO4	-20.55	-17.62	2.93	Na2CrO4
Na2Mo2O7	-13.45	-30.04	-16.60	Na2Mo2O7
Na2MoO4	-10.20	-8.71	1.49	Na2MoO4
Na2MoO4:2H2O	-9.94	-8.71	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.20	-1.90	10.30	Na2SeO3:5H2O
Na2SeO4	-13.94	-12.66	1.28	Na2SeO4
Na3Sb	-171.35	-76.89	94.45	Na3Sb
Na3VO4	-25.78	10.90	36.68	Na3VO4
Na4V2O7	-28.21	9.19	37.40	Na4V2O7
Nantokite	-5.13	-11.86	-6.73	CuCl
NaSb	-87.13	-63.97	23.17	NaSb
Natron	-7.73	-9.04	-1.31	Na2CO3:10H2O
NaVO3	-5.57	-1.72	3.86	NaVO3
Nesquehonite	-3.45	-8.12	-4.67	MgCO3:3H2O
Ni(OH)2	-5.43	7.37	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.89	-10.19	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.30	11.70	32.00	Ni4(OH)6SO4
NiCO3	-7.41	-14.28	-6.87	NiCO3
NiMoO4	-2.82	-13.96	-11.14	NiMoO4
NiS(alpha)	-73.32	-78.92	-5.60	NiS
NiS(beta)	-67.82	-78.92	-11.10	NiS
NiS(gamma)	-66.12	-78.92	-12.80	NiS
NiSe	-21.22	-38.92	-17.70	NiSe
NiSeO3:2H2O	-9.96	-7.14	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.39	-17.91	-1.52	NiSeO4:6H2O
Nsutite	-5.89	11.62	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.40	-304.47	-61.07	As2S3
Otavite	-2.47	-14.47	-12.00	CdCO3
Pb(BO2)2	-8.70	-2.18	6.52	Pb(BO2)2
Pb(OH)2	-2.44	5.71	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.02	-72.78	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.40	1.39	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.77	11.42	26.19	Pb2O(OH)2
Pb2O3	-24.07	36.97	61.04	Pb2O3
Pb2OCO3	-9.67	-10.23	-0.56	Pb2OCO3
Pb2V2O7	-2.73	-4.63	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.96	-15.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.06	1.08	6.14	Pb3(VO4)2
Pb3O2CO3	-15.53	-4.51	11.02	Pb3O2CO3
Pb3O2SO4	-11.33	-0.64	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.03	5.07	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.81	5.07	21.88	Pb4O3SO4
PbCrO4	-11.93	-24.53	-12.60	PbCrO4
PbF2	-10.52	-17.96	-7.44	PbF2
Pbmetal	-24.08	-19.83	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.27	5.71	12.98	PbO:0.33H2O
PbSeO4	-12.72	-19.56	-6.84	PbSeO4
Periclase	-8.05	13.53	21.58	MgO
Phosgenite	-10.47	-30.28	-19.81	PbCl2:PbCO3
Plattnerite	-18.34	31.26	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.77	11.42	15.19	Mn(OH)2
Pyrolusite	-4.41	36.97	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-8.37	-10.41	-2.04	NiSO4:6H2O
Rhodochrosite	0.35	-10.23	-10.58	MnCO3

Rutherfordine	-4.94	-19.44	-14.50	UO2CO3
Sb(OH)3	-12.08	-19.19	-7.11	Sb(OH)3
Sb2O4	-16.24	-12.83	3.40	Sb2O4
Sb2O5	-26.24	-35.91	-9.67	Sb2O5
Sb2Se3	-109.48	-177.23	-67.76	Sb2Se3
Sb4O6(cubic)	-58.49	-76.76	-18.26	Sb4O6
Sb4O6(orth)	-58.85	-76.76	-17.90	Sb4O6
SbCl3	-49.85	-49.27	0.57	SbCl3
SbF3	-44.46	-54.69	-10.23	SbF3
Sbmetal	-45.82	-57.51	-11.69	Sb
SbO2	-2.90	-30.73	-27.82	SbO2
Schoepite	-3.79	2.20	5.99	UO2(OH)2·H2O
Semetal(am)	-13.63	-20.74	-7.11	Se
Semetal(hex)	-13.03	-20.74	-7.71	Se
Senarmontite	-26.01	-38.38	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.27	21.04	SeO3
Siderite	-7.95	-18.19	-10.24	FeCO3
Smithsonite	-1.18	-11.18	-10.00	ZnCO3
Sphalerite	-64.38	-75.83	-11.45	ZnS
Spinel	-4.58	32.26	36.85	MgAl2O4
Stibnite	-246.80	-297.26	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.48	-5.16	0.32	Na2SO4
Thermonatrite	-9.67	-9.03	0.64	Na2CO3·H2O
Tyuyamunite	-2.56	1.52	4.08	Ca(UO2)2(VO4)2
U3O8	-12.37	8.72	21.08	U3O8
U3Sb4	-578.05	-425.67	152.38	U3Sb4
U4O9	-27.93	-30.95	-3.02	U4O9
UF4	-31.92	-61.46	-29.54	UF4
UF4·2.5H2O	-28.74	-61.46	-32.72	UF4·2.5H2O
UO2(am)	-15.06	-14.12	0.93	UO2
UO2(NO3)2	-41.45	-29.30	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-34.15	-29.30	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-32.69	-29.30	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-31.35	-29.31	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-3.41	2.20	5.61	UO2(OH)2
UO2SeO4·4H2O	-20.82	-23.07	-2.25	UO2SeO4·4H2O
UO3	-5.50	2.20	7.70	UO3
Uraninite	-9.46	-14.12	-4.67	UO2
USb2	-219.02	-189.44	29.58	USb2
V(OH)3	-18.56	-10.97	7.59	V(OH)3
V2O5	-14.69	-16.05	-1.36	V2O5
V3O5	-39.07	-37.23	1.84	V3O5
V4O7	-48.31	-41.13	7.19	V4O7
V6O13	-38.39	-99.25	-60.86	V6O13
Valentinite	-29.90	-38.38	-8.48	Sb2O3
VC12	-62.68	-43.80	18.87	VC12
VC13	-64.49	-41.06	23.43	VC13
VF4	-66.16	-51.23	14.93	VF4
Vmetal	-93.31	-49.29	44.03	V
VO	-38.50	-23.74	14.76	VO
VO(OH)2	-9.05	-3.90	5.15	VO(OH)2
VO2Cl	-20.90	-18.05	2.84	VO2Cl
VOC1	-32.15	-21.00	11.15	VOC1
VOC12	-36.71	-23.95	12.76	VOC12
VOSO4	-25.28	-21.67	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.88	-75.83	-8.95	ZnS
Zincite	-0.87	10.47	11.33	ZnO
Zincosite	-11.24	-7.31	3.93	ZnSO4
Zn(BO2)2	-5.71	2.58	8.29	Zn(BO2)2
Zn(NO3)2·6H2O	-24.36	-21.04	3.32	Zn(NO3)2·6H2O
Zn(OH)2	-1.73	10.47	12.20	Zn(OH)2
Zn(OH)2(am)	-2.01	10.47	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.29	10.47	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.07	10.47	11.53	Zn(OH)2

Zn(OH)2 (gamma)	-1.27	10.47	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.34	3.16	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.28	10.91	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-14.54	-0.89	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-23.06	-4.14	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.30	24.10	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.22	32.28	38.50	Zn5(OH)8Cl2
ZnCl2	-16.64	-9.59	7.05	ZnCl2
ZnCO3·1H2O	-0.92	-11.18	-10.26	ZnCO3·1H2O
ZnF2	-12.66	-13.20	-0.53	ZnF2
Znmetal	-40.86	-15.08	25.79	Zn
ZnMoO4	-0.74	-10.86	-10.13	ZnMoO4
ZnO(active)	-0.72	10.47	11.19	ZnO
ZnS(am)	-66.77	-75.83	-9.05	ZnS
ZnSb	-83.60	-72.58	11.01	ZnSb
ZnSe	-21.42	-35.82	-14.40	ZnSe
ZnSeO4·6H2O	-13.29	-14.81	-1.52	ZnSeO4·6H2O
ZnSO4·1H2O	-6.67	-7.31	-0.64	ZnSO4·1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 27.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 102
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 102
USE Surface 102
USE Solution 107
SAVE Solution 108  #Initial Stage 1 Run-off Water After Mineral
Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 102.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

-1.073e-19  Surface + diffuse layer charge, eq
 1.987e-07  Surface charge, eq
 4.399e-03  sigma, C/m²
 1.213e-01  psi, V
-4.722e+00  -F*psi/RT
 8.900e-03  exp(-F*psi/RT)
 6.420e+04  specific area, m²/mol Ferrihydrite
 4.359e+00  m² for 6.790e-05 moles of Ferrihydrite

```

Water in diffuse layer: 4.359e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.
Donnan Layer potential, $\psi_{DL} = 7.042e-02$ V.
Boltzmann factor, $\exp(-\psi_{DL} * F / RT) = 6.451e-02$ ($= c_{DL} / c_{free}$ if z is +1).

Element	Moles
C	1.1137e-10
Ca	1.3802e-12
Cl	2.2301e-09
H	3.2852e-10
K	2.1895e-12
Mg	2.1384e-13
N	9.0284e-09
Na	9.2767e-12
O	4.0241e-07
S	9.3766e-08

Hfo_s
3.395e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	2.270e-07	0.668	2.270e-07	-6.644
Hfo_sOH	1.113e-07	0.328	1.113e-07	-6.953
Hfo_sO-	1.251e-09	0.004	1.251e-09	-8.903
Hfo_sOHCa+2	4.143e-12	0.000	4.143e-12	-11.383

Hfo_w
1.358e-05 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	6.275e-06	0.462	6.275e-06	-5.202
Hfo_wOH	3.078e-06	0.227	3.078e-06	-5.512
Hfo_wSO4-	2.119e-06	0.156	2.119e-06	-5.674
Hfo_wOHSO4-2	2.074e-06	0.153	2.074e-06	-5.683
Hfo_wO-	3.458e-08	0.003	3.458e-08	-7.461
Hfo_wOMg+	4.887e-14	0.000	4.887e-14	-13.311
Hfo_wOCa+	1.658e-14	0.000	1.658e-14	-13.780

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 107. Solution after simulation 26.
Using surface 102.
Using pure phase assemblage 102. Pure-phase assemblage after simulation 26.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	9.490e-05	9.490e-05	1.469e-11
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	8.520e-08	1.134e-08	-7.386e-08
Barite	0.00	-9.98	-9.98	3.522e-05	3.544e-05	2.216e-07
Brochantite	0.00	15.22	15.22	1.718e-04	1.710e-04	-8.241e-07
Brucite	-3.32	13.53	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.014e+01	1.014e+01	6.623e-06
CaMoO4	-0.21	-8.16	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.24	-1.43	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	5.768e-02	5.767e-02	-1.102e-05
Carnotite	0.00	0.23	0.23	2.672e-06	1.170e-06	-1.502e-06
Cd(BO2)2	-10.55	-0.71	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	2.844e-07	2.843e-07	-9.993e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	2.316e-08	1.454e-08	-8.618e-09
Cu2Se (alpha)	-4.23	-50.03	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.00	-13.08	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.13	-4.25	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	6.790e-05	6.790e-05	-1.241e-13
Fluorite	0.00	-10.50	-10.50	4.628e-03	4.628e-03	8.428e-09
Gummite	-4.89	2.78	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	1.711e-02	1.712e-02	9.817e-06
HgSe	-1.26	-56.95	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.05	-5.17	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.30	-3.17	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.43	7.36	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.92	-10.22	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.42	-14.29	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.83	-13.97	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	4.753e-09
Otavite	-2.47	-14.47	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	8.558e-07	8.376e-07	-1.822e-08
Rutherfordine	-4.36	-18.86	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.90	-30.73	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.21	2.78	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2(am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-2.56	1.52	4.08	0.000e+00	0	0.000e+00
U3O8	-10.63	10.46	21.08	0.000e+00	0	0.000e+00
UO2(OH)2 (beta)	-2.83	2.78	5.61	0.000e+00	0	0.000e+00
UO3	-4.92	2.78	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.76	-10.88	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-6.016e-22 Surface + diffuse layer charge, eq
1.260e-06 Surface charge, eq
2.788e-02 sigma, C/m²
3.028e-02 psi, V
-1.179e+00 -F*psi/RT
3.077e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
4.359e+00 m² for 6.790e-05 moles of Ferrihydrite

Water in diffuse layer: 4.359e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.
Donnan Layer potential, psi_DL = 2.503e-03 V.

Boltzmann factor, $\exp(-\psi_{DL} * F / RT) = 9.072e-01$ (= c_{DL} / c_{free} if z is +1).

Element	Moles
Al	2.6245e-10
As	1.0753e-13
B	5.2584e-09
Ba	9.0849e-13
C	2.9611e-08
Ca	4.6095e-07
Cd	9.0294e-13
Cl	5.0678e-07
Co	4.5819e-12
Cr	6.2502e-14
Cu	2.0593e-11
F	1.1596e-08
Fe	4.4771e-14
H	4.5443e-08
Hg	4.7480e-13
K	7.5565e-07
Mg	9.4662e-07
Mn	1.1145e-08
Mo	5.4185e-10
N	1.0803e-09
Na	1.3352e-06
Ni	6.9479e-13
O	1.1389e-05
Pb	6.3687e-14
S	2.8195e-06
Sb	6.1280e-12
Se	4.0132e-11
U	1.2955e-10
V	1.5237e-12
Zn	1.2564e-09

Hfo_s

3.395e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	1.620e-07	0.477	1.615e-07	-6.792
Hfo_sOCu+	8.164e-08	0.240	8.141e-08	-7.089
Hfo_sOMn+	6.189e-08	0.182	6.171e-08	-7.210
Hfo_sOCrOH+	1.724e-08	0.051	1.718e-08	-7.765
Hfo_sOPb+	1.357e-08	0.040	1.353e-08	-7.869
Hfo_sOHCa+2	2.906e-09	0.009	2.898e-09	-8.538
Hfo_sOH	1.646e-10	0.000	1.641e-10	-9.785
Hfo_sO-	5.396e-11	0.000	5.380e-11	-10.269
Hfo_sONi+	3.183e-11	0.000	3.173e-11	-10.498
Hfo_sOCd+	2.647e-11	0.000	2.639e-11	-10.578
Hfo_sOCu+	2.104e-11	0.000	2.098e-11	-10.678
Hfo_sOH2+	1.151e-11	0.000	1.147e-11	-10.940
Hfo_sOHBa+2	3.814e-14	0.000	3.803e-14	-13.420
Hfo_sOFe+	8.396e-15	0.000	8.372e-15	-14.077
Hfo_sOHg+	1.378e-15	0.000	1.374e-15	-14.862

Hfo_w

1.358e-05 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOMg+	3.857e-06	0.284	3.846e-06	-5.415
Hfo_wOCu+	3.215e-06	0.237	3.205e-06	-5.494
Hfo_wOHVO4-3	1.587e-06	0.117	1.582e-06	-5.801
Hfo_wOZn+	1.302e-06	0.096	1.298e-06	-5.887
Hfo_wOH	1.264e-06	0.093	1.260e-06	-5.900
Hfo_wOHSO4-2	1.016e-06	0.075	1.013e-06	-5.994
Hfo_wO-	4.142e-07	0.031	4.130e-07	-6.384

Hfo_wOMn+	3.774e-07	0.028	3.763e-07	-6.424
Hfo_wOHasO4-3	1.477e-07	0.011	1.473e-07	-6.832
Hfo_wOHSeO3-2	1.474e-07	0.011	1.469e-07	-6.833
Hfo_wOCa+	9.422e-08	0.007	9.394e-08	-7.027
Hfo_wOH2+	8.833e-08	0.007	8.807e-08	-7.055
Hfo_wSO4-	3.567e-08	0.003	3.556e-08	-7.449
Hfo_wSeO3-	1.753e-08	0.001	1.748e-08	-7.757
Hfo_wOHMoO4-2	1.151e-08	0.001	1.148e-08	-7.940
Hfo_wOPb+	4.653e-09	0.000	4.639e-09	-8.334
Hfo_wH2BO3	5.987e-10	0.000	5.970e-10	-9.224
Hfo_wMoO4-	5.208e-10	0.000	5.193e-10	-9.285
Hfo_wOCo+	4.552e-10	0.000	4.539e-10	-9.343
Hfo_wONi+	3.296e-10	0.000	3.286e-10	-9.483
Hfo_wOCd+	8.669e-11	0.000	8.644e-11	-10.063
Hfo_wHAsO4-	1.619e-11	0.000	1.614e-11	-10.792
Hfo_wOHg+	5.180e-13	0.000	5.165e-13	-12.287
Hfo_wOFe+	4.067e-14	0.000	4.055e-14	-13.392
Hfo_wH2AsO4	3.662e-14	0.000	3.651e-14	-13.438
Hfo_wOHSeO4-2	2.723e-14	0.000	2.715e-14	-13.566
Hfo_wOBa+	1.787e-14	0.000	1.782e-14	-13.749
Hfo_wOHSbO(OH) 4-	7.771e-15	0.000	7.749e-15	-14.111
Hfo_wSeO4-	8.327e-16	0.000	8.303e-16	-15.081
Hfo_wOHCrO4-2	4.509e-16	0.000	4.495e-16	-15.347
Hfo_wSbO(OH) 4	3.515e-16	0.000	3.505e-16	-15.455
Hfo_wCrO4-	1.444e-17	0.000	1.440e-17	-16.842
Hfo_wH2AsO3	5.212e-24	0.000	5.197e-24	-23.284

-----Solution composition-----

Elements	Molality	Moles
Al	5.466e-06	5.482e-06
As	2.035e-09	2.041e-09
B	1.200e-04	1.204e-04
Ba	2.532e-08	2.539e-08
C	6.246e-04	6.264e-04
Ca	1.163e-02	1.166e-02
Cd	2.075e-08	2.081e-08
Cl	1.055e-02	1.058e-02
Co	1.201e-07	1.204e-07
Cr	1.550e-09	1.555e-09
Cu	4.920e-07	4.935e-07
F	2.575e-04	2.582e-04
Fe	1.079e-09	1.082e-09
Hg	1.089e-08	1.092e-08
K	1.878e-02	1.884e-02
Mg	2.415e-02	2.422e-02
Mn	2.936e-04	2.945e-04
Mo	1.023e-05	1.026e-05
N	2.252e-05	2.259e-05
Na	3.332e-02	3.342e-02
Ni	1.762e-08	1.767e-08
Pb	1.483e-09	1.488e-09
S	5.640e-02	5.657e-02
Sb	1.275e-07	1.279e-07
Se	7.893e-07	7.916e-07
U	2.032e-06	2.038e-06
V	3.031e-08	3.039e-08
Zn	2.947e-05	2.956e-05

-----Description of solution-----

equilibrium	pH	=	7.934	Charge balance
	pe	=	4.839	Adjusted to redox
	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.451e-01	
	Mass of water (kg)	=	1.003e+00	

Total alkalinity (eq/kg) = 6.746e-04
 Total CO2 (mol/kg) = 6.246e-04
 Temperature (°C) = 25.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 2
 Total H = 1.113399e+02
 Total O = 5.589811e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.177e-06	8.624e-07	-5.929	-6.064	-0.135	(0)
H+	1.530e-08	1.165e-08	-7.815	-7.934	-0.118	0.00
H2O	5.551e+01	9.977e-01	1.744	-0.001	0.000	18.07
Al	5.466e-06					
Al (OH) 4-	5.425e-06	4.075e-06	-5.266	-5.390	-0.124	(0)
Al (OH) 3	3.753e-08	3.753e-08	-7.426	-7.426	0.000	(0)
Al (OH) 2+	2.848e-09	2.181e-09	-8.545	-8.661	-0.116	(0)
AlF3	3.685e-10	3.685e-10	-9.434	-9.434	0.000	(0)
AlF2+	3.038e-10	2.326e-10	-9.517	-9.633	-0.116	(0)
AlF4-	3.093e-11	2.323e-11	-10.510	-10.634	-0.124	(0)
AlF+2	1.351e-11	4.645e-12	-10.869	-11.333	-0.464	(0)
AlOH+2	9.262e-12	3.184e-12	-11.033	-11.497	-0.464	(0)
AlSO4+	4.710e-13	3.537e-13	-12.327	-12.451	-0.124	(0)
Al (SO4) 2-	6.229e-14	4.679e-14	-13.206	-13.330	-0.124	(0)
Al+3	4.301e-14	3.692e-15	-13.366	-14.433	-1.066	(0)
AlMo6O21-3	8.396e-39	1.498e-40	-38.076	-39.824	-1.748	(0)
As (3)	1.711e-23					
H3AsO3	1.601e-23	1.601e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.102e-24	7.047e-25	-23.958	-24.152	-0.194	(0)
HAsO3-2	3.302e-28	5.517e-29	-27.481	-28.258	-0.777	(0)
H4AsO3+	1.445e-31	9.238e-32	-30.840	-31.034	-0.194	(0)
AsO3-3	1.023e-32	1.826e-34	-31.990	-33.739	-1.748	(0)
As (5)	2.035e-09					
HAsO4-2	1.975e-09	3.299e-10	-8.704	-9.482	-0.777	(0)
H2AsO4-	5.483e-11	3.505e-11	-10.261	-10.455	-0.194	(0)
AsO4-3	5.019e-12	8.957e-14	-11.299	-13.048	-1.748	(0)
H3AsO4	6.863e-17	7.096e-17	-16.163	-16.149	0.015	(0)
B	1.200e-04					
H3BO3	1.097e-04	1.134e-04	-3.960	-3.945	0.015	(0)
H2BO3-	7.948e-06	5.653e-06	-5.100	-5.248	-0.148	(0)
MgH2BO3+	1.267e-06	9.015e-07	-5.897	-6.045	-0.148	(0)
CaH2BO3+	9.137e-07	6.499e-07	-6.039	-6.187	-0.148	(0)
NaH2BO3	2.131e-07	2.131e-07	-6.671	-6.671	0.000	(0)
BF (OH) 3-	8.003e-09	5.692e-09	-8.097	-8.245	-0.148	(0)
H5 (BO3) 2-	7.670e-10	5.455e-10	-9.115	-9.263	-0.148	(0)
H8 (BO3) 3-	8.696e-12	6.185e-12	-11.061	-11.209	-0.148	(0)
BaH2BO3+	2.084e-12	1.482e-12	-11.681	-11.829	-0.148	(0)
BF2 (OH) 2-	1.257e-12	8.938e-13	-11.901	-12.049	-0.148	(0)
BF3OH-	7.182e-19	5.108e-19	-18.144	-18.292	-0.148	(0)
BF4-	5.191e-24	3.692e-24	-23.285	-23.433	-0.148	(0)
Ba	2.532e-08					
Ba+2	2.526e-08	8.483e-09	-7.597	-8.071	-0.474	(0)
BaHCO3+	4.308e-11	3.336e-11	-10.366	-10.477	-0.111	(0)
BaCO3	7.211e-12	7.211e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	2.084e-12	1.482e-12	-11.681	-11.829	-0.148	(0)
BaOH+	4.205e-14	3.194e-14	-13.376	-13.496	-0.120	(0)
BaNO3+	1.008e-15	6.443e-16	-14.997	-15.191	-0.194	(0)
BaNH3+2	2.545e-16	4.252e-17	-15.594	-16.371	-0.777	(0)
C (4)	6.246e-04					
HCO3-	5.378e-04	4.118e-04	-3.269	-3.385	-0.116	(0)
MgHCO3+	2.611e-05	1.938e-05	-4.583	-4.713	-0.129	(0)
CaHCO3+	1.978e-05	1.532e-05	-4.704	-4.815	-0.111	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
MgCO3	6.340e-06	6.340e-06	-5.198	-5.198	0.000	(0)

		NaHCO ₃	5.509e-06	5.509e-06	-5.259	-5.259	0.000	(0)
		CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CO ₃ -2	4.936e-06	1.657e-06	-5.307	-5.781	-0.474	(0)
		UO ₂ (CO ₃) 3-4	1.923e-06	1.499e-09	-5.716	-8.824	-3.108	(0)
		NaCO ₃ -	9.588e-07	7.342e-07	-6.018	-6.134	-0.116	(0)
		MnHCO ₃ +	3.868e-07	2.938e-07	-6.413	-6.532	-0.120	(0)
		ZnCO ₃	3.635e-07	3.635e-07	-6.440	-6.440	0.000	(0)
		CuCO ₃	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
		UO ₂ (CO ₃) 2-2	1.080e-07	1.804e-08	-6.967	-7.744	-0.777	(0)
		ZnHCO ₃ +	7.763e-08	4.963e-08	-7.110	-7.304	-0.194	(0)
		Cu (CO ₃) 2-2	6.302e-09	1.053e-09	-8.201	-8.978	-0.777	(0)
		CuHCO ₃ +	9.830e-10	6.285e-10	-9.007	-9.202	-0.194	(0)
		CoHCO ₃ +	6.991e-10	4.470e-10	-9.155	-9.350	-0.194	(0)
		UO ₂ CO ₃	5.457e-10	5.457e-10	-9.263	-9.263	0.000	(0)
		CoCO ₃	3.909e-10	3.909e-10	-9.408	-9.408	0.000	(0)
		PbCO ₃	3.480e-10	3.480e-10	-9.458	-9.458	0.000	(0)
		NiHCO ₃ +	2.479e-10	1.585e-10	-9.606	-9.800	-0.194	(0)
		NiCO ₃	1.931e-10	1.931e-10	-9.714	-9.714	0.000	(0)
		CdCO ₃	7.792e-11	7.792e-11	-10.108	-10.108	0.000	(0)
		BaHCO ₃ +	4.308e-11	3.336e-11	-10.366	-10.477	-0.111	(0)
		PbHCO ₃ +	3.343e-11	2.137e-11	-10.476	-10.670	-0.194	(0)
		Pb (CO ₃) 2-2	9.955e-12	1.663e-12	-11.002	-11.779	-0.777	(0)
		BaCO ₃	7.211e-12	7.211e-12	-11.142	-11.142	0.000	(0)
		CdHCO ₃ +	3.025e-12	1.934e-12	-11.519	-11.714	-0.194	(0)
		Cd (CO ₃) 2-2	5.730e-13	9.574e-14	-12.242	-13.019	-0.777	(0)
		HgCO ₃	1.102e-14	1.102e-14	-13.958	-13.958	0.000	(0)
		FeHCO ₃ +	2.579e-15	1.997e-15	-14.589	-14.700	-0.111	(0)
		Hg (CO ₃) 2-2	3.457e-16	5.776e-17	-15.461	-16.238	-0.777	(0)
		HgHCO ₃ +	3.739e-18	2.390e-18	-17.427	-17.622	-0.194	(0)
Ca	1.163e-02							
		Ca+2	5.950e-03	1.998e-03	-2.225	-2.699	-0.474	(0)
		CaSO ₄	5.650e-03	5.650e-03	-2.248	-2.248	0.000	(0)
		CaHCO ₃ +	1.978e-05	1.532e-05	-4.704	-4.815	-0.111	(0)
		CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.612e-06	2.743e-06	-5.442	-5.562	-0.120	(0)
		CaH ₂ BO ₃ +	9.137e-07	6.499e-07	-6.039	-6.187	-0.148	(0)
		CaOH+	4.439e-08	3.438e-08	-7.353	-7.464	-0.111	(0)
		CaNO ₃ +	1.498e-10	9.574e-11	-9.825	-10.019	-0.194	(0)
		CaNH ₃ +2	1.196e-10	1.998e-11	-9.922	-10.699	-0.777	(0)
		Ca (NH ₃) 2+2	3.781e-19	6.318e-20	-18.422	-19.199	-0.777	(0)
Cd	2.075e-08							
		Cd+2	6.143e-09	2.063e-09	-8.212	-8.686	-0.474	(0)
		CdSO ₄	5.969e-09	5.969e-09	-8.224	-8.224	0.000	(0)
		Cd (SO ₄) 2-2	5.948e-09	9.938e-10	-8.226	-9.003	-0.777	(0)
		CdCl+	2.473e-09	1.581e-09	-8.607	-8.801	-0.194	(0)
		CdCO ₃	7.792e-11	7.792e-11	-10.108	-10.108	0.000	(0)
		CdOHC1	5.594e-11	5.594e-11	-10.252	-10.252	0.000	(0)
		CdC12	5.292e-11	5.292e-11	-10.276	-10.276	0.000	(0)
		CdOH+	2.210e-11	1.413e-11	-10.656	-10.850	-0.194	(0)
		CdF+	6.433e-12	4.113e-12	-11.192	-11.386	-0.194	(0)
		CdHCO ₃ +	3.025e-12	1.934e-12	-11.519	-11.714	-0.194	(0)
		Cd (CO ₃) 2-2	5.730e-13	9.574e-14	-12.242	-13.019	-0.777	(0)
		CdCl ₃ -	4.192e-13	2.680e-13	-12.378	-12.572	-0.194	(0)
		Cd (OH) 2	7.689e-14	7.689e-14	-13.114	-13.114	0.000	(0)
		CdF ₂	1.032e-15	1.032e-15	-14.986	-14.986	0.000	(0)
		CdNO ₃ +	1.546e-16	9.885e-17	-15.811	-16.005	-0.194	(0)
		CdSeO ₄	1.242e-16	1.242e-16	-15.906	-15.906	0.000	(0)
		Cd (SeO ₃) 2-2	5.669e-17	9.471e-18	-16.247	-17.024	-0.777	(0)
		Cd ₂ OH+3	8.185e-18	1.461e-19	-17.087	-18.835	-1.748	(0)
		Cd (OH) 3-	6.336e-18	4.051e-18	-17.198	-17.392	-0.194	(0)
		Cd (OH) 4-2	3.422e-24	5.718e-25	-23.466	-24.243	-0.777	(0)
		Cd (NO ₃) 2	7.507e-25	7.507e-25	-24.125	-24.125	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.844	-79.039	-0.194	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.196	-150.196	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.463	-226.657	-0.194	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.045	-302.822	-0.777	(0)
Cl	1.055e-02							
		Cl-	1.055e-02	8.027e-03	-1.977	-2.095	-0.118	(0)

MnCl+	4.757e-07	3.613e-07	-6.323	-6.442	-0.120	(0)
ZnCl+	1.035e-07	7.685e-08	-6.985	-7.114	-0.129	(0)
ZnOHCl	8.677e-08	8.677e-08	-7.062	-7.062	0.000	(0)
MnCl2	4.097e-09	4.097e-09	-8.388	-8.388	0.000	(0)
CuCl2-	3.918e-09	2.908e-09	-8.407	-8.536	-0.129	(0)
CdCl+	2.473e-09	1.581e-09	-8.607	-8.801	-0.194	(0)
CuCl	1.734e-09	1.734e-09	-8.761	-8.761	0.000	(0)
ZnCl2	9.778e-10	9.778e-10	-9.010	-9.010	0.000	(0)
CoCl+	6.061e-10	3.875e-10	-9.217	-9.412	-0.194	(0)
CuCl+	4.146e-10	3.077e-10	-9.382	-9.512	-0.129	(0)
NiCl+	1.003e-10	6.413e-11	-9.999	-10.193	-0.194	(0)
HgClOH	6.793e-11	6.793e-11	-10.168	-10.168	0.000	(0)
CdOHCl	5.594e-11	5.594e-11	-10.252	-10.252	0.000	(0)
CdCl2	5.292e-11	5.292e-11	-10.276	-10.276	0.000	(0)
HgCl2	3.580e-11	3.580e-11	-10.446	-10.446	0.000	(0)
PbCl+	3.112e-11	1.989e-11	-10.507	-10.701	-0.194	(0)
CuCl3-2	1.500e-11	4.991e-12	-10.824	-11.302	-0.478	(0)
MnCl3-	1.193e-11	9.058e-12	-10.923	-11.043	-0.120	(0)
ZnCl3-	8.400e-12	6.235e-12	-11.076	-11.205	-0.129	(0)
HgCl3-	4.495e-12	2.874e-12	-11.347	-11.542	-0.194	(0)
CuCl2	8.565e-13	8.565e-13	-12.067	-12.067	0.000	(0)
PbCl2	7.134e-13	7.134e-13	-12.147	-12.147	0.000	(0)
HgCl4-2	5.497e-13	9.185e-14	-12.260	-13.037	-0.777	(0)
CdCl3-	4.192e-13	2.680e-13	-12.378	-12.572	-0.194	(0)
ZnCl4-2	7.524e-14	2.503e-14	-13.124	-13.602	-0.478	(0)
PbCl3-	3.566e-15	2.280e-15	-14.448	-14.642	-0.194	(0)
NiCl2	2.592e-15	2.592e-15	-14.586	-14.586	0.000	(0)
UO2Cl+	1.684e-15	1.077e-15	-14.774	-14.968	-0.194	(0)
HgCl+	1.392e-15	8.899e-16	-14.856	-15.051	-0.194	(0)
CuCl3-	8.646e-17	6.417e-17	-16.063	-16.193	-0.129	(0)
PbCl4-2	5.007e-17	8.365e-18	-16.300	-17.078	-0.777	(0)
CrCl+2	2.421e-17	4.045e-18	-16.616	-17.393	-0.777	(0)
CrOHCl2	5.323e-19	5.323e-19	-18.274	-18.274	0.000	(0)
CuCl4-2	7.761e-21	2.582e-21	-20.110	-20.588	-0.478	(0)
CrCl2+	4.819e-21	3.081e-21	-20.317	-20.511	-0.194	(0)
FeCl+2	1.801e-21	5.991e-22	-20.745	-21.223	-0.478	(0)
VOCl+	1.603e-22	1.025e-22	-21.795	-21.989	-0.194	(0)
FeCl2+	2.828e-23	2.148e-23	-22.548	-22.668	-0.120	(0)
CrO3Cl-	1.478e-25	9.450e-26	-24.830	-25.025	-0.194	(0)
FeCl3	1.724e-26	1.724e-26	-25.763	-25.763	0.000	(0)
CoCl+2	3.749e-35	6.264e-36	-34.426	-35.203	-0.777	(0)
UCl+3	0.000e+00	0.000e+00	-43.925	-45.673	-1.748	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.973	-49.750	-0.777	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.226	-52.003	-0.777	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.788	-64.566	-0.777	(0)
Co (2)	1.201e-07					
Co+2	8.351e-08	1.395e-08	-7.078	-7.855	-0.777	(0)
CoSO4	3.436e-08	3.436e-08	-7.464	-7.464	0.000	(0)
CoHCO3+	6.991e-10	4.470e-10	-9.155	-9.350	-0.194	(0)
CoCl+	6.061e-10	3.875e-10	-9.217	-9.412	-0.194	(0)
CoCO3	3.909e-10	3.909e-10	-9.408	-9.408	0.000	(0)
CoOH+	3.755e-10	2.401e-10	-9.425	-9.620	-0.194	(0)
CoF+	8.682e-11	5.551e-11	-10.061	-10.256	-0.194	(0)
Co (OH) 2	1.645e-11	1.645e-11	-10.784	-10.784	0.000	(0)
CoNO2+	2.470e-12	1.579e-12	-11.607	-11.802	-0.194	(0)
Co (NH3) +2	7.975e-14	1.332e-14	-13.098	-13.875	-0.777	(0)
CoSeO4	2.261e-15	2.261e-15	-14.646	-14.646	0.000	(0)
CoNO3+	5.241e-16	3.351e-16	-15.281	-15.475	-0.194	(0)
Co (OH) 3-	4.426e-16	2.830e-16	-15.354	-15.548	-0.194	(0)
CoOOH-	1.113e-16	7.117e-17	-15.953	-16.148	-0.194	(0)
Co2OH+3	9.407e-18	1.679e-19	-17.027	-18.775	-1.748	(0)
Co (NH3) 2+2	2.702e-20	4.515e-21	-19.568	-20.345	-0.777	(0)
Co (OH) 4-2	2.315e-22	3.868e-23	-21.635	-22.413	-0.777	(0)
Co (NO3) 2	1.033e-23	1.033e-23	-22.986	-22.986	0.000	(0)
Co (NH3) 3+2	2.702e-27	4.515e-28	-26.568	-27.345	-0.777	(0)
Co4 (OH) 4+4	8.507e-28	6.629e-31	-27.070	-30.179	-3.108	(0)
Co (NH3) 4+2	1.127e-34	1.882e-35	-33.948	-34.725	-0.777	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.828	-42.605	-0.777	(0)

Co (3)	1.006e-28					
CoOH+2	1.006e-28	1.681e-29	-27.997	-28.774	-0.777	(0)
Co+3	4.468e-35	3.835e-36	-34.350	-35.416	-1.066	(0)
CoCl+2	3.749e-35	6.264e-36	-34.426	-35.203	-0.777	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.973	-49.750	-0.777	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.259	-59.453	-0.194	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.557	-64.334	-0.777	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.788	-64.566	-0.777	(0)
Cr (2)	8.063e-27					
Cr+2	8.063e-27	1.347e-27	-26.093	-26.871	-0.777	(0)
Cr (3)	1.550e-09					
Cr (OH) 2+	1.206e-09	7.709e-10	-8.919	-9.113	-0.194	(0)
Cr (OH) 3	2.497e-10	2.497e-10	-9.603	-9.603	0.000	(0)
Cr (OH) +2	4.397e-11	7.346e-12	-10.357	-11.134	-0.777	(0)
CrOHSO4	2.152e-11	2.152e-11	-10.667	-10.667	0.000	(0)
CrO2-	1.596e-11	1.020e-11	-10.797	-10.991	-0.194	(0)
Cr (OH) 4-	1.341e-11	8.574e-12	-10.873	-11.067	-0.194	(0)
CrF+2	4.647e-14	7.764e-15	-13.333	-14.110	-0.777	(0)
Cr+3	2.182e-14	3.894e-16	-13.661	-15.410	-1.748	(0)
CrSO4+	1.755e-14	1.122e-14	-13.756	-13.950	-0.194	(0)
CrCl+2	2.421e-17	4.045e-18	-16.616	-17.393	-0.777	(0)
CrOHC12	5.323e-19	5.323e-19	-18.274	-18.274	0.000	(0)
Cr2 (OH) 2SO4+2	8.552e-20	1.429e-20	-19.068	-19.845	-0.777	(0)
Cr2 (OH) 2 (SO4) 2	1.048e-20	1.048e-20	-19.980	-19.980	0.000	(0)
CrCl2+	4.819e-21	3.081e-21	-20.317	-20.511	-0.194	(0)
CrNO3+2	1.544e-24	2.579e-25	-23.811	-24.589	-0.777	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.825	-41.602	-0.777	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.261	-51.010	-1.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.226	-52.003	-0.777	(0)
Cr (6)	1.403e-14					
CrO4-2	1.266e-14	4.253e-15	-13.897	-14.371	-0.474	(0)
NaCrO4-	7.863e-16	5.027e-16	-15.104	-15.299	-0.194	(0)
KCrO4-	3.251e-16	2.079e-16	-15.488	-15.682	-0.194	(0)
HCrO4-	2.507e-16	1.603e-16	-15.601	-15.795	-0.194	(0)
CrO3SO4-2	4.212e-23	7.037e-24	-22.376	-23.153	-0.777	(0)
H2CrO4	1.514e-24	1.514e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	1.478e-25	9.450e-26	-24.830	-25.025	-0.194	(0)
Cr2O7-2	5.346e-30	8.931e-31	-29.272	-30.049	-0.777	(0)
Cu (1)	5.935e-09					
CuCl2-	3.918e-09	2.908e-09	-8.407	-8.536	-0.129	(0)
CuCl	1.734e-09	1.734e-09	-8.761	-8.761	0.000	(0)
Cu+	2.684e-10	1.716e-10	-9.571	-9.766	-0.194	(0)
CuCl3-2	1.500e-11	4.991e-12	-10.824	-11.302	-0.478	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.779	-147.230	-0.451	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.537	-147.960	-0.424	(0)
Cu (2)	4.861e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	8.887e-08	6.596e-08	-7.051	-7.181	-0.129	(0)
Cu+2	7.203e-08	2.419e-08	-7.142	-7.616	-0.474	(0)
CuSO4	6.839e-08	6.839e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	6.302e-09	1.053e-09	-8.201	-8.978	-0.777	(0)
CuHCO3+	9.830e-10	6.285e-10	-9.007	-9.202	-0.194	(0)
Cu2 (OH) 2+2	6.541e-10	1.093e-10	-9.184	-9.961	-0.777	(0)
CuCl+	4.146e-10	3.077e-10	-9.382	-9.512	-0.129	(0)
CuF+	3.003e-10	1.920e-10	-9.522	-9.717	-0.194	(0)
CuNO2+	6.363e-11	4.068e-11	-10.196	-10.391	-0.194	(0)
Cu (OH) 3-	3.140e-11	2.008e-11	-10.503	-10.697	-0.194	(0)
CuNH3+2	1.177e-11	1.966e-12	-10.929	-11.706	-0.777	(0)
CuCl2	8.565e-13	8.565e-13	-12.067	-12.067	0.000	(0)
Cu (NO2) 2	6.687e-15	6.687e-15	-14.175	-14.175	0.000	(0)
CuNO3+	1.813e-15	1.159e-15	-14.742	-14.936	-0.194	(0)
Cu (OH) 4-2	8.156e-16	1.363e-16	-15.089	-15.866	-0.777	(0)
CuCl3-	8.646e-17	6.417e-17	-16.063	-16.193	-0.129	(0)
CuCl4-2	7.761e-21	2.582e-21	-20.110	-20.588	-0.478	(0)
Cu (NO3) 2	2.211e-24	2.211e-24	-23.655	-23.655	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.606	-216.801	-0.194	(0)
F	2.575e-04					

F-	1.653e-04	1.258e-04	-3.782	-3.900	-0.118	(0)
MgF+	8.644e-05	6.492e-05	-4.063	-4.188	-0.124	(0)
CaF+	3.612e-06	2.743e-06	-5.442	-5.562	-0.120	(0)
NaF	1.888e-06	1.888e-06	-5.724	-5.724	0.000	(0)
MnF+	2.358e-07	1.791e-07	-6.628	-6.747	-0.120	(0)
ZnF+	1.496e-08	9.567e-09	-7.825	-8.019	-0.194	(0)
BF (OH) 3-	8.003e-09	5.692e-09	-8.097	-8.245	-0.148	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	3.685e-10	3.685e-10	-9.434	-9.434	0.000	(0)
AlF2+	3.038e-10	2.326e-10	-9.517	-9.633	-0.116	(0)
CuF+	3.003e-10	1.920e-10	-9.522	-9.717	-0.194	(0)
CoF+	8.682e-11	5.551e-11	-10.061	-10.256	-0.194	(0)
AlF4-	3.093e-11	2.323e-11	-10.510	-10.634	-0.124	(0)
NiF+	1.543e-11	9.867e-12	-10.812	-11.006	-0.194	(0)
AlF+2	1.351e-11	4.645e-12	-10.869	-11.333	-0.464	(0)
CdF+	6.433e-12	4.113e-12	-11.192	-11.386	-0.194	(0)
UO2F+	2.246e-12	1.436e-12	-11.649	-11.843	-0.194	(0)
HF2-	1.415e-12	1.037e-12	-11.849	-11.984	-0.135	(0)
BF2 (OH) 2-	1.257e-12	8.938e-13	-11.901	-12.049	-0.148	(0)
PbF+	9.686e-13	6.192e-13	-12.014	-12.208	-0.194	(0)
UO2F2	5.211e-13	5.211e-13	-12.283	-12.283	0.000	(0)
CrF+2	4.647e-14	7.764e-15	-13.333	-14.110	-0.777	(0)
UO2F3-	2.576e-14	1.647e-14	-13.589	-13.783	-0.194	(0)
PbF2	1.533e-15	1.533e-15	-14.814	-14.814	0.000	(0)
CdF2	1.032e-15	1.032e-15	-14.986	-14.986	0.000	(0)
UO2F4-2	9.850e-17	1.646e-17	-16.007	-16.784	-0.777	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	6.371e-18	6.371e-18	-17.196	-17.196	0.000	(0)
FeF2+	1.511e-18	1.148e-18	-17.821	-17.940	-0.120	(0)
FeF+2	1.025e-18	3.409e-19	-17.989	-18.467	-0.478	(0)
BF3OH-	7.182e-19	5.108e-19	-18.144	-18.292	-0.148	(0)
PbF3-	5.722e-19	3.658e-19	-18.242	-18.437	-0.194	(0)
VO2F2-	4.552e-19	2.910e-19	-18.342	-18.536	-0.194	(0)
FeF3	2.037e-19	2.037e-19	-18.691	-18.691	0.000	(0)
VOF+	5.369e-21	3.433e-21	-20.270	-20.464	-0.194	(0)
VO2F3-2	2.733e-21	4.567e-22	-20.563	-21.340	-0.777	(0)
VOF2	1.619e-22	1.619e-22	-21.791	-21.791	0.000	(0)
PbF4-2	1.318e-22	2.203e-23	-21.880	-22.657	-0.777	(0)
HgF+	4.053e-23	2.591e-23	-22.392	-22.587	-0.194	(0)
BF4-	5.191e-24	3.692e-24	-23.285	-23.433	-0.148	(0)
VO2F4-3	1.584e-24	2.827e-26	-23.800	-25.549	-1.748	(0)
VOF3-	1.131e-24	7.229e-25	-23.947	-24.141	-0.194	(0)
Sb (OH) 2F	1.480e-25	1.480e-25	-24.830	-24.830	0.000	(0)
SbOF	1.459e-25	1.459e-25	-24.836	-24.836	0.000	(0)
VOF4-2	2.197e-27	3.671e-28	-26.658	-27.435	-0.777	(0)
UF3+	6.543e-36	4.183e-36	-35.184	-35.378	-0.194	(0)
UF2+2	1.256e-36	2.098e-37	-35.901	-36.678	-0.777	(0)
UF4	5.771e-38	5.771e-38	-37.239	-37.239	0.000	(0)
UF+3	7.422e-39	1.325e-40	-38.129	-39.878	-1.748	(0)
UF5-	4.500e-40	2.877e-40	-39.347	-39.541	-0.194	(0)
UF6-2	0.000e+00	0.000e+00	-40.184	-40.961	-0.777	(0)
Fe (2)	3.493e-12					
Fe+2	2.306e-12	3.853e-13	-11.637	-12.414	-0.777	(0)
FeSO4	1.167e-12	1.167e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.742e-14	1.323e-14	-13.759	-13.879	-0.120	(0)
FeHCO3+	2.579e-15	1.997e-15	-14.589	-14.700	-0.111	(0)
Fe (OH) 2	9.061e-18	9.061e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.254e-18	2.471e-18	-17.488	-17.607	-0.120	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.186	-160.186	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.316	-236.510	-0.194	(0)
Fe (3)	1.075e-09					
Fe (OH) 2+	6.029e-10	4.616e-10	-9.220	-9.336	-0.116	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.484e-11	3.433e-11	-10.348	-10.464	-0.116	(0)
FeOH+2	4.136e-15	1.376e-15	-14.383	-14.861	-0.478	(0)
FeF2+	1.511e-18	1.148e-18	-17.821	-17.940	-0.120	(0)
FeF+2	1.025e-18	3.409e-19	-17.989	-18.467	-0.478	(0)
FeSO4+	4.506e-19	3.422e-19	-18.346	-18.466	-0.120	(0)

FeF3	2.037e-19	2.037e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.413e-19	9.031e-20	-18.850	-19.044	-0.194	(0)
Fe+3	2.879e-20	2.471e-21	-19.541	-20.607	-1.066	(0)
FeCl+2	1.801e-21	5.991e-22	-20.745	-21.223	-0.478	(0)
FeCl2+	2.828e-23	2.148e-23	-22.548	-22.668	-0.120	(0)
FeHSeO3+2	8.536e-24	1.426e-24	-23.069	-23.846	-0.777	(0)
Fe2 (OH) 2+4	8.044e-26	6.269e-29	-25.095	-28.203	-3.108	(0)
FeCl3	1.724e-26	1.724e-26	-25.763	-25.763	0.000	(0)
FeNO3+2	2.241e-27	3.745e-28	-26.650	-27.427	-0.777	(0)
Fe3 (OH) 4+5	3.008e-32	4.183e-37	-31.522	-36.379	-4.857	(0)
H (0)	3.898e-29					
H2	1.949e-29	2.015e-29	-28.710	-28.696	0.015	(0)
Hg (0)	1.076e-08					
Hg	1.076e-08	1.076e-08	-7.968	-7.968	0.000	(0)
Hg (1)	4.857e-19					
Hg2+2	2.428e-19	4.057e-20	-18.615	-19.392	-0.777	(0)
Hg (2)	1.340e-10					
HgClOH	6.793e-11	6.793e-11	-10.168	-10.168	0.000	(0)
HgCl2	3.580e-11	3.580e-11	-10.446	-10.446	0.000	(0)
Hg (OH) 2	2.522e-11	2.607e-11	-10.598	-10.584	0.015	(0)
HgCl3-	4.495e-12	2.874e-12	-11.347	-11.542	-0.194	(0)
HgCl4-2	5.497e-13	9.185e-14	-12.260	-13.037	-0.777	(0)
HgCO3	1.102e-14	1.102e-14	-13.958	-13.958	0.000	(0)
HgCl+	1.392e-15	8.899e-16	-14.856	-15.051	-0.194	(0)
Hg (CO3) 2-2	3.457e-16	5.776e-17	-15.461	-16.238	-0.777	(0)
HgOH+	2.984e-16	1.908e-16	-15.525	-15.720	-0.194	(0)
Hg (OH) 3-	4.427e-18	2.831e-18	-17.354	-17.548	-0.194	(0)
HgHCO3+	3.739e-18	2.390e-18	-17.427	-17.622	-0.194	(0)
Hg (NH3) 2+2	1.324e-18	2.212e-19	-17.878	-18.655	-0.777	(0)
HgNH3+2	1.667e-19	2.785e-20	-18.778	-19.555	-0.777	(0)
Hg+2	3.325e-20	5.556e-21	-19.478	-20.255	-0.777	(0)
HgSO4	1.796e-20	1.796e-20	-19.746	-19.746	0.000	(0)
HgF+	4.053e-23	2.591e-23	-22.392	-22.587	-0.194	(0)
Hg (NH3) 3+2	4.186e-26	6.994e-27	-25.378	-26.155	-0.777	(0)
HgNO3+	4.862e-29	3.109e-29	-28.313	-28.507	-0.194	(0)
Hg (NH3) 4+2	2.641e-33	4.413e-34	-32.578	-33.355	-0.777	(0)
Hg (NO3) 2	1.958e-37	1.958e-37	-36.708	-36.708	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-136.921	-137.116	-0.194	(0)
HgS2-2	0.000e+00	0.000e+00	-137.113	-137.890	-0.777	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.655	-138.655	0.000	(0)
K	1.878e-02					
K+	1.728e-02	1.316e-02	-1.762	-1.881	-0.118	(0)
KSO4-	1.501e-03	1.150e-03	-2.823	-2.939	-0.116	(0)
KCrO4-	3.251e-16	2.079e-16	-15.488	-15.682	-0.194	(0)
Mg	2.415e-02					
Mg+2	1.370e-02	4.599e-03	-1.863	-2.337	-0.474	(0)
MgSO4	1.033e-02	1.033e-02	-1.986	-1.986	0.000	(0)
MgF+	8.644e-05	6.492e-05	-4.063	-4.188	-0.124	(0)
MgHCO3+	2.611e-05	1.938e-05	-4.583	-4.713	-0.129	(0)
MgCO3	6.340e-06	6.340e-06	-5.198	-5.198	0.000	(0)
MgOH+	2.021e-06	1.579e-06	-5.694	-5.802	-0.107	(0)
MgH2BO3+	1.267e-06	9.015e-07	-5.897	-6.045	-0.148	(0)
Mn (2)	2.936e-04					
Mn+2	2.140e-04	3.575e-05	-3.670	-4.447	-0.777	(0)
MnSO4	7.847e-05	7.847e-05	-4.105	-4.105	0.000	(0)
MnCl+	4.757e-07	3.613e-07	-6.323	-6.442	-0.120	(0)
MnHCO3+	3.868e-07	2.938e-07	-6.413	-6.532	-0.120	(0)
MnF+	2.358e-07	1.791e-07	-6.628	-6.747	-0.120	(0)
MnOH+	1.020e-07	7.744e-08	-6.992	-7.111	-0.120	(0)
MnCl2	4.097e-09	4.097e-09	-8.388	-8.388	0.000	(0)
MnCl3-	1.193e-11	9.058e-12	-10.923	-11.043	-0.120	(0)
MnSeO4	3.111e-12	3.111e-12	-11.507	-11.507	0.000	(0)
MnNO3+	1.343e-12	8.586e-13	-11.872	-12.066	-0.194	(0)
Mn (OH) 3-	4.687e-16	3.560e-16	-15.329	-15.449	-0.120	(0)
Mn (NO3) 2	3.268e-20	3.268e-20	-19.486	-19.486	0.000	(0)
Mn (OH) 4-2	2.979e-21	9.911e-22	-20.526	-21.004	-0.478	(0)
MnSe	0.000e+00	0.000e+00	-40.333	-40.333	0.000	(0)
Mn (3)	1.285e-24					

Mn+3	1.285e-24	1.103e-25	-23.891	-24.958	-1.066	(0)
Mn (6)	2.701e-40					
MnO4-2	2.701e-40	0.000e+00	-39.568	-40.046	-0.478	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.438	-44.579	-0.141	(0)
Mo	1.023e-05					
MoO4-2	1.023e-05	3.434e-06	-4.990	-5.464	-0.474	(0)
HMoO4-	1.245e-09	7.961e-10	-8.905	-9.099	-0.194	(0)
H2MoO4	6.792e-14	6.792e-14	-13.168	-13.168	0.000	(0)
AlMo6O21-3	8.396e-39	1.498e-40	-38.076	-39.824	-1.748	(0)
Mo7O24-6	0.000e+00	0.000e+00	-41.731	-48.725	-6.994	(0)
HMo7O24-5	0.000e+00	0.000e+00	-45.415	-50.272	-4.857	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.315	-53.423	-3.108	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.362	-58.111	-1.748	(0)
N (-3)	2.645e-07					
NH4+	2.282e-07	1.623e-07	-6.642	-6.790	-0.148	(0)
NH4SO4-	2.826e-08	2.146e-08	-7.549	-7.668	-0.120	(0)
NH3	7.943e-09	7.943e-09	-8.100	-8.100	0.000	(0)
CaNH3+2	1.196e-10	1.998e-11	-9.922	-10.699	-0.777	(0)
CuNH3+2	1.177e-11	1.966e-12	-10.929	-11.706	-0.777	(0)
Co (NH3) +2	7.975e-14	1.332e-14	-13.098	-13.875	-0.777	(0)
NiNH3+2	7.971e-14	1.332e-14	-13.098	-13.876	-0.777	(0)
BaNH3+2	2.545e-16	4.252e-17	-15.594	-16.371	-0.777	(0)
Hg (NH3) 2+2	1.324e-18	2.212e-19	-17.878	-18.655	-0.777	(0)
Ca (NH3) 2+2	3.781e-19	6.318e-20	-18.422	-19.199	-0.777	(0)
HgNH3+2	1.667e-19	2.785e-20	-18.778	-19.555	-0.777	(0)
Ni (NH3) 2+2	9.152e-20	1.529e-20	-19.038	-19.816	-0.777	(0)
Co (NH3) 2+2	2.702e-20	4.515e-21	-19.568	-20.345	-0.777	(0)
Hg (NH3) 3+2	4.186e-26	6.994e-27	-25.378	-26.155	-0.777	(0)
Co (NH3) 3+2	2.702e-27	4.515e-28	-26.568	-27.345	-0.777	(0)
Hg (NH3) 4+2	2.641e-33	4.413e-34	-32.578	-33.355	-0.777	(0)
Co (NH3) 4+2	1.127e-34	1.882e-35	-33.948	-34.725	-0.777	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.825	-41.602	-0.777	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.828	-42.605	-0.777	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.973	-49.750	-0.777	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.261	-51.010	-1.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.226	-52.003	-0.777	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.259	-59.453	-0.194	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.557	-64.334	-0.777	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.788	-64.566	-0.777	(0)
N (3)	2.224e-05					
NO2-	2.224e-05	1.606e-05	-4.653	-4.794	-0.141	(0)
CuNO2+	6.363e-11	4.068e-11	-10.196	-10.391	-0.194	(0)
CoNO2+	2.470e-12	1.579e-12	-11.607	-11.802	-0.194	(0)
Cu (NO2) 2	6.687e-15	6.687e-15	-14.175	-14.175	0.000	(0)
N (5)	2.006e-08					
NO3-	1.991e-08	1.515e-08	-7.701	-7.819	-0.118	(0)
CaNO3+	1.498e-10	9.574e-11	-9.825	-10.019	-0.194	(0)
MnNO3+	1.343e-12	8.586e-13	-11.872	-12.066	-0.194	(0)
ZnNO3+	2.269e-13	1.451e-13	-12.644	-12.838	-0.194	(0)
CuNO3+	1.813e-15	1.159e-15	-14.742	-14.936	-0.194	(0)
BaNO3+	1.008e-15	6.443e-16	-14.997	-15.191	-0.194	(0)
CoNO3+	5.241e-16	3.351e-16	-15.281	-15.475	-0.194	(0)
NiNO3+	1.859e-16	1.188e-16	-15.731	-15.925	-0.194	(0)
CdNO3+	1.546e-16	9.885e-17	-15.811	-16.005	-0.194	(0)
PbNO3+	2.449e-17	1.566e-17	-16.611	-16.805	-0.194	(0)
Mn (NO3) 2	3.268e-20	3.268e-20	-19.486	-19.486	0.000	(0)
UO2NO3+	3.911e-21	2.501e-21	-20.408	-20.602	-0.194	(0)
Zn (NO3) 2	4.387e-22	4.387e-22	-21.358	-21.358	0.000	(0)
Co (NO3) 2	1.033e-23	1.033e-23	-22.986	-22.986	0.000	(0)
Cu (NO3) 2	2.211e-24	2.211e-24	-23.655	-23.655	0.000	(0)
CrNO3+2	1.544e-24	2.579e-25	-23.811	-24.589	-0.777	(0)
Cd (NO3) 2	7.507e-25	7.507e-25	-24.125	-24.125	0.000	(0)
Pb (NO3) 2	4.029e-25	4.029e-25	-24.395	-24.395	0.000	(0)
VO2NO3	2.213e-25	2.213e-25	-24.655	-24.655	0.000	(0)
FeNO3+2	2.241e-27	3.745e-28	-26.650	-27.427	-0.777	(0)
HgNO3+	4.862e-29	3.109e-29	-28.313	-28.507	-0.194	(0)
Hg (NO3) 2	1.958e-37	1.958e-37	-36.708	-36.708	0.000	(0)

Na	3.332e-02					
Na+	3.125e-02	2.379e-02	-1.505	-1.624	-0.118	(0)
NaSO4-	2.059e-03	1.577e-03	-2.686	-2.802	-0.116	(0)
NaHCO3	5.509e-06	5.509e-06	-5.259	-5.259	0.000	(0)
NaF	1.888e-06	1.888e-06	-5.724	-5.724	0.000	(0)
NaCO3-	9.588e-07	7.342e-07	-6.018	-6.134	-0.116	(0)
NaH2BO3	2.131e-07	2.131e-07	-6.671	-6.671	0.000	(0)
NaCrO4-	7.863e-16	5.027e-16	-15.104	-15.299	-0.194	(0)
Ni	1.762e-08					
Ni+2	9.298e-09	3.122e-09	-8.032	-8.506	-0.474	(0)
NiSO4	7.689e-09	7.689e-09	-8.114	-8.114	0.000	(0)
NiHCO3+	2.479e-10	1.585e-10	-9.606	-9.800	-0.194	(0)
NiCO3	1.931e-10	1.931e-10	-9.714	-9.714	0.000	(0)
NiCl+	1.003e-10	6.413e-11	-9.999	-10.193	-0.194	(0)
NiOH+	5.302e-11	3.390e-11	-10.276	-10.470	-0.194	(0)
Ni (SO4) 2-2	1.881e-11	3.143e-12	-10.726	-11.503	-0.777	(0)
NiF+	1.543e-11	9.867e-12	-10.812	-11.006	-0.194	(0)
Ni (OH) 2	2.322e-12	2.322e-12	-11.634	-11.634	0.000	(0)
NiNH3+2	7.971e-14	1.332e-14	-13.098	-13.876	-0.777	(0)
Ni (OH) 3-	3.132e-15	2.002e-15	-14.504	-14.698	-0.194	(0)
NiCl2	2.592e-15	2.592e-15	-14.586	-14.586	0.000	(0)
NiSeO4	4.722e-16	4.722e-16	-15.326	-15.326	0.000	(0)
NiNO3+	1.859e-16	1.188e-16	-15.731	-15.925	-0.194	(0)
Ni (NH3) 2+2	9.152e-20	1.529e-20	-19.038	-19.816	-0.777	(0)
O (0)	2.404e-35					
O2	1.202e-35	1.243e-35	-34.920	-34.906	0.015	(0)
Pb	1.483e-09					
PbSO4	4.223e-10	4.223e-10	-9.374	-9.374	0.000	(0)
PbCO3	3.480e-10	3.480e-10	-9.458	-9.458	0.000	(0)
PbOH+	2.367e-10	1.513e-10	-9.626	-9.820	-0.194	(0)
Pb+2	2.080e-10	6.985e-11	-9.682	-10.156	-0.474	(0)
Pb (SO4) 2-2	1.880e-10	3.141e-11	-9.726	-10.503	-0.777	(0)
PbHCO3+	3.343e-11	2.137e-11	-10.476	-10.670	-0.194	(0)
PbCl+	3.112e-11	1.989e-11	-10.507	-10.701	-0.194	(0)
Pb (CO3) 2-2	9.955e-12	1.663e-12	-11.002	-11.779	-0.777	(0)
Pb (OH) 2	4.126e-12	4.126e-12	-11.384	-11.384	0.000	(0)
PbF+	9.686e-13	6.192e-13	-12.014	-12.208	-0.194	(0)
PbCl2	7.134e-13	7.134e-13	-12.147	-12.147	0.000	(0)
Pb (OH) 3-	5.566e-15	3.558e-15	-14.254	-14.449	-0.194	(0)
PbCl3-	3.566e-15	2.280e-15	-14.448	-14.642	-0.194	(0)
PbF2	1.533e-15	1.533e-15	-14.814	-14.814	0.000	(0)
PbCl4-2	5.007e-17	8.365e-18	-16.300	-17.078	-0.777	(0)
PbNO3+	2.449e-17	1.566e-17	-16.611	-16.805	-0.194	(0)
Pb2OH+3	9.385e-18	1.675e-19	-17.028	-18.776	-1.748	(0)
Pb (OH) 4-2	4.498e-18	7.516e-19	-17.347	-18.124	-0.777	(0)
PbF3-	5.722e-19	3.658e-19	-18.242	-18.437	-0.194	(0)
Pb3 (OH) 4+2	1.420e-22	2.373e-23	-21.848	-22.625	-0.777	(0)
PbF4-2	1.318e-22	2.203e-23	-21.880	-22.657	-0.777	(0)
Pb (NO3) 2	4.029e-25	4.029e-25	-24.395	-24.395	0.000	(0)
Pb4 (OH) 4+4	1.689e-26	1.316e-29	-25.772	-28.881	-3.108	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.608	-151.608	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.475	-228.669	-0.194	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.167	-78.361	-0.194	(0)
CdHS+	0.000e+00	0.000e+00	-78.844	-79.039	-0.194	(0)
S5-2	0.000e+00	0.000e+00	-79.015	-79.792	-0.777	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.531	-80.308	-0.777	(0)
S4-2	0.000e+00	0.000e+00	-79.611	-80.388	-0.777	(0)
S3-2	0.000e+00	0.000e+00	-80.417	-81.194	-0.777	(0)
S2-2	0.000e+00	0.000e+00	-81.433	-82.210	-0.777	(0)
S-2	0.000e+00	0.000e+00	-87.249	-87.727	-0.478	(0)
HgHS2-	0.000e+00	0.000e+00	-136.921	-137.116	-0.194	(0)
HgS2-2	0.000e+00	0.000e+00	-137.113	-137.890	-0.777	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.655	-138.655	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.779	-147.230	-0.451	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.203	-147.397	-0.194	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.537	-147.960	-0.424	(0)

Zn (HS) 2	0.000e+00	0.000e+00	-149.321	-149.321	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.196	-150.196	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.608	-151.608	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.186	-160.186	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.606	-216.801	-0.194	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.208	-224.402	-0.194	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.671	-226.448	-0.777	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.463	-226.657	-0.194	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.475	-228.669	-0.194	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.316	-236.510	-0.194	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.045	-302.822	-0.777	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.446	-304.223	-0.777	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.521	-318.298	-0.777	(0)
S (6)	5.640e-02					
SO4-2	3.676e-02	1.234e-02	-1.435	-1.909	-0.474	(0)
MgSO4	1.033e-02	1.033e-02	-1.986	-1.986	0.000	(0)
CaSO4	5.650e-03	5.650e-03	-2.248	-2.248	0.000	(0)
NaSO4-	2.059e-03	1.577e-03	-2.686	-2.802	-0.116	(0)
KSO4-	1.501e-03	1.150e-03	-2.823	-2.939	-0.116	(0)
MnSO4	7.847e-05	7.847e-05	-4.105	-4.105	0.000	(0)
ZnSO4	1.029e-05	1.029e-05	-4.987	-4.987	0.000	(0)
Zn (SO4) 2-2	6.623e-06	1.106e-06	-5.179	-5.956	-0.777	(0)
CuSO4	6.839e-08	6.839e-08	-7.165	-7.165	0.000	(0)
CoSO4	3.436e-08	3.436e-08	-7.464	-7.464	0.000	(0)
NH4SO4-	2.826e-08	2.146e-08	-7.549	-7.668	-0.120	(0)
HSO4-	1.871e-08	1.405e-08	-7.728	-7.852	-0.124	(0)
NiSO4	7.689e-09	7.689e-09	-8.114	-8.114	0.000	(0)
CdSO4	5.969e-09	5.969e-09	-8.224	-8.224	0.000	(0)
Cd (SO4) 2-2	5.948e-09	9.938e-10	-8.226	-9.003	-0.777	(0)
PbSO4	4.223e-10	4.223e-10	-9.374	-9.374	0.000	(0)
Pb (SO4) 2-2	1.880e-10	3.141e-11	-9.726	-10.503	-0.777	(0)
CrOHSO4	2.152e-11	2.152e-11	-10.667	-10.667	0.000	(0)
Ni (SO4) 2-2	1.881e-11	3.143e-12	-10.726	-11.503	-0.777	(0)
UO2SO4	1.545e-12	1.545e-12	-11.811	-11.811	0.000	(0)
UO2 (SO4) 2-2	1.505e-12	2.514e-13	-11.823	-12.600	-0.777	(0)
FeSO4	1.167e-12	1.167e-12	-11.933	-11.933	0.000	(0)
AlSO4+	4.710e-13	3.537e-13	-12.327	-12.451	-0.124	(0)
Al (SO4) 2-	6.229e-14	4.679e-14	-13.206	-13.330	-0.124	(0)
CrSO4+	1.755e-14	1.122e-14	-13.756	-13.950	-0.194	(0)
VO2SO4-	1.331e-17	8.510e-18	-16.876	-17.070	-0.194	(0)
FeSO4+	4.506e-19	3.422e-19	-18.346	-18.466	-0.120	(0)
Fe (SO4) 2-	1.413e-19	9.031e-20	-18.850	-19.044	-0.194	(0)
Cr2 (OH) 2SO4+2	8.552e-20	1.429e-20	-19.068	-19.845	-0.777	(0)
HgSO4	1.796e-20	1.796e-20	-19.746	-19.746	0.000	(0)
VOSO4	1.547e-20	1.547e-20	-19.811	-19.811	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.048e-20	1.048e-20	-19.980	-19.980	0.000	(0)
CrO3SO4-2	4.212e-23	7.037e-24	-22.376	-23.153	-0.777	(0)
VSO4+	4.056e-35	2.593e-35	-34.392	-34.586	-0.194	(0)
U (SO4) 2	2.543e-39	2.543e-39	-38.595	-38.595	0.000	(0)
USO4+2	1.552e-40	0.000e+00	-39.809	-40.586	-0.777	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.259	-59.453	-0.194	(0)
Sb (3)	1.276e-19					
Sb (OH) 3	6.450e-20	6.450e-20	-19.190	-19.190	0.000	(0)
HSbO2	6.311e-20	6.311e-20	-19.200	-19.200	0.000	(0)
SbO2-	1.372e-23	8.774e-24	-22.863	-23.057	-0.194	(0)
Sb (OH) 4-	7.828e-24	5.005e-24	-23.106	-23.301	-0.194	(0)
Sb (OH) 2F	1.480e-25	1.480e-25	-24.830	-24.830	0.000	(0)
SbOF	1.459e-25	1.459e-25	-24.836	-24.836	0.000	(0)
Sb (OH) 2+	2.860e-26	1.829e-26	-25.544	-25.738	-0.194	(0)
SbO+	9.884e-27	6.319e-27	-26.005	-26.199	-0.194	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.521	-318.298	-0.777	(0)
Sb (5)	1.275e-07					
SbO3-	1.274e-07	8.145e-08	-6.895	-7.089	-0.194	(0)
Sb (OH) 6-	1.243e-10	9.462e-11	-9.906	-10.024	-0.118	(0)
SbO2+	4.970e-24	3.177e-24	-23.304	-23.498	-0.194	(0)
Se (-2)	5.747e-39					
HSe-	5.747e-39	3.674e-39	-38.241	-38.435	-0.194	(0)
MnSe	0.000e+00	0.000e+00	-40.333	-40.333	0.000	(0)

H2Se	0.000e+00	0.000e+00	-42.479	-42.479	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.724	-45.501	-0.777	(0)
Se (4)	7.884e-07					
SeO3-2	4.467e-07	7.464e-08	-6.350	-7.127	-0.777	(0)
HSeO3-	3.416e-07	2.184e-07	-6.466	-6.661	-0.194	(0)
H2SeO3	1.085e-12	1.085e-12	-11.964	-11.964	0.000	(0)
Cd (SeO3) 2-2	5.669e-17	9.471e-18	-16.247	-17.024	-0.777	(0)
FeHSeO3+2	8.536e-24	1.426e-24	-23.069	-23.846	-0.777	(0)
Se (6)	9.663e-10					
SeO4-2	9.630e-10	3.234e-10	-9.016	-9.490	-0.474	(0)
MnSeO4	3.111e-12	3.111e-12	-11.507	-11.507	0.000	(0)
ZnSeO4	1.909e-13	1.909e-13	-12.719	-12.719	0.000	(0)
CoSeO4	2.261e-15	2.261e-15	-14.646	-14.646	0.000	(0)
NiSeO4	4.722e-16	4.722e-16	-15.326	-15.326	0.000	(0)
HSeO4-	2.953e-16	1.888e-16	-15.530	-15.724	-0.194	(0)
CdSeO4	1.242e-16	1.242e-16	-15.906	-15.906	0.000	(0)
Zn (SeO4) 2-2	3.746e-22	6.258e-23	-21.426	-22.204	-0.777	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.164	-58.913	-1.748	(0)
U (4)	2.886e-19					
U (OH) 5-	2.885e-19	1.845e-19	-18.540	-18.734	-0.194	(0)
U (OH) 4	9.020e-23	9.020e-23	-22.045	-22.045	0.000	(0)
U (OH) 3+	6.023e-27	3.850e-27	-26.220	-26.414	-0.194	(0)
U (OH) 2+2	1.244e-31	2.079e-32	-30.905	-31.682	-0.777	(0)
UF3+	6.543e-36	4.183e-36	-35.184	-35.378	-0.194	(0)
UF2+2	1.256e-36	2.098e-37	-35.901	-36.678	-0.777	(0)
UOH+3	6.405e-37	1.143e-38	-36.193	-37.942	-1.748	(0)
UF4	5.771e-38	5.771e-38	-37.239	-37.239	0.000	(0)
UF+3	7.422e-39	1.325e-40	-38.129	-39.878	-1.748	(0)
U (SO4) 2	2.543e-39	2.543e-39	-38.595	-38.595	0.000	(0)
UF5-	4.500e-40	2.877e-40	-39.347	-39.541	-0.194	(0)
USO4+2	1.552e-40	0.000e+00	-39.809	-40.586	-0.777	(0)
UF6-2	0.000e+00	0.000e+00	-40.184	-40.961	-0.777	(0)
U+4	0.000e+00	0.000e+00	-42.169	-45.278	-3.108	(0)
UCl+3	0.000e+00	0.000e+00	-43.925	-45.673	-1.748	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-154.094	-169.830	-15.736	(0)
U (5)	1.142e-15					
UO2+	1.142e-15	7.301e-16	-14.942	-15.137	-0.194	(0)
U (6)	2.032e-06					
UO2 (CO3) 3-4	1.923e-06	1.499e-09	-5.716	-8.824	-3.108	(0)
UO2 (CO3) 2-2	1.080e-07	1.804e-08	-6.967	-7.744	-0.777	(0)
UO2CO3	5.457e-10	5.457e-10	-9.263	-9.263	0.000	(0)
UO2OH+	1.404e-11	8.979e-12	-10.853	-11.047	-0.194	(0)
UO2F+	2.246e-12	1.436e-12	-11.649	-11.843	-0.194	(0)
UO2SO4	1.545e-12	1.545e-12	-11.811	-11.811	0.000	(0)
UO2 (SO4) 2-2	1.505e-12	2.514e-13	-11.823	-12.600	-0.777	(0)
UO2F2	5.211e-13	5.211e-13	-12.283	-12.283	0.000	(0)
UO2+2	2.463e-13	8.270e-14	-12.609	-13.082	-0.474	(0)
UO2F3-	2.576e-14	1.647e-14	-13.589	-13.783	-0.194	(0)
UO2Cl+	1.684e-15	1.077e-15	-14.774	-14.968	-0.194	(0)
(UO2) 3 (OH) 5+	1.060e-15	6.778e-16	-14.975	-15.169	-0.194	(0)
(UO2) 2 (OH) 2+2	8.008e-16	1.338e-16	-15.096	-15.874	-0.777	(0)
UO2F4-2	9.850e-17	1.646e-17	-16.007	-16.784	-0.777	(0)
UO2NO3+	3.911e-21	2.501e-21	-20.408	-20.602	-0.194	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.861	-43.055	-0.194	(0)
V+2	0.000e+00	0.000e+00	-43.724	-44.501	-0.777	(0)
V (3)	2.303e-15					
V (OH) 3	2.303e-15	2.303e-15	-14.638	-14.638	0.000	(0)
V (OH) 2+	2.717e-26	1.737e-26	-25.566	-25.760	-0.194	(0)
VOH+2	1.151e-29	1.924e-30	-28.939	-29.716	-0.777	(0)
V+3	2.494e-34	4.450e-36	-33.603	-35.352	-1.748	(0)
VSO4+	4.056e-35	2.593e-35	-34.392	-34.586	-0.194	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.276	-57.024	-1.748	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.523	-58.632	-3.108	(0)
V (4)	1.270e-18					
V (OH) 3+	1.222e-18	7.810e-19	-17.913	-18.107	-0.194	(0)
VO+2	2.723e-20	4.549e-21	-19.565	-20.342	-0.777	(0)

VOSO4	1.547e-20	1.547e-20	-19.811	-19.811	0.000	(0)
VOF+	5.369e-21	3.433e-21	-20.270	-20.464	-0.194	(0)
VOF2	1.619e-22	1.619e-22	-21.791	-21.791	0.000	(0)
VOC1+	1.603e-22	1.025e-22	-21.795	-21.989	-0.194	(0)
VOF3-	1.131e-24	7.229e-25	-23.947	-24.141	-0.194	(0)
VOF4-2	2.197e-27	3.671e-28	-26.658	-27.435	-0.777	(0)
H2V2O4+2	1.838e-31	3.071e-32	-30.736	-31.513	-0.777	(0)
V(5)	3.031e-08					
H2VO4-	1.660e-08	1.062e-08	-7.780	-7.974	-0.194	(0)
HVO4-2	1.370e-08	2.289e-09	-7.863	-8.640	-0.777	(0)
H3VO4	1.237e-12	1.237e-12	-11.908	-11.908	0.000	(0)
HV2O7-3	4.624e-13	8.252e-15	-12.335	-14.083	-1.748	(0)
H3V2O7-	1.329e-13	8.494e-14	-12.877	-13.071	-0.194	(0)
VO4-3	5.518e-14	9.848e-16	-13.258	-15.007	-1.748	(0)
V2O7-4	2.447e-14	1.907e-17	-13.611	-16.720	-3.108	(0)
V3O9-3	7.067e-17	1.261e-18	-16.151	-17.899	-1.748	(0)
VO2+	3.793e-17	2.887e-17	-16.421	-16.539	-0.118	(0)
VO2SO4-	1.331e-17	8.510e-18	-16.876	-17.070	-0.194	(0)
VO2F	6.371e-18	6.371e-18	-17.196	-17.196	0.000	(0)
VO2F2-	4.552e-19	2.910e-19	-18.342	-18.536	-0.194	(0)
V4O12-4	7.178e-21	5.594e-24	-20.144	-23.252	-3.108	(0)
VO2F3-2	2.733e-21	4.567e-22	-20.563	-21.340	-0.777	(0)
VO2F4-3	1.584e-24	2.827e-26	-23.800	-25.549	-1.748	(0)
VO2NO3	2.213e-25	2.213e-25	-24.655	-24.655	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.564	-62.558	-6.994	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.448	-62.305	-4.857	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.923	-65.031	-3.108	(0)
Zn	2.947e-05					
Zn+2	1.135e-05	3.811e-06	-4.945	-5.419	-0.474	(0)
ZnSO4	1.029e-05	1.029e-05	-4.987	-4.987	0.000	(0)
Zn(SO4) 2-2	6.623e-06	1.106e-06	-5.179	-5.956	-0.777	(0)
ZnOH+	5.141e-07	3.287e-07	-6.289	-6.483	-0.194	(0)
ZnCO3	3.635e-07	3.635e-07	-6.440	-6.440	0.000	(0)
ZnCl+	1.035e-07	7.685e-08	-6.985	-7.114	-0.129	(0)
ZnOHCl	8.677e-08	8.677e-08	-7.062	-7.062	0.000	(0)
ZnHCO3+	7.763e-08	4.963e-08	-7.110	-7.304	-0.194	(0)
Zn(OH) 2	4.493e-08	4.493e-08	-7.348	-7.348	0.000	(0)
ZnF+	1.496e-08	9.567e-09	-7.825	-8.019	-0.194	(0)
ZnCl2	9.778e-10	9.778e-10	-9.010	-9.010	0.000	(0)
Zn(OH) 3-	3.037e-10	1.942e-10	-9.518	-9.712	-0.194	(0)
ZnCl3-	8.400e-12	6.235e-12	-11.076	-11.205	-0.129	(0)
ZnNO3+	2.269e-13	1.451e-13	-12.644	-12.838	-0.194	(0)
ZnSeO4	1.909e-13	1.909e-13	-12.719	-12.719	0.000	(0)
ZnCl4-2	7.524e-14	2.503e-14	-13.124	-13.602	-0.478	(0)
Zn(OH) 4-2	3.990e-14	6.667e-15	-13.399	-14.176	-0.777	(0)
Zn(NO3) 2	4.387e-22	4.387e-22	-21.358	-21.358	0.000	(0)
Zn(SeO4) 2-2	3.746e-22	6.258e-23	-21.426	-22.204	-0.777	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.203	-147.397	-0.194	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.321	-149.321	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.208	-224.402	-0.194	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.671	-226.448	-0.777	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.446	-304.223	-0.777	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.72	-47.43	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-40.49	-35.98	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-47.72	-35.98	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.94	-52.01	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-54.87	-34.84	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.36	-27.95	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.52	-23.07	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.43	9.37	10.80	Al(OH)3
Al2(MoO4)3	-47.63	-45.26	2.37	Al2(MoO4)3
Al2O3	-0.92	18.73	19.65	Al2O3
Al4(OH)10SO4	-3.01	19.69	22.70	Al4(OH)10SO4

AlAsO4:2H2O	-11.58	-6.78	4.80	AlAsO4:2H2O
AlOHSO4	-5.18	-8.41	-3.23	AlOHSO4
AlSb	-152.08	-86.46	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.27	-12.06	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.81	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.19	5.41	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.29	6.71	As2O5
Atacamite	-0.92	6.47	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.55	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.61	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.50	-1.62	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.77	6.17	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.58	-13.54	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.63	-6.80	1.83	BaSeO3
BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-5.57	-7.33	-1.76	ZnSO4:6H2O
Birnessite	-6.48	11.61	18.09	MnO2
Bixbyite	-1.67	-2.32	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.79	9.37	8.58	AlOOH
Breithauptite	-57.17	-75.69	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.32	13.53	16.84	Mg(OH)2
Bunsenite	-5.08	7.36	12.45	NiO
Ca(VO3)2	-9.71	-4.05	5.66	Ca(VO3)2
Ca2V2O7	-8.38	9.12	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.43	9.12	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.67	22.29	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.58	22.28	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.12	-152.15	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.67	-23.58	-17.91	Hg2Cl2
CaMoO4	-0.21	-8.16	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.24	-1.43	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.17	-12.19	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.55	-0.71	9.84	Cd(BO2)2
Cd(OH)2	-6.46	7.18	13.64	Cd(OH)2
Cd(OH)2(am)	-6.55	7.18	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.72	-14.01	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.79	3.77	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.45	10.95	28.40	Cd4(OH)6SO4
CdCl2	-12.22	-12.88	-0.66	CdCl2
CdCl2:1H2O	-11.18	-12.88	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.97	-12.88	-1.91	CdCl2:2.5H2O
CdF2	-15.27	-16.49	-1.21	CdF2
Cdmetal(alpha)	-31.88	-18.36	13.51	Cd
Cdmetal(gamma)	-31.98	-18.36	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHC1	-6.39	-2.85	3.54	CdOHC1
CdSb	-75.52	-75.87	-0.35	CdSb
CdSe	-18.99	-39.19	-20.20	CdSe
CdSeO4:2H2O	-16.33	-18.18	-1.85	CdSeO4:2H2O
CdSO4	-10.42	-10.59	-0.17	CdSO4
CdSO4:1H2O	-8.87	-10.60	-1.73	CdSO4:1H2O

CdSO4:2.67H2O	-8.72	-10.60	-1.87	CdSO4:2.67H2O
Cerrusite	-2.81	-15.94	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.18	-96.88	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.56	-40.66	-27.10	PbSe
Co (BO2) 2	-26.95	0.12	27.07	Co (BO2) 2
Co (OH) 2	-5.08	8.01	13.09	Co (OH) 2
Co (OH) 3	-9.31	-11.62	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-21.30	-8.26	13.03	Co3 (AsO4) 2
Co3O4	-4.73	-15.22	-10.50	Co3O4
CoCl2	-20.31	-12.05	8.27	CoCl2
CoCl2:6H2O	-14.59	-12.05	2.54	CoCl2:6H2O
CoCO3	-3.66	-13.64	-9.98	CoCO3
CoF2	-14.06	-15.66	-1.60	CoF2
CoF3	-45.66	-47.12	-1.46	CoF3
CoFe2O4	17.92	14.40	-3.53	CoFe2O4
CoMoO4	-5.56	-13.32	-7.76	CoMoO4
CoO	-5.58	8.01	13.59	CoO
CoS (alpha)	-70.84	-78.28	-7.44	CoS
CoS (beta)	-67.21	-78.28	-11.07	CoS
CoSe	-22.16	-38.36	-16.20	CoSe
CoSeO3	-7.90	-6.58	1.32	CoSeO3
CoSeO4:6H2O	-15.82	-17.35	-1.53	CoSeO4:6H2O
CoSO4	-12.57	-9.76	2.80	CoSO4
CoSO4:6H2O	-7.30	-9.77	-2.47	CoSO4:6H2O
Cotunnite	-9.57	-14.35	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.01	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.15	-31.06	14.09	CrCl2
CrCl3	-46.38	-31.26	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.87	-42.71	-33.84	Na3AlF6
Cu (OH) 2	-0.43	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.25	20.96	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.51	0.75	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.53	-89.41	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.23	-50.03	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.73	-101.32	-42.59	Cu3Sb
Cu3Se2	-24.66	-88.15	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.27	10.30	CuOCuSO4
Cupricferrite	8.65	14.64	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.02	-38.12	-33.10	CuSe
CuSe2	-25.57	-58.94	-33.37	CuSe2
CuSeO3:2H2O	-6.86	-6.35	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.67	-17.11	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.52	2.94	CuSO4
Diaspore	2.49	9.37	6.87	AlOOH

Djurleite	-55.25	-89.17	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.06	-16.60	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	0.49	-16.60	-17.09	CaMg(CO ₃) ₂
Epsomite	-2.13	-4.25	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.11	3.45	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.22	0.18	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-10.04	-13.76	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.76	-8.21	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-16.77	-37.40	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-43.21	-46.94	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-13.36	-12.96	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.11	1.09	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.79	-17.88	-10.09	FeMoO ₄
Ferrihydrite	-0.00	3.19	3.19	Fe(OH) ₃
Ferroselite	-45.14	-63.74	-18.60	FeSe ₂
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.92	-42.92	-11.00	FeSe
Fix_pe	-4.84	-4.84	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF ₂
Galena	-66.61	-80.58	-13.97	PbS
Gibbsite	1.07	9.37	8.29	Al(OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.32	-7.33	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-64.75	-79.11	-14.36	CdS
Greigite	-290.30	-335.34	-45.03	Fe ₃ S ₄
Gummite	-4.89	2.78	7.67	UO ₃
Gypsum	0.00	-4.61	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-13.88	-25.98	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.46	-21.33	-12.88	H ₂ MoO ₄
H ₂ S(g)	-78.28	-86.29	-8.01	H ₂ S
H ₂ Se(g)	-41.41	-46.37	-4.96	H ₂ Se
Halite	-5.32	-3.72	1.60	NaCl
Hausmannite	-1.23	59.80	61.03	Mn ₃ O ₄
Hematite	7.80	6.39	-1.42	Fe ₂ O ₃
Hercynite	-0.71	22.19	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-184.53	-258.24	-73.71	Hg(CH ₃) ₂
Hg(g)	-6.66	-14.54	-7.87	Hg
Hg(OH) ₂	-7.09	-10.58	-3.50	Hg(OH) ₂
Hg ₂ (g)	-14.11	-29.07	-14.96	Hg ₂
Hg ₂ (OH) ₂	-8.79	-3.53	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-9.12	-25.17	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-25.06	-33.76	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-16.83	-27.19	-10.36	Hg ₂ F ₂
Hg ₂ S	-78.14	-89.82	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-13.46	-18.12	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-15.17	-21.30	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-23.71	-53.40	-29.68	Hg ₃ O ₂ CO ₃
HgCl(g)	-31.29	-11.79	19.50	HgCl
HgCl ₂	-9.38	-30.64	-21.26	HgCl ₂
HgF(g)	-46.27	-13.60	32.68	HgF
HgF ₂ (g)	-46.82	-34.25	12.57	HgF ₂
Hgmetal(1)	-1.08	-14.54	-13.45	Hg
HgSe	-1.26	-56.95	-55.69	HgSe
HgSeO ₃	-12.75	-25.18	-12.43	HgSeO ₃
HgSO ₄	-18.94	-28.36	-9.42	HgSO ₄
Huntite	-2.87	-32.83	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-7.39	-26.16	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-10.18	-18.95	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-14.97	-20.14	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.12	-19.92	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-31.13	-48.37	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-17.62	-18.13	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-12.49	-9.23	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-12.52	-13.25	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.92	-6.35	-0.43	PbO·PbSO ₄
Laurionite	-4.94	-4.32	0.62	PbOHCl

Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.98	5.71	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.39	6.39	Fe ₂ O ₃
Magnesianoferrite	3.05	19.91	16.86	Fe ₂ MgO ₄
Magnesite	-0.66	-8.12	-7.46	MgCO ₃
Magnetite	6.43	9.84	3.40	Fe ₃ O ₄
Malachite	0.16	-5.15	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.15	24.19	25.34	MnOOH
Massicot	-7.18	5.71	12.89	PbO
Matlockite	-7.18	-16.15	-8.97	PbClF
Melanothallite	-18.06	-11.81	6.26	CuCl ₂
Melanterite	-12.12	-14.33	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.78	-96.88	-45.09	HgS
Mg(OH) ₂ (active)	-5.27	13.53	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.96	-3.68	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-271.23	-196.55	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.51	9.85	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.03	11.17	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.09	-16.71	5.38	MgCrO ₄
MgF ₂	-2.01	-10.14	-8.13	MgF ₂
MgMoO ₄	-5.95	-7.80	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.13	-1.07	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-10.63	-11.83	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-30.85	42.68	73.52	Pb ₃ O ₄
Mirabilite	-4.05	-5.17	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-10.69	-5.79	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-49.93	-55.64	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.84	-85.76	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.54	1.96	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.36	-8.64	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-75.04	-74.87	0.17	MnS
MnS(pnk)	-78.21	-74.87	3.34	MnS
MnSb	-94.07	-96.98	-2.91	MnSb
MnSe	-38.45	-34.95	3.50	MnSe
MnSeO ₃	-4.30	-3.17	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.16	-3.18	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-11.89	-13.94	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-8.94	-6.36	2.58	MnSO ₄
Monteponite	-7.92	7.18	15.10	CdO
Montroydite	-6.94	-10.58	-3.64	HgO
MoO ₃	-13.33	-21.33	-8.00	MoO ₃
Morenosite	-8.28	-10.42	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.20	-219.46	-70.26	MoS ₂
Na-Jarosite	-8.47	-19.67	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-37.96	-47.86	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.55	-17.62	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-13.45	-30.04	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.20	-8.71	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-9.94	-8.71	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-12.28	-1.98	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-14.02	-12.74	1.28	Na ₂ SeO ₄
Na ₃ Sb	-171.35	-76.89	94.45	Na ₃ Sb
Na ₃ VO ₄	-26.36	10.32	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.37	8.03	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.13	-11.86	-6.73	CuCl
NaSb	-87.13	-63.97	23.17	NaSb
Natron	-7.73	-9.04	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.15	-2.30	3.86	NaVO ₃
Nesquehonite	-3.45	-8.12	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.43	7.36	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-25.92	-10.22	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.33	11.67	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-7.42	-14.29	-6.87	NiCO ₃
NiMoO ₄	-2.83	-13.97	-11.14	NiMoO ₄
NiS(alpha)	-73.33	-78.93	-5.60	NiS
NiS(beta)	-67.83	-78.93	-11.10	NiS

NiS (gamma)	-66.13	-78.93	-12.80	NiS
NiSe	-21.31	-39.01	-17.70	NiSe
NiSeO3:2H2O	-10.05	-7.23	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.48	-18.00	-1.52	NiSeO4:6H2O
Nsutite	-5.89	11.61	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.40	-304.47	-61.07	As2S3
Otavite	-2.47	-14.47	-12.00	CdCO3
Pb (BO2) 2	-8.70	-2.18	6.52	Pb (BO2) 2
Pb (OH) 2	-2.44	5.71	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-64.02	-72.78	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-7.40	1.39	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.77	11.42	26.19	Pb2O (OH) 2
Pb2O3	-24.07	36.97	61.04	Pb2O3
Pb2OCO3	-9.67	-10.23	-0.56	Pb2OCO3
Pb2V2O7	-3.89	-5.79	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.96	-15.16	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-6.22	-0.08	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.54	-4.52	11.02	Pb3O2CO3
Pb3O2SO4	-11.33	-0.64	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.04	5.06	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.81	5.07	21.88	Pb4O3SO4
PbCrO4	-11.93	-24.53	-12.60	PbCrO4
PbF2	-10.52	-17.96	-7.44	PbF2
Pbmetal	-24.08	-19.83	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.27	5.71	12.98	PbO:0.33H2O
PbSeO4	-12.81	-19.65	-6.84	PbSeO4
Periclase	-8.05	13.53	21.58	MgO
Phosgenite	-10.47	-30.28	-19.81	PbCl2:PbCO3
Plattnerite	-18.34	31.26	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.78	11.42	15.19	Mn (OH) 2
Pyrolusite	-4.42	36.96	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-8.38	-10.42	-2.04	NiSO4:6H2O
Rhodochrosite	0.35	-10.23	-10.58	MnCO3
Rutherfordine	-4.36	-18.86	-14.50	UO2CO3
Sb (OH) 3	-12.08	-19.19	-7.11	Sb (OH) 3
Sb2O4	-16.24	-12.83	3.40	Sb2O4
Sb2O5	-26.24	-35.91	-9.67	Sb2O5
Sb2Se3	-109.72	-177.48	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.49	-76.76	-18.26	Sb4O6
Sb4O6 (orth)	-58.85	-76.76	-17.90	Sb4O6
SbCl3	-49.85	-49.27	0.57	SbCl3
SbF3	-44.46	-54.69	-10.23	SbF3
Sbmetal	-45.82	-57.51	-11.69	Sb
SbO2	-2.90	-30.73	-27.82	SbO2
Schoepite	-3.21	2.78	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.71	-20.82	-7.11	Se
Semetal (hex)	-13.11	-20.82	-7.71	Se
Senarmontite	-26.01	-38.38	-12.37	Sb2O3
SeO2	-14.72	-14.59	0.12	SeO2
SeO3	-46.40	-25.36	21.04	SeO3
Siderite	-7.95	-18.19	-10.24	FeCO3
Smithsonite	-1.20	-11.20	-10.00	ZnCO3
Sphalerite	-64.40	-75.85	-11.45	ZnS
Spinel	-4.58	32.26	36.85	MgAl2O4
Stibnite	-246.80	-297.26	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.48	-5.16	0.32	Na2SO4
Thermonatrite	-9.67	-9.03	0.64	Na2CO3:H2O
Tyuyamunite	-2.56	1.52	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.63	10.46	21.08	U3O8
U3Sb4	-576.31	-423.93	152.38	U3Sb4
U4O9	-25.61	-28.63	-3.02	U4O9

UF4	-31.34	-60.88	-29.54	UF4
UF4:2.5H2O	-28.16	-60.88	-32.72	UF4:2.5H2O
UO2 (am)	-14.48	-13.54	0.93	UO2
UO2 (NO3) 2	-40.87	-28.72	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.57	-28.72	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.11	-28.72	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.77	-28.73	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.83	2.78	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.33	-22.58	-2.25	UO2SeO4:4H2O
UO3	-4.92	2.78	7.70	UO3
Uraninite	-8.88	-13.54	-4.67	UO2
USb2	-218.44	-188.86	29.58	USb2
V (OH) 3	-19.14	-11.55	7.59	V (OH) 3
V2O5	-15.85	-17.21	-1.36	V2O5
V3O5	-40.81	-38.97	1.84	V3O5
V4O7	-50.63	-43.45	7.19	V4O7
V6O13	-41.87	-102.73	-60.86	V6O13
Valentinite	-29.90	-38.38	-8.48	Sb2O3
VC12	-63.26	-44.38	18.87	VC12
VC13	-65.07	-41.64	23.43	VC13
VF4	-66.74	-51.81	14.93	VF4
Vmetal	-93.89	-49.87	44.03	V
VO	-39.08	-24.32	14.76	VO
VO (OH) 2	-9.63	-4.48	5.15	VO (OH) 2
VO2Cl	-21.48	-18.63	2.84	VO2Cl
VOC1	-32.73	-21.58	11.15	VOC1
VOC12	-37.29	-24.53	12.76	VOC12
VOSO4	-25.86	-22.25	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.90	-75.85	-8.95	ZnS
Zincite	-0.89	10.45	11.33	ZnO
Zincosite	-11.26	-7.33	3.93	ZnSO4
Zn (BO2) 2	-5.73	2.56	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.38	-21.06	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.75	10.45	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.03	10.45	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.31	10.45	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.09	10.45	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.29	10.45	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.38	3.12	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.33	10.86	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.60	-0.95	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.12	-4.21	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.39	24.01	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.32	32.18	38.50	Zn5 (OH) 8Cl2
ZnCl2	-16.66	-9.61	7.05	ZnCl2
ZnCO3:1H2O	-0.94	-11.20	-10.26	ZnCO3:1H2O
ZnF2	-12.69	-13.22	-0.53	ZnF2
Znmetal	-40.89	-15.10	25.79	Zn
ZnMoO4	-0.76	-10.88	-10.13	ZnMoO4
ZnO (active)	-0.74	10.45	11.19	ZnO
ZnS (am)	-66.79	-75.85	-9.05	ZnS
ZnSb	-83.62	-72.60	11.01	ZnSb
ZnSe	-21.52	-35.92	-14.40	ZnSe
ZnSeO4:6H2O	-13.40	-14.92	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.69	-7.33	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 28.

```

Title Stage 1 Pit lake Mix
Mix 103
104    0.641050
108    0.225985
1      0.010991
17     0.121974
16     0.000000
Save solution 109
end

```

```

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TITLE
-----

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Stage 1 Pit lake Mix

```

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Beginning of batch-reaction calculations.
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```

Reaction step 1.

Using mix 103.

Mixture 103.

```

1.099e-02 Solution 1    Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
0.000e+00 Solution 16   Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)
1.220e-01 Solution 17   Average water quality for Background Surface Water
SWQ-1 (representative of haul road and watershed run-off)
6.411e-01 Solution 104   Solution after simulation 23.
2.260e-01 Solution 108   Solution after simulation 27.

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-----Solution composition-----

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Elements	Molality	Moles
Ag	3.684e-08	3.686e-08
Al	2.045e-06	2.047e-06
As	4.918e-10	4.921e-10
B	3.569e-05	3.571e-05
Ba	1.810e-07	1.811e-07
C	4.959e-03	4.962e-03
Ca	4.066e-03	4.069e-03
Cd	9.257e-09	9.262e-09
Cl	3.371e-03	3.373e-03
Co	1.138e-07	1.139e-07
Cr	3.892e-09	3.894e-09
Cu	1.651e-07	1.652e-07
F	1.535e-04	1.536e-04
Fe	2.357e-09	2.358e-09
Hg	2.480e-09	2.481e-09
K	4.353e-03	4.356e-03
Mg	6.229e-03	6.232e-03
Mn	7.504e-05	7.508e-05
Mo	2.425e-06	2.427e-06
N	5.352e-06	5.355e-06
Na	1.070e-02	1.071e-02
Ni	1.386e-07	1.387e-07
Pb	2.017e-09	2.018e-09
S	1.386e-02	1.387e-02
Sb	3.407e-08	3.408e-08
Se	1.818e-07	1.819e-07
U	4.686e-07	4.689e-07
V	7.314e-09	7.318e-09
Zn	6.981e-06	6.985e-06

-----Description of solution-----

equilibrium

pH	=	7.269	Charge balance
pe	=	5.673	Adjusted to redox
Activity of water	=	0.999	
Ionic strength (mol/kgw)	=	4.626e-02	
Mass of water (kg)	=	1.001e+00	
Total alkalinity (eq/kg)	=	4.555e-03	
Total CO2 (mol/kg)	=	4.959e-03	
Temperature (°C)	=	25.00	
Electrical balance (eq)	=	6.333e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
Iterations	=	7	
Total H	=	1.110816e+02	
Total O	=	5.560855e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.289e-07	1.870e-07	-6.640	-6.728	-0.088	(0)
H+	6.518e-08	5.382e-08	-7.186	-7.269	-0.083	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	3.684e-08					
AgCl	2.379e-08	2.379e-08	-7.624	-7.624	0.000	(0)
AgCl2-	7.424e-09	5.767e-09	-8.129	-8.239	-0.110	(0)
Ag+	5.070e-09	4.186e-09	-8.295	-8.378	-0.083	(0)
AgSO4-	5.162e-10	4.010e-10	-9.287	-9.397	-0.110	(0)
AgCl3-2	3.929e-11	1.431e-11	-10.406	-10.844	-0.439	(0)
AgNO2	3.710e-12	3.710e-12	-11.431	-11.431	0.000	(0)
AgF	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
AgCl4-3	7.896e-13	8.130e-14	-12.103	-13.090	-0.987	(0)
AgOH	7.826e-14	7.826e-14	-13.106	-13.106	0.000	(0)
AgSeO3-	3.122e-14	2.425e-14	-13.506	-13.615	-0.110	(0)
AgH2BO3	2.542e-14	2.542e-14	-13.595	-13.595	0.000	(0)
AgNH3+	1.027e-14	7.980e-15	-13.988	-14.098	-0.110	(0)
Ag2Se	5.229e-15	5.229e-15	-14.282	-14.282	0.000	(0)
Ag(NO2)2-	3.138e-17	2.438e-17	-16.503	-16.613	-0.110	(0)
AgNO3	2.904e-17	2.904e-17	-16.537	-16.537	0.000	(0)
Ag(OH)2-	1.841e-18	1.430e-18	-17.735	-17.845	-0.110	(0)
Ag(NH3)2+	7.796e-20	6.056e-20	-19.108	-19.218	-0.110	(0)
Ag(SeO3)2-3	1.901e-20	1.957e-21	-19.721	-20.708	-0.987	(0)
Ag2MoO4	7.471e-24	7.471e-24	-23.127	-23.127	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.026	-74.026	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-84.735	-86.491	-1.755	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-149.279	-149.388	-0.110	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-149.390	-149.603	-0.213	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-151.387	-151.774	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.719	-152.085	-0.366	(0)
Al	2.045e-06					
Al(OH)4-	1.889e-06	1.559e-06	-5.724	-5.807	-0.083	(0)
Al(OH)3	6.625e-08	6.625e-08	-7.179	-7.179	0.000	(0)
AlF3	3.371e-08	3.371e-08	-7.472	-7.472	0.000	(0)
AlF2+	3.161e-08	2.633e-08	-7.500	-7.580	-0.079	(0)
Al(OH)2+	2.132e-08	1.776e-08	-7.671	-7.751	-0.079	(0)
AlF4-	2.081e-09	1.718e-09	-8.682	-8.765	-0.083	(0)
AlF+2	1.351e-09	6.504e-10	-8.869	-9.187	-0.318	(0)
AlOH+2	2.485e-10	1.196e-10	-9.605	-9.922	-0.318	(0)
AlSO4+	2.888e-11	2.384e-11	-10.539	-10.623	-0.083	(0)
Al+3	3.587e-12	6.397e-13	-11.445	-12.194	-0.749	(0)
Al(SO4)2-	1.486e-12	1.227e-12	-11.828	-11.911	-0.083	(0)
AlMo6O21-3	3.037e-36	3.127e-37	-35.518	-36.505	-0.987	(0)
As(3)	6.990e-23					
H3AsO3	6.905e-23	6.905e-23	-22.161	-22.161	0.000	(0)
H2AsO3-	8.471e-25	6.580e-25	-24.072	-24.182	-0.110	(0)

	HAsO3-2	3.063e-29	1.115e-29	-28.514	-28.953	-0.439	(0)
	H4AsO3+	2.370e-30	1.841e-30	-29.625	-29.735	-0.110	(0)
	AsO3-3	7.757e-35	7.987e-36	-34.110	-35.098	-0.987	(0)
As (5)	4.918e-10						
	HAsO4-2	3.998e-10	1.455e-10	-9.398	-9.837	-0.439	(0)
	H2AsO4-	9.196e-11	7.144e-11	-10.036	-10.146	-0.110	(0)
	AsO4-3	8.306e-14	8.552e-15	-13.081	-14.068	-0.987	(0)
	H3AsO4	6.610e-16	6.681e-16	-15.180	-15.175	0.005	(0)
B	3.569e-05						
	H3BO3	3.514e-05	3.551e-05	-4.454	-4.450	0.005	(0)
	H2BO3-	4.750e-07	3.832e-07	-6.323	-6.417	-0.093	(0)
	CaH2BO3+	3.330e-08	2.687e-08	-7.478	-7.571	-0.093	(0)
	MgH2BO3+	3.324e-08	2.682e-08	-7.478	-7.572	-0.093	(0)
	NaH2BO3	5.223e-09	5.223e-09	-8.282	-8.282	0.000	(0)
	BF(OH) 3-	1.786e-09	1.441e-09	-8.748	-8.841	-0.093	(0)
	H5(BO3) 2-	1.436e-11	1.158e-11	-10.843	-10.936	-0.093	(0)
	BaH2BO3+	1.211e-12	9.771e-13	-11.917	-12.010	-0.093	(0)
	BF2(OH) 2-	1.046e-12	8.436e-13	-11.981	-12.074	-0.093	(0)
	H8(BO3) 3-	5.099e-14	4.114e-14	-13.293	-13.386	-0.093	(0)
	AgH2BO3	2.542e-14	2.542e-14	-13.595	-13.595	0.000	(0)
	BF3OH-	2.228e-18	1.797e-18	-17.652	-17.745	-0.093	(0)
	BF4-	6.003e-23	4.843e-23	-22.222	-22.315	-0.093	(0)
Ba	1.810e-07						
	Ba+2	1.775e-07	8.251e-08	-6.751	-7.084	-0.333	(0)
	BaHCO3+	3.369e-09	2.821e-09	-8.473	-8.550	-0.077	(0)
	BaCO3	1.320e-10	1.320e-10	-9.879	-9.879	0.000	(0)
	BaH2BO3+	1.211e-12	9.771e-13	-11.917	-12.010	-0.093	(0)
	BaOH+	8.115e-14	6.734e-14	-13.091	-13.172	-0.081	(0)
	BaNO3+	4.650e-15	3.612e-15	-14.333	-14.442	-0.110	(0)
	BaNH3+2	1.335e-16	4.861e-17	-15.875	-16.313	-0.439	(0)
C (4)	4.959e-03						
	HCO3-	4.299e-03	3.580e-03	-2.367	-2.446	-0.079	(0)
	H2CO3	4.334e-04	4.334e-04	-3.363	-3.363	0.000	(0)
	CaHCO3+	9.699e-05	8.123e-05	-4.013	-4.090	-0.077	(0)
	MgHCO3+	9.003e-05	7.394e-05	-4.046	-4.131	-0.086	(0)
	NaHCO3	1.732e-05	1.732e-05	-4.762	-4.762	0.000	(0)
	CO3-2	6.712e-06	3.119e-06	-5.173	-5.506	-0.333	(0)
	CaCO3	6.022e-06	6.022e-06	-5.220	-5.220	0.000	(0)
	MgCO3	5.235e-06	5.235e-06	-5.281	-5.281	0.000	(0)
	MnHCO3+	1.748e-06	1.450e-06	-5.757	-5.839	-0.081	(0)
	NaCO3-	5.997e-07	4.995e-07	-6.222	-6.301	-0.079	(0)
	UO2(CO3) 3-4	3.576e-07	6.283e-09	-6.447	-8.202	-1.755	(0)
	ZnCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
	ZnHCO3+	2.761e-07	2.144e-07	-6.559	-6.669	-0.110	(0)
	CuCO3	1.313e-07	1.313e-07	-6.882	-6.882	0.000	(0)
	UO2(CO3) 2-2	1.104e-07	4.019e-08	-6.957	-7.396	-0.439	(0)
	NiHCO3+	2.068e-08	1.606e-08	-7.685	-7.794	-0.110	(0)
	CoHCO3+	9.865e-09	7.663e-09	-8.006	-8.116	-0.110	(0)
	NiCO3	4.234e-09	4.234e-09	-8.373	-8.373	0.000	(0)
	BaHCO3+	3.369e-09	2.821e-09	-8.473	-8.550	-0.077	(0)
	Cu(CO3) 2-2	3.028e-09	1.102e-09	-8.519	-8.958	-0.439	(0)
	CuHCO3+	2.079e-09	1.615e-09	-8.682	-8.792	-0.110	(0)
	CoCO3	1.451e-09	1.451e-09	-8.838	-8.838	0.000	(0)
	PbCO3	1.024e-09	1.024e-09	-8.990	-8.990	0.000	(0)
	UO2CO3	6.458e-10	6.458e-10	-9.190	-9.190	0.000	(0)
	PbHCO3+	3.740e-10	2.905e-10	-9.427	-9.537	-0.110	(0)
	CdCO3	1.683e-10	1.683e-10	-9.774	-9.774	0.000	(0)
	BaCO3	1.320e-10	1.320e-10	-9.879	-9.879	0.000	(0)
	Pb(CO3) 2-2	2.529e-11	9.209e-12	-10.597	-11.036	-0.439	(0)
	CdHCO3+	2.484e-11	1.929e-11	-10.605	-10.715	-0.110	(0)
	Cd(CO3) 2-2	1.069e-12	3.891e-13	-11.971	-12.410	-0.439	(0)
	FeHCO3+	2.333e-13	1.953e-13	-12.632	-12.709	-0.077	(0)
	HgCO3	2.125e-13	2.125e-13	-12.673	-12.673	0.000	(0)
	Hg(CO3) 2-2	5.756e-15	2.096e-15	-14.240	-14.679	-0.439	(0)
	HgHCO3+	2.741e-16	2.129e-16	-15.562	-15.672	-0.110	(0)
Ca	4.066e-03						
	Ca+2	2.622e-03	1.218e-03	-2.581	-2.914	-0.333	(0)
	CaSO4	1.340e-03	1.340e-03	-2.873	-2.873	0.000	(0)

	CaHCO3+	9.699e-05	8.123e-05	-4.013	-4.090	-0.077	(0)
	CaCO3	6.022e-06	6.022e-06	-5.220	-5.220	0.000	(0)
	CaF+	1.630e-06	1.352e-06	-5.788	-5.869	-0.081	(0)
	CaH2BO3+	3.330e-08	2.687e-08	-7.478	-7.571	-0.093	(0)
	CaOH+	5.427e-09	4.545e-09	-8.265	-8.342	-0.077	(0)
	CaNO3+	4.333e-11	3.365e-11	-10.363	-10.473	-0.110	(0)
	CaNH3+2	3.933e-12	1.432e-12	-11.405	-11.844	-0.439	(0)
	Ca (NH3) 2+2	1.462e-21	5.323e-22	-20.835	-21.274	-0.439	(0)
Cd		9.257e-09					
	Cd+2	5.093e-09	2.367e-09	-8.293	-8.626	-0.333	(0)
	CdSO4	2.664e-09	2.664e-09	-8.574	-8.574	0.000	(0)
	CdCl+	8.099e-10	6.292e-10	-9.092	-9.201	-0.110	(0)
	Cd (SO4) 2-2	4.739e-10	1.726e-10	-9.324	-9.763	-0.439	(0)
	CdCO3	1.683e-10	1.683e-10	-9.774	-9.774	0.000	(0)
	CdHCO3+	2.484e-11	1.929e-11	-10.605	-10.715	-0.110	(0)
	CdCl2	7.300e-12	7.300e-12	-11.137	-11.137	0.000	(0)
	CdF+	4.910e-12	3.814e-12	-11.309	-11.419	-0.110	(0)
	CdOHC1	4.825e-12	4.825e-12	-11.316	-11.316	0.000	(0)
	CdOH+	4.525e-12	3.515e-12	-11.344	-11.454	-0.110	(0)
	Cd (CO3) 2-2	1.069e-12	3.891e-13	-11.971	-12.410	-0.439	(0)
	CdCl3-	1.651e-14	1.282e-14	-13.782	-13.892	-0.110	(0)
	Cd (OH) 2	4.146e-15	4.146e-15	-14.382	-14.382	0.000	(0)
	CdF2	7.739e-16	7.739e-16	-15.111	-15.111	0.000	(0)
	CdNO3+	8.417e-17	6.538e-17	-16.075	-16.185	-0.110	(0)
	CdSeO4	3.756e-17	3.756e-17	-16.425	-16.425	0.000	(0)
	Cd (SeO3) 2-2	4.353e-19	1.585e-19	-18.361	-18.800	-0.439	(0)
	Cd2OH+3	4.049e-19	4.170e-20	-18.393	-19.380	-0.987	(0)
	Cd (OH) 3-	6.097e-20	4.736e-20	-19.215	-19.325	-0.110	(0)
	Cd (NO3) 2	2.862e-25	2.862e-25	-24.543	-24.543	0.000	(0)
	Cd (OH) 4-2	3.981e-27	1.449e-27	-26.400	-26.839	-0.439	(0)
	CdHS+	0.000e+00	0.000e+00	-79.971	-80.080	-0.110	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-152.339	-152.339	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-229.791	-229.901	-0.110	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-306.729	-307.167	-0.439	(0)
Cl		3.371e-03					
	Cl-	3.371e-03	2.783e-03	-2.472	-2.555	-0.083	(0)
	MnCl+	8.573e-08	7.114e-08	-7.067	-7.148	-0.081	(0)
	AgCl	2.379e-08	2.379e-08	-7.624	-7.624	0.000	(0)
	ZnCl+	1.612e-08	1.324e-08	-7.793	-7.878	-0.086	(0)
	AgCl2-	7.424e-09	5.767e-09	-8.129	-8.239	-0.110	(0)
	ZnOHC1	3.241e-09	3.241e-09	-8.489	-8.489	0.000	(0)
	CdCl+	8.099e-10	6.292e-10	-9.092	-9.201	-0.110	(0)
	CoCl+	3.411e-10	2.649e-10	-9.467	-9.577	-0.110	(0)
	NiCl+	3.336e-10	2.591e-10	-9.477	-9.586	-0.110	(0)
	MnCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
	ZnCl2	5.842e-11	5.842e-11	-10.233	-10.233	0.000	(0)
	HgClOH	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
	HgCl2	4.410e-11	4.410e-11	-10.356	-10.356	0.000	(0)
	AgCl3-2	3.929e-11	1.431e-11	-10.406	-10.844	-0.439	(0)
	CuCl+	3.841e-11	3.154e-11	-10.416	-10.501	-0.086	(0)
	CuCl	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
	CuCl2-	1.845e-11	1.515e-11	-10.734	-10.819	-0.086	(0)
	PbCl+	1.388e-11	1.078e-11	-10.858	-10.967	-0.110	(0)
	CdCl2	7.300e-12	7.300e-12	-11.137	-11.137	0.000	(0)
	CdOHC1	4.825e-12	4.825e-12	-11.316	-11.316	0.000	(0)
	HgCl3-	1.580e-12	1.228e-12	-11.801	-11.911	-0.110	(0)
	AgCl4-3	7.896e-13	8.130e-14	-12.103	-13.090	-0.987	(0)
	MnCl3-	2.584e-13	2.144e-13	-12.588	-12.669	-0.081	(0)
	ZnCl3-	1.573e-13	1.292e-13	-12.803	-12.889	-0.086	(0)
	PbCl2	1.341e-13	1.341e-13	-12.873	-12.873	0.000	(0)
	HgCl4-2	3.736e-14	1.360e-14	-13.428	-13.866	-0.439	(0)
	CuCl2	3.044e-14	3.044e-14	-13.517	-13.517	0.000	(0)
	CuCl3-2	1.903e-14	9.018e-15	-13.721	-14.045	-0.324	(0)
	CdCl3-	1.651e-14	1.282e-14	-13.782	-13.892	-0.110	(0)
	HgCl+	4.070e-15	3.161e-15	-14.390	-14.500	-0.110	(0)
	NiCl2	3.632e-15	3.632e-15	-14.440	-14.440	0.000	(0)
	ZnCl4-2	3.793e-16	1.798e-16	-15.421	-15.745	-0.324	(0)
	UO2Cl+	3.023e-16	2.348e-16	-15.520	-15.629	-0.110	(0)

CrCl+2	2.704e-16	9.845e-17	-15.568	-16.007	-0.439	(0)
PbCl3-	1.913e-16	1.486e-16	-15.718	-15.828	-0.110	(0)
CrOHC12	9.737e-19	9.737e-19	-18.012	-18.012	0.000	(0)
CuCl3-	9.629e-19	7.907e-19	-18.016	-18.102	-0.086	(0)
PbCl4-2	5.192e-19	1.890e-19	-18.285	-18.723	-0.439	(0)
FeCl+2	3.362e-20	1.593e-20	-19.473	-19.798	-0.324	(0)
CrCl2+	3.347e-20	2.600e-20	-19.475	-19.585	-0.110	(0)
VOCl+	1.479e-21	1.149e-21	-20.830	-20.940	-0.110	(0)
FeCl2+	2.388e-22	1.981e-22	-21.622	-21.703	-0.081	(0)
CuCl4-2	2.327e-23	1.103e-23	-22.633	-22.957	-0.324	(0)
CrO3Cl-	9.704e-26	7.538e-26	-25.013	-25.123	-0.110	(0)
FeCl3	5.515e-26	5.515e-26	-25.258	-25.258	0.000	(0)
CoCl+2	8.023e-35	2.921e-35	-34.096	-34.534	-0.439	(0)
UCl+3	0.000e+00	0.000e+00	-44.358	-45.345	-0.987	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
Co (2)	1.138e-07					
Co+2	7.557e-08	2.751e-08	-7.122	-7.560	-0.439	(0)
CoSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
CoHCO3+	9.865e-09	7.663e-09	-8.006	-8.116	-0.110	(0)
CoCO3	1.451e-09	1.451e-09	-8.838	-8.838	0.000	(0)
CoCl+	3.411e-10	2.649e-10	-9.467	-9.577	-0.110	(0)
CoOH+	1.321e-10	1.026e-10	-9.879	-9.989	-0.110	(0)
CoF+	1.139e-10	8.847e-11	-9.944	-10.053	-0.110	(0)
Co (OH) 2	1.524e-12	1.524e-12	-11.817	-11.817	0.000	(0)
CoNO2+	1.059e-12	8.225e-13	-11.975	-12.085	-0.110	(0)
Co (NH3) +2	8.483e-15	3.088e-15	-14.071	-14.510	-0.439	(0)
CoSeO4	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
CoNO3+	4.904e-16	3.809e-16	-15.309	-15.419	-0.110	(0)
Co (OH) 3-	7.320e-18	5.686e-18	-17.136	-17.245	-0.110	(0)
CoOOH-	1.838e-18	1.428e-18	-17.736	-17.845	-0.110	(0)
Co2OH+3	1.374e-18	1.415e-19	-17.862	-18.849	-0.987	(0)
Co (NH3) 2+2	3.379e-22	1.230e-22	-21.471	-21.910	-0.439	(0)
Co (NO3) 2	6.770e-24	6.770e-24	-23.169	-23.169	0.000	(0)
Co (OH) 4-2	4.627e-25	1.685e-25	-24.335	-24.773	-0.439	(0)
Co (NH3) 3+2	3.971e-30	1.446e-30	-29.401	-29.840	-0.439	(0)
Co4 (OH) 4+4	1.260e-30	2.214e-32	-29.900	-31.655	-1.755	(0)
Co (NH3) 4+2	1.946e-38	7.085e-39	-37.711	-38.150	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.521	-46.959	-0.439	(0)
Co (3)	1.346e-28					
CoOH+2	1.346e-28	4.900e-29	-27.871	-28.310	-0.439	(0)
Co+3	2.893e-34	5.158e-35	-33.539	-34.288	-0.749	(0)
CoCl+2	8.023e-35	2.921e-35	-34.096	-34.534	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-69.010	-69.448	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
Cr (2)	3.808e-26					
Cr+2	3.808e-26	1.386e-26	-25.419	-25.858	-0.439	(0)
Cr (3)	3.892e-09					
Cr (OH) 2+	3.274e-09	2.543e-09	-8.485	-8.595	-0.110	(0)
Cr (OH) +2	3.070e-10	1.118e-10	-9.513	-9.952	-0.439	(0)
Cr (OH) 3	1.786e-10	1.786e-10	-9.748	-9.748	0.000	(0)
CrOHSO4	1.274e-10	1.274e-10	-9.895	-9.895	0.000	(0)
CrO2-	2.030e-12	1.577e-12	-11.692	-11.802	-0.110	(0)
Cr (OH) 4-	1.711e-12	1.329e-12	-11.767	-11.876	-0.110	(0)
CrF+2	1.210e-12	4.404e-13	-11.917	-12.356	-0.439	(0)
CrSO4+	3.945e-13	3.064e-13	-12.404	-12.514	-0.110	(0)
Cr+3	2.654e-13	2.733e-14	-12.576	-13.563	-0.987	(0)
CrCl+2	2.704e-16	9.845e-17	-15.568	-16.007	-0.439	(0)
Cr2 (OH) 2SO4+2	3.534e-18	1.287e-18	-17.452	-17.890	-0.439	(0)
CrOHC12	9.737e-19	9.737e-19	-18.012	-18.012	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.670e-19	3.670e-19	-18.435	-18.435	0.000	(0)
CrCl2+	3.347e-20	2.600e-20	-19.475	-19.585	-0.110	(0)
CrNO3+2	2.866e-23	1.044e-23	-22.543	-22.981	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.630	-45.068	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.755	-54.742	-0.987	(0)

Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Cr(6)	1.124e-15					
CrO4-2	9.879e-16	4.591e-16	-15.005	-15.338	-0.333	(0)
HCrO4-	1.029e-16	7.995e-17	-15.987	-16.097	-0.110	(0)
NaCrO4-	2.526e-17	1.962e-17	-16.598	-16.707	-0.110	(0)
KCrO4-	7.635e-18	5.931e-18	-17.117	-17.227	-0.110	(0)
CrO3SO4-2	1.730e-23	6.297e-24	-22.762	-23.201	-0.439	(0)
H2CrO4	3.488e-24	3.488e-24	-23.457	-23.457	0.000	(0)
CrO3Cl-	9.704e-26	7.538e-26	-25.013	-25.123	-0.110	(0)
Cr2O7-2	6.092e-31	2.218e-31	-30.215	-30.654	-0.439	(0)
Cu(1)	5.410e-11					
CuCl	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
CuCl2-	1.845e-11	1.515e-11	-10.734	-10.819	-0.086	(0)
Cu+	9.573e-12	7.436e-12	-11.019	-11.129	-0.110	(0)
CuCl3-2	1.903e-14	9.018e-15	-13.721	-14.045	-0.324	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-151.749	-152.125	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.498	-152.855	-0.357	(0)
Cu(2)	1.651e-07					
CuCO3	1.313e-07	1.313e-07	-6.882	-6.882	0.000	(0)
Cu+2	1.539e-08	7.150e-09	-7.813	-8.146	-0.333	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
CuOH+	5.147e-09	4.227e-09	-8.288	-8.374	-0.086	(0)
Cu(CO3)2-2	3.028e-09	1.102e-09	-8.519	-8.958	-0.439	(0)
CuHCO3+	2.079e-09	1.615e-09	-8.682	-8.792	-0.110	(0)
Cu(OH)2	1.577e-10	1.577e-10	-9.802	-9.802	0.000	(0)
CuF+	5.905e-11	4.587e-11	-10.229	-10.338	-0.110	(0)
CuCl+	3.841e-11	3.154e-11	-10.416	-10.501	-0.086	(0)
CuNO2+	4.089e-12	3.176e-12	-11.388	-11.498	-0.110	(0)
Cu2(OH)2+2	1.233e-12	4.488e-13	-11.909	-12.348	-0.439	(0)
CuNH3+2	1.876e-13	6.831e-14	-12.727	-13.166	-0.439	(0)
Cu(OH)3-	7.785e-14	6.047e-14	-13.109	-13.218	-0.110	(0)
CuCl2	3.044e-14	3.044e-14	-13.517	-13.517	0.000	(0)
CuNO3+	2.543e-16	1.975e-16	-15.595	-15.704	-0.110	(0)
Cu(NO2)2	1.379e-16	1.379e-16	-15.860	-15.860	0.000	(0)
CuCl3-	9.629e-19	7.907e-19	-18.016	-18.102	-0.086	(0)
Cu(OH)4-2	2.444e-19	8.898e-20	-18.612	-19.051	-0.439	(0)
CuCl4-2	2.327e-23	1.103e-23	-22.633	-22.957	-0.324	(0)
Cu(NO3)2	2.172e-25	2.172e-25	-24.663	-24.663	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-220.524	-220.634	-0.110	(0)
F	1.535e-04					
F-	1.232e-04	1.017e-04	-3.910	-3.993	-0.083	(0)
MgF+	2.789e-05	2.302e-05	-4.555	-4.638	-0.083	(0)
CaF+	1.630e-06	1.352e-06	-5.788	-5.869	-0.081	(0)
NaF	5.518e-07	5.518e-07	-6.258	-6.258	0.000	(0)
MnF+	9.904e-08	8.218e-08	-7.004	-7.085	-0.081	(0)
AlF3	3.371e-08	3.371e-08	-7.472	-7.472	0.000	(0)
AlF2+	3.161e-08	2.633e-08	-7.500	-7.580	-0.079	(0)
HF	8.094e-09	8.094e-09	-8.092	-8.092	0.000	(0)
ZnF+	4.947e-09	3.843e-09	-8.306	-8.415	-0.110	(0)
AlF4-	2.081e-09	1.718e-09	-8.682	-8.765	-0.083	(0)
BF(OH)3-	1.786e-09	1.441e-09	-8.748	-8.841	-0.093	(0)
AlF+2	1.351e-09	6.504e-10	-8.869	-9.187	-0.318	(0)
NiF+	1.196e-10	9.294e-11	-9.922	-10.032	-0.110	(0)
CoF+	1.139e-10	8.847e-11	-9.944	-10.053	-0.110	(0)
CuF+	5.905e-11	4.587e-11	-10.229	-10.338	-0.110	(0)
CdF+	4.910e-12	3.814e-12	-11.309	-11.419	-0.110	(0)
HF2-	3.832e-12	3.129e-12	-11.417	-11.505	-0.088	(0)
CrF+2	1.210e-12	4.404e-13	-11.917	-12.356	-0.439	(0)
AgF	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
BF2(OH)2-	1.046e-12	8.436e-13	-11.981	-12.074	-0.093	(0)
PbF+	1.007e-12	7.824e-13	-11.997	-12.107	-0.110	(0)
UO2F+	9.398e-13	7.301e-13	-12.027	-12.137	-0.110	(0)
UO2F2	2.141e-13	2.141e-13	-12.669	-12.669	0.000	(0)
UO2F3-	7.040e-15	5.468e-15	-14.152	-14.262	-0.110	(0)
PbF2	1.566e-15	1.566e-15	-14.805	-14.805	0.000	(0)
CdF2	7.739e-16	7.739e-16	-15.111	-15.111	0.000	(0)
H2F2	1.755e-16	1.755e-16	-15.756	-15.756	0.000	(0)
FeF2+	6.932e-17	5.751e-17	-16.159	-16.240	-0.081	(0)

VO2F	5.331e-17	5.331e-17	-16.273	-16.273	0.000	(0)
FeF+2	4.459e-17	2.114e-17	-16.351	-16.675	-0.324	(0)
UO2F4-2	1.213e-17	4.417e-18	-16.916	-17.355	-0.439	(0)
FeF3	8.251e-18	8.251e-18	-17.083	-17.083	0.000	(0)
VO2F2-	2.534e-18	1.968e-18	-17.596	-17.706	-0.110	(0)
BF3OH-	2.228e-18	1.797e-18	-17.652	-17.745	-0.093	(0)
PbF3-	3.887e-19	3.020e-19	-18.410	-18.520	-0.110	(0)
VOF+	1.155e-19	8.975e-20	-18.937	-19.047	-0.110	(0)
VO2F3-2	6.857e-21	2.496e-21	-20.164	-20.603	-0.439	(0)
VOF2	3.422e-21	3.422e-21	-20.466	-20.466	0.000	(0)
HgF+	2.762e-22	2.146e-22	-21.559	-21.668	-0.110	(0)
BF4-	6.003e-23	4.843e-23	-22.222	-22.315	-0.093	(0)
PbF4-2	4.037e-23	1.470e-23	-22.394	-22.833	-0.439	(0)
VOF3-	1.589e-23	1.235e-23	-22.799	-22.908	-0.110	(0)
VO2F4-3	1.213e-24	1.249e-25	-23.916	-24.903	-0.987	(0)
Sb (OH) 2F	3.796e-25	3.796e-25	-24.421	-24.421	0.000	(0)
SbOF	3.736e-25	3.736e-25	-24.428	-24.428	0.000	(0)
VOF4-2	1.392e-26	5.068e-27	-25.856	-26.295	-0.439	(0)
UF3+	1.746e-35	1.356e-35	-34.758	-34.868	-0.110	(0)
UF2+2	2.312e-36	8.416e-37	-35.636	-36.075	-0.439	(0)
UF4	1.512e-37	1.512e-37	-36.820	-36.820	0.000	(0)
UF+3	6.385e-39	6.574e-40	-38.195	-39.182	-0.987	(0)
UF5-	7.845e-40	6.094e-40	-39.105	-39.215	-0.110	(0)
UF6-2	0.000e+00	0.000e+00	-40.289	-40.728	-0.439	(0)
Fe (2)	1.728e-11					
Fe+2	1.190e-11	4.334e-12	-10.924	-11.363	-0.439	(0)
FeSO4	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
FeHCO3+	2.333e-13	1.953e-13	-12.632	-12.709	-0.077	(0)
FeOH+	3.887e-14	3.225e-14	-13.410	-13.491	-0.081	(0)
Fe (OH) 2	4.790e-18	4.790e-18	-17.320	-17.320	0.000	(0)
Fe (OH) 3-	3.413e-19	2.832e-19	-18.467	-18.548	-0.081	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.338	-161.338	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.654	-238.763	-0.110	(0)
Fe (3)	2.340e-09					
Fe (OH) 2+	1.998e-09	1.664e-09	-8.699	-8.779	-0.079	(0)
Fe (OH) 3	3.342e-10	3.342e-10	-9.476	-9.476	0.000	(0)
Fe (OH) 4-	6.985e-12	5.818e-12	-11.156	-11.235	-0.079	(0)
FeOH+2	4.828e-14	2.288e-14	-13.316	-13.640	-0.324	(0)
FeF2+	6.932e-17	5.751e-17	-16.159	-16.240	-0.081	(0)
FeF+2	4.459e-17	2.114e-17	-16.351	-16.675	-0.324	(0)
FeSO4+	1.231e-17	1.021e-17	-16.910	-16.991	-0.081	(0)
FeF3	8.251e-18	8.251e-18	-17.083	-17.083	0.000	(0)
Fe (SO4) 2-	1.350e-18	1.048e-18	-17.870	-17.979	-0.110	(0)
Fe+3	1.063e-18	1.896e-19	-17.973	-18.722	-0.749	(0)
FeCl+2	3.362e-20	1.593e-20	-19.473	-19.798	-0.324	(0)
FeCl2+	2.388e-22	1.981e-22	-21.622	-21.703	-0.081	(0)
FeHSeO3+2	1.676e-22	6.104e-23	-21.776	-22.214	-0.439	(0)
Fe2 (OH) 2+4	9.868e-25	1.734e-26	-24.006	-25.761	-1.755	(0)
FeCl3	5.515e-26	5.515e-26	-25.258	-25.258	0.000	(0)
FeNO3+2	4.548e-26	1.656e-26	-25.342	-25.781	-0.439	(0)
Fe3 (OH) 4+5	2.306e-31	4.172e-34	-30.637	-33.380	-2.743	(0)
H (0)	1.830e-29					
H2	9.149e-30	9.247e-30	-29.039	-29.034	0.005	(0)
Hg (0)	2.369e-09					
Hg	2.369e-09	2.369e-09	-8.625	-8.625	0.000	(0)
Hg (1)	5.030e-19					
Hg2+2	2.515e-19	9.156e-20	-18.599	-19.038	-0.439	(0)
Hg (2)	1.107e-10					
HgClOH	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
HgCl2	4.410e-11	4.410e-11	-10.356	-10.356	0.000	(0)
Hg (OH) 2	1.242e-11	1.255e-11	-10.906	-10.901	0.005	(0)
HgCl3-	1.580e-12	1.228e-12	-11.801	-11.911	-0.110	(0)
HgCO3	2.125e-13	2.125e-13	-12.673	-12.673	0.000	(0)
HgCl4-2	3.736e-14	1.360e-14	-13.428	-13.866	-0.439	(0)
Hg (CO3) 2-2	5.756e-15	2.096e-15	-14.240	-14.679	-0.439	(0)
HgCl+	4.070e-15	3.161e-15	-14.390	-14.500	-0.110	(0)
HgOH+	5.454e-16	4.237e-16	-15.263	-15.373	-0.110	(0)
HgHCO3+	2.741e-16	2.129e-16	-15.562	-15.672	-0.110	(0)

	Hg (OH) 3-	3.804e-19	2.955e-19	-18.420	-18.529	-0.110	(0)
	Hg+2	1.563e-19	5.692e-20	-18.806	-19.245	-0.439	(0)
	HgNH3+2	9.210e-20	3.353e-20	-19.036	-19.475	-0.439	(0)
	Hg (NH3) 2+2	8.600e-20	3.131e-20	-19.066	-19.504	-0.439	(0)
	HgSO4	7.156e-20	7.156e-20	-19.145	-19.145	0.000	(0)
	HgF+	2.762e-22	2.146e-22	-21.559	-21.668	-0.110	(0)
	Hg (NH3) 3+2	3.197e-28	1.164e-28	-27.495	-27.934	-0.439	(0)
	HgNO3+	2.364e-28	1.836e-28	-27.626	-27.736	-0.110	(0)
	Hg (NH3) 4+2	2.371e-36	8.632e-37	-35.625	-36.064	-0.439	(0)
	Hg (NO3) 2	6.666e-37	6.666e-37	-36.176	-36.176	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.863	-138.972	-0.110	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.847	-139.847	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.973	-140.411	-0.439	(0)
K	4.353e-03						
	K+	4.211e-03	3.477e-03	-2.376	-2.459	-0.083	(0)
	KSO4-	1.419e-04	1.182e-04	-3.848	-3.927	-0.079	(0)
	KCrO4-	7.635e-18	5.931e-18	-17.117	-17.227	-0.110	(0)
Mg	6.229e-03						
	Mg+2	4.342e-03	2.018e-03	-2.362	-2.695	-0.333	(0)
	MgSO4	1.763e-03	1.763e-03	-2.754	-2.754	0.000	(0)
	MgHCO3+	9.003e-05	7.394e-05	-4.046	-4.131	-0.086	(0)
	MgF+	2.789e-05	2.302e-05	-4.555	-4.638	-0.083	(0)
	MgCO3	5.235e-06	5.235e-06	-5.281	-5.281	0.000	(0)
	MgOH+	1.786e-07	1.502e-07	-6.748	-6.823	-0.075	(0)
	MgH2BO3+	3.324e-08	2.682e-08	-7.478	-7.572	-0.093	(0)
Mn (2)	7.504e-05						
	Mn+2	5.576e-05	2.030e-05	-4.254	-4.692	-0.439	(0)
	MnSO4	1.733e-05	1.733e-05	-4.761	-4.761	0.000	(0)
	MnHCO3+	1.748e-06	1.450e-06	-5.757	-5.839	-0.081	(0)
	MnF+	9.904e-08	8.218e-08	-7.004	-7.085	-0.081	(0)
	MnCl+	8.573e-08	7.114e-08	-7.067	-7.148	-0.081	(0)
	MnOH+	1.149e-08	9.534e-09	-7.940	-8.021	-0.081	(0)
	MnCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
	MnSeO4	4.657e-13	4.657e-13	-12.332	-12.332	0.000	(0)
	MnNO3+	3.618e-13	2.811e-13	-12.442	-12.551	-0.110	(0)
	MnCl3-	2.584e-13	2.144e-13	-12.588	-12.669	-0.081	(0)
	Mn (OH) 3-	2.482e-18	2.059e-18	-17.605	-17.686	-0.081	(0)
	Mn (NO3) 2	6.167e-21	6.167e-21	-20.210	-20.210	0.000	(0)
	Mn (OH) 4-2	2.623e-24	1.243e-24	-23.581	-23.905	-0.324	(0)
	MnSe	0.000e+00	0.000e+00	-42.514	-42.514	0.000	(0)
Mn (3)	2.395e-24						
	Mn+3	2.395e-24	4.270e-25	-23.621	-24.370	-0.749	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.947	-42.272	-0.324	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-45.880	-45.971	-0.091	(0)
Mo	2.425e-06						
	MoO4-2	2.424e-06	1.126e-06	-5.615	-5.948	-0.333	(0)
	HMoO4-	1.553e-09	1.206e-09	-8.809	-8.919	-0.110	(0)
	H2MoO4	4.755e-13	4.755e-13	-12.323	-12.323	0.000	(0)
	Ag2MoO4	7.471e-24	7.471e-24	-23.127	-23.127	0.000	(0)
	AlMo6O21-3	3.037e-36	3.127e-37	-35.518	-36.505	-0.987	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-42.850	-46.799	-3.949	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-44.939	-47.682	-2.743	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-48.413	-50.169	-1.755	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-53.204	-54.192	-0.987	(0)
N (-3)	1.156e-07						
	NH4+	1.092e-07	8.813e-08	-6.962	-7.055	-0.093	(0)
	NH4SO4-	5.465e-09	4.534e-09	-8.262	-8.343	-0.081	(0)
	NH3	9.337e-10	9.337e-10	-9.030	-9.030	0.000	(0)
	CaNH3+2	3.933e-12	1.432e-12	-11.405	-11.844	-0.439	(0)
	CuNH3+2	1.876e-13	6.831e-14	-12.727	-13.166	-0.439	(0)
	NiNH3+2	5.011e-14	1.824e-14	-13.300	-13.739	-0.439	(0)
	AgNH3+	1.027e-14	7.980e-15	-13.988	-14.098	-0.110	(0)
	Co (NH3) +2	8.483e-15	3.088e-15	-14.071	-14.510	-0.439	(0)
	BaNH3+2	1.335e-16	4.861e-17	-15.875	-16.313	-0.439	(0)
	HgNH3+2	9.210e-20	3.353e-20	-19.036	-19.475	-0.439	(0)
	Hg (NH3) 2+2	8.600e-20	3.131e-20	-19.066	-19.504	-0.439	(0)

Ag (NH3) 2+	7.796e-20	6.056e-20	-19.108	-19.218	-0.110	(0)
Ni (NH3) 2+2	6.763e-21	2.462e-21	-20.170	-20.609	-0.439	(0)
Ca (NH3) 2+2	1.462e-21	5.323e-22	-20.835	-21.274	-0.439	(0)
Co (NH3) 2+2	3.379e-22	1.230e-22	-21.471	-21.910	-0.439	(0)
Hg (NH3) 3+2	3.197e-28	1.164e-28	-27.495	-27.934	-0.439	(0)
Co (NH3) 3+2	3.971e-30	1.446e-30	-29.401	-29.840	-0.439	(0)
Hg (NH3) 4+2	2.371e-36	8.632e-37	-35.625	-36.064	-0.439	(0)
Co (NH3) 4+2	1.946e-38	7.085e-39	-37.711	-38.150	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.630	-45.068	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.521	-46.959	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.755	-54.742	-0.987	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-69.010	-69.448	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
N (3)	5.226e-06					
NO2-	5.226e-06	4.242e-06	-5.282	-5.372	-0.091	(0)
CuNO2+	4.089e-12	3.176e-12	-11.388	-11.498	-0.110	(0)
AgNO2	3.710e-12	3.710e-12	-11.431	-11.431	0.000	(0)
CoNO2+	1.059e-12	8.225e-13	-11.975	-12.085	-0.110	(0)
Cu (NO2) 2	1.379e-16	1.379e-16	-15.860	-15.860	0.000	(0)
Ag (NO2) 2-	3.138e-17	2.438e-17	-16.503	-16.613	-0.110	(0)
N (5)	1.062e-08					
NO3-	1.058e-08	8.735e-09	-7.976	-8.059	-0.083	(0)
CaNO3+	4.333e-11	3.365e-11	-10.363	-10.473	-0.110	(0)
MnNO3+	3.618e-13	2.811e-13	-12.442	-12.551	-0.110	(0)
ZnNO3+	5.350e-14	4.156e-14	-13.272	-13.381	-0.110	(0)
BaNO3+	4.650e-15	3.612e-15	-14.333	-14.442	-0.110	(0)
NiNO3+	1.028e-15	7.984e-16	-14.988	-15.098	-0.110	(0)
CoNO3+	4.904e-16	3.809e-16	-15.309	-15.419	-0.110	(0)
CuNO3+	2.543e-16	1.975e-16	-15.595	-15.704	-0.110	(0)
CdNO3+	8.417e-17	6.538e-17	-16.075	-16.185	-0.110	(0)
AgNO3	2.904e-17	2.904e-17	-16.537	-16.537	0.000	(0)
PbNO3+	1.816e-17	1.411e-17	-16.741	-16.851	-0.110	(0)
Mn (NO3) 2	6.167e-21	6.167e-21	-20.210	-20.210	0.000	(0)
UO2NO3+	1.167e-21	9.065e-22	-20.933	-21.043	-0.110	(0)
Zn (NO3) 2	7.244e-23	7.244e-23	-22.140	-22.140	0.000	(0)
CrNO3+2	2.866e-23	1.044e-23	-22.543	-22.981	-0.439	(0)
Co (NO3) 2	6.770e-24	6.770e-24	-23.169	-23.169	0.000	(0)
VO2NO3	1.321e-24	1.321e-24	-23.879	-23.879	0.000	(0)
Cd (NO3) 2	2.862e-25	2.862e-25	-24.543	-24.543	0.000	(0)
Cu (NO3) 2	2.172e-25	2.172e-25	-24.663	-24.663	0.000	(0)
Pb (NO3) 2	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
FeNO3+2	4.548e-26	1.656e-26	-25.342	-25.781	-0.439	(0)
HgNO3+	2.364e-28	1.836e-28	-27.626	-27.736	-0.110	(0)
Hg (NO3) 2	6.666e-37	6.666e-37	-36.176	-36.176	0.000	(0)
Na	1.070e-02					
Na+	1.042e-02	8.600e-03	-1.982	-2.066	-0.083	(0)
NaSO4-	2.662e-04	2.218e-04	-3.575	-3.654	-0.079	(0)
NaHCO3	1.732e-05	1.732e-05	-4.762	-4.762	0.000	(0)
NaCO3-	5.997e-07	4.995e-07	-6.222	-6.301	-0.079	(0)
NaF	5.518e-07	5.518e-07	-6.258	-6.258	0.000	(0)
NaH2BO3	5.223e-09	5.223e-09	-8.282	-8.282	0.000	(0)
NaCrO4-	2.526e-17	1.962e-17	-16.598	-16.707	-0.110	(0)
Ni	1.386e-07					
Ni+2	7.830e-08	3.639e-08	-7.106	-7.439	-0.333	(0)
NiSO4	3.486e-08	3.486e-08	-7.458	-7.458	0.000	(0)
NiHCO3+	2.068e-08	1.606e-08	-7.685	-7.794	-0.110	(0)
NiCO3	4.234e-09	4.234e-09	-8.373	-8.373	0.000	(0)
NiCl+	3.336e-10	2.591e-10	-9.477	-9.586	-0.110	(0)
NiF+	1.196e-10	9.294e-11	-9.922	-10.032	-0.110	(0)
NiOH+	1.102e-10	8.564e-11	-9.958	-10.067	-0.110	(0)
Ni (SO4) 2-2	1.522e-11	5.542e-12	-10.818	-11.256	-0.439	(0)
Ni (OH) 2	1.272e-12	1.272e-12	-11.896	-11.896	0.000	(0)
NiNH3+2	5.011e-14	1.824e-14	-13.300	-13.739	-0.439	(0)
NiCl2	3.632e-15	3.632e-15	-14.440	-14.440	0.000	(0)
NiSeO4	1.450e-15	1.450e-15	-14.838	-14.838	0.000	(0)

NiNO3+	1.028e-15	7.984e-16	-14.988	-15.098	-0.110	(0)
Ni (OH) 3-	3.061e-16	2.378e-16	-15.514	-15.624	-0.110	(0)
Ni (NH3) 2+2	6.763e-21	2.462e-21	-20.170	-20.609	-0.439	(0)
O (0)	1.171e-34					
O2	5.857e-35	5.919e-35	-34.232	-34.228	0.005	(0)
Pb	2.017e-09					
PbCO3	1.024e-09	1.024e-09	-8.990	-8.990	0.000	(0)
PbHCO3+	3.740e-10	2.905e-10	-9.427	-9.537	-0.110	(0)
PbSO4	2.568e-10	2.568e-10	-9.590	-9.590	0.000	(0)
Pb+2	2.350e-10	1.092e-10	-9.629	-9.962	-0.333	(0)
PbOH+	6.602e-11	5.128e-11	-10.180	-10.290	-0.110	(0)
Pb (CO3) 2-2	2.529e-11	9.209e-12	-10.597	-11.036	-0.439	(0)
Pb (SO4) 2-2	2.041e-11	7.429e-12	-10.690	-11.129	-0.439	(0)
PbCl+	1.388e-11	1.078e-11	-10.858	-10.967	-0.110	(0)
PbF+	1.007e-12	7.824e-13	-11.997	-12.107	-0.110	(0)
Pb (OH) 2	3.032e-13	3.032e-13	-12.518	-12.518	0.000	(0)
PbCl2	1.341e-13	1.341e-13	-12.873	-12.873	0.000	(0)
PbF2	1.566e-15	1.566e-15	-14.805	-14.805	0.000	(0)
PbCl3-	1.913e-16	1.486e-16	-15.718	-15.828	-0.110	(0)
Pb (OH) 3-	7.297e-17	5.668e-17	-16.137	-16.247	-0.110	(0)
PbNO3+	1.816e-17	1.411e-17	-16.741	-16.851	-0.110	(0)
Pb2OH+3	8.619e-19	8.874e-20	-18.065	-19.052	-0.987	(0)
PbCl4-2	5.192e-19	1.890e-19	-18.285	-18.723	-0.439	(0)
PbF3-	3.887e-19	3.020e-19	-18.410	-18.520	-0.110	(0)
Pb (OH) 4-2	7.128e-21	2.595e-21	-20.147	-20.586	-0.439	(0)
PbF4-2	4.037e-23	1.470e-23	-22.394	-22.833	-0.439	(0)
Pb3 (OH) 4+2	5.500e-25	2.003e-25	-24.260	-24.698	-0.439	(0)
Pb (NO3) 2	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
Pb4 (OH) 4+4	9.885e-30	1.737e-31	-29.005	-30.760	-1.755	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.617	-153.617	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.669	-231.779	-0.110	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.026	-74.026	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.353	-79.462	-0.110	(0)
H2S	0.000e+00	0.000e+00	-79.711	-79.711	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.971	-80.080	-0.110	(0)
S5-2	0.000e+00	0.000e+00	-81.120	-81.558	-0.439	(0)
S6-2	0.000e+00	0.000e+00	-81.636	-82.074	-0.439	(0)
S4-2	0.000e+00	0.000e+00	-81.715	-82.154	-0.439	(0)
S3-2	0.000e+00	0.000e+00	-82.521	-82.960	-0.439	(0)
S2-2	0.000e+00	0.000e+00	-83.537	-83.976	-0.439	(0)
S-2	0.000e+00	0.000e+00	-89.169	-89.493	-0.324	(0)
HgHS2-	0.000e+00	0.000e+00	-138.863	-138.972	-0.110	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.847	-139.847	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.973	-140.411	-0.439	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.279	-149.388	-0.110	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.390	-149.603	-0.213	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.459	-150.568	-0.110	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.387	-151.774	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.719	-152.085	-0.366	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.749	-152.125	-0.376	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.827	-151.827	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.339	-152.339	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.498	-152.855	-0.357	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.617	-153.617	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.338	-161.338	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.524	-220.634	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.900	-228.010	-0.110	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-229.791	-229.901	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.282	-230.721	-0.439	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.669	-231.779	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.654	-238.763	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-306.729	-307.167	-0.439	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-308.493	-308.932	-0.439	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.264	-321.703	-0.439	(0)
S (6)	1.386e-02					
SO4-2	1.033e-02	4.801e-03	-1.986	-2.319	-0.333	(0)
MgSO4	1.763e-03	1.763e-03	-2.754	-2.754	0.000	(0)

CaSO4	1.340e-03	1.340e-03	-2.873	-2.873	0.000	(0)
NaSO4-	2.662e-04	2.218e-04	-3.575	-3.654	-0.079	(0)
KSO4-	1.419e-04	1.182e-04	-3.848	-3.927	-0.079	(0)
MnSO4	1.733e-05	1.733e-05	-4.761	-4.761	0.000	(0)
ZnSO4	1.990e-06	1.990e-06	-5.701	-5.701	0.000	(0)
Zn(SO4) 2-2	2.285e-07	8.320e-08	-6.641	-7.080	-0.439	(0)
NiSO4	3.486e-08	3.486e-08	-7.458	-7.458	0.000	(0)
HSO4-	3.059e-08	2.525e-08	-7.514	-7.598	-0.083	(0)
CoSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
NH4SO4-	5.465e-09	4.534e-09	-8.262	-8.343	-0.081	(0)
CdSO4	2.664e-09	2.664e-09	-8.574	-8.574	0.000	(0)
AgSO4-	5.162e-10	4.010e-10	-9.287	-9.397	-0.110	(0)
Cd(SO4) 2-2	4.739e-10	1.726e-10	-9.324	-9.763	-0.439	(0)
PbSO4	2.568e-10	2.568e-10	-9.590	-9.590	0.000	(0)
CrOHSO4	1.274e-10	1.274e-10	-9.895	-9.895	0.000	(0)
AlSO4+	2.888e-11	2.384e-11	-10.539	-10.623	-0.083	(0)
Pb(SO4) 2-2	2.041e-11	7.429e-12	-10.690	-11.129	-0.439	(0)
Ni(SO4) 2-2	1.522e-11	5.542e-12	-10.818	-11.256	-0.439	(0)
FeSO4	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
Al(SO4) 2-	1.486e-12	1.227e-12	-11.828	-11.911	-0.083	(0)
CrSO4+	3.945e-13	3.064e-13	-12.404	-12.514	-0.110	(0)
UO2SO4	3.780e-13	3.780e-13	-12.423	-12.423	0.000	(0)
UO2(SO4) 2-2	6.571e-14	2.392e-14	-13.182	-13.621	-0.439	(0)
VO2SO4-	4.412e-17	3.427e-17	-16.355	-16.465	-0.110	(0)
FeSO4+	1.231e-17	1.021e-17	-16.910	-16.991	-0.081	(0)
Cr2(OH) 2SO4+2	3.534e-18	1.287e-18	-17.452	-17.890	-0.439	(0)
Fe(SO4) 2-	1.350e-18	1.048e-18	-17.870	-17.979	-0.110	(0)
Cr2(OH) 2(SO4) 2	3.670e-19	3.670e-19	-18.435	-18.435	0.000	(0)
VOSO4	1.946e-19	1.946e-19	-18.711	-18.711	0.000	(0)
HgSO4	7.156e-20	7.156e-20	-19.145	-19.145	0.000	(0)
CrO3SO4-2	1.730e-23	6.297e-24	-22.762	-23.201	-0.439	(0)
VSO4+	1.313e-33	1.020e-33	-32.882	-32.992	-0.110	(0)
U(SO4) 2	2.362e-39	2.362e-39	-38.627	-38.627	0.000	(0)
USO4+2	1.701e-40	0.000e+00	-39.769	-40.208	-0.439	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Sb(3)	8.773e-20					
Sb(OH) 3	4.438e-20	4.438e-20	-19.353	-19.353	0.000	(0)
HSbO2	4.335e-20	4.335e-20	-19.363	-19.363	0.000	(0)
SbO2-	1.679e-24	1.305e-24	-23.775	-23.885	-0.110	(0)
Sb(OH) 4-	9.610e-25	7.465e-25	-24.017	-24.127	-0.110	(0)
Sb(OH) 2F	3.796e-25	3.796e-25	-24.421	-24.421	0.000	(0)
SbOF	3.736e-25	3.736e-25	-24.428	-24.428	0.000	(0)
Sb(OH) 2+	7.472e-26	5.804e-26	-25.127	-25.236	-0.110	(0)
SbO+	2.578e-26	2.002e-26	-25.589	-25.698	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.264	-321.703	-0.439	(0)
Sb(5)	3.407e-08					
SbO3-	3.403e-08	2.643e-08	-7.468	-7.578	-0.110	(0)
Sb(OH) 6-	3.737e-11	3.085e-11	-10.428	-10.511	-0.083	(0)
SbO2+	2.829e-23	2.197e-23	-22.548	-22.658	-0.110	(0)
Se(-2)	5.229e-15					
Ag2Se	5.229e-15	5.229e-15	-14.282	-14.282	0.000	(0)
HSe-	2.538e-40	1.972e-40	-39.595	-39.705	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-42.514	-42.514	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.084	-43.084	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.997	-47.436	-0.439	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-84.735	-86.491	-1.755	(0)
Se(4)	1.816e-07					
HSeO3-	1.569e-07	1.219e-07	-6.804	-6.914	-0.110	(0)
SeO3-2	2.476e-08	9.014e-09	-7.606	-8.045	-0.439	(0)
H2SeO3	2.797e-12	2.797e-12	-11.553	-11.553	0.000	(0)
AgSeO3-	3.122e-14	2.425e-14	-13.506	-13.615	-0.110	(0)
Cd(SeO3) 2-2	4.353e-19	1.585e-19	-18.361	-18.800	-0.439	(0)
Ag(SeO3) 2-3	1.901e-20	1.957e-21	-19.721	-20.708	-0.987	(0)
FeHSeO3+2	1.676e-22	6.104e-23	-21.776	-22.214	-0.439	(0)
Se(6)	1.839e-10					
SeO4-2	1.834e-10	8.523e-11	-9.737	-10.069	-0.333	(0)
MnSeO4	4.657e-13	4.657e-13	-12.332	-12.332	0.000	(0)

ZnSeO4	2.500e-14	2.500e-14	-13.602	-13.602	0.000	(0)
NiSeO4	1.450e-15	1.450e-15	-14.838	-14.838	0.000	(0)
CoSeO4	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
HSeO4-	2.959e-16	2.299e-16	-15.529	-15.638	-0.110	(0)
CdSeO4	3.756e-17	3.756e-17	-16.425	-16.425	0.000	(0)
Zn (SeO4) 2-2	5.934e-24	2.160e-24	-23.227	-23.665	-0.439	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.971	-58.958	-0.987	(0)
U (4)	6.995e-22					
U (OH) 5-	6.983e-22	5.424e-22	-21.156	-21.266	-0.110	(0)
U (OH) 4	1.224e-24	1.224e-24	-23.912	-23.912	0.000	(0)
U (OH) 3+	3.101e-28	2.409e-28	-27.508	-27.618	-0.110	(0)
U (OH) 2+2	1.648e-32	5.999e-33	-31.783	-32.222	-0.439	(0)
UF3+	1.746e-35	1.356e-35	-34.758	-34.868	-0.110	(0)
UF2+2	2.312e-36	8.416e-37	-35.636	-36.075	-0.439	(0)
UF4	1.512e-37	1.512e-37	-36.820	-36.820	0.000	(0)
UOH+3	1.478e-37	1.522e-38	-36.830	-37.818	-0.987	(0)
UF+3	6.385e-39	6.574e-40	-38.195	-39.182	-0.987	(0)
U (SO4) 2	2.362e-39	2.362e-39	-38.627	-38.627	0.000	(0)
UF5-	7.845e-40	6.094e-40	-39.105	-39.215	-0.110	(0)
USO4+2	1.701e-40	0.000e+00	-39.769	-40.208	-0.439	(0)
UF6-2	0.000e+00	0.000e+00	-40.289	-40.728	-0.439	(0)
U+4	0.000e+00	0.000e+00	-42.734	-44.489	-1.755	(0)
UC1+3	0.000e+00	0.000e+00	-44.358	-45.345	-0.987	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-166.174	-175.060	-8.886	(0)
U (5)	8.667e-17					
UO2+	8.667e-17	6.733e-17	-16.062	-16.172	-0.110	(0)
U (6)	4.686e-07					
UO2 (CO3) 3-4	3.576e-07	6.283e-09	-6.447	-8.202	-1.755	(0)
UO2 (CO3) 2-2	1.104e-07	4.019e-08	-6.957	-7.396	-0.439	(0)
UO2CO3	6.458e-10	6.458e-10	-9.190	-9.190	0.000	(0)
UO2OH+	1.576e-12	1.224e-12	-11.802	-11.912	-0.110	(0)
UO2F+	9.398e-13	7.301e-13	-12.027	-12.137	-0.110	(0)
UO2SO4	3.780e-13	3.780e-13	-12.423	-12.423	0.000	(0)
UO2F2	2.141e-13	2.141e-13	-12.669	-12.669	0.000	(0)
UO2+2	1.119e-13	5.201e-14	-12.951	-13.284	-0.333	(0)
UO2 (SO4) 2-2	6.571e-14	2.392e-14	-13.182	-13.621	-0.439	(0)
UO2F3-	7.040e-15	5.468e-15	-14.152	-14.262	-0.110	(0)
UO2Cl+	3.023e-16	2.348e-16	-15.520	-15.629	-0.110	(0)
UO2F4-2	1.213e-17	4.417e-18	-16.916	-17.355	-0.439	(0)
(UO2) 2 (OH) 2+2	6.831e-18	2.487e-18	-17.165	-17.604	-0.439	(0)
(UO2) 3 (OH) 5+	1.039e-19	8.073e-20	-18.983	-19.093	-0.110	(0)
UO2NO3+	1.167e-21	9.065e-22	-20.933	-21.043	-0.110	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.438	-42.548	-0.110	(0)
V+2	0.000e+00	0.000e+00	-42.891	-43.330	-0.439	(0)
V (3)	2.371e-15					
V (OH) 3	2.371e-15	2.371e-15	-14.625	-14.625	0.000	(0)
V (OH) 2+	1.062e-25	8.252e-26	-24.974	-25.083	-0.110	(0)
VOH+2	1.158e-28	4.215e-29	-27.936	-28.375	-0.439	(0)
V+3	4.369e-33	4.498e-34	-32.360	-33.347	-0.987	(0)
VSO4+	1.313e-33	1.020e-33	-32.882	-32.992	-0.110	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.019	-55.007	-0.987	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.195	-55.950	-1.755	(0)
V (4)	7.781e-18					
V (OH) 3+	7.062e-18	5.486e-18	-17.151	-17.261	-0.110	(0)
VO+2	4.042e-19	1.472e-19	-18.393	-18.832	-0.439	(0)
VOSO4	1.946e-19	1.946e-19	-18.711	-18.711	0.000	(0)
VOF+	1.155e-19	8.975e-20	-18.937	-19.047	-0.110	(0)
VOF2	3.422e-21	3.422e-21	-20.466	-20.466	0.000	(0)
VOC1+	1.479e-21	1.149e-21	-20.830	-20.940	-0.110	(0)
VOF3-	1.589e-23	1.235e-23	-22.799	-22.908	-0.110	(0)
VOF4-2	1.392e-26	5.068e-27	-25.856	-26.295	-0.439	(0)
H2V2O4+2	4.148e-30	1.510e-30	-29.382	-29.821	-0.439	(0)
V (5)	7.314e-09					
H2VO4-	6.649e-09	5.165e-09	-8.177	-8.287	-0.110	(0)
HVO4-2	6.621e-10	2.411e-10	-9.179	-9.618	-0.439	(0)
H3VO4	2.780e-12	2.780e-12	-11.556	-11.556	0.000	(0)

H3V2O7-	1.194e-13	9.275e-14	-12.923	-13.033	-0.110	(0)
HV2O7-3	4.100e-15	4.222e-16	-14.387	-15.375	-0.987	(0)
VO2+	3.620e-16	2.989e-16	-15.441	-15.524	-0.083	(0)
VO4-3	2.180e-16	2.245e-17	-15.662	-16.649	-0.987	(0)
VO2F	5.331e-17	5.331e-17	-16.273	-16.273	0.000	(0)
VO2SO4-	4.412e-17	3.427e-17	-16.355	-16.465	-0.110	(0)
V2O7-4	1.202e-17	2.111e-19	-16.920	-18.675	-1.755	(0)
VO2F2-	2.534e-18	1.968e-18	-17.596	-17.706	-0.110	(0)
V3O9-3	1.404e-18	1.446e-19	-17.853	-18.840	-0.987	(0)
VO2F3-2	6.857e-21	2.496e-21	-20.164	-20.603	-0.439	(0)
V4O12-4	1.773e-23	3.115e-25	-22.751	-24.507	-1.755	(0)
VO2NO3	1.321e-24	1.321e-24	-23.879	-23.879	0.000	(0)
VO2F4-3	1.213e-24	1.249e-25	-23.916	-24.903	-0.987	(0)
V10O28-6	0.000e+00	0.000e+00	-59.087	-63.036	-3.949	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.376	-62.119	-2.743	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.425	-64.180	-1.755	(0)
Zn	6.981e-06					
Zn+2	4.076e-06	1.894e-06	-5.390	-5.723	-0.333	(0)
ZnSO4	1.990e-06	1.990e-06	-5.701	-5.701	0.000	(0)
ZnCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
ZnHCO3+	2.761e-07	2.144e-07	-6.559	-6.669	-0.110	(0)
Zn(SO4) 2-2	2.285e-07	8.320e-08	-6.641	-7.080	-0.439	(0)
ZnOH+	4.559e-08	3.541e-08	-7.341	-7.451	-0.110	(0)
ZnCl+	1.612e-08	1.324e-08	-7.793	-7.878	-0.086	(0)
ZnF+	4.947e-09	3.843e-09	-8.306	-8.415	-0.110	(0)
ZnOHCl	3.241e-09	3.241e-09	-8.489	-8.489	0.000	(0)
Zn(OH) 2	1.049e-09	1.049e-09	-8.979	-8.979	0.000	(0)
ZnCl2	5.842e-11	5.842e-11	-10.233	-10.233	0.000	(0)
Zn(OH) 3-	1.266e-12	9.832e-13	-11.898	-12.007	-0.110	(0)
ZnCl3-	1.573e-13	1.292e-13	-12.803	-12.889	-0.086	(0)
ZnNO3+	5.350e-14	4.156e-14	-13.272	-13.381	-0.110	(0)
ZnSeO4	2.500e-14	2.500e-14	-13.602	-13.602	0.000	(0)
ZnCl4-2	3.793e-16	1.798e-16	-15.421	-15.745	-0.324	(0)
Zn(OH) 4-2	2.010e-17	7.318e-18	-16.697	-17.136	-0.439	(0)
Zn(NO3) 2	7.244e-23	7.244e-23	-22.140	-22.140	0.000	(0)
Zn(SeO4) 2-2	5.934e-24	2.160e-24	-23.227	-23.665	-0.439	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.459	-150.568	-0.110	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.827	-151.827	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.900	-228.010	-0.110	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-230.282	-230.721	-0.439	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-308.493	-308.932	-0.439	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-58.18	-51.89	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-45.39	-40.88	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-52.62	-40.88	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-75.11	-57.18	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-60.70	-40.67	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.85	-29.45	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.63	-24.18	0.45	(NH4)2SeO4
Acanthite	-52.73	-88.95	-36.22	Ag2S
Ag2CO3	-11.17	-22.26	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-11.95	-10.47	1.48	Ag2HVO4
Ag2MoO4	-11.15	-22.70	-11.55	Ag2MoO4
Ag2O	-14.79	-2.22	12.57	Ag2O
Ag2Se	-0.49	-49.19	-48.70	Ag2Se
Ag2SeO3	-9.25	-16.40	-7.15	Ag2SeO3
Ag2SeO4	-17.92	-26.83	-8.91	Ag2SeO4
Ag2SO4	-14.26	-19.08	-4.82	Ag2SO4
Ag3AsO3	-27.65	-25.49	2.16	Ag3AsO3
Ag3AsO4	-15.72	-18.50	-2.79	Ag3AsO4
Ag3H2VO5	-16.76	-11.58	5.18	Ag3H2VO5
AgF:4H2O	-13.42	-12.37	1.05	AgF:4H2O
Agmetal	-0.54	-14.05	-13.51	Ag

AgVO3	-10.13	-9.36	0.77	AgVO3
Al (OH) 3 (am)	-1.19	9.61	10.80	Al (OH) 3
Al2 (MoO4) 3	-44.60	-42.23	2.37	Al2 (MoO4) 3
Al2O3	-0.43	19.23	19.65	Al2O3
Al4 (OH) 10SO4	-1.11	21.59	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.36	-5.56	4.80	AlAsO4:2H2O
AlOHSO4	-4.01	-7.24	-3.23	AlOHSO4
AlSb	-153.01	-87.39	65.62	AlSb
Alunite	1.33	-0.07	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.49	-12.28	-7.79	PbSO4
Anhydrite	-0.87	-5.23	-4.36	CaSO4
Anilite	-59.04	-90.92	-31.88	Cu0.25Cu1.5S
Antlerite	-6.47	2.32	8.79	Cu3 (OH) 4SO4
Aragonite	-0.12	-8.42	-8.30	CaCO3
Arsenolite	-85.88	-88.64	-2.76	As4O6
Artinite	-5.96	3.64	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.06	-30.35	6.71	As2O5
Atacamite	-4.43	2.96	7.39	Cu2 (OH) 3Cl
Azurite	-4.01	-20.91	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.94	7.45	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.48	-1.60	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.92	-7.99	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.09	5.85	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.75	-22.42	-9.67	BaCrO4
BaF2	-9.25	-15.07	-5.82	BaF2
BaMoO4	-6.07	-13.03	-6.96	BaMoO4
Barite	0.58	-9.40	-9.98	BaSO4
BaS	-95.46	-79.28	16.18	BaS
BaSeO3	-8.56	-6.73	1.83	BaSeO3
BaSeO4	-9.69	-17.15	-7.46	BaSeO4
Bianchite	-6.28	-8.04	-1.76	ZnSO4:6H2O
Birnessite	-7.71	10.38	18.09	MnO2
Bixbyite	-4.48	-5.13	-0.64	Mn2O3
BlaubleiI	-57.59	-81.75	-24.16	Cu0.9Cu0.2S
BlaubleiII	-58.70	-85.98	-27.28	Cu0.6Cu0.8S
Boehmite	1.03	9.61	8.58	AlOOH
Breithauptite	-58.44	-76.96	-18.52	NiSb
Brochantite	-6.51	8.71	15.22	Cu4 (OH) 6SO4
Brucite	-5.00	11.84	16.84	Mg (OH) 2
Bunsenite	-5.35	7.10	12.45	NiO
Ca (VO3) 2	-10.55	-4.89	5.66	Ca (VO3) 2
Ca2V2O7	-10.76	6.74	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.82	6.74	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.78	4.52	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-20.60	18.36	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.50	18.36	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-302.11	-159.14	142.97	Ca3Sb2
CaCrO4	-15.99	-18.25	-2.27	CaCrO4
Calcite	0.06	-8.42	-8.48	CaCO3
Calomel	-6.24	-24.15	-17.91	Hg2Cl2
CaMoO4	-0.91	-8.86	-7.95	CaMoO4
Carnotite	-2.42	-2.19	0.23	KUO2VO4
CaSeO3:2H2O	-5.37	-2.56	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.96	-12.98	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-12.83	-2.99	9.84	Cd (BO2) 2
Cd (OH) 2	-7.73	5.91	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.82	5.91	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-22.69	-15.98	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.68	0.88	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-21.61	6.79	28.40	Cd4 (OH) 6SO4
CdCl2	-13.08	-13.74	-0.66	CdCl2
CdCl2:1H2O	-12.04	-13.74	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.82	-13.74	-1.91	CdCl2:2.5H2O
CdF2	-15.40	-16.61	-1.21	CdF2
Cdmetal (alpha)	-33.49	-19.97	13.51	Cd
Cdmetal (gamma)	-33.59	-19.97	13.62	Cd
CdMoO4	-0.42	-14.57	-14.15	CdMoO4
CdOHCl	-7.45	-3.91	3.54	CdOHCl

CdSb	-77.80	-78.15	-0.35	CdSb
CdSe	-20.86	-41.06	-20.20	CdSe
CdSeO4:2H2O	-16.85	-18.70	-1.85	CdSeO4:2H2O
CdSO4	-10.77	-10.94	-0.17	CdSO4
CdSO4:1H2O	-9.22	-10.94	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.07	-10.95	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.18	-10.93	-9.75	AgCl
Cerrusite	-2.34	-15.47	-13.13	PbCO3
CH4 (g)	-82.53	-123.58	-41.05	CH4
Chalcanthite	-7.83	-10.47	-2.64	CuSO4:5H2O
Chalcocite	-59.53	-94.45	-34.92	Cu2S
Chalcopyrite	-128.63	-163.90	-35.27	CuFeS2
Cinnabar	-51.94	-97.63	-45.69	HgS
Claudetite	-85.58	-88.64	-3.06	As4O6
Clausthalite	-15.30	-42.40	-27.10	PbSe
Co (BO2) 2	-28.99	-1.92	27.07	Co (BO2) 2
Co (OH) 2	-6.12	6.98	13.09	Co (OH) 2
Co (OH) 3	-10.17	-12.48	-2.31	Co (OH) 3
CO2 (g)	-1.90	-20.04	-18.15	CO2
Co3 (AsO4) 2	-22.45	-9.42	13.03	Co3 (AsO4) 2
Co3O4	-7.49	-17.98	-10.50	Co3O4
CoCl2	-20.94	-12.67	8.27	CoCl2
CoCl2:6H2O	-15.21	-12.67	2.54	CoCl2:6H2O
CoCO3	-3.09	-13.07	-9.98	CoCO3
CoF2	-13.95	-15.55	-1.60	CoF2
CoF3	-44.81	-46.27	-1.46	CoF3
CoFe2O4	16.67	13.15	-3.53	CoFe2O4
CoMoO4	-5.75	-13.51	-7.76	CoMoO4
CoO	-6.61	6.98	13.59	CoO
CoS (alpha)	-72.31	-79.75	-7.44	CoS
CoS (beta)	-68.68	-79.75	-11.07	CoS
CoSe	-23.80	-40.00	-16.20	CoSe
CoSeO3	-8.53	-7.21	1.32	CoSeO3
CoSeO4:6H2O	-16.10	-17.63	-1.53	CoSeO4:6H2O
CoSO4	-12.68	-9.88	2.80	CoSO4
CoSO4:6H2O	-7.41	-9.88	-2.47	CoSO4:6H2O
Cotunnite	-10.29	-15.07	-4.78	PbCl2
Covellite	-58.04	-80.34	-22.30	CuS
Cr (OH) 2	-22.14	-11.32	10.82	Cr (OH) 2
Cr (OH) 3	-2.66	-1.33	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.58	-1.33	-0.75	Cr (OH) 3
Cr2O3	-0.29	-2.65	-2.36	Cr2O3
CrCl2	-45.06	-30.97	14.09	CrCl2
CrCl3	-45.91	-30.80	15.11	CrCl3
CrF3	-23.77	-35.11	-11.34	CrF3
Crmetal	-67.69	-37.20	30.48	Cr
CrO3	-26.67	-29.88	-3.21	CrO3
Cryolite	-8.51	-42.35	-33.84	Na3AlF6
Cu (OH) 2	-2.28	6.39	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.76	19.45	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.79	-2.54	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.59	-94.47	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.89	-54.69	-45.80	Cu2Se
Cu2SO4	-22.63	-24.58	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-17.27	-11.17	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.99	-108.58	-42.59	Cu3Sb
Cu3Se2	-31.78	-95.28	-63.49	Cu3Se2
CuCO3	-2.15	-13.65	-11.50	CuCO3
CuCrO4	-18.04	-23.48	-5.44	CuCrO4
CuF	-10.22	-15.12	-4.91	CuF
CuF2	-17.25	-16.13	1.12	CuF2
CuF2:2H2O	-11.58	-16.13	-4.55	CuF2:2H2O
Cumetal	-8.05	-16.80	-8.76	Cu
CuMoO4	-1.02	-14.09	-13.08	CuMoO4
CuOCuSO4	-14.38	-4.07	10.30	CuOCuSO4
Cupricferrite	6.57	12.56	5.99	CuFe2O4
Cuprite	-6.31	-7.72	-1.41	Cu2O
Cuprousferrite	8.14	-0.78	-8.92	CuFeO2

CuSe	-7.48	-40.58	-33.10	CuSe
CuSe2	-28.31	-61.67	-33.37	CuSe2
CuSeO3:2H2O	-8.30	-7.79	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.78	-18.22	-2.44	CuSeO4:5H2O
CuSO4	-13.40	-10.46	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-59.60	-93.52	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.08	-16.62	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.47	-16.62	-17.09	CaMg(CO3)2
Epsomite	-2.89	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.39	3.17	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.18	0.14	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.62	-13.34	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.57	-8.01	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.75	-36.38	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-40.67	-44.40	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.88	9.34	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.49	-12.09	0.40	FeAsO4:2H2O
FeCr2O4	-6.68	0.52	7.20	FeCr2O4
FeMoO4	-7.22	-17.31	-10.09	FeMoO4
Ferrihydrite	-0.11	3.08	3.19	Fe(OH)3
Ferroselite	-46.29	-64.89	-18.60	FeSe2
FeS(ppt)	-80.61	-83.56	-2.95	FeS
FeSe	-32.80	-43.80	-11.00	FeSe
Fix_pe	-5.67	-5.67	0.00	e-
Fluorite	-0.40	-10.90	-10.50	CaF2
Galena	-68.19	-82.16	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al(OH)3
Goethite	2.59	3.08	0.49	FeOOH
Goslarite	-6.03	-8.04	-2.01	ZnSO4:7H2O
Greenockite	-66.46	-80.82	-14.36	CdS
Greigite	-292.55	-337.58	-45.03	Fe3S4
Gummite	-6.42	1.25	7.67	UO3
Gypsum	-0.62	-5.23	-4.61	CaSO4:2H2O
H-Jarosite	-12.36	-24.46	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.61	-20.49	-12.88	H2MoO4
H2S(g)	-78.72	-86.73	-8.01	H2S
H2Se(g)	-42.01	-46.97	-4.96	H2Se
Halite	-6.22	-4.62	1.60	NaCl
Hausmannite	-5.61	55.42	61.03	Mn3O4
Hematite	7.59	6.17	-1.42	Fe2O3
Hercynite	-0.49	22.40	22.89	FeAl2O4
Hg(CH3)2(g)	-184.35	-258.06	-73.71	Hg(CH3)2
Hg(g)	-7.32	-15.19	-7.87	Hg
Hg(OH)2	-7.40	-10.90	-3.50	Hg(OH)2
Hg2(g)	-15.43	-30.38	-14.96	Hg2
Hg2(OH)2	-9.76	-4.50	5.26	Hg2(OH)2
Hg2CO3	-8.49	-24.54	-16.05	Hg2CO3
Hg2CrO4	-25.68	-34.38	-8.70	Hg2CrO4
Hg2F2	-16.66	-27.02	-10.36	Hg2F2
Hg2S	-79.56	-91.23	-11.68	Hg2S
Hg2SeO3	-14.03	-18.68	-4.66	Hg2SeO3
Hg2SO4	-15.23	-21.36	-6.13	Hg2SO4
Hg3O2CO3	-23.06	-52.75	-29.68	Hg3O2CO3
HgCl(g)	-31.57	-12.07	19.50	HgCl
HgCl2	-9.29	-30.55	-21.26	HgCl2
HgF(g)	-46.19	-13.51	32.68	HgF
HgF2(g)	-45.99	-33.42	12.57	HgF2
Hgmetal(l)	-1.74	-15.19	-13.45	Hg
HgSe	-2.18	-57.87	-55.69	HgSe
HgSeO3	-12.65	-25.08	-12.43	HgSeO3
HgSO4	-18.34	-27.76	-9.42	HgSO4
Huntite	-3.06	-33.02	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.59	-26.36	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.20	-20.96	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-14.12	-19.29	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-4.85	-19.65	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.89	-50.13	-17.24	K2Cr2O7

K2CrO4	-19.74	-20.26	-0.51	K2CrO4
K2MoO4	-14.13	-10.87	3.26	K2MoO4
K2SeO4	-14.26	-14.99	-0.73	K2SeO4
Langite	-8.78	8.71	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.27	-7.70	-0.43	PbO:PbSO4
Laurionite	-5.87	-5.25	0.62	PbOHCl
Lepidocrocite	1.71	3.08	1.37	FeOOH
Lime	-21.08	11.62	32.70	CaO
Litharge	-8.12	4.58	12.69	PbO
Mackinawite	-79.96	-83.56	-3.60	FeS
Maghemite	-0.22	6.17	6.39	Fe2O3
Magnesioferrite	1.15	18.01	16.86	Fe2MgO4
Magnesite	-0.74	-8.20	-7.46	MgCO3
Magnetite	5.94	9.34	3.40	Fe3O4
Malachite	-1.95	-7.26	-5.31	Cu2 (OH) 2CO3
Manganite	-2.55	22.79	25.34	MnOOH
Massicot	-8.32	4.58	12.89	PbO
Matlockite	-7.54	-16.51	-8.97	PbClF
Melanothallite	-19.51	-13.26	6.26	CuCl2
Melanterite	-11.48	-13.68	-2.21	FeSO4:7H2O
Metacinnabar	-52.54	-97.63	-45.09	HgS
Mg (OH) 2 (active)	-6.95	11.84	18.79	Mg (OH) 2
Mg (VO3) 2	-15.95	-4.67	11.28	Mg (VO3) 2
Mg2Sb3	-277.30	-202.62	74.68	Mg2Sb3
Mg2V2O7	-19.19	7.17	26.36	Mg2V2O7
MgCr2O4	-7.01	9.19	16.20	MgCr2O4
MgCrO4	-23.41	-18.03	5.38	MgCrO4
MgF2	-2.55	-10.68	-8.13	MgF2
MgMoO4	-6.79	-8.64	-1.85	MgMoO4
MgSeO3:6H2O	-5.40	-2.34	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.57	-12.77	-1.20	MgSeO4:6H2O
Minium	-33.91	39.61	73.52	Pb3O4
Mirabilite	-5.34	-6.45	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.57	-6.67	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.98	-55.70	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.33	-90.25	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.32	-0.82	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.52	-9.80	2.72	MnCl2:4H2O
MnS (grn)	-77.06	-76.89	0.17	MnS
MnS (pnk)	-80.23	-76.89	3.34	MnS
MnSb	-96.66	-99.57	-2.91	MnSb
MnSe	-40.63	-37.13	3.50	MnSe
MnSeO3	-5.47	-4.34	1.13	MnSeO3
MnSeO3:2H2O	-5.32	-4.34	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.71	-14.76	-2.05	MnSeO4:5H2O
MnSO4	-9.59	-7.01	2.58	MnSO4
Monteponite	-9.19	5.91	15.10	CdO
Montroydite	-7.26	-10.90	-3.64	HgO
MoO3	-12.49	-20.49	-8.00	MoO3
Morenosite	-7.62	-9.76	-2.14	NiSO4:7H2O
MoS2	-149.57	-219.83	-70.26	MoS2
Na-Jarosite	-8.06	-19.26	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.45	-49.35	-9.90	Na2Cr2O7
Na2CrO4	-22.40	-19.47	2.93	Na2CrO4
Na2Mo2O7	-13.97	-30.57	-16.60	Na2Mo2O7
Na2MoO4	-11.57	-10.08	1.49	Na2MoO4
Na2MoO4:2H2O	-11.30	-10.08	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.08	-3.78	10.30	Na2SeO3:5H2O
Na2SeO4	-15.48	-14.20	1.28	Na2SeO4
Na3Sb	-175.84	-81.39	94.45	Na3Sb
Na3VO4	-29.33	7.35	36.68	Na3VO4
Na4V2O7	-33.10	4.30	37.40	Na4V2O7
Nantokite	-6.95	-13.68	-6.73	CuCl
NaSb	-89.08	-65.92	23.17	NaSb
Natron	-8.33	-9.64	-1.31	Na2CO3:10H2O
NaVO3	-6.91	-3.05	3.86	NaVO3
Nesquehonite	-3.53	-8.20	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.70	7.10	12.79	Ni (OH) 2

Ni3(AsO4)2·8H2O	-24.76	-9.06	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-20.46	11.54	32.00	Ni4(OH)6SO4
NiCO3	-6.08	-12.95	-6.87	NiCO3
NiMoO4	-2.25	-13.39	-11.14	NiMoO4
NiS(alpha)	-74.03	-79.63	-5.60	NiS
NiS(beta)	-68.53	-79.63	-11.10	NiS
NiS(gamma)	-66.83	-79.63	-12.80	NiS
NiSe	-22.18	-39.88	-17.70	NiSe
NiSeO3·2H2O	-9.90	-7.08	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-15.99	-17.51	-1.52	NiSeO4·6H2O
Nsutite	-7.12	10.38	17.50	MnO2
O2(g)	-31.32	51.77	83.09	O2
Orpiment	-243.45	-304.51	-61.07	As2S3
Otavite	-2.13	-14.13	-12.00	CdCO3
Pb(BO2)2	-10.84	-4.32	6.52	Pb(BO2)2
Pb(OH)2	-3.57	4.58	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-65.74	-74.50	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.47	-0.67	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.04	9.15	26.19	Pb2O(OH)2
Pb2O3	-26.00	35.04	61.04	Pb2O3
Pb2OCO3	-10.33	-10.89	-0.56	Pb2OCO3
Pb2V2O7	-5.46	-7.36	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.42	-16.62	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.92	-2.78	6.14	Pb3(VO4)2
Pb3O2CO3	-17.34	-6.32	11.02	Pb3O2CO3
Pb3O2SO4	-13.81	-3.13	10.69	Pb3O2SO4
Pb4(OH)6SO4	-19.65	1.45	21.10	Pb4(OH)6SO4
Pb4O3SO4	-20.43	1.45	21.88	Pb4O3SO4
PbCrO4	-12.70	-25.30	-12.60	PbCrO4
PbF2	-10.51	-17.95	-7.44	PbF2
Pbmetal	-25.55	-21.31	4.25	Pb
PbMoO4	-0.29	-15.91	-15.62	PbMoO4
PbO·0.3H2O	-8.40	4.58	12.98	PbO·0.33H2O
PbSeO4	-13.19	-20.03	-6.84	PbSeO4
Periclase	-9.74	11.84	21.58	MgO
Phosgenite	-10.73	-30.54	-19.81	PbCl2:PbCO3
Plattnerite	-19.14	30.46	49.60	PbO2
Portlandite	-11.18	11.62	22.80	Ca(OH)2
Pyrite	-125.90	-144.40	-18.51	FeS2
Pyrochroite	-5.35	9.85	15.19	Mn(OH)2
Pyrolusite	-5.65	35.73	41.38	MnO2
Realgar	-102.09	-121.83	-19.75	AsS
Retgersite	-7.72	-9.76	-2.04	NiSO4·6H2O
Rhodochrosite	0.38	-10.20	-10.58	MnCO3
Rutherfordine	-4.29	-18.79	-14.50	UO2CO3
Sb(OH)3	-12.24	-19.35	-7.11	Sb(OH)3
Sb2O4	-16.22	-12.82	3.40	Sb2O4
Sb2O5	-25.89	-35.56	-9.67	Sb2O5
Sb2Se3	-111.87	-179.63	-67.76	Sb2Se3
Sb4O6(cubic)	-59.15	-77.41	-18.26	Sb4O6
Sb4O6(orth)	-59.51	-77.41	-17.90	Sb4O6
SbCl3	-49.40	-48.83	0.57	SbCl3
SbF3	-42.91	-53.14	-10.23	SbF3
Sbmetal	-46.49	-58.18	-11.69	Sb
SbO2	-2.90	-30.72	-27.82	SbO2
Schoepite	-4.74	1.25	5.99	UO2(OH)2·H2O
Semetal(am)	-13.98	-21.09	-7.11	Se
Semetal(hex)	-13.38	-21.09	-7.71	Se
Senarmontite	-26.34	-38.70	-12.37	Sb2O3
SeO2	-14.31	-14.18	0.12	SeO2
SeO3	-45.65	-24.61	21.04	SeO3
Siderite	-6.63	-16.87	-10.24	FeCO3
Smithsonite	-1.23	-11.23	-10.00	ZnCO3
Sphalerite	-66.47	-77.92	-11.45	ZnS
Spinel	-5.78	31.07	36.85	MgAl2O4
Stibnite	-248.44	-298.90	-50.46	Sb2S3
Sulfur	-58.70	-60.85	-2.14	S
Tenorite	-1.25	6.39	7.64	CuO

Thenardite	-6.77	-6.45	0.32	Na2SO4
Thermonatrite	-10.27	-9.64	0.64	Na2CO3:H2O
Tyuyamunite	-6.46	-2.38	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.56	5.53	21.08	U3O8
U3Sb4	-586.64	-434.25	152.38	U3Sb4
U4O9	-32.75	-35.77	-3.02	U4O9
UF4	-30.92	-60.46	-29.54	UF4
UF4:2.5H2O	-27.74	-60.46	-32.72	UF4:2.5H2O
UO2 (am)	-16.35	-15.41	0.93	UO2
UO2 (NO3) 2	-41.55	-29.40	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.25	-29.40	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.79	-29.40	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.45	-29.40	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.36	1.25	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.10	-23.35	-2.25	UO2SeO4:4H2O
UO3	-6.45	1.25	7.70	UO3
Uraninite	-10.74	-15.41	-4.67	UO2
USb2	-222.33	-192.75	29.58	USb2
V (OH) 3	-19.13	-11.54	7.59	V (OH) 3
V2O5	-15.15	-16.51	-1.36	V2O5
V3O5	-40.60	-38.77	1.84	V3O5
V4O7	-50.25	-43.06	7.19	V4O7
V6O13	-40.44	-101.30	-60.86	V6O13
Valentinite	-30.22	-38.70	-8.48	Sb2O3
VC12	-63.01	-44.13	18.87	VC12
VC13	-64.45	-41.01	23.43	VC13
VF4	-64.27	-49.34	14.93	VF4
Vmetal	-94.39	-50.37	44.03	V
VO	-39.24	-24.48	14.76	VO
VO (OH) 2	-9.45	-4.29	5.15	VO (OH) 2
VO2Cl	-20.92	-18.08	2.84	VO2Cl
VOC1	-32.52	-21.36	11.15	VOC1
VOC12	-36.70	-23.94	12.76	VOC12
VOSO4	-24.76	-21.15	3.61	VOSO4
Witherite	-4.02	-12.59	-8.57	BaCO3
Wurtzite	-68.97	-77.92	-8.95	ZnS
Zincite	-2.52	8.82	11.33	ZnO
Zincosite	-11.97	-8.04	3.93	ZnSO4
Zn (BO2) 2	-8.37	-0.08	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.16	-21.84	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-3.39	8.81	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.66	8.81	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.94	8.81	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.72	8.81	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.92	8.81	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.73	0.77	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-7.39	7.81	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.55	-3.90	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.18	-7.27	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-10.00	18.40	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-14.07	24.43	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.88	-10.83	7.05	ZnCl2
ZnCO3:1H2O	-0.97	-11.23	-10.26	ZnCO3:1H2O
ZnF2	-13.17	-13.71	-0.53	ZnF2
Znmetal	-42.86	-17.07	25.79	Zn
ZnMoO4	-1.55	-11.67	-10.13	ZnMoO4
ZnO (active)	-2.37	8.82	11.19	ZnO
ZnS (am)	-68.86	-77.92	-9.05	ZnS
ZnSb	-86.26	-75.25	11.01	ZnSb
ZnSe	-23.76	-38.16	-14.40	ZnSe
ZnSeO4:6H2O	-14.27	-15.79	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.40	-8.04	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 29.

Title Stage 1 Pit wall interaction mix calculator
MIX 104
109 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0
11 0
12 0
13 0
14 0
15 0
Save solution 110
end

TITLE

Stage 1 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 104.

Mixture 104.

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
0.000e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
0.000e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
0.000e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 109 Solution after simulation 28.

-----Solution composition-----

Elements	Molality	Moles
Ag	3.684e-08	3.686e-08
Al	2.045e-06	2.047e-06
As	4.918e-10	4.921e-10
B	3.569e-05	3.571e-05
Ba	1.810e-07	1.811e-07
C	4.959e-03	4.962e-03
Ca	4.066e-03	4.069e-03
Cd	9.257e-09	9.262e-09
Cl	3.371e-03	3.373e-03
Co	1.138e-07	1.139e-07
Cr	3.892e-09	3.894e-09
Cu	1.651e-07	1.652e-07
F	1.535e-04	1.536e-04
Fe	2.357e-09	2.358e-09
Hg	2.480e-09	2.481e-09
K	4.353e-03	4.356e-03
Mg	6.229e-03	6.232e-03
Mn	7.504e-05	7.508e-05
Mo	2.425e-06	2.427e-06
N	5.352e-06	5.355e-06
Na	1.070e-02	1.071e-02
Ni	1.386e-07	1.387e-07
Pb	2.017e-09	2.018e-09
S	1.386e-02	1.387e-02
Sb	3.407e-08	3.408e-08
Se	1.818e-07	1.819e-07
U	4.686e-07	4.689e-07
V	7.314e-09	7.318e-09
Zn	6.981e-06	6.985e-06

-----Description of solution-----

	pH	=	7.269	Charge balance
	pe	=	5.673	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.626e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	4.555e-03	
	Total CO2 (mol/kg)	=	4.959e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	6.333e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110816e+02	
	Total O	=	5.560855e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.289e-07	1.870e-07	-6.640	-6.728	-0.088	(0)
H+	6.518e-08	5.382e-08	-7.186	-7.269	-0.083	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	3.684e-08					
AgCl	2.379e-08	2.379e-08	-7.624	-7.624	0.000	(0)
AgCl2-	7.424e-09	5.767e-09	-8.129	-8.239	-0.110	(0)
Ag+	5.070e-09	4.186e-09	-8.295	-8.378	-0.083	(0)
AgSO4-	5.162e-10	4.010e-10	-9.287	-9.397	-0.110	(0)
AgCl3-2	3.929e-11	1.431e-11	-10.406	-10.844	-0.439	(0)
AgNO2	3.710e-12	3.710e-12	-11.431	-11.431	0.000	(0)
AgF	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
AgCl4-3	7.896e-13	8.130e-14	-12.103	-13.090	-0.987	(0)

	AgOH	7.826e-14	7.826e-14	-13.106	-13.106	0.000	(0)
	AgSeO3-	3.122e-14	2.425e-14	-13.506	-13.615	-0.110	(0)
	AgH2BO3	2.542e-14	2.542e-14	-13.595	-13.595	0.000	(0)
	AgNH3+	1.027e-14	7.980e-15	-13.988	-14.098	-0.110	(0)
	Ag2Se	5.229e-15	5.229e-15	-14.282	-14.282	0.000	(0)
	Ag(NO2) 2-	3.138e-17	2.438e-17	-16.503	-16.613	-0.110	(0)
	AgNO3	2.904e-17	2.904e-17	-16.537	-16.537	0.000	(0)
	Ag(OH) 2-	1.841e-18	1.430e-18	-17.735	-17.845	-0.110	(0)
	Ag(NH3) 2+	7.796e-20	6.056e-20	-19.108	-19.218	-0.110	(0)
	Ag(SeO3) 2-3	1.901e-20	1.957e-21	-19.721	-20.708	-0.987	(0)
	Ag2MoO4	7.471e-24	7.471e-24	-23.127	-23.127	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.026	-74.026	0.000	(0)
	AgOH(Se) 2-4	0.000e+00	0.000e+00	-84.735	-86.491	-1.755	(0)
	Ag(HS) 2-	0.000e+00	0.000e+00	-149.279	-149.388	-0.110	(0)
	Ag(HS) S4-2	0.000e+00	0.000e+00	-149.390	-149.603	-0.213	(0)
	Ag(S4) 2-3	0.000e+00	0.000e+00	-151.387	-151.774	-0.387	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-151.719	-152.085	-0.366	(0)
Al	2.045e-06						
	Al(OH) 4-	1.889e-06	1.559e-06	-5.724	-5.807	-0.083	(0)
	Al(OH) 3	6.625e-08	6.625e-08	-7.179	-7.179	0.000	(0)
	AlF3	3.371e-08	3.371e-08	-7.472	-7.472	0.000	(0)
	AlF2+	3.161e-08	2.633e-08	-7.500	-7.580	-0.079	(0)
	Al(OH) 2+	2.132e-08	1.776e-08	-7.671	-7.751	-0.079	(0)
	AlF4-	2.081e-09	1.718e-09	-8.682	-8.765	-0.083	(0)
	AlF+2	1.351e-09	6.504e-10	-8.869	-9.187	-0.318	(0)
	AlOH+2	2.485e-10	1.196e-10	-9.605	-9.922	-0.318	(0)
	AlSO4+	2.888e-11	2.384e-11	-10.539	-10.623	-0.083	(0)
	Al+3	3.587e-12	6.397e-13	-11.445	-12.194	-0.749	(0)
	Al(SO4) 2-	1.486e-12	1.227e-12	-11.828	-11.911	-0.083	(0)
	AlMo6O21-3	3.037e-36	3.127e-37	-35.518	-36.505	-0.987	(0)
As (3)	6.990e-23						
	H3AsO3	6.905e-23	6.905e-23	-22.161	-22.161	0.000	(0)
	H2AsO3-	8.471e-25	6.580e-25	-24.072	-24.182	-0.110	(0)
	HAsO3-2	3.063e-29	1.115e-29	-28.514	-28.953	-0.439	(0)
	H4AsO3+	2.370e-30	1.841e-30	-29.625	-29.735	-0.110	(0)
	AsO3-3	7.757e-35	7.987e-36	-34.110	-35.098	-0.987	(0)
As (5)	4.918e-10						
	HAsO4-2	3.998e-10	1.455e-10	-9.398	-9.837	-0.439	(0)
	H2AsO4-	9.196e-11	7.144e-11	-10.036	-10.146	-0.110	(0)
	AsO4-3	8.306e-14	8.552e-15	-13.081	-14.068	-0.987	(0)
	H3AsO4	6.610e-16	6.681e-16	-15.180	-15.175	0.005	(0)
B	3.569e-05						
	H3BO3	3.514e-05	3.551e-05	-4.454	-4.450	0.005	(0)
	H2BO3-	4.750e-07	3.832e-07	-6.323	-6.417	-0.093	(0)
	CaH2BO3+	3.330e-08	2.687e-08	-7.478	-7.571	-0.093	(0)
	MgH2BO3+	3.324e-08	2.682e-08	-7.478	-7.572	-0.093	(0)
	NaH2BO3	5.223e-09	5.223e-09	-8.282	-8.282	0.000	(0)
	BF(OH) 3-	1.786e-09	1.441e-09	-8.748	-8.841	-0.093	(0)
	H5(BO3) 2-	1.436e-11	1.158e-11	-10.843	-10.936	-0.093	(0)
	BaH2BO3+	1.211e-12	9.771e-13	-11.917	-12.010	-0.093	(0)
	BF2(OH) 2-	1.046e-12	8.436e-13	-11.981	-12.074	-0.093	(0)
	H8(BO3) 3-	5.099e-14	4.114e-14	-13.293	-13.386	-0.093	(0)
	AgH2BO3	2.542e-14	2.542e-14	-13.595	-13.595	0.000	(0)
	BF3OH-	2.228e-18	1.797e-18	-17.652	-17.745	-0.093	(0)
	BF4-	6.003e-23	4.843e-23	-22.222	-22.315	-0.093	(0)
Ba	1.810e-07						
	Ba+2	1.775e-07	8.251e-08	-6.751	-7.084	-0.333	(0)
	BaHCO3+	3.369e-09	2.821e-09	-8.473	-8.550	-0.077	(0)
	BaCO3	1.320e-10	1.320e-10	-9.879	-9.879	0.000	(0)
	BaH2BO3+	1.211e-12	9.771e-13	-11.917	-12.010	-0.093	(0)
	BaOH+	8.115e-14	6.734e-14	-13.091	-13.172	-0.081	(0)
	BaNO3+	4.650e-15	3.612e-15	-14.333	-14.442	-0.110	(0)
	BaNH3+2	1.335e-16	4.861e-17	-15.875	-16.313	-0.439	(0)
C (4)	4.959e-03						
	HCO3-	4.299e-03	3.580e-03	-2.367	-2.446	-0.079	(0)
	H2CO3	4.334e-04	4.334e-04	-3.363	-3.363	0.000	(0)
	CaHCO3+	9.699e-05	8.123e-05	-4.013	-4.090	-0.077	(0)
	MgHCO3+	9.003e-05	7.394e-05	-4.046	-4.131	-0.086	(0)

	NaHCO ₃	1.732e-05	1.732e-05	-4.762	-4.762	0.000	(0)
	CO ₃ -2	6.712e-06	3.119e-06	-5.173	-5.506	-0.333	(0)
	CaCO ₃	6.022e-06	6.022e-06	-5.220	-5.220	0.000	(0)
	MgCO ₃	5.235e-06	5.235e-06	-5.281	-5.281	0.000	(0)
	MnHCO ₃ +	1.748e-06	1.450e-06	-5.757	-5.839	-0.081	(0)
	NaCO ₃ -	5.997e-07	4.995e-07	-6.222	-6.301	-0.079	(0)
	UO ₂ (CO ₃) 3-4	3.576e-07	6.283e-09	-6.447	-8.202	-1.755	(0)
	ZnCO ₃	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
	ZnHCO ₃ +	2.761e-07	2.144e-07	-6.559	-6.669	-0.110	(0)
	CuCO ₃	1.313e-07	1.313e-07	-6.882	-6.882	0.000	(0)
	UO ₂ (CO ₃) 2-2	1.104e-07	4.019e-08	-6.957	-7.396	-0.439	(0)
	NiHCO ₃ +	2.068e-08	1.606e-08	-7.685	-7.794	-0.110	(0)
	CoHCO ₃ +	9.865e-09	7.663e-09	-8.006	-8.116	-0.110	(0)
	NiCO ₃	4.234e-09	4.234e-09	-8.373	-8.373	0.000	(0)
	BaHCO ₃ +	3.369e-09	2.821e-09	-8.473	-8.550	-0.077	(0)
	Cu (CO ₃) 2-2	3.028e-09	1.102e-09	-8.519	-8.958	-0.439	(0)
	CuHCO ₃ +	2.079e-09	1.615e-09	-8.682	-8.792	-0.110	(0)
	CoCO ₃	1.451e-09	1.451e-09	-8.838	-8.838	0.000	(0)
	PbCO ₃	1.024e-09	1.024e-09	-8.990	-8.990	0.000	(0)
	UO ₂ CO ₃	6.458e-10	6.458e-10	-9.190	-9.190	0.000	(0)
	PbHCO ₃ +	3.740e-10	2.905e-10	-9.427	-9.537	-0.110	(0)
	CdCO ₃	1.683e-10	1.683e-10	-9.774	-9.774	0.000	(0)
	BaCO ₃	1.320e-10	1.320e-10	-9.879	-9.879	0.000	(0)
	Pb (CO ₃) 2-2	2.529e-11	9.209e-12	-10.597	-11.036	-0.439	(0)
	CdHCO ₃ +	2.484e-11	1.929e-11	-10.605	-10.715	-0.110	(0)
	Cd (CO ₃) 2-2	1.069e-12	3.891e-13	-11.971	-12.410	-0.439	(0)
	FeHCO ₃ +	2.333e-13	1.953e-13	-12.632	-12.709	-0.077	(0)
	HgCO ₃	2.125e-13	2.125e-13	-12.673	-12.673	0.000	(0)
	Hg (CO ₃) 2-2	5.756e-15	2.096e-15	-14.240	-14.679	-0.439	(0)
	HgHCO ₃ +	2.741e-16	2.129e-16	-15.562	-15.672	-0.110	(0)
Ca	4.066e-03						
	Ca+2	2.622e-03	1.218e-03	-2.581	-2.914	-0.333	(0)
	CaSO ₄	1.340e-03	1.340e-03	-2.873	-2.873	0.000	(0)
	CaHCO ₃ +	9.699e-05	8.123e-05	-4.013	-4.090	-0.077	(0)
	CaCO ₃	6.022e-06	6.022e-06	-5.220	-5.220	0.000	(0)
	CaF+	1.630e-06	1.352e-06	-5.788	-5.869	-0.081	(0)
	CaH ₂ BO ₃ +	3.330e-08	2.687e-08	-7.478	-7.571	-0.093	(0)
	CaOH+	5.427e-09	4.545e-09	-8.265	-8.342	-0.077	(0)
	CaNO ₃ +	4.333e-11	3.365e-11	-10.363	-10.473	-0.110	(0)
	CaNH ₃ +2	3.933e-12	1.432e-12	-11.405	-11.844	-0.439	(0)
	Ca (NH ₃) 2+2	1.462e-21	5.323e-22	-20.835	-21.274	-0.439	(0)
Cd	9.257e-09						
	Cd+2	5.093e-09	2.367e-09	-8.293	-8.626	-0.333	(0)
	CdSO ₄	2.664e-09	2.664e-09	-8.574	-8.574	0.000	(0)
	CdCl+	8.099e-10	6.292e-10	-9.092	-9.201	-0.110	(0)
	Cd (SO ₄) 2-2	4.739e-10	1.726e-10	-9.324	-9.763	-0.439	(0)
	CdCO ₃	1.683e-10	1.683e-10	-9.774	-9.774	0.000	(0)
	CdHCO ₃ +	2.484e-11	1.929e-11	-10.605	-10.715	-0.110	(0)
	CdCl ₂	7.300e-12	7.300e-12	-11.137	-11.137	0.000	(0)
	CdF+	4.910e-12	3.814e-12	-11.309	-11.419	-0.110	(0)
	CdOHC1	4.825e-12	4.825e-12	-11.316	-11.316	0.000	(0)
	CdOH+	4.525e-12	3.515e-12	-11.344	-11.454	-0.110	(0)
	Cd (CO ₃) 2-2	1.069e-12	3.891e-13	-11.971	-12.410	-0.439	(0)
	CdCl ₃ -	1.651e-14	1.282e-14	-13.782	-13.892	-0.110	(0)
	Cd (OH) 2	4.146e-15	4.146e-15	-14.382	-14.382	0.000	(0)
	CdF ₂	7.739e-16	7.739e-16	-15.111	-15.111	0.000	(0)
	CdNO ₃ +	8.417e-17	6.538e-17	-16.075	-16.185	-0.110	(0)
	CdSeO ₄	3.756e-17	3.756e-17	-16.425	-16.425	0.000	(0)
	Cd (SeO ₃) 2-2	4.353e-19	1.585e-19	-18.361	-18.800	-0.439	(0)
	Cd ₂ OH+3	4.049e-19	4.170e-20	-18.393	-19.380	-0.987	(0)
	Cd (OH) 3-	6.097e-20	4.736e-20	-19.215	-19.325	-0.110	(0)
	Cd (NO ₃) 2	2.862e-25	2.862e-25	-24.543	-24.543	0.000	(0)
	Cd (OH) 4-2	3.981e-27	1.449e-27	-26.400	-26.839	-0.439	(0)
	CdHS+	0.000e+00	0.000e+00	-79.971	-80.080	-0.110	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-152.339	-152.339	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-229.791	-229.901	-0.110	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-306.729	-307.167	-0.439	(0)
Cl	3.371e-03						

Cl-	3.371e-03	2.783e-03	-2.472	-2.555	-0.083	(0)
MnCl+	8.573e-08	7.114e-08	-7.067	-7.148	-0.081	(0)
AgCl	2.379e-08	2.379e-08	-7.624	-7.624	0.000	(0)
ZnCl+	1.612e-08	1.324e-08	-7.793	-7.878	-0.086	(0)
AgCl2-	7.424e-09	5.767e-09	-8.129	-8.239	-0.110	(0)
ZnOHCl	3.241e-09	3.241e-09	-8.489	-8.489	0.000	(0)
CdCl+	8.099e-10	6.292e-10	-9.092	-9.201	-0.110	(0)
CoCl+	3.411e-10	2.649e-10	-9.467	-9.577	-0.110	(0)
NiCl+	3.336e-10	2.591e-10	-9.477	-9.586	-0.110	(0)
MnCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
ZnCl2	5.842e-11	5.842e-11	-10.233	-10.233	0.000	(0)
HgClOH	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
HgCl2	4.410e-11	4.410e-11	-10.356	-10.356	0.000	(0)
AgCl3-2	3.929e-11	1.431e-11	-10.406	-10.844	-0.439	(0)
CuCl+	3.841e-11	3.154e-11	-10.416	-10.501	-0.086	(0)
CuCl	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
CuCl2-	1.845e-11	1.515e-11	-10.734	-10.819	-0.086	(0)
PbCl+	1.388e-11	1.078e-11	-10.858	-10.967	-0.110	(0)
CdCl2	7.300e-12	7.300e-12	-11.137	-11.137	0.000	(0)
CdOHCl	4.825e-12	4.825e-12	-11.316	-11.316	0.000	(0)
HgCl3-	1.580e-12	1.228e-12	-11.801	-11.911	-0.110	(0)
AgCl4-3	7.896e-13	8.130e-14	-12.103	-13.090	-0.987	(0)
MnCl3-	2.584e-13	2.144e-13	-12.588	-12.669	-0.081	(0)
ZnCl3-	1.573e-13	1.292e-13	-12.803	-12.889	-0.086	(0)
PbCl2	1.341e-13	1.341e-13	-12.873	-12.873	0.000	(0)
HgCl4-2	3.736e-14	1.360e-14	-13.428	-13.866	-0.439	(0)
CuCl2	3.044e-14	3.044e-14	-13.517	-13.517	0.000	(0)
CuCl3-2	1.903e-14	9.018e-15	-13.721	-14.045	-0.324	(0)
CdCl3-	1.651e-14	1.282e-14	-13.782	-13.892	-0.110	(0)
HgCl+	4.070e-15	3.161e-15	-14.390	-14.500	-0.110	(0)
NiCl2	3.632e-15	3.632e-15	-14.440	-14.440	0.000	(0)
ZnCl4-2	3.793e-16	1.798e-16	-15.421	-15.745	-0.324	(0)
UO2Cl+	3.023e-16	2.348e-16	-15.520	-15.629	-0.110	(0)
CrCl+2	2.704e-16	9.845e-17	-15.568	-16.007	-0.439	(0)
PbCl3-	1.913e-16	1.486e-16	-15.718	-15.828	-0.110	(0)
CrOHCl2	9.737e-19	9.737e-19	-18.012	-18.012	0.000	(0)
CuCl3-	9.629e-19	7.907e-19	-18.016	-18.102	-0.086	(0)
PbCl4-2	5.192e-19	1.890e-19	-18.285	-18.723	-0.439	(0)
FeCl+2	3.362e-20	1.593e-20	-19.473	-19.798	-0.324	(0)
CrCl2+	3.347e-20	2.600e-20	-19.475	-19.585	-0.110	(0)
VOCl+	1.479e-21	1.149e-21	-20.830	-20.940	-0.110	(0)
FeCl2+	2.388e-22	1.981e-22	-21.622	-21.703	-0.081	(0)
CuCl4-2	2.327e-23	1.103e-23	-22.633	-22.957	-0.324	(0)
CrO3Cl-	9.704e-26	7.538e-26	-25.013	-25.123	-0.110	(0)
FeCl3	5.515e-26	5.515e-26	-25.258	-25.258	0.000	(0)
CoCl+2	8.023e-35	2.921e-35	-34.096	-34.534	-0.439	(0)
UCl+3	0.000e+00	0.000e+00	-44.358	-45.345	-0.987	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
Co (2)	1.138e-07					
Co+2	7.557e-08	2.751e-08	-7.122	-7.560	-0.439	(0)
CoSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
CoHCO3+	9.865e-09	7.663e-09	-8.006	-8.116	-0.110	(0)
CoCO3	1.451e-09	1.451e-09	-8.838	-8.838	0.000	(0)
CoCl+	3.411e-10	2.649e-10	-9.467	-9.577	-0.110	(0)
CoOH+	1.321e-10	1.026e-10	-9.879	-9.989	-0.110	(0)
CoF+	1.139e-10	8.847e-11	-9.944	-10.053	-0.110	(0)
Co (OH) 2	1.524e-12	1.524e-12	-11.817	-11.817	0.000	(0)
CoNO2+	1.059e-12	8.225e-13	-11.975	-12.085	-0.110	(0)
Co (NH3) +2	8.483e-15	3.088e-15	-14.071	-14.510	-0.439	(0)
CoSeO4	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
CoNO3+	4.904e-16	3.809e-16	-15.309	-15.419	-0.110	(0)
Co (OH) 3-	7.320e-18	5.686e-18	-17.136	-17.245	-0.110	(0)
CoOOH-	1.838e-18	1.428e-18	-17.736	-17.845	-0.110	(0)
Co2OH+3	1.374e-18	1.415e-19	-17.862	-18.849	-0.987	(0)
Co (NH3) 2+2	3.379e-22	1.230e-22	-21.471	-21.910	-0.439	(0)
Co (NO3) 2	6.770e-24	6.770e-24	-23.169	-23.169	0.000	(0)

Co (OH) 4-2	4.627e-25	1.685e-25	-24.335	-24.773	-0.439	(0)
Co (NH3) 3+2	3.971e-30	1.446e-30	-29.401	-29.840	-0.439	(0)
Co4 (OH) 4+4	1.260e-30	2.214e-32	-29.900	-31.655	-1.755	(0)
Co (NH3) 4+2	1.946e-38	7.085e-39	-37.711	-38.150	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.521	-46.959	-0.439	(0)
Co (3)	1.346e-28					
CoOH+2	1.346e-28	4.900e-29	-27.871	-28.310	-0.439	(0)
Co+3	2.893e-34	5.158e-35	-33.539	-34.288	-0.749	(0)
CoCl+2	8.023e-35	2.921e-35	-34.096	-34.534	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-69.010	-69.448	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
Cr (2)	3.808e-26					
Cr+2	3.808e-26	1.386e-26	-25.419	-25.858	-0.439	(0)
Cr (3)	3.892e-09					
Cr (OH) 2+	3.274e-09	2.543e-09	-8.485	-8.595	-0.110	(0)
Cr (OH) +2	3.070e-10	1.118e-10	-9.513	-9.952	-0.439	(0)
Cr (OH) 3	1.786e-10	1.786e-10	-9.748	-9.748	0.000	(0)
CrOHSO4	1.274e-10	1.274e-10	-9.895	-9.895	0.000	(0)
CrO2-	2.030e-12	1.577e-12	-11.692	-11.802	-0.110	(0)
Cr (OH) 4-	1.711e-12	1.329e-12	-11.767	-11.876	-0.110	(0)
CrF+2	1.210e-12	4.404e-13	-11.917	-12.356	-0.439	(0)
CrSO4+	3.945e-13	3.064e-13	-12.404	-12.514	-0.110	(0)
Cr+3	2.654e-13	2.733e-14	-12.576	-13.563	-0.987	(0)
CrCl+2	2.704e-16	9.845e-17	-15.568	-16.007	-0.439	(0)
Cr2 (OH) 2SO4+2	3.534e-18	1.287e-18	-17.452	-17.890	-0.439	(0)
CrOHC12	9.737e-19	9.737e-19	-18.012	-18.012	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.670e-19	3.670e-19	-18.435	-18.435	0.000	(0)
CrCl2+	3.347e-20	2.600e-20	-19.475	-19.585	-0.110	(0)
CrNO3+2	2.866e-23	1.044e-23	-22.543	-22.981	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.630	-45.068	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.755	-54.742	-0.987	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Cr (6)	1.124e-15					
CrO4-2	9.879e-16	4.591e-16	-15.005	-15.338	-0.333	(0)
HCrO4-	1.029e-16	7.995e-17	-15.987	-16.097	-0.110	(0)
NaCrO4-	2.526e-17	1.962e-17	-16.598	-16.707	-0.110	(0)
KCrO4-	7.635e-18	5.931e-18	-17.117	-17.227	-0.110	(0)
CrO3SO4-2	1.730e-23	6.297e-24	-22.762	-23.201	-0.439	(0)
H2CrO4	3.488e-24	3.488e-24	-23.457	-23.457	0.000	(0)
CrO3Cl-	9.704e-26	7.538e-26	-25.013	-25.123	-0.110	(0)
Cr2O7-2	6.092e-31	2.218e-31	-30.215	-30.654	-0.439	(0)
Cu (1)	5.410e-11					
CuCl	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
CuCl2-	1.845e-11	1.515e-11	-10.734	-10.819	-0.086	(0)
Cu+	9.573e-12	7.436e-12	-11.019	-11.129	-0.110	(0)
CuCl3-2	1.903e-14	9.018e-15	-13.721	-14.045	-0.324	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.749	-152.125	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.498	-152.855	-0.357	(0)
Cu (2)	1.651e-07					
CuCO3	1.313e-07	1.313e-07	-6.882	-6.882	0.000	(0)
Cu+2	1.539e-08	7.150e-09	-7.813	-8.146	-0.333	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
CuOH+	5.147e-09	4.227e-09	-8.288	-8.374	-0.086	(0)
Cu (CO3) 2-2	3.028e-09	1.102e-09	-8.519	-8.958	-0.439	(0)
CuHCO3+	2.079e-09	1.615e-09	-8.682	-8.792	-0.110	(0)
Cu (OH) 2	1.577e-10	1.577e-10	-9.802	-9.802	0.000	(0)
CuF+	5.905e-11	4.587e-11	-10.229	-10.338	-0.110	(0)
CuCl+	3.841e-11	3.154e-11	-10.416	-10.501	-0.086	(0)
CuNO2+	4.089e-12	3.176e-12	-11.388	-11.498	-0.110	(0)
Cu2 (OH) 2+2	1.233e-12	4.488e-13	-11.909	-12.348	-0.439	(0)
CuNH3+2	1.876e-13	6.831e-14	-12.727	-13.166	-0.439	(0)
Cu (OH) 3-	7.785e-14	6.047e-14	-13.109	-13.218	-0.110	(0)
CuCl2	3.044e-14	3.044e-14	-13.517	-13.517	0.000	(0)
CuNO3+	2.543e-16	1.975e-16	-15.595	-15.704	-0.110	(0)
Cu (NO2) 2	1.379e-16	1.379e-16	-15.860	-15.860	0.000	(0)
CuCl3-	9.629e-19	7.907e-19	-18.016	-18.102	-0.086	(0)

	Cu (OH) 4-2	2.444e-19	8.898e-20	-18.612	-19.051	-0.439	(0)
	CuCl4-2	2.327e-23	1.103e-23	-22.633	-22.957	-0.324	(0)
	Cu (NO3) 2	2.172e-25	2.172e-25	-24.663	-24.663	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.524	-220.634	-0.110	(0)
F	1.535e-04						
	F-	1.232e-04	1.017e-04	-3.910	-3.993	-0.083	(0)
	MgF+	2.789e-05	2.302e-05	-4.555	-4.638	-0.083	(0)
	CaF+	1.630e-06	1.352e-06	-5.788	-5.869	-0.081	(0)
	NaF	5.518e-07	5.518e-07	-6.258	-6.258	0.000	(0)
	MnF+	9.904e-08	8.218e-08	-7.004	-7.085	-0.081	(0)
	AlF3	3.371e-08	3.371e-08	-7.472	-7.472	0.000	(0)
	AlF2+	3.161e-08	2.633e-08	-7.500	-7.580	-0.079	(0)
	HF	8.094e-09	8.094e-09	-8.092	-8.092	0.000	(0)
	ZnF+	4.947e-09	3.843e-09	-8.306	-8.415	-0.110	(0)
	AlF4-	2.081e-09	1.718e-09	-8.682	-8.765	-0.083	(0)
	BF (OH) 3-	1.786e-09	1.441e-09	-8.748	-8.841	-0.093	(0)
	AlF+2	1.351e-09	6.504e-10	-8.869	-9.187	-0.318	(0)
	NiF+	1.196e-10	9.294e-11	-9.922	-10.032	-0.110	(0)
	CoF+	1.139e-10	8.847e-11	-9.944	-10.053	-0.110	(0)
	CuF+	5.905e-11	4.587e-11	-10.229	-10.338	-0.110	(0)
	CdF+	4.910e-12	3.814e-12	-11.309	-11.419	-0.110	(0)
	HF2-	3.832e-12	3.129e-12	-11.417	-11.505	-0.088	(0)
	CrF+2	1.210e-12	4.404e-13	-11.917	-12.356	-0.439	(0)
	AgF	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
	BF2 (OH) 2-	1.046e-12	8.436e-13	-11.981	-12.074	-0.093	(0)
	PbF+	1.007e-12	7.824e-13	-11.997	-12.107	-0.110	(0)
	UO2F+	9.398e-13	7.301e-13	-12.027	-12.137	-0.110	(0)
	UO2F2	2.141e-13	2.141e-13	-12.669	-12.669	0.000	(0)
	UO2F3-	7.040e-15	5.468e-15	-14.152	-14.262	-0.110	(0)
	PbF2	1.566e-15	1.566e-15	-14.805	-14.805	0.000	(0)
	CdF2	7.739e-16	7.739e-16	-15.111	-15.111	0.000	(0)
	H2F2	1.755e-16	1.755e-16	-15.756	-15.756	0.000	(0)
	FeF2+	6.932e-17	5.751e-17	-16.159	-16.240	-0.081	(0)
	VO2F	5.331e-17	5.331e-17	-16.273	-16.273	0.000	(0)
	FeF+2	4.459e-17	2.114e-17	-16.351	-16.675	-0.324	(0)
	UO2F4-2	1.213e-17	4.417e-18	-16.916	-17.355	-0.439	(0)
	FeF3	8.251e-18	8.251e-18	-17.083	-17.083	0.000	(0)
	VO2F2-	2.534e-18	1.968e-18	-17.596	-17.706	-0.110	(0)
	BF3OH-	2.228e-18	1.797e-18	-17.652	-17.745	-0.093	(0)
	PbF3-	3.887e-19	3.020e-19	-18.410	-18.520	-0.110	(0)
	VOF+	1.155e-19	8.975e-20	-18.937	-19.047	-0.110	(0)
	VO2F3-2	6.857e-21	2.496e-21	-20.164	-20.603	-0.439	(0)
	VOF2	3.422e-21	3.422e-21	-20.466	-20.466	0.000	(0)
	HgF+	2.762e-22	2.146e-22	-21.559	-21.668	-0.110	(0)
	BF4-	6.003e-23	4.843e-23	-22.222	-22.315	-0.093	(0)
	PbF4-2	4.037e-23	1.470e-23	-22.394	-22.833	-0.439	(0)
	VOF3-	1.589e-23	1.235e-23	-22.799	-22.908	-0.110	(0)
	VO2F4-3	1.213e-24	1.249e-25	-23.916	-24.903	-0.987	(0)
	Sb (OH) 2F	3.796e-25	3.796e-25	-24.421	-24.421	0.000	(0)
	SbOF	3.736e-25	3.736e-25	-24.428	-24.428	0.000	(0)
	VOF4-2	1.392e-26	5.068e-27	-25.856	-26.295	-0.439	(0)
	UF3+	1.746e-35	1.356e-35	-34.758	-34.868	-0.110	(0)
	UF2+2	2.312e-36	8.416e-37	-35.636	-36.075	-0.439	(0)
	UF4	1.512e-37	1.512e-37	-36.820	-36.820	0.000	(0)
	UF+3	6.385e-39	6.574e-40	-38.195	-39.182	-0.987	(0)
	UF5-	7.845e-40	6.094e-40	-39.105	-39.215	-0.110	(0)
	UF6-2	0.000e+00	0.000e+00	-40.289	-40.728	-0.439	(0)
Fe (2)	1.728e-11						
	Fe+2	1.190e-11	4.334e-12	-10.924	-11.363	-0.439	(0)
	FeSO4	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
	FeHCO3+	2.333e-13	1.953e-13	-12.632	-12.709	-0.077	(0)
	FeOH+	3.887e-14	3.225e-14	-13.410	-13.491	-0.081	(0)
	Fe (OH) 2	4.790e-18	4.790e-18	-17.320	-17.320	0.000	(0)
	Fe (OH) 3-	3.413e-19	2.832e-19	-18.467	-18.548	-0.081	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-161.338	-161.338	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-238.654	-238.763	-0.110	(0)
Fe (3)	2.340e-09						
	Fe (OH) 2+	1.998e-09	1.664e-09	-8.699	-8.779	-0.079	(0)

	Fe (OH) 3	3.342e-10	3.342e-10	-9.476	-9.476	0.000	(0)
	Fe (OH) 4-	6.985e-12	5.818e-12	-11.156	-11.235	-0.079	(0)
	FeOH+2	4.828e-14	2.288e-14	-13.316	-13.640	-0.324	(0)
	FeF2+	6.932e-17	5.751e-17	-16.159	-16.240	-0.081	(0)
	FeF+2	4.459e-17	2.114e-17	-16.351	-16.675	-0.324	(0)
	FeSO4+	1.231e-17	1.021e-17	-16.910	-16.991	-0.081	(0)
	FeF3	8.251e-18	8.251e-18	-17.083	-17.083	0.000	(0)
	Fe (SO4) 2-	1.350e-18	1.048e-18	-17.870	-17.979	-0.110	(0)
	Fe+3	1.063e-18	1.896e-19	-17.973	-18.722	-0.749	(0)
	FeCl+2	3.362e-20	1.593e-20	-19.473	-19.798	-0.324	(0)
	FeCl2+	2.388e-22	1.981e-22	-21.622	-21.703	-0.081	(0)
	FeHSeO3+2	1.676e-22	6.104e-23	-21.776	-22.214	-0.439	(0)
	Fe2 (OH) 2+4	9.868e-25	1.734e-26	-24.006	-25.761	-1.755	(0)
	FeCl3	5.515e-26	5.515e-26	-25.258	-25.258	0.000	(0)
	FeNO3+2	4.548e-26	1.656e-26	-25.342	-25.781	-0.439	(0)
	Fe3 (OH) 4+5	2.306e-31	4.172e-34	-30.637	-33.380	-2.743	(0)
H (0)	1.830e-29						
	H2	9.149e-30	9.247e-30	-29.039	-29.034	0.005	(0)
Hg (0)	2.369e-09						
	Hg	2.369e-09	2.369e-09	-8.625	-8.625	0.000	(0)
Hg (1)	5.030e-19						
	Hg2+2	2.515e-19	9.156e-20	-18.599	-19.038	-0.439	(0)
Hg (2)	1.107e-10						
	HgClOH	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
	HgCl2	4.410e-11	4.410e-11	-10.356	-10.356	0.000	(0)
	Hg (OH) 2	1.242e-11	1.255e-11	-10.906	-10.901	0.005	(0)
	HgCl3-	1.580e-12	1.228e-12	-11.801	-11.911	-0.110	(0)
	HgCO3	2.125e-13	2.125e-13	-12.673	-12.673	0.000	(0)
	HgCl4-2	3.736e-14	1.360e-14	-13.428	-13.866	-0.439	(0)
	Hg (CO3) 2-2	5.756e-15	2.096e-15	-14.240	-14.679	-0.439	(0)
	HgCl+	4.070e-15	3.161e-15	-14.390	-14.500	-0.110	(0)
	HgOH+	5.454e-16	4.237e-16	-15.263	-15.373	-0.110	(0)
	HgHCO3+	2.741e-16	2.129e-16	-15.562	-15.672	-0.110	(0)
	Hg (OH) 3-	3.804e-19	2.955e-19	-18.420	-18.529	-0.110	(0)
	Hg+2	1.563e-19	5.692e-20	-18.806	-19.245	-0.439	(0)
	HgNH3+2	9.210e-20	3.353e-20	-19.036	-19.475	-0.439	(0)
	Hg (NH3) 2+2	8.600e-20	3.131e-20	-19.066	-19.504	-0.439	(0)
	HgSO4	7.156e-20	7.156e-20	-19.145	-19.145	0.000	(0)
	HgF+	2.762e-22	2.146e-22	-21.559	-21.668	-0.110	(0)
	Hg (NH3) 3+2	3.197e-28	1.164e-28	-27.495	-27.934	-0.439	(0)
	HgNO3+	2.364e-28	1.836e-28	-27.626	-27.736	-0.110	(0)
	Hg (NH3) 4+2	2.371e-36	8.632e-37	-35.625	-36.064	-0.439	(0)
	Hg (NO3) 2	6.666e-37	6.666e-37	-36.176	-36.176	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.863	-138.972	-0.110	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.847	-139.847	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.973	-140.411	-0.439	(0)
K	4.353e-03						
	K+	4.211e-03	3.477e-03	-2.376	-2.459	-0.083	(0)
	KSO4-	1.419e-04	1.182e-04	-3.848	-3.927	-0.079	(0)
	KCrO4-	7.635e-18	5.931e-18	-17.117	-17.227	-0.110	(0)
Mg	6.229e-03						
	Mg+2	4.342e-03	2.018e-03	-2.362	-2.695	-0.333	(0)
	MgSO4	1.763e-03	1.763e-03	-2.754	-2.754	0.000	(0)
	MgHCO3+	9.003e-05	7.394e-05	-4.046	-4.131	-0.086	(0)
	MgF+	2.789e-05	2.302e-05	-4.555	-4.638	-0.083	(0)
	MgCO3	5.235e-06	5.235e-06	-5.281	-5.281	0.000	(0)
	MgOH+	1.786e-07	1.502e-07	-6.748	-6.823	-0.075	(0)
	MgH2BO3+	3.324e-08	2.682e-08	-7.478	-7.572	-0.093	(0)
Mn (2)	7.504e-05						
	Mn+2	5.576e-05	2.030e-05	-4.254	-4.692	-0.439	(0)
	MnSO4	1.733e-05	1.733e-05	-4.761	-4.761	0.000	(0)
	MnHCO3+	1.748e-06	1.450e-06	-5.757	-5.839	-0.081	(0)
	MnF+	9.904e-08	8.218e-08	-7.004	-7.085	-0.081	(0)
	MnCl+	8.573e-08	7.114e-08	-7.067	-7.148	-0.081	(0)
	MnOH+	1.149e-08	9.534e-09	-7.940	-8.021	-0.081	(0)
	MnCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
	MnSeO4	4.657e-13	4.657e-13	-12.332	-12.332	0.000	(0)
	MnNO3+	3.618e-13	2.811e-13	-12.442	-12.551	-0.110	(0)

MnCl3-	2.584e-13	2.144e-13	-12.588	-12.669	-0.081	(0)
Mn (OH) 3-	2.482e-18	2.059e-18	-17.605	-17.686	-0.081	(0)
Mn (NO3) 2	6.167e-21	6.167e-21	-20.210	-20.210	0.000	(0)
Mn (OH) 4-2	2.623e-24	1.243e-24	-23.581	-23.905	-0.324	(0)
MnSe	0.000e+00	0.000e+00	-42.514	-42.514	0.000	(0)
Mn (3)	2.395e-24					
Mn+3	2.395e-24	4.270e-25	-23.621	-24.370	-0.749	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.947	-42.272	-0.324	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.880	-45.971	-0.091	(0)
Mo	2.425e-06					
MoO4-2	2.424e-06	1.126e-06	-5.615	-5.948	-0.333	(0)
HMoO4-	1.553e-09	1.206e-09	-8.809	-8.919	-0.110	(0)
H2MoO4	4.755e-13	4.755e-13	-12.323	-12.323	0.000	(0)
Ag2MoO4	7.471e-24	7.471e-24	-23.127	-23.127	0.000	(0)
AlMo6O21-3	3.037e-36	3.127e-37	-35.518	-36.505	-0.987	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.850	-46.799	-3.949	(0)
HMo7O24-5	0.000e+00	0.000e+00	-44.939	-47.682	-2.743	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-48.413	-50.169	-1.755	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-53.204	-54.192	-0.987	(0)
N (-3)	1.156e-07					
NH4+	1.092e-07	8.813e-08	-6.962	-7.055	-0.093	(0)
NH4SO4-	5.465e-09	4.534e-09	-8.262	-8.343	-0.081	(0)
NH3	9.337e-10	9.337e-10	-9.030	-9.030	0.000	(0)
CaNH3+2	3.933e-12	1.432e-12	-11.405	-11.844	-0.439	(0)
CuNH3+2	1.876e-13	6.831e-14	-12.727	-13.166	-0.439	(0)
NiNH3+2	5.011e-14	1.824e-14	-13.300	-13.739	-0.439	(0)
AgNH3+	1.027e-14	7.980e-15	-13.988	-14.098	-0.110	(0)
Co (NH3) +2	8.483e-15	3.088e-15	-14.071	-14.510	-0.439	(0)
BaNH3+2	1.335e-16	4.861e-17	-15.875	-16.313	-0.439	(0)
HgNH3+2	9.210e-20	3.353e-20	-19.036	-19.475	-0.439	(0)
Hg (NH3) 2+2	8.600e-20	3.131e-20	-19.066	-19.504	-0.439	(0)
Ag (NH3) 2+	7.796e-20	6.056e-20	-19.108	-19.218	-0.110	(0)
Ni (NH3) 2+2	6.763e-21	2.462e-21	-20.170	-20.609	-0.439	(0)
Ca (NH3) 2+2	1.462e-21	5.323e-22	-20.835	-21.274	-0.439	(0)
Co (NH3) 2+2	3.379e-22	1.230e-22	-21.471	-21.910	-0.439	(0)
Hg (NH3) 3+2	3.197e-28	1.164e-28	-27.495	-27.934	-0.439	(0)
Co (NH3) 3+2	3.971e-30	1.446e-30	-29.401	-29.840	-0.439	(0)
Hg (NH3) 4+2	2.371e-36	8.632e-37	-35.625	-36.064	-0.439	(0)
Co (NH3) 4+2	1.946e-38	7.085e-39	-37.711	-38.150	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.630	-45.068	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.521	-46.959	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.755	-54.742	-0.987	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-69.010	-69.448	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
N (3)	5.226e-06					
NO2-	5.226e-06	4.242e-06	-5.282	-5.372	-0.091	(0)
CuNO2+	4.089e-12	3.176e-12	-11.388	-11.498	-0.110	(0)
AgNO2	3.710e-12	3.710e-12	-11.431	-11.431	0.000	(0)
CoNO2+	1.059e-12	8.225e-13	-11.975	-12.085	-0.110	(0)
Cu (NO2) 2	1.379e-16	1.379e-16	-15.860	-15.860	0.000	(0)
Ag (NO2) 2-	3.138e-17	2.438e-17	-16.503	-16.613	-0.110	(0)
N (5)	1.062e-08					
NO3-	1.058e-08	8.735e-09	-7.976	-8.059	-0.083	(0)
CaNO3+	4.333e-11	3.365e-11	-10.363	-10.473	-0.110	(0)
MnNO3+	3.618e-13	2.811e-13	-12.442	-12.551	-0.110	(0)
ZnNO3+	5.350e-14	4.156e-14	-13.272	-13.381	-0.110	(0)
BaNO3+	4.650e-15	3.612e-15	-14.333	-14.442	-0.110	(0)
NiNO3+	1.028e-15	7.984e-16	-14.988	-15.098	-0.110	(0)
CoNO3+	4.904e-16	3.809e-16	-15.309	-15.419	-0.110	(0)
CuNO3+	2.543e-16	1.975e-16	-15.595	-15.704	-0.110	(0)
CdNO3+	8.417e-17	6.538e-17	-16.075	-16.185	-0.110	(0)
AgNO3	2.904e-17	2.904e-17	-16.537	-16.537	0.000	(0)
PbNO3+	1.816e-17	1.411e-17	-16.741	-16.851	-0.110	(0)

Mn(NO3)2	6.167e-21	6.167e-21	-20.210	-20.210	0.000	(0)
UO2NO3+	1.167e-21	9.065e-22	-20.933	-21.043	-0.110	(0)
Zn(NO3)2	7.244e-23	7.244e-23	-22.140	-22.140	0.000	(0)
CrNO3+2	2.866e-23	1.044e-23	-22.543	-22.981	-0.439	(0)
Co(NO3)2	6.770e-24	6.770e-24	-23.169	-23.169	0.000	(0)
VO2NO3	1.321e-24	1.321e-24	-23.879	-23.879	0.000	(0)
Cd(NO3)2	2.862e-25	2.862e-25	-24.543	-24.543	0.000	(0)
Cu(NO3)2	2.172e-25	2.172e-25	-24.663	-24.663	0.000	(0)
Pb(NO3)2	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
FeNO3+2	4.548e-26	1.656e-26	-25.342	-25.781	-0.439	(0)
HgNO3+	2.364e-28	1.836e-28	-27.626	-27.736	-0.110	(0)
Hg(NO3)2	6.666e-37	6.666e-37	-36.176	-36.176	0.000	(0)
Na	1.070e-02					
Na+	1.042e-02	8.600e-03	-1.982	-2.066	-0.083	(0)
NaSO4-	2.662e-04	2.218e-04	-3.575	-3.654	-0.079	(0)
NaHCO3	1.732e-05	1.732e-05	-4.762	-4.762	0.000	(0)
NaCO3-	5.997e-07	4.995e-07	-6.222	-6.301	-0.079	(0)
NaF	5.518e-07	5.518e-07	-6.258	-6.258	0.000	(0)
NaH2BO3	5.223e-09	5.223e-09	-8.282	-8.282	0.000	(0)
NaCrO4-	2.526e-17	1.962e-17	-16.598	-16.707	-0.110	(0)
Ni	1.386e-07					
Ni+2	7.830e-08	3.639e-08	-7.106	-7.439	-0.333	(0)
NiSO4	3.486e-08	3.486e-08	-7.458	-7.458	0.000	(0)
NiHCO3+	2.068e-08	1.606e-08	-7.685	-7.794	-0.110	(0)
NiCO3	4.234e-09	4.234e-09	-8.373	-8.373	0.000	(0)
NiCl+	3.336e-10	2.591e-10	-9.477	-9.586	-0.110	(0)
NiF+	1.196e-10	9.294e-11	-9.922	-10.032	-0.110	(0)
NiOH+	1.102e-10	8.564e-11	-9.958	-10.067	-0.110	(0)
Ni(SO4)2-2	1.522e-11	5.542e-12	-10.818	-11.256	-0.439	(0)
Ni(OH)2	1.272e-12	1.272e-12	-11.896	-11.896	0.000	(0)
NiNH3+2	5.011e-14	1.824e-14	-13.300	-13.739	-0.439	(0)
NiCl2	3.632e-15	3.632e-15	-14.440	-14.440	0.000	(0)
NiSeO4	1.450e-15	1.450e-15	-14.838	-14.838	0.000	(0)
NiNO3+	1.028e-15	7.984e-16	-14.988	-15.098	-0.110	(0)
Ni(OH)3-	3.061e-16	2.378e-16	-15.514	-15.624	-0.110	(0)
Ni(NH3)2+2	6.763e-21	2.462e-21	-20.170	-20.609	-0.439	(0)
O(0)	1.171e-34					
O2	5.857e-35	5.919e-35	-34.232	-34.228	0.005	(0)
Pb	2.017e-09					
PbCO3	1.024e-09	1.024e-09	-8.990	-8.990	0.000	(0)
PbHCO3+	3.740e-10	2.905e-10	-9.427	-9.537	-0.110	(0)
PbSO4	2.568e-10	2.568e-10	-9.590	-9.590	0.000	(0)
Pb+2	2.350e-10	1.092e-10	-9.629	-9.962	-0.333	(0)
PbOH+	6.602e-11	5.128e-11	-10.180	-10.290	-0.110	(0)
Pb(CO3)2-2	2.529e-11	9.209e-12	-10.597	-11.036	-0.439	(0)
Pb(SO4)2-2	2.041e-11	7.429e-12	-10.690	-11.129	-0.439	(0)
PbCl+	1.388e-11	1.078e-11	-10.858	-10.967	-0.110	(0)
PbF+	1.007e-12	7.824e-13	-11.997	-12.107	-0.110	(0)
Pb(OH)2	3.032e-13	3.032e-13	-12.518	-12.518	0.000	(0)
PbCl2	1.341e-13	1.341e-13	-12.873	-12.873	0.000	(0)
PbF2	1.566e-15	1.566e-15	-14.805	-14.805	0.000	(0)
PbCl3-	1.913e-16	1.486e-16	-15.718	-15.828	-0.110	(0)
Pb(OH)3-	7.297e-17	5.668e-17	-16.137	-16.247	-0.110	(0)
PbNO3+	1.816e-17	1.411e-17	-16.741	-16.851	-0.110	(0)
Pb2OH+3	8.619e-19	8.874e-20	-18.065	-19.052	-0.987	(0)
PbCl4-2	5.192e-19	1.890e-19	-18.285	-18.723	-0.439	(0)
PbF3-	3.887e-19	3.020e-19	-18.410	-18.520	-0.110	(0)
Pb(OH)4-2	7.128e-21	2.595e-21	-20.147	-20.586	-0.439	(0)
PbF4-2	4.037e-23	1.470e-23	-22.394	-22.833	-0.439	(0)
Pb3(OH)4+2	5.500e-25	2.003e-25	-24.260	-24.698	-0.439	(0)
Pb(NO3)2	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
Pb4(OH)4+4	9.885e-30	1.737e-31	-29.005	-30.760	-1.755	(0)
Pb(HS)2	0.000e+00	0.000e+00	-153.617	-153.617	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-231.669	-231.779	-0.110	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.026	-74.026	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.353	-79.462	-0.110	(0)
H2S	0.000e+00	0.000e+00	-79.711	-79.711	0.000	(0)

CdHS+	0.000e+00	0.000e+00	-79.971	-80.080	-0.110	(0)
S5-2	0.000e+00	0.000e+00	-81.120	-81.558	-0.439	(0)
S6-2	0.000e+00	0.000e+00	-81.636	-82.074	-0.439	(0)
S4-2	0.000e+00	0.000e+00	-81.715	-82.154	-0.439	(0)
S3-2	0.000e+00	0.000e+00	-82.521	-82.960	-0.439	(0)
S2-2	0.000e+00	0.000e+00	-83.537	-83.976	-0.439	(0)
S-2	0.000e+00	0.000e+00	-89.169	-89.493	-0.324	(0)
HgHS2-	0.000e+00	0.000e+00	-138.863	-138.972	-0.110	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.847	-139.847	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.973	-140.411	-0.439	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.279	-149.388	-0.110	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.390	-149.603	-0.213	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.459	-150.568	-0.110	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.387	-151.774	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.719	-152.085	-0.366	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.749	-152.125	-0.376	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.827	-151.827	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.339	-152.339	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.498	-152.855	-0.357	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.617	-153.617	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.338	-161.338	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.524	-220.634	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.900	-228.010	-0.110	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-229.791	-229.901	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.282	-230.721	-0.439	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.669	-231.779	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.654	-238.763	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-306.729	-307.167	-0.439	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-308.493	-308.932	-0.439	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.264	-321.703	-0.439	(0)
S (6)	1.386e-02					
SO4-2	1.033e-02	4.801e-03	-1.986	-2.319	-0.333	(0)
MgSO4	1.763e-03	1.763e-03	-2.754	-2.754	0.000	(0)
CaSO4	1.340e-03	1.340e-03	-2.873	-2.873	0.000	(0)
NaSO4-	2.662e-04	2.218e-04	-3.575	-3.654	-0.079	(0)
KSO4-	1.419e-04	1.182e-04	-3.848	-3.927	-0.079	(0)
MnSO4	1.733e-05	1.733e-05	-4.761	-4.761	0.000	(0)
ZnSO4	1.990e-06	1.990e-06	-5.701	-5.701	0.000	(0)
Zn (SO4) 2-2	2.285e-07	8.320e-08	-6.641	-7.080	-0.439	(0)
NiSO4	3.486e-08	3.486e-08	-7.458	-7.458	0.000	(0)
HSO4-	3.059e-08	2.525e-08	-7.514	-7.598	-0.083	(0)
CoSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
NH4SO4-	5.465e-09	4.534e-09	-8.262	-8.343	-0.081	(0)
CdSO4	2.664e-09	2.664e-09	-8.574	-8.574	0.000	(0)
AgSO4-	5.162e-10	4.010e-10	-9.287	-9.397	-0.110	(0)
Cd (SO4) 2-2	4.739e-10	1.726e-10	-9.324	-9.763	-0.439	(0)
PbSO4	2.568e-10	2.568e-10	-9.590	-9.590	0.000	(0)
CrOHSO4	1.274e-10	1.274e-10	-9.895	-9.895	0.000	(0)
AlSO4+	2.888e-11	2.384e-11	-10.539	-10.623	-0.083	(0)
Pb (SO4) 2-2	2.041e-11	7.429e-12	-10.690	-11.129	-0.439	(0)
Ni (SO4) 2-2	1.522e-11	5.542e-12	-10.818	-11.256	-0.439	(0)
FeSO4	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
Al (SO4) 2-	1.486e-12	1.227e-12	-11.828	-11.911	-0.083	(0)
CrSO4+	3.945e-13	3.064e-13	-12.404	-12.514	-0.110	(0)
UO2SO4	3.780e-13	3.780e-13	-12.423	-12.423	0.000	(0)
UO2 (SO4) 2-2	6.571e-14	2.392e-14	-13.182	-13.621	-0.439	(0)
VO2SO4-	4.412e-17	3.427e-17	-16.355	-16.465	-0.110	(0)
FeSO4+	1.231e-17	1.021e-17	-16.910	-16.991	-0.081	(0)
Cr2 (OH) 2SO4+2	3.534e-18	1.287e-18	-17.452	-17.890	-0.439	(0)
Fe (SO4) 2-	1.350e-18	1.048e-18	-17.870	-17.979	-0.110	(0)
Cr2 (OH) 2 (SO4) 2	3.670e-19	3.670e-19	-18.435	-18.435	0.000	(0)
VOSO4	1.946e-19	1.946e-19	-18.711	-18.711	0.000	(0)
HgSO4	7.156e-20	7.156e-20	-19.145	-19.145	0.000	(0)
CrO3SO4-2	1.730e-23	6.297e-24	-22.762	-23.201	-0.439	(0)
VSO4+	1.313e-33	1.020e-33	-32.882	-32.992	-0.110	(0)
U (SO4) 2	2.362e-39	2.362e-39	-38.627	-38.627	0.000	(0)
USO4+2	1.701e-40	0.000e+00	-39.769	-40.208	-0.439	(0)

Co(NH3)6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Sb(3)	8.773e-20					
Sb(OH)3	4.438e-20	4.438e-20	-19.353	-19.353	0.000	(0)
HSbO2	4.335e-20	4.335e-20	-19.363	-19.363	0.000	(0)
SbO2-	1.679e-24	1.305e-24	-23.775	-23.885	-0.110	(0)
Sb(OH)4-	9.610e-25	7.465e-25	-24.017	-24.127	-0.110	(0)
Sb(OH)2F	3.796e-25	3.796e-25	-24.421	-24.421	0.000	(0)
SbOF	3.736e-25	3.736e-25	-24.428	-24.428	0.000	(0)
Sb(OH)2+	7.472e-26	5.804e-26	-25.127	-25.236	-0.110	(0)
SbO+	2.578e-26	2.002e-26	-25.589	-25.698	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.264	-321.703	-0.439	(0)
Sb(5)	3.407e-08					
SbO3-	3.403e-08	2.643e-08	-7.468	-7.578	-0.110	(0)
Sb(OH)6-	3.737e-11	3.085e-11	-10.428	-10.511	-0.083	(0)
SbO2+	2.829e-23	2.197e-23	-22.548	-22.658	-0.110	(0)
Se(-2)	5.229e-15					
Ag2Se	5.229e-15	5.229e-15	-14.282	-14.282	0.000	(0)
HSe-	2.538e-40	1.972e-40	-39.595	-39.705	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-42.514	-42.514	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.084	-43.084	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.997	-47.436	-0.439	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-84.735	-86.491	-1.755	(0)
Se(4)	1.816e-07					
HSeO3-	1.569e-07	1.219e-07	-6.804	-6.914	-0.110	(0)
SeO3-2	2.476e-08	9.014e-09	-7.606	-8.045	-0.439	(0)
H2SeO3	2.797e-12	2.797e-12	-11.553	-11.553	0.000	(0)
AgSeO3-	3.122e-14	2.425e-14	-13.506	-13.615	-0.110	(0)
Cd(SeO3)2-2	4.353e-19	1.585e-19	-18.361	-18.800	-0.439	(0)
Ag(SeO3)2-3	1.901e-20	1.957e-21	-19.721	-20.708	-0.987	(0)
FeHSeO3+2	1.676e-22	6.104e-23	-21.776	-22.214	-0.439	(0)
Se(6)	1.839e-10					
SeO4-2	1.834e-10	8.523e-11	-9.737	-10.069	-0.333	(0)
MnSeO4	4.657e-13	4.657e-13	-12.332	-12.332	0.000	(0)
ZnSeO4	2.500e-14	2.500e-14	-13.602	-13.602	0.000	(0)
NiSeO4	1.450e-15	1.450e-15	-14.838	-14.838	0.000	(0)
CoSeO4	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
HSeO4-	2.959e-16	2.299e-16	-15.529	-15.638	-0.110	(0)
CdSeO4	3.756e-17	3.756e-17	-16.425	-16.425	0.000	(0)
Zn(SeO4)2-2	5.934e-24	2.160e-24	-23.227	-23.665	-0.439	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.971	-58.958	-0.987	(0)
U(4)	6.995e-22					
U(OH)5-	6.983e-22	5.424e-22	-21.156	-21.266	-0.110	(0)
U(OH)4	1.224e-24	1.224e-24	-23.912	-23.912	0.000	(0)
U(OH)3+	3.101e-28	2.409e-28	-27.508	-27.618	-0.110	(0)
U(OH)2+2	1.648e-32	5.999e-33	-31.783	-32.222	-0.439	(0)
UF3+	1.746e-35	1.356e-35	-34.758	-34.868	-0.110	(0)
UF2+2	2.312e-36	8.416e-37	-35.636	-36.075	-0.439	(0)
UF4	1.512e-37	1.512e-37	-36.820	-36.820	0.000	(0)
UOH+3	1.478e-37	1.522e-38	-36.830	-37.818	-0.987	(0)
UF+3	6.385e-39	6.574e-40	-38.195	-39.182	-0.987	(0)
U(SO4)2	2.362e-39	2.362e-39	-38.627	-38.627	0.000	(0)
UF5-	7.845e-40	6.094e-40	-39.105	-39.215	-0.110	(0)
USO4+2	1.701e-40	0.000e+00	-39.769	-40.208	-0.439	(0)
UF6-2	0.000e+00	0.000e+00	-40.289	-40.728	-0.439	(0)
U+4	0.000e+00	0.000e+00	-42.734	-44.489	-1.755	(0)
UCl+3	0.000e+00	0.000e+00	-44.358	-45.345	-0.987	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-166.174	-175.060	-8.886	(0)
U(5)	8.667e-17					
UO2+	8.667e-17	6.733e-17	-16.062	-16.172	-0.110	(0)
U(6)	4.686e-07					
UO2(CO3)3-4	3.576e-07	6.283e-09	-6.447	-8.202	-1.755	(0)
UO2(CO3)2-2	1.104e-07	4.019e-08	-6.957	-7.396	-0.439	(0)
UO2CO3	6.458e-10	6.458e-10	-9.190	-9.190	0.000	(0)
UO2OH+	1.576e-12	1.224e-12	-11.802	-11.912	-0.110	(0)
UO2F+	9.398e-13	7.301e-13	-12.027	-12.137	-0.110	(0)
UO2SO4	3.780e-13	3.780e-13	-12.423	-12.423	0.000	(0)
UO2F2	2.141e-13	2.141e-13	-12.669	-12.669	0.000	(0)

UO2+2	1.119e-13	5.201e-14	-12.951	-13.284	-0.333	(0)
UO2(SO4) 2-2	6.571e-14	2.392e-14	-13.182	-13.621	-0.439	(0)
UO2F3-	7.040e-15	5.468e-15	-14.152	-14.262	-0.110	(0)
UO2Cl+	3.023e-16	2.348e-16	-15.520	-15.629	-0.110	(0)
UO2F4-2	1.213e-17	4.417e-18	-16.916	-17.355	-0.439	(0)
(UO2) 2 (OH) 2+2	6.831e-18	2.487e-18	-17.165	-17.604	-0.439	(0)
(UO2) 3 (OH) 5+	1.039e-19	8.073e-20	-18.983	-19.093	-0.110	(0)
UO2NO3+	1.167e-21	9.065e-22	-20.933	-21.043	-0.110	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.438	-42.548	-0.110	(0)
V+2	0.000e+00	0.000e+00	-42.891	-43.330	-0.439	(0)
V(3)	2.371e-15					
V(OH) 3	2.371e-15	2.371e-15	-14.625	-14.625	0.000	(0)
V(OH) 2+	1.062e-25	8.252e-26	-24.974	-25.083	-0.110	(0)
VOH+2	1.158e-28	4.215e-29	-27.936	-28.375	-0.439	(0)
V+3	4.369e-33	4.498e-34	-32.360	-33.347	-0.987	(0)
VSO4+	1.313e-33	1.020e-33	-32.882	-32.992	-0.110	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.019	-55.007	-0.987	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-54.195	-55.950	-1.755	(0)
V(4)	7.781e-18					
V(OH) 3+	7.062e-18	5.486e-18	-17.151	-17.261	-0.110	(0)
VO+2	4.042e-19	1.472e-19	-18.393	-18.832	-0.439	(0)
VOSO4	1.946e-19	1.946e-19	-18.711	-18.711	0.000	(0)
VOF+	1.155e-19	8.975e-20	-18.937	-19.047	-0.110	(0)
VOF2	3.422e-21	3.422e-21	-20.466	-20.466	0.000	(0)
VOC1+	1.479e-21	1.149e-21	-20.830	-20.940	-0.110	(0)
VOF3-	1.589e-23	1.235e-23	-22.799	-22.908	-0.110	(0)
VOF4-2	1.392e-26	5.068e-27	-25.856	-26.295	-0.439	(0)
H2V2O4+2	4.148e-30	1.510e-30	-29.382	-29.821	-0.439	(0)
V(5)	7.314e-09					
H2VO4-	6.649e-09	5.165e-09	-8.177	-8.287	-0.110	(0)
HVO4-2	6.621e-10	2.411e-10	-9.179	-9.618	-0.439	(0)
H3VO4	2.780e-12	2.780e-12	-11.556	-11.556	0.000	(0)
H3V2O7-	1.194e-13	9.275e-14	-12.923	-13.033	-0.110	(0)
HV2O7-3	4.100e-15	4.222e-16	-14.387	-15.375	-0.987	(0)
VO2+	3.620e-16	2.989e-16	-15.441	-15.524	-0.083	(0)
VO4-3	2.180e-16	2.245e-17	-15.662	-16.649	-0.987	(0)
VO2F	5.331e-17	5.331e-17	-16.273	-16.273	0.000	(0)
VO2SO4-	4.412e-17	3.427e-17	-16.355	-16.465	-0.110	(0)
V2O7-4	1.202e-17	2.111e-19	-16.920	-18.675	-1.755	(0)
VO2F2-	2.534e-18	1.968e-18	-17.596	-17.706	-0.110	(0)
V3O9-3	1.404e-18	1.446e-19	-17.853	-18.840	-0.987	(0)
VO2F3-2	6.857e-21	2.496e-21	-20.164	-20.603	-0.439	(0)
V4O12-4	1.773e-23	3.115e-25	-22.751	-24.507	-1.755	(0)
VO2NO3	1.321e-24	1.321e-24	-23.879	-23.879	0.000	(0)
VO2F4-3	1.213e-24	1.249e-25	-23.916	-24.903	-0.987	(0)
V10O28-6	0.000e+00	0.000e+00	-59.087	-63.036	-3.949	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.376	-62.119	-2.743	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.425	-64.180	-1.755	(0)
Zn	6.981e-06					
Zn+2	4.076e-06	1.894e-06	-5.390	-5.723	-0.333	(0)
ZnSO4	1.990e-06	1.990e-06	-5.701	-5.701	0.000	(0)
ZnCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
ZnHCO3+	2.761e-07	2.144e-07	-6.559	-6.669	-0.110	(0)
Zn(SO4) 2-2	2.285e-07	8.320e-08	-6.641	-7.080	-0.439	(0)
ZnOH+	4.559e-08	3.541e-08	-7.341	-7.451	-0.110	(0)
ZnCl+	1.612e-08	1.324e-08	-7.793	-7.878	-0.086	(0)
ZnF+	4.947e-09	3.843e-09	-8.306	-8.415	-0.110	(0)
ZnOHCl	3.241e-09	3.241e-09	-8.489	-8.489	0.000	(0)
Zn(OH) 2	1.049e-09	1.049e-09	-8.979	-8.979	0.000	(0)
ZnCl2	5.842e-11	5.842e-11	-10.233	-10.233	0.000	(0)
Zn(OH) 3-	1.266e-12	9.832e-13	-11.898	-12.007	-0.110	(0)
ZnCl3-	1.573e-13	1.292e-13	-12.803	-12.889	-0.086	(0)
ZnNO3+	5.350e-14	4.156e-14	-13.272	-13.381	-0.110	(0)
ZnSeO4	2.500e-14	2.500e-14	-13.602	-13.602	0.000	(0)
ZnCl4-2	3.793e-16	1.798e-16	-15.421	-15.745	-0.324	(0)
Zn(OH) 4-2	2.010e-17	7.318e-18	-16.697	-17.136	-0.439	(0)
Zn(NO3) 2	7.244e-23	7.244e-23	-22.140	-22.140	0.000	(0)

Zn(SeO4) 2-2	5.934e-24	2.160e-24	-23.227	-23.665	-0.439	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.459	-150.568	-0.110	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.827	-151.827	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.900	-228.010	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.282	-230.721	-0.439	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-308.493	-308.932	-0.439	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-58.18	-51.89	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-45.39	-40.88	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-52.62	-40.88	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-75.11	-57.18	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-60.70	-40.67	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.85	-29.45	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-24.63	-24.18	0.45	(NH4) 2SeO4	
Acanthite	-52.73	-88.95	-36.22	Ag2S	
Ag2CO3	-11.17	-22.26	-11.09	Ag2CO3	
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4	
Ag2HVO4	-11.95	-10.47	1.48	Ag2HVO4	
Ag2MoO4	-11.15	-22.70	-11.55	Ag2MoO4	
Ag2O	-14.79	-2.22	12.57	Ag2O	
Ag2Se	-0.49	-49.19	-48.70	Ag2Se	
Ag2SeO3	-9.25	-16.40	-7.15	Ag2SeO3	
Ag2SeO4	-17.92	-26.83	-8.91	Ag2SeO4	
Ag2SO4	-14.26	-19.08	-4.82	Ag2SO4	
Ag3AsO3	-27.65	-25.49	2.16	Ag3AsO3	
Ag3AsO4	-15.72	-18.50	-2.79	Ag3AsO4	
Ag3H2VO5	-16.76	-11.58	5.18	Ag3H2VO5	
AgF:4H2O	-13.42	-12.37	1.05	AgF:4H2O	
Agmetal	-0.54	-14.05	-13.51	Ag	
AgVO3	-10.13	-9.36	0.77	AgVO3	
Al (OH) 3 (am)	-1.19	9.61	10.80	Al (OH) 3	
Al2 (MoO4) 3	-44.60	-42.23	2.37	Al2 (MoO4) 3	
Al2O3	-0.43	19.23	19.65	Al2O3	
Al4 (OH) 10SO4	-1.11	21.59	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-10.36	-5.56	4.80	AlAsO4:2H2O	
AlOHSO4	-4.01	-7.24	-3.23	AlOHSO4	
AlSb	-153.01	-87.39	65.62	AlSb	
Alunite	1.33	-0.07	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-4.49	-12.28	-7.79	PbSO4	
Anhydrite	-0.87	-5.23	-4.36	CaSO4	
Anilite	-59.04	-90.92	-31.88	Cu0.25Cu1.5S	
Antlerite	-6.47	2.32	8.79	Cu3 (OH) 4SO4	
Aragonite	-0.12	-8.42	-8.30	CaCO3	
Arsenolite	-85.88	-88.64	-2.76	As4O6	
Artinite	-5.96	3.64	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-37.06	-30.35	6.71	As2O5	
Atacamite	-4.43	2.96	7.39	Cu2 (OH) 3Cl	
Azurite	-4.01	-20.91	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-16.94	7.45	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-17.48	-1.60	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	0.92	-7.99	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-27.09	5.85	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-12.75	-22.42	-9.67	BaCrO4	
BaF2	-9.25	-15.07	-5.82	BaF2	
BaMoO4	-6.07	-13.03	-6.96	BaMoO4	
Barite	0.58	-9.40	-9.98	BaSO4	
BaS	-95.46	-79.28	16.18	BaS	
BaSeO3	-8.56	-6.73	1.83	BaSeO3	
BaSeO4	-9.69	-17.15	-7.46	BaSeO4	
Bianchite	-6.28	-8.04	-1.76	ZnSO4:6H2O	
Birnessite	-7.71	10.38	18.09	MnO2	
Bixbyite	-4.48	-5.13	-0.64	Mn2O3	
BlaubleiI	-57.59	-81.75	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-58.70	-85.98	-27.28	Cu0.6Cu0.8S	

Boehmite	1.03	9.61	8.58	AlOOH
Breithauptite	-58.44	-76.96	-18.52	NiSb
Brochantite	-6.51	8.71	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.00	11.84	16.84	Mg(OH) ₂
Bunsenite	-5.35	7.10	12.45	NiO
Ca(VO ₃) ₂	-10.55	-4.89	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.76	6.74	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.82	6.74	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-17.78	4.52	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-20.60	18.36	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-21.50	18.36	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-302.11	-159.14	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.99	-18.25	-2.27	CaCrO ₄
Calcite	0.06	-8.42	-8.48	CaCO ₃
Calomel	-6.24	-24.15	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.91	-8.86	-7.95	CaMoO ₄
Carnotite	-2.42	-2.19	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.37	-2.56	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.96	-12.98	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.83	-2.99	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.73	5.91	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.82	5.91	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.69	-15.98	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.68	0.88	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.61	6.79	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.08	-13.74	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.04	-13.74	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.82	-13.74	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.40	-16.61	-1.21	CdF ₂
Cdmetal(alpha)	-33.49	-19.97	13.51	Cd
Cdmetal(gamma)	-33.59	-19.97	13.62	Cd
CdMoO ₄	-0.42	-14.57	-14.15	CdMoO ₄
CdOHCl	-7.45	-3.91	3.54	CdOHCl
CdSb	-77.80	-78.15	-0.35	CdSb
CdSe	-20.86	-41.06	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.85	-18.70	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.77	-10.94	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.22	-10.94	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.07	-10.95	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.18	-10.93	-9.75	AgCl
Cerrusite	-2.34	-15.47	-13.13	PbCO ₃
CH ₄ (g)	-82.53	-123.58	-41.05	CH ₄
Chalcanthite	-7.83	-10.47	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-59.53	-94.45	-34.92	Cu ₂ S
Chalcopyrite	-128.63	-163.90	-35.27	CuFeS ₂
Cinnabar	-51.94	-97.63	-45.69	HgS
Claudetite	-85.58	-88.64	-3.06	As ₄ O ₆
Clausthalite	-15.30	-42.40	-27.10	PbSe
Co(BO ₂) ₂	-28.99	-1.92	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.12	6.98	13.09	Co(OH) ₂
Co(OH) ₃	-10.17	-12.48	-2.31	Co(OH) ₃
CO ₂ (g)	-1.90	-20.04	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.45	-9.42	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.49	-17.98	-10.50	Co ₃ O ₄
CoCl ₂	-20.94	-12.67	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.21	-12.67	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.09	-13.07	-9.98	CoCO ₃
CoF ₂	-13.95	-15.55	-1.60	CoF ₂
CoF ₃	-44.81	-46.27	-1.46	CoF ₃
CoFe ₂ O ₄	16.67	13.15	-3.53	CoFe ₂ O ₄
CoMoO ₄	-5.75	-13.51	-7.76	CoMoO ₄
CoO	-6.61	6.98	13.59	CoO
CoS(alpha)	-72.31	-79.75	-7.44	CoS
CoS(beta)	-68.68	-79.75	-11.07	CoS
CoSe	-23.80	-40.00	-16.20	CoSe
CoSeO ₃	-8.53	-7.21	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-16.10	-17.63	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.68	-9.88	2.80	CoSO ₄

CoSO4:6H2O	-7.41	-9.88	-2.47	CoSO4:6H2O
Cotunnite	-10.29	-15.07	-4.78	PbCl2
Covellite	-58.04	-80.34	-22.30	CuS
Cr (OH) 2	-22.14	-11.32	10.82	Cr (OH) 2
Cr (OH) 3	-2.66	-1.33	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.58	-1.33	-0.75	Cr (OH) 3
Cr2O3	-0.29	-2.65	-2.36	Cr2O3
CrCl2	-45.06	-30.97	14.09	CrCl2
CrCl3	-45.91	-30.80	15.11	CrCl3
CrF3	-23.77	-35.11	-11.34	CrF3
Crmetal	-67.69	-37.20	30.48	Cr
CrO3	-26.67	-29.88	-3.21	CrO3
Cryolite	-8.51	-42.35	-33.84	Na3AlF6
Cu (OH) 2	-2.28	6.39	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.76	19.45	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.79	-2.54	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.59	-94.47	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.89	-54.69	-45.80	Cu2Se
Cu2SO4	-22.63	-24.58	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-17.27	-11.17	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.99	-108.58	-42.59	Cu3Sb
Cu3Se2	-31.78	-95.28	-63.49	Cu3Se2
CuCO3	-2.15	-13.65	-11.50	CuCO3
CuCrO4	-18.04	-23.48	-5.44	CuCrO4
CuF	-10.22	-15.12	-4.91	CuF
CuF2	-17.25	-16.13	1.12	CuF2
CuF2:2H2O	-11.58	-16.13	-4.55	CuF2:2H2O
Cumetal	-8.05	-16.80	-8.76	Cu
CuMoO4	-1.02	-14.09	-13.08	CuMoO4
CuOCuSO4	-14.38	-4.07	10.30	CuOCuSO4
Cupricferrite	6.57	12.56	5.99	CuFe2O4
Cuprite	-6.31	-7.72	-1.41	Cu2O
Cuprousferrite	8.14	-0.78	-8.92	CuFeO2
CuSe	-7.48	-40.58	-33.10	CuSe
CuSe2	-28.31	-61.67	-33.37	CuSe2
CuSeO3:2H2O	-8.30	-7.79	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.78	-18.22	-2.44	CuSeO4:5H2O
CuSO4	-13.40	-10.46	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-59.60	-93.52	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.08	-16.62	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.47	-16.62	-17.09	CaMg (CO3) 2
Epsomite	-2.89	-5.02	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.39	3.17	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.18	0.14	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.62	-13.34	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.57	-8.01	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-15.75	-36.38	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-40.67	-44.40	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.88	9.34	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.49	-12.09	0.40	FeAsO4:2H2O
FeCr2O4	-6.68	0.52	7.20	FeCr2O4
FeMoO4	-7.22	-17.31	-10.09	FeMoO4
Ferrihydrite	-0.11	3.08	3.19	Fe (OH) 3
Ferroselite	-46.29	-64.89	-18.60	FeSe2
FeS (ppt)	-80.61	-83.56	-2.95	FeS
FeSe	-32.80	-43.80	-11.00	FeSe
Fix_pe	-5.67	-5.67	0.00	e-
Fluorite	-0.40	-10.90	-10.50	CaF2
Galena	-68.19	-82.16	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al (OH) 3
Goethite	2.59	3.08	0.49	FeOOH
Goslarite	-6.03	-8.04	-2.01	ZnSO4:7H2O
Greenockite	-66.46	-80.82	-14.36	CdS
Greigite	-292.55	-337.58	-45.03	Fe3S4
Gummite	-6.42	1.25	7.67	UO3
Gypsum	-0.62	-5.23	-4.61	CaSO4:2H2O
H-Jarosite	-12.36	-24.46	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6

H2MoO4	-7.61	-20.49	-12.88	H2MoO4
H2S (g)	-78.72	-86.73	-8.01	H2S
H2Se (g)	-42.01	-46.97	-4.96	H2Se
Halite	-6.22	-4.62	1.60	NaCl
Hausmannite	-5.61	55.42	61.03	Mn3O4
Hematite	7.59	6.17	-1.42	Fe2O3
Hercynite	-0.49	22.40	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.35	-258.06	-73.71	Hg (CH3) 2
Hg (g)	-7.32	-15.19	-7.87	Hg
Hg (OH) 2	-7.40	-10.90	-3.50	Hg (OH) 2
Hg2 (g)	-15.43	-30.38	-14.96	Hg2
Hg2 (OH) 2	-9.76	-4.50	5.26	Hg2 (OH) 2
Hg2CO3	-8.49	-24.54	-16.05	Hg2CO3
Hg2CrO4	-25.68	-34.38	-8.70	Hg2CrO4
Hg2F2	-16.66	-27.02	-10.36	Hg2F2
Hg2S	-79.56	-91.23	-11.68	Hg2S
Hg2SeO3	-14.03	-18.68	-4.66	Hg2SeO3
Hg2SO4	-15.23	-21.36	-6.13	Hg2SO4
Hg3O2CO3	-23.06	-52.75	-29.68	Hg3O2CO3
HgCl (g)	-31.57	-12.07	19.50	HgCl
HgCl2	-9.29	-30.55	-21.26	HgCl2
HgF (g)	-46.19	-13.51	32.68	HgF
HgF2 (g)	-45.99	-33.42	12.57	HgF2
Hgmetal (l)	-1.74	-15.19	-13.45	Hg
HgSe	-2.18	-57.87	-55.69	HgSe
HgSeO3	-12.65	-25.08	-12.43	HgSeO3
HgSO4	-18.34	-27.76	-9.42	HgSO4
Huntite	-3.06	-33.02	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.59	-26.36	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.20	-20.96	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.12	-19.29	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.85	-19.65	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.89	-50.13	-17.24	K2Cr2O7
K2CrO4	-19.74	-20.26	-0.51	K2CrO4
K2MoO4	-14.13	-10.87	3.26	K2MoO4
K2SeO4	-14.26	-14.99	-0.73	K2SeO4
Langite	-8.78	8.71	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.27	-7.70	-0.43	PbO : PbSO4
Laurionite	-5.87	-5.25	0.62	PbOHCl
Lepidocrocite	1.71	3.08	1.37	FeOOH
Lime	-21.08	11.62	32.70	CaO
Litharge	-8.12	4.58	12.69	PbO
Mackinawite	-79.96	-83.56	-3.60	FeS
Maghemite	-0.22	6.17	6.39	Fe2O3
Magnesioferrite	1.15	18.01	16.86	Fe2MgO4
Magnesite	-0.74	-8.20	-7.46	MgCO3
Magnetite	5.94	9.34	3.40	Fe3O4
Malachite	-1.95	-7.26	-5.31	Cu2 (OH) 2CO3
Manganite	-2.55	22.79	25.34	MnOOH
Massicot	-8.32	4.58	12.89	PbO
Matlockite	-7.54	-16.51	-8.97	PbClF
Melanothallite	-19.51	-13.26	6.26	CuCl2
Melanterite	-11.48	-13.68	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.54	-97.63	-45.09	HgS
Mg (OH) 2 (active)	-6.95	11.84	18.79	Mg (OH) 2
Mg (VO3) 2	-15.95	-4.67	11.28	Mg (VO3) 2
Mg2Sb3	-277.30	-202.62	74.68	Mg2Sb3
Mg2V2O7	-19.19	7.17	26.36	Mg2V2O7
MgCr2O4	-7.01	9.19	16.20	MgCr2O4
MgCrO4	-23.41	-18.03	5.38	MgCrO4
MgF2	-2.55	-10.68	-8.13	MgF2
MgMoO4	-6.79	-8.64	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.40	-2.34	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.57	-12.77	-1.20	MgSeO4 : 6H2O
Minium	-33.91	39.61	73.52	Pb3O4
Mirabilite	-5.34	-6.45	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.57	-6.67	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.98	-55.70	-5.71	Mn2 (SO4) 3

Mn2Sb	-151.33	-90.25	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.32	-0.82	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.52	-9.80	2.72	MnCl2:4H2O
MnS (grn)	-77.06	-76.89	0.17	MnS
MnS (pnk)	-80.23	-76.89	3.34	MnS
MnSb	-96.66	-99.57	-2.91	MnSb
MnSe	-40.63	-37.13	3.50	MnSe
MnSeO3	-5.47	-4.34	1.13	MnSeO3
MnSeO3:2H2O	-5.32	-4.34	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.71	-14.76	-2.05	MnSeO4:5H2O
MnSO4	-9.59	-7.01	2.58	MnSO4
Monteponite	-9.19	5.91	15.10	CdO
Montroydite	-7.26	-10.90	-3.64	HgO
MoO3	-12.49	-20.49	-8.00	MoO3
Morenosite	-7.62	-9.76	-2.14	NiSO4:7H2O
MoS2	-149.57	-219.83	-70.26	MoS2
Na-Jarosite	-8.06	-19.26	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.45	-49.35	-9.90	Na2Cr2O7
Na2CrO4	-22.40	-19.47	2.93	Na2CrO4
Na2Mo2O7	-13.97	-30.57	-16.60	Na2Mo2O7
Na2MoO4	-11.57	-10.08	1.49	Na2MoO4
Na2MoO4:2H2O	-11.30	-10.08	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.08	-3.78	10.30	Na2SeO3:5H2O
Na2SeO4	-15.48	-14.20	1.28	Na2SeO4
Na3Sb	-175.84	-81.39	94.45	Na3Sb
Na3VO4	-29.33	7.35	36.68	Na3VO4
Na4V2O7	-33.10	4.30	37.40	Na4V2O7
Nantokite	-6.95	-13.68	-6.73	CuCl
NaSb	-89.08	-65.92	23.17	NaSb
Natron	-8.33	-9.64	-1.31	Na2CO3:10H2O
NaVO3	-6.91	-3.05	3.86	NaVO3
Nesquehonite	-3.53	-8.20	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.70	7.10	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-24.76	-9.06	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-20.46	11.54	32.00	Ni4 (OH) 6SO4
NiCO3	-6.08	-12.95	-6.87	NiCO3
NiMoO4	-2.25	-13.39	-11.14	NiMoO4
NiS (alpha)	-74.03	-79.63	-5.60	NiS
NiS (beta)	-68.53	-79.63	-11.10	NiS
NiS (gamma)	-66.83	-79.63	-12.80	NiS
NiSe	-22.18	-39.88	-17.70	NiSe
NiSeO3:2H2O	-9.90	-7.08	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.99	-17.51	-1.52	NiSeO4:6H2O
Nsutite	-7.12	10.38	17.50	MnO2
O2 (g)	-31.32	51.77	83.09	O2
Orpiment	-243.45	-304.51	-61.07	As2S3
Otavite	-2.13	-14.13	-12.00	CdCO3
Pb (BO2) 2	-10.84	-4.32	6.52	Pb (BO2) 2
Pb (OH) 2	-3.57	4.58	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-65.74	-74.50	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.47	-0.67	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.04	9.15	26.19	Pb2O (OH) 2
Pb2O3	-26.00	35.04	61.04	Pb2O3
Pb2OCO3	-10.33	-10.89	-0.56	Pb2OCO3
Pb2V2O7	-5.46	-7.36	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-22.42	-16.62	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-8.92	-2.78	6.14	Pb3 (VO4) 2
Pb3O2CO3	-17.34	-6.32	11.02	Pb3O2CO3
Pb3O2SO4	-13.81	-3.13	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-19.65	1.45	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-20.43	1.45	21.88	Pb4O3SO4
PbCrO4	-12.70	-25.30	-12.60	PbCrO4
PbF2	-10.51	-17.95	-7.44	PbF2
Pbmetal	-25.55	-21.31	4.25	Pb
PbMoO4	-0.29	-15.91	-15.62	PbMoO4
PbO:0.3H2O	-8.40	4.58	12.98	PbO:0.33H2O
PbSeO4	-13.19	-20.03	-6.84	PbSeO4
Periclase	-9.74	11.84	21.58	MgO

Phosgenite	-10.73	-30.54	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-19.14	30.46	49.60	PbO ₂
Portlandite	-11.18	11.62	22.80	Ca(OH) ₂
Pyrite	-125.90	-144.40	-18.51	FeS ₂
Pyrochroite	-5.35	9.85	15.19	Mn(OH) ₂
Pyrolusite	-5.65	35.73	41.38	MnO ₂
Realgar	-102.09	-121.83	-19.75	AsS
Retgersite	-7.72	-9.76	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.38	-10.20	-10.58	MnCO ₃
Rutherfordine	-4.29	-18.79	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-12.24	-19.35	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-16.22	-12.82	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-25.89	-35.56	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-111.87	-179.63	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-59.15	-77.41	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-59.51	-77.41	-17.90	Sb ₄ O ₆
SbCl ₃	-49.40	-48.83	0.57	SbCl ₃
SbF ₃	-42.91	-53.14	-10.23	SbF ₃
Sbmetal	-46.49	-58.18	-11.69	Sb
SbO ₂	-2.90	-30.72	-27.82	SbO ₂
Schoepite	-4.74	1.25	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-13.98	-21.09	-7.11	Se
Semetal(hex)	-13.38	-21.09	-7.71	Se
Senarmontite	-26.34	-38.70	-12.37	Sb ₂ O ₃
SeO ₂	-14.31	-14.18	0.12	SeO ₂
SeO ₃	-45.65	-24.61	21.04	SeO ₃
Siderite	-6.63	-16.87	-10.24	FeCO ₃
Smithsonite	-1.23	-11.23	-10.00	ZnCO ₃
Sphalerite	-66.47	-77.92	-11.45	ZnS
Spinel	-5.78	31.07	36.85	MgAl ₂ O ₄
Stibnite	-248.44	-298.90	-50.46	Sb ₂ S ₃
Sulfur	-58.70	-60.85	-2.14	S
Tenorite	-1.25	6.39	7.64	CuO
Thenardite	-6.77	-6.45	0.32	Na ₂ SO ₄
Thermonatrite	-10.27	-9.64	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-6.46	-2.38	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-15.56	5.53	21.08	U ₃ O ₈
U ₃ Sb ₄	-586.64	-434.25	152.38	U ₃ Sb ₄
U ₄ O ₉	-32.75	-35.77	-3.02	U ₄ O ₉
UF ₄	-30.92	-60.46	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-27.74	-60.46	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.35	-15.41	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.55	-29.40	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.25	-29.40	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.79	-29.40	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.45	-29.40	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.36	1.25	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-21.10	-23.35	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.45	1.25	7.70	UO ₃
Uraninite	-10.74	-15.41	-4.67	UO ₂
USb ₂	-222.33	-192.75	29.58	USb ₂
V(OH) ₃	-19.13	-11.54	7.59	V(OH) ₃
V ₂ O ₅	-15.15	-16.51	-1.36	V ₂ O ₅
V ₃ O ₅	-40.60	-38.77	1.84	V ₃ O ₅
V ₄ O ₇	-50.25	-43.06	7.19	V ₄ O ₇
V ₆ O ₁₃	-40.44	-101.30	-60.86	V ₆ O ₁₃
Valentinite	-30.22	-38.70	-8.48	Sb ₂ O ₃
VC ₁₂	-63.01	-44.13	18.87	VC ₁₂
VC ₁₃	-64.45	-41.01	23.43	VC ₁₃
VF ₄	-64.27	-49.34	14.93	VF ₄
Vmetal	-94.39	-50.37	44.03	V
VO	-39.24	-24.48	14.76	VO
VO(OH) ₂	-9.45	-4.29	5.15	VO(OH) ₂
VO ₂ Cl	-20.92	-18.08	2.84	VO ₂ Cl
VOC ₁	-32.52	-21.36	11.15	VOC ₁
VOC ₁₂	-36.70	-23.94	12.76	VOC ₁₂
VOSO ₄	-24.76	-21.15	3.61	VOSO ₄
Witherite	-4.02	-12.59	-8.57	BaCO ₃

Wurtzite	-68.97	-77.92	-8.95	ZnS
Zincite	-2.52	8.82	11.33	ZnO
Zincosite	-11.97	-8.04	3.93	ZnSO4
Zn(BO2)2	-8.37	-0.08	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.16	-21.84	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.39	8.81	12.20	Zn(OH)2
Zn(OH)2(am)	-3.66	8.81	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.94	8.81	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.72	8.81	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.92	8.81	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.73	0.77	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.39	7.81	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.55	-3.90	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.18	-7.27	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-10.00	18.40	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-14.07	24.43	38.50	Zn5(OH)8Cl2
ZnCl2	-17.88	-10.83	7.05	ZnCl2
ZnCO3:1H2O	-0.97	-11.23	-10.26	ZnCO3:1H2O
ZnF2	-13.17	-13.71	-0.53	ZnF2
Znmetal	-42.86	-17.07	25.79	Zn
ZnMoO4	-1.55	-11.67	-10.13	ZnMoO4
ZnO(active)	-2.37	8.82	11.19	ZnO
ZnS(am)	-68.86	-77.92	-9.05	ZnS
ZnSb	-86.26	-75.25	11.01	ZnSb
ZnSe	-23.76	-38.16	-14.40	ZnSe
ZnSeO4:6H2O	-14.27	-15.79	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.40	-8.04	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 30.

```

REACTION 104
  H2O      -1
  0 moles ### Addition step. Removes HTC water but solute mass remains
USE solution 110
SAVE Solution 111
End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 110. Solution after simulation 29.
Using reaction 104.

Reaction 104.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	3.684e-08	3.686e-08
Al	2.045e-06	2.047e-06
As	4.918e-10	4.921e-10
B	3.569e-05	3.571e-05
Ba	1.810e-07	1.811e-07
C	4.959e-03	4.962e-03
Ca	4.066e-03	4.069e-03
Cd	9.257e-09	9.262e-09
Cl	3.371e-03	3.373e-03
Co	1.138e-07	1.139e-07
Cr	3.892e-09	3.894e-09
Cu	1.651e-07	1.652e-07
F	1.535e-04	1.536e-04
Fe	2.357e-09	2.358e-09
Hg	2.480e-09	2.481e-09
K	4.353e-03	4.356e-03
Mg	6.229e-03	6.232e-03
Mn	7.504e-05	7.508e-05
Mo	2.425e-06	2.427e-06
N	5.352e-06	5.355e-06
Na	1.070e-02	1.071e-02
Ni	1.386e-07	1.387e-07
Pb	2.017e-09	2.018e-09
S	1.386e-02	1.387e-02
Sb	3.407e-08	3.408e-08
Se	1.818e-07	1.819e-07
U	4.686e-07	4.689e-07
V	7.314e-09	7.318e-09
Zn	6.981e-06	6.985e-06

-----Description of solution-----

	pH	=	7.269	Charge balance
	pe	=	5.673	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.626e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	4.555e-03	
	Total CO2 (mol/kg)	=	4.959e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	6.333e-07	
Percent error,	$100 * (\text{Cat} - \text{An}) / (\text{Cat} + \text{An})$	=	0.00	
	Iterations	=	0	
	Total H	=	1.110816e+02	
	Total O	=	5.560855e+01	

-----Distribution of species-----

	Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
Ag	OH-	2.289e-07	1.870e-07	-6.640	-6.728	-0.088	(0)
	H+	6.518e-08	5.382e-08	-7.186	-7.269	-0.083	0.00
	H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
		3.684e-08					
	AgCl	2.379e-08	2.379e-08	-7.624	-7.624	0.000	(0)
	AgCl2-	7.424e-09	5.767e-09	-8.129	-8.239	-0.110	(0)
	Ag+	5.070e-09	4.186e-09	-8.295	-8.378	-0.083	(0)
	AgSO4-	5.162e-10	4.010e-10	-9.287	-9.397	-0.110	(0)
	AgCl3-2	3.929e-11	1.431e-11	-10.406	-10.844	-0.439	(0)
	AgNO2	3.710e-12	3.710e-12	-11.431	-11.431	0.000	(0)
	AgF	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
	AqCl4-3	7.896e-13	8.130e-14	-12.103	-13.090	-0.987	(0)

	AgOH	7.826e-14	7.826e-14	-13.106	-13.106	0.000	(0)
	AgSeO3-	3.122e-14	2.425e-14	-13.506	-13.615	-0.110	(0)
	AgH2BO3	2.542e-14	2.542e-14	-13.595	-13.595	0.000	(0)
	AgNH3+	1.027e-14	7.980e-15	-13.988	-14.098	-0.110	(0)
	Ag2Se	5.229e-15	5.229e-15	-14.282	-14.282	0.000	(0)
	Ag(NO2) 2-	3.138e-17	2.438e-17	-16.503	-16.613	-0.110	(0)
	AgNO3	2.904e-17	2.904e-17	-16.537	-16.537	0.000	(0)
	Ag(OH) 2-	1.841e-18	1.430e-18	-17.735	-17.845	-0.110	(0)
	Ag(NH3) 2+	7.796e-20	6.056e-20	-19.108	-19.218	-0.110	(0)
	Ag(SeO3) 2-3	1.901e-20	1.957e-21	-19.721	-20.708	-0.987	(0)
	Ag2MoO4	7.471e-24	7.471e-24	-23.127	-23.127	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.026	-74.026	0.000	(0)
	AgOH(Se) 2-4	0.000e+00	0.000e+00	-84.735	-86.491	-1.755	(0)
	Ag(HS) 2-	0.000e+00	0.000e+00	-149.279	-149.388	-0.110	(0)
	Ag(HS) S4-2	0.000e+00	0.000e+00	-149.390	-149.603	-0.213	(0)
	Ag(S4) 2-3	0.000e+00	0.000e+00	-151.387	-151.774	-0.387	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-151.719	-152.085	-0.366	(0)
Al	2.045e-06						
	Al(OH) 4-	1.889e-06	1.559e-06	-5.724	-5.807	-0.083	(0)
	Al(OH) 3	6.625e-08	6.625e-08	-7.179	-7.179	0.000	(0)
	AlF3	3.371e-08	3.371e-08	-7.472	-7.472	0.000	(0)
	AlF2+	3.161e-08	2.633e-08	-7.500	-7.580	-0.079	(0)
	Al(OH) 2+	2.132e-08	1.776e-08	-7.671	-7.751	-0.079	(0)
	AlF4-	2.081e-09	1.718e-09	-8.682	-8.765	-0.083	(0)
	AlF+2	1.351e-09	6.504e-10	-8.869	-9.187	-0.318	(0)
	AlOH+2	2.485e-10	1.196e-10	-9.605	-9.922	-0.318	(0)
	AlSO4+	2.888e-11	2.384e-11	-10.539	-10.623	-0.083	(0)
	Al+3	3.587e-12	6.397e-13	-11.445	-12.194	-0.749	(0)
	Al(SO4) 2-	1.486e-12	1.227e-12	-11.828	-11.911	-0.083	(0)
	AlMo6O21-3	3.037e-36	3.127e-37	-35.518	-36.505	-0.987	(0)
As (3)	6.990e-23						
	H3AsO3	6.905e-23	6.905e-23	-22.161	-22.161	0.000	(0)
	H2AsO3-	8.471e-25	6.580e-25	-24.072	-24.182	-0.110	(0)
	HAsO3-2	3.063e-29	1.115e-29	-28.514	-28.953	-0.439	(0)
	H4AsO3+	2.370e-30	1.841e-30	-29.625	-29.735	-0.110	(0)
	AsO3-3	7.757e-35	7.987e-36	-34.110	-35.098	-0.987	(0)
As (5)	4.918e-10						
	HAsO4-2	3.998e-10	1.455e-10	-9.398	-9.837	-0.439	(0)
	H2AsO4-	9.196e-11	7.144e-11	-10.036	-10.146	-0.110	(0)
	AsO4-3	8.306e-14	8.552e-15	-13.081	-14.068	-0.987	(0)
	H3AsO4	6.610e-16	6.681e-16	-15.180	-15.175	0.005	(0)
B	3.569e-05						
	H3BO3	3.514e-05	3.551e-05	-4.454	-4.450	0.005	(0)
	H2BO3-	4.750e-07	3.832e-07	-6.323	-6.417	-0.093	(0)
	CaH2BO3+	3.330e-08	2.687e-08	-7.478	-7.571	-0.093	(0)
	MgH2BO3+	3.324e-08	2.682e-08	-7.478	-7.572	-0.093	(0)
	NaH2BO3	5.223e-09	5.223e-09	-8.282	-8.282	0.000	(0)
	BF(OH) 3-	1.786e-09	1.441e-09	-8.748	-8.841	-0.093	(0)
	H5(BO3) 2-	1.436e-11	1.158e-11	-10.843	-10.936	-0.093	(0)
	BaH2BO3+	1.211e-12	9.771e-13	-11.917	-12.010	-0.093	(0)
	BF2(OH) 2-	1.046e-12	8.436e-13	-11.981	-12.074	-0.093	(0)
	H8(BO3) 3-	5.099e-14	4.114e-14	-13.293	-13.386	-0.093	(0)
	AgH2BO3	2.542e-14	2.542e-14	-13.595	-13.595	0.000	(0)
	BF3OH-	2.228e-18	1.797e-18	-17.652	-17.745	-0.093	(0)
	BF4-	6.003e-23	4.843e-23	-22.222	-22.315	-0.093	(0)
Ba	1.810e-07						
	Ba+2	1.775e-07	8.251e-08	-6.751	-7.084	-0.333	(0)
	BaHCO3+	3.369e-09	2.821e-09	-8.473	-8.550	-0.077	(0)
	BaCO3	1.320e-10	1.320e-10	-9.879	-9.879	0.000	(0)
	BaH2BO3+	1.211e-12	9.771e-13	-11.917	-12.010	-0.093	(0)
	BaOH+	8.115e-14	6.734e-14	-13.091	-13.172	-0.081	(0)
	BaNO3+	4.650e-15	3.612e-15	-14.333	-14.442	-0.110	(0)
	BaNH3+2	1.335e-16	4.861e-17	-15.875	-16.313	-0.439	(0)
C (4)	4.959e-03						
	HCO3-	4.299e-03	3.580e-03	-2.367	-2.446	-0.079	(0)
	H2CO3	4.334e-04	4.334e-04	-3.363	-3.363	0.000	(0)
	CaHCO3+	9.699e-05	8.123e-05	-4.013	-4.090	-0.077	(0)
	MgHCO3+	9.003e-05	7.394e-05	-4.046	-4.131	-0.086	(0)

	NaHCO ₃	1.732e-05	1.732e-05	-4.762	-4.762	0.000	(0)
	CO ₃ -2	6.712e-06	3.119e-06	-5.173	-5.506	-0.333	(0)
	CaCO ₃	6.022e-06	6.022e-06	-5.220	-5.220	0.000	(0)
	MgCO ₃	5.235e-06	5.235e-06	-5.281	-5.281	0.000	(0)
	MnHCO ₃ +	1.748e-06	1.450e-06	-5.757	-5.839	-0.081	(0)
	NaCO ₃ -	5.997e-07	4.995e-07	-6.222	-6.301	-0.079	(0)
	UO ₂ (CO ₃) 3-4	3.576e-07	6.283e-09	-6.447	-8.202	-1.755	(0)
	ZnCO ₃	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
	ZnHCO ₃ +	2.761e-07	2.144e-07	-6.559	-6.669	-0.110	(0)
	CuCO ₃	1.313e-07	1.313e-07	-6.882	-6.882	0.000	(0)
	UO ₂ (CO ₃) 2-2	1.104e-07	4.019e-08	-6.957	-7.396	-0.439	(0)
	NiHCO ₃ +	2.068e-08	1.606e-08	-7.685	-7.794	-0.110	(0)
	CoHCO ₃ +	9.865e-09	7.663e-09	-8.006	-8.116	-0.110	(0)
	NiCO ₃	4.234e-09	4.234e-09	-8.373	-8.373	0.000	(0)
	BaHCO ₃ +	3.369e-09	2.821e-09	-8.473	-8.550	-0.077	(0)
	Cu (CO ₃) 2-2	3.028e-09	1.102e-09	-8.519	-8.958	-0.439	(0)
	CuHCO ₃ +	2.079e-09	1.615e-09	-8.682	-8.792	-0.110	(0)
	CoCO ₃	1.451e-09	1.451e-09	-8.838	-8.838	0.000	(0)
	PbCO ₃	1.024e-09	1.024e-09	-8.990	-8.990	0.000	(0)
	UO ₂ CO ₃	6.458e-10	6.458e-10	-9.190	-9.190	0.000	(0)
	PbHCO ₃ +	3.740e-10	2.905e-10	-9.427	-9.537	-0.110	(0)
	CdCO ₃	1.683e-10	1.683e-10	-9.774	-9.774	0.000	(0)
	BaCO ₃	1.320e-10	1.320e-10	-9.879	-9.879	0.000	(0)
	Pb (CO ₃) 2-2	2.529e-11	9.209e-12	-10.597	-11.036	-0.439	(0)
	CdHCO ₃ +	2.484e-11	1.929e-11	-10.605	-10.715	-0.110	(0)
	Cd (CO ₃) 2-2	1.069e-12	3.891e-13	-11.971	-12.410	-0.439	(0)
	FeHCO ₃ +	2.333e-13	1.953e-13	-12.632	-12.709	-0.077	(0)
	HgCO ₃	2.125e-13	2.125e-13	-12.673	-12.673	0.000	(0)
	Hg (CO ₃) 2-2	5.756e-15	2.096e-15	-14.240	-14.679	-0.439	(0)
	HgHCO ₃ +	2.741e-16	2.129e-16	-15.562	-15.672	-0.110	(0)
Ca	4.066e-03						
	Ca+2	2.622e-03	1.218e-03	-2.581	-2.914	-0.333	(0)
	CaSO ₄	1.340e-03	1.340e-03	-2.873	-2.873	0.000	(0)
	CaHCO ₃ +	9.699e-05	8.123e-05	-4.013	-4.090	-0.077	(0)
	CaCO ₃	6.022e-06	6.022e-06	-5.220	-5.220	0.000	(0)
	CaF+	1.630e-06	1.352e-06	-5.788	-5.869	-0.081	(0)
	CaH ₂ BO ₃ +	3.330e-08	2.687e-08	-7.478	-7.571	-0.093	(0)
	CaOH+	5.427e-09	4.545e-09	-8.265	-8.342	-0.077	(0)
	CaNO ₃ +	4.333e-11	3.365e-11	-10.363	-10.473	-0.110	(0)
	CaNH ₃ +2	3.933e-12	1.432e-12	-11.405	-11.844	-0.439	(0)
	Ca (NH ₃) 2+2	1.462e-21	5.323e-22	-20.835	-21.274	-0.439	(0)
Cd	9.257e-09						
	Cd+2	5.093e-09	2.367e-09	-8.293	-8.626	-0.333	(0)
	CdSO ₄	2.664e-09	2.664e-09	-8.574	-8.574	0.000	(0)
	CdCl+	8.099e-10	6.292e-10	-9.092	-9.201	-0.110	(0)
	Cd (SO ₄) 2-2	4.739e-10	1.726e-10	-9.324	-9.763	-0.439	(0)
	CdCO ₃	1.683e-10	1.683e-10	-9.774	-9.774	0.000	(0)
	CdHCO ₃ +	2.484e-11	1.929e-11	-10.605	-10.715	-0.110	(0)
	CdCl ₂	7.300e-12	7.300e-12	-11.137	-11.137	0.000	(0)
	CdF+	4.910e-12	3.814e-12	-11.309	-11.419	-0.110	(0)
	CdOHC1	4.825e-12	4.825e-12	-11.316	-11.316	0.000	(0)
	CdOH+	4.525e-12	3.515e-12	-11.344	-11.454	-0.110	(0)
	Cd (CO ₃) 2-2	1.069e-12	3.891e-13	-11.971	-12.410	-0.439	(0)
	CdCl ₃ -	1.651e-14	1.282e-14	-13.782	-13.892	-0.110	(0)
	Cd (OH) 2	4.146e-15	4.146e-15	-14.382	-14.382	0.000	(0)
	CdF ₂	7.739e-16	7.739e-16	-15.111	-15.111	0.000	(0)
	CdNO ₃ +	8.417e-17	6.538e-17	-16.075	-16.185	-0.110	(0)
	CdSeO ₄	3.756e-17	3.756e-17	-16.425	-16.425	0.000	(0)
	Cd (SeO ₃) 2-2	4.353e-19	1.585e-19	-18.361	-18.800	-0.439	(0)
	Cd ₂ OH+3	4.049e-19	4.170e-20	-18.393	-19.380	-0.987	(0)
	Cd (OH) 3-	6.097e-20	4.736e-20	-19.215	-19.325	-0.110	(0)
	Cd (NO ₃) 2	2.862e-25	2.862e-25	-24.543	-24.543	0.000	(0)
	Cd (OH) 4-2	3.981e-27	1.449e-27	-26.400	-26.839	-0.439	(0)
	CdHS+	0.000e+00	0.000e+00	-79.971	-80.080	-0.110	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-152.339	-152.339	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-229.791	-229.901	-0.110	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-306.729	-307.167	-0.439	(0)
Cl	3.371e-03						

Cl-	3.371e-03	2.783e-03	-2.472	-2.555	-0.083	(0)
MnCl+	8.573e-08	7.114e-08	-7.067	-7.148	-0.081	(0)
AgCl	2.379e-08	2.379e-08	-7.624	-7.624	0.000	(0)
ZnCl+	1.612e-08	1.324e-08	-7.793	-7.878	-0.086	(0)
AgCl2-	7.424e-09	5.767e-09	-8.129	-8.239	-0.110	(0)
ZnOHCl	3.241e-09	3.241e-09	-8.489	-8.489	0.000	(0)
CdCl+	8.099e-10	6.292e-10	-9.092	-9.201	-0.110	(0)
CoCl+	3.411e-10	2.649e-10	-9.467	-9.577	-0.110	(0)
NiCl+	3.336e-10	2.591e-10	-9.477	-9.586	-0.110	(0)
MnCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
ZnCl2	5.842e-11	5.842e-11	-10.233	-10.233	0.000	(0)
HgClOH	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
HgCl2	4.410e-11	4.410e-11	-10.356	-10.356	0.000	(0)
AgCl3-2	3.929e-11	1.431e-11	-10.406	-10.844	-0.439	(0)
CuCl+	3.841e-11	3.154e-11	-10.416	-10.501	-0.086	(0)
CuCl	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
CuCl2-	1.845e-11	1.515e-11	-10.734	-10.819	-0.086	(0)
PbCl+	1.388e-11	1.078e-11	-10.858	-10.967	-0.110	(0)
CdCl2	7.300e-12	7.300e-12	-11.137	-11.137	0.000	(0)
CdOHCl	4.825e-12	4.825e-12	-11.316	-11.316	0.000	(0)
HgCl3-	1.580e-12	1.228e-12	-11.801	-11.911	-0.110	(0)
AgCl4-3	7.896e-13	8.130e-14	-12.103	-13.090	-0.987	(0)
MnCl3-	2.584e-13	2.144e-13	-12.588	-12.669	-0.081	(0)
ZnCl3-	1.573e-13	1.292e-13	-12.803	-12.889	-0.086	(0)
PbCl2	1.341e-13	1.341e-13	-12.873	-12.873	0.000	(0)
HgCl4-2	3.736e-14	1.360e-14	-13.428	-13.866	-0.439	(0)
CuCl2	3.044e-14	3.044e-14	-13.517	-13.517	0.000	(0)
CuCl3-2	1.903e-14	9.018e-15	-13.721	-14.045	-0.324	(0)
CdCl3-	1.651e-14	1.282e-14	-13.782	-13.892	-0.110	(0)
HgCl+	4.070e-15	3.161e-15	-14.390	-14.500	-0.110	(0)
NiCl2	3.632e-15	3.632e-15	-14.440	-14.440	0.000	(0)
ZnCl4-2	3.793e-16	1.798e-16	-15.421	-15.745	-0.324	(0)
UO2Cl+	3.023e-16	2.348e-16	-15.520	-15.629	-0.110	(0)
CrCl+2	2.704e-16	9.845e-17	-15.568	-16.007	-0.439	(0)
PbCl3-	1.913e-16	1.486e-16	-15.718	-15.828	-0.110	(0)
CrOHCl2	9.737e-19	9.737e-19	-18.012	-18.012	0.000	(0)
CuCl3-	9.629e-19	7.907e-19	-18.016	-18.102	-0.086	(0)
PbCl4-2	5.192e-19	1.890e-19	-18.285	-18.723	-0.439	(0)
FeCl+2	3.362e-20	1.593e-20	-19.473	-19.798	-0.324	(0)
CrCl2+	3.347e-20	2.600e-20	-19.475	-19.585	-0.110	(0)
VOCl+	1.479e-21	1.149e-21	-20.830	-20.940	-0.110	(0)
FeCl2+	2.388e-22	1.981e-22	-21.622	-21.703	-0.081	(0)
CuCl4-2	2.327e-23	1.103e-23	-22.633	-22.957	-0.324	(0)
CrO3Cl-	9.704e-26	7.538e-26	-25.013	-25.123	-0.110	(0)
FeCl3	5.515e-26	5.515e-26	-25.258	-25.258	0.000	(0)
CoCl+2	8.023e-35	2.921e-35	-34.096	-34.534	-0.439	(0)
UCl+3	0.000e+00	0.000e+00	-44.358	-45.345	-0.987	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
Co (2)	1.138e-07					
Co+2	7.557e-08	2.751e-08	-7.122	-7.560	-0.439	(0)
CoSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
CoHCO3+	9.865e-09	7.663e-09	-8.006	-8.116	-0.110	(0)
CoCO3	1.451e-09	1.451e-09	-8.838	-8.838	0.000	(0)
CoCl+	3.411e-10	2.649e-10	-9.467	-9.577	-0.110	(0)
CoOH+	1.321e-10	1.026e-10	-9.879	-9.989	-0.110	(0)
CoF+	1.139e-10	8.847e-11	-9.944	-10.053	-0.110	(0)
Co (OH) 2	1.524e-12	1.524e-12	-11.817	-11.817	0.000	(0)
CoNO2+	1.059e-12	8.225e-13	-11.975	-12.085	-0.110	(0)
Co (NH3) +2	8.483e-15	3.088e-15	-14.071	-14.510	-0.439	(0)
CoSeO4	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
CoNO3+	4.904e-16	3.809e-16	-15.309	-15.419	-0.110	(0)
Co (OH) 3-	7.320e-18	5.686e-18	-17.136	-17.245	-0.110	(0)
CoOOH-	1.838e-18	1.428e-18	-17.736	-17.845	-0.110	(0)
Co2OH+3	1.374e-18	1.415e-19	-17.862	-18.849	-0.987	(0)
Co (NH3) 2+2	3.379e-22	1.230e-22	-21.471	-21.910	-0.439	(0)
Co (NO3) 2	6.770e-24	6.770e-24	-23.169	-23.169	0.000	(0)

Co (OH) 4-2	4.627e-25	1.685e-25	-24.335	-24.773	-0.439	(0)
Co (NH3) 3+2	3.971e-30	1.446e-30	-29.401	-29.840	-0.439	(0)
Co4 (OH) 4+4	1.260e-30	2.214e-32	-29.900	-31.655	-1.755	(0)
Co (NH3) 4+2	1.946e-38	7.085e-39	-37.711	-38.150	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.521	-46.959	-0.439	(0)
Co (3)	1.346e-28					
CoOH+2	1.346e-28	4.900e-29	-27.871	-28.310	-0.439	(0)
Co+3	2.893e-34	5.158e-35	-33.539	-34.288	-0.749	(0)
CoCl+2	8.023e-35	2.921e-35	-34.096	-34.534	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-69.010	-69.448	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
Cr (2)	3.808e-26					
Cr+2	3.808e-26	1.386e-26	-25.419	-25.858	-0.439	(0)
Cr (3)	3.892e-09					
Cr (OH) 2+	3.274e-09	2.543e-09	-8.485	-8.595	-0.110	(0)
Cr (OH) +2	3.070e-10	1.118e-10	-9.513	-9.952	-0.439	(0)
Cr (OH) 3	1.786e-10	1.786e-10	-9.748	-9.748	0.000	(0)
CrOHSO4	1.274e-10	1.274e-10	-9.895	-9.895	0.000	(0)
CrO2-	2.030e-12	1.577e-12	-11.692	-11.802	-0.110	(0)
Cr (OH) 4-	1.711e-12	1.329e-12	-11.767	-11.876	-0.110	(0)
CrF+2	1.210e-12	4.404e-13	-11.917	-12.356	-0.439	(0)
CrSO4+	3.945e-13	3.064e-13	-12.404	-12.514	-0.110	(0)
Cr+3	2.654e-13	2.733e-14	-12.576	-13.563	-0.987	(0)
CrCl+2	2.704e-16	9.845e-17	-15.568	-16.007	-0.439	(0)
Cr2 (OH) 2SO4+2	3.534e-18	1.287e-18	-17.452	-17.890	-0.439	(0)
CrOHC12	9.737e-19	9.737e-19	-18.012	-18.012	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.670e-19	3.670e-19	-18.435	-18.435	0.000	(0)
CrCl2+	3.347e-20	2.600e-20	-19.475	-19.585	-0.110	(0)
CrNO3+2	2.866e-23	1.044e-23	-22.543	-22.981	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.630	-45.068	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.755	-54.742	-0.987	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Cr (6)	1.124e-15					
CrO4-2	9.879e-16	4.591e-16	-15.005	-15.338	-0.333	(0)
HCrO4-	1.029e-16	7.995e-17	-15.987	-16.097	-0.110	(0)
NaCrO4-	2.526e-17	1.962e-17	-16.598	-16.707	-0.110	(0)
KCrO4-	7.635e-18	5.931e-18	-17.117	-17.227	-0.110	(0)
CrO3SO4-2	1.730e-23	6.297e-24	-22.762	-23.201	-0.439	(0)
H2CrO4	3.488e-24	3.488e-24	-23.457	-23.457	0.000	(0)
CrO3Cl-	9.704e-26	7.538e-26	-25.013	-25.123	-0.110	(0)
Cr2O7-2	6.092e-31	2.218e-31	-30.215	-30.654	-0.439	(0)
Cu (1)	5.410e-11					
CuCl	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
CuCl2-	1.845e-11	1.515e-11	-10.734	-10.819	-0.086	(0)
Cu+	9.573e-12	7.436e-12	-11.019	-11.129	-0.110	(0)
CuCl3-2	1.903e-14	9.018e-15	-13.721	-14.045	-0.324	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.749	-152.125	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.498	-152.855	-0.357	(0)
Cu (2)	1.651e-07					
CuCO3	1.313e-07	1.313e-07	-6.882	-6.882	0.000	(0)
Cu+2	1.539e-08	7.150e-09	-7.813	-8.146	-0.333	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
CuOH+	5.147e-09	4.227e-09	-8.288	-8.374	-0.086	(0)
Cu (CO3) 2-2	3.028e-09	1.102e-09	-8.519	-8.958	-0.439	(0)
CuHCO3+	2.079e-09	1.615e-09	-8.682	-8.792	-0.110	(0)
Cu (OH) 2	1.577e-10	1.577e-10	-9.802	-9.802	0.000	(0)
CuF+	5.905e-11	4.587e-11	-10.229	-10.338	-0.110	(0)
CuCl+	3.841e-11	3.154e-11	-10.416	-10.501	-0.086	(0)
CuNO2+	4.089e-12	3.176e-12	-11.388	-11.498	-0.110	(0)
Cu2 (OH) 2+2	1.233e-12	4.488e-13	-11.909	-12.348	-0.439	(0)
CuNH3+2	1.876e-13	6.831e-14	-12.727	-13.166	-0.439	(0)
Cu (OH) 3-	7.785e-14	6.047e-14	-13.109	-13.218	-0.110	(0)
CuCl2	3.044e-14	3.044e-14	-13.517	-13.517	0.000	(0)
CuNO3+	2.543e-16	1.975e-16	-15.595	-15.704	-0.110	(0)
Cu (NO2) 2	1.379e-16	1.379e-16	-15.860	-15.860	0.000	(0)
CuCl3-	9.629e-19	7.907e-19	-18.016	-18.102	-0.086	(0)

	Cu (OH) 4-2	2.444e-19	8.898e-20	-18.612	-19.051	-0.439	(0)
	CuCl4-2	2.327e-23	1.103e-23	-22.633	-22.957	-0.324	(0)
	Cu (NO3) 2	2.172e-25	2.172e-25	-24.663	-24.663	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.524	-220.634	-0.110	(0)
F	1.535e-04						
	F-	1.232e-04	1.017e-04	-3.910	-3.993	-0.083	(0)
	MgF+	2.789e-05	2.302e-05	-4.555	-4.638	-0.083	(0)
	CaF+	1.630e-06	1.352e-06	-5.788	-5.869	-0.081	(0)
	NaF	5.518e-07	5.518e-07	-6.258	-6.258	0.000	(0)
	MnF+	9.904e-08	8.218e-08	-7.004	-7.085	-0.081	(0)
	AlF3	3.371e-08	3.371e-08	-7.472	-7.472	0.000	(0)
	AlF2+	3.161e-08	2.633e-08	-7.500	-7.580	-0.079	(0)
	HF	8.094e-09	8.094e-09	-8.092	-8.092	0.000	(0)
	ZnF+	4.947e-09	3.843e-09	-8.306	-8.415	-0.110	(0)
	AlF4-	2.081e-09	1.718e-09	-8.682	-8.765	-0.083	(0)
	BF (OH) 3-	1.786e-09	1.441e-09	-8.748	-8.841	-0.093	(0)
	AlF+2	1.351e-09	6.504e-10	-8.869	-9.187	-0.318	(0)
	NiF+	1.196e-10	9.294e-11	-9.922	-10.032	-0.110	(0)
	CoF+	1.139e-10	8.847e-11	-9.944	-10.053	-0.110	(0)
	CuF+	5.905e-11	4.587e-11	-10.229	-10.338	-0.110	(0)
	CdF+	4.910e-12	3.814e-12	-11.309	-11.419	-0.110	(0)
	HF2-	3.832e-12	3.129e-12	-11.417	-11.505	-0.088	(0)
	CrF+2	1.210e-12	4.404e-13	-11.917	-12.356	-0.439	(0)
	AgF	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
	BF2 (OH) 2-	1.046e-12	8.436e-13	-11.981	-12.074	-0.093	(0)
	PbF+	1.007e-12	7.824e-13	-11.997	-12.107	-0.110	(0)
	UO2F+	9.398e-13	7.301e-13	-12.027	-12.137	-0.110	(0)
	UO2F2	2.141e-13	2.141e-13	-12.669	-12.669	0.000	(0)
	UO2F3-	7.040e-15	5.468e-15	-14.152	-14.262	-0.110	(0)
	PbF2	1.566e-15	1.566e-15	-14.805	-14.805	0.000	(0)
	CdF2	7.739e-16	7.739e-16	-15.111	-15.111	0.000	(0)
	H2F2	1.755e-16	1.755e-16	-15.756	-15.756	0.000	(0)
	FeF2+	6.932e-17	5.751e-17	-16.159	-16.240	-0.081	(0)
	VO2F	5.331e-17	5.331e-17	-16.273	-16.273	0.000	(0)
	FeF+2	4.459e-17	2.114e-17	-16.351	-16.675	-0.324	(0)
	UO2F4-2	1.213e-17	4.417e-18	-16.916	-17.355	-0.439	(0)
	FeF3	8.251e-18	8.251e-18	-17.083	-17.083	0.000	(0)
	VO2F2-	2.534e-18	1.968e-18	-17.596	-17.706	-0.110	(0)
	BF3OH-	2.228e-18	1.797e-18	-17.652	-17.745	-0.093	(0)
	PbF3-	3.887e-19	3.020e-19	-18.410	-18.520	-0.110	(0)
	VOF+	1.155e-19	8.975e-20	-18.937	-19.047	-0.110	(0)
	VO2F3-2	6.857e-21	2.496e-21	-20.164	-20.603	-0.439	(0)
	VOF2	3.422e-21	3.422e-21	-20.466	-20.466	0.000	(0)
	HgF+	2.762e-22	2.146e-22	-21.559	-21.668	-0.110	(0)
	BF4-	6.003e-23	4.843e-23	-22.222	-22.315	-0.093	(0)
	PbF4-2	4.037e-23	1.470e-23	-22.394	-22.833	-0.439	(0)
	VOF3-	1.589e-23	1.235e-23	-22.799	-22.908	-0.110	(0)
	VO2F4-3	1.213e-24	1.249e-25	-23.916	-24.903	-0.987	(0)
	Sb (OH) 2F	3.796e-25	3.796e-25	-24.421	-24.421	0.000	(0)
	SbOF	3.736e-25	3.736e-25	-24.428	-24.428	0.000	(0)
	VOF4-2	1.392e-26	5.068e-27	-25.856	-26.295	-0.439	(0)
	UF3+	1.746e-35	1.356e-35	-34.758	-34.868	-0.110	(0)
	UF2+2	2.312e-36	8.416e-37	-35.636	-36.075	-0.439	(0)
	UF4	1.512e-37	1.512e-37	-36.820	-36.820	0.000	(0)
	UF+3	6.385e-39	6.574e-40	-38.195	-39.182	-0.987	(0)
	UF5-	7.845e-40	6.094e-40	-39.105	-39.215	-0.110	(0)
	UF6-2	0.000e+00	0.000e+00	-40.289	-40.728	-0.439	(0)
Fe (2)	1.728e-11						
	Fe+2	1.190e-11	4.334e-12	-10.924	-11.363	-0.439	(0)
	FeSO4	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
	FeHCO3+	2.333e-13	1.953e-13	-12.632	-12.709	-0.077	(0)
	FeOH+	3.887e-14	3.225e-14	-13.410	-13.491	-0.081	(0)
	Fe (OH) 2	4.790e-18	4.790e-18	-17.320	-17.320	0.000	(0)
	Fe (OH) 3-	3.413e-19	2.832e-19	-18.467	-18.548	-0.081	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-161.338	-161.338	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-238.654	-238.763	-0.110	(0)
Fe (3)	2.340e-09						
	Fe (OH) 2+	1.998e-09	1.664e-09	-8.699	-8.779	-0.079	(0)

	Fe (OH) 3	3.342e-10	3.342e-10	-9.476	-9.476	0.000	(0)
	Fe (OH) 4-	6.985e-12	5.818e-12	-11.156	-11.235	-0.079	(0)
	FeOH+2	4.828e-14	2.288e-14	-13.316	-13.640	-0.324	(0)
	FeF2+	6.932e-17	5.751e-17	-16.159	-16.240	-0.081	(0)
	FeF+2	4.459e-17	2.114e-17	-16.351	-16.675	-0.324	(0)
	FeSO4+	1.231e-17	1.021e-17	-16.910	-16.991	-0.081	(0)
	FeF3	8.251e-18	8.251e-18	-17.083	-17.083	0.000	(0)
	Fe (SO4) 2-	1.350e-18	1.048e-18	-17.870	-17.979	-0.110	(0)
	Fe+3	1.063e-18	1.896e-19	-17.973	-18.722	-0.749	(0)
	FeCl+2	3.362e-20	1.593e-20	-19.473	-19.798	-0.324	(0)
	FeCl2+	2.388e-22	1.981e-22	-21.622	-21.703	-0.081	(0)
	FeHSeO3+2	1.676e-22	6.104e-23	-21.776	-22.214	-0.439	(0)
	Fe2 (OH) 2+4	9.868e-25	1.734e-26	-24.006	-25.761	-1.755	(0)
	FeCl3	5.515e-26	5.515e-26	-25.258	-25.258	0.000	(0)
	FeNO3+2	4.548e-26	1.656e-26	-25.342	-25.781	-0.439	(0)
	Fe3 (OH) 4+5	2.306e-31	4.172e-34	-30.637	-33.380	-2.743	(0)
H (0)	1.830e-29						
	H2	9.149e-30	9.247e-30	-29.039	-29.034	0.005	(0)
Hg (0)	2.369e-09						
	Hg	2.369e-09	2.369e-09	-8.625	-8.625	0.000	(0)
Hg (1)	5.030e-19						
	Hg2+2	2.515e-19	9.156e-20	-18.599	-19.038	-0.439	(0)
Hg (2)	1.107e-10						
	HgClOH	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
	HgCl2	4.410e-11	4.410e-11	-10.356	-10.356	0.000	(0)
	Hg (OH) 2	1.242e-11	1.255e-11	-10.906	-10.901	0.005	(0)
	HgCl3-	1.580e-12	1.228e-12	-11.801	-11.911	-0.110	(0)
	HgCO3	2.125e-13	2.125e-13	-12.673	-12.673	0.000	(0)
	HgCl4-2	3.736e-14	1.360e-14	-13.428	-13.866	-0.439	(0)
	Hg (CO3) 2-2	5.756e-15	2.096e-15	-14.240	-14.679	-0.439	(0)
	HgCl+	4.070e-15	3.161e-15	-14.390	-14.500	-0.110	(0)
	HgOH+	5.454e-16	4.237e-16	-15.263	-15.373	-0.110	(0)
	HgHCO3+	2.741e-16	2.129e-16	-15.562	-15.672	-0.110	(0)
	Hg (OH) 3-	3.804e-19	2.955e-19	-18.420	-18.529	-0.110	(0)
	Hg+2	1.563e-19	5.692e-20	-18.806	-19.245	-0.439	(0)
	HgNH3+2	9.210e-20	3.353e-20	-19.036	-19.475	-0.439	(0)
	Hg (NH3) 2+2	8.600e-20	3.131e-20	-19.066	-19.504	-0.439	(0)
	HgSO4	7.156e-20	7.156e-20	-19.145	-19.145	0.000	(0)
	HgF+	2.762e-22	2.146e-22	-21.559	-21.668	-0.110	(0)
	Hg (NH3) 3+2	3.197e-28	1.164e-28	-27.495	-27.934	-0.439	(0)
	HgNO3+	2.364e-28	1.836e-28	-27.626	-27.736	-0.110	(0)
	Hg (NH3) 4+2	2.371e-36	8.632e-37	-35.625	-36.064	-0.439	(0)
	Hg (NO3) 2	6.666e-37	6.666e-37	-36.176	-36.176	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.863	-138.972	-0.110	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.847	-139.847	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.973	-140.411	-0.439	(0)
K	4.353e-03						
	K+	4.211e-03	3.477e-03	-2.376	-2.459	-0.083	(0)
	KSO4-	1.419e-04	1.182e-04	-3.848	-3.927	-0.079	(0)
	KCrO4-	7.635e-18	5.931e-18	-17.117	-17.227	-0.110	(0)
Mg	6.229e-03						
	Mg+2	4.342e-03	2.018e-03	-2.362	-2.695	-0.333	(0)
	MgSO4	1.763e-03	1.763e-03	-2.754	-2.754	0.000	(0)
	MgHCO3+	9.003e-05	7.394e-05	-4.046	-4.131	-0.086	(0)
	MgF+	2.789e-05	2.302e-05	-4.555	-4.638	-0.083	(0)
	MgCO3	5.235e-06	5.235e-06	-5.281	-5.281	0.000	(0)
	MgOH+	1.786e-07	1.502e-07	-6.748	-6.823	-0.075	(0)
	MgH2BO3+	3.324e-08	2.682e-08	-7.478	-7.572	-0.093	(0)
Mn (2)	7.504e-05						
	Mn+2	5.576e-05	2.030e-05	-4.254	-4.692	-0.439	(0)
	MnSO4	1.733e-05	1.733e-05	-4.761	-4.761	0.000	(0)
	MnHCO3+	1.748e-06	1.450e-06	-5.757	-5.839	-0.081	(0)
	MnF+	9.904e-08	8.218e-08	-7.004	-7.085	-0.081	(0)
	MnCl+	8.573e-08	7.114e-08	-7.067	-7.148	-0.081	(0)
	MnOH+	1.149e-08	9.534e-09	-7.940	-8.021	-0.081	(0)
	MnCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
	MnSeO4	4.657e-13	4.657e-13	-12.332	-12.332	0.000	(0)
	MnNO3+	3.618e-13	2.811e-13	-12.442	-12.551	-0.110	(0)

MnCl3-	2.584e-13	2.144e-13	-12.588	-12.669	-0.081	(0)
Mn (OH) 3-	2.482e-18	2.059e-18	-17.605	-17.686	-0.081	(0)
Mn (NO3) 2	6.167e-21	6.167e-21	-20.210	-20.210	0.000	(0)
Mn (OH) 4-2	2.623e-24	1.243e-24	-23.581	-23.905	-0.324	(0)
MnSe	0.000e+00	0.000e+00	-42.514	-42.514	0.000	(0)
Mn (3)	2.395e-24					
Mn+3	2.395e-24	4.270e-25	-23.621	-24.370	-0.749	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.947	-42.272	-0.324	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.880	-45.971	-0.091	(0)
Mo	2.425e-06					
MoO4-2	2.424e-06	1.126e-06	-5.615	-5.948	-0.333	(0)
HMoO4-	1.553e-09	1.206e-09	-8.809	-8.919	-0.110	(0)
H2MoO4	4.755e-13	4.755e-13	-12.323	-12.323	0.000	(0)
Ag2MoO4	7.471e-24	7.471e-24	-23.127	-23.127	0.000	(0)
AlMo6O21-3	3.037e-36	3.127e-37	-35.518	-36.505	-0.987	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.850	-46.799	-3.949	(0)
HMo7O24-5	0.000e+00	0.000e+00	-44.939	-47.682	-2.743	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-48.413	-50.169	-1.755	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-53.204	-54.192	-0.987	(0)
N (-3)	1.156e-07					
NH4+	1.092e-07	8.813e-08	-6.962	-7.055	-0.093	(0)
NH4SO4-	5.465e-09	4.534e-09	-8.262	-8.343	-0.081	(0)
NH3	9.337e-10	9.337e-10	-9.030	-9.030	0.000	(0)
CaNH3+2	3.933e-12	1.432e-12	-11.405	-11.844	-0.439	(0)
CuNH3+2	1.876e-13	6.831e-14	-12.727	-13.166	-0.439	(0)
NiNH3+2	5.011e-14	1.824e-14	-13.300	-13.739	-0.439	(0)
AgNH3+	1.027e-14	7.980e-15	-13.988	-14.098	-0.110	(0)
Co (NH3) +2	8.483e-15	3.088e-15	-14.071	-14.510	-0.439	(0)
BaNH3+2	1.335e-16	4.861e-17	-15.875	-16.313	-0.439	(0)
HgNH3+2	9.210e-20	3.353e-20	-19.036	-19.475	-0.439	(0)
Hg (NH3) 2+2	8.600e-20	3.131e-20	-19.066	-19.504	-0.439	(0)
Ag (NH3) 2+	7.796e-20	6.056e-20	-19.108	-19.218	-0.110	(0)
Ni (NH3) 2+2	6.763e-21	2.462e-21	-20.170	-20.609	-0.439	(0)
Ca (NH3) 2+2	1.462e-21	5.323e-22	-20.835	-21.274	-0.439	(0)
Co (NH3) 2+2	3.379e-22	1.230e-22	-21.471	-21.910	-0.439	(0)
Hg (NH3) 3+2	3.197e-28	1.164e-28	-27.495	-27.934	-0.439	(0)
Co (NH3) 3+2	3.971e-30	1.446e-30	-29.401	-29.840	-0.439	(0)
Hg (NH3) 4+2	2.371e-36	8.632e-37	-35.625	-36.064	-0.439	(0)
Co (NH3) 4+2	1.946e-38	7.085e-39	-37.711	-38.150	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.630	-45.068	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.521	-46.959	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.292	-53.730	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.755	-54.742	-0.987	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.757	-56.196	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-69.010	-69.448	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-69.037	-69.476	-0.439	(0)
N (3)	5.226e-06					
NO2-	5.226e-06	4.242e-06	-5.282	-5.372	-0.091	(0)
CuNO2+	4.089e-12	3.176e-12	-11.388	-11.498	-0.110	(0)
AgNO2	3.710e-12	3.710e-12	-11.431	-11.431	0.000	(0)
CoNO2+	1.059e-12	8.225e-13	-11.975	-12.085	-0.110	(0)
Cu (NO2) 2	1.379e-16	1.379e-16	-15.860	-15.860	0.000	(0)
Ag (NO2) 2-	3.138e-17	2.438e-17	-16.503	-16.613	-0.110	(0)
N (5)	1.062e-08					
NO3-	1.058e-08	8.735e-09	-7.976	-8.059	-0.083	(0)
CaNO3+	4.333e-11	3.365e-11	-10.363	-10.473	-0.110	(0)
MnNO3+	3.618e-13	2.811e-13	-12.442	-12.551	-0.110	(0)
ZnNO3+	5.350e-14	4.156e-14	-13.272	-13.381	-0.110	(0)
BaNO3+	4.650e-15	3.612e-15	-14.333	-14.442	-0.110	(0)
NiNO3+	1.028e-15	7.984e-16	-14.988	-15.098	-0.110	(0)
CoNO3+	4.904e-16	3.809e-16	-15.309	-15.419	-0.110	(0)
CuNO3+	2.543e-16	1.975e-16	-15.595	-15.704	-0.110	(0)
CdNO3+	8.417e-17	6.538e-17	-16.075	-16.185	-0.110	(0)
AgNO3	2.904e-17	2.904e-17	-16.537	-16.537	0.000	(0)
PbNO3+	1.816e-17	1.411e-17	-16.741	-16.851	-0.110	(0)

Mn(NO3)2	6.167e-21	6.167e-21	-20.210	-20.210	0.000	(0)
UO2NO3+	1.167e-21	9.065e-22	-20.933	-21.043	-0.110	(0)
Zn(NO3)2	7.244e-23	7.244e-23	-22.140	-22.140	0.000	(0)
CrNO3+2	2.866e-23	1.044e-23	-22.543	-22.981	-0.439	(0)
Co(NO3)2	6.770e-24	6.770e-24	-23.169	-23.169	0.000	(0)
VO2NO3	1.321e-24	1.321e-24	-23.879	-23.879	0.000	(0)
Cd(NO3)2	2.862e-25	2.862e-25	-24.543	-24.543	0.000	(0)
Cu(NO3)2	2.172e-25	2.172e-25	-24.663	-24.663	0.000	(0)
Pb(NO3)2	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
FeNO3+2	4.548e-26	1.656e-26	-25.342	-25.781	-0.439	(0)
HgNO3+	2.364e-28	1.836e-28	-27.626	-27.736	-0.110	(0)
Hg(NO3)2	6.666e-37	6.666e-37	-36.176	-36.176	0.000	(0)
Na	1.070e-02					
Na+	1.042e-02	8.600e-03	-1.982	-2.066	-0.083	(0)
NaSO4-	2.662e-04	2.218e-04	-3.575	-3.654	-0.079	(0)
NaHCO3	1.732e-05	1.732e-05	-4.762	-4.762	0.000	(0)
NaCO3-	5.997e-07	4.995e-07	-6.222	-6.301	-0.079	(0)
NaF	5.518e-07	5.518e-07	-6.258	-6.258	0.000	(0)
NaH2BO3	5.223e-09	5.223e-09	-8.282	-8.282	0.000	(0)
NaCrO4-	2.526e-17	1.962e-17	-16.598	-16.707	-0.110	(0)
Ni	1.386e-07					
Ni+2	7.830e-08	3.639e-08	-7.106	-7.439	-0.333	(0)
NiSO4	3.486e-08	3.486e-08	-7.458	-7.458	0.000	(0)
NiHCO3+	2.068e-08	1.606e-08	-7.685	-7.794	-0.110	(0)
NiCO3	4.234e-09	4.234e-09	-8.373	-8.373	0.000	(0)
NiCl+	3.336e-10	2.591e-10	-9.477	-9.586	-0.110	(0)
NiF+	1.196e-10	9.294e-11	-9.922	-10.032	-0.110	(0)
NiOH+	1.102e-10	8.564e-11	-9.958	-10.067	-0.110	(0)
Ni(SO4)2-2	1.522e-11	5.542e-12	-10.818	-11.256	-0.439	(0)
Ni(OH)2	1.272e-12	1.272e-12	-11.896	-11.896	0.000	(0)
NiNH3+2	5.011e-14	1.824e-14	-13.300	-13.739	-0.439	(0)
NiCl2	3.632e-15	3.632e-15	-14.440	-14.440	0.000	(0)
NiSeO4	1.450e-15	1.450e-15	-14.838	-14.838	0.000	(0)
NiNO3+	1.028e-15	7.984e-16	-14.988	-15.098	-0.110	(0)
Ni(OH)3-	3.061e-16	2.378e-16	-15.514	-15.624	-0.110	(0)
Ni(NH3)2+2	6.763e-21	2.462e-21	-20.170	-20.609	-0.439	(0)
O(0)	1.171e-34					
O2	5.857e-35	5.919e-35	-34.232	-34.228	0.005	(0)
Pb	2.017e-09					
PbCO3	1.024e-09	1.024e-09	-8.990	-8.990	0.000	(0)
PbHCO3+	3.740e-10	2.905e-10	-9.427	-9.537	-0.110	(0)
PbSO4	2.568e-10	2.568e-10	-9.590	-9.590	0.000	(0)
Pb+2	2.350e-10	1.092e-10	-9.629	-9.962	-0.333	(0)
PbOH+	6.602e-11	5.128e-11	-10.180	-10.290	-0.110	(0)
Pb(CO3)2-2	2.529e-11	9.209e-12	-10.597	-11.036	-0.439	(0)
Pb(SO4)2-2	2.041e-11	7.429e-12	-10.690	-11.129	-0.439	(0)
PbCl+	1.388e-11	1.078e-11	-10.858	-10.967	-0.110	(0)
PbF+	1.007e-12	7.824e-13	-11.997	-12.107	-0.110	(0)
Pb(OH)2	3.032e-13	3.032e-13	-12.518	-12.518	0.000	(0)
PbCl2	1.341e-13	1.341e-13	-12.873	-12.873	0.000	(0)
PbF2	1.566e-15	1.566e-15	-14.805	-14.805	0.000	(0)
PbCl3-	1.913e-16	1.486e-16	-15.718	-15.828	-0.110	(0)
Pb(OH)3-	7.297e-17	5.668e-17	-16.137	-16.247	-0.110	(0)
PbNO3+	1.816e-17	1.411e-17	-16.741	-16.851	-0.110	(0)
Pb2OH+3	8.619e-19	8.874e-20	-18.065	-19.052	-0.987	(0)
PbCl4-2	5.192e-19	1.890e-19	-18.285	-18.723	-0.439	(0)
PbF3-	3.887e-19	3.020e-19	-18.410	-18.520	-0.110	(0)
Pb(OH)4-2	7.128e-21	2.595e-21	-20.147	-20.586	-0.439	(0)
PbF4-2	4.037e-23	1.470e-23	-22.394	-22.833	-0.439	(0)
Pb3(OH)4+2	5.500e-25	2.003e-25	-24.260	-24.698	-0.439	(0)
Pb(NO3)2	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
Pb4(OH)4+4	9.885e-30	1.737e-31	-29.005	-30.760	-1.755	(0)
Pb(HS)2	0.000e+00	0.000e+00	-153.617	-153.617	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-231.669	-231.779	-0.110	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.026	-74.026	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.353	-79.462	-0.110	(0)
H2S	0.000e+00	0.000e+00	-79.711	-79.711	0.000	(0)

CdHS+	0.000e+00	0.000e+00	-79.971	-80.080	-0.110	(0)
S5-2	0.000e+00	0.000e+00	-81.120	-81.558	-0.439	(0)
S6-2	0.000e+00	0.000e+00	-81.636	-82.074	-0.439	(0)
S4-2	0.000e+00	0.000e+00	-81.715	-82.154	-0.439	(0)
S3-2	0.000e+00	0.000e+00	-82.521	-82.960	-0.439	(0)
S2-2	0.000e+00	0.000e+00	-83.537	-83.976	-0.439	(0)
S-2	0.000e+00	0.000e+00	-89.169	-89.493	-0.324	(0)
HgHS2-	0.000e+00	0.000e+00	-138.863	-138.972	-0.110	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.847	-139.847	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.973	-140.411	-0.439	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.279	-149.388	-0.110	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.390	-149.603	-0.213	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.459	-150.568	-0.110	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.387	-151.774	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.719	-152.085	-0.366	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.749	-152.125	-0.376	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.827	-151.827	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.339	-152.339	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.498	-152.855	-0.357	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.617	-153.617	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.338	-161.338	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.524	-220.634	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.900	-228.010	-0.110	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-229.791	-229.901	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.282	-230.721	-0.439	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.669	-231.779	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.654	-238.763	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-306.729	-307.167	-0.439	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-308.493	-308.932	-0.439	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.264	-321.703	-0.439	(0)
S (6)	1.386e-02					
SO4-2	1.033e-02	4.801e-03	-1.986	-2.319	-0.333	(0)
MgSO4	1.763e-03	1.763e-03	-2.754	-2.754	0.000	(0)
CaSO4	1.340e-03	1.340e-03	-2.873	-2.873	0.000	(0)
NaSO4-	2.662e-04	2.218e-04	-3.575	-3.654	-0.079	(0)
KSO4-	1.419e-04	1.182e-04	-3.848	-3.927	-0.079	(0)
MnSO4	1.733e-05	1.733e-05	-4.761	-4.761	0.000	(0)
ZnSO4	1.990e-06	1.990e-06	-5.701	-5.701	0.000	(0)
Zn (SO4) 2-2	2.285e-07	8.320e-08	-6.641	-7.080	-0.439	(0)
NiSO4	3.486e-08	3.486e-08	-7.458	-7.458	0.000	(0)
HSO4-	3.059e-08	2.525e-08	-7.514	-7.598	-0.083	(0)
CoSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
NH4SO4-	5.465e-09	4.534e-09	-8.262	-8.343	-0.081	(0)
CdSO4	2.664e-09	2.664e-09	-8.574	-8.574	0.000	(0)
AgSO4-	5.162e-10	4.010e-10	-9.287	-9.397	-0.110	(0)
Cd (SO4) 2-2	4.739e-10	1.726e-10	-9.324	-9.763	-0.439	(0)
PbSO4	2.568e-10	2.568e-10	-9.590	-9.590	0.000	(0)
CrOHSO4	1.274e-10	1.274e-10	-9.895	-9.895	0.000	(0)
AlSO4+	2.888e-11	2.384e-11	-10.539	-10.623	-0.083	(0)
Pb (SO4) 2-2	2.041e-11	7.429e-12	-10.690	-11.129	-0.439	(0)
Ni (SO4) 2-2	1.522e-11	5.542e-12	-10.818	-11.256	-0.439	(0)
FeSO4	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
Al (SO4) 2-	1.486e-12	1.227e-12	-11.828	-11.911	-0.083	(0)
CrSO4+	3.945e-13	3.064e-13	-12.404	-12.514	-0.110	(0)
UO2SO4	3.780e-13	3.780e-13	-12.423	-12.423	0.000	(0)
UO2 (SO4) 2-2	6.571e-14	2.392e-14	-13.182	-13.621	-0.439	(0)
VO2SO4-	4.412e-17	3.427e-17	-16.355	-16.465	-0.110	(0)
FeSO4+	1.231e-17	1.021e-17	-16.910	-16.991	-0.081	(0)
Cr2 (OH) 2SO4+2	3.534e-18	1.287e-18	-17.452	-17.890	-0.439	(0)
Fe (SO4) 2-	1.350e-18	1.048e-18	-17.870	-17.979	-0.110	(0)
Cr2 (OH) 2 (SO4) 2	3.670e-19	3.670e-19	-18.435	-18.435	0.000	(0)
VOSO4	1.946e-19	1.946e-19	-18.711	-18.711	0.000	(0)
HgSO4	7.156e-20	7.156e-20	-19.145	-19.145	0.000	(0)
CrO3SO4-2	1.730e-23	6.297e-24	-22.762	-23.201	-0.439	(0)
VSO4+	1.313e-33	1.020e-33	-32.882	-32.992	-0.110	(0)
U (SO4) 2	2.362e-39	2.362e-39	-38.627	-38.627	0.000	(0)
USO4+2	1.701e-40	0.000e+00	-39.769	-40.208	-0.439	(0)

Co(NH3)6SO4+	0.000e+00	0.000e+00	-64.204	-64.314	-0.110	(0)
Sb(3)	8.773e-20					
Sb(OH)3	4.438e-20	4.438e-20	-19.353	-19.353	0.000	(0)
HSbO2	4.335e-20	4.335e-20	-19.363	-19.363	0.000	(0)
SbO2-	1.679e-24	1.305e-24	-23.775	-23.885	-0.110	(0)
Sb(OH)4-	9.610e-25	7.465e-25	-24.017	-24.127	-0.110	(0)
Sb(OH)2F	3.796e-25	3.796e-25	-24.421	-24.421	0.000	(0)
SbOF	3.736e-25	3.736e-25	-24.428	-24.428	0.000	(0)
Sb(OH)2+	7.472e-26	5.804e-26	-25.127	-25.236	-0.110	(0)
SbO+	2.578e-26	2.002e-26	-25.589	-25.698	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.264	-321.703	-0.439	(0)
Sb(5)	3.407e-08					
SbO3-	3.403e-08	2.643e-08	-7.468	-7.578	-0.110	(0)
Sb(OH)6-	3.737e-11	3.085e-11	-10.428	-10.511	-0.083	(0)
SbO2+	2.829e-23	2.197e-23	-22.548	-22.658	-0.110	(0)
Se(-2)	5.229e-15					
Ag2Se	5.229e-15	5.229e-15	-14.282	-14.282	0.000	(0)
HSe-	2.538e-40	1.972e-40	-39.595	-39.705	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-42.514	-42.514	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.084	-43.084	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.997	-47.436	-0.439	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-84.735	-86.491	-1.755	(0)
Se(4)	1.816e-07					
HSeO3-	1.569e-07	1.219e-07	-6.804	-6.914	-0.110	(0)
SeO3-2	2.476e-08	9.014e-09	-7.606	-8.045	-0.439	(0)
H2SeO3	2.797e-12	2.797e-12	-11.553	-11.553	0.000	(0)
AgSeO3-	3.122e-14	2.425e-14	-13.506	-13.615	-0.110	(0)
Cd(SeO3)2-2	4.353e-19	1.585e-19	-18.361	-18.800	-0.439	(0)
Ag(SeO3)2-3	1.901e-20	1.957e-21	-19.721	-20.708	-0.987	(0)
FeHSeO3+2	1.676e-22	6.104e-23	-21.776	-22.214	-0.439	(0)
Se(6)	1.839e-10					
SeO4-2	1.834e-10	8.523e-11	-9.737	-10.069	-0.333	(0)
MnSeO4	4.657e-13	4.657e-13	-12.332	-12.332	0.000	(0)
ZnSeO4	2.500e-14	2.500e-14	-13.602	-13.602	0.000	(0)
NiSeO4	1.450e-15	1.450e-15	-14.838	-14.838	0.000	(0)
CoSeO4	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
HSeO4-	2.959e-16	2.299e-16	-15.529	-15.638	-0.110	(0)
CdSeO4	3.756e-17	3.756e-17	-16.425	-16.425	0.000	(0)
Zn(SeO4)2-2	5.934e-24	2.160e-24	-23.227	-23.665	-0.439	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.971	-58.958	-0.987	(0)
U(4)	6.995e-22					
U(OH)5-	6.983e-22	5.424e-22	-21.156	-21.266	-0.110	(0)
U(OH)4	1.224e-24	1.224e-24	-23.912	-23.912	0.000	(0)
U(OH)3+	3.101e-28	2.409e-28	-27.508	-27.618	-0.110	(0)
U(OH)2+2	1.648e-32	5.999e-33	-31.783	-32.222	-0.439	(0)
UF3+	1.746e-35	1.356e-35	-34.758	-34.868	-0.110	(0)
UF2+2	2.312e-36	8.416e-37	-35.636	-36.075	-0.439	(0)
UF4	1.512e-37	1.512e-37	-36.820	-36.820	0.000	(0)
UOH+3	1.478e-37	1.522e-38	-36.830	-37.818	-0.987	(0)
UF+3	6.385e-39	6.574e-40	-38.195	-39.182	-0.987	(0)
U(SO4)2	2.362e-39	2.362e-39	-38.627	-38.627	0.000	(0)
UF5-	7.845e-40	6.094e-40	-39.105	-39.215	-0.110	(0)
USO4+2	1.701e-40	0.000e+00	-39.769	-40.208	-0.439	(0)
UF6-2	0.000e+00	0.000e+00	-40.289	-40.728	-0.439	(0)
U+4	0.000e+00	0.000e+00	-42.734	-44.489	-1.755	(0)
UCl+3	0.000e+00	0.000e+00	-44.358	-45.345	-0.987	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-166.174	-175.060	-8.886	(0)
U(5)	8.667e-17					
UO2+	8.667e-17	6.733e-17	-16.062	-16.172	-0.110	(0)
U(6)	4.686e-07					
UO2(CO3)3-4	3.576e-07	6.283e-09	-6.447	-8.202	-1.755	(0)
UO2(CO3)2-2	1.104e-07	4.019e-08	-6.957	-7.396	-0.439	(0)
UO2CO3	6.458e-10	6.458e-10	-9.190	-9.190	0.000	(0)
UO2OH+	1.576e-12	1.224e-12	-11.802	-11.912	-0.110	(0)
UO2F+	9.398e-13	7.301e-13	-12.027	-12.137	-0.110	(0)
UO2SO4	3.780e-13	3.780e-13	-12.423	-12.423	0.000	(0)
UO2F2	2.141e-13	2.141e-13	-12.669	-12.669	0.000	(0)

UO2+2	1.119e-13	5.201e-14	-12.951	-13.284	-0.333	(0)
UO2(SO4) 2-2	6.571e-14	2.392e-14	-13.182	-13.621	-0.439	(0)
UO2F3-	7.040e-15	5.468e-15	-14.152	-14.262	-0.110	(0)
UO2Cl+	3.023e-16	2.348e-16	-15.520	-15.629	-0.110	(0)
UO2F4-2	1.213e-17	4.417e-18	-16.916	-17.355	-0.439	(0)
(UO2) 2 (OH) 2+2	6.831e-18	2.487e-18	-17.165	-17.604	-0.439	(0)
(UO2) 3 (OH) 5+	1.039e-19	8.073e-20	-18.983	-19.093	-0.110	(0)
UO2NO3+	1.167e-21	9.065e-22	-20.933	-21.043	-0.110	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.438	-42.548	-0.110	(0)
V+2	0.000e+00	0.000e+00	-42.891	-43.330	-0.439	(0)
V(3)	2.371e-15					
V(OH) 3	2.371e-15	2.371e-15	-14.625	-14.625	0.000	(0)
V(OH) 2+	1.062e-25	8.252e-26	-24.974	-25.083	-0.110	(0)
VOH+2	1.158e-28	4.215e-29	-27.936	-28.375	-0.439	(0)
V+3	4.369e-33	4.498e-34	-32.360	-33.347	-0.987	(0)
VSO4+	1.313e-33	1.020e-33	-32.882	-32.992	-0.110	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.019	-55.007	-0.987	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-54.195	-55.950	-1.755	(0)
V(4)	7.781e-18					
V(OH) 3+	7.062e-18	5.486e-18	-17.151	-17.261	-0.110	(0)
VO+2	4.042e-19	1.472e-19	-18.393	-18.832	-0.439	(0)
VOSO4	1.946e-19	1.946e-19	-18.711	-18.711	0.000	(0)
VOF+	1.155e-19	8.975e-20	-18.937	-19.047	-0.110	(0)
VOF2	3.422e-21	3.422e-21	-20.466	-20.466	0.000	(0)
VOC1+	1.479e-21	1.149e-21	-20.830	-20.940	-0.110	(0)
VOF3-	1.589e-23	1.235e-23	-22.799	-22.908	-0.110	(0)
VOF4-2	1.392e-26	5.068e-27	-25.856	-26.295	-0.439	(0)
H2V2O4+2	4.148e-30	1.510e-30	-29.382	-29.821	-0.439	(0)
V(5)	7.314e-09					
H2VO4-	6.649e-09	5.165e-09	-8.177	-8.287	-0.110	(0)
HVO4-2	6.621e-10	2.411e-10	-9.179	-9.618	-0.439	(0)
H3VO4	2.780e-12	2.780e-12	-11.556	-11.556	0.000	(0)
H3V2O7-	1.194e-13	9.275e-14	-12.923	-13.033	-0.110	(0)
HV2O7-3	4.100e-15	4.222e-16	-14.387	-15.375	-0.987	(0)
VO2+	3.620e-16	2.989e-16	-15.441	-15.524	-0.083	(0)
VO4-3	2.180e-16	2.245e-17	-15.662	-16.649	-0.987	(0)
VO2F	5.331e-17	5.331e-17	-16.273	-16.273	0.000	(0)
VO2SO4-	4.412e-17	3.427e-17	-16.355	-16.465	-0.110	(0)
V2O7-4	1.202e-17	2.111e-19	-16.920	-18.675	-1.755	(0)
VO2F2-	2.534e-18	1.968e-18	-17.596	-17.706	-0.110	(0)
V3O9-3	1.404e-18	1.446e-19	-17.853	-18.840	-0.987	(0)
VO2F3-2	6.857e-21	2.496e-21	-20.164	-20.603	-0.439	(0)
V4O12-4	1.773e-23	3.115e-25	-22.751	-24.507	-1.755	(0)
VO2NO3	1.321e-24	1.321e-24	-23.879	-23.879	0.000	(0)
VO2F4-3	1.213e-24	1.249e-25	-23.916	-24.903	-0.987	(0)
V10O28-6	0.000e+00	0.000e+00	-59.087	-63.036	-3.949	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.376	-62.119	-2.743	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.425	-64.180	-1.755	(0)
Zn	6.981e-06					
Zn+2	4.076e-06	1.894e-06	-5.390	-5.723	-0.333	(0)
ZnSO4	1.990e-06	1.990e-06	-5.701	-5.701	0.000	(0)
ZnCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
ZnHCO3+	2.761e-07	2.144e-07	-6.559	-6.669	-0.110	(0)
Zn(SO4) 2-2	2.285e-07	8.320e-08	-6.641	-7.080	-0.439	(0)
ZnOH+	4.559e-08	3.541e-08	-7.341	-7.451	-0.110	(0)
ZnCl+	1.612e-08	1.324e-08	-7.793	-7.878	-0.086	(0)
ZnF+	4.947e-09	3.843e-09	-8.306	-8.415	-0.110	(0)
ZnOHCl	3.241e-09	3.241e-09	-8.489	-8.489	0.000	(0)
Zn(OH) 2	1.049e-09	1.049e-09	-8.979	-8.979	0.000	(0)
ZnCl2	5.842e-11	5.842e-11	-10.233	-10.233	0.000	(0)
Zn(OH) 3-	1.266e-12	9.832e-13	-11.898	-12.007	-0.110	(0)
ZnCl3-	1.573e-13	1.292e-13	-12.803	-12.889	-0.086	(0)
ZnNO3+	5.350e-14	4.156e-14	-13.272	-13.381	-0.110	(0)
ZnSeO4	2.500e-14	2.500e-14	-13.602	-13.602	0.000	(0)
ZnCl4-2	3.793e-16	1.798e-16	-15.421	-15.745	-0.324	(0)
Zn(OH) 4-2	2.010e-17	7.318e-18	-16.697	-17.136	-0.439	(0)
Zn(NO3) 2	7.244e-23	7.244e-23	-22.140	-22.140	0.000	(0)

Zn(SeO4) 2-2	5.934e-24	2.160e-24	-23.227	-23.665	-0.439	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.459	-150.568	-0.110	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.827	-151.827	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.900	-228.010	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.282	-230.721	-0.439	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-308.493	-308.932	-0.439	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-58.18	-51.89	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-45.39	-40.88	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-52.62	-40.88	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-75.11	-57.18	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-60.70	-40.67	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.85	-29.45	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-24.63	-24.18	0.45	(NH4) 2SeO4	
Acanthite	-52.73	-88.95	-36.22	Ag2S	
Ag2CO3	-11.17	-22.26	-11.09	Ag2CO3	
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4	
Ag2HVO4	-11.95	-10.47	1.48	Ag2HVO4	
Ag2MoO4	-11.15	-22.70	-11.55	Ag2MoO4	
Ag2O	-14.79	-2.22	12.57	Ag2O	
Ag2Se	-0.49	-49.19	-48.70	Ag2Se	
Ag2SeO3	-9.25	-16.40	-7.15	Ag2SeO3	
Ag2SeO4	-17.92	-26.83	-8.91	Ag2SeO4	
Ag2SO4	-14.26	-19.08	-4.82	Ag2SO4	
Ag3AsO3	-27.65	-25.49	2.16	Ag3AsO3	
Ag3AsO4	-15.72	-18.50	-2.79	Ag3AsO4	
Ag3H2VO5	-16.76	-11.58	5.18	Ag3H2VO5	
AgF:4H2O	-13.42	-12.37	1.05	AgF:4H2O	
Agmetal	-0.54	-14.05	-13.51	Ag	
AgVO3	-10.13	-9.36	0.77	AgVO3	
Al (OH) 3 (am)	-1.19	9.61	10.80	Al (OH) 3	
Al2 (MoO4) 3	-44.60	-42.23	2.37	Al2 (MoO4) 3	
Al2O3	-0.43	19.23	19.65	Al2O3	
Al4 (OH) 10SO4	-1.11	21.59	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-10.36	-5.56	4.80	AlAsO4:2H2O	
AlOHSO4	-4.01	-7.24	-3.23	AlOHSO4	
AlSb	-153.01	-87.39	65.62	AlSb	
Alunite	1.33	-0.07	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-4.49	-12.28	-7.79	PbSO4	
Anhydrite	-0.87	-5.23	-4.36	CaSO4	
Anilite	-59.04	-90.92	-31.88	Cu0.25Cu1.5S	
Antlerite	-6.47	2.32	8.79	Cu3 (OH) 4SO4	
Aragonite	-0.12	-8.42	-8.30	CaCO3	
Arsenolite	-85.88	-88.64	-2.76	As4O6	
Artinite	-5.96	3.64	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-37.06	-30.35	6.71	As2O5	
Atacamite	-4.43	2.96	7.39	Cu2 (OH) 3Cl	
Azurite	-4.01	-20.91	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-16.94	7.45	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-17.48	-1.60	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	0.92	-7.99	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-27.09	5.85	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-12.75	-22.42	-9.67	BaCrO4	
BaF2	-9.25	-15.07	-5.82	BaF2	
BaMoO4	-6.07	-13.03	-6.96	BaMoO4	
Barite	0.58	-9.40	-9.98	BaSO4	
BaS	-95.46	-79.28	16.18	BaS	
BaSeO3	-8.56	-6.73	1.83	BaSeO3	
BaSeO4	-9.69	-17.15	-7.46	BaSeO4	
Bianchite	-6.28	-8.04	-1.76	ZnSO4:6H2O	
Birnessite	-7.71	10.38	18.09	MnO2	
Bixbyite	-4.48	-5.13	-0.64	Mn2O3	
BlaubleiI	-57.59	-81.75	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-58.70	-85.98	-27.28	Cu0.6Cu0.8S	

Boehmite	1.03	9.61	8.58	AlOOH
Breithauptite	-58.44	-76.96	-18.52	NiSb
Brochantite	-6.51	8.71	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-5.00	11.84	16.84	Mg(OH) 2
Bunsenite	-5.35	7.10	12.45	NiO
Ca(VO ₃) ₂	-10.55	-4.89	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.76	6.74	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.82	6.74	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-17.78	4.52	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-20.60	18.36	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-21.50	18.36	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-302.11	-159.14	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.99	-18.25	-2.27	CaCrO ₄
Calcite	0.06	-8.42	-8.48	CaCO ₃
Calomel	-6.24	-24.15	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.91	-8.86	-7.95	CaMoO ₄
Carnotite	-2.42	-2.19	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.37	-2.56	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.96	-12.98	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.83	-2.99	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.73	5.91	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.82	5.91	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.69	-15.98	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.68	0.88	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.61	6.79	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.08	-13.74	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.04	-13.74	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.82	-13.74	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.40	-16.61	-1.21	CdF ₂
Cdmetal(alpha)	-33.49	-19.97	13.51	Cd
Cdmetal(gamma)	-33.59	-19.97	13.62	Cd
CdMoO ₄	-0.42	-14.57	-14.15	CdMoO ₄
CdOHCl	-7.45	-3.91	3.54	CdOHCl
CdSb	-77.80	-78.15	-0.35	CdSb
CdSe	-20.86	-41.06	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.85	-18.70	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.77	-10.94	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.22	-10.94	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.07	-10.95	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.18	-10.93	-9.75	AgCl
Cerrusite	-2.34	-15.47	-13.13	PbCO ₃
CH ₄ (g)	-82.53	-123.58	-41.05	CH ₄
Chalcanthite	-7.83	-10.47	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-59.53	-94.45	-34.92	Cu ₂ S
Chalcopyrite	-128.63	-163.90	-35.27	CuFeS ₂
Cinnabar	-51.94	-97.63	-45.69	HgS
Claudetite	-85.58	-88.64	-3.06	As ₄ O ₆
Clausthalite	-15.30	-42.40	-27.10	PbSe
Co(BO ₂) ₂	-28.99	-1.92	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.12	6.98	13.09	Co(OH) ₂
Co(OH) ₃	-10.17	-12.48	-2.31	Co(OH) ₃
CO ₂ (g)	-1.90	-20.04	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.45	-9.42	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.49	-17.98	-10.50	Co ₃ O ₄
CoCl ₂	-20.94	-12.67	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.21	-12.67	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.09	-13.07	-9.98	CoCO ₃
CoF ₂	-13.95	-15.55	-1.60	CoF ₂
CoF ₃	-44.81	-46.27	-1.46	CoF ₃
CoFe ₂ O ₄	16.67	13.15	-3.53	CoFe ₂ O ₄
CoMoO ₄	-5.75	-13.51	-7.76	CoMoO ₄
CoO	-6.61	6.98	13.59	CoO
CoS(alpha)	-72.31	-79.75	-7.44	CoS
CoS(beta)	-68.68	-79.75	-11.07	CoS
CoSe	-23.80	-40.00	-16.20	CoSe
CoSeO ₃	-8.53	-7.21	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-16.10	-17.63	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.68	-9.88	2.80	CoSO ₄

CoSO4:6H2O	-7.41	-9.88	-2.47	CoSO4:6H2O
Cotunnite	-10.29	-15.07	-4.78	PbCl2
Covellite	-58.04	-80.34	-22.30	CuS
Cr (OH) 2	-22.14	-11.32	10.82	Cr (OH) 2
Cr (OH) 3	-2.66	-1.33	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.58	-1.33	-0.75	Cr (OH) 3
Cr2O3	-0.29	-2.65	-2.36	Cr2O3
CrCl2	-45.06	-30.97	14.09	CrCl2
CrCl3	-45.91	-30.80	15.11	CrCl3
CrF3	-23.77	-35.11	-11.34	CrF3
Crmetal	-67.69	-37.20	30.48	Cr
CrO3	-26.67	-29.88	-3.21	CrO3
Cryolite	-8.51	-42.35	-33.84	Na3AlF6
Cu (OH) 2	-2.28	6.39	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.76	19.45	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.79	-2.54	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.59	-94.47	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.89	-54.69	-45.80	Cu2Se
Cu2SO4	-22.63	-24.58	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-17.27	-11.17	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.99	-108.58	-42.59	Cu3Sb
Cu3Se2	-31.78	-95.28	-63.49	Cu3Se2
CuCO3	-2.15	-13.65	-11.50	CuCO3
CuCrO4	-18.04	-23.48	-5.44	CuCrO4
CuF	-10.22	-15.12	-4.91	CuF
CuF2	-17.25	-16.13	1.12	CuF2
CuF2:2H2O	-11.58	-16.13	-4.55	CuF2:2H2O
Cumetal	-8.05	-16.80	-8.76	Cu
CuMoO4	-1.02	-14.09	-13.08	CuMoO4
CuOCuSO4	-14.38	-4.07	10.30	CuOCuSO4
Cupricferrite	6.57	12.56	5.99	CuFe2O4
Cuprite	-6.31	-7.72	-1.41	Cu2O
Cuprousferrite	8.14	-0.78	-8.92	CuFeO2
CuSe	-7.48	-40.58	-33.10	CuSe
CuSe2	-28.31	-61.67	-33.37	CuSe2
CuSeO3:2H2O	-8.30	-7.79	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.78	-18.22	-2.44	CuSeO4:5H2O
CuSO4	-13.40	-10.46	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-59.60	-93.52	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.08	-16.62	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.47	-16.62	-17.09	CaMg (CO3) 2
Epsomite	-2.89	-5.02	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.39	3.17	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.18	0.14	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.62	-13.34	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.57	-8.01	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-15.75	-36.38	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-40.67	-44.40	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.88	9.34	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.49	-12.09	0.40	FeAsO4:2H2O
FeCr2O4	-6.68	0.52	7.20	FeCr2O4
FeMoO4	-7.22	-17.31	-10.09	FeMoO4
Ferrihydrite	-0.11	3.08	3.19	Fe (OH) 3
Ferroselite	-46.29	-64.89	-18.60	FeSe2
FeS (ppt)	-80.61	-83.56	-2.95	FeS
FeSe	-32.80	-43.80	-11.00	FeSe
Fix_pe	-5.67	-5.67	0.00	e-
Fluorite	-0.40	-10.90	-10.50	CaF2
Galena	-68.19	-82.16	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al (OH) 3
Goethite	2.59	3.08	0.49	FeOOH
Goslarite	-6.03	-8.04	-2.01	ZnSO4:7H2O
Greenockite	-66.46	-80.82	-14.36	CdS
Greigite	-292.55	-337.58	-45.03	Fe3S4
Gummite	-6.42	1.25	7.67	UO3
Gypsum	-0.62	-5.23	-4.61	CaSO4:2H2O
H-Jarosite	-12.36	-24.46	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6

H2MoO4	-7.61	-20.49	-12.88	H2MoO4
H2S (g)	-78.72	-86.73	-8.01	H2S
H2Se (g)	-42.01	-46.97	-4.96	H2Se
Halite	-6.22	-4.62	1.60	NaCl
Hausmannite	-5.61	55.42	61.03	Mn3O4
Hematite	7.59	6.17	-1.42	Fe2O3
Hercynite	-0.49	22.40	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.35	-258.06	-73.71	Hg (CH3) 2
Hg (g)	-7.32	-15.19	-7.87	Hg
Hg (OH) 2	-7.40	-10.90	-3.50	Hg (OH) 2
Hg2 (g)	-15.43	-30.38	-14.96	Hg2
Hg2 (OH) 2	-9.76	-4.50	5.26	Hg2 (OH) 2
Hg2CO3	-8.49	-24.54	-16.05	Hg2CO3
Hg2CrO4	-25.68	-34.38	-8.70	Hg2CrO4
Hg2F2	-16.66	-27.02	-10.36	Hg2F2
Hg2S	-79.56	-91.23	-11.68	Hg2S
Hg2SeO3	-14.03	-18.68	-4.66	Hg2SeO3
Hg2SO4	-15.23	-21.36	-6.13	Hg2SO4
Hg3O2CO3	-23.06	-52.75	-29.68	Hg3O2CO3
HgCl (g)	-31.57	-12.07	19.50	HgCl
HgCl2	-9.29	-30.55	-21.26	HgCl2
HgF (g)	-46.19	-13.51	32.68	HgF
HgF2 (g)	-45.99	-33.42	12.57	HgF2
Hgmetal (l)	-1.74	-15.19	-13.45	Hg
HgSe	-2.18	-57.87	-55.69	HgSe
HgSeO3	-12.65	-25.08	-12.43	HgSeO3
HgSO4	-18.34	-27.76	-9.42	HgSO4
Huntite	-3.06	-33.02	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.59	-26.36	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.20	-20.96	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.12	-19.29	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.85	-19.65	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.89	-50.13	-17.24	K2Cr2O7
K2CrO4	-19.74	-20.26	-0.51	K2CrO4
K2MoO4	-14.13	-10.87	3.26	K2MoO4
K2SeO4	-14.26	-14.99	-0.73	K2SeO4
Langite	-8.78	8.71	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.27	-7.70	-0.43	PbO : PbSO4
Laurionite	-5.87	-5.25	0.62	PbOHCl
Lepidocrocite	1.71	3.08	1.37	FeOOH
Lime	-21.08	11.62	32.70	CaO
Litharge	-8.12	4.58	12.69	PbO
Mackinawite	-79.96	-83.56	-3.60	FeS
Maghemite	-0.22	6.17	6.39	Fe2O3
Magnesioferrite	1.15	18.01	16.86	Fe2MgO4
Magnesite	-0.74	-8.20	-7.46	MgCO3
Magnetite	5.94	9.34	3.40	Fe3O4
Malachite	-1.95	-7.26	-5.31	Cu2 (OH) 2CO3
Manganite	-2.55	22.79	25.34	MnOOH
Massicot	-8.32	4.58	12.89	PbO
Matlockite	-7.54	-16.51	-8.97	PbClF
Melanothallite	-19.51	-13.26	6.26	CuCl2
Melanterite	-11.48	-13.68	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.54	-97.63	-45.09	HgS
Mg (OH) 2 (active)	-6.95	11.84	18.79	Mg (OH) 2
Mg (VO3) 2	-15.95	-4.67	11.28	Mg (VO3) 2
Mg2Sb3	-277.30	-202.62	74.68	Mg2Sb3
Mg2V2O7	-19.19	7.17	26.36	Mg2V2O7
MgCr2O4	-7.01	9.19	16.20	MgCr2O4
MgCrO4	-23.41	-18.03	5.38	MgCrO4
MgF2	-2.55	-10.68	-8.13	MgF2
MgMoO4	-6.79	-8.64	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.40	-2.34	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.57	-12.77	-1.20	MgSeO4 : 6H2O
Minium	-33.91	39.61	73.52	Pb3O4
Mirabilite	-5.34	-6.45	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.57	-6.67	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.98	-55.70	-5.71	Mn2 (SO4) 3

Mn2Sb	-151.33	-90.25	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.32	-0.82	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.52	-9.80	2.72	MnCl2:4H2O
MnS (grn)	-77.06	-76.89	0.17	MnS
MnS (pnk)	-80.23	-76.89	3.34	MnS
MnSb	-96.66	-99.57	-2.91	MnSb
MnSe	-40.63	-37.13	3.50	MnSe
MnSeO3	-5.47	-4.34	1.13	MnSeO3
MnSeO3:2H2O	-5.32	-4.34	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.71	-14.76	-2.05	MnSeO4:5H2O
MnSO4	-9.59	-7.01	2.58	MnSO4
Monteponite	-9.19	5.91	15.10	CdO
Montroydite	-7.26	-10.90	-3.64	HgO
MoO3	-12.49	-20.49	-8.00	MoO3
Morenosite	-7.62	-9.76	-2.14	NiSO4:7H2O
MoS2	-149.57	-219.83	-70.26	MoS2
Na-Jarosite	-8.06	-19.26	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.45	-49.35	-9.90	Na2Cr2O7
Na2CrO4	-22.40	-19.47	2.93	Na2CrO4
Na2Mo2O7	-13.97	-30.57	-16.60	Na2Mo2O7
Na2MoO4	-11.57	-10.08	1.49	Na2MoO4
Na2MoO4:2H2O	-11.30	-10.08	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.08	-3.78	10.30	Na2SeO3:5H2O
Na2SeO4	-15.48	-14.20	1.28	Na2SeO4
Na3Sb	-175.84	-81.39	94.45	Na3Sb
Na3VO4	-29.33	7.35	36.68	Na3VO4
Na4V2O7	-33.10	4.30	37.40	Na4V2O7
Nantokite	-6.95	-13.68	-6.73	CuCl
NaSb	-89.08	-65.92	23.17	NaSb
Natron	-8.33	-9.64	-1.31	Na2CO3:10H2O
NaVO3	-6.91	-3.05	3.86	NaVO3
Nesquehonite	-3.53	-8.20	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.70	7.10	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-24.76	-9.06	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-20.46	11.54	32.00	Ni4 (OH) 6SO4
NiCO3	-6.08	-12.95	-6.87	NiCO3
NiMoO4	-2.25	-13.39	-11.14	NiMoO4
NiS (alpha)	-74.03	-79.63	-5.60	NiS
NiS (beta)	-68.53	-79.63	-11.10	NiS
NiS (gamma)	-66.83	-79.63	-12.80	NiS
NiSe	-22.18	-39.88	-17.70	NiSe
NiSeO3:2H2O	-9.90	-7.08	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.99	-17.51	-1.52	NiSeO4:6H2O
Nsutite	-7.12	10.38	17.50	MnO2
O2 (g)	-31.32	51.77	83.09	O2
Orpiment	-243.45	-304.51	-61.07	As2S3
Otavite	-2.13	-14.13	-12.00	CdCO3
Pb (BO2) 2	-10.84	-4.32	6.52	Pb (BO2) 2
Pb (OH) 2	-3.57	4.58	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-65.74	-74.50	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.47	-0.67	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.04	9.15	26.19	Pb2O (OH) 2
Pb2O3	-26.00	35.04	61.04	Pb2O3
Pb2OCO3	-10.33	-10.89	-0.56	Pb2OCO3
Pb2V2O7	-5.46	-7.36	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-22.42	-16.62	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-8.92	-2.78	6.14	Pb3 (VO4) 2
Pb3O2CO3	-17.34	-6.32	11.02	Pb3O2CO3
Pb3O2SO4	-13.81	-3.13	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-19.65	1.45	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-20.43	1.45	21.88	Pb4O3SO4
PbCrO4	-12.70	-25.30	-12.60	PbCrO4
PbF2	-10.51	-17.95	-7.44	PbF2
Pbmetal	-25.55	-21.31	4.25	Pb
PbMoO4	-0.29	-15.91	-15.62	PbMoO4
PbO:0.3H2O	-8.40	4.58	12.98	PbO:0.33H2O
PbSeO4	-13.19	-20.03	-6.84	PbSeO4
Periclase	-9.74	11.84	21.58	MgO

Phosgenite	-10.73	-30.54	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-19.14	30.46	49.60	PbO ₂
Portlandite	-11.18	11.62	22.80	Ca(OH) ₂
Pyrite	-125.90	-144.40	-18.51	FeS ₂
Pyrochroite	-5.35	9.85	15.19	Mn(OH) ₂
Pyrolusite	-5.65	35.73	41.38	MnO ₂
Realgar	-102.09	-121.83	-19.75	AsS
Retgersite	-7.72	-9.76	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.38	-10.20	-10.58	MnCO ₃
Rutherfordine	-4.29	-18.79	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-12.24	-19.35	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-16.22	-12.82	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-25.89	-35.56	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-111.87	-179.63	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-59.15	-77.41	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-59.51	-77.41	-17.90	Sb ₄ O ₆
SbCl ₃	-49.40	-48.83	0.57	SbCl ₃
SbF ₃	-42.91	-53.14	-10.23	SbF ₃
Sbmetal	-46.49	-58.18	-11.69	Sb
SbO ₂	-2.90	-30.72	-27.82	SbO ₂
Schoepite	-4.74	1.25	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-13.98	-21.09	-7.11	Se
Semetal(hex)	-13.38	-21.09	-7.71	Se
Senarmontite	-26.34	-38.70	-12.37	Sb ₂ O ₃
SeO ₂	-14.31	-14.18	0.12	SeO ₂
SeO ₃	-45.65	-24.61	21.04	SeO ₃
Siderite	-6.63	-16.87	-10.24	FeCO ₃
Smithsonite	-1.23	-11.23	-10.00	ZnCO ₃
Sphalerite	-66.47	-77.92	-11.45	ZnS
Spinel	-5.78	31.07	36.85	MgAl ₂ O ₄
Stibnite	-248.44	-298.90	-50.46	Sb ₂ S ₃
Sulfur	-58.70	-60.85	-2.14	S
Tenorite	-1.25	6.39	7.64	CuO
Thenardite	-6.77	-6.45	0.32	Na ₂ SO ₄
Thermonatrite	-10.27	-9.64	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-6.46	-2.38	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-15.56	5.53	21.08	U ₃ O ₈
U ₃ Sb ₄	-586.64	-434.25	152.38	U ₃ Sb ₄
U ₄ O ₉	-32.75	-35.77	-3.02	U ₄ O ₉
UF ₄	-30.92	-60.46	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-27.74	-60.46	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.35	-15.41	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.55	-29.40	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.25	-29.40	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.79	-29.40	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.45	-29.40	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.36	1.25	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-21.10	-23.35	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.45	1.25	7.70	UO ₃
Uraninite	-10.74	-15.41	-4.67	UO ₂
USb ₂	-222.33	-192.75	29.58	USb ₂
V(OH) ₃	-19.13	-11.54	7.59	V(OH) ₃
V ₂ O ₅	-15.15	-16.51	-1.36	V ₂ O ₅
V ₃ O ₅	-40.60	-38.77	1.84	V ₃ O ₅
V ₄ O ₇	-50.25	-43.06	7.19	V ₄ O ₇
V ₆ O ₁₃	-40.44	-101.30	-60.86	V ₆ O ₁₃
Valentinite	-30.22	-38.70	-8.48	Sb ₂ O ₃
VCl ₂	-63.01	-44.13	18.87	VCl ₂
VCl ₃	-64.45	-41.01	23.43	VCl ₃
VF ₄	-64.27	-49.34	14.93	VF ₄
Vmetal	-94.39	-50.37	44.03	V
VO	-39.24	-24.48	14.76	VO
VO(OH) ₂	-9.45	-4.29	5.15	VO(OH) ₂
VO ₂ Cl	-20.92	-18.08	2.84	VO ₂ Cl
VOC ₁	-32.52	-21.36	11.15	VOC ₁
VOC ₁₂	-36.70	-23.94	12.76	VOC ₁₂
VOSO ₄	-24.76	-21.15	3.61	VOSO ₄
Witherite	-4.02	-12.59	-8.57	BaCO ₃

Wurtzite	-68.97	-77.92	-8.95	ZnS
Zincite	-2.52	8.82	11.33	ZnO
Zincosite	-11.97	-8.04	3.93	ZnSO4
Zn(BO2)2	-8.37	-0.08	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.16	-21.84	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.39	8.81	12.20	Zn(OH)2
Zn(OH)2(am)	-3.66	8.81	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.94	8.81	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.72	8.81	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.92	8.81	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.73	0.77	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.39	7.81	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.55	-3.90	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.18	-7.27	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-10.00	18.40	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-14.07	24.43	38.50	Zn5(OH)8Cl2
ZnCl2	-17.88	-10.83	7.05	ZnCl2
ZnCO3:1H2O	-0.97	-11.23	-10.26	ZnCO3:1H2O
ZnF2	-13.17	-13.71	-0.53	ZnF2
Znmetal	-42.86	-17.07	25.79	Zn
ZnMoO4	-1.55	-11.67	-10.13	ZnMoO4
ZnO(active)	-2.37	8.82	11.19	ZnO
ZnS(am)	-68.86	-77.92	-9.05	ZnS
ZnSb	-86.26	-75.25	11.01	ZnSb
ZnSe	-23.76	-38.16	-14.40	ZnSe
ZnSeO4:6H2O	-14.27	-15.79	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.40	-8.04	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 31.

```

Title Evaporate Stage 1 lake water to produce initial Stage 2 Lake water
REACTION 105
      H2O      -1
      6.43 moles      ## Removes x m3 water, but solute mass remains the same
USE solution 111
Save Solution 112
END

```

TITLE

Evaporate Stage 1 lake water to produce initial Stage 2 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 111. Solution after simulation 30.
Using reaction 105.

Reaction 105.

6.430e+00 moles of the following reaction have been added:

Reactant	Relative moles
----------	-------------------

H2O -1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	4.167e-08	3.686e-08
Al	2.313e-06	2.047e-06
As	5.562e-10	4.921e-10
B	4.036e-05	3.571e-05
Ba	2.048e-07	1.811e-07
C	5.608e-03	4.962e-03
Ca	4.599e-03	4.069e-03
Cd	1.047e-08	9.262e-09
Cl	3.813e-03	3.373e-03
Co	1.287e-07	1.139e-07
Cr	4.402e-09	3.894e-09
Cu	1.868e-07	1.652e-07
F	1.736e-04	1.536e-04
Fe	2.665e-09	2.358e-09
Hg	2.805e-09	2.481e-09
K	4.923e-03	4.356e-03
Mg	7.045e-03	6.232e-03
Mn	8.486e-05	7.508e-05
Mo	2.743e-06	2.427e-06
N	6.053e-06	5.355e-06
Na	1.210e-02	1.071e-02
Ni	1.568e-07	1.387e-07
Pb	2.281e-09	2.018e-09
S	1.568e-02	1.387e-02
Sb	3.853e-08	3.408e-08
Se	2.056e-07	1.819e-07
U	5.300e-07	4.689e-07
V	8.272e-09	7.318e-09
Zn	7.895e-06	6.985e-06

-----Description of solution-----

	pH =	7.263	Charge balance
	pe =	5.681	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	5.176e-02	
	Mass of water (kg) =	8.847e-01	
	Total alkalinity (eq/kg) =	5.151e-03	
	Total CO2 (mol/kg) =	5.608e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	6.333e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	4	
	Total H =	9.822157e+01	
	Total O =	4.917855e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.281e-07	1.845e-07	-6.642	-6.734	-0.092	(0)
H+	6.655e-08	5.452e-08	-7.177	-7.263	-0.087	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	4.167e-08					
AgCl	2.653e-08	2.653e-08	-7.576	-7.576	0.000	(0)

	AgCl2-	9.428e-09	7.217e-09	-8.026	-8.142	-0.116	(0)
	Ag+	5.079e-09	4.161e-09	-8.294	-8.381	-0.087	(0)
	AgSO4-	5.635e-10	4.313e-10	-9.249	-9.365	-0.116	(0)
	AgCl3-2	5.850e-11	2.009e-11	-10.233	-10.697	-0.464	(0)
	AgNO2	4.130e-12	4.130e-12	-11.384	-11.384	0.000	(0)
	AgCl4-3	1.419e-12	1.281e-13	-11.848	-12.892	-1.044	(0)
	AgF	1.174e-12	1.174e-12	-11.931	-11.931	0.000	(0)
	AgOH	7.678e-14	7.678e-14	-13.115	-13.115	0.000	(0)
	AgSeO3-	3.449e-14	2.641e-14	-13.462	-13.578	-0.116	(0)
	AgH2BO3	2.824e-14	2.824e-14	-13.549	-13.549	0.000	(0)
	AgNH3+	1.141e-14	8.735e-15	-13.943	-14.059	-0.116	(0)
	Ag2Se	5.495e-15	5.495e-15	-14.260	-14.260	0.000	(0)
	Ag (NO2) 2-	3.970e-17	3.039e-17	-16.401	-16.517	-0.116	(0)
	AgNO3	3.265e-17	3.265e-17	-16.486	-16.486	0.000	(0)
	Ag (OH) 2-	1.809e-18	1.385e-18	-17.743	-17.859	-0.116	(0)
	Ag (NH3) 2+	9.536e-20	7.300e-20	-19.021	-19.137	-0.116	(0)
	Ag (SeO3) 2-3	2.586e-20	2.335e-21	-19.587	-20.632	-1.044	(0)
	Ag2MoO4	8.089e-24	8.089e-24	-23.092	-23.092	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.006	-74.006	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.589	-86.445	-1.857	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-149.230	-149.346	-0.116	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-149.347	-149.566	-0.219	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-151.347	-151.742	-0.395	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-151.679	-152.053	-0.374	(0)
Al		2.313e-06					
	Al (OH) 4-	2.110e-06	1.728e-06	-5.676	-5.762	-0.087	(0)
	Al (OH) 3	7.437e-08	7.437e-08	-7.129	-7.129	0.000	(0)
	AlF3	5.298e-08	5.298e-08	-7.276	-7.276	0.000	(0)
	AlF2+	4.533e-08	3.748e-08	-7.344	-7.426	-0.083	(0)
	Al (OH) 2+	2.443e-08	2.020e-08	-7.612	-7.695	-0.083	(0)
	AlF4-	3.641e-09	2.981e-09	-8.439	-8.526	-0.087	(0)
	AlF+2	1.795e-09	8.384e-10	-8.746	-9.077	-0.331	(0)
	AlOH+2	2.951e-10	1.378e-10	-9.530	-9.861	-0.331	(0)
	AlSO4+	3.678e-11	3.011e-11	-10.434	-10.521	-0.087	(0)
	Al+3	4.494e-12	7.466e-13	-11.347	-12.127	-0.780	(0)
	Al (SO4) 2-	2.048e-12	1.677e-12	-11.689	-11.776	-0.087	(0)
	AlMo6O21-3	7.573e-36	6.838e-37	-35.121	-36.165	-1.044	(0)
As (3)		7.620e-23					
	H3AsO3	7.528e-23	7.528e-23	-22.123	-22.123	0.000	(0)
	H2AsO3-	9.251e-25	7.082e-25	-24.034	-24.150	-0.116	(0)
	HAsO3-2	3.449e-29	1.185e-29	-28.462	-28.926	-0.464	(0)
	H4AsO3+	2.656e-30	2.033e-30	-29.576	-29.692	-0.116	(0)
	AsO3-3	9.277e-35	8.376e-36	-34.033	-35.077	-1.044	(0)
As (5)		5.562e-10					
	HAsO4-2	4.547e-10	1.562e-10	-9.342	-9.806	-0.464	(0)
	H2AsO4-	1.014e-10	7.764e-11	-9.994	-10.110	-0.116	(0)
	AsO4-3	1.003e-13	9.058e-15	-12.999	-14.043	-1.044	(0)
	H3AsO4	7.268e-16	7.355e-16	-15.139	-15.133	0.005	(0)
B		4.036e-05					
	H3BO3	3.973e-05	4.021e-05	-4.401	-4.396	0.005	(0)
	H2BO3-	5.365e-07	4.283e-07	-6.270	-6.368	-0.098	(0)
	MgH2BO3+	4.051e-08	3.234e-08	-7.392	-7.490	-0.098	(0)
	CaH2BO3+	4.048e-08	3.232e-08	-7.393	-7.491	-0.098	(0)
	NaH2BO3	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
	BF (OH) 3-	2.256e-09	1.802e-09	-8.647	-8.744	-0.098	(0)
	H5 (BO3) 2-	1.836e-11	1.466e-11	-10.736	-10.834	-0.098	(0)
	BaH2BO3+	1.497e-12	1.195e-12	-11.825	-11.923	-0.098	(0)
	BF2 (OH) 2-	1.478e-12	1.180e-12	-11.830	-11.928	-0.098	(0)
	H8 (BO3) 3-	7.382e-14	5.894e-14	-13.132	-13.230	-0.098	(0)
	AgH2BO3	2.824e-14	2.824e-14	-13.549	-13.549	0.000	(0)
	BF3OH-	3.523e-18	2.812e-18	-17.453	-17.551	-0.098	(0)
	BF4-	1.062e-22	8.478e-23	-21.974	-22.072	-0.098	(0)
Ba		2.048e-07					
	Ba+2	2.004e-07	9.027e-08	-6.698	-7.044	-0.346	(0)
	BaHCO3+	4.150e-09	3.451e-09	-8.382	-8.462	-0.080	(0)
	BaCO3	1.594e-10	1.594e-10	-9.798	-9.798	0.000	(0)
	BaH2BO3+	1.497e-12	1.195e-12	-11.825	-11.923	-0.098	(0)
	BaOH+	8.833e-14	7.272e-14	-13.054	-13.138	-0.084	(0)

BaNO3+	5.838e-15	4.470e-15	-14.234	-14.350	-0.116	(0)
BaNH3+2	1.705e-16	5.856e-17	-15.768	-16.232	-0.464	(0)
C (4)	5.608e-03					
HCO3-	4.842e-03	4.003e-03	-2.315	-2.398	-0.083	(0)
H2CO3	4.908e-04	4.908e-04	-3.309	-3.309	0.000	(0)
CaHCO3+	1.175e-04	9.773e-05	-3.930	-4.010	-0.080	(0)
MgHCO3+	1.096e-04	8.921e-05	-3.960	-4.050	-0.089	(0)
NaHCO3	2.167e-05	2.167e-05	-4.664	-4.664	0.000	(0)
CO3-2	7.644e-06	3.442e-06	-5.117	-5.463	-0.346	(0)
CaCO3	7.153e-06	7.153e-06	-5.145	-5.145	0.000	(0)
MgCO3	6.236e-06	6.236e-06	-5.205	-5.205	0.000	(0)
MnHCO3+	2.088e-06	1.719e-06	-5.680	-5.765	-0.084	(0)
NaCO3-	7.466e-07	6.172e-07	-6.127	-6.210	-0.083	(0)
UO2 (CO3) 3-4	4.288e-07	5.965e-09	-6.368	-8.224	-1.857	(0)
ZnCO3	4.000e-07	4.000e-07	-6.398	-6.398	0.000	(0)
ZnHCO3+	3.339e-07	2.556e-07	-6.476	-6.592	-0.116	(0)
CuCO3	1.495e-07	1.495e-07	-6.825	-6.825	0.000	(0)
UO2 (CO3) 2-2	1.007e-07	3.457e-08	-6.997	-7.461	-0.464	(0)
NiHCO3+	2.497e-08	1.912e-08	-7.603	-7.719	-0.116	(0)
CoHCO3+	1.180e-08	9.034e-09	-7.928	-8.044	-0.116	(0)
NiCO3	4.974e-09	4.974e-09	-8.303	-8.303	0.000	(0)
BaHCO3+	4.150e-09	3.451e-09	-8.382	-8.462	-0.080	(0)
Cu (CO3) 2-2	4.033e-09	1.385e-09	-8.394	-8.859	-0.464	(0)
CuHCO3+	2.433e-09	1.863e-09	-8.614	-8.730	-0.116	(0)
CoCO3	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
PbCO3	1.163e-09	1.163e-09	-8.934	-8.934	0.000	(0)
UO2CO3	5.034e-10	5.034e-10	-9.298	-9.298	0.000	(0)
PbHCO3+	4.366e-10	3.342e-10	-9.360	-9.476	-0.116	(0)
CdCO3	1.966e-10	1.966e-10	-9.706	-9.706	0.000	(0)
BaCO3	1.594e-10	1.594e-10	-9.798	-9.798	0.000	(0)
Pb (CO3) 2-2	3.361e-11	1.154e-11	-10.473	-10.938	-0.464	(0)
CdHCO3+	2.983e-11	2.284e-11	-10.525	-10.641	-0.116	(0)
Cd (CO3) 2-2	1.461e-12	5.017e-13	-11.835	-12.300	-0.464	(0)
FeHCO3+	2.979e-13	2.477e-13	-12.526	-12.606	-0.080	(0)
HgCO3	2.724e-13	2.724e-13	-12.565	-12.565	0.000	(0)
Hg (CO3) 2-2	8.635e-15	2.965e-15	-14.064	-14.528	-0.464	(0)
HgHCO3+	3.613e-16	2.766e-16	-15.442	-15.558	-0.116	(0)
Ca	4.599e-03					
Ca+2	2.911e-03	1.311e-03	-2.536	-2.882	-0.346	(0)
CaSO4	1.561e-03	1.561e-03	-2.807	-2.807	0.000	(0)
CaHCO3+	1.175e-04	9.773e-05	-3.930	-4.010	-0.080	(0)
CaCO3	7.153e-06	7.153e-06	-5.145	-5.145	0.000	(0)
CaF+	1.952e-06	1.607e-06	-5.710	-5.794	-0.084	(0)
CaH2BO3+	4.048e-08	3.232e-08	-7.393	-7.491	-0.098	(0)
CaOH+	5.806e-09	4.828e-09	-8.236	-8.316	-0.080	(0)
CaNO3+	5.351e-11	4.096e-11	-10.272	-10.388	-0.116	(0)
CaNH3+2	4.942e-12	1.697e-12	-11.306	-11.770	-0.464	(0)
Ca (NH3) 2+2	2.023e-21	6.947e-22	-20.694	-21.158	-0.464	(0)
Cd	1.047e-08					
Cd+2	5.564e-09	2.506e-09	-8.255	-8.601	-0.346	(0)
CdSO4	3.052e-09	3.052e-09	-8.515	-8.515	0.000	(0)
CdCl+	9.763e-10	7.474e-10	-9.010	-9.126	-0.116	(0)
Cd (SO4) 2-2	6.229e-10	2.139e-10	-9.206	-9.670	-0.464	(0)
CdCO3	1.966e-10	1.966e-10	-9.706	-9.706	0.000	(0)
CdHCO3+	2.983e-11	2.284e-11	-10.525	-10.641	-0.116	(0)
CdCl2	9.731e-12	9.731e-12	-11.012	-11.012	0.000	(0)
CdF+	5.825e-12	4.459e-12	-11.235	-11.351	-0.116	(0)
CdOHC1	5.658e-12	5.658e-12	-11.247	-11.247	0.000	(0)
CdOH+	4.798e-12	3.673e-12	-11.319	-11.435	-0.116	(0)
Cd (CO3) 2-2	1.461e-12	5.017e-13	-11.835	-12.300	-0.464	(0)
CdCl3-	2.505e-14	1.918e-14	-13.601	-13.717	-0.116	(0)
Cd (OH) 2	4.277e-15	4.277e-15	-14.369	-14.369	0.000	(0)
CdF2	9.990e-16	9.990e-16	-15.000	-15.000	0.000	(0)
CdNO3+	1.023e-16	7.828e-17	-15.990	-16.106	-0.116	(0)
CdSeO4	4.400e-17	4.400e-17	-16.357	-16.357	0.000	(0)
Cd (SeO3) 2-2	5.864e-19	2.014e-19	-18.232	-18.696	-0.464	(0)
Cd2OH+3	5.109e-19	4.613e-20	-18.292	-19.336	-1.044	(0)
Cd (OH) 3-	6.299e-20	4.822e-20	-19.201	-19.317	-0.116	(0)

	Cd(NO3)2	3.876e-25	3.876e-25	-24.412	-24.412	0.000	(0)
	Cd(OH)4-2	4.241e-27	1.457e-27	-26.373	-26.837	-0.464	(0)
	CdHS+	0.000e+00	0.000e+00	-79.917	-80.033	-0.116	(0)
	Cd(HS)2	0.000e+00	0.000e+00	-152.268	-152.268	0.000	(0)
	Cd(HS)3-	0.000e+00	0.000e+00	-229.692	-229.808	-0.116	(0)
	Cd(HS)4-2	0.000e+00	0.000e+00	-306.587	-307.051	-0.464	(0)
Cl		3.813e-03					
	Cl-	3.813e-03	3.123e-03	-2.419	-2.505	-0.087	(0)
	MnCl+	1.028e-07	8.461e-08	-6.988	-7.073	-0.084	(0)
	AgCl	2.653e-08	2.653e-08	-7.576	-7.576	0.000	(0)
	ZnCl+	1.946e-08	1.584e-08	-7.711	-7.800	-0.089	(0)
	AgCl2-	9.428e-09	7.217e-09	-8.026	-8.142	-0.116	(0)
	ZnOHCl	3.827e-09	3.827e-09	-8.417	-8.417	0.000	(0)
	CdCl+	9.763e-10	7.474e-10	-9.010	-9.126	-0.116	(0)
	CoCl+	4.095e-10	3.135e-10	-9.388	-9.504	-0.116	(0)
	NiCl+	4.043e-10	3.095e-10	-9.393	-9.509	-0.116	(0)
	MnCl2	3.733e-10	3.733e-10	-9.428	-9.428	0.000	(0)
	ZnCl2	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)
	HgClOH	6.731e-11	6.731e-11	-10.172	-10.172	0.000	(0)
	HgCl2	6.451e-11	6.451e-11	-10.190	-10.190	0.000	(0)
	AgCl3-2	5.850e-11	2.009e-11	-10.233	-10.697	-0.464	(0)
	CuCl+	4.485e-11	3.651e-11	-10.348	-10.438	-0.089	(0)
	CuCl	2.963e-11	2.963e-11	-10.528	-10.528	0.000	(0)
	CuCl2-	2.375e-11	1.933e-11	-10.624	-10.714	-0.089	(0)
	PbCl+	1.627e-11	1.245e-11	-10.789	-10.905	-0.116	(0)
	CdCl2	9.731e-12	9.731e-12	-11.012	-11.012	0.000	(0)
	CdOHCl	5.658e-12	5.658e-12	-11.247	-11.247	0.000	(0)
	HgCl3-	2.632e-12	2.015e-12	-11.580	-11.696	-0.116	(0)
	AgCl4-3	1.419e-12	1.281e-13	-11.848	-12.892	-1.044	(0)
	MnCl3-	3.901e-13	3.211e-13	-12.409	-12.493	-0.084	(0)
	ZnCl3-	2.390e-13	1.946e-13	-12.622	-12.711	-0.089	(0)
	PbCl2	1.737e-13	1.737e-13	-12.760	-12.760	0.000	(0)
	HgCl4-2	7.295e-14	2.505e-14	-13.137	-13.601	-0.464	(0)
	CuCl2	3.954e-14	3.954e-14	-13.403	-13.403	0.000	(0)
	CuCl3-2	2.811e-14	1.291e-14	-13.551	-13.889	-0.338	(0)
	CdCl3-	2.505e-14	1.918e-14	-13.601	-13.717	-0.116	(0)
	HgCl+	5.383e-15	4.121e-15	-14.269	-14.385	-0.116	(0)
	NiCl2	4.868e-15	4.868e-15	-14.313	-14.313	0.000	(0)
	ZnCl4-2	6.615e-16	3.038e-16	-15.179	-15.517	-0.338	(0)
	CrCl+2	3.657e-16	1.256e-16	-15.437	-15.901	-0.464	(0)
	PbCl3-	2.822e-16	2.160e-16	-15.549	-15.665	-0.116	(0)
	UO2Cl+	2.431e-16	1.861e-16	-15.614	-15.730	-0.116	(0)
	CuCl3-	1.416e-18	1.152e-18	-17.849	-17.938	-0.089	(0)
	CrOHCl2	1.376e-18	1.376e-18	-17.861	-17.861	0.000	(0)
	PbCl4-2	8.980e-19	3.084e-19	-18.047	-18.511	-0.464	(0)
	CrCl2+	4.863e-20	3.722e-20	-19.313	-19.429	-0.116	(0)
	FeCl+2	4.496e-20	2.065e-20	-19.347	-19.685	-0.338	(0)
	VOC1+	1.937e-21	1.483e-21	-20.713	-20.829	-0.116	(0)
	FeCl2+	3.499e-22	2.881e-22	-21.456	-21.540	-0.084	(0)
	CuCl4-2	3.928e-23	1.804e-23	-22.406	-22.744	-0.338	(0)
	CrO3Cl-	1.226e-25	9.388e-26	-24.911	-25.027	-0.116	(0)
	FeCl3	8.998e-26	8.998e-26	-25.046	-25.046	0.000	(0)
	CoCl+2	1.025e-34	3.519e-35	-33.989	-34.454	-0.464	(0)
	UCl+3	0.000e+00	0.000e+00	-44.394	-45.439	-1.044	(0)
	Co(NH3)5Cl+2	0.000e+00	0.000e+00	-52.976	-53.440	-0.464	(0)
	Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-55.374	-55.838	-0.464	(0)
	Co(NH3)6Cl+2	0.000e+00	0.000e+00	-68.679	-69.143	-0.464	(0)
Co(2)		1.287e-07					
	Co+2	8.448e-08	2.901e-08	-7.073	-7.537	-0.464	(0)
	CoSO4	3.008e-08	3.008e-08	-7.522	-7.522	0.000	(0)
	CoHCO3+	1.180e-08	9.034e-09	-7.928	-8.044	-0.116	(0)
	CoCO3	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
	CoCl+	4.095e-10	3.135e-10	-9.388	-9.504	-0.116	(0)
	CoOH+	1.396e-10	1.068e-10	-9.855	-9.971	-0.116	(0)
	CoF+	1.346e-10	1.030e-10	-9.871	-9.987	-0.116	(0)
	Co(OH)2	1.566e-12	1.566e-12	-11.805	-11.805	0.000	(0)
	CoNO2+	1.269e-12	9.713e-13	-11.897	-12.013	-0.116	(0)
	Co(NH3)+2	1.044e-14	3.587e-15	-13.981	-14.445	-0.464	(0)

CoSeO4	1.371e-15	1.371e-15	-14.863	-14.863	0.000	(0)
CoNO3+	5.934e-16	4.543e-16	-15.227	-15.343	-0.116	(0)
Co (OH) 3-	7.533e-18	5.766e-18	-17.123	-17.239	-0.116	(0)
CoOOH-	1.892e-18	1.448e-18	-17.723	-17.839	-0.116	(0)
Co2OH+3	1.721e-18	1.553e-19	-17.764	-18.809	-1.044	(0)
Co (NH3) 2+2	4.581e-22	1.573e-22	-21.339	-21.803	-0.464	(0)
Co (NO3) 2	9.132e-24	9.132e-24	-23.039	-23.039	0.000	(0)
Co (OH) 4-2	4.911e-25	1.687e-25	-24.309	-24.773	-0.464	(0)
Co (NH3) 3+2	5.929e-30	2.036e-30	-29.227	-29.691	-0.464	(0)
Co4 (OH) 4+4	1.868e-30	2.599e-32	-29.729	-31.585	-1.857	(0)
Co (NH3) 4+2	3.200e-38	1.099e-38	-37.495	-37.959	-0.464	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.263	-46.727	-0.464	(0)
Co (3)	1.512e-28					
CoOH+2	1.512e-28	5.193e-29	-27.820	-28.285	-0.464	(0)
Co+3	3.333e-34	5.537e-35	-33.477	-34.257	-0.780	(0)
CoCl+2	1.025e-34	3.519e-35	-33.989	-34.454	-0.464	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.976	-53.440	-0.464	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.881	-63.997	-0.116	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.679	-69.143	-0.464	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-68.708	-69.172	-0.464	(0)
Cr (2)	4.509e-26					
Cr+2	4.509e-26	1.548e-26	-25.346	-25.810	-0.464	(0)
Cr (3)	4.402e-09					
Cr (OH) 2+	3.680e-09	2.817e-09	-8.434	-8.550	-0.116	(0)
Cr (OH) +2	3.653e-10	1.255e-10	-9.437	-9.901	-0.464	(0)
Cr (OH) 3	1.953e-10	1.953e-10	-9.709	-9.709	0.000	(0)
CrOHSO4	1.547e-10	1.547e-10	-9.811	-9.811	0.000	(0)
CrO2-	2.224e-12	1.703e-12	-11.653	-11.769	-0.116	(0)
Cr (OH) 4-	1.874e-12	1.435e-12	-11.727	-11.843	-0.116	(0)
CrF+2	1.610e-12	5.530e-13	-11.793	-12.257	-0.464	(0)
CrSO4+	4.925e-13	3.770e-13	-12.308	-12.424	-0.116	(0)
Cr+3	3.442e-13	3.107e-14	-12.463	-13.508	-1.044	(0)
CrCl+2	3.657e-16	1.256e-16	-15.437	-15.901	-0.464	(0)
Cr2 (OH) 2SO4+2	5.108e-18	1.754e-18	-17.292	-17.756	-0.464	(0)
CrOHC12	1.376e-18	1.376e-18	-17.861	-17.861	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.414e-19	5.414e-19	-18.266	-18.266	0.000	(0)
CrCl2+	4.863e-20	3.722e-20	-19.313	-19.429	-0.116	(0)
CrNO3+2	3.907e-23	1.342e-23	-22.408	-22.872	-0.464	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.345	-44.809	-0.464	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.391	-54.435	-1.044	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.374	-55.838	-0.464	(0)
Cr (6)	1.257e-15					
CrO4-2	1.103e-15	4.965e-16	-14.958	-15.304	-0.346	(0)
HCrO4-	1.144e-16	8.760e-17	-15.941	-16.058	-0.116	(0)
NaCrO4-	3.104e-17	2.376e-17	-16.508	-16.624	-0.116	(0)
KCrO4-	9.377e-18	7.179e-18	-17.028	-17.144	-0.116	(0)
CrO3SO4-2	2.202e-23	7.564e-24	-22.657	-23.121	-0.464	(0)
H2CrO4	3.871e-24	3.871e-24	-23.412	-23.412	0.000	(0)
CrO3Cl-	1.226e-25	9.388e-26	-24.911	-25.027	-0.116	(0)
Cr2O7-2	7.753e-31	2.663e-31	-30.111	-30.575	-0.464	(0)
Cu (1)	6.325e-11					
CuCl	2.963e-11	2.963e-11	-10.528	-10.528	0.000	(0)
CuCl2-	2.375e-11	1.933e-11	-10.624	-10.714	-0.089	(0)
Cu+	9.843e-12	7.535e-12	-11.007	-11.123	-0.116	(0)
CuCl3-2	2.811e-14	1.291e-14	-13.551	-13.889	-0.338	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.701	-152.085	-0.384	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.451	-152.815	-0.364	(0)
Cu (2)	1.867e-07					
CuCO3	1.495e-07	1.495e-07	-6.825	-6.825	0.000	(0)
Cu+2	1.638e-08	7.376e-09	-7.786	-8.132	-0.346	(0)
CuSO4	8.779e-09	8.779e-09	-8.057	-8.057	0.000	(0)
CuOH+	5.287e-09	4.304e-09	-8.277	-8.366	-0.089	(0)
Cu (CO3) 2-2	4.033e-09	1.385e-09	-8.394	-8.859	-0.464	(0)
CuHCO3+	2.433e-09	1.863e-09	-8.614	-8.730	-0.116	(0)
Cu (OH) 2	1.585e-10	1.585e-10	-9.800	-9.800	0.000	(0)
CuF+	6.826e-11	5.225e-11	-10.166	-10.282	-0.116	(0)
CuCl+	4.485e-11	3.651e-11	-10.348	-10.438	-0.089	(0)
CuNO2+	4.793e-12	3.669e-12	-11.319	-11.435	-0.116	(0)

	Cu ₂ (OH) 2+2	1.355e-12	4.654e-13	-11.868	-12.332	-0.464	(0)
	CuNH ₃ +2	2.260e-13	7.760e-14	-12.646	-13.110	-0.464	(0)
	Cu(OH) 3-	7.837e-14	5.999e-14	-13.106	-13.222	-0.116	(0)
	CuCl ₂	3.954e-14	3.954e-14	-13.403	-13.403	0.000	(0)
	CuNO ₃ +	3.010e-16	2.304e-16	-15.521	-15.637	-0.116	(0)
	Cu(NO ₂) 2	1.784e-16	1.784e-16	-15.749	-15.749	0.000	(0)
	CuCl ₃ -	1.416e-18	1.152e-18	-17.849	-17.938	-0.089	(0)
	Cu(OH) 4-2	2.537e-19	8.714e-20	-18.596	-19.060	-0.464	(0)
	CuCl ₄ -2	3.928e-23	1.804e-23	-22.406	-22.744	-0.338	(0)
	Cu(NO ₃) 2	2.866e-25	2.866e-25	-24.543	-24.543	0.000	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-220.436	-220.552	-0.116	(0)
F		1.736e-04					
	F-	1.371e-04	1.123e-04	-3.863	-3.950	-0.087	(0)
	MgF+	3.351e-05	2.744e-05	-4.475	-4.562	-0.087	(0)
	CaF+	1.952e-06	1.607e-06	-5.710	-5.794	-0.084	(0)
	NaF	6.822e-07	6.822e-07	-6.166	-6.166	0.000	(0)
	MnF+	1.168e-07	9.619e-08	-6.932	-7.017	-0.084	(0)
	AlF ₃	5.298e-08	5.298e-08	-7.276	-7.276	0.000	(0)
	AlF ₂ +	4.533e-08	3.748e-08	-7.344	-7.426	-0.083	(0)
	HF	9.054e-09	9.054e-09	-8.043	-8.043	0.000	(0)
	ZnF+	5.910e-09	4.524e-09	-8.228	-8.344	-0.116	(0)
	AlF ₄ -	3.641e-09	2.981e-09	-8.439	-8.526	-0.087	(0)
	BF(OH) 3-	2.256e-09	1.802e-09	-8.647	-8.744	-0.098	(0)
	AlF+2	1.795e-09	8.384e-10	-8.746	-9.077	-0.331	(0)
	NiF+	1.427e-10	1.093e-10	-9.846	-9.962	-0.116	(0)
	CoF+	1.346e-10	1.030e-10	-9.871	-9.987	-0.116	(0)
	CuF+	6.826e-11	5.225e-11	-10.166	-10.282	-0.116	(0)
	CdF+	5.825e-12	4.459e-12	-11.235	-11.351	-0.116	(0)
	HF ₂ -	4.777e-12	3.865e-12	-11.321	-11.413	-0.092	(0)
	CrF+2	1.610e-12	5.530e-13	-11.793	-12.257	-0.464	(0)
	BF ₂ (OH) 2-	1.478e-12	1.180e-12	-11.830	-11.928	-0.098	(0)
	AgF	1.174e-12	1.174e-12	-11.931	-11.931	0.000	(0)
	PbF+	1.162e-12	8.892e-13	-11.935	-12.051	-0.116	(0)
	UO ₂ F+	7.437e-13	5.694e-13	-12.129	-12.245	-0.116	(0)
	UO ₂ F ₂	1.844e-13	1.844e-13	-12.734	-12.734	0.000	(0)
	UO ₂ F ₃ -	6.793e-15	5.200e-15	-14.168	-14.284	-0.116	(0)
	PbF ₂	1.965e-15	1.965e-15	-14.707	-14.707	0.000	(0)
	CdF ₂	9.990e-16	9.990e-16	-15.000	-15.000	0.000	(0)
	H ₂ F ₂	2.196e-16	2.196e-16	-15.658	-15.658	0.000	(0)
	FeF ₂ +	9.838e-17	8.099e-17	-16.007	-16.092	-0.084	(0)
	VO ₂ F	6.715e-17	6.715e-17	-16.173	-16.173	0.000	(0)
	FeF+2	5.868e-17	2.695e-17	-16.231	-16.569	-0.338	(0)
	UO ₂ F ₄ -2	1.351e-17	4.638e-18	-16.869	-17.334	-0.464	(0)
	FeF ₃	1.283e-17	1.283e-17	-16.892	-16.892	0.000	(0)
	VO ₂ F ₂ -	3.576e-18	2.738e-18	-17.447	-17.563	-0.116	(0)
	BF ₃ OH-	3.523e-18	2.812e-18	-17.453	-17.551	-0.098	(0)
	PbF ₃ -	5.466e-19	4.185e-19	-18.262	-18.378	-0.116	(0)
	VOF+	1.489e-19	1.140e-19	-18.827	-18.943	-0.116	(0)
	VO ₂ F ₃ -2	1.116e-20	3.834e-21	-19.952	-20.416	-0.464	(0)
	VOF ₂	4.798e-21	4.798e-21	-20.319	-20.319	0.000	(0)
	HgF+	3.596e-22	2.752e-22	-21.444	-21.560	-0.116	(0)
	BF ₄ -	1.062e-22	8.478e-23	-21.974	-22.072	-0.098	(0)
	PbF ₄ -2	6.548e-23	2.249e-23	-22.184	-22.648	-0.464	(0)
	VOF ₃ -	2.497e-23	1.912e-23	-22.603	-22.719	-0.116	(0)
	VO ₂ F ₄ -3	2.346e-24	2.118e-25	-23.630	-24.674	-1.044	(0)
	Sb(OH) 2F	4.748e-25	4.748e-25	-24.324	-24.324	0.000	(0)
	SbOF	4.672e-25	4.672e-25	-24.330	-24.330	0.000	(0)
	VOF ₄ -2	2.523e-26	8.665e-27	-25.598	-26.062	-0.464	(0)
	UF ₃ +	1.712e-35	1.311e-35	-34.766	-34.882	-0.116	(0)
	UF ₂ +2	2.145e-36	7.365e-37	-35.669	-36.133	-0.464	(0)
	UF ₄	1.614e-37	1.614e-37	-36.792	-36.792	0.000	(0)
	UF+3	5.771e-39	5.210e-40	-38.239	-39.283	-1.044	(0)
	UF ₅ -	9.380e-40	7.181e-40	-39.028	-39.144	-0.116	(0)
	UF ₆ -2	0.000e+00	0.000e+00	-40.149	-40.614	-0.464	(0)
Fe(2)		2.093e-11					
	Fe+2	1.431e-11	4.916e-12	-10.844	-11.308	-0.464	(0)
	FeSO ₄	6.270e-12	6.270e-12	-11.203	-11.203	0.000	(0)
	FeHCO ₃ +	2.979e-13	2.477e-13	-12.526	-12.606	-0.080	(0)

FeOH+	4.387e-14	3.612e-14	-13.358	-13.442	-0.084	(0)
Fe (OH) 2	5.294e-18	5.294e-18	-17.276	-17.276	0.000	(0)
Fe (OH) 3-	3.753e-19	3.090e-19	-18.426	-18.510	-0.084	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.238	-161.238	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.524	-238.640	-0.116	(0)
Fe (3)	2.645e-09					
Fe (OH) 2+	2.266e-09	1.873e-09	-8.645	-8.727	-0.083	(0)
Fe (OH) 3	3.712e-10	3.712e-10	-9.430	-9.430	0.000	(0)
Fe (OH) 4-	7.716e-12	6.378e-12	-11.113	-11.195	-0.083	(0)
FeOH+2	5.679e-14	2.609e-14	-13.246	-13.584	-0.338	(0)
FeF2+	9.838e-17	8.099e-17	-16.007	-16.092	-0.084	(0)
FeF+2	5.868e-17	2.695e-17	-16.231	-16.569	-0.338	(0)
FeSO4+	1.550e-17	1.276e-17	-16.810	-16.894	-0.084	(0)
FeF3	1.283e-17	1.283e-17	-16.892	-16.892	0.000	(0)
Fe (SO4) 2-	1.852e-18	1.418e-18	-17.732	-17.848	-0.116	(0)
Fe+3	1.318e-18	2.189e-19	-17.880	-18.660	-0.780	(0)
FeCl+2	4.496e-20	2.065e-20	-19.347	-19.685	-0.338	(0)
FeCl2+	3.499e-22	2.881e-22	-21.456	-21.540	-0.084	(0)
FeHSeO3+2	2.278e-22	7.823e-23	-21.642	-22.107	-0.464	(0)
Fe2 (OH) 2+4	1.620e-24	2.253e-26	-23.791	-25.647	-1.857	(0)
FeCl3	8.998e-26	8.998e-26	-25.046	-25.046	0.000	(0)
FeNO3+2	6.298e-26	2.163e-26	-25.201	-25.665	-0.464	(0)
Fe3 (OH) 4+5	4.856e-31	6.100e-34	-30.314	-33.215	-2.901	(0)
H (0)	1.809e-29					
H2	9.047e-30	9.156e-30	-29.043	-29.038	0.005	(0)
Hg (0)	2.656e-09					
Hg	2.656e-09	2.656e-09	-8.576	-8.576	0.000	(0)
Hg (1)	6.944e-19					
Hg2+2	3.472e-19	1.192e-19	-18.459	-18.924	-0.464	(0)
Hg (2)	1.489e-10					
HgClOH	6.731e-11	6.731e-11	-10.172	-10.172	0.000	(0)
HgCl2	6.451e-11	6.451e-11	-10.190	-10.190	0.000	(0)
Hg (OH) 2	1.404e-11	1.421e-11	-10.853	-10.847	0.005	(0)
HgCl3-	2.632e-12	2.015e-12	-11.580	-11.696	-0.116	(0)
HgCO3	2.724e-13	2.724e-13	-12.565	-12.565	0.000	(0)
HgCl4-2	7.295e-14	2.505e-14	-13.137	-13.601	-0.464	(0)
Hg (CO3) 2-2	8.635e-15	2.965e-15	-14.064	-14.528	-0.464	(0)
HgCl+	5.383e-15	4.121e-15	-14.269	-14.385	-0.116	(0)
HgOH+	6.347e-16	4.858e-16	-15.197	-15.314	-0.116	(0)
HgHCO3+	3.613e-16	2.766e-16	-15.442	-15.558	-0.116	(0)
Hg (OH) 3-	4.313e-19	3.301e-19	-18.365	-18.481	-0.116	(0)
Hg+2	1.926e-19	6.613e-20	-18.715	-19.180	-0.464	(0)
Hg (NH3) 2+2	1.284e-19	4.411e-20	-18.891	-19.355	-0.464	(0)
HgNH3+2	1.249e-19	4.290e-20	-18.903	-19.368	-0.464	(0)
HgSO4	8.996e-20	8.996e-20	-19.046	-19.046	0.000	(0)
HgF+	3.596e-22	2.752e-22	-21.444	-21.560	-0.116	(0)
Hg (NH3) 3+2	5.258e-28	1.806e-28	-27.279	-27.743	-0.464	(0)
HgNO3+	3.151e-28	2.412e-28	-27.502	-27.618	-0.116	(0)
Hg (NH3) 4+2	4.294e-36	1.475e-36	-35.367	-35.831	-0.464	(0)
Hg (NO3) 2	9.905e-37	9.905e-37	-36.004	-36.004	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.751	-138.867	-0.116	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.737	-139.737	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.848	-140.312	-0.464	(0)
K	4.923e-03					
K+	4.750e-03	3.891e-03	-2.323	-2.410	-0.087	(0)
KSO4-	1.732e-04	1.431e-04	-3.762	-3.844	-0.083	(0)
KCrO4-	9.377e-18	7.179e-18	-17.028	-17.144	-0.116	(0)
Mg	7.045e-03					
Mg+2	4.836e-03	2.178e-03	-2.316	-2.662	-0.346	(0)
MgSO4	2.059e-03	2.059e-03	-2.686	-2.686	0.000	(0)
MgHCO3+	1.096e-04	8.921e-05	-3.960	-4.050	-0.089	(0)
MgF+	3.351e-05	2.744e-05	-4.475	-4.562	-0.087	(0)
MgCO3	6.236e-06	6.236e-06	-5.205	-5.205	0.000	(0)
MgOH+	1.915e-07	1.600e-07	-6.718	-6.796	-0.078	(0)
MgH2BO3+	4.051e-08	3.234e-08	-7.392	-7.490	-0.098	(0)
Mn (2)	8.486e-05					
Mn+2	6.266e-05	2.152e-05	-4.203	-4.667	-0.464	(0)
MnSO4	1.988e-05	1.988e-05	-4.702	-4.702	0.000	(0)

MnHCO3+	2.088e-06	1.719e-06	-5.680	-5.765	-0.084	(0)
MnF+	1.168e-07	9.619e-08	-6.932	-7.017	-0.084	(0)
MnCl+	1.028e-07	8.461e-08	-6.988	-7.073	-0.084	(0)
MnOH+	1.212e-08	9.975e-09	-7.917	-8.001	-0.084	(0)
MnCl2	3.733e-10	3.733e-10	-9.428	-9.428	0.000	(0)
MnSeO4	5.461e-13	5.461e-13	-12.263	-12.263	0.000	(0)
MnNO3+	4.401e-13	3.369e-13	-12.356	-12.472	-0.116	(0)
MnCl3-	3.901e-13	3.211e-13	-12.409	-12.493	-0.084	(0)
Mn (OH) 3-	2.550e-18	2.100e-18	-17.593	-17.678	-0.084	(0)
Mn (NO3) 2	8.361e-21	8.361e-21	-20.078	-20.078	0.000	(0)
Mn (OH) 4-2	2.723e-24	1.251e-24	-23.565	-23.903	-0.338	(0)
MnSe	0.000e+00	0.000e+00	-42.461	-42.461	0.000	(0)
Mn (3)	2.773e-24					
Mn+3	2.773e-24	4.608e-25	-23.557	-24.336	-0.780	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.922	-42.260	-0.338	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.857	-45.951	-0.095	(0)
Mo	2.743e-06					
MoO4-2	2.741e-06	1.235e-06	-5.562	-5.908	-0.346	(0)
HMoO4-	1.749e-09	1.339e-09	-8.757	-8.873	-0.116	(0)
H2MoO4	5.348e-13	5.348e-13	-12.272	-12.272	0.000	(0)
Ag2MoO4	8.089e-24	8.089e-24	-23.092	-23.092	0.000	(0)
AlMo6O21-3	7.573e-36	6.838e-37	-35.121	-36.165	-1.044	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.298	-46.476	-4.177	(0)
HMo7O24-5	0.000e+00	0.000e+00	-44.451	-47.352	-2.901	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-47.977	-49.834	-1.857	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-52.807	-53.851	-1.044	(0)
N (-3)	1.308e-07					
NH4+	1.231e-07	9.831e-08	-6.910	-7.007	-0.098	(0)
NH4SO4-	6.649e-09	5.474e-09	-8.177	-8.262	-0.084	(0)
NH3	1.028e-09	1.028e-09	-8.988	-8.988	0.000	(0)
CaNH3+2	4.942e-12	1.697e-12	-11.306	-11.770	-0.464	(0)
CuNH3+2	2.260e-13	7.760e-14	-12.646	-13.110	-0.464	(0)
NiNH3+2	6.228e-14	2.139e-14	-13.206	-13.670	-0.464	(0)
AgNH3+	1.141e-14	8.735e-15	-13.943	-14.059	-0.116	(0)
Co (NH3) +2	1.044e-14	3.587e-15	-13.981	-14.445	-0.464	(0)
BaNH3+2	1.705e-16	5.856e-17	-15.768	-16.232	-0.464	(0)
Hg (NH3) 2+2	1.284e-19	4.411e-20	-18.891	-19.355	-0.464	(0)
HgNH3+2	1.249e-19	4.290e-20	-18.903	-19.368	-0.464	(0)
Ag (NH3) 2+	9.536e-20	7.300e-20	-19.021	-19.137	-0.116	(0)
Ni (NH3) 2+2	9.256e-21	3.179e-21	-20.034	-20.498	-0.464	(0)
Ca (NH3) 2+2	2.023e-21	6.947e-22	-20.694	-21.158	-0.464	(0)
Co (NH3) 2+2	4.581e-22	1.573e-22	-21.339	-21.803	-0.464	(0)
Hg (NH3) 3+2	5.258e-28	1.806e-28	-27.279	-27.743	-0.464	(0)
Co (NH3) 3+2	5.929e-30	2.036e-30	-29.227	-29.691	-0.464	(0)
Hg (NH3) 4+2	4.294e-36	1.475e-36	-35.367	-35.831	-0.464	(0)
Co (NH3) 4+2	3.200e-38	1.099e-38	-37.495	-37.959	-0.464	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.345	-44.809	-0.464	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.263	-46.727	-0.464	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.976	-53.440	-0.464	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.391	-54.435	-1.044	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.374	-55.838	-0.464	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.881	-63.997	-0.116	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.679	-69.143	-0.464	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-68.708	-69.172	-0.464	(0)
N (3)	5.910e-06					
NO2-	5.910e-06	4.751e-06	-5.228	-5.323	-0.095	(0)
CuNO2+	4.793e-12	3.669e-12	-11.319	-11.435	-0.116	(0)
AgNO2	4.130e-12	4.130e-12	-11.384	-11.384	0.000	(0)
CoNO2+	1.269e-12	9.713e-13	-11.897	-12.013	-0.116	(0)
Cu (NO2) 2	1.784e-16	1.784e-16	-15.749	-15.749	0.000	(0)
Ag (NO2) 2-	3.970e-17	3.039e-17	-16.401	-16.517	-0.116	(0)
N (5)	1.211e-08					
NO3-	1.206e-08	9.879e-09	-7.919	-8.005	-0.087	(0)
CaNO3+	5.351e-11	4.096e-11	-10.272	-10.388	-0.116	(0)
MnNO3+	4.401e-13	3.369e-13	-12.356	-12.472	-0.116	(0)
ZnNO3+	6.546e-14	5.011e-14	-13.184	-13.300	-0.116	(0)

BaNO3+	5.838e-15	4.470e-15	-14.234	-14.350	-0.116	(0)
NiNO3+	1.256e-15	9.612e-16	-14.901	-15.017	-0.116	(0)
CoNO3+	5.934e-16	4.543e-16	-15.227	-15.343	-0.116	(0)
CuNO3+	3.010e-16	2.304e-16	-15.521	-15.637	-0.116	(0)
CdNO3+	1.023e-16	7.828e-17	-15.990	-16.106	-0.116	(0)
AgNO3	3.265e-17	3.265e-17	-16.486	-16.486	0.000	(0)
PbNO3+	2.145e-17	1.642e-17	-16.669	-16.785	-0.116	(0)
Mn (NO3) 2	8.361e-21	8.361e-21	-20.078	-20.078	0.000	(0)
UO2NO3+	9.458e-22	7.241e-22	-21.024	-21.140	-0.116	(0)
Zn (NO3) 2	9.877e-23	9.877e-23	-22.005	-22.005	0.000	(0)
CrNO3+2	3.907e-23	1.342e-23	-22.408	-22.872	-0.464	(0)
Co (NO3) 2	9.132e-24	9.132e-24	-23.039	-23.039	0.000	(0)
VO2NO3	1.704e-24	1.704e-24	-23.769	-23.769	0.000	(0)
Cd (NO3) 2	3.876e-25	3.876e-25	-24.412	-24.412	0.000	(0)
Cu (NO3) 2	2.866e-25	2.866e-25	-24.543	-24.543	0.000	(0)
Pb (NO3) 2	2.755e-25	2.755e-25	-24.560	-24.560	0.000	(0)
FeNO3+2	6.298e-26	2.163e-26	-25.201	-25.665	-0.464	(0)
HgNO3+	3.151e-28	2.412e-28	-27.502	-27.618	-0.116	(0)
Hg (NO3) 2	9.905e-37	9.905e-37	-36.004	-36.004	0.000	(0)
Na	1.210e-02					
Na+	1.175e-02	9.629e-03	-1.930	-2.016	-0.087	(0)
NaSO4-	3.250e-04	2.687e-04	-3.488	-3.571	-0.083	(0)
NaHCO3	2.167e-05	2.167e-05	-4.664	-4.664	0.000	(0)
NaCO3-	7.466e-07	6.172e-07	-6.127	-6.210	-0.083	(0)
NaF	6.822e-07	6.822e-07	-6.166	-6.166	0.000	(0)
NaH2BO3	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
NaCrO4-	3.104e-17	2.376e-17	-16.508	-16.624	-0.116	(0)
Ni	1.568e-07					
Ni+2	8.601e-08	3.873e-08	-7.065	-7.412	-0.346	(0)
NiSO4	4.016e-08	4.016e-08	-7.396	-7.396	0.000	(0)
NiHCO3+	2.497e-08	1.912e-08	-7.603	-7.719	-0.116	(0)
NiCO3	4.974e-09	4.974e-09	-8.303	-8.303	0.000	(0)
NiCl+	4.043e-10	3.095e-10	-9.393	-9.509	-0.116	(0)
NiF+	1.427e-10	1.093e-10	-9.846	-9.962	-0.116	(0)
NiOH+	1.176e-10	8.999e-11	-9.930	-10.046	-0.116	(0)
Ni (SO4) 2-2	2.012e-11	6.909e-12	-10.696	-11.161	-0.464	(0)
Ni (OH) 2	1.319e-12	1.319e-12	-11.880	-11.880	0.000	(0)
NiNH3+2	6.228e-14	2.139e-14	-13.206	-13.670	-0.464	(0)
NiCl2	4.868e-15	4.868e-15	-14.313	-14.313	0.000	(0)
NiSeO4	1.708e-15	1.708e-15	-14.767	-14.767	0.000	(0)
NiNO3+	1.256e-15	9.612e-16	-14.901	-15.017	-0.116	(0)
Ni (OH) 3-	3.180e-16	2.434e-16	-15.498	-15.614	-0.116	(0)
Ni (NH3) 2+2	9.256e-21	3.179e-21	-20.034	-20.498	-0.464	(0)
O (0)	1.193e-34					
O2	5.966e-35	6.037e-35	-34.224	-34.219	0.005	(0)
Pb	2.281e-09					
PbCO3	1.163e-09	1.163e-09	-8.934	-8.934	0.000	(0)
PbHCO3+	4.366e-10	3.342e-10	-9.360	-9.476	-0.116	(0)
PbSO4	2.860e-10	2.860e-10	-9.544	-9.544	0.000	(0)
Pb+2	2.495e-10	1.124e-10	-9.603	-9.949	-0.346	(0)
PbOH+	6.805e-11	5.209e-11	-10.167	-10.283	-0.116	(0)
Pb (CO3) 2-2	3.361e-11	1.154e-11	-10.473	-10.938	-0.464	(0)
Pb (SO4) 2-2	2.607e-11	8.954e-12	-10.584	-11.048	-0.464	(0)
PbCl+	1.627e-11	1.245e-11	-10.789	-10.905	-0.116	(0)
PbF+	1.162e-12	8.892e-13	-11.935	-12.051	-0.116	(0)
Pb (OH) 2	3.040e-13	3.040e-13	-12.517	-12.517	0.000	(0)
PbCl2	1.737e-13	1.737e-13	-12.760	-12.760	0.000	(0)
PbF2	1.965e-15	1.965e-15	-14.707	-14.707	0.000	(0)
PbCl3-	2.822e-16	2.160e-16	-15.549	-15.665	-0.116	(0)
Pb (OH) 3-	7.328e-17	5.610e-17	-16.135	-16.251	-0.116	(0)
PbNO3+	2.145e-17	1.642e-17	-16.669	-16.785	-0.116	(0)
Pb2OH+3	1.028e-18	9.278e-20	-17.988	-19.033	-1.044	(0)
PbCl4-2	8.980e-19	3.084e-19	-18.047	-18.511	-0.464	(0)
PbF3-	5.466e-19	4.185e-19	-18.262	-18.378	-0.116	(0)
Pb (OH) 4-2	7.383e-21	2.536e-21	-20.132	-20.596	-0.464	(0)
PbF4-2	6.548e-23	2.249e-23	-22.184	-22.648	-0.464	(0)
Pb3 (OH) 4+2	6.034e-25	2.072e-25	-24.219	-24.684	-0.464	(0)
Pb (NO3) 2	2.755e-25	2.755e-25	-24.560	-24.560	0.000	(0)

Pb4 (OH) 4+4	1.330e-29	1.850e-31	-28.876	-30.733	-1.857	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.559	-153.559	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.582	-231.698	-0.116	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.006	-74.006	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.324	-79.440	-0.116	(0)
H2S	0.000e+00	0.000e+00	-79.683	-79.683	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.917	-80.033	-0.116	(0)
S5-2	0.000e+00	0.000e+00	-81.077	-81.541	-0.464	(0)
S6-2	0.000e+00	0.000e+00	-81.593	-82.057	-0.464	(0)
S4-2	0.000e+00	0.000e+00	-81.673	-82.137	-0.464	(0)
S3-2	0.000e+00	0.000e+00	-82.479	-82.943	-0.464	(0)
S2-2	0.000e+00	0.000e+00	-83.495	-83.959	-0.464	(0)
S-2	0.000e+00	0.000e+00	-89.138	-89.476	-0.338	(0)
HgHS2-	0.000e+00	0.000e+00	-138.751	-138.867	-0.116	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.737	-139.737	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.848	-140.312	-0.464	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.230	-149.346	-0.116	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.347	-149.566	-0.219	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.385	-150.501	-0.116	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.347	-151.742	-0.395	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.679	-152.053	-0.374	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.701	-152.085	-0.384	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.754	-151.754	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.268	-152.268	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.451	-152.815	-0.364	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.559	-153.559	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.238	-161.238	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.436	-220.552	-0.116	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.798	-227.914	-0.116	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-229.692	-229.808	-0.116	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.166	-230.630	-0.464	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.582	-231.698	-0.116	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.524	-238.640	-0.116	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-306.587	-307.051	-0.464	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-308.349	-308.813	-0.464	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.039	-321.503	-0.464	(0)
S (6)	1.568e-02					
SO4-2	1.154e-02	5.196e-03	-1.938	-2.284	-0.346	(0)
MgSO4	2.059e-03	2.059e-03	-2.686	-2.686	0.000	(0)
CaSO4	1.561e-03	1.561e-03	-2.807	-2.807	0.000	(0)
NaSO4-	3.250e-04	2.687e-04	-3.488	-3.571	-0.083	(0)
KSO4-	1.732e-04	1.431e-04	-3.762	-3.844	-0.083	(0)
MnSO4	1.988e-05	1.988e-05	-4.702	-4.702	0.000	(0)
ZnSO4	2.295e-06	2.295e-06	-5.639	-5.639	0.000	(0)
Zn (SO4) 2-2	3.025e-07	1.039e-07	-6.519	-6.983	-0.464	(0)
NiSO4	4.016e-08	4.016e-08	-7.396	-7.396	0.000	(0)
HSO4-	3.381e-08	2.768e-08	-7.471	-7.558	-0.087	(0)
CoSO4	3.008e-08	3.008e-08	-7.522	-7.522	0.000	(0)
CuSO4	8.779e-09	8.779e-09	-8.057	-8.057	0.000	(0)
NH4SO4-	6.649e-09	5.474e-09	-8.177	-8.262	-0.084	(0)
CdSO4	3.052e-09	3.052e-09	-8.515	-8.515	0.000	(0)
Cd (SO4) 2-2	6.229e-10	2.139e-10	-9.206	-9.670	-0.464	(0)
AgSO4-	5.635e-10	4.313e-10	-9.249	-9.365	-0.116	(0)
PbSO4	2.860e-10	2.860e-10	-9.544	-9.544	0.000	(0)
CrOHSO4	1.547e-10	1.547e-10	-9.811	-9.811	0.000	(0)
AlSO4+	3.678e-11	3.011e-11	-10.434	-10.521	-0.087	(0)
Pb (SO4) 2-2	2.607e-11	8.954e-12	-10.584	-11.048	-0.464	(0)
Ni (SO4) 2-2	2.012e-11	6.909e-12	-10.696	-11.161	-0.464	(0)
FeSO4	6.270e-12	6.270e-12	-11.203	-11.203	0.000	(0)
Al (SO4) 2-	2.048e-12	1.677e-12	-11.689	-11.776	-0.087	(0)
CrSO4+	4.925e-13	3.770e-13	-12.308	-12.424	-0.116	(0)
UO2SO4	2.889e-13	2.889e-13	-12.539	-12.539	0.000	(0)
UO2 (SO4) 2-2	5.762e-14	1.979e-14	-13.239	-13.704	-0.464	(0)
VO2SO4-	5.526e-17	4.230e-17	-16.258	-16.374	-0.116	(0)
FeSO4+	1.550e-17	1.276e-17	-16.810	-16.894	-0.084	(0)
Cr2 (OH) 2SO4+2	5.108e-18	1.754e-18	-17.292	-17.756	-0.464	(0)
Fe (SO4) 2-	1.852e-18	1.418e-18	-17.732	-17.848	-0.116	(0)

Cr2(OH)2(SO4)2	5.414e-19	5.414e-19	-18.266	-18.266	0.000	(0)
VOSO4	2.422e-19	2.422e-19	-18.616	-18.616	0.000	(0)
HgSO4	8.996e-20	8.996e-20	-19.046	-19.046	0.000	(0)
CrO3SO4-2	2.202e-23	7.564e-24	-22.657	-23.121	-0.464	(0)
VSO4+	1.671e-33	1.279e-33	-32.777	-32.893	-0.116	(0)
U(SO4)2	1.986e-39	1.986e-39	-38.702	-38.702	0.000	(0)
USO4+2	1.401e-40	0.000e+00	-39.854	-40.318	-0.464	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-63.881	-63.997	-0.116	(0)
Sb(3)	9.808e-20					
Sb(OH)3	4.961e-20	4.961e-20	-19.304	-19.304	0.000	(0)
HSbO2	4.846e-20	4.846e-20	-19.315	-19.315	0.000	(0)
SbO2-	1.881e-24	1.440e-24	-23.726	-23.842	-0.116	(0)
Sb(OH)4-	1.076e-24	8.237e-25	-23.968	-24.084	-0.116	(0)
Sb(OH)2F	4.748e-25	4.748e-25	-24.324	-24.324	0.000	(0)
SbOF	4.672e-25	4.672e-25	-24.330	-24.330	0.000	(0)
Sb(OH)2+	8.586e-26	6.573e-26	-25.066	-25.182	-0.116	(0)
SbO+	2.963e-26	2.268e-26	-25.528	-25.644	-0.116	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.039	-321.503	-0.464	(0)
Sb(5)	3.853e-08					
SbO3-	3.848e-08	2.946e-08	-7.415	-7.531	-0.116	(0)
Sb(OH)6-	4.196e-11	3.437e-11	-10.377	-10.464	-0.087	(0)
SbO2+	3.283e-23	2.513e-23	-22.484	-22.600	-0.116	(0)
Se(-2)	5.495e-15					
Ag2Se	5.495e-15	5.495e-15	-14.260	-14.260	0.000	(0)
HSe-	2.775e-40	2.124e-40	-39.557	-39.673	-0.116	(0)
MnSe	0.000e+00	0.000e+00	-42.461	-42.461	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.046	-43.046	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.945	-47.409	-0.464	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-84.589	-86.445	-1.857	(0)
Se(4)	2.054e-07					
HSeO3-	1.766e-07	1.352e-07	-6.753	-6.869	-0.116	(0)
SeO3-2	2.875e-08	9.875e-09	-7.541	-8.005	-0.464	(0)
H2SeO3	3.145e-12	3.145e-12	-11.502	-11.502	0.000	(0)
AgSeO3-	3.449e-14	2.641e-14	-13.462	-13.578	-0.116	(0)
Cd(SeO3)2-2	5.864e-19	2.014e-19	-18.232	-18.696	-0.464	(0)
Ag(SeO3)2-3	2.586e-20	2.335e-21	-19.587	-20.632	-1.044	(0)
FeHSeO3+2	2.278e-22	7.823e-23	-21.642	-22.107	-0.464	(0)
Se(6)	2.100e-10					
SeO4-2	2.094e-10	9.430e-11	-9.679	-10.026	-0.346	(0)
MnSeO4	5.461e-13	5.461e-13	-12.263	-12.263	0.000	(0)
ZnSeO4	2.949e-14	2.949e-14	-13.530	-13.530	0.000	(0)
NiSeO4	1.708e-15	1.708e-15	-14.767	-14.767	0.000	(0)
CoSeO4	1.371e-15	1.371e-15	-14.863	-14.863	0.000	(0)
HSeO4-	3.366e-16	2.576e-16	-15.473	-15.589	-0.116	(0)
CdSeO4	4.400e-17	4.400e-17	-16.357	-16.357	0.000	(0)
Zn(SeO4)2-2	8.210e-24	2.820e-24	-23.086	-23.550	-0.464	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.066	-59.110	-1.044	(0)
U(4)	4.774e-22					
U(OH)5-	4.765e-22	3.648e-22	-21.322	-21.438	-0.116	(0)
U(OH)4	8.336e-25	8.336e-25	-24.079	-24.079	0.000	(0)
U(OH)3+	2.172e-28	1.663e-28	-27.663	-27.779	-0.116	(0)
U(OH)2+2	1.222e-32	4.195e-33	-31.913	-32.377	-0.464	(0)
UF3+	1.712e-35	1.311e-35	-34.766	-34.882	-0.116	(0)
UF2+2	2.145e-36	7.365e-37	-35.669	-36.133	-0.464	(0)
UF4	1.614e-37	1.614e-37	-36.792	-36.792	0.000	(0)
UOH+3	1.194e-37	1.078e-38	-36.923	-37.967	-1.044	(0)
UF+3	5.771e-39	5.210e-40	-38.239	-39.283	-1.044	(0)
U(SO4)2	1.986e-39	1.986e-39	-38.702	-38.702	0.000	(0)
UF5-	9.380e-40	7.181e-40	-39.028	-39.144	-0.116	(0)
USO4+2	1.401e-40	0.000e+00	-39.854	-40.318	-0.464	(0)
UF6-2	0.000e+00	0.000e+00	-40.149	-40.614	-0.464	(0)
U+4	0.000e+00	0.000e+00	-42.777	-44.633	-1.857	(0)
UCl+3	0.000e+00	0.000e+00	-44.394	-45.439	-1.044	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-166.610	-176.009	-9.399	(0)
U(5)	6.101e-17					
UO2+	6.101e-17	4.671e-17	-16.215	-16.331	-0.116	(0)
U(6)	5.300e-07					

UO2 (CO3) 3-4	4.288e-07	5.965e-09	-6.368	-8.224	-1.857	(0)
UO2 (CO3) 2-2	1.007e-07	3.457e-08	-6.997	-7.461	-0.464	(0)
UO2CO3	5.034e-10	5.034e-10	-9.298	-9.298	0.000	(0)
UO2OH+	1.115e-12	8.534e-13	-11.953	-12.069	-0.116	(0)
UO2F+	7.437e-13	5.694e-13	-12.129	-12.245	-0.116	(0)
UO2SO4	2.889e-13	2.889e-13	-12.539	-12.539	0.000	(0)
UO2F2	1.844e-13	1.844e-13	-12.734	-12.734	0.000	(0)
UO2+2	8.156e-14	3.673e-14	-13.088	-13.435	-0.346	(0)
UO2 (SO4) 2-2	5.762e-14	1.979e-14	-13.239	-13.704	-0.464	(0)
UO2F3-	6.793e-15	5.200e-15	-14.168	-14.284	-0.116	(0)
UO2Cl+	2.431e-16	1.861e-16	-15.614	-15.730	-0.116	(0)
UO2F4-2	1.351e-17	4.638e-18	-16.869	-17.334	-0.464	(0)
(UO2) 2 (OH) 2+2	3.519e-18	1.209e-18	-17.454	-17.918	-0.464	(0)
(UO2) 3 (OH) 5+	3.481e-20	2.665e-20	-19.458	-19.574	-0.116	(0)
UO2NO3+	9.458e-22	7.241e-22	-21.024	-21.140	-0.116	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.381	-42.497	-0.116	(0)
V+2	0.000e+00	0.000e+00	-42.809	-43.274	-0.464	(0)
V (3)	2.644e-15					
V (OH) 3	2.644e-15	2.644e-15	-14.578	-14.578	0.000	(0)
V (OH) 2+	1.217e-25	9.319e-26	-24.915	-25.031	-0.116	(0)
VOH+2	1.404e-28	4.823e-29	-27.853	-28.317	-0.464	(0)
V+3	5.775e-33	5.214e-34	-32.238	-33.283	-1.044	(0)
VSO4+	1.671e-33	1.279e-33	-32.777	-32.893	-0.116	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.851	-54.895	-1.044	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.977	-55.833	-1.857	(0)
V (4)	9.023e-18					
V (OH) 3+	8.132e-18	6.226e-18	-17.090	-17.206	-0.116	(0)
VO+2	4.927e-19	1.692e-19	-18.307	-18.772	-0.464	(0)
VOSO4	2.422e-19	2.422e-19	-18.616	-18.616	0.000	(0)
VOF+	1.489e-19	1.140e-19	-18.827	-18.943	-0.116	(0)
VOF2	4.798e-21	4.798e-21	-20.319	-20.319	0.000	(0)
VOC1+	1.937e-21	1.483e-21	-20.713	-20.829	-0.116	(0)
VOF3-	2.497e-23	1.912e-23	-22.603	-22.719	-0.116	(0)
VOF4-2	2.523e-26	8.665e-27	-25.598	-26.062	-0.464	(0)
H2V2O4+2	5.666e-30	1.946e-30	-29.247	-29.711	-0.464	(0)
V (5)	8.272e-09					
H2VO4-	7.498e-09	5.740e-09	-8.125	-8.241	-0.116	(0)
HVO4-2	7.701e-10	2.645e-10	-9.113	-9.578	-0.464	(0)
H3VO4	3.129e-12	3.129e-12	-11.505	-11.505	0.000	(0)
H3V2O7-	1.516e-13	1.161e-13	-12.819	-12.935	-0.116	(0)
HV2O7-3	5.702e-15	5.148e-16	-14.244	-15.288	-1.044	(0)
VO2+	4.162e-16	3.410e-16	-15.381	-15.467	-0.087	(0)
VO4-3	2.693e-16	2.431e-17	-15.570	-16.614	-1.044	(0)
VO2F	6.715e-17	6.715e-17	-16.173	-16.173	0.000	(0)
VO2SO4-	5.526e-17	4.230e-17	-16.258	-16.374	-0.116	(0)
V2O7-4	1.827e-17	2.542e-19	-16.738	-18.595	-1.857	(0)
VO2F2-	3.576e-18	2.738e-18	-17.447	-17.563	-0.116	(0)
V3O9-3	2.199e-18	1.985e-19	-17.658	-18.702	-1.044	(0)
VO2F3-2	1.116e-20	3.834e-21	-19.952	-20.416	-0.464	(0)
V4O12-4	3.418e-23	4.754e-25	-22.466	-24.323	-1.857	(0)
VO2F4-3	2.346e-24	2.118e-25	-23.630	-24.674	-1.044	(0)
VO2NO3	1.704e-24	1.704e-24	-23.769	-23.769	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-58.377	-62.555	-4.177	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.730	-61.631	-2.901	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.831	-63.687	-1.857	(0)
Zn	7.895e-06					
Zn+2	4.484e-06	2.019e-06	-5.348	-5.695	-0.346	(0)
ZnSO4	2.295e-06	2.295e-06	-5.639	-5.639	0.000	(0)
ZnCO3	4.000e-07	4.000e-07	-6.398	-6.398	0.000	(0)
ZnHCO3+	3.339e-07	2.556e-07	-6.476	-6.592	-0.116	(0)
Zn (SO4) 2-2	3.025e-07	1.039e-07	-6.519	-6.983	-0.464	(0)
ZnOH+	4.868e-08	3.726e-08	-7.313	-7.429	-0.116	(0)
ZnCl+	1.946e-08	1.584e-08	-7.711	-7.800	-0.089	(0)
ZnF+	5.910e-09	4.524e-09	-8.228	-8.344	-0.116	(0)
ZnOHCl	3.827e-09	3.827e-09	-8.417	-8.417	0.000	(0)
Zn (OH) 2	1.090e-09	1.090e-09	-8.963	-8.963	0.000	(0)
ZnCl2	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)

Zn(OH) 3-	1.317e-12	1.008e-12	-11.880	-11.996	-0.116	(0)
ZnCl3-	2.390e-13	1.946e-13	-12.622	-12.711	-0.089	(0)
ZnNO3+	6.546e-14	5.011e-14	-13.184	-13.300	-0.116	(0)
ZnSeO4	2.949e-14	2.949e-14	-13.530	-13.530	0.000	(0)
ZnCl4-2	6.615e-16	3.038e-16	-15.179	-15.517	-0.338	(0)
Zn(OH) 4-2	2.157e-17	7.406e-18	-16.666	-17.130	-0.464	(0)
Zn(NO3) 2	9.877e-23	9.877e-23	-22.005	-22.005	0.000	(0)
Zn(SeO4) 2-2	8.210e-24	2.820e-24	-23.086	-23.550	-0.464	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.385	-150.501	-0.116	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.754	-151.754	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.798	-227.914	-0.116	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-230.166	-230.630	-0.464	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-308.349	-308.813	-0.464	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-57.78	-51.49	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-45.00	-40.49	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-52.23	-40.49	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-74.67	-56.74	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-60.27	-40.24	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-29.72	-29.32	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.49	-24.04	0.45	(NH4) 2SeO4
Acanthite	-52.72	-88.94	-36.22	Ag2S
Ag2CO3	-11.13	-22.22	-11.09	Ag2CO3
Ag2CrO4	-20.48	-32.07	-11.59	Ag2CrO4
Ag2HVO4	-11.92	-10.44	1.48	Ag2HVO4
Ag2MoO4	-11.12	-22.67	-11.55	Ag2MoO4
Ag2O	-14.81	-2.24	12.57	Ag2O
Ag2Se	-0.47	-49.17	-48.70	Ag2Se
Ag2SeO3	-9.22	-16.37	-7.15	Ag2SeO3
Ag2SeO4	-17.88	-26.79	-8.91	Ag2SeO4
Ag2SO4	-14.23	-19.05	-4.82	Ag2SO4
Ag3AsO3	-27.63	-25.48	2.16	Ag3AsO3
Ag3AsO4	-15.70	-18.49	-2.79	Ag3AsO4
Ag3H2VO5	-16.74	-11.56	5.18	Ag3H2VO5
AgF:4H2O	-13.38	-12.33	1.05	AgF:4H2O
Agmetal	-0.56	-14.06	-13.51	Ag
AgVO3	-10.09	-9.32	0.77	AgVO3
Al(OH) 3 (am)	-1.14	9.66	10.80	Al(OH) 3
Al2(MoO4) 3	-44.35	-41.98	2.37	Al2(MoO4) 3
Al2O3	-0.33	19.33	19.65	Al2O3
Al4(OH) 10SO4	-0.86	21.84	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-10.27	-5.47	4.80	AlAsO4:2H2O
AlOHSO4	-3.92	-7.15	-3.23	AlOHSO4
AlSb	-152.93	-87.30	65.62	AlSb
Alunite	1.62	0.22	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-4.44	-12.23	-7.79	PbSO4
Anhydrite	-0.81	-5.17	-4.36	CaSO4
Anilite	-59.02	-90.89	-31.88	Cu0.25Cu1.5S
Antlerite	-6.42	2.37	8.79	Cu3(OH) 4SO4
Aragonite	-0.05	-8.35	-8.30	CaCO3
Arsenolite	-85.73	-88.49	-2.76	As4O6
Artinite	-5.86	3.74	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-36.97	-30.27	6.71	As2O5
Atacamite	-4.37	3.02	7.39	Cu2(OH) 3Cl
Azurite	-3.89	-20.80	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-16.92	7.48	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-17.32	-1.44	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	1.09	-7.82	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-26.90	6.04	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-12.68	-22.35	-9.67	BaCrO4
BaF2	-9.12	-14.94	-5.82	BaF2
BaMoO4	-5.99	-12.95	-6.96	BaMoO4
Barite	0.65	-9.33	-9.98	BaSO4
BaS	-95.40	-79.22	16.18	BaS

BaSeO3	-8.48	-6.65	1.83	BaSeO3
BaSeO4	-9.61	-17.07	-7.46	BaSeO4
Bianchite	-6.22	-7.98	-1.76	ZnSO4:6H2O
Birnessite	-7.69	10.40	18.09	MnO2
Bixbyite	-4.45	-5.09	-0.64	Mn2O3
BlaubleiI	-57.56	-81.72	-24.16	Cu0.9Cu0.2S
BlaubleiII	-58.67	-85.95	-27.28	Cu0.6Cu0.8S
Boehmite	1.08	9.66	8.58	AlOOH
Breithauptite	-58.39	-76.91	-18.52	NiSb
Brochantite	-6.46	8.77	15.22	Cu4(OH)6SO4
Brucite	-4.98	11.86	16.84	Mg(OH)2
Bunsenite	-5.33	7.11	12.45	NiO
Ca(VO3)2	-10.42	-4.76	5.66	Ca(VO3)2
Ca2V2O7	-10.62	6.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.67	6.88	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.63	4.67	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.44	18.52	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.34	18.52	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-301.98	-159.00	142.97	Ca3Sb2
CaCrO4	-15.92	-18.19	-2.27	CaCrO4
Calcite	0.13	-8.35	-8.48	CaCO3
Calomel	-6.02	-23.93	-17.91	Hg2Cl2
CaMoO4	-0.84	-8.79	-7.95	CaMoO4
Carnotite	-2.49	-2.26	0.23	KUO2VO4
CaSeO3:2H2O	-5.30	-2.49	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.89	-12.91	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.70	-2.86	9.84	Cd(BO2)2
Cd(OH)2	-7.72	5.93	13.64	Cd(OH)2
Cd(OH)2(am)	-7.80	5.93	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.56	-15.85	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.60	0.96	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.51	6.89	28.40	Cd4(OH)6SO4
CdCl2	-12.95	-13.61	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.61	-1.91	CdCl2:2.5H2O
CdF2	-15.29	-16.50	-1.21	CdF2
Cdmetal(alpha)	-33.48	-19.96	13.51	Cd
Cdmetal(gamma)	-33.58	-19.96	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-7.38	-3.84	3.54	CdOHCl
CdSb	-77.75	-78.10	-0.35	CdSb
CdSe	-20.81	-41.01	-20.20	CdSe
CdSeO4:2H2O	-16.78	-18.63	-1.85	CdSeO4:2H2O
CdSO4	-10.71	-10.89	-0.17	CdSO4
CdSO4:1H2O	-9.16	-10.89	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.01	-10.89	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-2.28	-15.41	-13.13	PbCO3
CH4(g)	-82.50	-123.54	-41.05	CH4
Chalcanthite	-7.78	-10.42	-2.64	CuSO4:5H2O
Chalcocite	-59.50	-94.42	-34.92	Cu2S
Chalcopyrite	-128.52	-163.79	-35.27	CuFeS2
Cinnabar	-51.86	-97.55	-45.69	HgS
Claudetite	-85.43	-88.49	-3.06	As4O6
Clausthalite	-15.26	-42.36	-27.10	PbSe
Co(BO2)2	-28.87	-1.80	27.07	Co(BO2)2
Co(OH)2	-6.11	6.99	13.09	Co(OH)2
Co(OH)3	-10.16	-12.47	-2.31	Co(OH)3
CO2(g)	-1.84	-19.99	-18.15	CO2
Co3(AsO4)2	-22.33	-9.30	13.03	Co3(AsO4)2
Co3O4	-7.45	-17.94	-10.50	Co3O4
CoCl2	-20.82	-12.55	8.27	CoCl2
CoCl2:6H2O	-15.09	-12.55	2.54	CoCl2:6H2O
CoCO3	-3.02	-13.00	-9.98	CoCO3
CoF2	-13.84	-15.44	-1.60	CoF2
CoF3	-44.65	-46.11	-1.46	CoF3
CoFe2O4	16.78	13.25	-3.53	CoFe2O4
CoMoO4	-5.68	-13.45	-7.76	CoMoO4

CoO	-6.60	6.99	13.59	CoO
CoS (alpha)	-72.27	-79.71	-7.44	CoS
CoS (beta)	-68.64	-79.71	-11.07	CoS
CoSe	-23.75	-39.95	-16.20	CoSe
CoSeO3	-8.46	-7.14	1.32	CoSeO3
CoSeO4:6H2O	-16.04	-17.57	-1.53	CoSeO4:6H2O
CoSO4	-12.62	-9.82	2.80	CoSO4
CoSO4:6H2O	-7.35	-9.82	-2.47	CoSO4:6H2O
Cotunnite	-10.18	-14.96	-4.78	PbCl2
Covellite	-58.01	-80.31	-22.30	CuS
Cr (OH) 2	-22.10	-11.28	10.82	Cr (OH) 2
Cr (OH) 3	-2.62	-1.29	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.54	-1.29	-0.75	Cr (OH) 3
Cr2O3	-0.22	-2.57	-2.36	Cr2O3
CrCl2	-44.91	-30.82	14.09	CrCl2
CrCl3	-45.71	-30.59	15.11	CrCl3
CrF3	-23.59	-34.93	-11.34	CrF3
Crmetal	-67.65	-37.17	30.48	Cr
CrO3	-26.62	-29.83	-3.21	CrO3
Cryolite	-8.03	-41.87	-33.84	Na3AlF6
Cu (OH) 2	-2.28	6.39	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.65	19.56	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.73	-2.48	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.55	-94.43	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.86	-54.66	-45.80	Cu2Se
Cu2SO4	-22.58	-24.53	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-17.18	-11.08	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.95	-108.55	-42.59	Cu3Sb
Cu3Se2	-31.71	-95.20	-63.49	Cu3Se2
CuCO3	-2.10	-13.60	-11.50	CuCO3
CuCrO4	-18.00	-23.44	-5.44	CuCrO4
CuF	-10.17	-15.07	-4.91	CuF
CuF2	-17.15	-16.03	1.12	CuF2
CuF2:2H2O	-11.48	-16.03	-4.55	CuF2:2H2O
Cumetal	-8.05	-16.80	-8.76	Cu
CuMoO4	-0.96	-14.04	-13.08	CuMoO4
CuOCuSO4	-14.33	-4.02	10.30	CuOCuSO4
Cupricferrite	6.67	12.65	5.99	CuFe2O4
Cuprite	-6.31	-7.72	-1.41	Cu2O
Cuprousferrite	8.19	-0.73	-8.92	CuFeO2
CuSe	-7.44	-40.54	-33.10	CuSe
CuSe2	-28.22	-61.59	-33.37	CuSe2
CuSeO3:2H2O	-8.25	-7.74	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.72	-18.16	-2.44	CuSeO4:5H2O
CuSO4	-13.36	-10.42	2.94	CuSO4
Diaspore	2.79	9.66	6.87	AlOOH
Djurleite	-59.57	-93.49	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.07	-16.47	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.62	-16.47	-17.09	CaMg (CO3) 2
Epsomite	-2.82	-4.95	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.35	3.22	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.24	0.20	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.47	-13.19	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.43	-7.87	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-15.51	-36.14	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-40.44	-44.17	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.74	9.48	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.40	-12.00	0.40	FeAsO4:2H2O
FeCr2O4	-6.56	0.65	7.20	FeCr2O4
FeMoO4	-7.13	-17.22	-10.09	FeMoO4
Ferrihydrite	-0.06	3.13	3.19	Fe (OH) 3
Ferroselite	-46.17	-64.77	-18.60	FeSe2
FeS (ppt)	-80.53	-83.48	-2.95	FeS
FeSe	-32.72	-43.72	-11.00	FeSe
Fix_pe	-5.68	-5.68	0.00	e-
Fluorite	-0.28	-10.78	-10.50	CaF2
Galena	-68.16	-82.13	-13.97	PbS
Gibbsite	1.37	9.66	8.29	Al (OH) 3

Goethite	2.64	3.13	0.49	FeOOH
Goslarite	-5.97	-7.98	-2.01	ZnSO4:7H2O
Greenockite	-66.42	-80.78	-14.36	CdS
Greigite	-292.30	-337.33	-45.03	Fe3S4
Gummite	-6.58	1.09	7.67	UO3
Gypsum	-0.56	-5.17	-4.61	CaSO4:2H2O
H-Jarosite	-12.13	-24.23	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-7.56	-20.44	-12.88	H2MoO4
H2S (g)	-78.69	-86.70	-8.01	H2S
H2Se (g)	-41.98	-46.94	-4.96	H2Se
Halite	-6.12	-4.52	1.60	NaCl
Hausmannite	-5.56	55.47	61.03	Mn3O4
Hematite	7.68	6.26	-1.42	Fe2O3
Hercynite	-0.35	22.54	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.22	-257.93	-73.71	Hg (CH3) 2
Hg (g)	-7.27	-15.14	-7.87	Hg
Hg (OH) 2	-7.35	-10.85	-3.50	Hg (OH) 2
Hg2 (g)	-15.33	-30.28	-14.96	Hg2
Hg2 (OH) 2	-9.66	-4.40	5.26	Hg2 (OH) 2
Hg2CO3	-8.34	-24.39	-16.05	Hg2CO3
Hg2CrO4	-25.53	-34.23	-8.70	Hg2CrO4
Hg2F2	-16.46	-26.82	-10.36	Hg2F2
Hg2S	-79.42	-91.10	-11.68	Hg2S
Hg2SeO3	-13.87	-18.53	-4.66	Hg2SeO3
Hg2SO4	-15.08	-21.21	-6.13	Hg2SO4
Hg3O2CO3	-22.85	-52.53	-29.68	Hg3O2CO3
HgCl (g)	-31.46	-11.97	19.50	HgCl
HgCl2	-9.12	-30.38	-21.26	HgCl2
HgF (g)	-46.09	-13.41	32.68	HgF
HgF2 (g)	-45.84	-33.27	12.57	HgF2
Hgmetal (l)	-1.69	-15.14	-13.45	Hg
HgSe	-2.09	-57.78	-55.69	HgSe
HgSeO3	-12.55	-24.98	-12.43	HgSeO3
HgSO4	-18.24	-27.66	-9.42	HgSO4
Huntite	-2.75	-32.72	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.48	-26.25	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.87	-20.64	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-13.94	-19.11	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-4.58	-19.38	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.71	-49.95	-17.24	K2Cr2O7
K2CrO4	-19.61	-20.12	-0.51	K2CrO4
K2MoO4	-13.99	-10.73	3.26	K2MoO4
K2SeO4	-14.12	-14.85	-0.73	K2SeO4
Langite	-8.72	8.77	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.22	-7.66	-0.43	PbO:PbSO4
Laurionite	-5.81	-5.19	0.62	PbOHCl
Lepidocrocite	1.76	3.13	1.37	FeOOH
Lime	-21.06	11.64	32.70	CaO
Litharge	-8.12	4.58	12.69	PbO
Mackinawite	-79.88	-83.48	-3.60	FeS
Maghemite	-0.13	6.26	6.39	Fe2O3
Magnesioferrite	1.27	18.12	16.86	Fe2MgO4
Magnesite	-0.67	-8.13	-7.46	MgCO3
Magnetite	6.08	9.48	3.40	Fe3O4
Malachite	-1.90	-7.20	-5.31	Cu2 (OH) 2CO3
Manganite	-2.54	22.80	25.34	MnOOH
Massicot	-8.32	4.58	12.89	PbO
Matlockite	-7.43	-16.40	-8.97	PbClF
Melanothallite	-19.40	-13.14	6.26	CuCl2
Melanterite	-11.39	-13.60	-2.21	FeSO4:7H2O
Metacinnabar	-52.46	-97.55	-45.09	HgS
Mg (OH) 2 (active)	-6.93	11.86	18.79	Mg (OH) 2
Mg (VO3) 2	-15.82	-4.54	11.28	Mg (VO3) 2
Mg2Sb3	-277.14	-202.45	74.68	Mg2Sb3
Mg2V2O7	-19.04	7.32	26.36	Mg2V2O7
MgCr2O4	-6.91	9.29	16.20	MgCr2O4
MgCrO4	-23.35	-17.97	5.38	MgCrO4
MgF2	-2.43	-10.56	-8.13	MgF2

MgMoO4	-6.72	-8.57	-1.85	MgMoO4
MgSeO3:6H2O	-5.33	-2.27	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.49	-12.69	-1.20	MgSeO4:6H2O
Minium	-33.90	39.62	73.52	Pb3O4
Mirabilite	-5.21	-6.32	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.45	-6.55	4.90	Mn(VO3)2
Mn2(SO4)3	-49.81	-55.53	-5.71	Mn2(SO4)3
Mn2Sb	-151.27	-90.19	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.19	-0.69	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.39	-9.68	2.72	MnCl2:4H2O
MnS(grn)	-77.01	-76.84	0.17	MnS
MnS(pnk)	-80.18	-76.84	3.34	MnS
MnSb	-96.60	-99.51	-2.91	MnSb
MnSe	-40.58	-37.08	3.50	MnSe
MnSeO3	-5.40	-4.27	1.13	MnSeO3
MnSeO3:2H2O	-5.26	-4.27	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.64	-14.69	-2.05	MnSeO4:5H2O
MnSO4	-9.53	-6.95	2.58	MnSO4
Monteponite	-9.18	5.93	15.10	CdO
Montroydite	-7.21	-10.85	-3.64	HgO
MoO3	-12.44	-20.44	-8.00	MoO3
Morenosite	-7.55	-9.70	-2.14	NiSO4:7H2O
MoS2	-149.47	-219.73	-70.26	MoS2
Na-Jarosite	-7.79	-18.99	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.27	-49.17	-9.90	Na2Cr2O7
Na2CrO4	-22.27	-19.34	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-11.43	-9.94	1.49	Na2MoO4
Na2MoO4:2H2O	-11.17	-9.94	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.94	-3.64	10.30	Na2SeO3:5H2O
Na2SeO4	-15.34	-14.06	1.28	Na2SeO4
Na3Sb	-175.68	-81.23	94.45	Na3Sb
Na3VO4	-29.14	7.54	36.68	Na3VO4
Na4V2O7	-32.82	4.58	37.40	Na4V2O7
Nantokite	-6.90	-13.63	-6.73	CuCl
NaSb	-89.00	-65.83	23.17	NaSb
Natron	-8.19	-9.50	-1.31	Na2CO3:10H2O
NaVO3	-6.82	-2.96	3.86	NaVO3
Nesquehonite	-3.46	-8.13	-4.67	MgCO3:3H2O
Ni(OH)2	-5.68	7.11	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.62	-8.92	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.35	11.65	32.00	Ni4(OH)6SO4
NiCO3	-6.01	-12.88	-6.87	NiCO3
NiMoO4	-2.18	-13.32	-11.14	NiMoO4
NiS(alpha)	-73.99	-79.59	-5.60	NiS
NiS(beta)	-68.49	-79.59	-11.10	NiS
NiS(gamma)	-66.79	-79.59	-12.80	NiS
NiSe	-22.12	-39.82	-17.70	NiSe
NiSeO3:2H2O	-9.83	-7.02	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.92	-17.44	-1.52	NiSeO4:6H2O
Nsutite	-7.11	10.40	17.50	MnO2
O2(g)	-31.31	51.78	83.09	O2
Orpiment	-243.29	-304.35	-61.07	As2S3
Otavite	-2.06	-14.06	-12.00	CdCO3
Pb(BO2)2	-10.73	-4.21	6.52	Pb(BO2)2
Pb(OH)2	-3.57	4.58	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-65.41	-74.17	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.41	-0.61	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.03	9.15	26.19	Pb2O(OH)2
Pb2O3	-26.00	35.04	61.04	Pb2O3
Pb2OCO3	-10.28	-10.84	-0.56	Pb2OCO3
Pb2V2O7	-5.35	-7.25	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.33	-16.53	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.82	-2.68	6.14	Pb3(VO4)2
Pb3O2CO3	-17.28	-6.26	11.02	Pb3O2CO3
Pb3O2SO4	-13.77	-3.08	10.69	Pb3O2SO4
Pb4(OH)6SO4	-19.60	1.50	21.10	Pb4(OH)6SO4
Pb4O3SO4	-20.38	1.50	21.88	Pb4O3SO4

PbCrO4	-12.65	-25.25	-12.60	PbCrO4
PbF2	-10.41	-17.85	-7.44	PbF2
Pbmetal	-25.56	-21.31	4.25	Pb
PbMoO4	-0.24	-15.86	-15.62	PbMoO4
PbO:0.3H2O	-8.40	4.58	12.98	PbO:0.33H2O
PbSeO4	-13.13	-19.97	-6.84	PbSeO4
Periclase	-9.72	11.86	21.58	MgO
Phosgenite	-10.56	-30.37	-19.81	PbCl2:PbCO3
Plattnerite	-19.13	30.47	49.60	PbO2
Portlandite	-11.16	11.64	22.80	Ca(OH)2
Pyrite	-125.79	-144.30	-18.51	FeS2
Pyrochroite	-5.33	9.86	15.19	Mn(OH)2
Pyrolusite	-5.63	35.75	41.38	MnO2
Realgar	-102.02	-121.77	-19.75	AsS
Retgersite	-7.66	-9.70	-2.04	NiSO4:6H2O
Rhodochrosite	0.45	-10.13	-10.58	MnCO3
Rutherfordine	-4.40	-18.90	-14.50	UO2CO3
Sb(OH)3	-12.19	-19.30	-7.11	Sb(OH)3
Sb2O4	-16.12	-12.72	3.40	Sb2O4
Sb2O5	-25.78	-35.45	-9.67	Sb2O5
Sb2Se3	-111.66	-179.42	-67.76	Sb2Se3
Sb4O6(cubic)	-58.95	-77.22	-18.26	Sb4O6
Sb4O6(orth)	-59.31	-77.22	-17.90	Sb4O6
SbCl3	-49.18	-48.61	0.57	SbCl3
SbF3	-42.72	-52.94	-10.23	SbF3
Sbmetal	-46.45	-58.14	-11.69	Sb
SbO2	-2.85	-30.67	-27.82	SbO2
Schoepite	-4.90	1.09	5.99	UO2(OH)2:H2O
Semetal(am)	-13.94	-21.05	-7.11	Se
Semetal(hex)	-13.34	-21.05	-7.71	Se
Senarmontite	-26.24	-38.61	-12.37	Sb2O3
SeO2	-14.26	-14.13	0.12	SeO2
SeO3	-45.60	-24.55	21.04	SeO3
Siderite	-6.53	-16.77	-10.24	FeCO3
Smithsonite	-1.16	-11.16	-10.00	ZnCO3
Sphalerite	-66.42	-77.87	-11.45	ZnS
Spinel	-5.66	31.19	36.85	MgAl2O4
Stibnite	-248.26	-298.72	-50.46	Sb2S3
Sulfur	-58.67	-60.81	-2.14	S
Tenorite	-1.25	6.39	7.64	CuO
Thenardite	-6.64	-6.32	0.32	Na2SO4
Thermonatrite	-10.13	-9.50	0.64	Na2CO3:H2O
Tyuyamunite	-6.66	-2.58	4.08	Ca(UO2)2(VO4)2
U3O8	-16.05	5.03	21.08	U3O8
U3Sb4	-586.99	-434.61	152.38	U3Sb4
U4O9	-33.41	-36.43	-3.02	U4O9
UF4	-30.90	-60.43	-29.54	UF4
UF4:2.5H2O	-27.72	-60.43	-32.72	UF4:2.5H2O
UO2(am)	-16.51	-15.58	0.93	UO2
UO2(NO3)2	-41.59	-29.45	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.30	-29.45	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.84	-29.45	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.49	-29.45	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.52	1.09	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.21	-23.46	-2.25	UO2SeO4:4H2O
UO3	-6.61	1.09	7.70	UO3
Uraninite	-10.91	-15.58	-4.67	UO2
USb2	-222.42	-192.84	29.58	USb2
V(OH)3	-19.08	-11.49	7.59	V(OH)3
V2O5	-15.05	-16.41	-1.36	V2O5
V3O5	-40.46	-38.62	1.84	V3O5
V4O7	-50.05	-42.87	7.19	V4O7
V6O13	-40.14	-101.00	-60.86	V6O13
Valentinite	-30.13	-38.61	-8.48	Sb2O3
VC12	-62.85	-43.97	18.87	VC12
VC13	-64.23	-40.80	23.43	VC13
VF4	-64.03	-49.10	14.93	VF4
Vmetal	-94.35	-50.32	44.03	V

VO	-39.19	-24.44	14.76	VO
VO(OH)2	-9.40	-4.25	5.15	VO(OH)2
VO2Cl	-20.81	-17.97	2.84	VO2Cl
VOC1	-32.41	-21.26	11.15	VOC1
VOC12	-36.54	-23.78	12.76	VOC12
VOSO4	-24.67	-21.06	3.61	VOSO4
Witherite	-3.94	-12.51	-8.57	BaCO3
Wurtzite	-68.92	-77.87	-8.95	ZnS
Zincite	-2.50	8.83	11.33	ZnO
Zincosite	-11.91	-7.98	3.93	ZnSO4
Zn(BO2)2	-8.25	0.04	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.02	-21.71	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.37	8.83	12.20	Zn(OH)2
Zn(OH)2(am)	-3.64	8.83	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.92	8.83	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.70	8.83	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.90	8.83	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.65	0.85	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.30	7.89	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.42	-3.77	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.04	-7.13	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.88	18.52	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.88	24.62	38.50	Zn5(OH)8Cl2
ZnCl2	-17.76	-10.71	7.05	ZnCl2
ZnCO3:1H2O	-0.90	-11.16	-10.26	ZnCO3:1H2O
ZnF2	-13.06	-13.59	-0.53	ZnF2
Znmetal	-42.84	-17.06	25.79	Zn
ZnMoO4	-1.48	-11.60	-10.13	ZnMoO4
ZnO(active)	-2.36	8.83	11.19	ZnO
ZnS(am)	-68.82	-77.87	-9.05	ZnS
ZnSb	-86.21	-75.19	11.01	ZnSb
ZnSe	-23.70	-38.10	-14.40	ZnSe
ZnSeO4:6H2O	-14.20	-15.72	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.34	-7.98	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 32.

```
Title Return solution back to 1L
Mix 105
      112  1.1309
save solution 113
end
```

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 105.

Mixture 105.

1.131e+00 Solution 112 Solution after simulation 31.

-----Solution composition-----

Elements	Molality	Moles
Ag	4.167e-08	4.169e-08
Al	2.313e-06	2.314e-06
As	5.562e-10	5.565e-10
B	4.036e-05	4.038e-05
Ba	2.048e-07	2.049e-07
C	5.608e-03	5.611e-03
Ca	4.599e-03	4.601e-03
Cd	1.047e-08	1.047e-08
Cl	3.813e-03	3.815e-03
Co	1.287e-07	1.288e-07
Cr	4.402e-09	4.404e-09
Cu	1.868e-07	1.869e-07
F	1.736e-04	1.737e-04
Fe	2.665e-09	2.667e-09
Hg	2.805e-09	2.806e-09
K	4.923e-03	4.926e-03
Mg	7.045e-03	7.048e-03
Mn	8.486e-05	8.491e-05
Mo	2.743e-06	2.744e-06
N	6.053e-06	6.056e-06
Na	1.210e-02	1.211e-02
Ni	1.568e-07	1.569e-07
Pb	2.281e-09	2.282e-09
S	1.568e-02	1.569e-02
Sb	3.853e-08	3.855e-08
Se	2.056e-07	2.057e-07
U	5.300e-07	5.302e-07
V	8.272e-09	8.276e-09
Zn	7.895e-06	7.899e-06

-----Description of solution-----

	pH	=	7.263	Charge balance
	pe	=	5.681	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	5.176e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	5.151e-03	
	Total CO2 (mol/kg)	=	5.608e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.162e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110788e+02	
	Total O	=	5.561602e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.281e-07	1.845e-07	-6.642	-6.734	-0.092	(0)
H+	6.655e-08	5.452e-08	-7.177	-7.263	-0.087	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	4.167e-08					
AgCl	2.653e-08	2.653e-08	-7.576	-7.576	0.000	(0)
AgCl2-	9.428e-09	7.217e-09	-8.026	-8.142	-0.116	(0)
Ag+	5.079e-09	4.161e-09	-8.294	-8.381	-0.087	(0)
AgSO4-	5.635e-10	4.313e-10	-9.249	-9.365	-0.116	(0)
AgCl3-2	5.850e-11	2.009e-11	-10.233	-10.697	-0.464	(0)
AgNO2	4.130e-12	4.130e-12	-11.384	-11.384	0.000	(0)
AgCl4-3	1.419e-12	1.281e-13	-11.848	-12.892	-1.044	(0)

	AgF	1.174e-12	1.174e-12	-11.931	-11.931	0.000	(0)
	AgOH	7.678e-14	7.678e-14	-13.115	-13.115	0.000	(0)
	AgSeO3-	3.449e-14	2.641e-14	-13.462	-13.578	-0.116	(0)
	AgH2BO3	2.824e-14	2.824e-14	-13.549	-13.549	0.000	(0)
	AgNH3+	1.141e-14	8.735e-15	-13.943	-14.059	-0.116	(0)
	Ag2Se	5.495e-15	5.495e-15	-14.260	-14.260	0.000	(0)
	Ag (NO2) 2-	3.970e-17	3.039e-17	-16.401	-16.517	-0.116	(0)
	AgNO3	3.265e-17	3.265e-17	-16.486	-16.486	0.000	(0)
	Ag (OH) 2-	1.809e-18	1.385e-18	-17.743	-17.859	-0.116	(0)
	Ag (NH3) 2+	9.536e-20	7.300e-20	-19.021	-19.137	-0.116	(0)
	Ag (SeO3) 2-3	2.586e-20	2.335e-21	-19.587	-20.632	-1.044	(0)
	Ag2MoO4	8.089e-24	8.089e-24	-23.092	-23.092	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.006	-74.006	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.589	-86.445	-1.857	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-149.230	-149.346	-0.116	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-149.347	-149.566	-0.219	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-151.347	-151.742	-0.395	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-151.679	-152.053	-0.374	(0)
Al		2.313e-06					
	Al (OH) 4-	2.110e-06	1.728e-06	-5.676	-5.762	-0.087	(0)
	Al (OH) 3	7.437e-08	7.437e-08	-7.129	-7.129	0.000	(0)
	AlF3	5.298e-08	5.298e-08	-7.276	-7.276	0.000	(0)
	AlF2+	4.533e-08	3.748e-08	-7.344	-7.426	-0.083	(0)
	Al (OH) 2+	2.443e-08	2.020e-08	-7.612	-7.695	-0.083	(0)
	AlF4-	3.641e-09	2.981e-09	-8.439	-8.526	-0.087	(0)
	AlF+2	1.795e-09	8.384e-10	-8.746	-9.077	-0.331	(0)
	AlOH+2	2.951e-10	1.378e-10	-9.530	-9.861	-0.331	(0)
	AlSO4+	3.678e-11	3.011e-11	-10.434	-10.521	-0.087	(0)
	Al+3	4.494e-12	7.466e-13	-11.347	-12.127	-0.780	(0)
	Al (SO4) 2-	2.048e-12	1.677e-12	-11.689	-11.776	-0.087	(0)
	AlMo6O21-3	7.573e-36	6.838e-37	-35.121	-36.165	-1.044	(0)
As (3)		7.620e-23					
	H3AsO3	7.528e-23	7.528e-23	-22.123	-22.123	0.000	(0)
	H2AsO3-	9.251e-25	7.082e-25	-24.034	-24.150	-0.116	(0)
	HAsO3-2	3.449e-29	1.185e-29	-28.462	-28.926	-0.464	(0)
	H4AsO3+	2.656e-30	2.033e-30	-29.576	-29.692	-0.116	(0)
	AsO3-3	9.277e-35	8.376e-36	-34.033	-35.077	-1.044	(0)
As (5)		5.562e-10					
	HAsO4-2	4.547e-10	1.562e-10	-9.342	-9.806	-0.464	(0)
	H2AsO4-	1.014e-10	7.764e-11	-9.994	-10.110	-0.116	(0)
	AsO4-3	1.003e-13	9.058e-15	-12.999	-14.043	-1.044	(0)
	H3AsO4	7.268e-16	7.355e-16	-15.139	-15.133	0.005	(0)
B		4.036e-05					
	H3BO3	3.973e-05	4.021e-05	-4.401	-4.396	0.005	(0)
	H2BO3-	5.365e-07	4.283e-07	-6.270	-6.368	-0.098	(0)
	MgH2BO3+	4.051e-08	3.234e-08	-7.392	-7.490	-0.098	(0)
	CaH2BO3+	4.048e-08	3.232e-08	-7.393	-7.491	-0.098	(0)
	NaH2BO3	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
	BF (OH) 3-	2.256e-09	1.802e-09	-8.647	-8.744	-0.098	(0)
	H5 (BO3) 2-	1.836e-11	1.466e-11	-10.736	-10.834	-0.098	(0)
	BaH2BO3+	1.497e-12	1.195e-12	-11.825	-11.923	-0.098	(0)
	BF2 (OH) 2-	1.478e-12	1.180e-12	-11.830	-11.928	-0.098	(0)
	H8 (BO3) 3-	7.382e-14	5.894e-14	-13.132	-13.230	-0.098	(0)
	AgH2BO3	2.824e-14	2.824e-14	-13.549	-13.549	0.000	(0)
	BF3OH-	3.523e-18	2.812e-18	-17.453	-17.551	-0.098	(0)
	BF4-	1.062e-22	8.478e-23	-21.974	-22.072	-0.098	(0)
Ba		2.048e-07					
	Ba+2	2.004e-07	9.027e-08	-6.698	-7.044	-0.346	(0)
	BaHCO3+	4.150e-09	3.451e-09	-8.382	-8.462	-0.080	(0)
	BaCO3	1.594e-10	1.594e-10	-9.798	-9.798	0.000	(0)
	BaH2BO3+	1.497e-12	1.195e-12	-11.825	-11.923	-0.098	(0)
	BaOH+	8.833e-14	7.272e-14	-13.054	-13.138	-0.084	(0)
	BaNO3+	5.838e-15	4.470e-15	-14.234	-14.350	-0.116	(0)
	BaNH3+2	1.705e-16	5.856e-17	-15.768	-16.232	-0.464	(0)
C (4)		5.608e-03					
	HCO3-	4.842e-03	4.003e-03	-2.315	-2.398	-0.083	(0)
	H2CO3	4.908e-04	4.908e-04	-3.309	-3.309	0.000	(0)
	CaHCO3+	1.175e-04	9.773e-05	-3.930	-4.010	-0.080	(0)

MgHCO3+	1.096e-04	8.921e-05	-3.960	-4.050	-0.089	(0)
NaHCO3	2.167e-05	2.167e-05	-4.664	-4.664	0.000	(0)
CO3-2	7.644e-06	3.442e-06	-5.117	-5.463	-0.346	(0)
CaCO3	7.153e-06	7.153e-06	-5.145	-5.145	0.000	(0)
MgCO3	6.236e-06	6.236e-06	-5.205	-5.205	0.000	(0)
MnHCO3+	2.088e-06	1.719e-06	-5.680	-5.765	-0.084	(0)
NaCO3-	7.466e-07	6.172e-07	-6.127	-6.210	-0.083	(0)
UO2 (CO3) 3-4	4.288e-07	5.965e-09	-6.368	-8.224	-1.857	(0)
ZnCO3	4.000e-07	4.000e-07	-6.398	-6.398	0.000	(0)
ZnHCO3+	3.339e-07	2.556e-07	-6.476	-6.592	-0.116	(0)
CuCO3	1.495e-07	1.495e-07	-6.825	-6.825	0.000	(0)
UO2 (CO3) 2-2	1.007e-07	3.457e-08	-6.997	-7.461	-0.464	(0)
NiHCO3+	2.497e-08	1.912e-08	-7.603	-7.719	-0.116	(0)
CoHCO3+	1.180e-08	9.034e-09	-7.928	-8.044	-0.116	(0)
NiCO3	4.974e-09	4.974e-09	-8.303	-8.303	0.000	(0)
BaHCO3+	4.150e-09	3.451e-09	-8.382	-8.462	-0.080	(0)
Cu (CO3) 2-2	4.033e-09	1.385e-09	-8.394	-8.859	-0.464	(0)
CuHCO3+	2.433e-09	1.863e-09	-8.614	-8.730	-0.116	(0)
CoCO3	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
PbCO3	1.163e-09	1.163e-09	-8.934	-8.934	0.000	(0)
UO2CO3	5.034e-10	5.034e-10	-9.298	-9.298	0.000	(0)
PbHCO3+	4.366e-10	3.342e-10	-9.360	-9.476	-0.116	(0)
CdCO3	1.966e-10	1.966e-10	-9.706	-9.706	0.000	(0)
BaCO3	1.594e-10	1.594e-10	-9.798	-9.798	0.000	(0)
Pb (CO3) 2-2	3.361e-11	1.154e-11	-10.473	-10.938	-0.464	(0)
CdHCO3+	2.983e-11	2.284e-11	-10.525	-10.641	-0.116	(0)
Cd (CO3) 2-2	1.461e-12	5.017e-13	-11.835	-12.300	-0.464	(0)
FeHCO3+	2.979e-13	2.477e-13	-12.526	-12.606	-0.080	(0)
HgCO3	2.724e-13	2.724e-13	-12.565	-12.565	0.000	(0)
Hg (CO3) 2-2	8.635e-15	2.965e-15	-14.064	-14.528	-0.464	(0)
HgHCO3+	3.613e-16	2.766e-16	-15.442	-15.558	-0.116	(0)
Ca	4.599e-03					
Ca+2	2.911e-03	1.311e-03	-2.536	-2.882	-0.346	(0)
CaSO4	1.561e-03	1.561e-03	-2.807	-2.807	0.000	(0)
CaHCO3+	1.175e-04	9.773e-05	-3.930	-4.010	-0.080	(0)
CaCO3	7.153e-06	7.153e-06	-5.145	-5.145	0.000	(0)
CaF+	1.952e-06	1.607e-06	-5.710	-5.794	-0.084	(0)
CaH2BO3+	4.048e-08	3.232e-08	-7.393	-7.491	-0.098	(0)
CaOH+	5.806e-09	4.828e-09	-8.236	-8.316	-0.080	(0)
CaNO3+	5.351e-11	4.096e-11	-10.272	-10.388	-0.116	(0)
CaNH3+2	4.942e-12	1.697e-12	-11.306	-11.770	-0.464	(0)
Ca (NH3) 2+2	2.023e-21	6.947e-22	-20.694	-21.158	-0.464	(0)
Cd	1.047e-08					
Cd+2	5.564e-09	2.506e-09	-8.255	-8.601	-0.346	(0)
CdSO4	3.052e-09	3.052e-09	-8.515	-8.515	0.000	(0)
CdCl+	9.763e-10	7.474e-10	-9.010	-9.126	-0.116	(0)
Cd (SO4) 2-2	6.229e-10	2.139e-10	-9.206	-9.670	-0.464	(0)
CdCO3	1.966e-10	1.966e-10	-9.706	-9.706	0.000	(0)
CdHCO3+	2.983e-11	2.284e-11	-10.525	-10.641	-0.116	(0)
CdCl2	9.731e-12	9.731e-12	-11.012	-11.012	0.000	(0)
CdF+	5.825e-12	4.459e-12	-11.235	-11.351	-0.116	(0)
CdOHC1	5.658e-12	5.658e-12	-11.247	-11.247	0.000	(0)
CdOH+	4.798e-12	3.673e-12	-11.319	-11.435	-0.116	(0)
Cd (CO3) 2-2	1.461e-12	5.017e-13	-11.835	-12.300	-0.464	(0)
CdCl3-	2.505e-14	1.918e-14	-13.601	-13.717	-0.116	(0)
Cd (OH) 2	4.277e-15	4.277e-15	-14.369	-14.369	0.000	(0)
CdF2	9.990e-16	9.990e-16	-15.000	-15.000	0.000	(0)
CdNO3+	1.023e-16	7.828e-17	-15.990	-16.106	-0.116	(0)
CdSeO4	4.400e-17	4.400e-17	-16.357	-16.357	0.000	(0)
Cd (SeO3) 2-2	5.864e-19	2.014e-19	-18.232	-18.696	-0.464	(0)
Cd2OH+3	5.109e-19	4.613e-20	-18.292	-19.336	-1.044	(0)
Cd (OH) 3-	6.299e-20	4.822e-20	-19.201	-19.317	-0.116	(0)
Cd (NO3) 2	3.876e-25	3.876e-25	-24.412	-24.412	0.000	(0)
Cd (OH) 4-2	4.241e-27	1.457e-27	-26.373	-26.837	-0.464	(0)
CdHS+	0.000e+00	0.000e+00	-79.917	-80.033	-0.116	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.268	-152.268	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-229.692	-229.808	-0.116	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-306.587	-307.051	-0.464	(0)

C1	3.813e-03					
Cl-	3.813e-03	3.123e-03	-2.419	-2.505	-0.087	(0)
MnCl+	1.028e-07	8.461e-08	-6.988	-7.073	-0.084	(0)
AgCl	2.653e-08	2.653e-08	-7.576	-7.576	0.000	(0)
ZnCl+	1.946e-08	1.584e-08	-7.711	-7.800	-0.089	(0)
AgCl2-	9.428e-09	7.217e-09	-8.026	-8.142	-0.116	(0)
ZnOHCl	3.827e-09	3.827e-09	-8.417	-8.417	0.000	(0)
CdCl+	9.763e-10	7.474e-10	-9.010	-9.126	-0.116	(0)
CoCl+	4.095e-10	3.135e-10	-9.388	-9.504	-0.116	(0)
NiCl+	4.043e-10	3.095e-10	-9.393	-9.509	-0.116	(0)
MnCl2	3.733e-10	3.733e-10	-9.428	-9.428	0.000	(0)
ZnCl2	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)
HgClOH	6.731e-11	6.731e-11	-10.172	-10.172	0.000	(0)
HgCl2	6.451e-11	6.451e-11	-10.190	-10.190	0.000	(0)
AgCl3-2	5.850e-11	2.009e-11	-10.233	-10.697	-0.464	(0)
CuCl+	4.485e-11	3.651e-11	-10.348	-10.438	-0.089	(0)
CuCl	2.963e-11	2.963e-11	-10.528	-10.528	0.000	(0)
CuCl2-	2.375e-11	1.933e-11	-10.624	-10.714	-0.089	(0)
PbCl+	1.627e-11	1.245e-11	-10.789	-10.905	-0.116	(0)
CdCl2	9.731e-12	9.731e-12	-11.012	-11.012	0.000	(0)
CdOHCl	5.658e-12	5.658e-12	-11.247	-11.247	0.000	(0)
HgCl3-	2.632e-12	2.015e-12	-11.580	-11.696	-0.116	(0)
AgCl4-3	1.419e-12	1.281e-13	-11.848	-12.892	-1.044	(0)
MnCl3-	3.901e-13	3.211e-13	-12.409	-12.493	-0.084	(0)
ZnCl3-	2.390e-13	1.946e-13	-12.622	-12.711	-0.089	(0)
PbCl2	1.737e-13	1.737e-13	-12.760	-12.760	0.000	(0)
HgCl4-2	7.295e-14	2.505e-14	-13.137	-13.601	-0.464	(0)
CuCl2	3.954e-14	3.954e-14	-13.403	-13.403	0.000	(0)
CuCl3-2	2.811e-14	1.291e-14	-13.551	-13.889	-0.338	(0)
CdCl3-	2.505e-14	1.918e-14	-13.601	-13.717	-0.116	(0)
HgCl+	5.383e-15	4.121e-15	-14.269	-14.385	-0.116	(0)
NiCl2	4.868e-15	4.868e-15	-14.313	-14.313	0.000	(0)
ZnCl4-2	6.615e-16	3.038e-16	-15.179	-15.517	-0.338	(0)
CrCl+2	3.657e-16	1.256e-16	-15.437	-15.901	-0.464	(0)
PbCl3-	2.822e-16	2.160e-16	-15.549	-15.665	-0.116	(0)
UO2Cl+	2.431e-16	1.861e-16	-15.614	-15.730	-0.116	(0)
CuCl3-	1.416e-18	1.152e-18	-17.849	-17.938	-0.089	(0)
CrOHCl2	1.376e-18	1.376e-18	-17.861	-17.861	0.000	(0)
PbCl4-2	8.980e-19	3.084e-19	-18.047	-18.511	-0.464	(0)
CrCl2+	4.863e-20	3.722e-20	-19.313	-19.429	-0.116	(0)
FeCl+2	4.496e-20	2.065e-20	-19.347	-19.685	-0.338	(0)
VOCl+	1.937e-21	1.483e-21	-20.713	-20.829	-0.116	(0)
FeCl2+	3.499e-22	2.881e-22	-21.456	-21.540	-0.084	(0)
CuCl4-2	3.928e-23	1.804e-23	-22.406	-22.744	-0.338	(0)
CrO3Cl-	1.226e-25	9.388e-26	-24.911	-25.027	-0.116	(0)
FeCl3	8.998e-26	8.998e-26	-25.046	-25.046	0.000	(0)
CoCl+2	1.025e-34	3.519e-35	-33.989	-34.454	-0.464	(0)
UCl+3	0.000e+00	0.000e+00	-44.394	-45.439	-1.044	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.976	-53.440	-0.464	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.374	-55.838	-0.464	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.679	-69.143	-0.464	(0)
Co (2)	1.287e-07					
Co+2	8.448e-08	2.901e-08	-7.073	-7.537	-0.464	(0)
CoSO4	3.008e-08	3.008e-08	-7.522	-7.522	0.000	(0)
CoHCO3+	1.180e-08	9.034e-09	-7.928	-8.044	-0.116	(0)
CoCO3	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
CoCl+	4.095e-10	3.135e-10	-9.388	-9.504	-0.116	(0)
CoOH+	1.396e-10	1.068e-10	-9.855	-9.971	-0.116	(0)
CoF+	1.346e-10	1.030e-10	-9.871	-9.987	-0.116	(0)
Co (OH) 2	1.566e-12	1.566e-12	-11.805	-11.805	0.000	(0)
CoNO2+	1.269e-12	9.713e-13	-11.897	-12.013	-0.116	(0)
Co (NH3) +2	1.044e-14	3.587e-15	-13.981	-14.445	-0.464	(0)
CoSeO4	1.371e-15	1.371e-15	-14.863	-14.863	0.000	(0)
CoNO3+	5.934e-16	4.543e-16	-15.227	-15.343	-0.116	(0)
Co (OH) 3-	7.533e-18	5.766e-18	-17.123	-17.239	-0.116	(0)
CoOOH-	1.892e-18	1.448e-18	-17.723	-17.839	-0.116	(0)
Co2OH+3	1.721e-18	1.553e-19	-17.764	-18.809	-1.044	(0)
Co (NH3) 2+2	4.581e-22	1.573e-22	-21.339	-21.803	-0.464	(0)

Co (NO3) 2	9.132e-24	9.132e-24	-23.039	-23.039	0.000	(0)
Co (OH) 4-2	4.911e-25	1.687e-25	-24.309	-24.773	-0.464	(0)
Co (NH3) 3+2	5.929e-30	2.036e-30	-29.227	-29.691	-0.464	(0)
Co4 (OH) 4+4	1.868e-30	2.599e-32	-29.729	-31.585	-1.857	(0)
Co (NH3) 4+2	3.200e-38	1.099e-38	-37.495	-37.959	-0.464	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.263	-46.727	-0.464	(0)
Co (3)	1.512e-28					
CoOH+2	1.512e-28	5.193e-29	-27.820	-28.285	-0.464	(0)
Co+3	3.333e-34	5.537e-35	-33.477	-34.257	-0.780	(0)
CoCl+2	1.025e-34	3.519e-35	-33.989	-34.454	-0.464	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.976	-53.440	-0.464	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.881	-63.997	-0.116	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.679	-69.143	-0.464	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-68.708	-69.172	-0.464	(0)
Cr (2)	4.509e-26					
Cr+2	4.509e-26	1.548e-26	-25.346	-25.810	-0.464	(0)
Cr (3)	4.402e-09					
Cr (OH) 2+	3.680e-09	2.817e-09	-8.434	-8.550	-0.116	(0)
Cr (OH) +2	3.653e-10	1.255e-10	-9.437	-9.901	-0.464	(0)
Cr (OH) 3	1.953e-10	1.953e-10	-9.709	-9.709	0.000	(0)
CrOHSO4	1.547e-10	1.547e-10	-9.811	-9.811	0.000	(0)
CrO2-	2.224e-12	1.703e-12	-11.653	-11.769	-0.116	(0)
Cr (OH) 4-	1.874e-12	1.435e-12	-11.727	-11.843	-0.116	(0)
CrF+2	1.610e-12	5.530e-13	-11.793	-12.257	-0.464	(0)
CrSO4+	4.925e-13	3.770e-13	-12.308	-12.424	-0.116	(0)
Cr+3	3.442e-13	3.107e-14	-12.463	-13.508	-1.044	(0)
CrCl+2	3.657e-16	1.256e-16	-15.437	-15.901	-0.464	(0)
Cr2 (OH) 2SO4+2	5.108e-18	1.754e-18	-17.292	-17.756	-0.464	(0)
CrOHC12	1.376e-18	1.376e-18	-17.861	-17.861	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.414e-19	5.414e-19	-18.266	-18.266	0.000	(0)
CrCl2+	4.863e-20	3.722e-20	-19.313	-19.429	-0.116	(0)
CrNO3+2	3.907e-23	1.342e-23	-22.408	-22.872	-0.464	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.345	-44.809	-0.464	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.391	-54.435	-1.044	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.374	-55.838	-0.464	(0)
Cr (6)	1.257e-15					
CrO4-2	1.103e-15	4.965e-16	-14.958	-15.304	-0.346	(0)
HCro4-	1.144e-16	8.760e-17	-15.941	-16.058	-0.116	(0)
NaCrO4-	3.104e-17	2.376e-17	-16.508	-16.624	-0.116	(0)
KCrO4-	9.377e-18	7.179e-18	-17.028	-17.144	-0.116	(0)
CrO3SO4-2	2.202e-23	7.564e-24	-22.657	-23.121	-0.464	(0)
H2CrO4	3.871e-24	3.871e-24	-23.412	-23.412	0.000	(0)
CrO3Cl-	1.226e-25	9.388e-26	-24.911	-25.027	-0.116	(0)
Cr2O7-2	7.753e-31	2.663e-31	-30.111	-30.575	-0.464	(0)
Cu (1)	6.325e-11					
CuCl	2.963e-11	2.963e-11	-10.528	-10.528	0.000	(0)
CuCl2-	2.375e-11	1.933e-11	-10.624	-10.714	-0.089	(0)
Cu+	9.843e-12	7.535e-12	-11.007	-11.123	-0.116	(0)
CuCl3-2	2.811e-14	1.291e-14	-13.551	-13.889	-0.338	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.701	-152.085	-0.384	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.451	-152.815	-0.364	(0)
Cu (2)	1.867e-07					
CuCO3	1.495e-07	1.495e-07	-6.825	-6.825	0.000	(0)
Cu+2	1.638e-08	7.376e-09	-7.786	-8.132	-0.346	(0)
CuSO4	8.779e-09	8.779e-09	-8.057	-8.057	0.000	(0)
CuOH+	5.287e-09	4.304e-09	-8.277	-8.366	-0.089	(0)
Cu (CO3) 2-2	4.033e-09	1.385e-09	-8.394	-8.859	-0.464	(0)
CuHCO3+	2.433e-09	1.863e-09	-8.614	-8.730	-0.116	(0)
Cu (OH) 2	1.585e-10	1.585e-10	-9.800	-9.800	0.000	(0)
CuF+	6.826e-11	5.225e-11	-10.166	-10.282	-0.116	(0)
CuCl+	4.485e-11	3.651e-11	-10.348	-10.438	-0.089	(0)
CuNO2+	4.793e-12	3.669e-12	-11.319	-11.435	-0.116	(0)
Cu2 (OH) 2+2	1.355e-12	4.654e-13	-11.868	-12.332	-0.464	(0)
CuNH3+2	2.260e-13	7.760e-14	-12.646	-13.110	-0.464	(0)
Cu (OH) 3-	7.837e-14	5.999e-14	-13.106	-13.222	-0.116	(0)
CuCl2	3.954e-14	3.954e-14	-13.403	-13.403	0.000	(0)
CuNO3+	3.010e-16	2.304e-16	-15.521	-15.637	-0.116	(0)
Cu (NO2) 2	1.784e-16	1.784e-16	-15.749	-15.749	0.000	(0)

	CuCl3-	1.416e-18	1.152e-18	-17.849	-17.938	-0.089	(0)
	Cu (OH) 4-2	2.537e-19	8.714e-20	-18.596	-19.060	-0.464	(0)
	CuCl4-2	3.928e-23	1.804e-23	-22.406	-22.744	-0.338	(0)
	Cu (NO3) 2	2.866e-25	2.866e-25	-24.543	-24.543	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.436	-220.552	-0.116	(0)
F		1.736e-04					
	F-	1.371e-04	1.123e-04	-3.863	-3.950	-0.087	(0)
	MgF+	3.351e-05	2.744e-05	-4.475	-4.562	-0.087	(0)
	CaF+	1.952e-06	1.607e-06	-5.710	-5.794	-0.084	(0)
	NaF	6.822e-07	6.822e-07	-6.166	-6.166	0.000	(0)
	MnF+	1.168e-07	9.619e-08	-6.932	-7.017	-0.084	(0)
	AlF3	5.298e-08	5.298e-08	-7.276	-7.276	0.000	(0)
	AlF2+	4.533e-08	3.748e-08	-7.344	-7.426	-0.083	(0)
	HF	9.054e-09	9.054e-09	-8.043	-8.043	0.000	(0)
	ZnF+	5.910e-09	4.524e-09	-8.228	-8.344	-0.116	(0)
	AlF4-	3.641e-09	2.981e-09	-8.439	-8.526	-0.087	(0)
	BF (OH) 3-	2.256e-09	1.802e-09	-8.647	-8.744	-0.098	(0)
	AlF+2	1.795e-09	8.384e-10	-8.746	-9.077	-0.331	(0)
	NiF+	1.427e-10	1.093e-10	-9.846	-9.962	-0.116	(0)
	CoF+	1.346e-10	1.030e-10	-9.871	-9.987	-0.116	(0)
	CuF+	6.826e-11	5.225e-11	-10.166	-10.282	-0.116	(0)
	CdF+	5.825e-12	4.459e-12	-11.235	-11.351	-0.116	(0)
	HF2-	4.777e-12	3.865e-12	-11.321	-11.413	-0.092	(0)
	CrF+2	1.610e-12	5.530e-13	-11.793	-12.257	-0.464	(0)
	BF2 (OH) 2-	1.478e-12	1.180e-12	-11.830	-11.928	-0.098	(0)
	AgF	1.174e-12	1.174e-12	-11.931	-11.931	0.000	(0)
	PbF+	1.162e-12	8.892e-13	-11.935	-12.051	-0.116	(0)
	UO2F+	7.437e-13	5.694e-13	-12.129	-12.245	-0.116	(0)
	UO2F2	1.844e-13	1.844e-13	-12.734	-12.734	0.000	(0)
	UO2F3-	6.793e-15	5.200e-15	-14.168	-14.284	-0.116	(0)
	PbF2	1.965e-15	1.965e-15	-14.707	-14.707	0.000	(0)
	CdF2	9.990e-16	9.990e-16	-15.000	-15.000	0.000	(0)
	H2F2	2.196e-16	2.196e-16	-15.658	-15.658	0.000	(0)
	FeF2+	9.838e-17	8.099e-17	-16.007	-16.092	-0.084	(0)
	VO2F	6.715e-17	6.715e-17	-16.173	-16.173	0.000	(0)
	FeF+2	5.868e-17	2.695e-17	-16.231	-16.569	-0.338	(0)
	UO2F4-2	1.351e-17	4.638e-18	-16.869	-17.334	-0.464	(0)
	FeF3	1.283e-17	1.283e-17	-16.892	-16.892	0.000	(0)
	VO2F2-	3.576e-18	2.738e-18	-17.447	-17.563	-0.116	(0)
	BF3OH-	3.523e-18	2.812e-18	-17.453	-17.551	-0.098	(0)
	PbF3-	5.466e-19	4.185e-19	-18.262	-18.378	-0.116	(0)
	VOF+	1.489e-19	1.140e-19	-18.827	-18.943	-0.116	(0)
	VO2F3-2	1.116e-20	3.834e-21	-19.952	-20.416	-0.464	(0)
	VOF2	4.798e-21	4.798e-21	-20.319	-20.319	0.000	(0)
	HgF+	3.596e-22	2.752e-22	-21.444	-21.560	-0.116	(0)
	BF4-	1.062e-22	8.478e-23	-21.974	-22.072	-0.098	(0)
	PbF4-2	6.548e-23	2.249e-23	-22.184	-22.648	-0.464	(0)
	VOF3-	2.497e-23	1.912e-23	-22.603	-22.719	-0.116	(0)
	VO2F4-3	2.346e-24	2.118e-25	-23.630	-24.674	-1.044	(0)
	Sb (OH) 2F	4.748e-25	4.748e-25	-24.324	-24.324	0.000	(0)
	SbOF	4.672e-25	4.672e-25	-24.330	-24.330	0.000	(0)
	VOF4-2	2.523e-26	8.665e-27	-25.598	-26.062	-0.464	(0)
	UF3+	1.712e-35	1.311e-35	-34.766	-34.882	-0.116	(0)
	UF2+2	2.145e-36	7.365e-37	-35.669	-36.133	-0.464	(0)
	UF4	1.614e-37	1.614e-37	-36.792	-36.792	0.000	(0)
	UF+3	5.771e-39	5.210e-40	-38.239	-39.283	-1.044	(0)
	UF5-	9.380e-40	7.181e-40	-39.028	-39.144	-0.116	(0)
	UF6-2	0.000e+00	0.000e+00	-40.149	-40.614	-0.464	(0)
Fe (2)		2.093e-11					
	Fe+2	1.431e-11	4.916e-12	-10.844	-11.308	-0.464	(0)
	FeSO4	6.270e-12	6.270e-12	-11.203	-11.203	0.000	(0)
	FeHCO3+	2.979e-13	2.477e-13	-12.526	-12.606	-0.080	(0)
	FeOH+	4.387e-14	3.612e-14	-13.358	-13.442	-0.084	(0)
	Fe (OH) 2	5.294e-18	5.294e-18	-17.276	-17.276	0.000	(0)
	Fe (OH) 3-	3.753e-19	3.090e-19	-18.426	-18.510	-0.084	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-161.238	-161.238	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-238.524	-238.640	-0.116	(0)
Fe (3)		2.645e-09					

Fe (OH) 2+	2.266e-09	1.873e-09	-8.645	-8.727	-0.083	(0)
Fe (OH) 3	3.712e-10	3.712e-10	-9.430	-9.430	0.000	(0)
Fe (OH) 4-	7.716e-12	6.378e-12	-11.113	-11.195	-0.083	(0)
FeOH+2	5.679e-14	2.609e-14	-13.246	-13.584	-0.338	(0)
FeF2+	9.838e-17	8.099e-17	-16.007	-16.092	-0.084	(0)
FeF+2	5.868e-17	2.695e-17	-16.231	-16.569	-0.338	(0)
FeSO4+	1.550e-17	1.276e-17	-16.810	-16.894	-0.084	(0)
FeF3	1.283e-17	1.283e-17	-16.892	-16.892	0.000	(0)
Fe (SO4) 2-	1.852e-18	1.418e-18	-17.732	-17.848	-0.116	(0)
Fe+3	1.318e-18	2.189e-19	-17.880	-18.660	-0.780	(0)
FeCl+2	4.496e-20	2.065e-20	-19.347	-19.685	-0.338	(0)
FeCl2+	3.499e-22	2.881e-22	-21.456	-21.540	-0.084	(0)
FeHSeO3+2	2.278e-22	7.823e-23	-21.642	-22.107	-0.464	(0)
Fe2 (OH) 2+4	1.620e-24	2.253e-26	-23.791	-25.647	-1.857	(0)
FeCl3	8.998e-26	8.998e-26	-25.046	-25.046	0.000	(0)
FeNO3+2	6.298e-26	2.163e-26	-25.201	-25.665	-0.464	(0)
Fe3 (OH) 4+5	4.856e-31	6.100e-34	-30.314	-33.215	-2.901	(0)
H (0)	1.809e-29					
H2	9.047e-30	9.156e-30	-29.043	-29.038	0.005	(0)
Hg (0)	2.656e-09					
Hg	2.656e-09	2.656e-09	-8.576	-8.576	0.000	(0)
Hg (1)	6.944e-19					
Hg2+2	3.472e-19	1.192e-19	-18.459	-18.924	-0.464	(0)
Hg (2)	1.489e-10					
HgClOH	6.731e-11	6.731e-11	-10.172	-10.172	0.000	(0)
HgCl2	6.451e-11	6.451e-11	-10.190	-10.190	0.000	(0)
Hg (OH) 2	1.404e-11	1.421e-11	-10.853	-10.847	0.005	(0)
HgCl3-	2.632e-12	2.015e-12	-11.580	-11.696	-0.116	(0)
HgCO3	2.724e-13	2.724e-13	-12.565	-12.565	0.000	(0)
HgCl4-2	7.295e-14	2.505e-14	-13.137	-13.601	-0.464	(0)
Hg (CO3) 2-2	8.635e-15	2.965e-15	-14.064	-14.528	-0.464	(0)
HgCl+	5.383e-15	4.121e-15	-14.269	-14.385	-0.116	(0)
HgOH+	6.347e-16	4.858e-16	-15.197	-15.314	-0.116	(0)
HgHCO3+	3.613e-16	2.766e-16	-15.442	-15.558	-0.116	(0)
Hg (OH) 3-	4.313e-19	3.301e-19	-18.365	-18.481	-0.116	(0)
Hg+2	1.926e-19	6.613e-20	-18.715	-19.180	-0.464	(0)
Hg (NH3) 2+2	1.284e-19	4.411e-20	-18.891	-19.355	-0.464	(0)
HgNH3+2	1.249e-19	4.290e-20	-18.903	-19.368	-0.464	(0)
HgSO4	8.996e-20	8.996e-20	-19.046	-19.046	0.000	(0)
HgF+	3.596e-22	2.752e-22	-21.444	-21.560	-0.116	(0)
Hg (NH3) 3+2	5.258e-28	1.806e-28	-27.279	-27.743	-0.464	(0)
HgNO3+	3.151e-28	2.412e-28	-27.502	-27.618	-0.116	(0)
Hg (NH3) 4+2	4.294e-36	1.475e-36	-35.367	-35.831	-0.464	(0)
Hg (NO3) 2	9.905e-37	9.905e-37	-36.004	-36.004	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.751	-138.867	-0.116	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.737	-139.737	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.848	-140.312	-0.464	(0)
K	4.923e-03					
K+	4.750e-03	3.891e-03	-2.323	-2.410	-0.087	(0)
KSO4-	1.732e-04	1.431e-04	-3.762	-3.844	-0.083	(0)
KCrO4-	9.377e-18	7.179e-18	-17.028	-17.144	-0.116	(0)
Mg	7.045e-03					
Mg+2	4.836e-03	2.178e-03	-2.316	-2.662	-0.346	(0)
MgSO4	2.059e-03	2.059e-03	-2.686	-2.686	0.000	(0)
MgHCO3+	1.096e-04	8.921e-05	-3.960	-4.050	-0.089	(0)
MgF+	3.351e-05	2.744e-05	-4.475	-4.562	-0.087	(0)
MgCO3	6.236e-06	6.236e-06	-5.205	-5.205	0.000	(0)
MgOH+	1.915e-07	1.600e-07	-6.718	-6.796	-0.078	(0)
MgH2BO3+	4.051e-08	3.234e-08	-7.392	-7.490	-0.098	(0)
Mn (2)	8.486e-05					
Mn+2	6.266e-05	2.152e-05	-4.203	-4.667	-0.464	(0)
MnSO4	1.988e-05	1.988e-05	-4.702	-4.702	0.000	(0)
MnHCO3+	2.088e-06	1.719e-06	-5.680	-5.765	-0.084	(0)
MnF+	1.168e-07	9.619e-08	-6.932	-7.017	-0.084	(0)
MnCl+	1.028e-07	8.461e-08	-6.988	-7.073	-0.084	(0)
MnOH+	1.212e-08	9.975e-09	-7.917	-8.001	-0.084	(0)
MnCl2	3.733e-10	3.733e-10	-9.428	-9.428	0.000	(0)
MnSeO4	5.461e-13	5.461e-13	-12.263	-12.263	0.000	(0)

MnNO3+	4.401e-13	3.369e-13	-12.356	-12.472	-0.116	(0)
MnCl3-	3.901e-13	3.211e-13	-12.409	-12.493	-0.084	(0)
Mn (OH) 3-	2.550e-18	2.100e-18	-17.593	-17.678	-0.084	(0)
Mn (NO3) 2	8.361e-21	8.361e-21	-20.078	-20.078	0.000	(0)
Mn (OH) 4-2	2.723e-24	1.251e-24	-23.565	-23.903	-0.338	(0)
MnSe	0.000e+00	0.000e+00	-42.461	-42.461	0.000	(0)
Mn (3)	2.773e-24					
Mn+3	2.773e-24	4.608e-25	-23.557	-24.336	-0.780	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.922	-42.260	-0.338	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.857	-45.951	-0.095	(0)
Mo	2.743e-06					
MoO4-2	2.741e-06	1.235e-06	-5.562	-5.908	-0.346	(0)
HMoO4-	1.749e-09	1.339e-09	-8.757	-8.873	-0.116	(0)
H2MoO4	5.348e-13	5.348e-13	-12.272	-12.272	0.000	(0)
Ag2MoO4	8.089e-24	8.089e-24	-23.092	-23.092	0.000	(0)
AlMo6O21-3	7.573e-36	6.838e-37	-35.121	-36.165	-1.044	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.298	-46.476	-4.177	(0)
HMo7O24-5	0.000e+00	0.000e+00	-44.451	-47.352	-2.901	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-47.977	-49.834	-1.857	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-52.807	-53.851	-1.044	(0)
N (-3)	1.308e-07					
NH4+	1.231e-07	9.831e-08	-6.910	-7.007	-0.098	(0)
NH4SO4-	6.649e-09	5.474e-09	-8.177	-8.262	-0.084	(0)
NH3	1.028e-09	1.028e-09	-8.988	-8.988	0.000	(0)
CaNH3+2	4.942e-12	1.697e-12	-11.306	-11.770	-0.464	(0)
CuNH3+2	2.260e-13	7.760e-14	-12.646	-13.110	-0.464	(0)
NiNH3+2	6.228e-14	2.139e-14	-13.206	-13.670	-0.464	(0)
AgNH3+	1.141e-14	8.735e-15	-13.943	-14.059	-0.116	(0)
Co (NH3) +2	1.044e-14	3.587e-15	-13.981	-14.445	-0.464	(0)
BaNH3+2	1.705e-16	5.856e-17	-15.768	-16.232	-0.464	(0)
Hg (NH3) 2+2	1.284e-19	4.411e-20	-18.891	-19.355	-0.464	(0)
HgNH3+2	1.249e-19	4.290e-20	-18.903	-19.368	-0.464	(0)
Ag (NH3) 2+	9.536e-20	7.300e-20	-19.021	-19.137	-0.116	(0)
Ni (NH3) 2+2	9.256e-21	3.179e-21	-20.034	-20.498	-0.464	(0)
Ca (NH3) 2+2	2.023e-21	6.947e-22	-20.694	-21.158	-0.464	(0)
Co (NH3) 2+2	4.581e-22	1.573e-22	-21.339	-21.803	-0.464	(0)
Hg (NH3) 3+2	5.258e-28	1.806e-28	-27.279	-27.743	-0.464	(0)
Co (NH3) 3+2	5.929e-30	2.036e-30	-29.227	-29.691	-0.464	(0)
Hg (NH3) 4+2	4.294e-36	1.475e-36	-35.367	-35.831	-0.464	(0)
Co (NH3) 4+2	3.200e-38	1.099e-38	-37.495	-37.959	-0.464	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.345	-44.809	-0.464	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-46.263	-46.727	-0.464	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.976	-53.440	-0.464	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.391	-54.435	-1.044	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.374	-55.838	-0.464	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.881	-63.997	-0.116	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.679	-69.143	-0.464	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-68.708	-69.172	-0.464	(0)
N (3)	5.910e-06					
NO2-	5.910e-06	4.751e-06	-5.228	-5.323	-0.095	(0)
CuNO2+	4.793e-12	3.669e-12	-11.319	-11.435	-0.116	(0)
AgNO2	4.130e-12	4.130e-12	-11.384	-11.384	0.000	(0)
CoNO2+	1.269e-12	9.713e-13	-11.897	-12.013	-0.116	(0)
Cu (NO2) 2	1.784e-16	1.784e-16	-15.749	-15.749	0.000	(0)
Ag (NO2) 2-	3.970e-17	3.039e-17	-16.401	-16.517	-0.116	(0)
N (5)	1.211e-08					
NO3-	1.206e-08	9.879e-09	-7.919	-8.005	-0.087	(0)
CaNO3+	5.351e-11	4.096e-11	-10.272	-10.388	-0.116	(0)
MnNO3+	4.401e-13	3.369e-13	-12.356	-12.472	-0.116	(0)
ZnNO3+	6.546e-14	5.011e-14	-13.184	-13.300	-0.116	(0)
BaNO3+	5.838e-15	4.470e-15	-14.234	-14.350	-0.116	(0)
NiNO3+	1.256e-15	9.612e-16	-14.901	-15.017	-0.116	(0)
CoNO3+	5.934e-16	4.543e-16	-15.227	-15.343	-0.116	(0)
CuNO3+	3.010e-16	2.304e-16	-15.521	-15.637	-0.116	(0)
CdNO3+	1.023e-16	7.828e-17	-15.990	-16.106	-0.116	(0)
AgNO3	3.265e-17	3.265e-17	-16.486	-16.486	0.000	(0)

	PbNO3+	2.145e-17	1.642e-17	-16.669	-16.785	-0.116	(0)
	Mn(NO3)2	8.361e-21	8.361e-21	-20.078	-20.078	0.000	(0)
	UO2NO3+	9.458e-22	7.241e-22	-21.024	-21.140	-0.116	(0)
	Zn(NO3)2	9.877e-23	9.877e-23	-22.005	-22.005	0.000	(0)
	CrNO3+2	3.907e-23	1.342e-23	-22.408	-22.872	-0.464	(0)
	Co(NO3)2	9.132e-24	9.132e-24	-23.039	-23.039	0.000	(0)
	VO2NO3	1.704e-24	1.704e-24	-23.769	-23.769	0.000	(0)
	Cd(NO3)2	3.876e-25	3.876e-25	-24.412	-24.412	0.000	(0)
	Cu(NO3)2	2.866e-25	2.866e-25	-24.543	-24.543	0.000	(0)
	Pb(NO3)2	2.755e-25	2.755e-25	-24.560	-24.560	0.000	(0)
	FeNO3+2	6.298e-26	2.163e-26	-25.201	-25.665	-0.464	(0)
	HgNO3+	3.151e-28	2.412e-28	-27.502	-27.618	-0.116	(0)
	Hg(NO3)2	9.905e-37	9.905e-37	-36.004	-36.004	0.000	(0)
Na		1.210e-02					
	Na+	1.175e-02	9.629e-03	-1.930	-2.016	-0.087	(0)
	NaSO4-	3.250e-04	2.687e-04	-3.488	-3.571	-0.083	(0)
	NaHCO3	2.167e-05	2.167e-05	-4.664	-4.664	0.000	(0)
	NaCO3-	7.466e-07	6.172e-07	-6.127	-6.210	-0.083	(0)
	NaF	6.822e-07	6.822e-07	-6.166	-6.166	0.000	(0)
	NaH2BO3	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
	NaCrO4-	3.104e-17	2.376e-17	-16.508	-16.624	-0.116	(0)
Ni		1.568e-07					
	Ni+2	8.601e-08	3.873e-08	-7.065	-7.412	-0.346	(0)
	NiSO4	4.016e-08	4.016e-08	-7.396	-7.396	0.000	(0)
	NiHCO3+	2.497e-08	1.912e-08	-7.603	-7.719	-0.116	(0)
	NiCO3	4.974e-09	4.974e-09	-8.303	-8.303	0.000	(0)
	NiCl+	4.043e-10	3.095e-10	-9.393	-9.509	-0.116	(0)
	NiF+	1.427e-10	1.093e-10	-9.846	-9.962	-0.116	(0)
	NiOH+	1.176e-10	8.999e-11	-9.930	-10.046	-0.116	(0)
	Ni(SO4)2-2	2.012e-11	6.909e-12	-10.696	-11.161	-0.464	(0)
	Ni(OH)2	1.319e-12	1.319e-12	-11.880	-11.880	0.000	(0)
	NiNH3+2	6.228e-14	2.139e-14	-13.206	-13.670	-0.464	(0)
	NiCl2	4.868e-15	4.868e-15	-14.313	-14.313	0.000	(0)
	NiSeO4	1.708e-15	1.708e-15	-14.767	-14.767	0.000	(0)
	NiNO3+	1.256e-15	9.612e-16	-14.901	-15.017	-0.116	(0)
	Ni(OH)3-	3.180e-16	2.434e-16	-15.498	-15.614	-0.116	(0)
	Ni(NH3)2+2	9.256e-21	3.179e-21	-20.034	-20.498	-0.464	(0)
O(0)		1.193e-34					
	O2	5.966e-35	6.037e-35	-34.224	-34.219	0.005	(0)
Pb		2.281e-09					
	PbCO3	1.163e-09	1.163e-09	-8.934	-8.934	0.000	(0)
	PbHCO3+	4.366e-10	3.342e-10	-9.360	-9.476	-0.116	(0)
	PbSO4	2.860e-10	2.860e-10	-9.544	-9.544	0.000	(0)
	Pb+2	2.495e-10	1.124e-10	-9.603	-9.949	-0.346	(0)
	PbOH+	6.805e-11	5.209e-11	-10.167	-10.283	-0.116	(0)
	Pb(CO3)2-2	3.361e-11	1.154e-11	-10.473	-10.938	-0.464	(0)
	Pb(SO4)2-2	2.607e-11	8.954e-12	-10.584	-11.048	-0.464	(0)
	PbCl+	1.627e-11	1.245e-11	-10.789	-10.905	-0.116	(0)
	PbF+	1.162e-12	8.892e-13	-11.935	-12.051	-0.116	(0)
	Pb(OH)2	3.040e-13	3.040e-13	-12.517	-12.517	0.000	(0)
	PbCl2	1.737e-13	1.737e-13	-12.760	-12.760	0.000	(0)
	PbF2	1.965e-15	1.965e-15	-14.707	-14.707	0.000	(0)
	PbCl3-	2.822e-16	2.160e-16	-15.549	-15.665	-0.116	(0)
	Pb(OH)3-	7.328e-17	5.610e-17	-16.135	-16.251	-0.116	(0)
	PbNO3+	2.145e-17	1.642e-17	-16.669	-16.785	-0.116	(0)
	Pb2OH+3	1.028e-18	9.278e-20	-17.988	-19.033	-1.044	(0)
	PbCl4-2	8.980e-19	3.084e-19	-18.047	-18.511	-0.464	(0)
	PbF3-	5.466e-19	4.185e-19	-18.262	-18.378	-0.116	(0)
	Pb(OH)4-2	7.383e-21	2.536e-21	-20.132	-20.596	-0.464	(0)
	PbF4-2	6.548e-23	2.249e-23	-22.184	-22.648	-0.464	(0)
	Pb3(OH)4+2	6.034e-25	2.072e-25	-24.219	-24.684	-0.464	(0)
	Pb(NO3)2	2.755e-25	2.755e-25	-24.560	-24.560	0.000	(0)
	Pb4(OH)4+4	1.330e-29	1.850e-31	-28.876	-30.733	-1.857	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-153.559	-153.559	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-231.582	-231.698	-0.116	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-74.006	-74.006	0.000	(0)
	HS-	0.000e+00	0.000e+00	-79.324	-79.440	-0.116	(0)

H2S	0.000e+00	0.000e+00	-79.683	-79.683	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.917	-80.033	-0.116	(0)
S5-2	0.000e+00	0.000e+00	-81.077	-81.541	-0.464	(0)
S6-2	0.000e+00	0.000e+00	-81.593	-82.057	-0.464	(0)
S4-2	0.000e+00	0.000e+00	-81.673	-82.137	-0.464	(0)
S3-2	0.000e+00	0.000e+00	-82.479	-82.943	-0.464	(0)
S2-2	0.000e+00	0.000e+00	-83.495	-83.959	-0.464	(0)
S-2	0.000e+00	0.000e+00	-89.138	-89.476	-0.338	(0)
HgHS2-	0.000e+00	0.000e+00	-138.751	-138.867	-0.116	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.737	-139.737	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.848	-140.312	-0.464	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.230	-149.346	-0.116	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.347	-149.566	-0.219	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.385	-150.501	-0.116	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.347	-151.742	-0.395	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.679	-152.053	-0.374	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.701	-152.085	-0.384	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.754	-151.754	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.268	-152.268	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.451	-152.815	-0.364	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.559	-153.559	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.238	-161.238	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.436	-220.552	-0.116	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.798	-227.914	-0.116	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-229.692	-229.808	-0.116	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.166	-230.630	-0.464	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.582	-231.698	-0.116	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.524	-238.640	-0.116	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-306.587	-307.051	-0.464	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-308.349	-308.813	-0.464	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.039	-321.503	-0.464	(0)
S (6)	1.568e-02					
SO4-2	1.154e-02	5.196e-03	-1.938	-2.284	-0.346	(0)
MgSO4	2.059e-03	2.059e-03	-2.686	-2.686	0.000	(0)
CaSO4	1.561e-03	1.561e-03	-2.807	-2.807	0.000	(0)
NaSO4-	3.250e-04	2.687e-04	-3.488	-3.571	-0.083	(0)
KSO4-	1.732e-04	1.431e-04	-3.762	-3.844	-0.083	(0)
MnSO4	1.988e-05	1.988e-05	-4.702	-4.702	0.000	(0)
ZnSO4	2.295e-06	2.295e-06	-5.639	-5.639	0.000	(0)
Zn (SO4) 2-2	3.025e-07	1.039e-07	-6.519	-6.983	-0.464	(0)
NiSO4	4.016e-08	4.016e-08	-7.396	-7.396	0.000	(0)
HSO4-	3.381e-08	2.768e-08	-7.471	-7.558	-0.087	(0)
CoSO4	3.008e-08	3.008e-08	-7.522	-7.522	0.000	(0)
CuSO4	8.779e-09	8.779e-09	-8.057	-8.057	0.000	(0)
NH4SO4-	6.649e-09	5.474e-09	-8.177	-8.262	-0.084	(0)
CdSO4	3.052e-09	3.052e-09	-8.515	-8.515	0.000	(0)
Cd (SO4) 2-2	6.229e-10	2.139e-10	-9.206	-9.670	-0.464	(0)
AgSO4-	5.635e-10	4.313e-10	-9.249	-9.365	-0.116	(0)
PbSO4	2.860e-10	2.860e-10	-9.544	-9.544	0.000	(0)
CrOHSO4	1.547e-10	1.547e-10	-9.811	-9.811	0.000	(0)
AlSO4+	3.678e-11	3.011e-11	-10.434	-10.521	-0.087	(0)
Pb (SO4) 2-2	2.607e-11	8.954e-12	-10.584	-11.048	-0.464	(0)
Ni (SO4) 2-2	2.012e-11	6.909e-12	-10.696	-11.161	-0.464	(0)
FeSO4	6.270e-12	6.270e-12	-11.203	-11.203	0.000	(0)
Al (SO4) 2-	2.048e-12	1.677e-12	-11.689	-11.776	-0.087	(0)
CrSO4+	4.925e-13	3.770e-13	-12.308	-12.424	-0.116	(0)
UO2SO4	2.889e-13	2.889e-13	-12.539	-12.539	0.000	(0)
UO2 (SO4) 2-2	5.762e-14	1.979e-14	-13.239	-13.704	-0.464	(0)
VO2SO4-	5.526e-17	4.230e-17	-16.258	-16.374	-0.116	(0)
FeSO4+	1.550e-17	1.276e-17	-16.810	-16.894	-0.084	(0)
Cr2 (OH) 2SO4+2	5.108e-18	1.754e-18	-17.292	-17.756	-0.464	(0)
Fe (SO4) 2-	1.852e-18	1.418e-18	-17.732	-17.848	-0.116	(0)
Cr2 (OH) 2 (SO4) 2	5.414e-19	5.414e-19	-18.266	-18.266	0.000	(0)
VOSO4	2.422e-19	2.422e-19	-18.616	-18.616	0.000	(0)
HgSO4	8.996e-20	8.996e-20	-19.046	-19.046	0.000	(0)
CrO3SO4-2	2.202e-23	7.564e-24	-22.657	-23.121	-0.464	(0)
VSO4+	1.671e-33	1.279e-33	-32.777	-32.893	-0.116	(0)
U (SO4) 2	1.986e-39	1.986e-39	-38.702	-38.702	0.000	(0)

USO4+2	1.401e-40	0.000e+00	-39.854	-40.318	-0.464	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.881	-63.997	-0.116	(0)
Sb (3)	9.808e-20					
Sb (OH) 3	4.961e-20	4.961e-20	-19.304	-19.304	0.000	(0)
HSbO2	4.846e-20	4.846e-20	-19.315	-19.315	0.000	(0)
SbO2-	1.881e-24	1.440e-24	-23.726	-23.842	-0.116	(0)
Sb (OH) 4-	1.076e-24	8.237e-25	-23.968	-24.084	-0.116	(0)
Sb (OH) 2F	4.748e-25	4.748e-25	-24.324	-24.324	0.000	(0)
SbOF	4.672e-25	4.672e-25	-24.330	-24.330	0.000	(0)
Sb (OH) 2+	8.586e-26	6.573e-26	-25.066	-25.182	-0.116	(0)
SbO+	2.963e-26	2.268e-26	-25.528	-25.644	-0.116	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.039	-321.503	-0.464	(0)
Sb (5)	3.853e-08					
SbO3-	3.848e-08	2.946e-08	-7.415	-7.531	-0.116	(0)
Sb (OH) 6-	4.196e-11	3.437e-11	-10.377	-10.464	-0.087	(0)
SbO2+	3.283e-23	2.513e-23	-22.484	-22.600	-0.116	(0)
Se (-2)	5.495e-15					
Ag2Se	5.495e-15	5.495e-15	-14.260	-14.260	0.000	(0)
HSe-	2.775e-40	2.124e-40	-39.557	-39.673	-0.116	(0)
MnSe	0.000e+00	0.000e+00	-42.461	-42.461	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.046	-43.046	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.945	-47.409	-0.464	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.589	-86.445	-1.857	(0)
Se (4)	2.054e-07					
HSeO3-	1.766e-07	1.352e-07	-6.753	-6.869	-0.116	(0)
SeO3-2	2.875e-08	9.875e-09	-7.541	-8.005	-0.464	(0)
H2SeO3	3.145e-12	3.145e-12	-11.502	-11.502	0.000	(0)
AgSeO3-	3.449e-14	2.641e-14	-13.462	-13.578	-0.116	(0)
Cd (SeO3) 2-2	5.864e-19	2.014e-19	-18.232	-18.696	-0.464	(0)
Ag (SeO3) 2-3	2.586e-20	2.335e-21	-19.587	-20.632	-1.044	(0)
FeHSeO3+2	2.278e-22	7.823e-23	-21.642	-22.107	-0.464	(0)
Se (6)	2.100e-10					
SeO4-2	2.094e-10	9.430e-11	-9.679	-10.026	-0.346	(0)
MnSeO4	5.461e-13	5.461e-13	-12.263	-12.263	0.000	(0)
ZnSeO4	2.949e-14	2.949e-14	-13.530	-13.530	0.000	(0)
NiSeO4	1.708e-15	1.708e-15	-14.767	-14.767	0.000	(0)
CoSeO4	1.371e-15	1.371e-15	-14.863	-14.863	0.000	(0)
HSeO4-	3.366e-16	2.576e-16	-15.473	-15.589	-0.116	(0)
CdSeO4	4.400e-17	4.400e-17	-16.357	-16.357	0.000	(0)
Zn (SeO4) 2-2	8.210e-24	2.820e-24	-23.086	-23.550	-0.464	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.066	-59.110	-1.044	(0)
U (4)	4.774e-22					
U (OH) 5-	4.765e-22	3.648e-22	-21.322	-21.438	-0.116	(0)
U (OH) 4	8.336e-25	8.336e-25	-24.079	-24.079	0.000	(0)
U (OH) 3+	2.172e-28	1.663e-28	-27.663	-27.779	-0.116	(0)
U (OH) 2+2	1.222e-32	4.195e-33	-31.913	-32.377	-0.464	(0)
UF3+	1.712e-35	1.311e-35	-34.766	-34.882	-0.116	(0)
UF2+2	2.145e-36	7.365e-37	-35.669	-36.133	-0.464	(0)
UF4	1.614e-37	1.614e-37	-36.792	-36.792	0.000	(0)
UOH+3	1.194e-37	1.078e-38	-36.923	-37.967	-1.044	(0)
UF+3	5.771e-39	5.210e-40	-38.239	-39.283	-1.044	(0)
U (SO4) 2	1.986e-39	1.986e-39	-38.702	-38.702	0.000	(0)
UF5-	9.380e-40	7.181e-40	-39.028	-39.144	-0.116	(0)
USO4+2	1.401e-40	0.000e+00	-39.854	-40.318	-0.464	(0)
UF6-2	0.000e+00	0.000e+00	-40.149	-40.614	-0.464	(0)
U+4	0.000e+00	0.000e+00	-42.777	-44.633	-1.857	(0)
UCl+3	0.000e+00	0.000e+00	-44.394	-45.439	-1.044	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-166.610	-176.009	-9.399	(0)
U (5)	6.101e-17					
UO2+	6.101e-17	4.671e-17	-16.215	-16.331	-0.116	(0)
U (6)	5.300e-07					
UO2 (CO3) 3-4	4.288e-07	5.965e-09	-6.368	-8.224	-1.857	(0)
UO2 (CO3) 2-2	1.007e-07	3.457e-08	-6.997	-7.461	-0.464	(0)
UO2CO3	5.034e-10	5.034e-10	-9.298	-9.298	0.000	(0)
UO2OH+	1.115e-12	8.534e-13	-11.953	-12.069	-0.116	(0)
UO2F+	7.437e-13	5.694e-13	-12.129	-12.245	-0.116	(0)
UO2SO4	2.889e-13	2.889e-13	-12.539	-12.539	0.000	(0)

UO2F2	1.844e-13	1.844e-13	-12.734	-12.734	0.000	(0)
UO2+2	8.156e-14	3.673e-14	-13.088	-13.435	-0.346	(0)
UO2 (SO4) 2-2	5.762e-14	1.979e-14	-13.239	-13.704	-0.464	(0)
UO2F3-	6.793e-15	5.200e-15	-14.168	-14.284	-0.116	(0)
UO2Cl+	2.431e-16	1.861e-16	-15.614	-15.730	-0.116	(0)
UO2F4-2	1.351e-17	4.638e-18	-16.869	-17.334	-0.464	(0)
(UO2) 2 (OH) 2+2	3.519e-18	1.209e-18	-17.454	-17.918	-0.464	(0)
(UO2) 3 (OH) 5+	3.481e-20	2.665e-20	-19.458	-19.574	-0.116	(0)
UO2NO3+	9.458e-22	7.241e-22	-21.024	-21.140	-0.116	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.381	-42.497	-0.116	(0)
V+2	0.000e+00	0.000e+00	-42.809	-43.274	-0.464	(0)
V (3)	2.644e-15					
V (OH) 3	2.644e-15	2.644e-15	-14.578	-14.578	0.000	(0)
V (OH) 2+	1.217e-25	9.319e-26	-24.915	-25.031	-0.116	(0)
VOH+2	1.404e-28	4.823e-29	-27.853	-28.317	-0.464	(0)
V+3	5.775e-33	5.214e-34	-32.238	-33.283	-1.044	(0)
VSO4+	1.671e-33	1.279e-33	-32.777	-32.893	-0.116	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.851	-54.895	-1.044	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.977	-55.833	-1.857	(0)
V (4)	9.023e-18					
V (OH) 3+	8.132e-18	6.226e-18	-17.090	-17.206	-0.116	(0)
VO+2	4.927e-19	1.692e-19	-18.307	-18.772	-0.464	(0)
VOSO4	2.422e-19	2.422e-19	-18.616	-18.616	0.000	(0)
VOF+	1.489e-19	1.140e-19	-18.827	-18.943	-0.116	(0)
VOF2	4.798e-21	4.798e-21	-20.319	-20.319	0.000	(0)
VOC1+	1.937e-21	1.483e-21	-20.713	-20.829	-0.116	(0)
VOF3-	2.497e-23	1.912e-23	-22.603	-22.719	-0.116	(0)
VOF4-2	2.523e-26	8.665e-27	-25.598	-26.062	-0.464	(0)
H2V2O4+2	5.666e-30	1.946e-30	-29.247	-29.711	-0.464	(0)
V (5)	8.272e-09					
H2VO4-	7.498e-09	5.740e-09	-8.125	-8.241	-0.116	(0)
HVO4-2	7.701e-10	2.645e-10	-9.113	-9.578	-0.464	(0)
H3VO4	3.129e-12	3.129e-12	-11.505	-11.505	0.000	(0)
H3V2O7-	1.516e-13	1.161e-13	-12.819	-12.935	-0.116	(0)
HV2O7-3	5.702e-15	5.148e-16	-14.244	-15.288	-1.044	(0)
VO2+	4.162e-16	3.410e-16	-15.381	-15.467	-0.087	(0)
VO4-3	2.693e-16	2.431e-17	-15.570	-16.614	-1.044	(0)
VO2F	6.715e-17	6.715e-17	-16.173	-16.173	0.000	(0)
VO2SO4-	5.526e-17	4.230e-17	-16.258	-16.374	-0.116	(0)
V2O7-4	1.827e-17	2.542e-19	-16.738	-18.595	-1.857	(0)
VO2F2-	3.576e-18	2.738e-18	-17.447	-17.563	-0.116	(0)
V3O9-3	2.199e-18	1.985e-19	-17.658	-18.702	-1.044	(0)
VO2F3-2	1.116e-20	3.834e-21	-19.952	-20.416	-0.464	(0)
V4O12-4	3.418e-23	4.754e-25	-22.466	-24.323	-1.857	(0)
VO2F4-3	2.346e-24	2.118e-25	-23.630	-24.674	-1.044	(0)
VO2NO3	1.704e-24	1.704e-24	-23.769	-23.769	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-58.377	-62.555	-4.177	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.730	-61.631	-2.901	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.831	-63.687	-1.857	(0)
Zn	7.895e-06					
Zn+2	4.484e-06	2.019e-06	-5.348	-5.695	-0.346	(0)
ZnSO4	2.295e-06	2.295e-06	-5.639	-5.639	0.000	(0)
ZnCO3	4.000e-07	4.000e-07	-6.398	-6.398	0.000	(0)
ZnHCO3+	3.339e-07	2.556e-07	-6.476	-6.592	-0.116	(0)
Zn (SO4) 2-2	3.025e-07	1.039e-07	-6.519	-6.983	-0.464	(0)
ZnOH+	4.868e-08	3.726e-08	-7.313	-7.429	-0.116	(0)
ZnCl+	1.946e-08	1.584e-08	-7.711	-7.800	-0.089	(0)
ZnF+	5.910e-09	4.524e-09	-8.228	-8.344	-0.116	(0)
ZnOHC1	3.827e-09	3.827e-09	-8.417	-8.417	0.000	(0)
Zn (OH) 2	1.090e-09	1.090e-09	-8.963	-8.963	0.000	(0)
ZnCl2	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)
Zn (OH) 3-	1.317e-12	1.008e-12	-11.880	-11.996	-0.116	(0)
ZnCl3-	2.390e-13	1.946e-13	-12.622	-12.711	-0.089	(0)
ZnNO3+	6.546e-14	5.011e-14	-13.184	-13.300	-0.116	(0)
ZnSeO4	2.949e-14	2.949e-14	-13.530	-13.530	0.000	(0)
ZnCl4-2	6.615e-16	3.038e-16	-15.179	-15.517	-0.338	(0)
Zn (OH) 4-2	2.157e-17	7.406e-18	-16.666	-17.130	-0.464	(0)

Zn(NO3)2	9.877e-23	9.877e-23	-22.005	-22.005	0.000	(0)
Zn(SeO4)2-2	8.210e-24	2.820e-24	-23.086	-23.550	-0.464	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-150.385	-150.501	-0.116	(0)
Zn(HS)2	0.000e+00	0.000e+00	-151.754	-151.754	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-227.798	-227.914	-0.116	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-230.166	-230.630	-0.464	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-308.349	-308.813	-0.464	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-57.78	-51.49	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-45.00	-40.49	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-52.23	-40.49	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-74.67	-56.74	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-60.27	-40.24	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-29.72	-29.32	0.40	(NH4)2CrO4	
(NH4)2SeO4	-24.49	-24.04	0.45	(NH4)2SeO4	
Acanthite	-52.72	-88.94	-36.22	Ag2S	
Ag2CO3	-11.13	-22.22	-11.09	Ag2CO3	
Ag2CrO4	-20.48	-32.07	-11.59	Ag2CrO4	
Ag2HVO4	-11.92	-10.44	1.48	Ag2HVO4	
Ag2MoO4	-11.12	-22.67	-11.55	Ag2MoO4	
Ag2O	-14.81	-2.24	12.57	Ag2O	
Ag2Se	-0.47	-49.17	-48.70	Ag2Se	
Ag2SeO3	-9.22	-16.37	-7.15	Ag2SeO3	
Ag2SeO4	-17.88	-26.79	-8.91	Ag2SeO4	
Ag2SO4	-14.23	-19.05	-4.82	Ag2SO4	
Ag3AsO3	-27.63	-25.48	2.16	Ag3AsO3	
Ag3AsO4	-15.70	-18.49	-2.79	Ag3AsO4	
Ag3H2VO5	-16.74	-11.56	5.18	Ag3H2VO5	
AgF:4H2O	-13.38	-12.33	1.05	AgF:4H2O	
Agmetal	-0.56	-14.06	-13.51	Ag	
AgVO3	-10.09	-9.32	0.77	AgVO3	
Al(OH)3(am)	-1.14	9.66	10.80	Al(OH)3	
Al2(MoO4)3	-44.35	-41.98	2.37	Al2(MoO4)3	
Al2O3	-0.33	19.33	19.65	Al2O3	
Al4(OH)10SO4	-0.86	21.84	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-10.27	-5.47	4.80	AlAsO4:2H2O	
AlOHSO4	-3.92	-7.15	-3.23	AlOHSO4	
AlSb	-152.93	-87.30	65.62	AlSb	
Alunite	1.62	0.22	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.44	-12.23	-7.79	PbSO4	
Anhydrite	-0.81	-5.17	-4.36	CaSO4	
Anilite	-59.02	-90.89	-31.88	Cu0.25Cu1.5S	
Antlerite	-6.42	2.37	8.79	Cu3(OH)4SO4	
Aragonite	-0.05	-8.35	-8.30	CaCO3	
Arsenolite	-85.73	-88.49	-2.76	As4O6	
Artinite	-5.86	3.74	9.60	MgCO3:Mg(OH)2:3H2O	
As2O5	-36.97	-30.27	6.71	As2O5	
Atacamite	-4.37	3.02	7.39	Cu2(OH)3Cl	
Azurite	-3.89	-20.80	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2:8H2O	-16.92	7.48	24.39	Ba(OH)2:8H2O	
Ba2V2O7:2H2O	-17.32	-1.44	15.87	Ba2V2O7:2H2O	
Ba3(AsO4)2	1.09	-7.82	-8.91	Ba3(AsO4)2	
Ba3(VO4)2:4H2O	-26.90	6.04	32.94	Ba3(VO4)2:4H2O	
BaCrO4	-12.68	-22.35	-9.67	BaCrO4	
BaF2	-9.12	-14.94	-5.82	BaF2	
BaMoO4	-5.99	-12.95	-6.96	BaMoO4	
Barite	0.65	-9.33	-9.98	BaSO4	
BaS	-95.40	-79.22	16.18	BaS	
BaSeO3	-8.48	-6.65	1.83	BaSeO3	
BaSeO4	-9.61	-17.07	-7.46	BaSeO4	
Bianchite	-6.22	-7.98	-1.76	ZnSO4:6H2O	
Birnessite	-7.69	10.40	18.09	MnO2	
Bixbyite	-4.45	-5.09	-0.64	Mn2O3	
BlaubleiI	-57.56	-81.72	-24.16	Cu0.9Cu0.2S	

BlaubleiII	-58.67	-85.95	-27.28	Cu0.6Cu0.8S
Boehmite	1.08	9.66	8.58	AlOOH
Breithauptite	-58.39	-76.91	-18.52	NiSb
Brochantite	-6.46	8.77	15.22	Cu4(OH)6SO4
Brucite	-4.98	11.86	16.84	Mg(OH)2
Bunsenite	-5.33	7.11	12.45	NiO
Ca(VO3)2	-10.42	-4.76	5.66	Ca(VO3)2
Ca2V2O7	-10.62	6.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.67	6.88	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.63	4.67	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.44	18.52	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.34	18.52	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-301.98	-159.00	142.97	Ca3Sb2
CaCrO4	-15.92	-18.19	-2.27	CaCrO4
Calcite	0.13	-8.35	-8.48	CaCO3
Calomel	-6.02	-23.93	-17.91	Hg2Cl2
CaMoO4	-0.84	-8.79	-7.95	CaMoO4
Carnotite	-2.49	-2.26	0.23	KUO2VO4
CaSeO3:2H2O	-5.30	-2.49	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.89	-12.91	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.70	-2.86	9.84	Cd(BO2)2
Cd(OH)2	-7.72	5.93	13.64	Cd(OH)2
Cd(OH)2(am)	-7.80	5.93	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.56	-15.85	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.60	0.96	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.51	6.89	28.40	Cd4(OH)6SO4
CdCl2	-12.95	-13.61	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.61	-1.91	CdCl2:2.5H2O
CdF2	-15.29	-16.50	-1.21	CdF2
Cdmetal(alpha)	-33.48	-19.96	13.51	Cd
Cdmetal(gamma)	-33.58	-19.96	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-7.38	-3.84	3.54	CdOHCl
CdSb	-77.75	-78.10	-0.35	CdSb
CdSe	-20.81	-41.01	-20.20	CdSe
CdSeO4:2H2O	-16.78	-18.63	-1.85	CdSeO4:2H2O
CdSO4	-10.71	-10.89	-0.17	CdSO4
CdSO4:1H2O	-9.16	-10.89	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.01	-10.89	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-2.28	-15.41	-13.13	PbCO3
CH4(g)	-82.50	-123.54	-41.05	CH4
Chalcanthite	-7.78	-10.42	-2.64	CuSO4:5H2O
Chalcocite	-59.50	-94.42	-34.92	Cu2S
Chalcopyrite	-128.52	-163.79	-35.27	CuFeS2
Cinnabar	-51.86	-97.55	-45.69	HgS
Claudetite	-85.43	-88.49	-3.06	As4O6
Clausthalite	-15.26	-42.36	-27.10	PbSe
Co(BO2)2	-28.87	-1.80	27.07	Co(BO2)2
Co(OH)2	-6.11	6.99	13.09	Co(OH)2
Co(OH)3	-10.16	-12.47	-2.31	Co(OH)3
CO2(g)	-1.84	-19.99	-18.15	CO2
Co3(AsO4)2	-22.33	-9.30	13.03	Co3(AsO4)2
Co3O4	-7.45	-17.94	-10.50	Co3O4
CoCl2	-20.82	-12.55	8.27	CoCl2
CoCl2:6H2O	-15.09	-12.55	2.54	CoCl2:6H2O
CoCO3	-3.02	-13.00	-9.98	CoCO3
CoF2	-13.84	-15.44	-1.60	CoF2
CoF3	-44.65	-46.11	-1.46	CoF3
CoFe2O4	16.78	13.25	-3.53	CoFe2O4
CoMoO4	-5.68	-13.45	-7.76	CoMoO4
CoO	-6.60	6.99	13.59	CoO
CoS(alpha)	-72.27	-79.71	-7.44	CoS
CoS(beta)	-68.64	-79.71	-11.07	CoS
CoSe	-23.75	-39.95	-16.20	CoSe
CoSeO3	-8.46	-7.14	1.32	CoSeO3
CoSeO4:6H2O	-16.04	-17.57	-1.53	CoSeO4:6H2O

CoSO4	-12.62	-9.82	2.80	CoSO4
CoSO4:6H2O	-7.35	-9.82	-2.47	CoSO4:6H2O
Cotunnite	-10.18	-14.96	-4.78	PbCl2
Covellite	-58.01	-80.31	-22.30	CuS
Cr (OH) 2	-22.10	-11.28	10.82	Cr (OH) 2
Cr (OH) 3	-2.62	-1.29	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.54	-1.29	-0.75	Cr (OH) 3
Cr2O3	-0.22	-2.57	-2.36	Cr2O3
CrCl2	-44.91	-30.82	14.09	CrCl2
CrCl3	-45.71	-30.59	15.11	CrCl3
CrF3	-23.59	-34.93	-11.34	CrF3
Crmetal	-67.65	-37.17	30.48	Cr
CrO3	-26.62	-29.83	-3.21	CrO3
Cryolite	-8.03	-41.87	-33.84	Na3AlF6
Cu (OH) 2	-2.28	6.39	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.65	19.56	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.73	-2.48	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.55	-94.43	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.86	-54.66	-45.80	Cu2Se
Cu2SO4	-22.58	-24.53	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-17.18	-11.08	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.95	-108.55	-42.59	Cu3Sb
Cu3Se2	-31.71	-95.20	-63.49	Cu3Se2
CuCO3	-2.10	-13.60	-11.50	CuCO3
CuCrO4	-18.00	-23.44	-5.44	CuCrO4
CuF	-10.17	-15.07	-4.91	CuF
CuF2	-17.15	-16.03	1.12	CuF2
CuF2:2H2O	-11.48	-16.03	-4.55	CuF2:2H2O
Cumetal	-8.05	-16.80	-8.76	Cu
CuMoO4	-0.96	-14.04	-13.08	CuMoO4
CuOCuSO4	-14.33	-4.02	10.30	CuOCuSO4
Cupricferrite	6.67	12.65	5.99	CuFe2O4
Cuprite	-6.31	-7.72	-1.41	Cu2O
Cuprousferrite	8.19	-0.73	-8.92	CuFeO2
CuSe	-7.44	-40.54	-33.10	CuSe
CuSe2	-28.22	-61.59	-33.37	CuSe2
CuSeO3:2H2O	-8.25	-7.74	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.72	-18.16	-2.44	CuSeO4:5H2O
CuSO4	-13.36	-10.42	2.94	CuSO4
Diaspore	2.79	9.66	6.87	AlOOH
Djurleite	-59.57	-93.49	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.07	-16.47	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.62	-16.47	-17.09	CaMg (CO3) 2
Epsomite	-2.82	-4.95	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.35	3.22	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.24	0.20	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-9.47	-13.19	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.43	-7.87	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-15.51	-36.14	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-40.44	-44.17	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.74	9.48	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.40	-12.00	0.40	FeAsO4:2H2O
FeCr2O4	-6.56	0.65	7.20	FeCr2O4
FeMoO4	-7.13	-17.22	-10.09	FeMoO4
Ferrihydrite	-0.06	3.13	3.19	Fe (OH) 3
Ferroselite	-46.17	-64.77	-18.60	FeSe2
FeS (ppt)	-80.53	-83.48	-2.95	FeS
FeSe	-32.72	-43.72	-11.00	FeSe
Fix_pe	-5.68	-5.68	0.00	e-
Fluorite	-0.28	-10.78	-10.50	CaF2
Galena	-68.16	-82.13	-13.97	PbS
Gibbsite	1.37	9.66	8.29	Al (OH) 3
Goethite	2.64	3.13	0.49	FeOOH
Goslarite	-5.97	-7.98	-2.01	ZnSO4:7H2O
Greenockite	-66.42	-80.78	-14.36	CdS
Greigite	-292.30	-337.33	-45.03	Fe3S4
Gummite	-6.58	1.09	7.67	UO3
Gypsum	-0.56	-5.17	-4.61	CaSO4:2H2O

H-Jarosite	-12.13	-24.23	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-7.56	-20.44	-12.88	H2MoO4
H2S (g)	-78.69	-86.70	-8.01	H2S
H2Se (g)	-41.98	-46.94	-4.96	H2Se
Halite	-6.12	-4.52	1.60	NaCl
Hausmannite	-5.56	55.47	61.03	Mn3O4
Hematite	7.68	6.26	-1.42	Fe2O3
Hercynite	-0.35	22.54	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.22	-257.93	-73.71	Hg (CH3) 2
Hg (g)	-7.27	-15.14	-7.87	Hg
Hg (OH) 2	-7.35	-10.85	-3.50	Hg (OH) 2
Hg2 (g)	-15.33	-30.28	-14.96	Hg2
Hg2 (OH) 2	-9.66	-4.40	5.26	Hg2 (OH) 2
Hg2CO3	-8.34	-24.39	-16.05	Hg2CO3
Hg2CrO4	-25.53	-34.23	-8.70	Hg2CrO4
Hg2F2	-16.46	-26.82	-10.36	Hg2F2
Hg2S	-79.42	-91.10	-11.68	Hg2S
Hg2SeO3	-13.87	-18.53	-4.66	Hg2SeO3
Hg2SO4	-15.08	-21.21	-6.13	Hg2SO4
Hg3O2CO3	-22.85	-52.53	-29.68	Hg3O2CO3
HgCl (g)	-31.46	-11.97	19.50	HgCl
HgCl2	-9.12	-30.38	-21.26	HgCl2
HgF (g)	-46.09	-13.41	32.68	HgF
HgF2 (g)	-45.84	-33.27	12.57	HgF2
Hgmetal (l)	-1.69	-15.14	-13.45	Hg
HgSe	-2.09	-57.78	-55.69	HgSe
HgSeO3	-12.55	-24.98	-12.43	HgSeO3
HgSO4	-18.24	-27.66	-9.42	HgSO4
Huntite	-2.75	-32.72	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-7.48	-26.25	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.87	-20.64	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-13.94	-19.11	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.58	-19.38	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.71	-49.95	-17.24	K2Cr2O7
K2CrO4	-19.61	-20.12	-0.51	K2CrO4
K2MoO4	-13.99	-10.73	3.26	K2MoO4
K2SeO4	-14.12	-14.85	-0.73	K2SeO4
Langite	-8.72	8.77	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.22	-7.66	-0.43	PbO : PbSO4
Laurionite	-5.81	-5.19	0.62	PbOHCl
Lepidocrocite	1.76	3.13	1.37	FeOOH
Lime	-21.06	11.64	32.70	CaO
Litharge	-8.12	4.58	12.69	PbO
Mackinawite	-79.88	-83.48	-3.60	FeS
Maghemite	-0.13	6.26	6.39	Fe2O3
Magnesioferrite	1.27	18.12	16.86	Fe2MgO4
Magnesite	-0.67	-8.13	-7.46	MgCO3
Magnetite	6.08	9.48	3.40	Fe3O4
Malachite	-1.90	-7.20	-5.31	Cu2 (OH) 2CO3
Manganite	-2.54	22.80	25.34	MnOOH
Massicot	-8.32	4.58	12.89	PbO
Matlockite	-7.43	-16.40	-8.97	PbClF
Melanothallite	-19.40	-13.14	6.26	CuCl2
Melanterite	-11.39	-13.60	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.46	-97.55	-45.09	HgS
Mg (OH) 2 (active)	-6.93	11.86	18.79	Mg (OH) 2
Mg (VO3) 2	-15.82	-4.54	11.28	Mg (VO3) 2
Mg2Sb3	-277.14	-202.45	74.68	Mg2Sb3
Mg2V2O7	-19.04	7.32	26.36	Mg2V2O7
MgCr2O4	-6.91	9.29	16.20	MgCr2O4
MgCrO4	-23.35	-17.97	5.38	MgCrO4
MgF2	-2.43	-10.56	-8.13	MgF2
MgMoO4	-6.72	-8.57	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.33	-2.27	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.49	-12.69	-1.20	MgSeO4 : 6H2O
Minium	-33.90	39.62	73.52	Pb3O4
Mirabilite	-5.21	-6.32	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.45	-6.55	4.90	Mn (VO3) 2

Mn2 (SO4) 3	-49.81	-55.53	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.27	-90.19	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.19	-0.69	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.39	-9.68	2.72	MnCl2 : 4H2O
MnS (grn)	-77.01	-76.84	0.17	MnS
MnS (pnk)	-80.18	-76.84	3.34	MnS
MnSb	-96.60	-99.51	-2.91	MnSb
MnSe	-40.58	-37.08	3.50	MnSe
MnSeO3	-5.40	-4.27	1.13	MnSeO3
MnSeO3 : 2H2O	-5.26	-4.27	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.64	-14.69	-2.05	MnSeO4 : 5H2O
MnSO4	-9.53	-6.95	2.58	MnSO4
Monteponite	-9.18	5.93	15.10	CdO
Montroydite	-7.21	-10.85	-3.64	HgO
MoO3	-12.44	-20.44	-8.00	MoO3
Morenosite	-7.55	-9.70	-2.14	NiSO4 : 7H2O
MoS2	-149.47	-219.73	-70.26	MoS2
Na-Jarosite	-7.79	-18.99	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.27	-49.17	-9.90	Na2Cr2O7
Na2CrO4	-22.27	-19.34	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-11.43	-9.94	1.49	Na2MoO4
Na2MoO4 : 2H2O	-11.17	-9.94	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-13.94	-3.64	10.30	Na2SeO3 : 5H2O
Na2SeO4	-15.34	-14.06	1.28	Na2SeO4
Na3Sb	-175.68	-81.23	94.45	Na3Sb
Na3VO4	-29.14	7.54	36.68	Na3VO4
Na4V2O7	-32.82	4.58	37.40	Na4V2O7
Nantokite	-6.90	-13.63	-6.73	CuCl
NaSb	-89.00	-65.83	23.17	NaSb
Natron	-8.19	-9.50	-1.31	Na2CO3 : 10H2O
NaVO3	-6.82	-2.96	3.86	NaVO3
Nesquehonite	-3.46	-8.13	-4.67	MgCO3 : 3H2O
Ni (OH) 2	-5.68	7.11	12.79	Ni (OH) 2
Ni3 (AsO4) 2 : 8H2O	-24.62	-8.92	15.70	Ni3 (AsO4) 2 : 8H2O
Ni4 (OH) 6SO4	-20.35	11.65	32.00	Ni4 (OH) 6SO4
NiCO3	-6.01	-12.88	-6.87	NiCO3
NiMoO4	-2.18	-13.32	-11.14	NiMoO4
NiS (alpha)	-73.99	-79.59	-5.60	NiS
NiS (beta)	-68.49	-79.59	-11.10	NiS
NiS (gamma)	-66.79	-79.59	-12.80	NiS
NiSe	-22.12	-39.82	-17.70	NiSe
NiSeO3 : 2H2O	-9.83	-7.02	2.81	NiSeO3 : 2H2O
NiSeO4 : 6H2O	-15.92	-17.44	-1.52	NiSeO4 : 6H2O
Nsutite	-7.11	10.40	17.50	MnO2
O2 (g)	-31.31	51.78	83.09	O2
Orpiment	-243.29	-304.35	-61.07	As2S3
Otavite	-2.06	-14.06	-12.00	CdCO3
Pb (BO2) 2	-10.73	-4.21	6.52	Pb (BO2) 2
Pb (OH) 2	-3.57	4.58	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-65.41	-74.17	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.41	-0.61	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.03	9.15	26.19	Pb2O (OH) 2
Pb2O3	-26.00	35.04	61.04	Pb2O3
Pb2OCO3	-10.28	-10.84	-0.56	Pb2OCO3
Pb2V2O7	-5.35	-7.25	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-22.33	-16.53	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-8.82	-2.68	6.14	Pb3 (VO4) 2
Pb3O2CO3	-17.28	-6.26	11.02	Pb3O2CO3
Pb3O2SO4	-13.77	-3.08	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-19.60	1.50	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-20.38	1.50	21.88	Pb4O3SO4
PbCrO4	-12.65	-25.25	-12.60	PbCrO4
PbF2	-10.41	-17.85	-7.44	PbF2
Pbmetal	-25.56	-21.31	4.25	Pb
PbMoO4	-0.24	-15.86	-15.62	PbMoO4
PbO : 0.3H2O	-8.40	4.58	12.98	PbO : 0.33H2O
PbSeO4	-13.13	-19.97	-6.84	PbSeO4

Periclase	-9.72	11.86	21.58	MgO
Phosgenite	-10.56	-30.37	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-19.13	30.47	49.60	PbO ₂
Portlandite	-11.16	11.64	22.80	Ca (OH) ₂
Pyrite	-125.79	-144.30	-18.51	FeS ₂
Pyrochroite	-5.33	9.86	15.19	Mn (OH) ₂
Pyrolusite	-5.63	35.75	41.38	MnO ₂
Realgar	-102.02	-121.77	-19.75	AsS
Retgersite	-7.66	-9.70	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.45	-10.13	-10.58	MnCO ₃
Rutherfordine	-4.40	-18.90	-14.50	UO ₂ CO ₃
Sb (OH) ₃	-12.19	-19.30	-7.11	Sb (OH) ₃
Sb ₂ O ₄	-16.12	-12.72	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-25.78	-35.45	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-111.66	-179.42	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-58.95	-77.22	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-59.31	-77.22	-17.90	Sb ₄ O ₆
SbCl ₃	-49.18	-48.61	0.57	SbCl ₃
SbF ₃	-42.72	-52.94	-10.23	SbF ₃
Sbmetal	-46.45	-58.14	-11.69	Sb
SbO ₂	-2.85	-30.67	-27.82	SbO ₂
Schoepite	-4.90	1.09	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal (am)	-13.94	-21.05	-7.11	Se
Semetal (hex)	-13.34	-21.05	-7.71	Se
Senarmontite	-26.24	-38.61	-12.37	Sb ₂ O ₃
SeO ₂	-14.26	-14.13	0.12	SeO ₂
SeO ₃	-45.60	-24.55	21.04	SeO ₃
Siderite	-6.53	-16.77	-10.24	FeCO ₃
Smithsonite	-1.16	-11.16	-10.00	ZnCO ₃
Sphalerite	-66.42	-77.87	-11.45	ZnS
Spinel	-5.66	31.19	36.85	MgAl ₂ O ₄
Stibnite	-248.26	-298.72	-50.46	Sb ₂ S ₃
Sulfur	-58.67	-60.81	-2.14	S
Tenorite	-1.25	6.39	7.64	CuO
Thenardite	-6.64	-6.32	0.32	Na ₂ SO ₄
Thermonatrite	-10.13	-9.50	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-6.66	-2.58	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-16.05	5.03	21.08	U ₃ O ₈
U ₃ Sb ₄	-586.99	-434.61	152.38	U ₃ Sb ₄
U ₄ O ₉	-33.41	-36.43	-3.02	U ₄ O ₉
UF ₄	-30.90	-60.43	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-27.72	-60.43	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.51	-15.58	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.59	-29.45	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.30	-29.45	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.84	-29.45	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.49	-29.45	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.52	1.09	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-21.21	-23.46	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.61	1.09	7.70	UO ₃
Uraninite	-10.91	-15.58	-4.67	UO ₂
USb ₂	-222.42	-192.84	29.58	USb ₂
V (OH) ₃	-19.08	-11.49	7.59	V (OH) ₃
V ₂ O ₅	-15.05	-16.41	-1.36	V ₂ O ₅
V ₃ O ₅	-40.46	-38.62	1.84	V ₃ O ₅
V ₄ O ₇	-50.05	-42.87	7.19	V ₄ O ₇
V ₆ O ₁₃	-40.14	-101.00	-60.86	V ₆ O ₁₃
Valentinite	-30.13	-38.61	-8.48	Sb ₂ O ₃
VC ₁₂	-62.85	-43.97	18.87	VC ₁₂
VC ₁₃	-64.23	-40.80	23.43	VC ₁₃
VF ₄	-64.03	-49.10	14.93	VF ₄
Vmetal	-94.35	-50.32	44.03	V
VO	-39.19	-24.44	14.76	VO
VO (OH) ₂	-9.40	-4.25	5.15	VO (OH) ₂
VO ₂ Cl	-20.81	-17.97	2.84	VO ₂ Cl
VOC ₁	-32.41	-21.26	11.15	VOC ₁
VOC ₁₂	-36.54	-23.78	12.76	VOC ₁₂
VOSO ₄	-24.67	-21.06	3.61	VOSO ₄

Witherite	-3.94	-12.51	-8.57	BaCO3
Wurtzite	-68.92	-77.87	-8.95	ZnS
Zincite	-2.50	8.83	11.33	ZnO
Zincosite	-11.91	-7.98	3.93	ZnSO4
Zn(BO2)2	-8.25	0.04	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.02	-21.71	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.37	8.83	12.20	Zn(OH)2
Zn(OH)2(am)	-3.64	8.83	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.92	8.83	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.70	8.83	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.90	8.83	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.65	0.85	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.30	7.89	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.42	-3.77	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.04	-7.13	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.88	18.52	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.88	24.62	38.50	Zn5(OH)8Cl2
ZnCl2	-17.76	-10.71	7.05	ZnCl2
ZnCO3:1H2O	-0.90	-11.16	-10.26	ZnCO3:1H2O
ZnF2	-13.06	-13.59	-0.53	ZnF2
Znmetal	-42.84	-17.06	25.79	Zn
ZnMoO4	-1.48	-11.60	-10.13	ZnMoO4
ZnO(active)	-2.36	8.83	11.19	ZnO
ZnS(am)	-68.82	-77.87	-9.05	ZnS
ZnSb	-86.21	-75.19	11.01	ZnSb
ZnSe	-23.70	-38.10	-14.40	ZnSe
ZnSeO4:6H2O	-14.20	-15.72	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.34	-7.98	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 33.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e-=e-
  log_k      0
EQUILIBRIUM_PHASES 105
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0

```

```

Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 113
SAVE Solution 114 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 105
END

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TITLE
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```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 113. Solution after simulation 32.
Using pure phase assemblage 105.

```

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	1.521e-08	1.521e-08
Alunite	-3.56	-4.96	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.04	-5.40	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	1.927e-10	1.927e-10
Barite	0.00	-9.98	-9.98	0.000e+00	1.629e-07	1.629e-07
Brochantite	-1.81	13.41	15.22	0.000e+00	0	0.000e+00
Brucite	-3.19	13.65	16.84	0.000e+00	0	0.000e+00

CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	2.602e-03
CaMoO4	-1.09	-9.04	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.98	-2.17	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.111e-03	2.111e-03
Carnotite	-1.20	-0.97	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.01	-1.17	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.36	-14.51	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	1.752e-09	1.752e-09
Cu2Se(alpha)	-5.48	-51.28	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.14	-14.21	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.79	-4.92	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	1.836e-09	1.836e-09
Fluorite	-0.53	-11.03	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.09	2.58	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.79	-5.40	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.58	-58.28	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.17	-6.29	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.81	-3.68	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.84	8.95	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-23.53	-7.83	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.83	-12.70	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.12	-13.26	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.329e-07
Otavite	-1.95	-13.95	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.32	-15.94	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.56	-19.06	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.56	-31.39	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.41	2.58	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.35	-0.27	4.08	0.000e+00	0	0.000e+00
U3O8	-11.23	9.85	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.03	2.58	5.61	0.000e+00	0	0.000e+00
UO3	-5.12	2.58	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.49	-11.61	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	1.127e-08	1.128e-08
Al	2.313e-06	2.314e-06
As	1.709e-10	1.710e-10
B	4.036e-05	4.038e-05
Ba	4.132e-08	4.134e-08
C	8.983e-04	8.988e-04
Ca	2.489e-03	2.491e-03
Cd	1.047e-08	1.047e-08
Cl	3.813e-03	3.815e-03
Co	1.287e-07	1.288e-07
Cr	9.005e-10	9.010e-10
Cu	1.867e-07	1.869e-07
F	1.736e-04	1.737e-04
Fe	8.300e-10	8.305e-10
Hg	2.805e-09	2.806e-09
K	4.923e-03	4.926e-03
Mg	7.044e-03	7.048e-03
Mn	8.486e-05	8.491e-05
Mo	2.743e-06	2.744e-06
N	6.052e-06	6.056e-06
Na	1.210e-02	1.211e-02
Ni	1.568e-07	1.569e-07
Pb	2.280e-09	2.282e-09
S	1.568e-02	1.569e-02
Sb	3.852e-08	3.855e-08
Se	1.904e-07	1.905e-07

U	5.299e-07	5.302e-07
V	8.271e-09	8.276e-09
Zn	7.894e-06	7.899e-06

-----Description of solution-----

	pH =	8.155	Charge balance
	pe =	4.617	Adjusted to redox
equilibrium	Activity of water	=	0.999
	Ionic strength (mol/kgw)	=	4.777e-02
	Mass of water (kg)	=	1.001e+00
	Total alkalinity (eq/kg)	=	9.318e-04
	Total CO2 (mol/kg)	=	8.983e-04
	Temperature (°C)	=	25.00
	Electrical balance (eq)	=	7.162e-07
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00
	Iterations	=	27
	Total H	=	1.110788e+02
	Total O	=	5.560448e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.766e-06	1.439e-06	-5.753	-5.842	-0.089	(0)
H+	8.490e-09	6.994e-09	-8.071	-8.155	-0.084	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	1.127e-08					
AgCl	7.192e-09	7.192e-09	-8.143	-8.143	0.000	(0)
AgCl2-	2.543e-09	1.967e-09	-8.595	-8.706	-0.111	(0)
Ag+	1.361e-09	1.122e-09	-8.866	-8.950	-0.084	(0)
AgSO4-	1.599e-10	1.237e-10	-9.796	-9.908	-0.111	(0)
AgCl3-2	1.537e-11	5.507e-12	-10.813	-11.259	-0.446	(0)
AgNO2	1.142e-12	1.142e-12	-11.942	-11.942	0.000	(0)
AgCl4-3	3.558e-13	3.531e-14	-12.449	-13.452	-1.003	(0)
AgF	3.197e-13	3.197e-13	-12.495	-12.495	0.000	(0)
AgOH	1.613e-13	1.613e-13	-12.792	-12.792	0.000	(0)
AgH2BO3	5.387e-14	5.387e-14	-13.269	-13.269	0.000	(0)
AgSeO3-	3.498e-14	2.706e-14	-13.456	-13.568	-0.111	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	4.291e-15	3.320e-15	-14.367	-14.479	-0.111	(0)
Ag(OH) 2-	2.932e-17	2.268e-17	-16.533	-16.644	-0.111	(0)
Ag(NO2) 2-	1.115e-17	8.626e-18	-16.953	-17.064	-0.111	(0)
AgNO3	4.097e-18	4.097e-18	-17.387	-17.387	0.000	(0)
Ag(SeO3) 2-3	9.163e-20	9.095e-21	-19.038	-20.041	-1.003	(0)
Ag(NH3) 2+	5.057e-20	3.912e-20	-19.296	-19.408	-0.111	(0)
Ag2MoO4	6.014e-25	6.014e-25	-24.221	-24.221	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.067	-74.067	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-81.120	-82.903	-1.784	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.227	-0.215	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.787	-148.899	-0.111	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.123	-149.512	-0.389	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.454	-149.823	-0.368	(0)
Al	2.313e-06					
Al(OH) 4-	2.302e-06	1.896e-06	-5.638	-5.722	-0.084	(0)
Al(OH) 3	1.047e-08	1.047e-08	-7.980	-7.980	0.000	(0)
Al(OH) 2+	4.388e-10	3.647e-10	-9.358	-9.438	-0.080	(0)
AlF3	1.624e-11	1.624e-11	-10.789	-10.789	0.000	(0)
AlF2+	1.368e-11	1.137e-11	-10.864	-10.944	-0.080	(0)
AlF4-	1.122e-12	9.238e-13	-11.950	-12.034	-0.084	(0)
AlOH+2	6.688e-13	3.191e-13	-12.175	-12.496	-0.321	(0)
AlF+2	5.275e-13	2.517e-13	-12.278	-12.599	-0.321	(0)
AlSO4+	1.156e-14	9.519e-15	-13.937	-14.021	-0.084	(0)
Al+3	1.269e-15	2.218e-16	-14.896	-15.654	-0.758	(0)
Al(SO4) 2-	6.846e-16	5.639e-16	-15.165	-15.249	-0.084	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.980	-44.983	-1.003	(0)

As (3)	1.137e-24					
H3AsO3	1.038e-24	1.038e-24	-23.984	-23.984	0.000	(0)
H2AsO3-	9.842e-26	7.614e-26	-25.007	-25.118	-0.111	(0)
HAsO3-2	2.772e-29	9.928e-30	-28.557	-29.003	-0.446	(0)
H4AsO3+	4.651e-33	3.598e-33	-32.332	-32.444	-0.111	(0)
AsO3-3	5.513e-34	5.472e-35	-33.259	-34.262	-1.003	(0)
As (5)	1.709e-10					
HAsO4-2	1.658e-10	5.937e-11	-9.781	-10.226	-0.446	(0)
H2AsO4-	4.895e-12	3.787e-12	-11.310	-11.422	-0.111	(0)
AsO4-3	2.705e-13	2.684e-14	-12.568	-13.571	-1.003	(0)
H3AsO4	4.552e-18	4.603e-18	-17.342	-17.337	0.005	(0)
B	4.036e-05					
H3BO3	3.610e-05	3.650e-05	-4.443	-4.438	0.005	(0)
H2BO3-	3.767e-06	3.031e-06	-5.424	-5.518	-0.095	(0)
MgH2BO3+	2.870e-07	2.309e-07	-6.542	-6.637	-0.095	(0)
CaH2BO3+	1.559e-07	1.254e-07	-6.807	-6.902	-0.095	(0)
NaH2BO3	4.649e-08	4.649e-08	-7.333	-7.333	0.000	(0)
BF (OH) 3-	2.054e-09	1.652e-09	-8.687	-8.782	-0.095	(0)
H5 (BO3) 2-	1.170e-10	9.414e-11	-9.932	-10.026	-0.095	(0)
BaH2BO3+	2.205e-12	1.774e-12	-11.657	-11.751	-0.095	(0)
H8 (BO3) 3-	4.271e-13	3.436e-13	-12.369	-12.464	-0.095	(0)
BF2 (OH) 2-	1.744e-13	1.403e-13	-12.758	-12.853	-0.095	(0)
AgH2BO3	5.387e-14	5.387e-14	-13.269	-13.269	0.000	(0)
BF3OH-	5.389e-20	4.335e-20	-19.268	-19.363	-0.095	(0)
BF4-	2.106e-25	1.694e-25	-24.677	-24.771	-0.095	(0)
Ba	4.132e-08					
Ba+2	4.113e-08	1.894e-08	-7.386	-7.723	-0.337	(0)
BaHCO3+	1.487e-10	1.243e-10	-9.828	-9.906	-0.078	(0)
BaCO3	4.474e-11	4.474e-11	-10.349	-10.349	0.000	(0)
BaH2BO3+	2.205e-12	1.774e-12	-11.657	-11.751	-0.095	(0)
BaOH+	1.437e-13	1.190e-13	-12.843	-12.925	-0.082	(0)
BaNO3+	5.644e-16	4.367e-16	-15.248	-15.360	-0.111	(0)
BaNH3+2	4.838e-17	1.733e-17	-16.315	-16.761	-0.446	(0)
C (4)	8.983e-04					
HCO3-	8.266e-04	6.870e-04	-3.083	-3.163	-0.080	(0)
MgHCO3+	1.886e-05	1.545e-05	-4.725	-4.811	-0.087	(0)
CaHCO3+	1.101e-05	9.199e-06	-4.958	-5.036	-0.078	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.998e-06	4.605e-06	-5.000	-5.337	-0.337	(0)
MgCO3	8.417e-06	8.417e-06	-5.075	-5.075	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	3.740e-06	3.740e-06	-5.427	-5.427	0.000	(0)
NaCO3-	9.987e-07	8.301e-07	-6.001	-6.081	-0.080	(0)
ZnCO3	5.124e-07	5.124e-07	-6.290	-6.290	0.000	(0)
UO2 (CO3) 3-4	4.417e-07	7.270e-09	-6.355	-8.138	-1.784	(0)
MnHCO3+	3.691e-07	3.056e-07	-6.433	-6.515	-0.082	(0)
CuCO3	1.314e-07	1.314e-07	-6.881	-6.881	0.000	(0)
UO2 (CO3) 2-2	8.794e-08	3.150e-08	-7.056	-7.502	-0.446	(0)
ZnHCO3+	5.430e-08	4.201e-08	-7.265	-7.377	-0.111	(0)
NiCO3	7.492e-09	7.492e-09	-8.125	-8.125	0.000	(0)
NiHCO3+	4.774e-09	3.693e-09	-8.321	-8.433	-0.111	(0)
Cu (CO3) 2-2	4.547e-09	1.629e-09	-8.342	-8.788	-0.446	(0)
CoCO3	2.444e-09	2.444e-09	-8.612	-8.612	0.000	(0)
CoHCO3+	2.168e-09	1.678e-09	-8.664	-8.775	-0.111	(0)
PbCO3	1.256e-09	1.256e-09	-8.901	-8.901	0.000	(0)
UO2CO3	3.428e-10	3.428e-10	-9.465	-9.465	0.000	(0)
CuHCO3+	2.715e-10	2.100e-10	-9.566	-9.678	-0.111	(0)
CdCO3	2.573e-10	2.573e-10	-9.590	-9.590	0.000	(0)
BaHCO3+	1.487e-10	1.243e-10	-9.828	-9.906	-0.078	(0)
PbHCO3+	5.986e-11	4.631e-11	-10.223	-10.334	-0.111	(0)
Pb (CO3) 2-2	4.657e-11	1.668e-11	-10.332	-10.778	-0.446	(0)
BaCO3	4.474e-11	4.474e-11	-10.349	-10.349	0.000	(0)
CdHCO3+	4.955e-12	3.833e-12	-11.305	-11.416	-0.111	(0)
Cd (CO3) 2-2	2.452e-12	8.782e-13	-11.611	-12.056	-0.446	(0)
HgCO3	2.862e-15	2.862e-15	-14.543	-14.543	0.000	(0)
FeHCO3+	1.431e-15	1.196e-15	-14.844	-14.922	-0.078	(0)
Hg (CO3) 2-2	1.163e-16	4.167e-17	-15.934	-16.380	-0.446	(0)
HgHCO3+	4.817e-19	3.727e-19	-18.317	-18.429	-0.111	(0)

Ca	2.489e-03					
Ca+2	1.561e-03	7.190e-04	-2.807	-3.143	-0.337	(0)
CaSO4	9.106e-04	9.106e-04	-3.041	-3.041	0.000	(0)
CaHCO3+	1.101e-05	9.199e-06	-4.958	-5.036	-0.078	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	1.076e-06	8.905e-07	-5.968	-6.050	-0.082	(0)
CaH2BO3+	1.559e-07	1.254e-07	-6.807	-6.902	-0.095	(0)
CaOH+	2.470e-08	2.064e-08	-7.607	-7.685	-0.078	(0)
CaNO3+	1.352e-11	1.046e-11	-10.869	-10.981	-0.111	(0)
CaNH3+2	3.664e-12	1.312e-12	-11.436	-11.882	-0.446	(0)
Ca (NH3) 2+2	2.115e-21	7.575e-22	-20.675	-21.121	-0.446	(0)
Cd	1.047e-08					
Cd+2	5.321e-09	2.451e-09	-8.274	-8.611	-0.337	(0)
CdSO4	3.176e-09	3.176e-09	-8.498	-8.498	0.000	(0)
CdCl+	9.502e-10	7.351e-10	-9.022	-9.134	-0.111	(0)
Cd (SO4) 2-2	6.612e-10	2.368e-10	-9.180	-9.626	-0.446	(0)
CdCO3	2.573e-10	2.573e-10	-9.590	-9.590	0.000	(0)
CdOHC1	4.338e-11	4.338e-11	-10.363	-10.363	0.000	(0)
CdOH+	3.620e-11	2.801e-11	-10.441	-10.553	-0.111	(0)
CdCl2	9.625e-12	9.625e-12	-11.017	-11.017	0.000	(0)
CdF+	5.697e-12	4.408e-12	-11.244	-11.356	-0.111	(0)
CdHCO3+	4.955e-12	3.833e-12	-11.305	-11.416	-0.111	(0)
Cd (CO3) 2-2	2.452e-12	8.782e-13	-11.611	-12.056	-0.446	(0)
Cd (OH) 2	2.542e-13	2.542e-13	-12.595	-12.595	0.000	(0)
CdCl3-	2.465e-14	1.907e-14	-13.608	-13.720	-0.111	(0)
CdF2	9.979e-16	9.979e-16	-15.001	-15.001	0.000	(0)
CdSeO4	7.422e-17	7.422e-17	-16.129	-16.129	0.000	(0)
CdNO3+	4.608e-17	3.565e-17	-16.337	-16.448	-0.111	(0)
Cd (OH) 3-	2.888e-17	2.235e-17	-16.539	-16.651	-0.111	(0)
Cd (SeO3) 2-2	7.947e-18	2.847e-18	-17.100	-17.546	-0.446	(0)
Cd2OH+3	3.466e-18	3.440e-19	-17.460	-18.463	-1.003	(0)
Cd (OH) 4-2	1.469e-23	5.262e-24	-22.833	-23.279	-0.446	(0)
Cd (NO3) 2	8.217e-26	8.217e-26	-25.085	-25.085	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.423	-79.534	-0.111	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.262	-151.262	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.182	-228.293	-0.111	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.583	-305.029	-0.446	(0)
Cl	3.813e-03					
Cl-	3.812e-03	3.141e-03	-2.419	-2.503	-0.084	(0)
MnCl+	1.065e-07	8.815e-08	-6.973	-7.055	-0.082	(0)
ZnOHC1	2.873e-08	2.873e-08	-7.542	-7.542	0.000	(0)
ZnCl+	1.862e-08	1.525e-08	-7.730	-7.817	-0.087	(0)
AgCl	7.192e-09	7.192e-09	-8.143	-8.143	0.000	(0)
AgCl2-	2.543e-09	1.967e-09	-8.595	-8.706	-0.111	(0)
CdCl+	9.502e-10	7.351e-10	-9.022	-9.134	-0.111	(0)
NiCl+	4.530e-10	3.504e-10	-9.344	-9.455	-0.111	(0)
CoCl+	4.409e-10	3.411e-10	-9.356	-9.467	-0.111	(0)
MnCl2	3.911e-10	3.911e-10	-9.408	-9.408	0.000	(0)
CuCl	2.265e-10	2.265e-10	-9.645	-9.645	0.000	(0)
CuCl2-	1.814e-10	1.486e-10	-9.741	-9.828	-0.087	(0)
ZnCl2	7.593e-11	7.593e-11	-10.120	-10.120	0.000	(0)
CdOHC1	4.338e-11	4.338e-11	-10.363	-10.363	0.000	(0)
CuCl+	2.944e-11	2.412e-11	-10.531	-10.618	-0.087	(0)
AgCl3-2	1.537e-11	5.507e-12	-10.813	-11.259	-0.446	(0)
PbCl+	1.307e-11	1.011e-11	-10.884	-10.995	-0.111	(0)
CdCl2	9.625e-12	9.625e-12	-11.017	-11.017	0.000	(0)
HgClOH	4.143e-12	4.143e-12	-11.383	-11.383	0.000	(0)
HgCl2	5.122e-13	5.122e-13	-12.291	-12.291	0.000	(0)
MnCl3-	4.086e-13	3.383e-13	-12.389	-12.471	-0.082	(0)
AgCl4-3	3.558e-13	3.531e-14	-12.449	-13.452	-1.003	(0)
ZnCl3-	2.312e-13	1.894e-13	-12.636	-12.723	-0.087	(0)
CuCl3-2	2.125e-13	9.981e-14	-12.673	-13.001	-0.328	(0)
PbCl2	1.418e-13	1.418e-13	-12.848	-12.848	0.000	(0)
CuCl2	2.626e-14	2.626e-14	-13.581	-13.581	0.000	(0)
CdCl3-	2.465e-14	1.907e-14	-13.608	-13.720	-0.111	(0)
HgCl3-	2.079e-14	1.609e-14	-13.682	-13.794	-0.111	(0)
NiCl2	5.541e-15	5.541e-15	-14.256	-14.256	0.000	(0)
ZnCl4-2	6.333e-16	2.975e-16	-15.198	-15.526	-0.328	(0)

HgCl4-2	5.616e-16	2.011e-16	-15.251	-15.696	-0.446	(0)
PbCl3-	2.292e-16	1.773e-16	-15.640	-15.751	-0.111	(0)
UO2Cl+	1.231e-16	9.524e-17	-15.910	-16.021	-0.111	(0)
HgCl+	4.206e-17	3.254e-17	-16.376	-16.488	-0.111	(0)
CrCl+2	9.540e-19	3.417e-19	-18.020	-18.466	-0.446	(0)
CuCl3-	9.397e-19	7.698e-19	-18.027	-18.114	-0.087	(0)
PbCl4-2	7.107e-19	2.546e-19	-18.148	-18.594	-0.446	(0)
CrOHC12	2.935e-20	2.935e-20	-19.532	-19.532	0.000	(0)
CrCl2+	1.316e-22	1.018e-22	-21.881	-21.992	-0.111	(0)
FeCl+2	1.075e-22	5.048e-23	-21.969	-22.297	-0.328	(0)
CuCl4-2	2.580e-23	1.212e-23	-22.588	-22.917	-0.328	(0)
VOCl+	3.792e-24	2.933e-24	-23.421	-23.533	-0.111	(0)
FeCl2+	8.555e-25	7.082e-25	-24.068	-24.150	-0.082	(0)
CrO3Cl-	4.779e-26	3.697e-26	-25.321	-25.432	-0.111	(0)
FeCl3	2.224e-28	2.224e-28	-27.653	-27.653	0.000	(0)
CoCl+2	9.236e-36	3.308e-36	-35.035	-35.480	-0.446	(0)
UCl+3	0.000e+00	0.000e+00	-46.167	-47.170	-1.003	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
Co (2)	1.287e-07					
Co+2	8.764e-08	3.139e-08	-7.057	-7.503	-0.446	(0)
CoSO4	3.462e-08	3.462e-08	-7.461	-7.461	0.000	(0)
CoCO3	2.444e-09	2.444e-09	-8.612	-8.612	0.000	(0)
CoHCO3+	2.168e-09	1.678e-09	-8.664	-8.775	-0.111	(0)
CoOH+	1.165e-09	9.011e-10	-8.934	-9.045	-0.111	(0)
CoCl+	4.409e-10	3.411e-10	-9.356	-9.467	-0.111	(0)
CoF+	1.456e-10	1.126e-10	-9.837	-9.948	-0.111	(0)
Co (OH) 2	1.030e-10	1.030e-10	-9.987	-9.987	0.000	(0)
CoNO2+	1.394e-12	1.078e-12	-11.856	-11.967	-0.111	(0)
Co (NH3) +2	1.528e-14	5.472e-15	-13.816	-14.262	-0.446	(0)
Co (OH) 3-	3.821e-15	2.956e-15	-14.418	-14.529	-0.111	(0)
CoSeO4	2.559e-15	2.559e-15	-14.592	-14.592	0.000	(0)
CoOOH-	9.594e-16	7.422e-16	-15.018	-15.129	-0.111	(0)
CoNO3+	2.958e-16	2.288e-16	-15.529	-15.640	-0.111	(0)
Co2OH+3	1.428e-17	1.418e-18	-16.845	-17.848	-1.003	(0)
Co (OH) 4-2	1.882e-21	6.740e-22	-20.725	-21.171	-0.446	(0)
Co (NH3) 2+2	9.447e-22	3.384e-22	-21.025	-21.471	-0.446	(0)
Co (NO3) 2	2.142e-24	2.142e-24	-23.669	-23.669	0.000	(0)
Co4 (OH) 4+4	7.992e-27	1.315e-28	-26.097	-27.881	-1.784	(0)
Co (NH3) 3+2	1.724e-29	6.176e-30	-28.763	-29.209	-0.446	(0)
Co (NH3) 4+2	1.312e-37	4.699e-38	-36.882	-37.328	-0.446	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.501	-45.947	-0.446	(0)
Co (3)	1.057e-28					
CoOH+2	1.057e-28	3.784e-29	-27.976	-28.422	-0.446	(0)
Co+3	2.962e-35	5.176e-36	-34.528	-35.286	-0.758	(0)
CoCl+2	9.236e-36	3.308e-36	-35.035	-35.480	-0.446	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.968	-68.414	-0.446	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
Cr (2)	1.354e-27					
Cr+2	1.354e-27	4.848e-28	-26.868	-27.314	-0.446	(0)
Cr (3)	9.004e-10					
Cr (OH) 2+	5.987e-10	4.632e-10	-9.223	-9.334	-0.111	(0)
Cr (OH) 3	2.503e-10	2.503e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.199e-11	1.701e-11	-10.658	-10.769	-0.111	(0)
Cr (OH) 4-	1.853e-11	1.434e-11	-10.732	-10.844	-0.111	(0)
Cr (OH) +2	7.387e-12	2.646e-12	-11.132	-11.577	-0.446	(0)
CrOHSO4	3.471e-12	3.471e-12	-11.460	-11.460	0.000	(0)
CrF+2	4.221e-15	1.512e-15	-14.375	-14.820	-0.446	(0)
CrSO4+	1.403e-15	1.085e-15	-14.853	-14.964	-0.111	(0)
Cr+3	8.470e-16	8.407e-17	-15.072	-16.075	-1.003	(0)
CrCl+2	9.540e-19	3.417e-19	-18.020	-18.466	-0.446	(0)
CrOHC12	2.935e-20	2.935e-20	-19.532	-19.532	0.000	(0)
Cr2 (OH) 2SO4+2	2.318e-21	8.302e-22	-20.635	-21.081	-0.446	(0)
Cr2 (OH) 2 (SO4) 2	2.726e-22	2.726e-22	-21.564	-21.564	0.000	(0)
CrCl2+	1.316e-22	1.018e-22	-21.881	-21.992	-0.111	(0)

	CrNO3+2	4.719e-26	1.690e-26	-25.326	-25.772	-0.446	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.293	-45.739	-0.446	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-55.104	-56.108	-1.003	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
Cr (6)	2.696e-14						
	CrO4-2	2.566e-14	1.182e-14	-13.591	-13.928	-0.337	(0)
	NaCrO4-	7.347e-16	5.684e-16	-15.134	-15.245	-0.111	(0)
	HCrO4-	3.457e-16	2.674e-16	-15.461	-15.573	-0.111	(0)
	KCrO4-	2.216e-16	1.714e-16	-15.655	-15.766	-0.111	(0)
	CrO3SO4-2	8.799e-24	3.152e-24	-23.056	-23.501	-0.446	(0)
	H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
	CrO3Cl-	4.779e-26	3.697e-26	-25.321	-25.432	-0.111	(0)
	Cr2O7-2	6.928e-30	2.482e-30	-29.159	-29.605	-0.446	(0)
Cu (1)	4.822e-10						
	CuCl	2.265e-10	2.265e-10	-9.645	-9.645	0.000	(0)
	CuCl2-	1.814e-10	1.486e-10	-9.741	-9.828	-0.087	(0)
	Cu+	7.405e-11	5.729e-11	-10.130	-10.242	-0.111	(0)
	CuCl3-2	2.125e-13	9.981e-14	-12.673	-13.001	-0.328	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-148.026	-148.404	-0.378	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.775	-149.134	-0.359	(0)
Cu (2)	1.863e-07						
	CuCO3	1.314e-07	1.314e-07	-6.881	-6.881	0.000	(0)
	CuOH+	2.691e-08	2.204e-08	-7.570	-7.657	-0.087	(0)
	Cu+2	1.052e-08	4.845e-09	-7.978	-8.315	-0.337	(0)
	Cu (OH) 2	6.327e-09	6.327e-09	-8.199	-8.199	0.000	(0)
	CuSO4	6.136e-09	6.136e-09	-8.212	-8.212	0.000	(0)
	Cu (CO3) 2-2	4.547e-09	1.629e-09	-8.342	-8.788	-0.446	(0)
	CuHCO3+	2.715e-10	2.100e-10	-9.566	-9.678	-0.111	(0)
	CuF+	4.484e-11	3.469e-11	-10.348	-10.460	-0.111	(0)
	Cu2 (OH) 2+2	3.407e-11	1.220e-11	-10.468	-10.913	-0.446	(0)
	CuCl+	2.944e-11	2.412e-11	-10.531	-10.618	-0.087	(0)
	Cu (OH) 3-	2.414e-11	1.867e-11	-10.617	-10.729	-0.111	(0)
	CuNO2+	3.197e-12	2.474e-12	-11.495	-11.607	-0.111	(0)
	CuNH3+2	2.007e-13	7.188e-14	-12.697	-13.143	-0.446	(0)
	CuCl2	2.626e-14	2.626e-14	-13.581	-13.581	0.000	(0)
	Cu (OH) 4-2	5.903e-16	2.114e-16	-15.229	-15.675	-0.446	(0)
	Cu (NO2) 2	1.234e-16	1.234e-16	-15.909	-15.909	0.000	(0)
	CuNO3+	9.109e-17	7.047e-17	-16.041	-16.152	-0.111	(0)
	CuCl3-	9.397e-19	7.698e-19	-18.027	-18.114	-0.087	(0)
	CuCl4-2	2.580e-23	1.212e-23	-22.588	-22.917	-0.328	(0)
	Cu (NO3) 2	4.081e-26	4.081e-26	-25.389	-25.389	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-219.099	-219.210	-0.111	(0)
F	1.736e-04						
	F-	1.377e-04	1.135e-04	-3.861	-3.945	-0.084	(0)
	MgF+	3.397e-05	2.798e-05	-4.469	-4.553	-0.084	(0)
	CaF+	1.076e-06	8.905e-07	-5.968	-6.050	-0.082	(0)
	NaF	6.930e-07	6.930e-07	-6.159	-6.159	0.000	(0)
	MnF+	1.217e-07	1.007e-07	-6.915	-6.997	-0.082	(0)
	ZnF+	5.659e-09	4.378e-09	-8.247	-8.359	-0.111	(0)
	BF (OH) 3-	2.054e-09	1.652e-09	-8.687	-8.782	-0.095	(0)
	HF	1.174e-09	1.174e-09	-8.930	-8.930	0.000	(0)
	NiF+	1.607e-10	1.243e-10	-9.794	-9.906	-0.111	(0)
	CoF+	1.456e-10	1.126e-10	-9.837	-9.948	-0.111	(0)
	CuF+	4.484e-11	3.469e-11	-10.348	-10.460	-0.111	(0)
	AlF3	1.624e-11	1.624e-11	-10.789	-10.789	0.000	(0)
	AlF2+	1.368e-11	1.137e-11	-10.864	-10.944	-0.080	(0)
	CdF+	5.697e-12	4.408e-12	-11.244	-11.356	-0.111	(0)
	AlF4-	1.122e-12	9.238e-13	-11.950	-12.034	-0.084	(0)
	PbF+	9.377e-13	7.254e-13	-12.028	-12.139	-0.111	(0)
	HF2-	6.217e-13	5.064e-13	-12.206	-12.296	-0.089	(0)
	AlF+2	5.275e-13	2.517e-13	-12.278	-12.599	-0.321	(0)
	UO2F+	3.786e-13	2.929e-13	-12.422	-12.533	-0.111	(0)
	AgF	3.197e-13	3.197e-13	-12.495	-12.495	0.000	(0)
	BF2 (OH) 2-	1.744e-13	1.403e-13	-12.758	-12.853	-0.095	(0)
	UO2F2	9.584e-14	9.584e-14	-13.018	-13.018	0.000	(0)
	CrF+2	4.221e-15	1.512e-15	-14.375	-14.820	-0.446	(0)
	UO2F3-	3.531e-15	2.732e-15	-14.452	-14.564	-0.111	(0)
	PbF2	1.620e-15	1.620e-15	-14.791	-14.791	0.000	(0)

CdF2	9.979e-16	9.979e-16	-15.001	-15.001	0.000	(0)
UO2F4-2	6.874e-18	2.462e-18	-17.163	-17.609	-0.446	(0)
H2F2	3.692e-18	3.692e-18	-17.433	-17.433	0.000	(0)
VO2F	7.009e-19	7.009e-19	-18.154	-18.154	0.000	(0)
PbF3-	4.506e-19	3.486e-19	-18.346	-18.458	-0.111	(0)
FeF2+	2.429e-19	2.011e-19	-18.615	-18.697	-0.082	(0)
FeF+2	1.410e-19	6.622e-20	-18.851	-19.179	-0.328	(0)
BF3OH-	5.389e-20	4.335e-20	-19.268	-19.363	-0.095	(0)
VO2F2-	3.733e-20	2.888e-20	-19.428	-19.539	-0.111	(0)
FeF3	3.219e-20	3.219e-20	-19.492	-19.492	0.000	(0)
VOF+	2.929e-22	2.266e-22	-21.533	-21.645	-0.111	(0)
VO2F3-2	1.141e-22	4.087e-23	-21.943	-22.389	-0.446	(0)
PbF4-2	5.286e-23	1.893e-23	-22.277	-22.723	-0.446	(0)
VOF2	9.640e-24	9.640e-24	-23.016	-23.016	0.000	(0)
HgF+	2.823e-24	2.184e-24	-23.549	-23.661	-0.111	(0)
BF4-	2.106e-25	1.694e-25	-24.677	-24.771	-0.095	(0)
VOF3-	5.017e-26	3.881e-26	-25.300	-25.411	-0.111	(0)
VO2F4-3	2.299e-26	2.282e-27	-25.638	-26.642	-1.003	(0)
Sb(OH) 2F	1.759e-26	1.759e-26	-25.755	-25.755	0.000	(0)
SbOF	1.731e-26	1.731e-26	-25.762	-25.762	0.000	(0)
VOF4-2	4.963e-29	1.778e-29	-28.304	-28.750	-0.446	(0)
UF3+	3.228e-37	2.498e-37	-36.491	-36.602	-0.111	(0)
UF2+2	3.877e-38	1.389e-38	-37.411	-37.857	-0.446	(0)
UF4	3.107e-39	3.107e-39	-38.508	-38.508	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.009	-41.012	-1.003	(0)
UF5-	0.000e+00	0.000e+00	-40.743	-40.855	-0.111	(0)
UF6-2	0.000e+00	0.000e+00	-41.874	-42.320	-0.446	(0)
Fe (2)	5.849e-13					
Fe+2	3.862e-13	1.383e-13	-12.413	-12.859	-0.446	(0)
FeSO4	1.877e-13	1.877e-13	-12.727	-12.727	0.000	(0)
FeOH+	9.569e-15	7.922e-15	-14.019	-14.101	-0.082	(0)
FeHCO3+	1.431e-15	1.196e-15	-14.844	-14.922	-0.078	(0)
Fe(OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.975e-18	4.119e-18	-17.303	-17.385	-0.082	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-161.772	-161.772	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.555	-238.667	-0.111	(0)
Fe (3)	8.294e-10					
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 2+	3.329e-10	2.767e-10	-9.478	-9.558	-0.080	(0)
Fe(OH) 4-	6.891e-11	5.727e-11	-10.162	-10.242	-0.080	(0)
FeOH+2	1.052e-15	4.944e-16	-14.978	-15.306	-0.328	(0)
FeF2+	2.429e-19	2.011e-19	-18.615	-18.697	-0.082	(0)
FeF+2	1.410e-19	6.622e-20	-18.851	-19.179	-0.328	(0)
FeSO4+	3.988e-20	3.301e-20	-19.399	-19.481	-0.082	(0)
FeF3	3.219e-20	3.219e-20	-19.492	-19.492	0.000	(0)
Fe(SO4) 2-	5.044e-21	3.902e-21	-20.297	-20.409	-0.111	(0)
Fe+3	3.045e-21	5.323e-22	-20.516	-21.274	-0.758	(0)
FeCl+2	1.075e-22	5.048e-23	-21.969	-22.297	-0.328	(0)
FeCl2+	8.555e-25	7.082e-25	-24.068	-24.150	-0.082	(0)
FeHSeO3+2	2.590e-25	9.275e-26	-24.587	-25.033	-0.446	(0)
Fe2(OH) 2+4	4.917e-28	8.094e-30	-27.308	-29.092	-1.784	(0)
FeCl3	2.224e-28	2.224e-28	-27.653	-27.653	0.000	(0)
FeNO3+2	6.835e-29	2.448e-29	-28.165	-28.611	-0.446	(0)
Fe3(OH) 4+5	1.982e-35	3.237e-38	-34.703	-37.490	-2.787	(0)
H (0)	3.992e-29					
H2	1.996e-29	2.018e-29	-28.700	-28.695	0.005	(0)
Hg (0)	2.793e-09					
Hg	2.793e-09	2.793e-09	-8.554	-8.554	0.000	(0)
Hg (1)	5.498e-21					
Hg2+2	2.749e-21	9.846e-22	-20.561	-21.007	-0.446	(0)
Hg (2)	1.139e-11					
Hg(OH) 2	6.707e-12	6.781e-12	-11.173	-11.169	0.005	(0)
HgClOH	4.143e-12	4.143e-12	-11.383	-11.383	0.000	(0)
HgCl2	5.122e-13	5.122e-13	-12.291	-12.291	0.000	(0)
HgCl3-	2.079e-14	1.609e-14	-13.682	-13.794	-0.111	(0)
HgCO3	2.862e-15	2.862e-15	-14.543	-14.543	0.000	(0)
HgCl4-2	5.616e-16	2.011e-16	-15.251	-15.696	-0.446	(0)
Hg(CO3) 2-2	1.163e-16	4.167e-17	-15.934	-16.380	-0.446	(0)

	HgCl+	4.206e-17	3.254e-17	-16.376	-16.488	-0.111	(0)
	HgOH+	3.844e-17	2.974e-17	-16.415	-16.527	-0.111	(0)
	Hg (OH) 3-	1.588e-18	1.228e-18	-17.799	-17.911	-0.111	(0)
	HgHCO3+	4.817e-19	3.727e-19	-18.317	-18.429	-0.111	(0)
	Hg (NH3) 2+2	1.923e-21	6.886e-22	-20.716	-21.162	-0.446	(0)
	Hg+2	1.450e-21	5.192e-22	-20.839	-21.285	-0.446	(0)
	HgNH3+2	1.326e-21	4.750e-22	-20.877	-21.323	-0.446	(0)
	HgSO4	7.515e-22	7.515e-22	-21.124	-21.124	0.000	(0)
	HgF+	2.823e-24	2.184e-24	-23.549	-23.661	-0.111	(0)
	Hg (NH3) 3+2	1.110e-29	3.975e-30	-28.955	-29.401	-0.446	(0)
	HgNO3+	1.140e-30	8.818e-31	-29.943	-30.055	-0.111	(0)
	Hg (NH3) 4+2	1.278e-37	4.577e-38	-36.894	-37.339	-0.446	(0)
	Hg (NO3) 2	1.686e-39	1.686e-39	-38.773	-38.773	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.953	-139.064	-0.111	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.171	-139.617	-0.446	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.826	-140.826	0.000	(0)
K		4.923e-03					
	K+	4.739e-03	3.904e-03	-2.324	-2.408	-0.084	(0)
	KSO4-	1.838e-04	1.528e-04	-3.736	-3.816	-0.080	(0)
	KCrO4-	2.216e-16	1.714e-16	-15.655	-15.766	-0.111	(0)
Mg		7.044e-03					
	Mg+2	4.771e-03	2.197e-03	-2.321	-2.658	-0.337	(0)
	MgSO4	2.210e-03	2.210e-03	-2.656	-2.656	0.000	(0)
	MgF+	3.397e-05	2.798e-05	-4.469	-4.553	-0.084	(0)
	MgHCO3+	1.886e-05	1.545e-05	-4.725	-4.811	-0.087	(0)
	MgCO3	8.417e-06	8.417e-06	-5.075	-5.075	0.000	(0)
	MgOH+	1.499e-06	1.259e-06	-5.824	-5.900	-0.076	(0)
	MgH2BO3+	2.870e-07	2.309e-07	-6.542	-6.637	-0.095	(0)
Mn (2)		8.486e-05					
	Mn+2	6.224e-05	2.230e-05	-4.206	-4.652	-0.446	(0)
	MnSO4	2.192e-05	2.192e-05	-4.659	-4.659	0.000	(0)
	MnHCO3+	3.691e-07	3.056e-07	-6.433	-6.515	-0.082	(0)
	MnF+	1.217e-07	1.007e-07	-6.915	-6.997	-0.082	(0)
	MnCl+	1.065e-07	8.815e-08	-6.973	-7.055	-0.082	(0)
	MnOH+	9.732e-08	8.057e-08	-7.012	-7.094	-0.082	(0)
	MnCl2	3.911e-10	3.911e-10	-9.408	-9.408	0.000	(0)
	MnSeO4	9.759e-13	9.759e-13	-12.011	-12.011	0.000	(0)
	MnCl3-	4.086e-13	3.383e-13	-12.389	-12.471	-0.082	(0)
	MnNO3+	2.101e-13	1.625e-13	-12.678	-12.789	-0.111	(0)
	Mn (OH) 3-	1.245e-15	1.031e-15	-14.905	-14.987	-0.082	(0)
	Mn (OH) 4-2	1.019e-20	4.787e-21	-19.992	-20.320	-0.328	(0)
	Mn (NO3) 2	1.878e-21	1.878e-21	-20.726	-20.726	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-40.836	-40.836	0.000	(0)
Mn (3)		2.360e-25					
	Mn+3	2.360e-25	4.125e-26	-24.627	-25.385	-0.758	(0)
Mn (6)		9.209e-40					
	MnO4-2	9.209e-40	4.326e-40	-39.036	-39.364	-0.328	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.027	-44.119	-0.092	(0)
Mo		2.743e-06					
	MoO4-2	2.743e-06	1.263e-06	-5.562	-5.899	-0.337	(0)
	HMoO4-	2.272e-10	1.758e-10	-9.644	-9.755	-0.111	(0)
	H2MoO4	9.006e-15	9.006e-15	-14.045	-14.045	0.000	(0)
	Ag2MoO4	6.014e-25	6.014e-25	-24.221	-24.221	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.980	-44.983	-1.003	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-49.528	-53.541	-4.013	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-52.522	-55.309	-2.787	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-56.899	-58.682	-1.784	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-62.588	-63.591	-1.003	(0)
N (-3)		2.483e-08					
	NH4+	2.211e-08	1.778e-08	-7.655	-7.750	-0.095	(0)
	NH3	1.450e-09	1.450e-09	-8.839	-8.839	0.000	(0)
	NH4SO4-	1.272e-09	1.053e-09	-8.895	-8.977	-0.082	(0)
	CaNH3+2	3.664e-12	1.312e-12	-11.436	-11.882	-0.446	(0)
	CuNH3+2	2.007e-13	7.188e-14	-12.697	-13.143	-0.446	(0)
	NiNH3+2	9.479e-14	3.395e-14	-13.023	-13.469	-0.446	(0)
	Co (NH3) +2	1.528e-14	5.472e-15	-13.816	-14.262	-0.446	(0)
	AgNH3+	4.291e-15	3.320e-15	-14.367	-14.479	-0.111	(0)

BaNH3+2	4.838e-17	1.733e-17	-16.315	-16.761	-0.446	(0)
Ag (NH3) 2+	5.057e-20	3.912e-20	-19.296	-19.408	-0.111	(0)
Ni (NH3) 2+2	1.986e-20	7.115e-21	-19.702	-20.148	-0.446	(0)
Ca (NH3) 2+2	2.115e-21	7.575e-22	-20.675	-21.121	-0.446	(0)
Hg (NH3) 2+2	1.923e-21	6.886e-22	-20.716	-21.162	-0.446	(0)
HgNH3+2	1.326e-21	4.750e-22	-20.877	-21.323	-0.446	(0)
Co (NH3) 2+2	9.447e-22	3.384e-22	-21.025	-21.471	-0.446	(0)
Co (NH3) 3+2	1.724e-29	6.176e-30	-28.763	-29.209	-0.446	(0)
Hg (NH3) 3+2	1.110e-29	3.975e-30	-28.955	-29.401	-0.446	(0)
Co (NH3) 4+2	1.312e-37	4.699e-38	-36.882	-37.328	-0.446	(0)
Hg (NH3) 4+2	1.278e-37	4.577e-38	-36.894	-37.339	-0.446	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.293	-45.739	-0.446	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.501	-45.947	-0.446	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-55.104	-56.108	-1.003	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.968	-68.414	-0.446	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
N (3)	6.022e-06					
NO2-	6.022e-06	4.875e-06	-5.220	-5.312	-0.092	(0)
CuNO2+	3.197e-12	2.474e-12	-11.495	-11.607	-0.111	(0)
CoNO2+	1.394e-12	1.078e-12	-11.856	-11.967	-0.111	(0)
AgNO2	1.142e-12	1.142e-12	-11.942	-11.942	0.000	(0)
Cu (NO2) 2	1.234e-16	1.234e-16	-15.909	-15.909	0.000	(0)
Ag (NO2) 2-	1.115e-17	8.626e-18	-16.953	-17.064	-0.111	(0)
N (5)	5.597e-09					
NO3-	5.583e-09	4.599e-09	-8.253	-8.337	-0.084	(0)
CaNO3+	1.352e-11	1.046e-11	-10.869	-10.981	-0.111	(0)
MnNO3+	2.101e-13	1.625e-13	-12.678	-12.789	-0.111	(0)
ZnNO3+	2.888e-14	2.234e-14	-13.539	-13.651	-0.111	(0)
NiNO3+	6.512e-16	5.038e-16	-15.186	-15.298	-0.111	(0)
BaNO3+	5.644e-16	4.367e-16	-15.248	-15.360	-0.111	(0)
CoNO3+	2.958e-16	2.288e-16	-15.529	-15.640	-0.111	(0)
CuNO3+	9.109e-17	7.047e-17	-16.041	-16.152	-0.111	(0)
CdNO3+	4.608e-17	3.565e-17	-16.337	-16.448	-0.111	(0)
PbNO3+	7.977e-18	6.172e-18	-17.098	-17.210	-0.111	(0)
AgNO3	4.097e-18	4.097e-18	-17.387	-17.387	0.000	(0)
Mn (NO3) 2	1.878e-21	1.878e-21	-20.726	-20.726	0.000	(0)
UO2NO3+	2.218e-22	1.716e-22	-21.654	-21.766	-0.111	(0)
Zn (NO3) 2	2.050e-23	2.050e-23	-22.688	-22.688	0.000	(0)
Co (NO3) 2	2.142e-24	2.142e-24	-23.669	-23.669	0.000	(0)
Cd (NO3) 2	8.217e-26	8.217e-26	-25.085	-25.085	0.000	(0)
Pb (NO3) 2	4.821e-26	4.821e-26	-25.317	-25.317	0.000	(0)
CrNO3+2	4.719e-26	1.690e-26	-25.326	-25.772	-0.446	(0)
Cu (NO3) 2	4.081e-26	4.081e-26	-25.389	-25.389	0.000	(0)
VO2NO3	8.194e-27	8.194e-27	-26.087	-26.087	0.000	(0)
FeNO3+2	6.835e-29	2.448e-29	-28.165	-28.611	-0.446	(0)
HgNO3+	1.140e-30	8.818e-31	-29.943	-30.055	-0.111	(0)
Hg (NO3) 2	1.686e-39	1.686e-39	-38.773	-38.773	0.000	(0)
Na	1.210e-02					
Na+	1.175e-02	9.680e-03	-1.930	-2.014	-0.084	(0)
NaSO4-	3.458e-04	2.874e-04	-3.461	-3.542	-0.080	(0)
NaHCO3	3.740e-06	3.740e-06	-5.427	-5.427	0.000	(0)
NaCO3-	9.987e-07	8.301e-07	-6.001	-6.081	-0.080	(0)
NaF	6.930e-07	6.930e-07	-6.159	-6.159	0.000	(0)
NaH2BO3	4.649e-08	4.649e-08	-7.333	-7.333	0.000	(0)
NaCrO4-	7.347e-16	5.684e-16	-15.134	-15.245	-0.111	(0)
Ni	1.568e-07					
Ni+2	9.468e-08	4.361e-08	-7.024	-7.360	-0.337	(0)
NiSO4	4.810e-08	4.810e-08	-7.318	-7.318	0.000	(0)
NiCO3	7.492e-09	7.492e-09	-8.125	-8.125	0.000	(0)
NiHCO3+	4.774e-09	3.693e-09	-8.321	-8.433	-0.111	(0)
NiOH+	1.021e-09	7.898e-10	-8.991	-9.102	-0.111	(0)
NiCl+	4.530e-10	3.504e-10	-9.344	-9.455	-0.111	(0)
NiF+	1.607e-10	1.243e-10	-9.794	-9.906	-0.111	(0)
Ni (OH) 2	9.026e-11	9.026e-11	-10.045	-10.045	0.000	(0)
Ni (SO4) 2-2	2.458e-11	8.805e-12	-10.609	-11.055	-0.446	(0)

Ni(OH) 3-	1.678e-13	1.298e-13	-12.775	-12.887	-0.111	(0)
NiNH3+2	9.479e-14	3.395e-14	-13.023	-13.469	-0.446	(0)
NiCl2	5.541e-15	5.541e-15	-14.256	-14.256	0.000	(0)
NiSeO4	3.317e-15	3.317e-15	-14.479	-14.479	0.000	(0)
NiNO3+	6.512e-16	5.038e-16	-15.186	-15.298	-0.111	(0)
Ni(NH3) 2+2	1.986e-20	7.115e-21	-19.702	-20.148	-0.446	(0)
O(0)	2.458e-35					
O2	1.229e-35	1.243e-35	-34.910	-34.906	0.005	(0)
Pb	2.280e-09					
PbCO3	1.256e-09	1.256e-09	-8.901	-8.901	0.000	(0)
PbOH+	4.238e-10	3.278e-10	-9.373	-9.484	-0.111	(0)
PbSO4	2.456e-10	2.456e-10	-9.610	-9.610	0.000	(0)
Pb+2	1.970e-10	9.072e-11	-9.706	-10.042	-0.337	(0)
PbHCO3+	5.986e-11	4.631e-11	-10.223	-10.334	-0.111	(0)
Pb(CO3) 2-2	4.657e-11	1.668e-11	-10.332	-10.778	-0.446	(0)
Pb(SO4) 2-2	2.284e-11	8.181e-12	-10.641	-11.087	-0.446	(0)
Pb(OH) 2	1.491e-11	1.491e-11	-10.826	-10.826	0.000	(0)
PbCl+	1.307e-11	1.011e-11	-10.884	-10.995	-0.111	(0)
PbF+	9.377e-13	7.254e-13	-12.028	-12.139	-0.111	(0)
PbCl2	1.418e-13	1.418e-13	-12.848	-12.848	0.000	(0)
Pb(OH) 3-	2.774e-14	2.146e-14	-13.557	-13.668	-0.111	(0)
PbF2	1.620e-15	1.620e-15	-14.791	-14.791	0.000	(0)
PbCl3-	2.292e-16	1.773e-16	-15.640	-15.751	-0.111	(0)
Pb(OH) 4-2	2.111e-17	7.560e-18	-16.676	-17.121	-0.446	(0)
PbNO3+	7.977e-18	6.172e-18	-17.098	-17.210	-0.111	(0)
Pb2OH+3	4.749e-18	4.713e-19	-17.323	-18.327	-1.003	(0)
PbCl4-2	7.107e-19	2.546e-19	-18.148	-18.594	-0.446	(0)
PbF3-	4.506e-19	3.486e-19	-18.346	-18.458	-0.111	(0)
Pb3(OH) 4+2	1.124e-21	4.026e-22	-20.949	-21.395	-0.446	(0)
PbF4-2	5.286e-23	1.893e-23	-22.277	-22.723	-0.446	(0)
Pb(NO3) 2	4.821e-26	4.821e-26	-25.317	-25.317	0.000	(0)
Pb4(OH) 4+4	1.763e-26	2.901e-28	-25.754	-27.537	-1.784	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.635	-152.635	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.155	-230.267	-0.111	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.067	-74.067	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.820	-78.932	-0.111	(0)
CdHS+	0.000e+00	0.000e+00	-79.423	-79.534	-0.111	(0)
S5-2	0.000e+00	0.000e+00	-79.695	-80.141	-0.446	(0)
H2S	0.000e+00	0.000e+00	-80.067	-80.067	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.211	-80.657	-0.446	(0)
S4-2	0.000e+00	0.000e+00	-80.291	-80.737	-0.446	(0)
S3-2	0.000e+00	0.000e+00	-81.097	-81.543	-0.446	(0)
S2-2	0.000e+00	0.000e+00	-82.113	-82.559	-0.446	(0)
S-2	0.000e+00	0.000e+00	-87.748	-88.076	-0.328	(0)
HgHS2-	0.000e+00	0.000e+00	-138.953	-139.064	-0.111	(0)
HgS2-2	0.000e+00	0.000e+00	-139.171	-139.617	-0.446	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.826	-140.826	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.227	-0.215	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-148.026	-148.404	-0.378	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.500	-148.611	-0.111	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.775	-149.134	-0.359	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.787	-148.899	-0.111	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.123	-149.512	-0.389	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.454	-149.823	-0.368	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.757	-150.757	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.262	-151.262	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.635	-152.635	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-161.772	-161.772	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-219.099	-219.210	-0.111	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.297	-226.408	-0.111	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.787	-228.233	-0.446	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-228.182	-228.293	-0.111	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.155	-230.267	-0.111	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.555	-238.667	-0.111	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-304.583	-305.029	-0.446	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.354	-306.800	-0.446	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.897	-322.343	-0.446	(0)

S (6)	1.568e-02					
SO4-2	1.200e-02	5.528e-03	-1.921	-2.257	-0.337	(0)
MgSO4	2.210e-03	2.210e-03	-2.656	-2.656	0.000	(0)
CaSO4	9.106e-04	9.106e-04	-3.041	-3.041	0.000	(0)
NaSO4-	3.458e-04	2.874e-04	-3.461	-3.542	-0.080	(0)
KSO4-	1.838e-04	1.528e-04	-3.736	-3.816	-0.080	(0)
MnSO4	2.192e-05	2.192e-05	-4.659	-4.659	0.000	(0)
ZnSO4	2.339e-06	2.339e-06	-5.631	-5.631	0.000	(0)
Zn (SO4) 2-2	3.143e-07	1.126e-07	-6.503	-6.948	-0.446	(0)
NiSO4	4.810e-08	4.810e-08	-7.318	-7.318	0.000	(0)
CoSO4	3.462e-08	3.462e-08	-7.461	-7.461	0.000	(0)
CuSO4	6.136e-09	6.136e-09	-8.212	-8.212	0.000	(0)
HSO4-	4.587e-09	3.778e-09	-8.338	-8.423	-0.084	(0)
CdSO4	3.176e-09	3.176e-09	-8.498	-8.498	0.000	(0)
NH4SO4-	1.272e-09	1.053e-09	-8.895	-8.977	-0.082	(0)
Cd (SO4) 2-2	6.612e-10	2.368e-10	-9.180	-9.626	-0.446	(0)
PbSO4	2.456e-10	2.456e-10	-9.610	-9.610	0.000	(0)
AgSO4-	1.599e-10	1.237e-10	-9.796	-9.908	-0.111	(0)
Ni (SO4) 2-2	2.458e-11	8.805e-12	-10.609	-11.055	-0.446	(0)
Pb (SO4) 2-2	2.284e-11	8.181e-12	-10.641	-11.087	-0.446	(0)
CrOHSO4	3.471e-12	3.471e-12	-11.460	-11.460	0.000	(0)
FeSO4	1.877e-13	1.877e-13	-12.727	-12.727	0.000	(0)
UO2SO4	1.564e-13	1.564e-13	-12.806	-12.806	0.000	(0)
UO2 (SO4) 2-2	3.183e-14	1.140e-14	-13.497	-13.943	-0.446	(0)
AlSO4+	1.156e-14	9.519e-15	-13.937	-14.021	-0.084	(0)
CrSO4+	1.403e-15	1.085e-15	-14.853	-14.964	-0.111	(0)
Al (SO4) 2-	6.846e-16	5.639e-16	-15.165	-15.249	-0.084	(0)
VO2SO4-	6.009e-19	4.649e-19	-18.221	-18.333	-0.111	(0)
FeSO4+	3.988e-20	3.301e-20	-19.399	-19.481	-0.082	(0)
Fe (SO4) 2-	5.044e-21	3.902e-21	-20.297	-20.409	-0.111	(0)
Cr2 (OH) 2SO4+2	2.318e-21	8.302e-22	-20.635	-21.081	-0.446	(0)
HgSO4	7.515e-22	7.515e-22	-21.124	-21.124	0.000	(0)
VOSO4	5.069e-22	5.069e-22	-21.295	-21.295	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.726e-22	2.726e-22	-21.564	-21.564	0.000	(0)
CrO3SO4-2	8.799e-24	3.152e-24	-23.056	-23.501	-0.446	(0)
VSO4+	6.590e-37	5.098e-37	-36.181	-36.293	-0.111	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.579	-42.025	-0.446	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Sb (3)	2.803e-20					
Sb (OH) 3	1.418e-20	1.418e-20	-19.848	-19.848	0.000	(0)
HSbO2	1.385e-20	1.385e-20	-19.859	-19.859	0.000	(0)
SbO2-	4.145e-24	3.207e-24	-23.382	-23.494	-0.111	(0)
Sb (OH) 4-	2.372e-24	1.835e-24	-23.625	-23.736	-0.111	(0)
Sb (OH) 2F	1.759e-26	1.759e-26	-25.755	-25.755	0.000	(0)
SbOF	1.731e-26	1.731e-26	-25.762	-25.762	0.000	(0)
Sb (OH) 2+	3.115e-27	2.409e-27	-26.507	-26.618	-0.111	(0)
SbO+	1.075e-27	8.313e-28	-26.969	-27.080	-0.111	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.897	-322.343	-0.446	(0)
Sb (5)	3.852e-08					
SbO3-	3.848e-08	2.977e-08	-7.415	-7.526	-0.111	(0)
Sb (OH) 6-	4.218e-11	3.475e-11	-10.375	-10.459	-0.084	(0)
SbO2+	5.403e-25	4.180e-25	-24.267	-24.379	-0.111	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.434e-39	1.109e-39	-38.843	-38.955	-0.111	(0)
MnSe	0.000e+00	0.000e+00	-40.836	-40.836	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.220	-43.220	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.354	-45.800	-0.446	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.120	-82.903	-1.784	(0)
Se (4)	1.901e-07					
SeO3-2	1.048e-07	3.754e-08	-6.980	-7.426	-0.446	(0)
HSeO3-	8.525e-08	6.595e-08	-7.069	-7.181	-0.111	(0)
H2SeO3	1.968e-13	1.968e-13	-12.706	-12.706	0.000	(0)
AgSeO3-	3.498e-14	2.706e-14	-13.456	-13.568	-0.111	(0)
Cd (SeO3) 2-2	7.947e-18	2.847e-18	-17.100	-17.546	-0.446	(0)
Ag (SeO3) 2-3	9.163e-20	9.095e-21	-19.038	-20.041	-1.003	(0)
FeHSeO3+2	2.590e-25	9.275e-26	-24.587	-25.033	-0.446	(0)

Se (6)	3.541e-10					
SeO4-2	3.531e-10	1.626e-10	-9.452	-9.789	-0.337	(0)
MnSeO4	9.759e-13	9.759e-13	-12.011	-12.011	0.000	(0)
ZnSeO4	4.870e-14	4.870e-14	-13.312	-13.312	0.000	(0)
NiSeO4	3.317e-15	3.317e-15	-14.479	-14.479	0.000	(0)
CoSeO4	2.559e-15	2.559e-15	-14.592	-14.592	0.000	(0)
CdSeO4	7.422e-17	7.422e-17	-16.129	-16.129	0.000	(0)
HSeO4-	7.369e-17	5.701e-17	-16.133	-16.244	-0.111	(0)
Zn (SeO4) 2-2	2.242e-23	8.031e-24	-22.649	-23.095	-0.446	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.777	-59.780	-1.003	(0)
U (4)	2.507e-19					
U (OH) 5-	2.507e-19	1.939e-19	-18.601	-18.712	-0.111	(0)
U (OH) 4	5.684e-23	5.684e-23	-22.245	-22.245	0.000	(0)
U (OH) 3+	1.880e-27	1.455e-27	-26.726	-26.837	-0.111	(0)
U (OH) 2+2	1.314e-32	4.707e-33	-31.881	-32.327	-0.446	(0)
UF3+	3.228e-37	2.498e-37	-36.491	-36.602	-0.111	(0)
UF2+2	3.877e-38	1.389e-38	-37.411	-37.857	-0.446	(0)
UOH+3	1.563e-38	1.552e-39	-37.806	-38.809	-1.003	(0)
UF4	3.107e-39	3.107e-39	-38.508	-38.508	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.009	-41.012	-1.003	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.743	-40.855	-0.111	(0)
USO4+2	0.000e+00	0.000e+00	-41.579	-42.025	-0.446	(0)
UF6-2	0.000e+00	0.000e+00	-41.874	-42.320	-0.446	(0)
U+4	0.000e+00	0.000e+00	-44.584	-46.367	-1.784	(0)
UC1+3	0.000e+00	0.000e+00	-46.167	-47.170	-1.003	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.004	-173.034	-9.029	(0)
U (5)	3.557e-16					
UO2+	3.557e-16	2.751e-16	-15.449	-15.560	-0.111	(0)
U (6)	5.299e-07					
UO2 (CO3) 3-4	4.417e-07	7.270e-09	-6.355	-8.138	-1.784	(0)
UO2 (CO3) 2-2	8.794e-08	3.150e-08	-7.056	-7.502	-0.446	(0)
UO2CO3	3.428e-10	3.428e-10	-9.465	-9.465	0.000	(0)
UO2OH+	4.377e-12	3.386e-12	-11.359	-11.470	-0.111	(0)
UO2F+	3.786e-13	2.929e-13	-12.422	-12.533	-0.111	(0)
UO2SO4	1.564e-13	1.564e-13	-12.806	-12.806	0.000	(0)
UO2F2	9.584e-14	9.584e-14	-13.018	-13.018	0.000	(0)
UO2+2	4.059e-14	1.870e-14	-13.392	-13.728	-0.337	(0)
UO2 (SO4) 2-2	3.183e-14	1.140e-14	-13.497	-13.943	-0.446	(0)
UO2F3-	3.531e-15	2.732e-15	-14.452	-14.564	-0.111	(0)
(UO2) 3 (OH) 5+	1.308e-16	1.012e-16	-15.883	-15.995	-0.111	(0)
UO2C1+	1.231e-16	9.524e-17	-15.910	-16.021	-0.111	(0)
(UO2) 2 (OH) 2+2	5.314e-17	1.903e-17	-16.275	-16.721	-0.446	(0)
UO2F4-2	6.874e-18	2.462e-18	-17.163	-17.609	-0.446	(0)
UO2NO3+	2.218e-22	1.716e-22	-21.654	-21.766	-0.111	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.857	-43.968	-0.111	(0)
V+2	0.000e+00	0.000e+00	-45.190	-45.636	-0.446	(0)
V (3)	4.693e-16					
V (OH) 3	4.693e-16	4.693e-16	-15.329	-15.329	0.000	(0)
V (OH) 2+	2.743e-27	2.122e-27	-26.562	-26.673	-0.111	(0)
VOH+2	3.933e-31	1.409e-31	-30.405	-30.851	-0.446	(0)
V+3	1.968e-36	1.954e-37	-35.706	-36.709	-1.003	(0)
VSO4+	6.590e-37	5.098e-37	-36.181	-36.293	-0.111	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-58.069	-59.073	-1.003	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-59.119	-60.902	-1.784	(0)
V (4)	1.252e-19					
V (OH) 3+	1.234e-19	9.549e-20	-18.909	-19.020	-0.111	(0)
VO+2	9.294e-22	3.329e-22	-21.032	-21.478	-0.446	(0)
VOSO4	5.069e-22	5.069e-22	-21.295	-21.295	0.000	(0)
VOF+	2.929e-22	2.266e-22	-21.533	-21.645	-0.111	(0)
VOF2	9.640e-24	9.640e-24	-23.016	-23.016	0.000	(0)
VOC1+	3.792e-24	2.933e-24	-23.421	-23.533	-0.111	(0)
VOF3-	5.017e-26	3.881e-26	-25.300	-25.411	-0.111	(0)
VOF4-2	4.963e-29	1.778e-29	-28.304	-28.750	-0.446	(0)
H2V2O4+2	1.278e-33	4.577e-34	-32.894	-33.339	-0.446	(0)
V (5)	8.271e-09					

H2VO4-	4.658e-09	3.603e-09	-8.332	-8.443	-0.111	(0)
HVO4-2	3.613e-09	1.294e-09	-8.442	-8.888	-0.446	(0)
H3VO4	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
HV2O7-3	1.593e-14	1.581e-15	-13.798	-14.801	-1.003	(0)
VO4-3	9.344e-15	9.274e-16	-14.029	-15.033	-1.003	(0)
H3V2O7-	7.584e-15	5.867e-15	-14.120	-14.232	-0.111	(0)
V2O7-4	3.697e-16	6.085e-18	-15.432	-17.216	-1.784	(0)
VO2+	4.275e-18	3.522e-18	-17.369	-17.453	-0.084	(0)
VO2F	7.009e-19	7.009e-19	-18.154	-18.154	0.000	(0)
VO2SO4-	6.009e-19	4.649e-19	-18.221	-18.333	-0.111	(0)
V3O9-3	4.947e-19	4.910e-20	-18.306	-19.309	-1.003	(0)
VO2F2-	3.733e-20	2.888e-20	-19.428	-19.539	-0.111	(0)
VO2F3-2	1.141e-22	4.087e-23	-21.943	-22.389	-0.446	(0)
V4O12-4	4.484e-24	7.381e-26	-23.348	-25.132	-1.784	(0)
VO2F4-3	2.299e-26	2.282e-27	-25.638	-26.642	-1.003	(0)
VO2NO3	8.194e-27	8.194e-27	-26.087	-26.087	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.132	-68.145	-4.013	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.326	-68.113	-2.787	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.277	-71.061	-1.784	(0)
Zn	7.894e-06					
Zn+2	4.198e-06	1.934e-06	-5.377	-5.714	-0.337	(0)
ZnSO4	2.339e-06	2.339e-06	-5.631	-5.631	0.000	(0)
ZnCO3	5.124e-07	5.124e-07	-6.290	-6.290	0.000	(0)
ZnOH+	3.596e-07	2.782e-07	-6.444	-6.556	-0.111	(0)
Zn(SO4) 2-2	3.143e-07	1.126e-07	-6.503	-6.948	-0.446	(0)
Zn(OH) 2	6.343e-08	6.343e-08	-7.198	-7.198	0.000	(0)
ZnHCO3+	5.430e-08	4.201e-08	-7.265	-7.377	-0.111	(0)
ZnOHCl	2.873e-08	2.873e-08	-7.542	-7.542	0.000	(0)
ZnCl+	1.862e-08	1.525e-08	-7.730	-7.817	-0.087	(0)
ZnF+	5.659e-09	4.378e-09	-8.247	-8.359	-0.111	(0)
Zn(OH) 3-	5.912e-10	4.574e-10	-9.228	-9.340	-0.111	(0)
ZnCl2	7.593e-11	7.593e-11	-10.120	-10.120	0.000	(0)
ZnCl3-	2.312e-13	1.894e-13	-12.636	-12.723	-0.087	(0)
Zn(OH) 4-2	7.313e-14	2.619e-14	-13.136	-13.582	-0.446	(0)
ZnSeO4	4.870e-14	4.870e-14	-13.312	-13.312	0.000	(0)
ZnNO3+	2.888e-14	2.234e-14	-13.539	-13.651	-0.111	(0)
ZnCl4-2	6.333e-16	2.975e-16	-15.198	-15.526	-0.328	(0)
Zn(SeO4) 2-2	2.242e-23	8.031e-24	-22.649	-23.095	-0.446	(0)
Zn(NO3) 2	2.050e-23	2.050e-23	-22.688	-22.688	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.500	-148.611	-0.111	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.757	-150.757	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.297	-226.408	-0.111	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.787	-228.233	-0.446	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.354	-306.800	-0.446	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3) 2	-58.73	-52.44	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2	-45.28	-40.77	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-52.50	-40.77	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3	-75.80	-57.87	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3	-60.39	-40.36	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-29.83	-29.43	0.40	(NH4)2CrO4	
(NH4)2SeO4	-25.74	-25.29	0.45	(NH4)2SeO4	
Acanthite	-52.46	-88.68	-36.22	Ag2S	
Ag2CO3	-12.15	-23.24	-11.09	Ag2CO3	
Ag2CrO4	-20.24	-31.83	-11.59	Ag2CrO4	
Ag2HVO4	-12.37	-10.89	1.48	Ag2HVO4	
Ag2MoO4	-12.25	-23.80	-11.55	Ag2MoO4	
Ag2O	-14.16	-1.59	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-15.34	-20.16	-4.82	Ag2SO4	
Ag3AsO3	-28.53	-26.37	2.16	Ag3AsO3	
Ag3AsO4	-16.94	-19.72	-2.79	Ag3AsO4	

Ag3H2VO5	-16.86	-11.68	5.18	Ag3H2VO5
AgF:4H2O	-13.95	-12.90	1.05	AgF:4H2O
Agmetal	-0.06	-13.57	-13.51	Ag
AgVO3	-10.86	-10.09	0.77	AgVO3
Al(OH)3(am)	-1.99	8.81	10.80	Al(OH)3
Al2(MoO4)3	-51.37	-49.00	2.37	Al2(MoO4)3
Al2O3	-2.03	17.62	19.65	Al2O3
Al4(OH)10SO4	-6.02	16.68	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-13.33	-8.53	4.80	AlAsO4:2H2O
AlOHSO4	-6.53	-9.76	-3.23	AlOHSO4
AlSb	-153.29	-87.67	65.62	AlSb
Alunite	-3.56	-4.96	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.51	-12.30	-7.79	PbSO4
Anhydrite	-1.04	-5.40	-4.36	CaSO4
Anilite	-56.34	-88.22	-31.88	Cu0.25Cu1.5S
Antlerite	-3.37	5.42	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-93.17	-95.93	-2.76	As4O6
Artinite	-3.94	5.66	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-41.38	-34.67	6.71	As2O5
Atacamite	-2.06	5.33	7.39	Cu2(OH)3Cl
Azurite	-2.40	-19.31	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.81	8.58	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.29	-1.42	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.77	7.17	32.94	Ba3(VO4)2:4H2O
BaCrO4	-11.98	-21.65	-9.67	BaCrO4
BaF2	-9.79	-15.61	-5.82	BaF2
BaMoO4	-6.66	-13.62	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.58	-6.75	1.83	BaSeO3
BaSeO4	-10.05	-17.51	-7.46	BaSeO4
Bianchite	-6.21	-7.97	-1.76	ZnSO4:6H2O
Birnessite	-6.24	11.85	18.09	MnO2
Bixbyite	-1.19	-1.84	-0.64	Mn2O3
BlaubleiI	-56.15	-80.31	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.68	-83.96	-27.28	Cu0.6Cu0.8S
Boehmite	0.23	8.81	8.58	AlOOH
Breithauptite	-56.24	-74.76	-18.52	NiSb
Brochantite	-1.81	13.41	15.22	Cu4(OH)6SO4
Brucite	-3.19	13.65	16.84	Mg(OH)2
Bunsenite	-3.50	8.95	12.45	NiO
Ca(VO3)2	-11.09	-5.43	5.66	Ca(VO3)2
Ca2V2O7	-9.76	7.74	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.81	7.74	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.47	4.83	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.06	20.90	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.96	20.90	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.44	-153.46	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.10	-26.01	-17.91	Hg2Cl2
CaMoO4	-1.09	-9.04	-7.95	CaMoO4
Carnotite	-1.20	-0.97	0.23	KUO2VO4
CaSeO3:2H2O	-4.98	-2.17	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.91	-12.93	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.01	-1.17	9.84	Cd(BO2)2
Cd(OH)2	-5.94	7.70	13.64	Cd(OH)2
Cd(OH)2(am)	-6.03	7.70	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.75	-14.04	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.03	4.53	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.17	12.23	28.40	Cd4(OH)6SO4
CdCl2	-12.96	-13.62	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.62	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.62	-1.91	CdCl2:2.5H2O
CdF2	-15.29	-16.50	-1.21	CdF2
Cdmetal(alpha)	-31.36	-17.85	13.51	Cd

Cdmetal (gamma)	-31.46	-17.85	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-6.50	-2.96	3.54	CdOHCl
CdSb	-75.66	-76.01	-0.35	CdSb
CdSe	-19.21	-39.41	-20.20	CdSe
CdSeO4:2H2O	-16.55	-18.40	-1.85	CdSeO4:2H2O
CdSO4	-10.70	-10.87	-0.17	CdSO4
CdSO4:1H2O	-9.14	-10.87	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.00	-10.87	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.70	-11.45	-9.75	AgCl
Cerrusite	-2.25	-15.38	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.93	-10.57	-2.64	CuSO4:5H2O
Chalcocite	-56.34	-91.26	-34.92	Cu2S
Chalcopyrite	-127.46	-162.73	-35.27	CuFeS2
Cinnabar	-52.56	-98.25	-45.69	HgS
Claudetite	-92.87	-95.93	-3.06	As4O6
Clausthalite	-13.74	-40.84	-27.10	PbSe
Co (BO2) 2	-27.14	-0.07	27.07	Co (BO2) 2
Co (OH) 2	-4.29	8.81	13.09	Co (OH) 2
Co (OH) 3	-8.51	-10.82	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-21.29	-8.25	13.03	Co3 (AsO4) 2
Co3O4	-2.34	-12.83	-10.50	Co3O4
CoCl2	-20.78	-12.51	8.27	CoCl2
CoCl2:6H2O	-15.05	-12.51	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.80	-15.39	-1.60	CoF2
CoF3	-45.66	-47.12	-1.46	CoF3
CoFe2O4	18.72	15.19	-3.53	CoFe2O4
CoMoO4	-5.64	-13.40	-7.76	CoMoO4
CoO	-4.78	8.81	13.59	CoO
CoS (alpha)	-70.84	-78.28	-7.44	CoS
CoS (beta)	-67.21	-78.28	-11.07	CoS
CoSe	-22.10	-38.30	-16.20	CoSe
CoSeO3	-7.85	-6.53	1.32	CoSeO3
CoSeO4:6H2O	-15.76	-17.29	-1.53	CoSeO4:6H2O
CoSO4	-12.56	-9.76	2.80	CoSO4
CoSO4:6H2O	-7.29	-9.76	-2.47	CoSO4:6H2O
Cotunnite	-10.27	-15.05	-4.78	PbCl2
Covellite	-56.79	-79.09	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.41	-32.32	14.09	CrCl2
CrCl3	-48.27	-33.15	15.11	CrCl3
CrF3	-26.14	-37.48	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.53	-45.37	-33.84	Na3AlF6
Cu (OH) 2	-0.68	8.00	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.82	19.39	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.75	-0.50	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.69	-90.57	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.48	-51.28	-45.80	Cu2Se
Cu2SO4	-20.79	-22.74	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-16.79	-10.69	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.15	-102.74	-42.59	Cu3Sb
Cu3Se2	-26.91	-90.40	-63.49	Cu3Se2
CuCO3	-2.15	-13.65	-11.50	CuCO3
CuCrO4	-16.80	-22.24	-5.44	CuCrO4
CuF	-9.28	-14.19	-4.91	CuF
CuF2	-17.32	-16.20	1.12	CuF2
CuF2:2H2O	-11.66	-16.21	-4.55	CuF2:2H2O
Cumetal	-6.10	-14.86	-8.76	Cu
CuMoO4	-1.14	-14.21	-13.08	CuMoO4
CuOCuSO4	-12.88	-2.58	10.30	CuOCuSO4

Cupricferrite	8.39	14.38	5.99	CuFe2O4
Cuprite	-2.77	-4.17	-1.41	Cu2O
Cuprousferrite	10.02	1.10	-8.92	CuFeO2
CuSe	-6.01	-39.11	-33.10	CuSe
CuSe2	-27.31	-60.68	-33.37	CuSe2
CuSeO3:2H2O	-7.85	-7.34	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.67	-18.11	-2.44	CuSeO4:5H2O
CuSO4	-13.51	-10.57	2.94	CuSO4
Diaspore	1.94	8.81	6.87	AlOOH
Djurleite	-56.54	-90.46	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.07	-16.47	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.62	-16.47	-17.09	CaMg(CO3)2
Epsomite	-2.79	-4.92	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.03	-0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.43	-15.15	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.51	-8.95	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.00	-39.62	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.59	-49.32	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.55	-14.15	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.67	-18.76	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.63	-65.22	-18.60	FeSe2
FeS(ppt)	-80.69	-83.64	-2.95	FeS
FeSe	-32.66	-43.66	-11.00	FeSe
Fix_pe	-4.62	-4.62	0.00	e-
Fluorite	-0.53	-11.03	-10.50	CaF2
Galena	-66.85	-80.82	-13.97	PbS
Gibbsite	0.52	8.81	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O
Greenockite	-65.03	-79.39	-14.36	CdS
Greigite	-293.48	-338.51	-45.03	Fe3S4
Gummite	-5.09	2.58	7.67	UO3
Gypsum	-0.79	-5.40	-4.61	CaSO4:2H2O
H-Jarosite	-15.46	-27.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.33	-22.21	-12.88	H2MoO4
H2S(g)	-79.08	-87.09	-8.01	H2S
H2Se(g)	-42.15	-47.11	-4.96	H2Se
Halite	-6.12	-4.52	1.60	NaCl
Hausmannite	-0.51	60.52	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.82	21.07	22.89	FeAl2O4
Hg(CH3)2(g)	-185.11	-258.82	-73.71	Hg(CH3)2
Hg(g)	-7.25	-15.12	-7.87	Hg
Hg(OH)2	-7.67	-11.17	-3.50	Hg(OH)2
Hg2(g)	-15.29	-30.24	-14.96	Hg2
Hg2(OH)2	-9.96	-4.70	5.26	Hg2(OH)2
Hg2CO3	-10.29	-26.34	-16.05	Hg2CO3
Hg2CrO4	-26.23	-34.93	-8.70	Hg2CrO4
Hg2F2	-18.53	-28.90	-10.36	Hg2F2
Hg2S	-80.11	-91.78	-11.68	Hg2S
Hg2SeO3	-15.38	-20.03	-4.66	Hg2SeO3
Hg2SO4	-17.13	-23.26	-6.13	Hg2SO4
Hg3O2CO3	-25.47	-55.15	-29.68	Hg3O2CO3
HgCl(g)	-32.50	-13.01	19.50	HgCl
HgCl2	-11.22	-32.48	-21.26	HgCl2
HgF(g)	-47.12	-14.45	32.68	HgF
HgF2(g)	-47.93	-35.37	12.57	HgF2
Hgmetal(l)	-1.67	-15.12	-13.45	Hg
HgSe	-2.58	-58.28	-55.69	HgSe
HgSeO3	-14.07	-26.50	-12.43	HgSeO3
HgSO4	-20.32	-29.74	-9.42	HgSO4
Huntite	-2.50	-32.46	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.72	-24.49	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-9.56	-18.33	-8.77	Mg5(CO3)4(OH)2:4H2O

K-Alum	-17.41	-22.58	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-7.02	-21.82	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-31.74	-48.98	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-18.23	-18.74	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-13.98	-10.72	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-13.88	-14.61	-0.73	K ₂ SeO ₄
Langite	-4.08	13.41	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.60	-6.03	-0.43	PbO:PbSO ₄
Laurionite	-5.01	-4.39	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.43	6.27	12.69	PbO
Mackinawite	-80.04	-83.64	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	3.18	20.04	16.86	Fe ₂ MgO ₄
Magnesite	-0.53	-7.99	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	-0.35	-5.66	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-0.91	24.43	25.34	MnOOH
Massicot	-6.63	6.27	12.89	PbO
Matlockite	-7.52	-16.49	-8.97	PbClF
Melanothallite	-19.58	-13.32	6.26	CuCl ₂
Melanterite	-12.91	-15.12	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-53.16	-98.25	-45.09	HgS
Mg(OH) ₂ (active)	-5.14	13.65	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.22	-4.94	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-272.96	-198.28	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-17.65	8.71	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-4.91	11.29	16.20	MgCr ₂ O ₄
MgCrO ₄	-21.97	-16.59	5.38	MgCrO ₄
MgF ₂	-2.42	-10.55	-8.13	MgF ₂
MgMoO ₄	-6.71	-8.56	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.74	-1.69	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.25	-12.45	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-29.17	44.35	73.52	Pb ₃ O ₄
Mirabilite	-5.17	-6.29	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.84	-6.94	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-51.83	-57.54	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.02	-85.94	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-12.20	0.30	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.37	-9.66	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.60	-75.43	0.17	MnS
MnS (pnk)	-78.77	-75.43	3.34	MnS
MnSb	-94.49	-97.40	-2.91	MnSb
MnSe	-38.95	-35.45	3.50	MnSe
MnSeO ₃	-4.81	-3.68	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.66	-3.68	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.39	-14.44	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.49	-6.91	2.58	MnSO ₄
Monteponite	-7.40	7.70	15.10	CdO
Montroydite	-7.53	-11.17	-3.64	HgO
MoO ₃	-14.21	-22.21	-8.00	MoO ₃
Morenosite	-7.48	-9.62	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-151.67	-221.93	-70.26	MoS ₂
Na-Jarosite	-10.22	-21.42	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.30	-48.19	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.89	-17.96	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.54	-32.14	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.42	-9.93	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.15	-9.93	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-13.36	-3.06	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.10	-13.82	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.51	-78.06	94.45	Na ₃ Sb
Na ₃ VO ₄	-27.56	9.12	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-31.43	5.97	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.01	-12.74	-6.73	CuCl
NaSb	-87.96	-64.80	23.17	NaSb
Natron	-8.06	-9.37	-1.31	Na ₂ CO ₃ ·10H ₂ O

NaVO3	-7.02	-3.16	3.86	NaVO3
Nesquehonite	-3.33	-8.00	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.84	8.95	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.53	-7.83	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.77	17.23	32.00	Ni4 (OH) 6SO4
NiCO3	-5.83	-12.70	-6.87	NiCO3
NiMoO4	-2.12	-13.26	-11.14	NiMoO4
NiS (alpha)	-72.54	-78.14	-5.60	NiS
NiS (beta)	-67.04	-78.14	-11.10	NiS
NiS (gamma)	-65.34	-78.14	-12.80	NiS
NiSe	-20.46	-38.16	-17.70	NiSe
NiSeO3:2H2O	-9.20	-6.39	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.63	-17.15	-1.52	NiSeO4:6H2O
Nsutite	-5.65	11.85	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-248.16	-309.23	-61.07	As2S3
Otavite	-1.95	-13.95	-12.00	CdCO3
Pb (BO2) 2	-9.13	-2.61	6.52	Pb (BO2) 2
Pb (OH) 2	-1.88	6.27	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-58.44	-67.20	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-6.92	1.88	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.65	12.54	26.19	Pb2O (OH) 2
Pb2O3	-22.96	38.08	61.04	Pb2O3
Pb2OCO3	-8.55	-9.11	-0.56	Pb2OCO3
Pb2V2O7	-4.16	-6.06	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.67	-15.87	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.93	0.21	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.86	-2.84	11.02	Pb3O2CO3
Pb3O2SO4	-10.45	0.24	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-14.60	6.50	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-15.37	6.50	21.88	Pb4O3SO4
PbCrO4	-11.37	-23.97	-12.60	PbCrO4
PbF2	-10.49	-17.93	-7.44	PbF2
Pbmetal	-23.52	-19.28	4.25	Pb
PbMoO4	-0.32	-15.94	-15.62	PbMoO4
PbO:0.3H2O	-6.71	6.27	12.98	PbO:0.33H2O
PbSeO4	-12.99	-19.83	-6.84	PbSeO4
Periclase	-7.93	13.65	21.58	MgO
Phosgenite	-10.62	-30.43	-19.81	PbCl2:PbCO3
Plattnerite	-17.79	31.81	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.67	-145.18	-18.51	FeS2
Pyrochroite	-3.54	11.66	15.19	Mn (OH) 2
Pyrolusite	-4.18	37.20	41.38	MnO2
Realgar	-104.10	-123.84	-19.75	AsS
Retgersite	-7.58	-9.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.59	-9.99	-10.58	MnCO3
Rutherfordine	-4.56	-19.06	-14.50	UO2CO3
Sb (OH) 3	-12.74	-19.85	-7.11	Sb (OH) 3
Sb2O4	-17.55	-14.15	3.40	Sb2O4
Sb2O5	-27.56	-37.23	-9.67	Sb2O5
Sb2Se3	-113.27	-181.03	-67.76	Sb2Se3
Sb4O6 (cubic)	-61.13	-79.39	-18.26	Sb4O6
Sb4O6 (orth)	-61.49	-79.39	-17.90	Sb4O6
SbCl3	-52.39	-51.82	0.57	SbCl3
SbF3	-45.92	-56.15	-10.23	SbF3
Sbmetal	-46.48	-58.16	-11.69	Sb
SbO2	-3.56	-31.39	-27.82	SbO2
Schoepite	-3.41	2.58	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.46	-21.57	-7.11	Se
Semetal (hex)	-13.86	-21.57	-7.71	Se
Senarmontite	-27.33	-39.70	-12.37	Sb2O3
SeO2	-15.46	-15.34	0.12	SeO2
SeO3	-47.14	-26.10	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.05	-11.05	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS
Spinel	-5.57	31.27	36.85	MgAl2O4

Stibnite	-250.50	-300.96	-50.46	Sb2S3
Sulfur	-59.40	-61.54	-2.14	S
Tenorite	0.35	8.00	7.64	CuO
Thenardite	-6.61	-6.29	0.32	Na2SO4
Thermonatrite	-10.00	-9.37	0.64	Na2CO3:H2O
Tyuyamunite	-4.35	-0.27	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.23	9.85	21.08	U3O8
U3Sb4	-579.55	-427.17	152.38	U3Sb4
U4O9	-26.42	-29.44	-3.02	U4O9
UF4	-32.61	-62.15	-29.54	UF4
UF4:2.5H2O	-29.43	-62.15	-32.72	UF4:2.5H2O
UO2 (am)	-14.68	-13.75	0.93	UO2
UO2 (NO3) 2	-42.55	-30.40	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.25	-30.40	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.79	-30.40	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.45	-30.40	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.03	2.58	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.27	-23.52	-2.25	UO2SeO4:4H2O
UO3	-5.12	2.58	7.70	UO3
Uraninite	-9.08	-13.75	-4.67	UO2
USb2	-219.96	-190.38	29.58	USb2
V (OH) 3	-19.84	-12.24	7.59	V (OH) 3
V2O5	-17.24	-18.60	-1.36	V2O5
V3O5	-42.88	-41.05	1.84	V3O5
V4O7	-53.40	-46.21	7.19	V4O7
V6O13	-46.02	-106.88	-60.86	V6O13
Valentinite	-31.22	-39.70	-8.48	Sb2O3
VC12	-65.21	-46.33	18.87	VC12
VC13	-67.65	-44.22	23.43	VC13
VF4	-68.50	-53.57	14.93	VF4
Vmetal	-94.59	-50.56	44.03	V
VO	-39.77	-25.02	14.76	VO
VO (OH) 2	-10.32	-5.17	5.15	VO (OH) 2
VO2Cl	-22.80	-19.96	2.84	VO2Cl
VOC1	-34.05	-22.90	11.15	VOC1
VOC12	-39.24	-26.48	12.76	VOC12
VOSO4	-27.34	-23.74	3.61	VOSO4
Witherite	-4.49	-13.06	-8.57	BaCO3
Wurtzite	-67.54	-76.49	-8.95	ZnS
Zincite	-0.74	10.60	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO4
Zn (BO2) 2	-6.57	1.72	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.71	-22.39	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.60	10.60	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-1.88	10.60	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.16	10.60	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-0.94	10.60	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.14	10.60	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.87	2.63	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.66	10.53	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.53	-2.88	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-24.26	-5.35	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.58	23.82	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.83	31.67	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.77	-10.72	7.05	ZnCl2
ZnCO3:1H2O	-0.79	-11.05	-10.26	ZnCO3:1H2O
ZnF2	-13.07	-13.60	-0.53	ZnF2
Znmetal	-40.74	-14.95	25.79	Zn
ZnMoO4	-1.49	-11.61	-10.13	ZnMoO4
ZnO (active)	-0.59	10.60	11.19	ZnO
ZnS (am)	-67.44	-76.49	-9.05	ZnS
ZnSb	-84.13	-73.11	11.01	ZnSb
ZnSe	-22.11	-36.51	-14.40	ZnSe
ZnSeO4:6H2O	-13.98	-15.50	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.33	-7.97	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 34.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 105
 equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 donnan 1e-008
USE EQUILIBRIUM_PHASES 105
USE Surface 105
USE Solution 114
SAVE Solution 115 #Initial Stage 1 Pit Water After Mineral Precipitation
and Sorption Loss
END

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 105.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.109e-19 Surface + diffuse layer charge, eq
5.374e-12 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.179e-04 m² for 1.836e-09 moles of Ferrihydrite

Water in diffuse layer: 1.179e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is

+1).

Element	Moles
C	3.0118e-15
Ca	3.7326e-17
Cl	6.0312e-14
H	8.8847e-15
K	5.9214e-17
Mg	5.7831e-18
N	2.4417e-13
Na	2.5088e-16
O	1.0883e-11
S	2.5358e-12

Hfo_s

9.182e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
---------	-------	---------------	----------	--------------

Hfo_sOH2+	6.138e-12	0.668	6.138e-12	-11.212
Hfo_sOH	3.010e-12	0.328	3.010e-12	-11.521
Hfo_sO-	3.382e-14	0.004	3.382e-14	-13.471
Hfo_sOHCa+2	1.120e-16	0.000	1.120e-16	-15.951

Hfo_w

3.673e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.697e-10	0.462	1.697e-10	-9.770
Hfo_wOH	8.323e-11	0.227	8.323e-11	-10.080
Hfo_wSO4-	5.732e-11	0.156	5.732e-11	-10.242
Hfo_wOHSO4-2	5.609e-11	0.153	5.609e-11	-10.251
Hfo_wO-	9.351e-13	0.003	9.351e-13	-12.029
Hfo_wOMg+	1.322e-18	0.000	1.322e-18	-17.879
Hfo_wOCa+	4.484e-19	0.000	4.484e-19	-18.348

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 114. Solution after simulation 33.
 Using surface 105.
 Using pure phase assemblage 105. Pure-phase assemblage after simulation 33.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	1.521e-08	1.520e-08	-4.034e-14
Alunite	-3.56	-4.96	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.04	-5.40	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	1.927e-10	1.920e-10	-7.376e-13
Barite	0.00	-9.98	-9.98	1.629e-07	1.629e-07	2.213e-12
Brochantite	-1.81	13.41	15.22	0.000e+00	0	0.000e+00
Brucite	-3.19	13.65	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	2.935e-10
CaMoO4	-1.09	-9.04	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.98	-2.17	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.111e-03	2.111e-03	-2.200e-10
Carnotite	-1.20	-0.97	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.01	-1.17	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.36	-14.51	-14.15	0.000e+00	0	0.000e+00
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	1.752e-09	1.751e-09	-1.757e-13
Cu2Se(alpha)	-5.48	-51.28	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.14	-14.21	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.79	-4.92	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	1.836e-09	1.836e-09	-1.338e-17

Fluorite	-0.53	-11.03	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.09	2.58	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.79	-5.40	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.58	-58.28	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.17	-6.29	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.81	-3.68	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.84	8.95	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.53	-7.83	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.83	-12.70	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.12	-13.26	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	8.882e-15
Otavite	-1.95	-13.95	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.32	-15.94	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.56	-19.06	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.56	-31.39	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.41	2.58	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.35	-0.27	4.08	0.000e+00	0	0.000e+00
U3O8	-11.23	9.85	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.03	2.58	5.61	0.000e+00	0	0.000e+00
UO3	-5.12	2.58	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.49	-11.61	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-6.852e-23 Surface + diffuse layer charge, eq
1.882e-11 Surface charge, eq
1.541e-02 sigma, C/m²
2.926e-02 psi, V
-1.139e+00 -F*psi/RT
3.201e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.179e-04 m² for 1.836e-09 moles of Ferrihydrite

Water in diffuse layer: 1.179e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 4.117e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.519e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	1.3614e-17
Al	3.1987e-15
As	2.7655e-19
B	4.8274e-14
Ba	3.5394e-17
C	1.2293e-12
Ca	2.4279e-12
Cd	1.0743e-17
Cl	5.2761e-12
Co	1.2275e-16
Cr	9.6304e-19
Cu	2.1399e-16
F	2.2676e-13
Fe	9.3442e-19
H	1.3610e-12
Hg	3.3066e-18
K	5.0144e-12
Mg	6.7531e-12
Mn	7.9799e-14
Mo	4.4555e-15
N	8.3669e-15

Na	1.2287e-11
Ni	1.5314e-16
O	9.9641e-11
Pb	2.5675e-18
S	2.3938e-11
Sb	5.3313e-17
Se	2.8880e-16
U	1.1317e-15
V	1.2242e-17
Zn	8.0136e-15

Hfo_s

9.182e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	4.650e-12	0.506	4.647e-12	-11.333
Hfo_sOMn+	2.184e-12	0.238	2.183e-12	-11.661
Hfo_sOPb+	9.965e-13	0.109	9.959e-13	-12.002
Hfo_sOCu+	9.253e-13	0.101	9.247e-13	-12.034
Hfo_sOCrOH+	3.513e-13	0.038	3.511e-13	-12.455
Hfo_sOHCa+2	3.697e-14	0.004	3.695e-14	-13.432
Hfo_sONi+	2.516e-14	0.003	2.514e-14	-13.600
Hfo_sOH	5.376e-15	0.001	5.373e-15	-14.270
Hfo_sO-	2.821e-15	0.000	2.819e-15	-14.550
Hfo_sOCu+	2.678e-15	0.000	2.677e-15	-14.572
Hfo_sOCd+	1.780e-15	0.000	1.779e-15	-14.750
Hfo_sOH2+	2.347e-16	0.000	2.346e-16	-15.630
Hfo_sOAg	1.643e-17	0.000	1.642e-17	-16.785
Hfo_sOHBa+2	3.010e-18	0.000	3.008e-18	-17.522
Hfo_sOFe+	1.706e-19	0.000	1.705e-19	-18.768
Hfo_sOHg+	7.285e-21	0.000	7.281e-21	-20.138

Hfo_w

3.673e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOMg+	1.198e-10	0.326	1.197e-10	-9.922
Hfo_wOHVO4-3	4.951e-11	0.135	4.948e-11	-10.306
Hfo_wOH	4.742e-11	0.129	4.739e-11	-10.324
Hfo_wOZn+	4.295e-11	0.117	4.292e-11	-10.367
Hfo_wOCu+	4.186e-11	0.114	4.183e-11	-10.378
Hfo_wO-	2.488e-11	0.068	2.487e-11	-10.604
Hfo_wOHSO4-2	1.577e-11	0.043	1.576e-11	-10.802
Hfo_wOMn+	1.530e-11	0.042	1.529e-11	-10.815
Hfo_wOHSeO3-2	2.569e-12	0.007	2.568e-12	-11.590
Hfo_wOCa+	2.205e-12	0.006	2.203e-12	-11.657
Hfo_wOH2+	2.070e-12	0.006	2.069e-12	-11.684
Hfo_wOHAsO4-3	1.475e-12	0.004	1.474e-12	-11.831
Hfo_wOPb+	3.926e-13	0.001	3.924e-13	-12.406
Hfo_wSO4-	3.453e-13	0.001	3.451e-13	-12.462
Hfo_wONi+	2.993e-13	0.001	2.991e-13	-12.524
Hfo_wSeO3-	1.906e-13	0.001	1.905e-13	-12.720
Hfo_wOHMoO4-2	1.468e-13	0.000	1.467e-13	-12.833
Hfo_wOCu+	6.659e-14	0.000	6.655e-14	-13.177
Hfo_wH2BO3	7.220e-15	0.000	7.216e-15	-14.142
Hfo_wOCd+	6.697e-15	0.000	6.693e-15	-14.174
Hfo_wMoO4-	4.142e-15	0.000	4.139e-15	-14.383
Hfo_wHAsO4-	6.299e-17	0.000	6.295e-17	-16.201
Hfo_wOAg	3.811e-17	0.000	3.809e-17	-16.419
Hfo_wOHg+	3.147e-18	0.000	3.146e-18	-17.502
Hfo_wOBa+	2.594e-18	0.000	2.593e-18	-17.586
Hfo_wOFe+	9.494e-19	0.000	9.489e-19	-18.023
Hfo_wOHSeO4-2	4.748e-19	0.000	4.745e-19	-18.324
Hfo_wOHSbO (OH) 4-	1.028e-19	0.000	1.027e-19	-18.988
Hfo_wH2AsO4	8.898e-20	0.000	8.893e-20	-19.051
Hfo_wOHCrO4-2	4.343e-20	0.000	4.341e-20	-19.362

Hfo_wSeO4-	9.055e-21	0.000	9.050e-21	-20.043
Hfo_wSbO(OH) 4	2.899e-21	0.000	2.897e-21	-20.538
Hfo_wCrO4-	8.673e-22	0.000	8.668e-22	-21.062
Hfo_wH2AsO3	1.267e-29	0.000	1.266e-29	-28.898

-----Solution composition-----

Elements	Molality	Moles
Ag	1.127e-08	1.128e-08
Al	2.313e-06	2.314e-06
As	1.709e-10	1.710e-10
B	4.036e-05	4.038e-05
Ba	4.132e-08	4.134e-08
C	8.983e-04	8.988e-04
Ca	2.489e-03	2.491e-03
Cd	1.047e-08	1.047e-08
Cl	3.813e-03	3.815e-03
Co	1.287e-07	1.288e-07
Cr	9.005e-10	9.010e-10
Cu	1.867e-07	1.868e-07
F	1.736e-04	1.737e-04
Fe	8.300e-10	8.305e-10
Hg	2.805e-09	2.806e-09
K	4.923e-03	4.926e-03
Mg	7.044e-03	7.048e-03
Mn	8.486e-05	8.491e-05
Mo	2.743e-06	2.744e-06
N	6.052e-06	6.056e-06
Na	1.210e-02	1.211e-02
Ni	1.568e-07	1.569e-07
Pb	2.279e-09	2.280e-09
S	1.568e-02	1.569e-02
Sb	3.852e-08	3.855e-08
Se	1.904e-07	1.905e-07
U	5.299e-07	5.302e-07
V	8.222e-09	8.226e-09
Zn	7.894e-06	7.899e-06

-----Description of solution-----

	pH =	8.155	Charge balance
	pe =	4.617	Adjusted to redox
equilibrium			
	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	4.777e-02	
	Mass of water (kg) =	1.001e+00	
	Total alkalinity (eq/kg) =	9.318e-04	
	Total CO2 (mol/kg) =	8.983e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	7.162e-07	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.00	
	Iterations =	1	
	Total H =	1.110788e+02	
	Total O =	5.560448e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.766e-06	1.439e-06	-5.753	-5.842	-0.089	(0)
H+	8.490e-09	6.994e-09	-8.071	-8.155	-0.084	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	1.127e-08					
AgCl	7.192e-09	7.192e-09	-8.143	-8.143	0.000	(0)
AgCl2-	2.543e-09	1.967e-09	-8.595	-8.706	-0.111	(0)
Ag+	1.361e-09	1.122e-09	-8.866	-8.950	-0.084	(0)

	AgSO4-	1.599e-10	1.237e-10	-9.796	-9.908	-0.111	(0)
	AgCl3-2	1.537e-11	5.507e-12	-10.813	-11.259	-0.446	(0)
	AgNO2	1.142e-12	1.142e-12	-11.942	-11.942	0.000	(0)
	AgCl4-3	3.558e-13	3.531e-14	-12.449	-13.452	-1.003	(0)
	AgF	3.197e-13	3.197e-13	-12.495	-12.495	0.000	(0)
	AgOH	1.613e-13	1.613e-13	-12.792	-12.792	0.000	(0)
	AgH2BO3	5.387e-14	5.387e-14	-13.269	-13.269	0.000	(0)
	AgSeO3-	3.498e-14	2.706e-14	-13.456	-13.568	-0.111	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgNH3+	4.291e-15	3.320e-15	-14.367	-14.479	-0.111	(0)
	Ag (OH) 2-	2.932e-17	2.268e-17	-16.533	-16.644	-0.111	(0)
	Ag (NO2) 2-	1.115e-17	8.626e-18	-16.953	-17.064	-0.111	(0)
	AgNO3	4.097e-18	4.097e-18	-17.387	-17.387	0.000	(0)
	Ag (SeO3) 2-3	9.163e-20	9.095e-21	-19.038	-20.041	-1.003	(0)
	Ag (NH3) 2+	5.057e-20	3.912e-20	-19.296	-19.408	-0.111	(0)
	Ag2MoO4	6.014e-25	6.014e-25	-24.221	-24.221	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.067	-74.067	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.120	-82.903	-1.784	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.227	-0.215	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.787	-148.899	-0.111	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.123	-149.512	-0.389	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.454	-149.823	-0.368	(0)
Al		2.313e-06					
	Al (OH) 4-	2.302e-06	1.896e-06	-5.638	-5.722	-0.084	(0)
	Al (OH) 3	1.047e-08	1.047e-08	-7.980	-7.980	0.000	(0)
	Al (OH) 2+	4.388e-10	3.647e-10	-9.358	-9.438	-0.080	(0)
	AlF3	1.624e-11	1.624e-11	-10.789	-10.789	0.000	(0)
	AlF2+	1.368e-11	1.137e-11	-10.864	-10.944	-0.080	(0)
	AlF4-	1.122e-12	9.238e-13	-11.950	-12.034	-0.084	(0)
	AlOH+2	6.688e-13	3.191e-13	-12.175	-12.496	-0.321	(0)
	AlF+2	5.275e-13	2.517e-13	-12.278	-12.599	-0.321	(0)
	AlSO4+	1.156e-14	9.519e-15	-13.937	-14.021	-0.084	(0)
	Al+3	1.269e-15	2.218e-16	-14.896	-15.654	-0.758	(0)
	Al (SO4) 2-	6.846e-16	5.639e-16	-15.165	-15.249	-0.084	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.980	-44.983	-1.003	(0)
As (3)		1.137e-24					
	H3AsO3	1.038e-24	1.038e-24	-23.984	-23.984	0.000	(0)
	H2AsO3-	9.842e-26	7.614e-26	-25.007	-25.118	-0.111	(0)
	HAsO3-2	2.772e-29	9.928e-30	-28.557	-29.003	-0.446	(0)
	H4AsO3+	4.651e-33	3.598e-33	-32.332	-32.444	-0.111	(0)
	AsO3-3	5.513e-34	5.472e-35	-33.259	-34.262	-1.003	(0)
As (5)		1.709e-10					
	HAsO4-2	1.658e-10	5.937e-11	-9.781	-10.226	-0.446	(0)
	H2AsO4-	4.895e-12	3.787e-12	-11.310	-11.422	-0.111	(0)
	AsO4-3	2.705e-13	2.684e-14	-12.568	-13.571	-1.003	(0)
	H3AsO4	4.552e-18	4.603e-18	-17.342	-17.337	0.005	(0)
B		4.036e-05					
	H3BO3	3.610e-05	3.650e-05	-4.443	-4.438	0.005	(0)
	H2BO3-	3.767e-06	3.031e-06	-5.424	-5.518	-0.095	(0)
	MgH2BO3+	2.870e-07	2.309e-07	-6.542	-6.637	-0.095	(0)
	CaH2BO3+	1.559e-07	1.254e-07	-6.807	-6.902	-0.095	(0)
	NaH2BO3	4.649e-08	4.649e-08	-7.333	-7.333	0.000	(0)
	BF (OH) 3-	2.054e-09	1.652e-09	-8.687	-8.782	-0.095	(0)
	H5 (BO3) 2-	1.170e-10	9.414e-11	-9.932	-10.026	-0.095	(0)
	BaH2BO3+	2.205e-12	1.774e-12	-11.657	-11.751	-0.095	(0)
	H8 (BO3) 3-	4.271e-13	3.436e-13	-12.369	-12.464	-0.095	(0)
	BF2 (OH) 2-	1.744e-13	1.403e-13	-12.758	-12.853	-0.095	(0)
	AgH2BO3	5.387e-14	5.387e-14	-13.269	-13.269	0.000	(0)
	BF3OH-	5.389e-20	4.335e-20	-19.268	-19.363	-0.095	(0)
	BF4-	2.106e-25	1.694e-25	-24.677	-24.771	-0.095	(0)
Ba		4.132e-08					
	Ba+2	4.113e-08	1.894e-08	-7.386	-7.723	-0.337	(0)
	BaHCO3+	1.487e-10	1.243e-10	-9.828	-9.906	-0.078	(0)
	BaCO3	4.474e-11	4.474e-11	-10.349	-10.349	0.000	(0)
	BaH2BO3+	2.205e-12	1.774e-12	-11.657	-11.751	-0.095	(0)
	BaOH+	1.437e-13	1.190e-13	-12.843	-12.925	-0.082	(0)
	BaNO3+	5.644e-16	4.367e-16	-15.248	-15.360	-0.111	(0)
	BaNH3+2	4.838e-17	1.733e-17	-16.315	-16.761	-0.446	(0)

C (4)	8.983e-04					
HCO3-	8.266e-04	6.870e-04	-3.083	-3.163	-0.080	(0)
MgHCO3+	1.886e-05	1.545e-05	-4.725	-4.811	-0.087	(0)
CaHCO3+	1.101e-05	9.199e-06	-4.958	-5.036	-0.078	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.998e-06	4.605e-06	-5.000	-5.337	-0.337	(0)
MgCO3	8.417e-06	8.417e-06	-5.075	-5.075	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	3.740e-06	3.740e-06	-5.427	-5.427	0.000	(0)
NaCO3-	9.987e-07	8.301e-07	-6.001	-6.081	-0.080	(0)
ZnCO3	5.124e-07	5.124e-07	-6.290	-6.290	0.000	(0)
UO2 (CO3) 3-4	4.417e-07	7.270e-09	-6.355	-8.138	-1.784	(0)
MnHCO3+	3.691e-07	3.056e-07	-6.433	-6.515	-0.082	(0)
CuCO3	1.314e-07	1.314e-07	-6.882	-6.882	0.000	(0)
UO2 (CO3) 2-2	8.794e-08	3.150e-08	-7.056	-7.502	-0.446	(0)
ZnHCO3+	5.430e-08	4.201e-08	-7.265	-7.377	-0.111	(0)
NiCO3	7.492e-09	7.492e-09	-8.125	-8.125	0.000	(0)
NiHCO3+	4.774e-09	3.693e-09	-8.321	-8.433	-0.111	(0)
Cu (CO3) 2-2	4.546e-09	1.628e-09	-8.342	-8.788	-0.446	(0)
CoCO3	2.444e-09	2.444e-09	-8.612	-8.612	0.000	(0)
CoHCO3+	2.168e-09	1.678e-09	-8.664	-8.775	-0.111	(0)
PbCO3	1.255e-09	1.255e-09	-8.901	-8.901	0.000	(0)
UO2CO3	3.428e-10	3.428e-10	-9.465	-9.465	0.000	(0)
CuHCO3+	2.714e-10	2.100e-10	-9.566	-9.678	-0.111	(0)
CdCO3	2.573e-10	2.573e-10	-9.590	-9.590	0.000	(0)
BaHCO3+	1.487e-10	1.243e-10	-9.828	-9.906	-0.078	(0)
PbHCO3+	5.982e-11	4.628e-11	-10.223	-10.335	-0.111	(0)
Pb (CO3) 2-2	4.654e-11	1.667e-11	-10.332	-10.778	-0.446	(0)
BaCO3	4.474e-11	4.474e-11	-10.349	-10.349	0.000	(0)
CdHCO3+	4.955e-12	3.833e-12	-11.305	-11.416	-0.111	(0)
Cd (CO3) 2-2	2.452e-12	8.782e-13	-11.611	-12.056	-0.446	(0)
HgCO3	2.862e-15	2.862e-15	-14.543	-14.543	0.000	(0)
FeHCO3+	1.431e-15	1.196e-15	-14.844	-14.922	-0.078	(0)
Hg (CO3) 2-2	1.163e-16	4.167e-17	-15.934	-16.380	-0.446	(0)
HgHCO3+	4.817e-19	3.727e-19	-18.317	-18.429	-0.111	(0)
Ca	2.489e-03					
Ca+2	1.561e-03	7.190e-04	-2.807	-3.143	-0.337	(0)
CaSO4	9.106e-04	9.106e-04	-3.041	-3.041	0.000	(0)
CaHCO3+	1.101e-05	9.199e-06	-4.958	-5.036	-0.078	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	1.076e-06	8.905e-07	-5.968	-6.050	-0.082	(0)
CaH2BO3+	1.559e-07	1.254e-07	-6.807	-6.902	-0.095	(0)
CaOH+	2.470e-08	2.064e-08	-7.607	-7.685	-0.078	(0)
CaNO3+	1.352e-11	1.046e-11	-10.869	-10.981	-0.111	(0)
CaNH3+2	3.664e-12	1.312e-12	-11.436	-11.882	-0.446	(0)
Ca (NH3) 2+2	2.115e-21	7.575e-22	-20.675	-21.121	-0.446	(0)
Cd	1.047e-08					
Cd+2	5.321e-09	2.451e-09	-8.274	-8.611	-0.337	(0)
CdSO4	3.176e-09	3.176e-09	-8.498	-8.498	0.000	(0)
CdCl+	9.502e-10	7.351e-10	-9.022	-9.134	-0.111	(0)
Cd (SO4) 2-2	6.612e-10	2.368e-10	-9.180	-9.626	-0.446	(0)
CdCO3	2.573e-10	2.573e-10	-9.590	-9.590	0.000	(0)
CdOHC1	4.338e-11	4.338e-11	-10.363	-10.363	0.000	(0)
CdOH+	3.620e-11	2.801e-11	-10.441	-10.553	-0.111	(0)
CdCl2	9.625e-12	9.625e-12	-11.017	-11.017	0.000	(0)
CdF+	5.697e-12	4.408e-12	-11.244	-11.356	-0.111	(0)
CdHCO3+	4.955e-12	3.833e-12	-11.305	-11.416	-0.111	(0)
Cd (CO3) 2-2	2.452e-12	8.782e-13	-11.611	-12.056	-0.446	(0)
Cd (OH) 2	2.542e-13	2.542e-13	-12.595	-12.595	0.000	(0)
CdCl3-	2.465e-14	1.907e-14	-13.608	-13.720	-0.111	(0)
CdF2	9.979e-16	9.979e-16	-15.001	-15.001	0.000	(0)
CdSeO4	7.422e-17	7.422e-17	-16.129	-16.129	0.000	(0)
CdNO3+	4.608e-17	3.565e-17	-16.337	-16.448	-0.111	(0)
Cd (OH) 3-	2.888e-17	2.235e-17	-16.539	-16.651	-0.111	(0)
Cd (SeO3) 2-2	7.947e-18	2.846e-18	-17.100	-17.546	-0.446	(0)
Cd2OH+3	3.466e-18	3.440e-19	-17.460	-18.463	-1.003	(0)
Cd (OH) 4-2	1.469e-23	5.262e-24	-22.833	-23.279	-0.446	(0)
Cd (NO3) 2	8.217e-26	8.217e-26	-25.085	-25.085	0.000	(0)

	CdHS+	0.000e+00	0.000e+00	-79.423	-79.534	-0.111	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.262	-151.262	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.182	-228.293	-0.111	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.583	-305.029	-0.446	(0)
Cl		3.813e-03					
	Cl-	3.812e-03	3.141e-03	-2.419	-2.503	-0.084	(0)
	MnCl+	1.065e-07	8.815e-08	-6.973	-7.055	-0.082	(0)
	ZnOHC1	2.873e-08	2.873e-08	-7.542	-7.542	0.000	(0)
	ZnCl+	1.862e-08	1.525e-08	-7.730	-7.817	-0.087	(0)
	AgCl	7.192e-09	7.192e-09	-8.143	-8.143	0.000	(0)
	AgCl2-	2.543e-09	1.967e-09	-8.595	-8.706	-0.111	(0)
	CdCl+	9.502e-10	7.351e-10	-9.022	-9.134	-0.111	(0)
	NiCl+	4.530e-10	3.504e-10	-9.344	-9.455	-0.111	(0)
	CoCl+	4.409e-10	3.411e-10	-9.356	-9.467	-0.111	(0)
	MnCl2	3.911e-10	3.911e-10	-9.408	-9.408	0.000	(0)
	CuCl	2.265e-10	2.265e-10	-9.645	-9.645	0.000	(0)
	CuCl2-	1.814e-10	1.486e-10	-9.741	-9.828	-0.087	(0)
	ZnCl2	7.593e-11	7.593e-11	-10.120	-10.120	0.000	(0)
	CdOHC1	4.338e-11	4.338e-11	-10.363	-10.363	0.000	(0)
	CuCl+	2.943e-11	2.411e-11	-10.531	-10.618	-0.087	(0)
	AgCl3-2	1.537e-11	5.507e-12	-10.813	-11.259	-0.446	(0)
	PbCl+	1.306e-11	1.010e-11	-10.884	-10.996	-0.111	(0)
	CdCl2	9.625e-12	9.625e-12	-11.017	-11.017	0.000	(0)
	HgClOH	4.143e-12	4.143e-12	-11.383	-11.383	0.000	(0)
	HgCl2	5.122e-13	5.122e-13	-12.291	-12.291	0.000	(0)
	MnCl3-	4.086e-13	3.383e-13	-12.389	-12.471	-0.082	(0)
	AgCl4-3	3.558e-13	3.531e-14	-12.449	-13.452	-1.003	(0)
	ZnCl3-	2.312e-13	1.894e-13	-12.636	-12.723	-0.087	(0)
	CuCl3-2	2.124e-13	9.979e-14	-12.673	-13.001	-0.328	(0)
	PbCl2	1.417e-13	1.417e-13	-12.849	-12.849	0.000	(0)
	CuCl2	2.626e-14	2.626e-14	-13.581	-13.581	0.000	(0)
	CdCl3-	2.465e-14	1.907e-14	-13.608	-13.720	-0.111	(0)
	HgCl3-	2.079e-14	1.609e-14	-13.682	-13.794	-0.111	(0)
	NiCl2	5.541e-15	5.541e-15	-14.256	-14.256	0.000	(0)
	ZnCl4-2	6.333e-16	2.975e-16	-15.198	-15.527	-0.328	(0)
	HgCl4-2	5.616e-16	2.011e-16	-15.251	-15.696	-0.446	(0)
	PbCl3-	2.291e-16	1.772e-16	-15.640	-15.751	-0.111	(0)
	UO2Cl+	1.231e-16	9.524e-17	-15.910	-16.021	-0.111	(0)
	HgCl+	4.206e-17	3.254e-17	-16.376	-16.488	-0.111	(0)
	CrCl+2	9.540e-19	3.417e-19	-18.020	-18.466	-0.446	(0)
	CuCl3-	9.395e-19	7.697e-19	-18.027	-18.114	-0.087	(0)
	PbCl4-2	7.103e-19	2.544e-19	-18.149	-18.594	-0.446	(0)
	CrOHC12	2.935e-20	2.935e-20	-19.532	-19.532	0.000	(0)
	CrCl2+	1.316e-22	1.018e-22	-21.881	-21.992	-0.111	(0)
	FeCl+2	1.075e-22	5.048e-23	-21.969	-22.297	-0.328	(0)
	CuCl4-2	2.579e-23	1.212e-23	-22.589	-22.917	-0.328	(0)
	VOCl+	3.769e-24	2.916e-24	-23.424	-23.535	-0.111	(0)
	FeCl2+	8.555e-25	7.082e-25	-24.068	-24.150	-0.082	(0)
	CrO3Cl-	4.779e-26	3.697e-26	-25.321	-25.432	-0.111	(0)
	FeCl3	2.224e-28	2.224e-28	-27.653	-27.653	0.000	(0)
	CoCl+2	9.236e-36	3.308e-36	-35.035	-35.480	-0.446	(0)
	UCl+3	0.000e+00	0.000e+00	-46.167	-47.170	-1.003	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
Co (2)		1.287e-07					
	Co+2	8.764e-08	3.139e-08	-7.057	-7.503	-0.446	(0)
	CoSO4	3.462e-08	3.462e-08	-7.461	-7.461	0.000	(0)
	CoCO3	2.444e-09	2.444e-09	-8.612	-8.612	0.000	(0)
	CoHCO3+	2.168e-09	1.678e-09	-8.664	-8.775	-0.111	(0)
	CoOH+	1.165e-09	9.011e-10	-8.934	-9.045	-0.111	(0)
	CoCl+	4.409e-10	3.411e-10	-9.356	-9.467	-0.111	(0)
	CoF+	1.456e-10	1.126e-10	-9.837	-9.948	-0.111	(0)
	Co (OH) 2	1.030e-10	1.030e-10	-9.987	-9.987	0.000	(0)
	CoNO2+	1.394e-12	1.078e-12	-11.856	-11.967	-0.111	(0)
	Co (NH3) +2	1.528e-14	5.472e-15	-13.816	-14.262	-0.446	(0)
	Co (OH) 3-	3.821e-15	2.956e-15	-14.418	-14.529	-0.111	(0)
	CoSeO4	2.559e-15	2.559e-15	-14.592	-14.592	0.000	(0)

CoOOH-	9.594e-16	7.422e-16	-15.018	-15.129	-0.111	(0)
CoNO3+	2.958e-16	2.288e-16	-15.529	-15.640	-0.111	(0)
Co2OH+3	1.428e-17	1.418e-18	-16.845	-17.848	-1.003	(0)
Co (OH) 4-2	1.882e-21	6.740e-22	-20.725	-21.171	-0.446	(0)
Co (NH3) 2+2	9.447e-22	3.384e-22	-21.025	-21.471	-0.446	(0)
Co (NO3) 2	2.142e-24	2.142e-24	-23.669	-23.669	0.000	(0)
Co4 (OH) 4+4	7.992e-27	1.315e-28	-26.097	-27.881	-1.784	(0)
Co (NH3) 3+2	1.724e-29	6.176e-30	-28.763	-29.209	-0.446	(0)
Co (NH3) 4+2	1.312e-37	4.699e-38	-36.882	-37.328	-0.446	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.501	-45.947	-0.446	(0)
Co (3)	1.057e-28					
CoOH+2	1.057e-28	3.784e-29	-27.976	-28.422	-0.446	(0)
Co+3	2.962e-35	5.176e-36	-34.528	-35.286	-0.758	(0)
CoCl+2	9.236e-36	3.308e-36	-35.035	-35.480	-0.446	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.968	-68.414	-0.446	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
Cr (2)	1.354e-27					
Cr+2	1.354e-27	4.848e-28	-26.868	-27.314	-0.446	(0)
Cr (3)	9.004e-10					
Cr (OH) 2+	5.987e-10	4.632e-10	-9.223	-9.334	-0.111	(0)
Cr (OH) 3	2.503e-10	2.503e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.199e-11	1.701e-11	-10.658	-10.769	-0.111	(0)
Cr (OH) 4-	1.853e-11	1.434e-11	-10.732	-10.844	-0.111	(0)
Cr (OH) +2	7.387e-12	2.646e-12	-11.132	-11.577	-0.446	(0)
CrOHSO4	3.471e-12	3.471e-12	-11.460	-11.460	0.000	(0)
CrF+2	4.221e-15	1.512e-15	-14.375	-14.820	-0.446	(0)
CrSO4+	1.403e-15	1.085e-15	-14.853	-14.964	-0.111	(0)
Cr+3	8.470e-16	8.407e-17	-15.072	-16.075	-1.003	(0)
CrCl+2	9.540e-19	3.417e-19	-18.020	-18.466	-0.446	(0)
CrOHC12	2.935e-20	2.935e-20	-19.532	-19.532	0.000	(0)
Cr2 (OH) 2SO4+2	2.318e-21	8.302e-22	-20.635	-21.081	-0.446	(0)
Cr2 (OH) 2 (SO4) 2	2.726e-22	2.726e-22	-21.564	-21.564	0.000	(0)
CrCl2+	1.316e-22	1.018e-22	-21.881	-21.992	-0.111	(0)
CrNO3+2	4.719e-26	1.690e-26	-25.326	-25.772	-0.446	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.293	-45.739	-0.446	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-55.104	-56.108	-1.003	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
Cr (6)	2.696e-14					
CrO4-2	2.566e-14	1.182e-14	-13.591	-13.928	-0.337	(0)
NaCrO4-	7.347e-16	5.684e-16	-15.134	-15.245	-0.111	(0)
HCrO4-	3.457e-16	2.674e-16	-15.461	-15.573	-0.111	(0)
KCrO4-	2.216e-16	1.714e-16	-15.655	-15.766	-0.111	(0)
CrO3SO4-2	8.799e-24	3.152e-24	-23.056	-23.501	-0.446	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	4.779e-26	3.697e-26	-25.321	-25.432	-0.111	(0)
Cr2O7-2	6.928e-30	2.482e-30	-29.159	-29.605	-0.446	(0)
Cu (1)	4.821e-10					
CuCl	2.265e-10	2.265e-10	-9.645	-9.645	0.000	(0)
CuCl2-	1.814e-10	1.486e-10	-9.741	-9.828	-0.087	(0)
Cu+	7.404e-11	5.728e-11	-10.131	-10.242	-0.111	(0)
CuCl3-2	2.124e-13	9.979e-14	-12.673	-13.001	-0.328	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.026	-148.404	-0.378	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.776	-149.134	-0.359	(0)
Cu (2)	1.862e-07					
CuCO3	1.314e-07	1.314e-07	-6.882	-6.882	0.000	(0)
CuOH+	2.690e-08	2.204e-08	-7.570	-7.657	-0.087	(0)
Cu+2	1.052e-08	4.844e-09	-7.978	-8.315	-0.337	(0)
Cu (OH) 2	6.326e-09	6.326e-09	-8.199	-8.199	0.000	(0)
CuSO4	6.134e-09	6.134e-09	-8.212	-8.212	0.000	(0)
Cu (CO3) 2-2	4.546e-09	1.628e-09	-8.342	-8.788	-0.446	(0)
CuHCO3+	2.714e-10	2.100e-10	-9.566	-9.678	-0.111	(0)
CuF+	4.483e-11	3.468e-11	-10.348	-10.460	-0.111	(0)
Cu2 (OH) 2+2	3.406e-11	1.220e-11	-10.468	-10.914	-0.446	(0)
CuCl+	2.943e-11	2.411e-11	-10.531	-10.618	-0.087	(0)
Cu (OH) 3-	2.413e-11	1.867e-11	-10.617	-10.729	-0.111	(0)
CuNO2+	3.197e-12	2.473e-12	-11.495	-11.607	-0.111	(0)

	CuNH3+2	2.006e-13	7.186e-14	-12.698	-13.143	-0.446	(0)
	CuCl2	2.626e-14	2.626e-14	-13.581	-13.581	0.000	(0)
	Cu (OH) 4-2	5.901e-16	2.114e-16	-15.229	-15.675	-0.446	(0)
	Cu (NO2) 2	1.234e-16	1.234e-16	-15.909	-15.909	0.000	(0)
	CuNO3+	9.107e-17	7.046e-17	-16.041	-16.152	-0.111	(0)
	CuCl3-	9.395e-19	7.697e-19	-18.027	-18.114	-0.087	(0)
	CuCl4-2	2.579e-23	1.212e-23	-22.589	-22.917	-0.328	(0)
	Cu (NO3) 2	4.080e-26	4.080e-26	-25.389	-25.389	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-219.099	-219.210	-0.111	(0)
F		1.736e-04					
	F-	1.377e-04	1.135e-04	-3.861	-3.945	-0.084	(0)
	MgF+	3.397e-05	2.798e-05	-4.469	-4.553	-0.084	(0)
	CaF+	1.076e-06	8.905e-07	-5.968	-6.050	-0.082	(0)
	NaF	6.930e-07	6.930e-07	-6.159	-6.159	0.000	(0)
	MnF+	1.217e-07	1.007e-07	-6.915	-6.997	-0.082	(0)
	ZnF+	5.659e-09	4.378e-09	-8.247	-8.359	-0.111	(0)
	BF (OH) 3-	2.054e-09	1.652e-09	-8.687	-8.782	-0.095	(0)
	HF	1.174e-09	1.174e-09	-8.930	-8.930	0.000	(0)
	NiF+	1.607e-10	1.243e-10	-9.794	-9.906	-0.111	(0)
	CoF+	1.456e-10	1.126e-10	-9.837	-9.948	-0.111	(0)
	CuF+	4.483e-11	3.468e-11	-10.348	-10.460	-0.111	(0)
	AlF3	1.624e-11	1.624e-11	-10.789	-10.789	0.000	(0)
	AlF2+	1.368e-11	1.137e-11	-10.864	-10.944	-0.080	(0)
	CdF+	5.697e-12	4.408e-12	-11.244	-11.356	-0.111	(0)
	AlF4-	1.122e-12	9.238e-13	-11.950	-12.034	-0.084	(0)
	PbF+	9.371e-13	7.249e-13	-12.028	-12.140	-0.111	(0)
	HF2-	6.217e-13	5.064e-13	-12.206	-12.296	-0.089	(0)
	AlF+2	5.275e-13	2.517e-13	-12.278	-12.599	-0.321	(0)
	UO2F+	3.786e-13	2.929e-13	-12.422	-12.533	-0.111	(0)
	AgF	3.197e-13	3.197e-13	-12.495	-12.495	0.000	(0)
	BF2 (OH) 2-	1.744e-13	1.403e-13	-12.758	-12.853	-0.095	(0)
	UO2F2	9.584e-14	9.584e-14	-13.018	-13.018	0.000	(0)
	CrF+2	4.221e-15	1.512e-15	-14.375	-14.820	-0.446	(0)
	UO2F3-	3.531e-15	2.732e-15	-14.452	-14.564	-0.111	(0)
	PbF2	1.619e-15	1.619e-15	-14.791	-14.791	0.000	(0)
	CdF2	9.979e-16	9.979e-16	-15.001	-15.001	0.000	(0)
	UO2F4-2	6.874e-18	2.462e-18	-17.163	-17.609	-0.446	(0)
	H2F2	3.692e-18	3.692e-18	-17.433	-17.433	0.000	(0)
	VO2F	6.967e-19	6.967e-19	-18.157	-18.157	0.000	(0)
	PbF3-	4.504e-19	3.484e-19	-18.346	-18.458	-0.111	(0)
	FeF2+	2.429e-19	2.011e-19	-18.615	-18.697	-0.082	(0)
	FeF+2	1.410e-19	6.622e-20	-18.851	-19.179	-0.328	(0)
	BF3OH-	5.389e-20	4.335e-20	-19.268	-19.363	-0.095	(0)
	VO2F2-	3.710e-20	2.870e-20	-19.431	-19.542	-0.111	(0)
	FeF3	3.219e-20	3.219e-20	-19.492	-19.492	0.000	(0)
	VOF+	2.911e-22	2.252e-22	-21.536	-21.647	-0.111	(0)
	VO2F3-2	1.134e-22	4.063e-23	-21.945	-22.391	-0.446	(0)
	PbF4-2	5.283e-23	1.892e-23	-22.277	-22.723	-0.446	(0)
	VOF2	9.583e-24	9.583e-24	-23.019	-23.019	0.000	(0)
	HgF+	2.823e-24	2.184e-24	-23.549	-23.661	-0.111	(0)
	BF4-	2.106e-25	1.694e-25	-24.677	-24.771	-0.095	(0)
	VOF3-	4.987e-26	3.858e-26	-25.302	-25.414	-0.111	(0)
	VO2F4-3	2.286e-26	2.268e-27	-25.641	-26.644	-1.003	(0)
	Sb (OH) 2F	1.759e-26	1.759e-26	-25.755	-25.755	0.000	(0)
	SbOF	1.731e-26	1.731e-26	-25.762	-25.762	0.000	(0)
	VOF4-2	4.933e-29	1.767e-29	-28.307	-28.753	-0.446	(0)
	UF3+	3.228e-37	2.498e-37	-36.491	-36.602	-0.111	(0)
	UF2+2	3.877e-38	1.389e-38	-37.411	-37.857	-0.446	(0)
	UF4	3.107e-39	3.107e-39	-38.508	-38.508	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.009	-41.012	-1.003	(0)
	UF5-	0.000e+00	0.000e+00	-40.743	-40.855	-0.111	(0)
	UF6-2	0.000e+00	0.000e+00	-41.874	-42.320	-0.446	(0)
Fe (2)		5.849e-13					
	Fe+2	3.862e-13	1.383e-13	-12.413	-12.859	-0.446	(0)
	FeSO4	1.877e-13	1.877e-13	-12.727	-12.727	0.000	(0)
	FeOH+	9.569e-15	7.922e-15	-14.019	-14.101	-0.082	(0)
	FeHCO3+	1.431e-15	1.196e-15	-14.844	-14.922	-0.078	(0)
	Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)

Fe (OH) 3-	4.975e-18	4.119e-18	-17.303	-17.385	-0.082	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.772	-161.772	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.555	-238.667	-0.111	(0)
Fe (3)	8.294e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	3.329e-10	2.767e-10	-9.478	-9.558	-0.080	(0)
Fe (OH) 4-	6.891e-11	5.727e-11	-10.162	-10.242	-0.080	(0)
FeOH+2	1.052e-15	4.944e-16	-14.978	-15.306	-0.328	(0)
FeF2+	2.429e-19	2.011e-19	-18.615	-18.697	-0.082	(0)
FeF+2	1.410e-19	6.622e-20	-18.851	-19.179	-0.328	(0)
FeSO4+	3.988e-20	3.301e-20	-19.399	-19.481	-0.082	(0)
FeF3	3.219e-20	3.219e-20	-19.492	-19.492	0.000	(0)
Fe (SO4) 2-	5.044e-21	3.902e-21	-20.297	-20.409	-0.111	(0)
Fe+3	3.045e-21	5.323e-22	-20.516	-21.274	-0.758	(0)
FeCl+2	1.075e-22	5.048e-23	-21.969	-22.297	-0.328	(0)
FeCl2+	8.555e-25	7.082e-25	-24.068	-24.150	-0.082	(0)
FeHSeO3+2	2.590e-25	9.275e-26	-24.587	-25.033	-0.446	(0)
Fe2 (OH) 2+4	4.917e-28	8.094e-30	-27.308	-29.092	-1.784	(0)
FeCl3	2.224e-28	2.224e-28	-27.653	-27.653	0.000	(0)
FeNO3+2	6.835e-29	2.448e-29	-28.165	-28.611	-0.446	(0)
Fe3 (OH) 4+5	1.982e-35	3.237e-38	-34.703	-37.490	-2.787	(0)
H (0)	3.992e-29					
H2	1.996e-29	2.018e-29	-28.700	-28.695	0.005	(0)
Hg (0)	2.793e-09					
Hg	2.793e-09	2.793e-09	-8.554	-8.554	0.000	(0)
Hg (1)	5.498e-21					
Hg2+2	2.749e-21	9.846e-22	-20.561	-21.007	-0.446	(0)
Hg (2)	1.139e-11					
Hg (OH) 2	6.707e-12	6.781e-12	-11.173	-11.169	0.005	(0)
HgClOH	4.143e-12	4.143e-12	-11.383	-11.383	0.000	(0)
HgCl2	5.122e-13	5.122e-13	-12.291	-12.291	0.000	(0)
HgCl3-	2.079e-14	1.609e-14	-13.682	-13.794	-0.111	(0)
HgCO3	2.862e-15	2.862e-15	-14.543	-14.543	0.000	(0)
HgCl4-2	5.616e-16	2.011e-16	-15.251	-15.696	-0.446	(0)
Hg (CO3) 2-2	1.163e-16	4.167e-17	-15.934	-16.380	-0.446	(0)
HgCl+	4.206e-17	3.254e-17	-16.376	-16.488	-0.111	(0)
HgOH+	3.844e-17	2.974e-17	-16.415	-16.527	-0.111	(0)
Hg (OH) 3-	1.588e-18	1.228e-18	-17.799	-17.911	-0.111	(0)
HgHCO3+	4.817e-19	3.727e-19	-18.317	-18.429	-0.111	(0)
Hg (NH3) 2+2	1.923e-21	6.886e-22	-20.716	-21.162	-0.446	(0)
Hg+2	1.450e-21	5.192e-22	-20.839	-21.285	-0.446	(0)
HgNH3+2	1.326e-21	4.750e-22	-20.877	-21.323	-0.446	(0)
HgSO4	7.515e-22	7.515e-22	-21.124	-21.124	0.000	(0)
HgF+	2.823e-24	2.184e-24	-23.549	-23.661	-0.111	(0)
Hg (NH3) 3+2	1.110e-29	3.975e-30	-28.955	-29.401	-0.446	(0)
HgNO3+	1.140e-30	8.818e-31	-29.943	-30.055	-0.111	(0)
Hg (NH3) 4+2	1.278e-37	4.577e-38	-36.894	-37.339	-0.446	(0)
Hg (NO3) 2	1.686e-39	1.686e-39	-38.773	-38.773	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.953	-139.064	-0.111	(0)
HgS2-2	0.000e+00	0.000e+00	-139.171	-139.617	-0.446	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.826	-140.826	0.000	(0)
K	4.923e-03					
K+	4.739e-03	3.904e-03	-2.324	-2.408	-0.084	(0)
KSO4-	1.838e-04	1.528e-04	-3.736	-3.816	-0.080	(0)
KCrO4-	2.216e-16	1.714e-16	-15.655	-15.766	-0.111	(0)
Mg	7.044e-03					
Mg+2	4.771e-03	2.197e-03	-2.321	-2.658	-0.337	(0)
MgSO4	2.210e-03	2.210e-03	-2.656	-2.656	0.000	(0)
MgF+	3.397e-05	2.798e-05	-4.469	-4.553	-0.084	(0)
MgHCO3+	1.886e-05	1.545e-05	-4.725	-4.811	-0.087	(0)
MgCO3	8.417e-06	8.417e-06	-5.075	-5.075	0.000	(0)
MgOH+	1.499e-06	1.259e-06	-5.824	-5.900	-0.076	(0)
MgH2BO3+	2.870e-07	2.309e-07	-6.542	-6.637	-0.095	(0)
Mn (2)	8.486e-05					
Mn+2	6.224e-05	2.230e-05	-4.206	-4.652	-0.446	(0)
MnSO4	2.192e-05	2.192e-05	-4.659	-4.659	0.000	(0)
MnHCO3+	3.691e-07	3.056e-07	-6.433	-6.515	-0.082	(0)
MnF+	1.217e-07	1.007e-07	-6.915	-6.997	-0.082	(0)

MnCl+	1.065e-07	8.815e-08	-6.973	-7.055	-0.082	(0)
MnOH+	9.732e-08	8.057e-08	-7.012	-7.094	-0.082	(0)
MnCl2	3.911e-10	3.911e-10	-9.408	-9.408	0.000	(0)
MnSeO4	9.759e-13	9.759e-13	-12.011	-12.011	0.000	(0)
MnCl3-	4.086e-13	3.383e-13	-12.389	-12.471	-0.082	(0)
MnNO3+	2.101e-13	1.625e-13	-12.678	-12.789	-0.111	(0)
Mn (OH) 3-	1.245e-15	1.031e-15	-14.905	-14.987	-0.082	(0)
Mn (OH) 4-2	1.019e-20	4.787e-21	-19.992	-20.320	-0.328	(0)
Mn (NO3) 2	1.878e-21	1.878e-21	-20.726	-20.726	0.000	(0)
MnSe	0.000e+00	0.000e+00	-40.836	-40.836	0.000	(0)
Mn (3)	2.360e-25					
Mn+3	2.360e-25	4.125e-26	-24.627	-25.385	-0.758	(0)
Mn (6)	9.209e-40					
MnO4-2	9.209e-40	4.326e-40	-39.036	-39.364	-0.328	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.027	-44.119	-0.092	(0)
Mo	2.743e-06					
MoO4-2	2.743e-06	1.263e-06	-5.562	-5.899	-0.337	(0)
HMoO4-	2.272e-10	1.758e-10	-9.644	-9.755	-0.111	(0)
H2MoO4	9.006e-15	9.006e-15	-14.045	-14.045	0.000	(0)
Ag2MoO4	6.014e-25	6.014e-25	-24.221	-24.221	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.980	-44.983	-1.003	(0)
Mo7O24-6	0.000e+00	0.000e+00	-49.528	-53.541	-4.013	(0)
HMo7O24-5	0.000e+00	0.000e+00	-52.522	-55.309	-2.787	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.899	-58.682	-1.784	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.588	-63.591	-1.003	(0)
N (-3)	2.483e-08					
NH4+	2.211e-08	1.778e-08	-7.655	-7.750	-0.095	(0)
NH3	1.450e-09	1.450e-09	-8.839	-8.839	0.000	(0)
NH4SO4-	1.272e-09	1.053e-09	-8.895	-8.977	-0.082	(0)
CaNH3+2	3.664e-12	1.312e-12	-11.436	-11.882	-0.446	(0)
CuNH3+2	2.006e-13	7.186e-14	-12.698	-13.143	-0.446	(0)
NiNH3+2	9.479e-14	3.395e-14	-13.023	-13.469	-0.446	(0)
Co (NH3) +2	1.528e-14	5.472e-15	-13.816	-14.262	-0.446	(0)
AgNH3+	4.291e-15	3.320e-15	-14.367	-14.479	-0.111	(0)
BaNH3+2	4.838e-17	1.733e-17	-16.315	-16.761	-0.446	(0)
Ag (NH3) 2+	5.057e-20	3.912e-20	-19.296	-19.408	-0.111	(0)
Ni (NH3) 2+2	1.986e-20	7.115e-21	-19.702	-20.148	-0.446	(0)
Ca (NH3) 2+2	2.115e-21	7.575e-22	-20.675	-21.121	-0.446	(0)
Hg (NH3) 2+2	1.923e-21	6.886e-22	-20.716	-21.162	-0.446	(0)
HgNH3+2	1.326e-21	4.750e-22	-20.877	-21.323	-0.446	(0)
Co (NH3) 2+2	9.447e-22	3.384e-22	-21.025	-21.471	-0.446	(0)
Co (NH3) 3+2	1.724e-29	6.176e-30	-28.763	-29.209	-0.446	(0)
Hg (NH3) 3+2	1.110e-29	3.975e-30	-28.955	-29.401	-0.446	(0)
Co (NH3) 4+2	1.312e-37	4.699e-38	-36.882	-37.328	-0.446	(0)
Hg (NH3) 4+2	1.278e-37	4.577e-38	-36.894	-37.339	-0.446	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.293	-45.739	-0.446	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.501	-45.947	-0.446	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-55.104	-56.108	-1.003	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.968	-68.414	-0.446	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
N (3)	6.022e-06					
NO2-	6.022e-06	4.875e-06	-5.220	-5.312	-0.092	(0)
CuNO2+	3.197e-12	2.473e-12	-11.495	-11.607	-0.111	(0)
CoNO2+	1.394e-12	1.078e-12	-11.856	-11.967	-0.111	(0)
AgNO2	1.142e-12	1.142e-12	-11.942	-11.942	0.000	(0)
Cu (NO2) 2	1.234e-16	1.234e-16	-15.909	-15.909	0.000	(0)
Ag (NO2) 2-	1.115e-17	8.626e-18	-16.953	-17.064	-0.111	(0)
N (5)	5.597e-09					
NO3-	5.583e-09	4.599e-09	-8.253	-8.337	-0.084	(0)
CaNO3+	1.352e-11	1.046e-11	-10.869	-10.981	-0.111	(0)
MnNO3+	2.101e-13	1.625e-13	-12.678	-12.789	-0.111	(0)
ZnNO3+	2.888e-14	2.234e-14	-13.539	-13.651	-0.111	(0)
NiNO3+	6.512e-16	5.038e-16	-15.186	-15.298	-0.111	(0)
BaNO3+	5.644e-16	4.367e-16	-15.248	-15.360	-0.111	(0)

	CoNO3+	2.958e-16	2.288e-16	-15.529	-15.640	-0.111	(0)
	CuNO3+	9.107e-17	7.046e-17	-16.041	-16.152	-0.111	(0)
	CdNO3+	4.608e-17	3.565e-17	-16.337	-16.448	-0.111	(0)
	PbNO3+	7.973e-18	6.168e-18	-17.098	-17.210	-0.111	(0)
	AgNO3	4.097e-18	4.097e-18	-17.387	-17.387	0.000	(0)
	Mn (NO3) 2	1.878e-21	1.878e-21	-20.726	-20.726	0.000	(0)
	UO2NO3+	2.218e-22	1.716e-22	-21.654	-21.766	-0.111	(0)
	Zn (NO3) 2	2.050e-23	2.050e-23	-22.688	-22.688	0.000	(0)
	Co (NO3) 2	2.142e-24	2.142e-24	-23.669	-23.669	0.000	(0)
	Cd (NO3) 2	8.217e-26	8.217e-26	-25.085	-25.085	0.000	(0)
	Pb (NO3) 2	4.818e-26	4.818e-26	-25.317	-25.317	0.000	(0)
	CrNO3+2	4.719e-26	1.690e-26	-25.326	-25.772	-0.446	(0)
	Cu (NO3) 2	4.080e-26	4.080e-26	-25.389	-25.389	0.000	(0)
	VO2NO3	8.145e-27	8.145e-27	-26.089	-26.089	0.000	(0)
	FeNO3+2	6.835e-29	2.448e-29	-28.165	-28.611	-0.446	(0)
	HgNO3+	1.140e-30	8.818e-31	-29.943	-30.055	-0.111	(0)
	Hg (NO3) 2	1.686e-39	1.686e-39	-38.773	-38.773	0.000	(0)
Na		1.210e-02					
	Na+	1.175e-02	9.680e-03	-1.930	-2.014	-0.084	(0)
	NaSO4-	3.458e-04	2.874e-04	-3.461	-3.542	-0.080	(0)
	NaHCO3	3.740e-06	3.740e-06	-5.427	-5.427	0.000	(0)
	NaCO3-	9.987e-07	8.301e-07	-6.001	-6.081	-0.080	(0)
	NaF	6.930e-07	6.930e-07	-6.159	-6.159	0.000	(0)
	NaH2BO3	4.649e-08	4.649e-08	-7.333	-7.333	0.000	(0)
	NaCrO4-	7.347e-16	5.684e-16	-15.134	-15.245	-0.111	(0)
Ni		1.568e-07					
	Ni+2	9.468e-08	4.361e-08	-7.024	-7.360	-0.337	(0)
	NiSO4	4.810e-08	4.810e-08	-7.318	-7.318	0.000	(0)
	NiCO3	7.492e-09	7.492e-09	-8.125	-8.125	0.000	(0)
	NiHCO3+	4.774e-09	3.693e-09	-8.321	-8.433	-0.111	(0)
	NiOH+	1.021e-09	7.898e-10	-8.991	-9.102	-0.111	(0)
	NiCl+	4.530e-10	3.504e-10	-9.344	-9.455	-0.111	(0)
	NiF+	1.607e-10	1.243e-10	-9.794	-9.906	-0.111	(0)
	Ni (OH) 2	9.026e-11	9.026e-11	-10.045	-10.045	0.000	(0)
	Ni (SO4) 2-2	2.458e-11	8.804e-12	-10.609	-11.055	-0.446	(0)
	Ni (OH) 3-	1.678e-13	1.298e-13	-12.775	-12.887	-0.111	(0)
	NiNH3+2	9.479e-14	3.395e-14	-13.023	-13.469	-0.446	(0)
	NiCl2	5.541e-15	5.541e-15	-14.256	-14.256	0.000	(0)
	NiSeO4	3.317e-15	3.317e-15	-14.479	-14.479	0.000	(0)
	NiNO3+	6.512e-16	5.038e-16	-15.186	-15.298	-0.111	(0)
	Ni (NH3) 2+2	1.986e-20	7.115e-21	-19.702	-20.148	-0.446	(0)
O (0)		2.458e-35					
	O2	1.229e-35	1.243e-35	-34.910	-34.906	0.005	(0)
Pb		2.279e-09					
	PbCO3	1.255e-09	1.255e-09	-8.901	-8.901	0.000	(0)
	PbOH+	4.235e-10	3.276e-10	-9.373	-9.485	-0.111	(0)
	PbSO4	2.455e-10	2.455e-10	-9.610	-9.610	0.000	(0)
	Pb+2	1.968e-10	9.066e-11	-9.706	-10.043	-0.337	(0)
	PbHCO3+	5.982e-11	4.628e-11	-10.223	-10.335	-0.111	(0)
	Pb (CO3) 2-2	4.654e-11	1.667e-11	-10.332	-10.778	-0.446	(0)
	Pb (SO4) 2-2	2.283e-11	8.176e-12	-10.642	-11.087	-0.446	(0)
	Pb (OH) 2	1.491e-11	1.491e-11	-10.827	-10.827	0.000	(0)
	PbCl+	1.306e-11	1.010e-11	-10.884	-10.996	-0.111	(0)
	PbF+	9.371e-13	7.249e-13	-12.028	-12.140	-0.111	(0)
	PbCl2	1.417e-13	1.417e-13	-12.849	-12.849	0.000	(0)
	Pb (OH) 3-	2.772e-14	2.144e-14	-13.557	-13.669	-0.111	(0)
	PbF2	1.619e-15	1.619e-15	-14.791	-14.791	0.000	(0)
	PbCl3-	2.291e-16	1.772e-16	-15.640	-15.751	-0.111	(0)
	Pb (OH) 4-2	2.109e-17	7.555e-18	-16.676	-17.122	-0.446	(0)
	PbNO3+	7.973e-18	6.168e-18	-17.098	-17.210	-0.111	(0)
	Pb2OH+3	4.743e-18	4.708e-19	-17.324	-18.327	-1.003	(0)
	PbCl4-2	7.103e-19	2.544e-19	-18.149	-18.594	-0.446	(0)
	PbF3-	4.504e-19	3.484e-19	-18.346	-18.458	-0.111	(0)
	Pb3 (OH) 4+2	1.122e-21	4.019e-22	-20.950	-21.396	-0.446	(0)
	PbF4-2	5.283e-23	1.892e-23	-22.277	-22.723	-0.446	(0)
	Pb (NO3) 2	4.818e-26	4.818e-26	-25.317	-25.317	0.000	(0)
	Pb4 (OH) 4+4	1.758e-26	2.894e-28	-25.755	-27.538	-1.784	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-152.636	-152.636	0.000	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-230.156	-230.267	-0.111	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.067	-74.067	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.820	-78.932	-0.111	(0)
CdHS+	0.000e+00	0.000e+00	-79.423	-79.534	-0.111	(0)
S5-2	0.000e+00	0.000e+00	-79.695	-80.141	-0.446	(0)
H2S	0.000e+00	0.000e+00	-80.067	-80.067	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.211	-80.657	-0.446	(0)
S4-2	0.000e+00	0.000e+00	-80.291	-80.737	-0.446	(0)
S3-2	0.000e+00	0.000e+00	-81.097	-81.543	-0.446	(0)
S2-2	0.000e+00	0.000e+00	-82.113	-82.559	-0.446	(0)
S-2	0.000e+00	0.000e+00	-87.748	-88.076	-0.328	(0)
HgHS2-	0.000e+00	0.000e+00	-138.953	-139.064	-0.111	(0)
HgS2-2	0.000e+00	0.000e+00	-139.171	-139.617	-0.446	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.826	-140.826	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.227	-0.215	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.026	-148.404	-0.378	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.500	-148.611	-0.111	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.776	-149.134	-0.359	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.787	-148.899	-0.111	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.123	-149.512	-0.389	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.454	-149.823	-0.368	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.757	-150.757	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.262	-151.262	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.636	-152.636	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.772	-161.772	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.099	-219.210	-0.111	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.297	-226.408	-0.111	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.787	-228.233	-0.446	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.182	-228.293	-0.111	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.156	-230.267	-0.111	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.555	-238.667	-0.111	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.583	-305.029	-0.446	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.354	-306.800	-0.446	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.897	-322.343	-0.446	(0)
S (6)	1.568e-02					
SO4-2	1.200e-02	5.528e-03	-1.921	-2.257	-0.337	(0)
MgSO4	2.210e-03	2.210e-03	-2.656	-2.656	0.000	(0)
CaSO4	9.106e-04	9.106e-04	-3.041	-3.041	0.000	(0)
NaSO4-	3.458e-04	2.874e-04	-3.461	-3.542	-0.080	(0)
KSO4-	1.838e-04	1.528e-04	-3.736	-3.816	-0.080	(0)
MnSO4	2.192e-05	2.192e-05	-4.659	-4.659	0.000	(0)
ZnSO4	2.339e-06	2.339e-06	-5.631	-5.631	0.000	(0)
Zn (SO4) 2-2	3.143e-07	1.126e-07	-6.503	-6.948	-0.446	(0)
NiSO4	4.810e-08	4.810e-08	-7.318	-7.318	0.000	(0)
CoSO4	3.462e-08	3.462e-08	-7.461	-7.461	0.000	(0)
CuSO4	6.134e-09	6.134e-09	-8.212	-8.212	0.000	(0)
HSO4-	4.587e-09	3.778e-09	-8.338	-8.423	-0.084	(0)
CdSO4	3.176e-09	3.176e-09	-8.498	-8.498	0.000	(0)
NH4SO4-	1.272e-09	1.053e-09	-8.895	-8.977	-0.082	(0)
Cd (SO4) 2-2	6.612e-10	2.368e-10	-9.180	-9.626	-0.446	(0)
PbSO4	2.455e-10	2.455e-10	-9.610	-9.610	0.000	(0)
AgSO4-	1.599e-10	1.237e-10	-9.796	-9.908	-0.111	(0)
Ni (SO4) 2-2	2.458e-11	8.804e-12	-10.609	-11.055	-0.446	(0)
Pb (SO4) 2-2	2.283e-11	8.176e-12	-10.642	-11.087	-0.446	(0)
CrOHSO4	3.471e-12	3.471e-12	-11.460	-11.460	0.000	(0)
FeSO4	1.877e-13	1.877e-13	-12.727	-12.727	0.000	(0)
UO2SO4	1.564e-13	1.564e-13	-12.806	-12.806	0.000	(0)
UO2 (SO4) 2-2	3.183e-14	1.140e-14	-13.497	-13.943	-0.446	(0)
AlSO4+	1.156e-14	9.519e-15	-13.937	-14.021	-0.084	(0)
CrSO4+	1.403e-15	1.085e-15	-14.853	-14.964	-0.111	(0)
Al (SO4) 2-	6.846e-16	5.639e-16	-15.165	-15.249	-0.084	(0)
VO2SO4-	5.973e-19	4.621e-19	-18.224	-18.335	-0.111	(0)
FeSO4+	3.988e-20	3.301e-20	-19.399	-19.481	-0.082	(0)
Fe (SO4) 2-	5.044e-21	3.902e-21	-20.297	-20.409	-0.111	(0)
Cr2 (OH) 2SO4+2	2.318e-21	8.302e-22	-20.635	-21.081	-0.446	(0)
HgSO4	7.515e-22	7.515e-22	-21.124	-21.124	0.000	(0)
VO4SO4	5.038e-22	5.038e-22	-21.298	-21.298	0.000	(0)

Cr2(OH)2(SO4)2	2.726e-22	2.726e-22	-21.564	-21.564	0.000	(0)
CrO3SO4-2	8.799e-24	3.152e-24	-23.056	-23.501	-0.446	(0)
VSO4+	6.551e-37	5.068e-37	-36.184	-36.295	-0.111	(0)
U(SO4)2	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.579	-42.025	-0.446	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Sb(3)	2.803e-20					
Sb(OH)3	1.418e-20	1.418e-20	-19.848	-19.848	0.000	(0)
HSbO2	1.385e-20	1.385e-20	-19.859	-19.859	0.000	(0)
SbO2-	4.145e-24	3.207e-24	-23.382	-23.494	-0.111	(0)
Sb(OH)4-	2.372e-24	1.835e-24	-23.625	-23.736	-0.111	(0)
Sb(OH)2F	1.759e-26	1.759e-26	-25.755	-25.755	0.000	(0)
SbOF	1.731e-26	1.731e-26	-25.762	-25.762	0.000	(0)
Sb(OH)2+	3.115e-27	2.409e-27	-26.507	-26.618	-0.111	(0)
SbO+	1.075e-27	8.313e-28	-26.969	-27.080	-0.111	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.897	-322.343	-0.446	(0)
Sb(5)	3.852e-08					
SbO3-	3.848e-08	2.977e-08	-7.415	-7.526	-0.111	(0)
Sb(OH)6-	4.218e-11	3.475e-11	-10.375	-10.459	-0.084	(0)
SbO2+	5.403e-25	4.180e-25	-24.267	-24.379	-0.111	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.434e-39	1.109e-39	-38.843	-38.955	-0.111	(0)
MnSe	0.000e+00	0.000e+00	-40.836	-40.836	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.220	-43.220	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.354	-45.800	-0.446	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-81.120	-82.903	-1.784	(0)
Se(4)	1.901e-07					
SeO3-2	1.048e-07	3.754e-08	-6.980	-7.426	-0.446	(0)
HSeO3-	8.525e-08	6.595e-08	-7.069	-7.181	-0.111	(0)
H2SeO3	1.968e-13	1.968e-13	-12.706	-12.706	0.000	(0)
AgSeO3-	3.498e-14	2.706e-14	-13.456	-13.568	-0.111	(0)
Cd(SeO3)2-2	7.947e-18	2.846e-18	-17.100	-17.546	-0.446	(0)
Ag(SeO3)2-3	9.163e-20	9.095e-21	-19.038	-20.041	-1.003	(0)
FeHSeO3+2	2.590e-25	9.275e-26	-24.587	-25.033	-0.446	(0)
Se(6)	3.541e-10					
SeO4-2	3.531e-10	1.626e-10	-9.452	-9.789	-0.337	(0)
MnSeO4	9.759e-13	9.759e-13	-12.011	-12.011	0.000	(0)
ZnSeO4	4.870e-14	4.870e-14	-13.312	-13.312	0.000	(0)
NiSeO4	3.317e-15	3.317e-15	-14.479	-14.479	0.000	(0)
CoSeO4	2.559e-15	2.559e-15	-14.592	-14.592	0.000	(0)
CdSeO4	7.422e-17	7.422e-17	-16.129	-16.129	0.000	(0)
HSeO4-	7.369e-17	5.700e-17	-16.133	-16.244	-0.111	(0)
Zn(SeO4)2-2	2.242e-23	8.031e-24	-22.649	-23.095	-0.446	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.777	-59.780	-1.003	(0)
U(4)	2.507e-19					
U(OH)5-	2.507e-19	1.939e-19	-18.601	-18.712	-0.111	(0)
U(OH)4	5.684e-23	5.684e-23	-22.245	-22.245	0.000	(0)
U(OH)3+	1.880e-27	1.455e-27	-26.726	-26.837	-0.111	(0)
U(OH)2+2	1.314e-32	4.707e-33	-31.881	-32.327	-0.446	(0)
UF3+	3.228e-37	2.498e-37	-36.491	-36.602	-0.111	(0)
UF2+2	3.877e-38	1.389e-38	-37.411	-37.857	-0.446	(0)
UOH+3	1.563e-38	1.552e-39	-37.806	-38.809	-1.003	(0)
UF4	3.107e-39	3.107e-39	-38.508	-38.508	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.009	-41.012	-1.003	(0)
U(SO4)2	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.743	-40.855	-0.111	(0)
USO4+2	0.000e+00	0.000e+00	-41.579	-42.025	-0.446	(0)
UF6-2	0.000e+00	0.000e+00	-41.874	-42.320	-0.446	(0)
U+4	0.000e+00	0.000e+00	-44.584	-46.367	-1.784	(0)
UCl+3	0.000e+00	0.000e+00	-46.167	-47.170	-1.003	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-164.004	-173.034	-9.029	(0)
U(5)	3.557e-16					
UO2+	3.557e-16	2.751e-16	-15.449	-15.560	-0.111	(0)
U(6)	5.299e-07					
UO2(CO3)3-4	4.417e-07	7.270e-09	-6.355	-8.138	-1.784	(0)
UO2(CO3)2-2	8.794e-08	3.150e-08	-7.056	-7.502	-0.446	(0)

UO2CO3	3.428e-10	3.428e-10	-9.465	-9.465	0.000	(0)
UO2OH+	4.377e-12	3.386e-12	-11.359	-11.470	-0.111	(0)
UO2F+	3.786e-13	2.929e-13	-12.422	-12.533	-0.111	(0)
UO2SO4	1.564e-13	1.564e-13	-12.806	-12.806	0.000	(0)
UO2F2	9.584e-14	9.584e-14	-13.018	-13.018	0.000	(0)
UO2+2	4.059e-14	1.870e-14	-13.392	-13.728	-0.337	(0)
UO2 (SO4) 2-2	3.183e-14	1.140e-14	-13.497	-13.943	-0.446	(0)
UO2F3-	3.531e-15	2.732e-15	-14.452	-14.564	-0.111	(0)
(UO2) 3 (OH) 5+	1.308e-16	1.012e-16	-15.883	-15.995	-0.111	(0)
UO2Cl+	1.231e-16	9.524e-17	-15.910	-16.021	-0.111	(0)
(UO2) 2 (OH) 2+2	5.314e-17	1.903e-17	-16.275	-16.721	-0.446	(0)
UO2F4-2	6.874e-18	2.462e-18	-17.163	-17.609	-0.446	(0)
UO2NO3+	2.218e-22	1.716e-22	-21.654	-21.766	-0.111	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.860	-43.971	-0.111	(0)
V+2	0.000e+00	0.000e+00	-45.193	-45.639	-0.446	(0)
V (3)	4.665e-16					
V (OH) 3	4.665e-16	4.665e-16	-15.331	-15.331	0.000	(0)
V (OH) 2+	2.727e-27	2.109e-27	-26.564	-26.676	-0.111	(0)
VOH+2	3.909e-31	1.400e-31	-30.408	-30.854	-0.446	(0)
V+3	1.957e-36	1.942e-37	-35.709	-36.712	-1.003	(0)
VSO4+	6.551e-37	5.068e-37	-36.184	-36.295	-0.111	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-58.074	-59.078	-1.003	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-59.124	-60.908	-1.784	(0)
V (4)	1.244e-19					
V (OH) 3+	1.227e-19	9.492e-20	-18.911	-19.023	-0.111	(0)
VO+2	9.238e-22	3.309e-22	-21.034	-21.480	-0.446	(0)
VOSO4	5.038e-22	5.038e-22	-21.298	-21.298	0.000	(0)
VOF+	2.911e-22	2.252e-22	-21.536	-21.647	-0.111	(0)
VOF2	9.583e-24	9.583e-24	-23.019	-23.019	0.000	(0)
VOCl+	3.769e-24	2.916e-24	-23.424	-23.535	-0.111	(0)
VOF3-	4.987e-26	3.858e-26	-25.302	-25.414	-0.111	(0)
VOF4-2	4.933e-29	1.767e-29	-28.307	-28.753	-0.446	(0)
H2V2O4+2	1.262e-33	4.522e-34	-32.899	-33.345	-0.446	(0)
V (5)	8.222e-09					
H2VO4-	4.630e-09	3.582e-09	-8.334	-8.446	-0.111	(0)
HVO4-2	3.591e-09	1.286e-09	-8.445	-8.891	-0.446	(0)
H3VO4	2.505e-13	2.505e-13	-12.601	-12.601	0.000	(0)
HV2O7-3	1.574e-14	1.562e-15	-13.803	-14.806	-1.003	(0)
VO4-3	9.288e-15	9.219e-16	-14.032	-15.035	-1.003	(0)
H3V2O7-	7.494e-15	5.797e-15	-14.125	-14.237	-0.111	(0)
V2O7-4	3.653e-16	6.013e-18	-15.437	-17.221	-1.784	(0)
VO2+	4.250e-18	3.501e-18	-17.372	-17.456	-0.084	(0)
VO2F	6.967e-19	6.967e-19	-18.157	-18.157	0.000	(0)
VO2SO4-	5.973e-19	4.621e-19	-18.224	-18.335	-0.111	(0)
V3O9-3	4.859e-19	4.822e-20	-18.313	-19.317	-1.003	(0)
VO2F2-	3.710e-20	2.870e-20	-19.431	-19.542	-0.111	(0)
VO2F3-2	1.134e-22	4.063e-23	-21.945	-22.391	-0.446	(0)
V4O12-4	4.378e-24	7.206e-26	-23.359	-25.142	-1.784	(0)
VO2F4-3	2.286e-26	2.268e-27	-25.641	-26.644	-1.003	(0)
VO2NO3	8.145e-27	8.145e-27	-26.089	-26.089	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.158	-68.171	-4.013	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.352	-68.139	-2.787	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.303	-71.087	-1.784	(0)
Zn	7.894e-06					
Zn+2	4.198e-06	1.934e-06	-5.377	-5.714	-0.337	(0)
ZnSO4	2.339e-06	2.339e-06	-5.631	-5.631	0.000	(0)
ZnCO3	5.124e-07	5.124e-07	-6.290	-6.290	0.000	(0)
ZnOH+	3.596e-07	2.782e-07	-6.444	-6.556	-0.111	(0)
Zn (SO4) 2-2	3.143e-07	1.126e-07	-6.503	-6.948	-0.446	(0)
Zn (OH) 2	6.343e-08	6.343e-08	-7.198	-7.198	0.000	(0)
ZnHCO3+	5.430e-08	4.201e-08	-7.265	-7.377	-0.111	(0)
ZnOHC1	2.873e-08	2.873e-08	-7.542	-7.542	0.000	(0)
ZnCl+	1.862e-08	1.525e-08	-7.730	-7.817	-0.087	(0)
ZnF+	5.659e-09	4.378e-09	-8.247	-8.359	-0.111	(0)
Zn (OH) 3-	5.912e-10	4.573e-10	-9.228	-9.340	-0.111	(0)
ZnCl2	7.593e-11	7.593e-11	-10.120	-10.120	0.000	(0)
ZnCl3-	2.312e-13	1.894e-13	-12.636	-12.723	-0.087	(0)

Zn(OH) 4-2	7.313e-14	2.619e-14	-13.136	-13.582	-0.446	(0)
ZnSeO4	4.870e-14	4.870e-14	-13.312	-13.312	0.000	(0)
ZnNO3+	2.888e-14	2.234e-14	-13.539	-13.651	-0.111	(0)
ZnCl4-2	6.333e-16	2.975e-16	-15.198	-15.527	-0.328	(0)
Zn(SeO4) 2-2	2.242e-23	8.031e-24	-22.649	-23.095	-0.446	(0)
Zn(NO3) 2	2.050e-23	2.050e-23	-22.688	-22.688	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.500	-148.611	-0.111	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.757	-150.757	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.297	-226.408	-0.111	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.787	-228.233	-0.446	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.354	-306.800	-0.446	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-58.73	-52.44	6.29	(Co(NH3) 5Cl) (NO3) 2	
(Co(NH3) 5Cl) Cl2	-45.28	-40.77	4.51	(Co(NH3) 5Cl) Cl2	
(Co(NH3) 5OH2) Cl3	-52.50	-40.77	11.74	(Co(NH3) 5OH2) Cl3	
(Co(NH3) 6) (NO3) 3	-75.80	-57.87	17.93	(Co(NH3) 6) (NO3) 3	
(Co(NH3) 6) Cl3	-60.39	-40.36	20.03	(Co(NH3) 6) Cl3	
(NH4) 2CrO4	-29.83	-29.43	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-25.74	-25.29	0.45	(NH4) 2SeO4	
Acanthite	-52.46	-88.68	-36.22	Ag2S	
Ag2CO3	-12.15	-23.24	-11.09	Ag2CO3	
Ag2CrO4	-20.24	-31.83	-11.59	Ag2CrO4	
Ag2HVO4	-12.37	-10.89	1.48	Ag2HVO4	
Ag2MoO4	-12.25	-23.80	-11.55	Ag2MoO4	
Ag2O	-14.16	-1.59	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-15.34	-20.16	-4.82	Ag2SO4	
Ag3AsO3	-28.53	-26.37	2.16	Ag3AsO3	
Ag3AsO4	-16.94	-19.72	-2.79	Ag3AsO4	
Ag3H2VO5	-16.87	-11.69	5.18	Ag3H2VO5	
AgF:4H2O	-13.95	-12.90	1.05	AgF:4H2O	
Agmetal	-0.06	-13.57	-13.51	Ag	
AgVO3	-10.87	-10.10	0.77	AgVO3	
Al(OH) 3 (am)	-1.99	8.81	10.80	Al(OH) 3	
Al2(MoO4) 3	-51.37	-49.00	2.37	Al2(MoO4) 3	
Al2O3	-2.03	17.62	19.65	Al2O3	
Al4(OH) 10SO4	-6.02	16.68	22.70	Al4(OH) 10SO4	
AlAsO4:2H2O	-13.33	-8.53	4.80	AlAsO4:2H2O	
AlOHSO4	-6.53	-9.76	-3.23	AlOHSO4	
AlSb	-153.29	-87.67	65.62	AlSb	
Alunite	-3.56	-4.96	-1.40	KA13(SO4) 2 (OH) 6	
Anglesite	-4.51	-12.30	-7.79	PbSO4	
Anhydrite	-1.04	-5.40	-4.36	CaSO4	
Anilite	-56.34	-88.22	-31.88	Cu0.25Cu1.5S	
Antlerite	-3.37	5.42	8.79	Cu3(OH) 4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-93.17	-95.93	-2.76	As4O6	
Artinite	-3.94	5.66	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5	-41.38	-34.67	6.71	As2O5	
Atacamite	-2.06	5.33	7.39	Cu2(OH) 3Cl	
Azurite	-2.40	-19.31	-16.91	Cu3(OH) 2 (CO3) 2	
Ba(OH) 2:8H2O	-15.81	8.58	24.39	Ba(OH) 2:8H2O	
Ba2V2O7:2H2O	-17.30	-1.43	15.87	Ba2V2O7:2H2O	
Ba3(AsO4) 2	0.00	-8.91	-8.91	Ba3(AsO4) 2	
Ba3(VO4) 2:4H2O	-25.78	7.16	32.94	Ba3(VO4) 2:4H2O	
BaCrO4	-11.98	-21.65	-9.67	BaCrO4	
BaF2	-9.79	-15.61	-5.82	BaF2	
BaMoO4	-6.66	-13.62	-6.96	BaMoO4	
Barite	0.00	-9.98	-9.98	BaSO4	
BaS	-94.68	-78.50	16.18	BaS	
BaSeO3	-8.58	-6.75	1.83	BaSeO3	
BaSeO4	-10.05	-17.51	-7.46	BaSeO4	

Bianchite	-6.21	-7.97	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-6.24	11.85	18.09	MnO ₂
Bixbyite	-1.19	-1.84	-0.64	Mn ₂ O ₃
BlaubleiI	-56.15	-80.31	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-56.68	-83.96	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.23	8.81	8.58	AlOOH
Breithauptite	-56.24	-74.76	-18.52	NiSb
Brochantite	-1.81	13.41	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-3.19	13.65	16.84	Mg(OH) 2
Bunsenite	-3.50	8.95	12.45	NiO
Ca(VO ₃) 2	-11.09	-5.43	5.66	Ca(VO ₃) 2
Ca ₂ V ₂ O ₇	-9.77	7.73	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-13.82	7.73	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-17.47	4.83	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-18.06	20.90	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-18.96	20.90	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-296.44	-153.46	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-8.10	-26.01	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.09	-9.04	-7.95	CaMoO ₄
Carnotite	-1.20	-0.97	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.98	-2.17	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.91	-12.93	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) 2	-11.01	-1.17	9.84	Cd(BO ₂) 2
Cd(OH) 2	-5.94	7.70	13.64	Cd(OH) 2
Cd(OH) 2 (am)	-6.03	7.70	13.73	Cd(OH) 2
Cd ₃ (OH) 2 (SO ₄) 2	-20.75	-14.04	6.71	Cd ₃ (OH) 2 (SO ₄) 2
Cd ₃ (OH) 4SO ₄	-18.03	4.53	22.56	Cd ₃ (OH) 4SO ₄
Cd ₄ (OH) 6SO ₄	-16.17	12.23	28.40	Cd ₄ (OH) 6SO ₄
CdCl ₂	-12.96	-13.62	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-11.92	-13.62	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.70	-13.62	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.29	-16.50	-1.21	CdF ₂
Cdmetal (alpha)	-31.36	-17.85	13.51	Cd
Cdmetal (gamma)	-31.46	-17.85	13.62	Cd
CdMoO ₄	-0.36	-14.51	-14.15	CdMoO ₄
CdOHC1	-6.50	-2.96	3.54	CdOHC1
CdSb	-75.66	-76.01	-0.35	CdSb
CdSe	-19.21	-39.41	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.55	-18.40	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.70	-10.87	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.14	-10.87	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.00	-10.87	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.70	-11.45	-9.75	AgCl
Cerrusite	-2.25	-15.38	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-7.93	-10.57	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-56.34	-91.26	-34.92	Cu ₂ S
Chalcopyrite	-127.46	-162.73	-35.27	CuFeS ₂
Cinnabar	-52.56	-98.25	-45.69	HgS
Claudetite	-92.87	-95.93	-3.06	As ₄ O ₆
Clausthalite	-13.74	-40.84	-27.10	PbSe
Co(BO ₂) 2	-27.14	-0.07	27.07	Co(BO ₂) 2
Co(OH) 2	-4.29	8.81	13.09	Co(OH) 2
Co(OH) 3	-8.51	-10.82	-2.31	Co(OH) 3
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) 2	-21.29	-8.25	13.03	Co ₃ (AsO ₄) 2
Co ₃ O ₄	-2.34	-12.83	-10.50	Co ₃ O ₄
CoCl ₂	-20.78	-12.51	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.05	-12.51	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.86	-12.84	-9.98	CoCO ₃
CoF ₂	-13.80	-15.39	-1.60	CoF ₂
CoF ₃	-45.66	-47.12	-1.46	CoF ₃
CoFe ₂ O ₄	18.72	15.19	-3.53	CoFe ₂ O ₄
CoMoO ₄	-5.64	-13.40	-7.76	CoMoO ₄
CoO	-4.78	8.81	13.59	CoO
CoS (alpha)	-70.84	-78.28	-7.44	CoS

CoS (beta)	-67.21	-78.28	-11.07	CoS
CoSe	-22.10	-38.30	-16.20	CoSe
CoSeO3	-7.85	-6.53	1.32	CoSeO3
CoSeO4:6H2O	-15.76	-17.29	-1.53	CoSeO4:6H2O
CoSO4	-12.56	-9.76	2.80	CoSO4
CoSO4:6H2O	-7.29	-9.76	-2.47	CoSO4:6H2O
Cotunnite	-10.27	-15.05	-4.78	PbCl2
Covellite	-56.79	-79.09	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.41	-32.32	14.09	CrCl2
CrCl3	-48.27	-33.15	15.11	CrCl3
CrF3	-26.14	-37.48	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.53	-45.37	-33.84	Na3AlF6
Cu (OH) 2	-0.68	8.00	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.82	19.39	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.75	-0.50	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.69	-90.57	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.48	-51.28	-45.80	Cu2Se
Cu2SO4	-20.79	-22.74	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-16.79	-10.69	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.15	-102.74	-42.59	Cu3Sb
Cu3Se2	-26.91	-90.40	-63.49	Cu3Se2
CuCO3	-2.15	-13.65	-11.50	CuCO3
CuCrO4	-16.80	-22.24	-5.44	CuCrO4
CuF	-9.28	-14.19	-4.91	CuF
CuF2	-17.32	-16.21	1.12	CuF2
CuF2:2H2O	-11.66	-16.21	-4.55	CuF2:2H2O
Cumetal	-6.10	-14.86	-8.76	Cu
CuMoO4	-1.14	-14.21	-13.08	CuMoO4
CuOCuSO4	-12.88	-2.58	10.30	CuOCuSO4
Cupricferrite	8.39	14.38	5.99	CuFe2O4
Cuprite	-2.77	-4.17	-1.41	Cu2O
Cuprousferrite	10.02	1.10	-8.92	CuFeO2
CuSe	-6.01	-39.11	-33.10	CuSe
CuSe2	-27.31	-60.68	-33.37	CuSe2
CuSeO3:2H2O	-7.85	-7.34	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.67	-18.11	-2.44	CuSeO4:5H2O
CuSO4	-13.51	-10.57	2.94	CuSO4
Diaspore	1.94	8.81	6.87	AlOOH
Djurleite	-56.54	-90.46	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.07	-16.47	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.62	-16.47	-17.09	CaMg (CO3) 2
Epsomite	-2.79	-4.92	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.03	-0.01	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-11.43	-15.15	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.51	-8.95	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.00	-39.62	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.59	-49.32	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-14.55	-14.15	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.67	-18.76	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.63	-65.22	-18.60	FeSe2
FeS (ppt)	-80.69	-83.64	-2.95	FeS
FeSe	-32.66	-43.66	-11.00	FeSe
Fix_pe	-4.62	-4.62	0.00	e-
Fluorite	-0.53	-11.03	-10.50	CaF2
Galena	-66.85	-80.82	-13.97	PbS
Gibbsite	0.52	8.81	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O

Greenockite	-65.03	-79.39	-14.36	CdS
Greigite	-293.48	-338.51	-45.03	Fe ₃ S ₄
Gummite	-5.09	2.58	7.67	UO ₃
Gypsum	-0.79	-5.40	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-15.46	-27.56	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-9.33	-22.21	-12.88	H ₂ MoO ₄
H ₂ S (g)	-79.08	-87.09	-8.01	H ₂ S
H ₂ Se (g)	-42.15	-47.11	-4.96	H ₂ Se
Halite	-6.12	-4.52	1.60	NaCl
Hausmannite	-0.51	60.52	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-1.82	21.07	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-185.11	-258.82	-73.71	Hg (CH ₃) ₂
Hg (g)	-7.25	-15.12	-7.87	Hg
Hg (OH) ₂	-7.67	-11.17	-3.50	Hg (OH) ₂
Hg ₂ (g)	-15.29	-30.24	-14.96	Hg ₂
Hg ₂ (OH) ₂	-9.96	-4.70	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-10.29	-26.34	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-26.23	-34.93	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-18.53	-28.90	-10.36	Hg ₂ F ₂
Hg ₂ S	-80.11	-91.78	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-15.38	-20.03	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-17.13	-23.26	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-25.47	-55.15	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-32.50	-13.01	19.50	HgCl
HgCl ₂	-11.22	-32.48	-21.26	HgCl ₂
HgF (g)	-47.12	-14.45	32.68	HgF
HgF ₂ (g)	-47.93	-35.37	12.57	HgF ₂
Hgmetal (l)	-1.67	-15.12	-13.45	Hg
HgSe	-2.58	-58.28	-55.69	HgSe
HgSeO ₃	-14.07	-26.50	-12.43	HgSeO ₃
HgSO ₄	-20.32	-29.74	-9.42	HgSO ₄
Huntite	-2.50	-32.46	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-5.72	-24.49	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-9.56	-18.33	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ :4H ₂ O
K-Alum	-17.41	-22.58	-5.17	KAl(SO ₄) ₂ :12H ₂ O
K-Jarosite	-7.02	-21.82	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-31.74	-48.98	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-18.23	-18.74	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-13.98	-10.72	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-13.88	-14.61	-0.73	K ₂ SeO ₄
Langite	-4.08	13.41	17.49	Cu ₄ (OH) ₆ SO ₄ :H ₂ O
Larnakite	-5.60	-6.03	-0.43	PbO:PbSO ₄
Laurionite	-5.01	-4.39	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.43	6.27	12.69	PbO
Mackinawite	-80.04	-83.64	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	3.18	20.04	16.86	Fe ₂ MgO ₄
Magnesite	-0.53	-7.99	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	-0.35	-5.66	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-0.91	24.43	25.34	MnOOH
Massicot	-6.63	6.27	12.89	PbO
Matlockite	-7.52	-16.49	-8.97	PbClF
Melanothallite	-19.58	-13.32	6.26	CuCl ₂
Melanterite	-12.91	-15.12	-2.21	FeSO ₄ :7H ₂ O
Metacinnabar	-53.16	-98.25	-45.09	HgS
Mg (OH) ₂ (active)	-5.14	13.65	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-16.23	-4.95	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-272.96	-198.28	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-17.66	8.70	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-4.91	11.29	16.20	MgCr ₂ O ₄
MgCrO ₄	-21.97	-16.59	5.38	MgCrO ₄
MgF ₂	-2.42	-10.55	-8.13	MgF ₂
MgMoO ₄	-6.71	-8.56	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-4.74	-1.69	3.06	MgSeO ₃ :6H ₂ O

MgSeO4:6H2O	-11.25	-12.45	-1.20	MgSeO4:6H2O
Minium	-29.17	44.35	73.52	Pb3O4
Mirabilite	-5.17	-6.29	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.84	-6.94	4.90	Mn(VO3)2
Mn2(SO4)3	-51.83	-57.54	-5.71	Mn2(SO4)3
Mn2Sb	-147.02	-85.94	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.20	0.30	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.37	-9.66	2.72	MnCl2:4H2O
MnS (grn)	-75.60	-75.43	0.17	MnS
MnS (pnk)	-78.77	-75.43	3.34	MnS
MnSb	-94.49	-97.40	-2.91	MnSb
MnSe	-38.95	-35.45	3.50	MnSe
MnSeO3	-4.81	-3.68	1.13	MnSeO3
MnSeO3:2H2O	-4.66	-3.68	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.39	-14.44	-2.05	MnSeO4:5H2O
MnSO4	-9.49	-6.91	2.58	MnSO4
Monteponite	-7.40	7.70	15.10	CdO
Montroydite	-7.53	-11.17	-3.64	HgO
MoO3	-14.21	-22.21	-8.00	MoO3
Morenosite	-7.48	-9.62	-2.14	NiSO4:7H2O
MoS2	-151.67	-221.93	-70.26	MoS2
Na-Jarosite	-10.22	-21.42	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.30	-48.19	-9.90	Na2Cr2O7
Na2CrO4	-20.89	-17.96	2.93	Na2CrO4
Na2Mo2O7	-15.54	-32.14	-16.60	Na2Mo2O7
Na2MoO4	-11.42	-9.93	1.49	Na2MoO4
Na2MoO4:2H2O	-11.15	-9.93	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.36	-3.06	10.30	Na2SeO3:5H2O
Na2SeO4	-15.10	-13.82	1.28	Na2SeO4
Na3Sb	-172.51	-78.06	94.45	Na3Sb
Na3VO4	-27.56	9.12	36.68	Na3VO4
Na4V2O7	-31.44	5.96	37.40	Na4V2O7
Nantokite	-6.01	-12.74	-6.73	CuCl
NaSb	-87.96	-64.80	23.17	NaSb
Natron	-8.06	-9.37	-1.31	Na2CO3:10H2O
NaVO3	-7.02	-3.16	3.86	NaVO3
Nesquehonite	-3.33	-8.00	-4.67	MgCO3:3H2O
Ni(OH)2	-3.84	8.95	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.53	-7.83	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.77	17.23	32.00	Ni4(OH)6SO4
NiCO3	-5.83	-12.70	-6.87	NiCO3
NiMoO4	-2.12	-13.26	-11.14	NiMoO4
NiS (alpha)	-72.54	-78.14	-5.60	NiS
NiS (beta)	-67.04	-78.14	-11.10	NiS
NiS (gamma)	-65.34	-78.14	-12.80	NiS
NiSe	-20.46	-38.16	-17.70	NiSe
NiSeO3:2H2O	-9.20	-6.39	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.63	-17.15	-1.52	NiSeO4:6H2O
Nsutite	-5.65	11.85	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-248.16	-309.23	-61.07	As2S3
Otavite	-1.95	-13.95	-12.00	CdCO3
Pb(BO2)2	-9.13	-2.61	6.52	Pb(BO2)2
Pb(OH)2	-1.88	6.27	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.45	-67.21	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.92	1.88	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.65	12.54	26.19	Pb2O(OH)2
Pb2O3	-22.96	38.08	61.04	Pb2O3
Pb2OCO3	-8.55	-9.11	-0.56	Pb2OCO3
Pb2V2O7	-4.17	-6.07	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.67	-15.87	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.94	0.20	6.14	Pb3(VO4)2
Pb3O2CO3	-13.86	-2.84	11.02	Pb3O2CO3
Pb3O2SO4	-10.45	0.24	10.69	Pb3O2SO4
Pb4(OH)6SO4	-14.60	6.50	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.37	6.50	21.88	Pb4O3SO4
PbCrO4	-11.37	-23.97	-12.60	PbCrO4
PbF2	-10.49	-17.93	-7.44	PbF2

Pbmetal	-23.52	-19.28	4.25	Pb
PbMoO4	-0.32	-15.94	-15.62	PbMoO4
PbO:0.3H2O	-6.71	6.27	12.98	PbO:0.33H2O
PbSeO4	-12.99	-19.83	-6.84	PbSeO4
Periclase	-7.93	13.65	21.58	MgO
Phosgenite	-10.62	-30.43	-19.81	PbCl2:PbCO3
Plattnerite	-17.79	31.81	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.67	-145.18	-18.51	FeS2
Pyrochroite	-3.54	11.66	15.19	Mn (OH) 2
Pyrolusite	-4.18	37.20	41.38	MnO2
Realgar	-104.10	-123.84	-19.75	AsS
Retgersite	-7.58	-9.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.59	-9.99	-10.58	MnCO3
Rutherfordine	-4.56	-19.06	-14.50	UO2CO3
Sb (OH) 3	-12.74	-19.85	-7.11	Sb (OH) 3
Sb2O4	-17.55	-14.15	3.40	Sb2O4
Sb2O5	-27.56	-37.23	-9.67	Sb2O5
Sb2Se3	-113.27	-181.03	-67.76	Sb2Se3
Sb4O6(cubic)	-61.13	-79.39	-18.26	Sb4O6
Sb4O6(orth)	-61.49	-79.39	-17.90	Sb4O6
SbCl3	-52.39	-51.82	0.57	SbCl3
SbF3	-45.92	-56.15	-10.23	SbF3
Sbmetal	-46.48	-58.16	-11.69	Sb
SbO2	-3.56	-31.39	-27.82	SbO2
Schoepite	-3.41	2.58	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.46	-21.57	-7.11	Se
Semetal (hex)	-13.86	-21.57	-7.71	Se
Senarmontite	-27.33	-39.70	-12.37	Sb2O3
SeO2	-15.46	-15.34	0.12	SeO2
SeO3	-47.14	-26.10	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.05	-11.05	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS
Spinel	-5.57	31.27	36.85	MgAl2O4
Stibnite	-250.50	-300.96	-50.46	Sb2S3
Sulfur	-59.40	-61.54	-2.14	S
Tenorite	0.35	8.00	7.64	CuO
Thenardite	-6.61	-6.29	0.32	Na2SO4
Thermonatrite	-10.00	-9.37	0.64	Na2CO3:H2O
Tyuyamunite	-4.35	-0.27	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.23	9.85	21.08	U3O8
U3Sb4	-579.55	-427.17	152.38	U3Sb4
U4O9	-26.42	-29.44	-3.02	U4O9
UF4	-32.61	-62.15	-29.54	UF4
UF4:2.5H2O	-29.43	-62.15	-32.72	UF4:2.5H2O
UO2 (am)	-14.68	-13.75	0.93	UO2
UO2 (NO3) 2	-42.55	-30.40	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.25	-30.40	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.79	-30.40	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.45	-30.40	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.03	2.58	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.27	-23.52	-2.25	UO2SeO4:4H2O
UO3	-5.12	2.58	7.70	UO3
Uraninite	-9.08	-13.75	-4.67	UO2
USb2	-219.96	-190.38	29.58	USb2
V (OH) 3	-19.84	-12.25	7.59	V (OH) 3
V2O5	-17.24	-18.60	-1.36	V2O5
V3O5	-42.89	-41.05	1.84	V3O5
V4O7	-53.41	-46.22	7.19	V4O7
V6O13	-46.03	-106.89	-60.86	V6O13
Valentinite	-31.22	-39.70	-8.48	Sb2O3
VC12	-65.21	-46.33	18.87	VC12
VC13	-67.65	-44.22	23.43	VC13
VF4	-68.50	-53.57	14.93	VF4
Vmetal	-94.59	-50.56	44.03	V
VO	-39.78	-25.02	14.76	VO
VO (OH) 2	-10.32	-5.17	5.15	VO (OH) 2

VO2Cl	-22.80	-19.96	2.84	VO2Cl
VOC1	-34.06	-22.90	11.15	VOC1
VOC12	-39.25	-26.49	12.76	VOC12
VOSO4	-27.35	-23.74	3.61	VOSO4
Witherite	-4.49	-13.06	-8.57	BaCO3
Wurtzite	-67.54	-76.49	-8.95	ZnS
Zincite	-0.74	10.60	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO4
Zn(BO2)2	-6.57	1.72	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.71	-22.39	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.60	10.60	12.20	Zn(OH)2
Zn(OH)2(am)	-1.88	10.60	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.16	10.60	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-0.94	10.60	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.14	10.60	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.87	2.63	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.66	10.53	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.53	-2.88	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.26	-5.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.83	31.67	38.50	Zn5(OH)8Cl2
ZnCl2	-17.77	-10.72	7.05	ZnCl2
ZnCO3:1H2O	-0.79	-11.05	-10.26	ZnCO3:1H2O
ZnF2	-13.07	-13.60	-0.53	ZnF2
Znmetal	-40.74	-14.95	25.79	Zn
ZnMoO4	-1.49	-11.61	-10.13	ZnMoO4
ZnO(active)	-0.59	10.60	11.19	ZnO
ZnS(am)	-67.44	-76.49	-9.05	ZnS
ZnSb	-84.13	-73.11	11.01	ZnSb
ZnSe	-22.11	-36.51	-14.40	ZnSe
ZnSeO4:6H2O	-13.98	-15.50	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.33	-7.97	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 35.

```

Title Use solution to allow model output
REACTION 106
      H2O      -0.0
      0 moles
USE solution 115
End

```

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 115. Solution after simulation 34.
Using reaction 106.

Reaction 106.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.127e-08	1.128e-08
Al	2.313e-06	2.314e-06
As	1.709e-10	1.710e-10
B	4.036e-05	4.038e-05
Ba	4.132e-08	4.134e-08
C	8.983e-04	8.988e-04
Ca	2.489e-03	2.491e-03
Cd	1.047e-08	1.047e-08
Cl	3.813e-03	3.815e-03
Co	1.287e-07	1.288e-07
Cr	9.005e-10	9.010e-10
Cu	1.867e-07	1.868e-07
F	1.736e-04	1.737e-04
Fe	8.300e-10	8.305e-10
Hg	2.805e-09	2.806e-09
K	4.923e-03	4.926e-03
Mg	7.044e-03	7.048e-03
Mn	8.486e-05	8.491e-05
Mo	2.743e-06	2.744e-06
N	6.052e-06	6.056e-06
Na	1.210e-02	1.211e-02
Ni	1.568e-07	1.569e-07
Pb	2.279e-09	2.280e-09
S	1.568e-02	1.569e-02
Sb	3.852e-08	3.855e-08
Se	1.904e-07	1.905e-07
U	5.299e-07	5.302e-07
V	8.222e-09	8.226e-09
Zn	7.894e-06	7.899e-06

-----Description of solution-----

	pH =	8.155	Charge balance
	pe =	4.617	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	4.777e-02	
	Mass of water (kg) =	1.001e+00	
	Total alkalinity (eq/kg) =	9.318e-04	
	Total CO2 (mol/kg) =	8.983e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	7.162e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	0	
	Total H =	1.110788e+02	
	Total O =	5.560448e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.766e-06	1.439e-06	-5.753	-5.842	-0.089	(0)

H+	8.490e-09	6.994e-09	-8.071	-8.155	-0.084	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	1.127e-08					
AgCl	7.192e-09	7.192e-09	-8.143	-8.143	0.000	(0)
AgCl2-	2.543e-09	1.967e-09	-8.595	-8.706	-0.111	(0)
Ag+	1.361e-09	1.122e-09	-8.866	-8.950	-0.084	(0)
AgSO4-	1.599e-10	1.237e-10	-9.796	-9.908	-0.111	(0)
AgCl3-2	1.537e-11	5.507e-12	-10.813	-11.259	-0.446	(0)
AgNO2	1.142e-12	1.142e-12	-11.942	-11.942	0.000	(0)
AgCl4-3	3.558e-13	3.531e-14	-12.449	-13.452	-1.003	(0)
AgF	3.197e-13	3.197e-13	-12.495	-12.495	0.000	(0)
AgOH	1.613e-13	1.613e-13	-12.792	-12.792	0.000	(0)
AgH2BO3	5.387e-14	5.387e-14	-13.269	-13.269	0.000	(0)
AgSeO3-	3.498e-14	2.706e-14	-13.456	-13.568	-0.111	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	4.291e-15	3.320e-15	-14.367	-14.479	-0.111	(0)
Ag (OH) 2-	2.932e-17	2.268e-17	-16.533	-16.644	-0.111	(0)
Ag (NO2) 2-	1.115e-17	8.626e-18	-16.953	-17.064	-0.111	(0)
AgNO3	4.097e-18	4.097e-18	-17.387	-17.387	0.000	(0)
Ag (SeO3) 2-3	9.163e-20	9.095e-21	-19.038	-20.041	-1.003	(0)
Ag (NH3) 2+	5.057e-20	3.912e-20	-19.296	-19.408	-0.111	(0)
Ag2MoO4	6.014e-25	6.014e-25	-24.221	-24.221	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.067	-74.067	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.120	-82.903	-1.784	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.227	-0.215	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.787	-148.899	-0.111	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.123	-149.512	-0.389	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.454	-149.823	-0.368	(0)
Al	2.313e-06					
Al (OH) 4-	2.302e-06	1.896e-06	-5.638	-5.722	-0.084	(0)
Al (OH) 3	1.047e-08	1.047e-08	-7.980	-7.980	0.000	(0)
Al (OH) 2+	4.388e-10	3.647e-10	-9.358	-9.438	-0.080	(0)
AlF3	1.624e-11	1.624e-11	-10.789	-10.789	0.000	(0)
AlF2+	1.368e-11	1.137e-11	-10.864	-10.944	-0.080	(0)
AlF4-	1.122e-12	9.238e-13	-11.950	-12.034	-0.084	(0)
AlOH+2	6.688e-13	3.191e-13	-12.175	-12.496	-0.321	(0)
AlF+2	5.275e-13	2.517e-13	-12.278	-12.599	-0.321	(0)
AlSO4+	1.156e-14	9.519e-15	-13.937	-14.021	-0.084	(0)
Al+3	1.269e-15	2.218e-16	-14.896	-15.654	-0.758	(0)
Al (SO4) 2-	6.846e-16	5.639e-16	-15.165	-15.249	-0.084	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.980	-44.983	-1.003	(0)
As (3)	1.137e-24					
H3AsO3	1.038e-24	1.038e-24	-23.984	-23.984	0.000	(0)
H2AsO3-	9.842e-26	7.614e-26	-25.007	-25.118	-0.111	(0)
HAsO3-2	2.772e-29	9.928e-30	-28.557	-29.003	-0.446	(0)
H4AsO3+	4.651e-33	3.598e-33	-32.332	-32.444	-0.111	(0)
AsO3-3	5.513e-34	5.472e-35	-33.259	-34.262	-1.003	(0)
As (5)	1.709e-10					
HAsO4-2	1.658e-10	5.937e-11	-9.781	-10.226	-0.446	(0)
H2AsO4-	4.895e-12	3.787e-12	-11.310	-11.422	-0.111	(0)
AsO4-3	2.705e-13	2.684e-14	-12.568	-13.571	-1.003	(0)
H3AsO4	4.552e-18	4.603e-18	-17.342	-17.337	0.005	(0)
B	4.036e-05					
H3BO3	3.610e-05	3.650e-05	-4.443	-4.438	0.005	(0)
H2BO3-	3.767e-06	3.031e-06	-5.424	-5.518	-0.095	(0)
MgH2BO3+	2.870e-07	2.309e-07	-6.542	-6.637	-0.095	(0)
CaH2BO3+	1.559e-07	1.254e-07	-6.807	-6.902	-0.095	(0)
NaH2BO3	4.649e-08	4.649e-08	-7.333	-7.333	0.000	(0)
BF (OH) 3-	2.054e-09	1.652e-09	-8.687	-8.782	-0.095	(0)
H5 (BO3) 2-	1.170e-10	9.414e-11	-9.932	-10.026	-0.095	(0)
BaH2BO3+	2.205e-12	1.774e-12	-11.657	-11.751	-0.095	(0)
H8 (BO3) 3-	4.271e-13	3.436e-13	-12.369	-12.464	-0.095	(0)
BF2 (OH) 2-	1.744e-13	1.403e-13	-12.758	-12.853	-0.095	(0)
AgH2BO3	5.387e-14	5.387e-14	-13.269	-13.269	0.000	(0)
BF3OH-	5.389e-20	4.335e-20	-19.268	-19.363	-0.095	(0)
BF4-	2.106e-25	1.694e-25	-24.677	-24.771	-0.095	(0)
Ba	4.132e-08					
Ba+2	4.113e-08	1.894e-08	-7.386	-7.723	-0.337	(0)

BaHCO3+	1.487e-10	1.243e-10	-9.828	-9.906	-0.078	(0)
BaCO3	4.474e-11	4.474e-11	-10.349	-10.349	0.000	(0)
BaH2BO3+	2.205e-12	1.774e-12	-11.657	-11.751	-0.095	(0)
BaOH+	1.437e-13	1.190e-13	-12.843	-12.925	-0.082	(0)
BaNO3+	5.644e-16	4.367e-16	-15.248	-15.360	-0.111	(0)
BaNH3+2	4.838e-17	1.733e-17	-16.315	-16.761	-0.446	(0)
C (4)	8.983e-04					
HCO3-	8.266e-04	6.870e-04	-3.083	-3.163	-0.080	(0)
MgHCO3+	1.886e-05	1.545e-05	-4.725	-4.811	-0.087	(0)
CaHCO3+	1.101e-05	9.199e-06	-4.958	-5.036	-0.078	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.998e-06	4.605e-06	-5.000	-5.337	-0.337	(0)
MgCO3	8.417e-06	8.417e-06	-5.075	-5.075	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	3.740e-06	3.740e-06	-5.427	-5.427	0.000	(0)
NaCO3-	9.987e-07	8.301e-07	-6.001	-6.081	-0.080	(0)
ZnCO3	5.124e-07	5.124e-07	-6.290	-6.290	0.000	(0)
UO2 (CO3) 3-4	4.417e-07	7.270e-09	-6.355	-8.138	-1.784	(0)
MnHCO3+	3.691e-07	3.056e-07	-6.433	-6.515	-0.082	(0)
CuCO3	1.314e-07	1.314e-07	-6.882	-6.882	0.000	(0)
UO2 (CO3) 2-2	8.794e-08	3.150e-08	-7.056	-7.502	-0.446	(0)
ZnHCO3+	5.430e-08	4.201e-08	-7.265	-7.377	-0.111	(0)
NiCO3	7.492e-09	7.492e-09	-8.125	-8.125	0.000	(0)
NiHCO3+	4.774e-09	3.693e-09	-8.321	-8.433	-0.111	(0)
Cu (CO3) 2-2	4.546e-09	1.628e-09	-8.342	-8.788	-0.446	(0)
CoCO3	2.444e-09	2.444e-09	-8.612	-8.612	0.000	(0)
CoHCO3+	2.168e-09	1.678e-09	-8.664	-8.775	-0.111	(0)
PbCO3	1.255e-09	1.255e-09	-8.901	-8.901	0.000	(0)
UO2CO3	3.428e-10	3.428e-10	-9.465	-9.465	0.000	(0)
CuHCO3+	2.714e-10	2.100e-10	-9.566	-9.678	-0.111	(0)
CdCO3	2.573e-10	2.573e-10	-9.590	-9.590	0.000	(0)
BaHCO3+	1.487e-10	1.243e-10	-9.828	-9.906	-0.078	(0)
PbHCO3+	5.982e-11	4.628e-11	-10.223	-10.335	-0.111	(0)
Pb (CO3) 2-2	4.654e-11	1.667e-11	-10.332	-10.778	-0.446	(0)
BaCO3	4.474e-11	4.474e-11	-10.349	-10.349	0.000	(0)
CdHCO3+	4.955e-12	3.833e-12	-11.305	-11.416	-0.111	(0)
Cd (CO3) 2-2	2.452e-12	8.782e-13	-11.611	-12.056	-0.446	(0)
HgCO3	2.862e-15	2.862e-15	-14.543	-14.543	0.000	(0)
FeHCO3+	1.431e-15	1.196e-15	-14.844	-14.922	-0.078	(0)
Hg (CO3) 2-2	1.163e-16	4.167e-17	-15.934	-16.380	-0.446	(0)
HgHCO3+	4.817e-19	3.727e-19	-18.317	-18.429	-0.111	(0)
Ca	2.489e-03					
Ca+2	1.561e-03	7.190e-04	-2.807	-3.143	-0.337	(0)
CaSO4	9.106e-04	9.106e-04	-3.041	-3.041	0.000	(0)
CaHCO3+	1.101e-05	9.199e-06	-4.958	-5.036	-0.078	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	1.076e-06	8.905e-07	-5.968	-6.050	-0.082	(0)
CaH2BO3+	1.559e-07	1.254e-07	-6.807	-6.902	-0.095	(0)
CaOH+	2.470e-08	2.064e-08	-7.607	-7.685	-0.078	(0)
CaNO3+	1.352e-11	1.046e-11	-10.869	-10.981	-0.111	(0)
CaNH3+2	3.664e-12	1.312e-12	-11.436	-11.882	-0.446	(0)
Ca (NH3) 2+2	2.115e-21	7.575e-22	-20.675	-21.121	-0.446	(0)
Cd	1.047e-08					
Cd+2	5.321e-09	2.451e-09	-8.274	-8.611	-0.337	(0)
CdSO4	3.176e-09	3.176e-09	-8.498	-8.498	0.000	(0)
CdCl+	9.502e-10	7.351e-10	-9.022	-9.134	-0.111	(0)
Cd (SO4) 2-2	6.612e-10	2.368e-10	-9.180	-9.626	-0.446	(0)
CdCO3	2.573e-10	2.573e-10	-9.590	-9.590	0.000	(0)
CdOHCl	4.338e-11	4.338e-11	-10.363	-10.363	0.000	(0)
CdOH+	3.620e-11	2.801e-11	-10.441	-10.553	-0.111	(0)
CdCl2	9.625e-12	9.625e-12	-11.017	-11.017	0.000	(0)
CdF+	5.697e-12	4.408e-12	-11.244	-11.356	-0.111	(0)
CdHCO3+	4.955e-12	3.833e-12	-11.305	-11.416	-0.111	(0)
Cd (CO3) 2-2	2.452e-12	8.782e-13	-11.611	-12.056	-0.446	(0)
Cd (OH) 2	2.542e-13	2.542e-13	-12.595	-12.595	0.000	(0)
CdCl3-	2.465e-14	1.907e-14	-13.608	-13.720	-0.111	(0)
CdF2	9.979e-16	9.979e-16	-15.001	-15.001	0.000	(0)
CdSeO4	7.422e-17	7.422e-17	-16.129	-16.129	0.000	(0)

	CdNO3+	4.608e-17	3.565e-17	-16.337	-16.448	-0.111	(0)
	Cd (OH) 3-	2.888e-17	2.235e-17	-16.539	-16.651	-0.111	(0)
	Cd (SeO3) 2-2	7.947e-18	2.846e-18	-17.100	-17.546	-0.446	(0)
	Cd2OH+3	3.466e-18	3.440e-19	-17.460	-18.463	-1.003	(0)
	Cd (OH) 4-2	1.469e-23	5.262e-24	-22.833	-23.279	-0.446	(0)
	Cd (NO3) 2	8.217e-26	8.217e-26	-25.085	-25.085	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.423	-79.534	-0.111	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.262	-151.262	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.182	-228.293	-0.111	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.583	-305.029	-0.446	(0)
C1		3.813e-03					
	Cl-	3.812e-03	3.141e-03	-2.419	-2.503	-0.084	(0)
	MnCl+	1.065e-07	8.815e-08	-6.973	-7.055	-0.082	(0)
	ZnOHC1	2.873e-08	2.873e-08	-7.542	-7.542	0.000	(0)
	ZnCl+	1.862e-08	1.525e-08	-7.730	-7.817	-0.087	(0)
	AgCl	7.192e-09	7.192e-09	-8.143	-8.143	0.000	(0)
	AgCl2-	2.543e-09	1.967e-09	-8.595	-8.706	-0.111	(0)
	CdCl+	9.502e-10	7.351e-10	-9.022	-9.134	-0.111	(0)
	NiCl+	4.530e-10	3.504e-10	-9.344	-9.455	-0.111	(0)
	CoCl+	4.409e-10	3.411e-10	-9.356	-9.467	-0.111	(0)
	MnCl2	3.911e-10	3.911e-10	-9.408	-9.408	0.000	(0)
	CuCl	2.265e-10	2.265e-10	-9.645	-9.645	0.000	(0)
	CuCl2-	1.814e-10	1.486e-10	-9.741	-9.828	-0.087	(0)
	ZnCl2	7.593e-11	7.593e-11	-10.120	-10.120	0.000	(0)
	CdOHC1	4.338e-11	4.338e-11	-10.363	-10.363	0.000	(0)
	CuCl+	2.943e-11	2.411e-11	-10.531	-10.618	-0.087	(0)
	AgCl3-2	1.537e-11	5.507e-12	-10.813	-11.259	-0.446	(0)
	PbCl+	1.306e-11	1.010e-11	-10.884	-10.996	-0.111	(0)
	CdCl2	9.625e-12	9.625e-12	-11.017	-11.017	0.000	(0)
	HgClOH	4.143e-12	4.143e-12	-11.383	-11.383	0.000	(0)
	HgCl2	5.122e-13	5.122e-13	-12.291	-12.291	0.000	(0)
	MnCl3-	4.086e-13	3.383e-13	-12.389	-12.471	-0.082	(0)
	AgCl4-3	3.558e-13	3.531e-14	-12.449	-13.452	-1.003	(0)
	ZnCl3-	2.312e-13	1.894e-13	-12.636	-12.723	-0.087	(0)
	CuCl3-2	2.124e-13	9.979e-14	-12.673	-13.001	-0.328	(0)
	PbCl2	1.417e-13	1.417e-13	-12.849	-12.849	0.000	(0)
	CuCl2	2.626e-14	2.626e-14	-13.581	-13.581	0.000	(0)
	CdCl3-	2.465e-14	1.907e-14	-13.608	-13.720	-0.111	(0)
	HgCl3-	2.079e-14	1.609e-14	-13.682	-13.794	-0.111	(0)
	NiCl2	5.541e-15	5.541e-15	-14.256	-14.256	0.000	(0)
	ZnCl4-2	6.333e-16	2.975e-16	-15.198	-15.527	-0.328	(0)
	HgCl4-2	5.616e-16	2.011e-16	-15.251	-15.696	-0.446	(0)
	PbCl3-	2.291e-16	1.772e-16	-15.640	-15.751	-0.111	(0)
	UO2Cl+	1.231e-16	9.524e-17	-15.910	-16.021	-0.111	(0)
	HgCl+	4.206e-17	3.254e-17	-16.376	-16.488	-0.111	(0)
	CrCl+2	9.540e-19	3.417e-19	-18.020	-18.466	-0.446	(0)
	CuCl3-	9.395e-19	7.697e-19	-18.027	-18.114	-0.087	(0)
	PbCl4-2	7.103e-19	2.544e-19	-18.149	-18.594	-0.446	(0)
	CrOHC12	2.935e-20	2.935e-20	-19.532	-19.532	0.000	(0)
	CrCl2+	1.316e-22	1.018e-22	-21.881	-21.992	-0.111	(0)
	FeCl+2	1.075e-22	5.048e-23	-21.969	-22.297	-0.328	(0)
	CuCl4-2	2.579e-23	1.212e-23	-22.589	-22.917	-0.328	(0)
	VOC1+	3.769e-24	2.916e-24	-23.424	-23.535	-0.111	(0)
	FeCl2+	8.555e-25	7.082e-25	-24.068	-24.150	-0.082	(0)
	CrO3Cl-	4.779e-26	3.697e-26	-25.321	-25.432	-0.111	(0)
	FeCl3	2.224e-28	2.224e-28	-27.653	-27.653	0.000	(0)
	CoCl+2	9.236e-36	3.308e-36	-35.035	-35.480	-0.446	(0)
	UCl+3	0.000e+00	0.000e+00	-46.167	-47.170	-1.003	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
Co (2)		1.287e-07					
	Co+2	8.764e-08	3.139e-08	-7.057	-7.503	-0.446	(0)
	CoSO4	3.462e-08	3.462e-08	-7.461	-7.461	0.000	(0)
	CoCO3	2.444e-09	2.444e-09	-8.612	-8.612	0.000	(0)
	CoHCO3+	2.168e-09	1.678e-09	-8.664	-8.775	-0.111	(0)
	CoOH+	1.165e-09	9.011e-10	-8.934	-9.045	-0.111	(0)
	CoCl+	4.409e-10	3.411e-10	-9.356	-9.467	-0.111	(0)

CoF+	1.456e-10	1.126e-10	-9.837	-9.948	-0.111	(0)
Co(OH) 2	1.030e-10	1.030e-10	-9.987	-9.987	0.000	(0)
CoNO2+	1.394e-12	1.078e-12	-11.856	-11.967	-0.111	(0)
Co(NH3) +2	1.528e-14	5.472e-15	-13.816	-14.262	-0.446	(0)
Co(OH) 3-	3.821e-15	2.956e-15	-14.418	-14.529	-0.111	(0)
CoSeO4	2.559e-15	2.559e-15	-14.592	-14.592	0.000	(0)
CoOOH-	9.594e-16	7.422e-16	-15.018	-15.129	-0.111	(0)
CoNO3+	2.958e-16	2.288e-16	-15.529	-15.640	-0.111	(0)
Co2OH+3	1.428e-17	1.418e-18	-16.845	-17.848	-1.003	(0)
Co(OH) 4-2	1.882e-21	6.740e-22	-20.725	-21.171	-0.446	(0)
Co(NH3) 2+2	9.447e-22	3.384e-22	-21.025	-21.471	-0.446	(0)
Co(NO3) 2	2.142e-24	2.142e-24	-23.669	-23.669	0.000	(0)
Co4(OH) 4+4	7.992e-27	1.315e-28	-26.097	-27.881	-1.784	(0)
Co(NH3) 3+2	1.724e-29	6.176e-30	-28.763	-29.209	-0.446	(0)
Co(NH3) 4+2	1.312e-37	4.699e-38	-36.882	-37.328	-0.446	(0)
Co(NH3) 5+2	0.000e+00	0.000e+00	-45.501	-45.947	-0.446	(0)
Co(3)	1.057e-28					
CoOH+2	1.057e-28	3.784e-29	-27.976	-28.422	-0.446	(0)
Co+3	2.962e-35	5.176e-36	-34.528	-35.286	-0.758	(0)
CoCl+2	9.236e-36	3.308e-36	-35.035	-35.480	-0.446	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Co(NH3) 6OH+2	0.000e+00	0.000e+00	-67.968	-68.414	-0.446	(0)
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
Cr(2)	1.354e-27					
Cr+2	1.354e-27	4.848e-28	-26.868	-27.314	-0.446	(0)
Cr(3)	9.004e-10					
Cr(OH) 2+	5.987e-10	4.632e-10	-9.223	-9.334	-0.111	(0)
Cr(OH) 3	2.503e-10	2.503e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.199e-11	1.701e-11	-10.658	-10.769	-0.111	(0)
Cr(OH) 4-	1.853e-11	1.434e-11	-10.732	-10.844	-0.111	(0)
Cr(OH) +2	7.387e-12	2.646e-12	-11.132	-11.577	-0.446	(0)
CrOHSO4	3.471e-12	3.471e-12	-11.460	-11.460	0.000	(0)
CrF+2	4.221e-15	1.512e-15	-14.375	-14.820	-0.446	(0)
CrSO4+	1.403e-15	1.085e-15	-14.853	-14.964	-0.111	(0)
Cr+3	8.470e-16	8.407e-17	-15.072	-16.075	-1.003	(0)
CrCl+2	9.540e-19	3.417e-19	-18.020	-18.466	-0.446	(0)
CrOHC12	2.935e-20	2.935e-20	-19.532	-19.532	0.000	(0)
Cr2(OH) 2SO4+2	2.318e-21	8.302e-22	-20.635	-21.081	-0.446	(0)
Cr2(OH) 2(SO4) 2	2.726e-22	2.726e-22	-21.564	-21.564	0.000	(0)
CrCl2+	1.316e-22	1.018e-22	-21.881	-21.992	-0.111	(0)
CrNO3+2	4.719e-26	1.690e-26	-25.326	-25.772	-0.446	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-45.293	-45.739	-0.446	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-55.104	-56.108	-1.003	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
Cr(6)	2.696e-14					
CrO4-2	2.566e-14	1.182e-14	-13.591	-13.928	-0.337	(0)
NaCrO4-	7.347e-16	5.684e-16	-15.134	-15.245	-0.111	(0)
HCrO4-	3.457e-16	2.674e-16	-15.461	-15.573	-0.111	(0)
KCrO4-	2.216e-16	1.714e-16	-15.655	-15.766	-0.111	(0)
CrO3SO4-2	8.799e-24	3.152e-24	-23.056	-23.501	-0.446	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	4.779e-26	3.697e-26	-25.321	-25.432	-0.111	(0)
Cr2O7-2	6.928e-30	2.482e-30	-29.159	-29.605	-0.446	(0)
Cu(1)	4.821e-10					
CuCl	2.265e-10	2.265e-10	-9.645	-9.645	0.000	(0)
CuCl2-	1.814e-10	1.486e-10	-9.741	-9.828	-0.087	(0)
Cu+	7.404e-11	5.728e-11	-10.131	-10.242	-0.111	(0)
CuCl3-2	2.124e-13	9.979e-14	-12.673	-13.001	-0.328	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-148.026	-148.404	-0.378	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.776	-149.134	-0.359	(0)
Cu(2)	1.862e-07					
CuCO3	1.314e-07	1.314e-07	-6.882	-6.882	0.000	(0)
CuOH+	2.690e-08	2.204e-08	-7.570	-7.657	-0.087	(0)
Cu+2	1.052e-08	4.844e-09	-7.978	-8.315	-0.337	(0)
Cu(OH) 2	6.326e-09	6.326e-09	-8.199	-8.199	0.000	(0)
CuSO4	6.134e-09	6.134e-09	-8.212	-8.212	0.000	(0)
Cu(CO3) 2-2	4.546e-09	1.628e-09	-8.342	-8.788	-0.446	(0)

	CuHCO3+	2.714e-10	2.100e-10	-9.566	-9.678	-0.111	(0)
	CuF+	4.483e-11	3.468e-11	-10.348	-10.460	-0.111	(0)
	Cu2 (OH) 2+2	3.406e-11	1.220e-11	-10.468	-10.914	-0.446	(0)
	CuCl+	2.943e-11	2.411e-11	-10.531	-10.618	-0.087	(0)
	Cu (OH) 3-	2.413e-11	1.867e-11	-10.617	-10.729	-0.111	(0)
	CuNO2+	3.197e-12	2.473e-12	-11.495	-11.607	-0.111	(0)
	CuNH3+2	2.006e-13	7.186e-14	-12.698	-13.143	-0.446	(0)
	CuCl2	2.626e-14	2.626e-14	-13.581	-13.581	0.000	(0)
	Cu (OH) 4-2	5.901e-16	2.114e-16	-15.229	-15.675	-0.446	(0)
	Cu (NO2) 2	1.234e-16	1.234e-16	-15.909	-15.909	0.000	(0)
	CuNO3+	9.107e-17	7.046e-17	-16.041	-16.152	-0.111	(0)
	CuCl3-	9.395e-19	7.697e-19	-18.027	-18.114	-0.087	(0)
	CuCl4-2	2.579e-23	1.212e-23	-22.589	-22.917	-0.328	(0)
	Cu (NO3) 2	4.080e-26	4.080e-26	-25.389	-25.389	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-219.099	-219.210	-0.111	(0)
F		1.736e-04					
	F-	1.377e-04	1.135e-04	-3.861	-3.945	-0.084	(0)
	MgF+	3.397e-05	2.798e-05	-4.469	-4.553	-0.084	(0)
	CaF+	1.076e-06	8.905e-07	-5.968	-6.050	-0.082	(0)
	NaF	6.930e-07	6.930e-07	-6.159	-6.159	0.000	(0)
	MnF+	1.217e-07	1.007e-07	-6.915	-6.997	-0.082	(0)
	ZnF+	5.659e-09	4.378e-09	-8.247	-8.359	-0.111	(0)
	BF (OH) 3-	2.054e-09	1.652e-09	-8.687	-8.782	-0.095	(0)
	HF	1.174e-09	1.174e-09	-8.930	-8.930	0.000	(0)
	NiF+	1.607e-10	1.243e-10	-9.794	-9.906	-0.111	(0)
	CoF+	1.456e-10	1.126e-10	-9.837	-9.948	-0.111	(0)
	CuF+	4.483e-11	3.468e-11	-10.348	-10.460	-0.111	(0)
	AlF3	1.624e-11	1.624e-11	-10.789	-10.789	0.000	(0)
	AlF2+	1.368e-11	1.137e-11	-10.864	-10.944	-0.080	(0)
	CdF+	5.697e-12	4.408e-12	-11.244	-11.356	-0.111	(0)
	AlF4-	1.122e-12	9.238e-13	-11.950	-12.034	-0.084	(0)
	PbF+	9.371e-13	7.249e-13	-12.028	-12.140	-0.111	(0)
	HF2-	6.217e-13	5.064e-13	-12.206	-12.296	-0.089	(0)
	AlF+2	5.275e-13	2.517e-13	-12.278	-12.599	-0.321	(0)
	UO2F+	3.786e-13	2.929e-13	-12.422	-12.533	-0.111	(0)
	AgF	3.197e-13	3.197e-13	-12.495	-12.495	0.000	(0)
	BF2 (OH) 2-	1.744e-13	1.403e-13	-12.758	-12.853	-0.095	(0)
	UO2F2	9.584e-14	9.584e-14	-13.018	-13.018	0.000	(0)
	CrF+2	4.221e-15	1.512e-15	-14.375	-14.820	-0.446	(0)
	UO2F3-	3.531e-15	2.732e-15	-14.452	-14.564	-0.111	(0)
	PbF2	1.619e-15	1.619e-15	-14.791	-14.791	0.000	(0)
	CdF2	9.979e-16	9.979e-16	-15.001	-15.001	0.000	(0)
	UO2F4-2	6.874e-18	2.462e-18	-17.163	-17.609	-0.446	(0)
	H2F2	3.692e-18	3.692e-18	-17.433	-17.433	0.000	(0)
	VO2F	6.967e-19	6.967e-19	-18.157	-18.157	0.000	(0)
	PbF3-	4.504e-19	3.484e-19	-18.346	-18.458	-0.111	(0)
	FeF2+	2.429e-19	2.011e-19	-18.615	-18.697	-0.082	(0)
	FeF+2	1.410e-19	6.622e-20	-18.851	-19.179	-0.328	(0)
	BF3OH-	5.389e-20	4.335e-20	-19.268	-19.363	-0.095	(0)
	VO2F2-	3.710e-20	2.870e-20	-19.431	-19.542	-0.111	(0)
	FeF3	3.219e-20	3.219e-20	-19.492	-19.492	0.000	(0)
	VOF+	2.911e-22	2.252e-22	-21.536	-21.647	-0.111	(0)
	VO2F3-2	1.134e-22	4.063e-23	-21.945	-22.391	-0.446	(0)
	PbF4-2	5.283e-23	1.892e-23	-22.277	-22.723	-0.446	(0)
	VOF2	9.583e-24	9.583e-24	-23.019	-23.019	0.000	(0)
	HgF+	2.823e-24	2.184e-24	-23.549	-23.661	-0.111	(0)
	BF4-	2.106e-25	1.694e-25	-24.677	-24.771	-0.095	(0)
	VOF3-	4.987e-26	3.858e-26	-25.302	-25.414	-0.111	(0)
	VO2F4-3	2.286e-26	2.268e-27	-25.641	-26.644	-1.003	(0)
	Sb (OH) 2F	1.759e-26	1.759e-26	-25.755	-25.755	0.000	(0)
	SbOF	1.731e-26	1.731e-26	-25.762	-25.762	0.000	(0)
	VOF4-2	4.933e-29	1.767e-29	-28.307	-28.753	-0.446	(0)
	UF3+	3.228e-37	2.498e-37	-36.491	-36.602	-0.111	(0)
	UF2+2	3.877e-38	1.389e-38	-37.411	-37.857	-0.446	(0)
	UF4	3.107e-39	3.107e-39	-38.508	-38.508	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.009	-41.012	-1.003	(0)
	UF5-	0.000e+00	0.000e+00	-40.743	-40.855	-0.111	(0)
	UF6-2	0.000e+00	0.000e+00	-41.874	-42.320	-0.446	(0)

Fe (2)	5.849e-13					
Fe+2	3.862e-13	1.383e-13	-12.413	-12.859	-0.446	(0)
FeSO4	1.877e-13	1.877e-13	-12.727	-12.727	0.000	(0)
FeOH+	9.569e-15	7.922e-15	-14.019	-14.101	-0.082	(0)
FeHCO3+	1.431e-15	1.196e-15	-14.844	-14.922	-0.078	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.975e-18	4.119e-18	-17.303	-17.385	-0.082	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.772	-161.772	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.555	-238.667	-0.111	(0)
Fe (3)	8.294e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	3.329e-10	2.767e-10	-9.478	-9.558	-0.080	(0)
Fe (OH) 4-	6.891e-11	5.727e-11	-10.162	-10.242	-0.080	(0)
FeOH+2	1.052e-15	4.944e-16	-14.978	-15.306	-0.328	(0)
FeF2+	2.429e-19	2.011e-19	-18.615	-18.697	-0.082	(0)
FeF+2	1.410e-19	6.622e-20	-18.851	-19.179	-0.328	(0)
FeSO4+	3.988e-20	3.301e-20	-19.399	-19.481	-0.082	(0)
FeF3	3.219e-20	3.219e-20	-19.492	-19.492	0.000	(0)
Fe (SO4) 2-	5.044e-21	3.902e-21	-20.297	-20.409	-0.111	(0)
Fe+3	3.045e-21	5.323e-22	-20.516	-21.274	-0.758	(0)
FeCl+2	1.075e-22	5.048e-23	-21.969	-22.297	-0.328	(0)
FeCl2+	8.555e-25	7.082e-25	-24.068	-24.150	-0.082	(0)
FeHSeO3+2	2.590e-25	9.275e-26	-24.587	-25.033	-0.446	(0)
Fe2 (OH) 2+4	4.917e-28	8.094e-30	-27.308	-29.092	-1.784	(0)
FeCl3	2.224e-28	2.224e-28	-27.653	-27.653	0.000	(0)
FeNO3+2	6.835e-29	2.448e-29	-28.165	-28.611	-0.446	(0)
Fe3 (OH) 4+5	1.982e-35	3.237e-38	-34.703	-37.490	-2.787	(0)
H (0)	3.992e-29					
H2	1.996e-29	2.018e-29	-28.700	-28.695	0.005	(0)
Hg (0)	2.793e-09					
Hg	2.793e-09	2.793e-09	-8.554	-8.554	0.000	(0)
Hg (1)	5.498e-21					
Hg2+2	2.749e-21	9.846e-22	-20.561	-21.007	-0.446	(0)
Hg (2)	1.139e-11					
Hg (OH) 2	6.707e-12	6.781e-12	-11.173	-11.169	0.005	(0)
HgClOH	4.143e-12	4.143e-12	-11.383	-11.383	0.000	(0)
HgCl2	5.122e-13	5.122e-13	-12.291	-12.291	0.000	(0)
HgCl3-	2.079e-14	1.609e-14	-13.682	-13.794	-0.111	(0)
HgCO3	2.862e-15	2.862e-15	-14.543	-14.543	0.000	(0)
HgCl4-2	5.616e-16	2.011e-16	-15.251	-15.696	-0.446	(0)
Hg (CO3) 2-2	1.163e-16	4.167e-17	-15.934	-16.380	-0.446	(0)
HgCl+	4.206e-17	3.254e-17	-16.376	-16.488	-0.111	(0)
HgOH+	3.844e-17	2.974e-17	-16.415	-16.527	-0.111	(0)
Hg (OH) 3-	1.588e-18	1.228e-18	-17.799	-17.911	-0.111	(0)
HgHCO3+	4.817e-19	3.727e-19	-18.317	-18.429	-0.111	(0)
Hg (NH3) 2+2	1.923e-21	6.886e-22	-20.716	-21.162	-0.446	(0)
Hg+2	1.450e-21	5.192e-22	-20.839	-21.285	-0.446	(0)
HgNH3+2	1.326e-21	4.750e-22	-20.877	-21.323	-0.446	(0)
HgSO4	7.515e-22	7.515e-22	-21.124	-21.124	0.000	(0)
HgF+	2.823e-24	2.184e-24	-23.549	-23.661	-0.111	(0)
Hg (NH3) 3+2	1.110e-29	3.975e-30	-28.955	-29.401	-0.446	(0)
HgNO3+	1.140e-30	8.818e-31	-29.943	-30.055	-0.111	(0)
Hg (NH3) 4+2	1.278e-37	4.577e-38	-36.894	-37.339	-0.446	(0)
Hg (NO3) 2	1.686e-39	1.686e-39	-38.773	-38.773	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.953	-139.064	-0.111	(0)
HgS2-2	0.000e+00	0.000e+00	-139.171	-139.617	-0.446	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.826	-140.826	0.000	(0)
K	4.923e-03					
K+	4.739e-03	3.904e-03	-2.324	-2.408	-0.084	(0)
KSO4-	1.838e-04	1.528e-04	-3.736	-3.816	-0.080	(0)
KCrO4-	2.216e-16	1.714e-16	-15.655	-15.766	-0.111	(0)
Mg	7.044e-03					
Mg+2	4.771e-03	2.197e-03	-2.321	-2.658	-0.337	(0)
MgSO4	2.210e-03	2.210e-03	-2.656	-2.656	0.000	(0)
MgF+	3.397e-05	2.798e-05	-4.469	-4.553	-0.084	(0)
MgHCO3+	1.886e-05	1.545e-05	-4.725	-4.811	-0.087	(0)
MgCO3	8.417e-06	8.417e-06	-5.075	-5.075	0.000	(0)
MgOH+	1.499e-06	1.259e-06	-5.824	-5.900	-0.076	(0)

MgH2BO3+	2.870e-07	2.309e-07	-6.542	-6.637	-0.095	(0)
Mn (2)	8.486e-05					
Mn+2	6.224e-05	2.230e-05	-4.206	-4.652	-0.446	(0)
MnSO4	2.192e-05	2.192e-05	-4.659	-4.659	0.000	(0)
MnHCO3+	3.691e-07	3.056e-07	-6.433	-6.515	-0.082	(0)
MnF+	1.217e-07	1.007e-07	-6.915	-6.997	-0.082	(0)
MnCl+	1.065e-07	8.815e-08	-6.973	-7.055	-0.082	(0)
MnOH+	9.732e-08	8.057e-08	-7.012	-7.094	-0.082	(0)
MnCl2	3.911e-10	3.911e-10	-9.408	-9.408	0.000	(0)
MnSeO4	9.759e-13	9.759e-13	-12.011	-12.011	0.000	(0)
MnCl3-	4.086e-13	3.383e-13	-12.389	-12.471	-0.082	(0)
MnNO3+	2.101e-13	1.625e-13	-12.678	-12.789	-0.111	(0)
Mn (OH) 3-	1.245e-15	1.031e-15	-14.905	-14.987	-0.082	(0)
Mn (OH) 4-2	1.019e-20	4.787e-21	-19.992	-20.320	-0.328	(0)
Mn (NO3) 2	1.878e-21	1.878e-21	-20.726	-20.726	0.000	(0)
MnSe	0.000e+00	0.000e+00	-40.836	-40.836	0.000	(0)
Mn (3)	2.360e-25					
Mn+3	2.360e-25	4.125e-26	-24.627	-25.385	-0.758	(0)
Mn (6)	9.209e-40					
MnO4-2	9.209e-40	4.326e-40	-39.036	-39.364	-0.328	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.027	-44.119	-0.092	(0)
Mo	2.743e-06					
MoO4-2	2.743e-06	1.263e-06	-5.562	-5.899	-0.337	(0)
HMoO4-	2.272e-10	1.758e-10	-9.644	-9.755	-0.111	(0)
H2MoO4	9.006e-15	9.006e-15	-14.045	-14.045	0.000	(0)
Ag2MoO4	6.014e-25	6.014e-25	-24.221	-24.221	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.980	-44.983	-1.003	(0)
Mo7O24-6	0.000e+00	0.000e+00	-49.528	-53.541	-4.013	(0)
HMo7O24-5	0.000e+00	0.000e+00	-52.522	-55.309	-2.787	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.899	-58.682	-1.784	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.588	-63.591	-1.003	(0)
N (-3)	2.483e-08					
NH4+	2.211e-08	1.778e-08	-7.655	-7.750	-0.095	(0)
NH3	1.450e-09	1.450e-09	-8.839	-8.839	0.000	(0)
NH4SO4-	1.272e-09	1.053e-09	-8.895	-8.977	-0.082	(0)
CaNH3+2	3.664e-12	1.312e-12	-11.436	-11.882	-0.446	(0)
CuNH3+2	2.006e-13	7.186e-14	-12.698	-13.143	-0.446	(0)
NiNH3+2	9.479e-14	3.395e-14	-13.023	-13.469	-0.446	(0)
Co (NH3) +2	1.528e-14	5.472e-15	-13.816	-14.262	-0.446	(0)
AgNH3+	4.291e-15	3.320e-15	-14.367	-14.479	-0.111	(0)
BaNH3+2	4.838e-17	1.733e-17	-16.315	-16.761	-0.446	(0)
Ag (NH3) 2+	5.057e-20	3.912e-20	-19.296	-19.408	-0.111	(0)
Ni (NH3) 2+2	1.986e-20	7.115e-21	-19.702	-20.148	-0.446	(0)
Ca (NH3) 2+2	2.115e-21	7.575e-22	-20.675	-21.121	-0.446	(0)
Hg (NH3) 2+2	1.923e-21	6.886e-22	-20.716	-21.162	-0.446	(0)
HgNH3+2	1.326e-21	4.750e-22	-20.877	-21.323	-0.446	(0)
Co (NH3) 2+2	9.447e-22	3.384e-22	-21.025	-21.471	-0.446	(0)
Co (NH3) 3+2	1.724e-29	6.176e-30	-28.763	-29.209	-0.446	(0)
Hg (NH3) 3+2	1.110e-29	3.975e-30	-28.955	-29.401	-0.446	(0)
Co (NH3) 4+2	1.312e-37	4.699e-38	-36.882	-37.328	-0.446	(0)
Hg (NH3) 4+2	1.278e-37	4.577e-38	-36.894	-37.339	-0.446	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.293	-45.739	-0.446	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.501	-45.947	-0.446	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.275	-53.721	-0.446	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-55.104	-56.108	-1.003	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-57.063	-57.508	-0.446	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.968	-68.414	-0.446	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.829	-69.275	-0.446	(0)
N (3)	6.022e-06					
NO2-	6.022e-06	4.875e-06	-5.220	-5.312	-0.092	(0)
CuNO2+	3.197e-12	2.473e-12	-11.495	-11.607	-0.111	(0)
CoNO2+	1.394e-12	1.078e-12	-11.856	-11.967	-0.111	(0)
AgNO2	1.142e-12	1.142e-12	-11.942	-11.942	0.000	(0)
Cu (NO2) 2	1.234e-16	1.234e-16	-15.909	-15.909	0.000	(0)
Ag (NO2) 2-	1.115e-17	8.626e-18	-16.953	-17.064	-0.111	(0)
N (5)	5.597e-09					

NO3-	5.583e-09	4.599e-09	-8.253	-8.337	-0.084	(0)
CaNO3+	1.352e-11	1.046e-11	-10.869	-10.981	-0.111	(0)
MnNO3+	2.101e-13	1.625e-13	-12.678	-12.789	-0.111	(0)
ZnNO3+	2.888e-14	2.234e-14	-13.539	-13.651	-0.111	(0)
NiNO3+	6.512e-16	5.038e-16	-15.186	-15.298	-0.111	(0)
BaNO3+	5.644e-16	4.367e-16	-15.248	-15.360	-0.111	(0)
CoNO3+	2.958e-16	2.288e-16	-15.529	-15.640	-0.111	(0)
CuNO3+	9.107e-17	7.046e-17	-16.041	-16.152	-0.111	(0)
CdNO3+	4.608e-17	3.565e-17	-16.337	-16.448	-0.111	(0)
PbNO3+	7.973e-18	6.168e-18	-17.098	-17.210	-0.111	(0)
AgNO3	4.097e-18	4.097e-18	-17.387	-17.387	0.000	(0)
Mn(NO3)2	1.878e-21	1.878e-21	-20.726	-20.726	0.000	(0)
UO2NO3+	2.218e-22	1.716e-22	-21.654	-21.766	-0.111	(0)
Zn(NO3)2	2.050e-23	2.050e-23	-22.688	-22.688	0.000	(0)
Co(NO3)2	2.142e-24	2.142e-24	-23.669	-23.669	0.000	(0)
Cd(NO3)2	8.217e-26	8.217e-26	-25.085	-25.085	0.000	(0)
Pb(NO3)2	4.818e-26	4.818e-26	-25.317	-25.317	0.000	(0)
CrNO3+2	4.719e-26	1.690e-26	-25.326	-25.772	-0.446	(0)
Cu(NO3)2	4.080e-26	4.080e-26	-25.389	-25.389	0.000	(0)
VO2NO3	8.145e-27	8.145e-27	-26.089	-26.089	0.000	(0)
FeNO3+2	6.835e-29	2.448e-29	-28.165	-28.611	-0.446	(0)
HgNO3+	1.140e-30	8.818e-31	-29.943	-30.055	-0.111	(0)
Hg(NO3)2	1.686e-39	1.686e-39	-38.773	-38.773	0.000	(0)
Na	1.210e-02					
Na+	1.175e-02	9.680e-03	-1.930	-2.014	-0.084	(0)
NaSO4-	3.458e-04	2.874e-04	-3.461	-3.542	-0.080	(0)
NaHCO3	3.740e-06	3.740e-06	-5.427	-5.427	0.000	(0)
NaCO3-	9.987e-07	8.301e-07	-6.001	-6.081	-0.080	(0)
NaF	6.930e-07	6.930e-07	-6.159	-6.159	0.000	(0)
NaH2BO3	4.649e-08	4.649e-08	-7.333	-7.333	0.000	(0)
NaCrO4-	7.347e-16	5.684e-16	-15.134	-15.245	-0.111	(0)
Ni	1.568e-07					
Ni+2	9.468e-08	4.361e-08	-7.024	-7.360	-0.337	(0)
NiSO4	4.810e-08	4.810e-08	-7.318	-7.318	0.000	(0)
NiCO3	7.492e-09	7.492e-09	-8.125	-8.125	0.000	(0)
NiHCO3+	4.774e-09	3.693e-09	-8.321	-8.433	-0.111	(0)
NiOH+	1.021e-09	7.898e-10	-8.991	-9.102	-0.111	(0)
NiCl+	4.530e-10	3.504e-10	-9.344	-9.455	-0.111	(0)
NiF+	1.607e-10	1.243e-10	-9.794	-9.906	-0.111	(0)
Ni(OH)2	9.026e-11	9.026e-11	-10.045	-10.045	0.000	(0)
Ni(SO4)2-2	2.458e-11	8.804e-12	-10.609	-11.055	-0.446	(0)
Ni(OH)3-	1.678e-13	1.298e-13	-12.775	-12.887	-0.111	(0)
NiNH3+2	9.479e-14	3.395e-14	-13.023	-13.469	-0.446	(0)
NiCl2	5.541e-15	5.541e-15	-14.256	-14.256	0.000	(0)
NiSeO4	3.317e-15	3.317e-15	-14.479	-14.479	0.000	(0)
NiNO3+	6.512e-16	5.038e-16	-15.186	-15.298	-0.111	(0)
Ni(NH3)2+2	1.986e-20	7.115e-21	-19.702	-20.148	-0.446	(0)
O(0)	2.458e-35					
O2	1.229e-35	1.243e-35	-34.910	-34.906	0.005	(0)
Pb	2.279e-09					
PbCO3	1.255e-09	1.255e-09	-8.901	-8.901	0.000	(0)
PbOH+	4.235e-10	3.276e-10	-9.373	-9.485	-0.111	(0)
PbSO4	2.455e-10	2.455e-10	-9.610	-9.610	0.000	(0)
Pb+2	1.968e-10	9.066e-11	-9.706	-10.043	-0.337	(0)
PbHCO3+	5.982e-11	4.628e-11	-10.223	-10.335	-0.111	(0)
Pb(CO3)2-2	4.654e-11	1.667e-11	-10.332	-10.778	-0.446	(0)
Pb(SO4)2-2	2.283e-11	8.176e-12	-10.642	-11.087	-0.446	(0)
Pb(OH)2	1.491e-11	1.491e-11	-10.827	-10.827	0.000	(0)
PbCl+	1.306e-11	1.010e-11	-10.884	-10.996	-0.111	(0)
PbF+	9.371e-13	7.249e-13	-12.028	-12.140	-0.111	(0)
PbCl2	1.417e-13	1.417e-13	-12.849	-12.849	0.000	(0)
Pb(OH)3-	2.772e-14	2.144e-14	-13.557	-13.669	-0.111	(0)
PbF2	1.619e-15	1.619e-15	-14.791	-14.791	0.000	(0)
PbCl3-	2.291e-16	1.772e-16	-15.640	-15.751	-0.111	(0)
Pb(OH)4-2	2.109e-17	7.555e-18	-16.676	-17.122	-0.446	(0)
PbNO3+	7.973e-18	6.168e-18	-17.098	-17.210	-0.111	(0)
Pb2OH+3	4.743e-18	4.708e-19	-17.324	-18.327	-1.003	(0)
PbCl4-2	7.103e-19	2.544e-19	-18.149	-18.594	-0.446	(0)

PbF3-	4.504e-19	3.484e-19	-18.346	-18.458	-0.111	(0)
Pb3 (OH) 4+2	1.122e-21	4.019e-22	-20.950	-21.396	-0.446	(0)
PbF4-2	5.283e-23	1.892e-23	-22.277	-22.723	-0.446	(0)
Pb (NO3) 2	4.818e-26	4.818e-26	-25.317	-25.317	0.000	(0)
Pb4 (OH) 4+4	1.758e-26	2.894e-28	-25.755	-27.538	-1.784	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.636	-152.636	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.156	-230.267	-0.111	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.067	-74.067	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.820	-78.932	-0.111	(0)
CdHS+	0.000e+00	0.000e+00	-79.423	-79.534	-0.111	(0)
S5-2	0.000e+00	0.000e+00	-79.695	-80.141	-0.446	(0)
H2S	0.000e+00	0.000e+00	-80.067	-80.067	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.211	-80.657	-0.446	(0)
S4-2	0.000e+00	0.000e+00	-80.291	-80.737	-0.446	(0)
S3-2	0.000e+00	0.000e+00	-81.097	-81.543	-0.446	(0)
S2-2	0.000e+00	0.000e+00	-82.113	-82.559	-0.446	(0)
S-2	0.000e+00	0.000e+00	-87.748	-88.076	-0.328	(0)
HgHS2-	0.000e+00	0.000e+00	-138.953	-139.064	-0.111	(0)
HgS2-2	0.000e+00	0.000e+00	-139.171	-139.617	-0.446	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.826	-140.826	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.227	-0.215	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.026	-148.404	-0.378	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.500	-148.611	-0.111	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.776	-149.134	-0.359	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.787	-148.899	-0.111	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.123	-149.512	-0.389	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.454	-149.823	-0.368	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.757	-150.757	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.262	-151.262	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.636	-152.636	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.772	-161.772	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.099	-219.210	-0.111	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.297	-226.408	-0.111	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.787	-228.233	-0.446	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.182	-228.293	-0.111	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.156	-230.267	-0.111	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.555	-238.667	-0.111	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.583	-305.029	-0.446	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.354	-306.800	-0.446	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.897	-322.343	-0.446	(0)
S (6)	1.568e-02					
SO4-2	1.200e-02	5.528e-03	-1.921	-2.257	-0.337	(0)
MgSO4	2.210e-03	2.210e-03	-2.656	-2.656	0.000	(0)
CaSO4	9.106e-04	9.106e-04	-3.041	-3.041	0.000	(0)
NaSO4-	3.458e-04	2.874e-04	-3.461	-3.542	-0.080	(0)
KSO4-	1.838e-04	1.528e-04	-3.736	-3.816	-0.080	(0)
MnSO4	2.192e-05	2.192e-05	-4.659	-4.659	0.000	(0)
ZnSO4	2.339e-06	2.339e-06	-5.631	-5.631	0.000	(0)
Zn (SO4) 2-2	3.143e-07	1.126e-07	-6.503	-6.948	-0.446	(0)
NiSO4	4.810e-08	4.810e-08	-7.318	-7.318	0.000	(0)
CoSO4	3.462e-08	3.462e-08	-7.461	-7.461	0.000	(0)
CuSO4	6.134e-09	6.134e-09	-8.212	-8.212	0.000	(0)
HSO4-	4.587e-09	3.778e-09	-8.338	-8.423	-0.084	(0)
CdSO4	3.176e-09	3.176e-09	-8.498	-8.498	0.000	(0)
NH4SO4-	1.272e-09	1.053e-09	-8.895	-8.977	-0.082	(0)
Cd (SO4) 2-2	6.612e-10	2.368e-10	-9.180	-9.626	-0.446	(0)
PbSO4	2.455e-10	2.455e-10	-9.610	-9.610	0.000	(0)
AgSO4-	1.599e-10	1.237e-10	-9.796	-9.908	-0.111	(0)
Ni (SO4) 2-2	2.458e-11	8.804e-12	-10.609	-11.055	-0.446	(0)
Pb (SO4) 2-2	2.283e-11	8.176e-12	-10.642	-11.087	-0.446	(0)
CrOHSO4	3.471e-12	3.471e-12	-11.460	-11.460	0.000	(0)
FeSO4	1.877e-13	1.877e-13	-12.727	-12.727	0.000	(0)
UO2SO4	1.564e-13	1.564e-13	-12.806	-12.806	0.000	(0)
UO2 (SO4) 2-2	3.183e-14	1.140e-14	-13.497	-13.943	-0.446	(0)
AlSO4+	1.156e-14	9.519e-15	-13.937	-14.021	-0.084	(0)
CrSO4+	1.403e-15	1.085e-15	-14.853	-14.964	-0.111	(0)
Al (SO4) 2-	6.846e-16	5.639e-16	-15.165	-15.249	-0.084	(0)

VO2SO4-	5.973e-19	4.621e-19	-18.224	-18.335	-0.111	(0)
FeSO4+	3.988e-20	3.301e-20	-19.399	-19.481	-0.082	(0)
Fe (SO4) 2-	5.044e-21	3.902e-21	-20.297	-20.409	-0.111	(0)
Cr2 (OH) 2SO4+2	2.318e-21	8.302e-22	-20.635	-21.081	-0.446	(0)
HgSO4	7.515e-22	7.515e-22	-21.124	-21.124	0.000	(0)
VOSO4	5.038e-22	5.038e-22	-21.298	-21.298	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.726e-22	2.726e-22	-21.564	-21.564	0.000	(0)
CrO3SO4-2	8.799e-24	3.152e-24	-23.056	-23.501	-0.446	(0)
VSO4+	6.551e-37	5.068e-37	-36.184	-36.295	-0.111	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.579	-42.025	-0.446	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.993	-64.104	-0.111	(0)
Sb (3)	2.803e-20					
Sb (OH) 3	1.418e-20	1.418e-20	-19.848	-19.848	0.000	(0)
HSbO2	1.385e-20	1.385e-20	-19.859	-19.859	0.000	(0)
SbO2-	4.145e-24	3.207e-24	-23.382	-23.494	-0.111	(0)
Sb (OH) 4-	2.372e-24	1.835e-24	-23.625	-23.736	-0.111	(0)
Sb (OH) 2F	1.759e-26	1.759e-26	-25.755	-25.755	0.000	(0)
SbOF	1.731e-26	1.731e-26	-25.762	-25.762	0.000	(0)
Sb (OH) 2+	3.115e-27	2.409e-27	-26.507	-26.618	-0.111	(0)
SbO+	1.075e-27	8.313e-28	-26.969	-27.080	-0.111	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.897	-322.343	-0.446	(0)
Sb (5)	3.852e-08					
SbO3-	3.848e-08	2.977e-08	-7.415	-7.526	-0.111	(0)
Sb (OH) 6-	4.218e-11	3.475e-11	-10.375	-10.459	-0.084	(0)
SbO2+	5.403e-25	4.180e-25	-24.267	-24.379	-0.111	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.434e-39	1.109e-39	-38.843	-38.955	-0.111	(0)
MnSe	0.000e+00	0.000e+00	-40.836	-40.836	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.220	-43.220	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.354	-45.800	-0.446	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.120	-82.903	-1.784	(0)
Se (4)	1.901e-07					
SeO3-2	1.048e-07	3.754e-08	-6.980	-7.426	-0.446	(0)
HSeO3-	8.525e-08	6.595e-08	-7.069	-7.181	-0.111	(0)
H2SeO3	1.968e-13	1.968e-13	-12.706	-12.706	0.000	(0)
AgSeO3-	3.498e-14	2.706e-14	-13.456	-13.568	-0.111	(0)
Cd (SeO3) 2-2	7.947e-18	2.846e-18	-17.100	-17.546	-0.446	(0)
Ag (SeO3) 2-3	9.163e-20	9.095e-21	-19.038	-20.041	-1.003	(0)
FeHSeO3+2	2.590e-25	9.275e-26	-24.587	-25.033	-0.446	(0)
Se (6)	3.541e-10					
SeO4-2	3.531e-10	1.626e-10	-9.452	-9.789	-0.337	(0)
MnSeO4	9.759e-13	9.759e-13	-12.011	-12.011	0.000	(0)
ZnSeO4	4.870e-14	4.870e-14	-13.312	-13.312	0.000	(0)
NiSeO4	3.317e-15	3.317e-15	-14.479	-14.479	0.000	(0)
CoSeO4	2.559e-15	2.559e-15	-14.592	-14.592	0.000	(0)
CdSeO4	7.422e-17	7.422e-17	-16.129	-16.129	0.000	(0)
HSeO4-	7.369e-17	5.700e-17	-16.133	-16.244	-0.111	(0)
Zn (SeO4) 2-2	2.242e-23	8.031e-24	-22.649	-23.095	-0.446	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.777	-59.780	-1.003	(0)
U (4)	2.507e-19					
U (OH) 5-	2.507e-19	1.939e-19	-18.601	-18.712	-0.111	(0)
U (OH) 4	5.684e-23	5.684e-23	-22.245	-22.245	0.000	(0)
U (OH) 3+	1.880e-27	1.455e-27	-26.726	-26.837	-0.111	(0)
U (OH) 2+2	1.314e-32	4.707e-33	-31.881	-32.327	-0.446	(0)
UF3+	3.228e-37	2.498e-37	-36.491	-36.602	-0.111	(0)
UF2+2	3.877e-38	1.389e-38	-37.411	-37.857	-0.446	(0)
UOH+3	1.563e-38	1.552e-39	-37.806	-38.809	-1.003	(0)
UF4	3.107e-39	3.107e-39	-38.508	-38.508	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.009	-41.012	-1.003	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.743	-40.855	-0.111	(0)
USO4+2	0.000e+00	0.000e+00	-41.579	-42.025	-0.446	(0)
UF6-2	0.000e+00	0.000e+00	-41.874	-42.320	-0.446	(0)
U+4	0.000e+00	0.000e+00	-44.584	-46.367	-1.784	(0)
UC1+3	0.000e+00	0.000e+00	-46.167	-47.170	-1.003	(0)

U6 (OH) 15+9	0.000e+00	0.000e+00	-164.004	-173.034	-9.029	(0)
U (5)	3.557e-16					
UO2+	3.557e-16	2.751e-16	-15.449	-15.560	-0.111	(0)
U (6)	5.299e-07					
UO2 (CO3) 3-4	4.417e-07	7.270e-09	-6.355	-8.138	-1.784	(0)
UO2 (CO3) 2-2	8.794e-08	3.150e-08	-7.056	-7.502	-0.446	(0)
UO2CO3	3.428e-10	3.428e-10	-9.465	-9.465	0.000	(0)
UO2OH+	4.377e-12	3.386e-12	-11.359	-11.470	-0.111	(0)
UO2F+	3.786e-13	2.929e-13	-12.422	-12.533	-0.111	(0)
UO2SO4	1.564e-13	1.564e-13	-12.806	-12.806	0.000	(0)
UO2F2	9.584e-14	9.584e-14	-13.018	-13.018	0.000	(0)
UO2+2	4.059e-14	1.870e-14	-13.392	-13.728	-0.337	(0)
UO2 (SO4) 2-2	3.183e-14	1.140e-14	-13.497	-13.943	-0.446	(0)
UO2F3-	3.531e-15	2.732e-15	-14.452	-14.564	-0.111	(0)
(UO2) 3 (OH) 5+	1.308e-16	1.012e-16	-15.883	-15.995	-0.111	(0)
UO2Cl+	1.231e-16	9.524e-17	-15.910	-16.021	-0.111	(0)
(UO2) 2 (OH) 2+2	5.314e-17	1.903e-17	-16.275	-16.721	-0.446	(0)
UO2F4-2	6.874e-18	2.462e-18	-17.163	-17.609	-0.446	(0)
UO2NO3+	2.218e-22	1.716e-22	-21.654	-21.766	-0.111	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.860	-43.971	-0.111	(0)
V+2	0.000e+00	0.000e+00	-45.193	-45.639	-0.446	(0)
V (3)	4.665e-16					
V (OH) 3	4.665e-16	4.665e-16	-15.331	-15.331	0.000	(0)
V (OH) 2+	2.727e-27	2.109e-27	-26.564	-26.676	-0.111	(0)
VOH+2	3.909e-31	1.400e-31	-30.408	-30.854	-0.446	(0)
V+3	1.957e-36	1.942e-37	-35.709	-36.712	-1.003	(0)
VSO4+	6.551e-37	5.068e-37	-36.184	-36.295	-0.111	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-58.074	-59.078	-1.003	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-59.124	-60.908	-1.784	(0)
V (4)	1.244e-19					
V (OH) 3+	1.227e-19	9.492e-20	-18.911	-19.023	-0.111	(0)
VO+2	9.238e-22	3.309e-22	-21.034	-21.480	-0.446	(0)
VOSO4	5.038e-22	5.038e-22	-21.298	-21.298	0.000	(0)
VOF+	2.911e-22	2.252e-22	-21.536	-21.647	-0.111	(0)
VOF2	9.583e-24	9.583e-24	-23.019	-23.019	0.000	(0)
VOC1+	3.769e-24	2.916e-24	-23.424	-23.535	-0.111	(0)
VOF3-	4.987e-26	3.858e-26	-25.302	-25.414	-0.111	(0)
VOF4-2	4.933e-29	1.767e-29	-28.307	-28.753	-0.446	(0)
H2V2O4+2	1.262e-33	4.522e-34	-32.899	-33.345	-0.446	(0)
V (5)	8.222e-09					
H2VO4-	4.630e-09	3.582e-09	-8.334	-8.446	-0.111	(0)
HVO4-2	3.591e-09	1.286e-09	-8.445	-8.891	-0.446	(0)
H3VO4	2.505e-13	2.505e-13	-12.601	-12.601	0.000	(0)
HV2O7-3	1.574e-14	1.562e-15	-13.803	-14.806	-1.003	(0)
VO4-3	9.288e-15	9.219e-16	-14.032	-15.035	-1.003	(0)
H3V2O7-	7.494e-15	5.797e-15	-14.125	-14.237	-0.111	(0)
V2O7-4	3.653e-16	6.013e-18	-15.437	-17.221	-1.784	(0)
VO2+	4.250e-18	3.501e-18	-17.372	-17.456	-0.084	(0)
VO2F	6.967e-19	6.967e-19	-18.157	-18.157	0.000	(0)
VO2SO4-	5.973e-19	4.621e-19	-18.224	-18.335	-0.111	(0)
V3O9-3	4.859e-19	4.822e-20	-18.313	-19.317	-1.003	(0)
VO2F2-	3.710e-20	2.870e-20	-19.431	-19.542	-0.111	(0)
VO2F3-2	1.134e-22	4.063e-23	-21.945	-22.391	-0.446	(0)
V4O12-4	4.378e-24	7.206e-26	-23.359	-25.142	-1.784	(0)
VO2F4-3	2.286e-26	2.268e-27	-25.641	-26.644	-1.003	(0)
VO2NO3	8.145e-27	8.145e-27	-26.089	-26.089	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.158	-68.171	-4.013	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.352	-68.139	-2.787	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.303	-71.087	-1.784	(0)
Zn	7.894e-06					
Zn+2	4.198e-06	1.934e-06	-5.377	-5.714	-0.337	(0)
ZnSO4	2.339e-06	2.339e-06	-5.631	-5.631	0.000	(0)
ZnCO3	5.124e-07	5.124e-07	-6.290	-6.290	0.000	(0)
ZnOH+	3.596e-07	2.782e-07	-6.444	-6.556	-0.111	(0)
Zn (SO4) 2-2	3.143e-07	1.126e-07	-6.503	-6.948	-0.446	(0)
Zn (OH) 2	6.343e-08	6.343e-08	-7.198	-7.198	0.000	(0)
ZnHCO3+	5.430e-08	4.201e-08	-7.265	-7.377	-0.111	(0)

ZnOHCl	2.873e-08	2.873e-08	-7.542	-7.542	0.000	(0)
ZnCl+	1.862e-08	1.525e-08	-7.730	-7.817	-0.087	(0)
ZnF+	5.659e-09	4.378e-09	-8.247	-8.359	-0.111	(0)
Zn(OH) 3-	5.912e-10	4.573e-10	-9.228	-9.340	-0.111	(0)
ZnCl2	7.593e-11	7.593e-11	-10.120	-10.120	0.000	(0)
ZnCl3-	2.312e-13	1.894e-13	-12.636	-12.723	-0.087	(0)
Zn(OH) 4-2	7.313e-14	2.619e-14	-13.136	-13.582	-0.446	(0)
ZnSeO4	4.870e-14	4.870e-14	-13.312	-13.312	0.000	(0)
ZnNO3+	2.888e-14	2.234e-14	-13.539	-13.651	-0.111	(0)
ZnCl4-2	6.333e-16	2.975e-16	-15.198	-15.527	-0.328	(0)
Zn(SeO4) 2-2	2.242e-23	8.031e-24	-22.649	-23.095	-0.446	(0)
Zn(NO3) 2	2.050e-23	2.050e-23	-22.688	-22.688	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.500	-148.611	-0.111	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.757	-150.757	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.297	-226.408	-0.111	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.787	-228.233	-0.446	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.354	-306.800	-0.446	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-58.73	-52.44	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-45.28	-40.77	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-52.50	-40.77	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-75.80	-57.87	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-60.39	-40.36	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-29.83	-29.43	0.40	(NH4)2CrO4	
(NH4)2SeO4	-25.74	-25.29	0.45	(NH4)2SeO4	
Acanthite	-52.46	-88.68	-36.22	Ag2S	
Ag2CO3	-12.15	-23.24	-11.09	Ag2CO3	
Ag2CrO4	-20.24	-31.83	-11.59	Ag2CrO4	
Ag2HVO4	-12.37	-10.89	1.48	Ag2HVO4	
Ag2MoO4	-12.25	-23.80	-11.55	Ag2MoO4	
Ag2O	-14.16	-1.59	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-15.34	-20.16	-4.82	Ag2SO4	
Ag3AsO3	-28.53	-26.37	2.16	Ag3AsO3	
Ag3AsO4	-16.94	-19.72	-2.79	Ag3AsO4	
Ag3H2VO5	-16.87	-11.69	5.18	Ag3H2VO5	
AgF·4H2O	-13.95	-12.90	1.05	AgF·4H2O	
Agmetal	-0.06	-13.57	-13.51	Ag	
AgVO3	-10.87	-10.10	0.77	AgVO3	
Al(OH)3(am)	-1.99	8.81	10.80	Al(OH)3	
Al2(MoO4)3	-51.37	-49.00	2.37	Al2(MoO4)3	
Al2O3	-2.03	17.62	19.65	Al2O3	
Al4(OH)10SO4	-6.02	16.68	22.70	Al4(OH)10SO4	
AlAsO4·2H2O	-13.33	-8.53	4.80	AlAsO4·2H2O	
AlOHSO4	-6.53	-9.76	-3.23	AlOHSO4	
AlSb	-153.29	-87.67	65.62	AlSb	
Alunite	-3.56	-4.96	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.51	-12.30	-7.79	PbSO4	
Anhydrite	-1.04	-5.40	-4.36	CaSO4	
Anilite	-56.34	-88.22	-31.88	Cu0.25Cu1.5S	
Antlerite	-3.37	5.42	8.79	Cu3(OH)4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-93.17	-95.93	-2.76	As4O6	
Artinite	-3.94	5.66	9.60	MgCO3:Mg(OH)2·3H2O	
As2O5	-41.38	-34.67	6.71	As2O5	
Atacamite	-2.06	5.33	7.39	Cu2(OH)3Cl	
Azurite	-2.40	-19.31	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2·8H2O	-15.81	8.58	24.39	Ba(OH)2·8H2O	
Ba2V2O7·2H2O	-17.30	-1.43	15.87	Ba2V2O7·2H2O	
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2	
Ba3(VO4)2·4H2O	-25.78	7.16	32.94	Ba3(VO4)2·4H2O	
BaCrO4	-11.98	-21.65	-9.67	BaCrO4	

BaF2	-9.79	-15.61	-5.82	BaF2
BaMoO4	-6.66	-13.62	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.58	-6.75	1.83	BaSeO3
BaSeO4	-10.05	-17.51	-7.46	BaSeO4
Bianchite	-6.21	-7.97	-1.76	ZnSO4:6H2O
Birnessite	-6.24	11.85	18.09	MnO2
Bixbyite	-1.19	-1.84	-0.64	Mn2O3
BlaubleiI	-56.15	-80.31	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-56.68	-83.96	-27.28	Cu0.6Cu0.8S
Boehmite	0.23	8.81	8.58	AlOOH
Breithauptite	-56.24	-74.76	-18.52	NiSb
Brochantite	-1.81	13.41	15.22	Cu4(OH)6SO4
Brucite	-3.19	13.65	16.84	Mg(OH)2
Bunsenite	-3.50	8.95	12.45	NiO
Ca(VO3)2	-11.09	-5.43	5.66	Ca(VO3)2
Ca2V2O7	-9.77	7.73	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.82	7.73	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.47	4.83	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.06	20.90	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.96	20.90	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.44	-153.46	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.10	-26.01	-17.91	Hg2Cl2
CaMoO4	-1.09	-9.04	-7.95	CaMoO4
Carnotite	-1.20	-0.97	0.23	KUO2VO4
CaSeO3:2H2O	-4.98	-2.17	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.91	-12.93	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.01	-1.17	9.84	Cd(BO2)2
Cd(OH)2	-5.94	7.70	13.64	Cd(OH)2
Cd(OH)2(am)	-6.03	7.70	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.75	-14.04	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.03	4.53	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.17	12.23	28.40	Cd4(OH)6SO4
CdCl2	-12.96	-13.62	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.62	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.62	-1.91	CdCl2:2.5H2O
CdF2	-15.29	-16.50	-1.21	CdF2
Cdmetal(alpha)	-31.36	-17.85	13.51	Cd
Cdmetal(gamma)	-31.46	-17.85	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-6.50	-2.96	3.54	CdOHCl
CdSb	-75.66	-76.01	-0.35	CdSb
CdSe	-19.21	-39.41	-20.20	CdSe
CdSeO4:2H2O	-16.55	-18.40	-1.85	CdSeO4:2H2O
CdSO4	-10.70	-10.87	-0.17	CdSO4
CdSO4:1H2O	-9.14	-10.87	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.00	-10.87	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.70	-11.45	-9.75	AgCl
Cerrusite	-2.25	-15.38	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.93	-10.57	-2.64	CuSO4:5H2O
Chalcocite	-56.34	-91.26	-34.92	Cu2S
Chalcopyrite	-127.46	-162.73	-35.27	CuFeS2
Cinnabar	-52.56	-98.25	-45.69	HgS
Claudetite	-92.87	-95.93	-3.06	As4O6
Clausthalite	-13.74	-40.84	-27.10	PbSe
Co(BO2)2	-27.14	-0.07	27.07	Co(BO2)2
Co(OH)2	-4.29	8.81	13.09	Co(OH)2
Co(OH)3	-8.51	-10.82	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.29	-8.25	13.03	Co3(AsO4)2
Co3O4	-2.34	-12.83	-10.50	Co3O4
CoCl2	-20.78	-12.51	8.27	CoCl2
CoCl2:6H2O	-15.05	-12.51	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3

CoF2	-13.80	-15.39	-1.60	CoF2
CoF3	-45.66	-47.12	-1.46	CoF3
CoFe2O4	18.72	15.19	-3.53	CoFe2O4
CoMoO4	-5.64	-13.40	-7.76	CoMoO4
CoO	-4.78	8.81	13.59	CoO
CoS (alpha)	-70.84	-78.28	-7.44	CoS
CoS (beta)	-67.21	-78.28	-11.07	CoS
CoSe	-22.10	-38.30	-16.20	CoSe
CoSeO3	-7.85	-6.53	1.32	CoSeO3
CoSeO4:6H2O	-15.76	-17.29	-1.53	CoSeO4:6H2O
CoSO4	-12.56	-9.76	2.80	CoSO4
CoSO4:6H2O	-7.29	-9.76	-2.47	CoSO4:6H2O
Cotunnite	-10.27	-15.05	-4.78	PbCl2
Covellite	-56.79	-79.09	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.41	-32.32	14.09	CrCl2
CrCl3	-48.27	-33.15	15.11	CrCl3
CrF3	-26.14	-37.48	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.53	-45.37	-33.84	Na3AlF6
Cu (OH) 2	-0.68	8.00	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.82	19.39	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.75	-0.50	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.69	-90.57	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.48	-51.28	-45.80	Cu2Se
Cu2SO4	-20.79	-22.74	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-16.79	-10.69	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.15	-102.74	-42.59	Cu3Sb
Cu3Se2	-26.91	-90.40	-63.49	Cu3Se2
CuCO3	-2.15	-13.65	-11.50	CuCO3
CuCrO4	-16.80	-22.24	-5.44	CuCrO4
CuF	-9.28	-14.19	-4.91	CuF
CuF2	-17.32	-16.21	1.12	CuF2
CuF2:2H2O	-11.66	-16.21	-4.55	CuF2:2H2O
Cumetal	-6.10	-14.86	-8.76	Cu
CuMoO4	-1.14	-14.21	-13.08	CuMoO4
CuOCuSO4	-12.88	-2.58	10.30	CuOCuSO4
Cupricferrite	8.39	14.38	5.99	CuFe2O4
Cuprite	-2.77	-4.17	-1.41	Cu2O
Cuprousferrite	10.02	1.10	-8.92	CuFeO2
CuSe	-6.01	-39.11	-33.10	CuSe
CuSe2	-27.31	-60.68	-33.37	CuSe2
CuSeO3:2H2O	-7.85	-7.34	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.67	-18.11	-2.44	CuSeO4:5H2O
CuSO4	-13.51	-10.57	2.94	CuSO4
Diaspore	1.94	8.81	6.87	AlOOH
Djurleite	-56.54	-90.46	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.07	-16.47	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.62	-16.47	-17.09	CaMg (CO3) 2
Epsomite	-2.79	-4.92	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.03	-0.01	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-11.43	-15.15	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.51	-8.95	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.00	-39.62	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.59	-49.32	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-14.55	-14.15	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.67	-18.76	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.63	-65.22	-18.60	FeSe2
FeS (ppt)	-80.69	-83.64	-2.95	FeS
FeSe	-32.66	-43.66	-11.00	FeSe

Fix_pe	-4.62	-4.62	0.00	e-
Fluorite	-0.53	-11.03	-10.50	CaF2
Galena	-66.85	-80.82	-13.97	PbS
Gibbsite	0.52	8.81	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.96	-7.97	-2.01	ZnSO4:7H2O
Greenockite	-65.03	-79.39	-14.36	CdS
Greigite	-293.48	-338.51	-45.03	Fe3S4
Gummite	-5.09	2.58	7.67	UO3
Gypsum	-0.79	-5.40	-4.61	CaSO4:2H2O
H-Jarosite	-15.46	-27.56	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.33	-22.21	-12.88	H2MoO4
H2S (g)	-79.08	-87.09	-8.01	H2S
H2Se (g)	-42.15	-47.11	-4.96	H2Se
Halite	-6.12	-4.52	1.60	NaCl
Hausmannite	-0.51	60.52	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.82	21.07	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.11	-258.82	-73.71	Hg (CH3) 2
Hg (g)	-7.25	-15.12	-7.87	Hg
Hg (OH) 2	-7.67	-11.17	-3.50	Hg (OH) 2
Hg2 (g)	-15.29	-30.24	-14.96	Hg2
Hg2 (OH) 2	-9.96	-4.70	5.26	Hg2 (OH) 2
Hg2CO3	-10.29	-26.34	-16.05	Hg2CO3
Hg2CrO4	-26.23	-34.93	-8.70	Hg2CrO4
Hg2F2	-18.53	-28.90	-10.36	Hg2F2
Hg2S	-80.11	-91.78	-11.68	Hg2S
Hg2SeO3	-15.38	-20.03	-4.66	Hg2SeO3
Hg2SO4	-17.13	-23.26	-6.13	Hg2SO4
Hg3O2CO3	-25.47	-55.15	-29.68	Hg3O2CO3
HgCl (g)	-32.50	-13.01	19.50	HgCl
HgCl2	-11.22	-32.48	-21.26	HgCl2
HgF (g)	-47.12	-14.45	32.68	HgF
HgF2 (g)	-47.93	-35.37	12.57	HgF2
Hgmetal (l)	-1.67	-15.12	-13.45	Hg
HgSe	-2.58	-58.28	-55.69	HgSe
HgSeO3	-14.07	-26.50	-12.43	HgSeO3
HgSO4	-20.32	-29.74	-9.42	HgSO4
Huntite	-2.50	-32.46	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.72	-24.49	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.56	-18.33	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.41	-22.58	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.02	-21.82	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.74	-48.98	-17.24	K2Cr2O7
K2CrO4	-18.23	-18.74	-0.51	K2CrO4
K2MoO4	-13.98	-10.72	3.26	K2MoO4
K2SeO4	-13.88	-14.61	-0.73	K2SeO4
Langite	-4.08	13.41	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.60	-6.03	-0.43	PbO:PbSO4
Laurionite	-5.01	-4.39	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.43	6.27	12.69	PbO
Mackinawite	-80.04	-83.64	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.18	20.04	16.86	Fe2MgO4
Magnesite	-0.53	-7.99	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-0.35	-5.66	-5.31	Cu2 (OH) 2CO3
Manganite	-0.91	24.43	25.34	MnOOH
Massicot	-6.63	6.27	12.89	PbO
Matlockite	-7.52	-16.49	-8.97	PbClF
Melanothallite	-19.58	-13.32	6.26	CuCl2
Melanterite	-12.91	-15.12	-2.21	FeSO4:7H2O
Metacinnabar	-53.16	-98.25	-45.09	HgS
Mg (OH) 2 (active)	-5.14	13.65	18.79	Mg (OH) 2
Mg (VO3) 2	-16.23	-4.95	11.28	Mg (VO3) 2
Mg2Sb3	-272.96	-198.28	74.68	Mg2Sb3

Mg2V2O7	-17.66	8.70	26.36	Mg2V2O7
MgCr2O4	-4.91	11.29	16.20	MgCr2O4
MgCrO4	-21.97	-16.59	5.38	MgCrO4
MgF2	-2.42	-10.55	-8.13	MgF2
MgMoO4	-6.71	-8.56	-1.85	MgMoO4
MgSeO3:6H2O	-4.74	-1.69	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.25	-12.45	-1.20	MgSeO4:6H2O
Minium	-29.17	44.35	73.52	Pb3O4
Mirabilite	-5.17	-6.29	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.84	-6.94	4.90	Mn(VO3)2
Mn2(SO4)3	-51.83	-57.54	-5.71	Mn2(SO4)3
Mn2Sb	-147.02	-85.94	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.20	0.30	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.37	-9.66	2.72	MnCl2:4H2O
MnS(grn)	-75.60	-75.43	0.17	MnS
MnS(pnk)	-78.77	-75.43	3.34	MnS
MnSb	-94.49	-97.40	-2.91	MnSb
MnSe	-38.95	-35.45	3.50	MnSe
MnSeO3	-4.81	-3.68	1.13	MnSeO3
MnSeO3:2H2O	-4.66	-3.68	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.39	-14.44	-2.05	MnSeO4:5H2O
MnSO4	-9.49	-6.91	2.58	MnSO4
Monteponite	-7.40	7.70	15.10	CdO
Montroydite	-7.53	-11.17	-3.64	HgO
MoO3	-14.21	-22.21	-8.00	MoO3
Morenosite	-7.48	-9.62	-2.14	NiSO4:7H2O
MoS2	-151.67	-221.93	-70.26	MoS2
Na-Jarosite	-10.22	-21.42	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.30	-48.19	-9.90	Na2Cr2O7
Na2CrO4	-20.89	-17.96	2.93	Na2CrO4
Na2Mo2O7	-15.54	-32.14	-16.60	Na2Mo2O7
Na2MoO4	-11.42	-9.93	1.49	Na2MoO4
Na2MoO4:2H2O	-11.15	-9.93	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.36	-3.06	10.30	Na2SeO3:5H2O
Na2SeO4	-15.10	-13.82	1.28	Na2SeO4
Na3Sb	-172.51	-78.06	94.45	Na3Sb
Na3VO4	-27.56	9.12	36.68	Na3VO4
Na4V2O7	-31.44	5.96	37.40	Na4V2O7
Nantokite	-6.01	-12.74	-6.73	CuCl
NaSb	-87.96	-64.80	23.17	NaSb
Natron	-8.06	-9.37	-1.31	Na2CO3:10H2O
NaVO3	-7.02	-3.16	3.86	NaVO3
Nesquehonite	-3.33	-8.00	-4.67	MgCO3:3H2O
Ni(OH)2	-3.84	8.95	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.53	-7.83	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.77	17.23	32.00	Ni4(OH)6SO4
NiCO3	-5.83	-12.70	-6.87	NiCO3
NiMoO4	-2.12	-13.26	-11.14	NiMoO4
NiS(alpha)	-72.54	-78.14	-5.60	NiS
NiS(beta)	-67.04	-78.14	-11.10	NiS
NiS(gamma)	-65.34	-78.14	-12.80	NiS
NiSe	-20.46	-38.16	-17.70	NiSe
NiSeO3:2H2O	-9.20	-6.39	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.63	-17.15	-1.52	NiSeO4:6H2O
Nsutite	-5.65	11.85	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-248.16	-309.23	-61.07	As2S3
Otavite	-1.95	-13.95	-12.00	CdCO3
Pb(BO2)2	-9.13	-2.61	6.52	Pb(BO2)2
Pb(OH)2	-1.88	6.27	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.45	-67.21	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.92	1.88	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.65	12.54	26.19	Pb2O(OH)2
Pb2O3	-22.96	38.08	61.04	Pb2O3
Pb2OCO3	-8.55	-9.11	-0.56	Pb2OCO3
Pb2V2O7	-4.17	-6.07	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.67	-15.87	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.94	0.20	6.14	Pb3(VO4)2

Pb3O2CO3	-13.86	-2.84	11.02	Pb3O2CO3
Pb3O2SO4	-10.45	0.24	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-14.60	6.50	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-15.37	6.50	21.88	Pb4O3SO4
PbCrO4	-11.37	-23.97	-12.60	PbCrO4
PbF2	-10.49	-17.93	-7.44	PbF2
Pbmetal	-23.52	-19.28	4.25	Pb
PbMoO4	-0.32	-15.94	-15.62	PbMoO4
PbO:0.3H2O	-6.71	6.27	12.98	PbO:0.33H2O
PbSeO4	-12.99	-19.83	-6.84	PbSeO4
Periclase	-7.93	13.65	21.58	MgO
Phosgenite	-10.62	-30.43	-19.81	PbCl2:PbCO3
Plattnerite	-17.79	31.81	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.67	-145.18	-18.51	FeS2
Pyrochroite	-3.54	11.66	15.19	Mn (OH) 2
Pyrolusite	-4.18	37.20	41.38	MnO2
Realgar	-104.10	-123.84	-19.75	AsS
Retgersite	-7.58	-9.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.59	-9.99	-10.58	MnCO3
Rutherfordine	-4.56	-19.06	-14.50	UO2CO3
Sb (OH) 3	-12.74	-19.85	-7.11	Sb (OH) 3
Sb2O4	-17.55	-14.15	3.40	Sb2O4
Sb2O5	-27.56	-37.23	-9.67	Sb2O5
Sb2Se3	-113.27	-181.03	-67.76	Sb2Se3
Sb4O6 (cubic)	-61.13	-79.39	-18.26	Sb4O6
Sb4O6 (orth)	-61.49	-79.39	-17.90	Sb4O6
SbCl3	-52.39	-51.82	0.57	SbCl3
SbF3	-45.92	-56.15	-10.23	SbF3
Sbmetal	-46.48	-58.16	-11.69	Sb
SbO2	-3.56	-31.39	-27.82	SbO2
Schoepite	-3.41	2.58	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.46	-21.57	-7.11	Se
Semetal (hex)	-13.86	-21.57	-7.71	Se
Senarmontite	-27.33	-39.70	-12.37	Sb2O3
SeO2	-15.46	-15.34	0.12	SeO2
SeO3	-47.14	-26.10	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.05	-11.05	-10.00	ZnCO3
Sphalerite	-65.04	-76.49	-11.45	ZnS
Spinel	-5.57	31.27	36.85	MgAl2O4
Stibnite	-250.50	-300.96	-50.46	Sb2S3
Sulfur	-59.40	-61.54	-2.14	S
Tenorite	0.35	8.00	7.64	CuO
Thenardite	-6.61	-6.29	0.32	Na2SO4
Thermonatrite	-10.00	-9.37	0.64	Na2CO3:H2O
Tyuyamunite	-4.35	-0.27	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.23	9.85	21.08	U3O8
U3Sb4	-579.55	-427.17	152.38	U3Sb4
U4O9	-26.42	-29.44	-3.02	U4O9
UF4	-32.61	-62.15	-29.54	UF4
UF4:2.5H2O	-29.43	-62.15	-32.72	UF4:2.5H2O
UO2 (am)	-14.68	-13.75	0.93	UO2
UO2 (NO3) 2	-42.55	-30.40	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.25	-30.40	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.79	-30.40	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.45	-30.40	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.03	2.58	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.27	-23.52	-2.25	UO2SeO4:4H2O
UO3	-5.12	2.58	7.70	UO3
Uraninite	-9.08	-13.75	-4.67	UO2
USb2	-219.96	-190.38	29.58	USb2
V (OH) 3	-19.84	-12.25	7.59	V (OH) 3
V2O5	-17.24	-18.60	-1.36	V2O5
V3O5	-42.89	-41.05	1.84	V3O5
V4O7	-53.41	-46.22	7.19	V4O7
V6O13	-46.03	-106.89	-60.86	V6O13
Valentinite	-31.22	-39.70	-8.48	Sb2O3

VC12	-65.21	-46.33	18.87	VC12
VC13	-67.65	-44.22	23.43	VC13
VF4	-68.50	-53.57	14.93	VF4
Vmetal	-94.59	-50.56	44.03	V
VO	-39.78	-25.02	14.76	VO
VO(OH)2	-10.32	-5.17	5.15	VO(OH)2
VO2Cl	-22.80	-19.96	2.84	VO2Cl
VOC1	-34.06	-22.90	11.15	VOC1
VOC12	-39.25	-26.49	12.76	VOC12
VOSO4	-27.35	-23.74	3.61	VOSO4
Witherite	-4.49	-13.06	-8.57	BaCO3
Wurtzite	-67.54	-76.49	-8.95	ZnS
Zincite	-0.74	10.60	11.33	ZnO
Zincosite	-11.90	-7.97	3.93	ZnSO4
Zn(BO2)2	-6.57	1.72	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.71	-22.39	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.60	10.60	12.20	Zn(OH)2
Zn(OH)2(am)	-1.88	10.60	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.16	10.60	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-0.94	10.60	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.14	10.60	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.87	2.63	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.66	10.53	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.53	-2.88	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.26	-5.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.83	31.67	38.50	Zn5(OH)8Cl2
ZnCl2	-17.77	-10.72	7.05	ZnCl2
ZnCO3:1H2O	-0.79	-11.05	-10.26	ZnCO3:1H2O
ZnF2	-13.07	-13.60	-0.53	ZnF2
Znmetal	-40.74	-14.95	25.79	Zn
ZnMoO4	-1.49	-11.61	-10.13	ZnMoO4
ZnO(active)	-0.59	10.60	11.19	ZnO
ZnS(am)	-67.44	-76.49	-9.05	ZnS
ZnSb	-84.13	-73.11	11.01	ZnSb
ZnSe	-22.11	-36.51	-14.40	ZnSe
ZnSeO4:6H2O	-13.98	-15.50	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.33	-7.97	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 36.

```

Title Stage 2 pit lake GW inflow
Title Stage 2 Groundwater mix
MIX 201
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.043220
11     0.523510
12     0.374727
13     0.631271
14     0
15     0
Save solution 201

```



```

end
-----
TITLE
-----

Stage 2 Groundwater mix

-----
Beginning of batch-reaction calculations.
-----

Reaction step 1.

Using mix 201.

Mixture 201.

1.000e+00 Solution 2      JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
4.322e-02 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
5.235e-01 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
3.747e-01 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
6.313e-01 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

```

-----Solution composition-----

Elements	Molality	Moles
Ag	3.246e-08	8.350e-08
Al	7.285e-07	1.874e-06
As	1.292e-08	3.324e-08
B	5.174e-06	1.331e-05
Ba	3.239e-07	8.332e-07
C	3.104e-03	7.986e-03
Ca	1.109e-03	2.854e-03
Cd	3.209e-09	8.256e-09
Cl	5.637e-04	1.450e-03
Co	5.280e-08	1.359e-07
Cr	4.938e-08	1.270e-07
Cu	9.480e-07	2.439e-06
F	6.951e-05	1.788e-04
Fe	1.033e-05	2.656e-05
Hg	2.161e-11	5.561e-11
K	8.183e-05	2.105e-04
Mg	3.861e-04	9.934e-04

Mn	5.582e-06	1.436e-05
Mo	8.262e-08	2.126e-07
Na	1.611e-03	4.145e-03
Ni	8.285e-08	2.131e-07
Pb	5.988e-09	1.541e-08
S	5.641e-04	1.451e-03
Sb	3.335e-09	8.579e-09
Se	9.719e-09	2.500e-08
U	9.506e-09	2.446e-08
V	1.531e-08	3.939e-08
Zn	2.387e-07	6.140e-07

-----Description of solution-----

equilibrium	pH	=	7.534	Charge balance
	pe	=	4.422	Adjusted to redox
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.358e-03	
	Mass of water (kg)	=	2.573e+00	
	Total alkalinity (eq/kg)	=	2.949e-03	
	Total CO2 (mol/kg)	=	3.104e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.417e-17	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	11	
	Total H	=	2.856165e+02	
	Total O	=	1.428339e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.753e-07	3.444e-07	-6.426	-6.463	-0.037	(0)
H+	3.181e-08	2.923e-08	-7.497	-7.534	-0.037	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	3.246e-08					
Ag+	1.318e-08	1.212e-08	-7.880	-7.917	-0.037	(0)
AgCl	1.281e-08	1.281e-08	-7.892	-7.892	0.000	(0)
Ag2Se	2.864e-09	2.864e-09	-8.543	-8.543	0.000	(0)
AgCl2-	6.348e-10	5.781e-10	-9.197	-9.238	-0.041	(0)
AgSO4-	9.225e-11	8.400e-11	-10.035	-10.076	-0.041	(0)
AgF	1.873e-12	1.873e-12	-11.727	-11.727	0.000	(0)
AgOH	4.173e-13	4.173e-13	-12.380	-12.380	0.000	(0)
AgCl3-2	3.881e-13	2.669e-13	-12.411	-12.574	-0.163	(0)
AgH2BO3	1.933e-14	1.933e-14	-13.714	-13.714	0.000	(0)
AgSeO3-	6.158e-15	5.608e-15	-14.211	-14.251	-0.041	(0)
AgCl4-3	6.556e-16	2.823e-16	-15.183	-15.549	-0.366	(0)
Ag (OH) 2-	1.542e-17	1.404e-17	-16.812	-16.852	-0.041	(0)
Ag (SeO3) 2-3	8.399e-23	3.616e-23	-22.076	-22.442	-0.366	(0)
Ag2MoO4	3.273e-24	3.273e-24	-23.485	-23.485	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.086	-67.086	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-75.482	-76.133	-0.651	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-135.803	-135.920	-0.117	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-135.930	-135.970	-0.041	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-137.593	-137.825	-0.232	(0)
AgS4S5-3	0.000e+00	0.000e+00	-137.912	-138.136	-0.225	(0)
Al	7.285e-07					
Al (OH) 4-	7.104e-07	6.533e-07	-6.149	-6.185	-0.036	(0)
Al (OH) 3	1.507e-08	1.507e-08	-7.822	-7.822	0.000	(0)
Al (OH) 2+	2.380e-09	2.193e-09	-8.623	-8.659	-0.036	(0)
AlF2+	3.810e-10	3.510e-10	-9.419	-9.455	-0.036	(0)
AlF3	2.720e-10	2.720e-10	-9.565	-9.565	0.000	(0)
AlF+2	1.989e-11	1.432e-11	-10.701	-10.844	-0.143	(0)
AlOH+2	1.113e-11	8.015e-12	-10.954	-11.096	-0.143	(0)
AlF4-	9.126e-12	8.393e-12	-11.040	-11.076	-0.036	(0)

AlSO4+	6.825e-14	6.277e-14	-13.166	-13.202	-0.036	(0)
Al+3	4.978e-14	2.327e-14	-13.303	-13.633	-0.330	(0)
Al (SO4) 2-	2.541e-16	2.337e-16	-15.595	-15.631	-0.036	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-46.859	-47.225	-0.366	(0)
As (3)	9.868e-20					
H3AsO3	9.682e-20	9.682e-20	-19.014	-19.014	0.000	(0)
H2AsO3-	1.865e-21	1.699e-21	-20.729	-20.770	-0.041	(0)
HAsO3-2	7.707e-26	5.299e-26	-25.113	-25.276	-0.163	(0)
H4AsO3+	1.540e-27	1.402e-27	-26.813	-26.853	-0.041	(0)
AsO3-3	1.623e-31	6.988e-32	-30.790	-31.156	-0.366	(0)
As (5)	1.292e-08					
HAsO4-2	1.075e-08	7.395e-09	-7.968	-8.131	-0.163	(0)
H2AsO4-	2.165e-09	1.971e-09	-8.665	-8.705	-0.041	(0)
AsO4-3	1.858e-12	7.999e-13	-11.731	-12.097	-0.366	(0)
H3AsO4	1.000e-14	1.002e-14	-14.000	-13.999	0.001	(0)
B	5.174e-06					
H3BO3	5.059e-06	5.066e-06	-5.296	-5.295	0.001	(0)
H2BO3-	1.099e-07	1.006e-07	-6.959	-6.997	-0.038	(0)
CaH2BO3+	4.547e-09	4.165e-09	-8.342	-8.380	-0.038	(0)
MgH2BO3+	9.770e-10	8.948e-10	-9.010	-9.048	-0.038	(0)
NaH2BO3	2.354e-10	2.354e-10	-9.628	-9.628	0.000	(0)
BF (OH) 3-	1.359e-10	1.244e-10	-9.867	-9.905	-0.038	(0)
BaH2BO3+	7.682e-13	7.036e-13	-12.115	-12.153	-0.038	(0)
H5 (BO3) 2-	4.738e-13	4.340e-13	-12.324	-12.363	-0.038	(0)
BF2 (OH) 2-	2.614e-14	2.394e-14	-13.583	-13.621	-0.038	(0)
AgH2BO3	1.933e-14	1.933e-14	-13.714	-13.714	0.000	(0)
H8 (BO3) 3-	2.401e-16	2.199e-16	-15.620	-15.658	-0.038	(0)
BF3OH-	1.830e-20	1.676e-20	-19.737	-19.776	-0.038	(0)
BF4-	1.621e-25	1.484e-25	-24.790	-24.828	-0.038	(0)
Ba	3.239e-07					
Ba+2	3.172e-07	2.262e-07	-6.499	-6.645	-0.147	(0)
BaHCO3+	6.191e-09	5.710e-09	-8.208	-8.243	-0.035	(0)
BaCO3	4.918e-10	4.918e-10	-9.308	-9.308	0.000	(0)
BaH2BO3+	7.682e-13	7.036e-13	-12.115	-12.153	-0.038	(0)
BaOH+	3.695e-13	3.401e-13	-12.432	-12.468	-0.036	(0)
C (4)	3.104e-03					
HCO3-	2.869e-03	2.643e-03	-2.542	-2.578	-0.036	(0)
H2CO3	1.738e-04	1.738e-04	-3.760	-3.760	0.000	(0)
CaHCO3+	3.837e-05	3.539e-05	-4.416	-4.451	-0.035	(0)
MgHCO3+	7.548e-06	6.935e-06	-5.122	-5.159	-0.037	(0)
CO3-2	5.943e-06	4.239e-06	-5.226	-5.373	-0.147	(0)
CaCO3	4.831e-06	4.831e-06	-5.316	-5.316	0.000	(0)
NaHCO3	2.193e-06	2.193e-06	-5.659	-5.659	0.000	(0)
MgCO3	9.040e-07	9.040e-07	-6.044	-6.044	0.000	(0)
CuCO3	8.349e-07	8.349e-07	-6.078	-6.078	0.000	(0)
MnHCO3+	2.027e-07	1.866e-07	-6.693	-6.729	-0.036	(0)
NaCO3-	1.264e-07	1.165e-07	-6.898	-6.934	-0.036	(0)
ZnCO3	3.135e-08	3.135e-08	-7.504	-7.504	0.000	(0)
NiHCO3+	1.486e-08	1.353e-08	-7.828	-7.869	-0.041	(0)
Cu (CO3) 2-2	1.385e-08	9.525e-09	-7.858	-8.021	-0.163	(0)
ZnHCO3+	1.180e-08	1.074e-08	-7.928	-7.969	-0.041	(0)
NiCO3	6.566e-09	6.566e-09	-8.183	-8.183	0.000	(0)
CoHCO3+	6.504e-09	5.923e-09	-8.187	-8.227	-0.041	(0)
BaHCO3+	6.191e-09	5.710e-09	-8.208	-8.243	-0.035	(0)
CuHCO3+	6.126e-09	5.578e-09	-8.213	-8.254	-0.041	(0)
UO2 (CO3) 2-2	5.721e-09	3.934e-09	-8.243	-8.405	-0.163	(0)
PbCO3	4.315e-09	4.315e-09	-8.365	-8.365	0.000	(0)
UO2 (CO3) 3-4	3.739e-09	8.357e-10	-8.427	-9.078	-0.651	(0)
FeHCO3+	3.416e-09	3.151e-09	-8.466	-8.502	-0.035	(0)
CoCO3	2.064e-09	2.064e-09	-8.685	-8.685	0.000	(0)
PbHCO3+	7.304e-10	6.651e-10	-9.136	-9.177	-0.041	(0)
BaCO3	4.918e-10	4.918e-10	-9.308	-9.308	0.000	(0)
CdCO3	1.882e-10	1.882e-10	-9.725	-9.725	0.000	(0)
Pb (CO3) 2-2	7.672e-11	5.275e-11	-10.115	-10.278	-0.163	(0)
UO2CO3	4.651e-11	4.651e-11	-10.332	-10.332	0.000	(0)
CdHCO3+	1.288e-11	1.172e-11	-10.890	-10.931	-0.041	(0)
Cd (CO3) 2-2	8.603e-13	5.915e-13	-12.065	-12.228	-0.163	(0)
HgCO3	8.303e-18	8.303e-18	-17.081	-17.081	0.000	(0)

	Hg (CO ₃) 2-2	1.619e-19	1.113e-19	-18.791	-18.954	-0.163	(0)
	HgHCO ₃ +	4.963e-21	4.520e-21	-20.304	-20.345	-0.041	(0)
Ca	1.109e-03						
	Ca+2	1.008e-03	7.191e-04	-2.996	-3.143	-0.147	(0)
	CaSO ₄	5.724e-05	5.724e-05	-4.242	-4.242	0.000	(0)
	CaHCO ₃ +	3.837e-05	3.539e-05	-4.416	-4.451	-0.035	(0)
	CaCO ₃	4.831e-06	4.831e-06	-5.316	-5.316	0.000	(0)
	CaF+	5.248e-07	4.831e-07	-6.280	-6.316	-0.036	(0)
	CaOH+	5.358e-09	4.941e-09	-8.271	-8.306	-0.035	(0)
	CaH ₂ BO ₃ +	4.547e-09	4.165e-09	-8.342	-8.380	-0.038	(0)
Cd	3.209e-09						
	Cd+2	2.732e-09	1.948e-09	-8.564	-8.710	-0.147	(0)
	CdCO ₃	1.882e-10	1.882e-10	-9.725	-9.725	0.000	(0)
	CdSO ₄	1.587e-10	1.587e-10	-9.799	-9.799	0.000	(0)
	CdCl+	1.058e-10	9.638e-11	-9.975	-10.016	-0.041	(0)
	CdHCO ₃ +	1.288e-11	1.172e-11	-10.890	-10.931	-0.041	(0)
	CdOH+	5.854e-12	5.330e-12	-11.233	-11.273	-0.041	(0)
	CdF+	2.087e-12	1.901e-12	-11.680	-11.721	-0.041	(0)
	CdOHC1	1.362e-12	1.362e-12	-11.866	-11.866	0.000	(0)
	Cd (SO ₄) 2-2	1.082e-12	7.440e-13	-11.966	-12.128	-0.163	(0)
	Cd (CO ₃) 2-2	8.603e-13	5.915e-13	-12.065	-12.228	-0.163	(0)
	CdCl ₂	2.081e-13	2.081e-13	-12.682	-12.682	0.000	(0)
	Cd (OH) 2	1.158e-14	1.158e-14	-13.936	-13.936	0.000	(0)
	CdF ₂	2.335e-16	2.335e-16	-15.632	-15.632	0.000	(0)
	CdCl ₃ -	7.470e-17	6.802e-17	-16.127	-16.167	-0.041	(0)
	Cd (OH) 3-	2.677e-19	2.437e-19	-18.572	-18.613	-0.041	(0)
	Cd ₂ OH+3	1.209e-19	5.205e-20	-18.918	-19.284	-0.366	(0)
	CdSeO ₄	2.641e-20	2.641e-20	-19.578	-19.578	0.000	(0)
	Cd (SeO ₃) 2-2	1.211e-21	8.328e-22	-20.917	-21.079	-0.163	(0)
	Cd (OH) 4-2	1.998e-26	1.374e-26	-25.699	-25.862	-0.163	(0)
	CdHS+	0.000e+00	0.000e+00	-73.646	-73.686	-0.041	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-139.466	-139.466	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-210.510	-210.550	-0.041	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-281.176	-281.338	-0.163	(0)
Cl	5.637e-04						
	Cl-	5.637e-04	5.180e-04	-3.249	-3.286	-0.037	(0)
	AgCl	1.281e-08	1.281e-08	-7.892	-7.892	0.000	(0)
	MnCl+	2.506e-09	2.307e-09	-8.601	-8.637	-0.036	(0)
	AgCl ₂ -	6.348e-10	5.781e-10	-9.197	-9.238	-0.041	(0)
	CuCl	4.041e-10	4.041e-10	-9.394	-9.394	0.000	(0)
	ZnCl+	1.820e-10	1.672e-10	-9.740	-9.777	-0.037	(0)
	CdCl+	1.058e-10	9.638e-11	-9.975	-10.016	-0.041	(0)
	ZnOHC1	7.540e-11	7.540e-11	-10.123	-10.123	0.000	(0)
	NiCl+	6.043e-11	5.503e-11	-10.219	-10.259	-0.041	(0)
	CoCl+	5.669e-11	5.162e-11	-10.246	-10.287	-0.041	(0)
	CuCl ₂ -	4.760e-11	4.373e-11	-10.322	-10.359	-0.037	(0)
	CuCl+	2.989e-11	2.746e-11	-10.524	-10.561	-0.037	(0)
	PbCl+	6.835e-12	6.224e-12	-11.165	-11.206	-0.041	(0)
	MnCl ₂	1.688e-12	1.688e-12	-11.773	-11.773	0.000	(0)
	CdOHC1	1.362e-12	1.362e-12	-11.866	-11.866	0.000	(0)
	AgCl ₃ -2	3.881e-13	2.669e-13	-12.411	-12.574	-0.163	(0)
	CdCl ₂	2.081e-13	2.081e-13	-12.682	-12.682	0.000	(0)
	ZnCl ₂	1.373e-13	1.373e-13	-12.862	-12.862	0.000	(0)
	PbCl ₂	1.440e-14	1.440e-14	-13.842	-13.842	0.000	(0)
	CuCl ₃ -2	6.744e-15	4.843e-15	-14.171	-14.315	-0.144	(0)
	CuCl ₂	4.932e-15	4.932e-15	-14.307	-14.307	0.000	(0)
	AgCl ₄ -3	6.556e-16	2.823e-16	-15.183	-15.549	-0.366	(0)
	HgClOH	5.157e-16	5.157e-16	-15.288	-15.288	0.000	(0)
	MnCl ₃ -	2.616e-16	2.408e-16	-15.582	-15.618	-0.036	(0)
	NiCl ₂	1.435e-16	1.435e-16	-15.843	-15.843	0.000	(0)
	CrCl+2	1.202e-16	8.264e-17	-15.920	-16.083	-0.163	(0)
	CdCl ₃ -	7.470e-17	6.802e-17	-16.127	-16.167	-0.041	(0)
	ZnCl ₃ -	6.148e-17	5.648e-17	-16.211	-16.248	-0.037	(0)
	HgCl ₂	4.392e-17	4.392e-17	-16.357	-16.357	0.000	(0)
	FeCl+2	5.067e-18	3.638e-18	-17.295	-17.439	-0.144	(0)
	PbCl ₃ -	3.261e-18	2.970e-18	-17.487	-17.527	-0.041	(0)
	UO ₂ Cl+	2.543e-18	2.315e-18	-17.595	-17.635	-0.041	(0)
	CrOHC12	2.802e-19	2.802e-19	-18.553	-18.553	0.000	(0)

HgCl3-	2.498e-19	2.275e-19	-18.602	-18.643	-0.041	(0)
CuCl3-	2.595e-20	2.384e-20	-19.586	-19.623	-0.037	(0)
ZnCl4-2	2.037e-20	1.463e-20	-19.691	-19.835	-0.144	(0)
HgCl+	1.858e-20	1.692e-20	-19.731	-19.772	-0.041	(0)
FeCl2+	9.145e-21	8.418e-21	-20.039	-20.075	-0.036	(0)
CrCl2+	4.460e-21	4.062e-21	-20.351	-20.391	-0.041	(0)
PbCl4-2	1.023e-21	7.032e-22	-20.990	-21.153	-0.163	(0)
VOC1+	8.805e-22	8.018e-22	-21.055	-21.096	-0.041	(0)
HgCl4-2	6.823e-22	4.691e-22	-21.166	-21.329	-0.163	(0)
FeCl3	4.361e-25	4.361e-25	-24.360	-24.360	0.000	(0)
CuCl4-2	8.620e-26	6.190e-26	-25.064	-25.208	-0.144	(0)
CrO3Cl-	4.798e-28	4.369e-28	-27.319	-27.360	-0.041	(0)
CoCl+2	4.648e-37	3.196e-37	-36.333	-36.495	-0.163	(0)
UCl+3	0.000e+00	0.000e+00	-45.544	-45.910	-0.366	(0)
Co (2)	5.280e-08					
Co+2	4.190e-08	2.881e-08	-7.378	-7.540	-0.163	(0)
CoHCO3+	6.504e-09	5.923e-09	-8.187	-8.227	-0.041	(0)
CoCO3	2.064e-09	2.064e-09	-8.685	-8.685	0.000	(0)
CoSO4	1.997e-09	1.997e-09	-8.700	-8.700	0.000	(0)
CoOH+	2.174e-10	1.980e-10	-9.663	-9.703	-0.041	(0)
CoF+	6.158e-11	5.608e-11	-10.211	-10.251	-0.041	(0)
CoCl+	5.669e-11	5.162e-11	-10.246	-10.287	-0.041	(0)
Co (OH) 2	5.416e-12	5.416e-12	-11.266	-11.266	0.000	(0)
Co (OH) 3-	4.087e-17	3.722e-17	-16.389	-16.429	-0.041	(0)
CoOOH-	1.026e-17	9.339e-18	-16.989	-17.030	-0.041	(0)
CoSeO4	1.051e-18	1.051e-18	-17.978	-17.978	0.000	(0)
Co2OH+3	6.639e-19	2.858e-19	-18.178	-18.544	-0.366	(0)
Co (OH) 4-2	2.955e-24	2.032e-24	-23.530	-23.692	-0.163	(0)
Co4 (OH) 4+4	1.371e-30	3.065e-31	-29.863	-30.514	-0.651	(0)
Co (3)	7.718e-30					
CoOH+2	7.718e-30	5.307e-30	-29.112	-29.275	-0.163	(0)
Co+3	6.486e-36	3.032e-36	-35.188	-35.518	-0.330	(0)
CoCl+2	4.648e-37	3.196e-37	-36.333	-36.495	-0.163	(0)
Cr (2)	1.620e-24					
Cr+2	1.620e-24	1.114e-24	-23.791	-23.953	-0.163	(0)
Cr (3)	4.938e-08					
Cr (OH) 2+	4.274e-08	3.892e-08	-7.369	-7.410	-0.041	(0)
Cr (OH) 3	5.036e-09	5.036e-09	-8.298	-8.298	0.000	(0)
Cr (OH) +2	1.351e-09	9.288e-10	-8.869	-9.032	-0.163	(0)
CrO2-	8.986e-11	8.182e-11	-10.046	-10.087	-0.041	(0)
CrOHSO4	7.659e-11	7.659e-11	-10.116	-10.116	0.000	(0)
Cr (OH) 4-	7.583e-11	6.905e-11	-10.120	-10.161	-0.041	(0)
CrF+2	1.749e-12	1.203e-12	-11.757	-11.920	-0.163	(0)
Cr+3	2.863e-13	1.233e-13	-12.543	-12.909	-0.366	(0)
CrSO4+	1.098e-13	1.000e-13	-12.959	-13.000	-0.041	(0)
CrCl+2	1.202e-16	8.264e-17	-15.920	-16.083	-0.163	(0)
Cr2 (OH) 2SO4+2	9.352e-18	6.430e-18	-17.029	-17.192	-0.163	(0)
CrOHC12	2.802e-19	2.802e-19	-18.553	-18.553	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.327e-19	1.327e-19	-18.877	-18.877	0.000	(0)
CrCl2+	4.460e-21	4.062e-21	-20.351	-20.391	-0.041	(0)
Cr (6)	7.343e-17					
CrO4-2	6.798e-17	4.849e-17	-16.168	-16.314	-0.147	(0)
HCrO4-	5.037e-18	4.587e-18	-17.298	-17.338	-0.041	(0)
NaCrO4-	3.905e-19	3.556e-19	-18.408	-18.449	-0.041	(0)
KCrO4-	1.484e-20	1.351e-20	-19.829	-19.869	-0.041	(0)
H2CrO4	1.087e-25	1.087e-25	-24.964	-24.964	0.000	(0)
CrO3SO4-2	2.064e-26	1.419e-26	-25.685	-25.848	-0.163	(0)
CrO3Cl-	4.798e-28	4.369e-28	-27.319	-27.360	-0.041	(0)
Cr2O7-2	1.061e-33	7.296e-34	-32.974	-33.137	-0.163	(0)
Cu (1)	1.132e-09					
Cu+	6.805e-10	6.196e-10	-9.167	-9.208	-0.041	(0)
CuCl	4.041e-10	4.041e-10	-9.394	-9.394	0.000	(0)
CuCl2-	4.760e-11	4.373e-11	-10.322	-10.359	-0.037	(0)
CuCl3-2	6.744e-15	4.843e-15	-14.171	-14.315	-0.144	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.489	-136.718	-0.228	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.226	-137.448	-0.221	(0)
Cu (2)	9.469e-07					
CuCO3	8.349e-07	8.349e-07	-6.078	-6.078	0.000	(0)

Cu+2	4.690e-08	3.345e-08	-7.329	-7.476	-0.147	(0)
CuOH+	3.965e-08	3.643e-08	-7.402	-7.439	-0.037	(0)
Cu (CO3) 2-2	1.385e-08	9.525e-09	-7.858	-8.021	-0.163	(0)
CuHCO3+	6.126e-09	5.578e-09	-8.213	-8.254	-0.041	(0)
CuSO4	2.663e-09	2.663e-09	-8.575	-8.575	0.000	(0)
Cu (OH) 2	2.503e-09	2.503e-09	-8.601	-8.601	0.000	(0)
CuF+	1.427e-10	1.299e-10	-9.846	-9.886	-0.041	(0)
Cu2 (OH) 2+2	4.848e-11	3.334e-11	-10.314	-10.477	-0.163	(0)
CuCl+	2.989e-11	2.746e-11	-10.524	-10.561	-0.037	(0)
Cu (OH) 3-	1.942e-12	1.769e-12	-11.712	-11.752	-0.041	(0)
CuCl2	4.932e-15	4.932e-15	-14.307	-14.307	0.000	(0)
Cu (OH) 4-2	6.972e-18	4.794e-18	-17.157	-17.319	-0.163	(0)
CuCl3-	2.595e-20	2.384e-20	-19.586	-19.623	-0.037	(0)
CuCl4-2	8.620e-26	6.190e-26	-25.064	-25.208	-0.144	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-200.488	-200.529	-0.041	(0)
F	6.951e-05					
F-	6.698e-05	6.156e-05	-4.174	-4.211	-0.037	(0)
MgF+	1.926e-06	1.771e-06	-5.715	-5.752	-0.036	(0)
CaF+	5.248e-07	4.831e-07	-6.280	-6.316	-0.036	(0)
NaF	5.731e-08	5.731e-08	-7.242	-7.242	0.000	(0)
MnF+	9.418e-09	8.669e-09	-8.026	-8.062	-0.036	(0)
HF	2.662e-09	2.662e-09	-8.575	-8.575	0.000	(0)
AlF2+	3.810e-10	3.510e-10	-9.419	-9.455	-0.036	(0)
AlF3	2.720e-10	2.720e-10	-9.565	-9.565	0.000	(0)
ZnF+	1.733e-10	1.578e-10	-9.761	-9.802	-0.041	(0)
CuF+	1.427e-10	1.299e-10	-9.846	-9.886	-0.041	(0)
BF (OH) 3-	1.359e-10	1.244e-10	-9.867	-9.905	-0.038	(0)
NiF+	7.050e-11	6.420e-11	-10.152	-10.192	-0.041	(0)
CoF+	6.158e-11	5.608e-11	-10.211	-10.251	-0.041	(0)
AlF+2	1.989e-11	1.432e-11	-10.701	-10.844	-0.143	(0)
AlF4-	9.126e-12	8.393e-12	-11.040	-11.076	-0.036	(0)
CdF+	2.087e-12	1.901e-12	-11.680	-11.721	-0.041	(0)
AgF	1.873e-12	1.873e-12	-11.727	-11.727	0.000	(0)
CrF+2	1.749e-12	1.203e-12	-11.757	-11.920	-0.163	(0)
PbF+	1.613e-12	1.469e-12	-11.792	-11.833	-0.041	(0)
HF2-	6.787e-13	6.229e-13	-12.168	-12.206	-0.037	(0)
FeF2+	2.809e-14	2.586e-14	-13.551	-13.587	-0.036	(0)
BF2 (OH) 2-	2.614e-14	2.394e-14	-13.583	-13.621	-0.038	(0)
UO2F+	2.572e-14	2.342e-14	-13.590	-13.630	-0.041	(0)
FeF+2	2.186e-14	1.570e-14	-13.660	-13.804	-0.144	(0)
UO2F2	4.158e-15	4.158e-15	-14.381	-14.381	0.000	(0)
FeF3	2.246e-15	2.246e-15	-14.649	-14.649	0.000	(0)
PbF2	1.780e-15	1.780e-15	-14.750	-14.750	0.000	(0)
CdF2	2.335e-16	2.335e-16	-15.632	-15.632	0.000	(0)
UO2F3-	7.060e-17	6.429e-17	-16.151	-16.192	-0.041	(0)
VO2F	2.304e-17	2.304e-17	-16.638	-16.638	0.000	(0)
H2F2	1.898e-17	1.898e-17	-16.722	-16.722	0.000	(0)
VO2F2-	5.655e-19	5.149e-19	-18.248	-18.288	-0.041	(0)
PbF3-	2.282e-19	2.078e-19	-18.642	-18.682	-0.041	(0)
VOF+	2.237e-19	2.037e-19	-18.650	-18.691	-0.041	(0)
UO2F4-2	4.572e-20	3.143e-20	-19.340	-19.503	-0.163	(0)
BF3OH-	1.830e-20	1.676e-20	-19.737	-19.776	-0.038	(0)
VOF2	4.702e-21	4.702e-21	-20.328	-20.328	0.000	(0)
VO2F3-2	5.750e-22	3.954e-22	-21.240	-21.403	-0.163	(0)
VOF3-	1.128e-23	1.027e-23	-22.948	-22.988	-0.041	(0)
PbF4-2	8.903e-24	6.122e-24	-23.050	-23.213	-0.163	(0)
Sb (OH) 2F	7.277e-25	7.277e-25	-24.138	-24.138	0.000	(0)
SbOF	7.157e-25	7.157e-25	-24.145	-24.145	0.000	(0)
BF4-	1.621e-25	1.484e-25	-24.790	-24.828	-0.038	(0)
VO2F4-3	2.782e-26	1.198e-26	-25.556	-25.922	-0.366	(0)
HgF+	4.101e-27	3.735e-27	-26.387	-26.428	-0.041	(0)
VOF4-2	3.711e-27	2.552e-27	-26.431	-26.593	-0.163	(0)
UF3+	4.829e-36	4.398e-36	-35.316	-35.357	-0.041	(0)
UF2+2	6.556e-37	4.508e-37	-36.183	-36.346	-0.163	(0)
UF4	2.968e-38	2.968e-38	-37.528	-37.528	0.000	(0)
UF+3	1.351e-39	5.817e-40	-38.869	-39.235	-0.366	(0)
UF5-	0.000e+00	0.000e+00	-40.100	-40.140	-0.041	(0)
UF6-2	0.000e+00	0.000e+00	-41.708	-41.871	-0.163	(0)

Fe (2)	1.506e-07					
Fe+2	1.377e-07	9.469e-08	-6.861	-7.024	-0.163	(0)
FeSO4	8.077e-09	8.077e-09	-8.093	-8.093	0.000	(0)
FeHCO3+	3.416e-09	3.151e-09	-8.466	-8.502	-0.035	(0)
FeOH+	1.410e-09	1.298e-09	-8.851	-8.887	-0.036	(0)
Fe (OH) 2	3.552e-13	3.552e-13	-12.450	-12.450	0.000	(0)
Fe (OH) 3-	4.203e-14	3.869e-14	-13.376	-13.412	-0.036	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.042	-144.042	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-214.948	-214.989	-0.041	(0)
Fe (3)	1.017e-05					
Fe (OH) 2+	7.522e-06	6.930e-06	-5.124	-5.159	-0.036	(0)
Fe (OH) 3	2.563e-06	2.563e-06	-5.591	-5.591	0.000	(0)
Fe (OH) 4-	8.923e-08	8.220e-08	-7.049	-7.085	-0.036	(0)
FeOH+2	7.202e-11	5.172e-11	-10.143	-10.286	-0.144	(0)
FeF2+	2.809e-14	2.586e-14	-13.551	-13.587	-0.036	(0)
FeF+2	2.186e-14	1.570e-14	-13.660	-13.804	-0.144	(0)
FeF3	2.246e-15	2.246e-15	-14.649	-14.649	0.000	(0)
FeSO4+	9.851e-16	9.068e-16	-15.007	-15.042	-0.036	(0)
Fe+3	4.975e-16	2.326e-16	-15.303	-15.633	-0.330	(0)
Fe (SO4) 2-	7.398e-18	6.737e-18	-17.131	-17.172	-0.041	(0)
FeCl+2	5.067e-18	3.638e-18	-17.295	-17.439	-0.144	(0)
Fe2 (OH) 2+4	3.962e-19	8.857e-20	-18.402	-19.053	-0.651	(0)
FeCl2+	9.145e-21	8.418e-21	-20.039	-20.075	-0.036	(0)
FeHSeO3+2	4.726e-21	3.250e-21	-20.325	-20.488	-0.163	(0)
Fe3 (OH) 4+5	9.219e-23	8.872e-24	-22.035	-23.052	-1.017	(0)
FeCl3	4.361e-25	4.361e-25	-24.360	-24.360	0.000	(0)
H (0)	1.728e-27					
H2	8.642e-28	8.654e-28	-27.063	-27.063	0.001	(0)
Hg (0)	2.161e-11					
Hg	2.161e-11	2.161e-11	-10.665	-10.665	0.000	(0)
Hg (1)	6.985e-26					
Hg2+2	3.493e-26	2.402e-26	-25.457	-25.620	-0.163	(0)
Hg (2)	1.792e-15					
Hg (OH) 2	1.223e-15	1.225e-15	-14.912	-14.912	0.001	(0)
HgClOH	5.157e-16	5.157e-16	-15.288	-15.288	0.000	(0)
HgCl2	4.392e-17	4.392e-17	-16.357	-16.357	0.000	(0)
HgCO3	8.303e-18	8.303e-18	-17.081	-17.081	0.000	(0)
HgCl3-	2.498e-19	2.275e-19	-18.602	-18.643	-0.041	(0)
Hg (CO3) 2-2	1.619e-19	1.113e-19	-18.791	-18.954	-0.163	(0)
HgOH+	2.465e-20	2.244e-20	-19.608	-19.649	-0.041	(0)
HgCl+	1.858e-20	1.692e-20	-19.731	-19.772	-0.041	(0)
HgHCO3+	4.963e-21	4.520e-21	-20.304	-20.345	-0.041	(0)
HgCl4-2	6.823e-22	4.691e-22	-21.166	-21.329	-0.163	(0)
Hg (OH) 3-	5.833e-23	5.312e-23	-22.234	-22.275	-0.041	(0)
Hg+2	2.380e-24	1.637e-24	-23.623	-23.786	-0.163	(0)
HgSO4	1.489e-25	1.489e-25	-24.827	-24.827	0.000	(0)
HgF+	4.101e-27	3.735e-27	-26.387	-26.428	-0.041	(0)
HgHS2-	0.000e+00	0.000e+00	-130.251	-130.292	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-131.303	-131.466	-0.163	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.432	-131.432	0.000	(0)
K	8.183e-05					
K+	8.163e-05	7.501e-05	-4.088	-4.125	-0.037	(0)
KSO4-	2.003e-07	1.845e-07	-6.698	-6.734	-0.036	(0)
KCrO4-	1.484e-20	1.351e-20	-19.829	-19.869	-0.041	(0)
Mg	3.861e-04					
Mg+2	3.595e-04	2.564e-04	-3.444	-3.591	-0.147	(0)
MgSO4	1.621e-05	1.621e-05	-4.790	-4.790	0.000	(0)
MgHCO3+	7.548e-06	6.935e-06	-5.122	-5.159	-0.037	(0)
MgF+	1.926e-06	1.771e-06	-5.715	-5.752	-0.036	(0)
MgCO3	9.040e-07	9.040e-07	-6.044	-6.044	0.000	(0)
MgOH+	3.809e-08	3.516e-08	-7.419	-7.454	-0.035	(0)
MgH2BO3+	9.770e-10	8.948e-10	-9.010	-9.048	-0.038	(0)
Mn (2)	5.582e-06					
Mn+2	5.145e-06	3.538e-06	-5.289	-5.451	-0.163	(0)
MnSO4	2.186e-07	2.186e-07	-6.660	-6.660	0.000	(0)
MnHCO3+	2.027e-07	1.866e-07	-6.693	-6.729	-0.036	(0)
MnF+	9.418e-09	8.669e-09	-8.026	-8.062	-0.036	(0)
MnOH+	3.325e-09	3.061e-09	-8.478	-8.514	-0.036	(0)

MnCl+	2.506e-09	2.307e-09	-8.601	-8.637	-0.036	(0)
MnCl2	1.688e-12	1.688e-12	-11.773	-11.773	0.000	(0)
MnCl3-	2.616e-16	2.408e-16	-15.582	-15.618	-0.036	(0)
MnSeO4	6.932e-17	6.932e-17	-16.159	-16.159	0.000	(0)
Mn (OH) 3-	2.437e-18	2.244e-18	-17.613	-17.649	-0.036	(0)
Mn (OH) 4-2	3.474e-24	2.495e-24	-23.459	-23.603	-0.144	(0)
MnSe	3.492e-39	3.492e-39	-38.457	-38.457	0.000	(0)
Mn (3)	8.937e-27					
Mn+3	8.937e-27	4.178e-27	-26.049	-26.379	-0.330	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.768	-45.911	-0.144	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.823	-50.861	-0.038	(0)
Mo	8.262e-08					
MoO4-2	8.258e-08	5.890e-08	-7.083	-7.230	-0.147	(0)
HMoO4-	3.762e-11	3.426e-11	-10.425	-10.465	-0.041	(0)
H2MoO4	7.336e-15	7.336e-15	-14.135	-14.135	0.000	(0)
Ag2MoO4	3.273e-24	3.273e-24	-23.485	-23.485	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-46.859	-47.225	-0.366	(0)
Mo7O24-6	0.000e+00	0.000e+00	-56.428	-57.892	-1.464	(0)
HMo7O24-5	0.000e+00	0.000e+00	-58.023	-59.039	-1.017	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-61.141	-61.791	-0.651	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-65.713	-66.079	-0.366	(0)
Na	1.611e-03					
Na+	1.606e-03	1.476e-03	-2.794	-2.831	-0.037	(0)
NaSO4-	2.989e-06	2.754e-06	-5.524	-5.560	-0.036	(0)
NaHCO3	2.193e-06	2.193e-06	-5.659	-5.659	0.000	(0)
NaCO3-	1.264e-07	1.165e-07	-6.898	-6.934	-0.036	(0)
NaF	5.731e-08	5.731e-08	-7.242	-7.242	0.000	(0)
NaH2BO3	2.354e-10	2.354e-10	-9.628	-9.628	0.000	(0)
NaCrO4-	3.905e-19	3.556e-19	-18.408	-18.449	-0.041	(0)
Ni	8.285e-08					
Ni+2	5.821e-08	4.152e-08	-7.235	-7.382	-0.147	(0)
NiHCO3+	1.486e-08	1.353e-08	-7.828	-7.869	-0.041	(0)
NiCO3	6.566e-09	6.566e-09	-8.183	-8.183	0.000	(0)
NiSO4	2.879e-09	2.879e-09	-8.541	-8.541	0.000	(0)
NiOH+	1.977e-10	1.800e-10	-9.704	-9.745	-0.041	(0)
NiF+	7.050e-11	6.420e-11	-10.152	-10.192	-0.041	(0)
NiCl+	6.043e-11	5.503e-11	-10.219	-10.259	-0.041	(0)
Ni (OH) 2	4.925e-12	4.925e-12	-11.308	-11.308	0.000	(0)
Ni (SO4) 2-2	4.817e-14	3.312e-14	-13.317	-13.480	-0.163	(0)
Ni (OH) 3-	1.863e-15	1.696e-15	-14.730	-14.771	-0.041	(0)
NiCl2	1.435e-16	1.435e-16	-15.843	-15.843	0.000	(0)
NiSeO4	1.414e-18	1.414e-18	-17.850	-17.850	0.000	(0)
O (0)	1.351e-38					
O2	6.756e-39	6.766e-39	-38.170	-38.170	0.001	(0)
Pb	5.988e-09					
PbCO3	4.315e-09	4.315e-09	-8.365	-8.365	0.000	(0)
PbHCO3+	7.304e-10	6.651e-10	-9.136	-9.177	-0.041	(0)
Pb+2	4.748e-10	3.387e-10	-9.323	-9.470	-0.147	(0)
PbOH+	3.217e-10	2.930e-10	-9.492	-9.533	-0.041	(0)
Pb (CO3) 2-2	7.672e-11	5.275e-11	-10.115	-10.278	-0.163	(0)
PbSO4	5.764e-11	5.764e-11	-10.239	-10.239	0.000	(0)
PbCl+	6.835e-12	6.224e-12	-11.165	-11.206	-0.041	(0)
Pb (OH) 2	3.191e-12	3.191e-12	-11.496	-11.496	0.000	(0)
PbF+	1.613e-12	1.469e-12	-11.792	-11.833	-0.041	(0)
Pb (SO4) 2-2	1.755e-13	1.207e-13	-12.756	-12.918	-0.163	(0)
PbCl2	1.440e-14	1.440e-14	-13.842	-13.842	0.000	(0)
PbF2	1.780e-15	1.780e-15	-14.750	-14.750	0.000	(0)
Pb (OH) 3-	1.207e-15	1.099e-15	-14.918	-14.959	-0.041	(0)
Pb2OH+3	3.653e-18	1.573e-18	-17.437	-17.803	-0.366	(0)
PbCl3-	3.261e-18	2.970e-18	-17.487	-17.527	-0.041	(0)
PbF3-	2.282e-19	2.078e-19	-18.642	-18.682	-0.041	(0)
Pb (OH) 4-2	1.348e-19	9.270e-20	-18.870	-19.033	-0.163	(0)
PbCl4-2	1.023e-21	7.032e-22	-20.990	-21.153	-0.163	(0)
Pb3 (OH) 4+2	1.001e-22	6.881e-23	-22.000	-22.162	-0.163	(0)
PbF4-2	8.903e-24	6.122e-24	-23.050	-23.213	-0.163	(0)
Pb4 (OH) 4+4	8.281e-28	1.851e-28	-27.082	-27.733	-0.651	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-140.168	-140.168	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.812	-211.852	-0.041	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.086	-67.086	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.943	-72.984	-0.041	(0)
H2S	0.000e+00	0.000e+00	-73.498	-73.498	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.646	-73.686	-0.041	(0)
S5-2	0.000e+00	0.000e+00	-74.652	-74.815	-0.163	(0)
S6-2	0.000e+00	0.000e+00	-75.168	-75.331	-0.163	(0)
S4-2	0.000e+00	0.000e+00	-75.248	-75.411	-0.163	(0)
S3-2	0.000e+00	0.000e+00	-76.054	-76.217	-0.163	(0)
S2-2	0.000e+00	0.000e+00	-77.070	-77.233	-0.163	(0)
S-2	0.000e+00	0.000e+00	-82.606	-82.750	-0.144	(0)
HgHS2-	0.000e+00	0.000e+00	-130.251	-130.292	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-131.303	-131.466	-0.163	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.432	-131.432	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-135.803	-135.920	-0.117	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-135.930	-135.970	-0.041	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.489	-136.718	-0.228	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.226	-137.448	-0.221	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-137.593	-137.825	-0.232	(0)
AgS4S5-3	0.000e+00	0.000e+00	-137.912	-138.136	-0.225	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.474	-138.515	-0.041	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.466	-139.466	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.039	-140.039	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-140.168	-140.168	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.042	-144.042	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-200.488	-200.529	-0.041	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.702	-209.743	-0.041	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.510	-210.550	-0.041	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.812	-211.852	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.026	-212.189	-0.163	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-214.948	-214.989	-0.041	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-281.176	-281.338	-0.163	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.024	-284.187	-0.163	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.627	-294.789	-0.163	(0)
S (6)	5.641e-04					
SO4-2	4.872e-04	3.475e-04	-3.312	-3.459	-0.147	(0)
CaSO4	5.724e-05	5.724e-05	-4.242	-4.242	0.000	(0)
MgSO4	1.621e-05	1.621e-05	-4.790	-4.790	0.000	(0)
NaSO4-	2.989e-06	2.754e-06	-5.524	-5.560	-0.036	(0)
MnSO4	2.186e-07	2.186e-07	-6.660	-6.660	0.000	(0)
KSO4-	2.003e-07	1.845e-07	-6.698	-6.734	-0.036	(0)
ZnSO4	9.770e-09	9.770e-09	-8.010	-8.010	0.000	(0)
FeSO4	8.077e-09	8.077e-09	-8.093	-8.093	0.000	(0)
NiSO4	2.879e-09	2.879e-09	-8.541	-8.541	0.000	(0)
CuSO4	2.663e-09	2.663e-09	-8.575	-8.575	0.000	(0)
CoSO4	1.997e-09	1.997e-09	-8.700	-8.700	0.000	(0)
HSO4-	1.079e-09	9.927e-10	-8.967	-9.003	-0.036	(0)
CdSO4	1.587e-10	1.587e-10	-9.799	-9.799	0.000	(0)
AgSO4-	9.225e-11	8.400e-11	-10.035	-10.076	-0.041	(0)
CrOHSO4	7.659e-11	7.659e-11	-10.116	-10.116	0.000	(0)
PbSO4	5.764e-11	5.764e-11	-10.239	-10.239	0.000	(0)
Zn (SO4) 2-2	4.300e-11	2.957e-11	-10.366	-10.529	-0.163	(0)
Cd (SO4) 2-2	1.082e-12	7.440e-13	-11.966	-12.128	-0.163	(0)
Pb (SO4) 2-2	1.755e-13	1.207e-13	-12.756	-12.918	-0.163	(0)
CrSO4+	1.098e-13	1.000e-13	-12.959	-13.000	-0.041	(0)
AlSO4+	6.825e-14	6.277e-14	-13.166	-13.202	-0.036	(0)
Ni (SO4) 2-2	4.817e-14	3.312e-14	-13.317	-13.480	-0.163	(0)
UO2SO4	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
FeSO4+	9.851e-16	9.068e-16	-15.007	-15.042	-0.036	(0)
Al (SO4) 2-	2.541e-16	2.337e-16	-15.595	-15.631	-0.036	(0)
UO2 (SO4) 2-2	9.658e-18	6.641e-18	-17.015	-17.178	-0.163	(0)
Cr2 (OH) 2SO4+2	9.352e-18	6.430e-18	-17.029	-17.192	-0.163	(0)
Fe (SO4) 2-	7.398e-18	6.737e-18	-17.131	-17.172	-0.041	(0)
VO2SO4-	1.944e-18	1.771e-18	-17.711	-17.752	-0.041	(0)
Cr2 (OH) 2 (SO4) 2	1.327e-19	1.327e-19	-18.877	-18.877	0.000	(0)
VO2SO4	5.281e-20	5.281e-20	-19.277	-19.277	0.000	(0)

HgSO4	1.489e-25	1.489e-25	-24.827	-24.827	0.000	(0)
CrO3SO4-2	2.064e-26	1.419e-26	-25.685	-25.848	-0.163	(0)
VSO4+	1.595e-33	1.453e-33	-32.797	-32.838	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.743	-40.743	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.021	-41.184	-0.163	(0)
Sb (3)	5.116e-19					
Sb (OH) 3	2.589e-19	2.589e-19	-18.587	-18.587	0.000	(0)
HSbO2	2.527e-19	2.527e-19	-18.597	-18.597	0.000	(0)
SbO2-	1.538e-23	1.400e-23	-22.813	-22.854	-0.041	(0)
Sb (OH) 4-	8.809e-24	8.021e-24	-23.055	-23.096	-0.041	(0)
Sb (OH) 2F	7.277e-25	7.277e-25	-24.138	-24.138	0.000	(0)
SbOF	7.157e-25	7.157e-25	-24.145	-24.145	0.000	(0)
Sb (OH) 2+	2.018e-25	1.838e-25	-24.695	-24.736	-0.041	(0)
SbO+	6.958e-26	6.336e-26	-25.157	-25.198	-0.041	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.627	-294.789	-0.163	(0)
Sb (5)	3.335e-09					
SbO3-	3.331e-09	3.033e-09	-8.477	-8.518	-0.041	(0)
Sb (OH) 6-	3.859e-12	3.547e-12	-11.414	-11.450	-0.037	(0)
SbO2+	8.164e-25	7.435e-25	-24.088	-24.129	-0.041	(0)
Se (-2)	2.864e-09					
Ag2Se	2.864e-09	2.864e-09	-8.543	-8.543	0.000	(0)
HSe-	7.688e-36	7.001e-36	-35.114	-35.155	-0.041	(0)
MnSe	3.492e-39	3.492e-39	-38.457	-38.457	0.000	(0)
H2Se	1.589e-39	1.589e-39	-38.799	-38.799	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.458	-42.621	-0.163	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-75.482	-76.133	-0.651	(0)
Se (4)	6.855e-09					
HSeO3-	5.807e-09	5.288e-09	-8.236	-8.277	-0.041	(0)
SeO3-2	1.047e-09	7.202e-10	-8.980	-9.143	-0.163	(0)
H2SeO3	6.594e-14	6.594e-14	-13.181	-13.181	0.000	(0)
AgSeO3-	6.158e-15	5.608e-15	-14.211	-14.251	-0.041	(0)
FeHSeO3+2	4.726e-21	3.250e-21	-20.325	-20.488	-0.163	(0)
Cd (SeO3) 2-2	1.211e-21	8.328e-22	-20.917	-21.079	-0.163	(0)
Ag (SeO3) 2-3	8.399e-23	3.616e-23	-22.076	-22.442	-0.366	(0)
Se (6)	1.021e-13					
SeO4-2	1.021e-13	7.280e-14	-12.991	-13.138	-0.147	(0)
MnSeO4	6.932e-17	6.932e-17	-16.159	-16.159	0.000	(0)
ZnSeO4	1.449e-18	1.449e-18	-17.839	-17.839	0.000	(0)
NiSeO4	1.414e-18	1.414e-18	-17.850	-17.850	0.000	(0)
CoSeO4	1.051e-18	1.051e-18	-17.978	-17.978	0.000	(0)
HSeO4-	1.171e-19	1.067e-19	-18.931	-18.972	-0.041	(0)
CdSeO4	2.641e-20	2.641e-20	-19.578	-19.578	0.000	(0)
Zn (SeO4) 2-2	1.556e-31	1.070e-31	-30.808	-30.971	-0.163	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.177	-57.543	-0.366	(0)
U (4)	1.849e-20					
U (OH) 5-	1.847e-20	1.682e-20	-19.734	-19.774	-0.041	(0)
U (OH) 4	2.059e-23	2.059e-23	-22.686	-22.686	0.000	(0)
U (OH) 3+	2.417e-27	2.201e-27	-26.617	-26.657	-0.041	(0)
U (OH) 2+2	4.327e-32	2.975e-32	-31.364	-31.526	-0.163	(0)
UF3+	4.829e-36	4.398e-36	-35.316	-35.357	-0.041	(0)
UF2+2	6.556e-37	4.508e-37	-36.183	-36.346	-0.163	(0)
UOH+3	9.517e-38	4.097e-38	-37.022	-37.388	-0.366	(0)
UF4	2.968e-38	2.968e-38	-37.528	-37.528	0.000	(0)
UF+3	1.351e-39	5.817e-40	-38.869	-39.235	-0.366	(0)
UF5-	0.000e+00	0.000e+00	-40.100	-40.140	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.743	-40.743	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.021	-41.184	-0.163	(0)
UF6-2	0.000e+00	0.000e+00	-41.708	-41.871	-0.163	(0)
U+4	0.000e+00	0.000e+00	-43.674	-44.325	-0.651	(0)
UCl+3	0.000e+00	0.000e+00	-45.544	-45.910	-0.366	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-166.797	-170.091	-3.294	(0)
U (5)	6.978e-17					
UO2+	6.978e-17	6.354e-17	-16.156	-16.197	-0.041	(0)
U (6)	9.506e-09					
UO2 (CO3) 2-2	5.721e-09	3.934e-09	-8.243	-8.405	-0.163	(0)
UO2 (CO3) 3-4	3.739e-09	8.357e-10	-8.427	-9.078	-0.651	(0)
UO2CO3	4.651e-11	4.651e-11	-10.332	-10.332	0.000	(0)

UO2OH+	1.312e-13	1.195e-13	-12.882	-12.923	-0.041	(0)
UO2F+	2.572e-14	2.342e-14	-13.590	-13.630	-0.041	(0)
UO2F2	4.158e-15	4.158e-15	-14.381	-14.381	0.000	(0)
UO2+2	3.864e-15	2.756e-15	-14.413	-14.560	-0.147	(0)
UO2SO4	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
UO2F3-	7.060e-17	6.429e-17	-16.151	-16.192	-0.041	(0)
UO2 (SO4) 2-2	9.658e-18	6.641e-18	-17.015	-17.178	-0.163	(0)
UO2Cl+	2.543e-18	2.315e-18	-17.595	-17.635	-0.041	(0)
UO2F4-2	4.572e-20	3.143e-20	-19.340	-19.503	-0.163	(0)
(UO2) 2 (OH) 2+2	3.447e-20	2.370e-20	-19.463	-19.625	-0.163	(0)
(UO2) 3 (OH) 5+	2.799e-22	2.549e-22	-21.553	-21.594	-0.041	(0)
V (2)	2.008e-40					
VOH+	2.008e-40	1.829e-40	-39.697	-39.738	-0.041	(0)
V+2	0.000e+00	0.000e+00	-40.622	-40.785	-0.163	(0)
V (3)	2.919e-13					
V (OH) 3	2.919e-13	2.919e-13	-12.535	-12.535	0.000	(0)
V (OH) 2+	6.055e-24	5.514e-24	-23.218	-23.259	-0.041	(0)
VOH+2	2.223e-27	1.529e-27	-26.653	-26.816	-0.163	(0)
V+3	2.057e-32	8.857e-33	-31.687	-32.053	-0.366	(0)
VSO4+	1.595e-33	1.453e-33	-32.797	-32.838	-0.041	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-51.256	-51.622	-0.366	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-52.181	-52.831	-0.651	(0)
V (4)	4.272e-17					
V (OH) 3+	4.163e-17	3.791e-17	-16.381	-16.421	-0.041	(0)
VO+2	8.024e-19	5.517e-19	-18.096	-18.258	-0.163	(0)
VOF+	2.237e-19	2.037e-19	-18.650	-18.691	-0.041	(0)
VOSO4	5.281e-20	5.281e-20	-19.277	-19.277	0.000	(0)
VOF2	4.702e-21	4.702e-21	-20.328	-20.328	0.000	(0)
VOC1+	8.805e-22	8.018e-22	-21.055	-21.096	-0.041	(0)
VOF3-	1.128e-23	1.027e-23	-22.948	-22.988	-0.041	(0)
VOF4-2	3.711e-27	2.552e-27	-26.431	-26.593	-0.163	(0)
H2V2O4+2	1.048e-28	7.205e-29	-27.980	-28.142	-0.163	(0)
V (5)	1.531e-08					
H2VO4-	1.374e-08	1.251e-08	-7.862	-7.903	-0.041	(0)
HVO4-2	1.564e-09	1.075e-09	-8.806	-8.969	-0.163	(0)
H3VO4	3.658e-12	3.658e-12	-11.437	-11.437	0.000	(0)
H3V2O7-	3.246e-13	2.955e-13	-12.489	-12.529	-0.041	(0)
HV2O7-3	1.059e-14	4.559e-15	-13.975	-14.341	-0.366	(0)
VO4-3	4.282e-16	1.843e-16	-15.368	-15.734	-0.366	(0)
VO2+	2.322e-16	2.134e-16	-15.634	-15.671	-0.037	(0)
VO2F	2.304e-17	2.304e-17	-16.638	-16.638	0.000	(0)
V2O7-4	1.878e-17	4.198e-18	-16.726	-17.377	-0.651	(0)
V3O9-3	4.767e-18	2.052e-18	-17.322	-17.688	-0.366	(0)
VO2SO4-	1.944e-18	1.771e-18	-17.711	-17.752	-0.041	(0)
VO2F2-	5.655e-19	5.149e-19	-18.248	-18.288	-0.041	(0)
VO2F3-2	5.750e-22	3.954e-22	-21.240	-21.403	-0.163	(0)
V4O12-4	4.789e-23	1.071e-23	-22.320	-22.970	-0.651	(0)
VO2F4-3	2.782e-26	1.198e-26	-25.556	-25.922	-0.366	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.587	-59.604	-1.017	(0)
V10O28-6	0.000e+00	0.000e+00	-58.793	-60.257	-1.464	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.280	-61.931	-0.651	(0)
Zn	2.387e-07					
Zn+2	1.802e-07	1.285e-07	-6.744	-6.891	-0.147	(0)
ZnCO3	3.135e-08	3.135e-08	-7.504	-7.504	0.000	(0)
ZnHCO3+	1.180e-08	1.074e-08	-7.928	-7.969	-0.041	(0)
ZnSO4	9.770e-09	9.770e-09	-8.010	-8.010	0.000	(0)
ZnOH+	4.861e-09	4.426e-09	-8.313	-8.354	-0.041	(0)
Zn (OH) 2	2.416e-10	2.416e-10	-9.617	-9.617	0.000	(0)
ZnCl+	1.820e-10	1.672e-10	-9.740	-9.777	-0.037	(0)
ZnF+	1.733e-10	1.578e-10	-9.761	-9.802	-0.041	(0)
ZnOHCl	7.540e-11	7.540e-11	-10.123	-10.123	0.000	(0)
Zn (SO4) 2-2	4.300e-11	2.957e-11	-10.366	-10.529	-0.163	(0)
Zn (OH) 3-	4.580e-13	4.170e-13	-12.339	-12.380	-0.041	(0)
ZnCl2	1.373e-13	1.373e-13	-12.862	-12.862	0.000	(0)
ZnCl3-	6.148e-17	5.648e-17	-16.211	-16.248	-0.037	(0)
Zn (OH) 4-2	8.316e-18	5.718e-18	-17.080	-17.243	-0.163	(0)
ZnSeO4	1.449e-18	1.449e-18	-17.839	-17.839	0.000	(0)
ZnCl4-2	2.037e-20	1.463e-20	-19.691	-19.835	-0.144	(0)

Zn(SeO4) 2-2	1.556e-31	1.070e-31	-30.808	-30.971	-0.163	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.474	-138.515	-0.041	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.039	-140.039	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.702	-209.743	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.026	-212.189	-0.163	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.024	-284.187	-0.163	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.06	-81.28	-36.22	Ag2S
Ag2CO3	-10.12	-21.21	-11.09	Ag2CO3
Ag2CrO4	-20.56	-32.15	-11.59	Ag2CrO4
Ag2HVO4	-10.38	-8.90	1.48	Ag2HVO4
Ag2MoO4	-11.51	-23.06	-11.55	Ag2MoO4
Ag2O	-13.34	-0.77	12.57	Ag2O
Ag2Se	5.25	-43.45	-48.70	Ag2Se
Ag2SeO3	-9.43	-16.58	-7.15	Ag2SeO3
Ag2SeO4	-20.06	-28.97	-8.91	Ag2SeO4
Ag2SO4	-14.47	-19.29	-4.82	Ag2SO4
Ag3AsO3	-22.32	-20.16	2.16	Ag3AsO3
Ag3AsO4	-12.36	-15.15	-2.79	Ag3AsO4
Ag3H2VO5	-14.46	-9.28	5.18	Ag3H2VO5
AgF:4H2O	-13.18	-12.13	1.05	AgF:4H2O
Agmetal	1.17	-12.34	-13.51	Ag
AgVO3	-9.29	-8.52	0.77	AgVO3
Al (OH) 3 (am)	-1.83	8.97	10.80	Al (OH) 3
Al2 (MoO4) 3	-51.32	-48.96	2.37	Al2 (MoO4) 3
Al2O3	-1.71	17.94	19.65	Al2O3
Al4 (OH) 10SO4	-5.35	17.35	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.83	-5.03	4.80	AlAsO4:2H2O
AlOHSO4	-6.33	-9.56	-3.23	AlOHSO4
AlSb	-146.98	-81.36	65.62	AlSb
Alunite	-5.34	-6.74	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.14	-12.93	-7.79	PbSO4
Anhydrite	-2.24	-6.60	-4.36	CaSO4
Anilite	-49.25	-81.13	-31.88	Cu0.25Cu1.5S
Antlerite	-4.54	4.25	8.79	Cu3 (OH) 4SO4
Aragonite	-0.22	-8.52	-8.30	CaCO3
Arsenolite	-73.30	-76.06	-2.76	As4O6
Artinite	-7.09	2.51	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-34.70	-28.00	6.71	As2O5
Atacamite	-3.03	4.37	7.39	Cu2 (OH) 3Cl
Azurite	-1.20	-18.10	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.97	8.42	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-15.30	0.57	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	6.18	-2.73	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-23.95	8.99	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.29	-22.96	-9.67	BaCrO4
BaF2	-9.25	-15.07	-5.82	BaF2
BaMoO4	-6.92	-13.88	-6.96	BaMoO4
Barite	-0.12	-10.10	-9.98	BaSO4
BaS	-88.28	-72.10	16.18	BaS
BaSeO3	-9.22	-7.39	1.83	BaSeO3
BaSeO4	-12.32	-19.78	-7.46	BaSeO4
Bianchite	-8.59	-10.35	-1.76	ZnSO4:6H2O
Birnessite	-9.91	8.18	18.09	MnO2
Bixbyite	-6.91	-7.55	-0.64	Mn2O3
BlaubleiI	-49.86	-74.02	-24.16	Cu0.9Cu0.2S
BlaubleiII	-50.02	-77.30	-27.28	Cu0.6Cu0.8S
Boehmite	0.39	8.97	8.58	AlOOH
Breithauptite	-52.16	-70.68	-18.52	NiSb
Brochantite	-3.38	11.84	15.22	Cu4 (OH) 6SO4
Brucite	-5.37	11.48	16.84	Mg (OH) 2
Bunsenite	-4.76	7.69	12.45	NiO
Ca (VO3) 2	-10.01	-4.35	5.66	Ca (VO3) 2
Ca2V2O7	-9.92	7.58	17.50	Ca2V2O7

Ca ₂ V ₂ O ₇ ·2H ₂ O	-13.98	7.58	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-14.52	7.78	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-19.46	19.50	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-20.36	19.50	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-287.85	-144.88	142.97	Ca ₃ Sb ₂
CaCrO ₄	-17.19	-19.46	-2.27	CaCrO ₄
Calcite	-0.04	-8.52	-8.48	CaCO ₃
Calomel	-14.28	-32.19	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.42	-10.37	-7.95	CaMoO ₄
Carnotite	-4.45	-4.22	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-6.70	-3.89	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-13.26	-16.28	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-14.07	-4.23	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.29	6.36	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.37	6.36	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-24.69	-17.98	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.01	0.55	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.50	6.90	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-14.62	-15.28	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-13.59	-15.28	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-13.37	-15.28	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.92	-17.13	-1.21	CdF ₂
Cdmetal(alpha)	-31.07	-17.55	13.51	Cd
Cdmetal(gamma)	-31.17	-17.55	13.62	Cd
CdMoO ₄	-1.79	-15.94	-14.15	CdMoO ₄
CdOHCl	-8.00	-4.46	3.54	CdOHCl
CdSb	-71.66	-72.01	-0.35	CdSb
CdSe	-16.13	-36.33	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-20.00	-21.85	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-12.00	-12.17	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-10.44	-12.17	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-10.30	-12.17	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.45	-11.20	-9.75	AgCl
Cerrusite	-1.71	-14.84	-13.13	PbCO ₃
CH ₄ (g)	-75.05	-116.09	-41.05	CH ₄
Chalcanthite	-8.29	-10.93	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-48.95	-83.87	-34.92	Cu ₂ S
Chalcopyrite	-110.13	-145.40	-35.27	CuFeS ₂
Cinnabar	-49.74	-95.43	-45.69	HgS
Claudetite	-72.99	-76.06	-3.06	As ₄ O ₆
Clausthalite	-9.99	-37.09	-27.10	PbSe
Co(BO ₂) ₂	-30.13	-3.06	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.57	7.53	13.09	Co(OH) ₂
Co(OH) ₃	-10.61	-12.92	-2.31	Co(OH) ₃
CO ₂ (g)	-2.29	-20.44	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-18.45	-5.42	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.81	-18.30	-10.50	Co ₃ O ₄
CoCl ₂	-22.38	-14.11	8.27	CoCl ₂
CoCl ₂ ·6H ₂ O	-16.65	-14.11	2.54	CoCl ₂ ·6H ₂ O
CoCO ₃	-2.93	-12.91	-9.98	CoCO ₃
CoF ₂	-14.37	-15.96	-1.60	CoF ₂
CoF ₃	-46.69	-48.15	-1.46	CoF ₃
CoFe ₂ O ₄	24.99	21.47	-3.53	CoFe ₂ O ₄
CoMoO ₄	-7.01	-14.77	-7.76	CoMoO ₄
CoO	-6.06	7.53	13.59	CoO
CoS(alpha)	-65.55	-72.99	-7.44	CoS
CoS(beta)	-61.92	-72.99	-11.07	CoS
CoSe	-18.96	-35.16	-16.20	CoSe
CoSeO ₃	-9.60	-8.28	1.32	CoSeO ₃
CoSeO ₄ ·6H ₂ O	-19.15	-20.68	-1.53	CoSeO ₄ ·6H ₂ O
CoSO ₄	-13.80	-11.00	2.80	CoSO ₄
CoSO ₄ ·6H ₂ O	-8.53	-11.00	-2.47	CoSO ₄ ·6H ₂ O
Cotunnite	-11.26	-16.04	-4.78	PbCl ₂
Covellite	-50.63	-72.93	-22.30	CuS
Cr(OH) ₂	-19.70	-8.89	10.82	Cr(OH) ₂
Cr(OH) ₃	-1.21	0.12	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	0.87	0.12	-0.75	Cr(OH) ₃
Cr ₂ O ₃	2.61	0.25	-2.36	Cr ₂ O ₃

CrCl2	-44.62	-30.52	14.09	CrCl2
CrCl3	-47.45	-32.33	15.11	CrCl3
CrF3	-23.77	-35.11	-11.34	CrF3
Crmetal	-63.28	-32.80	30.48	Cr
CrO3	-28.17	-31.38	-3.21	CrO3
Cryolite	-13.55	-47.39	-33.84	Na3AlF6
Cu(OH)2	-1.08	7.59	8.67	Cu(OH)2
Cu(SbO3)2	-26.97	18.24	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-49.52	-84.41	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-0.24	-46.04	-45.80	Cu2Se
Cu2SO4	-19.92	-21.87	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-11.32	-5.22	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-52.75	-95.35	-42.59	Cu3Sb
Cu3Se2	-17.64	-81.13	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-18.35	-23.79	-5.44	CuCrO4
CuF	-8.51	-13.42	-4.91	CuF
CuF2	-17.01	-15.90	1.12	CuF2
CuF2:2H2O	-11.35	-15.90	-4.55	CuF2:2H2O
Cumetal	-4.87	-13.63	-8.76	Cu
CuMoO4	-1.63	-14.71	-13.08	CuMoO4
CuOCuSO4	-13.65	-3.34	10.30	CuOCuSO4
Cupricferrite	15.54	21.53	5.99	CuFe2O4
Cuprite	-1.94	-3.35	-1.41	Cu2O
Cuprousferrite	14.21	5.30	-8.92	CuFeO2
CuSe	-2.00	-35.10	-33.10	CuSe
CuSe2	-20.51	-53.87	-33.37	CuSe2
CuSeO3:2H2O	-8.73	-8.22	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.17	-20.61	-2.44	CuSeO4:5H2O
CuSO4	-13.87	-10.93	2.94	CuSO4
Diaspore	2.10	8.97	6.87	AlOOH
Djurlite	-49.22	-83.14	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.94	-17.48	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.39	-17.48	-17.09	CaMg(CO3)2
Epsomite	-4.92	-7.05	-2.13	MgSO4:7H2O
Fe(OH)2	-5.52	8.04	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.76	3.72	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.51	-8.23	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-3.43	-1.87	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-12.87	-33.49	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.91	-41.64	-3.73	Fe2(SO4)3
Fe3(OH)8	1.76	21.98	20.22	Fe3(OH)8
FeAsO4:2H2O	-7.43	-7.03	0.40	FeAsO4:2H2O
FeCr2O4	1.09	8.29	7.20	FeCr2O4
FeMoO4	-4.16	-14.25	-10.09	FeMoO4
Ferrihydrite	3.78	6.97	3.19	Fe(OH)3
Ferroselite	-34.82	-53.42	-18.60	FeSe2
FeS(ppt)	-69.52	-72.47	-2.95	FeS
FeSe	-23.64	-34.64	-11.00	FeSe
Fix_pe	-4.42	-4.42	0.00	e-
Fluorite	-1.06	-11.56	-10.50	CaF2
Galena	-60.95	-74.92	-13.97	PbS
Gibbsite	0.68	8.97	8.29	Al(OH)3
Goethite	6.48	6.97	0.49	FeOOH
Goslarite	-8.34	-10.35	-2.01	ZnSO4:7H2O
Greenockite	-59.80	-74.16	-14.36	CdS
Greigite	-255.06	-300.09	-45.03	Fe3S4
Gummite	-7.16	0.51	7.67	UO3
Gypsum	-1.99	-6.60	-4.61	CaSO4:2H2O
H-Jarosite	-4.05	-16.15	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.42	-22.30	-12.88	H2MoO4
H2S(g)	-72.51	-80.52	-8.01	H2S
H2Se(g)	-37.73	-42.69	-4.96	H2Se
Halite	-7.72	-6.12	1.60	NaCl
Hausmannite	-8.27	52.76	61.03	Mn3O4
Hematite	15.36	13.94	-1.42	Fe2O3
Hercynite	3.09	25.98	22.89	FeAl2O4
Hg(CH3)2(g)	-173.39	-247.10	-73.71	Hg(CH3)2

Hg (g)	-9.36	-17.23	-7.87	Hg
Hg (OH) 2	-11.42	-14.91	-3.50	Hg (OH) 2
Hg2 (g)	-19.51	-34.46	-14.96	Hg2
Hg2 (OH) 2	-15.81	-10.55	5.26	Hg2 (OH) 2
Hg2CO3	-14.94	-30.99	-16.05	Hg2CO3
Hg2CrO4	-33.23	-41.93	-8.70	Hg2CrO4
Hg2F2	-23.68	-34.04	-10.36	Hg2F2
Hg2S	-79.39	-91.07	-11.68	Hg2S
Hg2SeO3	-21.71	-26.36	-4.66	Hg2SeO3
Hg2SO4	-22.95	-29.08	-6.13	Hg2SO4
Hg3O2CO3	-35.49	-65.18	-29.68	Hg3O2CO3
HgCl (g)	-35.59	-16.10	19.50	HgCl
HgCl2	-15.29	-36.55	-21.26	HgCl2
HgF (g)	-49.70	-17.02	32.68	HgF
HgF2 (g)	-50.97	-38.40	12.57	HgF2
Hgmetal (l)	-3.78	-17.23	-13.45	Hg
HgSe	-1.91	-57.60	-55.69	HgSe
HgSeO3	-18.29	-30.72	-12.43	HgSeO3
HgSO4	-24.02	-33.44	-9.42	HgSO4
Huntite	-5.44	-35.41	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.32	-24.09	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.61	-24.38	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-19.51	-24.68	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	2.06	-12.74	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-38.70	-55.95	-17.24	K2Cr2O7
K2CrO4	-24.05	-24.56	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.66	-21.39	-0.73	K2SeO4
Langite	-5.65	11.84	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.90	-7.33	-0.43	PbO:PbSO4
Laurionite	-5.84	-5.22	0.62	PbOHCl
Lepidocrocite	5.60	6.97	1.37	FeOOH
Lime	-20.77	11.92	32.70	CaO
Litharge	-7.10	5.60	12.69	PbO
Mackinawite	-68.87	-72.47	-3.60	FeS
Maghemite	7.55	13.94	6.39	Fe2O3
Magnesioferrite	8.56	25.41	16.86	Fe2MgO4
Magnesite	-1.50	-8.96	-7.46	MgCO3
Magnetite	18.58	21.98	3.40	Fe3O4
Malachite	0.05	-5.26	-5.31	Cu2 (OH) 2CO3
Manganite	-3.77	21.57	25.34	MnOOH
Massicot	-7.30	5.60	12.89	PbO
Matlockite	-7.99	-16.97	-8.97	PbClF
Melanothallite	-20.30	-14.05	6.26	CuCl2
Melanterite	-8.27	-10.48	-2.21	FeSO4:7H2O
Metacinnabar	-50.34	-95.43	-45.09	HgS
Mg (OH) 2 (active)	-7.32	11.48	18.79	Mg (OH) 2
Mg (VO3) 2	-16.08	-4.80	11.28	Mg (VO3) 2
Mg2Sb3	-262.92	-188.24	74.68	Mg2Sb3
Mg2V2O7	-19.68	6.68	26.36	Mg2V2O7
MgCr2O4	-4.47	11.73	16.20	MgCr2O4
MgCrO4	-25.29	-19.91	5.38	MgCrO4
MgF2	-3.88	-12.01	-8.13	MgF2
MgMoO4	-8.97	-10.82	-1.85	MgMoO4
MgSeO3:6H2O	-7.39	-4.33	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.53	-16.73	-1.20	MgSeO4:6H2O
Minium	-32.82	40.71	73.52	Pb3O4
Mirabilite	-8.01	-9.12	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.56	-6.66	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.42	-63.14	-5.71	Mn2 (SO4) 3
Mn2Sb	-144.13	-83.05	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-11.65	0.85	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-14.74	-12.02	2.72	MnCl2:4H2O
MnS (grn)	-71.07	-70.90	0.17	MnS
MnS (pnk)	-74.24	-70.90	3.34	MnS
MnSb	-91.19	-94.10	-2.91	MnSb
MnSe	-36.57	-33.07	3.50	MnSe
MnSeO3	-7.32	-6.19	1.13	MnSeO3

MnSeO3:2H2O	-7.18	-6.19	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.54	-18.59	-2.05	MnSeO4:5H2O
MnSO4	-11.49	-8.91	2.58	MnSO4
Monteponite	-8.75	6.36	15.10	CdO
Montroydite	-11.27	-14.91	-3.64	HgO
MoO3	-14.30	-22.30	-8.00	MoO3
Morenosite	-8.70	-10.84	-2.14	NiSO4:7H2O
MoS2	-136.99	-207.25	-70.26	MoS2
Na-Jarosite	-0.24	-11.44	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-43.46	-53.36	-9.90	Na2Cr2O7
Na2CrO4	-24.91	-21.98	2.93	Na2CrO4
Na2Mo2O7	-18.59	-35.19	-16.60	Na2Mo2O7
Na2MoO4	-14.38	-12.89	1.49	Na2MoO4
Na2MoO4:2H2O	-14.12	-12.89	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.70	-6.40	10.30	Na2SeO3:5H2O
Na2SeO4	-20.08	-18.80	1.28	Na2SeO4
Na3Sb	-170.67	-76.22	94.45	Na3Sb
Na3VO4	-30.71	5.97	36.68	Na3VO4
Na4V2O7	-34.86	2.54	37.40	Na4V2O7
Nantokite	-5.76	-12.49	-6.73	CuCl
NaSb	-84.87	-61.71	23.17	NaSb
Natron	-9.72	-11.04	-1.31	Na2CO3:10H2O
NaVO3	-7.29	-3.43	3.86	NaVO3
Nesquehonite	-4.29	-8.96	-4.67	MgCO3:3H2O
Ni(OH)2	-5.11	7.69	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.64	-4.94	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.78	12.22	32.00	Ni4(OH)6SO4
NiCO3	-5.88	-12.75	-6.87	NiCO3
NiMoO4	-3.47	-14.61	-11.14	NiMoO4
NiS(alpha)	-67.23	-72.83	-5.60	NiS
NiS(beta)	-61.73	-72.83	-11.10	NiS
NiS(gamma)	-60.03	-72.83	-12.80	NiS
NiSe	-17.30	-35.00	-17.70	NiSe
NiSeO3:2H2O	-10.94	-8.12	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.00	-20.52	-1.52	NiSeO4:6H2O
Nsutite	-9.32	8.18	17.50	MnO2
O2(g)	-35.26	47.83	83.09	O2
Orpiment	-218.52	-279.58	-61.07	As2S3
Otavite	-2.08	-14.08	-12.00	CdCO3
Pb(BO2)2	-11.51	-4.99	6.52	Pb(BO2)2
Pb(OH)2	-2.55	5.60	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.91	-66.67	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.42	0.38	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.99	11.20	26.19	Pb2O(OH)2
Pb2O3	-25.93	35.11	61.04	Pb2O3
Pb2OCO3	-8.69	-9.25	-0.56	Pb2OCO3
Pb2V2O7	-3.18	-5.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.00	-11.20	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.62	0.52	6.14	Pb3(VO4)2
Pb3O2CO3	-14.67	-3.65	11.02	Pb3O2CO3
Pb3O2SO4	-12.42	-1.73	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.24	3.86	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.01	3.86	21.88	Pb4O3SO4
PbCrO4	-13.18	-25.78	-12.60	PbCrO4
PbF2	-10.45	-17.89	-7.44	PbF2
Pbmetal	-22.56	-18.31	4.25	Pb
PbMoO4	-1.08	-16.70	-15.62	PbMoO4
PbO:0.3H2O	-7.38	5.60	12.98	PbO:0.33H2O
PbSeO4	-15.77	-22.61	-6.84	PbSeO4
Periclase	-10.11	11.48	21.58	MgO
Phosgenite	-11.07	-30.88	-19.81	PbCl2:PbCO3
Plattnerite	-20.09	29.51	49.60	PbO2
Portlandite	-10.88	11.92	22.80	Ca(OH)2
Pyrite	-110.57	-129.08	-18.51	FeS2
Pyrochroite	-5.58	9.62	15.19	Mn(OH)2
Pyrolusite	-7.85	33.53	41.38	MnO2
Realgar	-91.74	-111.49	-19.75	AsS
Retgersite	-8.80	-10.84	-2.04	NiSO4:6H2O

Rhodochrosite	-0.24	-10.82	-10.58	MnCO3
Rutherfordine	-5.43	-19.93	-14.50	UO2CO3
Sb(OH)3	-11.48	-18.59	-7.11	Sb(OH)3
Sb2O4	-16.66	-13.26	3.40	Sb2O4
Sb2O5	-28.30	-37.97	-9.67	Sb2O5
Sb2Se3	-97.48	-165.24	-67.76	Sb2Se3
Sb4O6(cubic)	-56.09	-74.35	-18.26	Sb4O6
Sb4O6(orth)	-56.45	-74.35	-17.90	Sb4O6
SbCl3	-51.62	-51.05	0.57	SbCl3
SbF3	-43.60	-53.82	-10.23	SbF3
Sbmetal	-42.77	-54.46	-11.69	Sb
SbO2	-3.12	-30.94	-27.82	SbO2
Schoepite	-5.49	0.51	5.99	UO2(OH)2·H2O
Semetal(am)	-11.67	-18.78	-7.11	Se
Semetal(hex)	-11.07	-18.78	-7.71	Se
Senarmontite	-24.81	-37.17	-12.37	Sb2O3
SeO2	-15.94	-15.81	0.12	SeO2
SeO3	-49.25	-28.21	21.04	SeO3
Siderite	-2.16	-12.40	-10.24	FeCO3
Smithsonite	-2.26	-12.26	-10.00	ZnCO3
Sphalerite	-60.89	-72.34	-11.45	ZnS
Spinel	-7.43	29.42	36.85	MgAl2O4
Stibnite	-228.27	-278.73	-50.46	Sb2S3
Sulfur	-54.46	-56.61	-2.14	S
Tenorite	-0.05	7.59	7.64	CuO
Thenardite	-9.44	-9.12	0.32	Na2SO4
Thermonatrite	-11.67	-11.03	0.64	Na2CO3·H2O
Tyuyamunite	-7.41	-3.33	4.08	Ca(UO2)2(VO4)2
U3O8	-15.82	5.26	21.08	U3O8
U3Sb4	-556.25	-403.86	152.38	U3Sb4
U4O9	-29.82	-32.84	-3.02	U4O9
UF4	-31.63	-61.17	-29.54	UF4
UF4:2.5H2O	-28.45	-61.17	-32.72	UF4:2.5H2O
UO2(am)	-15.12	-14.19	0.93	UO2
UO2(OH)2(beta)	-5.10	0.51	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.45	-27.70	-2.25	UO2SeO4:4H2O
UO3	-7.19	0.51	7.70	UO3
Uraninite	-9.52	-14.19	-4.67	UO2
USb2	-209.72	-180.14	29.58	USb2
V(OH)3	-17.04	-9.45	7.59	V(OH)3
V2O5	-14.91	-16.27	-1.36	V2O5
V3O5	-35.32	-33.48	1.84	V3O5
V4O7	-43.86	-36.67	7.19	V4O7
V6O13	-35.79	-96.65	-60.86	V6O13
Valentinite	-28.69	-37.17	-8.48	Sb2O3
VC12	-61.92	-43.05	18.87	VC12
VC13	-65.34	-41.91	23.43	VC13
VF4	-65.10	-50.17	14.93	VF4
Vmetal	-89.34	-45.32	44.03	V
VO	-36.16	-21.41	14.76	VO
VO(OH)2	-8.34	-3.19	5.15	VO(OH)2
VO2Cl	-21.80	-18.96	2.84	VO2Cl
VOC1	-31.42	-20.27	11.15	VOC1
VOC12	-37.59	-24.83	12.76	VOC12
VOSO4	-25.33	-21.72	3.61	VOSO4
Witherite	-3.45	-12.02	-8.57	BaCO3
Wurtzite	-63.39	-72.34	-8.95	ZnS
Zincite	-3.16	8.18	11.33	ZnO
Zincosite	-14.28	-10.35	3.93	ZnSO4
Zn(BO2)2	-10.70	-2.41	8.29	Zn(BO2)2
Zn(OH)2	-4.02	8.18	12.20	Zn(OH)2
Zn(OH)2(am)	-4.30	8.18	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.58	8.18	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.36	8.18	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.56	8.18	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.67	-2.17	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.66	5.53	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.12	-3.47	13.65	Zn3(AsO4)2:2.5H2O

Zn3O(SO4)2	-31.44	-12.52	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-14.22	14.18	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.25	19.25	38.50	Zn5(OH)8Cl2
ZnCl2	-20.51	-13.46	7.05	ZnCl2
ZnCO3:1H2O	-2.00	-12.26	-10.26	ZnCO3:1H2O
ZnF2	-14.78	-15.31	-0.53	ZnF2
Znmetal	-41.52	-15.74	25.79	Zn
ZnMoO4	-4.00	-14.12	-10.13	ZnMoO4
ZnO(active)	-3.01	8.18	11.19	ZnO
ZnS(am)	-63.29	-72.34	-9.05	ZnS
ZnSb	-81.21	-70.19	11.01	ZnSb
ZnSe	-20.11	-34.51	-14.40	ZnSe
ZnSeO4:6H2O	-18.51	-20.03	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.71	-10.35	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 37.

REACTION 201
H2O -1
87.3170 moles ### Addition step. Removes HTC water but solute mass remains
USE solution 201
SAVE Solution 202
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 201. Solution after simulation 36.
Using reaction 201.

Reaction 201.

8.732e+01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.353e-08	8.350e-08
Al	1.875e-06	1.874e-06
As	3.325e-08	3.324e-08
B	1.332e-05	1.331e-05
Ba	8.335e-07	8.332e-07
C	7.988e-03	7.986e-03
Ca	2.855e-03	2.854e-03
Cd	8.259e-09	8.256e-09

Cl	1.451e-03	1.450e-03
Co	1.359e-07	1.359e-07
Cr	1.271e-07	1.270e-07
Cu	2.440e-06	2.439e-06
F	1.789e-04	1.788e-04
Fe	2.657e-05	2.656e-05
Hg	5.563e-11	5.561e-11
K	2.106e-04	2.105e-04
Mg	9.938e-04	9.934e-04
Mn	1.436e-05	1.436e-05
Mo	2.126e-07	2.126e-07
Na	4.146e-03	4.145e-03
Ni	2.132e-07	2.131e-07
Pb	1.541e-08	1.541e-08
S	1.452e-03	1.451e-03
Sb	8.582e-09	8.579e-09
Se	2.501e-08	2.500e-08
U	2.447e-08	2.446e-08
V	3.940e-08	3.939e-08
Zn	6.143e-07	6.140e-07

-----Description of solution-----

	pH	=	7.498	Charge balance
	pe	=	4.579	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.562e-02	
	Mass of water (kg)	=	9.996e-01	
	Total alkalinity (eq/kg)	=	7.590e-03	
	Total CO2 (mol/kg)	=	7.988e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	4.286e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	9	
	Total H	=	1.109825e+02	
	Total O	=	5.551686e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.605e-07	3.171e-07	-6.443	-6.499	-0.056	(0)
H+	3.597e-08	3.175e-08	-7.444	-7.498	-0.054	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	8.353e-08					
AgCl	4.880e-08	4.880e-08	-7.312	-7.312	0.000	(0)
Ag+	2.115e-08	1.867e-08	-7.675	-7.729	-0.054	(0)
AgCl2-	6.301e-09	5.441e-09	-8.201	-8.264	-0.064	(0)
Ag2Se	3.481e-09	3.481e-09	-8.458	-8.458	0.000	(0)
AgSO4-	2.977e-10	2.570e-10	-9.526	-9.590	-0.064	(0)
AgCl3-2	1.117e-11	6.208e-12	-10.952	-11.207	-0.255	(0)
AgF	6.867e-12	6.867e-12	-11.163	-11.163	0.000	(0)
AgOH	5.919e-13	5.919e-13	-12.228	-12.228	0.000	(0)
AgH2BO3	7.070e-14	7.070e-14	-13.151	-13.151	0.000	(0)
AgCl4-3	6.081e-14	1.623e-14	-13.216	-13.790	-0.574	(0)
AgSeO3-	2.711e-14	2.341e-14	-13.567	-13.631	-0.064	(0)
Ag (OH) 2-	2.124e-17	1.834e-17	-16.673	-16.737	-0.064	(0)
Ag (SeO3) 2-3	1.533e-21	4.090e-22	-20.814	-21.388	-0.574	(0)
Ag2MoO4	1.701e-23	1.701e-23	-22.769	-22.769	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.530	-67.530	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-75.543	-76.563	-1.020	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.872	-137.030	-0.158	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.981	-137.045	-0.064	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.670	-138.972	-0.301	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.994	-139.283	-0.289	(0)

Al	1.875e-06					
Al (OH) 4-	1.807e-06	1.596e-06	-5.743	-5.797	-0.054	(0)
Al (OH) 3	3.998e-08	3.998e-08	-7.398	-7.398	0.000	(0)
AlF3	1.246e-08	1.246e-08	-7.905	-7.905	0.000	(0)
AlF2+	7.619e-09	6.756e-09	-8.118	-8.170	-0.052	(0)
Al (OH) 2+	7.126e-09	6.319e-09	-8.147	-8.199	-0.052	(0)
AlF4-	1.035e-09	9.143e-10	-8.985	-9.039	-0.054	(0)
AlF+2	1.874e-10	1.159e-10	-9.727	-9.936	-0.209	(0)
AlOH+2	4.057e-11	2.509e-11	-10.392	-10.600	-0.209	(0)
AlSO4+	4.798e-13	4.238e-13	-12.319	-12.373	-0.054	(0)
Al+3	2.437e-13	7.913e-14	-12.613	-13.102	-0.488	(0)
Al (SO4) 2-	3.547e-15	3.134e-15	-14.450	-14.504	-0.054	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.863	-44.437	-0.574	(0)
As (3)	1.406e-19					
H3AsO3	1.380e-19	1.380e-19	-18.860	-18.860	0.000	(0)
H2AsO3-	2.583e-21	2.230e-21	-20.588	-20.652	-0.064	(0)
HAsO3-2	1.152e-25	6.406e-26	-24.938	-25.193	-0.255	(0)
H4AsO3+	2.514e-27	2.171e-27	-26.600	-26.663	-0.064	(0)
AsO3-3	2.915e-31	7.779e-32	-30.535	-31.109	-0.574	(0)
As (5)	3.325e-08					
HAsO4-2	2.803e-08	1.558e-08	-7.552	-7.807	-0.255	(0)
H2AsO4-	5.224e-09	4.511e-09	-8.282	-8.346	-0.064	(0)
AsO4-3	5.816e-12	1.552e-12	-11.235	-11.809	-0.574	(0)
H3AsO4	2.479e-14	2.488e-14	-13.606	-13.604	0.002	(0)
B	1.332e-05					
H3BO3	1.301e-05	1.306e-05	-4.886	-4.884	0.002	(0)
H2BO3-	2.730e-07	2.389e-07	-6.564	-6.622	-0.058	(0)
CaH2BO3+	2.290e-08	2.005e-08	-7.640	-7.698	-0.058	(0)
MgH2BO3+	5.016e-09	4.390e-09	-8.300	-8.357	-0.058	(0)
NaH2BO3	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
BF (OH) 3-	8.719e-10	7.632e-10	-9.060	-9.117	-0.058	(0)
BaH2BO3+	4.082e-12	3.573e-12	-11.389	-11.447	-0.058	(0)
H5 (BO3) 2-	3.034e-12	2.656e-12	-11.518	-11.576	-0.058	(0)
BF2 (OH) 2-	4.335e-13	3.795e-13	-12.363	-12.421	-0.058	(0)
AgH2BO3	7.070e-14	7.070e-14	-13.151	-13.151	0.000	(0)
H8 (BO3) 3-	3.963e-15	3.469e-15	-14.402	-14.460	-0.058	(0)
BF3OH-	7.843e-19	6.866e-19	-18.106	-18.163	-0.058	(0)
BF4-	1.795e-23	1.571e-23	-22.746	-22.804	-0.058	(0)
Ba	8.335e-07					
Ba+2	7.978e-07	4.839e-07	-6.098	-6.315	-0.217	(0)
BaHCO3+	3.336e-08	2.965e-08	-7.477	-7.528	-0.051	(0)
BaCO3	2.352e-09	2.352e-09	-8.629	-8.629	0.000	(0)
BaH2BO3+	4.082e-12	3.573e-12	-11.389	-11.447	-0.058	(0)
BaOH+	7.566e-13	6.698e-13	-12.121	-12.174	-0.053	(0)
C (4)	7.988e-03					
HCO3-	7.235e-03	6.416e-03	-2.141	-2.193	-0.052	(0)
H2CO3	4.581e-04	4.581e-04	-3.339	-3.339	0.000	(0)
CaHCO3+	1.960e-04	1.742e-04	-3.708	-3.759	-0.051	(0)
MgHCO3+	3.947e-05	3.479e-05	-4.404	-4.458	-0.055	(0)
CaCO3	2.189e-05	2.189e-05	-4.660	-4.660	0.000	(0)
CO3-2	1.562e-05	9.475e-06	-4.806	-5.023	-0.217	(0)
NaHCO3	1.311e-05	1.311e-05	-4.882	-4.882	0.000	(0)
MgCO3	4.177e-06	4.177e-06	-5.379	-5.379	0.000	(0)
CuCO3	2.200e-06	2.200e-06	-5.658	-5.658	0.000	(0)
MnHCO3+	1.001e-06	8.861e-07	-6.000	-6.053	-0.053	(0)
NaCO3-	7.229e-07	6.410e-07	-6.141	-6.193	-0.052	(0)
ZnCO3	1.274e-07	1.274e-07	-6.895	-6.895	0.000	(0)
Cu (CO3) 2-2	1.009e-07	5.609e-08	-6.996	-7.251	-0.255	(0)
NiHCO3+	6.365e-08	5.496e-08	-7.196	-7.260	-0.064	(0)
ZnHCO3+	5.492e-08	4.742e-08	-7.260	-7.324	-0.064	(0)
BaHCO3+	3.336e-08	2.965e-08	-7.477	-7.528	-0.051	(0)
CoHCO3+	2.917e-08	2.519e-08	-7.535	-7.599	-0.064	(0)
NiCO3	2.456e-08	2.456e-08	-7.610	-7.610	0.000	(0)
CuHCO3+	1.848e-08	1.596e-08	-7.733	-7.797	-0.064	(0)
FeHCO3+	1.807e-08	1.606e-08	-7.743	-7.794	-0.051	(0)
UO2 (CO3) 3-4	1.795e-08	1.714e-09	-7.746	-8.766	-1.020	(0)
PbCO3	1.144e-08	1.144e-08	-7.942	-7.942	0.000	(0)
CoCO3	8.084e-09	8.084e-09	-8.092	-8.092	0.000	(0)

	UO2 (CO3) 2-2	6.494e-09	3.610e-09	-8.187	-8.442	-0.255	(0)
	BaCO3	2.352e-09	2.352e-09	-8.629	-8.629	0.000	(0)
	PbHCO3+	2.217e-09	1.914e-09	-8.654	-8.718	-0.064	(0)
	CdCO3	8.114e-10	8.114e-10	-9.091	-9.091	0.000	(0)
	Pb (CO3) 2-2	5.621e-10	3.125e-10	-9.250	-9.505	-0.255	(0)
	CdHCO3+	6.356e-11	5.488e-11	-10.197	-10.261	-0.064	(0)
	UO2CO3	1.909e-11	1.909e-11	-10.719	-10.719	0.000	(0)
	Cd (CO3) 2-2	1.025e-11	5.700e-12	-10.989	-11.244	-0.255	(0)
	HgCO3	9.818e-17	9.818e-17	-16.008	-16.008	0.000	(0)
	Hg (CO3) 2-2	5.292e-18	2.942e-18	-17.276	-17.531	-0.255	(0)
	HgHCO3+	6.721e-20	5.804e-20	-19.173	-19.236	-0.064	(0)
Ca	2.855e-03						
	Ca+2	2.404e-03	1.458e-03	-2.619	-2.836	-0.217	(0)
	CaSO4	2.305e-04	2.305e-04	-3.637	-3.637	0.000	(0)
	CaHCO3+	1.960e-04	1.742e-04	-3.708	-3.759	-0.051	(0)
	CaCO3	2.189e-05	2.189e-05	-4.660	-4.660	0.000	(0)
	CaF+	2.632e-06	2.330e-06	-5.580	-5.633	-0.053	(0)
	CaH2BO3+	2.290e-08	2.005e-08	-7.640	-7.698	-0.058	(0)
	CaOH+	1.038e-08	9.224e-09	-7.984	-8.035	-0.051	(0)
Cd	8.259e-09						
	Cd+2	6.194e-09	3.757e-09	-8.208	-8.425	-0.217	(0)
	CdCO3	8.114e-10	8.114e-10	-9.091	-9.091	0.000	(0)
	CdSO4	6.078e-10	6.078e-10	-9.216	-9.216	0.000	(0)
	CdCl+	5.320e-10	4.593e-10	-9.274	-9.338	-0.064	(0)
	CdHCO3+	6.356e-11	5.488e-11	-10.197	-10.261	-0.064	(0)
	CdOH+	1.096e-11	9.463e-12	-10.960	-11.024	-0.064	(0)
	Cd (CO3) 2-2	1.025e-11	5.700e-12	-10.989	-11.244	-0.255	(0)
	Cd (SO4) 2-2	1.018e-11	5.658e-12	-10.992	-11.247	-0.255	(0)
	CdF+	1.010e-11	8.721e-12	-10.996	-11.059	-0.064	(0)
	CdOHC1	5.975e-12	5.975e-12	-11.224	-11.224	0.000	(0)
	CdCl2	2.451e-12	2.451e-12	-11.611	-11.611	0.000	(0)
	Cd (OH) 2	1.893e-14	1.893e-14	-13.723	-13.723	0.000	(0)
	CdF2	2.548e-15	2.548e-15	-14.594	-14.594	0.000	(0)
	CdCl3-	2.293e-15	1.980e-15	-14.640	-14.703	-0.064	(0)
	Cd2OH+3	6.678e-19	1.782e-19	-18.175	-18.749	-0.574	(0)
	Cd (OH) 3-	4.248e-19	3.668e-19	-18.372	-18.436	-0.064	(0)
	CdSeO4	2.405e-19	2.405e-19	-18.619	-18.619	0.000	(0)
	Cd (SeO3) 2-2	2.121e-20	1.179e-20	-19.673	-19.928	-0.255	(0)
	Cd (OH) 4-2	3.424e-26	1.904e-26	-25.465	-25.720	-0.255	(0)
	CdHS+	0.000e+00	0.000e+00	-73.969	-74.032	-0.064	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-140.443	-140.443	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-212.095	-212.159	-0.064	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-283.323	-283.578	-0.255	(0)
Cl	1.451e-03						
	Cl-	1.451e-03	1.280e-03	-2.838	-2.893	-0.054	(0)
	AgCl	4.880e-08	4.880e-08	-7.312	-7.312	0.000	(0)
	MnCl+	1.260e-08	1.115e-08	-7.900	-7.953	-0.053	(0)
	AgCl2-	6.301e-09	5.441e-09	-8.201	-8.264	-0.064	(0)
	ZnCl+	8.526e-10	7.516e-10	-9.069	-9.124	-0.055	(0)
	CuCl	8.209e-10	8.209e-10	-9.086	-9.086	0.000	(0)
	CdCl+	5.320e-10	4.593e-10	-9.274	-9.338	-0.064	(0)
	ZnOHC1	3.120e-10	3.120e-10	-9.506	-9.506	0.000	(0)
	NiCl+	2.636e-10	2.276e-10	-9.579	-9.643	-0.064	(0)
	CoCl+	2.589e-10	2.235e-10	-9.587	-9.651	-0.064	(0)
	CuCl2-	2.491e-10	2.196e-10	-9.604	-9.658	-0.055	(0)
	CuCl+	9.073e-11	7.998e-11	-10.042	-10.097	-0.055	(0)
	PbCl+	2.112e-11	1.824e-11	-10.675	-10.739	-0.064	(0)
	MnCl2	2.017e-11	2.017e-11	-10.695	-10.695	0.000	(0)
	AgCl3-2	1.117e-11	6.208e-12	-10.952	-11.207	-0.255	(0)
	CdOHC1	5.975e-12	5.975e-12	-11.224	-11.224	0.000	(0)
	CdCl2	2.451e-12	2.451e-12	-11.611	-11.611	0.000	(0)
	ZnCl2	1.525e-12	1.525e-12	-11.817	-11.817	0.000	(0)
	PbCl2	1.043e-13	1.043e-13	-12.982	-12.982	0.000	(0)
	CuCl3-2	9.782e-14	6.009e-14	-13.010	-13.221	-0.212	(0)
	AgCl4-3	6.081e-14	1.623e-14	-13.216	-13.790	-0.574	(0)
	CuCl2	3.550e-14	3.550e-14	-13.450	-13.450	0.000	(0)
	MnCl3-	8.033e-15	7.112e-15	-14.095	-14.148	-0.053	(0)
	HgClOH	6.207e-15	6.207e-15	-14.207	-14.207	0.000	(0)

CdCl3-	2.293e-15	1.980e-15	-14.640	-14.703	-0.064	(0)
ZnCl3-	1.759e-15	1.551e-15	-14.755	-14.809	-0.055	(0)
NiCl2	1.467e-15	1.467e-15	-14.834	-14.834	0.000	(0)
HgCl2	1.419e-15	1.419e-15	-14.848	-14.848	0.000	(0)
CrCl+2	1.062e-15	5.905e-16	-14.974	-15.229	-0.255	(0)
PbCl3-	6.155e-17	5.315e-17	-16.211	-16.275	-0.064	(0)
FeCl+2	4.406e-17	2.707e-17	-16.356	-16.568	-0.212	(0)
HgCl3-	2.104e-17	1.817e-17	-16.677	-16.741	-0.064	(0)
CrOHC12	4.556e-18	4.556e-18	-17.341	-17.341	0.000	(0)
ZnCl4-2	1.616e-18	9.927e-19	-17.792	-18.003	-0.212	(0)
UO2Cl+	1.217e-18	1.051e-18	-17.915	-17.978	-0.064	(0)
CuCl3-	4.812e-19	4.242e-19	-18.318	-18.372	-0.055	(0)
HgCl+	2.561e-19	2.212e-19	-18.592	-18.655	-0.064	(0)
FeCl2+	1.748e-19	1.548e-19	-18.757	-18.810	-0.053	(0)
HgCl4-2	1.665e-19	9.258e-20	-18.778	-19.033	-0.255	(0)
CrCl2+	8.308e-20	7.174e-20	-19.081	-19.144	-0.064	(0)
PbCl4-2	5.594e-20	3.110e-20	-19.252	-19.507	-0.255	(0)
VOCl+	5.392e-21	4.655e-21	-20.268	-20.332	-0.064	(0)
FeCl3	1.982e-23	1.982e-23	-22.703	-22.703	0.000	(0)
CuCl4-2	4.430e-24	2.722e-24	-23.354	-23.565	-0.212	(0)
CrO3Cl-	6.493e-27	5.606e-27	-26.188	-26.251	-0.064	(0)
CoCl+2	3.569e-36	1.984e-36	-35.447	-35.702	-0.255	(0)
UCl+3	0.000e+00	0.000e+00	-45.849	-46.423	-0.574	(0)
Co (2)	1.359e-07					
Co+2	9.079e-08	5.047e-08	-7.042	-7.297	-0.255	(0)
CoHCO3+	2.917e-08	2.519e-08	-7.535	-7.599	-0.064	(0)
CoCO3	8.084e-09	8.084e-09	-8.092	-8.092	0.000	(0)
CoSO4	6.949e-09	6.949e-09	-8.158	-8.158	0.000	(0)
CoOH+	3.698e-10	3.193e-10	-9.432	-9.496	-0.064	(0)
CoF+	2.707e-10	2.337e-10	-9.568	-9.631	-0.064	(0)
CoCl+	2.589e-10	2.235e-10	-9.587	-9.651	-0.064	(0)
Co (OH) 2	8.042e-12	8.042e-12	-11.095	-11.095	0.000	(0)
Co (OH) 3-	5.893e-17	5.088e-17	-16.230	-16.293	-0.064	(0)
CoOOH-	1.479e-17	1.277e-17	-16.830	-16.894	-0.064	(0)
CoSeO4	8.695e-18	8.695e-18	-17.061	-17.061	0.000	(0)
Co2OH+3	3.027e-18	8.077e-19	-17.519	-18.093	-0.574	(0)
Co (OH) 4-2	4.600e-24	2.557e-24	-23.337	-23.592	-0.255	(0)
Co4 (OH) 4+4	2.172e-29	2.074e-30	-28.663	-29.683	-1.020	(0)
Co (3)	2.208e-29					
CoOH+2	2.208e-29	1.227e-29	-28.656	-28.911	-0.255	(0)
Co+3	2.346e-35	7.616e-36	-34.630	-35.118	-0.488	(0)
CoCl+2	3.569e-36	1.984e-36	-35.447	-35.702	-0.255	(0)
Cr (2)	4.041e-24					
Cr+2	4.041e-24	2.246e-24	-23.394	-23.649	-0.255	(0)
Cr (3)	1.271e-07					
Cr (OH) 2+	1.105e-07	9.540e-08	-6.957	-7.020	-0.064	(0)
Cr (OH) 3	1.136e-08	1.136e-08	-7.944	-7.944	0.000	(0)
Cr (OH) +2	4.448e-09	2.473e-09	-8.352	-8.607	-0.255	(0)
CrOHSO4	4.049e-10	4.049e-10	-9.393	-9.393	0.000	(0)
CrO2-	1.969e-10	1.700e-10	-9.706	-9.769	-0.064	(0)
Cr (OH) 4-	1.661e-10	1.434e-10	-9.780	-9.843	-0.064	(0)
CrF+2	1.488e-11	8.273e-12	-10.827	-11.082	-0.255	(0)
Cr+3	1.336e-12	3.564e-13	-11.874	-12.448	-0.574	(0)
CrSO4+	6.651e-13	5.743e-13	-12.177	-12.241	-0.064	(0)
CrCl+2	1.062e-15	5.905e-16	-14.974	-15.229	-0.255	(0)
Cr2 (OH) 2SO4+2	1.628e-16	9.049e-17	-15.788	-16.043	-0.255	(0)
CrOHC12	4.556e-18	4.556e-18	-17.341	-17.341	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.709e-18	3.709e-18	-17.431	-17.431	0.000	(0)
CrCl2+	8.308e-20	7.174e-20	-19.081	-19.144	-0.064	(0)
Cr (6)	3.819e-16					
CrO4-2	3.519e-16	2.135e-16	-15.454	-15.671	-0.217	(0)
HCrO4-	2.539e-17	2.193e-17	-16.595	-16.659	-0.064	(0)
NaCrO4-	4.463e-18	3.854e-18	-17.350	-17.414	-0.064	(0)
KCrO4-	1.699e-19	1.467e-19	-18.770	-18.834	-0.064	(0)
H2CrO4	5.642e-25	5.642e-25	-24.249	-24.249	0.000	(0)
CrO3SO4-2	2.633e-25	1.463e-25	-24.580	-24.835	-0.255	(0)
CrO3Cl-	6.493e-27	5.606e-27	-26.188	-26.251	-0.064	(0)
Cr2O7-2	3.000e-32	1.668e-32	-31.523	-31.778	-0.255	(0)

Cu (1)	1.660e-09					
CuCl	8.209e-10	8.209e-10	-9.086	-9.086	0.000	(0)
Cu+	5.899e-10	5.093e-10	-9.229	-9.293	-0.064	(0)
CuCl2-	2.491e-10	2.196e-10	-9.604	-9.658	-0.055	(0)
CuCl3-2	9.782e-14	6.009e-14	-13.010	-13.221	-0.212	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-137.842	-138.137	-0.295	(0)
CuS4S5-3	0.000e+00	0.000e+00	-138.584	-138.867	-0.283	(0)
Cu (2)	2.438e-06					
CuCO3	2.200e-06	2.200e-06	-5.658	-5.658	0.000	(0)
Cu (CO3) 2-2	1.009e-07	5.609e-08	-6.996	-7.251	-0.255	(0)
Cu+2	6.499e-08	3.942e-08	-7.187	-7.404	-0.217	(0)
CuOH+	4.484e-08	3.953e-08	-7.348	-7.403	-0.055	(0)
CuHCO3+	1.848e-08	1.596e-08	-7.733	-7.797	-0.064	(0)
CuSO4	6.232e-09	6.232e-09	-8.205	-8.205	0.000	(0)
Cu (OH) 2	2.501e-09	2.501e-09	-8.602	-8.602	0.000	(0)
CuF+	4.219e-10	3.643e-10	-9.375	-9.439	-0.064	(0)
CuCl+	9.073e-11	7.998e-11	-10.042	-10.097	-0.055	(0)
Cu2 (OH) 2+2	7.060e-11	3.925e-11	-10.151	-10.406	-0.255	(0)
Cu (OH) 3-	1.884e-12	1.627e-12	-11.725	-11.789	-0.064	(0)
CuCl2	3.550e-14	3.550e-14	-13.450	-13.450	0.000	(0)
Cu (OH) 4-2	7.302e-18	4.059e-18	-17.137	-17.392	-0.255	(0)
CuCl3-	4.812e-19	4.242e-19	-18.318	-18.372	-0.055	(0)
CuCl4-2	4.430e-24	2.722e-24	-23.354	-23.565	-0.212	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-202.287	-202.351	-0.064	(0)
F	1.789e-04					
F-	1.659e-04	1.464e-04	-3.780	-3.834	-0.054	(0)
MgF+	9.856e-06	8.708e-06	-5.006	-5.060	-0.054	(0)
CaF+	2.632e-06	2.330e-06	-5.580	-5.633	-0.053	(0)
NaF	3.357e-07	3.357e-07	-6.474	-6.474	0.000	(0)
MnF+	4.558e-08	4.035e-08	-7.341	-7.394	-0.053	(0)
AlF3	1.246e-08	1.246e-08	-7.905	-7.905	0.000	(0)
AlF2+	7.619e-09	6.756e-09	-8.118	-8.170	-0.052	(0)
HF	6.877e-09	6.877e-09	-8.163	-8.163	0.000	(0)
AlF4-	1.035e-09	9.143e-10	-8.985	-9.039	-0.054	(0)
BF (OH) 3-	8.719e-10	7.632e-10	-9.060	-9.117	-0.058	(0)
ZnF+	7.910e-10	6.830e-10	-9.102	-9.166	-0.064	(0)
CuF+	4.219e-10	3.643e-10	-9.375	-9.439	-0.064	(0)
NiF+	2.960e-10	2.556e-10	-9.529	-9.592	-0.064	(0)
CoF+	2.707e-10	2.337e-10	-9.568	-9.631	-0.064	(0)
AlF+2	1.874e-10	1.159e-10	-9.727	-9.936	-0.209	(0)
CrF+2	1.488e-11	8.273e-12	-10.827	-11.082	-0.255	(0)
CdF+	1.010e-11	8.721e-12	-10.996	-11.059	-0.064	(0)
AgF	6.867e-12	6.867e-12	-11.163	-11.163	0.000	(0)
PbF+	4.798e-12	4.143e-12	-11.319	-11.383	-0.064	(0)
HF2-	4.353e-12	3.829e-12	-11.361	-11.417	-0.056	(0)
FeF2+	4.977e-13	4.406e-13	-12.303	-12.356	-0.053	(0)
BF2 (OH) 2-	4.335e-13	3.795e-13	-12.363	-12.421	-0.058	(0)
FeF+2	1.830e-13	1.124e-13	-12.738	-12.949	-0.212	(0)
FeF3	9.104e-14	9.104e-14	-13.041	-13.041	0.000	(0)
PbF2	1.194e-14	1.194e-14	-13.923	-13.923	0.000	(0)
UO2F+	1.185e-14	1.023e-14	-13.926	-13.990	-0.064	(0)
UO2F2	4.322e-15	4.322e-15	-14.364	-14.364	0.000	(0)
CdF2	2.548e-15	2.548e-15	-14.594	-14.594	0.000	(0)
UO2F3-	1.841e-16	1.590e-16	-15.735	-15.799	-0.064	(0)
VO2F	1.565e-16	1.565e-16	-15.805	-15.805	0.000	(0)
H2F2	1.267e-16	1.267e-16	-15.897	-15.897	0.000	(0)
VO2F2-	9.639e-18	8.323e-18	-17.016	-17.080	-0.064	(0)
PbF3-	3.841e-18	3.317e-18	-17.416	-17.479	-0.064	(0)
VOF+	1.319e-18	1.139e-18	-17.880	-17.944	-0.064	(0)
BF3OH-	7.843e-19	6.866e-19	-18.106	-18.163	-0.058	(0)
UO2F4-2	3.327e-19	1.850e-19	-18.478	-18.733	-0.255	(0)
VOF2	6.253e-20	6.253e-20	-19.204	-19.204	0.000	(0)
VO2F3-2	2.735e-20	1.520e-20	-19.563	-19.818	-0.255	(0)
PbF4-2	4.182e-22	2.325e-22	-21.379	-21.634	-0.255	(0)
VOF3-	3.763e-22	3.249e-22	-21.425	-21.488	-0.064	(0)
BF4-	1.795e-23	1.571e-23	-22.746	-22.804	-0.058	(0)
VO2F4-3	4.106e-24	1.096e-24	-23.387	-23.960	-0.574	(0)
Sb (OH) 2F	2.859e-24	2.859e-24	-23.544	-23.544	0.000	(0)

SbOF	2.813e-24	2.813e-24	-23.551	-23.551	0.000	(0)
VOF4-2	3.455e-25	1.921e-25	-24.462	-24.717	-0.255	(0)
HgF+	5.443e-26	4.700e-26	-25.264	-25.328	-0.064	(0)
UF3+	8.525e-36	7.361e-36	-35.069	-35.133	-0.064	(0)
UF2+2	5.705e-37	3.172e-37	-36.244	-36.499	-0.255	(0)
UF4	1.182e-37	1.182e-37	-36.927	-36.927	0.000	(0)
UF5-	7.945e-40	6.860e-40	-39.100	-39.164	-0.064	(0)
UF+3	6.447e-40	1.720e-40	-39.191	-39.764	-0.574	(0)
UF6-2	0.000e+00	0.000e+00	-40.263	-40.518	-0.255	(0)
Fe (2)	4.122e-07					
Fe+2	3.577e-07	1.988e-07	-6.447	-6.702	-0.255	(0)
FeSO4	3.368e-08	3.368e-08	-7.473	-7.473	0.000	(0)
FeHCO3+	1.807e-08	1.606e-08	-7.743	-7.794	-0.051	(0)
FeOH+	2.835e-09	2.510e-09	-8.547	-8.600	-0.053	(0)
Fe (OH) 2	6.321e-13	6.321e-13	-12.199	-12.199	0.000	(0)
Fe (OH) 3-	7.160e-14	6.339e-14	-13.145	-13.198	-0.053	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.982	-144.982	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-216.496	-216.560	-0.064	(0)
Fe (3)	2.616e-05					
Fe (OH) 2+	1.994e-05	1.768e-05	-4.700	-4.752	-0.052	(0)
Fe (OH) 3	6.022e-06	6.022e-06	-5.220	-5.220	0.000	(0)
Fe (OH) 4-	2.005e-07	1.778e-07	-6.698	-6.750	-0.052	(0)
FeOH+2	2.333e-10	1.433e-10	-9.632	-9.844	-0.212	(0)
FeF2+	4.977e-13	4.406e-13	-12.303	-12.356	-0.053	(0)
FeF+2	1.830e-13	1.124e-13	-12.738	-12.949	-0.212	(0)
FeF3	9.104e-14	9.104e-14	-13.041	-13.041	0.000	(0)
FeSO4+	6.123e-15	5.421e-15	-14.213	-14.266	-0.053	(0)
Fe+3	2.156e-15	7.001e-16	-14.666	-15.155	-0.488	(0)
Fe (SO4) 2-	9.262e-17	7.997e-17	-16.033	-16.097	-0.064	(0)
FeCl+2	4.406e-17	2.707e-17	-16.356	-16.568	-0.212	(0)
Fe2 (OH) 2+4	7.124e-18	6.803e-19	-17.147	-18.167	-1.020	(0)
FeCl2+	1.748e-19	1.548e-19	-18.757	-18.810	-0.053	(0)
FeHSeO3+2	5.178e-20	2.879e-20	-19.286	-19.541	-0.255	(0)
Fe3 (OH) 4+5	6.824e-21	1.739e-22	-20.166	-21.760	-1.594	(0)
FeCl3	1.982e-23	1.982e-23	-22.703	-22.703	0.000	(0)
H (0)	9.895e-28					
H2	4.947e-28	4.965e-28	-27.306	-27.304	0.002	(0)
Hg (0)	5.561e-11					
Hg	5.561e-11	5.561e-11	-10.255	-10.255	0.000	(0)
Hg (1)	1.176e-24					
Hg2+2	5.880e-25	3.269e-25	-24.231	-24.486	-0.255	(0)
Hg (2)	1.322e-14					
HgClOH	6.207e-15	6.207e-15	-14.207	-14.207	0.000	(0)
Hg (OH) 2	5.473e-15	5.492e-15	-14.262	-14.260	0.002	(0)
HgCl2	1.419e-15	1.419e-15	-14.848	-14.848	0.000	(0)
HgCO3	9.818e-17	9.818e-17	-16.008	-16.008	0.000	(0)
HgCl3-	2.104e-17	1.817e-17	-16.677	-16.741	-0.064	(0)
Hg (CO3) 2-2	5.292e-18	2.942e-18	-17.276	-17.531	-0.255	(0)
HgCl+	2.561e-19	2.212e-19	-18.592	-18.655	-0.064	(0)
HgCl4-2	1.665e-19	9.258e-20	-18.778	-19.033	-0.255	(0)
HgOH+	1.266e-19	1.093e-19	-18.898	-18.961	-0.064	(0)
HgHCO3+	6.721e-20	5.804e-20	-19.173	-19.236	-0.064	(0)
Hg (OH) 3-	2.539e-22	2.193e-22	-21.595	-21.659	-0.064	(0)
Hg+2	1.557e-23	8.658e-24	-22.808	-23.063	-0.255	(0)
HgSO4	1.564e-24	1.564e-24	-23.806	-23.806	0.000	(0)
HgF+	5.443e-26	4.700e-26	-25.264	-25.328	-0.064	(0)
HgHS2-	0.000e+00	0.000e+00	-130.803	-130.867	-0.064	(0)
HgS2-2	0.000e+00	0.000e+00	-131.821	-132.076	-0.255	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.971	-131.971	0.000	(0)
K	2.106e-04					
K+	2.096e-04	1.850e-04	-3.679	-3.733	-0.054	(0)
KSO4-	1.019e-06	9.035e-07	-5.992	-6.044	-0.052	(0)
KCrO4-	1.699e-19	1.467e-19	-18.770	-18.834	-0.064	(0)
Mg	9.938e-04					
Mg+2	8.736e-04	5.299e-04	-3.059	-3.276	-0.217	(0)
MgSO4	6.654e-05	6.654e-05	-4.177	-4.177	0.000	(0)
MgHCO3+	3.947e-05	3.479e-05	-4.404	-4.458	-0.055	(0)
MgF+	9.856e-06	8.708e-06	-5.006	-5.060	-0.054	(0)

MgCO3	4.177e-06	4.177e-06	-5.379	-5.379	0.000	(0)
MgOH+	7.511e-08	6.690e-08	-7.124	-7.175	-0.050	(0)
MgH2BO3+	5.016e-09	4.390e-09	-8.300	-8.357	-0.058	(0)
Mn (2)	1.436e-05					
Mn+2	1.245e-05	6.921e-06	-4.905	-5.160	-0.255	(0)
MnHCO3+	1.001e-06	8.861e-07	-6.000	-6.053	-0.053	(0)
MnSO4	8.493e-07	8.493e-07	-6.071	-6.071	0.000	(0)
MnF+	4.558e-08	4.035e-08	-7.341	-7.394	-0.053	(0)
MnCl+	1.260e-08	1.115e-08	-7.900	-7.953	-0.053	(0)
MnOH+	6.227e-09	5.513e-09	-8.206	-8.259	-0.053	(0)
MnCl2	2.017e-11	2.017e-11	-10.695	-10.695	0.000	(0)
MnCl3-	8.033e-15	7.112e-15	-14.095	-14.148	-0.053	(0)
MnSeO4	6.404e-16	6.404e-16	-15.194	-15.194	0.000	(0)
Mn (OH) 3-	3.869e-18	3.425e-18	-17.412	-17.465	-0.053	(0)
Mn (OH) 4-2	5.708e-24	3.507e-24	-23.244	-23.455	-0.212	(0)
MnSe	3.497e-39	3.497e-39	-38.456	-38.456	0.000	(0)
Mn (3)	3.609e-26					
Mn+3	3.609e-26	1.172e-26	-25.443	-25.931	-0.488	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.069	-45.281	-0.212	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.018	-50.074	-0.057	(0)
Mo	2.126e-07					
MoO4-2	2.125e-07	1.289e-07	-6.673	-6.890	-0.217	(0)
HMoO4-	9.431e-11	8.143e-11	-10.025	-10.089	-0.064	(0)
H2MoO4	1.894e-14	1.894e-14	-13.723	-13.723	0.000	(0)
Ag2MoO4	1.701e-23	1.701e-23	-22.769	-22.769	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.863	-44.437	-0.574	(0)
Mo7O24-6	0.000e+00	0.000e+00	-52.929	-55.224	-2.295	(0)
HMo7O24-5	0.000e+00	0.000e+00	-54.741	-56.335	-1.594	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.031	-59.051	-1.020	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.730	-63.304	-0.574	(0)
Na	4.146e-03					
Na+	4.117e-03	3.633e-03	-2.385	-2.440	-0.054	(0)
NaSO4-	1.518e-05	1.346e-05	-4.819	-4.871	-0.052	(0)
NaHCO3	1.311e-05	1.311e-05	-4.882	-4.882	0.000	(0)
NaCO3-	7.229e-07	6.410e-07	-6.141	-6.193	-0.052	(0)
NaF	3.357e-07	3.357e-07	-6.474	-6.474	0.000	(0)
NaH2BO3	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
NaCrO4-	4.463e-18	3.854e-18	-17.350	-17.414	-0.064	(0)
Ni	2.132e-07					
Ni+2	1.146e-07	6.949e-08	-6.941	-7.158	-0.217	(0)
NiHCO3+	6.365e-08	5.496e-08	-7.196	-7.260	-0.064	(0)
NiCO3	2.456e-08	2.456e-08	-7.610	-7.610	0.000	(0)
NiSO4	9.567e-09	9.567e-09	-8.019	-8.019	0.000	(0)
NiOH+	3.212e-10	2.774e-10	-9.493	-9.557	-0.064	(0)
NiF+	2.960e-10	2.556e-10	-9.529	-9.592	-0.064	(0)
NiCl+	2.636e-10	2.276e-10	-9.579	-9.643	-0.064	(0)
Ni (OH) 2	6.986e-12	6.986e-12	-11.156	-11.156	0.000	(0)
Ni (SO4) 2-2	3.932e-13	2.186e-13	-12.405	-12.660	-0.255	(0)
Ni (OH) 3-	2.566e-15	2.215e-15	-14.591	-14.655	-0.064	(0)
NiCl2	1.467e-15	1.467e-15	-14.834	-14.834	0.000	(0)
NiSeO4	1.117e-17	1.117e-17	-16.952	-16.952	0.000	(0)
O (0)	4.095e-38					
O2	2.047e-38	2.055e-38	-37.689	-37.687	0.002	(0)
Pb	1.541e-08					
PbCO3	1.144e-08	1.144e-08	-7.942	-7.942	0.000	(0)
PbHCO3+	2.217e-09	1.914e-09	-8.654	-8.718	-0.064	(0)
Pb+2	6.619e-10	4.015e-10	-9.179	-9.396	-0.217	(0)
Pb (CO3) 2-2	5.621e-10	3.125e-10	-9.250	-9.505	-0.255	(0)
PbOH+	3.703e-10	3.198e-10	-9.431	-9.495	-0.064	(0)
PbSO4	1.357e-10	1.357e-10	-9.867	-9.867	0.000	(0)
PbCl+	2.112e-11	1.824e-11	-10.675	-10.739	-0.064	(0)
PbF+	4.798e-12	4.143e-12	-11.319	-11.383	-0.064	(0)
Pb (OH) 2	3.206e-12	3.206e-12	-11.494	-11.494	0.000	(0)
Pb (SO4) 2-2	1.015e-12	5.642e-13	-11.994	-12.249	-0.255	(0)
PbCl2	1.043e-13	1.043e-13	-12.982	-12.982	0.000	(0)
PbF2	1.194e-14	1.194e-14	-13.923	-13.923	0.000	(0)

Pb(OH) 3-	1.177e-15	1.017e-15	-14.929	-14.993	-0.064	(0)
PbCl3-	6.155e-17	5.315e-17	-16.211	-16.275	-0.064	(0)
Pb2OH+3	7.625e-18	2.035e-18	-17.118	-17.692	-0.574	(0)
PbF3-	3.841e-18	3.317e-18	-17.416	-17.479	-0.064	(0)
Pb(OH) 4-2	1.420e-19	7.895e-20	-18.848	-19.103	-0.255	(0)
PbCl4-2	5.594e-20	3.110e-20	-19.252	-19.507	-0.255	(0)
PbF4-2	4.182e-22	2.325e-22	-21.379	-21.634	-0.255	(0)
Pb3(OH) 4+2	1.481e-22	8.235e-23	-21.829	-22.084	-0.255	(0)
Pb4(OH) 4+4	2.750e-27	2.626e-28	-26.561	-27.581	-1.020	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-141.357	-141.357	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-213.608	-213.672	-0.064	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.530	-67.530	0.000	(0)
HS-	0.000e+00	0.000e+00	-73.551	-73.615	-0.064	(0)
CdHS+	0.000e+00	0.000e+00	-73.969	-74.032	-0.064	(0)
H2S	0.000e+00	0.000e+00	-74.093	-74.093	0.000	(0)
S5-2	0.000e+00	0.000e+00	-75.227	-75.482	-0.255	(0)
S6-2	0.000e+00	0.000e+00	-75.743	-75.998	-0.255	(0)
S4-2	0.000e+00	0.000e+00	-75.823	-76.078	-0.255	(0)
S3-2	0.000e+00	0.000e+00	-76.629	-76.884	-0.255	(0)
S2-2	0.000e+00	0.000e+00	-77.645	-77.900	-0.255	(0)
S-2	0.000e+00	0.000e+00	-83.205	-83.417	-0.212	(0)
HgHS2-	0.000e+00	0.000e+00	-130.803	-130.867	-0.064	(0)
HgS2-2	0.000e+00	0.000e+00	-131.821	-132.076	-0.255	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-131.971	-131.971	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-136.872	-137.030	-0.158	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-136.981	-137.045	-0.064	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-137.842	-138.137	-0.295	(0)
CuS4S5-3	0.000e+00	0.000e+00	-138.584	-138.867	-0.283	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-138.670	-138.972	-0.301	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.994	-139.283	-0.289	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-139.490	-139.553	-0.064	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-140.443	-140.443	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-141.042	-141.042	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-141.357	-141.357	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-144.982	-144.982	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-202.287	-202.351	-0.064	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-211.313	-211.377	-0.064	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-212.095	-212.159	-0.064	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-213.603	-213.858	-0.255	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-213.608	-213.672	-0.064	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-216.496	-216.560	-0.064	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-283.323	-283.578	-0.255	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-286.197	-286.452	-0.255	(0)
Sb2S4-2	0.000e+00	0.000e+00	-296.623	-296.878	-0.255	(0)
S(6)	1.452e-03					
SO4-2	1.138e-03	6.901e-04	-2.944	-3.161	-0.217	(0)
CaSO4	2.305e-04	2.305e-04	-3.637	-3.637	0.000	(0)
MgSO4	6.654e-05	6.654e-05	-4.177	-4.177	0.000	(0)
NaSO4-	1.518e-05	1.346e-05	-4.819	-4.871	-0.052	(0)
KSO4-	1.019e-06	9.035e-07	-5.992	-6.044	-0.052	(0)
MnSO4	8.493e-07	8.493e-07	-6.071	-6.071	0.000	(0)
ZnSO4	3.529e-08	3.529e-08	-7.452	-7.452	0.000	(0)
FeSO4	3.368e-08	3.368e-08	-7.473	-7.473	0.000	(0)
NiSO4	9.567e-09	9.567e-09	-8.019	-8.019	0.000	(0)
CoSO4	6.949e-09	6.949e-09	-8.158	-8.158	0.000	(0)
CuSO4	6.232e-09	6.232e-09	-8.205	-8.205	0.000	(0)
HSO4-	2.423e-09	2.141e-09	-8.616	-8.669	-0.054	(0)
CdSO4	6.078e-10	6.078e-10	-9.216	-9.216	0.000	(0)
CrOHSO4	4.049e-10	4.049e-10	-9.393	-9.393	0.000	(0)
Zn(SO4) 2-2	3.815e-10	2.121e-10	-9.419	-9.674	-0.255	(0)
AgSO4-	2.977e-10	2.570e-10	-9.526	-9.590	-0.064	(0)
PbSO4	1.357e-10	1.357e-10	-9.867	-9.867	0.000	(0)
Cd(SO4) 2-2	1.018e-11	5.658e-12	-10.992	-11.247	-0.255	(0)
Pb(SO4) 2-2	1.015e-12	5.642e-13	-11.994	-12.249	-0.255	(0)
CrSO4+	6.651e-13	5.743e-13	-12.177	-12.241	-0.064	(0)
AlSO4+	4.798e-13	4.238e-13	-12.319	-12.373	-0.054	(0)
Ni(SO4) 2-2	3.932e-13	2.186e-13	-12.405	-12.660	-0.255	(0)

FeSO4+	6.123e-15	5.421e-15	-14.213	-14.266	-0.053	(0)
Al (SO4) 2-	3.547e-15	3.134e-15	-14.450	-14.504	-0.054	(0)
UO2SO4	5.287e-16	5.287e-16	-15.277	-15.277	0.000	(0)
Cr2 (OH) 2SO4+2	1.628e-16	9.049e-17	-15.788	-16.043	-0.255	(0)
Fe (SO4) 2-	9.262e-17	7.997e-17	-16.033	-16.097	-0.064	(0)
VO2SO4-	1.163e-17	1.004e-17	-16.934	-16.998	-0.064	(0)
UO2 (SO4) 2-2	8.651e-18	4.809e-18	-17.063	-17.318	-0.255	(0)
Cr2 (OH) 2 (SO4) 2	3.709e-18	3.709e-18	-17.431	-17.431	0.000	(0)
VOSO4	2.464e-19	2.464e-19	-18.608	-18.608	0.000	(0)
HgSO4	1.564e-24	1.564e-24	-23.806	-23.806	0.000	(0)
CrO3SO4-2	2.633e-25	1.463e-25	-24.580	-24.835	-0.255	(0)
VSO4+	6.458e-33	5.576e-33	-32.190	-32.254	-0.064	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.052	-41.052	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.536	-41.791	-0.255	(0)
Sb (3)	7.780e-19					
Sb (OH) 3	3.936e-19	3.936e-19	-18.405	-18.405	0.000	(0)
HSbO2	3.843e-19	3.843e-19	-18.415	-18.415	0.000	(0)
SbO2-	2.271e-23	1.961e-23	-22.644	-22.708	-0.064	(0)
Sb (OH) 4-	1.300e-23	1.123e-23	-22.886	-22.950	-0.064	(0)
Sb (OH) 2F	2.859e-24	2.859e-24	-23.544	-23.544	0.000	(0)
SbOF	2.813e-24	2.813e-24	-23.551	-23.551	0.000	(0)
Sb (OH) 2+	3.515e-25	3.035e-25	-24.454	-24.518	-0.064	(0)
SbO+	1.212e-25	1.047e-25	-24.916	-24.980	-0.064	(0)
Sb2S4-2	0.000e+00	0.000e+00	-296.623	-296.878	-0.255	(0)
Sb (5)	8.582e-09					
SbO3-	8.572e-09	7.402e-09	-8.067	-8.131	-0.064	(0)
Sb (OH) 6-	9.802e-12	8.650e-12	-11.009	-11.063	-0.054	(0)
SbO2+	2.479e-24	2.140e-24	-23.606	-23.670	-0.064	(0)
Se (-2)	3.481e-09					
Ag2Se	3.481e-09	3.481e-09	-8.458	-8.458	0.000	(0)
HSe-	4.508e-36	3.893e-36	-35.346	-35.410	-0.064	(0)
MnSe	3.497e-39	3.497e-39	-38.456	-38.456	0.000	(0)
H2Se	9.592e-40	9.592e-40	-39.018	-39.018	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.656	-42.911	-0.255	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-75.543	-76.563	-1.020	(0)
Se (4)	2.153e-08					
HSeO3-	1.802e-08	1.556e-08	-7.744	-7.808	-0.064	(0)
SeO3-2	3.510e-09	1.951e-09	-8.455	-8.710	-0.255	(0)
H2SeO3	2.107e-13	2.107e-13	-12.676	-12.676	0.000	(0)
AgSeO3-	2.711e-14	2.341e-14	-13.567	-13.631	-0.064	(0)
FeHSeO3+2	5.178e-20	2.879e-20	-19.286	-19.541	-0.255	(0)
Cd (SeO3) 2-2	2.121e-20	1.179e-20	-19.673	-19.928	-0.255	(0)
Ag (SeO3) 2-3	1.533e-21	4.090e-22	-20.814	-21.388	-0.574	(0)
Se (6)	5.674e-13					
SeO4-2	5.667e-13	3.438e-13	-12.247	-12.464	-0.217	(0)
MnSeO4	6.404e-16	6.404e-16	-15.194	-15.194	0.000	(0)
ZnSeO4	1.244e-17	1.244e-17	-16.905	-16.905	0.000	(0)
NiSeO4	1.117e-17	1.117e-17	-16.952	-16.952	0.000	(0)
CoSeO4	8.695e-18	8.695e-18	-17.061	-17.061	0.000	(0)
HSeO4-	6.334e-19	5.469e-19	-18.198	-18.262	-0.064	(0)
CdSeO4	2.405e-19	2.405e-19	-18.619	-18.619	0.000	(0)
Zn (SeO4) 2-2	7.802e-30	4.337e-30	-29.108	-29.363	-0.255	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.031	-58.605	-0.574	(0)
U (4)	1.603e-21					
U (OH) 5-	1.601e-21	1.383e-21	-20.795	-20.859	-0.064	(0)
U (OH) 4	1.839e-24	1.839e-24	-23.735	-23.735	0.000	(0)
U (OH) 3+	2.473e-28	2.135e-28	-27.607	-27.671	-0.064	(0)
U (OH) 2+2	5.640e-33	3.135e-33	-32.249	-32.504	-0.255	(0)
UF3+	8.525e-36	7.361e-36	-35.069	-35.133	-0.064	(0)
UF2+2	5.705e-37	3.172e-37	-36.244	-36.499	-0.255	(0)
UF4	1.182e-37	1.182e-37	-36.927	-36.927	0.000	(0)
UOH+3	1.757e-38	4.689e-39	-37.755	-38.329	-0.574	(0)
UF5-	7.945e-40	6.860e-40	-39.100	-39.164	-0.064	(0)
UF+3	6.447e-40	1.720e-40	-39.191	-39.764	-0.574	(0)
UF6-2	0.000e+00	0.000e+00	-40.263	-40.518	-0.255	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.052	-41.052	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.536	-41.791	-0.255	(0)

U+4	0.000e+00	0.000e+00	-44.210	-45.230	-1.020	(0)
UC1+3	0.000e+00	0.000e+00	-45.849	-46.423	-0.574	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-170.899	-176.063	-5.164	(0)
U (5)	9.426e-18					
UO2+	9.426e-18	8.139e-18	-17.026	-17.089	-0.064	(0)
U (6)	2.447e-08					
UO2 (CO3) 3-4	1.795e-08	1.714e-09	-7.746	-8.766	-1.020	(0)
UO2 (CO3) 2-2	6.494e-09	3.610e-09	-8.187	-8.442	-0.255	(0)
UO2CO3	1.909e-11	1.909e-11	-10.719	-10.719	0.000	(0)
UO2OH+	2.340e-14	2.021e-14	-13.631	-13.695	-0.064	(0)
UO2F+	1.185e-14	1.023e-14	-13.926	-13.990	-0.064	(0)
UO2F2	4.322e-15	4.322e-15	-14.364	-14.364	0.000	(0)
UO2+2	8.345e-16	5.062e-16	-15.079	-15.296	-0.217	(0)
UO2SO4	5.287e-16	5.287e-16	-15.277	-15.277	0.000	(0)
UO2F3-	1.841e-16	1.590e-16	-15.735	-15.799	-0.064	(0)
UO2 (SO4) 2-2	8.651e-18	4.809e-18	-17.063	-17.318	-0.255	(0)
UO2Cl+	1.217e-18	1.051e-18	-17.915	-17.978	-0.064	(0)
UO2F4-2	3.327e-19	1.850e-19	-18.478	-18.733	-0.255	(0)
(UO2) 2 (OH) 2+2	1.219e-21	6.776e-22	-20.914	-21.169	-0.255	(0)
(UO2) 3 (OH) 5+	1.209e-24	1.044e-24	-23.917	-23.981	-0.064	(0)
V (2)	2.628e-40					
VOH+	2.628e-40	2.270e-40	-39.580	-39.644	-0.064	(0)
V+2	0.000e+00	0.000e+00	-40.400	-40.655	-0.255	(0)
V (3)	4.403e-13					
V (OH) 3	4.403e-13	4.403e-13	-12.356	-12.356	0.000	(0)
V (OH) 2+	1.046e-23	9.033e-24	-22.980	-23.044	-0.064	(0)
VOH+2	4.894e-27	2.721e-27	-26.310	-26.565	-0.255	(0)
V+3	6.416e-32	1.712e-32	-31.193	-31.767	-0.574	(0)
VSO4+	6.458e-33	5.576e-33	-32.190	-32.254	-0.064	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.584	-51.158	-0.574	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-51.311	-52.331	-1.020	(0)
V (4)	9.891e-17					
V (OH) 3+	9.495e-17	8.198e-17	-16.023	-16.086	-0.064	(0)
VO+2	2.332e-18	1.296e-18	-17.632	-17.887	-0.255	(0)
VOF+	1.319e-18	1.139e-18	-17.880	-17.944	-0.064	(0)
VOSO4	2.464e-19	2.464e-19	-18.608	-18.608	0.000	(0)
VOF2	6.253e-20	6.253e-20	-19.204	-19.204	0.000	(0)
VOC1+	5.392e-21	4.655e-21	-20.268	-20.332	-0.064	(0)
VOF3-	3.763e-22	3.249e-22	-21.425	-21.488	-0.064	(0)
VOF4-2	3.455e-25	1.921e-25	-24.462	-24.717	-0.255	(0)
H2V2O4+2	6.064e-28	3.371e-28	-27.217	-27.472	-0.255	(0)
V (5)	3.940e-08					
H2VO4-	3.508e-08	3.029e-08	-7.455	-7.519	-0.064	(0)
HVO4-2	4.311e-09	2.396e-09	-8.365	-8.620	-0.255	(0)
H3VO4	9.615e-12	9.615e-12	-11.017	-11.017	0.000	(0)
H3V2O7-	2.178e-12	1.881e-12	-11.662	-11.726	-0.064	(0)
HV2O7-3	9.220e-14	2.460e-14	-13.035	-13.609	-0.574	(0)
VO4-3	1.418e-15	3.783e-16	-14.848	-15.422	-0.574	(0)
VO2+	6.905e-16	6.094e-16	-15.161	-15.215	-0.054	(0)
V2O7-4	2.184e-16	2.086e-17	-15.661	-16.681	-1.020	(0)
VO2F	1.565e-16	1.565e-16	-15.805	-15.805	0.000	(0)
V3O9-3	1.091e-16	2.912e-17	-15.962	-16.536	-0.574	(0)
VO2SO4-	1.163e-17	1.004e-17	-16.934	-16.998	-0.064	(0)
VO2F2-	9.639e-18	8.323e-18	-17.016	-17.080	-0.064	(0)
VO2F3-2	2.735e-20	1.520e-20	-19.563	-19.818	-0.255	(0)
V4O12-4	3.851e-21	3.677e-22	-20.414	-21.434	-1.020	(0)
VO2F4-3	4.106e-24	1.096e-24	-23.387	-23.960	-0.574	(0)
V10O28-6	0.000e+00	0.000e+00	-53.978	-56.273	-2.295	(0)
HV10O28-5	0.000e+00	0.000e+00	-53.991	-55.585	-1.594	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.856	-57.876	-1.020	(0)
Zn	6.143e-07					
Zn+2	3.853e-07	2.337e-07	-6.414	-6.631	-0.217	(0)
ZnCO3	1.274e-07	1.274e-07	-6.895	-6.895	0.000	(0)
ZnHCO3+	5.492e-08	4.742e-08	-7.260	-7.324	-0.064	(0)
ZnSO4	3.529e-08	3.529e-08	-7.452	-7.452	0.000	(0)
ZnOH+	8.583e-09	7.411e-09	-8.066	-8.130	-0.064	(0)
ZnCl+	8.526e-10	7.516e-10	-9.069	-9.124	-0.055	(0)
ZnF+	7.910e-10	6.830e-10	-9.102	-9.166	-0.064	(0)

Zn(SO4) 2-2	3.815e-10	2.121e-10	-9.419	-9.674	-0.255	(0)
Zn(OH) 2	3.724e-10	3.724e-10	-9.429	-9.429	0.000	(0)
ZnOHCl	3.120e-10	3.120e-10	-9.506	-9.506	0.000	(0)
ZnCl2	1.525e-12	1.525e-12	-11.817	-11.817	0.000	(0)
Zn(OH) 3-	6.855e-13	5.919e-13	-12.164	-12.228	-0.064	(0)
ZnCl3-	1.759e-15	1.551e-15	-14.755	-14.809	-0.055	(0)
Zn(OH) 4-2	1.344e-17	7.472e-18	-16.872	-17.127	-0.255	(0)
ZnSeO4	1.244e-17	1.244e-17	-16.905	-16.905	0.000	(0)
ZnCl4-2	1.616e-18	9.927e-19	-17.792	-18.003	-0.212	(0)
Zn(SeO4) 2-2	7.802e-30	4.337e-30	-29.108	-29.363	-0.255	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-139.490	-139.553	-0.064	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-141.042	-141.042	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-211.313	-211.377	-0.064	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-213.603	-213.858	-0.255	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-286.197	-286.452	-0.255	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.35	-81.57	-36.22	Ag2S
Ag2CO3	-9.39	-20.48	-11.09	Ag2CO3
Ag2CrO4	-19.54	-31.13	-11.59	Ag2CrO4
Ag2HVO4	-9.66	-8.18	1.48	Ag2HVO4
Ag2MoO4	-10.80	-22.35	-11.55	Ag2MoO4
Ag2O	-13.04	-0.46	12.57	Ag2O
Ag2Se	5.33	-43.37	-48.70	Ag2Se
Ag2SeO3	-8.62	-15.77	-7.15	Ag2SeO3
Ag2SeO4	-19.01	-27.92	-8.91	Ag2SeO4
Ag2SO4	-13.80	-18.62	-4.82	Ag2SO4
Ag3AsO3	-21.71	-19.55	2.16	Ag3AsO3
Ag3AsO4	-11.51	-14.30	-2.79	Ag3AsO4
Ag3H2VO5	-13.59	-8.41	5.18	Ag3H2VO5
AgF·4H2O	-12.61	-11.56	1.05	AgF·4H2O
Agmetal	1.20	-12.31	-13.51	Ag
AgVO3	-8.72	-7.95	0.77	AgVO3
Al(OH) 3(am)	-1.41	9.39	10.80	Al(OH) 3
Al2(MoO4) 3	-49.24	-46.87	2.37	Al2(MoO4) 3
Al2O3	-0.87	18.79	19.65	Al2O3
Al4(OH) 10SO4	-3.29	19.41	22.70	Al4(OH) 10SO4
AlAsO4·2H2O	-9.01	-4.21	4.80	AlAsO4·2H2O
AlOHSO4	-5.53	-8.76	-3.23	AlOHSO4
AlSb	-147.10	-81.47	65.62	AlSb
Alunite	-2.97	-4.37	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.77	-12.56	-7.79	PbSO4
Anhydrite	-1.64	-6.00	-4.36	CaSO4
Anilite	-50.03	-81.91	-31.88	Cu0.25Cu1.5S
Antlerite	-4.17	4.62	8.79	Cu3(OH) 4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-72.68	-75.44	-2.76	As4O6
Artinite	-6.18	3.42	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-33.91	-27.21	6.71	As2O5
Atacamite	-2.60	4.79	7.39	Cu2(OH) 3Cl
Azurite	-0.36	-17.26	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-15.71	8.68	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-13.94	1.93	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	7.75	-1.16	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-22.33	10.61	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-12.32	-21.99	-9.67	BaCrO4
BaF2	-8.16	-13.98	-5.82	BaF2
BaMoO4	-6.24	-13.20	-6.96	BaMoO4
Barite	0.50	-9.48	-9.98	BaSO4
BaS	-88.61	-72.43	16.18	BaS
BaSeO3	-8.45	-6.62	1.83	BaSeO3
BaSeO4	-11.32	-18.78	-7.46	BaSeO4
Bianchite	-8.03	-9.79	-1.76	ZnSO4·6H2O
Birnessite	-9.45	8.64	18.09	MnO2
Bixbyite	-6.23	-6.87	-0.64	Mn2O3

BlaubleiI	-50.48	-74.64	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-50.71	-77.99	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.81	9.39	8.58	AlOOH
Breithauptite	-52.43	-70.95	-18.52	NiSb
Brochantite	-3.01	12.21	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.12	11.72	16.84	Mg(OH) ₂
Bunsenite	-4.61	7.84	12.45	NiO
Ca(VO ₃) ₂	-8.93	-3.27	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.61	8.89	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.67	8.89	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-13.03	9.27	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-17.91	21.05	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-18.81	21.05	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-288.23	-145.25	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.24	-18.51	-2.27	CaCrO ₄
Calcite	0.62	-7.86	-8.48	CaCO ₃
Calomel	-12.36	-30.27	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.78	-9.73	-7.95	CaMoO ₄
Carnotite	-4.48	-4.25	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.96	-3.15	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-12.28	-15.30	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.04	-3.20	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.07	6.57	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.16	6.57	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.31	-16.60	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.00	1.56	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.27	8.13	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.55	-14.21	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.52	-14.21	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.30	-14.21	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.88	-16.09	-1.21	CdF ₂
Cdmetal(alpha)	-31.10	-17.58	13.51	Cd
Cdmetal(gamma)	-31.20	-17.58	13.62	Cd
CdMoO ₄	-1.17	-15.31	-14.15	CdMoO ₄
CdOHCl	-7.36	-3.82	3.54	CdOHCl
CdSb	-71.87	-72.22	-0.35	CdSb
CdSe	-16.14	-36.34	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-19.04	-20.89	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-11.41	-11.59	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.86	-11.59	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.71	-11.59	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-0.87	-10.62	-9.75	AgCl
Cerrusite	-1.29	-14.42	-13.13	PbCO ₃
CH ₄ (g)	-75.59	-116.64	-41.05	CH ₄
Chalcanthite	-7.93	-10.57	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-49.78	-84.70	-34.92	Cu ₂ S
Chalcopyrite	-111.07	-146.34	-35.27	CuFeS ₂
Cinnabar	-49.68	-95.37	-45.69	HgS
Claudetite	-72.37	-75.44	-3.06	As ₄ O ₆
Clausthalite	-10.21	-37.31	-27.10	PbSe
Co(BO ₂) ₂	-29.14	-2.07	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.39	7.70	13.09	Co(OH) ₂
Co(OH) ₃	-10.31	-12.62	-2.31	Co(OH) ₃
CO ₂ (g)	-1.87	-20.02	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-17.14	-4.11	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.05	-17.55	-10.50	Co ₃ O ₄
CoCl ₂	-21.35	-13.08	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.62	-13.08	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.34	-12.32	-9.98	CoCO ₃
CoF ₂	-13.37	-14.97	-1.60	CoF ₂
CoF ₃	-45.16	-46.62	-1.46	CoF ₃
CoFe ₂ O ₄	25.91	22.38	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.43	-14.19	-7.76	CoMoO ₄
CoO	-5.89	7.70	13.59	CoO
CoS(alpha)	-65.97	-73.41	-7.44	CoS
CoS(beta)	-62.34	-73.41	-11.07	CoS
CoSe	-19.01	-35.21	-16.20	CoSe
CoSeO ₃	-8.93	-7.61	1.32	CoSeO ₃

CoSeO4:6H2O	-18.23	-19.76	-1.53	CoSeO4:6H2O
CoSO4	-13.26	-10.46	2.80	CoSO4
CoSO4:6H2O	-7.99	-10.46	-2.47	CoSO4:6H2O
Cotunnite	-10.40	-15.18	-4.78	PbCl2
Covellite	-51.22	-73.52	-22.30	CuS
Cr (OH) 2	-19.47	-8.65	10.82	Cr (OH) 2
Cr (OH) 3	-0.86	0.48	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.23	0.48	-0.75	Cr (OH) 3
Cr2O3	3.31	0.96	-2.36	Cr2O3
CrCl2	-43.53	-29.43	14.09	CrCl2
CrCl3	-45.81	-30.69	15.11	CrCl3
CrF3	-22.18	-33.52	-11.34	CrF3
Crmetal	-63.29	-32.81	30.48	Cr
CrO3	-27.46	-30.67	-3.21	CrO3
Cryolite	-9.59	-43.43	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.59	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.12	19.09	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-50.19	-85.07	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.70	-46.50	-45.80	Cu2Se
Cu2SO4	-19.80	-21.75	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.53	-4.43	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.66	-96.25	-42.59	Cu3Sb
Cu3Se2	-18.32	-81.81	-63.49	Cu3Se2
CuCO3	-0.93	-12.43	-11.50	CuCO3
CuCrO4	-17.63	-23.07	-5.44	CuCrO4
CuF	-8.22	-13.13	-4.91	CuF
CuF2	-16.19	-15.07	1.12	CuF2
CuF2:2H2O	-10.52	-15.07	-4.55	CuF2:2H2O
Cumetal	-5.12	-13.87	-8.76	Cu
CuMoO4	-1.22	-14.29	-13.08	CuMoO4
CuOCuSO4	-13.28	-2.97	10.30	CuOCuSO4
Cupricferrite	16.28	22.27	5.99	CuFe2O4
Cuprite	-2.18	-3.59	-1.41	Cu2O
Cuprousferrite	14.46	5.55	-8.92	CuFeO2
CuSe	-2.22	-35.32	-33.10	CuSe
CuSe2	-20.70	-54.07	-33.37	CuSe2
CuSeO3:2H2O	-8.23	-7.71	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.43	-19.87	-2.44	CuSeO4:5H2O
CuSO4	-13.50	-10.57	2.94	CuSO4
Diaspore	2.52	9.39	6.87	AlOOH
Djurleite	-50.04	-83.96	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.38	-16.16	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.93	-16.16	-17.09	CaMg (CO3) 2
Epsomite	-4.31	-6.44	-2.13	MgSO4:7H2O
Fe (OH) 2	-5.27	8.29	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	7.26	4.22	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-3.42	-7.14	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-2.18	-0.63	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-10.61	-31.24	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-36.06	-39.79	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	2.75	22.97	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.66	-6.26	0.40	FeAsO4:2H2O
FeCr2O4	2.05	9.25	7.20	FeCr2O4
FeMoO4	-3.50	-13.59	-10.09	FeMoO4
Ferrihydrite	4.15	7.34	3.19	Fe (OH) 3
Ferroselite	-34.77	-53.37	-18.60	FeSe2
FeS (ppt)	-69.87	-72.82	-2.95	FeS
FeSe	-23.61	-34.61	-11.00	FeSe
Fix_pe	-4.58	-4.58	0.00	e-
Fluorite	-0.00	-10.50	-10.50	CaF2
Galena	-61.54	-75.51	-13.97	PbS
Gibbsite	1.10	9.39	8.29	Al (OH) 3
Goethite	6.85	7.34	0.49	FeOOH
Goslarite	-7.78	-9.79	-2.01	ZnSO4:7H2O
Greenockite	-60.18	-74.54	-14.36	CdS
Greigite	-256.44	-301.48	-45.03	Fe3S4
Gummite	-7.97	-0.30	7.67	UO3
Gypsum	-1.39	-6.00	-4.61	CaSO4:2H2O

H-Jarosite	-2.20	-14.30	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.01	-21.89	-12.88	H2MoO4
H2S (g)	-73.10	-81.11	-8.01	H2S
H2Se (g)	-37.95	-42.91	-4.96	H2Se
Halite	-6.93	-5.33	1.60	NaCl
Hausmannite	-7.37	53.66	61.03	Mn3O4
Hematite	16.10	14.68	-1.42	Fe2O3
Hercynite	4.19	27.08	22.89	FeAl2O4
Hg (CH3) 2 (g)	-173.83	-247.53	-73.71	Hg (CH3) 2
Hg (g)	-8.95	-16.82	-7.87	Hg
Hg (OH) 2	-10.76	-14.26	-3.50	Hg (OH) 2
Hg2 (g)	-18.69	-33.64	-14.96	Hg2
Hg2 (OH) 2	-14.75	-9.49	5.26	Hg2 (OH) 2
Hg2CO3	-13.46	-29.51	-16.05	Hg2CO3
Hg2CrO4	-31.46	-40.16	-8.70	Hg2CrO4
Hg2F2	-21.79	-32.15	-10.36	Hg2F2
Hg2S	-78.93	-90.60	-11.68	Hg2S
Hg2SeO3	-20.14	-24.80	-4.66	Hg2SeO3
Hg2SO4	-21.52	-27.65	-6.13	Hg2SO4
Hg3O2CO3	-33.12	-62.80	-29.68	Hg3O2CO3
HgCl (g)	-34.63	-15.14	19.50	HgCl
HgCl2	-13.78	-35.04	-21.26	HgCl2
HgF (g)	-48.75	-16.08	32.68	HgF
HgF2 (g)	-49.49	-36.93	12.57	HgF2
Hgmetal (l)	-3.37	-16.82	-13.45	Hg
HgSe	-1.47	-57.17	-55.69	HgSe
HgSeO3	-17.14	-29.57	-12.43	HgSeO3
HgSO4	-23.00	-32.42	-9.42	HgSO4
Huntite	-2.79	-32.76	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-4.47	-23.24	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.71	-21.48	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.99	-23.16	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	4.27	-10.53	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.56	-53.80	-17.24	K2Cr2O7
K2CrO4	-22.62	-23.14	-0.51	K2CrO4
K2MoO4	-17.62	-14.36	3.26	K2MoO4
K2SeO4	-19.20	-19.93	-0.73	K2SeO4
Langite	-5.28	12.21	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.52	-6.96	-0.43	PbO : PbSO4
Laurionite	-5.41	-4.79	0.62	PbOHCl
Lepidocrocite	5.97	7.34	1.37	FeOOH
Lime	-20.54	12.16	32.70	CaO
Litharge	-7.09	5.60	12.69	PbO
Mackinawite	-69.22	-72.82	-3.60	FeS
Maghemite	8.29	14.68	6.39	Fe2O3
Magnesioferrite	9.54	26.40	16.86	Fe2MgO4
Magnesite	-0.84	-8.30	-7.46	MgCO3
Magnetite	19.57	22.97	3.40	Fe3O4
Malachite	0.47	-4.84	-5.31	Cu2 (OH) 2CO3
Manganite	-3.43	21.91	25.34	MnOOH
Massicot	-7.29	5.60	12.89	PbO
Matlockite	-7.15	-16.12	-8.97	PbClF
Melanothallite	-19.45	-13.19	6.26	CuCl2
Melanterite	-7.65	-9.86	-2.21	FeSO4 : 7H2O
Metacinnabar	-50.28	-95.37	-45.09	HgS
Mg (OH) 2 (active)	-7.07	11.72	18.79	Mg (OH) 2
Mg (VO3) 2	-14.99	-3.71	11.28	Mg (VO3) 2
Mg2Sb3	-263.46	-188.77	74.68	Mg2Sb3
Mg2V2O7	-18.35	8.01	26.36	Mg2V2O7
MgCr2O4	-3.52	12.68	16.20	MgCr2O4
MgCrO4	-24.33	-18.95	5.38	MgCrO4
MgF2	-2.81	-10.94	-8.13	MgF2
MgMoO4	-8.32	-10.17	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.64	-3.59	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-14.54	-15.74	-1.20	MgSeO4 : 6H2O
Minium	-32.57	40.95	73.52	Pb3O4
Mirabilite	-6.93	-8.04	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.50	-5.60	4.90	Mn (VO3) 2

Mn2 (SO4) 3	-55.63	-61.35	-5.71	Mn2 (SO4) 3
Mn2Sb	-144.35	-83.27	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.20	2.30	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.66	-10.95	2.72	MnCl2:4H2O
MnS (grn)	-71.45	-71.28	0.17	MnS
MnS (pnk)	-74.62	-71.28	3.34	MnS
MnSb	-91.39	-94.30	-2.91	MnSb
MnSe	-36.57	-33.07	3.50	MnSe
MnSeO3	-6.60	-5.47	1.13	MnSeO3
MnSeO3:2H2O	-6.45	-5.47	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.57	-17.62	-2.05	MnSeO4:5H2O
MnSO4	-10.90	-8.32	2.58	MnSO4
Monteponite	-8.53	6.57	15.10	CdO
Montroydite	-10.62	-14.26	-3.64	HgO
MoO3	-13.89	-21.89	-8.00	MoO3
Morenosite	-8.18	-10.32	-2.14	NiSO4:7H2O
MoS2	-138.01	-208.27	-70.26	MoS2
Na-Jarosite	1.96	-9.24	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.32	-51.22	-9.90	Na2Cr2O7
Na2CrO4	-23.48	-20.55	2.93	Na2CrO4
Na2Mo2O7	-17.06	-33.66	-16.60	Na2Mo2O7
Na2MoO4	-13.26	-11.77	1.49	Na2MoO4
Na2MoO4:2H2O	-12.99	-11.77	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.49	-5.19	10.30	Na2SeO3:5H2O
Na2SeO4	-18.62	-17.34	1.28	Na2SeO4
Na3Sb	-170.14	-75.69	94.45	Na3Sb
Na3VO4	-29.22	7.46	36.68	Na3VO4
Na4V2O7	-32.60	4.80	37.40	Na4V2O7
Nantokite	-5.46	-12.19	-6.73	CuCl
NaSb	-84.82	-61.65	23.17	NaSb
Natron	-8.59	-9.90	-1.31	Na2CO3:10H2O
NaVO3	-6.52	-2.66	3.86	NaVO3
Nesquehonite	-3.63	-8.30	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.96	7.84	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-19.39	-3.69	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-18.80	13.20	32.00	Ni4 (OH) 6SO4
NiCO3	-5.31	-12.18	-6.87	NiCO3
NiMoO4	-2.91	-14.05	-11.14	NiMoO4
NiS (alpha)	-67.67	-73.27	-5.60	NiS
NiS (beta)	-62.17	-73.27	-11.10	NiS
NiS (gamma)	-60.47	-73.27	-12.80	NiS
NiSe	-17.37	-35.07	-17.70	NiSe
NiSeO3:2H2O	-10.28	-7.47	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.10	-19.62	-1.52	NiSeO4:6H2O
Nsutite	-8.86	8.64	17.50	MnO2
O2 (g)	-34.78	48.31	83.09	O2
Orpiment	-219.99	-281.06	-61.07	As2S3
Otavite	-1.45	-13.45	-12.00	CdCO3
Pb (BO2) 2	-10.69	-4.17	6.52	Pb (BO2) 2
Pb (OH) 2	-2.55	5.60	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-55.36	-64.12	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-7.98	0.81	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.99	11.20	26.19	Pb2O (OH) 2
Pb2O3	-25.69	35.35	61.04	Pb2O3
Pb2OCO3	-8.26	-8.82	-0.56	Pb2OCO3
Pb2V2O7	-2.33	-4.23	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-16.21	-10.41	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.77	1.37	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.24	-3.22	11.02	Pb3O2CO3
Pb3O2SO4	-12.04	-1.36	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.86	4.24	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.63	4.24	21.88	Pb4O3SO4
PbCrO4	-12.47	-25.07	-12.60	PbCrO4
PbF2	-9.62	-17.06	-7.44	PbF2
Pbmetal	-22.80	-18.55	4.25	Pb
PbMoO4	-0.67	-16.29	-15.62	PbMoO4
PbO:0.3H2O	-7.38	5.60	12.98	PbO:0.33H2O
PbSeO4	-15.02	-21.86	-6.84	PbSeO4

Periclase	-9.86	11.72	21.58	MgO
Phosgenite	-9.79	-29.60	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-19.85	29.75	49.60	PbO ₂
Portlandite	-10.64	12.16	22.80	Ca (OH) ₂
Pyrite	-111.27	-129.78	-18.51	FeS ₂
Pyrochroite	-5.36	9.84	15.19	Mn (OH) ₂
Pyrolusite	-7.39	33.99	41.38	MnO ₂
Realgar	-92.30	-112.05	-19.75	AsS
Retgersite	-8.28	-10.32	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.40	-10.18	-10.58	MnCO ₃
Rutherfordine	-5.82	-20.32	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-11.30	-18.40	-7.11	Sb (OH) ₃
Sb ₂ O ₄	-16.06	-12.66	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-27.45	-37.12	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-97.78	-165.53	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-55.36	-73.62	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-55.72	-73.62	-17.90	Sb ₄ O ₆
SbCl ₃	-50.15	-49.58	0.57	SbCl ₃
SbF ₃	-42.18	-52.40	-10.23	SbF ₃
Sbmetal	-42.95	-54.64	-11.69	Sb
SbO ₂	-2.81	-30.64	-27.82	SbO ₂
Schoepite	-6.29	-0.30	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal (am)	-11.64	-18.75	-7.11	Se
Semetal (hex)	-11.05	-18.75	-7.71	Se
Senarmontite	-24.44	-36.81	-12.37	Sb ₂ O ₃
SeO ₂	-15.43	-15.31	0.12	SeO ₂
SeO ₃	-48.50	-27.46	21.04	SeO ₃
Siderite	-1.48	-11.72	-10.24	FeCO ₃
Smithsonite	-1.65	-11.65	-10.00	ZnCO ₃
Sphalerite	-61.30	-72.75	-11.45	ZnS
Spinel	-6.34	30.51	36.85	MgAl ₂ O ₄
Stibnite	-229.69	-280.15	-50.46	Sb ₂ S ₃
Sulfur	-54.81	-56.96	-2.14	S
Tenorite	-0.05	7.59	7.64	CuO
Thenardite	-8.36	-8.04	0.32	Na ₂ SO ₄
Thermonatrite	-10.54	-9.90	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-7.95	-3.87	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-18.49	2.60	21.08	U ₃ O ₈
U ₃ Sb ₄	-561.56	-409.18	152.38	U ₃ Sb ₄
U ₄ O ₉	-33.77	-36.79	-3.02	U ₄ O ₉
UF ₄	-31.03	-60.57	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-27.85	-60.57	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.17	-15.24	0.93	UO ₂
UO ₂ (OH) ₂ (beta)	-5.91	-0.30	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-25.51	-27.76	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-8.00	-0.30	7.70	UO ₃
Uraninite	-10.57	-15.24	-4.67	UO ₂
USb ₂	-211.61	-182.03	29.58	USb ₂
V (OH) ₃	-16.86	-9.27	7.59	V (OH) ₃
V ₂ O ₅	-14.07	-15.43	-1.36	V ₂ O ₅
V ₃ O ₅	-34.66	-32.83	1.84	V ₃ O ₅
V ₄ O ₇	-42.90	-35.72	7.19	V ₄ O ₇
V ₆ O ₁₃	-33.75	-94.61	-60.86	V ₆ O ₁₃
Valentinite	-28.33	-36.81	-8.48	Sb ₂ O ₃
VCl ₂	-61.01	-42.13	18.87	VCl ₂
VCl ₃	-63.88	-40.44	23.43	VCl ₃
VF ₄	-63.15	-48.22	14.93	VF ₄
Vmetal	-89.53	-45.50	44.03	V
VO	-36.11	-21.35	14.76	VO
VO (OH) ₂	-8.04	-2.89	5.15	VO (OH) ₂
VO ₂ Cl	-20.95	-18.11	2.84	VO ₂ Cl
VOC ₁	-30.82	-19.66	11.15	VOC ₁
VOC ₁₂	-36.43	-23.67	12.76	VOC ₁₂
VOSO ₄	-24.66	-21.05	3.61	VOSO ₄
Witherite	-2.77	-11.34	-8.57	BaCO ₃
Wurtzite	-63.80	-72.75	-8.95	ZnS
Zincite	-2.97	8.37	11.33	ZnO
Zincosite	-13.72	-9.79	3.93	ZnSO ₄

Zn(BO2)2	-9.69	-1.40	8.29	Zn(BO2)2
Zn(OH)2	-3.83	8.37	12.20	Zn(OH)2
Zn(OH)2(am)	-4.11	8.37	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.39	8.37	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.17	8.37	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.37	8.37	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.93	-1.43	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.85	6.34	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.76	-2.11	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.13	-11.22	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.10	15.30	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-17.46	21.04	38.50	Zn5(OH)8Cl2
ZnCl2	-19.47	-12.42	7.05	ZnCl2
ZnCO3:1H2O	-1.39	-11.65	-10.26	ZnCO3:1H2O
ZnF2	-13.77	-14.30	-0.53	ZnF2
Znmetal	-41.58	-15.79	25.79	Zn
ZnMoO4	-3.40	-13.52	-10.13	ZnMoO4
ZnO(active)	-2.82	8.37	11.19	ZnO
ZnS(am)	-63.70	-72.75	-9.05	ZnS
ZnSb	-81.44	-70.42	11.01	ZnSb
ZnSe	-20.14	-34.54	-14.40	ZnSe
ZnSeO4:6H2O	-17.58	-19.10	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.15	-9.79	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 38.

```

Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e==e-
  log_k      0
EQUILIBRIUM_PHASES 201
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0

```

```

MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 202
SAVE Solution 203 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 201
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases in groundwater

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 202. Solution after simulation 37.
Using pure phase assemblage 201.

```

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	1.784e-08	1.784e-08
Alunite	-1.27	-2.67	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.78	-6.14	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	1.659e-08	1.659e-08
Barite	0.00	-9.98	-9.98	0.000e+00	5.546e-07	5.546e-07
Brochantite	-3.14	12.08	15.22	0.000e+00	0	0.000e+00
Brucite	-5.73	11.11	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	7.900e-04
CaMoO4	-1.94	-9.89	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.88	-4.07	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.041e-03	1.041e-03
Carnotite	-3.85	-3.62	0.23	0.000e+00	0	0.000e+00

Cd(BO2)2	-13.61	-3.77	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.11	-15.26	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.070e-08	6.070e-08
Cu2Se(alpha)	-6.78	-52.58	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.77	-13.85	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.26	-6.38	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.656e-05	2.656e-05
Fluorite	-0.17	-10.67	-10.50	0.000e+00	0	0.000e+00
Gummite	-7.38	0.29	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.53	-6.14	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.38	-60.07	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.88	-8.00	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.32	-6.19	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.50	7.29	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-25.28	-9.58	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.67	-12.54	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.81	-13.95	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-8.179e-08
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.29	-15.91	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.04	-19.54	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.19	-31.01	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.70	0.29	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-6.88	-2.80	4.08	0.000e+00	0	0.000e+00
U3O8	-18.10	2.98	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-5.32	0.29	5.61	0.000e+00	0	0.000e+00
UO3	-7.41	0.29	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.29	-13.42	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	4.784e-08	4.782e-08
Al	1.875e-06	1.874e-06
As	6.622e-11	6.620e-11
B	1.332e-05	1.331e-05
Ba	2.289e-07	2.289e-07
C	6.157e-03	6.155e-03
Ca	1.813e-03	1.812e-03
Cd	8.259e-09	8.256e-09
Cl	1.451e-03	1.450e-03
Co	1.359e-07	1.359e-07
Cr	5.643e-09	5.641e-09
Cu	2.440e-06	2.439e-06
F	1.789e-04	1.788e-04
Fe	3.347e-09	3.346e-09
Hg	5.563e-11	5.561e-11
K	2.106e-04	2.105e-04
Mg	9.937e-04	9.934e-04
Mn	1.436e-05	1.436e-05
Mo	2.126e-07	2.126e-07
Na	4.146e-03	4.145e-03
Ni	2.132e-07	2.131e-07
Pb	1.541e-08	1.541e-08
S	1.451e-03	1.451e-03
Sb	8.582e-09	8.579e-09
Se	7.169e-09	7.166e-09
U	2.447e-08	2.446e-08
V	3.940e-08	3.939e-08
Zn	6.143e-07	6.140e-07

-----Description of solution-----

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                                pH = 7.185      Charge balance
                                pe = 5.588      Adjusted to redox
equilibrium
      Activity of water = 1.000
      Ionic strength (mol/kgw) = 1.296e-02
      Mass of water (kg) = 9.997e-01
      Total alkalinity (eq/kg) = 5.480e-03
      Total CO2 (mol/kg) = 6.157e-03
      Temperature (°C) = 25.00
      Pressure (atm) = 1.00
      Electrical balance (eq) = 1.502e-16
      Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
      Iterations = 5
      Total H = 1.109824e+02
      Total O = 5.551207e+01

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-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.733e-07	1.540e-07	-6.761	-6.812	-0.051	(0)
H+	7.337e-08	6.537e-08	-7.135	-7.185	-0.050	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.784e-08					
AgCl	3.065e-08	3.065e-08	-7.514	-7.514	0.000	(0)
Ag+	1.304e-08	1.162e-08	-7.885	-7.935	-0.050	(0)
AgCl2-	3.944e-09	3.450e-09	-8.404	-8.462	-0.058	(0)
AgSO4-	1.986e-10	1.738e-10	-9.702	-9.760	-0.058	(0)
AgCl3-2	6.784e-12	3.974e-12	-11.168	-11.401	-0.232	(0)
AgF	4.305e-12	4.305e-12	-11.366	-11.366	0.000	(0)
AgOH	1.789e-13	1.789e-13	-12.747	-12.747	0.000	(0)
AgCl4-3	3.494e-14	1.049e-14	-13.457	-13.979	-0.523	(0)
AgH2BO3	2.161e-14	2.161e-14	-13.665	-13.665	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	2.986e-15	2.613e-15	-14.525	-14.583	-0.058	(0)
Ag(OH) 2-	3.077e-18	2.692e-18	-17.512	-17.570	-0.058	(0)
Ag(SeO3) 2-3	2.727e-23	8.187e-24	-22.564	-23.087	-0.523	(0)
Ag2MoO4	6.835e-24	6.835e-24	-23.165	-23.165	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.949	-72.949	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.990	-86.920	-0.929	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.619	-147.677	-0.058	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.827	-147.976	-0.149	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.945	-150.232	-0.287	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.267	-150.543	-0.275	(0)
Al	1.875e-06					
Al(OH) 4-	1.464e-06	1.306e-06	-5.834	-5.884	-0.050	(0)
AlF3	1.874e-07	1.874e-07	-6.727	-6.727	0.000	(0)
AlF2+	1.127e-07	1.009e-07	-6.948	-6.996	-0.048	(0)
Al(OH) 3	6.737e-08	6.737e-08	-7.172	-7.172	0.000	(0)
Al(OH) 2+	2.450e-08	2.192e-08	-7.611	-7.659	-0.048	(0)
AlF4-	1.554e-08	1.386e-08	-7.809	-7.858	-0.050	(0)
AlF+2	2.679e-09	1.717e-09	-8.572	-8.765	-0.193	(0)
AlOH+2	2.797e-10	1.792e-10	-9.553	-9.747	-0.193	(0)
AlSO4+	7.595e-12	6.774e-12	-11.119	-11.169	-0.050	(0)
Al+3	3.290e-12	1.164e-12	-11.483	-11.934	-0.451	(0)
Al(SO4) 2-	6.102e-14	5.443e-14	-13.214	-13.264	-0.050	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.767	-41.290	-0.523	(0)
As(3)	4.273e-23					
H3AsO3	4.235e-23	4.235e-23	-22.373	-22.373	0.000	(0)
H2AsO3-	3.798e-25	3.323e-25	-24.420	-24.479	-0.058	(0)
HAsO3-2	7.914e-30	4.636e-30	-29.102	-29.334	-0.232	(0)
H4AsO3+	1.568e-30	1.371e-30	-29.805	-29.863	-0.058	(0)
AsO3-3	9.108e-36	2.734e-36	-35.041	-35.563	-0.523	(0)
As(5)	6.622e-11					
HAsO4-2	4.733e-11	2.772e-11	-10.325	-10.557	-0.232	(0)
H2AsO4-	1.889e-11	1.653e-11	-10.724	-10.782	-0.058	(0)
AsO4-3	4.468e-15	1.341e-15	-14.350	-14.873	-0.523	(0)

	H3AsO4	1.872e-16	1.877e-16	-15.728	-15.726	0.001	(0)
B	1.332e-05						
	H3BO3	1.317e-05	1.321e-05	-4.880	-4.879	0.001	(0)
	H2BO3-	1.327e-07	1.174e-07	-6.877	-6.930	-0.053	(0)
	CaH2BO3+	7.422e-09	6.568e-09	-8.129	-8.183	-0.053	(0)
	MgH2BO3+	2.540e-09	2.248e-09	-8.595	-8.648	-0.053	(0)
	BF(OH) 3-	8.791e-10	7.779e-10	-9.056	-9.109	-0.053	(0)
	NaH2BO3	6.828e-10	6.828e-10	-9.166	-9.166	0.000	(0)
	H5(BO3) 2-	1.492e-12	1.320e-12	-11.826	-11.879	-0.053	(0)
	BF2(OH) 2-	9.067e-13	8.023e-13	-12.043	-12.096	-0.053	(0)
	BaH2BO3+	5.725e-13	5.066e-13	-12.242	-12.295	-0.053	(0)
	AgH2BO3	2.161e-14	2.161e-14	-13.665	-13.665	0.000	(0)
	H8(BO3) 3-	1.971e-15	1.744e-15	-14.705	-14.758	-0.053	(0)
	BF3OH-	3.403e-18	3.011e-18	-17.468	-17.521	-0.053	(0)
	BF4-	1.615e-22	1.429e-22	-21.792	-21.845	-0.053	(0)
Ba	2.289e-07						
	Ba+2	2.216e-07	1.396e-07	-6.654	-6.855	-0.201	(0)
	BaHCO3+	7.063e-09	6.332e-09	-8.151	-8.198	-0.047	(0)
	BaCO3	2.439e-10	2.439e-10	-9.613	-9.613	0.000	(0)
	BaH2BO3+	5.725e-13	5.066e-13	-12.242	-12.295	-0.053	(0)
	BaOH+	1.051e-13	9.388e-14	-12.979	-13.027	-0.049	(0)
C(4)	6.157e-03						
	HCO3-	5.307e-03	4.748e-03	-2.275	-2.323	-0.048	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	9.589e-05	8.597e-05	-4.018	-4.066	-0.047	(0)
	MgHCO3+	3.014e-05	2.683e-05	-4.521	-4.571	-0.051	(0)
	NaHCO3	9.800e-06	9.800e-06	-5.009	-5.009	0.000	(0)
	CO3-2	5.405e-06	3.406e-06	-5.267	-5.468	-0.201	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CuCO3	2.123e-06	2.123e-06	-5.673	-5.673	0.000	(0)
	MgCO3	1.564e-06	1.564e-06	-5.806	-5.806	0.000	(0)
	MnHCO3+	7.790e-07	6.960e-07	-6.108	-6.157	-0.049	(0)
	NaCO3-	2.601e-07	2.327e-07	-6.585	-6.633	-0.048	(0)
	NiHCO3+	5.610e-08	4.908e-08	-7.251	-7.309	-0.058	(0)
	ZnCO3	5.609e-08	5.609e-08	-7.251	-7.251	0.000	(0)
	ZnHCO3+	4.912e-08	4.297e-08	-7.309	-7.367	-0.058	(0)
	CuHCO3+	3.625e-08	3.171e-08	-7.441	-7.499	-0.058	(0)
	Cu(CO3) 2-2	3.321e-08	1.946e-08	-7.479	-7.711	-0.232	(0)
	CoHCO3+	2.441e-08	2.135e-08	-7.612	-7.671	-0.058	(0)
	UO2(CO3) 2-2	1.317e-08	7.713e-09	-7.880	-8.113	-0.232	(0)
	UO2(CO3) 3-4	1.118e-08	1.317e-09	-7.951	-8.881	-0.929	(0)
	NiCO3	1.065e-08	1.065e-08	-7.973	-7.973	0.000	(0)
	PbCO3	9.332e-09	9.332e-09	-8.030	-8.030	0.000	(0)
	BaHCO3+	7.063e-09	6.332e-09	-8.151	-8.198	-0.047	(0)
	PbHCO3+	3.676e-09	3.216e-09	-8.435	-8.493	-0.058	(0)
	CoCO3	3.328e-09	3.328e-09	-8.478	-8.478	0.000	(0)
	CdCO3	3.201e-10	3.201e-10	-9.495	-9.495	0.000	(0)
	BaCO3	2.439e-10	2.439e-10	-9.613	-9.613	0.000	(0)
	Pb(CO3) 2-2	1.565e-10	9.165e-11	-9.806	-10.038	-0.232	(0)
	UO2CO3	1.135e-10	1.135e-10	-9.945	-9.945	0.000	(0)
	CdHCO3+	5.095e-11	4.458e-11	-10.293	-10.351	-0.058	(0)
	Cd(CO3) 2-2	1.379e-12	8.081e-13	-11.860	-12.093	-0.232	(0)
	FeHCO3+	8.046e-13	7.214e-13	-12.094	-12.142	-0.047	(0)
	HgCO3	3.640e-15	3.640e-15	-14.439	-14.439	0.000	(0)
	Hg(CO3) 2-2	6.691e-17	3.920e-17	-16.174	-16.407	-0.232	(0)
	HgHCO3+	5.064e-18	4.430e-18	-17.296	-17.354	-0.058	(0)
Ca	1.813e-03						
	Ca+2	1.543e-03	9.723e-04	-2.812	-3.012	-0.201	(0)
	CaSO4	1.670e-04	1.670e-04	-3.777	-3.777	0.000	(0)
	CaHCO3+	9.589e-05	8.597e-05	-4.018	-4.066	-0.047	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.753e-06	1.566e-06	-5.756	-5.805	-0.049	(0)
	CaH2BO3+	7.422e-09	6.568e-09	-8.129	-8.183	-0.053	(0)
	CaOH+	3.333e-09	2.988e-09	-8.477	-8.525	-0.047	(0)
Cd	8.259e-09						
	Cd+2	6.544e-09	4.123e-09	-8.184	-8.385	-0.201	(0)
	CdSO4	7.248e-10	7.248e-10	-9.140	-9.140	0.000	(0)
	CdCl+	5.817e-10	5.089e-10	-9.235	-9.293	-0.058	(0)

	CdCO ₃	3.201e-10	3.201e-10	-9.495	-9.495	0.000	(0)
	CdHCO ₃ +	5.095e-11	4.458e-11	-10.293	-10.351	-0.058	(0)
	Cd(SO ₄) ₂₋₂	1.252e-11	7.332e-12	-10.902	-11.135	-0.232	(0)
	CdF+	1.102e-11	9.643e-12	-10.958	-11.016	-0.058	(0)
	CdOH+	5.766e-12	5.044e-12	-11.239	-11.297	-0.058	(0)
	CdOHC1	3.215e-12	3.215e-12	-11.493	-11.493	0.000	(0)
	CdCl ₂	2.742e-12	2.742e-12	-11.562	-11.562	0.000	(0)
	Cd(CO ₃) ₂₋₂	1.379e-12	8.081e-13	-11.860	-12.093	-0.232	(0)
	Cd(OH) ₂	4.902e-15	4.902e-15	-14.310	-14.310	0.000	(0)
	CdF ₂	2.839e-15	2.839e-15	-14.547	-14.547	0.000	(0)
	CdCl ₃ -	2.556e-15	2.236e-15	-14.592	-14.651	-0.058	(0)
	CdSeO ₄	1.164e-18	1.164e-18	-17.934	-17.934	0.000	(0)
	Cd ₂ OH+ ₃	3.473e-19	1.042e-19	-18.459	-18.982	-0.523	(0)
	Cd(OH) ₃ -	5.272e-20	4.612e-20	-19.278	-19.336	-0.058	(0)
	Cd(SeO ₃) ₂₋₂	7.106e-22	4.163e-22	-21.148	-21.381	-0.232	(0)
	Cd(OH) ₄₋₂	1.985e-27	1.163e-27	-26.702	-26.935	-0.232	(0)
	CdHS+	0.000e+00	0.000e+00	-79.147	-79.205	-0.058	(0)
	Cd(HS) ₂	0.000e+00	0.000e+00	-150.830	-150.830	0.000	(0)
	Cd(HS) ₃ -	0.000e+00	0.000e+00	-227.700	-227.758	-0.058	(0)
	Cd(HS) ₄₋₂	0.000e+00	0.000e+00	-304.158	-304.391	-0.232	(0)
C1		1.451e-03					
	Cl-	1.451e-03	1.292e-03	-2.838	-2.889	-0.050	(0)
	AgCl	3.065e-08	3.065e-08	-7.514	-7.514	0.000	(0)
	MnCl+	1.338e-08	1.195e-08	-7.874	-7.923	-0.049	(0)
	AgCl ₂ -	3.944e-09	3.450e-09	-8.404	-8.462	-0.058	(0)
	ZnCl+	1.044e-09	9.291e-10	-8.981	-9.032	-0.051	(0)
	CdCl+	5.817e-10	5.089e-10	-9.235	-9.293	-0.058	(0)
	NiCl+	3.169e-10	2.772e-10	-9.499	-9.557	-0.058	(0)
	CoCl+	2.955e-10	2.585e-10	-9.529	-9.588	-0.058	(0)
	CuCl+	2.436e-10	2.168e-10	-9.613	-9.664	-0.051	(0)
	CuCl	2.179e-10	2.179e-10	-9.662	-9.662	0.000	(0)
	ZnOHC1	1.873e-10	1.873e-10	-9.727	-9.727	0.000	(0)
	CuCl ₂ -	6.611e-11	5.885e-11	-10.180	-10.230	-0.051	(0)
	PbCl+	4.778e-11	4.180e-11	-10.321	-10.379	-0.058	(0)
	MnCl ₂	2.182e-11	2.182e-11	-10.661	-10.661	0.000	(0)
	AgCl ₃ - ₂	6.784e-12	3.974e-12	-11.168	-11.401	-0.232	(0)
	CdOHC1	3.215e-12	3.215e-12	-11.493	-11.493	0.000	(0)
	CdCl ₂	2.742e-12	2.742e-12	-11.562	-11.562	0.000	(0)
	ZnCl ₂	1.903e-12	1.903e-12	-11.721	-11.721	0.000	(0)
	HgClOH	3.139e-13	3.139e-13	-12.503	-12.503	0.000	(0)
	PbCl ₂	2.413e-13	2.413e-13	-12.617	-12.617	0.000	(0)
	HgCl ₂	1.492e-13	1.492e-13	-12.826	-12.826	0.000	(0)
	CuCl ₂	9.716e-14	9.716e-14	-13.013	-13.013	0.000	(0)
	AgCl ₄ - ₃	3.494e-14	1.049e-14	-13.457	-13.979	-0.523	(0)
	CuCl ₃ - ₂	2.552e-14	1.626e-14	-13.593	-13.789	-0.196	(0)
	MnCl ₃ -	8.693e-15	7.767e-15	-14.061	-14.110	-0.049	(0)
	CdCl ₃ -	2.556e-15	2.236e-15	-14.592	-14.651	-0.058	(0)
	HgCl ₃ -	2.204e-15	1.928e-15	-14.657	-14.715	-0.058	(0)
	ZnCl ₃ -	2.195e-15	1.954e-15	-14.659	-14.709	-0.051	(0)
	NiCl ₂	1.804e-15	1.804e-15	-14.744	-14.744	0.000	(0)
	CrCl+ ₂	1.958e-16	1.147e-16	-15.708	-15.940	-0.232	(0)
	PbCl ₃ -	1.419e-16	1.242e-16	-15.848	-15.906	-0.058	(0)
	HgCl+	2.632e-17	2.303e-17	-16.580	-16.638	-0.058	(0)
	UO ₂ Cl+	2.006e-17	1.755e-17	-16.698	-16.756	-0.058	(0)
	HgCl ₄ - ₂	1.693e-17	9.919e-18	-16.771	-17.004	-0.232	(0)
	ZnCl ₄ - ₂	1.981e-18	1.263e-18	-17.703	-17.899	-0.196	(0)
	CuCl ₃ -	1.316e-18	1.172e-18	-17.881	-17.931	-0.051	(0)
	CrOHC1 ₂	4.340e-19	4.340e-19	-18.363	-18.363	0.000	(0)
	PbCl ₄ - ₂	1.252e-19	7.335e-20	-18.902	-19.135	-0.232	(0)
	FeCl+ ₂	2.658e-20	1.694e-20	-19.576	-19.771	-0.196	(0)
	CrCl ₂ +	1.608e-20	1.407e-20	-19.794	-19.852	-0.058	(0)
	VOCl+	1.017e-20	8.897e-21	-19.993	-20.051	-0.058	(0)
	FeCl ₂ +	1.094e-22	9.777e-23	-21.961	-22.010	-0.049	(0)
	CuCl ₄ - ₂	1.191e-23	7.591e-24	-22.924	-23.120	-0.196	(0)
	CrO ₃ Cl-	1.739e-26	1.521e-26	-25.760	-25.818	-0.058	(0)
	FeCl ₃	1.264e-26	1.264e-26	-25.898	-25.898	0.000	(0)
	CoCl+ ₂	3.999e-35	2.343e-35	-34.398	-34.630	-0.232	(0)
	UCl+ ₃	0.000e+00	0.000e+00	-45.441	-45.964	-0.523	(0)

Co (2)	1.359e-07					
Co+2	9.870e-08	5.782e-08	-7.006	-7.238	-0.232	(0)
CoHCO3+	2.441e-08	2.135e-08	-7.612	-7.671	-0.058	(0)
CoSO4	8.650e-09	8.650e-09	-8.063	-8.063	0.000	(0)
CoCO3	3.328e-09	3.328e-09	-8.478	-8.478	0.000	(0)
CoF+	3.084e-10	2.698e-10	-9.511	-9.569	-0.058	(0)
CoCl+	2.955e-10	2.585e-10	-9.529	-9.588	-0.058	(0)
CoOH+	2.031e-10	1.777e-10	-9.692	-9.750	-0.058	(0)
Co (OH) 2	2.173e-12	2.173e-12	-11.663	-11.663	0.000	(0)
CoSeO4	4.393e-17	4.393e-17	-16.357	-16.357	0.000	(0)
Co (OH) 3-	7.633e-18	6.678e-18	-17.117	-17.175	-0.058	(0)
CoOOH-	1.916e-18	1.676e-18	-17.718	-17.776	-0.058	(0)
Co2OH+3	1.715e-18	5.148e-19	-17.766	-18.288	-0.523	(0)
Co (OH) 4-2	2.783e-25	1.630e-25	-24.556	-24.788	-0.232	(0)
Co4 (OH) 4+4	1.688e-30	1.988e-31	-29.773	-30.702	-0.929	(0)
Co (3)	1.190e-28					
CoOH+2	1.190e-28	6.972e-29	-27.924	-28.157	-0.232	(0)
Co+3	2.519e-34	8.908e-35	-33.599	-34.050	-0.451	(0)
CoCl+2	3.999e-35	2.343e-35	-34.398	-34.630	-0.232	(0)
Cr (2)	7.227e-26					
Cr+2	7.227e-26	4.233e-26	-25.141	-25.373	-0.232	(0)
Cr (3)	5.643e-09					
Cr (OH) 2+	4.949e-09	4.330e-09	-8.305	-8.364	-0.058	(0)
Cr (OH) +2	3.945e-10	2.311e-10	-9.404	-9.636	-0.232	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	4.112e-11	4.112e-11	-10.386	-10.386	0.000	(0)
CrF+2	2.738e-12	1.604e-12	-11.563	-11.795	-0.232	(0)
CrO2-	2.081e-12	1.821e-12	-11.682	-11.740	-0.058	(0)
Cr (OH) 4-	1.756e-12	1.536e-12	-11.756	-11.814	-0.058	(0)
Cr+3	2.285e-13	6.858e-14	-12.641	-13.164	-0.523	(0)
CrSO4+	1.373e-13	1.201e-13	-12.862	-12.920	-0.058	(0)
CrCl+2	1.958e-16	1.147e-16	-15.708	-15.940	-0.232	(0)
Cr2 (OH) 2SO4+2	1.466e-18	8.588e-19	-17.834	-18.066	-0.232	(0)
CrOHCl2	4.340e-19	4.340e-19	-18.363	-18.363	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.825e-20	3.825e-20	-19.417	-19.417	0.000	(0)
CrCl2+	1.608e-20	1.407e-20	-19.794	-19.852	-0.058	(0)
Cr (6)	2.505e-16					
CrO4-2	2.148e-16	1.353e-16	-15.668	-15.869	-0.201	(0)
HCrO4-	3.272e-17	2.863e-17	-16.485	-16.543	-0.058	(0)
NaCrO4-	2.821e-18	2.468e-18	-17.550	-17.608	-0.058	(0)
KCrO4-	1.073e-19	9.385e-20	-18.969	-19.028	-0.058	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	7.298e-25	4.275e-25	-24.137	-24.369	-0.232	(0)
CrO3Cl-	1.739e-26	1.521e-26	-25.760	-25.818	-0.058	(0)
Cr2O7-2	4.853e-32	2.842e-32	-31.314	-31.546	-0.232	(0)
Cu (1)	4.372e-10					
CuCl	2.179e-10	2.179e-10	-9.662	-9.662	0.000	(0)
Cu+	1.531e-10	1.339e-10	-9.815	-9.873	-0.058	(0)
CuCl2-	6.611e-11	5.885e-11	-10.180	-10.230	-0.051	(0)
CuCl3-2	2.552e-14	1.626e-14	-13.593	-13.789	-0.196	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.490	-149.771	-0.281	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.231	-150.501	-0.270	(0)
Cu (2)	2.439e-06					
CuCO3	2.123e-06	2.123e-06	-5.673	-5.673	0.000	(0)
Cu+2	1.680e-07	1.058e-07	-6.775	-6.975	-0.201	(0)
CuOH+	5.791e-08	5.155e-08	-7.237	-7.288	-0.051	(0)
CuHCO3+	3.625e-08	3.171e-08	-7.441	-7.499	-0.058	(0)
Cu (CO3) 2-2	3.321e-08	1.946e-08	-7.479	-7.711	-0.232	(0)
CuSO4	1.818e-08	1.818e-08	-7.740	-7.740	0.000	(0)
Cu (OH) 2	1.584e-09	1.584e-09	-8.800	-8.800	0.000	(0)
CuF+	1.126e-09	9.854e-10	-8.948	-9.006	-0.058	(0)
CuCl+	2.436e-10	2.168e-10	-9.613	-9.664	-0.051	(0)
Cu2 (OH) 2+2	1.139e-10	6.675e-11	-9.943	-10.176	-0.232	(0)
Cu (OH) 3-	5.719e-13	5.004e-13	-12.243	-12.301	-0.058	(0)
CuCl2	9.716e-14	9.716e-14	-13.013	-13.013	0.000	(0)
CuCl3-	1.316e-18	1.172e-18	-17.881	-17.931	-0.051	(0)
Cu (OH) 4-2	1.035e-18	6.065e-19	-17.985	-18.217	-0.232	(0)
CuCl4-2	1.191e-23	7.591e-24	-22.924	-23.120	-0.196	(0)

F	Cu (HS) 3-	0.000e+00	0.000e+00	-217.504	-217.562	-0.058	(0)
	1.789e-04						
	F-	1.656e-04	1.476e-04	-3.781	-3.831	-0.050	(0)
	MgF+	1.025e-05	9.142e-06	-4.989	-5.039	-0.050	(0)
	CaF+	1.753e-06	1.566e-06	-5.756	-5.805	-0.049	(0)
	NaF	3.417e-07	3.417e-07	-6.466	-6.466	0.000	(0)
	AlF3	1.874e-07	1.874e-07	-6.727	-6.727	0.000	(0)
	AlF2+	1.127e-07	1.009e-07	-6.948	-6.996	-0.048	(0)
	MnF+	4.830e-08	4.315e-08	-7.316	-7.365	-0.049	(0)
	AlF4-	1.554e-08	1.386e-08	-7.809	-7.858	-0.050	(0)
	HF	1.427e-08	1.427e-08	-7.846	-7.846	0.000	(0)
	AlF+2	2.679e-09	1.717e-09	-8.572	-8.765	-0.193	(0)
	CuF+	1.126e-09	9.854e-10	-8.948	-9.006	-0.058	(0)
	ZnF+	9.631e-10	8.426e-10	-9.016	-9.074	-0.058	(0)
	BF (OH) 3-	8.791e-10	7.779e-10	-9.056	-9.109	-0.053	(0)
	NiF+	3.552e-10	3.107e-10	-9.450	-9.508	-0.058	(0)
	CoF+	3.084e-10	2.698e-10	-9.511	-9.569	-0.058	(0)
	CdF+	1.102e-11	9.643e-12	-10.958	-11.016	-0.058	(0)
	PbF+	1.083e-11	9.478e-12	-10.965	-11.023	-0.058	(0)
	HF2-	9.007e-12	8.003e-12	-11.045	-11.097	-0.051	(0)
	AgF	4.305e-12	4.305e-12	-11.366	-11.366	0.000	(0)
	CrF+2	2.738e-12	1.604e-12	-11.563	-11.795	-0.232	(0)
	BF2 (OH) 2-	9.067e-13	8.023e-13	-12.043	-12.096	-0.053	(0)
	UO2F+	1.949e-13	1.705e-13	-12.710	-12.768	-0.058	(0)
	UO2F2	7.257e-14	7.257e-14	-13.139	-13.139	0.000	(0)
	PbF2	2.752e-14	2.752e-14	-13.560	-13.560	0.000	(0)
	UO2F3-	3.075e-15	2.690e-15	-14.512	-14.570	-0.058	(0)
	CdF2	2.839e-15	2.839e-15	-14.547	-14.547	0.000	(0)
	VO2F	7.190e-16	7.190e-16	-15.143	-15.143	0.000	(0)
	H2F2	5.452e-16	5.452e-16	-15.263	-15.263	0.000	(0)
	FeF2+	3.103e-16	2.772e-16	-15.508	-15.557	-0.049	(0)
	FeF+2	1.102e-16	7.020e-17	-15.958	-16.154	-0.196	(0)
	FeF3	5.771e-17	5.771e-17	-16.239	-16.239	0.000	(0)
	VO2F2-	4.403e-17	3.852e-17	-16.356	-16.414	-0.058	(0)
	PbF3-	8.804e-18	7.702e-18	-17.055	-17.113	-0.058	(0)
	UO2F4-2	5.382e-18	3.153e-18	-17.269	-17.501	-0.232	(0)
	BF3OH-	3.403e-18	3.011e-18	-17.468	-17.521	-0.053	(0)
	VOF+	2.482e-18	2.172e-18	-17.605	-17.663	-0.058	(0)
	VO2F3-2	1.210e-19	7.090e-20	-18.917	-19.149	-0.232	(0)
	VOF2	1.202e-19	1.202e-19	-18.920	-18.920	0.000	(0)
	PbF4-2	9.287e-22	5.440e-22	-21.032	-21.264	-0.232	(0)
	VOF3-	7.190e-22	6.290e-22	-21.143	-21.201	-0.058	(0)
	BF4-	1.615e-22	1.429e-22	-21.792	-21.845	-0.053	(0)
	VO2F4-3	1.715e-23	5.147e-24	-22.766	-23.288	-0.523	(0)
	HgF+	5.583e-24	4.884e-24	-23.253	-23.311	-0.058	(0)
	VOF4-2	6.396e-25	3.747e-25	-24.194	-24.426	-0.232	(0)
	Sb (OH) 2F	5.032e-25	5.032e-25	-24.298	-24.298	0.000	(0)
	SbOF	4.950e-25	4.950e-25	-24.305	-24.305	0.000	(0)
	UF3+	2.454e-35	2.147e-35	-34.610	-34.668	-0.058	(0)
	UF2+2	1.567e-36	9.181e-37	-35.805	-36.037	-0.232	(0)
	UF4	3.474e-37	3.474e-37	-36.459	-36.459	0.000	(0)
	UF5-	2.322e-39	2.031e-39	-38.634	-38.692	-0.058	(0)
	UF+3	1.647e-39	4.942e-40	-38.783	-39.306	-0.523	(0)
	UF6-2	1.545e-40	0.000e+00	-39.811	-40.043	-0.232	(0)
Fe (2)	2.371e-11						
	Fe+2	2.060e-11	1.207e-11	-10.686	-10.918	-0.232	(0)
	FeSO4	2.221e-12	2.221e-12	-11.653	-11.653	0.000	(0)
	FeHCO3+	8.046e-13	7.214e-13	-12.094	-12.142	-0.047	(0)
	FeOH+	8.281e-14	7.399e-14	-13.082	-13.131	-0.049	(0)
	Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	4.934e-19	4.408e-19	-18.307	-18.356	-0.049	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-159.625	-159.625	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-236.359	-236.417	-0.058	(0)
Fe (3)	3.324e-09						
	Fe (OH) 2+	2.889e-09	2.585e-09	-8.539	-8.588	-0.048	(0)
	Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
	Fe (OH) 4-	6.852e-12	6.131e-12	-11.164	-11.212	-0.048	(0)
	FeOH+2	6.770e-14	4.314e-14	-13.169	-13.365	-0.196	(0)

FeF2+	3.103e-16	2.772e-16	-15.508	-15.557	-0.049	(0)
FeF+2	1.102e-16	7.020e-17	-15.958	-16.154	-0.196	(0)
FeF3	5.771e-17	5.771e-17	-16.239	-16.239	0.000	(0)
FeSO4+	4.086e-18	3.651e-18	-17.389	-17.438	-0.049	(0)
Fe+3	1.227e-18	4.339e-19	-17.911	-18.363	-0.451	(0)
Fe(SO4) 2-	6.690e-20	5.853e-20	-19.175	-19.233	-0.058	(0)
FeCl+2	2.658e-20	1.694e-20	-19.576	-19.771	-0.196	(0)
FeCl2+	1.094e-22	9.777e-23	-21.961	-22.010	-0.049	(0)
FeHSeO3+2	1.125e-23	6.589e-24	-22.949	-23.181	-0.232	(0)
Fe2(OH) 2+4	5.236e-25	6.164e-26	-24.281	-25.210	-0.929	(0)
FeCl3	1.264e-26	1.264e-26	-25.898	-25.898	0.000	(0)
Fe3(OH) 4+5	6.518e-32	2.303e-33	-31.186	-32.638	-1.452	(0)
H(0)	4.026e-29					
H2	2.013e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg(0)	5.502e-11					
Hg	5.502e-11	5.502e-11	-10.259	-10.259	0.000	(0)
Hg(1)	1.139e-22					
Hg2+2	5.695e-23	3.336e-23	-22.245	-22.477	-0.232	(0)
Hg(2)	6.023e-13					
HgClOH	3.139e-13	3.139e-13	-12.503	-12.503	0.000	(0)
HgCl2	1.492e-13	1.492e-13	-12.826	-12.826	0.000	(0)
Hg(OH) 2	1.332e-13	1.336e-13	-12.875	-12.874	0.001	(0)
HgCO3	3.640e-15	3.640e-15	-14.439	-14.439	0.000	(0)
HgCl3-	2.204e-15	1.928e-15	-14.657	-14.715	-0.058	(0)
Hg(CO3) 2-2	6.691e-17	3.920e-17	-16.174	-16.407	-0.232	(0)
HgCl+	2.632e-17	2.303e-17	-16.580	-16.638	-0.058	(0)
HgCl4-2	1.693e-17	9.919e-18	-16.771	-17.004	-0.232	(0)
HgOH+	6.258e-18	5.475e-18	-17.204	-17.262	-0.058	(0)
HgHCO3+	5.064e-18	4.430e-18	-17.296	-17.354	-0.058	(0)
Hg(OH) 3-	2.962e-21	2.591e-21	-20.528	-20.587	-0.058	(0)
Hg+2	1.525e-21	8.930e-22	-20.817	-21.049	-0.232	(0)
HgSO4	1.753e-22	1.753e-22	-21.756	-21.756	0.000	(0)
HgF+	5.583e-24	4.884e-24	-23.253	-23.311	-0.058	(0)
HgHS2-	0.000e+00	0.000e+00	-139.535	-139.593	-0.058	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.384	-140.384	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.884	-141.117	-0.232	(0)
K	2.106e-04					
K+	2.095e-04	1.866e-04	-3.679	-3.729	-0.050	(0)
KSO4-	1.107e-06	9.908e-07	-5.956	-6.004	-0.048	(0)
KCrO4-	1.073e-19	9.385e-20	-18.969	-19.028	-0.058	(0)
Mg	9.937e-04					
Mg+2	8.764e-04	5.522e-04	-3.057	-3.258	-0.201	(0)
MgSO4	7.535e-05	7.535e-05	-4.123	-4.123	0.000	(0)
MgHCO3+	3.014e-05	2.683e-05	-4.521	-4.571	-0.051	(0)
MgF+	1.025e-05	9.142e-06	-4.989	-5.039	-0.050	(0)
MgCO3	1.564e-06	1.564e-06	-5.806	-5.806	0.000	(0)
MgOH+	3.770e-08	3.386e-08	-7.424	-7.470	-0.047	(0)
MgH2BO3+	2.540e-09	2.248e-09	-8.595	-8.648	-0.053	(0)
Mn(2)	1.436e-05					
Mn+2	1.254e-05	7.346e-06	-4.902	-5.134	-0.232	(0)
MnSO4	9.796e-07	9.796e-07	-6.009	-6.009	0.000	(0)
MnHCO3+	7.790e-07	6.960e-07	-6.108	-6.157	-0.049	(0)
MnF+	4.830e-08	4.315e-08	-7.316	-7.365	-0.049	(0)
MnCl+	1.338e-08	1.195e-08	-7.874	-7.923	-0.049	(0)
MnOH+	3.181e-09	2.842e-09	-8.497	-8.546	-0.049	(0)
MnCl2	2.182e-11	2.182e-11	-10.661	-10.661	0.000	(0)
MnCl3-	8.693e-15	7.767e-15	-14.061	-14.110	-0.049	(0)
MnSeO4	2.998e-15	2.998e-15	-14.523	-14.523	0.000	(0)
Mn(OH) 3-	4.662e-19	4.165e-19	-18.331	-18.380	-0.049	(0)
Mn(OH) 4-2	3.250e-25	2.071e-25	-24.488	-24.684	-0.196	(0)
MnSe	0.000e+00	0.000e+00	-43.349	-43.349	0.000	(0)
Mn(3)	3.591e-25					
Mn+3	3.591e-25	1.270e-25	-24.445	-24.896	-0.451	(0)
Mn(6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.532	-43.728	-0.196	(0)
Mn(7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.460	-47.512	-0.052	(0)
Mo	2.126e-07					

	MoO4-2	2.124e-07	1.338e-07	-6.673	-6.873	-0.201	(0)
	HMoO4-	1.990e-10	1.741e-10	-9.701	-9.759	-0.058	(0)
	H2MoO4	8.335e-14	8.335e-14	-13.079	-13.079	0.000	(0)
	Ag2MoO4	6.835e-24	6.835e-24	-23.165	-23.165	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-40.767	-41.290	-0.523	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.510	-52.601	-2.091	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-51.947	-53.398	-1.452	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-54.872	-55.801	-0.929	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-59.217	-59.739	-0.523	(0)
Na		4.146e-03					
	Na+	4.119e-03	3.670e-03	-2.385	-2.435	-0.050	(0)
	NaSO4-	1.652e-05	1.478e-05	-4.782	-4.830	-0.048	(0)
	NaHCO3	9.800e-06	9.800e-06	-5.009	-5.009	0.000	(0)
	NaF	3.417e-07	3.417e-07	-6.466	-6.466	0.000	(0)
	NaCO3-	2.601e-07	2.327e-07	-6.585	-6.633	-0.048	(0)
	NaH2BO3	6.828e-10	6.828e-10	-9.166	-9.166	0.000	(0)
	NaCrO4-	2.821e-18	2.468e-18	-17.550	-17.608	-0.058	(0)
Ni		2.132e-07					
	Ni+2	1.331e-07	8.384e-08	-6.876	-7.077	-0.201	(0)
	NiHCO3+	5.610e-08	4.908e-08	-7.251	-7.309	-0.058	(0)
	NiSO4	1.254e-08	1.254e-08	-7.902	-7.902	0.000	(0)
	NiCO3	1.065e-08	1.065e-08	-7.973	-7.973	0.000	(0)
	NiF+	3.552e-10	3.107e-10	-9.450	-9.508	-0.058	(0)
	NiCl+	3.169e-10	2.772e-10	-9.499	-9.557	-0.058	(0)
	NiOH+	1.858e-10	1.626e-10	-9.731	-9.789	-0.058	(0)
	Ni (OH) 2	1.989e-12	1.989e-12	-11.701	-11.701	0.000	(0)
	Ni (SO4) 2-2	5.318e-13	3.115e-13	-12.274	-12.507	-0.232	(0)
	NiCl2	1.804e-15	1.804e-15	-14.744	-14.744	0.000	(0)
	Ni (OH) 3-	3.501e-16	3.062e-16	-15.456	-15.514	-0.058	(0)
	NiSeO4	5.946e-17	5.946e-17	-16.226	-16.226	0.000	(0)
O (0)		2.478e-35					
	O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb		1.541e-08					
	PbCO3	9.332e-09	9.332e-09	-8.030	-8.030	0.000	(0)
	PbHCO3+	3.676e-09	3.216e-09	-8.435	-8.493	-0.058	(0)
	Pb+2	1.447e-09	9.115e-10	-8.840	-9.040	-0.201	(0)
	PbOH+	4.031e-10	3.526e-10	-9.395	-9.453	-0.058	(0)
	PbSO4	3.348e-10	3.348e-10	-9.475	-9.475	0.000	(0)
	Pb (CO3) 2-2	1.565e-10	9.165e-11	-9.806	-10.038	-0.232	(0)
	PbCl+	4.778e-11	4.180e-11	-10.321	-10.379	-0.058	(0)
	PbF+	1.083e-11	9.478e-12	-10.965	-11.023	-0.058	(0)
	Pb (SO4) 2-2	2.582e-12	1.513e-12	-11.588	-11.820	-0.232	(0)
	Pb (OH) 2	1.717e-12	1.717e-12	-11.765	-11.765	0.000	(0)
	PbCl2	2.413e-13	2.413e-13	-12.617	-12.617	0.000	(0)
	PbF2	2.752e-14	2.752e-14	-13.560	-13.560	0.000	(0)
	Pb (OH) 3-	3.023e-16	2.645e-16	-15.520	-15.578	-0.058	(0)
	PbCl3-	1.419e-16	1.242e-16	-15.848	-15.906	-0.058	(0)
	Pb2OH+3	1.697e-17	5.094e-18	-16.770	-17.293	-0.523	(0)
	PbF3-	8.804e-18	7.702e-18	-17.055	-17.113	-0.058	(0)
	PbCl4-2	1.252e-19	7.335e-20	-18.902	-19.135	-0.232	(0)
	Pb (OH) 4-2	1.703e-20	9.975e-21	-19.769	-20.001	-0.232	(0)
	PbF4-2	9.287e-22	5.440e-22	-21.032	-21.264	-0.232	(0)
	Pb3 (OH) 4+2	9.157e-23	5.364e-23	-22.038	-22.271	-0.232	(0)
	Pb4 (OH) 4+4	3.299e-27	3.884e-28	-26.482	-27.411	-0.929	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.427	-151.427	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.898	-228.956	-0.058	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-72.949	-72.949	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.770	-78.828	-0.058	(0)
	H2S	0.000e+00	0.000e+00	-78.993	-78.993	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.147	-79.205	-0.058	(0)
	S5-2	0.000e+00	0.000e+00	-80.777	-81.009	-0.232	(0)
	S6-2	0.000e+00	0.000e+00	-81.293	-81.525	-0.232	(0)
	S4-2	0.000e+00	0.000e+00	-81.372	-81.605	-0.232	(0)
	S3-2	0.000e+00	0.000e+00	-82.178	-82.411	-0.232	(0)
	S2-2	0.000e+00	0.000e+00	-83.194	-83.427	-0.232	(0)
	S-2	0.000e+00	0.000e+00	-88.748	-88.944	-0.196	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.535	-139.593	-0.058	(0)

Hg (HS) 2	0.000e+00	0.000e+00	-140.384	-140.384	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.884	-141.117	-0.232	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.619	-147.677	-0.058	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.827	-147.976	-0.149	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.490	-149.771	-0.281	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.945	-150.232	-0.287	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.148	-150.206	-0.058	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.231	-150.501	-0.270	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.267	-150.543	-0.275	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.830	-150.830	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.380	-151.380	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.427	-151.427	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.625	-159.625	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.504	-217.562	-0.058	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.871	-226.929	-0.058	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.700	-227.758	-0.058	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.898	-228.956	-0.058	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.492	-229.724	-0.232	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.359	-236.417	-0.058	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.158	-304.391	-0.232	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.985	-307.217	-0.232	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.014	-319.247	-0.232	(0)
S (6)	1.451e-03					
SO4-2	1.190e-03	7.499e-04	-2.924	-3.125	-0.201	(0)
CaSO4	1.670e-04	1.670e-04	-3.777	-3.777	0.000	(0)
MgSO4	7.535e-05	7.535e-05	-4.123	-4.123	0.000	(0)
NaSO4-	1.652e-05	1.478e-05	-4.782	-4.830	-0.048	(0)
KSO4-	1.107e-06	9.908e-07	-5.956	-6.004	-0.048	(0)
MnSO4	9.796e-07	9.796e-07	-6.009	-6.009	0.000	(0)
ZnSO4	4.695e-08	4.695e-08	-7.328	-7.328	0.000	(0)
CuSO4	1.818e-08	1.818e-08	-7.740	-7.740	0.000	(0)
NiSO4	1.254e-08	1.254e-08	-7.902	-7.902	0.000	(0)
CoSO4	8.650e-09	8.650e-09	-8.063	-8.063	0.000	(0)
HSO4-	5.371e-09	4.790e-09	-8.270	-8.320	-0.050	(0)
CdSO4	7.248e-10	7.248e-10	-9.140	-9.140	0.000	(0)
Zn (SO4) 2-2	5.235e-10	3.066e-10	-9.281	-9.513	-0.232	(0)
PbSO4	3.348e-10	3.348e-10	-9.475	-9.475	0.000	(0)
AgSO4-	1.986e-10	1.738e-10	-9.702	-9.760	-0.058	(0)
CrOHSO4	4.112e-11	4.112e-11	-10.386	-10.386	0.000	(0)
Cd (SO4) 2-2	1.252e-11	7.332e-12	-10.902	-11.135	-0.232	(0)
AlSO4+	7.595e-12	6.774e-12	-11.119	-11.169	-0.050	(0)
Pb (SO4) 2-2	2.582e-12	1.513e-12	-11.588	-11.820	-0.232	(0)
FeSO4	2.221e-12	2.221e-12	-11.653	-11.653	0.000	(0)
Ni (SO4) 2-2	5.318e-13	3.115e-13	-12.274	-12.507	-0.232	(0)
CrSO4+	1.373e-13	1.201e-13	-12.862	-12.920	-0.058	(0)
Al (SO4) 2-	6.102e-14	5.443e-14	-13.214	-13.264	-0.050	(0)
UO2SO4	9.503e-15	9.503e-15	-14.022	-14.022	0.000	(0)
UO2 (SO4) 2-2	1.604e-16	9.394e-17	-15.795	-16.027	-0.232	(0)
VO2SO4-	5.686e-17	4.975e-17	-16.245	-16.303	-0.058	(0)
FeSO4+	4.086e-18	3.651e-18	-17.389	-17.438	-0.049	(0)
Cr2 (OH) 2SO4+2	1.466e-18	8.588e-19	-17.834	-18.066	-0.232	(0)
VOSO4	5.068e-19	5.068e-19	-18.295	-18.295	0.000	(0)
Fe (SO4) 2-	6.690e-20	5.853e-20	-19.175	-19.233	-0.058	(0)
Cr2 (OH) 2 (SO4) 2	3.825e-20	3.825e-20	-19.417	-19.417	0.000	(0)
HgSO4	1.753e-22	1.753e-22	-21.756	-21.756	0.000	(0)
CrO3SO4-2	7.298e-25	4.275e-25	-24.137	-24.369	-0.232	(0)
VSO4+	5.444e-33	4.763e-33	-32.264	-32.322	-0.058	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.525	-40.525	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.068	-41.300	-0.232	(0)
Sb (3)	6.600e-20					
Sb (OH) 3	3.339e-20	3.339e-20	-19.476	-19.476	0.000	(0)
HSbO2	3.260e-20	3.260e-20	-19.487	-19.487	0.000	(0)
SbO2-	9.234e-25	8.078e-25	-24.035	-24.093	-0.058	(0)
Sb (OH) 4-	5.289e-25	4.627e-25	-24.277	-24.335	-0.058	(0)
Sb (OH) 2F	5.032e-25	5.032e-25	-24.298	-24.298	0.000	(0)
SbOF	4.950e-25	4.950e-25	-24.305	-24.305	0.000	(0)
Sb (OH) 2+	6.060e-26	5.302e-26	-25.218	-25.276	-0.058	(0)
SbO+	2.090e-26	1.828e-26	-25.680	-25.738	-0.058	(0)

Sb2S4-2	0.000e+00	0.000e+00	-319.014	-319.247	-0.232	(0)
Sb (5)	8.582e-09					
SbO3-	8.572e-09	7.499e-09	-8.067	-8.125	-0.058	(0)
Sb (OH) 6-	9.838e-12	8.765e-12	-11.007	-11.057	-0.050	(0)
SbO2+	1.051e-23	9.192e-24	-22.979	-23.037	-0.058	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.105e-40	0.000e+00	-39.957	-40.015	-0.058	(0)
H2Se	0.000e+00	0.000e+00	-43.309	-43.309	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.349	-43.349	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.598	-47.830	-0.232	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.990	-86.920	-0.929	(0)
Se (4)	7.166e-09					
HSeO3-	6.568e-09	5.746e-09	-8.183	-8.241	-0.058	(0)
SeO3-2	5.975e-10	3.500e-10	-9.224	-9.456	-0.232	(0)
H2SeO3	1.602e-13	1.602e-13	-12.795	-12.795	0.000	(0)
AgSeO3-	2.986e-15	2.613e-15	-14.525	-14.583	-0.058	(0)
Cd (SeO3) 2-2	7.106e-22	4.163e-22	-21.148	-21.381	-0.232	(0)
Ag (SeO3) 2-3	2.727e-23	8.187e-24	-22.564	-23.087	-0.523	(0)
FeHSeO3+2	1.125e-23	6.589e-24	-22.949	-23.181	-0.232	(0)
Se (6)	2.409e-12					
SeO4-2	2.406e-12	1.516e-12	-11.619	-11.819	-0.201	(0)
MnSeO4	2.998e-15	2.998e-15	-14.523	-14.523	0.000	(0)
ZnSeO4	6.721e-17	6.721e-17	-16.173	-16.173	0.000	(0)
NiSeO4	5.946e-17	5.946e-17	-16.226	-16.226	0.000	(0)
CoSeO4	4.393e-17	4.393e-17	-16.357	-16.357	0.000	(0)
HSeO4-	5.678e-18	4.967e-18	-17.246	-17.304	-0.058	(0)
CdSeO4	1.164e-18	1.164e-18	-17.934	-17.934	0.000	(0)
Zn (SeO4) 2-2	1.764e-28	1.033e-28	-27.754	-27.986	-0.232	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.636	-59.159	-0.523	(0)
U (4)	1.221e-22					
U (OH) 5-	1.218e-22	1.066e-22	-21.914	-21.972	-0.058	(0)
U (OH) 4	2.918e-25	2.918e-25	-24.535	-24.535	0.000	(0)
U (OH) 3+	7.974e-29	6.976e-29	-28.098	-28.156	-0.058	(0)
U (OH) 2+2	3.600e-33	2.109e-33	-32.444	-32.676	-0.232	(0)
UF3+	2.454e-35	2.147e-35	-34.610	-34.668	-0.058	(0)
UF2+2	1.567e-36	9.181e-37	-35.805	-36.037	-0.232	(0)
UF4	3.474e-37	3.474e-37	-36.459	-36.459	0.000	(0)
UOH+3	2.163e-38	6.494e-39	-37.665	-38.187	-0.523	(0)
UF5-	2.322e-39	2.031e-39	-38.634	-38.692	-0.058	(0)
UF+3	1.647e-39	4.942e-40	-38.783	-39.306	-0.523	(0)
UF6-2	1.545e-40	0.000e+00	-39.811	-40.043	-0.232	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.525	-40.525	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.068	-41.300	-0.232	(0)
U+4	0.000e+00	0.000e+00	-43.846	-44.775	-0.929	(0)
UCl+3	0.000e+00	0.000e+00	-45.441	-45.964	-0.523	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-173.333	-178.037	-4.704	(0)
U (5)	1.507e-17					
UO2+	1.507e-17	1.319e-17	-16.822	-16.880	-0.058	(0)
U (6)	2.447e-08					
UO2 (CO3) 2-2	1.317e-08	7.713e-09	-7.880	-8.113	-0.232	(0)
UO2 (CO3) 3-4	1.118e-08	1.317e-09	-7.951	-8.881	-0.929	(0)
UO2CO3	1.135e-10	1.135e-10	-9.945	-9.945	0.000	(0)
UO2F+	1.949e-13	1.705e-13	-12.710	-12.768	-0.058	(0)
UO2OH+	1.856e-13	1.623e-13	-12.732	-12.790	-0.058	(0)
UO2F2	7.257e-14	7.257e-14	-13.139	-13.139	0.000	(0)
UO2+2	1.329e-14	8.373e-15	-13.877	-14.077	-0.201	(0)
UO2SO4	9.503e-15	9.503e-15	-14.022	-14.022	0.000	(0)
UO2F3-	3.075e-15	2.690e-15	-14.512	-14.570	-0.058	(0)
UO2 (SO4) 2-2	1.604e-16	9.394e-17	-15.795	-16.027	-0.232	(0)
UO2Cl+	2.006e-17	1.755e-17	-16.698	-16.756	-0.058	(0)
UO2F4-2	5.382e-18	3.153e-18	-17.269	-17.501	-0.232	(0)
(UO2) 2 (OH) 2+2	7.466e-20	4.373e-20	-19.127	-19.359	-0.232	(0)
(UO2) 3 (OH) 5+	1.460e-22	1.277e-22	-21.836	-21.894	-0.058	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-41.013	-41.071	-0.058	(0)
V+2	0.000e+00	0.000e+00	-41.537	-41.769	-0.232	(0)

V (3)	3.964e-14					
V (OH) 3	3.964e-14	3.964e-14	-13.402	-13.402	0.000	(0)
V (OH) 2+	1.914e-24	1.675e-24	-23.718	-23.776	-0.058	(0)
VOH+2	1.773e-27	1.039e-27	-26.751	-26.984	-0.232	(0)
V+3	4.482e-32	1.345e-32	-31.348	-31.871	-0.523	(0)
VSO4+	5.444e-33	4.763e-33	-32.264	-32.322	-0.058	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-51.785	-52.308	-0.523	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-52.238	-53.167	-0.929	(0)
V (4)	9.347e-17					
V (OH) 3+	8.616e-17	7.538e-17	-16.065	-16.123	-0.058	(0)
VO+2	4.189e-18	2.454e-18	-17.378	-17.610	-0.232	(0)
VOF+	2.482e-18	2.172e-18	-17.605	-17.663	-0.058	(0)
VOSO4	5.068e-19	5.068e-19	-18.295	-18.295	0.000	(0)
VOF2	1.202e-19	1.202e-19	-18.920	-18.920	0.000	(0)
VOC1+	1.017e-20	8.897e-21	-19.993	-20.051	-0.058	(0)
VOF3-	7.190e-22	6.290e-22	-21.143	-21.201	-0.058	(0)
VOF4-2	6.396e-25	3.747e-25	-24.194	-24.426	-0.232	(0)
H2V2O4+2	4.864e-28	2.849e-28	-27.313	-27.545	-0.232	(0)
V (5)	3.940e-08					
H2VO4-	3.723e-08	3.257e-08	-7.429	-7.487	-0.058	(0)
HVO4-2	2.137e-09	1.252e-09	-8.670	-8.903	-0.232	(0)
H3VO4	2.129e-11	2.129e-11	-10.672	-10.672	0.000	(0)
H3V2O7-	5.119e-12	4.479e-12	-11.291	-11.349	-0.058	(0)
HV2O7-3	4.603e-14	1.382e-14	-13.337	-13.860	-0.523	(0)
VO2+	3.118e-15	2.778e-15	-14.506	-14.556	-0.050	(0)
VO2F	7.190e-16	7.190e-16	-15.143	-15.143	0.000	(0)
VO4-3	3.197e-16	9.597e-17	-15.495	-16.018	-0.523	(0)
V3O9-3	1.206e-16	3.621e-17	-15.918	-16.441	-0.523	(0)
VO2SO4-	5.686e-17	4.975e-17	-16.245	-16.303	-0.058	(0)
V2O7-4	4.833e-17	5.690e-18	-16.316	-17.245	-0.929	(0)
VO2F2-	4.403e-17	3.852e-17	-16.356	-16.414	-0.058	(0)
VO2F3-2	1.210e-19	7.090e-20	-18.917	-19.149	-0.232	(0)
V4O12-4	4.178e-21	4.919e-22	-20.379	-21.308	-0.929	(0)
VO2F4-3	1.715e-23	5.147e-24	-22.766	-23.288	-0.523	(0)
HV10O28-5	0.000e+00	0.000e+00	-52.249	-53.701	-1.452	(0)
V10O28-6	0.000e+00	0.000e+00	-52.613	-54.703	-2.091	(0)
H2V10O28-4	0.000e+00	0.000e+00	-54.749	-55.678	-0.929	(0)
Zn	6.143e-07					
Zn+2	4.542e-07	2.862e-07	-6.343	-6.543	-0.201	(0)
ZnCO3	5.609e-08	5.609e-08	-7.251	-7.251	0.000	(0)
ZnHCO3+	4.912e-08	4.297e-08	-7.309	-7.367	-0.058	(0)
ZnSO4	4.695e-08	4.695e-08	-7.328	-7.328	0.000	(0)
ZnOH+	5.038e-09	4.408e-09	-8.298	-8.356	-0.058	(0)
ZnCl+	1.044e-09	9.291e-10	-8.981	-9.032	-0.051	(0)
ZnF+	9.631e-10	8.426e-10	-9.016	-9.074	-0.058	(0)
Zn (SO4) 2-2	5.235e-10	3.066e-10	-9.281	-9.513	-0.232	(0)
ZnOHCl	1.873e-10	1.873e-10	-9.727	-9.727	0.000	(0)
Zn (OH) 2	1.076e-10	1.076e-10	-9.968	-9.968	0.000	(0)
ZnCl2	1.903e-12	1.903e-12	-11.721	-11.721	0.000	(0)
Zn (OH) 3-	9.492e-14	8.304e-14	-13.023	-13.081	-0.058	(0)
ZnCl3-	2.195e-15	1.954e-15	-14.659	-14.709	-0.051	(0)
ZnSeO4	6.721e-17	6.721e-17	-16.173	-16.173	0.000	(0)
ZnCl4-2	1.981e-18	1.263e-18	-17.703	-17.899	-0.196	(0)
Zn (OH) 4-2	8.691e-19	5.091e-19	-18.061	-18.293	-0.232	(0)
Zn (SeO4) 2-2	1.764e-28	1.033e-28	-27.754	-27.986	-0.232	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.148	-150.206	-0.058	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.380	-151.380	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.871	-226.929	-0.058	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.492	-229.724	-0.232	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.985	-307.217	-0.232	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.29	-87.51	-36.22	Ag2S
Ag2CO3	-10.25	-21.34	-11.09	Ag2CO3
Ag2CrO4	-20.15	-31.74	-11.59	Ag2CrO4

Ag2HVO4	-10.35	-8.87	1.48	Ag2HVO4
Ag2MoO4	-11.19	-22.74	-11.55	Ag2MoO4
Ag2O	-14.07	-1.50	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.17	-18.99	-4.82	Ag2SO4
Ag3AsO3	-26.78	-24.62	2.16	Ag3AsO3
Ag3AsO4	-15.19	-17.98	-2.79	Ag3AsO4
Ag3H2VO5	-14.80	-9.62	5.18	Ag3H2VO5
AgF·4H2O	-12.82	-11.77	1.05	AgF·4H2O
Agmetal	-0.02	-13.52	-13.51	Ag
AgVO3	-8.89	-8.12	0.77	AgVO3
Al (OH) 3 (am)	-1.18	9.62	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.86	-44.49	2.37	Al2 (MoO4) 3
Al2O3	-0.41	19.24	19.65	Al2O3
Al4 (OH) 10SO4	-1.72	20.98	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.91	-6.11	4.80	AlAsO4·2H2O
AlOHSO4	-4.64	-7.87	-3.23	AlOHSO4
AlSb	-152.11	-86.49	65.62	AlSb
Alunite	-1.27	-2.67	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.38	-12.17	-7.79	PbSO4
Anhydrite	-1.78	-6.14	-4.36	CaSO4
Anilite	-56.32	-88.20	-31.88	Cu0.25Cu1.5S
Antlerite	-4.10	4.69	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-86.73	-89.49	-2.76	As4O6
Artinite	-7.21	2.39	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.16	-31.45	6.71	As2O5
Atacamite	-2.68	4.71	7.39	Cu2 (OH) 3Cl
Azurite	-0.59	-17.49	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.88	7.51	24.39	Ba (OH) 2:8H2O
Ba2V2O7·2H2O	-15.59	0.28	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.14	7.80	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.05	-22.72	-9.67	BaCrO4
BaF2	-8.70	-14.52	-5.82	BaF2
BaMoO4	-6.77	-13.73	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.74	-7.91	1.83	BaSeO3
BaSeO4	-11.21	-18.67	-7.46	BaSeO4
Bianchite	-7.90	-9.67	-1.76	ZnSO4:6H2O
Birnessite	-8.66	9.43	18.09	MnO2
Bixbyite	-6.04	-6.68	-0.64	Mn2O3
BlaubleiI	-55.73	-79.90	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.45	-83.73	-27.28	Cu0.6Cu0.8S
Boehmite	1.04	9.62	8.58	AlOOH
Breithauptite	-57.52	-76.05	-18.52	NiSb
Brochantite	-3.14	12.08	15.22	Cu4 (OH) 6SO4
Brucite	-5.73	11.11	16.84	Mg (OH) 2
Bunsenite	-5.15	7.29	12.45	NiO
Ca (VO3) 2	-9.05	-3.39	5.66	Ca (VO3) 2
Ca2V2O7	-9.53	7.97	17.50	Ca2V2O7
Ca2V2O7·2H2O	-13.58	7.97	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2:4H2O	-19.68	2.62	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.63	19.33	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.53	19.33	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-301.12	-158.15	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-10.34	-28.25	-17.91	Hg2Cl2
CaMoO4	-1.94	-9.89	-7.95	CaMoO4
Carnotite	-3.85	-3.62	0.23	KUO2VO4
CaSeO3·2H2O	-6.88	-4.07	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.81	-14.83	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-13.61	-3.77	9.84	Cd (BO2) 2
Cd (OH) 2	-7.66	5.98	13.64	Cd (OH) 2

Cd(OH)2(am)	-7.75	5.98	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.75	-17.04	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.10	0.46	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.96	6.44	28.40	Cd4(OH)6SO4
CdCl2	-13.50	-14.16	-0.66	CdCl2
CdCl2:1H2O	-12.47	-14.16	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.25	-14.16	-1.91	CdCl2:2.5H2O
CdF2	-14.83	-16.05	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO4	-1.11	-15.26	-14.15	CdMoO4
CdOHCl	-7.63	-4.09	3.54	CdOHCl
CdSb	-77.00	-77.35	-0.35	CdSb
CdSe	-21.01	-41.21	-20.20	CdSe
CdSeO4:2H2O	-18.35	-20.20	-1.85	CdSeO4:2H2O
CdSO4	-11.34	-11.51	-0.17	CdSO4
CdSO4:1H2O	-9.78	-11.51	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.64	-11.51	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.07	-10.82	-9.75	AgCl
Cerrusite	-1.38	-14.51	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-7.46	-10.10	-2.64	CuSO4:5H2O
Chalcocite	-56.47	-91.39	-34.92	Cu2S
Chalcopyrite	-125.91	-161.18	-35.27	CuFeS2
Cinnabar	-53.19	-98.89	-45.69	HgS
Claudetite	-86.43	-89.49	-3.06	As4O6
Clausthalite	-14.77	-41.87	-27.10	PbSe
Co(BO2)2	-29.70	-2.63	27.07	Co(BO2)2
Co(OH)2	-5.96	7.13	13.09	Co(OH)2
Co(OH)3	-10.19	-12.50	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-23.09	-10.06	13.03	Co3(AsO4)2
Co3O4	-7.37	-17.86	-10.50	Co3O4
CoCl2	-21.28	-13.02	8.27	CoCl2
CoCl2:6H2O	-15.55	-13.02	2.54	CoCl2:6H2O
CoCO3	-2.73	-12.71	-9.98	CoCO3
CoF2	-13.30	-14.90	-1.60	CoF2
CoF3	-44.09	-45.54	-1.46	CoF3
CoFe2O4	17.04	13.51	-3.53	CoFe2O4
CoMoO4	-6.35	-14.11	-7.76	CoMoO4
CoO	-6.46	7.13	13.59	CoO
CoS(alpha)	-71.44	-78.88	-7.44	CoS
CoS(beta)	-67.81	-78.88	-11.07	CoS
CoSe	-23.87	-40.07	-16.20	CoSe
CoSeO3	-9.61	-8.29	1.32	CoSeO3
CoSeO4:6H2O	-17.53	-19.06	-1.53	CoSeO4:6H2O
CoSO4	-13.17	-10.36	2.80	CoSO4
CoSO4:6H2O	-7.89	-10.36	-2.47	CoSO4:6H2O
Cotunnite	-10.04	-14.82	-4.78	PbCl2
Covellite	-56.32	-78.62	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.24	-31.15	14.09	CrCl2
CrCl3	-46.51	-31.40	15.11	CrCl3
CrF3	-22.89	-34.23	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.39	-42.23	-33.84	Na3AlF6
Cu(OH)2	-1.28	7.39	8.67	Cu(OH)2
Cu(SbO3)2	-25.68	19.53	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-56.52	-91.41	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.78	-52.58	-45.80	Cu2Se
Cu2SO4	-20.92	-22.87	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.37	-9.27	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.58	-104.18	-42.59	Cu3Sb
Cu3Se2	-28.89	-92.38	-63.49	Cu3Se2

CuCO3	-0.94	-12.44	-11.50	CuCO3
CuCrO4	-17.40	-22.84	-5.44	CuCrO4
CuF	-8.80	-13.70	-4.91	CuF
CuF2	-15.75	-14.64	1.12	CuF2
CuF2:2H2O	-10.09	-14.64	-4.55	CuF2:2H2O
Cumetal	-6.70	-15.46	-8.76	Cu
CuMoO4	-0.77	-13.85	-13.08	CuMoO4
CuOCuSO4	-13.01	-2.71	10.30	CuOCuSO4
Cupricferrite	7.79	13.78	5.99	CuFe2O4
Cuprite	-3.97	-5.38	-1.41	Cu2O
Cuprousferrite	9.42	0.50	-8.92	CuFeO2
CuSe	-6.71	-39.81	-33.10	CuSe
CuSe2	-28.09	-61.46	-33.37	CuSe2
CuSeO3:2H2O	-8.54	-8.03	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.36	-18.80	-2.44	CuSeO4:5H2O
CuSO4	-13.04	-10.10	2.94	CuSO4
Diaspore	2.75	9.62	6.87	AlOOH
Djurleite	-56.63	-90.55	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.67	-17.21	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.12	-17.21	-17.09	CaMg(CO3)2
Epsomite	-4.26	-6.38	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.21	0.17	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-7.57	-11.29	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.60	-9.04	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.27	-39.89	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.37	-46.10	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.94	-12.54	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.70	-17.79	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.81	-65.40	-18.60	FeSe2
FeS(ppt)	-79.61	-82.56	-2.95	FeS
FeSe	-32.75	-43.75	-11.00	FeSe
Fix_pe	-5.59	-5.59	0.00	e-
Fluorite	-0.17	-10.67	-10.50	CaF2
Galena	-66.71	-80.68	-13.97	PbS
Gibbsite	1.33	9.62	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.66	-9.67	-2.01	ZnSO4:7H2O
Greenockite	-65.67	-80.03	-14.36	CdS
Greigite	-289.18	-334.22	-45.03	Fe3S4
Gummite	-7.38	0.29	7.67	UO3
Gypsum	-1.53	-6.14	-4.61	CaSO4:2H2O
H-Jarosite	-13.32	-25.42	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.37	-21.24	-12.88	H2MoO4
H2S(g)	-78.00	-86.01	-8.01	H2S
H2Se(g)	-42.24	-47.20	-4.96	H2Se
Halite	-6.93	-5.32	1.60	NaCl
Hausmannite	-7.78	53.25	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.20	22.69	22.89	FeAl2O4
Hg(CH3)2(g)	-183.20	-256.91	-73.71	Hg(CH3)2
Hg(g)	-8.95	-16.83	-7.87	Hg
Hg(OH)2	-9.38	-12.87	-3.50	Hg(OH)2
Hg2(g)	-18.70	-33.65	-14.96	Hg2
Hg2(OH)2	-13.37	-8.11	5.26	Hg2(OH)2
Hg2CO3	-11.89	-27.94	-16.05	Hg2CO3
Hg2CrO4	-29.65	-38.35	-8.70	Hg2CrO4
Hg2F2	-19.78	-30.14	-10.36	Hg2F2
Hg2S	-82.44	-94.12	-11.68	Hg2S
Hg2SeO3	-18.88	-23.53	-4.66	Hg2SeO3
Hg2SO4	-19.47	-25.60	-6.13	Hg2SO4
Hg3O2CO3	-28.78	-58.46	-29.68	Hg3O2CO3
HgCl(g)	-33.62	-14.13	19.50	HgCl
HgCl2	-11.76	-33.02	-21.26	HgCl2
HgF(g)	-47.75	-15.07	32.68	HgF

HgF2(g)	-47.47	-34.91	12.57	HgF2
Hgmetal(l)	-3.37	-16.83	-13.45	Hg
HgSe	-4.38	-60.07	-55.69	HgSe
HgSeO3	-15.87	-28.30	-12.43	HgSeO3
HgSO4	-20.95	-30.37	-9.42	HgSO4
Huntite	-4.69	-34.66	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.92	-23.69	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-15.03	-23.79	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-16.74	-21.91	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-7.16	-21.96	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-36.32	-53.56	-17.24	K2Cr2O7
K2CrO4	-22.81	-23.33	-0.51	K2CrO4
K2MoO4	-17.59	-14.33	3.26	K2MoO4
K2SeO4	-18.55	-19.28	-0.73	K2SeO4
Langite	-5.41	12.08	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.40	-6.84	-0.43	PbO:PbSO4
Laurionite	-5.37	-4.74	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.37	5.33	12.69	PbO
Mackinawite	-78.96	-82.56	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.63	17.49	16.86	Fe2MgO4
Magnesite	-1.27	-8.73	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.26	-5.05	-5.31	Cu2(OH)2CO3
Manganite	-3.33	22.01	25.34	MnOOH
Massicot	-7.57	5.33	12.89	PbO
Matlockite	-6.79	-15.76	-8.97	PbClF
Melanothallite	-19.01	-12.75	6.26	CuCl2
Melanterite	-11.84	-14.04	-2.21	FeSO4·7H2O
Metacinnabar	-53.79	-98.89	-45.09	HgS
Mg(OH)2(active)	-7.68	11.11	18.79	Mg(OH)2
Mg(VO3)2	-14.91	-3.63	11.28	Mg(VO3)2
Mg2Sb3	-276.93	-202.25	74.68	Mg2Sb3
Mg2V2O7	-18.88	7.48	26.36	Mg2V2O7
MgCr2O4	-7.45	8.75	16.20	MgCr2O4
MgCrO4	-24.51	-19.13	5.38	MgCrO4
MgF2	-2.79	-10.92	-8.13	MgF2
MgMoO4	-8.28	-10.13	-1.85	MgMoO4
MgSeO3·6H2O	-7.37	-4.31	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-13.88	-15.08	-1.20	MgSeO4·6H2O
Minium	-31.99	41.53	73.52	Pb3O4
Mirabilite	-6.88	-8.00	-1.11	Na2SO4·10H2O
Mn(VO3)2	-10.41	-5.51	4.90	Mn(VO3)2
Mn2(SO4)3	-53.46	-59.17	-5.71	Mn2(SO4)3
Mn2Sb	-151.49	-90.41	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-16.25	-3.75	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.63	-10.91	2.72	MnCl2·4H2O
MnS(grn)	-76.95	-76.78	0.17	MnS
MnS(pnk)	-80.12	-76.78	3.34	MnS
MnSb	-96.54	-99.45	-2.91	MnSb
MnSe	-41.46	-37.96	3.50	MnSe
MnSeO3	-7.32	-6.19	1.13	MnSeO3
MnSeO3·2H2O	-7.17	-6.19	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.90	-16.95	-2.05	MnSeO4·5H2O
MnSO4	-10.84	-8.26	2.58	MnSO4
Monteponite	-9.12	5.98	15.10	CdO
Montroydite	-9.23	-12.87	-3.64	HgO
MoO3	-13.24	-21.24	-8.00	MoO3
Morenosite	-8.06	-10.20	-2.14	NiSO4·7H2O
MoS2	-148.55	-218.81	-70.26	MoS2
Na-Jarosite	-9.47	-20.67	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.08	-50.98	-9.90	Na2Cr2O7
Na2CrO4	-23.67	-20.74	2.93	Na2CrO4
Na2Mo2O7	-16.39	-32.99	-16.60	Na2Mo2O7
Na2MoO4	-13.23	-11.74	1.49	Na2MoO4
Na2MoO4·2H2O	-12.97	-11.74	1.22	Na2MoO4·2H2O

Na2SeO3:5H2O	-16.23	-5.93	10.30	Na2SeO3:5H2O
Na2SeO4	-17.97	-16.69	1.28	Na2SeO4
Na3Sb	-176.31	-81.86	94.45	Na3Sb
Na3VO4	-29.81	6.88	36.68	Na3VO4
Na4V2O7	-33.15	4.25	37.40	Na4V2O7
Nantokite	-6.03	-12.76	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-9.03	-10.34	-1.31	Na2CO3:10H2O
NaVO3	-6.48	-2.62	3.86	NaVO3
Nesquehonite	-4.06	-8.73	-4.67	MgCO3:3H2O
Ni(OH)2	-5.50	7.29	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.28	-9.58	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.32	11.68	32.00	Ni4(OH)6SO4
NiCO3	-5.67	-12.54	-6.87	NiCO3
NiMoO4	-2.81	-13.95	-11.14	NiMoO4
NiS(alpha)	-73.12	-78.72	-5.60	NiS
NiS(beta)	-67.62	-78.72	-11.10	NiS
NiS(gamma)	-65.92	-78.72	-12.80	NiS
NiSe	-22.21	-39.91	-17.70	NiSe
NiSeO3:2H2O	-10.95	-8.13	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.38	-18.90	-1.52	NiSeO4:6H2O
Nsutite	-8.07	9.43	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-241.72	-302.79	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.95	-4.43	6.52	Pb(BO2)2
Pb(OH)2	-2.82	5.33	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-56.97	-65.73	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.21	0.58	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.53	10.66	26.19	Pb2O(OH)2
Pb2O3	-24.84	36.20	61.04	Pb2O3
Pb2OCO3	-8.62	-9.18	-0.56	Pb2OCO3
Pb2V2O7	-2.19	-4.09	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.27	-15.47	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.90	1.24	6.14	Pb3(VO4)2
Pb3O2CO3	-14.87	-3.85	11.02	Pb3O2CO3
Pb3O2SO4	-12.19	-1.51	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.28	3.82	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.06	3.82	21.88	Pb4O3SO4
PbCrO4	-12.31	-24.91	-12.60	PbCrO4
PbF2	-9.26	-16.70	-7.44	PbF2
Pbmetal	-24.46	-20.22	4.25	Pb
PbMoO4	-0.29	-15.91	-15.62	PbMoO4
PbO:0.3H2O	-7.65	5.33	12.98	PbO:0.33H2O
PbSeO4	-14.02	-20.86	-6.84	PbSeO4
Periclase	-10.47	11.11	21.58	MgO
Phosgenite	-9.52	-29.33	-19.81	PbCl2:PbCO3
Plattnerite	-18.73	30.87	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.52	-143.03	-18.51	FeS2
Pyrochroite	-5.96	9.24	15.19	Mn(OH)2
Pyrolusite	-6.60	34.78	41.38	MnO2
Realgar	-101.41	-121.16	-19.75	AsS
Retgersite	-8.16	-10.20	-2.04	NiSO4:6H2O
Rhodochrosite	-0.02	-10.60	-10.58	MnCO3
Rutherfordine	-5.04	-19.54	-14.50	UO2CO3
Sb(OH)3	-12.37	-19.48	-7.11	Sb(OH)3
Sb2O4	-16.81	-13.41	3.40	Sb2O4
Sb2O5	-26.82	-36.48	-9.67	Sb2O5
Sb2Se3	-112.79	-180.55	-67.76	Sb2Se3
Sb4O6(cubic)	-59.64	-77.90	-18.26	Sb4O6
Sb4O6(orth)	-60.00	-77.90	-17.90	Sb4O6
SbCl3	-50.27	-49.70	0.57	SbCl3
SbF3	-42.30	-52.52	-10.23	SbF3
Sbmetal	-46.10	-57.79	-11.69	Sb
SbO2	-3.19	-31.01	-27.82	SbO2
Schoepite	-5.70	0.29	5.99	UO2(OH)2:H2O
Semetal(am)	-14.54	-21.65	-7.11	Se

Semetal(hex	-13.95	-21.65	-7.71	Se
Senarmontite	-26.59	-38.95	-12.37	Sb2O3
SeO2	-15.55	-15.43	0.12	SeO2
SeO3	-47.23	-26.19	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-2.01	-12.01	-10.00	ZnCO3
Sphalerite	-66.74	-78.19	-11.45	ZnS
Spinel	-6.50	30.35	36.85	MgAl2O4
Stibnite	-246.53	-296.99	-50.46	Sb2S3
Sulfur	-58.32	-60.47	-2.14	S
Tenorite	-0.25	7.39	7.64	CuO
Thenardite	-8.32	-8.00	0.32	Na2SO4
Thermonatrite	-10.98	-10.34	0.64	Na2CO3:H2O
Tyuyamunite	-6.88	-2.80	4.08	Ca(UO2)2(VO4)2
U3O8	-18.10	2.98	21.08	U3O8
U3Sb4	-584.93	-432.55	152.38	U3Sb4
U4O9	-35.58	-38.60	-3.02	U4O9
UF4	-30.56	-60.10	-29.54	UF4
UF4:2.5H2O	-27.38	-60.10	-32.72	UF4:2.5H2O
UO2(am)	-16.97	-16.04	0.93	UO2
UO2(OH)2(beta)	-5.32	0.29	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.65	-25.90	-2.25	UO2SeO4:4H2O
UO3	-7.41	0.29	7.70	UO3
Uraninite	-11.37	-16.04	-4.67	UO2
USb2	-221.51	-191.93	29.58	USb2
V(OH)3	-17.91	-10.32	7.59	V(OH)3
V2O5	-13.38	-14.74	-1.36	V2O5
V3O5	-37.10	-35.27	1.84	V3O5
V4O7	-45.70	-38.51	7.19	V4O7
V6O13	-34.46	-95.32	-60.86	V6O13
Valentinite	-30.47	-38.95	-8.48	Sb2O3
VC12	-62.11	-43.24	18.87	VC12
VC13	-63.97	-40.54	23.43	VC13
VF4	-62.23	-47.30	14.93	VF4
Vmetal	-92.66	-48.63	44.03	V
VO	-37.85	-23.09	14.76	VO
VO(OH)2	-8.39	-3.24	5.15	VO(OH)2
VO2Cl	-20.29	-17.44	2.84	VO2Cl
VOC1	-31.54	-20.39	11.15	VOC1
VOC12	-36.15	-23.39	12.76	VOC12
VOSO4	-24.34	-20.74	3.61	VOSO4
Witherite	-3.75	-12.32	-8.57	BaCO3
Wurtzite	-69.24	-78.19	-8.95	ZnS
Zincite	-3.51	7.83	11.33	ZnO
Zincosite	-13.60	-9.67	3.93	ZnSO4
Zn(BO2)2	-10.22	-1.93	8.29	Zn(BO2)2
Zn(OH)2	-4.37	7.83	12.20	Zn(OH)2
Zn(OH)2(am)	-4.65	7.83	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.93	7.83	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.71	7.83	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.91	7.83	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.34	-1.84	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.61	5.58	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-21.63	-7.98	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.42	-11.51	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-14.59	13.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.52	18.98	38.50	Zn5(OH)8Cl2
ZnCl2	-19.37	-12.32	7.05	ZnCl2
ZnCO3:1H2O	-1.75	-12.01	-10.26	ZnCO3:1H2O
ZnF2	-13.67	-14.21	-0.53	ZnF2
Znmetal	-43.51	-17.72	25.79	Zn
ZnMoO4	-3.29	-13.42	-10.13	ZnMoO4
ZnO(active)	-3.36	7.83	11.19	ZnO
ZnS(am)	-69.14	-78.19	-9.05	ZnS
ZnSb	-86.53	-75.51	11.01	ZnSb
ZnSe	-24.97	-39.37	-14.40	ZnSe
ZnSeO4:6H2O	-16.84	-18.36	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.03	-9.67	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 39.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 201
 equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 donnan 1e-008
USE EQUILIBRIUM_PHASES 201
USE Surface 201
USE Solution 203
SAVE Solution 204 #Initial Stage 2 groundwater after Mineral Precipitation
and Sorption Loss
END

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 201.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.246e-15 Surface + diffuse layer charge, eq
7.773e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.705e+00 m² for 2.656e-05 moles of Ferrihydrite

Water in diffuse layer: 1.705e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is
+1).

Element	Moles
C	4.3562e-11
Ca	5.3988e-13
Cl	8.7234e-10
H	1.2851e-10
K	8.5647e-13
Mg	8.3645e-14
N	3.5316e-09
Na	3.6287e-12
O	1.5741e-07
S	3.6678e-08

Hfo_s

1.328e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.878e-08	0.668	8.878e-08	-7.052
Hfo_sOH	4.354e-08	0.328	4.354e-08	-7.361
Hfo_sO-	4.892e-10	0.004	4.892e-10	-9.311
Hfo_sOHCa+2	1.621e-12	0.000	1.621e-12	-11.790

Hfo_w 5.312e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.455e-06	0.462	2.455e-06	-5.610
Hfo_wOH	1.204e-06	0.227	1.204e-06	-5.919
Hfo_wSO4-	8.291e-07	0.156	8.291e-07	-6.081
Hfo_wOHSO4-2	8.113e-07	0.153	8.113e-07	-6.091
Hfo_wO-	1.353e-08	0.003	1.353e-08	-7.869
Hfo_wOMg+	1.912e-14	0.000	1.912e-14	-13.719
Hfo_wOCa+	6.485e-15	0.000	6.485e-15	-14.188

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 203. Solution after simulation 38.
 Using surface 201.
 Using pure phase assemblage 201. Pure-phase assemblage after simulation 38.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	1.784e-08	1.388e-08	-3.957e-09
Alunite	-1.27	-2.67	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.78	-6.14	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.17	-9.08	-8.91	1.659e-08	0	-1.659e-08
Barite	0.00	-9.98	-9.98	5.546e-07	6.045e-07	4.990e-08
Brochantite	-4.36	10.86	15.22	0.000e+00	0	0.000e+00
Brucite	-5.73	11.11	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	2.573e-06
CaMoO4	-1.94	-9.89	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-7.02	-4.20	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.041e-03	1.040e-03	-7.551e-07
Carnotite	-5.71	-5.48	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.62	-3.78	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.12	-15.27	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.070e-08	1.574e-08	-4.496e-08
Cu2Se(alpha)	-7.52	-53.32	-45.80	0.000e+00	0	0.000e+00

CuMoO4	-1.09	-14.16	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.26	-6.38	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	2.656e-05	2.656e-05	-8.084e-13
Fluorite	-0.17	-10.67	-10.50	0.000e+00	0	0.000e+00
Gummite	-7.38	0.29	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.53	-6.14	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.51	-60.21	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.88	-8.00	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.45	-6.32	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.50	7.29	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-25.45	-9.75	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.68	-12.55	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.82	-13.96	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.950e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.86	-16.48	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.04	-19.54	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.19	-31.01	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.70	0.29	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-10.60	-6.52	4.08	0.000e+00	0	0.000e+00
U3O8	-18.10	2.98	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-5.32	0.29	5.61	0.000e+00	0	0.000e+00
UO3	-7.41	0.29	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.31	-13.44	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-6.205e-18 Surface + diffuse layer charge, eq
2.618e-07 Surface charge, eq
1.481e-02 sigma, C/m²
4.914e-02 psi, V
-1.913e+00 -F*psi/RT
1.477e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.705e+00 m² for 2.656e-05 moles of Ferrihydrite

Water in diffuse layer: 1.705e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.439e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.712e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	9.0170e-13
Al	4.9880e-11
As	2.5120e-15
B	2.2872e-10
Ba	1.3050e-12
C	1.7216e-07
Ca	1.2479e-08
Cd	6.1096e-14
Cl	4.3309e-08
Co	9.9650e-13
Cr	5.5515e-14
Cu	1.9928e-11
F	5.0816e-09
Fe	3.5802e-14
H	1.8450e-07
Hg	9.4832e-16
K	2.0734e-09
Mg	6.5805e-09

Mn	9.4592e-11
Mo	1.0885e-11
N	8.8256e-14
Na	4.0794e-08
Ni	1.6775e-12
O	7.8513e-07
Pb	6.1839e-14
S	6.6932e-08
Sb	2.5621e-13
Se	1.6750e-13
U	2.4818e-12
V	1.6947e-14
Zn	4.7190e-12

Hfo_s

1.328e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCrOH+	8.991e-08	0.677	8.994e-08	-7.046
Hfo_sOCu+	2.942e-08	0.222	2.943e-08	-7.531
Hfo_sOPb+	8.197e-09	0.062	8.200e-09	-8.086
Hfo_sOMn+	2.106e-09	0.016	2.107e-09	-8.676
Hfo_sOZn+	1.957e-09	0.015	1.957e-09	-8.708
Hfo_sOHCa+2	6.320e-10	0.005	6.322e-10	-9.199
Hfo_sOH	3.191e-10	0.002	3.192e-10	-9.496
Hfo_sONi+	1.406e-10	0.001	1.407e-10	-9.852
Hfo_sOH2+	6.009e-11	0.000	6.011e-11	-10.221
Hfo_sO-	3.883e-11	0.000	3.884e-11	-10.411
Hfo_sOCO+	1.442e-11	0.000	1.442e-11	-10.841
Hfo_sOCd+	8.733e-12	0.000	8.736e-12	-11.059
Hfo_sOAg	1.259e-12	0.000	1.259e-12	-11.900
Hfo_sOHBa+2	2.802e-13	0.000	2.803e-13	-12.552
Hfo_sOFe+	4.362e-14	0.000	4.364e-14	-13.360
Hfo_sOHg+	3.671e-17	0.000	3.672e-17	-16.435

Hfo_w

5.312e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH	2.535e-06	0.477	2.536e-06	-5.596
Hfo_wOCu+	1.199e-06	0.226	1.199e-06	-5.921
Hfo_wOHSO4-2	5.377e-07	0.101	5.378e-07	-6.269
Hfo_wOH2+	4.774e-07	0.090	4.775e-07	-6.321
Hfo_wO-	3.085e-07	0.058	3.086e-07	-6.511
Hfo_wOMg+	7.944e-08	0.015	7.947e-08	-7.100
Hfo_wSO4-	5.075e-08	0.010	5.077e-08	-7.294
Hfo_wOHVO4-3	3.884e-08	0.007	3.885e-08	-7.411
Hfo_wOHAsO4-3	3.316e-08	0.006	3.317e-08	-7.479
Hfo_wOZn+	1.628e-08	0.003	1.628e-08	-7.788
Hfo_wOMn+	1.329e-08	0.003	1.330e-08	-7.876
Hfo_wOCa+	7.870e-09	0.001	7.873e-09	-8.104
Hfo_wOHSeO3-2	4.429e-09	0.001	4.431e-09	-8.354
Hfo_wOHMoO4-2	3.828e-09	0.001	3.829e-09	-8.417
Hfo_wOPb+	2.909e-09	0.001	2.910e-09	-8.536
Hfo_wONi+	1.507e-09	0.000	1.507e-09	-8.822
Hfo_wSeO3-	1.417e-09	0.000	1.417e-09	-8.849
Hfo_wMoO4-	4.655e-10	0.000	4.656e-10	-9.332
Hfo_wOCO+	3.228e-10	0.000	3.229e-10	-9.491
Hfo_wH2BO3	1.397e-10	0.000	1.397e-10	-9.855
Hfo_wOCd+	2.960e-11	0.000	2.961e-11	-10.529
Hfo_wHAsO4-	2.633e-11	0.000	2.633e-11	-10.579
Hfo_wOAg	2.631e-12	0.000	2.632e-12	-11.580
Hfo_wOFe+	2.187e-13	0.000	2.188e-13	-12.660
Hfo_wH2AsO4	1.604e-13	0.000	1.605e-13	-12.795
Hfo_wOBa+	5.044e-14	0.000	5.046e-14	-13.297
Hfo_wOHg+	1.429e-14	0.000	1.429e-14	-13.845

Hfo_wOHSbO(OH) 4-	3.003e-15	0.000	3.004e-15	-14.522
Hfo_wOHSeO4-2	8.185e-16	0.000	8.188e-16	-15.087
Hfo_wSbO(OH) 4	3.651e-16	0.000	3.652e-16	-15.437
Hfo_wOHCrO4-2	1.249e-16	0.000	1.249e-16	-15.903
Hfo_wSeO4-	6.729e-17	0.000	6.732e-17	-16.172
Hfo_wCrO4-	1.075e-17	0.000	1.076e-17	-16.968
Hfo_wH2AsO3	2.283e-23	0.000	2.284e-23	-22.641

-----Solution composition-----

Elements	Molality	Moles
Ag	5.575e-08	5.573e-08
Al	1.875e-06	1.874e-06
As	5.475e-11	5.473e-11
B	1.332e-05	1.331e-05
Ba	2.288e-07	2.287e-07
C	6.155e-03	6.153e-03
Ca	1.814e-03	1.813e-03
Cd	8.220e-09	8.217e-09
Cl	1.451e-03	1.450e-03
Co	1.356e-07	1.355e-07
Cr	5.644e-09	5.642e-09
Cu	1.211e-06	1.211e-06
F	1.789e-04	1.788e-04
Fe	3.348e-09	3.347e-09
Hg	5.561e-11	5.559e-11
K	2.106e-04	2.105e-04
Mg	9.937e-04	9.933e-04
Mn	1.435e-05	1.434e-05
Mo	2.083e-07	2.082e-07
N	3.533e-09	3.531e-09
Na	4.146e-03	4.145e-03
Ni	2.116e-07	2.115e-07
Pb	4.302e-09	4.301e-09
S	1.452e-03	1.452e-03
Sb	8.582e-09	8.579e-09
Se	5.279e-09	5.277e-09
U	2.446e-08	2.445e-08
V	5.455e-10	5.453e-10
Zn	5.960e-07	5.958e-07

-----Description of solution-----

	pH	=	7.185	Charge balance
	pe	=	5.588	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.297e-02	
	Mass of water (kg)	=	9.997e-01	
	Total alkalinity (eq/kg)	=	5.477e-03	
	Total CO2 (mol/kg)	=	6.155e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.393e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.109824e+02	
	Total O	=	5.551207e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.733e-07	1.540e-07	-6.761	-6.813	-0.051	(0)
H+	7.338e-08	6.538e-08	-7.134	-7.185	-0.050	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07

Ag	5.575e-08					
AgCl	3.572e-08	3.572e-08	-7.447	-7.447	0.000	(0)
Ag+	1.519e-08	1.354e-08	-7.818	-7.868	-0.050	(0)
AgCl2-	4.596e-09	4.020e-09	-8.338	-8.396	-0.058	(0)
AgSO4-	2.317e-10	2.027e-10	-9.635	-9.693	-0.058	(0)
AgCl3-2	7.906e-12	4.631e-12	-11.102	-11.334	-0.232	(0)
AgF	5.017e-12	5.017e-12	-11.300	-11.300	0.000	(0)
AgOH	2.084e-13	2.084e-13	-12.681	-12.681	0.000	(0)
AgCl4-3	4.071e-14	1.222e-14	-13.390	-13.913	-0.523	(0)
AgH2BO3	2.518e-14	2.518e-14	-13.599	-13.599	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNO2	6.684e-15	6.684e-15	-14.175	-14.175	0.000	(0)
AgSeO3-	2.563e-15	2.242e-15	-14.591	-14.649	-0.058	(0)
AgNH3+	2.076e-16	1.816e-16	-15.683	-15.741	-0.058	(0)
Ag (OH) 2-	3.585e-18	3.136e-18	-17.445	-17.504	-0.058	(0)
AgNO3	2.397e-20	2.397e-20	-19.620	-19.620	0.000	(0)
Ag (NO2) 2-	2.796e-23	2.446e-23	-22.553	-22.611	-0.058	(0)
Ag (SeO3) 2-3	1.723e-23	5.172e-24	-22.764	-23.286	-0.523	(0)
Ag (NH3) 2+	1.109e-23	9.704e-24	-22.955	-23.013	-0.058	(0)
Ag2MoO4	9.095e-24	9.095e-24	-23.041	-23.041	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.882	-72.882	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.190	-87.119	-0.929	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.552	-147.610	-0.058	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.760	-147.909	-0.149	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.878	-150.165	-0.287	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.200	-150.476	-0.275	(0)
Al	1.875e-06					
Al (OH) 4-	1.464e-06	1.306e-06	-5.834	-5.884	-0.050	(0)
AlF3	1.874e-07	1.874e-07	-6.727	-6.727	0.000	(0)
AlF2+	1.128e-07	1.009e-07	-6.948	-6.996	-0.048	(0)
Al (OH) 3	6.737e-08	6.737e-08	-7.172	-7.172	0.000	(0)
Al (OH) 2+	2.451e-08	2.193e-08	-7.611	-7.659	-0.048	(0)
AlF4-	1.554e-08	1.386e-08	-7.808	-7.858	-0.050	(0)
AlF+2	2.681e-09	1.718e-09	-8.572	-8.765	-0.193	(0)
AlOH+2	2.798e-10	1.793e-10	-9.553	-9.746	-0.193	(0)
AlSO4+	7.604e-12	6.781e-12	-11.119	-11.169	-0.050	(0)
Al+3	3.292e-12	1.164e-12	-11.483	-11.934	-0.451	(0)
Al (SO4) 2-	6.113e-14	5.452e-14	-13.214	-13.263	-0.050	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.820	-41.342	-0.523	(0)
As (3)	3.534e-23					
H3AsO3	3.502e-23	3.502e-23	-22.456	-22.456	0.000	(0)
H2AsO3-	3.140e-25	2.747e-25	-24.503	-24.561	-0.058	(0)
HAsO3-2	6.543e-30	3.833e-30	-29.184	-29.417	-0.232	(0)
H4AsO3+	1.297e-30	1.134e-30	-29.887	-29.945	-0.058	(0)
AsO3-3	7.529e-36	2.260e-36	-35.123	-35.646	-0.523	(0)
As (5)	5.475e-11					
HAsO4-2	3.913e-11	2.292e-11	-10.408	-10.640	-0.232	(0)
H2AsO4-	1.562e-11	1.367e-11	-10.806	-10.864	-0.058	(0)
AsO4-3	3.694e-15	1.109e-15	-14.433	-14.955	-0.523	(0)
H3AsO4	1.548e-16	1.553e-16	-15.810	-15.809	0.001	(0)
B	1.332e-05					
H3BO3	1.317e-05	1.321e-05	-4.880	-4.879	0.001	(0)
H2BO3-	1.326e-07	1.174e-07	-6.877	-6.930	-0.053	(0)
CaH2BO3+	7.423e-09	6.569e-09	-8.129	-8.183	-0.053	(0)
MgH2BO3+	2.539e-09	2.247e-09	-8.595	-8.648	-0.053	(0)
BF (OH) 3-	8.790e-10	7.779e-10	-9.056	-9.109	-0.053	(0)
NaH2BO3	6.827e-10	6.827e-10	-9.166	-9.166	0.000	(0)
H5 (BO3) 2-	1.491e-12	1.320e-12	-11.826	-11.879	-0.053	(0)
BF2 (OH) 2-	9.067e-13	8.024e-13	-12.043	-12.096	-0.053	(0)
BaH2BO3+	5.720e-13	5.062e-13	-12.243	-12.296	-0.053	(0)
AgH2BO3	2.518e-14	2.518e-14	-13.599	-13.599	0.000	(0)
H8 (BO3) 3-	1.970e-15	1.744e-15	-14.705	-14.759	-0.053	(0)
BF3OH-	3.404e-18	3.012e-18	-17.468	-17.521	-0.053	(0)
BF4-	1.616e-22	1.430e-22	-21.792	-21.845	-0.053	(0)
Ba	2.288e-07					
Ba+2	2.215e-07	1.396e-07	-6.655	-6.855	-0.201	(0)
BaHCO3+	7.057e-09	6.327e-09	-8.151	-8.199	-0.047	(0)
BaCO3	2.437e-10	2.437e-10	-9.613	-9.613	0.000	(0)

BaH2BO3+	5.720e-13	5.062e-13	-12.243	-12.296	-0.053	(0)
BaOH+	1.050e-13	9.380e-14	-12.979	-13.028	-0.049	(0)
BaNO3+	1.783e-18	1.559e-18	-17.749	-17.807	-0.058	(0)
BaNH3+2	9.880e-19	5.787e-19	-18.005	-18.238	-0.232	(0)
C (4)	6.155e-03					
HCO3-	5.306e-03	4.747e-03	-2.275	-2.324	-0.048	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	9.591e-05	8.598e-05	-4.018	-4.066	-0.047	(0)
MgHCO3+	3.013e-05	2.682e-05	-4.521	-4.572	-0.051	(0)
NaHCO3	9.798e-06	9.798e-06	-5.009	-5.009	0.000	(0)
CO3-2	5.403e-06	3.404e-06	-5.267	-5.468	-0.201	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	1.563e-06	1.563e-06	-5.806	-5.806	0.000	(0)
CuCO3	1.054e-06	1.054e-06	-5.977	-5.977	0.000	(0)
MnHCO3+	7.779e-07	6.951e-07	-6.109	-6.158	-0.049	(0)
NaCO3-	2.600e-07	2.327e-07	-6.585	-6.633	-0.048	(0)
NiHCO3+	5.566e-08	4.869e-08	-7.254	-7.313	-0.058	(0)
ZnCO3	5.440e-08	5.440e-08	-7.264	-7.264	0.000	(0)
ZnHCO3+	4.765e-08	4.169e-08	-7.322	-7.380	-0.058	(0)
CoHCO3+	2.434e-08	2.130e-08	-7.614	-7.672	-0.058	(0)
CuHCO3+	1.800e-08	1.575e-08	-7.745	-7.803	-0.058	(0)
Cu (CO3) 2-2	1.648e-08	9.656e-09	-7.783	-8.015	-0.232	(0)
UO2 (CO3) 2-2	1.317e-08	7.713e-09	-7.880	-8.113	-0.232	(0)
UO2 (CO3) 3-4	1.118e-08	1.316e-09	-7.952	-8.881	-0.929	(0)
NiCO3	1.057e-08	1.057e-08	-7.976	-7.976	0.000	(0)
BaHCO3+	7.057e-09	6.327e-09	-8.151	-8.199	-0.047	(0)
CoCO3	3.319e-09	3.319e-09	-8.479	-8.479	0.000	(0)
PbCO3	2.605e-09	2.605e-09	-8.584	-8.584	0.000	(0)
PbHCO3+	1.026e-09	8.978e-10	-8.989	-9.047	-0.058	(0)
CdCO3	3.185e-10	3.185e-10	-9.497	-9.497	0.000	(0)
BaCO3	2.437e-10	2.437e-10	-9.613	-9.613	0.000	(0)
UO2CO3	1.136e-10	1.136e-10	-9.945	-9.945	0.000	(0)
CdHCO3+	5.070e-11	4.436e-11	-10.295	-10.353	-0.058	(0)
Pb (CO3) 2-2	4.366e-11	2.557e-11	-10.360	-10.592	-0.232	(0)
Cd (CO3) 2-2	1.372e-12	8.037e-13	-11.863	-12.095	-0.232	(0)
FeHCO3+	8.048e-13	7.215e-13	-12.094	-12.142	-0.047	(0)
HgCO3	3.639e-15	3.639e-15	-14.439	-14.439	0.000	(0)
Hg (CO3) 2-2	6.688e-17	3.917e-17	-16.175	-16.407	-0.232	(0)
HgHCO3+	5.063e-18	4.429e-18	-17.296	-17.354	-0.058	(0)
Ca	1.814e-03					
Ca+2	1.544e-03	9.727e-04	-2.811	-3.012	-0.201	(0)
CaSO4	1.672e-04	1.672e-04	-3.777	-3.777	0.000	(0)
CaHCO3+	9.591e-05	8.598e-05	-4.018	-4.066	-0.047	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	1.753e-06	1.566e-06	-5.756	-5.805	-0.049	(0)
CaH2BO3+	7.423e-09	6.569e-09	-8.129	-8.183	-0.053	(0)
CaOH+	3.333e-09	2.988e-09	-8.477	-8.525	-0.047	(0)
CaNH3+2	1.374e-14	8.048e-15	-13.862	-14.094	-0.232	(0)
CaNO3+	7.839e-15	6.858e-15	-14.106	-14.164	-0.058	(0)
Ca (NH3) 2+2	3.595e-26	2.106e-26	-25.444	-25.677	-0.232	(0)
Cd	8.220e-09					
Cd+2	6.514e-09	4.104e-09	-8.186	-8.387	-0.201	(0)
CdSO4	7.219e-10	7.219e-10	-9.142	-9.142	0.000	(0)
CdCl+	5.790e-10	5.065e-10	-9.237	-9.295	-0.058	(0)
CdCO3	3.185e-10	3.185e-10	-9.497	-9.497	0.000	(0)
CdHCO3+	5.070e-11	4.436e-11	-10.295	-10.353	-0.058	(0)
Cd (SO4) 2-2	1.247e-11	7.307e-12	-10.904	-11.136	-0.232	(0)
CdF+	1.097e-11	9.597e-12	-10.960	-11.018	-0.058	(0)
CdOH+	5.738e-12	5.020e-12	-11.241	-11.299	-0.058	(0)
CdOHC1	3.199e-12	3.199e-12	-11.495	-11.495	0.000	(0)
CdCl2	2.729e-12	2.729e-12	-11.564	-11.564	0.000	(0)
Cd (CO3) 2-2	1.372e-12	8.037e-13	-11.863	-12.095	-0.232	(0)
Cd (OH) 2	4.877e-15	4.877e-15	-14.312	-14.312	0.000	(0)
CdF2	2.825e-15	2.825e-15	-14.549	-14.549	0.000	(0)
CdCl3-	2.544e-15	2.225e-15	-14.595	-14.653	-0.058	(0)
CdSeO4	8.531e-19	8.531e-19	-18.069	-18.069	0.000	(0)
Cd2OH+3	3.440e-19	1.032e-19	-18.463	-18.986	-0.523	(0)
Cd (OH) 3-	5.244e-20	4.588e-20	-19.280	-19.338	-0.058	(0)

	CdNO3+	3.307e-20	2.894e-20	-19.481	-19.539	-0.058	(0)
	Cd (SeO3) 2-2	3.834e-22	2.246e-22	-21.416	-21.649	-0.232	(0)
	Cd (OH) 4-2	1.974e-27	1.156e-27	-26.705	-26.937	-0.232	(0)
	Cd (NO3) 2	3.233e-32	3.233e-32	-31.490	-31.490	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.149	-79.207	-0.058	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.831	-150.831	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-227.701	-227.759	-0.058	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.159	-304.391	-0.232	(0)
Cl		1.451e-03					
	Cl-	1.451e-03	1.292e-03	-2.838	-2.889	-0.050	(0)
	AgCl	3.572e-08	3.572e-08	-7.447	-7.447	0.000	(0)
	MnCl+	1.336e-08	1.194e-08	-7.874	-7.923	-0.049	(0)
	AgCl2-	4.596e-09	4.020e-09	-8.338	-8.396	-0.058	(0)
	ZnCl+	1.013e-09	9.015e-10	-8.995	-9.045	-0.051	(0)
	CdCl+	5.790e-10	5.065e-10	-9.237	-9.295	-0.058	(0)
	NiCl+	3.144e-10	2.751e-10	-9.502	-9.561	-0.058	(0)
	CoCl+	2.947e-10	2.578e-10	-9.531	-9.589	-0.058	(0)
	ZnOHC1	1.817e-10	1.817e-10	-9.741	-9.741	0.000	(0)
	CuCl+	1.209e-10	1.077e-10	-9.917	-9.968	-0.051	(0)
	CuCl	1.082e-10	1.082e-10	-9.966	-9.966	0.000	(0)
	CuCl2-	3.282e-11	2.922e-11	-10.484	-10.534	-0.051	(0)
	MnCl2	2.179e-11	2.179e-11	-10.662	-10.662	0.000	(0)
	PbCl+	1.334e-11	1.167e-11	-10.875	-10.933	-0.058	(0)
	AgCl3-2	7.906e-12	4.631e-12	-11.102	-11.334	-0.232	(0)
	CdOHC1	3.199e-12	3.199e-12	-11.495	-11.495	0.000	(0)
	CdCl2	2.729e-12	2.729e-12	-11.564	-11.564	0.000	(0)
	ZnCl2	1.846e-12	1.846e-12	-11.734	-11.734	0.000	(0)
	HgClOH	3.139e-13	3.139e-13	-12.503	-12.503	0.000	(0)
	HgCl2	1.492e-13	1.492e-13	-12.826	-12.826	0.000	(0)
	PbCl2	6.737e-14	6.737e-14	-13.172	-13.172	0.000	(0)
	CuCl2	4.825e-14	4.825e-14	-13.317	-13.317	0.000	(0)
	AgCl4-3	4.071e-14	1.222e-14	-13.390	-13.913	-0.523	(0)
	CuCl3-2	1.267e-14	8.073e-15	-13.897	-14.093	-0.196	(0)
	MnCl3-	8.682e-15	7.757e-15	-14.061	-14.110	-0.049	(0)
	CdCl3-	2.544e-15	2.225e-15	-14.595	-14.653	-0.058	(0)
	HgCl3-	2.204e-15	1.928e-15	-14.657	-14.715	-0.058	(0)
	ZnCl3-	2.129e-15	1.896e-15	-14.672	-14.722	-0.051	(0)
	NiCl2	1.790e-15	1.790e-15	-14.747	-14.747	0.000	(0)
	CrCl+2	1.959e-16	1.148e-16	-15.708	-15.940	-0.232	(0)
	PbCl3-	3.962e-17	3.466e-17	-16.402	-16.460	-0.058	(0)
	HgCl+	2.632e-17	2.303e-17	-16.580	-16.638	-0.058	(0)
	UO2Cl+	2.007e-17	1.756e-17	-16.697	-16.755	-0.058	(0)
	HgCl4-2	1.693e-17	9.918e-18	-16.771	-17.004	-0.232	(0)
	ZnCl4-2	1.922e-18	1.225e-18	-17.716	-17.912	-0.196	(0)
	CuCl3-	6.537e-19	5.819e-19	-18.185	-18.235	-0.051	(0)
	CrOHC12	4.341e-19	4.341e-19	-18.362	-18.362	0.000	(0)
	PbCl4-2	3.496e-20	2.048e-20	-19.456	-19.689	-0.232	(0)
	FeCl+2	2.659e-20	1.694e-20	-19.575	-19.771	-0.196	(0)
	CrCl2+	1.609e-20	1.407e-20	-19.794	-19.852	-0.058	(0)
	VOCl+	1.409e-22	1.233e-22	-21.851	-21.909	-0.058	(0)
	FeCl2+	1.095e-22	9.781e-23	-21.961	-22.010	-0.049	(0)
	CuCl4-2	5.915e-24	3.769e-24	-23.228	-23.424	-0.196	(0)
	CrO3Cl-	1.739e-26	1.521e-26	-25.760	-25.818	-0.058	(0)
	FeCl3	1.264e-26	1.264e-26	-25.898	-25.898	0.000	(0)
	CoCl+2	3.990e-35	2.337e-35	-34.399	-34.631	-0.232	(0)
	UCl+3	0.000e+00	0.000e+00	-45.441	-45.963	-0.523	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.357	-64.590	-0.232	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.812	-69.044	-0.232	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.255	-82.487	-0.232	(0)
Co (2)		1.356e-07					
	Co+2	9.846e-08	5.767e-08	-7.007	-7.239	-0.232	(0)
	CoHCO3+	2.434e-08	2.130e-08	-7.614	-7.672	-0.058	(0)
	CoSO4	8.634e-09	8.634e-09	-8.064	-8.064	0.000	(0)
	CoCO3	3.319e-09	3.319e-09	-8.479	-8.479	0.000	(0)
	CoF+	3.076e-10	2.691e-10	-9.512	-9.570	-0.058	(0)
	CoCl+	2.947e-10	2.578e-10	-9.531	-9.589	-0.058	(0)
	CoOH+	2.025e-10	1.772e-10	-9.694	-9.752	-0.058	(0)
	Co (OH) 2	2.167e-12	2.167e-12	-11.664	-11.664	0.000	(0)

CoNO2+	1.098e-15	9.604e-16	-14.959	-15.018	-0.058	(0)
Co(NH3)+2	7.780e-17	4.557e-17	-16.109	-16.341	-0.232	(0)
CoSeO4	3.227e-17	3.227e-17	-16.491	-16.491	0.000	(0)
Co(OH)3-	7.610e-18	6.658e-18	-17.119	-17.177	-0.058	(0)
CoOOH-	1.910e-18	1.671e-18	-17.719	-17.777	-0.058	(0)
Co2OH+3	1.706e-18	5.121e-19	-17.768	-18.291	-0.523	(0)
CoNO3+	2.329e-19	2.038e-19	-18.633	-18.691	-0.058	(0)
Co(OH)4-2	2.774e-25	1.625e-25	-24.557	-24.789	-0.232	(0)
Co(NH3)2+2	2.181e-26	1.278e-26	-25.661	-25.894	-0.232	(0)
Co4(OH)4+4	1.670e-30	1.966e-31	-29.777	-30.706	-0.929	(0)
Co(NO3)2	9.244e-31	9.244e-31	-30.034	-30.034	0.000	(0)
Co(NH3)3+2	1.805e-36	1.057e-36	-35.744	-35.976	-0.232	(0)
Co(NH3)4+2	0.000e+00	0.000e+00	-46.206	-46.438	-0.232	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-57.168	-57.400	-0.232	(0)
Co(3)	1.187e-28					
CoOH+2	1.187e-28	6.954e-29	-27.925	-28.158	-0.232	(0)
Co+3	2.513e-34	8.887e-35	-33.600	-34.051	-0.451	(0)
CoCl+2	3.990e-35	2.337e-35	-34.399	-34.631	-0.232	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-64.357	-64.590	-0.232	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-77.740	-77.798	-0.058	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-81.979	-82.211	-0.232	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-82.255	-82.487	-0.232	(0)
Cr(2)	7.229e-26					
Cr+2	7.229e-26	4.235e-26	-25.141	-25.373	-0.232	(0)
Cr(3)	5.644e-09					
Cr(OH)2+	4.950e-09	4.331e-09	-8.305	-8.363	-0.058	(0)
Cr(OH)+2	3.946e-10	2.312e-10	-9.404	-9.636	-0.232	(0)
Cr(OH)3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	4.116e-11	4.116e-11	-10.386	-10.386	0.000	(0)
CrF+2	2.739e-12	1.605e-12	-11.562	-11.795	-0.232	(0)
CrO2-	2.081e-12	1.820e-12	-11.682	-11.740	-0.058	(0)
Cr(OH)4-	1.755e-12	1.536e-12	-11.756	-11.814	-0.058	(0)
Cr+3	2.286e-13	6.862e-14	-12.641	-13.164	-0.523	(0)
CrSO4+	1.374e-13	1.202e-13	-12.862	-12.920	-0.058	(0)
CrCl+2	1.959e-16	1.148e-16	-15.708	-15.940	-0.232	(0)
Cr2(OH)2SO4+2	1.468e-18	8.599e-19	-17.833	-18.066	-0.232	(0)
CrOHC12	4.341e-19	4.341e-19	-18.362	-18.362	0.000	(0)
Cr2(OH)2(SO4)2	3.833e-20	3.833e-20	-19.416	-19.416	0.000	(0)
CrCl2+	1.609e-20	1.407e-20	-19.794	-19.852	-0.058	(0)
CrNO3+2	1.142e-26	6.687e-27	-25.942	-26.175	-0.232	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-55.283	-55.515	-0.232	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-66.735	-67.257	-0.523	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-68.812	-69.044	-0.232	(0)
Cr(6)	2.504e-16					
CrO4-2	2.147e-16	1.353e-16	-15.668	-15.869	-0.201	(0)
HCrO4-	3.272e-17	2.862e-17	-16.485	-16.543	-0.058	(0)
NaCrO4-	2.821e-18	2.467e-18	-17.550	-17.608	-0.058	(0)
KCrO4-	1.072e-19	9.382e-20	-18.970	-19.028	-0.058	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	7.303e-25	4.278e-25	-24.136	-24.369	-0.232	(0)
CrO3Cl-	1.739e-26	1.521e-26	-25.760	-25.818	-0.058	(0)
Cr2O7-2	4.851e-32	2.841e-32	-31.314	-31.546	-0.232	(0)
Cu(1)	2.171e-10					
CuCl	1.082e-10	1.082e-10	-9.966	-9.966	0.000	(0)
Cu+	7.602e-11	6.651e-11	-10.119	-10.177	-0.058	(0)
CuCl2-	3.282e-11	2.922e-11	-10.484	-10.534	-0.051	(0)
CuCl3-2	1.267e-14	8.073e-15	-13.897	-14.093	-0.196	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.793	-150.074	-0.281	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.534	-150.804	-0.270	(0)
Cu(2)	1.211e-06					
CuCO3	1.054e-06	1.054e-06	-5.977	-5.977	0.000	(0)
Cu+2	8.343e-08	5.256e-08	-7.079	-7.279	-0.201	(0)
CuOH+	2.875e-08	2.560e-08	-7.541	-7.592	-0.051	(0)
CuHCO3+	1.800e-08	1.575e-08	-7.745	-7.803	-0.058	(0)
Cu(CO3)2-2	1.648e-08	9.656e-09	-7.783	-8.015	-0.232	(0)
CuSO4	9.035e-09	9.035e-09	-8.044	-8.044	0.000	(0)
Cu(OH)2	7.864e-10	7.864e-10	-9.104	-9.104	0.000	(0)
CuF+	5.594e-10	4.894e-10	-9.252	-9.310	-0.058	(0)

	CuCl+	1.209e-10	1.077e-10	-9.917	-9.968	-0.051	(0)
	Cu2(OH) 2+2	2.809e-11	1.646e-11	-10.551	-10.784	-0.232	(0)
	Cu(OH) 3-	2.839e-13	2.484e-13	-12.547	-12.605	-0.058	(0)
	CuCl2	4.825e-14	4.825e-14	-13.317	-13.317	0.000	(0)
	CuNO2+	1.487e-14	1.301e-14	-13.828	-13.886	-0.058	(0)
	CuNH3+2	6.035e-15	3.535e-15	-14.219	-14.452	-0.232	(0)
	CuCl3-	6.537e-19	5.819e-19	-18.185	-18.235	-0.051	(0)
	Cu(OH) 4-2	5.139e-19	3.010e-19	-18.289	-18.521	-0.232	(0)
	CuNO3+	4.236e-19	3.706e-19	-18.373	-18.431	-0.058	(0)
	Cu(NO2) 2	3.146e-22	3.146e-22	-21.502	-21.502	0.000	(0)
	CuCl4-2	5.915e-24	3.769e-24	-23.228	-23.424	-0.196	(0)
	Cu(NO3) 2	1.040e-31	1.040e-31	-30.983	-30.983	0.000	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-217.807	-217.865	-0.058	(0)
F		1.789e-04					
	F-	1.656e-04	1.475e-04	-3.781	-3.831	-0.050	(0)
	MgF+	1.025e-05	9.140e-06	-4.989	-5.039	-0.050	(0)
	CaF+	1.753e-06	1.566e-06	-5.756	-5.805	-0.049	(0)
	NaF	3.417e-07	3.417e-07	-6.466	-6.466	0.000	(0)
	AlF3	1.874e-07	1.874e-07	-6.727	-6.727	0.000	(0)
	AlF2+	1.128e-07	1.009e-07	-6.948	-6.996	-0.048	(0)
	MnF+	4.824e-08	4.310e-08	-7.317	-7.365	-0.049	(0)
	AlF4-	1.554e-08	1.386e-08	-7.808	-7.858	-0.050	(0)
	HF	1.427e-08	1.427e-08	-7.846	-7.846	0.000	(0)
	AlF+2	2.681e-09	1.718e-09	-8.572	-8.765	-0.193	(0)
	ZnF+	9.345e-10	8.175e-10	-9.029	-9.087	-0.058	(0)
	BF(OH) 3-	8.790e-10	7.779e-10	-9.056	-9.109	-0.053	(0)
	CuF+	5.594e-10	4.894e-10	-9.252	-9.310	-0.058	(0)
	NiF+	3.525e-10	3.083e-10	-9.453	-9.511	-0.058	(0)
	CoF+	3.076e-10	2.691e-10	-9.512	-9.570	-0.058	(0)
	CdF+	1.097e-11	9.597e-12	-10.960	-11.018	-0.058	(0)
	HF2-	9.008e-12	8.004e-12	-11.045	-11.097	-0.051	(0)
	AgF	5.017e-12	5.017e-12	-11.300	-11.300	0.000	(0)
	PbF+	3.025e-12	2.646e-12	-11.519	-11.577	-0.058	(0)
	CrF+2	2.739e-12	1.605e-12	-11.562	-11.795	-0.232	(0)
	BF2(OH) 2-	9.067e-13	8.024e-13	-12.043	-12.096	-0.053	(0)
	UO2F+	1.951e-13	1.706e-13	-12.710	-12.768	-0.058	(0)
	UO2F2	7.261e-14	7.261e-14	-13.139	-13.139	0.000	(0)
	PbF2	7.684e-15	7.684e-15	-14.114	-14.114	0.000	(0)
	UO2F3-	3.076e-15	2.691e-15	-14.512	-14.570	-0.058	(0)
	CdF2	2.825e-15	2.825e-15	-14.549	-14.549	0.000	(0)
	H2F2	5.454e-16	5.454e-16	-15.263	-15.263	0.000	(0)
	FeF2+	3.104e-16	2.773e-16	-15.508	-15.557	-0.049	(0)
	FeF+2	1.102e-16	7.023e-17	-15.958	-16.153	-0.196	(0)
	FeF3	5.773e-17	5.773e-17	-16.239	-16.239	0.000	(0)
	VO2F	9.961e-18	9.961e-18	-17.002	-17.002	0.000	(0)
	UO2F4-2	5.385e-18	3.154e-18	-17.269	-17.501	-0.232	(0)
	BF3OH-	3.404e-18	3.012e-18	-17.468	-17.521	-0.053	(0)
	PbF3-	2.458e-18	2.150e-18	-17.609	-17.667	-0.058	(0)
	VO2F2-	6.100e-19	5.336e-19	-18.215	-18.273	-0.058	(0)
	VOF+	3.439e-20	3.009e-20	-19.464	-19.522	-0.058	(0)
	VO2F3-2	1.677e-21	9.821e-22	-20.776	-21.008	-0.232	(0)
	VOF2	1.665e-21	1.665e-21	-20.779	-20.779	0.000	(0)
	PbF4-2	2.593e-22	1.519e-22	-21.586	-21.819	-0.232	(0)
	BF4-	1.616e-22	1.430e-22	-21.792	-21.845	-0.053	(0)
	VOF3-	9.962e-24	8.715e-24	-23.002	-23.060	-0.058	(0)
	HgF+	5.583e-24	4.885e-24	-23.253	-23.311	-0.058	(0)
	Sb(OH) 2F	5.033e-25	5.033e-25	-24.298	-24.298	0.000	(0)
	SbOF	4.951e-25	4.951e-25	-24.305	-24.305	0.000	(0)
	VO2F4-3	2.376e-25	7.130e-26	-24.624	-25.147	-0.523	(0)
	VOF4-2	8.862e-27	5.191e-27	-26.052	-26.285	-0.232	(0)
	UF3+	2.456e-35	2.149e-35	-34.610	-34.668	-0.058	(0)
	UF2+2	1.569e-36	9.189e-37	-35.804	-36.037	-0.232	(0)
	UF4	3.477e-37	3.477e-37	-36.459	-36.459	0.000	(0)
	UF5-	2.324e-39	2.033e-39	-38.634	-38.692	-0.058	(0)
	UF+3	1.648e-39	4.947e-40	-38.783	-39.306	-0.523	(0)
	UF6-2	1.546e-40	0.000e+00	-39.811	-40.043	-0.232	(0)
Fe(2)		2.372e-11					
	Fe+2	2.061e-11	1.207e-11	-10.686	-10.918	-0.232	(0)

FeSO4	2.224e-12	2.224e-12	-11.653	-11.653	0.000	(0)
FeHCO3+	8.048e-13	7.215e-13	-12.094	-12.142	-0.047	(0)
FeOH+	8.283e-14	7.400e-14	-13.082	-13.131	-0.049	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.933e-19	4.407e-19	-18.307	-18.356	-0.049	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.624	-159.624	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.416	-0.058	(0)
Fe (3)	3.324e-09					
Fe (OH) 2+	2.890e-09	2.585e-09	-8.539	-8.587	-0.048	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.851e-12	6.130e-12	-11.164	-11.213	-0.048	(0)
FeOH+2	6.773e-14	4.316e-14	-13.169	-13.365	-0.196	(0)
FeF2+	3.104e-16	2.773e-16	-15.508	-15.557	-0.049	(0)
FeF+2	1.102e-16	7.023e-17	-15.958	-16.153	-0.196	(0)
FeF3	5.773e-17	5.773e-17	-16.239	-16.239	0.000	(0)
FeSO4+	4.091e-18	3.655e-18	-17.388	-17.437	-0.049	(0)
Fe+3	1.227e-18	4.341e-19	-17.911	-18.362	-0.451	(0)
Fe (SO4) 2-	6.702e-20	5.863e-20	-19.174	-19.232	-0.058	(0)
FeCl+2	2.659e-20	1.694e-20	-19.575	-19.771	-0.196	(0)
FeCl2+	1.095e-22	9.781e-23	-21.961	-22.010	-0.049	(0)
FeHSeO3+2	8.287e-24	4.854e-24	-23.082	-23.314	-0.232	(0)
Fe2 (OH) 2+4	5.240e-25	6.168e-26	-24.281	-25.210	-0.929	(0)
FeCl3	1.264e-26	1.264e-26	-25.898	-25.898	0.000	(0)
FeNO3+2	1.652e-29	9.679e-30	-28.782	-29.014	-0.232	(0)
Fe3 (OH) 4+5	6.524e-32	2.305e-33	-31.185	-32.637	-1.452	(0)
H (0)	4.026e-29					
H2	2.013e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	5.501e-11					
Hg	5.501e-11	5.501e-11	-10.260	-10.260	0.000	(0)
Hg (1)	1.139e-22					
Hg2+2	5.694e-23	3.335e-23	-22.245	-22.477	-0.232	(0)
Hg (2)	6.022e-13					
HgClOH	3.139e-13	3.139e-13	-12.503	-12.503	0.000	(0)
HgCl2	1.492e-13	1.492e-13	-12.826	-12.826	0.000	(0)
Hg (OH) 2	1.332e-13	1.336e-13	-12.875	-12.874	0.001	(0)
HgCO3	3.639e-15	3.639e-15	-14.439	-14.439	0.000	(0)
HgCl3-	2.204e-15	1.928e-15	-14.657	-14.715	-0.058	(0)
Hg (CO3) 2-2	6.688e-17	3.917e-17	-16.175	-16.407	-0.232	(0)
HgCl+	2.632e-17	2.303e-17	-16.580	-16.638	-0.058	(0)
HgCl4-2	1.693e-17	9.918e-18	-16.771	-17.004	-0.232	(0)
HgOH+	6.258e-18	5.475e-18	-17.204	-17.262	-0.058	(0)
HgHCO3+	5.063e-18	4.429e-18	-17.296	-17.354	-0.058	(0)
Hg (OH) 3-	2.960e-21	2.590e-21	-20.529	-20.587	-0.058	(0)
Hg+2	1.525e-21	8.931e-22	-20.817	-21.049	-0.232	(0)
HgSO4	1.754e-22	1.754e-22	-21.756	-21.756	0.000	(0)
HgNH3+2	6.323e-24	3.703e-24	-23.199	-23.431	-0.232	(0)
HgF+	5.583e-24	4.885e-24	-23.253	-23.311	-0.058	(0)
Hg (NH3) 2+2	4.155e-26	2.434e-26	-25.381	-25.614	-0.232	(0)
HgNO3+	8.404e-34	7.352e-34	-33.076	-33.134	-0.058	(0)
Hg (NH3) 3+2	1.087e-36	6.368e-37	-35.964	-36.196	-0.232	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.167	-45.167	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-46.246	-46.478	-0.232	(0)
HgHS2-	0.000e+00	0.000e+00	-139.535	-139.593	-0.058	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.383	-140.383	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.884	-141.116	-0.232	(0)
K	2.106e-04					
K+	2.095e-04	1.866e-04	-3.679	-3.729	-0.050	(0)
KSO4-	1.108e-06	9.914e-07	-5.955	-6.004	-0.048	(0)
KCrO4-	1.072e-19	9.382e-20	-18.970	-19.028	-0.058	(0)
Mg	9.937e-04					
Mg+2	8.763e-04	5.521e-04	-3.057	-3.258	-0.201	(0)
MgSO4	7.539e-05	7.539e-05	-4.123	-4.123	0.000	(0)
MgHCO3+	3.013e-05	2.682e-05	-4.521	-4.572	-0.051	(0)
MgF+	1.025e-05	9.140e-06	-4.989	-5.039	-0.050	(0)
MgCO3	1.563e-06	1.563e-06	-5.806	-5.806	0.000	(0)
MgOH+	3.769e-08	3.384e-08	-7.424	-7.471	-0.047	(0)
MgH2BO3+	2.539e-09	2.247e-09	-8.595	-8.648	-0.053	(0)
Mn (2)	1.435e-05					

Mn+2	1.253e-05	7.338e-06	-4.902	-5.134	-0.232	(0)
MnSO4	9.791e-07	9.791e-07	-6.009	-6.009	0.000	(0)
MnHCO3+	7.779e-07	6.951e-07	-6.109	-6.158	-0.049	(0)
MnF+	4.824e-08	4.310e-08	-7.317	-7.365	-0.049	(0)
MnCl+	1.336e-08	1.194e-08	-7.874	-7.923	-0.049	(0)
MnOH+	3.177e-09	2.838e-09	-8.498	-8.547	-0.049	(0)
MnCl2	2.179e-11	2.179e-11	-10.662	-10.662	0.000	(0)
MnCl3-	8.682e-15	7.757e-15	-14.061	-14.110	-0.049	(0)
MnSeO4	2.205e-15	2.205e-15	-14.657	-14.657	0.000	(0)
MnNO3+	2.964e-17	2.593e-17	-16.528	-16.586	-0.058	(0)
Mn (OH) 3-	4.655e-19	4.159e-19	-18.332	-18.381	-0.049	(0)
Mn (OH) 4-2	3.244e-25	2.067e-25	-24.489	-24.685	-0.196	(0)
Mn (NO3) 2	1.452e-28	1.452e-28	-27.838	-27.838	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.482	-43.482	0.000	(0)
Mn (3)	3.587e-25					
Mn+3	3.587e-25	1.269e-25	-24.445	-24.897	-0.451	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.533	-43.729	-0.196	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.461	-47.513	-0.052	(0)
Mo	2.083e-07					
MoO4-2	2.081e-07	1.311e-07	-6.682	-6.882	-0.201	(0)
HMoO4-	1.950e-10	1.706e-10	-9.710	-9.768	-0.058	(0)
H2MoO4	8.169e-14	8.169e-14	-13.088	-13.088	0.000	(0)
Ag2MoO4	9.095e-24	9.095e-24	-23.041	-23.041	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.820	-41.342	-0.523	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.572	-52.662	-2.091	(0)
HMo7O24-5	0.000e+00	0.000e+00	-52.008	-53.460	-1.452	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-54.933	-55.862	-0.929	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-59.278	-59.801	-0.523	(0)
N (-3)	8.650e-10					
NH4+	8.516e-10	7.536e-10	-9.070	-9.123	-0.053	(0)
NH4SO4-	6.781e-12	6.059e-12	-11.169	-11.218	-0.049	(0)
NH3	6.572e-12	6.572e-12	-11.182	-11.182	0.000	(0)
CaNH3+2	1.374e-14	8.048e-15	-13.862	-14.094	-0.232	(0)
CuNH3+2	6.035e-15	3.535e-15	-14.219	-14.452	-0.232	(0)
NiNH3+2	5.013e-16	2.936e-16	-15.300	-15.532	-0.232	(0)
AgNH3+	2.076e-16	1.816e-16	-15.683	-15.741	-0.058	(0)
Co (NH3) +2	7.780e-17	4.557e-17	-16.109	-16.341	-0.232	(0)
BaNH3+2	9.880e-19	5.787e-19	-18.005	-18.238	-0.232	(0)
Ag (NH3) 2+	1.109e-23	9.704e-24	-22.955	-23.013	-0.058	(0)
HgNH3+2	6.323e-24	3.703e-24	-23.199	-23.431	-0.232	(0)
Ni (NH3) 2+2	4.762e-25	2.789e-25	-24.322	-24.554	-0.232	(0)
Hg (NH3) 2+2	4.155e-26	2.434e-26	-25.381	-25.614	-0.232	(0)
Ca (NH3) 2+2	3.595e-26	2.106e-26	-25.444	-25.677	-0.232	(0)
Co (NH3) 2+2	2.181e-26	1.278e-26	-25.661	-25.894	-0.232	(0)
Co (NH3) 3+2	1.805e-36	1.057e-36	-35.744	-35.976	-0.232	(0)
Hg (NH3) 3+2	1.087e-36	6.368e-37	-35.964	-36.196	-0.232	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.206	-46.438	-0.232	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-46.246	-46.478	-0.232	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.283	-55.515	-0.232	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.168	-57.400	-0.232	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.357	-64.590	-0.232	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.735	-67.257	-0.523	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.812	-69.044	-0.232	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.740	-77.798	-0.058	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.979	-82.211	-0.232	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.255	-82.487	-0.232	(0)
N (3)	2.665e-09					
NO2-	2.665e-09	2.363e-09	-8.574	-8.626	-0.052	(0)
CuNO2+	1.487e-14	1.301e-14	-13.828	-13.886	-0.058	(0)
AgNO2	6.684e-15	6.684e-15	-14.175	-14.175	0.000	(0)
CoNO2+	1.098e-15	9.604e-16	-14.959	-15.018	-0.058	(0)
Cu (NO2) 2	3.146e-22	3.146e-22	-21.502	-21.502	0.000	(0)
Ag (NO2) 2-	2.796e-23	2.446e-23	-22.553	-22.611	-0.058	(0)
N (5)	2.510e-12					
NO3-	2.502e-12	2.230e-12	-11.602	-11.652	-0.050	(0)
CaNO3+	7.839e-15	6.858e-15	-14.106	-14.164	-0.058	(0)

MnNO3+	2.964e-17	2.593e-17	-16.528	-16.586	-0.058	(0)
BaNO3+	1.783e-18	1.559e-18	-17.749	-17.807	-0.058	(0)
ZnNO3+	1.778e-18	1.555e-18	-17.750	-17.808	-0.058	(0)
NiNO3+	5.326e-19	4.659e-19	-18.274	-18.332	-0.058	(0)
CuNO3+	4.236e-19	3.706e-19	-18.373	-18.431	-0.058	(0)
CoNO3+	2.329e-19	2.038e-19	-18.633	-18.691	-0.058	(0)
CdNO3+	3.307e-20	2.894e-20	-19.481	-19.539	-0.058	(0)
AgNO3	2.397e-20	2.397e-20	-19.620	-19.620	0.000	(0)
PbNO3+	9.594e-21	8.393e-21	-20.018	-20.076	-0.058	(0)
UO2NO3+	4.260e-26	3.727e-26	-25.371	-25.429	-0.058	(0)
CrNO3+2	1.142e-26	6.687e-27	-25.942	-26.175	-0.232	(0)
Mn (NO3) 2	1.452e-28	1.452e-28	-27.838	-27.838	0.000	(0)
VO2NO3	4.341e-29	4.341e-29	-28.362	-28.362	0.000	(0)
FeNO3+2	1.652e-29	9.679e-30	-28.782	-29.014	-0.232	(0)
Co (NO3) 2	9.244e-31	9.244e-31	-30.034	-30.034	0.000	(0)
Zn (NO3) 2	6.918e-31	6.918e-31	-30.160	-30.160	0.000	(0)
Cu (NO3) 2	1.040e-31	1.040e-31	-30.983	-30.983	0.000	(0)
Cd (NO3) 2	3.233e-32	3.233e-32	-31.490	-31.490	0.000	(0)
Pb (NO3) 2	3.178e-32	3.178e-32	-31.498	-31.498	0.000	(0)
HgNO3+	8.404e-34	7.352e-34	-33.076	-33.134	-0.058	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.167	-45.167	0.000	(0)
Na	4.146e-03					
Na+	4.119e-03	3.670e-03	-2.385	-2.435	-0.050	(0)
NaSO4-	1.653e-05	1.479e-05	-4.782	-4.830	-0.048	(0)
NaHCO3	9.798e-06	9.798e-06	-5.009	-5.009	0.000	(0)
NaF	3.417e-07	3.417e-07	-6.466	-6.466	0.000	(0)
NaCO3-	2.600e-07	2.327e-07	-6.585	-6.633	-0.048	(0)
NaH2BO3	6.827e-10	6.827e-10	-9.166	-9.166	0.000	(0)
NaCrO4-	2.821e-18	2.467e-18	-17.550	-17.608	-0.058	(0)
Ni	2.116e-07					
Ni+2	1.320e-07	8.319e-08	-6.879	-7.080	-0.201	(0)
NiHCO3+	5.566e-08	4.869e-08	-7.254	-7.313	-0.058	(0)
NiSO4	1.245e-08	1.245e-08	-7.905	-7.905	0.000	(0)
NiCO3	1.057e-08	1.057e-08	-7.976	-7.976	0.000	(0)
NiF+	3.525e-10	3.083e-10	-9.453	-9.511	-0.058	(0)
NiCl+	3.144e-10	2.751e-10	-9.502	-9.561	-0.058	(0)
NiOH+	1.843e-10	1.613e-10	-9.734	-9.792	-0.058	(0)
Ni (OH) 2	1.972e-12	1.972e-12	-11.705	-11.705	0.000	(0)
Ni (SO4) 2-2	5.283e-13	3.095e-13	-12.277	-12.509	-0.232	(0)
NiCl2	1.790e-15	1.790e-15	-14.747	-14.747	0.000	(0)
NiNH3+2	5.013e-16	2.936e-16	-15.300	-15.532	-0.232	(0)
Ni (OH) 3-	3.472e-16	3.037e-16	-15.459	-15.518	-0.058	(0)
NiSeO4	4.344e-17	4.344e-17	-16.362	-16.362	0.000	(0)
NiNO3+	5.326e-19	4.659e-19	-18.274	-18.332	-0.058	(0)
Ni (NH3) 2+2	4.762e-25	2.789e-25	-24.322	-24.554	-0.232	(0)
O (0)	2.478e-35					
O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	4.302e-09					
PbCO3	2.605e-09	2.605e-09	-8.584	-8.584	0.000	(0)
PbHCO3+	1.026e-09	8.978e-10	-8.989	-9.047	-0.058	(0)
Pb+2	4.040e-10	2.545e-10	-9.394	-9.594	-0.201	(0)
PbOH+	1.125e-10	9.844e-11	-9.949	-10.007	-0.058	(0)
PbSO4	9.354e-11	9.354e-11	-10.029	-10.029	0.000	(0)
Pb (CO3) 2-2	4.366e-11	2.557e-11	-10.360	-10.592	-0.232	(0)
PbCl+	1.334e-11	1.167e-11	-10.875	-10.933	-0.058	(0)
PbF+	3.025e-12	2.646e-12	-11.519	-11.577	-0.058	(0)
Pb (SO4) 2-2	7.220e-13	4.229e-13	-12.141	-12.374	-0.232	(0)
Pb (OH) 2	4.793e-13	4.793e-13	-12.319	-12.319	0.000	(0)
PbCl2	6.737e-14	6.737e-14	-13.172	-13.172	0.000	(0)
PbF2	7.684e-15	7.684e-15	-14.114	-14.114	0.000	(0)
Pb (OH) 3-	8.437e-17	7.381e-17	-16.074	-16.132	-0.058	(0)
PbCl3-	3.962e-17	3.466e-17	-16.402	-16.460	-0.058	(0)
PbF3-	2.458e-18	2.150e-18	-17.609	-17.667	-0.058	(0)
Pb2OH+3	1.323e-18	3.971e-19	-17.878	-18.401	-0.523	(0)
PbCl4-2	3.496e-20	2.048e-20	-19.456	-19.689	-0.232	(0)
PbNO3+	9.594e-21	8.393e-21	-20.018	-20.076	-0.058	(0)
Pb (OH) 4-2	4.752e-21	2.783e-21	-20.323	-20.555	-0.232	(0)
PbF4-2	2.593e-22	1.519e-22	-21.586	-21.819	-0.232	(0)

Pb3 (OH) 4+2	1.992e-24	1.167e-24	-23.701	-23.933	-0.232	(0)
Pb4 (OH) 4+4	2.004e-29	2.359e-30	-28.698	-29.627	-0.929	(0)
Pb (NO3) 2	3.178e-32	3.178e-32	-31.498	-31.498	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.981	-151.981	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.451	-229.509	-0.058	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.882	-72.882	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.770	-78.828	-0.058	(0)
H2S	0.000e+00	0.000e+00	-78.993	-78.993	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.149	-79.207	-0.058	(0)
S5-2	0.000e+00	0.000e+00	-80.776	-81.009	-0.232	(0)
S6-2	0.000e+00	0.000e+00	-81.292	-81.525	-0.232	(0)
S4-2	0.000e+00	0.000e+00	-81.372	-81.604	-0.232	(0)
S3-2	0.000e+00	0.000e+00	-82.178	-82.410	-0.232	(0)
S2-2	0.000e+00	0.000e+00	-83.194	-83.426	-0.232	(0)
S-2	0.000e+00	0.000e+00	-88.748	-88.944	-0.196	(0)
HgHS2-	0.000e+00	0.000e+00	-139.535	-139.593	-0.058	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.383	-140.383	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.884	-141.116	-0.232	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.552	-147.610	-0.058	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.760	-147.909	-0.149	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.793	-150.074	-0.281	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.878	-150.165	-0.287	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.160	-150.218	-0.058	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.200	-150.476	-0.275	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.534	-150.804	-0.270	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.831	-150.831	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.393	-151.393	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.981	-151.981	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.624	-159.624	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.807	-217.865	-0.058	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.883	-226.941	-0.058	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.701	-227.759	-0.058	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.451	-229.509	-0.058	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.504	-229.736	-0.232	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.416	-0.058	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.159	-304.391	-0.232	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.997	-307.229	-0.232	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.013	-319.245	-0.232	(0)
S (6)	1.452e-03					
SO4-2	1.191e-03	7.503e-04	-2.924	-3.125	-0.201	(0)
CaSO4	1.672e-04	1.672e-04	-3.777	-3.777	0.000	(0)
MgSO4	7.539e-05	7.539e-05	-4.123	-4.123	0.000	(0)
NaSO4-	1.653e-05	1.479e-05	-4.782	-4.830	-0.048	(0)
KSO4-	1.108e-06	9.914e-07	-5.955	-6.004	-0.048	(0)
MnSO4	9.791e-07	9.791e-07	-6.009	-6.009	0.000	(0)
ZnSO4	4.559e-08	4.559e-08	-7.341	-7.341	0.000	(0)
NiSO4	1.245e-08	1.245e-08	-7.905	-7.905	0.000	(0)
CuSO4	9.035e-09	9.035e-09	-8.044	-8.044	0.000	(0)
CoSO4	8.634e-09	8.634e-09	-8.064	-8.064	0.000	(0)
HSO4-	5.375e-09	4.794e-09	-8.270	-8.319	-0.050	(0)
CdSO4	7.219e-10	7.219e-10	-9.142	-9.142	0.000	(0)
Zn (SO4) 2-2	5.086e-10	2.979e-10	-9.294	-9.526	-0.232	(0)
AgSO4-	2.317e-10	2.027e-10	-9.635	-9.693	-0.058	(0)
PbSO4	9.354e-11	9.354e-11	-10.029	-10.029	0.000	(0)
CrOHSO4	4.116e-11	4.116e-11	-10.386	-10.386	0.000	(0)
Cd (SO4) 2-2	1.247e-11	7.307e-12	-10.904	-11.136	-0.232	(0)
AlSO4+	7.604e-12	6.781e-12	-11.119	-11.169	-0.050	(0)
NH4SO4-	6.781e-12	6.059e-12	-11.169	-11.218	-0.049	(0)
FeSO4	2.224e-12	2.224e-12	-11.653	-11.653	0.000	(0)
Pb (SO4) 2-2	7.220e-13	4.229e-13	-12.141	-12.374	-0.232	(0)
Ni (SO4) 2-2	5.283e-13	3.095e-13	-12.277	-12.509	-0.232	(0)
CrSO4+	1.374e-13	1.202e-13	-12.862	-12.920	-0.058	(0)
Al (SO4) 2-	6.113e-14	5.452e-14	-13.214	-13.263	-0.050	(0)
UO2SO4	9.515e-15	9.515e-15	-14.022	-14.022	0.000	(0)
UO2 (SO4) 2-2	1.607e-16	9.411e-17	-15.794	-16.026	-0.232	(0)
FeSO4+	4.091e-18	3.655e-18	-17.388	-17.437	-0.049	(0)
Cr2 (OH) 2SO4+2	1.468e-18	8.599e-19	-17.833	-18.066	-0.232	(0)

VO2SO4-	7.883e-19	6.896e-19	-18.103	-18.161	-0.058	(0)
Fe(SO4) 2-	6.702e-20	5.863e-20	-19.174	-19.232	-0.058	(0)
Cr2(OH) 2(SO4) 2	3.833e-20	3.833e-20	-19.416	-19.416	0.000	(0)
VOSO4	7.026e-21	7.026e-21	-20.153	-20.153	0.000	(0)
HgSO4	1.754e-22	1.754e-22	-21.756	-21.756	0.000	(0)
CrO3SO4-2	7.303e-25	4.278e-25	-24.136	-24.369	-0.232	(0)
VSO4+	7.550e-35	6.605e-35	-34.122	-34.180	-0.058	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.524	-40.524	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.067	-41.299	-0.232	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-77.740	-77.798	-0.058	(0)
Sb(3)	6.601e-20					
Sb(OH) 3	3.340e-20	3.340e-20	-19.476	-19.476	0.000	(0)
HSbO2	3.261e-20	3.261e-20	-19.487	-19.487	0.000	(0)
SbO2-	9.233e-25	8.078e-25	-24.035	-24.093	-0.058	(0)
Sb(OH) 4-	5.288e-25	4.627e-25	-24.277	-24.335	-0.058	(0)
Sb(OH) 2F	5.033e-25	5.033e-25	-24.298	-24.298	0.000	(0)
SbOF	4.951e-25	4.951e-25	-24.305	-24.305	0.000	(0)
Sb(OH) 2+	6.062e-26	5.303e-26	-25.217	-25.275	-0.058	(0)
SbO+	2.090e-26	1.829e-26	-25.680	-25.738	-0.058	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.013	-319.245	-0.232	(0)
Sb(5)	8.582e-09					
SbO3-	8.572e-09	7.499e-09	-8.067	-8.125	-0.058	(0)
Sb(OH) 6-	9.838e-12	8.765e-12	-11.007	-11.057	-0.050	(0)
SbO2+	1.051e-23	9.195e-24	-22.978	-23.036	-0.058	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.090	-40.148	-0.058	(0)
H2Se	0.000e+00	0.000e+00	-43.442	-43.442	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.482	-43.482	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.731	-47.963	-0.232	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-86.190	-87.119	-0.929	(0)
Se(4)	5.277e-09					
HSeO3-	4.837e-09	4.232e-09	-8.315	-8.373	-0.058	(0)
SeO3-2	4.399e-10	2.577e-10	-9.357	-9.589	-0.232	(0)
H2SeO3	1.180e-13	1.180e-13	-12.928	-12.928	0.000	(0)
AgSeO3-	2.563e-15	2.242e-15	-14.591	-14.649	-0.058	(0)
Cd(SeO3) 2-2	3.834e-22	2.246e-22	-21.416	-21.649	-0.232	(0)
Ag(SeO3) 2-3	1.723e-23	5.172e-24	-22.764	-23.286	-0.523	(0)
FeHSeO3+2	8.287e-24	4.854e-24	-23.082	-23.314	-0.232	(0)
Se(6)	1.774e-12					
SeO4-2	1.772e-12	1.116e-12	-11.752	-11.952	-0.201	(0)
MnSeO4	2.205e-15	2.205e-15	-14.657	-14.657	0.000	(0)
ZnSeO4	4.801e-17	4.801e-17	-16.319	-16.319	0.000	(0)
NiSeO4	4.344e-17	4.344e-17	-16.362	-16.362	0.000	(0)
CoSeO4	3.227e-17	3.227e-17	-16.491	-16.491	0.000	(0)
HSeO4-	4.181e-18	3.658e-18	-17.379	-17.437	-0.058	(0)
CdSeO4	8.531e-19	8.531e-19	-18.069	-18.069	0.000	(0)
Zn(SeO4) 2-2	9.278e-29	5.434e-29	-28.033	-28.265	-0.232	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.636	-59.158	-0.523	(0)
U(4)	1.221e-22					
U(OH) 5-	1.218e-22	1.066e-22	-21.914	-21.972	-0.058	(0)
U(OH) 4	2.919e-25	2.919e-25	-24.535	-24.535	0.000	(0)
U(OH) 3+	7.977e-29	6.979e-29	-28.098	-28.156	-0.058	(0)
U(OH) 2+2	3.603e-33	2.110e-33	-32.443	-32.676	-0.232	(0)
UF3+	2.456e-35	2.149e-35	-34.610	-34.668	-0.058	(0)
UF2+2	1.569e-36	9.189e-37	-35.804	-36.037	-0.232	(0)
UF4	3.477e-37	3.477e-37	-36.459	-36.459	0.000	(0)
UOH+3	2.165e-38	6.499e-39	-37.664	-38.187	-0.523	(0)
UF5-	2.324e-39	2.033e-39	-38.634	-38.692	-0.058	(0)
UF+3	1.648e-39	4.947e-40	-38.783	-39.306	-0.523	(0)
UF6-2	1.546e-40	0.000e+00	-39.811	-40.043	-0.232	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.524	-40.524	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.067	-41.299	-0.232	(0)
U+4	0.000e+00	0.000e+00	-43.845	-44.775	-0.929	(0)
UCl+3	0.000e+00	0.000e+00	-45.441	-45.963	-0.523	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-173.332	-178.036	-4.704	(0)
U(5)	1.508e-17					

UO2+	1.508e-17	1.319e-17	-16.822	-16.880	-0.058	(0)
U (6)	2.446e-08					
UO2 (CO3) 2-2	1.317e-08	7.713e-09	-7.880	-8.113	-0.232	(0)
UO2 (CO3) 3-4	1.118e-08	1.316e-09	-7.952	-8.881	-0.929	(0)
UO2CO3	1.136e-10	1.136e-10	-9.945	-9.945	0.000	(0)
UO2F+	1.951e-13	1.706e-13	-12.710	-12.768	-0.058	(0)
UO2OH+	1.856e-13	1.624e-13	-12.731	-12.789	-0.058	(0)
UO2F2	7.261e-14	7.261e-14	-13.139	-13.139	0.000	(0)
UO2+2	1.330e-14	8.378e-15	-13.876	-14.077	-0.201	(0)
UO2SO4	9.515e-15	9.515e-15	-14.022	-14.022	0.000	(0)
UO2F3-	3.076e-15	2.691e-15	-14.512	-14.570	-0.058	(0)
UO2 (SO4) 2-2	1.607e-16	9.411e-17	-15.794	-16.026	-0.232	(0)
UO2Cl+	2.007e-17	1.756e-17	-16.697	-16.755	-0.058	(0)
UO2F4-2	5.385e-18	3.154e-18	-17.269	-17.501	-0.232	(0)
(UO2) 2 (OH) 2+2	7.473e-20	4.377e-20	-19.126	-19.359	-0.232	(0)
(UO2) 3 (OH) 5+	1.462e-22	1.279e-22	-21.835	-21.893	-0.058	(0)
UO2NO3+	4.260e-26	3.727e-26	-25.371	-25.429	-0.058	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.872	-42.930	-0.058	(0)
V+2	0.000e+00	0.000e+00	-43.395	-43.627	-0.232	(0)
V (3)	5.491e-16					
V (OH) 3	5.491e-16	5.491e-16	-15.260	-15.260	0.000	(0)
V (OH) 2+	2.652e-26	2.320e-26	-25.576	-25.634	-0.058	(0)
VOH+2	2.457e-29	1.439e-29	-28.610	-28.842	-0.232	(0)
V+3	6.213e-34	1.865e-34	-33.207	-33.729	-0.523	(0)
VSO4+	7.550e-35	6.605e-35	-34.122	-34.180	-0.058	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.502	-56.025	-0.523	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.955	-56.884	-0.929	(0)
V (4)	1.295e-18					
V (OH) 3+	1.194e-18	1.044e-18	-17.923	-17.981	-0.058	(0)
VO+2	5.805e-20	3.400e-20	-19.236	-19.469	-0.232	(0)
VOF+	3.439e-20	3.009e-20	-19.464	-19.522	-0.058	(0)
VOSO4	7.026e-21	7.026e-21	-20.153	-20.153	0.000	(0)
VOF2	1.665e-21	1.665e-21	-20.779	-20.779	0.000	(0)
VOC1+	1.409e-22	1.233e-22	-21.851	-21.909	-0.058	(0)
VOF3-	9.962e-24	8.715e-24	-23.002	-23.060	-0.058	(0)
VOF4-2	8.862e-27	5.191e-27	-26.052	-26.285	-0.232	(0)
H2V2O4+2	9.336e-32	5.469e-32	-31.030	-31.262	-0.232	(0)
V (5)	5.455e-10					
H2VO4-	5.156e-10	4.511e-10	-9.288	-9.346	-0.058	(0)
HVO4-2	2.959e-11	1.733e-11	-10.529	-10.761	-0.232	(0)
H3VO4	2.949e-13	2.949e-13	-12.530	-12.530	0.000	(0)
H3V2O7-	9.821e-16	8.592e-16	-15.008	-15.066	-0.058	(0)
VO2+	4.320e-17	3.849e-17	-16.364	-16.415	-0.050	(0)
VO2F	9.961e-18	9.961e-18	-17.002	-17.002	0.000	(0)
HV2O7-3	8.829e-18	2.650e-18	-17.054	-17.577	-0.523	(0)
VO4-3	4.427e-18	1.329e-18	-17.354	-17.877	-0.523	(0)
VO2SO4-	7.883e-19	6.896e-19	-18.103	-18.161	-0.058	(0)
VO2F2-	6.100e-19	5.336e-19	-18.215	-18.273	-0.058	(0)
V2O7-4	9.268e-21	1.091e-21	-20.033	-20.962	-0.929	(0)
VO2F3-2	1.677e-21	9.821e-22	-20.776	-21.008	-0.232	(0)
V3O9-3	3.205e-22	9.620e-23	-21.494	-22.017	-0.523	(0)
VO2F4-3	2.376e-25	7.130e-26	-24.624	-25.147	-0.523	(0)
V4O12-4	1.537e-28	1.809e-29	-27.813	-28.742	-0.929	(0)
VO2NO3	4.341e-29	4.341e-29	-28.362	-28.362	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-70.835	-72.286	-1.452	(0)
V10O28-6	0.000e+00	0.000e+00	-71.198	-73.288	-2.091	(0)
H2V10O28-4	0.000e+00	0.000e+00	-73.334	-74.263	-0.929	(0)
Zn	5.960e-07					
Zn+2	4.407e-07	2.777e-07	-6.356	-6.556	-0.201	(0)
ZnCO3	5.440e-08	5.440e-08	-7.264	-7.264	0.000	(0)
ZnHCO3+	4.765e-08	4.169e-08	-7.322	-7.380	-0.058	(0)
ZnSO4	4.559e-08	4.559e-08	-7.341	-7.341	0.000	(0)
ZnOH+	4.888e-09	4.276e-09	-8.311	-8.369	-0.058	(0)
ZnCl+	1.013e-09	9.015e-10	-8.995	-9.045	-0.051	(0)
ZnF+	9.345e-10	8.175e-10	-9.029	-9.087	-0.058	(0)
Zn (SO4) 2-2	5.086e-10	2.979e-10	-9.294	-9.526	-0.232	(0)
ZnOHCl	1.817e-10	1.817e-10	-9.741	-9.741	0.000	(0)

Zn(OH) 2	1.043e-10	1.043e-10	-9.982	-9.982	0.000	(0)
ZnCl2	1.846e-12	1.846e-12	-11.734	-11.734	0.000	(0)
Zn(OH) 3-	9.205e-14	8.053e-14	-13.036	-13.094	-0.058	(0)
ZnCl3-	2.129e-15	1.896e-15	-14.672	-14.722	-0.051	(0)
ZnSeO4	4.801e-17	4.801e-17	-16.319	-16.319	0.000	(0)
ZnCl4-2	1.922e-18	1.225e-18	-17.716	-17.912	-0.196	(0)
ZnNO3+	1.778e-18	1.555e-18	-17.750	-17.808	-0.058	(0)
Zn(OH) 4-2	8.428e-19	4.936e-19	-18.074	-18.307	-0.232	(0)
Zn(SeO4) 2-2	9.278e-29	5.434e-29	-28.033	-28.265	-0.232	(0)
Zn(NO3) 2	6.918e-31	6.918e-31	-30.160	-30.160	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.160	-150.218	-0.058	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.393	-151.393	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.883	-226.941	-0.058	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.504	-229.736	-0.232	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.997	-307.229	-0.232	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3) 2	-76.22	-69.93	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2	-56.92	-52.41	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-64.14	-52.41	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3	-98.57	-80.64	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3	-74.38	-54.35	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-34.52	-34.11	0.40	(NH4)2CrO4	
(NH4)2SeO4	-30.65	-30.20	0.45	(NH4)2SeO4	
Acanthite	-51.16	-87.38	-36.22	Ag2S	
Ag2CO3	-10.11	-21.20	-11.09	Ag2CO3	
Ag2CrO4	-20.02	-31.61	-11.59	Ag2CrO4	
Ag2HVO4	-12.08	-10.60	1.48	Ag2HVO4	
Ag2MoO4	-11.07	-22.62	-11.55	Ag2MoO4	
Ag2O	-13.94	-1.37	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-14.04	-18.86	-4.82	Ag2SO4	
Ag3AsO3	-26.66	-24.51	2.16	Ag3AsO3	
Ag3AsO4	-15.07	-17.86	-2.79	Ag3AsO4	
Ag3H2VO5	-16.46	-11.28	5.18	Ag3H2VO5	
AgF:4H2O	-12.75	-11.70	1.05	AgF:4H2O	
Agmetal	0.05	-13.46	-13.51	Ag	
AgVO3	-10.68	-9.91	0.77	AgVO3	
Al(OH) 3(am)	-1.18	9.62	10.80	Al(OH) 3	
Al2(MoO4) 3	-46.88	-44.51	2.37	Al2(MoO4) 3	
Al2O3	-0.41	19.24	19.65	Al2O3	
Al4(OH)10SO4	-1.72	20.98	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-10.99	-6.19	4.80	AlAsO4:2H2O	
AlOHSO4	-4.64	-7.87	-3.23	AlOHSO4	
AlSb	-152.11	-86.49	65.62	AlSb	
Alunite	-1.27	-2.67	-1.40	KAl3(SO4) 2 (OH) 6	
Anglesite	-4.93	-12.72	-7.79	PbSO4	
Anhydrite	-1.78	-6.14	-4.36	CaSO4	
Anilite	-56.85	-88.73	-31.88	Cu0.25Cu1.5S	
Antlerite	-5.01	3.78	8.79	Cu3(OH) 4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-87.06	-89.82	-2.76	As4O6	
Artinite	-7.22	2.38	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5	-38.32	-31.62	6.71	As2O5	
Atacamite	-3.28	4.11	7.39	Cu2(OH) 3Cl	
Azurite	-1.50	-18.40	-16.91	Cu3(OH) 2 (CO3) 2	
Ba(OH) 2:8H2O	-16.88	7.51	24.39	Ba(OH) 2:8H2O	
Ba2V2O7:2H2O	-19.30	-3.43	15.87	Ba2V2O7:2H2O	
Ba3(AsO4) 2	-0.17	-9.08	-8.91	Ba3(AsO4) 2	
Ba3(VO4) 2:4H2O	-28.86	4.08	32.94	Ba3(VO4) 2:4H2O	
BaCrO4	-13.05	-22.72	-9.67	BaCrO4	
BaF2	-8.70	-14.52	-5.82	BaF2	
BaMoO4	-6.78	-13.74	-6.96	BaMoO4	

Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.87	-8.04	1.83	BaSeO ₃
BaSeO ₄	-11.35	-18.81	-7.46	BaSeO ₄
Bianchite	-7.92	-9.68	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-8.66	9.43	18.09	MnO ₂
Bixbyite	-6.04	-6.69	-0.64	Mn ₂ O ₃
BlaubleiI	-56.07	-80.23	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-56.87	-84.15	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.04	9.62	8.58	AlOOH
Breithauptite	-57.53	-76.05	-18.52	NiSb
Brochantite	-4.36	10.86	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.73	11.11	16.84	Mg(OH) ₂
Bunsenite	-5.16	7.29	12.45	NiO
Ca(VO ₃) ₂	-12.76	-7.10	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-13.25	4.25	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.30	4.25	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-19.85	2.45	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-23.35	15.61	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-24.25	15.61	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-301.12	-158.15	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-10.34	-28.25	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.94	-9.89	-7.95	CaMoO ₄
Carnotite	-5.71	-5.48	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.02	-4.20	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.94	-14.96	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.62	-3.78	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.66	5.98	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.75	5.98	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.75	-17.04	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.11	0.45	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.97	6.43	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.51	-14.16	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.47	-14.16	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.25	-14.16	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.84	-16.05	-1.21	CdF ₂
Cdmetal(alpha)	-33.08	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO ₄	-1.12	-15.27	-14.15	CdMoO ₄
CdOHCl	-7.63	-4.09	3.54	CdOHCl
CdSb	-77.01	-77.36	-0.35	CdSb
CdSe	-21.15	-41.35	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.49	-20.34	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-11.34	-11.51	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.79	-11.51	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.64	-11.51	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.01	-10.76	-9.75	AgCl
Cerrusite	-1.93	-15.06	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-7.76	-10.40	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-57.08	-92.00	-34.92	Cu ₂ S
Chalcopyrite	-126.21	-161.48	-35.27	CuFeS ₂
Cinnabar	-53.19	-98.89	-45.69	HgS
Claudetite	-86.76	-89.82	-3.06	As ₄ O ₆
Clausthalite	-15.46	-42.56	-27.10	PbSe
Co(BO ₂) ₂	-29.70	-2.63	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.96	7.13	13.09	Co(OH) ₂
Co(OH) ₃	-10.19	-12.50	-2.31	Co(OH) ₃
CO ₂ (g)	-1.69	-19.84	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-23.26	-10.23	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.37	-17.87	-10.50	Co ₃ O ₄
CoCl ₂	-21.28	-13.02	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.55	-13.02	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.73	-12.71	-9.98	CoCO ₃
CoF ₂	-13.30	-14.90	-1.60	CoF ₂
CoF ₃	-44.09	-45.54	-1.46	CoF ₃

CoFe2O4	17.04	13.51	-3.53	CoFe2O4
CoMoO4	-6.36	-14.12	-7.76	CoMoO4
CoO	-6.46	7.13	13.59	CoO
CoS (alpha)	-71.44	-78.88	-7.44	CoS
CoS (beta)	-67.81	-78.88	-11.07	CoS
CoSe	-24.00	-40.20	-16.20	CoSe
CoSeO3	-9.75	-8.43	1.32	CoSeO3
CoSeO4:6H2O	-17.66	-19.19	-1.53	CoSeO4:6H2O
CoSO4	-13.17	-10.36	2.80	CoSO4
CoSO4:6H2O	-7.89	-10.36	-2.47	CoSO4:6H2O
Cotunnite	-10.59	-15.37	-4.78	PbCl2
Covellite	-56.62	-78.92	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.24	-31.15	14.09	CrCl2
CrCl3	-46.51	-31.40	15.11	CrCl3
CrF3	-22.89	-34.23	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.39	-42.23	-33.84	Na3AlF6
Cu (OH) 2	-1.58	7.09	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.98	19.23	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-13.91	-4.66	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.13	-92.01	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-7.52	-53.32	-45.80	Cu2Se
Cu2SO4	-21.53	-23.48	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-16.45	-10.35	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.49	-105.09	-42.59	Cu3Sb
Cu3Se2	-30.07	-93.56	-63.49	Cu3Se2
CuCO3	-1.25	-12.75	-11.50	CuCO3
CuCrO4	-17.71	-23.15	-5.44	CuCrO4
CuF	-9.10	-14.01	-4.91	CuF
CuF2	-16.06	-14.94	1.12	CuF2
CuF2:2H2O	-10.39	-14.94	-4.55	CuF2:2H2O
Cumetal	-7.01	-15.76	-8.76	Cu
CuMoO4	-1.09	-14.16	-13.08	CuMoO4
CuOCuSO4	-13.62	-3.31	10.30	CuOCuSO4
Cupricferrite	7.48	13.47	5.99	CuFe2O4
Cuprite	-4.58	-5.99	-1.41	Cu2O
Cuprousferrite	9.12	0.20	-8.92	CuFeO2
CuSe	-7.14	-40.24	-33.10	CuSe
CuSe2	-28.66	-62.03	-33.37	CuSe2
CuSeO3:2H2O	-8.98	-8.47	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.79	-19.23	-2.44	CuSeO4:5H2O
CuSO4	-13.34	-10.40	2.94	CuSO4
Diaspore	2.75	9.62	6.87	AlOOH
Djurleite	-57.21	-91.13	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.67	-17.21	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.12	-17.21	-17.09	CaMg (CO3) 2
Epsomite	-4.26	-6.38	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.21	0.17	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-11.29	-15.01	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.73	-9.18	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.67	-40.29	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-42.36	-46.10	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.02	-12.62	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.71	-17.80	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-47.07	-65.67	-18.60	FeSe2
FeS (ppt)	-79.61	-82.56	-2.95	FeS
FeSe	-32.88	-43.88	-11.00	FeSe
Fix_pe	-5.59	-5.59	0.00	e-
Fluorite	-0.17	-10.67	-10.50	CaF2

Galena	-67.27	-81.24	-13.97	PbS
Gibbsite	1.33	9.62	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.67	-9.68	-2.01	ZnSO4:7H2O
Greenockite	-65.67	-80.03	-14.36	CdS
Greigite	-289.18	-334.22	-45.03	Fe3S4
Gummite	-7.38	0.29	7.67	UO3
Gypsum	-1.53	-6.14	-4.61	CaSO4:2H2O
H-Jarosite	-13.31	-25.41	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.37	-21.25	-12.88	H2MoO4
H2S (g)	-78.00	-86.01	-8.01	H2S
H2Se (g)	-42.37	-47.33	-4.96	H2Se
Halite	-6.93	-5.32	1.60	NaCl
Hausmannite	-7.78	53.25	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.20	22.69	22.89	FeAl2O4
Hg (CH3) 2 (g)	-183.20	-256.91	-73.71	Hg (CH3) 2
Hg (g)	-8.95	-16.83	-7.87	Hg
Hg (OH) 2	-9.38	-12.87	-3.50	Hg (OH) 2
Hg2 (g)	-18.70	-33.65	-14.96	Hg2
Hg2 (OH) 2	-13.37	-8.11	5.26	Hg2 (OH) 2
Hg2CO3	-11.89	-27.94	-16.05	Hg2CO3
Hg2CrO4	-29.65	-38.35	-8.70	Hg2CrO4
Hg2F2	-19.78	-30.14	-10.36	Hg2F2
Hg2S	-82.44	-94.12	-11.68	Hg2S
Hg2SeO3	-19.01	-23.67	-4.66	Hg2SeO3
Hg2SO4	-19.47	-25.60	-6.13	Hg2SO4
Hg3O2CO3	-28.78	-58.46	-29.68	Hg3O2CO3
HgCl (g)	-33.62	-14.13	19.50	HgCl
HgCl2	-11.76	-33.02	-21.26	HgCl2
HgF (g)	-47.75	-15.07	32.68	HgF
HgF2 (g)	-47.47	-34.91	12.57	HgF2
Hgmetal (l)	-3.37	-16.83	-13.45	Hg
HgSe	-4.51	-60.21	-55.69	HgSe
HgSeO3	-16.00	-28.43	-12.43	HgSeO3
HgSO4	-20.95	-30.37	-9.42	HgSO4
Huntite	-4.69	-34.66	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.58	-25.35	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.03	-23.79	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.74	-21.91	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-7.16	-21.96	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.32	-53.56	-17.24	K2Cr2O7
K2CrO4	-22.81	-23.33	-0.51	K2CrO4
K2MoO4	-17.60	-14.34	3.26	K2MoO4
K2SeO4	-18.68	-19.41	-0.73	K2SeO4
Langite	-6.62	10.86	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.51	-7.94	-0.43	PbO:PbSO4
Laurionite	-5.92	-5.30	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.92	4.77	12.69	PbO
Mackinawite	-78.96	-82.56	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.63	17.49	16.86	Fe2MgO4
Magnesite	-1.27	-8.73	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-0.35	-5.66	-5.31	Cu2 (OH) 2CO3
Manganite	-3.33	22.01	25.34	MnOOH
Massicot	-8.12	4.77	12.89	PbO
Matlockite	-7.34	-16.31	-8.97	PbClF
Melanothallite	-19.31	-13.06	6.26	CuCl2
Melanterite	-11.83	-14.04	-2.21	FeSO4:7H2O
Metacinnabar	-53.79	-98.89	-45.09	HgS
Mg (OH) 2 (active)	-7.68	11.11	18.79	Mg (OH) 2
Mg (VO3) 2	-18.63	-7.35	11.28	Mg (VO3) 2
Mg2Sb3	-276.93	-202.25	74.68	Mg2Sb3
Mg2V2O7	-22.60	3.76	26.36	Mg2V2O7
MgCr2O4	-7.45	8.75	16.20	MgCr2O4

MgCrO4	-24.51	-19.13	5.38	MgCrO4
MgF2	-2.79	-10.92	-8.13	MgF2
MgMoO4	-8.29	-10.14	-1.85	MgMoO4
MgSeO3:6H2O	-7.50	-4.45	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-14.01	-15.21	-1.20	MgSeO4:6H2O
Minium	-33.65	39.87	73.52	Pb3O4
Mirabilite	-6.88	-8.00	-1.11	Na2SO4:10H2O
Mn(VO3)2	-14.13	-9.23	4.90	Mn(VO3)2
Mn2(SO4)3	-53.46	-59.17	-5.71	Mn2(SO4)3
Mn2Sb	-151.49	-90.41	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-16.41	-3.91	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.63	-10.91	2.72	MnCl2:4H2O
MnS(grn)	-76.95	-76.78	0.17	MnS
MnS(pnk)	-80.12	-76.78	3.34	MnS
MnSb	-96.54	-99.45	-2.91	MnSb
MnSe	-41.60	-38.10	3.50	MnSe
MnSeO3	-7.45	-6.32	1.13	MnSeO3
MnSeO3:2H2O	-7.31	-6.32	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.04	-17.09	-2.05	MnSeO4:5H2O
MnSO4	-10.84	-8.26	2.58	MnSO4
Monteponite	-9.12	5.98	15.10	CdO
Montroydite	-9.23	-12.87	-3.64	HgO
MoO3	-13.25	-21.25	-8.00	MoO3
Morenosite	-8.06	-10.21	-2.14	NiSO4:7H2O
MoS2	-148.56	-218.82	-70.26	MoS2
Na-Jarosite	-9.47	-20.67	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.08	-50.98	-9.90	Na2Cr2O7
Na2CrO4	-23.67	-20.74	2.93	Na2CrO4
Na2Mo2O7	-16.41	-33.00	-16.60	Na2Mo2O7
Na2MoO4	-13.24	-11.75	1.49	Na2MoO4
Na2MoO4:2H2O	-12.98	-11.75	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.36	-6.06	10.30	Na2SeO3:5H2O
Na2SeO4	-18.10	-16.82	1.28	Na2SeO4
Na3Sb	-176.31	-81.86	94.45	Na3Sb
Na3VO4	-31.66	5.02	36.68	Na3VO4
Na4V2O7	-36.86	0.54	37.40	Na4V2O7
Nantokite	-6.34	-13.07	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-9.03	-10.34	-1.31	Na2CO3:10H2O
NaVO3	-8.34	-4.48	3.86	NaVO3
Nesquehonite	-4.06	-8.73	-4.67	MgCO3:3H2O
Ni(OH)2	-5.50	7.29	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.45	-9.75	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.34	11.66	32.00	Ni4(OH)6SO4
NiCO3	-5.68	-12.55	-6.87	NiCO3
NiMoO4	-2.82	-13.96	-11.14	NiMoO4
NiS(alpha)	-73.12	-78.72	-5.60	NiS
NiS(beta)	-67.62	-78.72	-11.10	NiS
NiS(gamma)	-65.92	-78.72	-12.80	NiS
NiSe	-22.34	-40.04	-17.70	NiSe
NiSeO3:2H2O	-11.08	-8.27	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.51	-19.03	-1.52	NiSeO4:6H2O
Nsutite	-8.07	9.43	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-241.88	-302.95	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-11.50	-4.98	6.52	Pb(BO2)2
Pb(OH)2	-3.38	4.77	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.51	-71.27	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.32	-0.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-16.64	9.55	26.19	Pb2O(OH)2
Pb2O3	-25.95	35.09	61.04	Pb2O3
Pb2OCO3	-9.73	-10.29	-0.56	Pb2OCO3
Pb2V2O7	-7.01	-8.91	-1.90	Pb2V2O7
Pb3(AsO4)2	-23.09	-17.29	5.80	Pb3(AsO4)2
Pb3(VO4)2	-10.28	-4.14	6.14	Pb3(VO4)2
Pb3O2CO3	-16.53	-5.51	11.02	Pb3O2CO3
Pb3O2SO4	-13.86	-3.17	10.69	Pb3O2SO4

Pb4(OH)6SO4	-19.50	1.60	21.10	Pb4(OH)6SO4
Pb4O3SO4	-20.27	1.61	21.88	Pb4O3SO4
PbCrO4	-12.86	-25.46	-12.60	PbCrO4
PbF2	-9.82	-17.26	-7.44	PbF2
Pbmetal	-25.02	-20.77	4.25	Pb
PbMoO4	-0.86	-16.48	-15.62	PbMoO4
PbO:0.3H2O	-8.21	4.77	12.98	PbO:0.33H2O
PbSeO4	-14.71	-21.55	-6.84	PbSeO4
Periclase	-10.47	11.11	21.58	MgO
Phosgenite	-10.62	-30.43	-19.81	PbCl2:PbCO3
Plattnerite	-19.28	30.32	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.52	-143.03	-18.51	FeS2
Pyrochroite	-5.96	9.23	15.19	Mn(OH)2
Pyrolusite	-6.60	34.78	41.38	MnO2
Realgar	-101.49	-121.24	-19.75	AsS
Retgersite	-8.17	-10.21	-2.04	NiSO4:6H2O
Rhodochrosite	-0.02	-10.60	-10.58	MnCO3
Rutherfordine	-5.04	-19.54	-14.50	UO2CO3
Sb(OH)3	-12.37	-19.48	-7.11	Sb(OH)3
Sb2O4	-16.81	-13.41	3.40	Sb2O4
Sb2O5	-26.82	-36.48	-9.67	Sb2O5
Sb2Se3	-113.19	-180.95	-67.76	Sb2Se3
Sb4O6(cubic)	-59.64	-77.90	-18.26	Sb4O6
Sb4O6(orth)	-60.00	-77.90	-17.90	Sb4O6
SbCl3	-50.27	-49.70	0.57	SbCl3
SbF3	-42.30	-52.52	-10.23	SbF3
Sbmetal	-46.10	-57.79	-11.69	Sb
SbO2	-3.19	-31.01	-27.82	SbO2
Schoepite	-5.70	0.29	5.99	UO2(OH)2:H2O
Semetal(am)	-14.68	-21.79	-7.11	Se
Semetal(hex)	-14.08	-21.79	-7.71	Se
Senarmontite	-26.59	-38.95	-12.37	Sb2O3
SeO2	-15.68	-15.56	0.12	SeO2
SeO3	-47.37	-26.32	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-2.02	-12.02	-10.00	ZnCO3
Sphalerite	-66.75	-78.20	-11.45	ZnS
Spinel	-6.50	30.35	36.85	MgAl2O4
Stibnite	-246.53	-296.99	-50.46	Sb2S3
Sulfur	-58.32	-60.47	-2.14	S
Tenorite	-0.55	7.09	7.64	CuO
Thenardite	-8.32	-8.00	0.32	Na2SO4
Thermonatrite	-10.98	-10.34	0.64	Na2CO3:H2O
Tyuyamunite	-10.60	-6.52	4.08	Ca(UO2)2(VO4)2
U3O8	-18.10	2.98	21.08	U3O8
U3Sb4	-584.93	-432.55	152.38	U3Sb4
U4O9	-35.58	-38.60	-3.02	U4O9
UF4	-30.56	-60.10	-29.54	UF4
UF4:2.5H2O	-27.38	-60.10	-32.72	UF4:2.5H2O
UO2(am)	-16.97	-16.04	0.93	UO2
UO2(NO3)2	-49.53	-37.38	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-42.23	-37.38	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.77	-37.38	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-39.43	-37.38	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-5.32	0.29	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.78	-26.03	-2.25	UO2SeO4:4H2O
UO3	-7.41	0.29	7.70	UO3
Uraninite	-11.37	-16.04	-4.67	UO2
USb2	-221.51	-191.93	29.58	USb2
V(OH)3	-19.77	-12.18	7.59	V(OH)3
V2O5	-17.10	-18.46	-1.36	V2O5
V3O5	-42.68	-40.84	1.84	V3O5
V4O7	-53.13	-45.94	7.19	V4O7
V6O13	-45.61	-106.47	-60.86	V6O13
Valentinite	-30.47	-38.95	-8.48	Sb2O3
VC12	-63.97	-45.09	18.87	VC12
VC13	-65.83	-42.40	23.43	VC13

VF4	-64.09	-49.16	14.93	VF4
Vmetal	-94.52	-50.49	44.03	V
VO	-39.70	-24.95	14.76	VO
VO(OH)2	-10.25	-5.10	5.15	VO(OH)2
VO2Cl	-22.14	-19.30	2.84	VO2Cl
VOC1	-33.40	-22.25	11.15	VOC1
VOC12	-38.01	-25.25	12.76	VOC12
VOSO4	-26.20	-22.59	3.61	VOSO4
Witherite	-3.75	-12.32	-8.57	BaCO3
Wurtzite	-69.25	-78.20	-8.95	ZnS
Zincite	-3.52	7.81	11.33	ZnO
Zincosite	-13.61	-9.68	3.93	ZnSO4
Zn(BO2)2	-10.24	-1.95	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.18	-29.86	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.39	7.81	12.20	Zn(OH)2
Zn(OH)2(am)	-4.66	7.81	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.94	7.81	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.72	7.81	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.92	7.81	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.37	-1.87	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.64	5.55	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-21.83	-8.18	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.46	-11.55	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-14.64	13.76	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.58	18.92	38.50	Zn5(OH)8Cl2
ZnCl2	-19.38	-12.33	7.05	ZnCl2
ZnCO3:1H2O	-1.76	-12.02	-10.26	ZnCO3:1H2O
ZnF2	-13.68	-14.22	-0.53	ZnF2
Znmetal	-43.52	-17.73	25.79	Zn
ZnMoO4	-3.31	-13.44	-10.13	ZnMoO4
ZnO(active)	-3.38	7.81	11.19	ZnO
ZnS(am)	-69.15	-78.20	-9.05	ZnS
ZnSb	-86.54	-75.53	11.01	ZnSb
ZnSe	-25.12	-39.52	-14.40	ZnSe
ZnSeO4:6H2O	-16.99	-18.51	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.04	-9.68	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 40.

```

Title Stage 2 Run-off mix
Mix 202
1      1
3      0.047503
4      0.158595
5      0.146804
6      0.020240
7      0.101567
8      0.000877
9      1.959266
10     3.852568
11     8.773920
12     31.924299
13     28.463210
14     8.075423
15     3.834866
Save solution 205
end

```

TITLE

Stage 2 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 202.

Mixture 202.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
4.750e-02 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
1.586e-01 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
1.468e-01 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
2.024e-02 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
1.016e-01 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
8.770e-04 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
1.959e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
3.853e+00 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
8.774e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
3.192e+01 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
2.846e+01 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
8.075e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
3.835e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	1.074e-06	9.486e-05
As	6.284e-10	5.552e-08
B	4.434e-07	3.918e-05
Ba	1.307e-07	1.155e-05
C	7.271e-04	6.424e-02
Ca	3.350e-04	2.960e-02
Cd	1.124e-09	9.935e-08
Cl	3.901e-05	3.447e-03
Co	4.503e-10	3.979e-08
Cr	1.783e-10	1.576e-08
Cu	2.536e-06	2.241e-04
F	3.501e-05	3.094e-03
Fe	2.526e-07	2.232e-05
Hg	4.027e-11	3.558e-09
K	6.969e-05	6.158e-03
Mg	8.906e-05	7.869e-03
Mn	1.085e-06	9.588e-05
Mo	4.191e-08	3.703e-06
N	2.555e-07	2.258e-05
Na	1.231e-04	1.088e-02

Ni	6.717e-11	5.935e-09
Pb	3.158e-09	2.790e-07
S	2.725e-04	2.408e-02
Sb	4.699e-10	4.152e-08
Se	3.523e-09	3.113e-07
U	1.181e-08	1.044e-06
V	1.024e-08	9.050e-07
Zn	1.142e-07	1.009e-05

-----Description of solution-----

	pH	=	6.493	Charge balance
	pe	=	6.445	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.679e-03	
	Mass of water (kg)	=	8.836e+01	
	Total alkalinity (eq/kg)	=	4.331e-04	
	Total CO2 (mol/kg)	=	7.271e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	13	
	Total H	=	9.809163e+03	
	Total O	=	4.904825e+03	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.362e-07	3.212e-07	-6.473	-6.493	-0.020	0.00
OH-	3.282e-08	3.135e-08	-7.484	-7.504	-0.020	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.074e-06					
AlF2+	4.698e-07	4.492e-07	-6.328	-6.348	-0.019	(0)
Al(OH)4-	2.275e-07	2.174e-07	-6.643	-6.663	-0.020	(0)
AlF3	1.788e-07	1.788e-07	-6.748	-6.748	0.000	(0)
Al(OH)2+	9.211e-08	8.807e-08	-7.036	-7.055	-0.019	(0)
Al(OH)3	5.509e-08	5.509e-08	-7.259	-7.259	0.000	(0)
AlF+2	4.269e-08	3.568e-08	-7.370	-7.448	-0.078	(0)
AlOH+2	4.232e-09	3.537e-09	-8.373	-8.451	-0.078	(0)
AlF4-	2.966e-09	2.835e-09	-8.528	-8.548	-0.020	(0)
AlSO4+	1.957e-10	1.870e-10	-9.708	-9.728	-0.020	(0)
Al+3	1.701e-10	1.128e-10	-9.769	-9.948	-0.178	(0)
Al(SO4)2-	4.478e-13	4.280e-13	-12.349	-12.369	-0.020	(0)
AlMo6O21-3	3.293e-39	2.135e-39	-38.482	-38.671	-0.188	(0)
As (3)	2.520e-21					
H3AsO3	2.516e-21	2.516e-21	-20.599	-20.599	0.000	(0)
H2AsO3-	4.215e-24	4.017e-24	-23.375	-23.396	-0.021	(0)
H4AsO3+	4.201e-28	4.004e-28	-27.377	-27.398	-0.021	(0)
HAsO3-2	1.383e-29	1.141e-29	-28.859	-28.943	-0.084	(0)
AsO3-3	2.111e-36	1.369e-36	-35.676	-35.864	-0.188	(0)
As (5)	6.284e-10					
H2AsO4-	4.506e-10	4.295e-10	-9.346	-9.367	-0.021	(0)
HAsO4-2	1.777e-10	1.466e-10	-9.750	-9.834	-0.084	(0)
H3AsO4	2.396e-14	2.397e-14	-13.620	-13.620	0.000	(0)
AsO4-3	2.226e-15	1.443e-15	-14.653	-14.841	-0.188	(0)
B	4.434e-07					
H3BO3	4.425e-07	4.427e-07	-6.354	-6.354	0.000	(0)
H2BO3-	8.386e-10	8.004e-10	-9.076	-9.097	-0.020	(0)
CaH2BO3+	1.286e-11	1.227e-11	-10.891	-10.911	-0.020	(0)
BF(OH)3-	5.852e-12	5.586e-12	-11.233	-11.253	-0.020	(0)
MgH2BO3+	2.076e-12	1.982e-12	-11.683	-11.703	-0.020	(0)
NaH2BO3	1.490e-13	1.490e-13	-12.827	-12.827	0.000	(0)
BF2(OH)2-	6.356e-15	6.066e-15	-14.197	-14.217	-0.020	(0)
BaH2BO3+	2.812e-15	2.684e-15	-14.551	-14.571	-0.020	(0)

	H5 (BO3) 2-	3.160e-16	3.016e-16	-15.500	-15.521	-0.020	(0)
	BF3OH-	2.512e-20	2.397e-20	-19.600	-19.620	-0.020	(0)
	H8 (BO3) 3-	1.399e-20	1.335e-20	-19.854	-19.874	-0.020	(0)
	BF4-	1.255e-24	1.198e-24	-23.901	-23.921	-0.020	(0)
Ba	1.307e-07						
	Ba+2	1.302e-07	1.085e-07	-6.885	-6.965	-0.079	(0)
	BaHCO3+	4.435e-10	4.242e-10	-9.353	-9.372	-0.019	(0)
	BaCO3	3.325e-12	3.325e-12	-11.478	-11.478	0.000	(0)
	BaOH+	1.553e-14	1.485e-14	-13.809	-13.828	-0.020	(0)
	BaH2BO3+	2.812e-15	2.684e-15	-14.551	-14.571	-0.020	(0)
	BaNO3+	1.585e-16	1.511e-16	-15.800	-15.821	-0.021	(0)
	BaNH3+2	1.565e-17	1.291e-17	-16.806	-16.889	-0.084	(0)
C (4)	7.271e-04						
	HCO3-	4.282e-04	4.094e-04	-3.368	-3.388	-0.019	(0)
	H2CO3	2.957e-04	2.957e-04	-3.529	-3.529	0.000	(0)
	CaHCO3+	2.123e-06	2.031e-06	-5.673	-5.692	-0.019	(0)
	CuCO3	5.141e-07	5.141e-07	-6.289	-6.289	0.000	(0)
	MgHCO3+	3.131e-07	2.991e-07	-6.504	-6.524	-0.020	(0)
	CO3-2	7.172e-08	5.975e-08	-7.144	-7.224	-0.079	(0)
	CuHCO3+	3.960e-08	3.774e-08	-7.402	-7.423	-0.021	(0)
	NaHCO3	2.704e-08	2.704e-08	-7.568	-7.568	0.000	(0)
	CaCO3	2.523e-08	2.523e-08	-7.598	-7.598	0.000	(0)
	MnHCO3+	7.358e-09	7.034e-09	-8.133	-8.153	-0.020	(0)
	UO2 (CO3) 2-2	6.834e-09	5.637e-09	-8.165	-8.249	-0.084	(0)
	UO2CO3	4.728e-09	4.728e-09	-8.325	-8.325	0.000	(0)
	MgCO3	3.549e-09	3.549e-09	-8.450	-8.450	0.000	(0)
	ZnHCO3+	1.223e-09	1.166e-09	-8.912	-8.933	-0.021	(0)
	PbHCO3+	5.333e-10	5.082e-10	-9.273	-9.294	-0.021	(0)
	BaHCO3+	4.435e-10	4.242e-10	-9.353	-9.372	-0.019	(0)
	ZnCO3	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
	PbCO3	3.001e-10	3.001e-10	-9.523	-9.523	0.000	(0)
	NaCO3-	1.367e-10	1.307e-10	-9.864	-9.884	-0.019	(0)
	Cu (CO3) 2-2	1.002e-10	8.268e-11	-9.999	-10.083	-0.084	(0)
	UO2 (CO3) 3-4	3.646e-11	1.688e-11	-10.438	-10.773	-0.334	(0)
	FeHCO3+	1.936e-11	1.852e-11	-10.713	-10.732	-0.019	(0)
	CoHCO3+	1.165e-11	1.111e-11	-10.934	-10.954	-0.021	(0)
	BaCO3	3.325e-12	3.325e-12	-11.478	-11.478	0.000	(0)
	NiHCO3+	2.738e-12	2.609e-12	-11.563	-11.584	-0.021	(0)
	CdCO3	1.218e-12	1.218e-12	-11.914	-11.914	0.000	(0)
	CdHCO3+	8.746e-13	8.335e-13	-12.058	-12.079	-0.021	(0)
	CoCO3	3.523e-13	3.523e-13	-12.453	-12.453	0.000	(0)
	NiCO3	1.152e-13	1.152e-13	-12.938	-12.938	0.000	(0)
	Pb (CO3) 2-2	6.269e-14	5.172e-14	-13.203	-13.286	-0.084	(0)
	HgCO3	2.408e-15	2.408e-15	-14.618	-14.618	0.000	(0)
	Cd (CO3) 2-2	6.540e-17	5.395e-17	-16.184	-16.268	-0.084	(0)
	HgHCO3+	1.511e-17	1.440e-17	-16.821	-16.842	-0.021	(0)
	Hg (CO3) 2-2	5.515e-19	4.550e-19	-18.258	-18.342	-0.084	(0)
Ca	3.350e-04						
	Ca+2	3.198e-04	2.664e-04	-3.495	-3.574	-0.079	(0)
	CaSO4	1.303e-05	1.303e-05	-4.885	-4.885	0.000	(0)
	CaHCO3+	2.123e-06	2.031e-06	-5.673	-5.692	-0.019	(0)
	CaF+	9.619e-08	9.195e-08	-7.017	-7.036	-0.020	(0)
	CaCO3	2.523e-08	2.523e-08	-7.598	-7.598	0.000	(0)
	CaOH+	1.742e-10	1.666e-10	-9.759	-9.778	-0.019	(0)
	CaH2BO3+	1.286e-11	1.227e-11	-10.891	-10.911	-0.020	(0)
	CaNO3+	2.456e-13	2.340e-13	-12.610	-12.631	-0.021	(0)
	CaNH3+2	7.666e-14	6.324e-14	-13.115	-13.199	-0.084	(0)
	Ca (NH3) 2+2	5.755e-24	4.747e-24	-23.240	-23.324	-0.084	(0)
Cd	1.124e-09						
	Cd+2	1.073e-09	8.942e-10	-8.969	-9.049	-0.079	(0)
	CdSO4	4.477e-11	4.477e-11	-10.349	-10.349	0.000	(0)
	CdCl+	3.340e-12	3.183e-12	-11.476	-11.497	-0.021	(0)
	CdCO3	1.218e-12	1.218e-12	-11.914	-11.914	0.000	(0)
	CdHCO3+	8.746e-13	8.335e-13	-12.058	-12.079	-0.021	(0)
	CdF+	4.703e-13	4.482e-13	-12.328	-12.349	-0.021	(0)
	CdOH+	2.336e-13	2.227e-13	-12.631	-12.652	-0.021	(0)
	Cd (SO4) 2-2	1.563e-13	1.290e-13	-12.806	-12.890	-0.084	(0)
	CdOHC1	4.093e-15	4.093e-15	-14.388	-14.388	0.000	(0)

	CdCl ₂	4.946e-16	4.946e-16	-15.306	-15.306	0.000	(0)
	Cd(CO ₃) ₂₋₂	6.540e-17	5.395e-17	-16.184	-16.268	-0.084	(0)
	Cd(OH) ₂	4.404e-17	4.404e-17	-16.356	-16.356	0.000	(0)
	CdF ₂	2.828e-17	2.828e-17	-16.549	-16.549	0.000	(0)
	CdNO ₃ ⁺	8.243e-19	7.856e-19	-18.084	-18.105	-0.021	(0)
	CdSeO ₄	6.360e-20	6.360e-20	-19.197	-19.197	0.000	(0)
	CdCl ₃ ⁻	1.220e-20	1.163e-20	-19.913	-19.934	-0.021	(0)
	Cd ₂ OH ⁺ ₃	1.539e-21	9.979e-22	-20.813	-21.001	-0.188	(0)
	Cd(OH) ₃ ⁻	8.851e-23	8.435e-23	-22.053	-22.074	-0.021	(0)
	Cd(SeO ₃) ₂₋₂	1.503e-24	1.240e-24	-23.823	-23.907	-0.084	(0)
	Cd(NO ₃) ₂	1.094e-28	1.094e-28	-27.961	-27.961	0.000	(0)
	Cd(OH) ₄₋₂	5.247e-31	4.328e-31	-30.280	-30.364	-0.084	(0)
	CdHS ⁺	0.000e+00	0.000e+00	-81.031	-81.052	-0.021	(0)
	Cd(HS) ₂	0.000e+00	0.000e+00	-153.860	-153.860	0.000	(0)
	Cd(HS) ₃ ⁻	0.000e+00	0.000e+00	-231.951	-231.972	-0.021	(0)
	Cd(HS) ₄₋₂	0.000e+00	0.000e+00	-309.704	-309.788	-0.084	(0)
C1		3.901e-05					
	Cl ⁻	3.901e-05	3.727e-05	-4.409	-4.429	-0.020	(0)
	CuCl ⁺	9.034e-11	8.631e-11	-10.044	-10.064	-0.020	(0)
	MnCl ⁺	4.227e-11	4.040e-11	-10.374	-10.394	-0.020	(0)
	CuCl	1.204e-11	1.204e-11	-10.919	-10.919	0.000	(0)
	ZnCl ⁺	8.825e-12	8.432e-12	-11.054	-11.074	-0.020	(0)
	CdCl ⁺	3.340e-12	3.183e-12	-11.476	-11.497	-0.021	(0)
	PbCl ⁺	2.318e-12	2.209e-12	-11.635	-11.656	-0.021	(0)
	ZnOHC1	3.460e-13	3.460e-13	-12.461	-12.461	0.000	(0)
	CuCl ₂ ⁻	9.817e-14	9.379e-14	-13.008	-13.028	-0.020	(0)
	HgClOH	6.948e-14	6.948e-14	-13.158	-13.158	0.000	(0)
	CoCl ⁺	4.719e-14	4.497e-14	-13.326	-13.347	-0.021	(0)
	NiCl ⁺	5.173e-15	4.930e-15	-14.286	-14.307	-0.021	(0)
	HgCl ₂	4.678e-15	4.678e-15	-14.330	-14.330	0.000	(0)
	CdOHC1	4.093e-15	4.093e-15	-14.388	-14.388	0.000	(0)
	MnCl ₂	2.127e-15	2.127e-15	-14.672	-14.672	0.000	(0)
	UO ₂ Cl ⁺	1.261e-15	1.202e-15	-14.899	-14.920	-0.021	(0)
	CuCl ₂	1.115e-15	1.115e-15	-14.953	-14.953	0.000	(0)
	ZnCl ₂	4.981e-16	4.981e-16	-15.303	-15.303	0.000	(0)
	CdCl ₂	4.946e-16	4.946e-16	-15.306	-15.306	0.000	(0)
	PbCl ₂	3.679e-16	3.679e-16	-15.434	-15.434	0.000	(0)
	HgCl ⁺	2.628e-17	2.504e-17	-16.580	-16.601	-0.021	(0)
	CrCl ₂	2.857e-18	2.357e-18	-17.544	-17.628	-0.084	(0)
	HgCl ₃ ⁻	1.829e-18	1.744e-18	-17.738	-17.759	-0.021	(0)
	FeCl ₂	1.254e-18	1.047e-18	-17.902	-17.980	-0.078	(0)
	CuCl ₃ ⁻²	8.951e-19	7.474e-19	-18.048	-18.126	-0.078	(0)
	MnCl ₃ ⁻	2.285e-20	2.184e-20	-19.641	-19.661	-0.020	(0)
	ZnCl ₃ ⁻	1.544e-20	1.475e-20	-19.811	-19.831	-0.020	(0)
	CdCl ₃ ⁻	1.220e-20	1.163e-20	-19.913	-19.934	-0.021	(0)
	VOCl ⁺	6.445e-21	6.142e-21	-20.191	-20.212	-0.021	(0)
	PbCl ₃ ⁻	5.727e-21	5.458e-21	-20.242	-20.263	-0.021	(0)
	NiCl ₂	9.252e-22	9.252e-22	-21.034	-21.034	0.000	(0)
	CuCl ₃ ⁻	4.061e-22	3.880e-22	-21.391	-21.411	-0.020	(0)
	HgCl ₄ ⁻²	3.136e-22	2.587e-22	-21.504	-21.587	-0.084	(0)
	FeCl ₂ ⁺	1.824e-22	1.744e-22	-21.739	-21.759	-0.020	(0)
	CrOHC1 ₂	5.234e-23	5.234e-23	-22.281	-22.281	0.000	(0)
	CrCl ₂ ⁺	8.745e-24	8.335e-24	-23.058	-23.079	-0.021	(0)
	ZnCl ₄ ⁻²	3.291e-25	2.748e-25	-24.483	-24.561	-0.078	(0)
	PbCl ₄ ⁻²	1.127e-25	9.299e-26	-24.948	-25.032	-0.084	(0)
	FeCl ₃	6.499e-28	6.499e-28	-27.187	-27.187	0.000	(0)
	CuCl ₄ ⁻²	8.680e-29	7.248e-29	-28.061	-28.140	-0.078	(0)
	CrO ₃ Cl ⁻	8.713e-30	8.304e-30	-29.060	-29.081	-0.021	(0)
	CoCl ₂	3.559e-38	2.936e-38	-37.449	-37.532	-0.084	(0)
	UCl ₃	0.000e+00	0.000e+00	-42.890	-43.078	-0.188	(0)
	Co(NH ₃) ₅ Cl ₂	0.000e+00	0.000e+00	-60.118	-60.202	-0.084	(0)
	Cr(NH ₃) ₆ Cl ₂	0.000e+00	0.000e+00	-61.901	-61.985	-0.084	(0)
	Co(NH ₃) ₆ Cl ₂	0.000e+00	0.000e+00	-76.558	-76.642	-0.084	(0)
Co(2)		4.503e-10					
	Co ₂	4.228e-10	3.488e-10	-9.374	-9.457	-0.084	(0)
	CoSO ₄	1.486e-11	1.486e-11	-10.828	-10.828	0.000	(0)
	CoHCO ₃ ⁺	1.165e-11	1.111e-11	-10.934	-10.954	-0.021	(0)
	CoF ⁺	3.660e-13	3.488e-13	-12.437	-12.457	-0.021	(0)

CoCO3	3.523e-13	3.523e-13	-12.453	-12.453	0.000	(0)
CoOH+	2.289e-13	2.181e-13	-12.640	-12.661	-0.021	(0)
CoCl+	4.719e-14	4.497e-14	-13.326	-13.347	-0.021	(0)
Co(OH) 2	5.432e-16	5.432e-16	-15.265	-15.265	0.000	(0)
CoNO2+	3.533e-16	3.367e-16	-15.452	-15.473	-0.021	(0)
Co(NH3) +2	9.585e-18	7.907e-18	-17.018	-17.102	-0.084	(0)
CoNO3+	1.611e-19	1.536e-19	-18.793	-18.814	-0.021	(0)
CoSeO4	6.676e-20	6.676e-20	-19.175	-19.175	0.000	(0)
Co(OH) 3-	3.565e-22	3.398e-22	-21.448	-21.469	-0.021	(0)
CoOOH-	8.945e-23	8.525e-23	-22.048	-22.069	-0.021	(0)
Co2OH+3	5.880e-24	3.813e-24	-23.231	-23.419	-0.188	(0)
Co(NH3) 2+2	7.710e-26	6.360e-26	-25.113	-25.197	-0.084	(0)
Co(NO3) 2	8.681e-29	8.681e-29	-28.061	-28.061	0.000	(0)
Co(OH) 4-2	2.046e-30	1.688e-30	-29.689	-29.773	-0.084	(0)
Co(NH3) 3+2	1.830e-34	1.510e-34	-33.738	-33.821	-0.084	(0)
Co4(OH) 4+4	0.000e+00	0.000e+00	-42.011	-42.345	-0.334	(0)
Co(NH3) 4+2	0.000e+00	0.000e+00	-42.742	-42.826	-0.084	(0)
Co(NH3) 5+2	0.000e+00	0.000e+00	-52.247	-52.330	-0.084	(0)
Co(3)	7.476e-31					
CoOH+2	7.475e-31	6.167e-31	-30.126	-30.210	-0.084	(0)
Co+3	5.837e-36	3.871e-36	-35.234	-35.412	-0.178	(0)
CoCl+2	3.559e-38	2.936e-38	-37.449	-37.532	-0.084	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-60.118	-60.202	-0.084	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-70.938	-70.959	-0.021	(0)
Co(NH3) 6OH+2	0.000e+00	0.000e+00	-75.433	-75.517	-0.084	(0)
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-76.558	-76.642	-0.084	(0)
Cr(2)	5.075e-27					
Cr+2	5.075e-27	4.186e-27	-26.295	-26.378	-0.084	(0)
Cr(3)	1.783e-10					
Cr(OH) 2+	1.341e-10	1.278e-10	-9.873	-9.893	-0.021	(0)
Cr(OH) +2	4.062e-11	3.351e-11	-10.391	-10.475	-0.084	(0)
CrOHSO4	1.698e-12	1.698e-12	-11.770	-11.770	0.000	(0)
Cr(OH) 3	1.505e-12	1.505e-12	-11.822	-11.822	0.000	(0)
CrF+2	2.968e-13	2.449e-13	-12.527	-12.611	-0.084	(0)
Cr+3	7.533e-14	4.885e-14	-13.123	-13.311	-0.188	(0)
CrSO4+	2.556e-14	2.436e-14	-13.592	-13.613	-0.021	(0)
CrO2-	2.335e-15	2.225e-15	-14.632	-14.653	-0.021	(0)
Cr(OH) 4-	1.971e-15	1.878e-15	-14.705	-14.726	-0.021	(0)
CrCl+2	2.857e-18	2.357e-18	-17.544	-17.628	-0.084	(0)
Cr2(OH) 2SO4+2	6.233e-21	5.142e-21	-20.205	-20.289	-0.084	(0)
Cr2(OH) 2(SO4) 2	6.523e-23	6.523e-23	-22.186	-22.186	0.000	(0)
CrOHC12	5.234e-23	5.234e-23	-22.281	-22.281	0.000	(0)
CrCl2+	8.745e-24	8.335e-24	-23.058	-23.079	-0.021	(0)
CrNO3+2	7.192e-25	5.933e-25	-24.143	-24.227	-0.084	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-48.982	-49.065	-0.084	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-58.470	-58.658	-0.188	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-61.901	-61.985	-0.084	(0)
Cr(6)	2.432e-19					
CrO4-2	1.273e-19	1.061e-19	-18.895	-18.974	-0.079	(0)
HCrO4-	1.157e-19	1.103e-19	-18.937	-18.958	-0.021	(0)
NaCrO4-	6.498e-23	6.193e-23	-22.187	-22.208	-0.021	(0)
KCrO4-	2.750e-23	2.621e-23	-22.561	-22.582	-0.021	(0)
H2CrO4	2.871e-26	2.871e-26	-25.542	-25.542	0.000	(0)
CrO3SO4-2	2.793e-27	2.304e-27	-26.554	-26.638	-0.084	(0)
CrO3Cl-	8.713e-30	8.304e-30	-29.060	-29.081	-0.021	(0)
Cr2O7-2	5.112e-37	4.217e-37	-36.291	-36.375	-0.084	(0)
Cu(1)	2.815e-10					
Cu+	2.693e-10	2.567e-10	-9.570	-9.591	-0.021	(0)
CuCl	1.204e-11	1.204e-11	-10.919	-10.919	0.000	(0)
CuCl2-	9.817e-14	9.379e-14	-13.008	-13.028	-0.020	(0)
CuCl3-2	8.951e-19	7.474e-19	-18.048	-18.126	-0.078	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-153.094	-153.238	-0.144	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.827	-153.968	-0.141	(0)
Cu(2)	2.536e-06					
Cu+2	1.754e-06	1.461e-06	-5.756	-5.835	-0.079	(0)
CuCO3	5.141e-07	5.141e-07	-6.289	-6.289	0.000	(0)
CuOH+	1.516e-07	1.448e-07	-6.819	-6.839	-0.020	(0)
CuSO4	7.148e-08	7.148e-08	-7.146	-7.146	0.000	(0)

	CuHCO3+	3.960e-08	3.774e-08	-7.402	-7.423	-0.021	(0)
	CuF+	3.059e-09	2.915e-09	-8.514	-8.535	-0.021	(0)
	Cu (OH) 2	9.059e-10	9.059e-10	-9.043	-9.043	0.000	(0)
	Cu2 (OH) 2+2	6.388e-10	5.269e-10	-9.195	-9.278	-0.084	(0)
	Cu (CO3) 2-2	1.002e-10	8.268e-11	-9.999	-10.083	-0.084	(0)
	CuCl+	9.034e-11	8.631e-11	-10.044	-10.064	-0.020	(0)
	CuNO2+	2.199e-11	2.096e-11	-10.658	-10.679	-0.021	(0)
	CuNH3+2	3.417e-12	2.819e-12	-11.466	-11.550	-0.084	(0)
	Cu (OH) 3-	6.112e-14	5.825e-14	-13.214	-13.235	-0.021	(0)
	CuNO3+	1.347e-15	1.284e-15	-14.871	-14.892	-0.021	(0)
	CuCl2	1.115e-15	1.115e-15	-14.953	-14.953	0.000	(0)
	Cu (NO2) 2	2.939e-17	2.939e-17	-16.532	-16.532	0.000	(0)
	Cu (OH) 4-2	1.742e-20	1.437e-20	-19.759	-19.842	-0.084	(0)
	CuCl3-	4.061e-22	3.880e-22	-21.391	-21.411	-0.020	(0)
	Cu (NO3) 2	4.489e-26	4.489e-26	-25.348	-25.348	0.000	(0)
	CuCl4-2	8.680e-29	7.248e-29	-28.061	-28.140	-0.078	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-219.951	-219.972	-0.021	(0)
F		3.501e-05					
	F-	3.310e-05	3.162e-05	-4.480	-4.500	-0.020	(0)
	AlF2+	4.698e-07	4.492e-07	-6.328	-6.348	-0.019	(0)
	MgF+	2.651e-07	2.534e-07	-6.577	-6.596	-0.020	(0)
	AlF3	1.788e-07	1.788e-07	-6.748	-6.748	0.000	(0)
	CaF+	9.619e-08	9.195e-08	-7.017	-7.036	-0.020	(0)
	AlF+2	4.269e-08	3.568e-08	-7.370	-7.448	-0.078	(0)
	HF	1.502e-08	1.502e-08	-7.823	-7.823	0.000	(0)
	CuF+	3.059e-09	2.915e-09	-8.514	-8.535	-0.021	(0)
	AlF4-	2.966e-09	2.835e-09	-8.528	-8.548	-0.020	(0)
	NaF	2.344e-09	2.344e-09	-8.630	-8.630	0.000	(0)
	MnF+	1.134e-09	1.084e-09	-8.945	-8.965	-0.020	(0)
	UO2F+	9.105e-11	8.677e-11	-10.041	-10.062	-0.021	(0)
	ZnF+	5.963e-11	5.682e-11	-10.225	-10.245	-0.021	(0)
	UO2F2	7.914e-12	7.914e-12	-11.102	-11.102	0.000	(0)
	BF (OH) 3-	5.852e-12	5.586e-12	-11.233	-11.253	-0.020	(0)
	PbF+	3.907e-12	3.723e-12	-11.408	-11.429	-0.021	(0)
	HF2-	1.891e-12	1.806e-12	-11.723	-11.743	-0.020	(0)
	CdF+	4.703e-13	4.482e-13	-12.328	-12.349	-0.021	(0)
	CoF+	3.660e-13	3.488e-13	-12.437	-12.457	-0.021	(0)
	CrF+2	2.968e-13	2.449e-13	-12.527	-12.611	-0.084	(0)
	UO2F3-	6.596e-14	6.287e-14	-13.181	-13.202	-0.021	(0)
	NiF+	4.309e-14	4.106e-14	-13.366	-13.387	-0.021	(0)
	FeF+2	3.864e-14	3.226e-14	-13.413	-13.491	-0.078	(0)
	FeF2+	2.856e-14	2.731e-14	-13.544	-13.564	-0.020	(0)
	BF2 (OH) 2-	6.356e-15	6.066e-15	-14.197	-14.217	-0.020	(0)
	PbF2	2.317e-15	2.317e-15	-14.635	-14.635	0.000	(0)
	FeF3	1.218e-15	1.218e-15	-14.914	-14.914	0.000	(0)
	VO2F	1.101e-15	1.101e-15	-14.958	-14.958	0.000	(0)
	H2F2	6.048e-16	6.048e-16	-15.218	-15.218	0.000	(0)
	CdF2	2.828e-17	2.828e-17	-16.549	-16.549	0.000	(0)
	UO2F4-2	1.914e-17	1.579e-17	-16.718	-16.802	-0.084	(0)
	VO2F2-	1.326e-17	1.264e-17	-16.877	-16.898	-0.021	(0)
	VOF+	1.169e-17	1.114e-17	-16.932	-16.953	-0.021	(0)
	PbF3-	1.458e-19	1.390e-19	-18.836	-18.857	-0.021	(0)
	VOF2	1.321e-19	1.321e-19	-18.879	-18.879	0.000	(0)
	BF3OH-	2.512e-20	2.397e-20	-19.600	-19.620	-0.020	(0)
	VO2F3-2	6.044e-21	4.986e-21	-20.219	-20.302	-0.084	(0)
	VOF3-	1.556e-22	1.483e-22	-21.808	-21.829	-0.021	(0)
	HgF+	4.142e-23	3.947e-23	-22.383	-22.404	-0.021	(0)
	PbF4-2	2.550e-24	2.104e-24	-23.593	-23.677	-0.084	(0)
	BF4-	1.255e-24	1.198e-24	-23.901	-23.921	-0.020	(0)
	VO2F4-3	1.196e-25	7.758e-26	-24.922	-25.110	-0.188	(0)
	Sb (OH) 2F	7.227e-26	7.227e-26	-25.141	-25.141	0.000	(0)
	SbOF	7.107e-26	7.107e-26	-25.148	-25.148	0.000	(0)
	VOF4-2	2.294e-26	1.893e-26	-25.639	-25.723	-0.084	(0)
	UF3+	5.914e-33	5.636e-33	-32.228	-32.249	-0.021	(0)
	UF2+2	1.363e-33	1.124e-33	-32.865	-32.949	-0.084	(0)
	UF4	1.954e-35	1.954e-35	-34.709	-34.709	0.000	(0)
	UF+3	4.355e-36	2.824e-36	-35.361	-35.549	-0.188	(0)
	UF5-	2.570e-38	2.449e-38	-37.590	-37.611	-0.021	(0)

UF6-2	2.835e-40	2.339e-40	-39.547	-39.631	-0.084	(0)
Fe (2)	4.567e-09					
Fe+2	4.355e-09	3.593e-09	-8.361	-8.445	-0.084	(0)
FeSO4	1.883e-10	1.883e-10	-9.725	-9.725	0.000	(0)
FeHCO3+	1.936e-11	1.852e-11	-10.713	-10.732	-0.019	(0)
FeOH+	4.690e-12	4.484e-12	-11.329	-11.348	-0.020	(0)
Fe (OH) 2	1.116e-16	1.116e-16	-15.952	-15.952	0.000	(0)
Fe (OH) 3-	1.158e-18	1.107e-18	-17.936	-17.956	-0.020	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.518	-159.518	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.472	-237.493	-0.021	(0)
Fe (3)	2.480e-07					
Fe (OH) 2+	2.402e-07	2.297e-07	-6.619	-6.639	-0.019	(0)
Fe (OH) 3	7.733e-09	7.733e-09	-8.112	-8.112	0.000	(0)
Fe (OH) 4-	2.361e-11	2.257e-11	-10.627	-10.646	-0.019	(0)
FeOH+2	2.255e-11	1.883e-11	-10.647	-10.725	-0.078	(0)
FeF+2	3.864e-14	3.226e-14	-13.413	-13.491	-0.078	(0)
FeF2+	2.856e-14	2.731e-14	-13.544	-13.564	-0.020	(0)
FeSO4+	2.332e-15	2.229e-15	-14.632	-14.652	-0.020	(0)
Fe+3	1.403e-15	9.305e-16	-14.853	-15.031	-0.178	(0)
FeF3	1.218e-15	1.218e-15	-14.914	-14.914	0.000	(0)
Fe (SO4) 2-	1.068e-17	1.018e-17	-16.971	-16.992	-0.021	(0)
FeCl+2	1.254e-18	1.047e-18	-17.902	-17.980	-0.078	(0)
Fe2 (OH) 2+4	2.536e-20	1.174e-20	-19.596	-19.930	-0.334	(0)
FeHSeO3+2	9.864e-21	8.137e-21	-20.006	-20.090	-0.084	(0)
FeCl2+	1.824e-22	1.744e-22	-21.739	-21.759	-0.020	(0)
FeNO3+2	3.134e-24	2.585e-24	-23.504	-23.588	-0.084	(0)
Fe3 (OH) 4+5	1.298e-25	3.899e-26	-24.887	-25.409	-0.522	(0)
FeCl3	6.499e-28	6.499e-28	-27.187	-27.187	0.000	(0)
H (0)	1.879e-29					
H2	9.393e-30	9.397e-30	-29.027	-29.027	0.000	(0)
Hg (0)	3.998e-11					
Hg	3.998e-11	3.998e-11	-10.398	-10.398	0.000	(0)
Hg (1)	2.216e-21					
Hg2+2	1.108e-21	9.140e-22	-20.955	-21.039	-0.084	(0)
Hg (2)	2.854e-13					
Hg (OH) 2	2.087e-13	2.088e-13	-12.680	-12.680	0.000	(0)
HgClOH	6.948e-14	6.948e-14	-13.158	-13.158	0.000	(0)
HgCl2	4.678e-15	4.678e-15	-14.330	-14.330	0.000	(0)
HgCO3	2.408e-15	2.408e-15	-14.618	-14.618	0.000	(0)
HgOH+	4.409e-17	4.202e-17	-16.356	-16.377	-0.021	(0)
HgCl+	2.628e-17	2.504e-17	-16.580	-16.601	-0.021	(0)
HgHCO3+	1.511e-17	1.440e-17	-16.821	-16.842	-0.021	(0)
HgCl3-	1.829e-18	1.744e-18	-17.738	-17.759	-0.021	(0)
Hg (CO3) 2-2	5.515e-19	4.550e-19	-18.258	-18.342	-0.084	(0)
Hg+2	4.082e-20	3.367e-20	-19.389	-19.473	-0.084	(0)
HgNH3+2	4.856e-21	4.006e-21	-20.314	-20.397	-0.084	(0)
HgSO4	1.883e-21	1.883e-21	-20.725	-20.725	0.000	(0)
Hg (NH3) 2+2	9.157e-22	7.554e-22	-21.038	-21.122	-0.084	(0)
Hg (OH) 3-	8.646e-22	8.239e-22	-21.063	-21.084	-0.021	(0)
HgCl4-2	3.136e-22	2.587e-22	-21.504	-21.587	-0.084	(0)
HgF+	4.142e-23	3.947e-23	-22.383	-22.404	-0.021	(0)
HgNO3+	3.624e-30	3.454e-30	-29.441	-29.462	-0.021	(0)
Hg (NH3) 3+2	6.874e-31	5.670e-31	-30.163	-30.246	-0.084	(0)
Hg (NH3) 4+2	1.030e-39	8.493e-40	-38.987	-39.071	-0.084	(0)
Hg (NO3) 2	3.988e-40	3.988e-40	-39.399	-39.399	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-141.054	-141.075	-0.021	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.174	-141.174	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.206	-143.290	-0.084	(0)
K	6.969e-05					
K+	6.959e-05	6.649e-05	-4.157	-4.177	-0.020	(0)
KSO4-	1.051e-07	1.005e-07	-6.978	-6.998	-0.019	(0)
KCrO4-	2.750e-23	2.621e-23	-22.561	-22.582	-0.021	(0)
Mg	8.906e-05					
Mg+2	8.570e-05	7.140e-05	-4.067	-4.146	-0.079	(0)
MgSO4	2.775e-06	2.775e-06	-5.557	-5.557	0.000	(0)
MgHCO3+	3.131e-07	2.991e-07	-6.504	-6.524	-0.020	(0)
MgF+	2.651e-07	2.534e-07	-6.577	-6.596	-0.020	(0)
MgCO3	3.549e-09	3.549e-09	-8.450	-8.450	0.000	(0)

MgOH+	9.314e-10	8.911e-10	-9.031	-9.050	-0.019	(0)
MgH2BO3+	2.076e-12	1.982e-12	-11.683	-11.703	-0.020	(0)
Mn (2)	1.085e-06					
Mn+2	1.044e-06	8.611e-07	-5.981	-6.065	-0.084	(0)
MnSO4	3.270e-08	3.270e-08	-7.485	-7.485	0.000	(0)
MnHCO3+	7.358e-09	7.034e-09	-8.133	-8.153	-0.020	(0)
MnF+	1.134e-09	1.084e-09	-8.945	-8.965	-0.020	(0)
MnOH+	7.093e-11	6.780e-11	-10.149	-10.169	-0.020	(0)
MnCl+	4.227e-11	4.040e-11	-10.374	-10.394	-0.020	(0)
MnCl2	2.127e-15	2.127e-15	-14.672	-14.672	0.000	(0)
MnNO3+	3.978e-16	3.791e-16	-15.400	-15.421	-0.021	(0)
MnSeO4	8.852e-17	8.852e-17	-16.053	-16.053	0.000	(0)
MnCl3-	2.285e-20	2.184e-20	-19.641	-19.661	-0.020	(0)
Mn (OH) 3-	4.308e-22	4.118e-22	-21.366	-21.385	-0.020	(0)
Mn (NO3) 2	2.646e-25	2.646e-25	-24.577	-24.577	0.000	(0)
Mn (OH) 4-2	4.991e-29	4.168e-29	-28.302	-28.380	-0.078	(0)
MnSe	0.000e+00	0.000e+00	-46.208	-46.208	0.000	(0)
Mn (3)	1.617e-25					
Mn+3	1.617e-25	1.072e-25	-24.791	-24.970	-0.178	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.682	-46.760	-0.078	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.667	-49.687	-0.020	(0)
Mo	4.191e-08					
MoO4-2	4.168e-08	3.473e-08	-7.380	-7.459	-0.079	(0)
HMoO4-	2.329e-10	2.219e-10	-9.633	-9.654	-0.021	(0)
H2MoO4	5.222e-13	5.222e-13	-12.282	-12.282	0.000	(0)
AlMo6O21-3	3.293e-39	2.135e-39	-38.482	-38.671	-0.188	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.419	-51.171	-0.752	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.755	-51.278	-0.522	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.654	-52.989	-0.334	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.048	-56.236	-0.188	(0)
N (-3)	1.117e-07					
NH4+	1.113e-07	1.062e-07	-6.954	-6.974	-0.020	(0)
NH4SO4-	2.543e-10	2.431e-10	-9.595	-9.614	-0.020	(0)
NH3	1.886e-10	1.886e-10	-9.725	-9.725	0.000	(0)
CuNH3+2	3.417e-12	2.819e-12	-11.466	-11.550	-0.084	(0)
CaNH3+2	7.666e-14	6.324e-14	-13.115	-13.199	-0.084	(0)
BaNH3+2	1.565e-17	1.291e-17	-16.806	-16.889	-0.084	(0)
Co (NH3) +2	9.585e-18	7.907e-18	-17.018	-17.102	-0.084	(0)
NiNH3+2	6.346e-18	5.235e-18	-17.198	-17.281	-0.084	(0)
HgNH3+2	4.856e-21	4.006e-21	-20.314	-20.397	-0.084	(0)
Hg (NH3) 2+2	9.157e-22	7.554e-22	-21.038	-21.122	-0.084	(0)
Ca (NH3) 2+2	5.755e-24	4.747e-24	-23.240	-23.324	-0.084	(0)
Ni (NH3) 2+2	1.730e-25	1.427e-25	-24.762	-24.846	-0.084	(0)
Co (NH3) 2+2	7.710e-26	6.360e-26	-25.113	-25.197	-0.084	(0)
Hg (NH3) 3+2	6.874e-31	5.670e-31	-30.163	-30.246	-0.084	(0)
Co (NH3) 3+2	1.830e-34	1.510e-34	-33.738	-33.821	-0.084	(0)
Hg (NH3) 4+2	1.030e-39	8.493e-40	-38.987	-39.071	-0.084	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-42.742	-42.826	-0.084	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-48.982	-49.065	-0.084	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.247	-52.330	-0.084	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.470	-58.658	-0.188	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.118	-60.202	-0.084	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.901	-61.985	-0.084	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.938	-70.959	-0.021	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-75.433	-75.517	-0.084	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-76.558	-76.642	-0.084	(0)
N (3)	1.435e-07					
NO2-	1.435e-07	1.370e-07	-6.843	-6.863	-0.020	(0)
CuNO2+	2.199e-11	2.096e-11	-10.658	-10.679	-0.021	(0)
CoNO2+	3.533e-16	3.367e-16	-15.452	-15.473	-0.021	(0)
Cu (NO2) 2	2.939e-17	2.939e-17	-16.532	-16.532	0.000	(0)
N (5)	2.910e-10					
NO3-	2.908e-10	2.778e-10	-9.536	-9.556	-0.020	(0)
CaNO3+	2.456e-13	2.340e-13	-12.610	-12.631	-0.021	(0)
CuNO3+	1.347e-15	1.284e-15	-14.871	-14.892	-0.021	(0)
MnNO3+	3.978e-16	3.791e-16	-15.400	-15.421	-0.021	(0)

BaNO3+	1.585e-16	1.511e-16	-15.800	-15.821	-0.021	(0)
ZnNO3+	6.594e-17	6.285e-17	-16.181	-16.202	-0.021	(0)
PbNO3+	7.204e-18	6.865e-18	-17.142	-17.163	-0.021	(0)
CdNO3+	8.243e-19	7.856e-19	-18.084	-18.105	-0.021	(0)
CoNO3+	1.611e-19	1.536e-19	-18.793	-18.814	-0.021	(0)
NiNO3+	3.785e-20	3.608e-20	-19.422	-19.443	-0.021	(0)
UO2NO3+	1.156e-20	1.102e-20	-19.937	-19.958	-0.021	(0)
FeNO3+2	3.134e-24	2.585e-24	-23.504	-23.588	-0.084	(0)
VO2NO3	2.789e-24	2.789e-24	-23.555	-23.555	0.000	(0)
CrNO3+2	7.192e-25	5.933e-25	-24.143	-24.227	-0.084	(0)
Mn(NO3)2	2.646e-25	2.646e-25	-24.577	-24.577	0.000	(0)
Cu(NO3)2	4.489e-26	4.489e-26	-25.348	-25.348	0.000	(0)
Zn(NO3)2	3.484e-27	3.484e-27	-26.458	-26.458	0.000	(0)
Pb(NO3)2	3.239e-27	3.239e-27	-26.490	-26.490	0.000	(0)
Cd(NO3)2	1.094e-28	1.094e-28	-27.961	-27.961	0.000	(0)
Co(NO3)2	8.681e-29	8.681e-29	-28.061	-28.061	0.000	(0)
HgNO3+	3.624e-30	3.454e-30	-29.441	-29.462	-0.021	(0)
Hg(NO3)2	3.988e-40	3.988e-40	-39.399	-39.399	0.000	(0)
Na	1.231e-04					
Na+	1.229e-04	1.175e-04	-3.910	-3.930	-0.020	(0)
NaSO4-	1.409e-07	1.347e-07	-6.851	-6.871	-0.019	(0)
NaHCO3	2.704e-08	2.704e-08	-7.568	-7.568	0.000	(0)
NaF	2.344e-09	2.344e-09	-8.630	-8.630	0.000	(0)
NaCO3-	1.367e-10	1.307e-10	-9.864	-9.884	-0.019	(0)
NaH2BO3	1.490e-13	1.490e-13	-12.827	-12.827	0.000	(0)
NaCrO4-	6.498e-23	6.193e-23	-22.187	-22.208	-0.021	(0)
Ni	6.717e-11					
Ni+2	6.205e-11	5.169e-11	-10.207	-10.287	-0.079	(0)
NiHCO3+	2.738e-12	2.609e-12	-11.563	-11.584	-0.021	(0)
NiSO4	2.203e-12	2.203e-12	-11.657	-11.657	0.000	(0)
NiCO3	1.152e-13	1.152e-13	-12.938	-12.938	0.000	(0)
NiF+	4.309e-14	4.106e-14	-13.366	-13.387	-0.021	(0)
NiOH+	2.141e-14	2.040e-14	-13.669	-13.690	-0.021	(0)
NiCl+	5.173e-15	4.930e-15	-14.286	-14.307	-0.021	(0)
Ni(OH)2	5.080e-17	5.080e-17	-16.294	-16.294	0.000	(0)
Ni(SO4)2-2	1.888e-17	1.558e-17	-16.724	-16.808	-0.084	(0)
NiNH3+2	6.346e-18	5.235e-18	-17.198	-17.281	-0.084	(0)
NiNO3+	3.785e-20	3.608e-20	-19.422	-19.443	-0.021	(0)
NiSeO4	9.235e-21	9.235e-21	-20.035	-20.035	0.000	(0)
Ni(OH)3-	1.671e-21	1.592e-21	-20.777	-20.798	-0.021	(0)
NiCl2	9.252e-22	9.252e-22	-21.034	-21.034	0.000	(0)
Ni(NH3)2+2	1.730e-25	1.427e-25	-24.762	-24.846	-0.084	(0)
O(0)	1.148e-34					
O2	5.738e-35	5.741e-35	-34.241	-34.241	0.000	(0)
Pb	3.158e-09					
Pb+2	2.005e-09	1.671e-09	-8.698	-8.777	-0.079	(0)
PbHCO3+	5.333e-10	5.082e-10	-9.273	-9.294	-0.021	(0)
PbCO3	3.001e-10	3.001e-10	-9.523	-9.523	0.000	(0)
PbSO4	1.747e-10	1.747e-10	-9.758	-9.758	0.000	(0)
PbOH+	1.380e-10	1.316e-10	-9.860	-9.881	-0.021	(0)
PbF+	3.907e-12	3.723e-12	-11.408	-11.429	-0.021	(0)
PbCl+	2.318e-12	2.209e-12	-11.635	-11.656	-0.021	(0)
Pb(SO4)2-2	2.726e-13	2.249e-13	-12.565	-12.648	-0.084	(0)
Pb(OH)2	1.304e-13	1.304e-13	-12.885	-12.885	0.000	(0)
Pb(CO3)2-2	6.269e-14	5.172e-14	-13.203	-13.286	-0.084	(0)
PbF2	2.317e-15	2.317e-15	-14.635	-14.635	0.000	(0)
PbCl2	3.679e-16	3.679e-16	-15.434	-15.434	0.000	(0)
PbNO3+	7.204e-18	6.865e-18	-17.142	-17.163	-0.021	(0)
Pb2OH+3	5.371e-18	3.483e-18	-17.270	-17.458	-0.188	(0)
Pb(OH)3-	4.290e-18	4.088e-18	-17.368	-17.388	-0.021	(0)
PbF3-	1.458e-19	1.390e-19	-18.836	-18.857	-0.021	(0)
PbCl3-	5.727e-21	5.458e-21	-20.242	-20.263	-0.021	(0)
Pb(OH)4-2	3.805e-23	3.139e-23	-22.420	-22.503	-0.084	(0)
PbF4-2	2.550e-24	2.104e-24	-23.593	-23.677	-0.084	(0)
Pb3(OH)4+2	6.873e-25	5.669e-25	-24.163	-24.246	-0.084	(0)
PbCl4-2	1.127e-25	9.299e-26	-24.948	-25.032	-0.084	(0)
Pb(NO3)2	3.239e-27	3.239e-27	-26.490	-26.490	0.000	(0)
Pb4(OH)4+4	1.625e-29	7.524e-30	-28.789	-29.124	-0.334	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-153.531	-153.531	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.222	-232.242	-0.021	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.485	-79.485	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.991	-80.012	-0.021	(0)
CdHS+	0.000e+00	0.000e+00	-81.031	-81.052	-0.021	(0)
S5-2	0.000e+00	0.000e+00	-82.800	-82.884	-0.084	(0)
S6-2	0.000e+00	0.000e+00	-83.316	-83.400	-0.084	(0)
S4-2	0.000e+00	0.000e+00	-83.396	-83.479	-0.084	(0)
S3-2	0.000e+00	0.000e+00	-84.202	-84.285	-0.084	(0)
S2-2	0.000e+00	0.000e+00	-85.218	-85.301	-0.084	(0)
S-2	0.000e+00	0.000e+00	-90.740	-90.819	-0.078	(0)
HgHS2-	0.000e+00	0.000e+00	-141.054	-141.075	-0.021	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.174	-141.174	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.206	-143.290	-0.084	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.094	-153.238	-0.144	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.531	-153.531	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.745	-153.766	-0.021	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.827	-153.968	-0.141	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-153.860	-153.860	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.249	-154.249	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.518	-159.518	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.951	-219.972	-0.021	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-230.960	-230.981	-0.021	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-231.951	-231.972	-0.021	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.222	-232.242	-0.021	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.384	-234.468	-0.084	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.472	-237.493	-0.021	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-309.704	-309.788	-0.084	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.369	-312.453	-0.084	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.245	-324.328	-0.084	(0)
S (6)	2.725e-04					
SO4-2	2.563e-04	2.136e-04	-3.591	-3.670	-0.079	(0)
CaSO4	1.303e-05	1.303e-05	-4.885	-4.885	0.000	(0)
MgSO4	2.775e-06	2.775e-06	-5.557	-5.557	0.000	(0)
NaSO4-	1.409e-07	1.347e-07	-6.851	-6.871	-0.019	(0)
KSO4-	1.051e-07	1.005e-07	-6.978	-6.998	-0.019	(0)
CuSO4	7.148e-08	7.148e-08	-7.146	-7.146	0.000	(0)
MnSO4	3.270e-08	3.270e-08	-7.485	-7.485	0.000	(0)
HSO4-	7.014e-09	6.703e-09	-8.154	-8.174	-0.020	(0)
ZnSO4	4.207e-09	4.207e-09	-8.376	-8.376	0.000	(0)
NH4SO4-	2.543e-10	2.431e-10	-9.595	-9.614	-0.020	(0)
AlSO4+	1.957e-10	1.870e-10	-9.708	-9.728	-0.020	(0)
FeSO4	1.883e-10	1.883e-10	-9.725	-9.725	0.000	(0)
PbSO4	1.747e-10	1.747e-10	-9.758	-9.758	0.000	(0)
CdSO4	4.477e-11	4.477e-11	-10.349	-10.349	0.000	(0)
CoSO4	1.486e-11	1.486e-11	-10.828	-10.828	0.000	(0)
Zn (SO4) 2-2	9.487e-12	7.826e-12	-11.023	-11.106	-0.084	(0)
UO2SO4	6.425e-12	6.425e-12	-11.192	-11.192	0.000	(0)
NiSO4	2.203e-12	2.203e-12	-11.657	-11.657	0.000	(0)
CrOHSO4	1.698e-12	1.698e-12	-11.770	-11.770	0.000	(0)
Al (SO4) 2-	4.478e-13	4.280e-13	-12.349	-12.369	-0.020	(0)
Pb (SO4) 2-2	2.726e-13	2.249e-13	-12.565	-12.648	-0.084	(0)
Cd (SO4) 2-2	1.563e-13	1.290e-13	-12.806	-12.890	-0.084	(0)
CrSO4+	2.556e-14	2.436e-14	-13.592	-13.613	-0.021	(0)
UO2 (SO4) 2-2	2.193e-14	1.809e-14	-13.659	-13.743	-0.084	(0)
FeSO4+	2.332e-15	2.229e-15	-14.632	-14.652	-0.020	(0)
VO2SO4-	1.062e-16	1.012e-16	-15.974	-15.995	-0.021	(0)
Ni (SO4) 2-2	1.888e-17	1.558e-17	-16.724	-16.808	-0.084	(0)
Fe (SO4) 2-	1.068e-17	1.018e-17	-16.971	-16.992	-0.021	(0)
VOSO4	3.455e-18	3.455e-18	-17.462	-17.462	0.000	(0)
Cr2 (OH) 2SO4+2	6.233e-21	5.142e-21	-20.205	-20.289	-0.084	(0)
HgSO4	1.883e-21	1.883e-21	-20.725	-20.725	0.000	(0)
Cr2 (OH) 2 (SO4) 2	6.523e-23	6.523e-23	-22.186	-22.186	0.000	(0)
CrO3SO4-2	2.793e-27	2.304e-27	-26.554	-26.638	-0.084	(0)
VSO4+	1.142e-31	1.088e-31	-30.942	-30.963	-0.021	(0)
U (SO4) 2	6.455e-38	6.455e-38	-37.190	-37.190	0.000	(0)
USO4+2	4.613e-38	3.805e-38	-37.336	-37.420	-0.084	(0)

Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.938	-70.959	-0.021	(0)
Sb (3)	9.000e-21					
Sb (OH) 3	4.554e-21	4.554e-21	-20.342	-20.342	0.000	(0)
HSbO2	4.446e-21	4.446e-21	-20.352	-20.352	0.000	(0)
Sb (OH) 2F	7.227e-26	7.227e-26	-25.141	-25.141	0.000	(0)
SbOF	7.107e-26	7.107e-26	-25.148	-25.148	0.000	(0)
Sb (OH) 2+	3.728e-26	3.552e-26	-25.429	-25.449	-0.021	(0)
SbO2-	2.352e-26	2.242e-26	-25.629	-25.649	-0.021	(0)
Sb (OH) 4-	1.348e-26	1.285e-26	-25.870	-25.891	-0.021	(0)
SbO+	1.285e-26	1.225e-26	-25.891	-25.912	-0.021	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.245	-324.328	-0.084	(0)
Sb (5)	4.699e-10					
SbO3-	4.693e-10	4.473e-10	-9.329	-9.349	-0.021	(0)
Sb (OH) 6-	5.476e-13	5.232e-13	-12.262	-12.281	-0.020	(0)
SbO2+	1.389e-23	1.324e-23	-22.857	-22.878	-0.021	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.230	-41.251	-0.021	(0)
H2Se	0.000e+00	0.000e+00	-43.855	-43.855	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.208	-46.208	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.674	-49.758	-0.084	(0)
Se (4)	3.523e-09					
HSeO3-	3.473e-09	3.309e-09	-8.459	-8.480	-0.021	(0)
SeO3-2	4.972e-11	4.102e-11	-10.303	-10.387	-0.084	(0)
H2SeO3	4.535e-13	4.535e-13	-12.343	-12.343	0.000	(0)
FeHSeO3+2	9.864e-21	8.137e-21	-20.006	-20.090	-0.084	(0)
Cd (SeO3) 2-2	1.503e-24	1.240e-24	-23.823	-23.907	-0.084	(0)
Se (6)	4.585e-13					
SeO4-2	4.584e-13	3.819e-13	-12.339	-12.418	-0.079	(0)
MnSeO4	8.852e-17	8.852e-17	-16.053	-16.053	0.000	(0)
HSeO4-	6.452e-18	6.149e-18	-17.190	-17.211	-0.021	(0)
ZnSeO4	5.327e-18	5.327e-18	-17.273	-17.273	0.000	(0)
CoSeO4	6.676e-20	6.676e-20	-19.175	-19.175	0.000	(0)
CdSeO4	6.360e-20	6.360e-20	-19.197	-19.197	0.000	(0)
NiSeO4	9.235e-21	9.235e-21	-20.035	-20.035	0.000	(0)
Zn (SeO4) 2-2	2.501e-30	2.063e-30	-29.602	-29.685	-0.084	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.402	-55.590	-0.188	(0)
U (4)	1.055e-21					
U (OH) 5-	1.042e-21	9.930e-22	-20.982	-21.003	-0.021	(0)
U (OH) 4	1.336e-23	1.336e-23	-22.874	-22.874	0.000	(0)
U (OH) 3+	1.646e-26	1.569e-26	-25.784	-25.804	-0.021	(0)
U (OH) 2+2	2.824e-30	2.330e-30	-29.549	-29.633	-0.084	(0)
UF3+	5.914e-33	5.636e-33	-32.228	-32.249	-0.021	(0)
UF2+2	1.363e-33	1.124e-33	-32.865	-32.949	-0.084	(0)
UOH+3	5.435e-35	3.525e-35	-34.265	-34.453	-0.188	(0)
UF4	1.954e-35	1.954e-35	-34.709	-34.709	0.000	(0)
UF+3	4.355e-36	2.824e-36	-35.361	-35.549	-0.188	(0)
U (SO4) 2	6.455e-38	6.455e-38	-37.190	-37.190	0.000	(0)
USO4+2	4.613e-38	3.805e-38	-37.336	-37.420	-0.084	(0)
UF5-	2.570e-38	2.449e-38	-37.590	-37.611	-0.021	(0)
UF6-2	2.835e-40	2.339e-40	-39.547	-39.631	-0.084	(0)
U+4	0.000e+00	0.000e+00	-40.015	-40.349	-0.334	(0)
UC1+3	0.000e+00	0.000e+00	-42.890	-43.078	-0.188	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-160.159	-161.851	-1.693	(0)
U (5)	4.560e-15					
UO2+	4.560e-15	4.346e-15	-14.341	-14.362	-0.021	(0)
U (6)	1.181e-08					
UO2 (CO3) 2-2	6.834e-09	5.637e-09	-8.165	-8.249	-0.084	(0)
UO2CO3	4.728e-09	4.728e-09	-8.325	-8.325	0.000	(0)
UO2F+	9.105e-11	8.677e-11	-10.041	-10.062	-0.021	(0)
UO2OH+	8.231e-11	7.844e-11	-10.085	-10.105	-0.021	(0)
UO2 (CO3) 3-4	3.646e-11	1.688e-11	-10.438	-10.773	-0.334	(0)
UO2+2	2.386e-11	1.988e-11	-10.622	-10.702	-0.079	(0)
UO2F2	7.914e-12	7.914e-12	-11.102	-11.102	0.000	(0)
UO2SO4	6.425e-12	6.425e-12	-11.192	-11.192	0.000	(0)
UO2F3-	6.596e-14	6.287e-14	-13.181	-13.202	-0.021	(0)
UO2 (SO4) 2-2	2.193e-14	1.809e-14	-13.659	-13.743	-0.084	(0)
(UO2) 2 (OH) 2+2	1.238e-14	1.021e-14	-13.907	-13.991	-0.084	(0)

UO2Cl+	1.261e-15	1.202e-15	-14.899	-14.920	-0.021	(0)
(UO2) 3 (OH) 5+	6.266e-16	5.972e-16	-15.203	-15.224	-0.021	(0)
UO2F4-2	1.914e-17	1.579e-17	-16.718	-16.802	-0.084	(0)
UO2NO3+	1.156e-20	1.102e-20	-19.937	-19.958	-0.021	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.638	-40.722	-0.084	(0)
VOH+	0.000e+00	0.000e+00	-40.695	-40.716	-0.021	(0)
V (3)	2.683e-14					
V (OH) 3	2.683e-14	2.683e-14	-13.571	-13.571	0.000	(0)
V (OH) 2+	5.842e-24	5.567e-24	-23.233	-23.254	-0.021	(0)
VOH+2	2.056e-26	1.696e-26	-25.687	-25.771	-0.084	(0)
V+3	1.665e-30	1.080e-30	-29.779	-29.967	-0.188	(0)
VSO4+	1.142e-31	1.088e-31	-30.942	-30.963	-0.021	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.385	-50.573	-0.188	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.407	-50.741	-0.334	(0)
V (4)	4.720e-16					
V (OH) 3+	3.855e-16	3.674e-16	-15.414	-15.435	-0.021	(0)
VO+2	7.121e-17	5.874e-17	-16.147	-16.231	-0.084	(0)
VOF+	1.169e-17	1.114e-17	-16.932	-16.953	-0.021	(0)
VOSO4	3.455e-18	3.455e-18	-17.462	-17.462	0.000	(0)
VOF2	1.321e-19	1.321e-19	-18.879	-18.879	0.000	(0)
VOC1+	6.445e-21	6.142e-21	-20.191	-20.212	-0.021	(0)
VOF3-	1.556e-22	1.483e-22	-21.808	-21.829	-0.021	(0)
VOF4-2	2.294e-26	1.893e-26	-25.639	-25.723	-0.084	(0)
H2V2O4+2	8.202e-27	6.766e-27	-26.086	-26.170	-0.084	(0)
V (5)	1.024e-08					
H2VO4-	1.012e-08	9.640e-09	-7.995	-8.016	-0.021	(0)
HVO4-2	9.139e-11	7.539e-11	-10.039	-10.123	-0.084	(0)
H3VO4	3.097e-11	3.097e-11	-10.509	-10.509	0.000	(0)
H3V2O7-	2.022e-12	1.927e-12	-11.694	-11.715	-0.021	(0)
VO2+	2.077e-14	1.985e-14	-13.683	-13.702	-0.020	(0)
VO2F	1.101e-15	1.101e-15	-14.958	-14.958	0.000	(0)
HV2O7-3	3.798e-16	2.463e-16	-15.420	-15.609	-0.188	(0)
VO2SO4-	1.062e-16	1.012e-16	-15.974	-15.995	-0.021	(0)
VO2F2-	1.326e-17	1.264e-17	-16.877	-16.898	-0.021	(0)
VO4-3	1.814e-18	1.176e-18	-17.741	-17.929	-0.188	(0)
V3O9-3	1.447e-18	9.383e-19	-17.840	-18.028	-0.188	(0)
V2O7-4	4.457e-20	2.064e-20	-19.351	-19.685	-0.334	(0)
VO2F3-2	6.044e-21	4.986e-21	-20.219	-20.302	-0.084	(0)
V4O12-4	8.143e-24	3.771e-24	-23.089	-23.424	-0.334	(0)
VO2NO3	2.789e-24	2.789e-24	-23.555	-23.555	0.000	(0)
VO2F4-3	1.196e-25	7.758e-26	-24.922	-25.110	-0.188	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.010	-55.533	-0.522	(0)
V10O28-6	0.000e+00	0.000e+00	-56.474	-57.226	-0.752	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.484	-56.818	-0.334	(0)
Zn	1.142e-07					
Zn+2	1.081e-07	9.006e-08	-6.966	-7.045	-0.079	(0)
ZnSO4	4.207e-09	4.207e-09	-8.376	-8.376	0.000	(0)
ZnHCO3+	1.223e-09	1.166e-09	-8.912	-8.933	-0.021	(0)
ZnCO3	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
ZnOH+	2.962e-10	2.823e-10	-9.528	-9.549	-0.021	(0)
ZnF+	5.963e-11	5.682e-11	-10.225	-10.245	-0.021	(0)
Zn (SO4) 2-2	9.487e-12	7.826e-12	-11.023	-11.106	-0.084	(0)
ZnCl+	8.825e-12	8.432e-12	-11.054	-11.074	-0.020	(0)
Zn (OH) 2	1.403e-12	1.403e-12	-11.853	-11.853	0.000	(0)
ZnOHC1	3.460e-13	3.460e-13	-12.461	-12.461	0.000	(0)
ZnCl2	4.981e-16	4.981e-16	-15.303	-15.303	0.000	(0)
Zn (OH) 3-	2.312e-16	2.204e-16	-15.636	-15.657	-0.021	(0)
ZnNO3+	6.594e-17	6.285e-17	-16.181	-16.202	-0.021	(0)
ZnSeO4	5.327e-18	5.327e-18	-17.273	-17.273	0.000	(0)
ZnCl3-	1.544e-20	1.475e-20	-19.811	-19.831	-0.020	(0)
Zn (OH) 4-2	3.334e-22	2.750e-22	-21.477	-21.561	-0.084	(0)
ZnCl4-2	3.291e-25	2.748e-25	-24.483	-24.561	-0.078	(0)
Zn (NO3) 2	3.484e-27	3.484e-27	-26.458	-26.458	0.000	(0)
Zn (SeO4) 2-2	2.501e-30	2.063e-30	-29.602	-29.685	-0.084	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.745	-153.766	-0.021	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.249	-154.249	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-230.960	-230.981	-0.021	(0)

ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.384	-234.468	-0.084	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.369	-312.453	-0.084	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-67.64	-61.36	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-55.61	-51.10	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-62.84	-51.10	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-84.90	-66.96	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-71.61	-51.58	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-33.33	-32.92	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-26.82	-26.37	0.45	(NH4) 2SeO4	
Al (OH) 3 (am)	-1.27	9.53	10.80	Al (OH) 3	
Al2 (MoO4) 3	-44.64	-42.27	2.37	Al2 (MoO4) 3	
Al2O3	-0.59	19.06	19.65	Al2O3	
Al4 (OH) 10SO4	-1.23	21.47	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-8.89	-4.09	4.80	AlAsO4:2H2O	
AlOHSO4	-3.89	-7.12	-3.23	AlOHSO4	
AlSb	-154.06	-88.44	65.62	AlSb	
Alunite	-1.00	-2.40	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-4.66	-12.45	-7.79	PbSO4	
Anhydrite	-2.88	-7.24	-4.36	CaSO4	
Anilite	-57.49	-89.36	-31.88	Cu0.25Cu1.5S	
Antlerite	-3.99	4.80	8.79	Cu3 (OH) 4SO4	
Aragonite	-2.50	-10.80	-8.30	CaCO3	
Arsenolite	-79.64	-82.40	-2.76	As4O6	
Artinite	-12.13	-2.53	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-33.95	-27.24	6.71	As2O5	
Atacamite	-4.01	3.38	7.39	Cu2 (OH) 3Cl	
Azurite	-2.06	-18.97	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-18.37	6.02	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-18.25	-2.37	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	-0.27	-9.18	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-29.29	3.65	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-16.27	-25.94	-9.67	BaCrO4	
BaF2	-10.14	-15.96	-5.82	BaF2	
BaMoO4	-7.46	-14.42	-6.96	BaMoO4	
Barite	-0.66	-10.64	-9.98	BaSO4	
BaS	-96.66	-80.48	16.18	BaS	
BaSeO3	-10.78	-8.95	1.83	BaSeO3	
BaSeO4	-11.92	-19.38	-7.46	BaSeO4	
Bianchite	-8.95	-10.72	-1.76	ZnSO4:6H2O	
Birnessite	-10.64	7.45	18.09	MnO2	
Bixbyite	-10.34	-10.98	-0.64	Mn2O3	
BlaubleiI	-56.53	-80.69	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-57.41	-84.69	-27.28	Cu0.6Cu0.8S	
Boehmite	0.95	9.53	8.58	AlOOH	
Breithauptite	-63.81	-82.33	-18.52	NiSb	
Brochantite	-3.27	11.95	15.22	Cu4 (OH) 6SO4	
Brucite	-8.00	8.84	16.84	Mg (OH) 2	
Bunsenite	-9.75	2.70	12.45	NiO	
Ca (VO3) 2	-10.67	-5.01	5.66	Ca (VO3) 2	
Ca2V2O7	-13.09	4.41	17.50	Ca2V2O7	
Ca2V2O7:2H2O	-17.15	4.41	21.55	Ca2V2O7:2H2O	
Ca3 (AsO4) 2:4H2O	-21.30	1.00	22.30	Ca3 (AsO4) 2:4H2O	
Ca3 (VO4) 2	-25.14	13.82	38.96	Ca3 (VO4) 2	
Ca3 (VO4) 2:4H2O	-26.04	13.82	39.86	Ca3 (VO4) 2:4H2O	
Ca3Sb2	-310.68	-167.71	142.97	Ca3Sb2	
CaCrO4	-20.28	-22.55	-2.27	CaCrO4	
Calcite	-2.32	-10.80	-8.48	CaCO3	
Calomel	-11.99	-29.90	-17.91	Hg2Cl2	
CaMoO4	-3.08	-11.03	-7.95	CaMoO4	
Carnotite	-2.84	-2.61	0.23	KUO2VO4	
CaSeO3:2H2O	-8.38	-5.56	2.81	CaSeO3:2H2O	
CaSeO4:2H2O	-12.97	-15.99	-3.02	CaSeO4:2H2O	
Cd (BO2) 2	-18.61	-8.77	9.84	Cd (BO2) 2	

Cd(OH) 2	-9.71	3.94	13.64	Cd(OH) 2
Cd(OH) 2 (am)	-9.79	3.94	13.73	Cd(OH) 2
Cd3(OH) 2 (SO4) 2	-28.21	-21.50	6.71	Cd3(OH) 2 (SO4) 2
Cd3(OH) 4SO4	-27.40	-4.84	22.56	Cd3(OH) 4SO4
Cd4(OH) 6SO4	-29.31	-0.91	28.40	Cd4(OH) 6SO4
CdCl2	-17.25	-17.91	-0.66	CdCl2
CdCl2:1H2O	-16.21	-17.91	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-15.99	-17.91	-1.91	CdCl2:2.5H2O
CdF2	-16.84	-18.05	-1.21	CdF2
Cdmetal (alpha)	-35.45	-21.94	13.51	Cd
Cdmetal (gamma)	-35.56	-21.94	13.62	Cd
CdMoO4	-2.36	-16.51	-14.15	CdMoO4
CdOHCl	-10.52	-6.98	3.54	CdOHCl
CdSb	-80.75	-81.10	-0.35	CdSb
CdSe	-23.61	-43.81	-20.20	CdSe
CdSeO4:2H2O	-19.62	-21.47	-1.85	CdSeO4:2H2O
CdSO4	-12.55	-12.72	-0.17	CdSO4
CdSO4:1H2O	-10.99	-12.72	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.85	-12.72	-1.87	CdSO4:2.67H2O
Cerrusite	-2.87	-16.00	-13.13	PbCO3
CH4 (g)	-82.67	-123.72	-41.05	CH4
Chalcanthite	-6.87	-9.51	-2.64	CuSO4:5H2O
Chalcocite	-57.78	-92.70	-34.92	Cu2S
Chalcopyrite	-126.05	-161.32	-35.27	CuFeS2
Cinnabar	-53.49	-99.19	-45.69	HgS
Claudetite	-79.33	-82.40	-3.06	As4O6
Clausthalite	-16.44	-43.54	-27.10	PbSe
Co(BO2) 2	-36.25	-9.18	27.07	Co(BO2) 2
Co(OH) 2	-9.57	3.53	13.09	Co(OH) 2
Co(OH) 3	-13.62	-15.93	-2.31	Co(OH) 3
CO2 (g)	-2.06	-20.21	-18.15	CO2
Co3(AsO4) 2	-29.69	-16.65	13.03	Co3(AsO4) 2
Co3O4	-17.84	-28.34	-10.50	Co3O4
CoCl2	-26.58	-18.31	8.27	CoCl2
CoCl2:6H2O	-20.85	-18.31	2.54	CoCl2:6H2O
CoCO3	-6.70	-16.68	-9.98	CoCO3
CoF2	-16.86	-18.46	-1.60	CoF2
CoF3	-47.45	-48.91	-1.46	CoF3
CoFe2O4	15.95	12.43	-3.53	CoFe2O4
CoMoO4	-9.16	-16.92	-7.76	CoMoO4
CoO	-10.06	3.53	13.59	CoO
CoS (alpha)	-75.54	-82.98	-7.44	CoS
CoS (beta)	-71.91	-82.98	-11.07	CoS
CoSe	-28.02	-44.22	-16.20	CoSe
CoSeO3	-12.76	-11.44	1.32	CoSeO3
CoSeO4:6H2O	-20.35	-21.88	-1.53	CoSeO4:6H2O
CoSO4	-15.93	-13.13	2.80	CoSO4
CoSO4:6H2O	-10.66	-13.13	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.05	-79.35	-22.30	CuS
Cr(OH) 2	-24.21	-13.39	10.82	Cr(OH) 2
Cr(OH) 3	-4.74	-3.40	1.34	Cr(OH) 3
Cr(OH) 3 (am)	-2.65	-3.40	-0.75	Cr(OH) 3
Cr2O3	-4.44	-6.80	-2.36	Cr2O3
CrCl2	-49.33	-35.24	14.09	CrCl2
CrCl3	-51.28	-36.17	15.11	CrCl3
CrF3	-25.04	-36.38	-11.34	CrF3
Crmetal	-69.75	-39.27	30.48	Cr
CrO3	-28.75	-31.96	-3.21	CrO3
Cryolite	-14.90	-48.74	-33.84	Na3AlF6
Cu(OH) 2	-1.52	7.15	8.67	Cu(OH) 2
Cu(SbO3) 2	-26.99	18.22	45.21	Cu(SbO3) 2
Cu2(OH) 3NO3	-11.00	-1.75	9.25	Cu2(OH) 3NO3
Cu2Sb:3H2O	-59.04	-93.92	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.14	-53.94	-45.80	Cu2Se
Cu2SO4	-20.90	-22.85	-1.95	Cu2SO4
Cu3(AsO4) 2:2H2O	-11.89	-5.79	6.10	Cu3(AsO4) 2:2H2O
Cu3Sb	-64.67	-107.26	-42.59	Cu3Sb

Cu3Se2	-31.04	-94.53	-63.49	Cu3Se2
CuCO3	-1.56	-13.06	-11.50	CuCO3
CuCrO4	-19.37	-24.81	-5.44	CuCrO4
CuF	-9.19	-14.09	-4.91	CuF
CuF2	-15.95	-14.84	1.12	CuF2
CuF2:2H2O	-10.29	-14.84	-4.55	CuF2:2H2O
Cumetal	-7.28	-16.04	-8.76	Cu
CuMoO4	-0.22	-13.29	-13.08	CuMoO4
CuOCuSO4	-12.66	-2.35	10.30	CuOCuSO4
Cupricferrite	10.06	16.05	5.99	CuFe2O4
Cuprite	-4.79	-6.19	-1.41	Cu2O
Cuprousferrite	10.27	1.35	-8.92	CuFeO2
CuSe	-7.49	-40.59	-33.10	CuSe
CuSe2	-29.10	-62.46	-33.37	CuSe2
CuSeO3:2H2O	-8.33	-7.82	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.81	-18.25	-2.44	CuSeO4:5H2O
CuSO4	-12.45	-9.51	2.94	CuSO4
Diaspore	2.66	9.53	6.87	AlOOH
Djurleite	-57.90	-91.82	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.63	-22.17	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.08	-22.17	-17.09	CaMg(CO3)2
Epsomite	-5.69	-7.82	-2.13	MgSO4:7H2O
Fe(OH)2	-9.02	4.54	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	4.21	1.17	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.16	-9.88	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-7.63	-6.08	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.40	-36.02	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.34	-41.07	-3.73	Fe2(SO4)3
Fe3(OH)8	-6.78	13.44	20.22	Fe3(OH)8
FeAsO4:2H2O	-9.57	-9.17	0.40	FeAsO4:2H2O
FeCr2O4	-9.46	-2.26	7.20	FeCr2O4
FeMoO4	-5.81	-15.90	-10.09	FeMoO4
Ferrihydrite	1.26	4.45	3.19	Fe(OH)3
Ferroselite	-46.47	-65.07	-18.60	FeSe2
FeS(ppt)	-79.01	-81.96	-2.95	FeS
FeSe	-32.20	-43.20	-11.00	FeSe
Fix_pe	-6.45	-6.45	0.00	e-
Fluorite	-2.07	-12.57	-10.50	CaF2
Galena	-68.33	-82.30	-13.97	PbS
Gibbsite	1.24	9.53	8.29	Al(OH)3
Goethite	3.96	4.45	0.49	FeOOH
Goslarite	-8.70	-10.72	-2.01	ZnSO4:7H2O
Greenockite	-68.21	-82.57	-14.36	CdS
Greigite	-287.55	-332.58	-45.03	Fe3S4
Gummite	-5.39	2.28	7.67	UO3
Gypsum	-2.63	-7.24	-4.61	CaSO4:2H2O
H-Jarosite	-7.87	-19.97	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.57	-20.45	-12.88	H2MoO4
H2S(g)	-78.50	-86.51	-8.01	H2S
H2Se(g)	-42.78	-47.74	-4.96	H2Se
Halite	-9.96	-8.36	1.60	NaCl
Hausmannite	-14.39	46.64	61.03	Mn3O4
Hematite	10.31	8.90	-1.42	Fe2O3
Hercynite	0.71	23.61	22.89	FeAl2O4
Hg(CH3)2(g)	-186.41	-260.12	-73.71	Hg(CH3)2
Hg(g)	-9.09	-16.96	-7.87	Hg
Hg(OH)2	-9.18	-12.68	-3.50	Hg(OH)2
Hg2(g)	-18.97	-33.93	-14.96	Hg2
Hg2(OH)2	-13.31	-8.05	5.26	Hg2(OH)2
Hg2CO3	-12.21	-28.26	-16.05	Hg2CO3
Hg2CrO4	-31.31	-40.01	-8.70	Hg2CrO4
Hg2F2	-19.68	-30.04	-10.36	Hg2F2
Hg2S	-82.88	-94.56	-11.68	Hg2S
Hg2SeO3	-18.37	-23.03	-4.66	Hg2SeO3
Hg2SO4	-18.58	-24.71	-6.13	Hg2SO4
Hg3O2CO3	-28.57	-58.25	-29.68	Hg3O2CO3
HgCl(g)	-34.44	-14.95	19.50	HgCl
HgCl2	-13.26	-34.52	-21.26	HgCl2

HgF(g)	-47.70	-15.02	32.68	HgF
HgF2(g)	-47.23	-34.67	12.57	HgF2
Hgmetal(l)	-3.51	-16.96	-13.45	Hg
HgSe	-4.73	-60.42	-55.69	HgSe
HgSeO3	-15.22	-27.65	-12.43	HgSeO3
HgSO4	-19.92	-29.34	-9.42	HgSO4
Huntite	-14.94	-44.91	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.02	-27.79	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-27.87	-36.64	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-16.30	-21.47	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-2.85	-17.65	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-42.05	-59.29	-17.24	K2Cr2O7
K2CrO4	-26.82	-27.33	-0.51	K2CrO4
K2MoO4	-19.08	-15.81	3.26	K2MoO4
K2SeO4	-20.04	-20.77	-0.73	K2SeO4
Langite	-5.54	11.95	17.49	Cu4(OH)6SO4·H2O
Larnakite	-7.80	-8.24	-0.43	PbO·PbSO4
Laurionite	-7.34	-6.71	0.62	PbOHCl
Lepidocrocite	3.08	4.45	1.37	FeOOH
Lime	-23.29	9.41	32.70	CaO
Litharge	-8.48	4.21	12.69	PbO
Mackinawite	-78.36	-81.96	-3.60	FeS
Maghemite	2.51	8.90	6.39	Fe2O3
Magnesioferrite	0.88	17.74	16.86	Fe2MgO4
Magnesite	-3.91	-11.37	-7.46	MgCO3
Magnetite	10.04	13.44	3.40	Fe3O4
Malachite	-0.60	-5.91	-5.31	Cu2(OH)2CO3
Manganite	-5.48	19.86	25.34	MnOOH
Massicot	-8.68	4.21	12.89	PbO
Matlockite	-8.73	-17.71	-8.97	PbClF
Melanothallite	-20.95	-14.69	6.26	CuCl2
Melanterite	-9.91	-12.12	-2.21	FeSO4·7H2O
Metacinnabar	-54.09	-99.19	-45.09	HgS
Mg(OH)2(active)	-9.95	8.84	18.79	Mg(OH)2
Mg(VO3)2	-16.86	-5.58	11.28	Mg(VO3)2
Mg2Sb3	-286.23	-211.54	74.68	Mg2Sb3
Mg2V2O7	-23.10	3.26	26.36	Mg2V2O7
MgCr2O4	-14.16	2.04	16.20	MgCr2O4
MgCrO4	-28.50	-23.12	5.38	MgCrO4
MgF2	-5.02	-13.15	-8.13	MgF2
MgMoO4	-9.76	-11.61	-1.85	MgMoO4
MgSeO3·6H2O	-9.19	-6.13	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-15.36	-16.56	-1.20	MgSeO4·6H2O
Minium	-35.02	38.51	73.52	Pb3O4
Mirabilite	-10.42	-11.53	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.40	-7.50	4.90	Mn(VO3)2
Mn2(SO4)3	-55.24	-60.95	-5.71	Mn2(SO4)3
Mn2Sb	-158.15	-97.07	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-18.98	-6.48	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-17.64	-14.92	2.72	MnCl2·4H2O
MnS(grn)	-79.75	-79.58	0.17	MnS
MnS(pnk)	-82.92	-79.58	3.34	MnS
MnSb	-100.55	-103.46	-2.91	MnSb
MnSe	-44.32	-40.82	3.50	MnSe
MnSeO3	-9.18	-8.05	1.13	MnSeO3
MnSeO3·2H2O	-9.03	-8.05	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-16.43	-18.48	-2.05	MnSeO4·5H2O
MnSO4	-12.32	-9.74	2.58	MnSO4
Monteponite	-11.17	3.94	15.10	CdO
Montroydite	-9.04	-12.68	-3.64	HgO
MoO3	-12.45	-20.45	-8.00	MoO3
Morenosite	-11.81	-13.96	-2.14	NiSO4·7H2O
MoS2	-149.07	-219.33	-70.26	MoS2
Na-Jarosite	-6.21	-17.41	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-48.90	-58.80	-9.90	Na2Cr2O7
Na2CrO4	-29.76	-26.83	2.93	Na2CrO4
Na2Mo2O7	-19.17	-35.77	-16.60	Na2Mo2O7
Na2MoO4	-16.81	-15.32	1.49	Na2MoO4

Na2MoO4:2H2O	-16.54	-15.32	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.15	-9.85	10.30	Na2SeO3:5H2O
Na2SeO4	-21.56	-20.28	1.28	Na2SeO4
Na3Sb	-184.74	-90.28	94.45	Na3Sb
Na3VO4	-36.20	0.48	36.68	Na3VO4
Na4V2O7	-41.57	-4.17	37.40	Na4V2O7
Nantokite	-7.29	-14.02	-6.73	CuCl
NaSb	-92.70	-69.53	23.17	NaSb
Natron	-13.77	-15.08	-1.31	Na2CO3:10H2O
NaVO3	-8.50	-4.65	3.86	NaVO3
Nesquehonite	-6.70	-11.37	-4.67	MgCO3:3H2O
Ni(OH)2	-10.09	2.70	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-34.84	-19.14	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-37.86	-5.86	32.00	Ni4(OH)6SO4
NiCO3	-10.64	-17.51	-6.87	NiCO3
NiMoO4	-6.60	-17.75	-11.14	NiMoO4
NiS(alpha)	-78.21	-83.81	-5.60	NiS
NiS(beta)	-72.71	-83.81	-11.10	NiS
NiS(gamma)	-71.01	-83.81	-12.80	NiS
NiSe	-27.34	-45.04	-17.70	NiSe
NiSeO3:2H2O	-15.09	-12.27	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-21.18	-22.70	-1.52	NiSeO4:6H2O
Nsutite	-10.06	7.45	17.50	MnO2
O2(g)	-31.34	51.75	83.09	O2
Orpiment	-239.65	-300.71	-61.07	As2S3
Otavite	-4.27	-16.27	-12.00	CdCO3
Pb(BO2)2	-15.02	-8.50	6.52	Pb(BO2)2
Pb(OH)2	-3.94	4.21	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-70.41	-79.17	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-11.30	-2.50	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.77	8.42	26.19	Pb2O(OH)2
Pb2O3	-26.74	34.30	61.04	Pb2O3
Pb2OCO3	-11.23	-11.79	-0.56	Pb2OCO3
Pb2V2O7	-4.10	-6.00	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.41	-14.61	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.93	-1.79	6.14	Pb3(VO4)2
Pb3O2CO3	-18.60	-7.58	11.02	Pb3O2CO3
Pb3O2SO4	-14.72	-4.03	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.92	0.18	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.70	0.18	21.88	Pb4O3SO4
PbCrO4	-15.15	-27.75	-12.60	PbCrO4
PbF2	-10.34	-17.78	-7.44	PbF2
Pbmetal	-25.91	-21.67	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.77	4.21	12.98	PbO:0.33H2O
PbSeO4	-14.36	-21.20	-6.84	PbSeO4
Periclase	-12.74	8.84	21.58	MgO
Phosgenite	-13.83	-33.64	-19.81	PbCl2:PbCO3
Plattnerite	-19.51	30.09	49.60	PbO2
Portlandite	-13.39	9.41	22.80	Ca(OH)2
Pyrite	-124.08	-142.59	-18.51	FeS2
Pyrochroite	-8.27	6.92	15.19	Mn(OH)2
Pyrolusite	-8.58	32.80	41.38	MnO2
Realgar	-100.30	-120.04	-19.75	AsS
Retgersite	-11.92	-13.96	-2.04	NiSO4:6H2O
Rhodochrosite	-2.71	-13.29	-10.58	MnCO3
Rutherfordine	-3.43	-17.93	-14.50	UO2CO3
Sb(OH)3	-13.23	-20.34	-7.11	Sb(OH)3
Sb2O4	-18.21	-14.81	3.40	Sb2O4
Sb2O5	-27.88	-37.55	-9.67	Sb2O5
Sb2Se3	-116.16	-183.92	-67.76	Sb2Se3
Sb4O6(cubic)	-63.10	-81.37	-18.26	Sb4O6
Sb4O6(orth)	-63.46	-81.37	-17.90	Sb4O6
SbCl3	-53.68	-53.11	0.57	SbCl3
SbF3	-43.10	-53.32	-10.23	SbF3
Sbmetal	-47.47	-59.16	-11.69	Sb
SbO2	-3.89	-31.71	-27.82	SbO2
Schoepite	-3.71	2.28	5.99	UO2(OH)2:H2O

Semetal (am)	-14.76	-21.87	-7.11	Se
Semetal (hex)	-14.16	-21.87	-7.71	Se
Senarmontite	-28.32	-40.68	-12.37	Sb2O3
SeO2	-15.10	-14.97	0.12	SeO2
SeO3	-46.45	-25.40	21.04	SeO3
Siderite	-5.43	-15.67	-10.24	FeCO3
Smithsonite	-4.27	-14.27	-10.00	ZnCO3
Sphalerite	-69.11	-80.56	-11.45	ZnS
Spinel	-8.94	27.90	36.85	MgAl2O4
Stibnite	-249.74	-300.20	-50.46	Sb2S3
Sulfur	-58.48	-60.63	-2.14	S
Tenorite	-0.49	7.15	7.64	CuO
Thenardite	-11.85	-11.53	0.32	Na2SO4
Thermonatrite	-15.72	-15.08	0.64	Na2CO3:H2O
Tyuyamunite	-4.52	-0.44	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.46	8.63	21.08	U3O8
U3Sb4	-587.40	-435.02	152.38	U3Sb4
U4O9	-28.61	-31.63	-3.02	U4O9
UF4	-28.81	-58.35	-29.54	UF4
UF4:2.5H2O	-25.63	-58.35	-32.72	UF4:2.5H2O
UO2 (am)	-15.31	-14.38	0.93	UO2
UO2 (NO3) 2	-41.96	-29.81	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.67	-29.81	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.20	-29.81	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.86	-29.81	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.33	2.28	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.87	-23.12	-2.25	UO2SeO4:4H2O
UO3	-5.42	2.28	7.70	UO3
Uraninite	-9.71	-14.38	-4.67	UO2
USb2	-223.24	-193.66	29.58	USb2
V (OH) 3	-18.08	-10.49	7.59	V (OH) 3
V2O5	-13.06	-14.42	-1.36	V2O5
V3O5	-37.45	-35.61	1.84	V3O5
V4O7	-46.04	-38.86	7.19	V4O7
V6O13	-34.15	-95.01	-60.86	V6O13
Valentinite	-32.20	-40.68	-8.48	Sb2O3
VC12	-64.14	-45.27	18.87	VC12
VC13	-66.69	-43.25	23.43	VC13
VF4	-62.15	-47.22	14.93	VF4
Vmetal	-93.33	-49.30	44.03	V
VO	-38.18	-23.43	14.76	VO
VO (OH) 2	-8.40	-3.24	5.15	VO (OH) 2
VO2Cl	-20.97	-18.13	2.84	VO2Cl
VOC1	-32.56	-21.41	11.15	VOC1
VOC12	-37.85	-25.09	12.76	VOC12
VOSO4	-23.51	-19.90	3.61	VOSO4
Witherite	-5.62	-14.19	-8.57	BaCO3
Wurtzite	-71.61	-80.56	-8.95	ZnS
Zincite	-5.39	5.94	11.33	ZnO
Zincosite	-14.65	-10.72	3.93	ZnSO4
Zn (BO2) 2	-15.06	-6.77	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-29.47	-26.16	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-6.26	5.94	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-6.53	5.94	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-5.81	5.94	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-5.59	5.94	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-5.79	5.94	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-12.28	-4.78	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-14.23	0.96	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-23.07	-9.42	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-34.40	-15.49	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-21.29	7.11	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-30.64	7.86	38.50	Zn5 (OH) 8Cl2
ZnCl2	-22.95	-15.90	7.05	ZnCl2
ZnCO3:1H2O	-4.01	-14.27	-10.26	ZnCO3:1H2O
ZnF2	-15.51	-16.05	-0.53	ZnF2
Znmetal	-45.72	-19.94	25.79	Zn
ZnMoO4	-4.38	-14.50	-10.13	ZnMoO4

ZnO(active)	-5.25	5.94	11.19	ZnO
ZnS(am)	-71.51	-80.56	-9.05	ZnS
ZnSb	-90.11	-79.09	11.01	ZnSb
ZnSe	-27.40	-41.80	-14.40	ZnSe
ZnSeO4:6H2O	-17.94	-19.46	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.08	-10.72	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 41.

```

REACTION 202
  H2O      -1
  4848.95 ### Addition step. Removes HTC water but solute mass remains
  USE solution 205
  SAVE Solution 206
  End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 205. Solution after simulation 40.
Using reaction 202.

Reaction 202.

4.849e+03 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	9.473e-05	9.486e-05
As	5.544e-08	5.552e-08
B	3.912e-05	3.918e-05
Ba	1.153e-05	1.155e-05
C	6.415e-02	6.424e-02
Ca	2.956e-02	2.960e-02
Cd	9.921e-08	9.935e-08
Cl	3.442e-03	3.447e-03
Co	3.973e-08	3.979e-08
Cr	1.573e-08	1.576e-08
Cu	2.238e-04	2.241e-04
F	3.089e-03	3.094e-03
Fe	2.228e-05	2.232e-05
Hg	3.553e-09	3.558e-09
K	6.149e-03	6.158e-03
Mg	7.858e-03	7.869e-03
Mn	9.575e-05	9.588e-05

Mo	3.698e-06	3.703e-06
N	2.255e-05	2.258e-05
Na	1.086e-02	1.088e-02
Ni	5.927e-09	5.935e-09
Pb	2.786e-07	2.790e-07
S	2.404e-02	2.408e-02
Sb	4.146e-08	4.152e-08
Se	3.109e-07	3.113e-07
U	1.042e-06	1.044e-06
V	9.037e-07	9.050e-07
Zn	1.008e-05	1.009e-05

-----Description of solution-----

	pH	=	6.349	Charge balance
	pe	=	6.646	Adjusted to redox
equilibrium				
	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.042e-01	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	3.821e-02	
	Total CO2 (mol/kg)	=	6.415e-02	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	28	
	Total H	=	1.112626e+02	
	Total O	=	5.587531e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	5.752e-07	4.480e-07	-6.240	-6.349	-0.109	0.00
OH-	2.957e-08	2.243e-08	-7.529	-7.649	-0.120	(0)
H2O	5.551e+01	9.977e-01	1.744	-0.001	0.000	18.07
Al	9.473e-05					
AlF4-	4.786e-05	3.703e-05	-4.320	-4.431	-0.111	(0)
AlF3	4.419e-05	4.419e-05	-4.355	-4.355	0.000	(0)
AlF2+	2.671e-06	2.099e-06	-5.573	-5.678	-0.105	(0)
AlF+2	8.272e-09	3.154e-09	-8.082	-8.501	-0.419	(0)
Al(OH)4-	1.230e-10	9.519e-11	-9.910	-10.021	-0.111	(0)
Al(OH)2+	9.589e-11	7.535e-11	-10.018	-10.123	-0.105	(0)
Al(OH)3	3.372e-11	3.372e-11	-10.472	-10.472	0.000	(0)
AlOH+2	1.110e-11	4.230e-12	-10.955	-11.374	-0.419	(0)
AlSO4+	9.788e-12	7.572e-12	-11.009	-11.121	-0.111	(0)
Al+3	1.788e-12	1.886e-13	-11.748	-12.724	-0.977	(0)
Al(SO4)2-	5.424e-13	4.196e-13	-12.266	-12.377	-0.111	(0)
AlMo6O21-3	2.826e-30	9.316e-32	-29.549	-31.031	-1.482	(0)
As (3)	1.364e-19					
H3AsO3	1.362e-19	1.362e-19	-18.866	-18.866	0.000	(0)
H2AsO3-	2.278e-22	1.559e-22	-21.642	-21.807	-0.165	(0)
H4AsO3+	4.417e-26	3.023e-26	-25.355	-25.520	-0.165	(0)
HAsO3-2	1.447e-27	3.175e-28	-26.840	-27.498	-0.659	(0)
AsO3-3	8.288e-34	2.732e-35	-33.082	-34.564	-1.482	(0)
As (5)	5.544e-08					
H2AsO4-	3.144e-08	2.152e-08	-7.503	-7.667	-0.165	(0)
HAsO4-2	2.400e-08	5.267e-09	-7.620	-8.278	-0.659	(0)
H3AsO4	1.635e-12	1.675e-12	-11.786	-11.776	0.010	(0)
AsO4-3	1.128e-12	3.718e-14	-11.948	-13.430	-1.482	(0)
B	3.912e-05					
H3BO3	3.898e-05	3.993e-05	-4.409	-4.399	0.010	(0)
H2BO3-	6.985e-08	5.176e-08	-7.156	-7.286	-0.130	(0)
BF(OH)3-	3.595e-08	2.664e-08	-7.444	-7.574	-0.130	(0)
CaH2BO3+	2.618e-08	1.940e-08	-7.582	-7.712	-0.130	(0)
MgH2BO3+	4.479e-09	3.319e-09	-8.349	-8.479	-0.130	(0)

	BF2 (OH) 2-	2.885e-09	2.138e-09	-8.540	-8.670	-0.130	(0)
	NaH2BO3	6.675e-10	6.675e-10	-9.176	-9.176	0.000	(0)
	BaH2BO3+	8.211e-12	6.085e-12	-11.086	-11.216	-0.130	(0)
	H5 (BO3) 2-	2.374e-12	1.759e-12	-11.625	-11.755	-0.130	(0)
	BF3OH-	8.426e-13	6.244e-13	-12.074	-12.205	-0.130	(0)
	H8 (BO3) 3-	9.478e-15	7.024e-15	-14.023	-14.153	-0.130	(0)
	BF4-	3.113e-15	2.307e-15	-14.507	-14.637	-0.130	(0)
Ba	1.153e-05						
	Ba+2	1.034e-05	3.804e-06	-4.986	-5.420	-0.434	(0)
	BaHCO3+	1.189e-06	9.428e-07	-5.925	-6.026	-0.101	(0)
	BaCO3	5.298e-09	5.298e-09	-8.276	-8.276	0.000	(0)
	BaH2BO3+	8.211e-12	6.085e-12	-11.086	-11.216	-0.130	(0)
	BaNO3+	7.043e-13	4.821e-13	-12.152	-12.317	-0.165	(0)
	BaOH+	4.771e-13	3.724e-13	-12.321	-12.429	-0.108	(0)
	BaNH3+2	9.412e-14	2.065e-14	-13.026	-13.685	-0.659	(0)
C (4)	6.415e-02						
	HCO3-	3.303e-02	2.595e-02	-1.481	-1.586	-0.105	(0)
	H2CO3	2.615e-02	2.615e-02	-1.583	-1.583	0.000	(0)
	CaHCO3+	3.968e-03	3.147e-03	-2.401	-2.502	-0.101	(0)
	MgHCO3+	6.409e-04	4.911e-04	-3.193	-3.309	-0.116	(0)
	CuCO3	1.550e-04	1.550e-04	-3.810	-3.810	0.000	(0)
	NaHCO3	1.188e-04	1.188e-04	-3.925	-3.925	0.000	(0)
	CaCO3	2.804e-05	2.804e-05	-4.552	-4.552	0.000	(0)
	CuHCO3+	2.319e-05	1.587e-05	-4.635	-4.799	-0.165	(0)
	MnHCO3+	1.020e-05	7.959e-06	-4.992	-5.099	-0.108	(0)
	CO3-2	7.380e-06	2.716e-06	-5.132	-5.566	-0.434	(0)
	Cu (CO3) 2-2	5.164e-06	1.133e-06	-5.287	-5.946	-0.659	(0)
	MgCO3	4.177e-06	4.177e-06	-5.379	-5.379	0.000	(0)
	ZnHCO3+	2.198e-06	1.504e-06	-5.658	-5.823	-0.165	(0)
	BaHCO3+	1.189e-06	9.428e-07	-5.925	-6.026	-0.101	(0)
	UO2 (CO3) 3-4	9.667e-07	2.242e-09	-6.015	-8.649	-2.635	(0)
	NaCO3-	5.237e-07	4.115e-07	-6.281	-6.386	-0.105	(0)
	ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
	PbHCO3+	1.841e-07	1.260e-07	-6.735	-6.900	-0.165	(0)
	FeHCO3+	1.246e-07	9.881e-08	-6.905	-7.005	-0.101	(0)
	UO2 (CO3) 2-2	7.505e-08	1.647e-08	-7.125	-7.783	-0.659	(0)
	PbCO3	5.336e-08	5.336e-08	-7.273	-7.273	0.000	(0)
	CoHCO3+	1.351e-08	9.245e-09	-7.869	-8.034	-0.165	(0)
	BaCO3	5.298e-09	5.298e-09	-8.276	-8.276	0.000	(0)
	NiHCO3+	3.223e-09	2.206e-09	-8.492	-8.656	-0.165	(0)
	Pb (CO3) 2-2	1.905e-09	4.180e-10	-8.720	-9.379	-0.659	(0)
	CdHCO3+	1.755e-09	1.201e-09	-8.756	-8.920	-0.165	(0)
	CdCO3	1.259e-09	1.259e-09	-8.900	-8.900	0.000	(0)
	UO2CO3	3.039e-10	3.039e-10	-9.517	-9.517	0.000	(0)
	CoCO3	2.103e-10	2.103e-10	-9.677	-9.677	0.000	(0)
	NiCO3	6.985e-11	6.985e-11	-10.156	-10.156	0.000	(0)
	Cd (CO3) 2-2	1.155e-11	2.534e-12	-10.938	-11.596	-0.659	(0)
	HgCO3	8.667e-12	8.667e-12	-11.062	-11.062	0.000	(0)
	Hg (CO3) 2-2	3.392e-13	7.444e-14	-12.470	-13.128	-0.659	(0)
	HgHCO3+	1.056e-13	7.230e-14	-12.976	-13.141	-0.165	(0)
Ca	2.956e-02						
	Ca+2	1.770e-02	6.513e-03	-1.752	-2.186	-0.434	(0)
	CaSO4	7.716e-03	7.716e-03	-2.113	-2.113	0.000	(0)
	CaHCO3+	3.968e-03	3.147e-03	-2.401	-2.502	-0.101	(0)
	CaF+	1.523e-04	1.188e-04	-3.817	-3.925	-0.108	(0)
	CaCO3	2.804e-05	2.804e-05	-4.552	-4.552	0.000	(0)
	CaH2BO3+	2.618e-08	1.940e-08	-7.582	-7.712	-0.130	(0)
	CaOH+	3.674e-09	2.914e-09	-8.435	-8.535	-0.101	(0)
	CaNO3+	7.609e-10	5.208e-10	-9.119	-9.283	-0.165	(0)
	CaNH3+2	3.215e-10	7.056e-11	-9.493	-10.151	-0.659	(0)
	Ca (NH3) 2+2	1.102e-18	2.417e-19	-17.958	-18.617	-0.659	(0)
Cd	9.921e-08						
	Cd+2	5.524e-08	2.033e-08	-7.258	-7.692	-0.434	(0)
	CdSO4	2.465e-08	2.465e-08	-7.608	-7.608	0.000	(0)
	Cd (SO4) 2-2	7.836e-09	1.720e-09	-8.106	-8.765	-0.659	(0)
	CdCl+	7.604e-09	5.205e-09	-8.119	-8.284	-0.165	(0)
	CdHCO3+	1.755e-09	1.201e-09	-8.756	-8.920	-0.165	(0)
	CdCO3	1.259e-09	1.259e-09	-8.900	-8.900	0.000	(0)

	CdF+	7.871e-10	5.387e-10	-9.104	-9.269	-0.165	(0)
	CdCl2	5.817e-11	5.817e-11	-10.235	-10.235	0.000	(0)
	Cd(CO3) 2-2	1.155e-11	2.534e-12	-10.938	-11.596	-0.659	(0)
	CdOH+	5.291e-12	3.621e-12	-11.276	-11.441	-0.165	(0)
	CdOHC1	4.788e-12	4.788e-12	-11.320	-11.320	0.000	(0)
	CdF2	1.797e-12	1.797e-12	-11.745	-11.745	0.000	(0)
	CdCl3-	1.438e-13	9.840e-14	-12.842	-13.007	-0.165	(0)
	CdNO3+	2.375e-15	1.626e-15	-14.624	-14.789	-0.165	(0)
	Cd(OH) 2	5.124e-16	5.124e-16	-15.290	-15.290	0.000	(0)
	CdSeO4	8.367e-17	8.367e-17	-16.077	-16.077	0.000	(0)
	Cd2OH+3	1.119e-17	3.690e-19	-16.951	-18.433	-1.482	(0)
	Cd(SeO3) 2-2	2.583e-19	5.667e-20	-18.588	-19.247	-0.659	(0)
	Cd(OH) 3-	1.026e-21	7.021e-22	-20.989	-21.154	-0.165	(0)
	Cd(NO3) 2	2.060e-23	2.060e-23	-22.686	-22.686	0.000	(0)
	Cd(OH) 4-2	1.174e-29	2.577e-30	-28.930	-29.589	-0.659	(0)
	CdHS+	0.000e+00	0.000e+00	-78.446	-78.610	-0.165	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.333	-150.333	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-227.195	-227.359	-0.165	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-303.431	-304.090	-0.659	(0)
C1		3.442e-03					
	Cl-	3.442e-03	2.681e-03	-2.463	-2.572	-0.109	(0)
	MnCl+	6.646e-08	5.187e-08	-7.177	-7.285	-0.108	(0)
	CuCl+	5.374e-08	4.118e-08	-7.270	-7.385	-0.116	(0)
	ZnCl+	1.611e-08	1.234e-08	-7.793	-7.909	-0.116	(0)
	CdCl+	7.604e-09	5.205e-09	-8.119	-8.284	-0.165	(0)
	CuCl	3.623e-09	3.623e-09	-8.441	-8.441	0.000	(0)
	CuCl2-	2.648e-09	2.029e-09	-8.577	-8.693	-0.116	(0)
	HgCl2	1.916e-09	1.916e-09	-8.717	-8.717	0.000	(0)
	PbCl+	9.082e-10	6.216e-10	-9.042	-9.206	-0.165	(0)
	ZnOHC1	3.624e-10	3.624e-10	-9.441	-9.441	0.000	(0)
	HgClOH	2.831e-10	2.831e-10	-9.548	-9.548	0.000	(0)
	MnCl2	1.964e-10	1.964e-10	-9.707	-9.707	0.000	(0)
	HgCl3-	7.507e-11	5.138e-11	-10.125	-10.289	-0.165	(0)
	CoCl+	6.206e-11	4.247e-11	-10.207	-10.372	-0.165	(0)
	CdCl2	5.817e-11	5.817e-11	-10.235	-10.235	0.000	(0)
	ZnCl2	5.245e-11	5.245e-11	-10.280	-10.280	0.000	(0)
	CuCl2	3.828e-11	3.828e-11	-10.417	-10.417	0.000	(0)
	PbCl2	7.444e-12	7.444e-12	-11.128	-11.128	0.000	(0)
	NiCl+	6.909e-12	4.729e-12	-11.161	-11.325	-0.165	(0)
	CdOHC1	4.788e-12	4.788e-12	-11.320	-11.320	0.000	(0)
	CuCl3-2	3.134e-12	1.163e-12	-11.504	-11.934	-0.430	(0)
	HgCl4-2	2.499e-12	5.484e-13	-11.602	-12.261	-0.659	(0)
	HgCl+	2.084e-13	1.426e-13	-12.681	-12.846	-0.165	(0)
	MnCl3-	1.858e-13	1.451e-13	-12.731	-12.838	-0.108	(0)
	ZnCl3-	1.458e-13	1.117e-13	-12.836	-12.952	-0.116	(0)
	CdCl3-	1.438e-13	9.840e-14	-12.842	-13.007	-0.165	(0)
	CrCl+2	4.104e-14	9.007e-15	-13.387	-14.045	-0.659	(0)
	FeCl+2	2.710e-14	1.006e-14	-13.567	-13.997	-0.430	(0)
	PbCl3-	1.161e-14	7.945e-15	-13.935	-14.100	-0.165	(0)
	CuCl3-	1.250e-15	9.579e-16	-14.903	-15.019	-0.116	(0)
	ZnCl4-2	4.034e-16	1.497e-16	-15.394	-15.825	-0.430	(0)
	UO2Cl+	1.785e-16	1.222e-16	-15.748	-15.913	-0.165	(0)
	FeCl2+	1.543e-16	1.205e-16	-15.812	-15.919	-0.108	(0)
	VOCl+	9.430e-17	6.454e-17	-16.025	-16.190	-0.165	(0)
	NiCl2	6.383e-17	6.383e-17	-16.195	-16.195	0.000	(0)
	PbCl4-2	4.437e-17	9.737e-18	-16.353	-17.012	-0.659	(0)
	CrOHC12	1.029e-17	1.029e-17	-16.987	-16.987	0.000	(0)
	CrCl2+	3.348e-18	2.291e-18	-17.475	-17.640	-0.165	(0)
	CuCl4-2	3.467e-20	1.287e-20	-19.460	-19.890	-0.430	(0)
	FeCl3	3.230e-20	3.230e-20	-19.491	-19.491	0.000	(0)
	CrO3Cl-	2.498e-26	1.710e-26	-25.602	-25.767	-0.165	(0)
	CoCl+2	2.004e-34	4.398e-35	-33.698	-34.357	-0.659	(0)
	UCl+3	0.000e+00	0.000e+00	-42.409	-43.891	-1.482	(0)
	Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-47.788	-48.447	-0.659	(0)
	Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-48.071	-48.730	-0.659	(0)
	Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-62.852	-63.510	-0.659	(0)
Co(2)		3.973e-08					
	Co+2	2.087e-08	4.580e-09	-7.681	-8.339	-0.659	(0)

CoHCO3+	1.351e-08	9.245e-09	-7.869	-8.034	-0.165	(0)
CoSO4	4.726e-09	4.726e-09	-8.326	-8.326	0.000	(0)
CoF+	3.538e-10	2.421e-10	-9.451	-9.616	-0.165	(0)
CoCO3	2.103e-10	2.103e-10	-9.677	-9.677	0.000	(0)
CoCl+	6.206e-11	4.247e-11	-10.207	-10.372	-0.165	(0)
CoOH+	2.994e-12	2.049e-12	-11.524	-11.688	-0.165	(0)
CoNO2+	4.556e-13	3.118e-13	-12.341	-12.506	-0.165	(0)
Co (NH3) +2	2.159e-14	4.738e-15	-13.666	-14.324	-0.659	(0)
Co (OH) 2	3.650e-15	3.650e-15	-14.438	-14.438	0.000	(0)
CoNO3+	2.682e-16	1.835e-16	-15.572	-15.736	-0.165	(0)
CoSeO4	5.074e-17	5.074e-17	-16.295	-16.295	0.000	(0)
Co2OH+3	1.427e-20	4.703e-22	-19.846	-21.328	-1.482	(0)
Co (NH3) 2+2	7.927e-21	1.740e-21	-20.101	-20.760	-0.659	(0)
Co (OH) 3-	2.387e-21	1.633e-21	-20.622	-20.787	-0.165	(0)
CoOOH-	6.002e-22	4.108e-22	-21.222	-21.386	-0.165	(0)
Co (NO3) 2	9.444e-24	9.444e-24	-23.025	-23.025	0.000	(0)
Co (NH3) 3+2	8.588e-28	1.885e-28	-27.066	-27.725	-0.659	(0)
Co (OH) 4-2	2.646e-29	5.806e-30	-28.577	-29.236	-0.659	(0)
Co (NH3) 4+2	3.879e-35	8.512e-36	-34.411	-35.070	-0.659	(0)
Co4 (OH) 4+4	1.517e-36	3.518e-39	-35.819	-38.454	-2.635	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.257	-42.915	-0.659	(0)
Co (3)	4.187e-29					
CoOH+2	4.187e-29	9.189e-30	-28.378	-29.037	-0.659	(0)
Co+3	7.643e-34	8.063e-35	-33.117	-34.094	-0.977	(0)
CoCl+2	2.004e-34	4.398e-35	-33.698	-34.357	-0.659	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.071	-48.730	-0.659	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.135	-58.300	-0.165	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.852	-63.510	-0.659	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.729	-64.388	-0.659	(0)
Cr (2)	6.390e-25					
Cr+2	6.390e-25	1.402e-25	-24.195	-24.853	-0.659	(0)
Cr (3)	1.573e-08					
Cr (OH) +2	5.804e-09	1.274e-09	-8.236	-8.895	-0.659	(0)
Cr (OH) 2+	5.078e-09	3.476e-09	-8.294	-8.459	-0.165	(0)
CrF+2	3.135e-09	6.879e-10	-8.504	-9.162	-0.659	(0)
CrOHSO4	1.563e-09	1.563e-09	-8.806	-8.806	0.000	(0)
Cr+3	7.876e-11	2.596e-12	-10.104	-11.586	-1.482	(0)
CrSO4+	4.581e-11	3.135e-11	-10.339	-10.504	-0.165	(0)
Cr (OH) 3	2.928e-11	2.928e-11	-10.533	-10.533	0.000	(0)
CrO2-	4.545e-14	3.111e-14	-13.342	-13.507	-0.165	(0)
CrCl+2	4.104e-14	9.007e-15	-13.387	-14.045	-0.659	(0)
Cr (OH) 4-	3.819e-14	2.614e-14	-13.418	-13.583	-0.165	(0)
Cr2 (OH) 2SO4+2	8.201e-16	1.800e-16	-15.086	-15.745	-0.659	(0)
Cr2 (OH) 2 (SO4) 2	5.529e-17	5.529e-17	-16.257	-16.257	0.000	(0)
CrOHC12	1.029e-17	1.029e-17	-16.987	-16.987	0.000	(0)
CrCl2+	3.348e-18	2.291e-18	-17.475	-17.640	-0.165	(0)
CrNO3+2	1.308e-20	2.870e-21	-19.884	-20.542	-0.659	(0)
Cr (NH3) 5OH+2	2.951e-39	6.477e-40	-38.530	-39.189	-0.659	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-45.495	-46.977	-1.482	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-47.788	-48.447	-0.659	(0)
Cr (6)	7.664e-18					
CrO4-2	4.233e-18	1.558e-18	-17.373	-17.807	-0.434	(0)
HCrO4-	3.300e-18	2.258e-18	-17.482	-17.646	-0.165	(0)
NaCrO4-	9.203e-20	6.299e-20	-19.036	-19.201	-0.165	(0)
KCrO4-	3.909e-20	2.675e-20	-19.408	-19.573	-0.165	(0)
CrO3SO4-2	7.279e-24	1.597e-24	-23.138	-23.797	-0.659	(0)
H2CrO4	8.200e-25	8.200e-25	-24.086	-24.086	0.000	(0)
CrO3Cl-	2.498e-26	1.710e-26	-25.602	-25.767	-0.165	(0)
Cr2O7-2	8.077e-34	1.772e-34	-33.093	-33.751	-0.659	(0)
Cu (1)	7.843e-09					
CuCl	3.623e-09	3.623e-09	-8.441	-8.441	0.000	(0)
CuCl2-	2.648e-09	2.029e-09	-8.577	-8.693	-0.116	(0)
Cu+	1.568e-09	1.073e-09	-8.805	-8.969	-0.165	(0)
CuCl3-2	3.134e-12	1.163e-12	-11.504	-11.934	-0.430	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.304	-150.735	-0.431	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.059	-151.465	-0.406	(0)
Cu (2)	2.238e-04					
CuCO3	1.550e-04	1.550e-04	-3.810	-3.810	0.000	(0)

	Cu+2	2.634e-05	9.692e-06	-4.579	-5.014	-0.434	(0)
	CuHCO3+	2.319e-05	1.587e-05	-4.635	-4.799	-0.165	(0)
	CuSO4	1.148e-05	1.148e-05	-4.940	-4.940	0.000	(0)
	Cu (CO3) 2-2	5.164e-06	1.133e-06	-5.287	-5.946	-0.659	(0)
	CuF+	1.494e-06	1.023e-06	-5.826	-5.990	-0.165	(0)
	CuOH+	8.970e-07	6.874e-07	-6.047	-6.163	-0.116	(0)
	Cu2 (OH) 2+2	5.408e-08	1.187e-08	-7.267	-7.926	-0.659	(0)
	CuCl+	5.374e-08	4.118e-08	-7.270	-7.385	-0.116	(0)
	CuNO2+	1.433e-08	9.806e-09	-7.844	-8.009	-0.165	(0)
	CuNH3+2	3.889e-09	8.535e-10	-8.410	-9.069	-0.659	(0)
	Cu (OH) 2	3.076e-09	3.076e-09	-8.512	-8.512	0.000	(0)
	CuCl2	3.828e-11	3.828e-11	-10.417	-10.417	0.000	(0)
	CuNO3+	1.132e-12	7.751e-13	-11.946	-12.111	-0.165	(0)
	Cu (NO2) 2	9.695e-13	9.695e-13	-12.013	-12.013	0.000	(0)
	Cu (OH) 3-	2.067e-13	1.415e-13	-12.685	-12.849	-0.165	(0)
	CuCl3-	1.250e-15	9.579e-16	-14.903	-15.019	-0.116	(0)
	Cu (OH) 4-2	1.138e-19	2.497e-20	-18.944	-19.603	-0.659	(0)
	CuCl4-2	3.467e-20	1.287e-20	-19.460	-19.890	-0.430	(0)
	Cu (NO3) 2	2.467e-21	2.467e-21	-20.608	-20.608	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.729	-215.894	-0.165	(0)
F		3.089e-03					
	F-	2.147e-03	1.672e-03	-2.668	-2.777	-0.109	(0)
	MgF+	4.484e-04	3.469e-04	-3.348	-3.460	-0.111	(0)
	CaF+	1.523e-04	1.188e-04	-3.817	-3.925	-0.108	(0)
	AlF4-	4.786e-05	3.703e-05	-4.320	-4.431	-0.111	(0)
	AlF3	4.419e-05	4.419e-05	-4.355	-4.355	0.000	(0)
	NaF	8.584e-06	8.584e-06	-5.066	-5.066	0.000	(0)
	AlF2+	2.671e-06	2.099e-06	-5.573	-5.678	-0.105	(0)
	CuF+	1.494e-06	1.023e-06	-5.826	-5.990	-0.165	(0)
	MnF+	1.311e-06	1.023e-06	-5.882	-5.990	-0.108	(0)
	HF	1.108e-06	1.108e-06	-5.956	-5.956	0.000	(0)
	ZnF+	8.935e-08	6.115e-08	-7.049	-7.214	-0.165	(0)
	BF (OH) 3-	3.595e-08	2.664e-08	-7.444	-7.574	-0.130	(0)
	FeF3	2.404e-08	2.404e-08	-7.619	-7.619	0.000	(0)
	FeF2+	1.306e-08	1.019e-08	-7.884	-7.992	-0.108	(0)
	HF2-	9.286e-09	7.043e-09	-8.032	-8.152	-0.120	(0)
	AlF+2	8.272e-09	3.154e-09	-8.082	-8.501	-0.419	(0)
	CrF+2	3.135e-09	6.879e-10	-8.504	-9.162	-0.659	(0)
	BF2 (OH) 2-	2.885e-09	2.138e-09	-8.540	-8.670	-0.130	(0)
	PbF+	1.125e-09	7.700e-10	-8.949	-9.114	-0.165	(0)
	CdF+	7.871e-10	5.387e-10	-9.104	-9.269	-0.165	(0)
	FeF+2	6.137e-10	2.278e-10	-9.212	-9.642	-0.430	(0)
	CoF+	3.538e-10	2.421e-10	-9.451	-9.616	-0.165	(0)
	NiF+	4.230e-11	2.895e-11	-10.374	-10.538	-0.165	(0)
	UO2F2	3.128e-11	3.128e-11	-10.505	-10.505	0.000	(0)
	PbF2	2.534e-11	2.534e-11	-10.596	-10.596	0.000	(0)
	UO2F3-	1.919e-11	1.314e-11	-10.717	-10.882	-0.165	(0)
	UO2F+	9.477e-12	6.487e-12	-11.023	-11.188	-0.165	(0)
	VO2F	6.918e-12	6.918e-12	-11.160	-11.160	0.000	(0)
	VO2F2-	6.136e-12	4.200e-12	-11.212	-11.377	-0.165	(0)
	H2F2	3.288e-12	3.288e-12	-11.483	-11.483	0.000	(0)
	CdF2	1.797e-12	1.797e-12	-11.745	-11.745	0.000	(0)
	BF3OH-	8.426e-13	6.244e-13	-12.074	-12.205	-0.130	(0)
	UO2F4-2	7.951e-13	1.745e-13	-12.100	-12.758	-0.659	(0)
	VO2F3-2	3.991e-13	8.759e-14	-12.399	-13.058	-0.659	(0)
	VOF+	1.257e-13	8.606e-14	-12.901	-13.065	-0.165	(0)
	PbF3-	1.174e-13	8.035e-14	-12.930	-13.095	-0.165	(0)
	VOF2	5.396e-14	5.396e-14	-13.268	-13.268	0.000	(0)
	VOF3-	4.677e-15	3.201e-15	-14.330	-14.495	-0.165	(0)
	BF4-	3.113e-15	2.307e-15	-14.507	-14.637	-0.130	(0)
	VO2F4-3	2.186e-15	7.206e-17	-14.660	-16.142	-1.482	(0)
	PbF4-2	2.930e-16	6.430e-17	-15.533	-16.192	-0.659	(0)
	VOF4-2	9.844e-17	2.160e-17	-16.007	-16.665	-0.659	(0)
	HgF+	2.414e-19	1.653e-19	-18.617	-18.782	-0.165	(0)
	Sb (OH) 2F	3.649e-22	3.649e-22	-21.438	-21.438	0.000	(0)
	SbOF	3.597e-22	3.597e-22	-21.444	-21.444	0.000	(0)
	UF3+	2.599e-30	1.779e-30	-29.585	-29.750	-0.165	(0)
	UF4	3.261e-31	3.261e-31	-30.487	-30.487	0.000	(0)

UF6-2	4.972e-32	1.091e-32	-31.303	-31.962	-0.659	(0)
UF5-	3.157e-32	2.161e-32	-31.501	-31.665	-0.165	(0)
UF2+2	3.059e-32	6.713e-33	-31.514	-32.173	-0.659	(0)
UF+3	9.675e-36	3.189e-37	-35.014	-36.496	-1.482	(0)
Fe (2)	1.887e-06					
Fe+2	1.378e-06	3.024e-07	-5.861	-6.519	-0.659	(0)
FeSO4	3.839e-07	3.839e-07	-6.416	-6.416	0.000	(0)
FeHCO3+	1.246e-07	9.881e-08	-6.905	-7.005	-0.101	(0)
FeOH+	3.459e-10	2.700e-10	-9.461	-9.569	-0.108	(0)
Fe (OH) 2	4.810e-15	4.810e-15	-14.318	-14.318	0.000	(0)
Fe (OH) 3-	4.370e-17	3.411e-17	-16.360	-16.467	-0.108	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.422	-155.422	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.147	-232.312	-0.165	(0)
Fe (3)	2.040e-05					
Fe (OH) 2+	1.998e-05	1.570e-05	-4.699	-4.804	-0.105	(0)
Fe (OH) 3	3.781e-07	3.781e-07	-6.422	-6.422	0.000	(0)
FeF3	2.404e-08	2.404e-08	-7.619	-7.619	0.000	(0)
FeF2+	1.306e-08	1.019e-08	-7.884	-7.992	-0.108	(0)
FeOH+2	4.847e-09	1.799e-09	-8.315	-8.745	-0.430	(0)
Fe (OH) 4-	1.005e-09	7.894e-10	-8.998	-9.103	-0.105	(0)
FeF+2	6.137e-10	2.278e-10	-9.212	-9.642	-0.430	(0)
FeSO4+	9.237e-12	7.210e-12	-11.034	-11.142	-0.108	(0)
Fe+3	1.178e-12	1.242e-13	-11.929	-12.906	-0.977	(0)
Fe (SO4) 2-	1.165e-12	7.973e-13	-11.934	-12.098	-0.165	(0)
Fe2 (OH) 2+4	4.621e-14	1.072e-16	-13.335	-15.970	-2.635	(0)
FeCl+2	2.710e-14	1.006e-14	-13.567	-13.997	-0.430	(0)
Fe3 (OH) 4+5	3.181e-16	2.432e-20	-15.497	-19.614	-4.117	(0)
FeHSeO3+2	3.096e-16	6.795e-17	-15.509	-16.168	-0.659	(0)
FeCl2+	1.543e-16	1.205e-16	-15.812	-15.919	-0.108	(0)
FeNO3+2	1.432e-19	3.142e-20	-18.844	-19.503	-0.659	(0)
FeCl3	3.230e-20	3.230e-20	-19.491	-19.491	0.000	(0)
H (0)	1.418e-29					
H2	7.092e-30	7.264e-30	-29.149	-29.139	0.010	(0)
Hg (0)	1.258e-09					
Hg	1.258e-09	1.258e-09	-8.900	-8.900	0.000	(0)
Hg (1)	2.076e-17					
Hg2+2	1.038e-17	2.278e-18	-16.984	-17.643	-0.659	(0)
Hg (2)	2.295e-09					
HgCl2	1.916e-09	1.916e-09	-8.717	-8.717	0.000	(0)
HgClOH	2.831e-10	2.831e-10	-9.548	-9.548	0.000	(0)
HgCl3-	7.507e-11	5.138e-11	-10.125	-10.289	-0.165	(0)
HgCO3	8.667e-12	8.667e-12	-11.062	-11.062	0.000	(0)
Hg (OH) 2	8.261e-12	8.461e-12	-11.083	-11.073	0.010	(0)
HgCl4-2	2.499e-12	5.484e-13	-11.602	-12.261	-0.659	(0)
Hg (CO3) 2-2	3.392e-13	7.444e-14	-12.470	-13.128	-0.659	(0)
HgCl+	2.084e-13	1.426e-13	-12.681	-12.846	-0.165	(0)
HgHCO3+	1.056e-13	7.230e-14	-12.976	-13.141	-0.165	(0)
HgOH+	3.478e-15	2.381e-15	-14.459	-14.623	-0.165	(0)
Hg (NH3) 2+2	5.678e-16	1.246e-16	-15.246	-15.904	-0.659	(0)
HgNH3+2	6.598e-17	1.448e-17	-16.181	-16.839	-0.659	(0)
Hg+2	1.215e-17	2.666e-18	-16.915	-17.574	-0.659	(0)
HgSO4	3.611e-18	3.611e-18	-17.442	-17.442	0.000	(0)
HgF+	2.414e-19	1.653e-19	-18.617	-18.782	-0.165	(0)
Hg (OH) 3-	3.490e-20	2.389e-20	-19.457	-19.622	-0.165	(0)
Hg (NH3) 3+2	1.945e-23	4.269e-24	-22.711	-23.370	-0.659	(0)
HgNO3+	3.637e-26	2.490e-26	-25.439	-25.604	-0.165	(0)
Hg (NH3) 4+2	1.330e-30	2.918e-31	-29.876	-30.535	-0.659	(0)
Hg (NO3) 2	2.617e-34	2.617e-34	-33.582	-33.582	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-136.986	-137.150	-0.165	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.105	-137.105	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.851	-139.510	-0.659	(0)
K	6.149e-03					
K+	5.934e-03	4.622e-03	-2.227	-2.335	-0.109	(0)
KSO4-	2.154e-04	1.692e-04	-3.667	-3.772	-0.105	(0)
KCrO4-	3.909e-20	2.675e-20	-19.408	-19.573	-0.165	(0)
Mg	7.858e-03					
Mg+2	5.024e-03	1.849e-03	-2.299	-2.733	-0.434	(0)
MgSO4	1.740e-03	1.740e-03	-2.759	-2.759	0.000	(0)

MgHCO3+	6.409e-04	4.911e-04	-3.193	-3.309	-0.116	(0)
MgF+	4.484e-04	3.469e-04	-3.348	-3.460	-0.111	(0)
MgCO3	4.177e-06	4.177e-06	-5.379	-5.379	0.000	(0)
MgOH+	2.066e-08	1.651e-08	-7.685	-7.782	-0.097	(0)
MgH2BO3+	4.479e-09	3.319e-09	-8.349	-8.479	-0.130	(0)
Mn (2)	9.575e-05					
Mn+2	7.004e-05	1.537e-05	-4.155	-4.813	-0.659	(0)
MnSO4	1.414e-05	1.414e-05	-4.850	-4.850	0.000	(0)
MnHCO3+	1.020e-05	7.959e-06	-4.992	-5.099	-0.108	(0)
MnF+	1.311e-06	1.023e-06	-5.882	-5.990	-0.108	(0)
MnCl+	6.646e-08	5.187e-08	-7.177	-7.285	-0.108	(0)
MnOH+	1.109e-09	8.658e-10	-8.955	-9.063	-0.108	(0)
MnCl2	1.964e-10	1.964e-10	-9.707	-9.707	0.000	(0)
MnNO3+	9.000e-13	6.160e-13	-12.046	-12.210	-0.165	(0)
MnCl3-	1.858e-13	1.451e-13	-12.731	-12.838	-0.108	(0)
MnSeO4	9.144e-14	9.144e-14	-13.039	-13.039	0.000	(0)
Mn (NO3) 2	3.913e-20	3.913e-20	-19.408	-19.408	0.000	(0)
Mn (OH) 3-	3.448e-21	2.691e-21	-20.462	-20.570	-0.108	(0)
Mn (OH) 4-2	5.249e-28	1.948e-28	-27.280	-27.710	-0.430	(0)
MnSe	0.000e+00	0.000e+00	-43.637	-43.637	0.000	(0)
Mn (3)	2.878e-23					
Mn+3	2.878e-23	3.036e-24	-22.541	-23.518	-0.977	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.436	-45.867	-0.430	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.468	-48.593	-0.125	(0)
Mo	3.698e-06					
MoO4-2	3.680e-06	1.354e-06	-5.434	-5.868	-0.434	(0)
HMoO4-	1.764e-08	1.207e-08	-7.754	-7.918	-0.165	(0)
H2MoO4	3.962e-11	3.962e-11	-10.402	-10.402	0.000	(0)
AlMo6O21-3	2.826e-30	9.316e-32	-29.549	-31.031	-1.482	(0)
Mo7O24-6	1.133e-33	1.338e-39	-32.946	-38.874	-5.928	(0)
HMo7O24-5	1.910e-35	1.460e-39	-34.719	-38.836	-4.117	(0)
H2Mo7O24-4	1.708e-38	0.000e+00	-37.767	-40.402	-2.635	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-42.023	-43.505	-1.482	(0)
N (-3)	9.617e-06					
NH4+	9.125e-06	6.762e-06	-5.040	-5.170	-0.130	(0)
NH4SO4-	4.801e-07	3.747e-07	-6.319	-6.426	-0.108	(0)
NH3	8.606e-09	8.606e-09	-8.065	-8.065	0.000	(0)
CuNH3+2	3.889e-09	8.535e-10	-8.410	-9.069	-0.659	(0)
CaNH3+2	3.215e-10	7.056e-11	-9.493	-10.151	-0.659	(0)
BaNH3+2	9.412e-14	2.065e-14	-13.026	-13.685	-0.659	(0)
Co (NH3) +2	2.159e-14	4.738e-15	-13.666	-14.324	-0.659	(0)
NiNH3+2	1.452e-14	3.186e-15	-13.838	-14.497	-0.659	(0)
Hg (NH3) 2+2	5.678e-16	1.246e-16	-15.246	-15.904	-0.659	(0)
HgNH3+2	6.598e-17	1.448e-17	-16.181	-16.839	-0.659	(0)
Ca (NH3) 2+2	1.102e-18	2.417e-19	-17.958	-18.617	-0.659	(0)
Ni (NH3) 2+2	1.806e-20	3.963e-21	-19.743	-20.402	-0.659	(0)
Co (NH3) 2+2	7.927e-21	1.740e-21	-20.101	-20.760	-0.659	(0)
Hg (NH3) 3+2	1.945e-23	4.269e-24	-22.711	-23.370	-0.659	(0)
Co (NH3) 3+2	8.588e-28	1.885e-28	-27.066	-27.725	-0.659	(0)
Hg (NH3) 4+2	1.330e-30	2.918e-31	-29.876	-30.535	-0.659	(0)
Co (NH3) 4+2	3.879e-35	8.512e-36	-34.411	-35.070	-0.659	(0)
Cr (NH3) 5OH+2	2.951e-39	6.477e-40	-38.530	-39.189	-0.659	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.257	-42.915	-0.659	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-45.495	-46.977	-1.482	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-47.788	-48.447	-0.659	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.071	-48.730	-0.659	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.135	-58.300	-0.165	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.852	-63.510	-0.659	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.729	-64.388	-0.659	(0)
N (3)	1.290e-05					
NO2-	1.288e-05	9.662e-06	-4.890	-5.015	-0.125	(0)
CuNO2+	1.433e-08	9.806e-09	-7.844	-8.009	-0.165	(0)
Cu (NO2) 2	9.695e-13	9.695e-13	-12.013	-12.013	0.000	(0)
CoNO2+	4.556e-13	3.118e-13	-12.341	-12.506	-0.165	(0)
N (5)	3.323e-08					
NO3-	3.247e-08	2.529e-08	-7.489	-7.597	-0.109	(0)

	CaNO3+	7.609e-10	5.208e-10	-9.119	-9.283	-0.165	(0)
	CuNO3+	1.132e-12	7.751e-13	-11.946	-12.111	-0.165	(0)
	MnNO3+	9.000e-13	6.160e-13	-12.046	-12.210	-0.165	(0)
	BaNO3+	7.043e-13	4.821e-13	-12.152	-12.317	-0.165	(0)
	ZnNO3+	1.701e-13	1.164e-13	-12.769	-12.934	-0.165	(0)
	PbNO3+	3.571e-15	2.444e-15	-14.447	-14.612	-0.165	(0)
	CdNO3+	2.375e-15	1.626e-15	-14.624	-14.789	-0.165	(0)
	CoNO3+	2.682e-16	1.835e-16	-15.572	-15.736	-0.165	(0)
	NiNO3+	6.397e-17	4.379e-17	-16.194	-16.359	-0.165	(0)
	FeNO3+2	1.432e-19	3.142e-20	-18.844	-19.503	-0.659	(0)
	Mn (NO3) 2	3.913e-20	3.913e-20	-19.408	-19.408	0.000	(0)
	VO2NO3	3.017e-20	3.017e-20	-19.520	-19.520	0.000	(0)
	CrNO3+2	1.308e-20	2.870e-21	-19.884	-20.542	-0.659	(0)
	Cu (NO3) 2	2.467e-21	2.467e-21	-20.608	-20.608	0.000	(0)
	UO2NO3+	2.072e-21	1.418e-21	-20.684	-20.848	-0.165	(0)
	Zn (NO3) 2	5.875e-22	5.875e-22	-21.231	-21.231	0.000	(0)
	Pb (NO3) 2	1.050e-22	1.050e-22	-21.979	-21.979	0.000	(0)
	Cd (NO3) 2	2.060e-23	2.060e-23	-22.686	-22.686	0.000	(0)
	Co (NO3) 2	9.444e-24	9.444e-24	-23.025	-23.025	0.000	(0)
	HgNO3+	3.637e-26	2.490e-26	-25.439	-25.604	-0.165	(0)
	Hg (NO3) 2	2.617e-34	2.617e-34	-33.582	-33.582	0.000	(0)
Na		1.086e-02					
	Na+	1.045e-02	8.137e-03	-1.981	-2.090	-0.109	(0)
	NaSO4-	2.876e-04	2.260e-04	-3.541	-3.646	-0.105	(0)
	NaHCO3	1.188e-04	1.188e-04	-3.925	-3.925	0.000	(0)
	NaF	8.584e-06	8.584e-06	-5.066	-5.066	0.000	(0)
	NaCO3-	5.237e-07	4.115e-07	-6.281	-6.386	-0.105	(0)
	NaH2BO3	6.675e-10	6.675e-10	-9.176	-9.176	0.000	(0)
	NaCrO4-	9.203e-20	6.299e-20	-19.036	-19.201	-0.165	(0)
Ni		5.927e-09					
	NiHCO3+	3.223e-09	2.206e-09	-8.492	-8.656	-0.165	(0)
	Ni+2	1.873e-09	6.893e-10	-8.727	-9.162	-0.434	(0)
	NiSO4	7.114e-10	7.114e-10	-9.148	-9.148	0.000	(0)
	NiCO3	6.985e-11	6.985e-11	-10.156	-10.156	0.000	(0)
	NiF+	4.230e-11	2.895e-11	-10.374	-10.538	-0.165	(0)
	NiCl+	6.909e-12	4.729e-12	-11.161	-11.325	-0.165	(0)
	Ni (SO4) 2-2	5.551e-13	1.218e-13	-12.256	-12.914	-0.659	(0)
	NiOH+	2.844e-13	1.946e-13	-12.546	-12.711	-0.165	(0)
	NiNH3+2	1.452e-14	3.186e-15	-13.838	-14.497	-0.659	(0)
	Ni (OH) 2	3.467e-16	3.467e-16	-15.460	-15.460	0.000	(0)
	NiNO3+	6.397e-17	4.379e-17	-16.194	-16.359	-0.165	(0)
	NiCl2	6.383e-17	6.383e-17	-16.195	-16.195	0.000	(0)
	NiSeO4	7.127e-18	7.127e-18	-17.147	-17.147	0.000	(0)
	Ni (NH3) 2+2	1.806e-20	3.963e-21	-19.743	-20.402	-0.659	(0)
	Ni (OH) 3-	1.136e-20	7.775e-21	-19.945	-20.109	-0.165	(0)
O (0)		1.867e-34					
	O2	9.337e-35	9.563e-35	-34.030	-34.019	0.010	(0)
Pb		2.786e-07					
	PbHCO3+	1.841e-07	1.260e-07	-6.735	-6.900	-0.165	(0)
	PbCO3	5.336e-08	5.336e-08	-7.273	-7.273	0.000	(0)
	Pb+2	1.776e-08	6.535e-09	-7.751	-8.185	-0.434	(0)
	PbSO4	1.655e-08	1.655e-08	-7.781	-7.781	0.000	(0)
	Pb (SO4) 2-2	2.351e-09	5.159e-10	-8.629	-9.287	-0.659	(0)
	Pb (CO3) 2-2	1.905e-09	4.180e-10	-8.720	-9.379	-0.659	(0)
	PbF+	1.125e-09	7.700e-10	-8.949	-9.114	-0.165	(0)
	PbCl+	9.082e-10	6.216e-10	-9.042	-9.206	-0.165	(0)
	PbOH+	5.379e-10	3.681e-10	-9.269	-9.434	-0.165	(0)
	PbF2	2.534e-11	2.534e-11	-10.596	-10.596	0.000	(0)
	PbCl2	7.444e-12	7.444e-12	-11.128	-11.128	0.000	(0)
	Pb (OH) 2	2.611e-13	2.611e-13	-12.583	-12.583	0.000	(0)
	PbF3-	1.174e-13	8.035e-14	-12.930	-13.095	-0.165	(0)
	PbCl3-	1.161e-14	7.945e-15	-13.935	-14.100	-0.165	(0)
	PbNO3+	3.571e-15	2.444e-15	-14.447	-14.612	-0.165	(0)
	Pb2OH+3	1.157e-15	3.813e-17	-14.937	-16.419	-1.482	(0)
	PbF4-2	2.930e-16	6.430e-17	-15.533	-16.192	-0.659	(0)
	PbCl4-2	4.437e-17	9.737e-18	-16.353	-17.012	-0.659	(0)
	Pb (OH) 3-	8.554e-18	5.855e-18	-17.068	-17.232	-0.165	(0)
	Pb (OH) 4-2	1.465e-22	3.216e-23	-21.834	-22.493	-0.659	(0)

Pb(NO3)2	1.050e-22	1.050e-22	-21.979	-21.979	0.000	(0)
Pb3(OH)4+2	4.050e-23	8.887e-24	-22.393	-23.051	-0.659	(0)
Pb4(OH)4+4	1.989e-25	4.613e-28	-24.701	-27.336	-2.635	(0)
Pb(HS)2	0.000e+00	0.000e+00	-150.768	-150.768	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.229	-228.394	-0.165	(0)
S(-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.255	-78.255	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.446	-78.610	-0.165	(0)
HS-	0.000e+00	0.000e+00	-78.762	-78.926	-0.165	(0)
S5-2	0.000e+00	0.000e+00	-81.284	-81.943	-0.659	(0)
S6-2	0.000e+00	0.000e+00	-81.800	-82.459	-0.659	(0)
S4-2	0.000e+00	0.000e+00	-81.880	-82.539	-0.659	(0)
S3-2	0.000e+00	0.000e+00	-82.686	-83.344	-0.659	(0)
S2-2	0.000e+00	0.000e+00	-83.702	-84.361	-0.659	(0)
S-2	0.000e+00	0.000e+00	-89.447	-89.878	-0.430	(0)
HgHS2-	0.000e+00	0.000e+00	-136.986	-137.150	-0.165	(0)
Hg(HS)2	0.000e+00	0.000e+00	-137.105	-137.105	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.851	-139.510	-0.659	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-150.266	-150.431	-0.165	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-150.304	-150.735	-0.431	(0)
Cd(HS)2	0.000e+00	0.000e+00	-150.333	-150.333	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-150.768	-150.768	0.000	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.770	-150.770	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.059	-151.465	-0.406	(0)
Fe(HS)2	0.000e+00	0.000e+00	-155.422	-155.422	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-215.729	-215.894	-0.165	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-226.252	-226.416	-0.165	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-227.195	-227.359	-0.165	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.229	-228.394	-0.165	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-229.389	-230.047	-0.659	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-232.147	-232.312	-0.165	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-303.431	-304.090	-0.659	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-306.144	-306.803	-0.659	(0)
Sb2S4-2	0.000e+00	0.000e+00	-315.364	-316.023	-0.659	(0)
S(6)	2.404e-02					
SO4-2	1.405e-02	5.172e-03	-1.852	-2.286	-0.434	(0)
CaSO4	7.716e-03	7.716e-03	-2.113	-2.113	0.000	(0)
MgSO4	1.740e-03	1.740e-03	-2.759	-2.759	0.000	(0)
NaSO4-	2.876e-04	2.260e-04	-3.541	-3.646	-0.105	(0)
KSO4-	2.154e-04	1.692e-04	-3.667	-3.772	-0.105	(0)
MnSO4	1.414e-05	1.414e-05	-4.850	-4.850	0.000	(0)
CuSO4	1.148e-05	1.148e-05	-4.940	-4.940	0.000	(0)
ZnSO4	2.074e-06	2.074e-06	-5.683	-5.683	0.000	(0)
NH4SO4-	4.801e-07	3.747e-07	-6.319	-6.426	-0.108	(0)
Zn(SO4)2-2	4.257e-07	9.343e-08	-6.371	-7.030	-0.659	(0)
FeSO4	3.839e-07	3.839e-07	-6.416	-6.416	0.000	(0)
HSO4-	2.927e-07	2.264e-07	-6.534	-6.645	-0.111	(0)
CdSO4	2.465e-08	2.465e-08	-7.608	-7.608	0.000	(0)
PbSO4	1.655e-08	1.655e-08	-7.781	-7.781	0.000	(0)
Cd(SO4)2-2	7.836e-09	1.720e-09	-8.106	-8.765	-0.659	(0)
CoSO4	4.726e-09	4.726e-09	-8.326	-8.326	0.000	(0)
Pb(SO4)2-2	2.351e-09	5.159e-10	-8.629	-9.287	-0.659	(0)
CrOHSO4	1.563e-09	1.563e-09	-8.806	-8.806	0.000	(0)
NiSO4	7.114e-10	7.114e-10	-9.148	-9.148	0.000	(0)
CrSO4+	4.581e-11	3.135e-11	-10.339	-10.504	-0.165	(0)
AlSO4+	9.788e-12	7.572e-12	-11.009	-11.121	-0.111	(0)
FeSO4+	9.237e-12	7.210e-12	-11.034	-11.142	-0.108	(0)
Fe(SO4)2-	1.165e-12	7.973e-13	-11.934	-12.098	-0.165	(0)
Ni(SO4)2-2	5.551e-13	1.218e-13	-12.256	-12.914	-0.659	(0)
Al(SO4)2-	5.424e-13	4.196e-13	-12.266	-12.377	-0.111	(0)
VO2SO4-	4.257e-13	2.913e-13	-12.371	-12.536	-0.165	(0)
UO2SO4	2.200e-13	2.200e-13	-12.658	-12.658	0.000	(0)
UO2(SO4)2-2	6.835e-14	1.500e-14	-13.165	-13.824	-0.659	(0)
VOSO4	1.222e-14	1.222e-14	-13.913	-13.913	0.000	(0)
Cr2(OH)2SO4+2	8.201e-16	1.800e-16	-15.086	-15.745	-0.659	(0)
Cr2(OH)2(SO4)2	5.529e-17	5.529e-17	-16.257	-16.257	0.000	(0)
HgSO4	3.611e-18	3.611e-18	-17.442	-17.442	0.000	(0)
CrO3SO4-2	7.279e-24	1.597e-24	-23.138	-23.797	-0.659	(0)

VSO4+	6.914e-28	4.732e-28	-27.160	-27.325	-0.165	(0)
U(SO4) 2	8.086e-38	8.086e-38	-37.092	-37.092	0.000	(0)
USO4+2	8.969e-39	1.968e-39	-38.047	-38.706	-0.659	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-58.135	-58.300	-0.165	(0)
Sb (3)	6.164e-19					
Sb(OH) 3	3.112e-19	3.112e-19	-18.507	-18.507	0.000	(0)
HSbO2	3.045e-19	3.045e-19	-18.516	-18.516	0.000	(0)
Sb(OH) 2F	3.649e-22	3.649e-22	-21.438	-21.438	0.000	(0)
SbOF	3.597e-22	3.597e-22	-21.444	-21.444	0.000	(0)
Sb(OH) 2+	4.957e-24	3.393e-24	-23.305	-23.469	-0.165	(0)
SbO+	1.713e-24	1.172e-24	-23.766	-23.931	-0.165	(0)
SbO2-	1.608e-24	1.101e-24	-23.794	-23.958	-0.165	(0)
Sb(OH) 4-	9.174e-25	6.279e-25	-24.037	-24.202	-0.165	(0)
Sb2S4-2	0.000e+00	0.000e+00	-315.364	-316.023	-0.659	(0)
Sb (5)	4.146e-08					
SbO3-	4.142e-08	2.835e-08	-7.383	-7.547	-0.165	(0)
Sb(OH) 6-	4.228e-11	3.293e-11	-10.374	-10.482	-0.109	(0)
SbO2+	2.389e-21	1.635e-21	-20.622	-20.786	-0.165	(0)
Se (-2)	2.382e-40					
HSe-	2.382e-40	1.631e-40	-39.623	-39.788	-0.165	(0)
H2Se	0.000e+00	0.000e+00	-42.246	-42.246	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.637	-43.637	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.780	-48.439	-0.659	(0)
Se (4)	3.108e-07					
HSeO3-	3.024e-07	2.070e-07	-6.519	-6.684	-0.165	(0)
SeO3-2	8.381e-09	1.839e-09	-8.077	-8.735	-0.659	(0)
H2SeO3	3.955e-11	3.955e-11	-10.403	-10.403	0.000	(0)
FeHSeO3+2	3.096e-16	6.795e-17	-15.509	-16.168	-0.659	(0)
Cd(SeO3) 2-2	2.583e-19	5.667e-20	-18.588	-19.247	-0.659	(0)
Se (6)	6.016e-11					
SeO4-2	6.006e-11	2.210e-11	-10.221	-10.656	-0.434	(0)
MnSeO4	9.144e-14	9.144e-14	-13.039	-13.039	0.000	(0)
ZnSeO4	6.276e-15	6.276e-15	-14.202	-14.202	0.000	(0)
HSeO4-	7.251e-16	4.963e-16	-15.140	-15.304	-0.165	(0)
CdSeO4	8.367e-17	8.367e-17	-16.077	-16.077	0.000	(0)
CoSeO4	5.074e-17	5.074e-17	-16.295	-16.295	0.000	(0)
NiSeO4	7.127e-18	7.127e-18	-17.147	-17.147	0.000	(0)
Zn(SeO4) 2-2	6.409e-25	1.406e-25	-24.193	-24.852	-0.659	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.979	-58.461	-1.482	(0)
U (4)	5.881e-25					
U(OH) 5-	5.806e-25	3.974e-25	-24.236	-24.401	-0.165	(0)
U(OH) 4	7.472e-27	7.472e-27	-26.127	-26.127	0.000	(0)
U(OH) 3+	1.792e-29	1.227e-29	-28.747	-28.911	-0.165	(0)
UF3+	2.599e-30	1.779e-30	-29.585	-29.750	-0.165	(0)
UF4	3.261e-31	3.261e-31	-30.487	-30.487	0.000	(0)
UF6-2	4.972e-32	1.091e-32	-31.303	-31.962	-0.659	(0)
UF5-	3.157e-32	2.161e-32	-31.501	-31.665	-0.165	(0)
UF2+2	3.059e-32	6.713e-33	-31.514	-32.173	-0.659	(0)
U(OH) 2+2	1.160e-32	2.547e-33	-31.935	-32.594	-0.659	(0)
UF+3	9.675e-36	3.189e-37	-35.014	-36.496	-1.482	(0)
UOH+3	1.634e-36	5.385e-38	-35.787	-37.269	-1.482	(0)
U(SO4) 2	8.086e-38	8.086e-38	-37.092	-37.092	0.000	(0)
USO4+2	8.969e-39	1.968e-39	-38.047	-38.706	-0.659	(0)
U+4	0.000e+00	0.000e+00	-40.385	-43.020	-2.635	(0)
UCl+3	0.000e+00	0.000e+00	-42.409	-43.891	-1.482	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-166.718	-180.056	-13.338	(0)
U (5)	5.659e-18					
UO2+	5.659e-18	3.874e-18	-17.247	-17.412	-0.165	(0)
U (6)	1.042e-06					
UO2 (CO3) 3-4	9.667e-07	2.242e-09	-6.015	-8.649	-2.635	(0)
UO2 (CO3) 2-2	7.505e-08	1.647e-08	-7.125	-7.783	-0.659	(0)
UO2CO3	3.039e-10	3.039e-10	-9.517	-9.517	0.000	(0)
UO2F2	3.128e-11	3.128e-11	-10.505	-10.505	0.000	(0)
UO2F3-	1.919e-11	1.314e-11	-10.717	-10.882	-0.165	(0)
UO2F+	9.477e-12	6.487e-12	-11.023	-11.188	-0.165	(0)
UO2F4-2	7.951e-13	1.745e-13	-12.100	-12.758	-0.659	(0)
UO2SO4	2.200e-13	2.200e-13	-12.658	-12.658	0.000	(0)

UO2OH+	1.159e-13	7.935e-14	-12.936	-13.100	-0.165	(0)
UO2+2	7.636e-14	2.810e-14	-13.117	-13.551	-0.434	(0)
UO2 (SO4) 2-2	6.835e-14	1.500e-14	-13.165	-13.824	-0.659	(0)
UO2Cl+	1.785e-16	1.222e-16	-15.748	-15.913	-0.165	(0)
(UO2) 2 (OH) 2+2	4.761e-20	1.045e-20	-19.322	-19.981	-0.659	(0)
UO2NO3+	2.072e-21	1.418e-21	-20.684	-20.848	-0.165	(0)
(UO2) 3 (OH) 5+	4.622e-25	3.163e-25	-24.335	-24.500	-0.165	(0)
V (2)	1.206e-38					
V+2	9.781e-39	2.146e-39	-38.010	-38.668	-0.659	(0)
VOH+	2.276e-39	1.558e-39	-38.643	-38.808	-0.165	(0)
V (3)	1.763e-12					
V (OH) 3	1.763e-12	1.763e-12	-11.754	-11.754	0.000	(0)
V (OH) 2+	7.474e-22	5.116e-22	-21.126	-21.291	-0.165	(0)
VOH+2	9.927e-24	2.178e-24	-23.003	-23.662	-0.659	(0)
V+3	5.880e-27	1.938e-28	-26.231	-27.713	-1.482	(0)
VSO4+	6.914e-28	4.732e-28	-27.160	-27.325	-0.165	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-43.889	-46.524	-2.635	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-45.019	-46.501	-1.482	(0)
V (4)	2.919e-13					
VOF+	1.257e-13	8.606e-14	-12.901	-13.065	-0.165	(0)
V (OH) 3+	5.598e-14	3.831e-14	-13.252	-13.417	-0.165	(0)
VOF2	5.396e-14	5.396e-14	-13.268	-13.268	0.000	(0)
VO+2	3.910e-14	8.581e-15	-13.408	-14.066	-0.659	(0)
VOSO4	1.222e-14	1.222e-14	-13.913	-13.913	0.000	(0)
VOF3-	4.677e-15	3.201e-15	-14.330	-14.495	-0.165	(0)
VOF4-2	9.844e-17	2.160e-17	-16.007	-16.665	-0.659	(0)
VOC1+	9.430e-17	6.454e-17	-16.025	-16.190	-0.165	(0)
H2V2O4+2	3.367e-22	7.390e-23	-21.473	-22.131	-0.659	(0)
V (5)	9.037e-07					
H2VO4-	8.569e-07	5.865e-07	-6.067	-6.232	-0.165	(0)
HVO4-2	1.499e-08	3.288e-09	-7.824	-8.483	-0.659	(0)
H3V2O7-	1.457e-08	9.971e-09	-7.837	-8.001	-0.165	(0)
H3VO4	2.627e-09	2.627e-09	-8.580	-8.580	0.000	(0)
HV2O7-3	1.987e-11	6.550e-13	-10.702	-12.184	-1.482	(0)
VO2F	6.918e-12	6.918e-12	-11.160	-11.160	0.000	(0)
V3O9-3	6.452e-12	2.127e-13	-11.190	-12.672	-1.482	(0)
VO2F2-	6.136e-12	4.200e-12	-11.212	-11.377	-0.165	(0)
VO2+	3.029e-12	2.359e-12	-11.519	-11.627	-0.109	(0)
VO2SO4-	4.257e-13	2.913e-13	-12.371	-12.536	-0.165	(0)
VO2F3-2	3.991e-13	8.759e-14	-12.399	-13.058	-0.659	(0)
V4O12-4	2.247e-14	5.211e-17	-13.648	-16.283	-2.635	(0)
V2O7-4	1.697e-14	3.935e-17	-13.770	-16.405	-2.635	(0)
VO2F4-3	2.186e-15	7.206e-17	-14.660	-16.142	-1.482	(0)
VO4-3	1.116e-15	3.679e-17	-14.952	-16.434	-1.482	(0)
VO2NO3	3.017e-20	3.017e-20	-19.520	-19.520	0.000	(0)
HV10O28-5	1.444e-33	1.104e-37	-32.840	-36.957	-4.117	(0)
V10O28-6	1.359e-33	1.604e-39	-32.867	-38.795	-5.928	(0)
H2V10O28-4	3.440e-36	7.978e-39	-35.463	-38.098	-2.635	(0)
Zn	1.008e-05					
Zn+2	4.981e-06	1.833e-06	-5.303	-5.737	-0.434	(0)
ZnHCO3+	2.198e-06	1.504e-06	-5.658	-5.823	-0.165	(0)
ZnSO4	2.074e-06	2.074e-06	-5.683	-5.683	0.000	(0)
Zn (SO4) 2-2	4.257e-07	9.343e-08	-6.371	-7.030	-0.659	(0)
ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
ZnF+	8.935e-08	6.115e-08	-7.049	-7.214	-0.165	(0)
ZnCl+	1.611e-08	1.234e-08	-7.793	-7.909	-0.116	(0)
ZnOH+	6.006e-09	4.111e-09	-8.221	-8.386	-0.165	(0)
ZnOHCl	3.624e-10	3.624e-10	-9.441	-9.441	0.000	(0)
ZnCl2	5.245e-11	5.245e-11	-10.280	-10.280	0.000	(0)
Zn (OH) 2	1.461e-11	1.461e-11	-10.835	-10.835	0.000	(0)
ZnNO3+	1.701e-13	1.164e-13	-12.769	-12.934	-0.165	(0)
ZnCl3-	1.458e-13	1.117e-13	-12.836	-12.952	-0.116	(0)
ZnSeO4	6.276e-15	6.276e-15	-14.202	-14.202	0.000	(0)
Zn (OH) 3-	2.399e-15	1.642e-15	-14.620	-14.785	-0.165	(0)
ZnCl4-2	4.034e-16	1.497e-16	-15.394	-15.825	-0.430	(0)
Zn (OH) 4-2	6.681e-21	1.466e-21	-20.175	-20.834	-0.659	(0)
Zn (NO3) 2	5.875e-22	5.875e-22	-21.231	-21.231	0.000	(0)
Zn (SeO4) 2-2	6.409e-25	1.406e-25	-24.193	-24.852	-0.659	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-150.266	-150.431	-0.165	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.770	-150.770	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.252	-226.416	-0.165	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.389	-230.047	-0.659	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.144	-306.803	-0.659	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-52.25	-45.97	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-40.42	-35.91	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-47.65	-35.92	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-67.75	-49.81	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-54.77	-34.74	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-28.55	-28.15	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-21.45	-21.00	0.45	(NH4) 2SeO4	
Al (OH) 3 (am)	-4.48	6.32	10.80	Al (OH) 3	
Al2 (MoO4) 3	-45.42	-43.05	2.37	Al2 (MoO4) 3	
Al2O3	-7.01	12.64	19.65	Al2O3	
Al4 (OH) 10SO4	-12.41	10.29	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-10.26	-5.46	4.80	AlAsO4:2H2O	
AlOHSO4	-5.43	-8.66	-3.23	AlOHSO4	
AlSb	-155.77	-90.15	65.62	AlSb	
Alunite	-5.59	-6.99	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-2.68	-10.47	-7.79	PbSO4	
Anhydrite	-0.11	-4.47	-4.36	CaSO4	
Anilite	-55.41	-87.28	-31.88	Cu0.25Cu1.5S	
Antlerite	-0.72	8.06	8.79	Cu3 (OH) 4SO4	
Aragonite	0.55	-7.75	-8.30	CaCO3	
Arsenolite	-72.70	-75.46	-2.76	As4O6	
Artinite	-7.94	1.66	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-30.25	-23.55	6.71	As2O5	
Atacamite	-0.95	6.44	7.39	Cu2 (OH) 3Cl	
Azurite	3.43	-13.48	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-17.13	7.27	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-11.88	3.99	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	7.19	-1.72	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-21.67	11.27	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-13.56	-23.23	-9.67	BaCrO4	
BaF2	-5.15	-10.97	-5.82	BaF2	
BaMoO4	-4.33	-11.29	-6.96	BaMoO4	
Barite	2.27	-7.71	-9.98	BaSO4	
BaS	-94.18	-78.00	16.18	BaS	
BaSeO3	-7.59	-5.76	1.83	BaSeO3	
BaSeO4	-8.62	-16.08	-7.46	BaSeO4	
Bianchite	-6.26	-8.03	-1.76	ZnSO4:6H2O	
Birnessite	-9.57	8.52	18.09	MnO2	
Bixbyite	-8.30	-8.95	-0.64	Mn2O3	
BlaubleiI	-54.72	-78.88	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-55.48	-82.76	-27.28	Cu0.6Cu0.8S	
Boehmite	-2.26	6.32	8.58	AlOOH	
Breithauptite	-61.42	-79.94	-18.52	NiSb	
Brochantite	0.52	15.75	15.22	Cu4 (OH) 6SO4	
Brucite	-6.88	9.96	16.84	Mg (OH) 2	
Bunsenite	-8.91	3.53	12.45	NiO	
Ca (VO3) 2	-5.71	-0.05	5.66	Ca (VO3) 2	
Ca2V2O7	-7.04	10.46	17.50	Ca2V2O7	
Ca2V2O7:2H2O	-11.09	10.46	21.55	Ca2V2O7:2H2O	
Ca3 (AsO4) 2:4H2O	-14.32	7.98	22.30	Ca3 (AsO4) 2:4H2O	
Ca3 (VO4) 2	-17.99	20.97	38.96	Ca3 (VO4) 2	
Ca3 (VO4) 2:4H2O	-18.89	20.97	39.86	Ca3 (VO4) 2:4H2O	
Ca3Sb2	-304.38	-161.41	142.97	Ca3Sb2	
CaCrO4	-17.73	-19.99	-2.27	CaCrO4	
Calcite	0.73	-7.75	-8.48	CaCO3	
Calomel	-4.88	-22.79	-17.91	Hg2Cl2	
CaMoO4	-0.10	-8.05	-7.95	CaMoO4	
Carnotite	-2.35	-2.12	0.23	KUO2VO4	

CaSeO3:2H2O	-5.34	-2.52	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.82	-12.84	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.63	-3.79	9.84	Cd(BO2)2
Cd(OH)2	-8.64	5.00	13.64	Cd(OH)2
Cd(OH)2(am)	-8.73	5.00	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.66	-14.95	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.53	0.03	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.37	5.03	28.40	Cd4(OH)6SO4
CdCl2	-12.18	-12.84	-0.66	CdCl2
CdCl2:1H2O	-11.14	-12.84	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.92	-12.84	-1.91	CdCl2:2.5H2O
CdF2	-12.03	-13.25	-1.21	CdF2
Cdmetal(alpha)	-34.50	-20.98	13.51	Cd
Cdmetal(gamma)	-34.60	-20.98	13.62	Cd
CdMoO4	0.59	-13.56	-14.15	CdMoO4
CdOHCl	-7.45	-3.92	3.54	CdOHCl
CdSb	-78.12	-78.47	-0.35	CdSb
CdSe	-20.93	-41.13	-20.20	CdSe
CdSeO4:2H2O	-16.50	-18.35	-1.85	CdSeO4:2H2O
CdSO4	-9.81	-9.98	-0.17	CdSO4
CdSO4:1H2O	-8.25	-9.98	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.11	-9.98	-1.87	CdSO4:2.67H2O
Cerrusite	-0.62	-13.75	-13.13	PbCO3
CH4(g)	-81.17	-122.22	-41.05	CH4
Chalcanthite	-4.66	-7.30	-2.64	CuSO4:5H2O
Chalcocite	-55.60	-90.52	-34.92	Cu2S
Chalcopyrite	-121.42	-156.69	-35.27	CuFeS2
Cinnabar	-50.65	-96.35	-45.69	HgS
Claudetite	-72.39	-75.46	-3.06	As4O6
Clausthalite	-14.52	-41.62	-27.10	PbSe
Co(BO2)2	-31.51	-4.44	27.07	Co(BO2)2
Co(OH)2	-8.74	4.36	13.09	Co(OH)2
Co(OH)3	-12.74	-15.05	-2.31	Co(OH)3
CO2(g)	-0.12	-18.26	-18.15	CO2
Co3(AsO4)2	-23.51	-10.48	13.03	Co3(AsO4)2
Co3O4	-15.24	-25.74	-10.50	Co3O4
CoCl2	-21.75	-13.48	8.27	CoCl2
CoCl2:6H2O	-16.03	-13.49	2.54	CoCl2:6H2O
CoCO3	-3.93	-13.91	-9.98	CoCO3
CoF2	-12.30	-13.89	-1.60	CoF2
CoF3	-40.97	-42.42	-1.46	CoF3
CoFe2O4	20.16	16.64	-3.53	CoFe2O4
CoMoO4	-6.45	-14.21	-7.76	CoMoO4
CoO	-9.23	4.36	13.59	CoO
CoS(alpha)	-73.48	-80.92	-7.44	CoS
CoS(beta)	-69.85	-80.92	-11.07	CoS
CoSe	-25.58	-41.78	-16.20	CoSe
CoSeO3	-9.99	-8.67	1.32	CoSeO3
CoSeO4:6H2O	-17.47	-19.00	-1.53	CoSeO4:6H2O
CoSO4	-13.43	-10.63	2.80	CoSO4
CoSO4:6H2O	-8.16	-10.63	-2.47	CoSO4:6H2O
Cotunnite	-8.55	-13.33	-4.78	PbCl2
Covellite	-55.29	-77.59	-22.30	CuS
Cr(OH)2	-22.98	-12.16	10.82	Cr(OH)2
Cr(OH)3	-3.45	-2.11	1.34	Cr(OH)3
Cr(OH)3(am)	-1.36	-2.11	-0.75	Cr(OH)3
Cr2O3	-1.86	-4.22	-2.36	Cr2O3
CrCl2	-44.09	-30.00	14.09	CrCl2
CrCl3	-43.98	-28.87	15.11	CrCl3
CrF3	-18.15	-29.48	-11.34	CrF3
Crmetal	-68.63	-38.14	30.48	Cr
CrO3	-27.29	-30.50	-3.21	CrO3
Cryolite	-1.81	-35.65	-33.84	Na3AlF6
Cu(OH)2	-0.99	7.68	8.67	Cu(OH)2
Cu(SbO3)2	-22.56	22.65	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-7.83	1.42	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.53	-91.41	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.58	-51.38	-45.80	Cu2Se

Cu2SO4	-18.27	-20.22	-1.95	Cu2SO4
Cu3(AsO4)2·2H2O	-6.60	-0.50	6.10	Cu3(AsO4)2·2H2O
Cu3Sb	-61.74	-104.33	-42.59	Cu3Sb
Cu3Se2	-26.34	-89.83	-63.49	Cu3Se2
CuCO3	0.92	-10.58	-11.50	CuCO3
CuCrO4	-17.38	-22.82	-5.44	CuCrO4
CuF	-6.84	-11.75	-4.91	CuF
CuF2	-11.68	-10.57	1.12	CuF2
CuF2·2H2O	-6.02	-10.57	-4.55	CuF2·2H2O
Cumetal	-6.86	-15.61	-8.76	Cu
CuMoO4	2.19	-10.88	-13.08	CuMoO4
CuOCuSO4	-9.92	0.38	10.30	CuOCuSO4
Cupricferrite	13.97	19.96	5.99	CuFe2O4
Cuprite	-3.84	-5.24	-1.41	Cu2O
Cuprousferrite	12.44	3.52	-8.92	CuFeO2
CuSe	-5.35	-38.45	-33.10	CuSe
CuSe2	-25.23	-58.60	-33.37	CuSe2
CuSeO3·2H2O	-5.86	-5.35	0.51	CuSeO3·2H2O
CuSeO4·5H2O	-13.23	-15.67	-2.44	CuSeO4·5H2O
CuSO4	-10.24	-7.30	2.94	CuSO4
Diaspore	-0.55	6.32	6.87	AlOOH
Djurleite	-55.74	-89.66	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.49	-16.05	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.04	-16.05	-17.09	CaMg(CO3)2
Epsomite	-2.90	-5.03	-2.13	MgSO4·7H2O
Fe(OH)2	-7.39	6.18	13.56	Fe(OH)2
Fe(OH)2·7Cl.3	6.50	3.46	-3.04	Fe(OH)2·7Cl.3
Fe(VO3)2	-0.66	-4.38	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.31	-0.76	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3·2H2O	-6.19	-26.82	-20.63	Fe2(SeO3)3·2H2O
Fe2(SO4)3	-28.94	-32.67	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.77	18.45	20.22	Fe3(OH)8
FeAsO4·2H2O	-6.04	-5.64	0.40	FeAsO4·2H2O
FeCr2O4	-5.24	1.96	7.20	FeCr2O4
FeMoO4	-2.30	-12.39	-10.09	FeMoO4
Ferrihydrite	2.95	6.14	3.19	Fe(OH)3
Ferroselite	-41.51	-60.11	-18.60	FeSe2
FeS(ppt)	-76.15	-79.10	-2.95	FeS
FeSe	-28.96	-39.96	-11.00	FeSe
Fix_pe	-6.65	-6.65	0.00	e-
Fluorite	2.76	-7.74	-10.50	CaF2
Galena	-66.79	-80.76	-13.97	PbS
Gibbsite	-1.97	6.32	8.29	Al(OH)3
Goethite	5.65	6.14	0.49	FeOOH
Goslarite	-6.02	-8.03	-2.01	ZnSO4·7H2O
Greenockite	-65.91	-80.27	-14.36	CdS
Greigite	-277.61	-322.64	-45.03	Fe3S4
Gummite	-8.53	-0.85	7.67	UO3
Gypsum	0.14	-4.47	-4.61	CaSO4·2H2O
H-Jarosite	0.55	-11.55	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-5.69	-18.57	-12.88	H2MoO4
H2S(g)	-77.27	-85.28	-8.01	H2S
H2Se(g)	-41.18	-46.14	-4.96	H2Se
Halite	-6.26	-4.66	1.60	NaCl
Hausmannite	-11.39	49.64	61.03	Mn3O4
Hematite	13.70	12.28	-1.42	Fe2O3
Hercynite	-4.08	18.82	22.89	FeAl2O4
Hg(CH3)2(g)	-181.80	-255.50	-73.71	Hg(CH3)2
Hg(g)	-7.59	-15.47	-7.87	Hg
Hg(OH)2	-7.58	-11.07	-3.50	Hg(OH)2
Hg2(g)	-15.98	-30.93	-14.96	Hg2
Hg2(OH)2	-10.21	-4.95	5.26	Hg2(OH)2
Hg2CO3	-7.16	-23.21	-16.05	Hg2CO3
Hg2CrO4	-26.75	-35.45	-8.70	Hg2CrO4
Hg2F2	-12.83	-23.20	-10.36	Hg2F2
Hg2S	-78.54	-90.22	-11.68	Hg2S
Hg2SeO3	-13.32	-17.98	-4.66	Hg2SeO3
Hg2SO4	-13.80	-19.93	-6.13	Hg2SO4

Hg3O2CO3	-21.80	-51.48	-29.68	Hg3O2CO3
HgCl (g)	-30.89	-11.39	19.50	HgCl
HgCl2	-7.65	-28.91	-21.26	HgCl2
HgF (g)	-44.27	-11.60	32.68	HgF
HgF2 (g)	-41.89	-29.32	12.57	HgF2
Hgmetal (l)	-2.02	-15.47	-13.45	Hg
HgSe	-1.51	-57.21	-55.69	HgSe
HgSeO3	-11.67	-24.10	-12.43	HgSeO3
HgSO4	-16.64	-26.05	-9.42	HgSO4
Huntite	-2.68	-32.65	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-4.22	-22.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.47	-23.24	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.47	-19.64	-5.17	KA1 (SO4) 2 : 12H2O
K-Jarosite	7.26	-7.54	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.74	-52.98	-17.24	K2Cr2O7
K2CrO4	-21.96	-22.48	-0.51	K2CrO4
K2MoO4	-13.80	-10.54	3.26	K2MoO4
K2SeO4	-14.60	-15.33	-0.73	K2SeO4
Langite	-1.74	15.74	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.52	-5.96	-0.43	PbO : PbSO4
Laurionite	-5.03	-4.41	0.62	PbOHCl
Lepidocrocite	4.77	6.14	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.18	4.51	12.69	PbO
Mackinawite	-75.50	-79.10	-3.60	FeS
Maghemite	5.89	12.28	6.39	Fe2O3
Magnesioferrite	5.38	22.24	16.86	Fe2MgO4
Magnetite	-0.84	-8.30	-7.46	MgCO3
Malachite	15.05	18.46	3.40	Fe3O4
Malachite	2.41	-2.90	-5.31	Cu2 (OH) 2CO3
Manganite	-4.46	20.88	25.34	MnOOH
Massicot	-8.38	4.51	12.89	PbO
Matlockite	-4.56	-13.53	-8.97	PbClF
Melanothallite	-16.41	-10.16	6.26	CuCl2
Melanterite	-6.60	-8.81	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.25	-96.35	-45.09	HgS
Mg (OH) 2 (active)	-8.83	9.96	18.79	Mg (OH) 2
Mg (VO3) 2	-11.87	-0.59	11.28	Mg (VO3) 2
Mg2Sb3	-279.19	-204.51	74.68	Mg2Sb3
Mg2V2O7	-16.99	9.37	26.36	Mg2V2O7
MgCr2O4	-10.46	5.74	16.20	MgCr2O4
MgCrO4	-25.92	-20.54	5.38	MgCrO4
MgF2	-0.16	-8.29	-8.13	MgF2
MgMoO4	-6.75	-8.60	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.13	-3.07	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.19	-13.39	-1.20	MgSeO4 : 6H2O
Minium	-34.00	39.52	73.52	Pb3O4
Mirabilite	-5.36	-6.48	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-7.57	-2.67	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-48.18	-53.89	-5.71	Mn2 (SO4) 3
Mn2Sb	-154.78	-93.70	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.41	0.09	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.68	-9.96	2.72	MnCl2 : 4H2O
MnS (grn)	-77.56	-77.39	0.17	MnS
MnS (pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.03	-100.94	-2.91	MnSb
MnSe	-41.75	-38.25	3.50	MnSe
MnSeO3	-6.28	-5.15	1.13	MnSeO3
MnSeO3 : 2H2O	-6.13	-5.15	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.42	-15.47	-2.05	MnSeO4 : 5H2O
MnSO4	-9.68	-7.10	2.58	MnSO4
Monteponite	-10.10	5.00	15.10	CdO
Montroydite	-7.43	-11.07	-3.64	HgO
MoO3	-10.56	-18.56	-8.00	MoO3
Morenosite	-9.31	-11.45	-2.14	NiSO4 : 7H2O
MoS2	-144.84	-215.10	-70.26	MoS2
Na-Jarosite	3.91	-7.29	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-42.60	-52.49	-9.90	Na2Cr2O7

Na2CrO4	-24.92	-21.99	2.93	Na2CrO4
Na2Mo2O7	-12.02	-28.61	-16.60	Na2Mo2O7
Na2MoO4	-11.54	-10.05	1.49	Na2MoO4
Na2MoO4:2H2O	-11.27	-10.05	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.82	-4.52	10.30	Na2SeO3:5H2O
Na2SeO4	-16.11	-14.83	1.28	Na2SeO4
Na3Sb	-178.14	-83.69	94.45	Na3Sb
Na3VO4	-29.18	7.50	36.68	Na3VO4
Na4V2O7	-30.92	6.48	37.40	Na4V2O7
Nantokite	-4.81	-11.54	-6.73	CuCl
NaSb	-89.39	-66.22	23.17	NaSb
Natron	-8.44	-9.76	-1.31	Na2CO3:10H2O
NaVO3	-4.88	-1.02	3.86	NaVO3
Nesquehonite	-3.63	-8.30	-4.67	MgCO3:3H2O
Ni(OH)2	-9.26	3.53	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-28.65	-12.95	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-32.85	-0.85	32.00	Ni4(OH)6SO4
NiCO3	-7.86	-14.73	-6.87	NiCO3
NiMoO4	-3.89	-15.03	-11.14	NiMoO4
NiS(alpha)	-76.14	-81.74	-5.60	NiS
NiS(beta)	-70.64	-81.74	-11.10	NiS
NiS(gamma)	-68.94	-81.74	-12.80	NiS
NiSe	-24.90	-42.60	-17.70	NiSe
NiSeO3:2H2O	-12.31	-9.50	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.30	-19.82	-1.52	NiSeO4:6H2O
Nsutite	-8.98	8.52	17.50	MnO2
O2(g)	-31.11	51.98	83.09	O2
Orpiment	-232.48	-293.55	-61.07	As2S3
Otavite	-1.26	-13.26	-12.00	CdCO3
Pb(BO2)2	-10.80	-4.28	6.52	Pb(BO2)2
Pb(OH)2	-3.64	4.51	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.70	-64.46	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.69	0.10	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.17	9.02	26.19	Pb2O(OH)2
Pb2O3	-26.03	35.01	61.04	Pb2O3
Pb2OCO3	-8.68	-9.24	-0.56	Pb2OCO3
Pb2V2O7	0.37	-1.53	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.81	-10.01	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.16	2.98	6.14	Pb3(VO4)2
Pb3O2CO3	-15.75	-4.73	11.02	Pb3O2CO3
Pb3O2SO4	-12.13	-1.45	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.04	3.06	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.81	3.06	21.88	Pb4O3SO4
PbCrO4	-13.39	-25.99	-12.60	PbCrO4
PbF2	-6.30	-13.74	-7.44	PbF2
Pbmetal	-25.72	-21.48	4.25	Pb
PbMoO4	1.57	-14.05	-15.62	PbMoO4
PbO:0.3H2O	-8.47	4.51	12.98	PbO:0.33H2O
PbSeO4	-12.00	-18.84	-6.84	PbSeO4
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-7.27	-27.08	-19.81	PbCl2:PbCO3
Plattnerite	-19.10	30.50	49.60	PbO2
Portlandite	-12.29	10.51	22.80	Ca(OH)2
Pyrite	-119.88	-138.38	-18.51	FeS2
Pyrochroite	-7.31	7.88	15.19	Mn(OH)2
Pyrolusite	-7.51	33.87	41.38	MnO2
Realgar	-97.39	-117.13	-19.75	AsS
Retgersite	-9.41	-11.45	-2.04	NiSO4:6H2O
Rhodochrosite	0.20	-10.38	-10.58	MnCO3
Rutherfordine	-4.62	-19.12	-14.50	UO2CO3
Sb(OH)3	-11.40	-18.51	-7.11	Sb(OH)3
Sb2O4	-14.43	-11.02	3.40	Sb2O4
Sb2O5	-23.99	-33.66	-9.67	Sb2O5
Sb2Se3	-107.66	-175.42	-67.76	Sb2Se3
Sb4O6(cubic)	-55.76	-74.02	-18.26	Sb4O6
Sb4O6(orth)	-56.12	-74.02	-17.90	Sb4O6
SbCl3	-45.84	-45.27	0.57	SbCl3
SbF3	-35.66	-45.88	-10.23	SbF3

Sbmetal	-45.80	-57.49	-11.69	Sb
SbO2	-2.00	-29.82	-27.82	SbO2
Schoepite	-6.85	-0.86	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.04	-20.15	-7.11	Se
Semetal (hex)	-12.44	-20.15	-7.71	Se
Senarmontite	-24.65	-37.01	-12.37	Sb2O3
SeO2	-13.16	-13.03	0.12	SeO2
SeO3	-44.40	-23.35	21.04	SeO3
Siderite	-1.85	-12.09	-10.24	FeCO3
Smithsonite	-1.30	-11.30	-10.00	ZnCO3
Sphalerite	-66.86	-78.31	-11.45	ZnS
Spinel	-14.24	22.60	36.85	MgAl2O4
Stibnite	-242.37	-292.83	-50.46	Sb2S3
Sulfur	-57.14	-59.29	-2.14	S
Tenorite	0.04	7.68	7.64	CuO
Thenardite	-6.79	-6.47	0.32	Na2SO4
Thermonatrite	-10.38	-9.75	0.64	Na2CO3:H2O
Tyuyamunite	-5.84	-1.76	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-21.99	-0.90	21.08	U3O8
U3Sb4	-591.14	-438.76	152.38	U3Sb4
U4O9	-41.50	-44.52	-3.02	U4O9
UF4	-24.59	-54.13	-29.54	UF4
UF4:2.5H2O	-21.41	-54.13	-32.72	UF4:2.5H2O
UO2 (am)	-18.56	-17.63	0.93	UO2
UO2 (NO3) 2	-40.89	-28.75	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.60	-28.75	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.14	-28.75	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.80	-28.75	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-6.47	-0.86	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.96	-24.21	-2.25	UO2SeO4:4H2O
UO3	-8.55	-0.85	7.70	UO3
Uraninite	-12.96	-17.63	-4.67	UO2
USb2	-223.37	-193.79	29.58	USb2
V (OH) 3	-16.26	-8.67	7.59	V (OH) 3
V2O5	-9.20	-10.56	-1.36	V2O5
V3O5	-31.93	-30.10	1.84	V3O5
V4O7	-38.65	-31.47	7.19	V4O7
V6O13	-22.79	-83.65	-60.86	V6O13
Valentinite	-28.53	-37.01	-8.48	Sb2O3
VC12	-58.38	-39.50	18.87	VC12
VC13	-58.86	-35.43	23.43	VC13
VF4	-52.80	-37.87	14.93	VF4
Vmetal	-91.67	-47.65	44.03	V
VO	-36.42	-21.66	14.76	VO
VO (OH) 2	-6.52	-1.37	5.15	VO (OH) 2
VO2Cl	-17.04	-14.20	2.84	VO2Cl
VOC1	-28.74	-17.59	11.15	VOC1
VOC12	-31.97	-19.21	12.76	VOC12
VOSO4	-19.96	-16.35	3.61	VOSO4
Witherite	-2.42	-10.99	-8.57	BaCO3
Wurtzite	-69.36	-78.31	-8.95	ZnS
Zincite	-4.37	6.96	11.33	ZnO
Zincosite	-11.95	-8.02	3.93	ZnSO4
Zn (BO2) 2	-10.12	-1.83	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.25	-20.94	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-5.24	6.96	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-5.52	6.96	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.80	6.96	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-4.58	6.96	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.78	6.96	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.56	-1.06	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-10.19	5.00	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.32	-2.67	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-28.00	-9.09	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.55	12.85	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-21.55	16.95	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.93	-10.88	7.05	ZnCl2
ZnCO3:1H2O	-1.04	-11.30	-10.26	ZnCO3:1H2O

ZnF2	-10.76	-11.29	-0.53	ZnF2
Znmetal	-44.82	-19.03	25.79	Zn
ZnMoO4	-1.48	-11.61	-10.13	ZnMoO4
ZnO(active)	-4.23	6.96	11.19	ZnO
ZnS(am)	-69.26	-78.31	-9.05	ZnS
ZnSb	-87.53	-76.52	11.01	ZnSb
ZnSe	-24.78	-39.18	-14.40	ZnSe
ZnSeO4:6H2O	-14.88	-16.40	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.39	-8.02	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 42.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 202

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

```

      U3O8 0 0
      UO3 0 0
      UO2(OH)2(beta) 0 0
      ZnMoO4 0 0
USE solution 206
SAVE Solution 207 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 202
END

-----
TITLE
-----

Precipitate oversaturated phases

-----
Beginning of batch-reaction calculations.
-----

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 206. Solution after simulation 41.
Using pure phase assemblage 202.

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	0.000e+00	2.868e-05	2.868e-05
Anhydrite	-0.42	-4.78	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.749e-08	2.749e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.143e-05	1.143e-05
Brochantite	0.00	15.22	15.22	0.000e+00	5.590e-05	5.590e-05
Brucite	-3.73	13.12	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.005e+01	4.515e-02
CaMoO4	-0.52	-8.47	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.43	-1.61	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.858e-02	1.858e-02
Carnotite	-0.00	0.23	0.23	0.000e+00	8.496e-07	8.496e-07
Cd(BO2)2	-11.21	-1.37	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	7.441e-08	7.441e-08
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	7.147e-09	7.147e-09
Cu2Se(alpha)	-4.34	-50.14	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.27	-13.35	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.70	-4.83	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.232e-05	2.232e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.456e-03	1.456e-03
Gummite	-4.85	2.82	7.67	0.000e+00	0	0.000e+00

Gypsum	-0.17	-4.78	-4.61	0.000e+00	0	0.000e+00
HgSe	-1.93	-57.62	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.19	-6.31	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.80	-3.67	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.83	6.97	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-27.60	-11.90	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.81	-14.68	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.53	-14.67	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.446e-05
Otavite	-2.16	-14.16	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	2.767e-07	2.767e-07
Rutherfordine	-4.33	-18.83	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.29	-31.11	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.18	2.82	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-1.58	2.50	4.08	0.000e+00	0	0.000e+00
U3O8	-10.53	10.56	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.79	2.82	5.61	0.000e+00	0	0.000e+00
UO3	-4.88	2.82	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.37	-11.50	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	8.795e-06	8.815e-06
As	5.385e-10	5.397e-10
B	3.909e-05	3.918e-05
Ba	3.559e-08	3.567e-08
C	5.189e-04	5.201e-04
Ca	9.550e-03	9.571e-03
Cd	2.488e-08	2.493e-08
Cl	3.439e-03	3.447e-03
Co	3.970e-08	3.979e-08
Cr	1.458e-09	1.462e-09
Cu	5.060e-07	5.071e-07
F	1.815e-04	1.819e-04
Fe	1.089e-09	1.092e-09
Hg	3.550e-09	3.558e-09
K	6.115e-03	6.129e-03
Mg	7.852e-03	7.869e-03
Mn	9.567e-05	9.588e-05
Mo	3.345e-06	3.352e-06
N	2.253e-05	2.258e-05
Na	1.085e-02	1.088e-02
Ni	5.922e-09	5.935e-09
Pb	2.342e-09	2.347e-09
S	2.390e-02	2.395e-02
Sb	4.143e-08	4.152e-08
Se	3.106e-07	3.113e-07
U	1.935e-07	1.939e-07
V	5.524e-08	5.536e-08
Zn	1.007e-05	1.009e-05

-----Description of solution-----

	pH	=	7.894	Charge balance
	pe	=	4.878	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	6.550e-02	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	5.606e-04	
	Total CO2 (mol/kg)	=	5.189e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	

Electrical balance (eq) = 2.673e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 9
Total H = 1.112620e+02
Total O = 5.572824e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.948e-07	7.886e-07	-6.002	-6.103	-0.101	(0)
H+	1.584e-08	1.276e-08	-7.800	-7.894	-0.094	0.00
H2O	5.551e+01	9.991e-01	1.744	-0.000	0.000	18.07
Al	8.795e-06					
Al (OH) 4-	8.718e-06	7.010e-06	-5.060	-5.154	-0.095	(0)
Al (OH) 3	7.060e-08	7.060e-08	-7.151	-7.151	0.000	(0)
Al (OH) 2+	5.517e-09	4.487e-09	-8.258	-8.348	-0.090	(0)
AlF3	6.917e-10	6.917e-10	-9.160	-9.160	0.000	(0)
AlF2+	5.877e-10	4.779e-10	-9.231	-9.321	-0.090	(0)
AlF4-	4.957e-11	3.986e-11	-10.305	-10.399	-0.095	(0)
AlF+2	2.387e-11	1.044e-11	-10.622	-10.981	-0.359	(0)
AlOH+2	1.638e-11	7.163e-12	-10.786	-11.145	-0.359	(0)
AlSO4+	6.140e-13	4.937e-13	-12.212	-12.307	-0.095	(0)
Al+3	6.360e-14	9.083e-15	-13.197	-14.042	-0.845	(0)
Al (SO4) 2-	4.607e-14	3.704e-14	-13.337	-13.431	-0.095	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.347	-41.522	-1.175	(0)
As (3)	9.468e-24					
H3AsO3	8.981e-24	8.981e-24	-23.047	-23.047	0.000	(0)
H2AsO3-	4.877e-25	3.611e-25	-24.312	-24.442	-0.131	(0)
HAsO3-2	8.590e-29	2.581e-29	-28.066	-28.588	-0.522	(0)
H4AsO3+	7.666e-32	5.676e-32	-31.115	-31.246	-0.131	(0)
AsO3-3	1.167e-33	7.801e-35	-32.933	-34.108	-1.175	(0)
As (5)	5.385e-10					
HAsO4-2	5.137e-10	1.544e-10	-9.289	-9.811	-0.522	(0)
H2AsO4-	2.426e-11	1.796e-11	-10.615	-10.746	-0.131	(0)
AsO4-3	5.723e-13	3.827e-14	-12.242	-13.417	-1.175	(0)
H3AsO4	3.922e-17	3.981e-17	-16.407	-16.400	0.007	(0)
B	3.909e-05					
H3BO3	3.645e-05	3.700e-05	-4.438	-4.432	0.007	(0)
H2BO3-	2.160e-06	1.685e-06	-5.666	-5.774	-0.108	(0)
CaH2BO3+	2.973e-07	2.319e-07	-6.527	-6.635	-0.108	(0)
MgH2BO3+	1.601e-07	1.249e-07	-6.796	-6.903	-0.108	(0)
NaH2BO3	2.250e-08	2.250e-08	-7.648	-7.648	0.000	(0)
BF (OH) 3-	2.176e-09	1.697e-09	-8.662	-8.770	-0.108	(0)
H5 (BO3) 2-	6.801e-11	5.305e-11	-10.167	-10.275	-0.108	(0)
BaH2BO3+	9.980e-13	7.785e-13	-12.001	-12.109	-0.108	(0)
BF2 (OH) 2-	3.415e-13	2.664e-13	-12.467	-12.575	-0.108	(0)
H8 (BO3) 3-	2.517e-13	1.963e-13	-12.599	-12.707	-0.108	(0)
BF3OH-	1.950e-19	1.521e-19	-18.710	-18.818	-0.108	(0)
BF4-	1.409e-24	1.099e-24	-23.851	-23.959	-0.108	(0)
Ba	3.559e-08					
Ba+2	3.552e-08	1.495e-08	-7.450	-7.825	-0.376	(0)
BaHCO3+	6.568e-11	5.378e-11	-10.183	-10.269	-0.087	(0)
BaCO3	1.061e-11	1.061e-11	-10.974	-10.974	0.000	(0)
BaH2BO3+	9.980e-13	7.785e-13	-12.001	-12.109	-0.108	(0)
BaOH+	6.361e-14	5.148e-14	-13.196	-13.288	-0.092	(0)
BaNO3+	1.668e-15	1.235e-15	-14.778	-14.908	-0.131	(0)
BaNH3+2	2.974e-16	8.938e-17	-15.527	-16.049	-0.522	(0)
C (4)	5.189e-04					
HCO3-	4.631e-04	3.766e-04	-3.334	-3.424	-0.090	(0)
CaHCO3+	2.049e-05	1.678e-05	-4.689	-4.775	-0.087	(0)
H2CO3	1.080e-05	1.080e-05	-4.966	-4.966	0.000	(0)
MgHCO3+	1.032e-05	8.241e-06	-4.986	-5.084	-0.098	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	3.287e-06	1.384e-06	-5.483	-5.859	-0.376	(0)
MgCO3	2.462e-06	2.462e-06	-5.609	-5.609	0.000	(0)
NaHCO3	1.785e-06	1.785e-06	-5.748	-5.748	0.000	(0)

		NaCO3-	2.670e-07	2.172e-07	-6.573	-6.663	-0.090	(0)
		CuCO3	2.597e-07	2.597e-07	-6.585	-6.585	0.000	(0)
		MnHCO3+	1.933e-07	1.565e-07	-6.714	-6.806	-0.092	(0)
		ZnCO3	1.803e-07	1.803e-07	-6.744	-6.744	0.000	(0)
		UO2 (CO3) 3-4	1.386e-07	1.131e-09	-6.858	-8.947	-2.089	(0)
		UO2 (CO3) 2-2	5.424e-08	1.630e-08	-7.266	-7.788	-0.522	(0)
		ZnHCO3+	3.640e-08	2.695e-08	-7.439	-7.569	-0.131	(0)
		Cu (CO3) 2-2	3.220e-09	9.676e-10	-8.492	-9.014	-0.522	(0)
		CuHCO3+	1.023e-09	7.573e-10	-8.990	-9.121	-0.131	(0)
		PbCO3	7.087e-10	7.087e-10	-9.150	-9.150	0.000	(0)
		UO2CO3	5.903e-10	5.903e-10	-9.229	-9.229	0.000	(0)
		CoHCO3+	3.253e-10	2.409e-10	-9.488	-9.618	-0.131	(0)
		CoCO3	1.924e-10	1.924e-10	-9.716	-9.716	0.000	(0)
		CdCO3	1.587e-10	1.587e-10	-9.799	-9.799	0.000	(0)
		NiHCO3+	9.485e-11	7.023e-11	-10.023	-10.153	-0.131	(0)
		NiCO3	7.811e-11	7.811e-11	-10.107	-10.107	0.000	(0)
		BaHCO3+	6.568e-11	5.378e-11	-10.183	-10.269	-0.087	(0)
		PbHCO3+	6.438e-11	4.767e-11	-10.191	-10.322	-0.131	(0)
		BaCO3	1.061e-11	1.061e-11	-10.974	-10.974	0.000	(0)
		Pb (CO3) 2-2	9.414e-12	2.829e-12	-11.026	-11.548	-0.522	(0)
		CdHCO3+	5.826e-12	4.313e-12	-11.235	-11.365	-0.131	(0)
		Cd (CO3) 2-2	5.418e-13	1.628e-13	-12.266	-12.788	-0.522	(0)
		HgCO3	3.618e-15	3.618e-15	-14.442	-14.442	0.000	(0)
		FeHCO3+	2.665e-15	2.183e-15	-14.574	-14.661	-0.087	(0)
		Hg (CO3) 2-2	5.269e-17	1.583e-17	-16.278	-16.800	-0.522	(0)
		HgHCO3+	1.161e-18	8.594e-19	-17.935	-18.066	-0.131	(0)
Ca	9.550e-03							
		Ca+2	5.682e-03	2.393e-03	-2.245	-2.621	-0.376	(0)
		CaSO4	3.838e-03	3.838e-03	-2.416	-2.416	0.000	(0)
		CaHCO3+	2.049e-05	1.678e-05	-4.689	-4.775	-0.087	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.710e-06	3.002e-06	-5.431	-5.523	-0.092	(0)
		CaH2BO3+	2.973e-07	2.319e-07	-6.527	-6.635	-0.108	(0)
		CaOH+	4.597e-08	3.765e-08	-7.338	-7.424	-0.087	(0)
		CaNO3+	1.684e-10	1.247e-10	-9.774	-9.904	-0.131	(0)
		CaNH3+2	9.494e-11	2.853e-11	-10.023	-10.545	-0.522	(0)
		Ca (NH3) 2+2	3.580e-19	1.076e-19	-18.446	-18.968	-0.522	(0)
Cd	2.488e-08							
		Cd+2	1.195e-08	5.031e-09	-7.923	-8.298	-0.376	(0)
		CdSO4	8.258e-09	8.258e-09	-8.083	-8.083	0.000	(0)
		Cd (SO4) 2-2	2.596e-09	7.800e-10	-8.586	-9.108	-0.522	(0)
		CdCl+	1.798e-09	1.331e-09	-8.745	-8.876	-0.131	(0)
		CdCO3	1.587e-10	1.587e-10	-9.799	-9.799	0.000	(0)
		CdOHC1	4.306e-11	4.306e-11	-10.366	-10.366	0.000	(0)
		CdOH+	4.256e-11	3.151e-11	-10.371	-10.501	-0.131	(0)
		CdCl2	1.537e-11	1.537e-11	-10.813	-10.813	0.000	(0)
		CdF+	1.238e-11	9.167e-12	-10.907	-11.038	-0.131	(0)
		CdHCO3+	5.826e-12	4.313e-12	-11.235	-11.365	-0.131	(0)
		Cd (CO3) 2-2	5.418e-13	1.628e-13	-12.266	-12.788	-0.522	(0)
		Cd (OH) 2	1.568e-13	1.568e-13	-12.805	-12.805	0.000	(0)
		CdCl3-	3.630e-14	2.687e-14	-13.440	-13.571	-0.131	(0)
		CdF2	2.103e-15	2.103e-15	-14.677	-14.677	0.000	(0)
		CdNO3+	3.541e-16	2.622e-16	-15.451	-15.581	-0.131	(0)
		CdSeO4	1.644e-16	1.644e-16	-15.784	-15.784	0.000	(0)
		Cd (SeO3) 2-2	2.265e-17	6.807e-18	-16.645	-17.167	-0.522	(0)
		Cd2OH+3	1.188e-17	7.946e-19	-16.925	-18.100	-1.175	(0)
		Cd (OH) 3-	1.020e-17	7.555e-18	-16.991	-17.122	-0.131	(0)
		Cd (OH) 4-2	3.245e-24	9.753e-25	-23.489	-24.011	-0.522	(0)
		Cd (NO3) 2	2.165e-24	2.165e-24	-23.664	-23.664	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.728	-78.858	-0.131	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.222	-150.222	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.759	-226.890	-0.131	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.740	-303.262	-0.522	(0)
Cl	3.439e-03							
		Cl-	3.439e-03	2.771e-03	-2.464	-2.557	-0.094	(0)
		MnCl+	8.974e-08	7.263e-08	-7.047	-7.139	-0.092	(0)
		ZnCl+	1.972e-08	1.575e-08	-7.705	-7.803	-0.098	(0)
		ZnOHC1	1.626e-08	1.626e-08	-7.789	-7.789	0.000	(0)

CdCl+	1.798e-09	1.331e-09	-8.745	-8.876	-0.131	(0)
CuCl	7.206e-10	7.206e-10	-9.142	-9.142	0.000	(0)
CuCl2-	5.223e-10	4.171e-10	-9.282	-9.380	-0.098	(0)
MnCl2	2.842e-10	2.842e-10	-9.546	-9.546	0.000	(0)
CuCl+	1.752e-10	1.399e-10	-9.756	-9.854	-0.098	(0)
CoCl+	1.064e-10	7.881e-11	-9.973	-10.103	-0.131	(0)
ZnCl2	6.916e-11	6.916e-11	-10.160	-10.160	0.000	(0)
CdOHC1	4.306e-11	4.306e-11	-10.366	-10.366	0.000	(0)
PbCl+	2.262e-11	1.675e-11	-10.646	-10.776	-0.131	(0)
CdCl2	1.537e-11	1.537e-11	-10.813	-10.813	0.000	(0)
NiCl+	1.448e-11	1.072e-11	-10.839	-10.970	-0.131	(0)
HgClOH	8.429e-12	8.429e-12	-11.074	-11.074	0.000	(0)
HgCl2	1.677e-12	1.677e-12	-11.776	-11.776	0.000	(0)
CuCl3-2	5.760e-13	2.471e-13	-12.240	-12.607	-0.368	(0)
MnCl3-	2.680e-13	2.169e-13	-12.572	-12.664	-0.092	(0)
PbCl2	2.072e-13	2.072e-13	-12.684	-12.684	0.000	(0)
ZnCl3-	1.906e-13	1.522e-13	-12.720	-12.818	-0.098	(0)
CuCl2	1.344e-13	1.344e-13	-12.871	-12.871	0.000	(0)
HgCl3-	6.274e-14	4.645e-14	-13.202	-13.333	-0.131	(0)
CdCl3-	3.630e-14	2.687e-14	-13.440	-13.571	-0.131	(0)
HgCl4-2	1.705e-15	5.124e-16	-14.768	-15.290	-0.522	(0)
UO2Cl+	6.501e-16	4.814e-16	-15.187	-15.318	-0.131	(0)
ZnCl4-2	4.916e-16	2.109e-16	-15.308	-15.676	-0.368	(0)
PbCl3-	3.087e-16	2.286e-16	-15.510	-15.641	-0.131	(0)
HgCl+	1.631e-16	1.207e-16	-15.788	-15.918	-0.131	(0)
NiCl2	1.496e-16	1.496e-16	-15.825	-15.825	0.000	(0)
CrCl+2	6.088e-18	1.830e-18	-17.216	-17.738	-0.522	(0)
CuCl3-	4.353e-18	3.476e-18	-17.361	-17.459	-0.098	(0)
PbCl4-2	9.633e-19	2.895e-19	-18.016	-18.538	-0.522	(0)
CrOHC12	7.598e-20	7.598e-20	-19.119	-19.119	0.000	(0)
CrCl2+	6.496e-22	4.810e-22	-21.187	-21.318	-0.131	(0)
FeCl+2	6.303e-22	2.704e-22	-21.200	-21.568	-0.368	(0)
VOCl+	1.621e-22	1.200e-22	-21.790	-21.921	-0.131	(0)
CuCl4-2	1.125e-22	4.827e-23	-21.949	-22.316	-0.368	(0)
FeCl2+	4.135e-24	3.346e-24	-23.384	-23.475	-0.092	(0)
CrO3Cl-	4.405e-26	3.261e-26	-25.356	-25.487	-0.131	(0)
FeCl3	9.270e-28	9.270e-28	-27.033	-27.033	0.000	(0)
CoCl+2	4.640e-36	1.394e-36	-35.333	-35.856	-0.522	(0)
UCl+3	0.000e+00	0.000e+00	-44.770	-45.944	-1.175	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.498	-50.020	-0.522	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.367	-51.889	-0.522	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.237	-64.759	-0.522	(0)
Co (2)	3.970e-08					
Co+2	2.736e-08	8.223e-09	-7.563	-8.085	-0.522	(0)
CoSO4	1.149e-08	1.149e-08	-7.940	-7.940	0.000	(0)
CoHCO3+	3.253e-10	2.409e-10	-9.488	-9.618	-0.131	(0)
CoCO3	1.924e-10	1.924e-10	-9.716	-9.716	0.000	(0)
CoOH+	1.748e-10	1.294e-10	-9.758	-9.888	-0.131	(0)
CoCl+	1.064e-10	7.881e-11	-9.973	-10.103	-0.131	(0)
CoF+	4.038e-11	2.990e-11	-10.394	-10.524	-0.131	(0)
Co (OH) 2	8.105e-12	8.105e-12	-11.091	-11.091	0.000	(0)
CoNO2+	1.367e-12	1.012e-12	-11.864	-11.995	-0.131	(0)
Co (NH3) +2	3.116e-14	9.365e-15	-13.506	-14.028	-0.522	(0)
CoSeO4	7.234e-16	7.234e-16	-15.141	-15.141	0.000	(0)
CoNO3+	2.901e-16	2.148e-16	-15.537	-15.668	-0.131	(0)
Co (OH) 3-	1.723e-16	1.275e-16	-15.764	-15.894	-0.131	(0)
CoOOH-	4.326e-17	3.203e-17	-16.364	-16.494	-0.131	(0)
Co2OH+3	7.975e-19	5.332e-20	-18.098	-19.273	-1.175	(0)
Co (NH3) 2+2	1.259e-20	3.784e-21	-19.900	-20.422	-0.522	(0)
Co (OH) 4-2	5.304e-23	1.594e-23	-22.275	-22.797	-0.522	(0)
Co (NO3) 2	7.202e-24	7.202e-24	-23.143	-23.143	0.000	(0)
Co (NH3) 3+2	1.502e-27	4.513e-28	-26.823	-27.346	-0.522	(0)
Co4 (OH) 4+4	6.857e-30	5.592e-32	-29.164	-31.252	-2.089	(0)
Co (NH3) 4+2	7.465e-35	2.243e-35	-34.127	-34.649	-0.522	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.930	-42.453	-0.522	(0)
Co (3)	3.298e-29					
CoOH+2	3.298e-29	9.912e-30	-28.482	-29.004	-0.522	(0)
Co+3	1.732e-35	2.473e-36	-34.761	-35.607	-0.845	(0)

	CoCl+2	4.640e-36	1.394e-36	-35.333	-35.856	-0.522	(0)
	Co(NH3)5Cl+2	0.000e+00	0.000e+00	-49.498	-50.020	-0.522	(0)
	Co(NH3)6SO4+	0.000e+00	0.000e+00	-59.301	-59.431	-0.131	(0)
	Co(NH3)6OH+2	0.000e+00	0.000e+00	-63.583	-64.105	-0.522	(0)
	Co(NH3)6Cl+2	0.000e+00	0.000e+00	-64.237	-64.759	-0.522	(0)
Cr(2)	5.368e-27						
	Cr+2	5.368e-27	1.613e-27	-26.270	-26.792	-0.522	(0)
Cr(3)	1.458e-09						
	Cr(OH)2+	1.141e-09	8.447e-10	-8.943	-9.073	-0.131	(0)
	Cr(OH)3	2.503e-10	2.503e-10	-9.602	-9.602	0.000	(0)
	Cr(OH)+2	2.929e-11	8.803e-12	-10.533	-11.055	-0.522	(0)
	CrOHSO4	1.463e-11	1.463e-11	-10.835	-10.835	0.000	(0)
	CrO2-	1.260e-11	9.326e-12	-10.900	-11.030	-0.131	(0)
	Cr(OH)4-	1.061e-11	7.857e-12	-10.974	-11.105	-0.131	(0)
	CrF+2	3.094e-14	9.297e-15	-13.510	-14.032	-0.522	(0)
	CrSO4+	1.127e-14	8.343e-15	-13.948	-14.079	-0.131	(0)
	Cr+3	7.631e-15	5.103e-16	-14.117	-15.292	-1.175	(0)
	CrCl+2	6.088e-18	1.830e-18	-17.216	-17.738	-0.522	(0)
	CrOHC12	7.598e-20	7.598e-20	-19.119	-19.119	0.000	(0)
	Cr2(OH)2SO4+2	3.873e-20	1.164e-20	-19.412	-19.934	-0.522	(0)
	Cr2(OH)2(SO4)2	4.841e-21	4.841e-21	-20.315	-20.315	0.000	(0)
	CrCl2+	6.496e-22	4.810e-22	-21.187	-21.318	-0.131	(0)
	CrNO3+2	1.223e-24	3.676e-25	-23.913	-24.435	-0.522	(0)
	Cr(NH3)5OH+2	0.000e+00	0.000e+00	-40.619	-41.141	-0.522	(0)
	Cr(NH3)6+3	0.000e+00	0.000e+00	-49.259	-50.433	-1.175	(0)
	Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-51.367	-51.889	-0.522	(0)
Cr(6)	8.917e-15						
	CrO4-2	8.434e-15	3.551e-15	-14.074	-14.450	-0.376	(0)
	NaCrO4-	2.009e-16	1.487e-16	-15.697	-15.828	-0.131	(0)
	HCrO4-	1.980e-16	1.466e-16	-15.703	-15.834	-0.131	(0)
	KCrO4-	8.368e-17	6.195e-17	-16.077	-16.208	-0.131	(0)
	CrO3SO4-2	1.328e-23	3.992e-24	-22.877	-23.399	-0.522	(0)
	H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
	CrO3Cl-	4.405e-26	3.261e-26	-25.356	-25.487	-0.131	(0)
	Cr2O7-2	2.482e-30	7.458e-31	-29.605	-30.127	-0.522	(0)
Cu(1)	1.522e-09						
	CuCl	7.206e-10	7.206e-10	-9.142	-9.142	0.000	(0)
	CuCl2-	5.223e-10	4.171e-10	-9.282	-9.380	-0.098	(0)
	Cu+	2.790e-10	2.066e-10	-9.554	-9.685	-0.131	(0)
	CuCl3-2	5.760e-13	2.471e-13	-12.240	-12.607	-0.368	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-147.242	-147.642	-0.400	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.993	-148.372	-0.379	(0)
Cu(2)	5.045e-07						
	CuCO3	2.597e-07	2.597e-07	-6.585	-6.585	0.000	(0)
	CuOH+	9.953e-08	7.948e-08	-7.002	-7.100	-0.098	(0)
	Cu+2	7.569e-08	3.187e-08	-7.121	-7.497	-0.376	(0)
	CuSO4	5.112e-08	5.112e-08	-7.291	-7.291	0.000	(0)
	Cu(OH)2	1.251e-08	1.251e-08	-7.903	-7.903	0.000	(0)
	Cu(CO3)2-2	3.220e-09	9.676e-10	-8.492	-9.014	-0.522	(0)
	CuHCO3+	1.023e-09	7.573e-10	-8.990	-9.121	-0.131	(0)
	Cu2(OH)2+2	5.280e-10	1.587e-10	-9.277	-9.799	-0.522	(0)
	CuF+	3.122e-10	2.312e-10	-9.506	-9.636	-0.131	(0)
	CuCl+	1.752e-10	1.399e-10	-9.756	-9.854	-0.098	(0)
	CuNO2+	7.874e-11	5.830e-11	-10.104	-10.234	-0.131	(0)
	Cu(OH)3-	2.732e-11	2.023e-11	-10.563	-10.694	-0.131	(0)
	CuNH3+2	1.028e-11	3.089e-12	-10.988	-11.510	-0.522	(0)
	CuCl2	1.344e-13	1.344e-13	-12.871	-12.871	0.000	(0)
	Cu(NO2)2	1.042e-14	1.042e-14	-13.982	-13.982	0.000	(0)
	CuNO3+	2.243e-15	1.661e-15	-14.649	-14.780	-0.131	(0)
	Cu(OH)4-2	4.178e-16	1.256e-16	-15.379	-15.901	-0.522	(0)
	CuCl3-	4.353e-18	3.476e-18	-17.361	-17.459	-0.098	(0)
	CuCl4-2	1.125e-22	4.827e-23	-21.949	-22.316	-0.368	(0)
	Cu(NO3)2	3.446e-24	3.446e-24	-23.463	-23.463	0.000	(0)
	Cu(HS)3-	0.000e+00	0.000e+00	-217.171	-217.301	-0.131	(0)
F	1.815e-04						
	F-	1.427e-04	1.150e-04	-3.846	-3.939	-0.094	(0)
	MgF+	3.431e-05	2.759e-05	-4.465	-4.559	-0.095	(0)
	CaF+	3.710e-06	3.002e-06	-5.431	-5.523	-0.092	(0)

NaF	6.113e-07	6.113e-07	-6.214	-6.214	0.000	(0)
MnF+	1.178e-07	9.530e-08	-6.929	-7.021	-0.092	(0)
ZnF+	7.012e-09	5.192e-09	-8.154	-8.285	-0.131	(0)
BF(OH) 3-	2.176e-09	1.697e-09	-8.662	-8.770	-0.108	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
AlF3	6.917e-10	6.917e-10	-9.160	-9.160	0.000	(0)
AlF2+	5.877e-10	4.779e-10	-9.231	-9.321	-0.090	(0)
CuF+	3.122e-10	2.312e-10	-9.506	-9.636	-0.131	(0)
AlF4-	4.957e-11	3.986e-11	-10.305	-10.399	-0.095	(0)
CoF+	4.038e-11	2.990e-11	-10.394	-10.524	-0.131	(0)
AlF+2	2.387e-11	1.044e-11	-10.622	-10.981	-0.359	(0)
CdF+	1.238e-11	9.167e-12	-10.907	-11.038	-0.131	(0)
NiF+	5.900e-12	4.368e-12	-11.229	-11.360	-0.131	(0)
UO2F+	2.296e-12	1.700e-12	-11.639	-11.770	-0.131	(0)
PbF+	1.864e-12	1.380e-12	-11.730	-11.860	-0.131	(0)
HF2-	1.196e-12	9.481e-13	-11.922	-12.023	-0.101	(0)
UO2F2	5.637e-13	5.637e-13	-12.249	-12.249	0.000	(0)
BF2(OH) 2-	3.415e-13	2.664e-13	-12.467	-12.575	-0.108	(0)
CrF+2	3.094e-14	9.297e-15	-13.510	-14.032	-0.522	(0)
UO2F3-	2.199e-14	1.628e-14	-13.658	-13.788	-0.131	(0)
PbF2	3.122e-15	3.122e-15	-14.506	-14.506	0.000	(0)
CdF2	2.103e-15	2.103e-15	-14.677	-14.677	0.000	(0)
UO2F4-2	4.947e-17	1.487e-17	-16.306	-16.828	-0.522	(0)
VO2F	1.806e-17	1.806e-17	-16.743	-16.743	0.000	(0)
H2F2	1.261e-17	1.261e-17	-16.899	-16.899	0.000	(0)
FeF2+	1.549e-18	1.253e-18	-17.810	-17.902	-0.092	(0)
VO2F2-	1.018e-18	7.538e-19	-17.992	-18.123	-0.131	(0)
FeF+2	9.497e-19	4.073e-19	-18.022	-18.390	-0.368	(0)
PbF3-	9.196e-19	6.809e-19	-18.036	-18.167	-0.131	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
BF3OH-	1.950e-19	1.521e-19	-18.710	-18.818	-0.108	(0)
VOF+	1.438e-20	1.065e-20	-19.842	-19.973	-0.131	(0)
VO2F3-2	3.597e-21	1.081e-21	-20.444	-20.966	-0.522	(0)
VOF2	4.590e-22	4.590e-22	-21.338	-21.338	0.000	(0)
PbF4-2	1.247e-22	3.747e-23	-21.904	-22.426	-0.522	(0)
HgF+	1.257e-23	9.309e-24	-22.901	-23.031	-0.131	(0)
VOF3-	2.529e-24	1.873e-24	-23.597	-23.728	-0.131	(0)
BF4-	1.409e-24	1.099e-24	-23.851	-23.959	-0.108	(0)
VO2F4-3	9.146e-25	6.115e-26	-24.039	-25.214	-1.175	(0)
Sb(OH) 2F	6.101e-26	6.101e-26	-25.215	-25.215	0.000	(0)
SbOF	6.005e-26	6.005e-26	-25.221	-25.221	0.000	(0)
VOF4-2	2.892e-27	8.690e-28	-26.539	-27.061	-0.522	(0)
UF3+	6.688e-36	4.952e-36	-35.175	-35.305	-0.131	(0)
UF2+2	9.044e-37	2.718e-37	-36.044	-36.566	-0.522	(0)
UF4	6.242e-38	6.242e-38	-37.205	-37.205	0.000	(0)
UF+3	2.808e-39	1.878e-40	-38.552	-39.726	-1.175	(0)
UF5-	3.841e-40	2.844e-40	-39.416	-39.546	-0.131	(0)
UF6-2	0.000e+00	0.000e+00	-40.483	-41.006	-0.522	(0)
Fe (2)	2.344e-12					
Fe+2	1.532e-12	4.604e-13	-11.815	-12.337	-0.522	(0)
FeSO4	7.913e-13	7.913e-13	-12.102	-12.102	0.000	(0)
FeOH+	1.786e-14	1.445e-14	-13.748	-13.840	-0.092	(0)
FeHCO3+	2.665e-15	2.183e-15	-14.574	-14.661	-0.087	(0)
Fe(OH) 2	9.054e-18	9.054e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	2.790e-18	2.258e-18	-17.554	-17.646	-0.092	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.523	-160.523	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.923	-237.053	-0.131	(0)
Fe (3)	1.087e-09					
Fe(OH) 2+	6.207e-10	5.048e-10	-9.207	-9.297	-0.090	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	3.861e-11	3.140e-11	-10.413	-10.503	-0.090	(0)
FeOH+2	3.836e-15	1.645e-15	-14.416	-14.784	-0.368	(0)
FeF2+	1.549e-18	1.253e-18	-17.810	-17.902	-0.092	(0)
FeF+2	9.497e-19	4.073e-19	-18.022	-18.390	-0.368	(0)
FeSO4+	3.137e-19	2.539e-19	-18.503	-18.595	-0.092	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
Fe(SO4) 2-	5.133e-20	3.801e-20	-19.290	-19.420	-0.131	(0)
Fe+3	2.263e-20	3.231e-21	-19.645	-20.491	-0.845	(0)

FeCl+2	6.303e-22	2.704e-22	-21.200	-21.568	-0.368	(0)
FeCl2+	4.135e-24	3.346e-24	-23.384	-23.475	-0.092	(0)
FeHSeO3+2	3.689e-24	1.109e-24	-23.433	-23.955	-0.522	(0)
Fe2(OH) 2+4	1.099e-26	8.965e-29	-25.959	-28.047	-2.089	(0)
FeNO3+2	1.772e-27	5.325e-28	-26.752	-27.274	-0.522	(0)
FeCl3	9.270e-28	9.270e-28	-27.033	-27.033	0.000	(0)
Fe3(OH) 4+5	1.200e-33	6.541e-37	-32.921	-36.184	-3.263	(0)
H (0)	3.975e-29					
H2	1.988e-29	2.018e-29	-28.702	-28.695	0.007	(0)
Hg (0)	3.532e-09					
Hg	3.532e-09	3.532e-09	-8.452	-8.452	0.000	(0)
Hg (1)	3.485e-20					
Hg2+2	1.743e-20	5.237e-21	-19.759	-20.281	-0.522	(0)
Hg (2)	1.862e-11					
Hg(OH) 2	8.443e-12	8.572e-12	-11.073	-11.067	0.007	(0)
HgClOH	8.429e-12	8.429e-12	-11.074	-11.074	0.000	(0)
HgCl2	1.677e-12	1.677e-12	-11.776	-11.776	0.000	(0)
HgCl3-	6.274e-14	4.645e-14	-13.202	-13.333	-0.131	(0)
HgCO3	3.618e-15	3.618e-15	-14.442	-14.442	0.000	(0)
HgCl4-2	1.705e-15	5.124e-16	-14.768	-15.290	-0.522	(0)
HgCl+	1.631e-16	1.207e-16	-15.788	-15.918	-0.131	(0)
HgOH+	9.262e-17	6.858e-17	-16.033	-16.164	-0.131	(0)
Hg(CO3) 2-2	5.269e-17	1.583e-17	-16.278	-16.800	-0.522	(0)
HgHCO3+	1.161e-18	8.594e-19	-17.935	-18.066	-0.131	(0)
Hg(OH) 3-	1.149e-18	8.510e-19	-17.940	-18.070	-0.131	(0)
Hg(NH3) 2+2	4.115e-19	1.237e-19	-18.386	-18.908	-0.522	(0)
HgNH3+2	4.344e-20	1.306e-20	-19.362	-19.884	-0.522	(0)
Hg+2	7.269e-21	2.184e-21	-20.139	-20.661	-0.522	(0)
HgSO4	4.005e-21	4.005e-21	-20.397	-20.397	0.000	(0)
HgF+	1.257e-23	9.309e-24	-22.901	-23.031	-0.131	(0)
Hg(NH3) 3+2	1.552e-26	4.664e-27	-25.809	-26.331	-0.522	(0)
HgNO3+	1.795e-29	1.329e-29	-28.746	-28.876	-0.131	(0)
Hg(NH3) 4+2	1.168e-33	3.509e-34	-32.933	-33.455	-0.522	(0)
Hg(NO3) 2	9.104e-38	9.104e-38	-37.041	-37.041	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.844	-137.974	-0.131	(0)
HgS2-2	0.000e+00	0.000e+00	-138.266	-138.788	-0.522	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-139.474	-139.474	0.000	(0)
K	6.115e-03					
K+	5.829e-03	4.695e-03	-2.234	-2.328	-0.094	(0)
KSO4-	2.862e-04	2.328e-04	-3.543	-3.633	-0.090	(0)
KCrO4-	8.368e-17	6.195e-17	-16.077	-16.208	-0.131	(0)
Mg	7.852e-03					
Mg+2	5.079e-03	2.139e-03	-2.294	-2.670	-0.376	(0)
MgSO4	2.725e-03	2.725e-03	-2.565	-2.565	0.000	(0)
MgF+	3.431e-05	2.759e-05	-4.465	-4.559	-0.095	(0)
MgHCO3+	1.032e-05	8.241e-06	-4.986	-5.084	-0.098	(0)
MgCO3	2.462e-06	2.462e-06	-5.609	-5.609	0.000	(0)
MgOH+	8.154e-07	6.714e-07	-6.089	-6.173	-0.084	(0)
MgH2BO3+	1.601e-07	1.249e-07	-6.796	-6.903	-0.108	(0)
Mn (2)	9.567e-05					
Mn+2	6.929e-05	2.082e-05	-4.159	-4.681	-0.522	(0)
MnSO4	2.593e-05	2.593e-05	-4.586	-4.586	0.000	(0)
MnHCO3+	1.933e-07	1.565e-07	-6.714	-6.806	-0.092	(0)
MnF+	1.178e-07	9.530e-08	-6.929	-7.021	-0.092	(0)
MnCl+	8.974e-08	7.263e-08	-7.047	-7.139	-0.092	(0)
MnOH+	5.097e-08	4.125e-08	-7.293	-7.385	-0.092	(0)
MnCl2	2.842e-10	2.842e-10	-9.546	-9.546	0.000	(0)
MnSeO4	9.838e-13	9.838e-13	-12.007	-12.007	0.000	(0)
MnNO3+	7.346e-13	5.439e-13	-12.134	-12.265	-0.131	(0)
MnCl3-	2.680e-13	2.169e-13	-12.572	-12.664	-0.092	(0)
Mn(OH) 3-	1.959e-16	1.585e-16	-15.708	-15.800	-0.092	(0)
Mn(NO3) 2	2.251e-20	2.251e-20	-19.648	-19.648	0.000	(0)
Mn(OH) 4-2	9.411e-22	4.037e-22	-21.026	-21.394	-0.368	(0)
MnSe	0.000e+00	0.000e+00	-40.833	-40.833	0.000	(0)
Mn (3)	4.921e-25					
Mn+3	4.921e-25	7.028e-26	-24.308	-25.153	-0.845	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-40.070	-40.438	-0.368	(0)

Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.827	-44.932	-0.104	(0)
Mo	3.345e-06					
MoO4-2	3.344e-06	1.408e-06	-5.476	-5.851	-0.376	(0)
HMoO4-	4.827e-10	3.574e-10	-9.316	-9.447	-0.131	(0)
H2MoO4	3.340e-14	3.340e-14	-13.476	-13.476	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.347	-41.522	-1.175	(0)
Mo7O24-6	0.000e+00	0.000e+00	-46.423	-51.122	-4.699	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.366	-52.629	-3.263	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-53.653	-55.742	-2.089	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-59.215	-60.390	-1.175	(0)
N (-3)	3.009e-07					
NH4+	2.717e-07	2.119e-07	-6.566	-6.674	-0.108	(0)
NH4SO4-	1.965e-08	1.590e-08	-7.707	-7.799	-0.092	(0)
NH3	9.473e-09	9.473e-09	-8.024	-8.024	0.000	(0)
CaNH3+2	9.494e-11	2.853e-11	-10.023	-10.545	-0.522	(0)
CuNH3+2	1.028e-11	3.089e-12	-10.988	-11.510	-0.522	(0)
Co (NH3) +2	3.116e-14	9.365e-15	-13.506	-14.028	-0.522	(0)
NiNH3+2	2.561e-14	7.695e-15	-13.592	-14.114	-0.522	(0)
BaNH3+2	2.974e-16	8.938e-17	-15.527	-16.049	-0.522	(0)
Hg (NH3) 2+2	4.115e-19	1.237e-19	-18.386	-18.908	-0.522	(0)
Ca (NH3) 2+2	3.580e-19	1.076e-19	-18.446	-18.968	-0.522	(0)
HgNH3+2	4.344e-20	1.306e-20	-19.362	-19.884	-0.522	(0)
Ni (NH3) 2+2	3.506e-20	1.054e-20	-19.455	-19.977	-0.522	(0)
Co (NH3) 2+2	1.259e-20	3.784e-21	-19.900	-20.422	-0.522	(0)
Hg (NH3) 3+2	1.552e-26	4.664e-27	-25.809	-26.331	-0.522	(0)
Co (NH3) 3+2	1.502e-27	4.513e-28	-26.823	-27.346	-0.522	(0)
Hg (NH3) 4+2	1.168e-33	3.509e-34	-32.933	-33.455	-0.522	(0)
Co (NH3) 4+2	7.465e-35	2.243e-35	-34.127	-34.649	-0.522	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.619	-41.141	-0.522	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.930	-42.453	-0.522	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.259	-50.433	-1.175	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.498	-50.020	-0.522	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.367	-51.889	-0.522	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.301	-59.431	-0.131	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.583	-64.105	-0.522	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.237	-64.759	-0.522	(0)
N (3)	2.221e-05					
NO2-	2.221e-05	1.747e-05	-4.654	-4.758	-0.104	(0)
CuNO2+	7.874e-11	5.830e-11	-10.104	-10.234	-0.131	(0)
CoNO2+	1.367e-12	1.012e-12	-11.864	-11.995	-0.131	(0)
Cu (NO2) 2	1.042e-14	1.042e-14	-13.982	-13.982	0.000	(0)
N (5)	2.063e-08					
NO3-	2.046e-08	1.648e-08	-7.689	-7.783	-0.094	(0)
CaNO3+	1.684e-10	1.247e-10	-9.774	-9.904	-0.131	(0)
MnNO3+	7.346e-13	5.439e-13	-12.134	-12.265	-0.131	(0)
ZnNO3+	1.265e-13	9.369e-14	-12.898	-13.028	-0.131	(0)
CuNO3+	2.243e-15	1.661e-15	-14.649	-14.780	-0.131	(0)
BaNO3+	1.668e-15	1.235e-15	-14.778	-14.908	-0.131	(0)
CdNO3+	3.541e-16	2.622e-16	-15.451	-15.581	-0.131	(0)
CoNO3+	2.901e-16	2.148e-16	-15.537	-15.668	-0.131	(0)
NiNO3+	8.457e-17	6.262e-17	-16.073	-16.203	-0.131	(0)
PbNO3+	5.608e-17	4.152e-17	-16.251	-16.382	-0.131	(0)
Mn (NO3) 2	2.251e-20	2.251e-20	-19.648	-19.648	0.000	(0)
UO2NO3+	4.758e-21	3.523e-21	-20.323	-20.453	-0.131	(0)
Zn (NO3) 2	3.081e-22	3.081e-22	-21.511	-21.511	0.000	(0)
Co (NO3) 2	7.202e-24	7.202e-24	-23.143	-23.143	0.000	(0)
Cu (NO3) 2	3.446e-24	3.446e-24	-23.463	-23.463	0.000	(0)
Cd (NO3) 2	2.165e-24	2.165e-24	-23.664	-23.664	0.000	(0)
CrNO3+2	1.223e-24	3.676e-25	-23.913	-24.435	-0.522	(0)
Pb (NO3) 2	1.162e-24	1.162e-24	-23.935	-23.935	0.000	(0)
VO2NO3	7.466e-25	7.466e-25	-24.127	-24.127	0.000	(0)
FeNO3+2	1.772e-27	5.325e-28	-26.752	-27.274	-0.522	(0)
HgNO3+	1.795e-29	1.329e-29	-28.746	-28.876	-0.131	(0)
Hg (NO3) 2	9.104e-38	9.104e-38	-37.041	-37.041	0.000	(0)
Na	1.085e-02					
Na+	1.046e-02	8.427e-03	-1.980	-2.074	-0.094	(0)
NaSO4-	3.897e-04	3.169e-04	-3.409	-3.499	-0.090	(0)

	NaHCO3	1.785e-06	1.785e-06	-5.748	-5.748	0.000	(0)
	NaF	6.113e-07	6.113e-07	-6.214	-6.214	0.000	(0)
	NaCO3-	2.670e-07	2.172e-07	-6.573	-6.663	-0.090	(0)
	NaH2BO3	2.250e-08	2.250e-08	-7.648	-7.648	0.000	(0)
	NaCrO4-	2.009e-16	1.487e-16	-15.697	-15.828	-0.131	(0)
Ni		5.922e-09					
	Ni+2	3.592e-09	1.513e-09	-8.445	-8.820	-0.376	(0)
	NiSO4	2.113e-09	2.113e-09	-8.675	-8.675	0.000	(0)
	NiHCO3+	9.485e-11	7.023e-11	-10.023	-10.153	-0.131	(0)
	NiCO3	7.811e-11	7.811e-11	-10.107	-10.107	0.000	(0)
	NiOH+	2.028e-11	1.502e-11	-10.693	-10.823	-0.131	(0)
	NiCl+	1.448e-11	1.072e-11	-10.839	-10.970	-0.131	(0)
	NiF+	5.900e-12	4.368e-12	-11.229	-11.360	-0.131	(0)
	Ni (SO4) 2-2	1.631e-12	4.900e-13	-11.788	-12.310	-0.522	(0)
	Ni (OH) 2	9.408e-13	9.408e-13	-12.027	-12.027	0.000	(0)
	NiNH3+2	2.561e-14	7.695e-15	-13.592	-14.114	-0.522	(0)
	Ni (OH) 3-	1.002e-15	7.419e-16	-14.999	-15.130	-0.131	(0)
	NiCl2	1.496e-16	1.496e-16	-15.825	-15.825	0.000	(0)
	NiSeO4	1.242e-16	1.242e-16	-15.906	-15.906	0.000	(0)
	NiNO3+	8.457e-17	6.262e-17	-16.073	-16.203	-0.131	(0)
	Ni (NH3) 2+2	3.506e-20	1.054e-20	-19.455	-19.977	-0.522	(0)
O (0)		2.448e-35					
	O2	1.224e-35	1.243e-35	-34.912	-34.906	0.007	(0)
Pb		2.342e-09					
	PbCO3	7.087e-10	7.087e-10	-9.150	-9.150	0.000	(0)
	PbSO4	5.842e-10	5.842e-10	-9.233	-9.233	0.000	(0)
	PbOH+	4.558e-10	3.375e-10	-9.341	-9.472	-0.131	(0)
	Pb+2	4.046e-10	1.704e-10	-9.393	-9.769	-0.376	(0)
	Pb (SO4) 2-2	8.202e-11	2.465e-11	-10.086	-10.608	-0.522	(0)
	PbHCO3+	6.438e-11	4.767e-11	-10.191	-10.322	-0.131	(0)
	PbCl+	2.262e-11	1.675e-11	-10.646	-10.776	-0.131	(0)
	Pb (CO3) 2-2	9.414e-12	2.829e-12	-11.026	-11.548	-0.522	(0)
	Pb (OH) 2	8.416e-12	8.416e-12	-11.075	-11.075	0.000	(0)
	PbF+	1.864e-12	1.380e-12	-11.730	-11.860	-0.131	(0)
	PbCl2	2.072e-13	2.072e-13	-12.684	-12.684	0.000	(0)
	Pb (OH) 3-	8.964e-15	6.637e-15	-14.048	-14.178	-0.131	(0)
	PbF2	3.122e-15	3.122e-15	-14.506	-14.506	0.000	(0)
	PbCl3-	3.087e-16	2.286e-16	-15.510	-15.641	-0.131	(0)
	PbNO3+	5.608e-17	4.152e-17	-16.251	-16.382	-0.131	(0)
	Pb2OH+3	1.363e-17	9.111e-19	-16.866	-18.040	-1.175	(0)
	Pb (OH) 4-2	4.265e-18	1.282e-18	-17.370	-17.892	-0.522	(0)
	PbCl4-2	9.633e-19	2.895e-19	-18.016	-18.538	-0.522	(0)
	PbF3-	9.196e-19	6.809e-19	-18.036	-18.167	-0.131	(0)
	Pb3 (OH) 4+2	8.010e-22	2.407e-22	-21.096	-21.618	-0.522	(0)
	PbF4-2	1.247e-22	3.747e-23	-21.904	-22.426	-0.522	(0)
	Pb (NO3) 2	1.162e-24	1.162e-24	-23.935	-23.935	0.000	(0)
	Pb4 (OH) 4+4	3.994e-26	3.257e-28	-25.399	-27.487	-2.089	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.634	-151.634	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.772	-228.902	-0.131	(0)
S (-2)		0.000e+00					
	HS-	0.000e+00	0.000e+00	-78.437	-78.568	-0.131	(0)
	CdHS+	0.000e+00	0.000e+00	-78.728	-78.858	-0.131	(0)
	H2S	0.000e+00	0.000e+00	-79.442	-79.442	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.517	-80.039	-0.522	(0)
	S6-2	0.000e+00	0.000e+00	-80.032	-80.555	-0.522	(0)
	S4-2	0.000e+00	0.000e+00	-80.112	-80.634	-0.522	(0)
	S3-2	0.000e+00	0.000e+00	-80.918	-81.440	-0.522	(0)
	S2-2	0.000e+00	0.000e+00	-81.934	-82.456	-0.522	(0)
	S-2	0.000e+00	0.000e+00	-87.606	-87.974	-0.368	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.844	-137.974	-0.131	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.266	-138.788	-0.522	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.474	-139.474	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.242	-147.642	-0.400	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-147.946	-148.077	-0.131	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.993	-148.372	-0.379	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-149.961	-149.961	0.000	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.222	-150.222	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.634	-151.634	0.000	(0)

Fe (HS) 2	0.000e+00	0.000e+00	-160.523	-160.523	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.171	-217.301	-0.131	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.118	-225.249	-0.131	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.759	-226.890	-0.131	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.812	-227.335	-0.522	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.772	-228.902	-0.131	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.923	-237.053	-0.131	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.740	-303.262	-0.522	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.755	-305.277	-0.522	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.297	-319.819	-0.522	(0)
S (6)	2.390e-02					
SO4-2	1.663e-02	7.002e-03	-1.779	-2.155	-0.376	(0)
CaSO4	3.838e-03	3.838e-03	-2.416	-2.416	0.000	(0)
MgSO4	2.725e-03	2.725e-03	-2.565	-2.565	0.000	(0)
NaSO4-	3.897e-04	3.169e-04	-3.409	-3.499	-0.090	(0)
KSO4-	2.862e-04	2.328e-04	-3.543	-3.633	-0.090	(0)
MnSO4	2.593e-05	2.593e-05	-4.586	-4.586	0.000	(0)
ZnSO4	3.467e-06	3.467e-06	-5.460	-5.460	0.000	(0)
Zn (SO4) 2-2	7.036e-07	2.114e-07	-6.153	-6.675	-0.522	(0)
CuSO4	5.112e-08	5.112e-08	-7.291	-7.291	0.000	(0)
NH4SO4-	1.965e-08	1.590e-08	-7.707	-7.799	-0.092	(0)
CoSO4	1.149e-08	1.149e-08	-7.940	-7.940	0.000	(0)
HSO4-	1.086e-08	8.729e-09	-7.964	-8.059	-0.095	(0)
CdSO4	8.258e-09	8.258e-09	-8.083	-8.083	0.000	(0)
Cd (SO4) 2-2	2.596e-09	7.800e-10	-8.586	-9.108	-0.522	(0)
NiSO4	2.113e-09	2.113e-09	-8.675	-8.675	0.000	(0)
PbSO4	5.842e-10	5.842e-10	-9.233	-9.233	0.000	(0)
Pb (SO4) 2-2	8.202e-11	2.465e-11	-10.086	-10.608	-0.522	(0)
CrOHSO4	1.463e-11	1.463e-11	-10.835	-10.835	0.000	(0)
Ni (SO4) 2-2	1.631e-12	4.900e-13	-11.788	-12.310	-0.522	(0)
UO2SO4	1.135e-12	1.135e-12	-11.945	-11.945	0.000	(0)
FeSO4	7.913e-13	7.913e-13	-12.102	-12.102	0.000	(0)
AlSO4+	6.140e-13	4.937e-13	-12.212	-12.307	-0.095	(0)
UO2 (SO4) 2-2	3.487e-13	1.048e-13	-12.457	-12.980	-0.522	(0)
Al (SO4) 2-	4.607e-14	3.704e-14	-13.337	-13.431	-0.095	(0)
CrSO4+	1.127e-14	8.343e-15	-13.948	-14.079	-0.131	(0)
VO2SO4-	2.023e-17	1.497e-17	-16.694	-16.825	-0.131	(0)
FeSO4+	3.137e-19	2.539e-19	-18.503	-18.595	-0.092	(0)
Fe (SO4) 2-	5.133e-20	3.801e-20	-19.290	-19.420	-0.131	(0)
Cr2 (OH) 2SO4+2	3.873e-20	1.164e-20	-19.412	-19.934	-0.522	(0)
VO4SO4	2.978e-20	2.978e-20	-19.526	-19.526	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.841e-21	4.841e-21	-20.315	-20.315	0.000	(0)
HgSO4	4.005e-21	4.005e-21	-20.397	-20.397	0.000	(0)
CrO3SO4-2	1.328e-23	3.992e-24	-22.877	-23.399	-0.522	(0)
VS4+	7.380e-35	5.464e-35	-34.132	-34.262	-0.131	(0)
U (SO4) 2	1.269e-39	1.269e-39	-38.896	-38.896	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.120	-40.642	-0.522	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.301	-59.431	-0.131	(0)
Sb (3)	5.261e-20					
Sb (OH) 3	2.661e-20	2.661e-20	-19.575	-19.575	0.000	(0)
HSbO2	2.600e-20	2.600e-20	-19.585	-19.585	0.000	(0)
SbO2-	4.458e-24	3.300e-24	-23.351	-23.481	-0.131	(0)
Sb (OH) 4-	2.550e-24	1.888e-24	-23.594	-23.724	-0.131	(0)
Sb (OH) 2F	6.101e-26	6.101e-26	-25.215	-25.215	0.000	(0)
SbOF	6.005e-26	6.005e-26	-25.221	-25.221	0.000	(0)
Sb (OH) 2+	1.114e-26	8.249e-27	-25.953	-26.084	-0.131	(0)
SbO+	3.845e-27	2.847e-27	-26.415	-26.546	-0.131	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.297	-319.819	-0.522	(0)
Sb (5)	4.143e-08					
SbO3-	4.138e-08	3.064e-08	-7.383	-7.514	-0.131	(0)
Sb (OH) 6-	4.437e-11	3.574e-11	-10.353	-10.447	-0.094	(0)
SbO2+	1.933e-24	1.431e-24	-23.714	-23.844	-0.131	(0)
Se (-2)	2.950e-39					
HSe-	2.950e-39	2.184e-39	-38.530	-38.661	-0.131	(0)
MnSe	0.000e+00	0.000e+00	-40.833	-40.833	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.665	-42.665	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.244	-45.766	-0.522	(0)
Se (4)	3.102e-07					

HSeO3-	1.754e-07	1.298e-07	-6.756	-6.887	-0.131	(0)
SeO3-2	1.348e-07	4.052e-08	-6.870	-7.392	-0.522	(0)
H2SeO3	7.065e-13	7.065e-13	-12.151	-12.151	0.000	(0)
Cd(SeO3) 2-2	2.265e-17	6.807e-18	-16.645	-17.167	-0.522	(0)
FeHSeO3+2	3.689e-24	1.109e-24	-23.433	-23.955	-0.522	(0)
Se (6)	4.179e-10					
SeO4-2	4.169e-10	1.755e-10	-9.380	-9.756	-0.376	(0)
MnSeO4	9.838e-13	9.838e-13	-12.007	-12.007	0.000	(0)
ZnSeO4	6.153e-14	6.153e-14	-13.211	-13.211	0.000	(0)
CoSeO4	7.234e-16	7.234e-16	-15.141	-15.141	0.000	(0)
CdSeO4	1.644e-16	1.644e-16	-15.784	-15.784	0.000	(0)
HSeO4-	1.516e-16	1.122e-16	-15.819	-15.950	-0.131	(0)
NiSeO4	1.242e-16	1.242e-16	-15.906	-15.906	0.000	(0)
Zn(SeO4) 2-2	3.644e-23	1.095e-23	-22.438	-22.961	-0.522	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.586	-58.761	-1.175	(0)
U (4)	2.472e-19					
U (OH) 5-	2.471e-19	1.830e-19	-18.607	-18.738	-0.131	(0)
U (OH) 4	9.785e-23	9.785e-23	-22.009	-22.009	0.000	(0)
U (OH) 3+	6.169e-27	4.567e-27	-26.210	-26.340	-0.131	(0)
U (OH) 2+2	8.973e-32	2.697e-32	-31.047	-31.569	-0.522	(0)
UF3+	6.688e-36	4.952e-36	-35.175	-35.305	-0.131	(0)
UF2+2	9.044e-37	2.718e-37	-36.044	-36.566	-0.522	(0)
UOH+3	2.425e-37	1.622e-38	-36.615	-37.790	-1.175	(0)
UF4	6.242e-38	6.242e-38	-37.205	-37.205	0.000	(0)
UF+3	2.808e-39	1.878e-40	-38.552	-39.726	-1.175	(0)
U (SO4) 2	1.269e-39	1.269e-39	-38.896	-38.896	0.000	(0)
UF5-	3.841e-40	2.844e-40	-39.416	-39.546	-0.131	(0)
USO4+2	0.000e+00	0.000e+00	-40.120	-40.642	-0.522	(0)
UF6-2	0.000e+00	0.000e+00	-40.483	-41.006	-0.522	(0)
U+4	0.000e+00	0.000e+00	-42.998	-45.087	-2.089	(0)
UCl+3	0.000e+00	0.000e+00	-44.770	-45.944	-1.175	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-158.695	-169.269	-10.573	(0)
U (5)	1.167e-15					
UO2+	1.167e-15	8.642e-16	-14.933	-15.063	-0.131	(0)
U (6)	1.935e-07					
UO2 (CO3) 3-4	1.386e-07	1.131e-09	-6.858	-8.947	-2.089	(0)
UO2 (CO3) 2-2	5.424e-08	1.630e-08	-7.266	-7.788	-0.522	(0)
UO2CO3	5.903e-10	5.903e-10	-9.229	-9.229	0.000	(0)
UO2OH+	1.437e-11	1.064e-11	-10.843	-10.973	-0.131	(0)
UO2F+	2.296e-12	1.700e-12	-11.639	-11.770	-0.131	(0)
UO2SO4	1.135e-12	1.135e-12	-11.945	-11.945	0.000	(0)
UO2F2	5.637e-13	5.637e-13	-12.249	-12.249	0.000	(0)
UO2 (SO4) 2-2	3.487e-13	1.048e-13	-12.457	-12.980	-0.522	(0)
UO2+2	2.544e-13	1.071e-13	-12.594	-12.970	-0.376	(0)
UO2F3-	2.199e-14	1.628e-14	-13.658	-13.788	-0.131	(0)
(UO2) 3 (OH) 5+	1.272e-15	9.420e-16	-14.895	-15.026	-0.131	(0)
UO2Cl+	6.501e-16	4.814e-16	-15.187	-15.318	-0.131	(0)
(UO2) 2 (OH) 2+2	6.247e-16	1.877e-16	-15.204	-15.726	-0.522	(0)
UO2F4-2	4.947e-17	1.487e-17	-16.306	-16.828	-0.522	(0)
UO2NO3+	4.758e-21	3.523e-21	-20.323	-20.453	-0.131	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.433	-42.563	-0.131	(0)
V+2	0.000e+00	0.000e+00	-43.448	-43.970	-0.522	(0)
V (3)	6.540e-15					
V (OH) 3	6.540e-15	6.540e-15	-14.184	-14.184	0.000	(0)
V (OH) 2+	7.287e-26	5.395e-26	-25.137	-25.268	-0.131	(0)
VOH+2	2.174e-29	6.534e-30	-28.663	-29.185	-0.522	(0)
V+3	2.472e-34	1.653e-35	-33.607	-34.782	-1.175	(0)
VSO4+	7.380e-35	5.464e-35	-34.132	-34.262	-0.131	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.826	-56.001	-1.175	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.481	-57.570	-2.089	(0)
V (4)	3.375e-18					
V (OH) 3+	3.279e-18	2.428e-18	-17.484	-17.615	-0.131	(0)
VO+2	5.139e-20	1.544e-20	-19.289	-19.811	-0.522	(0)
VOSO4	2.978e-20	2.978e-20	-19.526	-19.526	0.000	(0)
VOF+	1.438e-20	1.065e-20	-19.842	-19.973	-0.131	(0)
VOF2	4.590e-22	4.590e-22	-21.338	-21.338	0.000	(0)

VOC1+	1.621e-22	1.200e-22	-21.790	-21.921	-0.131	(0)
VOF3-	2.529e-24	1.873e-24	-23.597	-23.728	-0.131	(0)
VOF4-2	2.892e-27	8.690e-28	-26.539	-27.061	-0.522	(0)
H2V2O4+2	9.847e-31	2.959e-31	-30.007	-30.529	-0.522	(0)
V (5)	5.524e-08					
H2VO4-	3.719e-08	2.753e-08	-7.430	-7.560	-0.131	(0)
HVO4-2	1.804e-08	5.422e-09	-7.744	-8.266	-0.522	(0)
H3VO4	3.512e-12	3.512e-12	-11.454	-11.454	0.000	(0)
H3V2O7-	8.441e-13	6.250e-13	-12.074	-12.204	-0.131	(0)
HV2O7-3	7.572e-13	5.063e-14	-12.121	-13.296	-1.175	(0)
VO4-3	3.186e-14	2.130e-15	-13.497	-14.672	-1.175	(0)
V2O7-4	1.310e-14	1.068e-16	-13.883	-15.971	-2.089	(0)
V3O9-3	3.278e-16	2.192e-17	-15.484	-16.659	-1.175	(0)
VO2+	1.112e-16	8.956e-17	-15.954	-16.048	-0.094	(0)
VO2SO4-	2.023e-17	1.497e-17	-16.694	-16.825	-0.131	(0)
VO2F	1.806e-17	1.806e-17	-16.743	-16.743	0.000	(0)
VO2F2-	1.018e-18	7.538e-19	-17.992	-18.123	-0.131	(0)
V4O12-4	3.088e-20	2.518e-22	-19.510	-21.599	-2.089	(0)
VO2F3-2	3.597e-21	1.081e-21	-20.444	-20.966	-0.522	(0)
VO2F4-3	9.146e-25	6.115e-26	-24.039	-25.214	-1.175	(0)
VO2NO3	7.466e-25	7.466e-25	-24.127	-24.127	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.569	-58.268	-4.699	(0)
HV10O28-5	0.000e+00	0.000e+00	-54.712	-57.975	-3.263	(0)
H2V10O28-4	0.000e+00	0.000e+00	-58.574	-60.662	-2.089	(0)
Zn	1.007e-05					
Zn+2	5.375e-06	2.263e-06	-5.270	-5.645	-0.376	(0)
ZnSO4	3.467e-06	3.467e-06	-5.460	-5.460	0.000	(0)
Zn(SO4) 2-2	7.036e-07	2.114e-07	-6.153	-6.675	-0.522	(0)
ZnOH+	2.411e-07	1.785e-07	-6.618	-6.748	-0.131	(0)
ZnCO3	1.803e-07	1.803e-07	-6.744	-6.744	0.000	(0)
ZnHCO3+	3.640e-08	2.695e-08	-7.439	-7.569	-0.131	(0)
Zn(OH) 2	2.231e-08	2.231e-08	-7.652	-7.652	0.000	(0)
ZnCl+	1.972e-08	1.575e-08	-7.705	-7.803	-0.098	(0)
ZnOHCl	1.626e-08	1.626e-08	-7.789	-7.789	0.000	(0)
ZnF+	7.012e-09	5.192e-09	-8.154	-8.285	-0.131	(0)
Zn(OH) 3-	1.191e-10	8.817e-11	-9.924	-10.055	-0.131	(0)
ZnCl2	6.916e-11	6.916e-11	-10.160	-10.160	0.000	(0)
ZnCl3-	1.906e-13	1.522e-13	-12.720	-12.818	-0.098	(0)
ZnNO3+	1.265e-13	9.369e-14	-12.898	-13.028	-0.131	(0)
ZnSeO4	6.153e-14	6.153e-14	-13.211	-13.211	0.000	(0)
Zn(OH) 4-2	9.212e-15	2.768e-15	-14.036	-14.558	-0.522	(0)
ZnCl4-2	4.916e-16	2.109e-16	-15.308	-15.676	-0.368	(0)
Zn(NO3) 2	3.081e-22	3.081e-22	-21.511	-21.511	0.000	(0)
Zn(SeO4) 2-2	3.644e-23	1.095e-23	-22.438	-22.961	-0.522	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.946	-148.077	-0.131	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.961	-149.961	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.118	-225.249	-0.131	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.812	-227.335	-0.522	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.755	-305.277	-0.522	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-53.92	-47.63	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.69	-37.18	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.91	-37.18	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.57	-51.63	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.99	-35.96	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.20	-27.80	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.55	-23.10	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.16	9.64	10.80	Al(OH)3
Al2(MoO4)3	-48.01	-45.64	2.37	Al2(MoO4)3
Al2O3	-0.37	19.28	19.65	Al2O3
Al4(OH)10SO4	-2.08	20.62	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.56	-6.76	4.80	AlAsO4:2H2O
AlOHSO4	-5.07	-8.30	-3.23	AlOHSO4
AlSb	-152.19	-86.57	65.62	AlSb

Alunite	-0.00	-1.40	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-4.13	-11.92	-7.79	PbSO ₄
Anhydrite	-0.42	-4.78	-4.36	CaSO ₄
Anilite	-55.20	-87.08	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-1.86	6.93	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-89.42	-92.18	-2.76	As ₄ O ₆
Artinite	-5.01	4.59	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-39.50	-32.80	6.71	As ₂ O ₅
Atacamite	-1.26	6.13	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.51	-18.42	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.43	7.96	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-16.25	-0.38	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-25.36	7.58	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-12.60	-22.27	-9.67	BaCrO ₄
BaF ₂	-9.88	-15.70	-5.82	BaF ₂
BaMoO ₄	-6.72	-13.68	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-8.65	-6.82	1.83	BaSeO ₃
BaSeO ₄	-10.12	-17.58	-7.46	BaSeO ₄
Bianchite	-6.04	-7.80	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-6.79	11.30	18.09	MnO ₂
Bixbyite	-2.30	-2.94	-0.64	Mn ₂ O ₃
BlaubleiI	-55.20	-79.36	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.64	-82.92	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.06	9.64	8.58	AlOOH
Breithauptite	-57.95	-76.47	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.73	13.12	16.84	Mg(OH) ₂
Bunsenite	-5.48	6.97	12.45	NiO
Ca(VO ₃) ₂	-8.80	-3.14	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-7.47	10.03	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-11.53	10.03	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-15.60	6.70	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-15.77	23.19	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-16.67	23.19	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-295.89	-152.92	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-7.49	-25.40	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.52	-8.47	-7.95	CaMoO ₄
Carnotite	-0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.43	-1.61	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.36	-12.38	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-11.21	-1.37	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.15	7.49	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.24	7.49	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.13	-13.42	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.03	4.53	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-16.38	12.02	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.75	-13.41	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-11.72	-13.41	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.50	-13.41	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.96	-16.18	-1.21	CdF ₂
Cdmetal(alpha)	-31.57	-18.05	13.51	Cd
Cdmetal(gamma)	-31.67	-18.05	13.62	Cd
CdMoO ₄	0.00	-14.15	-14.15	CdMoO ₄
CdOHCl	-6.50	-2.96	3.54	CdOHCl
CdSb	-75.60	-75.95	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.20	-18.05	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.28	-10.45	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.73	-10.45	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.58	-10.45	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-2.50	-15.63	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄

Chalcanthite	-7.01	-9.65	-2.64	CuSO4:5H2O
Chalcocite	-55.12	-90.04	-34.92	Cu2S
Chalcopyrite	-125.91	-161.18	-35.27	CuFeS2
Cinnabar	-51.83	-97.53	-45.69	HgS
Claudetite	-89.12	-92.18	-3.06	As4O6
Clausthalite	-13.44	-40.54	-27.10	PbSe
Co(BO2)2	-28.23	-1.16	27.07	Co(BO2)2
Co(OH)2	-5.39	7.70	13.09	Co(OH)2
Co(OH)3	-9.62	-11.93	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-22.72	-9.69	13.03	Co3(AsO4)2
Co3O4	-5.65	-16.15	-10.50	Co3O4
CoCl2	-21.47	-13.20	8.27	CoCl2
CoCl2:6H2O	-15.74	-13.20	2.54	CoCl2:6H2O
CoCO3	-3.96	-13.94	-9.98	CoCO3
CoF2	-14.37	-15.96	-1.60	CoF2
CoF3	-45.97	-47.42	-1.46	CoF3
CoFe2O4	17.61	14.09	-3.53	CoFe2O4
CoMoO4	-6.18	-13.94	-7.76	CoMoO4
CoO	-5.88	7.70	13.59	CoO
CoS(alpha)	-71.32	-78.76	-7.44	CoS
CoS(beta)	-67.69	-78.76	-11.07	CoS
CoSe	-22.65	-38.85	-16.20	CoSe
CoSeO3	-8.40	-7.08	1.32	CoSeO3
CoSeO4:6H2O	-16.31	-17.84	-1.53	CoSeO4:6H2O
CoSO4	-13.04	-10.24	2.80	CoSO4
CoSO4:6H2O	-7.77	-10.24	-2.47	CoSO4:6H2O
Cotunnite	-10.10	-14.88	-4.78	PbCl2
Covellite	-55.87	-78.17	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.00	-31.91	14.09	CrCl2
CrCl3	-47.65	-32.53	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-10.06	-43.90	-33.84	Na3AlF6
Cu(OH)2	-0.38	8.29	8.67	Cu(OH)2
Cu(SbO3)2	-24.98	20.23	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.35	0.91	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.83	-89.71	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.34	-50.14	-45.80	Cu2Se
Cu2SO4	-19.57	-21.52	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.02	-7.92	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.99	-101.58	-42.59	Cu3Sb
Cu3Se2	-24.91	-88.40	-63.49	Cu3Se2
CuCO3	-1.86	-13.36	-11.50	CuCO3
CuCrO4	-16.51	-21.95	-5.44	CuCrO4
CuF	-8.72	-13.62	-4.91	CuF
CuF2	-16.49	-15.38	1.12	CuF2
CuF2:2H2O	-10.83	-15.38	-4.55	CuF2:2H2O
Cumetal	-5.81	-14.56	-8.76	Cu
CuMoO4	-0.27	-13.35	-13.08	CuMoO4
CuOCuSO4	-11.66	-1.36	10.30	CuOCuSO4
Cupricferrite	8.69	14.67	5.99	CuFe2O4
Cuprite	-2.18	-3.58	-1.41	Cu2O
Cuprousferrite	10.32	1.40	-8.92	CuFeO2
CuSe	-5.16	-38.26	-33.10	CuSe
CuSe2	-25.91	-59.27	-33.37	CuSe2
CuSeO3:2H2O	-7.00	-6.49	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.81	-17.25	-2.44	CuSeO4:5H2O
CuSO4	-12.59	-9.65	2.94	CuSO4
Diaspore	2.77	9.64	6.87	AlOOH
Djurleite	-55.34	-89.26	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.47	-17.01	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.08	-17.01	-17.09	CaMg(CO3)2

Epsomite	-2.70	-4.83	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.10	0.06	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.14	-12.86	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.95	-8.40	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.33	-37.96	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.71	-47.45	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.61	-13.21	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.10	-18.19	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.52	-64.11	-18.60	FeSe2
FeS(ppt)	-80.06	-83.01	-2.95	FeS
FeSe	-32.10	-43.10	-11.00	FeSe
Fix_pe	-4.88	-4.88	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.47	-80.44	-13.97	PbS
Gibbsite	1.35	9.64	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.79	-7.80	-2.01	ZnSO4:7H2O
Greenockite	-64.61	-78.97	-14.36	CdS
Greigite	-290.98	-336.01	-45.03	Fe3S4
Gummite	-4.85	2.82	7.67	UO3
Gypsum	-0.17	-4.78	-4.61	CaSO4:2H2O
H-Jarosite	-14.21	-26.31	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.76	-21.64	-12.88	H2MoO4
H2S(g)	-78.45	-86.46	-8.01	H2S
H2Se(g)	-41.59	-46.55	-4.96	H2Se
Halite	-6.23	-4.63	1.60	NaCl
Hausmannite	-2.17	58.86	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.16	22.73	22.89	FeAl2O4
Hg(CH3)2(g)	-185.01	-258.72	-73.71	Hg(CH3)2
Hg(g)	-7.15	-15.02	-7.87	Hg
Hg(OH)2	-7.57	-11.07	-3.50	Hg(OH)2
Hg2(g)	-15.08	-30.04	-14.96	Hg2
Hg2(OH)2	-9.75	-4.49	5.26	Hg2(OH)2
Hg2CO3	-10.09	-26.14	-16.05	Hg2CO3
Hg2CrO4	-26.03	-34.73	-8.70	Hg2CrO4
Hg2F2	-17.80	-28.16	-10.36	Hg2F2
Hg2S	-79.28	-90.95	-11.68	Hg2S
Hg2SeO3	-14.62	-19.27	-4.66	Hg2SeO3
Hg2SO4	-16.31	-22.44	-6.13	Hg2SO4
Hg3O2CO3	-25.16	-54.85	-29.68	Hg3O2CO3
HgCl(g)	-32.19	-12.70	19.50	HgCl
HgCl2	-10.71	-31.97	-21.26	HgCl2
HgF(g)	-46.76	-14.08	32.68	HgF
HgF2(g)	-47.30	-34.73	12.57	HgF2
Hgmetal(l)	-1.57	-15.02	-13.45	Hg
HgSe	-1.93	-57.62	-55.69	HgSe
HgSeO3	-13.42	-25.85	-12.43	HgSeO3
HgSO4	-19.59	-29.01	-9.42	HgSO4
Huntite	-4.10	-34.07	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.47	-25.24	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.23	-21.00	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.51	-20.68	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.95	-20.75	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.10	-49.34	-17.24	K2Cr2O7
K2CrO4	-18.59	-19.11	-0.51	K2CrO4
K2MoO4	-13.77	-10.51	3.26	K2MoO4
K2SeO4	-13.68	-14.41	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.47	-5.90	-0.43	PbO:PbSO4
Laurionite	-5.06	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.67	6.02	12.69	PbO

Mackinawite	-79.41	-83.01	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.64	19.50	16.86	Fe2MgO4
Magnesite	-1.07	-8.53	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.24	-5.06	-5.31	Cu2(OH)2CO3
Manganite	-1.46	23.88	25.34	MnOOH
Massicot	-6.87	6.02	12.89	PbO
Matlockite	-7.29	-16.27	-8.97	PbClF
Melanothallite	-18.87	-12.61	6.26	CuCl2
Melanterite	-12.29	-14.49	-2.21	FeSO4·7H2O
Metacinnabar	-52.43	-97.53	-45.09	HgS
Mg(OH)2 (active)	-5.68	13.12	18.79	Mg(OH)2
Mg(VO3)2	-14.47	-3.19	11.28	Mg(VO3)2
Mg2Sb3	-273.21	-198.53	74.68	Mg2Sb3
Mg2V2O7	-16.43	9.93	26.36	Mg2V2O7
MgCr2O4	-5.44	10.76	16.20	MgCr2O4
MgCrO4	-22.50	-17.12	5.38	MgCrO4
MgF2	-2.42	-10.55	-8.13	MgF2
MgMoO4	-6.67	-8.52	-1.85	MgMoO4
MgSeO3·6H2O	-4.72	-1.66	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.23	-12.43	-1.20	MgSeO4·6H2O
Minium	-29.92	43.60	73.52	Pb3O4
Mirabilite	-5.19	-6.31	-1.11	Na2SO4·10H2O
Mn(VO3)2	-10.10	-5.20	4.90	Mn(VO3)2
Mn2(SO4)3	-51.06	-56.77	-5.71	Mn2(SO4)3
Mn2Sb	-147.85	-86.77	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.98	0.52	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.51	-9.80	2.72	MnCl2·4H2O
MnS (grn)	-75.53	-75.36	0.17	MnS
MnS (pnk)	-78.70	-75.36	3.34	MnS
MnSb	-94.77	-97.68	-2.91	MnSb
MnSe	-38.95	-35.45	3.50	MnSe
MnSeO3	-4.80	-3.67	1.13	MnSeO3
MnSeO3·2H2O	-4.66	-3.67	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.39	-14.44	-2.05	MnSeO4·5H2O
MnSO4	-9.42	-6.84	2.58	MnSO4
Monteponite	-7.61	7.49	15.10	CdO
Montroydite	-7.43	-11.07	-3.64	HgO
MoO3	-13.64	-21.64	-8.00	MoO3
Morenosite	-8.83	-10.98	-2.14	NiSO4·7H2O
MoS2	-149.85	-220.11	-70.26	MoS2
Na-Jarosite	-9.29	-20.49	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.94	-48.84	-9.90	Na2Cr2O7
Na2CrO4	-21.53	-18.60	2.93	Na2CrO4
Na2Mo2O7	-15.04	-31.64	-16.60	Na2Mo2O7
Na2MoO4	-11.49	-10.00	1.49	Na2MoO4
Na2MoO4·2H2O	-11.22	-10.00	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.44	-3.14	10.30	Na2SeO3·5H2O
Na2SeO4	-15.18	-13.90	1.28	Na2SeO4
Na3Sb	-173.20	-78.75	94.45	Na3Sb
Na3VO4	-27.38	9.31	36.68	Na3VO4
Na4V2O7	-30.43	6.97	37.40	Na4V2O7
Nantokite	-5.51	-12.24	-6.73	CuCl
NaSb	-88.01	-64.84	23.17	NaSb
Natron	-8.70	-10.01	-1.31	Na2CO3·10H2O
NaVO3	-6.19	-2.33	3.86	NaVO3
Nesquehonite	-3.86	-8.53	-4.67	MgCO3·3H2O
Ni(OH)2	-5.83	6.97	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-27.60	-11.90	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-22.07	9.93	32.00	Ni4(OH)6SO4
NiCO3	-7.81	-14.68	-6.87	NiCO3
NiMoO4	-3.53	-14.67	-11.14	NiMoO4
NiS (alpha)	-73.89	-79.49	-5.60	NiS
NiS (beta)	-68.39	-79.49	-11.10	NiS
NiS (gamma)	-66.69	-79.49	-12.80	NiS
NiSe	-21.89	-39.59	-17.70	NiSe
NiSeO3·2H2O	-10.63	-7.81	2.81	NiSeO3·2H2O

NiSeO4:6H2O	-17.06	-18.58	-1.52	NiSeO4:6H2O
Nsutite	-6.20	11.30	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-244.41	-305.48	-61.07	As2S3
Otavite	-2.16	-14.16	-12.00	CdCO3
Pb(BO2)2	-9.36	-2.84	6.52	Pb(BO2)2
Pb(OH)2	-2.13	6.02	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.93	-69.69	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.21	1.59	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.15	12.04	26.19	Pb2O(OH)2
Pb2O3	-23.46	37.58	61.04	Pb2O3
Pb2OCO3	-9.05	-9.61	-0.56	Pb2OCO3
Pb2V2O7	-2.37	-4.27	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.54	-14.74	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.39	1.75	6.14	Pb3(VO4)2
Pb3O2CO3	-14.61	-3.59	11.02	Pb3O2CO3
Pb3O2SO4	-10.57	0.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-14.97	6.13	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.74	6.14	21.88	Pb4O3SO4
PbCrO4	-11.62	-24.22	-12.60	PbCrO4
PbF2	-10.21	-17.65	-7.44	PbF2
Pbmetal	-23.77	-19.53	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.96	6.02	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.47	13.12	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.04	31.56	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.42	-143.93	-18.51	FeS2
Pyrochroite	-4.09	11.11	15.19	Mn(OH)2
Pyrolusite	-4.73	36.65	41.38	MnO2
Realgar	-102.53	-122.28	-19.75	AsS
Retgersite	-8.94	-10.98	-2.04	NiSO4:6H2O
Rhodochrosite	0.04	-10.54	-10.58	MnCO3
Rutherfordine	-4.33	-18.83	-14.50	UO2CO3
Sb(OH)3	-12.47	-19.58	-7.11	Sb(OH)3
Sb2O4	-17.01	-13.60	3.40	Sb2O4
Sb2O5	-27.01	-36.68	-9.67	Sb2O5
Sb2Se3	-111.06	-178.81	-67.76	Sb2Se3
Sb4O6(cubic)	-60.04	-78.30	-18.26	Sb4O6
Sb4O6(orth)	-60.40	-78.30	-17.90	Sb4O6
SbCl3	-51.50	-50.93	0.57	SbCl3
SbF3	-44.85	-55.07	-10.23	SbF3
Sbmetal	-46.20	-57.89	-11.69	Sb
SbO2	-3.29	-31.11	-27.82	SbO2
Schoepite	-3.18	2.82	5.99	UO2(OH)2:H2O
Semetal(am)	-13.90	-21.01	-7.11	Se
Semetal(hex)	-13.30	-21.01	-7.71	Se
Senarmontite	-26.78	-39.15	-12.37	Sb2O3
SeO2	-14.91	-14.78	0.12	SeO2
SeO3	-46.59	-25.54	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.50	-11.50	-10.00	ZnCO3
Sphalerite	-64.87	-76.32	-11.45	ZnS
Spinel	-4.45	32.40	36.85	MgAl2O4
Stibnite	-248.07	-298.53	-50.46	Sb2S3
Sulfur	-58.77	-60.92	-2.14	S
Tenorite	0.65	8.29	7.64	CuO
Thenardite	-6.63	-6.30	0.32	Na2SO4
Thermonatrite	-10.64	-10.01	0.64	Na2CO3:H2O
Tyuyamunite	-1.58	2.50	4.08	Ca(UO2)2(VO4)2
U3O8	-10.53	10.56	21.08	U3O8
U3Sb4	-577.75	-425.37	152.38	U3Sb4
U4O9	-25.48	-28.50	-3.02	U4O9
UF4	-31.31	-60.84	-29.54	UF4
UF4:2.5H2O	-28.13	-60.85	-32.72	UF4:2.5H2O
UO2(am)	-14.44	-13.51	0.93	UO2

UO2(NO3)2	-40.68	-28.54	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.39	-28.54	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-31.93	-28.54	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-30.59	-28.54	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.79	2.82	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.48	-22.73	-2.25	UO2SeO4:4H2O
UO3	-4.88	2.82	7.70	UO3
Uraninite	-8.84	-13.51	-4.67	UO2
USb2	-219.18	-189.60	29.58	USb2
V(OH)3	-18.69	-11.10	7.59	V(OH)3
V2O5	-14.95	-16.31	-1.36	V2O5
V3O5	-39.45	-37.61	1.84	V3O5
V4O7	-48.82	-41.64	7.19	V4O7
V6O13	-39.15	-100.01	-60.86	V6O13
Valentinite	-30.67	-39.15	-8.48	Sb2O3
VC12	-63.65	-44.77	18.87	VC12
VC13	-65.89	-42.45	23.43	VC13
VF4	-66.29	-51.36	14.93	VF4
Vmetal	-93.44	-49.42	44.03	V
VO	-38.63	-23.87	14.76	VO
VO(OH)2	-9.17	-4.02	5.15	VO(OH)2
VO2Cl	-21.45	-18.61	2.84	VO2Cl
VOC1	-32.70	-21.55	11.15	VOC1
VOC12	-37.69	-24.93	12.76	VOC12
VOSO4	-25.58	-21.97	3.61	VOSO4
Witherite	-5.11	-13.68	-8.57	BaCO3
Wurtzite	-67.37	-76.32	-8.95	ZnS
Zincite	-1.19	10.14	11.33	ZnO
Zincosite	-11.73	-7.80	3.93	ZnSO4
Zn(BO2)2	-7.01	1.28	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.53	-21.21	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.06	10.14	12.20	Zn(OH)2
Zn(OH)2(am)	-2.33	10.14	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.61	10.14	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.39	10.14	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.59	10.14	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.16	2.34	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.36	9.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.02	-2.37	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.37	-5.46	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.77	22.63	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.69	29.81	38.50	Zn5(OH)8Cl2
ZnCl2	-17.81	-10.76	7.05	ZnCl2
ZnCO3:1H2O	-1.24	-11.50	-10.26	ZnCO3:1H2O
ZnF2	-12.99	-13.52	-0.53	ZnF2
Znmetal	-41.19	-15.40	25.79	Zn
ZnMoO4	-1.37	-11.50	-10.13	ZnMoO4
ZnO(active)	-1.05	10.14	11.19	ZnO
ZnS(am)	-67.27	-76.32	-9.05	ZnS
ZnSb	-84.31	-73.29	11.01	ZnSb
ZnSe	-22.01	-36.41	-14.40	ZnSe
ZnSeO4:6H2O	-13.88	-15.40	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.16	-7.80	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 43.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 202
equilibrate with solution 1

```

        Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
        Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
        donnan 1e-008
    USE EQUILIBRIUM_PHASES 202
    USE Surface 202
    USE Solution 207
    SAVE Solution 208 #Initial Stage 2 Run-off Water After Mineral
Precipitation and Sorption Loss
    END

```

```

-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

```

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Beginning of initial surface-composition calculations.
-----

```

Surface 202.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

    1.202e-15  Surface + diffuse layer charge, eq
    6.531e-08  Surface charge, eq
    4.399e-03  sigma, C/m²
    1.213e-01  psi, V
    -4.722e+00 -F*psi/RT
    8.900e-03  exp(-F*psi/RT)
    6.420e+04  specific area, m²/mol Ferrihydrite
    1.433e+00  m² for 2.232e-05 moles of Ferrihydrite

```

Water in diffuse layer: 1.433e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451\text{e-}02$ (= c_DL / c_free if z is +1).

Element	Moles
C	3.6598e-11
Ca	4.5358e-13
Cl	7.3288e-10
H	1.0796e-10
K	7.1955e-13
Mg	7.0274e-14
N	2.9670e-09
Na	3.0486e-12
O	1.3224e-07
S	3.0815e-08

Hfo_s

1.116e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	7.458e-08	0.668	7.458e-08	-7.127
Hfo_sOH	3.658e-08	0.328	3.658e-08	-7.437
Hfo_sO-	4.110e-10	0.004	4.110e-10	-9.386
Hfo_sOHCa+2	1.362e-12	0.000	1.362e-12	-11.866

Hfo_w

4.463e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.062e-06	0.462	2.062e-06	-5.686

Hfo_wOH	1.011e-06	0.227	1.011e-06	-5.995
Hfo_wSO4-	6.965e-07	0.156	6.965e-07	-6.157
Hfo_wOHSO4-2	6.816e-07	0.153	6.816e-07	-6.166
Hfo_wO-	1.136e-08	0.003	1.136e-08	-7.944
Hfo_wOMg+	1.606e-14	0.000	1.606e-14	-13.794
Hfo_wOCa+	5.449e-15	0.000	5.449e-15	-14.264

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 207. Solution after simulation 42.
Using surface 202.
Using pure phase assemblage 202. Pure-phase assemblage after simulation 42.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	Element not present.			0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	2.868e-05	2.868e-05	8.064e-10
Anhydrite	-0.42	-4.78	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	2.749e-08	9.840e-09	-1.765e-08
Barite	0.00	-9.98	-9.98	1.143e-05	1.148e-05	5.295e-08
Brochantite	-0.00	15.22	15.22	5.590e-05	5.548e-05	-4.176e-07
Brucite	-3.73	13.12	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.005e+01	1.005e+01	1.703e-06
CaMoO4	-0.52	-8.47	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.49	-1.67	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.858e-02	1.857e-02	-2.992e-06
Carnotite	0.00	0.23	0.23	8.496e-07	3.516e-07	-4.980e-07
Cd(BO2)2	-11.21	-1.37	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	7.441e-08	7.441e-08	-1.689e-12
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	7.147e-09	3.230e-09	-3.917e-09
Cu2Se(alpha)	-4.40	-50.20	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.27	-13.35	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.70	-4.83	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.232e-05	2.232e-05	-1.235e-13
Fluorite	0.00	-10.50	-10.50	1.456e-03	1.456e-03	1.229e-08
Gummite	-4.30	3.37	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.17	-4.78	-4.61	0.000e+00	0	0.000e+00
HgSe	-1.99	-57.68	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.19	-6.31	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.87	-3.74	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.83	6.96	12.79	0.000e+00	0	0.000e+00

Ni3(AsO4)2·8H2O	-27.61	-11.91	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.81	-14.68	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.53	-14.67	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	1.672e-09
Otavite	-2.16	-14.16	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	2.767e-07	2.599e-07	-1.683e-08
Rutherfordine	-3.78	-18.28	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.29	-31.11	-27.82	0.000e+00	0	0.000e+00
Schoepite	-2.62	3.37	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-1.58	2.50	4.08	0.000e+00	0	0.000e+00
U3O8	-8.87	12.22	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.24	3.37	5.61	0.000e+00	0	0.000e+00
UO3	-4.33	3.37	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.38	-11.51	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-5.642e-18 Surface + diffuse layer charge, eq
 2.970e-07 Surface charge, eq
 2.000e-02 sigma, C/m²
 3.210e-02 psi, V
 -1.249e+00 -F*psi/RT
 2.867e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.433e+00 m² for 2.232e-05 moles of Ferrihydrite

Water in diffuse layer: 1.433e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 3.931e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.581e-01 (= c_DL / c_free if z is +1).

Element	Moles
Al	1.4659e-10
As	1.0414e-14
B	5.6419e-10
Ba	3.7567e-13
C	8.5237e-09
Ca	1.1534e-07
Cd	3.1949e-13
Cl	5.7420e-08
Co	4.6285e-13
Cr	1.8521e-14
Cu	6.7713e-12
F	2.8600e-09
Fe	1.4430e-14
H	1.0734e-08
Hg	5.0859e-14
K	7.6442e-08
Mg	9.3203e-08
Mn	1.1069e-09
Mo	6.5345e-11
N	3.7494e-10
Na	1.3515e-07
Ni	7.0211e-14
O	1.7461e-06
Pb	3.1255e-14
S	4.2929e-07
Sb	6.9159e-13
Se	4.8333e-12
U	1.6864e-11
V	2.7230e-13

Zn 1.2287e-10

Hfo_s

1.116e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	4.080e-08	0.366	4.071e-08	-7.390
Hfo_sOZn+	3.530e-08	0.316	3.522e-08	-7.453
Hfo_sOMn+	1.365e-08	0.122	1.362e-08	-7.866
Hfo_sOPb+	1.250e-08	0.112	1.247e-08	-7.904
Hfo_sOCrOH+	7.834e-09	0.070	7.817e-09	-8.107
Hfo_sOHCa+2	1.347e-09	0.012	1.344e-09	-8.872
Hfo_sOH	7.339e-11	0.001	7.323e-11	-10.135
Hfo_sOCd+	2.438e-11	0.000	2.433e-11	-10.614
Hfo_sO-	2.358e-11	0.000	2.352e-11	-10.628
Hfo_sONi+	5.782e-12	0.000	5.769e-12	-11.239
Hfo_sOH2+	5.234e-12	0.000	5.222e-12	-11.282
Hfo_sOCu+	4.689e-12	0.000	4.678e-12	-11.330
Hfo_sOHBa+2	2.601e-14	0.000	2.595e-14	-13.586
Hfo_sOFe+	3.806e-15	0.000	3.797e-15	-14.421
Hfo_sOHg+	2.054e-16	0.000	2.050e-16	-15.688

Hfo_w

4.463e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	1.630e-06	0.365	1.626e-06	-5.789
Hfo_wOMg+	6.897e-07	0.155	6.882e-07	-6.162
Hfo_wOH	5.715e-07	0.128	5.702e-07	-6.244
Hfo_wOHVO4-3	5.378e-07	0.121	5.367e-07	-6.270
Hfo_wOHSO4-2	3.003e-07	0.067	2.996e-07	-6.523
Hfo_wOZn+	2.879e-07	0.065	2.872e-07	-6.542
Hfo_wO-	1.836e-07	0.041	1.832e-07	-6.737
Hfo_wOMn+	8.446e-08	0.019	8.428e-08	-7.074
Hfo_wOCa+	4.341e-08	0.010	4.331e-08	-7.363
Hfo_wOH2+	4.075e-08	0.009	4.066e-08	-7.391
Hfo_wOHSeO3-2	3.624e-08	0.008	3.616e-08	-7.442
Hfo_wOHAsO4-3	3.530e-08	0.008	3.522e-08	-7.453
Hfo_wSO4-	1.074e-08	0.002	1.072e-08	-7.970
Hfo_wSeO3-	4.393e-09	0.001	4.383e-09	-8.358
Hfo_wOPb+	4.346e-09	0.001	4.337e-09	-8.363
Hfo_wOHMoO4-2	2.470e-09	0.001	2.465e-09	-8.608
Hfo_wMoO4-	1.138e-10	0.000	1.136e-10	-9.945
Hfo_wOCu+	1.029e-10	0.000	1.027e-10	-9.989
Hfo_wH2BO3	8.824e-11	0.000	8.804e-11	-10.055
Hfo_wOCd+	8.099e-11	0.000	8.081e-11	-10.093
Hfo_wONi+	6.074e-11	0.000	6.060e-11	-10.218
Hfo_wHAsO4-	4.022e-12	0.000	4.013e-12	-11.396
Hfo_wOHg+	7.835e-14	0.000	7.818e-14	-13.107
Hfo_wOFe+	1.870e-14	0.000	1.866e-14	-13.729
Hfo_wOBa+	1.212e-14	0.000	1.209e-14	-13.918
Hfo_wH2AsO4	9.282e-15	0.000	9.261e-15	-14.033
Hfo_wOHSeO4-2	6.697e-15	0.000	6.682e-15	-14.175
Hfo_wOHSbO(OH) 4-	1.423e-15	0.000	1.420e-15	-14.848
Hfo_wSeO4-	2.087e-16	0.000	2.082e-16	-15.682
Hfo_wOHCrO4-2	1.961e-16	0.000	1.957e-16	-15.708
Hfo_wSbO(OH) 4	6.558e-17	0.000	6.543e-17	-16.184
Hfo_wCrO4-	6.399e-18	0.000	6.385e-18	-17.195
Hfo_wH2AsO3	1.321e-24	0.000	1.318e-24	-23.880

-----Solution composition-----

Elements	Molality	Moles
Al	8.793e-06	8.812e-06
As	5.386e-10	5.398e-10

B	3.909e-05	3.918e-05
Ba	3.559e-08	3.567e-08
C	5.202e-04	5.214e-04
Ca	9.552e-03	9.574e-03
Cd	2.477e-08	2.483e-08
Cl	3.439e-03	3.447e-03
Co	3.959e-08	3.968e-08
Cr	1.459e-09	1.462e-09
Cu	5.060e-07	5.072e-07
F	1.815e-04	1.819e-04
Fe	1.089e-09	1.092e-09
Hg	3.550e-09	3.558e-09
K	6.115e-03	6.129e-03
Mg	7.851e-03	7.868e-03
Mn	9.557e-05	9.578e-05
Mo	3.359e-06	3.366e-06
N	2.253e-05	2.258e-05
Na	1.085e-02	1.088e-02
Ni	5.856e-09	5.869e-09
Pb	2.332e-09	2.337e-09
S	2.390e-02	2.395e-02
Sb	4.143e-08	4.152e-08
Se	2.701e-07	2.707e-07
U	6.904e-07	6.919e-07
V	1.548e-08	1.551e-08
Zn	9.746e-06	9.768e-06

-----Description of solution-----

	pH	=	7.894	Charge balance
	pe	=	4.878	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	6.551e-02	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	5.631e-04	
	Total CO2 (mol/kg)	=	5.202e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	1	
	Total H	=	1.112620e+02	
	Total O	=	5.572825e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.946e-07	7.885e-07	-6.002	-6.103	-0.101	(0)
H+	1.584e-08	1.276e-08	-7.800	-7.894	-0.094	0.00
H2O	5.551e+01	9.991e-01	1.744	-0.000	0.000	18.07
Al	8.793e-06					
Al(OH)4-	8.715e-06	7.008e-06	-5.060	-5.154	-0.095	(0)
Al(OH)3	7.059e-08	7.059e-08	-7.151	-7.151	0.000	(0)
Al(OH)2+	5.517e-09	4.487e-09	-8.258	-8.348	-0.090	(0)
AlF3	6.916e-10	6.916e-10	-9.160	-9.160	0.000	(0)
AlF2+	5.877e-10	4.779e-10	-9.231	-9.321	-0.090	(0)
AlF4-	4.956e-11	3.985e-11	-10.305	-10.400	-0.095	(0)
AlF+2	2.388e-11	1.044e-11	-10.622	-10.981	-0.359	(0)
AlOH+2	1.638e-11	7.164e-12	-10.786	-11.145	-0.359	(0)
AlSO4+	6.141e-13	4.938e-13	-12.212	-12.306	-0.095	(0)
Al+3	6.362e-14	9.085e-15	-13.196	-14.042	-0.845	(0)
Al(SO4)2-	4.608e-14	3.705e-14	-13.337	-13.431	-0.095	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.336	-41.510	-1.175	(0)
As(3)	9.472e-24					
H3AsO3	8.984e-24	8.984e-24	-23.047	-23.047	0.000	(0)

	H2AsO3-	4.878e-25	3.612e-25	-24.312	-24.442	-0.131	(0)
	HAsO3-2	8.592e-29	2.582e-29	-28.066	-28.588	-0.522	(0)
	H4AsO3+	7.670e-32	5.679e-32	-31.115	-31.246	-0.131	(0)
	AsO3-3	1.167e-33	7.801e-35	-32.933	-34.108	-1.175	(0)
As (5)	5.386e-10						
	HAsO4-2	5.138e-10	1.544e-10	-9.289	-9.811	-0.522	(0)
	H2AsO4-	2.426e-11	1.796e-11	-10.615	-10.746	-0.131	(0)
	AsO4-3	5.724e-13	3.827e-14	-12.242	-13.417	-1.175	(0)
	H3AsO4	3.923e-17	3.983e-17	-16.406	-16.400	0.007	(0)
B	3.909e-05						
	H3BO3	3.645e-05	3.700e-05	-4.438	-4.432	0.007	(0)
	H2BO3-	2.159e-06	1.684e-06	-5.666	-5.774	-0.108	(0)
	CaH2BO3+	2.974e-07	2.320e-07	-6.527	-6.635	-0.108	(0)
	MgH2BO3+	1.601e-07	1.249e-07	-6.796	-6.904	-0.108	(0)
	NaH2BO3	2.250e-08	2.250e-08	-7.648	-7.648	0.000	(0)
	BF (OH) 3-	2.176e-09	1.697e-09	-8.662	-8.770	-0.108	(0)
	H5 (BO3) 2-	6.800e-11	5.305e-11	-10.167	-10.275	-0.108	(0)
	BaH2BO3+	9.979e-13	7.784e-13	-12.001	-12.109	-0.108	(0)
	BF2 (OH) 2-	3.414e-13	2.663e-13	-12.467	-12.575	-0.108	(0)
	H8 (BO3) 3-	2.516e-13	1.963e-13	-12.599	-12.707	-0.108	(0)
	BF3OH-	1.950e-19	1.521e-19	-18.710	-18.818	-0.108	(0)
	BF4-	1.408e-24	1.099e-24	-23.851	-23.959	-0.108	(0)
Ba	3.559e-08						
	Ba+2	3.552e-08	1.495e-08	-7.450	-7.825	-0.376	(0)
	BaHCO3+	6.567e-11	5.378e-11	-10.183	-10.269	-0.087	(0)
	BaCO3	1.061e-11	1.061e-11	-10.974	-10.974	0.000	(0)
	BaH2BO3+	9.979e-13	7.784e-13	-12.001	-12.109	-0.108	(0)
	BaOH+	6.360e-14	5.147e-14	-13.197	-13.288	-0.092	(0)
	BaNO3+	1.668e-15	1.235e-15	-14.778	-14.908	-0.131	(0)
	BaNH3+2	2.975e-16	8.940e-17	-15.526	-16.049	-0.522	(0)
C (4)	5.202e-04						
	HCO3-	4.630e-04	3.765e-04	-3.334	-3.424	-0.090	(0)
	CaHCO3+	2.049e-05	1.678e-05	-4.688	-4.775	-0.087	(0)
	H2CO3	1.080e-05	1.080e-05	-4.966	-4.966	0.000	(0)
	MgHCO3+	1.032e-05	8.239e-06	-4.986	-5.084	-0.098	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	3.286e-06	1.384e-06	-5.483	-5.859	-0.376	(0)
	MgCO3	2.461e-06	2.461e-06	-5.609	-5.609	0.000	(0)
	NaHCO3	1.784e-06	1.784e-06	-5.749	-5.749	0.000	(0)
	UO2 (CO3) 3-4	4.946e-07	4.033e-09	-6.306	-8.394	-2.089	(0)
	NaCO3-	2.670e-07	2.171e-07	-6.574	-6.663	-0.090	(0)
	CuCO3	2.597e-07	2.597e-07	-6.585	-6.585	0.000	(0)
	UO2 (CO3) 2-2	1.935e-07	5.816e-08	-6.713	-7.235	-0.522	(0)
	MnHCO3+	1.931e-07	1.563e-07	-6.714	-6.806	-0.092	(0)
	ZnCO3	1.744e-07	1.744e-07	-6.758	-6.758	0.000	(0)
	ZnHCO3+	3.523e-08	2.609e-08	-7.453	-7.584	-0.131	(0)
	Cu (CO3) 2-2	3.219e-09	9.672e-10	-8.492	-9.014	-0.522	(0)
	UO2CO3	2.107e-09	2.107e-09	-8.676	-8.676	0.000	(0)
	CuHCO3+	1.023e-09	7.573e-10	-8.990	-9.121	-0.131	(0)
	PbCO3	7.056e-10	7.056e-10	-9.151	-9.151	0.000	(0)
	CoHCO3+	3.244e-10	2.402e-10	-9.489	-9.619	-0.131	(0)
	CoCO3	1.918e-10	1.918e-10	-9.717	-9.717	0.000	(0)
	CdCO3	1.580e-10	1.580e-10	-9.801	-9.801	0.000	(0)
	NiHCO3+	9.378e-11	6.943e-11	-10.028	-10.158	-0.131	(0)
	NiCO3	7.721e-11	7.721e-11	-10.112	-10.112	0.000	(0)
	BaHCO3+	6.567e-11	5.378e-11	-10.183	-10.269	-0.087	(0)
	PbHCO3+	6.410e-11	4.746e-11	-10.193	-10.324	-0.131	(0)
	BaCO3	1.061e-11	1.061e-11	-10.974	-10.974	0.000	(0)
	Pb (CO3) 2-2	9.370e-12	2.816e-12	-11.028	-11.550	-0.522	(0)
	CdHCO3+	5.801e-12	4.295e-12	-11.237	-11.367	-0.131	(0)
	Cd (CO3) 2-2	5.393e-13	1.621e-13	-12.268	-12.790	-0.522	(0)
	HgCO3	3.618e-15	3.618e-15	-14.442	-14.442	0.000	(0)
	FeHCO3+	2.666e-15	2.183e-15	-14.574	-14.661	-0.087	(0)
	Hg (CO3) 2-2	5.268e-17	1.583e-17	-16.278	-16.801	-0.522	(0)
	HgHCO3+	1.161e-18	8.595e-19	-17.935	-18.066	-0.131	(0)
Ca	9.552e-03						
	Ca+2	5.684e-03	2.393e-03	-2.245	-2.621	-0.376	(0)
	CaSO4	3.839e-03	3.839e-03	-2.416	-2.416	0.000	(0)

	CaHCO3+	2.049e-05	1.678e-05	-4.688	-4.775	-0.087	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.710e-06	3.003e-06	-5.431	-5.523	-0.092	(0)
	CaH2BO3+	2.974e-07	2.320e-07	-6.527	-6.635	-0.108	(0)
	CaOH+	4.598e-08	3.765e-08	-7.337	-7.424	-0.087	(0)
	CaNO3+	1.685e-10	1.247e-10	-9.773	-9.904	-0.131	(0)
	CaNH3+2	9.500e-11	2.855e-11	-10.022	-10.544	-0.522	(0)
	Ca (NH3) 2+2	3.583e-19	1.077e-19	-18.446	-18.968	-0.522	(0)
Cd		2.477e-08					
	Cd+2	1.190e-08	5.010e-09	-7.925	-8.300	-0.376	(0)
	CdSO4	8.223e-09	8.223e-09	-8.085	-8.085	0.000	(0)
	Cd (SO4) 2-2	2.585e-09	7.767e-10	-8.588	-9.110	-0.522	(0)
	CdCl+	1.790e-09	1.325e-09	-8.747	-8.878	-0.131	(0)
	CdCO3	1.580e-10	1.580e-10	-9.801	-9.801	0.000	(0)
	CdOHCl	4.287e-11	4.287e-11	-10.368	-10.368	0.000	(0)
	CdOH+	4.238e-11	3.138e-11	-10.373	-10.503	-0.131	(0)
	CdCl2	1.531e-11	1.531e-11	-10.815	-10.815	0.000	(0)
	CdF+	1.233e-11	9.127e-12	-10.909	-11.040	-0.131	(0)
	CdHCO3+	5.801e-12	4.295e-12	-11.237	-11.367	-0.131	(0)
	Cd (CO3) 2-2	5.393e-13	1.621e-13	-12.268	-12.790	-0.522	(0)
	Cd (OH) 2	1.561e-13	1.561e-13	-12.807	-12.807	0.000	(0)
	CdCl3-	3.614e-14	2.676e-14	-13.442	-13.573	-0.131	(0)
	CdF2	2.093e-15	2.093e-15	-14.679	-14.679	0.000	(0)
	CdNO3+	3.527e-16	2.611e-16	-15.453	-15.583	-0.131	(0)
	CdSeO4	1.424e-16	1.424e-16	-15.847	-15.847	0.000	(0)
	Cd (SeO3) 2-2	1.705e-17	5.124e-18	-16.768	-17.290	-0.522	(0)
	Cd2OH+3	1.178e-17	7.879e-19	-16.929	-18.104	-1.175	(0)
	Cd (OH) 3-	1.016e-17	7.520e-18	-16.993	-17.124	-0.131	(0)
	Cd (OH) 4-2	3.230e-24	9.706e-25	-23.491	-24.013	-0.522	(0)
	Cd (NO3) 2	2.157e-24	2.157e-24	-23.666	-23.666	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.729	-78.860	-0.131	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.224	-150.224	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.761	-226.892	-0.131	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.741	-303.263	-0.522	(0)
Cl		3.439e-03					
	Cl-	3.439e-03	2.770e-03	-2.464	-2.557	-0.094	(0)
	MnCl+	8.964e-08	7.255e-08	-7.047	-7.139	-0.092	(0)
	ZnCl+	1.909e-08	1.525e-08	-7.719	-7.817	-0.098	(0)
	ZnOHCl	1.574e-08	1.574e-08	-7.803	-7.803	0.000	(0)
	CdCl+	1.790e-09	1.325e-09	-8.747	-8.878	-0.131	(0)
	CuCl	7.206e-10	7.206e-10	-9.142	-9.142	0.000	(0)
	CuCl2-	5.223e-10	4.171e-10	-9.282	-9.380	-0.098	(0)
	MnCl2	2.839e-10	2.839e-10	-9.547	-9.547	0.000	(0)
	CuCl+	1.753e-10	1.400e-10	-9.756	-9.854	-0.098	(0)
	CoCl+	1.062e-10	7.859e-11	-9.974	-10.105	-0.131	(0)
	ZnCl2	6.694e-11	6.694e-11	-10.174	-10.174	0.000	(0)
	CdOHCl	4.287e-11	4.287e-11	-10.368	-10.368	0.000	(0)
	PbCl+	2.252e-11	1.668e-11	-10.647	-10.778	-0.131	(0)
	CdCl2	1.531e-11	1.531e-11	-10.815	-10.815	0.000	(0)
	NiCl+	1.432e-11	1.060e-11	-10.844	-10.975	-0.131	(0)
	HgClOH	8.429e-12	8.429e-12	-11.074	-11.074	0.000	(0)
	HgCl2	1.677e-12	1.677e-12	-11.775	-11.775	0.000	(0)
	CuCl3-2	5.760e-13	2.471e-13	-12.240	-12.607	-0.368	(0)
	MnCl3-	2.677e-13	2.166e-13	-12.572	-12.664	-0.092	(0)
	PbCl2	2.064e-13	2.064e-13	-12.685	-12.685	0.000	(0)
	ZnCl3-	1.845e-13	1.473e-13	-12.734	-12.832	-0.098	(0)
	CuCl2	1.345e-13	1.345e-13	-12.871	-12.871	0.000	(0)
	HgCl3-	6.275e-14	4.646e-14	-13.202	-13.333	-0.131	(0)
	CdCl3-	3.614e-14	2.676e-14	-13.442	-13.573	-0.131	(0)
	UO2Cl+	2.321e-15	1.718e-15	-14.634	-14.765	-0.131	(0)
	HgCl4-2	1.705e-15	5.124e-16	-14.768	-15.290	-0.522	(0)
	ZnCl4-2	4.758e-16	2.041e-16	-15.323	-15.690	-0.368	(0)
	PbCl3-	3.074e-16	2.276e-16	-15.512	-15.643	-0.131	(0)
	HgCl+	1.631e-16	1.208e-16	-15.787	-15.918	-0.131	(0)
	NiCl2	1.479e-16	1.479e-16	-15.830	-15.830	0.000	(0)
	CrCl+2	6.091e-18	1.830e-18	-17.215	-17.737	-0.522	(0)
	CuCl3-	4.353e-18	3.477e-18	-17.361	-17.459	-0.098	(0)
	PbCl4-2	9.592e-19	2.882e-19	-18.018	-18.540	-0.522	(0)

CrOHC12	7.599e-20	7.599e-20	-19.119	-19.119	0.000	(0)
CrCl2+	6.499e-22	4.811e-22	-21.187	-21.318	-0.131	(0)
FeCl+2	6.306e-22	2.705e-22	-21.200	-21.568	-0.368	(0)
CuCl4-2	1.125e-22	4.827e-23	-21.949	-22.316	-0.368	(0)
VOCl+	4.544e-23	3.364e-23	-22.343	-22.473	-0.131	(0)
FeCl2+	4.136e-24	3.347e-24	-23.383	-23.475	-0.092	(0)
CrO3Cl-	4.405e-26	3.261e-26	-25.356	-25.487	-0.131	(0)
FeCl3	9.273e-28	9.273e-28	-27.033	-27.033	0.000	(0)
CoCl+2	4.628e-36	1.391e-36	-35.335	-35.857	-0.522	(0)
UCl+3	0.000e+00	0.000e+00	-44.217	-45.392	-1.175	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.499	-50.021	-0.522	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.366	-51.888	-0.522	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.238	-64.760	-0.522	(0)
Co (2)	3.959e-08					
Co+2	2.729e-08	8.200e-09	-7.564	-8.086	-0.522	(0)
CoSO4	1.146e-08	1.146e-08	-7.941	-7.941	0.000	(0)
CoHCO3+	3.244e-10	2.402e-10	-9.489	-9.619	-0.131	(0)
CoCO3	1.918e-10	1.918e-10	-9.717	-9.717	0.000	(0)
CoOH+	1.743e-10	1.290e-10	-9.759	-9.889	-0.131	(0)
CoCl+	1.062e-10	7.859e-11	-9.974	-10.105	-0.131	(0)
CoF+	4.026e-11	2.981e-11	-10.395	-10.526	-0.131	(0)
Co (OH) 2	8.081e-12	8.081e-12	-11.093	-11.093	0.000	(0)
CoNO2+	1.364e-12	1.010e-12	-11.865	-11.996	-0.131	(0)
Co (NH3) +2	3.109e-14	9.341e-15	-13.507	-14.030	-0.522	(0)
CoSeO4	6.272e-16	6.272e-16	-15.203	-15.203	0.000	(0)
CoNO3+	2.893e-16	2.142e-16	-15.539	-15.669	-0.131	(0)
Co (OH) 3-	1.717e-16	1.271e-16	-15.765	-15.896	-0.131	(0)
CoOOH-	4.312e-17	3.193e-17	-16.365	-16.496	-0.131	(0)
Co2OH+3	7.931e-19	5.302e-20	-18.101	-19.276	-1.175	(0)
Co (NH3) 2+2	1.256e-20	3.776e-21	-19.901	-20.423	-0.522	(0)
Co (OH) 4-2	5.287e-23	1.589e-23	-22.277	-22.799	-0.522	(0)
Co (NO3) 2	7.183e-24	7.183e-24	-23.144	-23.144	0.000	(0)
Co (NH3) 3+2	1.499e-27	4.504e-28	-26.824	-27.346	-0.522	(0)
Co4 (OH) 4+4	6.780e-30	5.528e-32	-29.169	-31.257	-2.089	(0)
Co (NH3) 4+2	7.452e-35	2.239e-35	-34.128	-34.650	-0.522	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.931	-42.453	-0.522	(0)
Co (3)	3.290e-29					
CoOH+2	3.290e-29	9.885e-30	-28.483	-29.005	-0.522	(0)
Co+3	1.727e-35	2.467e-36	-34.763	-35.608	-0.845	(0)
CoCl+2	4.628e-36	1.391e-36	-35.335	-35.857	-0.522	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.499	-50.021	-0.522	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.301	-59.432	-0.131	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.583	-64.105	-0.522	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.238	-64.760	-0.522	(0)
Cr (2)	5.370e-27					
Cr+2	5.370e-27	1.614e-27	-26.270	-26.792	-0.522	(0)
Cr (3)	1.459e-09					
Cr (OH) 2+	1.141e-09	8.449e-10	-8.943	-9.073	-0.131	(0)
Cr (OH) 3	2.503e-10	2.503e-10	-9.602	-9.602	0.000	(0)
Cr (OH) +2	2.930e-11	8.806e-12	-10.533	-11.055	-0.522	(0)
CrOHSO4	1.463e-11	1.463e-11	-10.835	-10.835	0.000	(0)
CrO2-	1.259e-11	9.324e-12	-10.900	-11.030	-0.131	(0)
Cr (OH) 4-	1.061e-11	7.856e-12	-10.974	-11.105	-0.131	(0)
CrF+2	3.095e-14	9.300e-15	-13.509	-14.032	-0.522	(0)
CrSO4+	1.127e-14	8.346e-15	-13.948	-14.079	-0.131	(0)
Cr+3	7.635e-15	5.105e-16	-14.117	-15.292	-1.175	(0)
CrCl+2	6.091e-18	1.830e-18	-17.215	-17.737	-0.522	(0)
CrOHC12	7.599e-20	7.599e-20	-19.119	-19.119	0.000	(0)
Cr2 (OH) 2SO4+2	3.876e-20	1.165e-20	-19.412	-19.934	-0.522	(0)
Cr2 (OH) 2 (SO4) 2	4.844e-21	4.844e-21	-20.315	-20.315	0.000	(0)
CrCl2+	6.499e-22	4.811e-22	-21.187	-21.318	-0.131	(0)
CrNO3+2	1.224e-24	3.678e-25	-23.912	-24.434	-0.522	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.618	-41.140	-0.522	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.258	-50.433	-1.175	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.366	-51.888	-0.522	(0)
Cr (6)	8.914e-15					
CrO4-2	8.432e-15	3.550e-15	-14.074	-14.450	-0.376	(0)
NaCrO4-	2.008e-16	1.487e-16	-15.697	-15.828	-0.131	(0)

HCrO4-	1.980e-16	1.466e-16	-15.703	-15.834	-0.131	(0)
KCrO4-	8.366e-17	6.194e-17	-16.077	-16.208	-0.131	(0)
CrO3SO4-2	1.328e-23	3.992e-24	-22.877	-23.399	-0.522	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	4.405e-26	3.261e-26	-25.356	-25.487	-0.131	(0)
Cr2O7-2	2.481e-30	7.456e-31	-29.605	-30.127	-0.522	(0)
Cu (1)	1.523e-09					
CuCl	7.206e-10	7.206e-10	-9.142	-9.142	0.000	(0)
CuCl2-	5.223e-10	4.171e-10	-9.282	-9.380	-0.098	(0)
Cu+	2.791e-10	2.066e-10	-9.554	-9.685	-0.131	(0)
CuCl3-2	5.113e-13	2.471e-13	-12.240	-12.607	-0.368	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.242	-147.642	-0.400	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.993	-148.372	-0.379	(0)
Cu (2)	5.045e-07					
CuCO3	2.597e-07	2.597e-07	-6.585	-6.585	0.000	(0)
CuOH+	9.954e-08	7.949e-08	-7.002	-7.100	-0.098	(0)
Cu+2	7.571e-08	3.188e-08	-7.121	-7.497	-0.376	(0)
CuSO4	5.113e-08	5.113e-08	-7.291	-7.291	0.000	(0)
Cu (OH) 2	1.251e-08	1.251e-08	-7.903	-7.903	0.000	(0)
Cu (CO3) 2-2	3.219e-09	9.672e-10	-8.492	-9.014	-0.522	(0)
CuHCO3+	1.023e-09	7.573e-10	-8.990	-9.121	-0.131	(0)
Cu2 (OH) 2+2	5.281e-10	1.587e-10	-9.277	-9.799	-0.522	(0)
CuF+	3.123e-10	2.312e-10	-9.505	-9.636	-0.131	(0)
CuCl+	1.753e-10	1.400e-10	-9.756	-9.854	-0.098	(0)
CuNO2+	7.876e-11	5.832e-11	-10.104	-10.234	-0.131	(0)
Cu (OH) 3-	2.732e-11	2.023e-11	-10.564	-10.694	-0.131	(0)
CuNH3+2	1.029e-11	3.091e-12	-10.988	-11.510	-0.522	(0)
CuCl2	1.345e-13	1.345e-13	-12.871	-12.871	0.000	(0)
Cu (NO2) 2	1.043e-14	1.043e-14	-13.982	-13.982	0.000	(0)
CuNO3+	2.244e-15	1.661e-15	-14.649	-14.780	-0.131	(0)
Cu (OH) 4-2	4.177e-16	1.255e-16	-15.379	-15.901	-0.522	(0)
CuCl3-	4.353e-18	3.477e-18	-17.361	-17.459	-0.098	(0)
CuCl4-2	1.125e-22	4.827e-23	-21.949	-22.316	-0.368	(0)
Cu (NO3) 2	3.447e-24	3.447e-24	-23.463	-23.463	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.170	-217.301	-0.131	(0)
F	1.815e-04					
F-	1.427e-04	1.150e-04	-3.846	-3.939	-0.094	(0)
MgF+	3.430e-05	2.758e-05	-4.465	-4.559	-0.095	(0)
CaF+	3.710e-06	3.003e-06	-5.431	-5.523	-0.092	(0)
NaF	6.112e-07	6.112e-07	-6.214	-6.214	0.000	(0)
MnF+	1.176e-07	9.519e-08	-6.930	-7.021	-0.092	(0)
ZnF+	6.786e-09	5.025e-09	-8.168	-8.299	-0.131	(0)
BF (OH) 3-	2.176e-09	1.697e-09	-8.662	-8.770	-0.108	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
AlF3	6.916e-10	6.916e-10	-9.160	-9.160	0.000	(0)
AlF2+	5.877e-10	4.779e-10	-9.231	-9.321	-0.090	(0)
CuF+	3.123e-10	2.312e-10	-9.505	-9.636	-0.131	(0)
AlF4-	4.956e-11	3.985e-11	-10.305	-10.400	-0.095	(0)
CoF+	4.026e-11	2.981e-11	-10.395	-10.526	-0.131	(0)
AlF+2	2.388e-11	1.044e-11	-10.622	-10.981	-0.359	(0)
CdF+	1.233e-11	9.127e-12	-10.909	-11.040	-0.131	(0)
UO2F+	8.196e-12	6.069e-12	-11.086	-11.217	-0.131	(0)
NiF+	5.833e-12	4.319e-12	-11.234	-11.365	-0.131	(0)
UO2F2	2.012e-12	2.012e-12	-11.696	-11.696	0.000	(0)
PbF+	1.856e-12	1.374e-12	-11.731	-11.862	-0.131	(0)
HF2-	1.196e-12	9.480e-13	-11.922	-12.023	-0.101	(0)
BF2 (OH) 2-	3.414e-13	2.663e-13	-12.467	-12.575	-0.108	(0)
UO2F3-	7.846e-14	5.809e-14	-13.105	-13.236	-0.131	(0)
CrF+2	3.095e-14	9.300e-15	-13.509	-14.032	-0.522	(0)
PbF2	3.108e-15	3.108e-15	-14.507	-14.507	0.000	(0)
CdF2	2.093e-15	2.093e-15	-14.679	-14.679	0.000	(0)
UO2F4-2	1.765e-16	5.304e-17	-15.753	-16.275	-0.522	(0)
H2F2	1.261e-17	1.261e-17	-16.899	-16.899	0.000	(0)
VO2F	5.061e-18	5.061e-18	-17.296	-17.296	0.000	(0)
FeF2+	1.549e-18	1.253e-18	-17.810	-17.902	-0.092	(0)
FeF+2	9.500e-19	4.075e-19	-18.022	-18.390	-0.368	(0)
PbF3-	9.154e-19	6.777e-19	-18.038	-18.169	-0.131	(0)
VO2F2-	2.853e-19	2.112e-19	-18.545	-18.675	-0.131	(0)

FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
BF3OH-	1.950e-19	1.521e-19	-18.710	-18.818	-0.108	(0)
VOF+	4.031e-21	2.984e-21	-20.395	-20.525	-0.131	(0)
VO2F3-2	1.008e-21	3.028e-22	-20.997	-21.519	-0.522	(0)
VOF2	1.286e-22	1.286e-22	-21.891	-21.891	0.000	(0)
PbF4-2	1.241e-22	3.729e-23	-21.906	-22.428	-0.522	(0)
HgF+	1.257e-23	9.310e-24	-22.901	-23.031	-0.131	(0)
BF4-	1.408e-24	1.099e-24	-23.851	-23.959	-0.108	(0)
VOF3-	7.086e-25	5.246e-25	-24.150	-24.280	-0.131	(0)
VO2F4-3	2.562e-25	1.713e-26	-24.591	-25.766	-1.175	(0)
Sb(OH) 2F	6.102e-26	6.102e-26	-25.215	-25.215	0.000	(0)
SbOF	6.006e-26	6.006e-26	-25.221	-25.221	0.000	(0)
VOF4-2	8.101e-28	2.434e-28	-27.091	-27.614	-0.522	(0)
UF3+	2.387e-35	1.768e-35	-34.622	-34.753	-0.131	(0)
UF2+2	3.229e-36	9.702e-37	-35.491	-36.013	-0.522	(0)
UF4	2.228e-37	2.228e-37	-36.652	-36.652	0.000	(0)
UF+3	1.003e-38	6.704e-40	-37.999	-39.174	-1.175	(0)
UF5-	1.371e-39	1.015e-39	-38.863	-38.994	-0.131	(0)
UF6-2	1.172e-40	0.000e+00	-39.931	-40.453	-0.522	(0)
Fe (2)	2.345e-12					
Fe+2	1.533e-12	4.605e-13	-11.815	-12.337	-0.522	(0)
FeSO4	7.915e-13	7.915e-13	-12.102	-12.102	0.000	(0)
FeOH+	1.786e-14	1.446e-14	-13.748	-13.840	-0.092	(0)
FeHCO3+	2.666e-15	2.183e-15	-14.574	-14.661	-0.087	(0)
Fe (OH) 2	9.054e-18	9.054e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	2.790e-18	2.258e-18	-17.554	-17.646	-0.092	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.522	-160.522	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.923	-237.053	-0.131	(0)
Fe (3)	1.087e-09					
Fe (OH) 2+	6.208e-10	5.049e-10	-9.207	-9.297	-0.090	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.860e-11	3.139e-11	-10.413	-10.503	-0.090	(0)
FeOH+2	3.837e-15	1.646e-15	-14.416	-14.784	-0.368	(0)
FeF2+	1.549e-18	1.253e-18	-17.810	-17.902	-0.092	(0)
FeF+2	9.500e-19	4.075e-19	-18.022	-18.390	-0.368	(0)
FeSO4+	3.138e-19	2.540e-19	-18.503	-18.595	-0.092	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
Fe (SO4) 2-	5.135e-20	3.802e-20	-19.289	-19.420	-0.131	(0)
Fe+3	2.264e-20	3.233e-21	-19.645	-20.490	-0.845	(0)
FeCl+2	6.306e-22	2.705e-22	-21.200	-21.568	-0.368	(0)
FeCl2+	4.136e-24	3.347e-24	-23.383	-23.475	-0.092	(0)
FeHSeO3+2	3.209e-24	9.644e-25	-23.494	-24.016	-0.522	(0)
Fe2 (OH) 2+4	1.100e-26	8.970e-29	-25.959	-28.047	-2.089	(0)
FeNO3+2	1.773e-27	5.328e-28	-26.751	-27.273	-0.522	(0)
FeCl3	9.273e-28	9.273e-28	-27.033	-27.033	0.000	(0)
Fe3 (OH) 4+5	1.201e-33	6.546e-37	-32.921	-36.184	-3.264	(0)
H (0)	3.975e-29					
H2	1.988e-29	2.018e-29	-28.702	-28.695	0.007	(0)
Hg (0)	3.531e-09					
Hg	3.531e-09	3.531e-09	-8.452	-8.452	0.000	(0)
Hg (1)	3.486e-20					
Hg2+2	1.743e-20	5.238e-21	-19.759	-20.281	-0.522	(0)
Hg (2)	1.862e-11					
Hg (OH) 2	8.443e-12	8.571e-12	-11.074	-11.067	0.007	(0)
HgClOH	8.429e-12	8.429e-12	-11.074	-11.074	0.000	(0)
HgCl2	1.677e-12	1.677e-12	-11.775	-11.775	0.000	(0)
HgCl3-	6.275e-14	4.646e-14	-13.202	-13.333	-0.131	(0)
HgCO3	3.618e-15	3.618e-15	-14.442	-14.442	0.000	(0)
HgCl4-2	1.705e-15	5.124e-16	-14.768	-15.290	-0.522	(0)
HgCl+	1.631e-16	1.208e-16	-15.787	-15.918	-0.131	(0)
HgOH+	9.264e-17	6.859e-17	-16.033	-16.164	-0.131	(0)
Hg (CO3) 2-2	5.268e-17	1.583e-17	-16.278	-16.801	-0.522	(0)
HgHCO3+	1.161e-18	8.595e-19	-17.935	-18.066	-0.131	(0)
Hg (OH) 3-	1.149e-18	8.508e-19	-17.940	-18.070	-0.131	(0)
Hg (NH3) 2+2	4.119e-19	1.238e-19	-18.385	-18.907	-0.522	(0)
HgNH3+2	4.347e-20	1.306e-20	-19.362	-19.884	-0.522	(0)
Hg+2	7.271e-21	2.185e-21	-20.138	-20.661	-0.522	(0)
HgSO4	4.005e-21	4.005e-21	-20.397	-20.397	0.000	(0)

	HgF+	1.257e-23	9.310e-24	-22.901	-23.031	-0.131	(0)
	Hg (NH3) 3+2	1.554e-26	4.668e-27	-25.809	-26.331	-0.522	(0)
	HgNO3+	1.796e-29	1.330e-29	-28.746	-28.876	-0.131	(0)
	Hg (NH3) 4+2	1.169e-33	3.513e-34	-32.932	-33.454	-0.522	(0)
	Hg (NO3) 2	9.108e-38	9.108e-38	-37.041	-37.041	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.843	-137.974	-0.131	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.266	-138.788	-0.522	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.474	-139.474	0.000	(0)
K		6.115e-03					
	K+	5.829e-03	4.696e-03	-2.234	-2.328	-0.094	(0)
	KSO4-	2.862e-04	2.328e-04	-3.543	-3.633	-0.090	(0)
	KCrO4-	8.366e-17	6.194e-17	-16.077	-16.208	-0.131	(0)
Mg		7.851e-03					
	Mg+2	5.078e-03	2.138e-03	-2.294	-2.670	-0.376	(0)
	MgSO4	2.725e-03	2.725e-03	-2.565	-2.565	0.000	(0)
	MgF+	3.430e-05	2.758e-05	-4.465	-4.559	-0.095	(0)
	MgHCO3+	1.032e-05	8.239e-06	-4.986	-5.084	-0.098	(0)
	MgCO3	2.461e-06	2.461e-06	-5.609	-5.609	0.000	(0)
	MgOH+	8.152e-07	6.712e-07	-6.089	-6.173	-0.084	(0)
	MgH2BO3+	1.601e-07	1.249e-07	-6.796	-6.904	-0.108	(0)
Mn (2)		9.557e-05					
	Mn+2	6.922e-05	2.080e-05	-4.160	-4.682	-0.522	(0)
	MnSO4	2.590e-05	2.590e-05	-4.587	-4.587	0.000	(0)
	MnHCO3+	1.931e-07	1.563e-07	-6.714	-6.806	-0.092	(0)
	MnF+	1.176e-07	9.519e-08	-6.930	-7.021	-0.092	(0)
	MnCl+	8.964e-08	7.255e-08	-7.047	-7.139	-0.092	(0)
	MnOH+	5.091e-08	4.120e-08	-7.293	-7.385	-0.092	(0)
	MnCl2	2.839e-10	2.839e-10	-9.547	-9.547	0.000	(0)
	MnSeO4	8.544e-13	8.544e-13	-12.068	-12.068	0.000	(0)
	MnNO3+	7.338e-13	5.433e-13	-12.134	-12.265	-0.131	(0)
	MnCl3-	2.677e-13	2.166e-13	-12.572	-12.664	-0.092	(0)
	Mn (OH) 3-	1.956e-16	1.583e-16	-15.709	-15.801	-0.092	(0)
	Mn (NO3) 2	2.249e-20	2.249e-20	-19.648	-19.648	0.000	(0)
	Mn (OH) 4-2	9.395e-22	4.030e-22	-21.027	-21.395	-0.368	(0)
	MnSe	0.000e+00	0.000e+00	-40.894	-40.894	0.000	(0)
Mn (3)		4.916e-25					
	Mn+3	4.916e-25	7.021e-26	-24.308	-25.154	-0.845	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-40.071	-40.438	-0.368	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.828	-44.932	-0.104	(0)
Mo		3.359e-06					
	MoO4-2	3.358e-06	1.414e-06	-5.474	-5.850	-0.376	(0)
	HMoO4-	4.848e-10	3.590e-10	-9.314	-9.445	-0.131	(0)
	H2MoO4	3.355e-14	3.355e-14	-13.474	-13.474	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-40.336	-41.510	-1.175	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-46.409	-51.109	-4.699	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-49.353	-52.616	-3.264	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.640	-55.728	-2.089	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-59.202	-60.376	-1.175	(0)
N (-3)		3.010e-07					
	NH4+	2.718e-07	2.120e-07	-6.566	-6.674	-0.108	(0)
	NH4SO4-	1.966e-08	1.591e-08	-7.707	-7.798	-0.092	(0)
	NH3	9.475e-09	9.475e-09	-8.023	-8.023	0.000	(0)
	CaNH3+2	9.500e-11	2.855e-11	-10.022	-10.544	-0.522	(0)
	CuNH3+2	1.029e-11	3.091e-12	-10.988	-11.510	-0.522	(0)
	Co (NH3) +2	3.109e-14	9.341e-15	-13.507	-14.030	-0.522	(0)
	NiNH3+2	2.533e-14	7.611e-15	-13.596	-14.119	-0.522	(0)
	BaNH3+2	2.975e-16	8.940e-17	-15.526	-16.049	-0.522	(0)
	Hg (NH3) 2+2	4.119e-19	1.238e-19	-18.385	-18.907	-0.522	(0)
	Ca (NH3) 2+2	3.583e-19	1.077e-19	-18.446	-18.968	-0.522	(0)
	HgNH3+2	4.347e-20	1.306e-20	-19.362	-19.884	-0.522	(0)
	Ni (NH3) 2+2	3.469e-20	1.042e-20	-19.460	-19.982	-0.522	(0)
	Co (NH3) 2+2	1.256e-20	3.776e-21	-19.901	-20.423	-0.522	(0)
	Hg (NH3) 3+2	1.554e-26	4.668e-27	-25.809	-26.331	-0.522	(0)
	Co (NH3) 3+2	1.499e-27	4.504e-28	-26.824	-27.346	-0.522	(0)
	Hg (NH3) 4+2	1.169e-33	3.513e-34	-32.932	-33.454	-0.522	(0)
	Co (NH3) 4+2	7.452e-35	2.239e-35	-34.128	-34.650	-0.522	(0)

	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.618	-41.140	-0.522	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-41.931	-42.453	-0.522	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.258	-50.433	-1.175	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.499	-50.021	-0.522	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.366	-51.888	-0.522	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.301	-59.432	-0.131	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.583	-64.105	-0.522	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.238	-64.760	-0.522	(0)
N (3)	2.221e-05						
	NO2-	2.221e-05	1.747e-05	-4.653	-4.758	-0.104	(0)
	CuNO2+	7.876e-11	5.832e-11	-10.104	-10.234	-0.131	(0)
	CoNO2+	1.364e-12	1.010e-12	-11.865	-11.996	-0.131	(0)
	Cu (NO2) 2	1.043e-14	1.043e-14	-13.982	-13.982	0.000	(0)
N (5)	2.063e-08						
	NO3-	2.046e-08	1.648e-08	-7.689	-7.783	-0.094	(0)
	CaNO3+	1.685e-10	1.247e-10	-9.773	-9.904	-0.131	(0)
	MnNO3+	7.338e-13	5.433e-13	-12.134	-12.265	-0.131	(0)
	ZnNO3+	1.225e-13	9.070e-14	-12.912	-13.042	-0.131	(0)
	CuNO3+	2.244e-15	1.661e-15	-14.649	-14.780	-0.131	(0)
	BaNO3+	1.668e-15	1.235e-15	-14.778	-14.908	-0.131	(0)
	CdNO3+	3.527e-16	2.611e-16	-15.453	-15.583	-0.131	(0)
	CoNO3+	2.893e-16	2.142e-16	-15.539	-15.669	-0.131	(0)
	NiNO3+	8.363e-17	6.192e-17	-16.078	-16.208	-0.131	(0)
	PbNO3+	5.586e-17	4.135e-17	-16.253	-16.383	-0.131	(0)
	Mn (NO3) 2	2.249e-20	2.249e-20	-19.648	-19.648	0.000	(0)
	UO2NO3+	1.699e-20	1.258e-20	-19.770	-19.900	-0.131	(0)
	Zn (NO3) 2	2.983e-22	2.983e-22	-21.525	-21.525	0.000	(0)
	Co (NO3) 2	7.183e-24	7.183e-24	-23.144	-23.144	0.000	(0)
	Cu (NO3) 2	3.447e-24	3.447e-24	-23.463	-23.463	0.000	(0)
	Cd (NO3) 2	2.157e-24	2.157e-24	-23.666	-23.666	0.000	(0)
	CrNO3+2	1.224e-24	3.678e-25	-23.912	-24.434	-0.522	(0)
	Pb (NO3) 2	1.158e-24	1.158e-24	-23.936	-23.936	0.000	(0)
	VO2NO3	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
	FeNO3+2	1.773e-27	5.328e-28	-26.751	-27.273	-0.522	(0)
	HgNO3+	1.796e-29	1.330e-29	-28.746	-28.876	-0.131	(0)
	Hg (NO3) 2	9.108e-38	9.108e-38	-37.041	-37.041	0.000	(0)
Na	1.085e-02						
	Na+	1.046e-02	8.427e-03	-1.980	-2.074	-0.094	(0)
	NaSO4-	3.896e-04	3.169e-04	-3.409	-3.499	-0.090	(0)
	NaHCO3	1.784e-06	1.784e-06	-5.749	-5.749	0.000	(0)
	NaF	6.112e-07	6.112e-07	-6.214	-6.214	0.000	(0)
	NaCO3-	2.670e-07	2.171e-07	-6.574	-6.663	-0.090	(0)
	NaH2BO3	2.250e-08	2.250e-08	-7.648	-7.648	0.000	(0)
	NaCrO4-	2.008e-16	1.487e-16	-15.697	-15.828	-0.131	(0)
Ni	5.856e-09						
	Ni+2	3.552e-09	1.496e-09	-8.449	-8.825	-0.376	(0)
	NiSO4	2.090e-09	2.090e-09	-8.680	-8.680	0.000	(0)
	NiHCO3+	9.378e-11	6.943e-11	-10.028	-10.158	-0.131	(0)
	NiCO3	7.721e-11	7.721e-11	-10.112	-10.112	0.000	(0)
	NiOH+	2.005e-11	1.485e-11	-10.698	-10.828	-0.131	(0)
	NiCl+	1.432e-11	1.060e-11	-10.844	-10.975	-0.131	(0)
	NiF+	5.833e-12	4.319e-12	-11.234	-11.365	-0.131	(0)
	Ni (SO4) 2-2	1.612e-12	4.845e-13	-11.793	-12.315	-0.522	(0)
	Ni (OH) 2	9.299e-13	9.299e-13	-12.032	-12.032	0.000	(0)
	NiNH3+2	2.533e-14	7.611e-15	-13.596	-14.119	-0.522	(0)
	Ni (OH) 3-	9.904e-16	7.333e-16	-15.004	-15.135	-0.131	(0)
	NiCl2	1.479e-16	1.479e-16	-15.830	-15.830	0.000	(0)
	NiSeO4	1.068e-16	1.068e-16	-15.972	-15.972	0.000	(0)
	NiNO3+	8.363e-17	6.192e-17	-16.078	-16.208	-0.131	(0)
	Ni (NH3) 2+2	3.469e-20	1.042e-20	-19.460	-19.982	-0.522	(0)
O (0)	2.448e-35						
	O2	1.224e-35	1.243e-35	-34.912	-34.906	0.007	(0)
Pb	2.332e-09						
	PbCO3	7.056e-10	7.056e-10	-9.151	-9.151	0.000	(0)
	PbSO4	5.818e-10	5.818e-10	-9.235	-9.235	0.000	(0)
	PbOH+	4.538e-10	3.360e-10	-9.343	-9.474	-0.131	(0)
	Pb+2	4.029e-10	1.696e-10	-9.395	-9.770	-0.376	(0)
	Pb (SO4) 2-2	8.168e-11	2.455e-11	-10.088	-10.610	-0.522	(0)

PbHCO3+	6.410e-11	4.746e-11	-10.193	-10.324	-0.131	(0)
PbCl+	2.252e-11	1.668e-11	-10.647	-10.778	-0.131	(0)
Pb (CO3) 2-2	9.370e-12	2.816e-12	-11.028	-11.550	-0.522	(0)
Pb (OH) 2	8.378e-12	8.378e-12	-11.077	-11.077	0.000	(0)
PbF+	1.856e-12	1.374e-12	-11.731	-11.862	-0.131	(0)
PbCl2	2.064e-13	2.064e-13	-12.685	-12.685	0.000	(0)
Pb (OH) 3-	8.923e-15	6.606e-15	-14.050	-14.180	-0.131	(0)
PbF2	3.108e-15	3.108e-15	-14.507	-14.507	0.000	(0)
PbCl3-	3.074e-16	2.276e-16	-15.512	-15.643	-0.131	(0)
PbNO3+	5.586e-17	4.135e-17	-16.253	-16.383	-0.131	(0)
Pb2OH+3	1.351e-17	9.033e-19	-16.869	-18.044	-1.175	(0)
Pb (OH) 4-2	4.245e-18	1.276e-18	-17.372	-17.894	-0.522	(0)
PbCl4-2	9.592e-19	2.882e-19	-18.018	-18.540	-0.522	(0)
PbF3-	9.154e-19	6.777e-19	-18.038	-18.169	-0.131	(0)
Pb3 (OH) 4+2	7.906e-22	2.376e-22	-21.102	-21.624	-0.522	(0)
PbF4-2	1.241e-22	3.729e-23	-21.906	-22.428	-0.522	(0)
Pb (NO3) 2	1.158e-24	1.158e-24	-23.936	-23.936	0.000	(0)
Pb4 (OH) 4+4	3.926e-26	3.201e-28	-25.406	-27.495	-2.089	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.636	-151.636	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.773	-228.904	-0.131	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.437	-78.568	-0.131	(0)
CdHS+	0.000e+00	0.000e+00	-78.729	-78.860	-0.131	(0)
H2S	0.000e+00	0.000e+00	-79.442	-79.442	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.517	-80.039	-0.522	(0)
S6-2	0.000e+00	0.000e+00	-80.032	-80.555	-0.522	(0)
S4-2	0.000e+00	0.000e+00	-80.112	-80.634	-0.522	(0)
S3-2	0.000e+00	0.000e+00	-80.918	-81.440	-0.522	(0)
S2-2	0.000e+00	0.000e+00	-81.934	-82.456	-0.522	(0)
S-2	0.000e+00	0.000e+00	-87.606	-87.974	-0.368	(0)
HgHS2-	0.000e+00	0.000e+00	-137.843	-137.974	-0.131	(0)
HgS2-2	0.000e+00	0.000e+00	-138.266	-138.788	-0.522	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.474	-139.474	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.242	-147.642	-0.400	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.960	-148.091	-0.131	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.993	-148.372	-0.379	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.975	-149.975	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.224	-150.224	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.636	-151.636	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.522	-160.522	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.170	-217.301	-0.131	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.132	-225.263	-0.131	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.761	-226.892	-0.131	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.826	-227.349	-0.522	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.773	-228.904	-0.131	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.923	-237.053	-0.131	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.741	-303.263	-0.522	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.768	-305.291	-0.522	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.296	-319.818	-0.522	(0)
S (6)	2.390e-02					
SO4-2	1.663e-02	7.002e-03	-1.779	-2.155	-0.376	(0)
CaSO4	3.839e-03	3.839e-03	-2.416	-2.416	0.000	(0)
MgSO4	2.725e-03	2.725e-03	-2.565	-2.565	0.000	(0)
NaSO4-	3.896e-04	3.169e-04	-3.409	-3.499	-0.090	(0)
KSO4-	2.862e-04	2.328e-04	-3.543	-3.633	-0.090	(0)
MnSO4	2.590e-05	2.590e-05	-4.587	-4.587	0.000	(0)
ZnSO4	3.356e-06	3.356e-06	-5.474	-5.474	0.000	(0)
Zn (SO4) 2-2	6.811e-07	2.047e-07	-6.167	-6.689	-0.522	(0)
CuSO4	5.113e-08	5.113e-08	-7.291	-7.291	0.000	(0)
NH4SO4-	1.966e-08	1.591e-08	-7.707	-7.798	-0.092	(0)
CoSO4	1.146e-08	1.146e-08	-7.941	-7.941	0.000	(0)
HSO4-	1.086e-08	8.730e-09	-7.964	-8.059	-0.095	(0)
CdSO4	8.223e-09	8.223e-09	-8.085	-8.085	0.000	(0)
Cd (SO4) 2-2	2.585e-09	7.767e-10	-8.588	-9.110	-0.522	(0)
NiSO4	2.090e-09	2.090e-09	-8.680	-8.680	0.000	(0)
PbSO4	5.818e-10	5.818e-10	-9.235	-9.235	0.000	(0)
Pb (SO4) 2-2	8.168e-11	2.455e-11	-10.088	-10.610	-0.522	(0)
CrOHSO4	1.463e-11	1.463e-11	-10.835	-10.835	0.000	(0)

UO2SO4	4.053e-12	4.053e-12	-11.392	-11.392	0.000	(0)
Ni (SO4) 2-2	1.612e-12	4.845e-13	-11.793	-12.315	-0.522	(0)
UO2 (SO4) 2-2	1.245e-12	3.741e-13	-11.905	-12.427	-0.522	(0)
FeSO4	7.915e-13	7.915e-13	-12.102	-12.102	0.000	(0)
AlSO4+	6.141e-13	4.938e-13	-12.212	-12.306	-0.095	(0)
Al (SO4) 2-	4.608e-14	3.705e-14	-13.337	-13.431	-0.095	(0)
CrSO4+	1.127e-14	8.346e-15	-13.948	-14.079	-0.131	(0)
VO2SO4-	5.668e-18	4.197e-18	-17.247	-17.377	-0.131	(0)
FeSO4+	3.138e-19	2.540e-19	-18.503	-18.595	-0.092	(0)
Fe (SO4) 2-	5.135e-20	3.802e-20	-19.289	-19.420	-0.131	(0)
Cr2 (OH) 2SO4+2	3.876e-20	1.165e-20	-19.412	-19.934	-0.522	(0)
VOSO4	8.347e-21	8.347e-21	-20.078	-20.078	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.844e-21	4.844e-21	-20.315	-20.315	0.000	(0)
HgSO4	4.005e-21	4.005e-21	-20.397	-20.397	0.000	(0)
CrO3SO4-2	1.328e-23	3.992e-24	-22.877	-23.399	-0.522	(0)
VSO4+	2.069e-35	1.532e-35	-34.684	-34.815	-0.131	(0)
U (SO4) 2	4.532e-39	4.532e-39	-38.344	-38.344	0.000	(0)
USO4+2	2.712e-40	0.000e+00	-39.567	-40.089	-0.522	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.301	-59.432	-0.131	(0)
Sb (3)	5.262e-20					
Sb (OH) 3	2.661e-20	2.661e-20	-19.575	-19.575	0.000	(0)
HSbo2	2.600e-20	2.600e-20	-19.585	-19.585	0.000	(0)
SbO2-	4.458e-24	3.300e-24	-23.351	-23.481	-0.131	(0)
Sb (OH) 4-	2.550e-24	1.888e-24	-23.594	-23.724	-0.131	(0)
Sb (OH) 2F	6.102e-26	6.102e-26	-25.215	-25.215	0.000	(0)
SbOF	6.006e-26	6.006e-26	-25.221	-25.221	0.000	(0)
Sb (OH) 2+	1.114e-26	8.251e-27	-25.953	-26.083	-0.131	(0)
SbO+	3.846e-27	2.847e-27	-26.415	-26.546	-0.131	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.296	-319.818	-0.522	(0)
Sb (5)	4.143e-08					
SbO3-	4.138e-08	3.064e-08	-7.383	-7.514	-0.131	(0)
Sb (OH) 6-	4.437e-11	3.574e-11	-10.353	-10.447	-0.094	(0)
SbO2+	1.934e-24	1.432e-24	-23.714	-23.844	-0.131	(0)
Se (-2)	2.565e-39					
HSe-	2.565e-39	1.899e-39	-38.591	-38.721	-0.131	(0)
MnSe	0.000e+00	0.000e+00	-40.894	-40.894	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.726	-42.726	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.305	-45.827	-0.522	(0)
Se (4)	2.697e-07					
HSeO3-	1.525e-07	1.129e-07	-6.817	-6.947	-0.131	(0)
SeO3-2	1.172e-07	3.523e-08	-6.931	-7.453	-0.522	(0)
H2SeO3	6.144e-13	6.144e-13	-12.212	-12.212	0.000	(0)
Cd (SeO3) 2-2	1.705e-17	5.124e-18	-16.768	-17.290	-0.522	(0)
FeHSeO3+2	3.209e-24	9.644e-25	-23.494	-24.016	-0.522	(0)
Se (6)	3.633e-10					
SeO4-2	3.624e-10	1.526e-10	-9.441	-9.816	-0.376	(0)
MnSeO4	8.544e-13	8.544e-13	-12.068	-12.068	0.000	(0)
ZnSeO4	5.178e-14	5.178e-14	-13.286	-13.286	0.000	(0)
CoSeO4	6.272e-16	6.272e-16	-15.203	-15.203	0.000	(0)
CdSeO4	1.424e-16	1.424e-16	-15.847	-15.847	0.000	(0)
HSeO4-	1.318e-16	9.758e-17	-15.880	-16.011	-0.131	(0)
NiSeO4	1.068e-16	1.068e-16	-15.972	-15.972	0.000	(0)
Zn (SeO4) 2-2	2.666e-23	8.012e-24	-22.574	-23.096	-0.522	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.034	-58.208	-1.175	(0)
U (4)	8.823e-19					
U (OH) 5-	8.819e-19	6.530e-19	-18.055	-18.185	-0.131	(0)
U (OH) 4	3.492e-22	3.492e-22	-21.457	-21.457	0.000	(0)
U (OH) 3+	2.202e-26	1.630e-26	-25.657	-25.788	-0.131	(0)
U (OH) 2+2	3.204e-31	9.626e-32	-30.494	-31.017	-0.522	(0)
UF3+	2.387e-35	1.768e-35	-34.622	-34.753	-0.131	(0)
UF2+2	3.229e-36	9.702e-37	-35.491	-36.013	-0.522	(0)
UOH+3	8.660e-37	5.790e-38	-36.062	-37.237	-1.175	(0)
UF4	2.228e-37	2.228e-37	-36.652	-36.652	0.000	(0)
UF+3	1.003e-38	6.704e-40	-37.999	-39.174	-1.175	(0)
U (SO4) 2	4.532e-39	4.532e-39	-38.344	-38.344	0.000	(0)
UF5-	1.371e-39	1.015e-39	-38.863	-38.994	-0.131	(0)
USO4+2	2.712e-40	0.000e+00	-39.567	-40.089	-0.522	(0)

UF6-2	1.172e-40	0.000e+00	-39.931	-40.453	-0.522	(0)
U+4	0.000e+00	0.000e+00	-42.445	-44.534	-2.089	(0)
UCl+3	0.000e+00	0.000e+00	-44.217	-45.392	-1.175	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.379	-165.953	-10.574	(0)
U (5)	4.167e-15					
UO2+	4.167e-15	3.085e-15	-14.380	-14.511	-0.131	(0)
U (6)	6.904e-07					
UO2 (CO3) 3-4	4.946e-07	4.033e-09	-6.306	-8.394	-2.089	(0)
UO2 (CO3) 2-2	1.935e-07	5.816e-08	-6.713	-7.235	-0.522	(0)
UO2CO3	2.107e-09	2.107e-09	-8.676	-8.676	0.000	(0)
UO2OH+	5.128e-11	3.796e-11	-10.290	-10.421	-0.131	(0)
UO2F+	8.196e-12	6.069e-12	-11.086	-11.217	-0.131	(0)
UO2SO4	4.053e-12	4.053e-12	-11.392	-11.392	0.000	(0)
UO2F2	2.012e-12	2.012e-12	-11.696	-11.696	0.000	(0)
UO2 (SO4) 2-2	1.245e-12	3.741e-13	-11.905	-12.427	-0.522	(0)
UO2+2	9.083e-13	3.824e-13	-12.042	-12.417	-0.376	(0)
UO2F3-	7.846e-14	5.809e-14	-13.105	-13.236	-0.131	(0)
(UO2) 3 (OH) 5+	5.785e-14	4.283e-14	-13.238	-13.368	-0.131	(0)
(UO2) 2 (OH) 2+2	7.960e-15	2.392e-15	-14.099	-14.621	-0.522	(0)
UO2Cl+	2.321e-15	1.718e-15	-14.634	-14.765	-0.131	(0)
UO2F4-2	1.765e-16	5.304e-17	-15.753	-16.275	-0.522	(0)
UO2NO3+	1.699e-20	1.258e-20	-19.770	-19.900	-0.131	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.985	-43.116	-0.131	(0)
V+2	0.000e+00	0.000e+00	-44.000	-44.522	-0.522	(0)
V (3)	1.833e-15					
V (OH) 3	1.833e-15	1.833e-15	-14.737	-14.737	0.000	(0)
V (OH) 2+	2.042e-26	1.512e-26	-25.690	-25.820	-0.131	(0)
VOH+2	6.094e-30	1.831e-30	-29.215	-29.737	-0.522	(0)
V+3	6.932e-35	4.634e-36	-34.159	-35.334	-1.175	(0)
VSO4+	2.069e-35	1.532e-35	-34.684	-34.815	-0.131	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.931	-57.106	-1.175	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-56.586	-58.674	-2.089	(0)
V (4)	9.459e-19					
V (OH) 3+	9.189e-19	6.803e-19	-18.037	-18.167	-0.131	(0)
VO+2	1.440e-20	4.328e-21	-19.842	-20.364	-0.522	(0)
VOSO4	8.347e-21	8.347e-21	-20.078	-20.078	0.000	(0)
VOF+	4.031e-21	2.984e-21	-20.395	-20.525	-0.131	(0)
VOF2	1.286e-22	1.286e-22	-21.891	-21.891	0.000	(0)
VOC1+	4.544e-23	3.364e-23	-22.343	-22.473	-0.131	(0)
VOF3-	7.086e-25	5.246e-25	-24.150	-24.280	-0.131	(0)
VOF4-2	8.101e-28	2.434e-28	-27.091	-27.614	-0.522	(0)
H2V2O4+2	7.734e-32	2.324e-32	-31.112	-31.634	-0.522	(0)
V (5)	1.548e-08					
H2VO4-	1.042e-08	7.714e-09	-7.982	-8.113	-0.131	(0)
HVO4-2	5.055e-09	1.519e-09	-8.296	-8.818	-0.522	(0)
H3VO4	9.842e-13	9.842e-13	-12.007	-12.007	0.000	(0)
H3V2O7-	6.627e-14	4.907e-14	-13.179	-13.309	-0.131	(0)
HV2O7-3	5.944e-14	3.974e-15	-13.226	-14.401	-1.175	(0)
VO4-3	8.925e-15	5.967e-16	-14.049	-15.224	-1.175	(0)
V2O7-4	1.028e-15	8.384e-18	-14.988	-17.077	-2.089	(0)
VO2+	3.116e-17	2.510e-17	-16.506	-16.600	-0.094	(0)
V3O9-3	7.211e-18	4.821e-19	-17.142	-18.317	-1.175	(0)
VO2SO4-	5.668e-18	4.197e-18	-17.247	-17.377	-0.131	(0)
VO2F	5.061e-18	5.061e-18	-17.296	-17.296	0.000	(0)
VO2F2-	2.853e-19	2.112e-19	-18.545	-18.675	-0.131	(0)
VO2F3-2	1.008e-21	3.028e-22	-20.997	-21.519	-0.522	(0)
V4O12-4	1.903e-22	1.552e-24	-21.721	-23.809	-2.089	(0)
VO2F4-3	2.562e-25	1.713e-26	-24.591	-25.766	-1.175	(0)
VO2NO3	2.093e-25	2.093e-25	-24.679	-24.679	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.094	-63.793	-4.699	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.237	-63.501	-3.264	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.099	-66.187	-2.089	(0)
Zn	9.746e-06					
Zn+2	5.203e-06	2.191e-06	-5.284	-5.659	-0.376	(0)
ZnSO4	3.356e-06	3.356e-06	-5.474	-5.474	0.000	(0)
Zn (SO4) 2-2	6.811e-07	2.047e-07	-6.167	-6.689	-0.522	(0)
ZnOH+	2.333e-07	1.727e-07	-6.632	-6.763	-0.131	(0)

ZnCO3	1.744e-07	1.744e-07	-6.758	-6.758	0.000	(0)
ZnHCO3+	3.523e-08	2.609e-08	-7.453	-7.584	-0.131	(0)
Zn(OH)2	2.159e-08	2.159e-08	-7.666	-7.666	0.000	(0)
ZnCl+	1.909e-08	1.525e-08	-7.719	-7.817	-0.098	(0)
ZnOHCl	1.574e-08	1.574e-08	-7.803	-7.803	0.000	(0)
ZnF+	6.786e-09	5.025e-09	-8.168	-8.299	-0.131	(0)
Zn(OH)3-	1.152e-10	8.531e-11	-9.938	-10.069	-0.131	(0)
ZnCl2	6.694e-11	6.694e-11	-10.174	-10.174	0.000	(0)
ZnCl3-	1.845e-13	1.473e-13	-12.734	-12.832	-0.098	(0)
ZnNO3+	1.225e-13	9.070e-14	-12.912	-13.042	-0.131	(0)
ZnSeO4	5.178e-14	5.178e-14	-13.286	-13.286	0.000	(0)
Zn(OH)4-2	8.912e-15	2.678e-15	-14.050	-14.572	-0.522	(0)
ZnCl4-2	4.758e-16	2.041e-16	-15.323	-15.690	-0.368	(0)
Zn(NO3)2	2.983e-22	2.983e-22	-21.525	-21.525	0.000	(0)
Zn(SeO4)2-2	2.666e-23	8.012e-24	-22.574	-23.096	-0.522	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.960	-148.091	-0.131	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.975	-149.975	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.132	-225.263	-0.131	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-226.826	-227.349	-0.522	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-304.768	-305.291	-0.522	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.92	-47.63	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.69	-37.18	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.91	-37.18	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.57	-51.63	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.99	-35.96	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.20	-27.80	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.61	-23.16	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.16	9.64	10.80	Al(OH)3
Al2(MoO4)3	-48.00	-45.63	2.37	Al2(MoO4)3
Al2O3	-0.37	19.28	19.65	Al2O3
Al4(OH)10SO4	-2.08	20.62	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.56	-6.76	4.80	AlAsO4:2H2O
AlOHSO4	-5.07	-8.30	-3.23	AlOHSO4
AlSb	-152.19	-86.57	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.14	-11.93	-7.79	PbSO4
Anhydrite	-0.42	-4.78	-4.36	CaSO4
Anilite	-55.20	-87.07	-31.88	Cu0.25Cu1.5S
Antlerite	-1.86	6.93	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-89.42	-92.18	-2.76	As4O6
Artinite	-5.01	4.59	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.50	-32.80	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2(OH)3Cl
Azurite	-1.51	-18.42	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.43	7.96	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.36	-1.49	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.47	6.47	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.60	-22.27	-9.67	BaCrO4
BaF2	-9.88	-15.70	-5.82	BaF2
BaMoO4	-6.71	-13.67	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.71	-6.88	1.83	BaSeO3
BaSeO4	-10.18	-17.64	-7.46	BaSeO4
Bianchite	-6.05	-7.82	-1.76	ZnSO4:6H2O
Birnessite	-6.79	11.30	18.09	MnO2
Bixbyite	-2.30	-2.94	-0.64	Mn2O3
BlaubleiI	-55.20	-79.36	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.64	-82.92	-27.28	Cu0.6Cu0.8S
Boehmite	1.06	9.64	8.58	AlOOH
Breithauptite	-57.95	-76.47	-18.52	NiSb

Brochantite	-0.00	15.22	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.73	13.12	16.84	Mg(OH) ₂
Bunsenite	-5.48	6.96	12.45	NiO
Ca(VO ₃) ₂	-9.91	-4.25	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.58	8.92	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.63	8.92	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-15.60	6.70	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-16.87	22.09	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-17.77	22.09	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-295.89	-152.92	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-7.49	-25.40	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.52	-8.47	-7.95	CaMoO ₄
Carnotite	0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.49	-1.67	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.42	-12.44	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-11.21	-1.37	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.16	7.49	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.24	7.49	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.13	-13.42	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.04	4.52	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-16.39	12.01	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.76	-13.42	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-11.72	-13.42	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.50	-13.42	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.97	-16.18	-1.21	CdF ₂
Cdmetal(alpha)	-31.57	-18.06	13.51	Cd
Cdmetal(gamma)	-31.67	-18.06	13.62	Cd
CdMoO ₄	0.00	-14.15	-14.15	CdMoO ₄
CdOHCl	-6.50	-2.96	3.54	CdOHCl
CdSb	-75.60	-75.95	-0.35	CdSb
CdSe	-18.93	-39.13	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.27	-18.12	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.28	-10.45	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.73	-10.46	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.58	-10.46	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-2.50	-15.63	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-7.01	-9.65	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.12	-90.04	-34.92	Cu ₂ S
Chalcopyrite	-125.91	-161.18	-35.27	CuFeS ₂
Cinnabar	-51.83	-97.53	-45.69	HgS
Claudetite	-89.12	-92.18	-3.06	As ₄ O ₆
Clausthalite	-13.50	-40.60	-27.10	PbSe
Co(BO ₂) ₂	-28.23	-1.16	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.39	7.70	13.09	Co(OH) ₂
Co(OH) ₃	-9.62	-11.93	-2.31	Co(OH) ₃
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.73	-9.69	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-5.65	-16.15	-10.50	Co ₃ O ₄
CoCl ₂	-21.47	-13.20	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.74	-13.20	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.97	-13.95	-9.98	CoCO ₃
CoF ₂	-14.37	-15.97	-1.60	CoF ₂
CoF ₃	-45.97	-47.43	-1.46	CoF ₃
CoFe ₂ O ₄	17.61	14.09	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.17	-13.94	-7.76	CoMoO ₄
CoO	-5.88	7.70	13.59	CoO
CoS(alpha)	-71.32	-78.76	-7.44	CoS
CoS(beta)	-67.69	-78.76	-11.07	CoS
CoSe	-22.71	-38.91	-16.20	CoSe
CoSeO ₃	-8.46	-7.14	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-16.38	-17.91	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-13.04	-10.24	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.77	-10.24	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-10.11	-14.89	-4.78	PbCl ₂
Covellite	-55.87	-78.17	-22.30	CuS

Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.00	-31.91	14.09	CrCl2
CrCl3	-47.65	-32.53	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-10.06	-43.90	-33.84	Na3AlF6
Cu(OH)2	-0.38	8.29	8.67	Cu(OH)2
Cu(SbO3)2	-24.98	20.23	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.35	0.91	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.83	-89.71	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.40	-50.20	-45.80	Cu2Se
Cu2SO4	-19.57	-21.52	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.02	-7.92	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.99	-101.58	-42.59	Cu3Sb
Cu3Se2	-25.03	-88.52	-63.49	Cu3Se2
CuCO3	-1.86	-13.36	-11.50	CuCO3
CuCrO4	-16.51	-21.95	-5.44	CuCrO4
CuF	-8.72	-13.62	-4.91	CuF
CuF2	-16.49	-15.38	1.12	CuF2
CuF2:2H2O	-10.83	-15.38	-4.55	CuF2:2H2O
Cumetal	-5.81	-14.56	-8.76	Cu
CuMoO4	-0.27	-13.35	-13.08	CuMoO4
CuOCuSO4	-11.66	-1.36	10.30	CuOCuSO4
Cupricferrite	8.69	14.67	5.99	CuFe2O4
Cuprite	-2.18	-3.58	-1.41	Cu2O
Cuprousferrite	10.32	1.40	-8.92	CuFeO2
CuSe	-5.22	-38.32	-33.10	CuSe
CuSe2	-26.03	-59.39	-33.37	CuSe2
CuSeO3:2H2O	-7.06	-6.55	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.87	-17.31	-2.44	CuSeO4:5H2O
CuSO4	-12.59	-9.65	2.94	CuSO4
Diaspore	2.77	9.64	6.87	AlOOH
Djurleite	-55.34	-89.26	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.47	-17.01	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.08	-17.01	-17.09	CaMg(CO3)2
Epsomite	-2.70	-4.83	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.10	0.06	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.24	-13.96	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.01	-8.46	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.51	-38.14	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.71	-47.45	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.61	-13.21	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.10	-18.19	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.64	-64.23	-18.60	FeSe2
FeS(ppt)	-80.06	-83.01	-2.95	FeS
FeSe	-32.16	-43.16	-11.00	FeSe
Fix_pe	-4.88	-4.88	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.47	-80.44	-13.97	PbS
Gibbsite	1.35	9.64	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.81	-7.82	-2.01	ZnSO4:7H2O
Greenockite	-64.61	-78.97	-14.36	CdS
Greigite	-290.98	-336.01	-45.03	Fe3S4
Gummite	-4.30	3.37	7.67	UO3
Gypsum	-0.17	-4.78	-4.61	CaSO4:2H2O
H-Jarosite	-14.21	-26.31	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.76	-21.64	-12.88	H2MoO4
H2S(g)	-78.45	-86.46	-8.01	H2S
H2Se(g)	-41.66	-46.62	-4.96	H2Se

Halite	-6.23	-4.63	1.60	NaCl
Hausmannite	-2.17	58.86	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.16	22.73	22.89	FeAl2O4
Hg(CH3)2(g)	-185.01	-258.72	-73.71	Hg(CH3)2
Hg(g)	-7.15	-15.02	-7.87	Hg
Hg(OH)2	-7.57	-11.07	-3.50	Hg(OH)2
Hg2(g)	-15.08	-30.04	-14.96	Hg2
Hg2(OH)2	-9.75	-4.49	5.26	Hg2(OH)2
Hg2CO3	-10.09	-26.14	-16.05	Hg2CO3
Hg2CrO4	-26.03	-34.73	-8.70	Hg2CrO4
Hg2F2	-17.80	-28.16	-10.36	Hg2F2
Hg2S	-79.28	-90.95	-11.68	Hg2S
Hg2SeO3	-14.68	-19.33	-4.66	Hg2SeO3
Hg2SO4	-16.31	-22.44	-6.13	Hg2SO4
Hg3O2CO3	-25.16	-54.85	-29.68	Hg3O2CO3
HgCl(g)	-32.19	-12.70	19.50	HgCl
HgCl2	-10.71	-31.97	-21.26	HgCl2
HgF(g)	-46.76	-14.08	32.68	HgF
HgF2(g)	-47.30	-34.73	12.57	HgF2
Hgmetal(l)	-1.57	-15.02	-13.45	Hg
HgSe	-1.99	-57.68	-55.69	HgSe
HgSeO3	-13.48	-25.91	-12.43	HgSeO3
HgSO4	-19.59	-29.01	-9.42	HgSO4
Huntite	-4.10	-34.07	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.47	-25.24	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.23	-21.00	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.51	-20.68	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.95	-20.75	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.10	-49.34	-17.24	K2Cr2O7
K2CrO4	-18.59	-19.11	-0.51	K2CrO4
K2MoO4	-13.77	-10.51	3.26	K2MoO4
K2SeO4	-13.74	-14.47	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.47	-5.91	-0.43	PbO:PbSO4
Laurionite	-5.06	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.68	6.02	12.69	PbO
Mackinawite	-79.41	-83.01	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.64	19.50	16.86	Fe2MgO4
Magnesite	-1.07	-8.53	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.24	-5.06	-5.31	Cu2(OH)2CO3
Manganite	-1.46	23.88	25.34	MnOOH
Massicot	-6.88	6.02	12.89	PbO
Matlockite	-7.29	-16.27	-8.97	PbClF
Melanothallite	-18.87	-12.61	6.26	CuCl2
Melanterite	-12.29	-14.49	-2.21	FeSO4:7H2O
Metacinnabar	-52.43	-97.53	-45.09	HgS
Mg(OH)2(active)	-5.68	13.12	18.79	Mg(OH)2
Mg(VO3)2	-15.57	-4.29	11.28	Mg(VO3)2
Mg2Sb3	-273.21	-198.53	74.68	Mg2Sb3
Mg2V2O7	-17.54	8.82	26.36	Mg2V2O7
MgCr2O4	-5.44	10.76	16.20	MgCr2O4
MgCrO4	-22.50	-17.12	5.38	MgCrO4
MgF2	-2.42	-10.55	-8.13	MgF2
MgMoO4	-6.67	-8.52	-1.85	MgMoO4
MgSeO3:6H2O	-4.78	-1.73	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.29	-12.49	-1.20	MgSeO4:6H2O
Minium	-29.92	43.60	73.52	Pb3O4
Mirabilite	-5.19	-6.31	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.21	-6.31	4.90	Mn(VO3)2
Mn2(SO4)3	-51.06	-56.77	-5.71	Mn2(SO4)3
Mn2Sb	-147.85	-86.77	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.98	0.52	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.51	-9.80	2.72	MnCl2:4H2O

MnS (grn)	-75.53	-75.36	0.17	MnS
MnS (pnk)	-78.70	-75.36	3.34	MnS
MnSb	-94.77	-97.68	-2.91	MnSb
MnSe	-39.01	-35.51	3.50	MnSe
MnSeO3	-4.87	-3.74	1.13	MnSeO3
MnSeO3:2H2O	-4.72	-3.74	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.45	-14.50	-2.05	MnSeO4:5H2O
MnSO4	-9.42	-6.84	2.58	MnSO4
Monteponite	-7.62	7.49	15.10	CdO
Montroydite	-7.43	-11.07	-3.64	HgO
MoO3	-13.64	-21.64	-8.00	MoO3
Morenosite	-8.84	-10.98	-2.14	NiSO4:7H2O
MoS2	-149.85	-220.11	-70.26	MoS2
Na-Jarosite	-9.29	-20.49	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.94	-48.84	-9.90	Na2Cr2O7
Na2CrO4	-21.53	-18.60	2.93	Na2CrO4
Na2Mo2O7	-15.04	-31.64	-16.60	Na2Mo2O7
Na2MoO4	-11.49	-10.00	1.49	Na2MoO4
Na2MoO4:2H2O	-11.22	-10.00	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.50	-3.20	10.30	Na2SeO3:5H2O
Na2SeO4	-15.25	-13.97	1.28	Na2SeO4
Na3Sb	-173.20	-78.75	94.45	Na3Sb
Na3VO4	-27.93	8.75	36.68	Na3VO4
Na4V2O7	-31.53	5.87	37.40	Na4V2O7
Nantokite	-5.51	-12.24	-6.73	CuCl
NaSb	-88.01	-64.84	23.17	NaSb
Natron	-8.70	-10.01	-1.31	Na2CO3:10H2O
NaVO3	-6.74	-2.89	3.86	NaVO3
Nesquehonite	-3.86	-8.53	-4.67	MgCO3:3H2O
Ni(OH)2	-5.83	6.96	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-27.61	-11.91	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-22.09	9.91	32.00	Ni4(OH)6SO4
NiCO3	-7.81	-14.68	-6.87	NiCO3
NiMoO4	-3.53	-14.67	-11.14	NiMoO4
NiS(alpha)	-73.90	-79.50	-5.60	NiS
NiS(beta)	-68.40	-79.50	-11.10	NiS
NiS(gamma)	-66.70	-79.50	-12.80	NiS
NiSe	-21.95	-39.65	-17.70	NiSe
NiSeO3:2H2O	-10.69	-7.88	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.12	-18.64	-1.52	NiSeO4:6H2O
Nsutite	-6.20	11.30	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-244.41	-305.48	-61.07	As2S3
Otavite	-2.16	-14.16	-12.00	CdCO3
Pb(BO2)2	-9.36	-2.84	6.52	Pb(BO2)2
Pb(OH)2	-2.13	6.02	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.95	-69.71	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.21	1.58	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.15	12.03	26.19	Pb2O(OH)2
Pb2O3	-23.46	37.58	61.04	Pb2O3
Pb2OCO3	-9.05	-9.61	-0.56	Pb2OCO3
Pb2V2O7	-3.48	-5.38	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.55	-14.75	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.50	0.64	6.14	Pb3(VO4)2
Pb3O2CO3	-14.61	-3.59	11.02	Pb3O2CO3
Pb3O2SO4	-10.58	0.11	10.69	Pb3O2SO4
Pb4(OH)6SO4	-14.97	6.13	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.75	6.13	21.88	Pb4O3SO4
PbCrO4	-11.62	-24.22	-12.60	PbCrO4
PbF2	-10.21	-17.65	-7.44	PbF2
Pbmetal	-23.77	-19.53	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.96	6.02	12.98	PbO:0.33H2O
PbSeO4	-12.75	-19.59	-6.84	PbSeO4
Periclase	-8.47	13.12	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.04	31.56	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2

Pyrite	-125.42	-143.93	-18.51	FeS2
Pyrochroite	-4.09	11.11	15.19	Mn(OH)2
Pyrolusite	-4.73	36.65	41.38	MnO2
Realgar	-102.53	-122.28	-19.75	AsS
Retgersite	-8.94	-10.98	-2.04	NiSO4:6H2O
Rhodochrosite	0.04	-10.54	-10.58	MnCO3
Rutherfordine	-3.78	-18.28	-14.50	UO2CO3
Sb(OH)3	-12.47	-19.57	-7.11	Sb(OH)3
Sb2O4	-17.01	-13.60	3.40	Sb2O4
Sb2O5	-27.01	-36.68	-9.67	Sb2O5
Sb2Se3	-111.24	-178.99	-67.76	Sb2Se3
Sb4O6(cubic)	-60.04	-78.30	-18.26	Sb4O6
Sb4O6(orth)	-60.40	-78.30	-17.90	Sb4O6
SbCl3	-51.50	-50.93	0.57	SbCl3
SbF3	-44.85	-55.07	-10.23	SbF3
Sbmetal	-46.20	-57.89	-11.69	Sb
SbO2	-3.29	-31.11	-27.82	SbO2
Schoepite	-2.62	3.37	5.99	UO2(OH)2:H2O
Semetal(am)	-13.96	-21.07	-7.11	Se
Semetal(hex)	-13.36	-21.07	-7.71	Se
Senarmontite	-26.78	-39.15	-12.37	Sb2O3
SeO2	-14.97	-14.84	0.12	SeO2
SeO3	-46.65	-25.60	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.52	-11.52	-10.00	ZnCO3
Sphalerite	-64.88	-76.33	-11.45	ZnS
Spinel	-4.45	32.40	36.85	MgAl2O4
Stibnite	-248.07	-298.53	-50.46	Sb2S3
Sulfur	-58.77	-60.92	-2.14	S
Tenorite	0.65	8.29	7.64	CuO
Thenardite	-6.63	-6.30	0.32	Na2SO4
Thermonatrite	-10.65	-10.01	0.64	Na2CO3:H2O
Tyuyamunite	-1.58	2.50	4.08	Ca(UO2)2(VO4)2
U3O8	-8.87	12.22	21.08	U3O8
U3Sb4	-576.09	-423.71	152.38	U3Sb4
U4O9	-23.27	-26.29	-3.02	U4O9
UF4	-30.76	-60.29	-29.54	UF4
UF4:2.5H2O	-27.58	-60.29	-32.72	UF4:2.5H2O
UO2(am)	-13.89	-12.96	0.93	UO2
UO2(NO3)2	-40.13	-27.98	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-32.84	-27.98	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-31.37	-27.98	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-30.03	-27.99	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.24	3.37	5.61	UO2(OH)2
UO2SeO4:4H2O	-19.99	-22.24	-2.25	UO2SeO4:4H2O
UO3	-4.33	3.37	7.70	UO3
Uraninite	-8.29	-12.96	-4.67	UO2
USb2	-218.62	-189.05	29.58	USb2
V(OH)3	-19.24	-11.65	7.59	V(OH)3
V2O5	-16.05	-17.41	-1.36	V2O5
V3O5	-41.11	-39.27	1.84	V3O5
V4O7	-51.03	-43.85	7.19	V4O7
V6O13	-42.47	-103.33	-60.86	V6O13
Valentinite	-30.67	-39.15	-8.48	Sb2O3
VCl2	-64.20	-45.33	18.87	VCl2
VCl3	-66.44	-43.01	23.43	VCl3
VF4	-66.84	-51.91	14.93	VF4
Vmetal	-93.99	-49.97	44.03	V
VO	-39.18	-24.42	14.76	VO
VO(OH)2	-9.73	-4.58	5.15	VO(OH)2
VO2Cl	-22.00	-19.16	2.84	VO2Cl
VOC1	-33.26	-22.10	11.15	VOC1
VOC12	-38.24	-25.48	12.76	VOC12
VOSO4	-26.13	-22.52	3.61	VOSO4
Witherite	-5.11	-13.68	-8.57	BaCO3
Wurtzite	-67.38	-76.33	-8.95	ZnS
Zincite	-1.21	10.13	11.33	ZnO
Zincosite	-11.74	-7.81	3.93	ZnSO4

Zn(BO2)2	-7.02	1.27	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.54	-21.23	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.07	10.13	12.20	Zn(OH)2
Zn(OH)2(am)	-2.35	10.13	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.63	10.13	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.41	10.13	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.61	10.13	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.19	2.31	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.39	9.81	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.06	-2.41	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.41	-5.50	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.83	22.57	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.76	29.74	38.50	Zn5(OH)8Cl2
ZnCl2	-17.82	-10.77	7.05	ZnCl2
ZnCO3:1H2O	-1.26	-11.52	-10.26	ZnCO3:1H2O
ZnF2	-13.00	-13.54	-0.53	ZnF2
Znmetal	-41.20	-15.42	25.79	Zn
ZnMoO4	-1.38	-11.51	-10.13	ZnMoO4
ZnO(active)	-1.06	10.13	11.19	ZnO
ZnS(am)	-67.28	-76.33	-9.05	ZnS
ZnSb	-84.32	-73.31	11.01	ZnSb
ZnSe	-22.09	-36.49	-14.40	ZnSe
ZnSeO4:6H2O	-13.96	-15.48	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.18	-7.81	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 44.

```
Title Stage 2 Pit lake Mix
Mix 203
204 0.262313
208 0.253649
1 0.019922
17 0.137443
16 0.000000
115 0.326673
Save solution 209
end
```

TITLE

Stage 2 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 203.

Mixture 203.

1.992e-02 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.

0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)

1.374e-01 Solution 17 Average water quality for Background Surface Water
 SWQ-1 (representative of haul road and watershed run-off)
 3.267e-01 Solution 115 Solution after simulation 34.
 2.623e-01 Solution 204 Solution after simulation 39.
 2.536e-01 Solution 208 Solution after simulation 43.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.829e-08	1.830e-08
Al	3.481e-06	3.483e-06
As	2.070e-10	2.072e-10
B	2.686e-05	2.687e-05
Ba	8.249e-08	8.255e-08
C	2.984e-03	2.986e-03
Ca	4.089e-03	4.092e-03
Cd	1.187e-08	1.188e-08
Cl	2.583e-03	2.584e-03
Co	8.763e-08	8.769e-08
Cr	2.144e-09	2.145e-09
Cu	5.069e-07	5.073e-07
F	1.518e-04	1.520e-04
Fe	1.425e-09	1.426e-09
Hg	1.833e-09	1.834e-09
K	3.223e-03	3.225e-03
Mg	4.759e-03	4.763e-03
Mn	5.576e-05	5.579e-05
Mo	1.804e-06	1.805e-06
N	8.151e-06	8.157e-06
Na	8.437e-03	8.442e-03
Ni	1.081e-07	1.082e-07
Pb	2.464e-09	2.466e-09
S	1.195e-02	1.195e-02
Sb	2.536e-08	2.537e-08
Se	1.322e-07	1.323e-07
U	3.549e-07	3.551e-07
V	6.760e-09	6.764e-09
Zn	5.211e-06	5.214e-06

-----Description of solution-----

pH = 7.480 Charge balance
 pe = 5.389 Adjusted to redox
 equilibrium
 Activity of water = 0.999
 Ionic strength (mol/kgw) = 3.885e-02
 Mass of water (kg) = 1.001e+00
 Total alkalinity (eq/kg) = 2.851e-03
 Total CO2 (mol/kg) = 2.984e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 9.651e-07
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 8
 Total H = 1.110906e+02
 Total O = 5.560061e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.673e-07	3.041e-07	-6.435	-6.517	-0.082	(0)
H+	3.960e-08	3.309e-08	-7.402	-7.480	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.829e-08					
AgCl	1.192e-08	1.192e-08	-7.924	-7.924	0.000	(0)
Ag+	3.238e-09	2.705e-09	-8.490	-8.568	-0.078	(0)

	AgCl2-	2.823e-09	2.240e-09	-8.549	-8.650	-0.101	(0)
	AgSO4-	2.987e-10	2.370e-10	-9.525	-9.625	-0.101	(0)
	AgCl3-2	1.087e-11	4.307e-12	-10.964	-11.366	-0.402	(0)
	AgNO2	3.705e-12	3.705e-12	-11.431	-11.431	0.000	(0)
	AgF	7.164e-13	7.164e-13	-12.145	-12.145	0.000	(0)
	AgCl4-3	1.524e-13	1.898e-14	-12.817	-13.722	-0.905	(0)
	AgOH	8.227e-14	8.227e-14	-13.085	-13.085	0.000	(0)
	AgSeO3-	2.226e-14	1.766e-14	-13.653	-13.753	-0.101	(0)
	AgH2BO3	1.990e-14	1.990e-14	-13.701	-13.701	0.000	(0)
	AgNH3+	1.690e-14	1.341e-14	-13.772	-13.873	-0.101	(0)
	Ag2Se	6.734e-15	6.734e-15	-14.172	-14.172	0.000	(0)
	Ag (NO2) 2-	4.741e-17	3.762e-17	-16.324	-16.425	-0.101	(0)
	AgNO3	2.074e-17	2.074e-17	-16.683	-16.683	0.000	(0)
	Ag (OH) 2-	3.082e-18	2.445e-18	-17.511	-17.612	-0.101	(0)
	Ag (NH3) 2+	3.335e-19	2.646e-19	-18.477	-18.577	-0.101	(0)
	Ag (SeO3) 2-3	1.290e-20	1.606e-21	-19.889	-20.794	-0.905	(0)
	Ag2MoO4	2.434e-24	2.434e-24	-23.614	-23.614	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.883	-73.883	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.882	-85.491	-1.609	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.712	-148.916	-0.204	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.812	-148.912	-0.101	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.502	-150.875	-0.373	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.832	-151.186	-0.354	(0)
Al		3.481e-06					
	Al (OH) 4-	3.373e-06	2.820e-06	-5.472	-5.550	-0.078	(0)
	Al (OH) 3	7.364e-08	7.364e-08	-7.133	-7.133	0.000	(0)
	Al (OH) 2+	1.441e-08	1.214e-08	-7.841	-7.916	-0.074	(0)
	AlF3	9.702e-09	9.702e-09	-8.013	-8.013	0.000	(0)
	AlF2+	8.677e-09	7.309e-09	-8.062	-8.136	-0.074	(0)
	AlF4-	6.133e-10	5.127e-10	-9.212	-9.290	-0.078	(0)
	AlF+2	3.458e-10	1.741e-10	-9.461	-9.759	-0.298	(0)
	AlOH+2	9.976e-11	5.023e-11	-10.001	-10.299	-0.298	(0)
	AlSO4+	6.735e-12	5.629e-12	-11.172	-11.250	-0.078	(0)
	Al+3	8.322e-13	1.652e-13	-12.080	-12.782	-0.702	(0)
	Al (SO4) 2-	3.168e-13	2.648e-13	-12.499	-12.577	-0.078	(0)
	AlMo6O21-3	7.896e-39	9.831e-40	-38.103	-39.007	-0.905	(0)
As (3)		1.822e-23					
	H3AsO3	1.787e-23	1.787e-23	-22.748	-22.748	0.000	(0)
	H2AsO3-	3.492e-25	2.770e-25	-24.457	-24.557	-0.101	(0)
	HAsO3-2	1.927e-29	7.636e-30	-28.715	-29.117	-0.402	(0)
	H4AsO3+	3.693e-31	2.930e-31	-30.433	-30.533	-0.101	(0)
	AsO3-3	7.145e-35	8.896e-36	-34.146	-35.051	-0.905	(0)
As (5)		2.070e-10					
	HAsO4-2	1.799e-10	7.125e-11	-9.745	-10.147	-0.402	(0)
	H2AsO4-	2.710e-11	2.150e-11	-10.567	-10.668	-0.101	(0)
	AsO4-3	5.469e-14	6.810e-15	-13.262	-14.167	-0.905	(0)
	H3AsO4	1.225e-16	1.236e-16	-15.912	-15.908	0.004	(0)
B		2.686e-05					
	H3BO3	2.621e-05	2.644e-05	-4.582	-4.578	0.004	(0)
	H2BO3-	5.665e-07	4.641e-07	-6.247	-6.333	-0.087	(0)
	CaH2BO3+	4.281e-08	3.508e-08	-7.368	-7.455	-0.087	(0)
	MgH2BO3+	3.229e-08	2.645e-08	-7.491	-7.578	-0.087	(0)
	NaH2BO3	5.061e-09	5.061e-09	-8.296	-8.296	0.000	(0)
	BF (OH) 3-	1.358e-09	1.113e-09	-8.867	-8.954	-0.087	(0)
	H5 (BO3) 2-	1.275e-11	1.045e-11	-10.895	-10.981	-0.087	(0)
	BaH2BO3+	6.946e-13	5.692e-13	-12.158	-12.245	-0.087	(0)
	BF2 (OH) 2-	5.067e-13	4.152e-13	-12.295	-12.382	-0.087	(0)
	H8 (BO3) 3-	3.372e-14	2.762e-14	-13.472	-13.559	-0.087	(0)
	AgH2BO3	1.990e-14	1.990e-14	-13.701	-13.701	0.000	(0)
	BF3OH-	6.881e-19	5.638e-19	-18.162	-18.249	-0.087	(0)
	BF4-	1.182e-23	9.684e-24	-22.927	-23.014	-0.087	(0)
Ba		8.249e-08					
	Ba+2	8.142e-08	3.968e-08	-7.089	-7.401	-0.312	(0)
	BaHCO3+	1.009e-09	8.543e-10	-8.996	-9.068	-0.072	(0)
	BaCO3	6.500e-11	6.500e-11	-10.187	-10.187	0.000	(0)
	BaH2BO3+	6.946e-13	5.692e-13	-12.158	-12.245	-0.087	(0)
	BaOH+	6.275e-14	5.268e-14	-13.202	-13.278	-0.076	(0)
	BaNO3+	2.419e-15	1.919e-15	-14.616	-14.717	-0.101	(0)

BaNH3+2	1.534e-16	6.078e-17	-15.814	-16.216	-0.402	(0)
C (4)	2.984e-03					
HCO3-	2.676e-03	2.254e-03	-2.573	-2.647	-0.074	(0)
H2CO3	1.678e-04	1.678e-04	-3.775	-3.775	0.000	(0)
CaHCO3+	6.513e-05	5.513e-05	-4.186	-4.259	-0.072	(0)
MgHCO3+	4.557e-05	3.792e-05	-4.341	-4.421	-0.080	(0)
NaHCO3	8.722e-06	8.722e-06	-5.059	-5.059	0.000	(0)
CaCO3	6.648e-06	6.648e-06	-5.177	-5.177	0.000	(0)
CO3-2	6.553e-06	3.194e-06	-5.184	-5.496	-0.312	(0)
MgCO3	4.367e-06	4.367e-06	-5.360	-5.360	0.000	(0)
MnHCO3+	8.870e-07	7.447e-07	-6.052	-6.128	-0.076	(0)
NaCO3-	4.857e-07	4.092e-07	-6.314	-6.388	-0.074	(0)
CuCO3	4.024e-07	4.024e-07	-6.395	-6.395	0.000	(0)
ZnCO3	2.792e-07	2.792e-07	-6.554	-6.554	0.000	(0)
UO2 (CO3) 3-4	2.552e-07	6.285e-09	-6.593	-8.202	-1.609	(0)
ZnHCO3+	1.365e-07	1.083e-07	-6.865	-6.965	-0.101	(0)
UO2 (CO3) 2-2	9.911e-08	3.926e-08	-7.004	-7.406	-0.402	(0)
NiHCO3+	1.110e-08	8.806e-09	-7.955	-8.055	-0.101	(0)
Cu (CO3) 2-2	8.732e-09	3.459e-09	-8.059	-8.461	-0.402	(0)
CoHCO3+	5.239e-09	4.157e-09	-8.281	-8.381	-0.101	(0)
CuHCO3+	3.836e-09	3.043e-09	-8.416	-8.517	-0.101	(0)
NiCO3	3.776e-09	3.776e-09	-8.423	-8.423	0.000	(0)
PbCO3	1.363e-09	1.363e-09	-8.865	-8.865	0.000	(0)
CoCO3	1.280e-09	1.280e-09	-8.893	-8.893	0.000	(0)
BaHCO3+	1.009e-09	8.543e-10	-8.996	-9.068	-0.072	(0)
UO2CO3	6.161e-10	6.161e-10	-9.210	-9.210	0.000	(0)
PbHCO3+	2.997e-10	2.378e-10	-9.523	-9.624	-0.101	(0)
CdCO3	2.411e-10	2.411e-10	-9.618	-9.618	0.000	(0)
BaCO3	6.500e-11	6.500e-11	-10.187	-10.187	0.000	(0)
Pb (CO3) 2-2	3.169e-11	1.256e-11	-10.499	-10.901	-0.402	(0)
CdHCO3+	2.142e-11	1.699e-11	-10.669	-10.770	-0.101	(0)
Cd (CO3) 2-2	1.441e-12	5.707e-13	-11.841	-12.244	-0.402	(0)
FeHCO3+	5.905e-14	4.998e-14	-13.229	-13.301	-0.072	(0)
HgCO3	4.483e-14	4.483e-14	-13.348	-13.348	0.000	(0)
Hg (CO3) 2-2	1.143e-15	4.528e-16	-14.942	-15.344	-0.402	(0)
HgHCO3+	3.481e-17	2.762e-17	-16.458	-16.559	-0.101	(0)
Ca	4.089e-03					
Ca+2	2.695e-03	1.313e-03	-2.570	-2.882	-0.312	(0)
CaSO4	1.321e-03	1.321e-03	-2.879	-2.879	0.000	(0)
CaHCO3+	6.513e-05	5.513e-05	-4.186	-4.259	-0.072	(0)
CaCO3	6.648e-06	6.648e-06	-5.177	-5.177	0.000	(0)
CaF+	1.800e-06	1.511e-06	-5.745	-5.821	-0.076	(0)
CaH2BO3+	4.281e-08	3.508e-08	-7.368	-7.455	-0.087	(0)
CaOH+	9.415e-09	7.969e-09	-8.026	-8.099	-0.072	(0)
CaNO3+	5.052e-11	4.008e-11	-10.297	-10.397	-0.101	(0)
CaNH3+2	1.013e-11	4.014e-12	-10.994	-11.396	-0.402	(0)
Ca (NH3) 2+2	9.792e-21	3.879e-21	-20.009	-20.411	-0.402	(0)
Cd	1.187e-08					
Cd+2	6.794e-09	3.311e-09	-8.168	-8.480	-0.312	(0)
CdSO4	3.408e-09	3.408e-09	-8.467	-8.467	0.000	(0)
CdCl+	8.600e-10	6.823e-10	-9.065	-9.166	-0.101	(0)
Cd (SO4) 2-2	5.095e-10	2.019e-10	-9.293	-9.695	-0.402	(0)
CdCO3	2.411e-10	2.411e-10	-9.618	-9.618	0.000	(0)
CdHCO3+	2.142e-11	1.699e-11	-10.669	-10.770	-0.101	(0)
CdOH+	1.008e-11	7.999e-12	-10.996	-11.097	-0.101	(0)
CdOHC1	8.512e-12	8.512e-12	-11.070	-11.070	0.000	(0)
CdF+	6.974e-12	5.533e-12	-11.157	-11.257	-0.101	(0)
CdCl2	6.138e-12	6.138e-12	-11.212	-11.212	0.000	(0)
Cd (CO3) 2-2	1.441e-12	5.707e-13	-11.841	-12.244	-0.402	(0)
Cd (OH) 2	1.535e-14	1.535e-14	-13.814	-13.814	0.000	(0)
CdCl3-	1.053e-14	8.356e-15	-13.977	-14.078	-0.101	(0)
CdF2	1.164e-15	1.164e-15	-14.934	-14.934	0.000	(0)
CdNO3+	1.274e-16	1.010e-16	-15.895	-15.995	-0.101	(0)
CdSeO4	4.233e-17	4.233e-17	-16.373	-16.373	0.000	(0)
Cd2OH+3	1.066e-18	1.327e-19	-17.972	-18.877	-0.905	(0)
Cd (SeO3) 2-2	7.106e-19	2.815e-19	-18.148	-18.550	-0.402	(0)
Cd (OH) 3-	3.595e-19	2.852e-19	-18.444	-18.545	-0.101	(0)
Cd (NO3) 2	4.887e-25	4.887e-25	-24.311	-24.311	0.000	(0)

	Cd(OH) 4-2	3.584e-26	1.420e-26	-25.446	-25.848	-0.402	(0)
	CdHS+	0.000e+00	0.000e+00	-79.501	-79.602	-0.101	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.527	-151.527	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.656	-228.757	-0.101	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-305.288	-305.690	-0.402	(0)
C1	2.583e-03						
	Cl-	2.583e-03	2.158e-03	-2.588	-2.666	-0.078	(0)
	MnCl+	5.357e-08	4.497e-08	-7.271	-7.347	-0.076	(0)
	AgCl	1.192e-08	1.192e-08	-7.924	-7.924	0.000	(0)
	ZnCl+	9.896e-09	8.234e-09	-8.005	-8.084	-0.080	(0)
	ZnOHC1	3.279e-09	3.279e-09	-8.484	-8.484	0.000	(0)
	AgCl2-	2.823e-09	2.240e-09	-8.549	-8.650	-0.101	(0)
	CdCl+	8.600e-10	6.823e-10	-9.065	-9.166	-0.101	(0)
	CoCl+	2.230e-10	1.769e-10	-9.652	-9.752	-0.101	(0)
	NiCl+	2.205e-10	1.749e-10	-9.657	-9.757	-0.101	(0)
	MnCl2	1.371e-10	1.371e-10	-9.863	-9.863	0.000	(0)
	CuCl	1.163e-10	1.163e-10	-9.934	-9.934	0.000	(0)
	CuCl+	8.794e-11	7.317e-11	-10.056	-10.136	-0.080	(0)
	CuCl2-	6.301e-11	5.243e-11	-10.201	-10.280	-0.080	(0)
	ZnCl2	2.816e-11	2.816e-11	-10.550	-10.550	0.000	(0)
	PbCl+	1.370e-11	1.087e-11	-10.863	-10.964	-0.101	(0)
	HgClOH	1.359e-11	1.359e-11	-10.867	-10.867	0.000	(0)
	AgCl3-2	1.087e-11	4.307e-12	-10.964	-11.366	-0.402	(0)
	CdOHC1	8.512e-12	8.512e-12	-11.070	-11.070	0.000	(0)
	CdCl2	6.138e-12	6.138e-12	-11.212	-11.212	0.000	(0)
	HgCl2	5.460e-12	5.460e-12	-11.263	-11.263	0.000	(0)
	AgCl4-3	1.524e-13	1.898e-14	-12.817	-13.722	-0.905	(0)
	HgCl3-	1.485e-13	1.178e-13	-12.828	-12.929	-0.101	(0)
	PbCl2	1.048e-13	1.048e-13	-12.980	-12.980	0.000	(0)
	MnCl3-	9.703e-14	8.147e-14	-13.013	-13.089	-0.076	(0)
	ZnCl3-	5.801e-14	4.827e-14	-13.237	-13.316	-0.080	(0)
	CuCl2	5.474e-14	5.474e-14	-13.262	-13.262	0.000	(0)
	CuCl3-2	4.868e-14	2.419e-14	-13.313	-13.616	-0.304	(0)
	CdCl3-	1.053e-14	8.356e-15	-13.977	-14.078	-0.101	(0)
	HgCl4-2	2.555e-15	1.012e-15	-14.593	-14.995	-0.402	(0)
	NiCl2	1.901e-15	1.901e-15	-14.721	-14.721	0.000	(0)
	HgCl+	6.364e-16	5.049e-16	-15.196	-15.297	-0.101	(0)
	UO2Cl+	2.137e-16	1.696e-16	-15.670	-15.771	-0.101	(0)
	PbCl3-	1.134e-16	8.999e-17	-15.945	-16.046	-0.101	(0)
	ZnCl4-2	1.048e-16	5.208e-17	-15.980	-16.283	-0.304	(0)
	CrCl+2	4.160e-17	1.648e-17	-16.381	-16.783	-0.402	(0)
	CuCl3-	1.325e-18	1.102e-18	-17.878	-17.958	-0.080	(0)
	PbCl4-2	2.241e-19	8.876e-20	-18.650	-19.052	-0.402	(0)
	CrOHC12	2.056e-19	2.056e-19	-18.687	-18.687	0.000	(0)
	FeCl+2	5.253e-21	2.610e-21	-20.280	-20.583	-0.304	(0)
	CrCl2+	4.253e-21	3.374e-21	-20.371	-20.472	-0.101	(0)
	VOCl+	2.780e-22	2.206e-22	-21.556	-21.656	-0.101	(0)
	FeCl2+	2.996e-23	2.515e-23	-22.523	-22.599	-0.076	(0)
	CuCl4-2	2.400e-23	1.192e-23	-22.620	-22.924	-0.304	(0)
	CrO3Cl-	4.138e-26	3.283e-26	-25.383	-25.484	-0.101	(0)
	FeCl3	5.428e-27	5.428e-27	-26.265	-26.265	0.000	(0)
	CoCl+2	2.560e-35	1.014e-35	-34.592	-34.994	-0.402	(0)
	UCl+3	0.000e+00	0.000e+00	-44.858	-45.763	-0.905	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.713	-52.115	-0.402	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.080	-54.482	-0.402	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.043	-67.445	-0.402	(0)
Co (2)	8.763e-08						
	Co+2	5.984e-08	2.370e-08	-7.223	-7.625	-0.402	(0)
	CoSO4	2.077e-08	2.077e-08	-7.683	-7.683	0.000	(0)
	CoHCO3+	5.239e-09	4.157e-09	-8.281	-8.381	-0.101	(0)
	CoCO3	1.280e-09	1.280e-09	-8.893	-8.893	0.000	(0)
	CoCl+	2.230e-10	1.769e-10	-9.652	-9.752	-0.101	(0)
	CoOH+	1.813e-10	1.438e-10	-9.742	-9.842	-0.101	(0)
	CoF+	9.962e-11	7.903e-11	-10.002	-10.102	-0.101	(0)
	Co (OH) 2	3.475e-12	3.475e-12	-11.459	-11.459	0.000	(0)
	CoNO2+	1.380e-12	1.095e-12	-11.860	-11.961	-0.101	(0)
	Co (NH3) +2	1.746e-14	6.919e-15	-13.758	-14.160	-0.402	(0)
	CoSeO4	8.157e-16	8.157e-16	-15.088	-15.088	0.000	(0)

CoNO3+	4.570e-16	3.626e-16	-15.340	-15.441	-0.101	(0)
Co(OH) 3-	2.658e-17	2.109e-17	-16.575	-16.676	-0.101	(0)
CoOOH-	6.673e-18	5.294e-18	-17.176	-17.276	-0.101	(0)
Co2OH+3	1.373e-18	1.709e-19	-17.862	-18.767	-0.905	(0)
Co(NH3) 2+2	1.809e-21	7.165e-22	-20.743	-21.145	-0.402	(0)
Co(NO3) 2	7.119e-24	7.119e-24	-23.148	-23.148	0.000	(0)
Co(OH) 4-2	2.566e-24	1.016e-24	-23.591	-23.993	-0.402	(0)
Co(NH3) 3+2	5.528e-29	2.190e-29	-28.257	-28.660	-0.402	(0)
Co4(OH) 4+4	3.468e-30	8.542e-32	-29.460	-31.068	-1.609	(0)
Co(NH3) 4+2	7.043e-37	2.790e-37	-36.152	-36.554	-0.402	(0)
Co(NH3) 5+2	0.000e+00	0.000e+00	-44.547	-44.949	-0.402	(0)
Co(3)	9.012e-29					
CoOH+2	9.012e-29	3.570e-29	-28.045	-28.447	-0.402	(0)
Co+3	1.164e-34	2.310e-35	-33.934	-34.636	-0.702	(0)
CoCl+2	2.560e-35	1.014e-35	-34.592	-34.994	-0.402	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-51.713	-52.115	-0.402	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-62.111	-62.211	-0.101	(0)
Co(NH3) 6OH+2	0.000e+00	0.000e+00	-66.694	-67.096	-0.402	(0)
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-67.043	-67.445	-0.402	(0)
Cr(2)	1.454e-26					
Cr+2	1.454e-26	5.760e-27	-25.837	-26.240	-0.402	(0)
Cr(3)	2.144e-09					
Cr(OH) 2+	1.832e-09	1.453e-09	-8.737	-8.838	-0.101	(0)
Cr(OH) 3	1.660e-10	1.660e-10	-9.780	-9.780	0.000	(0)
Cr(OH) +2	9.912e-11	3.927e-11	-10.004	-10.406	-0.402	(0)
CrOHSO4	4.091e-11	4.091e-11	-10.388	-10.388	0.000	(0)
CrO2-	3.005e-12	2.384e-12	-11.522	-11.623	-0.101	(0)
Cr(OH) 4-	2.534e-12	2.010e-12	-11.596	-11.697	-0.101	(0)
CrF+2	2.489e-13	9.862e-14	-12.604	-13.006	-0.402	(0)
CrSO4+	7.627e-14	6.051e-14	-13.118	-13.218	-0.101	(0)
Cr+3	4.740e-14	5.902e-15	-13.324	-14.229	-0.905	(0)
CrCl+2	4.160e-17	1.648e-17	-16.381	-16.783	-0.402	(0)
Cr2(OH) 2SO4+2	3.666e-19	1.452e-19	-18.436	-18.838	-0.402	(0)
CrOHCl2	2.056e-19	2.056e-19	-18.687	-18.687	0.000	(0)
Cr2(OH) 2(SO4) 2	3.787e-20	3.787e-20	-19.422	-19.422	0.000	(0)
CrCl2+	4.253e-21	3.374e-21	-20.371	-20.472	-0.101	(0)
CrNO3+2	6.284e-24	2.489e-24	-23.202	-23.604	-0.402	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-43.046	-43.448	-0.402	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-52.013	-52.918	-0.905	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-54.080	-54.482	-0.402	(0)
Cr(6)	1.530e-15					
CrO4-2	1.400e-15	6.824e-16	-14.854	-15.166	-0.312	(0)
HCrO4-	9.210e-17	7.307e-17	-16.036	-16.136	-0.101	(0)
NaCrO4-	2.941e-17	2.333e-17	-16.532	-16.632	-0.101	(0)
KCrO4-	8.349e-18	6.624e-18	-17.078	-17.179	-0.101	(0)
CrO3SO4-2	8.166e-24	3.235e-24	-23.088	-23.490	-0.402	(0)
H2CrO4	1.960e-24	1.960e-24	-23.708	-23.708	0.000	(0)
CrO3Cl-	4.138e-26	3.283e-26	-25.383	-25.484	-0.101	(0)
Cr2O7-2	4.676e-31	1.852e-31	-30.330	-30.732	-0.402	(0)
Cu(1)	2.333e-10					
CuCl	1.163e-10	1.163e-10	-9.934	-9.934	0.000	(0)
CuCl2-	6.301e-11	5.243e-11	-10.201	-10.280	-0.080	(0)
Cu+	5.396e-11	4.281e-11	-10.268	-10.368	-0.101	(0)
CuCl3-2	4.868e-14	2.419e-14	-13.313	-13.616	-0.304	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.913	-150.277	-0.363	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.661	-151.007	-0.346	(0)
Cu(2)	5.067e-07					
CuCO3	4.024e-07	4.024e-07	-6.395	-6.395	0.000	(0)
Cu+2	4.390e-08	2.140e-08	-7.358	-7.670	-0.312	(0)
CuOH+	2.473e-08	2.058e-08	-7.607	-7.687	-0.080	(0)
CuSO4	2.152e-08	2.152e-08	-7.667	-7.667	0.000	(0)
Cu(CO3) 2-2	8.732e-09	3.459e-09	-8.059	-8.461	-0.402	(0)
CuHCO3+	3.836e-09	3.043e-09	-8.416	-8.517	-0.101	(0)
Cu(OH) 2	1.249e-09	1.249e-09	-8.904	-8.904	0.000	(0)
CuF+	1.794e-10	1.423e-10	-9.746	-9.847	-0.101	(0)
CuCl+	8.794e-11	7.317e-11	-10.056	-10.136	-0.080	(0)
Cu2(OH) 2+2	2.685e-11	1.064e-11	-10.571	-10.973	-0.402	(0)
CuNO2+	1.851e-11	1.469e-11	-10.733	-10.833	-0.101	(0)

	CuNH3+2	1.342e-12	5.315e-13	-11.872	-12.274	-0.402	(0)
	Cu (OH) 3-	9.818e-13	7.789e-13	-12.008	-12.108	-0.101	(0)
	CuCl2	5.474e-14	5.474e-14	-13.262	-13.262	0.000	(0)
	Cu (NO2) 2	9.852e-16	9.852e-16	-15.006	-15.006	0.000	(0)
	CuNO3+	8.230e-16	6.529e-16	-15.085	-15.185	-0.101	(0)
	Cu (OH) 4-2	4.707e-18	1.865e-18	-17.327	-17.729	-0.402	(0)
	CuCl3-	1.325e-18	1.102e-18	-17.878	-17.958	-0.080	(0)
	CuCl4-2	2.400e-23	1.192e-23	-22.620	-22.924	-0.304	(0)
	Cu (NO3) 2	7.932e-25	7.932e-25	-24.101	-24.101	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-219.059	-219.159	-0.101	(0)
F		1.518e-04					
	F-	1.262e-04	1.054e-04	-3.899	-3.977	-0.078	(0)
	MgF+	2.326e-05	1.945e-05	-4.633	-4.711	-0.078	(0)
	CaF+	1.800e-06	1.511e-06	-5.745	-5.821	-0.076	(0)
	NaF	4.577e-07	4.577e-07	-6.339	-6.339	0.000	(0)
	MnF+	8.277e-08	6.949e-08	-7.082	-7.158	-0.076	(0)
	AlF3	9.702e-09	9.702e-09	-8.013	-8.013	0.000	(0)
	AlF2+	8.677e-09	7.309e-09	-8.062	-8.136	-0.074	(0)
	HF	5.160e-09	5.160e-09	-8.287	-8.287	0.000	(0)
	ZnF+	4.028e-09	3.196e-09	-8.395	-8.495	-0.101	(0)
	BF (OH) 3-	1.358e-09	1.113e-09	-8.867	-8.954	-0.087	(0)
	AlF4-	6.133e-10	5.127e-10	-9.212	-9.290	-0.078	(0)
	AlF+2	3.458e-10	1.741e-10	-9.461	-9.759	-0.298	(0)
	CuF+	1.794e-10	1.423e-10	-9.746	-9.847	-0.101	(0)
	NiF+	1.058e-10	8.392e-11	-9.976	-10.076	-0.101	(0)
	CoF+	9.962e-11	7.903e-11	-10.002	-10.102	-0.101	(0)
	CdF+	6.974e-12	5.533e-12	-11.157	-11.257	-0.101	(0)
	HF2-	2.498e-12	2.068e-12	-11.602	-11.684	-0.082	(0)
	PbF+	1.330e-12	1.055e-12	-11.876	-11.977	-0.101	(0)
	UO2F+	8.888e-13	7.051e-13	-12.051	-12.152	-0.101	(0)
	AgF	7.164e-13	7.164e-13	-12.145	-12.145	0.000	(0)
	BF2 (OH) 2-	5.067e-13	4.152e-13	-12.295	-12.382	-0.087	(0)
	CrF+2	2.489e-13	9.862e-14	-12.604	-13.006	-0.402	(0)
	UO2F2	2.144e-13	2.144e-13	-12.669	-12.669	0.000	(0)
	UO2F3-	7.158e-15	5.678e-15	-14.145	-14.246	-0.101	(0)
	PbF2	2.188e-15	2.188e-15	-14.660	-14.660	0.000	(0)
	CdF2	1.164e-15	1.164e-15	-14.934	-14.934	0.000	(0)
	H2F2	7.134e-17	7.134e-17	-16.147	-16.147	0.000	(0)
	VO2F	1.882e-17	1.882e-17	-16.725	-16.725	0.000	(0)
	FeF2+	1.556e-17	1.306e-17	-16.808	-16.884	-0.076	(0)
	UO2F4-2	1.200e-17	4.756e-18	-16.921	-17.323	-0.402	(0)
	FeF+2	9.319e-18	4.630e-18	-17.031	-17.334	-0.304	(0)
	FeF3	1.943e-18	1.943e-18	-17.711	-17.711	0.000	(0)
	VO2F2-	9.082e-19	7.206e-19	-18.042	-18.142	-0.101	(0)
	BF3OH-	6.881e-19	5.638e-19	-18.162	-18.249	-0.087	(0)
	PbF3-	5.516e-19	4.376e-19	-18.258	-18.359	-0.101	(0)
	VOF+	2.904e-20	2.304e-20	-19.537	-19.637	-0.101	(0)
	VO2F3-2	2.392e-21	9.476e-22	-20.621	-21.023	-0.402	(0)
	VOF2	9.110e-22	9.110e-22	-21.040	-21.040	0.000	(0)
	HgF+	5.777e-23	4.583e-23	-22.238	-22.339	-0.101	(0)
	PbF4-2	5.575e-23	2.208e-23	-22.254	-22.656	-0.402	(0)
	BF4-	1.182e-23	9.684e-24	-22.927	-23.014	-0.087	(0)
	VOF3-	4.295e-24	3.408e-24	-23.367	-23.468	-0.101	(0)
	VO2F4-3	3.948e-25	4.916e-26	-24.404	-25.308	-0.905	(0)
	Sb (OH) 2F	1.582e-25	1.582e-25	-24.801	-24.801	0.000	(0)
	SbOF	1.557e-25	1.557e-25	-24.808	-24.808	0.000	(0)
	VOF4-2	3.661e-27	1.450e-27	-26.436	-26.839	-0.402	(0)
	UF3+	9.385e-36	7.446e-36	-35.028	-35.128	-0.101	(0)
	UF2+2	1.125e-36	4.456e-37	-35.949	-36.351	-0.402	(0)
	UF4	8.608e-38	8.608e-38	-37.065	-37.065	0.000	(0)
	UF+3	2.696e-39	3.357e-40	-38.569	-39.474	-0.905	(0)
	UF5-	4.533e-40	3.596e-40	-39.344	-39.444	-0.101	(0)
	UF6-2	0.000e+00	0.000e+00	-40.539	-40.941	-0.402	(0)
Fe (2)		6.428e-12					
	Fe+2	4.446e-12	1.761e-12	-11.352	-11.754	-0.402	(0)
	FeSO4	1.898e-12	1.898e-12	-11.722	-11.722	0.000	(0)
	FeHCO3+	5.905e-14	4.998e-14	-13.229	-13.301	-0.072	(0)
	FeOH+	2.540e-14	2.132e-14	-13.595	-13.671	-0.076	(0)

Fe (OH) 2	5.151e-18	5.151e-18	-17.288	-17.288	0.000	(0)
Fe (OH) 3-	5.901e-19	4.954e-19	-18.229	-18.305	-0.076	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.063	-161.063	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.055	-238.156	-0.101	(0)
Fe (3)	1.419e-09					
Fe (OH) 2+	1.105e-09	9.305e-10	-8.957	-9.031	-0.074	(0)
Fe (OH) 3	3.039e-10	3.039e-10	-9.517	-9.517	0.000	(0)
Fe (OH) 4-	1.022e-11	8.607e-12	-10.991	-11.065	-0.074	(0)
FeOH+2	1.583e-14	7.864e-15	-13.801	-14.104	-0.304	(0)
FeF2+	1.556e-17	1.306e-17	-16.808	-16.884	-0.076	(0)
FeF+2	9.319e-18	4.630e-18	-17.031	-17.334	-0.304	(0)
FeSO4+	2.350e-18	1.973e-18	-17.629	-17.705	-0.076	(0)
FeF3	1.943e-18	1.943e-18	-17.711	-17.711	0.000	(0)
Fe (SO4) 2-	2.334e-19	1.852e-19	-18.632	-18.732	-0.101	(0)
Fe+3	2.018e-19	4.005e-20	-18.695	-19.397	-0.702	(0)
FeCl+2	5.253e-21	2.610e-21	-20.280	-20.583	-0.304	(0)
FeCl2+	2.996e-23	2.515e-23	-22.523	-22.599	-0.076	(0)
FeHSeO3+2	2.255e-23	8.934e-24	-22.647	-23.049	-0.402	(0)
Fe2 (OH) 2+4	8.315e-26	2.048e-27	-25.080	-26.689	-1.609	(0)
FeNO3+2	9.756e-27	3.865e-27	-26.011	-26.413	-0.402	(0)
FeCl3	5.428e-27	5.428e-27	-26.265	-26.265	0.000	(0)
Fe3 (OH) 4+5	8.982e-33	2.754e-35	-32.047	-34.560	-2.513	(0)
H (0)	2.564e-29					
H2	1.282e-29	1.294e-29	-28.892	-28.888	0.004	(0)
Hg (0)	1.807e-09					
Hg	1.807e-09	1.807e-09	-8.743	-8.743	0.000	(0)
Hg (1)	7.261e-20					
Hg2+2	3.631e-20	1.438e-20	-19.440	-19.842	-0.402	(0)
Hg (2)	2.603e-11					
HgClOH	1.359e-11	1.359e-11	-10.867	-10.867	0.000	(0)
Hg (OH) 2	6.783e-12	6.844e-12	-11.169	-11.165	0.004	(0)
HgCl2	5.460e-12	5.460e-12	-11.263	-11.263	0.000	(0)
HgCl3-	1.485e-13	1.178e-13	-12.828	-12.929	-0.101	(0)
HgCO3	4.483e-14	4.483e-14	-13.348	-13.348	0.000	(0)
HgCl4-2	2.555e-15	1.012e-15	-14.593	-14.995	-0.402	(0)
Hg (CO3) 2-2	1.143e-15	4.528e-16	-14.942	-15.344	-0.402	(0)
HgCl+	6.364e-16	5.049e-16	-15.196	-15.297	-0.101	(0)
HgOH+	1.790e-16	1.420e-16	-15.747	-15.848	-0.101	(0)
HgHCO3+	3.481e-17	2.762e-17	-16.458	-16.559	-0.101	(0)
Hg (OH) 3-	3.303e-19	2.621e-19	-18.481	-18.582	-0.101	(0)
Hg (NH3) 2+2	1.101e-19	4.361e-20	-18.958	-19.360	-0.402	(0)
HgNH3+2	4.535e-20	1.796e-20	-19.343	-19.746	-0.402	(0)
Hg+2	2.960e-20	1.173e-20	-19.529	-19.931	-0.402	(0)
HgSO4	1.348e-20	1.348e-20	-19.870	-19.870	0.000	(0)
HgF+	5.777e-23	4.583e-23	-22.238	-22.339	-0.101	(0)
Hg (NH3) 3+2	1.064e-27	4.215e-28	-26.973	-27.375	-0.402	(0)
HgNO3+	5.267e-29	4.179e-29	-28.278	-28.379	-0.101	(0)
Hg (NH3) 4+2	2.052e-35	8.128e-36	-34.688	-35.090	-0.402	(0)
Hg (NO3) 2	1.676e-37	1.676e-37	-36.776	-36.776	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.681	-138.782	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.607	-140.009	-0.402	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.868	-139.868	0.000	(0)
K	3.223e-03					
K+	3.127e-03	2.613e-03	-2.505	-2.583	-0.078	(0)
KSO4-	9.640e-05	8.121e-05	-4.016	-4.090	-0.074	(0)
KCrO4-	8.349e-18	6.624e-18	-17.078	-17.179	-0.101	(0)
Mg	4.759e-03					
Mg+2	3.373e-03	1.644e-03	-2.472	-2.784	-0.312	(0)
MgSO4	1.313e-03	1.313e-03	-2.882	-2.882	0.000	(0)
MgHCO3+	4.557e-05	3.792e-05	-4.341	-4.421	-0.080	(0)
MgF+	2.326e-05	1.945e-05	-4.633	-4.711	-0.078	(0)
MgCO3	4.367e-06	4.367e-06	-5.360	-5.360	0.000	(0)
MgOH+	2.342e-07	1.990e-07	-6.630	-6.701	-0.071	(0)
MgH2BO3+	3.229e-08	2.645e-08	-7.491	-7.578	-0.087	(0)
Mn (2)	5.576e-05					
Mn+2	4.179e-05	1.656e-05	-4.379	-4.781	-0.402	(0)
MnSO4	1.293e-05	1.293e-05	-4.889	-4.889	0.000	(0)
MnHCO3+	8.870e-07	7.447e-07	-6.052	-6.128	-0.076	(0)

MnF+	8.277e-08	6.949e-08	-7.082	-7.158	-0.076	(0)
MnCl+	5.357e-08	4.497e-08	-7.271	-7.347	-0.076	(0)
MnOH+	1.506e-08	1.265e-08	-7.822	-7.898	-0.076	(0)
MnCl2	1.371e-10	1.371e-10	-9.863	-9.863	0.000	(0)
MnNO3+	3.192e-13	2.532e-13	-12.496	-12.597	-0.101	(0)
MnSeO4	3.060e-13	3.060e-13	-12.514	-12.514	0.000	(0)
MnCl3-	9.703e-14	8.147e-14	-13.013	-13.089	-0.076	(0)
Mn (OH) 3-	8.612e-18	7.230e-18	-17.065	-17.141	-0.076	(0)
Mn (NO3) 2	6.138e-21	6.138e-21	-20.212	-20.212	0.000	(0)
Mn (OH) 4-2	1.429e-23	7.099e-24	-22.845	-23.149	-0.304	(0)
MnSe	0.000e+00	0.000e+00	-42.113	-42.113	0.000	(0)
Mn (3)	9.121e-25					
Mn+3	9.121e-25	1.810e-25	-24.040	-24.742	-0.702	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.503	-41.806	-0.304	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.705	-45.790	-0.084	(0)
Mo	1.804e-06					
MoO4-2	1.803e-06	8.788e-07	-5.744	-6.056	-0.312	(0)
HMoO4-	7.293e-10	5.786e-10	-9.137	-9.238	-0.101	(0)
H2MoO4	1.402e-13	1.402e-13	-12.853	-12.853	0.000	(0)
Ag2MoO4	2.434e-24	2.434e-24	-23.614	-23.614	0.000	(0)
AlMo6O21-3	7.896e-39	9.831e-40	-38.103	-39.007	-0.905	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.625	-49.244	-3.619	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.825	-50.338	-2.513	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.427	-53.036	-1.609	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.366	-57.270	-0.905	(0)
N (-3)	1.823e-07					
NH4+	1.719e-07	1.409e-07	-6.765	-6.851	-0.087	(0)
NH4SO4-	7.895e-09	6.628e-09	-8.103	-8.179	-0.076	(0)
NH3	2.428e-09	2.428e-09	-8.615	-8.615	0.000	(0)
CaNH3+2	1.013e-11	4.014e-12	-10.994	-11.396	-0.402	(0)
CuNH3+2	1.342e-12	5.315e-13	-11.872	-12.274	-0.402	(0)
NiNH3+2	1.043e-13	4.131e-14	-12.982	-13.384	-0.402	(0)
Co (NH3) +2	1.746e-14	6.919e-15	-13.758	-14.160	-0.402	(0)
AgNH3+	1.690e-14	1.341e-14	-13.772	-13.873	-0.101	(0)
BaNH3+2	1.534e-16	6.078e-17	-15.814	-16.216	-0.402	(0)
Ag (NH3) 2+	3.335e-19	2.646e-19	-18.477	-18.577	-0.101	(0)
Hg (NH3) 2+2	1.101e-19	4.361e-20	-18.958	-19.360	-0.402	(0)
HgNH3+2	4.535e-20	1.796e-20	-19.343	-19.746	-0.402	(0)
Ni (NH3) 2+2	3.659e-20	1.450e-20	-19.437	-19.839	-0.402	(0)
Ca (NH3) 2+2	9.792e-21	3.879e-21	-20.009	-20.411	-0.402	(0)
Co (NH3) 2+2	1.809e-21	7.165e-22	-20.743	-21.145	-0.402	(0)
Hg (NH3) 3+2	1.064e-27	4.215e-28	-26.973	-27.375	-0.402	(0)
Co (NH3) 3+2	5.528e-29	2.190e-29	-28.257	-28.660	-0.402	(0)
Hg (NH3) 4+2	2.052e-35	8.128e-36	-34.688	-35.090	-0.402	(0)
Co (NH3) 4+2	7.043e-37	2.790e-37	-36.152	-36.554	-0.402	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.046	-43.448	-0.402	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.547	-44.949	-0.402	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.713	-52.115	-0.402	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.013	-52.918	-0.905	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.080	-54.482	-0.402	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.111	-62.211	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.694	-67.096	-0.402	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.043	-67.445	-0.402	(0)
N (3)	7.958e-06					
NO2-	7.958e-06	6.555e-06	-5.099	-5.183	-0.084	(0)
CuNO2+	1.851e-11	1.469e-11	-10.733	-10.833	-0.101	(0)
AgNO2	3.705e-12	3.705e-12	-11.431	-11.431	0.000	(0)
CoNO2+	1.380e-12	1.095e-12	-11.860	-11.961	-0.101	(0)
Cu (NO2) 2	9.852e-16	9.852e-16	-15.006	-15.006	0.000	(0)
Ag (NO2) 2-	4.741e-17	3.762e-17	-16.324	-16.425	-0.101	(0)
N (5)	1.160e-08					
NO3-	1.155e-08	9.650e-09	-7.937	-8.015	-0.078	(0)
CaNO3+	5.052e-11	4.008e-11	-10.297	-10.397	-0.101	(0)
MnNO3+	3.192e-13	2.532e-13	-12.496	-12.597	-0.101	(0)
ZnNO3+	4.642e-14	3.683e-14	-13.333	-13.434	-0.101	(0)
BaNO3+	2.419e-15	1.919e-15	-14.616	-14.717	-0.101	(0)

NiNO3+	9.682e-16	7.681e-16	-15.014	-15.115	-0.101	(0)
CuNO3+	8.230e-16	6.529e-16	-15.085	-15.185	-0.101	(0)
CoNO3+	4.570e-16	3.626e-16	-15.340	-15.441	-0.101	(0)
CdNO3+	1.274e-16	1.010e-16	-15.895	-15.995	-0.101	(0)
PbNO3+	2.554e-17	2.026e-17	-16.593	-16.693	-0.101	(0)
AgNO3	2.074e-17	2.074e-17	-16.683	-16.683	0.000	(0)
Mn(NO3)2	6.138e-21	6.138e-21	-20.212	-20.212	0.000	(0)
UO2NO3+	1.176e-21	9.329e-22	-20.930	-21.030	-0.101	(0)
Zn(NO3)2	7.091e-23	7.091e-23	-22.149	-22.149	0.000	(0)
Co(NO3)2	7.119e-24	7.119e-24	-23.148	-23.148	0.000	(0)
CrNO3+2	6.284e-24	2.489e-24	-23.202	-23.604	-0.402	(0)
Cu(NO3)2	7.932e-25	7.932e-25	-24.101	-24.101	0.000	(0)
VO2NO3	4.969e-25	4.969e-25	-24.304	-24.304	0.000	(0)
Cd(NO3)2	4.887e-25	4.887e-25	-24.311	-24.311	0.000	(0)
Pb(NO3)2	3.321e-25	3.321e-25	-24.479	-24.479	0.000	(0)
FeNO3+2	9.756e-27	3.865e-27	-26.011	-26.413	-0.402	(0)
HgNO3+	5.267e-29	4.179e-29	-28.278	-28.379	-0.101	(0)
Hg(NO3)2	1.676e-37	1.676e-37	-36.776	-36.776	0.000	(0)
Na	8.437e-03					
Na+	8.234e-03	6.880e-03	-2.084	-2.162	-0.078	(0)
NaSO4-	1.926e-04	1.622e-04	-3.715	-3.790	-0.074	(0)
NaHCO3	8.722e-06	8.722e-06	-5.059	-5.059	0.000	(0)
NaCO3-	4.857e-07	4.092e-07	-6.314	-6.388	-0.074	(0)
NaF	4.577e-07	4.577e-07	-6.339	-6.339	0.000	(0)
NaH2BO3	5.061e-09	5.061e-09	-8.296	-8.296	0.000	(0)
NaCrO4-	2.941e-17	2.333e-17	-16.532	-16.632	-0.101	(0)
Ni	1.081e-07					
Ni+2	6.502e-08	3.169e-08	-7.187	-7.499	-0.312	(0)
NiSO4	2.776e-08	2.776e-08	-7.557	-7.557	0.000	(0)
NiHCO3+	1.110e-08	8.806e-09	-7.955	-8.055	-0.101	(0)
NiCO3	3.776e-09	3.776e-09	-8.423	-8.423	0.000	(0)
NiCl+	2.205e-10	1.749e-10	-9.657	-9.757	-0.101	(0)
NiOH+	1.529e-10	1.213e-10	-9.816	-9.916	-0.101	(0)
NiF+	1.058e-10	8.392e-11	-9.976	-10.076	-0.101	(0)
Ni(SO4)2-2	1.019e-11	4.036e-12	-10.992	-11.394	-0.402	(0)
Ni(OH)2	2.931e-12	2.931e-12	-11.533	-11.533	0.000	(0)
NiNH3+2	1.043e-13	4.131e-14	-12.982	-13.384	-0.402	(0)
NiCl2	1.901e-15	1.901e-15	-14.721	-14.721	0.000	(0)
Ni(OH)3-	1.124e-15	8.914e-16	-14.949	-15.050	-0.101	(0)
NiSeO4	1.018e-15	1.018e-15	-14.992	-14.992	0.000	(0)
NiNO3+	9.682e-16	7.681e-16	-15.014	-15.115	-0.101	(0)
Ni(NH3)2+2	3.659e-20	1.450e-20	-19.437	-19.839	-0.402	(0)
O(0)	5.997e-35					
O2	2.999e-35	3.026e-35	-34.523	-34.519	0.004	(0)
Pb	2.464e-09					
PbCO3	1.363e-09	1.363e-09	-8.865	-8.865	0.000	(0)
PbSO4	3.053e-10	3.053e-10	-9.515	-9.515	0.000	(0)
PbHCO3+	2.997e-10	2.378e-10	-9.523	-9.624	-0.101	(0)
Pb+2	2.913e-10	1.420e-10	-9.536	-9.848	-0.312	(0)
PbOH+	1.367e-10	1.085e-10	-9.864	-9.965	-0.101	(0)
Pb(CO3)2-2	3.169e-11	1.256e-11	-10.499	-10.901	-0.402	(0)
Pb(SO4)2-2	2.039e-11	8.077e-12	-10.691	-11.093	-0.402	(0)
PbCl+	1.370e-11	1.087e-11	-10.863	-10.964	-0.101	(0)
PbF+	1.330e-12	1.055e-12	-11.876	-11.977	-0.101	(0)
Pb(OH)2	1.043e-12	1.043e-12	-11.982	-11.982	0.000	(0)
PbCl2	1.048e-13	1.048e-13	-12.980	-12.980	0.000	(0)
PbF2	2.188e-15	2.188e-15	-14.660	-14.660	0.000	(0)
Pb(OH)3-	3.999e-16	3.172e-16	-15.398	-15.499	-0.101	(0)
PbCl3-	1.134e-16	8.999e-17	-15.945	-16.046	-0.101	(0)
PbNO3+	2.554e-17	2.026e-17	-16.593	-16.693	-0.101	(0)
Pb2OH+3	1.960e-18	2.440e-19	-17.708	-18.613	-0.905	(0)
PbF3-	5.516e-19	4.376e-19	-18.258	-18.359	-0.101	(0)
PbCl4-2	2.241e-19	8.876e-20	-18.650	-19.052	-0.402	(0)
Pb(OH)4-2	5.964e-20	2.363e-20	-19.224	-19.627	-0.402	(0)
PbF4-2	5.575e-23	2.208e-23	-22.254	-22.656	-0.402	(0)
Pb3(OH)4+2	7.779e-24	3.082e-24	-23.109	-23.511	-0.402	(0)
Pb(NO3)2	3.321e-25	3.321e-25	-24.479	-24.479	0.000	(0)
Pb4(OH)4+4	1.411e-28	3.475e-30	-27.850	-29.459	-1.609	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-152.837	-152.837	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.566	-230.666	-0.101	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.883	-73.883	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.029	-79.130	-0.101	(0)
CdHS+	0.000e+00	0.000e+00	-79.501	-79.602	-0.101	(0)
H2S	0.000e+00	0.000e+00	-79.590	-79.590	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.612	-81.014	-0.402	(0)
S6-2	0.000e+00	0.000e+00	-81.128	-81.530	-0.402	(0)
S4-2	0.000e+00	0.000e+00	-81.208	-81.610	-0.402	(0)
S3-2	0.000e+00	0.000e+00	-82.014	-82.416	-0.402	(0)
S2-2	0.000e+00	0.000e+00	-83.030	-83.432	-0.402	(0)
S-2	0.000e+00	0.000e+00	-88.645	-88.949	-0.304	(0)
HgHS2-	0.000e+00	0.000e+00	-138.681	-138.782	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.607	-140.009	-0.402	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.868	-139.868	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.712	-148.916	-0.204	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.812	-148.912	-0.101	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.687	-149.787	-0.101	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.913	-150.277	-0.363	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.502	-150.875	-0.373	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.661	-151.007	-0.346	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.832	-151.186	-0.354	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.257	-151.257	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.527	-151.527	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.837	-152.837	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.063	-161.063	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.059	-219.159	-0.101	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.007	-227.107	-0.101	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.656	-228.757	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.205	-229.607	-0.402	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.566	-230.666	-0.101	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.055	-238.156	-0.101	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-305.288	-305.690	-0.402	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.294	-307.697	-0.402	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.761	-321.163	-0.402	(0)
S (6)	1.195e-02					
SO4-2	9.009e-03	4.391e-03	-2.045	-2.357	-0.312	(0)
CaSO4	1.321e-03	1.321e-03	-2.879	-2.879	0.000	(0)
MgSO4	1.313e-03	1.313e-03	-2.882	-2.882	0.000	(0)
NaSO4-	1.926e-04	1.622e-04	-3.715	-3.790	-0.074	(0)
KSO4-	9.640e-05	8.121e-05	-4.016	-4.090	-0.074	(0)
MnSO4	1.293e-05	1.293e-05	-4.889	-4.889	0.000	(0)
ZnSO4	1.459e-06	1.459e-06	-5.836	-5.836	0.000	(0)
Zn (SO4) 2-2	1.409e-07	5.581e-08	-6.851	-7.253	-0.402	(0)
NiSO4	2.776e-08	2.776e-08	-7.557	-7.557	0.000	(0)
CuSO4	2.152e-08	2.152e-08	-7.667	-7.667	0.000	(0)
CoSO4	2.077e-08	2.077e-08	-7.683	-7.683	0.000	(0)
HSO4-	1.698e-08	1.420e-08	-7.770	-7.848	-0.078	(0)
NH4SO4-	7.895e-09	6.628e-09	-8.103	-8.179	-0.076	(0)
CdSO4	3.408e-09	3.408e-09	-8.467	-8.467	0.000	(0)
Cd (SO4) 2-2	5.095e-10	2.019e-10	-9.293	-9.695	-0.402	(0)
PbSO4	3.053e-10	3.053e-10	-9.515	-9.515	0.000	(0)
AgSO4-	2.987e-10	2.370e-10	-9.525	-9.625	-0.101	(0)
CrOHSO4	4.091e-11	4.091e-11	-10.388	-10.388	0.000	(0)
Pb (SO4) 2-2	2.039e-11	8.077e-12	-10.691	-11.093	-0.402	(0)
Ni (SO4) 2-2	1.019e-11	4.036e-12	-10.992	-11.394	-0.402	(0)
AlSO4+	6.735e-12	5.629e-12	-11.172	-11.250	-0.078	(0)
FeSO4	1.898e-12	1.898e-12	-11.722	-11.722	0.000	(0)
UO2SO4	3.220e-13	3.220e-13	-12.492	-12.492	0.000	(0)
Al (SO4) 2-	3.168e-13	2.648e-13	-12.499	-12.577	-0.078	(0)
CrSO4+	7.627e-14	6.051e-14	-13.118	-13.218	-0.101	(0)
UO2 (SO4) 2-2	4.704e-14	1.864e-14	-13.328	-13.730	-0.402	(0)
VO2SO4-	1.345e-17	1.067e-17	-16.871	-16.972	-0.101	(0)
FeSO4+	2.350e-18	1.973e-18	-17.629	-17.705	-0.076	(0)
Cr2 (OH) 2SO4+2	3.666e-19	1.452e-19	-18.436	-18.838	-0.402	(0)
Fe (SO4) 2-	2.334e-19	1.852e-19	-18.632	-18.732	-0.101	(0)
VOSO4	4.406e-20	4.406e-20	-19.356	-19.356	0.000	(0)

Cr2(OH)2(SO4)2	3.787e-20	3.787e-20	-19.422	-19.422	0.000	(0)
HgSO4	1.348e-20	1.348e-20	-19.870	-19.870	0.000	(0)
CrO3SO4-2	8.166e-24	3.235e-24	-23.088	-23.490	-0.402	(0)
VSO4+	2.116e-34	1.678e-34	-33.675	-33.775	-0.101	(0)
U(SO4)2	9.728e-40	9.728e-40	-39.012	-39.012	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.152	-40.554	-0.402	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-62.111	-62.211	-0.101	(0)
Sb(3)	5.736e-20					
Sb(OH)3	2.902e-20	2.902e-20	-19.537	-19.537	0.000	(0)
HSbO2	2.834e-20	2.834e-20	-19.548	-19.548	0.000	(0)
SbO2-	1.749e-24	1.387e-24	-23.757	-23.858	-0.101	(0)
Sb(OH)4-	1.001e-24	7.940e-25	-24.000	-24.100	-0.101	(0)
Sb(OH)2F	1.582e-25	1.582e-25	-24.801	-24.801	0.000	(0)
SbOF	1.557e-25	1.557e-25	-24.808	-24.808	0.000	(0)
Sb(OH)2+	2.941e-26	2.333e-26	-25.532	-25.632	-0.101	(0)
SbO+	1.014e-26	8.047e-27	-25.994	-26.094	-0.101	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.761	-321.163	-0.402	(0)
Sb(5)	2.536e-08					
SbO3-	2.533e-08	2.009e-08	-7.596	-7.697	-0.101	(0)
Sb(OH)6-	2.808e-11	2.346e-11	-10.552	-10.630	-0.078	(0)
SbO2+	7.958e-24	6.314e-24	-23.099	-23.200	-0.101	(0)
Se(-2)	6.734e-15					
Ag2Se	6.734e-15	6.734e-15	-14.172	-14.172	0.000	(0)
HSe-	4.711e-40	3.738e-40	-39.327	-39.427	-0.101	(0)
MnSe	0.000e+00	0.000e+00	-42.113	-42.113	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.018	-43.018	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.545	-46.947	-0.402	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-83.882	-85.491	-1.609	(0)
Se(4)	1.320e-07					
HSeO3-	1.064e-07	8.442e-08	-6.973	-7.074	-0.101	(0)
SeO3-2	2.564e-08	1.016e-08	-7.591	-7.993	-0.402	(0)
H2SeO3	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
AgSeO3-	2.226e-14	1.766e-14	-13.653	-13.753	-0.101	(0)
Cd(SeO3)2-2	7.106e-19	2.815e-19	-18.148	-18.550	-0.402	(0)
Ag(SeO3)2-3	1.290e-20	1.606e-21	-19.889	-20.794	-0.905	(0)
FeHSeO3+2	2.255e-23	8.934e-24	-22.647	-23.049	-0.402	(0)
Se(6)	1.412e-10					
SeO4-2	1.409e-10	6.866e-11	-9.851	-10.163	-0.312	(0)
MnSeO4	3.060e-13	3.060e-13	-12.514	-12.514	0.000	(0)
ZnSeO4	1.616e-14	1.616e-14	-13.792	-13.792	0.000	(0)
NiSeO4	1.018e-15	1.018e-15	-14.992	-14.992	0.000	(0)
CoSeO4	8.157e-16	8.157e-16	-15.088	-15.088	0.000	(0)
HSeO4-	1.435e-16	1.139e-16	-15.843	-15.944	-0.101	(0)
CdSeO4	4.233e-17	4.233e-17	-16.373	-16.373	0.000	(0)
Zn(SeO4)2-2	2.839e-24	1.125e-24	-23.547	-23.949	-0.402	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.077	-58.982	-0.905	(0)
U(4)	3.840e-21					
U(OH)5-	3.836e-21	3.043e-21	-20.416	-20.517	-0.101	(0)
U(OH)4	4.219e-24	4.219e-24	-23.375	-23.375	0.000	(0)
U(OH)3+	6.437e-28	5.107e-28	-27.191	-27.292	-0.101	(0)
U(OH)2+2	1.974e-32	7.818e-33	-31.705	-32.107	-0.402	(0)
UF3+	9.385e-36	7.446e-36	-35.028	-35.128	-0.101	(0)
UF2+2	1.125e-36	4.456e-37	-35.949	-36.351	-0.402	(0)
UOH+3	9.791e-38	1.219e-38	-37.009	-37.914	-0.905	(0)
UF4	8.608e-38	8.608e-38	-37.065	-37.065	0.000	(0)
UF+3	2.696e-39	3.357e-40	-38.569	-39.474	-0.905	(0)
U(SO4)2	9.728e-40	9.728e-40	-39.012	-39.012	0.000	(0)
UF5-	4.533e-40	3.596e-40	-39.344	-39.444	-0.101	(0)
USO4+2	0.000e+00	0.000e+00	-40.152	-40.554	-0.402	(0)
UF6-2	0.000e+00	0.000e+00	-40.539	-40.941	-0.402	(0)
U+4	0.000e+00	0.000e+00	-43.188	-44.797	-1.609	(0)
UC1+3	0.000e+00	0.000e+00	-44.858	-45.763	-0.905	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-165.593	-173.736	-8.143	(0)
U(5)	1.521e-16					
UO2+	1.521e-16	1.206e-16	-15.818	-15.918	-0.101	(0)
U(6)	3.549e-07					
UO2(CO3)3-4	2.552e-07	6.285e-09	-6.593	-8.202	-1.609	(0)

UO2 (CO3) 2-2	9.911e-08	3.926e-08	-7.004	-7.406	-0.402	(0)
UO2CO3	6.161e-10	6.161e-10	-9.210	-9.210	0.000	(0)
UO2OH+	2.338e-12	1.855e-12	-11.631	-11.732	-0.101	(0)
UO2F+	8.888e-13	7.051e-13	-12.051	-12.152	-0.101	(0)
UO2SO4	3.220e-13	3.220e-13	-12.492	-12.492	0.000	(0)
UO2F2	2.144e-13	2.144e-13	-12.669	-12.669	0.000	(0)
UO2+2	9.941e-14	4.845e-14	-13.003	-13.315	-0.312	(0)
UO2 (SO4) 2-2	4.704e-14	1.864e-14	-13.328	-13.730	-0.402	(0)
UO2F3-	7.158e-15	5.678e-15	-14.145	-14.246	-0.101	(0)
UO2Cl+	2.137e-16	1.696e-16	-15.670	-15.771	-0.101	(0)
(UO2) 2 (OH) 2+2	1.442e-17	5.711e-18	-16.841	-17.243	-0.402	(0)
UO2F4-2	1.200e-17	4.756e-18	-16.921	-17.323	-0.402	(0)
(UO2) 3 (OH) 5+	9.370e-19	7.434e-19	-18.028	-18.129	-0.101	(0)
UO2NO3+	1.176e-21	9.329e-22	-20.930	-21.030	-0.101	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.697	-42.797	-0.101	(0)
V+2	0.000e+00	0.000e+00	-43.388	-43.790	-0.402	(0)
V (3)	1.838e-15					
V (OH) 3	1.838e-15	1.838e-15	-14.736	-14.736	0.000	(0)
V (OH) 2+	4.955e-26	3.931e-26	-25.305	-25.405	-0.101	(0)
VOH+2	3.116e-29	1.234e-29	-28.506	-28.909	-0.402	(0)
V+3	6.504e-34	8.098e-35	-33.187	-34.092	-0.905	(0)
VSO4+	2.116e-34	1.678e-34	-33.675	-33.775	-0.101	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.957	-55.862	-0.905	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.409	-57.017	-1.609	(0)
V (4)	2.952e-18					
V (OH) 3+	2.785e-18	2.210e-18	-17.555	-17.656	-0.101	(0)
VO+2	9.198e-20	3.644e-20	-19.036	-19.438	-0.402	(0)
VOSO4	4.406e-20	4.406e-20	-19.356	-19.356	0.000	(0)
VOF+	2.904e-20	2.304e-20	-19.537	-19.637	-0.101	(0)
VOF2	9.110e-22	9.110e-22	-21.040	-21.040	0.000	(0)
VOC1+	2.780e-22	2.206e-22	-21.556	-21.656	-0.101	(0)
VOF3-	4.295e-24	3.408e-24	-23.367	-23.468	-0.101	(0)
VOF4-2	3.661e-27	1.450e-27	-26.436	-26.839	-0.402	(0)
H2V2O4+2	6.185e-31	2.450e-31	-30.209	-30.611	-0.402	(0)
V (5)	6.760e-09					
H2VO4-	5.866e-09	4.654e-09	-8.232	-8.332	-0.101	(0)
HVO4-2	8.919e-10	3.533e-10	-9.050	-9.452	-0.402	(0)
H3VO4	1.540e-12	1.540e-12	-11.812	-11.812	0.000	(0)
H3V2O7-	5.836e-14	4.630e-14	-13.234	-13.334	-0.101	(0)
HV2O7-3	4.478e-15	5.575e-16	-14.349	-15.254	-0.905	(0)
VO4-3	4.298e-16	5.352e-17	-15.367	-16.272	-0.905	(0)
VO2+	1.218e-16	1.018e-16	-15.914	-15.992	-0.078	(0)
VO2F	1.882e-17	1.882e-17	-16.725	-16.725	0.000	(0)
V2O7-4	1.841e-17	4.535e-19	-16.735	-18.343	-1.609	(0)
VO2SO4-	1.345e-17	1.067e-17	-16.871	-16.972	-0.101	(0)
VO2F2-	9.082e-19	7.206e-19	-18.042	-18.142	-0.101	(0)
V3O9-3	8.494e-19	1.058e-19	-18.071	-18.976	-0.905	(0)
VO2F3-2	2.392e-21	9.476e-22	-20.621	-21.023	-0.402	(0)
V4O12-4	8.336e-24	2.053e-25	-23.079	-24.688	-1.609	(0)
VO2NO3	4.969e-25	4.969e-25	-24.304	-24.304	0.000	(0)
VO2F4-3	3.948e-25	4.916e-26	-24.404	-25.308	-0.905	(0)
V10O28-6	0.000e+00	0.000e+00	-60.715	-64.334	-3.619	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.114	-63.628	-2.513	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.292	-65.900	-1.609	(0)
Zn	5.211e-06					
Zn+2	3.117e-06	1.519e-06	-5.506	-5.818	-0.312	(0)
ZnSO4	1.459e-06	1.459e-06	-5.836	-5.836	0.000	(0)
ZnCO3	2.792e-07	2.792e-07	-6.554	-6.554	0.000	(0)
Zn (SO4) 2-2	1.409e-07	5.581e-08	-6.851	-7.253	-0.402	(0)
ZnHCO3+	1.365e-07	1.083e-07	-6.865	-6.965	-0.101	(0)
ZnOH+	5.824e-08	4.620e-08	-7.235	-7.335	-0.101	(0)
ZnCl+	9.896e-09	8.234e-09	-8.005	-8.084	-0.080	(0)
ZnF+	4.028e-09	3.196e-09	-8.395	-8.495	-0.101	(0)
ZnOHC1	3.279e-09	3.279e-09	-8.484	-8.484	0.000	(0)
Zn (OH) 2	2.227e-09	2.227e-09	-8.652	-8.652	0.000	(0)
ZnCl2	2.816e-11	2.816e-11	-10.550	-10.550	0.000	(0)
Zn (OH) 3-	4.279e-12	3.395e-12	-11.369	-11.469	-0.101	(0)

ZnCl3-	5.801e-14	4.827e-14	-13.237	-13.316	-0.080	(0)
ZnNO3+	4.642e-14	3.683e-14	-13.333	-13.434	-0.101	(0)
ZnSeO4	1.616e-14	1.616e-14	-13.792	-13.792	0.000	(0)
ZnCl4-2	1.048e-16	5.208e-17	-15.980	-16.283	-0.304	(0)
Zn(OH) 4-2	1.038e-16	4.110e-17	-15.984	-16.386	-0.402	(0)
Zn(NO3) 2	7.091e-23	7.091e-23	-22.149	-22.149	0.000	(0)
Zn(SeO4) 2-2	2.839e-24	1.125e-24	-23.547	-23.949	-0.402	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.687	-149.787	-0.101	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.257	-151.257	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.007	-227.107	-0.101	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.205	-229.607	-0.402	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.294	-307.697	-0.402	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-56.48	-50.19	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-44.00	-39.49	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-51.22	-39.49	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-72.84	-54.91	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-58.89	-38.86	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-29.27	-28.87	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.32	-23.87	0.45	(NH4) 2SeO4
Acanthite	-52.56	-88.78	-36.22	Ag2S
Ag2CO3	-11.54	-22.63	-11.09	Ag2CO3
Ag2CrO4	-20.71	-32.30	-11.59	Ag2CrO4
Ag2HVO4	-12.17	-10.69	1.48	Ag2HVO4
Ag2MoO4	-11.64	-23.19	-11.55	Ag2MoO4
Ag2O	-14.75	-2.18	12.57	Ag2O
Ag2Se	-0.38	-49.08	-48.70	Ag2Se
Ag2SeO3	-9.58	-16.73	-7.15	Ag2SeO3
Ag2SeO4	-18.39	-27.30	-8.91	Ag2SeO4
Ag2SO4	-14.67	-19.49	-4.82	Ag2SO4
Ag3AsO3	-28.17	-26.01	2.16	Ag3AsO3
Ag3AsO4	-16.38	-19.17	-2.79	Ag3AsO4
Ag3H2VO5	-16.96	-11.78	5.18	Ag3H2VO5
AgF:4H2O	-13.59	-12.55	1.05	AgF:4H2O
Agmetal	-0.45	-13.96	-13.51	Ag
AgVO3	-10.37	-9.60	0.77	AgVO3
Al(OH) 3 (am)	-1.14	9.66	10.80	Al(OH) 3
Al2(MoO4) 3	-46.10	-43.73	2.37	Al2(MoO4) 3
Al2O3	-0.34	19.32	19.65	Al2O3
Al4(OH) 10SO4	-1.39	21.31	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-11.05	-6.25	4.80	AlAsO4:2H2O
AlOHSO4	-4.43	-7.66	-3.23	AlOHSO4
AlSb	-152.72	-87.09	65.62	AlSb
Alunite	0.64	-0.76	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-4.42	-12.21	-7.79	PbSO4
Anhydrite	-0.88	-5.24	-4.36	CaSO4
Anilite	-57.24	-89.12	-31.88	Cu0.25Cu1.5S
Antlerite	-4.23	4.55	8.79	Cu3(OH) 4SO4
Aragonite	-0.08	-8.38	-8.30	CaCO3
Arsenolite	-88.23	-90.99	-2.76	As4O6
Artinite	-5.70	3.90	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-38.52	-31.81	6.71	As2O5
Atacamite	-2.96	4.43	7.39	Cu2(OH) 3Cl
Azurite	-2.13	-19.04	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-16.84	7.56	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-17.78	-1.91	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-0.23	-9.14	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-27.29	5.65	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-12.90	-22.57	-9.67	BaCrO4
BaF2	-9.54	-15.36	-5.82	BaF2
BaMoO4	-6.50	-13.46	-6.96	BaMoO4
Barite	0.22	-9.76	-9.98	BaSO4
BaS	-95.23	-79.05	16.18	BaS
BaSeO3	-8.82	-6.99	1.83	BaSeO3

BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-6.41	-8.18	-1.76	ZnSO4:6H2O
Birnessite	-7.52	10.57	18.09	MnO2
Bixbyite	-3.96	-4.60	-0.64	Mn2O3
BlaubleiI	-56.46	-80.63	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.27	-84.55	-27.28	Cu0.6Cu0.8S
Boehmite	1.08	9.66	8.58	AlOOH
Breithauptite	-57.90	-76.42	-18.52	NiSb
Brochantite	-3.38	11.84	15.22	Cu4(OH)6SO4
Brucite	-4.67	12.18	16.84	Mg(OH)2
Bunsenite	-4.98	7.46	12.45	NiO
Ca(VO3)2	-10.61	-4.95	5.66	Ca(VO3)2
Ca2V2O7	-10.37	7.13	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.42	7.13	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.88	4.42	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.75	19.21	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.65	19.21	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.24	-157.27	142.97	Ca3Sb2
CaCrO4	-15.78	-18.05	-2.27	CaCrO4
Calcite	0.10	-8.38	-8.48	CaCO3
Calomel	-7.26	-25.17	-17.91	Hg2Cl2
CaMoO4	-0.99	-8.94	-7.95	CaMoO4
Carnotite	-2.20	-1.97	0.23	KUO2VO4
CaSeO3:2H2O	-5.29	-2.48	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.03	-13.05	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.51	-2.67	9.84	Cd(BO2)2
Cd(OH)2	-7.16	6.48	13.64	Cd(OH)2
Cd(OH)2(am)	-7.25	6.48	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.90	-15.19	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.44	2.12	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.80	8.60	28.40	Cd4(OH)6SO4
CdCl2	-13.15	-13.81	-0.66	CdCl2
CdCl2:1H2O	-12.12	-13.81	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.90	-13.81	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal(alpha)	-32.77	-19.26	13.51	Cd
Cdmetal(gamma)	-32.88	-19.26	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-7.20	-3.67	3.54	CdOHCl
CdSb	-77.05	-77.40	-0.35	CdSb
CdSe	-20.23	-40.43	-20.20	CdSe
CdSeO4:2H2O	-16.79	-18.64	-1.85	CdSeO4:2H2O
CdSO4	-10.67	-10.84	-0.17	CdSO4
CdSO4:1H2O	-9.11	-10.84	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.97	-10.84	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.48	-11.23	-9.75	AgCl
Cerrusite	-2.21	-15.34	-13.13	PbCO3
CH4(g)	-82.36	-123.41	-41.05	CH4
Chalcanthite	-7.39	-10.03	-2.64	CuSO4:5H2O
Chalcocite	-57.47	-92.39	-34.92	Cu2S
Chalcopyrite	-127.45	-162.72	-35.27	CuFeS2
Cinnabar	-52.08	-97.77	-45.69	HgS
Claudetite	-87.92	-90.99	-3.06	As4O6
Clausthalite	-14.69	-41.79	-27.10	PbSe
Co(BO2)2	-28.89	-1.82	27.07	Co(BO2)2
Co(OH)2	-5.76	7.33	13.09	Co(OH)2
Co(OH)3	-9.89	-12.20	-2.31	Co(OH)3
CO2(g)	-2.31	-20.46	-18.15	CO2
Co3(AsO4)2	-22.84	-9.81	13.03	Co3(AsO4)2
Co3O4	-6.56	-17.06	-10.50	Co3O4
CoCl2	-21.22	-12.96	8.27	CoCl2
CoCl2:6H2O	-15.50	-12.96	2.54	CoCl2:6H2O
CoCO3	-3.14	-13.12	-9.98	CoCO3
CoF2	-13.98	-15.58	-1.60	CoF2
CoF3	-45.11	-46.57	-1.46	CoF3
CoFe2O4	16.95	13.42	-3.53	CoFe2O4
CoMoO4	-5.92	-13.68	-7.76	CoMoO4
CoO	-6.25	7.34	13.59	CoO

CoS (alpha)	-71.83	-79.27	-7.44	CoS
CoS (beta)	-68.20	-79.27	-11.07	CoS
CoSe	-23.37	-39.57	-16.20	CoSe
CoSeO3	-8.54	-7.22	1.32	CoSeO3
CoSeO4:6H2O	-16.26	-17.79	-1.53	CoSeO4:6H2O
CoSO4	-12.79	-9.98	2.80	CoSO4
CoSO4:6H2O	-7.51	-9.98	-2.47	CoSO4:6H2O
Cotunnite	-10.40	-15.18	-4.78	PbCl2
Covellite	-57.02	-79.32	-22.30	CuS
Cr (OH) 2	-22.10	-11.28	10.82	Cr (OH) 2
Cr (OH) 3	-2.69	-1.36	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.61	-1.36	-0.75	Cr (OH) 3
Cr2O3	-0.36	-2.71	-2.36	Cr2O3
CrCl2	-45.66	-31.57	14.09	CrCl2
CrCl3	-46.91	-31.80	15.11	CrCl3
CrF3	-24.39	-35.73	-11.34	CrF3
Crmetal	-67.50	-37.02	30.48	Cr
CrO3	-26.92	-30.13	-3.21	CrO3
Cryolite	-9.29	-43.13	-33.84	Na3AlF6
Cu (OH) 2	-1.38	7.29	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.52	19.69	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-10.17	-0.91	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.47	-92.35	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.88	-52.68	-45.80	Cu2Se
Cu2SO4	-21.14	-23.09	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-16.04	-9.94	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.82	-105.42	-42.59	Cu3Sb
Cu3Se2	-28.81	-92.30	-63.49	Cu3Se2
CuCO3	-1.67	-13.17	-11.50	CuCO3
CuCrO4	-17.40	-22.84	-5.44	CuCrO4
CuF	-9.44	-14.35	-4.91	CuF
CuF2	-16.74	-15.62	1.12	CuF2
CuF2:2H2O	-11.07	-15.62	-4.55	CuF2:2H2O
Cumetal	-7.00	-15.76	-8.76	Cu
CuMoO4	-0.65	-13.73	-13.08	CuMoO4
CuOCuSO4	-13.04	-2.74	10.30	CuOCuSO4
Cupricferrite	7.39	13.38	5.99	CuFe2O4
Cuprite	-4.37	-5.78	-1.41	Cu2O
Cuprousferrite	9.07	0.15	-8.92	CuFeO2
CuSe	-6.52	-39.62	-33.10	CuSe
CuSe2	-27.42	-60.79	-33.37	CuSe2
CuSeO3:2H2O	-7.78	-7.26	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.39	-17.83	-2.44	CuSeO4:5H2O
CuSO4	-12.97	-10.03	2.94	CuSO4
Diaspore	2.79	9.66	6.87	AlOOH
Djurleite	-57.60	-91.52	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.12	-16.66	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.43	-16.66	-17.09	CaMg (CO3) 2
Epsomite	-3.02	-5.14	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.36	3.21	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.04	-0.00	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-10.10	-13.82	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.02	-8.47	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.95	-37.58	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-42.13	-45.87	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.93	9.29	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.26	-12.86	0.40	FeAsO4:2H2O
FeCr2O4	-6.71	0.49	7.20	FeCr2O4
FeMoO4	-7.72	-17.81	-10.09	FeMoO4
Ferrihydrite	-0.15	3.04	3.19	Fe (OH) 3
Ferroselite	-46.27	-64.87	-18.60	FeSe2
FeS (ppt)	-80.45	-83.40	-2.95	FeS
FeSe	-32.70	-43.70	-11.00	FeSe
Fix_pe	-5.39	-5.39	0.00	e-
Fluorite	-0.34	-10.84	-10.50	CaF2
Galena	-67.53	-81.50	-13.97	PbS
Gibbsite	1.37	9.66	8.29	Al (OH) 3
Goethite	2.55	3.04	0.49	FeOOH

Goslarite	-6.17	-8.18	-2.01	ZnSO4:7H2O
Greenockite	-65.77	-80.13	-14.36	CdS
Greigite	-292.11	-337.15	-45.03	Fe3S4
Gummite	-6.03	1.65	7.67	UO3
Gypsum	-0.63	-5.24	-4.61	CaSO4:2H2O
H-Jarosite	-13.41	-25.51	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.14	-21.02	-12.88	H2MoO4
H2S (g)	-78.60	-86.61	-8.01	H2S
H2Se (g)	-41.95	-46.91	-4.96	H2Se
Halite	-6.43	-4.83	1.60	NaCl
Hausmannite	-4.75	56.28	61.03	Mn3O4
Hematite	7.50	6.09	-1.42	Fe2O3
Hercynite	-0.37	22.52	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.27	-257.98	-73.71	Hg (CH3) 2
Hg (g)	-7.44	-15.31	-7.87	Hg
Hg (OH) 2	-7.67	-11.16	-3.50	Hg (OH) 2
Hg2 (g)	-15.66	-30.62	-14.96	Hg2
Hg2 (OH) 2	-10.14	-4.88	5.26	Hg2 (OH) 2
Hg2CO3	-9.29	-25.34	-16.05	Hg2CO3
Hg2CrO4	-26.31	-35.01	-8.70	Hg2CrO4
Hg2F2	-17.43	-27.80	-10.36	Hg2F2
Hg2S	-79.81	-91.49	-11.68	Hg2S
Hg2SeO3	-14.78	-19.44	-4.66	Hg2SeO3
Hg2SO4	-16.07	-22.20	-6.13	Hg2SO4
Hg3O2CO3	-24.27	-53.95	-29.68	Hg3O2CO3
HgCl (g)	-32.08	-12.59	19.50	HgCl
HgCl2	-10.19	-31.46	-21.26	HgCl2
HgF (g)	-46.57	-13.90	32.68	HgF
HgF2 (g)	-46.64	-34.08	12.57	HgF2
Hgmetal (l)	-1.86	-15.31	-13.45	Hg
HgSe	-2.38	-58.07	-55.69	HgSe
HgSeO3	-13.29	-25.72	-12.43	HgSeO3
HgSO4	-19.06	-28.48	-9.42	HgSO4
Huntite	-3.25	-33.22	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.80	-25.57	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.18	-20.94	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.91	-20.08	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.81	-20.61	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.22	-50.46	-17.24	K2Cr2O7
K2CrO4	-19.82	-20.33	-0.51	K2CrO4
K2MoO4	-14.48	-11.22	3.26	K2MoO4
K2SeO4	-14.60	-15.33	-0.73	K2SeO4
Langite	-5.64	11.84	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.66	-7.09	-0.43	PbO:PbSO4
Laurionite	-5.66	-5.03	0.62	PbOHCl
Lepidocrocite	1.67	3.04	1.37	FeOOH
Lime	-20.62	12.08	32.70	CaO
Litharge	-7.58	5.11	12.69	PbO
Mackinawite	-79.80	-83.40	-3.60	FeS
Maghemite	-0.30	6.09	6.39	Fe2O3
Magnesioferrite	1.40	18.26	16.86	Fe2MgO4
Magnesite	-0.82	-8.28	-7.46	MgCO3
Magnetite	5.89	9.29	3.40	Fe3O4
Malachite	-0.57	-5.87	-5.31	Cu2 (OH) 2CO3
Manganite	-2.29	23.05	25.34	MnOOH
Massicot	-7.78	5.11	12.89	PbO
Matlockite	-7.52	-16.49	-8.97	PbClF
Melanothallite	-19.26	-13.00	6.26	CuCl2
Melanterite	-11.90	-14.11	-2.21	FeSO4:7H2O
Metacinnabar	-52.68	-97.77	-45.09	HgS
Mg (OH) 2 (active)	-6.62	12.18	18.79	Mg (OH) 2
Mg (VO3) 2	-16.13	-4.85	11.28	Mg (VO3) 2
Mg2Sb3	-276.24	-201.56	74.68	Mg2Sb3
Mg2V2O7	-19.03	7.33	26.36	Mg2V2O7
MgCr2O4	-6.74	9.46	16.20	MgCr2O4
MgCrO4	-23.33	-17.95	5.38	MgCrO4
MgF2	-2.61	-10.74	-8.13	MgF2
MgMoO4	-6.99	-8.84	-1.85	MgMoO4

MgSeO3:6H2O	-5.43	-2.38	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.75	-12.95	-1.20	MgSeO4:6H2O
Minium	-32.45	41.08	73.52	Pb3O4
Mirabilite	-5.57	-6.68	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.74	-6.84	4.90	Mn(VO3)2
Mn2(SO4)3	-50.85	-56.56	-5.71	Mn2(SO4)3
Mn2Sb	-150.34	-89.26	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.78	-1.28	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.83	-10.11	2.72	MnCl2:4H2O
MnS (grn)	-76.60	-76.43	0.17	MnS
MnS (pnk)	-79.77	-76.43	3.34	MnS
MnSb	-96.14	-99.05	-2.91	MnSb
MnSe	-40.23	-36.73	3.50	MnSe
MnSeO3	-5.50	-4.37	1.13	MnSeO3
MnSeO3:2H2O	-5.36	-4.37	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.90	-14.95	-2.05	MnSeO4:5H2O
MnSO4	-9.72	-7.14	2.58	MnSO4
Monteponite	-8.62	6.48	15.10	CdO
Montroydite	-7.52	-11.16	-3.64	HgO
MoO3	-13.02	-21.02	-8.00	MoO3
Morenosite	-7.71	-9.86	-2.14	NiSO4:7H2O
MoS2	-149.71	-219.97	-70.26	MoS2
Na-Jarosite	-8.99	-20.19	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.72	-49.62	-9.90	Na2Cr2O7
Na2CrO4	-22.42	-19.49	2.93	Na2CrO4
Na2Mo2O7	-14.80	-31.40	-16.60	Na2Mo2O7
Na2MoO4	-11.87	-10.38	1.49	Na2MoO4
Na2MoO4:2H2O	-11.61	-10.38	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.22	-3.92	10.30	Na2SeO3:5H2O
Na2SeO4	-15.77	-14.49	1.28	Na2SeO4
Na3Sb	-175.25	-80.80	94.45	Na3Sb
Na3VO4	-29.24	7.44	36.68	Na3VO4
Na4V2O7	-33.15	4.25	37.40	Na4V2O7
Nantokite	-6.30	-13.03	-6.73	CuCl
NaSb	-88.86	-65.70	23.17	NaSb
Natron	-8.51	-9.82	-1.31	Na2CO3:10H2O
NaVO3	-7.05	-3.19	3.86	NaVO3
Nesquehonite	-3.61	-8.28	-4.67	MgCO3:3H2O
Ni(OH)2	-5.33	7.46	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.13	-9.43	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.47	12.53	32.00	Ni4(OH)6SO4
NiCO3	-6.12	-12.99	-6.87	NiCO3
NiMoO4	-2.41	-13.56	-11.14	NiMoO4
NiS(alpha)	-73.55	-79.15	-5.60	NiS
NiS(beta)	-68.05	-79.15	-11.10	NiS
NiS(gamma)	-66.35	-79.15	-12.80	NiS
NiSe	-21.75	-39.45	-17.70	NiSe
NiSeO3:2H2O	-9.91	-7.09	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.14	-17.66	-1.52	NiSeO4:6H2O
Nsutite	-6.94	10.57	17.50	MnO2
O2(g)	-31.61	51.48	83.09	O2
Orpiment	-244.26	-305.32	-61.07	As2S3
Otavite	-1.98	-13.98	-12.00	CdCO3
Pb(BO2)2	-10.56	-4.04	6.52	Pb(BO2)2
Pb(OH)2	-3.04	5.11	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.85	-71.61	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.71	0.08	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.96	10.22	26.19	Pb2O(OH)2
Pb2O3	-25.08	35.96	61.04	Pb2O3
Pb2OCO3	-9.67	-10.23	-0.56	Pb2OCO3
Pb2V2O7	-4.90	-6.80	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.28	-16.48	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.83	-1.69	6.14	Pb3(VO4)2
Pb3O2CO3	-16.14	-5.12	11.02	Pb3O2CO3
Pb3O2SO4	-12.67	-1.98	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.97	3.13	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.74	3.13	21.88	Pb4O3SO4
PbCrO4	-12.41	-25.01	-12.60	PbCrO4

PbF2	-10.36	-17.80	-7.44	PbF2
Pbmetal	-24.87	-20.63	4.25	Pb
PbMoO4	-0.28	-15.90	-15.62	PbMoO4
PbO:0.3H2O	-7.87	5.11	12.98	PbO:0.33H2O
PbSeO4	-13.17	-20.01	-6.84	PbSeO4
Periclase	-9.41	12.18	21.58	MgO
Phosgenite	-10.71	-30.52	-19.81	PbCl2:PbCO3
Plattnerite	-18.75	30.85	49.60	PbO2
Portlandite	-10.73	12.08	22.80	Ca(OH)2
Pyrite	-125.77	-144.28	-18.51	FeS2
Pyrochroite	-5.01	10.18	15.19	Mn(OH)2
Pyrolusite	-5.46	35.92	41.38	MnO2
Realgar	-102.48	-122.23	-19.75	AsS
Retgersite	-7.82	-9.86	-2.04	NiSO4:6H2O
Rhodochrosite	0.30	-10.28	-10.58	MnCO3
Rutherfordine	-4.31	-18.81	-14.50	UO2CO3
Sb(OH)3	-12.43	-19.54	-7.11	Sb(OH)3
Sb2O4	-16.74	-13.34	3.40	Sb2O4
Sb2O5	-26.55	-36.22	-9.67	Sb2O5
Sb2Se3	-112.04	-179.80	-67.76	Sb2Se3
Sb4O6(cubic)	-59.89	-78.15	-18.26	Sb4O6
Sb4O6(orth)	-60.25	-78.15	-17.90	Sb4O6
SbCl3	-50.55	-49.98	0.57	SbCl3
SbF3	-43.68	-53.91	-10.23	SbF3
Sbmetal	-46.45	-58.14	-11.69	Sb
SbO2	-3.15	-30.98	-27.82	SbO2
Schoepite	-4.35	1.65	5.99	UO2(OH)2:H2O
Semetal(am)	-14.06	-21.17	-7.11	Se
Semetal(hex)	-13.46	-21.17	-7.71	Se
Senarmontite	-26.71	-39.07	-12.37	Sb2O3
SeO2	-14.68	-14.55	0.12	SeO2
SeO3	-46.17	-25.12	21.04	SeO3
Siderite	-7.01	-17.25	-10.24	FeCO3
Smithsonite	-1.31	-11.31	-10.00	ZnCO3
Sphalerite	-66.02	-77.47	-11.45	ZnS
Spinel	-5.35	31.49	36.85	MgAl2O4
Stibnite	-248.44	-298.90	-50.46	Sb2S3
Sulfur	-58.73	-60.87	-2.14	S
Tenorite	-0.35	7.29	7.64	CuO
Thenardite	-7.00	-6.68	0.32	Na2SO4
Thermonatrite	-10.46	-9.82	0.64	Na2CO3:H2O
Tyuyamunite	-5.73	-1.65	4.08	Ca(UO2)2(VO4)2
U3O8	-14.24	6.85	21.08	U3O8
U3Sb4	-584.01	-431.63	152.38	U3Sb4
U4O9	-30.75	-33.77	-3.02	U4O9
UF4	-31.17	-60.71	-29.54	UF4
UF4:2.5H2O	-27.99	-60.71	-32.72	UF4:2.5H2O
UO2(am)	-15.81	-14.88	0.93	UO2
UO2(NO3)2	-41.49	-29.35	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.20	-29.35	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.74	-29.35	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.39	-29.35	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.97	1.65	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.23	-23.48	-2.25	UO2SeO4:4H2O
UO3	-6.05	1.65	7.70	UO3
Uraninite	-10.21	-14.88	-4.67	UO2
USb2	-221.43	-191.86	29.58	USb2
V(OH)3	-19.24	-11.65	7.59	V(OH)3
V2O5	-15.66	-17.02	-1.36	V2O5
V3O5	-41.01	-39.17	1.84	V3O5
V4O7	-50.84	-43.65	7.19	V4O7
V6O13	-41.69	-102.55	-60.86	V6O13
Valentinite	-30.59	-39.07	-8.48	Sb2O3
VC12	-63.69	-44.81	18.87	VC12
VC13	-65.52	-42.09	23.43	VC13
VF4	-65.24	-50.31	14.93	VF4
Vmetal	-94.28	-50.26	44.03	V
VO	-39.28	-24.52	14.76	VO

VO(OH)2	-9.63	-4.48	5.15	VO(OH)2
VO2Cl	-21.50	-18.66	2.84	VO2Cl
VOC1	-32.95	-21.80	11.15	VOC1
VOC12	-37.53	-24.77	12.76	VOC12
VOSO4	-25.41	-21.80	3.61	VOSO4
Witherite	-4.33	-12.90	-8.57	BaCO3
Wurtzite	-68.52	-77.47	-8.95	ZnS
Zincite	-2.19	9.14	11.33	ZnO
Zincosite	-12.11	-8.18	3.93	ZnSO4
Zn(BO2)2	-8.30	-0.01	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.17	-21.85	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.06	9.14	12.20	Zn(OH)2
Zn(OH)2(am)	-3.33	9.14	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.61	9.14	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.39	9.14	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.59	9.14	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.53	0.97	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.05	8.14	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.04	-4.39	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.12	-7.21	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.15	19.25	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.08	25.42	38.50	Zn5(OH)8Cl2
ZnCl2	-18.20	-11.15	7.05	ZnCl2
ZnCO3:1H2O	-1.05	-11.31	-10.26	ZnCO3:1H2O
ZnF2	-13.24	-13.77	-0.53	ZnF2
Znmetal	-42.38	-16.60	25.79	Zn
ZnMoO4	-1.75	-11.87	-10.13	ZnMoO4
ZnO(active)	-2.05	9.14	11.19	ZnO
ZnS(am)	-68.42	-77.47	-9.05	ZnS
ZnSb	-85.75	-74.74	11.01	ZnSb
ZnSe	-23.37	-37.77	-14.40	ZnSe
ZnSeO4:6H2O	-14.46	-15.98	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.54	-8.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 45.

```

Title Stage 2 Pit wall interaction mix calculator
MIX 204
209      1
3         0
4         0
5         0
6         0
7         0
8         0
9         0
10        0.000454
11        0.005503
12        0.003939
13        0.006636
14         0
15         0
Save solution 210
end

```

TITLE

Stage 2 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 204.

Mixture 204.

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
4.540e-04 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
5.503e-03 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
3.939e-03 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
6.636e-03 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 209 Solution after simulation 44.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.800e-08	1.830e-08
Al	3.432e-06	3.491e-06
As	2.297e-10	2.336e-10
B	2.643e-05	2.688e-05
Ba	8.306e-08	8.449e-08
C	2.948e-03	2.999e-03
Ca	4.030e-03	4.099e-03
Cd	1.169e-08	1.189e-08
Cl	2.541e-03	2.585e-03
Co	8.621e-08	8.769e-08
Cr	2.109e-09	2.145e-09
Cu	5.229e-07	5.319e-07
F	1.501e-04	1.527e-04
Fe	1.850e-09	1.881e-09
Hg	1.803e-09	1.834e-09
K	3.172e-03	3.227e-03
Mg	4.684e-03	4.765e-03
Mn	5.488e-05	5.582e-05
Mo	1.775e-06	1.806e-06
N	8.019e-06	8.157e-06
Na	8.302e-03	8.444e-03
Ni	1.064e-07	1.082e-07
Pb	2.459e-09	2.501e-09
S	1.176e-02	1.196e-02
Sb	2.496e-08	2.539e-08

Se	1.301e-07	1.323e-07
U	3.493e-07	3.553e-07
V	6.874e-09	6.993e-09
Zn	5.128e-06	5.216e-06

-----Description of solution-----

	pH =	7.475	Charge balance
	pe =	5.396	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	3.830e-02	
	Mass of water (kg) =	1.017e+00	
	Total alkalinity (eq/kg) =	2.814e-03	
	Total CO2 (mol/kg) =	2.948e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	9.651e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	5	
	Total H =	1.129259e+02	
	Total O =	5.651831e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.622e-07	3.002e-07	-6.441	-6.523	-0.081	(0)
H+	4.008e-08	3.352e-08	-7.397	-7.475	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.800e-08					
AgCl	1.172e-08	1.172e-08	-7.931	-7.931	0.000	(0)
Ag+	3.231e-09	2.702e-09	-8.491	-8.568	-0.078	(0)
AgCl2-	2.731e-09	2.170e-09	-8.564	-8.664	-0.100	(0)
AgSO4-	2.947e-10	2.342e-10	-9.531	-9.630	-0.100	(0)
AgCl3-2	1.031e-11	4.111e-12	-10.987	-11.386	-0.399	(0)
AgNO2	3.644e-12	3.644e-12	-11.438	-11.438	0.000	(0)
AgF	7.091e-13	7.091e-13	-12.149	-12.149	0.000	(0)
AgCl4-3	1.412e-13	1.784e-14	-12.850	-13.749	-0.898	(0)
AgOH	8.112e-14	8.112e-14	-13.091	-13.091	0.000	(0)
AgSeO3-	2.167e-14	1.722e-14	-13.664	-13.764	-0.100	(0)
AgH2BO3	1.931e-14	1.931e-14	-13.714	-13.714	0.000	(0)
AgNH3+	1.642e-14	1.305e-14	-13.785	-13.884	-0.100	(0)
Ag2Se	6.407e-15	6.407e-15	-14.193	-14.193	0.000	(0)
Ag (NO2) 2-	4.586e-17	3.644e-17	-16.339	-16.438	-0.100	(0)
AgNO3	2.056e-17	2.056e-17	-16.687	-16.687	0.000	(0)
Ag (OH) 2-	2.995e-18	2.380e-18	-17.524	-17.623	-0.100	(0)
Ag (NH3) 2+	3.156e-19	2.508e-19	-18.501	-18.601	-0.100	(0)
Ag (SeO3) 2-3	1.210e-20	1.530e-21	-19.917	-20.815	-0.898	(0)
Ag2MoO4	2.399e-24	2.399e-24	-23.620	-23.620	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.896	-73.896	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.941	-85.538	-1.597	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.744	-148.947	-0.203	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.839	-148.938	-0.100	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.540	-150.912	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.870	-151.223	-0.353	(0)
Al	3.432e-06					
Al (OH) 4-	3.324e-06	2.782e-06	-5.478	-5.556	-0.077	(0)
Al (OH) 3	7.359e-08	7.359e-08	-7.133	-7.133	0.000	(0)
Al (OH) 2+	1.457e-08	1.228e-08	-7.837	-7.911	-0.074	(0)
AlF3	9.808e-09	9.808e-09	-8.008	-8.008	0.000	(0)
AlF2+	8.843e-09	7.456e-09	-8.053	-8.127	-0.074	(0)
AlF4-	6.138e-10	5.136e-10	-9.212	-9.289	-0.077	(0)
AlF+2	3.547e-10	1.793e-10	-9.450	-9.747	-0.296	(0)
AlOH+2	1.019e-10	5.151e-11	-9.992	-10.288	-0.296	(0)
AlSO4+	6.915e-12	5.786e-12	-11.160	-11.238	-0.077	(0)
Al+3	8.570e-13	1.716e-13	-12.067	-12.766	-0.699	(0)
Al (SO4) 2-	3.219e-13	2.693e-13	-12.492	-12.570	-0.077	(0)

AlMo6O21-3	8.121e-39	1.026e-39	-38.090	-38.989	-0.898	(0)
As (3)	2.067e-23					
H3AsO3	2.027e-23	2.027e-23	-22.693	-22.693	0.000	(0)
H2AsO3-	3.904e-25	3.102e-25	-24.408	-24.508	-0.100	(0)
HAsO3-2	2.117e-29	8.441e-30	-28.674	-29.074	-0.399	(0)
H4AsO3+	4.237e-31	3.367e-31	-30.373	-30.473	-0.100	(0)
AsO3-3	7.683e-35	9.708e-36	-34.114	-35.013	-0.898	(0)
As (5)	2.297e-10					
HAsO4-2	1.991e-10	7.939e-11	-9.701	-10.100	-0.399	(0)
H2AsO4-	3.054e-11	2.427e-11	-10.515	-10.615	-0.100	(0)
AsO4-3	5.928e-14	7.490e-15	-13.227	-14.125	-0.898	(0)
H3AsO4	1.401e-16	1.414e-16	-15.853	-15.850	0.004	(0)
B	2.643e-05					
H3BO3	2.580e-05	2.603e-05	-4.588	-4.585	0.004	(0)
H2BO3-	5.497e-07	4.510e-07	-6.260	-6.346	-0.086	(0)
CaH2BO3+	4.120e-08	3.380e-08	-7.385	-7.471	-0.086	(0)
MgH2BO3+	3.102e-08	2.544e-08	-7.508	-7.594	-0.086	(0)
NaH2BO3	4.845e-09	4.845e-09	-8.315	-8.315	0.000	(0)
BF (OH) 3-	1.323e-09	1.085e-09	-8.879	-8.965	-0.086	(0)
H5 (BO3) 2-	1.218e-11	9.991e-12	-10.914	-11.000	-0.086	(0)
BaH2BO3+	6.815e-13	5.590e-13	-12.167	-12.253	-0.086	(0)
BF2 (OH) 2-	4.955e-13	4.065e-13	-12.305	-12.391	-0.086	(0)
H8 (BO3) 3-	3.170e-14	2.600e-14	-13.499	-13.585	-0.086	(0)
AgH2BO3	1.931e-14	1.931e-14	-13.714	-13.714	0.000	(0)
BF3OH-	6.755e-19	5.542e-19	-18.170	-18.256	-0.086	(0)
BF4-	1.165e-23	9.555e-24	-22.934	-23.020	-0.086	(0)
Ba	8.306e-08					
Ba+2	8.199e-08	4.011e-08	-7.086	-7.397	-0.310	(0)
BaHCO3+	1.008e-09	8.536e-10	-8.997	-9.069	-0.072	(0)
BaCO3	6.412e-11	6.412e-11	-10.193	-10.193	0.000	(0)
BaH2BO3+	6.815e-13	5.590e-13	-12.167	-12.253	-0.086	(0)
BaOH+	6.256e-14	5.257e-14	-13.204	-13.279	-0.076	(0)
BaNO3+	2.423e-15	1.926e-15	-14.616	-14.715	-0.100	(0)
BaNH3+2	1.501e-16	5.986e-17	-15.824	-16.223	-0.399	(0)
C (4)	2.948e-03					
HCO3-	2.643e-03	2.228e-03	-2.578	-2.652	-0.074	(0)
H2CO3	1.680e-04	1.680e-04	-3.775	-3.775	0.000	(0)
CaHCO3+	6.379e-05	5.404e-05	-4.195	-4.267	-0.072	(0)
MgHCO3+	4.455e-05	3.711e-05	-4.351	-4.431	-0.079	(0)
NaHCO3	8.494e-06	8.494e-06	-5.071	-5.071	0.000	(0)
CaCO3	6.433e-06	6.433e-06	-5.192	-5.192	0.000	(0)
CO3-2	6.371e-06	3.117e-06	-5.196	-5.506	-0.310	(0)
MgCO3	4.218e-06	4.218e-06	-5.375	-5.375	0.000	(0)
MnHCO3+	8.687e-07	7.300e-07	-6.061	-6.137	-0.076	(0)
NaCO3-	4.666e-07	3.934e-07	-6.331	-6.405	-0.074	(0)
CuCO3	4.140e-07	4.140e-07	-6.383	-6.383	0.000	(0)
ZnCO3	2.703e-07	2.703e-07	-6.568	-6.568	0.000	(0)
UO2 (CO3) 3-4	2.480e-07	6.271e-09	-6.606	-8.203	-1.597	(0)
ZnHCO3+	1.336e-07	1.062e-07	-6.874	-6.974	-0.100	(0)
UO2 (CO3) 2-2	1.007e-07	4.014e-08	-6.997	-7.396	-0.399	(0)
NiHCO3+	1.086e-08	8.626e-09	-7.964	-8.064	-0.100	(0)
Cu (CO3) 2-2	8.710e-09	3.473e-09	-8.060	-8.459	-0.399	(0)
CoHCO3+	5.129e-09	4.076e-09	-8.290	-8.390	-0.100	(0)
CuHCO3+	3.992e-09	3.172e-09	-8.399	-8.499	-0.100	(0)
NiCO3	3.651e-09	3.651e-09	-8.438	-8.438	0.000	(0)
PbCO3	1.352e-09	1.352e-09	-8.869	-8.869	0.000	(0)
CoCO3	1.239e-09	1.239e-09	-8.907	-8.907	0.000	(0)
BaHCO3+	1.008e-09	8.536e-10	-8.997	-9.069	-0.072	(0)
UO2CO3	6.455e-10	6.455e-10	-9.190	-9.190	0.000	(0)
PbHCO3+	3.007e-10	2.390e-10	-9.522	-9.622	-0.100	(0)
CdCO3	2.336e-10	2.336e-10	-9.632	-9.632	0.000	(0)
BaCO3	6.412e-11	6.412e-11	-10.193	-10.193	0.000	(0)
Pb (CO3) 2-2	3.048e-11	1.216e-11	-10.516	-10.915	-0.399	(0)
CdHCO3+	2.099e-11	1.668e-11	-10.678	-10.778	-0.100	(0)
Cd (CO3) 2-2	1.353e-12	5.396e-13	-11.869	-12.268	-0.399	(0)
FeHCO3+	7.665e-14	6.493e-14	-13.115	-13.188	-0.072	(0)
HgCO3	4.452e-14	4.452e-14	-13.351	-13.351	0.000	(0)
Hg (CO3) 2-2	1.100e-15	4.388e-16	-14.958	-15.358	-0.399	(0)

	HgHCO ₃ ⁺	3.496e-17	2.778e-17	-16.456	-16.556	-0.100	(0)
Ca	4.030e-03						
	Ca+2	2.662e-03	1.302e-03	-2.575	-2.885	-0.310	(0)
	CaSO ₄	1.296e-03	1.296e-03	-2.887	-2.887	0.000	(0)
	CaHCO ₃ ⁺	6.379e-05	5.404e-05	-4.195	-4.267	-0.072	(0)
	CaCO ₃	6.433e-06	6.433e-06	-5.192	-5.192	0.000	(0)
	CaF ⁺	1.767e-06	1.485e-06	-5.753	-5.828	-0.076	(0)
	CaH ₂ BO ₃ ⁺	4.120e-08	3.380e-08	-7.385	-7.471	-0.086	(0)
	CaOH ⁺	9.209e-09	7.801e-09	-8.036	-8.108	-0.072	(0)
	CaNO ₃ ⁺	4.964e-11	3.945e-11	-10.304	-10.404	-0.100	(0)
	CaNH ₃ +2	9.724e-12	3.878e-12	-11.012	-11.411	-0.399	(0)
	Ca (NH ₃) 2+2	9.156e-21	3.651e-21	-20.038	-20.438	-0.399	(0)
Cd	1.169e-08						
	Cd+2	6.720e-09	3.287e-09	-8.173	-8.483	-0.310	(0)
	CdSO ₄	3.348e-09	3.348e-09	-8.475	-8.475	0.000	(0)
	CdCl ⁺	8.397e-10	6.672e-10	-9.076	-9.176	-0.100	(0)
	Cd (SO ₄) 2-2	4.921e-10	1.962e-10	-9.308	-9.707	-0.399	(0)
	CdCO ₃	2.336e-10	2.336e-10	-9.632	-9.632	0.000	(0)
	CdHCO ₃ ⁺	2.099e-11	1.668e-11	-10.678	-10.778	-0.100	(0)
	CdOH ⁺	9.866e-12	7.840e-12	-11.006	-11.106	-0.100	(0)
	CdOHCl	8.218e-12	8.218e-12	-11.085	-11.085	0.000	(0)
	CdF ⁺	6.851e-12	5.444e-12	-11.164	-11.264	-0.100	(0)
	CdCl ₂	5.912e-12	5.912e-12	-11.228	-11.228	0.000	(0)
	Cd (CO ₃) 2-2	1.353e-12	5.396e-13	-11.869	-12.268	-0.399	(0)
	Cd (OH) 2	1.485e-14	1.485e-14	-13.828	-13.828	0.000	(0)
	CdCl ₃ -	9.976e-15	7.927e-15	-14.001	-14.101	-0.100	(0)
	CdF ₂	1.135e-15	1.135e-15	-14.945	-14.945	0.000	(0)
	CdNO ₃ ⁺	1.253e-16	9.959e-17	-15.902	-16.002	-0.100	(0)
	CdSeO ₄	4.137e-17	4.137e-17	-16.383	-16.383	0.000	(0)
	Cd2OH+3	1.022e-18	1.292e-19	-17.990	-18.889	-0.898	(0)
	Cd (SeO ₃) 2-2	6.684e-19	2.666e-19	-18.175	-18.574	-0.399	(0)
	Cd (OH) 3-	3.428e-19	2.724e-19	-18.465	-18.565	-0.100	(0)
	Cd (NO ₃) 2	4.781e-25	4.781e-25	-24.320	-24.320	0.000	(0)
	Cd (OH) 4-2	3.357e-26	1.339e-26	-25.474	-25.873	-0.399	(0)
	CdHS ⁺	0.000e+00	0.000e+00	-79.518	-79.617	-0.100	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.556	-151.556	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.698	-228.798	-0.100	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-305.345	-305.744	-0.399	(0)
Cl	2.541e-03						
	Cl-	2.541e-03	2.125e-03	-2.595	-2.673	-0.078	(0)
	MnCl ⁺	5.228e-08	4.393e-08	-7.282	-7.357	-0.076	(0)
	AgCl	1.172e-08	1.172e-08	-7.931	-7.931	0.000	(0)
	ZnCl ⁺	9.658e-09	8.044e-09	-8.015	-8.095	-0.079	(0)
	ZnOHCl	3.162e-09	3.162e-09	-8.500	-8.500	0.000	(0)
	AgCl ₂ -	2.731e-09	2.170e-09	-8.564	-8.664	-0.100	(0)
	CdCl ⁺	8.397e-10	6.672e-10	-9.076	-9.176	-0.100	(0)
	CoCl ⁺	2.175e-10	1.729e-10	-9.662	-9.762	-0.100	(0)
	NiCl ⁺	2.149e-10	1.707e-10	-9.668	-9.768	-0.100	(0)
	MnCl ₂	1.319e-10	1.319e-10	-9.880	-9.880	0.000	(0)
	CuCl	1.188e-10	1.188e-10	-9.925	-9.925	0.000	(0)
	CuCl ⁺	9.123e-11	7.599e-11	-10.040	-10.119	-0.079	(0)
	CuCl ₂ -	6.331e-11	5.273e-11	-10.199	-10.278	-0.079	(0)
	ZnCl ₂	2.710e-11	2.710e-11	-10.567	-10.567	0.000	(0)
	PbCl ⁺	1.369e-11	1.088e-11	-10.863	-10.963	-0.100	(0)
	HgClOH	1.345e-11	1.345e-11	-10.871	-10.871	0.000	(0)
	AgCl ₃ -2	1.031e-11	4.111e-12	-10.987	-11.386	-0.399	(0)
	CdOHCl	8.218e-12	8.218e-12	-11.085	-11.085	0.000	(0)
	CdCl ₂	5.912e-12	5.912e-12	-11.228	-11.228	0.000	(0)
	HgCl ₂	5.391e-12	5.391e-12	-11.268	-11.268	0.000	(0)
	HgCl ₃ -	1.442e-13	1.146e-13	-12.841	-12.941	-0.100	(0)
	AgCl ₄ -3	1.412e-13	1.784e-14	-12.850	-13.749	-0.898	(0)
	PbCl ₂	1.033e-13	1.033e-13	-12.986	-12.986	0.000	(0)
	MnCl ₃ -	9.186e-14	7.720e-14	-13.037	-13.112	-0.076	(0)
	CuCl ₂	5.600e-14	5.600e-14	-13.252	-13.252	0.000	(0)
	ZnCl ₃ -	5.492e-14	4.574e-14	-13.260	-13.340	-0.079	(0)
	CuCl ₃ -2	4.804e-14	2.396e-14	-13.318	-13.621	-0.302	(0)
	CdCl ₃ -	9.976e-15	7.927e-15	-14.001	-14.101	-0.100	(0)
	HgCl ₄ -2	2.431e-15	9.694e-16	-14.614	-15.014	-0.399	(0)

NiCl2	1.827e-15	1.827e-15	-14.738	-14.738	0.000	(0)
HgCl+	6.368e-16	5.061e-16	-15.196	-15.296	-0.100	(0)
UO2Cl+	2.256e-16	1.793e-16	-15.647	-15.746	-0.100	(0)
PbCl3-	1.100e-16	8.741e-17	-15.959	-16.058	-0.100	(0)
ZnCl4-2	9.748e-17	4.861e-17	-16.011	-16.313	-0.302	(0)
CrCl+2	4.118e-17	1.642e-17	-16.385	-16.785	-0.399	(0)
CuCl3-	1.333e-18	1.111e-18	-17.875	-17.954	-0.079	(0)
PbCl4-2	2.130e-19	8.492e-20	-18.672	-19.071	-0.399	(0)
CrOHC12	1.992e-19	1.992e-19	-18.701	-18.701	0.000	(0)
FeCl+2	6.889e-21	3.435e-21	-20.162	-20.464	-0.302	(0)
CrCl2+	4.167e-21	3.311e-21	-20.380	-20.480	-0.100	(0)
VOCl+	2.890e-22	2.296e-22	-21.539	-21.639	-0.100	(0)
FeCl2+	3.881e-23	3.261e-23	-22.411	-22.487	-0.076	(0)
CuCl4-2	2.372e-23	1.183e-23	-22.625	-22.927	-0.302	(0)
CrO3Cl-	4.007e-26	3.185e-26	-25.397	-25.497	-0.100	(0)
FeCl3	6.932e-27	6.932e-27	-26.159	-26.159	0.000	(0)
CoCl+2	2.527e-35	1.008e-35	-34.597	-34.997	-0.399	(0)
UCl+3	0.000e+00	0.000e+00	-44.833	-45.731	-0.898	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.775	-52.174	-0.399	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.152	-54.551	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.117	-67.516	-0.399	(0)
Co (2)	8.621e-08					
Co+2	5.896e-08	2.351e-08	-7.229	-7.629	-0.399	(0)
CoSO4	2.038e-08	2.038e-08	-7.691	-7.691	0.000	(0)
CoHCO3+	5.129e-09	4.076e-09	-8.290	-8.390	-0.100	(0)
CoCO3	1.239e-09	1.239e-09	-8.907	-8.907	0.000	(0)
CoCl+	2.175e-10	1.729e-10	-9.662	-9.762	-0.100	(0)
CoOH+	1.772e-10	1.408e-10	-9.751	-9.851	-0.100	(0)
CoF+	9.776e-11	7.769e-11	-10.010	-10.110	-0.100	(0)
Co (OH) 2	3.359e-12	3.359e-12	-11.474	-11.474	0.000	(0)
CoNO2+	1.346e-12	1.070e-12	-11.871	-11.971	-0.100	(0)
Co (NH3) +2	1.677e-14	6.686e-15	-13.776	-14.175	-0.399	(0)
CoSeO4	7.964e-16	7.964e-16	-15.099	-15.099	0.000	(0)
CoNO3+	4.492e-16	3.570e-16	-15.348	-15.447	-0.100	(0)
Co (OH) 3-	2.532e-17	2.012e-17	-16.596	-16.696	-0.100	(0)
CoOOH-	6.357e-18	5.052e-18	-17.197	-17.297	-0.100	(0)
Co2OH+3	1.313e-18	1.660e-19	-17.882	-18.780	-0.898	(0)
Co (NH3) 2+2	1.692e-21	6.745e-22	-20.772	-21.171	-0.399	(0)
Co (NO3) 2	6.958e-24	6.958e-24	-23.158	-23.158	0.000	(0)
Co (OH) 4-2	2.401e-24	9.575e-25	-23.620	-24.019	-0.399	(0)
Co (NH3) 3+2	5.037e-29	2.008e-29	-28.298	-28.697	-0.399	(0)
Co4 (OH) 4+4	3.105e-30	7.853e-32	-29.508	-31.105	-1.597	(0)
Co (NH3) 4+2	6.252e-37	2.493e-37	-36.204	-36.603	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.610	-45.009	-0.399	(0)
Co (3)	8.915e-29					
CoOH+2	8.915e-29	3.555e-29	-28.050	-28.449	-0.399	(0)
Co+3	1.164e-34	2.330e-35	-33.934	-34.633	-0.699	(0)
CoCl+2	2.527e-35	1.008e-35	-34.597	-34.997	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.775	-52.174	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.180	-62.280	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.767	-67.166	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.117	-67.516	-0.399	(0)
Cr (2)	1.437e-26					
Cr+2	1.437e-26	5.729e-27	-25.843	-26.242	-0.399	(0)
Cr (3)	2.109e-09					
Cr (OH) 2+	1.803e-09	1.433e-09	-8.744	-8.844	-0.100	(0)
Cr (OH) 3	1.616e-10	1.616e-10	-9.792	-9.792	0.000	(0)
Cr (OH) +2	9.834e-11	3.921e-11	-10.007	-10.407	-0.399	(0)
CrOHSO4	4.043e-11	4.043e-11	-10.393	-10.393	0.000	(0)
CrO2-	2.883e-12	2.291e-12	-11.540	-11.640	-0.100	(0)
Cr (OH) 4-	2.430e-12	1.931e-12	-11.614	-11.714	-0.100	(0)
CrF+2	2.479e-13	9.886e-14	-12.606	-13.005	-0.399	(0)
CrSO4+	7.621e-14	6.056e-14	-13.118	-13.218	-0.100	(0)
Cr+3	4.724e-14	5.970e-15	-13.326	-14.224	-0.898	(0)
CrCl+2	4.118e-17	1.642e-17	-16.385	-16.785	-0.399	(0)
Cr2 (OH) 2SO4+2	3.593e-19	1.433e-19	-18.445	-18.844	-0.399	(0)
CrOHC12	1.992e-19	1.992e-19	-18.701	-18.701	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.698e-20	3.698e-20	-19.432	-19.432	0.000	(0)

CrCl2+	4.167e-21	3.311e-21	-20.380	-20.480	-0.100	(0)
CrNO3+2	6.269e-24	2.500e-24	-23.203	-23.602	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.106	-43.505	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.083	-52.981	-0.898	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.152	-54.551	-0.399	(0)
Cr (6)	1.464e-15					
CrO4-2	1.339e-15	6.550e-16	-14.873	-15.184	-0.310	(0)
HCrO4-	8.939e-17	7.104e-17	-16.049	-16.149	-0.100	(0)
NaCrO4-	2.776e-17	2.206e-17	-16.557	-16.656	-0.100	(0)
KCrO4-	7.883e-18	6.265e-18	-17.103	-17.203	-0.100	(0)
CrO3SO4-2	7.906e-24	3.153e-24	-23.102	-23.501	-0.399	(0)
H2CrO4	1.930e-24	1.930e-24	-23.714	-23.714	0.000	(0)
CrO3Cl-	4.007e-26	3.185e-26	-25.397	-25.497	-0.100	(0)
Cr2O7-2	4.390e-31	1.751e-31	-30.357	-30.757	-0.399	(0)
Cu (1)	2.380e-10					
CuCl	1.188e-10	1.188e-10	-9.925	-9.925	0.000	(0)
CuCl2-	6.331e-11	5.273e-11	-10.199	-10.278	-0.079	(0)
Cu+	5.585e-11	4.438e-11	-10.253	-10.353	-0.100	(0)
CuCl3-2	4.804e-14	2.396e-14	-13.318	-13.621	-0.302	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.935	-150.298	-0.362	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.683	-151.028	-0.345	(0)
Cu (2)	5.227e-07					
CuCO3	4.140e-07	4.140e-07	-6.383	-6.383	0.000	(0)
Cu+2	4.611e-08	2.256e-08	-7.336	-7.647	-0.310	(0)
CuOH+	2.572e-08	2.142e-08	-7.590	-7.669	-0.079	(0)
CuSO4	2.245e-08	2.245e-08	-7.649	-7.649	0.000	(0)
Cu (CO3) 2-2	8.710e-09	3.473e-09	-8.060	-8.459	-0.399	(0)
CuHCO3+	3.992e-09	3.172e-09	-8.399	-8.499	-0.100	(0)
Cu (OH) 2	1.283e-09	1.283e-09	-8.892	-8.892	0.000	(0)
CuF+	1.872e-10	1.487e-10	-9.728	-9.828	-0.100	(0)
CuCl+	9.123e-11	7.599e-11	-10.040	-10.119	-0.079	(0)
Cu2 (OH) 2+2	2.890e-11	1.152e-11	-10.539	-10.938	-0.399	(0)
CuNO2+	1.919e-11	1.525e-11	-10.717	-10.817	-0.100	(0)
CuNH3+2	1.369e-12	5.460e-13	-11.864	-12.263	-0.399	(0)
Cu (OH) 3-	9.944e-13	7.902e-13	-12.002	-12.102	-0.100	(0)
CuCl2	5.600e-14	5.600e-14	-13.252	-13.252	0.000	(0)
Cu (NO2) 2	1.008e-15	1.008e-15	-14.997	-14.997	0.000	(0)
CuNO3+	8.600e-16	6.834e-16	-15.066	-15.165	-0.100	(0)
Cu (OH) 4-2	4.682e-18	1.867e-18	-17.330	-17.729	-0.399	(0)
CuCl3-	1.333e-18	1.111e-18	-17.875	-17.954	-0.079	(0)
CuCl4-2	2.372e-23	1.183e-23	-22.625	-22.927	-0.302	(0)
Cu (NO3) 2	8.241e-25	8.241e-25	-24.084	-24.084	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.075	-219.175	-0.100	(0)
F	1.501e-04					
F-	1.249e-04	1.045e-04	-3.903	-3.981	-0.078	(0)
MgF+	2.280e-05	1.908e-05	-4.642	-4.720	-0.077	(0)
CaF+	1.767e-06	1.485e-06	-5.753	-5.828	-0.076	(0)
NaF	4.469e-07	4.469e-07	-6.350	-6.350	0.000	(0)
MnF+	8.127e-08	6.830e-08	-7.090	-7.166	-0.076	(0)
AlF3	9.808e-09	9.808e-09	-8.008	-8.008	0.000	(0)
AlF2+	8.843e-09	7.456e-09	-8.053	-8.127	-0.074	(0)
HF	5.180e-09	5.180e-09	-8.286	-8.286	0.000	(0)
ZnF+	3.953e-09	3.141e-09	-8.403	-8.503	-0.100	(0)
BF (OH) 3-	1.323e-09	1.085e-09	-8.879	-8.965	-0.086	(0)
AlF4-	6.138e-10	5.136e-10	-9.212	-9.289	-0.077	(0)
AlF+2	3.547e-10	1.793e-10	-9.450	-9.747	-0.296	(0)
CuF+	1.872e-10	1.487e-10	-9.728	-9.828	-0.100	(0)
NiF+	1.037e-10	8.241e-11	-9.984	-10.084	-0.100	(0)
CoF+	9.776e-11	7.769e-11	-10.010	-10.110	-0.100	(0)
CdF+	6.851e-12	5.444e-12	-11.164	-11.264	-0.100	(0)
HF2-	2.482e-12	2.058e-12	-11.605	-11.687	-0.081	(0)
PbF+	1.337e-12	1.063e-12	-11.874	-11.974	-0.100	(0)
UO2F+	9.442e-13	7.503e-13	-12.025	-12.125	-0.100	(0)
AgF	7.091e-13	7.091e-13	-12.149	-12.149	0.000	(0)
BF2 (OH) 2-	4.955e-13	4.065e-13	-12.305	-12.391	-0.086	(0)
CrF+2	2.479e-13	9.886e-14	-12.606	-13.005	-0.399	(0)
UO2F2	2.261e-13	2.261e-13	-12.646	-12.646	0.000	(0)
UO2F3-	7.467e-15	5.934e-15	-14.127	-14.227	-0.100	(0)

PbF2	2.185e-15	2.185e-15	-14.661	-14.661	0.000	(0)
CdF2	1.135e-15	1.135e-15	-14.945	-14.945	0.000	(0)
H2F2	7.189e-17	7.189e-17	-16.143	-16.143	0.000	(0)
FeF2+	2.040e-17	1.715e-17	-16.690	-16.766	-0.076	(0)
VO2F	1.954e-17	1.954e-17	-16.709	-16.709	0.000	(0)
UO2F4-2	1.235e-17	4.925e-18	-16.908	-17.308	-0.399	(0)
FeF+2	1.230e-17	6.132e-18	-16.910	-17.212	-0.302	(0)
FeF3	2.528e-18	2.528e-18	-17.597	-17.597	0.000	(0)
VO2F2-	9.329e-19	7.414e-19	-18.030	-18.130	-0.100	(0)
BF3OH-	6.755e-19	5.542e-19	-18.170	-18.256	-0.086	(0)
PbF3-	5.449e-19	4.330e-19	-18.264	-18.364	-0.100	(0)
VOF+	3.037e-20	2.414e-20	-19.517	-19.617	-0.100	(0)
VO2F3-2	2.423e-21	9.662e-22	-20.616	-21.015	-0.399	(0)
VOF2	9.457e-22	9.457e-22	-21.024	-21.024	0.000	(0)
HgF+	5.817e-23	4.622e-23	-22.235	-22.335	-0.100	(0)
PbF4-2	5.430e-23	2.165e-23	-22.265	-22.664	-0.399	(0)
BF4-	1.165e-23	9.555e-24	-22.934	-23.020	-0.086	(0)
VOF3-	4.412e-24	3.506e-24	-23.355	-23.455	-0.100	(0)
VO2F4-3	3.931e-25	4.967e-26	-24.405	-25.304	-0.898	(0)
Sb(OH) 2F	1.574e-25	1.574e-25	-24.803	-24.803	0.000	(0)
SbOF	1.548e-25	1.548e-25	-24.810	-24.810	0.000	(0)
VOF4-2	3.708e-27	1.479e-27	-26.431	-26.830	-0.399	(0)
UF3+	9.967e-36	7.921e-36	-35.001	-35.101	-0.100	(0)
UF2+2	1.199e-36	4.783e-37	-35.921	-36.320	-0.399	(0)
UF4	9.074e-38	9.074e-38	-37.042	-37.042	0.000	(0)
UF+3	2.878e-39	3.636e-40	-38.541	-39.439	-0.898	(0)
UF5-	4.728e-40	3.757e-40	-39.325	-39.425	-0.100	(0)
UF6-2	0.000e+00	0.000e+00	-40.527	-40.926	-0.399	(0)
Fe (2)	8.382e-12					
Fe+2	5.804e-12	2.315e-12	-11.236	-11.636	-0.399	(0)
FeSO4	2.468e-12	2.468e-12	-11.608	-11.608	0.000	(0)
FeHCO3+	7.665e-14	6.493e-14	-13.115	-13.188	-0.072	(0)
FeOH+	3.292e-14	2.767e-14	-13.483	-13.558	-0.076	(0)
Fe(OH) 2	6.598e-18	6.598e-18	-17.181	-17.181	0.000	(0)
Fe(OH) 3-	7.454e-19	6.264e-19	-18.128	-18.203	-0.076	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.970	-160.970	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-237.976	-238.075	-0.100	(0)
Fe (3)	1.841e-09					
Fe(OH) 2+	1.437e-09	1.212e-09	-8.842	-8.917	-0.074	(0)
Fe(OH) 3	3.908e-10	3.908e-10	-9.408	-9.408	0.000	(0)
Fe(OH) 4-	1.296e-11	1.093e-11	-10.887	-10.962	-0.074	(0)
FeOH+2	2.081e-14	1.038e-14	-13.682	-13.984	-0.302	(0)
FeF2+	2.040e-17	1.715e-17	-16.690	-16.766	-0.076	(0)
FeF+2	1.230e-17	6.132e-18	-16.910	-17.212	-0.302	(0)
FeSO4+	3.105e-18	2.609e-18	-17.508	-17.583	-0.076	(0)
FeF3	2.528e-18	2.528e-18	-17.597	-17.597	0.000	(0)
Fe(SO4) 2-	3.050e-19	2.424e-19	-18.516	-18.616	-0.100	(0)
Fe+3	2.674e-19	5.353e-20	-18.573	-19.271	-0.699	(0)
FeCl+2	6.889e-21	3.435e-21	-20.162	-20.464	-0.302	(0)
FeCl2+	3.881e-23	3.261e-23	-22.411	-22.487	-0.076	(0)
FeHSeO3+2	2.962e-23	1.181e-23	-22.528	-22.928	-0.399	(0)
Fe2(OH) 2+4	1.410e-25	3.565e-27	-24.851	-26.448	-1.597	(0)
FeNO3+2	1.286e-26	5.127e-27	-25.891	-26.290	-0.399	(0)
FeCl3	6.932e-27	6.932e-27	-26.159	-26.159	0.000	(0)
Fe3(OH) 4+5	1.955e-32	6.245e-35	-31.709	-34.204	-2.495	(0)
H (0)	2.544e-29					
H2	1.272e-29	1.283e-29	-28.895	-28.892	0.004	(0)
Hg (0)	1.777e-09					
Hg	1.777e-09	1.777e-09	-8.750	-8.750	0.000	(0)
Hg (1)	7.223e-20					
Hg2+2	3.611e-20	1.440e-20	-19.442	-19.842	-0.399	(0)
Hg (2)	2.576e-11					
HgClOH	1.345e-11	1.345e-11	-10.871	-10.871	0.000	(0)
Hg(OH) 2	6.728e-12	6.788e-12	-11.172	-11.168	0.004	(0)
HgCl2	5.391e-12	5.391e-12	-11.268	-11.268	0.000	(0)
HgCl3-	1.442e-13	1.146e-13	-12.841	-12.941	-0.100	(0)
HgCO3	4.452e-14	4.452e-14	-13.351	-13.351	0.000	(0)
HgCl4-2	2.431e-15	9.694e-16	-14.614	-15.014	-0.399	(0)

	Hg (CO3) 2-2	1.100e-15	4.388e-16	-14.958	-15.358	-0.399	(0)
	HgCl+	6.368e-16	5.061e-16	-15.196	-15.296	-0.100	(0)
	HgOH+	1.795e-16	1.426e-16	-15.746	-15.846	-0.100	(0)
	HgHCO3+	3.496e-17	2.778e-17	-16.456	-16.556	-0.100	(0)
	Hg (OH) 3-	3.229e-19	2.566e-19	-18.491	-18.591	-0.100	(0)
	Hg (NH3) 2+2	1.056e-19	4.212e-20	-18.976	-19.375	-0.399	(0)
	HgNH3+2	4.466e-20	1.781e-20	-19.350	-19.749	-0.399	(0)
	Hg+2	2.993e-20	1.193e-20	-19.524	-19.923	-0.399	(0)
	HgSO4	1.357e-20	1.357e-20	-19.867	-19.867	0.000	(0)
	HgF+	5.817e-23	4.622e-23	-22.235	-22.335	-0.100	(0)
	Hg (NH3) 3+2	9.946e-28	3.966e-28	-27.002	-27.402	-0.399	(0)
	HgNO3+	5.312e-29	4.221e-29	-28.275	-28.375	-0.100	(0)
	Hg (NH3) 4+2	1.869e-35	7.451e-36	-34.729	-35.128	-0.399	(0)
	Hg (NO3) 2	1.681e-37	1.681e-37	-36.775	-36.775	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.705	-138.805	-0.100	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.639	-140.038	-0.399	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.886	-139.886	0.000	(0)
K	3.172e-03						
	K+	3.078e-03	2.574e-03	-2.512	-2.589	-0.078	(0)
	KSO4-	9.391e-05	7.918e-05	-4.027	-4.101	-0.074	(0)
	KCrO4-	7.883e-18	6.265e-18	-17.103	-17.203	-0.100	(0)
Mg	4.684e-03						
	Mg+2	3.326e-03	1.627e-03	-2.478	-2.789	-0.310	(0)
	MgSO4	1.286e-03	1.286e-03	-2.891	-2.891	0.000	(0)
	MgHCO3+	4.455e-05	3.711e-05	-4.351	-4.431	-0.079	(0)
	MgF+	2.280e-05	1.908e-05	-4.642	-4.720	-0.077	(0)
	MgCO3	4.218e-06	4.218e-06	-5.375	-5.375	0.000	(0)
	MgOH+	2.287e-07	1.945e-07	-6.641	-6.711	-0.070	(0)
	MgH2BO3+	3.102e-08	2.544e-08	-7.508	-7.594	-0.086	(0)
Mn (2)	5.488e-05						
	Mn+2	4.117e-05	1.642e-05	-4.385	-4.785	-0.399	(0)
	MnSO4	1.268e-05	1.268e-05	-4.897	-4.897	0.000	(0)
	MnHCO3+	8.687e-07	7.300e-07	-6.061	-6.137	-0.076	(0)
	MnF+	8.127e-08	6.830e-08	-7.090	-7.166	-0.076	(0)
	MnCl+	5.228e-08	4.393e-08	-7.282	-7.357	-0.076	(0)
	MnOH+	1.473e-08	1.238e-08	-7.832	-7.907	-0.076	(0)
	MnCl2	1.319e-10	1.319e-10	-9.880	-9.880	0.000	(0)
	MnNO3+	3.137e-13	2.493e-13	-12.503	-12.603	-0.100	(0)
	MnSeO4	2.987e-13	2.987e-13	-12.525	-12.525	0.000	(0)
	MnCl3-	9.186e-14	7.720e-14	-13.037	-13.112	-0.076	(0)
	Mn (OH) 3-	8.209e-18	6.898e-18	-17.086	-17.161	-0.076	(0)
	Mn (NO3) 2	5.998e-21	5.998e-21	-20.222	-20.222	0.000	(0)
	Mn (OH) 4-2	1.341e-23	6.687e-24	-22.873	-23.175	-0.302	(0)
	MnSe	0.000e+00	0.000e+00	-42.137	-42.137	0.000	(0)
Mn (3)	9.120e-25						
	Mn+3	9.120e-25	1.826e-25	-24.040	-24.739	-0.699	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.523	-41.826	-0.302	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-45.718	-45.801	-0.084	(0)
Mo	1.775e-06						
	MoO4-2	1.775e-06	8.683e-07	-5.751	-6.061	-0.310	(0)
	HMoO4-	7.287e-10	5.791e-10	-9.137	-9.237	-0.100	(0)
	H2MoO4	1.422e-13	1.422e-13	-12.847	-12.847	0.000	(0)
	Ag2MoO4	2.399e-24	2.399e-24	-23.620	-23.620	0.000	(0)
	AlMo6O21-3	8.121e-39	1.026e-39	-38.090	-38.989	-0.898	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-45.643	-49.236	-3.594	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-47.829	-50.324	-2.495	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.420	-53.017	-1.597	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.347	-57.245	-0.898	(0)
N (-3)	1.796e-07						
	NH4+	1.695e-07	1.390e-07	-6.771	-6.857	-0.086	(0)
	NH4SO4-	7.702e-09	6.473e-09	-8.113	-8.189	-0.076	(0)
	NH3	2.365e-09	2.365e-09	-8.626	-8.626	0.000	(0)
	CaNH3+2	9.724e-12	3.878e-12	-11.012	-11.411	-0.399	(0)
	CuNH3+2	1.369e-12	5.460e-13	-11.864	-12.263	-0.399	(0)
	NiNH3+2	1.000e-13	3.988e-14	-13.000	-13.399	-0.399	(0)
	Co (NH3) +2	1.677e-14	6.686e-15	-13.776	-14.175	-0.399	(0)

AgNH3+	1.642e-14	1.305e-14	-13.785	-13.884	-0.100	(0)
BaNH3+2	1.501e-16	5.986e-17	-15.824	-16.223	-0.399	(0)
Ag (NH3) 2+	3.156e-19	2.508e-19	-18.501	-18.601	-0.100	(0)
Hg (NH3) 2+2	1.056e-19	4.212e-20	-18.976	-19.375	-0.399	(0)
HgNH3+2	4.466e-20	1.781e-20	-19.350	-19.749	-0.399	(0)
Ni (NH3) 2+2	3.419e-20	1.363e-20	-19.466	-19.865	-0.399	(0)
Ca (NH3) 2+2	9.156e-21	3.651e-21	-20.038	-20.438	-0.399	(0)
Co (NH3) 2+2	1.692e-21	6.745e-22	-20.772	-21.171	-0.399	(0)
Hg (NH3) 3+2	9.946e-28	3.966e-28	-27.002	-27.402	-0.399	(0)
Co (NH3) 3+2	5.037e-29	2.008e-29	-28.298	-28.697	-0.399	(0)
Hg (NH3) 4+2	1.869e-35	7.451e-36	-34.729	-35.128	-0.399	(0)
Co (NH3) 4+2	6.252e-37	2.493e-37	-36.204	-36.603	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.106	-43.505	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.610	-45.009	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.775	-52.174	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.083	-52.981	-0.898	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.152	-54.551	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.180	-62.280	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.767	-67.166	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.117	-67.516	-0.399	(0)
N (3)	7.828e-06					
NO2-	7.828e-06	6.456e-06	-5.106	-5.190	-0.084	(0)
CuNO2+	1.919e-11	1.525e-11	-10.717	-10.817	-0.100	(0)
AgNO2	3.644e-12	3.644e-12	-11.438	-11.438	0.000	(0)
CoNO2+	1.346e-12	1.070e-12	-11.871	-11.971	-0.100	(0)
Cu (NO2) 2	1.008e-15	1.008e-15	-14.997	-14.997	0.000	(0)
Ag (NO2) 2-	4.586e-17	3.644e-17	-16.339	-16.438	-0.100	(0)
N (5)	1.150e-08					
NO3-	1.145e-08	9.579e-09	-7.941	-8.019	-0.078	(0)
CaNO3+	4.964e-11	3.945e-11	-10.304	-10.404	-0.100	(0)
MnNO3+	3.137e-13	2.493e-13	-12.503	-12.603	-0.100	(0)
ZnNO3+	4.563e-14	3.626e-14	-13.341	-13.441	-0.100	(0)
BaNO3+	2.423e-15	1.926e-15	-14.616	-14.715	-0.100	(0)
NiNO3+	9.508e-16	7.556e-16	-15.022	-15.122	-0.100	(0)
CuNO3+	8.600e-16	6.834e-16	-15.066	-15.165	-0.100	(0)
CoNO3+	4.492e-16	3.570e-16	-15.348	-15.447	-0.100	(0)
CdNO3+	1.253e-16	9.959e-17	-15.902	-16.002	-0.100	(0)
PbNO3+	2.573e-17	2.045e-17	-16.590	-16.689	-0.100	(0)
AgNO3	2.056e-17	2.056e-17	-16.687	-16.687	0.000	(0)
Mn (NO3) 2	5.998e-21	5.998e-21	-20.222	-20.222	0.000	(0)
UO2NO3+	1.251e-21	9.943e-22	-20.903	-21.002	-0.100	(0)
Zn (NO3) 2	6.930e-23	6.930e-23	-22.159	-22.159	0.000	(0)
Co (NO3) 2	6.958e-24	6.958e-24	-23.158	-23.158	0.000	(0)
CrNO3+2	6.269e-24	2.500e-24	-23.203	-23.602	-0.399	(0)
Cu (NO3) 2	8.241e-25	8.241e-25	-24.084	-24.084	0.000	(0)
VO2NO3	5.167e-25	5.167e-25	-24.287	-24.287	0.000	(0)
Cd (NO3) 2	4.781e-25	4.781e-25	-24.320	-24.320	0.000	(0)
Pb (NO3) 2	3.327e-25	3.327e-25	-24.478	-24.478	0.000	(0)
FeNO3+2	1.286e-26	5.127e-27	-25.891	-26.290	-0.399	(0)
HgNO3+	5.312e-29	4.221e-29	-28.275	-28.375	-0.100	(0)
Hg (NO3) 2	1.681e-37	1.681e-37	-36.775	-36.775	0.000	(0)
Na	8.302e-03					
Na+	8.105e-03	6.778e-03	-2.091	-2.169	-0.078	(0)
NaSO4-	1.876e-04	1.581e-04	-3.727	-3.801	-0.074	(0)
NaHCO3	8.494e-06	8.494e-06	-5.071	-5.071	0.000	(0)
NaCO3-	4.666e-07	3.934e-07	-6.331	-6.405	-0.074	(0)
NaF	4.469e-07	4.469e-07	-6.350	-6.350	0.000	(0)
NaH2BO3	4.845e-09	4.845e-09	-8.315	-8.315	0.000	(0)
NaCrO4-	2.776e-17	2.206e-17	-16.557	-16.656	-0.100	(0)
Ni	1.064e-07					
Ni+2	6.418e-08	3.140e-08	-7.193	-7.503	-0.310	(0)
NiSO4	2.722e-08	2.722e-08	-7.565	-7.565	0.000	(0)
NiHCO3+	1.086e-08	8.626e-09	-7.964	-8.064	-0.100	(0)
NiCO3	3.651e-09	3.651e-09	-8.438	-8.438	0.000	(0)
NiCl+	2.149e-10	1.707e-10	-9.668	-9.768	-0.100	(0)
NiOH+	1.494e-10	1.187e-10	-9.826	-9.926	-0.100	(0)
NiF+	1.037e-10	8.241e-11	-9.984	-10.084	-0.100	(0)
Ni (SO4) 2-2	9.819e-12	3.916e-12	-11.008	-11.407	-0.399	(0)

Ni (OH) 2	2.830e-12	2.830e-12	-11.548	-11.548	0.000	(0)
NiNH3+2	1.000e-13	3.988e-14	-13.000	-13.399	-0.399	(0)
NiCl2	1.827e-15	1.827e-15	-14.738	-14.738	0.000	(0)
Ni (OH) 3-	1.069e-15	8.498e-16	-14.971	-15.071	-0.100	(0)
NiSeO4	9.926e-16	9.926e-16	-15.003	-15.003	0.000	(0)
NiNO3+	9.508e-16	7.556e-16	-15.022	-15.122	-0.100	(0)
Ni (NH3) 2+2	3.419e-20	1.363e-20	-19.466	-19.865	-0.399	(0)
O (0)	6.094e-35					
O2	3.047e-35	3.074e-35	-34.516	-34.512	0.004	(0)
Pb	2.459e-09					
PbCO3	1.352e-09	1.352e-09	-8.869	-8.869	0.000	(0)
PbSO4	3.071e-10	3.071e-10	-9.513	-9.513	0.000	(0)
PbHCO3+	3.007e-10	2.390e-10	-9.522	-9.622	-0.100	(0)
Pb+2	2.950e-10	1.443e-10	-9.530	-9.841	-0.310	(0)
PbOH+	1.370e-10	1.088e-10	-9.863	-9.963	-0.100	(0)
Pb (CO3) 2-2	3.048e-11	1.216e-11	-10.516	-10.915	-0.399	(0)
Pb (SO4) 2-2	2.016e-11	8.039e-12	-10.696	-11.095	-0.399	(0)
PbCl+	1.369e-11	1.088e-11	-10.863	-10.963	-0.100	(0)
PbF+	1.337e-12	1.063e-12	-11.874	-11.974	-0.100	(0)
Pb (OH) 2	1.033e-12	1.033e-12	-11.986	-11.986	0.000	(0)
PbCl2	1.033e-13	1.033e-13	-12.986	-12.986	0.000	(0)
PbF2	2.185e-15	2.185e-15	-14.661	-14.661	0.000	(0)
Pb (OH) 3-	3.904e-16	3.103e-16	-15.408	-15.508	-0.100	(0)
PbCl3-	1.100e-16	8.741e-17	-15.959	-16.058	-0.100	(0)
PbNO3+	2.573e-17	2.045e-17	-16.590	-16.689	-0.100	(0)
Pb2OH+3	1.970e-18	2.489e-19	-17.706	-18.604	-0.898	(0)
PbF3-	5.449e-19	4.330e-19	-18.264	-18.364	-0.100	(0)
PbCl4-2	2.130e-19	8.492e-20	-18.672	-19.071	-0.399	(0)
Pb (OH) 4-2	5.721e-20	2.281e-20	-19.243	-19.642	-0.399	(0)
PbF4-2	5.430e-23	2.165e-23	-22.265	-22.664	-0.399	(0)
Pb3 (OH) 4+2	7.711e-24	3.075e-24	-23.113	-23.512	-0.399	(0)
Pb (NO3) 2	3.327e-25	3.327e-25	-24.478	-24.478	0.000	(0)
Pb4 (OH) 4+4	1.394e-28	3.525e-30	-27.856	-29.453	-1.597	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.855	-152.855	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.598	-230.698	-0.100	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.896	-73.896	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.042	-79.142	-0.100	(0)
CdHS+	0.000e+00	0.000e+00	-79.518	-79.617	-0.100	(0)
H2S	0.000e+00	0.000e+00	-79.597	-79.597	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.633	-81.033	-0.399	(0)
S6-2	0.000e+00	0.000e+00	-81.149	-81.549	-0.399	(0)
S4-2	0.000e+00	0.000e+00	-81.229	-81.628	-0.399	(0)
S3-2	0.000e+00	0.000e+00	-82.035	-82.434	-0.399	(0)
S2-2	0.000e+00	0.000e+00	-83.051	-83.450	-0.399	(0)
S-2	0.000e+00	0.000e+00	-88.665	-88.968	-0.302	(0)
HgHS2-	0.000e+00	0.000e+00	-138.705	-138.805	-0.100	(0)
HgS2-2	0.000e+00	0.000e+00	-139.639	-140.038	-0.399	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.886	-139.886	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.744	-148.947	-0.203	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.839	-148.938	-0.100	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.722	-149.822	-0.100	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.935	-150.298	-0.362	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.540	-150.912	-0.372	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.683	-151.028	-0.345	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.870	-151.223	-0.353	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.287	-151.287	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.556	-151.556	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.855	-152.855	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.970	-160.970	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.075	-219.175	-0.100	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.049	-227.149	-0.100	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.698	-228.798	-0.100	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.255	-229.654	-0.399	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.598	-230.698	-0.100	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.976	-238.075	-0.100	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-305.345	-305.744	-0.399	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.352	-307.751	-0.399	(0)

Sb2S4-2	0.000e+00	0.000e+00	-320.812	-321.211	-0.399	(0)
S (6)	1.176e-02					
SO4-2	8.880e-03	4.345e-03	-2.052	-2.362	-0.310	(0)
CaSO4	1.296e-03	1.296e-03	-2.887	-2.887	0.000	(0)
MgSO4	1.286e-03	1.286e-03	-2.891	-2.891	0.000	(0)
NaSO4-	1.876e-04	1.581e-04	-3.727	-3.801	-0.074	(0)
KSO4-	9.391e-05	7.918e-05	-4.027	-4.101	-0.074	(0)
MnSO4	1.268e-05	1.268e-05	-4.897	-4.897	0.000	(0)
ZnSO4	1.432e-06	1.432e-06	-5.844	-5.844	0.000	(0)
Zn (SO4) 2-2	1.359e-07	5.419e-08	-6.867	-7.266	-0.399	(0)
NiSO4	2.722e-08	2.722e-08	-7.565	-7.565	0.000	(0)
CuSO4	2.245e-08	2.245e-08	-7.649	-7.649	0.000	(0)
CoSO4	2.038e-08	2.038e-08	-7.691	-7.691	0.000	(0)
HSO4-	1.701e-08	1.423e-08	-7.769	-7.847	-0.077	(0)
NH4SO4-	7.702e-09	6.473e-09	-8.113	-8.189	-0.076	(0)
CdSO4	3.348e-09	3.348e-09	-8.475	-8.475	0.000	(0)
Cd (SO4) 2-2	4.921e-10	1.962e-10	-9.308	-9.707	-0.399	(0)
PbSO4	3.071e-10	3.071e-10	-9.513	-9.513	0.000	(0)
AgSO4-	2.947e-10	2.342e-10	-9.531	-9.630	-0.100	(0)
CrOHSO4	4.043e-11	4.043e-11	-10.393	-10.393	0.000	(0)
Pb (SO4) 2-2	2.016e-11	8.039e-12	-10.696	-11.095	-0.399	(0)
Ni (SO4) 2-2	9.819e-12	3.916e-12	-11.008	-11.407	-0.399	(0)
AlSO4+	6.915e-12	5.786e-12	-11.160	-11.238	-0.077	(0)
FeSO4	2.468e-12	2.468e-12	-11.608	-11.608	0.000	(0)
UO2SO4	3.421e-13	3.421e-13	-12.466	-12.466	0.000	(0)
Al (SO4) 2-	3.219e-13	2.693e-13	-12.492	-12.570	-0.077	(0)
CrSO4+	7.621e-14	6.056e-14	-13.118	-13.218	-0.100	(0)
UO2 (SO4) 2-2	4.913e-14	1.959e-14	-13.309	-13.708	-0.399	(0)
VO2SO4-	1.392e-17	1.106e-17	-16.856	-16.956	-0.100	(0)
FeSO4+	3.105e-18	2.609e-18	-17.508	-17.583	-0.076	(0)
Cr2 (OH) 2SO4+2	3.593e-19	1.433e-19	-18.445	-18.844	-0.399	(0)
Fe (SO4) 2-	3.050e-19	2.424e-19	-18.516	-18.616	-0.100	(0)
VOSO4	4.609e-20	4.609e-20	-19.336	-19.336	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.698e-20	3.698e-20	-19.432	-19.432	0.000	(0)
HgSO4	1.357e-20	1.357e-20	-19.867	-19.867	0.000	(0)
CrO3SO4-2	7.906e-24	3.153e-24	-23.102	-23.501	-0.399	(0)
VSO4+	2.229e-34	1.771e-34	-33.652	-33.752	-0.100	(0)
U (SO4) 2	1.041e-39	1.041e-39	-38.983	-38.983	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.121	-40.520	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.180	-62.280	-0.100	(0)
Sb (3)	5.683e-20					
Sb (OH) 3	2.875e-20	2.875e-20	-19.541	-19.541	0.000	(0)
HSbO2	2.808e-20	2.808e-20	-19.552	-19.552	0.000	(0)
SbO2-	1.707e-24	1.357e-24	-23.768	-23.867	-0.100	(0)
Sb (OH) 4-	9.773e-25	7.766e-25	-24.010	-24.110	-0.100	(0)
Sb (OH) 2F	1.574e-25	1.574e-25	-24.803	-24.803	0.000	(0)
SbOF	1.548e-25	1.548e-25	-24.810	-24.810	0.000	(0)
Sb (OH) 2+	2.946e-26	2.341e-26	-25.531	-25.631	-0.100	(0)
SbO+	1.016e-26	8.076e-27	-25.993	-26.093	-0.100	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.812	-321.211	-0.399	(0)
Sb (5)	2.496e-08					
SbO3-	2.493e-08	1.981e-08	-7.603	-7.703	-0.100	(0)
Sb (OH) 6-	2.766e-11	2.313e-11	-10.558	-10.636	-0.078	(0)
SbO2+	8.037e-24	6.387e-24	-23.095	-23.195	-0.100	(0)
Se (-2)	6.407e-15					
Ag2Se	6.407e-15	6.407e-15	-14.193	-14.193	0.000	(0)
HSe-	4.544e-40	3.611e-40	-39.343	-39.442	-0.100	(0)
MnSe	0.000e+00	0.000e+00	-42.137	-42.137	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.027	-43.027	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.568	-46.968	-0.399	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.941	-85.538	-1.597	(0)
Se (4)	1.300e-07					
HSeO3-	1.051e-07	8.351e-08	-6.978	-7.078	-0.100	(0)
SeO3-2	2.487e-08	9.919e-09	-7.604	-8.004	-0.399	(0)
H2SeO3	1.194e-12	1.194e-12	-11.923	-11.923	0.000	(0)
AgSeO3-	2.167e-14	1.722e-14	-13.664	-13.764	-0.100	(0)
Cd (SeO3) 2-2	6.684e-19	2.666e-19	-18.175	-18.574	-0.399	(0)
Ag (SeO3) 2-3	1.210e-20	1.530e-21	-19.917	-20.815	-0.898	(0)

FeHSeO3+2	2.962e-23	1.181e-23	-22.528	-22.928	-0.399	(0)
Se (6)	1.385e-10					
SeO4-2	1.381e-10	6.758e-11	-9.860	-10.170	-0.310	(0)
MnSeO4	2.987e-13	2.987e-13	-12.525	-12.525	0.000	(0)
ZnSeO4	1.577e-14	1.577e-14	-13.802	-13.802	0.000	(0)
NiSeO4	9.926e-16	9.926e-16	-15.003	-15.003	0.000	(0)
CoSeO4	7.964e-16	7.964e-16	-15.099	-15.099	0.000	(0)
HSeO4-	1.429e-16	1.135e-16	-15.845	-15.945	-0.100	(0)
CdSeO4	4.137e-17	4.137e-17	-16.383	-16.383	0.000	(0)
Zn (SeO4) 2-2	2.710e-24	1.081e-24	-23.567	-23.966	-0.399	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.052	-58.950	-0.898	(0)
U (4)	3.929e-21					
U (OH) 5-	3.924e-21	3.118e-21	-20.406	-20.506	-0.100	(0)
U (OH) 4	4.380e-24	4.380e-24	-23.359	-23.359	0.000	(0)
U (OH) 3+	6.758e-28	5.370e-28	-27.170	-27.270	-0.100	(0)
U (OH) 2+2	2.088e-32	8.328e-33	-31.680	-32.079	-0.399	(0)
UF3+	9.967e-36	7.921e-36	-35.001	-35.101	-0.100	(0)
UF2+2	1.199e-36	4.783e-37	-35.921	-36.320	-0.399	(0)
UOH+3	1.041e-37	1.315e-38	-36.983	-37.881	-0.898	(0)
UF4	9.074e-38	9.074e-38	-37.042	-37.042	0.000	(0)
UF+3	2.878e-39	3.636e-40	-38.541	-39.439	-0.898	(0)
U (SO4) 2	1.041e-39	1.041e-39	-38.983	-38.983	0.000	(0)
UF5-	4.728e-40	3.757e-40	-39.325	-39.425	-0.100	(0)
USO4+2	0.000e+00	0.000e+00	-40.121	-40.520	-0.399	(0)
UF6-2	0.000e+00	0.000e+00	-40.527	-40.926	-0.399	(0)
U+4	0.000e+00	0.000e+00	-43.161	-44.758	-1.597	(0)
UC1+3	0.000e+00	0.000e+00	-44.833	-45.731	-0.898	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.503	-173.588	-8.085	(0)
U (5)	1.603e-16					
UO2+	1.603e-16	1.274e-16	-15.795	-15.895	-0.100	(0)
U (6)	3.493e-07					
UO2 (CO3) 3-4	2.480e-07	6.271e-09	-6.606	-8.203	-1.597	(0)
UO2 (CO3) 2-2	1.007e-07	4.014e-08	-6.997	-7.396	-0.399	(0)
UO2CO3	6.455e-10	6.455e-10	-9.190	-9.190	0.000	(0)
UO2OH+	2.474e-12	1.966e-12	-11.607	-11.706	-0.100	(0)
UO2F+	9.442e-13	7.503e-13	-12.025	-12.125	-0.100	(0)
UO2SO4	3.421e-13	3.421e-13	-12.466	-12.466	0.000	(0)
UO2F2	2.261e-13	2.261e-13	-12.646	-12.646	0.000	(0)
UO2+2	1.063e-13	5.202e-14	-12.973	-13.284	-0.310	(0)
UO2 (SO4) 2-2	4.913e-14	1.959e-14	-13.309	-13.708	-0.399	(0)
UO2F3-	7.467e-15	5.934e-15	-14.127	-14.227	-0.100	(0)
UO2C1+	2.256e-16	1.793e-16	-15.647	-15.746	-0.100	(0)
(UO2) 2 (OH) 2+2	1.609e-17	6.416e-18	-16.793	-17.193	-0.399	(0)
UO2F4-2	1.235e-17	4.925e-18	-16.908	-17.308	-0.399	(0)
(UO2) 3 (OH) 5+	1.086e-18	8.627e-19	-17.964	-18.064	-0.100	(0)
UO2NO3+	1.251e-21	9.943e-22	-20.903	-21.002	-0.100	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.682	-42.782	-0.100	(0)
V+2	0.000e+00	0.000e+00	-43.370	-43.770	-0.399	(0)
V (3)	1.886e-15					
V (OH) 3	1.886e-15	1.886e-15	-14.725	-14.725	0.000	(0)
V (OH) 2+	5.142e-26	4.086e-26	-25.289	-25.389	-0.100	(0)
VOH+2	3.259e-29	1.300e-29	-28.487	-28.886	-0.399	(0)
V+3	6.835e-34	8.637e-35	-33.165	-34.064	-0.898	(0)
VSO4+	2.229e-34	1.771e-34	-33.652	-33.752	-0.100	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.925	-55.823	-0.898	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.375	-56.972	-1.597	(0)
V (4)	3.076e-18					
V (OH) 3+	2.902e-18	2.306e-18	-17.537	-17.637	-0.100	(0)
VO+2	9.659e-20	3.852e-20	-19.015	-19.414	-0.399	(0)
VOSO4	4.609e-20	4.609e-20	-19.336	-19.336	0.000	(0)
VOF+	3.037e-20	2.414e-20	-19.517	-19.617	-0.100	(0)
VOF2	9.457e-22	9.457e-22	-21.024	-21.024	0.000	(0)
VOC1+	2.890e-22	2.296e-22	-21.539	-21.639	-0.100	(0)
VOF3-	4.412e-24	3.506e-24	-23.355	-23.455	-0.100	(0)
VOF4-2	3.708e-27	1.479e-27	-26.431	-26.830	-0.399	(0)
H2V2O4+2	6.691e-31	2.668e-31	-30.175	-30.574	-0.399	(0)

V(5)	6.874e-09					
H2VO4-	5.980e-09	4.752e-09	-8.223	-8.323	-0.100	(0)
HVO4-2	8.930e-10	3.561e-10	-9.049	-9.448	-0.399	(0)
H3VO4	1.593e-12	1.593e-12	-11.798	-11.798	0.000	(0)
H3V2O7-	6.153e-14	4.889e-14	-13.211	-13.311	-0.100	(0)
HV2O7-3	4.540e-15	5.737e-16	-14.343	-15.241	-0.898	(0)
VO4-3	4.214e-16	5.325e-17	-15.375	-16.274	-0.898	(0)
VO2+	1.275e-16	1.066e-16	-15.894	-15.972	-0.078	(0)
VO2F	1.954e-17	1.954e-17	-16.709	-16.709	0.000	(0)
V2O7-4	1.822e-17	4.607e-19	-16.739	-18.337	-1.597	(0)
VO2SO4-	1.392e-17	1.106e-17	-16.856	-16.956	-0.100	(0)
VO2F2-	9.329e-19	7.414e-19	-18.030	-18.130	-0.100	(0)
V3O9-3	8.906e-19	1.125e-19	-18.050	-18.949	-0.898	(0)
VO2F3-2	2.423e-21	9.662e-22	-20.616	-21.015	-0.399	(0)
V4O12-4	8.822e-24	2.231e-25	-23.054	-24.652	-1.597	(0)
VO2NO3	5.167e-25	5.167e-25	-24.287	-24.287	0.000	(0)
VO2F4-3	3.931e-25	4.967e-26	-24.405	-25.304	-0.898	(0)
V10O28-6	0.000e+00	0.000e+00	-60.628	-64.222	-3.594	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.014	-63.510	-2.495	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.180	-65.777	-1.597	(0)
Zn	5.128e-06					
Zn+2	3.080e-06	1.507e-06	-5.511	-5.822	-0.310	(0)
ZnSO4	1.432e-06	1.432e-06	-5.844	-5.844	0.000	(0)
ZnCO3	2.703e-07	2.703e-07	-6.568	-6.568	0.000	(0)
Zn(SO4) 2-2	1.359e-07	5.419e-08	-6.867	-7.266	-0.399	(0)
ZnHCO3+	1.336e-07	1.062e-07	-6.874	-6.974	-0.100	(0)
ZnOH+	5.693e-08	4.524e-08	-7.245	-7.344	-0.100	(0)
ZnCl+	9.658e-09	8.044e-09	-8.015	-8.095	-0.079	(0)
ZnF+	3.953e-09	3.141e-09	-8.403	-8.503	-0.100	(0)
ZnOHCl	3.162e-09	3.162e-09	-8.500	-8.500	0.000	(0)
Zn(OH) 2	2.153e-09	2.153e-09	-8.667	-8.667	0.000	(0)
ZnCl2	2.710e-11	2.710e-11	-10.567	-10.567	0.000	(0)
Zn(OH) 3-	4.076e-12	3.239e-12	-11.390	-11.490	-0.100	(0)
ZnCl3-	5.492e-14	4.574e-14	-13.260	-13.340	-0.079	(0)
ZnNO3+	4.563e-14	3.626e-14	-13.341	-13.441	-0.100	(0)
ZnSeO4	1.577e-14	1.577e-14	-13.802	-13.802	0.000	(0)
ZnCl4-2	9.748e-17	4.861e-17	-16.011	-16.313	-0.302	(0)
Zn(OH) 4-2	9.710e-17	3.872e-17	-16.013	-16.412	-0.399	(0)
Zn(NO3) 2	6.930e-23	6.930e-23	-22.159	-22.159	0.000	(0)
Zn(SeO4) 2-2	2.710e-24	1.081e-24	-23.567	-23.966	-0.399	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.722	-149.822	-0.100	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.287	-151.287	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.049	-227.149	-0.100	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.255	-229.654	-0.399	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.352	-307.751	-0.399	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-56.54	-50.25	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-44.07	-39.56	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.30	-39.56	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-72.92	-54.98	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-58.97	-38.94	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.30	-28.90	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.33	-23.88	0.45	(NH4)2SeO4
Acanthite	-52.58	-88.80	-36.22	Ag2S
Ag2CO3	-11.55	-22.64	-11.09	Ag2CO3
Ag2CrO4	-20.73	-32.32	-11.59	Ag2CrO4
Ag2HVO4	-12.17	-10.69	1.48	Ag2HVO4
Ag2MoO4	-11.65	-23.20	-11.55	Ag2MoO4
Ag2O	-14.76	-2.19	12.57	Ag2O
Ag2Se	-0.40	-49.10	-48.70	Ag2Se
Ag2SeO3	-9.59	-16.74	-7.15	Ag2SeO3
Ag2SeO4	-18.40	-27.31	-8.91	Ag2SeO4
Ag2SO4	-14.68	-19.50	-4.82	Ag2SO4
Ag3AsO3	-28.13	-25.97	2.16	Ag3AsO3

Ag3AsO4	-16.34	-19.13	-2.79	Ag3AsO4
Ag3H2VO5	-16.96	-11.78	5.18	Ag3H2VO5
AgF·4H2O	-13.60	-12.55	1.05	AgF·4H2O
Agmetal	-0.46	-13.96	-13.51	Ag
AgVO3	-10.36	-9.59	0.77	AgVO3
Al (OH) 3 (am)	-1.14	9.66	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.08	-43.72	2.37	Al2 (MoO4) 3
Al2O3	-0.34	19.32	19.65	Al2O3
Al4 (OH) 10SO4	-1.38	21.32	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.99	-6.19	4.80	AlAsO4·2H2O
AlOHSO4	-4.42	-7.65	-3.23	AlOHSO4
AlSb	-152.73	-87.11	65.62	AlSb
Alunite	0.64	-0.76	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.41	-12.20	-7.79	PbSO4
Anhydrite	-0.89	-5.25	-4.36	CaSO4
Anilite	-57.23	-89.11	-31.88	Cu0.25Cu1.5S
Antlerite	-4.19	4.60	8.79	Cu3 (OH) 4SO4
Aragonite	-0.09	-8.39	-8.30	CaCO3
Arsenolite	-88.01	-90.77	-2.76	As4O6
Artinite	-5.74	3.86	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.40	-31.70	6.71	As2O5
Atacamite	-2.93	4.46	7.39	Cu2 (OH) 3Cl
Azurite	-2.10	-19.00	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.84	7.55	24.39	Ba (OH) 2:8H2O
Ba2V2O7·2H2O	-17.76	-1.89	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-0.13	-9.04	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.28	5.66	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-9.54	-15.36	-5.82	BaF2
BaMoO4	-6.50	-13.46	-6.96	BaMoO4
Barite	0.22	-9.76	-9.98	BaSO4
BaS	-95.24	-79.06	16.18	BaS
BaSeO3	-8.83	-7.00	1.83	BaSeO3
BaSeO4	-10.11	-17.57	-7.46	BaSeO4
Bianchite	-6.42	-8.19	-1.76	ZnSO4·6H2O
Birnessite	-7.54	10.56	18.09	MnO2
Bixbyite	-3.99	-4.63	-0.64	Mn2O3
BlaubleiI	-56.46	-80.62	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.26	-84.54	-27.28	Cu0.6Cu0.8S
Boehmite	1.08	9.66	8.58	AlOOH
Breithauptite	-57.93	-76.45	-18.52	NiSb
Brochantite	-3.32	11.90	15.22	Cu4 (OH) 6SO4
Brucite	-4.68	12.16	16.84	Mg (OH) 2
Bunsenite	-5.00	7.45	12.45	NiO
Ca (VO3) 2	-10.59	-4.93	5.66	Ca (VO3) 2
Ca2V2O7	-10.37	7.13	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.42	7.13	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2:4H2O	-17.81	4.49	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.76	19.20	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.66	19.20	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.31	-157.34	142.97	Ca3Sb2
CaCrO4	-15.80	-18.07	-2.27	CaCrO4
Calcite	0.09	-8.39	-8.48	CaCO3
Calomel	-7.28	-25.19	-17.91	Hg2Cl2
CaMoO4	-1.00	-8.95	-7.95	CaMoO4
Carnotite	-2.18	-1.95	0.23	KUO2VO4
CaSeO3·2H2O	-5.30	-2.49	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-10.04	-13.06	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-12.54	-2.70	9.84	Cd (BO2) 2
Cd (OH) 2	-7.18	6.47	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.26	6.47	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-21.93	-15.22	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.47	2.09	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-19.85	8.55	28.40	Cd4 (OH) 6SO4
CdCl2	-13.17	-13.83	-0.66	CdCl2
CdCl2:1H2O	-12.14	-13.83	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.92	-13.83	-1.91	CdCl2:2.5H2O
CdF2	-15.23	-16.45	-1.21	CdF2

Cdmetal (alpha)	-32.79	-19.28	13.51	Cd
Cdmetal (gamma)	-32.89	-19.28	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-7.22	-3.68	3.54	CdOHCl
CdSb	-77.08	-77.43	-0.35	CdSb
CdSe	-20.25	-40.45	-20.20	CdSe
CdSeO4:2H2O	-16.80	-18.65	-1.85	CdSeO4:2H2O
CdSO4	-10.67	-10.85	-0.17	CdSO4
CdSO4:1H2O	-9.12	-10.85	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.97	-10.85	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-2.22	-15.35	-13.13	PbCO3
CH4 (g)	-82.38	-123.42	-41.05	CH4
Chalcanthite	-7.37	-10.01	-2.64	CuSO4:5H2O
Chalcocite	-57.45	-92.37	-34.92	Cu2S
Chalcopyrite	-127.35	-162.62	-35.27	CuFeS2
Cinnabar	-52.09	-97.78	-45.69	HgS
Claudetite	-87.71	-90.77	-3.06	As4O6
Clausthalite	-14.71	-41.81	-27.10	PbSe
Co (BO2) 2	-28.92	-1.85	27.07	Co (BO2) 2
Co (OH) 2	-5.77	7.32	13.09	Co (OH) 2
Co (OH) 3	-9.90	-12.21	-2.31	Co (OH) 3
CO2 (g)	-2.31	-20.46	-18.15	CO2
Co3 (AsO4) 2	-22.77	-9.74	13.03	Co3 (AsO4) 2
Co3O4	-6.60	-17.10	-10.50	Co3O4
CoCl2	-21.24	-12.97	8.27	CoCl2
CoCl2:6H2O	-15.51	-12.98	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.99	-15.59	-1.60	CoF2
CoF3	-45.12	-46.58	-1.46	CoF3
CoFe2O4	17.15	13.63	-3.53	CoFe2O4
CoMoO4	-5.93	-13.69	-7.76	CoMoO4
CoO	-6.27	7.32	13.59	CoO
CoS (alpha)	-71.86	-79.30	-7.44	CoS
CoS (beta)	-68.23	-79.30	-11.07	CoS
CoSe	-23.40	-39.60	-16.20	CoSe
CoSeO3	-8.55	-7.23	1.32	CoSeO3
CoSeO4:6H2O	-16.27	-17.80	-1.53	CoSeO4:6H2O
CoSO4	-12.79	-9.99	2.80	CoSO4
CoSO4:6H2O	-7.52	-9.99	-2.47	CoSO4:6H2O
Cotunnite	-10.41	-15.19	-4.78	PbCl2
Covellite	-57.01	-79.31	-22.30	CuS
Cr (OH) 2	-22.11	-11.29	10.82	Cr (OH) 2
Cr (OH) 3	-2.70	-1.37	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.62	-1.37	-0.75	Cr (OH) 3
Cr2O3	-0.38	-2.74	-2.36	Cr2O3
CrCl2	-45.68	-31.59	14.09	CrCl2
CrCl3	-46.93	-31.81	15.11	CrCl3
CrF3	-24.40	-35.74	-11.34	CrF3
Crmetal	-67.52	-37.03	30.48	Cr
CrO3	-26.92	-30.13	-3.21	CrO3
Cryolite	-9.32	-43.16	-33.84	Na3AlF6
Cu (OH) 2	-1.37	7.30	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.51	19.70	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-10.14	-0.89	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.46	-92.34	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.87	-52.67	-45.80	Cu2Se
Cu2SO4	-21.12	-23.07	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.89	-9.79	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.81	-105.40	-42.59	Cu3Sb
Cu3Se2	-28.80	-92.29	-63.49	Cu3Se2
CuCO3	-1.65	-13.15	-11.50	CuCO3
CuCrO4	-17.39	-22.83	-5.44	CuCrO4
CuF	-9.43	-14.33	-4.91	CuF
CuF2	-16.72	-15.61	1.12	CuF2
CuF2:2H2O	-11.06	-15.61	-4.55	CuF2:2H2O
Cumetal	-6.99	-15.75	-8.76	Cu
CuMoO4	-0.63	-13.71	-13.08	CuMoO4

CuOCuSO4	-13.01	-2.71	10.30	CuOCuSO4
Cupricferrite	7.62	13.61	5.99	CuFe2O4
Cuprite	-4.35	-5.76	-1.41	Cu2O
Cuprousferrite	9.19	0.27	-8.92	CuFeO2
CuSe	-6.51	-39.61	-33.10	CuSe
CuSe2	-27.42	-60.79	-33.37	CuSe2
CuSeO3:2H2O	-7.76	-7.25	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.38	-17.82	-2.44	CuSeO4:5H2O
CuSO4	-12.95	-10.01	2.94	CuSO4
Diaspore	2.79	9.66	6.87	AlOOH
Djurleite	-57.59	-91.51	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.15	-16.69	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.40	-16.69	-17.09	CaMg(CO3)2
Epsomite	-3.03	-5.15	-2.13	MgSO4:7H2O
Fe(OH)2	-10.25	3.31	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.15	0.11	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.96	-13.68	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.80	-8.25	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.73	-37.35	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.89	-45.63	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.60	9.62	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.10	-12.70	0.40	FeAsO4:2H2O
FeCr2O4	-6.62	0.58	7.20	FeCr2O4
FeMoO4	-7.61	-17.70	-10.09	FeMoO4
Ferrihydrite	-0.04	3.15	3.19	Fe(OH)3
Ferroselite	-46.18	-64.78	-18.60	FeSe2
FeS(ppt)	-80.35	-83.30	-2.95	FeS
FeSe	-32.60	-43.60	-11.00	FeSe
Fix_pe	-5.40	-5.40	0.00	e-
Fluorite	-0.35	-10.85	-10.50	CaF2
Galena	-67.54	-81.51	-13.97	PbS
Gibbsite	1.37	9.66	8.29	Al(OH)3
Goethite	2.66	3.15	0.49	FeOOH
Goslarite	-6.17	-8.19	-2.01	ZnSO4:7H2O
Greenockite	-65.79	-80.15	-14.36	CdS
Greigite	-291.81	-336.85	-45.03	Fe3S4
Gummite	-6.01	1.67	7.67	UO3
Gypsum	-0.64	-5.25	-4.61	CaSO4:2H2O
H-Jarosite	-13.07	-25.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.13	-21.01	-12.88	H2MoO4
H2S(g)	-78.61	-86.62	-8.01	H2S
H2Se(g)	-41.96	-46.92	-4.96	H2Se
Halite	-6.44	-4.84	1.60	NaCl
Hausmannite	-4.80	56.23	61.03	Mn3O4
Hematite	7.72	6.30	-1.42	Fe2O3
Hercynite	-0.26	22.63	22.89	FeAl2O4
Hg(CH3)2(g)	-184.30	-258.01	-73.71	Hg(CH3)2
Hg(g)	-7.44	-15.32	-7.87	Hg
Hg(OH)2	-7.67	-11.17	-3.50	Hg(OH)2
Hg2(g)	-15.68	-30.63	-14.96	Hg2
Hg2(OH)2	-10.15	-4.89	5.26	Hg2(OH)2
Hg2CO3	-9.30	-25.35	-16.05	Hg2CO3
Hg2CrO4	-26.33	-35.03	-8.70	Hg2CrO4
Hg2F2	-17.44	-27.80	-10.36	Hg2F2
Hg2S	-79.83	-91.51	-11.68	Hg2S
Hg2SeO3	-14.79	-19.45	-4.66	Hg2SeO3
Hg2SO4	-16.07	-22.20	-6.13	Hg2SO4
Hg3O2CO3	-24.28	-53.96	-29.68	Hg3O2CO3
HgCl(g)	-32.09	-12.59	19.50	HgCl
HgCl2	-10.20	-31.46	-21.26	HgCl2
HgF(g)	-46.58	-13.90	32.68	HgF
HgF2(g)	-46.64	-34.08	12.57	HgF2
Hgmetal(1)	-1.87	-15.32	-13.45	Hg
HgSe	-2.39	-58.08	-55.69	HgSe
HgSeO3	-13.29	-25.72	-12.43	HgSeO3
HgSO4	-19.06	-28.48	-9.42	HgSO4
Huntite	-3.31	-33.28	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.82	-25.59	-18.77	Pb3(OH)2(CO3)2

Hydromagnesite	-12.25	-21.02	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-14.91	-20.08	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.48	-20.28	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-33.25	-50.50	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-19.85	-20.36	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-14.50	-11.24	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-14.62	-15.35	-0.73	K ₂ SeO ₄
Langite	-5.59	11.90	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-6.66	-7.09	-0.43	PbO:PbSO ₄
Laurionite	-5.66	-5.04	0.62	PbOHCl
Lepidocrocite	1.78	3.15	1.37	FeOOH
Lime	-20.64	12.06	32.70	CaO
Litharge	-7.59	5.11	12.69	PbO
Mackinawite	-79.70	-83.30	-3.60	FeS
Maghemite	-0.08	6.30	6.39	Fe ₂ O ₃
Magnesioferrite	1.61	18.47	16.86	Fe ₂ MgO ₄
Magnesite	-0.83	-8.29	-7.46	MgCO ₃
Magnetite	6.22	9.62	3.40	Fe ₃ O ₄
Malachite	-0.54	-5.85	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.30	23.04	25.34	MnOOH
Massicot	-7.79	5.11	12.89	PbO
Matlockite	-7.52	-16.49	-8.97	PbClF
Melanothallite	-19.25	-12.99	6.26	CuCl ₂
Melanterite	-11.79	-14.00	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.69	-97.78	-45.09	HgS
Mg(OH) ₂ (active)	-6.63	12.16	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.11	-4.83	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.30	-201.62	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-19.03	7.33	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.78	9.42	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.35	-17.97	5.38	MgCrO ₄
MgF ₂	-2.62	-10.75	-8.13	MgF ₂
MgMoO ₄	-7.00	-8.85	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.45	-2.39	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.76	-12.96	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.46	41.07	73.52	Pb ₃ O ₄
Mirabilite	-5.59	-6.70	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.73	-6.83	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.85	-56.56	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-150.39	-89.31	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.71	-1.21	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.85	-10.13	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.62	-76.45	0.17	MnS
MnS (pnk)	-79.79	-76.45	3.34	MnS
MnSb	-96.17	-99.08	-2.91	MnSb
MnSe	-40.25	-36.75	3.50	MnSe
MnSeO ₃	-5.52	-4.39	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.37	-4.39	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.91	-14.96	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.73	-7.15	2.58	MnSO ₄
Monteponite	-8.64	6.47	15.10	CdO
Montroydite	-7.53	-11.17	-3.64	HgO
MoO ₃	-13.01	-21.01	-8.00	MoO ₃
Morenosite	-7.72	-9.87	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.73	-219.99	-70.26	MoS ₂
Na-Jarosite	-8.66	-19.86	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.76	-49.65	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.45	-19.52	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.81	-31.41	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.89	-10.40	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.62	-10.40	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.24	-3.94	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.79	-14.51	1.28	Na ₂ SeO ₄
Na ₃ Sb	-175.30	-80.85	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.26	7.42	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-33.17	4.23	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.30	-13.03	-6.73	CuCl
NaSb	-88.88	-65.72	23.17	NaSb

Natron	-8.54	-9.85	-1.31	Na2CO3:10H2O
NaVO3	-7.05	-3.19	3.86	NaVO3
Nesquehonite	-3.63	-8.30	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.35	7.45	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-25.06	-9.36	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-19.53	12.47	32.00	Ni4 (OH) 6SO4
NiCO3	-6.14	-13.01	-6.87	NiCO3
NiMoO4	-2.42	-13.56	-11.14	NiMoO4
NiS (alpha)	-73.57	-79.17	-5.60	NiS
NiS (beta)	-68.07	-79.17	-11.10	NiS
NiS (gamma)	-66.37	-79.17	-12.80	NiS
NiSe	-21.77	-39.47	-17.70	NiSe
NiSeO3:2H2O	-9.92	-7.11	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.15	-17.67	-1.52	NiSeO4:6H2O
Nsutite	-6.95	10.56	17.50	MnO2
O2 (g)	-31.61	51.48	83.09	O2
Orpiment	-244.17	-305.24	-61.07	As2S3
Otavite	-1.99	-13.99	-12.00	CdCO3
Pb (BO2) 2	-10.58	-4.06	6.52	Pb (BO2) 2
Pb (OH) 2	-3.04	5.11	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-62.89	-71.65	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-8.72	0.07	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.97	10.22	26.19	Pb2O (OH) 2
Pb2O3	-25.08	35.96	61.04	Pb2O3
Pb2OCO3	-9.68	-10.24	-0.56	Pb2OCO3
Pb2V2O7	-4.88	-6.78	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-22.17	-16.37	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.81	-1.67	6.14	Pb3 (VO4) 2
Pb3O2CO3	-16.15	-5.13	11.02	Pb3O2CO3
Pb3O2SO4	-12.67	-1.99	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.98	3.12	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.75	3.12	21.88	Pb4O3SO4
PbCrO4	-12.42	-25.02	-12.60	PbCrO4
PbF2	-10.36	-17.80	-7.44	PbF2
Pbmetal	-24.88	-20.63	4.25	Pb
PbMoO4	-0.28	-15.90	-15.62	PbMoO4
PbO:0.3H2O	-7.87	5.11	12.98	PbO:0.33H2O
PbSeO4	-13.17	-20.01	-6.84	PbSeO4
Periclase	-9.42	12.16	21.58	MgO
Phosgenite	-10.72	-30.53	-19.81	PbCl2:PbCO3
Plattnerite	-18.75	30.85	49.60	PbO2
Portlandite	-10.74	12.06	22.80	Ca (OH) 2
Pyrite	-125.67	-144.18	-18.51	FeS2
Pyrochroite	-5.03	10.16	15.19	Mn (OH) 2
Pyrolusite	-5.47	35.91	41.38	MnO2
Realgar	-102.43	-122.18	-19.75	AsS
Retgersite	-7.83	-9.87	-2.04	NiSO4:6H2O
Rhodochrosite	0.29	-10.29	-10.58	MnCO3
Rutherfordine	-4.29	-18.79	-14.50	UO2CO3
Sb (OH) 3	-12.43	-19.54	-7.11	Sb (OH) 3
Sb2O4	-16.74	-13.34	3.40	Sb2O4
Sb2O5	-26.55	-36.22	-9.67	Sb2O5
Sb2Se3	-112.08	-179.83	-67.76	Sb2Se3
Sb4O6 (cubic)	-59.90	-78.16	-18.26	Sb4O6
Sb4O6 (orth)	-60.26	-78.16	-17.90	Sb4O6
SbCl3	-50.55	-49.98	0.57	SbCl3
SbF3	-43.68	-53.91	-10.23	SbF3
Sbmetal	-46.46	-58.15	-11.69	Sb
SbO2	-3.16	-30.98	-27.82	SbO2
Schoepite	-4.33	1.66	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.07	-21.18	-7.11	Se
Semetal (hex)	-13.47	-21.18	-7.71	Se
Senarmontite	-26.72	-39.08	-12.37	Sb2O3
SeO2	-14.68	-14.55	0.12	SeO2
SeO3	-46.16	-25.12	21.04	SeO3
Siderite	-6.90	-17.14	-10.24	FeCO3
Smithsonite	-1.33	-11.33	-10.00	ZnCO3
Sphalerite	-66.04	-77.49	-11.45	ZnS

Spinel	-5.37	31.48	36.85	MgAl2O4
Stibnite	-248.47	-298.93	-50.46	Sb2S3
Sulfur	-58.73	-60.88	-2.14	S
Tenorite	-0.34	7.30	7.64	CuO
Thenardite	-7.02	-6.70	0.32	Na2SO4
Thermonatrite	-10.48	-9.84	0.64	Na2CO3:H2O
Tyuyamunite	-5.68	-1.60	4.08	Ca(UO2)2(VO4)2
U3O8	-14.18	6.90	21.08	U3O8
U3Sb4	-584.02	-431.64	152.38	U3Sb4
U4O9	-30.68	-33.70	-3.02	U4O9
UF4	-31.15	-60.68	-29.54	UF4
UF4:2.5H2O	-27.96	-60.68	-32.72	UF4:2.5H2O
UO2(am)	-15.79	-14.86	0.93	UO2
UO2(NO3)2	-41.47	-29.32	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.17	-29.32	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.71	-29.32	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.37	-29.32	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.95	1.67	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.21	-23.46	-2.25	UO2SeO4:4H2O
UO3	-6.03	1.67	7.70	UO3
Uraninite	-10.19	-14.86	-4.67	UO2
USb2	-221.44	-191.86	29.58	USb2
V(OH)3	-19.23	-11.64	7.59	V(OH)3
V2O5	-15.63	-16.99	-1.36	V2O5
V3O5	-40.97	-39.14	1.84	V3O5
V4O7	-50.79	-43.60	7.19	V4O7
V6O13	-41.61	-102.47	-60.86	V6O13
Valentinite	-30.60	-39.08	-8.48	Sb2O3
VC12	-63.68	-44.80	18.87	VC12
VC13	-65.51	-42.08	23.43	VC13
VF4	-65.22	-50.29	14.93	VF4
Vmetal	-94.28	-50.25	44.03	V
VO	-39.27	-24.51	14.76	VO
VO(OH)2	-9.62	-4.47	5.15	VO(OH)2
VO2Cl	-21.49	-18.64	2.84	VO2Cl
VOC1	-32.94	-21.79	11.15	VOC1
VOC12	-37.52	-24.76	12.76	VOC12
VOSO4	-25.39	-21.78	3.61	VOSO4
Witherite	-4.33	-12.90	-8.57	BaCO3
Wurtzite	-68.54	-77.49	-8.95	ZnS
Zincite	-2.21	9.13	11.33	ZnO
Zincosite	-12.11	-8.18	3.93	ZnSO4
Zn(BO2)2	-8.33	-0.04	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.18	-21.86	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.07	9.13	12.20	Zn(OH)2
Zn(OH)2(am)	-3.35	9.13	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.63	9.13	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.41	9.13	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.61	9.13	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.56	0.94	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.08	8.11	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.97	-4.32	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.15	-7.24	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.20	19.20	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.16	25.34	38.50	Zn5(OH)8Cl2
ZnCl2	-18.22	-11.17	7.05	ZnCl2
ZnCO3:1H2O	-1.07	-11.33	-10.26	ZnCO3:1H2O
ZnF2	-13.25	-13.78	-0.53	ZnF2
Znmetal	-42.40	-16.61	25.79	Zn
ZnMoO4	-1.76	-11.88	-10.13	ZnMoO4
ZnO(active)	-2.06	9.13	11.19	ZnO
ZnS(am)	-68.44	-77.49	-9.05	ZnS
ZnSb	-85.78	-74.77	11.01	ZnSb
ZnSe	-23.39	-37.79	-14.40	ZnSe
ZnSeO4:6H2O	-14.47	-15.99	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.55	-8.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.

For ideal gases, $\phi = 1$.

End of simulation.

Reading input data for simulation 46.

REACTION 204
H2O -1
0.9436 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 210
SAVE Solution 211
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 210. Solution after simulation 45.
Using reaction 204.

Reaction 204.

9.436e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.830e-08	1.830e-08
Al	3.491e-06	3.491e-06
As	2.336e-10	2.336e-10
B	2.688e-05	2.688e-05
Ba	8.447e-08	8.449e-08
C	2.998e-03	2.999e-03
Ca	4.099e-03	4.099e-03
Cd	1.188e-08	1.189e-08
Cl	2.584e-03	2.585e-03
Co	8.767e-08	8.769e-08
Cr	2.145e-09	2.145e-09
Cu	5.318e-07	5.319e-07
F	1.526e-04	1.527e-04
Fe	1.881e-09	1.881e-09
Hg	1.834e-09	1.834e-09
K	3.226e-03	3.227e-03
Mg	4.764e-03	4.765e-03
Mn	5.581e-05	5.582e-05
Mo	1.806e-06	1.806e-06
N	8.155e-06	8.157e-06
Na	8.443e-03	8.444e-03
Ni	1.082e-07	1.082e-07
Pb	2.501e-09	2.501e-09
S	1.196e-02	1.196e-02

Sb	2.538e-08	2.539e-08
Se	1.323e-07	1.323e-07
U	3.553e-07	3.553e-07
V	6.991e-09	6.993e-09
Zn	5.215e-06	5.216e-06

-----Description of solution-----

	pH	=	7.474	Charge balance
	pe	=	5.397	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	3.890e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.862e-03	
	Total CO2 (mol/kg)	=	2.998e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	9.651e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	3	
	Total H	=	1.110387e+02	
	Total O	=	5.557471e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.619e-07	2.996e-07	-6.441	-6.523	-0.082	(0)
H+	4.020e-08	3.358e-08	-7.396	-7.474	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.830e-08					
AgCl	1.192e-08	1.192e-08	-7.924	-7.924	0.000	(0)
Ag+	3.237e-09	2.704e-09	-8.490	-8.568	-0.078	(0)
AgCl2-	2.827e-09	2.242e-09	-8.549	-8.649	-0.101	(0)
AgSO4-	2.988e-10	2.370e-10	-9.525	-9.625	-0.101	(0)
AgCl3-2	1.090e-11	4.315e-12	-10.963	-11.365	-0.402	(0)
AgNO2	3.705e-12	3.705e-12	-11.431	-11.431	0.000	(0)
AgF	7.198e-13	7.198e-13	-12.143	-12.143	0.000	(0)
AgCl4-3	1.530e-13	1.902e-14	-12.815	-13.721	-0.905	(0)
AgOH	8.104e-14	8.104e-14	-13.091	-13.091	0.000	(0)
AgSeO3-	2.201e-14	1.746e-14	-13.657	-13.758	-0.101	(0)
AgH2BO3	1.962e-14	1.962e-14	-13.707	-13.707	0.000	(0)
AgNH3+	1.668e-14	1.323e-14	-13.778	-13.878	-0.101	(0)
Ag2Se	6.472e-15	6.472e-15	-14.189	-14.189	0.000	(0)
Ag(NO2)2-	4.744e-17	3.763e-17	-16.324	-16.424	-0.101	(0)
AgNO3	2.093e-17	2.093e-17	-16.679	-16.679	0.000	(0)
Ag(OH)2-	2.992e-18	2.373e-18	-17.524	-17.625	-0.101	(0)
Ag(NH3)2+	3.250e-19	2.578e-19	-18.488	-18.589	-0.101	(0)
Ag(SeO3)2-3	1.262e-20	1.570e-21	-19.899	-20.804	-0.905	(0)
Ag2MoO4	2.435e-24	2.435e-24	-23.614	-23.614	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.893	-73.893	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-83.922	-85.532	-1.609	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.737	-148.941	-0.204	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-148.831	-148.932	-0.101	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-150.534	-150.908	-0.373	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.864	-151.219	-0.354	(0)
Al	3.491e-06					
Al(OH)4-	3.380e-06	2.825e-06	-5.471	-5.549	-0.078	(0)
Al(OH)3	7.489e-08	7.489e-08	-7.126	-7.126	0.000	(0)
Al(OH)2+	1.487e-08	1.253e-08	-7.828	-7.902	-0.075	(0)
AlF3	1.047e-08	1.047e-08	-7.980	-7.980	0.000	(0)
AlF2+	9.319e-09	7.850e-09	-8.031	-8.105	-0.075	(0)
AlF4-	6.653e-10	5.561e-10	-9.177	-9.255	-0.078	(0)
AlF+2	3.697e-10	1.861e-10	-9.432	-9.730	-0.298	(0)
AlOH+2	1.045e-10	5.262e-11	-9.981	-10.279	-0.298	(0)
AlSO4+	7.165e-12	5.988e-12	-11.145	-11.223	-0.078	(0)
Al+3	8.855e-13	1.756e-13	-12.053	-12.755	-0.703	(0)

Al (SO4) 2-	3.372e-13	2.819e-13	-12.472	-12.550	-0.078	(0)
AlMo6O21-3	9.226e-39	1.147e-39	-38.035	-38.940	-0.905	(0)
As (3)	2.093e-23					
H3AsO3	2.053e-23	2.053e-23	-22.688	-22.688	0.000	(0)
H2AsO3-	3.953e-25	3.136e-25	-24.403	-24.504	-0.101	(0)
HAsO3-2	2.151e-29	8.515e-30	-28.667	-29.070	-0.402	(0)
H4AsO3+	4.307e-31	3.417e-31	-30.366	-30.466	-0.101	(0)
AsO3-3	7.859e-35	9.774e-36	-34.105	-35.010	-0.905	(0)
As (5)	2.336e-10					
HAsO4-2	2.026e-10	8.021e-11	-9.693	-10.096	-0.402	(0)
H2AsO4-	3.097e-11	2.457e-11	-10.509	-10.610	-0.101	(0)
AsO4-3	6.073e-14	7.552e-15	-13.217	-14.122	-0.905	(0)
H3AsO4	1.421e-16	1.434e-16	-15.847	-15.844	0.004	(0)
B	2.688e-05					
H3BO3	2.624e-05	2.647e-05	-4.581	-4.577	0.004	(0)
H2BO3-	5.588e-07	4.578e-07	-6.253	-6.339	-0.087	(0)
CaH2BO3+	4.231e-08	3.466e-08	-7.374	-7.460	-0.087	(0)
MgH2BO3+	3.186e-08	2.611e-08	-7.497	-7.583	-0.087	(0)
NaH2BO3	4.995e-09	4.995e-09	-8.301	-8.301	0.000	(0)
BF (OH) 3-	1.366e-09	1.119e-09	-8.864	-8.951	-0.087	(0)
H5 (BO3) 2-	1.259e-11	1.032e-11	-10.900	-10.987	-0.087	(0)
BaH2BO3+	7.014e-13	5.747e-13	-12.154	-12.241	-0.087	(0)
BF2 (OH) 2-	5.200e-13	4.261e-13	-12.284	-12.371	-0.087	(0)
H8 (BO3) 3-	3.333e-14	2.731e-14	-13.477	-13.564	-0.087	(0)
AgH2BO3	1.962e-14	1.962e-14	-13.707	-13.707	0.000	(0)
BF3OH-	7.204e-19	5.902e-19	-18.142	-18.229	-0.087	(0)
BF4-	1.262e-23	1.034e-23	-22.899	-22.985	-0.087	(0)
Ba	8.447e-08					
Ba+2	8.337e-08	4.062e-08	-7.079	-7.391	-0.312	(0)
BaHCO3+	1.037e-09	8.778e-10	-8.984	-9.057	-0.072	(0)
BaCO3	6.581e-11	6.581e-11	-10.182	-10.182	0.000	(0)
BaH2BO3+	7.014e-13	5.747e-13	-12.154	-12.241	-0.087	(0)
BaOH+	6.329e-14	5.313e-14	-13.199	-13.275	-0.076	(0)
BaNO3+	2.501e-15	1.984e-15	-14.602	-14.703	-0.101	(0)
BaNH3+2	1.551e-16	6.142e-17	-15.809	-16.212	-0.402	(0)
C (4)	2.998e-03					
HCO3-	2.686e-03	2.263e-03	-2.571	-2.645	-0.075	(0)
H2CO3	1.709e-04	1.709e-04	-3.767	-3.767	0.000	(0)
CaHCO3+	6.551e-05	5.544e-05	-4.184	-4.256	-0.072	(0)
MgHCO3+	4.577e-05	3.808e-05	-4.339	-4.419	-0.080	(0)
NaHCO3	8.761e-06	8.761e-06	-5.057	-5.057	0.000	(0)
CaCO3	6.587e-06	6.587e-06	-5.181	-5.181	0.000	(0)
CO3-2	6.483e-06	3.159e-06	-5.188	-5.500	-0.312	(0)
MgCO3	4.321e-06	4.321e-06	-5.364	-5.364	0.000	(0)
MnHCO3+	8.908e-07	7.478e-07	-6.050	-6.126	-0.076	(0)
NaCO3-	4.808e-07	4.050e-07	-6.318	-6.393	-0.075	(0)
CuCO3	4.216e-07	4.216e-07	-6.375	-6.375	0.000	(0)
ZnCO3	2.765e-07	2.765e-07	-6.558	-6.558	0.000	(0)
UO2 (CO3) 3-4	2.547e-07	6.261e-09	-6.594	-8.203	-1.609	(0)
ZnHCO3+	1.372e-07	1.088e-07	-6.863	-6.963	-0.101	(0)
UO2 (CO3) 2-2	9.988e-08	3.955e-08	-7.001	-7.403	-0.402	(0)
NiHCO3+	1.115e-08	8.841e-09	-7.953	-8.053	-0.101	(0)
Cu (CO3) 2-2	9.053e-09	3.585e-09	-8.043	-8.446	-0.402	(0)
CoHCO3+	5.260e-09	4.172e-09	-8.279	-8.380	-0.101	(0)
CuHCO3+	4.080e-09	3.236e-09	-8.389	-8.490	-0.101	(0)
NiCO3	3.735e-09	3.735e-09	-8.428	-8.428	0.000	(0)
PbCO3	1.377e-09	1.377e-09	-8.861	-8.861	0.000	(0)
CoCO3	1.266e-09	1.266e-09	-8.898	-8.898	0.000	(0)
BaHCO3+	1.037e-09	8.778e-10	-8.984	-9.057	-0.072	(0)
UO2CO3	6.275e-10	6.275e-10	-9.202	-9.202	0.000	(0)
PbHCO3+	3.074e-10	2.438e-10	-9.512	-9.613	-0.101	(0)
CdCO3	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
BaCO3	6.581e-11	6.581e-11	-10.182	-10.182	0.000	(0)
Pb (CO3) 2-2	3.168e-11	1.254e-11	-10.499	-10.902	-0.402	(0)
CdHCO3+	2.153e-11	1.708e-11	-10.667	-10.767	-0.101	(0)
Cd (CO3) 2-2	1.412e-12	5.590e-13	-11.850	-12.253	-0.402	(0)
FeHCO3+	7.930e-14	6.712e-14	-13.101	-13.173	-0.072	(0)
HgCO3	4.612e-14	4.612e-14	-13.336	-13.336	0.000	(0)

	Hg (CO ₃) ₂₋₂	1.164e-15	4.607e-16	-14.934	-15.337	-0.402	(0)
	HgHCO ₃ +	3.636e-17	2.884e-17	-16.439	-16.540	-0.101	(0)
Ca	4.099e-03						
	Ca+2	2.701e-03	1.316e-03	-2.569	-2.881	-0.312	(0)
	CaSO ₄	1.324e-03	1.324e-03	-2.878	-2.878	0.000	(0)
	CaHCO ₃ +	6.551e-05	5.544e-05	-4.184	-4.256	-0.072	(0)
	CaCO ₃	6.587e-06	6.587e-06	-5.181	-5.181	0.000	(0)
	CaF+	1.813e-06	1.522e-06	-5.742	-5.818	-0.076	(0)
	CaH ₂ BO ₃ +	4.231e-08	3.466e-08	-7.374	-7.460	-0.087	(0)
	CaOH+	9.294e-09	7.867e-09	-8.032	-8.104	-0.072	(0)
	CaNO ₃ +	5.111e-11	4.054e-11	-10.291	-10.392	-0.101	(0)
	CaNH ₃ +2	1.003e-11	3.970e-12	-10.999	-11.401	-0.402	(0)
	Ca (NH ₃) ₂ +2	9.565e-21	3.787e-21	-20.019	-20.422	-0.402	(0)
Cd	1.188e-08						
	Cd+2	6.805e-09	3.315e-09	-8.167	-8.479	-0.312	(0)
	CdSO ₄	3.414e-09	3.414e-09	-8.467	-8.467	0.000	(0)
	CdCl+	8.618e-10	6.837e-10	-9.065	-9.165	-0.101	(0)
	Cd (SO ₄) ₂₋₂	5.109e-10	2.023e-10	-9.292	-9.694	-0.402	(0)
	CdCO ₃	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
	CdHCO ₃ +	2.153e-11	1.708e-11	-10.667	-10.767	-0.101	(0)
	CdOH+	9.948e-12	7.891e-12	-11.002	-11.103	-0.101	(0)
	CdOHC1	8.403e-12	8.403e-12	-11.076	-11.076	0.000	(0)
	CdF+	7.019e-12	5.568e-12	-11.154	-11.254	-0.101	(0)
	CdCl ₂	6.154e-12	6.154e-12	-11.211	-11.211	0.000	(0)
	Cd (CO ₃) ₂₋₂	1.412e-12	5.590e-13	-11.850	-12.253	-0.402	(0)
	Cd (OH) ₂	1.492e-14	1.492e-14	-13.826	-13.826	0.000	(0)
	CdCl ₃ -	1.057e-14	8.384e-15	-13.976	-14.077	-0.101	(0)
	CdF ₂	1.177e-15	1.177e-15	-14.929	-14.929	0.000	(0)
	CdNO ₃ +	1.288e-16	1.022e-16	-15.890	-15.991	-0.101	(0)
	CdSeO ₄	4.231e-17	4.231e-17	-16.374	-16.374	0.000	(0)
	Cd ₂ OH+3	1.054e-18	1.311e-19	-17.977	-18.882	-0.905	(0)
	Cd (SeO ₃) ₂₋₂	6.961e-19	2.756e-19	-18.157	-18.560	-0.402	(0)
	Cd (OH) ₃ -	3.443e-19	2.731e-19	-18.463	-18.564	-0.101	(0)
	Cd (NO ₃) ₂	4.989e-25	4.989e-25	-24.302	-24.302	0.000	(0)
	Cd (OH) ₄₋₂	3.383e-26	1.340e-26	-25.471	-25.873	-0.402	(0)
	CdHS+	0.000e+00	0.000e+00	-79.510	-79.611	-0.101	(0)
	Cd (HS) ₂	0.000e+00	0.000e+00	-151.546	-151.546	0.000	(0)
	Cd (HS) ₃ -	0.000e+00	0.000e+00	-228.684	-228.785	-0.101	(0)
	Cd (HS) ₄₋₂	0.000e+00	0.000e+00	-305.326	-305.728	-0.402	(0)
Cl	2.584e-03						
	Cl-	2.584e-03	2.159e-03	-2.588	-2.666	-0.078	(0)
	MnCl+	5.363e-08	4.502e-08	-7.271	-7.347	-0.076	(0)
	AgCl	1.192e-08	1.192e-08	-7.924	-7.924	0.000	(0)
	ZnCl+	9.915e-09	8.249e-09	-8.004	-8.084	-0.080	(0)
	ZnOHC1	3.236e-09	3.236e-09	-8.490	-8.490	0.000	(0)
	AgCl ₂ -	2.827e-09	2.242e-09	-8.549	-8.649	-0.101	(0)
	CdCl+	8.618e-10	6.837e-10	-9.065	-9.165	-0.101	(0)
	CoCl+	2.232e-10	1.771e-10	-9.651	-9.752	-0.101	(0)
	NiCl+	2.207e-10	1.751e-10	-9.656	-9.757	-0.101	(0)
	MnCl ₂	1.373e-10	1.373e-10	-9.862	-9.862	0.000	(0)
	CuCl	1.209e-10	1.209e-10	-9.918	-9.918	0.000	(0)
	CuCl+	9.323e-11	7.757e-11	-10.030	-10.110	-0.080	(0)
	CuCl ₂ -	6.555e-11	5.454e-11	-10.183	-10.263	-0.080	(0)
	ZnCl ₂	2.823e-11	2.823e-11	-10.549	-10.549	0.000	(0)
	PbCl+	1.400e-11	1.111e-11	-10.854	-10.954	-0.101	(0)
	HgClOH	1.394e-11	1.394e-11	-10.856	-10.856	0.000	(0)
	AgCl ₃ -2	1.090e-11	4.315e-12	-10.963	-11.365	-0.402	(0)
	CdOHC1	8.403e-12	8.403e-12	-11.076	-11.076	0.000	(0)
	CdCl ₂	6.154e-12	6.154e-12	-11.211	-11.211	0.000	(0)
	HgCl ₂	5.688e-12	5.688e-12	-11.245	-11.245	0.000	(0)
	HgCl ₃ -	1.548e-13	1.228e-13	-12.810	-12.911	-0.101	(0)
	AgCl ₄ -3	1.530e-13	1.902e-14	-12.815	-13.721	-0.905	(0)
	PbCl ₂	1.071e-13	1.071e-13	-12.970	-12.970	0.000	(0)
	MnCl ₃ -	9.727e-14	8.166e-14	-13.012	-13.088	-0.076	(0)
	ZnCl ₃ -	5.819e-14	4.842e-14	-13.235	-13.315	-0.080	(0)
	CuCl ₂	5.807e-14	5.807e-14	-13.236	-13.236	0.000	(0)
	CuCl ₃ -2	5.069e-14	2.518e-14	-13.295	-13.599	-0.304	(0)
	CdCl ₃ -	1.057e-14	8.384e-15	-13.976	-14.077	-0.101	(0)

HgCl4-2	2.666e-15	1.056e-15	-14.574	-14.976	-0.402	(0)
NiCl2	1.903e-15	1.903e-15	-14.720	-14.720	0.000	(0)
HgCl+	6.626e-16	5.256e-16	-15.179	-15.279	-0.101	(0)
UO2Cl+	2.203e-16	1.747e-16	-15.657	-15.758	-0.101	(0)
PbCl3-	1.161e-16	9.210e-17	-15.935	-16.036	-0.101	(0)
ZnCl4-2	1.052e-16	5.227e-17	-15.978	-16.282	-0.304	(0)
CrCl+2	4.293e-17	1.700e-17	-16.367	-16.770	-0.402	(0)
CuCl3-	1.407e-18	1.170e-18	-17.852	-17.932	-0.080	(0)
PbCl4-2	2.296e-19	9.090e-20	-18.639	-19.041	-0.402	(0)
CrOHC12	2.090e-19	2.090e-19	-18.680	-18.680	0.000	(0)
FeCl+2	7.172e-21	3.562e-21	-20.144	-20.448	-0.304	(0)
CrCl2+	4.390e-21	3.483e-21	-20.358	-20.458	-0.101	(0)
VOC1+	3.000e-22	2.380e-22	-21.523	-21.623	-0.101	(0)
FeCl2+	4.093e-23	3.436e-23	-22.388	-22.464	-0.076	(0)
CuCl4-2	2.550e-23	1.266e-23	-22.594	-22.897	-0.304	(0)
CrO3Cl-	4.140e-26	3.284e-26	-25.383	-25.484	-0.101	(0)
FeCl3	7.419e-27	7.419e-27	-26.130	-26.130	0.000	(0)
CoCl+2	2.614e-35	1.035e-35	-34.583	-34.985	-0.402	(0)
UCl+3	0.000e+00	0.000e+00	-44.836	-45.741	-0.905	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.732	-52.134	-0.402	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.100	-54.502	-0.402	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.068	-67.470	-0.402	(0)
Co (2)	8.767e-08					
Co+2	5.986e-08	2.370e-08	-7.223	-7.625	-0.402	(0)
CoSO4	2.078e-08	2.078e-08	-7.682	-7.682	0.000	(0)
CoHCO3+	5.260e-09	4.172e-09	-8.279	-8.380	-0.101	(0)
CoCO3	1.266e-09	1.266e-09	-8.898	-8.898	0.000	(0)
CoCl+	2.232e-10	1.771e-10	-9.651	-9.752	-0.101	(0)
CoOH+	1.787e-10	1.417e-10	-9.748	-9.849	-0.101	(0)
CoF+	1.001e-10	7.942e-11	-9.999	-10.100	-0.101	(0)
Co (OH) 2	3.373e-12	3.373e-12	-11.472	-11.472	0.000	(0)
CoNO2+	1.381e-12	1.095e-12	-11.860	-11.960	-0.101	(0)
Co (NH3) +2	1.725e-14	6.830e-15	-13.763	-14.166	-0.402	(0)
CoSeO4	8.142e-16	8.142e-16	-15.089	-15.089	0.000	(0)
CoNO3+	4.615e-16	3.661e-16	-15.336	-15.436	-0.101	(0)
Co (OH) 3-	2.542e-17	2.017e-17	-16.595	-16.695	-0.101	(0)
CoOOH-	6.383e-18	5.063e-18	-17.195	-17.296	-0.101	(0)
Co2OH+3	1.354e-18	1.684e-19	-17.868	-18.774	-0.905	(0)
Co (NH3) 2+2	1.763e-21	6.982e-22	-20.754	-21.156	-0.402	(0)
Co (NO3) 2	7.258e-24	7.258e-24	-23.139	-23.139	0.000	(0)
Co (OH) 4-2	2.419e-24	9.578e-25	-23.616	-24.019	-0.402	(0)
Co (NH3) 3+2	5.320e-29	2.107e-29	-28.274	-28.676	-0.402	(0)
Co4 (OH) 4+4	3.274e-30	8.048e-32	-29.485	-31.094	-1.609	(0)
Co (NH3) 4+2	6.691e-37	2.649e-37	-36.175	-36.577	-0.402	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.575	-44.977	-0.402	(0)
Co (3)	9.058e-29					
CoOH+2	9.058e-29	3.587e-29	-28.043	-28.445	-0.402	(0)
Co+3	1.188e-34	2.355e-35	-33.925	-34.628	-0.703	(0)
CoCl+2	2.614e-35	1.035e-35	-34.583	-34.985	-0.402	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.732	-52.134	-0.402	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.136	-62.236	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.725	-67.128	-0.402	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.068	-67.470	-0.402	(0)
Cr (2)	1.470e-26					
Cr+2	1.470e-26	5.822e-27	-25.833	-26.235	-0.402	(0)
Cr (3)	2.145e-09					
Cr (OH) 2+	1.833e-09	1.454e-09	-8.737	-8.837	-0.101	(0)
Cr (OH) 3	1.637e-10	1.637e-10	-9.786	-9.786	0.000	(0)
Cr (OH) +2	1.007e-10	3.988e-11	-9.997	-10.399	-0.402	(0)
CrOHSO4	4.157e-11	4.157e-11	-10.381	-10.381	0.000	(0)
CrO2-	2.919e-12	2.316e-12	-11.535	-11.635	-0.101	(0)
Cr (OH) 4-	2.461e-12	1.952e-12	-11.609	-11.709	-0.101	(0)
CrF+2	2.580e-13	1.022e-13	-12.588	-12.991	-0.402	(0)
CrSO4+	7.866e-14	6.240e-14	-13.104	-13.205	-0.101	(0)
Cr+3	4.891e-14	6.083e-15	-13.311	-14.216	-0.905	(0)
CrCl+2	4.293e-17	1.700e-17	-16.367	-16.770	-0.402	(0)
Cr2 (OH) 2SO4+2	3.784e-19	1.498e-19	-18.422	-18.824	-0.402	(0)
CrOHC12	2.090e-19	2.090e-19	-18.680	-18.680	0.000	(0)

Cr2(OH)2(SO4)2	3.910e-20	3.910e-20	-19.408	-19.408	0.000	(0)
CrCl2+	4.390e-21	3.483e-21	-20.358	-20.458	-0.101	(0)
CrNO3+2	6.544e-24	2.591e-24	-23.184	-23.587	-0.402	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-43.067	-43.469	-0.402	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-52.033	-52.938	-0.905	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-54.100	-54.502	-0.402	(0)
Cr(6)	1.487e-15					
CrO4-2	1.359e-15	6.623e-16	-14.867	-15.179	-0.312	(0)
HCrO4-	9.073e-17	7.197e-17	-16.042	-16.143	-0.101	(0)
NaCrO4-	2.856e-17	2.266e-17	-16.544	-16.645	-0.101	(0)
KCrO4-	8.110e-18	6.434e-18	-17.091	-17.192	-0.101	(0)
CrO3SO4-2	8.172e-24	3.236e-24	-23.088	-23.490	-0.402	(0)
H2CrO4	1.959e-24	1.959e-24	-23.708	-23.708	0.000	(0)
CrO3Cl-	4.140e-26	3.284e-26	-25.383	-25.484	-0.101	(0)
Cr2O7-2	4.539e-31	1.797e-31	-30.343	-30.745	-0.402	(0)
Cu(1)	2.426e-10					
CuCl	1.209e-10	1.209e-10	-9.918	-9.918	0.000	(0)
CuCl2-	6.555e-11	5.454e-11	-10.183	-10.263	-0.080	(0)
Cu+	5.607e-11	4.448e-11	-10.251	-10.352	-0.101	(0)
CuCl3-2	5.069e-14	2.518e-14	-13.295	-13.599	-0.304	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.929	-150.292	-0.364	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.677	-151.022	-0.346	(0)
Cu(2)	5.315e-07					
CuCO3	4.216e-07	4.216e-07	-6.375	-6.375	0.000	(0)
Cu+2	4.652e-08	2.267e-08	-7.332	-7.645	-0.312	(0)
CuOH+	2.582e-08	2.148e-08	-7.588	-7.668	-0.080	(0)
CuSO4	2.281e-08	2.281e-08	-7.642	-7.642	0.000	(0)
Cu(CO3)2-2	9.053e-09	3.585e-09	-8.043	-8.446	-0.402	(0)
CuHCO3+	4.080e-09	3.236e-09	-8.389	-8.490	-0.101	(0)
Cu(OH)2	1.284e-09	1.284e-09	-8.891	-8.891	0.000	(0)
CuF+	1.910e-10	1.515e-10	-9.719	-9.819	-0.101	(0)
CuCl+	9.323e-11	7.757e-11	-10.030	-10.110	-0.080	(0)
Cu2(OH)2+2	2.926e-11	1.159e-11	-10.534	-10.936	-0.402	(0)
CuNO2+	1.962e-11	1.556e-11	-10.707	-10.808	-0.101	(0)
CuNH3+2	1.404e-12	5.559e-13	-11.853	-12.255	-0.402	(0)
Cu(OH)3-	9.949e-13	7.892e-13	-12.002	-12.103	-0.101	(0)
CuCl2	5.807e-14	5.807e-14	-13.236	-13.236	0.000	(0)
Cu(NO2)2	1.044e-15	1.044e-15	-14.981	-14.981	0.000	(0)
CuNO3+	8.805e-16	6.984e-16	-15.055	-15.156	-0.101	(0)
Cu(OH)4-2	4.701e-18	1.861e-18	-17.328	-17.730	-0.402	(0)
CuCl3-	1.407e-18	1.170e-18	-17.852	-17.932	-0.080	(0)
CuCl4-2	2.550e-23	1.266e-23	-22.594	-22.897	-0.304	(0)
Cu(NO3)2	8.568e-25	8.568e-25	-24.067	-24.067	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-219.063	-219.163	-0.101	(0)
F	1.526e-04					
F-	1.268e-04	1.060e-04	-3.897	-3.975	-0.078	(0)
MgF+	2.339e-05	1.955e-05	-4.631	-4.709	-0.078	(0)
CaF+	1.813e-06	1.522e-06	-5.742	-5.818	-0.076	(0)
NaF	4.603e-07	4.603e-07	-6.337	-6.337	0.000	(0)
MnF+	8.322e-08	6.986e-08	-7.080	-7.156	-0.076	(0)
AlF3	1.047e-08	1.047e-08	-7.980	-7.980	0.000	(0)
AlF2+	9.319e-09	7.850e-09	-8.031	-8.105	-0.075	(0)
HF	5.263e-09	5.263e-09	-8.279	-8.279	0.000	(0)
ZnF+	4.053e-09	3.215e-09	-8.392	-8.493	-0.101	(0)
BF(OH)3-	1.366e-09	1.119e-09	-8.864	-8.951	-0.087	(0)
AlF4-	6.653e-10	5.561e-10	-9.177	-9.255	-0.078	(0)
AlF+2	3.697e-10	1.861e-10	-9.432	-9.730	-0.298	(0)
CuF+	1.910e-10	1.515e-10	-9.719	-9.819	-0.101	(0)
NiF+	1.063e-10	8.435e-11	-9.973	-10.074	-0.101	(0)
CoF+	1.001e-10	7.942e-11	-9.999	-10.100	-0.101	(0)
CdF+	7.019e-12	5.568e-12	-11.154	-11.254	-0.101	(0)
HF2-	2.561e-12	2.120e-12	-11.592	-11.674	-0.082	(0)
PbF+	1.365e-12	1.083e-12	-11.865	-11.965	-0.101	(0)
UO2F+	9.200e-13	7.298e-13	-12.036	-12.137	-0.101	(0)
AgF	7.198e-13	7.198e-13	-12.143	-12.143	0.000	(0)
BF2(OH)2-	5.200e-13	4.261e-13	-12.284	-12.371	-0.087	(0)
CrF+2	2.580e-13	1.022e-13	-12.588	-12.991	-0.402	(0)
UO2F2	2.230e-13	2.230e-13	-12.652	-12.652	0.000	(0)

UO2F3-	7.483e-15	5.936e-15	-14.126	-14.227	-0.101	(0)
PbF2	2.258e-15	2.258e-15	-14.646	-14.646	0.000	(0)
CdF2	1.177e-15	1.177e-15	-14.929	-14.929	0.000	(0)
H2F2	7.422e-17	7.422e-17	-16.129	-16.129	0.000	(0)
FeF2+	2.144e-17	1.800e-17	-16.669	-16.745	-0.076	(0)
VO2F	2.019e-17	2.019e-17	-16.695	-16.695	0.000	(0)
FeF+2	1.278e-17	6.347e-18	-16.894	-17.197	-0.304	(0)
UO2F4-2	1.262e-17	4.996e-18	-16.899	-17.301	-0.402	(0)
FeF3	2.691e-18	2.691e-18	-17.570	-17.570	0.000	(0)
VO2F2-	9.792e-19	7.767e-19	-18.009	-18.110	-0.101	(0)
BF3OH-	7.204e-19	5.902e-19	-18.142	-18.229	-0.087	(0)
PbF3-	5.720e-19	4.537e-19	-18.243	-18.343	-0.101	(0)
VOF+	3.148e-20	2.497e-20	-19.502	-19.603	-0.101	(0)
VO2F3-2	2.593e-21	1.027e-21	-20.586	-20.989	-0.402	(0)
VOF2	9.920e-22	9.920e-22	-21.003	-21.003	0.000	(0)
HgF+	6.040e-23	4.792e-23	-22.219	-22.320	-0.101	(0)
PbF4-2	5.811e-23	2.301e-23	-22.236	-22.638	-0.402	(0)
BF4-	1.262e-23	1.034e-23	-22.899	-22.985	-0.087	(0)
VOF3-	4.702e-24	3.730e-24	-23.328	-23.428	-0.101	(0)
VO2F4-3	4.304e-25	5.352e-26	-24.366	-25.271	-0.905	(0)
Sb(OH) 2F	1.624e-25	1.624e-25	-24.789	-24.789	0.000	(0)
SbOF	1.598e-25	1.598e-25	-24.796	-24.796	0.000	(0)
VOF4-2	4.029e-27	1.595e-27	-26.395	-26.797	-0.402	(0)
UF3+	1.001e-35	7.943e-36	-34.999	-35.100	-0.101	(0)
UF2+2	1.195e-36	4.730e-37	-35.923	-36.325	-0.402	(0)
UF4	9.228e-38	9.228e-38	-37.035	-37.035	0.000	(0)
UF+3	2.851e-39	3.546e-40	-38.545	-39.450	-0.905	(0)
UF5-	4.885e-40	3.875e-40	-39.311	-39.412	-0.101	(0)
UF6-2	0.000e+00	0.000e+00	-40.504	-40.907	-0.402	(0)
Fe (2)	8.603e-12					
Fe+2	5.950e-12	2.356e-12	-11.225	-11.628	-0.402	(0)
FeSO4	2.540e-12	2.540e-12	-11.595	-11.595	0.000	(0)
FeHCO3+	7.930e-14	6.712e-14	-13.101	-13.173	-0.072	(0)
FeOH+	3.348e-14	2.811e-14	-13.475	-13.551	-0.076	(0)
Fe (OH) 2	6.690e-18	6.690e-18	-17.175	-17.175	0.000	(0)
Fe (OH) 3-	7.551e-19	6.339e-19	-18.122	-18.198	-0.076	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.956	-160.956	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.958	-238.058	-0.101	(0)
Fe (3)	1.872e-09					
Fe (OH) 2+	1.463e-09	1.232e-09	-8.835	-8.909	-0.075	(0)
Fe (OH) 3	3.965e-10	3.965e-10	-9.402	-9.402	0.000	(0)
Fe (OH) 4-	1.313e-11	1.106e-11	-10.882	-10.956	-0.075	(0)
FeOH+2	2.128e-14	1.057e-14	-13.672	-13.976	-0.304	(0)
FeF2+	2.144e-17	1.800e-17	-16.669	-16.745	-0.076	(0)
FeF+2	1.278e-17	6.347e-18	-16.894	-17.197	-0.304	(0)
FeSO4+	3.207e-18	2.693e-18	-17.494	-17.570	-0.076	(0)
FeF3	2.691e-18	2.691e-18	-17.570	-17.570	0.000	(0)
Fe (SO4) 2-	3.188e-19	2.529e-19	-18.497	-18.597	-0.101	(0)
Fe+3	2.754e-19	5.463e-20	-18.560	-19.263	-0.703	(0)
FeCl+2	7.172e-21	3.562e-21	-20.144	-20.448	-0.304	(0)
FeCl2+	4.093e-23	3.436e-23	-22.388	-22.464	-0.076	(0)
FeHSeO3+2	3.089e-23	1.223e-23	-22.510	-22.913	-0.402	(0)
Fe2 (OH) 2+4	1.505e-25	3.699e-27	-24.822	-26.432	-1.609	(0)
FeNO3+2	1.344e-26	5.323e-27	-25.871	-26.274	-0.402	(0)
FeCl3	7.419e-27	7.419e-27	-26.130	-26.130	0.000	(0)
Fe3 (OH) 4+5	2.155e-32	6.588e-35	-31.667	-34.181	-2.515	(0)
H (0)	2.540e-29					
H2	1.270e-29	1.282e-29	-28.896	-28.892	0.004	(0)
Hg (0)	1.807e-09					
Hg	1.807e-09	1.807e-09	-8.743	-8.743	0.000	(0)
Hg (1)	7.560e-20					
Hg2+2	3.780e-20	1.497e-20	-19.422	-19.825	-0.402	(0)
Hg (2)	2.668e-11					
HgClOH	1.394e-11	1.394e-11	-10.856	-10.856	0.000	(0)
Hg (OH) 2	6.850e-12	6.911e-12	-11.164	-11.160	0.004	(0)
HgCl2	5.688e-12	5.688e-12	-11.245	-11.245	0.000	(0)
HgCl3-	1.548e-13	1.228e-13	-12.810	-12.911	-0.101	(0)
HgCO3	4.612e-14	4.612e-14	-13.336	-13.336	0.000	(0)

	HgCl4-2	2.666e-15	1.056e-15	-14.574	-14.976	-0.402	(0)
	Hg (CO3) 2-2	1.164e-15	4.607e-16	-14.934	-15.337	-0.402	(0)
	HgCl+	6.626e-16	5.256e-16	-15.179	-15.279	-0.101	(0)
	HgOH+	1.835e-16	1.455e-16	-15.736	-15.837	-0.101	(0)
	HgHCO3+	3.636e-17	2.884e-17	-16.439	-16.540	-0.101	(0)
	Hg (OH) 3-	3.287e-19	2.607e-19	-18.483	-18.584	-0.101	(0)
	Hg (NH3) 2+2	1.117e-19	4.421e-20	-18.952	-19.354	-0.402	(0)
	HgNH3+2	4.659e-20	1.845e-20	-19.332	-19.734	-0.402	(0)
	Hg+2	3.081e-20	1.220e-20	-19.511	-19.914	-0.402	(0)
	HgSO4	1.403e-20	1.403e-20	-19.853	-19.853	0.000	(0)
	HgF+	6.040e-23	4.792e-23	-22.219	-22.320	-0.101	(0)
	Hg (NH3) 3+2	1.065e-27	4.218e-28	-26.973	-27.375	-0.402	(0)
	HgNO3+	5.533e-29	4.389e-29	-28.257	-28.358	-0.101	(0)
	Hg (NH3) 4+2	2.028e-35	8.029e-36	-34.693	-35.095	-0.402	(0)
	Hg (NO3) 2	1.778e-37	1.778e-37	-36.750	-36.750	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.690	-138.790	-0.101	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.622	-140.024	-0.402	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.870	-139.870	0.000	(0)
K		3.226e-03					
	K+	3.130e-03	2.615e-03	-2.505	-2.583	-0.078	(0)
	KSO4-	9.653e-05	8.131e-05	-4.015	-4.090	-0.075	(0)
	KCrO4-	8.110e-18	6.434e-18	-17.091	-17.192	-0.101	(0)
Mg		4.764e-03					
	Mg+2	3.375e-03	1.645e-03	-2.472	-2.784	-0.312	(0)
	MgSO4	1.315e-03	1.315e-03	-2.881	-2.881	0.000	(0)
	MgHCO3+	4.577e-05	3.808e-05	-4.339	-4.419	-0.080	(0)
	MgF+	2.339e-05	1.955e-05	-4.631	-4.709	-0.078	(0)
	MgCO3	4.321e-06	4.321e-06	-5.364	-5.364	0.000	(0)
	MgOH+	2.309e-07	1.962e-07	-6.637	-6.707	-0.071	(0)
	MgH2BO3+	3.186e-08	2.611e-08	-7.497	-7.583	-0.087	(0)
Mn (2)		5.581e-05					
	Mn+2	4.183e-05	1.656e-05	-4.379	-4.781	-0.402	(0)
	MnSO4	1.294e-05	1.294e-05	-4.888	-4.888	0.000	(0)
	MnHCO3+	8.908e-07	7.478e-07	-6.050	-6.126	-0.076	(0)
	MnF+	8.322e-08	6.986e-08	-7.080	-7.156	-0.076	(0)
	MnCl+	5.363e-08	4.502e-08	-7.271	-7.347	-0.076	(0)
	MnOH+	1.485e-08	1.247e-08	-7.828	-7.904	-0.076	(0)
	MnCl2	1.373e-10	1.373e-10	-9.862	-9.862	0.000	(0)
	MnNO3+	3.224e-13	2.558e-13	-12.492	-12.592	-0.101	(0)
	MnSeO4	3.055e-13	3.055e-13	-12.515	-12.515	0.000	(0)
	MnCl3-	9.727e-14	8.166e-14	-13.012	-13.088	-0.076	(0)
	Mn (OH) 3-	8.240e-18	6.917e-18	-17.084	-17.160	-0.076	(0)
	Mn (NO3) 2	6.261e-21	6.261e-21	-20.203	-20.203	0.000	(0)
	Mn (OH) 4-2	1.347e-23	6.692e-24	-22.871	-23.174	-0.304	(0)
	MnSe	0.000e+00	0.000e+00	-42.130	-42.130	0.000	(0)
Mn (3)		9.311e-25					
	Mn+3	9.311e-25	1.847e-25	-24.031	-24.734	-0.703	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.520	-41.824	-0.304	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-45.714	-45.799	-0.084	(0)
Mo		1.806e-06					
	MoO4-2	1.805e-06	8.794e-07	-5.744	-6.056	-0.312	(0)
	HMoO4-	7.408e-10	5.876e-10	-9.130	-9.231	-0.101	(0)
	H2MoO4	1.446e-13	1.446e-13	-12.840	-12.840	0.000	(0)
	Ag2MoO4	2.435e-24	2.435e-24	-23.614	-23.614	0.000	(0)
	AlMo6O21-3	9.226e-39	1.147e-39	-38.035	-38.940	-0.905	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-45.569	-49.191	-3.621	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-47.763	-50.278	-2.515	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.360	-52.969	-1.609	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.292	-57.197	-0.905	(0)
N (-3)		1.826e-07					
	NH4+	1.723e-07	1.412e-07	-6.764	-6.850	-0.087	(0)
	NH4SO4-	7.914e-09	6.644e-09	-8.102	-8.178	-0.076	(0)
	NH3	2.397e-09	2.397e-09	-8.620	-8.620	0.000	(0)
	CaNH3+2	1.003e-11	3.970e-12	-10.999	-11.401	-0.402	(0)
	CuNH3+2	1.404e-12	5.559e-13	-11.853	-12.255	-0.402	(0)
	NiNH3+2	1.030e-13	4.079e-14	-12.987	-13.389	-0.402	(0)

Co (NH3) +2	1.725e-14	6.830e-15	-13.763	-14.166	-0.402	(0)
AgNH3+	1.668e-14	1.323e-14	-13.778	-13.878	-0.101	(0)
BaNH3+2	1.551e-16	6.142e-17	-15.809	-16.212	-0.402	(0)
Ag (NH3) 2+	3.250e-19	2.578e-19	-18.488	-18.589	-0.101	(0)
Hg (NH3) 2+2	1.117e-19	4.421e-20	-18.952	-19.354	-0.402	(0)
HgNH3+2	4.659e-20	1.845e-20	-19.332	-19.734	-0.402	(0)
Ni (NH3) 2+2	3.568e-20	1.413e-20	-19.448	-19.850	-0.402	(0)
Ca (NH3) 2+2	9.565e-21	3.787e-21	-20.019	-20.422	-0.402	(0)
Co (NH3) 2+2	1.763e-21	6.982e-22	-20.754	-21.156	-0.402	(0)
Hg (NH3) 3+2	1.065e-27	4.218e-28	-26.973	-27.375	-0.402	(0)
Co (NH3) 3+2	5.320e-29	2.107e-29	-28.274	-28.676	-0.402	(0)
Hg (NH3) 4+2	2.028e-35	8.029e-36	-34.693	-35.095	-0.402	(0)
Co (NH3) 4+2	6.691e-37	2.649e-37	-36.175	-36.577	-0.402	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.067	-43.469	-0.402	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.575	-44.977	-0.402	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.732	-52.134	-0.402	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.033	-52.938	-0.905	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.100	-54.502	-0.402	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.136	-62.236	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.725	-67.128	-0.402	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.068	-67.470	-0.402	(0)
N (3)	7.961e-06					
NO2-	7.961e-06	6.558e-06	-5.099	-5.183	-0.084	(0)
CuNO2+	1.962e-11	1.556e-11	-10.707	-10.808	-0.101	(0)
AgNO2	3.705e-12	3.705e-12	-11.431	-11.431	0.000	(0)
CoNO2+	1.381e-12	1.095e-12	-11.860	-11.960	-0.101	(0)
Cu (NO2) 2	1.044e-15	1.044e-15	-14.981	-14.981	0.000	(0)
Ag (NO2) 2-	4.744e-17	3.763e-17	-16.324	-16.424	-0.101	(0)
N (5)	1.171e-08					
NO3-	1.166e-08	9.744e-09	-7.933	-8.011	-0.078	(0)
CaNO3+	5.111e-11	4.054e-11	-10.291	-10.392	-0.101	(0)
MnNO3+	3.224e-13	2.558e-13	-12.492	-12.592	-0.101	(0)
ZnNO3+	4.693e-14	3.723e-14	-13.329	-13.429	-0.101	(0)
BaNO3+	2.501e-15	1.984e-15	-14.602	-14.703	-0.101	(0)
NiNO3+	9.779e-16	7.757e-16	-15.010	-15.110	-0.101	(0)
CuNO3+	8.805e-16	6.984e-16	-15.055	-15.156	-0.101	(0)
CoNO3+	4.615e-16	3.661e-16	-15.336	-15.436	-0.101	(0)
CdNO3+	1.288e-16	1.022e-16	-15.890	-15.991	-0.101	(0)
PbNO3+	2.635e-17	2.090e-17	-16.579	-16.680	-0.101	(0)
AgNO3	2.093e-17	2.093e-17	-16.679	-16.679	0.000	(0)
Mn (NO3) 2	6.261e-21	6.261e-21	-20.203	-20.203	0.000	(0)
UO2NO3+	1.223e-21	9.701e-22	-20.913	-21.013	-0.101	(0)
Zn (NO3) 2	7.238e-23	7.238e-23	-22.140	-22.140	0.000	(0)
Co (NO3) 2	7.258e-24	7.258e-24	-23.139	-23.139	0.000	(0)
CrNO3+2	6.544e-24	2.591e-24	-23.184	-23.587	-0.402	(0)
Cu (NO3) 2	8.568e-25	8.568e-25	-24.067	-24.067	0.000	(0)
VO2NO3	5.355e-25	5.355e-25	-24.271	-24.271	0.000	(0)
Cd (NO3) 2	4.989e-25	4.989e-25	-24.302	-24.302	0.000	(0)
Pb (NO3) 2	3.458e-25	3.458e-25	-24.461	-24.461	0.000	(0)
FeNO3+2	1.344e-26	5.323e-27	-25.871	-26.274	-0.402	(0)
HgNO3+	5.533e-29	4.389e-29	-28.257	-28.358	-0.101	(0)
Hg (NO3) 2	1.778e-37	1.778e-37	-36.750	-36.750	0.000	(0)
Na	8.443e-03					
Na+	8.240e-03	6.884e-03	-2.084	-2.162	-0.078	(0)
NaSO4-	1.928e-04	1.624e-04	-3.715	-3.789	-0.075	(0)
NaHCO3	8.761e-06	8.761e-06	-5.057	-5.057	0.000	(0)
NaCO3-	4.808e-07	4.050e-07	-6.318	-6.393	-0.075	(0)
NaF	4.603e-07	4.603e-07	-6.337	-6.337	0.000	(0)
NaH2BO3	4.995e-09	4.995e-09	-8.301	-8.301	0.000	(0)
NaCrO4-	2.856e-17	2.266e-17	-16.544	-16.645	-0.101	(0)
Ni	1.082e-07					
Ni+2	6.505e-08	3.169e-08	-7.187	-7.499	-0.312	(0)
NiSO4	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
NiHCO3+	1.115e-08	8.841e-09	-7.953	-8.053	-0.101	(0)
NiCO3	3.735e-09	3.735e-09	-8.428	-8.428	0.000	(0)
NiCl+	2.207e-10	1.751e-10	-9.656	-9.757	-0.101	(0)
NiOH+	1.507e-10	1.196e-10	-9.822	-9.922	-0.101	(0)
NiF+	1.063e-10	8.435e-11	-9.973	-10.074	-0.101	(0)

Ni (SO4) 2-2	1.020e-11	4.040e-12	-10.991	-11.394	-0.402	(0)
Ni (OH) 2	2.846e-12	2.846e-12	-11.546	-11.546	0.000	(0)
NiNH3+2	1.030e-13	4.079e-14	-12.987	-13.389	-0.402	(0)
NiCl2	1.903e-15	1.903e-15	-14.720	-14.720	0.000	(0)
Ni (OH) 3-	1.075e-15	8.527e-16	-14.969	-15.069	-0.101	(0)
NiSeO4	1.016e-15	1.016e-15	-14.993	-14.993	0.000	(0)
NiNO3+	9.779e-16	7.757e-16	-15.010	-15.110	-0.101	(0)
Ni (NH3) 2+2	3.568e-20	1.413e-20	-19.448	-19.850	-0.402	(0)
O (0)	6.111e-35					
O2	3.055e-35	3.083e-35	-34.515	-34.511	0.004	(0)
Pb	2.501e-09					
PbCO3	1.377e-09	1.377e-09	-8.861	-8.861	0.000	(0)
PbSO4	3.120e-10	3.120e-10	-9.506	-9.506	0.000	(0)
PbHCO3+	3.074e-10	2.438e-10	-9.512	-9.613	-0.101	(0)
Pb+2	2.976e-10	1.450e-10	-9.526	-9.839	-0.312	(0)
PbOH+	1.376e-10	1.091e-10	-9.861	-9.962	-0.101	(0)
Pb (CO3) 2-2	3.168e-11	1.254e-11	-10.499	-10.902	-0.402	(0)
Pb (SO4) 2-2	2.085e-11	8.257e-12	-10.681	-11.083	-0.402	(0)
PbCl+	1.400e-11	1.111e-11	-10.854	-10.954	-0.101	(0)
PbF+	1.365e-12	1.083e-12	-11.865	-11.965	-0.101	(0)
Pb (OH) 2	1.034e-12	1.034e-12	-11.985	-11.985	0.000	(0)
PbCl2	1.071e-13	1.071e-13	-12.970	-12.970	0.000	(0)
PbF2	2.258e-15	2.258e-15	-14.646	-14.646	0.000	(0)
Pb (OH) 3-	3.907e-16	3.099e-16	-15.408	-15.509	-0.101	(0)
PbCl3-	1.161e-16	9.210e-17	-15.935	-16.036	-0.101	(0)
PbNO3+	2.635e-17	2.090e-17	-16.579	-16.680	-0.101	(0)
Pb2OH+3	2.017e-18	2.508e-19	-17.695	-18.601	-0.905	(0)
PbF3-	5.720e-19	4.537e-19	-18.243	-18.343	-0.101	(0)
PbCl4-2	2.296e-19	9.090e-20	-18.639	-19.041	-0.402	(0)
Pb (OH) 4-2	5.744e-20	2.274e-20	-19.241	-19.643	-0.402	(0)
PbF4-2	5.811e-23	2.301e-23	-22.236	-22.638	-0.402	(0)
Pb3 (OH) 4+2	7.815e-24	3.094e-24	-23.107	-23.509	-0.402	(0)
Pb (NO3) 2	3.458e-25	3.458e-25	-24.461	-24.461	0.000	(0)
Pb4 (OH) 4+4	1.450e-28	3.564e-30	-27.839	-29.448	-1.609	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.847	-152.847	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.586	-230.686	-0.101	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.893	-73.893	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.039	-79.139	-0.101	(0)
CdHS+	0.000e+00	0.000e+00	-79.510	-79.611	-0.101	(0)
H2S	0.000e+00	0.000e+00	-79.593	-79.593	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.628	-81.030	-0.402	(0)
S6-2	0.000e+00	0.000e+00	-81.144	-81.546	-0.402	(0)
S4-2	0.000e+00	0.000e+00	-81.224	-81.626	-0.402	(0)
S3-2	0.000e+00	0.000e+00	-82.030	-82.432	-0.402	(0)
S2-2	0.000e+00	0.000e+00	-83.046	-83.448	-0.402	(0)
S-2	0.000e+00	0.000e+00	-88.661	-88.965	-0.304	(0)
HgHS2-	0.000e+00	0.000e+00	-138.690	-138.790	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.622	-140.024	-0.402	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.870	-139.870	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.737	-148.941	-0.204	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.831	-148.932	-0.101	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.712	-149.812	-0.101	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.929	-150.292	-0.364	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.534	-150.908	-0.373	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.677	-151.022	-0.346	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.864	-151.219	-0.354	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.276	-151.276	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.546	-151.546	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.847	-152.847	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.956	-160.956	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.063	-219.163	-0.101	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.035	-227.135	-0.101	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.684	-228.785	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.239	-229.642	-0.402	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.586	-230.686	-0.101	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.958	-238.058	-0.101	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-305.326	-305.728	-0.402	(0)

Zn (HS) 4-2	0.000e+00	0.000e+00	-307.332	-307.735	-0.402	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.781	-321.183	-0.402	(0)
S (6)	1.196e-02					
SO4-2	9.016e-03	4.393e-03	-2.045	-2.357	-0.312	(0)
CaSO4	1.324e-03	1.324e-03	-2.878	-2.878	0.000	(0)
MgSO4	1.315e-03	1.315e-03	-2.881	-2.881	0.000	(0)
NaSO4-	1.928e-04	1.624e-04	-3.715	-3.789	-0.075	(0)
KSO4-	9.653e-05	8.131e-05	-4.015	-4.090	-0.075	(0)
MnSO4	1.294e-05	1.294e-05	-4.888	-4.888	0.000	(0)
ZnSO4	1.462e-06	1.462e-06	-5.835	-5.835	0.000	(0)
Zn (SO4) 2-2	1.412e-07	5.592e-08	-6.850	-7.252	-0.402	(0)
NiSO4	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
CuSO4	2.281e-08	2.281e-08	-7.642	-7.642	0.000	(0)
CoSO4	2.078e-08	2.078e-08	-7.682	-7.682	0.000	(0)
HSO4-	1.725e-08	1.442e-08	-7.763	-7.841	-0.078	(0)
NH4SO4-	7.914e-09	6.644e-09	-8.102	-8.178	-0.076	(0)
CdSO4	3.414e-09	3.414e-09	-8.467	-8.467	0.000	(0)
Cd (SO4) 2-2	5.109e-10	2.023e-10	-9.292	-9.694	-0.402	(0)
PbSO4	3.120e-10	3.120e-10	-9.506	-9.506	0.000	(0)
AgSO4-	2.988e-10	2.370e-10	-9.525	-9.625	-0.101	(0)
CrOHSO4	4.157e-11	4.157e-11	-10.381	-10.381	0.000	(0)
Pb (SO4) 2-2	2.085e-11	8.257e-12	-10.681	-11.083	-0.402	(0)
Ni (SO4) 2-2	1.020e-11	4.040e-12	-10.991	-11.394	-0.402	(0)
AlSO4+	7.165e-12	5.988e-12	-11.145	-11.223	-0.078	(0)
FeSO4	2.540e-12	2.540e-12	-11.595	-11.595	0.000	(0)
Al (SO4) 2-	3.372e-13	2.819e-13	-12.472	-12.550	-0.078	(0)
UO2SO4	3.317e-13	3.317e-13	-12.479	-12.479	0.000	(0)
CrSO4+	7.866e-14	6.240e-14	-13.104	-13.205	-0.101	(0)
UO2 (SO4) 2-2	4.852e-14	1.921e-14	-13.314	-13.716	-0.402	(0)
VO2SO4-	1.437e-17	1.140e-17	-16.843	-16.943	-0.101	(0)
FeSO4+	3.207e-18	2.693e-18	-17.494	-17.570	-0.076	(0)
Cr2 (OH) 2SO4+2	3.784e-19	1.498e-19	-18.422	-18.824	-0.402	(0)
Fe (SO4) 2-	3.188e-19	2.529e-19	-18.497	-18.597	-0.101	(0)
VOSO4	4.753e-20	4.753e-20	-19.323	-19.323	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.910e-20	3.910e-20	-19.408	-19.408	0.000	(0)
HgSO4	1.403e-20	1.403e-20	-19.853	-19.853	0.000	(0)
CrO3SO4-2	8.172e-24	3.236e-24	-23.088	-23.490	-0.402	(0)
VSO4+	2.306e-34	1.829e-34	-33.637	-33.738	-0.101	(0)
U (SO4) 2	1.023e-39	1.023e-39	-38.990	-38.990	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.130	-40.533	-0.402	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.136	-62.236	-0.101	(0)
Sb (3)	5.772e-20					
Sb (OH) 3	2.920e-20	2.920e-20	-19.535	-19.535	0.000	(0)
HSbO2	2.852e-20	2.852e-20	-19.545	-19.545	0.000	(0)
SbO2-	1.734e-24	1.375e-24	-23.761	-23.862	-0.101	(0)
Sb (OH) 4-	9.924e-25	7.872e-25	-24.003	-24.104	-0.101	(0)
Sb (OH) 2F	1.624e-25	1.624e-25	-24.789	-24.789	0.000	(0)
SbOF	1.598e-25	1.598e-25	-24.796	-24.796	0.000	(0)
Sb (OH) 2+	3.004e-26	2.383e-26	-25.522	-25.623	-0.101	(0)
SbO+	1.036e-26	8.219e-27	-25.985	-26.085	-0.101	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.781	-321.183	-0.402	(0)
Sb (5)	2.538e-08					
SbO3-	2.535e-08	2.011e-08	-7.596	-7.697	-0.101	(0)
Sb (OH) 6-	2.811e-11	2.348e-11	-10.551	-10.629	-0.078	(0)
SbO2+	8.206e-24	6.510e-24	-23.086	-23.186	-0.101	(0)
Se (-2)	6.472e-15					
Ag2Se	6.472e-15	6.472e-15	-14.189	-14.189	0.000	(0)
HSe-	4.598e-40	3.647e-40	-39.337	-39.438	-0.101	(0)
MnSe	0.000e+00	0.000e+00	-42.130	-42.130	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.022	-43.022	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.562	-46.964	-0.402	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.922	-85.532	-1.609	(0)
Se (4)	1.322e-07					
HSeO3-	1.068e-07	8.472e-08	-6.971	-7.072	-0.101	(0)
SeO3-2	2.537e-08	1.004e-08	-7.596	-7.998	-0.402	(0)
H2SeO3	1.214e-12	1.214e-12	-11.916	-11.916	0.000	(0)
AgSeO3-	2.201e-14	1.746e-14	-13.657	-13.758	-0.101	(0)
Cd (SeO3) 2-2	6.961e-19	2.756e-19	-18.157	-18.560	-0.402	(0)

Ag (SeO3) 2-3	1.262e-20	1.570e-21	-19.899	-20.804	-0.905	(0)
FeHSeO3+2	3.089e-23	1.223e-23	-22.510	-22.913	-0.402	(0)
Se (6)	1.410e-10					
SeO4-2	1.407e-10	6.853e-11	-9.852	-10.164	-0.312	(0)
MnSeO4	3.055e-13	3.055e-13	-12.515	-12.515	0.000	(0)
ZnSeO4	1.614e-14	1.614e-14	-13.792	-13.792	0.000	(0)
NiSeO4	1.016e-15	1.016e-15	-14.993	-14.993	0.000	(0)
CoSeO4	8.142e-16	8.142e-16	-15.089	-15.089	0.000	(0)
HSeO4-	1.454e-16	1.154e-16	-15.837	-15.938	-0.101	(0)
CdSeO4	4.231e-17	4.231e-17	-16.374	-16.374	0.000	(0)
Zn (SeO4) 2-2	2.833e-24	1.122e-24	-23.548	-23.950	-0.402	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.063	-58.969	-0.905	(0)
U (4)	3.747e-21					
U (OH) 5-	3.743e-21	2.969e-21	-20.427	-20.527	-0.101	(0)
U (OH) 4	4.178e-24	4.178e-24	-23.379	-23.379	0.000	(0)
U (OH) 3+	6.471e-28	5.133e-28	-27.189	-27.290	-0.101	(0)
U (OH) 2+2	2.014e-32	7.976e-33	-31.696	-32.098	-0.402	(0)
UF3+	1.001e-35	7.943e-36	-34.999	-35.100	-0.101	(0)
UF2+2	1.195e-36	4.730e-37	-35.923	-36.325	-0.402	(0)
UOH+3	1.015e-37	1.262e-38	-36.994	-37.899	-0.905	(0)
UF4	9.228e-38	9.228e-38	-37.035	-37.035	0.000	(0)
UF+3	2.851e-39	3.546e-40	-38.545	-39.450	-0.905	(0)
U (SO4) 2	1.023e-39	1.023e-39	-38.990	-38.990	0.000	(0)
UF5-	4.885e-40	3.875e-40	-39.311	-39.412	-0.101	(0)
USO4+2	0.000e+00	0.000e+00	-40.130	-40.533	-0.402	(0)
UF6-2	0.000e+00	0.000e+00	-40.504	-40.907	-0.402	(0)
U+4	0.000e+00	0.000e+00	-43.166	-44.775	-1.609	(0)
UCl+3	0.000e+00	0.000e+00	-44.836	-45.741	-0.905	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.556	-173.703	-8.148	(0)
U (5)	1.536e-16					
UO2+	1.536e-16	1.218e-16	-15.814	-15.914	-0.101	(0)
U (6)	3.553e-07					
UO2 (CO3) 3-4	2.547e-07	6.261e-09	-6.594	-8.203	-1.609	(0)
UO2 (CO3) 2-2	9.988e-08	3.955e-08	-7.001	-7.403	-0.402	(0)
UO2CO3	6.275e-10	6.275e-10	-9.202	-9.202	0.000	(0)
UO2OH+	2.373e-12	1.882e-12	-11.625	-11.725	-0.101	(0)
UO2F+	9.200e-13	7.298e-13	-12.036	-12.137	-0.101	(0)
UO2SO4	3.317e-13	3.317e-13	-12.479	-12.479	0.000	(0)
UO2F2	2.230e-13	2.230e-13	-12.652	-12.652	0.000	(0)
UO2+2	1.024e-13	4.990e-14	-12.990	-13.302	-0.312	(0)
UO2 (SO4) 2-2	4.852e-14	1.921e-14	-13.314	-13.716	-0.402	(0)
UO2F3-	7.483e-15	5.936e-15	-14.126	-14.227	-0.101	(0)
UO2Cl+	2.203e-16	1.747e-16	-15.657	-15.758	-0.101	(0)
(UO2) 2 (OH) 2+2	1.485e-17	5.880e-18	-16.828	-17.231	-0.402	(0)
UO2F4-2	1.262e-17	4.996e-18	-16.899	-17.301	-0.402	(0)
(UO2) 3 (OH) 5+	9.502e-19	7.538e-19	-18.022	-18.123	-0.101	(0)
UO2NO3+	1.223e-21	9.701e-22	-20.913	-21.013	-0.101	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.675	-42.775	-0.101	(0)
V+2	0.000e+00	0.000e+00	-43.359	-43.762	-0.402	(0)
V (3)	1.914e-15					
V (OH) 3	1.914e-15	1.914e-15	-14.718	-14.718	0.000	(0)
V (OH) 2+	5.240e-26	4.156e-26	-25.281	-25.381	-0.101	(0)
VOH+2	3.346e-29	1.325e-29	-28.476	-28.878	-0.402	(0)
V+3	7.093e-34	8.821e-35	-33.149	-34.054	-0.905	(0)
VSO4+	2.306e-34	1.829e-34	-33.637	-33.738	-0.101	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.902	-55.807	-0.905	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.346	-56.956	-1.609	(0)
V (4)	3.139e-18					
V (OH) 3+	2.959e-18	2.347e-18	-17.529	-17.629	-0.101	(0)
VO+2	9.922e-20	3.929e-20	-19.003	-19.406	-0.402	(0)
VOSO4	4.753e-20	4.753e-20	-19.323	-19.323	0.000	(0)
VOF+	3.148e-20	2.497e-20	-19.502	-19.603	-0.101	(0)
VOF2	9.920e-22	9.920e-22	-21.003	-21.003	0.000	(0)
VOC1+	3.000e-22	2.380e-22	-21.523	-21.623	-0.101	(0)
VOF3-	4.702e-24	3.730e-24	-23.328	-23.428	-0.101	(0)
VOF4-2	4.029e-27	1.595e-27	-26.395	-26.797	-0.402	(0)

H2V2O4+2	6.984e-31	2.765e-31	-30.156	-30.558	-0.402	(0)
V(5)	6.991e-09					
H2VO4-	6.079e-09	4.822e-09	-8.216	-8.317	-0.101	(0)
HVO4-2	9.108e-10	3.606e-10	-9.041	-9.443	-0.402	(0)
H3VO4	1.619e-12	1.619e-12	-11.791	-11.791	0.000	(0)
H3V2O7-	6.359e-14	5.045e-14	-13.197	-13.297	-0.101	(0)
HV2O7-3	4.741e-15	5.896e-16	-14.324	-15.229	-0.905	(0)
VO4-3	4.328e-16	5.382e-17	-15.364	-16.269	-0.905	(0)
VO2+	1.300e-16	1.086e-16	-15.886	-15.964	-0.078	(0)
VO2F	2.019e-17	2.019e-17	-16.695	-16.695	0.000	(0)
V2O7-4	1.922e-17	4.725e-19	-16.716	-18.326	-1.609	(0)
VO2SO4-	1.437e-17	1.140e-17	-16.843	-16.943	-0.101	(0)
VO2F2-	9.792e-19	7.767e-19	-18.009	-18.110	-0.101	(0)
V3O9-3	9.456e-19	1.176e-19	-18.024	-18.930	-0.905	(0)
VO2F3-2	2.593e-21	1.027e-21	-20.586	-20.989	-0.402	(0)
V4O12-4	9.623e-24	2.365e-25	-23.017	-24.626	-1.609	(0)
VO2NO3	5.355e-25	5.355e-25	-24.271	-24.271	0.000	(0)
VO2F4-3	4.304e-25	5.352e-26	-24.366	-25.271	-0.905	(0)
V10O28-6	0.000e+00	0.000e+00	-60.533	-64.155	-3.621	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.927	-63.442	-2.515	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.099	-65.708	-1.609	(0)
Zn	5.215e-06					
Zn+2	3.122e-06	1.521e-06	-5.506	-5.818	-0.312	(0)
ZnSO4	1.462e-06	1.462e-06	-5.835	-5.835	0.000	(0)
ZnCO3	2.765e-07	2.765e-07	-6.558	-6.558	0.000	(0)
Zn(SO4)2-2	1.412e-07	5.592e-08	-6.850	-7.252	-0.402	(0)
ZnHCO3+	1.372e-07	1.088e-07	-6.863	-6.963	-0.101	(0)
ZnOH+	5.745e-08	4.557e-08	-7.241	-7.341	-0.101	(0)
ZnCl+	9.915e-09	8.249e-09	-8.004	-8.084	-0.080	(0)
ZnF+	4.053e-09	3.215e-09	-8.392	-8.493	-0.101	(0)
ZnOHCl	3.236e-09	3.236e-09	-8.490	-8.490	0.000	(0)
Zn(OH)2	2.164e-09	2.164e-09	-8.665	-8.665	0.000	(0)
ZnCl2	2.823e-11	2.823e-11	-10.549	-10.549	0.000	(0)
Zn(OH)3-	4.097e-12	3.250e-12	-11.387	-11.488	-0.101	(0)
ZnCl3-	5.819e-14	4.842e-14	-13.235	-13.315	-0.080	(0)
ZnNO3+	4.693e-14	3.723e-14	-13.329	-13.429	-0.101	(0)
ZnSeO4	1.614e-14	1.614e-14	-13.792	-13.792	0.000	(0)
ZnCl4-2	1.052e-16	5.227e-17	-15.978	-16.282	-0.304	(0)
Zn(OH)4-2	9.793e-17	3.877e-17	-16.009	-16.411	-0.402	(0)
Zn(NO3)2	7.238e-23	7.238e-23	-22.140	-22.140	0.000	(0)
Zn(SeO4)2-2	2.833e-24	1.122e-24	-23.548	-23.950	-0.402	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.712	-149.812	-0.101	(0)
Zn(HS)2	0.000e+00	0.000e+00	-151.276	-151.276	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-227.035	-227.135	-0.101	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-229.239	-229.642	-0.402	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-307.332	-307.735	-0.402	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-56.49	-50.20	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-44.02	-39.51	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.24	-39.51	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-72.85	-54.92	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-58.92	-38.88	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.28	-28.88	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.31	-23.86	0.45	(NH4)2SeO4
Acanthite	-52.58	-88.80	-36.22	Ag2S
Ag2CO3	-11.55	-22.64	-11.09	Ag2CO3
Ag2CrO4	-20.72	-32.31	-11.59	Ag2CrO4
Ag2HVO4	-12.16	-10.68	1.48	Ag2HVO4
Ag2MoO4	-11.64	-23.19	-11.55	Ag2MoO4
Ag2O	-14.76	-2.19	12.57	Ag2O
Ag2Se	-0.40	-49.10	-48.70	Ag2Se
Ag2SeO3	-9.58	-16.73	-7.15	Ag2SeO3
Ag2SeO4	-18.39	-27.30	-8.91	Ag2SeO4
Ag2SO4	-14.67	-19.49	-4.82	Ag2SO4

Ag3AsO3	-28.13	-25.97	2.16	Ag3AsO3
Ag3AsO4	-16.34	-19.13	-2.79	Ag3AsO4
Ag3H2VO5	-16.95	-11.77	5.18	Ag3H2VO5
AgF·4H2O	-13.59	-12.54	1.05	AgF·4H2O
Agmetal	-0.46	-13.97	-13.51	Ag
AgVO3	-10.35	-9.58	0.77	AgVO3
Al (OH) 3 (am)	-1.13	9.67	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.05	-43.68	2.37	Al2 (MoO4) 3
Al2O3	-0.32	19.33	19.65	Al2O3
Al4 (OH) 10SO4	-1.34	21.36	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.98	-6.18	4.80	AlAsO4·2H2O
AlOHSO4	-4.41	-7.64	-3.23	AlOHSO4
AlSb	-152.72	-87.09	65.62	AlSb
Alunite	0.68	-0.72	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.41	-12.20	-7.79	PbSO4
Anhydrite	-0.88	-5.24	-4.36	CaSO4
Anilite	-57.23	-89.10	-31.88	Cu0.25Cu1.5S
Antlerite	-4.18	4.60	8.79	Cu3 (OH) 4SO4
Aragonite	-0.08	-8.38	-8.30	CaCO3
Arsenolite	-87.99	-90.75	-2.76	As4O6
Artinite	-5.72	3.88	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.39	-31.69	6.71	As2O5
Atacamite	-2.93	4.47	7.39	Cu2 (OH) 3Cl
Azurite	-2.08	-18.99	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.84	7.55	24.39	Ba (OH) 2:8H2O
Ba2V2O7·2H2O	-17.74	-1.87	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-0.11	-9.02	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.25	5.69	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.90	-22.57	-9.67	BaCrO4
BaF2	-9.52	-15.34	-5.82	BaF2
BaMoO4	-6.49	-13.45	-6.96	BaMoO4
Barite	0.23	-9.75	-9.98	BaSO4
BaS	-95.24	-79.06	16.18	BaS
BaSeO3	-8.82	-6.99	1.83	BaSeO3
BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-6.41	-8.18	-1.76	ZnSO4:6H2O
Birnessite	-7.53	10.56	18.09	MnO2
Bixbyite	-3.98	-4.62	-0.64	Mn2O3
BlaubleiI	-56.45	-80.62	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.25	-84.53	-27.28	Cu0.6Cu0.8S
Boehmite	1.09	9.67	8.58	AlOOH
Breithauptite	-57.92	-76.44	-18.52	NiSb
Brochantite	-3.32	11.91	15.22	Cu4 (OH) 6SO4
Brucite	-4.68	12.16	16.84	Mg (OH) 2
Bunsenite	-5.00	7.45	12.45	NiO
Ca (VO3) 2	-10.57	-4.91	5.66	Ca (VO3) 2
Ca2V2O7	-10.35	7.15	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.40	7.15	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2:4H2O	-17.79	4.51	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.74	19.22	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.64	19.22	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.29	-157.32	142.97	Ca3Sb2
CaCrO4	-15.79	-18.06	-2.27	CaCrO4
Calcite	0.10	-8.38	-8.48	CaCO3
Calomel	-7.25	-25.16	-17.91	Hg2Cl2
CaMoO4	-0.99	-8.94	-7.95	CaMoO4
Carnotite	-2.18	-1.95	0.23	KUO2VO4
CaSeO3·2H2O	-5.29	-2.48	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-10.03	-13.05	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-12.53	-2.69	9.84	Cd (BO2) 2
Cd (OH) 2	-7.18	6.47	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.26	6.47	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-21.92	-15.21	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.46	2.10	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-19.83	8.57	28.40	Cd4 (OH) 6SO4
CdCl2	-13.15	-13.81	-0.66	CdCl2
CdCl2:1H2O	-12.12	-13.81	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.90	-13.81	-1.91	CdCl2:2.5H2O

CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal (alpha)	-32.79	-19.27	13.51	Cd
Cdmetal (gamma)	-32.89	-19.27	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-7.21	-3.67	3.54	CdOHCl
CdSb	-77.07	-77.42	-0.35	CdSb
CdSe	-20.24	-40.44	-20.20	CdSe
CdSeO4:2H2O	-16.79	-18.64	-1.85	CdSeO4:2H2O
CdSO4	-10.66	-10.84	-0.17	CdSO4
CdSO4:1H2O	-9.11	-10.84	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.96	-10.84	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.48	-11.23	-9.75	AgCl
Cerrusite	-2.21	-15.34	-13.13	PbCO3
CH4 (g)	-82.37	-123.42	-41.05	CH4
Chalcanthite	-7.36	-10.00	-2.64	CuSO4:5H2O
Chalcocite	-57.45	-92.37	-34.92	Cu2S
Chalcopyrite	-127.33	-162.60	-35.27	CuFeS2
Cinnabar	-52.08	-97.77	-45.69	HgS
Claudetite	-87.68	-90.75	-3.06	As4O6
Clausthalite	-14.70	-41.80	-27.10	PbSe
Co (BO2) 2	-28.90	-1.83	27.07	Co (BO2) 2
Co (OH) 2	-5.77	7.32	13.09	Co (OH) 2
Co (OH) 3	-9.90	-12.21	-2.31	Co (OH) 3
CO2 (g)	-2.30	-20.45	-18.15	CO2
Co3 (AsO4) 2	-22.75	-9.72	13.03	Co3 (AsO4) 2
Co3O4	-6.60	-17.09	-10.50	Co3O4
CoCl2	-21.22	-12.96	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.96	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.98	-15.57	-1.60	CoF2
CoF3	-45.09	-46.55	-1.46	CoF3
CoFe2O4	17.17	13.64	-3.53	CoFe2O4
CoMoO4	-5.92	-13.68	-7.76	CoMoO4
CoO	-6.26	7.32	13.59	CoO
CoS (alpha)	-71.85	-79.29	-7.44	CoS
CoS (beta)	-68.22	-79.29	-11.07	CoS
CoSe	-23.39	-39.59	-16.20	CoSe
CoSeO3	-8.54	-7.22	1.32	CoSeO3
CoSeO4:6H2O	-16.26	-17.79	-1.53	CoSeO4:6H2O
CoSO4	-12.78	-9.98	2.80	CoSO4
CoSO4:6H2O	-7.51	-9.98	-2.47	CoSO4:6H2O
Cotunnite	-10.39	-15.17	-4.78	PbCl2
Covellite	-57.01	-79.31	-22.30	CuS
Cr (OH) 2	-22.11	-11.29	10.82	Cr (OH) 2
Cr (OH) 3	-2.70	-1.36	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.61	-1.36	-0.75	Cr (OH) 3
Cr2O3	-0.37	-2.73	-2.36	Cr2O3
CrCl2	-45.66	-31.57	14.09	CrCl2
CrCl3	-46.90	-31.78	15.11	CrCl3
CrF3	-24.37	-35.71	-11.34	CrF3
Crmetal	-67.51	-37.03	30.48	Cr
CrO3	-26.92	-30.13	-3.21	CrO3
Cryolite	-9.25	-43.09	-33.84	Na3AlF6
Cu (OH) 2	-1.37	7.30	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.49	19.72	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-10.13	-0.88	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.45	-92.34	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.87	-52.67	-45.80	Cu2Se
Cu2SO4	-21.11	-23.06	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.88	-9.78	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.80	-105.39	-42.59	Cu3Sb
Cu3Se2	-28.79	-92.28	-63.49	Cu3Se2
CuCO3	-1.65	-13.15	-11.50	CuCO3
CuCrO4	-17.38	-22.82	-5.44	CuCrO4
CuF	-9.42	-14.33	-4.91	CuF
CuF2	-16.71	-15.59	1.12	CuF2
CuF2:2H2O	-11.04	-15.59	-4.55	CuF2:2H2O
Cumetal	-6.99	-15.75	-8.76	Cu

CuMoO4	-0.62	-13.70	-13.08	CuMoO4
CuOCuSO4	-13.00	-2.70	10.30	CuOCuSO4
Cupricferrite	7.63	13.62	5.99	CuFe2O4
Cuprite	-4.35	-5.76	-1.41	Cu2O
Cuprousferrite	9.20	0.28	-8.92	CuFeO2
CuSe	-6.51	-39.61	-33.10	CuSe
CuSe2	-27.41	-60.78	-33.37	CuSe2
CuSeO3:2H2O	-7.75	-7.24	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.37	-17.81	-2.44	CuSeO4:5H2O
CuSO4	-12.94	-10.00	2.94	CuSO4
Diaspore	2.79	9.67	6.87	AlOOH
Djurleite	-57.59	-91.51	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.13	-16.67	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.42	-16.67	-17.09	CaMg(CO3)2
Epsomite	-3.02	-5.14	-2.13	MgSO4:7H2O
Fe(OH)2	-10.24	3.32	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.16	0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.94	-13.66	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.78	-8.23	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.69	-37.32	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.86	-45.60	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.59	9.64	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.08	-12.68	0.40	FeAsO4:2H2O
FeCr2O4	-6.61	0.59	7.20	FeCr2O4
FeMoO4	-7.59	-17.68	-10.09	FeMoO4
Ferrihydrite	-0.03	3.16	3.19	Fe(OH)3
Ferroselite	-46.17	-64.76	-18.60	FeSe2
FeS(ppt)	-80.34	-83.29	-2.95	FeS
FeSe	-32.59	-43.59	-11.00	FeSe
Fix_pe	-5.40	-5.40	0.00	e-
Fluorite	-0.33	-10.83	-10.50	CaF2
Galena	-67.53	-81.50	-13.97	PbS
Gibbsite	1.37	9.67	8.29	Al(OH)3
Goethite	2.67	3.16	0.49	FeOOH
Goslarite	-6.17	-8.18	-2.01	ZnSO4:7H2O
Greenockite	-65.78	-80.14	-14.36	CdS
Greigite	-291.78	-336.81	-45.03	Fe3S4
Gummite	-6.03	1.65	7.67	UO3
Gypsum	-0.63	-5.24	-4.61	CaSO4:2H2O
H-Jarosite	-13.03	-25.13	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.13	-21.00	-12.88	H2MoO4
H2S(g)	-78.60	-86.61	-8.01	H2S
H2Se(g)	-41.95	-46.91	-4.96	H2Se
Halite	-6.43	-4.83	1.60	NaCl
Hausmannite	-4.79	56.24	61.03	Mn3O4
Hematite	7.74	6.32	-1.42	Fe2O3
Hercynite	-0.24	22.65	22.89	FeAl2O4
Hg(CH3)2(g)	-184.29	-257.99	-73.71	Hg(CH3)2
Hg(g)	-7.44	-15.31	-7.87	Hg
Hg(OH)2	-7.66	-11.16	-3.50	Hg(OH)2
Hg2(g)	-15.66	-30.62	-14.96	Hg2
Hg2(OH)2	-10.14	-4.88	5.26	Hg2(OH)2
Hg2CO3	-9.28	-25.33	-16.05	Hg2CO3
Hg2CrO4	-26.30	-35.00	-8.70	Hg2CrO4
Hg2F2	-17.41	-27.77	-10.36	Hg2F2
Hg2S	-79.81	-91.49	-11.68	Hg2S
Hg2SeO3	-14.77	-19.42	-4.66	Hg2SeO3
Hg2SO4	-16.05	-22.18	-6.13	Hg2SO4
Hg3O2CO3	-24.25	-53.93	-29.68	Hg3O2CO3
HgCl(g)	-32.07	-12.58	19.50	HgCl
HgCl2	-10.18	-31.44	-21.26	HgCl2
HgF(g)	-46.56	-13.89	32.68	HgF
HgF2(g)	-46.62	-34.06	12.57	HgF2
Hgmetal(l)	-1.86	-15.31	-13.45	Hg
HgSe	-2.38	-58.07	-55.69	HgSe
HgSeO3	-13.28	-25.71	-12.43	HgSeO3
HgSO4	-19.05	-28.46	-9.42	HgSO4
Huntite	-3.27	-33.23	-29.97	CaMg3(CO3)4

Hydrocerrusite	-6.80	-25.57	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.21	-20.98	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.89	-20.06	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.44	-20.24	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.23	-50.47	-17.24	K2Cr2O7
K2CrO4	-19.83	-20.34	-0.51	K2CrO4
K2MoO4	-14.48	-11.22	3.26	K2MoO4
K2SeO4	-14.60	-15.33	-0.73	K2SeO4
Langite	-5.58	11.91	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.65	-7.09	-0.43	PbO : PbSO4
Laurionite	-5.65	-5.03	0.62	PbOHCl
Lepidocrocite	1.79	3.16	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.59	5.11	12.69	PbO
Mackinawite	-79.69	-83.29	-3.60	FeS
Maghemite	-0.07	6.32	6.39	Fe2O3
Magnesioferrite	1.62	18.48	16.86	Fe2MgO4
Magnesite	-0.82	-8.28	-7.46	MgCO3
Magnetite	6.23	9.64	3.40	Fe3O4
Malachite	-0.54	-5.84	-5.31	Cu2 (OH) 2CO3
Manganite	-2.30	23.04	25.34	MnOOH
Massicot	-7.79	5.11	12.89	PbO
Matlockite	-7.51	-16.48	-8.97	PbClF
Melanothallite	-19.23	-12.98	6.26	CuCl2
Melanterite	-11.78	-13.99	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.68	-97.77	-45.09	HgS
Mg (OH) 2 (active)	-6.63	12.16	18.79	Mg (OH) 2
Mg (VO3) 2	-16.10	-4.82	11.28	Mg (VO3) 2
Mg2Sb3	-276.28	-201.60	74.68	Mg2Sb3
Mg2V2O7	-19.01	7.35	26.36	Mg2V2O7
MgCr2O4	-6.76	9.44	16.20	MgCr2O4
MgCrO4	-23.34	-17.96	5.38	MgCrO4
MgF2	-2.60	-10.73	-8.13	MgF2
MgMoO4	-6.99	-8.84	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.44	-2.38	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.75	-12.95	-1.20	MgSeO4 : 6H2O
Minium	-32.45	41.07	73.52	Pb3O4
Mirabilite	-5.57	-6.68	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.71	-6.81	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.83	-56.54	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.38	-89.30	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.69	-1.19	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.83	-10.11	2.72	MnCl2 : 4H2O
MnS (grn)	-76.62	-76.45	0.17	MnS
MnS (pnk)	-79.79	-76.45	3.34	MnS
MnSb	-96.16	-99.07	-2.91	MnSb
MnSe	-40.25	-36.75	3.50	MnSe
MnSeO3	-5.51	-4.38	1.13	MnSeO3
MnSeO3 : 2H2O	-5.36	-4.38	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.90	-14.95	-2.05	MnSeO4 : 5H2O
MnSO4	-9.72	-7.14	2.58	MnSO4
Monteponite	-8.64	6.47	15.10	CdO
Montroydite	-7.52	-11.16	-3.64	HgO
MoO3	-13.00	-21.00	-8.00	MoO3
Morenosite	-7.71	-9.86	-2.14	NiSO4 : 7H2O
MoS2	-149.71	-219.97	-70.26	MoS2
Na-Jarosite	-8.62	-19.82	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.73	-49.63	-9.90	Na2Cr2O7
Na2CrO4	-22.43	-19.50	2.93	Na2CrO4
Na2Mo2O7	-14.79	-31.38	-16.60	Na2Mo2O7
Na2MoO4	-11.87	-10.38	1.49	Na2MoO4
Na2MoO4 : 2H2O	-11.60	-10.38	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-14.22	-3.92	10.30	Na2SeO3 : 5H2O
Na2SeO4	-15.77	-14.49	1.28	Na2SeO4
Na3Sb	-175.28	-80.83	94.45	Na3Sb
Na3VO4	-29.24	7.44	36.68	Na3VO4
Na4V2O7	-33.13	4.27	37.40	Na4V2O7
Nantokite	-6.29	-13.02	-6.73	CuCl

NaSb	-88.87	-65.71	23.17	NaSb
Natron	-8.52	-9.83	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-7.04	-3.18	3.86	NaVO ₃
Nesquehonite	-3.62	-8.29	-4.67	MgCO ₃ :3H ₂ O
Ni(OH) ₂	-5.35	7.45	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ :8H ₂ O	-25.04	-9.34	15.70	Ni ₃ (AsO ₄) ₂ :8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-19.51	12.49	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.13	-13.00	-6.87	NiCO ₃
NiMoO ₄	-2.41	-13.55	-11.14	NiMoO ₄
NiS(alpha)	-73.56	-79.16	-5.60	NiS
NiS(beta)	-68.06	-79.16	-11.10	NiS
NiS(gamma)	-66.36	-79.16	-12.80	NiS
NiSe	-21.76	-39.46	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-9.91	-7.10	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-16.14	-17.66	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-6.95	10.56	17.50	MnO ₂
O ₂ (g)	-31.61	51.48	83.09	O ₂
Orpiment	-244.15	-305.21	-61.07	As ₂ S ₃
Otavite	-1.98	-13.98	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.56	-4.04	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.04	5.11	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-62.84	-71.60	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.72	0.08	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-15.97	10.22	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-25.08	35.96	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-9.67	-10.23	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-4.86	-6.76	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-22.16	-16.36	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-7.79	-1.65	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-16.14	-5.12	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-12.66	-1.98	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-17.97	3.13	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-18.75	3.13	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-12.42	-25.02	-12.60	PbCrO ₄
PbF ₂	-10.35	-17.79	-7.44	PbF ₂
Pbmetal	-24.88	-20.63	4.25	Pb
PbMoO ₄	-0.27	-15.89	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-7.87	5.11	12.98	PbO:0.33H ₂ O
PbSeO ₄	-13.16	-20.00	-6.84	PbSeO ₄
Periclase	-9.42	12.16	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-18.75	30.85	49.60	PbO ₂
Portlandite	-10.74	12.07	22.80	Ca(OH) ₂
Pyrite	-125.66	-144.16	-18.51	FeS ₂
Pyrochroite	-5.03	10.17	15.19	Mn(OH) ₂
Pyrolusite	-5.47	35.91	41.38	MnO ₂
Realgar	-102.42	-122.17	-19.75	AsS
Retgersite	-7.82	-9.86	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.30	-10.28	-10.58	MnCO ₃
Rutherfordine	-4.30	-18.80	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-12.42	-19.53	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-16.73	-13.33	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-26.54	-36.20	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-112.05	-179.80	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-59.88	-78.14	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-60.24	-78.14	-17.90	Sb ₄ O ₆
SbCl ₃	-50.52	-49.95	0.57	SbCl ₃
SbF ₃	-43.65	-53.88	-10.23	SbF ₃
Sbmetal	-46.46	-58.15	-11.69	Sb
SbO ₂	-3.15	-30.97	-27.82	SbO ₂
Schoepite	-4.35	1.65	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-14.06	-21.17	-7.11	Se
Semetal(hex)	-13.46	-21.17	-7.71	Se
Senarmontite	-26.70	-39.07	-12.37	Sb ₂ O ₃
SeO ₂	-14.67	-14.55	0.12	SeO ₂
SeO ₃	-46.16	-25.11	21.04	SeO ₃
Siderite	-6.89	-17.13	-10.24	FeCO ₃
Smithsonite	-1.32	-11.32	-10.00	ZnCO ₃

Sphalerite	-66.03	-77.48	-11.45	ZnS
Spinel	-5.35	31.50	36.85	MgAl ₂ O ₄
Stibnite	-248.45	-298.91	-50.46	Sb ₂ S ₃
Sulfur	-58.73	-60.87	-2.14	S
Tenorite	-0.34	7.30	7.64	CuO
Thenardite	-7.00	-6.68	0.32	Na ₂ SO ₄
Thermonatrite	-10.46	-9.82	0.64	Na ₂ CO ₃ ·H ₂ O
Tyuyamunite	-5.70	-1.62	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-14.24	6.84	21.08	U ₃ O ₈
U ₃ Sb ₄	-584.07	-431.68	152.38	U ₃ Sb ₄
U ₄ O ₉	-30.76	-33.78	-3.02	U ₄ O ₉
UF ₄	-31.14	-60.67	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-27.96	-60.68	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-15.81	-14.88	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.47	-29.32	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ ·2H ₂ O	-34.18	-29.32	4.85	UO ₂ (NO ₃) ₂ ·2H ₂ O
UO ₂ (NO ₃) ₂ ·3H ₂ O	-32.72	-29.33	3.39	UO ₂ (NO ₃) ₂ ·3H ₂ O
UO ₂ (NO ₃) ₂ ·6H ₂ O	-31.37	-29.33	2.05	UO ₂ (NO ₃) ₂ ·6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.97	1.65	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ ·4H ₂ O	-21.22	-23.47	-2.25	UO ₂ SeO ₄ ·4H ₂ O
UO ₃	-6.05	1.65	7.70	UO ₃
Uraninite	-10.21	-14.88	-4.67	UO ₂
USb ₂	-221.45	-191.87	29.58	USb ₂
V (OH) ₃	-19.22	-11.63	7.59	V (OH) ₃
V ₂ O ₅	-15.62	-16.98	-1.36	V ₂ O ₅
V ₃ O ₅	-40.95	-39.12	1.84	V ₃ O ₅
V ₄ O ₇	-50.76	-43.58	7.19	V ₄ O ₇
V ₆ O ₁₃	-41.57	-102.43	-60.86	V ₆ O ₁₃
Valentinite	-30.59	-39.07	-8.48	Sb ₂ O ₃
VC ₁₂	-63.66	-44.78	18.87	VC ₁₂
VC ₁₃	-65.48	-42.05	23.43	VC ₁₃
VF ₄	-65.18	-50.25	14.93	VF ₄
Vmetal	-94.27	-50.25	44.03	V
VO	-39.26	-24.50	14.76	VO
VO (OH) ₂	-9.61	-4.46	5.15	VO (OH) ₂
VO ₂ Cl	-21.47	-18.63	2.84	VO ₂ Cl
VOC ₁	-32.93	-21.77	11.15	VOC ₁
VOC ₁₂	-37.50	-24.74	12.76	VOC ₁₂
VOSO ₄	-25.37	-21.76	3.61	VOSO ₄
Witherite	-4.32	-12.89	-8.57	BaCO ₃
Wurtzite	-68.53	-77.48	-8.95	ZnS
Zincite	-2.20	9.13	11.33	ZnO
Zincosite	-12.10	-8.18	3.93	ZnSO ₄
Zn (BO ₂) ₂	-8.31	-0.02	8.29	Zn (BO ₂) ₂
Zn (NO ₃) ₂ ·6H ₂ O	-25.16	-21.84	3.32	Zn (NO ₃) ₂ ·6H ₂ O
Zn (OH) ₂	-3.07	9.13	12.20	Zn (OH) ₂
Zn (OH) ₂ (am)	-3.34	9.13	12.47	Zn (OH) ₂
Zn (OH) ₂ (beta)	-2.62	9.13	11.75	Zn (OH) ₂
Zn (OH) ₂ (epsilon)	-2.40	9.13	11.53	Zn (OH) ₂
Zn (OH) ₂ (gamma)	-2.60	9.13	11.73	Zn (OH) ₂
Zn ₂ (OH) ₂ SO ₄	-6.55	0.95	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-7.07	8.12	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O	-17.95	-4.30	13.65	Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O
Zn ₃ O (SO ₄) ₂	-26.13	-7.22	18.91	Zn ₃ O (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-9.19	19.21	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-13.13	25.37	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-18.20	-11.15	7.05	ZnCl ₂
ZnCO ₃ ·1H ₂ O	-1.06	-11.32	-10.26	ZnCO ₃ ·1H ₂ O
ZnF ₂	-13.23	-13.77	-0.53	ZnF ₂
Znmetal	-42.40	-16.61	25.79	Zn
ZnMoO ₄	-1.75	-11.87	-10.13	ZnMoO ₄
ZnO (active)	-2.06	9.13	11.19	ZnO
ZnS (am)	-68.43	-77.48	-9.05	ZnS
ZnSb	-85.77	-74.76	11.01	ZnSb
ZnSe	-23.38	-37.78	-14.40	ZnSe
ZnSeO ₄ ·6H ₂ O	-14.46	-15.98	-1.52	ZnSeO ₄ ·6H ₂ O
ZnSO ₄ ·1H ₂ O	-7.54	-8.18	-0.64	ZnSO ₄ ·1H ₂ O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 47.

Title Evaporate Stage 2 lake water to produce initial Stage 2 Lake water
REACTION 205
H2O -1
2.24 moles ## Removes x m3 water, but solute mass remains the same
USE solution 211
Save Solution 212
END

TITLE

Evaporate Stage 2 lake water to produce initial Stage 2 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 211. Solution after simulation 46.
Using reaction 205.

Reaction 205.

2.240e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.907e-08	1.830e-08
Al	3.637e-06	3.491e-06
As	2.434e-10	2.336e-10
B	2.801e-05	2.688e-05
Ba	8.803e-08	8.449e-08
C	3.124e-03	2.999e-03
Ca	4.271e-03	4.099e-03
Cd	1.238e-08	1.189e-08
Cl	2.693e-03	2.585e-03
Co	9.136e-08	8.769e-08
Cr	2.235e-09	2.145e-09
Cu	5.541e-07	5.319e-07
F	1.591e-04	1.527e-04
Fe	1.960e-09	1.881e-09
Hg	1.911e-09	1.834e-09
K	3.362e-03	3.227e-03
Mg	4.964e-03	4.765e-03

Mn	5.815e-05	5.582e-05
Mo	1.882e-06	1.806e-06
N	8.498e-06	8.157e-06
Na	8.798e-03	8.444e-03
Ni	1.127e-07	1.082e-07
Pb	2.606e-09	2.501e-09
S	1.246e-02	1.196e-02
Sb	2.645e-08	2.539e-08
Se	1.379e-07	1.323e-07
U	3.702e-07	3.553e-07
V	7.285e-09	6.993e-09
Zn	5.434e-06	5.216e-06

-----Description of solution-----

	pH	=	7.472	Charge balance
	pe	=	5.400	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.038e-02	
	Mass of water (kg)	=	9.598e-01	
	Total alkalinity (eq/kg)	=	2.982e-03	
	Total CO2 (mol/kg)	=	3.124e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	9.651e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	4	
	Total H	=	1.065587e+02	
	Total O	=	5.333471e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.612e-07	2.982e-07	-6.442	-6.525	-0.083	(0)
H+	4.049e-08	3.375e-08	-7.393	-7.472	-0.079	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.907e-08					
AgCl	1.242e-08	1.242e-08	-7.906	-7.906	0.000	(0)
Ag+	3.252e-09	2.710e-09	-8.488	-8.567	-0.079	(0)
AgCl2-	3.074e-09	2.427e-09	-8.512	-8.615	-0.102	(0)
AgSO4-	3.090e-10	2.440e-10	-9.510	-9.613	-0.102	(0)
AgCl3-2	1.248e-11	4.856e-12	-10.904	-11.314	-0.410	(0)
AgNO2	3.857e-12	3.857e-12	-11.414	-11.414	0.000	(0)
AgF	7.464e-13	7.464e-13	-12.127	-12.127	0.000	(0)
AgCl4-3	1.861e-13	2.225e-14	-12.730	-13.653	-0.922	(0)
AgOH	8.081e-14	8.081e-14	-13.093	-13.093	0.000	(0)
AgSeO3-	2.283e-14	1.803e-14	-13.641	-13.744	-0.102	(0)
AgH2BO3	2.040e-14	2.040e-14	-13.690	-13.690	0.000	(0)
AgNH3+	1.734e-14	1.369e-14	-13.761	-13.863	-0.102	(0)
Ag2Se	6.627e-15	6.627e-15	-14.179	-14.179	0.000	(0)
Ag(NO2)2-	5.153e-17	4.070e-17	-16.288	-16.390	-0.102	(0)
AgNO3	2.187e-17	2.187e-17	-16.660	-16.660	0.000	(0)
Ag(OH)2-	2.982e-18	2.355e-18	-17.526	-17.628	-0.102	(0)
Ag(NH3)2+	3.488e-19	2.755e-19	-18.457	-18.560	-0.102	(0)
Ag(SeO3)2-3	1.398e-20	1.672e-21	-19.854	-20.777	-0.922	(0)
Ag2MoO4	2.522e-24	2.522e-24	-23.598	-23.598	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.884	-73.884	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-83.876	-85.516	-1.640	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.722	-148.928	-0.206	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-148.813	-148.916	-0.102	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-150.520	-150.896	-0.376	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.850	-151.207	-0.357	(0)
Al	3.637e-06					
Al(OH)4-	3.519e-06	2.934e-06	-5.454	-5.533	-0.079	(0)
Al(OH)3	7.815e-08	7.815e-08	-7.107	-7.107	0.000	(0)
Al(OH)2+	1.563e-08	1.314e-08	-7.806	-7.882	-0.076	(0)

AlF3	1.228e-08	1.228e-08	-7.911	-7.911	0.000	(0)
AlF2+	1.059e-08	8.900e-09	-7.975	-8.051	-0.076	(0)
AlF4-	8.097e-10	6.750e-10	-9.092	-9.171	-0.079	(0)
AlF+2	4.089e-10	2.039e-10	-9.388	-9.691	-0.302	(0)
AlOH+2	1.112e-10	5.546e-11	-9.954	-10.256	-0.302	(0)
AlSO4+	7.814e-12	6.514e-12	-11.107	-11.186	-0.079	(0)
Al+3	9.592e-13	1.860e-13	-12.018	-12.731	-0.712	(0)
Al(SO4)2-	3.778e-13	3.150e-13	-12.423	-12.502	-0.079	(0)
AlMo6O21-3	1.261e-38	1.507e-39	-37.899	-38.822	-0.922	(0)
As (3)	2.158e-23					
H3AsO3	2.118e-23	2.118e-23	-22.674	-22.674	0.000	(0)
H2AsO3-	4.075e-25	3.218e-25	-24.390	-24.492	-0.102	(0)
HAsO3-2	2.235e-29	8.697e-30	-28.651	-29.061	-0.410	(0)
H4AsO3+	4.483e-31	3.541e-31	-30.348	-30.451	-0.102	(0)
AsO3-3	8.310e-35	9.935e-36	-34.080	-35.003	-0.922	(0)
As (5)	2.434e-10					
HAsO4-2	2.113e-10	8.222e-11	-9.675	-10.085	-0.410	(0)
H2AsO4-	3.204e-11	2.530e-11	-10.494	-10.597	-0.102	(0)
AsO4-3	6.444e-14	7.704e-15	-13.191	-14.113	-0.922	(0)
H3AsO4	1.470e-16	1.484e-16	-15.833	-15.829	0.004	(0)
B	2.801e-05					
H3BO3	2.734e-05	2.759e-05	-4.563	-4.559	0.004	(0)
H2BO3-	5.815e-07	4.749e-07	-6.235	-6.323	-0.088	(0)
CaH2BO3+	4.515e-08	3.687e-08	-7.345	-7.433	-0.088	(0)
MgH2BO3+	3.403e-08	2.779e-08	-7.468	-7.556	-0.088	(0)
NaH2BO3	5.382e-09	5.382e-09	-8.269	-8.269	0.000	(0)
BF(OH)3-	1.478e-09	1.207e-09	-8.830	-8.918	-0.088	(0)
H5(BO3)2-	1.366e-11	1.115e-11	-10.865	-10.953	-0.088	(0)
BaH2BO3+	7.527e-13	6.147e-13	-12.123	-12.211	-0.088	(0)
BF2(OH)2-	5.851e-13	4.778e-13	-12.233	-12.321	-0.088	(0)
H8(BO3)3-	3.769e-14	3.078e-14	-13.424	-13.512	-0.088	(0)
AgH2BO3	2.040e-14	2.040e-14	-13.690	-13.690	0.000	(0)
BF3OH-	8.428e-19	6.882e-19	-18.074	-18.162	-0.088	(0)
BF4-	1.535e-23	1.254e-23	-22.814	-22.902	-0.088	(0)
Ba	8.803e-08					
Ba+2	8.684e-08	4.189e-08	-7.061	-7.378	-0.317	(0)
BaHCO3+	1.113e-09	9.398e-10	-8.954	-9.027	-0.073	(0)
BaCO3	7.011e-11	7.011e-11	-10.154	-10.154	0.000	(0)
BaH2BO3+	7.527e-13	6.147e-13	-12.123	-12.211	-0.088	(0)
BaOH+	6.511e-14	5.452e-14	-13.186	-13.263	-0.077	(0)
BaNO3+	2.700e-15	2.133e-15	-14.569	-14.671	-0.102	(0)
BaNH3+2	1.681e-16	6.540e-17	-15.774	-16.184	-0.410	(0)
C (4)	3.124e-03					
HCO3-	2.796e-03	2.349e-03	-2.553	-2.629	-0.076	(0)
H2CO3	1.783e-04	1.783e-04	-3.749	-3.749	0.000	(0)
CaHCO3+	6.990e-05	5.902e-05	-4.156	-4.229	-0.073	(0)
MgHCO3+	4.891e-05	4.058e-05	-4.311	-4.392	-0.081	(0)
NaHCO3	9.448e-06	9.448e-06	-5.025	-5.025	0.000	(0)
CaCO3	6.979e-06	6.979e-06	-5.156	-5.156	0.000	(0)
CO3-2	6.767e-06	3.264e-06	-5.170	-5.486	-0.317	(0)
MgCO3	4.582e-06	4.582e-06	-5.339	-5.339	0.000	(0)
MnHCO3+	9.468e-07	7.929e-07	-6.024	-6.101	-0.077	(0)
NaCO3-	5.172e-07	4.346e-07	-6.286	-6.362	-0.076	(0)
CuCO3	4.407e-07	4.407e-07	-6.356	-6.356	0.000	(0)
ZnCO3	2.922e-07	2.922e-07	-6.534	-6.534	0.000	(0)
UO2(CO3)3-4	2.718e-07	6.227e-09	-6.566	-8.206	-1.640	(0)
ZnHCO3+	1.463e-07	1.156e-07	-6.835	-6.937	-0.102	(0)
UO2(CO3)2-2	9.785e-08	3.807e-08	-7.009	-7.419	-0.410	(0)
NiHCO3+	1.189e-08	9.389e-09	-7.925	-8.027	-0.102	(0)
Cu(CO3)2-2	9.950e-09	3.871e-09	-8.002	-8.412	-0.410	(0)
CoHCO3+	5.594e-09	4.418e-09	-8.252	-8.355	-0.102	(0)
CuHCO3+	4.304e-09	3.399e-09	-8.366	-8.469	-0.102	(0)
NiCO3	3.947e-09	3.947e-09	-8.404	-8.404	0.000	(0)
PbCO3	1.439e-09	1.439e-09	-8.842	-8.842	0.000	(0)
CoCO3	1.334e-09	1.334e-09	-8.875	-8.875	0.000	(0)
BaHCO3+	1.113e-09	9.398e-10	-8.954	-9.027	-0.073	(0)
UO2CO3	5.846e-10	5.846e-10	-9.233	-9.233	0.000	(0)
PbHCO3+	3.242e-10	2.561e-10	-9.489	-9.592	-0.102	(0)

		CdCO3	2.518e-10	2.518e-10	-9.599	-9.599	0.000	(0)
		BaCO3	7.011e-11	7.011e-11	-10.154	-10.154	0.000	(0)
		Pb (CO3) 2-2	3.482e-11	1.355e-11	-10.458	-10.868	-0.410	(0)
		CdHCO3+	2.292e-11	1.810e-11	-10.640	-10.742	-0.102	(0)
		Cd (CO3) 2-2	1.566e-12	6.091e-13	-11.805	-12.215	-0.410	(0)
		FeHCO3+	8.617e-14	7.277e-14	-13.065	-13.138	-0.073	(0)
		HgCO3	5.028e-14	5.028e-14	-13.299	-13.299	0.000	(0)
		Hg (CO3) 2-2	1.334e-15	5.190e-16	-14.875	-15.285	-0.410	(0)
		HgHCO3+	4.001e-17	3.160e-17	-16.398	-16.500	-0.102	(0)
Ca	4.271e-03							
		Ca+2	2.797e-03	1.349e-03	-2.553	-2.870	-0.317	(0)
		CaSO4	1.395e-03	1.395e-03	-2.856	-2.856	0.000	(0)
		CaHCO3+	6.990e-05	5.902e-05	-4.156	-4.229	-0.073	(0)
		CaCO3	6.979e-06	6.979e-06	-5.156	-5.156	0.000	(0)
		CaF+	1.928e-06	1.615e-06	-5.715	-5.792	-0.077	(0)
		CaH2BO3+	4.515e-08	3.687e-08	-7.345	-7.433	-0.088	(0)
		CaOH+	9.506e-09	8.028e-09	-8.022	-8.095	-0.073	(0)
		CaNO3+	5.488e-11	4.335e-11	-10.261	-10.363	-0.102	(0)
		CaNH3+2	1.080e-11	4.204e-12	-10.966	-11.376	-0.410	(0)
		Ca (NH3) 2+2	1.064e-20	4.142e-21	-19.973	-20.383	-0.410	(0)
Cd	1.238e-08							
		Cd+2	7.016e-09	3.384e-09	-8.154	-8.471	-0.317	(0)
		CdSO4	3.580e-09	3.580e-09	-8.446	-8.446	0.000	(0)
		CdCl+	9.184e-10	7.253e-10	-9.037	-9.139	-0.102	(0)
		Cd (SO4) 2-2	5.601e-10	2.179e-10	-9.252	-9.662	-0.410	(0)
		CdCO3	2.518e-10	2.518e-10	-9.599	-9.599	0.000	(0)
		CdHCO3+	2.292e-11	1.810e-11	-10.640	-10.742	-0.102	(0)
		CdOH+	1.015e-11	8.016e-12	-10.994	-11.096	-0.102	(0)
		CdOHC1	8.872e-12	8.872e-12	-11.052	-11.052	0.000	(0)
		CdF+	7.446e-12	5.881e-12	-11.128	-11.231	-0.102	(0)
		CdCl2	6.786e-12	6.786e-12	-11.168	-11.168	0.000	(0)
		Cd (CO3) 2-2	1.566e-12	6.091e-13	-11.805	-12.215	-0.410	(0)
		Cd (OH) 2	1.508e-14	1.508e-14	-13.822	-13.822	0.000	(0)
		CdCl3-	1.217e-14	9.610e-15	-13.915	-14.017	-0.102	(0)
		CdF2	1.286e-15	1.286e-15	-14.891	-14.891	0.000	(0)
		CdNO3+	1.377e-16	1.087e-16	-15.861	-15.964	-0.102	(0)
		CdSeO4	4.468e-17	4.468e-17	-16.350	-16.350	0.000	(0)
		Cd2OH+3	1.137e-18	1.360e-19	-17.944	-18.867	-0.922	(0)
		Cd (SeO3) 2-2	7.684e-19	2.989e-19	-18.114	-18.524	-0.410	(0)
		Cd (OH) 3-	3.479e-19	2.748e-19	-18.459	-18.561	-0.102	(0)
		Cd (NO3) 2	5.536e-25	5.536e-25	-24.257	-24.257	0.000	(0)
		Cd (OH) 4-2	3.447e-26	1.341e-26	-25.463	-25.873	-0.410	(0)
		CdHS+	0.000e+00	0.000e+00	-79.492	-79.594	-0.102	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.522	-151.522	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-228.651	-228.753	-0.102	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-305.279	-305.689	-0.410	(0)
Cl	2.693e-03							
		Cl-	2.693e-03	2.244e-03	-2.570	-2.649	-0.079	(0)
		MnCl+	5.707e-08	4.779e-08	-7.244	-7.321	-0.077	(0)
		AgCl	1.242e-08	1.242e-08	-7.906	-7.906	0.000	(0)
		ZnCl+	1.057e-08	8.770e-09	-7.976	-8.057	-0.081	(0)
		ZnOHC1	3.424e-09	3.424e-09	-8.465	-8.465	0.000	(0)
		AgCl2-	3.074e-09	2.427e-09	-8.512	-8.615	-0.102	(0)
		CdCl+	9.184e-10	7.253e-10	-9.037	-9.139	-0.102	(0)
		CoCl+	2.376e-10	1.877e-10	-9.624	-9.727	-0.102	(0)
		NiCl+	2.357e-10	1.861e-10	-9.628	-9.730	-0.102	(0)
		MnCl2	1.515e-10	1.515e-10	-9.820	-9.820	0.000	(0)
		CuCl	1.263e-10	1.263e-10	-9.899	-9.899	0.000	(0)
		CuCl+	9.830e-11	8.156e-11	-10.007	-10.089	-0.081	(0)
		CuCl2-	7.137e-11	5.921e-11	-10.147	-10.228	-0.081	(0)
		ZnCl2	3.120e-11	3.120e-11	-10.506	-10.506	0.000	(0)
		HgClOH	1.522e-11	1.522e-11	-10.818	-10.818	0.000	(0)
		PbCl+	1.479e-11	1.168e-11	-10.830	-10.933	-0.102	(0)
		AgCl3-2	1.248e-11	4.856e-12	-10.904	-11.314	-0.410	(0)
		CdOHC1	8.872e-12	8.872e-12	-11.052	-11.052	0.000	(0)
		CdCl2	6.786e-12	6.786e-12	-11.168	-11.168	0.000	(0)
		HgCl2	6.484e-12	6.484e-12	-11.188	-11.188	0.000	(0)
		AgCl4-3	1.861e-13	2.225e-14	-12.730	-13.653	-0.922	(0)

HgCl3-	1.843e-13	1.455e-13	-12.735	-12.837	-0.102	(0)
PbCl2	1.171e-13	1.171e-13	-12.931	-12.931	0.000	(0)
MnCl3-	1.118e-13	9.365e-14	-12.951	-13.028	-0.077	(0)
ZnCl3-	6.703e-14	5.561e-14	-13.174	-13.255	-0.081	(0)
CuCl2	6.347e-14	6.347e-14	-13.197	-13.197	0.000	(0)
CuCl3-2	5.777e-14	2.841e-14	-13.238	-13.547	-0.308	(0)
CdCl3-	1.217e-14	9.610e-15	-13.915	-14.017	-0.102	(0)
HgCl4-2	3.342e-15	1.300e-15	-14.476	-14.886	-0.410	(0)
NiCl2	2.103e-15	2.103e-15	-14.677	-14.677	0.000	(0)
HgCl+	7.299e-16	5.765e-16	-15.137	-15.239	-0.102	(0)
UO2Cl+	2.073e-16	1.638e-16	-15.683	-15.786	-0.102	(0)
PbCl3-	1.325e-16	1.046e-16	-15.878	-15.980	-0.102	(0)
ZnCl4-2	1.269e-16	6.241e-17	-15.897	-16.205	-0.308	(0)
CrCl+2	4.754e-17	1.850e-17	-16.323	-16.733	-0.410	(0)
CuCl3-	1.602e-18	1.329e-18	-17.795	-17.876	-0.081	(0)
PbCl4-2	2.759e-19	1.073e-19	-18.559	-18.969	-0.410	(0)
CrOHC12	2.353e-19	2.353e-19	-18.628	-18.628	0.000	(0)
FeCl+2	7.915e-21	3.893e-21	-20.102	-20.410	-0.308	(0)
CrCl2+	4.988e-21	3.939e-21	-20.302	-20.405	-0.102	(0)
VOCl+	3.288e-22	2.596e-22	-21.483	-21.586	-0.102	(0)
FeCl2+	4.660e-23	3.902e-23	-22.332	-22.409	-0.077	(0)
CuCl4-2	3.041e-23	1.495e-23	-22.517	-22.825	-0.308	(0)
CrO3Cl-	4.484e-26	3.541e-26	-25.348	-25.451	-0.102	(0)
FeCl3	8.758e-27	8.758e-27	-26.058	-26.058	0.000	(0)
CoCl+2	2.838e-35	1.104e-35	-34.547	-34.957	-0.410	(0)
UCl+3	0.000e+00	0.000e+00	-44.844	-45.767	-0.922	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.626	-52.036	-0.410	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.972	-54.382	-0.410	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.948	-67.358	-0.410	(0)
Co (2)	9.136e-08					
Co+2	6.213e-08	2.417e-08	-7.207	-7.617	-0.410	(0)
CoSO4	2.177e-08	2.177e-08	-7.662	-7.662	0.000	(0)
CoHCO3+	5.594e-09	4.418e-09	-8.252	-8.355	-0.102	(0)
CoCO3	1.334e-09	1.334e-09	-8.875	-8.875	0.000	(0)
CoCl+	2.376e-10	1.877e-10	-9.624	-9.727	-0.102	(0)
CoOH+	1.821e-10	1.438e-10	-9.740	-9.842	-0.102	(0)
CoF+	1.061e-10	8.382e-11	-9.974	-10.077	-0.102	(0)
Co (OH) 2	3.407e-12	3.407e-12	-11.468	-11.468	0.000	(0)
CoNO2+	1.469e-12	1.161e-12	-11.833	-11.935	-0.102	(0)
Co (NH3) +2	1.849e-14	7.193e-15	-13.733	-14.143	-0.410	(0)
CoSeO4	8.590e-16	8.590e-16	-15.066	-15.066	0.000	(0)
CoNO3+	4.929e-16	3.892e-16	-15.307	-15.410	-0.102	(0)
Co (OH) 3-	2.567e-17	2.027e-17	-16.591	-16.693	-0.102	(0)
CoOOH-	6.444e-18	5.089e-18	-17.191	-17.293	-0.102	(0)
Co2OH+3	1.458e-18	1.743e-19	-17.836	-18.759	-0.922	(0)
Co (NH3) 2+2	1.952e-21	7.593e-22	-20.710	-21.120	-0.410	(0)
Co (NO3) 2	8.046e-24	8.046e-24	-23.094	-23.094	0.000	(0)
Co (OH) 4-2	2.462e-24	9.580e-25	-23.609	-24.019	-0.410	(0)
Co (NH3) 3+2	6.081e-29	2.366e-29	-28.216	-28.626	-0.410	(0)
Co4 (OH) 4+4	3.727e-30	8.539e-32	-29.429	-31.069	-1.640	(0)
Co (NH3) 4+2	7.897e-37	3.073e-37	-36.103	-36.512	-0.410	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.489	-44.899	-0.410	(0)
Co (3)	9.418e-29					
CoOH+2	9.418e-29	3.664e-29	-28.026	-28.436	-0.410	(0)
Co+3	1.247e-34	2.418e-35	-33.904	-34.616	-0.712	(0)
CoCl+2	2.838e-35	1.104e-35	-34.547	-34.957	-0.410	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.626	-52.036	-0.410	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.027	-62.129	-0.102	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.625	-67.035	-0.410	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.948	-67.358	-0.410	(0)
Cr (2)	1.556e-26					
Cr+2	1.556e-26	6.054e-27	-25.808	-26.218	-0.410	(0)
Cr (3)	2.235e-09					
Cr (OH) 2+	1.909e-09	1.507e-09	-8.719	-8.822	-0.102	(0)
Cr (OH) 3	1.689e-10	1.689e-10	-9.772	-9.772	0.000	(0)
Cr (OH) +2	1.068e-10	4.155e-11	-9.971	-10.381	-0.410	(0)
CrOHSO4	4.449e-11	4.449e-11	-10.352	-10.352	0.000	(0)
CrO2-	3.011e-12	2.378e-12	-11.521	-11.624	-0.102	(0)

Cr(OH) 4-	2.538e-12	2.005e-12	-11.595	-11.698	-0.102	(0)
CrF+2	2.844e-13	1.107e-13	-12.546	-12.956	-0.410	(0)
CrSO4+	8.496e-14	6.710e-14	-13.071	-13.173	-0.102	(0)
Cr+3	5.327e-14	6.368e-15	-13.274	-14.196	-0.922	(0)
CrCl+2	4.754e-17	1.850e-17	-16.323	-16.733	-0.410	(0)
Cr2(OH)2SO4+2	4.294e-19	1.671e-19	-18.367	-18.777	-0.410	(0)
CrOHC12	2.353e-19	2.353e-19	-18.628	-18.628	0.000	(0)
Cr2(OH)2(SO4)2	4.478e-20	4.478e-20	-19.349	-19.349	0.000	(0)
CrCl2+	4.988e-21	3.939e-21	-20.302	-20.405	-0.102	(0)
CrNO3+2	7.269e-24	2.828e-24	-23.139	-23.549	-0.410	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-42.972	-43.381	-0.410	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-51.912	-52.835	-0.922	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-53.972	-54.382	-0.410	(0)
Cr(6)	1.544e-15					
CrO4-2	1.411e-15	6.804e-16	-14.851	-15.167	-0.317	(0)
HCrO4-	9.408e-17	7.430e-17	-16.027	-16.129	-0.102	(0)
NaCrO4-	3.061e-17	2.418e-17	-16.514	-16.617	-0.102	(0)
KCrO4-	8.692e-18	6.865e-18	-17.061	-17.163	-0.102	(0)
CrO3SO4-2	8.863e-24	3.448e-24	-23.052	-23.462	-0.410	(0)
H2CrO4	2.032e-24	2.032e-24	-23.692	-23.692	0.000	(0)
CrO3Cl-	4.484e-26	3.541e-26	-25.348	-25.451	-0.102	(0)
Cr2O7-2	4.923e-31	1.915e-31	-30.308	-30.718	-0.410	(0)
Cu(1)	2.543e-10					
CuCl	1.263e-10	1.263e-10	-9.899	-9.899	0.000	(0)
CuCl2-	7.137e-11	5.921e-11	-10.147	-10.228	-0.081	(0)
Cu+	5.659e-11	4.469e-11	-10.247	-10.350	-0.102	(0)
CuCl3-2	5.777e-14	2.841e-14	-13.238	-13.547	-0.308	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.913	-150.280	-0.366	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.661	-151.010	-0.348	(0)
Cu(2)	5.539e-07					
CuCO3	4.407e-07	4.407e-07	-6.356	-6.356	0.000	(0)
Cu+2	4.754e-08	2.293e-08	-7.323	-7.640	-0.317	(0)
CuOH+	2.606e-08	2.162e-08	-7.584	-7.665	-0.081	(0)
CuSO4	2.370e-08	2.370e-08	-7.625	-7.625	0.000	(0)
Cu(CO3)2-2	9.950e-09	3.871e-09	-8.002	-8.412	-0.410	(0)
CuHCO3+	4.304e-09	3.399e-09	-8.366	-8.469	-0.102	(0)
Cu(OH)2	1.286e-09	1.286e-09	-8.891	-8.891	0.000	(0)
CuF+	2.008e-10	1.586e-10	-9.697	-9.800	-0.102	(0)
CuCl+	9.830e-11	8.156e-11	-10.007	-10.089	-0.081	(0)
Cu2(OH)2+2	3.018e-11	1.174e-11	-10.520	-10.930	-0.410	(0)
CuNO2+	2.071e-11	1.636e-11	-10.684	-10.786	-0.102	(0)
CuNH3+2	1.492e-12	5.807e-13	-11.826	-12.236	-0.410	(0)
Cu(OH)3-	9.963e-13	7.868e-13	-12.002	-12.104	-0.102	(0)
CuCl2	6.347e-14	6.347e-14	-13.197	-13.197	0.000	(0)
Cu(NO2)2	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
CuNO3+	9.327e-16	7.366e-16	-15.030	-15.133	-0.102	(0)
Cu(OH)4-2	4.746e-18	1.847e-18	-17.324	-17.734	-0.410	(0)
CuCl3-	1.602e-18	1.329e-18	-17.795	-17.876	-0.081	(0)
CuCl4-2	3.041e-23	1.495e-23	-22.517	-22.825	-0.308	(0)
Cu(NO3)2	9.422e-25	9.422e-25	-24.026	-24.026	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-219.033	-219.136	-0.102	(0)
F	1.591e-04					
F-	1.316e-04	1.096e-04	-3.881	-3.960	-0.079	(0)
MgF+	2.491e-05	2.076e-05	-4.604	-4.683	-0.079	(0)
CaF+	1.928e-06	1.615e-06	-5.715	-5.792	-0.077	(0)
NaF	4.947e-07	4.947e-07	-6.306	-6.306	0.000	(0)
MnF+	8.816e-08	7.383e-08	-7.055	-7.132	-0.077	(0)
AlF3	1.228e-08	1.228e-08	-7.911	-7.911	0.000	(0)
AlF2+	1.059e-08	8.900e-09	-7.975	-8.051	-0.076	(0)
HF	5.473e-09	5.473e-09	-8.262	-8.262	0.000	(0)
ZnF+	4.309e-09	3.403e-09	-8.366	-8.468	-0.102	(0)
BF(OH)3-	1.478e-09	1.207e-09	-8.830	-8.918	-0.088	(0)
AlF4-	8.097e-10	6.750e-10	-9.092	-9.171	-0.079	(0)
AlF+2	4.089e-10	2.039e-10	-9.388	-9.691	-0.302	(0)
CuF+	2.008e-10	1.586e-10	-9.697	-9.800	-0.102	(0)
NiF+	1.130e-10	8.927e-11	-9.947	-10.049	-0.102	(0)
CoF+	1.061e-10	8.382e-11	-9.974	-10.077	-0.102	(0)
CdF+	7.446e-12	5.881e-12	-11.128	-11.231	-0.102	(0)

HF2-	2.763e-12	2.281e-12	-11.559	-11.642	-0.083	(0)
PbF+	1.435e-12	1.133e-12	-11.843	-11.946	-0.102	(0)
UO2F+	8.622e-13	6.809e-13	-12.064	-12.167	-0.102	(0)
AgF	7.464e-13	7.464e-13	-12.127	-12.127	0.000	(0)
BF2 (OH) 2-	5.851e-13	4.778e-13	-12.233	-12.321	-0.088	(0)
CrF+2	2.844e-13	1.107e-13	-12.546	-12.956	-0.410	(0)
UO2F2	2.153e-13	2.153e-13	-12.667	-12.667	0.000	(0)
UO2F3-	7.508e-15	5.930e-15	-14.124	-14.227	-0.102	(0)
PbF2	2.445e-15	2.445e-15	-14.612	-14.612	0.000	(0)
CdF2	1.286e-15	1.286e-15	-14.891	-14.891	0.000	(0)
H2F2	8.024e-17	8.024e-17	-16.096	-16.096	0.000	(0)
FeF2+	2.419e-17	2.026e-17	-16.616	-16.693	-0.077	(0)
VO2F	2.186e-17	2.186e-17	-16.660	-16.660	0.000	(0)
FeF+2	1.404e-17	6.904e-18	-16.853	-17.161	-0.308	(0)
UO2F4-2	1.327e-17	5.164e-18	-16.877	-17.287	-0.410	(0)
FeF3	3.134e-18	3.134e-18	-17.504	-17.504	0.000	(0)
VO2F2-	1.102e-18	8.703e-19	-17.958	-18.060	-0.102	(0)
BF3OH-	8.428e-19	6.882e-19	-18.074	-18.162	-0.088	(0)
PbF3-	6.439e-19	5.085e-19	-18.191	-18.294	-0.102	(0)
VOF+	3.434e-20	2.712e-20	-19.464	-19.567	-0.102	(0)
VO2F3-2	3.059e-21	1.190e-21	-20.514	-20.924	-0.410	(0)
VOF2	1.115e-21	1.115e-21	-20.953	-20.953	0.000	(0)
PbF4-2	6.859e-23	2.668e-23	-22.164	-22.574	-0.410	(0)
HgF+	6.625e-23	5.232e-23	-22.179	-22.281	-0.102	(0)
BF4-	1.535e-23	1.254e-23	-22.814	-22.902	-0.088	(0)
VOF3-	5.492e-24	4.337e-24	-23.260	-23.363	-0.102	(0)
VO2F4-3	5.371e-25	6.421e-26	-24.270	-25.192	-0.922	(0)
Sb (OH) 2F	1.754e-25	1.754e-25	-24.756	-24.756	0.000	(0)
SbOF	1.726e-25	1.726e-25	-24.763	-24.763	0.000	(0)
VOF4-2	4.933e-27	1.919e-27	-26.307	-26.717	-0.410	(0)
UF3+	1.011e-35	7.983e-36	-34.995	-35.098	-0.102	(0)
UF2+2	1.181e-36	4.594e-37	-35.928	-36.338	-0.410	(0)
UF4	9.598e-38	9.598e-38	-37.018	-37.018	0.000	(0)
UF+3	2.784e-39	3.329e-40	-38.555	-39.478	-0.922	(0)
UF5-	5.280e-40	4.170e-40	-39.277	-39.380	-0.102	(0)
UF6-2	0.000e+00	0.000e+00	-40.450	-40.860	-0.410	(0)
Fe (2)	9.170e-12					
Fe+2	6.324e-12	2.460e-12	-11.199	-11.609	-0.410	(0)
FeSO4	2.725e-12	2.725e-12	-11.565	-11.565	0.000	(0)
FeHCO3+	8.617e-14	7.277e-14	-13.065	-13.138	-0.073	(0)
FeOH+	3.488e-14	2.921e-14	-13.457	-13.534	-0.077	(0)
Fe (OH) 2	6.918e-18	6.918e-18	-17.160	-17.160	0.000	(0)
Fe (OH) 3-	7.790e-19	6.524e-19	-18.108	-18.185	-0.077	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.922	-160.922	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.914	-238.017	-0.102	(0)
Fe (3)	1.951e-09					
Fe (OH) 2+	1.527e-09	1.283e-09	-8.816	-8.892	-0.076	(0)
Fe (OH) 3	4.108e-10	4.108e-10	-9.386	-9.386	0.000	(0)
Fe (OH) 4-	1.357e-11	1.141e-11	-10.867	-10.943	-0.076	(0)
FeOH+2	2.248e-14	1.106e-14	-13.648	-13.956	-0.308	(0)
FeF2+	2.419e-17	2.026e-17	-16.616	-16.693	-0.077	(0)
FeF+2	1.404e-17	6.904e-18	-16.853	-17.161	-0.308	(0)
FeSO4+	3.472e-18	2.908e-18	-17.459	-17.536	-0.077	(0)
FeF3	3.134e-18	3.134e-18	-17.504	-17.504	0.000	(0)
Fe (SO4) 2-	3.552e-19	2.805e-19	-18.450	-18.552	-0.102	(0)
Fe+3	2.962e-19	5.743e-20	-18.528	-19.241	-0.712	(0)
FeCl+2	7.915e-21	3.893e-21	-20.102	-20.410	-0.308	(0)
FeCl2+	4.660e-23	3.902e-23	-22.332	-22.409	-0.077	(0)
FeHSeO3+2	3.423e-23	1.332e-23	-22.466	-22.876	-0.410	(0)
Fe2 (OH) 2+4	1.767e-25	4.049e-27	-24.753	-26.393	-1.640	(0)
FeNO3+2	1.500e-26	5.835e-27	-25.824	-26.234	-0.410	(0)
FeCl3	8.758e-27	8.758e-27	-26.058	-26.058	0.000	(0)
Fe3 (OH) 4+5	2.740e-32	7.507e-35	-31.562	-34.125	-2.562	(0)
H (0)	2.530e-29					
H2	1.265e-29	1.277e-29	-28.898	-28.894	0.004	(0)
Hg (0)	1.882e-09					
Hg	1.882e-09	1.882e-09	-8.725	-8.725	0.000	(0)
Hg (1)	8.455e-20					

Hg2+2	4.227e-20	1.645e-20	-19.374	-19.784	-0.410	(0)
Hg (2)	2.910e-11					
HgClOH	1.522e-11	1.522e-11	-10.818	-10.818	0.000	(0)
Hg (OH) 2	7.156e-12	7.223e-12	-11.145	-11.141	0.004	(0)
HgCl2	6.484e-12	6.484e-12	-11.188	-11.188	0.000	(0)
HgCl3-	1.843e-13	1.455e-13	-12.735	-12.837	-0.102	(0)
HgCO3	5.028e-14	5.028e-14	-13.299	-13.299	0.000	(0)
HgCl4-2	3.342e-15	1.300e-15	-14.476	-14.886	-0.410	(0)
Hg (CO3) 2-2	1.334e-15	5.190e-16	-14.875	-15.285	-0.410	(0)
HgCl+	7.299e-16	5.765e-16	-15.137	-15.239	-0.102	(0)
HgOH+	1.935e-16	1.528e-16	-15.713	-15.816	-0.102	(0)
HgHCO3+	4.001e-17	3.160e-17	-16.398	-16.500	-0.102	(0)
Hg (OH) 3-	3.433e-19	2.711e-19	-18.464	-18.567	-0.102	(0)
Hg (NH3) 2+2	1.279e-19	4.975e-20	-18.893	-19.303	-0.410	(0)
HgNH3+2	5.167e-20	2.010e-20	-19.287	-19.697	-0.410	(0)
Hg+2	3.309e-20	1.287e-20	-19.480	-19.890	-0.410	(0)
HgSO4	1.521e-20	1.521e-20	-19.818	-19.818	0.000	(0)
HgF+	6.625e-23	5.232e-23	-22.179	-22.281	-0.102	(0)
Hg (NH3) 3+2	1.260e-27	4.901e-28	-26.900	-27.310	-0.410	(0)
HgNO3+	6.114e-29	4.829e-29	-28.214	-28.316	-0.102	(0)
Hg (NH3) 4+2	2.476e-35	9.635e-36	-34.606	-35.016	-0.410	(0)
Hg (NO3) 2	2.039e-37	2.039e-37	-36.691	-36.691	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.651	-138.754	-0.102	(0)
HgS2-2	0.000e+00	0.000e+00	-139.580	-139.990	-0.410	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.832	-139.832	0.000	(0)
K	3.362e-03					
K+	3.259e-03	2.716e-03	-2.487	-2.566	-0.079	(0)
KSO4-	1.032e-04	8.675e-05	-3.986	-4.062	-0.076	(0)
KCrO4-	8.692e-18	6.865e-18	-17.061	-17.163	-0.102	(0)
Mg	4.964e-03					
Mg+2	3.499e-03	1.688e-03	-2.456	-2.773	-0.317	(0)
MgSO4	1.386e-03	1.386e-03	-2.858	-2.858	0.000	(0)
MgHCO3+	4.891e-05	4.058e-05	-4.311	-4.392	-0.081	(0)
MgF+	2.491e-05	2.076e-05	-4.604	-4.683	-0.079	(0)
MgCO3	4.582e-06	4.582e-06	-5.339	-5.339	0.000	(0)
MgOH+	2.364e-07	2.004e-07	-6.626	-6.698	-0.072	(0)
MgH2BO3+	3.403e-08	2.779e-08	-7.468	-7.556	-0.088	(0)
Mn (2)	5.815e-05					
Mn+2	4.347e-05	1.691e-05	-4.362	-4.772	-0.410	(0)
MnSO4	1.357e-05	1.357e-05	-4.867	-4.867	0.000	(0)
MnHCO3+	9.468e-07	7.929e-07	-6.024	-6.101	-0.077	(0)
MnF+	8.816e-08	7.383e-08	-7.055	-7.132	-0.077	(0)
MnCl+	5.707e-08	4.779e-08	-7.244	-7.321	-0.077	(0)
MnOH+	1.513e-08	1.267e-08	-7.820	-7.897	-0.077	(0)
MnCl2	1.515e-10	1.515e-10	-9.820	-9.820	0.000	(0)
MnNO3+	3.448e-13	2.723e-13	-12.462	-12.565	-0.102	(0)
MnSeO4	3.228e-13	3.228e-13	-12.491	-12.491	0.000	(0)
MnCl3-	1.118e-13	9.365e-14	-12.951	-13.028	-0.077	(0)
Mn (OH) 3-	8.314e-18	6.962e-18	-17.080	-17.157	-0.077	(0)
Mn (NO3) 2	6.950e-21	6.950e-21	-20.158	-20.158	0.000	(0)
Mn (OH) 4-2	1.363e-23	6.703e-24	-22.866	-23.174	-0.308	(0)
MnSe	0.000e+00	0.000e+00	-42.112	-42.112	0.000	(0)
Mn (3)	9.792e-25					
Mn+3	9.792e-25	1.898e-25	-24.009	-24.722	-0.712	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.512	-41.820	-0.308	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.706	-45.792	-0.086	(0)
Mo	1.882e-06					
MoO4-2	1.881e-06	9.071e-07	-5.726	-6.042	-0.317	(0)
HMoO4-	7.713e-10	6.091e-10	-9.113	-9.215	-0.102	(0)
H2MoO4	1.506e-13	1.506e-13	-12.822	-12.822	0.000	(0)
Ag2MoO4	2.522e-24	2.522e-24	-23.598	-23.598	0.000	(0)
AlMo6O21-3	1.261e-38	1.507e-39	-37.899	-38.822	-0.922	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.390	-49.079	-3.690	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.602	-50.164	-2.562	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.214	-52.854	-1.640	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.157	-57.080	-0.922	(0)

N (-3)	1.903e-07					
NH4+	1.794e-07	1.465e-07	-6.746	-6.834	-0.088	(0)
NH4SO4-	8.457e-09	7.082e-09	-8.073	-8.150	-0.077	(0)
NH3	2.475e-09	2.475e-09	-8.606	-8.606	0.000	(0)
CaNH3+2	1.080e-11	4.204e-12	-10.966	-11.376	-0.410	(0)
CuNH3+2	1.492e-12	5.807e-13	-11.826	-12.236	-0.410	(0)
NiNH3+2	1.107e-13	4.308e-14	-12.956	-13.366	-0.410	(0)
Co (NH3) +2	1.849e-14	7.193e-15	-13.733	-14.143	-0.410	(0)
AgNH3+	1.734e-14	1.369e-14	-13.761	-13.863	-0.102	(0)
BaNH3+2	1.681e-16	6.540e-17	-15.774	-16.184	-0.410	(0)
Ag (NH3) 2+	3.488e-19	2.755e-19	-18.457	-18.560	-0.102	(0)
Hg (NH3) 2+2	1.279e-19	4.975e-20	-18.893	-19.303	-0.410	(0)
HgNH3+2	5.167e-20	2.010e-20	-19.287	-19.697	-0.410	(0)
Ni (NH3) 2+2	3.961e-20	1.541e-20	-19.402	-19.812	-0.410	(0)
Ca (NH3) 2+2	1.064e-20	4.142e-21	-19.973	-20.383	-0.410	(0)
Co (NH3) 2+2	1.952e-21	7.593e-22	-20.710	-21.120	-0.410	(0)
Hg (NH3) 3+2	1.260e-27	4.901e-28	-26.900	-27.310	-0.410	(0)
Co (NH3) 3+2	6.081e-29	2.366e-29	-28.216	-28.626	-0.410	(0)
Hg (NH3) 4+2	2.476e-35	9.635e-36	-34.606	-35.016	-0.410	(0)
Co (NH3) 4+2	7.897e-37	3.073e-37	-36.103	-36.512	-0.410	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.972	-43.381	-0.410	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.489	-44.899	-0.410	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.626	-52.036	-0.410	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.912	-52.835	-0.922	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.972	-54.382	-0.410	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.027	-62.129	-0.102	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.625	-67.035	-0.410	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.948	-67.358	-0.410	(0)
N (3)	8.296e-06					
NO2-	8.296e-06	6.812e-06	-5.081	-5.167	-0.086	(0)
CuNO2+	2.071e-11	1.636e-11	-10.684	-10.786	-0.102	(0)
AgNO2	3.857e-12	3.857e-12	-11.414	-11.414	0.000	(0)
CoNO2+	1.469e-12	1.161e-12	-11.833	-11.935	-0.102	(0)
Cu (NO2) 2	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
Ag (NO2) 2-	5.153e-17	4.070e-17	-16.288	-16.390	-0.102	(0)
N (5)	1.225e-08					
NO3-	1.219e-08	1.016e-08	-7.914	-7.993	-0.079	(0)
CaNO3+	5.488e-11	4.335e-11	-10.261	-10.363	-0.102	(0)
MnNO3+	3.448e-13	2.723e-13	-12.462	-12.565	-0.102	(0)
ZnNO3+	5.027e-14	3.970e-14	-13.299	-13.401	-0.102	(0)
BaNO3+	2.700e-15	2.133e-15	-14.569	-14.671	-0.102	(0)
NiNO3+	1.047e-15	8.272e-16	-14.980	-15.082	-0.102	(0)
CuNO3+	9.327e-16	7.366e-16	-15.030	-15.133	-0.102	(0)
CoNO3+	4.929e-16	3.892e-16	-15.307	-15.410	-0.102	(0)
CdNO3+	1.377e-16	1.087e-16	-15.861	-15.964	-0.102	(0)
PbNO3+	2.791e-17	2.204e-17	-16.554	-16.657	-0.102	(0)
AgNO3	2.187e-17	2.187e-17	-16.660	-16.660	0.000	(0)
Mn (NO3) 2	6.950e-21	6.950e-21	-20.158	-20.158	0.000	(0)
UO2NO3+	1.155e-21	9.120e-22	-20.938	-21.040	-0.102	(0)
Zn (NO3) 2	8.047e-23	8.047e-23	-22.094	-22.094	0.000	(0)
Co (NO3) 2	8.046e-24	8.046e-24	-23.094	-23.094	0.000	(0)
CrNO3+2	7.269e-24	2.828e-24	-23.139	-23.549	-0.410	(0)
Cu (NO3) 2	9.422e-25	9.422e-25	-24.026	-24.026	0.000	(0)
VO2NO3	5.842e-25	5.842e-25	-24.233	-24.233	0.000	(0)
Cd (NO3) 2	5.536e-25	5.536e-25	-24.257	-24.257	0.000	(0)
Pb (NO3) 2	3.803e-25	3.803e-25	-24.420	-24.420	0.000	(0)
FeNO3+2	1.500e-26	5.835e-27	-25.824	-26.234	-0.410	(0)
HgNO3+	6.114e-29	4.829e-29	-28.214	-28.316	-0.102	(0)
Hg (NO3) 2	2.039e-37	2.039e-37	-36.691	-36.691	0.000	(0)
Na	8.798e-03					
Na+	8.581e-03	7.151e-03	-2.066	-2.146	-0.079	(0)
NaSO4-	2.062e-04	1.733e-04	-3.686	-3.761	-0.076	(0)
NaHCO3	9.448e-06	9.448e-06	-5.025	-5.025	0.000	(0)
NaCO3-	5.172e-07	4.346e-07	-6.286	-6.362	-0.076	(0)
NaF	4.947e-07	4.947e-07	-6.306	-6.306	0.000	(0)
NaH2BO3	5.382e-09	5.382e-09	-8.269	-8.269	0.000	(0)
NaCrO4-	3.061e-17	2.418e-17	-16.514	-16.617	-0.102	(0)
Ni	1.127e-07					

Ni+2	6.721e-08	3.242e-08	-7.173	-7.489	-0.317	(0)
NiSO4	2.919e-08	2.919e-08	-7.535	-7.535	0.000	(0)
NiHCO3+	1.189e-08	9.389e-09	-7.925	-8.027	-0.102	(0)
NiCO3	3.947e-09	3.947e-09	-8.404	-8.404	0.000	(0)
NiCl+	2.357e-10	1.861e-10	-9.628	-9.730	-0.102	(0)
NiOH+	1.541e-10	1.217e-10	-9.812	-9.915	-0.102	(0)
NiF+	1.130e-10	8.927e-11	-9.947	-10.049	-0.102	(0)
Ni (SO4) 2-2	1.121e-11	4.361e-12	-10.950	-11.360	-0.410	(0)
Ni (OH) 2	2.882e-12	2.882e-12	-11.540	-11.540	0.000	(0)
NiNH3+2	1.107e-13	4.308e-14	-12.956	-13.366	-0.410	(0)
NiCl2	2.103e-15	2.103e-15	-14.677	-14.677	0.000	(0)
Ni (OH) 3-	1.088e-15	8.595e-16	-14.963	-15.066	-0.102	(0)
NiSeO4	1.075e-15	1.075e-15	-14.969	-14.969	0.000	(0)
NiNO3+	1.047e-15	8.272e-16	-14.980	-15.082	-0.102	(0)
Ni (NH3) 2+2	3.961e-20	1.541e-20	-19.402	-19.812	-0.410	(0)
O (0)	6.153e-35					
O2	3.076e-35	3.105e-35	-34.512	-34.508	0.004	(0)
Pb	2.606e-09					
PbCO3	1.439e-09	1.439e-09	-8.842	-8.842	0.000	(0)
PbHCO3+	3.242e-10	2.561e-10	-9.489	-9.592	-0.102	(0)
PbSO4	3.242e-10	3.242e-10	-9.489	-9.489	0.000	(0)
Pb+2	3.041e-10	1.467e-10	-9.517	-9.834	-0.317	(0)
PbOH+	1.391e-10	1.099e-10	-9.857	-9.959	-0.102	(0)
Pb (CO3) 2-2	3.482e-11	1.355e-11	-10.458	-10.868	-0.410	(0)
Pb (SO4) 2-2	2.266e-11	8.815e-12	-10.645	-11.055	-0.410	(0)
PbCl+	1.479e-11	1.168e-11	-10.830	-10.933	-0.102	(0)
PbF+	1.435e-12	1.133e-12	-11.843	-11.946	-0.102	(0)
Pb (OH) 2	1.036e-12	1.036e-12	-11.985	-11.985	0.000	(0)
PbCl2	1.171e-13	1.171e-13	-12.931	-12.931	0.000	(0)
PbF2	2.445e-15	2.445e-15	-14.612	-14.612	0.000	(0)
Pb (OH) 3-	3.912e-16	3.089e-16	-15.408	-15.510	-0.102	(0)
PbCl3-	1.325e-16	1.046e-16	-15.878	-15.980	-0.102	(0)
PbNO3+	2.791e-17	2.204e-17	-16.554	-16.657	-0.102	(0)
Pb2OH+3	2.137e-18	2.554e-19	-17.670	-18.593	-0.922	(0)
PbF3-	6.439e-19	5.085e-19	-18.191	-18.294	-0.102	(0)
PbCl4-2	2.759e-19	1.073e-19	-18.559	-18.969	-0.410	(0)
Pb (OH) 4-2	5.799e-20	2.256e-20	-19.237	-19.647	-0.410	(0)
PbF4-2	6.859e-23	2.668e-23	-22.164	-22.574	-0.410	(0)
Pb3 (OH) 4+2	8.075e-24	3.142e-24	-23.093	-23.503	-0.410	(0)
Pb (NO3) 2	3.803e-25	3.803e-25	-24.420	-24.420	0.000	(0)
Pb4 (OH) 4+4	1.597e-28	3.661e-30	-27.797	-29.436	-1.640	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.827	-152.827	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.556	-230.659	-0.102	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.884	-73.884	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.029	-79.132	-0.102	(0)
CdHS+	0.000e+00	0.000e+00	-79.492	-79.594	-0.102	(0)
H2S	0.000e+00	0.000e+00	-79.583	-79.583	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.615	-81.025	-0.410	(0)
S6-2	0.000e+00	0.000e+00	-81.131	-81.541	-0.410	(0)
S4-2	0.000e+00	0.000e+00	-81.211	-81.621	-0.410	(0)
S3-2	0.000e+00	0.000e+00	-82.017	-82.427	-0.410	(0)
S2-2	0.000e+00	0.000e+00	-83.033	-83.443	-0.410	(0)
S-2	0.000e+00	0.000e+00	-88.652	-88.960	-0.308	(0)
HgHS2-	0.000e+00	0.000e+00	-138.651	-138.754	-0.102	(0)
HgS2-2	0.000e+00	0.000e+00	-139.580	-139.990	-0.410	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.832	-139.832	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.722	-148.928	-0.206	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.813	-148.916	-0.102	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.687	-149.790	-0.102	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.913	-150.280	-0.366	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.520	-150.896	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.661	-151.010	-0.348	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.850	-151.207	-0.357	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.251	-151.251	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.522	-151.522	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.827	-152.827	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.922	-160.922	0.000	(0)

Cu (HS) 3-	0.000e+00	0.000e+00	-219.033	-219.136	-0.102	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.001	-227.103	-0.102	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.651	-228.753	-0.102	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.201	-229.611	-0.410	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.556	-230.659	-0.102	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.914	-238.017	-0.102	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-305.279	-305.689	-0.410	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.285	-307.695	-0.410	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.706	-321.116	-0.410	(0)
S (6)	1.246e-02					
SO4-2	9.356e-03	4.512e-03	-2.029	-2.346	-0.317	(0)
CaSO4	1.395e-03	1.395e-03	-2.856	-2.856	0.000	(0)
MgSO4	1.386e-03	1.386e-03	-2.858	-2.858	0.000	(0)
NaSO4-	2.062e-04	1.733e-04	-3.686	-3.761	-0.076	(0)
KSO4-	1.032e-04	8.675e-05	-3.986	-4.062	-0.076	(0)
MnSO4	1.357e-05	1.357e-05	-4.867	-4.867	0.000	(0)
ZnSO4	1.536e-06	1.536e-06	-5.814	-5.814	0.000	(0)
Zn (SO4) 2-2	1.551e-07	6.036e-08	-6.809	-7.219	-0.410	(0)
NiSO4	2.919e-08	2.919e-08	-7.535	-7.535	0.000	(0)
CuSO4	2.370e-08	2.370e-08	-7.625	-7.625	0.000	(0)
CoSO4	2.177e-08	2.177e-08	-7.662	-7.662	0.000	(0)
HSO4-	1.785e-08	1.488e-08	-7.748	-7.827	-0.079	(0)
NH4SO4-	8.457e-09	7.082e-09	-8.073	-8.150	-0.077	(0)
CdSO4	3.580e-09	3.580e-09	-8.446	-8.446	0.000	(0)
Cd (SO4) 2-2	5.601e-10	2.179e-10	-9.252	-9.662	-0.410	(0)
PbSO4	3.242e-10	3.242e-10	-9.489	-9.489	0.000	(0)
AgSO4-	3.090e-10	2.440e-10	-9.510	-9.613	-0.102	(0)
CrOHSO4	4.449e-11	4.449e-11	-10.352	-10.352	0.000	(0)
Pb (SO4) 2-2	2.266e-11	8.815e-12	-10.645	-11.055	-0.410	(0)
Ni (SO4) 2-2	1.121e-11	4.361e-12	-10.950	-11.360	-0.410	(0)
AlSO4+	7.814e-12	6.514e-12	-11.107	-11.186	-0.079	(0)
FeSO4	2.725e-12	2.725e-12	-11.565	-11.565	0.000	(0)
Al (SO4) 2-	3.778e-13	3.150e-13	-12.423	-12.502	-0.079	(0)
UO2SO4	3.073e-13	3.073e-13	-12.512	-12.512	0.000	(0)
CrSO4+	8.496e-14	6.710e-14	-13.071	-13.173	-0.102	(0)
UO2 (SO4) 2-2	4.698e-14	1.828e-14	-13.328	-13.738	-0.410	(0)
VO2SO4-	1.551e-17	1.225e-17	-16.809	-16.912	-0.102	(0)
FeSO4+	3.472e-18	2.908e-18	-17.459	-17.536	-0.077	(0)
Cr2 (OH) 2SO4+2	4.294e-19	1.671e-19	-18.367	-18.777	-0.410	(0)
Fe (SO4) 2-	3.552e-19	2.805e-19	-18.450	-18.552	-0.102	(0)
VO4SO4	5.125e-20	5.125e-20	-19.290	-19.290	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.478e-20	4.478e-20	-19.349	-19.349	0.000	(0)
HgSO4	1.521e-20	1.521e-20	-19.818	-19.818	0.000	(0)
CrO3SO4-2	8.863e-24	3.448e-24	-23.052	-23.462	-0.410	(0)
VS4+	2.505e-34	1.978e-34	-33.601	-33.704	-0.102	(0)
U (SO4) 2	9.797e-40	9.797e-40	-39.009	-39.009	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.153	-40.563	-0.410	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.027	-62.129	-0.102	(0)
Sb (3)	5.996e-20					
Sb (OH) 3	3.033e-20	3.033e-20	-19.518	-19.518	0.000	(0)
HSbO2	2.963e-20	2.963e-20	-19.528	-19.528	0.000	(0)
SbO2-	1.800e-24	1.422e-24	-23.745	-23.847	-0.102	(0)
Sb (OH) 4-	1.030e-24	8.138e-25	-23.987	-24.089	-0.102	(0)
Sb (OH) 2F	1.754e-25	1.754e-25	-24.756	-24.756	0.000	(0)
SbOF	1.726e-25	1.726e-25	-24.763	-24.763	0.000	(0)
Sb (OH) 2+	3.149e-26	2.487e-26	-25.502	-25.604	-0.102	(0)
SbO+	1.086e-26	8.580e-27	-25.964	-26.067	-0.102	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.706	-321.116	-0.410	(0)
Sb (5)	2.645e-08					
SbO3-	2.642e-08	2.086e-08	-7.578	-7.681	-0.102	(0)
Sb (OH) 6-	2.923e-11	2.436e-11	-10.534	-10.613	-0.079	(0)
SbO2+	8.635e-24	6.819e-24	-23.064	-23.166	-0.102	(0)
Se (-2)	6.627e-15					
Ag2Se	6.627e-15	6.627e-15	-14.179	-14.179	0.000	(0)
HSe-	4.732e-40	3.737e-40	-39.325	-39.427	-0.102	(0)
MnSe	0.000e+00	0.000e+00	-42.112	-42.112	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.009	-43.009	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.546	-46.956	-0.410	(0)

AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.876	-85.516	-1.640	(0)
Se (4)	1.377e-07					
HSeO3-	1.111e-07	8.776e-08	-6.954	-7.057	-0.102	(0)
SeO3-2	2.661e-08	1.035e-08	-7.575	-7.985	-0.410	(0)
H2SeO3	1.263e-12	1.263e-12	-11.898	-11.898	0.000	(0)
AgSeO3-	2.283e-14	1.803e-14	-13.641	-13.744	-0.102	(0)
Cd (SeO3) 2-2	7.684e-19	2.989e-19	-18.114	-18.524	-0.410	(0)
Ag (SeO3) 2-3	1.398e-20	1.672e-21	-19.854	-20.777	-0.922	(0)
FeHSeO3+2	3.423e-23	1.332e-23	-22.466	-22.876	-0.410	(0)
Se (6)	1.473e-10					
SeO4-2	1.470e-10	7.090e-11	-9.833	-10.149	-0.317	(0)
MnSeO4	3.228e-13	3.228e-13	-12.491	-12.491	0.000	(0)
ZnSeO4	1.708e-14	1.708e-14	-13.767	-13.767	0.000	(0)
NiSeO4	1.075e-15	1.075e-15	-14.969	-14.969	0.000	(0)
CoSeO4	8.590e-16	8.590e-16	-15.066	-15.066	0.000	(0)
HSeO4-	1.518e-16	1.199e-16	-15.819	-15.921	-0.102	(0)
CdSeO4	4.468e-17	4.468e-17	-16.350	-16.350	0.000	(0)
Zn (SeO4) 2-2	3.156e-24	1.228e-24	-23.501	-23.911	-0.410	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.091	-59.014	-0.922	(0)
U (4)	3.332e-21					
U (OH) 5-	3.329e-21	2.629e-21	-20.478	-20.580	-0.102	(0)
U (OH) 4	3.718e-24	3.718e-24	-23.430	-23.430	0.000	(0)
U (OH) 3+	5.811e-28	4.590e-28	-27.236	-27.338	-0.102	(0)
U (OH) 2+2	1.842e-32	7.166e-33	-31.735	-32.145	-0.410	(0)
UF3+	1.011e-35	7.983e-36	-34.995	-35.098	-0.102	(0)
UF2+2	1.181e-36	4.594e-37	-35.928	-36.338	-0.410	(0)
UF4	9.598e-38	9.598e-38	-37.018	-37.018	0.000	(0)
UOH+3	9.533e-38	1.140e-38	-37.021	-37.943	-0.922	(0)
UF+3	2.784e-39	3.329e-40	-38.555	-39.478	-0.922	(0)
U (SO4) 2	9.797e-40	9.797e-40	-39.009	-39.009	0.000	(0)
UF5-	5.280e-40	4.170e-40	-39.277	-39.380	-0.102	(0)
USO4+2	0.000e+00	0.000e+00	-40.153	-40.563	-0.410	(0)
UF6-2	0.000e+00	0.000e+00	-40.450	-40.860	-0.410	(0)
U+4	0.000e+00	0.000e+00	-43.178	-44.818	-1.640	(0)
UCl+3	0.000e+00	0.000e+00	-44.844	-45.767	-0.922	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.687	-173.989	-8.302	(0)
U (5)	1.382e-16					
UO2+	1.382e-16	1.091e-16	-15.860	-15.962	-0.102	(0)
U (6)	3.702e-07					
UO2 (CO3) 3-4	2.718e-07	6.227e-09	-6.566	-8.206	-1.640	(0)
UO2 (CO3) 2-2	9.785e-08	3.807e-08	-7.009	-7.419	-0.410	(0)
UO2CO3	5.846e-10	5.846e-10	-9.233	-9.233	0.000	(0)
UO2OH+	2.139e-12	1.689e-12	-11.670	-11.772	-0.102	(0)
UO2F+	8.622e-13	6.809e-13	-12.064	-12.167	-0.102	(0)
UO2SO4	3.073e-13	3.073e-13	-12.512	-12.512	0.000	(0)
UO2F2	2.153e-13	2.153e-13	-12.667	-12.667	0.000	(0)
UO2+2	9.328e-14	4.499e-14	-13.030	-13.347	-0.317	(0)
UO2 (SO4) 2-2	4.698e-14	1.828e-14	-13.328	-13.738	-0.410	(0)
UO2F3-	7.508e-15	5.930e-15	-14.124	-14.227	-0.102	(0)
UO2Cl+	2.073e-16	1.638e-16	-15.683	-15.786	-0.102	(0)
UO2F4-2	1.327e-17	5.164e-18	-16.877	-17.287	-0.410	(0)
(UO2) 2 (OH) 2+2	1.217e-17	4.734e-18	-16.915	-17.325	-0.410	(0)
(UO2) 3 (OH) 5+	6.829e-19	5.394e-19	-18.166	-18.268	-0.102	(0)
UO2NO3+	1.155e-21	9.120e-22	-20.938	-21.040	-0.102	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.655	-42.758	-0.102	(0)
V+2	0.000e+00	0.000e+00	-43.332	-43.742	-0.410	(0)
V (3)	1.986e-15					
V (OH) 3	1.986e-15	1.986e-15	-14.702	-14.702	0.000	(0)
V (OH) 2+	5.487e-26	4.334e-26	-25.261	-25.363	-0.102	(0)
VOH+2	3.567e-29	1.388e-29	-28.448	-28.858	-0.410	(0)
V+3	7.768e-34	9.287e-35	-33.110	-34.032	-0.922	(0)
VSO4+	2.505e-34	1.978e-34	-33.601	-33.704	-0.102	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.846	-55.769	-0.922	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.275	-56.915	-1.640	(0)
V (4)	3.298e-18					
V (OH) 3+	3.105e-18	2.452e-18	-17.508	-17.610	-0.102	(0)

VO+2	1.060e-19	4.124e-20	-18.975	-19.385	-0.410	(0)
VOSO4	5.125e-20	5.125e-20	-19.290	-19.290	0.000	(0)
VOF+	3.434e-20	2.712e-20	-19.464	-19.567	-0.102	(0)
VOF2	1.115e-21	1.115e-21	-20.953	-20.953	0.000	(0)
VOCl+	3.288e-22	2.596e-22	-21.483	-21.586	-0.102	(0)
VOF3-	5.492e-24	4.337e-24	-23.260	-23.363	-0.102	(0)
VOF4-2	4.933e-27	1.919e-27	-26.307	-26.717	-0.410	(0)
H2V2O4+2	7.755e-31	3.017e-31	-30.110	-30.520	-0.410	(0)
V (5)	7.285e-09					
H2VO4-	6.327e-09	4.997e-09	-8.199	-8.301	-0.102	(0)
HVO4-2	9.560e-10	3.720e-10	-9.020	-9.430	-0.410	(0)
H3VO4	1.686e-12	1.686e-12	-11.773	-11.773	0.000	(0)
H3V2O7-	6.893e-14	5.444e-14	-13.162	-13.264	-0.102	(0)
HV2O7-3	5.271e-15	6.302e-16	-14.278	-15.201	-0.922	(0)
VO4-3	4.621e-16	5.524e-17	-15.335	-16.258	-0.922	(0)
VO2+	1.364e-16	1.137e-16	-15.865	-15.944	-0.079	(0)
V2O7-4	2.194e-17	5.026e-19	-16.659	-18.299	-1.640	(0)
VO2F	2.186e-17	2.186e-17	-16.660	-16.660	0.000	(0)
VO2SO4-	1.551e-17	1.225e-17	-16.809	-16.912	-0.102	(0)
VO2F2-	1.102e-18	8.703e-19	-17.958	-18.060	-0.102	(0)
V3O9-3	1.095e-18	1.309e-19	-17.961	-18.883	-0.922	(0)
VO2F3-2	3.059e-21	1.190e-21	-20.514	-20.924	-0.410	(0)
V4O12-4	1.191e-23	2.729e-25	-22.924	-24.564	-1.640	(0)
VO2NO3	5.842e-25	5.842e-25	-24.233	-24.233	0.000	(0)
VO2F4-3	5.371e-25	6.421e-26	-24.270	-25.192	-0.922	(0)
V10O28-6	0.000e+00	0.000e+00	-60.301	-63.991	-3.690	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.714	-63.276	-2.562	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.900	-65.540	-1.640	(0)
Zn	5.434e-06					
Zn+2	3.225e-06	1.556e-06	-5.491	-5.808	-0.317	(0)
ZnSO4	1.536e-06	1.536e-06	-5.814	-5.814	0.000	(0)
ZnCO3	2.922e-07	2.922e-07	-6.534	-6.534	0.000	(0)
Zn (SO4) 2-2	1.551e-07	6.036e-08	-6.809	-7.219	-0.410	(0)
ZnHCO3+	1.463e-07	1.156e-07	-6.835	-6.937	-0.102	(0)
ZnOH+	5.874e-08	4.639e-08	-7.231	-7.334	-0.102	(0)
ZnCl+	1.057e-08	8.770e-09	-7.976	-8.057	-0.081	(0)
ZnF+	4.309e-09	3.403e-09	-8.366	-8.468	-0.102	(0)
ZnOHCl	3.424e-09	3.424e-09	-8.465	-8.465	0.000	(0)
Zn (OH) 2	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
ZnCl2	3.120e-11	3.120e-11	-10.506	-10.506	0.000	(0)
Zn (OH) 3-	4.149e-12	3.277e-12	-11.382	-11.485	-0.102	(0)
ZnCl3-	6.703e-14	5.561e-14	-13.174	-13.255	-0.081	(0)
ZnNO3+	5.027e-14	3.970e-14	-13.299	-13.401	-0.102	(0)
ZnSeO4	1.708e-14	1.708e-14	-13.767	-13.767	0.000	(0)
ZnCl4-2	1.269e-16	6.241e-17	-15.897	-16.205	-0.308	(0)
Zn (OH) 4-2	9.998e-17	3.890e-17	-16.000	-16.410	-0.410	(0)
Zn (NO3) 2	8.047e-23	8.047e-23	-22.094	-22.094	0.000	(0)
Zn (SeO4) 2-2	3.156e-24	1.228e-24	-23.501	-23.911	-0.410	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.687	-149.790	-0.102	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.251	-151.251	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.001	-227.103	-0.102	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.201	-229.611	-0.410	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.285	-307.695	-0.410	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-56.35	-50.06	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-43.89	-39.38	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-51.11	-39.38	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-72.70	-54.77	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-58.77	-38.74	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.24	-28.84	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.27	-23.82	0.45	(NH4) 2SeO4
Acanthite	-52.57	-88.79	-36.22	Ag2S
Ag2CO3	-11.53	-22.62	-11.09	Ag2CO3
Ag2CrO4	-20.71	-32.30	-11.59	Ag2CrO4

Ag2HVO4	-12.14	-10.66	1.48	Ag2HVO4
Ag2MoO4	-11.63	-23.18	-11.55	Ag2MoO4
Ag2O	-14.76	-2.19	12.57	Ag2O
Ag2Se	-0.39	-49.09	-48.70	Ag2Se
Ag2SeO3	-9.57	-16.72	-7.15	Ag2SeO3
Ag2SeO4	-18.37	-27.28	-8.91	Ag2SeO4
Ag2SO4	-14.66	-19.48	-4.82	Ag2SO4
Ag3AsO3	-28.12	-25.96	2.16	Ag3AsO3
Ag3AsO4	-16.33	-19.11	-2.79	Ag3AsO4
Ag3H2VO5	-16.94	-11.76	5.18	Ag3H2VO5
AgF·4H2O	-13.58	-12.53	1.05	AgF·4H2O
Agmetal	-0.46	-13.97	-13.51	Ag
AgVO3	-10.34	-9.57	0.77	AgVO3
Al (OH) 3 (am)	-1.12	9.68	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.96	-43.59	2.37	Al2 (MoO4) 3
Al2O3	-0.28	19.37	19.65	Al2O3
Al4 (OH) 10SO4	-1.25	21.45	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.94	-6.14	4.80	AlAsO4·2H2O
AlOHSO4	-4.37	-7.60	-3.23	AlOHSO4
AlSb	-152.69	-87.06	65.62	AlSb
Alunite	0.78	-0.62	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.39	-12.18	-7.79	PbSO4
Anhydrite	-0.86	-5.22	-4.36	CaSO4
Anilite	-57.22	-89.09	-31.88	Cu0.25Cu1.5S
Antlerite	-4.17	4.62	8.79	Cu3 (OH) 4SO4
Aragonite	-0.06	-8.36	-8.30	CaCO3
Arsenolite	-87.93	-90.69	-2.76	As4O6
Artinite	-5.69	3.91	9.60	MgCO3:Mg (OH) 2·3H2O
As2O5	-38.36	-31.66	6.71	As2O5
Atacamite	-2.90	4.49	7.39	Cu2 (OH) 3Cl
Azurite	-2.04	-18.95	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-16.83	7.56	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-17.69	-1.82	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-0.05	-8.96	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-27.19	5.75	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-12.88	-22.55	-9.67	BaCrO4
BaF2	-9.48	-15.30	-5.82	BaF2
BaMoO4	-6.46	-13.42	-6.96	BaMoO4
Barite	0.26	-9.72	-9.98	BaSO4
BaS	-95.22	-79.04	16.18	BaS
BaSeO3	-8.79	-6.96	1.83	BaSeO3
BaSeO4	-10.07	-17.53	-7.46	BaSeO4
Bianchite	-6.39	-8.16	-1.76	ZnSO4·6H2O
Birnessite	-7.53	10.57	18.09	MnO2
Bixbyite	-3.97	-4.61	-0.64	Mn2O3
BlaubleiI	-56.44	-80.61	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.24	-84.52	-27.28	Cu0.6Cu0.8S
Boehmite	1.11	9.68	8.58	AlOOH
Breithauptite	-57.90	-76.42	-18.52	NiSb
Brochantite	-3.30	11.92	15.22	Cu4 (OH) 6SO4
Brucite	-4.67	12.17	16.84	Mg (OH) 2
Bunsenite	-4.99	7.45	12.45	NiO
Ca (VO3) 2	-10.53	-4.87	5.66	Ca (VO3) 2
Ca2V2O7	-10.30	7.20	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.35	7.20	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-17.74	4.56	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-19.69	19.27	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-20.59	19.27	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-300.25	-157.28	142.97	Ca3Sb2
CaCrO4	-15.77	-18.04	-2.27	CaCrO4
Calcite	0.12	-8.36	-8.48	CaCO3
Calomel	-7.17	-25.08	-17.91	Hg2Cl2
CaMoO4	-0.96	-8.91	-7.95	CaMoO4
Carnotite	-2.20	-1.97	0.23	KUO2VO4
CaSeO3·2H2O	-5.27	-2.46	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-10.00	-13.02	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-12.48	-2.64	9.84	Cd (BO2) 2
Cd (OH) 2	-7.17	6.47	13.64	Cd (OH) 2

Cd(OH)2(am)	-7.26	6.47	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.87	-15.16	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.43	2.13	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.80	8.60	28.40	Cd4(OH)6SO4
CdCl2	-13.11	-13.77	-0.66	CdCl2
CdCl2:1H2O	-12.08	-13.77	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.86	-13.77	-1.91	CdCl2:2.5H2O
CdF2	-15.18	-16.39	-1.21	CdF2
Cdmetal(alpha)	-32.79	-19.27	13.51	Cd
Cdmetal(gamma)	-32.89	-19.27	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-7.19	-3.65	3.54	CdOHCl
CdSb	-77.05	-77.40	-0.35	CdSb
CdSe	-20.23	-40.43	-20.20	CdSe
CdSeO4:2H2O	-16.77	-18.62	-1.85	CdSeO4:2H2O
CdSO4	-10.64	-10.82	-0.17	CdSO4
CdSO4:1H2O	-9.09	-10.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.94	-10.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.47	-11.22	-9.75	AgCl
Cerrusite	-2.19	-15.32	-13.13	PbCO3
CH4(g)	-82.36	-123.40	-41.05	CH4
Chalcanthite	-7.35	-9.99	-2.64	CuSO4:5H2O
Chalcocite	-57.44	-92.36	-34.92	Cu2S
Chalcopyrite	-127.30	-162.57	-35.27	CuFeS2
Cinnabar	-52.05	-97.74	-45.69	HgS
Claudetite	-87.63	-90.69	-3.06	As4O6
Clausthalite	-14.69	-41.79	-27.10	PbSe
Co(BO2)2	-28.86	-1.79	27.07	Co(BO2)2
Co(OH)2	-5.77	7.33	13.09	Co(OH)2
Co(OH)3	-9.89	-12.20	-2.31	Co(OH)3
CO2(g)	-2.28	-20.43	-18.15	CO2
Co3(AsO4)2	-22.71	-9.68	13.03	Co3(AsO4)2
Co3O4	-6.58	-17.08	-10.50	Co3O4
CoCl2	-21.18	-12.91	8.27	CoCl2
CoCl2:6H2O	-15.45	-12.92	2.54	CoCl2:6H2O
CoCO3	-3.12	-13.10	-9.98	CoCO3
CoF2	-13.94	-15.54	-1.60	CoF2
CoF3	-45.04	-46.50	-1.46	CoF3
CoFe2O4	17.20	13.67	-3.53	CoFe2O4
CoMoO4	-5.90	-13.66	-7.76	CoMoO4
CoO	-6.26	7.33	13.59	CoO
CoS(alpha)	-71.84	-79.28	-7.44	CoS
CoS(beta)	-68.21	-79.28	-11.07	CoS
CoSe	-23.37	-39.57	-16.20	CoSe
CoSeO3	-8.52	-7.20	1.32	CoSeO3
CoSeO4:6H2O	-16.24	-17.77	-1.53	CoSeO4:6H2O
CoSO4	-12.76	-9.96	2.80	CoSO4
CoSO4:6H2O	-7.49	-9.96	-2.47	CoSO4:6H2O
Cotunnite	-10.35	-15.13	-4.78	PbCl2
Covellite	-57.00	-79.30	-22.30	CuS
Cr(OH)2	-22.09	-11.27	10.82	Cr(OH)2
Cr(OH)3	-2.69	-1.35	1.34	Cr(OH)3
Cr(OH)3(am)	-0.60	-1.35	-0.75	Cr(OH)3
Cr2O3	-0.34	-2.70	-2.36	Cr2O3
CrCl2	-45.61	-31.52	14.09	CrCl2
CrCl3	-46.83	-31.71	15.11	CrCl3
CrF3	-24.31	-35.64	-11.34	CrF3
Crmetal	-67.50	-37.02	30.48	Cr
CrO3	-26.90	-30.11	-3.21	CrO3
Cryolite	-9.09	-42.93	-33.84	Na3AlF6
Cu(OH)2	-1.37	7.30	8.67	Cu(OH)2
Cu(SbO3)2	-25.46	19.76	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.11	-0.86	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.44	-92.32	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.86	-52.66	-45.80	Cu2Se
Cu2SO4	-21.10	-23.05	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.85	-9.75	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-62.79	-105.38	-42.59	Cu3Sb

Cu3Se2	-28.76	-92.25	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-17.37	-22.81	-5.44	CuCrO4
CuF	-9.40	-14.31	-4.91	CuF
CuF2	-16.67	-15.56	1.12	CuF2
CuF2:2H2O	-11.01	-15.56	-4.55	CuF2:2H2O
Cumetal	-6.99	-15.75	-8.76	Cu
CuMoO4	-0.61	-13.68	-13.08	CuMoO4
CuOCuSO4	-12.98	-2.68	10.30	CuOCuSO4
Cupricferrite	7.66	13.65	5.99	CuFe2O4
Cuprite	-4.35	-5.76	-1.41	Cu2O
Cuprousferrite	9.21	0.30	-8.92	CuFeO2
CuSe	-6.50	-39.60	-33.10	CuSe
CuSe2	-27.39	-60.75	-33.37	CuSe2
CuSeO3:2H2O	-7.74	-7.23	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.35	-17.79	-2.44	CuSeO4:5H2O
CuSO4	-12.92	-9.99	2.94	CuSO4
Diaspore	2.81	9.68	6.87	AlOOH
Djurleite	-57.58	-91.50	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.08	-16.62	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.47	-16.62	-17.09	CaMg(CO3)2
Epsomite	-2.99	-5.12	-2.13	MgSO4:7H2O
Fe(OH)2	-10.23	3.33	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.18	0.14	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.89	-13.61	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.73	-8.18	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.61	-37.24	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.78	-45.52	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.54	9.68	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.05	-12.65	0.40	FeAsO4:2H2O
FeCr2O4	-6.57	0.63	7.20	FeCr2O4
FeMoO4	-7.56	-17.65	-10.09	FeMoO4
Ferrihydrite	-0.02	3.17	3.19	Fe(OH)3
Ferroselite	-46.12	-64.72	-18.60	FeSe2
FeS(ppt)	-80.32	-83.27	-2.95	FeS
FeSe	-32.56	-43.56	-11.00	FeSe
Fix_pe	-5.40	-5.40	0.00	e-
Fluorite	-0.29	-10.79	-10.50	CaF2
Galena	-67.52	-81.49	-13.97	PbS
Gibbsite	1.39	9.68	8.29	Al(OH)3
Goethite	2.68	3.17	0.49	FeOOH
Goslarite	-6.14	-8.16	-2.01	ZnSO4:7H2O
Greenockite	-65.77	-80.13	-14.36	CdS
Greigite	-291.70	-336.73	-45.03	Fe3S4
Gummite	-6.08	1.60	7.67	UO3
Gypsum	-0.61	-5.22	-4.61	CaSO4:2H2O
H-Jarosite	-12.96	-25.06	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.11	-20.99	-12.88	H2MoO4
H2S(g)	-78.59	-86.60	-8.01	H2S
H2Se(g)	-41.94	-46.90	-4.96	H2Se
Halite	-6.40	-4.79	1.60	NaCl
Hausmannite	-4.77	56.26	61.03	Mn3O4
Hematite	7.77	6.35	-1.42	Fe2O3
Hercynite	-0.19	22.70	22.89	FeAl2O4
Hg(CH3)2(g)	-184.24	-257.95	-73.71	Hg(CH3)2
Hg(g)	-7.42	-15.29	-7.87	Hg
Hg(OH)2	-7.64	-11.14	-3.50	Hg(OH)2
Hg2(g)	-15.63	-30.58	-14.96	Hg2
Hg2(OH)2	-10.10	-4.84	5.26	Hg2(OH)2
Hg2CO3	-9.22	-25.27	-16.05	Hg2CO3
Hg2CrO4	-26.25	-34.95	-8.70	Hg2CrO4
Hg2F2	-17.34	-27.70	-10.36	Hg2F2
Hg2S	-79.77	-91.44	-11.68	Hg2S
Hg2SeO3	-14.71	-19.37	-4.66	Hg2SeO3
Hg2SO4	-16.00	-22.13	-6.13	Hg2SO4
Hg3O2CO3	-24.17	-53.85	-29.68	Hg3O2CO3
HgCl(g)	-32.04	-12.54	19.50	HgCl
HgCl2	-10.12	-31.38	-21.26	HgCl2

HgF(g)	-46.53	-13.85	32.68	HgF
HgF2(g)	-46.57	-34.00	12.57	HgF2
Hgmetal(l)	-1.84	-15.29	-13.45	Hg
HgSe	-2.35	-58.04	-55.69	HgSe
HgSeO3	-13.24	-25.67	-12.43	HgSeO3
HgSO4	-19.01	-28.43	-9.42	HgSO4
Huntite	-3.17	-33.13	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.76	-25.53	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.10	-20.87	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-14.82	-19.99	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.35	-20.15	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-33.17	-50.41	-17.24	K2Cr2O7
K2CrO4	-19.79	-20.30	-0.51	K2CrO4
K2MoO4	-14.44	-11.17	3.26	K2MoO4
K2SeO4	-14.55	-15.28	-0.73	K2SeO4
Langite	-5.56	11.92	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.64	-7.07	-0.43	PbO·PbSO4
Laurionite	-5.63	-5.01	0.62	PbOHCl
Lepidocrocite	1.80	3.17	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.58	5.11	12.69	PbO
Mackinawite	-79.67	-83.27	-3.60	FeS
Maghemite	-0.04	6.35	6.39	Fe2O3
Magnesioferrite	1.66	18.52	16.86	Fe2MgO4
Magnesite	-0.80	-8.26	-7.46	MgCO3
Magnetite	6.28	9.68	3.40	Fe3O4
Malachite	-0.52	-5.82	-5.31	Cu2(OH)2CO3
Manganite	-2.30	23.04	25.34	MnOOH
Massicot	-7.78	5.11	12.89	PbO
Matlockite	-7.47	-16.44	-8.97	PbClF
Melanothallite	-19.19	-12.94	6.26	CuCl2
Melanterite	-11.75	-13.96	-2.21	FeSO4·7H2O
Metacinnabar	-52.65	-97.74	-45.09	HgS
Mg(OH)2(active)	-6.62	12.17	18.79	Mg(OH)2
Mg(VO3)2	-16.05	-4.77	11.28	Mg(VO3)2
Mg2Sb3	-276.23	-201.55	74.68	Mg2Sb3
Mg2V2O7	-18.96	7.40	26.36	Mg2V2O7
MgCr2O4	-6.73	9.47	16.20	MgCr2O4
MgCrO4	-23.32	-17.94	5.38	MgCrO4
MgF2	-2.56	-10.69	-8.13	MgF2
MgMoO4	-6.96	-8.81	-1.85	MgMoO4
MgSeO3·6H2O	-5.41	-2.36	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.72	-12.92	-1.20	MgSeO4·6H2O
Minium	-32.45	41.07	73.52	Pb3O4
Mirabilite	-5.53	-6.64	-1.11	Na2SO4·10H2O
Mn(VO3)2	-11.67	-6.77	4.90	Mn(VO3)2
Mn2(SO4)3	-50.77	-56.48	-5.71	Mn2(SO4)3
Mn2Sb	-150.36	-89.28	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-13.64	-1.14	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.79	-10.07	2.72	MnCl2·4H2O
MnS(grn)	-76.60	-76.43	0.17	MnS
MnS(pnk)	-79.77	-76.43	3.34	MnS
MnSb	-96.15	-99.06	-2.91	MnSb
MnSe	-40.23	-36.73	3.50	MnSe
MnSeO3	-5.49	-4.36	1.13	MnSeO3
MnSeO3·2H2O	-5.34	-4.36	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.87	-14.92	-2.05	MnSeO4·5H2O
MnSO4	-9.70	-7.12	2.58	MnSO4
Monteponite	-8.63	6.47	15.10	CdO
Montroydite	-7.50	-11.14	-3.64	HgO
MoO3	-12.99	-20.99	-8.00	MoO3
Morenosite	-7.69	-9.84	-2.14	NiSO4·7H2O
MoS2	-149.68	-219.94	-70.26	MoS2
Na-Jarosite	-8.53	-19.73	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.67	-49.57	-9.90	Na2Cr2O7
Na2CrO4	-22.39	-19.46	2.93	Na2CrO4
Na2Mo2O7	-14.72	-31.32	-16.60	Na2Mo2O7
Na2MoO4	-11.82	-10.33	1.49	Na2MoO4

Na2MoO4:2H2O	-11.56	-10.33	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.18	-3.88	10.30	Na2SeO3:5H2O
Na2SeO4	-15.72	-14.44	1.28	Na2SeO4
Na3Sb	-175.22	-80.77	94.45	Na3Sb
Na3VO4	-29.18	7.51	36.68	Na3VO4
Na4V2O7	-33.04	4.36	37.40	Na4V2O7
Nantokite	-6.27	-13.00	-6.73	CuCl
NaSb	-88.84	-65.68	23.17	NaSb
Natron	-8.47	-9.78	-1.31	Na2CO3:10H2O
NaVO3	-7.00	-3.15	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni(OH)2	-5.34	7.45	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.00	-9.30	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.47	12.53	32.00	Ni4(OH)6SO4
NiCO3	-6.11	-12.98	-6.87	NiCO3
NiMoO4	-2.39	-13.53	-11.14	NiMoO4
NiS(alpha)	-73.55	-79.15	-5.60	NiS
NiS(beta)	-68.05	-79.15	-11.10	NiS
NiS(gamma)	-66.35	-79.15	-12.80	NiS
NiSe	-21.74	-39.44	-17.70	NiSe
NiSeO3:2H2O	-9.89	-7.07	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.12	-17.64	-1.52	NiSeO4:6H2O
Nsutite	-6.94	10.57	17.50	MnO2
O2(g)	-31.60	51.49	83.09	O2
Orpiment	-244.09	-305.16	-61.07	As2S3
Otavite	-1.96	-13.96	-12.00	CdCO3
Pb(BO2)2	-10.53	-4.01	6.52	Pb(BO2)2
Pb(OH)2	-3.04	5.11	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.72	-71.48	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.69	0.10	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.97	10.22	26.19	Pb2O(OH)2
Pb2O3	-25.08	35.96	61.04	Pb2O3
Pb2OCO3	-9.65	-10.21	-0.56	Pb2OCO3
Pb2V2O7	-4.83	-6.73	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.13	-16.33	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.76	-1.62	6.14	Pb3(VO4)2
Pb3O2CO3	-16.12	-5.10	11.02	Pb3O2CO3
Pb3O2SO4	-12.65	-1.96	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.95	3.15	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.73	3.15	21.88	Pb4O3SO4
PbCrO4	-12.40	-25.00	-12.60	PbCrO4
PbF2	-10.31	-17.75	-7.44	PbF2
Pbmetal	-24.88	-20.63	4.25	Pb
PbMoO4	-0.26	-15.88	-15.62	PbMoO4
PbO:0.3H2O	-7.87	5.11	12.98	PbO:0.33H2O
PbSeO4	-13.14	-19.98	-6.84	PbSeO4
Periclase	-9.41	12.17	21.58	MgO
Phosgenite	-10.64	-30.45	-19.81	PbCl2:PbCO3
Plattnerite	-18.75	30.85	49.60	PbO2
Portlandite	-10.73	12.07	22.80	Ca(OH)2
Pyrite	-125.62	-144.13	-18.51	FeS2
Pyrochroite	-5.02	10.17	15.19	Mn(OH)2
Pyrolusite	-5.46	35.92	41.38	MnO2
Realgar	-102.40	-122.15	-19.75	AsS
Retgersite	-7.80	-9.84	-2.04	NiSO4:6H2O
Rhodochrosite	0.32	-10.26	-10.58	MnCO3
Rutherfordine	-4.33	-18.83	-14.50	UO2CO3
Sb(OH)3	-12.41	-19.52	-7.11	Sb(OH)3
Sb2O4	-16.69	-13.29	3.40	Sb2O4
Sb2O5	-26.50	-36.17	-9.67	Sb2O5
Sb2Se3	-111.98	-179.73	-67.76	Sb2Se3
Sb4O6(cubic)	-59.81	-78.07	-18.26	Sb4O6
Sb4O6(orth)	-60.17	-78.07	-17.90	Sb4O6
SbCl3	-50.45	-49.88	0.57	SbCl3
SbF3	-43.59	-53.81	-10.23	SbF3
Sbmetal	-46.44	-58.13	-11.69	Sb
SbO2	-3.13	-30.96	-27.82	SbO2
Schoepite	-4.40	1.60	5.99	UO2(OH)2:H2O

Semetal (am)	-14.05	-21.16	-7.11	Se
Semetal (hex)	-13.45	-21.16	-7.71	Se
Senarmontite	-26.67	-39.04	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.14	-25.09	21.04	SeO3
Siderite	-6.86	-17.10	-10.24	FeCO3
Smithsonite	-1.29	-11.29	-10.00	ZnCO3
Sphalerite	-66.02	-77.47	-11.45	ZnS
Spinel	-5.31	31.54	36.85	MgAl2O4
Stibnite	-248.38	-298.84	-50.46	Sb2S3
Sulfur	-58.71	-60.86	-2.14	S
Tenorite	-0.34	7.30	7.64	CuO
Thenardite	-6.96	-6.64	0.32	Na2SO4
Thermonatrite	-10.41	-9.78	0.64	Na2CO3:H2O
Tyuyamunite	-5.76	-1.68	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.39	6.69	21.08	U3O8
U3Sb4	-584.17	-431.79	152.38	U3Sb4
U4O9	-30.96	-33.98	-3.02	U4O9
UF4	-31.12	-60.66	-29.54	UF4
UF4:2.5H2O	-27.94	-60.66	-32.72	UF4:2.5H2O
UO2 (am)	-15.87	-14.93	0.93	UO2
UO2 (NO3) 2	-41.48	-29.33	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.18	-29.33	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.72	-29.33	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.38	-29.33	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.02	1.60	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.25	-23.50	-2.25	UO2SeO4:4H2O
UO3	-6.10	1.60	7.70	UO3
Uraninite	-10.26	-14.93	-4.67	UO2
USb2	-221.48	-191.90	29.58	USb2
V (OH) 3	-19.21	-11.62	7.59	V (OH) 3
V2O5	-15.59	-16.95	-1.36	V2O5
V3O5	-40.90	-39.07	1.84	V3O5
V4O7	-50.70	-43.51	7.19	V4O7
V6O13	-41.46	-102.32	-60.86	V6O13
Valentinite	-30.55	-39.04	-8.48	Sb2O3
VC12	-63.60	-44.73	18.87	VC12
VC13	-65.41	-41.98	23.43	VC13
VF4	-65.10	-50.17	14.93	VF4
Vmetal	-94.26	-50.23	44.03	V
VO	-39.25	-24.49	14.76	VO
VO (OH) 2	-9.59	-4.44	5.15	VO (OH) 2
VO2Cl	-21.43	-18.59	2.84	VO2Cl
VOC1	-32.89	-21.74	11.15	VOC1
VOC12	-37.44	-24.68	12.76	VOC12
VOSO4	-25.34	-21.73	3.61	VOSO4
Witherite	-4.29	-12.86	-8.57	BaCO3
Wurtzite	-68.52	-77.47	-8.95	ZnS
Zincite	-2.20	9.14	11.33	ZnO
Zincosite	-12.08	-8.15	3.93	ZnSO4
Zn (BO2) 2	-8.27	0.02	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.11	-21.80	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-3.07	9.13	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.34	9.13	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.62	9.13	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.40	9.13	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.60	9.13	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.52	0.98	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-7.04	8.15	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.90	-4.25	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.09	-7.17	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-9.15	19.25	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-13.07	25.43	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.16	-11.11	7.05	ZnCl2
ZnCO3:1H2O	-1.03	-11.29	-10.26	ZnCO3:1H2O
ZnF2	-13.19	-13.73	-0.53	ZnF2
Znmetal	-42.40	-16.61	25.79	Zn
ZnMoO4	-1.73	-11.85	-10.13	ZnMoO4

ZnO(active)	-2.05	9.14	11.19	ZnO
ZnS(am)	-68.42	-77.47	-9.05	ZnS
ZnSb	-85.76	-74.74	11.01	ZnSb
ZnSe	-23.36	-37.76	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.52	-8.15	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 48.

Title Return solution back to 1L
Mix 205
212 1.0419
save solution 213
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 205.

Mixture 205.

1.042e+00 Solution 212 Solution after simulation 47.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.907e-08	1.907e-08
Al	3.637e-06	3.638e-06
As	2.434e-10	2.434e-10
B	2.801e-05	2.801e-05
Ba	8.803e-08	8.803e-08
C	3.124e-03	3.124e-03
Ca	4.271e-03	4.271e-03
Cd	1.238e-08	1.239e-08
Cl	2.693e-03	2.693e-03
Co	9.136e-08	9.136e-08
Cr	2.235e-09	2.235e-09
Cu	5.541e-07	5.542e-07
F	1.591e-04	1.591e-04
Fe	1.960e-09	1.960e-09
Hg	1.911e-09	1.911e-09
K	3.362e-03	3.362e-03
Mg	4.964e-03	4.964e-03
Mn	5.815e-05	5.816e-05
Mo	1.882e-06	1.882e-06
N	8.498e-06	8.499e-06
Na	8.798e-03	8.798e-03
Ni	1.127e-07	1.128e-07
Pb	2.606e-09	2.606e-09

S	1.246e-02	1.246e-02
Sb	2.645e-08	2.645e-08
Se	1.379e-07	1.379e-07
U	3.702e-07	3.702e-07
V	7.285e-09	7.286e-09
Zn	5.434e-06	5.434e-06

-----Description of solution-----

	pH =	7.472	Charge balance
	pe =	5.400	Adjusted to redox
equilibrium			
	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	4.038e-02	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	2.982e-03	
	Total CO2 (mol/kg) =	3.124e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.006e-06	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.00	
	Iterations =	0	
	Total H =	1.110236e+02	
	Total O =	5.556943e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.612e-07	2.982e-07	-6.442	-6.525	-0.083	(0)
H+	4.049e-08	3.375e-08	-7.393	-7.472	-0.079	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.907e-08					
AgCl	1.242e-08	1.242e-08	-7.906	-7.906	0.000	(0)
Ag+	3.252e-09	2.710e-09	-8.488	-8.567	-0.079	(0)
AgCl2-	3.074e-09	2.427e-09	-8.512	-8.615	-0.102	(0)
AgSO4-	3.090e-10	2.440e-10	-9.510	-9.613	-0.102	(0)
AgCl3-2	1.248e-11	4.856e-12	-10.904	-11.314	-0.410	(0)
AgNO2	3.857e-12	3.857e-12	-11.414	-11.414	0.000	(0)
AgF	7.464e-13	7.464e-13	-12.127	-12.127	0.000	(0)
AgCl4-3	1.861e-13	2.225e-14	-12.730	-13.653	-0.922	(0)
AgOH	8.081e-14	8.081e-14	-13.093	-13.093	0.000	(0)
AgSeO3-	2.283e-14	1.803e-14	-13.641	-13.744	-0.102	(0)
AgH2BO3	2.040e-14	2.040e-14	-13.690	-13.690	0.000	(0)
AgNH3+	1.734e-14	1.369e-14	-13.761	-13.863	-0.102	(0)
Ag2Se	6.627e-15	6.627e-15	-14.179	-14.179	0.000	(0)
Ag (NO2) 2-	5.153e-17	4.070e-17	-16.288	-16.390	-0.102	(0)
AgNO3	2.187e-17	2.187e-17	-16.660	-16.660	0.000	(0)
Ag (OH) 2-	2.982e-18	2.355e-18	-17.526	-17.628	-0.102	(0)
Ag (NH3) 2+	3.488e-19	2.755e-19	-18.457	-18.560	-0.102	(0)
Ag (SeO3) 2-3	1.398e-20	1.672e-21	-19.854	-20.777	-0.922	(0)
Ag2MoO4	2.522e-24	2.522e-24	-23.598	-23.598	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.884	-73.884	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.876	-85.516	-1.640	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.722	-148.928	-0.206	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.813	-148.916	-0.102	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.520	-150.896	-0.376	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.850	-151.207	-0.357	(0)
Al	3.637e-06					
Al (OH) 4-	3.519e-06	2.934e-06	-5.454	-5.533	-0.079	(0)
Al (OH) 3	7.815e-08	7.815e-08	-7.107	-7.107	0.000	(0)
Al (OH) 2+	1.563e-08	1.314e-08	-7.806	-7.882	-0.076	(0)
AlF3	1.228e-08	1.228e-08	-7.911	-7.911	0.000	(0)
AlF2+	1.059e-08	8.900e-09	-7.975	-8.051	-0.076	(0)
AlF4-	8.097e-10	6.750e-10	-9.092	-9.171	-0.079	(0)
AlF+2	4.089e-10	2.039e-10	-9.388	-9.691	-0.302	(0)
AlOH+2	1.112e-10	5.546e-11	-9.954	-10.256	-0.302	(0)
AlSO4+	7.814e-12	6.514e-12	-11.107	-11.186	-0.079	(0)

Al+3	9.592e-13	1.860e-13	-12.018	-12.731	-0.712	(0)
Al(SO4)2-	3.778e-13	3.150e-13	-12.423	-12.502	-0.079	(0)
AlMo6O21-3	1.261e-38	1.507e-39	-37.899	-38.822	-0.922	(0)
As (3)	2.158e-23					
H3AsO3	2.118e-23	2.118e-23	-22.674	-22.674	0.000	(0)
H2AsO3-	4.075e-25	3.218e-25	-24.390	-24.492	-0.102	(0)
HAsO3-2	2.235e-29	8.697e-30	-28.651	-29.061	-0.410	(0)
H4AsO3+	4.483e-31	3.541e-31	-30.348	-30.451	-0.102	(0)
AsO3-3	8.310e-35	9.935e-36	-34.080	-35.003	-0.922	(0)
As (5)	2.434e-10					
HAsO4-2	2.113e-10	8.222e-11	-9.675	-10.085	-0.410	(0)
H2AsO4-	3.204e-11	2.530e-11	-10.494	-10.597	-0.102	(0)
AsO4-3	6.444e-14	7.704e-15	-13.191	-14.113	-0.922	(0)
H3AsO4	1.470e-16	1.484e-16	-15.833	-15.829	0.004	(0)
B	2.801e-05					
H3BO3	2.734e-05	2.759e-05	-4.563	-4.559	0.004	(0)
H2BO3-	5.815e-07	4.749e-07	-6.235	-6.323	-0.088	(0)
CaH2BO3+	4.515e-08	3.687e-08	-7.345	-7.433	-0.088	(0)
MgH2BO3+	3.403e-08	2.779e-08	-7.468	-7.556	-0.088	(0)
NaH2BO3	5.382e-09	5.382e-09	-8.269	-8.269	0.000	(0)
BF(OH)3-	1.478e-09	1.207e-09	-8.830	-8.918	-0.088	(0)
H5(BO3)2-	1.366e-11	1.115e-11	-10.865	-10.953	-0.088	(0)
BaH2BO3+	7.527e-13	6.147e-13	-12.123	-12.211	-0.088	(0)
BF2(OH)2-	5.851e-13	4.778e-13	-12.233	-12.321	-0.088	(0)
H8(BO3)3-	3.769e-14	3.078e-14	-13.424	-13.512	-0.088	(0)
AgH2BO3	2.040e-14	2.040e-14	-13.690	-13.690	0.000	(0)
BF3OH-	8.428e-19	6.882e-19	-18.074	-18.162	-0.088	(0)
BF4-	1.535e-23	1.254e-23	-22.814	-22.902	-0.088	(0)
Ba	8.803e-08					
Ba+2	8.684e-08	4.189e-08	-7.061	-7.378	-0.317	(0)
BaHCO3+	1.113e-09	9.398e-10	-8.954	-9.027	-0.073	(0)
BaCO3	7.011e-11	7.011e-11	-10.154	-10.154	0.000	(0)
BaH2BO3+	7.527e-13	6.147e-13	-12.123	-12.211	-0.088	(0)
BaOH+	6.511e-14	5.452e-14	-13.186	-13.263	-0.077	(0)
BaNO3+	2.700e-15	2.133e-15	-14.569	-14.671	-0.102	(0)
BaNH3+2	1.681e-16	6.540e-17	-15.774	-16.184	-0.410	(0)
C (4)	3.124e-03					
HCO3-	2.796e-03	2.349e-03	-2.553	-2.629	-0.076	(0)
H2CO3	1.783e-04	1.783e-04	-3.749	-3.749	0.000	(0)
CaHCO3+	6.990e-05	5.902e-05	-4.156	-4.229	-0.073	(0)
MgHCO3+	4.891e-05	4.058e-05	-4.311	-4.392	-0.081	(0)
NaHCO3	9.448e-06	9.448e-06	-5.025	-5.025	0.000	(0)
CaCO3	6.979e-06	6.979e-06	-5.156	-5.156	0.000	(0)
CO3-2	6.767e-06	3.264e-06	-5.170	-5.486	-0.317	(0)
MgCO3	4.582e-06	4.582e-06	-5.339	-5.339	0.000	(0)
MnHCO3+	9.468e-07	7.929e-07	-6.024	-6.101	-0.077	(0)
NaCO3-	5.172e-07	4.346e-07	-6.286	-6.362	-0.076	(0)
CuCO3	4.407e-07	4.407e-07	-6.356	-6.356	0.000	(0)
ZnCO3	2.922e-07	2.922e-07	-6.534	-6.534	0.000	(0)
UO2(CO3)3-4	2.718e-07	6.227e-09	-6.566	-8.206	-1.640	(0)
ZnHCO3+	1.463e-07	1.156e-07	-6.835	-6.937	-0.102	(0)
UO2(CO3)2-2	9.785e-08	3.807e-08	-7.009	-7.419	-0.410	(0)
NiHCO3+	1.189e-08	9.389e-09	-7.925	-8.027	-0.102	(0)
Cu(CO3)2-2	9.950e-09	3.871e-09	-8.002	-8.412	-0.410	(0)
CoHCO3+	5.594e-09	4.418e-09	-8.252	-8.355	-0.102	(0)
CuHCO3+	4.304e-09	3.399e-09	-8.366	-8.469	-0.102	(0)
NiCO3	3.947e-09	3.947e-09	-8.404	-8.404	0.000	(0)
PbCO3	1.439e-09	1.439e-09	-8.842	-8.842	0.000	(0)
CoCO3	1.334e-09	1.334e-09	-8.875	-8.875	0.000	(0)
BaHCO3+	1.113e-09	9.398e-10	-8.954	-9.027	-0.073	(0)
UO2CO3	5.846e-10	5.846e-10	-9.233	-9.233	0.000	(0)
PbHCO3+	3.242e-10	2.561e-10	-9.489	-9.592	-0.102	(0)
CdCO3	2.518e-10	2.518e-10	-9.599	-9.599	0.000	(0)
BaCO3	7.011e-11	7.011e-11	-10.154	-10.154	0.000	(0)
Pb(CO3)2-2	3.482e-11	1.355e-11	-10.458	-10.868	-0.410	(0)
CdHCO3+	2.292e-11	1.810e-11	-10.640	-10.742	-0.102	(0)
Cd(CO3)2-2	1.566e-12	6.091e-13	-11.805	-12.215	-0.410	(0)
FeHCO3+	8.617e-14	7.277e-14	-13.065	-13.138	-0.073	(0)

		HgCO3	5.028e-14	5.028e-14	-13.299	-13.299	0.000	(0)
		Hg (CO3) 2-2	1.334e-15	5.190e-16	-14.875	-15.285	-0.410	(0)
		HgHCO3+	4.001e-17	3.160e-17	-16.398	-16.500	-0.102	(0)
Ca	4.271e-03							
		Ca+2	2.797e-03	1.349e-03	-2.553	-2.870	-0.317	(0)
		CaSO4	1.395e-03	1.395e-03	-2.856	-2.856	0.000	(0)
		CaHCO3+	6.990e-05	5.902e-05	-4.156	-4.229	-0.073	(0)
		CaCO3	6.979e-06	6.979e-06	-5.156	-5.156	0.000	(0)
		CaF+	1.928e-06	1.615e-06	-5.715	-5.792	-0.077	(0)
		CaH2BO3+	4.515e-08	3.687e-08	-7.345	-7.433	-0.088	(0)
		CaOH+	9.506e-09	8.028e-09	-8.022	-8.095	-0.073	(0)
		CaNO3+	5.488e-11	4.335e-11	-10.261	-10.363	-0.102	(0)
		CaNH3+2	1.080e-11	4.204e-12	-10.966	-11.376	-0.410	(0)
		Ca (NH3) 2+2	1.064e-20	4.142e-21	-19.973	-20.383	-0.410	(0)
Cd	1.238e-08							
		Cd+2	7.016e-09	3.384e-09	-8.154	-8.471	-0.317	(0)
		CdSO4	3.580e-09	3.580e-09	-8.446	-8.446	0.000	(0)
		CdCl+	9.184e-10	7.253e-10	-9.037	-9.139	-0.102	(0)
		Cd (SO4) 2-2	5.601e-10	2.179e-10	-9.252	-9.662	-0.410	(0)
		CdCO3	2.518e-10	2.518e-10	-9.599	-9.599	0.000	(0)
		CdHCO3+	2.292e-11	1.810e-11	-10.640	-10.742	-0.102	(0)
		CdOH+	1.015e-11	8.016e-12	-10.994	-11.096	-0.102	(0)
		CdOHC1	8.872e-12	8.872e-12	-11.052	-11.052	0.000	(0)
		CdF+	7.446e-12	5.881e-12	-11.128	-11.231	-0.102	(0)
		CdCl2	6.786e-12	6.786e-12	-11.168	-11.168	0.000	(0)
		Cd (CO3) 2-2	1.566e-12	6.091e-13	-11.805	-12.215	-0.410	(0)
		Cd (OH) 2	1.508e-14	1.508e-14	-13.822	-13.822	0.000	(0)
		CdCl3-	1.217e-14	9.610e-15	-13.915	-14.017	-0.102	(0)
		CdF2	1.286e-15	1.286e-15	-14.891	-14.891	0.000	(0)
		CdNO3+	1.377e-16	1.087e-16	-15.861	-15.964	-0.102	(0)
		CdSeO4	4.468e-17	4.468e-17	-16.350	-16.350	0.000	(0)
		Cd2OH+3	1.137e-18	1.360e-19	-17.944	-18.867	-0.922	(0)
		Cd (SeO3) 2-2	7.684e-19	2.989e-19	-18.114	-18.524	-0.410	(0)
		Cd (OH) 3-	3.479e-19	2.748e-19	-18.459	-18.561	-0.102	(0)
		Cd (NO3) 2	5.536e-25	5.536e-25	-24.257	-24.257	0.000	(0)
		Cd (OH) 4-2	3.447e-26	1.341e-26	-25.463	-25.873	-0.410	(0)
		CdHS+	0.000e+00	0.000e+00	-79.492	-79.594	-0.102	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.522	-151.522	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-228.651	-228.753	-0.102	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-305.279	-305.689	-0.410	(0)
Cl	2.693e-03							
		Cl-	2.693e-03	2.244e-03	-2.570	-2.649	-0.079	(0)
		MnCl+	5.707e-08	4.779e-08	-7.244	-7.321	-0.077	(0)
		AgCl	1.242e-08	1.242e-08	-7.906	-7.906	0.000	(0)
		ZnCl+	1.057e-08	8.770e-09	-7.976	-8.057	-0.081	(0)
		ZnOHC1	3.424e-09	3.424e-09	-8.465	-8.465	0.000	(0)
		AgCl2-	3.074e-09	2.427e-09	-8.512	-8.615	-0.102	(0)
		CdCl+	9.184e-10	7.253e-10	-9.037	-9.139	-0.102	(0)
		CoCl+	2.376e-10	1.877e-10	-9.624	-9.727	-0.102	(0)
		NiCl+	2.357e-10	1.861e-10	-9.628	-9.730	-0.102	(0)
		MnCl2	1.515e-10	1.515e-10	-9.820	-9.820	0.000	(0)
		CuCl	1.263e-10	1.263e-10	-9.899	-9.899	0.000	(0)
		CuCl+	9.830e-11	8.156e-11	-10.007	-10.089	-0.081	(0)
		CuCl2-	7.137e-11	5.921e-11	-10.147	-10.228	-0.081	(0)
		ZnCl2	3.120e-11	3.120e-11	-10.506	-10.506	0.000	(0)
		HgClOH	1.522e-11	1.522e-11	-10.818	-10.818	0.000	(0)
		PbCl+	1.479e-11	1.168e-11	-10.830	-10.933	-0.102	(0)
		AgCl3-2	1.248e-11	4.856e-12	-10.904	-11.314	-0.410	(0)
		CdOHC1	8.872e-12	8.872e-12	-11.052	-11.052	0.000	(0)
		CdCl2	6.786e-12	6.786e-12	-11.168	-11.168	0.000	(0)
		HgCl2	6.484e-12	6.484e-12	-11.188	-11.188	0.000	(0)
		AgCl4-3	1.861e-13	2.225e-14	-12.730	-13.653	-0.922	(0)
		HgCl3-	1.843e-13	1.455e-13	-12.735	-12.837	-0.102	(0)
		PbCl2	1.171e-13	1.171e-13	-12.931	-12.931	0.000	(0)
		MnCl3-	1.118e-13	9.365e-14	-12.951	-13.028	-0.077	(0)
		ZnCl3-	6.703e-14	5.561e-14	-13.174	-13.255	-0.081	(0)
		CuCl2	6.347e-14	6.347e-14	-13.197	-13.197	0.000	(0)
		CuCl3-2	5.777e-14	2.841e-14	-13.238	-13.547	-0.308	(0)

CdCl3-	1.217e-14	9.610e-15	-13.915	-14.017	-0.102	(0)
HgCl4-2	3.342e-15	1.300e-15	-14.476	-14.886	-0.410	(0)
NiCl2	2.103e-15	2.103e-15	-14.677	-14.677	0.000	(0)
HgCl+	7.299e-16	5.765e-16	-15.137	-15.239	-0.102	(0)
UO2Cl+	2.073e-16	1.638e-16	-15.683	-15.786	-0.102	(0)
PbCl3-	1.325e-16	1.046e-16	-15.878	-15.980	-0.102	(0)
ZnCl4-2	1.269e-16	6.241e-17	-15.897	-16.205	-0.308	(0)
CrCl+2	4.754e-17	1.850e-17	-16.323	-16.733	-0.410	(0)
CuCl3-	1.602e-18	1.329e-18	-17.795	-17.876	-0.081	(0)
PbCl4-2	2.759e-19	1.073e-19	-18.559	-18.969	-0.410	(0)
CrOHC12	2.353e-19	2.353e-19	-18.628	-18.628	0.000	(0)
FeCl+2	7.915e-21	3.893e-21	-20.102	-20.410	-0.308	(0)
CrCl2+	4.988e-21	3.939e-21	-20.302	-20.405	-0.102	(0)
VOCl+	3.288e-22	2.596e-22	-21.483	-21.586	-0.102	(0)
FeCl2+	4.660e-23	3.902e-23	-22.332	-22.409	-0.077	(0)
CuCl4-2	3.041e-23	1.495e-23	-22.517	-22.825	-0.308	(0)
CrO3Cl-	4.484e-26	3.541e-26	-25.348	-25.451	-0.102	(0)
FeCl3	8.758e-27	8.758e-27	-26.058	-26.058	0.000	(0)
CoCl+2	2.838e-35	1.104e-35	-34.547	-34.957	-0.410	(0)
UCl+3	0.000e+00	0.000e+00	-44.844	-45.767	-0.922	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.626	-52.036	-0.410	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.972	-54.382	-0.410	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.948	-67.358	-0.410	(0)
Co (2)	9.136e-08					
Co+2	6.213e-08	2.417e-08	-7.207	-7.617	-0.410	(0)
CoSO4	2.177e-08	2.177e-08	-7.662	-7.662	0.000	(0)
CoHCO3+	5.594e-09	4.418e-09	-8.252	-8.355	-0.102	(0)
CoCO3	1.334e-09	1.334e-09	-8.875	-8.875	0.000	(0)
CoCl+	2.376e-10	1.877e-10	-9.624	-9.727	-0.102	(0)
CoOH+	1.821e-10	1.438e-10	-9.740	-9.842	-0.102	(0)
CoF+	1.061e-10	8.382e-11	-9.974	-10.077	-0.102	(0)
Co (OH) 2	3.407e-12	3.407e-12	-11.468	-11.468	0.000	(0)
CoNO2+	1.469e-12	1.161e-12	-11.833	-11.935	-0.102	(0)
Co (NH3) +2	1.849e-14	7.193e-15	-13.733	-14.143	-0.410	(0)
CoSeO4	8.590e-16	8.590e-16	-15.066	-15.066	0.000	(0)
CoNO3+	4.929e-16	3.892e-16	-15.307	-15.410	-0.102	(0)
Co (OH) 3-	2.567e-17	2.027e-17	-16.591	-16.693	-0.102	(0)
CoOOH-	6.444e-18	5.089e-18	-17.191	-17.293	-0.102	(0)
Co2OH+3	1.458e-18	1.743e-19	-17.836	-18.759	-0.922	(0)
Co (NH3) 2+2	1.952e-21	7.593e-22	-20.710	-21.120	-0.410	(0)
Co (NO3) 2	8.046e-24	8.046e-24	-23.094	-23.094	0.000	(0)
Co (OH) 4-2	2.462e-24	9.580e-25	-23.609	-24.019	-0.410	(0)
Co (NH3) 3+2	6.081e-29	2.366e-29	-28.216	-28.626	-0.410	(0)
Co4 (OH) 4+4	3.727e-30	8.539e-32	-29.429	-31.069	-1.640	(0)
Co (NH3) 4+2	7.897e-37	3.073e-37	-36.103	-36.512	-0.410	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.489	-44.899	-0.410	(0)
Co (3)	9.418e-29					
CoOH+2	9.418e-29	3.664e-29	-28.026	-28.436	-0.410	(0)
Co+3	1.247e-34	2.418e-35	-33.904	-34.616	-0.712	(0)
CoCl+2	2.838e-35	1.104e-35	-34.547	-34.957	-0.410	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.626	-52.036	-0.410	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.027	-62.129	-0.102	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.625	-67.035	-0.410	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.948	-67.358	-0.410	(0)
Cr (2)	1.556e-26					
Cr+2	1.556e-26	6.054e-27	-25.808	-26.218	-0.410	(0)
Cr (3)	2.235e-09					
Cr (OH) 2+	1.909e-09	1.507e-09	-8.719	-8.822	-0.102	(0)
Cr (OH) 3	1.689e-10	1.689e-10	-9.772	-9.772	0.000	(0)
Cr (OH) +2	1.068e-10	4.155e-11	-9.971	-10.381	-0.410	(0)
CrOHSO4	4.449e-11	4.449e-11	-10.352	-10.352	0.000	(0)
CrO2-	3.011e-12	2.378e-12	-11.521	-11.624	-0.102	(0)
Cr (OH) 4-	2.538e-12	2.005e-12	-11.595	-11.698	-0.102	(0)
CrF+2	2.844e-13	1.107e-13	-12.546	-12.956	-0.410	(0)
CrSO4+	8.496e-14	6.710e-14	-13.071	-13.173	-0.102	(0)
Cr+3	5.327e-14	6.368e-15	-13.274	-14.196	-0.922	(0)
CrCl+2	4.754e-17	1.850e-17	-16.323	-16.733	-0.410	(0)
Cr2 (OH) 2SO4+2	4.294e-19	1.671e-19	-18.367	-18.777	-0.410	(0)

CrOHC12	2.353e-19	2.353e-19	-18.628	-18.628	0.000	(0)
Cr2(OH)2(SO4)2	4.478e-20	4.478e-20	-19.349	-19.349	0.000	(0)
CrCl2+	4.988e-21	3.939e-21	-20.302	-20.405	-0.102	(0)
CrNO3+2	7.269e-24	2.828e-24	-23.139	-23.549	-0.410	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-42.972	-43.381	-0.410	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-51.912	-52.835	-0.922	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-53.972	-54.382	-0.410	(0)
Cr(6)	1.544e-15					
CrO4-2	1.411e-15	6.804e-16	-14.851	-15.167	-0.317	(0)
HCrO4-	9.408e-17	7.430e-17	-16.027	-16.129	-0.102	(0)
NaCrO4-	3.061e-17	2.418e-17	-16.514	-16.617	-0.102	(0)
KCrO4-	8.692e-18	6.865e-18	-17.061	-17.163	-0.102	(0)
CrO3SO4-2	8.863e-24	3.448e-24	-23.052	-23.462	-0.410	(0)
H2CrO4	2.032e-24	2.032e-24	-23.692	-23.692	0.000	(0)
CrO3Cl-	4.484e-26	3.541e-26	-25.348	-25.451	-0.102	(0)
Cr2O7-2	4.923e-31	1.915e-31	-30.308	-30.718	-0.410	(0)
Cu(1)	2.543e-10					
CuCl	1.263e-10	1.263e-10	-9.899	-9.899	0.000	(0)
CuCl2-	7.137e-11	5.921e-11	-10.147	-10.228	-0.081	(0)
Cu+	5.659e-11	4.469e-11	-10.247	-10.350	-0.102	(0)
CuCl3-2	5.777e-14	2.841e-14	-13.238	-13.547	-0.308	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.913	-150.280	-0.366	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.661	-151.010	-0.348	(0)
Cu(2)	5.539e-07					
CuCO3	4.407e-07	4.407e-07	-6.356	-6.356	0.000	(0)
Cu+2	4.754e-08	2.293e-08	-7.323	-7.640	-0.317	(0)
CuOH+	2.606e-08	2.162e-08	-7.584	-7.665	-0.081	(0)
CuSO4	2.370e-08	2.370e-08	-7.625	-7.625	0.000	(0)
Cu(CO3)2-2	9.950e-09	3.871e-09	-8.002	-8.412	-0.410	(0)
CuHCO3+	4.304e-09	3.399e-09	-8.366	-8.469	-0.102	(0)
Cu(OH)2	1.286e-09	1.286e-09	-8.891	-8.891	0.000	(0)
CuF+	2.008e-10	1.586e-10	-9.697	-9.800	-0.102	(0)
CuCl+	9.830e-11	8.156e-11	-10.007	-10.089	-0.081	(0)
Cu2(OH)2+2	3.018e-11	1.174e-11	-10.520	-10.930	-0.410	(0)
CuNO2+	2.071e-11	1.636e-11	-10.684	-10.786	-0.102	(0)
CuNH3+2	1.492e-12	5.807e-13	-11.826	-12.236	-0.410	(0)
Cu(OH)3-	9.963e-13	7.868e-13	-12.002	-12.104	-0.102	(0)
CuCl2	6.347e-14	6.347e-14	-13.197	-13.197	0.000	(0)
Cu(NO2)2	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
CuNO3+	9.327e-16	7.366e-16	-15.030	-15.133	-0.102	(0)
Cu(OH)4-2	4.746e-18	1.847e-18	-17.324	-17.734	-0.410	(0)
CuCl3-	1.602e-18	1.329e-18	-17.795	-17.876	-0.081	(0)
CuCl4-2	3.041e-23	1.495e-23	-22.517	-22.825	-0.308	(0)
Cu(NO3)2	9.422e-25	9.422e-25	-24.026	-24.026	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-219.033	-219.136	-0.102	(0)
F	1.591e-04					
F-	1.316e-04	1.096e-04	-3.881	-3.960	-0.079	(0)
MgF+	2.491e-05	2.076e-05	-4.604	-4.683	-0.079	(0)
CaF+	1.928e-06	1.615e-06	-5.715	-5.792	-0.077	(0)
NaF	4.947e-07	4.947e-07	-6.306	-6.306	0.000	(0)
MnF+	8.816e-08	7.383e-08	-7.055	-7.132	-0.077	(0)
AlF3	1.228e-08	1.228e-08	-7.911	-7.911	0.000	(0)
AlF2+	1.059e-08	8.900e-09	-7.975	-8.051	-0.076	(0)
HF	5.473e-09	5.473e-09	-8.262	-8.262	0.000	(0)
ZnF+	4.309e-09	3.403e-09	-8.366	-8.468	-0.102	(0)
BF(OH)3-	1.478e-09	1.207e-09	-8.830	-8.918	-0.088	(0)
AlF4-	8.097e-10	6.750e-10	-9.092	-9.171	-0.079	(0)
AlF+2	4.089e-10	2.039e-10	-9.388	-9.691	-0.302	(0)
CuF+	2.008e-10	1.586e-10	-9.697	-9.800	-0.102	(0)
NiF+	1.130e-10	8.927e-11	-9.947	-10.049	-0.102	(0)
CoF+	1.061e-10	8.382e-11	-9.974	-10.077	-0.102	(0)
CdF+	7.446e-12	5.881e-12	-11.128	-11.231	-0.102	(0)
HF2-	2.763e-12	2.281e-12	-11.559	-11.642	-0.083	(0)
PbF+	1.435e-12	1.133e-12	-11.843	-11.946	-0.102	(0)
UO2F+	8.622e-13	6.809e-13	-12.064	-12.167	-0.102	(0)
AgF	7.464e-13	7.464e-13	-12.127	-12.127	0.000	(0)
BF2(OH)2-	5.851e-13	4.778e-13	-12.233	-12.321	-0.088	(0)
CrF+2	2.844e-13	1.107e-13	-12.546	-12.956	-0.410	(0)

UO2F2	2.153e-13	2.153e-13	-12.667	-12.667	0.000	(0)
UO2F3-	7.508e-15	5.930e-15	-14.124	-14.227	-0.102	(0)
PbF2	2.445e-15	2.445e-15	-14.612	-14.612	0.000	(0)
CdF2	1.286e-15	1.286e-15	-14.891	-14.891	0.000	(0)
H2F2	8.024e-17	8.024e-17	-16.096	-16.096	0.000	(0)
FeF2+	2.419e-17	2.026e-17	-16.616	-16.693	-0.077	(0)
VO2F	2.186e-17	2.186e-17	-16.660	-16.660	0.000	(0)
FeF+2	1.404e-17	6.904e-18	-16.853	-17.161	-0.308	(0)
UO2F4-2	1.327e-17	5.164e-18	-16.877	-17.287	-0.410	(0)
FeF3	3.134e-18	3.134e-18	-17.504	-17.504	0.000	(0)
VO2F2-	1.102e-18	8.703e-19	-17.958	-18.060	-0.102	(0)
BF3OH-	8.428e-19	6.882e-19	-18.074	-18.162	-0.088	(0)
PbF3-	6.439e-19	5.085e-19	-18.191	-18.294	-0.102	(0)
VOF+	3.434e-20	2.712e-20	-19.464	-19.567	-0.102	(0)
VO2F3-2	3.059e-21	1.190e-21	-20.514	-20.924	-0.410	(0)
VOF2	1.115e-21	1.115e-21	-20.953	-20.953	0.000	(0)
PbF4-2	6.859e-23	2.668e-23	-22.164	-22.574	-0.410	(0)
HgF+	6.625e-23	5.232e-23	-22.179	-22.281	-0.102	(0)
BF4-	1.535e-23	1.254e-23	-22.814	-22.902	-0.088	(0)
VOF3-	5.492e-24	4.337e-24	-23.260	-23.363	-0.102	(0)
VO2F4-3	5.371e-25	6.421e-26	-24.270	-25.192	-0.922	(0)
Sb(OH) 2F	1.754e-25	1.754e-25	-24.756	-24.756	0.000	(0)
SbOF	1.726e-25	1.726e-25	-24.763	-24.763	0.000	(0)
VOF4-2	4.933e-27	1.919e-27	-26.307	-26.717	-0.410	(0)
UF3+	1.011e-35	7.983e-36	-34.995	-35.098	-0.102	(0)
UF2+2	1.181e-36	4.594e-37	-35.928	-36.338	-0.410	(0)
UF4	9.598e-38	9.598e-38	-37.018	-37.018	0.000	(0)
UF+3	2.784e-39	3.329e-40	-38.555	-39.478	-0.922	(0)
UF5-	5.280e-40	4.170e-40	-39.277	-39.380	-0.102	(0)
UF6-2	0.000e+00	0.000e+00	-40.450	-40.860	-0.410	(0)
Fe (2)	9.170e-12					
Fe+2	6.324e-12	2.460e-12	-11.199	-11.609	-0.410	(0)
FeSO4	2.725e-12	2.725e-12	-11.565	-11.565	0.000	(0)
FeHCO3+	8.617e-14	7.277e-14	-13.065	-13.138	-0.073	(0)
FeOH+	3.488e-14	2.921e-14	-13.457	-13.534	-0.077	(0)
Fe (OH) 2	6.918e-18	6.918e-18	-17.160	-17.160	0.000	(0)
Fe (OH) 3-	7.790e-19	6.524e-19	-18.108	-18.185	-0.077	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.922	-160.922	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.914	-238.017	-0.102	(0)
Fe (3)	1.951e-09					
Fe (OH) 2+	1.527e-09	1.283e-09	-8.816	-8.892	-0.076	(0)
Fe (OH) 3	4.108e-10	4.108e-10	-9.386	-9.386	0.000	(0)
Fe (OH) 4-	1.357e-11	1.141e-11	-10.867	-10.943	-0.076	(0)
FeOH+2	2.248e-14	1.106e-14	-13.648	-13.956	-0.308	(0)
FeF2+	2.419e-17	2.026e-17	-16.616	-16.693	-0.077	(0)
FeF+2	1.404e-17	6.904e-18	-16.853	-17.161	-0.308	(0)
FeSO4+	3.472e-18	2.908e-18	-17.459	-17.536	-0.077	(0)
FeF3	3.134e-18	3.134e-18	-17.504	-17.504	0.000	(0)
Fe (SO4) 2-	3.552e-19	2.805e-19	-18.450	-18.552	-0.102	(0)
Fe+3	2.962e-19	5.743e-20	-18.528	-19.241	-0.712	(0)
FeCl+2	7.915e-21	3.893e-21	-20.102	-20.410	-0.308	(0)
FeCl2+	4.660e-23	3.902e-23	-22.332	-22.409	-0.077	(0)
FeHSeO3+2	3.423e-23	1.332e-23	-22.466	-22.876	-0.410	(0)
Fe2 (OH) 2+4	1.767e-25	4.049e-27	-24.753	-26.393	-1.640	(0)
FeNO3+2	1.500e-26	5.835e-27	-25.824	-26.234	-0.410	(0)
FeCl3	8.758e-27	8.758e-27	-26.058	-26.058	0.000	(0)
Fe3 (OH) 4+5	2.740e-32	7.507e-35	-31.562	-34.125	-2.562	(0)
H (0)	2.530e-29					
H2	1.265e-29	1.277e-29	-28.898	-28.894	0.004	(0)
Hg (0)	1.882e-09					
Hg	1.882e-09	1.882e-09	-8.725	-8.725	0.000	(0)
Hg (1)	8.455e-20					
Hg2+2	4.227e-20	1.645e-20	-19.374	-19.784	-0.410	(0)
Hg (2)	2.910e-11					
HgClOH	1.522e-11	1.522e-11	-10.818	-10.818	0.000	(0)
Hg (OH) 2	7.156e-12	7.223e-12	-11.145	-11.141	0.004	(0)
HgCl2	6.484e-12	6.484e-12	-11.188	-11.188	0.000	(0)
HgCl3-	1.843e-13	1.455e-13	-12.735	-12.837	-0.102	(0)

	HgCO3	5.028e-14	5.028e-14	-13.299	-13.299	0.000	(0)
	HgCl4-2	3.342e-15	1.300e-15	-14.476	-14.886	-0.410	(0)
	Hg (CO3) 2-2	1.334e-15	5.190e-16	-14.875	-15.285	-0.410	(0)
	HgCl+	7.299e-16	5.765e-16	-15.137	-15.239	-0.102	(0)
	HgOH+	1.935e-16	1.528e-16	-15.713	-15.816	-0.102	(0)
	HgHCO3+	4.001e-17	3.160e-17	-16.398	-16.500	-0.102	(0)
	Hg (OH) 3-	3.433e-19	2.711e-19	-18.464	-18.567	-0.102	(0)
	Hg (NH3) 2+2	1.279e-19	4.975e-20	-18.893	-19.303	-0.410	(0)
	HgNH3+2	5.167e-20	2.010e-20	-19.287	-19.697	-0.410	(0)
	Hg+2	3.309e-20	1.287e-20	-19.480	-19.890	-0.410	(0)
	HgSO4	1.521e-20	1.521e-20	-19.818	-19.818	0.000	(0)
	HgF+	6.625e-23	5.232e-23	-22.179	-22.281	-0.102	(0)
	Hg (NH3) 3+2	1.260e-27	4.901e-28	-26.900	-27.310	-0.410	(0)
	HgNO3+	6.114e-29	4.829e-29	-28.214	-28.316	-0.102	(0)
	Hg (NH3) 4+2	2.476e-35	9.635e-36	-34.606	-35.016	-0.410	(0)
	Hg (NO3) 2	2.039e-37	2.039e-37	-36.691	-36.691	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.651	-138.754	-0.102	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.580	-139.990	-0.410	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.832	-139.832	0.000	(0)
K		3.362e-03					
	K+	3.259e-03	2.716e-03	-2.487	-2.566	-0.079	(0)
	KSO4-	1.032e-04	8.675e-05	-3.986	-4.062	-0.076	(0)
	KCrO4-	8.692e-18	6.865e-18	-17.061	-17.163	-0.102	(0)
Mg		4.964e-03					
	Mg+2	3.499e-03	1.688e-03	-2.456	-2.773	-0.317	(0)
	MgSO4	1.386e-03	1.386e-03	-2.858	-2.858	0.000	(0)
	MgHCO3+	4.891e-05	4.058e-05	-4.311	-4.392	-0.081	(0)
	MgF+	2.491e-05	2.076e-05	-4.604	-4.683	-0.079	(0)
	MgCO3	4.582e-06	4.582e-06	-5.339	-5.339	0.000	(0)
	MgOH+	2.364e-07	2.004e-07	-6.626	-6.698	-0.072	(0)
	MgH2BO3+	3.403e-08	2.779e-08	-7.468	-7.556	-0.088	(0)
Mn (2)		5.815e-05					
	Mn+2	4.347e-05	1.691e-05	-4.362	-4.772	-0.410	(0)
	MnSO4	1.357e-05	1.357e-05	-4.867	-4.867	0.000	(0)
	MnHCO3+	9.468e-07	7.929e-07	-6.024	-6.101	-0.077	(0)
	MnF+	8.816e-08	7.383e-08	-7.055	-7.132	-0.077	(0)
	MnCl+	5.707e-08	4.779e-08	-7.244	-7.321	-0.077	(0)
	MnOH+	1.513e-08	1.267e-08	-7.820	-7.897	-0.077	(0)
	MnCl2	1.515e-10	1.515e-10	-9.820	-9.820	0.000	(0)
	MnNO3+	3.448e-13	2.723e-13	-12.462	-12.565	-0.102	(0)
	MnSeO4	3.228e-13	3.228e-13	-12.491	-12.491	0.000	(0)
	MnCl3-	1.118e-13	9.365e-14	-12.951	-13.028	-0.077	(0)
	Mn (OH) 3-	8.314e-18	6.962e-18	-17.080	-17.157	-0.077	(0)
	Mn (NO3) 2	6.950e-21	6.950e-21	-20.158	-20.158	0.000	(0)
	Mn (OH) 4-2	1.363e-23	6.703e-24	-22.866	-23.174	-0.308	(0)
	MnSe	0.000e+00	0.000e+00	-42.112	-42.112	0.000	(0)
Mn (3)		9.792e-25					
	Mn+3	9.792e-25	1.898e-25	-24.009	-24.722	-0.712	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.512	-41.820	-0.308	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-45.706	-45.792	-0.086	(0)
Mo		1.882e-06					
	MoO4-2	1.881e-06	9.071e-07	-5.726	-6.042	-0.317	(0)
	HMoO4-	7.713e-10	6.091e-10	-9.113	-9.215	-0.102	(0)
	H2MoO4	1.506e-13	1.506e-13	-12.822	-12.822	0.000	(0)
	Ag2MoO4	2.522e-24	2.522e-24	-23.598	-23.598	0.000	(0)
	AlMo6O21-3	1.261e-38	1.507e-39	-37.899	-38.822	-0.922	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-45.390	-49.079	-3.690	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-47.602	-50.164	-2.562	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.214	-52.854	-1.640	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.157	-57.080	-0.922	(0)
N (-3)		1.903e-07					
	NH4+	1.794e-07	1.465e-07	-6.746	-6.834	-0.088	(0)
	NH4SO4-	8.457e-09	7.082e-09	-8.073	-8.150	-0.077	(0)
	NH3	2.475e-09	2.475e-09	-8.606	-8.606	0.000	(0)
	CaNH3+2	1.080e-11	4.204e-12	-10.966	-11.376	-0.410	(0)
	CuNH3+2	1.492e-12	5.807e-13	-11.826	-12.236	-0.410	(0)

NiNH3+2	1.107e-13	4.308e-14	-12.956	-13.366	-0.410	(0)
Co (NH3) +2	1.849e-14	7.193e-15	-13.733	-14.143	-0.410	(0)
AgNH3+	1.734e-14	1.369e-14	-13.761	-13.863	-0.102	(0)
BaNH3+2	1.681e-16	6.540e-17	-15.774	-16.184	-0.410	(0)
Ag (NH3) 2+	3.488e-19	2.755e-19	-18.457	-18.560	-0.102	(0)
Hg (NH3) 2+2	1.279e-19	4.975e-20	-18.893	-19.303	-0.410	(0)
HgNH3+2	5.167e-20	2.010e-20	-19.287	-19.697	-0.410	(0)
Ni (NH3) 2+2	3.961e-20	1.541e-20	-19.402	-19.812	-0.410	(0)
Ca (NH3) 2+2	1.064e-20	4.142e-21	-19.973	-20.383	-0.410	(0)
Co (NH3) 2+2	1.952e-21	7.593e-22	-20.710	-21.120	-0.410	(0)
Hg (NH3) 3+2	1.260e-27	4.901e-28	-26.900	-27.310	-0.410	(0)
Co (NH3) 3+2	6.081e-29	2.366e-29	-28.216	-28.626	-0.410	(0)
Hg (NH3) 4+2	2.476e-35	9.635e-36	-34.606	-35.016	-0.410	(0)
Co (NH3) 4+2	7.897e-37	3.073e-37	-36.103	-36.512	-0.410	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.972	-43.381	-0.410	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.489	-44.899	-0.410	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.626	-52.036	-0.410	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.912	-52.835	-0.922	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.972	-54.382	-0.410	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.027	-62.129	-0.102	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.625	-67.035	-0.410	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.948	-67.358	-0.410	(0)
N (3)	8.296e-06					
NO2-	8.296e-06	6.812e-06	-5.081	-5.167	-0.086	(0)
CuNO2+	2.071e-11	1.636e-11	-10.684	-10.786	-0.102	(0)
AgNO2	3.857e-12	3.857e-12	-11.414	-11.414	0.000	(0)
CoNO2+	1.469e-12	1.161e-12	-11.833	-11.935	-0.102	(0)
Cu (NO2) 2	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
Ag (NO2) 2-	5.153e-17	4.070e-17	-16.288	-16.390	-0.102	(0)
N (5)	1.225e-08					
NO3-	1.219e-08	1.016e-08	-7.914	-7.993	-0.079	(0)
CaNO3+	5.488e-11	4.335e-11	-10.261	-10.363	-0.102	(0)
MnNO3+	3.448e-13	2.723e-13	-12.462	-12.565	-0.102	(0)
ZnNO3+	5.027e-14	3.970e-14	-13.299	-13.401	-0.102	(0)
BaNO3+	2.700e-15	2.133e-15	-14.569	-14.671	-0.102	(0)
NiNO3+	1.047e-15	8.272e-16	-14.980	-15.082	-0.102	(0)
CuNO3+	9.327e-16	7.366e-16	-15.030	-15.133	-0.102	(0)
CoNO3+	4.929e-16	3.892e-16	-15.307	-15.410	-0.102	(0)
CdNO3+	1.377e-16	1.087e-16	-15.861	-15.964	-0.102	(0)
PbNO3+	2.791e-17	2.204e-17	-16.554	-16.657	-0.102	(0)
AgNO3	2.187e-17	2.187e-17	-16.660	-16.660	0.000	(0)
Mn (NO3) 2	6.950e-21	6.950e-21	-20.158	-20.158	0.000	(0)
UO2NO3+	1.155e-21	9.120e-22	-20.938	-21.040	-0.102	(0)
Zn (NO3) 2	8.047e-23	8.047e-23	-22.094	-22.094	0.000	(0)
Co (NO3) 2	8.046e-24	8.046e-24	-23.094	-23.094	0.000	(0)
CrNO3+2	7.269e-24	2.828e-24	-23.139	-23.549	-0.410	(0)
Cu (NO3) 2	9.422e-25	9.422e-25	-24.026	-24.026	0.000	(0)
VO2NO3	5.842e-25	5.842e-25	-24.233	-24.233	0.000	(0)
Cd (NO3) 2	5.536e-25	5.536e-25	-24.257	-24.257	0.000	(0)
Pb (NO3) 2	3.803e-25	3.803e-25	-24.420	-24.420	0.000	(0)
FeNO3+2	1.500e-26	5.835e-27	-25.824	-26.234	-0.410	(0)
HgNO3+	6.114e-29	4.829e-29	-28.214	-28.316	-0.102	(0)
Hg (NO3) 2	2.039e-37	2.039e-37	-36.691	-36.691	0.000	(0)
Na	8.798e-03					
Na+	8.581e-03	7.151e-03	-2.066	-2.146	-0.079	(0)
NaSO4-	2.062e-04	1.733e-04	-3.686	-3.761	-0.076	(0)
NaHCO3	9.448e-06	9.448e-06	-5.025	-5.025	0.000	(0)
NaCO3-	5.172e-07	4.346e-07	-6.286	-6.362	-0.076	(0)
NaF	4.947e-07	4.947e-07	-6.306	-6.306	0.000	(0)
NaH2BO3	5.382e-09	5.382e-09	-8.269	-8.269	0.000	(0)
NaCrO4-	3.061e-17	2.418e-17	-16.514	-16.617	-0.102	(0)
Ni	1.127e-07					
Ni+2	6.721e-08	3.242e-08	-7.173	-7.489	-0.317	(0)
NiSO4	2.919e-08	2.919e-08	-7.535	-7.535	0.000	(0)
NiHCO3+	1.189e-08	9.389e-09	-7.925	-8.027	-0.102	(0)
NiCO3	3.947e-09	3.947e-09	-8.404	-8.404	0.000	(0)
NiCl+	2.357e-10	1.861e-10	-9.628	-9.730	-0.102	(0)
NiOH+	1.541e-10	1.217e-10	-9.812	-9.915	-0.102	(0)

NiF+	1.130e-10	8.927e-11	-9.947	-10.049	-0.102	(0)
Ni(SO4)2-2	1.121e-11	4.361e-12	-10.950	-11.360	-0.410	(0)
Ni(OH)2	2.882e-12	2.882e-12	-11.540	-11.540	0.000	(0)
NiNH3+2	1.107e-13	4.308e-14	-12.956	-13.366	-0.410	(0)
NiCl2	2.103e-15	2.103e-15	-14.677	-14.677	0.000	(0)
Ni(OH)3-	1.088e-15	8.595e-16	-14.963	-15.066	-0.102	(0)
NiSeO4	1.075e-15	1.075e-15	-14.969	-14.969	0.000	(0)
NiNO3+	1.047e-15	8.272e-16	-14.980	-15.082	-0.102	(0)
Ni(NH3)2+2	3.961e-20	1.541e-20	-19.402	-19.812	-0.410	(0)
O(0)	6.153e-35					
O2	3.076e-35	3.105e-35	-34.512	-34.508	0.004	(0)
Pb	2.606e-09					
PbCO3	1.439e-09	1.439e-09	-8.842	-8.842	0.000	(0)
PbHCO3+	3.242e-10	2.561e-10	-9.489	-9.592	-0.102	(0)
PbSO4	3.242e-10	3.242e-10	-9.489	-9.489	0.000	(0)
Pb+2	3.041e-10	1.467e-10	-9.517	-9.834	-0.317	(0)
PbOH+	1.391e-10	1.099e-10	-9.857	-9.959	-0.102	(0)
Pb(CO3)2-2	3.482e-11	1.355e-11	-10.458	-10.868	-0.410	(0)
Pb(SO4)2-2	2.266e-11	8.815e-12	-10.645	-11.055	-0.410	(0)
PbCl+	1.479e-11	1.168e-11	-10.830	-10.933	-0.102	(0)
PbF+	1.435e-12	1.133e-12	-11.843	-11.946	-0.102	(0)
Pb(OH)2	1.036e-12	1.036e-12	-11.985	-11.985	0.000	(0)
PbCl2	1.171e-13	1.171e-13	-12.931	-12.931	0.000	(0)
PbF2	2.445e-15	2.445e-15	-14.612	-14.612	0.000	(0)
Pb(OH)3-	3.912e-16	3.089e-16	-15.408	-15.510	-0.102	(0)
PbCl3-	1.325e-16	1.046e-16	-15.878	-15.980	-0.102	(0)
PbNO3+	2.791e-17	2.204e-17	-16.554	-16.657	-0.102	(0)
Pb2OH+3	2.137e-18	2.554e-19	-17.670	-18.593	-0.922	(0)
PbF3-	6.439e-19	5.085e-19	-18.191	-18.294	-0.102	(0)
PbCl4-2	2.759e-19	1.073e-19	-18.559	-18.969	-0.410	(0)
Pb(OH)4-2	5.799e-20	2.256e-20	-19.237	-19.647	-0.410	(0)
PbF4-2	6.859e-23	2.668e-23	-22.164	-22.574	-0.410	(0)
Pb3(OH)4+2	8.075e-24	3.142e-24	-23.093	-23.503	-0.410	(0)
Pb(NO3)2	3.803e-25	3.803e-25	-24.420	-24.420	0.000	(0)
Pb4(OH)4+4	1.597e-28	3.661e-30	-27.797	-29.436	-1.640	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.827	-152.827	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-230.556	-230.659	-0.102	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.884	-73.884	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.029	-79.132	-0.102	(0)
CdHS+	0.000e+00	0.000e+00	-79.492	-79.594	-0.102	(0)
H2S	0.000e+00	0.000e+00	-79.583	-79.583	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.615	-81.025	-0.410	(0)
S6-2	0.000e+00	0.000e+00	-81.131	-81.541	-0.410	(0)
S4-2	0.000e+00	0.000e+00	-81.211	-81.621	-0.410	(0)
S3-2	0.000e+00	0.000e+00	-82.017	-82.427	-0.410	(0)
S2-2	0.000e+00	0.000e+00	-83.033	-83.443	-0.410	(0)
S-2	0.000e+00	0.000e+00	-88.652	-88.960	-0.308	(0)
HgHS2-	0.000e+00	0.000e+00	-138.651	-138.754	-0.102	(0)
HgS2-2	0.000e+00	0.000e+00	-139.580	-139.990	-0.410	(0)
Hg(HS)2	0.000e+00	0.000e+00	-139.832	-139.832	0.000	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.722	-148.928	-0.206	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-148.813	-148.916	-0.102	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.687	-149.790	-0.102	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.913	-150.280	-0.366	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-150.520	-150.896	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.661	-151.010	-0.348	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.850	-151.207	-0.357	(0)
Zn(HS)2	0.000e+00	0.000e+00	-151.251	-151.251	0.000	(0)
Cd(HS)2	0.000e+00	0.000e+00	-151.522	-151.522	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.827	-152.827	0.000	(0)
Fe(HS)2	0.000e+00	0.000e+00	-160.922	-160.922	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-219.033	-219.136	-0.102	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-227.001	-227.103	-0.102	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-228.651	-228.753	-0.102	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-229.201	-229.611	-0.410	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-230.556	-230.659	-0.102	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-237.914	-238.017	-0.102	(0)

Cd (HS) 4-2	0.000e+00	0.000e+00	-305.279	-305.689	-0.410	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.285	-307.695	-0.410	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.706	-321.116	-0.410	(0)
S (6)	1.246e-02					
SO4-2	9.356e-03	4.512e-03	-2.029	-2.346	-0.317	(0)
CaSO4	1.395e-03	1.395e-03	-2.856	-2.856	0.000	(0)
MgSO4	1.386e-03	1.386e-03	-2.858	-2.858	0.000	(0)
NaSO4-	2.062e-04	1.733e-04	-3.686	-3.761	-0.076	(0)
KSO4-	1.032e-04	8.675e-05	-3.986	-4.062	-0.076	(0)
MnSO4	1.357e-05	1.357e-05	-4.867	-4.867	0.000	(0)
ZnSO4	1.536e-06	1.536e-06	-5.814	-5.814	0.000	(0)
Zn (SO4) 2-2	1.551e-07	6.036e-08	-6.809	-7.219	-0.410	(0)
NiSO4	2.919e-08	2.919e-08	-7.535	-7.535	0.000	(0)
CuSO4	2.370e-08	2.370e-08	-7.625	-7.625	0.000	(0)
CoSO4	2.177e-08	2.177e-08	-7.662	-7.662	0.000	(0)
HSO4-	1.785e-08	1.488e-08	-7.748	-7.827	-0.079	(0)
NH4SO4-	8.457e-09	7.082e-09	-8.073	-8.150	-0.077	(0)
CdSO4	3.580e-09	3.580e-09	-8.446	-8.446	0.000	(0)
Cd (SO4) 2-2	5.601e-10	2.179e-10	-9.252	-9.662	-0.410	(0)
PbSO4	3.242e-10	3.242e-10	-9.489	-9.489	0.000	(0)
AgSO4-	3.090e-10	2.440e-10	-9.510	-9.613	-0.102	(0)
CrOHSO4	4.449e-11	4.449e-11	-10.352	-10.352	0.000	(0)
Pb (SO4) 2-2	2.266e-11	8.815e-12	-10.645	-11.055	-0.410	(0)
Ni (SO4) 2-2	1.121e-11	4.361e-12	-10.950	-11.360	-0.410	(0)
AlSO4+	7.814e-12	6.514e-12	-11.107	-11.186	-0.079	(0)
FeSO4	2.725e-12	2.725e-12	-11.565	-11.565	0.000	(0)
Al (SO4) 2-	3.778e-13	3.150e-13	-12.423	-12.502	-0.079	(0)
UO2SO4	3.073e-13	3.073e-13	-12.512	-12.512	0.000	(0)
CrSO4+	8.496e-14	6.710e-14	-13.071	-13.173	-0.102	(0)
UO2 (SO4) 2-2	4.698e-14	1.828e-14	-13.328	-13.738	-0.410	(0)
VO2SO4-	1.551e-17	1.225e-17	-16.809	-16.912	-0.102	(0)
FeSO4+	3.472e-18	2.908e-18	-17.459	-17.536	-0.077	(0)
Cr2 (OH) 2SO4+2	4.294e-19	1.671e-19	-18.367	-18.777	-0.410	(0)
Fe (SO4) 2-	3.552e-19	2.805e-19	-18.450	-18.552	-0.102	(0)
VOSO4	5.125e-20	5.125e-20	-19.290	-19.290	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.478e-20	4.478e-20	-19.349	-19.349	0.000	(0)
HgSO4	1.521e-20	1.521e-20	-19.818	-19.818	0.000	(0)
CrO3SO4-2	8.863e-24	3.448e-24	-23.052	-23.462	-0.410	(0)
VSO4+	2.505e-34	1.978e-34	-33.601	-33.704	-0.102	(0)
U (SO4) 2	9.797e-40	9.797e-40	-39.009	-39.009	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.153	-40.563	-0.410	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.027	-62.129	-0.102	(0)
Sb (3)	5.996e-20					
Sb (OH) 3	3.033e-20	3.033e-20	-19.518	-19.518	0.000	(0)
HSbO2	2.963e-20	2.963e-20	-19.528	-19.528	0.000	(0)
SbO2-	1.800e-24	1.422e-24	-23.745	-23.847	-0.102	(0)
Sb (OH) 4-	1.030e-24	8.138e-25	-23.987	-24.089	-0.102	(0)
Sb (OH) 2F	1.754e-25	1.754e-25	-24.756	-24.756	0.000	(0)
SbOF	1.726e-25	1.726e-25	-24.763	-24.763	0.000	(0)
Sb (OH) 2+	3.149e-26	2.487e-26	-25.502	-25.604	-0.102	(0)
SbO+	1.086e-26	8.580e-27	-25.964	-26.067	-0.102	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.706	-321.116	-0.410	(0)
Sb (5)	2.645e-08					
SbO3-	2.642e-08	2.086e-08	-7.578	-7.681	-0.102	(0)
Sb (OH) 6-	2.923e-11	2.436e-11	-10.534	-10.613	-0.079	(0)
SbO2+	8.635e-24	6.819e-24	-23.064	-23.166	-0.102	(0)
Se (-2)	6.627e-15					
Ag2Se	6.627e-15	6.627e-15	-14.179	-14.179	0.000	(0)
HSe-	4.732e-40	3.737e-40	-39.325	-39.427	-0.102	(0)
MnSe	0.000e+00	0.000e+00	-42.112	-42.112	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.009	-43.009	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.546	-46.956	-0.410	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.876	-85.516	-1.640	(0)
Se (4)	1.377e-07					
HSeO3-	1.111e-07	8.776e-08	-6.954	-7.057	-0.102	(0)
SeO3-2	2.661e-08	1.035e-08	-7.575	-7.985	-0.410	(0)
H2SeO3	1.263e-12	1.263e-12	-11.898	-11.898	0.000	(0)
AgSeO3-	2.283e-14	1.803e-14	-13.641	-13.744	-0.102	(0)

Cd(SeO3) 2-2	7.684e-19	2.989e-19	-18.114	-18.524	-0.410	(0)
Ag(SeO3) 2-3	1.398e-20	1.672e-21	-19.854	-20.777	-0.922	(0)
FeHSeO3+2	3.423e-23	1.332e-23	-22.466	-22.876	-0.410	(0)
Se (6)	1.473e-10					
SeO4-2	1.470e-10	7.090e-11	-9.833	-10.149	-0.317	(0)
MnSeO4	3.228e-13	3.228e-13	-12.491	-12.491	0.000	(0)
ZnSeO4	1.708e-14	1.708e-14	-13.767	-13.767	0.000	(0)
NiSeO4	1.075e-15	1.075e-15	-14.969	-14.969	0.000	(0)
CoSeO4	8.590e-16	8.590e-16	-15.066	-15.066	0.000	(0)
HSeO4-	1.518e-16	1.199e-16	-15.819	-15.921	-0.102	(0)
CdSeO4	4.468e-17	4.468e-17	-16.350	-16.350	0.000	(0)
Zn(SeO4) 2-2	3.156e-24	1.228e-24	-23.501	-23.911	-0.410	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.091	-59.014	-0.922	(0)
U (4)	3.332e-21					
U (OH) 5-	3.329e-21	2.629e-21	-20.478	-20.580	-0.102	(0)
U (OH) 4	3.718e-24	3.718e-24	-23.430	-23.430	0.000	(0)
U (OH) 3+	5.811e-28	4.590e-28	-27.236	-27.338	-0.102	(0)
U (OH) 2+2	1.842e-32	7.166e-33	-31.735	-32.145	-0.410	(0)
UF3+	1.011e-35	7.983e-36	-34.995	-35.098	-0.102	(0)
UF2+2	1.181e-36	4.594e-37	-35.928	-36.338	-0.410	(0)
UF4	9.598e-38	9.598e-38	-37.018	-37.018	0.000	(0)
UOH+3	9.533e-38	1.140e-38	-37.021	-37.943	-0.922	(0)
UF+3	2.784e-39	3.329e-40	-38.555	-39.478	-0.922	(0)
U (SO4) 2	9.797e-40	9.797e-40	-39.009	-39.009	0.000	(0)
UF5-	5.280e-40	4.170e-40	-39.277	-39.380	-0.102	(0)
USO4+2	0.000e+00	0.000e+00	-40.153	-40.563	-0.410	(0)
UF6-2	0.000e+00	0.000e+00	-40.450	-40.860	-0.410	(0)
U+4	0.000e+00	0.000e+00	-43.178	-44.818	-1.640	(0)
UC1+3	0.000e+00	0.000e+00	-44.844	-45.767	-0.922	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.687	-173.989	-8.302	(0)
U (5)	1.382e-16					
UO2+	1.382e-16	1.091e-16	-15.860	-15.962	-0.102	(0)
U (6)	3.702e-07					
UO2 (CO3) 3-4	2.718e-07	6.227e-09	-6.566	-8.206	-1.640	(0)
UO2 (CO3) 2-2	9.785e-08	3.807e-08	-7.009	-7.419	-0.410	(0)
UO2CO3	5.846e-10	5.846e-10	-9.233	-9.233	0.000	(0)
UO2OH+	2.139e-12	1.689e-12	-11.670	-11.772	-0.102	(0)
UO2F+	8.622e-13	6.809e-13	-12.064	-12.167	-0.102	(0)
UO2SO4	3.073e-13	3.073e-13	-12.512	-12.512	0.000	(0)
UO2F2	2.153e-13	2.153e-13	-12.667	-12.667	0.000	(0)
UO2+2	9.328e-14	4.499e-14	-13.030	-13.347	-0.317	(0)
UO2 (SO4) 2-2	4.698e-14	1.828e-14	-13.328	-13.738	-0.410	(0)
UO2F3-	7.508e-15	5.930e-15	-14.124	-14.227	-0.102	(0)
UO2C1+	2.073e-16	1.638e-16	-15.683	-15.786	-0.102	(0)
UO2F4-2	1.327e-17	5.164e-18	-16.877	-17.287	-0.410	(0)
(UO2) 2 (OH) 2+2	1.217e-17	4.734e-18	-16.915	-17.325	-0.410	(0)
(UO2) 3 (OH) 5+	6.829e-19	5.394e-19	-18.166	-18.268	-0.102	(0)
UO2NO3+	1.155e-21	9.120e-22	-20.938	-21.040	-0.102	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.655	-42.758	-0.102	(0)
V+2	0.000e+00	0.000e+00	-43.332	-43.742	-0.410	(0)
V (3)	1.986e-15					
V (OH) 3	1.986e-15	1.986e-15	-14.702	-14.702	0.000	(0)
V (OH) 2+	5.487e-26	4.334e-26	-25.261	-25.363	-0.102	(0)
VOH+2	3.567e-29	1.388e-29	-28.448	-28.858	-0.410	(0)
V+3	7.768e-34	9.287e-35	-33.110	-34.032	-0.922	(0)
VSO4+	2.505e-34	1.978e-34	-33.601	-33.704	-0.102	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.846	-55.769	-0.922	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.275	-56.915	-1.640	(0)
V (4)	3.298e-18					
V (OH) 3+	3.105e-18	2.452e-18	-17.508	-17.610	-0.102	(0)
VO+2	1.060e-19	4.124e-20	-18.975	-19.385	-0.410	(0)
VOSO4	5.125e-20	5.125e-20	-19.290	-19.290	0.000	(0)
VOF+	3.434e-20	2.712e-20	-19.464	-19.567	-0.102	(0)
VOF2	1.115e-21	1.115e-21	-20.953	-20.953	0.000	(0)
VOCl+	3.288e-22	2.596e-22	-21.483	-21.586	-0.102	(0)
VOF3-	5.492e-24	4.337e-24	-23.260	-23.363	-0.102	(0)

VOF4-2	4.933e-27	1.919e-27	-26.307	-26.717	-0.410	(0)
H2V2O4+2	7.755e-31	3.017e-31	-30.110	-30.520	-0.410	(0)
V (5)	7.285e-09					
H2VO4-	6.327e-09	4.997e-09	-8.199	-8.301	-0.102	(0)
HVO4-2	9.560e-10	3.720e-10	-9.020	-9.430	-0.410	(0)
H3VO4	1.686e-12	1.686e-12	-11.773	-11.773	0.000	(0)
H3V2O7-	6.893e-14	5.444e-14	-13.162	-13.264	-0.102	(0)
HV2O7-3	5.271e-15	6.302e-16	-14.278	-15.201	-0.922	(0)
VO4-3	4.621e-16	5.524e-17	-15.335	-16.258	-0.922	(0)
VO2+	1.364e-16	1.137e-16	-15.865	-15.944	-0.079	(0)
V2O7-4	2.194e-17	5.026e-19	-16.659	-18.299	-1.640	(0)
VO2F	2.186e-17	2.186e-17	-16.660	-16.660	0.000	(0)
VO2SO4-	1.551e-17	1.225e-17	-16.809	-16.912	-0.102	(0)
VO2F2-	1.102e-18	8.703e-19	-17.958	-18.060	-0.102	(0)
V3O9-3	1.095e-18	1.309e-19	-17.961	-18.883	-0.922	(0)
VO2F3-2	3.059e-21	1.190e-21	-20.514	-20.924	-0.410	(0)
V4O12-4	1.191e-23	2.729e-25	-22.924	-24.564	-1.640	(0)
VO2NO3	5.842e-25	5.842e-25	-24.233	-24.233	0.000	(0)
VO2F4-3	5.371e-25	6.421e-26	-24.270	-25.192	-0.922	(0)
V10O28-6	0.000e+00	0.000e+00	-60.301	-63.991	-3.690	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.714	-63.276	-2.562	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.900	-65.540	-1.640	(0)
Zn	5.434e-06					
Zn+2	3.225e-06	1.556e-06	-5.491	-5.808	-0.317	(0)
ZnSO4	1.536e-06	1.536e-06	-5.814	-5.814	0.000	(0)
ZnCO3	2.922e-07	2.922e-07	-6.534	-6.534	0.000	(0)
Zn (SO4) 2-2	1.551e-07	6.036e-08	-6.809	-7.219	-0.410	(0)
ZnHCO3+	1.463e-07	1.156e-07	-6.835	-6.937	-0.102	(0)
ZnOH+	5.874e-08	4.639e-08	-7.231	-7.334	-0.102	(0)
ZnCl+	1.057e-08	8.770e-09	-7.976	-8.057	-0.081	(0)
ZnF+	4.309e-09	3.403e-09	-8.366	-8.468	-0.102	(0)
ZnOHCl	3.424e-09	3.424e-09	-8.465	-8.465	0.000	(0)
Zn (OH) 2	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
ZnCl2	3.120e-11	3.120e-11	-10.506	-10.506	0.000	(0)
Zn (OH) 3-	4.149e-12	3.277e-12	-11.382	-11.485	-0.102	(0)
ZnCl3-	6.703e-14	5.561e-14	-13.174	-13.255	-0.081	(0)
ZnNO3+	5.027e-14	3.970e-14	-13.299	-13.401	-0.102	(0)
ZnSeO4	1.708e-14	1.708e-14	-13.767	-13.767	0.000	(0)
ZnCl4-2	1.269e-16	6.241e-17	-15.897	-16.205	-0.308	(0)
Zn (OH) 4-2	9.998e-17	3.890e-17	-16.000	-16.410	-0.410	(0)
Zn (NO3) 2	8.047e-23	8.047e-23	-22.094	-22.094	0.000	(0)
Zn (SeO4) 2-2	3.156e-24	1.228e-24	-23.501	-23.911	-0.410	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.687	-149.790	-0.102	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.251	-151.251	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.001	-227.103	-0.102	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.201	-229.611	-0.410	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.285	-307.695	-0.410	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-56.35	-50.06	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-43.89	-39.38	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-51.11	-39.38	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-72.70	-54.77	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-58.77	-38.74	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.24	-28.84	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.27	-23.82	0.45	(NH4) 2SeO4
Acanthite	-52.57	-88.79	-36.22	Ag2S
Ag2CO3	-11.53	-22.62	-11.09	Ag2CO3
Ag2CrO4	-20.71	-32.30	-11.59	Ag2CrO4
Ag2HVO4	-12.14	-10.66	1.48	Ag2HVO4
Ag2MoO4	-11.63	-23.18	-11.55	Ag2MoO4
Ag2O	-14.76	-2.19	12.57	Ag2O
Ag2Se	-0.39	-49.09	-48.70	Ag2Se
Ag2SeO3	-9.57	-16.72	-7.15	Ag2SeO3
Ag2SeO4	-18.37	-27.28	-8.91	Ag2SeO4

Ag2SO4	-14.66	-19.48	-4.82	Ag2SO4
Ag3AsO3	-28.12	-25.96	2.16	Ag3AsO3
Ag3AsO4	-16.33	-19.11	-2.79	Ag3AsO4
Ag3H2VO5	-16.94	-11.76	5.18	Ag3H2VO5
AgF·4H2O	-13.58	-12.53	1.05	AgF·4H2O
Agmetal	-0.46	-13.97	-13.51	Ag
AgVO3	-10.34	-9.57	0.77	AgVO3
Al (OH) 3 (am)	-1.12	9.68	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.96	-43.59	2.37	Al2 (MoO4) 3
Al2O3	-0.28	19.37	19.65	Al2O3
Al4 (OH) 10SO4	-1.25	21.45	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.94	-6.14	4.80	AlAsO4·2H2O
AlOHSO4	-4.37	-7.60	-3.23	AlOHSO4
AlSb	-152.69	-87.06	65.62	AlSb
Alunite	0.78	-0.62	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.39	-12.18	-7.79	PbSO4
Anhydrite	-0.86	-5.22	-4.36	CaSO4
Anilite	-57.22	-89.09	-31.88	Cu0.25Cu1.5S
Antlerite	-4.17	4.62	8.79	Cu3 (OH) 4SO4
Aragonite	-0.06	-8.36	-8.30	CaCO3
Arsenolite	-87.93	-90.69	-2.76	As4O6
Artinite	-5.69	3.91	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.36	-31.66	6.71	As2O5
Atacamite	-2.90	4.49	7.39	Cu2 (OH) 3Cl
Azurite	-2.04	-18.95	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.83	7.56	24.39	Ba (OH) 2:8H2O
Ba2V2O7·2H2O	-17.69	-1.82	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-0.05	-8.96	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.19	5.75	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.88	-22.55	-9.67	BaCrO4
BaF2	-9.48	-15.30	-5.82	BaF2
BaMoO4	-6.46	-13.42	-6.96	BaMoO4
Barite	0.26	-9.72	-9.98	BaSO4
BaS	-95.22	-79.04	16.18	BaS
BaSeO3	-8.79	-6.96	1.83	BaSeO3
BaSeO4	-10.07	-17.53	-7.46	BaSeO4
Bianchite	-6.39	-8.16	-1.76	ZnSO4:6H2O
Birnessite	-7.53	10.57	18.09	MnO2
Bixbyite	-3.97	-4.61	-0.64	Mn2O3
BlaubleiI	-56.44	-80.61	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.24	-84.52	-27.28	Cu0.6Cu0.8S
Boehmite	1.11	9.68	8.58	AlOOH
Breithauptite	-57.90	-76.42	-18.52	NiSb
Brochantite	-3.30	11.92	15.22	Cu4 (OH) 6SO4
Brucite	-4.67	12.17	16.84	Mg (OH) 2
Bunsenite	-4.99	7.45	12.45	NiO
Ca (VO3) 2	-10.53	-4.87	5.66	Ca (VO3) 2
Ca2V2O7	-10.30	7.20	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.35	7.20	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2:4H2O	-17.74	4.56	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.69	19.27	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.59	19.27	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.25	-157.28	142.97	Ca3Sb2
CaCrO4	-15.77	-18.04	-2.27	CaCrO4
Calcite	0.12	-8.36	-8.48	CaCO3
Calomel	-7.17	-25.08	-17.91	Hg2Cl2
CaMoO4	-0.96	-8.91	-7.95	CaMoO4
Carnotite	-2.20	-1.97	0.23	KUO2VO4
CaSeO3·2H2O	-5.27	-2.46	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-10.00	-13.02	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-12.48	-2.64	9.84	Cd (BO2) 2
Cd (OH) 2	-7.17	6.47	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.26	6.47	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-21.87	-15.16	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.43	2.13	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-19.80	8.60	28.40	Cd4 (OH) 6SO4
CdCl2	-13.11	-13.77	-0.66	CdCl2
CdCl2·1H2O	-12.08	-13.77	-1.69	CdCl2·1H2O

CdCl2:2.5H2O	-11.86	-13.77	-1.91	CdCl2:2.5H2O
CdF2	-15.18	-16.39	-1.21	CdF2
Cdmetal (alpha)	-32.79	-19.27	13.51	Cd
Cdmetal (gamma)	-32.89	-19.27	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-7.19	-3.65	3.54	CdOHCl
CdSb	-77.05	-77.40	-0.35	CdSb
CdSe	-20.23	-40.43	-20.20	CdSe
CdSeO4:2H2O	-16.77	-18.62	-1.85	CdSeO4:2H2O
CdSO4	-10.64	-10.82	-0.17	CdSO4
CdSO4:1H2O	-9.09	-10.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.94	-10.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.47	-11.22	-9.75	AgCl
Cerrusite	-2.19	-15.32	-13.13	PbCO3
CH4 (g)	-82.36	-123.40	-41.05	CH4
Chalcanthite	-7.35	-9.99	-2.64	CuSO4:5H2O
Chalcocite	-57.44	-92.36	-34.92	Cu2S
Chalcopyrite	-127.30	-162.57	-35.27	CuFeS2
Cinnabar	-52.05	-97.74	-45.69	HgS
Claudetite	-87.63	-90.69	-3.06	As4O6
Clausthalite	-14.69	-41.79	-27.10	PbSe
Co (BO2) 2	-28.86	-1.79	27.07	Co (BO2) 2
Co (OH) 2	-5.77	7.33	13.09	Co (OH) 2
Co (OH) 3	-9.89	-12.20	-2.31	Co (OH) 3
CO2 (g)	-2.28	-20.43	-18.15	CO2
Co3 (AsO4) 2	-22.71	-9.68	13.03	Co3 (AsO4) 2
Co3O4	-6.58	-17.08	-10.50	Co3O4
CoCl2	-21.18	-12.91	8.27	CoCl2
CoCl2:6H2O	-15.45	-12.92	2.54	CoCl2:6H2O
CoCO3	-3.12	-13.10	-9.98	CoCO3
CoF2	-13.94	-15.54	-1.60	CoF2
CoF3	-45.04	-46.50	-1.46	CoF3
CoFe2O4	17.20	13.67	-3.53	CoFe2O4
CoMoO4	-5.90	-13.66	-7.76	CoMoO4
CoO	-6.26	7.33	13.59	CoO
CoS (alpha)	-71.84	-79.28	-7.44	CoS
CoS (beta)	-68.21	-79.28	-11.07	CoS
CoSe	-23.37	-39.57	-16.20	CoSe
CoSeO3	-8.52	-7.20	1.32	CoSeO3
CoSeO4:6H2O	-16.24	-17.77	-1.53	CoSeO4:6H2O
CoSO4	-12.76	-9.96	2.80	CoSO4
CoSO4:6H2O	-7.49	-9.96	-2.47	CoSO4:6H2O
Cotunnite	-10.35	-15.13	-4.78	PbCl2
Covellite	-57.00	-79.30	-22.30	CuS
Cr (OH) 2	-22.09	-11.27	10.82	Cr (OH) 2
Cr (OH) 3	-2.69	-1.35	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.60	-1.35	-0.75	Cr (OH) 3
Cr2O3	-0.34	-2.70	-2.36	Cr2O3
CrCl2	-45.61	-31.52	14.09	CrCl2
CrCl3	-46.83	-31.71	15.11	CrCl3
CrF3	-24.31	-35.64	-11.34	CrF3
Crmetal	-67.50	-37.02	30.48	Cr
CrO3	-26.90	-30.11	-3.21	CrO3
Cryolite	-9.09	-42.93	-33.84	Na3AlF6
Cu (OH) 2	-1.37	7.30	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.46	19.76	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-10.11	-0.86	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.44	-92.32	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.86	-52.66	-45.80	Cu2Se
Cu2SO4	-21.10	-23.05	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.85	-9.75	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.79	-105.38	-42.59	Cu3Sb
Cu3Se2	-28.76	-92.25	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-17.37	-22.81	-5.44	CuCrO4
CuF	-9.40	-14.31	-4.91	CuF
CuF2	-16.67	-15.56	1.12	CuF2
CuF2:2H2O	-11.01	-15.56	-4.55	CuF2:2H2O

Cumetal	-6.99	-15.75	-8.76	Cu
CuMoO4	-0.61	-13.68	-13.08	CuMoO4
CuOCuSO4	-12.98	-2.68	10.30	CuOCuSO4
Cupricferrite	7.66	13.65	5.99	CuFe2O4
Cuprite	-4.35	-5.76	-1.41	Cu2O
Cuprousferrite	9.21	0.30	-8.92	CuFeO2
CuSe	-6.50	-39.60	-33.10	CuSe
CuSe2	-27.39	-60.75	-33.37	CuSe2
CuSeO3:2H2O	-7.74	-7.23	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.35	-17.79	-2.44	CuSeO4:5H2O
CuSO4	-12.92	-9.99	2.94	CuSO4
Diaspore	2.81	9.68	6.87	AlOOH
Djurleite	-57.58	-91.50	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.08	-16.62	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.47	-16.62	-17.09	CaMg(CO3)2
Epsomite	-2.99	-5.12	-2.13	MgSO4:7H2O
Fe(OH)2	-10.23	3.33	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.18	0.14	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.89	-13.61	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.73	-8.18	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.61	-37.24	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.78	-45.52	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.54	9.68	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.05	-12.65	0.40	FeAsO4:2H2O
FeCr2O4	-6.57	0.63	7.20	FeCr2O4
FeMoO4	-7.56	-17.65	-10.09	FeMoO4
Ferrihydrite	-0.02	3.17	3.19	Fe(OH)3
Ferroselite	-46.12	-64.72	-18.60	FeSe2
FeS(ppt)	-80.32	-83.27	-2.95	FeS
FeSe	-32.56	-43.56	-11.00	FeSe
Fix_pe	-5.40	-5.40	0.00	e-
Fluorite	-0.29	-10.79	-10.50	CaF2
Galena	-67.52	-81.49	-13.97	PbS
Gibbsite	1.39	9.68	8.29	Al(OH)3
Goethite	2.68	3.17	0.49	FeOOH
Goslarite	-6.14	-8.16	-2.01	ZnSO4:7H2O
Greenockite	-65.77	-80.13	-14.36	CdS
Greigite	-291.70	-336.73	-45.03	Fe3S4
Gummite	-6.08	1.60	7.67	UO3
Gypsum	-0.61	-5.22	-4.61	CaSO4:2H2O
H-Jarosite	-12.96	-25.06	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.11	-20.99	-12.88	H2MoO4
H2S(g)	-78.59	-86.60	-8.01	H2S
H2Se(g)	-41.94	-46.90	-4.96	H2Se
Halite	-6.40	-4.79	1.60	NaCl
Hausmannite	-4.77	56.26	61.03	Mn3O4
Hematite	7.77	6.35	-1.42	Fe2O3
Hercynite	-0.19	22.70	22.89	FeAl2O4
Hg(CH3)2(g)	-184.24	-257.95	-73.71	Hg(CH3)2
Hg(g)	-7.42	-15.29	-7.87	Hg
Hg(OH)2	-7.64	-11.14	-3.50	Hg(OH)2
Hg2(g)	-15.63	-30.58	-14.96	Hg2
Hg2(OH)2	-10.10	-4.84	5.26	Hg2(OH)2
Hg2CO3	-9.22	-25.27	-16.05	Hg2CO3
Hg2CrO4	-26.25	-34.95	-8.70	Hg2CrO4
Hg2F2	-17.34	-27.70	-10.36	Hg2F2
Hg2S	-79.77	-91.44	-11.68	Hg2S
Hg2SeO3	-14.71	-19.37	-4.66	Hg2SeO3
Hg2SO4	-16.00	-22.13	-6.13	Hg2SO4
Hg3O2CO3	-24.17	-53.85	-29.68	Hg3O2CO3
HgCl(g)	-32.04	-12.54	19.50	HgCl
HgCl2	-10.12	-31.38	-21.26	HgCl2
HgF(g)	-46.53	-13.85	32.68	HgF
HgF2(g)	-46.57	-34.00	12.57	HgF2
Hgmetal(l)	-1.84	-15.29	-13.45	Hg
HgSe	-2.35	-58.04	-55.69	HgSe
HgSeO3	-13.24	-25.67	-12.43	HgSeO3
HgSO4	-19.01	-28.43	-9.42	HgSO4

Huntite	-3.17	-33.13	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-6.76	-25.53	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.10	-20.87	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-14.82	-19.99	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.35	-20.15	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-33.17	-50.41	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-19.79	-20.30	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-14.44	-11.17	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-14.55	-15.28	-0.73	K ₂ SeO ₄
Langite	-5.56	11.92	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-6.64	-7.07	-0.43	PbO:PbSO ₄
Laurionite	-5.63	-5.01	0.62	PbOHCl
Lepidocrocite	1.80	3.17	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.58	5.11	12.69	PbO
Mackinawite	-79.67	-83.27	-3.60	FeS
Maghemite	-0.04	6.35	6.39	Fe ₂ O ₃
Magnesioferrite	1.66	18.52	16.86	Fe ₂ MgO ₄
Magnesite	-0.80	-8.26	-7.46	MgCO ₃
Magnetite	6.28	9.68	3.40	Fe ₃ O ₄
Malachite	-0.52	-5.82	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.30	23.04	25.34	MnOOH
Massicot	-7.78	5.11	12.89	PbO
Matlockite	-7.47	-16.44	-8.97	PbClF
Melanothallite	-19.19	-12.94	6.26	CuCl ₂
Melanterite	-11.75	-13.96	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.65	-97.74	-45.09	HgS
Mg(OH) ₂ (active)	-6.62	12.17	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.05	-4.77	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.23	-201.55	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.96	7.40	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.73	9.47	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.32	-17.94	5.38	MgCrO ₄
MgF ₂	-2.56	-10.69	-8.13	MgF ₂
MgMoO ₄	-6.96	-8.81	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.41	-2.36	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.72	-12.92	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.45	41.07	73.52	Pb ₃ O ₄
Mirabilite	-5.53	-6.64	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.67	-6.77	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.77	-56.48	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-150.36	-89.28	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.64	-1.14	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.79	-10.07	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.60	-76.43	0.17	MnS
MnS (pnk)	-79.77	-76.43	3.34	MnS
MnSb	-96.15	-99.06	-2.91	MnSb
MnSe	-40.23	-36.73	3.50	MnSe
MnSeO ₃	-5.49	-4.36	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.34	-4.36	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.87	-14.92	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.70	-7.12	2.58	MnSO ₄
Monteponite	-8.63	6.47	15.10	CdO
Montroydite	-7.50	-11.14	-3.64	HgO
MoO ₃	-12.99	-20.99	-8.00	MoO ₃
Morenosite	-7.69	-9.84	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.68	-219.94	-70.26	MoS ₂
Na-Jarosite	-8.53	-19.73	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.67	-49.57	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.39	-19.46	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.72	-31.32	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.82	-10.33	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.56	-10.33	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.18	-3.88	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.72	-14.44	1.28	Na ₂ SeO ₄
Na ₃ Sb	-175.22	-80.77	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.18	7.51	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-33.04	4.36	37.40	Na ₄ V ₂ O ₇

Nantokite	-6.27	-13.00	-6.73	CuCl
NaSb	-88.84	-65.68	23.17	NaSb
Natron	-8.47	-9.78	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.00	-3.15	3.86	NaVO ₃
Nesquehonite	-3.59	-8.26	-4.67	MgCO ₃ ·3H ₂ O
Ni (OH) 2	-5.34	7.45	12.79	Ni (OH) 2
Ni ₃ (AsO ₄) 2·8H ₂ O	-25.00	-9.30	15.70	Ni ₃ (AsO ₄) 2·8H ₂ O
Ni ₄ (OH) 6SO ₄	-19.47	12.53	32.00	Ni ₄ (OH) 6SO ₄
NiCO ₃	-6.11	-12.98	-6.87	NiCO ₃
NiMoO ₄	-2.39	-13.53	-11.14	NiMoO ₄
NiS (alpha)	-73.55	-79.15	-5.60	NiS
NiS (beta)	-68.05	-79.15	-11.10	NiS
NiS (gamma)	-66.35	-79.15	-12.80	NiS
NiSe	-21.74	-39.44	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-9.89	-7.07	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-16.12	-17.64	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-6.94	10.57	17.50	MnO ₂
O ₂ (g)	-31.60	51.49	83.09	O ₂
Orpiment	-244.09	-305.16	-61.07	As ₂ S ₃
Otavite	-1.96	-13.96	-12.00	CdCO ₃
Pb (BO ₂) 2	-10.53	-4.01	6.52	Pb (BO ₂) 2
Pb (OH) 2	-3.04	5.11	8.15	Pb (OH) 2
Pb ₁₀ (OH) 6O (CO ₃) 6	-62.72	-71.48	-8.76	Pb ₁₀ (OH) 6O (CO ₃) 6
Pb ₂ (OH) 3Cl	-8.69	0.10	8.79	Pb ₂ (OH) 3Cl
Pb ₂ O (OH) 2	-15.97	10.22	26.19	Pb ₂ O (OH) 2
Pb ₂ O ₃	-25.08	35.96	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-9.65	-10.21	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-4.83	-6.73	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) 2	-22.13	-16.33	5.80	Pb ₃ (AsO ₄) 2
Pb ₃ (VO ₄) 2	-7.76	-1.62	6.14	Pb ₃ (VO ₄) 2
Pb ₃ O ₂ CO ₃	-16.12	-5.10	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-12.65	-1.96	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) 6SO ₄	-17.95	3.15	21.10	Pb ₄ (OH) 6SO ₄
Pb ₄ O ₃ SO ₄	-18.73	3.15	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-12.40	-25.00	-12.60	PbCrO ₄
PbF ₂	-10.31	-17.75	-7.44	PbF ₂
Pbmetal	-24.88	-20.63	4.25	Pb
PbMoO ₄	-0.26	-15.88	-15.62	PbMoO ₄
PbO·0.3H ₂ O	-7.87	5.11	12.98	PbO·0.33H ₂ O
PbSeO ₄	-13.14	-19.98	-6.84	PbSeO ₄
Periclase	-9.41	12.17	21.58	MgO
Phosgenite	-10.64	-30.45	-19.81	PbCl ₂ ·PbCO ₃
Plattnerite	-18.75	30.85	49.60	PbO ₂
Portlandite	-10.73	12.07	22.80	Ca (OH) 2
Pyrite	-125.62	-144.13	-18.51	FeS ₂
Pyrochroite	-5.02	10.17	15.19	Mn (OH) 2
Pyrolusite	-5.46	35.92	41.38	MnO ₂
Realgar	-102.40	-122.15	-19.75	AsS
Retgersite	-7.80	-9.84	-2.04	NiSO ₄ ·6H ₂ O
Rhodochrosite	0.32	-10.26	-10.58	MnCO ₃
Rutherfordine	-4.33	-18.83	-14.50	UO ₂ CO ₃
Sb (OH) 3	-12.41	-19.52	-7.11	Sb (OH) 3
Sb ₂ O ₄	-16.69	-13.29	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-26.50	-36.17	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-111.98	-179.73	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-59.81	-78.07	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-60.17	-78.07	-17.90	Sb ₄ O ₆
SbCl ₃	-50.45	-49.88	0.57	SbCl ₃
SbF ₃	-43.59	-53.81	-10.23	SbF ₃
Sbmetal	-46.44	-58.13	-11.69	Sb
SbO ₂	-3.13	-30.96	-27.82	SbO ₂
Schoepite	-4.40	1.60	5.99	UO ₂ (OH) 2·H ₂ O
Semetal (am)	-14.05	-21.16	-7.11	Se
Semetal (hex)	-13.45	-21.16	-7.71	Se
Senarmontite	-26.67	-39.04	-12.37	Sb ₂ O ₃
SeO ₂	-14.65	-14.53	0.12	SeO ₂
SeO ₃	-46.14	-25.09	21.04	SeO ₃
Siderite	-6.86	-17.10	-10.24	FeCO ₃

Smithsonite	-1.29	-11.29	-10.00	ZnCO3
Sphalerite	-66.02	-77.47	-11.45	ZnS
Spinel	-5.31	31.54	36.85	MgAl2O4
Stibnite	-248.38	-298.84	-50.46	Sb2S3
Sulfur	-58.71	-60.86	-2.14	S
Tenorite	-0.34	7.30	7.64	CuO
Thenardite	-6.96	-6.64	0.32	Na2SO4
Thermonatrite	-10.41	-9.78	0.64	Na2CO3:H2O
Tyuyamunite	-5.76	-1.68	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.39	6.69	21.08	U3O8
U3Sb4	-584.17	-431.79	152.38	U3Sb4
U4O9	-30.96	-33.98	-3.02	U4O9
UF4	-31.12	-60.66	-29.54	UF4
UF4:2.5H2O	-27.94	-60.66	-32.72	UF4:2.5H2O
UO2 (am)	-15.87	-14.93	0.93	UO2
UO2 (NO3) 2	-41.48	-29.33	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.18	-29.33	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.72	-29.33	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.38	-29.33	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.02	1.60	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.25	-23.50	-2.25	UO2SeO4:4H2O
UO3	-6.10	1.60	7.70	UO3
Uraninite	-10.26	-14.93	-4.67	UO2
USb2	-221.48	-191.90	29.58	USb2
V (OH) 3	-19.21	-11.62	7.59	V (OH) 3
V2O5	-15.59	-16.95	-1.36	V2O5
V3O5	-40.90	-39.07	1.84	V3O5
V4O7	-50.70	-43.51	7.19	V4O7
V6O13	-41.46	-102.32	-60.86	V6O13
Valentinite	-30.55	-39.04	-8.48	Sb2O3
VC12	-63.60	-44.73	18.87	VC12
VC13	-65.41	-41.98	23.43	VC13
VF4	-65.10	-50.17	14.93	VF4
Vmetal	-94.26	-50.23	44.03	V
VO	-39.25	-24.49	14.76	VO
VO (OH) 2	-9.59	-4.44	5.15	VO (OH) 2
VO2Cl	-21.43	-18.59	2.84	VO2Cl
VOC1	-32.89	-21.74	11.15	VOC1
VOC12	-37.44	-24.68	12.76	VOC12
VOSO4	-25.34	-21.73	3.61	VOSO4
Witherite	-4.29	-12.86	-8.57	BaCO3
Wurtzite	-68.52	-77.47	-8.95	ZnS
Zincite	-2.20	9.14	11.33	ZnO
Zincosite	-12.08	-8.15	3.93	ZnSO4
Zn (BO2) 2	-8.27	0.02	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.11	-21.80	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-3.07	9.13	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.34	9.13	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.62	9.13	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.40	9.13	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.60	9.13	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.52	0.98	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-7.04	8.15	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.90	-4.25	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.09	-7.17	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-9.15	19.25	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-13.07	25.43	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.16	-11.11	7.05	ZnCl2
ZnCO3:1H2O	-1.03	-11.29	-10.26	ZnCO3:1H2O
ZnF2	-13.19	-13.73	-0.53	ZnF2
Znmetal	-42.40	-16.61	25.79	Zn
ZnMoO4	-1.73	-11.85	-10.13	ZnMoO4
ZnO (active)	-2.05	9.14	11.19	ZnO
ZnS (am)	-68.42	-77.47	-9.05	ZnS
ZnSb	-85.76	-74.74	11.01	ZnSb
ZnSe	-23.36	-37.76	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.52	-8.15	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 49.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 205

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 213

SAVE Solution 214 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 205

END

TITLE

Precipitate oversaturated phases

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 213. Solution after simulation 48.
Using pure phase assemblage 205.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	4.776e-09	4.776e-09
Alunite	-2.80	-4.20	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.96	-5.32	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	5.009e-11	5.009e-11
Barite	0.00	-9.98	-9.98	0.000e+00	4.211e-08	4.211e-08
Brochantite	-0.00	15.22	15.22	0.000e+00	6.931e-09	6.931e-09
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.275e-03
CaMoO4	-1.08	-9.03	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-5.00	-2.18	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.104e-03	1.104e-03
Carnotite	-1.09	-0.86	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.33	-1.49	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.36	-14.51	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.236e-10	6.236e-10
Cu2Se(alpha)	-4.63	-50.43	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.69	-13.77	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.97	-5.10	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.086e-09	1.086e-09
Fluorite	-0.41	-10.91	-10.50	0.000e+00	0	0.000e+00
Gummite	-4.83	2.85	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.72	-5.33	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.76	-58.46	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.51	-6.62	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.08	-3.95	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.09	8.71	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-24.03	-8.33	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.07	-12.94	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.35	-13.49	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.039e-07
Otavite	-1.96	-13.96	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.28	-15.90	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.30	-18.80	-14.50	0.000e+00	0	0.000e+00

SbO2	-3.64	-31.46	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.15	2.84	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2 (am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.67	0.41	4.08	0.000e+00	0	0.000e+00
U3O8	-10.44	10.64	21.08	0.000e+00	0	0.000e+00
UO2 (OH)2 (beta)	-2.77	2.85	5.61	0.000e+00	0	0.000e+00
UO3	-4.85	2.85	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.73	-11.85	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	9.519e-09	9.520e-09
Al	3.637e-06	3.638e-06
As	1.432e-10	1.433e-10
B	2.801e-05	2.801e-05
Ba	4.576e-08	4.577e-08
C	7.449e-04	7.450e-04
Ca	3.166e-03	3.167e-03
Cd	1.238e-08	1.239e-08
Cl	2.693e-03	2.693e-03
Co	9.136e-08	9.136e-08
Cr	9.876e-10	9.877e-10
Cu	5.264e-07	5.265e-07
F	1.591e-04	1.591e-04
Fe	8.744e-10	8.744e-10
Hg	1.911e-09	1.911e-09
K	3.362e-03	3.362e-03
Mg	4.964e-03	4.964e-03
Mn	5.815e-05	5.816e-05
Mo	1.881e-06	1.882e-06
N	8.498e-06	8.499e-06
Na	8.798e-03	8.798e-03
Ni	1.127e-07	1.128e-07
Pb	2.606e-09	2.606e-09
S	1.246e-02	1.246e-02
Sb	2.645e-08	2.645e-08
Se	1.331e-07	1.331e-07
U	3.702e-07	3.702e-07
V	7.285e-09	7.286e-09
Zn	5.434e-06	5.434e-06

-----Description of solution-----

	pH =	8.082	Charge balance
	pe =	4.691	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	3.822e-02	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	7.729e-04	
	Total CO2 (mol/kg) =	7.449e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.006e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	72	
	Total H =	1.110236e+02	
	Total O =	5.556357e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.465e-06	1.214e-06	-5.834	-5.916	-0.081	(0)
H+	9.907e-09	8.286e-09	-8.004	-8.082	-0.078	0.00

H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	9.519e-09					
AgCl	6.206e-09	6.206e-09	-8.207	-8.207	0.000	(0)
Ag+	1.613e-09	1.349e-09	-8.792	-8.870	-0.078	(0)
AgCl2-	1.532e-09	1.218e-09	-8.815	-8.915	-0.100	(0)
AgSO4-	1.590e-10	1.264e-10	-9.799	-9.898	-0.100	(0)
AgCl3-2	6.124e-12	2.444e-12	-11.213	-11.612	-0.399	(0)
AgNO2	1.963e-12	1.963e-12	-11.707	-11.707	0.000	(0)
AgF	3.739e-13	3.739e-13	-12.427	-12.427	0.000	(0)
AgOH	1.639e-13	1.639e-13	-12.785	-12.785	0.000	(0)
AgCl4-3	8.877e-14	1.124e-14	-13.052	-13.949	-0.897	(0)
AgH2BO3	3.860e-14	3.860e-14	-13.413	-13.413	0.000	(0)
AgSeO3-	2.829e-14	2.249e-14	-13.548	-13.648	-0.100	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	8.506e-15	6.761e-15	-14.070	-14.170	-0.100	(0)
Ag (NO2) 2-	2.664e-17	2.117e-17	-16.574	-16.674	-0.100	(0)
Ag (OH) 2-	2.447e-17	1.945e-17	-16.611	-16.711	-0.100	(0)
AgNO3	7.042e-18	7.042e-18	-17.152	-17.152	0.000	(0)
Ag (NH3) 2+	1.697e-19	1.349e-19	-18.770	-18.870	-0.100	(0)
Ag (SeO3) 2-3	4.123e-20	5.221e-21	-19.385	-20.282	-0.897	(0)
Ag2MoO4	6.348e-25	6.348e-25	-24.197	-24.197	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.984	-73.984	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.623	-83.218	-1.595	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.215	-0.203	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.714	-148.813	-0.100	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.202	-149.574	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.531	-149.885	-0.353	(0)
Al	3.637e-06					
Al (OH) 4-	3.616e-06	3.026e-06	-5.442	-5.519	-0.077	(0)
Al (OH) 3	1.979e-08	1.979e-08	-7.703	-7.703	0.000	(0)
Al (OH) 2+	9.687e-10	8.169e-10	-9.014	-9.088	-0.074	(0)
AlF3	4.691e-11	4.691e-11	-10.329	-10.329	0.000	(0)
AlF2+	4.006e-11	3.378e-11	-10.397	-10.471	-0.074	(0)
AlF4-	3.099e-12	2.594e-12	-11.509	-11.586	-0.077	(0)
AlOH+2	1.675e-12	8.468e-13	-11.776	-12.072	-0.296	(0)
AlF+2	1.521e-12	7.692e-13	-11.818	-12.114	-0.296	(0)
AlSO4+	3.035e-14	2.540e-14	-13.518	-13.595	-0.077	(0)
Al+3	3.479e-15	6.973e-16	-14.459	-15.157	-0.698	(0)
Al (SO4) 2-	1.526e-15	1.277e-15	-14.816	-14.894	-0.077	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.970	-44.868	-0.897	(0)
As (3)	1.456e-24					
H3AsO3	1.351e-24	1.351e-24	-23.869	-23.869	0.000	(0)
H2AsO3-	1.052e-25	8.360e-26	-24.978	-25.078	-0.100	(0)
HAsO3-2	2.305e-29	9.201e-30	-28.637	-29.036	-0.399	(0)
H4AsO3+	6.977e-33	5.546e-33	-32.156	-32.256	-0.100	(0)
AsO3-3	3.380e-34	4.280e-35	-33.471	-34.369	-0.897	(0)
As (5)	1.432e-10					
HAsO4-2	1.378e-10	5.502e-11	-9.861	-10.259	-0.399	(0)
H2AsO4-	5.232e-12	4.158e-12	-11.281	-11.381	-0.100	(0)
AsO4-3	1.658e-13	2.100e-14	-12.780	-13.678	-0.897	(0)
H3AsO4	5.936e-18	5.988e-18	-17.227	-17.223	0.004	(0)
B	2.801e-05					
H3BO3	2.553e-05	2.575e-05	-4.593	-4.589	0.004	(0)
H2BO3-	2.200e-06	1.805e-06	-5.658	-5.744	-0.086	(0)
MgH2BO3+	1.296e-07	1.063e-07	-6.887	-6.973	-0.086	(0)
CaH2BO3+	1.277e-07	1.048e-07	-6.894	-6.980	-0.086	(0)
NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
BF (OH) 3-	1.382e-09	1.134e-09	-8.860	-8.946	-0.086	(0)
H5 (BO3) 2-	4.822e-11	3.956e-11	-10.317	-10.403	-0.086	(0)
BaH2BO3+	1.517e-12	1.244e-12	-11.819	-11.905	-0.086	(0)
BF2 (OH) 2-	1.351e-13	1.108e-13	-12.869	-12.955	-0.086	(0)
H8 (BO3) 3-	1.242e-13	1.019e-13	-12.906	-12.992	-0.086	(0)
AgH2BO3	3.860e-14	3.860e-14	-13.413	-13.413	0.000	(0)
BF3OH-	4.807e-20	3.944e-20	-19.318	-19.404	-0.086	(0)
BF4-	2.163e-25	1.775e-25	-24.665	-24.751	-0.086	(0)
Ba	4.576e-08					
Ba+2	4.558e-08	2.231e-08	-7.341	-7.651	-0.310	(0)
BaHCO3+	1.458e-10	1.236e-10	-9.836	-9.908	-0.072	(0)

BaCO3	3.755e-11	3.755e-11	-10.425	-10.425	0.000	(0)
BaH2BO3+	1.517e-12	1.244e-12	-11.819	-11.905	-0.086	(0)
BaOH+	1.407e-13	1.183e-13	-12.852	-12.927	-0.075	(0)
BaNO3+	9.243e-16	7.347e-16	-15.034	-15.134	-0.100	(0)
BaNH3+2	8.655e-17	3.455e-17	-16.063	-16.462	-0.399	(0)
C (4)	7.449e-04					
HCO3-	6.877e-04	5.799e-04	-3.163	-3.237	-0.074	(0)
CaHCO3+	1.286e-05	1.090e-05	-4.891	-4.963	-0.072	(0)
MgHCO3+	1.210e-05	1.008e-05	-4.917	-4.996	-0.079	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	6.703e-06	3.281e-06	-5.174	-5.484	-0.310	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.636e-06	4.636e-06	-5.334	-5.334	0.000	(0)
NaHCO3	2.340e-06	2.340e-06	-5.631	-5.631	0.000	(0)
NaCO3-	5.200e-07	4.385e-07	-6.284	-6.358	-0.074	(0)
CuCO3	3.561e-07	3.561e-07	-6.448	-6.448	0.000	(0)
ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
UO2 (CO3) 3-4	2.665e-07	6.765e-09	-6.574	-8.170	-1.595	(0)
MnHCO3+	2.379e-07	1.999e-07	-6.624	-6.699	-0.075	(0)
UO2 (CO3) 2-2	1.031e-07	4.114e-08	-6.987	-7.386	-0.399	(0)
ZnHCO3+	3.501e-08	2.783e-08	-7.456	-7.556	-0.100	(0)
Cu (CO3) 2-2	7.878e-09	3.145e-09	-8.104	-8.502	-0.399	(0)
NiCO3	4.281e-09	4.281e-09	-8.368	-8.368	0.000	(0)
NiHCO3+	3.146e-09	2.501e-09	-8.502	-8.602	-0.100	(0)
CoHCO3+	1.440e-09	1.144e-09	-8.842	-8.941	-0.100	(0)
CoCO3	1.407e-09	1.407e-09	-8.852	-8.852	0.000	(0)
PbCO3	1.338e-09	1.338e-09	-8.874	-8.874	0.000	(0)
CuHCO3+	8.485e-10	6.744e-10	-9.071	-9.171	-0.100	(0)
UO2CO3	6.284e-10	6.284e-10	-9.202	-9.202	0.000	(0)
CdCO3	2.508e-10	2.508e-10	-9.601	-9.601	0.000	(0)
BaHCO3+	1.458e-10	1.236e-10	-9.836	-9.908	-0.072	(0)
PbHCO3+	7.353e-11	5.845e-11	-10.134	-10.233	-0.100	(0)
BaCO3	3.755e-11	3.755e-11	-10.425	-10.425	0.000	(0)
Pb (CO3) 2-2	3.171e-11	1.266e-11	-10.499	-10.898	-0.399	(0)
CdHCO3+	5.572e-12	4.429e-12	-11.254	-11.354	-0.100	(0)
Cd (CO3) 2-2	1.528e-12	6.101e-13	-11.816	-12.215	-0.399	(0)
HgCO3	1.950e-15	1.950e-15	-14.710	-14.710	0.000	(0)
FeHCO3+	1.673e-15	1.417e-15	-14.777	-14.849	-0.072	(0)
Hg (CO3) 2-2	5.069e-17	2.024e-17	-16.295	-16.694	-0.399	(0)
HgHCO3+	3.786e-19	3.009e-19	-18.422	-18.522	-0.100	(0)
Ca	3.166e-03					
Ca+2	2.062e-03	1.009e-03	-2.686	-2.996	-0.310	(0)
CaSO4	1.085e-03	1.085e-03	-2.965	-2.965	0.000	(0)
CaHCO3+	1.286e-05	1.090e-05	-4.891	-4.963	-0.072	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	1.446e-06	1.215e-06	-5.840	-5.915	-0.075	(0)
CaH2BO3+	1.277e-07	1.048e-07	-6.894	-6.980	-0.086	(0)
CaOH+	2.886e-08	2.446e-08	-7.540	-7.612	-0.072	(0)
CaNO3+	2.638e-11	2.097e-11	-10.579	-10.678	-0.100	(0)
CaNH3+2	7.811e-12	3.118e-12	-11.107	-11.506	-0.399	(0)
Ca (NH3) 2+2	7.630e-21	3.046e-21	-20.117	-20.516	-0.399	(0)
Cd	1.238e-08					
Cd+2	6.852e-09	3.354e-09	-8.164	-8.474	-0.310	(0)
CdSO4	3.690e-09	3.690e-09	-8.433	-8.433	0.000	(0)
CdCl+	9.078e-10	7.216e-10	-9.042	-9.142	-0.100	(0)
Cd (SO4) 2-2	5.853e-10	2.336e-10	-9.233	-9.631	-0.399	(0)
CdCO3	2.508e-10	2.508e-10	-9.601	-9.601	0.000	(0)
CdOH+	4.071e-11	3.236e-11	-10.390	-10.490	-0.100	(0)
CdOHCl	3.595e-11	3.595e-11	-10.444	-10.444	0.000	(0)
CdF+	7.378e-12	5.864e-12	-11.132	-11.232	-0.100	(0)
CdCl2	6.776e-12	6.776e-12	-11.169	-11.169	0.000	(0)
CdHCO3+	5.572e-12	4.429e-12	-11.254	-11.354	-0.100	(0)
Cd (CO3) 2-2	1.528e-12	6.101e-13	-11.816	-12.215	-0.399	(0)
Cd (OH) 2	2.479e-13	2.479e-13	-12.606	-12.606	0.000	(0)
CdCl3-	1.212e-14	9.630e-15	-13.917	-14.016	-0.100	(0)
CdF2	1.291e-15	1.291e-15	-14.889	-14.889	0.000	(0)
CdNO3+	8.767e-17	6.968e-17	-16.057	-16.157	-0.100	(0)
CdSeO4	7.016e-17	7.016e-17	-16.154	-16.154	0.000	(0)

	Cd(OH) 3-	2.314e-17	1.840e-17	-16.636	-16.735	-0.100	(0)
	Cd(SeO3) 2-2	4.657e-18	1.859e-18	-17.332	-17.731	-0.399	(0)
	Cd2OH+3	4.295e-18	5.440e-19	-17.367	-18.264	-0.897	(0)
	Cd(OH) 4-2	9.161e-24	3.657e-24	-23.038	-23.437	-0.399	(0)
	Cd(NO3) 2	2.294e-25	2.294e-25	-24.639	-24.639	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.296	-79.395	-0.100	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-151.120	-151.120	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-228.050	-228.149	-0.100	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-304.483	-304.882	-0.399	(0)
	C1	2.693e-03					
	C1-	2.693e-03	2.253e-03	-2.570	-2.647	-0.078	(0)
	MnCl+	5.830e-08	4.900e-08	-7.234	-7.310	-0.075	(0)
	ZnOHC1	1.365e-08	1.365e-08	-7.865	-7.865	0.000	(0)
	ZnCl+	1.031e-08	8.585e-09	-7.987	-8.066	-0.079	(0)
	AgCl	6.206e-09	6.206e-09	-8.207	-8.207	0.000	(0)
	AgCl2-	1.532e-09	1.218e-09	-8.815	-8.915	-0.100	(0)
	CdCl+	9.078e-10	7.216e-10	-9.042	-9.142	-0.100	(0)
	CuCl	5.217e-10	5.217e-10	-9.283	-9.283	0.000	(0)
	CuCl2-	2.947e-10	2.455e-10	-9.531	-9.610	-0.079	(0)
	NiCl+	2.536e-10	2.016e-10	-9.596	-9.696	-0.100	(0)
	CoCl+	2.487e-10	1.977e-10	-9.604	-9.704	-0.100	(0)
	MnCl2	1.559e-10	1.559e-10	-9.807	-9.807	0.000	(0)
	CuCl+	7.899e-11	6.580e-11	-10.102	-10.182	-0.079	(0)
	CdOHC1	3.595e-11	3.595e-11	-10.444	-10.444	0.000	(0)
	ZnCl2	3.065e-11	3.065e-11	-10.514	-10.514	0.000	(0)
	PbCl+	1.364e-11	1.084e-11	-10.865	-10.965	-0.100	(0)
	CdCl2	6.776e-12	6.776e-12	-11.169	-11.169	0.000	(0)
	AgCl3-2	6.124e-12	2.444e-12	-11.213	-11.612	-0.399	(0)
	HgClOH	2.400e-12	2.400e-12	-11.620	-11.620	0.000	(0)
	HgCl2	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
	CuCl3-2	2.370e-13	1.182e-13	-12.625	-12.927	-0.302	(0)
	MnCl3-	1.151e-13	9.672e-14	-12.939	-13.014	-0.075	(0)
	PbCl2	1.091e-13	1.091e-13	-12.962	-12.962	0.000	(0)
	AgCl4-3	8.877e-14	1.124e-14	-13.052	-13.949	-0.897	(0)
	ZnCl3-	6.583e-14	5.484e-14	-13.182	-13.261	-0.079	(0)
	CuCl2	5.140e-14	5.140e-14	-13.289	-13.289	0.000	(0)
	CdCl3-	1.212e-14	9.630e-15	-13.917	-14.016	-0.100	(0)
	HgCl3-	7.142e-15	5.677e-15	-14.146	-14.246	-0.100	(0)
	NiCl2	2.286e-15	2.286e-15	-14.641	-14.641	0.000	(0)
	UO2Cl+	2.211e-16	1.758e-16	-15.655	-15.755	-0.100	(0)
	HgCl4-2	1.275e-16	5.091e-17	-15.894	-16.293	-0.399	(0)
	ZnCl4-2	1.238e-16	6.177e-17	-15.907	-16.209	-0.302	(0)
	PbCl3-	1.231e-16	9.782e-17	-15.910	-16.010	-0.100	(0)
	HgCl+	2.809e-17	2.232e-17	-16.552	-16.651	-0.100	(0)
	CuCl3-	1.297e-18	1.080e-18	-17.887	-17.966	-0.079	(0)
	CrCl+2	1.021e-18	4.075e-19	-17.991	-18.390	-0.399	(0)
	PbCl4-2	2.523e-19	1.007e-19	-18.598	-18.997	-0.399	(0)
	CrOHC12	2.119e-20	2.119e-20	-19.674	-19.674	0.000	(0)
	FeCl+2	1.206e-22	6.019e-23	-21.919	-22.220	-0.302	(0)
	CrCl2+	1.096e-22	8.710e-23	-21.960	-22.060	-0.100	(0)
CuCl4-2	2.444e-23	1.220e-23	-22.612	-22.914	-0.302	(0)	
VOC1+	4.409e-24	3.505e-24	-23.356	-23.455	-0.100	(0)	
FeCl2+	7.206e-25	6.056e-25	-24.142	-24.218	-0.075	(0)	
CrO3C1-	3.336e-26	2.652e-26	-25.477	-25.576	-0.100	(0)	
FeCl3	1.364e-28	1.364e-28	-27.865	-27.865	0.000	(0)	
CoCl+2	5.691e-36	2.272e-36	-35.245	-35.644	-0.399	(0)	
UCl+3	0.000e+00	0.000e+00	-45.859	-46.757	-0.897	(0)	
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)	
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)	
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)	
Co (2)	9.136e-08						
	Co+2	6.356e-08	2.537e-08	-7.197	-7.596	-0.399	(0)
	CoSO4	2.376e-08	2.376e-08	-7.624	-7.624	0.000	(0)
	CoHCO3+	1.440e-09	1.144e-09	-8.842	-8.941	-0.100	(0)
	CoCO3	1.407e-09	1.407e-09	-8.852	-8.852	0.000	(0)
	CoOH+	7.734e-10	6.148e-10	-9.112	-9.211	-0.100	(0)
	CoCl+	2.487e-10	1.977e-10	-9.604	-9.704	-0.100	(0)
	CoF+	1.113e-10	8.850e-11	-9.953	-10.053	-0.100	(0)

Co (OH) 2	5.931e-11	5.931e-11	-10.227	-10.227	0.000	(0)
CoNO2+	1.566e-12	1.245e-12	-11.805	-11.905	-0.100	(0)
Co (NH3) +2	1.875e-14	7.485e-15	-13.727	-14.126	-0.399	(0)
Co (OH) 3-	1.808e-15	1.437e-15	-14.743	-14.843	-0.100	(0)
CoSeO4	1.428e-15	1.428e-15	-14.845	-14.845	0.000	(0)
CoOOH-	4.539e-16	3.608e-16	-15.343	-15.443	-0.100	(0)
CoNO3+	3.323e-16	2.642e-16	-15.478	-15.578	-0.100	(0)
Co2OH+3	6.172e-18	7.817e-19	-17.210	-18.107	-0.897	(0)
Co (NH3) 2+2	1.963e-21	7.835e-22	-20.707	-21.106	-0.399	(0)
Co (OH) 4-2	6.930e-22	2.766e-22	-21.159	-21.558	-0.399	(0)
Co (NO3) 2	3.531e-24	3.531e-24	-23.452	-23.452	0.000	(0)
Co4 (OH) 4+4	1.123e-27	2.850e-29	-26.950	-28.545	-1.595	(0)
Co (NH3) 3+2	6.064e-29	2.421e-29	-28.217	-28.616	-0.399	(0)
Co (NH3) 4+2	7.809e-37	3.117e-37	-36.107	-36.506	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.498	-44.896	-0.399	(0)
Co (3)	7.663e-29					
CoOH+2	7.663e-29	3.059e-29	-28.116	-28.514	-0.399	(0)
Co+3	2.473e-35	4.956e-36	-34.607	-35.305	-0.698	(0)
CoCl+2	5.691e-36	2.272e-36	-35.245	-35.644	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.736	-67.135	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
Cr (2)	1.705e-27					
Cr+2	1.705e-27	6.805e-28	-26.768	-27.167	-0.399	(0)
Cr (3)	9.876e-10					
Cr (OH) 2+	6.905e-10	5.488e-10	-9.161	-9.261	-0.100	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.806e-11	1.436e-11	-10.743	-10.843	-0.100	(0)
Cr (OH) 4-	1.523e-11	1.211e-11	-10.817	-10.917	-0.100	(0)
Cr (OH) +2	9.305e-12	3.714e-12	-11.031	-11.430	-0.399	(0)
CrOHSO4	4.136e-12	4.136e-12	-11.383	-11.383	0.000	(0)
CrF+2	6.123e-15	2.444e-15	-14.213	-14.612	-0.399	(0)
CrSO4+	1.927e-15	1.532e-15	-14.715	-14.815	-0.100	(0)
Cr+3	1.104e-15	1.398e-16	-14.957	-15.855	-0.897	(0)
CrCl+2	1.021e-18	4.075e-19	-17.991	-18.390	-0.399	(0)
CrOHC12	2.119e-20	2.119e-20	-19.674	-19.674	0.000	(0)
Cr2 (OH) 2SO4+2	3.479e-21	1.389e-21	-20.459	-20.857	-0.399	(0)
Cr2 (OH) 2 (SO4) 2	3.871e-22	3.871e-22	-21.412	-21.412	0.000	(0)
CrCl2+	1.096e-22	8.710e-23	-21.960	-22.060	-0.100	(0)
CrNO3+2	1.006e-25	4.014e-26	-24.998	-25.396	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.050	-44.449	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.618	-54.515	-0.897	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Cr (6)	1.797e-14					
CrO4-2	1.720e-14	8.419e-15	-13.765	-14.075	-0.310	(0)
NaCrO4-	3.777e-16	3.002e-16	-15.423	-15.523	-0.100	(0)
HCrO4-	2.840e-16	2.258e-16	-15.547	-15.646	-0.100	(0)
KCrO4-	1.071e-16	8.515e-17	-15.970	-16.070	-0.100	(0)
CrO3SO4-2	6.703e-24	2.676e-24	-23.174	-23.573	-0.399	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.336e-26	2.652e-26	-25.477	-25.576	-0.100	(0)
Cr2O7-2	4.429e-30	1.768e-30	-29.354	-29.752	-0.399	(0)
Cu (1)	1.048e-09					
CuCl	5.217e-10	5.217e-10	-9.283	-9.283	0.000	(0)
CuCl2-	2.947e-10	2.455e-10	-9.531	-9.610	-0.079	(0)
Cu+	2.314e-10	1.840e-10	-9.636	-9.735	-0.100	(0)
CuCl3-2	2.370e-13	1.182e-13	-12.625	-12.927	-0.302	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.678	-148.040	-0.362	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.426	-148.770	-0.344	(0)
Cu (2)	5.254e-07					
CuCO3	3.561e-07	3.561e-07	-6.448	-6.448	0.000	(0)
CuOH+	8.497e-08	7.079e-08	-7.071	-7.150	-0.079	(0)
Cu+2	3.765e-08	1.843e-08	-7.424	-7.734	-0.310	(0)
CuSO4	1.982e-08	1.982e-08	-7.703	-7.703	0.000	(0)
Cu (OH) 2	1.715e-08	1.715e-08	-7.766	-7.766	0.000	(0)
Cu (CO3) 2-2	7.878e-09	3.145e-09	-8.104	-8.502	-0.399	(0)
CuHCO3+	8.485e-10	6.744e-10	-9.071	-9.171	-0.100	(0)

	Cu2 (OH) 2+2	3.153e-10	1.259e-10	-9.501	-9.900	-0.399	(0)
	CuF+	1.614e-10	1.283e-10	-9.792	-9.892	-0.100	(0)
	CuCl+	7.899e-11	6.580e-11	-10.102	-10.182	-0.079	(0)
	Cu (OH) 3-	5.376e-11	4.273e-11	-10.270	-10.369	-0.100	(0)
	CuNO2+	1.691e-11	1.344e-11	-10.772	-10.872	-0.100	(0)
	CuNH3+2	1.159e-12	4.628e-13	-11.936	-12.335	-0.399	(0)
	CuCl2	5.140e-14	5.140e-14	-13.289	-13.289	0.000	(0)
	Cu (OH) 4-2	1.023e-15	4.084e-16	-14.990	-15.389	-0.399	(0)
	Cu (NO2) 2	9.577e-16	9.577e-16	-15.019	-15.019	0.000	(0)
	CuNO3+	4.817e-16	3.829e-16	-15.317	-15.417	-0.100	(0)
	CuCl3-	1.297e-18	1.080e-18	-17.887	-17.966	-0.079	(0)
	CuCl4-2	2.444e-23	1.220e-23	-22.612	-22.914	-0.302	(0)
	Cu (NO3) 2	3.167e-25	3.167e-25	-24.499	-24.499	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.523	-218.622	-0.100	(0)
F		1.591e-04					
	F-	1.319e-04	1.103e-04	-3.880	-3.957	-0.078	(0)
	MgF+	2.513e-05	2.103e-05	-4.600	-4.677	-0.077	(0)
	CaF+	1.446e-06	1.215e-06	-5.840	-5.915	-0.075	(0)
	NaF	4.995e-07	4.995e-07	-6.301	-6.301	0.000	(0)
	MnF+	9.028e-08	7.588e-08	-7.044	-7.120	-0.075	(0)
	ZnF+	4.201e-09	3.340e-09	-8.377	-8.476	-0.100	(0)
	BF (OH) 3-	1.382e-09	1.134e-09	-8.860	-8.946	-0.086	(0)
	HF	1.352e-09	1.352e-09	-8.869	-8.869	0.000	(0)
	CuF+	1.614e-10	1.283e-10	-9.792	-9.892	-0.100	(0)
	NiF+	1.219e-10	9.692e-11	-9.914	-10.014	-0.100	(0)
	CoF+	1.113e-10	8.850e-11	-9.953	-10.053	-0.100	(0)
	AlF3	4.691e-11	4.691e-11	-10.329	-10.329	0.000	(0)
	AlF2+	4.006e-11	3.378e-11	-10.397	-10.471	-0.074	(0)
	CdF+	7.378e-12	5.864e-12	-11.132	-11.232	-0.100	(0)
	AlF4-	3.099e-12	2.594e-12	-11.509	-11.586	-0.077	(0)
	AlF+2	1.521e-12	7.692e-13	-11.818	-12.114	-0.296	(0)
	PbF+	1.327e-12	1.054e-12	-11.877	-11.977	-0.100	(0)
	UO2F+	9.217e-13	7.326e-13	-12.035	-12.135	-0.100	(0)
	HF2-	6.840e-13	5.671e-13	-12.165	-12.246	-0.081	(0)
	AgF	3.739e-13	3.739e-13	-12.427	-12.427	0.000	(0)
	UO2F2	2.331e-13	2.331e-13	-12.632	-12.632	0.000	(0)
	BF2 (OH) 2-	1.351e-13	1.108e-13	-12.869	-12.955	-0.086	(0)
	UO2F3-	8.126e-15	6.459e-15	-14.090	-14.190	-0.100	(0)
	CrF+2	6.123e-15	2.444e-15	-14.213	-14.612	-0.399	(0)
	PbF2	2.289e-15	2.289e-15	-14.640	-14.640	0.000	(0)
	CdF2	1.291e-15	1.291e-15	-14.889	-14.889	0.000	(0)
	UO2F4-2	1.418e-17	5.659e-18	-16.848	-17.247	-0.399	(0)
	H2F2	4.898e-18	4.898e-18	-17.310	-17.310	0.000	(0)
	VO2F	9.582e-19	9.582e-19	-18.019	-18.019	0.000	(0)
	PbF3-	6.025e-19	4.789e-19	-18.220	-18.320	-0.100	(0)
	FeF2+	3.759e-19	3.159e-19	-18.425	-18.500	-0.075	(0)
	FeF+2	2.145e-19	1.070e-19	-18.669	-18.971	-0.302	(0)
	FeF3	4.917e-20	4.917e-20	-19.308	-19.308	0.000	(0)
	VO2F2-	4.828e-20	3.838e-20	-19.316	-19.416	-0.100	(0)
	BF3OH-	4.807e-20	3.944e-20	-19.318	-19.404	-0.086	(0)
	VOF+	4.616e-22	3.669e-22	-21.336	-21.435	-0.100	(0)
	VO2F3-2	1.323e-22	5.281e-23	-21.878	-22.277	-0.399	(0)
	PbF4-2	6.335e-23	2.529e-23	-22.198	-22.597	-0.399	(0)
	VOF2	1.518e-23	1.518e-23	-22.819	-22.819	0.000	(0)
	HgF+	2.555e-24	2.031e-24	-23.593	-23.692	-0.100	(0)
	BF4-	2.163e-25	1.775e-25	-24.665	-24.751	-0.086	(0)
	VOF3-	7.474e-26	5.941e-26	-25.126	-25.226	-0.100	(0)
	VO2F4-3	2.263e-26	2.866e-27	-25.645	-26.543	-0.897	(0)
	Sb (OH) 2F	1.693e-26	1.693e-26	-25.771	-25.771	0.000	(0)
	SbOF	1.666e-26	1.666e-26	-25.778	-25.778	0.000	(0)
	VOF4-2	6.627e-29	2.645e-29	-28.179	-28.578	-0.399	(0)
	UF3+	1.043e-36	8.288e-37	-35.982	-36.082	-0.100	(0)
	UF2+2	1.188e-37	4.740e-38	-36.925	-37.324	-0.399	(0)
	UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
	UF+3	2.695e-40	0.000e+00	-39.569	-40.467	-0.897	(0)
	UF5-	0.000e+00	0.000e+00	-40.259	-40.358	-0.100	(0)
	UF6-2	0.000e+00	0.000e+00	-41.437	-41.836	-0.399	(0)
Fe (2)		7.227e-13					

Fe+2	4.862e-13	1.941e-13	-12.313	-12.712	-0.399	(0)
FeSO4	2.236e-13	2.236e-13	-12.651	-12.651	0.000	(0)
FeOH+	1.117e-14	9.384e-15	-13.952	-14.028	-0.075	(0)
FeHCO3+	1.673e-15	1.417e-15	-14.777	-14.849	-0.072	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.136e-18	3.477e-18	-17.383	-17.459	-0.075	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.620	-161.620	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.412	-238.512	-0.100	(0)
Fe (3)	8.736e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	3.887e-10	3.278e-10	-9.410	-9.484	-0.074	(0)
Fe (OH) 4-	5.733e-11	4.835e-11	-10.242	-10.316	-0.074	(0)
FeOH+2	1.390e-15	6.938e-16	-14.857	-15.159	-0.302	(0)
FeF2+	3.759e-19	3.159e-19	-18.425	-18.500	-0.075	(0)
FeF+2	2.145e-19	1.070e-19	-18.669	-18.971	-0.302	(0)
FeSO4+	5.543e-20	4.659e-20	-19.256	-19.332	-0.075	(0)
FeF3	4.917e-20	4.917e-20	-19.308	-19.308	0.000	(0)
Fe (SO4) 2-	5.881e-21	4.675e-21	-20.231	-20.330	-0.100	(0)
Fe+3	4.414e-21	8.848e-22	-20.355	-21.053	-0.698	(0)
FeCl+2	1.206e-22	6.019e-23	-21.919	-22.220	-0.302	(0)
FeCl2+	7.206e-25	6.056e-25	-24.142	-24.218	-0.075	(0)
FeHSeO3+2	3.161e-25	1.262e-25	-24.500	-24.899	-0.399	(0)
Fe2 (OH) 2+4	6.278e-28	1.594e-29	-27.202	-28.798	-1.595	(0)
FeNO3+2	1.456e-28	5.813e-29	-27.837	-28.236	-0.399	(0)
FeCl3	1.364e-28	1.364e-28	-27.865	-27.865	0.000	(0)
Fe3 (OH) 4+5	2.349e-35	7.552e-38	-34.629	-37.122	-2.493	(0)
H (0)	4.002e-29					
H2	2.001e-29	2.019e-29	-28.699	-28.695	0.004	(0)
Hg (0)	1.904e-09					
Hg	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
Hg (1)	3.216e-21					
Hg2+2	1.608e-21	6.419e-22	-20.794	-21.193	-0.399	(0)
Hg (2)	7.243e-12					
Hg (OH) 2	4.582e-12	4.622e-12	-11.339	-11.335	0.004	(0)
HgClOH	2.400e-12	2.400e-12	-11.620	-11.620	0.000	(0)
HgCl2	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
HgCl3-	7.142e-15	5.677e-15	-14.146	-14.246	-0.100	(0)
HgCO3	1.950e-15	1.950e-15	-14.710	-14.710	0.000	(0)
HgCl4-2	1.275e-16	5.091e-17	-15.894	-16.293	-0.399	(0)
Hg (CO3) 2-2	5.069e-17	2.024e-17	-16.295	-16.694	-0.399	(0)
HgOH+	3.021e-17	2.401e-17	-16.520	-16.620	-0.100	(0)
HgCl+	2.809e-17	2.232e-17	-16.552	-16.651	-0.100	(0)
Hg (OH) 3-	8.891e-19	7.067e-19	-18.051	-18.151	-0.100	(0)
HgHCO3+	3.786e-19	3.009e-19	-18.422	-18.522	-0.100	(0)
Hg (NH3) 2+2	4.728e-21	1.887e-21	-20.325	-20.724	-0.399	(0)
HgNH3+2	1.927e-21	7.690e-22	-20.715	-21.114	-0.399	(0)
Hg+2	1.244e-21	4.967e-22	-20.905	-21.304	-0.399	(0)
HgSO4	6.103e-22	6.103e-22	-21.214	-21.214	0.000	(0)
HgF+	2.555e-24	2.031e-24	-23.593	-23.692	-0.100	(0)
Hg (NH3) 3+2	4.619e-29	1.844e-29	-28.335	-28.734	-0.399	(0)
HgNO3+	1.516e-30	1.205e-30	-29.819	-29.919	-0.100	(0)
Hg (NH3) 4+2	9.003e-37	3.594e-37	-36.046	-36.444	-0.399	(0)
Hg (NO3) 2	3.290e-39	3.290e-39	-38.483	-38.483	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.053	-139.152	-0.100	(0)
HgS2-2	0.000e+00	0.000e+00	-139.380	-139.779	-0.399	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.840	-140.840	0.000	(0)
K	3.362e-03					
K+	3.254e-03	2.722e-03	-2.488	-2.565	-0.078	(0)
KSO4-	1.073e-04	9.044e-05	-3.970	-4.044	-0.074	(0)
KCrO4-	1.071e-16	8.515e-17	-15.970	-16.070	-0.100	(0)
Mg	4.964e-03					
Mg+2	3.470e-03	1.699e-03	-2.460	-2.770	-0.310	(0)
MgSO4	1.451e-03	1.451e-03	-2.838	-2.838	0.000	(0)
MgF+	2.513e-05	2.103e-05	-4.600	-4.677	-0.077	(0)
MgHCO3+	1.210e-05	1.008e-05	-4.917	-4.996	-0.079	(0)
MgCO3	4.636e-06	4.636e-06	-5.334	-5.334	0.000	(0)
MgOH+	9.658e-07	8.213e-07	-6.015	-6.085	-0.070	(0)
MgH2BO3+	1.296e-07	1.063e-07	-6.887	-6.973	-0.086	(0)

Mn (2)	5.815e-05					
Mn+2	4.328e-05	1.728e-05	-4.364	-4.763	-0.399	(0)
MnSO4	1.442e-05	1.442e-05	-4.841	-4.841	0.000	(0)
MnHCO3+	2.379e-07	1.999e-07	-6.624	-6.699	-0.075	(0)
MnF+	9.028e-08	7.588e-08	-7.044	-7.120	-0.075	(0)
MnOH+	6.271e-08	5.271e-08	-7.203	-7.278	-0.075	(0)
MnCl+	5.830e-08	4.900e-08	-7.234	-7.310	-0.075	(0)
MnCl2	1.559e-10	1.559e-10	-9.807	-9.807	0.000	(0)
MnSeO4	5.224e-13	5.224e-13	-12.282	-12.282	0.000	(0)
MnNO3+	2.263e-13	1.799e-13	-12.645	-12.745	-0.100	(0)
MnCl3-	1.151e-13	9.672e-14	-12.939	-13.014	-0.075	(0)
Mn (OH) 3-	5.716e-16	4.804e-16	-15.243	-15.318	-0.075	(0)
Mn (OH) 4-2	3.775e-21	1.884e-21	-20.423	-20.725	-0.302	(0)
Mn (NO3) 2	2.969e-21	2.969e-21	-20.527	-20.527	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.108	-41.108	0.000	(0)
Mn (3)	1.889e-25					
Mn+3	1.889e-25	3.787e-26	-24.724	-25.422	-0.698	(0)
Mn (6)	3.411e-40					
MnO4-2	3.411e-40	1.702e-40	-39.467	-39.769	-0.302	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.367	-44.450	-0.084	(0)
Mo	1.881e-06					
MoO4-2	1.881e-06	9.209e-07	-5.726	-6.036	-0.310	(0)
HMoO4-	1.910e-10	1.518e-10	-9.719	-9.819	-0.100	(0)
H2MoO4	9.217e-15	9.217e-15	-14.035	-14.035	0.000	(0)
Ag2MoO4	6.348e-25	6.348e-25	-24.197	-24.197	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.970	-44.868	-0.897	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.323	-53.912	-3.590	(0)
HMo7O24-5	0.000e+00	0.000e+00	-53.115	-55.607	-2.493	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-57.311	-58.907	-1.595	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.845	-63.742	-0.897	(0)
N (-3)	4.806e-08					
NH4+	4.347e-08	3.566e-08	-7.362	-7.448	-0.086	(0)
NH3	2.454e-09	2.454e-09	-8.610	-8.610	0.000	(0)
NH4SO4-	2.134e-09	1.793e-09	-8.671	-8.746	-0.075	(0)
CaNH3+2	7.811e-12	3.118e-12	-11.107	-11.506	-0.399	(0)
CuNH3+2	1.159e-12	4.628e-13	-11.936	-12.335	-0.399	(0)
NiNH3+2	1.155e-13	4.609e-14	-12.938	-13.336	-0.399	(0)
Co (NH3) +2	1.875e-14	7.485e-15	-13.727	-14.126	-0.399	(0)
AgNH3+	8.506e-15	6.761e-15	-14.070	-14.170	-0.100	(0)
BaNH3+2	8.655e-17	3.455e-17	-16.063	-16.462	-0.399	(0)
Ag (NH3) 2+	1.697e-19	1.349e-19	-18.770	-18.870	-0.100	(0)
Ni (NH3) 2+2	4.096e-20	1.635e-20	-19.388	-19.787	-0.399	(0)
Ca (NH3) 2+2	7.630e-21	3.046e-21	-20.117	-20.516	-0.399	(0)
Hg (NH3) 2+2	4.728e-21	1.887e-21	-20.325	-20.724	-0.399	(0)
Co (NH3) 2+2	1.963e-21	7.835e-22	-20.707	-21.106	-0.399	(0)
HgNH3+2	1.927e-21	7.690e-22	-20.715	-21.114	-0.399	(0)
Co (NH3) 3+2	6.064e-29	2.421e-29	-28.217	-28.616	-0.399	(0)
Hg (NH3) 3+2	4.619e-29	1.844e-29	-28.335	-28.734	-0.399	(0)
Hg (NH3) 4+2	9.003e-37	3.594e-37	-36.046	-36.444	-0.399	(0)
Co (NH3) 4+2	7.809e-37	3.117e-37	-36.107	-36.506	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.050	-44.449	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.498	-44.896	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.618	-54.515	-0.897	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.736	-67.135	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
N (3)	8.442e-06					
NO2-	8.442e-06	6.964e-06	-5.074	-5.157	-0.084	(0)
CuNO2+	1.691e-11	1.344e-11	-10.772	-10.872	-0.100	(0)
AgNO2	1.963e-12	1.963e-12	-11.707	-11.707	0.000	(0)
CoNO2+	1.566e-12	1.245e-12	-11.805	-11.905	-0.100	(0)
Cu (NO2) 2	9.577e-16	9.577e-16	-15.019	-15.019	0.000	(0)
Ag (NO2) 2-	2.664e-17	2.117e-17	-16.574	-16.674	-0.100	(0)
N (5)	7.881e-09					
NO3-	7.854e-09	6.570e-09	-8.105	-8.182	-0.078	(0)

CaNO3+	2.638e-11	2.097e-11	-10.579	-10.678	-0.100	(0)
MnNO3+	2.263e-13	1.799e-13	-12.645	-12.745	-0.100	(0)
ZnNO3+	3.150e-14	2.504e-14	-13.502	-13.601	-0.100	(0)
BaNO3+	9.243e-16	7.347e-16	-15.034	-15.134	-0.100	(0)
NiNO3+	7.261e-16	5.772e-16	-15.139	-15.239	-0.100	(0)
CuNO3+	4.817e-16	3.829e-16	-15.317	-15.417	-0.100	(0)
CoNO3+	3.323e-16	2.642e-16	-15.478	-15.578	-0.100	(0)
CdNO3+	8.767e-17	6.968e-17	-16.057	-16.157	-0.100	(0)
PbNO3+	1.658e-17	1.318e-17	-16.780	-16.880	-0.100	(0)
AgNO3	7.042e-18	7.042e-18	-17.152	-17.152	0.000	(0)
Mn(NO3)2	2.969e-21	2.969e-21	-20.527	-20.527	0.000	(0)
UO2NO3+	7.934e-22	6.307e-22	-21.100	-21.200	-0.100	(0)
Zn(NO3)2	3.282e-23	3.282e-23	-22.484	-22.484	0.000	(0)
Co(NO3)2	3.531e-24	3.531e-24	-23.452	-23.452	0.000	(0)
Cu(NO3)2	3.167e-25	3.167e-25	-24.499	-24.499	0.000	(0)
Cd(NO3)2	2.294e-25	2.294e-25	-24.639	-24.639	0.000	(0)
Pb(NO3)2	1.471e-25	1.471e-25	-24.833	-24.833	0.000	(0)
CrNO3+2	1.006e-25	4.014e-26	-24.998	-25.396	-0.399	(0)
VO2NO3	1.646e-26	1.646e-26	-25.784	-25.784	0.000	(0)
FeNO3+2	1.456e-28	5.813e-29	-27.837	-28.236	-0.399	(0)
HgNO3+	1.516e-30	1.205e-30	-29.819	-29.919	-0.100	(0)
Hg(NO3)2	3.290e-39	3.290e-39	-38.483	-38.483	0.000	(0)
Na	8.798e-03					
Na+	8.580e-03	7.176e-03	-2.067	-2.144	-0.078	(0)
NaSO4-	2.145e-04	1.809e-04	-3.669	-3.743	-0.074	(0)
NaHCO3	2.340e-06	2.340e-06	-5.631	-5.631	0.000	(0)
NaCO3-	5.200e-07	4.385e-07	-6.284	-6.358	-0.074	(0)
NaF	4.995e-07	4.995e-07	-6.301	-6.301	0.000	(0)
NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
NaCrO4-	3.777e-16	3.002e-16	-15.423	-15.523	-0.100	(0)
Ni	1.127e-07					
Ni+2	7.145e-08	3.498e-08	-7.146	-7.456	-0.310	(0)
NiSO4	3.275e-08	3.275e-08	-7.485	-7.485	0.000	(0)
NiCO3	4.281e-09	4.281e-09	-8.368	-8.368	0.000	(0)
NiHCO3+	3.146e-09	2.501e-09	-8.502	-8.602	-0.100	(0)
NiOH+	6.728e-10	5.348e-10	-9.172	-9.272	-0.100	(0)
NiCl+	2.536e-10	2.016e-10	-9.596	-9.696	-0.100	(0)
NiF+	1.219e-10	9.692e-11	-9.914	-10.014	-0.100	(0)
Ni(OH)2	5.159e-11	5.159e-11	-10.287	-10.287	0.000	(0)
Ni(SO4)2-2	1.275e-11	5.090e-12	-10.894	-11.293	-0.399	(0)
NiNH3+2	1.155e-13	4.609e-14	-12.938	-13.336	-0.399	(0)
Ni(OH)3-	7.882e-14	6.265e-14	-13.103	-13.203	-0.100	(0)
NiCl2	2.286e-15	2.286e-15	-14.641	-14.641	0.000	(0)
NiSeO4	1.838e-15	1.838e-15	-14.736	-14.736	0.000	(0)
NiNO3+	7.261e-16	5.772e-16	-15.139	-15.239	-0.100	(0)
Ni(NH3)2+2	4.096e-20	1.635e-20	-19.388	-19.787	-0.399	(0)
O(0)	2.463e-35					
O2	1.232e-35	1.243e-35	-34.909	-34.906	0.004	(0)
Pb	2.606e-09					
PbCO3	1.338e-09	1.338e-09	-8.874	-8.874	0.000	(0)
PbOH+	5.206e-10	4.138e-10	-9.284	-9.383	-0.100	(0)
PbSO4	3.118e-10	3.118e-10	-9.506	-9.506	0.000	(0)
Pb+2	2.771e-10	1.356e-10	-9.557	-9.868	-0.310	(0)
PbHCO3+	7.353e-11	5.845e-11	-10.134	-10.233	-0.100	(0)
Pb(CO3)2-2	3.171e-11	1.266e-11	-10.499	-10.898	-0.399	(0)
Pb(SO4)2-2	2.209e-11	8.817e-12	-10.656	-11.055	-0.399	(0)
Pb(OH)2	1.589e-11	1.589e-11	-10.799	-10.799	0.000	(0)
PbCl+	1.364e-11	1.084e-11	-10.865	-10.965	-0.100	(0)
PbF+	1.327e-12	1.054e-12	-11.877	-11.977	-0.100	(0)
PbCl2	1.091e-13	1.091e-13	-12.962	-12.962	0.000	(0)
Pb(OH)3-	2.428e-14	1.930e-14	-13.615	-13.714	-0.100	(0)
PbF2	2.289e-15	2.289e-15	-14.640	-14.640	0.000	(0)
PbCl3-	1.231e-16	9.782e-17	-15.910	-16.010	-0.100	(0)
PbNO3+	1.658e-17	1.318e-17	-16.780	-16.880	-0.100	(0)
Pb(OH)4-2	1.438e-17	5.740e-18	-16.842	-17.241	-0.399	(0)
Pb2OH+3	7.023e-18	8.895e-19	-17.153	-18.051	-0.897	(0)
PbF3-	6.025e-19	4.789e-19	-18.220	-18.320	-0.100	(0)
PbCl4-2	2.523e-19	1.007e-19	-18.598	-18.997	-0.399	(0)

Pb3 (OH) 4+2	1.712e-21	6.834e-22	-20.766	-21.165	-0.399	(0)
PbF4-2	6.335e-23	2.529e-23	-22.198	-22.597	-0.399	(0)
Pb (NO3) 2	1.471e-25	1.471e-25	-24.833	-24.833	0.000	(0)
Pb4 (OH) 4+4	2.900e-26	7.363e-28	-25.538	-27.133	-1.595	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.456	-152.456	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.985	-230.085	-0.100	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.984	-73.984	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.829	-78.929	-0.100	(0)
CdHS+	0.000e+00	0.000e+00	-79.296	-79.395	-0.100	(0)
S5-2	0.000e+00	0.000e+00	-79.814	-80.212	-0.399	(0)
H2S	0.000e+00	0.000e+00	-79.991	-79.991	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.330	-80.728	-0.399	(0)
S4-2	0.000e+00	0.000e+00	-80.409	-80.808	-0.399	(0)
S3-2	0.000e+00	0.000e+00	-81.215	-81.614	-0.399	(0)
S2-2	0.000e+00	0.000e+00	-82.231	-82.630	-0.399	(0)
S-2	0.000e+00	0.000e+00	-87.845	-88.147	-0.302	(0)
HgHS2-	0.000e+00	0.000e+00	-139.053	-139.152	-0.100	(0)
HgS2-2	0.000e+00	0.000e+00	-139.380	-139.779	-0.399	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.840	-140.840	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.678	-148.040	-0.362	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.215	-0.203	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.426	-148.770	-0.344	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.686	-148.785	-0.100	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.714	-148.813	-0.100	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.202	-149.574	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.531	-149.885	-0.353	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.857	-150.857	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.120	-151.120	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.456	-152.456	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.620	-161.620	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.523	-218.622	-0.100	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.406	-226.506	-0.100	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.005	-228.404	-0.399	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.050	-228.149	-0.100	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.985	-230.085	-0.100	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.412	-238.512	-0.100	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.483	-304.882	-0.399	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.496	-306.895	-0.399	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.943	-322.342	-0.399	(0)
S (6)	1.246e-02					
SO4-2	9.587e-03	4.693e-03	-2.018	-2.329	-0.310	(0)
MgSO4	1.451e-03	1.451e-03	-2.838	-2.838	0.000	(0)
CaSO4	1.085e-03	1.085e-03	-2.965	-2.965	0.000	(0)
NaSO4-	2.145e-04	1.809e-04	-3.669	-3.743	-0.074	(0)
KSO4-	1.073e-04	9.044e-05	-3.970	-4.044	-0.074	(0)
MnSO4	1.442e-05	1.442e-05	-4.841	-4.841	0.000	(0)
ZnSO4	1.558e-06	1.558e-06	-5.807	-5.807	0.000	(0)
Zn (SO4) 2-2	1.595e-07	6.368e-08	-6.797	-7.196	-0.399	(0)
NiSO4	3.275e-08	3.275e-08	-7.485	-7.485	0.000	(0)
CoSO4	2.376e-08	2.376e-08	-7.624	-7.624	0.000	(0)
CuSO4	1.982e-08	1.982e-08	-7.703	-7.703	0.000	(0)
HSO4-	4.541e-09	3.800e-09	-8.343	-8.420	-0.077	(0)
CdSO4	3.690e-09	3.690e-09	-8.433	-8.433	0.000	(0)
NH4SO4-	2.134e-09	1.793e-09	-8.671	-8.746	-0.075	(0)
Cd (SO4) 2-2	5.853e-10	2.336e-10	-9.233	-9.631	-0.399	(0)
PbSO4	3.118e-10	3.118e-10	-9.506	-9.506	0.000	(0)
AgSO4-	1.590e-10	1.264e-10	-9.799	-9.898	-0.100	(0)
Pb (SO4) 2-2	2.209e-11	8.817e-12	-10.656	-11.055	-0.399	(0)
Ni (SO4) 2-2	1.275e-11	5.090e-12	-10.894	-11.293	-0.399	(0)
CrOHSO4	4.136e-12	4.136e-12	-11.383	-11.383	0.000	(0)
UO2SO4	3.418e-13	3.418e-13	-12.466	-12.466	0.000	(0)
FeSO4	2.236e-13	2.236e-13	-12.651	-12.651	0.000	(0)
UO2 (SO4) 2-2	5.297e-14	2.114e-14	-13.276	-13.675	-0.399	(0)
AlSO4+	3.035e-14	2.540e-14	-13.518	-13.595	-0.077	(0)
CrSO4+	1.927e-15	1.532e-15	-14.715	-14.815	-0.100	(0)
Al (SO4) 2-	1.526e-15	1.277e-15	-14.816	-14.894	-0.077	(0)
VO2SO4-	6.982e-19	5.550e-19	-18.156	-18.256	-0.100	(0)

FeSO4+	5.543e-20	4.659e-20	-19.256	-19.332	-0.075	(0)
Fe (SO4) 2-	5.881e-21	4.675e-21	-20.231	-20.330	-0.100	(0)
Cr2 (OH) 2SO4+2	3.479e-21	1.389e-21	-20.459	-20.857	-0.399	(0)
VOSO4	7.169e-22	7.169e-22	-21.145	-21.145	0.000	(0)
HgSO4	6.103e-22	6.103e-22	-21.214	-21.214	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.871e-22	3.871e-22	-21.412	-21.412	0.000	(0)
CrO3SO4-2	6.703e-24	2.676e-24	-23.174	-23.573	-0.399	(0)
VSO4+	1.075e-36	8.542e-37	-35.969	-36.068	-0.100	(0)
U (SO4) 2	1.080e-40	1.080e-40	-39.967	-39.967	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.139	-41.538	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Sb (3)	2.343e-20					
Sb (OH) 3	1.185e-20	1.185e-20	-19.926	-19.926	0.000	(0)
HSbO2	1.157e-20	1.157e-20	-19.937	-19.937	0.000	(0)
SbO2-	2.846e-24	2.262e-24	-23.546	-23.646	-0.100	(0)
Sb (OH) 4-	1.629e-24	1.295e-24	-23.788	-23.888	-0.100	(0)
Sb (OH) 2F	1.693e-26	1.693e-26	-25.771	-25.771	0.000	(0)
SbOF	1.666e-26	1.666e-26	-25.778	-25.778	0.000	(0)
Sb (OH) 2+	3.001e-27	2.386e-27	-26.523	-26.622	-0.100	(0)
SbO+	1.035e-27	8.230e-28	-26.985	-27.085	-0.100	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.943	-322.342	-0.399	(0)
Sb (5)	2.645e-08					
SbO3-	2.642e-08	2.100e-08	-7.578	-7.678	-0.100	(0)
Sb (OH) 6-	2.932e-11	2.452e-11	-10.533	-10.610	-0.078	(0)
SbO2+	5.206e-25	4.138e-25	-24.284	-24.383	-0.100	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.142e-39	9.080e-40	-38.942	-39.042	-0.100	(0)
MnSe	0.000e+00	0.000e+00	-41.108	-41.108	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.234	-43.234	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.561	-45.960	-0.399	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.623	-83.218	-1.595	(0)
Se (4)	1.329e-07					
HSeO3-	6.791e-08	5.398e-08	-7.168	-7.268	-0.100	(0)
SeO3-2	6.496e-08	2.593e-08	-7.187	-7.586	-0.399	(0)
H2SeO3	1.908e-13	1.908e-13	-12.719	-12.719	0.000	(0)
AgSeO3-	2.829e-14	2.249e-14	-13.548	-13.648	-0.100	(0)
Cd (SeO3) 2-2	4.657e-18	1.859e-18	-17.332	-17.731	-0.399	(0)
Ag (SeO3) 2-3	4.123e-20	5.221e-21	-19.385	-20.282	-0.897	(0)
FeHSeO3+2	3.161e-25	1.262e-25	-24.500	-24.899	-0.399	(0)
Se (6)	2.300e-10					
SeO4-2	2.295e-10	1.123e-10	-9.639	-9.949	-0.310	(0)
MnSeO4	5.224e-13	5.224e-13	-12.282	-12.282	0.000	(0)
ZnSeO4	2.640e-14	2.640e-14	-13.578	-13.578	0.000	(0)
NiSeO4	1.838e-15	1.838e-15	-14.736	-14.736	0.000	(0)
CoSeO4	1.428e-15	1.428e-15	-14.845	-14.845	0.000	(0)
CdSeO4	7.016e-17	7.016e-17	-16.154	-16.154	0.000	(0)
HSeO4-	5.870e-17	4.665e-17	-16.231	-16.331	-0.100	(0)
Zn (SeO4) 2-2	7.533e-24	3.007e-24	-23.123	-23.522	-0.399	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.399	-59.296	-0.897	(0)
U (4)	3.778e-19					
U (OH) 5-	3.777e-19	3.002e-19	-18.423	-18.523	-0.100	(0)
U (OH) 4	1.042e-22	1.042e-22	-21.982	-21.982	0.000	(0)
U (OH) 3+	3.976e-27	3.160e-27	-26.401	-26.500	-0.100	(0)
U (OH) 2+2	3.035e-32	1.211e-32	-31.518	-31.917	-0.399	(0)
UF3+	1.043e-36	8.288e-37	-35.982	-36.082	-0.100	(0)
UF2+2	1.188e-37	4.740e-38	-36.925	-37.324	-0.399	(0)
UOH+3	3.735e-38	4.731e-39	-37.428	-38.325	-0.897	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	2.695e-40	0.000e+00	-39.569	-40.467	-0.897	(0)
U (SO4) 2	1.080e-40	1.080e-40	-39.967	-39.967	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.259	-40.358	-0.100	(0)
USO4+2	0.000e+00	0.000e+00	-41.139	-41.538	-0.399	(0)
UF6-2	0.000e+00	0.000e+00	-41.437	-41.836	-0.399	(0)
U+4	0.000e+00	0.000e+00	-44.214	-45.809	-1.595	(0)
UCl+3	0.000e+00	0.000e+00	-45.859	-46.757	-0.897	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-162.715	-170.791	-8.077	(0)

U (5)	7.518e-16					
UO2+	7.518e-16	5.976e-16	-15.124	-15.224	-0.100	(0)
U (6)	3.702e-07					
UO2 (CO3) 3-4	2.665e-07	6.765e-09	-6.574	-8.170	-1.595	(0)
UO2 (CO3) 2-2	1.031e-07	4.114e-08	-6.987	-7.386	-0.399	(0)
UO2CO3	6.284e-10	6.284e-10	-9.202	-9.202	0.000	(0)
UO2OH+	9.254e-12	7.356e-12	-11.034	-11.133	-0.100	(0)
UO2F+	9.217e-13	7.326e-13	-12.035	-12.135	-0.100	(0)
UO2SO4	3.418e-13	3.418e-13	-12.466	-12.466	0.000	(0)
UO2F2	2.331e-13	2.331e-13	-12.632	-12.632	0.000	(0)
UO2+2	9.828e-14	4.811e-14	-13.008	-13.318	-0.310	(0)
UO2 (SO4) 2-2	5.297e-14	2.114e-14	-13.276	-13.675	-0.399	(0)
UO2F3-	8.126e-15	6.459e-15	-14.090	-14.190	-0.100	(0)
(UO2) 3 (OH) 5+	9.298e-16	7.391e-16	-15.032	-15.131	-0.100	(0)
(UO2) 2 (OH) 2+2	2.250e-16	8.980e-17	-15.648	-16.047	-0.399	(0)
UO2Cl+	2.211e-16	1.758e-16	-15.655	-15.755	-0.100	(0)
UO2F4-2	1.418e-17	5.659e-18	-16.848	-17.247	-0.399	(0)
UO2NO3+	7.934e-22	6.307e-22	-21.100	-21.200	-0.100	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.721	-43.820	-0.100	(0)
V+2	0.000e+00	0.000e+00	-45.016	-45.415	-0.399	(0)
V (3)	5.571e-16					
V (OH) 3	5.571e-16	5.571e-16	-15.254	-15.254	0.000	(0)
V (OH) 2+	3.755e-27	2.985e-27	-26.425	-26.525	-0.100	(0)
VOH+2	5.879e-31	2.347e-31	-30.231	-30.630	-0.399	(0)
V+3	3.044e-36	3.856e-37	-35.516	-36.414	-0.897	(0)
VSO4+	1.075e-36	8.542e-37	-35.969	-36.068	-0.100	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.805	-58.703	-0.897	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-58.864	-60.459	-1.595	(0)
V (4)	1.716e-19					
V (OH) 3+	1.690e-19	1.343e-19	-18.772	-18.872	-0.100	(0)
VO+2	1.389e-21	5.546e-22	-20.857	-21.256	-0.399	(0)
VOSO4	7.169e-22	7.169e-22	-21.145	-21.145	0.000	(0)
VOF+	4.616e-22	3.669e-22	-21.336	-21.435	-0.100	(0)
VOF2	1.518e-23	1.518e-23	-22.819	-22.819	0.000	(0)
VOC1+	4.409e-24	3.505e-24	-23.356	-23.455	-0.100	(0)
VOF3-	7.474e-26	5.941e-26	-25.126	-25.226	-0.100	(0)
VOF4-2	6.627e-29	2.645e-29	-28.179	-28.578	-0.399	(0)
H2V2O4+2	2.268e-33	9.051e-34	-32.644	-33.043	-0.399	(0)
V (5)	7.285e-09					
H2VO4-	4.543e-09	3.611e-09	-8.343	-8.442	-0.100	(0)
HVO4-2	2.742e-09	1.095e-09	-8.562	-8.961	-0.399	(0)
H3VO4	2.992e-13	2.992e-13	-12.524	-12.524	0.000	(0)
HV2O7-3	1.058e-14	1.340e-15	-13.976	-14.873	-0.897	(0)
H3V2O7-	8.781e-15	6.979e-15	-14.056	-14.156	-0.100	(0)
VO4-3	5.227e-15	6.620e-16	-14.282	-15.179	-0.897	(0)
V2O7-4	1.714e-16	4.352e-18	-15.766	-17.361	-1.595	(0)
VO2+	5.921e-18	4.953e-18	-17.228	-17.305	-0.078	(0)
VO2F	9.582e-19	9.582e-19	-18.019	-18.019	0.000	(0)
VO2SO4-	6.982e-19	5.550e-19	-18.156	-18.256	-0.100	(0)
V3O9-3	3.899e-19	4.938e-20	-18.409	-19.306	-0.897	(0)
VO2F2-	4.828e-20	3.838e-20	-19.316	-19.416	-0.100	(0)
VO2F3-2	1.323e-22	5.281e-23	-21.878	-22.277	-0.399	(0)
V4O12-4	2.929e-24	7.437e-26	-23.533	-25.129	-1.595	(0)
VO2F4-3	2.263e-26	2.866e-27	-25.645	-26.543	-0.897	(0)
VO2NO3	1.646e-26	1.646e-26	-25.784	-25.784	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.252	-67.842	-3.590	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.244	-67.737	-2.493	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.015	-70.611	-1.595	(0)
Zn	5.434e-06					
Zn+2	3.099e-06	1.517e-06	-5.509	-5.819	-0.310	(0)
ZnSO4	1.558e-06	1.558e-06	-5.807	-5.807	0.000	(0)
ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
ZnOH+	2.318e-07	1.843e-07	-6.635	-6.735	-0.100	(0)
Zn (SO4) 2-2	1.595e-07	6.368e-08	-6.797	-7.196	-0.399	(0)
Zn (OH) 2	3.547e-08	3.547e-08	-7.450	-7.450	0.000	(0)
ZnHCO3+	3.501e-08	2.783e-08	-7.456	-7.556	-0.100	(0)
ZnOHCl	1.365e-08	1.365e-08	-7.865	-7.865	0.000	(0)

ZnCl+	1.031e-08	8.585e-09	-7.987	-8.066	-0.079	(0)
ZnF+	4.201e-09	3.340e-09	-8.377	-8.476	-0.100	(0)
Zn (OH) 3-	2.716e-10	2.159e-10	-9.566	-9.666	-0.100	(0)
ZnCl2	3.065e-11	3.065e-11	-10.514	-10.514	0.000	(0)
ZnCl3-	6.583e-14	5.484e-14	-13.182	-13.261	-0.079	(0)
ZnNO3+	3.150e-14	2.504e-14	-13.502	-13.601	-0.100	(0)
ZnSeO4	2.640e-14	2.640e-14	-13.578	-13.578	0.000	(0)
Zn (OH) 4-2	2.615e-14	1.044e-14	-13.583	-13.981	-0.399	(0)
ZnCl4-2	1.238e-16	6.177e-17	-15.907	-16.209	-0.302	(0)
Zn (NO3) 2	3.282e-23	3.282e-23	-22.484	-22.484	0.000	(0)
Zn (SeO4) 2-2	7.533e-24	3.007e-24	-23.123	-23.522	-0.399	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.686	-148.785	-0.100	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.857	-150.857	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.406	-226.506	-0.100	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.005	-228.404	-0.399	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.496	-306.895	-0.399	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-57.44	-51.15	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-44.59	-40.08	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-51.81	-40.08	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-73.98	-56.05	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-59.48	-39.44	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.37	-28.97	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-25.30	-24.85	0.45	(NH4) 2SeO4
Acanthite	-52.37	-88.59	-36.22	Ag2S
Ag2CO3	-12.13	-23.22	-11.09	Ag2CO3
Ag2CrO4	-20.22	-31.81	-11.59	Ag2CrO4
Ag2HVO4	-12.28	-10.80	1.48	Ag2HVO4
Ag2MoO4	-12.23	-23.78	-11.55	Ag2MoO4
Ag2O	-14.15	-1.58	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.25	-20.07	-4.82	Ag2SO4
Ag3AsO3	-28.39	-26.23	2.16	Ag3AsO3
Ag3AsO4	-16.80	-19.59	-2.79	Ag3AsO4
Ag3H2VO5	-16.77	-11.59	5.18	Ag3H2VO5
AgF:4H2O	-13.88	-12.83	1.05	AgF:4H2O
Agmetal	-0.05	-13.56	-13.51	Ag
AgVO3	-10.78	-10.01	0.77	AgVO3
Al (OH) 3 (am)	-1.71	9.09	10.80	Al (OH) 3
Al2 (MoO4) 3	-50.79	-48.42	2.37	Al2 (MoO4) 3
Al2O3	-1.48	18.18	19.65	Al2O3
Al4 (OH) 10SO4	-4.84	17.86	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.93	-8.13	4.80	AlAsO4:2H2O
AlOHSO4	-6.17	-9.40	-3.23	AlOHSO4
AlSb	-153.10	-87.47	65.62	AlSb
Alunite	-2.80	-4.20	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.41	-12.20	-7.79	PbSO4
Anhydrite	-0.96	-5.32	-4.36	CaSO4
Anilite	-55.51	-87.38	-31.88	Cu0.25Cu1.5S
Antlerite	-1.99	6.79	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.72	-95.48	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-41.15	-34.44	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2 (OH) 3Cl
Azurite	-1.10	-18.01	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.88	8.51	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.30	-1.42	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.85	7.09	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.06	-21.73	-9.67	BaCrO4
BaF2	-9.75	-15.57	-5.82	BaF2

BaMoO4	-6.73	-13.69	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.67	-6.84	1.83	BaSeO3
BaSeO4	-10.14	-17.60	-7.46	BaSeO4
Bianchite	-6.38	-8.15	-1.76	ZnSO4:6H2O
Birnessite	-6.50	11.60	18.09	MnO2
Bixbyite	-1.71	-2.35	-0.64	Mn2O3
BlaubleiI	-55.59	-79.76	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.00	-83.28	-27.28	Cu0.6Cu0.8S
Boehmite	0.51	9.09	8.58	AlOOH
Breithauptite	-56.56	-75.08	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.45	13.39	16.84	Mg(OH)2
Bunsenite	-3.74	8.71	12.45	NiO
Ca(VO3)2	-10.94	-5.28	5.66	Ca(VO3)2
Ca2V2O7	-9.61	7.89	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.67	7.89	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.24	5.06	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.91	21.05	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.81	21.05	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.59	-153.62	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.58	-26.49	-17.91	Hg2Cl2
CaMoO4	-1.08	-9.03	-7.95	CaMoO4
Carnotite	-1.09	-0.86	0.23	KUO2VO4
CaSeO3:2H2O	-5.00	-2.18	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.93	-12.95	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.33	-1.49	9.84	Cd(BO2)2
Cd(OH)2	-5.96	7.69	13.64	Cd(OH)2
Cd(OH)2(am)	-6.04	7.69	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.63	-13.92	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.99	4.57	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.14	12.26	28.40	Cd4(OH)6SO4
CdCl2	-13.11	-13.77	-0.66	CdCl2
CdCl2:1H2O	-12.08	-13.77	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.86	-13.77	-1.91	CdCl2:2.5H2O
CdF2	-15.18	-16.39	-1.21	CdF2
Cdmetal(alpha)	-31.37	-17.86	13.51	Cd
Cdmetal(gamma)	-31.47	-17.86	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-6.58	-3.04	3.54	CdOHCl
CdSb	-75.75	-76.10	-0.35	CdSb
CdSe	-19.23	-39.43	-20.20	CdSe
CdSeO4:2H2O	-16.57	-18.42	-1.85	CdSeO4:2H2O
CdSO4	-10.63	-10.80	-0.17	CdSO4
CdSO4:1H2O	-9.08	-10.80	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.93	-10.80	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.77	-11.52	-9.75	AgCl
Cerrusite	-2.22	-15.35	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.42	-10.06	-2.64	CuSO4:5H2O
Chalcocite	-55.40	-90.32	-34.92	Cu2S
Chalcopyrite	-126.87	-162.14	-35.27	CuFeS2
Cinnabar	-52.65	-98.35	-45.69	HgS
Claudetite	-92.41	-95.48	-3.06	As4O6
Clausthalite	-13.73	-40.83	-27.10	PbSe
Co(BO2)2	-27.68	-0.61	27.07	Co(BO2)2
Co(OH)2	-4.53	8.57	13.09	Co(OH)2
Co(OH)3	-8.75	-11.06	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.78	-8.74	13.03	Co3(AsO4)2
Co3O4	-3.06	-13.55	-10.50	Co3O4
CoCl2	-21.16	-12.89	8.27	CoCl2
CoCl2:6H2O	-15.43	-12.89	2.54	CoCl2:6H2O
CoCO3	-3.10	-13.08	-9.98	CoCO3
CoF2	-13.91	-15.51	-1.60	CoF2

CoF3	-45.72	-47.18	-1.46	CoF3
CoFe2O4	18.48	14.95	-3.53	CoFe2O4
CoMoO4	-5.87	-13.63	-7.76	CoMoO4
CoO	-5.02	8.57	13.59	CoO
CoS (alpha)	-71.00	-78.44	-7.44	CoS
CoS (beta)	-67.37	-78.44	-11.07	CoS
CoSe	-22.36	-38.56	-16.20	CoSe
CoSeO3	-8.10	-6.78	1.32	CoSeO3
CoSeO4:6H2O	-16.02	-17.55	-1.53	CoSeO4:6H2O
CoSO4	-12.73	-9.92	2.80	CoSO4
CoSO4:6H2O	-7.45	-9.93	-2.47	CoSO4:6H2O
Cotunnite	-10.38	-15.16	-4.78	PbCl2
Covellite	-56.28	-78.58	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.55	-32.46	14.09	CrCl2
CrCl3	-48.48	-33.37	15.11	CrCl3
CrF3	-25.96	-37.30	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.49	-45.33	-33.84	Na3AlF6
Cu (OH) 2	-0.25	8.43	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.54	19.67	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.66	0.59	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.90	-89.79	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.63	-50.43	-45.80	Cu2Se
Cu2SO4	-19.85	-21.80	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.26	-9.16	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-25.63	-89.13	-63.49	Cu3Se2
CuCO3	-1.72	-13.22	-11.50	CuCO3
CuCrO4	-16.37	-21.81	-5.44	CuCrO4
CuF	-8.79	-13.69	-4.91	CuF
CuF2	-16.76	-15.65	1.12	CuF2
CuF2:2H2O	-11.10	-15.65	-4.55	CuF2:2H2O
Cumetal	-5.67	-14.43	-8.76	Cu
CuMoO4	-0.69	-13.77	-13.08	CuMoO4
CuOCuSO4	-11.94	-1.63	10.30	CuOCuSO4
Cupricferrite	8.82	14.81	5.99	CuFe2O4
Cuprite	-1.90	-3.31	-1.41	Cu2O
Cuprousferrite	10.45	1.54	-8.92	CuFeO2
CuSe	-5.59	-38.69	-33.10	CuSe
CuSe2	-26.91	-60.27	-33.37	CuSe2
CuSeO3:2H2O	-7.43	-6.92	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.25	-17.69	-2.44	CuSeO4:5H2O
CuSO4	-13.00	-10.06	2.94	CuSO4
Diaspore	2.21	9.09	6.87	AlOOH
Djurleite	-55.62	-89.54	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.97	-5.10	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.01	-0.03	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-11.28	-15.00	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.52	-8.97	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.04	-39.67	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.36	-49.09	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-14.43	-14.03	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.66	-18.75	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.65	-65.25	-18.60	FeSe2
FeS (ppt)	-80.61	-83.56	-2.95	FeS
FeSe	-32.67	-43.67	-11.00	FeSe
Fix_pe	-4.69	-4.69	0.00	e-

Fluorite	-0.41	-10.91	-10.50	CaF2
Galena	-66.74	-80.71	-13.97	PbS
Gibbsite	0.80	9.09	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.14	-8.15	-2.01	ZnSO4:7H2O
Greenockite	-64.96	-79.32	-14.36	CdS
Greigite	-293.17	-338.21	-45.03	Fe3S4
Gummite	-4.83	2.85	7.67	UO3
Gypsum	-0.72	-5.33	-4.61	CaSO4:2H2O
H-Jarosite	-15.31	-27.41	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.32	-22.20	-12.88	H2MoO4
H2S(g)	-79.00	-87.01	-8.01	H2S
H2Se(g)	-42.16	-47.12	-4.96	H2Se
Halite	-6.39	-4.79	1.60	NaCl
Hausmannite	-1.28	59.75	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.27	21.63	22.89	FeAl2O4
Hg(CH3)2(g)	-185.28	-258.99	-73.71	Hg(CH3)2
Hg(g)	-7.41	-15.29	-7.87	Hg
Hg(OH)2	-7.84	-11.34	-3.50	Hg(OH)2
Hg2(g)	-15.62	-30.57	-14.96	Hg2
Hg2(OH)2	-10.29	-5.03	5.26	Hg2(OH)2
Hg2CO3	-10.63	-26.68	-16.05	Hg2CO3
Hg2CrO4	-26.57	-35.27	-8.70	Hg2CrO4
Hg2F2	-18.74	-29.11	-10.36	Hg2F2
Hg2S	-80.36	-92.04	-11.68	Hg2S
Hg2SeO3	-15.72	-20.38	-4.66	Hg2SeO3
Hg2SO4	-17.39	-23.52	-6.13	Hg2SO4
Hg3O2CO3	-25.97	-55.65	-29.68	Hg3O2CO3
HgCl(g)	-32.74	-13.24	19.50	HgCl
HgCl2	-11.53	-32.79	-21.26	HgCl2
HgF(g)	-47.23	-14.55	32.68	HgF
HgF2(g)	-47.98	-35.41	12.57	HgF2
Hgmetal(l)	-1.84	-15.29	-13.45	Hg
HgSe	-2.76	-58.46	-55.69	HgSe
HgSeO3	-14.25	-26.68	-12.43	HgSeO3
HgSO4	-20.41	-29.83	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.64	-24.41	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.86	-19.62	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-17.21	-22.38	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-7.09	-21.89	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.20	-49.44	-17.24	K2Cr2O7
K2CrO4	-18.69	-19.20	-0.51	K2CrO4
K2MoO4	-14.43	-11.17	3.26	K2MoO4
K2SeO4	-14.35	-15.08	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.47	-5.90	-0.43	PbO:PbSO4
Laurionite	-5.06	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.40	6.30	12.69	PbO
Mackinawite	-79.96	-83.56	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.52	-4.79	-5.31	Cu2(OH)2CO3
Manganite	-1.17	24.17	25.34	MnOOH
Massicot	-6.60	6.30	12.89	PbO
Matlockite	-7.50	-16.47	-8.97	PbClF
Melanothallite	-19.29	-13.03	6.26	CuCl2
Melanterite	-12.83	-15.04	-2.21	FeSO4:7H2O
Metacinnabar	-53.25	-98.35	-45.09	HgS
Mg(OH)2(active)	-5.40	13.39	18.79	Mg(OH)2
Mg(VO3)2	-16.33	-5.05	11.28	Mg(VO3)2
Mg2Sb3	-273.72	-199.03	74.68	Mg2Sb3
Mg2V2O7	-18.02	8.34	26.36	Mg2V2O7

MgCr2O4	-5.17	11.04	16.20	MgCr2O4
MgCrO4	-22.22	-16.84	5.38	MgCrO4
MgF2	-2.55	-10.68	-8.13	MgF2
MgMoO4	-6.96	-8.81	-1.85	MgMoO4
MgSeO3:6H2O	-5.01	-1.96	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.52	-12.72	-1.20	MgSeO4:6H2O
Minium	-29.09	44.43	73.52	Pb3O4
Mirabilite	-5.51	-6.62	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.95	-7.05	4.90	Mn(VO3)2
Mn2(SO4)3	-52.12	-57.83	-5.71	Mn2(SO4)3
Mn2Sb	-147.61	-86.53	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.75	-0.25	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.77	-10.06	2.72	MnCl2:4H2O
MnS(grn)	-75.78	-75.61	0.17	MnS
MnS(pnk)	-78.95	-75.61	3.34	MnS
MnSb	-94.83	-97.74	-2.91	MnSb
MnSe	-39.22	-35.72	3.50	MnSe
MnSeO3	-5.08	-3.95	1.13	MnSeO3
MnSeO3:2H2O	-4.93	-3.95	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.66	-14.71	-2.05	MnSeO4:5H2O
MnSO4	-9.67	-7.09	2.58	MnSO4
Monteponite	-7.41	7.69	15.10	CdO
Montroydite	-7.69	-11.33	-3.64	HgO
MoO3	-14.20	-22.20	-8.00	MoO3
Morenosite	-7.64	-9.79	-2.14	NiSO4:7H2O
MoS2	-151.50	-221.76	-70.26	MoS2
Na-Jarosite	-10.27	-21.47	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.71	-48.60	-9.90	Na2Cr2O7
Na2CrO4	-21.29	-18.36	2.93	Na2CrO4
Na2Mo2O7	-15.93	-32.52	-16.60	Na2Mo2O7
Na2MoO4	-11.81	-10.32	1.49	Na2MoO4
Na2MoO4:2H2O	-11.55	-10.32	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.78	-3.48	10.30	Na2SeO3:5H2O
Na2SeO4	-15.52	-14.24	1.28	Na2SeO4
Na3Sb	-173.20	-78.75	94.45	Na3Sb
Na3VO4	-28.09	8.59	36.68	Na3VO4
Na4V2O7	-32.10	5.30	37.40	Na4V2O7
Nantokite	-5.65	-12.38	-6.73	CuCl
NaSb	-88.24	-65.08	23.17	NaSb
Natron	-8.46	-9.77	-1.31	Na2CO3:10H2O
NaVO3	-7.14	-3.29	3.86	NaVO3
Nesquehonite	-3.58	-8.25	-4.67	MgCO3:3H2O
Ni(OH)2	-4.09	8.71	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.03	-8.33	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.67	16.33	32.00	Ni4(OH)6SO4
NiCO3	-6.07	-12.94	-6.87	NiCO3
NiMoO4	-2.35	-13.49	-11.14	NiMoO4
NiS(alpha)	-72.70	-78.30	-5.60	NiS
NiS(beta)	-67.20	-78.30	-11.10	NiS
NiS(gamma)	-65.50	-78.30	-12.80	NiS
NiSe	-20.72	-38.42	-17.70	NiSe
NiSeO3:2H2O	-9.46	-6.64	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.89	-17.41	-1.52	NiSeO4:6H2O
Nsutite	-5.91	11.60	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-247.70	-308.77	-61.07	As2S3
Otavite	-1.96	-13.96	-12.00	CdCO3
Pb(BO2)2	-9.40	-2.88	6.52	Pb(BO2)2
Pb(OH)2	-1.85	6.30	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.17	-66.93	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.93	1.86	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.60	12.59	26.19	Pb2O(OH)2
Pb2O3	-22.90	38.14	61.04	Pb2O3
Pb2OCO3	-8.50	-9.06	-0.56	Pb2OCO3
Pb2V2O7	-3.96	-5.86	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.36	-15.56	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.70	0.44	6.14	Pb3(VO4)2
Pb3O2CO3	-13.78	-2.76	11.02	Pb3O2CO3

Pb3O2SO4	-10.29	0.39	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-14.41	6.69	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-15.19	6.69	21.88	Pb4O3SO4
PbCrO4	-11.34	-23.94	-12.60	PbCrO4
PbF2	-10.34	-17.78	-7.44	PbF2
Pbmetal	-23.50	-19.25	4.25	Pb
PbMoO4	-0.28	-15.90	-15.62	PbMoO4
PbO:0.3H2O	-6.68	6.30	12.98	PbO:0.33H2O
PbSeO4	-12.98	-19.82	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl2:PbCO3
Plattnerite	-17.76	31.84	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.52	-145.02	-18.51	FeS2
Pyrochroite	-3.79	11.40	15.19	Mn (OH) 2
Pyrolusite	-4.43	36.95	41.38	MnO2
Realgar	-103.90	-123.65	-19.75	AsS
Retgersite	-7.75	-9.79	-2.04	NiSO4:6H2O
Rhodochrosite	0.33	-10.25	-10.58	MnCO3
Rutherfordine	-4.30	-18.80	-14.50	UO2CO3
Sb (OH) 3	-12.82	-19.93	-7.11	Sb (OH) 3
Sb2O4	-17.71	-14.31	3.40	Sb2O4
Sb2O5	-27.72	-37.38	-9.67	Sb2O5
Sb2Se3	-113.46	-181.22	-67.76	Sb2Se3
Sb4O6 (cubic)	-61.44	-79.70	-18.26	Sb4O6
Sb4O6 (orth)	-61.80	-79.70	-17.90	Sb4O6
SbCl3	-52.68	-52.11	0.57	SbCl3
SbF3	-45.82	-56.04	-10.23	SbF3
Sbmetal	-46.55	-58.24	-11.69	Sb
SbO2	-3.64	-31.46	-27.82	SbO2
Schoepite	-3.15	2.84	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.47	-21.58	-7.11	Se
Semetal (hex)	-13.87	-21.58	-7.71	Se
Senarmontite	-27.49	-39.85	-12.37	Sb2O3
SeO2	-15.47	-15.35	0.12	SeO2
SeO3	-47.16	-26.11	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.30	-11.30	-10.00	ZnCO3
Sphalerite	-65.22	-76.67	-11.45	ZnS
Spinel	-5.28	31.57	36.85	MgAl2O4
Stibnite	-250.42	-300.88	-50.46	Sb2S3
Sulfur	-59.32	-61.47	-2.14	S
Tenorite	0.78	8.43	7.64	CuO
Thenardite	-6.94	-6.62	0.32	Na2SO4
Thermonatrite	-10.41	-9.77	0.64	Na2CO3:H2O
Tyuyamunite	-3.67	0.41	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.44	10.64	21.08	U3O8
U3Sb4	-579.07	-426.69	152.38	U3Sb4
U4O9	-25.37	-28.39	-3.02	U4O9
UF4	-32.10	-61.64	-29.54	UF4
UF4:2.5H2O	-28.92	-61.64	-32.72	UF4:2.5H2O
UO2 (am)	-14.42	-13.48	0.93	UO2
UO2 (NO3) 2	-41.83	-29.68	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.53	-29.68	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.07	-29.68	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.73	-29.68	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.77	2.85	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.02	-23.27	-2.25	UO2SeO4:4H2O
UO3	-4.85	2.85	7.70	UO3
Uraninite	-8.81	-13.48	-4.67	UO2
USb2	-219.85	-190.27	29.58	USb2
V (OH) 3	-19.76	-12.17	7.59	V (OH) 3
V2O5	-17.09	-18.45	-1.36	V2O5
V3O5	-42.66	-40.82	1.84	V3O5
V4O7	-53.10	-45.92	7.19	V4O7
V6O13	-45.57	-106.43	-60.86	V6O13
Valentinite	-31.37	-39.85	-8.48	Sb2O3
VCl2	-65.27	-46.40	18.87	VCl2

VC13	-67.79	-44.36	23.43	VC13
VF4	-68.18	-53.25	14.93	VF4
Vmetal	-94.51	-50.49	44.03	V
VO	-39.70	-24.94	14.76	VO
VO(OH)2	-10.24	-5.09	5.15	VO(OH)2
VO2Cl	-22.79	-19.95	2.84	VO2Cl
VOC1	-34.05	-22.90	11.15	VOC1
VOC12	-39.31	-26.55	12.76	VOC12
VOSO4	-27.19	-23.58	3.61	VOSO4
Witherite	-4.57	-13.14	-8.57	BaCO3
Wurtzite	-67.72	-76.67	-8.95	ZnS
Zincite	-0.99	10.34	11.33	ZnO
Zincosite	-12.08	-8.15	3.93	ZnSO4
Zn(BO2)2	-7.12	1.17	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.50	-22.19	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.86	10.34	12.20	Zn(OH)2
Zn(OH)2(am)	-2.13	10.34	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.41	10.34	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.19	10.34	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.39	10.34	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.30	2.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.23	9.96	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.06	-3.41	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.86	-5.95	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.52	22.88	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.24	30.26	38.50	Zn5(OH)8Cl2
ZnCl2	-18.16	-11.11	7.05	ZnCl2
ZnCO3:1H2O	-1.04	-11.30	-10.26	ZnCO3:1H2O
ZnF2	-13.20	-13.73	-0.53	ZnF2
Znmetal	-40.99	-15.20	25.79	Zn
ZnMoO4	-1.73	-11.85	-10.13	ZnMoO4
ZnO(active)	-0.84	10.34	11.19	ZnO
ZnS(am)	-67.61	-76.67	-9.05	ZnS
ZnSb	-84.46	-73.44	11.01	ZnSb
ZnSe	-22.38	-36.78	-14.40	ZnSe
ZnSeO4:6H2O	-14.25	-15.77	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.51	-8.15	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 50.

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Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 205
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 205
USE Surface 205
USE Solution 214
SAVE Solution 215  #Initial Stage 2 Pit Water After Mineral Precipitation
and Sorption Loss
END
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TITLE
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Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 205.

Diffuse Double Layer Surface-Complexation Model

Hfo

3.769e-20 Surface + diffuse layer charge, eq
3.178e-12 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.971e-05 m² for 1.086e-09 moles of Ferrihydrite

Water in diffuse layer: 6.971e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is +1).

Element	Moles
C	1.7808e-15
Ca	2.2071e-17
Cl	3.5661e-14
H	5.2534e-15
K	3.5012e-17
Mg	3.4194e-18
N	1.4437e-13
Na	1.4834e-16
O	6.4348e-12
S	1.4994e-12

Hfo_s

Species	Moles	Mole Fraction	Molality	Log Molality
5.429e-12 moles [0.005 mol/(mol Ferrihydrite)]				
Hfo_sOH2+	3.629e-12	0.668	3.629e-12	-11.440
Hfo_sOH	1.780e-12	0.328	1.780e-12	-11.750
Hfo_sO-	2.000e-14	0.004	2.000e-14	-13.699
Hfo_sOHCa+2	6.625e-17	0.000	6.625e-17	-16.179

Hfo_w

Species	Moles	Mole Fraction	Molality	Log Molality
2.172e-10 moles [0.2 mol/(mol Ferrihydrite)]				
Hfo_wOH2+	1.003e-10	0.462	1.003e-10	-9.999
Hfo_wOH	4.921e-11	0.227	4.921e-11	-10.308
Hfo_wSO4-	3.389e-11	0.156	3.389e-11	-10.470
Hfo_wOHSO4-2	3.317e-11	0.153	3.317e-11	-10.479
Hfo_wO-	5.529e-13	0.003	5.529e-13	-12.257
Hfo_wOMg+	7.815e-19	0.000	7.815e-19	-18.107
Hfo_wOCa+	2.651e-19	0.000	2.651e-19	-18.577

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),

but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 214. Solution after simulation 49.
 Using surface 205.
 Using pure phase assemblage 205. Pure-phase assemblage after simulation 49.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	4.776e-09	4.776e-09	-2.489e-14
Alunite	-2.80	-4.20	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.96	-5.32	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	5.009e-11	4.961e-11	-4.798e-13
Barite	0.00	-9.98	-9.98	4.211e-08	4.211e-08	1.439e-12
Brochantite	0.00	15.22	15.22	6.931e-09	6.913e-09	-1.791e-11
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.184e-10
CaMoO4	-1.08	-9.03	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-5.00	-2.18	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.104e-03	1.104e-03	-1.062e-10
Carnotite	-1.09	-0.86	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.33	-1.49	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.36	-14.51	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.236e-10	6.234e-10	-1.224e-13
Cu2Se(alpha)	-4.63	-50.43	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.69	-13.77	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.97	-5.10	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.086e-09	1.086e-09	-6.501e-18
Fluorite	-0.41	-10.91	-10.50	0.000e+00	0	0.000e+00
Gummite	-4.83	2.85	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.72	-5.33	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.76	-58.46	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.51	-6.62	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.08	-3.95	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.09	8.71	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-24.03	-8.33	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.07	-12.94	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.35	-13.49	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	3.908e-14
Otavite	-1.96	-13.96	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.28	-15.90	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.30	-18.80	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.64	-31.46	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.15	2.84	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.67	0.41	4.08	0.000e+00	0	0.000e+00
U3O8	-10.44	10.64	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.77	2.85	5.61	0.000e+00	0	0.000e+00
UO3	-4.85	2.85	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.73	-11.85	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

6.339e-25 Surface + diffuse layer charge, eq
1.111e-11 Surface charge, eq
1.537e-02 sigma, C/m²
3.228e-02 psi, V
-1.256e+00 -F*psi/RT
2.847e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.971e-05 m² for 1.086e-09 moles of Ferrihydrite

Water in diffuse layer: 6.971e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 5.081e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.205e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	6.6938e-18
Al	3.0868e-15
As	1.4737e-19
B	1.9826e-14
Ba	2.1504e-17
C	6.2406e-13
Ca	1.7360e-12
Cd	7.1508e-18
Cl	2.2879e-12
Co	4.8888e-17
Cr	6.0508e-19
Cu	3.5017e-16
F	1.2765e-13
Fe	5.6952e-19
H	6.8750e-13
Hg	1.3321e-18
K	1.9527e-12
Mg	2.6653e-12
Mn	3.0625e-14
Mo	1.9480e-15
N	7.2071e-15
Na	5.0923e-12
Ni	6.1800e-17
O	4.9884e-11
Pb	1.6946e-18
S	1.1979e-11
Sb	2.2469e-17
Se	1.2519e-16
U	5.1692e-16
V	6.6714e-18
Zn	3.1010e-15

Hfo_s

5.429e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	1.811e-12	0.334	1.811e-12	-11.742
Hfo_sOCu+	1.748e-12	0.322	1.748e-12	-11.758
Hfo_sOMn+	8.403e-13	0.155	8.402e-13	-12.076
Hfo_sOPb+	7.399e-13	0.136	7.398e-13	-12.131
Hfo_sOCrOH+	2.448e-13	0.045	2.448e-13	-12.611
Hfo_sOHCa+2	2.714e-14	0.005	2.714e-14	-13.566
Hfo_sONi+	1.002e-14	0.002	1.002e-14	-13.999
Hfo_sOH	3.556e-15	0.001	3.556e-15	-14.449
Hfo_sO-	1.771e-15	0.000	1.771e-15	-14.752
Hfo_sOCd+	1.209e-15	0.000	1.209e-15	-14.917
Hfo_sOCo+	1.075e-15	0.000	1.075e-15	-14.969
Hfo_sOH2+	1.636e-16	0.000	1.636e-16	-15.786

Hfo_sOAg	1.103e-17	0.000	1.103e-17	-16.957
Hfo_sOHBa+2	1.855e-18	0.000	1.854e-18	-17.732
Hfo_sOFe+	1.188e-19	0.000	1.188e-19	-18.925
Hfo_sOHg+	3.460e-21	0.000	3.459e-21	-20.461

Hfo_w

2.172e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	6.991e-11	0.322	6.991e-11	-10.155
Hfo_wOMg+	4.066e-11	0.187	4.065e-11	-10.391
Hfo_wOHVO4-3	2.944e-11	0.136	2.944e-11	-10.531
Hfo_wOH	2.773e-11	0.128	2.773e-11	-10.557
Hfo_wOZn+	1.479e-11	0.068	1.479e-11	-10.830
Hfo_wO-	1.381e-11	0.064	1.381e-11	-10.860
Hfo_wOHSO4-2	9.901e-12	0.046	9.901e-12	-11.004
Hfo_wOMn+	5.206e-12	0.024	5.205e-12	-11.284
Hfo_wOCa+	1.358e-12	0.006	1.358e-12	-11.867
Hfo_wOHSeO3-2	1.312e-12	0.006	1.312e-12	-11.882
Hfo_wOH2+	1.276e-12	0.006	1.276e-12	-11.894
Hfo_wOHAsO4-3	9.595e-13	0.004	9.594e-13	-12.018
Hfo_wOPb+	2.578e-13	0.001	2.577e-13	-12.589
Hfo_wSO4-	2.284e-13	0.001	2.284e-13	-12.641
Hfo_wONi+	1.054e-13	0.000	1.054e-13	-12.977
Hfo_wSeO3-	1.026e-13	0.000	1.026e-13	-12.989
Hfo_wOHMoO4-2	7.915e-14	0.000	7.915e-14	-13.102
Hfo_wOCu+	2.362e-14	0.000	2.362e-14	-13.627
Hfo_wOCd+	4.023e-15	0.000	4.023e-15	-14.395
Hfo_wH2BO3	2.979e-15	0.000	2.979e-15	-14.526
Hfo_wMoO4-	2.352e-15	0.000	2.352e-15	-14.629
Hfo_wHAsO4-	4.548e-17	0.000	4.547e-17	-16.342
Hfo_wOAg	2.263e-17	0.000	2.263e-17	-16.645
Hfo_wOBa+	1.341e-18	0.000	1.341e-18	-17.872
Hfo_wOHg+	1.322e-18	0.000	1.321e-18	-17.879
Hfo_wOFe+	5.848e-19	0.000	5.847e-19	-18.233
Hfo_wOHSeO4-2	2.425e-19	0.000	2.425e-19	-18.615
Hfo_wH2AsO4	6.769e-20	0.000	6.769e-20	-19.170
Hfo_wOHSbO(OH) 4-	4.769e-20	0.000	4.768e-20	-19.322
Hfo_wOHCrO4-2	2.288e-20	0.000	2.288e-20	-19.641
Hfo_wSeO4-	4.872e-21	0.000	4.872e-21	-20.312
Hfo_wSbO(OH) 4	1.417e-21	0.000	1.417e-21	-20.849
Hfo_wCrO4-	4.814e-22	0.000	4.813e-22	-21.318
Hfo_wH2AsO3	9.635e-30	0.000	9.634e-30	-29.016

-----Solution composition-----

Elements	Molality	Moles
Ag	9.519e-09	9.520e-09
Al	3.637e-06	3.638e-06
As	1.432e-10	1.433e-10
B	2.801e-05	2.801e-05
Ba	4.576e-08	4.577e-08
C	7.449e-04	7.450e-04
Ca	3.166e-03	3.167e-03
Cd	1.238e-08	1.239e-08
Cl	2.693e-03	2.693e-03
Co	9.136e-08	9.136e-08
Cr	9.876e-10	9.877e-10
Cu	5.264e-07	5.265e-07
F	1.591e-04	1.591e-04
Fe	8.744e-10	8.744e-10
Hg	1.911e-09	1.911e-09
K	3.362e-03	3.362e-03
Mg	4.964e-03	4.964e-03
Mn	5.815e-05	5.816e-05
Mo	1.881e-06	1.882e-06

N	8.498e-06	8.499e-06
Na	8.798e-03	8.798e-03
Ni	1.127e-07	1.128e-07
Pb	2.605e-09	2.605e-09
S	1.246e-02	1.246e-02
Sb	2.645e-08	2.645e-08
Se	1.331e-07	1.331e-07
U	3.702e-07	3.702e-07
V	7.256e-09	7.256e-09
Zn	5.434e-06	5.434e-06

-----Description of solution-----

	pH	=	8.082	Charge balance
	pe	=	4.691	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	3.822e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	7.729e-04	
	Total CO2 (mol/kg)	=	7.449e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.006e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.110236e+02	
	Total O	=	5.556357e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.465e-06	1.214e-06	-5.834	-5.916	-0.081	(0)
H+	9.907e-09	8.286e-09	-8.004	-8.082	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	9.519e-09					
AgCl	6.206e-09	6.206e-09	-8.207	-8.207	0.000	(0)
Ag+	1.613e-09	1.349e-09	-8.792	-8.870	-0.078	(0)
AgCl2-	1.532e-09	1.218e-09	-8.815	-8.914	-0.100	(0)
AgSO4-	1.590e-10	1.264e-10	-9.799	-9.898	-0.100	(0)
AgCl3-2	6.124e-12	2.444e-12	-11.213	-11.612	-0.399	(0)
AgNO2	1.963e-12	1.963e-12	-11.707	-11.707	0.000	(0)
AgF	3.739e-13	3.739e-13	-12.427	-12.427	0.000	(0)
AgOH	1.639e-13	1.639e-13	-12.785	-12.785	0.000	(0)
AgCl4-3	8.877e-14	1.124e-14	-13.052	-13.949	-0.897	(0)
AgH2BO3	3.860e-14	3.860e-14	-13.413	-13.413	0.000	(0)
AgSeO3-	2.829e-14	2.249e-14	-13.548	-13.648	-0.100	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	8.506e-15	6.761e-15	-14.070	-14.170	-0.100	(0)
Ag (NO2) 2-	2.664e-17	2.117e-17	-16.574	-16.674	-0.100	(0)
Ag (OH) 2-	2.447e-17	1.945e-17	-16.611	-16.711	-0.100	(0)
AgNO3	7.042e-18	7.042e-18	-17.152	-17.152	0.000	(0)
Ag (NH3) 2+	1.697e-19	1.349e-19	-18.770	-18.870	-0.100	(0)
Ag (SeO3) 2-3	4.123e-20	5.221e-21	-19.385	-20.282	-0.897	(0)
Ag2MoO4	6.348e-25	6.348e-25	-24.197	-24.197	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.984	-73.984	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.623	-83.218	-1.595	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.215	-0.203	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.714	-148.813	-0.100	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.202	-149.574	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.531	-149.885	-0.353	(0)
Al	3.637e-06					
Al (OH) 4-	3.616e-06	3.026e-06	-5.442	-5.519	-0.077	(0)
Al (OH) 3	1.979e-08	1.979e-08	-7.703	-7.703	0.000	(0)
Al (OH) 2+	9.687e-10	8.169e-10	-9.014	-9.088	-0.074	(0)
AlF3	4.691e-11	4.691e-11	-10.329	-10.329	0.000	(0)
AlF2+	4.006e-11	3.378e-11	-10.397	-10.471	-0.074	(0)

AlF4-	3.099e-12	2.594e-12	-11.509	-11.586	-0.077	(0)
AlOH+2	1.675e-12	8.468e-13	-11.776	-12.072	-0.296	(0)
AlF+2	1.521e-12	7.692e-13	-11.818	-12.114	-0.296	(0)
AlSO4+	3.035e-14	2.540e-14	-13.518	-13.595	-0.077	(0)
Al+3	3.479e-15	6.973e-16	-14.459	-15.157	-0.698	(0)
Al (SO4) 2-	1.526e-15	1.277e-15	-14.816	-14.894	-0.077	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.970	-44.868	-0.897	(0)
As (3)	1.456e-24					
H3AsO3	1.351e-24	1.351e-24	-23.869	-23.869	0.000	(0)
H2AsO3-	1.052e-25	8.360e-26	-24.978	-25.078	-0.100	(0)
HAsO3-2	2.305e-29	9.201e-30	-28.637	-29.036	-0.399	(0)
H4AsO3+	6.977e-33	5.546e-33	-32.156	-32.256	-0.100	(0)
AsO3-3	3.380e-34	4.280e-35	-33.471	-34.369	-0.897	(0)
As (5)	1.432e-10					
HAsO4-2	1.378e-10	5.502e-11	-9.861	-10.259	-0.399	(0)
H2AsO4-	5.232e-12	4.158e-12	-11.281	-11.381	-0.100	(0)
AsO4-3	1.658e-13	2.100e-14	-12.780	-13.678	-0.897	(0)
H3AsO4	5.936e-18	5.988e-18	-17.227	-17.223	0.004	(0)
B	2.801e-05					
H3BO3	2.553e-05	2.575e-05	-4.593	-4.589	0.004	(0)
H2BO3-	2.200e-06	1.805e-06	-5.658	-5.744	-0.086	(0)
MgH2BO3+	1.296e-07	1.063e-07	-6.887	-6.973	-0.086	(0)
CaH2BO3+	1.277e-07	1.048e-07	-6.894	-6.980	-0.086	(0)
NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
BF (OH) 3-	1.382e-09	1.134e-09	-8.860	-8.946	-0.086	(0)
H5 (BO3) 2-	4.822e-11	3.956e-11	-10.317	-10.403	-0.086	(0)
BaH2BO3+	1.517e-12	1.244e-12	-11.819	-11.905	-0.086	(0)
BF2 (OH) 2-	1.351e-13	1.108e-13	-12.869	-12.955	-0.086	(0)
H8 (BO3) 3-	1.242e-13	1.019e-13	-12.906	-12.992	-0.086	(0)
AgH2BO3	3.860e-14	3.860e-14	-13.413	-13.413	0.000	(0)
BF3OH-	4.807e-20	3.944e-20	-19.318	-19.404	-0.086	(0)
BF4-	2.163e-25	1.775e-25	-24.665	-24.751	-0.086	(0)
Ba	4.576e-08					
Ba+2	4.558e-08	2.231e-08	-7.341	-7.651	-0.310	(0)
BaHCO3+	1.458e-10	1.236e-10	-9.836	-9.908	-0.072	(0)
BaCO3	3.755e-11	3.755e-11	-10.425	-10.425	0.000	(0)
BaH2BO3+	1.517e-12	1.244e-12	-11.819	-11.905	-0.086	(0)
BaOH+	1.407e-13	1.183e-13	-12.852	-12.927	-0.075	(0)
BaNO3+	9.243e-16	7.347e-16	-15.034	-15.134	-0.100	(0)
BaNH3+2	8.655e-17	3.455e-17	-16.063	-16.462	-0.399	(0)
C (4)	7.449e-04					
HCO3-	6.877e-04	5.799e-04	-3.163	-3.237	-0.074	(0)
CaHCO3+	1.286e-05	1.090e-05	-4.891	-4.963	-0.072	(0)
MgHCO3+	1.210e-05	1.008e-05	-4.917	-4.996	-0.079	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	6.703e-06	3.281e-06	-5.174	-5.484	-0.310	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.636e-06	4.636e-06	-5.334	-5.334	0.000	(0)
NaHCO3	2.340e-06	2.340e-06	-5.631	-5.631	0.000	(0)
NaCO3-	5.200e-07	4.385e-07	-6.284	-6.358	-0.074	(0)
CuCO3	3.561e-07	3.561e-07	-6.448	-6.448	0.000	(0)
ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
UO2 (CO3) 3-4	2.665e-07	6.765e-09	-6.574	-8.170	-1.595	(0)
MnHCO3+	2.379e-07	1.999e-07	-6.624	-6.699	-0.075	(0)
UO2 (CO3) 2-2	1.031e-07	4.114e-08	-6.987	-7.386	-0.399	(0)
ZnHCO3+	3.501e-08	2.783e-08	-7.456	-7.556	-0.100	(0)
Cu (CO3) 2-2	7.878e-09	3.145e-09	-8.104	-8.502	-0.399	(0)
NiCO3	4.281e-09	4.281e-09	-8.368	-8.368	0.000	(0)
NiHCO3+	3.146e-09	2.501e-09	-8.502	-8.602	-0.100	(0)
CoHCO3+	1.440e-09	1.144e-09	-8.842	-8.941	-0.100	(0)
CoCO3	1.407e-09	1.407e-09	-8.852	-8.852	0.000	(0)
PbCO3	1.337e-09	1.337e-09	-8.874	-8.874	0.000	(0)
CuHCO3+	8.485e-10	6.744e-10	-9.071	-9.171	-0.100	(0)
UO2CO3	6.284e-10	6.284e-10	-9.202	-9.202	0.000	(0)
CdCO3	2.508e-10	2.508e-10	-9.601	-9.601	0.000	(0)
BaHCO3+	1.458e-10	1.236e-10	-9.836	-9.908	-0.072	(0)
PbHCO3+	7.350e-11	5.843e-11	-10.134	-10.233	-0.100	(0)
BaCO3	3.755e-11	3.755e-11	-10.425	-10.425	0.000	(0)

	Pb(CO ₃) 2-2	3.170e-11	1.265e-11	-10.499	-10.898	-0.399	(0)
	CdHCO ₃ +	5.572e-12	4.429e-12	-11.254	-11.354	-0.100	(0)
	Cd(CO ₃) 2-2	1.528e-12	6.101e-13	-11.816	-12.215	-0.399	(0)
	HgCO ₃	1.950e-15	1.950e-15	-14.710	-14.710	0.000	(0)
	FeHCO ₃ +	1.673e-15	1.417e-15	-14.777	-14.849	-0.072	(0)
	Hg(CO ₃) 2-2	5.069e-17	2.024e-17	-16.295	-16.694	-0.399	(0)
	HgHCO ₃ +	3.786e-19	3.009e-19	-18.422	-18.522	-0.100	(0)
Ca	3.166e-03						
	Ca+2	2.062e-03	1.009e-03	-2.686	-2.996	-0.310	(0)
	CaSO ₄	1.085e-03	1.085e-03	-2.965	-2.965	0.000	(0)
	CaHCO ₃ +	1.286e-05	1.090e-05	-4.891	-4.963	-0.072	(0)
	CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.446e-06	1.215e-06	-5.840	-5.915	-0.075	(0)
	CaH ₂ BO ₃ +	1.277e-07	1.048e-07	-6.894	-6.980	-0.086	(0)
	CaOH+	2.886e-08	2.446e-08	-7.540	-7.612	-0.072	(0)
	CaNO ₃ +	2.638e-11	2.097e-11	-10.579	-10.678	-0.100	(0)
	CaNH ₃ 2	7.811e-12	3.118e-12	-11.107	-11.506	-0.399	(0)
	Ca(NH ₃) 2+2	7.630e-21	3.046e-21	-20.117	-20.516	-0.399	(0)
Cd	1.238e-08						
	Cd+2	6.852e-09	3.354e-09	-8.164	-8.474	-0.310	(0)
	CdSO ₄	3.690e-09	3.690e-09	-8.433	-8.433	0.000	(0)
	CdCl+	9.078e-10	7.216e-10	-9.042	-9.142	-0.100	(0)
	Cd(SO ₄) 2-2	5.853e-10	2.336e-10	-9.233	-9.631	-0.399	(0)
	CdCO ₃	2.508e-10	2.508e-10	-9.601	-9.601	0.000	(0)
	CdOH+	4.071e-11	3.236e-11	-10.390	-10.490	-0.100	(0)
	CdOHC1	3.595e-11	3.595e-11	-10.444	-10.444	0.000	(0)
	CdF+	7.378e-12	5.864e-12	-11.132	-11.232	-0.100	(0)
	CdCl ₂	6.776e-12	6.776e-12	-11.169	-11.169	0.000	(0)
	CdHCO ₃ +	5.572e-12	4.429e-12	-11.254	-11.354	-0.100	(0)
	Cd(CO ₃) 2-2	1.528e-12	6.101e-13	-11.816	-12.215	-0.399	(0)
	Cd(OH) 2	2.479e-13	2.479e-13	-12.606	-12.606	0.000	(0)
	CdCl ₃ -	1.212e-14	9.630e-15	-13.917	-14.016	-0.100	(0)
	CdF ₂	1.291e-15	1.291e-15	-14.889	-14.889	0.000	(0)
	CdNO ₃ +	8.767e-17	6.968e-17	-16.057	-16.157	-0.100	(0)
	CdSeO ₄	7.016e-17	7.016e-17	-16.154	-16.154	0.000	(0)
	Cd(OH) 3-	2.314e-17	1.840e-17	-16.636	-16.735	-0.100	(0)
	Cd(SeO ₃) 2-2	4.657e-18	1.859e-18	-17.332	-17.731	-0.399	(0)
	Cd ₂ OH+3	4.295e-18	5.439e-19	-17.367	-18.264	-0.897	(0)
	Cd(OH) 4-2	9.161e-24	3.657e-24	-23.038	-23.437	-0.399	(0)
	Cd(NO ₃) 2	2.294e-25	2.294e-25	-24.639	-24.639	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.296	-79.395	-0.100	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-151.120	-151.120	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-228.050	-228.149	-0.100	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-304.483	-304.882	-0.399	(0)
Cl	2.693e-03						
	Cl-	2.693e-03	2.253e-03	-2.570	-2.647	-0.078	(0)
	MnCl+	5.830e-08	4.900e-08	-7.234	-7.310	-0.075	(0)
	ZnOHC1	1.365e-08	1.365e-08	-7.865	-7.865	0.000	(0)
	ZnCl+	1.031e-08	8.585e-09	-7.987	-8.066	-0.079	(0)
	AgCl	6.206e-09	6.206e-09	-8.207	-8.207	0.000	(0)
	AgCl ₂ -	1.532e-09	1.218e-09	-8.815	-8.914	-0.100	(0)
	CdCl+	9.078e-10	7.216e-10	-9.042	-9.142	-0.100	(0)
	CuCl	5.217e-10	5.217e-10	-9.283	-9.283	0.000	(0)
	CuCl ₂ -	2.947e-10	2.455e-10	-9.531	-9.610	-0.079	(0)
	NiCl+	2.536e-10	2.016e-10	-9.596	-9.696	-0.100	(0)
	CoCl+	2.487e-10	1.977e-10	-9.604	-9.704	-0.100	(0)
	MnCl ₂	1.559e-10	1.559e-10	-9.807	-9.807	0.000	(0)
	CuCl+	7.899e-11	6.580e-11	-10.102	-10.182	-0.079	(0)
	CdOHC1	3.595e-11	3.595e-11	-10.444	-10.444	0.000	(0)
	ZnCl ₂	3.065e-11	3.065e-11	-10.514	-10.514	0.000	(0)
	PbCl+	1.363e-11	1.084e-11	-10.865	-10.965	-0.100	(0)
	CdCl ₂	6.776e-12	6.776e-12	-11.169	-11.169	0.000	(0)
	AgCl ₃ -2	6.124e-12	2.444e-12	-11.213	-11.612	-0.399	(0)
	HgClOH	2.400e-12	2.400e-12	-11.620	-11.620	0.000	(0)
	HgCl ₂	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
	CuCl ₃ -2	2.370e-13	1.182e-13	-12.625	-12.927	-0.302	(0)
	MnCl ₃ -	1.151e-13	9.672e-14	-12.939	-13.014	-0.075	(0)
	PbCl ₂	1.090e-13	1.090e-13	-12.962	-12.962	0.000	(0)

AgCl4-3	8.877e-14	1.124e-14	-13.052	-13.949	-0.897	(0)
ZnCl3-	6.583e-14	5.484e-14	-13.182	-13.261	-0.079	(0)
CuCl2	5.140e-14	5.140e-14	-13.289	-13.289	0.000	(0)
CdCl3-	1.212e-14	9.630e-15	-13.917	-14.016	-0.100	(0)
HgCl3-	7.142e-15	5.677e-15	-14.146	-14.246	-0.100	(0)
NiCl2	2.286e-15	2.286e-15	-14.641	-14.641	0.000	(0)
UO2Cl+	2.211e-16	1.758e-16	-15.655	-15.755	-0.100	(0)
HgCl4-2	1.275e-16	5.091e-17	-15.894	-16.293	-0.399	(0)
ZnCl4-2	1.238e-16	6.177e-17	-15.907	-16.209	-0.302	(0)
PbCl3-	1.230e-16	9.778e-17	-15.910	-16.010	-0.100	(0)
HgCl+	2.809e-17	2.232e-17	-16.552	-16.651	-0.100	(0)
CuCl3-	1.297e-18	1.080e-18	-17.887	-17.966	-0.079	(0)
CrCl+2	1.021e-18	4.075e-19	-17.991	-18.390	-0.399	(0)
PbCl4-2	2.522e-19	1.007e-19	-18.598	-18.997	-0.399	(0)
CrOHC12	2.119e-20	2.119e-20	-19.674	-19.674	0.000	(0)
FeCl+2	1.206e-22	6.019e-23	-21.919	-22.220	-0.302	(0)
CrCl2+	1.096e-22	8.710e-23	-21.960	-22.060	-0.100	(0)
CuCl4-2	2.444e-23	1.220e-23	-22.612	-22.914	-0.302	(0)
VOCl+	4.391e-24	3.491e-24	-23.357	-23.457	-0.100	(0)
FeCl2+	7.206e-25	6.056e-25	-24.142	-24.218	-0.075	(0)
CrO3Cl-	3.336e-26	2.652e-26	-25.477	-25.576	-0.100	(0)
FeCl3	1.364e-28	1.364e-28	-27.865	-27.865	0.000	(0)
CoCl+2	5.691e-36	2.272e-36	-35.245	-35.644	-0.399	(0)
UCl+3	0.000e+00	0.000e+00	-45.859	-46.757	-0.897	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
Co (2)	9.136e-08					
Co+2	6.356e-08	2.537e-08	-7.197	-7.596	-0.399	(0)
CoSO4	2.376e-08	2.376e-08	-7.624	-7.624	0.000	(0)
CoHCO3+	1.440e-09	1.144e-09	-8.842	-8.941	-0.100	(0)
CoCO3	1.407e-09	1.407e-09	-8.852	-8.852	0.000	(0)
CoOH+	7.734e-10	6.148e-10	-9.112	-9.211	-0.100	(0)
CoCl+	2.487e-10	1.977e-10	-9.604	-9.704	-0.100	(0)
CoF+	1.113e-10	8.850e-11	-9.953	-10.053	-0.100	(0)
Co (OH) 2	5.931e-11	5.931e-11	-10.227	-10.227	0.000	(0)
CoNO2+	1.566e-12	1.245e-12	-11.805	-11.905	-0.100	(0)
Co (NH3) +2	1.875e-14	7.485e-15	-13.727	-14.126	-0.399	(0)
Co (OH) 3-	1.808e-15	1.437e-15	-14.743	-14.843	-0.100	(0)
CoSeO4	1.428e-15	1.428e-15	-14.845	-14.845	0.000	(0)
CoOOH-	4.539e-16	3.608e-16	-15.343	-15.443	-0.100	(0)
CoNO3+	3.323e-16	2.642e-16	-15.478	-15.578	-0.100	(0)
Co2OH+3	6.172e-18	7.817e-19	-17.210	-18.107	-0.897	(0)
Co (NH3) 2+2	1.963e-21	7.835e-22	-20.707	-21.106	-0.399	(0)
Co (OH) 4-2	6.930e-22	2.766e-22	-21.159	-21.558	-0.399	(0)
Co (NO3) 2	3.531e-24	3.531e-24	-23.452	-23.452	0.000	(0)
Co4 (OH) 4+4	1.123e-27	2.850e-29	-26.950	-28.545	-1.595	(0)
Co (NH3) 3+2	6.064e-29	2.421e-29	-28.217	-28.616	-0.399	(0)
Co (NH3) 4+2	7.809e-37	3.117e-37	-36.107	-36.506	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.498	-44.896	-0.399	(0)
Co (3)	7.663e-29					
CoOH+2	7.663e-29	3.059e-29	-28.116	-28.514	-0.399	(0)
Co+3	2.473e-35	4.956e-36	-34.607	-35.305	-0.698	(0)
CoCl+2	5.691e-36	2.272e-36	-35.245	-35.644	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.736	-67.135	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
Cr (2)	1.705e-27					
Cr+2	1.705e-27	6.805e-28	-26.768	-27.167	-0.399	(0)
Cr (3)	9.876e-10					
Cr (OH) 2+	6.905e-10	5.488e-10	-9.161	-9.261	-0.100	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.806e-11	1.436e-11	-10.743	-10.843	-0.100	(0)
Cr (OH) 4-	1.523e-11	1.211e-11	-10.817	-10.917	-0.100	(0)
Cr (OH) +2	9.305e-12	3.714e-12	-11.031	-11.430	-0.399	(0)
CrOHSO4	4.136e-12	4.136e-12	-11.383	-11.383	0.000	(0)
CrF+2	6.123e-15	2.444e-15	-14.213	-14.612	-0.399	(0)

CrSO4+	1.927e-15	1.532e-15	-14.715	-14.815	-0.100	(0)
Cr+3	1.104e-15	1.398e-16	-14.957	-15.855	-0.897	(0)
CrCl+2	1.021e-18	4.075e-19	-17.991	-18.390	-0.399	(0)
CrOHC12	2.119e-20	2.119e-20	-19.674	-19.674	0.000	(0)
Cr2 (OH) 2SO4+2	3.479e-21	1.389e-21	-20.459	-20.857	-0.399	(0)
Cr2 (OH) 2 (SO4) 2	3.871e-22	3.871e-22	-21.412	-21.412	0.000	(0)
CrCl2+	1.096e-22	8.710e-23	-21.960	-22.060	-0.100	(0)
CrNO3+2	1.006e-25	4.014e-26	-24.998	-25.396	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.050	-44.449	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.618	-54.515	-0.897	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Cr (6)	1.797e-14					
CrO4-2	1.720e-14	8.419e-15	-13.765	-14.075	-0.310	(0)
NaCrO4-	3.777e-16	3.002e-16	-15.423	-15.523	-0.100	(0)
HCrO4-	2.840e-16	2.258e-16	-15.547	-15.646	-0.100	(0)
KCrO4-	1.071e-16	8.515e-17	-15.970	-16.070	-0.100	(0)
CrO3SO4-2	6.703e-24	2.676e-24	-23.174	-23.573	-0.399	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.336e-26	2.652e-26	-25.477	-25.576	-0.100	(0)
Cr2O7-2	4.429e-30	1.768e-30	-29.354	-29.752	-0.399	(0)
Cu (1)	1.048e-09					
CuCl	5.217e-10	5.217e-10	-9.283	-9.283	0.000	(0)
CuCl2-	2.947e-10	2.455e-10	-9.531	-9.610	-0.079	(0)
Cu+	2.314e-10	1.840e-10	-9.636	-9.735	-0.100	(0)
CuCl3-2	2.370e-13	1.182e-13	-12.625	-12.927	-0.302	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.678	-148.040	-0.362	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.426	-148.770	-0.344	(0)
Cu (2)	5.254e-07					
CuCO3	3.561e-07	3.561e-07	-6.448	-6.448	0.000	(0)
CuOH+	8.497e-08	7.079e-08	-7.071	-7.150	-0.079	(0)
Cu+2	3.765e-08	1.843e-08	-7.424	-7.734	-0.310	(0)
CuSO4	1.982e-08	1.982e-08	-7.703	-7.703	0.000	(0)
Cu (OH) 2	1.715e-08	1.715e-08	-7.766	-7.766	0.000	(0)
Cu (CO3) 2-2	7.878e-09	3.145e-09	-8.104	-8.502	-0.399	(0)
CuHCO3+	8.485e-10	6.744e-10	-9.071	-9.171	-0.100	(0)
Cu2 (OH) 2+2	3.153e-10	1.259e-10	-9.501	-9.900	-0.399	(0)
CuF+	1.614e-10	1.283e-10	-9.792	-9.892	-0.100	(0)
CuCl+	7.899e-11	6.580e-11	-10.102	-10.182	-0.079	(0)
Cu (OH) 3-	5.376e-11	4.273e-11	-10.270	-10.369	-0.100	(0)
CuNO2+	1.691e-11	1.344e-11	-10.772	-10.872	-0.100	(0)
CuNH3+2	1.159e-12	4.628e-13	-11.936	-12.335	-0.399	(0)
CuCl2	5.140e-14	5.140e-14	-13.289	-13.289	0.000	(0)
Cu (OH) 4-2	1.023e-15	4.084e-16	-14.990	-15.389	-0.399	(0)
Cu (NO2) 2	9.577e-16	9.577e-16	-15.019	-15.019	0.000	(0)
CuNO3+	4.817e-16	3.829e-16	-15.317	-15.417	-0.100	(0)
CuCl3-	1.297e-18	1.080e-18	-17.887	-17.966	-0.079	(0)
CuCl4-2	2.444e-23	1.220e-23	-22.612	-22.914	-0.302	(0)
Cu (NO3) 2	3.167e-25	3.167e-25	-24.499	-24.499	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.523	-218.622	-0.100	(0)
F	1.591e-04					
F-	1.319e-04	1.103e-04	-3.880	-3.957	-0.078	(0)
MgF+	2.513e-05	2.103e-05	-4.600	-4.677	-0.077	(0)
CaF+	1.446e-06	1.215e-06	-5.840	-5.915	-0.075	(0)
NaF	4.995e-07	4.995e-07	-6.301	-6.301	0.000	(0)
MnF+	9.028e-08	7.588e-08	-7.044	-7.120	-0.075	(0)
ZnF+	4.201e-09	3.340e-09	-8.377	-8.476	-0.100	(0)
BF (OH) 3-	1.382e-09	1.134e-09	-8.860	-8.946	-0.086	(0)
HF	1.352e-09	1.352e-09	-8.869	-8.869	0.000	(0)
CuF+	1.614e-10	1.283e-10	-9.792	-9.892	-0.100	(0)
NiF+	1.219e-10	9.692e-11	-9.914	-10.014	-0.100	(0)
CoF+	1.113e-10	8.850e-11	-9.953	-10.053	-0.100	(0)
AlF3	4.691e-11	4.691e-11	-10.329	-10.329	0.000	(0)
AlF2+	4.006e-11	3.378e-11	-10.397	-10.471	-0.074	(0)
CdF+	7.378e-12	5.864e-12	-11.132	-11.232	-0.100	(0)
AlF4-	3.099e-12	2.594e-12	-11.509	-11.586	-0.077	(0)
AlF+2	1.521e-12	7.692e-13	-11.818	-12.114	-0.296	(0)
PbF+	1.326e-12	1.054e-12	-11.877	-11.977	-0.100	(0)
UO2F+	9.217e-13	7.326e-13	-12.035	-12.135	-0.100	(0)

HF2-	6.840e-13	5.671e-13	-12.165	-12.246	-0.081	(0)
AgF	3.739e-13	3.739e-13	-12.427	-12.427	0.000	(0)
UO2F2	2.331e-13	2.331e-13	-12.632	-12.632	0.000	(0)
BF2(OH) 2-	1.351e-13	1.108e-13	-12.869	-12.955	-0.086	(0)
UO2F3-	8.126e-15	6.459e-15	-14.090	-14.190	-0.100	(0)
CrF+2	6.123e-15	2.444e-15	-14.213	-14.612	-0.399	(0)
PbF2	2.288e-15	2.288e-15	-14.641	-14.641	0.000	(0)
CdF2	1.291e-15	1.291e-15	-14.889	-14.889	0.000	(0)
UO2F4-2	1.418e-17	5.659e-18	-16.848	-17.247	-0.399	(0)
H2F2	4.898e-18	4.898e-18	-17.310	-17.310	0.000	(0)
VO2F	9.543e-19	9.543e-19	-18.020	-18.020	0.000	(0)
PbF3-	6.023e-19	4.788e-19	-18.220	-18.320	-0.100	(0)
FeF2+	3.759e-19	3.159e-19	-18.425	-18.500	-0.075	(0)
FeF+2	2.145e-19	1.070e-19	-18.669	-18.971	-0.302	(0)
FeF3	4.917e-20	4.917e-20	-19.308	-19.308	0.000	(0)
VO2F2-	4.809e-20	3.822e-20	-19.318	-19.418	-0.100	(0)
BF3OH-	4.807e-20	3.944e-20	-19.318	-19.404	-0.086	(0)
VOF+	4.598e-22	3.655e-22	-21.337	-21.437	-0.100	(0)
VO2F3-2	1.318e-22	5.260e-23	-21.880	-22.279	-0.399	(0)
PbF4-2	6.333e-23	2.528e-23	-22.198	-22.597	-0.399	(0)
VOF2	1.512e-23	1.512e-23	-22.821	-22.821	0.000	(0)
HgF+	2.555e-24	2.031e-24	-23.593	-23.692	-0.100	(0)
BF4-	2.163e-25	1.775e-25	-24.665	-24.751	-0.086	(0)
VOF3-	7.444e-26	5.917e-26	-25.128	-25.228	-0.100	(0)
VO2F4-3	2.254e-26	2.855e-27	-25.647	-26.544	-0.897	(0)
Sb(OH) 2F	1.693e-26	1.693e-26	-25.771	-25.771	0.000	(0)
SbOF	1.666e-26	1.666e-26	-25.778	-25.778	0.000	(0)
VOF4-2	6.600e-29	2.635e-29	-28.180	-28.579	-0.399	(0)
UF3+	1.043e-36	8.288e-37	-35.982	-36.082	-0.100	(0)
UF2+2	1.188e-37	4.740e-38	-36.925	-37.324	-0.399	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	2.695e-40	0.000e+00	-39.569	-40.467	-0.897	(0)
UF5-	0.000e+00	0.000e+00	-40.259	-40.358	-0.100	(0)
UF6-2	0.000e+00	0.000e+00	-41.437	-41.836	-0.399	(0)
Fe (2)	7.227e-13					
Fe+2	4.862e-13	1.941e-13	-12.313	-12.712	-0.399	(0)
FeSO4	2.236e-13	2.236e-13	-12.651	-12.651	0.000	(0)
FeOH+	1.117e-14	9.384e-15	-13.952	-14.028	-0.075	(0)
FeHCO3+	1.673e-15	1.417e-15	-14.777	-14.849	-0.072	(0)
Fe(OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.136e-18	3.477e-18	-17.383	-17.459	-0.075	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-161.620	-161.620	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.412	-238.512	-0.100	(0)
Fe (3)	8.736e-10					
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 2+	3.887e-10	3.278e-10	-9.410	-9.484	-0.074	(0)
Fe(OH) 4-	5.733e-11	4.835e-11	-10.242	-10.316	-0.074	(0)
FeOH+2	1.390e-15	6.938e-16	-14.857	-15.159	-0.302	(0)
FeF2+	3.759e-19	3.159e-19	-18.425	-18.500	-0.075	(0)
FeF+2	2.145e-19	1.070e-19	-18.669	-18.971	-0.302	(0)
FeSO4+	5.543e-20	4.659e-20	-19.256	-19.332	-0.075	(0)
FeF3	4.917e-20	4.917e-20	-19.308	-19.308	0.000	(0)
Fe(SO4) 2-	5.881e-21	4.675e-21	-20.231	-20.330	-0.100	(0)
Fe+3	4.414e-21	8.848e-22	-20.355	-21.053	-0.698	(0)
FeCl+2	1.206e-22	6.019e-23	-21.919	-22.220	-0.302	(0)
FeCl2+	7.206e-25	6.056e-25	-24.142	-24.218	-0.075	(0)
FeHSeO3+2	3.161e-25	1.262e-25	-24.500	-24.899	-0.399	(0)
Fe2(OH) 2+4	6.278e-28	1.594e-29	-27.202	-28.798	-1.595	(0)
FeNO3+2	1.456e-28	5.813e-29	-27.837	-28.236	-0.399	(0)
FeCl3	1.364e-28	1.364e-28	-27.865	-27.865	0.000	(0)
Fe3(OH) 4+5	2.349e-35	7.552e-38	-34.629	-37.122	-2.493	(0)
H (0)	4.002e-29					
H2	2.001e-29	2.019e-29	-28.699	-28.695	0.004	(0)
Hg (0)	1.904e-09					
Hg	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
Hg (1)	3.216e-21					
Hg2+2	1.608e-21	6.419e-22	-20.794	-21.193	-0.399	(0)
Hg (2)	7.243e-12					

	Hg (OH) 2	4.582e-12	4.622e-12	-11.339	-11.335	0.004	(0)
	HgClOH	2.400e-12	2.400e-12	-11.620	-11.620	0.000	(0)
	HgCl2	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
	HgCl3-	7.142e-15	5.677e-15	-14.146	-14.246	-0.100	(0)
	HgCO3	1.950e-15	1.950e-15	-14.710	-14.710	0.000	(0)
	HgCl4-2	1.275e-16	5.091e-17	-15.894	-16.293	-0.399	(0)
	Hg (CO3) 2-2	5.069e-17	2.024e-17	-16.295	-16.694	-0.399	(0)
	HgOH+	3.021e-17	2.401e-17	-16.520	-16.620	-0.100	(0)
	HgCl+	2.809e-17	2.232e-17	-16.552	-16.651	-0.100	(0)
	Hg (OH) 3-	8.891e-19	7.067e-19	-18.051	-18.151	-0.100	(0)
	HgHCO3+	3.786e-19	3.009e-19	-18.422	-18.522	-0.100	(0)
	Hg (NH3) 2+2	4.728e-21	1.887e-21	-20.325	-20.724	-0.399	(0)
	HgNH3+2	1.927e-21	7.690e-22	-20.715	-21.114	-0.399	(0)
	Hg+2	1.244e-21	4.967e-22	-20.905	-21.304	-0.399	(0)
	HgSO4	6.103e-22	6.103e-22	-21.214	-21.214	0.000	(0)
	HgF+	2.555e-24	2.031e-24	-23.593	-23.692	-0.100	(0)
	Hg (NH3) 3+2	4.619e-29	1.844e-29	-28.335	-28.734	-0.399	(0)
	HgNO3+	1.516e-30	1.205e-30	-29.819	-29.919	-0.100	(0)
	Hg (NH3) 4+2	9.003e-37	3.594e-37	-36.046	-36.444	-0.399	(0)
	Hg (NO3) 2	3.290e-39	3.290e-39	-38.483	-38.483	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.053	-139.152	-0.100	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.380	-139.779	-0.399	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.840	-140.840	0.000	(0)
K	3.362e-03						
	K+	3.254e-03	2.722e-03	-2.488	-2.565	-0.078	(0)
	KSO4-	1.073e-04	9.044e-05	-3.970	-4.044	-0.074	(0)
	KCrO4-	1.071e-16	8.515e-17	-15.970	-16.070	-0.100	(0)
Mg	4.964e-03						
	Mg+2	3.470e-03	1.699e-03	-2.460	-2.770	-0.310	(0)
	MgSO4	1.451e-03	1.451e-03	-2.838	-2.838	0.000	(0)
	MgF+	2.513e-05	2.103e-05	-4.600	-4.677	-0.077	(0)
	MgHCO3+	1.210e-05	1.008e-05	-4.917	-4.996	-0.079	(0)
	MgCO3	4.636e-06	4.636e-06	-5.334	-5.334	0.000	(0)
	MgOH+	9.658e-07	8.213e-07	-6.015	-6.085	-0.070	(0)
	MgH2BO3+	1.296e-07	1.063e-07	-6.887	-6.973	-0.086	(0)
Mn (2)	5.815e-05						
	Mn+2	4.328e-05	1.728e-05	-4.364	-4.763	-0.399	(0)
	MnSO4	1.442e-05	1.442e-05	-4.841	-4.841	0.000	(0)
	MnHCO3+	2.379e-07	1.999e-07	-6.624	-6.699	-0.075	(0)
	MnF+	9.028e-08	7.588e-08	-7.044	-7.120	-0.075	(0)
	MnOH+	6.271e-08	5.271e-08	-7.203	-7.278	-0.075	(0)
	MnCl+	5.830e-08	4.900e-08	-7.234	-7.310	-0.075	(0)
	MnCl2	1.559e-10	1.559e-10	-9.807	-9.807	0.000	(0)
	MnSeO4	5.224e-13	5.224e-13	-12.282	-12.282	0.000	(0)
	MnNO3+	2.263e-13	1.799e-13	-12.645	-12.745	-0.100	(0)
	MnCl3-	1.151e-13	9.672e-14	-12.939	-13.014	-0.075	(0)
	Mn (OH) 3-	5.716e-16	4.804e-16	-15.243	-15.318	-0.075	(0)
	Mn (OH) 4-2	3.775e-21	1.884e-21	-20.423	-20.725	-0.302	(0)
	Mn (NO3) 2	2.969e-21	2.969e-21	-20.527	-20.527	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.108	-41.108	0.000	(0)
Mn (3)	1.889e-25						
	Mn+3	1.889e-25	3.787e-26	-24.724	-25.422	-0.698	(0)
Mn (6)	3.411e-40						
	MnO4-2	3.411e-40	1.702e-40	-39.467	-39.769	-0.302	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.367	-44.450	-0.084	(0)
Mo	1.881e-06						
	MoO4-2	1.881e-06	9.209e-07	-5.726	-6.036	-0.310	(0)
	HMoO4-	1.910e-10	1.518e-10	-9.719	-9.819	-0.100	(0)
	H2MoO4	9.217e-15	9.217e-15	-14.035	-14.035	0.000	(0)
	Ag2MoO4	6.348e-25	6.348e-25	-24.197	-24.197	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.970	-44.868	-0.897	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.323	-53.912	-3.590	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-53.115	-55.607	-2.493	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-57.311	-58.907	-1.595	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-62.845	-63.742	-0.897	(0)
N (-3)	4.806e-08						
	NH4+	4.347e-08	3.566e-08	-7.362	-7.448	-0.086	(0)

NH3	2.454e-09	2.454e-09	-8.610	-8.610	0.000	(0)
NH4SO4-	2.134e-09	1.793e-09	-8.671	-8.746	-0.075	(0)
CaNH3+2	7.811e-12	3.118e-12	-11.107	-11.506	-0.399	(0)
CuNH3+2	1.159e-12	4.628e-13	-11.936	-12.335	-0.399	(0)
NiNH3+2	1.155e-13	4.609e-14	-12.938	-13.336	-0.399	(0)
Co (NH3) +2	1.875e-14	7.485e-15	-13.727	-14.126	-0.399	(0)
AgNH3+	8.506e-15	6.761e-15	-14.070	-14.170	-0.100	(0)
BaNH3+2	8.655e-17	3.455e-17	-16.063	-16.462	-0.399	(0)
Ag (NH3) 2+	1.697e-19	1.349e-19	-18.770	-18.870	-0.100	(0)
Ni (NH3) 2+2	4.096e-20	1.635e-20	-19.388	-19.787	-0.399	(0)
Ca (NH3) 2+2	7.630e-21	3.046e-21	-20.117	-20.516	-0.399	(0)
Hg (NH3) 2+2	4.728e-21	1.887e-21	-20.325	-20.724	-0.399	(0)
Co (NH3) 2+2	1.963e-21	7.835e-22	-20.707	-21.106	-0.399	(0)
HgNH3+2	1.927e-21	7.690e-22	-20.715	-21.114	-0.399	(0)
Co (NH3) 3+2	6.064e-29	2.421e-29	-28.217	-28.616	-0.399	(0)
Hg (NH3) 3+2	4.619e-29	1.844e-29	-28.335	-28.734	-0.399	(0)
Hg (NH3) 4+2	9.003e-37	3.594e-37	-36.046	-36.444	-0.399	(0)
Co (NH3) 4+2	7.809e-37	3.117e-37	-36.107	-36.506	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.050	-44.449	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.498	-44.896	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.618	-54.515	-0.897	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.736	-67.135	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
N (3)	8.442e-06					
NO2-	8.442e-06	6.964e-06	-5.074	-5.157	-0.084	(0)
CuNO2+	1.691e-11	1.344e-11	-10.772	-10.872	-0.100	(0)
AgNO2	1.963e-12	1.963e-12	-11.707	-11.707	0.000	(0)
CoNO2+	1.566e-12	1.245e-12	-11.805	-11.905	-0.100	(0)
Cu (NO2) 2	9.577e-16	9.577e-16	-15.019	-15.019	0.000	(0)
Ag (NO2) 2-	2.664e-17	2.117e-17	-16.574	-16.674	-0.100	(0)
N (5)	7.881e-09					
NO3-	7.854e-09	6.570e-09	-8.105	-8.182	-0.078	(0)
CaNO3+	2.638e-11	2.097e-11	-10.579	-10.678	-0.100	(0)
MnNO3+	2.263e-13	1.799e-13	-12.645	-12.745	-0.100	(0)
ZnNO3+	3.150e-14	2.504e-14	-13.502	-13.601	-0.100	(0)
BaNO3+	9.243e-16	7.347e-16	-15.034	-15.134	-0.100	(0)
NiNO3+	7.261e-16	5.772e-16	-15.139	-15.239	-0.100	(0)
CuNO3+	4.817e-16	3.829e-16	-15.317	-15.417	-0.100	(0)
CoNO3+	3.323e-16	2.642e-16	-15.478	-15.578	-0.100	(0)
CdNO3+	8.767e-17	6.968e-17	-16.057	-16.157	-0.100	(0)
PbNO3+	1.658e-17	1.318e-17	-16.781	-16.880	-0.100	(0)
AgNO3	7.042e-18	7.042e-18	-17.152	-17.152	0.000	(0)
Mn (NO3) 2	2.969e-21	2.969e-21	-20.527	-20.527	0.000	(0)
UO2NO3+	7.934e-22	6.307e-22	-21.100	-21.200	-0.100	(0)
Zn (NO3) 2	3.282e-23	3.282e-23	-22.484	-22.484	0.000	(0)
Co (NO3) 2	3.531e-24	3.531e-24	-23.452	-23.452	0.000	(0)
Cu (NO3) 2	3.167e-25	3.167e-25	-24.499	-24.499	0.000	(0)
Cd (NO3) 2	2.294e-25	2.294e-25	-24.639	-24.639	0.000	(0)
Pb (NO3) 2	1.470e-25	1.470e-25	-24.833	-24.833	0.000	(0)
CrNO3+2	1.006e-25	4.014e-26	-24.998	-25.396	-0.399	(0)
VO2NO3	1.639e-26	1.639e-26	-25.785	-25.785	0.000	(0)
FeNO3+2	1.456e-28	5.813e-29	-27.837	-28.236	-0.399	(0)
HgNO3+	1.516e-30	1.205e-30	-29.819	-29.919	-0.100	(0)
Hg (NO3) 2	3.290e-39	3.290e-39	-38.483	-38.483	0.000	(0)
Na	8.798e-03					
Na+	8.580e-03	7.176e-03	-2.067	-2.144	-0.078	(0)
NaSO4-	2.145e-04	1.809e-04	-3.669	-3.743	-0.074	(0)
NaHCO3	2.340e-06	2.340e-06	-5.631	-5.631	0.000	(0)
NaCO3-	5.200e-07	4.385e-07	-6.284	-6.358	-0.074	(0)
NaF	4.995e-07	4.995e-07	-6.301	-6.301	0.000	(0)
NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
NaCrO4-	3.777e-16	3.002e-16	-15.423	-15.523	-0.100	(0)
Ni	1.127e-07					
Ni+2	7.145e-08	3.498e-08	-7.146	-7.456	-0.310	(0)
NiSO4	3.275e-08	3.275e-08	-7.485	-7.485	0.000	(0)

NiCO3	4.281e-09	4.281e-09	-8.368	-8.368	0.000	(0)
NiHCO3+	3.146e-09	2.501e-09	-8.502	-8.602	-0.100	(0)
NiOH+	6.728e-10	5.348e-10	-9.172	-9.272	-0.100	(0)
NiCl+	2.536e-10	2.016e-10	-9.596	-9.696	-0.100	(0)
NiF+	1.219e-10	9.692e-11	-9.914	-10.014	-0.100	(0)
Ni (OH) 2	5.159e-11	5.159e-11	-10.287	-10.287	0.000	(0)
Ni (SO4) 2-2	1.275e-11	5.090e-12	-10.894	-11.293	-0.399	(0)
NiNH3+2	1.155e-13	4.609e-14	-12.938	-13.336	-0.399	(0)
Ni (OH) 3-	7.882e-14	6.265e-14	-13.103	-13.203	-0.100	(0)
NiCl2	2.286e-15	2.286e-15	-14.641	-14.641	0.000	(0)
NiSeO4	1.838e-15	1.838e-15	-14.736	-14.736	0.000	(0)
NiNO3+	7.261e-16	5.772e-16	-15.139	-15.239	-0.100	(0)
Ni (NH3) 2+2	4.096e-20	1.635e-20	-19.388	-19.787	-0.399	(0)
O (0)	2.463e-35					
O2	1.232e-35	1.243e-35	-34.909	-34.906	0.004	(0)
Pb	2.605e-09					
PbCO3	1.337e-09	1.337e-09	-8.874	-8.874	0.000	(0)
PbOH+	5.204e-10	4.136e-10	-9.284	-9.383	-0.100	(0)
PbSO4	3.117e-10	3.117e-10	-9.506	-9.506	0.000	(0)
Pb+2	2.770e-10	1.356e-10	-9.558	-9.868	-0.310	(0)
PbHCO3+	7.350e-11	5.843e-11	-10.134	-10.233	-0.100	(0)
Pb (CO3) 2-2	3.170e-11	1.265e-11	-10.499	-10.898	-0.399	(0)
Pb (SO4) 2-2	2.208e-11	8.813e-12	-10.656	-11.055	-0.399	(0)
Pb (OH) 2	1.589e-11	1.589e-11	-10.799	-10.799	0.000	(0)
PbCl+	1.363e-11	1.084e-11	-10.865	-10.965	-0.100	(0)
PbF+	1.326e-12	1.054e-12	-11.877	-11.977	-0.100	(0)
PbCl2	1.090e-13	1.090e-13	-12.962	-12.962	0.000	(0)
Pb (OH) 3-	2.427e-14	1.929e-14	-13.615	-13.715	-0.100	(0)
PbF2	2.288e-15	2.288e-15	-14.641	-14.641	0.000	(0)
PbCl3-	1.230e-16	9.778e-17	-15.910	-16.010	-0.100	(0)
PbNO3+	1.658e-17	1.318e-17	-16.781	-16.880	-0.100	(0)
Pb (OH) 4-2	1.437e-17	5.738e-18	-16.842	-17.241	-0.399	(0)
Pb2OH+3	7.018e-18	8.888e-19	-17.154	-18.051	-0.897	(0)
PbF3-	6.023e-19	4.788e-19	-18.220	-18.320	-0.100	(0)
PbCl4-2	2.522e-19	1.007e-19	-18.598	-18.997	-0.399	(0)
Pb3 (OH) 4+2	1.710e-21	6.826e-22	-20.767	-21.166	-0.399	(0)
PbF4-2	6.333e-23	2.528e-23	-22.198	-22.597	-0.399	(0)
Pb (NO3) 2	1.470e-25	1.470e-25	-24.833	-24.833	0.000	(0)
Pb4 (OH) 4+4	2.896e-26	7.352e-28	-25.538	-27.134	-1.595	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.456	-152.456	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.985	-230.085	-0.100	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.984	-73.984	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.829	-78.929	-0.100	(0)
CdHS+	0.000e+00	0.000e+00	-79.296	-79.395	-0.100	(0)
S5-2	0.000e+00	0.000e+00	-79.814	-80.212	-0.399	(0)
H2S	0.000e+00	0.000e+00	-79.991	-79.991	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.330	-80.728	-0.399	(0)
S4-2	0.000e+00	0.000e+00	-80.409	-80.808	-0.399	(0)
S3-2	0.000e+00	0.000e+00	-81.215	-81.614	-0.399	(0)
S2-2	0.000e+00	0.000e+00	-82.231	-82.630	-0.399	(0)
S-2	0.000e+00	0.000e+00	-87.845	-88.147	-0.302	(0)
HgHS2-	0.000e+00	0.000e+00	-139.053	-139.152	-0.100	(0)
HgS2-2	0.000e+00	0.000e+00	-139.380	-139.779	-0.399	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.840	-140.840	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.678	-148.040	-0.362	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.215	-0.203	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.426	-148.770	-0.344	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.686	-148.785	-0.100	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.714	-148.813	-0.100	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.202	-149.574	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.531	-149.885	-0.353	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.857	-150.857	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.120	-151.120	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.456	-152.456	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.620	-161.620	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.523	-218.622	-0.100	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.406	-226.506	-0.100	(0)

ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.005	-228.404	-0.399	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.050	-228.149	-0.100	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.985	-230.085	-0.100	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.412	-238.512	-0.100	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.483	-304.882	-0.399	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.496	-306.895	-0.399	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.943	-322.342	-0.399	(0)
S (6)	1.246e-02					
SO4-2	9.587e-03	4.693e-03	-2.018	-2.329	-0.310	(0)
MgSO4	1.451e-03	1.451e-03	-2.838	-2.838	0.000	(0)
CaSO4	1.085e-03	1.085e-03	-2.965	-2.965	0.000	(0)
NaSO4-	2.145e-04	1.809e-04	-3.669	-3.743	-0.074	(0)
KSO4-	1.073e-04	9.044e-05	-3.970	-4.044	-0.074	(0)
MnSO4	1.442e-05	1.442e-05	-4.841	-4.841	0.000	(0)
ZnSO4	1.558e-06	1.558e-06	-5.807	-5.807	0.000	(0)
Zn (SO4) 2-2	1.595e-07	6.368e-08	-6.797	-7.196	-0.399	(0)
NiSO4	3.275e-08	3.275e-08	-7.485	-7.485	0.000	(0)
CoSO4	2.376e-08	2.376e-08	-7.624	-7.624	0.000	(0)
CuSO4	1.982e-08	1.982e-08	-7.703	-7.703	0.000	(0)
HSO4-	4.541e-09	3.800e-09	-8.343	-8.420	-0.077	(0)
CdSO4	3.690e-09	3.690e-09	-8.433	-8.433	0.000	(0)
NH4SO4-	2.134e-09	1.793e-09	-8.671	-8.746	-0.075	(0)
Cd (SO4) 2-2	5.853e-10	2.336e-10	-9.233	-9.631	-0.399	(0)
PbSO4	3.117e-10	3.117e-10	-9.506	-9.506	0.000	(0)
AgSO4-	1.590e-10	1.264e-10	-9.799	-9.898	-0.100	(0)
Pb (SO4) 2-2	2.208e-11	8.813e-12	-10.656	-11.055	-0.399	(0)
Ni (SO4) 2-2	1.275e-11	5.090e-12	-10.894	-11.293	-0.399	(0)
CrOHSO4	4.136e-12	4.136e-12	-11.383	-11.383	0.000	(0)
UO2SO4	3.418e-13	3.418e-13	-12.466	-12.466	0.000	(0)
FeSO4	2.236e-13	2.236e-13	-12.651	-12.651	0.000	(0)
UO2 (SO4) 2-2	5.297e-14	2.114e-14	-13.276	-13.675	-0.399	(0)
AlSO4+	3.035e-14	2.540e-14	-13.518	-13.595	-0.077	(0)
CrSO4+	1.927e-15	1.532e-15	-14.715	-14.815	-0.100	(0)
Al (SO4) 2-	1.526e-15	1.277e-15	-14.816	-14.894	-0.077	(0)
VO2SO4-	6.954e-19	5.528e-19	-18.158	-18.257	-0.100	(0)
FeSO4+	5.543e-20	4.659e-20	-19.256	-19.332	-0.075	(0)
Fe (SO4) 2-	5.881e-21	4.675e-21	-20.231	-20.330	-0.100	(0)
Cr2 (OH) 2SO4+2	3.479e-21	1.389e-21	-20.459	-20.857	-0.399	(0)
VOSO4	7.140e-22	7.140e-22	-21.146	-21.146	0.000	(0)
HgSO4	6.103e-22	6.103e-22	-21.214	-21.214	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.871e-22	3.871e-22	-21.412	-21.412	0.000	(0)
CrO3SO4-2	6.703e-24	2.676e-24	-23.174	-23.573	-0.399	(0)
VSO4+	1.070e-36	8.508e-37	-35.970	-36.070	-0.100	(0)
U (SO4) 2	1.080e-40	1.080e-40	-39.967	-39.967	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.139	-41.538	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Sb (3)	2.343e-20					
Sb (OH) 3	1.185e-20	1.185e-20	-19.926	-19.926	0.000	(0)
HSbO2	1.157e-20	1.157e-20	-19.937	-19.937	0.000	(0)
SbO2-	2.846e-24	2.262e-24	-23.546	-23.646	-0.100	(0)
Sb (OH) 4-	1.629e-24	1.295e-24	-23.788	-23.888	-0.100	(0)
Sb (OH) 2F	1.693e-26	1.693e-26	-25.771	-25.771	0.000	(0)
SbOF	1.666e-26	1.666e-26	-25.778	-25.778	0.000	(0)
Sb (OH) 2+	3.001e-27	2.386e-27	-26.523	-26.622	-0.100	(0)
SbO+	1.035e-27	8.230e-28	-26.985	-27.085	-0.100	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.943	-322.342	-0.399	(0)
Sb (5)	2.645e-08					
SbO3-	2.642e-08	2.100e-08	-7.578	-7.678	-0.100	(0)
Sb (OH) 6-	2.932e-11	2.452e-11	-10.533	-10.610	-0.078	(0)
SbO2+	5.206e-25	4.138e-25	-24.284	-24.383	-0.100	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.142e-39	9.080e-40	-38.942	-39.042	-0.100	(0)
MnSe	0.000e+00	0.000e+00	-41.108	-41.108	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.234	-43.234	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.561	-45.960	-0.399	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.623	-83.218	-1.595	(0)
Se (4)	1.329e-07					

HSeO3-	6.790e-08	5.397e-08	-7.168	-7.268	-0.100	(0)
SeO3-2	6.496e-08	2.593e-08	-7.187	-7.586	-0.399	(0)
H2SeO3	1.908e-13	1.908e-13	-12.719	-12.719	0.000	(0)
AgSeO3-	2.829e-14	2.249e-14	-13.548	-13.648	-0.100	(0)
Cd (SeO3) 2-2	4.657e-18	1.859e-18	-17.332	-17.731	-0.399	(0)
Ag (SeO3) 2-3	4.123e-20	5.221e-21	-19.385	-20.282	-0.897	(0)
FeHSeO3+2	3.161e-25	1.262e-25	-24.500	-24.899	-0.399	(0)
Se (6)	2.300e-10					
SeO4-2	2.295e-10	1.123e-10	-9.639	-9.949	-0.310	(0)
MnSeO4	5.224e-13	5.224e-13	-12.282	-12.282	0.000	(0)
ZnSeO4	2.640e-14	2.640e-14	-13.578	-13.578	0.000	(0)
NiSeO4	1.838e-15	1.838e-15	-14.736	-14.736	0.000	(0)
CoSeO4	1.428e-15	1.428e-15	-14.845	-14.845	0.000	(0)
CdSeO4	7.016e-17	7.016e-17	-16.154	-16.154	0.000	(0)
HSeO4-	5.869e-17	4.665e-17	-16.231	-16.331	-0.100	(0)
Zn (SeO4) 2-2	7.532e-24	3.007e-24	-23.123	-23.522	-0.399	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.399	-59.296	-0.897	(0)
U (4)	3.778e-19					
U (OH) 5-	3.777e-19	3.002e-19	-18.423	-18.523	-0.100	(0)
U (OH) 4	1.042e-22	1.042e-22	-21.982	-21.982	0.000	(0)
U (OH) 3+	3.976e-27	3.160e-27	-26.401	-26.500	-0.100	(0)
U (OH) 2+2	3.035e-32	1.211e-32	-31.518	-31.917	-0.399	(0)
UF3+	1.043e-36	8.288e-37	-35.982	-36.082	-0.100	(0)
UF2+2	1.188e-37	4.740e-38	-36.925	-37.324	-0.399	(0)
UOH+3	3.735e-38	4.731e-39	-37.428	-38.325	-0.897	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	2.695e-40	0.000e+00	-39.569	-40.467	-0.897	(0)
U (SO4) 2	1.080e-40	1.080e-40	-39.967	-39.967	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.259	-40.358	-0.100	(0)
USO4+2	0.000e+00	0.000e+00	-41.139	-41.538	-0.399	(0)
UF6-2	0.000e+00	0.000e+00	-41.437	-41.836	-0.399	(0)
U+4	0.000e+00	0.000e+00	-44.214	-45.809	-1.595	(0)
UCl+3	0.000e+00	0.000e+00	-45.859	-46.757	-0.897	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-162.715	-170.791	-8.077	(0)
U (5)	7.518e-16					
UO2+	7.518e-16	5.976e-16	-15.124	-15.224	-0.100	(0)
U (6)	3.702e-07					
UO2 (CO3) 3-4	2.665e-07	6.765e-09	-6.574	-8.170	-1.595	(0)
UO2 (CO3) 2-2	1.031e-07	4.114e-08	-6.987	-7.386	-0.399	(0)
UO2CO3	6.284e-10	6.284e-10	-9.202	-9.202	0.000	(0)
UO2OH+	9.254e-12	7.356e-12	-11.034	-11.133	-0.100	(0)
UO2F+	9.217e-13	7.326e-13	-12.035	-12.135	-0.100	(0)
UO2SO4	3.418e-13	3.418e-13	-12.466	-12.466	0.000	(0)
UO2F2	2.331e-13	2.331e-13	-12.632	-12.632	0.000	(0)
UO2+2	9.828e-14	4.811e-14	-13.008	-13.318	-0.310	(0)
UO2 (SO4) 2-2	5.297e-14	2.114e-14	-13.276	-13.675	-0.399	(0)
UO2F3-	8.126e-15	6.459e-15	-14.090	-14.190	-0.100	(0)
(UO2) 3 (OH) 5+	9.298e-16	7.391e-16	-15.032	-15.131	-0.100	(0)
(UO2) 2 (OH) 2+2	2.250e-16	8.980e-17	-15.648	-16.047	-0.399	(0)
UO2Cl+	2.211e-16	1.758e-16	-15.655	-15.755	-0.100	(0)
UO2F4-2	1.418e-17	5.659e-18	-16.848	-17.247	-0.399	(0)
UO2NO3+	7.934e-22	6.307e-22	-21.100	-21.200	-0.100	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.722	-43.822	-0.100	(0)
V+2	0.000e+00	0.000e+00	-45.018	-45.416	-0.399	(0)
V (3)	5.549e-16					
V (OH) 3	5.549e-16	5.549e-16	-15.256	-15.256	0.000	(0)
V (OH) 2+	3.740e-27	2.973e-27	-26.427	-26.527	-0.100	(0)
VOH+2	5.856e-31	2.337e-31	-30.232	-30.631	-0.399	(0)
V+3	3.032e-36	3.840e-37	-35.518	-36.416	-0.897	(0)
VSO4+	1.070e-36	8.508e-37	-35.970	-36.070	-0.100	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.809	-58.706	-0.897	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-58.867	-60.463	-1.595	(0)
V (4)	1.709e-19					
V (OH) 3+	1.683e-19	1.338e-19	-18.774	-18.874	-0.100	(0)
VO+2	1.384e-21	5.523e-22	-20.859	-21.258	-0.399	(0)
VOSO4	7.140e-22	7.140e-22	-21.146	-21.146	0.000	(0)

VOF+	4.598e-22	3.655e-22	-21.337	-21.437	-0.100	(0)
VOF2	1.512e-23	1.512e-23	-22.821	-22.821	0.000	(0)
VOC1+	4.391e-24	3.491e-24	-23.357	-23.457	-0.100	(0)
VOF3-	7.444e-26	5.917e-26	-25.128	-25.228	-0.100	(0)
VOF4-2	6.600e-29	2.635e-29	-28.180	-28.579	-0.399	(0)
H2V2O4+2	2.249e-33	8.978e-34	-32.648	-33.047	-0.399	(0)
V (5)	7.256e-09					
H2VO4-	4.524e-09	3.596e-09	-8.344	-8.444	-0.100	(0)
HVO4-2	2.731e-09	1.090e-09	-8.564	-8.963	-0.399	(0)
H3VO4	2.980e-13	2.980e-13	-12.526	-12.526	0.000	(0)
HV2O7-3	1.049e-14	1.329e-15	-13.979	-14.876	-0.897	(0)
H3V2O7-	8.710e-15	6.923e-15	-14.060	-14.160	-0.100	(0)
VO4-3	5.206e-15	6.593e-16	-14.284	-15.181	-0.897	(0)
V2O7-4	1.700e-16	4.317e-18	-15.769	-17.365	-1.595	(0)
VO2+	5.897e-18	4.933e-18	-17.229	-17.307	-0.078	(0)
VO2F	9.543e-19	9.543e-19	-18.020	-18.020	0.000	(0)
VO2SO4-	6.954e-19	5.528e-19	-18.158	-18.257	-0.100	(0)
V3O9-3	3.852e-19	4.878e-20	-18.414	-19.312	-0.897	(0)
VO2F2-	4.809e-20	3.822e-20	-19.318	-19.418	-0.100	(0)
VO2F3-2	1.318e-22	5.260e-23	-21.880	-22.279	-0.399	(0)
V4O12-4	2.882e-24	7.317e-26	-23.540	-25.136	-1.595	(0)
VO2F4-3	2.254e-26	2.855e-27	-25.647	-26.544	-0.897	(0)
VO2NO3	1.639e-26	1.639e-26	-25.785	-25.785	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.270	-67.859	-3.590	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.262	-67.754	-2.493	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.033	-70.628	-1.595	(0)
Zn	5.434e-06					
Zn+2	3.099e-06	1.517e-06	-5.509	-5.819	-0.310	(0)
ZnSO4	1.558e-06	1.558e-06	-5.807	-5.807	0.000	(0)
ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
ZnOH+	2.318e-07	1.843e-07	-6.635	-6.735	-0.100	(0)
Zn (SO4) 2-2	1.595e-07	6.368e-08	-6.797	-7.196	-0.399	(0)
Zn (OH) 2	3.547e-08	3.547e-08	-7.450	-7.450	0.000	(0)
ZnHCO3+	3.501e-08	2.783e-08	-7.456	-7.556	-0.100	(0)
ZnOHCl	1.365e-08	1.365e-08	-7.865	-7.865	0.000	(0)
ZnCl+	1.031e-08	8.585e-09	-7.987	-8.066	-0.079	(0)
ZnF+	4.201e-09	3.340e-09	-8.377	-8.476	-0.100	(0)
Zn (OH) 3-	2.716e-10	2.159e-10	-9.566	-9.666	-0.100	(0)
ZnCl2	3.065e-11	3.065e-11	-10.514	-10.514	0.000	(0)
ZnCl3-	6.583e-14	5.484e-14	-13.182	-13.261	-0.079	(0)
ZnNO3+	3.150e-14	2.504e-14	-13.502	-13.601	-0.100	(0)
ZnSeO4	2.640e-14	2.640e-14	-13.578	-13.578	0.000	(0)
Zn (OH) 4-2	2.615e-14	1.044e-14	-13.583	-13.981	-0.399	(0)
ZnCl4-2	1.238e-16	6.177e-17	-15.907	-16.209	-0.302	(0)
Zn (NO3) 2	3.282e-23	3.282e-23	-22.484	-22.484	0.000	(0)
Zn (SeO4) 2-2	7.532e-24	3.007e-24	-23.123	-23.522	-0.399	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.686	-148.785	-0.100	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.857	-150.857	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.406	-226.506	-0.100	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.005	-228.404	-0.399	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.496	-306.895	-0.399	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-57.44	-51.15	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-44.59	-40.08	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-51.81	-40.08	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-73.98	-56.05	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-59.48	-39.44	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.37	-28.97	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-25.30	-24.85	0.45	(NH4) 2SeO4
Acanthite	-52.37	-88.59	-36.22	Ag2S
Ag2CO3	-12.13	-23.22	-11.09	Ag2CO3
Ag2CrO4	-20.22	-31.81	-11.59	Ag2CrO4
Ag2HVO4	-12.28	-10.80	1.48	Ag2HVO4
Ag2MoO4	-12.23	-23.78	-11.55	Ag2MoO4

Ag2O	-14.15	-1.58	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.25	-20.07	-4.82	Ag2SO4
Ag3AsO3	-28.39	-26.23	2.16	Ag3AsO3
Ag3AsO4	-16.80	-19.59	-2.79	Ag3AsO4
Ag3H2VO5	-16.77	-11.59	5.18	Ag3H2VO5
AgF:4H2O	-13.88	-12.83	1.05	AgF:4H2O
Agmetal	-0.05	-13.56	-13.51	Ag
AgVO3	-10.78	-10.01	0.77	AgVO3
Al (OH) 3 (am)	-1.71	9.09	10.80	Al (OH) 3
Al2 (MoO4) 3	-50.79	-48.42	2.37	Al2 (MoO4) 3
Al2O3	-1.48	18.18	19.65	Al2O3
Al4 (OH) 10SO4	-4.84	17.86	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.93	-8.13	4.80	AlAsO4:2H2O
AlOHSO4	-6.17	-9.40	-3.23	AlOHSO4
AlSb	-153.10	-87.47	65.62	AlSb
Alunite	-2.80	-4.20	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.41	-12.20	-7.79	PbSO4
Anhydrite	-0.96	-5.32	-4.36	CaSO4
Anilite	-55.51	-87.38	-31.88	Cu0.25Cu1.5S
Antlerite	-1.99	6.79	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.72	-95.48	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-41.15	-34.44	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2 (OH) 3Cl
Azurite	-1.10	-18.01	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.88	8.51	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.30	-1.43	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.86	7.08	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.06	-21.73	-9.67	BaCrO4
BaF2	-9.75	-15.57	-5.82	BaF2
BaMoO4	-6.73	-13.69	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.67	-6.84	1.83	BaSeO3
BaSeO4	-10.14	-17.60	-7.46	BaSeO4
Bianchite	-6.38	-8.15	-1.76	ZnSO4:6H2O
Birnessite	-6.50	11.60	18.09	MnO2
Bixbyite	-1.71	-2.35	-0.64	Mn2O3
BlaubleiI	-55.59	-79.76	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.00	-83.28	-27.28	Cu0.6Cu0.8S
Boehmite	0.51	9.09	8.58	AlOOH
Breithauptite	-56.56	-75.08	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.45	13.39	16.84	Mg (OH) 2
Bunsenite	-3.74	8.71	12.45	NiO
Ca (VO3) 2	-10.94	-5.28	5.66	Ca (VO3) 2
Ca2V2O7	-9.62	7.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.67	7.88	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.24	5.06	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.91	21.05	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.81	21.05	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-296.59	-153.62	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.58	-26.49	-17.91	Hg2Cl2
CaMoO4	-1.08	-9.03	-7.95	CaMoO4
Carnotite	-1.09	-0.86	0.23	KUO2VO4
CaSeO3:2H2O	-5.00	-2.18	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.93	-12.95	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-11.33	-1.49	9.84	Cd (BO2) 2
Cd (OH) 2	-5.96	7.69	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.04	7.69	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.63	-13.92	6.71	Cd3 (OH) 2 (SO4) 2

Cd3(OH)4SO4	-17.99	4.57	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.14	12.26	28.40	Cd4(OH)6SO4
CdCl2	-13.11	-13.77	-0.66	CdCl2
CdCl2:1H2O	-12.08	-13.77	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.86	-13.77	-1.91	CdCl2:2.5H2O
CdF2	-15.18	-16.39	-1.21	CdF2
Cdmetal(alpha)	-31.37	-17.86	13.51	Cd
Cdmetal(gamma)	-31.47	-17.86	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-6.58	-3.04	3.54	CdOHCl
CdSb	-75.75	-76.10	-0.35	CdSb
CdSe	-19.23	-39.43	-20.20	CdSe
CdSeO4:2H2O	-16.57	-18.42	-1.85	CdSeO4:2H2O
CdSO4	-10.63	-10.80	-0.17	CdSO4
CdSO4:1H2O	-9.08	-10.80	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.93	-10.80	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.77	-11.52	-9.75	AgCl
Cerrusite	-2.22	-15.35	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.42	-10.06	-2.64	CuSO4:5H2O
Chalcocite	-55.40	-90.32	-34.92	Cu2S
Chalcopyrite	-126.87	-162.14	-35.27	CuFeS2
Cinnabar	-52.65	-98.35	-45.69	HgS
Claudetite	-92.41	-95.48	-3.06	As4O6
Clausthalite	-13.73	-40.83	-27.10	PbSe
Co(BO2)2	-27.68	-0.61	27.07	Co(BO2)2
Co(OH)2	-4.53	8.57	13.09	Co(OH)2
Co(OH)3	-8.75	-11.06	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.78	-8.74	13.03	Co3(AsO4)2
Co3O4	-3.06	-13.55	-10.50	Co3O4
CoCl2	-21.16	-12.89	8.27	CoCl2
CoCl2:6H2O	-15.43	-12.89	2.54	CoCl2:6H2O
CoCO3	-3.10	-13.08	-9.98	CoCO3
CoF2	-13.91	-15.51	-1.60	CoF2
CoF3	-45.72	-47.18	-1.46	CoF3
CoFe2O4	18.48	14.95	-3.53	CoFe2O4
CoMoO4	-5.87	-13.63	-7.76	CoMoO4
CoO	-5.02	8.57	13.59	CoO
CoS(alpha)	-71.00	-78.44	-7.44	CoS
CoS(beta)	-67.37	-78.44	-11.07	CoS
CoSe	-22.36	-38.56	-16.20	CoSe
CoSeO3	-8.10	-6.78	1.32	CoSeO3
CoSeO4:6H2O	-16.02	-17.55	-1.53	CoSeO4:6H2O
CoSO4	-12.73	-9.92	2.80	CoSO4
CoSO4:6H2O	-7.45	-9.93	-2.47	CoSO4:6H2O
Cotunnite	-10.38	-15.16	-4.78	PbCl2
Covellite	-56.28	-78.58	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.55	-32.46	14.09	CrCl2
CrCl3	-48.48	-33.37	15.11	CrCl3
CrF3	-25.96	-37.30	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.49	-45.33	-33.84	Na3AlF6
Cu(OH)2	-0.25	8.43	8.67	Cu(OH)2
Cu(SbO3)2	-25.54	19.67	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.66	0.59	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.90	-89.79	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.63	-50.43	-45.80	Cu2Se
Cu2SO4	-19.85	-21.80	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.26	-9.16	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-25.63	-89.13	-63.49	Cu3Se2
CuCO3	-1.72	-13.22	-11.50	CuCO3

CuCrO4	-16.37	-21.81	-5.44	CuCrO4
CuF	-8.79	-13.69	-4.91	CuF
CuF2	-16.76	-15.65	1.12	CuF2
CuF2:2H2O	-11.10	-15.65	-4.55	CuF2:2H2O
Cumetal	-5.67	-14.43	-8.76	Cu
CuMoO4	-0.69	-13.77	-13.08	CuMoO4
CuOCuSO4	-11.94	-1.63	10.30	CuOCuSO4
Cupricferrite	8.82	14.81	5.99	CuFe2O4
Cuprite	-1.90	-3.31	-1.41	Cu2O
Cuprousferrite	10.45	1.54	-8.92	CuFeO2
CuSe	-5.59	-38.69	-33.10	CuSe
CuSe2	-26.91	-60.27	-33.37	CuSe2
CuSeO3:2H2O	-7.43	-6.92	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.25	-17.69	-2.44	CuSeO4:5H2O
CuSO4	-13.00	-10.06	2.94	CuSO4
Diaspore	2.21	9.09	6.87	AlOOH
Djurleite	-55.62	-89.54	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg(CO3)2
Epsomite	-2.97	-5.10	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.01	-0.03	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.28	-15.00	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.52	-8.97	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.04	-39.67	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.36	-49.09	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.43	-14.03	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.66	-18.75	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.65	-65.25	-18.60	FeSe2
FeS(ppt)	-80.61	-83.56	-2.95	FeS
FeSe	-32.67	-43.67	-11.00	FeSe
Fix_pe	-4.69	-4.69	0.00	e-
Fluorite	-0.41	-10.91	-10.50	CaF2
Galena	-66.75	-80.72	-13.97	PbS
Gibbsite	0.80	9.09	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.14	-8.15	-2.01	ZnSO4:7H2O
Greenockite	-64.96	-79.32	-14.36	CdS
Greigite	-293.17	-338.21	-45.03	Fe3S4
Gummite	-4.83	2.85	7.67	UO3
Gypsum	-0.72	-5.33	-4.61	CaSO4:2H2O
H-Jarosite	-15.31	-27.41	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.32	-22.20	-12.88	H2MoO4
H2S(g)	-79.00	-87.01	-8.01	H2S
H2Se(g)	-42.16	-47.12	-4.96	H2Se
Halite	-6.39	-4.79	1.60	NaCl
Hausmannite	-1.28	59.75	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.27	21.63	22.89	FeAl2O4
Hg(CH3)2(g)	-185.28	-258.99	-73.71	Hg(CH3)2
Hg(g)	-7.41	-15.29	-7.87	Hg
Hg(OH)2	-7.84	-11.34	-3.50	Hg(OH)2
Hg2(g)	-15.62	-30.57	-14.96	Hg2
Hg2(OH)2	-10.29	-5.03	5.26	Hg2(OH)2
Hg2CO3	-10.63	-26.68	-16.05	Hg2CO3
Hg2CrO4	-26.57	-35.27	-8.70	Hg2CrO4
Hg2F2	-18.74	-29.11	-10.36	Hg2F2
Hg2S	-80.36	-92.04	-11.68	Hg2S
Hg2SeO3	-15.72	-20.38	-4.66	Hg2SeO3
Hg2SO4	-17.39	-23.52	-6.13	Hg2SO4
Hg3O2CO3	-25.97	-55.65	-29.68	Hg3O2CO3
HgCl(g)	-32.74	-13.24	19.50	HgCl
HgCl2	-11.53	-32.79	-21.26	HgCl2
HgF(g)	-47.23	-14.55	32.68	HgF
HgF2(g)	-47.98	-35.41	12.57	HgF2

Hgmetal (1)	-1.84	-15.29	-13.45	Hg
HgSe	-2.76	-58.46	-55.69	HgSe
HgSeO3	-14.25	-26.68	-12.43	HgSeO3
HgSO4	-20.41	-29.83	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.64	-24.41	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.86	-19.62	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.21	-22.38	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.09	-21.89	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.20	-49.44	-17.24	K2Cr2O7
K2CrO4	-18.69	-19.20	-0.51	K2CrO4
K2MoO4	-14.43	-11.17	3.26	K2MoO4
K2SeO4	-14.35	-15.08	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.47	-5.90	-0.43	PbO : PbSO4
Laurionite	-5.06	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.40	6.30	12.69	PbO
Mackinawite	-79.96	-83.56	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.52	-4.79	-5.31	Cu2 (OH) 2CO3
Manganite	-1.17	24.17	25.34	MnOOH
Massicot	-6.60	6.30	12.89	PbO
Matlockite	-7.50	-16.47	-8.97	PbClF
Melanothallite	-19.29	-13.03	6.26	CuCl2
Melanterite	-12.83	-15.04	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.25	-98.35	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-16.34	-5.06	11.28	Mg (VO3) 2
Mg2Sb3	-273.72	-199.03	74.68	Mg2Sb3
Mg2V2O7	-18.02	8.34	26.36	Mg2V2O7
MgCr2O4	-5.17	11.04	16.20	MgCr2O4
MgCrO4	-22.22	-16.84	5.38	MgCrO4
MgF2	-2.55	-10.68	-8.13	MgF2
MgMoO4	-6.96	-8.81	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.01	-1.96	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.52	-12.72	-1.20	MgSeO4 : 6H2O
Minium	-29.09	44.43	73.52	Pb3O4
Mirabilite	-5.51	-6.62	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.95	-7.05	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.12	-57.83	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.61	-86.53	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.75	-0.25	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.77	-10.06	2.72	MnCl2 : 4H2O
MnS (grn)	-75.78	-75.61	0.17	MnS
MnS (pnk)	-78.95	-75.61	3.34	MnS
MnSb	-94.83	-97.74	-2.91	MnSb
MnSe	-39.22	-35.72	3.50	MnSe
MnSeO3	-5.08	-3.95	1.13	MnSeO3
MnSeO3 : 2H2O	-4.93	-3.95	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.66	-14.71	-2.05	MnSeO4 : 5H2O
MnSO4	-9.67	-7.09	2.58	MnSO4
Monteponite	-7.41	7.69	15.10	CdO
Montroydite	-7.69	-11.33	-3.64	HgO
MoO3	-14.20	-22.20	-8.00	MoO3
Morenosite	-7.64	-9.79	-2.14	NiSO4 : 7H2O
MoS2	-151.50	-221.76	-70.26	MoS2
Na-Jarosite	-10.27	-21.47	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.71	-48.60	-9.90	Na2Cr2O7
Na2CrO4	-21.29	-18.36	2.93	Na2CrO4
Na2Mo2O7	-15.93	-32.52	-16.60	Na2Mo2O7
Na2MoO4	-11.81	-10.32	1.49	Na2MoO4
Na2MoO4 : 2H2O	-11.55	-10.32	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-13.78	-3.48	10.30	Na2SeO3 : 5H2O

Na2SeO4	-15.52	-14.24	1.28	Na2SeO4
Na3Sb	-173.20	-78.75	94.45	Na3Sb
Na3VO4	-28.09	8.59	36.68	Na3VO4
Na4V2O7	-32.10	5.30	37.40	Na4V2O7
Nantokite	-5.65	-12.38	-6.73	CuCl
NaSb	-88.24	-65.08	23.17	NaSb
Natron	-8.46	-9.77	-1.31	Na2CO3:10H2O
NaVO3	-7.15	-3.29	3.86	NaVO3
Nesquehonite	-3.58	-8.25	-4.67	MgCO3:3H2O
Ni(OH)2	-4.09	8.71	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.03	-8.33	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.67	16.33	32.00	Ni4(OH)6SO4
NiCO3	-6.07	-12.94	-6.87	NiCO3
NiMoO4	-2.35	-13.49	-11.14	NiMoO4
NiS(alpha)	-72.70	-78.30	-5.60	NiS
NiS(beta)	-67.20	-78.30	-11.10	NiS
NiS(gamma)	-65.50	-78.30	-12.80	NiS
NiSe	-20.72	-38.42	-17.70	NiSe
NiSeO3:2H2O	-9.46	-6.64	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.89	-17.41	-1.52	NiSeO4:6H2O
Nsutite	-5.91	11.60	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-247.70	-308.77	-61.07	As2S3
Otavite	-1.96	-13.96	-12.00	CdCO3
Pb(BO2)2	-9.40	-2.88	6.52	Pb(BO2)2
Pb(OH)2	-1.86	6.29	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.17	-66.93	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.93	1.86	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.60	12.59	26.19	Pb2O(OH)2
Pb2O3	-22.90	38.14	61.04	Pb2O3
Pb2OCO3	-8.50	-9.06	-0.56	Pb2OCO3
Pb2V2O7	-3.96	-5.86	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.36	-15.56	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.71	0.43	6.14	Pb3(VO4)2
Pb3O2CO3	-13.78	-2.76	11.02	Pb3O2CO3
Pb3O2SO4	-10.29	0.39	10.69	Pb3O2SO4
Pb4(OH)6SO4	-14.41	6.69	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.19	6.69	21.88	Pb4O3SO4
PbCrO4	-11.34	-23.94	-12.60	PbCrO4
PbF2	-10.34	-17.78	-7.44	PbF2
Pbmetal	-23.50	-19.25	4.25	Pb
PbMoO4	-0.28	-15.90	-15.62	PbMoO4
PbO:0.3H2O	-6.68	6.30	12.98	PbO:0.33H2O
PbSeO4	-12.98	-19.82	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl2:PbCO3
Plattnerite	-17.76	31.84	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-126.52	-145.02	-18.51	FeS2
Pyrochroite	-3.79	11.40	15.19	Mn(OH)2
Pyrolusite	-4.43	36.95	41.38	MnO2
Realgar	-103.90	-123.65	-19.75	AsS
Retgersite	-7.75	-9.79	-2.04	NiSO4:6H2O
Rhodochrosite	0.33	-10.25	-10.58	MnCO3
Rutherfordine	-4.30	-18.80	-14.50	UO2CO3
Sb(OH)3	-12.82	-19.93	-7.11	Sb(OH)3
Sb2O4	-17.71	-14.31	3.40	Sb2O4
Sb2O5	-27.72	-37.38	-9.67	Sb2O5
Sb2Se3	-113.46	-181.22	-67.76	Sb2Se3
Sb4O6(cubic)	-61.44	-79.70	-18.26	Sb4O6
Sb4O6(orth)	-61.80	-79.70	-17.90	Sb4O6
SbCl3	-52.68	-52.11	0.57	SbCl3
SbF3	-45.82	-56.04	-10.23	SbF3
Sbmetal	-46.55	-58.24	-11.69	Sb
SbO2	-3.64	-31.46	-27.82	SbO2
Schoepite	-3.15	2.84	5.99	UO2(OH)2:H2O
Semetal(am)	-14.47	-21.58	-7.11	Se
Semetal(hex)	-13.87	-21.58	-7.71	Se

Senarmontite	-27.49	-39.85	-12.37	Sb2O3
SeO2	-15.47	-15.35	0.12	SeO2
SeO3	-47.16	-26.11	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.30	-11.30	-10.00	ZnCO3
Sphalerite	-65.22	-76.67	-11.45	ZnS
Spinel	-5.28	31.57	36.85	MgAl2O4
Stibnite	-250.42	-300.88	-50.46	Sb2S3
Sulfur	-59.32	-61.47	-2.14	S
Tenorite	0.78	8.43	7.64	CuO
Thenardite	-6.94	-6.62	0.32	Na2SO4
Thermonatrite	-10.41	-9.77	0.64	Na2CO3:H2O
Tyuyamunite	-3.67	0.41	4.08	Ca(UO2)2(VO4)2
U3O8	-10.44	10.64	21.08	U3O8
U3Sb4	-579.07	-426.69	152.38	U3Sb4
U4O9	-25.37	-28.39	-3.02	U4O9
UF4	-32.10	-61.64	-29.54	UF4
UF4:2.5H2O	-28.92	-61.64	-32.72	UF4:2.5H2O
UO2(am)	-14.42	-13.48	0.93	UO2
UO2(NO3)2	-41.83	-29.68	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.53	-29.68	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.07	-29.68	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.73	-29.68	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.77	2.85	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.02	-23.27	-2.25	UO2SeO4:4H2O
UO3	-4.85	2.85	7.70	UO3
Uraninite	-8.81	-13.48	-4.67	UO2
USb2	-219.85	-190.27	29.58	USb2
V(OH)3	-19.76	-12.17	7.59	V(OH)3
V2O5	-17.09	-18.45	-1.36	V2O5
V3O5	-42.67	-40.83	1.84	V3O5
V4O7	-53.11	-45.92	7.19	V4O7
V6O13	-45.58	-106.44	-60.86	V6O13
Valentinite	-31.37	-39.85	-8.48	Sb2O3
VC12	-65.28	-46.40	18.87	VC12
VC13	-67.79	-44.36	23.43	VC13
VF4	-68.18	-53.25	14.93	VF4
Vmetal	-94.51	-50.49	44.03	V
VO	-39.70	-24.94	14.76	VO
VO(OH)2	-10.25	-5.10	5.15	VO(OH)2
VO2Cl	-22.80	-19.95	2.84	VO2Cl
VOC1	-34.05	-22.90	11.15	VOC1
VOC12	-39.31	-26.55	12.76	VOC12
VOSO4	-27.20	-23.59	3.61	VOSO4
Witherite	-4.57	-13.14	-8.57	BaCO3
Wurtzite	-67.72	-76.67	-8.95	ZnS
Zincite	-0.99	10.34	11.33	ZnO
Zincosite	-12.08	-8.15	3.93	ZnSO4
Zn(BO2)2	-7.12	1.17	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.50	-22.19	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.86	10.34	12.20	Zn(OH)2
Zn(OH)2(am)	-2.13	10.34	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.41	10.34	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.19	10.34	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.39	10.34	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.30	2.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.23	9.96	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.06	-3.41	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.86	-5.95	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.52	22.88	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.24	30.26	38.50	Zn5(OH)8Cl2
ZnCl2	-18.16	-11.11	7.05	ZnCl2
ZnCO3:1H2O	-1.04	-11.30	-10.26	ZnCO3:1H2O
ZnF2	-13.20	-13.73	-0.53	ZnF2
Znmetal	-40.99	-15.20	25.79	Zn
ZnMoO4	-1.73	-11.85	-10.13	ZnMoO4
ZnO(active)	-0.84	10.34	11.19	ZnO
ZnS(am)	-67.61	-76.67	-9.05	ZnS

ZnSb	-84.46	-73.44	11.01	ZnSb
ZnSe	-22.38	-36.78	-14.40	ZnSe
ZnSeO4:6H2O	-14.25	-15.77	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.51	-8.15	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 51.

Title Use solution to allow model output
REACTION 206
H2O -0.0
0 moles
USE solution 215
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 215. Solution after simulation 50.
Using reaction 206.

Reaction 206.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	9.519e-09	9.520e-09
Al	3.637e-06	3.638e-06
As	1.432e-10	1.433e-10
B	2.801e-05	2.801e-05
Ba	4.576e-08	4.577e-08
C	7.449e-04	7.450e-04
Ca	3.166e-03	3.167e-03
Cd	1.238e-08	1.239e-08
Cl	2.693e-03	2.693e-03
Co	9.136e-08	9.136e-08
Cr	9.876e-10	9.877e-10
Cu	5.264e-07	5.265e-07
F	1.591e-04	1.591e-04

Fe	8.744e-10	8.744e-10
Hg	1.911e-09	1.911e-09
K	3.362e-03	3.362e-03
Mg	4.964e-03	4.964e-03
Mn	5.815e-05	5.816e-05
Mo	1.881e-06	1.882e-06
N	8.498e-06	8.499e-06
Na	8.798e-03	8.798e-03
Ni	1.127e-07	1.128e-07
Pb	2.605e-09	2.605e-09
S	1.246e-02	1.246e-02
Sb	2.645e-08	2.645e-08
Se	1.331e-07	1.331e-07
U	3.702e-07	3.702e-07
V	7.256e-09	7.256e-09
Zn	5.434e-06	5.434e-06

-----Description of solution-----

	pH =	8.082	Charge balance
	pe =	4.691	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	3.822e-02	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	7.729e-04	
	Total CO2 (mol/kg) =	7.449e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.006e-06	
Percent error, 100*(Cat- An)/(Cat+ An) =	0.00		
	Iterations =	0	
	Total H =	1.110236e+02	
	Total O =	5.556357e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.465e-06	1.214e-06	-5.834	-5.916	-0.081	(0)
H+	9.907e-09	8.286e-09	-8.004	-8.082	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	9.519e-09					
AgCl	6.206e-09	6.206e-09	-8.207	-8.207	0.000	(0)
Ag+	1.613e-09	1.349e-09	-8.792	-8.870	-0.078	(0)
AgCl2-	1.532e-09	1.218e-09	-8.815	-8.914	-0.100	(0)
AgSO4-	1.590e-10	1.264e-10	-9.799	-9.898	-0.100	(0)
AgCl3-2	6.124e-12	2.444e-12	-11.213	-11.612	-0.399	(0)
AgNO2	1.963e-12	1.963e-12	-11.707	-11.707	0.000	(0)
AgF	3.739e-13	3.739e-13	-12.427	-12.427	0.000	(0)
AgOH	1.639e-13	1.639e-13	-12.785	-12.785	0.000	(0)
AgCl4-3	8.877e-14	1.124e-14	-13.052	-13.949	-0.897	(0)
AgH2BO3	3.860e-14	3.860e-14	-13.413	-13.413	0.000	(0)
AgSeO3-	2.829e-14	2.249e-14	-13.548	-13.648	-0.100	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	8.506e-15	6.761e-15	-14.070	-14.170	-0.100	(0)
Ag (NO2) 2-	2.664e-17	2.117e-17	-16.574	-16.674	-0.100	(0)
Ag (OH) 2-	2.447e-17	1.945e-17	-16.611	-16.711	-0.100	(0)
AgNO3	7.042e-18	7.042e-18	-17.152	-17.152	0.000	(0)
Ag (NH3) 2+	1.697e-19	1.349e-19	-18.770	-18.870	-0.100	(0)
Ag (SeO3) 2-3	4.123e-20	5.221e-21	-19.385	-20.282	-0.897	(0)
Ag2MoO4	6.348e-25	6.348e-25	-24.197	-24.197	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.984	-73.984	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.623	-83.218	-1.595	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.012	-148.215	-0.203	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.714	-148.813	-0.100	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.202	-149.574	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.531	-149.885	-0.353	(0)

Al	3.637e-06					
Al (OH) 4-	3.616e-06	3.026e-06	-5.442	-5.519	-0.077	(0)
Al (OH) 3	1.979e-08	1.979e-08	-7.703	-7.703	0.000	(0)
Al (OH) 2+	9.687e-10	8.169e-10	-9.014	-9.088	-0.074	(0)
AlF3	4.691e-11	4.691e-11	-10.329	-10.329	0.000	(0)
AlF2+	4.006e-11	3.378e-11	-10.397	-10.471	-0.074	(0)
AlF4-	3.099e-12	2.594e-12	-11.509	-11.586	-0.077	(0)
AlOH+2	1.675e-12	8.468e-13	-11.776	-12.072	-0.296	(0)
AlF+2	1.521e-12	7.692e-13	-11.818	-12.114	-0.296	(0)
AlSO4+	3.035e-14	2.540e-14	-13.518	-13.595	-0.077	(0)
Al+3	3.479e-15	6.973e-16	-14.459	-15.157	-0.698	(0)
Al (SO4) 2-	1.526e-15	1.277e-15	-14.816	-14.894	-0.077	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.970	-44.868	-0.897	(0)
As (3)	1.456e-24					
H3AsO3	1.351e-24	1.351e-24	-23.869	-23.869	0.000	(0)
H2AsO3-	1.052e-25	8.360e-26	-24.978	-25.078	-0.100	(0)
HAsO3-2	2.305e-29	9.201e-30	-28.637	-29.036	-0.399	(0)
H4AsO3+	6.977e-33	5.546e-33	-32.156	-32.256	-0.100	(0)
AsO3-3	3.380e-34	4.280e-35	-33.471	-34.369	-0.897	(0)
As (5)	1.432e-10					
HAsO4-2	1.378e-10	5.502e-11	-9.861	-10.259	-0.399	(0)
H2AsO4-	5.232e-12	4.158e-12	-11.281	-11.381	-0.100	(0)
AsO4-3	1.658e-13	2.100e-14	-12.780	-13.678	-0.897	(0)
H3AsO4	5.936e-18	5.988e-18	-17.227	-17.223	0.004	(0)
B	2.801e-05					
H3BO3	2.553e-05	2.575e-05	-4.593	-4.589	0.004	(0)
H2BO3-	2.200e-06	1.805e-06	-5.658	-5.744	-0.086	(0)
MgH2BO3+	1.296e-07	1.063e-07	-6.887	-6.973	-0.086	(0)
CaH2BO3+	1.277e-07	1.048e-07	-6.894	-6.980	-0.086	(0)
NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
BF (OH) 3-	1.382e-09	1.134e-09	-8.860	-8.946	-0.086	(0)
H5 (BO3) 2-	4.822e-11	3.956e-11	-10.317	-10.403	-0.086	(0)
BaH2BO3+	1.517e-12	1.244e-12	-11.819	-11.905	-0.086	(0)
BF2 (OH) 2-	1.351e-13	1.108e-13	-12.869	-12.955	-0.086	(0)
H8 (BO3) 3-	1.242e-13	1.019e-13	-12.906	-12.992	-0.086	(0)
AgH2BO3	3.860e-14	3.860e-14	-13.413	-13.413	0.000	(0)
BF3OH-	4.807e-20	3.944e-20	-19.318	-19.404	-0.086	(0)
BF4-	2.163e-25	1.775e-25	-24.665	-24.751	-0.086	(0)
Ba	4.576e-08					
Ba+2	4.558e-08	2.231e-08	-7.341	-7.651	-0.310	(0)
BaHCO3+	1.458e-10	1.236e-10	-9.836	-9.908	-0.072	(0)
BaCO3	3.755e-11	3.755e-11	-10.425	-10.425	0.000	(0)
BaH2BO3+	1.517e-12	1.244e-12	-11.819	-11.905	-0.086	(0)
BaOH+	1.407e-13	1.183e-13	-12.852	-12.927	-0.075	(0)
BaNO3+	9.243e-16	7.347e-16	-15.034	-15.134	-0.100	(0)
BaNH3+2	8.655e-17	3.455e-17	-16.063	-16.462	-0.399	(0)
C (4)	7.449e-04					
HCO3-	6.877e-04	5.799e-04	-3.163	-3.237	-0.074	(0)
CaHCO3+	1.286e-05	1.090e-05	-4.891	-4.963	-0.072	(0)
MgHCO3+	1.210e-05	1.008e-05	-4.917	-4.996	-0.079	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	6.703e-06	3.281e-06	-5.174	-5.484	-0.310	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.636e-06	4.636e-06	-5.334	-5.334	0.000	(0)
NaHCO3	2.340e-06	2.340e-06	-5.631	-5.631	0.000	(0)
NaCO3-	5.200e-07	4.385e-07	-6.284	-6.358	-0.074	(0)
CuCO3	3.561e-07	3.561e-07	-6.448	-6.448	0.000	(0)
ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
UO2 (CO3) 3-4	2.665e-07	6.765e-09	-6.574	-8.170	-1.595	(0)
MnHCO3+	2.379e-07	1.999e-07	-6.624	-6.699	-0.075	(0)
UO2 (CO3) 2-2	1.031e-07	4.114e-08	-6.987	-7.386	-0.399	(0)
ZnHCO3+	3.501e-08	2.783e-08	-7.456	-7.556	-0.100	(0)
Cu (CO3) 2-2	7.878e-09	3.145e-09	-8.104	-8.502	-0.399	(0)
NiCO3	4.281e-09	4.281e-09	-8.368	-8.368	0.000	(0)
NiHCO3+	3.146e-09	2.501e-09	-8.502	-8.602	-0.100	(0)
CoHCO3+	1.440e-09	1.144e-09	-8.842	-8.941	-0.100	(0)
CoCO3	1.407e-09	1.407e-09	-8.852	-8.852	0.000	(0)
PbCO3	1.337e-09	1.337e-09	-8.874	-8.874	0.000	(0)

		CuHCO3+	8.485e-10	6.744e-10	-9.071	-9.171	-0.100	(0)
		UO2CO3	6.284e-10	6.284e-10	-9.202	-9.202	0.000	(0)
		CdCO3	2.508e-10	2.508e-10	-9.601	-9.601	0.000	(0)
		BaHCO3+	1.458e-10	1.236e-10	-9.836	-9.908	-0.072	(0)
		PbHCO3+	7.350e-11	5.843e-11	-10.134	-10.233	-0.100	(0)
		BaCO3	3.755e-11	3.755e-11	-10.425	-10.425	0.000	(0)
		Pb (CO3) 2-2	3.170e-11	1.265e-11	-10.499	-10.898	-0.399	(0)
		CdHCO3+	5.572e-12	4.429e-12	-11.254	-11.354	-0.100	(0)
		Cd (CO3) 2-2	1.528e-12	6.101e-13	-11.816	-12.215	-0.399	(0)
		HgCO3	1.950e-15	1.950e-15	-14.710	-14.710	0.000	(0)
		FeHCO3+	1.673e-15	1.417e-15	-14.777	-14.849	-0.072	(0)
		Hg (CO3) 2-2	5.069e-17	2.024e-17	-16.295	-16.694	-0.399	(0)
		HgHCO3+	3.786e-19	3.009e-19	-18.422	-18.522	-0.100	(0)
Ca	3.166e-03							
		Ca+2	2.062e-03	1.009e-03	-2.686	-2.996	-0.310	(0)
		CaSO4	1.085e-03	1.085e-03	-2.965	-2.965	0.000	(0)
		CaHCO3+	1.286e-05	1.090e-05	-4.891	-4.963	-0.072	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	1.446e-06	1.215e-06	-5.840	-5.915	-0.075	(0)
		CaH2BO3+	1.277e-07	1.048e-07	-6.894	-6.980	-0.086	(0)
		CaOH+	2.886e-08	2.446e-08	-7.540	-7.612	-0.072	(0)
		CaNO3+	2.638e-11	2.097e-11	-10.579	-10.678	-0.100	(0)
		CaNH3+2	7.811e-12	3.118e-12	-11.107	-11.506	-0.399	(0)
		Ca (NH3) 2+2	7.630e-21	3.046e-21	-20.117	-20.516	-0.399	(0)
Cd	1.238e-08							
		Cd+2	6.852e-09	3.354e-09	-8.164	-8.474	-0.310	(0)
		CdSO4	3.690e-09	3.690e-09	-8.433	-8.433	0.000	(0)
		CdCl+	9.078e-10	7.216e-10	-9.042	-9.142	-0.100	(0)
		Cd (SO4) 2-2	5.853e-10	2.336e-10	-9.233	-9.631	-0.399	(0)
		CdCO3	2.508e-10	2.508e-10	-9.601	-9.601	0.000	(0)
		CdOH+	4.071e-11	3.236e-11	-10.390	-10.490	-0.100	(0)
		CdOHC1	3.595e-11	3.595e-11	-10.444	-10.444	0.000	(0)
		CdF+	7.378e-12	5.864e-12	-11.132	-11.232	-0.100	(0)
		CdCl2	6.776e-12	6.776e-12	-11.169	-11.169	0.000	(0)
		CdHCO3+	5.572e-12	4.429e-12	-11.254	-11.354	-0.100	(0)
		Cd (CO3) 2-2	1.528e-12	6.101e-13	-11.816	-12.215	-0.399	(0)
		Cd (OH) 2	2.479e-13	2.479e-13	-12.606	-12.606	0.000	(0)
		CdCl3-	1.212e-14	9.630e-15	-13.917	-14.016	-0.100	(0)
		CdF2	1.291e-15	1.291e-15	-14.889	-14.889	0.000	(0)
		CdNO3+	8.767e-17	6.968e-17	-16.057	-16.157	-0.100	(0)
		CdSeO4	7.016e-17	7.016e-17	-16.154	-16.154	0.000	(0)
		Cd (OH) 3-	2.314e-17	1.840e-17	-16.636	-16.735	-0.100	(0)
		Cd (SeO3) 2-2	4.657e-18	1.859e-18	-17.332	-17.731	-0.399	(0)
		Cd2OH+3	4.295e-18	5.439e-19	-17.367	-18.264	-0.897	(0)
		Cd (OH) 4-2	9.161e-24	3.657e-24	-23.038	-23.437	-0.399	(0)
		Cd (NO3) 2	2.294e-25	2.294e-25	-24.639	-24.639	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-79.296	-79.395	-0.100	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.120	-151.120	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-228.050	-228.149	-0.100	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-304.483	-304.882	-0.399	(0)
Cl	2.693e-03							
		Cl-	2.693e-03	2.253e-03	-2.570	-2.647	-0.078	(0)
		MnCl+	5.830e-08	4.900e-08	-7.234	-7.310	-0.075	(0)
		ZnOHC1	1.365e-08	1.365e-08	-7.865	-7.865	0.000	(0)
		ZnCl+	1.031e-08	8.585e-09	-7.987	-8.066	-0.079	(0)
		AgCl	6.206e-09	6.206e-09	-8.207	-8.207	0.000	(0)
		AgCl2-	1.532e-09	1.218e-09	-8.815	-8.914	-0.100	(0)
		CdCl+	9.078e-10	7.216e-10	-9.042	-9.142	-0.100	(0)
		CuCl	5.217e-10	5.217e-10	-9.283	-9.283	0.000	(0)
		CuCl2-	2.947e-10	2.455e-10	-9.531	-9.610	-0.079	(0)
		NiCl+	2.536e-10	2.016e-10	-9.596	-9.696	-0.100	(0)
		CoCl+	2.487e-10	1.977e-10	-9.604	-9.704	-0.100	(0)
		MnCl2	1.559e-10	1.559e-10	-9.807	-9.807	0.000	(0)
		CuCl+	7.899e-11	6.580e-11	-10.102	-10.182	-0.079	(0)
		CdOHC1	3.595e-11	3.595e-11	-10.444	-10.444	0.000	(0)
		ZnCl2	3.065e-11	3.065e-11	-10.514	-10.514	0.000	(0)
		PbCl+	1.363e-11	1.084e-11	-10.865	-10.965	-0.100	(0)
		CdCl2	6.776e-12	6.776e-12	-11.169	-11.169	0.000	(0)

AgCl3-2	6.124e-12	2.444e-12	-11.213	-11.612	-0.399	(0)
HgClOH	2.400e-12	2.400e-12	-11.620	-11.620	0.000	(0)
HgCl2	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
CuCl3-2	2.370e-13	1.182e-13	-12.625	-12.927	-0.302	(0)
MnCl3-	1.151e-13	9.672e-14	-12.939	-13.014	-0.075	(0)
PbCl2	1.090e-13	1.090e-13	-12.962	-12.962	0.000	(0)
AgCl4-3	8.877e-14	1.124e-14	-13.052	-13.949	-0.897	(0)
ZnCl3-	6.583e-14	5.484e-14	-13.182	-13.261	-0.079	(0)
CuCl2	5.140e-14	5.140e-14	-13.289	-13.289	0.000	(0)
CdCl3-	1.212e-14	9.630e-15	-13.917	-14.016	-0.100	(0)
HgCl3-	7.142e-15	5.677e-15	-14.146	-14.246	-0.100	(0)
NiCl2	2.286e-15	2.286e-15	-14.641	-14.641	0.000	(0)
UO2Cl+	2.211e-16	1.758e-16	-15.655	-15.755	-0.100	(0)
HgCl4-2	1.275e-16	5.091e-17	-15.894	-16.293	-0.399	(0)
ZnCl4-2	1.238e-16	6.177e-17	-15.907	-16.209	-0.302	(0)
PbCl3-	1.230e-16	9.778e-17	-15.910	-16.010	-0.100	(0)
HgCl+	2.809e-17	2.232e-17	-16.552	-16.651	-0.100	(0)
CuCl3-	1.297e-18	1.080e-18	-17.887	-17.966	-0.079	(0)
CrCl+2	1.021e-18	4.075e-19	-17.991	-18.390	-0.399	(0)
PbCl4-2	2.522e-19	1.007e-19	-18.598	-18.997	-0.399	(0)
CrOHCl2	2.119e-20	2.119e-20	-19.674	-19.674	0.000	(0)
FeCl+2	1.206e-22	6.019e-23	-21.919	-22.220	-0.302	(0)
CrCl2+	1.096e-22	8.710e-23	-21.960	-22.060	-0.100	(0)
CuCl4-2	2.444e-23	1.220e-23	-22.612	-22.914	-0.302	(0)
VOC1+	4.391e-24	3.491e-24	-23.357	-23.457	-0.100	(0)
FeCl2+	7.206e-25	6.056e-25	-24.142	-24.218	-0.075	(0)
CrO3Cl-	3.336e-26	2.652e-26	-25.477	-25.576	-0.100	(0)
FeCl3	1.364e-28	1.364e-28	-27.865	-27.865	0.000	(0)
CoCl+2	5.691e-36	2.272e-36	-35.245	-35.644	-0.399	(0)
UCl+3	0.000e+00	0.000e+00	-45.859	-46.757	-0.897	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
Co (2)	9.136e-08					
Co+2	6.356e-08	2.537e-08	-7.197	-7.596	-0.399	(0)
CoSO4	2.376e-08	2.376e-08	-7.624	-7.624	0.000	(0)
CoHCO3+	1.440e-09	1.144e-09	-8.842	-8.941	-0.100	(0)
CoCO3	1.407e-09	1.407e-09	-8.852	-8.852	0.000	(0)
CoOH+	7.734e-10	6.148e-10	-9.112	-9.211	-0.100	(0)
CoCl+	2.487e-10	1.977e-10	-9.604	-9.704	-0.100	(0)
CoF+	1.113e-10	8.850e-11	-9.953	-10.053	-0.100	(0)
Co (OH) 2	5.931e-11	5.931e-11	-10.227	-10.227	0.000	(0)
CoNO2+	1.566e-12	1.245e-12	-11.805	-11.905	-0.100	(0)
Co (NH3) +2	1.875e-14	7.485e-15	-13.727	-14.126	-0.399	(0)
Co (OH) 3-	1.808e-15	1.437e-15	-14.743	-14.843	-0.100	(0)
CoSeO4	1.428e-15	1.428e-15	-14.845	-14.845	0.000	(0)
CoOOH-	4.539e-16	3.608e-16	-15.343	-15.443	-0.100	(0)
CoNO3+	3.323e-16	2.642e-16	-15.478	-15.578	-0.100	(0)
Co2OH+3	6.172e-18	7.817e-19	-17.210	-18.107	-0.897	(0)
Co (NH3) 2+2	1.963e-21	7.835e-22	-20.707	-21.106	-0.399	(0)
Co (OH) 4-2	6.930e-22	2.766e-22	-21.159	-21.558	-0.399	(0)
Co (NO3) 2	3.531e-24	3.531e-24	-23.452	-23.452	0.000	(0)
Co4 (OH) 4+4	1.123e-27	2.850e-29	-26.950	-28.545	-1.595	(0)
Co (NH3) 3+2	6.064e-29	2.421e-29	-28.217	-28.616	-0.399	(0)
Co (NH3) 4+2	7.809e-37	3.117e-37	-36.107	-36.506	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.498	-44.896	-0.399	(0)
Co (3)	7.663e-29					
CoOH+2	7.663e-29	3.059e-29	-28.116	-28.514	-0.399	(0)
Co+3	2.473e-35	4.956e-36	-34.607	-35.305	-0.698	(0)
CoCl+2	5.691e-36	2.272e-36	-35.245	-35.644	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.736	-67.135	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
Cr (2)	1.705e-27					
Cr+2	1.705e-27	6.805e-28	-26.768	-27.167	-0.399	(0)
Cr (3)	9.876e-10					
Cr (OH) 2+	6.905e-10	5.488e-10	-9.161	-9.261	-0.100	(0)

Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.806e-11	1.436e-11	-10.743	-10.843	-0.100	(0)
Cr (OH) 4-	1.523e-11	1.211e-11	-10.817	-10.917	-0.100	(0)
Cr (OH) +2	9.305e-12	3.714e-12	-11.031	-11.430	-0.399	(0)
CrOHSO4	4.136e-12	4.136e-12	-11.383	-11.383	0.000	(0)
CrF+2	6.123e-15	2.444e-15	-14.213	-14.612	-0.399	(0)
CrSO4+	1.927e-15	1.532e-15	-14.715	-14.815	-0.100	(0)
Cr+3	1.104e-15	1.398e-16	-14.957	-15.855	-0.897	(0)
CrCl+2	1.021e-18	4.075e-19	-17.991	-18.390	-0.399	(0)
CrOHC12	2.119e-20	2.119e-20	-19.674	-19.674	0.000	(0)
Cr2 (OH) 2SO4+2	3.479e-21	1.389e-21	-20.459	-20.857	-0.399	(0)
Cr2 (OH) 2 (SO4) 2	3.871e-22	3.871e-22	-21.412	-21.412	0.000	(0)
CrCl2+	1.096e-22	8.710e-23	-21.960	-22.060	-0.100	(0)
CrNO3+2	1.006e-25	4.014e-26	-24.998	-25.396	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.050	-44.449	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.618	-54.515	-0.897	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Cr (6)	1.797e-14					
CrO4-2	1.720e-14	8.419e-15	-13.765	-14.075	-0.310	(0)
NaCrO4-	3.777e-16	3.002e-16	-15.423	-15.523	-0.100	(0)
HCrO4-	2.840e-16	2.258e-16	-15.547	-15.646	-0.100	(0)
KCrO4-	1.071e-16	8.515e-17	-15.970	-16.070	-0.100	(0)
CrO3SO4-2	6.703e-24	2.676e-24	-23.174	-23.573	-0.399	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.336e-26	2.652e-26	-25.477	-25.576	-0.100	(0)
Cr2O7-2	4.429e-30	1.768e-30	-29.354	-29.752	-0.399	(0)
Cu (1)	1.048e-09					
CuCl	5.217e-10	5.217e-10	-9.283	-9.283	0.000	(0)
CuCl2-	2.947e-10	2.455e-10	-9.531	-9.610	-0.079	(0)
Cu+	2.314e-10	1.840e-10	-9.636	-9.735	-0.100	(0)
CuCl3-2	2.370e-13	1.182e-13	-12.625	-12.927	-0.302	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.678	-148.040	-0.362	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.426	-148.770	-0.344	(0)
Cu (2)	5.254e-07					
CuCO3	3.561e-07	3.561e-07	-6.448	-6.448	0.000	(0)
CuOH+	8.497e-08	7.079e-08	-7.071	-7.150	-0.079	(0)
Cu+2	3.765e-08	1.843e-08	-7.424	-7.734	-0.310	(0)
CuSO4	1.982e-08	1.982e-08	-7.703	-7.703	0.000	(0)
Cu (OH) 2	1.715e-08	1.715e-08	-7.766	-7.766	0.000	(0)
Cu (CO3) 2-2	7.878e-09	3.145e-09	-8.104	-8.502	-0.399	(0)
CuHCO3+	8.485e-10	6.744e-10	-9.071	-9.171	-0.100	(0)
Cu2 (OH) 2+2	3.153e-10	1.259e-10	-9.501	-9.900	-0.399	(0)
CuF+	1.614e-10	1.283e-10	-9.792	-9.892	-0.100	(0)
CuCl+	7.899e-11	6.580e-11	-10.102	-10.182	-0.079	(0)
Cu (OH) 3-	5.376e-11	4.273e-11	-10.270	-10.369	-0.100	(0)
CuNO2+	1.691e-11	1.344e-11	-10.772	-10.872	-0.100	(0)
CuNH3+2	1.159e-12	4.628e-13	-11.936	-12.335	-0.399	(0)
CuCl2	5.140e-14	5.140e-14	-13.289	-13.289	0.000	(0)
Cu (OH) 4-2	1.023e-15	4.084e-16	-14.990	-15.389	-0.399	(0)
Cu (NO2) 2	9.577e-16	9.577e-16	-15.019	-15.019	0.000	(0)
CuNO3+	4.817e-16	3.829e-16	-15.317	-15.417	-0.100	(0)
CuCl3-	1.297e-18	1.080e-18	-17.887	-17.966	-0.079	(0)
CuCl4-2	2.444e-23	1.220e-23	-22.612	-22.914	-0.302	(0)
Cu (NO3) 2	3.167e-25	3.167e-25	-24.499	-24.499	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.523	-218.622	-0.100	(0)
F	1.591e-04					
F-	1.319e-04	1.103e-04	-3.880	-3.957	-0.078	(0)
MgF+	2.513e-05	2.103e-05	-4.600	-4.677	-0.077	(0)
CaF+	1.446e-06	1.215e-06	-5.840	-5.915	-0.075	(0)
NaF	4.995e-07	4.995e-07	-6.301	-6.301	0.000	(0)
MnF+	9.028e-08	7.588e-08	-7.044	-7.120	-0.075	(0)
ZnF+	4.201e-09	3.340e-09	-8.377	-8.476	-0.100	(0)
BF (OH) 3-	1.382e-09	1.134e-09	-8.860	-8.946	-0.086	(0)
HF	1.352e-09	1.352e-09	-8.869	-8.869	0.000	(0)
CuF+	1.614e-10	1.283e-10	-9.792	-9.892	-0.100	(0)
NiF+	1.219e-10	9.692e-11	-9.914	-10.014	-0.100	(0)
CoF+	1.113e-10	8.850e-11	-9.953	-10.053	-0.100	(0)
AlF3	4.691e-11	4.691e-11	-10.329	-10.329	0.000	(0)

AlF2+	4.006e-11	3.378e-11	-10.397	-10.471	-0.074	(0)
CdF+	7.378e-12	5.864e-12	-11.132	-11.232	-0.100	(0)
AlF4-	3.099e-12	2.594e-12	-11.509	-11.586	-0.077	(0)
AlF+2	1.521e-12	7.692e-13	-11.818	-12.114	-0.296	(0)
PbF+	1.326e-12	1.054e-12	-11.877	-11.977	-0.100	(0)
UO2F+	9.217e-13	7.326e-13	-12.035	-12.135	-0.100	(0)
HF2-	6.840e-13	5.671e-13	-12.165	-12.246	-0.081	(0)
AgF	3.739e-13	3.739e-13	-12.427	-12.427	0.000	(0)
UO2F2	2.331e-13	2.331e-13	-12.632	-12.632	0.000	(0)
BF2 (OH) 2-	1.351e-13	1.108e-13	-12.869	-12.955	-0.086	(0)
UO2F3-	8.126e-15	6.459e-15	-14.090	-14.190	-0.100	(0)
CrF+2	6.123e-15	2.444e-15	-14.213	-14.612	-0.399	(0)
PbF2	2.288e-15	2.288e-15	-14.641	-14.641	0.000	(0)
CdF2	1.291e-15	1.291e-15	-14.889	-14.889	0.000	(0)
UO2F4-2	1.418e-17	5.659e-18	-16.848	-17.247	-0.399	(0)
H2F2	4.898e-18	4.898e-18	-17.310	-17.310	0.000	(0)
VO2F	9.543e-19	9.543e-19	-18.020	-18.020	0.000	(0)
PbF3-	6.023e-19	4.788e-19	-18.220	-18.320	-0.100	(0)
FeF2+	3.759e-19	3.159e-19	-18.425	-18.500	-0.075	(0)
FeF+2	2.145e-19	1.070e-19	-18.669	-18.971	-0.302	(0)
FeF3	4.917e-20	4.917e-20	-19.308	-19.308	0.000	(0)
VO2F2-	4.809e-20	3.822e-20	-19.318	-19.418	-0.100	(0)
BF3OH-	4.807e-20	3.944e-20	-19.318	-19.404	-0.086	(0)
VOF+	4.598e-22	3.655e-22	-21.337	-21.437	-0.100	(0)
VO2F3-2	1.318e-22	5.260e-23	-21.880	-22.279	-0.399	(0)
PbF4-2	6.333e-23	2.528e-23	-22.198	-22.597	-0.399	(0)
VOF2	1.512e-23	1.512e-23	-22.821	-22.821	0.000	(0)
HgF+	2.555e-24	2.031e-24	-23.593	-23.692	-0.100	(0)
BF4-	2.163e-25	1.775e-25	-24.665	-24.751	-0.086	(0)
VOF3-	7.444e-26	5.917e-26	-25.128	-25.228	-0.100	(0)
VO2F4-3	2.254e-26	2.855e-27	-25.647	-26.544	-0.897	(0)
Sb (OH) 2F	1.693e-26	1.693e-26	-25.771	-25.771	0.000	(0)
SbOF	1.666e-26	1.666e-26	-25.778	-25.778	0.000	(0)
VOF4-2	6.600e-29	2.635e-29	-28.180	-28.579	-0.399	(0)
UF3+	1.043e-36	8.288e-37	-35.982	-36.082	-0.100	(0)
UF2+2	1.188e-37	4.740e-38	-36.925	-37.324	-0.399	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	2.695e-40	0.000e+00	-39.569	-40.467	-0.897	(0)
UF5-	0.000e+00	0.000e+00	-40.259	-40.358	-0.100	(0)
UF6-2	0.000e+00	0.000e+00	-41.437	-41.836	-0.399	(0)
Fe (2)	7.227e-13					
Fe+2	4.862e-13	1.941e-13	-12.313	-12.712	-0.399	(0)
FeSO4	2.236e-13	2.236e-13	-12.651	-12.651	0.000	(0)
FeOH+	1.117e-14	9.384e-15	-13.952	-14.028	-0.075	(0)
FeHCO3+	1.673e-15	1.417e-15	-14.777	-14.849	-0.072	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.136e-18	3.477e-18	-17.383	-17.459	-0.075	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.620	-161.620	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.412	-238.512	-0.100	(0)
Fe (3)	8.736e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	3.887e-10	3.278e-10	-9.410	-9.484	-0.074	(0)
Fe (OH) 4-	5.733e-11	4.835e-11	-10.242	-10.316	-0.074	(0)
FeOH+2	1.390e-15	6.938e-16	-14.857	-15.159	-0.302	(0)
FeF2+	3.759e-19	3.159e-19	-18.425	-18.500	-0.075	(0)
FeF+2	2.145e-19	1.070e-19	-18.669	-18.971	-0.302	(0)
FeSO4+	5.543e-20	4.659e-20	-19.256	-19.332	-0.075	(0)
FeF3	4.917e-20	4.917e-20	-19.308	-19.308	0.000	(0)
Fe (SO4) 2-	5.881e-21	4.675e-21	-20.231	-20.330	-0.100	(0)
Fe+3	4.414e-21	8.848e-22	-20.355	-21.053	-0.698	(0)
FeCl+2	1.206e-22	6.019e-23	-21.919	-22.220	-0.302	(0)
FeCl2+	7.206e-25	6.056e-25	-24.142	-24.218	-0.075	(0)
FeHSeO3+2	3.161e-25	1.262e-25	-24.500	-24.899	-0.399	(0)
Fe2 (OH) 2+4	6.278e-28	1.594e-29	-27.202	-28.798	-1.595	(0)
FeNO3+2	1.456e-28	5.813e-29	-27.837	-28.236	-0.399	(0)
FeCl3	1.364e-28	1.364e-28	-27.865	-27.865	0.000	(0)
Fe3 (OH) 4+5	2.349e-35	7.552e-38	-34.629	-37.122	-2.493	(0)
H (0)	4.002e-29					

H2	2.001e-29	2.019e-29	-28.699	-28.695	0.004	(0)
Hg (0)	1.904e-09					
Hg	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
Hg (1)	3.216e-21					
Hg2+2	1.608e-21	6.419e-22	-20.794	-21.193	-0.399	(0)
Hg (2)	7.243e-12					
Hg (OH) 2	4.582e-12	4.622e-12	-11.339	-11.335	0.004	(0)
HgClOH	2.400e-12	2.400e-12	-11.620	-11.620	0.000	(0)
HgCl2	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
HgCl3-	7.142e-15	5.677e-15	-14.146	-14.246	-0.100	(0)
HgCO3	1.950e-15	1.950e-15	-14.710	-14.710	0.000	(0)
HgCl4-2	1.275e-16	5.091e-17	-15.894	-16.293	-0.399	(0)
Hg (CO3) 2-2	5.069e-17	2.024e-17	-16.295	-16.694	-0.399	(0)
HgOH+	3.021e-17	2.401e-17	-16.520	-16.620	-0.100	(0)
HgCl+	2.809e-17	2.232e-17	-16.552	-16.651	-0.100	(0)
Hg (OH) 3-	8.891e-19	7.067e-19	-18.051	-18.151	-0.100	(0)
HgHCO3+	3.786e-19	3.009e-19	-18.422	-18.522	-0.100	(0)
Hg (NH3) 2+2	4.728e-21	1.887e-21	-20.325	-20.724	-0.399	(0)
HgNH3+2	1.927e-21	7.690e-22	-20.715	-21.114	-0.399	(0)
Hg+2	1.244e-21	4.967e-22	-20.905	-21.304	-0.399	(0)
HgSO4	6.103e-22	6.103e-22	-21.214	-21.214	0.000	(0)
HgF+	2.555e-24	2.031e-24	-23.593	-23.692	-0.100	(0)
Hg (NH3) 3+2	4.619e-29	1.844e-29	-28.335	-28.734	-0.399	(0)
HgNO3+	1.516e-30	1.205e-30	-29.819	-29.919	-0.100	(0)
Hg (NH3) 4+2	9.003e-37	3.594e-37	-36.046	-36.444	-0.399	(0)
Hg (NO3) 2	3.290e-39	3.290e-39	-38.483	-38.483	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.053	-139.152	-0.100	(0)
HgS2-2	0.000e+00	0.000e+00	-139.380	-139.779	-0.399	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.840	-140.840	0.000	(0)
K	3.362e-03					
K+	3.254e-03	2.722e-03	-2.488	-2.565	-0.078	(0)
KSO4-	1.073e-04	9.044e-05	-3.970	-4.044	-0.074	(0)
KCrO4-	1.071e-16	8.515e-17	-15.970	-16.070	-0.100	(0)
Mg	4.964e-03					
Mg+2	3.470e-03	1.699e-03	-2.460	-2.770	-0.310	(0)
MgSO4	1.451e-03	1.451e-03	-2.838	-2.838	0.000	(0)
MgF+	2.513e-05	2.103e-05	-4.600	-4.677	-0.077	(0)
MgHCO3+	1.210e-05	1.008e-05	-4.917	-4.996	-0.079	(0)
MgCO3	4.636e-06	4.636e-06	-5.334	-5.334	0.000	(0)
MgOH+	9.658e-07	8.213e-07	-6.015	-6.085	-0.070	(0)
MgH2BO3+	1.296e-07	1.063e-07	-6.887	-6.973	-0.086	(0)
Mn (2)	5.815e-05					
Mn+2	4.328e-05	1.728e-05	-4.364	-4.763	-0.399	(0)
MnSO4	1.442e-05	1.442e-05	-4.841	-4.841	0.000	(0)
MnHCO3+	2.379e-07	1.999e-07	-6.624	-6.699	-0.075	(0)
MnF+	9.028e-08	7.588e-08	-7.044	-7.120	-0.075	(0)
MnOH+	6.271e-08	5.271e-08	-7.203	-7.278	-0.075	(0)
MnCl+	5.830e-08	4.900e-08	-7.234	-7.310	-0.075	(0)
MnCl2	1.559e-10	1.559e-10	-9.807	-9.807	0.000	(0)
MnSeO4	5.224e-13	5.224e-13	-12.282	-12.282	0.000	(0)
MnNO3+	2.263e-13	1.799e-13	-12.645	-12.745	-0.100	(0)
MnCl3-	1.151e-13	9.672e-14	-12.939	-13.014	-0.075	(0)
Mn (OH) 3-	5.716e-16	4.804e-16	-15.243	-15.318	-0.075	(0)
Mn (OH) 4-2	3.775e-21	1.884e-21	-20.423	-20.725	-0.302	(0)
Mn (NO3) 2	2.969e-21	2.969e-21	-20.527	-20.527	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.108	-41.108	0.000	(0)
Mn (3)	1.889e-25					
Mn+3	1.889e-25	3.787e-26	-24.724	-25.422	-0.698	(0)
Mn (6)	3.411e-40					
MnO4-2	3.411e-40	1.702e-40	-39.467	-39.769	-0.302	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.367	-44.450	-0.084	(0)
Mo	1.881e-06					
MoO4-2	1.881e-06	9.209e-07	-5.726	-6.036	-0.310	(0)
HMoO4-	1.910e-10	1.518e-10	-9.719	-9.819	-0.100	(0)
H2MoO4	9.217e-15	9.217e-15	-14.035	-14.035	0.000	(0)
Ag2MoO4	6.348e-25	6.348e-25	-24.197	-24.197	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.970	-44.868	-0.897	(0)

Mo7O24-6	0.000e+00	0.000e+00	-50.323	-53.912	-3.590	(0)
HMo7O24-5	0.000e+00	0.000e+00	-53.115	-55.607	-2.493	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-57.311	-58.907	-1.595	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.845	-63.742	-0.897	(0)
N (-3)	4.806e-08					
NH4+	4.347e-08	3.566e-08	-7.362	-7.448	-0.086	(0)
NH3	2.454e-09	2.454e-09	-8.610	-8.610	0.000	(0)
NH4SO4-	2.134e-09	1.793e-09	-8.671	-8.746	-0.075	(0)
CaNH3+2	7.811e-12	3.118e-12	-11.107	-11.506	-0.399	(0)
CuNH3+2	1.159e-12	4.628e-13	-11.936	-12.335	-0.399	(0)
NiNH3+2	1.155e-13	4.609e-14	-12.938	-13.336	-0.399	(0)
Co (NH3) +2	1.875e-14	7.485e-15	-13.727	-14.126	-0.399	(0)
AgNH3+	8.506e-15	6.761e-15	-14.070	-14.170	-0.100	(0)
BaNH3+2	8.655e-17	3.455e-17	-16.063	-16.462	-0.399	(0)
Ag (NH3) 2+	1.697e-19	1.349e-19	-18.770	-18.870	-0.100	(0)
Ni (NH3) 2+2	4.096e-20	1.635e-20	-19.388	-19.787	-0.399	(0)
Ca (NH3) 2+2	7.630e-21	3.046e-21	-20.117	-20.516	-0.399	(0)
Hg (NH3) 2+2	4.728e-21	1.887e-21	-20.325	-20.724	-0.399	(0)
Co (NH3) 2+2	1.963e-21	7.835e-22	-20.707	-21.106	-0.399	(0)
HgNH3+2	1.927e-21	7.690e-22	-20.715	-21.114	-0.399	(0)
Co (NH3) 3+2	6.064e-29	2.421e-29	-28.217	-28.616	-0.399	(0)
Hg (NH3) 3+2	4.619e-29	1.844e-29	-28.335	-28.734	-0.399	(0)
Hg (NH3) 4+2	9.003e-37	3.594e-37	-36.046	-36.444	-0.399	(0)
Co (NH3) 4+2	7.809e-37	3.117e-37	-36.107	-36.506	-0.399	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-44.050	-44.449	-0.399	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.498	-44.896	-0.399	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.342	-52.741	-0.399	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.618	-54.515	-0.897	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.662	-56.061	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.736	-67.135	-0.399	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.668	-68.067	-0.399	(0)
N (3)	8.442e-06					
NO2-	8.442e-06	6.964e-06	-5.074	-5.157	-0.084	(0)
CuNO2+	1.691e-11	1.344e-11	-10.772	-10.872	-0.100	(0)
AgNO2	1.963e-12	1.963e-12	-11.707	-11.707	0.000	(0)
CoNO2+	1.566e-12	1.245e-12	-11.805	-11.905	-0.100	(0)
Cu (NO2) 2	9.577e-16	9.577e-16	-15.019	-15.019	0.000	(0)
Ag (NO2) 2-	2.664e-17	2.117e-17	-16.574	-16.674	-0.100	(0)
N (5)	7.881e-09					
NO3-	7.854e-09	6.570e-09	-8.105	-8.182	-0.078	(0)
CaNO3+	2.638e-11	2.097e-11	-10.579	-10.678	-0.100	(0)
MnNO3+	2.263e-13	1.799e-13	-12.645	-12.745	-0.100	(0)
ZnNO3+	3.150e-14	2.504e-14	-13.502	-13.601	-0.100	(0)
BaNO3+	9.243e-16	7.347e-16	-15.034	-15.134	-0.100	(0)
NiNO3+	7.261e-16	5.772e-16	-15.139	-15.239	-0.100	(0)
CuNO3+	4.817e-16	3.829e-16	-15.317	-15.417	-0.100	(0)
CoNO3+	3.323e-16	2.642e-16	-15.478	-15.578	-0.100	(0)
CdNO3+	8.767e-17	6.968e-17	-16.057	-16.157	-0.100	(0)
PbNO3+	1.658e-17	1.318e-17	-16.781	-16.880	-0.100	(0)
AgNO3	7.042e-18	7.042e-18	-17.152	-17.152	0.000	(0)
Mn (NO3) 2	2.969e-21	2.969e-21	-20.527	-20.527	0.000	(0)
UO2NO3+	7.934e-22	6.307e-22	-21.100	-21.200	-0.100	(0)
Zn (NO3) 2	3.282e-23	3.282e-23	-22.484	-22.484	0.000	(0)
Co (NO3) 2	3.531e-24	3.531e-24	-23.452	-23.452	0.000	(0)
Cu (NO3) 2	3.167e-25	3.167e-25	-24.499	-24.499	0.000	(0)
Cd (NO3) 2	2.294e-25	2.294e-25	-24.639	-24.639	0.000	(0)
Pb (NO3) 2	1.470e-25	1.470e-25	-24.833	-24.833	0.000	(0)
CrNO3+2	1.006e-25	4.014e-26	-24.998	-25.396	-0.399	(0)
VO2NO3	1.639e-26	1.639e-26	-25.785	-25.785	0.000	(0)
FeNO3+2	1.456e-28	5.813e-29	-27.837	-28.236	-0.399	(0)
HgNO3+	1.516e-30	1.205e-30	-29.819	-29.919	-0.100	(0)
Hg (NO3) 2	3.290e-39	3.290e-39	-38.483	-38.483	0.000	(0)
Na	8.798e-03					
Na+	8.580e-03	7.176e-03	-2.067	-2.144	-0.078	(0)
NaSO4-	2.145e-04	1.809e-04	-3.669	-3.743	-0.074	(0)
NaHCO3	2.340e-06	2.340e-06	-5.631	-5.631	0.000	(0)
NaCO3-	5.200e-07	4.385e-07	-6.284	-6.358	-0.074	(0)

	NaF	4.995e-07	4.995e-07	-6.301	-6.301	0.000	(0)
	NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
	NaCrO4-	3.777e-16	3.002e-16	-15.423	-15.523	-0.100	(0)
Ni		1.127e-07					
	Ni+2	7.145e-08	3.498e-08	-7.146	-7.456	-0.310	(0)
	NiSO4	3.275e-08	3.275e-08	-7.485	-7.485	0.000	(0)
	NiCO3	4.281e-09	4.281e-09	-8.368	-8.368	0.000	(0)
	NiHCO3+	3.146e-09	2.501e-09	-8.502	-8.602	-0.100	(0)
	NiOH+	6.728e-10	5.348e-10	-9.172	-9.272	-0.100	(0)
	NiCl+	2.536e-10	2.016e-10	-9.596	-9.696	-0.100	(0)
	NiF+	1.219e-10	9.692e-11	-9.914	-10.014	-0.100	(0)
	Ni(OH)2	5.159e-11	5.159e-11	-10.287	-10.287	0.000	(0)
	Ni(SO4)2-2	1.275e-11	5.090e-12	-10.894	-11.293	-0.399	(0)
	NiNH3+2	1.155e-13	4.609e-14	-12.938	-13.336	-0.399	(0)
	Ni(OH)3-	7.882e-14	6.265e-14	-13.103	-13.203	-0.100	(0)
	NiCl2	2.286e-15	2.286e-15	-14.641	-14.641	0.000	(0)
	NiSeO4	1.838e-15	1.838e-15	-14.736	-14.736	0.000	(0)
	NiNO3+	7.261e-16	5.772e-16	-15.139	-15.239	-0.100	(0)
	Ni(NH3)2+2	4.096e-20	1.635e-20	-19.388	-19.787	-0.399	(0)
O(0)		2.463e-35					
	O2	1.232e-35	1.243e-35	-34.909	-34.906	0.004	(0)
Pb		2.605e-09					
	PbCO3	1.337e-09	1.337e-09	-8.874	-8.874	0.000	(0)
	PbOH+	5.204e-10	4.136e-10	-9.284	-9.383	-0.100	(0)
	PbSO4	3.117e-10	3.117e-10	-9.506	-9.506	0.000	(0)
	Pb+2	2.770e-10	1.356e-10	-9.558	-9.868	-0.310	(0)
	PbHCO3+	7.350e-11	5.843e-11	-10.134	-10.233	-0.100	(0)
	Pb(CO3)2-2	3.170e-11	1.265e-11	-10.499	-10.898	-0.399	(0)
	Pb(SO4)2-2	2.208e-11	8.813e-12	-10.656	-11.055	-0.399	(0)
	Pb(OH)2	1.589e-11	1.589e-11	-10.799	-10.799	0.000	(0)
	PbCl+	1.363e-11	1.084e-11	-10.865	-10.965	-0.100	(0)
	PbF+	1.326e-12	1.054e-12	-11.877	-11.977	-0.100	(0)
	PbCl2	1.090e-13	1.090e-13	-12.962	-12.962	0.000	(0)
	Pb(OH)3-	2.427e-14	1.929e-14	-13.615	-13.715	-0.100	(0)
	PbF2	2.288e-15	2.288e-15	-14.641	-14.641	0.000	(0)
	PbCl3-	1.230e-16	9.778e-17	-15.910	-16.010	-0.100	(0)
	PbNO3+	1.658e-17	1.318e-17	-16.781	-16.880	-0.100	(0)
	Pb(OH)4-2	1.437e-17	5.738e-18	-16.842	-17.241	-0.399	(0)
	Pb2OH+3	7.018e-18	8.888e-19	-17.154	-18.051	-0.897	(0)
	PbF3-	6.023e-19	4.788e-19	-18.220	-18.320	-0.100	(0)
	PbCl4-2	2.522e-19	1.007e-19	-18.598	-18.997	-0.399	(0)
	Pb3(OH)4+2	1.710e-21	6.826e-22	-20.767	-21.166	-0.399	(0)
	PbF4-2	6.333e-23	2.528e-23	-22.198	-22.597	-0.399	(0)
	Pb(NO3)2	1.470e-25	1.470e-25	-24.833	-24.833	0.000	(0)
	Pb4(OH)4+4	2.896e-26	7.352e-28	-25.538	-27.134	-1.595	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-152.456	-152.456	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-229.985	-230.085	-0.100	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.984	-73.984	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.829	-78.929	-0.100	(0)
	CdHS+	0.000e+00	0.000e+00	-79.296	-79.395	-0.100	(0)
	S5-2	0.000e+00	0.000e+00	-79.814	-80.212	-0.399	(0)
	H2S	0.000e+00	0.000e+00	-79.991	-79.991	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-80.330	-80.728	-0.399	(0)
	S4-2	0.000e+00	0.000e+00	-80.409	-80.808	-0.399	(0)
	S3-2	0.000e+00	0.000e+00	-81.215	-81.614	-0.399	(0)
	S2-2	0.000e+00	0.000e+00	-82.231	-82.630	-0.399	(0)
	S-2	0.000e+00	0.000e+00	-87.845	-88.147	-0.302	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.053	-139.152	-0.100	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.380	-139.779	-0.399	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-140.840	-140.840	0.000	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-147.678	-148.040	-0.362	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-148.012	-148.215	-0.203	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.426	-148.770	-0.344	(0)
	ZnS(HS)-	0.000e+00	0.000e+00	-148.686	-148.785	-0.100	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-148.714	-148.813	-0.100	(0)
	Ag(S4)2-3	0.000e+00	0.000e+00	-149.202	-149.574	-0.372	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.531	-149.885	-0.353	(0)

Zn (HS) 2	0.000e+00	0.000e+00	-150.857	-150.857	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.120	-151.120	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.456	-152.456	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.620	-161.620	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.523	-218.622	-0.100	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.406	-226.506	-0.100	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.005	-228.404	-0.399	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.050	-228.149	-0.100	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.985	-230.085	-0.100	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.412	-238.512	-0.100	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.483	-304.882	-0.399	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.496	-306.895	-0.399	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.943	-322.342	-0.399	(0)
S (6)	1.246e-02					
SO4-2	9.587e-03	4.693e-03	-2.018	-2.329	-0.310	(0)
MgSO4	1.451e-03	1.451e-03	-2.838	-2.838	0.000	(0)
CaSO4	1.085e-03	1.085e-03	-2.965	-2.965	0.000	(0)
NaSO4-	2.145e-04	1.809e-04	-3.669	-3.743	-0.074	(0)
KSO4-	1.073e-04	9.044e-05	-3.970	-4.044	-0.074	(0)
MnSO4	1.442e-05	1.442e-05	-4.841	-4.841	0.000	(0)
ZnSO4	1.558e-06	1.558e-06	-5.807	-5.807	0.000	(0)
Zn (SO4) 2-2	1.595e-07	6.368e-08	-6.797	-7.196	-0.399	(0)
NiSO4	3.275e-08	3.275e-08	-7.485	-7.485	0.000	(0)
CoSO4	2.376e-08	2.376e-08	-7.624	-7.624	0.000	(0)
CuSO4	1.982e-08	1.982e-08	-7.703	-7.703	0.000	(0)
HSO4-	4.541e-09	3.800e-09	-8.343	-8.420	-0.077	(0)
CdSO4	3.690e-09	3.690e-09	-8.433	-8.433	0.000	(0)
NH4SO4-	2.134e-09	1.793e-09	-8.671	-8.746	-0.075	(0)
Cd (SO4) 2-2	5.853e-10	2.336e-10	-9.233	-9.631	-0.399	(0)
PbSO4	3.117e-10	3.117e-10	-9.506	-9.506	0.000	(0)
AgSO4-	1.590e-10	1.264e-10	-9.799	-9.898	-0.100	(0)
Pb (SO4) 2-2	2.208e-11	8.813e-12	-10.656	-11.055	-0.399	(0)
Ni (SO4) 2-2	1.275e-11	5.090e-12	-10.894	-11.293	-0.399	(0)
CrOHSO4	4.136e-12	4.136e-12	-11.383	-11.383	0.000	(0)
UO2SO4	3.418e-13	3.418e-13	-12.466	-12.466	0.000	(0)
FeSO4	2.236e-13	2.236e-13	-12.651	-12.651	0.000	(0)
UO2 (SO4) 2-2	5.297e-14	2.114e-14	-13.276	-13.675	-0.399	(0)
AlSO4+	3.035e-14	2.540e-14	-13.518	-13.595	-0.077	(0)
CrSO4+	1.927e-15	1.532e-15	-14.715	-14.815	-0.100	(0)
Al (SO4) 2-	1.526e-15	1.277e-15	-14.816	-14.894	-0.077	(0)
VO2SO4-	6.954e-19	5.528e-19	-18.158	-18.257	-0.100	(0)
FeSO4+	5.543e-20	4.659e-20	-19.256	-19.332	-0.075	(0)
Fe (SO4) 2-	5.881e-21	4.675e-21	-20.231	-20.330	-0.100	(0)
Cr2 (OH) 2SO4+2	3.479e-21	1.389e-21	-20.459	-20.857	-0.399	(0)
VOSO4	7.140e-22	7.140e-22	-21.146	-21.146	0.000	(0)
HgSO4	6.103e-22	6.103e-22	-21.214	-21.214	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.871e-22	3.871e-22	-21.412	-21.412	0.000	(0)
CrO3SO4-2	6.703e-24	2.676e-24	-23.174	-23.573	-0.399	(0)
VSO4+	1.070e-36	8.508e-37	-35.970	-36.070	-0.100	(0)
U (SO4) 2	1.080e-40	1.080e-40	-39.967	-39.967	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.139	-41.538	-0.399	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.723	-62.823	-0.100	(0)
Sb (3)	2.343e-20					
Sb (OH) 3	1.185e-20	1.185e-20	-19.926	-19.926	0.000	(0)
HSbO2	1.157e-20	1.157e-20	-19.937	-19.937	0.000	(0)
SbO2-	2.846e-24	2.262e-24	-23.546	-23.646	-0.100	(0)
Sb (OH) 4-	1.629e-24	1.295e-24	-23.788	-23.888	-0.100	(0)
Sb (OH) 2F	1.693e-26	1.693e-26	-25.771	-25.771	0.000	(0)
SbOF	1.666e-26	1.666e-26	-25.778	-25.778	0.000	(0)
Sb (OH) 2+	3.001e-27	2.386e-27	-26.523	-26.622	-0.100	(0)
SbO+	1.035e-27	8.230e-28	-26.985	-27.085	-0.100	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.943	-322.342	-0.399	(0)
Sb (5)	2.645e-08					
SbO3-	2.642e-08	2.100e-08	-7.578	-7.678	-0.100	(0)
Sb (OH) 6-	2.932e-11	2.452e-11	-10.533	-10.610	-0.078	(0)
SbO2+	5.206e-25	4.138e-25	-24.284	-24.383	-0.100	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)

HSe-	1.142e-39	9.080e-40	-38.942	-39.042	-0.100	(0)
MnSe	0.000e+00	0.000e+00	-41.108	-41.108	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.234	-43.234	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.561	-45.960	-0.399	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.623	-83.218	-1.595	(0)
Se (4)	1.329e-07					
HSeO3-	6.790e-08	5.397e-08	-7.168	-7.268	-0.100	(0)
SeO3-2	6.496e-08	2.593e-08	-7.187	-7.586	-0.399	(0)
H2SeO3	1.908e-13	1.908e-13	-12.719	-12.719	0.000	(0)
AgSeO3-	2.829e-14	2.249e-14	-13.548	-13.648	-0.100	(0)
Cd (SeO3) 2-2	4.657e-18	1.859e-18	-17.332	-17.731	-0.399	(0)
Ag (SeO3) 2-3	4.123e-20	5.221e-21	-19.385	-20.282	-0.897	(0)
FeHSeO3+2	3.161e-25	1.262e-25	-24.500	-24.899	-0.399	(0)
Se (6)	2.300e-10					
SeO4-2	2.295e-10	1.123e-10	-9.639	-9.949	-0.310	(0)
MnSeO4	5.224e-13	5.224e-13	-12.282	-12.282	0.000	(0)
ZnSeO4	2.640e-14	2.640e-14	-13.578	-13.578	0.000	(0)
NiSeO4	1.838e-15	1.838e-15	-14.736	-14.736	0.000	(0)
CoSeO4	1.428e-15	1.428e-15	-14.845	-14.845	0.000	(0)
CdSeO4	7.016e-17	7.016e-17	-16.154	-16.154	0.000	(0)
HSeO4-	5.869e-17	4.665e-17	-16.231	-16.331	-0.100	(0)
Zn (SeO4) 2-2	7.532e-24	3.007e-24	-23.123	-23.522	-0.399	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.399	-59.296	-0.897	(0)
U (4)	3.778e-19					
U (OH) 5-	3.777e-19	3.002e-19	-18.423	-18.523	-0.100	(0)
U (OH) 4	1.042e-22	1.042e-22	-21.982	-21.982	0.000	(0)
U (OH) 3+	3.976e-27	3.160e-27	-26.401	-26.500	-0.100	(0)
U (OH) 2+2	3.035e-32	1.211e-32	-31.518	-31.917	-0.399	(0)
UF3+	1.043e-36	8.288e-37	-35.982	-36.082	-0.100	(0)
UF2+2	1.188e-37	4.740e-38	-36.925	-37.324	-0.399	(0)
UOH+3	3.735e-38	4.731e-39	-37.428	-38.325	-0.897	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	2.695e-40	0.000e+00	-39.569	-40.467	-0.897	(0)
U (SO4) 2	1.080e-40	1.080e-40	-39.967	-39.967	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.259	-40.358	-0.100	(0)
USO4+2	0.000e+00	0.000e+00	-41.139	-41.538	-0.399	(0)
UF6-2	0.000e+00	0.000e+00	-41.437	-41.836	-0.399	(0)
U+4	0.000e+00	0.000e+00	-44.214	-45.809	-1.595	(0)
UC1+3	0.000e+00	0.000e+00	-45.859	-46.757	-0.897	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-162.715	-170.791	-8.077	(0)
U (5)	7.518e-16					
UO2+	7.518e-16	5.976e-16	-15.124	-15.224	-0.100	(0)
U (6)	3.702e-07					
UO2 (CO3) 3-4	2.665e-07	6.765e-09	-6.574	-8.170	-1.595	(0)
UO2 (CO3) 2-2	1.031e-07	4.114e-08	-6.987	-7.386	-0.399	(0)
UO2CO3	6.284e-10	6.284e-10	-9.202	-9.202	0.000	(0)
UO2OH+	9.254e-12	7.356e-12	-11.034	-11.133	-0.100	(0)
UO2F+	9.217e-13	7.326e-13	-12.035	-12.135	-0.100	(0)
UO2SO4	3.418e-13	3.418e-13	-12.466	-12.466	0.000	(0)
UO2F2	2.331e-13	2.331e-13	-12.632	-12.632	0.000	(0)
UO2+2	9.828e-14	4.811e-14	-13.008	-13.318	-0.310	(0)
UO2 (SO4) 2-2	5.297e-14	2.114e-14	-13.276	-13.675	-0.399	(0)
UO2F3-	8.126e-15	6.459e-15	-14.090	-14.190	-0.100	(0)
(UO2) 3 (OH) 5+	9.298e-16	7.391e-16	-15.032	-15.131	-0.100	(0)
(UO2) 2 (OH) 2+2	2.250e-16	8.980e-17	-15.648	-16.047	-0.399	(0)
UO2C1+	2.211e-16	1.758e-16	-15.655	-15.755	-0.100	(0)
UO2F4-2	1.418e-17	5.659e-18	-16.848	-17.247	-0.399	(0)
UO2NO3+	7.934e-22	6.307e-22	-21.100	-21.200	-0.100	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.722	-43.822	-0.100	(0)
V+2	0.000e+00	0.000e+00	-45.018	-45.416	-0.399	(0)
V (3)	5.549e-16					
V (OH) 3	5.549e-16	5.549e-16	-15.256	-15.256	0.000	(0)
V (OH) 2+	3.740e-27	2.973e-27	-26.427	-26.527	-0.100	(0)
VOH+2	5.856e-31	2.337e-31	-30.232	-30.631	-0.399	(0)
V+3	3.032e-36	3.840e-37	-35.518	-36.416	-0.897	(0)
VSO4+	1.070e-36	8.508e-37	-35.970	-36.070	-0.100	(0)

V2 (OH) 3+3	0.000e+00	0.000e+00	-57.809	-58.706	-0.897	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-58.867	-60.463	-1.595	(0)
V (4)	1.709e-19					
V (OH) 3+	1.683e-19	1.338e-19	-18.774	-18.874	-0.100	(0)
VO+2	1.384e-21	5.523e-22	-20.859	-21.258	-0.399	(0)
VOSO4	7.140e-22	7.140e-22	-21.146	-21.146	0.000	(0)
VOF+	4.598e-22	3.655e-22	-21.337	-21.437	-0.100	(0)
VOF2	1.512e-23	1.512e-23	-22.821	-22.821	0.000	(0)
VOC1+	4.391e-24	3.491e-24	-23.357	-23.457	-0.100	(0)
VOF3-	7.444e-26	5.917e-26	-25.128	-25.228	-0.100	(0)
VOF4-2	6.600e-29	2.635e-29	-28.180	-28.579	-0.399	(0)
H2VO4+2	2.249e-33	8.978e-34	-32.648	-33.047	-0.399	(0)
V (5)	7.256e-09					
H2VO4-	4.524e-09	3.596e-09	-8.344	-8.444	-0.100	(0)
HVO4-2	2.731e-09	1.090e-09	-8.564	-8.963	-0.399	(0)
H3VO4	2.980e-13	2.980e-13	-12.526	-12.526	0.000	(0)
HV2O7-3	1.049e-14	1.329e-15	-13.979	-14.876	-0.897	(0)
H3V2O7-	8.710e-15	6.923e-15	-14.060	-14.160	-0.100	(0)
VO4-3	5.206e-15	6.593e-16	-14.284	-15.181	-0.897	(0)
V2O7-4	1.700e-16	4.317e-18	-15.769	-17.365	-1.595	(0)
VO2+	5.897e-18	4.933e-18	-17.229	-17.307	-0.078	(0)
VO2F	9.543e-19	9.543e-19	-18.020	-18.020	0.000	(0)
VO2SO4-	6.954e-19	5.528e-19	-18.158	-18.257	-0.100	(0)
V3O9-3	3.852e-19	4.878e-20	-18.414	-19.312	-0.897	(0)
VO2F2-	4.809e-20	3.822e-20	-19.318	-19.418	-0.100	(0)
VO2F3-2	1.318e-22	5.260e-23	-21.880	-22.279	-0.399	(0)
V4O12-4	2.882e-24	7.317e-26	-23.540	-25.136	-1.595	(0)
VO2F4-3	2.254e-26	2.855e-27	-25.647	-26.544	-0.897	(0)
VO2NO3	1.639e-26	1.639e-26	-25.785	-25.785	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.270	-67.859	-3.590	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.262	-67.754	-2.493	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.033	-70.628	-1.595	(0)
Zn	5.434e-06					
Zn+2	3.099e-06	1.517e-06	-5.509	-5.819	-0.310	(0)
ZnSO4	1.558e-06	1.558e-06	-5.807	-5.807	0.000	(0)
ZnCO3	2.865e-07	2.865e-07	-6.543	-6.543	0.000	(0)
ZnOH+	2.318e-07	1.843e-07	-6.635	-6.735	-0.100	(0)
Zn (SO4) 2-2	1.595e-07	6.368e-08	-6.797	-7.196	-0.399	(0)
Zn (OH) 2	3.547e-08	3.547e-08	-7.450	-7.450	0.000	(0)
ZnHCO3+	3.501e-08	2.783e-08	-7.456	-7.556	-0.100	(0)
ZnOHCl	1.365e-08	1.365e-08	-7.865	-7.865	0.000	(0)
ZnCl+	1.031e-08	8.585e-09	-7.987	-8.066	-0.079	(0)
ZnF+	4.201e-09	3.340e-09	-8.377	-8.476	-0.100	(0)
Zn (OH) 3-	2.716e-10	2.159e-10	-9.566	-9.666	-0.100	(0)
ZnCl2	3.065e-11	3.065e-11	-10.514	-10.514	0.000	(0)
ZnCl3-	6.583e-14	5.484e-14	-13.182	-13.261	-0.079	(0)
ZnNO3+	3.150e-14	2.504e-14	-13.502	-13.601	-0.100	(0)
ZnSeO4	2.640e-14	2.640e-14	-13.578	-13.578	0.000	(0)
Zn (OH) 4-2	2.615e-14	1.044e-14	-13.583	-13.981	-0.399	(0)
ZnCl4-2	1.238e-16	6.177e-17	-15.907	-16.209	-0.302	(0)
Zn (NO3) 2	3.282e-23	3.282e-23	-22.484	-22.484	0.000	(0)
Zn (SeO4) 2-2	7.532e-24	3.007e-24	-23.123	-23.522	-0.399	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.686	-148.785	-0.100	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.857	-150.857	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.406	-226.506	-0.100	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.005	-228.404	-0.399	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.496	-306.895	-0.399	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-57.44	-51.15	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-44.59	-40.08	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-51.81	-40.08	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-73.98	-56.05	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-59.48	-39.44	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.37	-28.97	0.40	(NH4) 2CrO4	

(NH4)2SeO4	-25.30	-24.85	0.45	(NH4)2SeO4
Acanthite	-52.37	-88.59	-36.22	Ag2S
Ag2CO3	-12.13	-23.22	-11.09	Ag2CO3
Ag2CrO4	-20.22	-31.81	-11.59	Ag2CrO4
Ag2HVO4	-12.28	-10.80	1.48	Ag2HVO4
Ag2MoO4	-12.23	-23.78	-11.55	Ag2MoO4
Ag2O	-14.15	-1.58	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.25	-20.07	-4.82	Ag2SO4
Ag3AsO3	-28.39	-26.23	2.16	Ag3AsO3
Ag3AsO4	-16.80	-19.59	-2.79	Ag3AsO4
Ag3H2VO5	-16.77	-11.59	5.18	Ag3H2VO5
AgF:4H2O	-13.88	-12.83	1.05	AgF:4H2O
Agmetal	-0.05	-13.56	-13.51	Ag
AgVO3	-10.78	-10.01	0.77	AgVO3
Al(OH)3(am)	-1.71	9.09	10.80	Al(OH)3
Al2(MoO4)3	-50.79	-48.42	2.37	Al2(MoO4)3
Al2O3	-1.48	18.18	19.65	Al2O3
Al4(OH)10SO4	-4.84	17.86	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.93	-8.13	4.80	AlAsO4:2H2O
AlOHSO4	-6.17	-9.40	-3.23	AlOHSO4
AlSb	-153.10	-87.47	65.62	AlSb
Alunite	-2.80	-4.20	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.41	-12.20	-7.79	PbSO4
Anhydrite	-0.96	-5.32	-4.36	CaSO4
Anilite	-55.51	-87.38	-31.88	Cu0.25Cu1.5S
Antlerite	-1.99	6.79	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.72	-95.48	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-41.15	-34.44	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2(OH)3Cl
Azurite	-1.10	-18.01	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.88	8.51	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.30	-1.43	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.86	7.08	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.06	-21.73	-9.67	BaCrO4
BaF2	-9.75	-15.57	-5.82	BaF2
BaMoO4	-6.73	-13.69	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.67	-6.84	1.83	BaSeO3
BaSeO4	-10.14	-17.60	-7.46	BaSeO4
Bianchite	-6.38	-8.15	-1.76	ZnSO4:6H2O
Birnessite	-6.50	11.60	18.09	MnO2
Bixbyite	-1.71	-2.35	-0.64	Mn2O3
BlaubleiI	-55.59	-79.76	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.00	-83.28	-27.28	Cu0.6Cu0.8S
Boehmite	0.51	9.09	8.58	AlOOH
Breithauptite	-56.56	-75.08	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.45	13.39	16.84	Mg(OH)2
Bunsenite	-3.74	8.71	12.45	NiO
Ca(VO3)2	-10.94	-5.28	5.66	Ca(VO3)2
Ca2V2O7	-9.62	7.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.67	7.88	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.24	5.06	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.91	21.05	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.81	21.05	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.59	-153.62	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.58	-26.49	-17.91	Hg2Cl2
CaMoO4	-1.08	-9.03	-7.95	CaMoO4
Carnotite	-1.09	-0.86	0.23	KUO2VO4

CaSeO3:2H2O	-5.00	-2.18	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.93	-12.95	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.33	-1.49	9.84	Cd(BO2)2
Cd(OH)2	-5.96	7.69	13.64	Cd(OH)2
Cd(OH)2(am)	-6.04	7.69	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.63	-13.92	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.99	4.57	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.14	12.26	28.40	Cd4(OH)6SO4
CdCl2	-13.11	-13.77	-0.66	CdCl2
CdCl2:1H2O	-12.08	-13.77	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.86	-13.77	-1.91	CdCl2:2.5H2O
CdF2	-15.18	-16.39	-1.21	CdF2
Cdmetal(alpha)	-31.37	-17.86	13.51	Cd
Cdmetal(gamma)	-31.47	-17.86	13.62	Cd
CdMoO4	-0.36	-14.51	-14.15	CdMoO4
CdOHCl	-6.58	-3.04	3.54	CdOHCl
CdSb	-75.75	-76.10	-0.35	CdSb
CdSe	-19.23	-39.43	-20.20	CdSe
CdSeO4:2H2O	-16.57	-18.42	-1.85	CdSeO4:2H2O
CdSO4	-10.63	-10.80	-0.17	CdSO4
CdSO4:1H2O	-9.08	-10.80	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.93	-10.80	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.77	-11.52	-9.75	AgCl
Cerrusite	-2.22	-15.35	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.42	-10.06	-2.64	CuSO4:5H2O
Chalcocite	-55.40	-90.32	-34.92	Cu2S
Chalcopyrite	-126.87	-162.14	-35.27	CuFeS2
Cinnabar	-52.65	-98.35	-45.69	HgS
Claudetite	-92.41	-95.48	-3.06	As4O6
Clausthalite	-13.73	-40.83	-27.10	PbSe
Co(BO2)2	-27.68	-0.61	27.07	Co(BO2)2
Co(OH)2	-4.53	8.57	13.09	Co(OH)2
Co(OH)3	-8.75	-11.06	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.78	-8.74	13.03	Co3(AsO4)2
Co3O4	-3.06	-13.55	-10.50	Co3O4
CoCl2	-21.16	-12.89	8.27	CoCl2
CoCl2:6H2O	-15.43	-12.89	2.54	CoCl2:6H2O
CoCO3	-3.10	-13.08	-9.98	CoCO3
CoF2	-13.91	-15.51	-1.60	CoF2
CoF3	-45.72	-47.18	-1.46	CoF3
CoFe2O4	18.48	14.95	-3.53	CoFe2O4
CoMoO4	-5.87	-13.63	-7.76	CoMoO4
CoO	-5.02	8.57	13.59	CoO
CoS(alpha)	-71.00	-78.44	-7.44	CoS
CoS(beta)	-67.37	-78.44	-11.07	CoS
CoSe	-22.36	-38.56	-16.20	CoSe
CoSeO3	-8.10	-6.78	1.32	CoSeO3
CoSeO4:6H2O	-16.02	-17.55	-1.53	CoSeO4:6H2O
CoSO4	-12.73	-9.92	2.80	CoSO4
CoSO4:6H2O	-7.45	-9.93	-2.47	CoSO4:6H2O
Cotunnite	-10.38	-15.16	-4.78	PbCl2
Covellite	-56.28	-78.58	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.55	-32.46	14.09	CrCl2
CrCl3	-48.48	-33.37	15.11	CrCl3
CrF3	-25.96	-37.30	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.49	-45.33	-33.84	Na3AlF6
Cu(OH)2	-0.25	8.43	8.67	Cu(OH)2
Cu(SbO3)2	-25.54	19.67	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.66	0.59	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.90	-89.79	-34.88	Cu2Sb:3H2O

Cu ₂ Se (alpha)	-4.63	-50.43	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.85	-21.80	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-15.26	-9.16	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-58.93	-101.52	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-25.63	-89.13	-63.49	Cu ₃ Se ₂
CuCO ₃	-1.72	-13.22	-11.50	CuCO ₃
CuCrO ₄	-16.37	-21.81	-5.44	CuCrO ₄
CuF	-8.79	-13.69	-4.91	CuF
CuF ₂	-16.76	-15.65	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-11.10	-15.65	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-5.67	-14.43	-8.76	Cu
CuMoO ₄	-0.69	-13.77	-13.08	CuMoO ₄
CuOCuSO ₄	-11.94	-1.63	10.30	CuOCuSO ₄
Cupricferrite	8.82	14.81	5.99	CuFe ₂ O ₄
Cuprite	-1.90	-3.31	-1.41	Cu ₂ O
Cuprousferrite	10.45	1.54	-8.92	CuFeO ₂
CuSe	-5.59	-38.69	-33.10	CuSe
CuSe ₂	-26.91	-60.27	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-7.43	-6.92	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-15.25	-17.69	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-13.00	-10.06	2.94	CuSO ₄
Diaspore	2.21	9.09	6.87	AlOOH
Djurleite	-55.62	-89.54	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite (disordered)	-0.19	-16.73	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	0.36	-16.73	-17.09	CaMg (CO ₃) ₂
Epsomite	-2.97	-5.10	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-10.11	3.45	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl _{1.3}	3.01	-0.03	-3.04	Fe (OH) ₂ ·7Cl _{1.3}
Fe (VO ₃) ₂	-11.28	-15.00	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-10.52	-8.97	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-19.04	-39.67	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-45.36	-49.09	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-14.43	-14.03	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.11	1.09	7.20	FeCr ₂ O ₄
FeMoO ₄	-8.66	-18.75	-10.09	FeMoO ₄
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) ₃
Ferroselite	-46.65	-65.25	-18.60	FeSe ₂
FeS (ppt)	-80.61	-83.56	-2.95	FeS
FeSe	-32.67	-43.67	-11.00	FeSe
Fix_pe	-4.69	-4.69	0.00	e-
Fluorite	-0.41	-10.91	-10.50	CaF ₂
Galena	-66.75	-80.72	-13.97	PbS
Gibbsite	0.80	9.09	8.29	Al (OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.14	-8.15	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-64.96	-79.32	-14.36	CdS
Greigite	-293.17	-338.21	-45.03	Fe ₃ S ₄
Gummite	-4.83	2.85	7.67	UO ₃
Gypsum	-0.72	-5.33	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-15.31	-27.41	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-9.32	-22.20	-12.88	H ₂ MoO ₄
H ₂ S (g)	-79.00	-87.01	-8.01	H ₂ S
H ₂ Se (g)	-42.16	-47.12	-4.96	H ₂ Se
Halite	-6.39	-4.79	1.60	NaCl
Hausmannite	-1.28	59.75	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-1.27	21.63	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-185.28	-258.99	-73.71	Hg (CH ₃) ₂
Hg (g)	-7.41	-15.29	-7.87	Hg
Hg (OH) ₂	-7.84	-11.34	-3.50	Hg (OH) ₂
Hg ₂ (g)	-15.62	-30.57	-14.96	Hg ₂
Hg ₂ (OH) ₂	-10.29	-5.03	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-10.63	-26.68	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-26.57	-35.27	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-18.74	-29.11	-10.36	Hg ₂ F ₂
Hg ₂ S	-80.36	-92.04	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-15.72	-20.38	-4.66	Hg ₂ SeO ₃

Hg2SO4	-17.39	-23.52	-6.13	Hg2SO4
Hg3O2CO3	-25.97	-55.65	-29.68	Hg3O2CO3
HgCl (g)	-32.74	-13.24	19.50	HgCl
HgCl2	-11.53	-32.79	-21.26	HgCl2
HgF (g)	-47.23	-14.55	32.68	HgF
HgF2 (g)	-47.98	-35.41	12.57	HgF2
Hgmetal (l)	-1.84	-15.29	-13.45	Hg
HgSe	-2.76	-58.46	-55.69	HgSe
HgSeO3	-14.25	-26.68	-12.43	HgSeO3
HgSO4	-20.41	-29.83	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.64	-24.41	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.86	-19.62	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.21	-22.38	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.09	-21.89	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.20	-49.44	-17.24	K2Cr2O7
K2CrO4	-18.69	-19.20	-0.51	K2CrO4
K2MoO4	-14.43	-11.17	3.26	K2MoO4
K2SeO4	-14.35	-15.08	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.47	-5.90	-0.43	PbO : PbSO4
Laurionite	-5.06	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.40	6.30	12.69	PbO
Mackinawite	-79.96	-83.56	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.52	-4.79	-5.31	Cu2 (OH) 2CO3
Manganite	-1.17	24.17	25.34	MnOOH
Massicot	-6.60	6.30	12.89	PbO
Matlockite	-7.50	-16.47	-8.97	PbClF
Melanothallite	-19.29	-13.03	6.26	CuCl2
Melanterite	-12.83	-15.04	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.25	-98.35	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-16.34	-5.06	11.28	Mg (VO3) 2
Mg2Sb3	-273.72	-199.03	74.68	Mg2Sb3
Mg2V2O7	-18.02	8.34	26.36	Mg2V2O7
MgCr2O4	-5.17	11.04	16.20	MgCr2O4
MgCrO4	-22.22	-16.84	5.38	MgCrO4
MgF2	-2.55	-10.68	-8.13	MgF2
MgMoO4	-6.96	-8.81	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.01	-1.96	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.52	-12.72	-1.20	MgSeO4 : 6H2O
Minium	-29.09	44.43	73.52	Pb3O4
Mirabilite	-5.51	-6.62	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.95	-7.05	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.12	-57.83	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.61	-86.53	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.75	-0.25	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.77	-10.06	2.72	MnCl2 : 4H2O
MnS (grn)	-75.78	-75.61	0.17	MnS
MnS (pnk)	-78.95	-75.61	3.34	MnS
MnSb	-94.83	-97.74	-2.91	MnSb
MnSe	-39.22	-35.72	3.50	MnSe
MnSeO3	-5.08	-3.95	1.13	MnSeO3
MnSeO3 : 2H2O	-4.93	-3.95	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.66	-14.71	-2.05	MnSeO4 : 5H2O
MnSO4	-9.67	-7.09	2.58	MnSO4
Monteponite	-7.41	7.69	15.10	CdO
Montroydite	-7.69	-11.33	-3.64	HgO
MoO3	-14.20	-22.20	-8.00	MoO3
Morenosite	-7.64	-9.79	-2.14	NiSO4 : 7H2O
MoS2	-151.50	-221.76	-70.26	MoS2
Na-Jarosite	-10.27	-21.47	-11.20	NaFe3 (SO4) 2 (OH) 6

Na2Cr2O7	-38.71	-48.60	-9.90	Na2Cr2O7
Na2CrO4	-21.29	-18.36	2.93	Na2CrO4
Na2Mo2O7	-15.93	-32.52	-16.60	Na2Mo2O7
Na2MoO4	-11.81	-10.32	1.49	Na2MoO4
Na2MoO4:2H2O	-11.55	-10.32	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.78	-3.48	10.30	Na2SeO3:5H2O
Na2SeO4	-15.52	-14.24	1.28	Na2SeO4
Na3Sb	-173.20	-78.75	94.45	Na3Sb
Na3VO4	-28.09	8.59	36.68	Na3VO4
Na4V2O7	-32.10	5.30	37.40	Na4V2O7
Nantokite	-5.65	-12.38	-6.73	CuCl
NaSb	-88.24	-65.08	23.17	NaSb
Natron	-8.46	-9.77	-1.31	Na2CO3:10H2O
NaVO3	-7.15	-3.29	3.86	NaVO3
Nesquehonite	-3.58	-8.25	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.09	8.71	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-24.03	-8.33	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-15.67	16.33	32.00	Ni4 (OH) 6SO4
NiCO3	-6.07	-12.94	-6.87	NiCO3
NiMoO4	-2.35	-13.49	-11.14	NiMoO4
NiS (alpha)	-72.70	-78.30	-5.60	NiS
NiS (beta)	-67.20	-78.30	-11.10	NiS
NiS (gamma)	-65.50	-78.30	-12.80	NiS
NiSe	-20.72	-38.42	-17.70	NiSe
NiSeO3:2H2O	-9.46	-6.64	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.89	-17.41	-1.52	NiSeO4:6H2O
Nsutite	-5.91	11.60	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-247.70	-308.77	-61.07	As2S3
Otavite	-1.96	-13.96	-12.00	CdCO3
Pb (BO2) 2	-9.40	-2.88	6.52	Pb (BO2) 2
Pb (OH) 2	-1.86	6.29	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-58.17	-66.93	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-6.93	1.86	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.60	12.59	26.19	Pb2O (OH) 2
Pb2O3	-22.90	38.14	61.04	Pb2O3
Pb2OCO3	-8.50	-9.06	-0.56	Pb2OCO3
Pb2V2O7	-3.96	-5.86	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.36	-15.56	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.71	0.43	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.78	-2.76	11.02	Pb3O2CO3
Pb3O2SO4	-10.29	0.39	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-14.41	6.69	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-15.19	6.69	21.88	Pb4O3SO4
PbCrO4	-11.34	-23.94	-12.60	PbCrO4
PbF2	-10.34	-17.78	-7.44	PbF2
Pbmetal	-23.50	-19.25	4.25	Pb
PbMoO4	-0.28	-15.90	-15.62	PbMoO4
PbO:0.3H2O	-6.68	6.30	12.98	PbO:0.33H2O
PbSeO4	-12.98	-19.82	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl2:PbCO3
Plattnerite	-17.76	31.84	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.52	-145.02	-18.51	FeS2
Pyrochroite	-3.79	11.40	15.19	Mn (OH) 2
Pyrolusite	-4.43	36.95	41.38	MnO2
Realgar	-103.90	-123.65	-19.75	AsS
Retgersite	-7.75	-9.79	-2.04	NiSO4:6H2O
Rhodochrosite	0.33	-10.25	-10.58	MnCO3
Rutherfordine	-4.30	-18.80	-14.50	UO2CO3
Sb (OH) 3	-12.82	-19.93	-7.11	Sb (OH) 3
Sb2O4	-17.71	-14.31	3.40	Sb2O4
Sb2O5	-27.72	-37.38	-9.67	Sb2O5
Sb2Se3	-113.46	-181.22	-67.76	Sb2Se3
Sb4O6 (cubic)	-61.44	-79.70	-18.26	Sb4O6
Sb4O6 (orth)	-61.80	-79.70	-17.90	Sb4O6
SbCl3	-52.68	-52.11	0.57	SbCl3

SbF3	-45.82	-56.04	-10.23	SbF3
Sbmetal	-46.55	-58.24	-11.69	Sb
SbO2	-3.64	-31.46	-27.82	SbO2
Schoepite	-3.15	2.84	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.47	-21.58	-7.11	Se
Semetal (hex)	-13.87	-21.58	-7.71	Se
Senarmontite	-27.49	-39.85	-12.37	Sb2O3
SeO2	-15.47	-15.35	0.12	SeO2
SeO3	-47.16	-26.11	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.30	-11.30	-10.00	ZnCO3
Sphalerite	-65.22	-76.67	-11.45	ZnS
Spinel	-5.28	31.57	36.85	MgAl2O4
Stibnite	-250.42	-300.88	-50.46	Sb2S3
Sulfur	-59.32	-61.47	-2.14	S
Tenorite	0.78	8.43	7.64	CuO
Thenardite	-6.94	-6.62	0.32	Na2SO4
Thermonatrite	-10.41	-9.77	0.64	Na2CO3:H2O
Tyuyamunite	-3.67	0.41	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.44	10.64	21.08	U3O8
U3Sb4	-579.07	-426.69	152.38	U3Sb4
U4O9	-25.37	-28.39	-3.02	U4O9
UF4	-32.10	-61.64	-29.54	UF4
UF4:2.5H2O	-28.92	-61.64	-32.72	UF4:2.5H2O
UO2 (am)	-14.42	-13.48	0.93	UO2
UO2 (NO3) 2	-41.83	-29.68	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.53	-29.68	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.07	-29.68	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.73	-29.68	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.77	2.85	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.02	-23.27	-2.25	UO2SeO4:4H2O
UO3	-4.85	2.85	7.70	UO3
Uraninite	-8.81	-13.48	-4.67	UO2
USb2	-219.85	-190.27	29.58	USb2
V (OH) 3	-19.76	-12.17	7.59	V (OH) 3
V2O5	-17.09	-18.45	-1.36	V2O5
V3O5	-42.67	-40.83	1.84	V3O5
V4O7	-53.11	-45.92	7.19	V4O7
V6O13	-45.58	-106.44	-60.86	V6O13
Valentinite	-31.37	-39.85	-8.48	Sb2O3
VC12	-65.28	-46.40	18.87	VC12
VC13	-67.79	-44.36	23.43	VC13
VF4	-68.18	-53.25	14.93	VF4
Vmetal	-94.51	-50.49	44.03	V
VO	-39.70	-24.94	14.76	VO
VO (OH) 2	-10.25	-5.10	5.15	VO (OH) 2
VO2Cl	-22.80	-19.95	2.84	VO2Cl
VOC1	-34.05	-22.90	11.15	VOC1
VOC12	-39.31	-26.55	12.76	VOC12
VOSO4	-27.20	-23.59	3.61	VOSO4
Witherite	-4.57	-13.14	-8.57	BaCO3
Wurtzite	-67.72	-76.67	-8.95	ZnS
Zincite	-0.99	10.34	11.33	ZnO
Zincosite	-12.08	-8.15	3.93	ZnSO4
Zn (BO2) 2	-7.12	1.17	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.50	-22.19	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.86	10.34	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.13	10.34	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.41	10.34	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.19	10.34	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.39	10.34	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-5.30	2.20	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.23	9.96	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.06	-3.41	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-24.86	-5.95	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-5.52	22.88	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-8.24	30.26	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.16	-11.11	7.05	ZnCl2

ZnCO3:1H2O	-1.04	-11.30	-10.26	ZnCO3:1H2O
ZnF2	-13.20	-13.73	-0.53	ZnF2
Znmetal	-40.99	-15.20	25.79	Zn
ZnMoO4	-1.73	-11.85	-10.13	ZnMoO4
ZnO(active)	-0.84	10.34	11.19	ZnO
ZnS(am)	-67.61	-76.67	-9.05	ZnS
ZnSb	-84.46	-73.44	11.01	ZnSb
ZnSe	-22.38	-36.78	-14.40	ZnSe
ZnSeO4:6H2O	-14.25	-15.77	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.51	-8.15	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 52.

```

Title Stage 3 pit lake GW inflow
Title Stage 3 Groundwater mix
MIX 301
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.050588
11     0.760447
12     0.726748
13     0.824755
14     0
15     0
Save solution 301
end

```

TITLE

Stage 3 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 301.

Mixture 301.

```

1.000e+00 Solution 2      JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

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0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
5.059e-02 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
7.604e-01 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
7.267e-01 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
8.248e-01 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	2.483e-08	8.350e-08
Al	7.312e-07	2.459e-06
As	1.021e-08	3.434e-08
B	4.067e-06	1.368e-05
Ba	2.839e-07	9.547e-07
C	2.570e-03	8.642e-03
Ca	9.370e-04	3.151e-03
Cd	2.772e-09	9.321e-09
Cl	4.396e-04	1.478e-03
Co	4.040e-08	1.359e-07
Cr	3.778e-08	1.270e-07
Cu	1.368e-06	4.599e-06
F	6.220e-05	2.091e-04
Fe	7.909e-06	2.660e-05
Hg	2.632e-11	8.851e-11
K	8.019e-05	2.696e-04
Mg	3.198e-04	1.075e-03
Mn	4.535e-06	1.525e-05
Mo	7.380e-08	2.482e-07
Na	1.262e-03	4.242e-03
Ni	6.339e-08	2.131e-07
Pb	5.444e-09	1.831e-08
S	5.047e-04	1.697e-03
Sb	2.680e-09	9.010e-09
Se	8.287e-09	2.787e-08
U	1.060e-08	3.565e-08
V	1.480e-08	4.976e-08
Zn	2.142e-07	7.204e-07

-----Description of solution-----

	pH	=	7.352	Charge balance
	pe	=	4.674	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	5.320e-03	
	Mass of water (kg)	=	3.363e+00	
	Total alkalinity (eq/kg)	=	2.367e-03	
	Total CO2 (mol/kg)	=	2.570e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.057e-17	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	10	
	Total H	=	3.732971e+02	

Total O = 1.866767e+02

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.452e-07	2.265e-07	-6.611	-6.645	-0.034	(0)
H+	4.805e-08	4.444e-08	-7.318	-7.352	-0.034	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	2.483e-08					
Ag+	1.287e-08	1.190e-08	-7.891	-7.924	-0.034	(0)
AgCl	9.880e-09	9.880e-09	-8.005	-8.005	0.000	(0)
Ag2Se	8.089e-10	8.089e-10	-9.092	-9.092	0.000	(0)
AgCl2-	3.812e-10	3.499e-10	-9.419	-9.456	-0.037	(0)
AgSO4-	8.381e-11	7.693e-11	-10.077	-10.114	-0.037	(0)
AgF	1.666e-12	1.666e-12	-11.778	-11.778	0.000	(0)
AgOH	2.696e-13	2.696e-13	-12.569	-12.569	0.000	(0)
AgCl3-2	1.786e-13	1.268e-13	-12.748	-12.897	-0.149	(0)
AgH2BO3	9.891e-15	9.891e-15	-14.005	-14.005	0.000	(0)
AgSeO3-	4.592e-15	4.215e-15	-14.338	-14.375	-0.037	(0)
AgCl4-3	2.275e-16	1.053e-16	-15.643	-15.978	-0.335	(0)
Ag (OH) 2-	6.503e-18	5.969e-18	-17.187	-17.224	-0.037	(0)
Ag (SeO3) 2-3	4.496e-23	2.080e-23	-22.347	-22.682	-0.335	(0)
Ag2MoO4	2.895e-24	2.895e-24	-23.538	-23.538	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.499	-67.499	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-76.795	-77.390	-0.595	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.751	-136.788	-0.037	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.810	-136.919	-0.109	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.788	-139.007	-0.219	(0)
AgS4S5-3	0.000e+00	0.000e+00	-139.106	-139.318	-0.213	(0)
Al	7.312e-07					
Al (OH) 4-	7.002e-07	6.481e-07	-6.155	-6.188	-0.034	(0)
Al (OH) 3	2.272e-08	2.272e-08	-7.644	-7.644	0.000	(0)
Al (OH) 2+	5.424e-09	5.028e-09	-8.266	-8.299	-0.033	(0)
AlF2+	1.645e-09	1.525e-09	-8.784	-8.817	-0.033	(0)
AlF3	1.070e-09	1.070e-09	-8.971	-8.971	0.000	(0)
AlF+2	9.309e-11	6.873e-11	-10.031	-10.163	-0.132	(0)
AlOH+2	3.784e-11	2.794e-11	-10.422	-10.554	-0.132	(0)
AlF4-	3.227e-11	2.987e-11	-10.491	-10.525	-0.034	(0)
AlSO4+	3.351e-13	3.101e-13	-12.475	-12.508	-0.034	(0)
Al+3	2.488e-13	1.233e-13	-12.604	-12.909	-0.305	(0)
Al (SO4) 2-	1.163e-15	1.076e-15	-14.934	-14.968	-0.034	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-45.301	-45.635	-0.335	(0)
As (3)	1.228e-19					
H3AsO3	1.213e-19	1.213e-19	-18.916	-18.916	0.000	(0)
H2AsO3-	1.524e-21	1.399e-21	-20.817	-20.854	-0.037	(0)
HAsO3-2	4.044e-26	2.871e-26	-25.393	-25.542	-0.149	(0)
H4AsO3+	2.909e-27	2.670e-27	-26.536	-26.573	-0.037	(0)
AsO3-3	5.383e-32	2.490e-32	-31.269	-31.604	-0.335	(0)
As (5)	1.021e-08					
HAsO4-2	7.775e-09	5.520e-09	-8.109	-8.258	-0.149	(0)
H2AsO4-	2.437e-09	2.237e-09	-8.613	-8.650	-0.037	(0)
AsO4-3	8.490e-13	3.927e-13	-12.071	-12.406	-0.335	(0)
H3AsO4	1.726e-14	1.728e-14	-13.763	-13.762	0.001	(0)
B	4.067e-06					
H3BO3	4.008e-06	4.013e-06	-5.397	-5.397	0.001	(0)
H2BO3-	5.685e-08	5.243e-08	-7.245	-7.280	-0.035	(0)
CaH2BO3+	2.061e-09	1.901e-09	-8.686	-8.721	-0.035	(0)
MgH2BO3+	4.325e-10	3.990e-10	-9.364	-9.399	-0.035	(0)
BF (OH) 3-	9.673e-11	8.922e-11	-10.014	-10.050	-0.035	(0)
NaH2BO3	9.669e-11	9.669e-11	-10.015	-10.015	0.000	(0)
BaH2BO3+	3.590e-13	3.312e-13	-12.445	-12.480	-0.035	(0)
H5 (BO3) 2-	1.941e-13	1.791e-13	-12.712	-12.747	-0.035	(0)
BF2 (OH) 2-	2.561e-14	2.363e-14	-13.592	-13.627	-0.035	(0)
AgH2BO3	9.891e-15	9.891e-15	-14.005	-14.005	0.000	(0)
H8 (BO3) 3-	7.790e-17	7.186e-17	-16.108	-16.144	-0.035	(0)
BF3OH-	2.468e-20	2.277e-20	-19.608	-19.643	-0.035	(0)

Ba	BF4-	3.008e-25	2.775e-25	-24.522	-24.557	-0.035	(0)
	2.839e-07						
	Ba+2	2.792e-07	2.044e-07	-6.554	-6.690	-0.135	(0)
	BaHCO3+	4.513e-09	4.188e-09	-8.346	-8.378	-0.033	(0)
	BaCO3	2.372e-10	2.372e-10	-9.625	-9.625	0.000	(0)
	BaH2BO3+	3.590e-13	3.312e-13	-12.445	-12.480	-0.035	(0)
	BaOH+	2.182e-13	2.021e-13	-12.661	-12.694	-0.033	(0)
C (4)	2.570e-03						
	HCO3-	2.315e-03	2.146e-03	-2.636	-2.668	-0.033	(0)
	H2CO3	2.145e-04	2.145e-04	-3.669	-3.669	0.000	(0)
	CaHCO3+	2.713e-05	2.517e-05	-4.567	-4.599	-0.033	(0)
	MgHCO3+	5.210e-06	4.818e-06	-5.283	-5.317	-0.034	(0)
	CO3-2	3.091e-06	2.263e-06	-5.510	-5.645	-0.135	(0)
	CaCO3	2.260e-06	2.260e-06	-5.646	-5.646	0.000	(0)
	NaHCO3	1.404e-06	1.404e-06	-5.853	-5.853	0.000	(0)
	CuCO3	1.149e-06	1.149e-06	-5.940	-5.940	0.000	(0)
	MgCO3	4.131e-07	4.131e-07	-6.384	-6.384	0.000	(0)
	MnHCO3+	1.382e-07	1.281e-07	-6.859	-6.893	-0.033	(0)
	NaCO3-	5.290e-08	4.904e-08	-7.277	-7.309	-0.033	(0)
	ZnCO3	1.671e-08	1.671e-08	-7.777	-7.777	0.000	(0)
	CuHCO3+	1.272e-08	1.167e-08	-7.896	-7.933	-0.037	(0)
	NiHCO3+	1.010e-08	9.269e-09	-7.996	-8.033	-0.037	(0)
	Cu (CO3) 2-2	9.862e-09	7.001e-09	-8.006	-8.155	-0.149	(0)
	ZnHCO3+	9.486e-09	8.707e-09	-8.023	-8.060	-0.037	(0)
	UO2 (CO3) 2-2	7.953e-09	5.646e-09	-8.099	-8.248	-0.149	(0)
	BaHCO3+	4.513e-09	4.188e-09	-8.346	-8.378	-0.033	(0)
	CoHCO3+	4.317e-09	3.962e-09	-8.365	-8.402	-0.037	(0)
	PbCO3	3.438e-09	3.438e-09	-8.464	-8.464	0.000	(0)
	FeHCO3+	3.008e-09	2.791e-09	-8.522	-8.554	-0.033	(0)
	NiCO3	2.959e-09	2.959e-09	-8.529	-8.529	0.000	(0)
	UO2 (CO3) 3-4	2.522e-09	6.404e-10	-8.598	-9.194	-0.595	(0)
	CoCO3	9.083e-10	9.083e-10	-9.042	-9.042	0.000	(0)
	PbHCO3+	8.777e-10	8.057e-10	-9.057	-9.094	-0.037	(0)
	BaCO3	2.372e-10	2.372e-10	-9.625	-9.625	0.000	(0)
	UO2CO3	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
	CdCO3	9.255e-11	9.255e-11	-10.034	-10.034	0.000	(0)
	Pb (CO3) 2-2	3.161e-11	2.244e-11	-10.500	-10.649	-0.149	(0)
	CdHCO3+	9.548e-12	8.764e-12	-11.020	-11.057	-0.037	(0)
	Cd (CO3) 2-2	2.187e-13	1.553e-13	-12.660	-12.809	-0.149	(0)
	HgCO3	1.719e-17	1.719e-17	-16.765	-16.765	0.000	(0)
	Hg (CO3) 2-2	1.733e-19	1.230e-19	-18.761	-18.910	-0.149	(0)
	HgHCO3+	1.550e-20	1.423e-20	-19.810	-19.847	-0.037	(0)
Ca	9.370e-04						
	Ca+2	8.605e-04	6.299e-04	-3.065	-3.201	-0.135	(0)
	CaSO4	4.675e-05	4.675e-05	-4.330	-4.330	0.000	(0)
	CaHCO3+	2.713e-05	2.517e-05	-4.567	-4.599	-0.033	(0)
	CaCO3	2.260e-06	2.260e-06	-5.646	-5.646	0.000	(0)
	CaF+	4.136e-07	3.831e-07	-6.383	-6.417	-0.033	(0)
	CaOH+	3.069e-09	2.847e-09	-8.513	-8.546	-0.033	(0)
	CaH2BO3+	2.061e-09	1.901e-09	-8.686	-8.721	-0.035	(0)
Cd	2.772e-09						
	Cd+2	2.451e-09	1.794e-09	-8.611	-8.746	-0.135	(0)
	CdSO4	1.362e-10	1.362e-10	-9.866	-9.866	0.000	(0)
	CdCO3	9.255e-11	9.255e-11	-10.034	-10.034	0.000	(0)
	CdCl+	7.589e-11	6.966e-11	-10.120	-10.157	-0.037	(0)
	CdHCO3+	9.548e-12	8.764e-12	-11.020	-11.057	-0.037	(0)
	CdOH+	3.517e-12	3.228e-12	-11.454	-11.491	-0.037	(0)
	CdF+	1.726e-12	1.584e-12	-11.763	-11.800	-0.037	(0)
	Cd (SO4) 2-2	8.386e-13	5.953e-13	-12.076	-12.225	-0.149	(0)
	CdOHC1	6.473e-13	6.473e-13	-12.189	-12.189	0.000	(0)
	Cd (CO3) 2-2	2.187e-13	1.553e-13	-12.660	-12.809	-0.149	(0)
	CdCl2	1.181e-13	1.181e-13	-12.928	-12.928	0.000	(0)
	Cd (OH) 2	4.614e-15	4.614e-15	-14.336	-14.336	0.000	(0)
	CdF2	1.762e-16	1.762e-16	-15.754	-15.754	0.000	(0)
	CdCl3-	3.300e-17	3.029e-17	-16.482	-16.519	-0.037	(0)
	Cd (OH) 3-	6.957e-20	6.386e-20	-19.158	-19.195	-0.037	(0)
	Cd2OH+3	6.275e-20	2.903e-20	-19.202	-19.537	-0.335	(0)
	CdSeO4	2.564e-20	2.564e-20	-19.591	-19.591	0.000	(0)

	Cd(SeO3) 2-2	6.324e-22	4.489e-22	-21.199	-21.348	-0.149	(0)
	Cd(OH) 4-2	3.336e-27	2.368e-27	-26.477	-26.626	-0.149	(0)
	CdHS+	0.000e+00	0.000e+00	-74.090	-74.127	-0.037	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-140.312	-140.312	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-211.764	-211.802	-0.037	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-282.846	-282.995	-0.149	(0)
Cl		4.396e-04					
	Cl-	4.396e-04	4.066e-04	-3.357	-3.391	-0.034	(0)
	AgCl	9.880e-09	9.880e-09	-8.005	-8.005	0.000	(0)
	MnCl+	1.653e-09	1.531e-09	-8.782	-8.815	-0.033	(0)
	CuCl	4.582e-10	4.582e-10	-9.339	-9.339	0.000	(0)
	AgCl2-	3.812e-10	3.499e-10	-9.419	-9.456	-0.037	(0)
	ZnCl+	1.417e-10	1.311e-10	-9.849	-9.883	-0.034	(0)
	CdCl+	7.589e-11	6.966e-11	-10.120	-10.157	-0.037	(0)
	CuCl+	6.009e-11	5.557e-11	-10.221	-10.255	-0.034	(0)
	CuCl2-	4.209e-11	3.893e-11	-10.376	-10.410	-0.034	(0)
	NiCl+	3.971e-11	3.645e-11	-10.401	-10.438	-0.037	(0)
	ZnOHC1	3.887e-11	3.887e-11	-10.410	-10.410	0.000	(0)
	CoCl+	3.638e-11	3.339e-11	-10.439	-10.476	-0.037	(0)
	PbCl+	7.943e-12	7.291e-12	-11.100	-11.137	-0.037	(0)
	MnCl2	8.794e-13	8.794e-13	-12.056	-12.056	0.000	(0)
	CdOHC1	6.473e-13	6.473e-13	-12.189	-12.189	0.000	(0)
	AgCl3-2	1.786e-13	1.268e-13	-12.748	-12.897	-0.149	(0)
	CdCl2	1.181e-13	1.181e-13	-12.928	-12.928	0.000	(0)
	ZnCl2	8.446e-14	8.446e-14	-13.073	-13.073	0.000	(0)
	PbCl2	1.324e-14	1.324e-14	-13.878	-13.878	0.000	(0)
	CuCl2	7.834e-15	7.834e-15	-14.106	-14.106	0.000	(0)
	CuCl3-2	4.595e-15	3.384e-15	-14.338	-14.471	-0.133	(0)
	HgClOH	1.033e-15	1.033e-15	-14.986	-14.986	0.000	(0)
	AgCl4-3	2.275e-16	1.053e-16	-15.643	-15.978	-0.335	(0)
	CrCl+2	1.666e-16	1.183e-16	-15.778	-15.927	-0.149	(0)
	MnCl3-	1.063e-16	9.847e-17	-15.973	-16.007	-0.033	(0)
	HgCl2	1.049e-16	1.049e-16	-15.979	-15.979	0.000	(0)
	NiCl2	7.462e-17	7.462e-17	-16.127	-16.127	0.000	(0)
	CdCl3-	3.300e-17	3.029e-17	-16.482	-16.519	-0.037	(0)
	ZnCl3-	2.949e-17	2.728e-17	-16.530	-16.564	-0.034	(0)
	UO2Cl+	9.968e-18	9.150e-18	-17.001	-17.039	-0.037	(0)
	FeCl+2	7.552e-18	5.561e-18	-17.122	-17.255	-0.133	(0)
	PbCl3-	2.335e-18	2.143e-18	-17.632	-17.669	-0.037	(0)
	HgCl3-	4.648e-19	4.266e-19	-18.333	-18.370	-0.037	(0)
	CrOHC12	2.070e-19	2.070e-19	-18.684	-18.684	0.000	(0)
	HgCl+	5.610e-20	5.149e-20	-19.251	-19.288	-0.037	(0)
	CuCl3-	3.214e-20	2.973e-20	-19.493	-19.527	-0.034	(0)
	FeCl2+	1.090e-20	1.010e-20	-19.962	-19.996	-0.033	(0)
	ZnCl4-2	7.530e-21	5.545e-21	-20.123	-20.256	-0.133	(0)
	CrCl2+	4.971e-21	4.563e-21	-20.304	-20.341	-0.037	(0)
	VOCl+	2.076e-21	1.905e-21	-20.683	-20.720	-0.037	(0)
	HgCl4-2	9.728e-22	6.906e-22	-21.012	-21.161	-0.149	(0)
	PbCl4-2	5.611e-22	3.983e-22	-21.251	-21.400	-0.149	(0)
	FeCl3	4.107e-25	4.107e-25	-24.387	-24.387	0.000	(0)
	CuCl4-2	8.226e-26	6.058e-26	-25.085	-25.218	-0.133	(0)
	CrO3Cl-	3.134e-28	2.877e-28	-27.504	-27.541	-0.037	(0)
	CoCl+2	5.196e-37	3.689e-37	-36.284	-36.433	-0.149	(0)
	UCl+3	0.000e+00	0.000e+00	-44.754	-45.089	-0.335	(0)
Co (2)		4.040e-08					
	Co+2	3.344e-08	2.374e-08	-7.476	-7.625	-0.149	(0)
	CoHCO3+	4.317e-09	3.962e-09	-8.365	-8.402	-0.037	(0)
	CoSO4	1.534e-09	1.534e-09	-8.814	-8.814	0.000	(0)
	CoCO3	9.083e-10	9.083e-10	-9.042	-9.042	0.000	(0)
	CoOH+	1.169e-10	1.073e-10	-9.932	-9.969	-0.037	(0)
	CoF+	4.558e-11	4.183e-11	-10.341	-10.378	-0.037	(0)
	CoCl+	3.638e-11	3.339e-11	-10.439	-10.476	-0.037	(0)
	Co(OH) 2	1.931e-12	1.931e-12	-11.714	-11.714	0.000	(0)
	Co(OH) 3-	9.508e-18	8.728e-18	-17.022	-17.059	-0.037	(0)
	CoOOH-	2.386e-18	2.190e-18	-17.622	-17.660	-0.037	(0)
	CoSeO4	9.131e-19	9.131e-19	-18.039	-18.039	0.000	(0)
	Co2OH+3	2.760e-19	1.277e-19	-18.559	-18.894	-0.335	(0)
	Co(OH) 4-2	4.414e-25	3.133e-25	-24.355	-24.504	-0.149	(0)

Co4 (OH) 4+4	1.042e-31	2.645e-32	-30.982	-31.578	-0.595	(0)
Co (3)	7.231e-30					
CoOH+2	7.231e-30	5.133e-30	-29.141	-29.290	-0.149	(0)
Co+3	8.994e-36	4.459e-36	-35.046	-35.351	-0.305	(0)
CoCl+2	5.196e-37	3.689e-37	-36.284	-36.433	-0.149	(0)
Cr (2)	1.603e-24					
Cr+2	1.603e-24	1.138e-24	-23.795	-23.944	-0.149	(0)
Cr (3)	3.778e-08					
Cr (OH) 2+	3.345e-08	3.070e-08	-7.476	-7.513	-0.037	(0)
Cr (OH) 3	2.613e-09	2.613e-09	-8.583	-8.583	0.000	(0)
Cr (OH) +2	1.569e-09	1.114e-09	-8.804	-8.953	-0.149	(0)
CrOHSO4	8.563e-11	8.563e-11	-10.067	-10.067	0.000	(0)
CrO2-	3.042e-11	2.792e-11	-10.517	-10.554	-0.037	(0)
Cr (OH) 4-	2.567e-11	2.357e-11	-10.591	-10.628	-0.037	(0)
CrF+2	2.796e-12	1.985e-12	-11.553	-11.702	-0.149	(0)
Cr+3	4.859e-13	2.248e-13	-12.313	-12.648	-0.335	(0)
CrSO4+	1.852e-13	1.700e-13	-12.732	-12.770	-0.037	(0)
CrCl+2	1.666e-16	1.183e-16	-15.778	-15.927	-0.149	(0)
Cr2 (OH) 2SO4+2	1.215e-17	8.622e-18	-16.916	-17.064	-0.149	(0)
CrOHC12	2.070e-19	2.070e-19	-18.684	-18.684	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.659e-19	1.659e-19	-18.780	-18.780	0.000	(0)
CrCl2+	4.971e-21	4.563e-21	-20.304	-20.341	-0.037	(0)
Cr (6)	2.691e-17					
CrO4-2	2.404e-17	1.760e-17	-16.619	-16.754	-0.135	(0)
HCro4-	2.758e-18	2.531e-18	-17.559	-17.597	-0.037	(0)
NaCrO4-	1.109e-19	1.018e-19	-18.955	-18.992	-0.037	(0)
KCrO4-	5.272e-21	4.839e-21	-20.278	-20.315	-0.037	(0)
H2CrO4	9.119e-26	9.119e-26	-25.040	-25.040	0.000	(0)
CrO3SO4-2	1.564e-26	1.110e-26	-25.806	-25.955	-0.149	(0)
CrO3Cl-	3.134e-28	2.877e-28	-27.504	-27.541	-0.037	(0)
Cr2O7-2	3.130e-34	2.222e-34	-33.505	-33.653	-0.149	(0)
Cu (1)	1.476e-09					
Cu+	9.753e-10	8.952e-10	-9.011	-9.048	-0.037	(0)
CuCl	4.582e-10	4.582e-10	-9.339	-9.339	0.000	(0)
CuCl2-	4.209e-11	3.893e-11	-10.376	-10.410	-0.034	(0)
CuCl3-2	4.595e-15	3.384e-15	-14.338	-14.471	-0.133	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-137.516	-137.732	-0.216	(0)
CuS4S5-3	0.000e+00	0.000e+00	-138.253	-138.462	-0.209	(0)
Cu (2)	1.366e-06					
CuCO3	1.149e-06	1.149e-06	-5.940	-5.940	0.000	(0)
Cu+2	1.178e-07	8.624e-08	-6.929	-7.064	-0.135	(0)
CuOH+	6.680e-08	6.178e-08	-7.175	-7.209	-0.034	(0)
CuHCO3+	1.272e-08	1.167e-08	-7.896	-7.933	-0.037	(0)
Cu (CO3) 2-2	9.862e-09	7.001e-09	-8.006	-8.155	-0.149	(0)
CuSO4	6.400e-09	6.400e-09	-8.194	-8.194	0.000	(0)
Cu (OH) 2	2.792e-09	2.792e-09	-8.554	-8.554	0.000	(0)
CuF+	3.303e-10	3.032e-10	-9.481	-9.518	-0.037	(0)
Cu2 (OH) 2+2	1.350e-10	9.587e-11	-9.870	-10.018	-0.149	(0)
CuCl+	6.009e-11	5.557e-11	-10.221	-10.255	-0.034	(0)
Cu (OH) 3-	1.414e-12	1.297e-12	-11.850	-11.887	-0.037	(0)
CuCl2	7.834e-15	7.834e-15	-14.106	-14.106	0.000	(0)
Cu (OH) 4-2	3.259e-18	2.313e-18	-17.487	-17.636	-0.149	(0)
CuCl3-	3.214e-20	2.973e-20	-19.493	-19.527	-0.034	(0)
CuCl4-2	8.226e-26	6.058e-26	-25.085	-25.218	-0.133	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-201.295	-201.333	-0.037	(0)
F	6.220e-05					
F-	6.024e-05	5.572e-05	-4.220	-4.254	-0.034	(0)
MgF+	1.482e-06	1.372e-06	-5.829	-5.863	-0.034	(0)
CaF+	4.136e-07	3.831e-07	-6.383	-6.417	-0.033	(0)
NaF	4.091e-08	4.091e-08	-7.388	-7.388	0.000	(0)
MnF+	7.164e-09	6.636e-09	-8.145	-8.178	-0.033	(0)
HF	3.663e-09	3.663e-09	-8.436	-8.436	0.000	(0)
AlF2+	1.645e-09	1.525e-09	-8.784	-8.817	-0.033	(0)
AlF3	1.070e-09	1.070e-09	-8.971	-8.971	0.000	(0)
CuF+	3.303e-10	3.032e-10	-9.481	-9.518	-0.037	(0)
ZnF+	1.554e-10	1.427e-10	-9.808	-9.846	-0.037	(0)
BF (OH) 3-	9.673e-11	8.922e-11	-10.014	-10.050	-0.035	(0)
AlF+2	9.309e-11	6.873e-11	-10.031	-10.163	-0.132	(0)

NiF+	5.343e-11	4.905e-11	-10.272	-10.309	-0.037	(0)
CoF+	4.558e-11	4.183e-11	-10.341	-10.378	-0.037	(0)
AlF4-	3.227e-11	2.987e-11	-10.491	-10.525	-0.034	(0)
CrF+2	2.796e-12	1.985e-12	-11.553	-11.702	-0.149	(0)
PbF+	2.162e-12	1.985e-12	-11.665	-11.702	-0.037	(0)
CdF+	1.726e-12	1.584e-12	-11.763	-11.800	-0.037	(0)
AgF	1.666e-12	1.666e-12	-11.778	-11.778	0.000	(0)
HF2-	8.399e-13	7.761e-13	-12.076	-12.110	-0.034	(0)
UO2F+	1.163e-13	1.067e-13	-12.934	-12.972	-0.037	(0)
FeF2+	4.455e-14	4.127e-14	-13.351	-13.384	-0.033	(0)
FeF+2	3.758e-14	2.767e-14	-13.425	-13.558	-0.133	(0)
BF2 (OH) 2-	2.561e-14	2.363e-14	-13.592	-13.627	-0.035	(0)
UO2F2	1.715e-14	1.715e-14	-13.766	-13.766	0.000	(0)
FeF3	3.245e-15	3.245e-15	-14.489	-14.489	0.000	(0)
PbF2	2.176e-15	2.176e-15	-14.662	-14.662	0.000	(0)
UO2F3-	2.616e-16	2.401e-16	-15.582	-15.620	-0.037	(0)
CdF2	1.762e-16	1.762e-16	-15.754	-15.754	0.000	(0)
VO2F	4.874e-17	4.874e-17	-16.312	-16.312	0.000	(0)
H2F2	3.595e-17	3.595e-17	-16.444	-16.444	0.000	(0)
VO2F2-	1.074e-18	9.862e-19	-17.969	-18.006	-0.037	(0)
VOF+	6.082e-19	5.583e-19	-18.216	-18.253	-0.037	(0)
PbF3-	2.506e-19	2.300e-19	-18.601	-18.638	-0.037	(0)
UO2F4-2	1.497e-19	1.063e-19	-18.825	-18.974	-0.149	(0)
BF3OH-	2.468e-20	2.277e-20	-19.608	-19.643	-0.035	(0)
VOF2	1.166e-20	1.166e-20	-19.933	-19.933	0.000	(0)
VO2F3-2	9.656e-22	6.855e-22	-21.015	-21.164	-0.149	(0)
VOF3-	2.513e-23	2.306e-23	-22.600	-22.637	-0.037	(0)
PbF4-2	8.642e-24	6.135e-24	-23.063	-23.212	-0.149	(0)
Sb (OH) 2F	8.954e-25	8.954e-25	-24.048	-24.048	0.000	(0)
SbOF	8.805e-25	8.805e-25	-24.055	-24.055	0.000	(0)
BF4-	3.008e-25	2.775e-25	-24.522	-24.557	-0.035	(0)
VO2F4-3	4.063e-26	1.880e-26	-25.391	-25.726	-0.335	(0)
HgF+	1.428e-26	1.311e-26	-25.845	-25.882	-0.037	(0)
VOF4-2	7.308e-27	5.188e-27	-26.136	-26.285	-0.149	(0)
UF3+	3.002e-35	2.756e-35	-34.523	-34.560	-0.037	(0)
UF2+2	4.395e-36	3.120e-36	-35.357	-35.506	-0.149	(0)
UF4	1.684e-37	1.684e-37	-36.774	-36.774	0.000	(0)
UF+3	9.615e-39	4.448e-39	-38.017	-38.352	-0.335	(0)
UF5-	4.051e-40	3.718e-40	-39.392	-39.430	-0.037	(0)
UF6-2	0.000e+00	0.000e+00	-41.055	-41.204	-0.149	(0)
Fe (2)	1.578e-07					
Fe+2	1.456e-07	1.033e-07	-6.837	-6.986	-0.149	(0)
FeSO4	8.217e-09	8.217e-09	-8.085	-8.085	0.000	(0)
FeHCO3+	3.008e-09	2.791e-09	-8.522	-8.554	-0.033	(0)
FeOH+	1.006e-09	9.320e-10	-8.997	-9.031	-0.033	(0)
Fe (OH) 2	1.677e-13	1.677e-13	-12.775	-12.775	0.000	(0)
Fe (OH) 3-	1.297e-14	1.201e-14	-13.887	-13.920	-0.033	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.814	-144.814	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-216.129	-216.166	-0.037	(0)
Fe (3)	7.752e-06					
Fe (OH) 2+	6.299e-06	5.839e-06	-5.201	-5.234	-0.033	(0)
Fe (OH) 3	1.421e-06	1.421e-06	-5.848	-5.848	0.000	(0)
Fe (OH) 4-	3.232e-08	2.996e-08	-7.490	-7.523	-0.033	(0)
FeOH+2	8.996e-11	6.625e-11	-10.046	-10.179	-0.133	(0)
FeF2+	4.455e-14	4.127e-14	-13.351	-13.384	-0.033	(0)
FeF+2	3.758e-14	2.767e-14	-13.425	-13.558	-0.133	(0)
FeF3	3.245e-15	3.245e-15	-14.489	-14.489	0.000	(0)
FeSO4+	1.777e-15	1.646e-15	-14.750	-14.784	-0.033	(0)
Fe+3	9.136e-16	4.529e-16	-15.039	-15.344	-0.305	(0)
Fe (SO4) 2-	1.242e-17	1.140e-17	-16.906	-16.943	-0.037	(0)
FeCl+2	7.552e-18	5.561e-18	-17.122	-17.255	-0.133	(0)
Fe2 (OH) 2+4	5.722e-19	1.453e-19	-18.242	-18.838	-0.595	(0)
FeCl2+	1.090e-20	1.010e-20	-19.962	-19.996	-0.033	(0)
FeHSeO3+2	1.037e-20	7.363e-21	-19.984	-20.133	-0.149	(0)
Fe3 (OH) 4+5	1.044e-22	1.226e-23	-21.981	-22.911	-0.930	(0)
FeCl3	4.107e-25	4.107e-25	-24.387	-24.387	0.000	(0)
H (0)	1.255e-27					
H2	6.274e-28	6.282e-28	-27.202	-27.202	0.001	(0)

Hg (0)	2.632e-11					
Hg	2.632e-11	2.632e-11	-10.580	-10.580	0.000	(0)
Hg (1)	3.195e-25					
Hg2+2	1.598e-25	1.134e-25	-24.797	-24.945	-0.149	(0)
Hg (2)	3.208e-15					
Hg (OH) 2	2.053e-15	2.055e-15	-14.688	-14.687	0.001	(0)
HgClOH	1.033e-15	1.033e-15	-14.986	-14.986	0.000	(0)
HgCl2	1.049e-16	1.049e-16	-15.979	-15.979	0.000	(0)
HgCO3	1.719e-17	1.719e-17	-16.765	-16.765	0.000	(0)
HgCl3-	4.648e-19	4.266e-19	-18.333	-18.370	-0.037	(0)
Hg (CO3) 2-2	1.733e-19	1.230e-19	-18.761	-18.910	-0.149	(0)
HgOH+	6.237e-20	5.725e-20	-19.205	-19.242	-0.037	(0)
HgCl+	5.610e-20	5.149e-20	-19.251	-19.288	-0.037	(0)
HgHCO3+	1.550e-20	1.423e-20	-19.810	-19.847	-0.037	(0)
HgCl4-2	9.728e-22	6.906e-22	-21.012	-21.161	-0.149	(0)
Hg (OH) 3-	6.386e-23	5.862e-23	-22.195	-22.232	-0.037	(0)
Hg+2	8.941e-24	6.348e-24	-23.049	-23.197	-0.149	(0)
HgSO4	5.383e-25	5.383e-25	-24.269	-24.269	0.000	(0)
HgF+	1.428e-26	1.311e-26	-25.845	-25.882	-0.037	(0)
HgHS2-	0.000e+00	0.000e+00	-130.658	-130.695	-0.037	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.654	-131.654	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.902	-132.051	-0.149	(0)
K	8.019e-05					
K+	8.000e-05	7.400e-05	-4.097	-4.131	-0.034	(0)
KSO4-	1.831e-07	1.697e-07	-6.737	-6.770	-0.033	(0)
KCrO4-	5.272e-21	4.839e-21	-20.278	-20.315	-0.037	(0)
Mg	3.198e-04					
Mg+2	2.997e-04	2.194e-04	-3.523	-3.659	-0.135	(0)
MgSO4	1.294e-05	1.294e-05	-4.888	-4.888	0.000	(0)
MgHCO3+	5.210e-06	4.818e-06	-5.283	-5.317	-0.034	(0)
MgF+	1.482e-06	1.372e-06	-5.829	-5.863	-0.034	(0)
MgCO3	4.131e-07	4.131e-07	-6.384	-6.384	0.000	(0)
MgOH+	2.131e-08	1.979e-08	-7.671	-7.704	-0.032	(0)
MgH2BO3+	4.325e-10	3.990e-10	-9.364	-9.399	-0.035	(0)
Mn (2)	4.535e-06					
Mn+2	4.214e-06	2.991e-06	-5.375	-5.524	-0.149	(0)
MnSO4	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
MnHCO3+	1.382e-07	1.281e-07	-6.859	-6.893	-0.033	(0)
MnF+	7.164e-09	6.636e-09	-8.145	-8.178	-0.033	(0)
MnOH+	1.837e-09	1.702e-09	-8.736	-8.769	-0.033	(0)
MnCl+	1.653e-09	1.531e-09	-8.782	-8.815	-0.033	(0)
MnCl2	8.794e-13	8.794e-13	-12.056	-12.056	0.000	(0)
MnCl3-	1.063e-16	9.847e-17	-15.973	-16.007	-0.033	(0)
MnSeO4	6.179e-17	6.179e-17	-16.209	-16.209	0.000	(0)
Mn (OH) 3-	5.828e-19	5.399e-19	-18.235	-18.268	-0.033	(0)
Mn (OH) 4-2	5.362e-25	3.948e-25	-24.271	-24.404	-0.133	(0)
MnSe	8.640e-40	8.640e-40	-39.064	-39.064	0.000	(0)
Mn (3)	1.272e-26					
Mn+3	1.272e-26	6.304e-27	-25.896	-26.200	-0.305	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.301	-46.434	-0.133	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-51.097	-51.132	-0.035	(0)
Mo	7.380e-08					
MoO4-2	7.375e-08	5.399e-08	-7.132	-7.268	-0.135	(0)
HMoO4-	5.202e-11	4.775e-11	-10.284	-10.321	-0.037	(0)
H2MoO4	1.554e-14	1.554e-14	-13.808	-13.808	0.000	(0)
Ag2MoO4	2.895e-24	2.895e-24	-23.538	-23.538	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-45.301	-45.635	-0.335	(0)
Mo7O24-6	0.000e+00	0.000e+00	-55.362	-56.701	-1.339	(0)
HMo7O24-5	0.000e+00	0.000e+00	-56.736	-57.666	-0.930	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-59.641	-60.236	-0.595	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-64.008	-64.343	-0.335	(0)
Na	1.262e-03					
Na+	1.258e-03	1.164e-03	-2.900	-2.934	-0.034	(0)
NaSO4-	2.184e-06	2.024e-06	-5.661	-5.694	-0.033	(0)
NaHCO3	1.404e-06	1.404e-06	-5.853	-5.853	0.000	(0)
NaCO3-	5.290e-08	4.904e-08	-7.277	-7.309	-0.033	(0)

	NaF	4.091e-08	4.091e-08	-7.388	-7.388	0.000	(0)
	NaH2BO3	9.669e-11	9.669e-11	-10.015	-10.015	0.000	(0)
	NaCrO4-	1.109e-19	1.018e-19	-18.955	-18.992	-0.037	(0)
Ni		6.339e-08					
	Ni+2	4.786e-08	3.504e-08	-7.320	-7.455	-0.135	(0)
	NiHCO3+	1.010e-08	9.269e-09	-7.996	-8.033	-0.037	(0)
	NiCO3	2.959e-09	2.959e-09	-8.529	-8.529	0.000	(0)
	NiSO4	2.265e-09	2.265e-09	-8.645	-8.645	0.000	(0)
	NiOH+	1.089e-10	9.993e-11	-9.963	-10.000	-0.037	(0)
	NiF+	5.343e-11	4.905e-11	-10.272	-10.309	-0.037	(0)
	NiCl+	3.971e-11	3.645e-11	-10.401	-10.438	-0.037	(0)
	Ni(OH)2	1.798e-12	1.798e-12	-11.745	-11.745	0.000	(0)
	Ni(SO4)2-2	3.422e-14	2.429e-14	-13.466	-13.615	-0.149	(0)
	Ni(OH)3-	4.438e-16	4.074e-16	-15.353	-15.390	-0.037	(0)
	NiCl2	7.462e-17	7.462e-17	-16.127	-16.127	0.000	(0)
	NiSeO4	1.258e-18	1.258e-18	-17.900	-17.900	0.000	(0)
O(0)		2.565e-38					
	O2	1.283e-38	1.284e-38	-37.892	-37.891	0.001	(0)
Pb		5.444e-09					
	PbCO3	3.438e-09	3.438e-09	-8.464	-8.464	0.000	(0)
	PbHCO3+	8.777e-10	8.057e-10	-9.057	-9.094	-0.037	(0)
	Pb+2	6.903e-10	5.054e-10	-9.161	-9.296	-0.135	(0)
	PbOH+	3.133e-10	2.876e-10	-9.504	-9.541	-0.037	(0)
	PbSO4	8.018e-11	8.018e-11	-10.096	-10.096	0.000	(0)
	Pb(CO3)2-2	3.161e-11	2.244e-11	-10.500	-10.649	-0.149	(0)
	PbCl+	7.943e-12	7.291e-12	-11.100	-11.137	-0.037	(0)
	PbF+	2.162e-12	1.985e-12	-11.665	-11.702	-0.037	(0)
	Pb(OH)2	2.060e-12	2.060e-12	-11.686	-11.686	0.000	(0)
	Pb(SO4)2-2	2.205e-13	1.565e-13	-12.657	-12.805	-0.149	(0)
	PbCl2	1.324e-14	1.324e-14	-13.878	-13.878	0.000	(0)
	PbF2	2.176e-15	2.176e-15	-14.662	-14.662	0.000	(0)
	Pb(OH)3-	5.084e-16	4.667e-16	-15.294	-15.331	-0.037	(0)
	Pb2OH+3	4.979e-18	2.303e-18	-17.303	-17.638	-0.335	(0)
	PbCl3-	2.335e-18	2.143e-18	-17.632	-17.669	-0.037	(0)
	PbF3-	2.506e-19	2.300e-19	-18.601	-18.638	-0.037	(0)
	Pb(OH)4-2	3.647e-20	2.589e-20	-19.438	-19.587	-0.149	(0)
	PbCl4-2	5.611e-22	3.983e-22	-21.251	-21.400	-0.149	(0)
	Pb3(OH)4+2	6.028e-23	4.279e-23	-22.220	-22.369	-0.149	(0)
	PbF4-2	8.642e-24	6.135e-24	-23.063	-23.212	-0.149	(0)
	Pb4(OH)4+4	6.764e-28	1.718e-28	-27.170	-27.765	-0.595	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-140.805	-140.805	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-212.857	-212.894	-0.037	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-67.499	-67.499	0.000	(0)
	HS-	0.000e+00	0.000e+00	-73.352	-73.389	-0.037	(0)
	H2S	0.000e+00	0.000e+00	-73.721	-73.721	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-74.090	-74.127	-0.037	(0)
	S5-2	0.000e+00	0.000e+00	-75.253	-75.402	-0.149	(0)
	S6-2	0.000e+00	0.000e+00	-75.769	-75.918	-0.149	(0)
	S4-2	0.000e+00	0.000e+00	-75.849	-75.998	-0.149	(0)
	S3-2	0.000e+00	0.000e+00	-76.655	-76.804	-0.149	(0)
	S2-2	0.000e+00	0.000e+00	-77.671	-77.820	-0.149	(0)
	S-2	0.000e+00	0.000e+00	-83.204	-83.337	-0.133	(0)
	HgHS2-	0.000e+00	0.000e+00	-130.658	-130.695	-0.037	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-131.654	-131.654	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-131.902	-132.051	-0.149	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-136.751	-136.788	-0.037	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-136.810	-136.919	-0.109	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-137.516	-137.732	-0.216	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-138.253	-138.462	-0.209	(0)
	Ag(S4)2-3	0.000e+00	0.000e+00	-138.788	-139.007	-0.219	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-139.106	-139.318	-0.213	(0)
	ZnS(HS)-	0.000e+00	0.000e+00	-139.471	-139.508	-0.037	(0)
	Cd(HS)2	0.000e+00	0.000e+00	-140.312	-140.312	0.000	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-140.805	-140.805	0.000	(0)
	Zn(HS)2	0.000e+00	0.000e+00	-140.850	-140.850	0.000	(0)
	Fe(HS)2	0.000e+00	0.000e+00	-144.814	-144.814	0.000	(0)
	Cu(HS)3-	0.000e+00	0.000e+00	-201.295	-201.333	-0.037	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-210.922	-210.959	-0.037	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-211.764	-211.802	-0.037	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-212.857	-212.894	-0.037	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-213.438	-213.587	-0.149	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-216.129	-216.166	-0.037	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-282.846	-282.995	-0.149	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-285.659	-285.808	-0.149	(0)
Sb2S4-2	0.000e+00	0.000e+00	-295.994	-296.143	-0.149	(0)
S (6)	5.047e-04					
SO4-2	4.425e-04	3.239e-04	-3.354	-3.490	-0.135	(0)
CaSO4	4.675e-05	4.675e-05	-4.330	-4.330	0.000	(0)
MgSO4	1.294e-05	1.294e-05	-4.888	-4.888	0.000	(0)
NaSO4-	2.184e-06	2.024e-06	-5.661	-5.694	-0.033	(0)
KSO4-	1.831e-07	1.697e-07	-6.737	-6.770	-0.033	(0)
MnSO4	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
ZnSO4	9.095e-09	9.095e-09	-8.041	-8.041	0.000	(0)
FeSO4	8.217e-09	8.217e-09	-8.085	-8.085	0.000	(0)
CuSO4	6.400e-09	6.400e-09	-8.194	-8.194	0.000	(0)
NiSO4	2.265e-09	2.265e-09	-8.645	-8.645	0.000	(0)
CoSO4	1.534e-09	1.534e-09	-8.814	-8.814	0.000	(0)
HSO4-	1.520e-09	1.407e-09	-8.818	-8.852	-0.034	(0)
CdSO4	1.362e-10	1.362e-10	-9.866	-9.866	0.000	(0)
CrOHSO4	8.563e-11	8.563e-11	-10.067	-10.067	0.000	(0)
AgSO4-	8.381e-11	7.693e-11	-10.077	-10.114	-0.037	(0)
PbSO4	8.018e-11	8.018e-11	-10.096	-10.096	0.000	(0)
Zn (SO4) 2-2	3.614e-11	2.566e-11	-10.442	-10.591	-0.149	(0)
Cd (SO4) 2-2	8.386e-13	5.953e-13	-12.076	-12.225	-0.149	(0)
AlSO4+	3.351e-13	3.101e-13	-12.475	-12.508	-0.034	(0)
Pb (SO4) 2-2	2.205e-13	1.565e-13	-12.657	-12.805	-0.149	(0)
CrSO4+	1.852e-13	1.700e-13	-12.732	-12.770	-0.037	(0)
Ni (SO4) 2-2	3.422e-14	2.429e-14	-13.466	-13.615	-0.149	(0)
UO2SO4	6.803e-15	6.803e-15	-14.167	-14.167	0.000	(0)
FeSO4+	1.777e-15	1.646e-15	-14.750	-14.784	-0.033	(0)
Al (SO4) 2-	1.163e-15	1.076e-15	-14.934	-14.968	-0.034	(0)
UO2 (SO4) 2-2	4.092e-17	2.905e-17	-16.388	-16.537	-0.149	(0)
Fe (SO4) 2-	1.242e-17	1.140e-17	-16.906	-16.943	-0.037	(0)
Cr2 (OH) 2SO4+2	1.215e-17	8.622e-18	-16.916	-17.064	-0.149	(0)
VO2SO4-	4.203e-18	3.858e-18	-17.376	-17.414	-0.037	(0)
Cr2 (OH) 2 (SO4) 2	1.659e-19	1.659e-19	-18.780	-18.780	0.000	(0)
VOSO4	1.490e-19	1.490e-19	-18.827	-18.827	0.000	(0)
HgSO4	5.383e-25	5.383e-25	-24.269	-24.269	0.000	(0)
CrO3SO4-2	1.564e-26	1.110e-26	-25.806	-25.955	-0.149	(0)
VSO4+	5.786e-33	5.311e-33	-32.238	-32.275	-0.037	(0)
U (SO4) 2	1.327e-40	1.327e-40	-39.877	-39.877	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.139	-40.287	-0.149	(0)
Sb (3)	4.573e-19					
Sb (OH) 3	2.314e-19	2.314e-19	-18.636	-18.636	0.000	(0)
HSbO2	2.259e-19	2.259e-19	-18.646	-18.646	0.000	(0)
SbO2-	8.969e-24	8.232e-24	-23.047	-23.084	-0.037	(0)
Sb (OH) 4-	5.138e-24	4.717e-24	-23.289	-23.326	-0.037	(0)
Sb (OH) 2F	8.954e-25	8.954e-25	-24.048	-24.048	0.000	(0)
SbOF	8.805e-25	8.805e-25	-24.055	-24.055	0.000	(0)
Sb (OH) 2+	2.721e-25	2.498e-25	-24.565	-24.602	-0.037	(0)
SbO+	9.382e-26	8.612e-26	-25.028	-25.065	-0.037	(0)
Sb2S4-2	0.000e+00	0.000e+00	-295.994	-296.143	-0.149	(0)
Sb (5)	2.680e-09					
SbO3-	2.677e-09	2.457e-09	-8.572	-8.610	-0.037	(0)
Sb (OH) 6-	3.106e-12	2.873e-12	-11.508	-11.542	-0.034	(0)
SbO2+	1.517e-24	1.392e-24	-23.819	-23.856	-0.037	(0)
Se (-2)	8.089e-10					
Ag2Se	8.089e-10	8.089e-10	-9.092	-9.092	0.000	(0)
HSe-	3.393e-36	3.115e-36	-35.469	-35.507	-0.037	(0)
H2Se	1.075e-39	1.075e-39	-38.969	-38.969	0.000	(0)
MnSe	8.640e-40	8.640e-40	-39.064	-39.064	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.006	-43.154	-0.149	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-76.795	-77.390	-0.595	(0)
Se (4)	7.478e-09					
HSeO3-	6.702e-09	6.152e-09	-8.174	-8.211	-0.037	(0)

SeO3-2	7.762e-10	5.510e-10	-9.110	-9.259	-0.149	(0)
H2SeO3	1.166e-13	1.166e-13	-12.933	-12.933	0.000	(0)
AgSeO3-	4.592e-15	4.215e-15	-14.338	-14.375	-0.037	(0)
FeHSeO3+2	1.037e-20	7.363e-21	-19.984	-20.133	-0.149	(0)
Cd (SeO3) 2-2	6.324e-22	4.489e-22	-21.199	-21.348	-0.149	(0)
Ag (SeO3) 2-3	4.496e-23	2.080e-23	-22.347	-22.682	-0.335	(0)
Se (6)	1.049e-13					
SeO4-2	1.048e-13	7.674e-14	-12.980	-13.115	-0.135	(0)
MnSeO4	6.179e-17	6.179e-17	-16.209	-16.209	0.000	(0)
ZnSeO4	1.525e-18	1.525e-18	-17.817	-17.817	0.000	(0)
NiSeO4	1.258e-18	1.258e-18	-17.900	-17.900	0.000	(0)
CoSeO4	9.131e-19	9.131e-19	-18.039	-18.039	0.000	(0)
HSeO4-	1.862e-19	1.709e-19	-18.730	-18.767	-0.037	(0)
CdSeO4	2.564e-20	2.564e-20	-19.591	-19.591	0.000	(0)
Zn (SeO4) 2-2	1.672e-31	1.187e-31	-30.777	-30.926	-0.149	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.533	-56.868	-0.335	(0)
U (4)	1.909e-20					
U (OH) 5-	1.905e-20	1.749e-20	-19.720	-19.757	-0.037	(0)
U (OH) 4	3.256e-23	3.256e-23	-22.487	-22.487	0.000	(0)
U (OH) 3+	5.764e-27	5.291e-27	-26.239	-26.276	-0.037	(0)
U (OH) 2+2	1.532e-31	1.087e-31	-30.815	-30.964	-0.149	(0)
UF3+	3.002e-35	2.756e-35	-34.523	-34.560	-0.037	(0)
UF2+2	4.395e-36	3.120e-36	-35.357	-35.506	-0.149	(0)
UOH+3	4.921e-37	2.276e-37	-36.308	-36.643	-0.335	(0)
UF4	1.684e-37	1.684e-37	-36.774	-36.774	0.000	(0)
UF+3	9.615e-39	4.448e-39	-38.017	-38.352	-0.335	(0)
UF5-	4.051e-40	3.718e-40	-39.392	-39.430	-0.037	(0)
U (SO4) 2	1.327e-40	1.327e-40	-39.877	-39.877	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.139	-40.287	-0.149	(0)
UF6-2	0.000e+00	0.000e+00	-41.055	-41.204	-0.149	(0)
U+4	0.000e+00	0.000e+00	-42.803	-43.398	-0.595	(0)
UCl+3	0.000e+00	0.000e+00	-44.754	-45.089	-0.335	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.247	-167.260	-3.013	(0)
U (5)	1.953e-16					
UO2+	1.953e-16	1.793e-16	-15.709	-15.746	-0.037	(0)
U (6)	1.060e-08					
UO2 (CO3) 2-2	7.953e-09	5.646e-09	-8.099	-8.248	-0.149	(0)
UO2 (CO3) 3-4	2.522e-09	6.404e-10	-8.598	-9.194	-0.595	(0)
UO2CO3	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
UO2OH+	4.311e-13	3.957e-13	-12.365	-12.403	-0.037	(0)
UO2F+	1.163e-13	1.067e-13	-12.934	-12.972	-0.037	(0)
UO2+2	1.895e-14	1.388e-14	-13.722	-13.858	-0.135	(0)
UO2F2	1.715e-14	1.715e-14	-13.766	-13.766	0.000	(0)
UO2SO4	6.803e-15	6.803e-15	-14.167	-14.167	0.000	(0)
UO2F3-	2.616e-16	2.401e-16	-15.582	-15.620	-0.037	(0)
UO2 (SO4) 2-2	4.092e-17	2.905e-17	-16.388	-16.537	-0.149	(0)
UO2Cl+	9.968e-18	9.150e-18	-17.001	-17.039	-0.037	(0)
(UO2) 2 (OH) 2+2	3.661e-19	2.599e-19	-18.436	-18.585	-0.149	(0)
UO2F4-2	1.497e-19	1.063e-19	-18.825	-18.974	-0.149	(0)
(UO2) 3 (OH) 5+	4.362e-21	4.004e-21	-20.360	-20.397	-0.037	(0)
V (2)	2.879e-40					
VOH+	2.879e-40	2.643e-40	-39.541	-39.578	-0.037	(0)
V+2	0.000e+00	0.000e+00	-40.294	-40.443	-0.149	(0)
V (3)	3.257e-13					
V (OH) 3	3.257e-13	3.257e-13	-12.487	-12.487	0.000	(0)
V (OH) 2+	1.019e-23	9.354e-24	-22.992	-23.029	-0.037	(0)
VOH+2	5.555e-27	3.943e-27	-26.255	-26.404	-0.149	(0)
V+3	7.508e-32	3.473e-32	-31.124	-31.459	-0.335	(0)
VSO4+	5.786e-33	5.311e-33	-32.238	-32.275	-0.037	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.646	-50.981	-0.335	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-51.413	-52.008	-0.595	(0)
V (4)	8.536e-17					
V (OH) 3+	8.224e-17	7.549e-17	-16.085	-16.122	-0.037	(0)
VO+2	2.353e-18	1.670e-18	-17.628	-17.777	-0.149	(0)
VOF+	6.082e-19	5.583e-19	-18.216	-18.253	-0.037	(0)
VOSO4	1.490e-19	1.490e-19	-18.827	-18.827	0.000	(0)
VOF2	1.166e-20	1.166e-20	-19.933	-19.933	0.000	(0)

VOC1+	2.076e-21	1.905e-21	-20.683	-20.720	-0.037	(0)
VOF3-	2.513e-23	2.306e-23	-22.600	-22.637	-0.037	(0)
VOF4-2	7.308e-27	5.188e-27	-26.136	-26.285	-0.149	(0)
H2V2O4+2	4.024e-28	2.857e-28	-27.395	-27.544	-0.149	(0)
V (5)	1.480e-08					
H2VO4-	1.378e-08	1.265e-08	-7.861	-7.898	-0.037	(0)
HVO4-2	1.007e-09	7.150e-10	-8.997	-9.146	-0.149	(0)
H3VO4	5.623e-12	5.623e-12	-11.250	-11.250	0.000	(0)
H3V2O7-	5.005e-13	4.594e-13	-12.301	-12.338	-0.037	(0)
HV2O7-3	6.627e-15	3.066e-15	-14.179	-14.513	-0.335	(0)
VO2+	5.392e-16	4.987e-16	-15.268	-15.302	-0.034	(0)
VO4-3	1.743e-16	8.063e-17	-15.759	-16.093	-0.335	(0)
VO2F	4.874e-17	4.874e-17	-16.312	-16.312	0.000	(0)
V2O7-4	7.310e-18	1.857e-18	-17.136	-17.731	-0.595	(0)
V3O9-3	4.586e-18	2.121e-18	-17.339	-17.673	-0.335	(0)
VO2SO4-	4.203e-18	3.858e-18	-17.376	-17.414	-0.037	(0)
VO2F2-	1.074e-18	9.862e-19	-17.969	-18.006	-0.037	(0)
VO2F3-2	9.656e-22	6.855e-22	-21.015	-21.164	-0.149	(0)
V4O12-4	4.405e-23	1.119e-23	-22.356	-22.951	-0.595	(0)
VO2F4-3	4.063e-26	1.880e-26	-25.391	-25.726	-0.335	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.716	-58.646	-0.930	(0)
V10O28-6	0.000e+00	0.000e+00	-58.142	-59.481	-1.339	(0)
H2V10O28-4	0.000e+00	0.000e+00	-60.196	-60.791	-0.595	(0)
Zn	2.142e-07					
Zn+2	1.753e-07	1.283e-07	-6.756	-6.892	-0.135	(0)
ZnCO3	1.671e-08	1.671e-08	-7.777	-7.777	0.000	(0)
ZnHCO3+	9.486e-09	8.707e-09	-8.023	-8.060	-0.037	(0)
ZnSO4	9.095e-09	9.095e-09	-8.041	-8.041	0.000	(0)
ZnOH+	3.167e-09	2.907e-09	-8.499	-8.537	-0.037	(0)
ZnF+	1.554e-10	1.427e-10	-9.808	-9.846	-0.037	(0)
ZnCl+	1.417e-10	1.311e-10	-9.849	-9.883	-0.034	(0)
Zn (OH) 2	1.044e-10	1.044e-10	-9.981	-9.981	0.000	(0)
ZnOHC1	3.887e-11	3.887e-11	-10.410	-10.410	0.000	(0)
Zn (SO4) 2-2	3.614e-11	2.566e-11	-10.442	-10.591	-0.149	(0)
Zn (OH) 3-	1.291e-13	1.185e-13	-12.889	-12.926	-0.037	(0)
ZnCl2	8.446e-14	8.446e-14	-13.073	-13.073	0.000	(0)
ZnCl3-	2.949e-17	2.728e-17	-16.530	-16.564	-0.034	(0)
ZnSeO4	1.525e-18	1.525e-18	-17.817	-17.817	0.000	(0)
Zn (OH) 4-2	1.505e-18	1.069e-18	-17.822	-17.971	-0.149	(0)
ZnCl4-2	7.530e-21	5.545e-21	-20.123	-20.256	-0.133	(0)
Zn (SeO4) 2-2	1.672e-31	1.187e-31	-30.777	-30.926	-0.149	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-139.471	-139.508	-0.037	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.850	-140.850	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-210.922	-210.959	-0.037	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-213.438	-213.587	-0.149	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-285.659	-285.808	-0.149	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.67	-81.89	-36.22	Ag2S
Ag2CO3	-10.40	-21.49	-11.09	Ag2CO3
Ag2CrO4	-21.01	-32.60	-11.59	Ag2CrO4
Ag2HVO4	-10.57	-9.09	1.48	Ag2HVO4
Ag2MoO4	-11.57	-23.12	-11.55	Ag2MoO4
Ag2O	-13.72	-1.14	12.57	Ag2O
Ag2Se	4.70	-44.00	-48.70	Ag2Se
Ag2SeO3	-9.56	-16.71	-7.15	Ag2SeO3
Ag2SeO4	-20.05	-28.96	-8.91	Ag2SeO4
Ag2SO4	-14.52	-19.34	-4.82	Ag2SO4
Ag3AsO3	-22.79	-20.63	2.16	Ag3AsO3
Ag3AsO4	-12.69	-15.48	-2.79	Ag3AsO4
Ag3H2VO5	-14.85	-9.67	5.18	Ag3H2VO5
AgF:4H2O	-13.23	-12.18	1.05	AgF:4H2O
Agmetal	0.91	-12.60	-13.51	Ag
AgVO3	-9.29	-8.52	0.77	AgVO3
Al (OH) 3 (am)	-1.65	9.15	10.80	Al (OH) 3

Al ₂ (MoO ₄) ₃	-49.99	-47.62	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	-1.36	18.30	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	-4.30	18.40	22.70	Al ₄ (OH) ₁₀ SO ₄
AlAsO ₄ :2H ₂ O	-9.41	-4.61	4.80	AlAsO ₄ :2H ₂ O
AlOHSO ₄	-5.82	-9.05	-3.23	AlOHSO ₄
AlSb	-147.27	-81.64	65.62	AlSb
Alunite	-4.32	-5.72	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-5.00	-12.79	-7.79	PbSO ₄
Anhydrite	-2.33	-6.69	-4.36	CaSO ₄
Anilite	-49.50	-81.38	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-4.06	4.73	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.55	-8.85	-8.30	CaCO ₃
Arsenolite	-72.90	-75.66	-2.76	As ₄ O ₆
Artinite	-7.86	1.74	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-34.23	-27.52	6.71	As ₂ O ₅
Atacamite	-2.85	4.54	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-0.87	-17.78	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.38	8.01	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-15.74	0.13	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	5.43	-3.48	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-24.80	8.14	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.77	-23.44	-9.67	BaCrO ₄
BaF ₂	-9.38	-15.20	-5.82	BaF ₂
BaMoO ₄	-7.00	-13.96	-6.96	BaMoO ₄
Barite	-0.20	-10.18	-9.98	BaSO ₄
BaS	-88.91	-72.73	16.18	BaS
BaSeO ₃	-9.38	-7.55	1.83	BaSeO ₃
BaSeO ₄	-12.34	-19.80	-7.46	BaSeO ₄
Bianchite	-8.62	-10.38	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-10.21	7.88	18.09	MnO ₂
Bixbyite	-7.64	-8.29	-0.64	Mn ₂ O ₃
BlaubleiI	-50.04	-74.20	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-50.23	-77.51	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.57	9.15	8.58	AlOOH
Breithauptite	-52.99	-71.52	-18.52	NiSb
Brochantite	-2.86	12.37	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.80	11.05	16.84	Mg(OH) ₂
Bunsenite	-5.20	7.25	12.45	NiO
Ca(VO ₃) ₂	-10.06	-4.40	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.39	7.11	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.44	7.11	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-15.31	6.99	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-20.35	18.61	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-21.25	18.61	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-290.05	-147.07	142.97	Ca ₃ Sb ₂
CaCrO ₄	-17.69	-19.96	-2.27	CaCrO ₄
Calcite	-0.37	-8.85	-8.48	CaCO ₃
Calomel	-13.82	-31.73	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.52	-10.47	-7.95	CaMoO ₄
Carnotite	-4.11	-3.88	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.87	-4.06	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-13.30	-16.32	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-14.67	-4.83	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.69	5.96	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.77	5.96	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-25.22	-18.51	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.88	-0.32	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-22.76	5.64	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-14.87	-15.53	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-13.83	-15.53	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-13.61	-15.53	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.04	-17.25	-1.21	CdF ₂
Cdmetal(alpha)	-31.61	-18.09	13.51	Cd
Cdmetal(gamma)	-31.71	-18.09	13.62	Cd
CdMoO ₄	-1.86	-16.01	-14.15	CdMoO ₄
CdOHC1	-8.32	-4.78	3.54	CdOHC1
CdSb	-72.46	-72.81	-0.35	CdSb
CdSe	-16.70	-36.90	-20.20	CdSe

CdSeO4:2H2O	-20.01	-21.86	-1.85	CdSeO4:2H2O
CdSO4	-12.06	-12.24	-0.17	CdSO4
CdSO4:1H2O	-10.51	-12.24	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.36	-12.24	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.57	-11.32	-9.75	AgCl
Cerrusite	-1.81	-14.94	-13.13	PbCO3
CH4 (g)	-75.51	-116.56	-41.05	CH4
Chalcanthite	-7.91	-10.55	-2.64	CuSO4:5H2O
Chalcocite	-49.21	-84.13	-34.92	Cu2S
Chalcopyrite	-110.85	-146.12	-35.27	CuFeS2
Cinnabar	-49.73	-95.43	-45.69	HgS
Claudetite	-72.60	-75.66	-3.06	As4O6
Clausthalite	-10.35	-37.45	-27.10	PbSe
Co (BO2) 2	-30.78	-3.71	27.07	Co (BO2) 2
Co (OH) 2	-6.01	7.08	13.09	Co (OH) 2
Co (OH) 3	-10.99	-13.29	-2.31	Co (OH) 3
CO2 (g)	-2.20	-20.35	-18.15	CO2
Co3 (AsO4) 2	-19.32	-6.29	13.03	Co3 (AsO4) 2
Co3O4	-9.01	-19.51	-10.50	Co3O4
CoCl2	-22.67	-14.41	8.27	CoCl2
CoCl2:6H2O	-16.94	-14.41	2.54	CoCl2:6H2O
CoCO3	-3.29	-13.27	-9.98	CoCO3
CoF2	-14.54	-16.13	-1.60	CoF2
CoF3	-46.65	-48.11	-1.46	CoF3
CoFe2O4	24.03	20.50	-3.53	CoFe2O4
CoMoO4	-7.13	-14.89	-7.76	CoMoO4
CoO	-6.51	7.08	13.59	CoO
CoS (alpha)	-66.22	-73.66	-7.44	CoS
CoS (beta)	-62.59	-73.66	-11.07	CoS
CoSe	-19.58	-35.78	-16.20	CoSe
CoSeO3	-9.80	-8.48	1.32	CoSeO3
CoSeO4:6H2O	-19.21	-20.74	-1.53	CoSeO4:6H2O
CoSO4	-13.92	-11.11	2.80	CoSO4
CoSO4:6H2O	-8.64	-11.11	-2.47	CoSO4:6H2O
Cotunnite	-11.30	-16.08	-4.78	PbCl2
Covellite	-50.80	-73.10	-22.30	CuS
Cr (OH) 2	-20.06	-9.24	10.82	Cr (OH) 2
Cr (OH) 3	-1.50	-0.16	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.59	-0.16	-0.75	Cr (OH) 3
Cr2O3	2.04	-0.32	-2.36	Cr2O3
CrCl2	-44.82	-30.73	14.09	CrCl2
CrCl3	-47.50	-32.39	15.11	CrCl3
CrF3	-23.64	-34.98	-11.34	CrF3
Crmetal	-63.77	-33.29	30.48	Cr
CrO3	-28.25	-31.46	-3.21	CrO3
Cryolite	-13.40	-47.24	-33.84	Na3AlF6
Cu (OH) 2	-1.03	7.64	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.74	18.47	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.96	-84.85	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.45	-46.25	-45.80	Cu2Se
Cu2SO4	-19.64	-21.59	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.70	-4.60	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.29	-95.88	-42.59	Cu3Sb
Cu3Se2	-17.98	-81.47	-63.49	Cu3Se2
CuCO3	-1.21	-12.71	-11.50	CuCO3
CuCrO4	-18.38	-23.82	-5.44	CuCrO4
CuF	-8.40	-13.30	-4.91	CuF
CuF2	-16.69	-15.57	1.12	CuF2
CuF2:2H2O	-11.02	-15.57	-4.55	CuF2:2H2O
Cumetal	-4.97	-13.72	-8.76	Cu
CuMoO4	-1.26	-14.33	-13.08	CuMoO4
CuOCuSO4	-13.22	-2.91	10.30	CuOCuSO4
Cupricferrite	15.08	21.07	5.99	CuFe2O4
Cuprite	-1.99	-3.39	-1.41	Cu2O
Cuprousferrite	13.93	5.02	-8.92	CuFeO2
CuSe	-2.12	-35.22	-33.10	CuSe
CuSe2	-20.66	-54.03	-33.37	CuSe2
CuSeO3:2H2O	-8.43	-7.92	0.51	CuSeO3:2H2O

CuSeO4:5H2O	-17.74	-20.18	-2.44	CuSeO4:5H2O
CuSO4	-13.49	-10.55	2.94	CuSO4
Diaspore	2.27	9.15	6.87	AlOOH
Djurleite	-49.48	-83.40	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-1.61	-18.15	-16.54	CaMg(CO3)2
Dolomite(ordered)	-1.06	-18.15	-17.09	CaMg(CO3)2
Epsomite	-5.02	-7.15	-2.13	MgSO4:7H2O
Fe(OH)2	-5.85	7.72	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.53	3.49	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.46	-8.18	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-3.69	-2.14	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-12.64	-33.26	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.42	-41.16	-3.73	Fe2(SO4)3
Fe3(OH)8	0.92	21.14	20.22	Fe3(OH)8
FeAsO4:2H2O	-7.45	-7.05	0.40	FeAsO4:2H2O
FeCr2O4	0.20	7.40	7.20	FeCr2O4
FeMoO4	-4.16	-14.25	-10.09	FeMoO4
Ferrihydrite	3.52	6.71	3.19	Fe(OH)3
Ferroselite	-35.35	-53.95	-18.60	FeSe2
FeS(ppt)	-70.07	-73.02	-2.95	FeS
FeSe	-24.14	-35.14	-11.00	FeSe
Fix_pe	-4.67	-4.67	0.00	e-
Fluorite	-1.21	-11.71	-10.50	CaF2
Galena	-61.36	-75.33	-13.97	PbS
Gibbsite	0.86	9.15	8.29	Al(OH)3
Goethite	6.22	6.71	0.49	FeOOH
Goslarite	-8.37	-10.38	-2.01	ZnSO4:7H2O
Greenockite	-60.42	-74.78	-14.36	CdS
Greigite	-256.79	-301.82	-45.03	Fe3S4
Gummite	-6.83	0.85	7.67	UO3
Gypsum	-2.08	-6.69	-4.61	CaSO4:2H2O
H-Jarosite	-4.15	-16.25	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.10	-21.97	-12.88	H2MoO4
H2S(g)	-72.73	-80.74	-8.01	H2S
H2Se(g)	-37.90	-42.86	-4.96	H2Se
Halite	-7.93	-6.33	1.60	NaCl
Hausmannite	-9.44	51.59	61.03	Mn3O4
Hematite	14.84	13.43	-1.42	Fe2O3
Hercynite	3.12	26.01	22.89	FeAl2O4
Hg(CH3)2(g)	-174.09	-247.80	-73.71	Hg(CH3)2
Hg(g)	-9.27	-17.15	-7.87	Hg
Hg(OH)2	-11.19	-14.69	-3.50	Hg(OH)2
Hg2(g)	-19.34	-34.29	-14.96	Hg2
Hg2(OH)2	-15.50	-10.24	5.26	Hg2(OH)2
Hg2CO3	-14.54	-30.59	-16.05	Hg2CO3
Hg2CrO4	-33.00	-41.70	-8.70	Hg2CrO4
Hg2F2	-23.09	-33.45	-10.36	Hg2F2
Hg2S	-79.31	-90.98	-11.68	Hg2S
Hg2SeO3	-21.15	-25.80	-4.66	Hg2SeO3
Hg2SO4	-22.30	-28.43	-6.13	Hg2SO4
Hg3O2CO3	-34.73	-64.41	-29.68	Hg3O2CO3
HgCl(g)	-35.36	-15.86	19.50	HgCl
HgCl2	-14.91	-36.17	-21.26	HgCl2
HgF(g)	-49.40	-16.73	32.68	HgF
HgF2(g)	-50.46	-37.90	12.57	HgF2
Hgmetal(1)	-3.69	-17.15	-13.45	Hg
HgSe	-1.85	-57.55	-55.69	HgSe
HgSeO3	-17.82	-30.25	-12.43	HgSeO3
HgSO4	-23.46	-32.88	-9.42	HgSO4
Huntite	-6.79	-36.76	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.70	-24.48	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-17.40	-26.17	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-18.85	-24.02	-5.17	KAl(SO4)2:12H2O
K-Jarosite	1.77	-13.03	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-39.23	-56.47	-17.24	K2Cr2O7
K2CrO4	-24.50	-25.02	-0.51	K2CrO4
K2MoO4	-18.79	-15.53	3.26	K2MoO4
K2SeO4	-20.65	-21.38	-0.73	K2SeO4

Langite	-5.12	12.37	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-6.94	-7.38	-0.43	PbO:PbSO ₄
Laurionite	-5.96	-5.34	0.62	PbOHCl
Lepidocrocite	5.34	6.71	1.37	FeOOH
Lime	-21.20	11.50	32.70	CaO
Litharge	-7.29	5.41	12.69	PbO
Mackinawite	-69.42	-73.02	-3.60	FeS
Maghemite	7.04	13.43	6.39	Fe ₂ O ₃
Magnesioferrite	7.61	24.47	16.86	Fe ₂ MgO ₄
Magnesite	-1.84	-9.30	-7.46	MgCO ₃
Magnetite	17.74	21.14	3.40	Fe ₃ O ₄
Malachite	0.24	-5.07	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-4.13	21.21	25.34	MnOOH
Massicot	-7.49	5.41	12.89	PbO
Matlockite	-7.97	-16.94	-8.97	PbClF
Melanothallite	-20.10	-13.85	6.26	CuCl ₂
Melanterite	-8.27	-10.48	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-50.33	-95.43	-45.09	HgS
Mg(OH) ₂ (active)	-7.75	11.05	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.13	-4.85	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-264.84	-190.15	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.17	6.19	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.48	10.72	16.20	MgCr ₂ O ₄
MgCrO ₄	-25.79	-20.41	5.38	MgCrO ₄
MgF ₂	-4.04	-12.17	-8.13	MgF ₂
MgMoO ₄	-9.08	-10.93	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-7.57	-4.52	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-15.57	-16.77	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-33.25	40.28	73.52	Pb ₃ O ₄
Mirabilite	-8.24	-9.36	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.62	-6.72	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.16	-62.87	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-145.54	-84.46	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-12.48	0.02	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-15.02	-12.31	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-71.73	-71.56	0.17	MnS
MnS (pnk)	-74.90	-71.56	3.34	MnS
MnSb	-92.03	-94.93	-2.91	MnSb
MnSe	-37.18	-33.68	3.50	MnSe
MnSeO ₃	-7.51	-6.38	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-7.37	-6.38	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.59	-18.64	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.60	-9.01	2.58	MnSO ₄
Montepontite	-9.15	5.96	15.10	CdO
Montroydite	-11.05	-14.69	-3.64	HgO
MoO ₃	-13.97	-21.97	-8.00	MoO ₃
Morenosite	-8.80	-10.95	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-137.25	-207.51	-70.26	MoS ₂
Na-Jarosite	-0.63	-11.83	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-44.19	-54.08	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-25.55	-22.62	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-18.51	-35.11	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-14.63	-13.14	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-14.36	-13.14	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-17.03	-6.73	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-20.26	-18.98	1.28	Na ₂ SeO ₄
Na ₃ Sb	-171.99	-77.54	94.45	Na ₃ Sb
Na ₃ VO ₄	-31.38	5.30	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-35.63	1.77	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.71	-12.44	-6.73	CuCl
NaSb	-85.49	-62.32	23.17	NaSb
Natron	-10.20	-11.51	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.39	-3.53	3.86	NaVO ₃
Nesquehonite	-4.63	-9.30	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.55	7.25	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-21.48	-5.78	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-21.20	10.80	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.23	-13.10	-6.87	NiCO ₃

NiMoO4	-3.58	-14.72	-11.14	NiMoO4
NiS(alpha)	-67.89	-73.49	-5.60	NiS
NiS(beta)	-62.39	-73.49	-11.10	NiS
NiS(gamma)	-60.69	-73.49	-12.80	NiS
NiSe	-17.91	-35.61	-17.70	NiSe
NiSeO3:2H2O	-11.13	-8.31	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.05	-20.57	-1.52	NiSeO4:6H2O
Nsutite	-9.62	7.88	17.50	MnO2
O2(g)	-34.99	48.10	83.09	O2
Orpiment	-218.99	-280.06	-61.07	As2S3
Otavite	-2.39	-14.39	-12.00	CdCO3
Pb(BO2)2	-11.90	-5.39	6.52	Pb(BO2)2
Pb(OH)2	-2.74	5.41	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-59.26	-68.02	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.72	0.07	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.37	10.82	26.19	Pb2O(OH)2
Pb2O3	-26.17	34.87	61.04	Pb2O3
Pb2OCO3	-8.98	-9.53	-0.56	Pb2OCO3
Pb2V2O7	-3.18	-5.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.10	-11.30	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.82	0.32	6.14	Pb3(VO4)2
Pb3O2CO3	-15.15	-4.13	11.02	Pb3O2CO3
Pb3O2SO4	-12.66	-1.97	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.66	3.44	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.44	3.44	21.88	Pb4O3SO4
PbCrO4	-13.45	-26.05	-12.60	PbCrO4
PbF2	-10.36	-17.80	-7.44	PbF2
Pbmetal	-22.89	-18.64	4.25	Pb
PbMoO4	-0.94	-16.56	-15.62	PbMoO4
PbO:0.3H2O	-7.57	5.41	12.98	PbO:0.33H2O
PbSeO4	-15.57	-22.41	-6.84	PbSeO4
Periclase	-10.54	11.05	21.58	MgO
Phosgenite	-11.21	-31.02	-19.81	PbCl2:PbCO3
Plattnerite	-20.14	29.46	49.60	PbO2
Portlandite	-11.30	11.50	22.80	Ca(OH)2
Pyrite	-111.20	-129.71	-18.51	FeS2
Pyrochroite	-6.01	9.18	15.19	Mn(OH)2
Pyrolusite	-8.15	33.23	41.38	MnO2
Realgar	-91.94	-111.68	-19.75	AsS
Retgersite	-8.91	-10.95	-2.04	NiSO4:6H2O
Rhodochrosite	-0.59	-11.17	-10.58	MnCO3
Rutherfordine	-5.00	-19.50	-14.50	UO2CO3
Sb(OH)3	-11.53	-18.64	-7.11	Sb(OH)3
Sb2O4	-16.62	-13.22	3.40	Sb2O4
Sb2O5	-28.12	-37.79	-9.67	Sb2O5
Sb2Se3	-98.09	-165.85	-67.76	Sb2Se3
Sb4O6(cubic)	-56.28	-74.54	-18.26	Sb4O6
Sb4O6(orth)	-56.64	-74.54	-17.90	Sb4O6
SbCl3	-51.44	-50.86	0.57	SbCl3
SbF3	-43.23	-53.45	-10.23	SbF3
Sbmetal	-43.02	-54.71	-11.69	Sb
SbO2	-3.10	-30.92	-27.82	SbO2
Schoepite	-5.15	0.85	5.99	UO2(OH)2:H2O
Semetal(am)	-11.70	-18.81	-7.11	Se
Semetal(hex)	-11.10	-18.81	-7.71	Se
Senarmontite	-24.91	-37.27	-12.37	Sb2O3
SeO2	-15.69	-15.56	0.12	SeO2
SeO3	-48.86	-27.82	21.04	SeO3
Siderite	-2.39	-12.63	-10.24	FeCO3
Smithsonite	-2.54	-12.54	-10.00	ZnCO3
Sphalerite	-61.48	-72.93	-11.45	ZnS
Spinel	-7.51	29.34	36.85	MgAl2O4
Stibnite	-229.03	-279.49	-50.46	Sb2S3
Sulfur	-54.54	-56.69	-2.14	S
Tenorite	-0.00	7.64	7.64	CuO
Thenardite	-9.68	-9.36	0.32	Na2SO4
Thermonatrite	-12.15	-11.51	0.64	Na2CO3:H2O
Tyuyamunite	-6.78	-2.70	4.08	Ca(UO2)2(VO4)2

U3O8	-14.95	6.14	21.08	U3O8
U3Sb4	-557.52	-405.13	152.38	U3Sb4
U4O9	-28.89	-31.91	-3.02	U4O9
UF4	-30.88	-60.41	-29.54	UF4
UF4:2.5H2O	-27.70	-60.41	-32.72	UF4:2.5H2O
UO2 (am)	-14.92	-13.99	0.93	UO2
UO2 (OH) 2 (beta)	-4.77	0.85	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.72	-26.97	-2.25	UO2SeO4:4H2O
UO3	-6.85	0.85	7.70	UO3
Uraninite	-9.32	-13.99	-4.67	UO2
USb2	-210.31	-180.74	29.58	USb2
V (OH) 3	-16.99	-9.40	7.59	V (OH) 3
V2O5	-14.54	-15.90	-1.36	V2O5
V3O5	-35.11	-33.27	1.84	V3O5
V4O7	-43.53	-36.34	7.19	V4O7
V6O13	-34.94	-95.80	-60.86	V6O13
Valentinite	-28.79	-37.27	-8.48	Sb2O3
VC12	-61.79	-42.91	18.87	VC12
VC13	-65.06	-41.63	23.43	VC13
VF4	-64.43	-49.50	14.93	VF4
Vmetal	-89.51	-45.48	44.03	V
VO	-36.19	-21.43	14.76	VO
VO (OH) 2	-8.22	-3.07	5.15	VO (OH) 2
VO2Cl	-21.53	-18.69	2.84	VO2Cl
VOC1	-31.30	-20.15	11.15	VOC1
VOC12	-37.32	-24.56	12.76	VOC12
VOSO4	-24.88	-21.27	3.61	VOSO4
Witherite	-3.76	-12.33	-8.57	BaCO3
Wurtzite	-63.98	-72.93	-8.95	ZnS
Zincite	-3.52	7.81	11.33	ZnO
Zincosite	-14.31	-10.38	3.93	ZnSO4
Zn (BO2) 2	-11.27	-2.98	8.29	Zn (BO2) 2
Zn (OH) 2	-4.39	7.81	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.66	7.81	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.94	7.81	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.72	7.81	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.92	7.81	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.07	-2.57	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-10.31	4.88	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.74	-4.09	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-31.86	-12.95	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.34	13.06	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-20.92	17.58	38.50	Zn5 (OH) 8Cl2
ZnCl2	-20.72	-13.67	7.05	ZnCl2
ZnCO3:1H2O	-2.28	-12.54	-10.26	ZnCO3:1H2O
ZnF2	-14.87	-15.40	-0.53	ZnF2
Znmetal	-42.03	-16.24	25.79	Zn
ZnMoO4	-4.03	-14.16	-10.13	ZnMoO4
ZnO (active)	-3.38	7.81	11.19	ZnO
ZnS (am)	-63.88	-72.93	-9.05	ZnS
ZnSb	-81.97	-70.95	11.01	ZnSb
ZnSe	-20.65	-35.05	-14.40	ZnSe
ZnSeO4:6H2O	-18.49	-20.01	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.74	-10.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 53.

REACTION 301

H2O

-1

131.0 moles ### Addition step. Removes HTC water but solute mass remains
 USE solution 301
 SAVE Solution 302
 End

 Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 301. Solution after simulation 52.

Using reaction 301.

Reaction 301.

1.310e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.329e-08	8.350e-08
Al	2.453e-06	2.459e-06
As	3.426e-08	3.434e-08
B	1.364e-05	1.368e-05
Ba	9.523e-07	9.547e-07
C	8.621e-03	8.642e-03
Ca	3.143e-03	3.151e-03
Cd	9.298e-09	9.321e-09
Cl	1.474e-03	1.478e-03
Co	1.355e-07	1.359e-07
Cr	1.267e-07	1.270e-07
Cu	4.588e-06	4.599e-06
F	2.086e-04	2.091e-04
Fe	2.653e-05	2.660e-05
Hg	8.829e-11	8.851e-11
K	2.690e-04	2.696e-04
Mg	1.073e-03	1.075e-03
Mn	1.521e-05	1.525e-05
Mo	2.475e-07	2.482e-07
Na	4.232e-03	4.242e-03
Ni	2.126e-07	2.131e-07
Pb	1.826e-08	1.831e-08
S	1.693e-03	1.697e-03
Sb	8.988e-09	9.010e-09
Se	2.780e-08	2.787e-08
U	3.556e-08	3.565e-08
V	4.963e-08	4.976e-08
Zn	7.186e-07	7.204e-07

-----Description of solution-----

	pH =	7.315	Charge balance
	pe =	4.871	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.681e-02	
	Mass of water (kg) =	1.002e+00	

Total alkalinity (eq/kg) = 7.941e-03
 Total CO2 (mol/kg) = 8.621e-03
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 1.125e-16
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 10
 Total H = 1.112971e+02
 Total O = 5.567667e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.374e-07	2.079e-07	-6.625	-6.682	-0.058	(0)
H+	5.506e-08	4.841e-08	-7.259	-7.315	-0.056	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	8.329e-08					
AgCl	5.216e-08	5.216e-08	-7.283	-7.283	0.000	(0)
Ag+	2.242e-08	1.971e-08	-7.649	-7.705	-0.056	(0)
AgCl2-	6.856e-09	5.888e-09	-8.164	-8.230	-0.066	(0)
Ag2Se	7.412e-10	7.412e-10	-9.130	-9.130	0.000	(0)
AgSO4-	3.588e-10	3.082e-10	-9.445	-9.511	-0.066	(0)
AgCl3-2	1.250e-11	6.801e-12	-10.903	-11.167	-0.264	(0)
AgF	8.370e-12	8.370e-12	-11.077	-11.077	0.000	(0)
AgOH	4.098e-13	4.098e-13	-12.387	-12.387	0.000	(0)
AgCl4-3	7.085e-14	1.800e-14	-13.150	-13.745	-0.595	(0)
AgH2BO3	5.054e-14	5.054e-14	-13.296	-13.296	0.000	(0)
AgSeO3-	2.495e-14	2.142e-14	-13.603	-13.669	-0.066	(0)
Ag (OH) 2-	9.698e-18	8.329e-18	-17.013	-17.079	-0.066	(0)
Ag (SeO3) 2-3	1.277e-21	3.244e-22	-20.894	-21.489	-0.595	(0)
Ag2MoO4	2.172e-23	2.172e-23	-22.663	-22.663	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.143	-68.143	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.102	-78.160	-1.058	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.230	-138.296	-0.066	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-138.303	-138.464	-0.161	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-140.282	-140.589	-0.307	(0)
AgS4S5-3	0.000e+00	0.000e+00	-140.606	-140.900	-0.294	(0)
Al	2.453e-06					
Al (OH) 4-	2.158e-06	1.899e-06	-5.666	-5.721	-0.055	(0)
AlF3	1.233e-07	1.233e-07	-6.909	-6.909	0.000	(0)
Al (OH) 3	7.255e-08	7.255e-08	-7.139	-7.139	0.000	(0)
AlF2+	6.555e-08	5.792e-08	-7.183	-7.237	-0.054	(0)
Al (OH) 2+	1.979e-08	1.749e-08	-7.704	-7.757	-0.054	(0)
AlF4-	1.187e-08	1.044e-08	-7.926	-7.981	-0.055	(0)
AlF+2	1.412e-09	8.606e-10	-8.850	-9.065	-0.215	(0)
AlOH+2	1.737e-10	1.059e-10	-9.760	-9.975	-0.215	(0)
AlSO4+	3.519e-12	3.097e-12	-11.454	-11.509	-0.055	(0)
Al+3	1.623e-12	5.091e-13	-11.790	-12.293	-0.504	(0)
Al (SO4) 2-	2.954e-14	2.600e-14	-13.530	-13.585	-0.055	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.579	-42.174	-0.595	(0)
As (3)	1.834e-19					
H3AsO3	1.812e-19	1.812e-19	-18.742	-18.742	0.000	(0)
H2AsO3-	2.235e-21	1.920e-21	-20.651	-20.717	-0.066	(0)
HAsO3-2	6.649e-26	3.616e-26	-25.177	-25.442	-0.264	(0)
H4AsO3+	5.060e-27	4.345e-27	-26.296	-26.362	-0.066	(0)
AsO3-3	1.134e-31	2.880e-32	-30.946	-31.541	-0.595	(0)
As (5)	3.426e-08					
HAsO4-2	2.677e-08	1.456e-08	-7.572	-7.837	-0.264	(0)
H2AsO4-	7.485e-09	6.428e-09	-8.126	-8.192	-0.066	(0)
AsO4-3	3.744e-12	9.511e-13	-11.427	-12.022	-0.595	(0)
H3AsO4	5.386e-14	5.407e-14	-13.269	-13.267	0.002	(0)
B	1.364e-05					
H3BO3	1.343e-05	1.349e-05	-4.872	-4.870	0.002	(0)
H2BO3-	1.857e-07	1.618e-07	-6.731	-6.791	-0.060	(0)
CaH2BO3+	1.673e-08	1.458e-08	-7.776	-7.836	-0.060	(0)
MgH2BO3+	3.593e-09	3.131e-09	-8.445	-8.504	-0.060	(0)

	BF(OH) 3-	1.044e-09	9.098e-10	-8.981	-9.041	-0.060	(0)
	NaH2BO3	9.467e-10	9.467e-10	-9.024	-9.024	0.000	(0)
	BaH2BO3+	3.123e-12	2.721e-12	-11.505	-11.565	-0.060	(0)
	H5(BO3) 2-	2.131e-12	1.857e-12	-11.671	-11.731	-0.060	(0)
	BF2(OH) 2-	9.137e-13	7.962e-13	-12.039	-12.099	-0.060	(0)
	AgH2BO3	5.054e-14	5.054e-14	-13.296	-13.296	0.000	(0)
	H8(BO3) 3-	2.875e-15	2.505e-15	-14.541	-14.601	-0.060	(0)
	BF3OH-	2.910e-18	2.536e-18	-17.536	-17.596	-0.060	(0)
	BF4-	1.172e-22	1.021e-22	-21.931	-21.991	-0.060	(0)
Ba		9.523e-07					
	Ba+2	9.112e-07	5.442e-07	-6.040	-6.264	-0.224	(0)
	BaHCO3+	3.928e-08	3.480e-08	-7.406	-7.458	-0.053	(0)
	BaCO3	1.810e-09	1.810e-09	-8.742	-8.742	0.000	(0)
	BaH2BO3+	3.123e-12	2.721e-12	-11.505	-11.565	-0.060	(0)
	BaOH+	5.601e-13	4.940e-13	-12.252	-12.306	-0.055	(0)
C(4)		8.621e-03					
	HCO3-	7.578e-03	6.695e-03	-2.120	-2.174	-0.054	(0)
	H2CO3	7.289e-04	7.289e-04	-3.137	-3.137	0.000	(0)
	CaHCO3+	2.204e-04	1.952e-04	-3.657	-3.709	-0.053	(0)
	MgHCO3+	4.355e-05	3.824e-05	-4.361	-4.418	-0.056	(0)
	CaCO3	1.609e-05	1.609e-05	-4.793	-4.793	0.000	(0)
	NaHCO3	1.390e-05	1.390e-05	-4.857	-4.857	0.000	(0)
	CO3-2	1.086e-05	6.484e-06	-4.964	-5.188	-0.224	(0)
	CuCO3	4.115e-06	4.115e-06	-5.386	-5.386	0.000	(0)
	MgCO3	3.010e-06	3.010e-06	-5.521	-5.521	0.000	(0)
	MnHCO3+	1.077e-06	9.498e-07	-5.968	-6.022	-0.055	(0)
	NaCO3-	5.045e-07	4.457e-07	-6.297	-6.351	-0.054	(0)
	Cu(CO3) 2-2	1.321e-07	7.182e-08	-6.879	-7.144	-0.264	(0)
	ZnCO3	1.072e-07	1.072e-07	-6.970	-6.970	0.000	(0)
	ZnHCO3+	7.084e-08	6.083e-08	-7.150	-7.216	-0.066	(0)
	NiHCO3+	6.710e-08	5.762e-08	-7.173	-7.239	-0.066	(0)
	CuHCO3+	5.302e-08	4.553e-08	-7.276	-7.342	-0.066	(0)
	BaHCO3+	3.928e-08	3.480e-08	-7.406	-7.458	-0.053	(0)
	CoHCO3+	3.013e-08	2.588e-08	-7.521	-7.587	-0.066	(0)
	FeHCO3+	2.423e-08	2.146e-08	-7.616	-7.668	-0.053	(0)
	UO2(CO3) 3-4	2.375e-08	2.078e-09	-7.624	-8.682	-1.058	(0)
	NiCO3	1.689e-08	1.689e-08	-7.772	-7.772	0.000	(0)
	PbCO3	1.240e-08	1.240e-08	-7.906	-7.906	0.000	(0)
	UO2(CO3) 2-2	1.176e-08	6.395e-09	-7.930	-8.194	-0.264	(0)
	CoCO3	5.446e-09	5.446e-09	-8.264	-8.264	0.000	(0)
	PbHCO3+	3.686e-09	3.166e-09	-8.433	-8.500	-0.066	(0)
	BaCO3	1.810e-09	1.810e-09	-8.742	-8.742	0.000	(0)
	CdCO3	6.305e-10	6.305e-10	-9.200	-9.200	0.000	(0)
	Pb(CO3) 2-2	4.265e-10	2.320e-10	-9.370	-9.635	-0.264	(0)
	CdHCO3+	7.572e-11	6.503e-11	-10.121	-10.187	-0.066	(0)
	UO2CO3	4.943e-11	4.943e-11	-10.306	-10.306	0.000	(0)
	Cd(CO3) 2-2	5.573e-12	3.031e-12	-11.254	-11.518	-0.264	(0)
	HgCO3	4.104e-16	4.104e-16	-15.387	-15.387	0.000	(0)
	Hg(CO3) 2-2	1.547e-17	8.415e-18	-16.810	-17.075	-0.264	(0)
	HgHCO3+	4.307e-19	3.699e-19	-18.366	-18.432	-0.066	(0)
Ca		3.143e-03					
	Ca+2	2.622e-03	1.566e-03	-2.581	-2.805	-0.224	(0)
	CaSO4	2.811e-04	2.811e-04	-3.551	-3.551	0.000	(0)
	CaHCO3+	2.204e-04	1.952e-04	-3.657	-3.709	-0.053	(0)
	CaCO3	1.609e-05	1.609e-05	-4.793	-4.793	0.000	(0)
	CaF+	3.276e-06	2.890e-06	-5.485	-5.539	-0.055	(0)
	CaH2BO3+	1.673e-08	1.458e-08	-7.776	-7.836	-0.060	(0)
	CaOH+	7.335e-09	6.497e-09	-8.135	-8.187	-0.053	(0)
Cd		9.298e-09					
	Cd+2	7.143e-09	4.266e-09	-8.146	-8.370	-0.224	(0)
	CdSO4	7.837e-10	7.837e-10	-9.106	-9.106	0.000	(0)
	CdCO3	6.305e-10	6.305e-10	-9.200	-9.200	0.000	(0)
	CdCl+	6.149e-10	5.280e-10	-9.211	-9.277	-0.066	(0)
	CdHCO3+	7.572e-11	6.503e-11	-10.121	-10.187	-0.066	(0)
	Cd(SO4) 2-2	1.523e-11	8.284e-12	-10.817	-11.082	-0.264	(0)
	CdF+	1.331e-11	1.143e-11	-10.876	-10.942	-0.066	(0)
	CdOH+	8.206e-12	7.047e-12	-11.086	-11.152	-0.066	(0)
	Cd(CO3) 2-2	5.573e-12	3.031e-12	-11.254	-11.518	-0.264	(0)

CdOHC1	4.504e-12	4.504e-12	-11.346	-11.346	0.000	(0)
CdCl2	2.853e-12	2.853e-12	-11.545	-11.545	0.000	(0)
Cd(OH)2	9.246e-15	9.246e-15	-14.034	-14.034	0.000	(0)
CdF2	3.856e-15	3.856e-15	-14.414	-14.414	0.000	(0)
CdCl3-	2.717e-15	2.333e-15	-14.566	-14.632	-0.066	(0)
Cd2OH+3	5.931e-19	1.507e-19	-18.227	-18.822	-0.595	(0)
CdSeO4	3.918e-19	3.918e-19	-18.407	-18.407	0.000	(0)
Cd(OH)3-	1.368e-19	1.175e-19	-18.864	-18.930	-0.066	(0)
Cd(SeO3)2-2	1.849e-20	1.006e-20	-19.733	-19.998	-0.264	(0)
Cd(OH)4-2	7.351e-27	3.998e-27	-26.134	-26.398	-0.264	(0)
CdHS+	0.000e+00	0.000e+00	-74.548	-74.614	-0.066	(0)
Cd(HS)2	0.000e+00	0.000e+00	-141.663	-141.663	0.000	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-213.949	-214.015	-0.066	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-285.807	-286.072	-0.264	(0)
Cl	1.474e-03					
Cl-	1.474e-03	1.296e-03	-2.831	-2.887	-0.056	(0)
AgCl	5.216e-08	5.216e-08	-7.283	-7.283	0.000	(0)
MnCl+	1.315e-08	1.160e-08	-7.881	-7.936	-0.055	(0)
AgCl2-	6.856e-09	5.888e-09	-8.164	-8.230	-0.066	(0)
CuCl	1.158e-09	1.158e-09	-8.936	-8.936	0.000	(0)
ZnCl+	1.065e-09	9.354e-10	-8.973	-9.029	-0.056	(0)
CdCl+	6.149e-10	5.280e-10	-9.211	-9.277	-0.066	(0)
CuCl2-	3.572e-10	3.136e-10	-9.447	-9.504	-0.056	(0)
NiCl+	2.696e-10	2.315e-10	-9.569	-9.635	-0.066	(0)
CoCl+	2.594e-10	2.228e-10	-9.586	-9.652	-0.066	(0)
ZnOHC1	2.546e-10	2.546e-10	-9.594	-9.594	0.000	(0)
CuCl+	2.521e-10	2.214e-10	-9.598	-9.655	-0.056	(0)
PbCl+	3.407e-11	2.926e-11	-10.468	-10.534	-0.066	(0)
MnCl2	2.124e-11	2.124e-11	-10.673	-10.673	0.000	(0)
AgCl3-2	1.250e-11	6.801e-12	-10.903	-11.167	-0.264	(0)
CdOHC1	4.504e-12	4.504e-12	-11.346	-11.346	0.000	(0)
CdCl2	2.853e-12	2.853e-12	-11.545	-11.545	0.000	(0)
ZnCl2	1.921e-12	1.921e-12	-11.716	-11.716	0.000	(0)
PbCl2	1.694e-13	1.694e-13	-12.771	-12.771	0.000	(0)
CuCl3-2	1.436e-13	8.689e-14	-12.843	-13.061	-0.218	(0)
CuCl2	9.949e-14	9.949e-14	-13.002	-13.002	0.000	(0)
AgCl4-3	7.085e-14	1.800e-14	-13.150	-13.745	-0.595	(0)
HgClOH	2.517e-14	2.517e-14	-13.599	-13.599	0.000	(0)
HgCl2	8.883e-15	8.883e-15	-14.051	-14.051	0.000	(0)
MnCl3-	8.595e-15	7.581e-15	-14.066	-14.120	-0.055	(0)
CdCl3-	2.717e-15	2.333e-15	-14.566	-14.632	-0.066	(0)
CrCl+2	2.563e-15	1.394e-15	-14.591	-14.856	-0.264	(0)
ZnCl3-	2.253e-15	1.978e-15	-14.647	-14.704	-0.056	(0)
NiCl2	1.511e-15	1.511e-15	-14.821	-14.821	0.000	(0)
HgCl3-	1.341e-16	1.151e-16	-15.873	-15.939	-0.066	(0)
FeCl+2	1.138e-16	6.886e-17	-15.944	-16.162	-0.218	(0)
PbCl3-	1.018e-16	8.741e-17	-15.992	-16.058	-0.066	(0)
CrOHC12	7.141e-18	7.141e-18	-17.146	-17.146	0.000	(0)
UO2Cl+	4.686e-18	4.024e-18	-17.329	-17.395	-0.066	(0)
ZnCl4-2	2.118e-18	1.282e-18	-17.674	-17.892	-0.218	(0)
HgCl+	1.592e-18	1.368e-18	-17.798	-17.864	-0.066	(0)
CuCl3-	1.371e-18	1.203e-18	-17.863	-17.920	-0.056	(0)
HgCl4-2	1.092e-18	5.941e-19	-17.962	-18.226	-0.264	(0)
FeCl2+	4.519e-19	3.986e-19	-18.345	-18.399	-0.055	(0)
CrCl2+	1.996e-19	1.714e-19	-18.700	-18.766	-0.066	(0)
PbCl4-2	9.521e-20	5.178e-20	-19.021	-19.286	-0.264	(0)
VOC1+	1.966e-20	1.688e-20	-19.706	-19.773	-0.066	(0)
FeCl3	5.167e-23	5.167e-23	-22.287	-22.287	0.000	(0)
CuCl4-2	1.291e-23	7.817e-24	-22.889	-23.107	-0.218	(0)
CrO3Cl1-	9.258e-27	7.951e-27	-26.033	-26.100	-0.066	(0)
CoCl+2	7.133e-36	3.880e-36	-35.147	-35.411	-0.264	(0)
UCl+3	0.000e+00	0.000e+00	-45.097	-45.692	-0.595	(0)
Co(2)	1.355e-07					
Co+2	9.136e-08	4.969e-08	-7.039	-7.304	-0.264	(0)
CoHCO3+	3.013e-08	2.588e-08	-7.521	-7.587	-0.066	(0)
CoSO4	7.769e-09	7.769e-09	-8.110	-8.110	0.000	(0)
CoCO3	5.446e-09	5.446e-09	-8.264	-8.264	0.000	(0)
CoF+	3.093e-10	2.656e-10	-9.510	-9.576	-0.066	(0)

CoCl+	2.594e-10	2.228e-10	-9.586	-9.652	-0.066	(0)
CoOH+	2.401e-10	2.062e-10	-9.620	-9.686	-0.066	(0)
Co (OH) 2	3.405e-12	3.405e-12	-11.468	-11.468	0.000	(0)
Co (OH) 3-	1.645e-17	1.413e-17	-16.784	-16.850	-0.066	(0)
CoSeO4	1.228e-17	1.228e-17	-16.911	-16.911	0.000	(0)
CoOOH-	4.129e-18	3.546e-18	-17.384	-17.450	-0.066	(0)
Co2OH+3	2.021e-18	5.134e-19	-17.694	-18.290	-0.595	(0)
Co (OH) 4-2	8.561e-25	4.656e-25	-24.067	-24.332	-0.264	(0)
Co4 (OH) 4+4	4.119e-30	3.604e-31	-29.385	-30.443	-1.058	(0)
Co (3)	2.858e-29					
CoOH+2	2.858e-29	1.555e-29	-28.544	-28.808	-0.264	(0)
Co+3	4.692e-35	1.471e-35	-34.329	-34.832	-0.504	(0)
CoCl+2	7.133e-36	3.880e-36	-35.147	-35.411	-0.264	(0)
Cr (2)	4.908e-24					
Cr+2	4.908e-24	2.669e-24	-23.309	-23.574	-0.264	(0)
Cr (3)	1.267e-07					
Cr (OH) 2+	1.114e-07	9.566e-08	-6.953	-7.019	-0.066	(0)
Cr (OH) 3	7.472e-09	7.472e-09	-8.127	-8.127	0.000	(0)
Cr (OH) +2	6.951e-09	3.781e-09	-8.158	-8.422	-0.264	(0)
CrOHSO4	7.030e-10	7.030e-10	-9.153	-9.153	0.000	(0)
CrO2-	8.539e-11	7.333e-11	-10.069	-10.135	-0.066	(0)
Cr (OH) 4-	7.203e-11	6.186e-11	-10.142	-10.209	-0.066	(0)
CrF+2	4.094e-11	2.227e-11	-10.388	-10.652	-0.264	(0)
Cr+3	3.271e-12	8.310e-13	-11.485	-12.080	-0.595	(0)
CrSO4+	1.771e-12	1.521e-12	-11.752	-11.818	-0.066	(0)
CrCl+2	2.563e-15	1.394e-15	-14.591	-14.856	-0.264	(0)
Cr2 (OH) 2SO4+2	4.417e-16	2.402e-16	-15.355	-15.619	-0.264	(0)
Cr2 (OH) 2 (SO4) 2	1.118e-17	1.118e-17	-16.951	-16.951	0.000	(0)
CrOHC12	7.141e-18	7.141e-18	-17.146	-17.146	0.000	(0)
CrCl2+	1.996e-19	1.714e-19	-18.700	-18.766	-0.066	(0)
Cr (6)	2.416e-16					
CrO4-2	2.153e-16	1.286e-16	-15.667	-15.891	-0.224	(0)
HCrO4-	2.346e-17	2.014e-17	-16.630	-16.696	-0.066	(0)
NaCrO4-	2.747e-18	2.359e-18	-17.561	-17.627	-0.066	(0)
KCrO4-	1.308e-19	1.123e-19	-18.883	-18.949	-0.066	(0)
H2CrO4	7.904e-25	7.904e-25	-24.102	-24.102	0.000	(0)
CrO3SO4-2	4.280e-25	2.328e-25	-24.369	-24.633	-0.264	(0)
CrO3Cl-	9.258e-27	7.951e-27	-26.033	-26.100	-0.066	(0)
Cr2O7-2	2.588e-32	1.407e-32	-31.587	-31.852	-0.264	(0)
Cu (1)	2.342e-09					
CuCl	1.158e-09	1.158e-09	-8.936	-8.936	0.000	(0)
Cu+	8.265e-10	7.097e-10	-9.083	-9.149	-0.066	(0)
CuCl2-	3.572e-10	3.136e-10	-9.447	-9.504	-0.056	(0)
CuCl3-2	1.436e-13	8.689e-14	-12.843	-13.061	-0.218	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-139.333	-139.634	-0.301	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.075	-140.364	-0.288	(0)
Cu (2)	4.586e-06					
CuCO3	4.115e-06	4.115e-06	-5.386	-5.386	0.000	(0)
Cu+2	1.805e-07	1.078e-07	-6.744	-6.967	-0.224	(0)
Cu (CO3) 2-2	1.321e-07	7.182e-08	-6.879	-7.144	-0.264	(0)
CuOH+	8.071e-08	7.087e-08	-7.093	-7.150	-0.056	(0)
CuHCO3+	5.302e-08	4.553e-08	-7.276	-7.342	-0.066	(0)
CuSO4	1.935e-08	1.935e-08	-7.713	-7.713	0.000	(0)
Cu (OH) 2	2.940e-09	2.940e-09	-8.532	-8.532	0.000	(0)
CuF+	1.339e-09	1.150e-09	-8.873	-8.939	-0.066	(0)
CuCl+	2.521e-10	2.214e-10	-9.598	-9.655	-0.056	(0)
Cu2 (OH) 2+2	2.320e-10	1.262e-10	-9.635	-9.899	-0.264	(0)
Cu (OH) 3-	1.460e-12	1.254e-12	-11.836	-11.902	-0.066	(0)
CuCl2	9.949e-14	9.949e-14	-13.002	-13.002	0.000	(0)
Cu (OH) 4-2	3.774e-18	2.053e-18	-17.423	-17.688	-0.264	(0)
CuCl3-	1.371e-18	1.203e-18	-17.863	-17.920	-0.056	(0)
CuCl4-2	1.291e-23	7.817e-24	-22.889	-23.107	-0.218	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-203.760	-203.826	-0.066	(0)
F	2.086e-04					
F-	1.923e-04	1.691e-04	-3.716	-3.772	-0.056	(0)
MgF+	1.203e-05	1.059e-05	-4.920	-4.975	-0.055	(0)
CaF+	3.276e-06	2.890e-06	-5.485	-5.539	-0.055	(0)
NaF	3.938e-07	3.938e-07	-6.405	-6.405	0.000	(0)

AlF3	1.233e-07	1.233e-07	-6.909	-6.909	0.000	(0)
AlF2+	6.555e-08	5.792e-08	-7.183	-7.237	-0.054	(0)
MnF+	5.425e-08	4.785e-08	-7.266	-7.320	-0.055	(0)
HF	1.210e-08	1.210e-08	-7.917	-7.917	0.000	(0)
AlF4-	1.187e-08	1.044e-08	-7.926	-7.981	-0.055	(0)
AlF+2	1.412e-09	8.606e-10	-8.850	-9.065	-0.215	(0)
CuF+	1.339e-09	1.150e-09	-8.873	-8.939	-0.066	(0)
ZnF+	1.129e-09	9.691e-10	-8.947	-9.014	-0.066	(0)
BF(OH) 3-	1.044e-09	9.098e-10	-8.981	-9.041	-0.060	(0)
NiF+	3.452e-10	2.965e-10	-9.462	-9.528	-0.066	(0)
CoF+	3.093e-10	2.656e-10	-9.510	-9.576	-0.066	(0)
CrF+2	4.094e-11	2.227e-11	-10.388	-10.652	-0.264	(0)
CdF+	1.331e-11	1.143e-11	-10.876	-10.942	-0.066	(0)
HF2-	8.882e-12	7.780e-12	-11.051	-11.109	-0.058	(0)
PbF+	8.827e-12	7.581e-12	-11.054	-11.120	-0.066	(0)
AgF	8.370e-12	8.370e-12	-11.077	-11.077	0.000	(0)
FeF2+	1.673e-12	1.475e-12	-11.777	-11.831	-0.055	(0)
BF2(OH) 2-	9.137e-13	7.962e-13	-12.039	-12.099	-0.060	(0)
FeF+2	5.388e-13	3.261e-13	-12.269	-12.487	-0.218	(0)
FeF3	3.519e-13	3.519e-13	-12.454	-12.454	0.000	(0)
UO2F+	5.203e-14	4.468e-14	-13.284	-13.350	-0.066	(0)
PbF2	2.522e-14	2.522e-14	-13.598	-13.598	0.000	(0)
UO2F2	2.178e-14	2.178e-14	-13.662	-13.662	0.000	(0)
CdF2	3.856e-15	3.856e-15	-14.414	-14.414	0.000	(0)
UO2F3-	1.077e-15	9.251e-16	-14.968	-15.034	-0.066	(0)
VO2F	5.462e-16	5.462e-16	-15.263	-15.263	0.000	(0)
H2F2	3.925e-16	3.925e-16	-15.406	-15.406	0.000	(0)
VO2F2-	3.904e-17	3.352e-17	-16.409	-16.475	-0.066	(0)
PbF3-	9.417e-18	8.087e-18	-17.026	-17.092	-0.066	(0)
VOF+	5.483e-18	4.708e-18	-17.261	-17.327	-0.066	(0)
BF3OH-	2.910e-18	2.536e-18	-17.536	-17.596	-0.060	(0)
UO2F4-2	2.284e-18	1.242e-18	-17.641	-17.906	-0.264	(0)
VOF2	2.985e-19	2.985e-19	-18.525	-18.525	0.000	(0)
VO2F3-2	1.300e-19	7.069e-20	-18.886	-19.151	-0.264	(0)
VOF3-	2.085e-21	1.790e-21	-20.681	-20.747	-0.066	(0)
PbF4-2	1.203e-21	6.543e-22	-20.920	-21.184	-0.264	(0)
BF4-	1.172e-22	1.021e-22	-21.931	-21.991	-0.060	(0)
VO2F4-3	2.315e-23	5.880e-24	-22.635	-23.231	-0.595	(0)
Sb(OH) 2F	4.829e-24	4.829e-24	-23.316	-23.316	0.000	(0)
SbOF	4.750e-24	4.750e-24	-23.323	-23.323	0.000	(0)
VOF4-2	2.246e-24	1.222e-24	-23.649	-23.913	-0.264	(0)
HgF+	3.859e-25	3.314e-25	-24.414	-24.480	-0.066	(0)
UF3+	7.005e-35	6.015e-35	-34.155	-34.221	-0.066	(0)
UF2+2	4.128e-36	2.245e-36	-35.384	-35.649	-0.264	(0)
UF4	1.115e-36	1.115e-36	-35.953	-35.953	0.000	(0)
UF5-	8.699e-39	7.470e-39	-38.061	-38.127	-0.066	(0)
UF+3	4.153e-39	1.055e-39	-38.382	-38.977	-0.595	(0)
UF6-2	7.012e-40	3.814e-40	-39.154	-39.419	-0.264	(0)
Fe (2)	5.438e-07					
Fe+2	4.682e-07	2.546e-07	-6.330	-6.594	-0.264	(0)
FeSO4	4.898e-08	4.898e-08	-7.310	-7.310	0.000	(0)
FeHCO3+	2.423e-08	2.146e-08	-7.616	-7.668	-0.053	(0)
FeOH+	2.390e-09	2.108e-09	-8.622	-8.676	-0.055	(0)
Fe(OH) 2	3.482e-13	3.482e-13	-12.458	-12.458	0.000	(0)
Fe(OH) 3-	2.596e-14	2.290e-14	-13.586	-13.640	-0.055	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-146.149	-146.149	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-218.298	-218.364	-0.066	(0)
Fe (3)	2.599e-05					
Fe(OH) 2+	2.163e-05	1.911e-05	-4.665	-4.719	-0.054	(0)
Fe(OH) 3	4.267e-06	4.267e-06	-5.370	-5.370	0.000	(0)
Fe(OH) 4-	9.351e-08	8.262e-08	-7.029	-7.083	-0.054	(0)
FeOH+2	3.902e-10	2.362e-10	-9.409	-9.627	-0.218	(0)
FeF2+	1.673e-12	1.475e-12	-11.777	-11.831	-0.055	(0)
FeF+2	5.388e-13	3.261e-13	-12.269	-12.487	-0.218	(0)
FeF3	3.519e-13	3.519e-13	-12.454	-12.454	0.000	(0)
FeSO4+	1.754e-14	1.547e-14	-13.756	-13.811	-0.055	(0)
Fe+3	5.610e-15	1.759e-15	-14.251	-14.755	-0.504	(0)
Fe(SO4) 2-	3.017e-16	2.591e-16	-15.520	-15.586	-0.066	(0)

	FeCl+2	1.138e-16	6.886e-17	-15.944	-16.162	-0.218	(0)
	Fe2 (OH) 2+4	2.111e-17	1.847e-18	-16.676	-17.733	-1.058	(0)
	FeCl2+	4.519e-19	3.986e-19	-18.345	-18.399	-0.055	(0)
	FeHSeO3+2	1.757e-19	9.559e-20	-18.755	-19.020	-0.264	(0)
	Fe3 (OH) 4+5	2.295e-20	5.102e-22	-19.639	-21.292	-1.653	(0)
	FeCl3	5.167e-23	5.167e-23	-22.287	-22.287	0.000	(0)
H (0)	5.975e-28						
	H2	2.988e-28	2.999e-28	-27.525	-27.523	0.002	(0)
Hg (0)	8.824e-11						
	Hg	8.824e-11	8.824e-11	-10.054	-10.054	0.000	(0)
Hg (1)	1.165e-23						
	Hg2+2	5.825e-24	3.168e-24	-23.235	-23.499	-0.264	(0)
Hg (2)	4.899e-14						
	HgClOH	2.517e-14	2.517e-14	-13.599	-13.599	0.000	(0)
	Hg (OH) 2	1.437e-14	1.443e-14	-13.842	-13.841	0.002	(0)
	HgCl2	8.883e-15	8.883e-15	-14.051	-14.051	0.000	(0)
	HgCO3	4.104e-16	4.104e-16	-15.387	-15.387	0.000	(0)
	HgCl3-	1.341e-16	1.151e-16	-15.873	-15.939	-0.066	(0)
	Hg (CO3) 2-2	1.547e-17	8.415e-18	-16.810	-17.075	-0.264	(0)
	HgCl+	1.592e-18	1.368e-18	-17.798	-17.864	-0.066	(0)
	HgCl4-2	1.092e-18	5.941e-19	-17.962	-18.226	-0.264	(0)
	HgOH+	5.098e-19	4.378e-19	-18.293	-18.359	-0.066	(0)
	HgHCO3+	4.307e-19	3.699e-19	-18.366	-18.432	-0.066	(0)
	Hg (OH) 3-	4.398e-22	3.777e-22	-21.357	-21.423	-0.066	(0)
	Hg+2	9.723e-23	5.288e-23	-22.012	-22.277	-0.264	(0)
	HgSO4	1.085e-23	1.085e-23	-22.965	-22.965	0.000	(0)
	HgF+	3.859e-25	3.314e-25	-24.414	-24.480	-0.066	(0)
	HgHS2-	0.000e+00	0.000e+00	-131.472	-131.538	-0.066	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-132.460	-132.460	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-132.667	-132.931	-0.264	(0)
K	2.690e-04						
	K+	2.675e-04	2.351e-04	-3.573	-3.629	-0.056	(0)
	KSO4-	1.476e-06	1.305e-06	-5.831	-5.885	-0.054	(0)
	KCrO4-	1.308e-19	1.123e-19	-18.883	-18.949	-0.066	(0)
Mg	1.073e-03						
	Mg+2	9.345e-04	5.581e-04	-3.029	-3.253	-0.224	(0)
	MgSO4	7.958e-05	7.958e-05	-4.099	-4.099	0.000	(0)
	MgHCO3+	4.355e-05	3.824e-05	-4.361	-4.418	-0.056	(0)
	MgF+	1.203e-05	1.059e-05	-4.920	-4.975	-0.055	(0)
	MgCO3	3.010e-06	3.010e-06	-5.521	-5.521	0.000	(0)
	MgOH+	5.205e-08	4.620e-08	-7.284	-7.335	-0.052	(0)
	MgH2BO3+	3.593e-09	3.131e-09	-8.445	-8.504	-0.060	(0)
Mn (2)	1.521e-05						
	Mn+2	1.307e-05	7.110e-06	-4.884	-5.148	-0.264	(0)
	MnHCO3+	1.077e-06	9.498e-07	-5.968	-6.022	-0.055	(0)
	MnSO4	9.907e-07	9.907e-07	-6.004	-6.004	0.000	(0)
	MnF+	5.425e-08	4.785e-08	-7.266	-7.320	-0.055	(0)
	MnCl+	1.315e-08	1.160e-08	-7.881	-7.936	-0.055	(0)
	MnOH+	4.210e-09	3.714e-09	-8.376	-8.430	-0.055	(0)
	MnCl2	2.124e-11	2.124e-11	-10.673	-10.673	0.000	(0)
	MnCl3-	8.595e-15	7.581e-15	-14.066	-14.120	-0.055	(0)
	MnSeO4	9.439e-16	9.439e-16	-15.025	-15.025	0.000	(0)
	Mn (OH) 3-	1.125e-18	9.924e-19	-17.949	-18.003	-0.055	(0)
	Mn (OH) 4-2	1.101e-24	6.663e-25	-23.958	-24.176	-0.218	(0)
	MnSe	6.862e-40	6.862e-40	-39.164	-39.164	0.000	(0)
Mn (3)	7.532e-26						
	Mn+3	7.532e-26	2.362e-26	-25.123	-25.627	-0.504	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-45.346	-45.564	-0.218	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-50.006	-50.065	-0.059	(0)
Mo	2.475e-07						
	MoO4-2	2.474e-07	1.477e-07	-6.607	-6.830	-0.224	(0)
	HMoO4-	1.657e-10	1.423e-10	-9.781	-9.847	-0.066	(0)
	H2MoO4	5.046e-14	5.046e-14	-13.297	-13.297	0.000	(0)
	Ag2MoO4	2.172e-23	2.172e-23	-22.663	-22.663	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-41.579	-42.174	-0.595	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.963	-53.344	-2.380	(0)

	HMo7O24-5	0.000e+00	0.000e+00	-52.619	-54.272	-1.653	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-55.747	-56.805	-1.058	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-60.279	-60.874	-0.595	(0)
Na	4.232e-03						
	Na+	4.199e-03	3.692e-03	-2.377	-2.433	-0.056	(0)
	NaSO4-	1.758e-05	1.554e-05	-4.755	-4.809	-0.054	(0)
	NaHCO3	1.390e-05	1.390e-05	-4.857	-4.857	0.000	(0)
	NaCO3-	5.045e-07	4.457e-07	-6.297	-6.351	-0.054	(0)
	NaF	3.938e-07	3.938e-07	-6.405	-6.405	0.000	(0)
	NaH2BO3	9.467e-10	9.467e-10	-9.024	-9.024	0.000	(0)
	NaCrO4-	2.747e-18	2.359e-18	-17.561	-17.627	-0.066	(0)
Ni	2.126e-07						
	Ni+2	1.169e-07	6.981e-08	-6.932	-7.156	-0.224	(0)
	NiHCO3+	6.710e-08	5.762e-08	-7.173	-7.239	-0.066	(0)
	NiCO3	1.689e-08	1.689e-08	-7.772	-7.772	0.000	(0)
	NiSO4	1.092e-08	1.092e-08	-7.962	-7.962	0.000	(0)
	NiF+	3.452e-10	2.965e-10	-9.462	-9.528	-0.066	(0)
	NiCl+	2.696e-10	2.315e-10	-9.569	-9.635	-0.066	(0)
	NiOH+	2.128e-10	1.828e-10	-9.672	-9.738	-0.066	(0)
	Ni (OH) 2	3.019e-12	3.019e-12	-11.520	-11.520	0.000	(0)
	Ni (SO4) 2-2	5.207e-13	2.832e-13	-12.283	-12.548	-0.264	(0)
	NiCl2	1.511e-15	1.511e-15	-14.821	-14.821	0.000	(0)
	Ni (OH) 3-	7.310e-16	6.277e-16	-15.136	-15.202	-0.066	(0)
	NiSeO4	1.611e-17	1.611e-17	-16.793	-16.793	0.000	(0)
O (0)	1.122e-37						
	O2	5.610e-38	5.632e-38	-37.251	-37.249	0.002	(0)
Pb	1.826e-08						
	PbCO3	1.240e-08	1.240e-08	-7.906	-7.906	0.000	(0)
	PbHCO3+	3.686e-09	3.166e-09	-8.433	-8.500	-0.066	(0)
	Pb+2	1.065e-09	6.363e-10	-8.972	-9.196	-0.224	(0)
	Pb (CO3) 2-2	4.265e-10	2.320e-10	-9.370	-9.635	-0.264	(0)
	PbOH+	3.870e-10	3.324e-10	-9.412	-9.478	-0.066	(0)
	PbSO4	2.442e-10	2.442e-10	-9.612	-9.612	0.000	(0)
	PbCl+	3.407e-11	2.926e-11	-10.468	-10.534	-0.066	(0)
	PbF+	8.827e-12	7.581e-12	-11.054	-11.120	-0.066	(0)
	Pb (OH) 2	2.186e-12	2.186e-12	-11.660	-11.660	0.000	(0)
	Pb (SO4) 2-2	2.120e-12	1.153e-12	-11.674	-11.938	-0.264	(0)
	PbCl2	1.694e-13	1.694e-13	-12.771	-12.771	0.000	(0)
	PbF2	2.522e-14	2.522e-14	-13.598	-13.598	0.000	(0)
	Pb (OH) 3-	5.292e-16	4.545e-16	-15.276	-15.342	-0.066	(0)
	PbCl3-	1.018e-16	8.741e-17	-15.992	-16.058	-0.066	(0)
	Pb2OH+3	1.320e-17	3.352e-18	-16.880	-17.475	-0.595	(0)
	PbF3-	9.417e-18	8.087e-18	-17.026	-17.092	-0.066	(0)
	PbCl4-2	9.521e-20	5.178e-20	-19.021	-19.286	-0.264	(0)
	Pb (OH) 4-2	4.256e-20	2.315e-20	-19.371	-19.636	-0.264	(0)
	PbF4-2	1.203e-21	6.543e-22	-20.920	-21.184	-0.264	(0)
	Pb3 (OH) 4+2	1.115e-22	6.065e-23	-21.953	-22.217	-0.264	(0)
	Pb4 (OH) 4+4	3.503e-27	3.065e-28	-26.456	-27.514	-1.058	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-142.431	-142.431	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-215.318	-215.384	-0.066	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-68.143	-68.143	0.000	(0)
	HS-	0.000e+00	0.000e+00	-74.186	-74.252	-0.066	(0)
	H2S	0.000e+00	0.000e+00	-74.548	-74.548	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-74.548	-74.614	-0.066	(0)
	S5-2	0.000e+00	0.000e+00	-76.038	-76.302	-0.264	(0)
	S6-2	0.000e+00	0.000e+00	-76.554	-76.818	-0.264	(0)
	S4-2	0.000e+00	0.000e+00	-76.634	-76.898	-0.264	(0)
	S3-2	0.000e+00	0.000e+00	-77.440	-77.704	-0.264	(0)
	S2-2	0.000e+00	0.000e+00	-78.456	-78.720	-0.264	(0)
	S-2	0.000e+00	0.000e+00	-84.019	-84.237	-0.218	(0)
	HgHS2-	0.000e+00	0.000e+00	-131.472	-131.538	-0.066	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-132.460	-132.460	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-132.667	-132.931	-0.264	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-138.230	-138.296	-0.066	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-138.303	-138.464	-0.161	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-139.333	-139.634	-0.301	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-140.075	-140.364	-0.288	(0)

Ag (S4) 2-3	0.000e+00	0.000e+00	-140.282	-140.589	-0.307	(0)
AgS4S5-3	0.000e+00	0.000e+00	-140.606	-140.900	-0.294	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-140.855	-140.921	-0.066	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-141.663	-141.663	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.227	-142.227	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.431	-142.431	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.149	-146.149	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-203.760	-203.826	-0.066	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.133	-213.199	-0.066	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-213.949	-214.015	-0.066	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-215.318	-215.384	-0.066	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-215.599	-215.864	-0.264	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-218.298	-218.364	-0.066	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-285.807	-286.072	-0.264	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-288.647	-288.911	-0.264	(0)
Sb2S4-2	0.000e+00	0.000e+00	-298.832	-299.096	-0.264	(0)
S (6)	1.693e-03					
SO4-2	1.312e-03	7.836e-04	-2.882	-3.106	-0.224	(0)
CaSO4	2.811e-04	2.811e-04	-3.551	-3.551	0.000	(0)
MgSO4	7.958e-05	7.958e-05	-4.099	-4.099	0.000	(0)
NaSO4-	1.758e-05	1.554e-05	-4.755	-4.809	-0.054	(0)
KSO4-	1.476e-06	1.305e-06	-5.831	-5.885	-0.054	(0)
MnSO4	9.907e-07	9.907e-07	-6.004	-6.004	0.000	(0)
ZnSO4	4.926e-08	4.926e-08	-7.308	-7.308	0.000	(0)
FeSO4	4.898e-08	4.898e-08	-7.310	-7.310	0.000	(0)
CuSO4	1.935e-08	1.935e-08	-7.713	-7.713	0.000	(0)
NiSO4	1.092e-08	1.092e-08	-7.962	-7.962	0.000	(0)
CoSO4	7.769e-09	7.769e-09	-8.110	-8.110	0.000	(0)
HSO4-	4.212e-09	3.707e-09	-8.376	-8.431	-0.055	(0)
CdSO4	7.837e-10	7.837e-10	-9.106	-9.106	0.000	(0)
CrOHSO4	7.030e-10	7.030e-10	-9.153	-9.153	0.000	(0)
Zn (SO4) 2-2	6.181e-10	3.362e-10	-9.209	-9.473	-0.264	(0)
AgSO4-	3.588e-10	3.082e-10	-9.445	-9.511	-0.066	(0)
PbSO4	2.442e-10	2.442e-10	-9.612	-9.612	0.000	(0)
Cd (SO4) 2-2	1.523e-11	8.284e-12	-10.817	-11.082	-0.264	(0)
AlSO4+	3.519e-12	3.097e-12	-11.454	-11.509	-0.055	(0)
Pb (SO4) 2-2	2.120e-12	1.153e-12	-11.674	-11.938	-0.264	(0)
CrSO4+	1.771e-12	1.521e-12	-11.752	-11.818	-0.066	(0)
Ni (SO4) 2-2	5.207e-13	2.832e-13	-12.283	-12.548	-0.264	(0)
Al (SO4) 2-	2.954e-14	2.600e-14	-13.530	-13.585	-0.055	(0)
FeSO4+	1.754e-14	1.547e-14	-13.756	-13.811	-0.055	(0)
UO2SO4	2.271e-15	2.271e-15	-14.644	-14.644	0.000	(0)
Cr2 (OH) 2SO4+2	4.417e-16	2.402e-16	-15.355	-15.619	-0.264	(0)
Fe (SO4) 2-	3.017e-16	2.591e-16	-15.520	-15.586	-0.066	(0)
UO2 (SO4) 2-2	4.313e-17	2.346e-17	-16.365	-16.630	-0.264	(0)
VO2SO4-	4.013e-17	3.447e-17	-16.396	-16.463	-0.066	(0)
Cr2 (OH) 2 (SO4) 2	1.118e-17	1.118e-17	-16.951	-16.951	0.000	(0)
VOSO4	1.002e-18	1.002e-18	-17.999	-17.999	0.000	(0)
HgSO4	1.085e-23	1.085e-23	-22.965	-22.965	0.000	(0)
CrO3SO4-2	4.280e-25	2.328e-25	-24.369	-24.633	-0.264	(0)
VSO4+	3.130e-32	2.688e-32	-31.504	-31.571	-0.066	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.217	-40.217	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.746	-41.011	-0.264	(0)
Sb (3)	7.464e-19					
Sb (OH) 3	3.776e-19	3.776e-19	-18.423	-18.423	0.000	(0)
HSbO2	3.687e-19	3.687e-19	-18.433	-18.433	0.000	(0)
SbO2-	1.437e-23	1.234e-23	-22.843	-22.909	-0.066	(0)
Sb (OH) 4-	8.227e-24	7.065e-24	-23.085	-23.151	-0.066	(0)
Sb (OH) 2F	4.829e-24	4.829e-24	-23.316	-23.316	0.000	(0)
SbOF	4.750e-24	4.750e-24	-23.323	-23.323	0.000	(0)
Sb (OH) 2+	5.170e-25	4.440e-25	-24.286	-24.353	-0.066	(0)
SbO+	1.783e-25	1.531e-25	-24.749	-24.815	-0.066	(0)
Sb2S4-2	0.000e+00	0.000e+00	-298.832	-299.096	-0.264	(0)
Sb (5)	8.988e-09					
SbO3-	8.978e-09	7.710e-09	-8.047	-8.113	-0.066	(0)
Sb (OH) 6-	1.025e-11	9.010e-12	-10.989	-11.045	-0.056	(0)
SbO2+	6.036e-24	5.183e-24	-23.219	-23.285	-0.066	(0)
Se (-2)	7.412e-10					

Ag ₂ Se	7.412e-10	7.412e-10	-9.130	-9.130	0.000	(0)
HSe-	1.320e-36	1.134e-36	-35.879	-35.945	-0.066	(0)
MnSe	6.862e-40	6.862e-40	-39.164	-39.164	0.000	(0)
H ₂ Se	4.260e-40	4.260e-40	-39.371	-39.371	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.366	-43.630	-0.264	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.102	-78.160	-1.058	(0)
Se (4)	2.706e-08					
HSeO ₃ -	2.395e-08	2.056e-08	-7.621	-7.687	-0.066	(0)
SeO ₃ -2	3.109e-09	1.691e-09	-8.507	-8.772	-0.264	(0)
H ₂ SeO ₃	4.246e-13	4.246e-13	-12.372	-12.372	0.000	(0)
AgSeO ₃ -	2.495e-14	2.142e-14	-13.603	-13.669	-0.066	(0)
FeHSeO ₃ +2	1.757e-19	9.559e-20	-18.755	-19.020	-0.264	(0)
Cd (SeO ₃) 2-2	1.849e-20	1.006e-20	-19.733	-19.998	-0.264	(0)
Ag (SeO ₃) 2-3	1.277e-21	3.244e-22	-20.894	-21.489	-0.595	(0)
Se (6)	8.269e-13					
SeO ₄ -2	8.259e-13	4.932e-13	-12.083	-12.307	-0.224	(0)
MnSeO ₄	9.439e-16	9.439e-16	-15.025	-15.025	0.000	(0)
ZnSeO ₄	2.195e-17	2.195e-17	-16.659	-16.659	0.000	(0)
NiSeO ₄	1.611e-17	1.611e-17	-16.793	-16.793	0.000	(0)
CoSeO ₄	1.228e-17	1.228e-17	-16.911	-16.911	0.000	(0)
HSeO ₄ -	1.393e-18	1.197e-18	-17.856	-17.922	-0.066	(0)
CdSeO ₄	3.918e-19	3.918e-19	-18.407	-18.407	0.000	(0)
Zn (SeO ₄) 2-2	2.018e-29	1.098e-29	-28.695	-28.960	-0.264	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.577	-58.172	-0.595	(0)
U (4)	1.039e-21					
U (OH) 5-	1.038e-21	8.911e-22	-20.984	-21.050	-0.066	(0)
U (OH) 4	1.807e-24	1.807e-24	-23.743	-23.743	0.000	(0)
U (OH) 3+	3.725e-28	3.199e-28	-27.429	-27.495	-0.066	(0)
U (OH) 2+2	1.317e-32	7.163e-33	-31.880	-32.145	-0.264	(0)
UF ₃ +	7.005e-35	6.015e-35	-34.155	-34.221	-0.066	(0)
UF ₂ +2	4.128e-36	2.245e-36	-35.384	-35.649	-0.264	(0)
UF ₄	1.115e-36	1.115e-36	-35.953	-35.953	0.000	(0)
UOH+3	6.430e-38	1.634e-38	-37.192	-37.787	-0.595	(0)
UF ₅ -	8.699e-39	7.470e-39	-38.061	-38.127	-0.066	(0)
UF+3	4.153e-39	1.055e-39	-38.382	-38.977	-0.595	(0)
UF ₆ -2	7.012e-40	3.814e-40	-39.154	-39.419	-0.264	(0)
U (SO ₄) 2	0.000e+00	0.000e+00	-40.217	-40.217	0.000	(0)
USO ₄ +2	0.000e+00	0.000e+00	-40.746	-41.011	-0.264	(0)
U+4	0.000e+00	0.000e+00	-43.447	-44.505	-1.058	(0)
UCl+3	0.000e+00	0.000e+00	-45.097	-45.692	-0.595	(0)
U ₆ (OH) 15+9	0.000e+00	0.000e+00	-169.104	-174.460	-5.356	(0)
U (5)	1.827e-17					
UO ₂ +	1.827e-17	1.569e-17	-16.738	-16.804	-0.066	(0)
U (6)	3.556e-08					
UO ₂ (CO ₃) 3-4	2.375e-08	2.078e-09	-7.624	-8.682	-1.058	(0)
UO ₂ (CO ₃) 2-2	1.176e-08	6.395e-09	-7.930	-8.194	-0.264	(0)
UO ₂ CO ₃	4.943e-11	4.943e-11	-10.306	-10.306	0.000	(0)
UO ₂ OH+	5.836e-14	5.012e-14	-13.234	-13.300	-0.066	(0)
UO ₂ F+	5.203e-14	4.468e-14	-13.284	-13.350	-0.066	(0)
UO ₂ F ₂	2.178e-14	2.178e-14	-13.662	-13.662	0.000	(0)
UO ₂ +2	3.206e-15	1.915e-15	-14.494	-14.718	-0.224	(0)
UO ₂ SO ₄	2.271e-15	2.271e-15	-14.644	-14.644	0.000	(0)
UO ₂ F ₃ -	1.077e-15	9.251e-16	-14.968	-15.034	-0.066	(0)
UO ₂ (SO ₄) 2-2	4.313e-17	2.346e-17	-16.365	-16.630	-0.264	(0)
UO ₂ Cl+	4.686e-18	4.024e-18	-17.329	-17.395	-0.066	(0)
UO ₂ F ₄ -2	2.284e-18	1.242e-18	-17.641	-17.906	-0.264	(0)
(UO ₂) ₂ (OH) 2+2	7.666e-21	4.169e-21	-20.115	-20.380	-0.264	(0)
(UO ₂) ₃ (OH) 5+	7.982e-24	6.855e-24	-23.098	-23.164	-0.066	(0)
V (2)	3.750e-40					
VOH+	3.750e-40	3.220e-40	-39.426	-39.492	-0.066	(0)
V+2	0.000e+00	0.000e+00	-40.056	-40.320	-0.264	(0)
V (3)	5.271e-13					
V (OH) 3	5.271e-13	5.271e-13	-12.278	-12.278	0.000	(0)
V (OH) 2+	1.920e-23	1.649e-23	-22.717	-22.783	-0.066	(0)
VOH+2	1.393e-26	7.574e-27	-25.856	-26.121	-0.264	(0)
V+3	2.861e-31	7.267e-32	-30.544	-31.139	-0.595	(0)
VSO ₄ +	3.130e-32	2.688e-32	-31.504	-31.571	-0.066	(0)

V2 (OH) 3+3	0.000e+00	0.000e+00	-49.856	-50.451	-0.595	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.383	-51.441	-1.058	(0)
V (4)	2.396e-16					
V (OH) 3+	2.243e-16	1.926e-16	-15.649	-15.715	-0.066	(0)
VO+2	8.537e-18	4.643e-18	-17.069	-17.333	-0.264	(0)
VOF+	5.483e-18	4.708e-18	-17.261	-17.327	-0.066	(0)
VOSO4	1.002e-18	1.002e-18	-17.999	-17.999	0.000	(0)
VOF2	2.985e-19	2.985e-19	-18.525	-18.525	0.000	(0)
VOC1+	1.966e-20	1.688e-20	-19.706	-19.773	-0.066	(0)
VOF3-	2.085e-21	1.790e-21	-20.681	-20.747	-0.066	(0)
VOF4-2	2.246e-24	1.222e-24	-23.649	-23.913	-0.264	(0)
H2V2O4+2	3.420e-27	1.860e-27	-26.466	-26.730	-0.264	(0)
V (5)	4.963e-08					
H2VO4-	4.585e-08	3.937e-08	-7.339	-7.405	-0.066	(0)
HVO4-2	3.756e-09	2.043e-09	-8.425	-8.690	-0.264	(0)
H3VO4	1.906e-11	1.906e-11	-10.720	-10.720	0.000	(0)
H3V2O7-	5.643e-12	4.846e-12	-11.248	-11.315	-0.066	(0)
HV2O7-3	1.073e-13	2.727e-14	-12.969	-13.564	-0.595	(0)
VO2+	2.095e-15	1.842e-15	-14.679	-14.735	-0.056	(0)
VO4-3	8.327e-16	2.115e-16	-15.080	-15.675	-0.595	(0)
VO2F	5.462e-16	5.462e-16	-15.263	-15.263	0.000	(0)
V3O9-3	2.518e-16	6.397e-17	-15.599	-16.194	-0.595	(0)
V2O7-4	1.733e-16	1.516e-17	-15.761	-16.819	-1.058	(0)
VO2SO4-	4.013e-17	3.447e-17	-16.396	-16.463	-0.066	(0)
VO2F2-	3.904e-17	3.352e-17	-16.409	-16.475	-0.066	(0)
VO2F3-2	1.300e-19	7.069e-20	-18.886	-19.151	-0.264	(0)
V4O12-4	1.200e-20	1.050e-21	-19.921	-20.979	-1.058	(0)
VO2F4-3	2.315e-23	5.880e-24	-22.635	-23.231	-0.595	(0)
HV10O28-5	0.000e+00	0.000e+00	-51.876	-53.529	-1.653	(0)
V10O28-6	0.000e+00	0.000e+00	-52.021	-54.401	-2.380	(0)
H2V10O28-4	0.000e+00	0.000e+00	-54.579	-55.637	-1.058	(0)
Zn	7.186e-07					
Zn+2	4.811e-07	2.873e-07	-6.318	-6.542	-0.224	(0)
ZnCO3	1.072e-07	1.072e-07	-6.970	-6.970	0.000	(0)
ZnHCO3+	7.084e-08	6.083e-08	-7.150	-7.216	-0.066	(0)
ZnSO4	4.926e-08	4.926e-08	-7.308	-7.308	0.000	(0)
ZnOH+	6.957e-09	5.974e-09	-8.158	-8.224	-0.066	(0)
ZnF+	1.129e-09	9.691e-10	-8.947	-9.014	-0.066	(0)
ZnCl+	1.065e-09	9.354e-10	-8.973	-9.029	-0.056	(0)
Zn (SO4) 2-2	6.181e-10	3.362e-10	-9.209	-9.473	-0.264	(0)
ZnOHCl	2.546e-10	2.546e-10	-9.594	-9.594	0.000	(0)
Zn (OH) 2	1.969e-10	1.969e-10	-9.706	-9.706	0.000	(0)
ZnCl2	1.921e-12	1.921e-12	-11.716	-11.716	0.000	(0)
Zn (OH) 3-	2.390e-13	2.052e-13	-12.622	-12.688	-0.066	(0)
ZnCl3-	2.253e-15	1.978e-15	-14.647	-14.704	-0.056	(0)
ZnSeO4	2.195e-17	2.195e-17	-16.659	-16.659	0.000	(0)
Zn (OH) 4-2	3.124e-18	1.699e-18	-17.505	-17.770	-0.264	(0)
ZnCl4-2	2.118e-18	1.282e-18	-17.674	-17.892	-0.218	(0)
Zn (SeO4) 2-2	2.018e-29	1.098e-29	-28.695	-28.960	-0.264	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-140.855	-140.921	-0.066	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.227	-142.227	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.133	-213.199	-0.066	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-215.599	-215.864	-0.264	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-288.647	-288.911	-0.264	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.13	-82.35	-36.22	Ag2S
Ag2CO3	-9.51	-20.60	-11.09	Ag2CO3
Ag2CrO4	-19.71	-31.30	-11.59	Ag2CrO4
Ag2HVO4	-9.68	-8.20	1.48	Ag2HVO4
Ag2MoO4	-10.69	-22.24	-11.55	Ag2MoO4
Ag2O	-13.35	-0.78	12.57	Ag2O
Ag2Se	4.66	-44.04	-48.70	Ag2Se
Ag2SeO3	-8.63	-15.78	-7.15	Ag2SeO3
Ag2SeO4	-18.81	-27.72	-8.91	Ag2SeO4

Ag2SO4	-13.70	-18.52	-4.82	Ag2SO4
Ag3AsO3	-22.07	-19.91	2.16	Ag3AsO3
Ag3AsO4	-11.65	-14.44	-2.79	Ag3AsO4
Ag3H2VO5	-13.77	-8.59	5.18	Ag3H2VO5
AgF·4H2O	-12.53	-11.48	1.05	AgF·4H2O
Agmetal	0.93	-12.58	-13.51	Ag
AgVO3	-8.58	-7.81	0.77	AgVO3
Al(OH)3(am)	-1.15	9.65	10.80	Al(OH)3
Al2(MoO4)3	-47.45	-45.08	2.37	Al2(MoO4)3
Al2O3	-0.35	19.30	19.65	Al2O3
Al4(OH)10SO4	-1.83	20.87	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-8.42	-3.62	4.80	AlAsO4·2H2O
AlOHSO4	-4.85	-8.08	-3.23	AlOHSO4
AlSb	-147.51	-81.89	65.62	AlSb
Alunite	-1.43	-2.83	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.51	-12.30	-7.79	PbSO4
Anhydrite	-1.55	-5.91	-4.36	CaSO4
Anilite	-50.52	-82.40	-31.88	Cu0.25Cu1.5S
Antlerite	-3.54	5.25	8.79	Cu3(OH)4SO4
Aragonite	0.31	-7.99	-8.30	CaCO3
Arsenolite	-72.21	-74.97	-2.76	As4O6
Artinite	-6.67	2.93	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-33.24	-26.53	6.71	As2O5
Atacamite	-2.27	5.12	7.39	Cu2(OH)3Cl
Azurite	0.26	-16.65	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-16.03	8.36	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-13.98	1.89	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	7.47	-1.44	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-22.68	10.26	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.49	-22.16	-9.67	BaCrO4
BaF2	-7.99	-13.81	-5.82	BaF2
BaMoO4	-6.13	-13.09	-6.96	BaMoO4
Barite	0.61	-9.37	-9.98	BaSO4
BaS	-89.38	-73.20	16.18	BaS
BaSeO3	-8.47	-6.64	1.83	BaSeO3
BaSeO4	-11.11	-18.57	-7.46	BaSeO4
Bianchite	-7.88	-9.65	-1.76	ZnSO4·6H2O
Birnessite	-9.59	8.50	18.09	MnO2
Bixbyite	-6.72	-7.36	-0.64	Mn2O3
BlaubleiI	-50.88	-75.04	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.16	-78.44	-27.28	Cu0.6Cu0.8S
Boehmite	1.07	9.65	8.58	AlOOH
Breithauptite	-53.36	-71.88	-18.52	NiSb
Brochantite	-2.31	12.91	15.22	Cu4(OH)6SO4
Brucite	-5.47	11.38	16.84	Mg(OH)2
Bunsenite	-4.97	7.47	12.45	NiO
Ca(VO3)2	-8.67	-3.01	5.66	Ca(VO3)2
Ca2V2O7	-8.69	8.81	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.74	8.81	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-13.36	8.94	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-18.32	20.64	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-19.23	20.63	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-290.58	-147.61	142.97	Ca3Sb2
CaCrO4	-16.43	-18.70	-2.27	CaCrO4
Calcite	0.49	-7.99	-8.48	CaCO3
Calomel	-11.36	-29.27	-17.91	Hg2Cl2
CaMoO4	-1.69	-9.64	-7.95	CaMoO4
Carnotite	-4.05	-3.82	0.23	KUO2VO4
CaSeO3·2H2O	-5.99	-3.18	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-12.09	-15.11	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.32	-3.48	9.84	Cd(BO2)2
Cd(OH)2	-7.38	6.26	13.64	Cd(OH)2
Cd(OH)2(am)	-7.47	6.26	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.40	-16.69	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.52	1.04	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.10	7.30	28.40	Cd4(OH)6SO4
CdCl2	-13.49	-14.14	-0.66	CdCl2
CdCl2·1H2O	-12.45	-14.14	-1.69	CdCl2·1H2O

CdCl2:2.5H2O	-12.23	-14.15	-1.91	CdCl2:2.5H2O
CdF2	-14.70	-15.91	-1.21	CdF2
Cdmetal (alpha)	-31.63	-18.11	13.51	Cd
Cdmetal (gamma)	-31.73	-18.11	13.62	Cd
CdMoO4	-1.05	-15.20	-14.15	CdMoO4
CdOHCl	-7.48	-3.94	3.54	CdOHCl
CdSb	-72.74	-73.09	-0.35	CdSb
CdSe	-16.80	-37.00	-20.20	CdSe
CdSeO4:2H2O	-18.83	-20.68	-1.85	CdSeO4:2H2O
CdSO4	-11.30	-11.48	-0.17	CdSO4
CdSO4:1H2O	-9.75	-11.48	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.60	-11.48	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.84	-10.59	-9.75	AgCl
Cerrusite	-1.25	-14.38	-13.13	PbCO3
CH4 (g)	-76.26	-117.31	-41.05	CH4
Chalcanthite	-7.43	-10.07	-2.64	CuSO4:5H2O
Chalcocite	-50.32	-85.24	-34.92	Cu2S
Chalcopyrite	-112.17	-147.44	-35.27	CuFeS2
Cinnabar	-49.71	-95.41	-45.69	HgS
Claudetite	-71.90	-74.97	-3.06	As4O6
Clausthalite	-10.73	-37.83	-27.10	PbSe
Co (BO2) 2	-29.48	-2.41	27.07	Co (BO2) 2
Co (OH) 2	-5.77	7.33	13.09	Co (OH) 2
Co (OH) 3	-10.58	-12.89	-2.31	Co (OH) 3
CO2 (g)	-1.67	-19.82	-18.15	CO2
Co3 (AsO4) 2	-17.59	-4.55	13.03	Co3 (AsO4) 2
Co3O4	-7.95	-18.45	-10.50	Co3O4
CoCl2	-21.35	-13.08	8.27	CoCl2
CoCl2:6H2O	-15.62	-13.08	2.54	CoCl2:6H2O
CoCO3	-2.51	-12.49	-9.98	CoCO3
CoF2	-13.25	-14.85	-1.60	CoF2
CoF3	-44.69	-46.15	-1.46	CoF3
CoFe2O4	25.24	21.71	-3.53	CoFe2O4
CoMoO4	-6.37	-14.13	-7.76	CoMoO4
CoO	-6.26	7.33	13.59	CoO
CoS (alpha)	-66.80	-74.24	-7.44	CoS
CoS (beta)	-63.17	-74.24	-11.07	CoS
CoSe	-19.73	-35.93	-16.20	CoSe
CoSeO3	-9.00	-7.68	1.32	CoSeO3
CoSeO4:6H2O	-18.08	-19.61	-1.53	CoSeO4:6H2O
CoSO4	-13.21	-10.41	2.80	CoSO4
CoSO4:6H2O	-7.94	-10.41	-2.47	CoSO4:6H2O
Cotunnite	-10.19	-14.97	-4.78	PbCl2
Covellite	-51.60	-73.90	-22.30	CuS
Cr (OH) 2	-19.76	-8.94	10.82	Cr (OH) 2
Cr (OH) 3	-1.04	0.30	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.05	0.30	-0.75	Cr (OH) 3
Cr2O3	2.95	0.59	-2.36	Cr2O3
CrCl2	-43.44	-29.35	14.09	CrCl2
CrCl3	-45.43	-30.31	15.11	CrCl3
CrF3	-21.63	-32.97	-11.34	CrF3
Crmetal	-63.80	-33.32	30.48	Cr
CrO3	-27.31	-30.52	-3.21	CrO3
Cryolite	-8.38	-42.22	-33.84	Na3AlF6
Cu (OH) 2	-1.01	7.66	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.65	19.56	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-50.83	-85.71	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.13	-46.93	-45.80	Cu2Se
Cu2SO4	-19.45	-21.40	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-9.65	-3.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-54.45	-97.04	-42.59	Cu3Sb
Cu3Se2	-19.03	-82.53	-63.49	Cu3Se2
CuCO3	-0.66	-12.16	-11.50	CuCO3
CuCrO4	-17.42	-22.86	-5.44	CuCrO4
CuF	-8.02	-12.92	-4.91	CuF
CuF2	-15.63	-14.51	1.12	CuF2
CuF2:2H2O	-9.96	-14.51	-4.55	CuF2:2H2O
Cumetal	-5.26	-14.02	-8.76	Cu

CuMoO4	-0.72	-13.80	-13.08	CuMoO4
CuOCuSO4	-12.71	-2.41	10.30	CuOCuSO4
Cupricferrite	16.06	22.04	5.99	CuFe2O4
Cuprite	-2.26	-3.67	-1.41	Cu2O
Cuprousferrite	14.27	5.36	-8.92	CuFeO2
CuSe	-2.50	-35.60	-33.10	CuSe
CuSe2	-21.12	-54.49	-33.37	CuSe2
CuSeO3:2H2O	-7.85	-7.34	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.84	-19.28	-2.44	CuSeO4:5H2O
CuSO4	-13.01	-10.07	2.94	CuSO4
Diaspore	2.78	9.65	6.87	AlOOH
Djurleite	-50.57	-84.49	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.11	-16.43	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.66	-16.43	-17.09	CaMg(CO3)2
Epsomite	-4.23	-6.36	-2.13	MgSO4:7H2O
Fe(OH)2	-5.53	8.04	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.17	4.13	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-3.08	-6.80	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.18	-0.62	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-10.00	-30.63	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-35.09	-38.83	-3.73	Fe2(SO4)3
Fe3(OH)8	2.19	22.42	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.48	-6.08	0.40	FeAsO4:2H2O
FeCr2O4	1.43	8.63	7.20	FeCr2O4
FeMoO4	-3.33	-13.42	-10.09	FeMoO4
Ferrihydrite	4.00	7.19	3.19	Fe(OH)3
Ferroselite	-35.52	-54.11	-18.60	FeSe2
FeS(ppt)	-70.58	-73.53	-2.95	FeS
FeSe	-24.22	-35.22	-11.00	FeSe
Fix_pe	-4.87	-4.87	0.00	e-
Fluorite	0.15	-10.35	-10.50	CaF2
Galena	-62.16	-76.13	-13.97	PbS
Gibbsite	1.36	9.65	8.29	Al(OH)3
Goethite	6.70	7.19	0.49	FeOOH
Goslarite	-7.64	-9.65	-2.01	ZnSO4:7H2O
Greenockite	-60.95	-75.31	-14.36	CdS
Greigite	-258.82	-303.85	-45.03	Fe3S4
Gummite	-7.76	-0.09	7.67	UO3
Gypsum	-1.30	-5.91	-4.61	CaSO4:2H2O
H-Jarosite	-1.80	-13.90	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.58	-21.46	-12.88	H2MoO4
H2S(g)	-73.56	-81.57	-8.01	H2S
H2Se(g)	-38.30	-43.26	-4.96	H2Se
Halite	-6.92	-5.32	1.60	NaCl
Hausmannite	-8.21	52.82	61.03	Mn3O4
Hematite	15.80	14.38	-1.42	Fe2O3
Hercynite	4.45	27.34	22.89	FeAl2O4
Hg(CH3)2(g)	-174.75	-248.46	-73.71	Hg(CH3)2
Hg(g)	-8.75	-16.62	-7.87	Hg
Hg(OH)2	-10.34	-13.84	-3.50	Hg(OH)2
Hg2(g)	-18.29	-33.24	-14.96	Hg2
Hg2(OH)2	-14.13	-8.87	5.26	Hg2(OH)2
Hg2CO3	-12.64	-28.69	-16.05	Hg2CO3
Hg2CrO4	-30.69	-39.39	-8.70	Hg2CrO4
Hg2F2	-20.68	-31.04	-10.36	Hg2F2
Hg2S	-78.76	-90.44	-11.68	Hg2S
Hg2SeO3	-19.21	-23.87	-4.66	Hg2SeO3
Hg2SO4	-20.48	-26.61	-6.13	Hg2SO4
Hg3O2CO3	-31.66	-61.34	-29.68	Hg3O2CO3
HgCl(g)	-34.13	-14.64	19.50	HgCl
HgCl2	-12.98	-34.25	-21.26	HgCl2
HgF(g)	-48.20	-15.52	32.68	HgF
HgF2(g)	-48.58	-36.01	12.57	HgF2
Hgmetal(l)	-3.17	-16.62	-13.45	Hg
HgSe	-1.41	-57.10	-55.69	HgSe
HgSeO3	-16.41	-28.84	-12.43	HgSeO3
HgSO4	-22.16	-31.58	-9.42	HgSO4
Huntite	-3.35	-33.32	-29.97	CaMg3(CO3)4

Hydrocerrusite	-4.56	-23.34	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.62	-22.39	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.97	-22.14	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	4.59	-10.21	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.43	-53.67	-17.24	K2Cr2O7
K2CrO4	-22.63	-23.15	-0.51	K2CrO4
K2MoO4	-17.35	-14.09	3.26	K2MoO4
K2SeO4	-18.83	-19.56	-0.73	K2SeO4
Langite	-4.57	12.91	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.43	-6.87	-0.43	PbO : PbSO4
Laurionite	-5.39	-4.77	0.62	PbOHCl
Lepidocrocite	5.82	7.19	1.37	FeOOH
Lime	-20.87	11.82	32.70	CaO
Litharge	-7.26	5.43	12.69	PbO
Mackinawite	-69.93	-73.53	-3.60	FeS
Maghemite	7.99	14.38	6.39	Fe2O3
Magnesioferrite	8.90	25.76	16.86	Fe2MgO4
Magnesite	-0.98	-8.44	-7.46	MgCO3
Magnetite	19.01	22.42	3.40	Fe3O4
Malachite	0.81	-4.49	-5.31	Cu2 (OH) 2CO3
Manganite	-3.67	21.67	25.34	MnOOH
Massicot	-7.46	5.43	12.89	PbO
Matlockite	-6.88	-15.86	-8.97	PbClF
Melanothallite	-19.00	-12.74	6.26	CuCl2
Melanterite	-7.49	-9.70	-2.21	FeSO4 : 7H2O
Metacinnabar	-50.31	-95.41	-45.09	HgS
Mg (OH) 2 (active)	-7.42	11.38	18.79	Mg (OH) 2
Mg (VO3) 2	-14.74	-3.46	11.28	Mg (VO3) 2
Mg2Sb3	-265.62	-190.94	74.68	Mg2Sb3
Mg2V2O7	-18.45	7.91	26.36	Mg2V2O7
MgCr2O4	-4.23	11.97	16.20	MgCr2O4
MgCrO4	-24.52	-19.14	5.38	MgCrO4
MgF2	-2.67	-10.80	-8.13	MgF2
MgMoO4	-8.23	-10.08	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.68	-3.63	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-14.36	-15.56	-1.20	MgSeO4 : 6H2O
Minium	-32.85	40.67	73.52	Pb3O4
Mirabilite	-6.86	-7.97	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.26	-5.36	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-54.86	-60.57	-5.71	Mn2 (SO4) 3
Mn2Sb	-145.84	-84.76	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.59	1.91	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.64	-10.92	2.72	MnCl2 : 4H2O
MnS (grn)	-72.26	-72.09	0.17	MnS
MnS (pnk)	-75.43	-72.09	3.34	MnS
MnSb	-92.31	-95.22	-2.91	MnSb
MnSe	-37.28	-33.78	3.50	MnSe
MnSeO3	-6.65	-5.52	1.13	MnSeO3
MnSeO3 : 2H2O	-6.50	-5.52	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-15.41	-17.46	-2.05	MnSeO4 : 5H2O
MnSO4	-10.84	-8.25	2.58	MnSO4
Monteponite	-8.84	6.26	15.10	CdO
Montroydite	-10.20	-13.84	-3.64	HgO
MoO3	-13.46	-21.46	-8.00	MoO3
Morenosite	-8.12	-10.26	-2.14	NiSO4 : 7H2O
MoS2	-138.71	-208.97	-70.26	MoS2
Na-Jarosite	2.18	-9.02	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.38	-51.28	-9.90	Na2Cr2O7
Na2CrO4	-23.69	-20.76	2.93	Na2CrO4
Na2Mo2O7	-16.56	-33.16	-16.60	Na2Mo2O7
Na2MoO4	-13.19	-11.70	1.49	Na2MoO4
Na2MoO4 : 2H2O	-12.92	-11.70	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-15.54	-5.24	10.30	Na2SeO3 : 5H2O
Na2SeO4	-18.45	-17.17	1.28	Na2SeO4
Na3Sb	-171.35	-76.89	94.45	Na3Sb
Na3VO4	-29.45	7.23	36.68	Na3VO4
Na4V2O7	-32.71	4.69	37.40	Na4V2O7
Nantokite	-5.31	-12.04	-6.73	CuCl

NaSb	-85.45	-62.29	23.17	NaSb
Natron	-8.74	-10.06	-1.31	Na2CO3:10H2O
NaVO3	-6.40	-2.54	3.86	NaVO3
Nesquehonite	-3.77	-8.44	-4.67	MgCO3:3H2O
Ni(OH)2	-5.32	7.47	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-19.81	-4.11	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.84	12.16	32.00	Ni4(OH)6SO4
NiCO3	-5.47	-12.34	-6.87	NiCO3
NiMoO4	-2.84	-13.99	-11.14	NiMoO4
NiS(alpha)	-68.49	-74.09	-5.60	NiS
NiS(beta)	-62.99	-74.09	-11.10	NiS
NiS(gamma)	-61.29	-74.09	-12.80	NiS
NiSe	-18.09	-35.79	-17.70	NiSe
NiSeO3:2H2O	-10.34	-7.53	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.94	-19.46	-1.52	NiSeO4:6H2O
Nsutite	-9.00	8.50	17.50	MnO2
O2(g)	-34.34	48.75	83.09	O2
Orpiment	-221.12	-282.19	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.83	-4.31	6.52	Pb(BO2)2
Pb(OH)2	-2.72	5.43	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.81	-64.57	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.13	0.66	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.32	10.87	26.19	Pb2O(OH)2
Pb2O3	-25.80	35.24	61.04	Pb2O3
Pb2OCO3	-8.39	-8.95	-0.56	Pb2OCO3
Pb2V2O7	-2.07	-3.97	-1.90	Pb2V2O7
Pb3(AsO4)2	-16.03	-10.23	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.68	1.46	6.14	Pb3(VO4)2
Pb3O2CO3	-14.54	-3.52	11.02	Pb3O2CO3
Pb3O2SO4	-12.12	-1.43	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.10	4.00	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.88	4.00	21.88	Pb4O3SO4
PbCrO4	-12.49	-25.09	-12.60	PbCrO4
PbF2	-9.30	-16.74	-7.44	PbF2
Pbmetal	-23.19	-18.94	4.25	Pb
PbMoO4	-0.41	-16.03	-15.62	PbMoO4
PbO:0.3H2O	-7.55	5.43	12.98	PbO:0.33H2O
PbSeO4	-14.66	-21.50	-6.84	PbSeO4
Periclase	-10.21	11.38	21.58	MgO
Phosgenite	-9.55	-29.36	-19.81	PbCl2:PbCO3
Plattnerite	-19.79	29.81	49.60	PbO2
Portlandite	-10.98	11.82	22.80	Ca(OH)2
Pyrite	-112.22	-130.73	-18.51	FeS2
Pyrochroite	-5.71	9.48	15.19	Mn(OH)2
Pyrolusite	-7.53	33.85	41.38	MnO2
Realgar	-92.75	-112.50	-19.75	AsS
Retgersite	-8.22	-10.26	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-5.41	-19.91	-14.50	UO2CO3
Sb(OH)3	-11.31	-18.42	-7.11	Sb(OH)3
Sb2O4	-15.87	-12.47	3.40	Sb2O4
Sb2O5	-27.05	-36.72	-9.67	Sb2O5
Sb2Se3	-98.87	-166.63	-67.76	Sb2Se3
Sb4O6(cubic)	-55.43	-73.69	-18.26	Sb4O6
Sb4O6(orth)	-55.79	-73.69	-17.90	Sb4O6
SbCl3	-49.60	-49.03	0.57	SbCl3
SbF3	-41.46	-51.68	-10.23	SbF3
Sbmetal	-43.29	-54.98	-11.69	Sb
SbO2	-2.72	-30.55	-27.82	SbO2
Schoepite	-6.08	-0.09	5.99	UO2(OH)2:H2O
Semetal(am)	-11.78	-18.89	-7.11	Se
Semetal(hex)	-11.18	-18.89	-7.71	Se
Senarmontite	-24.48	-36.85	-12.37	Sb2O3
SeO2	-15.13	-15.00	0.12	SeO2
SeO3	-47.98	-26.94	21.04	SeO3
Siderite	-1.54	-11.78	-10.24	FeCO3
Smithsonite	-1.73	-11.73	-10.00	ZnCO3

Sphalerite	-62.03	-73.48	-11.45	ZnS
Spinel	-6.17	30.68	36.85	MgAl2O4
Stibnite	-231.09	-281.55	-50.46	Sb2S3
Sulfur	-55.05	-57.19	-2.14	S
Tenorite	0.02	7.66	7.64	CuO
Thenardite	-8.29	-7.97	0.32	Na2SO4
Thermonatrite	-10.69	-10.05	0.64	Na2CO3:H2O
Tyuyamunite	-7.27	-3.19	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-18.07	3.01	21.08	U3O8
U3Sb4	-564.28	-411.90	152.38	U3Sb4
U4O9	-33.59	-36.61	-3.02	U4O9
UF4	-30.06	-59.59	-29.54	UF4
UF4:2.5H2O	-26.88	-59.59	-32.72	UF4:2.5H2O
UO2 (am)	-16.18	-15.24	0.93	UO2
UO2 (OH) 2 (beta)	-5.70	-0.09	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.78	-27.03	-2.25	UO2SeO4:4H2O
UO3	-7.79	-0.09	7.70	UO3
Uraninite	-10.58	-15.24	-4.67	UO2
USb2	-212.75	-183.17	29.58	USb2
V (OH) 3	-16.78	-9.19	7.59	V (OH) 3
V2O5	-13.48	-14.84	-1.36	V2O5
V3O5	-34.32	-32.48	1.84	V3O5
V4O7	-42.37	-35.19	7.19	V4O7
V6O13	-32.40	-93.26	-60.86	V6O13
Valentinite	-28.36	-36.85	-8.48	Sb2O3
VC12	-60.66	-41.78	18.87	VC12
VC13	-63.23	-39.80	23.43	VC13
VF4	-61.98	-47.05	14.93	VF4
Vmetal	-89.78	-45.75	44.03	V
VO	-36.14	-21.38	14.76	VO
VO (OH) 2	-7.85	-2.70	5.15	VO (OH) 2
VO2Cl	-20.46	-17.62	2.84	VO2Cl
VOC1	-30.55	-19.40	11.15	VOC1
VOC12	-35.87	-23.11	12.76	VOC12
VOSO4	-24.05	-20.44	3.61	VOSO4
Witherite	-2.88	-11.45	-8.57	BaCO3
Wurtzite	-64.53	-73.48	-8.95	ZnS
Zincite	-3.25	8.09	11.33	ZnO
Zincosite	-13.58	-9.65	3.93	ZnSO4
Zn (BO2) 2	-9.94	-1.65	8.29	Zn (BO2) 2
Zn (OH) 2	-4.11	8.09	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.39	8.09	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.67	8.09	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.45	8.09	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.65	8.09	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-9.06	-1.56	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.22	5.97	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.92	-2.27	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-30.12	-11.21	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.78	14.62	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.46	20.04	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.37	-12.32	7.05	ZnCl2
ZnCO3:1H2O	-1.47	-11.73	-10.26	ZnCO3:1H2O
ZnF2	-13.55	-14.09	-0.53	ZnF2
Znmetal	-42.07	-16.28	25.79	Zn
ZnMoO4	-3.25	-13.37	-10.13	ZnMoO4
ZnO (active)	-3.10	8.09	11.19	ZnO
ZnS (am)	-64.43	-73.48	-9.05	ZnS
ZnSb	-82.28	-71.27	11.01	ZnSb
ZnSe	-20.77	-35.17	-14.40	ZnSe
ZnSeO4:6H2O	-17.33	-18.85	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.01	-9.65	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 54.

Title Precipitate oversaturated phases in groundwater
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 301

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -1.69 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 302

SAVE Solution 303 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 301

END

TITLE

Precipitate oversaturated phases in groundwater

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 302. Solution after simulation 53.
Using pure phase assemblage 301.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	1.931e-08	1.931e-08
Alunite	-0.79	-2.19	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.71	-6.07	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	1.713e-08	1.713e-08
Barite	0.00	-9.98	-9.98	0.000e+00	7.016e-07	7.016e-07
Brochantite	-1.98	13.24	15.22	0.000e+00	0	0.000e+00
Brucite	-5.72	11.12	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	1.278e-03
CaMoO4	-1.86	-9.81	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.80	-3.99	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.244e-03	1.244e-03
Carnotite	-3.49	-3.26	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.56	-3.72	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.00	-15.15	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	0.000e+00	6.063e-08	6.063e-08
Cu2Se(alpha)	-6.15	-51.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.43	-13.50	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.17	-6.30	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.659e-05	2.659e-05
Fluorite	-0.04	-10.54	-10.50	0.000e+00	0	0.000e+00
Gummite	-7.22	0.46	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.46	-6.07	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.10	-59.79	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.81	-7.92	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.24	-6.11	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.52	7.27	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-25.11	-9.41	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.69	-12.56	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.75	-13.89	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.088e-07
Otavite	-1.82	-13.82	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.15	-15.77	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.88	-19.38	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.17	-30.99	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.54	0.46	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-6.34	-2.26	4.08	0.000e+00	0	0.000e+00
U3O8	-17.61	3.47	21.08	0.000e+00	0	0.000e+00

UO2 (OH) 2 (beta)	-5.16	0.46	5.61	0.000e+00	0	0.000e+00
UO3	-7.24	0.46	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.17	-13.29	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	4.477e-08	4.488e-08
Al	2.453e-06	2.459e-06
As	8.385e-11	8.406e-11
B	1.364e-05	1.368e-05
Ba	2.012e-07	2.017e-07
C	6.105e-03	6.121e-03
Ca	1.902e-03	1.907e-03
Cd	9.297e-09	9.321e-09
Cl	1.474e-03	1.478e-03
Co	1.355e-07	1.359e-07
Cr	5.749e-09	5.764e-09
Cu	4.588e-06	4.599e-06
F	2.086e-04	2.091e-04
Fe	3.394e-09	3.402e-09
Hg	8.829e-11	8.851e-11
K	2.690e-04	2.696e-04
Mg	1.073e-03	1.075e-03
Mn	1.521e-05	1.525e-05
Mo	2.475e-07	2.482e-07
Na	4.232e-03	4.242e-03
Ni	2.126e-07	2.131e-07
Pb	1.826e-08	1.831e-08
S	1.692e-03	1.696e-03
Sb	8.988e-09	9.010e-09
Se	8.534e-09	8.556e-09
U	3.556e-08	3.565e-08
V	4.963e-08	4.976e-08
Zn	7.186e-07	7.204e-07

-----Description of solution-----

	pH =	7.179	Charge balance
	pe =	5.593	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.365e-02	
	Mass of water (kg) =	1.002e+00	
	Total alkalinity (eq/kg) =	5.432e-03	
	Total CO2 (mol/kg) =	6.105e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	1.117e-16	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	15	
	Total H =	1.112970e+02	
	Total O =	5.567030e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.716e-07	1.520e-07	-6.766	-6.818	-0.053	(0)
H+	7.452e-08	6.622e-08	-7.128	-7.179	-0.051	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.477e-08					
AgCl	2.871e-08	2.871e-08	-7.542	-7.542	0.000	(0)
Ag+	1.208e-08	1.073e-08	-7.918	-7.969	-0.051	(0)
AgCl2-	3.758e-09	3.276e-09	-8.425	-8.485	-0.060	(0)
AgSO4-	2.116e-10	1.845e-10	-9.674	-9.734	-0.060	(0)

	AgCl3-2	6.623e-12	3.825e-12	-11.179	-11.417	-0.238	(0)
	AgF	4.597e-12	4.597e-12	-11.338	-11.338	0.000	(0)
	AgOH	1.631e-13	1.631e-13	-12.787	-12.787	0.000	(0)
	AgCl4-3	3.518e-14	1.023e-14	-13.454	-13.990	-0.536	(0)
	AgH2BO3	2.020e-14	2.020e-14	-13.695	-13.695	0.000	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgSeO3-	3.243e-15	2.827e-15	-14.489	-14.549	-0.060	(0)
	Ag (OH) 2-	2.780e-18	2.423e-18	-17.556	-17.616	-0.060	(0)
	Ag (SeO3) 2-3	3.568e-23	1.038e-23	-22.448	-22.984	-0.536	(0)
	Ag2MoO4	6.725e-24	6.725e-24	-23.172	-23.172	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.917	-72.917	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.869	-86.822	-0.953	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.520	-147.580	-0.060	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.733	-147.884	-0.151	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.855	-150.145	-0.291	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.177	-150.456	-0.279	(0)
Al		2.453e-06					
	Al (OH) 4-	1.749e-06	1.556e-06	-5.757	-5.808	-0.051	(0)
	AlF3	3.631e-07	3.631e-07	-6.440	-6.440	0.000	(0)
	AlF2+	1.895e-07	1.691e-07	-6.722	-6.772	-0.049	(0)
	Al (OH) 3	8.133e-08	8.133e-08	-7.090	-7.090	0.000	(0)
	AlF4-	3.488e-08	3.103e-08	-7.457	-7.508	-0.051	(0)
	Al (OH) 2+	3.004e-08	2.681e-08	-7.522	-7.572	-0.049	(0)
	AlF+2	3.925e-09	2.491e-09	-8.406	-8.604	-0.197	(0)
	AlOH+2	3.499e-10	2.221e-10	-9.456	-9.654	-0.197	(0)
	AlSO4+	1.098e-11	9.770e-12	-10.959	-11.010	-0.051	(0)
	Al+3	4.227e-12	1.461e-12	-11.374	-11.835	-0.461	(0)
	Al (SO4) 2-	1.014e-13	9.019e-14	-12.994	-13.045	-0.051	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-40.251	-40.788	-0.536	(0)
As (3)		5.471e-23					
	H3AsO3	5.423e-23	5.423e-23	-22.266	-22.266	0.000	(0)
	H2AsO3-	4.818e-25	4.200e-25	-24.317	-24.377	-0.060	(0)
	HAsO3-2	1.001e-29	5.784e-30	-28.999	-29.238	-0.238	(0)
	H4AsO3+	2.041e-30	1.779e-30	-29.690	-29.750	-0.060	(0)
	AsO3-3	1.158e-35	3.367e-36	-34.936	-35.473	-0.536	(0)
As (5)		8.385e-11					
	HAsO4-2	5.988e-11	3.459e-11	-10.223	-10.461	-0.238	(0)
	H2AsO4-	2.396e-11	2.089e-11	-10.620	-10.680	-0.060	(0)
	AsO4-3	5.679e-15	1.652e-15	-14.246	-14.782	-0.536	(0)
	H3AsO4	2.396e-16	2.404e-16	-15.620	-15.619	0.001	(0)
B		1.364e-05					
	H3BO3	1.350e-05	1.354e-05	-4.870	-4.868	0.001	(0)
	H2BO3-	1.346e-07	1.187e-07	-6.871	-6.925	-0.054	(0)
	CaH2BO3+	7.728e-09	6.818e-09	-8.112	-8.166	-0.054	(0)
	MgH2BO3+	2.722e-09	2.402e-09	-8.565	-8.619	-0.054	(0)
	BF (OH) 3-	1.044e-09	9.212e-10	-8.981	-9.036	-0.054	(0)
	NaH2BO3	7.026e-10	7.026e-10	-9.153	-9.153	0.000	(0)
	H5 (BO3) 2-	1.551e-12	1.368e-12	-11.810	-11.864	-0.054	(0)
	BF2 (OH) 2-	1.261e-12	1.112e-12	-11.899	-11.954	-0.054	(0)
	BaH2BO3+	5.054e-13	4.459e-13	-12.296	-12.351	-0.054	(0)
	AgH2BO3	2.020e-14	2.020e-14	-13.695	-13.695	0.000	(0)
	H8 (BO3) 3-	2.099e-15	1.852e-15	-14.678	-14.732	-0.054	(0)
	BF3OH-	5.541e-18	4.889e-18	-17.256	-17.311	-0.054	(0)
	BF4-	3.080e-22	2.717e-22	-21.511	-21.566	-0.054	(0)
Ba		2.012e-07					
	Ba+2	1.949e-07	1.215e-07	-6.710	-6.915	-0.205	(0)
	BaHCO3+	6.082e-09	5.440e-09	-8.216	-8.264	-0.048	(0)
	BaCO3	2.068e-10	2.068e-10	-9.684	-9.684	0.000	(0)
	BaH2BO3+	5.054e-13	4.459e-13	-12.296	-12.351	-0.054	(0)
	BaOH+	9.049e-14	8.065e-14	-13.043	-13.093	-0.050	(0)
C (4)		6.105e-03					
	HCO3-	5.251e-03	4.687e-03	-2.280	-2.329	-0.049	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	9.738e-05	8.710e-05	-4.012	-4.060	-0.048	(0)
	MgHCO3+	3.151e-05	2.798e-05	-4.501	-4.553	-0.052	(0)
	NaHCO3	9.841e-06	9.841e-06	-5.007	-5.007	0.000	(0)
	CO3-2	5.320e-06	3.318e-06	-5.274	-5.479	-0.205	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)

CuCO3	3.973e-06	3.973e-06	-5.401	-5.401	0.000	(0)
MgCO3	1.610e-06	1.610e-06	-5.793	-5.793	0.000	(0)
MnHCO3+	7.983e-07	7.115e-07	-6.098	-6.148	-0.050	(0)
NaCO3-	2.585e-07	2.307e-07	-6.588	-6.637	-0.049	(0)
CuHCO3+	6.899e-08	6.014e-08	-7.161	-7.221	-0.060	(0)
ZnCO3	6.289e-08	6.289e-08	-7.201	-7.201	0.000	(0)
Cu (CO3) 2-2	6.143e-08	3.548e-08	-7.212	-7.450	-0.238	(0)
ZnHCO3+	5.600e-08	4.882e-08	-7.252	-7.311	-0.060	(0)
NiHCO3+	5.477e-08	4.775e-08	-7.261	-7.321	-0.060	(0)
CoHCO3+	2.369e-08	2.065e-08	-7.625	-7.685	-0.060	(0)
UO2 (CO3) 2-2	1.900e-08	1.097e-08	-7.721	-7.960	-0.238	(0)
UO2 (CO3) 3-4	1.639e-08	1.825e-09	-7.785	-8.739	-0.953	(0)
PbCO3	1.092e-08	1.092e-08	-7.962	-7.962	0.000	(0)
NiCO3	1.023e-08	1.023e-08	-7.990	-7.990	0.000	(0)
BaHCO3+	6.082e-09	5.440e-09	-8.216	-8.264	-0.048	(0)
PbHCO3+	4.375e-09	3.814e-09	-8.359	-8.419	-0.060	(0)
CoCO3	3.177e-09	3.177e-09	-8.498	-8.498	0.000	(0)
CdCO3	3.434e-10	3.434e-10	-9.464	-9.464	0.000	(0)
BaCO3	2.068e-10	2.068e-10	-9.684	-9.684	0.000	(0)
Pb (CO3) 2-2	1.810e-10	1.045e-10	-9.742	-9.981	-0.238	(0)
UO2CO3	1.657e-10	1.657e-10	-9.781	-9.781	0.000	(0)
CdHCO3+	5.558e-11	4.846e-11	-10.255	-10.315	-0.060	(0)
Cd (CO3) 2-2	1.462e-12	8.447e-13	-11.835	-12.073	-0.238	(0)
FeHCO3+	8.171e-13	7.309e-13	-12.088	-12.136	-0.048	(0)
HgCO3	5.775e-15	5.775e-15	-14.238	-14.238	0.000	(0)
Hg (CO3) 2-2	1.049e-16	6.059e-17	-15.979	-16.218	-0.238	(0)
HgHCO3+	8.169e-18	7.121e-18	-17.088	-17.147	-0.060	(0)
Ca	1.902e-03					
Ca+2	1.600e-03	9.980e-04	-2.796	-3.001	-0.205	(0)
CaSO4	1.970e-04	1.970e-04	-3.706	-3.706	0.000	(0)
CaHCO3+	9.738e-05	8.710e-05	-4.012	-4.060	-0.048	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.084e-06	1.858e-06	-5.681	-5.731	-0.050	(0)
CaH2BO3+	7.728e-09	6.818e-09	-8.112	-8.166	-0.054	(0)
CaOH+	3.384e-09	3.027e-09	-8.471	-8.519	-0.048	(0)
Cd	9.297e-09					
Cd+2	7.282e-09	4.541e-09	-8.138	-8.343	-0.205	(0)
CdSO4	9.172e-10	9.172e-10	-9.038	-9.038	0.000	(0)
CdCl+	6.518e-10	5.682e-10	-9.186	-9.245	-0.060	(0)
CdCO3	3.434e-10	3.434e-10	-9.464	-9.464	0.000	(0)
CdHCO3+	5.558e-11	4.846e-11	-10.255	-10.315	-0.060	(0)
Cd (SO4) 2-2	1.846e-11	1.066e-11	-10.734	-10.972	-0.238	(0)
CdF+	1.408e-11	1.227e-11	-10.851	-10.911	-0.060	(0)
CdOH+	6.290e-12	5.484e-12	-11.201	-11.261	-0.060	(0)
CdOHC1	3.543e-12	3.543e-12	-11.451	-11.451	0.000	(0)
CdCl2	3.103e-12	3.103e-12	-11.508	-11.508	0.000	(0)
Cd (CO3) 2-2	1.462e-12	8.447e-13	-11.835	-12.073	-0.238	(0)
Cd (OH) 2	5.259e-15	5.259e-15	-14.279	-14.279	0.000	(0)
CdF2	4.176e-15	4.176e-15	-14.379	-14.379	0.000	(0)
CdCl3-	2.943e-15	2.565e-15	-14.531	-14.591	-0.060	(0)
CdSeO4	1.502e-18	1.502e-18	-17.823	-17.823	0.000	(0)
Cd2OH+3	4.291e-19	1.248e-19	-18.367	-18.904	-0.536	(0)
Cd (OH) 3-	5.603e-20	4.884e-20	-19.252	-19.311	-0.060	(0)
Cd (SeO3) 2-2	1.089e-21	6.289e-22	-20.963	-21.201	-0.238	(0)
Cd (OH) 4-2	2.104e-27	1.215e-27	-26.677	-26.915	-0.238	(0)
CdHS+	0.000e+00	0.000e+00	-79.038	-79.097	-0.060	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.656	-150.656	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.459	-227.518	-0.060	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.846	-304.085	-0.238	(0)
Cl	1.474e-03					
Cl-	1.474e-03	1.310e-03	-2.831	-2.883	-0.051	(0)
AgCl	2.871e-08	2.871e-08	-7.542	-7.542	0.000	(0)
MnCl+	1.408e-08	1.255e-08	-7.851	-7.901	-0.050	(0)
AgCl2-	3.758e-09	3.276e-09	-8.425	-8.485	-0.060	(0)
ZnCl+	1.221e-09	1.084e-09	-8.913	-8.965	-0.052	(0)
CdCl+	6.518e-10	5.682e-10	-9.186	-9.245	-0.060	(0)
CuCl+	4.757e-10	4.223e-10	-9.323	-9.374	-0.052	(0)
CuCl	4.190e-10	4.190e-10	-9.378	-9.378	0.000	(0)

NiCl+	3.177e-10	2.770e-10	-9.498	-9.558	-0.060	(0)
CoCl+	2.945e-10	2.567e-10	-9.531	-9.591	-0.060	(0)
ZnOHCl	2.157e-10	2.157e-10	-9.666	-9.666	0.000	(0)
CuCl2-	1.292e-10	1.147e-10	-9.889	-9.940	-0.052	(0)
PbCl+	5.841e-11	5.092e-11	-10.234	-10.293	-0.060	(0)
MnCl2	2.322e-11	2.322e-11	-10.634	-10.634	0.000	(0)
AgCl3-2	6.623e-12	3.825e-12	-11.179	-11.417	-0.238	(0)
CdOHCl	3.543e-12	3.543e-12	-11.451	-11.451	0.000	(0)
CdCl2	3.103e-12	3.103e-12	-11.508	-11.508	0.000	(0)
ZnCl2	2.251e-12	2.251e-12	-11.648	-11.648	0.000	(0)
HgClOH	5.115e-13	5.115e-13	-12.291	-12.291	0.000	(0)
PbCl2	2.980e-13	2.980e-13	-12.526	-12.526	0.000	(0)
HgCl2	2.497e-13	2.497e-13	-12.603	-12.603	0.000	(0)
CuCl2	1.918e-13	1.918e-13	-12.717	-12.717	0.000	(0)
CuCl3-2	5.092e-14	3.213e-14	-13.293	-13.493	-0.200	(0)
AgCl4-3	3.518e-14	1.023e-14	-13.454	-13.990	-0.536	(0)
MnCl3-	9.403e-15	8.380e-15	-14.027	-14.077	-0.050	(0)
HgCl3-	3.752e-15	3.271e-15	-14.426	-14.485	-0.060	(0)
CdCl3-	2.943e-15	2.565e-15	-14.531	-14.591	-0.060	(0)
ZnCl3-	2.638e-15	2.343e-15	-14.579	-14.630	-0.052	(0)
NiCl2	1.827e-15	1.827e-15	-14.738	-14.738	0.000	(0)
CrCl+2	2.094e-16	1.209e-16	-15.679	-15.917	-0.238	(0)
PbCl3-	1.783e-16	1.554e-16	-15.749	-15.808	-0.060	(0)
HgCl+	4.361e-17	3.802e-17	-16.360	-16.420	-0.060	(0)
UO2Cl+	3.059e-17	2.666e-17	-16.514	-16.574	-0.060	(0)
HgCl4-2	2.954e-17	1.706e-17	-16.530	-16.768	-0.238	(0)
CuCl3-	2.642e-18	2.346e-18	-17.578	-17.630	-0.052	(0)
ZnCl4-2	2.432e-18	1.535e-18	-17.614	-17.814	-0.200	(0)
CrOHCl2	4.577e-19	4.577e-19	-18.339	-18.339	0.000	(0)
PbCl4-2	1.611e-19	9.308e-20	-18.793	-19.031	-0.238	(0)
FeCl+2	2.830e-20	1.785e-20	-19.548	-19.748	-0.200	(0)
CrCl2+	1.724e-20	1.503e-20	-19.763	-19.823	-0.060	(0)
VOCl+	1.351e-20	1.177e-20	-19.869	-19.929	-0.060	(0)
FeCl2+	1.172e-22	1.045e-22	-21.931	-21.981	-0.050	(0)
CuCl4-2	2.441e-23	1.540e-23	-22.612	-22.812	-0.200	(0)
CrO3Cl-	1.769e-26	1.542e-26	-25.752	-25.812	-0.060	(0)
FeCl3	1.369e-26	1.369e-26	-25.864	-25.864	0.000	(0)
CoCl+2	4.081e-35	2.357e-35	-34.389	-34.628	-0.238	(0)
UCl+3	0.000e+00	0.000e+00	-45.234	-45.771	-0.536	(0)
Co (2)	1.355e-07					
Co+2	9.807e-08	5.664e-08	-7.008	-7.247	-0.238	(0)
CoHCO3+	2.369e-08	2.065e-08	-7.625	-7.685	-0.060	(0)
CoSO4	9.737e-09	9.737e-09	-8.012	-8.012	0.000	(0)
CoCO3	3.177e-09	3.177e-09	-8.498	-8.498	0.000	(0)
CoF+	3.504e-10	3.055e-10	-9.455	-9.515	-0.060	(0)
CoCl+	2.945e-10	2.567e-10	-9.531	-9.591	-0.060	(0)
CoOH+	1.971e-10	1.718e-10	-9.705	-9.765	-0.060	(0)
Co (OH) 2	2.074e-12	2.074e-12	-11.683	-11.683	0.000	(0)
CoSeO4	5.041e-17	5.041e-17	-16.297	-16.297	0.000	(0)
Co (OH) 3-	7.217e-18	6.292e-18	-17.142	-17.201	-0.060	(0)
CoOOH-	1.811e-18	1.579e-18	-17.742	-17.802	-0.060	(0)
Co2OH+3	1.677e-18	4.877e-19	-17.775	-18.312	-0.536	(0)
Co (OH) 4-2	2.624e-25	1.516e-25	-24.581	-24.819	-0.238	(0)
Co4 (OH) 4+4	1.562e-30	1.738e-31	-29.806	-30.760	-0.953	(0)
Co (3)	1.183e-28					
CoOH+2	1.183e-28	6.830e-29	-27.927	-28.166	-0.238	(0)
Co+3	2.559e-34	8.843e-35	-33.592	-34.053	-0.461	(0)
CoCl+2	4.081e-35	2.357e-35	-34.389	-34.628	-0.238	(0)
Cr (2)	7.523e-26					
Cr+2	7.523e-26	4.345e-26	-25.124	-25.362	-0.238	(0)
Cr (3)	5.749e-09					
Cr (OH) 2+	5.032e-09	4.387e-09	-8.298	-8.358	-0.060	(0)
Cr (OH) +2	4.106e-10	2.372e-10	-9.387	-9.625	-0.238	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	4.849e-11	4.849e-11	-10.314	-10.314	0.000	(0)
CrF+2	3.337e-12	1.928e-12	-11.477	-11.715	-0.238	(0)
CrO2-	2.061e-12	1.797e-12	-11.686	-11.745	-0.060	(0)
Cr (OH) 4-	1.739e-12	1.516e-12	-11.760	-11.819	-0.060	(0)

Cr+3	2.452e-13	7.132e-14	-12.610	-13.147	-0.536	(0)
CrSO4+	1.646e-13	1.435e-13	-12.784	-12.843	-0.060	(0)
CrCl+2	2.094e-16	1.209e-16	-15.679	-15.917	-0.238	(0)
Cr2(OH)2SO4+2	1.800e-18	1.040e-18	-17.745	-17.983	-0.238	(0)
CrOHC12	4.577e-19	4.577e-19	-18.339	-18.339	0.000	(0)
Cr2(OH)2(SO4)2	5.320e-20	5.320e-20	-19.274	-19.274	0.000	(0)
CrCl2+	1.724e-20	1.503e-20	-19.763	-19.823	-0.060	(0)
Cr (6)	2.468e-16					
CrO4-2	2.114e-16	1.319e-16	-15.675	-15.880	-0.205	(0)
HCrO4-	3.241e-17	2.826e-17	-16.489	-16.549	-0.060	(0)
NaCrO4-	2.806e-18	2.447e-18	-17.552	-17.611	-0.060	(0)
KCrO4-	1.335e-19	1.164e-19	-18.875	-18.934	-0.060	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	8.504e-25	4.912e-25	-24.070	-24.309	-0.238	(0)
CrO3Cl-	1.769e-26	1.542e-26	-25.752	-25.812	-0.060	(0)
Cr2O7-2	4.794e-32	2.769e-32	-31.319	-31.558	-0.238	(0)
Cu (1)	8.396e-10					
CuCl	4.190e-10	4.190e-10	-9.378	-9.378	0.000	(0)
Cu+	2.914e-10	2.540e-10	-9.536	-9.595	-0.060	(0)
CuCl2-	1.292e-10	1.147e-10	-9.889	-9.940	-0.052	(0)
CuCl3-2	5.092e-14	3.213e-14	-13.293	-13.493	-0.200	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.087	-149.372	-0.285	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.828	-150.102	-0.274	(0)
Cu (2)	4.587e-06					
CuCO3	3.973e-06	3.973e-06	-5.401	-5.401	0.000	(0)
Cu+2	3.261e-07	2.034e-07	-6.487	-6.692	-0.205	(0)
CuOH+	1.101e-07	9.776e-08	-6.958	-7.010	-0.052	(0)
CuHCO3+	6.899e-08	6.014e-08	-7.161	-7.221	-0.060	(0)
Cu (CO3) 2-2	6.143e-08	3.548e-08	-7.212	-7.450	-0.238	(0)
CuSO4	4.014e-08	4.014e-08	-7.396	-7.396	0.000	(0)
Cu (OH) 2	2.965e-09	2.965e-09	-8.528	-8.528	0.000	(0)
CuF+	2.510e-09	2.188e-09	-8.600	-8.660	-0.060	(0)
CuCl+	4.757e-10	4.223e-10	-9.323	-9.374	-0.052	(0)
Cu2(OH)2+2	4.156e-10	2.401e-10	-9.381	-9.620	-0.238	(0)
Cu (OH) 3-	1.060e-12	9.245e-13	-11.974	-12.034	-0.060	(0)
CuCl2	1.918e-13	1.918e-13	-12.717	-12.717	0.000	(0)
CuCl3-	2.642e-18	2.346e-18	-17.578	-17.630	-0.052	(0)
Cu (OH) 4-2	1.915e-18	1.106e-18	-17.718	-17.956	-0.238	(0)
CuCl4-2	2.441e-23	1.540e-23	-22.612	-22.812	-0.200	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.021	-217.080	-0.060	(0)
F	2.086e-04					
F-	1.919e-04	1.705e-04	-3.717	-3.768	-0.051	(0)
MgF+	1.255e-05	1.116e-05	-4.901	-4.952	-0.051	(0)
CaF+	2.084e-06	1.858e-06	-5.681	-5.731	-0.050	(0)
NaF	4.017e-07	4.017e-07	-6.396	-6.396	0.000	(0)
AlF3	3.631e-07	3.631e-07	-6.440	-6.440	0.000	(0)
AlF2+	1.895e-07	1.691e-07	-6.722	-6.772	-0.049	(0)
MnF+	5.795e-08	5.165e-08	-7.237	-7.287	-0.050	(0)
AlF4-	3.488e-08	3.103e-08	-7.457	-7.508	-0.051	(0)
HF	1.670e-08	1.670e-08	-7.777	-7.777	0.000	(0)
AlF+2	3.925e-09	2.491e-09	-8.406	-8.604	-0.197	(0)
CuF+	2.510e-09	2.188e-09	-8.600	-8.660	-0.060	(0)
ZnF+	1.286e-09	1.121e-09	-8.891	-8.950	-0.060	(0)
BF (OH) 3-	1.044e-09	9.212e-10	-8.981	-9.036	-0.054	(0)
NiF+	4.060e-10	3.540e-10	-9.391	-9.451	-0.060	(0)
CoF+	3.504e-10	3.055e-10	-9.455	-9.515	-0.060	(0)
PbF+	1.510e-11	1.316e-11	-10.821	-10.881	-0.060	(0)
CdF+	1.408e-11	1.227e-11	-10.851	-10.911	-0.060	(0)
HF2-	1.222e-11	1.083e-11	-10.913	-10.965	-0.053	(0)
AgF	4.597e-12	4.597e-12	-11.338	-11.338	0.000	(0)
CrF+2	3.337e-12	1.928e-12	-11.477	-11.715	-0.238	(0)
BF2 (OH) 2-	1.261e-12	1.112e-12	-11.899	-11.954	-0.054	(0)
UO2F+	3.388e-13	2.954e-13	-12.470	-12.530	-0.060	(0)
UO2F2	1.453e-13	1.453e-13	-12.838	-12.838	0.000	(0)
PbF2	4.417e-14	4.417e-14	-13.355	-13.355	0.000	(0)
UO2F3-	7.138e-15	6.223e-15	-14.146	-14.206	-0.060	(0)
CdF2	4.176e-15	4.176e-15	-14.379	-14.379	0.000	(0)
VO2F	1.071e-15	1.071e-15	-14.970	-14.970	0.000	(0)

H2F2	7.475e-16	7.475e-16	-15.126	-15.126	0.000	(0)
FeF2+	4.320e-16	3.850e-16	-15.365	-15.415	-0.050	(0)
FeF+2	1.337e-16	8.437e-17	-15.874	-16.074	-0.200	(0)
FeF3	9.264e-17	9.264e-17	-16.033	-16.033	0.000	(0)
VO2F2-	7.604e-17	6.629e-17	-16.119	-16.179	-0.060	(0)
PbF3-	1.639e-17	1.429e-17	-16.785	-16.845	-0.060	(0)
UO2F4-2	1.459e-17	8.429e-18	-16.836	-17.074	-0.238	(0)
BF3OH-	5.541e-18	4.889e-18	-17.256	-17.311	-0.054	(0)
VOF+	3.758e-18	3.276e-18	-17.425	-17.485	-0.060	(0)
VO2F3-2	2.441e-19	1.410e-19	-18.612	-18.851	-0.238	(0)
VOF2	2.095e-19	2.095e-19	-18.679	-18.679	0.000	(0)
PbF4-2	2.019e-21	1.166e-21	-20.695	-20.933	-0.238	(0)
VOF3-	1.454e-21	1.268e-21	-20.837	-20.897	-0.060	(0)
BF4-	3.080e-22	2.717e-22	-21.511	-21.566	-0.054	(0)
VO2F4-3	4.068e-23	1.183e-23	-22.391	-22.927	-0.536	(0)
HgF+	1.055e-23	9.194e-24	-22.977	-23.037	-0.060	(0)
VOF4-2	1.511e-24	8.725e-25	-23.821	-24.059	-0.238	(0)
Sb(OH) 2F	6.230e-25	6.230e-25	-24.206	-24.206	0.000	(0)
SbOF	6.128e-25	6.128e-25	-24.213	-24.213	0.000	(0)
UF3+	5.848e-35	5.098e-35	-34.233	-34.293	-0.060	(0)
UF2+2	3.266e-36	1.886e-36	-35.486	-35.724	-0.238	(0)
UF4	9.533e-37	9.533e-37	-36.021	-36.021	0.000	(0)
UF5-	7.389e-39	6.442e-39	-38.131	-38.191	-0.060	(0)
UF+3	3.021e-39	8.787e-40	-38.520	-39.056	-0.536	(0)
UF6-2	5.744e-40	3.317e-40	-39.241	-39.479	-0.238	(0)
Fe (2)	2.497e-11					
Fe+2	2.145e-11	1.239e-11	-10.669	-10.907	-0.238	(0)
FeSO4	2.620e-12	2.620e-12	-11.582	-11.582	0.000	(0)
FeHCO3+	8.171e-13	7.309e-13	-12.088	-12.136	-0.048	(0)
FeOH+	8.411e-14	7.496e-14	-13.075	-13.125	-0.050	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.882e-19	4.351e-19	-18.311	-18.361	-0.050	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.482	-159.482	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.148	-236.208	-0.060	(0)
Fe (3)	3.369e-09					
Fe (OH) 2+	2.934e-09	2.619e-09	-8.533	-8.582	-0.049	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.780e-12	6.052e-12	-11.169	-11.218	-0.049	(0)
FeOH+2	7.019e-14	4.429e-14	-13.154	-13.354	-0.200	(0)
FeF2+	4.320e-16	3.850e-16	-15.365	-15.415	-0.050	(0)
FeF+2	1.337e-16	8.437e-17	-15.874	-16.074	-0.200	(0)
FeF3	9.264e-17	9.264e-17	-16.033	-16.033	0.000	(0)
FeSO4+	4.894e-18	4.362e-18	-17.310	-17.360	-0.050	(0)
Fe+3	1.306e-18	4.512e-19	-17.884	-18.346	-0.461	(0)
Fe (SO4) 2-	9.216e-20	8.034e-20	-19.035	-19.095	-0.060	(0)
FeCl+2	2.830e-20	1.785e-20	-19.548	-19.748	-0.200	(0)
FeCl2+	1.172e-22	1.045e-22	-21.931	-21.981	-0.050	(0)
FeHSeO3+2	1.408e-23	8.130e-24	-22.852	-23.090	-0.238	(0)
Fe2 (OH) 2+4	5.835e-25	6.494e-26	-24.234	-25.187	-0.953	(0)
FeCl3	1.369e-26	1.369e-26	-25.864	-25.864	0.000	(0)
Fe3 (OH) 4+5	7.594e-32	2.458e-33	-31.120	-32.609	-1.490	(0)
H (0)	4.026e-29					
H2	2.013e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	8.731e-11					
Hg	8.731e-11	8.731e-11	-10.059	-10.059	0.000	(0)
Hg (1)	2.985e-22					
Hg2+2	1.493e-22	8.621e-23	-21.826	-22.064	-0.238	(0)
Hg (2)	9.823e-13					
HgClOH	5.115e-13	5.115e-13	-12.291	-12.291	0.000	(0)
HgCl2	2.497e-13	2.497e-13	-12.603	-12.603	0.000	(0)
Hg (OH) 2	2.114e-13	2.120e-13	-12.675	-12.674	0.001	(0)
HgCO3	5.775e-15	5.775e-15	-14.238	-14.238	0.000	(0)
HgCl3-	3.752e-15	3.271e-15	-14.426	-14.485	-0.060	(0)
Hg (CO3) 2-2	1.049e-16	6.059e-17	-15.979	-16.218	-0.238	(0)
HgCl+	4.361e-17	3.802e-17	-16.360	-16.420	-0.060	(0)
HgCl4-2	2.954e-17	1.706e-17	-16.530	-16.768	-0.238	(0)
HgOH+	1.010e-17	8.802e-18	-16.996	-17.055	-0.060	(0)
HgHCO3+	8.169e-18	7.121e-18	-17.088	-17.147	-0.060	(0)

	Hg (OH) 3-	4.655e-21	4.058e-21	-20.332	-20.392	-0.060	(0)
	Hg+2	2.518e-21	1.454e-21	-20.599	-20.837	-0.238	(0)
	HgSO4	3.281e-22	3.281e-22	-21.484	-21.484	0.000	(0)
	HgF+	1.055e-23	9.194e-24	-22.977	-23.037	-0.060	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.196	-139.255	-0.060	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.040	-140.040	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-140.546	-140.784	-0.238	(0)
K		2.690e-04					
	K+	2.673e-04	2.376e-04	-3.573	-3.624	-0.051	(0)
	KSO4-	1.623e-06	1.449e-06	-5.790	-5.839	-0.049	(0)
	KCrO4-	1.335e-19	1.164e-19	-18.875	-18.934	-0.060	(0)
Mg		1.073e-03					
	Mg+2	9.355e-04	5.834e-04	-3.029	-3.234	-0.205	(0)
	MgSO4	9.146e-05	9.146e-05	-4.039	-4.039	0.000	(0)
	MgHCO3+	3.151e-05	2.798e-05	-4.501	-4.553	-0.052	(0)
	MgF+	1.255e-05	1.116e-05	-4.901	-4.952	-0.051	(0)
	MgCO3	1.610e-06	1.610e-06	-5.793	-5.793	0.000	(0)
	MgOH+	3.940e-08	3.531e-08	-7.404	-7.452	-0.048	(0)
	MgH2BO3+	2.722e-09	2.402e-09	-8.565	-8.619	-0.054	(0)
Mn (2)		1.521e-05					
	Mn+2	1.317e-05	7.608e-06	-4.880	-5.119	-0.238	(0)
	MnSO4	1.166e-06	1.166e-06	-5.933	-5.933	0.000	(0)
	MnHCO3+	7.983e-07	7.115e-07	-6.098	-6.148	-0.050	(0)
	MnF+	5.795e-08	5.165e-08	-7.237	-7.287	-0.050	(0)
	MnCl+	1.408e-08	1.255e-08	-7.851	-7.901	-0.050	(0)
	MnOH+	3.259e-09	2.905e-09	-8.487	-8.537	-0.050	(0)
	MnCl2	2.322e-11	2.322e-11	-10.634	-10.634	0.000	(0)
	MnCl3-	9.403e-15	8.380e-15	-14.027	-14.077	-0.050	(0)
	MnSeO4	3.636e-15	3.636e-15	-14.439	-14.439	0.000	(0)
	Mn (OH) 3-	4.655e-19	4.148e-19	-18.332	-18.382	-0.050	(0)
	Mn (OH) 4-2	3.227e-25	2.036e-25	-24.491	-24.691	-0.200	(0)
	MnSe	0.000e+00	0.000e+00	-43.265	-43.265	0.000	(0)
Mn (3)		3.856e-25					
	Mn+3	3.856e-25	1.333e-25	-24.414	-24.875	-0.461	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-43.536	-43.736	-0.200	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-47.461	-47.514	-0.053	(0)
Mo		2.475e-07					
	MoO4-2	2.473e-07	1.542e-07	-6.607	-6.812	-0.205	(0)
	HMoO4-	2.331e-10	2.032e-10	-9.632	-9.692	-0.060	(0)
	H2MoO4	9.858e-14	9.858e-14	-13.006	-13.006	0.000	(0)
	Ag2MoO4	6.725e-24	6.725e-24	-23.172	-23.172	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-40.251	-40.788	-0.536	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-49.979	-52.124	-2.145	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-51.427	-52.917	-1.490	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-54.360	-55.313	-0.953	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-58.710	-59.246	-0.536	(0)
Na		4.232e-03					
	Na+	4.202e-03	3.734e-03	-2.377	-2.428	-0.051	(0)
	NaSO4-	1.936e-05	1.728e-05	-4.713	-4.763	-0.049	(0)
	NaHCO3	9.841e-06	9.841e-06	-5.007	-5.007	0.000	(0)
	NaF	4.017e-07	4.017e-07	-6.396	-6.396	0.000	(0)
	NaCO3-	2.585e-07	2.307e-07	-6.588	-6.637	-0.049	(0)
	NaH2BO3	7.026e-10	7.026e-10	-9.153	-9.153	0.000	(0)
	NaCrO4-	2.806e-18	2.447e-18	-17.552	-17.611	-0.060	(0)
Ni		2.126e-07					
	Ni+2	1.325e-07	8.264e-08	-6.878	-7.083	-0.205	(0)
	NiHCO3+	5.477e-08	4.775e-08	-7.261	-7.321	-0.060	(0)
	NiSO4	1.421e-08	1.421e-08	-7.848	-7.848	0.000	(0)
	NiCO3	1.023e-08	1.023e-08	-7.990	-7.990	0.000	(0)
	NiF+	4.060e-10	3.540e-10	-9.391	-9.451	-0.060	(0)
	NiCl+	3.177e-10	2.770e-10	-9.498	-9.558	-0.060	(0)
	NiOH+	1.814e-10	1.581e-10	-9.741	-9.801	-0.060	(0)
	Ni (OH) 2	1.909e-12	1.909e-12	-11.719	-11.719	0.000	(0)
	Ni (SO4) 2-2	7.016e-13	4.052e-13	-12.154	-12.392	-0.238	(0)
	NiCl2	1.827e-15	1.827e-15	-14.738	-14.738	0.000	(0)
	Ni (OH) 3-	3.329e-16	2.902e-16	-15.478	-15.537	-0.060	(0)

NiSeO4	6.864e-17	6.864e-17	-16.163	-16.163	0.000	(0)
O(0)	2.477e-35					
O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	1.826e-08					
PbCO3	1.092e-08	1.092e-08	-7.962	-7.962	0.000	(0)
PbHCO3+	4.375e-09	3.814e-09	-8.359	-8.419	-0.060	(0)
Pb+2	1.756e-09	1.095e-09	-8.755	-8.960	-0.205	(0)
PbOH+	4.798e-10	4.182e-10	-9.319	-9.379	-0.060	(0)
PbSO4	4.622e-10	4.622e-10	-9.335	-9.335	0.000	(0)
Pb(CO3) 2-2	1.810e-10	1.045e-10	-9.742	-9.981	-0.238	(0)
PbCl+	5.841e-11	5.092e-11	-10.234	-10.293	-0.060	(0)
PbF+	1.510e-11	1.316e-11	-10.821	-10.881	-0.060	(0)
Pb(SO4) 2-2	4.154e-12	2.399e-12	-11.382	-11.620	-0.238	(0)
Pb(OH) 2	2.010e-12	2.010e-12	-11.697	-11.697	0.000	(0)
PbCl2	2.980e-13	2.980e-13	-12.526	-12.526	0.000	(0)
PbF2	4.417e-14	4.417e-14	-13.355	-13.355	0.000	(0)
Pb(OH) 3-	3.506e-16	3.056e-16	-15.455	-15.515	-0.060	(0)
PbCl3-	1.783e-16	1.554e-16	-15.749	-15.808	-0.060	(0)
Pb2OH+3	2.496e-17	7.261e-18	-16.603	-17.139	-0.536	(0)
PbF3-	1.639e-17	1.429e-17	-16.785	-16.845	-0.060	(0)
PbCl4-2	1.611e-19	9.308e-20	-18.793	-19.031	-0.238	(0)
Pb(OH) 4-2	1.970e-20	1.138e-20	-19.706	-19.944	-0.238	(0)
PbF4-2	2.019e-21	1.166e-21	-20.695	-20.933	-0.238	(0)
Pb3(OH) 4+2	1.529e-22	8.834e-23	-21.815	-22.054	-0.238	(0)
Pb4(OH) 4+4	6.905e-27	7.686e-28	-26.161	-27.114	-0.953	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.215	-151.215	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.618	-228.678	-0.060	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.917	-72.917	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.703	-78.763	-0.060	(0)
H2S	0.000e+00	0.000e+00	-78.922	-78.922	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.038	-79.097	-0.060	(0)
S5-2	0.000e+00	0.000e+00	-80.710	-80.949	-0.238	(0)
S6-2	0.000e+00	0.000e+00	-81.226	-81.465	-0.238	(0)
S4-2	0.000e+00	0.000e+00	-81.306	-81.544	-0.238	(0)
S3-2	0.000e+00	0.000e+00	-82.112	-82.350	-0.238	(0)
S2-2	0.000e+00	0.000e+00	-83.128	-83.366	-0.238	(0)
S-2	0.000e+00	0.000e+00	-88.684	-88.884	-0.200	(0)
HgHS2-	0.000e+00	0.000e+00	-139.196	-139.255	-0.060	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.040	-140.040	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.546	-140.784	-0.238	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.520	-147.580	-0.060	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.733	-147.884	-0.151	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.087	-149.372	-0.285	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.828	-150.102	-0.274	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.855	-150.145	-0.291	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.959	-150.018	-0.060	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.177	-150.456	-0.279	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.656	-150.656	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.187	-151.187	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.215	-151.215	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.482	-159.482	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-217.021	-217.080	-0.060	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.610	-226.670	-0.060	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-227.459	-227.518	-0.060	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.618	-228.678	-0.060	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.232	-229.471	-0.238	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.148	-236.208	-0.060	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-303.846	-304.085	-0.238	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.654	-306.892	-0.238	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.685	-318.923	-0.238	(0)
S(6)	1.692e-03					
SO4-2	1.382e-03	8.615e-04	-2.860	-3.065	-0.205	(0)
CaSO4	1.970e-04	1.970e-04	-3.706	-3.706	0.000	(0)
MgSO4	9.146e-05	9.146e-05	-4.039	-4.039	0.000	(0)
NaSO4-	1.936e-05	1.728e-05	-4.713	-4.763	-0.049	(0)
KSO4-	1.623e-06	1.449e-06	-5.790	-5.839	-0.049	(0)
MnSO4	1.166e-06	1.166e-06	-5.933	-5.933	0.000	(0)

ZnSO4	6.209e-08	6.209e-08	-7.207	-7.207	0.000	(0)
CuSO4	4.014e-08	4.014e-08	-7.396	-7.396	0.000	(0)
NiSO4	1.421e-08	1.421e-08	-7.848	-7.848	0.000	(0)
CoSO4	9.737e-09	9.737e-09	-8.012	-8.012	0.000	(0)
HSO4-	6.268e-09	5.576e-09	-8.203	-8.254	-0.051	(0)
CdSO4	9.172e-10	9.172e-10	-9.038	-9.038	0.000	(0)
Zn (SO4) 2-2	8.066e-10	4.659e-10	-9.093	-9.332	-0.238	(0)
PbSO4	4.622e-10	4.622e-10	-9.335	-9.335	0.000	(0)
AgSO4-	2.116e-10	1.845e-10	-9.674	-9.734	-0.060	(0)
CrOHSO4	4.849e-11	4.849e-11	-10.314	-10.314	0.000	(0)
Cd (SO4) 2-2	1.846e-11	1.066e-11	-10.734	-10.972	-0.238	(0)
AlSO4+	1.098e-11	9.770e-12	-10.959	-11.010	-0.051	(0)
Pb (SO4) 2-2	4.154e-12	2.399e-12	-11.382	-11.620	-0.238	(0)
FeSO4	2.620e-12	2.620e-12	-11.582	-11.582	0.000	(0)
Ni (SO4) 2-2	7.016e-13	4.052e-13	-12.154	-12.392	-0.238	(0)
CrSO4+	1.646e-13	1.435e-13	-12.784	-12.843	-0.060	(0)
Al (SO4) 2-	1.014e-13	9.019e-14	-12.994	-13.045	-0.051	(0)
UO2SO4	1.636e-14	1.636e-14	-13.786	-13.786	0.000	(0)
UO2 (SO4) 2-2	3.217e-16	1.858e-16	-15.492	-15.731	-0.238	(0)
VO2SO4-	8.448e-17	7.365e-17	-16.073	-16.133	-0.060	(0)
FeSO4+	4.894e-18	4.362e-18	-17.310	-17.360	-0.050	(0)
Cr2 (OH) 2SO4+2	1.800e-18	1.040e-18	-17.745	-17.983	-0.238	(0)
VOSO4	7.601e-19	7.601e-19	-18.119	-18.119	0.000	(0)
Fe (SO4) 2-	9.216e-20	8.034e-20	-19.035	-19.095	-0.060	(0)
Cr2 (OH) 2 (SO4) 2	5.320e-20	5.320e-20	-19.274	-19.274	0.000	(0)
HgSO4	3.281e-22	3.281e-22	-21.484	-21.484	0.000	(0)
CrO3SO4-2	8.504e-25	4.912e-25	-24.070	-24.309	-0.238	(0)
VSO4+	8.302e-33	7.238e-33	-32.081	-32.140	-0.060	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.217	-40.217	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.814	-41.053	-0.238	(0)
Sb (3)	6.978e-20					
Sb (OH) 3	3.531e-20	3.531e-20	-19.452	-19.452	0.000	(0)
HSbO2	3.447e-20	3.447e-20	-19.463	-19.463	0.000	(0)
SbO2-	9.671e-25	8.431e-25	-24.015	-24.074	-0.060	(0)
Sb (OH) 2F	6.230e-25	6.230e-25	-24.206	-24.206	0.000	(0)
SbOF	6.128e-25	6.128e-25	-24.213	-24.213	0.000	(0)
Sb (OH) 4-	5.539e-25	4.829e-25	-24.257	-24.316	-0.060	(0)
Sb (OH) 2+	6.515e-26	5.679e-26	-25.186	-25.246	-0.060	(0)
SbO+	2.247e-26	1.958e-26	-25.648	-25.708	-0.060	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.685	-318.923	-0.238	(0)
Sb (5)	8.988e-09					
SbO3-	8.978e-09	7.827e-09	-8.047	-8.106	-0.060	(0)
Sb (OH) 6-	1.029e-11	9.148e-12	-10.987	-11.039	-0.051	(0)
SbO2+	1.130e-23	9.847e-24	-22.947	-23.007	-0.060	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.316e-40	1.147e-40	-39.881	-39.940	-0.060	(0)
H2Se	0.000e+00	0.000e+00	-43.229	-43.229	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.265	-43.265	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.523	-47.761	-0.238	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.869	-86.822	-0.953	(0)
Se (4)	8.531e-09					
HSeO3-	7.822e-09	6.819e-09	-8.107	-8.166	-0.060	(0)
SeO3-2	7.097e-10	4.099e-10	-9.149	-9.387	-0.238	(0)
H2SeO3	1.926e-13	1.926e-13	-12.715	-12.715	0.000	(0)
AgSeO3-	3.243e-15	2.827e-15	-14.489	-14.549	-0.060	(0)
Cd (SeO3) 2-2	1.089e-21	6.289e-22	-20.963	-21.201	-0.238	(0)
Ag (SeO3) 2-3	3.568e-23	1.038e-23	-22.448	-22.984	-0.536	(0)
FeHSeO3+2	1.408e-23	8.130e-24	-22.852	-23.090	-0.238	(0)
Se (6)	2.851e-12					
SeO4-2	2.848e-12	1.776e-12	-11.546	-11.751	-0.205	(0)
MnSeO4	3.636e-15	3.636e-15	-14.439	-14.439	0.000	(0)
ZnSeO4	9.060e-17	9.060e-17	-16.043	-16.043	0.000	(0)
NiSeO4	6.864e-17	6.864e-17	-16.163	-16.163	0.000	(0)
CoSeO4	5.041e-17	5.041e-17	-16.297	-16.297	0.000	(0)
HSeO4-	6.761e-18	5.894e-18	-17.170	-17.230	-0.060	(0)
CdSeO4	1.502e-18	1.502e-18	-17.823	-17.823	0.000	(0)
Zn (SeO4) 2-2	2.824e-28	1.631e-28	-27.549	-27.787	-0.238	(0)

U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.441	-58.977	-0.536	(0)
U (4)	1.766e-22					
U (OH) 5-	1.762e-22	1.536e-22	-21.754	-21.814	-0.060	(0)
U (OH) 4	4.261e-25	4.261e-25	-24.370	-24.370	0.000	(0)
U (OH) 3+	1.184e-28	1.032e-28	-27.927	-27.986	-0.060	(0)
U (OH) 2+2	5.472e-33	3.161e-33	-32.262	-32.500	-0.238	(0)
UF3+	5.848e-35	5.098e-35	-34.233	-34.293	-0.060	(0)
UF2+2	3.266e-36	1.886e-36	-35.486	-35.724	-0.238	(0)
UF4	9.533e-37	9.533e-37	-36.021	-36.021	0.000	(0)
UOH+3	3.390e-38	9.861e-39	-37.470	-38.006	-0.536	(0)
UF5-	7.389e-39	6.442e-39	-38.131	-38.191	-0.060	(0)
UF+3	3.021e-39	8.787e-40	-38.520	-39.056	-0.536	(0)
UF6-2	5.744e-40	3.317e-40	-39.241	-39.479	-0.238	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.217	-40.217	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.814	-41.053	-0.238	(0)
U+4	0.000e+00	0.000e+00	-43.634	-44.588	-0.953	(0)
UC1+3	0.000e+00	0.000e+00	-45.234	-45.771	-0.536	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-172.173	-177.000	-4.827	(0)
U (5)	2.238e-17					
UO2+	2.238e-17	1.951e-17	-16.650	-16.710	-0.060	(0)
U (6)	3.556e-08					
UO2 (CO3) 2-2	1.900e-08	1.097e-08	-7.721	-7.960	-0.238	(0)
UO2 (CO3) 3-4	1.639e-08	1.825e-09	-7.785	-8.739	-0.953	(0)
UO2CO3	1.657e-10	1.657e-10	-9.781	-9.781	0.000	(0)
UO2F+	3.388e-13	2.954e-13	-12.470	-12.530	-0.060	(0)
UO2OH+	2.755e-13	2.401e-13	-12.560	-12.620	-0.060	(0)
UO2F2	1.453e-13	1.453e-13	-12.838	-12.838	0.000	(0)
UO2+2	2.012e-14	1.255e-14	-13.696	-13.901	-0.205	(0)
UO2SO4	1.636e-14	1.636e-14	-13.786	-13.786	0.000	(0)
UO2F3-	7.138e-15	6.223e-15	-14.146	-14.206	-0.060	(0)
UO2 (SO4) 2-2	3.217e-16	1.858e-16	-15.492	-15.731	-0.238	(0)
UO2C1+	3.059e-17	2.666e-17	-16.514	-16.574	-0.060	(0)
UO2F4-2	1.459e-17	8.429e-18	-16.836	-17.074	-0.238	(0)
(UO2) 2 (OH) 2+2	1.657e-19	9.570e-20	-18.781	-19.019	-0.238	(0)
(UO2) 3 (OH) 5+	4.621e-22	4.028e-22	-21.335	-21.395	-0.060	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.902	-40.961	-0.060	(0)
V+2	0.000e+00	0.000e+00	-41.415	-41.653	-0.238	(0)
V (3)	5.042e-14					
V (OH) 3	5.042e-14	5.042e-14	-13.297	-13.297	0.000	(0)
V (OH) 2+	2.475e-24	2.158e-24	-23.606	-23.666	-0.060	(0)
VOH+2	2.347e-27	1.356e-27	-26.629	-26.868	-0.238	(0)
V+3	6.119e-32	1.780e-32	-31.213	-31.750	-0.536	(0)
VSO4+	8.302e-33	7.238e-33	-32.081	-32.140	-0.060	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-51.546	-52.082	-0.536	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-51.982	-52.936	-0.953	(0)
V (4)	1.217e-16					
V (OH) 3+	1.114e-16	9.713e-17	-15.953	-16.013	-0.060	(0)
VO+2	5.546e-18	3.203e-18	-17.256	-17.494	-0.238	(0)
VOF+	3.758e-18	3.276e-18	-17.425	-17.485	-0.060	(0)
VOSO4	7.601e-19	7.601e-19	-18.119	-18.119	0.000	(0)
VOF2	2.095e-19	2.095e-19	-18.679	-18.679	0.000	(0)
VOC1+	1.351e-20	1.177e-20	-19.869	-19.929	-0.060	(0)
VOF3-	1.454e-21	1.268e-21	-20.837	-20.897	-0.060	(0)
VOF4-2	1.511e-24	8.725e-25	-23.821	-24.059	-0.238	(0)
H2V2O4+2	8.191e-28	4.731e-28	-27.087	-27.325	-0.238	(0)
V (5)	4.963e-08					
H2VO4-	4.690e-08	4.089e-08	-7.329	-7.388	-0.060	(0)
HVO4-2	2.685e-09	1.551e-09	-8.571	-8.809	-0.238	(0)
H3VO4	2.708e-11	2.708e-11	-10.567	-10.567	0.000	(0)
H3V2O7-	8.203e-12	7.151e-12	-11.086	-11.146	-0.060	(0)
HV2O7-3	7.391e-14	2.150e-14	-13.131	-13.668	-0.536	(0)
VO2+	4.029e-15	3.580e-15	-14.395	-14.446	-0.051	(0)
VO2F	1.071e-15	1.071e-15	-14.970	-14.970	0.000	(0)
VO4-3	4.036e-16	1.174e-16	-15.394	-15.930	-0.536	(0)
V3O9-3	2.464e-16	7.165e-17	-15.608	-16.145	-0.536	(0)
VO2SO4-	8.448e-17	7.365e-17	-16.073	-16.133	-0.060	(0)

V2O7-4	7.849e-17	8.737e-18	-16.105	-17.059	-0.953	(0)
VO2F2-	7.604e-17	6.629e-17	-16.119	-16.179	-0.060	(0)
VO2F3-2	2.441e-19	1.410e-19	-18.612	-18.851	-0.238	(0)
V4O12-4	1.098e-20	1.222e-21	-19.960	-20.913	-0.953	(0)
VO2F4-3	4.068e-23	1.183e-23	-22.391	-22.927	-0.536	(0)
HV10O28-5	0.000e+00	0.000e+00	-51.195	-52.685	-1.490	(0)
V10O28-6	0.000e+00	0.000e+00	-51.547	-53.693	-2.145	(0)
H2V10O28-4	0.000e+00	0.000e+00	-53.703	-54.656	-0.953	(0)
Zn	7.186e-07					
Zn+2	5.282e-07	3.294e-07	-6.277	-6.482	-0.205	(0)
ZnCO3	6.289e-08	6.289e-08	-7.201	-7.201	0.000	(0)
ZnSO4	6.209e-08	6.209e-08	-7.207	-7.207	0.000	(0)
ZnHCO3+	5.600e-08	4.882e-08	-7.252	-7.311	-0.060	(0)
ZnOH+	5.744e-09	5.007e-09	-8.241	-8.300	-0.060	(0)
ZnF+	1.286e-09	1.121e-09	-8.891	-8.950	-0.060	(0)
ZnCl+	1.221e-09	1.084e-09	-8.913	-8.965	-0.052	(0)
Zn (SO4) 2-2	8.066e-10	4.659e-10	-9.093	-9.332	-0.238	(0)
ZnOHCl	2.157e-10	2.157e-10	-9.666	-9.666	0.000	(0)
Zn (OH) 2	1.206e-10	1.206e-10	-9.919	-9.919	0.000	(0)
ZnCl2	2.251e-12	2.251e-12	-11.648	-11.648	0.000	(0)
Zn (OH) 3-	1.054e-13	9.190e-14	-12.977	-13.037	-0.060	(0)
ZnCl3-	2.638e-15	2.343e-15	-14.579	-14.630	-0.052	(0)
ZnSeO4	9.060e-17	9.060e-17	-16.043	-16.043	0.000	(0)
ZnCl4-2	2.432e-18	1.535e-18	-17.614	-17.814	-0.200	(0)
Zn (OH) 4-2	9.629e-19	5.562e-19	-18.016	-18.255	-0.238	(0)
Zn (SeO4) 2-2	2.824e-28	1.631e-28	-27.549	-27.787	-0.238	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.959	-150.018	-0.060	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.187	-151.187	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.610	-226.670	-0.060	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.232	-229.471	-0.238	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.654	-306.892	-0.238	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.30	-87.52	-36.22	Ag2S
Ag2CO3	-10.33	-21.42	-11.09	Ag2CO3
Ag2CrO4	-20.23	-31.82	-11.59	Ag2CrO4
Ag2HVO4	-10.33	-8.85	1.48	Ag2HVO4
Ag2MoO4	-11.20	-22.75	-11.55	Ag2MoO4
Ag2O	-14.15	-1.58	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.18	-19.00	-4.82	Ag2SO4
Ag3AsO3	-26.79	-24.64	2.16	Ag3AsO3
Ag3AsO4	-15.20	-17.99	-2.79	Ag3AsO4
Ag3H2VO5	-14.82	-9.64	5.18	Ag3H2VO5
AgF:4H2O	-12.79	-11.74	1.05	AgF:4H2O
Agmetal	-0.06	-13.56	-13.51	Ag
AgVO3	-8.83	-8.06	0.77	AgVO3
Al (OH) 3 (am)	-1.10	9.70	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.47	-44.11	2.37	Al2 (MoO4) 3
Al2O3	-0.25	19.40	19.65	Al2O3
Al4 (OH) 10SO4	-1.32	21.38	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.72	-5.92	4.80	AlAsO4:2H2O
AlOHSO4	-4.49	-7.72	-3.23	AlOHSO4
AlSb	-152.01	-86.38	65.62	AlSb
Alunite	-0.79	-2.19	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.24	-12.03	-7.79	PbSO4
Anhydrite	-1.71	-6.07	-4.36	CaSO4
Anilite	-55.77	-87.65	-31.88	Cu0.25Cu1.5S
Antlerite	-3.21	5.58	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-86.30	-89.06	-2.76	As4O6
Artinite	-7.19	2.41	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.94	-31.24	6.71	As2O5

Atacamite	-2.12	5.27	7.39	Cu ₂ (OH) ₃ Cl
Azurite	0.23	-16.68	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-16.95	7.44	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-15.52	0.35	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-25.15	7.79	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-13.13	-22.80	-9.67	BaCrO ₄
BaF ₂	-8.63	-14.45	-5.82	BaF ₂
BaMoO ₄	-6.77	-13.73	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.73	-7.90	1.83	BaSeO ₃
BaSeO ₄	-11.21	-18.67	-7.46	BaSeO ₄
Bianchite	-7.78	-9.55	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-8.66	9.43	18.09	MnO ₂
Bixbyite	-6.03	-6.68	-0.64	Mn ₂ O ₃
BlaubleiI	-55.36	-79.53	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-56.00	-83.27	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.12	9.70	8.58	AlOOH
Breithauptite	-57.52	-76.04	-18.52	NiSb
Brochantite	-1.98	13.24	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.72	11.12	16.84	Mg(OH) ₂
Bunsenite	-5.17	7.28	12.45	NiO
Ca(VO ₃) ₂	-8.84	-3.18	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-9.32	8.18	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-13.37	8.18	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-19.47	2.83	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-19.42	19.54	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-20.32	19.54	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-301.08	-158.10	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-9.92	-27.83	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.86	-9.81	-7.95	CaMoO ₄
Carnotite	-3.49	-3.26	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-6.80	-3.99	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-11.73	-14.75	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-13.56	-3.72	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.63	6.01	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.72	6.01	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.51	-16.80	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.94	0.62	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.76	6.64	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.45	-14.11	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.42	-14.11	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-12.20	-14.11	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-14.67	-15.88	-1.21	CdF ₂
Cdmetal(α)	-33.04	-19.53	13.51	Cd
Cdmetal(γ)	-33.15	-19.53	13.62	Cd
CdMoO ₄	-1.00	-15.15	-14.15	CdMoO ₄
CdOHC1	-7.58	-4.05	3.54	CdOHC1
CdSb	-76.95	-77.30	-0.35	CdSb
CdSe	-20.90	-41.10	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-18.24	-20.09	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-11.24	-11.41	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.68	-11.41	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-9.53	-11.41	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.10	-10.85	-9.75	AgCl
Cerrusite	-1.31	-14.44	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-7.12	-9.76	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-55.85	-90.77	-34.92	Cu ₂ S
Chalcopyrite	-125.50	-160.77	-35.27	CuFeS ₂
Cinnabar	-52.92	-98.61	-45.69	HgS
Claudetite	-86.00	-89.06	-3.06	As ₄ O ₆
Clausthalite	-14.62	-41.72	-27.10	PbSe
Co(BO ₂) ₂	-29.70	-2.63	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.98	7.11	13.09	Co(OH) ₂

Co(OH) 3	-10.21	-12.52	-2.31	Co(OH) 3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4) 2	-22.94	-9.90	13.03	Co3(AsO4) 2
Co3O4	-7.43	-17.92	-10.50	Co3O4
CoCl2	-21.28	-13.01	8.27	CoCl2
CoCl2:6H2O	-15.55	-13.01	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-13.19	-14.78	-1.60	CoF2
CoF3	-43.90	-45.36	-1.46	CoF3
CoFe2O4	17.02	13.49	-3.53	CoFe2O4
CoMoO4	-6.30	-14.06	-7.76	CoMoO4
CoO	-6.48	7.11	13.59	CoO
CoS(alpha)	-71.39	-78.83	-7.44	CoS
CoS(beta)	-67.76	-78.83	-11.07	CoS
CoSe	-23.81	-40.01	-16.20	CoSe
CoSeO3	-9.55	-8.23	1.32	CoSeO3
CoSeO4:6H2O	-17.47	-19.00	-1.53	CoSeO4:6H2O
CoSO4	-13.11	-10.31	2.80	CoSO4
CoSO4:6H2O	-7.84	-10.31	-2.47	CoSO4:6H2O
Cotunnite	-9.95	-14.73	-4.78	PbCl2
Covellite	-55.98	-78.28	-22.30	CuS
Cr(OH) 2	-21.82	-11.00	10.82	Cr(OH) 2
Cr(OH) 3	-2.51	-1.18	1.34	Cr(OH) 3
Cr(OH) 3(am)	-0.43	-1.18	-0.75	Cr(OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.22	-31.13	14.09	CrCl2
CrCl3	-46.48	-31.36	15.11	CrCl3
CrF3	-22.68	-34.02	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.89	-41.73	-33.84	Na3AlF6
Cu(OH) 2	-1.01	7.67	8.67	Cu(OH) 2
Cu(SbO3) 2	-25.36	19.85	45.21	Cu(SbO3) 2
Cu2Sb:3H2O	-55.95	-90.84	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.15	-51.95	-45.80	Cu2Se
Cu2SO4	-20.30	-22.25	-1.95	Cu2SO4
Cu3(AsO4) 2:2H2O	-14.34	-8.24	6.10	Cu3(AsO4) 2:2H2O
Cu3Sb	-60.74	-103.33	-42.59	Cu3Sb
Cu3Se2	-27.91	-91.40	-63.49	Cu3Se2
CuCO3	-0.67	-12.17	-11.50	CuCO3
CuCrO4	-17.13	-22.57	-5.44	CuCrO4
CuF	-8.46	-13.36	-4.91	CuF
CuF2	-15.34	-14.23	1.12	CuF2
CuF2:2H2O	-9.68	-14.23	-4.55	CuF2:2H2O
Cumetal	-6.43	-15.19	-8.76	Cu
CuMoO4	-0.43	-13.50	-13.08	CuMoO4
CuOCuSO4	-12.39	-2.09	10.30	CuOCuSO4
Cupricferrite	8.06	14.05	5.99	CuFe2O4
Cuprite	-3.43	-4.83	-1.41	Cu2O
Cuprousferrite	9.69	0.77	-8.92	CuFeO2
CuSe	-6.35	-39.45	-33.10	CuSe
CuSe2	-27.66	-61.03	-33.37	CuSe2
CuSeO3:2H2O	-8.19	-7.68	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.00	-18.44	-2.44	CuSeO4:5H2O
CuSO4	-12.70	-9.76	2.94	CuSO4
Diaspore	2.83	9.70	6.87	AlOOH
Djurleite	-56.03	-89.95	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.65	-17.19	-16.54	CaMg(CO3) 2
Dolomite(ordered)	-0.10	-17.19	-17.09	CaMg(CO3) 2
Epsomite	-4.17	-6.30	-2.13	MgSO4:7H2O
Fe(OH) 2	-10.11	3.45	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	3.21	0.17	-3.04	Fe(OH) 2.7Cl.3
Fe(VO3) 2	-7.36	-11.08	-3.72	Fe(VO3) 2
Fe2(OH) 4SeO3	-10.52	-8.96	1.55	Fe2(OH) 4SeO3
Fe2(SeO3) 3:2H2O	-19.03	-39.65	-20.63	Fe2(SeO3) 3:2H2O
Fe2(SO4) 3	-42.15	-45.89	-3.73	Fe2(SO4) 3
Fe3(OH) 8	-10.39	9.83	20.22	Fe3(OH) 8
FeAsO4:2H2O	-12.83	-12.43	0.40	FeAsO4:2H2O

FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.63	-17.72	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.65	-65.24	-18.60	FeSe2
FeS(ppt)	-79.54	-82.49	-2.95	FeS
FeSe	-32.67	-43.67	-11.00	FeSe
Fix_pe	-5.59	-5.59	0.00	e-
Fluorite	-0.04	-10.54	-10.50	CaF2
Galena	-66.57	-80.54	-13.97	PbS
Gibbsite	1.41	9.70	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.54	-9.55	-2.01	ZnSO4:7H2O
Greenockite	-65.57	-79.93	-14.36	CdS
Greigite	-288.90	-333.93	-45.03	Fe3S4
Gummite	-7.22	0.46	7.67	UO3
Gypsum	-1.46	-6.07	-4.61	CaSO4:2H2O
H-Jarosite	-13.17	-25.27	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.29	-21.17	-12.88	H2MoO4
H2S(g)	-77.93	-85.94	-8.01	H2S
H2Se(g)	-42.16	-47.12	-4.96	H2Se
Halite	-6.91	-5.31	1.60	NaCl
Hausmannite	-7.77	53.26	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.04	22.85	22.89	FeAl2O4
Hg(CH3)2(g)	-183.00	-256.71	-73.71	Hg(CH3)2
Hg(g)	-8.75	-16.63	-7.87	Hg
Hg(OH)2	-9.18	-12.67	-3.50	Hg(OH)2
Hg2(g)	-18.30	-33.25	-14.96	Hg2
Hg2(OH)2	-12.97	-7.71	5.26	Hg2(OH)2
Hg2CO3	-11.49	-27.54	-16.05	Hg2CO3
Hg2CrO4	-29.24	-37.94	-8.70	Hg2CrO4
Hg2F2	-19.24	-29.60	-10.36	Hg2F2
Hg2S	-81.97	-93.65	-11.68	Hg2S
Hg2SeO3	-18.39	-23.05	-4.66	Hg2SeO3
Hg2SO4	-19.00	-25.13	-6.13	Hg2SO4
Hg3O2CO3	-28.18	-57.86	-29.68	Hg3O2CO3
HgCl(g)	-33.41	-13.91	19.50	HgCl
HgCl2	-11.53	-32.80	-21.26	HgCl2
HgF(g)	-47.48	-14.80	32.68	HgF
HgF2(g)	-47.13	-34.57	12.57	HgF2
Hgmetal(l)	-3.17	-16.63	-13.45	Hg
HgSe	-4.10	-59.79	-55.69	HgSe
HgSeO3	-15.59	-28.02	-12.43	HgSeO3
HgSO4	-20.68	-30.10	-9.42	HgSO4
Huntite	-4.65	-34.62	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.71	-23.48	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.96	-23.73	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.42	-21.59	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.92	-21.72	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-36.12	-53.37	-17.24	K2Cr2O7
K2CrO4	-22.61	-23.13	-0.51	K2CrO4
K2MoO4	-17.32	-14.06	3.26	K2MoO4
K2SeO4	-18.27	-19.00	-0.73	K2SeO4
Langite	-4.25	13.24	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.19	-6.63	-0.43	PbO:PbSO4
Laurionite	-5.29	-4.66	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.30	5.40	12.69	PbO
Mackinawite	-78.89	-82.49	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.65	17.51	16.86	Fe2MgO4
Magnesite	-1.25	-8.71	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.80	-4.50	-5.31	Cu2(OH)2CO3
Manganite	-3.33	22.01	25.34	MnOOH
Massicot	-7.50	5.40	12.89	PbO
Matlockite	-6.64	-15.61	-8.97	PbClF

Melanothallite	-18.71	-12.46	6.26	CuCl ₂
Melanterite	-11.76	-13.97	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-53.52	-98.61	-45.09	HgS
Mg(OH) ₂ (active)	-7.67	11.12	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.69	-3.41	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.83	-202.15	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.65	7.71	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.43	8.77	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.49	-19.11	5.38	MgCrO ₄
MgF ₂	-2.64	-10.77	-8.13	MgF ₂
MgMoO ₄	-8.20	-10.05	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-7.28	-4.22	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-13.79	-14.99	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.78	41.74	73.52	Pb ₃ O ₄
Mirabilite	-6.81	-7.92	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-10.20	-5.30	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-53.23	-58.94	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.46	-90.38	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-16.02	-3.52	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.60	-10.88	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.87	-76.70	0.17	MnS
MnS (pnk)	-80.04	-76.70	3.34	MnS
MnSb	-96.51	-99.42	-2.91	MnSb
MnSe	-41.38	-37.88	3.50	MnSe
MnSeO ₃	-7.24	-6.11	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-7.09	-6.11	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-14.82	-16.87	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.77	-8.18	2.58	MnSO ₄
Monteponite	-9.09	6.02	15.10	CdO
Montroydite	-9.03	-12.67	-3.64	HgO
MoO ₃	-13.17	-21.17	-8.00	MoO ₃
Morenosite	-8.00	-10.15	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-148.34	-218.60	-70.26	MoS ₂
Na-Jarosite	-9.32	-20.52	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.08	-50.97	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.67	-20.74	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-16.24	-32.84	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-13.16	-11.67	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.89	-11.67	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-16.14	-5.84	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-17.89	-16.61	1.28	Na ₂ SeO ₄
Na ₃ Sb	-176.28	-81.83	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.70	6.99	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.93	4.47	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.75	-12.48	-6.73	CuCl
NaSb	-88.96	-65.79	23.17	NaSb
Natron	-9.03	-10.34	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.37	-2.52	3.86	NaVO ₃
Nesquehonite	-4.04	-8.71	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.52	7.27	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-25.11	-9.41	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.32	11.68	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.69	-12.56	-6.87	NiCO ₃
NiMoO ₄	-2.75	-13.89	-11.14	NiMoO ₄
NiS (alpha)	-73.07	-78.67	-5.60	NiS
NiS (beta)	-67.57	-78.67	-11.10	NiS
NiS (gamma)	-65.87	-78.67	-12.80	NiS
NiSe	-22.14	-39.84	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.89	-8.07	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.31	-18.83	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-8.07	9.43	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-241.29	-302.36	-61.07	As ₂ S ₃
Otavite	-1.82	-13.82	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.86	-4.34	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.75	5.40	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-56.29	-65.05	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.06	0.73	8.79	Pb ₂ (OH) ₃ Cl

Pb2O(OH)2	-15.39	10.79	26.19	Pb2O(OH)2
Pb2O3	-24.70	36.34	61.04	Pb2O3
Pb2OCO3	-8.48	-9.04	-0.56	Pb2OCO3
Pb2V2O7	-1.84	-3.74	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.85	-15.05	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.48	1.66	6.14	Pb3(VO4)2
Pb3O2CO3	-14.66	-3.64	11.02	Pb3O2CO3
Pb3O2SO4	-11.92	-1.23	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.93	4.17	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.71	4.17	21.88	Pb4O3SO4
PbCrO4	-12.24	-24.84	-12.60	PbCrO4
PbF2	-9.06	-16.50	-7.44	PbF2
Pbmetal	-24.39	-20.15	4.25	Pb
PbMoO4	-0.15	-15.77	-15.62	PbMoO4
PbO:0.3H2O	-7.58	5.40	12.98	PbO:0.33H2O
PbSeO4	-13.87	-20.71	-6.84	PbSeO4
Periclase	-10.46	11.12	21.58	MgO
Phosgenite	-9.36	-29.17	-19.81	PbCl2:PbCO3
Plattnerite	-18.66	30.94	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.38	-142.89	-18.51	FeS2
Pyrochroite	-5.95	9.24	15.19	Mn(OH)2
Pyrolusite	-6.60	34.78	41.38	MnO2
Realgar	-101.23	-120.98	-19.75	AsS
Retgersite	-8.11	-10.15	-2.04	NiSO4:6H2O
Rhodochrosite	-0.02	-10.60	-10.58	MnCO3
Rutherfordine	-4.88	-19.38	-14.50	UO2CO3
Sb(OH)3	-12.34	-19.45	-7.11	Sb(OH)3
Sb2O4	-16.76	-13.36	3.40	Sb2O4
Sb2O5	-26.77	-36.43	-9.67	Sb2O5
Sb2Se3	-112.50	-180.26	-67.76	Sb2Se3
Sb4O6(cubic)	-59.55	-77.81	-18.26	Sb4O6
Sb4O6(orth)	-59.91	-77.81	-17.90	Sb4O6
SbCl3	-50.21	-49.64	0.57	SbCl3
SbF3	-42.07	-52.29	-10.23	SbF3
Sbmetal	-46.08	-57.77	-11.69	Sb
SbO2	-3.17	-30.99	-27.82	SbO2
Schoepite	-5.54	0.46	5.99	UO2(OH)2:H2O
Semetal(am)	-14.46	-21.57	-7.11	Se
Semetal(hex)	-13.87	-21.57	-7.71	Se
Senarmontite	-26.54	-38.90	-12.37	Sb2O3
SeO2	-15.47	-15.35	0.12	SeO2
SeO3	-47.15	-26.11	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.96	-11.96	-10.00	ZnCO3
Sphalerite	-66.62	-78.07	-11.45	ZnS
Spinel	-6.32	30.53	36.85	MgAl2O4
Stibnite	-246.27	-296.73	-50.46	Sb2S3
Sulfur	-58.25	-60.40	-2.14	S
Tenorite	0.02	7.67	7.64	CuO
Thenardite	-8.24	-7.92	0.32	Na2SO4
Thermonatrite	-10.97	-10.33	0.64	Na2CO3:H2O
Tyuyamunite	-6.34	-2.26	4.08	Ca(UO2)2(VO4)2
U3O8	-17.61	3.47	21.08	U3O8
U3Sb4	-584.34	-431.96	152.38	U3Sb4
U4O9	-34.92	-37.94	-3.02	U4O9
UF4	-30.12	-59.66	-29.54	UF4
UF4:2.5H2O	-26.94	-59.66	-32.72	UF4:2.5H2O
UO2(am)	-16.81	-15.87	0.93	UO2
UO2(OH)2(beta)	-5.16	0.46	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.40	-25.65	-2.25	UO2SeO4:4H2O
UO3	-7.24	0.46	7.70	UO3
Uraninite	-11.20	-15.87	-4.67	UO2
USb2	-221.29	-191.72	29.58	USb2
V(OH)3	-17.80	-10.21	7.59	V(OH)3
V2O5	-13.17	-14.53	-1.36	V2O5
V3O5	-36.79	-34.95	1.84	V3O5
V4O7	-45.28	-38.09	7.19	V4O7

V6O13	-33.83	-94.69	-60.86	V6O13
Valentinite	-30.42	-38.90	-8.48	Sb2O3
VC12	-61.98	-43.11	18.87	VC12
VC13	-63.83	-40.40	23.43	VC13
VF4	-61.86	-46.93	14.93	VF4
Vmetal	-92.56	-48.53	44.03	V
VO	-37.74	-22.99	14.76	VO
VO(OH)2	-8.29	-3.14	5.15	VO(OH)2
VO2Cl	-20.17	-17.33	2.84	VO2Cl
VOC1	-31.43	-20.27	11.15	VOC1
VOC12	-36.02	-23.26	12.76	VOC12
VOSO4	-24.17	-20.56	3.61	VOSO4
Witherite	-3.82	-12.39	-8.57	BaCO3
Wurtzite	-69.12	-78.07	-8.95	ZnS
Zincite	-3.46	7.88	11.33	ZnO
Zincosite	-13.48	-9.55	3.93	ZnSO4
Zn(BO2)2	-10.15	-1.86	8.29	Zn(BO2)2
Zn(OH)2	-4.32	7.88	12.20	Zn(OH)2
Zn(OH)2(am)	-4.60	7.88	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.88	7.88	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.66	7.88	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.86	7.88	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.17	-1.67	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.50	5.69	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-21.26	-7.61	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.13	-11.22	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-14.32	14.08	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.25	19.25	38.50	Zn5(OH)8Cl2
ZnCl2	-19.30	-12.25	7.05	ZnCl2
ZnCO3:1H2O	-1.70	-11.96	-10.26	ZnCO3:1H2O
ZnF2	-13.48	-14.02	-0.53	ZnF2
Znmetal	-43.46	-17.67	25.79	Zn
ZnMoO4	-3.17	-13.29	-10.13	ZnMoO4
ZnO(active)	-3.31	7.88	11.19	ZnO
ZnS(am)	-69.01	-78.07	-9.05	ZnS
ZnSb	-86.45	-75.44	11.01	ZnSb
ZnSe	-24.84	-39.24	-14.40	ZnSe
ZnSeO4:6H2O	-16.71	-18.23	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.91	-9.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 55.

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 301
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 301
USE Surface 301
USE Solution 303
SAVE Solution 304 #Initial Stage 3 groundwater after Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 301.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.223e-15 Surface + diffuse layer charge, eq
7.782e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.707e+00 m² for 2.659e-05 moles of Ferrihydrite

Water in diffuse layer: 1.707e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is +1).

Element	Moles
C	4.3613e-11
Ca	5.4051e-13
Cl	8.7335e-10
H	1.2866e-10
K	8.5746e-13
Mg	8.3742e-14
N	3.5357e-09
Na	3.6329e-12
O	1.5759e-07
S	3.6721e-08

Hfo_s

1.330e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.888e-08	0.668	8.888e-08	-7.051
Hfo_sOH	4.359e-08	0.328	4.359e-08	-7.361
Hfo_sO-	4.898e-10	0.004	4.898e-10	-9.310
Hfo_sOHCa+2	1.622e-12	0.000	1.622e-12	-11.790

Hfo_w

5.318e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.457e-06	0.462	2.457e-06	-5.610
Hfo_wOH	1.205e-06	0.227	1.205e-06	-5.919
Hfo_wSO4-	8.300e-07	0.156	8.300e-07	-6.081
Hfo_wOHSO4-2	8.122e-07	0.153	8.122e-07	-6.090
Hfo_wO-	1.354e-08	0.003	1.354e-08	-7.868
Hfo_wOMg+	1.914e-14	0.000	1.914e-14	-13.718
Hfo_wOCa+	6.493e-15	0.000	6.493e-15	-14.188

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),

but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 303. Solution after simulation 54.
 Using surface 301.
 Using pure phase assemblage 301. Pure-phase assemblage after simulation 54.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	1.931e-08	1.485e-08	-4.463e-09
Alunite	-0.79	-2.19	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.71	-6.07	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.59	-9.50	-8.91	1.713e-08	0	-1.713e-08
Barite	0.00	-9.98	-9.98	7.016e-07	7.531e-07	5.147e-08
Brochantite	-2.87	12.35	15.22	0.000e+00	0	0.000e+00
Brucite	-5.72	11.12	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	2.875e-06
CaMoO4	-1.87	-9.82	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.96	-4.15	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.244e-03	1.243e-03	-6.528e-07
Carnotite	-5.46	-5.23	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.56	-3.72	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.02	-15.17	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.063e-08	2.627e-08	-3.437e-08
Cu2Se(alpha)	-6.75	-52.55	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.66	-13.74	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.17	-6.30	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.659e-05	2.659e-05	-6.458e-13
Fluorite	-0.04	-10.54	-10.50	0.000e+00	0	0.000e+00
Gummite	-7.22	0.46	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.46	-6.07	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.26	-59.95	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.81	-7.92	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.39	-6.26	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.52	7.27	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.71	-10.01	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.69	-12.56	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.76	-13.91	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-3.707e-09
Otavite	-1.82	-13.82	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.62	-16.24	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.88	-19.38	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.17	-30.99	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.54	0.46	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-10.30	-6.22	4.08	0.000e+00	0	0.000e+00
U3O8	-17.61	3.47	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-5.16	0.46	5.61	0.000e+00	0	0.000e+00
UO3	-7.24	0.46	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.19	-13.31	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.421e-18 Surface + diffuse layer charge, eq
 3.036e-07 Surface charge, eq
 1.716e-02 sigma, C/m²
 5.389e-02 psi, V
 -2.097e+00 -F*psi/RT
 1.228e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.707e+00 m² for 2.659e-05 moles of Ferrihydrite

Water in diffuse layer: 1.707e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.541e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.489e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	8.7181e-13
Al	6.5158e-11
As	2.1029e-15
B	2.3472e-10
Ba	1.0627e-12
C	1.7707e-07
Ca	1.2622e-08
Cd	6.6846e-14
Cl	4.5853e-08
Co	9.5337e-13
Cr	5.4519e-14
Cu	4.5251e-11
F	6.1395e-09
Fe	3.5176e-14
H	1.8944e-07
Hg	1.5071e-15
K	2.5558e-09
Mg	6.8147e-09
Mn	9.5783e-11
Mo	1.3707e-11
N	9.0758e-14
Na	4.0161e-08
Ni	1.6125e-12
O	8.6787e-07
Pb	9.0460e-14
S	8.3912e-08
Sb	2.7953e-13
Se	1.9738e-13
U	4.1610e-12
V	1.6933e-14
Zn	5.3983e-12

Hfo_s

1.330e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCrOH+	6.874e-08	0.517	6.857e-08	-7.164
Hfo_sOCu+	5.086e-08	0.383	5.073e-08	-7.295
Hfo_sOPb+	9.138e-09	0.069	9.116e-09	-8.040
Hfo_sOZn+	1.695e-09	0.013	1.691e-09	-8.772
Hfo_sOMn+	1.625e-09	0.012	1.621e-09	-8.790
Hfo_sOHCa+2	4.068e-10	0.003	4.058e-10	-9.392
Hfo_sOH	2.897e-10	0.002	2.890e-10	-9.539
Hfo_sONi+	1.035e-10	0.001	1.033e-10	-9.986
Hfo_sOH2+	4.593e-11	0.000	4.582e-11	-10.339
Hfo_sO-	4.186e-11	0.000	4.176e-11	-10.379

Hfo_sOCo+	1.053e-11	0.000	1.050e-11	-10.979
Hfo_sOCd+	7.175e-12	0.000	7.158e-12	-11.145
Hfo_sOAg	1.072e-12	0.000	1.070e-12	-11.971
Hfo_sOHBa+2	1.530e-13	0.000	1.526e-13	-12.816
Hfo_sOFe+	3.335e-14	0.000	3.327e-14	-13.478
Hfo_sOHg+	4.454e-17	0.000	4.443e-17	-16.352

Hfo_w

5.318e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH	1.988e-06	0.374	1.983e-06	-5.703
Hfo_wOCu+	1.790e-06	0.337	1.786e-06	-5.748
Hfo_wOHSO4-2	7.011e-07	0.132	6.994e-07	-6.155
Hfo_wOH2+	3.152e-07	0.059	3.145e-07	-6.502
Hfo_wO-	2.873e-07	0.054	2.866e-07	-6.543
Hfo_wSO4-	5.573e-08	0.010	5.559e-08	-7.255
Hfo_wOMg+	5.401e-08	0.010	5.387e-08	-7.269
Hfo_wOHVO4-3	4.923e-08	0.009	4.911e-08	-7.309
Hfo_wOHAsO4-3	3.428e-08	0.006	3.420e-08	-7.466
Hfo_wOZn+	1.218e-08	0.002	1.215e-08	-7.915
Hfo_wOMn+	8.861e-09	0.002	8.839e-09	-8.054
Hfo_wOHSeO3-2	5.566e-09	0.001	5.552e-09	-8.256
Hfo_wOCa+	5.197e-09	0.001	5.184e-09	-8.285
Hfo_wOHMoO4-2	4.997e-09	0.001	4.985e-09	-8.302
Hfo_wOPb+	2.802e-09	0.001	2.795e-09	-8.554
Hfo_wSeO3-	1.499e-09	0.000	1.495e-09	-8.825
Hfo_wONi+	9.583e-10	0.000	9.559e-10	-9.020
Hfo_wMoO4-	5.117e-10	0.000	5.104e-10	-9.292
Hfo_wOCa+	2.037e-10	0.000	2.032e-10	-9.692
Hfo_wH2BO3	1.122e-10	0.000	1.120e-10	-9.951
Hfo_wOCd+	2.101e-11	0.000	2.096e-11	-10.679
Hfo_wHAsO4-	1.930e-11	0.000	1.925e-11	-10.716
Hfo_wOAg	1.936e-12	0.000	1.931e-12	-11.714
Hfo_wOFe+	1.444e-13	0.000	1.441e-13	-12.841
Hfo_wH2AsO4	9.900e-14	0.000	9.875e-14	-13.005
Hfo_wOBa+	2.825e-14	0.000	2.818e-14	-13.550
Hfo_wOHg+	1.497e-14	0.000	1.493e-14	-13.826
Hfo_wOHSbO(OH) 4-	2.957e-15	0.000	2.950e-15	-14.530
Hfo_wOHSeO4-2	1.029e-15	0.000	1.026e-15	-14.989
Hfo_wSbO(OH) 4	3.028e-16	0.000	3.020e-16	-15.520
Hfo_wOHCrO4-2	1.381e-16	0.000	1.378e-16	-15.861
Hfo_wSeO4-	7.120e-17	0.000	7.102e-17	-16.149
Hfo_wCrO4-	1.001e-17	0.000	9.989e-18	-17.000
Hfo_wH2AsO3	1.409e-23	0.000	1.406e-23	-22.852

-----Solution composition-----

Elements	Molality	Moles
Ag	5.367e-08	5.380e-08
Al	2.453e-06	2.459e-06
As	4.261e-11	4.271e-11
B	1.364e-05	1.368e-05
Ba	2.011e-07	2.016e-07
C	6.103e-03	6.118e-03
Ca	1.903e-03	1.907e-03
Cd	9.269e-09	9.292e-09
Cl	1.474e-03	1.478e-03
Co	1.353e-07	1.356e-07
Cr	5.750e-09	5.764e-09
Cu	2.751e-06	2.758e-06
F	2.086e-04	2.091e-04
Fe	3.394e-09	3.402e-09
Hg	8.827e-11	8.849e-11
K	2.690e-04	2.696e-04
Mg	1.073e-03	1.075e-03

Mn	1.520e-05	1.524e-05
Mo	2.420e-07	2.426e-07
N	3.527e-09	3.536e-09
Na	4.232e-03	4.242e-03
Ni	2.116e-07	2.121e-07
Pb	6.349e-09	6.365e-09
S	1.693e-03	1.697e-03
Sb	8.988e-09	9.010e-09
Se	5.939e-09	5.954e-09
U	3.555e-08	3.564e-08
V	5.214e-10	5.227e-10
Zn	7.047e-07	7.065e-07

-----Description of solution-----

	pH	=	7.179	Charge balance
	pe	=	5.593	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.365e-02	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	5.428e-03	
	Total CO2 (mol/kg)	=	6.103e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.325e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.112971e+02	
	Total O	=	5.567029e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.715e-07	1.520e-07	-6.766	-6.818	-0.053	(0)
H+	7.453e-08	6.623e-08	-7.128	-7.179	-0.051	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	5.367e-08					
AgCl	3.442e-08	3.442e-08	-7.463	-7.463	0.000	(0)
Ag+	1.448e-08	1.287e-08	-7.839	-7.891	-0.051	(0)
AgCl2-	4.505e-09	3.927e-09	-8.346	-8.406	-0.060	(0)
AgSO4-	2.538e-10	2.213e-10	-9.595	-9.655	-0.060	(0)
AgCl3-2	7.939e-12	4.585e-12	-11.100	-11.339	-0.238	(0)
AgF	5.511e-12	5.511e-12	-11.259	-11.259	0.000	(0)
AgOH	1.956e-13	1.956e-13	-12.709	-12.709	0.000	(0)
AgCl4-3	4.217e-14	1.227e-14	-13.375	-13.911	-0.536	(0)
AgH2BO3	2.421e-14	2.421e-14	-13.616	-13.616	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNO2	6.282e-15	6.282e-15	-14.202	-14.202	0.000	(0)
AgSeO3-	2.705e-15	2.359e-15	-14.568	-14.627	-0.060	(0)
AgNH3+	1.984e-16	1.730e-16	-15.702	-15.762	-0.060	(0)
Ag (OH) 2-	3.332e-18	2.905e-18	-17.477	-17.537	-0.060	(0)
AgNO3	2.253e-20	2.253e-20	-19.647	-19.647	0.000	(0)
Ag (NO2) 2-	2.608e-23	2.274e-23	-22.584	-22.643	-0.060	(0)
Ag (SeO3) 2-3	2.071e-23	6.023e-24	-22.684	-23.220	-0.536	(0)
Ag (NH3) 2+	1.062e-23	9.256e-24	-22.974	-23.034	-0.060	(0)
Ag2MoO4	9.449e-24	9.449e-24	-23.025	-23.025	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.838	-72.838	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.105	-87.059	-0.954	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.441	-147.501	-0.060	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.654	-147.805	-0.151	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.775	-150.066	-0.291	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.098	-150.377	-0.279	(0)
Al	2.453e-06					
Al (OH) 4-	1.749e-06	1.556e-06	-5.757	-5.808	-0.051	(0)
AlF3	3.632e-07	3.632e-07	-6.440	-6.440	0.000	(0)

AlF2+	1.896e-07	1.692e-07	-6.722	-6.772	-0.049	(0)
Al(OH)3	8.132e-08	8.132e-08	-7.090	-7.090	0.000	(0)
AlF4-	3.489e-08	3.104e-08	-7.457	-7.508	-0.051	(0)
Al(OH)2+	3.005e-08	2.682e-08	-7.522	-7.572	-0.049	(0)
AlF+2	3.927e-09	2.492e-09	-8.406	-8.603	-0.197	(0)
AlOH+2	3.500e-10	2.221e-10	-9.456	-9.653	-0.197	(0)
AlSO4+	1.099e-11	9.778e-12	-10.959	-11.010	-0.051	(0)
Al+3	4.229e-12	1.462e-12	-11.374	-11.835	-0.461	(0)
Al(SO4)2-	1.015e-13	9.031e-14	-12.993	-13.044	-0.051	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.309	-40.846	-0.536	(0)
As(3)	2.781e-23					
H3AsO3	2.756e-23	2.756e-23	-22.560	-22.560	0.000	(0)
H2AsO3-	2.448e-25	2.134e-25	-24.611	-24.671	-0.060	(0)
HAsO3-2	5.088e-30	2.939e-30	-29.293	-29.532	-0.238	(0)
H4AsO3+	1.037e-30	9.044e-31	-29.984	-30.044	-0.060	(0)
AsO3-3	5.881e-36	1.710e-36	-35.231	-35.767	-0.536	(0)
As(5)	4.261e-11					
HAsO4-2	3.043e-11	1.757e-11	-10.517	-10.755	-0.238	(0)
H2AsO4-	1.218e-11	1.062e-11	-10.914	-10.974	-0.060	(0)
AsO4-3	2.885e-15	8.390e-16	-14.540	-15.076	-0.536	(0)
H3AsO4	1.218e-16	1.222e-16	-15.914	-15.913	0.001	(0)
B	1.364e-05					
H3BO3	1.350e-05	1.354e-05	-4.870	-4.868	0.001	(0)
H2BO3-	1.345e-07	1.187e-07	-6.871	-6.926	-0.054	(0)
CaH2BO3+	7.729e-09	6.819e-09	-8.112	-8.166	-0.054	(0)
MgH2BO3+	2.721e-09	2.401e-09	-8.565	-8.620	-0.054	(0)
BF(OH)3-	1.044e-09	9.211e-10	-8.981	-9.036	-0.054	(0)
NaH2BO3	7.025e-10	7.025e-10	-9.153	-9.153	0.000	(0)
H5(BO3)2-	1.550e-12	1.368e-12	-11.810	-11.864	-0.054	(0)
BF2(OH)2-	1.261e-12	1.113e-12	-11.899	-11.954	-0.054	(0)
BaH2BO3+	5.051e-13	4.457e-13	-12.297	-12.351	-0.054	(0)
AgH2BO3	2.421e-14	2.421e-14	-13.616	-13.616	0.000	(0)
H8(BO3)3-	2.099e-15	1.852e-15	-14.678	-14.732	-0.054	(0)
BF3OH-	5.542e-18	4.890e-18	-17.256	-17.311	-0.054	(0)
BF4-	3.081e-22	2.718e-22	-21.511	-21.566	-0.054	(0)
Ba	2.011e-07					
Ba+2	1.948e-07	1.215e-07	-6.710	-6.915	-0.205	(0)
BaHCO3+	6.078e-09	5.437e-09	-8.216	-8.265	-0.048	(0)
BaCO3	2.067e-10	2.067e-10	-9.685	-9.685	0.000	(0)
BaH2BO3+	5.051e-13	4.457e-13	-12.297	-12.351	-0.054	(0)
BaOH+	9.044e-14	8.060e-14	-13.044	-13.094	-0.050	(0)
BaNO3+	1.540e-18	1.342e-18	-17.813	-17.872	-0.060	(0)
BaNH3+2	8.738e-19	5.047e-19	-18.059	-18.297	-0.238	(0)
C(4)	6.103e-03					
HCO3-	5.250e-03	4.686e-03	-2.280	-2.329	-0.049	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	9.739e-05	8.711e-05	-4.011	-4.060	-0.048	(0)
MgHCO3+	3.151e-05	2.797e-05	-4.502	-4.553	-0.052	(0)
NaHCO3	9.839e-06	9.839e-06	-5.007	-5.007	0.000	(0)
CO3-2	5.319e-06	3.317e-06	-5.274	-5.479	-0.205	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CuCO3	2.383e-06	2.383e-06	-5.623	-5.623	0.000	(0)
MgCO3	1.609e-06	1.609e-06	-5.793	-5.793	0.000	(0)
MnHCO3+	7.976e-07	7.108e-07	-6.098	-6.148	-0.050	(0)
NaCO3-	2.584e-07	2.306e-07	-6.588	-6.637	-0.049	(0)
ZnCO3	6.166e-08	6.166e-08	-7.210	-7.210	0.000	(0)
ZnHCO3+	5.491e-08	4.787e-08	-7.260	-7.320	-0.060	(0)
NiHCO3+	5.449e-08	4.750e-08	-7.264	-7.323	-0.060	(0)
CuHCO3+	4.138e-08	3.607e-08	-7.383	-7.443	-0.060	(0)
Cu(CO3)2-2	3.683e-08	2.127e-08	-7.434	-7.672	-0.238	(0)
CoHCO3+	2.365e-08	2.061e-08	-7.626	-7.686	-0.060	(0)
UO2(CO3)2-2	1.900e-08	1.097e-08	-7.721	-7.960	-0.238	(0)
UO2(CO3)3-4	1.639e-08	1.824e-09	-7.785	-8.739	-0.954	(0)
NiCO3	1.017e-08	1.017e-08	-7.992	-7.992	0.000	(0)
BaHCO3+	6.078e-09	5.437e-09	-8.216	-8.265	-0.048	(0)
PbCO3	3.799e-09	3.799e-09	-8.420	-8.420	0.000	(0)
CoCO3	3.171e-09	3.171e-09	-8.499	-8.499	0.000	(0)
PbHCO3+	1.522e-09	1.326e-09	-8.818	-8.877	-0.060	(0)

		CdCO3	3.423e-10	3.423e-10	-9.466	-9.466	0.000	(0)
		BaCO3	2.067e-10	2.067e-10	-9.685	-9.685	0.000	(0)
		UO2CO3	1.658e-10	1.658e-10	-9.780	-9.780	0.000	(0)
		Pb (CO3) 2-2	6.291e-11	3.634e-11	-10.201	-10.440	-0.238	(0)
		CdHCO3+	5.541e-11	4.830e-11	-10.256	-10.316	-0.060	(0)
		Cd (CO3) 2-2	1.457e-12	8.416e-13	-11.836	-12.075	-0.238	(0)
		FeHCO3+	8.172e-13	7.310e-13	-12.088	-12.136	-0.048	(0)
		HgCO3	5.774e-15	5.774e-15	-14.239	-14.239	0.000	(0)
		Hg (CO3) 2-2	1.049e-16	6.056e-17	-15.979	-16.218	-0.238	(0)
		HgHCO3+	8.168e-18	7.121e-18	-17.088	-17.147	-0.060	(0)
Ca	1.903e-03							
		Ca+2	1.601e-03	9.983e-04	-2.796	-3.001	-0.205	(0)
		CaSO4	1.971e-04	1.971e-04	-3.705	-3.705	0.000	(0)
		CaHCO3+	9.739e-05	8.711e-05	-4.011	-4.060	-0.048	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.085e-06	1.858e-06	-5.681	-5.731	-0.050	(0)
		CaH2BO3+	7.729e-09	6.819e-09	-8.112	-8.166	-0.054	(0)
		CaOH+	3.385e-09	3.027e-09	-8.470	-8.519	-0.048	(0)
		CaNH3+2	1.433e-14	8.275e-15	-13.844	-14.082	-0.238	(0)
		CaNO3+	7.984e-15	6.960e-15	-14.098	-14.157	-0.060	(0)
		Ca (NH3) 2+2	3.755e-26	2.169e-26	-25.425	-25.664	-0.238	(0)
Cd	9.269e-09							
		Cd+2	7.260e-09	4.527e-09	-8.139	-8.344	-0.205	(0)
		CdSO4	9.148e-10	9.148e-10	-9.039	-9.039	0.000	(0)
		CdCl+	6.498e-10	5.665e-10	-9.187	-9.247	-0.060	(0)
		CdCO3	3.423e-10	3.423e-10	-9.466	-9.466	0.000	(0)
		CdHCO3+	5.541e-11	4.830e-11	-10.256	-10.316	-0.060	(0)
		Cd (SO4) 2-2	1.841e-11	1.064e-11	-10.735	-10.973	-0.238	(0)
		CdF+	1.404e-11	1.224e-11	-10.853	-10.912	-0.060	(0)
		CdOH+	6.270e-12	5.466e-12	-11.203	-11.262	-0.060	(0)
		CdOHC1	3.532e-12	3.532e-12	-11.452	-11.452	0.000	(0)
		CdCl2	3.094e-12	3.094e-12	-11.510	-11.510	0.000	(0)
		Cd (CO3) 2-2	1.457e-12	8.416e-13	-11.836	-12.075	-0.238	(0)
		Cd (OH) 2	5.242e-15	5.242e-15	-14.281	-14.281	0.000	(0)
		CdF2	4.163e-15	4.163e-15	-14.381	-14.381	0.000	(0)
		CdCl3-	2.933e-15	2.557e-15	-14.533	-14.592	-0.060	(0)
		CdSeO4	1.042e-18	1.042e-18	-17.982	-17.982	0.000	(0)
		Cd2OH+3	4.265e-19	1.240e-19	-18.370	-18.906	-0.536	(0)
		Cd (OH) 3-	5.583e-20	4.867e-20	-19.253	-19.313	-0.060	(0)
		CdNO3+	3.621e-20	3.156e-20	-19.441	-19.501	-0.060	(0)
		Cd (SeO3) 2-2	5.255e-22	3.035e-22	-21.279	-21.518	-0.238	(0)
		Cd (OH) 4-2	2.096e-27	1.211e-27	-26.679	-26.917	-0.238	(0)
		Cd (NO3) 2	3.488e-32	3.488e-32	-31.457	-31.457	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-79.039	-79.098	-0.060	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.657	-150.657	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-227.459	-227.519	-0.060	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-303.847	-304.085	-0.238	(0)
Cl	1.474e-03							
		Cl-	1.474e-03	1.310e-03	-2.831	-2.883	-0.051	(0)
		AgCl	3.442e-08	3.442e-08	-7.463	-7.463	0.000	(0)
		MnCl+	1.407e-08	1.254e-08	-7.852	-7.902	-0.050	(0)
		AgCl2-	4.505e-09	3.927e-09	-8.346	-8.406	-0.060	(0)
		ZnCl+	1.197e-09	1.063e-09	-8.922	-8.973	-0.052	(0)
		CdCl+	6.498e-10	5.665e-10	-9.187	-9.247	-0.060	(0)
		NiCl+	3.162e-10	2.756e-10	-9.500	-9.560	-0.060	(0)
		CoCl+	2.940e-10	2.563e-10	-9.532	-9.591	-0.060	(0)
		CuCl+	2.853e-10	2.533e-10	-9.545	-9.596	-0.052	(0)
		CuCl	2.513e-10	2.513e-10	-9.600	-9.600	0.000	(0)
		ZnOHC1	2.115e-10	2.115e-10	-9.675	-9.675	0.000	(0)
		CuCl2-	7.748e-11	6.879e-11	-10.111	-10.162	-0.052	(0)
		MnCl2	2.320e-11	2.320e-11	-10.634	-10.634	0.000	(0)
		PbCl+	2.031e-11	1.771e-11	-10.692	-10.752	-0.060	(0)
		AgCl3-2	7.939e-12	4.585e-12	-11.100	-11.339	-0.238	(0)
		CdOHC1	3.532e-12	3.532e-12	-11.452	-11.452	0.000	(0)
		CdCl2	3.094e-12	3.094e-12	-11.510	-11.510	0.000	(0)
		ZnCl2	2.207e-12	2.207e-12	-11.656	-11.656	0.000	(0)
		HgClOH	5.115e-13	5.115e-13	-12.291	-12.291	0.000	(0)
		HgCl2	2.497e-13	2.497e-13	-12.603	-12.603	0.000	(0)

CuCl2	1.151e-13	1.151e-13	-12.939	-12.939	0.000	(0)
PbCl2	1.036e-13	1.036e-13	-12.985	-12.985	0.000	(0)
AgCl4-3	4.217e-14	1.227e-14	-13.375	-13.911	-0.536	(0)
CuCl3-2	3.054e-14	1.927e-14	-13.515	-13.715	-0.200	(0)
MnCl3-	9.395e-15	8.373e-15	-14.027	-14.077	-0.050	(0)
HgCl3-	3.752e-15	3.271e-15	-14.426	-14.485	-0.060	(0)
CdCl3-	2.933e-15	2.557e-15	-14.533	-14.592	-0.060	(0)
ZnCl3-	2.587e-15	2.297e-15	-14.587	-14.639	-0.052	(0)
NiCl2	1.818e-15	1.818e-15	-14.740	-14.740	0.000	(0)
CrCl+2	2.095e-16	1.210e-16	-15.679	-15.917	-0.238	(0)
PbCl3-	6.200e-17	5.405e-17	-16.208	-16.267	-0.060	(0)
HgCl+	4.362e-17	3.802e-17	-16.360	-16.420	-0.060	(0)
UO2Cl+	3.060e-17	2.668e-17	-16.514	-16.574	-0.060	(0)
HgCl4-2	2.954e-17	1.706e-17	-16.530	-16.768	-0.238	(0)
ZnCl4-2	2.385e-18	1.505e-18	-17.623	-17.823	-0.200	(0)
CuCl3-	1.585e-18	1.407e-18	-17.800	-17.852	-0.052	(0)
CrOHC12	4.578e-19	4.578e-19	-18.339	-18.339	0.000	(0)
PbCl4-2	5.604e-20	3.237e-20	-19.252	-19.490	-0.238	(0)
FeCl+2	2.831e-20	1.786e-20	-19.548	-19.748	-0.200	(0)
CrCl2+	1.725e-20	1.504e-20	-19.763	-19.823	-0.060	(0)
VOCl+	1.420e-22	1.238e-22	-21.848	-21.907	-0.060	(0)
FeCl2+	1.173e-22	1.045e-22	-21.931	-21.981	-0.050	(0)
CuCl4-2	1.464e-23	9.239e-24	-22.834	-23.034	-0.200	(0)
CrO3Cl1-	1.769e-26	1.542e-26	-25.752	-25.812	-0.060	(0)
FeCl3	1.369e-26	1.369e-26	-25.864	-25.864	0.000	(0)
CoCl+2	4.075e-35	2.354e-35	-34.390	-34.628	-0.238	(0)
UCl+3	0.000e+00	0.000e+00	-45.234	-45.770	-0.536	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.344	-64.583	-0.238	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.778	-69.016	-0.238	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.241	-82.480	-0.238	(0)
Co (2)	1.353e-07					
Co+2	9.791e-08	5.655e-08	-7.009	-7.248	-0.238	(0)
CoHCO3+	2.365e-08	2.061e-08	-7.626	-7.686	-0.060	(0)
CoSO4	9.726e-09	9.726e-09	-8.012	-8.012	0.000	(0)
CoCO3	3.171e-09	3.171e-09	-8.499	-8.499	0.000	(0)
CoF+	3.498e-10	3.050e-10	-9.456	-9.516	-0.060	(0)
CoCl+	2.940e-10	2.563e-10	-9.532	-9.591	-0.060	(0)
CoOH+	1.967e-10	1.715e-10	-9.706	-9.766	-0.060	(0)
Co (OH) 2	2.071e-12	2.071e-12	-11.684	-11.684	0.000	(0)
CoNO2+	1.068e-15	9.313e-16	-14.971	-15.031	-0.060	(0)
Co (NH3) +2	7.751e-17	4.477e-17	-16.111	-16.349	-0.238	(0)
CoSeO4	3.502e-17	3.502e-17	-16.456	-16.456	0.000	(0)
Co (OH) 3-	7.202e-18	6.279e-18	-17.143	-17.202	-0.060	(0)
CoOOH-	1.808e-18	1.576e-18	-17.743	-17.802	-0.060	(0)
Co2OH+3	1.671e-18	4.861e-19	-17.777	-18.313	-0.536	(0)
CoNO3+	2.267e-19	1.976e-19	-18.645	-18.704	-0.060	(0)
Co (OH) 4-2	2.619e-25	1.512e-25	-24.582	-24.820	-0.238	(0)
Co (NH3) 2+2	2.177e-26	1.257e-26	-25.662	-25.901	-0.238	(0)
Co4 (OH) 4+4	1.551e-30	1.726e-31	-29.809	-30.763	-0.954	(0)
Co (NO3) 2	8.864e-31	8.864e-31	-30.052	-30.052	0.000	(0)
Co (NH3) 3+2	1.804e-36	1.042e-36	-35.744	-35.982	-0.238	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.205	-46.444	-0.238	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.167	-57.405	-0.238	(0)
Co (3)	1.181e-28					
CoOH+2	1.181e-28	6.819e-29	-27.928	-28.166	-0.238	(0)
Co+3	2.555e-34	8.830e-35	-33.593	-34.054	-0.461	(0)
CoCl+2	4.075e-35	2.354e-35	-34.390	-34.628	-0.238	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.344	-64.583	-0.238	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.677	-77.736	-0.060	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.977	-82.215	-0.238	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.241	-82.480	-0.238	(0)
Cr (2)	7.525e-26					
Cr+2	7.525e-26	4.346e-26	-25.124	-25.362	-0.238	(0)
Cr (3)	5.750e-09					
Cr (OH) 2+	5.033e-09	4.387e-09	-8.298	-8.358	-0.060	(0)
Cr (OH) +2	4.108e-10	2.372e-10	-9.386	-9.625	-0.238	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	4.853e-11	4.853e-11	-10.314	-10.314	0.000	(0)

CrF+2	3.339e-12	1.928e-12	-11.476	-11.715	-0.238	(0)
CrO2-	2.061e-12	1.797e-12	-11.686	-11.746	-0.060	(0)
Cr (OH) 4-	1.739e-12	1.516e-12	-11.760	-11.819	-0.060	(0)
Cr+3	2.453e-13	7.135e-14	-12.610	-13.147	-0.536	(0)
CrSO4+	1.647e-13	1.436e-13	-12.783	-12.843	-0.060	(0)
CrCl+2	2.095e-16	1.210e-16	-15.679	-15.917	-0.238	(0)
Cr2 (OH) 2SO4+2	1.802e-18	1.041e-18	-17.744	-17.983	-0.238	(0)
CrOHC12	4.578e-19	4.578e-19	-18.339	-18.339	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.328e-20	5.328e-20	-19.273	-19.273	0.000	(0)
CrCl2+	1.725e-20	1.504e-20	-19.763	-19.823	-0.060	(0)
CrNO3+2	1.190e-26	6.876e-27	-25.924	-26.163	-0.238	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.262	-55.500	-0.238	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.699	-67.236	-0.536	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.778	-69.016	-0.238	(0)
Cr (6)	2.467e-16					
CrO4-2	2.114e-16	1.318e-16	-15.675	-15.880	-0.205	(0)
HCrO4-	3.241e-17	2.825e-17	-16.489	-16.549	-0.060	(0)
NaCrO4-	2.806e-18	2.446e-18	-17.552	-17.612	-0.060	(0)
KCrO4-	1.335e-19	1.163e-19	-18.875	-18.934	-0.060	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	8.507e-25	4.914e-25	-24.070	-24.309	-0.238	(0)
CrO3Cl-	1.769e-26	1.542e-26	-25.752	-25.812	-0.060	(0)
Cr2O7-2	4.793e-32	2.768e-32	-31.319	-31.558	-0.238	(0)
Cu (1)	5.036e-10					
CuCl	2.513e-10	2.513e-10	-9.600	-9.600	0.000	(0)
Cu+	1.748e-10	1.524e-10	-9.758	-9.817	-0.060	(0)
CuCl2-	7.748e-11	6.879e-11	-10.111	-10.162	-0.052	(0)
CuCl3-2	3.054e-14	1.927e-14	-13.515	-13.715	-0.200	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.309	-149.594	-0.285	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.050	-150.324	-0.274	(0)
Cu (2)	2.751e-06					
CuCO3	2.383e-06	2.383e-06	-5.623	-5.623	0.000	(0)
Cu+2	1.956e-07	1.220e-07	-6.709	-6.914	-0.205	(0)
CuOH+	6.605e-08	5.864e-08	-7.180	-7.232	-0.052	(0)
CuHCO3+	4.138e-08	3.607e-08	-7.383	-7.443	-0.060	(0)
Cu (CO3) 2-2	3.683e-08	2.127e-08	-7.434	-7.672	-0.238	(0)
CuSO4	2.409e-08	2.409e-08	-7.618	-7.618	0.000	(0)
Cu (OH) 2	1.778e-09	1.778e-09	-8.750	-8.750	0.000	(0)
CuF+	1.506e-09	1.313e-09	-8.822	-8.882	-0.060	(0)
CuCl+	2.853e-10	2.533e-10	-9.545	-9.596	-0.052	(0)
Cu2 (OH) 2+2	1.495e-10	8.637e-11	-9.825	-10.064	-0.238	(0)
Cu (OH) 3-	6.359e-13	5.544e-13	-12.197	-12.256	-0.060	(0)
CuCl2	1.151e-13	1.151e-13	-12.939	-12.939	0.000	(0)
CuNO2+	3.425e-14	2.986e-14	-13.465	-13.525	-0.060	(0)
CuNH3+2	1.423e-14	8.220e-15	-13.847	-14.085	-0.238	(0)
CuCl3-	1.585e-18	1.407e-18	-17.800	-17.852	-0.052	(0)
Cu (OH) 4-2	1.148e-18	6.632e-19	-17.940	-18.178	-0.238	(0)
CuNO3+	9.757e-19	8.506e-19	-18.011	-18.070	-0.060	(0)
Cu (NO2) 2	7.139e-22	7.139e-22	-21.146	-21.146	0.000	(0)
CuCl4-2	1.464e-23	9.239e-24	-22.834	-23.034	-0.200	(0)
Cu (NO3) 2	2.361e-31	2.361e-31	-30.627	-30.627	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.242	-217.301	-0.060	(0)
F	2.086e-04					
F-	1.919e-04	1.705e-04	-3.717	-3.768	-0.051	(0)
MgF+	1.255e-05	1.116e-05	-4.901	-4.952	-0.051	(0)
CaF+	2.085e-06	1.858e-06	-5.681	-5.731	-0.050	(0)
NaF	4.017e-07	4.017e-07	-6.396	-6.396	0.000	(0)
AlF3	3.632e-07	3.632e-07	-6.440	-6.440	0.000	(0)
AlF2+	1.896e-07	1.692e-07	-6.722	-6.772	-0.049	(0)
MnF+	5.791e-08	5.161e-08	-7.237	-7.287	-0.050	(0)
AlF4-	3.489e-08	3.104e-08	-7.457	-7.508	-0.051	(0)
HF	1.671e-08	1.671e-08	-7.777	-7.777	0.000	(0)
AlF+2	3.927e-09	2.492e-09	-8.406	-8.603	-0.197	(0)
CuF+	1.506e-09	1.313e-09	-8.822	-8.882	-0.060	(0)
ZnF+	1.261e-09	1.099e-09	-8.899	-8.959	-0.060	(0)
BF (OH) 3-	1.044e-09	9.211e-10	-8.981	-9.036	-0.054	(0)
NiF+	4.040e-10	3.522e-10	-9.394	-9.453	-0.060	(0)
CoF+	3.498e-10	3.050e-10	-9.456	-9.516	-0.060	(0)

CdF+	1.404e-11	1.224e-11	-10.853	-10.912	-0.060	(0)
HF2-	1.222e-11	1.083e-11	-10.913	-10.965	-0.053	(0)
AgF	5.511e-12	5.511e-12	-11.259	-11.259	0.000	(0)
PbF+	5.251e-12	4.578e-12	-11.280	-11.339	-0.060	(0)
CrF+2	3.339e-12	1.928e-12	-11.476	-11.715	-0.238	(0)
BF2 (OH) 2-	1.261e-12	1.113e-12	-11.899	-11.954	-0.054	(0)
UO2F+	3.390e-13	2.955e-13	-12.470	-12.529	-0.060	(0)
UO2F2	1.453e-13	1.453e-13	-12.838	-12.838	0.000	(0)
PbF2	1.536e-14	1.536e-14	-13.814	-13.814	0.000	(0)
UO2F3-	7.141e-15	6.225e-15	-14.146	-14.206	-0.060	(0)
CdF2	4.163e-15	4.163e-15	-14.381	-14.381	0.000	(0)
H2F2	7.477e-16	7.477e-16	-15.126	-15.126	0.000	(0)
FeF2+	4.322e-16	3.852e-16	-15.364	-15.414	-0.050	(0)
FeF+2	1.338e-16	8.440e-17	-15.874	-16.074	-0.200	(0)
FeF3	9.267e-17	9.267e-17	-16.033	-16.033	0.000	(0)
UO2F4-2	1.460e-17	8.432e-18	-16.836	-17.074	-0.238	(0)
VO2F	1.125e-17	1.125e-17	-16.949	-16.949	0.000	(0)
PbF3-	5.699e-18	4.969e-18	-17.244	-17.304	-0.060	(0)
BF3OH-	5.542e-18	4.890e-18	-17.256	-17.311	-0.054	(0)
VO2F2-	7.993e-19	6.968e-19	-18.097	-18.157	-0.060	(0)
VOF+	3.951e-20	3.444e-20	-19.403	-19.463	-0.060	(0)
VO2F3-2	2.566e-21	1.482e-21	-20.591	-20.829	-0.238	(0)
VOF2	2.202e-21	2.202e-21	-20.657	-20.657	0.000	(0)
PbF4-2	7.021e-22	4.055e-22	-21.154	-21.392	-0.238	(0)
BF4-	3.081e-22	2.718e-22	-21.511	-21.566	-0.054	(0)
VOF3-	1.528e-23	1.332e-23	-22.816	-22.875	-0.060	(0)
HgF+	1.055e-23	9.194e-24	-22.977	-23.036	-0.060	(0)
Sb (OH) 2F	6.231e-25	6.231e-25	-24.205	-24.205	0.000	(0)
SbOF	6.129e-25	6.129e-25	-24.213	-24.213	0.000	(0)
VO2F4-3	4.276e-25	1.244e-25	-24.369	-24.905	-0.536	(0)
VOF4-2	1.588e-26	9.172e-27	-25.799	-26.038	-0.238	(0)
UF3+	5.852e-35	5.102e-35	-34.233	-34.292	-0.060	(0)
UF2+2	3.268e-36	1.888e-36	-35.486	-35.724	-0.238	(0)
UF4	9.539e-37	9.539e-37	-36.020	-36.020	0.000	(0)
UF5-	7.394e-39	6.446e-39	-38.131	-38.191	-0.060	(0)
UF+3	3.024e-39	8.794e-40	-38.519	-39.056	-0.536	(0)
UF6-2	5.747e-40	3.320e-40	-39.241	-39.479	-0.238	(0)
Fe (2)	2.498e-11					
Fe+2	2.145e-11	1.239e-11	-10.669	-10.907	-0.238	(0)
FeSO4	2.622e-12	2.622e-12	-11.581	-11.581	0.000	(0)
FeHCO3+	8.172e-13	7.310e-13	-12.088	-12.136	-0.048	(0)
FeOH+	8.412e-14	7.497e-14	-13.075	-13.125	-0.050	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.881e-19	4.350e-19	-18.311	-18.361	-0.050	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.481	-159.481	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.147	-236.207	-0.060	(0)
Fe (3)	3.369e-09					
Fe (OH) 2+	2.935e-09	2.619e-09	-8.532	-8.582	-0.049	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.779e-12	6.051e-12	-11.169	-11.218	-0.049	(0)
FeOH+2	7.021e-14	4.430e-14	-13.154	-13.354	-0.200	(0)
FeF2+	4.322e-16	3.852e-16	-15.364	-15.414	-0.050	(0)
FeF+2	1.338e-16	8.440e-17	-15.874	-16.074	-0.200	(0)
FeF3	9.267e-17	9.267e-17	-16.033	-16.033	0.000	(0)
FeSO4+	4.898e-18	4.366e-18	-17.310	-17.360	-0.050	(0)
Fe+3	1.306e-18	4.514e-19	-17.884	-18.345	-0.461	(0)
Fe (SO4) 2-	9.228e-20	8.045e-20	-19.035	-19.094	-0.060	(0)
FeCl+2	2.831e-20	1.786e-20	-19.548	-19.748	-0.200	(0)
FeCl2+	1.173e-22	1.045e-22	-21.931	-21.981	-0.050	(0)
FeHSeO3+2	9.800e-24	5.660e-24	-23.009	-23.247	-0.238	(0)
Fe2 (OH) 2+4	5.839e-25	6.498e-26	-24.234	-25.187	-0.954	(0)
FeCl3	1.369e-26	1.369e-26	-25.864	-25.864	0.000	(0)
FeNO3+2	1.723e-29	9.952e-30	-28.764	-29.002	-0.238	(0)
Fe3 (OH) 4+5	7.601e-32	2.460e-33	-31.119	-32.609	-1.490	(0)
H (0)	4.026e-29					
H2	2.013e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	8.729e-11					
Hg	8.729e-11	8.729e-11	-10.059	-10.059	0.000	(0)

Hg (1)	2.985e-22					
Hg2+2	1.492e-22	8.620e-23	-21.826	-22.064	-0.238	(0)
Hg (2)	9.822e-13					
HgClOH	5.115e-13	5.115e-13	-12.291	-12.291	0.000	(0)
HgCl2	2.497e-13	2.497e-13	-12.603	-12.603	0.000	(0)
Hg (OH) 2	2.113e-13	2.120e-13	-12.675	-12.674	0.001	(0)
HgCO3	5.774e-15	5.774e-15	-14.239	-14.239	0.000	(0)
HgCl3-	3.752e-15	3.271e-15	-14.426	-14.485	-0.060	(0)
Hg (CO3) 2-2	1.049e-16	6.056e-17	-15.979	-16.218	-0.238	(0)
HgCl+	4.362e-17	3.802e-17	-16.360	-16.420	-0.060	(0)
HgCl4-2	2.954e-17	1.706e-17	-16.530	-16.768	-0.238	(0)
HgOH+	1.010e-17	8.801e-18	-16.996	-17.055	-0.060	(0)
HgHCO3+	8.168e-18	7.121e-18	-17.088	-17.147	-0.060	(0)
Hg (OH) 3-	4.653e-21	4.057e-21	-20.332	-20.392	-0.060	(0)
Hg+2	2.518e-21	1.455e-21	-20.599	-20.837	-0.238	(0)
HgSO4	3.282e-22	3.282e-22	-21.484	-21.484	0.000	(0)
HgF+	1.055e-23	9.194e-24	-22.977	-23.036	-0.060	(0)
HgNH3+2	1.046e-23	6.043e-24	-22.980	-23.219	-0.238	(0)
Hg (NH3) 2+2	6.888e-26	3.978e-26	-25.162	-25.400	-0.238	(0)
HgNO3+	1.358e-33	1.184e-33	-32.867	-32.927	-0.060	(0)
Hg (NH3) 3+2	1.805e-36	1.043e-36	-35.743	-35.982	-0.238	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.965	-44.965	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-46.025	-46.263	-0.238	(0)
HgHS2-	0.000e+00	0.000e+00	-139.195	-139.255	-0.060	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.040	-140.040	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.546	-140.784	-0.238	(0)
K	2.690e-04					
K+	2.673e-04	2.376e-04	-3.573	-3.624	-0.051	(0)
KSO4-	1.624e-06	1.450e-06	-5.789	-5.839	-0.049	(0)
KCrO4-	1.335e-19	1.163e-19	-18.875	-18.934	-0.060	(0)
Mg	1.073e-03					
Mg+2	9.354e-04	5.833e-04	-3.029	-3.234	-0.205	(0)
MgSO4	9.149e-05	9.149e-05	-4.039	-4.039	0.000	(0)
MgHCO3+	3.151e-05	2.797e-05	-4.502	-4.553	-0.052	(0)
MgF+	1.255e-05	1.116e-05	-4.901	-4.952	-0.051	(0)
MgCO3	1.609e-06	1.609e-06	-5.793	-5.793	0.000	(0)
MgOH+	3.939e-08	3.530e-08	-7.405	-7.452	-0.048	(0)
MgH2BO3+	2.721e-09	2.401e-09	-8.565	-8.620	-0.054	(0)
Mn (2)	1.520e-05					
Mn+2	1.316e-05	7.603e-06	-4.881	-5.119	-0.238	(0)
MnSO4	1.165e-06	1.165e-06	-5.934	-5.934	0.000	(0)
MnHCO3+	7.976e-07	7.108e-07	-6.098	-6.148	-0.050	(0)
MnF+	5.791e-08	5.161e-08	-7.237	-7.287	-0.050	(0)
MnCl+	1.407e-08	1.254e-08	-7.852	-7.902	-0.050	(0)
MnOH+	3.257e-09	2.902e-09	-8.487	-8.537	-0.050	(0)
MnCl2	2.320e-11	2.320e-11	-10.634	-10.634	0.000	(0)
MnCl3-	9.395e-15	8.373e-15	-14.027	-14.077	-0.050	(0)
MnSeO4	2.528e-15	2.528e-15	-14.597	-14.597	0.000	(0)
MnNO3+	3.047e-17	2.656e-17	-16.516	-16.576	-0.060	(0)
Mn (OH) 3-	4.649e-19	4.144e-19	-18.333	-18.383	-0.050	(0)
Mn (OH) 4-2	3.222e-25	2.033e-25	-24.492	-24.692	-0.200	(0)
Mn (NO3) 2	1.471e-28	1.471e-28	-27.832	-27.832	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.423	-43.423	0.000	(0)
Mn (3)	3.854e-25					
Mn+3	3.854e-25	1.332e-25	-24.414	-24.876	-0.461	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.536	-43.736	-0.200	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.461	-47.515	-0.053	(0)
Mo	2.420e-07					
MoO4-2	2.418e-07	1.508e-07	-6.617	-6.822	-0.205	(0)
HMoO4-	2.280e-10	1.987e-10	-9.642	-9.702	-0.060	(0)
H2MoO4	9.641e-14	9.641e-14	-13.016	-13.016	0.000	(0)
Ag2MoO4	9.449e-24	9.449e-24	-23.025	-23.025	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.309	-40.846	-0.536	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.047	-52.192	-2.145	(0)
HMo7O24-5	0.000e+00	0.000e+00	-51.495	-52.984	-1.490	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-54.428	-55.381	-0.954	(0)

H3Mo7O24-3	0.000e+00	0.000e+00	-58.778	-59.314	-0.536	(0)
N(-3)	8.814e-10					
NH4+	8.668e-10	7.648e-10	-9.062	-9.116	-0.054	(0)
NH4SO4-	7.925e-12	7.064e-12	-11.101	-11.151	-0.050	(0)
NH3	6.584e-12	6.584e-12	-11.182	-11.182	0.000	(0)
CaNH3+2	1.433e-14	8.275e-15	-13.844	-14.082	-0.238	(0)
CuNH3+2	1.423e-14	8.220e-15	-13.847	-14.085	-0.238	(0)
NiNH3+2	5.033e-16	2.907e-16	-15.298	-15.537	-0.238	(0)
AgNH3+	1.984e-16	1.730e-16	-15.702	-15.762	-0.060	(0)
Co(NH3)+2	7.751e-17	4.477e-17	-16.111	-16.349	-0.238	(0)
BaNH3+2	8.738e-19	5.047e-19	-18.059	-18.297	-0.238	(0)
Ag(NH3)2+	1.062e-23	9.256e-24	-22.974	-23.034	-0.060	(0)
HgNH3+2	1.046e-23	6.043e-24	-22.980	-23.219	-0.238	(0)
Ni(NH3)2+2	4.790e-25	2.767e-25	-24.320	-24.558	-0.238	(0)
Hg(NH3)2+2	6.888e-26	3.978e-26	-25.162	-25.400	-0.238	(0)
Ca(NH3)2+2	3.755e-26	2.169e-26	-25.425	-25.664	-0.238	(0)
Co(NH3)2+2	2.177e-26	1.257e-26	-25.662	-25.901	-0.238	(0)
Hg(NH3)3+2	1.805e-36	1.043e-36	-35.743	-35.982	-0.238	(0)
Co(NH3)3+2	1.804e-36	1.042e-36	-35.744	-35.982	-0.238	(0)
Hg(NH3)4+2	0.000e+00	0.000e+00	-46.025	-46.263	-0.238	(0)
Co(NH3)4+2	0.000e+00	0.000e+00	-46.205	-46.444	-0.238	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-55.262	-55.500	-0.238	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-57.167	-57.405	-0.238	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-64.344	-64.583	-0.238	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-66.699	-67.236	-0.536	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-68.778	-69.016	-0.238	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-77.677	-77.736	-0.060	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-81.977	-82.215	-0.238	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-82.241	-82.480	-0.238	(0)
N(3)	2.643e-09					
NO2-	2.643e-09	2.337e-09	-8.578	-8.631	-0.053	(0)
CuNO2+	3.425e-14	2.986e-14	-13.465	-13.525	-0.060	(0)
AgNO2	6.282e-15	6.282e-15	-14.202	-14.202	0.000	(0)
CoNO2+	1.068e-15	9.313e-16	-14.971	-15.031	-0.060	(0)
Cu(NO2)2	7.139e-22	7.139e-22	-21.146	-21.146	0.000	(0)
Ag(NO2)2-	2.608e-23	2.274e-23	-22.584	-22.643	-0.060	(0)
N(5)	2.489e-12					
NO3-	2.481e-12	2.205e-12	-11.605	-11.657	-0.051	(0)
CaNO3+	7.984e-15	6.960e-15	-14.098	-14.157	-0.060	(0)
MnNO3+	3.047e-17	2.656e-17	-16.516	-16.576	-0.060	(0)
ZnNO3+	2.052e-18	1.789e-18	-17.688	-17.747	-0.060	(0)
BaNO3+	1.540e-18	1.342e-18	-17.813	-17.872	-0.060	(0)
CuNO3+	9.757e-19	8.506e-19	-18.011	-18.070	-0.060	(0)
NiNO3+	5.223e-19	4.553e-19	-18.282	-18.342	-0.060	(0)
CoNO3+	2.267e-19	1.976e-19	-18.645	-18.704	-0.060	(0)
CdNO3+	3.621e-20	3.156e-20	-19.441	-19.501	-0.060	(0)
AgNO3	2.253e-20	2.253e-20	-19.647	-19.647	0.000	(0)
PbNO3+	1.425e-20	1.242e-20	-19.846	-19.906	-0.060	(0)
UO2NO3+	6.335e-26	5.523e-26	-25.198	-25.258	-0.060	(0)
CrNO3+2	1.190e-26	6.876e-27	-25.924	-26.163	-0.238	(0)
Mn(NO3)2	1.471e-28	1.471e-28	-27.832	-27.832	0.000	(0)
VO2NO3	4.196e-29	4.196e-29	-28.377	-28.377	0.000	(0)
FeNO3+2	1.723e-29	9.952e-30	-28.764	-29.002	-0.238	(0)
Co(NO3)2	8.864e-31	8.864e-31	-30.052	-30.052	0.000	(0)
Zn(NO3)2	7.869e-31	7.869e-31	-30.104	-30.104	0.000	(0)
Cu(NO3)2	2.361e-31	2.361e-31	-30.627	-30.627	0.000	(0)
Pb(NO3)2	4.651e-32	4.651e-32	-31.332	-31.332	0.000	(0)
Cd(NO3)2	3.488e-32	3.488e-32	-31.457	-31.457	0.000	(0)
HgNO3+	1.358e-33	1.184e-33	-32.867	-32.927	-0.060	(0)
Hg(NO3)2	0.000e+00	0.000e+00	-44.965	-44.965	0.000	(0)
Na	4.232e-03					
Na+	4.202e-03	3.734e-03	-2.377	-2.428	-0.051	(0)
NaSO4-	1.936e-05	1.728e-05	-4.713	-4.762	-0.049	(0)
NaHCO3	9.839e-06	9.839e-06	-5.007	-5.007	0.000	(0)
NaF	4.017e-07	4.017e-07	-6.396	-6.396	0.000	(0)
NaCO3-	2.584e-07	2.306e-07	-6.588	-6.637	-0.049	(0)
NaH2BO3	7.025e-10	7.025e-10	-9.153	-9.153	0.000	(0)
NaCrO4-	2.806e-18	2.446e-18	-17.552	-17.612	-0.060	(0)

Ni	2.116e-07					
Ni+2	1.319e-07	8.222e-08	-6.880	-7.085	-0.205	(0)
NiHCO3+	5.449e-08	4.750e-08	-7.264	-7.323	-0.060	(0)
NiSO4	1.414e-08	1.414e-08	-7.850	-7.850	0.000	(0)
NiCO3	1.017e-08	1.017e-08	-7.992	-7.992	0.000	(0)
NiF+	4.040e-10	3.522e-10	-9.394	-9.453	-0.060	(0)
NiCl+	3.162e-10	2.756e-10	-9.500	-9.560	-0.060	(0)
NiOH+	1.805e-10	1.573e-10	-9.744	-9.803	-0.060	(0)
Ni (OH) 2	1.899e-12	1.899e-12	-11.721	-11.721	0.000	(0)
Ni (SO4) 2-2	6.987e-13	4.036e-13	-12.156	-12.394	-0.238	(0)
NiCl2	1.818e-15	1.818e-15	-14.740	-14.740	0.000	(0)
NiNH3+2	5.033e-16	2.907e-16	-15.298	-15.537	-0.238	(0)
Ni (OH) 3-	3.311e-16	2.887e-16	-15.480	-15.540	-0.060	(0)
NiSeO4	4.752e-17	4.752e-17	-16.323	-16.323	0.000	(0)
NiNO3+	5.223e-19	4.553e-19	-18.282	-18.342	-0.060	(0)
Ni (NH3) 2+2	4.790e-25	2.767e-25	-24.320	-24.558	-0.238	(0)
O (0)	2.477e-35					
O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	6.349e-09					
PbCO3	3.799e-09	3.799e-09	-8.420	-8.420	0.000	(0)
PbHCO3+	1.522e-09	1.326e-09	-8.818	-8.877	-0.060	(0)
Pb+2	6.109e-10	3.810e-10	-9.214	-9.419	-0.205	(0)
PbOH+	1.668e-10	1.454e-10	-9.778	-9.837	-0.060	(0)
PbSO4	1.608e-10	1.608e-10	-9.794	-9.794	0.000	(0)
Pb (CO3) 2-2	6.291e-11	3.634e-11	-10.201	-10.440	-0.238	(0)
PbCl+	2.031e-11	1.771e-11	-10.692	-10.752	-0.060	(0)
PbF+	5.251e-12	4.578e-12	-11.280	-11.339	-0.060	(0)
Pb (SO4) 2-2	1.446e-12	8.352e-13	-11.840	-12.078	-0.238	(0)
Pb (OH) 2	6.990e-13	6.990e-13	-12.156	-12.156	0.000	(0)
PbCl2	1.036e-13	1.036e-13	-12.985	-12.985	0.000	(0)
PbF2	1.536e-14	1.536e-14	-13.814	-13.814	0.000	(0)
Pb (OH) 3-	1.219e-16	1.062e-16	-15.914	-15.974	-0.060	(0)
PbCl3-	6.200e-17	5.405e-17	-16.208	-16.267	-0.060	(0)
PbF3-	5.699e-18	4.969e-18	-17.244	-17.304	-0.060	(0)
Pb2OH+3	3.020e-18	8.782e-19	-17.520	-18.056	-0.536	(0)
PbCl4-2	5.604e-20	3.237e-20	-19.252	-19.490	-0.238	(0)
PbNO3+	1.425e-20	1.242e-20	-19.846	-19.906	-0.060	(0)
Pb (OH) 4-2	6.847e-21	3.955e-21	-20.165	-20.403	-0.238	(0)
PbF4-2	7.021e-22	4.055e-22	-21.154	-21.392	-0.238	(0)
Pb3 (OH) 4+2	6.431e-24	3.714e-24	-23.192	-23.430	-0.238	(0)
Pb4 (OH) 4+4	1.010e-28	1.124e-29	-27.996	-28.949	-0.954	(0)
Pb (NO3) 2	4.651e-32	4.651e-32	-31.332	-31.332	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.674	-151.674	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.076	-229.136	-0.060	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.838	-72.838	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.703	-78.762	-0.060	(0)
H2S	0.000e+00	0.000e+00	-78.921	-78.921	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.039	-79.098	-0.060	(0)
S5-2	0.000e+00	0.000e+00	-80.710	-80.948	-0.238	(0)
S6-2	0.000e+00	0.000e+00	-81.226	-81.464	-0.238	(0)
S4-2	0.000e+00	0.000e+00	-81.306	-81.544	-0.238	(0)
S3-2	0.000e+00	0.000e+00	-82.112	-82.350	-0.238	(0)
S2-2	0.000e+00	0.000e+00	-83.128	-83.366	-0.238	(0)
S-2	0.000e+00	0.000e+00	-88.683	-88.883	-0.200	(0)
HgHS2-	0.000e+00	0.000e+00	-139.195	-139.255	-0.060	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.040	-140.040	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.546	-140.784	-0.238	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.441	-147.501	-0.060	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.654	-147.805	-0.151	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.309	-149.594	-0.285	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.775	-150.066	-0.291	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.967	-150.026	-0.060	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.050	-150.324	-0.274	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.098	-150.377	-0.279	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.657	-150.657	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.195	-151.195	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.674	-151.674	0.000	(0)

Fe (HS) 2	0.000e+00	0.000e+00	-159.481	-159.481	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.242	-217.301	-0.060	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.618	-226.678	-0.060	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.459	-227.519	-0.060	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.076	-229.136	-0.060	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.240	-229.479	-0.238	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.147	-236.207	-0.060	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.847	-304.085	-0.238	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.661	-306.900	-0.238	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.683	-318.922	-0.238	(0)
S (6)	1.693e-03					
SO4-2	1.382e-03	8.619e-04	-2.859	-3.065	-0.205	(0)
CaSO4	1.971e-04	1.971e-04	-3.705	-3.705	0.000	(0)
MgSO4	9.149e-05	9.149e-05	-4.039	-4.039	0.000	(0)
NaSO4-	1.936e-05	1.728e-05	-4.713	-4.762	-0.049	(0)
KSO4-	1.624e-06	1.450e-06	-5.789	-5.839	-0.049	(0)
MnSO4	1.165e-06	1.165e-06	-5.934	-5.934	0.000	(0)
ZnSO4	6.092e-08	6.092e-08	-7.215	-7.215	0.000	(0)
CuSO4	2.409e-08	2.409e-08	-7.618	-7.618	0.000	(0)
NiSO4	1.414e-08	1.414e-08	-7.850	-7.850	0.000	(0)
CoSO4	9.726e-09	9.726e-09	-8.012	-8.012	0.000	(0)
HSO4-	6.271e-09	5.579e-09	-8.203	-8.253	-0.051	(0)
CdSO4	9.148e-10	9.148e-10	-9.039	-9.039	0.000	(0)
Zn (SO4) 2-2	7.917e-10	4.573e-10	-9.101	-9.340	-0.238	(0)
AgSO4-	2.538e-10	2.213e-10	-9.595	-9.655	-0.060	(0)
PbSO4	1.608e-10	1.608e-10	-9.794	-9.794	0.000	(0)
CrOHSO4	4.853e-11	4.853e-11	-10.314	-10.314	0.000	(0)
Cd (SO4) 2-2	1.841e-11	1.064e-11	-10.735	-10.973	-0.238	(0)
AlSO4+	1.099e-11	9.778e-12	-10.959	-11.010	-0.051	(0)
NH4SO4-	7.925e-12	7.064e-12	-11.101	-11.151	-0.050	(0)
FeSO4	2.622e-12	2.622e-12	-11.581	-11.581	0.000	(0)
Pb (SO4) 2-2	1.446e-12	8.352e-13	-11.840	-12.078	-0.238	(0)
Ni (SO4) 2-2	6.987e-13	4.036e-13	-12.156	-12.394	-0.238	(0)
CrSO4+	1.647e-13	1.436e-13	-12.783	-12.843	-0.060	(0)
Al (SO4) 2-	1.015e-13	9.031e-14	-12.993	-13.044	-0.051	(0)
UO2SO4	1.638e-14	1.638e-14	-13.786	-13.786	0.000	(0)
UO2 (SO4) 2-2	3.222e-16	1.861e-16	-15.492	-15.730	-0.238	(0)
FeSO4+	4.898e-18	4.366e-18	-17.310	-17.360	-0.050	(0)
Cr2 (OH) 2SO4+2	1.802e-18	1.041e-18	-17.744	-17.983	-0.238	(0)
VO2SO4-	8.884e-19	7.744e-19	-18.051	-18.111	-0.060	(0)
Fe (SO4) 2-	9.228e-20	8.045e-20	-19.035	-19.094	-0.060	(0)
Cr2 (OH) 2 (SO4) 2	5.328e-20	5.328e-20	-19.273	-19.273	0.000	(0)
VOSO4	7.994e-21	7.994e-21	-20.097	-20.097	0.000	(0)
HgSO4	3.282e-22	3.282e-22	-21.484	-21.484	0.000	(0)
CrO3SO4-2	8.507e-25	4.914e-25	-24.070	-24.309	-0.238	(0)
VSO4+	8.733e-35	7.613e-35	-34.059	-34.118	-0.060	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.217	-40.217	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.814	-41.052	-0.238	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.677	-77.736	-0.060	(0)
Sb (3)	6.979e-20					
Sb (OH) 3	3.531e-20	3.531e-20	-19.452	-19.452	0.000	(0)
HSbO2	3.448e-20	3.448e-20	-19.462	-19.462	0.000	(0)
SbO2-	9.671e-25	8.431e-25	-24.015	-24.074	-0.060	(0)
Sb (OH) 2F	6.231e-25	6.231e-25	-24.205	-24.205	0.000	(0)
SbOF	6.129e-25	6.129e-25	-24.213	-24.213	0.000	(0)
Sb (OH) 4-	5.539e-25	4.828e-25	-24.257	-24.316	-0.060	(0)
Sb (OH) 2+	6.516e-26	5.681e-26	-25.186	-25.246	-0.060	(0)
SbO+	2.247e-26	1.959e-26	-25.648	-25.708	-0.060	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.683	-318.922	-0.238	(0)
Sb (5)	8.988e-09					
SbO3-	8.977e-09	7.826e-09	-8.047	-8.106	-0.060	(0)
Sb (OH) 6-	1.029e-11	9.147e-12	-10.987	-11.039	-0.051	(0)
SbO2+	1.130e-23	9.850e-24	-22.947	-23.007	-0.060	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.038	-40.098	-0.060	(0)
H2Se	0.000e+00	0.000e+00	-43.387	-43.387	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.423	-43.423	0.000	(0)

Se-2	0.000e+00	0.000e+00	-47.681	-47.919	-0.238	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.105	-87.059	-0.954	(0)
Se (4)	5.937e-09					
HSeO3-	5.443e-09	4.745e-09	-8.264	-8.324	-0.060	(0)
SeO3-2	4.938e-10	2.852e-10	-9.306	-9.545	-0.238	(0)
H2SeO3	1.341e-13	1.341e-13	-12.873	-12.873	0.000	(0)
AgSeO3-	2.705e-15	2.359e-15	-14.568	-14.627	-0.060	(0)
Cd (SeO3) 2-2	5.255e-22	3.035e-22	-21.279	-21.518	-0.238	(0)
Ag (SeO3) 2-3	2.071e-23	6.023e-24	-22.684	-23.220	-0.536	(0)
FeHSeO3+2	9.800e-24	5.660e-24	-23.009	-23.247	-0.238	(0)
Se (6)	1.984e-12					
SeO4-2	1.981e-12	1.236e-12	-11.703	-11.908	-0.205	(0)
MnSeO4	2.528e-15	2.528e-15	-14.597	-14.597	0.000	(0)
ZnSeO4	6.182e-17	6.182e-17	-16.209	-16.209	0.000	(0)
NiSeO4	4.752e-17	4.752e-17	-16.323	-16.323	0.000	(0)
CoSeO4	3.502e-17	3.502e-17	-16.456	-16.456	0.000	(0)
HSeO4-	4.705e-18	4.102e-18	-17.327	-17.387	-0.060	(0)
CdSeO4	1.042e-18	1.042e-18	-17.982	-17.982	0.000	(0)
Zn (SeO4) 2-2	1.341e-28	7.745e-29	-27.873	-28.111	-0.238	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.441	-58.977	-0.536	(0)
U (4)	1.766e-22					
U (OH) 5-	1.762e-22	1.536e-22	-21.754	-21.814	-0.060	(0)
U (OH) 4	4.262e-25	4.262e-25	-24.370	-24.370	0.000	(0)
U (OH) 3+	1.184e-28	1.032e-28	-27.927	-27.986	-0.060	(0)
U (OH) 2+2	5.475e-33	3.162e-33	-32.262	-32.500	-0.238	(0)
UF3+	5.852e-35	5.102e-35	-34.233	-34.292	-0.060	(0)
UF2+2	3.268e-36	1.888e-36	-35.486	-35.724	-0.238	(0)
UF4	9.539e-37	9.539e-37	-36.020	-36.020	0.000	(0)
UOH+3	3.393e-38	9.867e-39	-37.469	-38.006	-0.536	(0)
UF5-	7.394e-39	6.446e-39	-38.131	-38.191	-0.060	(0)
UF+3	3.024e-39	8.794e-40	-38.519	-39.056	-0.536	(0)
UF6-2	5.747e-40	3.320e-40	-39.241	-39.479	-0.238	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.217	-40.217	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.814	-41.052	-0.238	(0)
U+4	0.000e+00	0.000e+00	-43.634	-44.588	-0.954	(0)
UC1+3	0.000e+00	0.000e+00	-45.234	-45.770	-0.536	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-172.171	-176.999	-4.827	(0)
U (5)	2.238e-17					
UO2+	2.238e-17	1.951e-17	-16.650	-16.710	-0.060	(0)
U (6)	3.555e-08					
UO2 (CO3) 2-2	1.900e-08	1.097e-08	-7.721	-7.960	-0.238	(0)
UO2 (CO3) 3-4	1.639e-08	1.824e-09	-7.785	-8.739	-0.954	(0)
UO2CO3	1.658e-10	1.658e-10	-9.780	-9.780	0.000	(0)
UO2F+	3.390e-13	2.955e-13	-12.470	-12.529	-0.060	(0)
UO2OH+	2.756e-13	2.402e-13	-12.560	-12.619	-0.060	(0)
UO2F2	1.453e-13	1.453e-13	-12.838	-12.838	0.000	(0)
UO2+2	2.013e-14	1.256e-14	-13.696	-13.901	-0.205	(0)
UO2SO4	1.638e-14	1.638e-14	-13.786	-13.786	0.000	(0)
UO2F3-	7.141e-15	6.225e-15	-14.146	-14.206	-0.060	(0)
UO2 (SO4) 2-2	3.222e-16	1.861e-16	-15.492	-15.730	-0.238	(0)
UO2Cl+	3.060e-17	2.668e-17	-16.514	-16.574	-0.060	(0)
UO2F4-2	1.460e-17	8.432e-18	-16.836	-17.074	-0.238	(0)
(UO2) 2 (OH) 2+2	1.658e-19	9.577e-20	-18.780	-19.019	-0.238	(0)
(UO2) 3 (OH) 5+	4.625e-22	4.032e-22	-21.335	-21.395	-0.060	(0)
UO2NO3+	6.335e-26	5.523e-26	-25.198	-25.258	-0.060	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.880	-42.940	-0.060	(0)
V+2	0.000e+00	0.000e+00	-43.393	-43.631	-0.238	(0)
V (3)	5.299e-16					
V (OH) 3	5.299e-16	5.299e-16	-15.276	-15.276	0.000	(0)
V (OH) 2+	2.602e-26	2.268e-26	-25.585	-25.644	-0.060	(0)
VOH+2	2.468e-29	1.425e-29	-28.608	-28.846	-0.238	(0)
V+3	6.434e-34	1.871e-34	-33.192	-33.728	-0.536	(0)
VSO4+	8.733e-35	7.613e-35	-34.059	-34.118	-0.060	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.502	-56.038	-0.536	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.939	-56.892	-0.954	(0)
V (4)	1.279e-18					

V(OH) 3+	1.171e-18	1.021e-18	-17.931	-17.991	-0.060	(0)
VO+2	5.830e-20	3.368e-20	-19.234	-19.473	-0.238	(0)
VOF+	3.951e-20	3.444e-20	-19.403	-19.463	-0.060	(0)
VOSO4	7.994e-21	7.994e-21	-20.097	-20.097	0.000	(0)
VOF2	2.202e-21	2.202e-21	-20.657	-20.657	0.000	(0)
VOC1+	1.420e-22	1.238e-22	-21.848	-21.907	-0.060	(0)
VOF3-	1.528e-23	1.332e-23	-22.816	-22.875	-0.060	(0)
VOF4-2	1.588e-26	9.172e-27	-25.799	-26.038	-0.238	(0)
H2V2O4+2	9.049e-32	5.227e-32	-31.043	-31.282	-0.238	(0)
V (5)	5.214e-10					
H2VO4-	4.929e-10	4.297e-10	-9.307	-9.367	-0.060	(0)
HVO4-2	2.821e-11	1.630e-11	-10.550	-10.788	-0.238	(0)
H3VO4	2.846e-13	2.846e-13	-12.546	-12.546	0.000	(0)
H3V2O7-	9.059e-16	7.897e-16	-15.043	-15.103	-0.060	(0)
VO2+	4.234e-17	3.763e-17	-16.373	-16.424	-0.051	(0)
VO2F	1.125e-17	1.125e-17	-16.949	-16.949	0.000	(0)
HV2O7-3	8.160e-18	2.373e-18	-17.088	-17.625	-0.536	(0)
VO4-3	4.240e-18	1.233e-18	-17.373	-17.909	-0.536	(0)
VO2SO4-	8.884e-19	7.744e-19	-18.051	-18.111	-0.060	(0)
VO2F2-	7.993e-19	6.968e-19	-18.097	-18.157	-0.060	(0)
V2O7-4	8.666e-21	9.644e-22	-20.062	-21.016	-0.954	(0)
VO2F3-2	2.566e-21	1.482e-21	-20.591	-20.829	-0.238	(0)
V3O9-3	2.859e-22	8.314e-23	-21.544	-22.080	-0.536	(0)
VO2F4-3	4.276e-25	1.244e-25	-24.369	-24.905	-0.536	(0)
V4O12-4	1.338e-28	1.490e-29	-27.873	-28.827	-0.954	(0)
VO2NO3	4.196e-29	4.196e-29	-28.377	-28.377	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-70.979	-72.469	-1.490	(0)
V10O28-6	0.000e+00	0.000e+00	-71.332	-73.477	-2.145	(0)
H2V10O28-4	0.000e+00	0.000e+00	-73.487	-74.441	-0.954	(0)
Zn	7.047e-07					
Zn+2	5.180e-07	3.230e-07	-6.286	-6.491	-0.205	(0)
ZnCO3	6.166e-08	6.166e-08	-7.210	-7.210	0.000	(0)
ZnSO4	6.092e-08	6.092e-08	-7.215	-7.215	0.000	(0)
ZnHCO3+	5.491e-08	4.787e-08	-7.260	-7.320	-0.060	(0)
ZnOH+	5.632e-09	4.910e-09	-8.249	-8.309	-0.060	(0)
ZnF+	1.261e-09	1.099e-09	-8.899	-8.959	-0.060	(0)
ZnCl+	1.197e-09	1.063e-09	-8.922	-8.973	-0.052	(0)
Zn(SO4) 2-2	7.917e-10	4.573e-10	-9.101	-9.340	-0.238	(0)
ZnOHCl	2.115e-10	2.115e-10	-9.675	-9.675	0.000	(0)
Zn(OH) 2	1.183e-10	1.183e-10	-9.927	-9.927	0.000	(0)
ZnCl2	2.207e-12	2.207e-12	-11.656	-11.656	0.000	(0)
Zn(OH) 3-	1.033e-13	9.009e-14	-12.986	-13.045	-0.060	(0)
ZnCl3-	2.587e-15	2.297e-15	-14.587	-14.639	-0.052	(0)
ZnSeO4	6.182e-17	6.182e-17	-16.209	-16.209	0.000	(0)
ZnCl4-2	2.385e-18	1.505e-18	-17.623	-17.823	-0.200	(0)
ZnNO3+	2.052e-18	1.789e-18	-17.688	-17.747	-0.060	(0)
Zn(OH) 4-2	9.438e-19	5.451e-19	-18.025	-18.264	-0.238	(0)
Zn(SeO4) 2-2	1.341e-28	7.745e-29	-27.873	-28.111	-0.238	(0)
Zn(NO3) 2	7.869e-31	7.869e-31	-30.104	-30.104	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.967	-150.026	-0.060	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.195	-151.195	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.618	-226.678	-0.060	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.240	-229.479	-0.238	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.661	-306.900	-0.238	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-76.23	-69.94	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-56.90	-52.39	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-64.12	-52.39	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-98.58	-80.65	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-74.36	-54.33	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-34.52	-34.11	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-30.59	-30.14	0.45	(NH4) 2SeO4
Acanthite	-51.14	-87.36	-36.22	Ag2S
Ag2CO3	-10.17	-21.26	-11.09	Ag2CO3

Ag2CrO4	-20.07	-31.66	-11.59	Ag2CrO4
Ag2HVO4	-12.15	-10.67	1.48	Ag2HVO4
Ag2MoO4	-11.05	-22.60	-11.55	Ag2MoO4
Ag2O	-14.00	-1.42	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.03	-18.85	-4.82	Ag2SO4
Ag3AsO3	-26.85	-24.69	2.16	Ag3AsO3
Ag3AsO4	-15.26	-18.05	-2.79	Ag3AsO4
Ag3H2VO5	-16.56	-11.38	5.18	Ag3H2VO5
AgF:4H2O	-12.71	-11.66	1.05	AgF:4H2O
Agmetal	0.02	-13.48	-13.51	Ag
AgVO3	-10.73	-9.96	0.77	AgVO3
Al (OH) 3 (am)	-1.10	9.70	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.50	-44.14	2.37	Al2 (MoO4) 3
Al2O3	-0.25	19.40	19.65	Al2O3
Al4 (OH) 10SO4	-1.32	21.38	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.01	-6.21	4.80	AlAsO4:2H2O
AlOHSO4	-4.49	-7.72	-3.23	AlOHSO4
AlSb	-152.01	-86.38	65.62	AlSb
Alunite	-0.79	-2.19	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.69	-12.48	-7.79	PbSO4
Anhydrite	-1.71	-6.07	-4.36	CaSO4
Anilite	-56.16	-88.04	-31.88	Cu0.25Cu1.5S
Antlerite	-3.88	4.91	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-87.48	-90.24	-2.76	As4O6
Artinite	-7.19	2.41	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.53	-31.83	6.71	As2O5
Atacamite	-2.56	4.83	7.39	Cu2 (OH) 3Cl
Azurite	-0.44	-17.34	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.95	7.44	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.48	-3.61	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.59	-9.50	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-29.10	3.84	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.13	-22.80	-9.67	BaCrO4
BaF2	-8.63	-14.45	-5.82	BaF2
BaMoO4	-6.78	-13.74	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.89	-8.06	1.83	BaSeO3
BaSeO4	-11.36	-18.82	-7.46	BaSeO4
Bianchite	-7.79	-9.56	-1.76	ZnSO4:6H2O
Birnessite	-8.66	9.43	18.09	MnO2
Bixbyite	-6.03	-6.68	-0.64	Mn2O3
BlaubleiI	-55.61	-79.77	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.31	-83.59	-27.28	Cu0.6Cu0.8S
Boehmite	1.12	9.70	8.58	AlOOH
Breithauptite	-57.52	-76.04	-18.52	NiSb
Brochantite	-2.87	12.35	15.22	Cu4 (OH) 6SO4
Brucite	-5.72	11.12	16.84	Mg (OH) 2
Bunsenite	-5.17	7.27	12.45	NiO
Ca (VO3) 2	-12.79	-7.13	5.66	Ca (VO3) 2
Ca2V2O7	-13.28	4.22	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.33	4.22	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-20.06	2.24	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-23.38	15.58	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-24.28	15.58	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-301.08	-158.10	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-9.92	-27.83	-17.91	Hg2Cl2
CaMoO4	-1.87	-9.82	-7.95	CaMoO4
Carnotite	-5.46	-5.23	0.23	KUO2VO4
CaSeO3:2H2O	-6.96	-4.15	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.89	-14.91	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.56	-3.72	9.84	Cd (BO2) 2

Cd(OH) 2	-7.63	6.01	13.64	Cd(OH) 2
Cd(OH) 2 (am)	-7.72	6.01	13.73	Cd(OH) 2
Cd3(OH) 2 (SO4) 2	-23.51	-16.80	6.71	Cd3(OH) 2 (SO4) 2
Cd3(OH) 4SO4	-21.94	0.62	22.56	Cd3(OH) 4SO4
Cd4(OH) 6SO4	-21.77	6.63	28.40	Cd4(OH) 6SO4
CdCl2	-13.45	-14.11	-0.66	CdCl2
CdCl2:1H2O	-12.42	-14.11	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.20	-14.11	-1.91	CdCl2:2.5H2O
CdF2	-14.67	-15.88	-1.21	CdF2
Cdmetal (alpha)	-33.05	-19.53	13.51	Cd
Cdmetal (gamma)	-33.15	-19.53	13.62	Cd
CdMoO4	-1.02	-15.17	-14.15	CdMoO4
CdOHCl	-7.59	-4.05	3.54	CdOHCl
CdSb	-76.95	-77.30	-0.35	CdSb
CdSe	-21.06	-41.26	-20.20	CdSe
CdSeO4:2H2O	-18.40	-20.25	-1.85	CdSeO4:2H2O
CdSO4	-11.24	-11.41	-0.17	CdSO4
CdSO4:1H2O	-9.68	-11.41	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.54	-11.41	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.02	-10.77	-9.75	AgCl
Cerrusite	-1.77	-14.90	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-7.34	-9.98	-2.64	CuSO4:5H2O
Chalcocite	-56.30	-91.22	-34.92	Cu2S
Chalcopyrite	-125.72	-160.99	-35.27	CuFeS2
Cinnabar	-52.92	-98.61	-45.69	HgS
Claudetite	-87.17	-90.24	-3.06	As4O6
Clausthalite	-15.24	-42.34	-27.10	PbSe
Co(BO2) 2	-29.70	-2.63	27.07	Co(BO2) 2
Co(OH) 2	-5.98	7.11	13.09	Co(OH) 2
Co(OH) 3	-10.21	-12.52	-2.31	Co(OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4) 2	-23.53	-10.50	13.03	Co3(AsO4) 2
Co3O4	-7.43	-17.92	-10.50	Co3O4
CoCl2	-21.28	-13.01	8.27	CoCl2
CoCl2:6H2O	-15.55	-13.01	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-13.19	-14.78	-1.60	CoF2
CoF3	-43.90	-45.36	-1.46	CoF3
CoFe2O4	17.02	13.49	-3.53	CoFe2O4
CoMoO4	-6.31	-14.07	-7.76	CoMoO4
CoO	-6.48	7.11	13.59	CoO
CoS (alpha)	-71.39	-78.83	-7.44	CoS
CoS (beta)	-67.76	-78.83	-11.07	CoS
CoSe	-23.97	-40.17	-16.20	CoSe
CoSeO3	-9.71	-8.39	1.32	CoSeO3
CoSeO4:6H2O	-17.63	-19.16	-1.53	CoSeO4:6H2O
CoSO4	-13.11	-10.31	2.80	CoSO4
CoSO4:6H2O	-7.84	-10.31	-2.47	CoSO4:6H2O
Cotunnite	-10.40	-15.18	-4.78	PbCl2
Covellite	-56.20	-78.50	-22.30	CuS
Cr(OH) 2	-21.82	-11.00	10.82	Cr(OH) 2
Cr(OH) 3	-2.51	-1.18	1.34	Cr(OH) 3
Cr(OH) 3 (am)	-0.43	-1.18	-0.75	Cr(OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.22	-31.13	14.09	CrCl2
CrCl3	-46.48	-31.36	15.11	CrCl3
CrF3	-22.68	-34.02	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.89	-41.73	-33.84	Na3AlF6
Cu(OH) 2	-1.23	7.44	8.67	Cu(OH) 2
Cu(SbO3) 2	-25.58	19.63	45.21	Cu(SbO3) 2
Cu2(OH) 3NO3	-13.20	-3.95	9.25	Cu2(OH) 3NO3
Cu2Sb:3H2O	-56.40	-91.28	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.75	-52.55	-45.80	Cu2Se
Cu2SO4	-20.75	-22.70	-1.95	Cu2SO4
Cu3(AsO4) 2:2H2O	-15.59	-9.49	6.10	Cu3(AsO4) 2:2H2O

Cu3Sb	-61.41	-104.00	-42.59	Cu3Sb
Cu3Se2	-28.89	-92.39	-63.49	Cu3Se2
CuCO3	-0.89	-12.39	-11.50	CuCO3
CuCrO4	-17.35	-22.79	-5.44	CuCrO4
CuF	-8.68	-13.59	-4.91	CuF
CuF2	-15.57	-14.45	1.12	CuF2
CuF2:2H2O	-9.90	-14.45	-4.55	CuF2:2H2O
Cumetal	-6.65	-15.41	-8.76	Cu
CuMoO4	-0.66	-13.74	-13.08	CuMoO4
CuOCuSO4	-12.84	-2.53	10.30	CuOCuSO4
Cupricferrite	7.84	13.83	5.99	CuFe2O4
Cuprite	-3.87	-5.28	-1.41	Cu2O
Cuprousferrite	9.47	0.55	-8.92	CuFeO2
CuSe	-6.73	-39.83	-33.10	CuSe
CuSe2	-28.20	-61.56	-33.37	CuSe2
CuSeO3:2H2O	-8.57	-8.06	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.38	-18.82	-2.44	CuSeO4:5H2O
CuSO4	-12.92	-9.98	2.94	CuSO4
Diaspore	2.83	9.70	6.87	AlOOH
Djurleite	-56.46	-90.38	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.65	-17.19	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.10	-17.19	-17.09	CaMg(CO3)2
Epsomite	-4.17	-6.30	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.21	0.17	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.32	-15.04	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.67	-9.12	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.50	-40.13	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.15	-45.88	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.12	-12.72	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.64	-17.73	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.96	-65.56	-18.60	FeSe2
FeS(ppt)	-79.54	-82.49	-2.95	FeS
FeSe	-32.83	-43.83	-11.00	FeSe
Fix_pe	-5.59	-5.59	0.00	e-
Fluorite	-0.04	-10.54	-10.50	CaF2
Galena	-67.03	-81.00	-13.97	PbS
Gibbsite	1.41	9.70	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.54	-9.56	-2.01	ZnSO4:7H2O
Greenockite	-65.57	-79.93	-14.36	CdS
Greigite	-288.90	-333.93	-45.03	Fe3S4
Gummite	-7.22	0.46	7.67	UO3
Gypsum	-1.46	-6.07	-4.61	CaSO4:2H2O
H-Jarosite	-13.17	-25.27	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.30	-21.18	-12.88	H2MoO4
H2S(g)	-77.93	-85.94	-8.01	H2S
H2Se(g)	-42.32	-47.28	-4.96	H2Se
Halite	-6.91	-5.31	1.60	NaCl
Hausmannite	-7.77	53.26	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.04	22.85	22.89	FeAl2O4
Hg(CH3)2(g)	-183.00	-256.71	-73.71	Hg(CH3)2
Hg(g)	-8.75	-16.63	-7.87	Hg
Hg(OH)2	-9.18	-12.67	-3.50	Hg(OH)2
Hg2(g)	-18.30	-33.25	-14.96	Hg2
Hg2(OH)2	-12.97	-7.71	5.26	Hg2(OH)2
Hg2CO3	-11.49	-27.54	-16.05	Hg2CO3
Hg2CrO4	-29.24	-37.94	-8.70	Hg2CrO4
Hg2F2	-19.24	-29.60	-10.36	Hg2F2
Hg2S	-81.97	-93.65	-11.68	Hg2S
Hg2SeO3	-18.55	-23.21	-4.66	Hg2SeO3
Hg2SO4	-19.00	-25.13	-6.13	Hg2SO4
Hg3O2CO3	-28.18	-57.86	-29.68	Hg3O2CO3
HgCl(g)	-33.41	-13.91	19.50	HgCl

HgCl2	-11.53	-32.80	-21.26	HgCl2
HgF(g)	-47.48	-14.80	32.68	HgF
HgF2(g)	-47.13	-34.57	12.57	HgF2
Hgmetal(1)	-3.17	-16.63	-13.45	Hg
HgSe	-4.26	-59.95	-55.69	HgSe
HgSeO3	-15.75	-28.18	-12.43	HgSeO3
HgSO4	-20.68	-30.10	-9.42	HgSO4
Huntite	-4.65	-34.62	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.09	-24.86	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.96	-23.73	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.42	-21.59	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.92	-21.72	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-36.12	-53.37	-17.24	K2Cr2O7
K2CrO4	-22.62	-23.13	-0.51	K2CrO4
K2MoO4	-17.33	-14.07	3.26	K2MoO4
K2SeO4	-18.43	-19.16	-0.73	K2SeO4
Langite	-5.13	12.35	17.49	Cu4(OH)6SO4:H2O
Larnakite	-7.11	-7.55	-0.43	PbO:PbSO4
Laurionite	-5.75	-5.12	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.76	4.94	12.69	PbO
Mackinawite	-78.89	-82.49	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.65	17.51	16.86	Fe2MgO4
Magnesite	-1.25	-8.71	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.36	-4.95	-5.31	Cu2(OH)2CO3
Manganite	-3.33	22.01	25.34	MnOOH
Massicot	-7.96	4.94	12.89	PbO
Matlockite	-7.10	-16.07	-8.97	PbClF
Melanothallite	-18.94	-12.68	6.26	CuCl2
Melanterite	-11.76	-13.97	-2.21	FeSO4:7H2O
Metacinnabar	-53.52	-98.61	-45.09	HgS
Mg(OH)2(active)	-7.67	11.12	18.79	Mg(OH)2
Mg(VO3)2	-18.65	-7.37	11.28	Mg(VO3)2
Mg2Sb3	-276.83	-202.15	74.68	Mg2Sb3
Mg2V2O7	-22.60	3.76	26.36	Mg2V2O7
MgCr2O4	-7.43	8.77	16.20	MgCr2O4
MgCrO4	-24.49	-19.11	5.38	MgCrO4
MgF2	-2.64	-10.77	-8.13	MgF2
MgMoO4	-8.21	-10.06	-1.85	MgMoO4
MgSeO3:6H2O	-7.44	-4.38	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.94	-15.14	-1.20	MgSeO4:6H2O
Minium	-33.16	40.36	73.52	Pb3O4
Mirabilite	-6.81	-7.92	-1.11	Na2SO4:10H2O
Mn(VO3)2	-14.15	-9.25	4.90	Mn(VO3)2
Mn2(SO4)3	-53.23	-58.94	-5.71	Mn2(SO4)3
Mn2Sb	-151.46	-90.38	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-16.61	-4.11	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.60	-10.88	2.72	MnCl2:4H2O
MnS(grn)	-76.87	-76.70	0.17	MnS
MnS(pnk)	-80.04	-76.70	3.34	MnS
MnSb	-96.52	-99.42	-2.91	MnSb
MnSe	-41.54	-38.04	3.50	MnSe
MnSeO3	-7.39	-6.26	1.13	MnSeO3
MnSeO3:2H2O	-7.25	-6.26	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.98	-17.03	-2.05	MnSeO4:5H2O
MnSO4	-10.77	-8.18	2.58	MnSO4
Monteponite	-9.09	6.01	15.10	CdO
Montroydite	-9.03	-12.67	-3.64	HgO
MoO3	-13.18	-21.18	-8.00	MoO3
Morenosite	-8.01	-10.15	-2.14	NiSO4:7H2O
MoS2	-148.35	-218.61	-70.26	MoS2
Na-Jarosite	-9.32	-20.52	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.08	-50.97	-9.90	Na2Cr2O7
Na2CrO4	-23.67	-20.74	2.93	Na2CrO4
Na2Mo2O7	-16.26	-32.86	-16.60	Na2Mo2O7

Na2MoO4	-13.17	-11.68	1.49	Na2MoO4
Na2MoO4:2H2O	-12.90	-11.68	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.30	-6.00	10.30	Na2SeO3:5H2O
Na2SeO4	-18.04	-16.76	1.28	Na2SeO4
Na3Sb	-176.28	-81.83	94.45	Na3Sb
Na3VO4	-31.67	5.01	36.68	Na3VO4
Na4V2O7	-36.89	0.51	37.40	Na4V2O7
Nantokite	-5.97	-12.70	-6.73	CuCl
NaSb	-88.96	-65.79	23.17	NaSb
Natron	-9.03	-10.34	-1.31	Na2CO3:10H2O
NaVO3	-8.35	-4.49	3.86	NaVO3
Nesquehonite	-4.04	-8.71	-4.67	MgCO3:3H2O
Ni(OH)2	-5.52	7.27	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.71	-10.01	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.33	11.67	32.00	Ni4(OH)6SO4
NiCO3	-5.69	-12.56	-6.87	NiCO3
NiMoO4	-2.76	-13.91	-11.14	NiMoO4
NiS(alpha)	-73.07	-78.67	-5.60	NiS
NiS(beta)	-67.57	-78.67	-11.10	NiS
NiS(gamma)	-65.87	-78.67	-12.80	NiS
NiSe	-22.30	-40.00	-17.70	NiSe
NiSeO3:2H2O	-11.04	-8.23	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.47	-18.99	-1.52	NiSeO4:6H2O
Nsutite	-8.07	9.43	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-241.88	-302.94	-61.07	As2S3
Otavite	-1.82	-13.82	-12.00	CdCO3
Pb(BO2)2	-11.32	-4.80	6.52	Pb(BO2)2
Pb(OH)2	-3.21	4.94	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.88	-69.64	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.98	-0.18	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-16.31	9.88	26.19	Pb2O(OH)2
Pb2O3	-25.62	35.42	61.04	Pb2O3
Pb2OCO3	-9.40	-9.96	-0.56	Pb2OCO3
Pb2V2O7	-6.71	-8.61	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.81	-17.01	5.80	Pb3(AsO4)2
Pb3(VO4)2	-9.82	-3.68	6.14	Pb3(VO4)2
Pb3O2CO3	-16.04	-5.02	11.02	Pb3O2CO3
Pb3O2SO4	-13.29	-2.61	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.77	2.33	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.54	2.33	21.88	Pb4O3SO4
PbCrO4	-12.70	-25.30	-12.60	PbCrO4
PbF2	-9.52	-16.96	-7.44	PbF2
Pbmetal	-24.85	-20.61	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.04	4.94	12.98	PbO:0.33H2O
PbSeO4	-14.49	-21.33	-6.84	PbSeO4
Periclase	-10.46	11.12	21.58	MgO
Phosgenite	-10.27	-30.08	-19.81	PbCl2:PbCO3
Plattnerite	-19.12	30.48	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.38	-142.89	-18.51	FeS2
Pyrochroite	-5.96	9.24	15.19	Mn(OH)2
Pyrolusite	-6.60	34.78	41.38	MnO2
Realgar	-101.53	-121.27	-19.75	AsS
Retgersite	-8.11	-10.15	-2.04	NiSO4:6H2O
Rhodochrosite	-0.02	-10.60	-10.58	MnCO3
Rutherfordine	-4.88	-19.38	-14.50	UO2CO3
Sb(OH)3	-12.34	-19.45	-7.11	Sb(OH)3
Sb2O4	-16.76	-13.36	3.40	Sb2O4
Sb2O5	-26.77	-36.43	-9.67	Sb2O5
Sb2Se3	-112.98	-180.73	-67.76	Sb2Se3
Sb4O6(cubic)	-59.55	-77.81	-18.26	Sb4O6
Sb4O6(orth)	-59.91	-77.81	-17.90	Sb4O6
SbCl3	-50.21	-49.64	0.57	SbCl3
SbF3	-42.07	-52.29	-10.23	SbF3
Sbmetal	-46.08	-57.77	-11.69	Sb
SbO2	-3.17	-30.99	-27.82	SbO2

Schoepite	-5.54	0.46	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.62	-21.73	-7.11	Se
Semetal (hex)	-14.02	-21.73	-7.71	Se
Senarmontite	-26.54	-38.90	-12.37	Sb2O3
SeO2	-15.63	-15.50	0.12	SeO2
SeO3	-47.31	-26.27	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.97	-11.97	-10.00	ZnCO3
Sphalerite	-66.62	-78.07	-11.45	ZnS
Spinel	-6.32	30.53	36.85	MgAl2O4
Stibnite	-246.27	-296.73	-50.46	Sb2S3
Sulfur	-58.25	-60.40	-2.14	S
Tenorite	-0.20	7.44	7.64	CuO
Thenardite	-8.24	-7.92	0.32	Na2SO4
Thermonatrite	-10.97	-10.34	0.64	Na2CO3:H2O
Tyuyamunite	-10.30	-6.22	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-17.61	3.47	21.08	U3O8
U3Sb4	-584.34	-431.96	152.38	U3Sb4
U4O9	-34.92	-37.94	-3.02	U4O9
UF4	-30.12	-59.66	-29.54	UF4
UF4:2.5H2O	-26.94	-59.66	-32.72	UF4:2.5H2O
UO2 (am)	-16.81	-15.87	0.93	UO2
UO2 (NO3) 2	-49.36	-37.21	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-42.07	-37.21	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-40.60	-37.21	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-39.26	-37.22	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-5.16	0.46	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-23.56	-25.81	-2.25	UO2SeO4:4H2O
UO3	-7.24	0.46	7.70	UO3
Uraninite	-11.20	-15.87	-4.67	UO2
USb2	-221.29	-191.72	29.58	USb2
V (OH) 3	-19.78	-12.19	7.59	V (OH) 3
V2O5	-17.13	-18.49	-1.36	V2O5
V3O5	-42.73	-40.89	1.84	V3O5
V4O7	-53.19	-46.00	7.19	V4O7
V6O13	-45.70	-106.56	-60.86	V6O13
Valentinite	-30.42	-38.90	-8.48	Sb2O3
VC12	-63.96	-45.09	18.87	VC12
VC13	-65.81	-42.38	23.43	VC13
VF4	-63.83	-48.90	14.93	VF4
Vmetal	-94.53	-50.51	44.03	V
VO	-39.72	-24.96	14.76	VO
VO (OH) 2	-10.27	-5.12	5.15	VO (OH) 2
VO2Cl	-22.15	-19.31	2.84	VO2Cl
VOC1	-33.41	-22.25	11.15	VOC1
VOC12	-38.00	-25.24	12.76	VOC12
VOSO4	-26.15	-22.54	3.61	VOSO4
Witherite	-3.82	-12.39	-8.57	BaCO3
Wurtzite	-69.12	-78.07	-8.95	ZnS
Zincite	-3.47	7.87	11.33	ZnO
Zincosite	-13.48	-9.56	3.93	ZnSO4
Zn (BO2) 2	-10.16	-1.87	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-33.12	-29.80	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-4.33	7.87	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.61	7.87	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.89	7.87	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.67	7.87	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.87	7.87	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-9.19	-1.69	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.52	5.67	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-21.87	-8.22	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-30.16	-11.24	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-14.35	14.05	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-19.29	19.21	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.31	-12.26	7.05	ZnCl2
ZnCO3:1H2O	-1.71	-11.97	-10.26	ZnCO3:1H2O
ZnF2	-13.49	-14.03	-0.53	ZnF2
Znmetal	-43.47	-17.68	25.79	Zn

ZnMoO4	-3.19	-13.31	-10.13	ZnMoO4
ZnO(active)	-3.32	7.87	11.19	ZnO
ZnS(am)	-69.02	-78.07	-9.05	ZnS
ZnSb	-86.46	-75.45	11.01	ZnSb
ZnSe	-25.01	-39.41	-14.40	ZnSe
ZnSeO4:6H2O	-16.88	-18.40	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.92	-9.56	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 56.

```

Title Stage 3 Run-off mix
Mix 302
1      1
3      0.072759
4      0.242916
5      0.224856
6      0.031001
7      0.155567
8      0.001344
9      3.000956
10     5.889154
11     13.062714
12     48.339275
13     43.289040
14     12.368910
15     5.873762
Save solution 305
end

```

TITLE

Stage 3 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 302.

Mixture 302.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.

7.276e-02 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)

2.429e-01 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)

2.249e-01 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)

3.100e-02 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

1.556e-01 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

1.344e-03 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

3.001e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
5.889e+00 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.306e+01 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
4.834e+01 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
4.329e+01 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
1.237e+01 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
5.874e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	1.081e-06	1.444e-04
As	6.237e-10	8.330e-08
B	4.450e-07	5.943e-05
Ba	1.310e-07	1.749e-05
C	7.290e-04	9.736e-02
Ca	3.360e-04	4.487e-02
Cd	1.127e-09	1.505e-07
Cl	3.919e-05	5.234e-03
Co	4.563e-10	6.094e-08
Cr	1.807e-10	2.413e-08
Cu	2.544e-06	3.398e-04
F	3.512e-05	4.691e-03
Fe	2.556e-07	3.413e-05
Hg	4.042e-11	5.398e-09
K	6.992e-05	9.338e-03
Mg	8.927e-05	1.192e-02
Mn	1.089e-06	1.454e-04
Mo	4.205e-08	5.616e-06
N	1.691e-07	2.258e-05
Na	1.236e-04	1.650e-02
Ni	6.807e-11	9.091e-09
Pb	3.166e-09	4.228e-07
S	2.732e-04	3.648e-02
Sb	4.710e-10	6.291e-08
Se	3.536e-09	4.723e-07
U	1.184e-08	1.581e-06
V	1.026e-08	1.370e-06
Zn	1.145e-07	1.529e-05

-----Description of solution-----

	pH =	6.494	Charge balance
	pe =	6.410	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.683e-03	
	Mass of water (kg) =	1.336e+02	
	Total alkalinity (eq/kg) =	4.345e-04	
	Total CO2 (mol/kg) =	7.290e-04	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	2.673e-06	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.00	
	Iterations =	13	
	Total H =	1.482626e+04	
	Total O =	7.413501e+03	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.357e-07	3.207e-07	-6.474	-6.494	-0.020	0.00
OH-	3.288e-08	3.140e-08	-7.483	-7.503	-0.020	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.081e-06					
AlF2+	4.730e-07	4.522e-07	-6.325	-6.345	-0.020	(0)
Al(OH) 4-	2.292e-07	2.190e-07	-6.640	-6.660	-0.020	(0)
AlF3	1.805e-07	1.805e-07	-6.743	-6.743	0.000	(0)
Al(OH) 2+	9.250e-08	8.844e-08	-7.034	-7.053	-0.020	(0)
Al(OH) 3	5.540e-08	5.540e-08	-7.256	-7.256	0.000	(0)
AlF+2	4.287e-08	3.582e-08	-7.368	-7.446	-0.078	(0)
AlOH+2	4.244e-09	3.546e-09	-8.372	-8.450	-0.078	(0)
AlF4-	3.003e-09	2.869e-09	-8.523	-8.542	-0.020	(0)
AlSO4+	1.963e-10	1.876e-10	-9.707	-9.727	-0.020	(0)
Al+3	1.704e-10	1.129e-10	-9.769	-9.947	-0.179	(0)
Al(SO4) 2-	4.502e-13	4.303e-13	-12.347	-12.366	-0.020	(0)
AlMo6O21-3	3.327e-39	2.157e-39	-38.478	-38.666	-0.188	(0)
As (3)	2.922e-21					
H3AsO3	2.917e-21	2.917e-21	-20.535	-20.535	0.000	(0)
H2AsO3-	4.895e-24	4.665e-24	-23.310	-23.331	-0.021	(0)
H4AsO3+	4.864e-28	4.635e-28	-27.313	-27.334	-0.021	(0)
HAsO3-2	1.609e-29	1.327e-29	-28.794	-28.877	-0.084	(0)
AsO3-3	2.460e-36	1.595e-36	-35.609	-35.797	-0.188	(0)
As (5)	6.237e-10					
H2AsO4-	4.471e-10	4.260e-10	-9.350	-9.371	-0.021	(0)
HAsO4-2	1.766e-10	1.457e-10	-9.753	-9.837	-0.084	(0)
H3AsO4	2.373e-14	2.374e-14	-13.625	-13.624	0.000	(0)
AsO4-3	2.216e-15	1.436e-15	-14.654	-14.843	-0.188	(0)
B	4.450e-07					
H3BO3	4.441e-07	4.443e-07	-6.353	-6.352	0.000	(0)
H2BO3-	8.430e-10	8.046e-10	-9.074	-9.094	-0.020	(0)
CaH2BO3+	1.295e-11	1.236e-11	-10.888	-10.908	-0.020	(0)
BF(OH) 3-	5.890e-12	5.622e-12	-11.230	-11.250	-0.020	(0)
MgH2BO3+	2.091e-12	1.996e-12	-11.680	-11.700	-0.020	(0)
NaH2BO3	1.503e-13	1.503e-13	-12.823	-12.823	0.000	(0)
BF2(OH) 2-	6.404e-15	6.113e-15	-14.194	-14.214	-0.020	(0)
BaH2BO3+	2.832e-15	2.703e-15	-14.548	-14.568	-0.020	(0)
H5(BO3) 2-	3.188e-16	3.043e-16	-15.497	-15.517	-0.020	(0)
BF3OH-	2.534e-20	2.419e-20	-19.596	-19.616	-0.020	(0)
H8(BO3) 3-	1.416e-20	1.352e-20	-19.849	-19.869	-0.020	(0)
BF4-	1.268e-24	1.210e-24	-23.897	-23.917	-0.020	(0)
Ba	1.310e-07					
Ba+2	1.305e-07	1.087e-07	-6.884	-6.964	-0.079	(0)
BaHCO3+	4.459e-10	4.264e-10	-9.351	-9.370	-0.019	(0)
BaCO3	3.348e-12	3.348e-12	-11.475	-11.475	0.000	(0)
BaOH+	1.559e-14	1.490e-14	-13.807	-13.827	-0.020	(0)
BaH2BO3+	2.832e-15	2.703e-15	-14.548	-14.568	-0.020	(0)
BaNO3+	7.113e-17	6.779e-17	-16.148	-16.169	-0.021	(0)
BaNH3+2	1.317e-17	1.086e-17	-16.880	-16.964	-0.084	(0)
C (4)	7.290e-04					
HCO3-	4.296e-04	4.107e-04	-3.367	-3.386	-0.020	(0)
H2CO3	2.962e-04	2.962e-04	-3.528	-3.528	0.000	(0)
CaHCO3+	2.135e-06	2.042e-06	-5.671	-5.690	-0.019	(0)
CuCO3	5.175e-07	5.175e-07	-6.286	-6.286	0.000	(0)
MgHCO3+	3.148e-07	3.007e-07	-6.502	-6.522	-0.020	(0)
CO3-2	7.208e-08	6.004e-08	-7.142	-7.222	-0.079	(0)
CuHCO3+	3.981e-08	3.793e-08	-7.400	-7.421	-0.021	(0)
NaHCO3	2.723e-08	2.723e-08	-7.565	-7.565	0.000	(0)
CaCO3	2.541e-08	2.541e-08	-7.595	-7.595	0.000	(0)
MnHCO3+	7.406e-09	7.080e-09	-8.130	-8.150	-0.020	(0)
UO2(CO3) 2-2	6.863e-09	5.660e-09	-8.163	-8.247	-0.084	(0)
UO2CO3	4.725e-09	4.725e-09	-8.326	-8.326	0.000	(0)
MgCO3	3.573e-09	3.573e-09	-8.447	-8.447	0.000	(0)
ZnHCO3+	1.230e-09	1.172e-09	-8.910	-8.931	-0.021	(0)
PbHCO3+	5.356e-10	5.104e-10	-9.271	-9.292	-0.021	(0)
BaHCO3+	4.459e-10	4.264e-10	-9.351	-9.370	-0.019	(0)

	ZnCO3	3.117e-10	3.117e-10	-9.506	-9.506	0.000	(0)
	PbCO3	3.019e-10	3.019e-10	-9.520	-9.520	0.000	(0)
	NaCO3-	1.379e-10	1.318e-10	-9.861	-9.880	-0.020	(0)
	Cu (CO3) 2-2	1.014e-10	8.363e-11	-9.994	-10.078	-0.084	(0)
	UO2 (CO3) 3-4	3.682e-11	1.703e-11	-10.434	-10.769	-0.335	(0)
	FeHCO3+	2.120e-11	2.027e-11	-10.674	-10.693	-0.019	(0)
	CoHCO3+	1.184e-11	1.129e-11	-10.927	-10.947	-0.021	(0)
	BaCO3	3.348e-12	3.348e-12	-11.475	-11.475	0.000	(0)
	NiHCO3+	2.782e-12	2.651e-12	-11.556	-11.577	-0.021	(0)
	CdCO3	1.226e-12	1.226e-12	-11.912	-11.912	0.000	(0)
	CdHCO3+	8.790e-13	8.376e-13	-12.056	-12.077	-0.021	(0)
	CoCO3	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
	NiCO3	1.173e-13	1.173e-13	-12.931	-12.931	0.000	(0)
	Pb (CO3) 2-2	6.338e-14	5.227e-14	-13.198	-13.282	-0.084	(0)
	HgCO3	2.070e-15	2.070e-15	-14.684	-14.684	0.000	(0)
	Cd (CO3) 2-2	6.616e-17	5.456e-17	-16.179	-16.263	-0.084	(0)
	HgHCO3+	1.297e-17	1.236e-17	-16.887	-16.908	-0.021	(0)
	Hg (CO3) 2-2	4.765e-19	3.930e-19	-18.322	-18.406	-0.084	(0)
Ca	3.360e-04						
	Ca+2	3.206e-04	2.671e-04	-3.494	-3.573	-0.079	(0)
	CaSO4	1.309e-05	1.309e-05	-4.883	-4.883	0.000	(0)
	CaHCO3+	2.135e-06	2.042e-06	-5.671	-5.690	-0.019	(0)
	CaF+	9.670e-08	9.243e-08	-7.015	-7.034	-0.020	(0)
	CaCO3	2.541e-08	2.541e-08	-7.595	-7.595	0.000	(0)
	CaOH+	1.749e-10	1.673e-10	-9.757	-9.777	-0.019	(0)
	CaH2BO3+	1.295e-11	1.236e-11	-10.888	-10.908	-0.020	(0)
	CaNO3+	1.102e-13	1.051e-13	-12.958	-12.979	-0.021	(0)
	CaNH3+2	6.456e-14	5.324e-14	-13.190	-13.274	-0.084	(0)
	Ca (NH3) 2+2	4.070e-24	3.356e-24	-23.390	-23.474	-0.084	(0)
Cd	1.127e-09						
	Cd+2	1.075e-09	8.958e-10	-8.968	-9.048	-0.079	(0)
	CdSO4	4.494e-11	4.494e-11	-10.347	-10.347	0.000	(0)
	CdCl+	3.361e-12	3.203e-12	-11.474	-11.494	-0.021	(0)
	CdCO3	1.226e-12	1.226e-12	-11.912	-11.912	0.000	(0)
	CdHCO3+	8.790e-13	8.376e-13	-12.056	-12.077	-0.021	(0)
	CdF+	4.725e-13	4.502e-13	-12.326	-12.347	-0.021	(0)
	CdOH+	2.344e-13	2.234e-13	-12.630	-12.651	-0.021	(0)
	Cd (SO4) 2-2	1.573e-13	1.297e-13	-12.803	-12.887	-0.084	(0)
	CdOHC1	4.125e-15	4.125e-15	-14.385	-14.385	0.000	(0)
	CdCl2	4.999e-16	4.999e-16	-15.301	-15.301	0.000	(0)
	Cd (CO3) 2-2	6.616e-17	5.456e-17	-16.179	-16.263	-0.084	(0)
	Cd (OH) 2	4.426e-17	4.426e-17	-16.354	-16.354	0.000	(0)
	CdF2	2.849e-17	2.849e-17	-16.545	-16.545	0.000	(0)
	CdNO3+	3.698e-19	3.524e-19	-18.432	-18.453	-0.021	(0)
	CdSeO4	5.471e-20	5.471e-20	-19.262	-19.262	0.000	(0)
	CdCl3-	1.239e-20	1.181e-20	-19.907	-19.928	-0.021	(0)
	Cd2OH+3	1.548e-21	1.003e-21	-20.810	-20.999	-0.188	(0)
	Cd (OH) 3-	8.909e-23	8.490e-23	-22.050	-22.071	-0.021	(0)
	Cd (SeO3) 2-2	1.522e-24	1.255e-24	-23.818	-23.901	-0.084	(0)
	Cd (NO3) 2	2.197e-29	2.197e-29	-28.658	-28.658	0.000	(0)
	Cd (OH) 4-2	5.290e-31	4.363e-31	-30.277	-30.360	-0.084	(0)
	CdHS+	0.000e+00	0.000e+00	-80.757	-80.778	-0.021	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-153.311	-153.311	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-231.128	-231.149	-0.021	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-308.607	-308.691	-0.084	(0)
Cl	3.919e-05						
	Cl-	3.919e-05	3.744e-05	-4.407	-4.427	-0.020	(0)
	CuCl+	9.092e-11	8.686e-11	-10.041	-10.061	-0.020	(0)
	MnCl+	4.260e-11	4.072e-11	-10.371	-10.390	-0.020	(0)
	CuCl	1.313e-11	1.313e-11	-10.882	-10.882	0.000	(0)
	ZnCl+	8.883e-12	8.486e-12	-11.051	-11.071	-0.020	(0)
	CdCl+	3.361e-12	3.203e-12	-11.474	-11.494	-0.021	(0)
	PbCl+	2.331e-12	2.222e-12	-11.632	-11.653	-0.021	(0)
	ZnOHC1	3.488e-13	3.488e-13	-12.457	-12.457	0.000	(0)
	CuCl2-	1.075e-13	1.027e-13	-12.968	-12.988	-0.020	(0)
	HgClOH	5.980e-14	5.980e-14	-13.223	-13.223	0.000	(0)
	CoCl+	4.802e-14	4.576e-14	-13.319	-13.340	-0.021	(0)
	NiCl+	5.264e-15	5.016e-15	-14.279	-14.300	-0.021	(0)

CdOHC1	4.125e-15	4.125e-15	-14.385	-14.385	0.000	(0)
HgCl2	4.038e-15	4.038e-15	-14.394	-14.394	0.000	(0)
MnCl2	2.153e-15	2.153e-15	-14.667	-14.667	0.000	(0)
UO2Cl+	1.259e-15	1.200e-15	-14.900	-14.921	-0.021	(0)
CuCl2	1.128e-15	1.128e-15	-14.948	-14.948	0.000	(0)
ZnCl2	5.035e-16	5.035e-16	-15.298	-15.298	0.000	(0)
CdCl2	4.999e-16	4.999e-16	-15.301	-15.301	0.000	(0)
PbCl2	3.716e-16	3.716e-16	-15.430	-15.430	0.000	(0)
HgCl+	2.258e-17	2.152e-17	-16.646	-16.667	-0.021	(0)
CrCl+2	2.900e-18	2.392e-18	-17.538	-17.621	-0.084	(0)
HgCl3-	1.586e-18	1.512e-18	-17.800	-17.821	-0.021	(0)
FeCl+2	1.269e-18	1.060e-18	-17.896	-17.975	-0.078	(0)
CuCl3-2	9.851e-19	8.224e-19	-18.007	-18.085	-0.078	(0)
MnCl3-	2.323e-20	2.221e-20	-19.634	-19.654	-0.020	(0)
ZnCl3-	1.568e-20	1.497e-20	-19.805	-19.825	-0.020	(0)
CdCl3-	1.239e-20	1.181e-20	-19.907	-19.928	-0.021	(0)
VOCl+	6.981e-21	6.653e-21	-20.156	-20.177	-0.021	(0)
PbCl3-	5.812e-21	5.538e-21	-20.236	-20.257	-0.021	(0)
NiCl2	9.456e-22	9.456e-22	-21.024	-21.024	0.000	(0)
CuCl3-	4.124e-22	3.940e-22	-21.385	-21.405	-0.020	(0)
HgCl4-2	2.732e-22	2.253e-22	-21.563	-21.647	-0.084	(0)
FeCl2+	1.854e-22	1.772e-22	-21.732	-21.752	-0.020	(0)
CrOHC12	5.344e-23	5.344e-23	-22.272	-22.272	0.000	(0)
CrCl2+	8.917e-24	8.497e-24	-23.050	-23.071	-0.021	(0)
ZnCl4-2	3.358e-25	2.803e-25	-24.474	-24.552	-0.078	(0)
PbCl4-2	1.149e-25	9.478e-26	-24.940	-25.023	-0.084	(0)
FeCl3	6.634e-28	6.634e-28	-27.178	-27.178	0.000	(0)
CuCl4-2	8.856e-29	7.393e-29	-28.053	-28.131	-0.078	(0)
CrO3Cl-	7.015e-30	6.685e-30	-29.154	-29.175	-0.021	(0)
CoCl+2	3.342e-38	2.756e-38	-37.476	-37.560	-0.084	(0)
UCl+3	0.000e+00	0.000e+00	-42.823	-43.011	-0.188	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.525	-60.608	-0.084	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.350	-62.433	-0.084	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.040	-77.124	-0.084	(0)
Co (2)	4.563e-10					
Co+2	4.284e-10	3.533e-10	-9.368	-9.452	-0.084	(0)
CoSO4	1.509e-11	1.509e-11	-10.821	-10.821	0.000	(0)
CoHCO3+	1.184e-11	1.129e-11	-10.927	-10.947	-0.021	(0)
CoF+	3.718e-13	3.543e-13	-12.430	-12.451	-0.021	(0)
CoCO3	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
CoOH+	2.322e-13	2.213e-13	-12.634	-12.655	-0.021	(0)
CoCl+	4.802e-14	4.576e-14	-13.319	-13.340	-0.021	(0)
Co (OH) 2	5.520e-16	5.520e-16	-15.258	-15.258	0.000	(0)
CoNO2+	1.876e-16	1.788e-16	-15.727	-15.748	-0.021	(0)
Co (NH3) +2	8.156e-18	6.726e-18	-17.089	-17.172	-0.084	(0)
CoNO3+	7.310e-20	6.966e-20	-19.136	-19.157	-0.021	(0)
CoSeO4	5.807e-20	5.807e-20	-19.236	-19.236	0.000	(0)
Co (OH) 3-	3.628e-22	3.458e-22	-21.440	-21.461	-0.021	(0)
CoOOH-	9.104e-23	8.676e-23	-22.041	-22.062	-0.021	(0)
Co2OH+3	6.046e-24	3.919e-24	-23.219	-23.407	-0.188	(0)
Co (NH3) 2+2	5.510e-26	4.544e-26	-25.259	-25.343	-0.084	(0)
Co (NO3) 2	1.763e-29	1.763e-29	-28.754	-28.754	0.000	(0)
Co (OH) 4-2	2.086e-30	1.721e-30	-29.681	-29.764	-0.084	(0)
Co (NH3) 3+2	1.098e-34	9.059e-35	-33.959	-34.043	-0.084	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-41.985	-42.320	-0.335	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-43.040	-43.123	-0.084	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.620	-52.704	-0.084	(0)
Co (3)	7.000e-31					
CoOH+2	7.000e-31	5.773e-31	-30.155	-30.239	-0.084	(0)
Co+3	5.459e-36	3.618e-36	-35.263	-35.441	-0.179	(0)
CoCl+2	3.342e-38	2.756e-38	-37.476	-37.560	-0.084	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.525	-60.608	-0.084	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-71.421	-71.442	-0.021	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-75.917	-76.001	-0.084	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.040	-77.124	-0.084	(0)
Cr (2)	5.558e-27					
Cr+2	5.558e-27	4.584e-27	-26.255	-26.339	-0.084	(0)
Cr (3)	1.807e-10					

Cr (OH) 2+	1.359e-10	1.295e-10	-9.867	-9.888	-0.021	(0)
Cr (OH) +2	4.112e-11	3.391e-11	-10.386	-10.470	-0.084	(0)
CrOHSO4	1.722e-12	1.722e-12	-11.764	-11.764	0.000	(0)
Cr (OH) 3	1.528e-12	1.528e-12	-11.816	-11.816	0.000	(0)
CrF+2	3.008e-13	2.481e-13	-12.522	-12.605	-0.084	(0)
Cr+3	7.616e-14	4.936e-14	-13.118	-13.307	-0.188	(0)
CrSO4+	2.589e-14	2.467e-14	-13.587	-13.608	-0.021	(0)
CrO2-	2.374e-15	2.263e-15	-14.624	-14.645	-0.021	(0)
Cr (OH) 4-	2.004e-15	1.910e-15	-14.698	-14.719	-0.021	(0)
CrCl+2	2.900e-18	2.392e-18	-17.538	-17.621	-0.084	(0)
Cr2 (OH) 2SO4+2	6.400e-21	5.278e-21	-20.194	-20.278	-0.084	(0)
Cr2 (OH) 2 (SO4) 2	6.709e-23	6.709e-23	-22.173	-22.173	0.000	(0)
CrOHC12	5.344e-23	5.344e-23	-22.272	-22.272	0.000	(0)
CrCl2+	8.917e-24	8.497e-24	-23.050	-23.071	-0.021	(0)
CrNO3+2	3.255e-25	2.684e-25	-24.487	-24.571	-0.084	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.355	-49.439	-0.084	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.920	-59.109	-0.188	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.350	-62.433	-0.084	(0)
Cr (6)	1.954e-19					
CrO4-2	1.024e-19	8.530e-20	-18.990	-19.069	-0.079	(0)
HCrO4-	9.289e-20	8.852e-20	-19.032	-19.053	-0.021	(0)
NaCrO4-	5.244e-23	4.998e-23	-22.280	-22.301	-0.021	(0)
KCrO4-	2.218e-23	2.114e-23	-22.654	-22.675	-0.021	(0)
H2CrO4	2.301e-26	2.301e-26	-25.638	-25.638	0.000	(0)
CrO3SO4-2	2.244e-27	1.851e-27	-26.649	-26.733	-0.084	(0)
CrO3Cl-	7.015e-30	6.685e-30	-29.154	-29.175	-0.021	(0)
Cr2O7-2	3.295e-37	2.717e-37	-36.482	-36.566	-0.084	(0)
Cu (1)	3.057e-10					
Cu+	2.924e-10	2.787e-10	-9.534	-9.555	-0.021	(0)
CuCl	1.313e-11	1.313e-11	-10.882	-10.882	0.000	(0)
CuCl2-	1.075e-13	1.027e-13	-12.968	-12.988	-0.020	(0)
CuCl3-2	9.851e-19	8.224e-19	-18.007	-18.085	-0.078	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-152.509	-152.653	-0.144	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.242	-153.383	-0.141	(0)
Cu (2)	2.544e-06					
Cu+2	1.757e-06	1.464e-06	-5.755	-5.835	-0.079	(0)
CuCO3	5.175e-07	5.175e-07	-6.286	-6.286	0.000	(0)
CuOH+	1.521e-07	1.453e-07	-6.818	-6.838	-0.020	(0)
CuSO4	7.177e-08	7.177e-08	-7.144	-7.144	0.000	(0)
CuHCO3+	3.981e-08	3.793e-08	-7.400	-7.421	-0.021	(0)
CuF+	3.074e-09	2.929e-09	-8.512	-8.533	-0.021	(0)
Cu (OH) 2	9.105e-10	9.105e-10	-9.041	-9.041	0.000	(0)
Cu2 (OH) 2+2	6.434e-10	5.306e-10	-9.192	-9.275	-0.084	(0)
Cu (CO3) 2-2	1.014e-10	8.363e-11	-9.994	-10.078	-0.084	(0)
CuCl+	9.092e-11	8.686e-11	-10.041	-10.061	-0.020	(0)
CuNO2+	1.155e-11	1.101e-11	-10.937	-10.958	-0.021	(0)
CuNH3+2	2.876e-12	2.372e-12	-11.541	-11.625	-0.084	(0)
Cu (OH) 3-	6.153e-14	5.863e-14	-13.211	-13.232	-0.021	(0)
CuCl2	1.128e-15	1.128e-15	-14.948	-14.948	0.000	(0)
CuNO3+	6.043e-16	5.759e-16	-15.219	-15.240	-0.021	(0)
Cu (NO2) 2	8.091e-18	8.091e-18	-17.092	-17.092	0.000	(0)
Cu (OH) 4-2	1.757e-20	1.449e-20	-19.755	-19.839	-0.084	(0)
CuCl3-	4.124e-22	3.940e-22	-21.385	-21.405	-0.020	(0)
Cu (NO3) 2	9.019e-27	9.019e-27	-26.045	-26.045	0.000	(0)
CuCl4-2	8.856e-29	7.393e-29	-28.053	-28.131	-0.078	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.128	-219.149	-0.021	(0)
F	3.512e-05					
F-	3.319e-05	3.171e-05	-4.479	-4.499	-0.020	(0)
AlF2+	4.730e-07	4.522e-07	-6.325	-6.345	-0.020	(0)
MgF+	2.664e-07	2.546e-07	-6.574	-6.594	-0.020	(0)
AlF3	1.805e-07	1.805e-07	-6.743	-6.743	0.000	(0)
CaF+	9.670e-08	9.243e-08	-7.015	-7.034	-0.020	(0)
AlF+2	4.287e-08	3.582e-08	-7.368	-7.446	-0.078	(0)
HF	1.504e-08	1.504e-08	-7.823	-7.823	0.000	(0)
CuF+	3.074e-09	2.929e-09	-8.512	-8.533	-0.021	(0)
AlF4-	3.003e-09	2.869e-09	-8.523	-8.542	-0.020	(0)
NaF	2.359e-09	2.359e-09	-8.627	-8.627	0.000	(0)
MnF+	1.141e-09	1.091e-09	-8.943	-8.962	-0.020	(0)

UO2F+	9.080e-11	8.653e-11	-10.042	-10.063	-0.021	(0)
ZnF+	5.991e-11	5.709e-11	-10.222	-10.243	-0.021	(0)
UO2F2	7.914e-12	7.914e-12	-11.102	-11.102	0.000	(0)
BF(OH) 3-	5.890e-12	5.622e-12	-11.230	-11.250	-0.020	(0)
PbF+	3.922e-12	3.738e-12	-11.406	-11.427	-0.021	(0)
HF2-	1.899e-12	1.814e-12	-11.721	-11.741	-0.020	(0)
CdF+	4.725e-13	4.502e-13	-12.326	-12.347	-0.021	(0)
CoF+	3.718e-13	3.543e-13	-12.430	-12.451	-0.021	(0)
CrF+2	3.008e-13	2.481e-13	-12.522	-12.605	-0.084	(0)
UO2F3-	6.615e-14	6.304e-14	-13.179	-13.200	-0.021	(0)
NiF+	4.377e-14	4.171e-14	-13.359	-13.380	-0.021	(0)
FeF+2	3.904e-14	3.259e-14	-13.409	-13.487	-0.078	(0)
FeF2+	2.893e-14	2.765e-14	-13.539	-13.558	-0.020	(0)
BF2(OH) 2-	6.404e-15	6.113e-15	-14.194	-14.214	-0.020	(0)
PbF2	2.333e-15	2.333e-15	-14.632	-14.632	0.000	(0)
FeF3	1.237e-15	1.237e-15	-14.908	-14.908	0.000	(0)
VO2F	1.102e-15	1.102e-15	-14.958	-14.958	0.000	(0)
H2F2	6.063e-16	6.063e-16	-15.217	-15.217	0.000	(0)
CdF2	2.849e-17	2.849e-17	-16.545	-16.545	0.000	(0)
UO2F4-2	1.926e-17	1.588e-17	-16.715	-16.799	-0.084	(0)
VO2F2-	1.331e-17	1.269e-17	-16.876	-16.897	-0.021	(0)
VOF+	1.264e-17	1.205e-17	-16.898	-16.919	-0.021	(0)
PbF3-	1.472e-19	1.403e-19	-18.832	-18.853	-0.021	(0)
VOF2	1.433e-19	1.433e-19	-18.844	-18.844	0.000	(0)
BF3OH-	2.534e-20	2.419e-20	-19.596	-19.616	-0.020	(0)
VO2F3-2	6.085e-21	5.018e-21	-20.216	-20.299	-0.084	(0)
VOF3-	1.692e-22	1.612e-22	-21.772	-21.793	-0.021	(0)
HgF+	3.553e-23	3.386e-23	-22.449	-22.470	-0.021	(0)
PbF4-2	2.582e-24	2.130e-24	-23.588	-23.672	-0.084	(0)
BF4-	1.268e-24	1.210e-24	-23.897	-23.917	-0.020	(0)
VO2F4-3	1.208e-25	7.830e-26	-24.918	-25.106	-0.188	(0)
Sb(OH) 2F	8.478e-26	8.478e-26	-25.072	-25.072	0.000	(0)
SbOF	8.337e-26	8.337e-26	-25.079	-25.079	0.000	(0)
VOF4-2	2.502e-26	2.064e-26	-25.602	-25.685	-0.084	(0)
UF3+	6.921e-33	6.596e-33	-32.160	-32.181	-0.021	(0)
UF2+2	1.591e-33	1.312e-33	-32.798	-32.882	-0.084	(0)
UF4	2.293e-35	2.293e-35	-34.640	-34.640	0.000	(0)
UF+3	5.071e-36	3.287e-36	-35.295	-35.483	-0.188	(0)
UF5-	3.024e-38	2.882e-38	-37.519	-37.540	-0.021	(0)
UF6-2	3.347e-40	2.760e-40	-39.475	-39.559	-0.084	(0)
Fe (2)	4.987e-09					
Fe+2	4.755e-09	3.921e-09	-8.323	-8.407	-0.084	(0)
FeSO4	2.060e-10	2.060e-10	-9.686	-9.686	0.000	(0)
FeHCO3+	2.120e-11	2.027e-11	-10.674	-10.693	-0.019	(0)
FeOH+	5.128e-12	4.901e-12	-11.290	-11.310	-0.020	(0)
Fe(OH) 2	1.222e-16	1.222e-16	-15.913	-15.913	0.000	(0)
Fe(OH) 3-	1.270e-18	1.214e-18	-17.896	-17.916	-0.020	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.932	-158.932	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.612	-236.633	-0.021	(0)
Fe (3)	2.506e-07					
Fe(OH) 2+	2.427e-07	2.321e-07	-6.615	-6.634	-0.020	(0)
Fe(OH) 3	7.825e-09	7.825e-09	-8.107	-8.107	0.000	(0)
Fe(OH) 4-	2.393e-11	2.288e-11	-10.621	-10.641	-0.020	(0)
FeOH+2	2.276e-11	1.900e-11	-10.643	-10.721	-0.078	(0)
FeF+2	3.904e-14	3.259e-14	-13.409	-13.487	-0.078	(0)
FeF2+	2.893e-14	2.765e-14	-13.539	-13.558	-0.020	(0)
FeSO4+	2.354e-15	2.250e-15	-14.628	-14.648	-0.020	(0)
Fe+3	1.414e-15	9.372e-16	-14.850	-15.028	-0.179	(0)
FeF3	1.237e-15	1.237e-15	-14.908	-14.908	0.000	(0)
Fe(SO4) 2-	1.080e-17	1.030e-17	-16.966	-16.987	-0.021	(0)
FeCl+2	1.269e-18	1.060e-18	-17.896	-17.975	-0.078	(0)
Fe2(OH) 2+4	2.584e-20	1.195e-20	-19.588	-19.923	-0.335	(0)
FeHSeO3+2	9.974e-21	8.225e-21	-20.001	-20.085	-0.084	(0)
FeCl2+	1.854e-22	1.772e-22	-21.732	-21.752	-0.020	(0)
FeNO3+2	1.414e-24	1.166e-24	-23.850	-23.933	-0.084	(0)
Fe3(OH) 4+5	1.337e-25	4.009e-26	-24.874	-25.397	-0.523	(0)
FeCl3	6.634e-28	6.634e-28	-27.178	-27.178	0.000	(0)
H (0)	2.199e-29					

H2	1.100e-29	1.100e-29	-28.959	-28.959	0.000	(0)
Hg (0)	4.017e-11					
Hg	4.017e-11	4.017e-11	-10.396	-10.396	0.000	(0)
Hg (1)	1.905e-21					
Hg2+2	9.526e-22	7.856e-22	-21.021	-21.105	-0.084	(0)
Hg (2)	2.451e-13					
Hg (OH) 2	1.791e-13	1.792e-13	-12.747	-12.747	0.000	(0)
HgClOH	5.980e-14	5.980e-14	-13.223	-13.223	0.000	(0)
HgCl2	4.038e-15	4.038e-15	-14.394	-14.394	0.000	(0)
HgCO3	2.070e-15	2.070e-15	-14.684	-14.684	0.000	(0)
HgOH+	3.778e-17	3.601e-17	-16.423	-16.444	-0.021	(0)
HgCl+	2.258e-17	2.152e-17	-16.646	-16.667	-0.021	(0)
HgHCO3+	1.297e-17	1.236e-17	-16.887	-16.908	-0.021	(0)
HgCl3-	1.586e-18	1.512e-18	-17.800	-17.821	-0.021	(0)
Hg (CO3) 2-2	4.765e-19	3.930e-19	-18.322	-18.406	-0.084	(0)
Hg+2	3.493e-20	2.881e-20	-19.457	-19.541	-0.084	(0)
HgNH3+2	3.490e-21	2.878e-21	-20.457	-20.541	-0.084	(0)
HgSO4	1.614e-21	1.614e-21	-20.792	-20.792	0.000	(0)
Hg (OH) 3-	7.432e-22	7.082e-22	-21.129	-21.150	-0.021	(0)
Hg (NH3) 2+2	5.527e-22	4.558e-22	-21.258	-21.341	-0.084	(0)
HgCl4-2	2.732e-22	2.253e-22	-21.563	-21.647	-0.084	(0)
HgF+	3.553e-23	3.386e-23	-22.449	-22.470	-0.021	(0)
HgNO3+	1.389e-30	1.323e-30	-29.857	-29.878	-0.021	(0)
Hg (NH3) 3+2	3.484e-31	2.874e-31	-30.458	-30.542	-0.084	(0)
Hg (NH3) 4+2	4.383e-40	3.615e-40	-39.358	-39.442	-0.084	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.165	-40.165	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-140.573	-140.594	-0.021	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.694	-140.694	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-142.724	-142.808	-0.084	(0)
K	6.992e-05					
K+	6.982e-05	6.670e-05	-4.156	-4.176	-0.020	(0)
KSO4-	1.057e-07	1.011e-07	-6.976	-6.995	-0.020	(0)
KCrO4-	2.218e-23	2.114e-23	-22.654	-22.675	-0.021	(0)
Mg	8.927e-05					
Mg+2	8.590e-05	7.155e-05	-4.066	-4.145	-0.079	(0)
MgSO4	2.786e-06	2.786e-06	-5.555	-5.555	0.000	(0)
MgHCO3+	3.148e-07	3.007e-07	-6.502	-6.522	-0.020	(0)
MgF+	2.664e-07	2.546e-07	-6.574	-6.594	-0.020	(0)
MgCO3	3.573e-09	3.573e-09	-8.447	-8.447	0.000	(0)
MgOH+	9.349e-10	8.943e-10	-9.029	-9.048	-0.019	(0)
MgH2BO3+	2.091e-12	1.996e-12	-11.680	-11.700	-0.020	(0)
Mn (2)	1.089e-06					
Mn+2	1.048e-06	8.639e-07	-5.980	-6.064	-0.084	(0)
MnSO4	3.288e-08	3.288e-08	-7.483	-7.483	0.000	(0)
MnHCO3+	7.406e-09	7.080e-09	-8.130	-8.150	-0.020	(0)
MnF+	1.141e-09	1.091e-09	-8.943	-8.962	-0.020	(0)
MnOH+	7.128e-11	6.813e-11	-10.147	-10.167	-0.020	(0)
MnCl+	4.260e-11	4.072e-11	-10.371	-10.390	-0.020	(0)
MnCl2	2.153e-15	2.153e-15	-14.667	-14.667	0.000	(0)
MnNO3+	1.787e-16	1.703e-16	-15.748	-15.769	-0.021	(0)
MnSeO4	7.626e-17	7.626e-17	-16.118	-16.118	0.000	(0)
MnCl3-	2.323e-20	2.221e-20	-19.634	-19.654	-0.020	(0)
Mn (OH) 3-	4.343e-22	4.151e-22	-21.362	-21.382	-0.020	(0)
Mn (NO3) 2	5.323e-26	5.323e-26	-25.274	-25.274	0.000	(0)
Mn (OH) 4-2	5.040e-29	4.208e-29	-28.298	-28.376	-0.078	(0)
MnSe	0.000e+00	0.000e+00	-45.999	-45.999	0.000	(0)
Mn (3)	1.498e-25					
Mn+3	1.498e-25	9.928e-26	-24.825	-25.003	-0.179	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.814	-46.893	-0.078	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.834	-49.854	-0.020	(0)
Mo	4.205e-08					
MoO4-2	4.182e-08	3.483e-08	-7.379	-7.458	-0.079	(0)
HMoO4-	2.332e-10	2.223e-10	-9.632	-9.653	-0.021	(0)
H2MoO4	5.221e-13	5.221e-13	-12.282	-12.282	0.000	(0)
AlMo6O21-3	3.327e-39	2.157e-39	-38.478	-38.666	-0.188	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.414	-51.167	-0.753	(0)

	HMo7O24-5	0.000e+00	0.000e+00	-50.751	-51.275	-0.523	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.651	-52.986	-0.335	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.046	-56.234	-0.188	(0)
N (-3)	9.370e-08						
	NH4+	9.332e-08	8.907e-08	-7.030	-7.050	-0.020	(0)
	NH4SO4-	2.137e-10	2.043e-10	-9.670	-9.690	-0.020	(0)
	NH3	1.584e-10	1.584e-10	-9.800	-9.800	0.000	(0)
	CuNH3+2	2.876e-12	2.372e-12	-11.541	-11.625	-0.084	(0)
	CaNH3+2	6.456e-14	5.324e-14	-13.190	-13.274	-0.084	(0)
	BaNH3+2	1.317e-17	1.086e-17	-16.880	-16.964	-0.084	(0)
	Co (NH3) +2	8.156e-18	6.726e-18	-17.089	-17.172	-0.084	(0)
	NiNH3+2	5.400e-18	4.453e-18	-17.268	-17.351	-0.084	(0)
	HgNH3+2	3.490e-21	2.878e-21	-20.457	-20.541	-0.084	(0)
	Hg (NH3) 2+2	5.527e-22	4.558e-22	-21.258	-21.341	-0.084	(0)
	Ca (NH3) 2+2	4.070e-24	3.356e-24	-23.390	-23.474	-0.084	(0)
	Ni (NH3) 2+2	1.236e-25	1.019e-25	-24.908	-24.992	-0.084	(0)
	Co (NH3) 2+2	5.510e-26	4.544e-26	-25.259	-25.343	-0.084	(0)
	Hg (NH3) 3+2	3.484e-31	2.874e-31	-30.458	-30.542	-0.084	(0)
	Co (NH3) 3+2	1.098e-34	9.059e-35	-33.959	-34.043	-0.084	(0)
	Hg (NH3) 4+2	4.383e-40	3.615e-40	-39.358	-39.442	-0.084	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-43.040	-43.123	-0.084	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.355	-49.439	-0.084	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-52.620	-52.704	-0.084	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.920	-59.109	-0.188	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.525	-60.608	-0.084	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.350	-62.433	-0.084	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-71.421	-71.442	-0.021	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-75.917	-76.001	-0.084	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.040	-77.124	-0.084	(0)
N (3)	7.524e-08						
	NO2-	7.523e-08	7.182e-08	-7.124	-7.144	-0.020	(0)
	CuNO2+	1.155e-11	1.101e-11	-10.937	-10.958	-0.021	(0)
	CoNO2+	1.876e-16	1.788e-16	-15.727	-15.748	-0.021	(0)
	Cu (NO2) 2	8.091e-18	8.091e-18	-17.092	-17.092	0.000	(0)
N (5)	1.303e-10						
	NO3-	1.302e-10	1.244e-10	-9.885	-9.905	-0.020	(0)
	CaNO3+	1.102e-13	1.051e-13	-12.958	-12.979	-0.021	(0)
	CuNO3+	6.043e-16	5.759e-16	-15.219	-15.240	-0.021	(0)
	MnNO3+	1.787e-16	1.703e-16	-15.748	-15.769	-0.021	(0)
	BaNO3+	7.113e-17	6.779e-17	-16.148	-16.169	-0.021	(0)
	ZnNO3+	2.959e-17	2.820e-17	-16.529	-16.550	-0.021	(0)
	PbNO3+	3.230e-18	3.078e-18	-17.491	-17.512	-0.021	(0)
	CdNO3+	3.698e-19	3.524e-19	-18.432	-18.453	-0.021	(0)
	CoNO3+	7.310e-20	6.966e-20	-19.136	-19.157	-0.021	(0)
	NiNO3+	1.717e-20	1.636e-20	-19.765	-19.786	-0.021	(0)
	UO2NO3+	5.149e-21	4.906e-21	-20.288	-20.309	-0.021	(0)
	FeNO3+2	1.414e-24	1.166e-24	-23.850	-23.933	-0.084	(0)
	VO2NO3	1.247e-24	1.247e-24	-23.904	-23.904	0.000	(0)
	CrNO3+2	3.255e-25	2.684e-25	-24.487	-24.571	-0.084	(0)
	Mn (NO3) 2	5.323e-26	5.323e-26	-25.274	-25.274	0.000	(0)
	Cu (NO3) 2	9.019e-27	9.019e-27	-26.045	-26.045	0.000	(0)
	Zn (NO3) 2	6.999e-28	6.999e-28	-27.155	-27.155	0.000	(0)
	Pb (NO3) 2	6.502e-28	6.502e-28	-27.187	-27.187	0.000	(0)
	Cd (NO3) 2	2.197e-29	2.197e-29	-28.658	-28.658	0.000	(0)
	Co (NO3) 2	1.763e-29	1.763e-29	-28.754	-28.754	0.000	(0)
	HgNO3+	1.389e-30	1.323e-30	-29.857	-29.878	-0.021	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.165	-40.165	0.000	(0)
Na	1.236e-04						
	Na+	1.234e-04	1.179e-04	-3.909	-3.928	-0.020	(0)
	NaSO4-	1.417e-07	1.355e-07	-6.849	-6.868	-0.020	(0)
	NaHCO3	2.723e-08	2.723e-08	-7.565	-7.565	0.000	(0)
	NaF	2.359e-09	2.359e-09	-8.627	-8.627	0.000	(0)
	NaCO3-	1.379e-10	1.318e-10	-9.861	-9.880	-0.020	(0)
	NaH2BO3	1.503e-13	1.503e-13	-12.823	-12.823	0.000	(0)
	NaCrO4-	5.244e-23	4.998e-23	-22.280	-22.301	-0.021	(0)
Ni	6.807e-11						
	Ni+2	6.286e-11	5.236e-11	-10.202	-10.281	-0.079	(0)
	NiHCO3+	2.782e-12	2.651e-12	-11.556	-11.577	-0.021	(0)

NiSO4	2.236e-12	2.236e-12	-11.651	-11.651	0.000	(0)
NiCO3	1.173e-13	1.173e-13	-12.931	-12.931	0.000	(0)
NiF+	4.377e-14	4.171e-14	-13.359	-13.380	-0.021	(0)
NiOH+	2.172e-14	2.070e-14	-13.663	-13.684	-0.021	(0)
NiCl+	5.264e-15	5.016e-15	-14.279	-14.300	-0.021	(0)
Ni (OH) 2	5.162e-17	5.162e-17	-16.287	-16.287	0.000	(0)
Ni (SO4) 2-2	1.921e-17	1.585e-17	-16.716	-16.800	-0.084	(0)
NiNH3+2	5.400e-18	4.453e-18	-17.268	-17.351	-0.084	(0)
NiNO3+	1.717e-20	1.636e-20	-19.765	-19.786	-0.021	(0)
NiSeO4	8.032e-21	8.032e-21	-20.095	-20.095	0.000	(0)
Ni (OH) 3-	1.701e-21	1.621e-21	-20.769	-20.790	-0.021	(0)
NiCl2	9.456e-22	9.456e-22	-21.024	-21.024	0.000	(0)
Ni (NH3) 2+2	1.236e-25	1.019e-25	-24.908	-24.992	-0.084	(0)
O (0)	8.374e-35					
O2	4.187e-35	4.189e-35	-34.378	-34.378	0.000	(0)
Pb	3.166e-09					
Pb+2	2.008e-09	1.673e-09	-8.697	-8.777	-0.079	(0)
PbHCO3+	5.356e-10	5.104e-10	-9.271	-9.292	-0.021	(0)
PbCO3	3.019e-10	3.019e-10	-9.520	-9.520	0.000	(0)
PbSO4	1.753e-10	1.753e-10	-9.756	-9.756	0.000	(0)
PbOH+	1.384e-10	1.319e-10	-9.859	-9.880	-0.021	(0)
PbF+	3.922e-12	3.738e-12	-11.406	-11.427	-0.021	(0)
PbCl+	2.331e-12	2.222e-12	-11.632	-11.653	-0.021	(0)
Pb (SO4) 2-2	2.741e-13	2.261e-13	-12.562	-12.646	-0.084	(0)
Pb (OH) 2	1.310e-13	1.310e-13	-12.883	-12.883	0.000	(0)
Pb (CO3) 2-2	6.338e-14	5.227e-14	-13.198	-13.282	-0.084	(0)
PbF2	2.333e-15	2.333e-15	-14.632	-14.632	0.000	(0)
PbCl2	3.716e-16	3.716e-16	-15.430	-15.430	0.000	(0)
Pb2OH+3	5.395e-18	3.497e-18	-17.268	-17.456	-0.188	(0)
Pb (OH) 3-	4.315e-18	4.112e-18	-17.365	-17.386	-0.021	(0)
PbNO3+	3.230e-18	3.078e-18	-17.491	-17.512	-0.021	(0)
PbF3-	1.472e-19	1.403e-19	-18.832	-18.853	-0.021	(0)
PbCl3-	5.812e-21	5.538e-21	-20.236	-20.257	-0.021	(0)
Pb (OH) 4-2	3.834e-23	3.162e-23	-22.416	-22.500	-0.084	(0)
PbF4-2	2.582e-24	2.130e-24	-23.588	-23.672	-0.084	(0)
Pb3 (OH) 4+2	6.941e-25	5.724e-25	-24.159	-24.242	-0.084	(0)
PbCl4-2	1.149e-25	9.478e-26	-24.940	-25.023	-0.084	(0)
Pb (NO3) 2	6.502e-28	6.502e-28	-27.187	-27.187	0.000	(0)
Pb4 (OH) 4+4	1.644e-29	7.605e-30	-28.784	-29.119	-0.335	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.982	-152.982	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.399	-231.420	-0.021	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.212	-79.212	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.717	-79.738	-0.021	(0)
CdHS+	0.000e+00	0.000e+00	-80.757	-80.778	-0.021	(0)
S5-2	0.000e+00	0.000e+00	-82.525	-82.609	-0.084	(0)
S6-2	0.000e+00	0.000e+00	-83.041	-83.125	-0.084	(0)
S4-2	0.000e+00	0.000e+00	-83.121	-83.205	-0.084	(0)
S3-2	0.000e+00	0.000e+00	-83.927	-84.011	-0.084	(0)
S2-2	0.000e+00	0.000e+00	-84.943	-85.027	-0.084	(0)
S-2	0.000e+00	0.000e+00	-90.465	-90.544	-0.078	(0)
HgHS2-	0.000e+00	0.000e+00	-140.573	-140.594	-0.021	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.694	-140.694	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-142.724	-142.808	-0.084	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-152.509	-152.653	-0.144	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.982	-152.982	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.195	-153.216	-0.021	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.242	-153.383	-0.141	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-153.311	-153.311	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-153.700	-153.700	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.932	-158.932	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.128	-219.149	-0.021	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-230.137	-230.158	-0.021	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-231.128	-231.149	-0.021	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-231.399	-231.420	-0.021	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.560	-233.644	-0.084	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.612	-236.633	-0.021	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-308.607	-308.691	-0.084	(0)

Zn(HS) 4-2	0.000e+00	0.000e+00	-311.272	-311.356	-0.084	(0)
Sb2S4-2	0.000e+00	0.000e+00	-323.012	-323.096	-0.084	(0)
S (6)	2.732e-04					
SO4-2	2.569e-04	2.140e-04	-3.590	-3.670	-0.079	(0)
CaSO4	1.309e-05	1.309e-05	-4.883	-4.883	0.000	(0)
MgSO4	2.786e-06	2.786e-06	-5.555	-5.555	0.000	(0)
NaSO4-	1.417e-07	1.355e-07	-6.849	-6.868	-0.020	(0)
KSO4-	1.057e-07	1.011e-07	-6.976	-6.995	-0.020	(0)
CuSO4	7.177e-08	7.177e-08	-7.144	-7.144	0.000	(0)
MnSO4	3.288e-08	3.288e-08	-7.483	-7.483	0.000	(0)
HSO4-	7.019e-09	6.707e-09	-8.154	-8.173	-0.020	(0)
ZnSO4	4.225e-09	4.225e-09	-8.374	-8.374	0.000	(0)
NH4SO4-	2.137e-10	2.043e-10	-9.670	-9.690	-0.020	(0)
FeSO4	2.060e-10	2.060e-10	-9.686	-9.686	0.000	(0)
AlSO4+	1.963e-10	1.876e-10	-9.707	-9.727	-0.020	(0)
PbSO4	1.753e-10	1.753e-10	-9.756	-9.756	0.000	(0)
CdSO4	4.494e-11	4.494e-11	-10.347	-10.347	0.000	(0)
CoSO4	1.509e-11	1.509e-11	-10.821	-10.821	0.000	(0)
Zn(SO4) 2-2	9.549e-12	7.875e-12	-11.020	-11.104	-0.084	(0)
UO2SO4	6.403e-12	6.403e-12	-11.194	-11.194	0.000	(0)
NiSO4	2.236e-12	2.236e-12	-11.651	-11.651	0.000	(0)
CrOHSO4	1.722e-12	1.722e-12	-11.764	-11.764	0.000	(0)
Al(SO4) 2-	4.502e-13	4.303e-13	-12.347	-12.366	-0.020	(0)
Pb(SO4) 2-2	2.741e-13	2.261e-13	-12.562	-12.646	-0.084	(0)
Cd(SO4) 2-2	1.573e-13	1.297e-13	-12.803	-12.887	-0.084	(0)
CrSO4+	2.589e-14	2.467e-14	-13.587	-13.608	-0.021	(0)
UO2(SO4) 2-2	2.190e-14	1.806e-14	-13.659	-13.743	-0.084	(0)
FeSO4+	2.354e-15	2.250e-15	-14.628	-14.648	-0.020	(0)
VO2SO4-	1.062e-16	1.012e-16	-15.974	-15.995	-0.021	(0)
Ni(SO4) 2-2	1.921e-17	1.585e-17	-16.716	-16.800	-0.084	(0)
Fe(SO4) 2-	1.080e-17	1.030e-17	-16.966	-16.987	-0.021	(0)
VOSO4	3.734e-18	3.734e-18	-17.428	-17.428	0.000	(0)
Cr2(OH) 2SO4+2	6.400e-21	5.278e-21	-20.194	-20.278	-0.084	(0)
HgSO4	1.614e-21	1.614e-21	-20.792	-20.792	0.000	(0)
Cr2(OH) 2(SO4) 2	6.709e-23	6.709e-23	-22.173	-22.173	0.000	(0)
CrO3SO4-2	2.244e-27	1.851e-27	-26.649	-26.733	-0.084	(0)
VSO4+	1.333e-31	1.270e-31	-30.875	-30.896	-0.021	(0)
U(SO4) 2	7.524e-38	7.524e-38	-37.124	-37.124	0.000	(0)
USO4+2	5.367e-38	4.426e-38	-37.270	-37.354	-0.084	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-71.421	-71.442	-0.021	(0)
Sb (3)	1.055e-20					
Sb(OH) 3	5.336e-21	5.336e-21	-20.273	-20.273	0.000	(0)
HSbO2	5.209e-21	5.209e-21	-20.283	-20.283	0.000	(0)
Sb(OH) 2F	8.478e-26	8.478e-26	-25.072	-25.072	0.000	(0)
SbOF	8.337e-26	8.337e-26	-25.079	-25.079	0.000	(0)
Sb(OH) 2+	4.361e-26	4.156e-26	-25.360	-25.381	-0.021	(0)
SbO2-	2.760e-26	2.631e-26	-25.559	-25.580	-0.021	(0)
Sb(OH) 4-	1.582e-26	1.507e-26	-25.801	-25.822	-0.021	(0)
SbO+	1.503e-26	1.433e-26	-25.823	-25.844	-0.021	(0)
Sb2S4-2	0.000e+00	0.000e+00	-323.012	-323.096	-0.084	(0)
Sb (5)	4.710e-10					
SbO3-	4.705e-10	4.484e-10	-9.327	-9.348	-0.021	(0)
Sb(OH) 6-	5.489e-13	5.244e-13	-12.260	-12.280	-0.020	(0)
SbO2+	1.388e-23	1.323e-23	-22.858	-22.879	-0.021	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.023	-41.044	-0.021	(0)
H2Se	0.000e+00	0.000e+00	-43.648	-43.648	0.000	(0)
MnSe	0.000e+00	0.000e+00	-45.999	-45.999	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.467	-49.550	-0.084	(0)
Se (4)	3.536e-09					
HSeO3-	3.485e-09	3.321e-09	-8.458	-8.479	-0.021	(0)
SeO3-2	5.000e-11	4.123e-11	-10.301	-10.385	-0.084	(0)
H2SeO3	4.544e-13	4.544e-13	-12.343	-12.343	0.000	(0)
FeHSeO3+2	9.974e-21	8.225e-21	-20.001	-20.085	-0.084	(0)
Cd(SeO3) 2-2	1.522e-24	1.255e-24	-23.818	-23.901	-0.084	(0)
Se (6)	3.938e-13					
SeO4-2	3.937e-13	3.279e-13	-12.405	-12.484	-0.079	(0)
MnSeO4	7.626e-17	7.626e-17	-16.118	-16.118	0.000	(0)

HSeO4-	5.531e-18	5.271e-18	-17.257	-17.278	-0.021	(0)
ZnSeO4	4.583e-18	4.583e-18	-17.339	-17.339	0.000	(0)
CoSeO4	5.807e-20	5.807e-20	-19.236	-19.236	0.000	(0)
CdSeO4	5.471e-20	5.471e-20	-19.262	-19.262	0.000	(0)
NiSeO4	8.032e-21	8.032e-21	-20.095	-20.095	0.000	(0)
Zn (SeO4) 2-2	1.848e-30	1.524e-30	-29.733	-29.817	-0.084	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.302	-55.491	-0.188	(0)
U (4)	1.234e-21					
U (OH) 5-	1.219e-21	1.161e-21	-20.914	-20.935	-0.021	(0)
U (OH) 4	1.560e-23	1.560e-23	-22.807	-22.807	0.000	(0)
U (OH) 3+	1.919e-26	1.829e-26	-25.717	-25.738	-0.021	(0)
U (OH) 2+2	3.289e-30	2.712e-30	-29.483	-29.567	-0.084	(0)
UF3+	6.921e-33	6.596e-33	-32.160	-32.181	-0.021	(0)
UF2+2	1.591e-33	1.312e-33	-32.798	-32.882	-0.084	(0)
UOH+3	6.321e-35	4.097e-35	-34.199	-34.388	-0.188	(0)
UF4	2.293e-35	2.293e-35	-34.640	-34.640	0.000	(0)
UF+3	5.071e-36	3.287e-36	-35.295	-35.483	-0.188	(0)
U (SO4) 2	7.524e-38	7.524e-38	-37.124	-37.124	0.000	(0)
USO4+2	5.367e-38	4.426e-38	-37.270	-37.354	-0.084	(0)
UF5-	3.024e-38	2.882e-38	-37.519	-37.540	-0.021	(0)
UF6-2	3.347e-40	2.760e-40	-39.475	-39.559	-0.084	(0)
U+4	1.123e-40	0.000e+00	-39.950	-40.284	-0.335	(0)
UC1+3	0.000e+00	0.000e+00	-42.823	-43.011	-0.188	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.758	-161.453	-1.695	(0)
U (5)	4.914e-15					
UO2+	4.914e-15	4.683e-15	-14.309	-14.329	-0.021	(0)
U (6)	1.184e-08					
UO2 (CO3) 2-2	6.863e-09	5.660e-09	-8.163	-8.247	-0.084	(0)
UO2CO3	4.725e-09	4.725e-09	-8.326	-8.326	0.000	(0)
UO2F+	9.080e-11	8.653e-11	-10.042	-10.063	-0.021	(0)
UO2OH+	8.199e-11	7.813e-11	-10.086	-10.107	-0.021	(0)
UO2 (CO3) 3-4	3.682e-11	1.703e-11	-10.434	-10.769	-0.335	(0)
UO2+2	2.373e-11	1.977e-11	-10.625	-10.704	-0.079	(0)
UO2F2	7.914e-12	7.914e-12	-11.102	-11.102	0.000	(0)
UO2SO4	6.403e-12	6.403e-12	-11.194	-11.194	0.000	(0)
UO2F3-	6.615e-14	6.304e-14	-13.179	-13.200	-0.021	(0)
UO2 (SO4) 2-2	2.190e-14	1.806e-14	-13.659	-13.743	-0.084	(0)
(UO2) 2 (OH) 2+2	1.228e-14	1.013e-14	-13.911	-13.994	-0.084	(0)
UO2C1+	1.259e-15	1.200e-15	-14.900	-14.921	-0.021	(0)
(UO2) 3 (OH) 5+	6.211e-16	5.919e-16	-15.207	-15.228	-0.021	(0)
UO2F4-2	1.926e-17	1.588e-17	-16.715	-16.799	-0.084	(0)
UO2NO3+	5.149e-21	4.906e-21	-20.288	-20.309	-0.021	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.537	-40.621	-0.084	(0)
VOH+	0.000e+00	0.000e+00	-40.593	-40.614	-0.021	(0)
V (3)	3.140e-14					
V (OH) 3	3.140e-14	3.140e-14	-13.503	-13.503	0.000	(0)
V (OH) 2+	6.827e-24	6.506e-24	-23.166	-23.187	-0.021	(0)
VOH+2	2.399e-26	1.979e-26	-25.620	-25.704	-0.084	(0)
V+3	1.940e-30	1.258e-30	-29.712	-29.900	-0.188	(0)
VSO4+	1.333e-31	1.270e-31	-30.875	-30.896	-0.021	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.250	-50.438	-0.188	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.272	-50.607	-0.335	(0)
V (4)	5.097e-16					
V (OH) 3+	4.164e-16	3.968e-16	-15.381	-15.401	-0.021	(0)
VO+2	7.681e-17	6.334e-17	-16.115	-16.198	-0.084	(0)
VOF+	1.264e-17	1.205e-17	-16.898	-16.919	-0.021	(0)
VOSO4	3.734e-18	3.734e-18	-17.428	-17.428	0.000	(0)
VOF2	1.433e-19	1.433e-19	-18.844	-18.844	0.000	(0)
VOC1+	6.981e-21	6.653e-21	-20.156	-20.177	-0.021	(0)
VOF3-	1.692e-22	1.612e-22	-21.772	-21.793	-0.021	(0)
VOF4-2	2.502e-26	2.064e-26	-25.602	-25.685	-0.084	(0)
H2V2O4+2	9.569e-27	7.891e-27	-26.019	-26.103	-0.084	(0)
V (5)	1.026e-08					
H2VO4-	1.013e-08	9.653e-09	-7.994	-8.015	-0.021	(0)
HVO4-2	9.167e-11	7.560e-11	-10.038	-10.121	-0.084	(0)
H3VO4	3.096e-11	3.096e-11	-10.509	-10.509	0.000	(0)

H3V2O7-	2.025e-12	1.929e-12	-11.694	-11.715	-0.021	(0)
VO2+	2.074e-14	1.981e-14	-13.683	-13.703	-0.020	(0)
VO2F	1.102e-15	1.102e-15	-14.958	-14.958	0.000	(0)
HV2O7-3	3.815e-16	2.473e-16	-15.418	-15.607	-0.188	(0)
VO2SO4-	1.062e-16	1.012e-16	-15.974	-15.995	-0.021	(0)
VO2F2-	1.331e-17	1.269e-17	-16.876	-16.897	-0.021	(0)
VO4-3	1.823e-18	1.182e-18	-17.739	-17.928	-0.188	(0)
V3O9-3	1.453e-18	9.418e-19	-17.838	-18.026	-0.188	(0)
V2O7-4	4.487e-20	2.075e-20	-19.348	-19.683	-0.335	(0)
VO2F3-2	6.085e-21	5.018e-21	-20.216	-20.299	-0.084	(0)
V4O12-4	8.193e-24	3.790e-24	-23.087	-23.421	-0.335	(0)
VO2NO3	1.247e-24	1.247e-24	-23.904	-23.904	0.000	(0)
VO2F4-3	1.208e-25	7.830e-26	-24.918	-25.106	-0.188	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.007	-55.531	-0.523	(0)
V10O28-6	0.000e+00	0.000e+00	-56.470	-57.223	-0.753	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.482	-56.817	-0.335	(0)
Zn	1.145e-07					
Zn+2	1.083e-07	9.023e-08	-6.965	-7.045	-0.079	(0)
ZnSO4	4.225e-09	4.225e-09	-8.374	-8.374	0.000	(0)
ZnHCO3+	1.230e-09	1.172e-09	-8.910	-8.931	-0.021	(0)
ZnCO3	3.117e-10	3.117e-10	-9.506	-9.506	0.000	(0)
ZnOH+	2.973e-10	2.833e-10	-9.527	-9.548	-0.021	(0)
ZnF+	5.991e-11	5.709e-11	-10.222	-10.243	-0.021	(0)
Zn(SO4) 2-2	9.549e-12	7.875e-12	-11.020	-11.104	-0.084	(0)
ZnCl+	8.883e-12	8.486e-12	-11.051	-11.071	-0.020	(0)
Zn(OH) 2	1.410e-12	1.410e-12	-11.851	-11.851	0.000	(0)
ZnOHCl	3.488e-13	3.488e-13	-12.457	-12.457	0.000	(0)
ZnCl2	5.035e-16	5.035e-16	-15.298	-15.298	0.000	(0)
Zn(OH) 3-	2.328e-16	2.218e-16	-15.633	-15.654	-0.021	(0)
ZnNO3+	2.959e-17	2.820e-17	-16.529	-16.550	-0.021	(0)
ZnSeO4	4.583e-18	4.583e-18	-17.339	-17.339	0.000	(0)
ZnCl3-	1.568e-20	1.497e-20	-19.805	-19.825	-0.020	(0)
Zn(OH) 4-2	3.362e-22	2.773e-22	-21.473	-21.557	-0.084	(0)
ZnCl4-2	3.358e-25	2.803e-25	-24.474	-24.552	-0.078	(0)
Zn(NO3) 2	6.999e-28	6.999e-28	-27.155	-27.155	0.000	(0)
Zn(SeO4) 2-2	1.848e-30	1.524e-30	-29.733	-29.817	-0.084	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.195	-153.216	-0.021	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-153.700	-153.700	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-230.137	-230.158	-0.021	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.560	-233.644	-0.084	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-311.272	-311.356	-0.084	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-68.75	-62.46	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-56.01	-51.50	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-63.24	-51.50	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-86.43	-68.50	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-72.09	-52.06	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-33.57	-33.17	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.03	-26.58	0.45	(NH4)2SeO4
Al(OH) 3 (am)	-1.27	9.53	10.80	Al(OH) 3
Al2(MoO4) 3	-44.64	-42.27	2.37	Al2(MoO4) 3
Al2O3	-0.58	19.07	19.65	Al2O3
Al4(OH)10SO4	-1.22	21.48	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-8.89	-4.09	4.80	AlAsO4:2H2O
AlOHSO4	-3.89	-7.12	-3.23	AlOHSO4
AlSb	-153.79	-88.16	65.62	AlSb
Alunite	-0.99	-2.39	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-4.66	-12.45	-7.79	PbSO4
Anhydrite	-2.88	-7.24	-4.36	CaSO4
Anilite	-57.16	-89.03	-31.88	Cu0.25Cu1.5S
Antlerite	-3.99	4.80	8.79	Cu3(OH) 4SO4
Aragonite	-2.49	-10.79	-8.30	CaCO3
Arsenolite	-79.38	-82.14	-2.76	As4O6
Artinite	-12.12	-2.52	9.60	MgCO3:Mg(OH) 2:3H2O

As2O5	-33.95	-27.25	6.71	As2O5
Atacamite	-4.01	3.39	7.39	Cu2(OH)3Cl
Azurite	-2.05	-18.96	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-18.37	6.02	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-18.24	-2.37	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.27	-9.18	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-29.29	3.65	32.94	Ba3(VO4)2·4H2O
BaCrO4	-16.36	-26.03	-9.67	BaCrO4
BaF2	-10.14	-15.96	-5.82	BaF2
BaMoO4	-7.46	-14.42	-6.96	BaMoO4
Barite	-0.65	-10.63	-9.98	BaSO4
BaS	-96.39	-80.21	16.18	BaS
BaSeO3	-10.78	-8.95	1.83	BaSeO3
BaSeO4	-11.99	-19.45	-7.46	BaSeO4
Bianchite	-8.95	-10.71	-1.76	ZnSO4·6H2O
Birnessite	-10.71	7.38	18.09	MnO2
Bixbyite	-10.40	-11.04	-0.64	Mn2O3
BlaubleiI	-56.24	-80.41	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.11	-84.39	-27.28	Cu0.6Cu0.8S
Boehmite	0.96	9.53	8.58	AlOOH
Breithauptite	-63.56	-82.09	-18.52	NiSb
Brochantite	-3.27	11.96	15.22	Cu4(OH)6SO4
Brucite	-8.00	8.84	16.84	Mg(OH)2
Bunsenite	-9.74	2.71	12.45	NiO
Ca(VO3)2	-10.66	-5.00	5.66	Ca(VO3)2
Ca2V2O7	-13.09	4.41	17.50	Ca2V2O7
Ca2V2O7·2H2O	-17.14	4.41	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-21.31	0.99	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-25.14	13.82	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-26.04	13.82	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-310.13	-167.15	142.97	Ca3Sb2
CaCrO4	-20.38	-22.64	-2.27	CaCrO4
Calcite	-2.31	-10.79	-8.48	CaCO3
Calomel	-12.05	-29.96	-17.91	Hg2Cl2
CaMoO4	-3.08	-11.03	-7.95	CaMoO4
Carnotite	-2.84	-2.61	0.23	KUO2VO4
CaSeO3·2H2O	-8.37	-5.56	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-13.04	-16.06	-3.02	CaSeO4·2H2O
Cd(BO2)2	-18.60	-8.76	9.84	Cd(BO2)2
Cd(OH)2	-9.70	3.94	13.64	Cd(OH)2
Cd(OH)2(am)	-9.79	3.94	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.20	-21.49	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.40	-4.84	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.30	-0.90	28.40	Cd4(OH)6SO4
CdCl2	-17.24	-17.90	-0.66	CdCl2
CdCl2·1H2O	-16.21	-17.90	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-15.99	-17.90	-1.91	CdCl2·2.5H2O
CdF2	-16.83	-18.05	-1.21	CdF2
Cdmetal(alpha)	-35.38	-21.87	13.51	Cd
Cdmetal(gamma)	-35.49	-21.87	13.62	Cd
CdMoO4	-2.36	-16.51	-14.15	CdMoO4
CdOHCl	-10.52	-6.98	3.54	CdOHCl
CdSb	-80.50	-80.85	-0.35	CdSb
CdSe	-23.40	-43.60	-20.20	CdSe
CdSeO4·2H2O	-19.68	-21.53	-1.85	CdSeO4·2H2O
CdSO4	-12.55	-12.72	-0.17	CdSO4
CdSO4·1H2O	-10.99	-12.72	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-10.84	-12.72	-1.87	CdSO4·2.67H2O
Cerrusite	-2.87	-16.00	-13.13	PbCO3
CH4(g)	-82.40	-123.44	-41.05	CH4
Chalcanthite	-6.86	-9.50	-2.64	CuSO4·5H2O
Chalcocite	-57.43	-92.35	-34.92	Cu2S
Chalcopyrite	-125.46	-160.73	-35.27	CuFeS2
Cinnabar	-53.28	-98.98	-45.69	HgS
Claudetite	-79.08	-82.14	-3.06	As4O6
Clausthalite	-16.23	-43.33	-27.10	PbSe
Co(BO2)2	-36.24	-9.17	27.07	Co(BO2)2
Co(OH)2	-9.56	3.54	13.09	Co(OH)2

Co(OH) 3	-13.65	-15.96	-2.31	Co(OH) 3
CO2(g)	-2.06	-20.21	-18.15	CO2
Co3(AsO4) 2	-29.68	-16.64	13.03	Co3(AsO4) 2
Co3O4	-17.89	-28.38	-10.50	Co3O4
CoCl2	-26.57	-18.31	8.27	CoCl2
CoCl2:6H2O	-20.84	-18.31	2.54	CoCl2:6H2O
CoCO3	-6.69	-16.67	-9.98	CoCO3
CoF2	-16.85	-18.45	-1.60	CoF2
CoF3	-47.48	-48.94	-1.46	CoF3
CoFe2O4	15.97	12.44	-3.53	CoFe2O4
CoMoO4	-9.15	-16.91	-7.76	CoMoO4
CoO	-10.05	3.54	13.59	CoO
CoS(alpha)	-75.26	-82.70	-7.44	CoS
CoS(beta)	-71.63	-82.70	-11.07	CoS
CoSe	-27.80	-44.00	-16.20	CoSe
CoSeO3	-12.76	-11.44	1.32	CoSeO3
CoSeO4:6H2O	-20.41	-21.94	-1.53	CoSeO4:6H2O
CoSO4	-15.92	-13.12	2.80	CoSO4
CoSO4:6H2O	-10.65	-13.12	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-56.78	-79.08	-22.30	CuS
Cr(OH) 2	-24.17	-13.35	10.82	Cr(OH) 2
Cr(OH) 3	-4.73	-3.39	1.34	Cr(OH) 3
Cr(OH) 3(am)	-2.64	-3.39	-0.75	Cr(OH) 3
Cr2O3	-4.43	-6.79	-2.36	Cr2O3
CrCl2	-49.28	-35.19	14.09	CrCl2
CrCl3	-51.27	-36.16	15.11	CrCl3
CrF3	-25.03	-36.37	-11.34	CrF3
Crmetal	-69.64	-39.16	30.48	Cr
CrO3	-28.85	-32.06	-3.21	CrO3
Cryolite	-14.89	-48.73	-33.84	Na3AlF6
Cu(OH) 2	-1.52	7.15	8.67	Cu(OH) 2
Cu(SbO3) 2	-26.99	18.22	45.21	Cu(SbO3) 2
Cu2(OH) 3NO3	-11.34	-2.09	9.25	Cu2(OH) 3NO3
Cu2Sb:3H2O	-58.72	-93.61	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-7.86	-53.66	-45.80	Cu2Se
Cu2SO4	-20.83	-22.78	-1.95	Cu2SO4
Cu3(AsO4) 2:2H2O	-11.89	-5.79	6.10	Cu3(AsO4) 2:2H2O
Cu3Sb	-64.29	-106.88	-42.59	Cu3Sb
Cu3Se2	-30.55	-94.05	-63.49	Cu3Se2
CuCO3	-1.56	-13.06	-11.50	CuCO3
CuCrO4	-19.46	-24.90	-5.44	CuCrO4
CuF	-9.15	-14.05	-4.91	CuF
CuF2	-15.95	-14.83	1.12	CuF2
CuF2:2H2O	-10.28	-14.83	-4.55	CuF2:2H2O
Cumetal	-7.21	-15.97	-8.76	Cu
CuMoO4	-0.22	-13.29	-13.08	CuMoO4
CuOCuSO4	-12.65	-2.35	10.30	CuOCuSO4
Cupricferrite	10.07	16.06	5.99	CuFe2O4
Cuprite	-4.72	-6.12	-1.41	Cu2O
Cuprousferrite	10.31	1.39	-8.92	CuFeO2
CuSe	-7.28	-40.38	-33.10	CuSe
CuSe2	-28.75	-62.11	-33.37	CuSe2
CuSeO3:2H2O	-8.33	-7.82	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.88	-18.32	-2.44	CuSeO4:5H2O
CuSO4	-12.44	-9.50	2.94	CuSO4
Diaspore	2.66	9.53	6.87	AlOOH
Djurleite	-57.56	-91.48	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.62	-22.16	-16.54	CaMg(CO3) 2
Dolomite(ordered)	-5.07	-22.16	-17.09	CaMg(CO3) 2
Epsomite	-5.69	-7.82	-2.13	MgSO4:7H2O
Fe(OH) 2	-8.98	4.58	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	4.22	1.18	-3.04	Fe(OH) 2.7Cl.3
Fe(VO3) 2	-6.12	-9.84	-3.72	Fe(VO3) 2
Fe2(OH) 4SeO3	-7.62	-6.07	1.55	Fe2(OH) 4SeO3
Fe2(SeO3) 3:2H2O	-15.38	-36.01	-20.63	Fe2(SeO3) 3:2H2O
Fe2(SO4) 3	-37.33	-41.07	-3.73	Fe2(SO4) 3
Fe3(OH) 8	-6.73	13.49	20.22	Fe3(OH) 8

FeAsO4:2H2O	-9.57	-9.17	0.40	FeAsO4:2H2O
FeCr2O4	-9.41	-2.21	7.20	FeCr2O4
FeMoO4	-5.77	-15.86	-10.09	FeMoO4
Ferrihydrite	1.26	4.45	3.19	Fe(OH)3
Ferroselite	-46.09	-64.69	-18.60	FeSe2
FeS (ppt)	-78.70	-81.65	-2.95	FeS
FeSe	-31.96	-42.96	-11.00	FeSe
Fix_pe	-6.41	-6.41	0.00	e-
Fluorite	-2.07	-12.57	-10.50	CaF2
Galena	-68.05	-82.02	-13.97	PbS
Gibbsite	1.24	9.53	8.29	Al(OH)3
Goethite	3.96	4.45	0.49	FeOOH
Goslarite	-8.70	-10.71	-2.01	ZnSO4:7H2O
Greenockite	-67.93	-82.29	-14.36	CdS
Greigite	-286.40	-331.44	-45.03	Fe3S4
Gummite	-5.39	2.28	7.67	UO3
Gypsum	-2.63	-7.24	-4.61	CaSO4:2H2O
H-Jarosite	-7.85	-19.95	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.57	-20.45	-12.88	H2MoO4
H2S (g)	-78.22	-86.23	-8.01	H2S
H2Se (g)	-42.58	-47.54	-4.96	H2Se
Halite	-9.96	-8.36	1.60	NaCl
Hausmannite	-14.45	46.58	61.03	Mn3O4
Hematite	10.32	8.91	-1.42	Fe2O3
Hercynite	0.76	23.65	22.89	FeAl2O4
Hg(CH3)2 (g)	-185.93	-259.63	-73.71	Hg(CH3)2
Hg (g)	-9.09	-16.96	-7.87	Hg
Hg(OH)2	-9.25	-12.75	-3.50	Hg(OH)2
Hg2 (g)	-18.97	-33.93	-14.96	Hg2
Hg2(OH)2	-13.38	-8.12	5.26	Hg2(OH)2
Hg2CO3	-12.28	-28.33	-16.05	Hg2CO3
Hg2CrO4	-31.47	-40.17	-8.70	Hg2CrO4
Hg2F2	-19.74	-30.10	-10.36	Hg2F2
Hg2S	-82.67	-94.35	-11.68	Hg2S
Hg2SeO3	-18.43	-23.09	-4.66	Hg2SeO3
Hg2SO4	-18.64	-24.77	-6.13	Hg2SO4
Hg3O2CO3	-28.77	-58.45	-29.68	Hg3O2CO3
HgCl (g)	-34.48	-14.98	19.50	HgCl
HgCl2	-13.33	-34.59	-21.26	HgCl2
HgF (g)	-47.73	-15.05	32.68	HgF
HgF2 (g)	-47.30	-34.73	12.57	HgF2
Hgmetal (l)	-3.51	-16.96	-13.45	Hg
HgSe	-4.59	-60.28	-55.69	HgSe
HgSeO3	-15.29	-27.72	-12.43	HgSeO3
HgSO4	-19.99	-29.40	-9.42	HgSO4
Huntite	-14.93	-44.90	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.01	-27.79	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-27.86	-36.63	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.29	-21.46	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-2.84	-17.64	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-42.24	-59.48	-17.24	K2Cr2O7
K2CrO4	-26.91	-27.42	-0.51	K2CrO4
K2MoO4	-19.07	-15.81	3.26	K2MoO4
K2SeO4	-20.11	-20.84	-0.73	K2SeO4
Langite	-5.53	11.96	17.49	Cu4(OH)6SO4:H2O
Larnakite	-7.80	-8.24	-0.43	PbO:PbSO4
Laurionite	-7.33	-6.71	0.62	PbOHCl
Lepidocrocite	3.08	4.45	1.37	FeOOH
Lime	-23.28	9.41	32.70	CaO
Litharge	-8.48	4.21	12.69	PbO
Mackinawite	-78.05	-81.65	-3.60	FeS
Maghemite	2.52	8.91	6.39	Fe2O3
Magnesioferrite	0.89	17.75	16.86	Fe2MgO4
Magnetite	-3.91	-11.37	-7.46	MgCO3
Magnetite	10.09	13.49	3.40	Fe3O4
Malachite	-0.60	-5.90	-5.31	Cu2(OH)2CO3
Manganite	-5.51	19.83	25.34	MnOOH
Massicot	-8.68	4.21	12.89	PbO

Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-20.95	-14.69	6.26	CuCl ₂
Melanterite	-9.87	-12.08	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-53.88	-98.98	-45.09	HgS
Mg(OH) ₂ (active)	-9.95	8.84	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.86	-5.58	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-285.57	-210.89	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.09	3.27	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-14.15	2.06	16.20	MgCr ₂ O ₄
MgCrO ₄	-28.59	-23.21	5.38	MgCrO ₄
MgF ₂	-5.01	-13.14	-8.13	MgF ₂
MgMoO ₄	-9.75	-11.60	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-9.19	-6.13	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-15.43	-16.63	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-35.08	38.44	73.52	Pb ₃ O ₄
Mirabilite	-10.41	-11.53	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.39	-7.49	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.30	-61.01	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-157.83	-96.75	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-18.98	-6.48	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-17.63	-14.92	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-79.48	-79.31	0.17	MnS
MnS (pnk)	-82.65	-79.31	3.34	MnS
MnSb	-100.31	-103.22	-2.91	MnSb
MnSe	-44.11	-40.61	3.50	MnSe
MnSeO ₃	-9.18	-8.05	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-9.03	-8.05	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.50	-18.55	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-12.32	-9.73	2.58	MnSO ₄
Monteponite	-11.16	3.94	15.10	CdO
Montroydite	-9.11	-12.75	-3.64	HgO
MoO ₃	-12.45	-20.45	-8.00	MoO ₃
Morenosite	-11.81	-13.95	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-148.46	-218.72	-70.26	MoS ₂
Na-Jarosite	-6.19	-17.39	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-49.09	-58.98	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-29.86	-26.93	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-19.16	-35.76	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.81	-15.32	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-16.54	-15.32	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-20.14	-9.84	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-21.62	-20.34	1.28	Na ₂ SeO ₄
Na ₃ Sb	-184.45	-90.00	94.45	Na ₃ Sb
Na ₃ VO ₄	-36.19	0.49	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-41.56	-4.16	37.40	Na ₄ V ₂ O ₇
Nantokite	-7.25	-13.98	-6.73	CuCl
NaSb	-92.49	-69.32	23.17	NaSb
Natron	-13.77	-15.08	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.50	-4.64	3.86	NaVO ₃
Nesquehonite	-6.70	-11.37	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-10.09	2.71	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-34.83	-19.13	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-37.83	-5.83	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-10.63	-17.50	-6.87	NiCO ₃
NiMoO ₄	-6.60	-17.74	-11.14	NiMoO ₄
NiS (alpha)	-77.92	-83.52	-5.60	NiS
NiS (beta)	-72.42	-83.52	-11.10	NiS
NiS (gamma)	-70.72	-83.52	-12.80	NiS
NiSe	-27.13	-44.83	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-15.08	-12.27	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-21.25	-22.77	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-10.12	7.38	17.50	MnO ₂
O ₂ (g)	-31.47	51.62	83.09	O ₂
Orpiment	-238.70	-299.76	-61.07	As ₂ S ₃
Otavite	-4.27	-16.27	-12.00	CdCO ₃
Pb(BO ₂) ₂	-15.01	-8.49	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.94	4.21	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-70.38	-79.14	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆

Pb2 (OH) 3Cl	-11.29	-2.50	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.77	8.42	26.19	Pb2O (OH) 2
Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.23	-11.79	-0.56	Pb2OCO3
Pb2V2O7	-4.10	-6.00	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.42	-14.62	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.92	-1.78	6.14	Pb3 (VO4) 2
Pb3O2CO3	-18.60	-7.58	11.02	Pb3O2CO3
Pb3O2SO4	-14.71	-4.02	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-20.91	0.19	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-21.69	0.19	21.88	Pb4O3SO4
PbCrO4	-15.25	-27.85	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.84	-21.60	4.25	Pb
PbMoO4	-0.61	-16.23	-15.62	PbMoO4
PbO:0.3H2O	-8.77	4.21	12.98	PbO:0.3H2O
PbSeO4	-14.42	-21.26	-6.84	PbSeO4
Periclase	-12.74	8.84	21.58	MgO
Phosgenite	-13.82	-33.63	-19.81	PbCl2:PbCO3
Plattnerite	-19.58	30.02	49.60	PbO2
Portlandite	-13.39	9.41	22.80	Ca (OH) 2
Pyrite	-123.57	-142.07	-18.51	FeS2
Pyrochroite	-8.27	6.92	15.19	Mn (OH) 2
Pyrolusite	-8.65	32.73	41.38	MnO2
Realgar	-99.92	-119.67	-19.75	AsS
Retgersite	-11.91	-13.95	-2.04	NiSO4:6H2O
Rhodochrosite	-2.71	-13.29	-10.58	MnCO3
Rutherfordine	-3.43	-17.93	-14.50	UO2CO3
Sb (OH) 3	-13.16	-20.27	-7.11	Sb (OH) 3
Sb2O4	-18.14	-14.74	3.40	Sb2O4
Sb2O5	-27.88	-37.55	-9.67	Sb2O5
Sb2Se3	-115.40	-183.16	-67.76	Sb2Se3
Sb4O6(cubic)	-62.83	-81.09	-18.26	Sb4O6
Sb4O6(orth)	-63.19	-81.09	-17.90	Sb4O6
SbCl3	-53.61	-53.03	0.57	SbCl3
SbF3	-43.03	-53.25	-10.23	SbF3
Sbmetal	-47.30	-58.99	-11.69	Sb
SbO2	-3.85	-31.68	-27.82	SbO2
Schoepite	-3.71	2.28	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.62	-21.73	-7.11	Se
Semetal (hex)	-14.02	-21.73	-7.71	Se
Senarmontite	-28.18	-40.55	-12.37	Sb2O3
SeO2	-15.10	-14.97	0.12	SeO2
SeO3	-46.52	-25.47	21.04	SeO3
Siderite	-5.39	-15.63	-10.24	FeCO3
Smithsonite	-4.27	-14.27	-10.00	ZnCO3
Sphalerite	-68.84	-80.29	-11.45	ZnS
Spinel	-8.94	27.91	36.85	MgAl2O4
Stibnite	-248.78	-299.24	-50.46	Sb2S3
Sulfur	-58.28	-60.42	-2.14	S
Tenorite	-0.49	7.15	7.64	CuO
Thenardite	-11.85	-11.53	0.32	Na2SO4
Thermonatrite	-15.72	-15.08	0.64	Na2CO3:H2O
Tyuyamunite	-4.52	-0.44	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.39	8.69	21.08	U3O8
U3Sb4	-586.10	-433.72	152.38	U3Sb4
U4O9	-28.41	-31.43	-3.02	U4O9
UF4	-28.74	-58.28	-29.54	UF4
UF4:2.5H2O	-25.56	-58.28	-32.72	UF4:2.5H2O
UO2 (am)	-15.24	-14.31	0.93	UO2
UO2 (NO3) 2	-42.66	-30.51	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.37	-30.51	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.90	-30.51	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.56	-30.51	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.33	2.28	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.94	-23.19	-2.25	UO2SeO4:4H2O
UO3	-5.42	2.28	7.70	UO3
Uraninite	-9.64	-14.31	-4.67	UO2

USb2	-222.69	-193.11	29.58	USb2
V(OH)3	-18.01	-10.42	7.59	V(OH)3
V2O5	-13.06	-14.42	-1.36	V2O5
V3O5	-37.28	-35.44	1.84	V3O5
V4O7	-45.84	-38.65	7.19	V4O7
V6O13	-34.01	-94.87	-60.86	V6O13
Valentinite	-32.06	-40.55	-8.48	Sb2O3
VC12	-64.04	-45.16	18.87	VC12
VC13	-66.61	-43.18	23.43	VC13
VF4	-62.11	-47.18	14.93	VF4
Vmetal	-93.16	-49.13	44.03	V
VO	-38.08	-23.32	14.76	VO
VO(OH)2	-8.36	-3.21	5.15	VO(OH)2
VO2Cl	-20.97	-18.13	2.84	VO2Cl
VOC1	-32.49	-21.34	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO4	-23.48	-19.87	3.61	VOSO4
Witherite	-5.62	-14.19	-8.57	BaCO3
Wurtzite	-71.34	-80.29	-8.95	ZnS
Zincite	-5.39	5.94	11.33	ZnO
Zincosite	-14.64	-10.71	3.93	ZnSO4
Zn(BO2)2	-15.05	-6.76	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-30.17	-26.86	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-6.26	5.94	12.20	Zn(OH)2
Zn(OH)2(am)	-6.53	5.94	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.81	5.94	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.59	5.94	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.79	5.94	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.27	-4.77	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.23	0.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.07	-9.42	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.40	-15.49	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.28	7.12	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.63	7.87	38.50	Zn5(OH)8Cl2
ZnCl2	-22.95	-15.90	7.05	ZnCl2
ZnCO3:1H2O	-4.01	-14.27	-10.26	ZnCO3:1H2O
ZnF2	-15.51	-16.04	-0.53	ZnF2
Znmetal	-45.65	-19.87	25.79	Zn
ZnMoO4	-4.38	-14.50	-10.13	ZnMoO4
ZnO(active)	-5.25	5.94	11.19	ZnO
ZnS(am)	-71.24	-80.29	-9.05	ZnS
ZnSb	-89.86	-78.85	11.01	ZnSb
ZnSe	-27.20	-41.60	-14.40	ZnSe
ZnSeO4:6H2O	-18.01	-19.53	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.08	-10.71	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 57.

```

      REACTION 302
      H2O      -1
      7357.4 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 305
      SAVE Solution 306
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 305. Solution after simulation 56.

Using reaction 302.

Reaction 302.

7.357e+03 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	1.440e-04	1.444e-04
As	8.306e-08	8.330e-08
B	5.926e-05	5.943e-05
Ba	1.744e-05	1.749e-05
C	9.708e-02	9.736e-02
Ca	4.474e-02	4.487e-02
Cd	1.501e-07	1.505e-07
Cl	5.219e-03	5.234e-03
Co	6.077e-08	6.094e-08
Cr	2.407e-08	2.413e-08
Cu	3.389e-04	3.398e-04
F	4.678e-03	4.691e-03
Fe	3.404e-05	3.413e-05
Hg	5.383e-09	5.398e-09
K	9.312e-03	9.338e-03
Mg	1.189e-02	1.192e-02
Mn	1.450e-04	1.454e-04
Mo	5.600e-06	5.616e-06
N	2.252e-05	2.258e-05
Na	1.646e-02	1.650e-02
Ni	9.065e-09	9.091e-09
Pb	4.216e-07	4.228e-07
S	3.638e-02	3.648e-02
Sb	6.273e-08	6.291e-08
Se	4.710e-07	4.723e-07
U	1.576e-06	1.581e-06
V	1.366e-06	1.370e-06
Zn	1.525e-05	1.529e-05

-----Description of solution-----

	pH	=	6.323	Charge balance
	pe	=	6.652	Adjusted to redox
equilibrium	Activity of water	=	0.997	
	Ionic strength (mol/kgw)	=	1.497e-01	
	Mass of water (kg)	=	1.003e+00	
	Total alkalinity (eq/kg)	=	5.787e-02	
	Total CO2 (mol/kg)	=	9.708e-02	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	30	
	Total H	=	1.114628e+02	

Total O = 5.610118e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	6.262e-07	4.757e-07	-6.203	-6.323	-0.119	0.00
OH-	2.889e-08	2.110e-08	-7.539	-7.676	-0.137	(0)
H2O	5.551e+01	9.966e-01	1.744	-0.001	0.000	18.07
Al	1.440e-04					
AlF4-	8.601e-05	6.442e-05	-4.065	-4.191	-0.126	(0)
AlF3	5.546e-05	5.546e-05	-4.256	-4.256	0.000	(0)
AlF2+	2.488e-06	1.901e-06	-5.604	-5.721	-0.117	(0)
AlF+2	6.052e-09	2.060e-09	-8.218	-8.686	-0.468	(0)
Al (OH) 4-	4.690e-11	3.513e-11	-10.329	-10.454	-0.126	(0)
Al (OH) 2+	4.114e-11	3.142e-11	-10.386	-10.503	-0.117	(0)
Al (OH) 3	1.323e-11	1.323e-11	-10.879	-10.879	0.000	(0)
AlSO4+	6.138e-12	4.598e-12	-11.212	-11.337	-0.126	(0)
AlOH+2	5.509e-12	1.875e-12	-11.259	-11.727	-0.468	(0)
Al+3	1.055e-12	8.888e-14	-11.977	-13.051	-1.074	(0)
Al (SO4) 2-	4.383e-13	3.283e-13	-12.358	-12.484	-0.126	(0)
AlMo6O21-3	2.493e-29	4.176e-31	-28.603	-30.379	-1.776	(0)
As (3)	2.049e-19					
H3AsO3	2.046e-19	2.046e-19	-18.689	-18.689	0.000	(0)
H2AsO3-	3.474e-22	2.206e-22	-21.459	-21.656	-0.197	(0)
H4AsO3+	7.595e-26	4.821e-26	-25.119	-25.317	-0.197	(0)
HAsO3-2	2.603e-27	4.229e-28	-26.584	-27.374	-0.789	(0)
AsO3-3	2.046e-33	3.427e-35	-32.689	-34.465	-1.776	(0)
As (5)	8.306e-08					
H2AsO4-	4.369e-08	2.774e-08	-7.360	-7.557	-0.197	(0)
HAsO4-2	3.936e-08	6.394e-09	-7.405	-8.194	-0.789	(0)
AsO4-3	2.537e-12	4.251e-14	-11.596	-13.372	-1.776	(0)
H3AsO4	2.215e-12	2.293e-12	-11.655	-11.640	0.015	(0)
B	5.926e-05					
H3BO3	5.901e-05	6.108e-05	-4.229	-4.214	0.015	(0)
H2BO3-	1.053e-07	7.457e-08	-6.978	-7.127	-0.150	(0)
BF (OH) 3-	7.974e-08	5.649e-08	-7.098	-7.248	-0.150	(0)
CaH2BO3+	4.965e-08	3.517e-08	-7.304	-7.454	-0.150	(0)
BF2 (OH) 2-	9.431e-09	6.680e-09	-8.025	-8.175	-0.150	(0)
MgH2BO3+	8.548e-09	6.055e-09	-8.068	-8.218	-0.150	(0)
NaH2BO3	1.404e-09	1.404e-09	-8.853	-8.853	0.000	(0)
BaH2BO3+	1.639e-11	1.161e-11	-10.785	-10.935	-0.150	(0)
H5 (BO3) 2-	5.472e-12	3.876e-12	-11.262	-11.412	-0.150	(0)
BF3OH-	4.059e-12	2.875e-12	-11.392	-11.541	-0.150	(0)
H8 (BO3) 3-	3.342e-14	2.368e-14	-13.476	-13.626	-0.150	(0)
BF4-	2.209e-14	1.565e-14	-13.656	-13.805	-0.150	(0)
Ba	1.744e-05					
Ba+2	1.513e-05	5.039e-06	-4.820	-5.298	-0.478	(0)
BaHCO3+	2.302e-06	1.779e-06	-5.638	-5.750	-0.112	(0)
BaCO3	9.416e-09	9.416e-09	-8.026	-8.026	0.000	(0)
BaH2BO3+	1.639e-11	1.161e-11	-10.785	-10.935	-0.150	(0)
BaNO3+	7.207e-13	4.576e-13	-12.142	-12.340	-0.197	(0)
BaOH+	6.127e-13	4.641e-13	-12.213	-12.333	-0.121	(0)
BaNH3+2	1.855e-13	3.013e-14	-12.732	-13.521	-0.789	(0)
C (4)	9.708e-02					
HCO3-	4.840e-02	3.697e-02	-1.315	-1.432	-0.117	(0)
H2CO3	3.955e-02	3.955e-02	-1.403	-1.403	0.000	(0)
CaHCO3+	7.300e-03	5.641e-03	-2.137	-2.249	-0.112	(0)
MgHCO3+	1.197e-03	8.858e-04	-2.922	-3.053	-0.131	(0)
NaHCO3	2.469e-04	2.469e-04	-3.607	-3.607	0.000	(0)
CuCO3	2.323e-04	2.323e-04	-3.634	-3.634	0.000	(0)
CaCO3	4.732e-05	4.732e-05	-4.325	-4.325	0.000	(0)
CuHCO3+	3.978e-05	2.525e-05	-4.400	-4.598	-0.197	(0)
MnHCO3+	1.673e-05	1.267e-05	-4.777	-4.897	-0.121	(0)
Cu (CO3) 2-2	1.402e-05	2.277e-06	-4.853	-5.643	-0.789	(0)
CO3-2	1.094e-05	3.643e-06	-4.961	-5.439	-0.478	(0)
MgCO3	7.096e-06	7.096e-06	-5.149	-5.149	0.000	(0)

		ZnHCO3+	3.941e-06	2.502e-06	-5.404	-5.602	-0.197	(0)
		BaHCO3+	2.302e-06	1.779e-06	-5.638	-5.750	-0.112	(0)
		UO2 (CO3) 3-4	1.540e-06	1.072e-09	-5.812	-8.970	-3.157	(0)
		NaCO3-	1.055e-06	8.059e-07	-5.977	-6.094	-0.117	(0)
		ZnCO3	4.487e-07	4.487e-07	-6.348	-6.348	0.000	(0)
		PbHCO3+	2.915e-07	1.851e-07	-6.535	-6.733	-0.197	(0)
		FeHCO3+	2.896e-07	2.238e-07	-6.538	-6.650	-0.112	(0)
		PbCO3	7.380e-08	7.380e-08	-7.132	-7.132	0.000	(0)
		UO2 (CO3) 2-2	3.615e-08	5.872e-09	-7.442	-8.231	-0.789	(0)
		CoHCO3+	2.254e-08	1.431e-08	-7.647	-7.844	-0.197	(0)
		BaCO3	9.416e-09	9.416e-09	-8.026	-8.026	0.000	(0)
		NiHCO3+	5.535e-09	3.514e-09	-8.257	-8.454	-0.197	(0)
		Pb (CO3) 2-2	4.773e-09	7.754e-10	-8.321	-9.110	-0.789	(0)
		CdHCO3+	3.154e-09	2.002e-09	-8.501	-8.699	-0.197	(0)
		CdCO3	1.975e-09	1.975e-09	-8.704	-8.704	0.000	(0)
		CoCO3	3.064e-10	3.064e-10	-9.514	-9.514	0.000	(0)
		NiCO3	1.048e-10	1.048e-10	-9.980	-9.980	0.000	(0)
		UO2CO3	8.078e-11	8.078e-11	-10.093	-10.093	0.000	(0)
		Cd (CO3) 2-2	3.284e-11	5.335e-12	-10.484	-11.273	-0.789	(0)
		HgCO3	1.025e-11	1.025e-11	-10.989	-10.989	0.000	(0)
		Hg (CO3) 2-2	7.268e-13	1.181e-13	-12.139	-12.928	-0.789	(0)
		HgHCO3+	1.430e-13	9.077e-14	-12.845	-13.042	-0.197	(0)
Ca	4.474e-02							
		Ca+2	2.461e-02	8.196e-03	-1.609	-2.086	-0.478	(0)
		CaSO4	1.251e-02	1.251e-02	-1.903	-1.903	0.000	(0)
		CaHCO3+	7.300e-03	5.641e-03	-2.137	-2.249	-0.112	(0)
		CaF+	2.737e-04	2.073e-04	-3.563	-3.683	-0.121	(0)
		CaCO3	4.732e-05	4.732e-05	-4.325	-4.325	0.000	(0)
		CaH2BO3+	4.965e-08	3.517e-08	-7.304	-7.454	-0.150	(0)
		CaOH+	4.464e-09	3.450e-09	-8.350	-8.462	-0.112	(0)
		CaNO3+	7.396e-10	4.695e-10	-9.131	-9.328	-0.197	(0)
		CaNH3+2	6.020e-10	9.779e-11	-9.220	-10.010	-0.789	(0)
		Ca (NH3) 2+2	2.271e-18	3.690e-19	-17.644	-18.433	-0.789	(0)
Cd	1.501e-07							
		Cd+2	7.143e-08	2.379e-08	-7.146	-7.624	-0.478	(0)
		CdSO4	3.716e-08	3.716e-08	-7.430	-7.430	0.000	(0)
		Cd (SO4) 2-2	2.057e-08	3.341e-09	-7.687	-8.476	-0.789	(0)
		CdCl+	1.419e-08	9.007e-09	-7.848	-8.045	-0.197	(0)
		CdHCO3+	3.154e-09	2.002e-09	-8.501	-8.699	-0.197	(0)
		CdCO3	1.975e-09	1.975e-09	-8.704	-8.704	0.000	(0)
		CdF+	1.376e-09	8.739e-10	-8.861	-9.059	-0.197	(0)
		CdCl2	1.489e-10	1.489e-10	-9.827	-9.827	0.000	(0)
		Cd (CO3) 2-2	3.284e-11	5.335e-12	-10.484	-11.273	-0.789	(0)
		CdOHC1	7.795e-12	7.795e-12	-11.108	-11.108	0.000	(0)
		CdOH+	6.279e-12	3.987e-12	-11.202	-11.399	-0.197	(0)
		CdF2	4.041e-12	4.041e-12	-11.393	-11.393	0.000	(0)
		CdCl3-	5.866e-13	3.724e-13	-12.232	-12.429	-0.197	(0)
		CdNO3+	2.147e-15	1.363e-15	-14.668	-14.866	-0.197	(0)
		Cd (OH) 2	5.306e-16	5.306e-16	-15.275	-15.275	0.000	(0)
		CdSeO4	1.175e-16	1.175e-16	-15.930	-15.930	0.000	(0)
		Cd2OH+3	2.837e-17	4.753e-19	-16.547	-18.323	-1.776	(0)
		Cd (SeO3) 2-2	7.082e-19	1.150e-19	-18.150	-18.939	-0.789	(0)
		Cd (OH) 3-	1.077e-21	6.839e-22	-20.968	-21.165	-0.197	(0)
		Cd (NO3) 2	1.238e-23	1.238e-23	-22.907	-22.907	0.000	(0)
		Cd (OH) 4-2	1.454e-29	2.362e-30	-28.837	-29.627	-0.789	(0)
		CdHS+	0.000e+00	0.000e+00	-78.047	-78.245	-0.197	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-149.670	-149.670	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.202	-226.399	-0.197	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.043	-302.832	-0.789	(0)
Cl	5.219e-03							
		Cl-	5.219e-03	3.965e-03	-2.282	-2.402	-0.119	(0)
		MnCl+	1.132e-07	8.574e-08	-6.946	-7.067	-0.121	(0)
		CuCl+	9.194e-08	6.803e-08	-7.036	-7.167	-0.131	(0)
		ZnCl+	2.881e-08	2.132e-08	-7.540	-7.671	-0.131	(0)
		CdCl+	1.419e-08	9.007e-09	-7.848	-8.045	-0.197	(0)
		CuCl2-	6.605e-09	4.887e-09	-8.180	-8.311	-0.131	(0)
		CuCl	5.900e-09	5.900e-09	-8.229	-8.229	0.000	(0)
		HgCl2	3.694e-09	3.694e-09	-8.432	-8.432	0.000	(0)

PbCl+	1.493e-09	9.479e-10	-8.826	-9.023	-0.197	(0)
ZnOHC1	5.887e-10	5.887e-10	-9.230	-9.230	0.000	(0)
MnCl2	4.802e-10	4.802e-10	-9.319	-9.319	0.000	(0)
HgClOH	3.472e-10	3.472e-10	-9.459	-9.459	0.000	(0)
HgCl3-	2.307e-10	1.465e-10	-9.637	-9.834	-0.197	(0)
CdCl2	1.489e-10	1.489e-10	-9.827	-9.827	0.000	(0)
ZnCl2	1.339e-10	1.339e-10	-9.873	-9.873	0.000	(0)
CoCl+	1.075e-10	6.824e-11	-9.969	-10.166	-0.197	(0)
CuCl2	9.352e-11	9.352e-11	-10.029	-10.029	0.000	(0)
PbCl2	1.679e-11	1.679e-11	-10.775	-10.775	0.000	(0)
HgCl4-2	1.423e-11	2.312e-12	-10.847	-11.636	-0.789	(0)
CuCl3-2	1.259e-11	4.143e-12	-10.900	-11.383	-0.483	(0)
NiCl+	1.232e-11	7.822e-12	-10.909	-11.107	-0.197	(0)
CdOHC1	7.795e-12	7.795e-12	-11.108	-11.108	0.000	(0)
MnCl3-	6.922e-13	5.243e-13	-12.160	-12.280	-0.121	(0)
CdCl3-	5.866e-13	3.724e-13	-12.232	-12.429	-0.197	(0)
ZnCl3-	5.701e-13	4.218e-13	-12.244	-12.375	-0.131	(0)
HgCl+	2.929e-13	1.859e-13	-12.533	-12.731	-0.197	(0)
CrCl+2	9.755e-14	1.585e-14	-13.011	-13.800	-0.789	(0)
FeCl+2	7.291e-14	2.400e-14	-13.137	-13.620	-0.483	(0)
PbCl3-	4.174e-14	2.650e-14	-13.379	-13.577	-0.197	(0)
CuCl3-	4.677e-15	3.460e-15	-14.330	-14.461	-0.131	(0)
ZnCl4-2	2.541e-15	8.362e-16	-14.595	-15.078	-0.483	(0)
FeCl2+	5.611e-16	4.250e-16	-15.251	-15.372	-0.121	(0)
PbCl4-2	2.956e-16	4.802e-17	-15.529	-16.319	-0.789	(0)
VOCl+	2.604e-16	1.653e-16	-15.584	-15.782	-0.197	(0)
NiCl2	1.561e-16	1.561e-16	-15.806	-15.806	0.000	(0)
UO2Cl+	5.641e-17	3.581e-17	-16.249	-16.446	-0.197	(0)
CrOHC12	2.519e-17	2.519e-17	-16.599	-16.599	0.000	(0)
CrCl2+	9.390e-18	5.961e-18	-17.027	-17.225	-0.197	(0)
CuCl4-2	2.089e-19	6.876e-20	-18.680	-19.163	-0.483	(0)
FeCl3	1.685e-19	1.685e-19	-18.773	-18.773	0.000	(0)
CrO3Cl-	3.438e-26	2.182e-26	-25.464	-25.661	-0.197	(0)
CoCl+2	4.412e-34	7.168e-35	-33.355	-34.145	-0.789	(0)
UCl+3	0.000e+00	0.000e+00	-42.555	-44.331	-1.776	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-47.161	-47.950	-0.789	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.519	-48.308	-0.789	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.258	-63.047	-0.789	(0)
Co (2)	6.077e-08					
Co+2	3.063e-08	4.976e-09	-7.514	-8.303	-0.789	(0)
CoHCO3+	2.254e-08	1.431e-08	-7.647	-7.844	-0.197	(0)
CoSO4	6.616e-09	6.616e-09	-8.179	-8.179	0.000	(0)
CoF+	5.744e-10	3.647e-10	-9.241	-9.438	-0.197	(0)
CoCO3	3.064e-10	3.064e-10	-9.514	-9.514	0.000	(0)
CoCl+	1.075e-10	6.824e-11	-9.969	-10.166	-0.197	(0)
CoOH+	3.299e-12	2.094e-12	-11.482	-11.679	-0.197	(0)
CoNO2+	4.195e-13	2.663e-13	-12.377	-12.575	-0.197	(0)
Co (NH3) +2	3.490e-14	5.669e-15	-13.457	-14.246	-0.789	(0)
Co (OH) 2	3.510e-15	3.510e-15	-14.455	-14.455	0.000	(0)
CoNO3+	2.250e-16	1.429e-16	-15.648	-15.845	-0.197	(0)
CoSeO4	6.617e-17	6.617e-17	-16.179	-16.179	0.000	(0)
Co2OH+3	3.118e-20	5.223e-22	-19.506	-21.282	-1.776	(0)
Co (NH3) 2+2	1.411e-20	2.292e-21	-19.850	-20.640	-0.789	(0)
Co (OH) 3-	2.327e-21	1.477e-21	-20.633	-20.831	-0.197	(0)
CoOOH-	5.858e-22	3.719e-22	-21.232	-21.430	-0.197	(0)
Co (NO3) 2	5.267e-24	5.267e-24	-23.278	-23.278	0.000	(0)
Co (NH3) 3+2	1.684e-27	2.735e-28	-26.774	-27.563	-0.789	(0)
Co (OH) 4-2	3.041e-29	4.939e-30	-28.517	-29.306	-0.789	(0)
Co (NH3) 4+2	8.374e-35	1.360e-35	-34.077	-34.866	-0.789	(0)
Co4 (OH) 4+4	5.513e-36	3.839e-39	-35.259	-38.416	-3.157	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.880	-42.670	-0.789	(0)
Co (3)	5.864e-29					
CoOH+2	5.864e-29	9.525e-30	-28.232	-29.021	-0.789	(0)
Co+3	1.055e-33	8.885e-35	-32.977	-34.051	-1.074	(0)
CoCl+2	4.412e-34	7.168e-35	-33.355	-34.145	-0.789	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.519	-48.308	-0.789	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-57.699	-57.896	-0.197	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.258	-63.047	-0.789	(0)

Co(NH3)6OH+2	0.000e+00	0.000e+00	-63.331	-64.121	-0.789	(0)
Cr(2)	1.013e-24					
Cr+2	1.013e-24	1.645e-25	-23.995	-24.784	-0.789	(0)
Cr(3)	2.407e-08					
Cr(OH)+2	8.775e-09	1.425e-09	-8.057	-8.846	-0.789	(0)
CrF+2	6.984e-09	1.134e-09	-8.156	-8.945	-0.789	(0)
Cr(OH)2+	5.763e-09	3.659e-09	-8.239	-8.437	-0.197	(0)
CrOHSO4	2.254e-09	2.254e-09	-8.647	-8.647	0.000	(0)
Cr+3	1.844e-10	3.088e-12	-9.734	-11.510	-1.776	(0)
CrSO4+	7.570e-11	4.806e-11	-10.121	-10.318	-0.197	(0)
Cr(OH)3	2.900e-11	2.900e-11	-10.538	-10.538	0.000	(0)
CrCl+2	9.755e-14	1.585e-14	-13.011	-13.800	-0.789	(0)
CrO2-	4.576e-14	2.905e-14	-13.340	-13.537	-0.197	(0)
Cr(OH)4-	3.836e-14	2.435e-14	-13.416	-13.613	-0.197	(0)
Cr2(OH)2SO4+2	1.788e-15	2.904e-16	-14.748	-15.537	-0.789	(0)
Cr2(OH)2(SO4)2	1.150e-16	1.150e-16	-15.939	-15.939	0.000	(0)
CrOHC12	2.519e-17	2.519e-17	-16.599	-16.599	0.000	(0)
CrCl2+	9.390e-18	5.961e-18	-17.027	-17.225	-0.197	(0)
CrNO3+2	1.506e-20	2.446e-21	-19.822	-20.612	-0.789	(0)
Cr(NH3)5OH+2	7.228e-39	1.174e-39	-38.141	-38.930	-0.789	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-44.874	-46.650	-1.776	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-47.161	-47.950	-0.789	(0)
Cr(6)	6.623e-18					
CrO4-2	3.577e-18	1.191e-18	-17.446	-17.924	-0.478	(0)
HCrO4-	2.888e-18	1.834e-18	-17.539	-17.737	-0.197	(0)
NaCrO4-	1.108e-19	7.032e-20	-18.956	-19.153	-0.197	(0)
KCrO4-	4.711e-20	2.991e-20	-19.327	-19.524	-0.197	(0)
CrO3SO4-2	1.094e-23	1.776e-24	-22.961	-23.750	-0.789	(0)
H2CrO4	7.070e-25	7.070e-25	-24.151	-24.151	0.000	(0)
CrO3Cl-	3.438e-26	2.182e-26	-25.464	-25.661	-0.197	(0)
Cr2O7-2	7.202e-34	1.170e-34	-33.143	-33.932	-0.789	(0)
Cu(1)	1.438e-08					
CuCl2-	6.605e-09	4.887e-09	-8.180	-8.311	-0.131	(0)
CuCl	5.900e-09	5.900e-09	-8.229	-8.229	0.000	(0)
Cu+	1.862e-09	1.182e-09	-8.730	-8.927	-0.197	(0)
CuCl3-2	1.259e-11	4.143e-12	-10.900	-11.383	-0.483	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.698	-150.150	-0.453	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.455	-150.880	-0.425	(0)
Cu(2)	3.388e-04					
CuCO3	2.323e-04	2.323e-04	-3.634	-3.634	0.000	(0)
CuHCO3+	3.978e-05	2.525e-05	-4.400	-4.598	-0.197	(0)
Cu+2	3.251e-05	1.083e-05	-4.488	-4.966	-0.478	(0)
CuSO4	1.653e-05	1.653e-05	-4.782	-4.782	0.000	(0)
Cu(CO3)2-2	1.402e-05	2.277e-06	-4.853	-5.643	-0.789	(0)
CuF+	2.494e-06	1.583e-06	-5.603	-5.800	-0.197	(0)
CuOH+	9.761e-07	7.223e-07	-6.010	-6.141	-0.131	(0)
CuCl+	9.194e-08	6.803e-08	-7.036	-7.167	-0.131	(0)
Cu2(OH)2+2	8.067e-08	1.310e-08	-7.093	-7.883	-0.789	(0)
CuNO2+	1.356e-08	8.610e-09	-7.868	-8.065	-0.197	(0)
CuNH3+2	6.464e-09	1.050e-09	-8.190	-8.979	-0.789	(0)
Cu(OH)2	3.040e-09	3.040e-09	-8.517	-8.517	0.000	(0)
CuCl2	9.352e-11	9.352e-11	-10.029	-10.029	0.000	(0)
CuNO3+	9.770e-13	6.203e-13	-12.010	-12.207	-0.197	(0)
Cu(NO2)2	6.692e-13	6.692e-13	-12.174	-12.174	0.000	(0)
Cu(OH)3-	2.072e-13	1.316e-13	-12.684	-12.881	-0.197	(0)
CuCl3-	4.677e-15	3.460e-15	-14.330	-14.461	-0.131	(0)
CuCl4-2	2.089e-19	6.876e-20	-18.680	-19.163	-0.483	(0)
Cu(OH)4-2	1.345e-19	2.184e-20	-18.871	-19.661	-0.789	(0)
Cu(NO3)2	1.415e-21	1.415e-21	-20.849	-20.849	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-214.757	-214.954	-0.197	(0)
F	4.678e-03					
F-	3.051e-03	2.318e-03	-2.516	-2.635	-0.119	(0)
MgF+	8.131e-04	6.090e-04	-3.090	-3.215	-0.126	(0)
CaF+	2.737e-04	2.073e-04	-3.563	-3.683	-0.121	(0)
AlF4-	8.601e-05	6.442e-05	-4.065	-4.191	-0.126	(0)
AlF3	5.546e-05	5.546e-05	-4.256	-4.256	0.000	(0)
NaF	1.737e-05	1.737e-05	-4.760	-4.760	0.000	(0)
CuF+	2.494e-06	1.583e-06	-5.603	-5.800	-0.197	(0)

AlF2+	2.488e-06	1.901e-06	-5.604	-5.721	-0.117	(0)
MnF+	2.093e-06	1.585e-06	-5.679	-5.800	-0.121	(0)
HF	1.631e-06	1.631e-06	-5.788	-5.788	0.000	(0)
ZnF+	1.559e-07	9.898e-08	-6.807	-7.004	-0.197	(0)
FeF3	1.033e-07	1.033e-07	-6.986	-6.986	0.000	(0)
BF(OH) 3-	7.974e-08	5.649e-08	-7.098	-7.248	-0.150	(0)
FeF2+	4.171e-08	3.159e-08	-7.380	-7.500	-0.121	(0)
HF2-	1.968e-08	1.437e-08	-7.706	-7.843	-0.137	(0)
BF2(OH) 2-	9.431e-09	6.680e-09	-8.025	-8.175	-0.150	(0)
CrF+2	6.984e-09	1.134e-09	-8.156	-8.945	-0.789	(0)
AlF+2	6.052e-09	2.060e-09	-8.218	-8.686	-0.468	(0)
PbF+	1.734e-09	1.101e-09	-8.761	-8.958	-0.197	(0)
FeF+2	1.548e-09	5.093e-10	-8.810	-9.293	-0.483	(0)
CdF+	1.376e-09	8.739e-10	-8.861	-9.059	-0.197	(0)
CoF+	5.744e-10	3.647e-10	-9.241	-9.438	-0.197	(0)
NiF+	7.071e-11	4.489e-11	-10.151	-10.348	-0.197	(0)
PbF2	5.020e-11	5.020e-11	-10.299	-10.299	0.000	(0)
VO2F2-	1.978e-11	1.256e-11	-10.704	-10.901	-0.197	(0)
VO2F	1.492e-11	1.492e-11	-10.826	-10.826	0.000	(0)
UO2F2	1.191e-11	1.191e-11	-10.924	-10.924	0.000	(0)
UO2F3-	1.092e-11	6.935e-12	-10.962	-11.159	-0.197	(0)
H2F2	7.125e-12	7.125e-12	-11.147	-11.147	0.000	(0)
BF3OH-	4.059e-12	2.875e-12	-11.392	-11.541	-0.150	(0)
CdF2	4.041e-12	4.041e-12	-11.393	-11.393	0.000	(0)
UO2F+	2.807e-12	1.782e-12	-11.552	-11.749	-0.197	(0)
VO2F3-2	2.235e-12	3.631e-13	-11.651	-12.440	-0.789	(0)
UO2F4-2	7.860e-13	1.277e-13	-12.105	-12.894	-0.789	(0)
PbF3-	3.476e-13	2.207e-13	-12.459	-12.656	-0.197	(0)
VOF+	3.254e-13	2.066e-13	-12.488	-12.685	-0.197	(0)
VOF2	1.796e-13	1.796e-13	-12.746	-12.746	0.000	(0)
VO2F4-3	2.472e-14	4.140e-16	-13.607	-15.383	-1.776	(0)
VOF3-	2.326e-14	1.477e-14	-13.633	-13.831	-0.197	(0)
BF4-	2.209e-14	1.565e-14	-13.656	-13.805	-0.150	(0)
PbF4-2	1.507e-15	2.448e-16	-14.822	-15.611	-0.789	(0)
VOF4-2	8.504e-16	1.381e-16	-15.070	-15.860	-0.789	(0)
HgF+	3.181e-19	2.019e-19	-18.497	-18.695	-0.197	(0)
Sb(OH) 2F	8.784e-22	8.784e-22	-21.056	-21.056	0.000	(0)
SbOF	8.667e-22	8.667e-22	-21.062	-21.062	0.000	(0)
UF3+	1.832e-30	1.163e-30	-29.737	-29.934	-0.197	(0)
UF4	2.956e-31	2.956e-31	-30.529	-30.529	0.000	(0)
UF6-2	1.170e-31	1.900e-32	-30.932	-31.721	-0.789	(0)
UF5-	4.276e-32	2.715e-32	-31.369	-31.566	-0.197	(0)
UF2+2	1.949e-32	3.166e-33	-31.710	-32.499	-0.789	(0)
UF+3	6.477e-36	1.085e-37	-35.189	-36.965	-1.776	(0)
Fe (2)	4.038e-06					
Fe+2	2.961e-06	4.810e-07	-5.529	-6.318	-0.789	(0)
FeSO4	7.868e-07	7.868e-07	-6.104	-6.104	0.000	(0)
FeHCO3+	2.896e-07	2.238e-07	-6.538	-6.650	-0.112	(0)
FeOH+	5.333e-10	4.039e-10	-9.273	-9.394	-0.121	(0)
Fe(OH) 2	6.769e-15	6.769e-15	-14.169	-14.169	0.000	(0)
Fe(OH) 3-	5.962e-17	4.516e-17	-16.225	-16.345	-0.121	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-154.626	-154.626	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-231.021	-231.218	-0.197	(0)
Fe (3)	3.000e-05					
Fe(OH) 2+	2.933e-05	2.241e-05	-4.533	-4.650	-0.117	(0)
Fe(OH) 3	5.077e-07	5.077e-07	-6.294	-6.294	0.000	(0)
FeF3	1.033e-07	1.033e-07	-6.986	-6.986	0.000	(0)
FeF2+	4.171e-08	3.159e-08	-7.380	-7.500	-0.121	(0)
FeOH+2	8.294e-09	2.730e-09	-8.081	-8.564	-0.483	(0)
FeF+2	1.548e-09	5.093e-10	-8.810	-9.293	-0.483	(0)
Fe(OH) 4-	1.306e-09	9.972e-10	-8.884	-9.001	-0.117	(0)
FeSO4+	1.979e-11	1.499e-11	-10.704	-10.824	-0.121	(0)
Fe(SO4) 2-	3.363e-12	2.135e-12	-11.473	-11.671	-0.197	(0)
Fe+3	2.379e-12	2.004e-13	-11.624	-12.698	-1.074	(0)
Fe2(OH) 2+4	3.544e-13	2.468e-16	-12.450	-15.608	-3.157	(0)
FeCl+2	7.291e-14	2.400e-14	-13.137	-13.620	-0.483	(0)
Fe3(OH) 4+5	6.852e-15	7.993e-20	-14.164	-19.097	-4.933	(0)
FeHSeO3+2	9.436e-16	1.533e-16	-15.025	-15.815	-0.789	(0)

	FeCl2+	5.611e-16	4.250e-16	-15.251	-15.372	-0.121	(0)
	FeNO3+2	2.235e-19	3.631e-20	-18.651	-19.440	-0.789	(0)
	FeCl3	1.685e-19	1.685e-19	-18.773	-18.773	0.000	(0)
H (0)	1.538e-29						
	H2	7.691e-30	7.961e-30	-29.114	-29.099	0.015	(0)
Hg (0)	1.078e-09						
	Hg	1.078e-09	1.078e-09	-8.967	-8.967	0.000	(0)
Hg (1)	2.118e-17						
	Hg2+2	1.059e-17	1.720e-18	-16.975	-17.764	-0.789	(0)
Hg (2)	4.304e-09						
	HgCl2	3.694e-09	3.694e-09	-8.432	-8.432	0.000	(0)
	HgClOH	3.472e-10	3.472e-10	-9.459	-9.459	0.000	(0)
	HgCl3-	2.307e-10	1.465e-10	-9.637	-9.834	-0.197	(0)
	HgCl4-2	1.423e-11	2.312e-12	-10.847	-11.636	-0.789	(0)
	HgCO3	1.025e-11	1.025e-11	-10.989	-10.989	0.000	(0)
	Hg (OH) 2	6.377e-12	6.600e-12	-11.195	-11.180	0.015	(0)
	Hg (CO3) 2-2	7.268e-13	1.181e-13	-12.139	-12.928	-0.789	(0)
	HgCl+	2.929e-13	1.859e-13	-12.533	-12.731	-0.197	(0)
	HgHCO3+	1.430e-13	9.077e-14	-12.845	-13.042	-0.197	(0)
	HgOH+	3.109e-15	1.974e-15	-14.507	-14.705	-0.197	(0)
	Hg (NH3) 2+2	8.200e-16	1.332e-16	-15.086	-15.875	-0.789	(0)
	HgNH3+2	8.652e-17	1.406e-17	-16.063	-16.852	-0.789	(0)
	Hg+2	1.447e-17	2.350e-18	-16.840	-17.629	-0.789	(0)
	HgSO4	4.101e-18	4.101e-18	-17.387	-17.387	0.000	(0)
	HgF+	3.181e-19	2.019e-19	-18.497	-18.695	-0.197	(0)
	Hg (OH) 3-	2.761e-20	1.753e-20	-19.559	-19.756	-0.197	(0)
	Hg (NH3) 3+2	3.094e-23	5.026e-24	-22.509	-23.299	-0.789	(0)
	HgNO3+	2.477e-26	1.572e-26	-25.606	-25.803	-0.197	(0)
	Hg (NH3) 4+2	2.329e-30	3.784e-31	-29.633	-30.422	-0.789	(0)
	Hg (NO3) 2	1.184e-34	1.184e-34	-33.927	-33.927	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-136.439	-136.637	-0.197	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-136.565	-136.565	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.233	-139.022	-0.789	(0)
K	9.312e-03						
	K+	8.895e-03	6.757e-03	-2.051	-2.170	-0.119	(0)
	KSO4-	4.174e-04	3.188e-04	-3.379	-3.497	-0.117	(0)
	KCrO4-	4.711e-20	2.991e-20	-19.327	-19.524	-0.197	(0)
Mg	1.189e-02						
	Mg+2	7.032e-03	2.342e-03	-2.153	-2.630	-0.478	(0)
	MgSO4	2.840e-03	2.840e-03	-2.547	-2.547	0.000	(0)
	MgHCO3+	1.197e-03	8.858e-04	-2.922	-3.053	-0.131	(0)
	MgF+	8.131e-04	6.090e-04	-3.090	-3.215	-0.126	(0)
	MgCO3	7.096e-06	7.096e-06	-5.149	-5.149	0.000	(0)
	MgOH+	2.522e-08	1.967e-08	-7.598	-7.706	-0.108	(0)
	MgH2BO3+	8.548e-09	6.055e-09	-8.068	-8.218	-0.150	(0)
Mn (2)	1.450e-04						
	Mn+2	1.057e-04	1.718e-05	-3.976	-4.765	-0.789	(0)
	MnSO4	2.036e-05	2.036e-05	-4.691	-4.691	0.000	(0)
	MnHCO3+	1.673e-05	1.267e-05	-4.777	-4.897	-0.121	(0)
	MnF+	2.093e-06	1.585e-06	-5.679	-5.800	-0.121	(0)
	MnCl+	1.132e-07	8.574e-08	-6.946	-7.067	-0.121	(0)
	MnOH+	1.202e-09	9.103e-10	-8.920	-9.041	-0.121	(0)
	MnCl2	4.802e-10	4.802e-10	-9.319	-9.319	0.000	(0)
	MnNO3+	7.770e-13	4.933e-13	-12.110	-12.307	-0.197	(0)
	MnCl3-	6.922e-13	5.243e-13	-12.160	-12.280	-0.121	(0)
	MnSeO4	1.227e-13	1.227e-13	-12.911	-12.911	0.000	(0)
	Mn (NO3) 2	2.245e-20	2.245e-20	-19.649	-19.649	0.000	(0)
	Mn (OH) 3-	3.306e-21	2.504e-21	-20.481	-20.601	-0.121	(0)
	Mn (OH) 4-2	5.181e-28	1.705e-28	-27.286	-27.768	-0.483	(0)
	MnSe	0.000e+00	0.000e+00	-43.348	-43.348	0.000	(0)
Mn (3)	4.085e-23						
	Mn+3	4.085e-23	3.442e-24	-22.389	-23.463	-1.074	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-45.521	-46.004	-0.483	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-48.581	-48.724	-0.143	(0)
Mo	5.600e-06						
	MoO4-2	5.572e-06	1.856e-06	-5.254	-5.731	-0.478	(0)

HM04-	2.767e-08	1.756e-08	-7.558	-7.755	-0.197	(0)
H2MoO4	6.120e-11	6.120e-11	-10.213	-10.213	0.000	(0)
AlMo6O21-3	2.493e-29	4.176e-31	-28.603	-30.379	-1.776	(0)
Mo7O24-6	2.500e-31	1.969e-38	-30.602	-37.706	-7.104	(0)
HM07O24-5	1.956e-33	2.282e-38	-32.709	-37.642	-4.933	(0)
H2Mo7O24-4	9.440e-37	6.573e-40	-36.025	-39.182	-3.157	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-40.483	-42.259	-1.776	(0)
N(-3)	1.192e-05					
NH4+	1.116e-05	7.907e-06	-4.952	-5.102	-0.150	(0)
NH4SO4-	7.454e-07	5.646e-07	-6.128	-6.248	-0.121	(0)
NH3	9.478e-09	9.478e-09	-8.023	-8.023	0.000	(0)
CuNH3+2	6.464e-09	1.050e-09	-8.190	-8.979	-0.789	(0)
CaNH3+2	6.020e-10	9.779e-11	-9.220	-10.010	-0.789	(0)
BaNH3+2	1.855e-13	3.013e-14	-12.732	-13.521	-0.789	(0)
Co(NH3)+2	3.490e-14	5.669e-15	-13.457	-14.246	-0.789	(0)
NiNH3+2	2.416e-14	3.925e-15	-13.617	-14.406	-0.789	(0)
Hg(NH3)2+2	8.200e-16	1.332e-16	-15.086	-15.875	-0.789	(0)
HgNH3+2	8.652e-17	1.406e-17	-16.063	-16.852	-0.789	(0)
Ca(NH3)2+2	2.271e-18	3.690e-19	-17.644	-18.433	-0.789	(0)
Ni(NH3)2+2	3.310e-20	5.376e-21	-19.480	-20.270	-0.789	(0)
Co(NH3)2+2	1.411e-20	2.292e-21	-19.850	-20.640	-0.789	(0)
Hg(NH3)3+2	3.094e-23	5.026e-24	-22.509	-23.299	-0.789	(0)
Co(NH3)3+2	1.684e-27	2.735e-28	-26.774	-27.563	-0.789	(0)
Hg(NH3)4+2	2.329e-30	3.784e-31	-29.633	-30.422	-0.789	(0)
Co(NH3)4+2	8.374e-35	1.360e-35	-34.077	-34.866	-0.789	(0)
Cr(NH3)5OH+2	7.228e-39	1.174e-39	-38.141	-38.930	-0.789	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-41.880	-42.670	-0.789	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-44.874	-46.650	-1.776	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-47.161	-47.950	-0.789	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-47.519	-48.308	-0.789	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-57.699	-57.896	-0.197	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-62.258	-63.047	-0.789	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-63.331	-64.121	-0.789	(0)
N(3)	1.057e-05					
NO2-	1.055e-05	7.595e-06	-4.977	-5.119	-0.143	(0)
CuNO2+	1.356e-08	8.610e-09	-7.868	-8.065	-0.197	(0)
Cu(NO2)2	6.692e-13	6.692e-13	-12.174	-12.174	0.000	(0)
CoNO2+	4.195e-13	2.663e-13	-12.377	-12.575	-0.197	(0)
N(5)	2.459e-08					
NO3-	2.385e-08	1.812e-08	-7.623	-7.742	-0.119	(0)
CaNO3+	7.396e-10	4.695e-10	-9.131	-9.328	-0.197	(0)
CuNO3+	9.770e-13	6.203e-13	-12.010	-12.207	-0.197	(0)
MnNO3+	7.770e-13	4.933e-13	-12.110	-12.307	-0.197	(0)
BaNO3+	7.207e-13	4.576e-13	-12.142	-12.340	-0.197	(0)
ZnNO3+	1.534e-13	9.741e-14	-12.814	-13.011	-0.197	(0)
PbNO3+	2.844e-15	1.806e-15	-14.546	-14.743	-0.197	(0)
CdNO3+	2.147e-15	1.363e-15	-14.668	-14.866	-0.197	(0)
CoNO3+	2.250e-16	1.429e-16	-15.648	-15.845	-0.197	(0)
NiNO3+	5.528e-17	3.509e-17	-16.257	-16.455	-0.197	(0)
FeNO3+2	2.235e-19	3.631e-20	-18.651	-19.440	-0.789	(0)
VO2NO3	3.364e-20	3.364e-20	-19.473	-19.473	0.000	(0)
Mn(NO3)2	2.245e-20	2.245e-20	-19.649	-19.649	0.000	(0)
CrNO3+2	1.506e-20	2.446e-21	-19.822	-20.612	-0.789	(0)
Cu(NO3)2	1.415e-21	1.415e-21	-20.849	-20.849	0.000	(0)
Zn(NO3)2	3.521e-22	3.521e-22	-21.453	-21.453	0.000	(0)
UO2NO3+	3.171e-22	2.013e-22	-21.499	-21.696	-0.197	(0)
Pb(NO3)2	5.556e-23	5.556e-23	-22.255	-22.255	0.000	(0)
Cd(NO3)2	1.238e-23	1.238e-23	-22.907	-22.907	0.000	(0)
Co(NO3)2	5.267e-24	5.267e-24	-23.278	-23.278	0.000	(0)
HgNO3+	2.477e-26	1.572e-26	-25.606	-25.803	-0.197	(0)
Hg(NO3)2	1.184e-34	1.184e-34	-33.927	-33.927	0.000	(0)
Na	1.646e-02					
Na+	1.564e-02	1.188e-02	-1.806	-1.925	-0.119	(0)
NaSO4-	5.566e-04	4.251e-04	-3.254	-3.371	-0.117	(0)
NaHCO3	2.469e-04	2.469e-04	-3.607	-3.607	0.000	(0)
NaF	1.737e-05	1.737e-05	-4.760	-4.760	0.000	(0)
NaCO3-	1.055e-06	8.059e-07	-5.977	-6.094	-0.117	(0)
NaH2BO3	1.404e-09	1.404e-09	-8.853	-8.853	0.000	(0)

NaCrO4-	1.108e-19	7.032e-20	-18.956	-19.153	-0.197	(0)
Ni	9.065e-09					
NiHCO3+	5.535e-09	3.514e-09	-8.257	-8.454	-0.197	(0)
Ni+2	2.315e-09	7.711e-10	-8.635	-9.113	-0.478	(0)
NiSO4	1.025e-09	1.025e-09	-8.989	-8.989	0.000	(0)
NiCO3	1.048e-10	1.048e-10	-9.980	-9.980	0.000	(0)
NiF+	7.071e-11	4.489e-11	-10.151	-10.348	-0.197	(0)
NiCl+	1.232e-11	7.822e-12	-10.909	-11.107	-0.197	(0)
Ni (SO4) 2-2	1.393e-12	2.263e-13	-11.856	-12.645	-0.789	(0)
NiOH+	3.226e-13	2.048e-13	-12.491	-12.689	-0.197	(0)
NiNH3+2	2.416e-14	3.925e-15	-13.617	-14.406	-0.789	(0)
Ni (OH) 2	3.432e-16	3.432e-16	-15.464	-15.464	0.000	(0)
NiCl2	1.561e-16	1.561e-16	-15.806	-15.806	0.000	(0)
NiNO3+	5.528e-17	3.509e-17	-16.257	-16.455	-0.197	(0)
NiSeO4	9.570e-18	9.570e-18	-17.019	-17.019	0.000	(0)
Ni (NH3) 2+2	3.310e-20	5.376e-21	-19.480	-20.270	-0.789	(0)
Ni (OH) 3-	1.140e-20	7.240e-21	-19.943	-20.140	-0.197	(0)
O (0)	1.535e-34					
O2	7.675e-35	7.944e-35	-34.115	-34.100	0.015	(0)
Pb	4.216e-07					
PbHCO3+	2.915e-07	1.851e-07	-6.535	-6.733	-0.197	(0)
PbCO3	7.380e-08	7.380e-08	-7.132	-7.132	0.000	(0)
PbSO4	2.199e-08	2.199e-08	-7.658	-7.658	0.000	(0)
Pb+2	2.023e-08	6.738e-09	-7.694	-8.171	-0.478	(0)
Pb (SO4) 2-2	5.437e-09	8.832e-10	-8.265	-9.054	-0.789	(0)
Pb (CO3) 2-2	4.773e-09	7.754e-10	-8.321	-9.110	-0.789	(0)
PbF+	1.734e-09	1.101e-09	-8.761	-8.958	-0.197	(0)
PbCl+	1.493e-09	9.479e-10	-8.826	-9.023	-0.197	(0)
PbOH+	5.625e-10	3.571e-10	-9.250	-9.447	-0.197	(0)
PbF2	5.020e-11	5.020e-11	-10.299	-10.299	0.000	(0)
PbCl2	1.679e-11	1.679e-11	-10.775	-10.775	0.000	(0)
PbF3-	3.476e-13	2.207e-13	-12.459	-12.656	-0.197	(0)
Pb (OH) 2	2.382e-13	2.382e-13	-12.623	-12.623	0.000	(0)
PbCl3-	4.174e-14	2.650e-14	-13.379	-13.577	-0.197	(0)
PbNO3+	2.844e-15	1.806e-15	-14.546	-14.743	-0.197	(0)
Pb2OH+3	2.276e-15	3.814e-17	-14.643	-16.419	-1.776	(0)
PbF4-2	1.507e-15	2.448e-16	-14.822	-15.611	-0.789	(0)
PbCl4-2	2.956e-16	4.802e-17	-15.529	-16.319	-0.789	(0)
Pb (OH) 3-	7.916e-18	5.026e-18	-17.101	-17.299	-0.197	(0)
Pb (OH) 4-2	1.598e-22	2.597e-23	-21.796	-22.586	-0.789	(0)
Pb (NO3) 2	5.556e-23	5.556e-23	-22.255	-22.255	0.000	(0)
Pb3 (OH) 4+2	4.697e-23	7.630e-24	-22.328	-23.117	-0.789	(0)
Pb4 (OH) 4+4	5.865e-25	4.084e-28	-24.232	-27.389	-3.157	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.160	-150.160	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.292	-227.489	-0.197	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-77.932	-77.932	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.047	-78.245	-0.197	(0)
HS-	0.000e+00	0.000e+00	-78.432	-78.629	-0.197	(0)
S5-2	0.000e+00	0.000e+00	-80.882	-81.672	-0.789	(0)
S6-2	0.000e+00	0.000e+00	-81.398	-82.187	-0.789	(0)
S4-2	0.000e+00	0.000e+00	-81.478	-82.267	-0.789	(0)
S3-2	0.000e+00	0.000e+00	-82.284	-83.073	-0.789	(0)
S2-2	0.000e+00	0.000e+00	-83.300	-84.089	-0.789	(0)
S-2	0.000e+00	0.000e+00	-89.124	-89.606	-0.483	(0)
HgHS2-	0.000e+00	0.000e+00	-136.439	-136.637	-0.197	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-136.565	-136.565	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.233	-139.022	-0.789	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.598	-149.795	-0.197	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.670	-149.670	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.698	-150.150	-0.453	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.108	-150.108	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.160	-150.160	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.455	-150.880	-0.425	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-154.626	-154.626	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-214.757	-214.954	-0.197	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.260	-225.457	-0.197	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.202	-226.399	-0.197	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-227.292	-227.489	-0.197	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.325	-229.114	-0.789	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-231.021	-231.218	-0.197	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.043	-302.832	-0.789	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.757	-305.546	-0.789	(0)
Sb2S4-2	0.000e+00	0.000e+00	-313.563	-314.352	-0.789	(0)
S (6)	3.638e-02					
SO4-2	2.001e-02	6.664e-03	-1.699	-2.176	-0.478	(0)
CaSO4	1.251e-02	1.251e-02	-1.903	-1.903	0.000	(0)
MgSO4	2.840e-03	2.840e-03	-2.547	-2.547	0.000	(0)
NaSO4-	5.566e-04	4.251e-04	-3.254	-3.371	-0.117	(0)
KSO4-	4.174e-04	3.188e-04	-3.379	-3.497	-0.117	(0)
MnSO4	2.036e-05	2.036e-05	-4.691	-4.691	0.000	(0)
CuSO4	1.653e-05	1.653e-05	-4.782	-4.782	0.000	(0)
ZnSO4	3.121e-06	3.121e-06	-5.506	-5.506	0.000	(0)
Zn (SO4) 2-2	1.115e-06	1.811e-07	-5.953	-6.742	-0.789	(0)
FeSO4	7.868e-07	7.868e-07	-6.104	-6.104	0.000	(0)
NH4SO4-	7.454e-07	5.646e-07	-6.128	-6.248	-0.121	(0)
HSO4-	4.136e-07	3.098e-07	-6.383	-6.509	-0.126	(0)
CdSO4	3.716e-08	3.716e-08	-7.430	-7.430	0.000	(0)
PbSO4	2.199e-08	2.199e-08	-7.658	-7.658	0.000	(0)
Cd (SO4) 2-2	2.057e-08	3.341e-09	-7.687	-8.476	-0.789	(0)
CoSO4	6.616e-09	6.616e-09	-8.179	-8.179	0.000	(0)
Pb (SO4) 2-2	5.437e-09	8.832e-10	-8.265	-9.054	-0.789	(0)
CrOHSO4	2.254e-09	2.254e-09	-8.647	-8.647	0.000	(0)
NiSO4	1.025e-09	1.025e-09	-8.989	-8.989	0.000	(0)
CrSO4+	7.570e-11	4.806e-11	-10.121	-10.318	-0.197	(0)
FeSO4+	1.979e-11	1.499e-11	-10.704	-10.824	-0.121	(0)
AlSO4+	6.138e-12	4.598e-12	-11.212	-11.337	-0.126	(0)
Fe (SO4) 2-	3.363e-12	2.135e-12	-11.473	-11.671	-0.197	(0)
Ni (SO4) 2-2	1.393e-12	2.263e-13	-11.856	-12.645	-0.789	(0)
VO2SO4-	9.202e-13	5.842e-13	-12.036	-12.233	-0.197	(0)
Al (SO4) 2-	4.383e-13	3.283e-13	-12.358	-12.484	-0.126	(0)
UO2SO4	5.618e-14	5.618e-14	-13.250	-13.250	0.000	(0)
UO2 (SO4) 2-2	3.038e-14	4.936e-15	-13.517	-14.307	-0.789	(0)
VOSO4	2.728e-14	2.728e-14	-13.564	-13.564	0.000	(0)
Cr2 (OH) 2SO4+2	1.788e-15	2.904e-16	-14.748	-15.537	-0.789	(0)
Cr2 (OH) 2 (SO4) 2	1.150e-16	1.150e-16	-15.939	-15.939	0.000	(0)
HgSO4	4.101e-18	4.101e-18	-17.387	-17.387	0.000	(0)
CrO3SO4-2	1.094e-23	1.776e-24	-22.961	-23.750	-0.789	(0)
VSO4+	1.851e-27	1.175e-27	-26.733	-26.930	-0.197	(0)
U (SO4) 2	3.295e-38	3.295e-38	-37.482	-37.482	0.000	(0)
USO4+2	3.832e-39	6.225e-40	-38.417	-39.206	-0.789	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-57.699	-57.896	-0.197	(0)
Sb (3)	1.008e-18					
Sb (OH) 3	5.083e-19	5.083e-19	-18.294	-18.294	0.000	(0)
HSbO2	4.978e-19	4.978e-19	-18.303	-18.303	0.000	(0)
Sb (OH) 2F	8.784e-22	8.784e-22	-21.056	-21.056	0.000	(0)
SbOF	8.667e-22	8.667e-22	-21.062	-21.062	0.000	(0)
Sb (OH) 2+	9.280e-24	5.891e-24	-23.032	-23.230	-0.197	(0)
SbO+	3.210e-24	2.038e-24	-23.493	-23.691	-0.197	(0)
SbO2-	2.670e-24	1.695e-24	-23.573	-23.771	-0.197	(0)
Sb (OH) 4-	1.520e-24	9.648e-25	-23.818	-24.016	-0.197	(0)
Sb2S4-2	0.000e+00	0.000e+00	-313.563	-314.352	-0.789	(0)
Sb (5)	6.273e-08					
SbO3-	6.267e-08	3.979e-08	-7.203	-7.400	-0.197	(0)
Sb (OH) 6-	6.064e-11	4.607e-11	-10.217	-10.337	-0.119	(0)
SbO2+	4.081e-21	2.591e-21	-20.389	-20.587	-0.197	(0)
Se (-2)	4.745e-40					
HSe-	4.745e-40	3.012e-40	-39.324	-39.521	-0.197	(0)
H2Se	0.000e+00	0.000e+00	-41.954	-41.954	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.348	-43.348	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.409	-48.198	-0.789	(0)
Se (4)	4.709e-07					
HSeO3-	4.559e-07	2.894e-07	-6.341	-6.538	-0.197	(0)
SeO3-2	1.491e-08	2.422e-09	-7.826	-8.616	-0.789	(0)
H2SeO3	5.873e-11	5.873e-11	-10.231	-10.231	0.000	(0)
FeHSeO3+2	9.436e-16	1.533e-16	-15.025	-15.815	-0.789	(0)

Cd(SeO3) 2-2	7.082e-19	1.150e-19	-18.150	-18.939	-0.789	(0)
Se (6)	7.980e-11					
SeO4-2	7.967e-11	2.653e-11	-10.099	-10.576	-0.478	(0)
MnSeO4	1.227e-13	1.227e-13	-12.911	-12.911	0.000	(0)
ZnSeO4	8.796e-15	8.796e-15	-14.056	-14.056	0.000	(0)
HSeO4-	9.964e-16	6.326e-16	-15.002	-15.199	-0.197	(0)
CdSeO4	1.175e-16	1.175e-16	-15.930	-15.930	0.000	(0)
CoSeO4	6.617e-17	6.617e-17	-16.179	-16.179	0.000	(0)
NiSeO4	9.570e-18	9.570e-18	-17.019	-17.019	0.000	(0)
Zn (SeO4) 2-2	1.457e-24	2.366e-25	-23.837	-24.626	-0.789	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.302	-59.077	-1.776	(0)
U (4)	1.146e-25					
U (OH) 5-	1.132e-25	7.185e-26	-24.946	-25.144	-0.197	(0)
U (OH) 4	1.436e-27	1.436e-27	-26.843	-26.843	0.000	(0)
U (OH) 3+	3.948e-30	2.506e-30	-29.404	-29.601	-0.197	(0)
UF3+	1.832e-30	1.163e-30	-29.737	-29.934	-0.197	(0)
UF4	2.956e-31	2.956e-31	-30.529	-30.529	0.000	(0)
UF6-2	1.170e-31	1.900e-32	-30.932	-31.721	-0.789	(0)
UF5-	4.276e-32	2.715e-32	-31.369	-31.566	-0.197	(0)
UF2+2	1.949e-32	3.166e-33	-31.710	-32.499	-0.789	(0)
U (OH) 2+2	3.405e-33	5.531e-34	-32.468	-33.257	-0.789	(0)
UF+3	6.477e-36	1.085e-37	-35.189	-36.965	-1.776	(0)
UOH+3	7.422e-37	1.243e-38	-36.129	-37.905	-1.776	(0)
U (SO4) 2	3.295e-38	3.295e-38	-37.482	-37.482	0.000	(0)
USO4+2	3.832e-39	6.225e-40	-38.417	-39.206	-0.789	(0)
U+4	0.000e+00	0.000e+00	-40.472	-43.630	-3.157	(0)
UCl+3	0.000e+00	0.000e+00	-42.555	-44.331	-1.776	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.131	-184.115	-15.983	(0)
U (5)	1.192e-18					
UO2+	1.192e-18	7.568e-19	-17.924	-18.121	-0.197	(0)
U (6)	1.576e-06					
UO2 (CO3) 3-4	1.540e-06	1.072e-09	-5.812	-8.970	-3.157	(0)
UO2 (CO3) 2-2	3.615e-08	5.872e-09	-7.442	-8.231	-0.789	(0)
UO2CO3	8.078e-11	8.078e-11	-10.093	-10.093	0.000	(0)
UO2F2	1.191e-11	1.191e-11	-10.924	-10.924	0.000	(0)
UO2F3-	1.092e-11	6.935e-12	-10.962	-11.159	-0.197	(0)
UO2F+	2.807e-12	1.782e-12	-11.552	-11.749	-0.197	(0)
UO2F4-2	7.860e-13	1.277e-13	-12.105	-12.894	-0.789	(0)
UO2SO4	5.618e-14	5.618e-14	-13.250	-13.250	0.000	(0)
UO2 (SO4) 2-2	3.038e-14	4.936e-15	-13.517	-14.307	-0.789	(0)
UO2OH+	2.330e-14	1.479e-14	-13.633	-13.830	-0.197	(0)
UO2+2	1.672e-14	5.570e-15	-13.777	-14.254	-0.478	(0)
UO2Cl+	5.641e-17	3.581e-17	-16.249	-16.446	-0.197	(0)
(UO2) 2 (OH) 2+2	2.236e-21	3.632e-22	-20.651	-21.440	-0.789	(0)
UO2NO3+	3.171e-22	2.013e-22	-21.499	-21.696	-0.197	(0)
(UO2) 3 (OH) 5+	2.857e-27	1.814e-27	-26.544	-26.741	-0.197	(0)
V (2)	2.949e-38					
V+2	2.511e-38	4.079e-39	-37.600	-38.389	-0.789	(0)
VOH+	4.386e-39	2.784e-39	-38.358	-38.555	-0.197	(0)
V (3)	2.829e-12					
V (OH) 3	2.829e-12	2.829e-12	-11.548	-11.548	0.000	(0)
V (OH) 2+	1.374e-21	8.725e-22	-20.862	-21.059	-0.197	(0)
VOH+2	2.431e-23	3.950e-24	-22.614	-23.403	-0.789	(0)
V+3	2.230e-26	3.735e-28	-25.652	-27.428	-1.776	(0)
VSO4+	1.851e-27	1.175e-27	-26.733	-26.930	-0.197	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-42.850	-46.007	-3.157	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-44.235	-46.011	-1.776	(0)
V (4)	7.463e-13					
VOF+	3.254e-13	2.066e-13	-12.488	-12.685	-0.197	(0)
VOF2	1.796e-13	1.796e-13	-12.746	-12.746	0.000	(0)
V (OH) 3+	9.820e-14	6.234e-14	-13.008	-13.205	-0.197	(0)
VO+2	9.149e-14	1.486e-14	-13.039	-13.828	-0.789	(0)
VOSO4	2.728e-14	2.728e-14	-13.564	-13.564	0.000	(0)
VOF3-	2.326e-14	1.477e-14	-13.633	-13.831	-0.197	(0)
VOF4-2	8.504e-16	1.381e-16	-15.070	-15.860	-0.789	(0)
VOCl+	2.604e-16	1.653e-16	-15.584	-15.782	-0.197	(0)
H2V2O4+2	1.207e-21	1.961e-22	-20.918	-21.707	-0.789	(0)

V(5)	1.366e-06					
H2VO4-	1.272e-06	8.076e-07	-5.895	-6.093	-0.197	(0)
H3VO7-	3.166e-08	2.010e-08	-7.499	-7.697	-0.197	(0)
HVO4-2	2.625e-08	4.265e-09	-7.581	-8.370	-0.789	(0)
H3VO4	3.842e-09	3.842e-09	-8.415	-8.415	0.000	(0)
HV2O7-3	6.991e-11	1.171e-12	-10.155	-11.931	-1.776	(0)
V3O9-3	3.326e-11	5.573e-13	-10.478	-12.254	-1.776	(0)
VO2F2-	1.978e-11	1.256e-11	-10.704	-10.901	-0.197	(0)
VO2F	1.492e-11	1.492e-11	-10.826	-10.826	0.000	(0)
VO2+	4.832e-12	3.671e-12	-11.316	-11.435	-0.119	(0)
VO2F3-2	2.235e-12	3.631e-13	-11.651	-12.440	-0.789	(0)
VO2SO4-	9.202e-13	5.842e-13	-12.036	-12.233	-0.197	(0)
V4O12-4	2.704e-13	1.883e-16	-12.568	-15.725	-3.157	(0)
V2O7-4	9.516e-14	6.626e-17	-13.022	-16.179	-3.157	(0)
VO2F4-3	2.472e-14	4.140e-16	-13.607	-15.383	-1.776	(0)
VO4-3	2.682e-15	4.493e-17	-14.571	-16.347	-1.776	(0)
VO2NO3	3.364e-20	3.364e-20	-19.473	-19.473	0.000	(0)
V10O28-6	6.434e-31	5.067e-38	-30.192	-37.295	-7.104	(0)
HV10O28-5	3.176e-31	3.705e-36	-30.498	-35.431	-4.933	(0)
H2V10O28-4	4.082e-34	2.842e-37	-33.389	-36.546	-3.157	(0)
Zn	1.525e-05					
Zn+2	6.427e-06	2.140e-06	-5.192	-5.670	-0.478	(0)
ZnHCO3+	3.941e-06	2.502e-06	-5.404	-5.602	-0.197	(0)
ZnSO4	3.121e-06	3.121e-06	-5.506	-5.506	0.000	(0)
Zn(SO4)2-2	1.115e-06	1.811e-07	-5.953	-6.742	-0.789	(0)
ZnCO3	4.487e-07	4.487e-07	-6.348	-6.348	0.000	(0)
ZnF+	1.559e-07	9.898e-08	-6.807	-7.004	-0.197	(0)
ZnCl+	2.881e-08	2.132e-08	-7.540	-7.671	-0.131	(0)
ZnOH+	7.113e-09	4.516e-09	-8.148	-8.345	-0.197	(0)
ZnOHCl	5.887e-10	5.887e-10	-9.230	-9.230	0.000	(0)
ZnCl2	1.339e-10	1.339e-10	-9.873	-9.873	0.000	(0)
Zn(OH)2	1.510e-11	1.510e-11	-10.821	-10.821	0.000	(0)
ZnCl3-	5.701e-13	4.218e-13	-12.244	-12.375	-0.131	(0)
ZnNO3+	1.534e-13	9.741e-14	-12.814	-13.011	-0.197	(0)
ZnSeO4	8.796e-15	8.796e-15	-14.056	-14.056	0.000	(0)
ZnCl4-2	2.541e-15	8.362e-16	-14.595	-15.078	-0.483	(0)
Zn(OH)3-	2.514e-15	1.596e-15	-14.600	-14.797	-0.197	(0)
Zn(OH)4-2	8.253e-21	1.341e-21	-20.083	-20.873	-0.789	(0)
Zn(NO3)2	3.521e-22	3.521e-22	-21.453	-21.453	0.000	(0)
Zn(SeO4)2-2	1.457e-24	2.366e-25	-23.837	-24.626	-0.789	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.598	-149.795	-0.197	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.108	-150.108	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.260	-225.457	-0.197	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-228.325	-229.114	-0.789	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-304.757	-305.546	-0.789	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-52.12	-45.83	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-39.66	-35.15	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-46.89	-35.15	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-67.89	-49.95	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-53.96	-33.93	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.53	-28.13	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.23	-20.78	0.45	(NH4)2SeO4
Al(OH)3(am)	-4.89	5.91	10.80	Al(OH)3
Al2(MoO4)3	-45.66	-43.30	2.37	Al2(MoO4)3
Al2O3	-7.82	11.83	19.65	Al2O3
Al4(OH)10SO4	-13.87	8.83	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.53	-5.73	4.80	AlAsO4:2H2O
AlOHSO4	-5.68	-8.91	-3.23	AlOHSO4
AlSb	-155.84	-90.22	65.62	AlSb
Alunite	-6.35	-7.75	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.56	-10.35	-7.79	PbSO4
Anhydrite	0.10	-4.26	-4.36	CaSO4
Anilite	-55.06	-86.94	-31.88	Cu0.25Cu1.5S

Antlerite	-0.58	8.21	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	0.78	-7.52	-8.30	CaCO ₃
Arsenolite	-71.99	-74.75	-2.76	As ₄ O ₆
Artinite	-7.66	1.94	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-29.98	-23.27	6.71	As ₂ O ₅
Atacamite	-0.76	6.63	7.39	Cu ₂ (OH) ₃ Cl
Azurite	3.77	-13.13	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.06	7.33	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-11.41	4.46	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	7.67	-1.24	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-21.13	11.81	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.55	-23.22	-9.67	BaCrO ₄
BaF ₂	-4.75	-10.57	-5.82	BaF ₂
BaMoO ₄	-4.07	-11.03	-6.96	BaMoO ₄
Barite	2.51	-7.47	-9.98	BaSO ₄
BaS	-93.78	-77.60	16.18	BaS
BaSeO ₃	-7.34	-5.51	1.83	BaSeO ₃
BaSeO ₄	-8.41	-15.87	-7.46	BaSeO ₄
Bianchite	-6.09	-7.85	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-9.61	8.48	18.09	MnO ₂
Bixbyite	-8.35	-8.99	-0.64	Mn ₂ O ₃
BlaubleiI	-54.40	-78.56	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.15	-82.43	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-2.66	5.91	8.58	AlOOH
Breithauptite	-61.11	-79.63	-18.52	NiSb
Brochantite	0.67	15.89	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.83	10.01	16.84	Mg(OH) ₂
Bunsenite	-8.91	3.53	12.45	NiO
Ca(VO ₃) ₂	-5.33	0.33	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-6.61	10.89	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-10.67	10.89	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-13.91	8.39	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-17.51	21.45	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-18.42	21.44	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-303.57	-160.60	142.97	Ca ₃ Sb ₂
CaCrO ₄	-17.74	-20.01	-2.27	CaCrO ₄
Calcite	0.96	-7.52	-8.48	CaCO ₃
Calomel	-4.66	-22.57	-17.91	Hg ₂ Cl ₂
CaMoO ₄	0.13	-7.82	-7.95	CaMoO ₄
Carnotite	-2.80	-2.57	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.12	-2.31	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.65	-12.67	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.24	-3.40	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.63	5.02	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.71	5.02	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-21.29	-14.58	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.32	0.24	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-23.14	5.26	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-11.77	-12.43	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-10.74	-12.43	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-10.52	-12.43	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-11.68	-12.89	-1.21	CdF ₂
Cdmetal(alpha)	-34.44	-20.93	13.51	Cd
Cdmetal(gamma)	-34.55	-20.93	13.62	Cd
CdMoO ₄	0.79	-13.36	-14.15	CdMoO ₄
CdOHCl	-7.24	-3.70	3.54	CdOHCl
CdSb	-77.79	-78.14	-0.35	CdSb
CdSe	-20.62	-40.82	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.35	-18.20	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-9.63	-9.80	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.08	-9.80	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-7.93	-9.80	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-0.48	-13.61	-13.13	PbCO ₃
CH ₄ (g)	-80.83	-121.88	-41.05	CH ₄
Chalcantite	-4.51	-7.15	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.24	-90.16	-34.92	Cu ₂ S
Chalcopyrite	-120.63	-155.90	-35.27	CuFeS ₂
Cinnabar	-50.44	-96.13	-45.69	HgS

Claudetite	-71.68	-74.75	-3.06	As4O6
Clausthalite	-14.27	-41.37	-27.10	PbSe
Co (BO2) 2	-31.15	-4.08	27.07	Co (BO2) 2
Co (OH) 2	-8.75	4.34	13.09	Co (OH) 2
Co (OH) 3	-12.78	-15.09	-2.31	Co (OH) 3
CO2 (g)	0.06	-18.08	-18.15	CO2
Co3 (AsO4) 2	-23.29	-10.25	13.03	Co3 (AsO4) 2
Co3O4	-15.33	-25.83	-10.50	Co3O4
CoCl2	-21.37	-13.11	8.27	CoCl2
CoCl2:6H2O	-15.65	-13.12	2.54	CoCl2:6H2O
CoCO3	-3.76	-13.74	-9.98	CoCO3
CoF2	-11.98	-13.57	-1.60	CoF2
CoF3	-40.50	-41.96	-1.46	CoF3
CoFe2O4	20.40	16.88	-3.53	CoFe2O4
CoMoO4	-6.27	-14.03	-7.76	CoMoO4
CoO	-9.25	4.34	13.59	CoO
CoS (alpha)	-73.17	-80.61	-7.44	CoS
CoS (beta)	-69.54	-80.61	-11.07	CoS
CoSe	-25.30	-41.50	-16.20	CoSe
CoSeO3	-9.84	-8.52	1.32	CoSeO3
CoSeO4:6H2O	-17.36	-18.89	-1.53	CoSeO4:6H2O
CoSO4	-13.28	-10.48	2.80	CoSO4
CoSO4:6H2O	-8.02	-10.49	-2.47	CoSO4:6H2O
Cotunnite	-8.20	-12.98	-4.78	PbCl2
Covellite	-54.97	-77.27	-22.30	CuS
Cr (OH) 2	-22.96	-12.14	10.82	Cr (OH) 2
Cr (OH) 3	-3.45	-2.12	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-1.37	-2.12	-0.75	Cr (OH) 3
Cr2O3	-1.87	-4.23	-2.36	Cr2O3
CrCl2	-43.68	-29.59	14.09	CrCl2
CrCl3	-43.40	-28.28	15.11	CrCl3
CrF3	-17.65	-28.98	-11.34	CrF3
Crmetal	-68.57	-38.09	30.48	Cr
CrO3	-27.36	-30.57	-3.21	CrO3
Cryolite	-0.80	-34.64	-33.84	Na3AlF6
Cu (OH) 2	-1.00	7.68	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.22	22.99	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.96	1.29	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.18	-91.07	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.25	-51.05	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.34	-0.24	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-61.36	-103.95	-42.59	Cu3Sb
Cu3Se2	-25.73	-89.22	-63.49	Cu3Se2
CuCO3	1.10	-10.40	-11.50	CuCO3
CuCrO4	-17.45	-22.89	-5.44	CuCrO4
CuF	-6.66	-11.56	-4.91	CuF
CuF2	-11.35	-10.24	1.12	CuF2
CuF2:2H2O	-5.69	-10.24	-4.55	CuF2:2H2O
Cumetal	-6.82	-15.58	-8.76	Cu
CuMoO4	2.38	-10.70	-13.08	CuMoO4
CuOCuSO4	-9.77	0.54	10.30	CuOCuSO4
Cupricferrite	14.23	20.21	5.99	CuFe2O4
Cuprite	-3.80	-5.21	-1.41	Cu2O
Cuprousferrite	12.58	3.66	-8.92	CuFeO2
CuSe	-5.06	-38.16	-33.10	CuSe
CuSe2	-24.69	-58.06	-33.37	CuSe2
CuSeO3:2H2O	-5.70	-5.18	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-13.11	-15.55	-2.44	CuSeO4:5H2O
CuSO4	-10.08	-7.14	2.94	CuSO4
Diaspore	-0.96	5.91	6.87	AlOOH
Djurleite	-55.39	-89.31	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.95	-15.59	-16.54	CaMg (CO3) 2
Dolomite (ordered)	1.50	-15.59	-17.09	CaMg (CO3) 2
Epsomite	-2.69	-4.82	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.24	6.32	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.69	3.65	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-0.18	-3.90	-3.72	Fe (VO3) 2

Fe2 (OH) 4SeO3	-1.88	-0.33	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-5.42	-26.05	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-28.19	-31.92	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-1.37	18.86	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-5.77	-5.37	0.40	FeAsO4:2H2O
FeCr2O4	-5.10	2.10	7.20	FeCr2O4
FeMoO4	-1.96	-12.05	-10.09	FeMoO4
Ferrihydrite	3.07	6.27	3.19	Fe (OH) 3
Ferroselite	-40.82	-59.41	-18.60	FeSe2
FeS (ppt)	-75.67	-78.62	-2.95	FeS
FeSe	-28.52	-39.52	-11.00	FeSe
Fix_pe	-6.65	-6.65	0.00	e-
Fluorite	3.14	-7.36	-10.50	CaF2
Galena	-66.51	-80.48	-13.97	PbS
Gibbsite	-2.38	5.91	8.29	Al (OH) 3
Goethite	5.78	6.27	0.49	FeOOH
Goslarite	-5.84	-7.86	-2.01	ZnSO4:7H2O
Greenockite	-65.57	-79.93	-14.36	CdS
Greigite	-275.90	-320.94	-45.03	Fe3S4
Gummite	-9.28	-1.61	7.67	UO3
Gypsum	0.34	-4.27	-4.61	CaSO4:2H2O
H-Jarosite	1.26	-10.84	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-5.50	-18.38	-12.88	H2MoO4
H2S (g)	-76.94	-84.95	-8.01	H2S
H2Se (g)	-40.88	-45.84	-4.96	H2Se
Halite	-5.93	-4.33	1.60	NaCl
Hausmannite	-11.45	49.58	61.03	Mn3O4
Hematite	13.95	12.54	-1.42	Fe2O3
Hercynite	-4.74	18.16	22.89	FeAl2O4
Hg (CH3) 2 (g)	-181.22	-254.93	-73.71	Hg (CH3) 2
Hg (g)	-7.66	-15.53	-7.87	Hg
Hg (OH) 2	-7.68	-11.18	-3.50	Hg (OH) 2
Hg2 (g)	-16.11	-31.07	-14.96	Hg2
Hg2 (OH) 2	-10.38	-5.12	5.26	Hg2 (OH) 2
Hg2CO3	-7.15	-23.20	-16.05	Hg2CO3
Hg2CrO4	-26.99	-35.69	-8.70	Hg2CrO4
Hg2F2	-12.67	-23.03	-10.36	Hg2F2
Hg2S	-78.39	-90.07	-11.68	Hg2S
Hg2SeO3	-13.32	-17.98	-4.66	Hg2SeO3
Hg2SO4	-13.81	-19.94	-6.13	Hg2SO4
Hg3O2CO3	-21.94	-51.62	-29.68	Hg3O2CO3
HgCl (g)	-30.78	-11.28	19.50	HgCl
HgCl2	-7.36	-28.63	-21.26	HgCl2
HgF (g)	-44.19	-11.52	32.68	HgF
HgF2 (g)	-41.66	-29.09	12.57	HgF2
Hgmetal (l)	-2.08	-15.53	-13.45	Hg
HgSe	-1.33	-57.02	-55.69	HgSe
HgSeO3	-11.61	-24.04	-12.43	HgSeO3
HgSO4	-16.58	-26.00	-9.42	HgSO4
Huntite	-1.76	-31.73	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-3.98	-22.75	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.50	-22.27	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-14.42	-19.59	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	8.11	-6.69	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.59	-52.83	-17.24	K2Cr2O7
K2CrO4	-21.75	-22.26	-0.51	K2CrO4
K2MoO4	-13.33	-10.07	3.26	K2MoO4
K2SeO4	-14.19	-14.92	-0.73	K2SeO4
Langite	-1.60	15.89	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.44	-5.88	-0.43	PbO:PbSO4
Laurionite	-4.88	-4.25	0.62	PbOHCl
Lepidocrocite	4.90	6.27	1.37	FeOOH
Lime	-22.14	10.56	32.70	CaO
Litharge	-8.22	4.47	12.69	PbO
Mackinawite	-75.02	-78.62	-3.60	FeS
Maghemite	6.15	12.54	6.39	Fe2O3
Magnesioferrite	5.69	22.55	16.86	Fe2MgO4
Magnesite	-0.61	-8.07	-7.46	MgCO3

Magnetite	15.46	18.86	3.40	Fe3O4
Malachite	2.58	-2.73	-5.31	Cu2(OH)2CO3
Manganite	-4.49	20.85	25.34	MnOOH
Massicot	-8.42	4.47	12.89	PbO
Matlockite	-4.23	-13.21	-8.97	PbClF
Melanothallite	-16.03	-9.77	6.26	CuCl2
Melanterite	-6.30	-8.50	-2.21	FeSO4·7H2O
Metacinnabar	-51.04	-96.13	-45.09	HgS
Mg(OH)2(active)	-8.78	10.01	18.79	Mg(OH)2
Mg(VO3)2	-11.49	-0.21	11.28	Mg(VO3)2
Mg2Sb3	-278.19	-203.51	74.68	Mg2Sb3
Mg2V2O7	-16.56	9.80	26.36	Mg2V2O7
MgCr2O4	-10.41	5.79	16.20	MgCr2O4
MgCrO4	-25.93	-20.55	5.38	MgCrO4
MgF2	0.23	-7.90	-8.13	MgF2
MgMoO4	-6.51	-8.36	-1.85	MgMoO4
MgSeO3·6H2O	-5.91	-2.86	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-12.02	-13.22	-1.20	MgSeO4·6H2O
Minium	-34.16	39.36	73.52	Pb3O4
Mirabilite	-4.93	-6.04	-1.11	Na2SO4·10H2O
Mn(VO3)2	-7.25	-2.35	4.90	Mn(VO3)2
Mn2(SO4)3	-47.74	-53.46	-5.71	Mn2(SO4)3
Mn2Sb	-154.43	-93.35	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-12.15	0.35	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.29	-9.57	2.72	MnCl2·4H2O
MnS(grn)	-77.24	-77.07	0.17	MnS
MnS(pnk)	-80.41	-77.07	3.34	MnS
MnSb	-97.72	-100.63	-2.91	MnSb
MnSe	-41.46	-37.96	3.50	MnSe
MnSeO3	-6.11	-4.98	1.13	MnSeO3
MnSeO3·2H2O	-5.97	-4.98	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-13.30	-15.35	-2.05	MnSeO4·5H2O
MnSO4	-9.52	-6.94	2.58	MnSO4
Monteponite	-10.08	5.02	15.10	CdO
Montroydite	-7.54	-11.18	-3.64	HgO
MoO3	-10.38	-18.38	-8.00	MoO3
Morenosite	-9.15	-11.30	-2.14	NiSO4·7H2O
MoS2	-143.96	-214.22	-70.26	MoS2
Na-Jarosite	4.76	-6.44	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-42.45	-52.34	-9.90	Na2Cr2O7
Na2CrO4	-24.70	-21.77	2.93	Na2CrO4
Na2Mo2O7	-11.36	-27.96	-16.60	Na2Mo2O7
Na2MoO4	-11.07	-9.58	1.49	Na2MoO4
Na2MoO4·2H2O	-10.81	-9.58	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-14.37	-4.07	10.30	Na2SeO3·5H2O
Na2SeO4	-15.71	-14.43	1.28	Na2SeO4
Na3Sb	-177.40	-82.94	94.45	Na3Sb
Na3VO4	-28.60	8.08	36.68	Na3VO4
Na4V2O7	-30.04	7.36	37.40	Na4V2O7
Nantokite	-4.60	-11.33	-6.73	CuCl
NaSb	-88.96	-65.79	23.17	NaSb
Natron	-7.99	-9.30	-1.31	Na2CO3·10H2O
NaVO3	-4.57	-0.72	3.86	NaVO3
Nesquehonite	-3.40	-8.07	-4.67	MgCO3·3H2O
Ni(OH)2	-9.26	3.53	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-28.39	-12.69	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-32.70	-0.70	32.00	Ni4(OH)6SO4
NiCO3	-7.68	-14.55	-6.87	NiCO3
NiMoO4	-3.70	-14.84	-11.14	NiMoO4
NiS(alpha)	-75.82	-81.42	-5.60	NiS
NiS(beta)	-70.32	-81.42	-11.10	NiS
NiS(gamma)	-68.62	-81.42	-12.80	NiS
NiSe	-24.61	-42.31	-17.70	NiSe
NiSeO3·2H2O	-12.15	-9.33	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-18.18	-19.70	-1.52	NiSeO4·6H2O
Nsutite	-9.03	8.48	17.50	MnO2
O2(g)	-31.19	51.90	83.09	O2
Orpiment	-231.16	-292.23	-61.07	As2S3

Otavite	-1.06	-13.06	-12.00	CdCO3
Pb(BO2)2	-10.47	-3.95	6.52	Pb(BO2)2
Pb(OH)2	-3.68	4.47	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.01	-63.77	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.57	0.22	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.24	8.94	26.19	Pb2O(OH)2
Pb2O3	-26.15	34.89	61.04	Pb2O3
Pb2OCO3	-8.58	-9.14	-0.56	Pb2OCO3
Pb2V2O7	0.62	-1.28	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.66	-9.86	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.95	3.19	6.14	Pb3(VO4)2
Pb3O2CO3	-15.69	-4.67	11.02	Pb3O2CO3
Pb3O2SO4	-12.09	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.03	3.07	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.81	3.07	21.88	Pb4O3SO4
PbCrO4	-13.50	-26.10	-12.60	PbCrO4
PbF2	-6.00	-13.44	-7.44	PbF2
Pbmetal	-25.72	-21.48	4.25	Pb
PbMoO4	1.72	-13.90	-15.62	PbMoO4
PbO:0.3H2O	-8.51	4.47	12.98	PbO:0.33H2O
PbSeO4	-11.91	-18.75	-6.84	PbSeO4
Periclase	-11.57	10.01	21.58	MgO
Phosgenite	-6.77	-26.58	-19.81	PbCl2:PbCO3
Plattnerite	-19.18	30.42	49.60	PbO2
Portlandite	-12.25	10.56	22.80	Ca(OH)2
Pyrite	-119.12	-137.63	-18.51	FeS2
Pyrochroite	-7.32	7.88	15.19	Mn(OH)2
Pyrolusite	-7.55	33.83	41.38	MnO2
Realgar	-96.86	-116.61	-19.75	AsS
Retgersite	-9.26	-11.30	-2.04	NiSO4:6H2O
Rhodochrosite	0.38	-10.20	-10.58	MnCO3
Rutherfordine	-5.19	-19.69	-14.50	UO2CO3
Sb(OH)3	-11.18	-18.29	-7.11	Sb(OH)3
Sb2O4	-14.04	-10.64	3.40	Sb2O4
Sb2O5	-23.64	-33.31	-9.67	Sb2O5
Sb2Se3	-106.35	-174.11	-67.76	Sb2Se3
Sb4O6(cubic)	-54.91	-73.17	-18.26	Sb4O6
Sb4O6(orth)	-55.27	-73.17	-17.90	Sb4O6
SbCl3	-45.03	-44.46	0.57	SbCl3
SbF3	-34.94	-45.16	-10.23	SbF3
Sbmetal	-45.52	-57.21	-11.69	Sb
SbO2	-1.80	-29.63	-27.82	SbO2
Schoepite	-7.61	-1.61	5.99	UO2(OH)2:H2O
Semetal(am)	-12.78	-19.89	-7.11	Se
Semetal(hex)	-12.19	-19.89	-7.71	Se
Senarmontite	-24.22	-36.58	-12.37	Sb2O3
SeO2	-12.98	-12.86	0.12	SeO2
SeO3	-44.26	-23.22	21.04	SeO3
Siderite	-1.52	-11.76	-10.24	FeCO3
Smithsonite	-1.11	-11.11	-10.00	ZnCO3
Sphalerite	-66.53	-77.98	-11.45	ZnS
Spinel	-15.00	21.84	36.85	MgAl2O4
Stibnite	-240.97	-291.43	-50.46	Sb2S3
Sulfur	-56.86	-59.00	-2.14	S
Tenorite	0.03	7.68	7.64	CuO
Thenardite	-6.35	-6.03	0.32	Na2SO4
Thermonatrite	-9.93	-9.29	0.64	Na2CO3:H2O
Tyuyamunite	-6.97	-2.89	4.08	Ca(UO2)2(VO4)2
U3O8	-24.21	-3.13	21.08	U3O8
U3Sb4	-591.95	-439.56	152.38	U3Sb4
U4O9	-44.40	-47.42	-3.02	U4O9
UF4	-24.63	-54.17	-29.54	UF4
UF4:2.5H2O	-21.46	-54.17	-32.72	UF4:2.5H2O
UO2(am)	-19.28	-18.34	0.93	UO2
UO2(NO3)2	-41.89	-29.74	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.59	-29.74	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.13	-29.74	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.79	-29.75	2.05	UO2(NO3)2:6H2O

UO2(OH)2(beta)	-7.22	-1.61	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.59	-24.84	-2.25	UO2SeO4:4H2O
UO3	-9.31	-1.61	7.70	UO3
Uraninite	-13.67	-18.34	-4.67	UO2
USb2	-223.46	-193.88	29.58	USb2
V(OH)3	-16.06	-8.46	7.59	V(OH)3
V2O5	-8.87	-10.23	-1.36	V2O5
V3O5	-31.34	-29.50	1.84	V3O5
V4O7	-37.87	-30.68	7.19	V4O7
V6O13	-21.71	-82.57	-60.86	V6O13
Valentinite	-28.10	-36.58	-8.48	Sb2O3
VC12	-57.76	-38.88	18.87	VC12
VC13	-58.07	-34.63	23.43	VC13
VF4	-51.94	-37.01	14.93	VF4
Vmetal	-91.41	-47.38	44.03	V
VO	-36.19	-21.44	14.76	VO
VO(OH)2	-6.34	-1.19	5.15	VO(OH)2
VO2Cl	-16.68	-13.84	2.84	VO2Cl
VOC1	-28.34	-17.19	11.15	VOC1
VOC12	-31.39	-18.63	12.76	VOC12
VOSO4	-19.61	-16.00	3.61	VOSO4
Witherite	-2.17	-10.74	-8.57	BaCO3
Wurtzite	-69.03	-77.98	-8.95	ZnS
Zincite	-4.36	6.97	11.33	ZnO
Zincosite	-11.78	-7.85	3.93	ZnSO4
Zn(BO2)2	-9.74	-1.45	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.48	-21.16	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.23	6.97	12.20	Zn(OH)2
Zn(OH)2(am)	-5.50	6.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.78	6.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.56	6.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.76	6.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.37	-0.87	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.97	5.22	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.01	-2.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.63	-8.72	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.33	13.07	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-21.08	17.42	38.50	Zn5(OH)8Cl2
ZnCl2	-17.52	-10.47	7.05	ZnCl2
ZnCO3:1H2O	-0.85	-11.11	-10.26	ZnCO3:1H2O
ZnF2	-10.41	-10.94	-0.53	ZnF2
Znmetal	-44.76	-18.97	25.79	Zn
ZnMoO4	-1.28	-11.40	-10.13	ZnMoO4
ZnO(active)	-4.21	6.97	11.19	ZnO
ZnS(am)	-68.92	-77.98	-9.05	ZnS
ZnSb	-87.20	-76.19	11.01	ZnSb
ZnSe	-24.47	-38.87	-14.40	ZnSe
ZnSeO4:6H2O	-14.73	-16.25	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.21	-7.85	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 58.

Title Precipitate oversaturated phases
PHASES
Fix_pe
e-=e-
log_k 0
EQUILIBRIUM_PHASES 302
Ag2Se 0 0


```

Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 306
SAVE Solution 307 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 302
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.

```

WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Ag2Se, is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Ag2Se, is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 306. Solution after simulation 57.
 Using pure phase assemblage 302.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	4.616e-05	4.616e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	4.113e-08	4.113e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.734e-05	1.734e-05
Brochantite	-0.00	15.22	15.22	0.000e+00	8.482e-05	8.482e-05
Brucite	-3.67	13.17	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.007e+01	6.853e-02
CaMoO4	-0.32	-8.27	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.26	-1.45	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.832e-02	2.832e-02
Carnotite	0.00	0.23	0.23	0.000e+00	1.320e-06	1.320e-06
Cd(BO2)2	-11.05	-1.21	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	1.270e-07	1.270e-07
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	1.125e-08	1.125e-08
Cu2Se(alpha)	-4.25	-50.05	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.11	-13.19	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.48	-4.61	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	3.413e-05	3.413e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	2.253e-03	2.253e-03
Gummite	-4.93	2.74	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.00	-4.61	-4.61	0.000e+00	1.332e-03	1.332e-03
HgSe	-1.58	-57.27	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.76	-5.87	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.61	-3.48	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.77	7.03	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-26.93	-11.23	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.75	-14.62	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.27	-14.42	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.842e-05
Otavite	-2.36	-14.36	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	4.210e-07	4.210e-07
Rutherfordine	-4.41	-18.91	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.10	-30.92	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.25	2.74	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2(am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-1.85	2.23	4.08	0.000e+00	0	0.000e+00
U3O8	-10.76	10.32	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.87	2.74	5.61	0.000e+00	0	0.000e+00
UO3	-4.96	2.74	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.14	-11.27	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.880e-06	5.904e-06

As	1.031e-09	1.035e-09
B	5.919e-05	5.943e-05
Ba	3.085e-08	3.098e-08
C	5.031e-04	5.051e-04
Ca	1.291e-02	1.296e-02
Cd	2.340e-08	2.349e-08
Cl	5.213e-03	5.234e-03
Co	6.070e-08	6.094e-08
Cr	1.632e-09	1.638e-09
Cu	5.120e-07	5.140e-07
F	1.839e-04	1.847e-04
Fe	1.152e-09	1.156e-09
Hg	5.376e-09	5.398e-09
K	9.254e-03	9.291e-03
Mg	1.188e-02	1.192e-02
Mn	1.449e-04	1.454e-04
Mo	5.048e-06	5.068e-06
N	2.249e-05	2.258e-05
Na	1.644e-02	1.650e-02
Ni	9.055e-09	9.091e-09
Pb	1.851e-09	1.859e-09
S	3.482e-02	3.496e-02
Sb	6.266e-08	6.291e-08
Se	4.704e-07	4.723e-07
U	2.595e-07	2.605e-07
V	4.941e-08	4.960e-08
Zn	1.523e-05	1.529e-05

-----Description of solution-----

	pH	=	7.863	Charge balance
	pe	=	4.910	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	9.177e-02	
	Mass of water (kg)	=	1.004e+00	
	Total alkalinity (eq/kg)	=	5.353e-04	
	Total CO2 (mol/kg)	=	5.031e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	10	
	Total H	=	1.114565e+02	
	Total O	=	5.586953e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.551e-07	7.336e-07	-6.020	-6.135	-0.115	(0)
H+	1.744e-08	1.371e-08	-7.759	-7.863	-0.105	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Al	5.880e-06					
Al(OH) 4-	5.826e-06	4.557e-06	-5.235	-5.341	-0.107	(0)
Al(OH) 3	4.934e-08	4.934e-08	-7.307	-7.307	0.000	(0)
Al(OH) 2+	4.248e-09	3.371e-09	-8.372	-8.472	-0.101	(0)
AlF3	4.837e-10	4.837e-10	-9.315	-9.315	0.000	(0)
AlF2+	4.527e-10	3.592e-10	-9.344	-9.445	-0.101	(0)
AlF4-	3.315e-11	2.593e-11	-10.479	-10.586	-0.107	(0)
AlF+2	2.129e-11	8.435e-12	-10.672	-11.074	-0.402	(0)
AlOH+2	1.460e-11	5.785e-12	-10.836	-11.238	-0.402	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.264	-0.107	(0)
Al+3	6.882e-14	7.885e-15	-13.162	-14.103	-0.941	(0)
Al(SO4) 2-	6.651e-14	5.202e-14	-13.177	-13.284	-0.107	(0)
AlMo6O21-3	6.495e-40	0.000e+00	-39.187	-40.578	-1.391	(0)
As (3)	1.684e-23					

	H3AsO3	1.598e-23	1.598e-23	-22.796	-22.796	0.000	(0)
	H2AsO3-	8.536e-25	5.980e-25	-24.069	-24.223	-0.155	(0)
	HAsO3-2	1.651e-28	3.979e-29	-27.782	-28.400	-0.618	(0)
	H4AsO3+	1.549e-31	1.086e-31	-30.810	-30.964	-0.155	(0)
	AsO3-3	2.750e-33	1.119e-34	-32.561	-33.951	-1.391	(0)
As (5)	1.031e-09						
	HAsO4-2	9.874e-10	2.379e-10	-9.005	-9.624	-0.618	(0)
	H2AsO4-	4.246e-11	2.975e-11	-10.372	-10.527	-0.155	(0)
	AsO4-3	1.349e-12	5.489e-14	-11.870	-13.260	-1.391	(0)
	H3AsO4	6.938e-17	7.086e-17	-16.159	-16.150	0.009	(0)
B	5.919e-05						
	H3BO3	5.516e-05	5.634e-05	-4.258	-4.249	0.009	(0)
	H2BO3-	3.174e-06	2.387e-06	-5.498	-5.622	-0.124	(0)
	CaH2BO3+	5.047e-07	3.796e-07	-6.297	-6.421	-0.124	(0)
	MgH2BO3+	3.067e-07	2.306e-07	-6.513	-6.637	-0.124	(0)
	NaH2BO3	4.666e-08	4.666e-08	-7.331	-7.331	0.000	(0)
	BF(OH) 3-	3.197e-09	2.405e-09	-8.495	-8.619	-0.124	(0)
	H5 (BO3) 2-	1.522e-10	1.144e-10	-9.818	-9.941	-0.124	(0)
	BaH2BO3+	1.153e-12	8.673e-13	-11.938	-12.062	-0.124	(0)
	H8 (BO3) 3-	8.573e-13	6.447e-13	-12.067	-12.191	-0.124	(0)
	BF2(OH) 2-	5.018e-13	3.774e-13	-12.299	-12.423	-0.124	(0)
	BF3OH-	2.866e-19	2.156e-19	-18.543	-18.666	-0.124	(0)
	BF4-	2.071e-24	1.557e-24	-23.684	-23.808	-0.124	(0)
Ba	3.085e-08						
	Ba+2	3.080e-08	1.176e-08	-7.512	-7.930	-0.418	(0)
	BaHCO3+	4.915e-11	3.933e-11	-10.308	-10.405	-0.097	(0)
	BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
	BaH2BO3+	1.153e-12	8.673e-13	-11.938	-12.062	-0.124	(0)
	BaOH+	4.775e-14	3.765e-14	-13.321	-13.424	-0.103	(0)
	BaNO3+	1.334e-15	9.349e-16	-14.875	-15.029	-0.155	(0)
	BaNH3+2	3.016e-16	7.267e-17	-15.521	-16.139	-0.618	(0)
C (4)	5.031e-04						
	HCO3-	4.415e-04	3.503e-04	-3.355	-3.456	-0.101	(0)
	CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
	MgHCO3+	1.288e-05	9.990e-06	-4.890	-5.000	-0.111	(0)
	H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	3.138e-06	1.198e-06	-5.503	-5.922	-0.418	(0)
	MgCO3	2.777e-06	2.777e-06	-5.556	-5.556	0.000	(0)
	NaHCO3	2.430e-06	2.430e-06	-5.614	-5.614	0.000	(0)
	NaCO3-	3.468e-07	2.752e-07	-6.460	-6.560	-0.101	(0)
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	MnHCO3+	2.231e-07	1.759e-07	-6.652	-6.755	-0.103	(0)
	UO2 (CO3) 3-4	2.101e-07	7.083e-10	-6.678	-9.150	-2.472	(0)
	ZnCO3	1.937e-07	1.937e-07	-6.713	-6.713	0.000	(0)
	UO2 (CO3) 2-2	4.895e-08	1.180e-08	-7.310	-7.928	-0.618	(0)
	ZnHCO3+	4.443e-08	3.113e-08	-7.352	-7.507	-0.155	(0)
	Cu (CO3) 2-2	3.158e-09	7.610e-10	-8.501	-9.119	-0.618	(0)
	CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
	UO2CO3	4.934e-10	4.934e-10	-9.307	-9.307	0.000	(0)
	PbCO3	4.484e-10	4.484e-10	-9.348	-9.348	0.000	(0)
	CoHCO3+	3.913e-10	2.742e-10	-9.407	-9.562	-0.155	(0)
	CoCO3	2.038e-10	2.038e-10	-9.691	-9.691	0.000	(0)
	NiHCO3+	1.230e-10	8.619e-11	-9.910	-10.065	-0.155	(0)
	CdCO3	1.004e-10	1.004e-10	-9.998	-9.998	0.000	(0)
	NiCO3	8.921e-11	8.921e-11	-10.050	-10.050	0.000	(0)
	BaHCO3+	4.915e-11	3.933e-11	-10.308	-10.405	-0.097	(0)
	PbHCO3+	4.625e-11	3.240e-11	-10.335	-10.489	-0.155	(0)
	BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
	Pb (CO3) 2-2	6.429e-12	1.549e-12	-11.192	-11.810	-0.618	(0)
	CdHCO3+	4.185e-12	2.932e-12	-11.378	-11.533	-0.155	(0)
	Cd (CO3) 2-2	3.701e-13	8.917e-14	-12.432	-13.050	-0.618	(0)
	HgCO3	5.467e-15	5.467e-15	-14.262	-14.262	0.000	(0)
	FeHCO3+	2.932e-15	2.347e-15	-14.533	-14.630	-0.097	(0)
	Hg (CO3) 2-2	8.596e-17	2.071e-17	-16.066	-16.684	-0.618	(0)
	HgHCO3+	1.992e-18	1.395e-18	-17.701	-17.855	-0.155	(0)
Ca	1.291e-02						
	Ca+2	7.239e-03	2.764e-03	-2.140	-2.558	-0.418	(0)

	CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
	CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
	CaH2BO3+	5.047e-07	3.796e-07	-6.297	-6.421	-0.124	(0)
	CaOH+	5.055e-08	4.045e-08	-7.296	-7.393	-0.097	(0)
	CaNO3+	1.979e-10	1.387e-10	-9.704	-9.858	-0.155	(0)
	CaNH3+2	1.414e-10	3.408e-11	-9.849	-10.467	-0.618	(0)
	Ca (NH3) 2+2	5.515e-19	1.329e-19	-18.258	-18.876	-0.618	(0)
Cd	2.340e-08						
	Cd+2	9.629e-09	3.677e-09	-8.016	-8.435	-0.418	(0)
	CdSO4	7.676e-09	7.676e-09	-8.115	-8.115	0.000	(0)
	Cd (SO4) 2-2	3.827e-09	9.221e-10	-8.417	-9.035	-0.618	(0)
	CdCl+	2.053e-09	1.439e-09	-8.688	-8.842	-0.155	(0)
	CdCO3	1.004e-10	1.004e-10	-9.998	-9.998	0.000	(0)
	CdOHC1	4.329e-11	4.329e-11	-10.364	-10.364	0.000	(0)
	CdOH+	3.058e-11	2.142e-11	-10.515	-10.669	-0.155	(0)
	CdCl2	2.458e-11	2.458e-11	-10.609	-10.609	0.000	(0)
	CdF+	8.896e-12	6.233e-12	-11.051	-11.205	-0.155	(0)
	CdHCO3+	4.185e-12	2.932e-12	-11.378	-11.533	-0.155	(0)
	Cd (CO3) 2-2	3.701e-13	8.917e-14	-12.432	-13.050	-0.618	(0)
	Cd (OH) 2	9.916e-14	9.916e-14	-13.004	-13.004	0.000	(0)
	CdCl3-	9.069e-14	6.354e-14	-13.042	-13.197	-0.155	(0)
	CdF2	1.330e-15	1.330e-15	-14.876	-14.876	0.000	(0)
	CdNO3+	2.633e-16	1.845e-16	-15.580	-15.734	-0.155	(0)
	CdSeO4	1.537e-16	1.537e-16	-15.813	-15.813	0.000	(0)
	Cd (SeO3) 2-2	3.378e-17	8.140e-18	-16.471	-17.089	-0.618	(0)
	Cd2OH+3	9.703e-18	3.948e-19	-17.013	-18.404	-1.391	(0)
	Cd (OH) 3-	6.343e-18	4.444e-18	-17.198	-17.352	-0.155	(0)
	Cd (OH) 4-2	2.215e-24	5.336e-25	-23.655	-24.273	-0.618	(0)
	Cd (NO3) 2	1.467e-24	1.467e-24	-23.834	-23.834	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.704	-78.859	-0.155	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.087	-150.087	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.465	-226.619	-0.155	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.237	-302.855	-0.618	(0)
Cl	5.213e-03						
	Cl-	5.213e-03	4.098e-03	-2.283	-2.387	-0.105	(0)
	MnCl+	1.646e-07	1.298e-07	-6.783	-6.887	-0.103	(0)
	ZnCl+	3.730e-08	2.892e-08	-7.428	-7.539	-0.111	(0)
	ZnOHC1	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
	CdCl+	2.053e-09	1.439e-09	-8.688	-8.842	-0.155	(0)
	CuCl2-	1.149e-09	8.910e-10	-8.940	-9.050	-0.111	(0)
	CuCl	1.041e-09	1.041e-09	-8.983	-8.983	0.000	(0)
	MnCl2	7.514e-10	7.514e-10	-9.124	-9.124	0.000	(0)
	CuCl+	2.802e-10	2.172e-10	-9.553	-9.663	-0.111	(0)
	CoCl+	2.036e-10	1.426e-10	-9.691	-9.846	-0.155	(0)
	ZnCl2	1.878e-10	1.878e-10	-9.726	-9.726	0.000	(0)
	CdOHC1	4.329e-11	4.329e-11	-10.364	-10.364	0.000	(0)
	NiCl+	2.986e-11	2.092e-11	-10.525	-10.679	-0.155	(0)
	PbCl+	2.583e-11	1.810e-11	-10.588	-10.742	-0.155	(0)
	CdCl2	2.458e-11	2.458e-11	-10.609	-10.609	0.000	(0)
	HgClOH	2.024e-11	2.024e-11	-10.694	-10.694	0.000	(0)
	HgCl2	6.402e-12	6.402e-12	-11.194	-11.194	0.000	(0)
	CuCl3-2	2.019e-12	7.806e-13	-11.695	-12.108	-0.413	(0)
	MnCl3-	1.075e-12	8.481e-13	-11.968	-12.072	-0.103	(0)
	ZnCl3-	7.885e-13	6.114e-13	-12.103	-12.214	-0.111	(0)
	HgCl3-	3.744e-13	2.623e-13	-12.427	-12.581	-0.155	(0)
	PbCl2	3.313e-13	3.313e-13	-12.480	-12.480	0.000	(0)
	CuCl2	3.087e-13	3.087e-13	-12.511	-12.511	0.000	(0)
	CdCl3-	9.069e-14	6.354e-14	-13.042	-13.197	-0.155	(0)
	HgCl4-2	1.776e-14	4.280e-15	-13.751	-14.369	-0.618	(0)
	ZnCl4-2	3.240e-15	1.253e-15	-14.489	-14.902	-0.413	(0)
	UO2Cl+	9.812e-16	6.875e-16	-15.008	-15.163	-0.155	(0)
	PbCl3-	7.714e-16	5.404e-16	-15.113	-15.267	-0.155	(0)
	HgCl+	4.449e-16	3.117e-16	-15.352	-15.506	-0.155	(0)
	NiCl2	4.317e-16	4.317e-16	-15.365	-15.365	0.000	(0)
	CuCl3-	1.522e-17	1.180e-17	-16.817	-16.928	-0.111	(0)
	CrCl+2	1.394e-17	3.360e-18	-16.856	-17.474	-0.618	(0)

PbCl4-2	4.201e-18	1.012e-18	-17.377	-17.995	-0.618	(0)
CrOHC12	1.919e-19	1.919e-19	-18.717	-18.717	0.000	(0)
CrCl2+	1.864e-21	1.306e-21	-20.729	-20.884	-0.155	(0)
FeCl+2	1.285e-21	4.968e-22	-20.891	-21.304	-0.413	(0)
CuCl4-2	6.270e-22	2.424e-22	-21.203	-21.615	-0.413	(0)
VOCl+	2.581e-22	1.808e-22	-21.588	-21.743	-0.155	(0)
FeCl2+	1.153e-23	9.093e-24	-22.938	-23.041	-0.103	(0)
CrO3Cl-	6.885e-26	4.824e-26	-25.162	-25.317	-0.155	(0)
FeCl3	3.726e-27	3.726e-27	-26.429	-26.429	0.000	(0)
CoCl+2	1.126e-35	2.712e-36	-34.949	-35.567	-0.618	(0)
UCl+3	0.000e+00	0.000e+00	-44.336	-45.727	-1.391	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.040	-49.658	-0.618	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.920	-51.538	-0.618	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.765	-64.383	-0.618	(0)
Co (2)	6.070e-08					
Co+2	4.175e-08	1.006e-08	-7.379	-7.997	-0.618	(0)
CoSO4	1.788e-08	1.788e-08	-7.748	-7.748	0.000	(0)
CoHCO3+	3.913e-10	2.742e-10	-9.407	-9.562	-0.155	(0)
CoOH+	2.102e-10	1.473e-10	-9.677	-9.832	-0.155	(0)
CoCO3	2.038e-10	2.038e-10	-9.691	-9.691	0.000	(0)
CoCl+	2.036e-10	1.426e-10	-9.691	-9.846	-0.155	(0)
CoF+	4.858e-11	3.403e-11	-10.314	-10.468	-0.155	(0)
Co (OH) 2	8.582e-12	8.582e-12	-11.066	-11.066	0.000	(0)
CoNO2+	1.702e-12	1.192e-12	-11.769	-11.924	-0.155	(0)
Co (NH3) +2	4.917e-14	1.185e-14	-13.308	-13.926	-0.618	(0)
CoSeO4	1.132e-15	1.132e-15	-14.946	-14.946	0.000	(0)
CoNO3+	3.611e-16	2.530e-16	-15.442	-15.597	-0.155	(0)
Co (OH) 3-	1.793e-16	1.256e-16	-15.746	-15.901	-0.155	(0)
CoOOH-	4.504e-17	3.156e-17	-16.346	-16.501	-0.155	(0)
Co2OH+3	1.825e-18	7.427e-20	-17.739	-19.129	-1.391	(0)
Co (NH3) 2+2	2.055e-20	4.951e-21	-19.687	-20.305	-0.618	(0)
Co (OH) 4-2	6.061e-23	1.460e-23	-22.217	-22.836	-0.618	(0)
Co (NO3) 2	8.167e-24	8.167e-24	-23.088	-23.088	0.000	(0)
Co (NH3) 3+2	2.534e-27	6.106e-28	-26.596	-27.214	-0.618	(0)
Co4 (OH) 4+4	2.784e-29	9.387e-32	-28.555	-31.027	-2.472	(0)
Co (NH3) 4+2	1.303e-34	3.139e-35	-33.885	-34.503	-0.618	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.674	-42.292	-0.618	(0)
Co (3)	5.032e-29					
CoOH+2	5.032e-29	1.213e-29	-28.298	-28.916	-0.618	(0)
Co+3	2.839e-35	3.253e-36	-34.547	-35.488	-0.941	(0)
CoCl+2	1.126e-35	2.712e-36	-34.949	-35.567	-0.618	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.040	-49.658	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.966	-59.121	-0.155	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.312	-63.930	-0.618	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.765	-64.383	-0.618	(0)
Cr (2)	7.734e-27					
Cr+2	7.734e-27	1.864e-27	-26.112	-26.730	-0.618	(0)
Cr (3)	1.632e-09					
Cr (OH) 2+	1.295e-09	9.075e-10	-8.888	-9.042	-0.155	(0)
Cr (OH) 3	2.501e-10	2.501e-10	-9.602	-9.602	0.000	(0)
Cr (OH) +2	4.219e-11	1.017e-11	-10.375	-10.993	-0.618	(0)
CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
CrO2-	1.238e-11	8.677e-12	-10.907	-11.062	-0.155	(0)
Cr (OH) 4-	1.042e-11	7.304e-12	-10.982	-11.136	-0.155	(0)
CrF+2	4.457e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
CrSO4+	1.880e-14	1.317e-14	-13.726	-13.880	-0.155	(0)
Cr+3	1.557e-14	6.335e-16	-13.808	-15.198	-1.391	(0)
CrCl+2	1.394e-17	3.360e-18	-16.856	-17.474	-0.618	(0)
CrOHC12	1.919e-19	1.919e-19	-18.717	-18.717	0.000	(0)
Cr2 (OH) 2SO4+2	8.195e-20	1.975e-20	-19.086	-19.705	-0.618	(0)
Cr2 (OH) 2 (SO4) 2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
CrCl2+	1.864e-21	1.306e-21	-20.729	-20.884	-0.155	(0)
CrNO3+2	1.823e-24	4.393e-25	-23.739	-24.357	-0.618	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.387	-41.005	-0.618	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.862	-50.252	-1.391	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.920	-51.538	-0.618	(0)
Cr (6)	8.627e-15					
CrO4-2	8.052e-15	3.074e-15	-14.094	-14.512	-0.418	(0)

NaCrO4-	2.690e-16	1.884e-16	-15.570	-15.725	-0.155	(0)
HCrO4-	1.946e-16	1.364e-16	-15.711	-15.865	-0.155	(0)
KCrO4-	1.116e-16	7.820e-17	-15.952	-16.107	-0.155	(0)
CrO3SO4-2	2.107e-23	5.077e-24	-22.676	-23.294	-0.618	(0)
H2CrO4	1.515e-24	1.515e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	6.885e-26	4.824e-26	-25.162	-25.317	-0.155	(0)
Cr2O7-2	2.679e-30	6.456e-31	-29.572	-30.190	-0.618	(0)
Cu (1)	2.480e-09					
CuCl2-	1.149e-09	8.910e-10	-8.940	-9.050	-0.111	(0)
CuCl	1.041e-09	1.041e-09	-8.983	-8.983	0.000	(0)
Cu+	2.879e-10	2.017e-10	-9.541	-9.695	-0.155	(0)
CuCl3-2	2.019e-12	7.806e-13	-11.695	-12.108	-0.413	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.021	-147.443	-0.423	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.775	-148.173	-0.399	(0)
Cu (2)	5.095e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	1.001e-07	7.760e-08	-7.000	-7.110	-0.111	(0)
Cu+2	8.761e-08	3.345e-08	-7.057	-7.476	-0.418	(0)
CuSO4	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
Cu (OH) 2	1.136e-08	1.136e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	3.158e-09	7.610e-10	-8.501	-9.119	-0.618	(0)
CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
Cu2 (OH) 2+2	6.277e-10	1.513e-10	-9.202	-9.820	-0.618	(0)
CuF+	3.222e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
CuCl+	2.802e-10	2.172e-10	-9.553	-9.663	-0.111	(0)
CuNO2+	8.407e-11	5.891e-11	-10.075	-10.230	-0.155	(0)
Cu (OH) 3-	2.439e-11	1.709e-11	-10.613	-10.767	-0.155	(0)
CuNH3+2	1.391e-11	3.353e-12	-10.857	-11.475	-0.618	(0)
CuCl2	3.087e-13	3.087e-13	-12.511	-12.511	0.000	(0)
Cu (NO2) 2	1.014e-14	1.014e-14	-13.994	-13.994	0.000	(0)
CuNO3+	2.395e-15	1.678e-15	-14.621	-14.775	-0.155	(0)
Cu (OH) 4-2	4.095e-16	9.868e-17	-15.388	-16.006	-0.618	(0)
CuCl3-	1.522e-17	1.180e-17	-16.817	-16.928	-0.111	(0)
CuCl4-2	6.270e-22	2.424e-22	-21.203	-21.615	-0.413	(0)
Cu (NO3) 2	3.352e-24	3.352e-24	-23.475	-23.475	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
F	1.839e-04					
F-	1.361e-04	1.070e-04	-3.866	-3.971	-0.105	(0)
MgF+	4.276e-05	3.345e-05	-4.369	-4.476	-0.107	(0)
CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
NaF	8.325e-07	8.325e-07	-6.080	-6.080	0.000	(0)
MnF+	1.359e-07	1.072e-07	-6.867	-6.970	-0.103	(0)
ZnF+	8.560e-09	5.997e-09	-8.068	-8.222	-0.155	(0)
BF (OH) 3-	3.197e-09	2.405e-09	-8.495	-8.619	-0.124	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
AlF3	4.837e-10	4.837e-10	-9.315	-9.315	0.000	(0)
AlF2+	4.527e-10	3.592e-10	-9.344	-9.445	-0.101	(0)
CuF+	3.222e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
CoF+	4.858e-11	3.403e-11	-10.314	-10.468	-0.155	(0)
AlF4-	3.315e-11	2.593e-11	-10.479	-10.586	-0.107	(0)
AlF+2	2.129e-11	8.435e-12	-10.672	-11.074	-0.402	(0)
CdF+	8.896e-12	6.233e-12	-11.051	-11.205	-0.155	(0)
NiF+	7.653e-12	5.362e-12	-11.116	-11.271	-0.155	(0)
UO2F+	2.180e-12	1.527e-12	-11.662	-11.816	-0.155	(0)
PbF+	1.339e-12	9.384e-13	-11.873	-12.028	-0.155	(0)
HF2-	1.148e-12	8.820e-13	-11.940	-12.055	-0.115	(0)
BF2 (OH) 2-	5.018e-13	3.774e-13	-12.299	-12.423	-0.124	(0)
UO2F2	4.712e-13	4.712e-13	-12.327	-12.327	0.000	(0)
CrF+2	4.457e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
UO2F3-	1.807e-14	1.266e-14	-13.743	-13.898	-0.155	(0)
PbF2	1.975e-15	1.975e-15	-14.704	-14.704	0.000	(0)
CdF2	1.330e-15	1.330e-15	-14.876	-14.876	0.000	(0)
UO2F4-2	4.464e-17	1.076e-17	-16.350	-16.968	-0.618	(0)
VO2F	1.592e-17	1.592e-17	-16.798	-16.798	0.000	(0)
H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
FeF2+	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
FeF+2	1.218e-18	4.709e-19	-17.914	-18.327	-0.413	(0)
VO2F2-	8.827e-19	6.185e-19	-18.054	-18.209	-0.155	(0)

PbF3-	5.720e-19	4.008e-19	-18.243	-18.397	-0.155	(0)
BF3OH-	2.866e-19	2.156e-19	-18.543	-18.666	-0.124	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
VOF+	1.440e-20	1.009e-20	-19.842	-19.996	-0.155	(0)
VO2F3-2	3.425e-21	8.252e-22	-20.465	-21.083	-0.618	(0)
VOF2	4.048e-22	4.048e-22	-21.393	-21.393	0.000	(0)
PbF4-2	8.515e-23	2.052e-23	-22.070	-22.688	-0.618	(0)
HgF+	2.158e-23	1.512e-23	-22.666	-22.820	-0.155	(0)
VOF3-	2.193e-24	1.536e-24	-23.659	-23.814	-0.155	(0)
BF4-	2.071e-24	1.557e-24	-23.684	-23.808	-0.124	(0)
VO2F4-3	1.068e-24	4.343e-26	-23.972	-25.362	-1.391	(0)
Sb(OH) 2F	9.382e-26	9.382e-26	-25.028	-25.028	0.000	(0)
SbOF	9.238e-26	9.238e-26	-25.034	-25.034	0.000	(0)
VOF4-2	2.753e-27	6.633e-28	-26.560	-27.178	-0.618	(0)
UF3+	6.350e-36	4.449e-36	-35.197	-35.352	-0.155	(0)
UF2+2	1.089e-36	2.624e-37	-35.963	-36.581	-0.618	(0)
UF4	5.218e-38	5.218e-38	-37.282	-37.282	0.000	(0)
UF+3	4.790e-39	1.949e-40	-38.320	-39.710	-1.391	(0)
UF5-	3.157e-40	2.212e-40	-39.501	-39.655	-0.155	(0)
UF6-2	0.000e+00	0.000e+00	-40.528	-41.146	-0.618	(0)
Fe (2)	3.394e-12					
Fe+2	2.208e-12	5.322e-13	-11.656	-12.274	-0.618	(0)
FeSO4	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
FeOH+	1.971e-14	1.554e-14	-13.705	-13.809	-0.103	(0)
FeHCO3+	2.932e-15	2.347e-15	-14.533	-14.630	-0.097	(0)
Fe (OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	2.664e-18	2.101e-18	-17.574	-17.678	-0.103	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.429	-236.583	-0.155	(0)
Fe (3)	1.148e-09					
Fe (OH) 2+	6.840e-10	5.427e-10	-9.165	-9.265	-0.101	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.681e-11	2.920e-11	-10.434	-10.535	-0.101	(0)
FeOH+2	4.918e-15	1.901e-15	-14.308	-14.721	-0.413	(0)
FeF2+	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
FeF+2	1.218e-18	4.709e-19	-17.914	-18.327	-0.413	(0)
FeSO4+	5.087e-19	4.012e-19	-18.294	-18.397	-0.103	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
Fe (SO4) 2-	1.090e-19	7.638e-20	-18.962	-19.117	-0.155	(0)
Fe+3	3.504e-20	4.015e-21	-19.455	-20.396	-0.941	(0)
FeCl+2	1.285e-21	4.968e-22	-20.891	-21.304	-0.413	(0)
FeCl2+	1.153e-23	9.093e-24	-22.938	-23.041	-0.103	(0)
FeHSeO3+2	7.856e-24	1.893e-24	-23.105	-23.723	-0.618	(0)
Fe2 (OH) 2+4	3.551e-26	1.197e-28	-25.450	-27.922	-2.472	(0)
FeCl3	3.726e-27	3.726e-27	-26.429	-26.429	0.000	(0)
FeNO3+2	2.643e-27	6.369e-28	-26.578	-27.196	-0.618	(0)
Fe3 (OH) 4+5	6.846e-33	9.391e-37	-32.165	-36.027	-3.863	(0)
H (0)	3.950e-29					
H2	1.975e-29	2.017e-29	-28.704	-28.695	0.009	(0)
Hg (0)	5.337e-09					
Hg	5.337e-09	5.337e-09	-8.273	-8.273	0.000	(0)
Hg (1)	1.147e-19					
Hg2+2	5.733e-20	1.381e-20	-19.242	-19.860	-0.618	(0)
Hg (2)	3.972e-11					
HgClOH	2.024e-11	2.024e-11	-10.694	-10.694	0.000	(0)
Hg (OH) 2	1.268e-11	1.295e-11	-10.897	-10.888	0.009	(0)
HgCl2	6.402e-12	6.402e-12	-11.194	-11.194	0.000	(0)
HgCl3-	3.744e-13	2.623e-13	-12.427	-12.581	-0.155	(0)
HgCl4-2	1.776e-14	4.280e-15	-13.751	-14.369	-0.618	(0)
HgCO3	5.467e-15	5.467e-15	-14.262	-14.262	0.000	(0)
HgCl+	4.449e-16	3.117e-16	-15.352	-15.506	-0.155	(0)
HgOH+	1.589e-16	1.114e-16	-15.799	-15.953	-0.155	(0)
Hg (CO3) 2-2	8.596e-17	2.071e-17	-16.066	-16.684	-0.618	(0)
HgHCO3+	1.992e-18	1.395e-18	-17.701	-17.855	-0.155	(0)
Hg (OH) 3-	1.707e-18	1.196e-18	-17.768	-17.922	-0.155	(0)
Hg (NH3) 2+2	9.579e-19	2.308e-19	-18.019	-18.637	-0.618	(0)
HgNH3+2	9.779e-20	2.357e-20	-19.010	-19.628	-0.618	(0)
Hg+2	1.582e-20	3.813e-21	-19.801	-20.419	-0.618	(0)

		HgSO4	8.891e-21	8.891e-21	-20.051	-20.051	0.000	(0)
		HgF+	2.158e-23	1.512e-23	-22.666	-22.820	-0.155	(0)
		Hg (NH3) 3+2	3.736e-26	9.002e-27	-25.428	-26.046	-0.618	(0)
		HgNO3+	3.188e-29	2.234e-29	-28.496	-28.651	-0.155	(0)
		Hg (NH3) 4+2	2.907e-33	7.004e-34	-32.537	-33.155	-0.618	(0)
		Hg (NO3) 2	1.473e-37	1.473e-37	-36.832	-36.832	0.000	(0)
		HgHS2-	0.000e+00	0.000e+00	-137.338	-137.492	-0.155	(0)
		HgS2-2	0.000e+00	0.000e+00	-137.719	-138.337	-0.618	(0)
		Hg (HS) 2	0.000e+00	0.000e+00	-138.961	-138.961	0.000	(0)
K	9.254e-03							
		K+	8.710e-03	6.846e-03	-2.060	-2.165	-0.105	(0)
		KSO4-	5.441e-04	4.317e-04	-3.264	-3.365	-0.101	(0)
		KCrO4-	1.116e-16	7.820e-17	-15.952	-16.107	-0.155	(0)
Mg	1.188e-02							
		Mg+2	7.299e-03	2.787e-03	-2.137	-2.555	-0.418	(0)
		MgSO4	4.516e-03	4.516e-03	-2.345	-2.345	0.000	(0)
		MgF+	4.276e-05	3.345e-05	-4.369	-4.476	-0.107	(0)
		MgHCO3+	1.288e-05	9.990e-06	-4.890	-5.000	-0.111	(0)
		MgCO3	2.777e-06	2.777e-06	-5.556	-5.556	0.000	(0)
		MgOH+	1.010e-06	8.139e-07	-5.996	-6.089	-0.094	(0)
		MgH2BO3+	3.067e-07	2.306e-07	-6.513	-6.637	-0.124	(0)
Mn (2)	1.449e-04							
		Mn+2	1.044e-04	2.517e-05	-3.981	-4.599	-0.618	(0)
		MnSO4	3.986e-05	3.986e-05	-4.400	-4.400	0.000	(0)
		MnHCO3+	2.231e-07	1.759e-07	-6.652	-6.755	-0.103	(0)
		MnCl+	1.646e-07	1.298e-07	-6.783	-6.887	-0.103	(0)
		MnF+	1.359e-07	1.072e-07	-6.867	-6.970	-0.103	(0)
		MnOH+	5.881e-08	4.637e-08	-7.231	-7.334	-0.103	(0)
		MnCl2	7.514e-10	7.514e-10	-9.124	-9.124	0.000	(0)
		MnSeO4	1.521e-12	1.521e-12	-11.818	-11.818	0.000	(0)
		MnCl3-	1.075e-12	8.481e-13	-11.968	-12.072	-0.103	(0)
		MnNO3+	9.032e-13	6.328e-13	-12.044	-12.199	-0.155	(0)
		Mn (OH) 3-	1.956e-16	1.542e-16	-15.709	-15.812	-0.103	(0)
		Mn (NO3) 2	2.522e-20	2.522e-20	-19.598	-19.598	0.000	(0)
		Mn (OH) 4-2	9.447e-22	3.653e-22	-21.025	-21.437	-0.413	(0)
		MnSe	0.000e+00	0.000e+00	-40.644	-40.644	0.000	(0)
Mn (3)	7.967e-25							
		Mn+3	7.967e-25	9.129e-26	-24.099	-25.040	-0.941	(0)
Mn (6)	0.000e+00							
		MnO4-2	0.000e+00	0.000e+00	-40.068	-40.481	-0.413	(0)
Mn (7)	0.000e+00							
		MnO4-	0.000e+00	0.000e+00	-44.824	-44.943	-0.119	(0)
Mo	5.048e-06							
		MoO4-2	5.047e-06	1.927e-06	-5.297	-5.715	-0.418	(0)
		HMoO4-	7.501e-10	5.256e-10	-9.125	-9.279	-0.155	(0)
		H2MoO4	5.277e-14	5.277e-14	-13.278	-13.278	0.000	(0)
		AlMo6O21-3	6.495e-40	0.000e+00	-39.187	-40.578	-1.391	(0)
		Mo7O24-6	0.000e+00	0.000e+00	-44.356	-49.918	-5.562	(0)
		HMo7O24-5	0.000e+00	0.000e+00	-47.531	-51.394	-3.863	(0)
		H2Mo7O24-4	0.000e+00	0.000e+00	-52.003	-54.475	-2.472	(0)
		H3Mo7O24-3	0.000e+00	0.000e+00	-57.702	-59.092	-1.391	(0)
N (-3)	3.516e-07							
		NH4+	3.131e-07	2.355e-07	-6.504	-6.628	-0.124	(0)
		NH4SO4-	2.850e-08	2.247e-08	-7.545	-7.648	-0.103	(0)
		NH3	9.795e-09	9.795e-09	-8.009	-8.009	0.000	(0)
		CaNH3+2	1.414e-10	3.408e-11	-9.849	-10.467	-0.618	(0)
		CuNH3+2	1.391e-11	3.353e-12	-10.857	-11.475	-0.618	(0)
		Co (NH3) +2	4.917e-14	1.185e-14	-13.308	-13.926	-0.618	(0)
		NiNH3+2	4.357e-14	1.050e-14	-13.361	-13.979	-0.618	(0)
		BaNH3+2	3.016e-16	7.267e-17	-15.521	-16.139	-0.618	(0)
		Hg (NH3) 2+2	9.579e-19	2.308e-19	-18.019	-18.637	-0.618	(0)
		Ca (NH3) 2+2	5.515e-19	1.329e-19	-18.258	-18.876	-0.618	(0)
		HgNH3+2	9.779e-20	2.357e-20	-19.010	-19.628	-0.618	(0)
		Ni (NH3) 2+2	6.168e-20	1.486e-20	-19.210	-19.828	-0.618	(0)
		Co (NH3) 2+2	2.055e-20	4.951e-21	-19.687	-20.305	-0.618	(0)
		Hg (NH3) 3+2	3.736e-26	9.002e-27	-25.428	-26.046	-0.618	(0)
		Co (NH3) 3+2	2.534e-27	6.106e-28	-26.596	-27.214	-0.618	(0)
		Hg (NH3) 4+2	2.907e-33	7.004e-34	-32.537	-33.155	-0.618	(0)

	Co (NH3) 4+2	1.303e-34	3.139e-35	-33.885	-34.503	-0.618	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.387	-41.005	-0.618	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-41.674	-42.292	-0.618	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.862	-50.252	-1.391	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.040	-49.658	-0.618	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.920	-51.538	-0.618	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.966	-59.121	-0.155	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.312	-63.930	-0.618	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.765	-64.383	-0.618	(0)
N (3)	2.212e-05						
	NO2-	2.212e-05	1.682e-05	-4.655	-4.774	-0.119	(0)
	CuNO2+	8.407e-11	5.891e-11	-10.075	-10.230	-0.155	(0)
	CoNO2+	1.702e-12	1.192e-12	-11.769	-11.924	-0.155	(0)
	Cu (NO2) 2	1.014e-14	1.014e-14	-13.994	-13.994	0.000	(0)
N (5)	2.038e-08						
	NO3-	2.018e-08	1.587e-08	-7.695	-7.800	-0.105	(0)
	CaNO3+	1.979e-10	1.387e-10	-9.704	-9.858	-0.155	(0)
	MnNO3+	9.032e-13	6.328e-13	-12.044	-12.199	-0.155	(0)
	ZnNO3+	1.598e-13	1.120e-13	-12.796	-12.951	-0.155	(0)
	CuNO3+	2.395e-15	1.678e-15	-14.621	-14.775	-0.155	(0)
	BaNO3+	1.334e-15	9.349e-16	-14.875	-15.029	-0.155	(0)
	CoNO3+	3.611e-16	2.530e-16	-15.442	-15.597	-0.155	(0)
	CdNO3+	2.633e-16	1.845e-16	-15.580	-15.734	-0.155	(0)
	NiNO3+	1.135e-16	7.953e-17	-15.945	-16.099	-0.155	(0)
	PbNO3+	4.170e-17	2.921e-17	-16.380	-16.534	-0.155	(0)
	Mn (NO3) 2	2.522e-20	2.522e-20	-19.598	-19.598	0.000	(0)
	UO2NO3+	4.674e-21	3.275e-21	-20.330	-20.485	-0.155	(0)
	Zn (NO3) 2	3.545e-22	3.545e-22	-21.450	-21.450	0.000	(0)
	Co (NO3) 2	8.167e-24	8.167e-24	-23.088	-23.088	0.000	(0)
	Cu (NO3) 2	3.352e-24	3.352e-24	-23.475	-23.475	0.000	(0)
	CrNO3+2	1.823e-24	4.393e-25	-23.739	-24.357	-0.618	(0)
	Cd (NO3) 2	1.467e-24	1.467e-24	-23.834	-23.834	0.000	(0)
	Pb (NO3) 2	7.871e-25	7.871e-25	-24.104	-24.104	0.000	(0)
	VO2NO3	6.812e-25	6.812e-25	-24.167	-24.167	0.000	(0)
	FeNO3+2	2.643e-27	6.369e-28	-26.578	-27.196	-0.618	(0)
	HgNO3+	3.188e-29	2.234e-29	-28.496	-28.651	-0.155	(0)
	Hg (NO3) 2	1.473e-37	1.473e-37	-36.832	-36.832	0.000	(0)
Na	1.644e-02						
	Na+	1.569e-02	1.234e-02	-1.804	-1.909	-0.105	(0)
	NaSO4-	7.436e-04	5.900e-04	-3.129	-3.229	-0.101	(0)
	NaHCO3	2.430e-06	2.430e-06	-5.614	-5.614	0.000	(0)
	NaF	8.325e-07	8.325e-07	-6.080	-6.080	0.000	(0)
	NaCO3-	3.468e-07	2.752e-07	-6.460	-6.560	-0.101	(0)
	NaH2BO3	4.666e-08	4.666e-08	-7.331	-7.331	0.000	(0)
	NaCrO4-	2.690e-16	1.884e-16	-15.570	-15.725	-0.155	(0)
Ni	9.055e-09						
	Ni+2	5.227e-09	1.996e-09	-8.282	-8.700	-0.418	(0)
	NiSO4	3.546e-09	3.546e-09	-8.450	-8.450	0.000	(0)
	NiHCO3+	1.230e-10	8.619e-11	-9.910	-10.065	-0.155	(0)
	NiCO3	8.921e-11	8.921e-11	-10.050	-10.050	0.000	(0)
	NiCl+	2.986e-11	2.092e-11	-10.525	-10.679	-0.155	(0)
	NiOH+	2.631e-11	1.843e-11	-10.580	-10.734	-0.155	(0)
	NiF+	7.653e-12	5.362e-12	-11.116	-11.271	-0.155	(0)
	Ni (SO4) 2-2	4.340e-12	1.046e-12	-11.363	-11.981	-0.618	(0)
	Ni (OH) 2	1.074e-12	1.074e-12	-11.969	-11.969	0.000	(0)
	NiNH3+2	4.357e-14	1.050e-14	-13.361	-13.979	-0.618	(0)
	Ni (OH) 3-	1.125e-15	7.879e-16	-14.949	-15.104	-0.155	(0)
	NiCl2	4.317e-16	4.317e-16	-15.365	-15.365	0.000	(0)
	NiSeO4	2.096e-16	2.096e-16	-15.679	-15.679	0.000	(0)
	NiNO3+	1.135e-16	7.953e-17	-15.945	-16.099	-0.155	(0)
	Ni (NH3) 2+2	6.168e-20	1.486e-20	-19.210	-19.828	-0.618	(0)
O (0)	2.433e-35						
	O2	1.217e-35	1.243e-35	-34.915	-34.906	0.009	(0)
Pb	1.851e-09						
	PbSO4	5.430e-10	5.430e-10	-9.265	-9.265	0.000	(0)
	PbCO3	4.484e-10	4.484e-10	-9.348	-9.348	0.000	(0)
	PbOH+	3.274e-10	2.294e-10	-9.485	-9.639	-0.155	(0)
	Pb+2	3.261e-10	1.245e-10	-9.487	-9.905	-0.418	(0)

Pb(SO ₄) 2-2	1.209e-10	2.914e-11	-9.917	-10.536	-0.618	(0)
PbHCO ₃ +	4.625e-11	3.240e-11	-10.335	-10.489	-0.155	(0)
PbCl ₁ +	2.583e-11	1.810e-11	-10.588	-10.742	-0.155	(0)
Pb(CO ₃) 2-2	6.429e-12	1.549e-12	-11.192	-11.810	-0.618	(0)
Pb(OH) 2	5.322e-12	5.322e-12	-11.274	-11.274	0.000	(0)
PbF ₁ +	1.339e-12	9.384e-13	-11.873	-12.028	-0.155	(0)
PbCl ₁₂	3.313e-13	3.313e-13	-12.480	-12.480	0.000	(0)
Pb(OH) 3-	5.572e-15	3.904e-15	-14.254	-14.409	-0.155	(0)
PbF ₂	1.975e-15	1.975e-15	-14.704	-14.704	0.000	(0)
PbCl ₁₃ -	7.714e-16	5.404e-16	-15.113	-15.267	-0.155	(0)
PbNO ₃ +	4.170e-17	2.921e-17	-16.380	-16.534	-0.155	(0)
Pb ₂ OH+3	1.112e-17	4.526e-19	-16.954	-18.344	-1.391	(0)
PbCl ₁₄ -2	4.201e-18	1.012e-18	-17.377	-17.995	-0.618	(0)
Pb(OH) 4-2	2.911e-18	7.014e-19	-17.536	-18.154	-0.618	(0)
PbF ₃ -	5.720e-19	4.008e-19	-18.243	-18.397	-0.155	(0)
Pb ₃ (OH) 4+2	2.919e-22	7.034e-23	-21.535	-22.153	-0.618	(0)
PbF ₄ -2	8.515e-23	2.052e-23	-22.070	-22.688	-0.618	(0)
Pb(NO ₃) 2	7.871e-25	7.871e-25	-24.104	-24.104	0.000	(0)
Pb ₄ (OH) 4+4	2.063e-26	6.956e-29	-25.686	-28.158	-2.472	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.499	-151.499	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.477	-228.631	-0.155	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.278	-78.432	-0.155	(0)
CdHS+	0.000e+00	0.000e+00	-78.704	-78.859	-0.155	(0)
H ₂ S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S ₅ -2	0.000e+00	0.000e+00	-79.316	-79.934	-0.618	(0)
S ₆ -2	0.000e+00	0.000e+00	-79.832	-80.450	-0.618	(0)
S ₄ -2	0.000e+00	0.000e+00	-79.912	-80.530	-0.618	(0)
S ₃ -2	0.000e+00	0.000e+00	-80.718	-81.336	-0.618	(0)
S ₂ -2	0.000e+00	0.000e+00	-81.734	-82.352	-0.618	(0)
S-2	0.000e+00	0.000e+00	-87.456	-87.869	-0.413	(0)
HgHS ₂ -	0.000e+00	0.000e+00	-137.338	-137.492	-0.155	(0)
HgS ₂ -2	0.000e+00	0.000e+00	-137.719	-138.337	-0.618	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.961	-138.961	0.000	(0)
Cu(S ₄) 2-3	0.000e+00	0.000e+00	-147.021	-147.443	-0.423	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.588	-147.743	-0.155	(0)
CuS ₄ S ₅ -3	0.000e+00	0.000e+00	-147.775	-148.173	-0.399	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.596	-149.596	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.087	-150.087	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.499	-151.499	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.593	-224.748	-0.155	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.247	-226.865	-0.618	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.465	-226.619	-0.155	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.477	-228.631	-0.155	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.429	-236.583	-0.155	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.237	-302.855	-0.618	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.022	-304.640	-0.618	(0)
Sb ₂ S ₄ -2	0.000e+00	0.000e+00	-318.221	-318.839	-0.618	(0)
S(6)	3.482e-02					
SO ₄ -2	2.333e-02	8.906e-03	-1.632	-2.050	-0.418	(0)
CaSO ₄	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
MgSO ₄	4.516e-03	4.516e-03	-2.345	-2.345	0.000	(0)
NaSO ₄ -	7.436e-04	5.900e-04	-3.129	-3.229	-0.101	(0)
KSO ₄ -	5.441e-04	4.317e-04	-3.264	-3.365	-0.101	(0)
MnSO ₄	3.986e-05	3.986e-05	-4.400	-4.400	0.000	(0)
ZnSO ₄	5.475e-06	5.475e-06	-5.262	-5.262	0.000	(0)
Zn(SO ₄) 2-2	1.762e-06	4.247e-07	-5.754	-6.372	-0.618	(0)
CuSO ₄	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
NH ₄ SO ₄ -	2.850e-08	2.247e-08	-7.545	-7.648	-0.103	(0)
CoSO ₄	1.788e-08	1.788e-08	-7.748	-7.748	0.000	(0)
HSO ₄ -	1.525e-08	1.193e-08	-7.817	-7.923	-0.107	(0)
CdSO ₄	7.676e-09	7.676e-09	-8.115	-8.115	0.000	(0)
Cd(SO ₄) 2-2	3.827e-09	9.221e-10	-8.417	-9.035	-0.618	(0)
NiSO ₄	3.546e-09	3.546e-09	-8.450	-8.450	0.000	(0)
PbSO ₄	5.430e-10	5.430e-10	-9.265	-9.265	0.000	(0)
Pb(SO ₄) 2-2	1.209e-10	2.914e-11	-9.917	-10.536	-0.618	(0)

CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
Ni (SO4) 2-2	4.340e-12	1.046e-12	-11.363	-11.981	-0.618	(0)
UO2SO4	1.394e-12	1.394e-12	-11.856	-11.856	0.000	(0)
FeSO4	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.264	-0.107	(0)
UO2 (SO4) 2-2	6.794e-13	1.637e-13	-12.168	-12.786	-0.618	(0)
Al (SO4) 2-	6.651e-14	5.202e-14	-13.177	-13.284	-0.107	(0)
CrSO4+	1.880e-14	1.317e-14	-13.726	-13.880	-0.155	(0)
VO2SO4-	2.576e-17	1.805e-17	-16.589	-16.743	-0.155	(0)
FeSO4+	5.087e-19	4.012e-19	-18.294	-18.397	-0.103	(0)
Fe (SO4) 2-	1.090e-19	7.638e-20	-18.962	-19.117	-0.155	(0)
Cr2 (OH) 2SO4+2	8.195e-20	1.975e-20	-19.086	-19.705	-0.618	(0)
VOSO4	3.858e-20	3.858e-20	-19.414	-19.414	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
HgSO4	8.891e-21	8.891e-21	-20.051	-20.051	0.000	(0)
CrO3SO4-2	2.107e-23	5.077e-24	-22.676	-23.294	-0.618	(0)
VSO4+	1.086e-34	7.609e-35	-33.964	-34.119	-0.155	(0)
U (SO4) 2	2.290e-39	2.290e-39	-38.640	-38.640	0.000	(0)
USO4+2	1.343e-40	0.000e+00	-39.872	-40.490	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.966	-59.121	-0.155	(0)
Sb (3)	8.090e-20					
Sb (OH) 3	4.091e-20	4.091e-20	-19.388	-19.388	0.000	(0)
HSbO2	3.998e-20	3.998e-20	-19.398	-19.398	0.000	(0)
SbO2-	6.743e-24	4.724e-24	-23.171	-23.326	-0.155	(0)
Sb (OH) 4-	3.853e-24	2.700e-24	-23.414	-23.569	-0.155	(0)
Sb (OH) 2F	9.382e-26	9.382e-26	-25.028	-25.028	0.000	(0)
SbOF	9.238e-26	9.238e-26	-25.034	-25.034	0.000	(0)
Sb (OH) 2+	1.946e-26	1.363e-26	-25.711	-25.865	-0.155	(0)
SbO+	6.718e-27	4.707e-27	-26.173	-26.327	-0.155	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.221	-318.839	-0.618	(0)
Sb (5)	6.266e-08					
SbO3-	6.259e-08	4.386e-08	-7.203	-7.358	-0.155	(0)
Sb (OH) 6-	6.500e-11	5.109e-11	-10.187	-10.292	-0.105	(0)
SbO2+	3.378e-24	2.367e-24	-23.471	-23.626	-0.155	(0)
Se (-2)	4.285e-39					
HSe-	4.285e-39	3.002e-39	-38.368	-38.523	-0.155	(0)
MnSe	0.000e+00	0.000e+00	-40.644	-40.644	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.496	-42.496	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.041	-45.659	-0.618	(0)
Se (4)	4.698e-07					
HSeO3-	2.547e-07	1.785e-07	-6.594	-6.748	-0.155	(0)
SeO3-2	2.151e-07	5.183e-08	-6.667	-7.285	-0.618	(0)
H2SeO3	1.044e-12	1.044e-12	-11.981	-11.981	0.000	(0)
Cd (SeO3) 2-2	3.378e-17	8.140e-18	-16.471	-17.089	-0.618	(0)
FeHSeO3+2	7.856e-24	1.893e-24	-23.105	-23.723	-0.618	(0)
Se (6)	5.897e-10					
SeO4-2	5.881e-10	2.245e-10	-9.231	-9.649	-0.418	(0)
MnSeO4	1.521e-12	1.521e-12	-11.818	-11.818	0.000	(0)
ZnSeO4	9.772e-14	9.772e-14	-13.010	-13.010	0.000	(0)
CoSeO4	1.132e-15	1.132e-15	-14.946	-14.946	0.000	(0)
HSeO4-	2.202e-16	1.543e-16	-15.657	-15.812	-0.155	(0)
NiSeO4	2.096e-16	2.096e-16	-15.679	-15.679	0.000	(0)
CdSeO4	1.537e-16	1.537e-16	-15.813	-15.813	0.000	(0)
Zn (SeO4) 2-2	9.233e-23	2.225e-23	-22.035	-22.653	-0.618	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.355	-58.745	-1.391	(0)
U (4)	2.030e-19					
U (OH) 5-	2.029e-19	1.422e-19	-18.693	-18.847	-0.155	(0)
U (OH) 4	8.172e-23	8.172e-23	-22.088	-22.088	0.000	(0)
U (OH) 3+	5.853e-27	4.101e-27	-26.233	-26.387	-0.155	(0)
U (OH) 2+2	1.080e-31	2.603e-32	-30.967	-31.585	-0.618	(0)
UF3+	6.350e-36	4.449e-36	-35.197	-35.352	-0.155	(0)
UF2+2	1.089e-36	2.624e-37	-35.963	-36.581	-0.618	(0)
UOH+3	4.136e-37	1.683e-38	-36.383	-37.774	-1.391	(0)
UF4	5.218e-38	5.218e-38	-37.282	-37.282	0.000	(0)
UF+3	4.790e-39	1.949e-40	-38.320	-39.710	-1.391	(0)
U (SO4) 2	2.290e-39	2.290e-39	-38.640	-38.640	0.000	(0)
UF5-	3.157e-40	2.212e-40	-39.501	-39.655	-0.155	(0)

USO4+2	1.343e-40	0.000e+00	-39.872	-40.490	-0.618	(0)
UF6-2	0.000e+00	0.000e+00	-40.528	-41.146	-0.618	(0)
U+4	0.000e+00	0.000e+00	-42.567	-45.039	-2.472	(0)
UC1+3	0.000e+00	0.000e+00	-44.336	-45.727	-1.391	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-156.940	-169.455	-12.515	(0)
U (5)	1.108e-15					
UO2+	1.108e-15	7.765e-16	-14.955	-15.110	-0.155	(0)
U (6)	2.595e-07					
UO2 (CO3) 3-4	2.101e-07	7.083e-10	-6.678	-9.150	-2.472	(0)
UO2 (CO3) 2-2	4.895e-08	1.180e-08	-7.310	-7.928	-0.618	(0)
UO2CO3	4.934e-10	4.934e-10	-9.307	-9.307	0.000	(0)
UO2OH+	1.364e-11	9.554e-12	-10.865	-11.020	-0.155	(0)
UO2F+	2.180e-12	1.527e-12	-11.662	-11.816	-0.155	(0)
UO2SO4	1.394e-12	1.394e-12	-11.856	-11.856	0.000	(0)
UO2 (SO4) 2-2	6.794e-13	1.637e-13	-12.168	-12.786	-0.618	(0)
UO2F2	4.712e-13	4.712e-13	-12.327	-12.327	0.000	(0)
UO2+2	2.709e-13	1.034e-13	-12.567	-12.985	-0.418	(0)
UO2F3-	1.807e-14	1.266e-14	-13.743	-13.898	-0.155	(0)
UO2Cl+	9.812e-16	6.875e-16	-15.008	-15.163	-0.155	(0)
(UO2) 3 (OH) 5+	8.432e-16	5.908e-16	-15.074	-15.229	-0.155	(0)
(UO2) 2 (OH) 2+2	6.286e-16	1.515e-16	-15.202	-15.820	-0.618	(0)
UO2F4-2	4.464e-17	1.076e-17	-16.350	-16.968	-0.618	(0)
UO2NO3+	4.674e-21	3.275e-21	-20.330	-20.485	-0.155	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.432	-42.587	-0.155	(0)
V+2	0.000e+00	0.000e+00	-43.344	-43.962	-0.618	(0)
V (3)	5.764e-15					
V (OH) 3	5.764e-15	5.764e-15	-14.239	-14.239	0.000	(0)
V (OH) 2+	7.295e-26	5.111e-26	-25.137	-25.291	-0.155	(0)
VOH+2	2.761e-29	6.654e-30	-28.559	-29.177	-0.618	(0)
V+3	4.448e-34	1.810e-35	-33.352	-34.742	-1.391	(0)
VSO4+	1.086e-34	7.609e-35	-33.964	-34.119	-0.155	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.626	-56.016	-1.391	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.082	-57.554	-2.472	(0)
V (4)	3.401e-18					
V (OH) 3+	3.282e-18	2.299e-18	-17.484	-17.638	-0.155	(0)
VO+2	6.528e-20	1.573e-20	-19.185	-19.803	-0.618	(0)
VOSO4	3.858e-20	3.858e-20	-19.414	-19.414	0.000	(0)
VOF+	1.440e-20	1.009e-20	-19.842	-19.996	-0.155	(0)
VOF2	4.048e-22	4.048e-22	-21.393	-21.393	0.000	(0)
VOC1+	2.581e-22	1.808e-22	-21.588	-21.743	-0.155	(0)
VOF3-	2.193e-24	1.536e-24	-23.659	-23.814	-0.155	(0)
VOF4-2	2.753e-27	6.633e-28	-26.560	-27.178	-0.618	(0)
H2V2O4+2	1.103e-30	2.657e-31	-29.958	-30.576	-0.618	(0)
V (5)	4.941e-08					
H2VO4-	3.223e-08	2.258e-08	-7.492	-7.646	-0.155	(0)
HVO4-2	1.717e-08	4.138e-09	-7.765	-8.383	-0.618	(0)
H3VO4	3.095e-12	3.095e-12	-11.509	-11.509	0.000	(0)
HV2O7-3	7.792e-13	3.170e-14	-12.108	-13.499	-1.391	(0)
H3V2O7-	6.449e-13	4.519e-13	-12.190	-12.345	-0.155	(0)
VO4-3	3.719e-14	1.513e-15	-13.430	-14.820	-1.391	(0)
V2O7-4	1.846e-14	6.225e-17	-13.734	-16.206	-2.472	(0)
V3O9-3	2.975e-16	1.211e-17	-15.526	-16.917	-1.391	(0)
VO2+	1.080e-16	8.488e-17	-15.967	-16.071	-0.105	(0)
VO2SO4-	2.576e-17	1.805e-17	-16.589	-16.743	-0.155	(0)
VO2F	1.592e-17	1.592e-17	-16.798	-16.798	0.000	(0)
VO2F2-	8.827e-19	6.185e-19	-18.054	-18.209	-0.155	(0)
V4O12-4	3.384e-20	1.141e-22	-19.471	-21.943	-2.472	(0)
VO2F3-2	3.425e-21	8.252e-22	-20.465	-21.083	-0.618	(0)
VO2F4-3	1.068e-24	4.343e-26	-23.972	-25.362	-1.391	(0)
VO2NO3	6.812e-25	6.812e-25	-24.167	-24.167	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.440	-59.002	-5.562	(0)
HV10O28-5	0.000e+00	0.000e+00	-54.816	-58.678	-3.863	(0)
H2V10O28-4	0.000e+00	0.000e+00	-58.862	-61.334	-2.472	(0)
Zn	1.523e-05					
Zn+2	7.360e-06	2.810e-06	-5.133	-5.551	-0.418	(0)
ZnSO4	5.475e-06	5.475e-06	-5.262	-5.262	0.000	(0)
Zn (SO4) 2-2	1.762e-06	4.247e-07	-5.754	-6.372	-0.618	(0)

ZnOH+	2.942e-07	2.061e-07	-6.531	-6.686	-0.155	(0)
ZnCO3	1.937e-07	1.937e-07	-6.713	-6.713	0.000	(0)
ZnHCO3+	4.443e-08	3.113e-08	-7.352	-7.507	-0.155	(0)
ZnCl+	3.730e-08	2.892e-08	-7.428	-7.539	-0.111	(0)
ZnOHCl	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
Zn(OH)2	2.397e-08	2.397e-08	-7.620	-7.620	0.000	(0)
ZnF+	8.560e-09	5.997e-09	-8.068	-8.222	-0.155	(0)
ZnCl2	1.878e-10	1.878e-10	-9.726	-9.726	0.000	(0)
Zn(OH)3-	1.258e-10	8.812e-11	-9.900	-10.055	-0.155	(0)
ZnCl3-	7.885e-13	6.114e-13	-12.103	-12.214	-0.111	(0)
ZnNO3+	1.598e-13	1.120e-13	-12.796	-12.951	-0.155	(0)
ZnSeO4	9.772e-14	9.772e-14	-13.010	-13.010	0.000	(0)
Zn(OH)4-2	1.068e-14	2.573e-15	-13.971	-14.589	-0.618	(0)
ZnCl4-2	3.240e-15	1.253e-15	-14.489	-14.902	-0.413	(0)
Zn(NO3)2	3.545e-22	3.545e-22	-21.450	-21.450	0.000	(0)
Zn(SeO4)2-2	9.233e-23	2.225e-23	-22.035	-22.653	-0.618	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.588	-147.743	-0.155	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.596	-149.596	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.593	-224.748	-0.155	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-226.247	-226.865	-0.618	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-304.022	-304.640	-0.618	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.59	-47.30	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-40.99	-36.48	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.21	-36.48	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.41	-51.48	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.27	-35.24	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.17	-27.77	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.35	-22.90	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.32	9.48	10.80	Al(OH)3
Al2(MoO4)3	-47.72	-45.35	2.37	Al2(MoO4)3
Al2O3	-0.68	18.97	19.65	Al2O3
Al4(OH)10SO4	-2.54	20.16	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.46	-6.66	4.80	AlAsO4:2H2O
AlOHSO4	-5.06	-8.29	-3.23	AlOHSO4
AlSb	-152.16	-86.54	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.17	-11.96	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.91	4.69	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.14	6.25	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.60	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.70	-0.83	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.97	6.97	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.68	-13.64	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.65	-6.82	1.83	BaSeO3
BaSeO4	-10.12	-17.58	-7.46	BaSeO4
Bianchite	-5.84	-7.61	-1.76	ZnSO4:6H2O
Birnessite	-6.77	11.32	18.09	MnO2
Bixbyite	-2.26	-2.90	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.91	9.48	8.58	AlOOH

Breithauptite	-57.70	-76.22	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.67	13.17	16.84	Mg(OH)2
Bunsenite	-5.42	7.03	12.45	NiO
Ca(VO3)2	-8.91	-3.25	5.66	Ca(VO3)2
Ca2V2O7	-7.58	9.92	17.50	Ca2V2O7
Ca2V2O7·2H2O	-11.64	9.92	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-15.10	7.20	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-15.88	23.08	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-16.78	23.08	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-295.52	-152.54	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-6.72	-24.63	-17.91	Hg2Cl2
CaMoO4	-0.32	-8.27	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3·2H2O	-4.26	-1.45	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.19	-12.21	-3.02	CaSeO4·2H2O
Cd(BO2)2	-11.05	-1.21	9.84	Cd(BO2)2
Cd(OH)2	-6.35	7.29	13.64	Cd(OH)2
Cd(OH)2(am)	-6.44	7.29	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.39	-13.68	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.46	4.10	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.01	11.39	28.40	Cd4(OH)6SO4
CdCl2	-12.55	-13.21	-0.66	CdCl2
CdCl2·1H2O	-11.52	-13.21	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.30	-13.21	-1.91	CdCl2·2.5H2O
CdF2	-15.16	-16.38	-1.21	CdF2
Cdmetal(alpha)	-31.77	-18.25	13.51	Cd
Cdmetal(gamma)	-31.87	-18.25	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.50	-2.96	3.54	CdOHCl
CdSb	-75.61	-75.96	-0.35	CdSb
CdSe	-18.89	-39.09	-20.20	CdSe
CdSeO4·2H2O	-16.23	-18.08	-1.85	CdSeO4·2H2O
CdSO4	-10.31	-10.48	-0.17	CdSO4
CdSO4·1H2O	-8.76	-10.49	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-8.61	-10.49	-1.87	CdSO4·2.67H2O
Cerrusite	-2.70	-15.83	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4·5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.49	-97.18	-45.69	HgS
Claudetite	-88.12	-91.18	-3.06	As4O6
Clausthalite	-13.46	-40.56	-27.10	PbSe
Co(BO2)2	-27.84	-0.77	27.07	Co(BO2)2
Co(OH)2	-5.37	7.73	13.09	Co(OH)2
Co(OH)3	-9.59	-11.90	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-22.15	-9.11	13.03	Co3(AsO4)2
Co3O4	-5.58	-16.07	-10.50	Co3O4
CoCl2	-21.04	-12.77	8.27	CoCl2
CoCl2·6H2O	-15.31	-12.78	2.54	CoCl2·6H2O
CoCO3	-3.94	-13.92	-9.98	CoCO3
CoF2	-14.34	-15.94	-1.60	CoF2
CoF3	-45.94	-47.40	-1.46	CoF3
CoFe2O4	17.64	14.11	-3.53	CoFe2O4
CoMoO4	-5.95	-13.71	-7.76	CoMoO4
CoO	-5.86	7.73	13.59	CoO
CoS(alpha)	-71.13	-78.57	-7.44	CoS
CoS(beta)	-67.50	-78.57	-11.07	CoS
CoSe	-22.46	-38.66	-16.20	CoSe
CoSeO3	-8.20	-6.88	1.32	CoSeO3
CoSeO4·6H2O	-16.12	-17.65	-1.53	CoSeO4·6H2O
CoSO4	-12.85	-10.05	2.80	CoSO4
CoSO4·6H2O	-7.58	-10.05	-2.47	CoSO4·6H2O
Cotunnite	-9.90	-14.68	-4.78	PbCl2

Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.52	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.60	-31.50	14.09	CrCl2
CrCl3	-47.04	-31.93	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.81	-43.65	-33.84	Na3AlF6
Cu(OH)2	-0.42	8.25	8.67	Cu(OH)2
Cu(SbO3)2	-24.65	20.56	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.41	0.84	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.72	-89.61	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.25	-50.05	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.65	-7.55	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-24.69	-88.18	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.11	-13.19	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.04	-38.14	-33.10	CuSe
CuSe2	-25.61	-58.98	-33.37	CuSe2
CuSeO3:2H2O	-6.87	-6.36	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.69	-17.13	-2.44	CuSeO4:5H2O
CuSO4	-12.47	-9.53	2.94	CuSO4
Diaspore	2.61	9.48	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.42	-16.96	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.13	-16.96	-17.09	CaMg(CO3)2
Epsomite	-2.48	-4.61	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.16	0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.25	-12.97	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.78	-8.23	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.82	-37.45	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.90	-17.99	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.18	-63.77	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.93	-42.93	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.50	-80.47	-13.97	PbS
Gibbsite	1.19	9.48	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.59	-7.61	-2.01	ZnSO4:7H2O
Greenockite	-64.64	-79.00	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.93	2.74	7.67	UO3
Gypsum	-0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.56	-21.44	-12.88	H2MoO4
H2S(g)	-78.29	-86.30	-8.01	H2S

H2Se(g)	-41.43	-46.39	-4.96	H2Se
Halite	-5.90	-4.30	1.60	NaCl
Hausmannite	-2.11	58.92	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.47	22.42	22.89	FeAl2O4
Hg(CH3)2(g)	-184.83	-258.54	-73.71	Hg(CH3)2
Hg(g)	-6.97	-14.84	-7.87	Hg
Hg(OH)2	-7.39	-10.89	-3.50	Hg(OH)2
Hg2(g)	-14.72	-29.68	-14.96	Hg2
Hg2(OH)2	-9.40	-4.13	5.26	Hg2(OH)2
Hg2CO3	-9.73	-25.78	-16.05	Hg2CO3
Hg2CrO4	-25.67	-34.37	-8.70	Hg2CrO4
Hg2F2	-17.44	-27.80	-10.36	Hg2F2
Hg2S	-78.75	-90.43	-11.68	Hg2S
Hg2SeO3	-14.09	-18.75	-4.66	Hg2SeO3
Hg2SO4	-15.78	-21.91	-6.13	Hg2SO4
Hg3O2CO3	-24.63	-54.31	-29.68	Hg3O2CO3
HgCl(g)	-31.81	-12.32	19.50	HgCl
HgCl2	-10.13	-31.39	-21.26	HgCl2
HgF(g)	-46.58	-13.90	32.68	HgF
HgF2(g)	-47.12	-34.55	12.57	HgF2
Hgmetal(l)	-1.39	-14.84	-13.45	Hg
HgSe	-1.58	-57.27	-55.69	HgSe
HgSeO3	-13.07	-25.50	-12.43	HgSeO3
HgSO4	-19.24	-28.66	-9.42	HgSO4
Huntite	-3.94	-33.91	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.06	-25.83	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.97	-20.74	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.21	-20.38	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.48	-20.28	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-31.84	-49.08	-17.24	K2Cr2O7
K2CrO4	-18.33	-18.84	-0.51	K2CrO4
K2MoO4	-13.31	-10.04	3.26	K2MoO4
K2SeO4	-13.25	-13.98	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.70	-6.13	-0.43	PbO:PbSO4
Laurionite	-5.05	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.87	5.82	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.69	19.55	16.86	Fe2MgO4
Magnesite	-1.02	-8.48	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2(OH)2CO3
Manganite	-1.44	23.90	25.34	MnOOH
Massicot	-7.07	5.82	12.89	PbO
Matlockite	-7.29	-16.26	-8.97	PbClF
Melanothallite	-18.51	-12.25	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-52.09	-97.18	-45.09	HgS
Mg(OH)2(active)	-5.62	13.17	18.79	Mg(OH)2
Mg(VO3)2	-14.53	-3.25	11.28	Mg(VO3)2
Mg2Sb3	-272.55	-197.86	74.68	Mg2Sb3
Mg2V2O7	-16.44	9.92	26.36	Mg2V2O7
MgCr2O4	-5.39	10.81	16.20	MgCr2O4
MgCrO4	-22.45	-17.07	5.38	MgCrO4
MgF2	-2.37	-10.50	-8.13	MgF2
MgMoO4	-6.42	-8.27	-1.85	MgMoO4
MgSeO3:6H2O	-4.50	-1.44	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.01	-12.21	-1.20	MgSeO4:6H2O
Minium	-30.52	43.01	73.52	Pb3O4
Mirabilite	-4.76	-5.87	-1.11	Na2SO4:10H2O
Mn(VO3)2	-10.19	-5.29	4.90	Mn(VO3)2
Mn2(SO4)3	-50.52	-56.23	-5.71	Mn2(SO4)3
Mn2Sb	-147.62	-86.54	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.42	1.08	12.50	Mn3(AsO4)2:8H2O

MnCl2:4H2O	-12.09	-9.38	2.72	MnCl2:4H2O
MnS (grn)	-75.34	-75.17	0.17	MnS
MnS (pnk)	-78.51	-75.17	3.34	MnS
MnSb	-94.56	-97.47	-2.91	MnSb
MnSe	-38.76	-35.26	3.50	MnSe
MnSeO3	-4.61	-3.48	1.13	MnSeO3
MnSeO3:2H2O	-4.47	-3.49	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.20	-14.25	-2.05	MnSeO4:5H2O
MnSO4	-9.23	-6.65	2.58	MnSO4
Monteponite	-7.81	7.29	15.10	CdO
Montroydite	-7.25	-10.89	-3.64	HgO
MoO3	-13.44	-21.44	-8.00	MoO3
Morenosite	-8.61	-10.75	-2.14	NiSO4:7H2O
MoS2	-149.31	-219.57	-70.26	MoS2
Na-Jarosite	-8.82	-20.02	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.67	-48.57	-9.90	Na2Cr2O7
Na2CrO4	-21.26	-18.33	2.93	Na2CrO4
Na2Mo2O7	-14.38	-30.97	-16.60	Na2Mo2O7
Na2MoO4	-11.02	-9.53	1.49	Na2MoO4
Na2MoO4:2H2O	-10.76	-9.53	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.01	-2.71	10.30	Na2SeO3:5H2O
Na2SeO4	-14.75	-13.47	1.28	Na2SeO4
Na3Sb	-172.61	-78.16	94.45	Na3Sb
Na3VO4	-27.03	9.65	36.68	Na3VO4
Na4V2O7	-30.00	7.40	37.40	Na4V2O7
Nantokite	-5.35	-12.08	-6.73	CuCl
NaSb	-87.69	-64.52	23.17	NaSb
Natron	-8.43	-9.75	-1.31	Na2CO3:10H2O
NaVO3	-6.11	-2.25	3.86	NaVO3
Nesquehonite	-3.81	-8.48	-4.67	MgCO3:3H2O
Ni(OH)2	-5.77	7.03	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-26.93	-11.23	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.68	10.32	32.00	Ni4(OH)6SO4
NiCO3	-7.75	-14.62	-6.87	NiCO3
NiMoO4	-3.27	-14.42	-11.14	NiMoO4
NiS (alpha)	-73.67	-79.27	-5.60	NiS
NiS (beta)	-68.17	-79.27	-11.10	NiS
NiS (gamma)	-66.47	-79.27	-12.80	NiS
NiSe	-21.66	-39.36	-17.70	NiSe
NiSeO3:2H2O	-10.40	-7.59	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.83	-18.35	-1.52	NiSeO4:6H2O
Nsutite	-6.18	11.32	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.36	-14.36	-12.00	CdCO3
Pb(BO2)2	-9.20	-2.68	6.52	Pb(BO2)2
Pb(OH)2	-2.33	5.82	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.92	-71.68	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.40	1.39	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.55	11.64	26.19	Pb2O(OH)2
Pb2O3	-23.85	37.19	61.04	Pb2O3
Pb2OCO3	-9.45	-10.01	-0.56	Pb2OCO3
Pb2V2O7	-2.88	-4.78	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.64	-14.84	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.09	1.05	6.14	Pb3(VO4)2
Pb3O2CO3	-15.21	-4.19	11.02	Pb3O2CO3
Pb3O2SO4	-11.00	-0.31	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.60	5.50	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.37	5.51	21.88	Pb4O3SO4
PbCrO4	-11.82	-24.42	-12.60	PbCrO4
PbF2	-10.41	-17.85	-7.44	PbF2
Pbmetal	-23.97	-19.72	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.16	5.82	12.98	PbO:0.33H2O
PbSeO4	-12.71	-19.55	-6.84	PbSeO4
Periclase	-8.41	13.17	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.23	31.37	49.60	PbO2

Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-4.07	11.13	15.19	Mn (OH) 2
Pyrolusite	-4.71	36.67	41.38	MnO2
Realgar	-102.12	-121.86	-19.75	AsS
Retgersite	-8.71	-10.75	-2.04	NiSO4:6H2O
Rhodochrosite	0.06	-10.52	-10.58	MnCO3
Rutherfordine	-4.41	-18.91	-14.50	UO2CO3
Sb (OH) 3	-12.28	-19.39	-7.11	Sb (OH) 3
Sb2O4	-16.63	-13.23	3.40	Sb2O4
Sb2O5	-26.64	-36.31	-9.67	Sb2O5
Sb2Se3	-110.17	-177.93	-67.76	Sb2Se3
Sb4O6 (cubic)	-59.29	-77.55	-18.26	Sb4O6
Sb4O6 (orth)	-59.65	-77.55	-17.90	Sb4O6
SbCl3	-50.71	-50.14	0.57	SbCl3
SbF3	-44.66	-54.89	-10.23	SbF3
Sbmetal	-46.02	-57.70	-11.69	Sb
SbO2	-3.10	-30.92	-27.82	SbO2
Schoepite	-3.25	2.74	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.73	-20.84	-7.11	Se
Semetal (hex)	-13.13	-20.84	-7.71	Se
Senarmontite	-26.41	-38.77	-12.37	Sb2O3
SeO2	-14.74	-14.61	0.12	SeO2
SeO3	-46.42	-25.37	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.47	-11.47	-10.00	ZnCO3
Sphalerite	-64.67	-76.12	-11.45	ZnS
Spinel	-4.71	32.14	36.85	MgAl2O4
Stibnite	-247.20	-297.66	-50.46	Sb2S3
Sulfur	-58.61	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.19	-5.87	0.32	Na2SO4
Thermonatrite	-10.38	-9.74	0.64	Na2CO3:H2O
Tyuyamunite	-1.85	2.23	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.76	10.32	21.08	U3O8
U3Sb4	-577.23	-424.85	152.38	U3Sb4
U4O9	-25.79	-28.81	-3.02	U4O9
UF4	-31.39	-60.92	-29.54	UF4
UF4:2.5H2O	-28.21	-60.92	-32.72	UF4:2.5H2O
UO2 (am)	-14.52	-13.59	0.93	UO2
UO2 (NO3) 2	-40.73	-28.58	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.44	-28.59	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.98	-28.59	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.63	-28.59	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.87	2.74	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.39	-22.64	-2.25	UO2SeO4:4H2O
UO3	-4.96	2.74	7.70	UO3
Uraninite	-8.92	-13.59	-4.67	UO2
USb2	-218.88	-189.30	29.58	USb2
V (OH) 3	-18.75	-11.16	7.59	V (OH) 3
V2O5	-15.06	-16.42	-1.36	V2O5
V3O5	-39.61	-37.78	1.84	V3O5
V4O7	-49.04	-41.86	7.19	V4O7
V6O13	-39.48	-100.34	-60.86	V6O13
Valentinite	-30.29	-38.77	-8.48	Sb2O3
VC12	-63.30	-44.43	18.87	VC12
VC13	-65.34	-41.90	23.43	VC13
VF4	-66.34	-51.41	14.93	VF4
Vmetal	-93.50	-49.47	44.03	V
VO	-38.68	-23.93	14.76	VO
VO (OH) 2	-9.23	-4.08	5.15	VO (OH) 2
VO2Cl	-21.30	-18.46	2.84	VO2Cl
VOC1	-32.56	-21.40	11.15	VOC1
VOC12	-37.34	-24.58	12.76	VOC12
VOSO4	-25.46	-21.85	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.17	-76.12	-8.95	ZnS
Zincite	-1.16	10.17	11.33	ZnO

Zincosite	-11.53	-7.60	3.93	ZnSO4
Zn(BO2)2	-6.61	1.68	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.47	-21.15	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.03	10.17	12.20	Zn(OH)2
Zn(OH)2(am)	-2.30	10.17	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.58	10.17	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.36	10.17	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.56	10.17	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.93	2.57	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.09	10.10	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.43	-1.78	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.94	-5.03	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.48	22.92	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.13	30.37	38.50	Zn5(OH)8Cl2
ZnCl2	-17.38	-10.33	7.05	ZnCl2
ZnCO3:1H2O	-1.21	-11.47	-10.26	ZnCO3:1H2O
ZnF2	-12.96	-13.49	-0.53	ZnF2
Znmetal	-41.16	-15.37	25.79	Zn
ZnMoO4	-1.14	-11.27	-10.13	ZnMoO4
ZnO(active)	-1.01	10.17	11.19	ZnO
ZnS(am)	-67.07	-76.12	-9.05	ZnS
ZnSb	-84.09	-73.07	11.01	ZnSb
ZnSe	-21.81	-36.21	-14.40	ZnSe
ZnSeO4:6H2O	-13.68	-15.20	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.96	-7.60	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 59.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 302
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 302
USE Surface 302
USE Solution 307
SAVE Solution 308  #Initial Stage 3 Run-off Water After Mineral
Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 302.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

1.621e-15  Surface + diffuse layer charge, eq
9.989e-08  Surface charge, eq
4.399e-03  sigma, C/m^2
1.213e-01  psi, V

```

-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
2.191e+00 m² for 3.413e-05 moles of Ferrihydrite

Water in diffuse layer: 2.191e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is +1).

Element	Moles
C	5.5977e-11
Ca	6.9374e-13
Cl	1.1209e-09
H	1.6513e-10
K	1.1005e-12
Mg	1.0748e-13
N	4.5380e-09
Na	4.6629e-12
O	2.0227e-07
S	4.7131e-08

Hfo_s
1.707e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	1.141e-07	0.668	1.141e-07	-6.943
Hfo_sOH	5.595e-08	0.328	5.595e-08	-7.252
Hfo_sO-	6.286e-10	0.004	6.286e-10	-9.202
Hfo_sOHCa+2	2.082e-12	0.000	2.082e-12	-11.681

Hfo_w
6.826e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	3.154e-06	0.462	3.154e-06	-5.501
Hfo_wOH	1.547e-06	0.227	1.547e-06	-5.811
Hfo_wSO4-	1.065e-06	0.156	1.065e-06	-5.973
Hfo_wOHSO4-2	1.042e-06	0.153	1.042e-06	-5.982
Hfo_wO-	1.738e-08	0.003	1.738e-08	-7.760
Hfo_wOMg+	2.456e-14	0.000	2.456e-14	-13.610
Hfo_wOCa+	8.334e-15	0.000	8.334e-15	-14.079

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.

WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 307. Solution after simulation 58.
 Using surface 302.
 Using pure phase assemblage 302. Pure-phase assemblage after simulation 58.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	4.616e-05	4.616e-05	2.447e-11
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.01	-8.92	-8.91	4.113e-08	0	-4.113e-08
Barite	0.00	-9.98	-9.98	1.734e-05	1.746e-05	1.234e-07
Brochantite	0.00	15.22	15.22	8.482e-05	8.423e-05	-5.896e-07
Brucite	-3.67	13.17	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.007e+01	1.007e+01	2.688e-06
CaMoO4	-0.32	-8.27	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.34	-1.52	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.832e-02	2.832e-02	-4.425e-06
Carnotite	0.00	0.23	0.23	1.320e-06	6.971e-07	-6.230e-07
Cd(BO2)2	-11.05	-1.21	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	1.270e-07	1.269e-07	-5.182e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	1.125e-08	4.970e-09	-6.277e-09
Cu2Se (alpha)	-4.33	-50.13	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.11	-13.19	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.48	-4.61	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	3.413e-05	3.413e-05	-7.851e-14
Fluorite	0.00	-10.50	-10.50	2.253e-03	2.253e-03	2.850e-09
Gummite	-4.40	3.27	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	1.332e-03	1.335e-03	3.665e-06
HgSe	-1.66	-57.35	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.76	-5.87	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.69	-3.56	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.77	7.02	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-26.95	-11.25	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.76	-14.63	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.28	-14.42	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	2.422e-09
Otavite	-2.36	-14.36	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	4.210e-07	4.040e-07	-1.697e-08
Rutherfordine	-3.88	-18.38	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.10	-30.92	-27.82	0.000e+00	0	0.000e+00
Schoepite	-2.72	3.27	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2 (am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-1.85	2.23	4.08	0.000e+00	0	0.000e+00
U3O8	-9.17	11.92	21.08	0.000e+00	0	0.000e+00
UO2(OH)2 (beta)	-2.34	3.27	5.61	0.000e+00	0	0.000e+00
UO3	-4.43	3.27	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.16	-11.28	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

4.578e-18 Surface + diffuse layer charge, eq
 5.529e-07 Surface charge, eq
 2.435e-02 sigma, C/m²
 3.290e-02 psi, V
 -1.281e+00 -F*psi/RT
 2.778e-01 exp(-F*psi/RT)

6.420e+04 specific area, m²/mol Ferrihydrite
 2.191e+00 m² for 3.413e-05 moles of Ferrihydrite

Water in diffuse layer: 2.191e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 3.431e-03 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 8.750e-01$ (= c_DL / c_free if z is +1).

Element	Moles
Al	1.4707e-10
As	2.9155e-14
B	1.3047e-09
Ba	5.1779e-13
C	1.2404e-08
Ca	2.4564e-07
Cd	4.8207e-13
Cl	1.3055e-07
Co	1.1101e-12
Cr	3.2067e-14
Cu	1.0507e-11
F	4.3271e-09
Fe	2.3468e-14
H	1.6762e-08
Hg	1.1780e-13
K	1.8062e-07
Mg	2.2254e-07
Mn	2.6336e-09
Mo	1.4479e-10
N	5.6143e-10
Na	3.1956e-07
Ni	1.6886e-13
O	3.7371e-06
Pb	3.8560e-14
S	9.2340e-07
Sb	1.5691e-12
Se	1.0445e-11
U	3.1416e-11
V	3.8289e-13
Zn	2.9580e-10

Hfo_s

1.707e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	6.063e-08	0.355	6.039e-08	-7.219
Hfo_sOCu+	5.943e-08	0.348	5.919e-08	-7.228
Hfo_sOMn+	2.290e-08	0.134	2.281e-08	-7.642
Hfo_sOPb+	1.270e-08	0.074	1.265e-08	-7.898
Hfo_sOCrOH+	1.255e-08	0.074	1.250e-08	-7.903
Hfo_sOHCa+2	2.248e-09	0.013	2.239e-09	-8.650
Hfo_sOH	1.129e-10	0.001	1.125e-10	-9.949
Hfo_sO-	3.483e-11	0.000	3.469e-11	-10.460
Hfo_sOCd+	2.478e-11	0.000	2.468e-11	-10.608
Hfo_sONi+	1.057e-11	0.000	1.053e-11	-10.978
Hfo_sOH2+	8.385e-12	0.000	8.352e-12	-11.078
Hfo_sOCu+	7.961e-12	0.000	7.929e-12	-11.101
Hfo_sOHBa+2	2.956e-14	0.000	2.944e-14	-13.531
Hfo_sOFe+	6.104e-15	0.000	6.080e-15	-14.216
Hfo_sOHg+	4.975e-16	0.000	4.956e-16	-15.305

Hfo_w

6.826e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
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Hfo_wOCu+	2.299e-06	0.337	2.290e-06	-5.640
Hfo_wOMg+	1.208e-06	0.177	1.203e-06	-5.920
Hfo_wOH	8.516e-07	0.125	8.482e-07	-6.071
Hfo_wOHVO4-3	6.580e-07	0.096	6.554e-07	-6.184
Hfo_wOHSO4-2	6.057e-07	0.089	6.033e-07	-6.219
Hfo_wOZn+	4.788e-07	0.070	4.769e-07	-6.322
Hfo_wO-	2.627e-07	0.038	2.617e-07	-6.582
Hfo_wOMn+	1.372e-07	0.020	1.367e-07	-6.864
Hfo_wOHAsO4-3	8.226e-08	0.012	8.193e-08	-7.087
Hfo_wOHSeO3-2	7.038e-08	0.010	7.010e-08	-7.154
Hfo_wOCa+	6.739e-08	0.010	6.712e-08	-7.173
Hfo_wOH2+	6.324e-08	0.009	6.299e-08	-7.201
Hfo_wSO4-	2.258e-08	0.003	2.249e-08	-7.648
Hfo_wSeO3-	8.888e-09	0.001	8.852e-09	-8.053
Hfo_wOHMoO4-2	5.351e-09	0.001	5.330e-09	-8.273
Hfo_wOPb+	4.278e-09	0.001	4.261e-09	-8.370
Hfo_wMoO4-	2.569e-10	0.000	2.559e-10	-9.592
Hfo_wH2BO3	2.003e-10	0.000	1.995e-10	-9.700
Hfo_wOCa+	1.692e-10	0.000	1.686e-10	-9.773
Hfo_wONi+	1.075e-10	0.000	1.071e-10	-9.970
Hfo_wOCd+	7.972e-11	0.000	7.940e-11	-10.100
Hfo_wHAsO4-	1.017e-11	0.000	1.013e-11	-10.994
Hfo_wOHg+	1.838e-13	0.000	1.831e-13	-12.737
Hfo_wOFe+	2.905e-14	0.000	2.893e-14	-13.539
Hfo_wH2AsO4	2.444e-14	0.000	2.434e-14	-13.614
Hfo_wOHSeO4-2	1.301e-14	0.000	1.295e-14	-13.888
Hfo_wOBa+	1.281e-14	0.000	1.276e-14	-13.894
Hfo_wOHSbO(OH) 4-	3.129e-15	0.000	3.116e-15	-14.506
Hfo_wSeO4-	4.222e-16	0.000	4.205e-16	-15.376
Hfo_wOHCrO4-2	2.694e-16	0.000	2.683e-16	-15.571
Hfo_wSbO(OH) 4	1.502e-16	0.000	1.496e-16	-15.825
Hfo_wCrO4-	9.156e-18	0.000	9.120e-18	-17.040
Hfo_wH2AsO3	3.478e-24	0.000	3.465e-24	-23.460

-----Solution composition-----

Elements	Molality	Moles
Al	5.880e-06	5.904e-06
As	1.024e-09	1.028e-09
B	5.919e-05	5.943e-05
Ba	3.086e-08	3.098e-08
C	5.048e-04	5.068e-04
Ca	1.291e-02	1.296e-02
Cd	2.334e-08	2.344e-08
Cl	5.213e-03	5.234e-03
Co	6.052e-08	6.077e-08
Cr	1.632e-09	1.639e-09
Cu	5.120e-07	5.140e-07
F	1.839e-04	1.846e-04
Fe	1.152e-09	1.156e-09
Hg	5.376e-09	5.397e-09
K	9.254e-03	9.291e-03
Mg	1.187e-02	1.192e-02
Mn	1.447e-04	1.453e-04
Mo	5.059e-06	5.079e-06
N	2.249e-05	2.258e-05
Na	1.644e-02	1.650e-02
Ni	8.937e-09	8.973e-09
Pb	1.847e-09	1.854e-09
S	3.482e-02	3.495e-02
Sb	6.266e-08	6.291e-08
Se	3.914e-07	3.930e-07
U	8.800e-07	8.835e-07
V	1.457e-08	1.462e-08
Zn	1.469e-05	1.475e-05

-----Description of solution-----

pH = 7.863 Charge balance
 pe = 4.910 Adjusted to redox
 equilibrium
 Activity of water = 0.999
 Ionic strength (mol/kgw) = 9.177e-02
 Mass of water (kg) = 1.004e+00
 Total alkalinity (eq/kg) = 5.386e-04
 Total CO2 (mol/kg) = 5.048e-04
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 1
 Total H = 1.114565e+02
 Total O = 5.586952e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.551e-07	7.336e-07	-6.020	-6.135	-0.115	(0)
H+	1.744e-08	1.371e-08	-7.758	-7.863	-0.105	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Al	5.880e-06					
Al (OH) 4-	5.826e-06	4.556e-06	-5.235	-5.341	-0.107	(0)
Al (OH) 3	4.934e-08	4.934e-08	-7.307	-7.307	0.000	(0)
Al (OH) 2+	4.249e-09	3.371e-09	-8.372	-8.472	-0.101	(0)
AlF3	4.837e-10	4.837e-10	-9.315	-9.315	0.000	(0)
AlF2+	4.527e-10	3.592e-10	-9.344	-9.445	-0.101	(0)
AlF4-	3.315e-11	2.593e-11	-10.479	-10.586	-0.107	(0)
AlF+2	2.129e-11	8.435e-12	-10.672	-11.074	-0.402	(0)
AlOH+2	1.460e-11	5.785e-12	-10.836	-11.238	-0.402	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.263	-0.107	(0)
Al+3	6.882e-14	7.886e-15	-13.162	-14.103	-0.941	(0)
Al (SO4) 2-	6.651e-14	5.202e-14	-13.177	-13.284	-0.107	(0)
AlMo6O21-3	6.584e-40	0.000e+00	-39.182	-40.572	-1.391	(0)
As (3)	1.672e-23					
H3AsO3	1.587e-23	1.587e-23	-22.799	-22.799	0.000	(0)
H2AsO3-	8.474e-25	5.937e-25	-24.072	-24.226	-0.155	(0)
HAsO3-2	1.639e-28	3.950e-29	-27.785	-28.403	-0.618	(0)
H4AsO3+	1.538e-31	1.078e-31	-30.813	-30.967	-0.155	(0)
AsO3-3	2.730e-33	1.111e-34	-32.564	-33.954	-1.391	(0)
As (5)	1.024e-09					
HAsO4-2	9.803e-10	2.362e-10	-9.009	-9.627	-0.618	(0)
H2AsO4-	4.215e-11	2.953e-11	-10.375	-10.530	-0.155	(0)
AsO4-3	1.339e-12	5.449e-14	-11.873	-13.264	-1.391	(0)
H3AsO4	6.888e-17	7.035e-17	-16.162	-16.153	0.009	(0)
B	5.919e-05					
H3BO3	5.516e-05	5.633e-05	-4.258	-4.249	0.009	(0)
H2BO3-	3.173e-06	2.387e-06	-5.498	-5.622	-0.124	(0)
CaH2BO3+	5.047e-07	3.796e-07	-6.297	-6.421	-0.124	(0)
MgH2BO3+	3.066e-07	2.306e-07	-6.513	-6.637	-0.124	(0)
NaH2BO3	4.666e-08	4.666e-08	-7.331	-7.331	0.000	(0)
BF (OH) 3-	3.197e-09	2.404e-09	-8.495	-8.619	-0.124	(0)
H5 (BO3) 2-	1.522e-10	1.144e-10	-9.818	-9.941	-0.124	(0)
BaH2BO3+	1.153e-12	8.673e-13	-11.938	-12.062	-0.124	(0)
H8 (BO3) 3-	8.572e-13	6.447e-13	-12.067	-12.191	-0.124	(0)
BF2 (OH) 2-	5.018e-13	3.774e-13	-12.299	-12.423	-0.124	(0)
BF3OH-	2.866e-19	2.156e-19	-18.543	-18.666	-0.124	(0)
BF4-	2.071e-24	1.557e-24	-23.684	-23.808	-0.124	(0)
Ba	3.086e-08					
Ba+2	3.080e-08	1.176e-08	-7.511	-7.930	-0.418	(0)
BaHCO3+	4.915e-11	3.934e-11	-10.308	-10.405	-0.097	(0)
BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
BaH2BO3+	1.153e-12	8.673e-13	-11.938	-12.062	-0.124	(0)
BaOH+	4.775e-14	3.765e-14	-13.321	-13.424	-0.103	(0)

BaNO3+	1.335e-15	9.351e-16	-14.875	-15.029	-0.155	(0)
BaNH3+2	3.016e-16	7.269e-17	-15.521	-16.139	-0.618	(0)
C (4)	5.048e-04					
HCO3-	4.415e-04	3.503e-04	-3.355	-3.456	-0.101	(0)
CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
MgHCO3+	1.288e-05	9.988e-06	-4.890	-5.000	-0.111	(0)
H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	3.138e-06	1.198e-06	-5.503	-5.922	-0.418	(0)
MgCO3	2.777e-06	2.777e-06	-5.556	-5.556	0.000	(0)
NaHCO3	2.430e-06	2.430e-06	-5.614	-5.614	0.000	(0)
UO2 (CO3) 3-4	7.123e-07	2.402e-09	-6.147	-8.619	-2.472	(0)
NaCO3-	3.468e-07	2.752e-07	-6.460	-6.560	-0.101	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
MnHCO3+	2.228e-07	1.757e-07	-6.652	-6.755	-0.103	(0)
ZnCO3	1.869e-07	1.869e-07	-6.728	-6.728	0.000	(0)
UO2 (CO3) 2-2	1.660e-07	4.000e-08	-6.780	-7.398	-0.618	(0)
ZnHCO3+	4.286e-08	3.003e-08	-7.368	-7.522	-0.155	(0)
Cu (CO3) 2-2	3.158e-09	7.610e-10	-8.501	-9.119	-0.618	(0)
UO2CO3	1.673e-09	1.673e-09	-8.776	-8.776	0.000	(0)
CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
PbCO3	4.473e-10	4.473e-10	-9.349	-9.349	0.000	(0)
CoHCO3+	3.902e-10	2.734e-10	-9.409	-9.563	-0.155	(0)
CoCO3	2.032e-10	2.032e-10	-9.692	-9.692	0.000	(0)
NiHCO3+	1.214e-10	8.507e-11	-9.916	-10.070	-0.155	(0)
CdCO3	1.002e-10	1.002e-10	-9.999	-9.999	0.000	(0)
NiCO3	8.804e-11	8.804e-11	-10.055	-10.055	0.000	(0)
BaHCO3+	4.915e-11	3.934e-11	-10.308	-10.405	-0.097	(0)
PbHCO3+	4.614e-11	3.233e-11	-10.336	-10.490	-0.155	(0)
BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
Pb (CO3) 2-2	6.414e-12	1.546e-12	-11.193	-11.811	-0.618	(0)
CdHCO3+	4.176e-12	2.926e-12	-11.379	-11.534	-0.155	(0)
Cd (CO3) 2-2	3.692e-13	8.896e-14	-12.433	-13.051	-0.618	(0)
HgCO3	5.467e-15	5.467e-15	-14.262	-14.262	0.000	(0)
FeHCO3+	2.933e-15	2.347e-15	-14.533	-14.629	-0.097	(0)
Hg (CO3) 2-2	8.595e-17	2.071e-17	-16.066	-16.684	-0.618	(0)
HgHCO3+	1.992e-18	1.395e-18	-17.701	-17.855	-0.155	(0)
Ca	1.291e-02					
Ca+2	7.239e-03	2.764e-03	-2.140	-2.558	-0.418	(0)
CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
CaH2BO3+	5.047e-07	3.796e-07	-6.297	-6.421	-0.124	(0)
CaOH+	5.055e-08	4.045e-08	-7.296	-7.393	-0.097	(0)
CaNO3+	1.980e-10	1.387e-10	-9.703	-9.858	-0.155	(0)
CaNH3+2	1.415e-10	3.409e-11	-9.849	-10.467	-0.618	(0)
Ca (NH3) 2+2	5.518e-19	1.330e-19	-18.258	-18.876	-0.618	(0)
Cd	2.334e-08					
Cd+2	9.608e-09	3.668e-09	-8.017	-8.436	-0.418	(0)
CdSO4	7.658e-09	7.658e-09	-8.116	-8.116	0.000	(0)
Cd (SO4) 2-2	3.818e-09	9.200e-10	-8.418	-9.036	-0.618	(0)
CdCl+	2.049e-09	1.435e-09	-8.688	-8.843	-0.155	(0)
CdCO3	1.002e-10	1.002e-10	-9.999	-9.999	0.000	(0)
CdOHC1	4.320e-11	4.320e-11	-10.365	-10.365	0.000	(0)
CdOH+	3.051e-11	2.138e-11	-10.516	-10.670	-0.155	(0)
CdCl2	2.452e-11	2.452e-11	-10.610	-10.610	0.000	(0)
CdF+	8.876e-12	6.219e-12	-11.052	-11.206	-0.155	(0)
CdHCO3+	4.176e-12	2.926e-12	-11.379	-11.534	-0.155	(0)
Cd (CO3) 2-2	3.692e-13	8.896e-14	-12.433	-13.051	-0.618	(0)
Cd (OH) 2	9.894e-14	9.894e-14	-13.005	-13.005	0.000	(0)
CdCl3-	9.048e-14	6.339e-14	-13.043	-13.198	-0.155	(0)
CdF2	1.327e-15	1.327e-15	-14.877	-14.877	0.000	(0)
CdNO3+	2.627e-16	1.841e-16	-15.580	-15.735	-0.155	(0)
CdSeO4	1.276e-16	1.276e-16	-15.894	-15.894	0.000	(0)
Cd (SeO3) 2-2	2.334e-17	5.624e-18	-16.632	-17.250	-0.618	(0)
Cd2OH+3	9.659e-18	3.930e-19	-17.015	-18.406	-1.391	(0)
Cd (OH) 3-	6.328e-18	4.434e-18	-17.199	-17.353	-0.155	(0)

	Cd(OH) 4-2	2.209e-24	5.324e-25	-23.656	-24.274	-0.618	(0)
	Cd(NO3) 2	1.464e-24	1.464e-24	-23.834	-23.834	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.705	-78.860	-0.155	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.088	-150.088	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.466	-226.620	-0.155	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.238	-302.856	-0.618	(0)
Cl	5.213e-03						
	Cl-	5.213e-03	4.098e-03	-2.283	-2.387	-0.105	(0)
	MnCl+	1.644e-07	1.297e-07	-6.784	-6.887	-0.103	(0)
	ZnCl+	3.599e-08	2.790e-08	-7.444	-7.554	-0.111	(0)
	ZnOHC1	2.680e-08	2.680e-08	-7.572	-7.572	0.000	(0)
	CdCl+	2.049e-09	1.435e-09	-8.688	-8.843	-0.155	(0)
	CuCl2-	1.149e-09	8.910e-10	-8.940	-9.050	-0.111	(0)
	CuCl	1.041e-09	1.041e-09	-8.983	-8.983	0.000	(0)
	MnCl2	7.506e-10	7.506e-10	-9.125	-9.125	0.000	(0)
	CuCl+	2.802e-10	2.172e-10	-9.553	-9.663	-0.111	(0)
	CoCl+	2.030e-10	1.422e-10	-9.693	-9.847	-0.155	(0)
	ZnCl2	1.812e-10	1.812e-10	-9.742	-9.742	0.000	(0)
	CdOHC1	4.320e-11	4.320e-11	-10.365	-10.365	0.000	(0)
	NiCl+	2.947e-11	2.065e-11	-10.531	-10.685	-0.155	(0)
	PbCl+	2.578e-11	1.806e-11	-10.589	-10.743	-0.155	(0)
	CdCl2	2.452e-11	2.452e-11	-10.610	-10.610	0.000	(0)
	HgClOH	2.024e-11	2.024e-11	-10.694	-10.694	0.000	(0)
	HgCl2	6.402e-12	6.402e-12	-11.194	-11.194	0.000	(0)
	CuCl3-2	2.019e-12	7.805e-13	-11.695	-12.108	-0.413	(0)
	MnCl3-	1.074e-12	8.471e-13	-11.969	-12.072	-0.103	(0)
	ZnCl3-	7.607e-13	5.898e-13	-12.119	-12.229	-0.111	(0)
	HgCl3-	3.744e-13	2.623e-13	-12.427	-12.581	-0.155	(0)
	PbCl2	3.305e-13	3.305e-13	-12.481	-12.481	0.000	(0)
	CuCl2	3.087e-13	3.087e-13	-12.511	-12.511	0.000	(0)
	CdCl3-	9.048e-14	6.339e-14	-13.043	-13.198	-0.155	(0)
	HgCl4-2	1.776e-14	4.279e-15	-13.751	-14.369	-0.618	(0)
	UO2Cl+	3.328e-15	2.332e-15	-14.478	-14.632	-0.155	(0)
	ZnCl4-2	3.125e-15	1.208e-15	-14.505	-14.918	-0.413	(0)
	PbCl3-	7.696e-16	5.392e-16	-15.114	-15.268	-0.155	(0)
	HgCl+	4.449e-16	3.117e-16	-15.352	-15.506	-0.155	(0)
	NiCl2	4.261e-16	4.261e-16	-15.371	-15.371	0.000	(0)
	CuCl3-	1.522e-17	1.180e-17	-16.817	-16.928	-0.111	(0)
	CrCl+2	1.394e-17	3.360e-18	-16.856	-17.474	-0.618	(0)
	PbCl4-2	4.191e-18	1.010e-18	-17.378	-17.996	-0.618	(0)
	CrOHC12	1.920e-19	1.920e-19	-18.717	-18.717	0.000	(0)
	CrCl2+	1.864e-21	1.306e-21	-20.729	-20.884	-0.155	(0)
	FeCl+2	1.285e-21	4.968e-22	-20.891	-21.304	-0.413	(0)
	CuCl4-2	6.269e-22	2.424e-22	-21.203	-21.615	-0.413	(0)
	VOCl+	7.610e-23	5.332e-23	-22.119	-22.273	-0.155	(0)
	FeCl2+	1.153e-23	9.094e-24	-22.938	-23.041	-0.103	(0)
	CrO3Cl-	6.885e-26	4.824e-26	-25.162	-25.317	-0.155	(0)
	FeCl3	3.726e-27	3.726e-27	-26.429	-26.429	0.000	(0)
	CoCl+2	1.122e-35	2.704e-36	-34.950	-35.568	-0.618	(0)
	UCl+3	0.000e+00	0.000e+00	-43.806	-45.197	-1.391	(0)
	Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-49.041	-49.659	-0.618	(0)
	Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-50.919	-51.537	-0.618	(0)
	Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-63.766	-64.384	-0.618	(0)
Co(2)	6.052e-08						
	Co+2	4.163e-08	1.003e-08	-7.381	-7.999	-0.618	(0)
	CoSO4	1.783e-08	1.783e-08	-7.749	-7.749	0.000	(0)
	CoHCO3+	3.902e-10	2.734e-10	-9.409	-9.563	-0.155	(0)
	CoOH+	2.096e-10	1.468e-10	-9.679	-9.833	-0.155	(0)
	CoCO3	2.032e-10	2.032e-10	-9.692	-9.692	0.000	(0)
	CoCl+	2.030e-10	1.422e-10	-9.693	-9.847	-0.155	(0)
	CoF+	4.843e-11	3.393e-11	-10.315	-10.469	-0.155	(0)
	Co(OH) 2	8.556e-12	8.556e-12	-11.068	-11.068	0.000	(0)
	CoNO2+	1.697e-12	1.189e-12	-11.770	-11.925	-0.155	(0)
	Co(NH3) +2	4.904e-14	1.182e-14	-13.309	-13.927	-0.618	(0)
	CoSeO4	9.395e-16	9.395e-16	-15.027	-15.027	0.000	(0)
	CoNO3+	3.601e-16	2.523e-16	-15.444	-15.598	-0.155	(0)
	Co(OH) 3-	1.787e-16	1.252e-16	-15.748	-15.902	-0.155	(0)
	CoOOH-	4.491e-17	3.146e-17	-16.348	-16.502	-0.155	(0)

Co2OH+3	1.815e-18	7.384e-20	-17.741	-19.132	-1.391	(0)
Co(NH3)2+2	2.050e-20	4.939e-21	-19.688	-20.306	-0.618	(0)
Co(OH)4-2	6.042e-23	1.456e-23	-22.219	-22.837	-0.618	(0)
Co(NO3)2	8.147e-24	8.147e-24	-23.089	-23.089	0.000	(0)
Co(NH3)3+2	2.528e-27	6.092e-28	-26.597	-27.215	-0.618	(0)
Co4(OH)4+4	2.751e-29	9.277e-32	-28.560	-31.033	-2.472	(0)
Co(NH3)4+2	1.300e-34	3.132e-35	-33.886	-34.504	-0.618	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-41.675	-42.293	-0.618	(0)
Co(3)	5.018e-29					
CoOH+2	5.018e-29	1.209e-29	-28.300	-28.918	-0.618	(0)
Co+3	2.831e-35	3.244e-36	-34.548	-35.489	-0.941	(0)
CoCl+2	1.122e-35	2.704e-36	-34.950	-35.568	-0.618	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-49.041	-49.659	-0.618	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-58.967	-59.121	-0.155	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-63.313	-63.931	-0.618	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-63.766	-64.384	-0.618	(0)
Cr(2)	7.734e-27					
Cr+2	7.734e-27	1.864e-27	-26.112	-26.730	-0.618	(0)
Cr(3)	1.632e-09					
Cr(OH)2+	1.295e-09	9.076e-10	-8.888	-9.042	-0.155	(0)
Cr(OH)3	2.501e-10	2.501e-10	-9.602	-9.602	0.000	(0)
Cr(OH)+2	4.220e-11	1.017e-11	-10.375	-10.993	-0.618	(0)
CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
CrO2-	1.238e-11	8.676e-12	-10.907	-11.062	-0.155	(0)
Cr(OH)4-	1.042e-11	7.304e-12	-10.982	-11.136	-0.155	(0)
CrF+2	4.457e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
CrSO4+	1.880e-14	1.317e-14	-13.726	-13.880	-0.155	(0)
Cr+3	1.557e-14	6.336e-16	-13.808	-15.198	-1.391	(0)
CrCl+2	1.394e-17	3.360e-18	-16.856	-17.474	-0.618	(0)
CrOHC12	1.920e-19	1.920e-19	-18.717	-18.717	0.000	(0)
Cr2(OH)2SO4+2	8.195e-20	1.975e-20	-19.086	-19.704	-0.618	(0)
Cr2(OH)2(SO4)2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
CrCl2+	1.864e-21	1.306e-21	-20.729	-20.884	-0.155	(0)
CrNO3+2	1.824e-24	4.395e-25	-23.739	-24.357	-0.618	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-40.387	-41.005	-0.618	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-48.861	-50.252	-1.391	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-50.919	-51.537	-0.618	(0)
Cr(6)	8.627e-15					
CrO4-2	8.052e-15	3.074e-15	-14.094	-14.512	-0.418	(0)
NaCrO4-	2.689e-16	1.884e-16	-15.570	-15.725	-0.155	(0)
HCrO4-	1.946e-16	1.364e-16	-15.711	-15.865	-0.155	(0)
KCrO4-	1.116e-16	7.820e-17	-15.952	-16.107	-0.155	(0)
CrO3SO4-2	2.107e-23	5.077e-24	-22.676	-23.294	-0.618	(0)
H2CrO4	1.515e-24	1.515e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	6.885e-26	4.824e-26	-25.162	-25.317	-0.155	(0)
Cr2O7-2	2.679e-30	6.456e-31	-29.572	-30.190	-0.618	(0)
Cu(1)	2.480e-09					
CuCl2-	1.149e-09	8.910e-10	-8.940	-9.050	-0.111	(0)
CuCl	1.041e-09	1.041e-09	-8.983	-8.983	0.000	(0)
Cu+	2.880e-10	2.017e-10	-9.541	-9.695	-0.155	(0)
CuCl3-2	2.019e-12	7.805e-13	-11.695	-12.108	-0.413	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-147.021	-147.443	-0.423	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.775	-148.173	-0.399	(0)
Cu(2)	5.095e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	1.001e-07	7.760e-08	-7.000	-7.110	-0.111	(0)
Cu+2	8.762e-08	3.345e-08	-7.057	-7.476	-0.418	(0)
CuSO4	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
Cu(OH)2	1.136e-08	1.136e-08	-7.945	-7.945	0.000	(0)
Cu(CO3)2-2	3.158e-09	7.610e-10	-8.501	-9.119	-0.618	(0)
CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
Cu2(OH)2+2	6.277e-10	1.513e-10	-9.202	-9.820	-0.618	(0)
CuF+	3.222e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
CuCl+	2.802e-10	2.172e-10	-9.553	-9.663	-0.111	(0)
CuNO2+	8.409e-11	5.892e-11	-10.075	-10.230	-0.155	(0)
Cu(OH)3-	2.439e-11	1.709e-11	-10.613	-10.767	-0.155	(0)
CuNH3+2	1.392e-11	3.354e-12	-10.856	-11.474	-0.618	(0)
CuCl2	3.087e-13	3.087e-13	-12.511	-12.511	0.000	(0)

	Cu (NO ₂) ₂	1.014e-14	1.014e-14	-13.994	-13.994	0.000	(0)
	CuNO ₃ +	2.396e-15	1.679e-15	-14.621	-14.775	-0.155	(0)
	Cu (OH) ₄₋₂	4.095e-16	9.867e-17	-15.388	-16.006	-0.618	(0)
	CuCl ₃₋	1.522e-17	1.180e-17	-16.817	-16.928	-0.111	(0)
	CuCl ₄₋₂	6.269e-22	2.424e-22	-21.203	-21.615	-0.413	(0)
	Cu (NO ₃) ₂	3.353e-24	3.353e-24	-23.475	-23.475	0.000	(0)
	Cu (HS) ₃₋	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
F		1.839e-04					
	F-	1.361e-04	1.070e-04	-3.866	-3.971	-0.105	(0)
	MgF+	4.276e-05	3.344e-05	-4.369	-4.476	-0.107	(0)
	CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
	NaF	8.325e-07	8.325e-07	-6.080	-6.080	0.000	(0)
	MnF+	1.358e-07	1.070e-07	-6.867	-6.970	-0.103	(0)
	ZnF+	8.257e-09	5.785e-09	-8.083	-8.238	-0.155	(0)
	BF (OH) ₃₋	3.197e-09	2.404e-09	-8.495	-8.619	-0.124	(0)
	HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
	AlF ₃	4.837e-10	4.837e-10	-9.315	-9.315	0.000	(0)
	AlF ₂ +	4.527e-10	3.592e-10	-9.344	-9.445	-0.101	(0)
	CuF+	3.222e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
	CoF+	4.843e-11	3.393e-11	-10.315	-10.469	-0.155	(0)
	AlF ₄₋	3.315e-11	2.593e-11	-10.479	-10.586	-0.107	(0)
	AlF ₂ +	2.129e-11	8.435e-12	-10.672	-11.074	-0.402	(0)
	CdF+	8.876e-12	6.219e-12	-11.052	-11.206	-0.155	(0)
	NiF+	7.554e-12	5.292e-12	-11.122	-11.276	-0.155	(0)
	UO ₂ F+	7.394e-12	5.180e-12	-11.131	-11.286	-0.155	(0)
	UO ₂ F ₂	1.598e-12	1.598e-12	-11.796	-11.796	0.000	(0)
	PbF+	1.336e-12	9.363e-13	-11.874	-12.029	-0.155	(0)
	HF ₂₋	1.148e-12	8.819e-13	-11.940	-12.055	-0.115	(0)
	BF ₂ (OH) ₂₋	5.018e-13	3.774e-13	-12.299	-12.423	-0.124	(0)
	UO ₂ F ₃₋	6.128e-14	4.294e-14	-13.213	-13.367	-0.155	(0)
	CrF ₂ +	4.457e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
	PbF ₂	1.971e-15	1.971e-15	-14.705	-14.705	0.000	(0)
	CdF ₂	1.327e-15	1.327e-15	-14.877	-14.877	0.000	(0)
	UO ₂ F ₄₋₂	1.514e-16	3.648e-17	-15.820	-16.438	-0.618	(0)
	H ₂ F ₂	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
	VO ₂ F	4.696e-18	4.696e-18	-17.328	-17.328	0.000	(0)
	FeF ₂ +	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
	FeF ₂ +	1.218e-18	4.709e-19	-17.914	-18.327	-0.413	(0)
	PbF ₃₋	5.707e-19	3.998e-19	-18.244	-18.398	-0.155	(0)
	BF ₃ OH-	2.866e-19	2.156e-19	-18.543	-18.666	-0.124	(0)
	VO ₂ F ₂₋	2.603e-19	1.824e-19	-18.585	-18.739	-0.155	(0)
	FeF ₃	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
	VOF+	4.247e-21	2.976e-21	-20.372	-20.526	-0.155	(0)
	VO ₂ F ₃₋₂	1.010e-21	2.433e-22	-20.996	-21.614	-0.618	(0)
	VOF ₂	1.194e-22	1.194e-22	-21.923	-21.923	0.000	(0)
	PbF ₄₋₂	8.495e-23	2.047e-23	-22.071	-22.689	-0.618	(0)
	HgF+	2.158e-23	1.512e-23	-22.666	-22.821	-0.155	(0)
	BF ₄₋	2.071e-24	1.557e-24	-23.684	-23.808	-0.124	(0)
	VOF ₃₋	6.465e-25	4.530e-25	-24.189	-24.344	-0.155	(0)
	VO ₂ F ₄₋₃	3.147e-25	1.281e-26	-24.502	-25.893	-1.391	(0)
	Sb (OH) ₂ F	9.382e-26	9.382e-26	-25.028	-25.028	0.000	(0)
	SbOF	9.238e-26	9.238e-26	-25.034	-25.034	0.000	(0)
	VOF ₄₋₂	8.116e-28	1.956e-28	-27.091	-27.709	-0.618	(0)
	UF ₃ +	2.154e-35	1.509e-35	-34.667	-34.821	-0.155	(0)
	UF ₂ +	3.694e-36	8.901e-37	-35.433	-36.051	-0.618	(0)
	UF ₄	1.770e-37	1.770e-37	-36.752	-36.752	0.000	(0)
	UF ₃	1.625e-38	6.610e-40	-37.789	-39.180	-1.391	(0)
	UF ₅₋	1.071e-39	7.501e-40	-38.970	-39.125	-0.155	(0)
	UF ₆₋₂	1.006e-40	0.000e+00	-39.998	-40.616	-0.618	(0)
Fe (2)		3.395e-12					
	Fe+2	2.208e-12	5.322e-13	-11.656	-12.274	-0.618	(0)
	FeSO ₄	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
	FeOH+	1.971e-14	1.554e-14	-13.705	-13.808	-0.103	(0)
	FeHCO ₃ +	2.933e-15	2.347e-15	-14.533	-14.629	-0.097	(0)
	Fe (OH) ₂	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) ₃₋	2.664e-18	2.101e-18	-17.574	-17.678	-0.103	(0)
	Fe (HS) ₂	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
	Fe (HS) ₃₋	0.000e+00	0.000e+00	-236.429	-236.583	-0.155	(0)

Fe (3)	1.148e-09					
Fe (OH) 2+	6.840e-10	5.427e-10	-9.165	-9.265	-0.101	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.681e-11	2.920e-11	-10.434	-10.535	-0.101	(0)
FeOH+2	4.918e-15	1.902e-15	-14.308	-14.721	-0.413	(0)
FeF2+	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
FeF+2	1.218e-18	4.709e-19	-17.914	-18.327	-0.413	(0)
FeSO4+	5.087e-19	4.012e-19	-18.293	-18.397	-0.103	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
Fe (SO4) 2-	1.090e-19	7.638e-20	-18.963	-19.117	-0.155	(0)
Fe+3	3.504e-20	4.015e-21	-19.455	-20.396	-0.941	(0)
FeCl+2	1.285e-21	4.968e-22	-20.891	-21.304	-0.413	(0)
FeCl2+	1.153e-23	9.094e-24	-22.938	-23.041	-0.103	(0)
FeHSeO3+2	6.538e-24	1.576e-24	-23.185	-23.803	-0.618	(0)
Fe2 (OH) 2+4	3.551e-26	1.197e-28	-25.450	-27.922	-2.472	(0)
FeCl3	3.726e-27	3.726e-27	-26.429	-26.429	0.000	(0)
FeNO3+2	2.644e-27	6.371e-28	-26.578	-27.196	-0.618	(0)
Fe3 (OH) 4+5	6.847e-33	9.393e-37	-32.165	-36.027	-3.863	(0)
H (0)	3.950e-29					
H2	1.975e-29	2.017e-29	-28.704	-28.695	0.009	(0)
Hg (0)	5.336e-09					
Hg	5.336e-09	5.336e-09	-8.273	-8.273	0.000	(0)
Hg (1)	1.146e-19					
Hg2+2	5.732e-20	1.381e-20	-19.242	-19.860	-0.618	(0)
Hg (2)	3.972e-11					
HgClOH	2.024e-11	2.024e-11	-10.694	-10.694	0.000	(0)
Hg (OH) 2	1.268e-11	1.295e-11	-10.897	-10.888	0.009	(0)
HgCl2	6.402e-12	6.402e-12	-11.194	-11.194	0.000	(0)
HgCl3-	3.744e-13	2.623e-13	-12.427	-12.581	-0.155	(0)
HgCl4-2	1.776e-14	4.279e-15	-13.751	-14.369	-0.618	(0)
HgCO3	5.467e-15	5.467e-15	-14.262	-14.262	0.000	(0)
HgCl+	4.449e-16	3.117e-16	-15.352	-15.506	-0.155	(0)
HgOH+	1.589e-16	1.114e-16	-15.799	-15.953	-0.155	(0)
Hg (CO3) 2-2	8.595e-17	2.071e-17	-16.066	-16.684	-0.618	(0)
HgHCO3+	1.992e-18	1.395e-18	-17.701	-17.855	-0.155	(0)
Hg (OH) 3-	1.706e-18	1.196e-18	-17.768	-17.922	-0.155	(0)
Hg (NH3) 2+2	9.583e-19	2.309e-19	-18.018	-18.637	-0.618	(0)
HgNH3+2	9.781e-20	2.357e-20	-19.010	-19.628	-0.618	(0)
Hg+2	1.582e-20	3.813e-21	-19.801	-20.419	-0.618	(0)
HgSO4	8.890e-21	8.890e-21	-20.051	-20.051	0.000	(0)
HgF+	2.158e-23	1.512e-23	-22.666	-22.821	-0.155	(0)
Hg (NH3) 3+2	3.738e-26	9.007e-27	-25.427	-26.045	-0.618	(0)
HgNO3+	3.189e-29	2.234e-29	-28.496	-28.651	-0.155	(0)
Hg (NH3) 4+2	2.909e-33	7.010e-34	-32.536	-33.154	-0.618	(0)
Hg (NO3) 2	1.473e-37	1.473e-37	-36.832	-36.832	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.338	-137.492	-0.155	(0)
HgS2-2	0.000e+00	0.000e+00	-137.719	-138.337	-0.618	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.961	-138.961	0.000	(0)
K	9.254e-03					
K+	8.710e-03	6.847e-03	-2.060	-2.165	-0.105	(0)
KSO4-	5.440e-04	4.317e-04	-3.264	-3.365	-0.101	(0)
KCrO4-	1.116e-16	7.820e-17	-15.952	-16.107	-0.155	(0)
Mg	1.187e-02					
Mg+2	7.298e-03	2.787e-03	-2.137	-2.555	-0.418	(0)
MgSO4	4.516e-03	4.516e-03	-2.345	-2.345	0.000	(0)
MgF+	4.276e-05	3.344e-05	-4.369	-4.476	-0.107	(0)
MgHCO3+	1.288e-05	9.988e-06	-4.890	-5.000	-0.111	(0)
MgCO3	2.777e-06	2.777e-06	-5.556	-5.556	0.000	(0)
MgOH+	1.010e-06	8.138e-07	-5.996	-6.089	-0.094	(0)
MgH2BO3+	3.066e-07	2.306e-07	-6.513	-6.637	-0.124	(0)
Mn (2)	1.447e-04					
Mn+2	1.043e-04	2.514e-05	-3.982	-4.600	-0.618	(0)
MnSO4	3.981e-05	3.981e-05	-4.400	-4.400	0.000	(0)
MnHCO3+	2.228e-07	1.757e-07	-6.652	-6.755	-0.103	(0)
MnCl+	1.644e-07	1.297e-07	-6.784	-6.887	-0.103	(0)
MnF+	1.358e-07	1.070e-07	-6.867	-6.970	-0.103	(0)
MnOH+	5.874e-08	4.632e-08	-7.231	-7.334	-0.103	(0)
MnCl2	7.506e-10	7.506e-10	-9.125	-9.125	0.000	(0)

MnSeO4	1.264e-12	1.264e-12	-11.898	-11.898	0.000	(0)
MnCl3-	1.074e-12	8.471e-13	-11.969	-12.072	-0.103	(0)
MnNO3+	9.023e-13	6.322e-13	-12.045	-12.199	-0.155	(0)
Mn (OH) 3-	1.954e-16	1.540e-16	-15.709	-15.812	-0.103	(0)
Mn (NO3) 2	2.520e-20	2.520e-20	-19.599	-19.599	0.000	(0)
Mn (OH) 4-2	9.436e-22	3.648e-22	-21.025	-21.438	-0.413	(0)
MnSe	0.000e+00	0.000e+00	-40.724	-40.724	0.000	(0)
Mn (3)	7.958e-25					
Mn+3	7.958e-25	9.119e-26	-24.099	-25.040	-0.941	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-40.069	-40.481	-0.413	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.825	-44.944	-0.119	(0)
Mo	5.059e-06					
MoO4-2	5.058e-06	1.931e-06	-5.296	-5.714	-0.418	(0)
HMoO4-	7.518e-10	5.267e-10	-9.124	-9.278	-0.155	(0)
H2MoO4	5.289e-14	5.289e-14	-13.277	-13.277	0.000	(0)
AlMo6O21-3	6.584e-40	0.000e+00	-39.182	-40.572	-1.391	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.349	-49.911	-5.562	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.525	-51.387	-3.863	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.996	-54.468	-2.472	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.695	-59.085	-1.391	(0)
N (-3)	3.516e-07					
NH4+	3.132e-07	2.355e-07	-6.504	-6.628	-0.124	(0)
NH4SO4-	2.850e-08	2.248e-08	-7.545	-7.648	-0.103	(0)
NH3	9.797e-09	9.797e-09	-8.009	-8.009	0.000	(0)
CaNH3+2	1.415e-10	3.409e-11	-9.849	-10.467	-0.618	(0)
CuNH3+2	1.392e-11	3.354e-12	-10.856	-11.474	-0.618	(0)
Co (NH3) +2	4.904e-14	1.182e-14	-13.309	-13.927	-0.618	(0)
NiNH3+2	4.301e-14	1.036e-14	-13.366	-13.984	-0.618	(0)
BaNH3+2	3.016e-16	7.269e-17	-15.521	-16.139	-0.618	(0)
Hg (NH3) 2+2	9.583e-19	2.309e-19	-18.018	-18.637	-0.618	(0)
Ca (NH3) 2+2	5.518e-19	1.330e-19	-18.258	-18.876	-0.618	(0)
HgNH3+2	9.781e-20	2.357e-20	-19.010	-19.628	-0.618	(0)
Ni (NH3) 2+2	6.091e-20	1.468e-20	-19.215	-19.833	-0.618	(0)
Co (NH3) 2+2	2.050e-20	4.939e-21	-19.688	-20.306	-0.618	(0)
Hg (NH3) 3+2	3.738e-26	9.007e-27	-25.427	-26.045	-0.618	(0)
Co (NH3) 3+2	2.528e-27	6.092e-28	-26.597	-27.215	-0.618	(0)
Hg (NH3) 4+2	2.909e-33	7.010e-34	-32.536	-33.154	-0.618	(0)
Co (NH3) 4+2	1.300e-34	3.132e-35	-33.886	-34.504	-0.618	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.387	-41.005	-0.618	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.675	-42.293	-0.618	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.861	-50.252	-1.391	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.041	-49.659	-0.618	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.919	-51.537	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.967	-59.121	-0.155	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.313	-63.931	-0.618	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.766	-64.384	-0.618	(0)
N (3)	2.212e-05					
NO2-	2.212e-05	1.682e-05	-4.655	-4.774	-0.119	(0)
CuNO2+	8.409e-11	5.892e-11	-10.075	-10.230	-0.155	(0)
CoNO2+	1.697e-12	1.189e-12	-11.770	-11.925	-0.155	(0)
Cu (NO2) 2	1.014e-14	1.014e-14	-13.994	-13.994	0.000	(0)
N (5)	2.039e-08					
NO3-	2.019e-08	1.587e-08	-7.695	-7.799	-0.105	(0)
CaNO3+	1.980e-10	1.387e-10	-9.703	-9.858	-0.155	(0)
MnNO3+	9.023e-13	6.322e-13	-12.045	-12.199	-0.155	(0)
ZnNO3+	1.542e-13	1.081e-13	-12.812	-12.966	-0.155	(0)
CuNO3+	2.396e-15	1.679e-15	-14.621	-14.775	-0.155	(0)
BaNO3+	1.335e-15	9.351e-16	-14.875	-15.029	-0.155	(0)
CoNO3+	3.601e-16	2.523e-16	-15.444	-15.598	-0.155	(0)
CdNO3+	2.627e-16	1.841e-16	-15.580	-15.735	-0.155	(0)
NiNO3+	1.121e-16	7.851e-17	-15.951	-16.105	-0.155	(0)
PbNO3+	4.161e-17	2.915e-17	-16.381	-16.535	-0.155	(0)
Mn (NO3) 2	2.520e-20	2.520e-20	-19.599	-19.599	0.000	(0)
UO2NO3+	1.585e-20	1.111e-20	-19.800	-19.954	-0.155	(0)
Zn (NO3) 2	3.421e-22	3.421e-22	-21.466	-21.466	0.000	(0)
Co (NO3) 2	8.147e-24	8.147e-24	-23.089	-23.089	0.000	(0)

	Cu (NO3) 2	3.353e-24	3.353e-24	-23.475	-23.475	0.000	(0)
	CrNO3+2	1.824e-24	4.395e-25	-23.739	-24.357	-0.618	(0)
	Cd (NO3) 2	1.464e-24	1.464e-24	-23.834	-23.834	0.000	(0)
	Pb (NO3) 2	7.857e-25	7.857e-25	-24.105	-24.105	0.000	(0)
	VO2NO3	2.009e-25	2.009e-25	-24.697	-24.697	0.000	(0)
	FeNO3+2	2.644e-27	6.371e-28	-26.578	-27.196	-0.618	(0)
	HgNO3+	3.189e-29	2.234e-29	-28.496	-28.651	-0.155	(0)
	Hg (NO3) 2	1.473e-37	1.473e-37	-36.832	-36.832	0.000	(0)
Na		1.644e-02					
	Na+	1.569e-02	1.233e-02	-1.804	-1.909	-0.105	(0)
	NaSO4-	7.435e-04	5.899e-04	-3.129	-3.229	-0.101	(0)
	NaHCO3	2.430e-06	2.430e-06	-5.614	-5.614	0.000	(0)
	NaF	8.325e-07	8.325e-07	-6.080	-6.080	0.000	(0)
	NaCO3-	3.468e-07	2.752e-07	-6.460	-6.560	-0.101	(0)
	NaH2BO3	4.666e-08	4.666e-08	-7.331	-7.331	0.000	(0)
	NaCrO4-	2.689e-16	1.884e-16	-15.570	-15.725	-0.155	(0)
Ni		8.937e-09					
	Ni+2	5.159e-09	1.970e-09	-8.287	-8.706	-0.418	(0)
	NiSO4	3.500e-09	3.500e-09	-8.456	-8.456	0.000	(0)
	NiHCO3+	1.214e-10	8.507e-11	-9.916	-10.070	-0.155	(0)
	NiCO3	8.804e-11	8.804e-11	-10.055	-10.055	0.000	(0)
	NiCl+	2.947e-11	2.065e-11	-10.531	-10.685	-0.155	(0)
	NiOH+	2.596e-11	1.819e-11	-10.586	-10.740	-0.155	(0)
	NiF+	7.554e-12	5.292e-12	-11.122	-11.276	-0.155	(0)
	Ni (SO4) 2-2	4.283e-12	1.032e-12	-11.368	-11.986	-0.618	(0)
	Ni (OH) 2	1.060e-12	1.060e-12	-11.975	-11.975	0.000	(0)
	NiNH3+2	4.301e-14	1.036e-14	-13.366	-13.984	-0.618	(0)
	Ni (OH) 3-	1.110e-15	7.776e-16	-14.955	-15.109	-0.155	(0)
	NiCl2	4.261e-16	4.261e-16	-15.371	-15.371	0.000	(0)
	NiSeO4	1.722e-16	1.722e-16	-15.764	-15.764	0.000	(0)
	NiNO3+	1.121e-16	7.851e-17	-15.951	-16.105	-0.155	(0)
	Ni (NH3) 2+2	6.091e-20	1.468e-20	-19.215	-19.833	-0.618	(0)
O (0)		2.433e-35					
	O2	1.217e-35	1.243e-35	-34.915	-34.906	0.009	(0)
Pb		1.847e-09					
	PbSO4	5.418e-10	5.418e-10	-9.266	-9.266	0.000	(0)
	PbCO3	4.473e-10	4.473e-10	-9.349	-9.349	0.000	(0)
	PbOH+	3.267e-10	2.289e-10	-9.486	-9.640	-0.155	(0)
	Pb+2	3.253e-10	1.242e-10	-9.488	-9.906	-0.418	(0)
	Pb (SO4) 2-2	1.206e-10	2.907e-11	-9.918	-10.537	-0.618	(0)
	PbHCO3+	4.614e-11	3.233e-11	-10.336	-10.490	-0.155	(0)
	PbCl+	2.578e-11	1.806e-11	-10.589	-10.743	-0.155	(0)
	Pb (CO3) 2-2	6.414e-12	1.546e-12	-11.193	-11.811	-0.618	(0)
	Pb (OH) 2	5.309e-12	5.309e-12	-11.275	-11.275	0.000	(0)
	PbF+	1.336e-12	9.363e-13	-11.874	-12.029	-0.155	(0)
	PbCl2	3.305e-13	3.305e-13	-12.481	-12.481	0.000	(0)
	Pb (OH) 3-	5.559e-15	3.895e-15	-14.255	-14.410	-0.155	(0)
	PbF2	1.971e-15	1.971e-15	-14.705	-14.705	0.000	(0)
	PbCl3-	7.696e-16	5.392e-16	-15.114	-15.268	-0.155	(0)
	PbNO3+	4.161e-17	2.915e-17	-16.381	-16.535	-0.155	(0)
	Pb2OH+3	1.108e-17	4.506e-19	-16.956	-18.346	-1.391	(0)
	PbCl4-2	4.191e-18	1.010e-18	-17.378	-17.996	-0.618	(0)
	Pb (OH) 4-2	2.904e-18	6.997e-19	-17.537	-18.155	-0.618	(0)
	PbF3-	5.707e-19	3.998e-19	-18.244	-18.398	-0.155	(0)
	Pb3 (OH) 4+2	2.899e-22	6.987e-23	-21.538	-22.156	-0.618	(0)
	PbF4-2	8.495e-23	2.047e-23	-22.071	-22.689	-0.618	(0)
	Pb (NO3) 2	7.857e-25	7.857e-25	-24.105	-24.105	0.000	(0)
	Pb4 (OH) 4+4	2.044e-26	6.894e-29	-25.689	-28.162	-2.472	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.500	-151.500	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.478	-228.632	-0.155	(0)
S (-2)		0.000e+00					
	HS-	0.000e+00	0.000e+00	-78.278	-78.432	-0.155	(0)
	CdHS+	0.000e+00	0.000e+00	-78.705	-78.860	-0.155	(0)
	H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.316	-79.934	-0.618	(0)
	S6-2	0.000e+00	0.000e+00	-79.832	-80.450	-0.618	(0)
	S4-2	0.000e+00	0.000e+00	-79.912	-80.530	-0.618	(0)
	S3-2	0.000e+00	0.000e+00	-80.718	-81.336	-0.618	(0)

S2-2	0.000e+00	0.000e+00	-81.734	-82.352	-0.618	(0)
S-2	0.000e+00	0.000e+00	-87.456	-87.869	-0.413	(0)
HgHS2-	0.000e+00	0.000e+00	-137.338	-137.492	-0.155	(0)
HgS2-2	0.000e+00	0.000e+00	-137.719	-138.337	-0.618	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.961	-138.961	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.021	-147.443	-0.423	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.604	-147.758	-0.155	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.775	-148.173	-0.399	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.611	-149.611	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.088	-150.088	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.500	-151.500	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.609	-224.763	-0.155	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.262	-226.880	-0.618	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.466	-226.620	-0.155	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.478	-228.632	-0.155	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.429	-236.583	-0.155	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.238	-302.856	-0.618	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.038	-304.656	-0.618	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.221	-318.839	-0.618	(0)
S (6)	3.482e-02					
SO4-2	2.332e-02	8.905e-03	-1.632	-2.050	-0.418	(0)
CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
MgSO4	4.516e-03	4.516e-03	-2.345	-2.345	0.000	(0)
NaSO4-	7.435e-04	5.899e-04	-3.129	-3.229	-0.101	(0)
KSO4-	5.440e-04	4.317e-04	-3.264	-3.365	-0.101	(0)
MnSO4	3.981e-05	3.981e-05	-4.400	-4.400	0.000	(0)
ZnSO4	5.281e-06	5.281e-06	-5.277	-5.277	0.000	(0)
Zn (SO4) 2-2	1.700e-06	4.096e-07	-5.770	-6.388	-0.618	(0)
CuSO4	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
NH4SO4-	2.850e-08	2.248e-08	-7.545	-7.648	-0.103	(0)
CoSO4	1.783e-08	1.783e-08	-7.749	-7.749	0.000	(0)
HSO4-	1.525e-08	1.193e-08	-7.817	-7.923	-0.107	(0)
CdSO4	7.658e-09	7.658e-09	-8.116	-8.116	0.000	(0)
Cd (SO4) 2-2	3.818e-09	9.200e-10	-8.418	-9.036	-0.618	(0)
NiSO4	3.500e-09	3.500e-09	-8.456	-8.456	0.000	(0)
PbSO4	5.418e-10	5.418e-10	-9.266	-9.266	0.000	(0)
Pb (SO4) 2-2	1.206e-10	2.907e-11	-9.918	-10.537	-0.618	(0)
CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
UO2SO4	4.729e-12	4.729e-12	-11.325	-11.325	0.000	(0)
Ni (SO4) 2-2	4.283e-12	1.032e-12	-11.368	-11.986	-0.618	(0)
UO2 (SO4) 2-2	2.304e-12	5.552e-13	-11.638	-12.256	-0.618	(0)
FeSO4	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.263	-0.107	(0)
Al (SO4) 2-	6.651e-14	5.202e-14	-13.177	-13.284	-0.107	(0)
CrSO4+	1.880e-14	1.317e-14	-13.726	-13.880	-0.155	(0)
VO2SO4-	7.596e-18	5.322e-18	-17.119	-17.274	-0.155	(0)
FeSO4+	5.087e-19	4.012e-19	-18.293	-18.397	-0.103	(0)
Fe (SO4) 2-	1.090e-19	7.638e-20	-18.963	-19.117	-0.155	(0)
Cr2 (OH) 2SO4+2	8.195e-20	1.975e-20	-19.086	-19.704	-0.618	(0)
VOSO4	1.138e-20	1.138e-20	-19.944	-19.944	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
HgSO4	8.890e-21	8.890e-21	-20.051	-20.051	0.000	(0)
CrO3SO4-2	2.107e-23	5.077e-24	-22.676	-23.294	-0.618	(0)
VSO4+	3.202e-35	2.244e-35	-34.495	-34.649	-0.155	(0)
U (SO4) 2	7.767e-39	7.767e-39	-38.110	-38.110	0.000	(0)
USO4+2	4.557e-40	1.098e-40	-39.341	-39.959	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.967	-59.121	-0.155	(0)
Sb (3)	8.090e-20					
Sb (OH) 3	4.091e-20	4.091e-20	-19.388	-19.388	0.000	(0)
HSbO2	3.998e-20	3.998e-20	-19.398	-19.398	0.000	(0)
SbO2-	6.742e-24	4.724e-24	-23.171	-23.326	-0.155	(0)
Sb (OH) 4-	3.853e-24	2.700e-24	-23.414	-23.569	-0.155	(0)
Sb (OH) 2F	9.382e-26	9.382e-26	-25.028	-25.028	0.000	(0)
SbOF	9.238e-26	9.238e-26	-25.034	-25.034	0.000	(0)
Sb (OH) 2+	1.946e-26	1.363e-26	-25.711	-25.865	-0.155	(0)
SbO+	6.718e-27	4.707e-27	-26.173	-26.327	-0.155	(0)

Sb2S4-2	0.000e+00	0.000e+00	-318.221	-318.839	-0.618	(0)
Sb (5)	6.266e-08					
SbO3-	6.259e-08	4.385e-08	-7.203	-7.358	-0.155	(0)
Sb (OH) 6-	6.500e-11	5.109e-11	-10.187	-10.292	-0.105	(0)
SbO2+	3.378e-24	2.367e-24	-23.471	-23.626	-0.155	(0)
Se (-2)	3.566e-39					
HSe-	3.566e-39	2.498e-39	-38.448	-38.602	-0.155	(0)
MnSe	0.000e+00	0.000e+00	-40.724	-40.724	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.575	-42.575	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.121	-45.739	-0.618	(0)
Se (4)	3.910e-07					
HSeO3-	2.120e-07	1.485e-07	-6.674	-6.828	-0.155	(0)
SeO3-2	1.790e-07	4.313e-08	-6.747	-7.365	-0.618	(0)
H2SeO3	8.684e-13	8.684e-13	-12.061	-12.061	0.000	(0)
Cd (SeO3) 2-2	2.334e-17	5.624e-18	-16.632	-17.250	-0.618	(0)
FeHSeO3+2	6.538e-24	1.576e-24	-23.185	-23.803	-0.618	(0)
Se (6)	4.907e-10					
SeO4-2	4.894e-10	1.868e-10	-9.310	-9.729	-0.418	(0)
MnSeO4	1.264e-12	1.264e-12	-11.898	-11.898	0.000	(0)
ZnSeO4	7.845e-14	7.845e-14	-13.105	-13.105	0.000	(0)
CoSeO4	9.395e-16	9.395e-16	-15.027	-15.027	0.000	(0)
HSeO4-	1.832e-16	1.284e-16	-15.737	-15.892	-0.155	(0)
NiSeO4	1.722e-16	1.722e-16	-15.764	-15.764	0.000	(0)
CdSeO4	1.276e-16	1.276e-16	-15.894	-15.894	0.000	(0)
Zn (SeO4) 2-2	6.168e-23	1.486e-23	-22.210	-22.828	-0.618	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.824	-58.215	-1.391	(0)
U (4)	6.884e-19					
U (OH) 5-	6.881e-19	4.821e-19	-18.162	-18.317	-0.155	(0)
U (OH) 4	2.772e-22	2.772e-22	-21.557	-21.557	0.000	(0)
U (OH) 3+	1.985e-26	1.391e-26	-25.702	-25.857	-0.155	(0)
U (OH) 2+2	3.663e-31	8.828e-32	-30.436	-31.054	-0.618	(0)
UF3+	2.154e-35	1.509e-35	-34.667	-34.821	-0.155	(0)
UF2+2	3.694e-36	8.901e-37	-35.433	-36.051	-0.618	(0)
UOH+3	1.403e-36	5.707e-38	-35.853	-37.244	-1.391	(0)
UF4	1.770e-37	1.770e-37	-36.752	-36.752	0.000	(0)
UF+3	1.625e-38	6.610e-40	-37.789	-39.180	-1.391	(0)
U (SO4) 2	7.767e-39	7.767e-39	-38.110	-38.110	0.000	(0)
UF5-	1.071e-39	7.501e-40	-38.970	-39.125	-0.155	(0)
USO4+2	4.557e-40	1.098e-40	-39.341	-39.959	-0.618	(0)
UF6-2	1.006e-40	0.000e+00	-39.998	-40.616	-0.618	(0)
U+4	0.000e+00	0.000e+00	-42.037	-44.509	-2.472	(0)
UC1+3	0.000e+00	0.000e+00	-43.806	-45.197	-1.391	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-153.758	-166.273	-12.515	(0)
U (5)	3.759e-15					
UO2+	3.759e-15	2.633e-15	-14.425	-14.579	-0.155	(0)
U (6)	8.800e-07					
UO2 (CO3) 3-4	7.123e-07	2.402e-09	-6.147	-8.619	-2.472	(0)
UO2 (CO3) 2-2	1.660e-07	4.000e-08	-6.780	-7.398	-0.618	(0)
UO2CO3	1.673e-09	1.673e-09	-8.776	-8.776	0.000	(0)
UO2OH+	4.625e-11	3.240e-11	-10.335	-10.489	-0.155	(0)
UO2F+	7.394e-12	5.180e-12	-11.131	-11.286	-0.155	(0)
UO2SO4	4.729e-12	4.729e-12	-11.325	-11.325	0.000	(0)
UO2 (SO4) 2-2	2.304e-12	5.552e-13	-11.638	-12.256	-0.618	(0)
UO2F2	1.598e-12	1.598e-12	-11.796	-11.796	0.000	(0)
UO2+2	9.190e-13	3.509e-13	-12.037	-12.455	-0.418	(0)
UO2F3-	6.128e-14	4.294e-14	-13.213	-13.367	-0.155	(0)
(UO2) 3 (OH) 5+	3.289e-14	2.305e-14	-13.483	-13.637	-0.155	(0)
(UO2) 2 (OH) 2+2	7.230e-15	1.742e-15	-14.141	-14.759	-0.618	(0)
UO2C1+	3.328e-15	2.332e-15	-14.478	-14.632	-0.155	(0)
UO2F4-2	1.514e-16	3.648e-17	-15.820	-16.438	-0.618	(0)
UO2NO3+	1.585e-20	1.111e-20	-19.800	-19.954	-0.155	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.962	-43.117	-0.155	(0)
V+2	0.000e+00	0.000e+00	-43.874	-44.492	-0.618	(0)
V (3)	1.699e-15					
V (OH) 3	1.699e-15	1.699e-15	-14.770	-14.770	0.000	(0)
V (OH) 2+	2.151e-26	1.507e-26	-25.667	-25.822	-0.155	(0)

VOH+2	8.142e-30	1.962e-30	-29.089	-29.707	-0.618	(0)
V+3	1.312e-34	5.337e-36	-33.882	-35.273	-1.391	(0)
VSO4+	3.202e-35	2.244e-35	-34.495	-34.649	-0.155	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.687	-57.077	-1.391	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-56.142	-58.615	-2.472	(0)
V (4)	1.003e-18					
V (OH) 3+	9.677e-19	6.780e-19	-18.014	-18.169	-0.155	(0)
VO+2	1.925e-20	4.638e-21	-19.716	-20.334	-0.618	(0)
VOSO4	1.138e-20	1.138e-20	-19.944	-19.944	0.000	(0)
VOF+	4.247e-21	2.976e-21	-20.372	-20.526	-0.155	(0)
VOF2	1.194e-22	1.194e-22	-21.923	-21.923	0.000	(0)
VOC1+	7.610e-23	5.332e-23	-22.119	-22.273	-0.155	(0)
VOF3-	6.465e-25	4.530e-25	-24.189	-24.344	-0.155	(0)
VOF4-2	8.116e-28	1.956e-28	-27.091	-27.709	-0.618	(0)
H2V2O4+2	9.586e-32	2.310e-32	-31.018	-31.636	-0.618	(0)
V (5)	1.457e-08					
H2VO4-	9.502e-09	6.658e-09	-8.022	-8.177	-0.155	(0)
HVO4-2	5.063e-09	1.220e-09	-8.296	-8.914	-0.618	(0)
H3VO4	9.126e-13	9.126e-13	-12.040	-12.040	0.000	(0)
HV2O7-3	6.774e-14	2.756e-15	-13.169	-14.560	-1.391	(0)
H3V2O7-	5.607e-14	3.928e-14	-13.251	-13.406	-0.155	(0)
VO4-3	1.096e-14	4.461e-16	-13.960	-15.351	-1.391	(0)
V2O7-4	1.605e-15	5.411e-18	-14.795	-17.267	-2.472	(0)
VO2+	3.184e-17	2.503e-17	-16.497	-16.602	-0.105	(0)
V3O9-3	7.626e-18	3.103e-19	-17.118	-18.508	-1.391	(0)
VO2SO4-	7.596e-18	5.322e-18	-17.119	-17.274	-0.155	(0)
VO2F	4.696e-18	4.696e-18	-17.328	-17.328	0.000	(0)
VO2F2-	2.603e-19	1.824e-19	-18.585	-18.739	-0.155	(0)
VO2F3-2	1.010e-21	2.433e-22	-20.996	-21.614	-0.618	(0)
V4O12-4	2.557e-22	8.623e-25	-21.592	-24.064	-2.472	(0)
VO2F4-3	3.147e-25	1.281e-26	-24.502	-25.893	-1.391	(0)
VO2NO3	2.009e-25	2.009e-25	-24.697	-24.697	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-58.744	-64.306	-5.562	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.120	-63.982	-3.863	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.166	-66.638	-2.472	(0)
Zn	1.469e-05					
Zn+2	7.100e-06	2.711e-06	-5.149	-5.567	-0.418	(0)
ZnSO4	5.281e-06	5.281e-06	-5.277	-5.277	0.000	(0)
Zn (SO4) 2-2	1.700e-06	4.096e-07	-5.770	-6.388	-0.618	(0)
ZnOH+	2.838e-07	1.989e-07	-6.547	-6.701	-0.155	(0)
ZnCO3	1.869e-07	1.869e-07	-6.728	-6.728	0.000	(0)
ZnHCO3+	4.286e-08	3.003e-08	-7.368	-7.522	-0.155	(0)
ZnCl+	3.599e-08	2.790e-08	-7.444	-7.554	-0.111	(0)
ZnOHC1	2.680e-08	2.680e-08	-7.572	-7.572	0.000	(0)
Zn (OH) 2	2.312e-08	2.312e-08	-7.636	-7.636	0.000	(0)
ZnF+	8.257e-09	5.785e-09	-8.083	-8.238	-0.155	(0)
ZnCl2	1.812e-10	1.812e-10	-9.742	-9.742	0.000	(0)
Zn (OH) 3-	1.213e-10	8.500e-11	-9.916	-10.071	-0.155	(0)
ZnCl3-	7.607e-13	5.898e-13	-12.119	-12.229	-0.111	(0)
ZnNO3+	1.542e-13	1.081e-13	-12.812	-12.966	-0.155	(0)
ZnSeO4	7.845e-14	7.845e-14	-13.105	-13.105	0.000	(0)
Zn (OH) 4-2	1.030e-14	2.482e-15	-13.987	-14.605	-0.618	(0)
ZnCl4-2	3.125e-15	1.208e-15	-14.505	-14.918	-0.413	(0)
Zn (NO3) 2	3.421e-22	3.421e-22	-21.466	-21.466	0.000	(0)
Zn (SeO4) 2-2	6.168e-23	1.486e-23	-22.210	-22.828	-0.618	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.604	-147.758	-0.155	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.611	-149.611	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.609	-224.763	-0.155	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.262	-226.880	-0.618	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.038	-304.656	-0.618	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-53.59	-47.30	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-40.99	-36.48	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.21	-36.48	11.74	(Co (NH3) 5OH2) Cl3

(Co(NH3)6)(NO3)3	-69.41	-51.48	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.27	-35.24	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.17	-27.77	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.43	-22.98	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.32	9.48	10.80	Al(OH)3
Al2(MoO4)3	-47.72	-45.35	2.37	Al2(MoO4)3
Al2O3	-0.68	18.97	19.65	Al2O3
Al4(OH)10SO4	-2.54	20.16	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.47	-6.67	4.80	AlAsO4:2H2O
AlOHSO4	-5.06	-8.29	-3.23	AlOHSO4
AlSb	-152.16	-86.54	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.17	-11.96	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.43	-91.19	-2.76	As4O6
Artinite	-4.91	4.69	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.01	-32.30	6.71	As2O5
Atacamite	-1.14	6.25	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.60	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.76	-1.89	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.01	-8.92	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-27.03	5.91	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.68	-13.64	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.72	-6.89	1.83	BaSeO3
BaSeO4	-10.20	-17.66	-7.46	BaSeO4
Bianchite	-5.86	-7.62	-1.76	ZnSO4:6H2O
Birnessite	-6.77	11.32	18.09	MnO2
Bixbyite	-2.26	-2.90	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.91	9.48	8.58	AlOOH
Breithauptite	-57.71	-76.23	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.67	13.17	16.84	Mg(OH)2
Bunsenite	-5.43	7.02	12.45	NiO
Ca(VO3)2	-9.97	-4.31	5.66	Ca(VO3)2
Ca2V2O7	-8.64	8.86	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.70	8.86	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.11	7.19	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.94	22.02	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.84	22.02	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.52	-152.54	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-6.72	-24.63	-17.91	Hg2Cl2
CaMoO4	-0.32	-8.27	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.34	-1.52	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.27	-12.29	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.05	-1.21	9.84	Cd(BO2)2
Cd(OH)2	-6.35	7.29	13.64	Cd(OH)2
Cd(OH)2(am)	-6.44	7.29	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.39	-13.68	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.47	4.09	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.02	11.38	28.40	Cd4(OH)6SO4
CdCl2	-12.55	-13.21	-0.66	CdCl2
CdCl2:1H2O	-11.52	-13.21	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.30	-13.21	-1.91	CdCl2:2.5H2O
CdF2	-15.16	-16.38	-1.21	CdF2
Cdmetal(alpha)	-31.77	-18.25	13.51	Cd

Cdmetal (gamma)	-31.87	-18.25	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.50	-2.96	3.54	CdOHCl
CdSb	-75.61	-75.96	-0.35	CdSb
CdSe	-18.97	-39.17	-20.20	CdSe
CdSeO4:2H2O	-16.32	-18.17	-1.85	CdSeO4:2H2O
CdSO4	-10.31	-10.49	-0.17	CdSO4
CdSO4:1H2O	-8.76	-10.49	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.61	-10.49	-1.87	CdSO4:2.67H2O
Cerrusite	-2.70	-15.83	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.49	-97.18	-45.69	HgS
Claudetite	-88.13	-91.19	-3.06	As4O6
Clausthalite	-13.55	-40.65	-27.10	PbSe
Co (BO2) 2	-27.84	-0.77	27.07	Co (BO2) 2
Co (OH) 2	-5.37	7.73	13.09	Co (OH) 2
Co (OH) 3	-9.59	-11.90	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-22.16	-9.12	13.03	Co3 (AsO4) 2
Co3O4	-5.58	-16.07	-10.50	Co3O4
CoCl2	-21.04	-12.77	8.27	CoCl2
CoCl2:6H2O	-15.31	-12.78	2.54	CoCl2:6H2O
CoCO3	-3.94	-13.92	-9.98	CoCO3
CoF2	-14.34	-15.94	-1.60	CoF2
CoF3	-45.94	-47.40	-1.46	CoF3
CoFe2O4	17.64	14.11	-3.53	CoFe2O4
CoMoO4	-5.95	-13.71	-7.76	CoMoO4
CoO	-5.86	7.73	13.59	CoO
CoS (alpha)	-71.13	-78.57	-7.44	CoS
CoS (beta)	-67.50	-78.57	-11.07	CoS
CoSe	-22.54	-38.74	-16.20	CoSe
CoSeO3	-8.28	-6.96	1.32	CoSeO3
CoSeO4:6H2O	-16.20	-17.73	-1.53	CoSeO4:6H2O
CoSO4	-12.85	-10.05	2.80	CoSO4
CoSO4:6H2O	-7.58	-10.05	-2.47	CoSO4:6H2O
Cotunnite	-9.90	-14.68	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.60	-31.50	14.09	CrCl2
CrCl3	-47.04	-31.93	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.81	-43.65	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.65	20.56	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.41	0.84	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.72	-89.61	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.33	-50.13	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.66	-7.56	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-24.85	-88.34	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.11	-13.19	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4

Cuprite	-2.26	-3.66	-1.41	Cu ₂ O
Cuprousferrite	10.28	1.36	-8.92	CuFeO ₂
CuSe	-5.11	-38.21	-33.10	CuSe
CuSe ₂	-25.77	-59.13	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-6.95	-6.44	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-14.77	-17.21	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.47	-9.53	2.94	CuSO ₄
Diaspore	2.61	9.48	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite (disordered)	-0.42	-16.96	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	0.13	-16.96	-17.09	CaMg (CO ₃) ₂
Epsomite	-2.48	-4.61	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-10.11	3.45	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl _{1.3}	3.16	0.12	-3.04	Fe (OH) ₂ ·7Cl _{1.3}
Fe (VO ₃) ₂	-10.31	-14.03	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.86	-8.31	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-17.06	-37.69	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-43.21	-46.94	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-13.36	-12.96	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.11	1.09	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.90	-17.99	-10.09	FeMoO ₄
Ferrihydrite	0.00	3.19	3.19	Fe (OH) ₃
Ferroselite	-45.34	-63.93	-18.60	FeSe ₂
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-32.01	-43.01	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF ₂
Galena	-66.50	-80.47	-13.97	PbS
Gibbsite	1.19	9.48	8.29	Al (OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.61	-7.62	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-64.64	-79.00	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe ₃ S ₄
Gummite	-4.40	3.27	7.67	UO ₃
Gypsum	0.00	-4.61	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-13.88	-25.98	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.56	-21.44	-12.88	H ₂ MoO ₄
H ₂ S (g)	-78.29	-86.30	-8.01	H ₂ S
H ₂ Se (g)	-41.51	-46.47	-4.96	H ₂ Se
Halite	-5.90	-4.30	1.60	NaCl
Hausmannite	-2.11	58.92	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-0.47	22.42	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-184.83	-258.54	-73.71	Hg (CH ₃) ₂
Hg (g)	-6.97	-14.84	-7.87	Hg
Hg (OH) ₂	-7.39	-10.89	-3.50	Hg (OH) ₂
Hg ₂ (g)	-14.72	-29.68	-14.96	Hg ₂
Hg ₂ (OH) ₂	-9.40	-4.13	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-9.73	-25.78	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-25.67	-34.37	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-17.44	-27.80	-10.36	Hg ₂ F ₂
Hg ₂ S	-78.75	-90.43	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-14.17	-18.82	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-15.78	-21.91	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-24.63	-54.31	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-31.81	-12.32	19.50	HgCl
HgCl ₂	-10.13	-31.39	-21.26	HgCl ₂
HgF (g)	-46.58	-13.90	32.68	HgF
HgF ₂ (g)	-47.12	-34.55	12.57	HgF ₂
Hgmetal (l)	-1.39	-14.84	-13.45	Hg
HgSe	-1.66	-57.35	-55.69	HgSe
HgSeO ₃	-13.15	-25.58	-12.43	HgSeO ₃
HgSO ₄	-19.24	-28.66	-9.42	HgSO ₄
Huntite	-3.94	-33.91	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-7.07	-25.84	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-11.97	-20.74	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.21	-20.38	-5.17	KAl (SO ₄) ₂ ·12H ₂ O

K-Jarosite	-5.48	-20.28	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-31.84	-49.08	-17.24	K2Cr2O7
K2CrO4	-18.33	-18.84	-0.51	K2CrO4
K2MoO4	-13.31	-10.04	3.26	K2MoO4
K2SeO4	-13.33	-14.06	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.70	-6.14	-0.43	PbO:PbSO4
Laurionite	-5.05	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.87	5.82	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.69	19.55	16.86	Fe2MgO4
Magnesite	-1.02	-8.48	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2(OH)2CO3
Manganite	-1.44	23.90	25.34	MnOOH
Massicot	-7.07	5.82	12.89	PbO
Matlockite	-7.29	-16.26	-8.97	PbClF
Melanothallite	-18.51	-12.25	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-52.09	-97.18	-45.09	HgS
Mg(OH)2(active)	-5.62	13.17	18.79	Mg(OH)2
Mg(VO3)2	-15.59	-4.31	11.28	Mg(VO3)2
Mg2Sb3	-272.55	-197.86	74.68	Mg2Sb3
Mg2V2O7	-17.50	8.86	26.36	Mg2V2O7
MgCr2O4	-5.39	10.81	16.20	MgCr2O4
MgCrO4	-22.45	-17.07	5.38	MgCrO4
MgF2	-2.37	-10.50	-8.13	MgF2
MgMoO4	-6.42	-8.27	-1.85	MgMoO4
MgSeO3:6H2O	-4.58	-1.52	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.09	-12.29	-1.20	MgSeO4:6H2O
Minium	-30.52	43.00	73.52	Pb3O4
Mirabilite	-4.76	-5.87	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.25	-6.35	4.90	Mn(VO3)2
Mn2(SO4)3	-50.52	-56.23	-5.71	Mn2(SO4)3
Mn2Sb	-147.62	-86.54	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.43	1.07	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.09	-9.38	2.72	MnCl2:4H2O
MnS(grn)	-75.34	-75.17	0.17	MnS
MnS(pnk)	-78.51	-75.17	3.34	MnS
MnSb	-94.56	-97.47	-2.91	MnSb
MnSe	-38.84	-35.34	3.50	MnSe
MnSeO3	-4.69	-3.56	1.13	MnSeO3
MnSeO3:2H2O	-4.55	-3.57	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.28	-14.33	-2.05	MnSeO4:5H2O
MnSO4	-9.23	-6.65	2.58	MnSO4
Monteponite	-7.81	7.29	15.10	CdO
Montroydite	-7.25	-10.89	-3.64	HgO
MoO3	-13.44	-21.44	-8.00	MoO3
Morenosite	-8.62	-10.76	-2.14	NiSO4:7H2O
MoS2	-149.31	-219.57	-70.26	MoS2
Na-Jarosite	-8.82	-20.02	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.67	-48.57	-9.90	Na2Cr2O7
Na2CrO4	-21.26	-18.33	2.93	Na2CrO4
Na2Mo2O7	-14.37	-30.97	-16.60	Na2Mo2O7
Na2MoO4	-11.02	-9.53	1.49	Na2MoO4
Na2MoO4:2H2O	-10.76	-9.53	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.09	-2.79	10.30	Na2SeO3:5H2O
Na2SeO4	-14.83	-13.55	1.28	Na2SeO4
Na3Sb	-172.61	-78.16	94.45	Na3Sb
Na3VO4	-27.56	9.12	36.68	Na3VO4
Na4V2O7	-31.06	6.34	37.40	Na4V2O7
Nantokite	-5.35	-12.08	-6.73	CuCl
NaSb	-87.69	-64.52	23.17	NaSb
Natron	-8.43	-9.75	-1.31	Na2CO3:10H2O
NaVO3	-6.64	-2.78	3.86	NaVO3

Nesquehonite	-3.81	-8.48	-4.67	MgCO3:3H2O
Ni(OH)2	-5.77	7.02	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-26.95	-11.25	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.70	10.30	32.00	Ni4(OH)6SO4
NiCO3	-7.76	-14.63	-6.87	NiCO3
NiMoO4	-3.28	-14.42	-11.14	NiMoO4
NiS(alpha)	-73.67	-79.27	-5.60	NiS
NiS(beta)	-68.17	-79.27	-11.10	NiS
NiS(gamma)	-66.47	-79.27	-12.80	NiS
NiSe	-21.74	-39.44	-17.70	NiSe
NiSeO3:2H2O	-10.49	-7.67	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.92	-18.44	-1.52	NiSeO4:6H2O
Nsutite	-6.18	11.32	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.48	-61.07	As2S3
Otavite	-2.36	-14.36	-12.00	CdCO3
Pb(BO2)2	-9.20	-2.68	6.52	Pb(BO2)2
Pb(OH)2	-2.33	5.82	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.93	-71.69	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.40	1.39	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.55	11.64	26.19	Pb2O(OH)2
Pb2O3	-23.86	37.18	61.04	Pb2O3
Pb2OCO3	-9.45	-10.01	-0.56	Pb2OCO3
Pb2V2O7	-3.94	-5.84	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.64	-14.84	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.16	-0.02	6.14	Pb3(VO4)2
Pb3O2CO3	-15.21	-4.19	11.02	Pb3O2CO3
Pb3O2SO4	-11.00	-0.32	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.60	5.50	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.37	5.50	21.88	Pb4O3SO4
PbCrO4	-11.82	-24.42	-12.60	PbCrO4
PbF2	-10.41	-17.85	-7.44	PbF2
Pbmetal	-23.97	-19.73	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.16	5.82	12.98	PbO:0.33H2O
PbSeO4	-12.79	-19.63	-6.84	PbSeO4
Periclase	-8.41	13.17	21.58	MgO
Phosgenite	-10.70	-30.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.24	31.36	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-4.07	11.13	15.19	Mn(OH)2
Pyrolusite	-4.71	36.67	41.38	MnO2
Realgar	-102.12	-121.87	-19.75	AsS
Retgersite	-8.72	-10.76	-2.04	NiSO4:6H2O
Rhodochrosite	0.06	-10.52	-10.58	MnCO3
Rutherfordine	-3.88	-18.38	-14.50	UO2CO3
Sb(OH)3	-12.28	-19.39	-7.11	Sb(OH)3
Sb2O4	-16.63	-13.23	3.40	Sb2O4
Sb2O5	-26.64	-36.31	-9.67	Sb2O5
Sb2Se3	-110.41	-178.17	-67.76	Sb2Se3
Sb4O6(cubic)	-59.29	-77.55	-18.26	Sb4O6
Sb4O6(orth)	-59.65	-77.55	-17.90	Sb4O6
SbCl3	-50.71	-50.14	0.57	SbCl3
SbF3	-44.66	-54.89	-10.23	SbF3
Sbmetal	-46.02	-57.70	-11.69	Sb
SbO2	-3.10	-30.92	-27.82	SbO2
Schoepite	-2.72	3.27	5.99	UO2(OH)2:H2O
Semetal(am)	-13.81	-20.92	-7.11	Se
Semetal(hex)	-13.21	-20.92	-7.71	Se
Senarmontite	-26.41	-38.77	-12.37	Sb2O3
SeO2	-14.82	-14.69	0.12	SeO2
SeO3	-46.50	-25.45	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.49	-11.49	-10.00	ZnCO3
Sphalerite	-64.69	-76.14	-11.45	ZnS
Spinel	-4.71	32.14	36.85	MgAl2O4
Stibnite	-247.20	-297.66	-50.46	Sb2S3

Sulfur	-58.61	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.19	-5.87	0.32	Na2SO4
Thermonatrite	-10.38	-9.74	0.64	Na2CO3:H2O
Tyuyamunite	-1.85	2.23	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-9.17	11.92	21.08	U3O8
U3Sb4	-575.64	-423.26	152.38	U3Sb4
U4O9	-23.67	-26.69	-3.02	U4O9
UF4	-30.86	-60.39	-29.54	UF4
UF4:2.5H2O	-27.68	-60.39	-32.72	UF4:2.5H2O
UO2 (am)	-13.99	-13.06	0.93	UO2
UO2 (NO3) 2	-40.20	-28.05	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-32.91	-28.05	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.45	-28.06	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.10	-28.06	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.34	3.27	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-19.94	-22.19	-2.25	UO2SeO4:4H2O
UO3	-4.43	3.27	7.70	UO3
Uraninite	-8.39	-13.06	-4.67	UO2
USb2	-218.35	-188.77	29.58	USb2
V (OH) 3	-19.28	-11.69	7.59	V (OH) 3
V2O5	-16.12	-17.48	-1.36	V2O5
V3O5	-41.21	-39.37	1.84	V3O5
V4O7	-51.16	-43.98	7.19	V4O7
V6O13	-42.66	-103.52	-60.86	V6O13
Valentinite	-30.29	-38.77	-8.48	Sb2O3
VC12	-63.83	-44.96	18.87	VC12
VC13	-65.87	-42.44	23.43	VC13
VF4	-66.87	-51.94	14.93	VF4
Vmetal	-94.03	-50.00	44.03	V
VO	-39.21	-24.46	14.76	VO
VO (OH) 2	-9.76	-4.61	5.15	VO (OH) 2
VO2Cl	-21.83	-18.99	2.84	VO2Cl
VOC1	-33.09	-21.93	11.15	VOC1
VOC12	-37.87	-25.11	12.76	VOC12
VOSO4	-25.99	-22.38	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.19	-76.14	-8.95	ZnS
Zincite	-1.18	10.16	11.33	ZnO
Zincosite	-11.55	-7.62	3.93	ZnSO4
Zn (BO2) 2	-6.63	1.66	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.48	-21.17	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.04	10.16	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.32	10.16	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.60	10.16	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.38	10.16	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.58	10.16	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.96	2.54	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.12	10.07	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.48	-1.83	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.99	-5.08	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-5.54	22.86	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-8.21	30.29	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.39	-10.34	7.05	ZnCl2
ZnCO3:1H2O	-1.23	-11.49	-10.26	ZnCO3:1H2O
ZnF2	-12.97	-13.51	-0.53	ZnF2
Znmetal	-41.17	-15.39	25.79	Zn
ZnMoO4	-1.16	-11.28	-10.13	ZnMoO4
ZnO (active)	-1.03	10.16	11.19	ZnO
ZnS (am)	-67.08	-76.14	-9.05	ZnS
ZnSb	-84.10	-73.09	11.01	ZnSb
ZnSe	-21.91	-36.31	-14.40	ZnSe
ZnSeO4:6H2O	-13.78	-15.30	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.98	-7.62	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 60.

Title Stage 3 Pit lake Mix
Mix 303
304 0.256178
308 0.161627
1 0.024769
17 0.089062
16 0.000000
215 0.468363
Save solution 309
end

TITLE

Stage 3 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 303.

Mixture 303.

2.477e-02 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.

0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)

8.906e-02 Solution 17 Average water quality for Background Surface Water
SWQ-1 (representative of haul road and watershed run-off)

4.684e-01 Solution 215 Solution after simulation 50.

2.562e-01 Solution 304 Solution after simulation 55.

1.616e-01 Solution 308 Solution after simulation 59.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.822e-08	1.824e-08
Al	3.283e-06	3.288e-06
As	2.438e-10	2.442e-10
B	2.636e-05	2.639e-05
Ba	7.799e-08	7.809e-08
C	2.608e-03	2.611e-03
Ca	4.304e-03	4.309e-03
Cd	1.195e-08	1.197e-08
Cl	2.537e-03	2.540e-03
Co	8.724e-08	8.736e-08
Cr	2.201e-09	2.204e-09
Cu	1.035e-06	1.036e-06
F	1.591e-04	1.593e-04
Fe	1.466e-09	1.468e-09
Hg	1.788e-09	1.790e-09
K	3.145e-03	3.149e-03
Mg	4.653e-03	4.659e-03
Mn	5.455e-05	5.463e-05
Mo	1.762e-06	1.764e-06

N	8.180e-06	8.191e-06
Na	8.279e-03	8.290e-03
Ni	1.084e-07	1.086e-07
Pb	3.146e-09	3.150e-09
S	1.215e-02	1.216e-02
Sb	2.483e-08	2.486e-08
Se	1.272e-07	1.274e-07
U	3.249e-07	3.253e-07
V	5.888e-09	5.896e-09
Zn	5.103e-06	5.110e-06

-----Description of solution-----

	pH	=	7.413	Charge balance
	pe	=	5.471	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	3.889e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	2.468e-03	
	Total CO2 (mol/kg)	=	2.608e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	9.691e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	7	
	Total H	=	1.111630e+02	
	Total O	=	5.563666e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.147e-07	2.605e-07	-6.502	-6.584	-0.082	(0)
H+	4.624e-08	3.863e-08	-7.335	-7.413	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.822e-08					
AgCl	1.186e-08	1.186e-08	-7.926	-7.926	0.000	(0)
Ag+	3.280e-09	2.740e-09	-8.484	-8.562	-0.078	(0)
AgCl2-	2.759e-09	2.189e-09	-8.559	-8.660	-0.101	(0)
AgSO4-	3.069e-10	2.435e-10	-9.513	-9.614	-0.101	(0)
AgCl3-2	1.044e-11	4.134e-12	-10.981	-11.384	-0.402	(0)
AgNO2	3.757e-12	3.757e-12	-11.425	-11.425	0.000	(0)
AgF	7.627e-13	7.627e-13	-12.118	-12.118	0.000	(0)
AgCl4-3	1.438e-13	1.789e-14	-12.842	-13.747	-0.905	(0)
AgOH	7.138e-14	7.138e-14	-13.146	-13.146	0.000	(0)
AgSeO3-	1.912e-14	1.517e-14	-13.719	-13.819	-0.101	(0)
AgH2BO3	1.700e-14	1.700e-14	-13.769	-13.769	0.000	(0)
AgNH3+	1.617e-14	1.283e-14	-13.791	-13.892	-0.101	(0)
Ag2Se	4.736e-15	4.736e-15	-14.325	-14.325	0.000	(0)
Ag(NO2)2-	4.814e-17	3.818e-17	-16.318	-16.418	-0.101	(0)
AgNO3	2.257e-17	2.257e-17	-16.646	-16.646	0.000	(0)
Ag(OH)2-	2.291e-18	1.817e-18	-17.640	-17.741	-0.101	(0)
Ag(NH3)2+	3.015e-19	2.391e-19	-18.521	-18.621	-0.101	(0)
Ag(SeO3)2-3	9.402e-21	1.169e-21	-20.027	-20.932	-0.905	(0)
Ag2MoO4	2.439e-24	2.439e-24	-23.613	-23.613	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.927	-73.927	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-84.271	-85.881	-1.609	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.873	-149.077	-0.204	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-148.906	-149.007	-0.101	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-150.731	-151.104	-0.373	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.061	-151.415	-0.354	(0)
Al	3.283e-06					
Al(OH)4-	3.147e-06	2.630e-06	-5.502	-5.580	-0.078	(0)
Al(OH)3	8.019e-08	8.019e-08	-7.096	-7.096	0.000	(0)
AlF3	1.951e-08	1.951e-08	-7.710	-7.710	0.000	(0)
Al(OH)2+	1.832e-08	1.543e-08	-7.737	-7.812	-0.075	(0)
AlF2+	1.661e-08	1.399e-08	-7.780	-7.854	-0.075	(0)

AlF4-	1.296e-09	1.084e-09	-8.887	-8.965	-0.078	(0)
AlF+2	6.299e-10	3.171e-10	-9.201	-9.499	-0.298	(0)
AlOH+2	1.481e-10	7.455e-11	-9.829	-10.128	-0.298	(0)
AlSO4+	1.184e-11	9.893e-12	-10.927	-11.005	-0.078	(0)
Al+3	1.443e-12	2.862e-13	-11.841	-12.543	-0.703	(0)
Al (SO4) 2-	5.648e-13	4.721e-13	-12.248	-12.326	-0.078	(0)
AlMo6O21-3	3.006e-38	3.738e-39	-37.522	-38.427	-0.905	(0)
As (3)	2.658e-23					
H3AsO3	2.614e-23	2.614e-23	-22.583	-22.583	0.000	(0)
H2AsO3-	4.376e-25	3.471e-25	-24.359	-24.460	-0.101	(0)
HAsO3-2	2.070e-29	8.195e-30	-28.684	-29.086	-0.402	(0)
H4AsO3+	6.308e-31	5.004e-31	-30.200	-30.301	-0.101	(0)
AsO3-3	6.575e-35	8.178e-36	-34.182	-35.087	-0.905	(0)
As (5)	2.438e-10					
HAsO4-2	2.073e-10	8.210e-11	-9.683	-10.086	-0.402	(0)
H2AsO4-	3.646e-11	2.892e-11	-10.438	-10.539	-0.101	(0)
AsO4-3	5.403e-14	6.721e-15	-13.267	-14.173	-0.905	(0)
H3AsO4	1.924e-16	1.942e-16	-15.716	-15.712	0.004	(0)
B	2.636e-05					
H3BO3	2.581e-05	2.604e-05	-4.588	-4.584	0.004	(0)
H2BO3-	4.779e-07	3.915e-07	-6.321	-6.407	-0.087	(0)
CaH2BO3+	3.792e-08	3.107e-08	-7.421	-7.508	-0.087	(0)
MgH2BO3+	2.655e-08	2.175e-08	-7.576	-7.662	-0.087	(0)
NaH2BO3	4.188e-09	4.188e-09	-8.378	-8.378	0.000	(0)
BF (OH) 3-	1.405e-09	1.151e-09	-8.852	-8.939	-0.087	(0)
H5 (BO3) 2-	1.059e-11	8.678e-12	-10.975	-11.062	-0.087	(0)
BF2 (OH) 2-	6.434e-13	5.272e-13	-12.191	-12.278	-0.087	(0)
BaH2BO3+	5.549e-13	4.546e-13	-12.256	-12.342	-0.087	(0)
H8 (BO3) 3-	2.758e-14	2.260e-14	-13.559	-13.646	-0.087	(0)
AgH2BO3	1.700e-14	1.700e-14	-13.769	-13.769	0.000	(0)
BF3OH-	1.072e-18	8.784e-19	-17.970	-18.056	-0.087	(0)
BF4-	2.259e-23	1.851e-23	-22.646	-22.733	-0.087	(0)
Ba	7.799e-08					
Ba+2	7.711e-08	3.757e-08	-7.113	-7.425	-0.312	(0)
BaHCO3+	8.274e-10	7.003e-10	-9.082	-9.155	-0.072	(0)
BaCO3	4.564e-11	4.564e-11	-10.341	-10.341	0.000	(0)
BaH2BO3+	5.549e-13	4.546e-13	-12.256	-12.342	-0.087	(0)
BaOH+	5.090e-14	4.273e-14	-13.293	-13.369	-0.076	(0)
BaNO3+	2.462e-15	1.953e-15	-14.609	-14.709	-0.101	(0)
BaNH3+2	1.373e-16	5.436e-17	-15.862	-16.265	-0.402	(0)
C (4)	2.608e-03					
HCO3-	2.317e-03	1.952e-03	-2.635	-2.710	-0.075	(0)
H2CO3	1.696e-04	1.696e-04	-3.771	-3.771	0.000	(0)
CaHCO3+	5.921e-05	5.012e-05	-4.228	-4.300	-0.072	(0)
MgHCO3+	3.847e-05	3.200e-05	-4.415	-4.495	-0.080	(0)
NaHCO3	7.408e-06	7.408e-06	-5.130	-5.130	0.000	(0)
CaCO3	5.177e-06	5.177e-06	-5.286	-5.286	0.000	(0)
CO3-2	4.861e-06	2.369e-06	-5.313	-5.626	-0.312	(0)
MgCO3	3.157e-06	3.157e-06	-5.501	-5.501	0.000	(0)
CuCO3	7.819e-07	7.819e-07	-6.107	-6.107	0.000	(0)
MnHCO3+	7.502e-07	6.298e-07	-6.125	-6.201	-0.076	(0)
NaCO3-	3.534e-07	2.977e-07	-6.452	-6.526	-0.075	(0)
UO2 (CO3) 3-4	2.127e-07	5.229e-09	-6.672	-8.282	-1.609	(0)
ZnCO3	2.057e-07	2.057e-07	-6.687	-6.687	0.000	(0)
ZnHCO3+	1.174e-07	9.315e-08	-6.930	-7.031	-0.101	(0)
UO2 (CO3) 2-2	1.112e-07	4.405e-08	-6.954	-7.356	-0.402	(0)
Cu (CO3) 2-2	1.259e-08	4.985e-09	-7.900	-8.302	-0.402	(0)
NiHCO3+	9.826e-09	7.795e-09	-8.008	-8.108	-0.101	(0)
CuHCO3+	8.702e-09	6.903e-09	-8.060	-8.161	-0.101	(0)
CoHCO3+	4.555e-09	3.613e-09	-8.342	-8.442	-0.101	(0)
NiCO3	2.863e-09	2.863e-09	-8.543	-8.543	0.000	(0)
PbCO3	1.557e-09	1.557e-09	-8.808	-8.808	0.000	(0)
CoCO3	9.529e-10	9.529e-10	-9.021	-9.021	0.000	(0)
UO2CO3	9.321e-10	9.321e-10	-9.031	-9.031	0.000	(0)
BaHCO3+	8.274e-10	7.003e-10	-9.082	-9.155	-0.072	(0)
PbHCO3+	3.997e-10	3.171e-10	-9.398	-9.499	-0.101	(0)
CdCO3	1.803e-10	1.803e-10	-9.744	-9.744	0.000	(0)
BaCO3	4.564e-11	4.564e-11	-10.341	-10.341	0.000	(0)

	Pb(CO ₃) 2-2	2.686e-11	1.064e-11	-10.571	-10.973	-0.402	(0)
	CdHCO ₃ +	1.871e-11	1.484e-11	-10.728	-10.828	-0.101	(0)
	Cd(CO ₃) 2-2	7.997e-13	3.167e-13	-12.097	-12.499	-0.402	(0)
	FeHCO ₃ +	6.121e-14	5.181e-14	-13.213	-13.286	-0.072	(0)
	HgCO ₃	4.729e-14	4.729e-14	-13.325	-13.325	0.000	(0)
	Hg(CO ₃) 2-2	8.946e-16	3.542e-16	-15.048	-15.451	-0.402	(0)
	HgHCO ₃ +	4.288e-17	3.402e-17	-16.368	-16.468	-0.101	(0)
Ca	4.304e-03						
	Ca+2	2.830e-03	1.379e-03	-2.548	-2.860	-0.312	(0)
	CaSO ₄	1.407e-03	1.407e-03	-2.852	-2.852	0.000	(0)
	CaHCO ₃ +	5.921e-05	5.012e-05	-4.228	-4.300	-0.072	(0)
	CaCO ₃	5.177e-06	5.177e-06	-5.286	-5.286	0.000	(0)
	CaF+	1.987e-06	1.668e-06	-5.702	-5.778	-0.076	(0)
	CaH ₂ BO ₃ +	3.792e-08	3.107e-08	-7.421	-7.508	-0.087	(0)
	CaOH+	8.469e-09	7.168e-09	-8.072	-8.145	-0.072	(0)
	CaNO ₃ +	5.701e-11	4.523e-11	-10.244	-10.345	-0.101	(0)
	CaNH ₃ +2	1.005e-11	3.981e-12	-10.998	-11.400	-0.402	(0)
	Ca(NH ₃) 2+2	9.179e-21	3.635e-21	-20.037	-20.440	-0.402	(0)
Cd	1.195e-08						
	Cd+2	6.856e-09	3.340e-09	-8.164	-8.476	-0.312	(0)
	CdSO ₄	3.487e-09	3.487e-09	-8.458	-8.458	0.000	(0)
	CdCl+	8.523e-10	6.761e-10	-9.069	-9.170	-0.101	(0)
	Cd(SO ₄) 2-2	5.291e-10	2.095e-10	-9.276	-9.679	-0.402	(0)
	CdCO ₃	1.803e-10	1.803e-10	-9.744	-9.744	0.000	(0)
	CdHCO ₃ +	1.871e-11	1.484e-11	-10.728	-10.828	-0.101	(0)
	CdOH+	8.714e-12	6.913e-12	-11.060	-11.160	-0.101	(0)
	CdF+	7.395e-12	5.866e-12	-11.131	-11.232	-0.101	(0)
	CdOHC1	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
	CdCl ₂	5.973e-12	5.973e-12	-11.224	-11.224	0.000	(0)
	Cd(CO ₃) 2-2	7.997e-13	3.167e-13	-12.097	-12.499	-0.402	(0)
	Cd(OH) 2	1.136e-14	1.136e-14	-13.945	-13.945	0.000	(0)
	CdCl ₃ -	1.007e-14	7.987e-15	-13.997	-14.098	-0.101	(0)
	CdF ₂	1.297e-15	1.297e-15	-14.887	-14.887	0.000	(0)
	CdNO ₃ +	1.381e-16	1.096e-16	-15.860	-15.960	-0.101	(0)
	CdSeO ₄	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
	Cd ₂ OH+3	9.304e-19	1.157e-19	-18.031	-18.937	-0.905	(0)
	Cd(SeO ₃) 2-2	5.156e-19	2.042e-19	-18.288	-18.690	-0.402	(0)
	Cd(OH) 3-	2.280e-19	1.808e-19	-18.642	-18.743	-0.101	(0)
	Cd(NO ₃) 2	5.694e-25	5.694e-25	-24.245	-24.245	0.000	(0)
	Cd(OH) 4-2	1.947e-26	7.712e-27	-25.711	-26.113	-0.402	(0)
	CdHS+	0.000e+00	0.000e+00	-79.547	-79.648	-0.101	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-151.623	-151.623	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-228.802	-228.902	-0.101	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-305.484	-305.886	-0.402	(0)
Cl	2.537e-03						
	Cl-	2.537e-03	2.119e-03	-2.596	-2.674	-0.078	(0)
	MnCl+	5.140e-08	4.315e-08	-7.289	-7.365	-0.076	(0)
	AgCl	1.186e-08	1.186e-08	-7.926	-7.926	0.000	(0)
	ZnCl+	9.657e-09	8.035e-09	-8.015	-8.095	-0.080	(0)
	AgCl ₂ -	2.759e-09	2.189e-09	-8.559	-8.660	-0.101	(0)
	ZnOHC1	2.740e-09	2.740e-09	-8.562	-8.562	0.000	(0)
	CdCl+	8.523e-10	6.761e-10	-9.069	-9.170	-0.101	(0)
	CuCl	2.474e-10	2.474e-10	-9.607	-9.607	0.000	(0)
	CuCl+	2.263e-10	1.883e-10	-9.645	-9.725	-0.080	(0)
	NiCl+	2.214e-10	1.757e-10	-9.655	-9.755	-0.101	(0)
	CoCl+	2.200e-10	1.745e-10	-9.658	-9.758	-0.101	(0)
	CuCl ₂ -	1.317e-10	1.096e-10	-9.880	-9.960	-0.080	(0)
	MnCl ₂	1.292e-10	1.292e-10	-9.889	-9.889	0.000	(0)
	ZnCl ₂	2.699e-11	2.699e-11	-10.569	-10.569	0.000	(0)
	PbCl+	2.073e-11	1.644e-11	-10.683	-10.784	-0.101	(0)
	HgClOH	1.627e-11	1.627e-11	-10.789	-10.789	0.000	(0)
	AgCl ₃ -2	1.044e-11	4.134e-12	-10.981	-11.384	-0.402	(0)
	HgCl ₂	7.494e-12	7.494e-12	-11.125	-11.125	0.000	(0)
	CdOHC1	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
	CdCl ₂	5.973e-12	5.973e-12	-11.224	-11.224	0.000	(0)
	HgCl ₃ -	2.002e-13	1.588e-13	-12.699	-12.799	-0.101	(0)
	PbCl ₂	1.557e-13	1.557e-13	-12.808	-12.808	0.000	(0)
	AgCl ₄ -3	1.438e-13	1.789e-14	-12.842	-13.747	-0.905	(0)

CuCl2	1.384e-13	1.384e-13	-12.859	-12.859	0.000	(0)
CuCl3-2	9.993e-14	4.964e-14	-13.000	-13.304	-0.304	(0)
MnCl3-	8.982e-14	7.540e-14	-13.047	-13.123	-0.076	(0)
ZnCl3-	5.461e-14	4.543e-14	-13.263	-13.343	-0.080	(0)
CdCl3-	1.007e-14	7.987e-15	-13.997	-14.098	-0.101	(0)
HgCl4-2	3.384e-15	1.340e-15	-14.471	-14.873	-0.402	(0)
NiCl2	1.874e-15	1.874e-15	-14.727	-14.727	0.000	(0)
HgCl+	8.894e-16	7.055e-16	-15.051	-15.151	-0.101	(0)
UO2Cl+	4.283e-16	3.398e-16	-15.368	-15.469	-0.101	(0)
PbCl3-	1.656e-16	1.313e-16	-15.781	-15.882	-0.101	(0)
ZnCl4-2	9.693e-17	4.815e-17	-16.014	-16.317	-0.304	(0)
CrCl+2	5.723e-17	2.266e-17	-16.242	-16.645	-0.402	(0)
CuCl3-	3.289e-18	2.737e-18	-17.483	-17.563	-0.080	(0)
PbCl4-2	3.213e-19	1.272e-19	-18.493	-18.895	-0.402	(0)
CrOHC12	2.378e-19	2.378e-19	-18.624	-18.624	0.000	(0)
FeCl+2	7.473e-21	3.712e-21	-20.126	-20.430	-0.304	(0)
CrCl2+	5.745e-21	4.557e-21	-20.241	-20.341	-0.101	(0)
VOC1+	3.723e-22	2.953e-22	-21.429	-21.530	-0.101	(0)
CuCl4-2	5.852e-23	2.907e-23	-22.233	-22.537	-0.304	(0)
FeCl2+	4.186e-23	3.514e-23	-22.378	-22.454	-0.076	(0)
CrO3Cl-	3.978e-26	3.156e-26	-25.400	-25.501	-0.101	(0)
FeCl3	7.447e-27	7.447e-27	-26.128	-26.128	0.000	(0)
CoCl+2	3.055e-35	1.210e-35	-34.515	-34.917	-0.402	(0)
UCl+3	0.000e+00	0.000e+00	-44.452	-45.358	-0.905	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.760	-52.162	-0.402	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.090	-54.492	-0.402	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.115	-67.517	-0.402	(0)
Co (2)	8.724e-08					
Co+2	6.010e-08	2.380e-08	-7.221	-7.623	-0.402	(0)
CoSO4	2.115e-08	2.115e-08	-7.675	-7.675	0.000	(0)
CoHCO3+	4.555e-09	3.613e-09	-8.342	-8.442	-0.101	(0)
CoCO3	9.529e-10	9.529e-10	-9.021	-9.021	0.000	(0)
CoCl+	2.200e-10	1.745e-10	-9.658	-9.758	-0.101	(0)
CoOH+	1.560e-10	1.237e-10	-9.807	-9.908	-0.101	(0)
CoF+	1.051e-10	8.339e-11	-9.978	-10.079	-0.101	(0)
Co (OH) 2	2.560e-12	2.560e-12	-11.592	-11.592	0.000	(0)
CoNO2+	1.387e-12	1.101e-12	-11.858	-11.958	-0.101	(0)
Co (NH3) +2	1.657e-14	6.562e-15	-13.781	-14.183	-0.402	(0)
CoSeO4	7.455e-16	7.455e-16	-15.128	-15.128	0.000	(0)
CoNO3+	4.931e-16	3.912e-16	-15.307	-15.408	-0.101	(0)
Co (OH) 3-	1.678e-17	1.331e-17	-16.775	-16.876	-0.101	(0)
CoOOH-	4.211e-18	3.341e-18	-17.376	-17.476	-0.101	(0)
Co2OH+3	1.186e-18	1.476e-19	-17.926	-18.831	-0.905	(0)
Co (NH3) 2+2	1.621e-21	6.419e-22	-20.790	-21.193	-0.402	(0)
Co (NO3) 2	8.255e-24	8.255e-24	-23.083	-23.083	0.000	(0)
Co (OH) 4-2	1.388e-24	5.494e-25	-23.858	-24.260	-0.402	(0)
Co (NH3) 3+2	4.680e-29	1.853e-29	-28.330	-28.732	-0.402	(0)
Co4 (OH) 4+4	1.901e-30	4.673e-32	-29.721	-31.330	-1.609	(0)
Co (NH3) 4+2	5.632e-37	2.230e-37	-36.249	-36.652	-0.402	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.669	-45.071	-0.402	(0)
Co (3)	9.379e-29					
CoOH+2	9.379e-29	3.714e-29	-28.028	-28.430	-0.402	(0)
Co+3	1.414e-34	2.805e-35	-33.849	-34.552	-0.703	(0)
CoCl+2	3.055e-35	1.210e-35	-34.515	-34.917	-0.402	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.760	-52.162	-0.402	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.169	-62.269	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.825	-67.227	-0.402	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.115	-67.517	-0.402	(0)
Cr (2)	1.684e-26					
Cr+2	1.684e-26	6.666e-27	-25.774	-26.176	-0.402	(0)
Cr (3)	2.201e-09					
Cr (OH) 2+	1.882e-09	1.493e-09	-8.725	-8.826	-0.101	(0)
Cr (OH) 3	1.461e-10	1.461e-10	-9.835	-9.835	0.000	(0)
Cr (OH) +2	1.189e-10	4.709e-11	-9.925	-10.327	-0.402	(0)
CrOHSO4	4.977e-11	4.977e-11	-10.303	-10.303	0.000	(0)
CrO2-	2.265e-12	1.797e-12	-11.645	-11.745	-0.101	(0)
Cr (OH) 4-	1.910e-12	1.515e-12	-11.719	-11.820	-0.101	(0)
CrF+2	3.664e-13	1.451e-13	-12.436	-12.838	-0.402	(0)

CrSO4+	1.083e-13	8.592e-14	-12.965	-13.066	-0.101	(0)
Cr+3	6.643e-14	8.262e-15	-13.178	-14.083	-0.905	(0)
CrCl+2	5.723e-17	2.266e-17	-16.242	-16.645	-0.402	(0)
Cr2(OH)2SO4+2	5.350e-19	2.118e-19	-18.272	-18.674	-0.402	(0)
CrOHC12	2.378e-19	2.378e-19	-18.624	-18.624	0.000	(0)
Cr2(OH)2(SO4)2	5.604e-20	5.604e-20	-19.252	-19.252	0.000	(0)
CrCl2+	5.745e-21	4.557e-21	-20.241	-20.341	-0.101	(0)
CrNO3+2	9.459e-24	3.746e-24	-23.024	-23.426	-0.402	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-43.090	-43.493	-0.402	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-52.015	-52.920	-0.905	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-54.090	-54.492	-0.402	(0)
Cr(6)	1.110e-15					
CrO4-2	1.006e-15	4.901e-16	-14.997	-15.310	-0.312	(0)
HCrO4-	7.722e-17	6.126e-17	-16.112	-16.213	-0.101	(0)
NaCrO4-	2.072e-17	1.644e-17	-16.684	-16.784	-0.101	(0)
KCrO4-	5.849e-18	4.640e-18	-17.233	-17.334	-0.101	(0)
CrO3SO4-2	8.111e-24	3.212e-24	-23.091	-23.493	-0.402	(0)
H2CrO4	1.918e-24	1.918e-24	-23.717	-23.717	0.000	(0)
CrO3Cl-	3.978e-26	3.156e-26	-25.400	-25.501	-0.101	(0)
Cr2O7-2	3.288e-31	1.302e-31	-30.483	-30.885	-0.402	(0)
Cu(1)	4.961e-10					
CuCl	2.474e-10	2.474e-10	-9.607	-9.607	0.000	(0)
CuCl2-	1.317e-10	1.096e-10	-9.880	-9.960	-0.080	(0)
Cu+	1.169e-10	9.273e-11	-9.932	-10.033	-0.101	(0)
CuCl3-2	9.993e-14	4.964e-14	-13.000	-13.304	-0.304	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.812	-150.175	-0.364	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.560	-150.905	-0.346	(0)
Cu(2)	1.034e-06					
CuCO3	7.819e-07	7.819e-07	-6.107	-6.107	0.000	(0)
Cu+2	1.151e-07	5.606e-08	-6.939	-7.251	-0.312	(0)
CuSO4	5.719e-08	5.719e-08	-7.243	-7.243	0.000	(0)
CuOH+	5.551e-08	4.618e-08	-7.256	-7.336	-0.080	(0)
Cu(CO3)2-2	1.259e-08	4.985e-09	-7.900	-8.302	-0.402	(0)
CuHCO3+	8.702e-09	6.903e-09	-8.060	-8.161	-0.101	(0)
Cu(OH)2	2.401e-09	2.401e-09	-8.620	-8.620	0.000	(0)
CuF+	4.941e-10	3.919e-10	-9.306	-9.407	-0.101	(0)
CuCl+	2.263e-10	1.883e-10	-9.645	-9.725	-0.080	(0)
Cu2(OH)2+2	1.353e-10	5.358e-11	-9.869	-10.271	-0.402	(0)
CuNO2+	4.856e-11	3.852e-11	-10.314	-10.414	-0.101	(0)
CuNH3+2	3.322e-12	1.315e-12	-11.479	-11.881	-0.402	(0)
Cu(OH)3-	1.617e-12	1.283e-12	-11.791	-11.892	-0.101	(0)
CuCl2	1.384e-13	1.384e-13	-12.859	-12.859	0.000	(0)
Cu(NO2)2	2.587e-15	2.587e-15	-14.587	-14.587	0.000	(0)
CuNO3+	2.318e-15	1.838e-15	-14.635	-14.736	-0.101	(0)
Cu(OH)4-2	6.642e-18	2.630e-18	-17.178	-17.580	-0.402	(0)
CuCl3-	3.289e-18	2.737e-18	-17.483	-17.563	-0.080	(0)
CuCl4-2	5.852e-23	2.907e-23	-22.233	-22.537	-0.304	(0)
Cu(NO3)2	2.400e-24	2.400e-24	-23.620	-23.620	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-218.790	-218.891	-0.101	(0)
F	1.591e-04					
F-	1.326e-04	1.108e-04	-3.877	-3.955	-0.078	(0)
MgF+	2.384e-05	1.992e-05	-4.623	-4.701	-0.078	(0)
CaF+	1.987e-06	1.668e-06	-5.702	-5.778	-0.076	(0)
NaF	4.719e-07	4.719e-07	-6.326	-6.326	0.000	(0)
MnF+	8.499e-08	7.135e-08	-7.071	-7.147	-0.076	(0)
AlF3	1.951e-08	1.951e-08	-7.710	-7.710	0.000	(0)
AlF2+	1.661e-08	1.399e-08	-7.780	-7.854	-0.075	(0)
HF	6.331e-09	6.331e-09	-8.199	-8.199	0.000	(0)
ZnF+	4.207e-09	3.337e-09	-8.376	-8.477	-0.101	(0)
BF(OH)3-	1.405e-09	1.151e-09	-8.852	-8.939	-0.087	(0)
AlF4-	1.296e-09	1.084e-09	-8.887	-8.965	-0.078	(0)
AlF+2	6.299e-10	3.171e-10	-9.201	-9.499	-0.298	(0)
CuF+	4.941e-10	3.919e-10	-9.306	-9.407	-0.101	(0)
NiF+	1.137e-10	9.017e-11	-9.944	-10.045	-0.101	(0)
CoF+	1.051e-10	8.339e-11	-9.978	-10.079	-0.101	(0)
CdF+	7.395e-12	5.866e-12	-11.131	-11.232	-0.101	(0)
HF2-	3.221e-12	2.667e-12	-11.492	-11.574	-0.082	(0)
PbF+	2.152e-12	1.707e-12	-11.667	-11.768	-0.101	(0)

UO2F+	1.906e-12	1.512e-12	-11.720	-11.820	-0.101	(0)
AgF	7.627e-13	7.627e-13	-12.118	-12.118	0.000	(0)
BF2 (OH) 2-	6.434e-13	5.272e-13	-12.191	-12.278	-0.087	(0)
UO2F2	4.832e-13	4.832e-13	-12.316	-12.316	0.000	(0)
CrF+2	3.664e-13	1.451e-13	-12.436	-12.838	-0.402	(0)
UO2F3-	1.695e-14	1.345e-14	-13.771	-13.871	-0.101	(0)
PbF2	3.723e-15	3.723e-15	-14.429	-14.429	0.000	(0)
CdF2	1.297e-15	1.297e-15	-14.887	-14.887	0.000	(0)
H2F2	1.074e-16	1.074e-16	-15.969	-15.969	0.000	(0)
UO2F4-2	2.989e-17	1.184e-17	-16.524	-16.927	-0.402	(0)
FeF2+	2.489e-17	2.089e-17	-16.604	-16.680	-0.076	(0)
VO2F	2.393e-17	2.393e-17	-16.621	-16.621	0.000	(0)
FeF+2	1.419e-17	7.047e-18	-16.848	-17.152	-0.304	(0)
FeF3	3.267e-18	3.267e-18	-17.486	-17.486	0.000	(0)
VO2F2-	1.214e-18	9.629e-19	-17.916	-18.016	-0.101	(0)
BF3OH-	1.072e-18	8.784e-19	-17.970	-18.056	-0.087	(0)
PbF3-	9.864e-19	7.825e-19	-18.006	-18.107	-0.101	(0)
VOF+	4.161e-20	3.301e-20	-19.381	-19.481	-0.101	(0)
VO2F3-2	3.361e-21	1.331e-21	-20.474	-20.876	-0.402	(0)
VOF2	1.372e-21	1.372e-21	-20.863	-20.863	0.000	(0)
PbF4-2	1.048e-22	4.150e-23	-21.980	-22.382	-0.402	(0)
HgF+	8.639e-23	6.853e-23	-22.064	-22.164	-0.101	(0)
BF4-	2.259e-23	1.851e-23	-22.646	-22.733	-0.087	(0)
VOF3-	6.798e-24	5.392e-24	-23.168	-23.268	-0.101	(0)
VO2F4-3	5.834e-25	7.256e-26	-24.234	-25.139	-0.905	(0)
Sb (OH) 2F	2.067e-25	2.067e-25	-24.685	-24.685	0.000	(0)
SbOF	2.034e-25	2.034e-25	-24.692	-24.692	0.000	(0)
VOF4-2	6.091e-27	2.412e-27	-26.215	-26.618	-0.402	(0)
UF3+	2.822e-35	2.239e-35	-34.549	-34.650	-0.101	(0)
UF2+2	3.219e-36	1.275e-36	-35.492	-35.895	-0.402	(0)
UF4	2.720e-37	2.720e-37	-36.565	-36.565	0.000	(0)
UF+3	7.347e-39	9.138e-40	-38.134	-39.039	-0.905	(0)
UF5-	1.506e-39	1.194e-39	-38.822	-38.923	-0.101	(0)
UF6-2	1.009e-40	0.000e+00	-39.996	-40.398	-0.402	(0)
Fe (2)	7.718e-12					
Fe+2	5.325e-12	2.109e-12	-11.274	-11.676	-0.402	(0)
FeSO4	2.305e-12	2.305e-12	-11.637	-11.637	0.000	(0)
FeHCO3+	6.121e-14	5.181e-14	-13.213	-13.286	-0.072	(0)
FeOH+	2.605e-14	2.187e-14	-13.584	-13.660	-0.076	(0)
Fe (OH) 2	4.526e-18	4.526e-18	-17.344	-17.344	0.000	(0)
Fe (OH) 3-	4.441e-19	3.728e-19	-18.353	-18.428	-0.076	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.085	-161.085	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.127	-238.227	-0.101	(0)
Fe (3)	1.458e-09					
Fe (OH) 2+	1.174e-09	9.887e-10	-8.930	-9.005	-0.075	(0)
Fe (OH) 3	2.766e-10	2.766e-10	-9.558	-9.558	0.000	(0)
Fe (OH) 4-	7.967e-12	6.711e-12	-11.099	-11.173	-0.075	(0)
FeOH+2	1.964e-14	9.755e-15	-13.707	-14.011	-0.304	(0)
FeF2+	2.489e-17	2.089e-17	-16.604	-16.680	-0.076	(0)
FeF+2	1.419e-17	7.047e-18	-16.848	-17.152	-0.304	(0)
FeSO4+	3.452e-18	2.898e-18	-17.462	-17.538	-0.076	(0)
FeF3	3.267e-18	3.267e-18	-17.486	-17.486	0.000	(0)
Fe (SO4) 2-	3.478e-19	2.759e-19	-18.459	-18.559	-0.101	(0)
Fe+3	2.924e-19	5.800e-20	-18.534	-19.237	-0.703	(0)
FeCl+2	7.473e-21	3.712e-21	-20.126	-20.430	-0.304	(0)
FeCl2+	4.186e-23	3.514e-23	-22.378	-22.454	-0.076	(0)
FeHSeO3+2	3.234e-23	1.281e-23	-22.490	-22.893	-0.402	(0)
Fe2 (OH) 2+4	1.282e-25	3.151e-27	-24.892	-26.502	-1.609	(0)
FeNO3+2	1.519e-26	6.015e-27	-25.818	-26.221	-0.402	(0)
FeCl3	7.447e-27	7.447e-27	-26.128	-26.128	0.000	(0)
Fe3 (OH) 4+5	1.473e-32	4.504e-35	-31.832	-34.346	-2.515	(0)
H (0)	2.389e-29					
H2	1.194e-29	1.205e-29	-28.923	-28.919	0.004	(0)
Hg (0)	1.757e-09					
Hg	1.757e-09	1.757e-09	-8.755	-8.755	0.000	(0)
Hg (1)	1.005e-19					
Hg2+2	5.025e-20	1.990e-20	-19.299	-19.701	-0.402	(0)
Hg (2)	3.110e-11					

	HgClOH	1.627e-11	1.627e-11	-10.789	-10.789	0.000	(0)
	HgCl2	7.494e-12	7.494e-12	-11.125	-11.125	0.000	(0)
	Hg (OH) 2	7.081e-12	7.145e-12	-11.150	-11.146	0.004	(0)
	HgCl3-	2.002e-13	1.588e-13	-12.699	-12.799	-0.101	(0)
	HgCO3	4.729e-14	4.729e-14	-13.325	-13.325	0.000	(0)
	HgCl4-2	3.384e-15	1.340e-15	-14.471	-14.873	-0.402	(0)
	Hg (CO3) 2-2	8.946e-16	3.542e-16	-15.048	-15.451	-0.402	(0)
	HgCl+	8.894e-16	7.055e-16	-15.051	-15.151	-0.101	(0)
	HgOH+	2.181e-16	1.730e-16	-15.661	-15.762	-0.101	(0)
	HgHCO3+	4.288e-17	3.402e-17	-16.368	-16.468	-0.101	(0)
	Hg (OH) 3-	2.954e-19	2.343e-19	-18.530	-18.630	-0.101	(0)
	Hg (NH3) 2+2	1.398e-19	5.536e-20	-18.854	-19.257	-0.402	(0)
	HgNH3+2	6.097e-20	2.414e-20	-19.215	-19.617	-0.402	(0)
	Hg+2	4.214e-20	1.668e-20	-19.375	-19.778	-0.402	(0)
	HgSO4	1.945e-20	1.945e-20	-19.711	-19.711	0.000	(0)
	HgF+	8.639e-23	6.853e-23	-22.064	-22.164	-0.101	(0)
	Hg (NH3) 3+2	1.276e-27	5.054e-28	-26.894	-27.296	-0.402	(0)
	HgNO3+	8.054e-29	6.389e-29	-28.094	-28.195	-0.101	(0)
	Hg (NH3) 4+2	2.325e-35	9.206e-36	-34.634	-35.036	-0.402	(0)
	Hg (NO3) 2	2.754e-37	2.754e-37	-36.560	-36.560	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.695	-138.795	-0.101	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.688	-140.090	-0.402	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.815	-139.815	0.000	(0)
K		3.145e-03					
	K+	3.050e-03	2.548e-03	-2.516	-2.594	-0.078	(0)
	KSO4-	9.538e-05	8.034e-05	-4.021	-4.095	-0.075	(0)
	KCrO4-	5.849e-18	4.640e-18	-17.233	-17.334	-0.101	(0)
Mg		4.653e-03					
	Mg+2	3.289e-03	1.603e-03	-2.483	-2.795	-0.312	(0)
	MgSO4	1.299e-03	1.299e-03	-2.887	-2.887	0.000	(0)
	MgHCO3+	3.847e-05	3.200e-05	-4.415	-4.495	-0.080	(0)
	MgF+	2.384e-05	1.992e-05	-4.623	-4.701	-0.078	(0)
	MgCO3	3.157e-06	3.157e-06	-5.501	-5.501	0.000	(0)
	MgOH+	1.956e-07	1.662e-07	-6.709	-6.779	-0.071	(0)
	MgH2BO3+	2.655e-08	2.175e-08	-7.576	-7.662	-0.087	(0)
Mn (2)		5.455e-05					
	Mn+2	4.085e-05	1.617e-05	-4.389	-4.791	-0.402	(0)
	MnSO4	1.281e-05	1.281e-05	-4.892	-4.892	0.000	(0)
	MnHCO3+	7.502e-07	6.298e-07	-6.125	-6.201	-0.076	(0)
	MnF+	8.499e-08	7.135e-08	-7.071	-7.147	-0.076	(0)
	MnCl+	5.140e-08	4.315e-08	-7.289	-7.365	-0.076	(0)
	MnOH+	1.261e-08	1.058e-08	-7.899	-7.975	-0.076	(0)
	MnCl2	1.292e-10	1.292e-10	-9.889	-9.889	0.000	(0)
	MnNO3+	3.351e-13	2.658e-13	-12.475	-12.575	-0.101	(0)
	MnSeO4	2.721e-13	2.721e-13	-12.565	-12.565	0.000	(0)
	MnCl3-	8.982e-14	7.540e-14	-13.047	-13.123	-0.076	(0)
	Mn (OH) 3-	5.288e-18	4.439e-18	-17.277	-17.353	-0.076	(0)
	Mn (NO3) 2	6.925e-21	6.925e-21	-20.160	-20.160	0.000	(0)
	Mn (OH) 4-2	7.517e-24	3.734e-24	-23.124	-23.428	-0.304	(0)
	MnSe	0.000e+00	0.000e+00	-42.287	-42.287	0.000	(0)
Mn (3)		1.078e-24					
	Mn+3	1.078e-24	2.139e-25	-23.967	-24.670	-0.703	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.720	-42.024	-0.304	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-45.840	-45.924	-0.084	(0)
Mo		1.762e-06					
	MoO4-2	1.761e-06	8.581e-07	-5.754	-6.066	-0.312	(0)
	HMoO4-	8.315e-10	6.596e-10	-9.080	-9.181	-0.101	(0)
	H2MoO4	1.866e-13	1.866e-13	-12.729	-12.729	0.000	(0)
	Ag2MoO4	2.439e-24	2.439e-24	-23.613	-23.613	0.000	(0)
	AlMo6O21-3	3.006e-38	3.738e-39	-37.522	-38.427	-0.905	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-45.158	-48.779	-3.621	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-47.291	-49.805	-2.515	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-50.827	-52.436	-1.609	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-55.698	-56.603	-0.905	(0)
N (-3)		2.008e-07					
	NH4+	1.896e-07	1.554e-07	-6.722	-6.809	-0.087	(0)

NH4SO4-	8.831e-09	7.414e-09	-8.054	-8.130	-0.076	(0)
NH3	2.293e-09	2.293e-09	-8.640	-8.640	0.000	(0)
CaNH3+2	1.005e-11	3.981e-12	-10.998	-11.400	-0.402	(0)
CuNH3+2	3.322e-12	1.315e-12	-11.479	-11.881	-0.402	(0)
NiNH3+2	1.008e-13	3.990e-14	-12.997	-13.399	-0.402	(0)
Co (NH3) +2	1.657e-14	6.562e-15	-13.781	-14.183	-0.402	(0)
AgNH3+	1.617e-14	1.283e-14	-13.791	-13.892	-0.101	(0)
BaNH3+2	1.373e-16	5.436e-17	-15.862	-16.265	-0.402	(0)
Ag (NH3) 2+	3.015e-19	2.391e-19	-18.521	-18.621	-0.101	(0)
Hg (NH3) 2+2	1.398e-19	5.536e-20	-18.854	-19.257	-0.402	(0)
HgNH3+2	6.097e-20	2.414e-20	-19.215	-19.617	-0.402	(0)
Ni (NH3) 2+2	3.340e-20	1.322e-20	-19.476	-19.879	-0.402	(0)
Ca (NH3) 2+2	9.179e-21	3.635e-21	-20.037	-20.440	-0.402	(0)
Co (NH3) 2+2	1.621e-21	6.419e-22	-20.790	-21.193	-0.402	(0)
Hg (NH3) 3+2	1.276e-27	5.054e-28	-26.894	-27.296	-0.402	(0)
Co (NH3) 3+2	4.680e-29	1.853e-29	-28.330	-28.732	-0.402	(0)
Hg (NH3) 4+2	2.325e-35	9.206e-36	-34.634	-35.036	-0.402	(0)
Co (NH3) 4+2	5.632e-37	2.230e-37	-36.249	-36.652	-0.402	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.090	-43.493	-0.402	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.669	-45.071	-0.402	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.760	-52.162	-0.402	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.015	-52.920	-0.905	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.090	-54.492	-0.402	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.169	-62.269	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.825	-67.227	-0.402	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.115	-67.517	-0.402	(0)
N (3)	7.967e-06					
NO2-	7.967e-06	6.562e-06	-5.099	-5.183	-0.084	(0)
CuNO2+	4.856e-11	3.852e-11	-10.314	-10.414	-0.101	(0)
AgNO2	3.757e-12	3.757e-12	-11.425	-11.425	0.000	(0)
CoNO2+	1.387e-12	1.101e-12	-11.858	-11.958	-0.101	(0)
Cu (NO2) 2	2.587e-15	2.587e-15	-14.587	-14.587	0.000	(0)
Ag (NO2) 2-	4.814e-17	3.818e-17	-16.318	-16.418	-0.101	(0)
N (5)	1.247e-08					
NO3-	1.241e-08	1.037e-08	-7.906	-7.984	-0.078	(0)
CaNO3+	5.701e-11	4.523e-11	-10.244	-10.345	-0.101	(0)
MnNO3+	3.351e-13	2.658e-13	-12.475	-12.575	-0.101	(0)
ZnNO3+	4.957e-14	3.932e-14	-13.305	-13.405	-0.101	(0)
BaNO3+	2.462e-15	1.953e-15	-14.609	-14.709	-0.101	(0)
CuNO3+	2.318e-15	1.838e-15	-14.635	-14.736	-0.101	(0)
NiNO3+	1.064e-15	8.439e-16	-14.973	-15.074	-0.101	(0)
CoNO3+	4.931e-16	3.912e-16	-15.307	-15.408	-0.101	(0)
CdNO3+	1.381e-16	1.096e-16	-15.860	-15.960	-0.101	(0)
PbNO3+	4.228e-17	3.354e-17	-16.374	-16.474	-0.101	(0)
AgNO3	2.257e-17	2.257e-17	-16.646	-16.646	0.000	(0)
Mn (NO3) 2	6.925e-21	6.925e-21	-20.160	-20.160	0.000	(0)
UO2NO3+	2.579e-21	2.045e-21	-20.589	-20.689	-0.101	(0)
Zn (NO3) 2	8.136e-23	8.136e-23	-22.090	-22.090	0.000	(0)
CrNO3+2	9.459e-24	3.746e-24	-23.024	-23.426	-0.402	(0)
Co (NO3) 2	8.255e-24	8.255e-24	-23.083	-23.083	0.000	(0)
Cu (NO3) 2	2.400e-24	2.400e-24	-23.620	-23.620	0.000	(0)
VO2NO3	6.460e-25	6.460e-25	-24.190	-24.190	0.000	(0)
Pb (NO3) 2	5.908e-25	5.908e-25	-24.229	-24.229	0.000	(0)
Cd (NO3) 2	5.694e-25	5.694e-25	-24.245	-24.245	0.000	(0)
FeNO3+2	1.519e-26	6.015e-27	-25.818	-26.221	-0.402	(0)
HgNO3+	8.054e-29	6.389e-29	-28.094	-28.195	-0.101	(0)
Hg (NO3) 2	2.754e-37	2.754e-37	-36.560	-36.560	0.000	(0)
Na	8.279e-03					
Na+	8.079e-03	6.750e-03	-2.093	-2.171	-0.078	(0)
NaSO4-	1.917e-04	1.614e-04	-3.717	-3.792	-0.075	(0)
NaHCO3	7.408e-06	7.408e-06	-5.130	-5.130	0.000	(0)
NaF	4.719e-07	4.719e-07	-6.326	-6.326	0.000	(0)
NaCO3-	3.534e-07	2.977e-07	-6.452	-6.526	-0.075	(0)
NaH2BO3	4.188e-09	4.188e-09	-8.378	-8.378	0.000	(0)
NaCrO4-	2.072e-17	1.644e-17	-16.684	-16.784	-0.101	(0)
Ni	1.084e-07					
Ni+2	6.649e-08	3.240e-08	-7.177	-7.490	-0.312	(0)
NiSO4	2.879e-08	2.879e-08	-7.541	-7.541	0.000	(0)

NiHCO3+	9.826e-09	7.795e-09	-8.008	-8.108	-0.101	(0)
NiCO3	2.863e-09	2.863e-09	-8.543	-8.543	0.000	(0)
NiCl+	2.214e-10	1.757e-10	-9.655	-9.755	-0.101	(0)
NiOH+	1.339e-10	1.063e-10	-9.873	-9.974	-0.101	(0)
NiF+	1.137e-10	9.017e-11	-9.944	-10.045	-0.101	(0)
Ni (SO4) 2-2	1.072e-11	4.245e-12	-10.970	-11.372	-0.402	(0)
Ni (OH) 2	2.199e-12	2.199e-12	-11.658	-11.658	0.000	(0)
NiNH3+2	1.008e-13	3.990e-14	-12.997	-13.399	-0.402	(0)
NiCl2	1.874e-15	1.874e-15	-14.727	-14.727	0.000	(0)
NiNO3+	1.064e-15	8.439e-16	-14.973	-15.074	-0.101	(0)
NiSeO4	9.470e-16	9.470e-16	-15.024	-15.024	0.000	(0)
Ni (OH) 3-	7.221e-16	5.728e-16	-15.141	-15.242	-0.101	(0)
Ni (NH3) 2+2	3.340e-20	1.322e-20	-19.476	-19.879	-0.402	(0)
O (0)	6.912e-35					
O2	3.456e-35	3.487e-35	-34.461	-34.458	0.004	(0)
Pb	3.146e-09					
PbCO3	1.557e-09	1.557e-09	-8.808	-8.808	0.000	(0)
PbSO4	4.770e-10	4.770e-10	-9.322	-9.322	0.000	(0)
Pb+2	4.488e-10	2.187e-10	-9.348	-9.660	-0.312	(0)
PbHCO3+	3.997e-10	3.171e-10	-9.398	-9.499	-0.101	(0)
PbOH+	1.804e-10	1.431e-10	-9.744	-9.844	-0.101	(0)
Pb (SO4) 2-2	3.232e-11	1.280e-11	-10.490	-10.893	-0.402	(0)
Pb (CO3) 2-2	2.686e-11	1.064e-11	-10.571	-10.973	-0.402	(0)
PbCl+	2.073e-11	1.644e-11	-10.683	-10.784	-0.101	(0)
PbF+	2.152e-12	1.707e-12	-11.667	-11.768	-0.101	(0)
Pb (OH) 2	1.179e-12	1.179e-12	-11.929	-11.929	0.000	(0)
PbCl2	1.557e-13	1.557e-13	-12.808	-12.808	0.000	(0)
PbF2	3.723e-15	3.723e-15	-14.429	-14.429	0.000	(0)
Pb (OH) 3-	3.871e-16	3.071e-16	-15.412	-15.513	-0.101	(0)
PbCl3-	1.656e-16	1.313e-16	-15.781	-15.882	-0.101	(0)
PbNO3+	4.228e-17	3.354e-17	-16.374	-16.474	-0.101	(0)
Pb2OH+3	3.987e-18	4.959e-19	-17.399	-18.305	-0.905	(0)
PbF3-	9.864e-19	7.825e-19	-18.006	-18.107	-0.101	(0)
PbCl4-2	3.213e-19	1.272e-19	-18.493	-18.895	-0.402	(0)
Pb (OH) 4-2	4.948e-20	1.959e-20	-19.306	-19.708	-0.402	(0)
PbF4-2	1.048e-22	4.150e-23	-21.980	-22.382	-0.402	(0)
Pb3 (OH) 4+2	1.531e-23	6.063e-24	-22.815	-23.217	-0.402	(0)
Pb (NO3) 2	5.908e-25	5.908e-25	-24.229	-24.229	0.000	(0)
Pb4 (OH) 4+4	4.284e-28	1.053e-29	-27.368	-28.978	-1.609	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.749	-152.749	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.528	-230.628	-0.101	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.927	-73.927	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.079	-79.179	-0.101	(0)
CdHS+	0.000e+00	0.000e+00	-79.547	-79.648	-0.101	(0)
H2S	0.000e+00	0.000e+00	-79.573	-79.573	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.729	-81.131	-0.402	(0)
S6-2	0.000e+00	0.000e+00	-81.245	-81.647	-0.402	(0)
S4-2	0.000e+00	0.000e+00	-81.325	-81.727	-0.402	(0)
S3-2	0.000e+00	0.000e+00	-82.131	-82.533	-0.402	(0)
S2-2	0.000e+00	0.000e+00	-83.147	-83.549	-0.402	(0)
S-2	0.000e+00	0.000e+00	-88.762	-89.066	-0.304	(0)
HgHS2-	0.000e+00	0.000e+00	-138.695	-138.795	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.688	-140.090	-0.402	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.815	-139.815	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.873	-149.077	-0.204	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.906	-149.007	-0.101	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.812	-150.175	-0.364	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.856	-149.957	-0.101	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.560	-150.905	-0.346	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.731	-151.104	-0.373	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.061	-151.415	-0.354	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.360	-151.360	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.623	-151.623	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.749	-152.749	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.085	-161.085	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.790	-218.891	-0.101	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.159	-227.259	-0.101	(0)

Cd (HS) 3-	0.000e+00	0.000e+00	-228.802	-228.902	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.424	-229.826	-0.402	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.528	-230.628	-0.101	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.127	-238.227	-0.101	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-305.484	-305.886	-0.402	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.497	-307.899	-0.402	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.772	-321.174	-0.402	(0)
S (6)	1.215e-02					
SO4-2	9.140e-03	4.453e-03	-2.039	-2.351	-0.312	(0)
CaSO4	1.407e-03	1.407e-03	-2.852	-2.852	0.000	(0)
MgSO4	1.299e-03	1.299e-03	-2.887	-2.887	0.000	(0)
NaSO4-	1.917e-04	1.614e-04	-3.717	-3.792	-0.075	(0)
KSO4-	9.538e-05	8.034e-05	-4.021	-4.095	-0.075	(0)
MnSO4	1.281e-05	1.281e-05	-4.892	-4.892	0.000	(0)
ZnSO4	1.471e-06	1.471e-06	-5.833	-5.833	0.000	(0)
Zn (SO4) 2-2	1.440e-07	5.704e-08	-6.841	-7.244	-0.402	(0)
CuSO4	5.719e-08	5.719e-08	-7.243	-7.243	0.000	(0)
NiSO4	2.879e-08	2.879e-08	-7.541	-7.541	0.000	(0)
CoSO4	2.115e-08	2.115e-08	-7.675	-7.675	0.000	(0)
HSO4-	2.011e-08	1.681e-08	-7.697	-7.774	-0.078	(0)
NH4SO4-	8.831e-09	7.414e-09	-8.054	-8.130	-0.076	(0)
CdSO4	3.487e-09	3.487e-09	-8.458	-8.458	0.000	(0)
Cd (SO4) 2-2	5.291e-10	2.095e-10	-9.276	-9.679	-0.402	(0)
PbSO4	4.770e-10	4.770e-10	-9.322	-9.322	0.000	(0)
AgSO4-	3.069e-10	2.435e-10	-9.513	-9.614	-0.101	(0)
CrOHSO4	4.977e-11	4.977e-11	-10.303	-10.303	0.000	(0)
Pb (SO4) 2-2	3.232e-11	1.280e-11	-10.490	-10.893	-0.402	(0)
AlSO4+	1.184e-11	9.893e-12	-10.927	-11.005	-0.078	(0)
Ni (SO4) 2-2	1.072e-11	4.245e-12	-10.970	-11.372	-0.402	(0)
FeSO4	2.305e-12	2.305e-12	-11.637	-11.637	0.000	(0)
UO2SO4	6.663e-13	6.663e-13	-12.176	-12.176	0.000	(0)
Al (SO4) 2-	5.648e-13	4.721e-13	-12.248	-12.326	-0.078	(0)
CrSO4+	1.083e-13	8.592e-14	-12.965	-13.066	-0.101	(0)
UO2 (SO4) 2-2	9.879e-14	3.912e-14	-13.005	-13.408	-0.402	(0)
VO2SO4-	1.651e-17	1.310e-17	-16.782	-16.883	-0.101	(0)
FeSO4+	3.452e-18	2.898e-18	-17.462	-17.538	-0.076	(0)
Cr2 (OH) 2SO4+2	5.350e-19	2.118e-19	-18.272	-18.674	-0.402	(0)
Fe (SO4) 2-	3.478e-19	2.759e-19	-18.459	-18.559	-0.101	(0)
VOSO4	6.092e-20	6.092e-20	-19.215	-19.215	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.604e-20	5.604e-20	-19.252	-19.252	0.000	(0)
HgSO4	1.945e-20	1.945e-20	-19.711	-19.711	0.000	(0)
CrO3SO4-2	8.111e-24	3.212e-24	-23.091	-23.493	-0.402	(0)
VSO4+	3.296e-34	2.615e-34	-33.482	-33.583	-0.101	(0)
U (SO4) 2	2.592e-39	2.592e-39	-38.586	-38.586	0.000	(0)
USO4+2	1.851e-40	0.000e+00	-39.733	-40.135	-0.402	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.169	-62.269	-0.101	(0)
Sb (3)	6.108e-20					
Sb (OH) 3	3.090e-20	3.090e-20	-19.510	-19.510	0.000	(0)
HSbO2	3.018e-20	3.018e-20	-19.520	-19.520	0.000	(0)
SbO2-	1.595e-24	1.265e-24	-23.797	-23.898	-0.101	(0)
Sb (OH) 4-	9.129e-25	7.242e-25	-24.040	-24.140	-0.101	(0)
Sb (OH) 2F	2.067e-25	2.067e-25	-24.685	-24.685	0.000	(0)
SbOF	2.034e-25	2.034e-25	-24.692	-24.692	0.000	(0)
Sb (OH) 2+	3.656e-26	2.900e-26	-25.437	-25.538	-0.101	(0)
SbO+	1.261e-26	1.000e-26	-25.899	-26.000	-0.101	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.772	-321.174	-0.402	(0)
Sb (5)	2.483e-08					
SbO3-	2.480e-08	1.968e-08	-7.605	-7.706	-0.101	(0)
Sb (OH) 6-	2.750e-11	2.297e-11	-10.561	-10.639	-0.078	(0)
SbO2+	1.062e-23	8.426e-24	-22.974	-23.074	-0.101	(0)
Se (-2)	4.736e-15					
Ag2Se	4.736e-15	4.736e-15	-14.325	-14.325	0.000	(0)
HSe-	3.770e-40	2.991e-40	-39.424	-39.524	-0.101	(0)
MnSe	0.000e+00	0.000e+00	-42.287	-42.287	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.047	-43.047	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.709	-47.111	-0.402	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.271	-85.881	-1.609	(0)
Se (4)	1.271e-07					

HSeO3-	1.053e-07	8.356e-08	-6.977	-7.078	-0.101	(0)
SeO3-2	2.175e-08	8.612e-09	-7.663	-8.065	-0.402	(0)
H2SeO3	1.377e-12	1.377e-12	-11.861	-11.861	0.000	(0)
AgSeO3-	1.912e-14	1.517e-14	-13.719	-13.819	-0.101	(0)
Cd (SeO3) 2-2	5.156e-19	2.042e-19	-18.288	-18.690	-0.402	(0)
Ag (SeO3) 2-3	9.402e-21	1.169e-21	-20.027	-20.932	-0.905	(0)
FeHSeO3+2	3.234e-23	1.281e-23	-22.490	-22.893	-0.402	(0)
Se (6)	1.286e-10					
SeO4-2	1.283e-10	6.250e-11	-9.892	-10.204	-0.312	(0)
MnSeO4	2.721e-13	2.721e-13	-12.565	-12.565	0.000	(0)
ZnSeO4	1.461e-14	1.461e-14	-13.835	-13.835	0.000	(0)
NiSeO4	9.470e-16	9.470e-16	-15.024	-15.024	0.000	(0)
CoSeO4	7.455e-16	7.455e-16	-15.128	-15.128	0.000	(0)
HSeO4-	1.525e-16	1.210e-16	-15.817	-15.917	-0.101	(0)
CdSeO4	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
Zn (SeO4) 2-2	2.338e-24	9.258e-25	-23.631	-24.033	-0.402	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.746	-58.651	-0.905	(0)
U (4)	4.588e-21					
U (OH) 5-	4.582e-21	3.635e-21	-20.339	-20.440	-0.101	(0)
U (OH) 4	5.883e-24	5.883e-24	-23.230	-23.230	0.000	(0)
U (OH) 3+	1.048e-27	8.314e-28	-26.980	-27.080	-0.101	(0)
U (OH) 2+2	3.752e-32	1.486e-32	-31.426	-31.828	-0.402	(0)
UF3+	2.822e-35	2.239e-35	-34.549	-34.650	-0.101	(0)
UF2+2	3.219e-36	1.275e-36	-35.492	-35.895	-0.402	(0)
UF4	2.720e-37	2.720e-37	-36.565	-36.565	0.000	(0)
UOH+3	2.175e-37	2.705e-38	-36.663	-37.568	-0.905	(0)
UF+3	7.347e-39	9.138e-40	-38.134	-39.039	-0.905	(0)
U (SO4) 2	2.592e-39	2.592e-39	-38.586	-38.586	0.000	(0)
UF5-	1.506e-39	1.194e-39	-38.822	-38.923	-0.101	(0)
USO4+2	1.851e-40	0.000e+00	-39.733	-40.135	-0.402	(0)
UF6-2	1.009e-40	0.000e+00	-39.996	-40.398	-0.402	(0)
U+4	0.000e+00	0.000e+00	-42.774	-44.384	-1.609	(0)
UCl+3	0.000e+00	0.000e+00	-44.452	-45.358	-0.905	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.117	-172.265	-8.147	(0)
U (5)	2.565e-16					
UO2+	2.565e-16	2.035e-16	-15.591	-15.691	-0.101	(0)
U (6)	3.249e-07					
UO2 (CO3) 3-4	2.127e-07	5.229e-09	-6.672	-8.282	-1.609	(0)
UO2 (CO3) 2-2	1.112e-07	4.405e-08	-6.954	-7.356	-0.402	(0)
UO2CO3	9.321e-10	9.321e-10	-9.031	-9.031	0.000	(0)
UO2OH+	4.087e-12	3.242e-12	-11.389	-11.489	-0.101	(0)
UO2F+	1.906e-12	1.512e-12	-11.720	-11.820	-0.101	(0)
UO2SO4	6.663e-13	6.663e-13	-12.176	-12.176	0.000	(0)
UO2F2	4.832e-13	4.832e-13	-12.316	-12.316	0.000	(0)
UO2+2	2.029e-13	9.885e-14	-12.693	-13.005	-0.312	(0)
UO2 (SO4) 2-2	9.879e-14	3.912e-14	-13.005	-13.408	-0.402	(0)
UO2F3-	1.695e-14	1.345e-14	-13.771	-13.871	-0.101	(0)
UO2Cl+	4.283e-16	3.398e-16	-15.368	-15.469	-0.101	(0)
(UO2) 2 (OH) 2+2	4.405e-17	1.744e-17	-16.356	-16.758	-0.402	(0)
UO2F4-2	2.989e-17	1.184e-17	-16.524	-16.927	-0.402	(0)
(UO2) 3 (OH) 5+	3.670e-18	2.911e-18	-17.435	-17.536	-0.101	(0)
UO2NO3+	2.579e-21	2.045e-21	-20.589	-20.689	-0.101	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.660	-42.761	-0.101	(0)
V+2	0.000e+00	0.000e+00	-43.284	-43.687	-0.402	(0)
V (3)	1.774e-15					
V (OH) 3	1.774e-15	1.774e-15	-14.751	-14.751	0.000	(0)
V (OH) 2+	5.585e-26	4.430e-26	-25.253	-25.354	-0.101	(0)
VOH+2	4.101e-29	1.624e-29	-28.387	-28.789	-0.402	(0)
V+3	1.000e-33	1.244e-34	-33.000	-33.905	-0.905	(0)
VSO4+	3.296e-34	2.615e-34	-33.482	-33.583	-0.101	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.786	-55.691	-0.905	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.170	-56.779	-1.609	(0)
V (4)	3.482e-18					
V (OH) 3+	3.253e-18	2.580e-18	-17.488	-17.588	-0.101	(0)
VO+2	1.254e-19	4.967e-20	-18.902	-19.304	-0.402	(0)
VOSO4	6.092e-20	6.092e-20	-19.215	-19.215	0.000	(0)

VOF+	4.161e-20	3.301e-20	-19.381	-19.481	-0.101	(0)
VOF2	1.372e-21	1.372e-21	-20.863	-20.863	0.000	(0)
VOC1+	3.723e-22	2.953e-22	-21.429	-21.530	-0.101	(0)
VOF3-	6.798e-24	5.392e-24	-23.168	-23.268	-0.101	(0)
VOF4-2	6.091e-27	2.412e-27	-26.215	-26.618	-0.402	(0)
H2V2O4+2	8.437e-31	3.341e-31	-30.074	-30.476	-0.402	(0)
V (5)	5.888e-09					
H2VO4-	5.208e-09	4.131e-09	-8.283	-8.384	-0.101	(0)
HVO4-2	6.785e-10	2.687e-10	-9.168	-9.571	-0.402	(0)
H3VO4	1.596e-12	1.596e-12	-11.797	-11.797	0.000	(0)
H3V2O7-	5.370e-14	4.260e-14	-13.270	-13.371	-0.101	(0)
HV2O7-3	3.026e-15	3.763e-16	-14.519	-15.424	-0.905	(0)
VO4-3	2.802e-16	3.486e-17	-15.552	-16.458	-0.905	(0)
VO2+	1.474e-16	1.231e-16	-15.832	-15.910	-0.078	(0)
VO2F	2.393e-17	2.393e-17	-16.621	-16.621	0.000	(0)
VO2SO4-	1.651e-17	1.310e-17	-16.782	-16.883	-0.101	(0)
V2O7-4	1.067e-17	2.622e-19	-16.972	-18.581	-1.609	(0)
VO2F2-	1.214e-18	9.629e-19	-17.916	-18.016	-0.101	(0)
V3O9-3	5.947e-19	7.397e-20	-18.226	-19.131	-0.905	(0)
VO2F3-2	3.361e-21	1.331e-21	-20.474	-20.876	-0.402	(0)
V4O12-4	5.185e-24	1.275e-25	-23.285	-24.895	-1.609	(0)
VO2NO3	6.460e-25	6.460e-25	-24.190	-24.190	0.000	(0)
VO2F4-3	5.834e-25	7.256e-26	-24.234	-25.139	-0.905	(0)
V10O28-6	0.000e+00	0.000e+00	-60.962	-64.583	-3.621	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.294	-63.809	-2.515	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.405	-66.014	-1.609	(0)
Zn	5.103e-06					
Zn+2	3.098e-06	1.509e-06	-5.509	-5.821	-0.312	(0)
ZnSO4	1.471e-06	1.471e-06	-5.833	-5.833	0.000	(0)
ZnCO3	2.057e-07	2.057e-07	-6.687	-6.687	0.000	(0)
Zn (SO4) 2-2	1.440e-07	5.704e-08	-6.841	-7.244	-0.402	(0)
ZnHCO3+	1.174e-07	9.315e-08	-6.930	-7.031	-0.101	(0)
ZnOH+	4.957e-08	3.932e-08	-7.305	-7.405	-0.101	(0)
ZnCl+	9.657e-09	8.035e-09	-8.015	-8.095	-0.080	(0)
ZnF+	4.207e-09	3.337e-09	-8.376	-8.477	-0.101	(0)
ZnOHCl	2.740e-09	2.740e-09	-8.562	-8.562	0.000	(0)
Zn (OH) 2	1.624e-09	1.624e-09	-8.790	-8.790	0.000	(0)
ZnCl2	2.699e-11	2.699e-11	-10.569	-10.569	0.000	(0)
Zn (OH) 3-	2.672e-12	2.120e-12	-11.573	-11.674	-0.101	(0)
ZnCl3-	5.461e-14	4.543e-14	-13.263	-13.343	-0.080	(0)
ZnNO3+	4.957e-14	3.932e-14	-13.305	-13.405	-0.101	(0)
ZnSeO4	1.461e-14	1.461e-14	-13.835	-13.835	0.000	(0)
ZnCl4-2	9.693e-17	4.815e-17	-16.014	-16.317	-0.304	(0)
Zn (OH) 4-2	5.552e-17	2.198e-17	-16.256	-16.658	-0.402	(0)
Zn (NO3) 2	8.136e-23	8.136e-23	-22.090	-22.090	0.000	(0)
Zn (SeO4) 2-2	2.338e-24	9.258e-25	-23.631	-24.033	-0.402	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.856	-149.957	-0.101	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.360	-151.360	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.159	-227.259	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.424	-229.826	-0.402	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.497	-307.899	-0.402	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-56.46	-50.17	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-44.06	-39.55	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-51.29	-39.55	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-72.81	-54.88	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-58.98	-38.95	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.33	-28.93	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.27	-23.82	0.45	(NH4) 2SeO4
Acanthite	-52.67	-88.89	-36.22	Ag2S
Ag2CO3	-11.66	-22.75	-11.09	Ag2CO3
Ag2CrO4	-20.84	-32.43	-11.59	Ag2CrO4
Ag2HVO4	-12.28	-10.80	1.48	Ag2HVO4
Ag2MoO4	-11.64	-23.19	-11.55	Ag2MoO4

Ag2O	-14.87	-2.30	12.57	Ag2O
Ag2Se	-0.54	-49.24	-48.70	Ag2Se
Ag2SeO3	-9.64	-16.79	-7.15	Ag2SeO3
Ag2SeO4	-18.42	-27.33	-8.91	Ag2SeO4
Ag2SO4	-14.66	-19.48	-4.82	Ag2SO4
Ag3AsO3	-28.19	-26.03	2.16	Ag3AsO3
Ag3AsO4	-16.37	-19.16	-2.79	Ag3AsO4
Ag3H2VO5	-17.12	-11.94	5.18	Ag3H2VO5
AgF:4H2O	-13.57	-12.52	1.05	AgF:4H2O
Agmetal	-0.53	-14.03	-13.51	Ag
AgVO3	-10.42	-9.65	0.77	AgVO3
Al(OH)3(am)	-1.10	9.70	10.80	Al(OH)3
Al2(MoO4)3	-45.65	-43.29	2.37	Al2(MoO4)3
Al2O3	-0.26	19.39	19.65	Al2O3
Al4(OH)10SO4	-1.10	21.60	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.82	-6.02	4.80	AlAsO4:2H2O
AlOHSO4	-4.25	-7.48	-3.23	AlOHSO4
AlSb	-152.74	-87.12	65.62	AlSb
Alunite	0.95	-0.45	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.85	-5.21	-4.36	CaSO4
Anilite	-56.75	-88.63	-31.88	Cu0.25Cu1.5S
Antlerite	-3.24	5.55	8.79	Cu3(OH)4SO4
Aragonite	-0.19	-8.49	-8.30	CaCO3
Arsenolite	-87.57	-90.33	-2.76	As4O6
Artinite	-5.99	3.61	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.13	-31.42	6.71	As2O5
Atacamite	-2.33	5.06	7.39	Cu2(OH)3Cl
Azurite	-1.27	-18.18	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.00	7.40	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.06	-2.19	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.31	-9.22	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-27.73	5.21	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.06	-22.73	-9.67	BaCrO4
BaF2	-9.52	-15.34	-5.82	BaF2
BaMoO4	-6.53	-13.49	-6.96	BaMoO4
Barite	0.20	-9.78	-9.98	BaSO4
BaS	-95.37	-79.19	16.18	BaS
BaSeO3	-8.92	-7.09	1.83	BaSeO3
BaSeO4	-10.17	-17.63	-7.46	BaSeO4
Bianchite	-6.41	-8.17	-1.76	ZnSO4:6H2O
Birnessite	-7.64	10.45	18.09	MnO2
Bixbyite	-4.22	-4.86	-0.64	Mn2O3
BlaubleiI	-56.14	-80.30	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.86	-84.14	-27.28	Cu0.6Cu0.8S
Boehmite	1.12	9.70	8.58	AlOOH
Breithauptite	-58.07	-76.60	-18.52	NiSb
Brochantite	-2.10	13.12	15.22	Cu4(OH)6SO4
Brucite	-4.81	12.03	16.84	Mg(OH)2
Bunsenite	-5.11	7.34	12.45	NiO
Ca(VO3)2	-10.69	-5.03	5.66	Ca(VO3)2
Ca2V2O7	-10.56	6.94	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.61	6.94	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.83	4.47	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.06	18.90	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.96	18.90	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.71	-157.74	142.97	Ca3Sb2
CaCrO4	-15.90	-18.17	-2.27	CaCrO4
Calcite	-0.01	-8.49	-8.48	CaCO3
Calomel	-7.14	-25.05	-17.91	Hg2Cl2
CaMoO4	-0.98	-8.93	-7.95	CaMoO4
Carnotite	-2.09	-1.86	0.23	KUO2VO4
CaSeO3:2H2O	-5.34	-2.53	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.05	-13.07	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.66	-2.82	9.84	Cd(BO2)2
Cd(OH)2	-7.29	6.35	13.64	Cd(OH)2
Cd(OH)2(am)	-7.38	6.35	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.02	-15.31	6.71	Cd3(OH)2(SO4)2

Cd3(OH)4SO4	-20.69	1.87	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.18	8.22	28.40	Cd4(OH)6SO4
CdCl2	-13.17	-13.82	-0.66	CdCl2
CdCl2:1H2O	-12.13	-13.82	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.91	-13.82	-1.91	CdCl2:2.5H2O
CdF2	-15.17	-16.39	-1.21	CdF2
Cdmetal(alpha)	-32.93	-19.42	13.51	Cd
Cdmetal(gamma)	-33.04	-19.42	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-7.27	-3.74	3.54	CdOHCl
CdSb	-77.23	-77.58	-0.35	CdSb
CdSe	-20.39	-40.59	-20.20	CdSe
CdSeO4:2H2O	-16.83	-18.68	-1.85	CdSeO4:2H2O
CdSO4	-10.66	-10.83	-0.17	CdSO4
CdSO4:1H2O	-9.10	-10.83	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.96	-10.83	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-2.16	-15.29	-13.13	PbCO3
CH4(g)	-82.48	-123.53	-41.05	CH4
Chalcanthite	-6.96	-9.60	-2.64	CuSO4:5H2O
Chalcocite	-56.91	-91.83	-34.92	Cu2S
Chalcopyrite	-127.19	-162.46	-35.27	CuFeS2
Cinnabar	-52.04	-97.74	-45.69	HgS
Claudetite	-87.26	-90.33	-3.06	As4O6
Clausthalite	-14.67	-41.77	-27.10	PbSe
Co(BO2)2	-29.04	-1.97	27.07	Co(BO2)2
Co(OH)2	-5.89	7.20	13.09	Co(OH)2
Co(OH)3	-10.00	-12.31	-2.31	Co(OH)3
CO2(g)	-2.30	-20.45	-18.15	CO2
Co3(AsO4)2	-22.85	-9.82	13.03	Co3(AsO4)2
Co3O4	-6.93	-17.42	-10.50	Co3O4
CoCl2	-21.24	-12.97	8.27	CoCl2
CoCl2:6H2O	-15.51	-12.97	2.54	CoCl2:6H2O
CoCO3	-3.27	-13.25	-9.98	CoCO3
CoF2	-13.94	-15.53	-1.60	CoF2
CoF3	-44.96	-46.42	-1.46	CoF3
CoFe2O4	16.74	13.21	-3.53	CoFe2O4
CoMoO4	-5.93	-13.69	-7.76	CoMoO4
CoO	-6.38	7.20	13.59	CoO
CoS(alpha)	-71.95	-79.39	-7.44	CoS
CoS(beta)	-68.32	-79.39	-11.07	CoS
CoSe	-23.53	-39.73	-16.20	CoSe
CoSeO3	-8.61	-7.29	1.32	CoSeO3
CoSeO4:6H2O	-16.30	-17.83	-1.53	CoSeO4:6H2O
CoSO4	-12.78	-9.97	2.80	CoSO4
CoSO4:6H2O	-7.50	-9.98	-2.47	CoSO4:6H2O
Cotunnite	-10.23	-15.01	-4.78	PbCl2
Covellite	-56.72	-79.02	-22.30	CuS
Cr(OH)2	-22.17	-11.35	10.82	Cr(OH)2
Cr(OH)3	-2.75	-1.41	1.34	Cr(OH)3
Cr(OH)3(am)	-0.66	-1.41	-0.75	Cr(OH)3
Cr2O3	-0.47	-2.83	-2.36	Cr2O3
CrCl2	-45.62	-31.52	14.09	CrCl2
CrCl3	-46.79	-31.67	15.11	CrCl3
CrF3	-24.18	-35.52	-11.34	CrF3
Crmetal	-67.60	-37.12	30.48	Cr
CrO3	-26.93	-30.14	-3.21	CrO3
Cryolite	-8.95	-42.79	-33.84	Na3AlF6
Cu(OH)2	-1.10	7.57	8.67	Cu(OH)2
Cu(SbO3)2	-25.12	20.09	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.50	-0.25	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.98	-91.86	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.38	-52.18	-45.80	Cu2Se
Cu2SO4	-20.47	-22.42	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.80	-8.70	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-62.08	-104.68	-42.59	Cu3Sb
Cu3Se2	-28.05	-91.54	-63.49	Cu3Se2
CuCO3	-1.38	-12.88	-11.50	CuCO3

CuCrO4	-17.12	-22.56	-5.44	CuCrO4
CuF	-9.08	-13.99	-4.91	CuF
CuF2	-16.28	-15.16	1.12	CuF2
CuF2:2H2O	-10.61	-15.16	-4.55	CuF2:2H2O
Cumetal	-6.75	-15.50	-8.76	Cu
CuMoO4	-0.24	-13.32	-13.08	CuMoO4
CuOCuSO4	-12.33	-2.03	10.30	CuOCuSO4
Cupricferrite	7.59	13.58	5.99	CuFe2O4
Cuprite	-3.83	-5.24	-1.41	Cu2O
Cuprousferrite	9.30	0.38	-8.92	CuFeO2
CuSe	-6.26	-39.36	-33.10	CuSe
CuSe2	-27.17	-60.53	-33.37	CuSe2
CuSeO3:2H2O	-7.43	-6.92	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.02	-17.46	-2.44	CuSeO4:5H2O
CuSO4	-12.54	-9.60	2.94	CuSO4
Diaspore	2.82	9.70	6.87	AlOOH
Djurleite	-57.07	-90.99	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.37	-16.91	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.18	-16.91	-17.09	CaMg(CO3)2
Epsomite	-3.02	-5.15	-2.13	MgSO4:7H2O
Fe(OH)2	-10.41	3.15	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.02	-0.02	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.12	-13.84	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.04	-8.49	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.84	-37.47	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.79	-45.53	-3.73	Fe2(SO4)3
Fe3(OH)8	-11.07	9.15	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.11	-12.71	0.40	FeAsO4:2H2O
FeCr2O4	-6.88	0.32	7.20	FeCr2O4
FeMoO4	-7.65	-17.74	-10.09	FeMoO4
Ferrihydrite	-0.19	3.00	3.19	Fe(OH)3
Ferroselite	-46.36	-64.96	-18.60	FeSe2
FeS(ppt)	-80.49	-83.44	-2.95	FeS
FeSe	-32.79	-43.79	-11.00	FeSe
Fix_pe	-5.47	-5.47	0.00	e-
Fluorite	-0.27	-10.77	-10.50	CaF2
Galena	-67.46	-81.43	-13.97	PbS
Gibbsite	1.40	9.70	8.29	Al(OH)3
Goethite	2.51	3.00	0.49	FeOOH
Goslarite	-6.16	-8.17	-2.01	ZnSO4:7H2O
Greenockite	-65.88	-80.24	-14.36	CdS
Greigite	-292.18	-337.21	-45.03	Fe3S4
Gummite	-5.85	1.82	7.67	UO3
Gypsum	-0.60	-5.21	-4.61	CaSO4:2H2O
H-Jarosite	-13.25	-25.35	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.02	-20.89	-12.88	H2MoO4
H2S(g)	-78.58	-86.59	-8.01	H2S
H2Se(g)	-41.98	-46.94	-4.96	H2Se
Halite	-6.45	-4.84	1.60	NaCl
Hausmannite	-5.16	55.87	61.03	Mn3O4
Hematite	7.42	6.00	-1.42	Fe2O3
Hercynite	-0.35	22.54	22.89	FeAl2O4
Hg(CH3)2(g)	-184.49	-258.20	-73.71	Hg(CH3)2
Hg(g)	-7.45	-15.32	-7.87	Hg
Hg(OH)2	-7.65	-11.15	-3.50	Hg(OH)2
Hg2(g)	-15.69	-30.64	-14.96	Hg2
Hg2(OH)2	-10.14	-4.88	5.26	Hg2(OH)2
Hg2CO3	-9.28	-25.33	-16.05	Hg2CO3
Hg2CrO4	-26.31	-35.01	-8.70	Hg2CrO4
Hg2F2	-17.25	-27.61	-10.36	Hg2F2
Hg2S	-79.79	-91.47	-11.68	Hg2S
Hg2SeO3	-14.71	-19.37	-4.66	Hg2SeO3
Hg2SO4	-15.92	-22.05	-6.13	Hg2SO4
Hg3O2CO3	-24.21	-53.89	-29.68	Hg3O2CO3
HgCl(g)	-32.02	-12.52	19.50	HgCl
HgCl2	-10.06	-31.32	-21.26	HgCl2
HgF(g)	-46.48	-13.81	32.68	HgF
HgF2(g)	-46.45	-33.88	12.57	HgF2

Hgmetal (1)	-1.87	-15.32	-13.45	Hg
HgSe	-2.39	-58.08	-55.69	HgSe
HgSeO3	-13.21	-25.64	-12.43	HgSeO3
HgSO4	-18.90	-28.32	-9.42	HgSO4
Huntite	-3.78	-33.75	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.64	-25.41	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.89	-21.65	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.67	-19.84	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.73	-20.53	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.39	-50.63	-17.24	K2Cr2O7
K2CrO4	-19.98	-20.50	-0.51	K2CrO4
K2MoO4	-14.52	-11.25	3.26	K2MoO4
K2SeO4	-14.66	-15.39	-0.73	K2SeO4
Langite	-4.37	13.12	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.41	-6.85	-0.43	PbO : PbSO4
Laurionite	-5.54	-4.92	0.62	PbOHCl
Lepidocrocite	1.63	3.00	1.37	FeOOH
Lime	-20.73	11.97	32.70	CaO
Litharge	-7.53	5.17	12.69	PbO
Mackinawite	-79.84	-83.44	-3.60	FeS
Maghemite	-0.38	6.00	6.39	Fe2O3
Magnesioferrite	1.18	18.04	16.86	Fe2MgO4
Magnesite	-0.96	-8.42	-7.46	MgCO3
Magnetite	5.75	9.15	3.40	Fe3O4
Malachite	0.00	-5.30	-5.31	Cu2 (OH) 2CO3
Manganite	-2.42	22.92	25.34	MnOOH
Massicot	-7.73	5.17	12.89	PbO
Matlockite	-7.32	-16.29	-8.97	PbClF
Melanothallite	-18.86	-12.60	6.26	CuCl2
Melanterite	-11.82	-14.03	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.64	-97.74	-45.09	HgS
Mg (OH) 2 (active)	-6.76	12.03	18.79	Mg (OH) 2
Mg (VO3) 2	-16.24	-4.96	11.28	Mg (VO3) 2
Mg2Sb3	-276.65	-201.96	74.68	Mg2Sb3
Mg2V2O7	-19.29	7.07	26.36	Mg2V2O7
MgCr2O4	-7.00	9.21	16.20	MgCr2O4
MgCrO4	-23.49	-18.10	5.38	MgCrO4
MgF2	-2.58	-10.71	-8.13	MgF2
MgMoO4	-7.01	-8.86	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.52	-2.46	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.80	-13.00	-1.20	MgSeO4 : 6H2O
Minium	-32.26	41.27	73.52	Pb3O4
Mirabilite	-5.58	-6.70	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.86	-6.96	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.68	-56.39	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.71	-89.63	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.82	-1.32	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.85	-10.14	2.72	MnCl2 : 4H2O
MnS (grn)	-76.73	-76.56	0.17	MnS
MnS (pnk)	-79.90	-76.56	3.34	MnS
MnSb	-96.34	-99.25	-2.91	MnSb
MnSe	-40.40	-36.90	3.50	MnSe
MnSeO3	-5.59	-4.46	1.13	MnSeO3
MnSeO3 : 2H2O	-5.44	-4.46	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.95	-15.00	-2.05	MnSeO4 : 5H2O
MnSO4	-9.73	-7.14	2.58	MnSO4
Monteponite	-8.75	6.35	15.10	CdO
Montroydite	-7.51	-11.15	-3.64	HgO
MoO3	-12.89	-20.89	-8.00	MoO3
Morenosite	-7.70	-9.84	-2.14	NiSO4 : 7H2O
MoS2	-149.59	-219.85	-70.26	MoS2
Na-Jarosite	-8.91	-20.11	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.89	-49.79	-9.90	Na2Cr2O7
Na2CrO4	-22.58	-19.65	2.93	Na2CrO4
Na2Mo2O7	-14.70	-31.30	-16.60	Na2Mo2O7
Na2MoO4	-11.90	-10.41	1.49	Na2MoO4
Na2MoO4 : 2H2O	-11.63	-10.41	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-14.31	-4.01	10.30	Na2SeO3 : 5H2O

Na2SeO4	-15.83	-14.55	1.28	Na2SeO4
Na3Sb	-175.54	-81.09	94.45	Na3Sb
Na3VO4	-29.45	7.23	36.68	Na3VO4
Na4V2O7	-33.42	3.98	37.40	Na4V2O7
Nantokite	-5.98	-12.71	-6.73	CuCl
NaSb	-88.97	-65.80	23.17	NaSb
Natron	-8.66	-9.97	-1.31	Na2CO3:10H2O
NaVO3	-7.11	-3.25	3.86	NaVO3
Nesquehonite	-3.75	-8.42	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.46	7.34	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-25.12	-9.42	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-19.83	12.17	32.00	Ni4 (OH) 6SO4
NiCO3	-6.25	-13.12	-6.87	NiCO3
NiMoO4	-2.41	-13.56	-11.14	NiMoO4
NiS (alpha)	-73.66	-79.26	-5.60	NiS
NiS (beta)	-68.16	-79.26	-11.10	NiS
NiS (gamma)	-66.46	-79.26	-12.80	NiS
NiSe	-21.90	-39.60	-17.70	NiSe
NiSeO3:2H2O	-9.97	-7.15	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.18	-17.70	-1.52	NiSeO4:6H2O
Nsutite	-7.05	10.45	17.50	MnO2
O2 (g)	-31.55	51.54	83.09	O2
Orpiment	-243.87	-304.94	-61.07	As2S3
Otavite	-2.10	-14.10	-12.00	CdCO3
Pb (BO2) 2	-10.52	-4.00	6.52	Pb (BO2) 2
Pb (OH) 2	-2.98	5.17	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-62.29	-71.05	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.55	0.24	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.86	10.33	26.19	Pb2O (OH) 2
Pb2O3	-24.94	36.10	61.04	Pb2O3
Pb2OCO3	-9.56	-10.12	-0.56	Pb2OCO3
Pb2V2O7	-4.76	-6.66	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.73	-15.93	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.64	-1.50	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.97	-4.95	11.02	Pb3O2CO3
Pb3O2SO4	-12.37	-1.68	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.62	3.48	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.39	3.49	21.88	Pb4O3SO4
PbCrO4	-12.37	-24.97	-12.60	PbCrO4
PbF2	-10.13	-17.57	-7.44	PbF2
Pbmetal	-24.85	-20.60	4.25	Pb
PbMoO4	-0.11	-15.73	-15.62	PbMoO4
PbO:0.3H2O	-7.81	5.17	12.98	PbO:0.33H2O
PbSeO4	-13.02	-19.86	-6.84	PbSeO4
Periclase	-9.55	12.03	21.58	MgO
Phosgenite	-10.48	-30.29	-19.81	PbCl2:PbCO3
Plattnerite	-18.67	30.93	49.60	PbO2
Portlandite	-10.84	11.97	22.80	Ca (OH) 2
Pyrite	-125.76	-144.27	-18.51	FeS2
Pyrochroite	-5.16	10.03	15.19	Mn (OH) 2
Pyrolusite	-5.58	35.80	41.38	MnO2
Realgar	-102.31	-122.06	-19.75	AsS
Retgersite	-7.80	-9.84	-2.04	NiSO4:6H2O
Rhodochrosite	0.16	-10.42	-10.58	MnCO3
Rutherfordine	-4.13	-18.63	-14.50	UO2CO3
Sb (OH) 3	-12.40	-19.51	-7.11	Sb (OH) 3
Sb2O4	-16.65	-13.25	3.40	Sb2O4
Sb2O5	-26.43	-36.10	-9.67	Sb2O5
Sb2Se3	-112.07	-179.83	-67.76	Sb2Se3
Sb4O6 (cubic)	-59.78	-78.04	-18.26	Sb4O6
Sb4O6 (orth)	-60.14	-78.04	-17.90	Sb4O6
SbCl3	-50.34	-49.77	0.57	SbCl3
SbF3	-43.39	-53.61	-10.23	SbF3
Sbmetal	-46.47	-58.16	-11.69	Sb
SbO2	-3.11	-30.94	-27.82	SbO2
Schoepite	-4.17	1.82	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.06	-21.17	-7.11	Se
Semetal (hex)	-13.46	-21.17	-7.71	Se

Senarmontite	-26.65	-39.02	-12.37	Sb2O3
SeO2	-14.62	-14.49	0.12	SeO2
SeO3	-46.07	-25.03	21.04	SeO3
Siderite	-7.06	-17.30	-10.24	FeCO3
Smithsonite	-1.45	-11.45	-10.00	ZnCO3
Sphalerite	-66.14	-77.59	-11.45	ZnS
Spinel	-5.43	31.42	36.85	MgAl2O4
Stibnite	-248.34	-298.80	-50.46	Sb2S3
Sulfur	-58.68	-60.82	-2.14	S
Tenorite	-0.07	7.57	7.64	CuO
Thenardite	-7.01	-6.69	0.32	Na2SO4
Thermonatrite	-10.60	-9.97	0.64	Na2CO3:H2O
Tyuyamunite	-5.47	-1.39	4.08	Ca(UO2)2(VO4)2
U3O8	-13.74	7.34	21.08	U3O8
U3Sb4	-583.84	-431.46	152.38	U3Sb4
U4O9	-30.14	-33.16	-3.02	U4O9
UF4	-30.67	-60.21	-29.54	UF4
UF4:2.5H2O	-27.49	-60.21	-32.72	UF4:2.5H2O
UO2(am)	-15.67	-14.73	0.93	UO2
UO2(NO3)2	-41.12	-28.97	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.82	-28.97	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.36	-28.97	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.02	-28.97	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.79	1.82	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.96	-23.21	-2.25	UO2SeO4:4H2O
UO3	-5.88	1.82	7.70	UO3
Uraninite	-10.06	-14.73	-4.67	UO2
USb2	-221.39	-191.81	29.58	USb2
V(OH)3	-19.26	-11.67	7.59	V(OH)3
V2O5	-15.63	-16.99	-1.36	V2O5
V3O5	-41.04	-39.20	1.84	V3O5
V4O7	-50.87	-43.68	7.19	V4O7
V6O13	-41.66	-102.52	-60.86	V6O13
Valentinite	-30.54	-39.02	-8.48	Sb2O3
VC12	-63.60	-44.72	18.87	VC12
VC13	-65.36	-41.93	23.43	VC13
VF4	-64.88	-49.95	14.93	VF4
Vmetal	-94.34	-50.32	44.03	V
VO	-39.31	-24.55	14.76	VO
VO(OH)2	-9.63	-4.48	5.15	VO(OH)2
VO2Cl	-21.42	-18.58	2.84	VO2Cl
VOC1	-32.91	-21.75	11.15	VOC1
VOC12	-37.41	-24.65	12.76	VOC12
VOSO4	-25.26	-21.66	3.61	VOSO4
Witherite	-4.48	-13.05	-8.57	BaCO3
Wurtzite	-68.64	-77.59	-8.95	ZnS
Zincite	-2.33	9.00	11.33	ZnO
Zincosite	-12.10	-8.17	3.93	ZnSO4
Zn(BO2)2	-8.45	-0.16	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.11	-21.79	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.20	9.00	12.20	Zn(OH)2
Zn(OH)2(am)	-3.47	9.00	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.75	9.00	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.53	9.00	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.73	9.00	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.67	0.83	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.27	7.92	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.06	-4.41	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.25	-7.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.56	18.84	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.65	24.85	38.50	Zn5(OH)8Cl2
ZnCl2	-18.22	-11.17	7.05	ZnCl2
ZnCO3:1H2O	-1.19	-11.45	-10.26	ZnCO3:1H2O
ZnF2	-13.20	-13.73	-0.53	ZnF2
Znmetal	-42.55	-16.76	25.79	Zn
ZnMoO4	-1.76	-11.89	-10.13	ZnMoO4
ZnO(active)	-2.18	9.00	11.19	ZnO
ZnS(am)	-68.54	-77.59	-9.05	ZnS

ZnSb	-85.94	-74.93	11.01	ZnSb
ZnSe	-23.53	-37.93	-14.40	ZnSe
ZnSeO4:6H2O	-14.51	-16.03	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.53	-8.17	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 61.

```

Title Stage 3 Pit wall interaction mix calculator
MIX 304
309 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000274
11 0.004118
12 0.003936
13 0.004467
14 0
15 0
Save solution 310
end

```

TITLE

Stage 3 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 304.

Mixture 304.

```

0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.740e-04 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
4.118e-03 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

```

3.936e-03 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
4.467e-03 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 309 Solution after simulation 60.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.799e-08	1.824e-08
Al	3.249e-06	3.295e-06
As	2.601e-10	2.638e-10
B	2.603e-05	2.640e-05
Ba	7.864e-08	7.975e-08
C	2.585e-03	2.621e-03
Ca	4.255e-03	4.315e-03
Cd	1.181e-08	1.198e-08
Cl	2.505e-03	2.541e-03
Co	8.614e-08	8.736e-08
Cr	2.173e-09	2.204e-09
Cu	1.046e-06	1.061e-06
F	1.576e-04	1.599e-04
Fe	1.844e-09	1.870e-09
Hg	1.766e-09	1.791e-09
K	3.107e-03	3.151e-03
Mg	4.596e-03	4.661e-03
Mn	5.388e-05	5.464e-05
Mo	1.740e-06	1.765e-06
N	8.077e-06	8.191e-06
Na	8.176e-03	8.292e-03
Ni	1.071e-07	1.086e-07
Pb	3.140e-09	3.184e-09
S	1.200e-02	1.217e-02
Sb	2.453e-08	2.487e-08
Se	1.257e-07	1.274e-07
U	3.210e-07	3.255e-07
V	5.985e-09	6.070e-09
Zn	5.040e-06	5.111e-06

-----Description of solution-----

	pH =	7.407	Charge balance
	pe =	5.479	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	3.846e-02	
	Mass of water (kg) =	1.014e+00	
	Total alkalinity (eq/kg) =	2.443e-03	
	Total CO2 (mol/kg) =	2.585e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	9.691e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	4	
	Total H =	1.125834e+02	
	Total O =	5.634691e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.101e-07	2.570e-07	-6.508	-6.590	-0.082	(0)

H+	4.684e-08	3.916e-08	-7.329	-7.407	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.799e-08					
AgCl	1.171e-08	1.171e-08	-7.932	-7.932	0.000	(0)
Ag+	3.274e-09	2.737e-09	-8.485	-8.563	-0.078	(0)
AgCl2-	2.689e-09	2.136e-09	-8.570	-8.670	-0.100	(0)
AgSO4-	3.037e-10	2.413e-10	-9.518	-9.618	-0.100	(0)
AgCl3-2	1.002e-11	3.987e-12	-10.999	-11.399	-0.400	(0)
AgNO2	3.709e-12	3.709e-12	-11.431	-11.431	0.000	(0)
AgF	7.563e-13	7.563e-13	-12.121	-12.121	0.000	(0)
AgCl4-3	1.355e-13	1.705e-14	-12.868	-13.768	-0.900	(0)
AgOH	7.035e-14	7.035e-14	-13.153	-13.153	0.000	(0)
AgSeO3-	1.867e-14	1.483e-14	-13.729	-13.829	-0.100	(0)
AgH2BO3	1.655e-14	1.655e-14	-13.781	-13.781	0.000	(0)
AgNH3+	1.576e-14	1.252e-14	-13.802	-13.902	-0.100	(0)
Ag2Se	4.509e-15	4.509e-15	-14.346	-14.346	0.000	(0)
Ag (NO2) 2-	4.690e-17	3.725e-17	-16.329	-16.429	-0.100	(0)
AgNO3	2.247e-17	2.247e-17	-16.648	-16.648	0.000	(0)
Ag (OH) 2-	2.224e-18	1.767e-18	-17.653	-17.753	-0.100	(0)
Ag (NH3) 2+	2.869e-19	2.279e-19	-18.542	-18.642	-0.100	(0)
Ag (SeO3) 2-3	8.891e-21	1.119e-21	-20.051	-20.951	-0.900	(0)
Ag2MoO4	2.411e-24	2.411e-24	-23.618	-23.618	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.940	-73.940	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.328	-85.928	-1.600	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.905	-149.108	-0.203	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.932	-149.032	-0.100	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.768	-151.141	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.098	-151.452	-0.354	(0)
Al	3.249e-06					
Al (OH) 4-	3.111e-06	2.602e-06	-5.507	-5.585	-0.078	(0)
Al (OH) 3	8.044e-08	8.044e-08	-7.095	-7.095	0.000	(0)
AlF3	1.995e-08	1.995e-08	-7.700	-7.700	0.000	(0)
Al (OH) 2+	1.861e-08	1.569e-08	-7.730	-7.804	-0.074	(0)
AlF2+	1.709e-08	1.440e-08	-7.767	-7.842	-0.074	(0)
AlF4-	1.315e-09	1.100e-09	-8.881	-8.959	-0.078	(0)
AlF+2	6.515e-10	3.289e-10	-9.186	-9.483	-0.297	(0)
AlOH+2	1.522e-10	7.685e-11	-9.818	-10.114	-0.297	(0)
AlSO4+	1.226e-11	1.025e-11	-10.912	-10.989	-0.078	(0)
Al+3	1.498e-12	2.990e-13	-11.825	-12.524	-0.700	(0)
Al (SO4) 2-	5.801e-13	4.853e-13	-12.236	-12.314	-0.078	(0)
AlMo6O21-3	3.185e-38	4.008e-39	-37.497	-38.397	-0.900	(0)
As (3)	2.896e-23					
H3AsO3	2.849e-23	2.849e-23	-22.545	-22.545	0.000	(0)
H2AsO3-	4.697e-25	3.731e-25	-24.328	-24.428	-0.100	(0)
HAsO3-2	2.183e-29	8.689e-30	-28.661	-29.061	-0.400	(0)
H4AsO3+	6.958e-31	5.527e-31	-30.157	-30.258	-0.100	(0)
AsO3-3	6.799e-35	8.554e-36	-34.168	-35.068	-0.900	(0)
As (5)	2.601e-10					
HAsO4-2	2.206e-10	8.779e-11	-9.656	-10.057	-0.400	(0)
H2AsO4-	3.947e-11	3.135e-11	-10.404	-10.504	-0.100	(0)
AsO4-3	5.634e-14	7.089e-15	-13.249	-14.149	-0.900	(0)
H3AsO4	2.115e-16	2.134e-16	-15.675	-15.671	0.004	(0)
B	2.603e-05					
H3BO3	2.550e-05	2.572e-05	-4.594	-4.590	0.004	(0)
H2BO3-	4.652e-07	3.815e-07	-6.332	-6.418	-0.086	(0)
CaH2BO3+	3.667e-08	3.007e-08	-7.436	-7.522	-0.086	(0)
MgH2BO3+	2.565e-08	2.103e-08	-7.591	-7.677	-0.086	(0)
NaH2BO3	4.035e-09	4.035e-09	-8.394	-8.394	0.000	(0)
BF (OH) 3-	1.377e-09	1.129e-09	-8.861	-8.947	-0.086	(0)
H5 (BO3) 2-	1.019e-11	8.353e-12	-10.992	-11.078	-0.086	(0)
BF2 (OH) 2-	6.343e-13	5.202e-13	-12.198	-12.284	-0.086	(0)
BaH2BO3+	5.463e-13	4.480e-13	-12.263	-12.349	-0.086	(0)
H8 (BO3) 3-	2.620e-14	2.149e-14	-13.582	-13.668	-0.086	(0)
AgH2BO3	1.655e-14	1.655e-14	-13.781	-13.781	0.000	(0)
BF3OH-	1.064e-18	8.722e-19	-17.973	-18.059	-0.086	(0)
BF4-	2.256e-23	1.850e-23	-22.647	-22.733	-0.086	(0)
Ba	7.864e-08					
Ba+2	7.776e-08	3.800e-08	-7.109	-7.420	-0.311	(0)

BaHCO3+	8.290e-10	7.021e-10	-9.081	-9.154	-0.072	(0)
BaCO3	4.514e-11	4.514e-11	-10.345	-10.345	0.000	(0)
BaH2BO3+	5.463e-13	4.480e-13	-12.263	-12.349	-0.086	(0)
BaOH+	5.074e-14	4.263e-14	-13.295	-13.370	-0.076	(0)
BaNO3+	2.478e-15	1.969e-15	-14.606	-14.706	-0.100	(0)
BaNH3+2	1.349e-16	5.370e-17	-15.870	-16.270	-0.400	(0)
C (4)	2.585e-03					
HCO3-	2.295e-03	1.935e-03	-2.639	-2.713	-0.074	(0)
H2CO3	1.704e-04	1.704e-04	-3.769	-3.769	0.000	(0)
CaHCO3+	5.827e-05	4.935e-05	-4.235	-4.307	-0.072	(0)
MgHCO3+	3.781e-05	3.148e-05	-4.422	-4.502	-0.080	(0)
NaHCO3	7.260e-06	7.260e-06	-5.139	-5.139	0.000	(0)
CaCO3	5.029e-06	5.029e-06	-5.299	-5.299	0.000	(0)
CO3-2	4.740e-06	2.316e-06	-5.324	-5.635	-0.311	(0)
MgCO3	3.063e-06	3.063e-06	-5.514	-5.514	0.000	(0)
CuCO3	7.877e-07	7.877e-07	-6.104	-6.104	0.000	(0)
MnHCO3+	7.384e-07	6.203e-07	-6.132	-6.207	-0.076	(0)
NaCO3-	3.414e-07	2.878e-07	-6.467	-6.541	-0.074	(0)
UO2 (CO3) 3-4	2.074e-07	5.203e-09	-6.683	-8.284	-1.600	(0)
ZnCO3	1.999e-07	1.999e-07	-6.699	-6.699	0.000	(0)
ZnHCO3+	1.155e-07	9.176e-08	-6.937	-7.037	-0.100	(0)
UO2 (CO3) 2-2	1.126e-07	4.482e-08	-6.948	-7.349	-0.400	(0)
Cu (CO3) 2-2	1.234e-08	4.911e-09	-7.909	-8.309	-0.400	(0)
NiHCO3+	9.659e-09	7.672e-09	-8.015	-8.115	-0.100	(0)
CuHCO3+	8.876e-09	7.050e-09	-8.052	-8.152	-0.100	(0)
CoHCO3+	4.481e-09	3.559e-09	-8.349	-8.449	-0.100	(0)
NiCO3	2.780e-09	2.780e-09	-8.556	-8.556	0.000	(0)
PbCO3	1.543e-09	1.543e-09	-8.812	-8.812	0.000	(0)
UO2CO3	9.698e-10	9.698e-10	-9.013	-9.013	0.000	(0)
CoCO3	9.260e-10	9.260e-10	-9.033	-9.033	0.000	(0)
BaHCO3+	8.290e-10	7.021e-10	-9.081	-9.154	-0.072	(0)
PbHCO3+	4.011e-10	3.186e-10	-9.397	-9.497	-0.100	(0)
CdCO3	1.754e-10	1.754e-10	-9.756	-9.756	0.000	(0)
BaCO3	4.514e-11	4.514e-11	-10.345	-10.345	0.000	(0)
Pb (CO3) 2-2	2.590e-11	1.031e-11	-10.587	-10.987	-0.400	(0)
CdHCO3+	1.843e-11	1.464e-11	-10.735	-10.835	-0.100	(0)
Cd (CO3) 2-2	7.568e-13	3.012e-13	-12.121	-12.521	-0.400	(0)
FeHCO3+	7.723e-14	6.541e-14	-13.112	-13.184	-0.072	(0)
HgCO3	4.733e-14	4.733e-14	-13.325	-13.325	0.000	(0)
Hg (CO3) 2-2	8.711e-16	3.467e-16	-15.060	-15.460	-0.400	(0)
HgHCO3+	4.345e-17	3.451e-17	-16.362	-16.462	-0.100	(0)
Ca	4.255e-03					
Ca+2	2.803e-03	1.370e-03	-2.552	-2.863	-0.311	(0)
CaSO4	1.386e-03	1.386e-03	-2.858	-2.858	0.000	(0)
CaHCO3+	5.827e-05	4.935e-05	-4.235	-4.307	-0.072	(0)
CaCO3	5.029e-06	5.029e-06	-5.299	-5.299	0.000	(0)
CaF+	1.958e-06	1.645e-06	-5.708	-5.784	-0.076	(0)
CaH2BO3+	3.667e-08	3.007e-08	-7.436	-7.522	-0.086	(0)
CaOH+	8.294e-09	7.024e-09	-8.081	-8.153	-0.072	(0)
CaNO3+	5.637e-11	4.478e-11	-10.249	-10.349	-0.100	(0)
CaNH3+2	9.705e-12	3.863e-12	-11.013	-11.413	-0.400	(0)
Ca (NH3) 2+2	8.653e-21	3.444e-21	-20.063	-20.463	-0.400	(0)
Cd	1.181e-08					
Cd+2	6.799e-09	3.323e-09	-8.168	-8.479	-0.311	(0)
CdSO4	3.440e-09	3.440e-09	-8.463	-8.463	0.000	(0)
CdCl+	8.368e-10	6.646e-10	-9.077	-9.177	-0.100	(0)
Cd (SO4) 2-2	5.151e-10	2.050e-10	-9.288	-9.688	-0.400	(0)
CdCO3	1.754e-10	1.754e-10	-9.756	-9.756	0.000	(0)
CdHCO3+	1.843e-11	1.464e-11	-10.735	-10.835	-0.100	(0)
CdOH+	8.539e-12	6.783e-12	-11.069	-11.169	-0.100	(0)
CdF+	7.293e-12	5.792e-12	-11.137	-11.237	-0.100	(0)
CdOHC1	7.006e-12	7.006e-12	-11.155	-11.155	0.000	(0)
CdCl2	5.803e-12	5.803e-12	-11.236	-11.236	0.000	(0)
Cd (CO3) 2-2	7.568e-13	3.012e-13	-12.121	-12.521	-0.400	(0)
Cd (OH) 2	1.100e-14	1.100e-14	-13.959	-13.959	0.000	(0)
CdCl3-	9.656e-15	7.669e-15	-14.015	-14.115	-0.100	(0)
CdF2	1.271e-15	1.271e-15	-14.896	-14.896	0.000	(0)
CdNO3+	1.367e-16	1.086e-16	-15.864	-15.964	-0.100	(0)

	CdSeO4	3.816e-17	3.816e-17	-16.418	-16.418	0.000	(0)
	Cd2OH+3	8.977e-19	1.129e-19	-18.047	-18.947	-0.900	(0)
	Cd (SeO3) 2-2	4.886e-19	1.945e-19	-18.311	-18.711	-0.400	(0)
	Cd (OH) 3-	2.174e-19	1.727e-19	-18.663	-18.763	-0.100	(0)
	Cd (NO3) 2	5.626e-25	5.626e-25	-24.250	-24.250	0.000	(0)
	Cd (OH) 4-2	1.825e-26	7.263e-27	-25.739	-26.139	-0.400	(0)
	CdHS+	0.000e+00	0.000e+00	-79.562	-79.662	-0.100	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.650	-151.650	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.842	-228.942	-0.100	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-305.538	-305.938	-0.400	(0)
C1	2.505e-03						
	Cl-	2.505e-03	2.095e-03	-2.601	-2.679	-0.078	(0)
	MnCl+	5.044e-08	4.237e-08	-7.297	-7.373	-0.076	(0)
	AgCl	1.171e-08	1.171e-08	-7.932	-7.932	0.000	(0)
	ZnCl+	9.477e-09	7.891e-09	-8.023	-8.103	-0.080	(0)
	AgCl2-	2.689e-09	2.136e-09	-8.570	-8.670	-0.100	(0)
	ZnOHC1	2.655e-09	2.655e-09	-8.576	-8.576	0.000	(0)
	CdCl+	8.368e-10	6.646e-10	-9.077	-9.177	-0.100	(0)
	CuCl	2.474e-10	2.474e-10	-9.607	-9.607	0.000	(0)
	CuCl+	2.302e-10	1.917e-10	-9.638	-9.717	-0.080	(0)
	NiCl+	2.170e-10	1.724e-10	-9.663	-9.764	-0.100	(0)
	CoCl+	2.157e-10	1.714e-10	-9.666	-9.766	-0.100	(0)
	CuCl2-	1.300e-10	1.083e-10	-9.886	-9.965	-0.080	(0)
	MnCl2	1.254e-10	1.254e-10	-9.902	-9.902	0.000	(0)
	ZnCl2	2.619e-11	2.619e-11	-10.582	-10.582	0.000	(0)
	PbCl+	2.074e-11	1.647e-11	-10.683	-10.783	-0.100	(0)
	HgClOH	1.623e-11	1.623e-11	-10.790	-10.790	0.000	(0)
	AgCl3-2	1.002e-11	3.987e-12	-10.999	-11.399	-0.400	(0)
	HgCl2	7.491e-12	7.491e-12	-11.125	-11.125	0.000	(0)
	CdOHC1	7.006e-12	7.006e-12	-11.155	-11.155	0.000	(0)
	CdCl2	5.803e-12	5.803e-12	-11.236	-11.236	0.000	(0)
	HgCl3-	1.975e-13	1.569e-13	-12.704	-12.804	-0.100	(0)
	PbCl2	1.541e-13	1.541e-13	-12.812	-12.812	0.000	(0)
	CuCl2	1.392e-13	1.392e-13	-12.856	-12.856	0.000	(0)
	AgCl4-3	1.355e-13	1.705e-14	-12.868	-13.768	-0.900	(0)
	CuCl3-2	9.734e-14	4.849e-14	-13.012	-13.314	-0.303	(0)
	MnCl3-	8.608e-14	7.232e-14	-13.065	-13.141	-0.076	(0)
	ZnCl3-	5.234e-14	4.358e-14	-13.281	-13.361	-0.080	(0)
	CdCl3-	9.656e-15	7.669e-15	-14.015	-14.115	-0.100	(0)
	HgCl4-2	3.287e-15	1.308e-15	-14.483	-14.883	-0.400	(0)
	NiCl2	1.818e-15	1.818e-15	-14.740	-14.740	0.000	(0)
	HgCl+	8.984e-16	7.136e-16	-15.047	-15.147	-0.100	(0)
	UO2Cl+	4.498e-16	3.573e-16	-15.347	-15.447	-0.100	(0)
	PbCl3-	1.618e-16	1.285e-16	-15.791	-15.891	-0.100	(0)
	ZnCl4-2	9.163e-17	4.564e-17	-16.038	-16.341	-0.303	(0)
	CrCl+2	5.718e-17	2.276e-17	-16.243	-16.643	-0.400	(0)
	CuCl3-	3.269e-18	2.722e-18	-17.486	-17.565	-0.080	(0)
	PbCl4-2	3.091e-19	1.230e-19	-18.510	-18.910	-0.400	(0)
	CrOHC12	2.328e-19	2.328e-19	-18.633	-18.633	0.000	(0)
	FeCl+2	9.549e-21	4.757e-21	-20.020	-20.323	-0.303	(0)
	CrCl2+	5.695e-21	4.523e-21	-20.245	-20.345	-0.100	(0)
	VOCl+	3.887e-22	3.088e-22	-21.410	-21.510	-0.100	(0)
	CuCl4-2	5.735e-23	2.857e-23	-22.241	-22.544	-0.303	(0)
	FeCl2+	5.297e-23	4.450e-23	-22.276	-22.352	-0.076	(0)
	CrO3Cl-	3.879e-26	3.081e-26	-25.411	-25.511	-0.100	(0)
	FeCl3	9.321e-27	9.321e-27	-26.031	-26.031	0.000	(0)
	CoCl+2	3.039e-35	1.209e-35	-34.517	-34.917	-0.400	(0)
	UCl+3	0.000e+00	0.000e+00	-44.427	-45.328	-0.900	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.813	-52.213	-0.400	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.152	-54.552	-0.400	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.179	-67.579	-0.400	(0)
Co (2)	8.614e-08						
	Co+2	5.942e-08	2.365e-08	-7.226	-7.626	-0.400	(0)
	CoSO4	2.084e-08	2.084e-08	-7.681	-7.681	0.000	(0)
	CoHCO3+	4.481e-09	3.559e-09	-8.349	-8.449	-0.100	(0)
	CoCO3	9.260e-10	9.260e-10	-9.033	-9.033	0.000	(0)
	CoCl+	2.157e-10	1.714e-10	-9.666	-9.766	-0.100	(0)
	CoOH+	1.527e-10	1.213e-10	-9.816	-9.916	-0.100	(0)

CoF+	1.036e-10	8.226e-11	-9.985	-10.085	-0.100	(0)
Co(OH)2	2.475e-12	2.475e-12	-11.606	-11.606	0.000	(0)
CoNO2+	1.361e-12	1.081e-12	-11.866	-11.966	-0.100	(0)
Co(NH3)2+	1.600e-14	6.368e-15	-13.796	-14.196	-0.400	(0)
CoSeO4	7.310e-16	7.310e-16	-15.136	-15.136	0.000	(0)
CoNO3+	4.877e-16	3.874e-16	-15.312	-15.412	-0.100	(0)
Co(OH)3-	1.598e-17	1.269e-17	-16.796	-16.896	-0.100	(0)
CoOOH-	4.012e-18	3.186e-18	-17.397	-17.497	-0.100	(0)
Co2OH+3	1.142e-18	1.437e-19	-17.942	-18.842	-0.900	(0)
Co(NH3)2+2	1.529e-21	6.084e-22	-20.816	-21.216	-0.400	(0)
Co(NO3)2	8.147e-24	8.147e-24	-23.089	-23.089	0.000	(0)
Co(OH)4-2	1.299e-24	5.170e-25	-23.886	-24.287	-0.400	(0)
Co(NH3)3+2	4.310e-29	1.715e-29	-28.366	-28.766	-0.400	(0)
Co4(OH)4+4	1.719e-30	4.314e-32	-29.765	-31.365	-1.600	(0)
Co(NH3)4+2	5.066e-37	2.016e-37	-36.295	-36.695	-0.400	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-44.725	-45.125	-0.400	(0)
Co(3)	9.311e-29					
CoOH+2	9.311e-29	3.706e-29	-28.031	-28.431	-0.400	(0)
Co+3	1.421e-34	2.838e-35	-33.847	-34.547	-0.700	(0)
CoCl+2	3.039e-35	1.209e-35	-34.517	-34.917	-0.400	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-51.813	-52.213	-0.400	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-62.229	-62.329	-0.100	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-66.890	-67.290	-0.400	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-67.179	-67.579	-0.400	(0)
Cr(2)	1.672e-26					
Cr+2	1.672e-26	6.654e-27	-25.777	-26.177	-0.400	(0)
Cr(3)	2.173e-09					
Cr(OH)2+	1.858e-09	1.476e-09	-8.731	-8.831	-0.100	(0)
Cr(OH)3	1.425e-10	1.425e-10	-9.846	-9.846	0.000	(0)
Cr(OH)+2	1.186e-10	4.720e-11	-9.926	-10.326	-0.400	(0)
CrOHSO4	4.948e-11	4.948e-11	-10.306	-10.306	0.000	(0)
CrO2-	2.177e-12	1.729e-12	-11.662	-11.762	-0.100	(0)
Cr(OH)4-	1.836e-12	1.458e-12	-11.736	-11.836	-0.100	(0)
CrF+2	3.678e-13	1.464e-13	-12.434	-12.835	-0.400	(0)
CrSO4+	1.090e-13	8.660e-14	-12.962	-13.062	-0.100	(0)
Cr+3	6.673e-14	8.396e-15	-13.176	-14.076	-0.900	(0)
CrCl+2	5.718e-17	2.276e-17	-16.243	-16.643	-0.400	(0)
Cr2(OH)2SO4+2	5.304e-19	2.111e-19	-18.275	-18.675	-0.400	(0)
CrOHC12	2.328e-19	2.328e-19	-18.633	-18.633	0.000	(0)
Cr2(OH)2(SO4)2	5.539e-20	5.539e-20	-19.257	-19.257	0.000	(0)
CrCl2+	5.695e-21	4.523e-21	-20.245	-20.345	-0.100	(0)
CrNO3+2	9.531e-24	3.793e-24	-23.021	-23.421	-0.400	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-43.143	-43.543	-0.400	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-52.075	-52.975	-0.900	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-54.152	-54.552	-0.400	(0)
Cr(6)	1.064e-15					
CrO4-2	9.641e-16	4.711e-16	-15.016	-15.327	-0.311	(0)
HCrO4-	7.516e-17	5.970e-17	-16.124	-16.224	-0.100	(0)
NaCrO4-	1.967e-17	1.562e-17	-16.706	-16.806	-0.100	(0)
KCrO4-	5.552e-18	4.410e-18	-17.256	-17.356	-0.100	(0)
CrO3SO4-2	7.907e-24	3.147e-24	-23.102	-23.502	-0.400	(0)
H2CrO4	1.895e-24	1.895e-24	-23.722	-23.722	0.000	(0)
CrO3Cl-	3.879e-26	3.081e-26	-25.411	-25.511	-0.100	(0)
Cr2O7-2	3.107e-31	1.236e-31	-30.508	-30.908	-0.400	(0)
Cu(1)	4.957e-10					
CuCl	2.474e-10	2.474e-10	-9.607	-9.607	0.000	(0)
CuCl2-	1.300e-10	1.083e-10	-9.886	-9.965	-0.080	(0)
Cu+	1.181e-10	9.384e-11	-9.928	-10.028	-0.100	(0)
CuCl3-2	9.734e-14	4.849e-14	-13.012	-13.314	-0.303	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.844	-150.207	-0.363	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.592	-150.937	-0.345	(0)
Cu(2)	1.045e-06					
CuCO3	7.877e-07	7.877e-07	-6.104	-6.104	0.000	(0)
Cu+2	1.182e-07	5.775e-08	-6.927	-7.238	-0.311	(0)
CuSO4	5.844e-08	5.844e-08	-7.233	-7.233	0.000	(0)
CuOH+	5.637e-08	4.693e-08	-7.249	-7.329	-0.080	(0)
Cu(CO3)2-2	1.234e-08	4.911e-09	-7.909	-8.309	-0.400	(0)
CuHCO3+	8.876e-09	7.050e-09	-8.052	-8.152	-0.100	(0)

	Cu (OH) 2	2.407e-09	2.407e-09	-8.619	-8.619	0.000	(0)
	CuF+	5.046e-10	4.008e-10	-9.297	-9.397	-0.100	(0)
	CuCl+	2.302e-10	1.917e-10	-9.638	-9.717	-0.080	(0)
	Cu2 (OH) 2+2	1.390e-10	5.533e-11	-9.857	-10.257	-0.400	(0)
	CuNO2+	4.937e-11	3.922e-11	-10.306	-10.407	-0.100	(0)
	CuNH3+2	3.325e-12	1.324e-12	-11.478	-11.878	-0.400	(0)
	Cu (OH) 3-	1.597e-12	1.269e-12	-11.797	-11.897	-0.100	(0)
	CuCl2	1.392e-13	1.392e-13	-12.856	-12.856	0.000	(0)
	Cu (NO2) 2	2.602e-15	2.602e-15	-14.585	-14.585	0.000	(0)
	CuNO3+	2.377e-15	1.888e-15	-14.624	-14.724	-0.100	(0)
	Cu (OH) 4-2	6.447e-18	2.566e-18	-17.191	-17.591	-0.400	(0)
	CuCl3-	3.269e-18	2.722e-18	-17.486	-17.565	-0.080	(0)
	CuCl4-2	5.735e-23	2.857e-23	-22.241	-22.544	-0.303	(0)
	Cu (NO3) 2	2.456e-24	2.456e-24	-23.610	-23.610	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.815	-218.915	-0.100	(0)
F	1.576e-04						
	F-	1.316e-04	1.100e-04	-3.881	-3.959	-0.078	(0)
	MgF+	2.346e-05	1.962e-05	-4.630	-4.707	-0.078	(0)
	CaF+	1.958e-06	1.645e-06	-5.708	-5.784	-0.076	(0)
	NaF	4.631e-07	4.631e-07	-6.334	-6.334	0.000	(0)
	MnF+	8.376e-08	7.037e-08	-7.077	-7.153	-0.076	(0)
	AlF3	1.995e-08	1.995e-08	-7.700	-7.700	0.000	(0)
	AlF2+	1.709e-08	1.440e-08	-7.767	-7.842	-0.074	(0)
	HF	6.371e-09	6.371e-09	-8.196	-8.196	0.000	(0)
	ZnF+	4.144e-09	3.292e-09	-8.383	-8.483	-0.100	(0)
	BF (OH) 3-	1.377e-09	1.129e-09	-8.861	-8.947	-0.086	(0)
	AlF4-	1.315e-09	1.100e-09	-8.881	-8.959	-0.078	(0)
	AlF+2	6.515e-10	3.289e-10	-9.186	-9.483	-0.297	(0)
	CuF+	5.046e-10	4.008e-10	-9.297	-9.397	-0.100	(0)
	NiF+	1.119e-10	8.887e-11	-9.951	-10.051	-0.100	(0)
	CoF+	1.036e-10	8.226e-11	-9.985	-10.085	-0.100	(0)
	CdF+	7.293e-12	5.792e-12	-11.137	-11.237	-0.100	(0)
	HF2-	3.215e-12	2.664e-12	-11.493	-11.574	-0.082	(0)
	PbF+	2.163e-12	1.718e-12	-11.665	-11.765	-0.100	(0)
	UO2F+	2.010e-12	1.597e-12	-11.697	-11.797	-0.100	(0)
	AgF	7.563e-13	7.563e-13	-12.121	-12.121	0.000	(0)
	BF2 (OH) 2-	6.343e-13	5.202e-13	-12.198	-12.284	-0.086	(0)
	UO2F2	5.066e-13	5.066e-13	-12.295	-12.295	0.000	(0)
	CrF+2	3.678e-13	1.464e-13	-12.434	-12.835	-0.400	(0)
	UO2F3-	1.762e-14	1.400e-14	-13.754	-13.854	-0.100	(0)
	PbF2	3.719e-15	3.719e-15	-14.430	-14.430	0.000	(0)
	CdF2	1.271e-15	1.271e-15	-14.896	-14.896	0.000	(0)
	H2F2	1.087e-16	1.087e-16	-15.964	-15.964	0.000	(0)
	FeF2+	3.178e-17	2.670e-17	-16.498	-16.574	-0.076	(0)
	UO2F4-2	3.073e-17	1.223e-17	-16.512	-16.913	-0.400	(0)
	VO2F	2.490e-17	2.490e-17	-16.604	-16.604	0.000	(0)
	FeF+2	1.821e-17	9.070e-18	-16.740	-17.042	-0.303	(0)
	FeF3	4.143e-18	4.143e-18	-17.383	-17.383	0.000	(0)
	VO2F2-	1.252e-18	9.944e-19	-17.902	-18.002	-0.100	(0)
	BF3OH-	1.064e-18	8.722e-19	-17.973	-18.059	-0.086	(0)
	PbF3-	9.768e-19	7.759e-19	-18.010	-18.110	-0.100	(0)
	VOF+	4.364e-20	3.467e-20	-19.360	-19.460	-0.100	(0)
	VO2F3-2	3.428e-21	1.364e-21	-20.465	-20.865	-0.400	(0)
	VOF2	1.430e-21	1.430e-21	-20.845	-20.845	0.000	(0)
	PbF4-2	1.026e-22	4.085e-23	-21.989	-22.389	-0.400	(0)
	HgF+	8.765e-23	6.962e-23	-22.057	-22.157	-0.100	(0)
	BF4-	2.256e-23	1.850e-23	-22.647	-22.733	-0.086	(0)
	VOF3-	7.026e-24	5.580e-24	-23.153	-23.253	-0.100	(0)
	VO2F4-3	5.869e-25	7.384e-26	-24.231	-25.132	-0.900	(0)
	Sb (OH) 2F	2.068e-25	2.068e-25	-24.684	-24.684	0.000	(0)
	SbOF	2.035e-25	2.035e-25	-24.692	-24.692	0.000	(0)
	VOF4-2	6.225e-27	2.478e-27	-26.206	-26.606	-0.400	(0)
	UF3+	2.989e-35	2.374e-35	-34.524	-34.625	-0.100	(0)
	UF2+2	3.422e-36	1.362e-36	-35.466	-35.866	-0.400	(0)
	UF4	2.863e-37	2.863e-37	-36.543	-36.543	0.000	(0)
	UF+3	7.816e-39	9.834e-40	-38.107	-39.007	-0.900	(0)
	UF5-	1.571e-39	1.248e-39	-38.804	-38.904	-0.100	(0)
	UF6-2	1.042e-40	0.000e+00	-39.982	-40.382	-0.400	(0)

Fe (2)	9.769e-12					
Fe+2	6.748e-12	2.686e-12	-11.171	-11.571	-0.400	(0)
FeSO4	2.912e-12	2.912e-12	-11.536	-11.536	0.000	(0)
FeHCO3+	7.723e-14	6.541e-14	-13.112	-13.184	-0.072	(0)
FeOH+	3.270e-14	2.748e-14	-13.485	-13.561	-0.076	(0)
Fe (OH) 2	5.609e-18	5.609e-18	-17.251	-17.251	0.000	(0)
Fe (OH) 3-	5.426e-19	4.558e-19	-18.266	-18.341	-0.076	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.005	-161.005	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.059	-238.159	-0.100	(0)
Fe (3)	1.834e-09					
Fe (OH) 2+	1.480e-09	1.248e-09	-8.830	-8.904	-0.074	(0)
Fe (OH) 3	3.443e-10	3.443e-10	-9.463	-9.463	0.000	(0)
Fe (OH) 4-	9.774e-12	8.239e-12	-11.010	-11.084	-0.074	(0)
FeOH+2	2.505e-14	1.248e-14	-13.601	-13.904	-0.303	(0)
FeF2+	3.178e-17	2.670e-17	-16.498	-16.574	-0.076	(0)
FeF+2	1.821e-17	9.070e-18	-16.740	-17.042	-0.303	(0)
FeSO4+	4.436e-18	3.727e-18	-17.353	-17.429	-0.076	(0)
FeF3	4.143e-18	4.143e-18	-17.383	-17.383	0.000	(0)
Fe (SO4) 2-	4.431e-19	3.520e-19	-18.353	-18.454	-0.100	(0)
Fe+3	3.766e-19	7.520e-20	-18.424	-19.124	-0.700	(0)
FeCl+2	9.549e-21	4.757e-21	-20.020	-20.323	-0.303	(0)
FeCl2+	5.297e-23	4.450e-23	-22.276	-22.352	-0.076	(0)
FeHSeO3+2	4.138e-23	1.647e-23	-22.383	-22.783	-0.400	(0)
Fe2 (OH) 2+4	2.055e-25	5.155e-27	-24.687	-26.288	-1.600	(0)
FeNO3+2	1.953e-26	7.773e-27	-25.709	-26.109	-0.400	(0)
FeCl3	9.321e-27	9.321e-27	-26.031	-26.031	0.000	(0)
Fe3 (OH) 4+5	2.945e-32	9.296e-35	-31.531	-34.032	-2.501	(0)
H (0)	2.369e-29					
H2	1.184e-29	1.195e-29	-28.927	-28.923	0.004	(0)
Hg (0)	1.735e-09					
Hg	1.735e-09	1.735e-09	-8.761	-8.761	0.000	(0)
Hg (1)	1.010e-19					
Hg2+2	5.052e-20	2.011e-20	-19.297	-19.697	-0.400	(0)
Hg (2)	3.103e-11					
HgClOH	1.623e-11	1.623e-11	-10.790	-10.790	0.000	(0)
HgCl2	7.491e-12	7.491e-12	-11.125	-11.125	0.000	(0)
Hg (OH) 2	7.052e-12	7.115e-12	-11.152	-11.148	0.004	(0)
HgCl3-	1.975e-13	1.569e-13	-12.704	-12.804	-0.100	(0)
HgCO3	4.733e-14	4.733e-14	-13.325	-13.325	0.000	(0)
HgCl4-2	3.287e-15	1.308e-15	-14.483	-14.883	-0.400	(0)
HgCl+	8.984e-16	7.136e-16	-15.047	-15.147	-0.100	(0)
Hg (CO3) 2-2	8.711e-16	3.467e-16	-15.060	-15.460	-0.400	(0)
HgOH+	2.199e-16	1.747e-16	-15.658	-15.758	-0.100	(0)
HgHCO3+	4.345e-17	3.451e-17	-16.362	-16.462	-0.100	(0)
Hg (OH) 3-	2.898e-19	2.302e-19	-18.538	-18.638	-0.100	(0)
Hg (NH3) 2+2	1.358e-19	5.404e-20	-18.867	-19.267	-0.400	(0)
HgNH3+2	6.062e-20	2.413e-20	-19.217	-19.617	-0.400	(0)
Hg+2	4.290e-20	1.707e-20	-19.368	-19.768	-0.400	(0)
HgSO4	1.975e-20	1.975e-20	-19.705	-19.705	0.000	(0)
HgF+	8.765e-23	6.962e-23	-22.057	-22.157	-0.100	(0)
Hg (NH3) 3+2	1.211e-27	4.818e-28	-26.917	-27.317	-0.400	(0)
HgNO3+	8.204e-29	6.516e-29	-28.086	-28.186	-0.100	(0)
Hg (NH3) 4+2	2.154e-35	8.571e-36	-34.667	-35.067	-0.400	(0)
Hg (NO3) 2	2.799e-37	2.799e-37	-36.553	-36.553	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.716	-138.816	-0.100	(0)
HgS2-2	0.000e+00	0.000e+00	-139.717	-140.117	-0.400	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.829	-139.829	0.000	(0)
K	3.107e-03					
K+	3.013e-03	2.519e-03	-2.521	-2.599	-0.078	(0)
KSO4-	9.346e-05	7.878e-05	-4.029	-4.104	-0.074	(0)
KCrO4-	5.552e-18	4.410e-18	-17.256	-17.356	-0.100	(0)
Mg	4.596e-03					
Mg+2	3.254e-03	1.590e-03	-2.488	-2.799	-0.311	(0)
MgSO4	1.278e-03	1.278e-03	-2.893	-2.893	0.000	(0)
MgHCO3+	3.781e-05	3.148e-05	-4.422	-4.502	-0.080	(0)
MgF+	2.346e-05	1.962e-05	-4.630	-4.707	-0.078	(0)
MgCO3	3.063e-06	3.063e-06	-5.514	-5.514	0.000	(0)
MgOH+	1.913e-07	1.627e-07	-6.718	-6.789	-0.071	(0)

MgH2BO3+	2.565e-08	2.103e-08	-7.591	-7.677	-0.086	(0)
Mn (2)	5.388e-05					
Mn+2	4.037e-05	1.607e-05	-4.394	-4.794	-0.400	(0)
MnSO4	1.262e-05	1.262e-05	-4.899	-4.899	0.000	(0)
MnHCO3+	7.384e-07	6.203e-07	-6.132	-6.207	-0.076	(0)
MnF+	8.376e-08	7.037e-08	-7.077	-7.153	-0.076	(0)
MnCl+	5.044e-08	4.237e-08	-7.297	-7.373	-0.076	(0)
MnOH+	1.235e-08	1.037e-08	-7.908	-7.984	-0.076	(0)
MnCl2	1.254e-10	1.254e-10	-9.902	-9.902	0.000	(0)
MnNO3+	3.314e-13	2.632e-13	-12.480	-12.580	-0.100	(0)
MnSeO4	2.668e-13	2.668e-13	-12.574	-12.574	0.000	(0)
MnCl3-	8.608e-14	7.232e-14	-13.065	-13.141	-0.076	(0)
Mn (OH) 3-	5.040e-18	4.234e-18	-17.298	-17.373	-0.076	(0)
Mn (NO3) 2	6.834e-21	6.834e-21	-20.165	-20.165	0.000	(0)
Mn (OH) 4-2	7.052e-24	3.513e-24	-23.152	-23.454	-0.303	(0)
MnSe	0.000e+00	0.000e+00	-42.311	-42.311	0.000	(0)
Mn (3)	1.084e-24					
Mn+3	1.084e-24	2.164e-25	-23.965	-24.665	-0.700	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.740	-42.043	-0.303	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.852	-45.936	-0.084	(0)
Mo	1.740e-06					
MoO4-2	1.740e-06	8.501e-07	-5.760	-6.071	-0.311	(0)
HMoO4-	8.340e-10	6.624e-10	-9.079	-9.179	-0.100	(0)
H2MoO4	1.900e-13	1.900e-13	-12.721	-12.721	0.000	(0)
Ag2MoO4	2.411e-24	2.411e-24	-23.618	-23.618	0.000	(0)
AlMo6O21-3	3.185e-38	4.008e-39	-37.497	-38.397	-0.900	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.159	-48.760	-3.601	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.280	-49.780	-2.501	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.805	-52.405	-1.600	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.666	-56.566	-0.900	(0)
N (-3)	1.985e-07					
NH4+	1.876e-07	1.538e-07	-6.727	-6.813	-0.086	(0)
NH4SO4-	8.666e-09	7.280e-09	-8.062	-8.138	-0.076	(0)
NH3	2.240e-09	2.240e-09	-8.650	-8.650	0.000	(0)
CaNH3+2	9.705e-12	3.863e-12	-11.013	-11.413	-0.400	(0)
CuNH3+2	3.325e-12	1.324e-12	-11.478	-11.878	-0.400	(0)
NiNH3+2	9.720e-14	3.869e-14	-13.012	-13.412	-0.400	(0)
Co (NH3) +2	1.600e-14	6.368e-15	-13.796	-14.196	-0.400	(0)
AgNH3+	1.576e-14	1.252e-14	-13.802	-13.902	-0.100	(0)
BaNH3+2	1.349e-16	5.370e-17	-15.870	-16.270	-0.400	(0)
Ag (NH3) 2+	2.869e-19	2.279e-19	-18.542	-18.642	-0.100	(0)
Hg (NH3) 2+2	1.358e-19	5.404e-20	-18.867	-19.267	-0.400	(0)
HgNH3+2	6.062e-20	2.413e-20	-19.217	-19.617	-0.400	(0)
Ni (NH3) 2+2	3.147e-20	1.252e-20	-19.502	-19.902	-0.400	(0)
Ca (NH3) 2+2	8.653e-21	3.444e-21	-20.063	-20.463	-0.400	(0)
Co (NH3) 2+2	1.529e-21	6.084e-22	-20.816	-21.216	-0.400	(0)
Hg (NH3) 3+2	1.211e-27	4.818e-28	-26.917	-27.317	-0.400	(0)
Co (NH3) 3+2	4.310e-29	1.715e-29	-28.366	-28.766	-0.400	(0)
Hg (NH3) 4+2	2.154e-35	8.571e-36	-34.667	-35.067	-0.400	(0)
Co (NH3) 4+2	5.066e-37	2.016e-37	-36.295	-36.695	-0.400	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.143	-43.543	-0.400	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.725	-45.125	-0.400	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.813	-52.213	-0.400	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.075	-52.975	-0.900	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.152	-54.552	-0.400	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.229	-62.329	-0.100	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.890	-67.290	-0.400	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.179	-67.579	-0.400	(0)
N (3)	7.866e-06					
NO2-	7.866e-06	6.485e-06	-5.104	-5.188	-0.084	(0)
CuNO2+	4.937e-11	3.922e-11	-10.306	-10.407	-0.100	(0)
AgNO2	3.709e-12	3.709e-12	-11.431	-11.431	0.000	(0)
CoNO2+	1.361e-12	1.081e-12	-11.866	-11.966	-0.100	(0)
Cu (NO2) 2	2.602e-15	2.602e-15	-14.585	-14.585	0.000	(0)
Ag (NO2) 2-	4.690e-17	3.725e-17	-16.329	-16.429	-0.100	(0)
N (5)	1.242e-08					

NO3-	1.236e-08	1.034e-08	-7.908	-7.986	-0.078	(0)
CaNO3+	5.637e-11	4.478e-11	-10.249	-10.349	-0.100	(0)
MnNO3+	3.314e-13	2.632e-13	-12.480	-12.580	-0.100	(0)
ZnNO3+	4.902e-14	3.894e-14	-13.310	-13.410	-0.100	(0)
BaNO3+	2.478e-15	1.969e-15	-14.606	-14.706	-0.100	(0)
CuNO3+	2.377e-15	1.888e-15	-14.624	-14.724	-0.100	(0)
NiNO3+	1.051e-15	8.351e-16	-14.978	-15.078	-0.100	(0)
CoNO3+	4.877e-16	3.874e-16	-15.312	-15.412	-0.100	(0)
CdNO3+	1.367e-16	1.086e-16	-15.864	-15.964	-0.100	(0)
PbNO3+	4.266e-17	3.388e-17	-16.370	-16.470	-0.100	(0)
AgNO3	2.247e-17	2.247e-17	-16.648	-16.648	0.000	(0)
Mn(NO3)2	6.834e-21	6.834e-21	-20.165	-20.165	0.000	(0)
UO2NO3+	2.731e-21	2.169e-21	-20.564	-20.664	-0.100	(0)
Zn(NO3)2	8.030e-23	8.030e-23	-22.095	-22.095	0.000	(0)
CrNO3+2	9.531e-24	3.793e-24	-23.021	-23.421	-0.400	(0)
Co(NO3)2	8.147e-24	8.147e-24	-23.089	-23.089	0.000	(0)
Cu(NO3)2	2.456e-24	2.456e-24	-23.610	-23.610	0.000	(0)
VO2NO3	6.747e-25	6.747e-25	-24.171	-24.171	0.000	(0)
Pb(NO3)2	5.948e-25	5.948e-25	-24.226	-24.226	0.000	(0)
Cd(NO3)2	5.626e-25	5.626e-25	-24.250	-24.250	0.000	(0)
FeNO3+2	1.953e-26	7.773e-27	-25.709	-26.109	-0.400	(0)
HgNO3+	8.204e-29	6.516e-29	-28.086	-28.186	-0.100	(0)
Hg(NO3)2	2.799e-37	2.799e-37	-36.553	-36.553	0.000	(0)
Na	8.176e-03					
Na+	7.981e-03	6.673e-03	-2.098	-2.176	-0.078	(0)
NaSO4-	1.878e-04	1.583e-04	-3.726	-3.801	-0.074	(0)
NaHCO3	7.260e-06	7.260e-06	-5.139	-5.139	0.000	(0)
NaF	4.631e-07	4.631e-07	-6.334	-6.334	0.000	(0)
NaCO3-	3.414e-07	2.878e-07	-6.467	-6.541	-0.074	(0)
NaH2BO3	4.035e-09	4.035e-09	-8.394	-8.394	0.000	(0)
NaCrO4-	1.967e-17	1.562e-17	-16.706	-16.806	-0.100	(0)
Ni	1.071e-07					
Ni+2	6.582e-08	3.217e-08	-7.182	-7.493	-0.311	(0)
NiSO4	2.835e-08	2.835e-08	-7.547	-7.547	0.000	(0)
NiHCO3+	9.659e-09	7.672e-09	-8.015	-8.115	-0.100	(0)
NiCO3	2.780e-09	2.780e-09	-8.556	-8.556	0.000	(0)
NiCl+	2.170e-10	1.724e-10	-9.663	-9.764	-0.100	(0)
NiOH+	1.310e-10	1.041e-10	-9.883	-9.983	-0.100	(0)
NiF+	1.119e-10	8.887e-11	-9.951	-10.051	-0.100	(0)
Ni(SO4)2-2	1.042e-11	4.146e-12	-10.982	-11.382	-0.400	(0)
Ni(OH)2	2.124e-12	2.124e-12	-11.673	-11.673	0.000	(0)
NiNH3+2	9.720e-14	3.869e-14	-13.012	-13.412	-0.400	(0)
NiCl2	1.818e-15	1.818e-15	-14.740	-14.740	0.000	(0)
NiNO3+	1.051e-15	8.351e-16	-14.978	-15.078	-0.100	(0)
NiSeO4	9.279e-16	9.279e-16	-15.032	-15.032	0.000	(0)
Ni(OH)3-	6.873e-16	5.459e-16	-15.163	-15.263	-0.100	(0)
Ni(NH3)2+2	3.147e-20	1.252e-20	-19.502	-19.902	-0.400	(0)
O(0)	7.030e-35					
O2	3.515e-35	3.547e-35	-34.454	-34.450	0.004	(0)
Pb	3.140e-09					
PbCO3	1.543e-09	1.543e-09	-8.812	-8.812	0.000	(0)
PbSO4	4.795e-10	4.795e-10	-9.319	-9.319	0.000	(0)
Pb+2	4.535e-10	2.216e-10	-9.343	-9.654	-0.311	(0)
PbHCO3+	4.011e-10	3.186e-10	-9.397	-9.497	-0.100	(0)
PbOH+	1.801e-10	1.431e-10	-9.744	-9.844	-0.100	(0)
Pb(SO4)2-2	3.207e-11	1.276e-11	-10.494	-10.894	-0.400	(0)
Pb(CO3)2-2	2.590e-11	1.031e-11	-10.587	-10.987	-0.400	(0)
PbCl+	2.074e-11	1.647e-11	-10.683	-10.783	-0.100	(0)
PbF+	2.163e-12	1.718e-12	-11.665	-11.765	-0.100	(0)
Pb(OH)2	1.163e-12	1.163e-12	-11.935	-11.935	0.000	(0)
PbCl2	1.541e-13	1.541e-13	-12.812	-12.812	0.000	(0)
PbF2	3.719e-15	3.719e-15	-14.430	-14.430	0.000	(0)
Pb(OH)3-	3.762e-16	2.988e-16	-15.425	-15.525	-0.100	(0)
PbCl3-	1.618e-16	1.285e-16	-15.791	-15.891	-0.100	(0)
PbNO3+	4.266e-17	3.388e-17	-16.370	-16.470	-0.100	(0)
Pb2OH+3	3.995e-18	5.026e-19	-17.399	-18.299	-0.900	(0)
PbF3-	9.768e-19	7.759e-19	-18.010	-18.110	-0.100	(0)
PbCl4-2	3.091e-19	1.230e-19	-18.510	-18.910	-0.400	(0)

Pb(OH) 4-2	4.725e-20	1.881e-20	-19.326	-19.726	-0.400	(0)
PbF4-2	1.026e-22	4.085e-23	-21.989	-22.389	-0.400	(0)
Pb3(OH) 4+2	1.502e-23	5.979e-24	-22.823	-23.223	-0.400	(0)
Pb(NO3) 2	5.948e-25	5.948e-25	-24.226	-24.226	0.000	(0)
Pb4(OH) 4+4	4.195e-28	1.053e-29	-27.377	-28.978	-1.600	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.768	-152.768	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.560	-230.660	-0.100	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.940	-73.940	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.092	-79.192	-0.100	(0)
CdHS+	0.000e+00	0.000e+00	-79.562	-79.662	-0.100	(0)
H2S	0.000e+00	0.000e+00	-79.579	-79.579	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.750	-81.150	-0.400	(0)
S6-2	0.000e+00	0.000e+00	-81.266	-81.666	-0.400	(0)
S4-2	0.000e+00	0.000e+00	-81.345	-81.745	-0.400	(0)
S3-2	0.000e+00	0.000e+00	-82.151	-82.551	-0.400	(0)
S2-2	0.000e+00	0.000e+00	-83.167	-83.567	-0.400	(0)
S-2	0.000e+00	0.000e+00	-88.782	-89.085	-0.303	(0)
HgHS2-	0.000e+00	0.000e+00	-138.716	-138.816	-0.100	(0)
HgS2-2	0.000e+00	0.000e+00	-139.717	-140.117	-0.400	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-139.829	-139.829	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-148.905	-149.108	-0.203	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.932	-149.032	-0.100	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.844	-150.207	-0.363	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.890	-149.990	-0.100	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.592	-150.937	-0.345	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-150.768	-151.141	-0.372	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.098	-151.452	-0.354	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.388	-151.388	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.650	-151.650	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.768	-152.768	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-161.005	-161.005	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-218.815	-218.915	-0.100	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.199	-227.299	-0.100	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-228.842	-228.942	-0.100	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.472	-229.872	-0.400	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.560	-230.660	-0.100	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.059	-238.159	-0.100	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-305.538	-305.938	-0.400	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.551	-307.951	-0.400	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.817	-321.217	-0.400	(0)
S(6)	1.200e-02					
SO4-2	9.039e-03	4.417e-03	-2.044	-2.355	-0.311	(0)
CaSO4	1.386e-03	1.386e-03	-2.858	-2.858	0.000	(0)
MgSO4	1.278e-03	1.278e-03	-2.893	-2.893	0.000	(0)
NaSO4-	1.878e-04	1.583e-04	-3.726	-3.801	-0.074	(0)
KSO4-	9.346e-05	7.878e-05	-4.029	-4.104	-0.074	(0)
MnSO4	1.262e-05	1.262e-05	-4.899	-4.899	0.000	(0)
ZnSO4	1.449e-06	1.449e-06	-5.839	-5.839	0.000	(0)
Zn(SO4) 2-2	1.401e-07	5.576e-08	-6.854	-7.254	-0.400	(0)
CuSO4	5.844e-08	5.844e-08	-7.233	-7.233	0.000	(0)
NiSO4	2.835e-08	2.835e-08	-7.547	-7.547	0.000	(0)
CoSO4	2.084e-08	2.084e-08	-7.681	-7.681	0.000	(0)
HSO4-	2.021e-08	1.690e-08	-7.694	-7.772	-0.078	(0)
NH4SO4-	8.666e-09	7.280e-09	-8.062	-8.138	-0.076	(0)
CdSO4	3.440e-09	3.440e-09	-8.463	-8.463	0.000	(0)
Cd(SO4) 2-2	5.151e-10	2.050e-10	-9.288	-9.688	-0.400	(0)
PbSO4	4.795e-10	4.795e-10	-9.319	-9.319	0.000	(0)
AgSO4-	3.037e-10	2.413e-10	-9.518	-9.618	-0.100	(0)
CrOHSO4	4.948e-11	4.948e-11	-10.306	-10.306	0.000	(0)
Pb(SO4) 2-2	3.207e-11	1.276e-11	-10.494	-10.894	-0.400	(0)
AlSO4+	1.226e-11	1.025e-11	-10.912	-10.989	-0.078	(0)
Ni(SO4) 2-2	1.042e-11	4.146e-12	-10.982	-11.382	-0.400	(0)
FeSO4	2.912e-12	2.912e-12	-11.536	-11.536	0.000	(0)
UO2SO4	7.031e-13	7.031e-13	-12.153	-12.153	0.000	(0)
Al(SO4) 2-	5.801e-13	4.853e-13	-12.236	-12.314	-0.078	(0)
CrSO4+	1.090e-13	8.660e-14	-12.962	-13.062	-0.100	(0)
UO2(SO4) 2-2	1.029e-13	4.094e-14	-12.988	-13.388	-0.400	(0)

VO2SO4-	1.714e-17	1.361e-17	-16.766	-16.866	-0.100	(0)
FeSO4+	4.436e-18	3.727e-18	-17.353	-17.429	-0.076	(0)
Cr2 (OH) 2SO4+2	5.304e-19	2.111e-19	-18.275	-18.675	-0.400	(0)
Fe (SO4) 2-	4.431e-19	3.520e-19	-18.353	-18.454	-0.100	(0)
VOSO4	6.392e-20	6.392e-20	-19.194	-19.194	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.539e-20	5.539e-20	-19.257	-19.257	0.000	(0)
HgSO4	1.975e-20	1.975e-20	-19.705	-19.705	0.000	(0)
CrO3SO4-2	7.907e-24	3.147e-24	-23.102	-23.502	-0.400	(0)
VSO4+	3.487e-34	2.769e-34	-33.458	-33.558	-0.100	(0)
U (SO4) 2	2.765e-39	2.765e-39	-38.558	-38.558	0.000	(0)
USO4+2	1.980e-40	0.000e+00	-39.703	-40.104	-0.400	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.229	-62.329	-0.100	(0)
Sb (3)	6.072e-20					
Sb (OH) 3	3.072e-20	3.072e-20	-19.513	-19.513	0.000	(0)
HSbO2	3.000e-20	3.000e-20	-19.523	-19.523	0.000	(0)
SbO2-	1.562e-24	1.241e-24	-23.806	-23.906	-0.100	(0)
Sb (OH) 4-	8.941e-25	7.102e-25	-24.049	-24.149	-0.100	(0)
Sb (OH) 2F	2.068e-25	2.068e-25	-24.684	-24.684	0.000	(0)
SbOF	2.035e-25	2.035e-25	-24.692	-24.692	0.000	(0)
Sb (OH) 2+	3.679e-26	2.922e-26	-25.434	-25.534	-0.100	(0)
SbO+	1.269e-26	1.008e-26	-25.896	-25.997	-0.100	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.817	-321.217	-0.400	(0)
Sb (5)	2.453e-08					
SbO3-	2.450e-08	1.946e-08	-7.611	-7.711	-0.100	(0)
Sb (OH) 6-	2.718e-11	2.272e-11	-10.566	-10.644	-0.078	(0)
SbO2+	1.078e-23	8.563e-24	-22.967	-23.067	-0.100	(0)
Se (-2)	4.509e-15					
Ag2Se	4.509e-15	4.509e-15	-14.346	-14.346	0.000	(0)
HSe-	3.641e-40	2.892e-40	-39.439	-39.539	-0.100	(0)
MnSe	0.000e+00	0.000e+00	-42.311	-42.311	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.056	-43.056	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.732	-47.132	-0.400	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.328	-85.928	-1.600	(0)
Se (4)	1.255e-07					
HSeO3-	1.044e-07	8.289e-08	-6.981	-7.081	-0.100	(0)
SeO3-2	2.117e-08	8.427e-09	-7.674	-8.074	-0.400	(0)
H2SeO3	1.385e-12	1.385e-12	-11.859	-11.859	0.000	(0)
AgSeO3-	1.867e-14	1.483e-14	-13.729	-13.829	-0.100	(0)
Cd (SeO3) 2-2	4.886e-19	1.945e-19	-18.311	-18.711	-0.400	(0)
Ag (SeO3) 2-3	8.891e-21	1.119e-21	-20.051	-20.951	-0.900	(0)
FeHSeO3+2	4.138e-23	1.647e-23	-22.383	-22.783	-0.400	(0)
Se (6)	1.265e-10					
SeO4-2	1.262e-10	6.168e-11	-9.899	-10.210	-0.311	(0)
MnSeO4	2.668e-13	2.668e-13	-12.574	-12.574	0.000	(0)
ZnSeO4	1.433e-14	1.433e-14	-13.844	-13.844	0.000	(0)
NiSeO4	9.279e-16	9.279e-16	-15.032	-15.032	0.000	(0)
CoSeO4	7.310e-16	7.310e-16	-15.136	-15.136	0.000	(0)
HSeO4-	1.524e-16	1.210e-16	-15.817	-15.917	-0.100	(0)
CdSeO4	3.816e-17	3.816e-17	-16.418	-16.418	0.000	(0)
Zn (SeO4) 2-2	2.251e-24	8.959e-25	-23.648	-24.048	-0.400	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.724	-58.624	-0.900	(0)
U (4)	4.640e-21					
U (OH) 5-	4.634e-21	3.681e-21	-20.334	-20.434	-0.100	(0)
U (OH) 4	6.040e-24	6.040e-24	-23.219	-23.219	0.000	(0)
U (OH) 3+	1.089e-27	8.652e-28	-26.963	-27.063	-0.100	(0)
U (OH) 2+2	3.938e-32	1.567e-32	-31.405	-31.805	-0.400	(0)
UF3+	2.989e-35	2.374e-35	-34.524	-34.625	-0.100	(0)
UF2+2	3.422e-36	1.362e-36	-35.466	-35.866	-0.400	(0)
UF4	2.863e-37	2.863e-37	-36.543	-36.543	0.000	(0)
UOH+3	2.299e-37	2.893e-38	-36.638	-37.539	-0.900	(0)
UF+3	7.816e-39	9.834e-40	-38.107	-39.007	-0.900	(0)
U (SO4) 2	2.765e-39	2.765e-39	-38.558	-38.558	0.000	(0)
UF5-	1.571e-39	1.248e-39	-38.804	-38.904	-0.100	(0)
USO4+2	1.980e-40	0.000e+00	-39.703	-40.104	-0.400	(0)
UF6-2	1.042e-40	0.000e+00	-39.982	-40.382	-0.400	(0)
U+4	0.000e+00	0.000e+00	-42.748	-44.349	-1.600	(0)
UC1+3	0.000e+00	0.000e+00	-44.427	-45.328	-0.900	(0)

U6 (OH) 15+9	0.000e+00	0.000e+00	-164.041	-172.143	-8.102	(0)
U (5)	2.678e-16					
UO2+	2.678e-16	2.127e-16	-15.572	-15.672	-0.100	(0)
U (6)	3.210e-07					
UO2 (CO3) 3-4	2.074e-07	5.203e-09	-6.683	-8.284	-1.600	(0)
UO2 (CO3) 2-2	1.126e-07	4.482e-08	-6.948	-7.349	-0.400	(0)
UO2CO3	9.698e-10	9.698e-10	-9.013	-9.013	0.000	(0)
UO2OH+	4.284e-12	3.403e-12	-11.368	-11.468	-0.100	(0)
UO2F+	2.010e-12	1.597e-12	-11.697	-11.797	-0.100	(0)
UO2SO4	7.031e-13	7.031e-13	-12.153	-12.153	0.000	(0)
UO2F2	5.066e-13	5.066e-13	-12.295	-12.295	0.000	(0)
UO2+2	2.152e-13	1.052e-13	-12.667	-12.978	-0.311	(0)
UO2 (SO4) 2-2	1.029e-13	4.094e-14	-12.988	-13.388	-0.400	(0)
UO2F3-	1.762e-14	1.400e-14	-13.754	-13.854	-0.100	(0)
UO2Cl+	4.498e-16	3.573e-16	-15.347	-15.447	-0.100	(0)
(UO2) 2 (OH) 2+2	4.827e-17	1.921e-17	-16.316	-16.716	-0.400	(0)
UO2F4-2	3.073e-17	1.223e-17	-16.512	-16.913	-0.400	(0)
(UO2) 3 (OH) 5+	4.123e-18	3.275e-18	-17.385	-17.485	-0.100	(0)
UO2NO3+	2.731e-21	2.169e-21	-20.564	-20.664	-0.100	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.646	-42.746	-0.100	(0)
V+2	0.000e+00	0.000e+00	-43.266	-43.666	-0.400	(0)
V (3)	1.818e-15					
V (OH) 3	1.818e-15	1.818e-15	-14.740	-14.740	0.000	(0)
V (OH) 2+	5.796e-26	4.604e-26	-25.237	-25.337	-0.100	(0)
VOH+2	4.298e-29	1.711e-29	-28.367	-28.767	-0.400	(0)
V+3	1.056e-33	1.328e-34	-32.976	-33.877	-0.900	(0)
VSO4+	3.487e-34	2.769e-34	-33.458	-33.558	-0.100	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.752	-55.652	-0.900	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.133	-56.734	-1.600	(0)
V (4)	3.632e-18					
V (OH) 3+	3.390e-18	2.693e-18	-17.470	-17.570	-0.100	(0)
VO+2	1.320e-19	5.254e-20	-18.879	-19.279	-0.400	(0)
VOSO4	6.392e-20	6.392e-20	-19.194	-19.194	0.000	(0)
VOF+	4.364e-20	3.467e-20	-19.360	-19.460	-0.100	(0)
VOF2	1.430e-21	1.430e-21	-20.845	-20.845	0.000	(0)
VOC1+	3.887e-22	3.088e-22	-21.410	-21.510	-0.100	(0)
VOF3-	7.026e-24	5.580e-24	-23.153	-23.253	-0.100	(0)
VOF4-2	6.225e-27	2.478e-27	-26.206	-26.606	-0.400	(0)
H2V2O4+2	9.141e-31	3.638e-31	-30.039	-30.439	-0.400	(0)
V (5)	5.985e-09					
H2VO4-	5.305e-09	4.213e-09	-8.275	-8.375	-0.100	(0)
HVO4-2	6.790e-10	2.703e-10	-9.168	-9.568	-0.400	(0)
H3VO4	1.650e-12	1.650e-12	-11.783	-11.783	0.000	(0)
H3V2O7-	5.654e-14	4.491e-14	-13.248	-13.348	-0.100	(0)
HV2O7-3	3.068e-15	3.861e-16	-14.513	-15.413	-0.900	(0)
VO4-3	2.749e-16	3.459e-17	-15.561	-16.461	-0.900	(0)
VO2+	1.544e-16	1.291e-16	-15.811	-15.889	-0.078	(0)
VO2F	2.490e-17	2.490e-17	-16.604	-16.604	0.000	(0)
VO2SO4-	1.714e-17	1.361e-17	-16.766	-16.866	-0.100	(0)
V2O7-4	1.057e-17	2.654e-19	-16.976	-18.576	-1.600	(0)
VO2F2-	1.252e-18	9.944e-19	-17.902	-18.002	-0.100	(0)
V3O9-3	6.235e-19	7.845e-20	-18.205	-19.105	-0.900	(0)
VO2F3-2	3.428e-21	1.364e-21	-20.465	-20.865	-0.400	(0)
V4O12-4	5.495e-24	1.379e-25	-23.260	-24.861	-1.600	(0)
VO2NO3	6.747e-25	6.747e-25	-24.171	-24.171	0.000	(0)
VO2F4-3	5.869e-25	7.384e-26	-24.231	-25.132	-0.900	(0)
V10O28-6	0.000e+00	0.000e+00	-60.873	-64.474	-3.601	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.194	-63.694	-2.501	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.293	-65.894	-1.600	(0)
Zn	5.040e-06					
Zn+2	3.069e-06	1.500e-06	-5.513	-5.824	-0.311	(0)
ZnSO4	1.449e-06	1.449e-06	-5.839	-5.839	0.000	(0)
ZnCO3	1.999e-07	1.999e-07	-6.699	-6.699	0.000	(0)
Zn (SO4) 2-2	1.401e-07	5.576e-08	-6.854	-7.254	-0.400	(0)
ZnHCO3+	1.155e-07	9.176e-08	-6.937	-7.037	-0.100	(0)
ZnOH+	4.853e-08	3.854e-08	-7.314	-7.414	-0.100	(0)
ZnCl+	9.477e-09	7.891e-09	-8.023	-8.103	-0.080	(0)

ZnF+	4.144e-09	3.292e-09	-8.383	-8.483	-0.100	(0)
ZnOHCl	2.655e-09	2.655e-09	-8.576	-8.576	0.000	(0)
Zn(OH)2	1.570e-09	1.570e-09	-8.804	-8.804	0.000	(0)
ZnCl2	2.619e-11	2.619e-11	-10.582	-10.582	0.000	(0)
Zn(OH)3-	2.546e-12	2.022e-12	-11.594	-11.694	-0.100	(0)
ZnCl3-	5.234e-14	4.358e-14	-13.281	-13.361	-0.080	(0)
ZnNO3+	4.902e-14	3.894e-14	-13.310	-13.410	-0.100	(0)
ZnSeO4	1.433e-14	1.433e-14	-13.844	-13.844	0.000	(0)
ZnCl4-2	9.163e-17	4.564e-17	-16.038	-16.341	-0.303	(0)
Zn(OH)4-2	5.198e-17	2.069e-17	-16.284	-16.684	-0.400	(0)
Zn(NO3)2	8.030e-23	8.030e-23	-22.095	-22.095	0.000	(0)
Zn(SeO4)2-2	2.251e-24	8.959e-25	-23.648	-24.048	-0.400	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.890	-149.990	-0.100	(0)
Zn(HS)2	0.000e+00	0.000e+00	-151.388	-151.388	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-227.199	-227.299	-0.100	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-229.472	-229.872	-0.400	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-307.551	-307.951	-0.400	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-56.52	-50.23	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-44.12	-39.61	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-51.35	-39.61	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-72.87	-54.94	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-59.05	-39.02	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-29.36	-28.95	0.40	(NH4)2CrO4	
(NH4)2SeO4	-24.29	-23.84	0.45	(NH4)2SeO4	
Acanthite	-52.69	-88.91	-36.22	Ag2S	
Ag2CO3	-11.67	-22.76	-11.09	Ag2CO3	
Ag2CrO4	-20.86	-32.45	-11.59	Ag2CrO4	
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4	
Ag2MoO4	-11.65	-23.20	-11.55	Ag2MoO4	
Ag2O	-14.89	-2.31	12.57	Ag2O	
Ag2Se	-0.56	-49.26	-48.70	Ag2Se	
Ag2SeO3	-9.65	-16.80	-7.15	Ag2SeO3	
Ag2SeO4	-18.43	-27.34	-8.91	Ag2SeO4	
Ag2SO4	-14.66	-19.48	-4.82	Ag2SO4	
Ag3AsO3	-28.17	-26.01	2.16	Ag3AsO3	
Ag3AsO4	-16.35	-19.14	-2.79	Ag3AsO4	
Ag3H2VO5	-17.13	-11.95	5.18	Ag3H2VO5	
AgF·4H2O	-13.57	-12.52	1.05	AgF·4H2O	
Agmetal	-0.54	-14.04	-13.51	Ag	
AgVO3	-10.41	-9.64	0.77	AgVO3	
Al(OH)3(am)	-1.10	9.70	10.80	Al(OH)3	
Al2(MoO4)3	-45.63	-43.26	2.37	Al2(MoO4)3	
Al2O3	-0.26	19.39	19.65	Al2O3	
Al4(OH)10SO4	-1.08	21.62	22.70	Al4(OH)10SO4	
AlAsO4·2H2O	-10.77	-5.97	4.80	AlAsO4·2H2O	
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4	
AlSb	-152.76	-87.13	65.62	AlSb	
Alunite	0.96	-0.44	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.22	-12.01	-7.79	PbSO4	
Anhydrite	-0.86	-5.22	-4.36	CaSO4	
Anilite	-56.76	-88.64	-31.88	Cu0.25Cu1.5S	
Antlerite	-3.23	5.56	8.79	Cu3(OH)4SO4	
Aragonite	-0.20	-8.50	-8.30	CaCO3	
Arsenolite	-87.42	-90.18	-2.76	As4O6	
Artinite	-6.02	3.58	9.60	MgCO3:Mg(OH)2·3H2O	
As2O5	-38.05	-31.34	6.71	As2O5	
Atacamite	-2.33	5.06	7.39	Cu2(OH)3Cl	
Azurite	-1.27	-18.17	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2·8H2O	-17.00	7.39	24.39	Ba(OH)2·8H2O	
Ba2V2O7·2H2O	-18.05	-2.18	15.87	Ba2V2O7·2H2O	
Ba3(AsO4)2	-0.25	-9.16	-8.91	Ba3(AsO4)2	
Ba3(VO4)2·4H2O	-27.72	5.22	32.94	Ba3(VO4)2·4H2O	
BaCrO4	-13.08	-22.75	-9.67	BaCrO4	

BaF2	-9.52	-15.34	-5.82	BaF2
BaMoO4	-6.53	-13.49	-6.96	BaMoO4
Barite	0.20	-9.78	-9.98	BaSO4
BaS	-95.38	-79.20	16.18	BaS
BaSeO3	-8.92	-7.09	1.83	BaSeO3
BaSeO4	-10.17	-17.63	-7.46	BaSeO4
Bianchite	-6.42	-8.18	-1.76	ZnSO4:6H2O
Birnessite	-7.65	10.44	18.09	MnO2
Bixbyite	-4.24	-4.89	-0.64	Mn2O3
BlaubleiI	-56.14	-80.30	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-56.87	-84.15	-27.28	Cu0.6Cu0.8S
Boehmite	1.12	9.70	8.58	AlOOH
Breithauptite	-58.10	-76.62	-18.52	NiSb
Brochantite	-2.09	13.13	15.22	Cu4(OH)6SO4
Brucite	-4.83	12.02	16.84	Mg(OH)2
Bunsenite	-5.12	7.32	12.45	NiO
Ca(VO3)2	-10.67	-5.01	5.66	Ca(VO3)2
Ca2V2O7	-10.56	6.94	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.62	6.94	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.79	4.51	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.07	18.89	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.97	18.89	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.78	-157.81	142.97	Ca3Sb2
CaCrO4	-15.92	-18.19	-2.27	CaCrO4
Calcite	-0.02	-8.50	-8.48	CaCO3
Calomel	-7.14	-25.05	-17.91	Hg2Cl2
CaMoO4	-0.98	-8.93	-7.95	CaMoO4
Carnotite	-2.07	-1.84	0.23	KUO2VO4
CaSeO3:2H2O	-5.35	-2.54	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.05	-13.07	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.68	-2.84	9.84	Cd(BO2)2
Cd(OH)2	-7.31	6.34	13.64	Cd(OH)2
Cd(OH)2(am)	-7.39	6.34	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.04	-15.33	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.72	1.84	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.23	8.17	28.40	Cd4(OH)6SO4
CdCl2	-13.18	-13.84	-0.66	CdCl2
CdCl2:1H2O	-12.14	-13.84	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.92	-13.84	-1.91	CdCl2:2.5H2O
CdF2	-15.18	-16.40	-1.21	CdF2
Cdmetal(alpha)	-32.95	-19.44	13.51	Cd
Cdmetal(gamma)	-33.05	-19.44	13.62	Cd
CdMoO4	-0.40	-14.55	-14.15	CdMoO4
CdOHCl	-7.29	-3.75	3.54	CdOHCl
CdSb	-77.26	-77.61	-0.35	CdSb
CdSe	-20.41	-40.61	-20.20	CdSe
CdSeO4:2H2O	-16.84	-18.69	-1.85	CdSeO4:2H2O
CdSO4	-10.66	-10.83	-0.17	CdSO4
CdSO4:1H2O	-9.11	-10.83	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.96	-10.83	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-2.16	-15.29	-13.13	PbCO3
CH4(g)	-82.49	-123.54	-41.05	CH4
Chalcanthite	-6.95	-9.59	-2.64	CuSO4:5H2O
Chalcocite	-56.92	-91.84	-34.92	Cu2S
Chalcopyrite	-127.11	-162.38	-35.27	CuFeS2
Cinnabar	-52.05	-97.75	-45.69	HgS
Claudetite	-87.11	-90.18	-3.06	As4O6
Clausthalite	-14.69	-41.79	-27.10	PbSe
Co(BO2)2	-29.06	-1.99	27.07	Co(BO2)2
Co(OH)2	-5.91	7.19	13.09	Co(OH)2
Co(OH)3	-10.02	-12.33	-2.31	Co(OH)3
CO2(g)	-2.30	-20.45	-18.15	CO2
Co3(AsO4)2	-22.81	-9.78	13.03	Co3(AsO4)2
Co3O4	-6.97	-17.46	-10.50	Co3O4
CoCl2	-21.25	-12.98	8.27	CoCl2
CoCl2:6H2O	-15.52	-12.99	2.54	CoCl2:6H2O
CoCO3	-3.28	-13.26	-9.98	CoCO3

CoF2	-13.95	-15.54	-1.60	CoF2
CoF3	-44.96	-46.42	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-5.94	-13.70	-7.76	CoMoO4
CoO	-6.40	7.19	13.59	CoO
CoS (alpha)	-71.97	-79.41	-7.44	CoS
CoS (beta)	-68.34	-79.41	-11.07	CoS
CoSe	-23.56	-39.76	-16.20	CoSe
CoSeO3	-8.62	-7.30	1.32	CoSeO3
CoSeO4:6H2O	-16.31	-17.84	-1.53	CoSeO4:6H2O
CoSO4	-12.78	-9.98	2.80	CoSO4
CoSO4:6H2O	-7.51	-9.98	-2.47	CoSO4:6H2O
Cotunnite	-10.23	-15.01	-4.78	PbCl2
Covellite	-56.72	-79.02	-22.30	CuS
Cr (OH) 2	-22.18	-11.36	10.82	Cr (OH) 2
Cr (OH) 3	-2.76	-1.42	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.67	-1.42	-0.75	Cr (OH) 3
Cr2O3	-0.49	-2.85	-2.36	Cr2O3
CrCl2	-45.63	-31.53	14.09	CrCl2
CrCl3	-46.80	-31.68	15.11	CrCl3
CrF3	-24.18	-35.52	-11.34	CrF3
Crmetal	-67.62	-37.14	30.48	Cr
CrO3	-26.93	-30.14	-3.21	CrO3
Cryolite	-8.96	-42.80	-33.84	Na3AlF6
Cu (OH) 2	-1.10	7.58	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.11	20.10	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.49	-0.24	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.99	-91.88	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.39	-52.19	-45.80	Cu2Se
Cu2SO4	-20.46	-22.41	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.71	-8.61	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.10	-104.69	-42.59	Cu3Sb
Cu3Se2	-28.07	-91.56	-63.49	Cu3Se2
CuCO3	-1.37	-12.87	-11.50	CuCO3
CuCrO4	-17.13	-22.57	-5.44	CuCrO4
CuF	-9.08	-13.99	-4.91	CuF
CuF2	-16.27	-15.16	1.12	CuF2
CuF2:2H2O	-10.61	-15.16	-4.55	CuF2:2H2O
Cumetal	-6.75	-15.51	-8.76	Cu
CuMoO4	-0.23	-13.31	-13.08	CuMoO4
CuOCuSO4	-12.32	-2.02	10.30	CuOCuSO4
Cupricferrite	7.78	13.77	5.99	CuFe2O4
Cuprite	-3.84	-5.24	-1.41	Cu2O
Cuprousferrite	9.39	0.48	-8.92	CuFeO2
CuSe	-6.27	-39.37	-33.10	CuSe
CuSe2	-27.18	-60.54	-33.37	CuSe2
CuSeO3:2H2O	-7.42	-6.91	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.01	-17.45	-2.44	CuSeO4:5H2O
CuSO4	-12.53	-9.59	2.94	CuSO4
Diaspore	2.82	9.70	6.87	AlOOH
Djurleite	-57.07	-90.99	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.39	-16.93	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.16	-16.93	-17.09	CaMg (CO3) 2
Epsomite	-3.03	-5.16	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.32	3.24	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.11	0.07	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.00	-13.72	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.85	-8.29	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.64	-37.27	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.58	-45.31	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.79	9.44	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.97	-12.57	0.40	FeAsO4:2H2O
FeCr2O4	-6.80	0.40	7.20	FeCr2O4
FeMoO4	-7.55	-17.64	-10.09	FeMoO4
Ferrihydrite	-0.09	3.10	3.19	Fe (OH) 3
Ferroselite	-46.28	-64.88	-18.60	FeSe2
FeS (ppt)	-80.41	-83.36	-2.95	FeS
FeSe	-32.70	-43.70	-11.00	FeSe

Fix_pe	-5.48	-5.48	0.00	e-
Fluorite	-0.28	-10.78	-10.50	CaF2
Galena	-67.47	-81.44	-13.97	PbS
Gibbsite	1.41	9.70	8.29	Al (OH) 3
Goethite	2.61	3.10	0.49	FeOOH
Goslarite	-6.17	-8.18	-2.01	ZnSO4:7H2O
Greenockite	-65.90	-80.26	-14.36	CdS
Greigite	-291.92	-336.96	-45.03	Fe3S4
Gummite	-5.84	1.84	7.67	UO3
Gypsum	-0.61	-5.22	-4.61	CaSO4:2H2O
H-Jarosite	-12.95	-25.05	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.01	-20.88	-12.88	H2MoO4
H2S (g)	-78.59	-86.60	-8.01	H2S
H2Se (g)	-41.99	-46.95	-4.96	H2Se
Halite	-6.46	-4.85	1.60	NaCl
Hausmannite	-5.20	55.83	61.03	Mn3O4
Hematite	7.61	6.19	-1.42	Fe2O3
Hercynite	-0.26	22.64	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.52	-258.23	-73.71	Hg (CH3) 2
Hg (g)	-7.45	-15.33	-7.87	Hg
Hg (OH) 2	-7.65	-11.15	-3.50	Hg (OH) 2
Hg2 (g)	-15.70	-30.65	-14.96	Hg2
Hg2 (OH) 2	-10.14	-4.88	5.26	Hg2 (OH) 2
Hg2CO3	-9.28	-25.33	-16.05	Hg2CO3
Hg2CrO4	-26.32	-35.02	-8.70	Hg2CrO4
Hg2F2	-17.25	-27.61	-10.36	Hg2F2
Hg2S	-79.80	-91.48	-11.68	Hg2S
Hg2SeO3	-14.71	-19.37	-4.66	Hg2SeO3
Hg2SO4	-15.92	-22.05	-6.13	Hg2SO4
Hg3O2CO3	-24.21	-53.89	-29.68	Hg3O2CO3
HgCl (g)	-32.02	-12.53	19.50	HgCl
HgCl2	-10.06	-31.32	-21.26	HgCl2
HgF (g)	-46.48	-13.81	32.68	HgF
HgF2 (g)	-46.44	-33.88	12.57	HgF2
Hgmetal (l)	-1.88	-15.33	-13.45	Hg
HgSe	-2.40	-58.09	-55.69	HgSe
HgSeO3	-13.21	-25.64	-12.43	HgSeO3
HgSO4	-18.90	-28.32	-9.42	HgSO4
Huntite	-3.83	-33.80	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.65	-25.42	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.96	-21.72	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.67	-19.84	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.44	-20.24	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.42	-50.67	-17.24	K2Cr2O7
K2CrO4	-20.01	-20.52	-0.51	K2CrO4
K2MoO4	-14.53	-11.27	3.26	K2MoO4
K2SeO4	-14.68	-15.41	-0.73	K2SeO4
Langite	-4.36	13.13	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.42	-6.85	-0.43	PbO:PbSO4
Laurionite	-5.55	-4.93	0.62	PbOHCl
Lepidocrocite	1.73	3.10	1.37	FeOOH
Lime	-20.75	11.95	32.70	CaO
Litharge	-7.53	5.16	12.69	PbO
Mackinawite	-79.76	-83.36	-3.60	FeS
Maghemite	-0.19	6.19	6.39	Fe2O3
Magnesioferrite	1.35	18.21	16.86	Fe2MgO4
Magnesite	-0.97	-8.43	-7.46	MgCO3
Magnetite	6.04	9.44	3.40	Fe3O4
Malachite	0.01	-5.30	-5.31	Cu2 (OH) 2CO3
Manganite	-2.43	22.91	25.34	MnOOH
Massicot	-7.73	5.16	12.89	PbO
Matlockite	-7.32	-16.29	-8.97	PbClF
Melanothallite	-18.85	-12.60	6.26	CuCl2
Melanterite	-11.72	-13.93	-2.21	FeSO4:7H2O
Metacinnabar	-52.65	-97.75	-45.09	HgS
Mg (OH) 2 (active)	-6.78	12.02	18.79	Mg (OH) 2
Mg (VO3) 2	-16.23	-4.95	11.28	Mg (VO3) 2
Mg2Sb3	-276.71	-202.03	74.68	Mg2Sb3

Mg2V2O7	-19.29	7.07	26.36	Mg2V2O7
MgCr2O4	-7.03	9.17	16.20	MgCr2O4
MgCrO4	-23.51	-18.13	5.38	MgCrO4
MgF2	-2.59	-10.72	-8.13	MgF2
MgMoO4	-7.02	-8.87	-1.85	MgMoO4
MgSeO3:6H2O	-5.53	-2.47	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.81	-13.01	-1.20	MgSeO4:6H2O
Minium	-32.27	41.25	73.52	Pb3O4
Mirabilite	-5.59	-6.71	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.84	-6.94	4.90	Mn(VO3)2
Mn2(SO4)3	-50.68	-56.39	-5.71	Mn2(SO4)3
Mn2Sb	-150.76	-89.68	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.78	-1.28	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.87	-10.15	2.72	MnCl2:4H2O
MnS (grn)	-76.75	-76.58	0.17	MnS
MnS (pnk)	-79.92	-76.58	3.34	MnS
MnSb	-96.36	-99.27	-2.91	MnSb
MnSe	-40.43	-36.93	3.50	MnSe
MnSeO3	-5.60	-4.47	1.13	MnSeO3
MnSeO3:2H2O	-5.45	-4.47	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.96	-15.01	-2.05	MnSeO4:5H2O
MnSO4	-9.73	-7.15	2.58	MnSO4
Monteponite	-8.77	6.34	15.10	CdO
Montroydite	-7.51	-11.15	-3.64	HgO
MoO3	-12.88	-20.88	-8.00	MoO3
Morenosite	-7.70	-9.85	-2.14	NiSO4:7H2O
MoS2	-149.59	-219.85	-70.26	MoS2
Na-Jarosite	-8.62	-19.82	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.92	-49.82	-9.90	Na2Cr2O7
Na2CrO4	-22.61	-19.68	2.93	Na2CrO4
Na2Mo2O7	-14.71	-31.31	-16.60	Na2Mo2O7
Na2MoO4	-11.91	-10.42	1.49	Na2MoO4
Na2MoO4:2H2O	-11.65	-10.42	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.33	-4.03	10.30	Na2SeO3:5H2O
Na2SeO4	-15.84	-14.56	1.28	Na2SeO4
Na3Sb	-175.59	-81.14	94.45	Na3Sb
Na3VO4	-29.47	7.21	36.68	Na3VO4
Na4V2O7	-33.44	3.96	37.40	Na4V2O7
Nantokite	-5.98	-12.71	-6.73	CuCl
NaSb	-88.99	-65.83	23.17	NaSb
Natron	-8.68	-9.99	-1.31	Na2CO3:10H2O
NaVO3	-7.11	-3.25	3.86	NaVO3
Nesquehonite	-3.76	-8.43	-4.67	MgCO3:3H2O
Ni(OH)2	-5.47	7.32	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.08	-9.38	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.88	12.12	32.00	Ni4(OH)6SO4
NiCO3	-6.26	-13.13	-6.87	NiCO3
NiMoO4	-2.42	-13.56	-11.14	NiMoO4
NiS (alpha)	-73.68	-79.28	-5.60	NiS
NiS (beta)	-68.18	-79.28	-11.10	NiS
NiS (gamma)	-66.48	-79.28	-12.80	NiS
NiSe	-21.92	-39.62	-17.70	NiSe
NiSeO3:2H2O	-9.98	-7.17	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.18	-17.70	-1.52	NiSeO4:6H2O
Nsutite	-7.06	10.44	17.50	MnO2
O2 (g)	-31.54	51.54	83.09	O2
Orpiment	-243.82	-304.89	-61.07	As2S3
Otavite	-2.11	-14.11	-12.00	CdCO3
Pb(BO2)2	-10.54	-4.02	6.52	Pb(BO2)2
Pb(OH)2	-2.99	5.16	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.34	-71.10	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.56	0.23	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.87	10.32	26.19	Pb2O(OH)2
Pb2O3	-24.95	36.09	61.04	Pb2O3
Pb2OCO3	-9.57	-10.13	-0.56	Pb2OCO3
Pb2V2O7	-4.74	-6.64	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.66	-15.86	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.63	-1.49	6.14	Pb3(VO4)2

Pb3O2CO3	-15.99	-4.97	11.02	Pb3O2CO3
Pb3O2SO4	-12.38	-1.69	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.63	3.47	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.41	3.47	21.88	Pb4O3SO4
PbCrO4	-12.38	-24.98	-12.60	PbCrO4
PbF2	-10.13	-17.57	-7.44	PbF2
Pbmetal	-24.86	-20.61	4.25	Pb
PbMoO4	-0.10	-15.72	-15.62	PbMoO4
PbO:0.3H2O	-7.82	5.16	12.98	PbO:0.33H2O
PbSeO4	-13.02	-19.86	-6.84	PbSeO4
Periclase	-9.57	12.02	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.67	30.93	49.60	PbO2
Portlandite	-10.85	11.95	22.80	Ca(OH)2
Pyrite	-125.67	-144.18	-18.51	FeS2
Pyrochroite	-5.17	10.02	15.19	Mn(OH)2
Pyrolusite	-5.59	35.79	41.38	MnO2
Realgar	-102.28	-122.03	-19.75	AsS
Retgersite	-7.81	-9.85	-2.04	NiSO4:6H2O
Rhodochrosite	0.15	-10.43	-10.58	MnCO3
Rutherfordine	-4.11	-18.61	-14.50	UO2CO3
Sb(OH)3	-12.40	-19.51	-7.11	Sb(OH)3
Sb2O4	-16.65	-13.25	3.40	Sb2O4
Sb2O5	-26.43	-36.10	-9.67	Sb2O5
Sb2Se3	-112.10	-179.86	-67.76	Sb2Se3
Sb4O6(cubic)	-59.79	-78.05	-18.26	Sb4O6
Sb4O6(orth)	-60.15	-78.05	-17.90	Sb4O6
SbCl3	-50.34	-49.77	0.57	SbCl3
SbF3	-43.38	-53.61	-10.23	SbF3
Sbmetal	-46.48	-58.17	-11.69	Sb
SbO2	-3.11	-30.94	-27.82	SbO2
Schoepite	-4.16	1.84	5.99	UO2(OH)2:H2O
Semetal(am)	-14.06	-21.17	-7.11	Se
Semetal(hex)	-13.46	-21.17	-7.71	Se
Senarmontite	-26.66	-39.02	-12.37	Sb2O3
SeO2	-14.61	-14.49	0.12	SeO2
SeO3	-46.07	-25.02	21.04	SeO3
Siderite	-6.97	-17.21	-10.24	FeCO3
Smithsonite	-1.46	-11.46	-10.00	ZnCO3
Sphalerite	-66.16	-77.61	-11.45	ZnS
Spinel	-5.44	31.41	36.85	MgAl2O4
Stibnite	-248.36	-298.82	-50.46	Sb2S3
Sulfur	-58.68	-60.83	-2.14	S
Tenorite	-0.07	7.58	7.64	CuO
Thenardite	-7.03	-6.71	0.32	Na2SO4
Thermonatrite	-10.62	-9.99	0.64	Na2CO3:H2O
Tyuyamunite	-5.42	-1.34	4.08	Ca(UO2)2(VO4)2
U3O8	-13.70	7.38	21.08	U3O8
U3Sb4	-583.86	-431.48	152.38	U3Sb4
U4O9	-30.09	-33.11	-3.02	U4O9
UF4	-30.65	-60.18	-29.54	UF4
UF4:2.5H2O	-27.47	-60.18	-32.72	UF4:2.5H2O
UO2(am)	-15.65	-14.72	0.93	UO2
UO2(NO3)2	-41.10	-28.95	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.80	-28.95	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.34	-28.95	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.00	-28.95	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.78	1.84	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.94	-23.19	-2.25	UO2SeO4:4H2O
UO3	-5.86	1.84	7.70	UO3
Uraninite	-10.05	-14.72	-4.67	UO2
USb2	-221.40	-191.82	29.58	USb2
V(OH)3	-19.25	-11.66	7.59	V(OH)3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-41.00	-39.17	1.84	V3O5
V4O7	-50.82	-43.63	7.19	V4O7
V6O13	-41.58	-102.44	-60.86	V6O13
Valentinite	-30.54	-39.02	-8.48	Sb2O3

VC12	-63.59	-44.71	18.87	VC12
VC13	-65.35	-41.91	23.43	VC13
VF4	-64.86	-49.93	14.93	VF4
Vmetal	-94.34	-50.31	44.03	V
VO	-39.30	-24.54	14.76	VO
VO(OH)2	-9.62	-4.47	5.15	VO(OH)2
VO2Cl	-21.41	-18.57	2.84	VO2Cl
VOC1	-32.89	-21.74	11.15	VOC1
VOC12	-37.40	-24.64	12.76	VOC12
VOSO4	-25.24	-21.63	3.61	VOSO4
Witherite	-4.49	-13.06	-8.57	BaCO3
Wurtzite	-68.66	-77.61	-8.95	ZnS
Zincite	-2.34	8.99	11.33	ZnO
Zincosite	-12.11	-8.18	3.93	ZnSO4
Zn(BO2)2	-8.48	-0.19	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.11	-21.80	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.21	8.99	12.20	Zn(OH)2
Zn(OH)2(am)	-3.48	8.99	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.76	8.99	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.54	8.99	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.74	8.99	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.69	0.81	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.30	7.89	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.02	-4.37	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.28	-7.37	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.61	18.79	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.72	24.78	38.50	Zn5(OH)8Cl2
ZnCl2	-18.23	-11.18	7.05	ZnCl2
ZnCO3:1H2O	-1.20	-11.46	-10.26	ZnCO3:1H2O
ZnF2	-13.21	-13.74	-0.53	ZnF2
Znmetal	-42.57	-16.78	25.79	Zn
ZnMoO4	-1.77	-11.89	-10.13	ZnMoO4
ZnO(active)	-2.20	8.99	11.19	ZnO
ZnS(am)	-68.56	-77.61	-9.05	ZnS
ZnSb	-85.97	-74.95	11.01	ZnSb
ZnSe	-23.56	-37.96	-14.40	ZnSe
ZnSeO4:6H2O	-14.52	-16.04	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.54	-8.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 62.

```

      REACTION 304
      H2O      -1
      0.7771 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 310
      SAVE Solution 311
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 310. Solution after simulation 61.
Using reaction 304.

Reaction 304.

7.771e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.824e-08	1.824e-08
Al	3.295e-06	3.295e-06
As	2.637e-10	2.638e-10
B	2.639e-05	2.640e-05
Ba	7.974e-08	7.975e-08
C	2.621e-03	2.621e-03
Ca	4.314e-03	4.315e-03
Cd	1.198e-08	1.198e-08
Cl	2.540e-03	2.541e-03
Co	8.735e-08	8.736e-08
Cr	2.204e-09	2.204e-09
Cu	1.061e-06	1.061e-06
F	1.598e-04	1.599e-04
Fe	1.870e-09	1.870e-09
Hg	1.790e-09	1.791e-09
K	3.150e-03	3.151e-03
Mg	4.660e-03	4.661e-03
Mn	5.464e-05	5.464e-05
Mo	1.765e-06	1.765e-06
N	8.190e-06	8.191e-06
Na	8.291e-03	8.292e-03
Ni	1.086e-07	1.086e-07
Pb	3.184e-09	3.184e-09
S	1.217e-02	1.217e-02
Sb	2.487e-08	2.487e-08
Se	1.274e-07	1.274e-07
U	3.254e-07	3.255e-07
V	6.069e-09	6.070e-09
Zn	5.111e-06	5.111e-06

-----Description of solution-----

	pH	=	7.407	Charge balance
	pe	=	5.480	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	3.895e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.478e-03	
	Total CO2 (mol/kg)	=	2.621e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	9.691e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	3	
	Total H	=	1.110292e+02	
	Total O	=	5.556981e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
---------	----------	----------	--------------	--------------	-----------	-----------------------------

	OH-	3.100e-07	2.566e-07	-6.509	-6.591	-0.082	(0)
	H+	4.695e-08	3.922e-08	-7.328	-7.407	-0.078	0.00
	H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag		1.824e-08					
	AgCl	1.187e-08	1.187e-08	-7.926	-7.926	0.000	(0)
	Ag+	3.280e-09	2.740e-09	-8.484	-8.562	-0.078	(0)
	AgCl2-	2.766e-09	2.194e-09	-8.558	-8.659	-0.101	(0)
	AgSO4-	3.072e-10	2.437e-10	-9.513	-9.613	-0.101	(0)
	AgCl3-2	1.049e-11	4.150e-12	-10.979	-11.382	-0.403	(0)
	AgNO2	3.760e-12	3.760e-12	-11.425	-11.425	0.000	(0)
	AgF	7.658e-13	7.658e-13	-12.116	-12.116	0.000	(0)
	AgCl4-3	1.448e-13	1.798e-14	-12.839	-13.745	-0.906	(0)
	AgOH	7.030e-14	7.030e-14	-13.153	-13.153	0.000	(0)
	AgSeO3-	1.891e-14	1.499e-14	-13.723	-13.824	-0.101	(0)
	AgH2BO3	1.677e-14	1.677e-14	-13.775	-13.775	0.000	(0)
	AgNH3+	1.597e-14	1.267e-14	-13.797	-13.897	-0.101	(0)
	Ag2Se	4.548e-15	4.548e-15	-14.342	-14.342	0.000	(0)
	Ag (NO2) 2-	4.824e-17	3.826e-17	-16.317	-16.417	-0.101	(0)
	AgNO3	2.281e-17	2.281e-17	-16.642	-16.642	0.000	(0)
	Ag (OH) 2-	2.223e-18	1.763e-18	-17.653	-17.754	-0.101	(0)
	Ag (NH3) 2+	2.939e-19	2.331e-19	-18.532	-18.632	-0.101	(0)
	Ag (SeO3) 2-3	9.207e-21	1.143e-21	-20.036	-20.942	-0.906	(0)
	Ag2MoO4	2.441e-24	2.441e-24	-23.612	-23.612	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.937	-73.937	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.312	-85.922	-1.611	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.899	-149.103	-0.204	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.925	-149.026	-0.101	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.763	-151.137	-0.373	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-151.093	-151.448	-0.354	(0)
Al		3.295e-06					
	Al (OH) 4-	3.153e-06	2.635e-06	-5.501	-5.579	-0.078	(0)
	Al (OH) 3	8.158e-08	8.158e-08	-7.088	-7.088	0.000	(0)
	AlF3	2.104e-08	2.104e-08	-7.677	-7.677	0.000	(0)
	Al (OH) 2+	1.892e-08	1.593e-08	-7.723	-7.798	-0.075	(0)
	AlF2+	1.783e-08	1.502e-08	-7.749	-7.823	-0.075	(0)
	AlF4-	1.404e-09	1.173e-09	-8.853	-8.931	-0.078	(0)
	AlF+2	6.737e-10	3.390e-10	-9.172	-9.470	-0.298	(0)
	AlOH+2	1.553e-10	7.817e-11	-9.809	-10.107	-0.298	(0)
	AlSO4+	1.261e-11	1.054e-11	-10.899	-10.977	-0.078	(0)
	Al+3	1.537e-12	3.047e-13	-11.813	-12.516	-0.703	(0)
	Al (SO4) 2-	6.024e-13	5.035e-13	-12.220	-12.298	-0.078	(0)
	AlMo6O21-3	3.534e-38	4.389e-39	-37.452	-38.358	-0.906	(0)
As (3)		2.926e-23					
	H3AsO3	2.878e-23	2.878e-23	-22.541	-22.541	0.000	(0)
	H2AsO3-	4.746e-25	3.764e-25	-24.324	-24.424	-0.101	(0)
	HAsO3-2	2.212e-29	8.754e-30	-28.655	-29.058	-0.403	(0)
	H4AsO3+	7.052e-31	5.593e-31	-30.152	-30.252	-0.101	(0)
	AsO3-3	6.929e-35	8.604e-36	-34.159	-35.065	-0.906	(0)
As (5)		2.637e-10					
	HAsO4-2	2.238e-10	8.854e-11	-9.650	-10.053	-0.403	(0)
	H2AsO4-	3.993e-11	3.167e-11	-10.399	-10.499	-0.101	(0)
	AsO4-3	5.749e-14	7.139e-15	-13.240	-14.146	-0.906	(0)
	H3AsO4	2.139e-16	2.158e-16	-15.670	-15.666	0.004	(0)
B		2.639e-05					
	H3BO3	2.585e-05	2.609e-05	-4.587	-4.584	0.004	(0)
	H2BO3-	4.716e-07	3.863e-07	-6.326	-6.413	-0.087	(0)
	CaH2BO3+	3.749e-08	3.071e-08	-7.426	-7.513	-0.087	(0)
	MgH2BO3+	2.623e-08	2.148e-08	-7.581	-7.668	-0.087	(0)
	NaH2BO3	4.138e-09	4.138e-09	-8.383	-8.383	0.000	(0)
	BF (OH) 3-	1.414e-09	1.158e-09	-8.850	-8.936	-0.087	(0)
	H5 (BO3) 2-	1.047e-11	8.577e-12	-10.980	-11.067	-0.087	(0)
	BF2 (OH) 2-	6.601e-13	5.407e-13	-12.180	-12.267	-0.087	(0)
	BaH2BO3+	5.596e-13	4.584e-13	-12.252	-12.339	-0.087	(0)
	H8 (BO3) 3-	2.731e-14	2.237e-14	-13.564	-13.650	-0.087	(0)
	AgH2BO3	1.677e-14	1.677e-14	-13.775	-13.775	0.000	(0)
	BF3OH-	1.121e-18	9.186e-19	-17.950	-18.037	-0.087	(0)
	BF4-	2.409e-23	1.974e-23	-22.618	-22.705	-0.087	(0)

Ba	7.974e-08						
Ba+2	7.884e-08	3.840e-08	-7.103	-7.416	-0.312	(0)	
BaHCO3+	8.490e-10	7.185e-10	-9.071	-9.144	-0.072	(0)	
BaCO3	4.613e-11	4.613e-11	-10.336	-10.336	0.000	(0)	
BaH2BO3+	5.596e-13	4.584e-13	-12.252	-12.339	-0.087	(0)	
BaOH+	5.124e-14	4.301e-14	-13.290	-13.366	-0.076	(0)	
BaNO3+	2.543e-15	2.017e-15	-14.595	-14.695	-0.101	(0)	
BaNH3+2	1.386e-16	5.486e-17	-15.858	-16.261	-0.403	(0)	
C (4)	2.621e-03						
HCO3-	2.326e-03	1.959e-03	-2.633	-2.708	-0.075	(0)	
H2CO3	1.728e-04	1.728e-04	-3.762	-3.762	0.000	(0)	
CaHCO3+	5.956e-05	5.041e-05	-4.225	-4.297	-0.072	(0)	
MgHCO3+	3.866e-05	3.216e-05	-4.413	-4.493	-0.080	(0)	
NaHCO3	7.447e-06	7.447e-06	-5.128	-5.128	0.000	(0)	
CaCO3	5.129e-06	5.129e-06	-5.290	-5.290	0.000	(0)	
CO3-2	4.809e-06	2.342e-06	-5.318	-5.630	-0.312	(0)	
MgCO3	3.125e-06	3.125e-06	-5.505	-5.505	0.000	(0)	
CuCO3	7.999e-07	7.999e-07	-6.097	-6.097	0.000	(0)	
MnHCO3+	7.538e-07	6.328e-07	-6.123	-6.199	-0.076	(0)	
NaCO3-	3.500e-07	2.948e-07	-6.456	-6.530	-0.075	(0)	
UO2 (CO3) 3-4	2.124e-07	5.207e-09	-6.673	-8.283	-1.611	(0)	
ZnCO3	2.037e-07	2.037e-07	-6.691	-6.691	0.000	(0)	
ZnHCO3+	1.181e-07	9.365e-08	-6.928	-7.028	-0.101	(0)	
UO2 (CO3) 2-2	1.121e-07	4.435e-08	-6.950	-7.353	-0.403	(0)	
Cu (CO3) 2-2	1.274e-08	5.043e-09	-7.895	-8.297	-0.403	(0)	
NiHCO3+	9.873e-09	7.831e-09	-8.006	-8.106	-0.101	(0)	
CuHCO3+	9.040e-09	7.170e-09	-8.044	-8.144	-0.101	(0)	
CoHCO3+	4.576e-09	3.629e-09	-8.340	-8.440	-0.101	(0)	
NiCO3	2.833e-09	2.833e-09	-8.548	-8.548	0.000	(0)	
PbCO3	1.567e-09	1.567e-09	-8.805	-8.805	0.000	(0)	
UO2CO3	9.490e-10	9.490e-10	-9.023	-9.023	0.000	(0)	
CoCO3	9.427e-10	9.427e-10	-9.026	-9.026	0.000	(0)	
BaHCO3+	8.490e-10	7.185e-10	-9.071	-9.144	-0.072	(0)	
PbHCO3+	4.085e-10	3.240e-10	-9.389	-9.489	-0.101	(0)	
CdCO3	1.786e-10	1.786e-10	-9.748	-9.748	0.000	(0)	
BaCO3	4.613e-11	4.613e-11	-10.336	-10.336	0.000	(0)	
Pb (CO3) 2-2	2.675e-11	1.059e-11	-10.573	-10.975	-0.403	(0)	
CdHCO3+	1.882e-11	1.493e-11	-10.725	-10.826	-0.101	(0)	
Cd (CO3) 2-2	7.839e-13	3.102e-13	-12.106	-12.508	-0.403	(0)	
FeHCO3+	7.942e-14	6.721e-14	-13.100	-13.173	-0.072	(0)	
HgCO3	4.872e-14	4.872e-14	-13.312	-13.312	0.000	(0)	
Hg (CO3) 2-2	9.120e-16	3.609e-16	-15.040	-15.443	-0.403	(0)	
HgHCO3+	4.486e-17	3.558e-17	-16.348	-16.449	-0.101	(0)	
Ca	4.314e-03						
Ca+2	2.837e-03	1.382e-03	-2.547	-2.860	-0.312	(0)	
CaSO4	1.411e-03	1.411e-03	-2.851	-2.851	0.000	(0)	
CaHCO3+	5.956e-05	5.041e-05	-4.225	-4.297	-0.072	(0)	
CaCO3	5.129e-06	5.129e-06	-5.290	-5.290	0.000	(0)	
CaF+	1.999e-06	1.678e-06	-5.699	-5.775	-0.076	(0)	
CaH2BO3+	3.749e-08	3.071e-08	-7.426	-7.513	-0.087	(0)	
CaOH+	8.358e-09	7.074e-09	-8.078	-8.150	-0.072	(0)	
CaNO3+	5.774e-11	4.580e-11	-10.239	-10.339	-0.101	(0)	
CaNH3+2	9.953e-12	3.938e-12	-11.002	-11.405	-0.403	(0)	
Ca (NH3) 2+2	8.972e-21	3.550e-21	-20.047	-20.450	-0.403	(0)	
Cd	1.198e-08						
Cd+2	6.870e-09	3.346e-09	-8.163	-8.475	-0.312	(0)	
CdSO4	3.496e-09	3.496e-09	-8.456	-8.456	0.000	(0)	
CdCl+	8.549e-10	6.781e-10	-9.068	-9.169	-0.101	(0)	
Cd (SO4) 2-2	5.313e-10	2.102e-10	-9.275	-9.677	-0.403	(0)	
CdCO3	1.786e-10	1.786e-10	-9.748	-9.748	0.000	(0)	
CdHCO3+	1.882e-11	1.493e-11	-10.725	-10.826	-0.101	(0)	
CdOH+	8.599e-12	6.820e-12	-11.066	-11.166	-0.101	(0)	
CdF+	7.440e-12	5.901e-12	-11.128	-11.229	-0.101	(0)	
CdOHC1	7.137e-12	7.137e-12	-11.146	-11.146	0.000	(0)	
CdCl2	5.998e-12	5.998e-12	-11.222	-11.222	0.000	(0)	
Cd (CO3) 2-2	7.839e-13	3.102e-13	-12.106	-12.508	-0.403	(0)	
Cd (OH) 2	1.104e-14	1.104e-14	-13.957	-13.957	0.000	(0)	
CdCl3-	1.013e-14	8.031e-15	-13.995	-14.095	-0.101	(0)	

	CdF2	1.310e-15	1.310e-15	-14.883	-14.883	0.000	(0)
	CdNO3+	1.398e-16	1.109e-16	-15.854	-15.955	-0.101	(0)
	CdSeO4	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
	Cd2OH+3	9.210e-19	1.144e-19	-18.036	-18.942	-0.906	(0)
	Cd (SeO3) 2-2	5.054e-19	2.000e-19	-18.296	-18.699	-0.403	(0)
	Cd (OH) 3-	2.182e-19	1.731e-19	-18.661	-18.762	-0.101	(0)
	Cd (NO3) 2	5.826e-25	5.826e-25	-24.235	-24.235	0.000	(0)
	Cd (OH) 4-2	1.837e-26	7.270e-27	-25.736	-26.138	-0.403	(0)
	CdHS+	0.000e+00	0.000e+00	-79.556	-79.657	-0.101	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.642	-151.642	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.830	-228.931	-0.101	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-305.521	-305.924	-0.403	(0)
C1	2.540e-03						
	Cl-	2.540e-03	2.122e-03	-2.595	-2.673	-0.078	(0)
	MnCl+	5.151e-08	4.324e-08	-7.288	-7.364	-0.076	(0)
	AgCl	1.187e-08	1.187e-08	-7.926	-7.926	0.000	(0)
	ZnCl+	9.685e-09	8.057e-09	-8.014	-8.094	-0.080	(0)
	AgCl2-	2.766e-09	2.194e-09	-8.558	-8.659	-0.101	(0)
	ZnOHCl	2.706e-09	2.706e-09	-8.568	-8.568	0.000	(0)
	CdCl+	8.549e-10	6.781e-10	-9.068	-9.169	-0.101	(0)
	CuCl	2.512e-10	2.512e-10	-9.600	-9.600	0.000	(0)
	CuCl+	2.345e-10	1.950e-10	-9.630	-9.710	-0.080	(0)
	NiCl+	2.219e-10	1.760e-10	-9.654	-9.754	-0.101	(0)
	CoCl+	2.204e-10	1.748e-10	-9.657	-9.757	-0.101	(0)
	CuCl2-	1.339e-10	1.114e-10	-9.873	-9.953	-0.080	(0)
	MnCl2	1.296e-10	1.296e-10	-9.887	-9.887	0.000	(0)
	ZnCl2	2.710e-11	2.710e-11	-10.567	-10.567	0.000	(0)
	PbCl+	2.113e-11	1.676e-11	-10.675	-10.776	-0.101	(0)
	HgClOH	1.671e-11	1.671e-11	-10.777	-10.777	0.000	(0)
	AgCl3-2	1.049e-11	4.150e-12	-10.979	-11.382	-0.403	(0)
	HgCl2	7.827e-12	7.827e-12	-11.106	-11.106	0.000	(0)
	CdOHCl	7.137e-12	7.137e-12	-11.146	-11.146	0.000	(0)
	CdCl2	5.998e-12	5.998e-12	-11.222	-11.222	0.000	(0)
	HgCl3-	2.094e-13	1.661e-13	-12.679	-12.780	-0.101	(0)
	PbCl2	1.588e-13	1.588e-13	-12.799	-12.799	0.000	(0)
	AgCl4-3	1.448e-13	1.798e-14	-12.839	-13.745	-0.906	(0)
	CuCl2	1.435e-13	1.435e-13	-12.843	-12.843	0.000	(0)
	CuCl3-2	1.018e-13	5.053e-14	-12.992	-13.296	-0.304	(0)
	MnCl3-	9.024e-14	7.575e-14	-13.045	-13.121	-0.076	(0)
	ZnCl3-	5.490e-14	4.567e-14	-13.260	-13.340	-0.080	(0)
	CdCl3-	1.013e-14	8.031e-15	-13.995	-14.095	-0.101	(0)
	HgCl4-2	3.546e-15	1.403e-15	-14.450	-14.853	-0.403	(0)
	NiCl2	1.881e-15	1.881e-15	-14.726	-14.726	0.000	(0)
	HgCl+	9.279e-16	7.359e-16	-15.032	-15.133	-0.101	(0)
	UO2Cl+	4.416e-16	3.503e-16	-15.355	-15.456	-0.101	(0)
	PbCl3-	1.692e-16	1.342e-16	-15.772	-15.872	-0.101	(0)
	ZnCl4-2	9.761e-17	4.846e-17	-16.010	-16.315	-0.304	(0)
	CrCl+2	5.916e-17	2.341e-17	-16.228	-16.631	-0.403	(0)
	CuCl3-	3.417e-18	2.842e-18	-17.466	-17.546	-0.080	(0)
	PbCl4-2	3.290e-19	1.302e-19	-18.483	-18.886	-0.403	(0)
	CrOHCl2	2.423e-19	2.423e-19	-18.616	-18.616	0.000	(0)
	FeCl+2	9.868e-21	4.900e-21	-20.006	-20.310	-0.304	(0)
	CrCl2+	5.943e-21	4.714e-21	-20.226	-20.327	-0.101	(0)
	VOCl+	4.008e-22	3.179e-22	-21.397	-21.498	-0.101	(0)
	CuCl4-2	6.088e-23	3.023e-23	-22.216	-22.520	-0.304	(0)
	FeCl2+	5.533e-23	4.644e-23	-22.257	-22.333	-0.076	(0)
	CrO3Cl-	3.985e-26	3.160e-26	-25.400	-25.500	-0.101	(0)
	FeCl3	9.856e-27	9.856e-27	-26.006	-26.006	0.000	(0)
	CoCl+2	3.124e-35	1.236e-35	-34.505	-34.908	-0.403	(0)
	UCl+3	0.000e+00	0.000e+00	-44.429	-45.335	-0.906	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.777	-52.180	-0.403	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.108	-54.511	-0.403	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.138	-67.541	-0.403	(0)
Co (2)	8.735e-08						
	Co+2	6.017e-08	2.381e-08	-7.221	-7.623	-0.403	(0)
	CoSO4	2.118e-08	2.118e-08	-7.674	-7.674	0.000	(0)
	CoHCO3+	4.576e-09	3.629e-09	-8.340	-8.440	-0.101	(0)
	CoCO3	9.427e-10	9.427e-10	-9.026	-9.026	0.000	(0)

CoCl+	2.204e-10	1.748e-10	-9.657	-9.757	-0.101	(0)
CoOH+	1.537e-10	1.219e-10	-9.813	-9.914	-0.101	(0)
CoF+	1.056e-10	8.378e-11	-9.976	-10.077	-0.101	(0)
Co(OH) 2	2.485e-12	2.485e-12	-11.605	-11.605	0.000	(0)
CoNO2+	1.390e-12	1.102e-12	-11.857	-11.958	-0.101	(0)
Co(NH3) +2	1.638e-14	6.482e-15	-13.786	-14.188	-0.403	(0)
CoSeO4	7.446e-16	7.446e-16	-15.128	-15.128	0.000	(0)
CoNO3+	4.987e-16	3.955e-16	-15.302	-15.403	-0.101	(0)
Co(OH) 3-	1.604e-17	1.272e-17	-16.795	-16.895	-0.101	(0)
CoOOH-	4.027e-18	3.193e-18	-17.395	-17.496	-0.101	(0)
Co2OH+3	1.171e-18	1.455e-19	-17.931	-18.837	-0.906	(0)
Co(NH3) 2+2	1.582e-21	6.261e-22	-20.801	-21.203	-0.403	(0)
Co(NO3) 2	8.436e-24	8.436e-24	-23.074	-23.074	0.000	(0)
Co(OH) 4-2	1.307e-24	5.173e-25	-23.884	-24.286	-0.403	(0)
Co(NH3) 3+2	4.510e-29	1.785e-29	-28.346	-28.748	-0.403	(0)
Co4(OH) 4+4	1.797e-30	4.406e-32	-29.745	-31.356	-1.611	(0)
Co(NH3) 4+2	5.360e-37	2.121e-37	-36.271	-36.674	-0.403	(0)
Co(NH3) 5+2	0.000e+00	0.000e+00	-44.696	-45.099	-0.403	(0)
Co(3)	9.435e-29					
CoOH+2	9.435e-29	3.733e-29	-28.025	-28.428	-0.403	(0)
Co+3	1.445e-34	2.863e-35	-33.840	-34.543	-0.703	(0)
CoCl+2	3.124e-35	1.236e-35	-34.505	-34.908	-0.403	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-51.777	-52.180	-0.403	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-62.192	-62.293	-0.101	(0)
Co(NH3) 6OH+2	0.000e+00	0.000e+00	-66.855	-67.258	-0.403	(0)
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-67.138	-67.541	-0.403	(0)
Cr(2)	1.704e-26					
Cr+2	1.704e-26	6.742e-27	-25.769	-26.171	-0.403	(0)
Cr(3)	2.204e-09					
Cr(OH) 2+	1.884e-09	1.494e-09	-8.725	-8.826	-0.101	(0)
Cr(OH) 3	1.440e-10	1.440e-10	-9.842	-9.842	0.000	(0)
Cr(OH) +2	1.209e-10	4.785e-11	-9.917	-10.320	-0.403	(0)
CrOHSO4	5.062e-11	5.062e-11	-10.296	-10.296	0.000	(0)
CrO2-	2.200e-12	1.745e-12	-11.658	-11.758	-0.101	(0)
Cr(OH) 4-	1.855e-12	1.471e-12	-11.732	-11.832	-0.101	(0)
CrF+2	3.799e-13	1.503e-13	-12.420	-12.823	-0.403	(0)
CrSO4+	1.119e-13	8.872e-14	-12.951	-13.052	-0.101	(0)
Cr+3	6.865e-14	8.524e-15	-13.163	-14.069	-0.906	(0)
CrCl+2	5.916e-17	2.341e-17	-16.228	-16.631	-0.403	(0)
Cr2(OH) 2SO4+2	5.533e-19	2.189e-19	-18.257	-18.660	-0.403	(0)
CrOHC12	2.423e-19	2.423e-19	-18.616	-18.616	0.000	(0)
Cr2(OH) 2(SO4) 2	5.797e-20	5.797e-20	-19.237	-19.237	0.000	(0)
CrCl2+	5.943e-21	4.714e-21	-20.226	-20.327	-0.101	(0)
CrNO3+2	9.870e-24	3.906e-24	-23.006	-23.408	-0.403	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-43.110	-43.513	-0.403	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-52.034	-52.940	-0.906	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-54.108	-54.511	-0.403	(0)
Cr(6)	1.078e-15					
CrO4-2	9.763e-16	4.755e-16	-15.010	-15.323	-0.312	(0)
HCrO4-	7.609e-17	6.035e-17	-16.119	-16.219	-0.101	(0)
NaCrO4-	2.014e-17	1.597e-17	-16.696	-16.797	-0.101	(0)
KCrO4-	5.684e-18	4.508e-18	-17.245	-17.346	-0.101	(0)
CrO3SO4-2	8.125e-24	3.215e-24	-23.090	-23.493	-0.403	(0)
H2CrO4	1.918e-24	1.918e-24	-23.717	-23.717	0.000	(0)
CrO3Cl-	3.985e-26	3.160e-26	-25.400	-25.500	-0.101	(0)
Cr2O7-2	3.193e-31	1.263e-31	-30.496	-30.898	-0.403	(0)
Cu(1)	5.038e-10					
CuCl	2.512e-10	2.512e-10	-9.600	-9.600	0.000	(0)
CuCl2-	1.339e-10	1.114e-10	-9.873	-9.953	-0.080	(0)
Cu+	1.186e-10	9.404e-11	-9.926	-10.027	-0.101	(0)
CuCl3-2	1.018e-13	5.053e-14	-12.992	-13.296	-0.304	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.838	-150.202	-0.364	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.586	-150.932	-0.346	(0)
Cu(2)	1.060e-06					
CuCO3	7.999e-07	7.999e-07	-6.097	-6.097	0.000	(0)
Cu+2	1.191e-07	5.799e-08	-6.924	-7.237	-0.312	(0)
CuSO4	5.922e-08	5.922e-08	-7.228	-7.228	0.000	(0)
CuOH+	5.657e-08	4.706e-08	-7.247	-7.327	-0.080	(0)

	Cu (CO3) 2-2	1.274e-08	5.043e-09	-7.895	-8.297	-0.403	(0)
	CuHCO3+	9.040e-09	7.170e-09	-8.044	-8.144	-0.101	(0)
	Cu (OH) 2	2.409e-09	2.409e-09	-8.618	-8.618	0.000	(0)
	CuF+	5.134e-10	4.072e-10	-9.290	-9.390	-0.101	(0)
	CuCl+	2.345e-10	1.950e-10	-9.630	-9.710	-0.080	(0)
	Cu2 (OH) 2+2	1.406e-10	5.562e-11	-9.852	-10.255	-0.403	(0)
	CuNO2+	5.030e-11	3.989e-11	-10.298	-10.399	-0.101	(0)
	CuNH3+2	3.396e-12	1.344e-12	-11.469	-11.872	-0.403	(0)
	Cu (OH) 3-	1.599e-12	1.268e-12	-11.796	-11.897	-0.101	(0)
	CuCl2	1.435e-13	1.435e-13	-12.843	-12.843	0.000	(0)
	Cu (NO2) 2	2.682e-15	2.682e-15	-14.572	-14.572	0.000	(0)
	CuNO3+	2.424e-15	1.922e-15	-14.616	-14.716	-0.101	(0)
	Cu (OH) 4-2	6.472e-18	2.561e-18	-17.189	-17.592	-0.403	(0)
	CuCl3-	3.417e-18	2.842e-18	-17.466	-17.546	-0.080	(0)
	CuCl4-2	6.088e-23	3.023e-23	-22.216	-22.520	-0.304	(0)
	Cu (NO3) 2	2.537e-24	2.537e-24	-23.596	-23.596	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.804	-218.905	-0.101	(0)
F	1.598e-04						
	F-	1.332e-04	1.113e-04	-3.875	-3.954	-0.078	(0)
	MgF+	2.396e-05	2.003e-05	-4.620	-4.698	-0.078	(0)
	CaF+	1.999e-06	1.678e-06	-5.699	-5.775	-0.076	(0)
	NaF	4.745e-07	4.745e-07	-6.324	-6.324	0.000	(0)
	MnF+	8.542e-08	7.170e-08	-7.068	-7.144	-0.076	(0)
	AlF3	2.104e-08	2.104e-08	-7.677	-7.677	0.000	(0)
	AlF2+	1.783e-08	1.502e-08	-7.749	-7.823	-0.075	(0)
	HF	6.455e-09	6.455e-09	-8.190	-8.190	0.000	(0)
	ZnF+	4.231e-09	3.356e-09	-8.374	-8.474	-0.101	(0)
	BF (OH) 3-	1.414e-09	1.158e-09	-8.850	-8.936	-0.087	(0)
	AlF4-	1.404e-09	1.173e-09	-8.853	-8.931	-0.078	(0)
	AlF+2	6.737e-10	3.390e-10	-9.172	-9.470	-0.298	(0)
	CuF+	5.134e-10	4.072e-10	-9.290	-9.390	-0.101	(0)
	NiF+	1.142e-10	9.061e-11	-9.942	-10.043	-0.101	(0)
	CoF+	1.056e-10	8.378e-11	-9.976	-10.077	-0.101	(0)
	CdF+	7.440e-12	5.901e-12	-11.128	-11.229	-0.101	(0)
	HF2-	3.299e-12	2.731e-12	-11.482	-11.564	-0.082	(0)
	PbF+	2.200e-12	1.745e-12	-11.657	-11.758	-0.101	(0)
	UO2F+	1.971e-12	1.563e-12	-11.705	-11.806	-0.101	(0)
	AgF	7.658e-13	7.658e-13	-12.116	-12.116	0.000	(0)
	BF2 (OH) 2-	6.601e-13	5.407e-13	-12.180	-12.267	-0.087	(0)
	UO2F2	5.017e-13	5.017e-13	-12.300	-12.300	0.000	(0)
	CrF+2	3.799e-13	1.503e-13	-12.420	-12.823	-0.403	(0)
	UO2F3-	1.768e-14	1.402e-14	-13.753	-13.853	-0.101	(0)
	PbF2	3.822e-15	3.822e-15	-14.418	-14.418	0.000	(0)
	CdF2	1.310e-15	1.310e-15	-14.883	-14.883	0.000	(0)
	H2F2	1.116e-16	1.116e-16	-15.952	-15.952	0.000	(0)
	FeF2+	3.309e-17	2.778e-17	-16.480	-16.556	-0.076	(0)
	UO2F4-2	3.132e-17	1.239e-17	-16.504	-16.907	-0.403	(0)
	VO2F	2.557e-17	2.557e-17	-16.592	-16.592	0.000	(0)
	FeF+2	1.879e-17	9.328e-18	-16.726	-17.030	-0.304	(0)
	FeF3	4.361e-18	4.361e-18	-17.360	-17.360	0.000	(0)
	VO2F2-	1.303e-18	1.033e-18	-17.885	-17.986	-0.101	(0)
	BF3OH-	1.121e-18	9.186e-19	-17.950	-18.037	-0.087	(0)
	PbF3-	1.017e-18	8.066e-19	-17.993	-18.093	-0.101	(0)
	VOF+	4.494e-20	3.564e-20	-19.347	-19.448	-0.101	(0)
	VO2F3-2	3.624e-21	1.434e-21	-20.441	-20.843	-0.403	(0)
	VOF2	1.487e-21	1.487e-21	-20.828	-20.828	0.000	(0)
	PbF4-2	1.086e-22	4.296e-23	-21.964	-22.367	-0.403	(0)
	HgF+	9.040e-23	7.169e-23	-22.044	-22.145	-0.101	(0)
	BF4-	2.409e-23	1.974e-23	-22.618	-22.705	-0.087	(0)
	VOF3-	7.403e-24	5.871e-24	-23.131	-23.231	-0.101	(0)
	VO2F4-3	6.323e-25	7.852e-26	-24.199	-25.105	-0.906	(0)
	Sb (OH) 2F	2.122e-25	2.122e-25	-24.673	-24.673	0.000	(0)
	SbOF	2.088e-25	2.088e-25	-24.680	-24.680	0.000	(0)
	VOF4-2	6.665e-27	2.637e-27	-26.176	-26.579	-0.403	(0)
	UF3+	3.005e-35	2.383e-35	-34.522	-34.623	-0.101	(0)
	UF2+2	3.415e-36	1.351e-36	-35.467	-35.869	-0.403	(0)
	UF4	2.908e-37	2.908e-37	-36.536	-36.536	0.000	(0)
	UF+3	7.768e-39	9.646e-40	-38.110	-39.016	-0.906	(0)

UF5-	1.617e-39	1.282e-39	-38.791	-38.892	-0.101	(0)
UF6-2	1.089e-40	0.000e+00	-39.963	-40.366	-0.403	(0)
Fe (2)	9.980e-12					
Fe+2	6.886e-12	2.725e-12	-11.162	-11.565	-0.403	(0)
FeSO4	2.981e-12	2.981e-12	-11.526	-11.526	0.000	(0)
FeHCO3+	7.942e-14	6.721e-14	-13.100	-13.173	-0.072	(0)
FeOH+	3.316e-14	2.783e-14	-13.479	-13.555	-0.076	(0)
Fe (OH) 2	5.673e-18	5.673e-18	-17.246	-17.246	0.000	(0)
Fe (OH) 3-	5.484e-19	4.603e-19	-18.261	-18.337	-0.076	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.993	-160.993	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.044	-238.145	-0.101	(0)
Fe (3)	1.860e-09					
Fe (OH) 2+	1.501e-09	1.264e-09	-8.824	-8.898	-0.075	(0)
Fe (OH) 3	3.485e-10	3.485e-10	-9.458	-9.458	0.000	(0)
Fe (OH) 4-	9.885e-12	8.326e-12	-11.005	-11.080	-0.075	(0)
FeOH+2	2.551e-14	1.267e-14	-13.593	-13.897	-0.304	(0)
FeF2+	3.309e-17	2.778e-17	-16.480	-16.556	-0.076	(0)
FeF+2	1.879e-17	9.328e-18	-16.726	-17.030	-0.304	(0)
FeSO4+	4.555e-18	3.824e-18	-17.341	-17.418	-0.076	(0)
FeF3	4.361e-18	4.361e-18	-17.360	-17.360	0.000	(0)
Fe (SO4) 2-	4.595e-19	3.644e-19	-18.338	-18.438	-0.101	(0)
Fe+3	3.858e-19	7.646e-20	-18.414	-19.117	-0.703	(0)
FeCl+2	9.868e-21	4.900e-21	-20.006	-20.310	-0.304	(0)
FeCl2+	5.533e-23	4.644e-23	-22.257	-22.333	-0.076	(0)
FeHSeO3+2	4.283e-23	1.695e-23	-22.368	-22.771	-0.403	(0)
Fe2 (OH) 2+4	2.167e-25	5.313e-27	-24.664	-26.275	-1.611	(0)
FeNO3+2	2.025e-26	8.014e-27	-25.694	-26.096	-0.403	(0)
FeCl3	9.856e-27	9.856e-27	-26.006	-26.006	0.000	(0)
Fe3 (OH) 4+5	3.190e-32	9.710e-35	-31.496	-34.013	-2.517	(0)
H (0)	2.366e-29					
H2	1.183e-29	1.193e-29	-28.927	-28.923	0.004	(0)
Hg (0)	1.758e-09					
Hg	1.758e-09	1.758e-09	-8.755	-8.755	0.000	(0)
Hg (1)	1.049e-19					
Hg2+2	5.244e-20	2.075e-20	-19.280	-19.683	-0.403	(0)
Hg (2)	3.196e-11					
HgClOH	1.671e-11	1.671e-11	-10.777	-10.777	0.000	(0)
HgCl2	7.827e-12	7.827e-12	-11.106	-11.106	0.000	(0)
Hg (OH) 2	7.156e-12	7.221e-12	-11.145	-11.141	0.004	(0)
HgCl3-	2.094e-13	1.661e-13	-12.679	-12.780	-0.101	(0)
HgCO3	4.872e-14	4.872e-14	-13.312	-13.312	0.000	(0)
HgCl4-2	3.546e-15	1.403e-15	-14.450	-14.853	-0.403	(0)
HgCl+	9.279e-16	7.359e-16	-15.032	-15.133	-0.101	(0)
Hg (CO3) 2-2	9.120e-16	3.609e-16	-15.040	-15.443	-0.403	(0)
HgOH+	2.239e-16	1.776e-16	-15.650	-15.751	-0.101	(0)
HgHCO3+	4.486e-17	3.558e-17	-16.348	-16.449	-0.101	(0)
Hg (OH) 3-	2.941e-19	2.333e-19	-18.531	-18.632	-0.101	(0)
Hg (NH3) 2+2	1.421e-19	5.623e-20	-18.847	-19.250	-0.403	(0)
HgNH3+2	6.276e-20	2.483e-20	-19.202	-19.605	-0.403	(0)
Hg+2	4.393e-20	1.738e-20	-19.357	-19.760	-0.403	(0)
HgSO4	2.028e-20	2.028e-20	-19.693	-19.693	0.000	(0)
HgF+	9.040e-23	7.169e-23	-22.044	-22.145	-0.101	(0)
Hg (NH3) 3+2	1.281e-27	5.069e-28	-26.892	-27.295	-0.403	(0)
HgNO3+	8.482e-29	6.727e-29	-28.072	-28.172	-0.101	(0)
Hg (NH3) 4+2	2.304e-35	9.117e-36	-34.638	-35.040	-0.403	(0)
Hg (NO3) 2	2.931e-37	2.931e-37	-36.533	-36.533	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.703	-138.804	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.703	-140.105	-0.403	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.816	-139.816	0.000	(0)
K	3.150e-03					
K+	3.055e-03	2.552e-03	-2.515	-2.593	-0.078	(0)
KSO4-	9.561e-05	8.052e-05	-4.020	-4.094	-0.075	(0)
KCrO4-	5.684e-18	4.508e-18	-17.245	-17.346	-0.101	(0)
Mg	4.660e-03					
Mg+2	3.293e-03	1.604e-03	-2.482	-2.795	-0.312	(0)
MgSO4	1.301e-03	1.301e-03	-2.886	-2.886	0.000	(0)
MgHCO3+	3.866e-05	3.216e-05	-4.413	-4.493	-0.080	(0)
MgF+	2.396e-05	2.003e-05	-4.620	-4.698	-0.078	(0)

MgCO3	3.125e-06	3.125e-06	-5.505	-5.505	0.000	(0)
MgOH+	1.929e-07	1.639e-07	-6.715	-6.786	-0.071	(0)
MgH2BO3+	2.623e-08	2.148e-08	-7.581	-7.668	-0.087	(0)
Mn (2)	5.464e-05					
Mn+2	4.090e-05	1.619e-05	-4.388	-4.791	-0.403	(0)
MnSO4	1.283e-05	1.283e-05	-4.892	-4.892	0.000	(0)
MnHCO3+	7.538e-07	6.328e-07	-6.123	-6.199	-0.076	(0)
MnF+	8.542e-08	7.170e-08	-7.068	-7.144	-0.076	(0)
MnCl+	5.151e-08	4.324e-08	-7.288	-7.364	-0.076	(0)
MnOH+	1.243e-08	1.043e-08	-7.906	-7.982	-0.076	(0)
MnCl2	1.296e-10	1.296e-10	-9.887	-9.887	0.000	(0)
MnNO3+	3.390e-13	2.689e-13	-12.470	-12.570	-0.101	(0)
MnSeO4	2.718e-13	2.718e-13	-12.566	-12.566	0.000	(0)
MnCl3-	9.024e-14	7.575e-14	-13.045	-13.121	-0.076	(0)
Mn (OH) 3-	5.057e-18	4.245e-18	-17.296	-17.372	-0.076	(0)
Mn (NO3) 2	7.079e-21	7.079e-21	-20.150	-20.150	0.000	(0)
Mn (OH) 4-2	7.083e-24	3.517e-24	-23.150	-23.454	-0.304	(0)
MnSe	0.000e+00	0.000e+00	-42.304	-42.304	0.000	(0)
Mn (3)	1.102e-24					
Mn+3	1.102e-24	2.184e-25	-23.958	-24.661	-0.703	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.737	-42.041	-0.304	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.849	-45.933	-0.084	(0)
Mo	1.765e-06					
MoO4-2	1.764e-06	8.591e-07	-5.754	-6.066	-0.312	(0)
HMoO4-	8.453e-10	6.704e-10	-9.073	-9.174	-0.101	(0)
H2MoO4	1.926e-13	1.926e-13	-12.715	-12.715	0.000	(0)
Ag2MoO4	2.441e-24	2.441e-24	-23.612	-23.612	0.000	(0)
AlMo6O21-3	3.534e-38	4.389e-39	-37.452	-38.358	-0.906	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.099	-48.723	-3.624	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.226	-49.742	-2.517	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.756	-52.367	-1.611	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.621	-56.527	-0.906	(0)
N (-3)	2.013e-07					
NH4+	1.901e-07	1.557e-07	-6.721	-6.808	-0.087	(0)
NH4SO4-	8.862e-09	7.439e-09	-8.052	-8.128	-0.076	(0)
NH3	2.264e-09	2.264e-09	-8.645	-8.645	0.000	(0)
CaNH3+2	9.953e-12	3.938e-12	-11.002	-11.405	-0.403	(0)
CuNH3+2	3.396e-12	1.344e-12	-11.469	-11.872	-0.403	(0)
NiNH3+2	9.962e-14	3.942e-14	-13.002	-13.404	-0.403	(0)
Co (NH3) +2	1.638e-14	6.482e-15	-13.786	-14.188	-0.403	(0)
AgNH3+	1.597e-14	1.267e-14	-13.797	-13.897	-0.101	(0)
BaNH3+2	1.386e-16	5.486e-17	-15.858	-16.261	-0.403	(0)
Ag (NH3) 2+	2.939e-19	2.331e-19	-18.532	-18.632	-0.101	(0)
Hg (NH3) 2+2	1.421e-19	5.623e-20	-18.847	-19.250	-0.403	(0)
HgNH3+2	6.276e-20	2.483e-20	-19.202	-19.605	-0.403	(0)
Ni (NH3) 2+2	3.261e-20	1.290e-20	-19.487	-19.889	-0.403	(0)
Ca (NH3) 2+2	8.972e-21	3.550e-21	-20.047	-20.450	-0.403	(0)
Co (NH3) 2+2	1.582e-21	6.261e-22	-20.801	-21.203	-0.403	(0)
Hg (NH3) 3+2	1.281e-27	5.069e-28	-26.892	-27.295	-0.403	(0)
Co (NH3) 3+2	4.510e-29	1.785e-29	-28.346	-28.748	-0.403	(0)
Hg (NH3) 4+2	2.304e-35	9.117e-36	-34.638	-35.040	-0.403	(0)
Co (NH3) 4+2	5.360e-37	2.121e-37	-36.271	-36.674	-0.403	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.110	-43.513	-0.403	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.696	-45.099	-0.403	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.777	-52.180	-0.403	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.034	-52.940	-0.906	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.108	-54.511	-0.403	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.192	-62.293	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.855	-67.258	-0.403	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.138	-67.541	-0.403	(0)
N (3)	7.976e-06					
NO2-	7.976e-06	6.569e-06	-5.098	-5.182	-0.084	(0)
CuNO2+	5.030e-11	3.989e-11	-10.298	-10.399	-0.101	(0)
AgNO2	3.760e-12	3.760e-12	-11.425	-11.425	0.000	(0)
CoNO2+	1.390e-12	1.102e-12	-11.857	-11.958	-0.101	(0)
Cu (NO2) 2	2.682e-15	2.682e-15	-14.572	-14.572	0.000	(0)

Ag (NO ₂) ₂ -	4.824e-17	3.826e-17	-16.317	-16.417	-0.101	(0)
N (5)	1.261e-08					
NO ₃ -	1.255e-08	1.048e-08	-7.901	-7.980	-0.078	(0)
CaNO ₃ +	5.774e-11	4.580e-11	-10.239	-10.339	-0.101	(0)
MnNO ₃ +	3.390e-13	2.689e-13	-12.470	-12.570	-0.101	(0)
ZnNO ₃ +	5.017e-14	3.979e-14	-13.300	-13.400	-0.101	(0)
BaNO ₃ +	2.543e-15	2.017e-15	-14.595	-14.695	-0.101	(0)
CuNO ₃ +	2.424e-15	1.922e-15	-14.616	-14.716	-0.101	(0)
NiNO ₃ +	1.076e-15	8.535e-16	-14.968	-15.069	-0.101	(0)
CoNO ₃ +	4.987e-16	3.955e-16	-15.302	-15.403	-0.101	(0)
CdNO ₃ +	1.398e-16	1.109e-16	-15.854	-15.955	-0.101	(0)
PbNO ₃ +	4.351e-17	3.451e-17	-16.361	-16.462	-0.101	(0)
AgNO ₃	2.281e-17	2.281e-17	-16.642	-16.642	0.000	(0)
Mn (NO ₃) ₂	7.079e-21	7.079e-21	-20.150	-20.150	0.000	(0)
UO ₂ NO ₃ +	2.684e-21	2.128e-21	-20.571	-20.672	-0.101	(0)
Zn (NO ₃) ₂	8.323e-23	8.323e-23	-22.080	-22.080	0.000	(0)
CrNO ₃ +2	9.870e-24	3.906e-24	-23.006	-23.408	-0.403	(0)
Co (NO ₃) ₂	8.436e-24	8.436e-24	-23.074	-23.074	0.000	(0)
Cu (NO ₃) ₂	2.537e-24	2.537e-24	-23.596	-23.596	0.000	(0)
VO ₂ NO ₃	6.947e-25	6.947e-25	-24.158	-24.158	0.000	(0)
Pb (NO ₃) ₂	6.142e-25	6.142e-25	-24.212	-24.212	0.000	(0)
Cd (NO ₃) ₂	5.826e-25	5.826e-25	-24.235	-24.235	0.000	(0)
FeNO ₃ +2	2.025e-26	8.014e-27	-25.694	-26.096	-0.403	(0)
HgNO ₃ +	8.482e-29	6.727e-29	-28.072	-28.172	-0.101	(0)
Hg (NO ₃) ₂	2.931e-37	2.931e-37	-36.533	-36.533	0.000	(0)
Na	8.291e-03					
Na+	8.090e-03	6.759e-03	-2.092	-2.170	-0.078	(0)
NaSO ₄ -	1.921e-04	1.618e-04	-3.716	-3.791	-0.075	(0)
NaHCO ₃	7.447e-06	7.447e-06	-5.128	-5.128	0.000	(0)
NaF	4.745e-07	4.745e-07	-6.324	-6.324	0.000	(0)
NaCO ₃ -	3.500e-07	2.948e-07	-6.456	-6.530	-0.075	(0)
NaH ₂ BO ₃	4.138e-09	4.138e-09	-8.383	-8.383	0.000	(0)
NaCrO ₄ -	2.014e-17	1.597e-17	-16.696	-16.797	-0.101	(0)
Ni	1.086e-07					
Ni+2	6.656e-08	3.242e-08	-7.177	-7.489	-0.312	(0)
NiSO ₄	2.883e-08	2.883e-08	-7.540	-7.540	0.000	(0)
NiHCO ₃ +	9.873e-09	7.831e-09	-8.006	-8.106	-0.101	(0)
NiCO ₃	2.833e-09	2.833e-09	-8.548	-8.548	0.000	(0)
NiCl+	2.219e-10	1.760e-10	-9.654	-9.754	-0.101	(0)
NiOH+	1.320e-10	1.047e-10	-9.879	-9.980	-0.101	(0)
NiF+	1.142e-10	9.061e-11	-9.942	-10.043	-0.101	(0)
Ni (SO ₄) ₂ -2	1.075e-11	4.255e-12	-10.968	-11.371	-0.403	(0)
Ni (OH) ₂	2.134e-12	2.134e-12	-11.671	-11.671	0.000	(0)
NiNH ₃ +2	9.962e-14	3.942e-14	-13.002	-13.404	-0.403	(0)
NiCl ₂	1.881e-15	1.881e-15	-14.726	-14.726	0.000	(0)
NiNO ₃ +	1.076e-15	8.535e-16	-14.968	-15.069	-0.101	(0)
NiSeO ₄	9.461e-16	9.461e-16	-15.024	-15.024	0.000	(0)
Ni (OH) ₃ -	6.905e-16	5.477e-16	-15.161	-15.261	-0.101	(0)
Ni (NH ₃) ₂ +2	3.261e-20	1.290e-20	-19.487	-19.889	-0.403	(0)
O (0)	7.046e-35					
O ₂	3.523e-35	3.555e-35	-34.453	-34.449	0.004	(0)
Pb	3.184e-09					
PbCO ₃	1.567e-09	1.567e-09	-8.805	-8.805	0.000	(0)
PbSO ₄	4.859e-10	4.859e-10	-9.313	-9.313	0.000	(0)
Pb+2	4.570e-10	2.226e-10	-9.340	-9.653	-0.312	(0)
PbHCO ₃ +	4.085e-10	3.240e-10	-9.389	-9.489	-0.101	(0)
PbOH+	1.809e-10	1.435e-10	-9.743	-9.843	-0.101	(0)
Pb (SO ₄) ₂ -2	3.298e-11	1.305e-11	-10.482	-10.884	-0.403	(0)
Pb (CO ₃) ₂ -2	2.675e-11	1.059e-11	-10.573	-10.975	-0.403	(0)
PbCl+	2.113e-11	1.676e-11	-10.675	-10.776	-0.101	(0)
PbF+	2.200e-12	1.745e-12	-11.657	-11.758	-0.101	(0)
Pb (OH) ₂	1.164e-12	1.164e-12	-11.934	-11.934	0.000	(0)
PbCl ₂	1.588e-13	1.588e-13	-12.799	-12.799	0.000	(0)
PbF ₂	3.822e-15	3.822e-15	-14.418	-14.418	0.000	(0)
Pb (OH) ₃ -	3.766e-16	2.987e-16	-15.424	-15.525	-0.101	(0)
PbCl ₃ -	1.692e-16	1.342e-16	-15.772	-15.872	-0.101	(0)
PbNO ₃ +	4.351e-17	3.451e-17	-16.361	-16.462	-0.101	(0)
Pb ₂ OH+3	4.075e-18	5.060e-19	-17.390	-18.296	-0.906	(0)

PbF3-	1.017e-18	8.066e-19	-17.993	-18.093	-0.101	(0)
PbCl4-2	3.290e-19	1.302e-19	-18.483	-18.886	-0.403	(0)
Pb (OH) 4-2	4.744e-20	1.877e-20	-19.324	-19.727	-0.403	(0)
PbF4-2	1.086e-22	4.296e-23	-21.964	-22.367	-0.403	(0)
Pb3 (OH) 4+2	1.521e-23	6.017e-24	-22.818	-23.221	-0.403	(0)
Pb (NO3) 2	6.142e-25	6.142e-25	-24.212	-24.212	0.000	(0)
Pb4 (OH) 4+4	4.339e-28	1.064e-29	-27.363	-28.973	-1.611	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.761	-152.761	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.549	-230.650	-0.101	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.937	-73.937	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.088	-79.189	-0.101	(0)
CdHS+	0.000e+00	0.000e+00	-79.556	-79.657	-0.101	(0)
H2S	0.000e+00	0.000e+00	-79.576	-79.576	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.745	-81.148	-0.403	(0)
S6-2	0.000e+00	0.000e+00	-81.261	-81.664	-0.403	(0)
S4-2	0.000e+00	0.000e+00	-81.341	-81.743	-0.403	(0)
S3-2	0.000e+00	0.000e+00	-82.147	-82.549	-0.403	(0)
S2-2	0.000e+00	0.000e+00	-83.163	-83.565	-0.403	(0)
S-2	0.000e+00	0.000e+00	-88.779	-89.083	-0.304	(0)
HgHS2-	0.000e+00	0.000e+00	-138.703	-138.804	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.703	-140.105	-0.403	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.816	-139.816	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.899	-149.103	-0.204	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.925	-149.026	-0.101	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.838	-150.202	-0.364	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.882	-149.982	-0.101	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.586	-150.932	-0.346	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.763	-151.137	-0.373	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.093	-151.448	-0.354	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.379	-151.379	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.642	-151.642	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.761	-152.761	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.993	-160.993	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.804	-218.905	-0.101	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.187	-227.288	-0.101	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.830	-228.931	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.459	-229.862	-0.403	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.549	-230.650	-0.101	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.044	-238.145	-0.101	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-305.521	-305.924	-0.403	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.535	-307.937	-0.403	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.791	-321.194	-0.403	(0)
S (6)	1.217e-02					
SO4-2	9.152e-03	4.457e-03	-2.038	-2.351	-0.312	(0)
CaSO4	1.411e-03	1.411e-03	-2.851	-2.851	0.000	(0)
MgSO4	1.301e-03	1.301e-03	-2.886	-2.886	0.000	(0)
NaSO4-	1.921e-04	1.618e-04	-3.716	-3.791	-0.075	(0)
KSO4-	9.561e-05	8.052e-05	-4.020	-4.094	-0.075	(0)
MnSO4	1.283e-05	1.283e-05	-4.892	-4.892	0.000	(0)
ZnSO4	1.474e-06	1.474e-06	-5.832	-5.832	0.000	(0)
Zn (SO4) 2-2	1.446e-07	5.722e-08	-6.840	-7.242	-0.403	(0)
CuSO4	5.922e-08	5.922e-08	-7.228	-7.228	0.000	(0)
NiSO4	2.883e-08	2.883e-08	-7.540	-7.540	0.000	(0)
CoSO4	2.118e-08	2.118e-08	-7.674	-7.674	0.000	(0)
HSO4-	2.044e-08	1.708e-08	-7.689	-7.767	-0.078	(0)
NH4SO4-	8.862e-09	7.439e-09	-8.052	-8.128	-0.076	(0)
CdSO4	3.496e-09	3.496e-09	-8.456	-8.456	0.000	(0)
Cd (SO4) 2-2	5.313e-10	2.102e-10	-9.275	-9.677	-0.403	(0)
PbSO4	4.859e-10	4.859e-10	-9.313	-9.313	0.000	(0)
AgSO4-	3.072e-10	2.437e-10	-9.513	-9.613	-0.101	(0)
CrOHSO4	5.062e-11	5.062e-11	-10.296	-10.296	0.000	(0)
Pb (SO4) 2-2	3.298e-11	1.305e-11	-10.482	-10.884	-0.403	(0)
AlSO4+	1.261e-11	1.054e-11	-10.899	-10.977	-0.078	(0)
Ni (SO4) 2-2	1.075e-11	4.255e-12	-10.968	-11.371	-0.403	(0)
FeSO4	2.981e-12	2.981e-12	-11.526	-11.526	0.000	(0)
UO2SO4	6.866e-13	6.866e-13	-12.163	-12.163	0.000	(0)
Al (SO4) 2-	6.024e-13	5.035e-13	-12.220	-12.298	-0.078	(0)

CrSO4+	1.119e-13	8.872e-14	-12.951	-13.052	-0.101	(0)
UO2(SO4) 2-2	1.020e-13	4.035e-14	-12.992	-13.394	-0.403	(0)
VO2SO4-	1.758e-17	1.395e-17	-16.755	-16.856	-0.101	(0)
FeSO4+	4.555e-18	3.824e-18	-17.341	-17.418	-0.076	(0)
Cr2(OH) 2SO4+2	5.533e-19	2.189e-19	-18.257	-18.660	-0.403	(0)
Fe(SO4) 2-	4.595e-19	3.644e-19	-18.338	-18.438	-0.101	(0)
VOSO4	6.556e-20	6.556e-20	-19.183	-19.183	0.000	(0)
Cr2(OH) 2(SO4) 2	5.797e-20	5.797e-20	-19.237	-19.237	0.000	(0)
HgSO4	2.028e-20	2.028e-20	-19.693	-19.693	0.000	(0)
CrO3SO4-2	8.125e-24	3.215e-24	-23.090	-23.493	-0.403	(0)
VSO4+	3.584e-34	2.843e-34	-33.446	-33.546	-0.101	(0)
U(SO4) 2	2.730e-39	2.730e-39	-38.564	-38.564	0.000	(0)
USO4+2	1.948e-40	0.000e+00	-39.710	-40.113	-0.403	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-62.192	-62.293	-0.101	(0)
Sb(3)	6.150e-20					
Sb(OH) 3	3.111e-20	3.111e-20	-19.507	-19.507	0.000	(0)
HSbO2	3.039e-20	3.039e-20	-19.517	-19.517	0.000	(0)
SbO2-	1.582e-24	1.255e-24	-23.801	-23.901	-0.101	(0)
Sb(OH) 4-	9.056e-25	7.182e-25	-24.043	-24.144	-0.101	(0)
Sb(OH) 2F	2.122e-25	2.122e-25	-24.673	-24.673	0.000	(0)
SbOF	2.088e-25	2.088e-25	-24.680	-24.680	0.000	(0)
Sb(OH) 2+	3.738e-26	2.965e-26	-25.427	-25.528	-0.101	(0)
SbO+	1.289e-26	1.023e-26	-25.890	-25.990	-0.101	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.791	-321.194	-0.403	(0)
Sb(5)	2.487e-08					
SbO3-	2.484e-08	1.970e-08	-7.605	-7.705	-0.101	(0)
Sb(OH) 6-	2.754e-11	2.301e-11	-10.560	-10.638	-0.078	(0)
SbO2+	1.097e-23	8.697e-24	-22.960	-23.061	-0.101	(0)
Se(-2)	4.548e-15					
Ag2Se	4.548e-15	4.548e-15	-14.342	-14.342	0.000	(0)
HSe-	3.678e-40	2.917e-40	-39.434	-39.535	-0.101	(0)
MnSe	0.000e+00	0.000e+00	-42.304	-42.304	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.052	-43.052	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.726	-47.129	-0.403	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-84.312	-85.922	-1.611	(0)
Se(4)	1.273e-07					
HSeO3-	1.058e-07	8.389e-08	-6.976	-7.076	-0.101	(0)
SeO3-2	2.152e-08	8.516e-09	-7.667	-8.070	-0.403	(0)
H2SeO3	1.403e-12	1.403e-12	-11.853	-11.853	0.000	(0)
AgSeO3-	1.891e-14	1.499e-14	-13.723	-13.824	-0.101	(0)
Cd(SeO3) 2-2	5.054e-19	2.000e-19	-18.296	-18.699	-0.403	(0)
Ag(SeO3) 2-3	9.207e-21	1.143e-21	-20.036	-20.942	-0.906	(0)
FeHSeO3+2	4.283e-23	1.695e-23	-22.368	-22.771	-0.403	(0)
Se(6)	1.284e-10					
SeO4-2	1.281e-10	6.239e-11	-9.892	-10.205	-0.312	(0)
MnSeO4	2.718e-13	2.718e-13	-12.566	-12.566	0.000	(0)
ZnSeO4	1.461e-14	1.461e-14	-13.835	-13.835	0.000	(0)
NiSeO4	9.461e-16	9.461e-16	-15.024	-15.024	0.000	(0)
CoSeO4	7.446e-16	7.446e-16	-15.128	-15.128	0.000	(0)
HSeO4-	1.546e-16	1.226e-16	-15.811	-15.911	-0.101	(0)
CdSeO4	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
Zn(SeO4) 2-2	2.335e-24	9.240e-25	-23.632	-24.034	-0.403	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.732	-58.638	-0.906	(0)
U(4)	4.471e-21					
U(OH) 5-	4.465e-21	3.542e-21	-20.350	-20.451	-0.101	(0)
U(OH) 4	5.820e-24	5.820e-24	-23.235	-23.235	0.000	(0)
U(OH) 3+	1.053e-27	8.350e-28	-26.978	-27.078	-0.101	(0)
U(OH) 2+2	3.829e-32	1.515e-32	-31.417	-31.820	-0.403	(0)
UF3+	3.005e-35	2.383e-35	-34.522	-34.623	-0.101	(0)
UF2+2	3.415e-36	1.351e-36	-35.467	-35.869	-0.403	(0)
UF4	2.908e-37	2.908e-37	-36.536	-36.536	0.000	(0)
UOH+3	2.255e-37	2.800e-38	-36.647	-37.553	-0.906	(0)
UF+3	7.768e-39	9.646e-40	-38.110	-39.016	-0.906	(0)
U(SO4) 2	2.730e-39	2.730e-39	-38.564	-38.564	0.000	(0)
UF5-	1.617e-39	1.282e-39	-38.791	-38.892	-0.101	(0)
USO4+2	1.948e-40	0.000e+00	-39.710	-40.113	-0.403	(0)
UF6-2	1.089e-40	0.000e+00	-39.963	-40.366	-0.403	(0)

U+4	0.000e+00	0.000e+00	-42.751	-44.362	-1.611	(0)
UC1+3	0.000e+00	0.000e+00	-44.429	-45.335	-0.906	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.080	-172.234	-8.154	(0)
U (5)	2.589e-16					
UO2+	2.589e-16	2.054e-16	-15.587	-15.687	-0.101	(0)
U (6)	3.254e-07					
UO2 (CO3) 3-4	2.124e-07	5.207e-09	-6.673	-8.283	-1.611	(0)
UO2 (CO3) 2-2	1.121e-07	4.435e-08	-6.950	-7.353	-0.403	(0)
UO2CO3	9.490e-10	9.490e-10	-9.023	-9.023	0.000	(0)
UO2OH+	4.145e-12	3.288e-12	-11.382	-11.483	-0.101	(0)
UO2F+	1.971e-12	1.563e-12	-11.705	-11.806	-0.101	(0)
UO2SO4	6.866e-13	6.866e-13	-12.163	-12.163	0.000	(0)
UO2F2	5.017e-13	5.017e-13	-12.300	-12.300	0.000	(0)
UO2+2	2.090e-13	1.018e-13	-12.680	-12.992	-0.312	(0)
UO2 (SO4) 2-2	1.020e-13	4.035e-14	-12.992	-13.394	-0.403	(0)
UO2F3-	1.768e-14	1.402e-14	-13.753	-13.853	-0.101	(0)
UO2Cl+	4.416e-16	3.503e-16	-15.355	-15.456	-0.101	(0)
(UO2) 2 (OH) 2+2	4.533e-17	1.794e-17	-16.344	-16.746	-0.403	(0)
UO2F4-2	3.132e-17	1.239e-17	-16.504	-16.907	-0.403	(0)
(UO2) 3 (OH) 5+	3.714e-18	2.946e-18	-17.430	-17.531	-0.101	(0)
UO2NO3+	2.684e-21	2.128e-21	-20.571	-20.672	-0.101	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.639	-42.740	-0.101	(0)
V+2	0.000e+00	0.000e+00	-43.257	-43.659	-0.403	(0)
V (3)	1.841e-15					
V (OH) 3	1.841e-15	1.841e-15	-14.735	-14.735	0.000	(0)
V (OH) 2+	5.886e-26	4.669e-26	-25.230	-25.331	-0.101	(0)
VOH+2	4.391e-29	1.738e-29	-28.357	-28.760	-0.403	(0)
V+3	1.088e-33	1.351e-34	-32.963	-33.869	-0.906	(0)
VSO4+	3.584e-34	2.843e-34	-33.446	-33.546	-0.101	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.733	-55.639	-0.906	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.110	-56.720	-1.611	(0)
V (4)	3.692e-18					
V (OH) 3+	3.445e-18	2.732e-18	-17.463	-17.563	-0.101	(0)
VO+2	1.349e-19	5.340e-20	-18.870	-19.272	-0.403	(0)
VOSO4	6.556e-20	6.556e-20	-19.183	-19.183	0.000	(0)
VOF+	4.494e-20	3.564e-20	-19.347	-19.448	-0.101	(0)
VOF2	1.487e-21	1.487e-21	-20.828	-20.828	0.000	(0)
VOC1+	4.008e-22	3.179e-22	-21.397	-21.498	-0.101	(0)
VOF3-	7.403e-24	5.871e-24	-23.131	-23.231	-0.101	(0)
VOF4-2	6.665e-27	2.637e-27	-26.176	-26.579	-0.403	(0)
H2V2O4+2	9.467e-31	3.746e-31	-30.024	-30.426	-0.403	(0)
V (5)	6.069e-09					
H2VO4-	5.377e-09	4.265e-09	-8.269	-8.370	-0.101	(0)
HVO4-2	6.903e-10	2.731e-10	-9.161	-9.564	-0.403	(0)
H3VO4	1.673e-12	1.673e-12	-11.777	-11.777	0.000	(0)
H3V2O7-	5.810e-14	4.608e-14	-13.236	-13.336	-0.101	(0)
HV2O7-3	3.180e-15	3.949e-16	-14.498	-15.403	-0.906	(0)
VO4-3	2.811e-16	3.491e-17	-15.551	-16.457	-0.906	(0)
VO2+	1.568e-16	1.310e-16	-15.805	-15.883	-0.078	(0)
VO2F	2.557e-17	2.557e-17	-16.592	-16.592	0.000	(0)
VO2SO4-	1.758e-17	1.395e-17	-16.755	-16.856	-0.101	(0)
V2O7-4	1.106e-17	2.710e-19	-16.956	-18.567	-1.611	(0)
VO2F2-	1.303e-18	1.033e-18	-17.885	-17.986	-0.101	(0)
V3O9-3	6.552e-19	8.136e-20	-18.184	-19.090	-0.906	(0)
VO2F3-2	3.624e-21	1.434e-21	-20.441	-20.843	-0.403	(0)
V4O12-4	5.904e-24	1.447e-25	-23.229	-24.839	-1.611	(0)
VO2NO3	6.947e-25	6.947e-25	-24.158	-24.158	0.000	(0)
VO2F4-3	6.323e-25	7.852e-26	-24.199	-25.105	-0.906	(0)
V10O28-6	0.000e+00	0.000e+00	-60.795	-64.418	-3.624	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.122	-63.638	-2.517	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.227	-65.837	-1.611	(0)
Zn	5.111e-06					
Zn+2	3.103e-06	1.511e-06	-5.508	-5.821	-0.312	(0)
ZnSO4	1.474e-06	1.474e-06	-5.832	-5.832	0.000	(0)
ZnCO3	2.037e-07	2.037e-07	-6.691	-6.691	0.000	(0)
Zn (SO4) 2-2	1.446e-07	5.722e-08	-6.840	-7.242	-0.403	(0)
ZnHCO3+	1.181e-07	9.365e-08	-6.928	-7.028	-0.101	(0)

ZnOH+	4.890e-08	3.878e-08	-7.311	-7.411	-0.101	(0)
ZnCl+	9.685e-09	8.057e-09	-8.014	-8.094	-0.080	(0)
ZnF+	4.231e-09	3.356e-09	-8.374	-8.474	-0.101	(0)
ZnOHCl	2.706e-09	2.706e-09	-8.568	-8.568	0.000	(0)
Zn(OH) 2	1.577e-09	1.577e-09	-8.802	-8.802	0.000	(0)
ZnCl2	2.710e-11	2.710e-11	-10.567	-10.567	0.000	(0)
Zn(OH) 3-	2.557e-12	2.028e-12	-11.592	-11.693	-0.101	(0)
ZnCl3-	5.490e-14	4.567e-14	-13.260	-13.340	-0.080	(0)
ZnNO3+	5.017e-14	3.979e-14	-13.300	-13.400	-0.101	(0)
ZnSeO4	1.461e-14	1.461e-14	-13.835	-13.835	0.000	(0)
ZnCl4-2	9.761e-17	4.846e-17	-16.010	-16.315	-0.304	(0)
Zn(OH) 4-2	5.237e-17	2.072e-17	-16.281	-16.684	-0.403	(0)
Zn(NO3) 2	8.323e-23	8.323e-23	-22.080	-22.080	0.000	(0)
Zn(SeO4) 2-2	2.335e-24	9.240e-25	-23.632	-24.034	-0.403	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.882	-149.982	-0.101	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.379	-151.379	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.187	-227.288	-0.101	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.459	-229.862	-0.403	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.535	-307.937	-0.403	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-56.47	-50.18	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-44.08	-39.57	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.30	-39.57	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-72.82	-54.89	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-59.00	-38.97	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.34	-28.94	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.27	-23.82	0.45	(NH4)2SeO4
Acanthite	-52.69	-88.91	-36.22	Ag2S
Ag2CO3	-11.66	-22.75	-11.09	Ag2CO3
Ag2CrO4	-20.86	-32.45	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-11.64	-23.19	-11.55	Ag2MoO4
Ag2O	-14.89	-2.31	12.57	Ag2O
Ag2Se	-0.55	-49.25	-48.70	Ag2Se
Ag2SeO3	-9.64	-16.79	-7.15	Ag2SeO3
Ag2SeO4	-18.42	-27.33	-8.91	Ag2SeO4
Ag2SO4	-14.66	-19.48	-4.82	Ag2SO4
Ag3AsO3	-28.17	-26.01	2.16	Ag3AsO3
Ag3AsO4	-16.35	-19.13	-2.79	Ag3AsO4
Ag3H2VO5	-17.12	-11.94	5.18	Ag3H2VO5
AgF:4H2O	-13.57	-12.52	1.05	AgF:4H2O
Agmetal	-0.54	-14.04	-13.51	Ag
AgVO3	-10.40	-9.63	0.77	AgVO3
Al(OH)3(am)	-1.10	9.70	10.80	Al(OH)3
Al2(MoO4)3	-45.60	-43.23	2.37	Al2(MoO4)3
Al2O3	-0.25	19.41	19.65	Al2O3
Al4(OH)10SO4	-1.05	21.65	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.76	-5.96	4.80	AlAsO4:2H2O
AlOHSO4	-4.23	-7.46	-3.23	AlOHSO4
AlSb	-152.75	-87.12	65.62	AlSb
Alunite	0.99	-0.41	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.21	-12.00	-7.79	PbSO4
Anhydrite	-0.85	-5.21	-4.36	CaSO4
Anilite	-56.75	-88.63	-31.88	Cu0.25Cu1.5S
Antlerite	-3.22	5.56	8.79	Cu3(OH)4SO4
Aragonite	-0.19	-8.49	-8.30	CaCO3
Arsenolite	-87.40	-90.16	-2.76	As4O6
Artinite	-6.01	3.59	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.04	-31.33	6.71	As2O5
Atacamite	-2.32	5.07	7.39	Cu2(OH)3Cl
Azurite	-1.25	-18.16	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.00	7.39	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.03	-2.16	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.23	-9.14	-8.91	Ba3(AsO4)2

Ba ₃ (VO ₄) ₂ ·4H ₂ O	-27.70	5.24	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-13.07	-22.74	-9.67	BaCrO ₄
BaF ₂	-9.50	-15.32	-5.82	BaF ₂
BaMoO ₄	-6.52	-13.48	-6.96	BaMoO ₄
Barite	0.21	-9.77	-9.98	BaSO ₄
BaS	-95.38	-79.20	16.18	BaS
BaSeO ₃	-8.92	-7.09	1.83	BaSeO ₃
BaSeO ₄	-10.16	-17.62	-7.46	BaSeO ₄
Bianchite	-6.41	-8.17	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-7.65	10.44	18.09	MnO ₂
Bixbyite	-4.24	-4.88	-0.64	Mn ₂ O ₃
BlaubleiI	-56.14	-80.30	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-56.87	-84.15	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.12	9.70	8.58	AlOOH
Breithauptite	-58.09	-76.62	-18.52	NiSb
Brochantite	-2.08	13.14	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.83	12.02	16.84	Mg(OH) ₂
Bunsenite	-5.12	7.32	12.45	NiO
Ca(VO ₃) ₂	-10.66	-5.00	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.55	6.95	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-14.60	6.95	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-17.77	4.53	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-20.05	18.91	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-20.95	18.91	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-300.77	-157.79	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.92	-18.18	-2.27	CaCrO ₄
Calcite	-0.01	-8.49	-8.48	CaCO ₃
Calomel	-7.12	-25.03	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.98	-8.93	-7.95	CaMoO ₄
Carnotite	-2.07	-1.84	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-5.34	-2.53	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-10.04	-13.06	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-12.67	-2.83	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.31	6.34	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.39	6.34	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.03	-15.32	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.71	1.85	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.22	8.18	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.16	-13.82	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.13	-13.82	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.91	-13.82	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.17	-16.38	-1.21	CdF ₂
Cdmetal(alpha)	-32.95	-19.44	13.51	Cd
Cdmetal(gamma)	-33.05	-19.44	13.62	Cd
CdMoO ₄	-0.39	-14.54	-14.15	CdMoO ₄
CdOHCl	-7.28	-3.74	3.54	CdOHCl
CdSb	-77.25	-77.60	-0.35	CdSb
CdSe	-20.40	-40.60	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.83	-18.68	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.65	-10.83	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.10	-10.83	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-8.95	-10.83	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-2.15	-15.28	-13.13	PbCO ₃
CH ₄ (g)	-82.49	-123.54	-41.05	CH ₄
Chalcanthite	-6.95	-9.59	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-56.92	-91.84	-34.92	Cu ₂ S
Chalcopyrite	-127.10	-162.37	-35.27	CuFeS ₂
Cinnabar	-52.04	-97.74	-45.69	HgS
Claudetite	-87.10	-90.16	-3.06	As ₄ O ₆
Clausthalite	-14.68	-41.78	-27.10	PbSe
Co(BO ₂) ₂	-29.05	-1.98	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.90	7.19	13.09	Co(OH) ₂
Co(OH) ₃	-10.02	-12.32	-2.31	Co(OH) ₃
CO ₂ (g)	-2.30	-20.44	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.80	-9.76	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-6.96	-17.46	-10.50	Co ₃ O ₄
CoCl ₂	-21.24	-12.97	8.27	CoCl ₂

CoCl2:6H2O	-15.51	-12.97	2.54	CoCl2:6H2O
CoCO3	-3.27	-13.25	-9.98	CoCO3
CoF2	-13.93	-15.53	-1.60	CoF2
CoF3	-44.95	-46.40	-1.46	CoF3
CoFe2O4	16.92	13.39	-3.53	CoFe2O4
CoMoO4	-5.93	-13.69	-7.76	CoMoO4
CoO	-6.40	7.19	13.59	CoO
CoS (alpha)	-71.97	-79.41	-7.44	CoS
CoS (beta)	-68.34	-79.41	-11.07	CoS
CoSe	-23.55	-39.75	-16.20	CoSe
CoSeO3	-8.61	-7.29	1.32	CoSeO3
CoSeO4:6H2O	-16.30	-17.83	-1.53	CoSeO4:6H2O
CoSO4	-12.78	-9.97	2.80	CoSO4
CoSO4:6H2O	-7.50	-9.98	-2.47	CoSO4:6H2O
Cotunnite	-10.22	-15.00	-4.78	PbCl2
Covellite	-56.72	-79.02	-22.30	CuS
Cr (OH) 2	-22.18	-11.36	10.82	Cr (OH) 2
Cr (OH) 3	-2.75	-1.42	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.67	-1.42	-0.75	Cr (OH) 3
Cr2O3	-0.48	-2.84	-2.36	Cr2O3
CrCl2	-45.61	-31.52	14.09	CrCl2
CrCl3	-46.77	-31.66	15.11	CrCl3
CrF3	-24.16	-35.50	-11.34	CrF3
Crmetal	-67.61	-37.13	30.48	Cr
CrO3	-26.93	-30.14	-3.21	CrO3
Cryolite	-8.91	-42.75	-33.84	Na3AlF6
Cu (OH) 2	-1.10	7.58	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.10	20.11	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.49	-0.23	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.99	-91.87	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-6.38	-52.18	-45.80	Cu2Se
Cu2SO4	-20.45	-22.40	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.70	-8.60	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.09	-104.69	-42.59	Cu3Sb
Cu3Se2	-28.06	-91.55	-63.49	Cu3Se2
CuCO3	-1.37	-12.87	-11.50	CuCO3
CuCrO4	-17.12	-22.56	-5.44	CuCrO4
CuF	-9.07	-13.98	-4.91	CuF
CuF2	-16.26	-15.14	1.12	CuF2
CuF2:2H2O	-10.59	-15.14	-4.55	CuF2:2H2O
Cumetal	-6.75	-15.51	-8.76	Cu
CuMoO4	-0.23	-13.30	-13.08	CuMoO4
CuOCuSO4	-12.31	-2.01	10.30	CuOCuSO4
Cupricferrite	7.79	13.78	5.99	CuFe2O4
Cuprite	-3.83	-5.24	-1.41	Cu2O
Cuprousferrite	9.40	0.48	-8.92	CuFeO2
CuSe	-6.27	-39.37	-33.10	CuSe
CuSe2	-27.17	-60.53	-33.37	CuSe2
CuSeO3:2H2O	-7.42	-6.91	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.00	-17.44	-2.44	CuSeO4:5H2O
CuSO4	-12.53	-9.59	2.94	CuSO4
Diaspore	2.83	9.70	6.87	AlOOH
Djurleite	-57.07	-90.99	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.38	-16.92	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.17	-16.92	-17.09	CaMg (CO3) 2
Epsomite	-3.02	-5.15	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.32	3.25	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.12	0.08	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.98	-13.70	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.83	-8.28	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.62	-37.24	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.55	-45.29	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.77	9.45	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.96	-12.56	0.40	FeAsO4:2H2O
FeCr2O4	-6.79	0.41	7.20	FeCr2O4
FeMoO4	-7.54	-17.63	-10.09	FeMoO4
Ferrihydrite	-0.09	3.10	3.19	Fe (OH) 3
Ferroselite	-46.27	-64.86	-18.60	FeSe2

FeS (ppt)	-80.40	-83.35	-2.95	FeS
FeSe	-32.69	-43.69	-11.00	FeSe
Fix_pe	-5.48	-5.48	0.00	e-
Fluorite	-0.27	-10.77	-10.50	CaF2
Galena	-67.47	-81.44	-13.97	PbS
Gibbsite	1.41	9.70	8.29	Al (OH) 3
Goethite	2.61	3.10	0.49	FeOOH
Goslarite	-6.16	-8.17	-2.01	ZnSO4:7H2O
Greenockite	-65.90	-80.26	-14.36	CdS
Greigite	-291.89	-336.93	-45.03	Fe3S4
Gummite	-5.85	1.82	7.67	UO3
Gypsum	-0.60	-5.21	-4.61	CaSO4:2H2O
H-Jarosite	-12.92	-25.02	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.00	-20.88	-12.88	H2MoO4
H2S (g)	-78.59	-86.60	-8.01	H2S
H2Se (g)	-41.98	-46.94	-4.96	H2Se
Halite	-6.45	-4.84	1.60	NaCl
Hausmannite	-5.19	55.84	61.03	Mn3O4
Hematite	7.62	6.21	-1.42	Fe2O3
Hercynite	-0.24	22.65	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.51	-258.21	-73.71	Hg (CH3) 2
Hg (g)	-7.45	-15.32	-7.87	Hg
Hg (OH) 2	-7.65	-11.14	-3.50	Hg (OH) 2
Hg2 (g)	-15.69	-30.64	-14.96	Hg2
Hg2 (OH) 2	-10.13	-4.87	5.26	Hg2 (OH) 2
Hg2CO3	-9.26	-25.31	-16.05	Hg2CO3
Hg2CrO4	-26.31	-35.01	-8.70	Hg2CrO4
Hg2F2	-17.23	-27.59	-10.36	Hg2F2
Hg2S	-79.79	-91.47	-11.68	Hg2S
Hg2SeO3	-14.70	-19.35	-4.66	Hg2SeO3
Hg2SO4	-15.90	-22.03	-6.13	Hg2SO4
Hg3O2CO3	-24.18	-53.87	-29.68	Hg3O2CO3
HgCl (g)	-32.01	-12.51	19.50	HgCl
HgCl2	-10.04	-31.30	-21.26	HgCl2
HgF (g)	-46.47	-13.80	32.68	HgF
HgF2 (g)	-46.43	-33.86	12.57	HgF2
Hgmetal (l)	-1.87	-15.32	-13.45	Hg
HgSe	-2.39	-58.08	-55.69	HgSe
HgSeO3	-13.19	-25.62	-12.43	HgSeO3
HgSO4	-18.89	-28.30	-9.42	HgSO4
Huntite	-3.80	-33.77	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.64	-25.41	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.92	-21.68	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-14.64	-19.81	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.41	-20.21	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.40	-50.64	-17.24	K2Cr2O7
K2CrO4	-20.00	-20.51	-0.51	K2CrO4
K2MoO4	-14.51	-11.25	3.26	K2MoO4
K2SeO4	-14.66	-15.39	-0.73	K2SeO4
Langite	-4.35	13.14	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.41	-6.84	-0.43	PbO:PbSO4
Laurionite	-5.54	-4.92	0.62	PbOHCl
Lepidocrocite	1.73	3.10	1.37	FeOOH
Lime	-20.75	11.95	32.70	CaO
Litharge	-7.53	5.16	12.69	PbO
Mackinawite	-79.75	-83.35	-3.60	FeS
Maghemite	-0.18	6.21	6.39	Fe2O3
Magnesioferrite	1.36	18.22	16.86	Fe2MgO4
Magnesite	-0.97	-8.43	-7.46	MgCO3
Magnetite	6.05	9.45	3.40	Fe3O4
Malachite	0.01	-5.29	-5.31	Cu2 (OH) 2CO3
Manganite	-2.43	22.91	25.34	MnOOH
Massicot	-7.73	5.16	12.89	PbO
Matlockite	-7.31	-16.28	-8.97	PbClF
Melanothallite	-18.84	-12.58	6.26	CuCl2
Melanterite	-11.71	-13.92	-2.21	FeSO4:7H2O
Metacinnabar	-52.64	-97.74	-45.09	HgS
Mg (OH) 2 (active)	-6.78	12.02	18.79	Mg (OH) 2

Mg (VO3) 2	-16.21	-4.93	11.28	Mg (VO3) 2
Mg2Sb3	-276.69	-202.01	74.68	Mg2Sb3
Mg2V2O7	-19.28	7.08	26.36	Mg2V2O7
MgCr2O4	-7.02	9.18	16.20	MgCr2O4
MgCrO4	-23.50	-18.12	5.38	MgCrO4
MgF2	-2.57	-10.70	-8.13	MgF2
MgMoO4	-7.01	-8.86	-1.85	MgMoO4
MgSeO3:6H2O	-5.52	-2.47	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.80	-13.00	-1.20	MgSeO4:6H2O
Minium	-32.27	41.25	73.52	Pb3O4
Mirabilite	-5.58	-6.69	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.83	-6.93	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.66	-56.37	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.75	-89.67	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.77	-1.27	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.85	-10.14	2.72	MnCl2:4H2O
MnS (grn)	-76.74	-76.57	0.17	MnS
MnS (pnk)	-79.91	-76.57	3.34	MnS
MnSb	-96.36	-99.27	-2.91	MnSb
MnSe	-40.42	-36.92	3.50	MnSe
MnSeO3	-5.59	-4.46	1.13	MnSeO3
MnSeO3:2H2O	-5.44	-4.46	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.95	-15.00	-2.05	MnSeO4:5H2O
MnSO4	-9.72	-7.14	2.58	MnSO4
Monteponite	-8.77	6.34	15.10	CdO
Montroydite	-7.50	-11.14	-3.64	HgO
MoO3	-12.88	-20.88	-8.00	MoO3
Morenosite	-7.70	-9.84	-2.14	NiSO4:7H2O
MoS2	-149.58	-219.84	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.90	-49.80	-9.90	Na2Cr2O7
Na2CrO4	-22.59	-19.66	2.93	Na2CrO4
Na2Mo2O7	-14.69	-31.28	-16.60	Na2Mo2O7
Na2MoO4	-11.90	-10.41	1.49	Na2MoO4
Na2MoO4:2H2O	-11.63	-10.41	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.31	-4.01	10.30	Na2SeO3:5H2O
Na2SeO4	-15.83	-14.55	1.28	Na2SeO4
Na3Sb	-175.57	-81.12	94.45	Na3Sb
Na3VO4	-29.45	7.23	36.68	Na3VO4
Na4V2O7	-33.41	3.99	37.40	Na4V2O7
Nantokite	-5.97	-12.70	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-8.66	-9.97	-1.31	Na2CO3:10H2O
NaVO3	-7.10	-3.24	3.86	NaVO3
Nesquehonite	-3.76	-8.43	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.47	7.32	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-25.06	-9.36	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-19.87	12.13	32.00	Ni4 (OH) 6SO4
NiCO3	-6.25	-13.12	-6.87	NiCO3
NiMoO4	-2.41	-13.56	-11.14	NiMoO4
NiS (alpha)	-73.67	-79.27	-5.60	NiS
NiS (beta)	-68.17	-79.27	-11.10	NiS
NiS (gamma)	-66.47	-79.27	-12.80	NiS
NiSe	-21.92	-39.62	-17.70	NiSe
NiSeO3:2H2O	-9.97	-7.16	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.18	-17.70	-1.52	NiSeO4:6H2O
Nsutite	-7.06	10.44	17.50	MnO2
O2 (g)	-31.54	51.55	83.09	O2
Orpiment	-243.80	-304.87	-61.07	As2S3
Otavite	-2.11	-14.11	-12.00	CdCO3
Pb (BO2) 2	-10.53	-4.01	6.52	Pb (BO2) 2
Pb (OH) 2	-2.99	5.16	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-62.30	-71.06	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.55	0.24	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.87	10.32	26.19	Pb2O (OH) 2
Pb2O3	-24.95	36.09	61.04	Pb2O3
Pb2OCO3	-9.56	-10.12	-0.56	Pb2OCO3
Pb2V2O7	-4.73	-6.63	-1.90	Pb2V2O7

Pb3(AsO4)2	-21.65	-15.85	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.61	-1.47	6.14	Pb3(VO4)2
Pb3O2CO3	-15.98	-4.96	11.02	Pb3O2CO3
Pb3O2SO4	-12.37	-1.68	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.62	3.48	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.40	3.48	21.88	Pb4O3SO4
PbCrO4	-12.38	-24.98	-12.60	PbCrO4
PbF2	-10.12	-17.56	-7.44	PbF2
Pbmetal	-24.86	-20.61	4.25	Pb
PbMoO4	-0.10	-15.72	-15.62	PbMoO4
PbO:0.3H2O	-7.82	5.16	12.98	PbO:0.33H2O
PbSeO4	-13.02	-19.86	-6.84	PbSeO4
Periclase	-9.57	12.02	21.58	MgO
Phosgenite	-10.47	-30.28	-19.81	PbCl2:PbCO3
Plattnerite	-18.67	30.93	49.60	PbO2
Portlandite	-10.85	11.95	22.80	Ca(OH)2
Pyrite	-125.66	-144.17	-18.51	FeS2
Pyrochroite	-5.17	10.02	15.19	Mn(OH)2
Pyrolusite	-5.59	35.79	41.38	MnO2
Realgar	-102.28	-122.02	-19.75	AsS
Retgersite	-7.80	-9.84	-2.04	NiSO4:6H2O
Rhodochrosite	0.16	-10.42	-10.58	MnCO3
Rutherfordine	-4.12	-18.62	-14.50	UO2CO3
Sb(OH)3	-12.40	-19.51	-7.11	Sb(OH)3
Sb2O4	-16.64	-13.24	3.40	Sb2O4
Sb2O5	-26.42	-36.09	-9.67	Sb2O5
Sb2Se3	-112.08	-179.84	-67.76	Sb2Se3
Sb4O6(cubic)	-59.77	-78.03	-18.26	Sb4O6
Sb4O6(orth)	-60.13	-78.03	-17.90	Sb4O6
SbCl3	-50.32	-49.75	0.57	SbCl3
SbF3	-43.36	-53.59	-10.23	SbF3
Sbmetal	-46.48	-58.17	-11.69	Sb
SbO2	-3.11	-30.93	-27.82	SbO2
Schoepite	-4.17	1.82	5.99	UO2(OH)2:H2O
Semetal(am)	-14.06	-21.17	-7.11	Se
Semetal(hex)	-13.46	-21.17	-7.71	Se
Senarmontite	-26.65	-39.01	-12.37	Sb2O3
SeO2	-14.61	-14.48	0.12	SeO2
SeO3	-46.06	-25.02	21.04	SeO3
Siderite	-6.96	-17.20	-10.24	FeCO3
Smithsonite	-1.45	-11.45	-10.00	ZnCO3
Sphalerite	-66.15	-77.60	-11.45	ZnS
Spinel	-5.42	31.42	36.85	MgAl2O4
Stibnite	-248.34	-298.80	-50.46	Sb2S3
Sulfur	-58.68	-60.82	-2.14	S
Tenorite	-0.07	7.58	7.64	CuO
Thenardite	-7.01	-6.69	0.32	Na2SO4
Thermonatrite	-10.61	-9.97	0.64	Na2CO3:H2O
Tyuyamunite	-5.44	-1.36	4.08	Ca(UO2)2(VO4)2
U3O8	-13.75	7.34	21.08	U3O8
U3Sb4	-583.89	-431.51	152.38	U3Sb4
U4O9	-30.15	-33.17	-3.02	U4O9
UF4	-30.64	-60.18	-29.54	UF4
UF4:2.5H2O	-27.46	-60.18	-32.72	UF4:2.5H2O
UO2(am)	-15.67	-14.74	0.93	UO2
UO2(NO3)2	-41.10	-28.95	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.80	-28.95	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.34	-28.95	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.00	-28.95	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.79	1.82	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.95	-23.20	-2.25	UO2SeO4:4H2O
UO3	-5.88	1.82	7.70	UO3
Uraninite	-10.07	-14.74	-4.67	UO2
USb2	-221.41	-191.83	29.58	USb2
V(OH)3	-19.24	-11.65	7.59	V(OH)3
V2O5	-15.59	-16.95	-1.36	V2O5
V3O5	-40.99	-39.15	1.84	V3O5
V4O7	-50.80	-43.61	7.19	V4O7

V6O13	-41.54	-102.40	-60.86	V6O13
Valentinite	-30.53	-39.01	-8.48	Sb2O3
VCl2	-63.57	-44.70	18.87	VCl2
VC13	-65.32	-41.89	23.43	VC13
VF4	-64.83	-49.90	14.93	VF4
Vmetal	-94.33	-50.31	44.03	V
VO	-39.29	-24.54	14.76	VO
VO(OH)2	-9.61	-4.46	5.15	VO(OH)2
VO2Cl	-21.40	-18.56	2.84	VO2Cl
VOC1	-32.88	-21.73	11.15	VOC1
VOC12	-37.38	-24.62	12.76	VOC12
VOSO4	-25.23	-21.62	3.61	VOSO4
Witherite	-4.48	-13.05	-8.57	BaCO3
Wurtzite	-68.65	-77.60	-8.95	ZnS
Zincite	-2.34	8.99	11.33	ZnO
Zincosite	-12.10	-8.17	3.93	ZnSO4
Zn(BO2)2	-8.46	-0.17	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.10	-21.78	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.21	8.99	12.20	Zn(OH)2
Zn(OH)2(am)	-3.48	8.99	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.76	8.99	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.54	8.99	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.74	8.99	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.68	0.82	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.29	7.90	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.01	-4.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.26	-7.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.60	18.80	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.70	24.80	38.50	Zn5(OH)8Cl2
ZnCl2	-18.22	-11.17	7.05	ZnCl2
ZnCO3:1H2O	-1.19	-11.45	-10.26	ZnCO3:1H2O
ZnF2	-13.19	-13.73	-0.53	ZnF2
Znmetal	-42.57	-16.78	25.79	Zn
ZnMoO4	-1.76	-11.89	-10.13	ZnMoO4
ZnO(active)	-2.20	8.99	11.19	ZnO
ZnS(am)	-68.55	-77.60	-9.05	ZnS
ZnSb	-85.96	-74.95	11.01	ZnSb
ZnSe	-23.55	-37.95	-14.40	ZnSe
ZnSeO4:6H2O	-14.51	-16.03	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.53	-8.17	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 63.

```

Title Evaporate Stage 3 lake water to produce initial Stage 2 Lake water
REACTION 305
      H2O      -1
      5.02 moles      ## Removes x m3 water, but solute mass remains the same
USE solution 311
Save Solution 312
END

```

TITLE

Evaporate Stage 3 lake water to produce initial Stage 2 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 311. Solution after simulation 62.

Using reaction 305.

Reaction 305.

5.020e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.005e-08	1.824e-08
Al	3.622e-06	3.295e-06
As	2.900e-10	2.638e-10
B	2.902e-05	2.640e-05
Ba	8.766e-08	7.975e-08
C	2.882e-03	2.621e-03
Ca	4.743e-03	4.315e-03
Cd	1.317e-08	1.198e-08
Cl	2.793e-03	2.541e-03
Co	9.603e-08	8.736e-08
Cr	2.423e-09	2.204e-09
Cu	1.166e-06	1.061e-06
F	1.757e-04	1.599e-04
Fe	2.056e-09	1.870e-09
Hg	1.968e-09	1.791e-09
K	3.463e-03	3.151e-03
Mg	5.124e-03	4.661e-03
Mn	6.007e-05	5.464e-05
Mo	1.940e-06	1.765e-06
N	9.004e-06	8.191e-06
Na	9.115e-03	8.292e-03
Ni	1.194e-07	1.086e-07
Pb	3.500e-09	3.184e-09
S	1.338e-02	1.217e-02
Sb	2.734e-08	2.487e-08
Se	1.401e-07	1.274e-07
U	3.578e-07	3.255e-07
V	6.672e-09	6.070e-09
Zn	5.619e-06	5.111e-06

-----Description of solution-----

	pH	=	7.402	Charge balance
	pe	=	5.486	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.246e-02	
	Mass of water (kg)	=	9.097e-01	
	Total alkalinity (eq/kg)	=	2.724e-03	
	Total CO2 (mol/kg)	=	2.882e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	9.691e-07	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	

Iterations = 4
Total H = 1.009892e+02
Total O = 5.054981e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	3.088e-07	2.539e-07	-6.510	-6.595	-0.085	(0)
H+	4.772e-08	3.963e-08	-7.321	-7.402	-0.081	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	2.005e-08					
AgCl	1.303e-08	1.303e-08	-7.885	-7.885	0.000	(0)
AgCl2-	3.354e-09	2.633e-09	-8.474	-8.580	-0.105	(0)
Ag+	3.314e-09	2.752e-09	-8.480	-8.560	-0.081	(0)
AgSO4-	3.317e-10	2.604e-10	-9.479	-9.584	-0.105	(0)
AgCl3-2	1.433e-11	5.443e-12	-10.844	-11.264	-0.420	(0)
AgNO2	4.123e-12	4.123e-12	-11.385	-11.385	0.000	(0)
AgF	8.321e-13	8.321e-13	-12.080	-12.080	0.000	(0)
AgCl4-3	2.276e-13	2.578e-14	-12.643	-13.589	-0.946	(0)
AgOH	6.988e-14	6.988e-14	-13.156	-13.156	0.000	(0)
AgSeO3-	2.059e-14	1.617e-14	-13.686	-13.791	-0.105	(0)
AgH2BO3	1.835e-14	1.835e-14	-13.736	-13.736	0.000	(0)
AgNH3+	1.746e-14	1.371e-14	-13.758	-13.863	-0.105	(0)
Ag2Se	4.811e-15	4.811e-15	-14.318	-14.318	0.000	(0)
Ag (NO2) 2-	5.833e-17	4.580e-17	-16.234	-16.339	-0.105	(0)
AgNO3	2.521e-17	2.521e-17	-16.598	-16.598	0.000	(0)
Ag (OH) 2-	2.209e-18	1.734e-18	-17.656	-17.761	-0.105	(0)
Ag (NH3) 2+	3.462e-19	2.718e-19	-18.461	-18.566	-0.105	(0)
Ag (SeO3) 2-3	1.168e-20	1.323e-21	-19.933	-20.879	-0.946	(0)
Ag2MoO4	2.646e-24	2.646e-24	-23.577	-23.577	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.917	-73.917	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.202	-85.884	-1.682	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.862	-149.070	-0.209	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.884	-148.989	-0.105	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.728	-151.108	-0.380	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.059	-151.419	-0.360	(0)
Al	3.622e-06					
Al (OH) 4-	3.454e-06	2.869e-06	-5.462	-5.542	-0.081	(0)
Al (OH) 3	8.976e-08	8.976e-08	-7.047	-7.047	0.000	(0)
AlF3	3.024e-08	3.024e-08	-7.519	-7.519	0.000	(0)
AlF2+	2.382e-08	1.996e-08	-7.623	-7.700	-0.077	(0)
Al (OH) 2+	2.115e-08	1.772e-08	-7.675	-7.752	-0.077	(0)
AlF4-	2.196e-09	1.824e-09	-8.658	-8.739	-0.081	(0)
AlF+2	8.461e-10	4.164e-10	-9.073	-9.380	-0.308	(0)
AlOH+2	1.785e-10	8.785e-11	-9.748	-10.056	-0.308	(0)
AlSO4+	1.533e-11	1.273e-11	-10.814	-10.895	-0.081	(0)
Al+3	1.840e-12	3.460e-13	-11.735	-12.461	-0.726	(0)
Al (SO4) 2-	7.788e-13	6.469e-13	-12.109	-12.189	-0.081	(0)
AlMo6O21-3	7.194e-38	8.149e-39	-37.143	-38.089	-0.946	(0)
As (3)	3.138e-23					
H3AsO3	3.087e-23	3.087e-23	-22.510	-22.510	0.000	(0)
H2AsO3-	5.089e-25	3.995e-25	-24.293	-24.398	-0.105	(0)
HAsO3-2	2.420e-29	9.194e-30	-28.616	-29.036	-0.420	(0)
H4AsO3+	7.721e-31	6.062e-31	-30.112	-30.217	-0.105	(0)
AsO3-3	7.895e-35	8.943e-36	-34.103	-35.049	-0.946	(0)
As (5)	2.900e-10					
HAsO4-2	2.467e-10	9.373e-11	-9.608	-10.028	-0.420	(0)
H2AsO4-	4.315e-11	3.388e-11	-10.365	-10.470	-0.105	(0)
AsO4-3	6.602e-14	7.479e-15	-13.180	-14.126	-0.946	(0)
H3AsO4	2.310e-16	2.333e-16	-15.636	-15.632	0.004	(0)
B	2.902e-05					
H3BO3	2.842e-05	2.870e-05	-4.546	-4.542	0.004	(0)
H2BO3-	5.173e-07	4.206e-07	-6.286	-6.376	-0.090	(0)
CaH2BO3+	4.357e-08	3.542e-08	-7.361	-7.451	-0.090	(0)
MgH2BO3+	3.054e-08	2.483e-08	-7.515	-7.605	-0.090	(0)
NaH2BO3	4.917e-09	4.917e-09	-8.308	-8.308	0.000	(0)

	BF(OH) 3-	1.695e-09	1.378e-09	-8.771	-8.861	-0.090	(0)
	H5(BO3) 2-	1.264e-11	1.027e-11	-10.898	-10.988	-0.090	(0)
	BF2(OH) 2-	8.652e-13	7.034e-13	-12.063	-12.153	-0.090	(0)
	BaH2BO3+	6.588e-13	5.356e-13	-12.181	-12.271	-0.090	(0)
	H8(BO3) 3-	3.626e-14	2.948e-14	-13.441	-13.530	-0.090	(0)
	AgH2BO3	1.835e-14	1.835e-14	-13.736	-13.736	0.000	(0)
	BF3OH-	1.607e-18	1.306e-18	-17.794	-17.884	-0.090	(0)
	BF4-	3.774e-23	3.068e-23	-22.423	-22.513	-0.090	(0)
Ba	8.766e-08						
	Ba+2	8.661e-08	4.121e-08	-7.062	-7.385	-0.323	(0)
	BaHCO3+	9.985e-10	8.406e-10	-9.001	-9.075	-0.075	(0)
	BaCO3	5.340e-11	5.340e-11	-10.272	-10.272	0.000	(0)
	BaH2BO3+	6.588e-13	5.356e-13	-12.181	-12.271	-0.090	(0)
	BaOH+	5.473e-14	4.568e-14	-13.262	-13.340	-0.079	(0)
	BaNO3+	3.034e-15	2.382e-15	-14.518	-14.623	-0.105	(0)
	BaNH3+2	1.670e-16	6.343e-17	-15.777	-16.198	-0.420	(0)
C(4)	2.882e-03						
	HCO3-	2.550e-03	2.136e-03	-2.593	-2.670	-0.077	(0)
	H2CO3	1.904e-04	1.904e-04	-3.720	-3.720	0.000	(0)
	CaHCO3+	6.914e-05	5.821e-05	-4.160	-4.235	-0.075	(0)
	MgHCO3+	4.502e-05	3.721e-05	-4.347	-4.429	-0.083	(0)
	NaHCO3	8.859e-06	8.859e-06	-5.053	-5.053	0.000	(0)
	CaCO3	5.861e-06	5.861e-06	-5.232	-5.232	0.000	(0)
	CO3-2	5.310e-06	2.527e-06	-5.275	-5.597	-0.323	(0)
	MgCO3	3.578e-06	3.578e-06	-5.446	-5.446	0.000	(0)
	CuCO3	8.875e-07	8.875e-07	-6.052	-6.052	0.000	(0)
	MnHCO3+	8.672e-07	7.238e-07	-6.062	-6.140	-0.079	(0)
	NaCO3-	4.143e-07	3.470e-07	-6.383	-6.460	-0.077	(0)
	UO2(CO3) 3-4	2.492e-07	5.187e-09	-6.604	-8.285	-1.682	(0)
	ZnCO3	2.315e-07	2.315e-07	-6.635	-6.635	0.000	(0)
	ZnHCO3+	1.370e-07	1.076e-07	-6.863	-6.968	-0.105	(0)
	UO2(CO3) 2-2	1.078e-07	4.096e-08	-6.967	-7.388	-0.420	(0)
	Cu(CO3) 2-2	1.589e-08	6.036e-09	-7.799	-8.219	-0.420	(0)
	NiHCO3+	1.146e-08	8.998e-09	-7.941	-8.046	-0.105	(0)
	CuHCO3+	1.024e-08	8.039e-09	-7.990	-8.095	-0.105	(0)
	CoHCO3+	5.272e-09	4.139e-09	-8.278	-8.383	-0.105	(0)
	NiCO3	3.221e-09	3.221e-09	-8.492	-8.492	0.000	(0)
	PbCO3	1.738e-09	1.738e-09	-8.760	-8.760	0.000	(0)
	CoCO3	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
	BaHCO3+	9.985e-10	8.406e-10	-9.001	-9.075	-0.075	(0)
	UO2CO3	8.125e-10	8.125e-10	-9.090	-9.090	0.000	(0)
	PbHCO3+	4.626e-10	3.632e-10	-9.335	-9.440	-0.105	(0)
	CdCO3	2.019e-10	2.019e-10	-9.695	-9.695	0.000	(0)
	BaCO3	5.340e-11	5.340e-11	-10.272	-10.272	0.000	(0)
	Pb(CO3) 2-2	3.334e-11	1.267e-11	-10.477	-10.897	-0.420	(0)
	CdHCO3+	2.172e-11	1.705e-11	-10.663	-10.768	-0.105	(0)
	Cd(CO3) 2-2	9.958e-13	3.783e-13	-12.002	-12.422	-0.420	(0)
	FeHCO3+	9.605e-14	8.086e-14	-13.018	-13.092	-0.075	(0)
	HgCO3	5.935e-14	5.935e-14	-13.227	-13.227	0.000	(0)
	Hg(CO3) 2-2	1.248e-15	4.742e-16	-14.904	-15.324	-0.420	(0)
	HgHCO3+	5.579e-17	4.380e-17	-16.253	-16.359	-0.105	(0)
Ca	4.743e-03						
	Ca+2	3.076e-03	1.464e-03	-2.512	-2.835	-0.323	(0)
	CaSO4	1.590e-03	1.590e-03	-2.799	-2.799	0.000	(0)
	CaHCO3+	6.914e-05	5.821e-05	-4.160	-4.235	-0.075	(0)
	CaCO3	5.861e-06	5.861e-06	-5.232	-5.232	0.000	(0)
	CaF+	2.304e-06	1.923e-06	-5.638	-5.716	-0.079	(0)
	CaH2BO3+	4.357e-08	3.542e-08	-7.361	-7.451	-0.090	(0)
	CaOH+	8.808e-09	7.415e-09	-8.055	-8.130	-0.075	(0)
	CaNO3+	6.799e-11	5.338e-11	-10.168	-10.273	-0.105	(0)
	CaNH3+2	1.183e-11	4.495e-12	-10.927	-11.347	-0.420	(0)
	Ca(NH3) 2+2	1.149e-20	4.365e-21	-19.940	-20.360	-0.420	(0)
Cd	1.317e-08						
	Cd+2	7.370e-09	3.507e-09	-8.133	-8.455	-0.323	(0)
	CdSO4	3.898e-09	3.898e-09	-8.409	-8.409	0.000	(0)
	CdCl+	9.894e-10	7.767e-10	-9.005	-9.110	-0.105	(0)
	Cd(SO4) 2-2	6.563e-10	2.493e-10	-9.183	-9.603	-0.420	(0)
	CdCO3	2.019e-10	2.019e-10	-9.695	-9.695	0.000	(0)

	CdHCO3+	2.172e-11	1.705e-11	-10.663	-10.768	-0.105	(0)
	CdOH+	9.009e-12	7.073e-12	-11.045	-11.150	-0.105	(0)
	CdF+	8.521e-12	6.690e-12	-11.070	-11.175	-0.105	(0)
	CdOHC1	8.090e-12	8.090e-12	-11.092	-11.092	0.000	(0)
	CdCl2	7.510e-12	7.510e-12	-11.124	-11.124	0.000	(0)
	Cd(CO3) 2-2	9.958e-13	3.783e-13	-12.002	-12.422	-0.420	(0)
	CdCl3-	1.400e-14	1.099e-14	-13.854	-13.959	-0.105	(0)
	Cd(OH) 2	1.133e-14	1.133e-14	-13.946	-13.946	0.000	(0)
	CdF2	1.607e-15	1.607e-15	-14.794	-14.794	0.000	(0)
	CdNO3+	1.629e-16	1.279e-16	-15.788	-15.893	-0.105	(0)
	CdSeO4	4.407e-17	4.407e-17	-16.356	-16.356	0.000	(0)
	Cd2OH+3	1.097e-18	1.243e-19	-17.960	-18.906	-0.946	(0)
	Cd(SeO3) 2-2	6.355e-19	2.414e-19	-18.197	-18.617	-0.420	(0)
	Cd(OH) 3-	2.239e-19	1.758e-19	-18.650	-18.755	-0.105	(0)
	Cd(NO3) 2	7.392e-25	7.392e-25	-24.131	-24.131	0.000	(0)
	Cd(OH) 4-2	1.923e-26	7.305e-27	-25.716	-26.136	-0.420	(0)
	CdHS+	0.000e+00	0.000e+00	-79.513	-79.619	-0.105	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-151.586	-151.586	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-228.752	-228.858	-0.105	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-305.413	-305.833	-0.420	(0)
C1	2.793e-03						
	Cl-	2.793e-03	2.319e-03	-2.554	-2.635	-0.081	(0)
	MnCl+	5.942e-08	4.959e-08	-7.226	-7.305	-0.079	(0)
	AgCl	1.303e-08	1.303e-08	-7.885	-7.885	0.000	(0)
	ZnCl+	1.122e-08	9.278e-09	-7.950	-8.033	-0.083	(0)
	AgCl2-	3.354e-09	2.633e-09	-8.474	-8.580	-0.105	(0)
	ZnOHC1	3.084e-09	3.084e-09	-8.511	-8.511	0.000	(0)
	CdCl+	9.894e-10	7.767e-10	-9.005	-9.110	-0.105	(0)
	CuCl	2.784e-10	2.784e-10	-9.555	-9.555	0.000	(0)
	CuCl+	2.653e-10	2.193e-10	-9.576	-9.659	-0.083	(0)
	NiCl+	2.583e-10	2.028e-10	-9.588	-9.693	-0.105	(0)
	CoCl+	2.546e-10	1.999e-10	-9.594	-9.699	-0.105	(0)
	CuCl2-	1.632e-10	1.349e-10	-9.787	-9.870	-0.083	(0)
	MnCl2	1.625e-10	1.625e-10	-9.789	-9.789	0.000	(0)
	ZnCl2	3.411e-11	3.411e-11	-10.467	-10.467	0.000	(0)
	PbCl+	2.399e-11	1.883e-11	-10.620	-10.725	-0.105	(0)
	HgClOH	2.041e-11	2.041e-11	-10.690	-10.690	0.000	(0)
	AgCl3-2	1.433e-11	5.443e-12	-10.844	-11.264	-0.420	(0)
	HgCl2	1.056e-11	1.056e-11	-10.976	-10.976	0.000	(0)
	CdOHC1	8.090e-12	8.090e-12	-11.092	-11.092	0.000	(0)
	CdCl2	7.510e-12	7.510e-12	-11.124	-11.124	0.000	(0)
	HgCl3-	3.120e-13	2.449e-13	-12.506	-12.611	-0.105	(0)
	AgCl4-3	2.276e-13	2.578e-14	-12.643	-13.589	-0.946	(0)
	PbCl2	1.951e-13	1.951e-13	-12.710	-12.710	0.000	(0)
	CuCl2	1.764e-13	1.764e-13	-12.754	-12.754	0.000	(0)
	CuCl3-2	1.379e-13	6.690e-14	-12.860	-13.175	-0.314	(0)
	MnCl3-	1.244e-13	1.038e-13	-12.905	-12.984	-0.079	(0)
	ZnCl3-	7.602e-14	6.284e-14	-13.119	-13.202	-0.083	(0)
	CdCl3-	1.400e-14	1.099e-14	-13.854	-13.959	-0.105	(0)
	HgCl4-2	5.954e-15	2.262e-15	-14.225	-14.646	-0.420	(0)
	NiCl2	2.368e-15	2.368e-15	-14.626	-14.626	0.000	(0)
	HgCl+	1.157e-15	9.083e-16	-14.937	-15.042	-0.105	(0)
	UO2Cl+	3.871e-16	3.039e-16	-15.412	-15.517	-0.105	(0)
	PbCl3-	2.295e-16	1.802e-16	-15.639	-15.744	-0.105	(0)
	ZnCl4-2	1.502e-16	7.288e-17	-15.823	-16.137	-0.314	(0)
	CrCl+2	7.468e-17	2.837e-17	-16.127	-16.547	-0.420	(0)
	CuCl3-	4.618e-18	3.818e-18	-17.336	-17.418	-0.083	(0)
	PbCl4-2	5.029e-19	1.910e-19	-18.299	-18.719	-0.420	(0)
	CrOHC12	3.176e-19	3.176e-19	-18.498	-18.498	0.000	(0)
	FeCl+2	1.236e-20	5.997e-21	-19.908	-20.222	-0.314	(0)
	CrCl2+	7.953e-21	6.244e-21	-20.099	-20.205	-0.105	(0)
	VOCl+	4.940e-22	3.878e-22	-21.306	-21.411	-0.105	(0)
	CuCl4-2	9.147e-23	4.438e-23	-22.039	-22.353	-0.314	(0)
	FeCl2+	7.444e-23	6.213e-23	-22.128	-22.207	-0.079	(0)
	CrO3Cl-	4.784e-26	3.755e-26	-25.320	-25.425	-0.105	(0)
	FeCl3	1.441e-26	1.441e-26	-25.841	-25.841	0.000	(0)
	CoCl+2	3.776e-35	1.434e-35	-34.423	-34.843	-0.420	(0)
	UCl+3	0.000e+00	0.000e+00	-44.445	-45.391	-0.946	(0)

Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.534	-51.954	-0.420	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.813	-54.234	-0.420	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.862	-67.282	-0.420	(0)
Co (2)	9.603e-08					
Co+2	6.559e-08	2.491e-08	-7.183	-7.604	-0.420	(0)
CoSO4	2.357e-08	2.357e-08	-7.628	-7.628	0.000	(0)
CoHCO3+	5.272e-09	4.139e-09	-8.278	-8.383	-0.105	(0)
CoCO3	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
CoCl+	2.546e-10	1.999e-10	-9.594	-9.699	-0.105	(0)
CoOH+	1.608e-10	1.262e-10	-9.794	-9.899	-0.105	(0)
CoF+	1.208e-10	9.483e-11	-9.918	-10.023	-0.105	(0)
Co (OH) 2	2.546e-12	2.546e-12	-11.594	-11.594	0.000	(0)
CoNO2+	1.604e-12	1.259e-12	-11.795	-11.900	-0.105	(0)
Co (NH3) +2	1.923e-14	7.306e-15	-13.716	-14.136	-0.420	(0)
CoSeO4	8.428e-16	8.428e-16	-15.074	-15.074	0.000	(0)
CoNO3+	5.800e-16	4.554e-16	-15.237	-15.342	-0.105	(0)
Co (OH) 3-	1.643e-17	1.290e-17	-16.784	-16.890	-0.105	(0)
CoOH-	4.125e-18	3.238e-18	-17.385	-17.490	-0.105	(0)
Co2OH+3	1.391e-18	1.576e-19	-17.857	-18.802	-0.946	(0)
Co (NH3) 2+2	2.001e-21	7.603e-22	-20.699	-21.119	-0.420	(0)
Co (NO3) 2	1.069e-23	1.069e-23	-22.971	-22.971	0.000	(0)
Co (OH) 4-2	1.366e-24	5.190e-25	-23.864	-24.285	-0.420	(0)
Co (NH3) 3+2	6.146e-29	2.335e-29	-28.211	-28.632	-0.420	(0)
Co4 (OH) 4+4	2.432e-30	5.064e-32	-29.614	-31.295	-1.682	(0)
Co (NH3) 4+2	7.868e-37	2.989e-37	-36.104	-36.525	-0.420	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.497	-44.917	-0.420	(0)
Co (3)	1.032e-28					
CoOH+2	1.032e-28	3.922e-29	-27.986	-28.407	-0.420	(0)
Co+3	1.617e-34	3.039e-35	-33.791	-34.517	-0.726	(0)
CoCl+2	3.776e-35	1.434e-35	-34.423	-34.843	-0.420	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.534	-51.954	-0.420	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.941	-62.046	-0.105	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.622	-67.043	-0.420	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.862	-67.282	-0.420	(0)
Cr (2)	1.940e-26					
Cr+2	1.940e-26	7.367e-27	-25.712	-26.133	-0.420	(0)
Cr (3)	2.423e-09					
Cr (OH) 2+	2.066e-09	1.622e-09	-8.685	-8.790	-0.105	(0)
Cr (OH) 3	1.547e-10	1.547e-10	-9.810	-9.810	0.000	(0)
Cr (OH) +2	1.382e-10	5.250e-11	-9.859	-10.280	-0.420	(0)
CrOHSO4	5.907e-11	5.907e-11	-10.229	-10.229	0.000	(0)
CrO2-	2.363e-12	1.855e-12	-11.627	-11.732	-0.105	(0)
Cr (OH) 4-	1.992e-12	1.564e-12	-11.701	-11.806	-0.105	(0)
CrF+2	4.746e-13	1.803e-13	-12.324	-12.744	-0.420	(0)
CrSO4+	1.333e-13	1.046e-13	-12.875	-12.980	-0.105	(0)
Cr+3	8.343e-14	9.451e-15	-13.079	-14.025	-0.946	(0)
CrCl+2	7.468e-17	2.837e-17	-16.127	-16.547	-0.420	(0)
Cr2 (OH) 2SO4+2	7.379e-19	2.803e-19	-18.132	-18.552	-0.420	(0)
CrOHC12	3.176e-19	3.176e-19	-18.498	-18.498	0.000	(0)
Cr2 (OH) 2 (SO4) 2	7.894e-20	7.894e-20	-19.103	-19.103	0.000	(0)
CrCl2+	7.953e-21	6.244e-21	-20.099	-20.205	-0.105	(0)
CrNO3+2	1.254e-23	4.764e-24	-22.902	-23.322	-0.420	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.891	-43.311	-0.420	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.755	-52.701	-0.946	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.813	-54.234	-0.420	(0)
Cr (6)	1.177e-15					
CrO4-2	1.064e-15	5.062e-16	-14.973	-15.296	-0.323	(0)
HCrO4-	8.269e-17	6.492e-17	-16.083	-16.188	-0.105	(0)
NaCrO4-	2.363e-17	1.855e-17	-16.626	-16.732	-0.105	(0)
KCrO4-	6.669e-18	5.236e-18	-17.176	-17.281	-0.105	(0)
CrO3SO4-2	9.787e-24	3.718e-24	-23.009	-23.430	-0.420	(0)
H2CrO4	2.085e-24	2.085e-24	-23.681	-23.681	0.000	(0)
CrO3Cl-	4.784e-26	3.755e-26	-25.320	-25.425	-0.105	(0)
Cr2O7-2	3.849e-31	1.462e-31	-30.415	-30.835	-0.420	(0)
Cu (1)	5.632e-10					
CuCl	2.784e-10	2.784e-10	-9.555	-9.555	0.000	(0)
CuCl2-	1.632e-10	1.349e-10	-9.787	-9.870	-0.083	(0)
Cu+	1.214e-10	9.534e-11	-9.916	-10.021	-0.105	(0)

CuCl3-2	1.379e-13	6.690e-14	-12.860	-13.175	-0.314	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.800	-150.170	-0.370	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.548	-150.900	-0.351	(0)
Cu (2)	1.165e-06					
CuCO3	8.875e-07	8.875e-07	-6.052	-6.052	0.000	(0)
Cu+2	1.254e-07	5.965e-08	-6.902	-7.224	-0.323	(0)
CuSO4	6.479e-08	6.479e-08	-7.188	-7.188	0.000	(0)
CuOH+	5.794e-08	4.790e-08	-7.237	-7.320	-0.083	(0)
Cu (CO3) 2-2	1.589e-08	6.036e-09	-7.799	-8.219	-0.420	(0)
CuHCO3+	1.024e-08	8.039e-09	-7.990	-8.095	-0.105	(0)
Cu (OH) 2	2.427e-09	2.427e-09	-8.615	-8.615	0.000	(0)
CuF+	5.771e-10	4.530e-10	-9.239	-9.344	-0.105	(0)
CuCl+	2.653e-10	2.193e-10	-9.576	-9.659	-0.083	(0)
Cu2 (OH) 2+2	1.517e-10	5.763e-11	-9.819	-10.239	-0.420	(0)
CuNO2+	5.706e-11	4.479e-11	-10.244	-10.349	-0.105	(0)
CuNH3+2	3.920e-12	1.489e-12	-11.407	-11.827	-0.420	(0)
Cu (OH) 3-	1.610e-12	1.264e-12	-11.793	-11.898	-0.105	(0)
CuCl2	1.764e-13	1.764e-13	-12.754	-12.754	0.000	(0)
Cu (NO2) 2	3.287e-15	3.287e-15	-14.483	-14.483	0.000	(0)
CuNO3+	2.771e-15	2.175e-15	-14.557	-14.662	-0.105	(0)
Cu (OH) 4-2	6.649e-18	2.526e-18	-17.177	-17.598	-0.420	(0)
CuCl3-	4.618e-18	3.818e-18	-17.336	-17.418	-0.083	(0)
CuCl4-2	9.147e-23	4.438e-23	-22.039	-22.353	-0.314	(0)
Cu (NO3) 2	3.159e-24	3.159e-24	-23.501	-23.501	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.735	-218.840	-0.105	(0)
F	1.757e-04					
F-	1.449e-04	1.204e-04	-3.839	-3.919	-0.081	(0)
MgF+	2.768e-05	2.299e-05	-4.558	-4.638	-0.081	(0)
CaF+	2.304e-06	1.923e-06	-5.638	-5.716	-0.079	(0)
NaF	5.602e-07	5.602e-07	-6.252	-6.252	0.000	(0)
MnF+	9.751e-08	8.138e-08	-7.011	-7.089	-0.079	(0)
AlF3	3.024e-08	3.024e-08	-7.519	-7.519	0.000	(0)
AlF2+	2.382e-08	1.996e-08	-7.623	-7.700	-0.077	(0)
HF	7.056e-09	7.056e-09	-8.151	-8.151	0.000	(0)
ZnF+	4.871e-09	3.824e-09	-8.312	-8.417	-0.105	(0)
AlF4-	2.196e-09	1.824e-09	-8.658	-8.739	-0.081	(0)
BF (OH) 3-	1.695e-09	1.378e-09	-8.771	-8.861	-0.090	(0)
AlF+2	8.461e-10	4.164e-10	-9.073	-9.380	-0.308	(0)
CuF+	5.771e-10	4.530e-10	-9.239	-9.344	-0.105	(0)
NiF+	1.316e-10	1.033e-10	-9.881	-9.986	-0.105	(0)
CoF+	1.208e-10	9.483e-11	-9.918	-10.023	-0.105	(0)
CdF+	8.521e-12	6.690e-12	-11.070	-11.175	-0.105	(0)
HF2-	3.927e-12	3.229e-12	-11.406	-11.491	-0.085	(0)
PbF+	2.473e-12	1.941e-12	-11.607	-11.712	-0.105	(0)
UO2F+	1.710e-12	1.342e-12	-11.767	-11.872	-0.105	(0)
BF2 (OH) 2-	8.652e-13	7.034e-13	-12.063	-12.153	-0.090	(0)
AgF	8.321e-13	8.321e-13	-12.080	-12.080	0.000	(0)
CrF+2	4.746e-13	1.803e-13	-12.324	-12.744	-0.420	(0)
UO2F2	4.659e-13	4.659e-13	-12.332	-12.332	0.000	(0)
UO2F3-	1.794e-14	1.409e-14	-13.746	-13.851	-0.105	(0)
PbF2	4.598e-15	4.598e-15	-14.337	-14.337	0.000	(0)
CdF2	1.607e-15	1.607e-15	-14.794	-14.794	0.000	(0)
H2F2	1.334e-16	1.334e-16	-15.875	-15.875	0.000	(0)
FeF2+	4.361e-17	3.640e-17	-16.360	-16.439	-0.079	(0)
UO2F4-2	3.546e-17	1.347e-17	-16.450	-16.871	-0.420	(0)
VO2F	3.067e-17	3.067e-17	-16.513	-16.513	0.000	(0)
FeF+2	2.329e-17	1.130e-17	-16.633	-16.947	-0.314	(0)
FeF3	6.181e-18	6.181e-18	-17.209	-17.209	0.000	(0)
VO2F2-	1.707e-18	1.340e-18	-17.768	-17.873	-0.105	(0)
BF3OH-	1.607e-18	1.306e-18	-17.794	-17.884	-0.090	(0)
PbF3-	1.337e-18	1.050e-18	-17.874	-17.979	-0.105	(0)
VOF+	5.481e-20	4.303e-20	-19.261	-19.366	-0.105	(0)
VO2F3-2	5.298e-21	2.013e-21	-20.276	-20.696	-0.420	(0)
VOF2	1.942e-21	1.942e-21	-20.712	-20.712	0.000	(0)
PbF4-2	1.592e-22	6.048e-23	-21.798	-22.218	-0.420	(0)
HgF+	1.115e-22	8.757e-23	-21.953	-22.058	-0.105	(0)
BF4-	3.774e-23	3.068e-23	-22.423	-22.513	-0.090	(0)
VOF3-	1.056e-23	8.294e-24	-22.976	-23.081	-0.105	(0)

VO2F4-3	1.052e-24	1.192e-25	-23.978	-24.924	-0.946	(0)
Sb(OH) 2F	2.531e-25	2.531e-25	-24.597	-24.597	0.000	(0)
SbOF	2.490e-25	2.490e-25	-24.604	-24.604	0.000	(0)
VOF4-2	1.061e-26	4.030e-27	-25.974	-26.395	-0.420	(0)
UF3+	3.090e-35	2.426e-35	-34.510	-34.615	-0.105	(0)
UF2+2	3.347e-36	1.271e-36	-35.475	-35.896	-0.420	(0)
UF4	3.201e-37	3.201e-37	-36.495	-36.495	0.000	(0)
UF+3	7.407e-39	8.390e-40	-38.130	-39.076	-0.946	(0)
UF5-	1.945e-39	1.527e-39	-38.711	-38.816	-0.105	(0)
UF6-2	1.461e-40	0.000e+00	-39.835	-40.256	-0.420	(0)
Fe (2)	1.155e-11					
Fe+2	7.917e-12	3.007e-12	-11.101	-11.522	-0.420	(0)
FeSO4	3.500e-12	3.500e-12	-11.456	-11.456	0.000	(0)
FeHCO3+	9.605e-14	8.086e-14	-13.018	-13.092	-0.075	(0)
FeOH+	3.642e-14	3.040e-14	-13.439	-13.517	-0.079	(0)
Fe (OH) 2	6.131e-18	6.131e-18	-17.212	-17.212	0.000	(0)
Fe (OH) 3-	5.899e-19	4.923e-19	-18.229	-18.308	-0.079	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.915	-160.915	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.944	-238.049	-0.105	(0)
Fe (3)	2.044e-09					
Fe (OH) 2+	1.655e-09	1.386e-09	-8.781	-8.858	-0.077	(0)
Fe (OH) 3	3.781e-10	3.781e-10	-9.422	-9.422	0.000	(0)
Fe (OH) 4-	1.067e-11	8.939e-12	-10.972	-11.049	-0.077	(0)
FeOH+2	2.893e-14	1.403e-14	-13.539	-13.853	-0.314	(0)
FeF2+	4.361e-17	3.640e-17	-16.360	-16.439	-0.079	(0)
FeF+2	2.329e-17	1.130e-17	-16.633	-16.947	-0.314	(0)
FeF3	6.181e-18	6.181e-18	-17.209	-17.209	0.000	(0)
FeSO4+	5.457e-18	4.554e-18	-17.263	-17.342	-0.079	(0)
Fe (SO4) 2-	5.881e-19	4.617e-19	-18.231	-18.336	-0.105	(0)
Fe+3	4.553e-19	8.561e-20	-18.342	-19.067	-0.726	(0)
FeCl+2	1.236e-20	5.997e-21	-19.908	-20.222	-0.314	(0)
FeCl2+	7.444e-23	6.213e-23	-22.128	-22.207	-0.079	(0)
FeHSeO3+2	5.418e-23	2.058e-23	-22.266	-22.687	-0.420	(0)
Fe2 (OH) 2+4	3.133e-25	6.523e-27	-24.504	-26.186	-1.682	(0)
FeNO3+2	2.599e-26	9.873e-27	-25.585	-26.006	-0.420	(0)
FeCl3	1.441e-26	1.441e-26	-25.841	-25.841	0.000	(0)
Fe3 (OH) 4+5	5.543e-32	1.307e-34	-31.256	-33.884	-2.627	(0)
H (0)	2.345e-29					
H2	1.173e-29	1.184e-29	-28.931	-28.927	0.004	(0)
Hg (0)	1.929e-09					
Hg	1.929e-09	1.929e-09	-8.715	-8.715	0.000	(0)
Hg (1)	1.353e-19					
Hg2+2	6.767e-20	2.570e-20	-19.170	-19.590	-0.420	(0)
Hg (2)	3.926e-11					
HgClOH	2.041e-11	2.041e-11	-10.690	-10.690	0.000	(0)
HgCl2	1.056e-11	1.056e-11	-10.976	-10.976	0.000	(0)
Hg (OH) 2	7.906e-12	7.984e-12	-11.102	-11.098	0.004	(0)
HgCl3-	3.120e-13	2.449e-13	-12.506	-12.611	-0.105	(0)
HgCO3	5.935e-14	5.935e-14	-13.227	-13.227	0.000	(0)
HgCl4-2	5.954e-15	2.262e-15	-14.225	-14.646	-0.420	(0)
Hg (CO3) 2-2	1.248e-15	4.742e-16	-14.904	-15.324	-0.420	(0)
HgCl+	1.157e-15	9.083e-16	-14.937	-15.042	-0.105	(0)
HgOH+	2.527e-16	1.984e-16	-15.597	-15.702	-0.105	(0)
HgHCO3+	5.579e-17	4.380e-17	-16.253	-16.359	-0.105	(0)
Hg (OH) 3-	3.251e-19	2.552e-19	-18.488	-18.593	-0.105	(0)
Hg (NH3) 2+2	1.940e-19	7.368e-20	-18.712	-19.133	-0.420	(0)
HgNH3+2	7.952e-20	3.021e-20	-19.100	-19.520	-0.420	(0)
Hg+2	5.167e-20	1.963e-20	-19.287	-19.707	-0.420	(0)
HgSO4	2.436e-20	2.436e-20	-19.613	-19.613	0.000	(0)
HgF+	1.115e-22	8.757e-23	-21.953	-22.058	-0.105	(0)
Hg (NH3) 3+2	1.884e-27	7.155e-28	-26.725	-27.145	-0.420	(0)
HgNO3+	1.065e-28	8.358e-29	-27.973	-28.078	-0.105	(0)
Hg (NH3) 4+2	3.650e-35	1.386e-35	-34.438	-34.858	-0.420	(0)
Hg (NO3) 2	4.006e-37	4.006e-37	-36.397	-36.397	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.615	-138.720	-0.105	(0)
HgS2-2	0.000e+00	0.000e+00	-139.606	-140.026	-0.420	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.728	-139.728	0.000	(0)
K	3.463e-03					

K+	3.352e-03	2.784e-03	-2.475	-2.555	-0.081	(0)
KSO4-	1.116e-04	9.344e-05	-3.952	-4.029	-0.077	(0)
KCrO4-	6.669e-18	5.236e-18	-17.176	-17.281	-0.105	(0)
Mg	5.124e-03					
Mg+2	3.578e-03	1.703e-03	-2.446	-2.769	-0.323	(0)
MgSO4	1.469e-03	1.469e-03	-2.833	-2.833	0.000	(0)
MgHCO3+	4.502e-05	3.721e-05	-4.347	-4.429	-0.083	(0)
MgF+	2.768e-05	2.299e-05	-4.558	-4.638	-0.081	(0)
MgCO3	3.578e-06	3.578e-06	-5.446	-5.446	0.000	(0)
MgOH+	2.036e-07	1.721e-07	-6.691	-6.764	-0.073	(0)
MgH2BO3+	3.054e-08	2.483e-08	-7.515	-7.605	-0.090	(0)
Mn (2)	6.007e-05					
Mn+2	4.471e-05	1.698e-05	-4.350	-4.770	-0.420	(0)
MnSO4	1.432e-05	1.432e-05	-4.844	-4.844	0.000	(0)
MnHCO3+	8.672e-07	7.238e-07	-6.062	-6.140	-0.079	(0)
MnF+	9.751e-08	8.138e-08	-7.011	-7.089	-0.079	(0)
MnCl+	5.942e-08	4.959e-08	-7.226	-7.305	-0.079	(0)
MnOH+	1.298e-08	1.083e-08	-7.887	-7.965	-0.079	(0)
MnCl2	1.625e-10	1.625e-10	-9.789	-9.789	0.000	(0)
MnNO3+	3.954e-13	3.104e-13	-12.403	-12.508	-0.105	(0)
MnSeO4	3.085e-13	3.085e-13	-12.511	-12.511	0.000	(0)
MnCl3-	1.244e-13	1.038e-13	-12.905	-12.984	-0.079	(0)
Mn (OH) 3-	5.171e-18	4.316e-18	-17.286	-17.365	-0.079	(0)
Mn (NO3) 2	8.993e-21	8.993e-21	-20.046	-20.046	0.000	(0)
Mn (OH) 4-2	7.292e-24	3.538e-24	-23.137	-23.451	-0.314	(0)
MnSe	0.000e+00	0.000e+00	-42.263	-42.263	0.000	(0)
Mn (3)	1.236e-24					
Mn+3	1.236e-24	2.325e-25	-23.908	-24.634	-0.726	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.718	-42.032	-0.314	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.830	-45.918	-0.087	(0)
Mo	1.940e-06					
MoO4-2	1.939e-06	9.228e-07	-5.712	-6.035	-0.323	(0)
HMoO4-	9.269e-10	7.276e-10	-9.033	-9.138	-0.105	(0)
H2MoO4	2.112e-13	2.112e-13	-12.675	-12.675	0.000	(0)
Ag2MoO4	2.646e-24	2.646e-24	-23.577	-23.577	0.000	(0)
AlMo6O21-3	7.194e-38	8.149e-39	-37.143	-38.089	-0.946	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.686	-48.469	-3.783	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.857	-49.484	-2.627	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.422	-52.104	-1.682	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.314	-56.260	-0.946	(0)
N (-3)	2.213e-07					
NH4+	2.085e-07	1.695e-07	-6.681	-6.771	-0.090	(0)
NH4SO4-	1.032e-08	8.614e-09	-7.986	-8.065	-0.079	(0)
NH3	2.439e-09	2.439e-09	-8.613	-8.613	0.000	(0)
CaNH3+2	1.183e-11	4.495e-12	-10.927	-11.347	-0.420	(0)
CuNH3+2	3.920e-12	1.489e-12	-11.407	-11.827	-0.420	(0)
NiNH3+2	1.178e-13	4.476e-14	-12.929	-13.349	-0.420	(0)
Co (NH3) +2	1.923e-14	7.306e-15	-13.716	-14.136	-0.420	(0)
AgNH3+	1.746e-14	1.371e-14	-13.758	-13.863	-0.105	(0)
BaNH3+2	1.670e-16	6.343e-17	-15.777	-16.198	-0.420	(0)
Ag (NH3) 2+	3.462e-19	2.718e-19	-18.461	-18.566	-0.105	(0)
Hg (NH3) 2+2	1.940e-19	7.368e-20	-18.712	-19.133	-0.420	(0)
HgNH3+2	7.952e-20	3.021e-20	-19.100	-19.520	-0.420	(0)
Ni (NH3) 2+2	4.155e-20	1.578e-20	-19.381	-19.802	-0.420	(0)
Ca (NH3) 2+2	1.149e-20	4.365e-21	-19.940	-20.360	-0.420	(0)
Co (NH3) 2+2	2.001e-21	7.603e-22	-20.699	-21.119	-0.420	(0)
Hg (NH3) 3+2	1.884e-27	7.155e-28	-26.725	-27.145	-0.420	(0)
Co (NH3) 3+2	6.146e-29	2.335e-29	-28.211	-28.632	-0.420	(0)
Hg (NH3) 4+2	3.650e-35	1.386e-35	-34.438	-34.858	-0.420	(0)
Co (NH3) 4+2	7.868e-37	2.989e-37	-36.104	-36.525	-0.420	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.891	-43.311	-0.420	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.497	-44.917	-0.420	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.534	-51.954	-0.420	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.755	-52.701	-0.946	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.813	-54.234	-0.420	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.941	-62.046	-0.105	(0)

	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.622	-67.043	-0.420	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.862	-67.282	-0.420	(0)
N (3)	8.769e-06						
	NO2-	8.769e-06	7.171e-06	-5.057	-5.144	-0.087	(0)
	CuNO2+	5.706e-11	4.479e-11	-10.244	-10.349	-0.105	(0)
	AgNO2	4.123e-12	4.123e-12	-11.385	-11.385	0.000	(0)
	CoNO2+	1.604e-12	1.259e-12	-11.795	-11.900	-0.105	(0)
	Cu (NO2) 2	3.287e-15	3.287e-15	-14.483	-14.483	0.000	(0)
	Ag (NO2) 2-	5.833e-17	4.580e-17	-16.234	-16.339	-0.105	(0)
N (5)	1.395e-08						
	NO3-	1.389e-08	1.153e-08	-7.857	-7.938	-0.081	(0)
	CaNO3+	6.799e-11	5.338e-11	-10.168	-10.273	-0.105	(0)
	MnNO3+	3.954e-13	3.104e-13	-12.403	-12.508	-0.105	(0)
	ZnNO3+	5.876e-14	4.613e-14	-13.231	-13.336	-0.105	(0)
	BaNO3+	3.034e-15	2.382e-15	-14.518	-14.623	-0.105	(0)
	CuNO3+	2.771e-15	2.175e-15	-14.557	-14.662	-0.105	(0)
	NiNO3+	1.261e-15	9.899e-16	-14.899	-15.004	-0.105	(0)
	CoNO3+	5.800e-16	4.554e-16	-15.237	-15.342	-0.105	(0)
	CdNO3+	1.629e-16	1.279e-16	-15.788	-15.893	-0.105	(0)
	PbNO3+	4.972e-17	3.904e-17	-16.303	-16.409	-0.105	(0)
	AgNO3	2.521e-17	2.521e-17	-16.598	-16.598	0.000	(0)
	Mn (NO3) 2	8.993e-21	8.993e-21	-20.046	-20.046	0.000	(0)
	UO2NO3+	2.368e-21	1.859e-21	-20.626	-20.731	-0.105	(0)
	Zn (NO3) 2	1.061e-22	1.061e-22	-21.974	-21.974	0.000	(0)
	CrNO3+2	1.254e-23	4.764e-24	-22.902	-23.322	-0.420	(0)
	Co (NO3) 2	1.069e-23	1.069e-23	-22.971	-22.971	0.000	(0)
	Cu (NO3) 2	3.159e-24	3.159e-24	-23.501	-23.501	0.000	(0)
	VO2NO3	8.475e-25	8.475e-25	-24.072	-24.072	0.000	(0)
	Pb (NO3) 2	7.645e-25	7.645e-25	-24.117	-24.117	0.000	(0)
	Cd (NO3) 2	7.392e-25	7.392e-25	-24.131	-24.131	0.000	(0)
	FeNO3+2	2.599e-26	9.873e-27	-25.585	-26.006	-0.420	(0)
	HgNO3+	1.065e-28	8.358e-29	-27.973	-28.078	-0.105	(0)
	Hg (NO3) 2	4.006e-37	4.006e-37	-36.397	-36.397	0.000	(0)
Na	9.115e-03						
	Na+	8.881e-03	7.376e-03	-2.052	-2.132	-0.081	(0)
	NaSO4-	2.242e-04	1.878e-04	-3.649	-3.726	-0.077	(0)
	NaHCO3	8.859e-06	8.859e-06	-5.053	-5.053	0.000	(0)
	NaF	5.602e-07	5.602e-07	-6.252	-6.252	0.000	(0)
	NaCO3-	4.143e-07	3.470e-07	-6.383	-6.460	-0.077	(0)
	NaH2BO3	4.917e-09	4.917e-09	-8.308	-8.308	0.000	(0)
	NaCrO4-	2.363e-17	1.855e-17	-16.626	-16.732	-0.105	(0)
Ni	1.194e-07						
	Ni+2	7.182e-08	3.417e-08	-7.144	-7.466	-0.323	(0)
	NiSO4	3.233e-08	3.233e-08	-7.490	-7.490	0.000	(0)
	NiHCO3+	1.146e-08	8.998e-09	-7.941	-8.046	-0.105	(0)
	NiCO3	3.221e-09	3.221e-09	-8.492	-8.492	0.000	(0)
	NiCl+	2.583e-10	2.028e-10	-9.588	-9.693	-0.105	(0)
	NiOH+	1.391e-10	1.092e-10	-9.857	-9.962	-0.105	(0)
	NiF+	1.316e-10	1.033e-10	-9.881	-9.986	-0.105	(0)
	Ni (SO4) 2-2	1.336e-11	5.075e-12	-10.874	-11.295	-0.420	(0)
	Ni (OH) 2	2.203e-12	2.203e-12	-11.657	-11.657	0.000	(0)
	NiNH3+2	1.178e-13	4.476e-14	-12.929	-13.349	-0.420	(0)
	NiCl2	2.368e-15	2.368e-15	-14.626	-14.626	0.000	(0)
	NiNO3+	1.261e-15	9.899e-16	-14.899	-15.004	-0.105	(0)
	NiSeO4	1.079e-15	1.079e-15	-14.967	-14.967	0.000	(0)
	Ni (OH) 3-	7.125e-16	5.594e-16	-15.147	-15.252	-0.105	(0)
	Ni (NH3) 2+2	4.155e-20	1.578e-20	-19.381	-19.802	-0.420	(0)
O (0)	7.152e-35						
	O2	3.576e-35	3.611e-35	-34.447	-34.442	0.004	(0)
Pb	3.500e-09						
	PbCO3	1.738e-09	1.738e-09	-8.760	-8.760	0.000	(0)
	PbSO4	5.314e-10	5.314e-10	-9.275	-9.275	0.000	(0)
	Pb+2	4.810e-10	2.288e-10	-9.318	-9.640	-0.323	(0)
	PbHCO3+	4.626e-10	3.632e-10	-9.335	-9.440	-0.105	(0)
	PbOH+	1.859e-10	1.460e-10	-9.731	-9.836	-0.105	(0)
	Pb (SO4) 2-2	3.997e-11	1.518e-11	-10.398	-10.819	-0.420	(0)
	Pb (CO3) 2-2	3.334e-11	1.267e-11	-10.477	-10.897	-0.420	(0)
	PbCl+	2.399e-11	1.883e-11	-10.620	-10.725	-0.105	(0)

PbF+	2.473e-12	1.941e-12	-11.607	-11.712	-0.105	(0)
Pb(OH) 2	1.172e-12	1.172e-12	-11.931	-11.931	0.000	(0)
PbCl2	1.951e-13	1.951e-13	-12.710	-12.710	0.000	(0)
PbF2	4.598e-15	4.598e-15	-14.337	-14.337	0.000	(0)
Pb(OH) 3-	3.791e-16	2.976e-16	-15.421	-15.526	-0.105	(0)
PbCl3-	2.295e-16	1.802e-16	-15.639	-15.744	-0.105	(0)
PbNO3+	4.972e-17	3.904e-17	-16.303	-16.409	-0.105	(0)
Pb2OH+3	4.673e-18	5.294e-19	-17.330	-18.276	-0.946	(0)
PbF3-	1.337e-18	1.050e-18	-17.874	-17.979	-0.105	(0)
PbCl4-2	5.029e-19	1.910e-19	-18.299	-18.719	-0.420	(0)
Pb(OH) 4-2	4.872e-20	1.851e-20	-19.312	-19.733	-0.420	(0)
PbF4-2	1.592e-22	6.048e-23	-21.798	-22.218	-0.420	(0)
Pb3(OH) 4+2	1.651e-23	6.272e-24	-22.782	-23.203	-0.420	(0)
Pb(NO3) 2	7.645e-25	7.645e-25	-24.117	-24.117	0.000	(0)
Pb4(OH) 4+4	5.476e-28	1.140e-29	-27.262	-28.943	-1.682	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.713	-152.713	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.480	-230.585	-0.105	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.917	-73.917	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.066	-79.171	-0.105	(0)
CdHS+	0.000e+00	0.000e+00	-79.513	-79.619	-0.105	(0)
H2S	0.000e+00	0.000e+00	-79.553	-79.553	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.714	-81.135	-0.420	(0)
S6-2	0.000e+00	0.000e+00	-81.230	-81.651	-0.420	(0)
S4-2	0.000e+00	0.000e+00	-81.310	-81.730	-0.420	(0)
S3-2	0.000e+00	0.000e+00	-82.116	-82.536	-0.420	(0)
S2-2	0.000e+00	0.000e+00	-83.132	-83.552	-0.420	(0)
S-2	0.000e+00	0.000e+00	-88.755	-89.070	-0.314	(0)
HgHS2-	0.000e+00	0.000e+00	-138.615	-138.720	-0.105	(0)
HgS2-2	0.000e+00	0.000e+00	-139.606	-140.026	-0.420	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-139.728	-139.728	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-148.862	-149.070	-0.209	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.884	-148.989	-0.105	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.800	-150.170	-0.370	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.824	-149.929	-0.105	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.548	-150.900	-0.351	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-150.728	-151.108	-0.380	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.059	-151.419	-0.360	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.321	-151.321	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.586	-151.586	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.713	-152.713	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.915	-160.915	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-218.735	-218.840	-0.105	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.107	-227.212	-0.105	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-228.752	-228.858	-0.105	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.370	-229.790	-0.420	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.480	-230.585	-0.105	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-237.944	-238.049	-0.105	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-305.413	-305.833	-0.420	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.423	-307.844	-0.420	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.618	-321.038	-0.420	(0)
S(6)	1.338e-02					
SO4-2	9.965e-03	4.741e-03	-2.002	-2.324	-0.323	(0)
CaSO4	1.590e-03	1.590e-03	-2.799	-2.799	0.000	(0)
MgSO4	1.469e-03	1.469e-03	-2.833	-2.833	0.000	(0)
NaSO4-	2.242e-04	1.878e-04	-3.649	-3.726	-0.077	(0)
KSO4-	1.116e-04	9.344e-05	-3.952	-4.029	-0.077	(0)
MnSO4	1.432e-05	1.432e-05	-4.844	-4.844	0.000	(0)
ZnSO4	1.652e-06	1.652e-06	-5.782	-5.782	0.000	(0)
Zn(SO4) 2-2	1.796e-07	6.821e-08	-6.746	-7.166	-0.420	(0)
CuSO4	6.479e-08	6.479e-08	-7.188	-7.188	0.000	(0)
NiSO4	3.233e-08	3.233e-08	-7.490	-7.490	0.000	(0)
CoSO4	2.357e-08	2.357e-08	-7.628	-7.628	0.000	(0)
HSO4-	2.211e-08	1.836e-08	-7.656	-7.736	-0.081	(0)
NH4SO4-	1.032e-08	8.614e-09	-7.986	-8.065	-0.079	(0)
CdSO4	3.898e-09	3.898e-09	-8.409	-8.409	0.000	(0)
Cd(SO4) 2-2	6.563e-10	2.493e-10	-9.183	-9.603	-0.420	(0)
PbSO4	5.314e-10	5.314e-10	-9.275	-9.275	0.000	(0)

AgSO4-	3.317e-10	2.604e-10	-9.479	-9.584	-0.105	(0)
CrOHSO4	5.907e-11	5.907e-11	-10.229	-10.229	0.000	(0)
Pb(SO4) 2-2	3.997e-11	1.518e-11	-10.398	-10.819	-0.420	(0)
AlSO4+	1.533e-11	1.273e-11	-10.814	-10.895	-0.081	(0)
Ni(SO4) 2-2	1.336e-11	5.075e-12	-10.874	-11.295	-0.420	(0)
FeSO4	3.500e-12	3.500e-12	-11.456	-11.456	0.000	(0)
Al(SO4) 2-	7.788e-13	6.469e-13	-12.109	-12.189	-0.081	(0)
UO2SO4	5.797e-13	5.797e-13	-12.237	-12.237	0.000	(0)
CrSO4+	1.333e-13	1.046e-13	-12.875	-12.980	-0.105	(0)
UO2(SO4) 2-2	9.539e-14	3.623e-14	-13.021	-13.441	-0.420	(0)
VO2SO4-	2.095e-17	1.645e-17	-16.679	-16.784	-0.105	(0)
FeSO4+	5.457e-18	4.554e-18	-17.263	-17.342	-0.079	(0)
Cr2(OH) 2SO4+2	7.379e-19	2.803e-19	-18.132	-18.552	-0.420	(0)
Fe(SO4) 2-	5.881e-19	4.617e-19	-18.231	-18.336	-0.105	(0)
Cr2(OH) 2(SO4) 2	7.894e-20	7.894e-20	-19.103	-19.103	0.000	(0)
VOSO4	7.783e-20	7.783e-20	-19.109	-19.109	0.000	(0)
HgSO4	2.436e-20	2.436e-20	-19.613	-19.613	0.000	(0)
CrO3SO4-2	9.787e-24	3.718e-24	-23.009	-23.430	-0.420	(0)
VSO4+	4.327e-34	3.397e-34	-33.364	-33.469	-0.105	(0)
U(SO4) 2	2.484e-39	2.484e-39	-38.605	-38.605	0.000	(0)
USO4+2	1.736e-40	0.000e+00	-39.760	-40.181	-0.420	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-61.941	-62.046	-0.105	(0)
Sb(3)	6.710e-20					
Sb(OH) 3	3.394e-20	3.394e-20	-19.469	-19.469	0.000	(0)
HSbO2	3.315e-20	3.315e-20	-19.479	-19.479	0.000	(0)
SbO2-	1.726e-24	1.355e-24	-23.763	-23.868	-0.105	(0)
Sb(OH) 4-	9.877e-25	7.754e-25	-24.005	-24.110	-0.105	(0)
Sb(OH) 2F	2.531e-25	2.531e-25	-24.597	-24.597	0.000	(0)
SbOF	2.490e-25	2.490e-25	-24.604	-24.604	0.000	(0)
Sb(OH) 2+	4.163e-26	3.269e-26	-25.381	-25.486	-0.105	(0)
SbO+	1.436e-26	1.128e-26	-25.843	-25.948	-0.105	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.618	-321.038	-0.420	(0)
Sb(5)	2.734e-08					
SbO3-	2.731e-08	2.144e-08	-7.564	-7.669	-0.105	(0)
Sb(OH) 6-	3.014e-11	2.503e-11	-10.521	-10.601	-0.081	(0)
SbO2+	1.231e-23	9.665e-24	-22.910	-23.015	-0.105	(0)
Se(-2)	4.811e-15					
Ag2Se	4.811e-15	4.811e-15	-14.318	-14.318	0.000	(0)
HSe-	3.935e-40	3.089e-40	-39.405	-39.510	-0.105	(0)
MnSe	0.000e+00	0.000e+00	-42.263	-42.263	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.022	-43.022	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.688	-47.108	-0.420	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-84.202	-85.884	-1.682	(0)
Se(4)	1.399e-07					
HSeO3-	1.159e-07	9.098e-08	-6.936	-7.041	-0.105	(0)
SeO3-2	2.406e-08	9.139e-09	-7.619	-8.039	-0.420	(0)
H2SeO3	1.538e-12	1.538e-12	-11.813	-11.813	0.000	(0)
AgSeO3-	2.059e-14	1.617e-14	-13.686	-13.791	-0.105	(0)
Cd(SeO3) 2-2	6.355e-19	2.414e-19	-18.197	-18.617	-0.420	(0)
Ag(SeO3) 2-3	1.168e-20	1.323e-21	-19.933	-20.879	-0.946	(0)
FeHSeO3+2	5.418e-23	2.058e-23	-22.266	-22.687	-0.420	(0)
Se(6)	1.422e-10					
SeO4-2	1.419e-10	6.749e-11	-9.848	-10.171	-0.323	(0)
MnSeO4	3.085e-13	3.085e-13	-12.511	-12.511	0.000	(0)
ZnSeO4	1.665e-14	1.665e-14	-13.779	-13.779	0.000	(0)
NiSeO4	1.079e-15	1.079e-15	-14.967	-14.967	0.000	(0)
CoSeO4	8.428e-16	8.428e-16	-15.074	-15.074	0.000	(0)
HSeO4-	1.708e-16	1.341e-16	-15.768	-15.873	-0.105	(0)
CdSeO4	4.407e-17	4.407e-17	-16.356	-16.356	0.000	(0)
Zn(SeO4) 2-2	2.999e-24	1.139e-24	-23.523	-23.943	-0.420	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.793	-58.739	-0.946	(0)
U(4)	3.446e-21					
U(OH) 5-	3.442e-21	2.702e-21	-20.463	-20.568	-0.105	(0)
U(OH) 4	4.488e-24	4.488e-24	-23.348	-23.348	0.000	(0)
U(OH) 3+	8.288e-28	6.506e-28	-27.082	-27.187	-0.105	(0)
U(OH) 2+2	3.141e-32	1.193e-32	-31.503	-31.923	-0.420	(0)
UF3+	3.090e-35	2.426e-35	-34.510	-34.615	-0.105	(0)

UF2+2	3.347e-36	1.271e-36	-35.475	-35.896	-0.420	(0)
UF4	3.201e-37	3.201e-37	-36.495	-36.495	0.000	(0)
UOH+3	1.967e-37	2.228e-38	-36.706	-37.652	-0.946	(0)
UF+3	7.407e-39	8.390e-40	-38.130	-39.076	-0.946	(0)
U (SO4) 2	2.484e-39	2.484e-39	-38.605	-38.605	0.000	(0)
UF5-	1.945e-39	1.527e-39	-38.711	-38.816	-0.105	(0)
USO4+2	1.736e-40	0.000e+00	-39.760	-40.181	-0.420	(0)
UF6-2	1.461e-40	0.000e+00	-39.835	-40.256	-0.420	(0)
U+4	0.000e+00	0.000e+00	-42.775	-44.457	-1.682	(0)
UC1+3	0.000e+00	0.000e+00	-44.445	-45.391	-0.946	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.357	-172.870	-8.513	(0)
U (5)	2.047e-16					
UO2+	2.047e-16	1.607e-16	-15.689	-15.794	-0.105	(0)
U (6)	3.578e-07					
UO2 (CO3) 3-4	2.492e-07	5.187e-09	-6.604	-8.285	-1.682	(0)
UO2 (CO3) 2-2	1.078e-07	4.096e-08	-6.967	-7.388	-0.420	(0)
UO2CO3	8.125e-10	8.125e-10	-9.090	-9.090	0.000	(0)
UO2OH+	3.289e-12	2.582e-12	-11.483	-11.588	-0.105	(0)
UO2F+	1.710e-12	1.342e-12	-11.767	-11.872	-0.105	(0)
UO2SO4	5.797e-13	5.797e-13	-12.237	-12.237	0.000	(0)
UO2F2	4.659e-13	4.659e-13	-12.332	-12.332	0.000	(0)
UO2+2	1.698e-13	8.078e-14	-12.770	-13.093	-0.323	(0)
UO2 (SO4) 2-2	9.539e-14	3.623e-14	-13.021	-13.441	-0.420	(0)
UO2F3-	1.794e-14	1.409e-14	-13.746	-13.851	-0.105	(0)
UO2Cl+	3.871e-16	3.039e-16	-15.412	-15.517	-0.105	(0)
UO2F4-2	3.546e-17	1.347e-17	-16.450	-16.871	-0.420	(0)
(UO2) 2 (OH) 2+2	2.913e-17	1.106e-17	-16.536	-16.956	-0.420	(0)
(UO2) 3 (OH) 5+	1.780e-18	1.397e-18	-17.750	-17.855	-0.105	(0)
UO2NO3+	2.368e-21	1.859e-21	-20.626	-20.731	-0.105	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.595	-42.700	-0.105	(0)
V+2	0.000e+00	0.000e+00	-43.195	-43.615	-0.420	(0)
V (3)	2.004e-15					
V (OH) 3	2.004e-15	2.004e-15	-14.698	-14.698	0.000	(0)
V (OH) 2+	6.542e-26	5.136e-26	-25.184	-25.289	-0.105	(0)
VOH+2	5.085e-29	1.932e-29	-28.294	-28.714	-0.420	(0)
V+3	1.340e-33	1.518e-34	-32.873	-33.819	-0.946	(0)
VSO4+	4.327e-34	3.397e-34	-33.364	-33.469	-0.105	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.606	-55.552	-0.946	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.947	-56.628	-1.682	(0)
V (4)	4.135e-18					
V (OH) 3+	3.843e-18	3.017e-18	-17.415	-17.520	-0.105	(0)
VO+2	1.569e-19	5.960e-20	-18.804	-19.225	-0.420	(0)
VOSO4	7.783e-20	7.783e-20	-19.109	-19.109	0.000	(0)
VOF+	5.481e-20	4.303e-20	-19.261	-19.366	-0.105	(0)
VOF2	1.942e-21	1.942e-21	-20.712	-20.712	0.000	(0)
VOC1+	4.940e-22	3.878e-22	-21.306	-21.411	-0.105	(0)
VOF3-	1.056e-23	8.294e-24	-22.976	-23.081	-0.105	(0)
VOF4-2	1.061e-26	4.030e-27	-25.974	-26.395	-0.420	(0)
H2V2O4+2	1.203e-30	4.569e-31	-29.920	-30.340	-0.420	(0)
V (5)	6.672e-09					
H2VO4-	5.898e-09	4.630e-09	-8.229	-8.334	-0.105	(0)
HVO4-2	7.726e-10	2.935e-10	-9.112	-9.532	-0.420	(0)
H3VO4	1.835e-12	1.835e-12	-11.736	-11.736	0.000	(0)
H3V2O7-	6.992e-14	5.489e-14	-13.155	-13.260	-0.105	(0)
HV2O7-3	4.067e-15	4.607e-16	-14.391	-15.337	-0.946	(0)
VO4-3	3.276e-16	3.711e-17	-15.485	-16.430	-0.946	(0)
VO2+	1.749e-16	1.453e-16	-15.757	-15.838	-0.081	(0)
VO2F	3.067e-17	3.067e-17	-16.513	-16.513	0.000	(0)
VO2SO4-	2.095e-17	1.645e-17	-16.679	-16.784	-0.105	(0)
V2O7-4	1.503e-17	3.129e-19	-16.823	-18.505	-1.682	(0)
VO2F2-	1.707e-18	1.340e-18	-17.768	-17.873	-0.105	(0)
V3O9-3	9.194e-19	1.041e-19	-18.036	-18.982	-0.946	(0)
VO2F3-2	5.298e-21	2.013e-21	-20.276	-20.696	-0.420	(0)
V4O12-4	9.662e-24	2.012e-25	-23.015	-24.696	-1.682	(0)
VO2F4-3	1.052e-24	1.192e-25	-23.978	-24.924	-0.946	(0)
VO2NO3	8.475e-25	8.475e-25	-24.072	-24.072	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-60.259	-64.043	-3.783	(0)

	HV10028-5	0.000e+00	0.000e+00	-60.631	-63.258	-2.627	(0)
	H2V10028-4	0.000e+00	0.000e+00	-63.771	-65.452	-1.682	(0)
Zn	5.619e-06						
	Zn+2	3.347e-06	1.592e-06	-5.475	-5.798	-0.323	(0)
	ZnSO4	1.652e-06	1.652e-06	-5.782	-5.782	0.000	(0)
	ZnCO3	2.315e-07	2.315e-07	-6.635	-6.635	0.000	(0)
	Zn(SO4) 2-2	1.796e-07	6.821e-08	-6.746	-7.166	-0.420	(0)
	ZnHCO3+	1.370e-07	1.076e-07	-6.863	-6.968	-0.105	(0)
	ZnOH+	5.150e-08	4.043e-08	-7.288	-7.393	-0.105	(0)
	ZnCl+	1.122e-08	9.278e-09	-7.950	-8.033	-0.083	(0)
	ZnF+	4.871e-09	3.824e-09	-8.312	-8.417	-0.105	(0)
	ZnOHCl	3.084e-09	3.084e-09	-8.511	-8.511	0.000	(0)
	Zn(OH) 2	1.627e-09	1.627e-09	-8.789	-8.789	0.000	(0)
	ZnCl2	3.411e-11	3.411e-11	-10.467	-10.467	0.000	(0)
	Zn(OH) 3-	2.638e-12	2.071e-12	-11.579	-11.684	-0.105	(0)
	ZnCl3-	7.602e-14	6.284e-14	-13.119	-13.202	-0.083	(0)
	ZnNO3+	5.876e-14	4.613e-14	-13.231	-13.336	-0.105	(0)
	ZnSeO4	1.665e-14	1.665e-14	-13.779	-13.779	0.000	(0)
	ZnCl4-2	1.502e-16	7.288e-17	-15.823	-16.137	-0.314	(0)
	Zn(OH) 4-2	5.510e-17	2.093e-17	-16.259	-16.679	-0.420	(0)
	Zn(NO3) 2	1.061e-22	1.061e-22	-21.974	-21.974	0.000	(0)
	Zn(SeO4) 2-2	2.999e-24	1.139e-24	-23.523	-23.943	-0.420	(0)
	ZnS(HS) -	0.000e+00	0.000e+00	-149.824	-149.929	-0.105	(0)
	Zn(HS) 2	0.000e+00	0.000e+00	-151.321	-151.321	0.000	(0)
	Zn(HS) 3-	0.000e+00	0.000e+00	-227.107	-227.212	-0.105	(0)
	ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.370	-229.790	-0.420	(0)
	Zn(HS) 4-2	0.000e+00	0.000e+00	-307.423	-307.844	-0.420	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-56.16	-49.87	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-43.77	-39.26	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.00	-39.27	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-72.48	-54.54	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-58.67	-38.63	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.24	-28.84	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.16	-23.71	0.45	(NH4)2SeO4
Acanthite	-52.67	-88.89	-36.22	Ag2S
Ag2CO3	-11.63	-22.72	-11.09	Ag2CO3
Ag2CrO4	-20.83	-32.42	-11.59	Ag2CrO4
Ag2HVO4	-12.23	-10.75	1.48	Ag2HVO4
Ag2MoO4	-11.61	-23.16	-11.55	Ag2MoO4
Ag2O	-14.89	-2.32	12.57	Ag2O
Ag2Se	-0.53	-49.23	-48.70	Ag2Se
Ag2SeO3	-9.61	-16.76	-7.15	Ag2SeO3
Ag2SeO4	-18.38	-27.29	-8.91	Ag2SeO4
Ag2SO4	-14.62	-19.44	-4.82	Ag2SO4
Ag3AsO3	-28.14	-25.99	2.16	Ag3AsO3
Ag3AsO4	-16.32	-19.11	-2.79	Ag3AsO4
Ag3H2VO5	-17.09	-11.91	5.18	Ag3H2VO5
AgF·4H2O	-13.53	-12.48	1.05	AgF·4H2O
Agmetal	-0.54	-14.05	-13.51	Ag
AgVO3	-10.36	-9.59	0.77	AgVO3
Al(OH)3(am)	-1.06	9.74	10.80	Al(OH)3
Al2(MoO4)3	-45.39	-43.03	2.37	Al2(MoO4)3
Al2O3	-0.16	19.49	19.65	Al2O3
Al4(OH)10SO4	-0.85	21.85	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-10.69	-5.89	4.80	AlAsO4·2H2O
AlOHSO4	-4.15	-7.38	-3.23	AlOHSO4
AlSb	-152.68	-87.05	65.62	AlSb
Alunite	1.22	-0.18	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.17	-11.96	-7.79	PbSO4
Anhydrite	-0.80	-5.16	-4.36	CaSO4
Anilite	-56.73	-88.61	-31.88	Cu0.25Cu1.5S
Antlerite	-3.18	5.61	8.79	Cu3(OH)4SO4
Aragonite	-0.13	-8.43	-8.30	CaCO3

Arsenolite	-87.28	-90.04	-2.76	As4O6
Artinite	-5.93	3.67	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-37.97	-31.26	6.71	As2O5
Atacamite	-2.27	5.12	7.39	Cu2(OH)3Cl
Azurite	-1.16	-18.06	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.98	7.42	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.91	-2.04	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.10	-9.01	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-27.56	5.38	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.01	-22.68	-9.67	BaCrO4
BaF2	-9.40	-15.22	-5.82	BaF2
BaMoO4	-6.46	-13.42	-6.96	BaMoO4
Barite	0.27	-9.71	-9.98	BaSO4
BaS	-95.33	-79.15	16.18	BaS
BaSeO3	-8.85	-7.02	1.83	BaSeO3
BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-6.36	-8.12	-1.76	ZnSO4:6H2O
Birnessite	-7.63	10.46	18.09	MnO2
Bixbyite	-4.21	-4.86	-0.64	Mn2O3
BlaubleiI	-56.11	-80.28	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.84	-84.12	-27.28	Cu0.6Cu0.8S
Boehmite	1.17	9.74	8.58	AlOOH
Breithauptite	-58.05	-76.57	-18.52	NiSb
Brochantite	-2.03	13.19	15.22	Cu4(OH)6SO4
Brucite	-4.81	12.03	16.84	Mg(OH)2
Bunsenite	-5.11	7.34	12.45	NiO
Ca(VO3)2	-10.56	-4.90	5.66	Ca(VO3)2
Ca2V2O7	-10.43	7.07	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.49	7.07	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.66	4.64	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.92	19.04	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.83	19.03	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.66	-157.69	142.97	Ca3Sb2
CaCrO4	-15.86	-18.13	-2.27	CaCrO4
Calcite	0.05	-8.43	-8.48	CaCO3
Calomel	-6.95	-24.86	-17.91	Hg2Cl2
CaMoO4	-0.92	-8.87	-7.95	CaMoO4
Carnotite	-2.11	-1.88	0.23	KUO2VO4
CaSeO3:2H2O	-5.29	-2.47	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.99	-13.01	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.57	-2.73	9.84	Cd(BO2)2
Cd(OH)2	-7.30	6.35	13.64	Cd(OH)2
Cd(OH)2(am)	-7.38	6.35	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.92	-15.21	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.64	1.92	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.13	8.27	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.72	-0.66	CdCl2
CdCl2:1H2O	-12.03	-13.72	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.81	-13.73	-1.91	CdCl2:2.5H2O
CdF2	-15.08	-16.29	-1.21	CdF2
Cdmetal(alpha)	-32.94	-19.43	13.51	Cd
Cdmetal(gamma)	-33.05	-19.43	13.62	Cd
CdMoO4	-0.34	-14.49	-14.15	CdMoO4
CdOHCl	-7.23	-3.69	3.54	CdOHCl
CdSb	-77.21	-77.56	-0.35	CdSb
CdSe	-20.36	-40.56	-20.20	CdSe
CdSeO4:2H2O	-16.78	-18.63	-1.85	CdSeO4:2H2O
CdSO4	-10.61	-10.78	-0.17	CdSO4
CdSO4:1H2O	-9.05	-10.78	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.91	-10.78	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.44	-11.19	-9.75	AgCl
Cerrusite	-2.11	-15.24	-13.13	PbCO3
CH4(g)	-82.46	-123.51	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-56.89	-91.81	-34.92	Cu2S
Chalcopyrite	-127.02	-162.29	-35.27	CuFeS2
Cinnabar	-51.98	-97.67	-45.69	HgS
Claudetite	-86.98	-90.04	-3.06	As4O6

Clausthalite	-14.65	-41.75	-27.10	PbSe
Co(BO ₂) ₂	-28.95	-1.88	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.89	7.20	13.09	Co(OH) ₂
Co(OH) ₃	-10.00	-12.31	-2.31	Co(OH) ₃
CO ₂ (g)	-2.25	-20.40	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.70	-9.66	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-6.93	-17.42	-10.50	Co ₃ O ₄
CoCl ₂	-21.14	-12.87	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.41	-12.87	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.22	-13.20	-9.98	CoCO ₃
CoF ₂	-13.85	-15.44	-1.60	CoF ₂
CoF ₃	-44.82	-46.28	-1.46	CoF ₃
CoFe ₂ O ₄	17.00	13.48	-3.53	CoFe ₂ O ₄
CoMoO ₄	-5.88	-13.64	-7.76	CoMoO ₄
CoO	-6.39	7.20	13.59	CoO
CoS(alpha)	-71.93	-79.37	-7.44	CoS
CoS(beta)	-68.30	-79.37	-11.07	CoS
CoSe	-23.51	-39.71	-16.20	CoSe
CoSeO ₃	-8.56	-7.24	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-16.25	-17.78	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.73	-9.93	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.46	-9.93	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-10.13	-14.91	-4.78	PbCl ₂
Covellite	-56.69	-78.99	-22.30	CuS
Cr(OH) ₂	-22.15	-11.33	10.82	Cr(OH) ₂
Cr(OH) ₃	-2.72	-1.39	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	-0.64	-1.39	-0.75	Cr(OH) ₃
Cr ₂ O ₃	-0.42	-2.78	-2.36	Cr ₂ O ₃
CrCl ₂	-45.49	-31.40	14.09	CrCl ₂
CrCl ₃	-46.61	-31.50	15.11	CrCl ₃
CrF ₃	-24.02	-35.35	-11.34	CrF ₃
Crmetal	-67.59	-37.11	30.48	Cr
CrO ₃	-26.89	-30.10	-3.21	CrO ₃
Cryolite	-8.53	-42.37	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-1.10	7.58	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-25.02	20.19	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-9.43	-0.18	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb:3H ₂ O	-56.96	-91.84	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se(alpha)	-6.35	-52.15	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-20.42	-22.37	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ :2H ₂ O	-14.63	-8.53	6.10	Cu ₃ (AsO ₄) ₂ :2H ₂ O
Cu ₃ Sb	-62.06	-104.65	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-27.99	-91.48	-63.49	Cu ₃ Se ₂
CuCO ₃	-1.32	-12.82	-11.50	CuCO ₃
CuCrO ₄	-17.08	-22.52	-5.44	CuCrO ₄
CuF	-9.03	-13.94	-4.91	CuF
CuF ₂	-16.18	-15.06	1.12	CuF ₂
CuF ₂ :2H ₂ O	-10.51	-15.06	-4.55	CuF ₂ :2H ₂ O
Cumetal	-6.75	-15.51	-8.76	Cu
CuMoO ₄	-0.18	-13.26	-13.08	CuMoO ₄
CuOCuSO ₄	-12.27	-1.97	10.30	CuOCuSO ₄
Cupricferrite	7.87	13.86	5.99	CuFe ₂ O ₄
Cuprite	-3.83	-5.24	-1.41	Cu ₂ O
Cuprousferrite	9.44	0.52	-8.92	CuFeO ₂
CuSe	-6.23	-39.33	-33.10	CuSe
CuSe ₂	-27.10	-60.47	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-7.38	-6.86	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-14.96	-17.40	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-12.49	-9.55	2.94	CuSO ₄
Diaspore	2.87	9.74	6.87	AlOOH
Djurleite	-57.05	-90.97	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.26	-16.80	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	0.29	-16.80	-17.09	CaMg(CO ₃) ₂
Epsomite	-2.97	-5.09	-2.13	MgSO ₄ :7H ₂ O
Fe(OH) ₂	-10.28	3.28	13.56	Fe(OH) ₂
Fe(OH) ₂ .7Cl.3	3.17	0.13	-3.04	Fe(OH) ₂ .7Cl.3
Fe(VO ₃) ₂	-9.87	-13.59	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.72	-8.17	1.55	Fe ₂ (OH) ₄ SeO ₃

Fe2 (SeO3) 3:2H2O	-16.43	-37.05	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.37	-45.11	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.67	9.56	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.89	-12.49	0.40	FeAsO4:2H2O
FeCr2O4	-6.69	0.51	7.20	FeCr2O4
FeMoO4	-7.47	-17.56	-10.09	FeMoO4
Ferrihydrite	-0.05	3.14	3.19	Fe (OH) 3
Ferroselite	-46.17	-64.77	-18.60	FeSe2
FeS (ppt)	-80.34	-83.29	-2.95	FeS
FeSe	-32.63	-43.63	-11.00	FeSe
Fix_pe	-5.49	-5.49	0.00	e-
Fluorite	-0.17	-10.67	-10.50	CaF2
Galena	-67.44	-81.41	-13.97	PbS
Gibbsite	1.45	9.74	8.29	Al (OH) 3
Goethite	2.65	3.14	0.49	FeOOH
Goslarite	-6.11	-8.12	-2.01	ZnSO4:7H2O
Greenockite	-65.86	-80.22	-14.36	CdS
Greigite	-291.70	-336.73	-45.03	Fe3S4
Gummite	-5.96	1.71	7.67	UO3
Gypsum	-0.55	-5.16	-4.61	CaSO4:2H2O
H-Jarosite	-12.74	-24.84	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-7.96	-20.84	-12.88	H2MoO4
H2S (g)	-78.56	-86.57	-8.01	H2S
H2Se (g)	-41.95	-46.91	-4.96	H2Se
Halite	-6.37	-4.77	1.60	NaCl
Hausmannite	-5.15	55.88	61.03	Mn3O4
Hematite	7.69	6.28	-1.42	Fe2O3
Hercynite	-0.12	22.77	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.40	-258.11	-73.71	Hg (CH3) 2
Hg (g)	-7.41	-15.28	-7.87	Hg
Hg (OH) 2	-7.60	-11.10	-3.50	Hg (OH) 2
Hg2 (g)	-15.61	-30.56	-14.96	Hg2
Hg2 (OH) 2	-10.05	-4.79	5.26	Hg2 (OH) 2
Hg2CO3	-9.14	-25.19	-16.05	Hg2CO3
Hg2CrO4	-26.19	-34.89	-8.70	Hg2CrO4
Hg2F2	-17.07	-27.43	-10.36	Hg2F2
Hg2S	-79.68	-91.36	-11.68	Hg2S
Hg2SeO3	-14.57	-19.23	-4.66	Hg2SeO3
Hg2SO4	-15.78	-21.91	-6.13	Hg2SO4
Hg3O2CO3	-24.01	-53.69	-29.68	Hg3O2CO3
HgCl (g)	-31.93	-12.43	19.50	HgCl
HgCl2	-9.91	-31.17	-21.26	HgCl2
HgF (g)	-46.39	-13.71	32.68	HgF
HgF2 (g)	-46.31	-33.74	12.57	HgF2
Hgmetal (l)	-1.83	-15.28	-13.45	Hg
HgSe	-2.32	-58.01	-55.69	HgSe
HgSeO3	-13.11	-25.54	-12.43	HgSeO3
HgSO4	-18.81	-28.23	-9.42	HgSO4
Huntite	-3.56	-33.53	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.54	-25.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.67	-21.43	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-14.50	-19.67	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.20	-20.00	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.26	-50.51	-17.24	K2Cr2O7
K2CrO4	-19.89	-20.41	-0.51	K2CrO4
K2MoO4	-14.41	-11.15	3.26	K2MoO4
K2SeO4	-14.55	-15.28	-0.73	K2SeO4
Langite	-4.30	13.19	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.37	-6.80	-0.43	PbO:PbSO4
Laurionite	-5.50	-4.87	0.62	PbOHCl
Lepidocrocite	1.77	3.14	1.37	FeOOH
Lime	-20.73	11.97	32.70	CaO
Litharge	-7.53	5.16	12.69	PbO
Mackinawite	-79.69	-83.29	-3.60	FeS
Maghemite	-0.11	6.28	6.39	Fe2O3
Magnesioferrite	1.45	18.31	16.86	Fe2MgO4
Magnesite	-0.91	-8.37	-7.46	MgCO3
Magnetite	6.16	9.56	3.40	Fe3O4

Malachite	0.06	-5.24	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.42	22.92	25.34	MnOOH
Massicot	-7.73	5.16	12.89	PbO
Matlockite	-7.22	-16.19	-8.97	PbClF
Melanothallite	-18.75	-12.49	6.26	CuCl ₂
Melanterite	-11.64	-13.85	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.58	-97.67	-45.09	HgS
Mg(OH) ₂ (active)	-6.76	12.03	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.12	-4.84	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.57	-201.88	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-19.16	7.20	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.94	9.26	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.44	-18.06	5.38	MgCrO ₄
MgF ₂	-2.48	-10.61	-8.13	MgF ₂
MgMoO ₄	-6.95	-8.80	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.47	-2.41	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.74	-12.94	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.26	41.27	73.52	Pb ₃ O ₄
Mirabilite	-5.48	-6.59	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.74	-6.84	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.53	-56.24	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-150.70	-89.62	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.66	-1.16	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.76	-10.04	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.71	-76.54	0.17	MnS
MnS (pnk)	-79.88	-76.54	3.34	MnS
MnSb	-96.32	-99.23	-2.91	MnSb
MnSe	-40.38	-36.88	3.50	MnSe
MnSeO ₃	-5.54	-4.41	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.39	-4.41	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.89	-14.94	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.68	-7.09	2.58	MnSO ₄
Monteponite	-8.75	6.35	15.10	CdO
Montroydite	-7.46	-11.10	-3.64	HgO
MoO ₃	-12.84	-20.84	-8.00	MoO ₃
Morenosite	-7.65	-9.79	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.50	-219.76	-70.26	MoS ₂
Na-Jarosite	-8.37	-19.57	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.76	-49.66	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.49	-19.56	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.54	-31.14	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.79	-10.30	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.52	-10.30	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.20	-3.90	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.72	-14.44	1.28	Na ₂ SeO ₄
Na ₃ Sb	-175.44	-80.99	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.31	7.37	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-33.19	4.21	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.93	-12.66	-6.73	CuCl
NaSb	-88.92	-65.75	23.17	NaSb
Natron	-8.55	-9.86	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.02	-3.17	3.86	NaVO ₃
Nesquehonite	-3.70	-8.37	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.46	7.34	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-24.95	-9.25	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-19.78	12.22	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.19	-13.06	-6.87	NiCO ₃
NiMoO ₄	-2.36	-13.50	-11.14	NiMoO ₄
NiS (alpha)	-73.64	-79.24	-5.60	NiS
NiS (beta)	-68.14	-79.24	-11.10	NiS
NiS (gamma)	-66.44	-79.24	-12.80	NiS
NiSe	-21.87	-39.57	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-9.92	-7.11	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-16.12	-17.64	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-7.04	10.46	17.50	MnO ₂
O ₂ (g)	-31.54	51.55	83.09	O ₂
Orpiment	-243.67	-304.74	-61.07	As ₂ S ₃
Otavite	-2.05	-14.05	-12.00	CdCO ₃

Pb(BO ₂) ₂	-10.44	-3.92	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.99	5.16	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-62.02	-70.78	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.50	0.29	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-15.86	10.33	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-24.94	36.10	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-9.52	-10.07	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-4.65	-6.55	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-21.57	-15.77	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-7.52	-1.38	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-15.93	-4.91	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-12.32	-1.64	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-17.58	3.52	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-18.35	3.53	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-12.34	-24.94	-12.60	PbCrO ₄
PbF ₂	-10.04	-17.48	-7.44	PbF ₂
Pbmetal	-24.86	-20.61	4.25	Pb
PbMoO ₄	-0.06	-15.68	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-7.82	5.16	12.98	PbO:0.33H ₂ O
PbSeO ₄	-12.97	-19.81	-6.84	PbSeO ₄
Periclase	-9.55	12.03	21.58	MgO
Phosgenite	-10.34	-30.15	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-18.66	30.94	49.60	PbO ₂
Portlandite	-10.84	11.97	22.80	Ca(OH) ₂
Pyrite	-125.58	-144.09	-18.51	FeS ₂
Pyrochroite	-5.16	10.03	15.19	Mn(OH) ₂
Pyrolusite	-5.57	35.81	41.38	MnO ₂
Realgar	-102.22	-121.97	-19.75	AsS
Retgersite	-7.75	-9.79	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.21	-10.37	-10.58	MnCO ₃
Rutherfordine	-4.19	-18.69	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-12.36	-19.47	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-16.56	-13.16	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-26.34	-36.00	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-111.92	-179.67	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-59.61	-77.88	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-59.97	-77.88	-17.90	Sb ₄ O ₆
SbCl ₃	-50.15	-49.58	0.57	SbCl ₃
SbF ₃	-43.21	-53.43	-10.23	SbF ₃
Sbmetal	-46.44	-58.13	-11.69	Sb
SbO ₂	-3.07	-30.89	-27.82	SbO ₂
Schoepite	-4.28	1.71	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-14.03	-21.14	-7.11	Se
Semetal(hex)	-13.43	-21.14	-7.71	Se
Senarmontite	-26.57	-38.94	-12.37	Sb ₂ O ₃
SeO ₂	-14.57	-14.44	0.12	SeO ₂
SeO ₃	-46.02	-24.97	21.04	SeO ₃
Siderite	-6.88	-17.12	-10.24	FeCO ₃
Smithsonite	-1.40	-11.40	-10.00	ZnCO ₃
Sphalerite	-66.12	-77.57	-11.45	ZnS
Spinel	-5.32	31.52	36.85	MgAl ₂ O ₄
Stibnite	-248.20	-298.66	-50.46	Sb ₂ S ₃
Sulfur	-58.65	-60.80	-2.14	S
Tenorite	-0.06	7.58	7.64	CuO
Thenardite	-6.91	-6.59	0.32	Na ₂ SO ₄
Thermonatrite	-10.50	-9.86	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-5.56	-1.48	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-14.08	7.00	21.08	U ₃ O ₈
U ₃ Sb ₄	-584.12	-431.74	152.38	U ₃ Sb ₄
U ₄ O ₉	-30.60	-33.62	-3.02	U ₄ O ₉
UF ₄	-30.60	-60.13	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-27.42	-60.14	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-15.78	-14.85	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.12	-28.97	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-33.82	-28.97	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.36	-28.97	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.02	-28.97	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.90	1.71	5.61	UO ₂ (OH) ₂

UO2SeO4:4H2O	-21.01	-23.26	-2.25	UO2SeO4:4H2O
UO3	-5.99	1.71	7.70	UO3
Uraninite	-10.18	-14.85	-4.67	UO2
USb2	-221.46	-191.88	29.58	USb2
V(OH)3	-19.20	-11.61	7.59	V(OH)3
V2O5	-15.51	-16.87	-1.36	V2O5
V3O5	-40.88	-39.04	1.84	V3O5
V4O7	-50.65	-43.46	7.19	V4O7
V6O13	-41.31	-102.17	-60.86	V6O13
Valentinite	-30.46	-38.94	-8.48	Sb2O3
VC12	-63.45	-44.57	18.87	VC12
VC13	-65.16	-41.72	23.43	VC13
VF4	-64.64	-49.71	14.93	VF4
Vmetal	-94.30	-50.28	44.03	V
VO	-39.26	-24.50	14.76	VO
VO(OH)2	-9.57	-4.42	5.15	VO(OH)2
VO2Cl	-21.31	-18.47	2.84	VO2Cl
VOC1	-32.80	-21.65	11.15	VOC1
VOC12	-37.25	-24.49	12.76	VOC12
VOSO4	-25.16	-21.55	3.61	VOSO4
Witherite	-4.41	-12.98	-8.57	BaCO3
Wurtzite	-68.62	-77.57	-8.95	ZnS
Zincite	-2.33	9.01	11.33	ZnO
Zincosite	-12.05	-8.12	3.93	ZnSO4
Zn(BO2)2	-8.37	-0.08	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.99	-21.68	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.19	9.01	12.20	Zn(OH)2
Zn(OH)2(am)	-3.47	9.01	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.75	9.01	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.53	9.01	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.73	9.01	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.62	0.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.22	7.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.90	-4.25	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.15	-7.24	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.51	18.89	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.55	24.95	38.50	Zn5(OH)8Cl2
ZnCl2	-18.12	-11.07	7.05	ZnCl2
ZnCO3:1H2O	-1.14	-11.40	-10.26	ZnCO3:1H2O
ZnF2	-13.10	-13.64	-0.53	ZnF2
Znmetal	-42.56	-16.77	25.79	Zn
ZnMoO4	-1.71	-11.83	-10.13	ZnMoO4
ZnO(active)	-2.18	9.01	11.19	ZnO
ZnS(am)	-68.52	-77.57	-9.05	ZnS
ZnSb	-85.92	-74.90	11.01	ZnSb
ZnSe	-23.51	-37.91	-14.40	ZnSe
ZnSeO4:6H2O	-14.45	-15.97	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.48	-8.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 64.

Title Return solution back to 1L
Mix 305
312 1.0993
save solution 313
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 305.

Mixture 305.

1.099e+00 Solution 312 Solution after simulation 63.

-----Solution composition-----

Elements	Molality	Moles
Ag	2.005e-08	2.005e-08
Al	3.622e-06	3.622e-06
As	2.900e-10	2.900e-10
B	2.902e-05	2.902e-05
Ba	8.766e-08	8.767e-08
C	2.882e-03	2.882e-03
Ca	4.743e-03	4.743e-03
Cd	1.317e-08	1.317e-08
Cl	2.793e-03	2.793e-03
Co	9.603e-08	9.603e-08
Cr	2.423e-09	2.423e-09
Cu	1.166e-06	1.166e-06
F	1.757e-04	1.757e-04
Fe	2.056e-09	2.056e-09
Hg	1.968e-09	1.968e-09
K	3.463e-03	3.463e-03
Mg	5.124e-03	5.124e-03
Mn	6.007e-05	6.007e-05
Mo	1.940e-06	1.940e-06
N	9.004e-06	9.004e-06
Na	9.115e-03	9.115e-03
Ni	1.194e-07	1.194e-07
Pb	3.500e-09	3.500e-09
S	1.338e-02	1.338e-02
Sb	2.734e-08	2.734e-08
Se	1.401e-07	1.401e-07
U	3.578e-07	3.578e-07
V	6.672e-09	6.673e-09
Zn	5.619e-06	5.619e-06

-----Description of solution-----

	pH	=	7.402	Charge balance
	pe	=	5.486	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.246e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.724e-03	
	Total CO2 (mol/kg)	=	2.882e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.065e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110174e+02	
	Total O	=	5.556941e+01	

-----Distribution of species-----

Species	Molality	Activity	Log		Log Gamma	mole V cm ³ /mol
			Molality	Activity		
OH-	3.088e-07	2.539e-07	-6.510	-6.595	-0.085	(0)
H+	4.772e-08	3.963e-08	-7.321	-7.402	-0.081	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	2.005e-08					
AgCl	1.303e-08	1.303e-08	-7.885	-7.885	0.000	(0)
AgCl2-	3.354e-09	2.633e-09	-8.474	-8.580	-0.105	(0)
Ag+	3.314e-09	2.752e-09	-8.480	-8.560	-0.081	(0)
AgSO4-	3.317e-10	2.604e-10	-9.479	-9.584	-0.105	(0)
AgCl3-2	1.433e-11	5.443e-12	-10.844	-11.264	-0.420	(0)
AgNO2	4.123e-12	4.123e-12	-11.385	-11.385	0.000	(0)
AgF	8.321e-13	8.321e-13	-12.080	-12.080	0.000	(0)
AgCl4-3	2.276e-13	2.578e-14	-12.643	-13.589	-0.946	(0)
AgOH	6.988e-14	6.988e-14	-13.156	-13.156	0.000	(0)
AgSeO3-	2.059e-14	1.617e-14	-13.686	-13.791	-0.105	(0)
AgH2BO3	1.835e-14	1.835e-14	-13.736	-13.736	0.000	(0)
AgNH3+	1.746e-14	1.371e-14	-13.758	-13.863	-0.105	(0)
Ag2Se	4.811e-15	4.811e-15	-14.318	-14.318	0.000	(0)
Ag (NO2) 2-	5.833e-17	4.580e-17	-16.234	-16.339	-0.105	(0)
AgNO3	2.521e-17	2.521e-17	-16.598	-16.598	0.000	(0)
Ag (OH) 2-	2.209e-18	1.734e-18	-17.656	-17.761	-0.105	(0)
Ag (NH3) 2+	3.462e-19	2.718e-19	-18.461	-18.566	-0.105	(0)
Ag (SeO3) 2-3	1.168e-20	1.323e-21	-19.933	-20.879	-0.946	(0)
Ag2MoO4	2.646e-24	2.646e-24	-23.577	-23.577	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.917	-73.917	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.202	-85.884	-1.682	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.862	-149.070	-0.209	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.884	-148.989	-0.105	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.728	-151.108	-0.380	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.059	-151.419	-0.360	(0)
Al	3.622e-06					
Al (OH) 4-	3.454e-06	2.869e-06	-5.462	-5.542	-0.081	(0)
Al (OH) 3	8.976e-08	8.976e-08	-7.047	-7.047	0.000	(0)
AlF3	3.024e-08	3.024e-08	-7.519	-7.519	0.000	(0)
AlF2+	2.382e-08	1.996e-08	-7.623	-7.700	-0.077	(0)
Al (OH) 2+	2.115e-08	1.772e-08	-7.675	-7.752	-0.077	(0)
AlF4-	2.196e-09	1.824e-09	-8.658	-8.739	-0.081	(0)
AlF+2	8.461e-10	4.164e-10	-9.073	-9.380	-0.308	(0)
AlOH+2	1.785e-10	8.785e-11	-9.748	-10.056	-0.308	(0)
AlSO4+	1.533e-11	1.273e-11	-10.814	-10.895	-0.081	(0)
Al+3	1.840e-12	3.460e-13	-11.735	-12.461	-0.726	(0)
Al (SO4) 2-	7.788e-13	6.469e-13	-12.109	-12.189	-0.081	(0)
AlMo6O21-3	7.194e-38	8.149e-39	-37.143	-38.089	-0.946	(0)
As (3)	3.138e-23					
H3AsO3	3.087e-23	3.087e-23	-22.510	-22.510	0.000	(0)
H2AsO3-	5.089e-25	3.995e-25	-24.293	-24.398	-0.105	(0)
HAsO3-2	2.420e-29	9.194e-30	-28.616	-29.036	-0.420	(0)
H4AsO3+	7.721e-31	6.062e-31	-30.112	-30.217	-0.105	(0)
AsO3-3	7.895e-35	8.943e-36	-34.103	-35.049	-0.946	(0)
As (5)	2.900e-10					
HAsO4-2	2.467e-10	9.373e-11	-9.608	-10.028	-0.420	(0)
H2AsO4-	4.315e-11	3.388e-11	-10.365	-10.470	-0.105	(0)
AsO4-3	6.602e-14	7.479e-15	-13.180	-14.126	-0.946	(0)
H3AsO4	2.310e-16	2.333e-16	-15.636	-15.632	0.004	(0)
B	2.902e-05					
H3BO3	2.842e-05	2.870e-05	-4.546	-4.542	0.004	(0)
H2BO3-	5.173e-07	4.206e-07	-6.286	-6.376	-0.090	(0)
CaH2BO3+	4.357e-08	3.542e-08	-7.361	-7.451	-0.090	(0)
MgH2BO3+	3.054e-08	2.483e-08	-7.515	-7.605	-0.090	(0)
NaH2BO3	4.917e-09	4.917e-09	-8.308	-8.308	0.000	(0)
BF (OH) 3-	1.695e-09	1.378e-09	-8.771	-8.861	-0.090	(0)
H5 (BO3) 2-	1.264e-11	1.027e-11	-10.898	-10.988	-0.090	(0)
BF2 (OH) 2-	8.652e-13	7.034e-13	-12.063	-12.153	-0.090	(0)
BaH2BO3+	6.588e-13	5.356e-13	-12.181	-12.271	-0.090	(0)
H8 (BO3) 3-	3.626e-14	2.948e-14	-13.441	-13.530	-0.090	(0)

	AgH2BO3	1.835e-14	1.835e-14	-13.736	-13.736	0.000	(0)
	BF3OH-	1.607e-18	1.306e-18	-17.794	-17.884	-0.090	(0)
	BF4-	3.774e-23	3.068e-23	-22.423	-22.513	-0.090	(0)
Ba	8.766e-08						
	Ba+2	8.661e-08	4.121e-08	-7.062	-7.385	-0.323	(0)
	BaHCO3+	9.985e-10	8.406e-10	-9.001	-9.075	-0.075	(0)
	BaCO3	5.340e-11	5.340e-11	-10.272	-10.272	0.000	(0)
	BaH2BO3+	6.588e-13	5.356e-13	-12.181	-12.271	-0.090	(0)
	BaOH+	5.473e-14	4.568e-14	-13.262	-13.340	-0.079	(0)
	BaNO3+	3.034e-15	2.382e-15	-14.518	-14.623	-0.105	(0)
	BaNH3+2	1.670e-16	6.343e-17	-15.777	-16.198	-0.420	(0)
C (4)	2.882e-03						
	HCO3-	2.550e-03	2.136e-03	-2.593	-2.670	-0.077	(0)
	H2CO3	1.904e-04	1.904e-04	-3.720	-3.720	0.000	(0)
	CaHCO3+	6.914e-05	5.821e-05	-4.160	-4.235	-0.075	(0)
	MgHCO3+	4.502e-05	3.721e-05	-4.347	-4.429	-0.083	(0)
	NaHCO3	8.859e-06	8.859e-06	-5.053	-5.053	0.000	(0)
	CaCO3	5.861e-06	5.861e-06	-5.232	-5.232	0.000	(0)
	CO3-2	5.310e-06	2.527e-06	-5.275	-5.597	-0.323	(0)
	MgCO3	3.578e-06	3.578e-06	-5.446	-5.446	0.000	(0)
	CuCO3	8.875e-07	8.875e-07	-6.052	-6.052	0.000	(0)
	MnHCO3+	8.672e-07	7.238e-07	-6.062	-6.140	-0.079	(0)
	NaCO3-	4.143e-07	3.470e-07	-6.383	-6.460	-0.077	(0)
	UO2 (CO3) 3-4	2.492e-07	5.187e-09	-6.604	-8.285	-1.682	(0)
	ZnCO3	2.315e-07	2.315e-07	-6.635	-6.635	0.000	(0)
	ZnHCO3+	1.370e-07	1.076e-07	-6.863	-6.968	-0.105	(0)
	UO2 (CO3) 2-2	1.078e-07	4.096e-08	-6.967	-7.388	-0.420	(0)
	Cu (CO3) 2-2	1.589e-08	6.036e-09	-7.799	-8.219	-0.420	(0)
	NiHCO3+	1.146e-08	8.998e-09	-7.941	-8.046	-0.105	(0)
	CuHCO3+	1.024e-08	8.039e-09	-7.990	-8.095	-0.105	(0)
	CoHCO3+	5.272e-09	4.139e-09	-8.278	-8.383	-0.105	(0)
	NiCO3	3.221e-09	3.221e-09	-8.492	-8.492	0.000	(0)
	PbCO3	1.738e-09	1.738e-09	-8.760	-8.760	0.000	(0)
	CoCO3	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
	BaHCO3+	9.985e-10	8.406e-10	-9.001	-9.075	-0.075	(0)
	UO2CO3	8.125e-10	8.125e-10	-9.090	-9.090	0.000	(0)
	PbHCO3+	4.626e-10	3.632e-10	-9.335	-9.440	-0.105	(0)
	CdCO3	2.019e-10	2.019e-10	-9.695	-9.695	0.000	(0)
	BaCO3	5.340e-11	5.340e-11	-10.272	-10.272	0.000	(0)
	Pb (CO3) 2-2	3.334e-11	1.267e-11	-10.477	-10.897	-0.420	(0)
	CdHCO3+	2.172e-11	1.705e-11	-10.663	-10.768	-0.105	(0)
	Cd (CO3) 2-2	9.958e-13	3.783e-13	-12.002	-12.422	-0.420	(0)
	FeHCO3+	9.605e-14	8.086e-14	-13.018	-13.092	-0.075	(0)
	HgCO3	5.935e-14	5.935e-14	-13.227	-13.227	0.000	(0)
	Hg (CO3) 2-2	1.248e-15	4.742e-16	-14.904	-15.324	-0.420	(0)
	HgHCO3+	5.579e-17	4.380e-17	-16.253	-16.359	-0.105	(0)
Ca	4.743e-03						
	Ca+2	3.076e-03	1.464e-03	-2.512	-2.835	-0.323	(0)
	CaSO4	1.590e-03	1.590e-03	-2.799	-2.799	0.000	(0)
	CaHCO3+	6.914e-05	5.821e-05	-4.160	-4.235	-0.075	(0)
	CaCO3	5.861e-06	5.861e-06	-5.232	-5.232	0.000	(0)
	CaF+	2.304e-06	1.923e-06	-5.638	-5.716	-0.079	(0)
	CaH2BO3+	4.357e-08	3.542e-08	-7.361	-7.451	-0.090	(0)
	CaOH+	8.808e-09	7.415e-09	-8.055	-8.130	-0.075	(0)
	CaNO3+	6.799e-11	5.338e-11	-10.168	-10.273	-0.105	(0)
	CaNH3+2	1.183e-11	4.495e-12	-10.927	-11.347	-0.420	(0)
	Ca (NH3) 2+2	1.149e-20	4.365e-21	-19.940	-20.360	-0.420	(0)
Cd	1.317e-08						
	Cd+2	7.370e-09	3.507e-09	-8.133	-8.455	-0.323	(0)
	CdSO4	3.898e-09	3.898e-09	-8.409	-8.409	0.000	(0)
	CdCl+	9.894e-10	7.767e-10	-9.005	-9.110	-0.105	(0)
	Cd (SO4) 2-2	6.563e-10	2.493e-10	-9.183	-9.603	-0.420	(0)
	CdCO3	2.019e-10	2.019e-10	-9.695	-9.695	0.000	(0)
	CdHCO3+	2.172e-11	1.705e-11	-10.663	-10.768	-0.105	(0)
	CdOH+	9.009e-12	7.073e-12	-11.045	-11.150	-0.105	(0)
	CdF+	8.521e-12	6.690e-12	-11.070	-11.175	-0.105	(0)
	CdOHC1	8.090e-12	8.090e-12	-11.092	-11.092	0.000	(0)
	CdCl2	7.510e-12	7.510e-12	-11.124	-11.124	0.000	(0)

	Cd (CO3) 2-2	9.958e-13	3.783e-13	-12.002	-12.422	-0.420	(0)
	CdCl3-	1.400e-14	1.099e-14	-13.854	-13.959	-0.105	(0)
	Cd (OH) 2	1.133e-14	1.133e-14	-13.946	-13.946	0.000	(0)
	CdF2	1.607e-15	1.607e-15	-14.794	-14.794	0.000	(0)
	CdNO3+	1.629e-16	1.279e-16	-15.788	-15.893	-0.105	(0)
	CdSeO4	4.407e-17	4.407e-17	-16.356	-16.356	0.000	(0)
	Cd2OH+3	1.097e-18	1.243e-19	-17.960	-18.906	-0.946	(0)
	Cd (SeO3) 2-2	6.355e-19	2.414e-19	-18.197	-18.617	-0.420	(0)
	Cd (OH) 3-	2.239e-19	1.758e-19	-18.650	-18.755	-0.105	(0)
	Cd (NO3) 2	7.392e-25	7.392e-25	-24.131	-24.131	0.000	(0)
	Cd (OH) 4-2	1.923e-26	7.305e-27	-25.716	-26.136	-0.420	(0)
	CdHS+	0.000e+00	0.000e+00	-79.513	-79.619	-0.105	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.586	-151.586	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.752	-228.858	-0.105	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-305.413	-305.833	-0.420	(0)
C1	2.793e-03						
	Cl-	2.793e-03	2.319e-03	-2.554	-2.635	-0.081	(0)
	MnCl+	5.942e-08	4.959e-08	-7.226	-7.305	-0.079	(0)
	AgCl	1.303e-08	1.303e-08	-7.885	-7.885	0.000	(0)
	ZnCl+	1.122e-08	9.278e-09	-7.950	-8.033	-0.083	(0)
	AgCl2-	3.354e-09	2.633e-09	-8.474	-8.580	-0.105	(0)
	ZnOHCl	3.084e-09	3.084e-09	-8.511	-8.511	0.000	(0)
	CdCl+	9.894e-10	7.767e-10	-9.005	-9.110	-0.105	(0)
	CuCl	2.784e-10	2.784e-10	-9.555	-9.555	0.000	(0)
	CuCl+	2.653e-10	2.193e-10	-9.576	-9.659	-0.083	(0)
	NiCl+	2.583e-10	2.028e-10	-9.588	-9.693	-0.105	(0)
	CoCl+	2.546e-10	1.999e-10	-9.594	-9.699	-0.105	(0)
	CuCl2-	1.632e-10	1.349e-10	-9.787	-9.870	-0.083	(0)
	MnCl2	1.625e-10	1.625e-10	-9.789	-9.789	0.000	(0)
	ZnCl2	3.411e-11	3.411e-11	-10.467	-10.467	0.000	(0)
	PbCl+	2.399e-11	1.883e-11	-10.620	-10.725	-0.105	(0)
	HgClOH	2.041e-11	2.041e-11	-10.690	-10.690	0.000	(0)
	AgCl3-2	1.433e-11	5.443e-12	-10.844	-11.264	-0.420	(0)
	HgCl2	1.056e-11	1.056e-11	-10.976	-10.976	0.000	(0)
	CdOHCl	8.090e-12	8.090e-12	-11.092	-11.092	0.000	(0)
	CdCl2	7.510e-12	7.510e-12	-11.124	-11.124	0.000	(0)
	HgCl3-	3.120e-13	2.449e-13	-12.506	-12.611	-0.105	(0)
	AgCl4-3	2.276e-13	2.578e-14	-12.643	-13.589	-0.946	(0)
	PbCl2	1.951e-13	1.951e-13	-12.710	-12.710	0.000	(0)
	CuCl2	1.764e-13	1.764e-13	-12.754	-12.754	0.000	(0)
	CuCl3-2	1.379e-13	6.690e-14	-12.860	-13.175	-0.314	(0)
	MnCl3-	1.244e-13	1.038e-13	-12.905	-12.984	-0.079	(0)
	ZnCl3-	7.602e-14	6.284e-14	-13.119	-13.202	-0.083	(0)
	CdCl3-	1.400e-14	1.099e-14	-13.854	-13.959	-0.105	(0)
	HgCl4-2	5.954e-15	2.262e-15	-14.225	-14.646	-0.420	(0)
	NiCl2	2.368e-15	2.368e-15	-14.626	-14.626	0.000	(0)
	HgCl+	1.157e-15	9.083e-16	-14.937	-15.042	-0.105	(0)
	UO2Cl+	3.871e-16	3.039e-16	-15.412	-15.517	-0.105	(0)
	PbCl3-	2.295e-16	1.802e-16	-15.639	-15.744	-0.105	(0)
	ZnCl4-2	1.502e-16	7.288e-17	-15.823	-16.137	-0.314	(0)
	CrCl+2	7.468e-17	2.837e-17	-16.127	-16.547	-0.420	(0)
	CuCl3-	4.618e-18	3.818e-18	-17.336	-17.418	-0.083	(0)
	PbCl4-2	5.029e-19	1.910e-19	-18.299	-18.719	-0.420	(0)
	CrOHCl2	3.176e-19	3.176e-19	-18.498	-18.498	0.000	(0)
	FeCl+2	1.236e-20	5.997e-21	-19.908	-20.222	-0.314	(0)
	CrCl2+	7.953e-21	6.244e-21	-20.099	-20.205	-0.105	(0)
	VOCl+	4.940e-22	3.878e-22	-21.306	-21.411	-0.105	(0)
	CuCl4-2	9.147e-23	4.438e-23	-22.039	-22.353	-0.314	(0)
	FeCl2+	7.444e-23	6.213e-23	-22.128	-22.207	-0.079	(0)
	CrO3Cl-	4.784e-26	3.755e-26	-25.320	-25.425	-0.105	(0)
	FeCl3	1.441e-26	1.441e-26	-25.841	-25.841	0.000	(0)
	CoCl+2	3.776e-35	1.434e-35	-34.423	-34.843	-0.420	(0)
	UCl+3	0.000e+00	0.000e+00	-44.445	-45.391	-0.946	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.534	-51.954	-0.420	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.813	-54.234	-0.420	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.862	-67.282	-0.420	(0)
Co (2)	9.603e-08						
	Co+2	6.559e-08	2.491e-08	-7.183	-7.604	-0.420	(0)

CoSO4	2.357e-08	2.357e-08	-7.628	-7.628	0.000	(0)
CoHCO3+	5.272e-09	4.139e-09	-8.278	-8.383	-0.105	(0)
CoCO3	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
CoCl+	2.546e-10	1.999e-10	-9.594	-9.699	-0.105	(0)
CoOH+	1.608e-10	1.262e-10	-9.794	-9.899	-0.105	(0)
CoF+	1.208e-10	9.483e-11	-9.918	-10.023	-0.105	(0)
Co (OH) 2	2.546e-12	2.546e-12	-11.594	-11.594	0.000	(0)
CoNO2+	1.604e-12	1.259e-12	-11.795	-11.900	-0.105	(0)
Co (NH3) +2	1.923e-14	7.306e-15	-13.716	-14.136	-0.420	(0)
CoSeO4	8.428e-16	8.428e-16	-15.074	-15.074	0.000	(0)
CoNO3+	5.800e-16	4.554e-16	-15.237	-15.342	-0.105	(0)
Co (OH) 3-	1.643e-17	1.290e-17	-16.784	-16.890	-0.105	(0)
CoOOH-	4.125e-18	3.238e-18	-17.385	-17.490	-0.105	(0)
Co2OH+3	1.391e-18	1.576e-19	-17.857	-18.802	-0.946	(0)
Co (NH3) 2+2	2.001e-21	7.603e-22	-20.699	-21.119	-0.420	(0)
Co (NO3) 2	1.069e-23	1.069e-23	-22.971	-22.971	0.000	(0)
Co (OH) 4-2	1.366e-24	5.190e-25	-23.864	-24.285	-0.420	(0)
Co (NH3) 3+2	6.146e-29	2.335e-29	-28.211	-28.632	-0.420	(0)
Co4 (OH) 4+4	2.432e-30	5.064e-32	-29.614	-31.295	-1.682	(0)
Co (NH3) 4+2	7.868e-37	2.989e-37	-36.104	-36.525	-0.420	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.497	-44.917	-0.420	(0)
Co (3)	1.032e-28					
CoOH+2	1.032e-28	3.922e-29	-27.986	-28.407	-0.420	(0)
Co+3	1.617e-34	3.039e-35	-33.791	-34.517	-0.726	(0)
CoCl+2	3.776e-35	1.434e-35	-34.423	-34.843	-0.420	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.534	-51.954	-0.420	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.941	-62.046	-0.105	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.622	-67.043	-0.420	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.862	-67.282	-0.420	(0)
Cr (2)	1.940e-26					
Cr+2	1.940e-26	7.367e-27	-25.712	-26.133	-0.420	(0)
Cr (3)	2.423e-09					
Cr (OH) 2+	2.066e-09	1.622e-09	-8.685	-8.790	-0.105	(0)
Cr (OH) 3	1.547e-10	1.547e-10	-9.810	-9.810	0.000	(0)
Cr (OH) +2	1.382e-10	5.250e-11	-9.859	-10.280	-0.420	(0)
CrOHSO4	5.907e-11	5.907e-11	-10.229	-10.229	0.000	(0)
CrO2-	2.363e-12	1.855e-12	-11.627	-11.732	-0.105	(0)
Cr (OH) 4-	1.992e-12	1.564e-12	-11.701	-11.806	-0.105	(0)
CrF+2	4.746e-13	1.803e-13	-12.324	-12.744	-0.420	(0)
CrSO4+	1.333e-13	1.046e-13	-12.875	-12.980	-0.105	(0)
Cr+3	8.343e-14	9.451e-15	-13.079	-14.025	-0.946	(0)
CrCl+2	7.468e-17	2.837e-17	-16.127	-16.547	-0.420	(0)
Cr2 (OH) 2SO4+2	7.379e-19	2.803e-19	-18.132	-18.552	-0.420	(0)
CrOHC12	3.176e-19	3.176e-19	-18.498	-18.498	0.000	(0)
Cr2 (OH) 2 (SO4) 2	7.894e-20	7.894e-20	-19.103	-19.103	0.000	(0)
CrCl2+	7.953e-21	6.244e-21	-20.099	-20.205	-0.105	(0)
CrNO3+2	1.254e-23	4.764e-24	-22.902	-23.322	-0.420	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.891	-43.311	-0.420	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.755	-52.701	-0.946	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.813	-54.234	-0.420	(0)
Cr (6)	1.177e-15					
CrO4-2	1.064e-15	5.062e-16	-14.973	-15.296	-0.323	(0)
HCrO4-	8.269e-17	6.492e-17	-16.083	-16.188	-0.105	(0)
NaCrO4-	2.363e-17	1.855e-17	-16.626	-16.732	-0.105	(0)
KCrO4-	6.669e-18	5.236e-18	-17.176	-17.281	-0.105	(0)
CrO3SO4-2	9.787e-24	3.718e-24	-23.009	-23.430	-0.420	(0)
H2CrO4	2.085e-24	2.085e-24	-23.681	-23.681	0.000	(0)
CrO3Cl-	4.784e-26	3.755e-26	-25.320	-25.425	-0.105	(0)
Cr2O7-2	3.849e-31	1.462e-31	-30.415	-30.835	-0.420	(0)
Cu (1)	5.632e-10					
CuCl	2.784e-10	2.784e-10	-9.555	-9.555	0.000	(0)
CuCl2-	1.632e-10	1.349e-10	-9.787	-9.870	-0.083	(0)
Cu+	1.214e-10	9.534e-11	-9.916	-10.021	-0.105	(0)
CuCl3-2	1.379e-13	6.690e-14	-12.860	-13.175	-0.314	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.800	-150.170	-0.370	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.548	-150.900	-0.351	(0)
Cu (2)	1.165e-06					
CuCO3	8.875e-07	8.875e-07	-6.052	-6.052	0.000	(0)

	Cu+2	1.254e-07	5.965e-08	-6.902	-7.224	-0.323	(0)
	CuSO4	6.479e-08	6.479e-08	-7.188	-7.188	0.000	(0)
	CuOH+	5.794e-08	4.790e-08	-7.237	-7.320	-0.083	(0)
	Cu (CO3) 2-2	1.589e-08	6.036e-09	-7.799	-8.219	-0.420	(0)
	CuHCO3+	1.024e-08	8.039e-09	-7.990	-8.095	-0.105	(0)
	Cu (OH) 2	2.427e-09	2.427e-09	-8.615	-8.615	0.000	(0)
	CuF+	5.771e-10	4.530e-10	-9.239	-9.344	-0.105	(0)
	CuCl+	2.653e-10	2.193e-10	-9.576	-9.659	-0.083	(0)
	Cu2 (OH) 2+2	1.517e-10	5.763e-11	-9.819	-10.239	-0.420	(0)
	CuNO2+	5.706e-11	4.479e-11	-10.244	-10.349	-0.105	(0)
	CuNH3+2	3.920e-12	1.489e-12	-11.407	-11.827	-0.420	(0)
	Cu (OH) 3-	1.610e-12	1.264e-12	-11.793	-11.898	-0.105	(0)
	CuCl2	1.764e-13	1.764e-13	-12.754	-12.754	0.000	(0)
	Cu (NO2) 2	3.287e-15	3.287e-15	-14.483	-14.483	0.000	(0)
	CuNO3+	2.771e-15	2.175e-15	-14.557	-14.662	-0.105	(0)
	Cu (OH) 4-2	6.649e-18	2.526e-18	-17.177	-17.598	-0.420	(0)
	CuCl3-	4.618e-18	3.818e-18	-17.336	-17.418	-0.083	(0)
	CuCl4-2	9.147e-23	4.438e-23	-22.039	-22.353	-0.314	(0)
	Cu (NO3) 2	3.159e-24	3.159e-24	-23.501	-23.501	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.735	-218.840	-0.105	(0)
F		1.757e-04					
	F-	1.449e-04	1.204e-04	-3.839	-3.919	-0.081	(0)
	MgF+	2.768e-05	2.299e-05	-4.558	-4.638	-0.081	(0)
	CaF+	2.304e-06	1.923e-06	-5.638	-5.716	-0.079	(0)
	NaF	5.602e-07	5.602e-07	-6.252	-6.252	0.000	(0)
	MnF+	9.751e-08	8.138e-08	-7.011	-7.089	-0.079	(0)
	AlF3	3.024e-08	3.024e-08	-7.519	-7.519	0.000	(0)
	AlF2+	2.382e-08	1.996e-08	-7.623	-7.700	-0.077	(0)
	HF	7.056e-09	7.056e-09	-8.151	-8.151	0.000	(0)
	ZnF+	4.871e-09	3.824e-09	-8.312	-8.417	-0.105	(0)
	AlF4-	2.196e-09	1.824e-09	-8.658	-8.739	-0.081	(0)
	BF (OH) 3-	1.695e-09	1.378e-09	-8.771	-8.861	-0.090	(0)
	AlF+2	8.461e-10	4.164e-10	-9.073	-9.380	-0.308	(0)
	CuF+	5.771e-10	4.530e-10	-9.239	-9.344	-0.105	(0)
	NiF+	1.316e-10	1.033e-10	-9.881	-9.986	-0.105	(0)
	CoF+	1.208e-10	9.483e-11	-9.918	-10.023	-0.105	(0)
	CdF+	8.521e-12	6.690e-12	-11.070	-11.175	-0.105	(0)
	HF2-	3.927e-12	3.229e-12	-11.406	-11.491	-0.085	(0)
	PbF+	2.473e-12	1.941e-12	-11.607	-11.712	-0.105	(0)
	UO2F+	1.710e-12	1.342e-12	-11.767	-11.872	-0.105	(0)
	BF2 (OH) 2-	8.652e-13	7.034e-13	-12.063	-12.153	-0.090	(0)
	AgF	8.321e-13	8.321e-13	-12.080	-12.080	0.000	(0)
	CrF+2	4.746e-13	1.803e-13	-12.324	-12.744	-0.420	(0)
	UO2F2	4.659e-13	4.659e-13	-12.332	-12.332	0.000	(0)
	UO2F3-	1.794e-14	1.409e-14	-13.746	-13.851	-0.105	(0)
	PbF2	4.598e-15	4.598e-15	-14.337	-14.337	0.000	(0)
	CdF2	1.607e-15	1.607e-15	-14.794	-14.794	0.000	(0)
	H2F2	1.334e-16	1.334e-16	-15.875	-15.875	0.000	(0)
	FeF2+	4.361e-17	3.640e-17	-16.360	-16.439	-0.079	(0)
	UO2F4-2	3.546e-17	1.347e-17	-16.450	-16.871	-0.420	(0)
	VO2F	3.067e-17	3.067e-17	-16.513	-16.513	0.000	(0)
	FeF+2	2.329e-17	1.130e-17	-16.633	-16.947	-0.314	(0)
	FeF3	6.181e-18	6.181e-18	-17.209	-17.209	0.000	(0)
	VO2F2-	1.707e-18	1.340e-18	-17.768	-17.873	-0.105	(0)
	BF3OH-	1.607e-18	1.306e-18	-17.794	-17.884	-0.090	(0)
	PbF3-	1.337e-18	1.050e-18	-17.874	-17.979	-0.105	(0)
	VOF+	5.481e-20	4.303e-20	-19.261	-19.366	-0.105	(0)
	VO2F3-2	5.298e-21	2.013e-21	-20.276	-20.696	-0.420	(0)
	VOF2	1.942e-21	1.942e-21	-20.712	-20.712	0.000	(0)
	PbF4-2	1.592e-22	6.048e-23	-21.798	-22.218	-0.420	(0)
	HgF+	1.115e-22	8.757e-23	-21.953	-22.058	-0.105	(0)
	BF4-	3.774e-23	3.068e-23	-22.423	-22.513	-0.090	(0)
	VOF3-	1.056e-23	8.294e-24	-22.976	-23.081	-0.105	(0)
	VO2F4-3	1.052e-24	1.192e-25	-23.978	-24.924	-0.946	(0)
	Sb (OH) 2F	2.531e-25	2.531e-25	-24.597	-24.597	0.000	(0)
	SbOF	2.490e-25	2.490e-25	-24.604	-24.604	0.000	(0)
	VOF4-2	1.061e-26	4.030e-27	-25.974	-26.395	-0.420	(0)
	UF3+	3.090e-35	2.426e-35	-34.510	-34.615	-0.105	(0)

UF2+2	3.347e-36	1.271e-36	-35.475	-35.896	-0.420	(0)
UF4	3.201e-37	3.201e-37	-36.495	-36.495	0.000	(0)
UF+3	7.407e-39	8.390e-40	-38.130	-39.076	-0.946	(0)
UF5-	1.945e-39	1.527e-39	-38.711	-38.816	-0.105	(0)
UF6-2	1.461e-40	0.000e+00	-39.835	-40.256	-0.420	(0)
Fe (2)	1.155e-11					
Fe+2	7.917e-12	3.007e-12	-11.101	-11.522	-0.420	(0)
FeSO4	3.500e-12	3.500e-12	-11.456	-11.456	0.000	(0)
FeHCO3+	9.605e-14	8.086e-14	-13.018	-13.092	-0.075	(0)
FeOH+	3.642e-14	3.040e-14	-13.439	-13.517	-0.079	(0)
Fe (OH) 2	6.131e-18	6.131e-18	-17.212	-17.212	0.000	(0)
Fe (OH) 3-	5.899e-19	4.923e-19	-18.229	-18.308	-0.079	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.915	-160.915	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.944	-238.049	-0.105	(0)
Fe (3)	2.044e-09					
Fe (OH) 2+	1.655e-09	1.386e-09	-8.781	-8.858	-0.077	(0)
Fe (OH) 3	3.781e-10	3.781e-10	-9.422	-9.422	0.000	(0)
Fe (OH) 4-	1.067e-11	8.939e-12	-10.972	-11.049	-0.077	(0)
FeOH+2	2.893e-14	1.403e-14	-13.539	-13.853	-0.314	(0)
FeF2+	4.361e-17	3.640e-17	-16.360	-16.439	-0.079	(0)
FeF+2	2.329e-17	1.130e-17	-16.633	-16.947	-0.314	(0)
FeF3	6.181e-18	6.181e-18	-17.209	-17.209	0.000	(0)
FeSO4+	5.457e-18	4.554e-18	-17.263	-17.342	-0.079	(0)
Fe (SO4) 2-	5.881e-19	4.617e-19	-18.231	-18.336	-0.105	(0)
Fe+3	4.553e-19	8.561e-20	-18.342	-19.067	-0.726	(0)
FeCl+2	1.236e-20	5.997e-21	-19.908	-20.222	-0.314	(0)
FeCl2+	7.444e-23	6.213e-23	-22.128	-22.207	-0.079	(0)
FeHSeO3+2	5.418e-23	2.058e-23	-22.266	-22.687	-0.420	(0)
Fe2 (OH) 2+4	3.133e-25	6.523e-27	-24.504	-26.186	-1.682	(0)
FeNO3+2	2.599e-26	9.873e-27	-25.585	-26.006	-0.420	(0)
FeCl3	1.441e-26	1.441e-26	-25.841	-25.841	0.000	(0)
Fe3 (OH) 4+5	5.543e-32	1.307e-34	-31.256	-33.884	-2.627	(0)
H (0)	2.345e-29					
H2	1.173e-29	1.184e-29	-28.931	-28.927	0.004	(0)
Hg (0)	1.929e-09					
Hg	1.929e-09	1.929e-09	-8.715	-8.715	0.000	(0)
Hg (1)	1.353e-19					
Hg2+2	6.767e-20	2.570e-20	-19.170	-19.590	-0.420	(0)
Hg (2)	3.926e-11					
HgClOH	2.041e-11	2.041e-11	-10.690	-10.690	0.000	(0)
HgCl2	1.056e-11	1.056e-11	-10.976	-10.976	0.000	(0)
Hg (OH) 2	7.906e-12	7.984e-12	-11.102	-11.098	0.004	(0)
HgCl3-	3.120e-13	2.449e-13	-12.506	-12.611	-0.105	(0)
HgCO3	5.935e-14	5.935e-14	-13.227	-13.227	0.000	(0)
HgCl4-2	5.954e-15	2.262e-15	-14.225	-14.646	-0.420	(0)
Hg (CO3) 2-2	1.248e-15	4.742e-16	-14.904	-15.324	-0.420	(0)
HgCl+	1.157e-15	9.083e-16	-14.937	-15.042	-0.105	(0)
HgOH+	2.527e-16	1.984e-16	-15.597	-15.702	-0.105	(0)
HgHCO3+	5.579e-17	4.380e-17	-16.253	-16.359	-0.105	(0)
Hg (OH) 3-	3.251e-19	2.552e-19	-18.488	-18.593	-0.105	(0)
Hg (NH3) 2+2	1.940e-19	7.368e-20	-18.712	-19.133	-0.420	(0)
HgNH3+2	7.952e-20	3.021e-20	-19.100	-19.520	-0.420	(0)
Hg+2	5.167e-20	1.963e-20	-19.287	-19.707	-0.420	(0)
HgSO4	2.436e-20	2.436e-20	-19.613	-19.613	0.000	(0)
HgF+	1.115e-22	8.757e-23	-21.953	-22.058	-0.105	(0)
Hg (NH3) 3+2	1.884e-27	7.155e-28	-26.725	-27.145	-0.420	(0)
HgNO3+	1.065e-28	8.358e-29	-27.973	-28.078	-0.105	(0)
Hg (NH3) 4+2	3.650e-35	1.386e-35	-34.438	-34.858	-0.420	(0)
Hg (NO3) 2	4.006e-37	4.006e-37	-36.397	-36.397	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.615	-138.720	-0.105	(0)
HgS2-2	0.000e+00	0.000e+00	-139.606	-140.026	-0.420	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.728	-139.728	0.000	(0)
K	3.463e-03					
K+	3.352e-03	2.784e-03	-2.475	-2.555	-0.081	(0)
KSO4-	1.116e-04	9.344e-05	-3.952	-4.029	-0.077	(0)
KCrO4-	6.669e-18	5.236e-18	-17.176	-17.281	-0.105	(0)
Mg	5.124e-03					
Mg+2	3.578e-03	1.703e-03	-2.446	-2.769	-0.323	(0)

MgSO4	1.469e-03	1.469e-03	-2.833	-2.833	0.000	(0)
MgHCO3+	4.502e-05	3.721e-05	-4.347	-4.429	-0.083	(0)
MgF+	2.768e-05	2.299e-05	-4.558	-4.638	-0.081	(0)
MgCO3	3.578e-06	3.578e-06	-5.446	-5.446	0.000	(0)
MgOH+	2.036e-07	1.721e-07	-6.691	-6.764	-0.073	(0)
MgH2BO3+	3.054e-08	2.483e-08	-7.515	-7.605	-0.090	(0)
Mn (2)	6.007e-05					
Mn+2	4.471e-05	1.698e-05	-4.350	-4.770	-0.420	(0)
MnSO4	1.432e-05	1.432e-05	-4.844	-4.844	0.000	(0)
MnHCO3+	8.672e-07	7.238e-07	-6.062	-6.140	-0.079	(0)
MnF+	9.751e-08	8.138e-08	-7.011	-7.089	-0.079	(0)
MnCl+	5.942e-08	4.959e-08	-7.226	-7.305	-0.079	(0)
MnOH+	1.298e-08	1.083e-08	-7.887	-7.965	-0.079	(0)
MnCl2	1.625e-10	1.625e-10	-9.789	-9.789	0.000	(0)
MnNO3+	3.954e-13	3.104e-13	-12.403	-12.508	-0.105	(0)
MnSeO4	3.085e-13	3.085e-13	-12.511	-12.511	0.000	(0)
MnCl3-	1.244e-13	1.038e-13	-12.905	-12.984	-0.079	(0)
Mn (OH) 3-	5.171e-18	4.316e-18	-17.286	-17.365	-0.079	(0)
Mn (NO3) 2	8.993e-21	8.993e-21	-20.046	-20.046	0.000	(0)
Mn (OH) 4-2	7.292e-24	3.538e-24	-23.137	-23.451	-0.314	(0)
MnSe	0.000e+00	0.000e+00	-42.263	-42.263	0.000	(0)
Mn (3)	1.236e-24					
Mn+3	1.236e-24	2.325e-25	-23.908	-24.634	-0.726	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.718	-42.032	-0.314	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.830	-45.918	-0.087	(0)
Mo	1.940e-06					
MoO4-2	1.939e-06	9.228e-07	-5.712	-6.035	-0.323	(0)
HMoO4-	9.269e-10	7.276e-10	-9.033	-9.138	-0.105	(0)
H2MoO4	2.112e-13	2.112e-13	-12.675	-12.675	0.000	(0)
Ag2MoO4	2.646e-24	2.646e-24	-23.577	-23.577	0.000	(0)
AlMo6O21-3	7.194e-38	8.149e-39	-37.143	-38.089	-0.946	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.686	-48.469	-3.783	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.857	-49.484	-2.627	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.422	-52.104	-1.682	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.314	-56.260	-0.946	(0)
N (-3)	2.213e-07					
NH4+	2.085e-07	1.695e-07	-6.681	-6.771	-0.090	(0)
NH4SO4-	1.032e-08	8.614e-09	-7.986	-8.065	-0.079	(0)
NH3	2.439e-09	2.439e-09	-8.613	-8.613	0.000	(0)
CaNH3+2	1.183e-11	4.495e-12	-10.927	-11.347	-0.420	(0)
CuNH3+2	3.920e-12	1.489e-12	-11.407	-11.827	-0.420	(0)
NiNH3+2	1.178e-13	4.476e-14	-12.929	-13.349	-0.420	(0)
Co (NH3) +2	1.923e-14	7.306e-15	-13.716	-14.136	-0.420	(0)
AgNH3+	1.746e-14	1.371e-14	-13.758	-13.863	-0.105	(0)
BaNH3+2	1.670e-16	6.343e-17	-15.777	-16.198	-0.420	(0)
Ag (NH3) 2+	3.462e-19	2.718e-19	-18.461	-18.566	-0.105	(0)
Hg (NH3) 2+2	1.940e-19	7.368e-20	-18.712	-19.133	-0.420	(0)
HgNH3+2	7.952e-20	3.021e-20	-19.100	-19.520	-0.420	(0)
Ni (NH3) 2+2	4.155e-20	1.578e-20	-19.381	-19.802	-0.420	(0)
Ca (NH3) 2+2	1.149e-20	4.365e-21	-19.940	-20.360	-0.420	(0)
Co (NH3) 2+2	2.001e-21	7.603e-22	-20.699	-21.119	-0.420	(0)
Hg (NH3) 3+2	1.884e-27	7.155e-28	-26.725	-27.145	-0.420	(0)
Co (NH3) 3+2	6.146e-29	2.335e-29	-28.211	-28.632	-0.420	(0)
Hg (NH3) 4+2	3.650e-35	1.386e-35	-34.438	-34.858	-0.420	(0)
Co (NH3) 4+2	7.868e-37	2.989e-37	-36.104	-36.525	-0.420	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.891	-43.311	-0.420	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.497	-44.917	-0.420	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.534	-51.954	-0.420	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.755	-52.701	-0.946	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.813	-54.234	-0.420	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.941	-62.046	-0.105	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.622	-67.043	-0.420	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.862	-67.282	-0.420	(0)
N (3)	8.769e-06					
NO2-	8.769e-06	7.171e-06	-5.057	-5.144	-0.087	(0)
CuNO2+	5.706e-11	4.479e-11	-10.244	-10.349	-0.105	(0)

AgNO2	4.123e-12	4.123e-12	-11.385	-11.385	0.000	(0)
CoNO2+	1.604e-12	1.259e-12	-11.795	-11.900	-0.105	(0)
Cu (NO2) 2	3.287e-15	3.287e-15	-14.483	-14.483	0.000	(0)
Ag (NO2) 2-	5.833e-17	4.580e-17	-16.234	-16.339	-0.105	(0)
N (5)	1.395e-08					
NO3-	1.389e-08	1.153e-08	-7.857	-7.938	-0.081	(0)
CaNO3+	6.799e-11	5.338e-11	-10.168	-10.273	-0.105	(0)
MnNO3+	3.954e-13	3.104e-13	-12.403	-12.508	-0.105	(0)
ZnNO3+	5.876e-14	4.613e-14	-13.231	-13.336	-0.105	(0)
BaNO3+	3.034e-15	2.382e-15	-14.518	-14.623	-0.105	(0)
CuNO3+	2.771e-15	2.175e-15	-14.557	-14.662	-0.105	(0)
NiNO3+	1.261e-15	9.899e-16	-14.899	-15.004	-0.105	(0)
CoNO3+	5.800e-16	4.554e-16	-15.237	-15.342	-0.105	(0)
CdNO3+	1.629e-16	1.279e-16	-15.788	-15.893	-0.105	(0)
PbNO3+	4.972e-17	3.904e-17	-16.303	-16.409	-0.105	(0)
AgNO3	2.521e-17	2.521e-17	-16.598	-16.598	0.000	(0)
Mn (NO3) 2	8.993e-21	8.993e-21	-20.046	-20.046	0.000	(0)
UO2NO3+	2.368e-21	1.859e-21	-20.626	-20.731	-0.105	(0)
Zn (NO3) 2	1.061e-22	1.061e-22	-21.974	-21.974	0.000	(0)
CrNO3+2	1.254e-23	4.764e-24	-22.902	-23.322	-0.420	(0)
Co (NO3) 2	1.069e-23	1.069e-23	-22.971	-22.971	0.000	(0)
Cu (NO3) 2	3.159e-24	3.159e-24	-23.501	-23.501	0.000	(0)
VO2NO3	8.475e-25	8.475e-25	-24.072	-24.072	0.000	(0)
Pb (NO3) 2	7.645e-25	7.645e-25	-24.117	-24.117	0.000	(0)
Cd (NO3) 2	7.392e-25	7.392e-25	-24.131	-24.131	0.000	(0)
FeNO3+2	2.599e-26	9.873e-27	-25.585	-26.006	-0.420	(0)
HgNO3+	1.065e-28	8.358e-29	-27.973	-28.078	-0.105	(0)
Hg (NO3) 2	4.006e-37	4.006e-37	-36.397	-36.397	0.000	(0)
Na	9.115e-03					
Na+	8.881e-03	7.376e-03	-2.052	-2.132	-0.081	(0)
NaSO4-	2.242e-04	1.878e-04	-3.649	-3.726	-0.077	(0)
NaHCO3	8.859e-06	8.859e-06	-5.053	-5.053	0.000	(0)
NaF	5.602e-07	5.602e-07	-6.252	-6.252	0.000	(0)
NaCO3-	4.143e-07	3.470e-07	-6.383	-6.460	-0.077	(0)
NaH2BO3	4.917e-09	4.917e-09	-8.308	-8.308	0.000	(0)
NaCrO4-	2.363e-17	1.855e-17	-16.626	-16.732	-0.105	(0)
Ni	1.194e-07					
Ni+2	7.182e-08	3.417e-08	-7.144	-7.466	-0.323	(0)
NiSO4	3.233e-08	3.233e-08	-7.490	-7.490	0.000	(0)
NiHCO3+	1.146e-08	8.998e-09	-7.941	-8.046	-0.105	(0)
NiCO3	3.221e-09	3.221e-09	-8.492	-8.492	0.000	(0)
NiCl+	2.583e-10	2.028e-10	-9.588	-9.693	-0.105	(0)
NiOH+	1.391e-10	1.092e-10	-9.857	-9.962	-0.105	(0)
NiF+	1.316e-10	1.033e-10	-9.881	-9.986	-0.105	(0)
Ni (SO4) 2-2	1.336e-11	5.075e-12	-10.874	-11.295	-0.420	(0)
Ni (OH) 2	2.203e-12	2.203e-12	-11.657	-11.657	0.000	(0)
NiNH3+2	1.178e-13	4.476e-14	-12.929	-13.349	-0.420	(0)
NiCl2	2.368e-15	2.368e-15	-14.626	-14.626	0.000	(0)
NiNO3+	1.261e-15	9.899e-16	-14.899	-15.004	-0.105	(0)
NiSeO4	1.079e-15	1.079e-15	-14.967	-14.967	0.000	(0)
Ni (OH) 3-	7.125e-16	5.594e-16	-15.147	-15.252	-0.105	(0)
Ni (NH3) 2+2	4.155e-20	1.578e-20	-19.381	-19.802	-0.420	(0)
O (0)	7.152e-35					
O2	3.576e-35	3.611e-35	-34.447	-34.442	0.004	(0)
Pb	3.500e-09					
PbCO3	1.738e-09	1.738e-09	-8.760	-8.760	0.000	(0)
PbSO4	5.314e-10	5.314e-10	-9.275	-9.275	0.000	(0)
Pb+2	4.810e-10	2.288e-10	-9.318	-9.640	-0.323	(0)
PbHCO3+	4.626e-10	3.632e-10	-9.335	-9.440	-0.105	(0)
PbOH+	1.859e-10	1.460e-10	-9.731	-9.836	-0.105	(0)
Pb (SO4) 2-2	3.997e-11	1.518e-11	-10.398	-10.819	-0.420	(0)
Pb (CO3) 2-2	3.334e-11	1.267e-11	-10.477	-10.897	-0.420	(0)
PbCl+	2.399e-11	1.883e-11	-10.620	-10.725	-0.105	(0)
PbF+	2.473e-12	1.941e-12	-11.607	-11.712	-0.105	(0)
Pb (OH) 2	1.172e-12	1.172e-12	-11.931	-11.931	0.000	(0)
PbCl2	1.951e-13	1.951e-13	-12.710	-12.710	0.000	(0)
PbF2	4.598e-15	4.598e-15	-14.337	-14.337	0.000	(0)
Pb (OH) 3-	3.791e-16	2.976e-16	-15.421	-15.526	-0.105	(0)

PbCl3-	2.295e-16	1.802e-16	-15.639	-15.744	-0.105	(0)
PbNO3+	4.972e-17	3.904e-17	-16.303	-16.409	-0.105	(0)
Pb2OH+3	4.673e-18	5.294e-19	-17.330	-18.276	-0.946	(0)
PbF3-	1.337e-18	1.050e-18	-17.874	-17.979	-0.105	(0)
PbCl4-2	5.029e-19	1.910e-19	-18.299	-18.719	-0.420	(0)
Pb(OH) 4-2	4.872e-20	1.851e-20	-19.312	-19.733	-0.420	(0)
PbF4-2	1.592e-22	6.048e-23	-21.798	-22.218	-0.420	(0)
Pb3(OH) 4+2	1.651e-23	6.272e-24	-22.782	-23.203	-0.420	(0)
Pb(NO3) 2	7.645e-25	7.645e-25	-24.117	-24.117	0.000	(0)
Pb4(OH) 4+4	5.476e-28	1.140e-29	-27.262	-28.943	-1.682	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.713	-152.713	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.480	-230.585	-0.105	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.917	-73.917	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.066	-79.171	-0.105	(0)
CdHS+	0.000e+00	0.000e+00	-79.513	-79.619	-0.105	(0)
H2S	0.000e+00	0.000e+00	-79.553	-79.553	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.714	-81.135	-0.420	(0)
S6-2	0.000e+00	0.000e+00	-81.230	-81.651	-0.420	(0)
S4-2	0.000e+00	0.000e+00	-81.310	-81.730	-0.420	(0)
S3-2	0.000e+00	0.000e+00	-82.116	-82.536	-0.420	(0)
S2-2	0.000e+00	0.000e+00	-83.132	-83.552	-0.420	(0)
S-2	0.000e+00	0.000e+00	-88.755	-89.070	-0.314	(0)
HgHS2-	0.000e+00	0.000e+00	-138.615	-138.720	-0.105	(0)
HgS2-2	0.000e+00	0.000e+00	-139.606	-140.026	-0.420	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-139.728	-139.728	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-148.862	-149.070	-0.209	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.884	-148.989	-0.105	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.800	-150.170	-0.370	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.824	-149.929	-0.105	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.548	-150.900	-0.351	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-150.728	-151.108	-0.380	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.059	-151.419	-0.360	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.321	-151.321	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.586	-151.586	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.713	-152.713	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.915	-160.915	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-218.735	-218.840	-0.105	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.107	-227.212	-0.105	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-228.752	-228.858	-0.105	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.370	-229.790	-0.420	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.480	-230.585	-0.105	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-237.944	-238.049	-0.105	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-305.413	-305.833	-0.420	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.423	-307.844	-0.420	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.618	-321.038	-0.420	(0)
S(6)	1.338e-02					
SO4-2	9.965e-03	4.741e-03	-2.002	-2.324	-0.323	(0)
CaSO4	1.590e-03	1.590e-03	-2.799	-2.799	0.000	(0)
MgSO4	1.469e-03	1.469e-03	-2.833	-2.833	0.000	(0)
NaSO4-	2.242e-04	1.878e-04	-3.649	-3.726	-0.077	(0)
KSO4-	1.116e-04	9.344e-05	-3.952	-4.029	-0.077	(0)
MnSO4	1.432e-05	1.432e-05	-4.844	-4.844	0.000	(0)
ZnSO4	1.652e-06	1.652e-06	-5.782	-5.782	0.000	(0)
Zn(SO4) 2-2	1.796e-07	6.821e-08	-6.746	-7.166	-0.420	(0)
CuSO4	6.479e-08	6.479e-08	-7.188	-7.188	0.000	(0)
NiSO4	3.233e-08	3.233e-08	-7.490	-7.490	0.000	(0)
CoSO4	2.357e-08	2.357e-08	-7.628	-7.628	0.000	(0)
HSO4-	2.211e-08	1.836e-08	-7.656	-7.736	-0.081	(0)
NH4SO4-	1.032e-08	8.614e-09	-7.986	-8.065	-0.079	(0)
CdSO4	3.898e-09	3.898e-09	-8.409	-8.409	0.000	(0)
Cd(SO4) 2-2	6.563e-10	2.493e-10	-9.183	-9.603	-0.420	(0)
PbSO4	5.314e-10	5.314e-10	-9.275	-9.275	0.000	(0)
AgSO4-	3.317e-10	2.604e-10	-9.479	-9.584	-0.105	(0)
CrOHSO4	5.907e-11	5.907e-11	-10.229	-10.229	0.000	(0)
Pb(SO4) 2-2	3.997e-11	1.518e-11	-10.398	-10.819	-0.420	(0)
AlSO4+	1.533e-11	1.273e-11	-10.814	-10.895	-0.081	(0)
Ni(SO4) 2-2	1.336e-11	5.075e-12	-10.874	-11.295	-0.420	(0)

FeSO4	3.500e-12	3.500e-12	-11.456	-11.456	0.000	(0)
Al (SO4) 2-	7.788e-13	6.469e-13	-12.109	-12.189	-0.081	(0)
UO2SO4	5.797e-13	5.797e-13	-12.237	-12.237	0.000	(0)
CrSO4+	1.333e-13	1.046e-13	-12.875	-12.980	-0.105	(0)
UO2 (SO4) 2-2	9.539e-14	3.623e-14	-13.021	-13.441	-0.420	(0)
VO2SO4-	2.095e-17	1.645e-17	-16.679	-16.784	-0.105	(0)
FeSO4+	5.457e-18	4.554e-18	-17.263	-17.342	-0.079	(0)
Cr2 (OH) 2SO4+2	7.379e-19	2.803e-19	-18.132	-18.552	-0.420	(0)
Fe (SO4) 2-	5.881e-19	4.617e-19	-18.231	-18.336	-0.105	(0)
Cr2 (OH) 2 (SO4) 2	7.894e-20	7.894e-20	-19.103	-19.103	0.000	(0)
VOSO4	7.783e-20	7.783e-20	-19.109	-19.109	0.000	(0)
HgSO4	2.436e-20	2.436e-20	-19.613	-19.613	0.000	(0)
CrO3SO4-2	9.787e-24	3.718e-24	-23.009	-23.430	-0.420	(0)
VSO4+	4.327e-34	3.397e-34	-33.364	-33.469	-0.105	(0)
U (SO4) 2	2.484e-39	2.484e-39	-38.605	-38.605	0.000	(0)
USO4+2	1.736e-40	0.000e+00	-39.760	-40.181	-0.420	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.941	-62.046	-0.105	(0)
Sb (3)	6.710e-20					
Sb (OH) 3	3.394e-20	3.394e-20	-19.469	-19.469	0.000	(0)
HSbO2	3.315e-20	3.315e-20	-19.479	-19.479	0.000	(0)
SbO2-	1.726e-24	1.355e-24	-23.763	-23.868	-0.105	(0)
Sb (OH) 4-	9.877e-25	7.754e-25	-24.005	-24.110	-0.105	(0)
Sb (OH) 2F	2.531e-25	2.531e-25	-24.597	-24.597	0.000	(0)
SbOF	2.490e-25	2.490e-25	-24.604	-24.604	0.000	(0)
Sb (OH) 2+	4.163e-26	3.269e-26	-25.381	-25.486	-0.105	(0)
SbO+	1.436e-26	1.128e-26	-25.843	-25.948	-0.105	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.618	-321.038	-0.420	(0)
Sb (5)	2.734e-08					
SbO3-	2.731e-08	2.144e-08	-7.564	-7.669	-0.105	(0)
Sb (OH) 6-	3.014e-11	2.503e-11	-10.521	-10.601	-0.081	(0)
SbO2+	1.231e-23	9.665e-24	-22.910	-23.015	-0.105	(0)
Se (-2)	4.811e-15					
Ag2Se	4.811e-15	4.811e-15	-14.318	-14.318	0.000	(0)
HSe-	3.935e-40	3.089e-40	-39.405	-39.510	-0.105	(0)
MnSe	0.000e+00	0.000e+00	-42.263	-42.263	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.022	-43.022	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.688	-47.108	-0.420	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.202	-85.884	-1.682	(0)
Se (4)	1.399e-07					
HSeO3-	1.159e-07	9.098e-08	-6.936	-7.041	-0.105	(0)
SeO3-2	2.406e-08	9.139e-09	-7.619	-8.039	-0.420	(0)
H2SeO3	1.538e-12	1.538e-12	-11.813	-11.813	0.000	(0)
AgSeO3-	2.059e-14	1.617e-14	-13.686	-13.791	-0.105	(0)
Cd (SeO3) 2-2	6.355e-19	2.414e-19	-18.197	-18.617	-0.420	(0)
Ag (SeO3) 2-3	1.168e-20	1.323e-21	-19.933	-20.879	-0.946	(0)
FeHSeO3+2	5.418e-23	2.058e-23	-22.266	-22.687	-0.420	(0)
Se (6)	1.422e-10					
SeO4-2	1.419e-10	6.749e-11	-9.848	-10.171	-0.323	(0)
MnSeO4	3.085e-13	3.085e-13	-12.511	-12.511	0.000	(0)
ZnSeO4	1.665e-14	1.665e-14	-13.779	-13.779	0.000	(0)
NiSeO4	1.079e-15	1.079e-15	-14.967	-14.967	0.000	(0)
CoSeO4	8.428e-16	8.428e-16	-15.074	-15.074	0.000	(0)
HSeO4-	1.708e-16	1.341e-16	-15.768	-15.873	-0.105	(0)
CdSeO4	4.407e-17	4.407e-17	-16.356	-16.356	0.000	(0)
Zn (SeO4) 2-2	2.999e-24	1.139e-24	-23.523	-23.943	-0.420	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.793	-58.739	-0.946	(0)
U (4)	3.446e-21					
U (OH) 5-	3.442e-21	2.702e-21	-20.463	-20.568	-0.105	(0)
U (OH) 4	4.488e-24	4.488e-24	-23.348	-23.348	0.000	(0)
U (OH) 3+	8.288e-28	6.506e-28	-27.082	-27.187	-0.105	(0)
U (OH) 2+2	3.141e-32	1.193e-32	-31.503	-31.923	-0.420	(0)
UF3+	3.090e-35	2.426e-35	-34.510	-34.615	-0.105	(0)
UF2+2	3.347e-36	1.271e-36	-35.475	-35.896	-0.420	(0)
UF4	3.201e-37	3.201e-37	-36.495	-36.495	0.000	(0)
UOH+3	1.967e-37	2.228e-38	-36.706	-37.652	-0.946	(0)
UF+3	7.407e-39	8.390e-40	-38.130	-39.076	-0.946	(0)
U (SO4) 2	2.484e-39	2.484e-39	-38.605	-38.605	0.000	(0)

UF5-	1.945e-39	1.527e-39	-38.711	-38.816	-0.105	(0)
USO4+2	1.736e-40	0.000e+00	-39.760	-40.181	-0.420	(0)
UF6-2	1.461e-40	0.000e+00	-39.835	-40.256	-0.420	(0)
U+4	0.000e+00	0.000e+00	-42.775	-44.457	-1.682	(0)
UCl+3	0.000e+00	0.000e+00	-44.445	-45.391	-0.946	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.357	-172.870	-8.513	(0)
U (5)	2.047e-16					
UO2+	2.047e-16	1.607e-16	-15.689	-15.794	-0.105	(0)
U (6)	3.578e-07					
UO2 (CO3) 3-4	2.492e-07	5.187e-09	-6.604	-8.285	-1.682	(0)
UO2 (CO3) 2-2	1.078e-07	4.096e-08	-6.967	-7.388	-0.420	(0)
UO2CO3	8.125e-10	8.125e-10	-9.090	-9.090	0.000	(0)
UO2OH+	3.289e-12	2.582e-12	-11.483	-11.588	-0.105	(0)
UO2F+	1.710e-12	1.342e-12	-11.767	-11.872	-0.105	(0)
UO2SO4	5.797e-13	5.797e-13	-12.237	-12.237	0.000	(0)
UO2F2	4.659e-13	4.659e-13	-12.332	-12.332	0.000	(0)
UO2+2	1.698e-13	8.078e-14	-12.770	-13.093	-0.323	(0)
UO2 (SO4) 2-2	9.539e-14	3.623e-14	-13.021	-13.441	-0.420	(0)
UO2F3-	1.794e-14	1.409e-14	-13.746	-13.851	-0.105	(0)
UO2Cl+	3.871e-16	3.039e-16	-15.412	-15.517	-0.105	(0)
UO2F4-2	3.546e-17	1.347e-17	-16.450	-16.871	-0.420	(0)
(UO2) 2 (OH) 2+2	2.913e-17	1.106e-17	-16.536	-16.956	-0.420	(0)
(UO2) 3 (OH) 5+	1.780e-18	1.397e-18	-17.750	-17.855	-0.105	(0)
UO2NO3+	2.368e-21	1.859e-21	-20.626	-20.731	-0.105	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.595	-42.700	-0.105	(0)
V+2	0.000e+00	0.000e+00	-43.195	-43.615	-0.420	(0)
V (3)	2.004e-15					
V (OH) 3	2.004e-15	2.004e-15	-14.698	-14.698	0.000	(0)
V (OH) 2+	6.542e-26	5.136e-26	-25.184	-25.289	-0.105	(0)
VOH+2	5.085e-29	1.932e-29	-28.294	-28.714	-0.420	(0)
V+3	1.340e-33	1.518e-34	-32.873	-33.819	-0.946	(0)
VSO4+	4.327e-34	3.397e-34	-33.364	-33.469	-0.105	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.606	-55.552	-0.946	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.947	-56.628	-1.682	(0)
V (4)	4.135e-18					
V (OH) 3+	3.843e-18	3.017e-18	-17.415	-17.520	-0.105	(0)
VO+2	1.569e-19	5.960e-20	-18.804	-19.225	-0.420	(0)
VOSO4	7.783e-20	7.783e-20	-19.109	-19.109	0.000	(0)
VOF+	5.481e-20	4.303e-20	-19.261	-19.366	-0.105	(0)
VOF2	1.942e-21	1.942e-21	-20.712	-20.712	0.000	(0)
VOC1+	4.940e-22	3.878e-22	-21.306	-21.411	-0.105	(0)
VOF3-	1.056e-23	8.294e-24	-22.976	-23.081	-0.105	(0)
VOF4-2	1.061e-26	4.030e-27	-25.974	-26.395	-0.420	(0)
H2V2O4+2	1.203e-30	4.569e-31	-29.920	-30.340	-0.420	(0)
V (5)	6.672e-09					
H2VO4-	5.898e-09	4.630e-09	-8.229	-8.334	-0.105	(0)
HVO4-2	7.726e-10	2.935e-10	-9.112	-9.532	-0.420	(0)
H3VO4	1.835e-12	1.835e-12	-11.736	-11.736	0.000	(0)
H3V2O7-	6.992e-14	5.489e-14	-13.155	-13.260	-0.105	(0)
HV2O7-3	4.067e-15	4.607e-16	-14.391	-15.337	-0.946	(0)
VO4-3	3.276e-16	3.711e-17	-15.485	-16.430	-0.946	(0)
VO2+	1.749e-16	1.453e-16	-15.757	-15.838	-0.081	(0)
VO2F	3.067e-17	3.067e-17	-16.513	-16.513	0.000	(0)
VO2SO4-	2.095e-17	1.645e-17	-16.679	-16.784	-0.105	(0)
V2O7-4	1.503e-17	3.129e-19	-16.823	-18.505	-1.682	(0)
VO2F2-	1.707e-18	1.340e-18	-17.768	-17.873	-0.105	(0)
V3O9-3	9.194e-19	1.041e-19	-18.036	-18.982	-0.946	(0)
VO2F3-2	5.298e-21	2.013e-21	-20.276	-20.696	-0.420	(0)
V4O12-4	9.662e-24	2.012e-25	-23.015	-24.696	-1.682	(0)
VO2F4-3	1.052e-24	1.192e-25	-23.978	-24.924	-0.946	(0)
VO2NO3	8.475e-25	8.475e-25	-24.072	-24.072	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-60.259	-64.043	-3.783	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.631	-63.258	-2.627	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.771	-65.452	-1.682	(0)
Zn	5.619e-06					
Zn+2	3.347e-06	1.592e-06	-5.475	-5.798	-0.323	(0)
ZnSO4	1.652e-06	1.652e-06	-5.782	-5.782	0.000	(0)

ZnCO3	2.315e-07	2.315e-07	-6.635	-6.635	0.000	(0)
Zn(SO4) 2-2	1.796e-07	6.821e-08	-6.746	-7.166	-0.420	(0)
ZnHCO3+	1.370e-07	1.076e-07	-6.863	-6.968	-0.105	(0)
ZnOH+	5.150e-08	4.043e-08	-7.288	-7.393	-0.105	(0)
ZnCl+	1.122e-08	9.278e-09	-7.950	-8.033	-0.083	(0)
ZnF+	4.871e-09	3.824e-09	-8.312	-8.417	-0.105	(0)
ZnOHCl	3.084e-09	3.084e-09	-8.511	-8.511	0.000	(0)
Zn(OH) 2	1.627e-09	1.627e-09	-8.789	-8.789	0.000	(0)
ZnCl2	3.411e-11	3.411e-11	-10.467	-10.467	0.000	(0)
Zn(OH) 3-	2.638e-12	2.071e-12	-11.579	-11.684	-0.105	(0)
ZnCl3-	7.602e-14	6.284e-14	-13.119	-13.202	-0.083	(0)
ZnNO3+	5.876e-14	4.613e-14	-13.231	-13.336	-0.105	(0)
ZnSeO4	1.665e-14	1.665e-14	-13.779	-13.779	0.000	(0)
ZnCl4-2	1.502e-16	7.288e-17	-15.823	-16.137	-0.314	(0)
Zn(OH) 4-2	5.510e-17	2.093e-17	-16.259	-16.679	-0.420	(0)
Zn(NO3) 2	1.061e-22	1.061e-22	-21.974	-21.974	0.000	(0)
Zn(SeO4) 2-2	2.999e-24	1.139e-24	-23.523	-23.943	-0.420	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.824	-149.929	-0.105	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.321	-151.321	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.107	-227.212	-0.105	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-229.370	-229.790	-0.420	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.423	-307.844	-0.420	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-56.16	-49.87	6.29	(Co(NH3) 5Cl) (NO3) 2	
(Co(NH3) 5Cl) Cl2	-43.77	-39.26	4.51	(Co(NH3) 5Cl) Cl2	
(Co(NH3) 5OH2) Cl3	-51.00	-39.27	11.74	(Co(NH3) 5OH2) Cl3	
(Co(NH3) 6) (NO3) 3	-72.48	-54.54	17.93	(Co(NH3) 6) (NO3) 3	
(Co(NH3) 6) Cl3	-58.67	-38.63	20.03	(Co(NH3) 6) Cl3	
(NH4) 2CrO4	-29.24	-28.84	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-24.16	-23.71	0.45	(NH4) 2SeO4	
Acanthite	-52.67	-88.89	-36.22	Ag2S	
Ag2CO3	-11.63	-22.72	-11.09	Ag2CO3	
Ag2CrO4	-20.83	-32.42	-11.59	Ag2CrO4	
Ag2HVO4	-12.23	-10.75	1.48	Ag2HVO4	
Ag2MoO4	-11.61	-23.16	-11.55	Ag2MoO4	
Ag2O	-14.89	-2.32	12.57	Ag2O	
Ag2Se	-0.53	-49.23	-48.70	Ag2Se	
Ag2SeO3	-9.61	-16.76	-7.15	Ag2SeO3	
Ag2SeO4	-18.38	-27.29	-8.91	Ag2SeO4	
Ag2SO4	-14.62	-19.44	-4.82	Ag2SO4	
Ag3AsO3	-28.14	-25.99	2.16	Ag3AsO3	
Ag3AsO4	-16.32	-19.11	-2.79	Ag3AsO4	
Ag3H2VO5	-17.09	-11.91	5.18	Ag3H2VO5	
AgF:4H2O	-13.53	-12.48	1.05	AgF:4H2O	
Agmetal	-0.54	-14.05	-13.51	Ag	
AgVO3	-10.36	-9.59	0.77	AgVO3	
Al(OH) 3 (am)	-1.06	9.74	10.80	Al(OH) 3	
Al2(MoO4) 3	-45.39	-43.03	2.37	Al2(MoO4) 3	
Al2O3	-0.16	19.49	19.65	Al2O3	
Al4(OH) 10SO4	-0.85	21.85	22.70	Al4(OH) 10SO4	
AlAsO4:2H2O	-10.69	-5.89	4.80	AlAsO4:2H2O	
AlOHSO4	-4.15	-7.38	-3.23	AlOHSO4	
AlSb	-152.68	-87.05	65.62	AlSb	
Alunite	1.22	-0.18	-1.40	KAl3(SO4) 2 (OH) 6	
Anglesite	-4.17	-11.96	-7.79	PbSO4	
Anhydrite	-0.80	-5.16	-4.36	CaSO4	
Anilite	-56.73	-88.61	-31.88	Cu0.25Cu1.5S	
Antlerite	-3.18	5.61	8.79	Cu3(OH) 4SO4	
Aragonite	-0.13	-8.43	-8.30	CaCO3	
Arsenolite	-87.28	-90.04	-2.76	As4O6	
Artinite	-5.93	3.67	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5	-37.97	-31.26	6.71	As2O5	
Atacamite	-2.27	5.12	7.39	Cu2(OH) 3Cl	
Azurite	-1.16	-18.06	-16.91	Cu3(OH) 2 (CO3) 2	

Ba(OH)2:8H2O	-16.98	7.42	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.91	-2.04	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.10	-9.01	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-27.56	5.38	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.01	-22.68	-9.67	BaCrO4
BaF2	-9.40	-15.22	-5.82	BaF2
BaMoO4	-6.46	-13.42	-6.96	BaMoO4
Barite	0.27	-9.71	-9.98	BaSO4
BaS	-95.33	-79.15	16.18	BaS
BaSeO3	-8.85	-7.02	1.83	BaSeO3
BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-6.36	-8.12	-1.76	ZnSO4:6H2O
Birnessite	-7.63	10.46	18.09	MnO2
Bixbyite	-4.21	-4.86	-0.64	Mn2O3
BlaubleiI	-56.11	-80.28	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.84	-84.12	-27.28	Cu0.6Cu0.8S
Boehmite	1.17	9.74	8.58	AlOOH
Breithauptite	-58.05	-76.57	-18.52	NiSb
Brochantite	-2.03	13.19	15.22	Cu4(OH)6SO4
Brucite	-4.81	12.03	16.84	Mg(OH)2
Bunsenite	-5.11	7.34	12.45	NiO
Ca(VO3)2	-10.56	-4.90	5.66	Ca(VO3)2
Ca2V2O7	-10.43	7.07	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.49	7.07	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.66	4.64	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.92	19.04	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.83	19.03	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.66	-157.69	142.97	Ca3Sb2
CaCrO4	-15.86	-18.13	-2.27	CaCrO4
Calcite	0.05	-8.43	-8.48	CaCO3
Calomel	-6.95	-24.86	-17.91	Hg2Cl2
CaMoO4	-0.92	-8.87	-7.95	CaMoO4
Carnotite	-2.11	-1.88	0.23	KUO2VO4
CaSeO3:2H2O	-5.29	-2.47	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.99	-13.01	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.57	-2.73	9.84	Cd(BO2)2
Cd(OH)2	-7.30	6.35	13.64	Cd(OH)2
Cd(OH)2(am)	-7.38	6.35	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.92	-15.21	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.64	1.92	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.13	8.27	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.72	-0.66	CdCl2
CdCl2:1H2O	-12.03	-13.72	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.81	-13.73	-1.91	CdCl2:2.5H2O
CdF2	-15.08	-16.29	-1.21	CdF2
Cdmetal(alpha)	-32.94	-19.43	13.51	Cd
Cdmetal(gamma)	-33.05	-19.43	13.62	Cd
CdMoO4	-0.34	-14.49	-14.15	CdMoO4
CdOHCl	-7.23	-3.69	3.54	CdOHCl
CdSb	-77.21	-77.56	-0.35	CdSb
CdSe	-20.36	-40.56	-20.20	CdSe
CdSeO4:2H2O	-16.78	-18.63	-1.85	CdSeO4:2H2O
CdSO4	-10.61	-10.78	-0.17	CdSO4
CdSO4:1H2O	-9.05	-10.78	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.91	-10.78	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.44	-11.19	-9.75	AgCl
Cerrusite	-2.11	-15.24	-13.13	PbCO3
CH4(g)	-82.46	-123.51	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-56.89	-91.81	-34.92	Cu2S
Chalcopyrite	-127.02	-162.29	-35.27	CuFeS2
Cinnabar	-51.98	-97.67	-45.69	HgS
Claudetite	-86.98	-90.04	-3.06	As4O6
Clausthalite	-14.65	-41.75	-27.10	PbSe
Co(BO2)2	-28.95	-1.88	27.07	Co(BO2)2
Co(OH)2	-5.89	7.20	13.09	Co(OH)2
Co(OH)3	-10.00	-12.31	-2.31	Co(OH)3
CO2(g)	-2.25	-20.40	-18.15	CO2

Co3(AsO4)2	-22.70	-9.66	13.03	Co3(AsO4)2
Co3O4	-6.93	-17.42	-10.50	Co3O4
CoCl2	-21.14	-12.87	8.27	CoCl2
CoCl2:6H2O	-15.41	-12.87	2.54	CoCl2:6H2O
CoCO3	-3.22	-13.20	-9.98	CoCO3
CoF2	-13.85	-15.44	-1.60	CoF2
CoF3	-44.82	-46.28	-1.46	CoF3
CoFe2O4	17.00	13.48	-3.53	CoFe2O4
CoMoO4	-5.88	-13.64	-7.76	CoMoO4
CoO	-6.39	7.20	13.59	CoO
CoS(alpha)	-71.93	-79.37	-7.44	CoS
CoS(beta)	-68.30	-79.37	-11.07	CoS
CoSe	-23.51	-39.71	-16.20	CoSe
CoSeO3	-8.56	-7.24	1.32	CoSeO3
CoSeO4:6H2O	-16.25	-17.78	-1.53	CoSeO4:6H2O
CoSO4	-12.73	-9.93	2.80	CoSO4
CoSO4:6H2O	-7.46	-9.93	-2.47	CoSO4:6H2O
Cotunnite	-10.13	-14.91	-4.78	PbCl2
Covellite	-56.69	-78.99	-22.30	CuS
Cr(OH)2	-22.15	-11.33	10.82	Cr(OH)2
Cr(OH)3	-2.72	-1.39	1.34	Cr(OH)3
Cr(OH)3(am)	-0.64	-1.39	-0.75	Cr(OH)3
Cr2O3	-0.42	-2.78	-2.36	Cr2O3
CrCl2	-45.49	-31.40	14.09	CrCl2
CrCl3	-46.61	-31.50	15.11	CrCl3
CrF3	-24.02	-35.35	-11.34	CrF3
Crmetal	-67.59	-37.11	30.48	Cr
CrO3	-26.89	-30.10	-3.21	CrO3
Cryolite	-8.53	-42.37	-33.84	Na3AlF6
Cu(OH)2	-1.10	7.58	8.67	Cu(OH)2
Cu(SbO3)2	-25.02	20.19	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.43	-0.18	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.96	-91.84	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.35	-52.15	-45.80	Cu2Se
Cu2SO4	-20.42	-22.37	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.63	-8.53	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-62.06	-104.65	-42.59	Cu3Sb
Cu3Se2	-27.99	-91.48	-63.49	Cu3Se2
CuCO3	-1.32	-12.82	-11.50	CuCO3
CuCrO4	-17.08	-22.52	-5.44	CuCrO4
CuF	-9.03	-13.94	-4.91	CuF
CuF2	-16.18	-15.06	1.12	CuF2
CuF2:2H2O	-10.51	-15.06	-4.55	CuF2:2H2O
Cumetal	-6.75	-15.51	-8.76	Cu
CuMoO4	-0.18	-13.26	-13.08	CuMoO4
CuOCuSO4	-12.27	-1.97	10.30	CuOCuSO4
Cupricferrite	7.87	13.86	5.99	CuFe2O4
Cuprite	-3.83	-5.24	-1.41	Cu2O
Cuprousferrite	9.44	0.52	-8.92	CuFeO2
CuSe	-6.23	-39.33	-33.10	CuSe
CuSe2	-27.10	-60.47	-33.37	CuSe2
CuSeO3:2H2O	-7.38	-6.86	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.96	-17.40	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.87	9.74	6.87	AlOOH
Djurleite	-57.05	-90.97	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.26	-16.80	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.29	-16.80	-17.09	CaMg(CO3)2
Epsomite	-2.97	-5.09	-2.13	MgSO4:7H2O
Fe(OH)2	-10.28	3.28	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.17	0.13	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.87	-13.59	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.72	-8.17	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.43	-37.05	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.37	-45.11	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.67	9.56	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.89	-12.49	0.40	FeAsO4:2H2O
FeCr2O4	-6.69	0.51	7.20	FeCr2O4

FeMoO4	-7.47	-17.56	-10.09	FeMoO4
Ferrihydrite	-0.05	3.14	3.19	Fe(OH)3
Ferroselite	-46.17	-64.77	-18.60	FeSe2
FeS(ppt)	-80.34	-83.29	-2.95	FeS
FeSe	-32.63	-43.63	-11.00	FeSe
Fix_pe	-5.49	-5.49	0.00	e-
Fluorite	-0.17	-10.67	-10.50	CaF2
Galena	-67.44	-81.41	-13.97	PbS
Gibbsite	1.45	9.74	8.29	Al(OH)3
Goethite	2.65	3.14	0.49	FeOOH
Goslarite	-6.11	-8.12	-2.01	ZnSO4·7H2O
Greenockite	-65.86	-80.22	-14.36	CdS
Greigite	-291.70	-336.73	-45.03	Fe3S4
Gummite	-5.96	1.71	7.67	UO3
Gypsum	-0.55	-5.16	-4.61	CaSO4·2H2O
H-Jarosite	-12.74	-24.84	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.96	-20.84	-12.88	H2MoO4
H2S(g)	-78.56	-86.57	-8.01	H2S
H2Se(g)	-41.95	-46.91	-4.96	H2Se
Halite	-6.37	-4.77	1.60	NaCl
Hausmannite	-5.15	55.88	61.03	Mn3O4
Hematite	7.69	6.28	-1.42	Fe2O3
Hercynite	-0.12	22.77	22.89	FeAl2O4
Hg(CH3)2(g)	-184.40	-258.11	-73.71	Hg(CH3)2
Hg(g)	-7.41	-15.28	-7.87	Hg
Hg(OH)2	-7.60	-11.10	-3.50	Hg(OH)2
Hg2(g)	-15.61	-30.56	-14.96	Hg2
Hg2(OH)2	-10.05	-4.79	5.26	Hg2(OH)2
Hg2CO3	-9.14	-25.19	-16.05	Hg2CO3
Hg2CrO4	-26.19	-34.89	-8.70	Hg2CrO4
Hg2F2	-17.07	-27.43	-10.36	Hg2F2
Hg2S	-79.68	-91.36	-11.68	Hg2S
Hg2SeO3	-14.57	-19.23	-4.66	Hg2SeO3
Hg2SO4	-15.78	-21.91	-6.13	Hg2SO4
Hg3O2CO3	-24.01	-53.69	-29.68	Hg3O2CO3
HgCl(g)	-31.93	-12.43	19.50	HgCl
HgCl2	-9.91	-31.17	-21.26	HgCl2
HgF(g)	-46.39	-13.71	32.68	HgF
HgF2(g)	-46.31	-33.74	12.57	HgF2
Hgmetal(l)	-1.83	-15.28	-13.45	Hg
HgSe	-2.32	-58.01	-55.69	HgSe
HgSeO3	-13.11	-25.54	-12.43	HgSeO3
HgSO4	-18.81	-28.23	-9.42	HgSO4
Huntite	-3.56	-33.53	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.54	-25.31	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.67	-21.43	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-14.50	-19.67	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.20	-20.00	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-33.26	-50.51	-17.24	K2Cr2O7
K2CrO4	-19.89	-20.41	-0.51	K2CrO4
K2MoO4	-14.41	-11.15	3.26	K2MoO4
K2SeO4	-14.55	-15.28	-0.73	K2SeO4
Langite	-4.30	13.19	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.37	-6.80	-0.43	PbO·PbSO4
Laurionite	-5.50	-4.87	0.62	PbOHCl
Lepidocrocite	1.77	3.14	1.37	FeOOH
Lime	-20.73	11.97	32.70	CaO
Litharge	-7.53	5.16	12.69	PbO
Mackinawite	-79.69	-83.29	-3.60	FeS
Maghemite	-0.11	6.28	6.39	Fe2O3
Magnesioferrite	1.45	18.31	16.86	Fe2MgO4
Magnesite	-0.91	-8.37	-7.46	MgCO3
Magnetite	6.16	9.56	3.40	Fe3O4
Malachite	0.06	-5.24	-5.31	Cu2(OH)2CO3
Manganite	-2.42	22.92	25.34	MnOOH
Massicot	-7.73	5.16	12.89	PbO
Matlockite	-7.22	-16.19	-8.97	PbClF
Melanothallite	-18.75	-12.49	6.26	CuCl2

Melanterite	-11.64	-13.85	-2.21	FeSO4:7H2O
Metacinnabar	-52.58	-97.67	-45.09	HgS
Mg(OH)2(active)	-6.76	12.03	18.79	Mg(OH)2
Mg(VO3)2	-16.12	-4.84	11.28	Mg(VO3)2
Mg2Sb3	-276.57	-201.88	74.68	Mg2Sb3
Mg2V2O7	-19.16	7.20	26.36	Mg2V2O7
MgCr2O4	-6.94	9.26	16.20	MgCr2O4
MgCrO4	-23.44	-18.06	5.38	MgCrO4
MgF2	-2.48	-10.61	-8.13	MgF2
MgMoO4	-6.95	-8.80	-1.85	MgMoO4
MgSeO3:6H2O	-5.47	-2.41	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.74	-12.94	-1.20	MgSeO4:6H2O
Minium	-32.26	41.27	73.52	Pb3O4
Mirabilite	-5.48	-6.59	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.74	-6.84	4.90	Mn(VO3)2
Mn2(SO4)3	-50.53	-56.24	-5.71	Mn2(SO4)3
Mn2Sb	-150.70	-89.62	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.66	-1.16	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.76	-10.04	2.72	MnCl2:4H2O
MnS(grn)	-76.71	-76.54	0.17	MnS
MnS(pnk)	-79.88	-76.54	3.34	MnS
MnSb	-96.32	-99.23	-2.91	MnSb
MnSe	-40.38	-36.88	3.50	MnSe
MnSeO3	-5.54	-4.41	1.13	MnSeO3
MnSeO3:2H2O	-5.39	-4.41	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.89	-14.94	-2.05	MnSeO4:5H2O
MnSO4	-9.68	-7.09	2.58	MnSO4
Monteponite	-8.75	6.35	15.10	CdO
Montroydite	-7.46	-11.10	-3.64	HgO
MoO3	-12.84	-20.84	-8.00	MoO3
Morenosite	-7.65	-9.79	-2.14	NiSO4:7H2O
MoS2	-149.50	-219.76	-70.26	MoS2
Na-Jarosite	-8.37	-19.57	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.76	-49.66	-9.90	Na2Cr2O7
Na2CrO4	-22.49	-19.56	2.93	Na2CrO4
Na2Mo2O7	-14.54	-31.14	-16.60	Na2Mo2O7
Na2MoO4	-11.79	-10.30	1.49	Na2MoO4
Na2MoO4:2H2O	-11.52	-10.30	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.20	-3.90	10.30	Na2SeO3:5H2O
Na2SeO4	-15.72	-14.44	1.28	Na2SeO4
Na3Sb	-175.44	-80.99	94.45	Na3Sb
Na3VO4	-29.31	7.37	36.68	Na3VO4
Na4V2O7	-33.19	4.21	37.40	Na4V2O7
Nantokite	-5.93	-12.66	-6.73	CuCl
NaSb	-88.92	-65.75	23.17	NaSb
Natron	-8.55	-9.86	-1.31	Na2CO3:10H2O
NaVO3	-7.02	-3.17	3.86	NaVO3
Nesquehonite	-3.70	-8.37	-4.67	MgCO3:3H2O
Ni(OH)2	-5.46	7.34	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.95	-9.25	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.78	12.22	32.00	Ni4(OH)6SO4
NiCO3	-6.19	-13.06	-6.87	NiCO3
NiMoO4	-2.36	-13.50	-11.14	NiMoO4
NiS(alpha)	-73.64	-79.24	-5.60	NiS
NiS(beta)	-68.14	-79.24	-11.10	NiS
NiS(gamma)	-66.44	-79.24	-12.80	NiS
NiSe	-21.87	-39.57	-17.70	NiSe
NiSeO3:2H2O	-9.92	-7.11	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.12	-17.64	-1.52	NiSeO4:6H2O
Nsutite	-7.04	10.46	17.50	MnO2
O2(g)	-31.54	51.55	83.09	O2
Orpiment	-243.67	-304.74	-61.07	As2S3
Otavite	-2.05	-14.05	-12.00	CdCO3
Pb(BO2)2	-10.44	-3.92	6.52	Pb(BO2)2
Pb(OH)2	-2.99	5.16	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.02	-70.78	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.50	0.29	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.86	10.33	26.19	Pb2O(OH)2

Pb2O3	-24.94	36.10	61.04	Pb2O3
Pb2OCO3	-9.52	-10.07	-0.56	Pb2OCO3
Pb2V2O7	-4.65	-6.55	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.57	-15.77	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.52	-1.38	6.14	Pb3(VO4)2
Pb3O2CO3	-15.93	-4.91	11.02	Pb3O2CO3
Pb3O2SO4	-12.32	-1.64	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.58	3.52	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.35	3.53	21.88	Pb4O3SO4
PbCrO4	-12.34	-24.94	-12.60	PbCrO4
PbF2	-10.04	-17.48	-7.44	PbF2
Pbmetal	-24.86	-20.61	4.25	Pb
PbMoO4	-0.06	-15.68	-15.62	PbMoO4
PbO:0.3H2O	-7.82	5.16	12.98	PbO:0.33H2O
PbSeO4	-12.97	-19.81	-6.84	PbSeO4
Periclase	-9.55	12.03	21.58	MgO
Phosgenite	-10.34	-30.15	-19.81	PbCl2:PbCO3
Plattnerite	-18.66	30.94	49.60	PbO2
Portlandite	-10.84	11.97	22.80	Ca(OH)2
Pyrite	-125.58	-144.09	-18.51	FeS2
Pyrochroite	-5.16	10.03	15.19	Mn(OH)2
Pyrolusite	-5.57	35.81	41.38	MnO2
Realgar	-102.22	-121.97	-19.75	AsS
Retgersite	-7.75	-9.79	-2.04	NiSO4:6H2O
Rhodochrosite	0.21	-10.37	-10.58	MnCO3
Rutherfordine	-4.19	-18.69	-14.50	UO2CO3
Sb(OH)3	-12.36	-19.47	-7.11	Sb(OH)3
Sb2O4	-16.56	-13.16	3.40	Sb2O4
Sb2O5	-26.34	-36.00	-9.67	Sb2O5
Sb2Se3	-111.92	-179.67	-67.76	Sb2Se3
Sb4O6(cubic)	-59.61	-77.88	-18.26	Sb4O6
Sb4O6(orth)	-59.97	-77.88	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-43.21	-53.43	-10.23	SbF3
Sbmetal	-46.44	-58.13	-11.69	Sb
SbO2	-3.07	-30.89	-27.82	SbO2
Schoepite	-4.28	1.71	5.99	UO2(OH)2:H2O
Semetal(am)	-14.03	-21.14	-7.11	Se
Semetal(hex)	-13.43	-21.14	-7.71	Se
Senarmontite	-26.57	-38.94	-12.37	Sb2O3
SeO2	-14.57	-14.44	0.12	SeO2
SeO3	-46.02	-24.97	21.04	SeO3
Siderite	-6.88	-17.12	-10.24	FeCO3
Smithsonite	-1.40	-11.40	-10.00	ZnCO3
Sphalerite	-66.12	-77.57	-11.45	ZnS
Spinel	-5.32	31.52	36.85	MgAl2O4
Stibnite	-248.20	-298.66	-50.46	Sb2S3
Sulfur	-58.65	-60.80	-2.14	S
Tenorite	-0.06	7.58	7.64	CuO
Thenardite	-6.91	-6.59	0.32	Na2SO4
Thermonatrite	-10.50	-9.86	0.64	Na2CO3:H2O
Tyuyamunite	-5.56	-1.48	4.08	Ca(UO2)2(VO4)2
U3O8	-14.08	7.00	21.08	U3O8
U3Sb4	-584.12	-431.74	152.38	U3Sb4
U4O9	-30.60	-33.62	-3.02	U4O9
UF4	-30.60	-60.13	-29.54	UF4
UF4:2.5H2O	-27.42	-60.14	-32.72	UF4:2.5H2O
UO2(am)	-15.78	-14.85	0.93	UO2
UO2(NO3)2	-41.12	-28.97	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.82	-28.97	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.36	-28.97	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.02	-28.97	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.90	1.71	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.01	-23.26	-2.25	UO2SeO4:4H2O
UO3	-5.99	1.71	7.70	UO3
Uraninite	-10.18	-14.85	-4.67	UO2
USb2	-221.46	-191.88	29.58	USb2
V(OH)3	-19.20	-11.61	7.59	V(OH)3

V2O5	-15.51	-16.87	-1.36	V2O5
V3O5	-40.88	-39.04	1.84	V3O5
V4O7	-50.65	-43.46	7.19	V4O7
V6O13	-41.31	-102.17	-60.86	V6O13
Valentinite	-30.46	-38.94	-8.48	Sb2O3
VC12	-63.45	-44.57	18.87	VC12
VC13	-65.16	-41.72	23.43	VC13
VF4	-64.64	-49.71	14.93	VF4
Vmetal	-94.30	-50.28	44.03	V
VO	-39.26	-24.50	14.76	VO
VO(OH)2	-9.57	-4.42	5.15	VO(OH)2
VO2Cl	-21.31	-18.47	2.84	VO2Cl
VOC1	-32.80	-21.65	11.15	VOC1
VOC12	-37.25	-24.49	12.76	VOC12
VOSO4	-25.16	-21.55	3.61	VOSO4
Witherite	-4.41	-12.98	-8.57	BaCO3
Wurtzite	-68.62	-77.57	-8.95	ZnS
Zincite	-2.33	9.01	11.33	ZnO
Zincosite	-12.05	-8.12	3.93	ZnSO4
Zn(BO2)2	-8.37	-0.08	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.99	-21.68	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.19	9.01	12.20	Zn(OH)2
Zn(OH)2(am)	-3.47	9.01	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.75	9.01	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.53	9.01	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.73	9.01	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.62	0.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.22	7.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.90	-4.25	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.15	-7.24	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.51	18.89	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.55	24.95	38.50	Zn5(OH)8Cl2
ZnCl2	-18.12	-11.07	7.05	ZnCl2
ZnCO3:1H2O	-1.14	-11.40	-10.26	ZnCO3:1H2O
ZnF2	-13.10	-13.64	-0.53	ZnF2
Znmetal	-42.56	-16.77	25.79	Zn
ZnMoO4	-1.71	-11.83	-10.13	ZnMoO4
ZnO(active)	-2.18	9.01	11.19	ZnO
ZnS(am)	-68.52	-77.57	-9.05	ZnS
ZnSb	-85.92	-74.90	11.01	ZnSb
ZnSe	-23.51	-37.91	-14.40	ZnSe
ZnSeO4:6H2O	-14.45	-15.97	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.48	-8.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 65.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0
EQUILIBRIUM_PHASES 305
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0

```

```

Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 313
SAVE Solution 314 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 305
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.

```

Using solution 313. Solution after simulation 64.
Using pure phase assemblage 305.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	5.004e-09	5.004e-09
Alunite	-2.58	-3.98	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.88	-5.24	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	6.040e-11	6.040e-11
Barite	0.00	-9.98	-9.98	0.000e+00	4.301e-08	4.301e-08
Brochantite	0.00	15.22	15.22	0.000e+00	1.619e-07	1.619e-07
Brucite	-3.51	13.33	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.184e-03
CaMoO4	-1.01	-8.96	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-4.95	-2.14	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	9.989e-04	9.989e-04
Carnotite	-1.06	-0.83	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.34	-1.50	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.34	-14.49	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.894e-10	6.894e-10
Cu2Se(alpha)	-4.63	-50.43	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.65	-13.72	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.95	-5.08	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	1.155e-09	1.155e-09
Fluorite	-0.27	-10.77	-10.50	0.000e+00	0	0.000e+00
Gummite	-4.77	2.90	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.63	-5.24	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.71	-58.40	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.46	-6.57	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.09	-3.96	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.13	8.66	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.92	-8.22	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.11	-12.98	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.33	-13.47	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.337e-07
Otavite	-2.01	-14.01	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.11	-15.73	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.25	-18.75	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.60	-31.42	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.10	2.90	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.57	0.51	4.08	0.000e+00	0	0.000e+00
U3O8	-10.28	10.80	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.71	2.90	5.61	0.000e+00	0	0.000e+00
UO3	-4.80	2.90	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.71	-11.84	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	1.005e-08	1.005e-08
Al	3.622e-06	3.622e-06
As	1.692e-10	1.692e-10
B	2.902e-05	2.902e-05
Ba	4.447e-08	4.447e-08
C	6.986e-04	6.986e-04
Ca	3.744e-03	3.744e-03
Cd	1.317e-08	1.317e-08
Cl	2.793e-03	2.793e-03
Co	9.603e-08	9.603e-08
Cr	1.044e-09	1.044e-09

Cu	5.183e-07	5.184e-07
F	1.757e-04	1.757e-04
Fe	9.011e-10	9.011e-10
Hg	1.968e-09	1.968e-09
K	3.463e-03	3.463e-03
Mg	5.124e-03	5.124e-03
Mn	6.007e-05	6.007e-05
Mo	1.940e-06	1.940e-06
N	9.004e-06	9.004e-06
Na	9.115e-03	9.115e-03
Ni	1.194e-07	1.194e-07
Pb	3.500e-09	3.500e-09
S	1.338e-02	1.338e-02
Sb	2.734e-08	2.734e-08
Se	1.351e-07	1.351e-07
U	3.578e-07	3.578e-07
V	6.672e-09	6.673e-09
Zn	5.619e-06	5.619e-06

-----Description of solution-----

	pH	=	8.051	Charge balance
	pe	=	4.722	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.052e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	7.248e-04	
	Total CO2 (mol/kg)	=	6.986e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.065e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	8	
	Total H	=	1.110174e+02	
	Total O	=	5.556404e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.370e-06	1.131e-06	-5.863	-5.947	-0.083	(0)
H+	1.068e-08	8.899e-09	-7.971	-8.051	-0.079	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.005e-08					
AgCl	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
AgCl2-	1.678e-09	1.325e-09	-8.775	-8.878	-0.103	(0)
Ag+	1.651e-09	1.376e-09	-8.782	-8.861	-0.079	(0)
AgSO4-	1.705e-10	1.346e-10	-9.768	-9.871	-0.103	(0)
AgCl3-2	7.071e-12	2.747e-12	-11.151	-11.561	-0.411	(0)
AgNO2	2.109e-12	2.109e-12	-11.676	-11.676	0.000	(0)
AgF	4.184e-13	4.184e-13	-12.378	-12.378	0.000	(0)
AgOH	1.556e-13	1.556e-13	-12.808	-12.808	0.000	(0)
AgCl4-3	1.095e-13	1.305e-14	-12.960	-13.884	-0.924	(0)
AgH2BO3	3.818e-14	3.818e-14	-13.418	-13.418	0.000	(0)
AgSeO3-	2.794e-14	2.206e-14	-13.554	-13.656	-0.103	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	9.879e-15	7.799e-15	-14.005	-14.108	-0.103	(0)
Ag(NO2)2-	3.035e-17	2.396e-17	-16.518	-16.620	-0.103	(0)
Ag(OH)2-	2.178e-17	1.719e-17	-16.662	-16.765	-0.103	(0)
AgNO3	7.564e-18	7.564e-18	-17.121	-17.121	0.000	(0)
Ag(NH3)2+	2.229e-19	1.760e-19	-18.652	-18.754	-0.103	(0)
Ag(SeO3)2-3	4.136e-20	4.927e-21	-19.383	-20.307	-0.924	(0)
Ag2MoO4	6.698e-25	6.698e-25	-24.174	-24.174	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.926	-73.926	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-81.632	-83.274	-1.643	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-147.931	-148.138	-0.206	(0)

	Ag (HS) 2-	0.000e+00	0.000e+00	-148.602	-148.705	-0.103	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.151	-149.527	-0.376	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.481	-149.838	-0.357	(0)
Al	3.622e-06						
	Al (OH) 4-	3.600e-06	3.000e-06	-5.444	-5.523	-0.079	(0)
	Al (OH) 3	2.108e-08	2.108e-08	-7.676	-7.676	0.000	(0)
	Al (OH) 2+	1.112e-09	9.341e-10	-8.954	-9.030	-0.076	(0)
	AlF3	8.181e-11	8.181e-11	-10.087	-10.087	0.000	(0)
	AlF2+	6.388e-11	5.367e-11	-10.195	-10.270	-0.076	(0)
	AlF4-	5.956e-12	4.964e-12	-11.225	-11.304	-0.079	(0)
	AlF+2	2.235e-12	1.113e-12	-11.651	-11.953	-0.303	(0)
	AlOH+2	2.087e-12	1.040e-12	-11.680	-11.983	-0.303	(0)
	AlSO4+	4.200e-14	3.501e-14	-13.377	-13.456	-0.079	(0)
	Al+3	4.753e-15	9.196e-16	-14.323	-15.036	-0.713	(0)
	Al (SO4) 2-	2.207e-15	1.840e-15	-14.656	-14.735	-0.079	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.598	-44.522	-0.924	(0)
As (3)	1.918e-24						
	H3AsO3	1.787e-24	1.787e-24	-23.748	-23.748	0.000	(0)
	H2AsO3-	1.305e-25	1.030e-25	-24.885	-24.987	-0.103	(0)
	HAsO3-2	2.717e-29	1.056e-29	-28.566	-28.977	-0.411	(0)
	H4AsO3+	9.981e-33	7.880e-33	-32.001	-32.103	-0.103	(0)
	AsO3-3	3.838e-34	4.572e-35	-33.416	-34.340	-0.924	(0)
As (5)	1.692e-10						
	HAsO4-2	1.625e-10	6.312e-11	-9.789	-10.200	-0.411	(0)
	H2AsO4-	6.489e-12	5.123e-12	-11.188	-11.290	-0.103	(0)
	AsO4-3	1.883e-13	2.243e-14	-12.725	-13.649	-0.924	(0)
	H3AsO4	7.849e-18	7.922e-18	-17.105	-17.101	0.004	(0)
B	2.902e-05						
	H3BO3	2.658e-05	2.683e-05	-4.575	-4.571	0.004	(0)
	H2BO3-	2.145e-06	1.751e-06	-5.669	-5.757	-0.088	(0)
	CaH2BO3+	1.437e-07	1.173e-07	-6.843	-6.931	-0.088	(0)
	MgH2BO3+	1.273e-07	1.039e-07	-6.895	-6.983	-0.088	(0)
	NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
	BF (OH) 3-	1.588e-09	1.296e-09	-8.799	-8.887	-0.088	(0)
	H5 (BO3) 2-	4.897e-11	3.998e-11	-10.310	-10.398	-0.088	(0)
	BaH2BO3+	1.415e-12	1.155e-12	-11.849	-11.937	-0.088	(0)
	BF2 (OH) 2-	1.830e-13	1.494e-13	-12.738	-12.826	-0.088	(0)
	H8 (BO3) 3-	1.314e-13	1.073e-13	-12.881	-12.970	-0.088	(0)
	AgH2BO3	3.818e-14	3.818e-14	-13.418	-13.418	0.000	(0)
	BF3OH-	7.676e-20	6.266e-20	-19.115	-19.203	-0.088	(0)
	BF4-	4.072e-25	3.324e-25	-24.390	-24.478	-0.088	(0)
Ba	4.447e-08						
	Ba+2	4.431e-08	2.135e-08	-7.354	-7.671	-0.317	(0)
	BaHCO3+	1.304e-10	1.101e-10	-9.885	-9.958	-0.074	(0)
	BaCO3	3.115e-11	3.115e-11	-10.506	-10.506	0.000	(0)
	BaH2BO3+	1.415e-12	1.155e-12	-11.849	-11.937	-0.088	(0)
	BaOH+	1.259e-13	1.054e-13	-12.900	-12.977	-0.077	(0)
	BaNO3+	9.383e-16	7.408e-16	-15.028	-15.130	-0.103	(0)
	BaNH3+2	9.629e-17	3.741e-17	-16.016	-16.427	-0.411	(0)
C (4)	6.986e-04						
	HCO3-	6.427e-04	5.400e-04	-3.192	-3.268	-0.076	(0)
	CaHCO3+	1.386e-05	1.170e-05	-4.858	-4.932	-0.074	(0)
	MgHCO3+	1.140e-05	9.458e-06	-4.943	-5.024	-0.081	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CO3-2	5.903e-06	2.845e-06	-5.229	-5.546	-0.317	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	4.050e-06	4.050e-06	-5.393	-5.393	0.000	(0)
	NaHCO3	2.247e-06	2.247e-06	-5.648	-5.648	0.000	(0)
	NaCO3-	4.665e-07	3.919e-07	-6.331	-6.407	-0.076	(0)
	CuCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
	ZnCO3	2.531e-07	2.531e-07	-6.597	-6.597	0.000	(0)
	UO2 (CO3) 3-4	2.530e-07	5.762e-09	-6.597	-8.239	-1.643	(0)
	MnHCO3+	2.227e-07	1.864e-07	-6.652	-6.730	-0.077	(0)
	UO2 (CO3) 2-2	1.040e-07	4.042e-08	-6.983	-7.393	-0.411	(0)
	ZnHCO3+	3.345e-08	2.641e-08	-7.476	-7.578	-0.103	(0)
	Cu (CO3) 2-2	6.699e-09	2.602e-09	-8.174	-8.585	-0.411	(0)
	NiCO3	3.868e-09	3.868e-09	-8.412	-8.412	0.000	(0)
	NiHCO3+	3.073e-09	2.426e-09	-8.512	-8.615	-0.103	(0)

	PbCO3	1.690e-09	1.690e-09	-8.772	-8.772	0.000	(0)
	CoHCO3+	1.381e-09	1.090e-09	-8.860	-8.962	-0.103	(0)
	CoCO3	1.248e-09	1.248e-09	-8.904	-8.904	0.000	(0)
	CuHCO3+	8.756e-10	6.913e-10	-9.058	-9.160	-0.103	(0)
	UO2CO3	7.121e-10	7.121e-10	-9.147	-9.147	0.000	(0)
	CdCO3	2.250e-10	2.250e-10	-9.648	-9.648	0.000	(0)
	BaHCO3+	1.304e-10	1.101e-10	-9.885	-9.958	-0.074	(0)
	PbHCO3+	1.004e-10	7.927e-11	-9.998	-10.101	-0.103	(0)
	Pb (CO3) 2-2	3.568e-11	1.386e-11	-10.448	-10.858	-0.411	(0)
	BaCO3	3.115e-11	3.115e-11	-10.506	-10.506	0.000	(0)
	CdHCO3+	5.404e-12	4.267e-12	-11.267	-11.370	-0.103	(0)
	Cd (CO3) 2-2	1.222e-12	4.746e-13	-11.913	-12.324	-0.411	(0)
	HgCO3	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
	FeHCO3+	1.803e-15	1.522e-15	-14.744	-14.818	-0.074	(0)
	Hg (CO3) 2-2	4.651e-17	1.807e-17	-16.332	-16.743	-0.411	(0)
	HgHCO3+	4.216e-19	3.328e-19	-18.375	-18.478	-0.103	(0)
Ca		3.744e-03					
	Ca+2	2.415e-03	1.164e-03	-2.617	-2.934	-0.317	(0)
	CaSO4	1.308e-03	1.308e-03	-2.884	-2.884	0.000	(0)
	CaHCO3+	1.386e-05	1.170e-05	-4.858	-4.932	-0.074	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.837e-06	1.538e-06	-5.736	-5.813	-0.077	(0)
	CaH2BO3+	1.437e-07	1.173e-07	-6.843	-6.931	-0.088	(0)
	CaOH+	3.111e-08	2.626e-08	-7.507	-7.581	-0.074	(0)
	CaNO3+	3.227e-11	2.548e-11	-10.491	-10.594	-0.103	(0)
	CaNH3+2	1.047e-11	4.069e-12	-10.980	-11.391	-0.411	(0)
	Ca (NH3) 2+2	1.158e-20	4.497e-21	-19.936	-20.347	-0.411	(0)
Cd		1.317e-08					
	Cd+2	7.202e-09	3.471e-09	-8.143	-8.460	-0.317	(0)
	CdSO4	3.990e-09	3.990e-09	-8.399	-8.399	0.000	(0)
	CdCl+	9.768e-10	7.712e-10	-9.010	-9.113	-0.103	(0)
	Cd (SO4) 2-2	6.794e-10	2.639e-10	-9.168	-9.579	-0.411	(0)
	CdCO3	2.250e-10	2.250e-10	-9.648	-9.648	0.000	(0)
	CdOH+	3.949e-11	3.117e-11	-10.404	-10.506	-0.103	(0)
	CdOHC1	3.577e-11	3.577e-11	-10.446	-10.446	0.000	(0)
	CdF+	8.436e-12	6.660e-12	-11.074	-11.177	-0.103	(0)
	CdCl2	7.480e-12	7.480e-12	-11.126	-11.126	0.000	(0)
	CdHCO3+	5.404e-12	4.267e-12	-11.267	-11.370	-0.103	(0)
	Cd (CO3) 2-2	1.222e-12	4.746e-13	-11.913	-12.324	-0.411	(0)
	Cd (OH) 2	2.224e-13	2.224e-13	-12.653	-12.653	0.000	(0)
	CdCl3-	1.391e-14	1.098e-14	-13.857	-13.959	-0.103	(0)
	CdF2	1.609e-15	1.609e-15	-14.793	-14.793	0.000	(0)
	CdNO3+	9.622e-17	7.596e-17	-16.017	-16.119	-0.103	(0)
	CdSeO4	6.984e-17	6.984e-17	-16.156	-16.156	0.000	(0)
	Cd (OH) 3-	1.946e-17	1.537e-17	-16.711	-16.813	-0.103	(0)
	Cd (SeO3) 2-2	4.582e-18	1.780e-18	-17.339	-17.750	-0.411	(0)
	Cd2OH+3	4.551e-18	5.422e-19	-17.342	-18.266	-0.924	(0)
	Cd (OH) 4-2	7.322e-24	2.844e-24	-23.135	-23.546	-0.411	(0)
	Cd (NO3) 2	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.228	-79.331	-0.103	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.005	-151.005	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-227.882	-227.984	-0.103	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.257	-304.667	-0.411	(0)
Cl		2.793e-03					
	Cl-	2.793e-03	2.327e-03	-2.554	-2.633	-0.079	(0)
	MnCl+	6.053e-08	5.068e-08	-7.218	-7.295	-0.077	(0)
	ZnOHC1	1.338e-08	1.338e-08	-7.874	-7.874	0.000	(0)
	ZnCl+	1.090e-08	9.038e-09	-7.963	-8.044	-0.081	(0)
	AgCl	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
	AgCl2-	1.678e-09	1.325e-09	-8.775	-8.878	-0.103	(0)
	CdCl+	9.768e-10	7.712e-10	-9.010	-9.113	-0.103	(0)
	CuCl	5.523e-10	5.523e-10	-9.258	-9.258	0.000	(0)
	CuCl2-	3.237e-10	2.685e-10	-9.490	-9.571	-0.081	(0)
	NiCl+	2.748e-10	2.170e-10	-9.561	-9.664	-0.103	(0)
	CoCl+	2.647e-10	2.089e-10	-9.577	-9.680	-0.103	(0)
	MnCl2	1.666e-10	1.666e-10	-9.778	-9.778	0.000	(0)
	CuCl+	9.020e-11	7.482e-11	-10.045	-10.126	-0.081	(0)
	CdOHC1	3.577e-11	3.577e-11	-10.446	-10.446	0.000	(0)

ZnCl2	3.333e-11	3.333e-11	-10.477	-10.477	0.000	(0)
PbCl+	2.066e-11	1.631e-11	-10.685	-10.788	-0.103	(0)
CdCl2	7.480e-12	7.480e-12	-11.126	-11.126	0.000	(0)
AgCl3-2	7.071e-12	2.747e-12	-11.151	-11.561	-0.411	(0)
HgClOH	2.741e-12	2.741e-12	-11.562	-11.562	0.000	(0)
HgCl2	3.194e-13	3.194e-13	-12.496	-12.496	0.000	(0)
CuCl3-2	2.719e-13	1.336e-13	-12.566	-12.874	-0.309	(0)
PbCl2	1.695e-13	1.695e-13	-12.771	-12.771	0.000	(0)
MnCl3-	1.275e-13	1.068e-13	-12.894	-12.972	-0.077	(0)
AgCl4-3	1.095e-13	1.305e-14	-12.960	-13.884	-0.924	(0)
ZnCl3-	7.426e-14	6.160e-14	-13.129	-13.210	-0.081	(0)
CuCl2	6.037e-14	6.037e-14	-13.219	-13.219	0.000	(0)
CdCl3-	1.391e-14	1.098e-14	-13.857	-13.959	-0.103	(0)
HgCl3-	9.414e-15	7.432e-15	-14.026	-14.129	-0.103	(0)
NiCl2	2.542e-15	2.542e-15	-14.595	-14.595	0.000	(0)
UO2Cl+	3.005e-16	2.373e-16	-15.522	-15.625	-0.103	(0)
PbCl3-	1.989e-16	1.570e-16	-15.701	-15.804	-0.103	(0)
HgCl4-2	1.772e-16	6.885e-17	-15.751	-16.162	-0.411	(0)
ZnCl4-2	1.459e-16	7.167e-17	-15.836	-16.145	-0.309	(0)
HgCl+	3.469e-17	2.739e-17	-16.460	-16.562	-0.103	(0)
CuCl3-	1.580e-18	1.311e-18	-17.801	-17.882	-0.081	(0)
CrCl+2	1.342e-18	5.214e-19	-17.872	-18.283	-0.411	(0)
PbCl4-2	4.300e-19	1.670e-19	-18.367	-18.777	-0.411	(0)
CrOHC12	2.608e-20	2.608e-20	-19.584	-19.584	0.000	(0)
FeCl+2	1.567e-22	7.702e-23	-21.805	-22.113	-0.309	(0)
CrCl2+	1.458e-22	1.151e-22	-21.836	-21.939	-0.103	(0)
CuCl4-2	3.111e-23	1.529e-23	-22.507	-22.816	-0.309	(0)
VOCl+	5.266e-24	4.157e-24	-23.279	-23.381	-0.103	(0)
FeCl2+	9.561e-25	8.005e-25	-24.019	-24.097	-0.077	(0)
CrO3Cl-	3.470e-26	2.739e-26	-25.460	-25.562	-0.103	(0)
FeCl3	1.863e-28	1.863e-28	-27.730	-27.730	0.000	(0)
CoCl+2	6.637e-36	2.578e-36	-35.178	-35.589	-0.411	(0)
UCl+3	0.000e+00	0.000e+00	-45.641	-46.565	-0.924	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
Co (2)	9.603e-08					
Co+2	6.682e-08	2.596e-08	-7.175	-7.586	-0.411	(0)
CoSO4	2.540e-08	2.540e-08	-7.595	-7.595	0.000	(0)
CoHCO3+	1.381e-09	1.090e-09	-8.860	-8.962	-0.103	(0)
CoCO3	1.248e-09	1.248e-09	-8.904	-8.904	0.000	(0)
CoOH+	7.418e-10	5.857e-10	-9.130	-9.232	-0.103	(0)
CoCl+	2.647e-10	2.089e-10	-9.577	-9.680	-0.103	(0)
CoF+	1.259e-10	9.938e-11	-9.900	-10.003	-0.103	(0)
Co (OH) 2	5.261e-11	5.261e-11	-10.279	-10.279	0.000	(0)
CoNO2+	1.700e-12	1.342e-12	-11.770	-11.872	-0.103	(0)
Co (NH3) +2	2.230e-14	8.665e-15	-13.652	-14.062	-0.411	(0)
Co (OH) 3-	1.503e-15	1.187e-15	-14.823	-14.926	-0.103	(0)
CoSeO4	1.406e-15	1.406e-15	-14.852	-14.852	0.000	(0)
CoOOH-	3.774e-16	2.980e-16	-15.423	-15.526	-0.103	(0)
CoNO3+	3.607e-16	2.848e-16	-15.443	-15.546	-0.103	(0)
Co2OH+3	6.395e-18	7.619e-19	-17.194	-18.118	-0.924	(0)
Co (NH3) 2+2	2.642e-21	1.026e-21	-20.578	-20.989	-0.411	(0)
Co (OH) 4-2	5.476e-22	2.127e-22	-21.262	-21.672	-0.411	(0)
Co (NO3) 2	4.010e-24	4.010e-24	-23.397	-23.397	0.000	(0)
Co4 (OH) 4+4	1.031e-27	2.347e-29	-26.987	-28.629	-1.643	(0)
Co (NH3) 3+2	9.234e-29	3.587e-29	-28.035	-28.445	-0.411	(0)
Co (NH3) 4+2	1.346e-36	5.227e-37	-35.871	-36.282	-0.411	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-44.618	-0.411	(0)
Co (3)	8.056e-29					
CoOH+2	8.056e-29	3.129e-29	-28.094	-28.505	-0.411	(0)
Co+3	2.815e-35	5.446e-36	-34.551	-35.264	-0.713	(0)
CoCl+2	6.637e-36	2.578e-36	-35.178	-35.589	-0.411	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.393	-66.803	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
Cr (2)	2.020e-27					

Cr+2	2.020e-27	7.849e-28	-26.695	-27.105	-0.411	(0)
Cr (3)	1.044e-09					
Cr (OH) 2+	7.466e-10	5.894e-10	-9.127	-9.230	-0.103	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.693e-11	1.337e-11	-10.771	-10.874	-0.103	(0)
Cr (OH) 4-	1.428e-11	1.127e-11	-10.845	-10.948	-0.103	(0)
Cr (OH) +2	1.103e-11	4.284e-12	-10.958	-11.368	-0.411	(0)
CrOHSO4	4.985e-12	4.985e-12	-11.302	-11.302	0.000	(0)
CrF+2	8.553e-15	3.323e-15	-14.068	-14.479	-0.411	(0)
CrSO4+	2.512e-15	1.983e-15	-14.600	-14.703	-0.103	(0)
Cr+3	1.453e-15	1.732e-16	-14.838	-15.762	-0.924	(0)
CrCl+2	1.342e-18	5.214e-19	-17.872	-18.283	-0.411	(0)
CrOHC12	2.608e-20	2.608e-20	-19.584	-19.584	0.000	(0)
Cr2 (OH) 2SO4+2	4.969e-21	1.930e-21	-20.304	-20.714	-0.411	(0)
Cr2 (OH) 2 (SO4) 2	5.623e-22	5.623e-22	-21.250	-21.250	0.000	(0)
CrCl2+	1.458e-22	1.151e-22	-21.836	-21.939	-0.103	(0)
CrNO3+2	1.349e-25	5.239e-26	-24.870	-25.281	-0.411	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.708	-44.118	-0.411	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.177	-54.101	-0.924	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
Cr (6)	1.585e-14					
CrO4-2	1.515e-14	7.300e-15	-13.820	-14.137	-0.317	(0)
NaCrO4-	3.399e-16	2.684e-16	-15.469	-15.571	-0.103	(0)
HCrO4-	2.663e-16	2.102e-16	-15.575	-15.677	-0.103	(0)
KCrO4-	9.583e-17	7.565e-17	-16.019	-16.121	-0.103	(0)
CrO3SO4-2	7.197e-24	2.796e-24	-23.143	-23.554	-0.411	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.470e-26	2.739e-26	-25.460	-25.562	-0.103	(0)
Cr2O7-2	3.946e-30	1.533e-30	-29.404	-29.814	-0.411	(0)
Cu (1)	1.115e-09					
CuCl	5.523e-10	5.523e-10	-9.258	-9.258	0.000	(0)
CuCl2-	3.237e-10	2.685e-10	-9.490	-9.571	-0.081	(0)
Cu+	2.388e-10	1.886e-10	-9.622	-9.725	-0.103	(0)
CuCl3-2	2.719e-13	1.336e-13	-12.566	-12.874	-0.309	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.625	-147.991	-0.367	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.373	-148.721	-0.348	(0)
Cu (2)	5.172e-07					
CuCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
CuOH+	8.747e-08	7.256e-08	-7.058	-7.139	-0.081	(0)
Cu+2	4.210e-08	2.029e-08	-7.376	-7.693	-0.317	(0)
CuSO4	2.279e-08	2.279e-08	-7.642	-7.642	0.000	(0)
Cu (OH) 2	1.637e-08	1.637e-08	-7.786	-7.786	0.000	(0)
Cu (CO3) 2-2	6.699e-09	2.602e-09	-8.174	-8.585	-0.411	(0)
CuHCO3+	8.756e-10	6.913e-10	-9.058	-9.160	-0.103	(0)
Cu2 (OH) 2+2	3.404e-10	1.322e-10	-9.468	-9.879	-0.411	(0)
CuF+	1.963e-10	1.550e-10	-9.707	-9.810	-0.103	(0)
CuCl+	9.020e-11	7.482e-11	-10.045	-10.126	-0.081	(0)
Cu (OH) 3-	4.810e-11	3.797e-11	-10.318	-10.421	-0.103	(0)
CuNO2+	1.974e-11	1.559e-11	-10.705	-10.807	-0.103	(0)
CuNH3+2	1.484e-12	5.765e-13	-11.829	-12.239	-0.411	(0)
CuCl2	6.037e-14	6.037e-14	-13.219	-13.219	0.000	(0)
Cu (NO2) 2	1.170e-15	1.170e-15	-14.932	-14.932	0.000	(0)
Cu (OH) 4-2	8.699e-16	3.379e-16	-15.061	-15.471	-0.411	(0)
CuNO3+	5.625e-16	4.441e-16	-15.250	-15.353	-0.103	(0)
CuCl3-	1.580e-18	1.311e-18	-17.801	-17.882	-0.081	(0)
CuCl4-2	3.111e-23	1.529e-23	-22.507	-22.816	-0.309	(0)
Cu (NO3) 2	3.870e-25	3.870e-25	-24.412	-24.412	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.328	-218.430	-0.103	(0)
F	1.757e-04					
F-	1.453e-04	1.211e-04	-3.838	-3.917	-0.079	(0)
MgF+	2.790e-05	2.325e-05	-4.554	-4.634	-0.079	(0)
CaF+	1.837e-06	1.538e-06	-5.736	-5.813	-0.077	(0)
NaF	5.652e-07	5.652e-07	-6.248	-6.248	0.000	(0)
MnF+	9.961e-08	8.340e-08	-7.002	-7.079	-0.077	(0)
ZnF+	4.732e-09	3.736e-09	-8.325	-8.428	-0.103	(0)
HF	1.594e-09	1.594e-09	-8.798	-8.798	0.000	(0)
BF (OH) 3-	1.588e-09	1.296e-09	-8.799	-8.887	-0.088	(0)
CuF+	1.963e-10	1.550e-10	-9.707	-9.810	-0.103	(0)

NiF+	1.404e-10	1.108e-10	-9.853	-9.955	-0.103	(0)
CoF+	1.259e-10	9.938e-11	-9.900	-10.003	-0.103	(0)
AlF3	8.181e-11	8.181e-11	-10.087	-10.087	0.000	(0)
AlF2+	6.388e-11	5.367e-11	-10.195	-10.270	-0.076	(0)
CdF+	8.436e-12	6.660e-12	-11.074	-11.177	-0.103	(0)
AlF4-	5.956e-12	4.964e-12	-11.225	-11.304	-0.079	(0)
AlF+2	2.235e-12	1.113e-12	-11.651	-11.953	-0.303	(0)
PbF+	2.135e-12	1.686e-12	-11.671	-11.773	-0.103	(0)
UO2F+	1.331e-12	1.051e-12	-11.876	-11.978	-0.103	(0)
HF2-	8.889e-13	7.336e-13	-12.051	-12.135	-0.083	(0)
AgF	4.184e-13	4.184e-13	-12.378	-12.378	0.000	(0)
UO2F2	3.669e-13	3.669e-13	-12.435	-12.435	0.000	(0)
BF2 (OH) 2-	1.830e-13	1.494e-13	-12.738	-12.826	-0.088	(0)
UO2F3-	1.414e-14	1.116e-14	-13.850	-13.952	-0.103	(0)
CrF+2	8.553e-15	3.323e-15	-14.068	-14.479	-0.411	(0)
PbF2	4.017e-15	4.017e-15	-14.396	-14.396	0.000	(0)
CdF2	1.609e-15	1.609e-15	-14.793	-14.793	0.000	(0)
UO2F4-2	2.763e-17	1.073e-17	-16.559	-16.969	-0.411	(0)
H2F2	6.805e-18	6.805e-18	-17.167	-17.167	0.000	(0)
PbF3-	1.168e-18	9.224e-19	-17.932	-18.035	-0.103	(0)
VO2F	1.125e-18	1.125e-18	-17.949	-17.949	0.000	(0)
FeF2+	5.631e-19	4.715e-19	-18.249	-18.327	-0.077	(0)
FeF+2	2.961e-19	1.455e-19	-18.528	-18.837	-0.309	(0)
FeF3	8.054e-20	8.054e-20	-19.094	-19.094	0.000	(0)
BF3OH-	7.676e-20	6.266e-20	-19.115	-19.203	-0.088	(0)
VO2F2-	6.262e-20	4.944e-20	-19.203	-19.306	-0.103	(0)
VOF+	5.858e-22	4.625e-22	-21.232	-21.335	-0.103	(0)
VO2F3-2	1.922e-22	7.466e-23	-21.716	-22.127	-0.411	(0)
PbF4-2	1.376e-22	5.345e-23	-21.861	-22.272	-0.411	(0)
VOF2	2.100e-23	2.100e-23	-22.678	-22.678	0.000	(0)
HgF+	3.354e-24	2.648e-24	-23.474	-23.577	-0.103	(0)
BF4-	4.072e-25	3.324e-25	-24.390	-24.478	-0.088	(0)
VOF3-	1.143e-25	9.020e-26	-24.942	-25.045	-0.103	(0)
VO2F4-3	3.733e-26	4.448e-27	-25.428	-26.352	-0.924	(0)
Sb (OH) 2F	2.201e-26	2.201e-26	-25.657	-25.657	0.000	(0)
SbOF	2.165e-26	2.165e-26	-25.665	-25.665	0.000	(0)
VOF4-2	1.135e-28	4.408e-29	-27.945	-28.356	-0.411	(0)
UF3+	2.092e-36	1.652e-36	-35.679	-35.782	-0.103	(0)
UF2+2	2.216e-37	8.607e-38	-36.655	-37.065	-0.411	(0)
UF4	2.193e-38	2.193e-38	-37.659	-37.659	0.000	(0)
UF+3	4.740e-40	0.000e+00	-39.324	-40.248	-0.924	(0)
UF5-	1.333e-40	1.052e-40	-39.875	-39.978	-0.103	(0)
UF6-2	0.000e+00	0.000e+00	-41.004	-41.415	-0.411	(0)
Fe (2)	8.596e-13					
Fe+2	5.763e-13	2.239e-13	-12.239	-12.650	-0.411	(0)
FeSO4	2.695e-13	2.695e-13	-12.569	-12.569	0.000	(0)
FeOH+	1.204e-14	1.008e-14	-13.919	-13.997	-0.077	(0)
FeHCO3+	1.803e-15	1.522e-15	-14.744	-14.818	-0.074	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.867e-18	3.237e-18	-17.413	-17.490	-0.077	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.458	-161.458	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.197	-238.300	-0.103	(0)
Fe (3)	9.002e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	4.190e-10	3.521e-10	-9.378	-9.453	-0.076	(0)
Fe (OH) 4-	5.358e-11	4.502e-11	-10.271	-10.347	-0.076	(0)
FeOH+2	1.629e-15	8.002e-16	-14.788	-15.097	-0.309	(0)
FeF2+	5.631e-19	4.715e-19	-18.249	-18.327	-0.077	(0)
FeF+2	2.961e-19	1.455e-19	-18.528	-18.837	-0.309	(0)
FeF3	8.054e-20	8.054e-20	-19.094	-19.094	0.000	(0)
FeSO4+	7.203e-20	6.031e-20	-19.142	-19.220	-0.077	(0)
Fe (SO4) 2-	8.009e-21	6.323e-21	-20.096	-20.199	-0.103	(0)
Fe+3	5.665e-21	1.096e-21	-20.247	-20.960	-0.713	(0)
FeCl+2	1.567e-22	7.702e-23	-21.805	-22.113	-0.309	(0)
FeCl2+	9.561e-25	8.005e-25	-24.019	-24.097	-0.077	(0)
FeHSeO3+2	4.158e-25	1.615e-25	-24.381	-24.792	-0.411	(0)
Fe2 (OH) 2+4	9.311e-28	2.120e-29	-27.031	-28.674	-1.643	(0)
FeNO3+2	1.953e-28	7.586e-29	-27.709	-28.120	-0.411	(0)

	FeCl3	1.863e-28	1.863e-28	-27.730	-27.730	0.000	(0)
	Fe3(OH) 4+5	3.977e-35	1.079e-37	-34.400	-36.967	-2.567	(0)
H (0)	4.000e-29						
	H2	2.000e-29	2.019e-29	-28.699	-28.695	0.004	(0)
Hg (0)	1.961e-09						
	Hg	1.961e-09	1.961e-09	-8.708	-8.708	0.000	(0)
Hg (1)	4.043e-21						
	Hg2+2	2.021e-21	7.852e-22	-20.694	-21.105	-0.411	(0)
Hg (2)	7.788e-12						
	Hg(OH) 2	4.716e-12	4.760e-12	-11.326	-11.322	0.004	(0)
	HgClOH	2.741e-12	2.741e-12	-11.562	-11.562	0.000	(0)
	HgCl2	3.194e-13	3.194e-13	-12.496	-12.496	0.000	(0)
	HgCl3-	9.414e-15	7.432e-15	-14.026	-14.129	-0.103	(0)
	HgCO3	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
	HgCl4-2	1.772e-16	6.885e-17	-15.751	-16.162	-0.411	(0)
	Hg(CO3) 2-2	4.651e-17	1.807e-17	-16.332	-16.743	-0.411	(0)
	HgCl+	3.469e-17	2.739e-17	-16.460	-16.562	-0.103	(0)
	HgOH+	3.364e-17	2.656e-17	-16.473	-16.576	-0.103	(0)
	Hg(OH) 3-	8.583e-19	6.776e-19	-18.066	-18.169	-0.103	(0)
	HgHCO3+	4.216e-19	3.328e-19	-18.375	-18.478	-0.103	(0)
	Hg(NH3) 2+2	7.387e-21	2.870e-21	-20.132	-20.542	-0.411	(0)
	HgNH3+2	2.661e-21	1.034e-21	-20.575	-20.986	-0.411	(0)
	Hg+2	1.519e-21	5.900e-22	-20.819	-21.229	-0.411	(0)
	HgSO4	7.575e-22	7.575e-22	-21.121	-21.121	0.000	(0)
	HgF+	3.354e-24	2.648e-24	-23.474	-23.577	-0.103	(0)
	Hg(NH3) 3+2	8.165e-29	3.172e-29	-28.088	-28.499	-0.411	(0)
	HgNO3+	1.910e-30	1.508e-30	-29.719	-29.822	-0.103	(0)
	Hg(NH3) 4+2	1.801e-36	6.996e-37	-35.745	-36.155	-0.411	(0)
	Hg(NO3) 2	4.338e-39	4.338e-39	-38.363	-38.363	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.906	-139.008	-0.103	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.255	-139.666	-0.411	(0)
	Hg(HS) 2	0.000e+00	0.000e+00	-140.665	-140.665	0.000	(0)
K	3.463e-03						
	K+	3.348e-03	2.790e-03	-2.475	-2.554	-0.079	(0)
	KSO4-	1.153e-04	9.684e-05	-3.938	-4.014	-0.076	(0)
	KCrO4-	9.583e-17	7.565e-17	-16.019	-16.121	-0.103	(0)
Mg	5.124e-03						
	Mg+2	3.552e-03	1.712e-03	-2.450	-2.767	-0.317	(0)
	MgSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
	MgF+	2.790e-05	2.325e-05	-4.554	-4.634	-0.079	(0)
	MgHCO3+	1.140e-05	9.458e-06	-4.943	-5.024	-0.081	(0)
	MgCO3	4.050e-06	4.050e-06	-5.393	-5.393	0.000	(0)
	MgOH+	9.091e-07	7.706e-07	-6.041	-6.113	-0.072	(0)
	MgH2BO3+	1.273e-07	1.039e-07	-6.895	-6.983	-0.088	(0)
Mn (2)	6.007e-05						
	Mn+2	4.454e-05	1.730e-05	-4.351	-4.762	-0.411	(0)
	MnSO4	1.509e-05	1.509e-05	-4.821	-4.821	0.000	(0)
	MnHCO3+	2.227e-07	1.864e-07	-6.652	-6.730	-0.077	(0)
	MnF+	9.961e-08	8.340e-08	-7.002	-7.079	-0.077	(0)
	MnCl+	6.053e-08	5.068e-08	-7.218	-7.295	-0.077	(0)
	MnOH+	5.870e-08	4.914e-08	-7.231	-7.309	-0.077	(0)
	MnCl2	1.666e-10	1.666e-10	-9.778	-9.778	0.000	(0)
	MnSeO4	5.033e-13	5.033e-13	-12.298	-12.298	0.000	(0)
	MnNO3+	2.404e-13	1.898e-13	-12.619	-12.722	-0.103	(0)
	MnCl3-	1.275e-13	1.068e-13	-12.894	-12.972	-0.077	(0)
	Mn(OH) 3-	4.639e-16	3.884e-16	-15.334	-15.411	-0.077	(0)
	Mn(NO3) 2	3.300e-21	3.300e-21	-20.481	-20.481	0.000	(0)
	Mn(OH) 4-2	2.886e-21	1.418e-21	-20.540	-20.848	-0.309	(0)
	MnSe	0.000e+00	0.000e+00	-41.124	-41.124	0.000	(0)
Mn (3)	2.105e-25						
	Mn+3	2.105e-25	4.073e-26	-24.677	-25.390	-0.713	(0)
Mn (6)	2.607e-40						
	MnO4-2	2.607e-40	1.281e-40	-39.584	-39.892	-0.309	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.457	-44.543	-0.086	(0)
Mo	1.940e-06						
	MoO4-2	1.940e-06	9.349e-07	-5.712	-6.029	-0.317	(0)
	HMoO4-	2.097e-10	1.655e-10	-9.678	-9.781	-0.103	(0)

H2MoO4	1.079e-14	1.079e-14	-13.967	-13.967	0.000	(0)
Ag2MoO4	6.698e-25	6.698e-25	-24.174	-24.174	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.598	-44.522	-0.924	(0)
Mo7O24-6	0.000e+00	0.000e+00	-49.923	-53.619	-3.696	(0)
HMo7O24-5	0.000e+00	0.000e+00	-52.716	-55.283	-2.567	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.909	-58.551	-1.643	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.432	-63.356	-0.924	(0)
N (-3)	5.859e-08					
NH4+	5.308e-08	4.334e-08	-7.275	-7.363	-0.088	(0)
NH3	2.777e-09	2.777e-09	-8.556	-8.556	0.000	(0)
NH4SO4-	2.720e-09	2.277e-09	-8.565	-8.643	-0.077	(0)
CaNH3+2	1.047e-11	4.069e-12	-10.980	-11.391	-0.411	(0)
CuNH3+2	1.484e-12	5.765e-13	-11.829	-12.239	-0.411	(0)
NiNH3+2	1.399e-13	5.435e-14	-12.854	-13.265	-0.411	(0)
Co (NH3) +2	2.230e-14	8.665e-15	-13.652	-14.062	-0.411	(0)
AgNH3+	9.879e-15	7.799e-15	-14.005	-14.108	-0.103	(0)
BaNH3+2	9.629e-17	3.741e-17	-16.016	-16.427	-0.411	(0)
Ag (NH3) 2+	2.229e-19	1.760e-19	-18.652	-18.754	-0.103	(0)
Ni (NH3) 2+2	5.615e-20	2.181e-20	-19.251	-19.661	-0.411	(0)
Ca (NH3) 2+2	1.158e-20	4.497e-21	-19.936	-20.347	-0.411	(0)
Hg (NH3) 2+2	7.387e-21	2.870e-21	-20.132	-20.542	-0.411	(0)
HgNH3+2	2.661e-21	1.034e-21	-20.575	-20.986	-0.411	(0)
Co (NH3) 2+2	2.642e-21	1.026e-21	-20.578	-20.989	-0.411	(0)
Co (NH3) 3+2	9.234e-29	3.587e-29	-28.035	-28.445	-0.411	(0)
Hg (NH3) 3+2	8.165e-29	3.172e-29	-28.088	-28.499	-0.411	(0)
Hg (NH3) 4+2	1.801e-36	6.996e-37	-35.745	-36.155	-0.411	(0)
Co (NH3) 4+2	1.346e-36	5.227e-37	-35.871	-36.282	-0.411	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.708	-44.118	-0.411	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-44.618	-0.411	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.177	-54.101	-0.924	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.393	-66.803	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
N (3)	8.937e-06					
NO2-	8.937e-06	7.337e-06	-5.049	-5.134	-0.086	(0)
CuNO2+	1.974e-11	1.559e-11	-10.705	-10.807	-0.103	(0)
AgNO2	2.109e-12	2.109e-12	-11.676	-11.676	0.000	(0)
CoNO2+	1.700e-12	1.342e-12	-11.770	-11.872	-0.103	(0)
Cu (NO2) 2	1.170e-15	1.170e-15	-14.932	-14.932	0.000	(0)
Ag (NO2) 2-	3.035e-17	2.396e-17	-16.518	-16.620	-0.103	(0)
N (5)	8.340e-09					
NO3-	8.308e-09	6.922e-09	-8.081	-8.160	-0.079	(0)
CaNO3+	3.227e-11	2.548e-11	-10.491	-10.594	-0.103	(0)
MnNO3+	2.404e-13	1.898e-13	-12.619	-12.722	-0.103	(0)
ZnNO3+	3.405e-14	2.689e-14	-13.468	-13.570	-0.103	(0)
BaNO3+	9.383e-16	7.408e-16	-15.028	-15.130	-0.103	(0)
NiNO3+	8.027e-16	6.337e-16	-15.095	-15.198	-0.103	(0)
CuNO3+	5.625e-16	4.441e-16	-15.250	-15.353	-0.103	(0)
CoNO3+	3.607e-16	2.848e-16	-15.443	-15.546	-0.103	(0)
CdNO3+	9.622e-17	7.596e-17	-16.017	-16.119	-0.103	(0)
PbNO3+	2.562e-17	2.023e-17	-16.591	-16.694	-0.103	(0)
AgNO3	7.564e-18	7.564e-18	-17.121	-17.121	0.000	(0)
Mn (NO3) 2	3.300e-21	3.300e-21	-20.481	-20.481	0.000	(0)
UO2NO3+	1.100e-21	8.683e-22	-20.959	-21.061	-0.103	(0)
Zn (NO3) 2	3.713e-23	3.713e-23	-22.430	-22.430	0.000	(0)
Co (NO3) 2	4.010e-24	4.010e-24	-23.397	-23.397	0.000	(0)
Cu (NO3) 2	3.870e-25	3.870e-25	-24.412	-24.412	0.000	(0)
Cd (NO3) 2	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
Pb (NO3) 2	2.378e-25	2.378e-25	-24.624	-24.624	0.000	(0)
CrNO3+2	1.349e-25	5.239e-26	-24.870	-25.281	-0.411	(0)
VO2NO3	1.854e-26	1.854e-26	-25.732	-25.732	0.000	(0)
FeNO3+2	1.953e-28	7.586e-29	-27.709	-28.120	-0.411	(0)
HgNO3+	1.910e-30	1.508e-30	-29.719	-29.822	-0.103	(0)
Hg (NO3) 2	4.338e-39	4.338e-39	-38.363	-38.363	0.000	(0)
Na	9.115e-03					
Na+	8.880e-03	7.398e-03	-2.052	-2.131	-0.079	(0)

	NaSO4-	2.319e-04	1.948e-04	-3.635	-3.710	-0.076	(0)
	NaHCO3	2.247e-06	2.247e-06	-5.648	-5.648	0.000	(0)
	NaF	5.652e-07	5.652e-07	-6.248	-6.248	0.000	(0)
	NaCO3-	4.665e-07	3.919e-07	-6.331	-6.407	-0.076	(0)
	NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
	NaCrO4-	3.399e-16	2.684e-16	-15.469	-15.571	-0.103	(0)
Ni		1.194e-07					
	Ni+2	7.563e-08	3.645e-08	-7.121	-7.438	-0.317	(0)
	NiSO4	3.566e-08	3.566e-08	-7.448	-7.448	0.000	(0)
	NiCO3	3.868e-09	3.868e-09	-8.412	-8.412	0.000	(0)
	NiHCO3+	3.073e-09	2.426e-09	-8.512	-8.615	-0.103	(0)
	NiOH+	6.572e-10	5.189e-10	-9.182	-9.285	-0.103	(0)
	NiCl+	2.748e-10	2.170e-10	-9.561	-9.664	-0.103	(0)
	NiF+	1.404e-10	1.108e-10	-9.853	-9.955	-0.103	(0)
	Ni(OH)2	4.661e-11	4.661e-11	-10.332	-10.332	0.000	(0)
	Ni(SO4)2-2	1.491e-11	5.791e-12	-10.827	-11.237	-0.411	(0)
	NiNH3+2	1.399e-13	5.435e-14	-12.854	-13.265	-0.411	(0)
	Ni(OH)3-	6.676e-14	5.270e-14	-13.176	-13.278	-0.103	(0)
	NiCl2	2.542e-15	2.542e-15	-14.595	-14.595	0.000	(0)
	NiSeO4	1.842e-15	1.842e-15	-14.735	-14.735	0.000	(0)
	NiNO3+	8.027e-16	6.337e-16	-15.095	-15.198	-0.103	(0)
	Ni(NH3)2+2	5.615e-20	2.181e-20	-19.251	-19.661	-0.411	(0)
O(0)		2.462e-35					
	O2	1.231e-35	1.243e-35	-34.910	-34.906	0.004	(0)
Pb		3.500e-09					
	PbCO3	1.690e-09	1.690e-09	-8.772	-8.772	0.000	(0)
	PbOH+	7.109e-10	5.612e-10	-9.148	-9.251	-0.103	(0)
	PbSO4	4.745e-10	4.745e-10	-9.324	-9.324	0.000	(0)
	Pb+2	4.100e-10	1.976e-10	-9.387	-9.704	-0.317	(0)
	PbHCO3+	1.004e-10	7.927e-11	-9.998	-10.101	-0.103	(0)
	Pb(SO4)2-2	3.610e-11	1.402e-11	-10.443	-10.853	-0.411	(0)
	Pb(CO3)2-2	3.568e-11	1.386e-11	-10.448	-10.858	-0.411	(0)
	PbCl+	2.066e-11	1.631e-11	-10.685	-10.788	-0.103	(0)
	Pb(OH)2	2.007e-11	2.007e-11	-10.697	-10.697	0.000	(0)
	PbF+	2.135e-12	1.686e-12	-11.671	-11.773	-0.103	(0)
	PbCl2	1.695e-13	1.695e-13	-12.771	-12.771	0.000	(0)
	Pb(OH)3-	2.875e-14	2.269e-14	-13.541	-13.644	-0.103	(0)
	PbF2	4.017e-15	4.017e-15	-14.396	-14.396	0.000	(0)
	PbCl3-	1.989e-16	1.570e-16	-15.701	-15.804	-0.103	(0)
	PbNO3+	2.562e-17	2.023e-17	-16.591	-16.694	-0.103	(0)
	Pb(OH)4-2	1.618e-17	6.285e-18	-16.791	-17.202	-0.411	(0)
	Pb2OH+3	1.475e-17	1.757e-18	-16.831	-17.755	-0.924	(0)
	PbF3-	1.168e-18	9.224e-19	-17.932	-18.035	-0.103	(0)
	PbCl4-2	4.300e-19	1.670e-19	-18.367	-18.777	-0.411	(0)
	Pb3(OH)4+2	4.087e-21	1.588e-21	-20.389	-20.799	-0.411	(0)
	PbF4-2	1.376e-22	5.345e-23	-21.861	-22.272	-0.411	(0)
	Pb(NO3)2	2.378e-25	2.378e-25	-24.624	-24.624	0.000	(0)
	Pb4(OH)4+4	1.094e-25	2.492e-27	-24.961	-26.604	-1.643	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-152.192	-152.192	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-229.668	-229.771	-0.103	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.926	-73.926	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.776	-78.879	-0.103	(0)
	CdHS+	0.000e+00	0.000e+00	-79.228	-79.331	-0.103	(0)
	S5-2	0.000e+00	0.000e+00	-79.783	-80.193	-0.411	(0)
	H2S	0.000e+00	0.000e+00	-79.910	-79.910	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-80.299	-80.709	-0.411	(0)
	S4-2	0.000e+00	0.000e+00	-80.378	-80.789	-0.411	(0)
	S3-2	0.000e+00	0.000e+00	-81.184	-81.595	-0.411	(0)
	S2-2	0.000e+00	0.000e+00	-82.200	-82.611	-0.411	(0)
	S-2	0.000e+00	0.000e+00	-87.820	-88.128	-0.309	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.906	-139.008	-0.103	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.255	-139.666	-0.411	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-140.665	-140.665	0.000	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-147.625	-147.991	-0.367	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-147.931	-148.138	-0.206	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.373	-148.721	-0.348	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-148.602	-148.705	-0.103	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-148.605	-148.708	-0.103	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.151	-149.527	-0.376	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.481	-149.838	-0.357	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.749	-150.749	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.005	-151.005	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.192	-152.192	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.458	-161.458	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.328	-218.430	-0.103	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.245	-226.347	-0.103	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.866	-228.277	-0.411	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.882	-227.984	-0.103	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.668	-229.771	-0.103	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.197	-238.300	-0.103	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.257	-304.667	-0.411	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.276	-306.686	-0.411	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.584	-321.994	-0.411	(0)
S (6)	1.338e-02					
SO4-2	1.018e-02	4.904e-03	-1.992	-2.309	-0.317	(0)
MgSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
CaSO4	1.308e-03	1.308e-03	-2.884	-2.884	0.000	(0)
NaSO4-	2.319e-04	1.948e-04	-3.635	-3.710	-0.076	(0)
KSO4-	1.153e-04	9.684e-05	-3.938	-4.014	-0.076	(0)
MnSO4	1.509e-05	1.509e-05	-4.821	-4.821	0.000	(0)
ZnSO4	1.659e-06	1.659e-06	-5.780	-5.780	0.000	(0)
Zn (SO4) 2-2	1.824e-07	7.086e-08	-6.739	-7.150	-0.411	(0)
NiSO4	3.566e-08	3.566e-08	-7.448	-7.448	0.000	(0)
CoSO4	2.540e-08	2.540e-08	-7.595	-7.595	0.000	(0)
CuSO4	2.279e-08	2.279e-08	-7.642	-7.642	0.000	(0)
HSO4-	5.117e-09	4.265e-09	-8.291	-8.370	-0.079	(0)
CdSO4	3.990e-09	3.990e-09	-8.399	-8.399	0.000	(0)
NH4SO4-	2.720e-09	2.277e-09	-8.565	-8.643	-0.077	(0)
Cd (SO4) 2-2	6.794e-10	2.639e-10	-9.168	-9.579	-0.411	(0)
PbSO4	4.745e-10	4.745e-10	-9.324	-9.324	0.000	(0)
AgSO4-	1.705e-10	1.346e-10	-9.768	-9.871	-0.103	(0)
Pb (SO4) 2-2	3.610e-11	1.402e-11	-10.443	-10.853	-0.411	(0)
Ni (SO4) 2-2	1.491e-11	5.791e-12	-10.827	-11.237	-0.411	(0)
CrOHSO4	4.985e-12	4.985e-12	-11.302	-11.302	0.000	(0)
UO2SO4	4.667e-13	4.667e-13	-12.331	-12.331	0.000	(0)
FeSO4	2.695e-13	2.695e-13	-12.569	-12.569	0.000	(0)
UO2 (SO4) 2-2	7.766e-14	3.017e-14	-13.110	-13.520	-0.411	(0)
AlSO4+	4.200e-14	3.501e-14	-13.377	-13.456	-0.079	(0)
CrSO4+	2.512e-15	1.983e-15	-14.600	-14.703	-0.103	(0)
Al (SO4) 2-	2.207e-15	1.840e-15	-14.656	-14.735	-0.079	(0)
VO2SO4-	7.854e-19	6.201e-19	-18.105	-18.208	-0.103	(0)
FeSO4+	7.203e-20	6.031e-20	-19.142	-19.220	-0.077	(0)
Fe (SO4) 2-	8.009e-21	6.323e-21	-20.096	-20.199	-0.103	(0)
Cr2 (OH) 2SO4+2	4.969e-21	1.930e-21	-20.304	-20.714	-0.411	(0)
VOSO4	8.602e-22	8.602e-22	-21.065	-21.065	0.000	(0)
HgSO4	7.575e-22	7.575e-22	-21.121	-21.121	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.623e-22	5.623e-22	-21.250	-21.250	0.000	(0)
CrO3SO4-2	7.197e-24	2.796e-24	-23.143	-23.554	-0.411	(0)
VSO4+	1.394e-36	1.101e-36	-35.856	-35.958	-0.103	(0)
U (SO4) 2	1.778e-40	1.778e-40	-39.750	-39.750	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.930	-41.341	-0.411	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Sb (3)	2.583e-20					
Sb (OH) 3	1.307e-20	1.307e-20	-19.884	-19.884	0.000	(0)
HSbO2	1.276e-20	1.276e-20	-19.894	-19.894	0.000	(0)
SbO2-	2.942e-24	2.323e-24	-23.531	-23.634	-0.103	(0)
Sb (OH) 4-	1.684e-24	1.329e-24	-23.774	-23.876	-0.103	(0)
Sb (OH) 2F	2.201e-26	2.201e-26	-25.657	-25.657	0.000	(0)
SbOF	2.165e-26	2.165e-26	-25.665	-25.665	0.000	(0)
Sb (OH) 2+	3.579e-27	2.825e-27	-26.446	-26.549	-0.103	(0)
SbO+	1.235e-27	9.746e-28	-26.909	-27.011	-0.103	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.584	-321.994	-0.411	(0)
Sb (5)	2.734e-08					
SbO3-	2.731e-08	2.156e-08	-7.564	-7.666	-0.103	(0)
Sb (OH) 6-	3.022e-11	2.518e-11	-10.520	-10.599	-0.079	(0)

SbO2+	6.207e-25	4.900e-25	-24.207	-24.310	-0.103	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.188e-39	9.382e-40	-38.925	-39.028	-0.103	(0)
MnSe	0.000e+00	0.000e+00	-41.124	-41.124	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.188	-43.188	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.566	-45.977	-0.411	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.632	-83.274	-1.643	(0)
Se (4)	1.349e-07					
HSeO3-	7.064e-08	5.577e-08	-7.151	-7.254	-0.103	(0)
SeO3-2	6.422e-08	2.495e-08	-7.192	-7.603	-0.411	(0)
H2SeO3	2.117e-13	2.117e-13	-12.674	-12.674	0.000	(0)
AgSeO3-	2.794e-14	2.206e-14	-13.554	-13.656	-0.103	(0)
Cd (SeO3) 2-2	4.582e-18	1.780e-18	-17.339	-17.750	-0.411	(0)
Ag (SeO3) 2-3	4.136e-20	4.927e-21	-19.383	-20.307	-0.924	(0)
FeHSeO3+2	4.158e-25	1.615e-25	-24.381	-24.792	-0.411	(0)
Se (6)	2.248e-10					
SeO4-2	2.243e-10	1.081e-10	-9.649	-9.966	-0.317	(0)
MnSeO4	5.033e-13	5.033e-13	-12.298	-12.298	0.000	(0)
ZnSeO4	2.588e-14	2.588e-14	-13.587	-13.587	0.000	(0)
NiSeO4	1.842e-15	1.842e-15	-14.735	-14.735	0.000	(0)
CoSeO4	1.406e-15	1.406e-15	-14.852	-14.852	0.000	(0)
CdSeO4	6.984e-17	6.984e-17	-16.156	-16.156	0.000	(0)
HSeO4-	6.106e-17	4.820e-17	-16.214	-16.317	-0.103	(0)
Zn (SeO4) 2-2	7.301e-24	2.836e-24	-23.137	-23.547	-0.411	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.225	-59.149	-0.924	(0)
U (4)	4.013e-19					
U (OH) 5-	4.012e-19	3.167e-19	-18.397	-18.499	-0.103	(0)
U (OH) 4	1.181e-22	1.181e-22	-21.928	-21.928	0.000	(0)
U (OH) 3+	4.870e-27	3.845e-27	-26.312	-26.415	-0.103	(0)
U (OH) 2+2	4.075e-32	1.583e-32	-31.390	-31.800	-0.411	(0)
UF3+	2.092e-36	1.652e-36	-35.679	-35.782	-0.103	(0)
UF2+2	2.216e-37	8.607e-38	-36.655	-37.065	-0.411	(0)
UOH+3	5.573e-38	6.639e-39	-37.254	-38.178	-0.924	(0)
UF4	2.193e-38	2.193e-38	-37.659	-37.659	0.000	(0)
UF+3	4.740e-40	0.000e+00	-39.324	-40.248	-0.924	(0)
U (SO4) 2	1.778e-40	1.778e-40	-39.750	-39.750	0.000	(0)
UF5-	1.333e-40	1.052e-40	-39.875	-39.978	-0.103	(0)
USO4+2	0.000e+00	0.000e+00	-40.930	-41.341	-0.411	(0)
UF6-2	0.000e+00	0.000e+00	-41.004	-41.415	-0.411	(0)
U+4	0.000e+00	0.000e+00	-43.989	-45.631	-1.643	(0)
UC1+3	0.000e+00	0.000e+00	-45.641	-46.565	-0.924	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-161.871	-170.187	-8.316	(0)
U (5)	9.211e-16					
UO2+	9.211e-16	7.272e-16	-15.036	-15.138	-0.103	(0)
U (6)	3.578e-07					
UO2 (CO3) 3-4	2.530e-07	5.762e-09	-6.597	-8.239	-1.643	(0)
UO2 (CO3) 2-2	1.040e-07	4.042e-08	-6.983	-7.393	-0.411	(0)
UO2CO3	7.121e-10	7.121e-10	-9.147	-9.147	0.000	(0)
UO2OH+	1.134e-11	8.951e-12	-10.945	-11.048	-0.103	(0)
UO2F+	1.331e-12	1.051e-12	-11.876	-11.978	-0.103	(0)
UO2SO4	4.667e-13	4.667e-13	-12.331	-12.331	0.000	(0)
UO2F2	3.669e-13	3.669e-13	-12.435	-12.435	0.000	(0)
UO2+2	1.305e-13	6.287e-14	-12.884	-13.202	-0.317	(0)
UO2 (SO4) 2-2	7.766e-14	3.017e-14	-13.110	-13.520	-0.411	(0)
UO2F3-	1.414e-14	1.116e-14	-13.850	-13.952	-0.103	(0)
(UO2) 3 (OH) 5+	1.462e-15	1.154e-15	-14.835	-14.938	-0.103	(0)
(UO2) 2 (OH) 2+2	3.423e-16	1.330e-16	-15.466	-15.876	-0.411	(0)
UO2Cl+	3.005e-16	2.373e-16	-15.522	-15.625	-0.103	(0)
UO2F4-2	2.763e-17	1.073e-17	-16.559	-16.969	-0.411	(0)
UO2NO3+	1.100e-21	8.683e-22	-20.959	-21.061	-0.103	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.689	-43.791	-0.103	(0)
V+2	0.000e+00	0.000e+00	-44.944	-45.355	-0.411	(0)
V (3)	5.547e-16					
V (OH) 3	5.547e-16	5.547e-16	-15.256	-15.256	0.000	(0)
V (OH) 2+	4.042e-27	3.191e-27	-26.393	-26.496	-0.103	(0)

VOH+2	6.937e-31	2.695e-31	-30.159	-30.569	-0.411	(0)
V+3	3.991e-36	4.755e-37	-35.399	-36.323	-0.924	(0)
VSO4+	1.394e-36	1.101e-36	-35.856	-35.958	-0.103	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-57.690	-58.614	-0.924	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-58.696	-60.339	-1.643	(0)
V (4)	1.850e-19					
V(OH) 3+	1.819e-19	1.436e-19	-18.740	-18.843	-0.103	(0)
VO+2	1.639e-21	6.369e-22	-20.785	-21.196	-0.411	(0)
VOSO4	8.602e-22	8.602e-22	-21.065	-21.065	0.000	(0)
VOF+	5.858e-22	4.625e-22	-21.232	-21.335	-0.103	(0)
VOF2	2.100e-23	2.100e-23	-22.678	-22.678	0.000	(0)
VOCl+	5.266e-24	4.157e-24	-23.279	-23.381	-0.103	(0)
VOF3-	1.143e-25	9.020e-26	-24.942	-25.045	-0.103	(0)
VOF4-2	1.135e-28	4.408e-29	-27.945	-28.356	-0.411	(0)
H2V2O4+2	2.664e-33	1.035e-33	-32.574	-32.985	-0.411	(0)
V (5)	6.672e-09					
H2VO4-	4.240e-09	3.347e-09	-8.373	-8.475	-0.103	(0)
HVO4-2	2.432e-09	9.448e-10	-8.614	-9.025	-0.411	(0)
H3VO4	2.979e-13	2.979e-13	-12.526	-12.526	0.000	(0)
HV2O7-3	9.000e-15	1.072e-15	-14.046	-14.970	-0.924	(0)
H3V2O7-	8.159e-15	6.442e-15	-14.088	-14.191	-0.103	(0)
VO4-3	4.466e-15	5.321e-16	-14.350	-15.274	-0.924	(0)
V2O7-4	1.424e-16	3.243e-18	-15.846	-17.489	-1.643	(0)
VO2+	6.356e-18	5.296e-18	-17.197	-17.276	-0.079	(0)
VO2F	1.125e-18	1.125e-18	-17.949	-17.949	0.000	(0)
VO2SO4-	7.854e-19	6.201e-19	-18.105	-18.208	-0.103	(0)
V3O9-3	3.302e-19	3.934e-20	-18.481	-19.405	-0.924	(0)
VO2F2-	6.262e-20	4.944e-20	-19.203	-19.306	-0.103	(0)
VO2F3-2	1.922e-22	7.466e-23	-21.716	-22.127	-0.411	(0)
V4O12-4	2.412e-24	5.493e-26	-23.618	-25.260	-1.643	(0)
VO2F4-3	3.733e-26	4.448e-27	-25.428	-26.352	-0.924	(0)
VO2NO3	1.854e-26	1.854e-26	-25.732	-25.732	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.351	-68.047	-3.696	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.344	-67.911	-2.567	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.111	-70.754	-1.643	(0)
Zn	5.619e-06					
Zn+2	3.209e-06	1.546e-06	-5.494	-5.811	-0.317	(0)
ZnSO4	1.659e-06	1.659e-06	-5.780	-5.780	0.000	(0)
ZnCO3	2.531e-07	2.531e-07	-6.597	-6.597	0.000	(0)
ZnOH+	2.215e-07	1.749e-07	-6.655	-6.757	-0.103	(0)
Zn(SO4) 2-2	1.824e-07	7.086e-08	-6.739	-7.150	-0.411	(0)
ZnHCO3+	3.345e-08	2.641e-08	-7.476	-7.578	-0.103	(0)
Zn(OH) 2	3.134e-08	3.134e-08	-7.504	-7.504	0.000	(0)
ZnOHCl	1.338e-08	1.338e-08	-7.874	-7.874	0.000	(0)
ZnCl+	1.090e-08	9.038e-09	-7.963	-8.044	-0.081	(0)
ZnF+	4.732e-09	3.736e-09	-8.325	-8.428	-0.103	(0)
Zn(OH) 3-	2.250e-10	1.776e-10	-9.648	-9.751	-0.103	(0)
ZnCl2	3.333e-11	3.333e-11	-10.477	-10.477	0.000	(0)
ZnCl3-	7.426e-14	6.160e-14	-13.129	-13.210	-0.081	(0)
ZnNO3+	3.405e-14	2.689e-14	-13.468	-13.570	-0.103	(0)
ZnSeO4	2.588e-14	2.588e-14	-13.587	-13.587	0.000	(0)
Zn(OH) 4-2	2.058e-14	7.996e-15	-13.686	-14.097	-0.411	(0)
ZnCl4-2	1.459e-16	7.167e-17	-15.836	-16.145	-0.309	(0)
Zn(NO3) 2	3.713e-23	3.713e-23	-22.430	-22.430	0.000	(0)
Zn(SeO4) 2-2	7.301e-24	2.836e-24	-23.137	-23.547	-0.411	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.605	-148.708	-0.103	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.749	-150.749	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.245	-226.347	-0.103	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.866	-228.277	-0.411	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.276	-306.686	-0.411	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-57.07	-50.78	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-44.24	-39.73	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.46	-39.73	11.74	(Co(NH3)5OH2)Cl3

(Co (NH3) 6) (NO3) 3	-73.55	-55.62	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-59.07	-39.04	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.27	-28.86	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-25.14	-24.69	0.45	(NH4) 2SeO4
Acanthite	-52.33	-88.55	-36.22	Ag2S
Ag2CO3	-12.18	-23.27	-11.09	Ag2CO3
Ag2CrO4	-20.27	-31.86	-11.59	Ag2CrO4
Ag2HVO4	-12.33	-10.85	1.48	Ag2HVO4
Ag2MoO4	-12.20	-23.75	-11.55	Ag2MoO4
Ag2O	-14.20	-1.62	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.21	-20.03	-4.82	Ag2SO4
Ag3AsO3	-28.34	-26.18	2.16	Ag3AsO3
Ag3AsO4	-16.75	-19.53	-2.79	Ag3AsO4
Ag3H2VO5	-16.84	-11.66	5.18	Ag3H2VO5
AgF:4H2O	-13.83	-12.78	1.05	AgF:4H2O
Agmetal	-0.08	-13.58	-13.51	Ag
AgVO3	-10.81	-10.04	0.77	AgVO3
Al (OH) 3 (am)	-1.69	9.11	10.80	Al (OH) 3
Al2 (MoO4) 3	-50.53	-48.16	2.37	Al2 (MoO4) 3
Al2O3	-1.42	18.23	19.65	Al2O3
Al4 (OH) 10SO4	-4.65	18.05	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.79	-7.99	4.80	AlAsO4:2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-153.03	-87.40	65.62	AlSb
Alunite	-2.58	-3.98	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.88	-5.24	-4.36	CaSO4
Anilite	-55.46	-87.34	-31.88	Cu0.25Cu1.5S
Antlerite	-1.97	6.81	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.23	-94.99	-2.76	As4O6
Artinite	-4.58	5.02	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.91	-34.20	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2 (OH) 3Cl
Azurite	-1.16	-18.07	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.97	8.43	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.46	-1.59	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.10	6.84	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.14	-21.81	-9.67	BaCrO4
BaF2	-9.68	-15.50	-5.82	BaF2
BaMoO4	-6.74	-13.70	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.70	-6.87	1.83	BaSeO3
BaSeO4	-10.18	-17.64	-7.46	BaSeO4
Bianchite	-6.36	-8.12	-1.76	ZnSO4:6H2O
Birnessite	-6.56	11.53	18.09	MnO2
Bixbyite	-1.83	-2.48	-0.64	Mn2O3
BlaubleiI	-55.53	-79.70	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.94	-83.22	-27.28	Cu0.6Cu0.8S
Boehmite	0.54	9.12	8.58	AlOOH
Breithauptite	-56.56	-75.08	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.51	13.33	16.84	Mg (OH) 2
Bunsenite	-3.78	8.66	12.45	NiO
Ca (VO3) 2	-10.94	-5.28	5.66	Ca (VO3) 2
Ca2V2O7	-9.62	7.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.67	7.88	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.00	5.30	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.91	21.05	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.81	21.05	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-296.51	-153.53	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3

Calomel	-8.46	-26.37	-17.91	Hg2Cl2
CaMoO4	-1.01	-8.96	-7.95	CaMoO4
Carnotite	-1.06	-0.83	0.23	KUO2VO4
CaSeO3:2H2O	-4.95	-2.14	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.88	-12.90	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.34	-1.50	9.84	Cd(BO2)2
Cd(OH)2	-6.00	7.64	13.64	Cd(OH)2
Cd(OH)2(am)	-6.09	7.64	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.61	-13.90	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.05	4.51	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.25	12.15	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.73	-0.66	CdCl2
CdCl2:1H2O	-12.03	-13.73	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.81	-13.73	-1.91	CdCl2:2.5H2O
CdF2	-15.08	-16.29	-1.21	CdF2
Cdmetal(alpha)	-31.42	-17.90	13.51	Cd
Cdmetal(gamma)	-31.52	-17.90	13.62	Cd
CdMoO4	-0.34	-14.49	-14.15	CdMoO4
CdOHCl	-6.58	-3.04	3.54	CdOHCl
CdSb	-75.75	-76.10	-0.35	CdSb
CdSe	-19.24	-39.44	-20.20	CdSe
CdSeO4:2H2O	-16.58	-18.43	-1.85	CdSeO4:2H2O
CdSO4	-10.60	-10.77	-0.17	CdSO4
CdSO4:1H2O	-9.04	-10.77	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.90	-10.77	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.74	-11.49	-9.75	AgCl
Cerrusite	-2.12	-15.25	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.36	-10.00	-2.64	CuSO4:5H2O
Chalcocite	-55.36	-90.28	-34.92	Cu2S
Chalcopyrite	-126.73	-162.00	-35.27	CuFeS2
Cinnabar	-52.56	-98.25	-45.69	HgS
Claudetite	-91.92	-94.99	-3.06	As4O6
Clausthalite	-13.58	-40.68	-27.10	PbSe
Co(BO2)2	-27.70	-0.63	27.07	Co(BO2)2
Co(OH)2	-4.58	8.52	13.09	Co(OH)2
Co(OH)3	-8.80	-11.11	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.69	-8.66	13.03	Co3(AsO4)2
Co3O4	-3.21	-13.71	-10.50	Co3O4
CoCl2	-21.12	-12.85	8.27	CoCl2
CoCl2:6H2O	-15.39	-12.85	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.82	-15.42	-1.60	CoF2
CoF3	-45.56	-47.01	-1.46	CoF3
CoFe2O4	18.43	14.90	-3.53	CoFe2O4
CoMoO4	-5.85	-13.61	-7.76	CoMoO4
CoO	-5.07	8.52	13.59	CoO
CoS(alpha)	-70.97	-78.41	-7.44	CoS
CoS(beta)	-67.34	-78.41	-11.07	CoS
CoSe	-22.36	-38.56	-16.20	CoSe
CoSeO3	-8.11	-6.79	1.32	CoSeO3
CoSeO4:6H2O	-16.02	-17.55	-1.53	CoSeO4:6H2O
CoSO4	-12.70	-9.90	2.80	CoSO4
CoSO4:6H2O	-7.42	-9.90	-2.47	CoSO4:6H2O
Cotunnite	-10.19	-14.97	-4.78	PbCl2
Covellite	-56.22	-78.52	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.46	-32.37	14.09	CrCl2
CrCl3	-48.34	-33.23	15.11	CrCl3
CrF3	-25.74	-37.08	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.09	-44.93	-33.84	Na3AlF6
Cu(OH)2	-0.27	8.41	8.67	Cu(OH)2

Cu(SbO3)2	-25.48	19.73	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.65	0.61	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.90	-89.78	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.63	-50.43	-45.80	Cu2Se
Cu2SO4	-19.81	-21.76	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.08	-8.98	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.95	-101.54	-42.59	Cu3Sb
Cu3Se2	-25.60	-89.10	-63.49	Cu3Se2
CuCO3	-1.74	-13.24	-11.50	CuCO3
CuCrO4	-16.39	-21.83	-5.44	CuCrO4
CuF	-8.74	-13.64	-4.91	CuF
CuF2	-16.64	-15.53	1.12	CuF2
CuF2:2H2O	-10.98	-15.53	-4.55	CuF2:2H2O
Cumetal	-5.69	-14.45	-8.76	Cu
CuMoO4	-0.65	-13.72	-13.08	CuMoO4
CuOCuSO4	-11.90	-1.59	10.30	CuOCuSO4
Cupricferrite	8.80	14.79	5.99	CuFe2O4
Cuprite	-1.94	-3.35	-1.41	Cu2O
Cuprousferrite	10.43	1.52	-8.92	CuFeO2
CuSe	-5.57	-38.67	-33.10	CuSe
CuSe2	-26.84	-60.20	-33.37	CuSe2
CuSeO3:2H2O	-7.41	-6.90	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.22	-17.66	-2.44	CuSeO4:5H2O
CuSO4	-12.94	-10.00	2.94	CuSO4
Diaspore	2.24	9.12	6.87	AlOOH
Djurleite	-55.58	-89.50	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.25	-16.79	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.30	-16.79	-17.09	CaMg(CO3)2
Epsomite	-2.95	-5.08	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.03	-0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.28	-15.00	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.48	-8.92	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.90	-39.53	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.11	-48.85	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.31	-13.91	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.59	-18.68	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.56	-65.16	-18.60	FeSe2
FeS(ppt)	-80.53	-83.48	-2.95	FeS
FeSe	-32.63	-43.63	-11.00	FeSe
Fix_pe	-4.72	-4.72	0.00	e-
Fluorite	-0.27	-10.77	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	0.82	9.11	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.11	-8.12	-2.01	ZnSO4:7H2O
Greenockite	-64.93	-79.29	-14.36	CdS
Greigite	-292.85	-337.88	-45.03	Fe3S4
Gummite	-4.77	2.90	7.67	UO3
Gypsum	-0.63	-5.24	-4.61	CaSO4:2H2O
H-Jarosite	-15.15	-27.25	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.25	-22.13	-12.88	H2MoO4
H2S(g)	-78.92	-86.93	-8.01	H2S
H2Se(g)	-42.12	-47.08	-4.96	H2Se
Halite	-6.37	-4.76	1.60	NaCl
Hausmannite	-1.47	59.56	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.21	21.68	22.89	FeAl2O4
Hg(CH3)2(g)	-185.27	-258.97	-73.71	Hg(CH3)2
Hg(g)	-7.40	-15.27	-7.87	Hg
Hg(OH)2	-7.83	-11.32	-3.50	Hg(OH)2
Hg2(g)	-15.59	-30.55	-14.96	Hg2
Hg2(OH)2	-10.26	-5.00	5.26	Hg2(OH)2
Hg2CO3	-10.60	-26.65	-16.05	Hg2CO3
Hg2CrO4	-26.54	-35.24	-8.70	Hg2CrO4

Hg2F2	-18.58	-28.94	-10.36	Hg2F2
Hg2S	-80.26	-91.93	-11.68	Hg2S
Hg2SeO3	-15.65	-20.31	-4.66	Hg2SeO3
Hg2SO4	-17.28	-23.41	-6.13	Hg2SO4
Hg3O2CO3	-25.93	-55.61	-29.68	Hg3O2CO3
HgCl (g)	-32.68	-13.19	19.50	HgCl
HgCl2	-11.43	-32.69	-21.26	HgCl2
HgF (g)	-47.15	-14.47	32.68	HgF
HgF2 (g)	-47.82	-35.26	12.57	HgF2
Hgmetal (l)	-1.82	-15.27	-13.45	Hg
HgSe	-2.71	-58.40	-55.69	HgSe
HgSeO3	-14.20	-26.63	-12.43	HgSeO3
HgSO4	-20.31	-29.73	-9.42	HgSO4
Huntite	-3.45	-33.42	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.33	-24.10	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.15	-19.92	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-17.04	-22.21	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.95	-21.75	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.24	-49.48	-17.24	K2Cr2O7
K2CrO4	-18.73	-19.25	-0.51	K2CrO4
K2MoO4	-14.40	-11.14	3.26	K2MoO4
K2SeO4	-14.35	-15.08	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.18	-5.62	-0.43	PbO:PbSO4
Laurionite	-4.91	-4.29	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.30	6.40	12.69	PbO
Mackinawite	-79.88	-83.48	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.86	19.72	16.86	Fe2MgO4
Magnesite	-0.85	-8.31	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.48	-4.83	-5.31	Cu2 (OH) 2CO3
Manganite	-1.23	24.11	25.34	MnOOH
Massicot	-6.50	6.40	12.89	PbO
Matlockite	-7.28	-16.25	-8.97	PbClF
Melanothallite	-19.22	-12.96	6.26	CuCl2
Melanterite	-12.75	-14.96	-2.21	FeSO4:7H2O
Metacinnabar	-53.16	-98.25	-45.09	HgS
Mg (OH) 2 (active)	-5.46	13.33	18.79	Mg (OH) 2
Mg (VO3) 2	-16.40	-5.12	11.28	Mg (VO3) 2
Mg2Sb3	-273.71	-199.02	74.68	Mg2Sb3
Mg2V2O7	-18.14	8.22	26.36	Mg2V2O7
MgCr2O4	-5.22	10.98	16.20	MgCr2O4
MgCrO4	-22.28	-16.90	5.38	MgCrO4
MgF2	-2.47	-10.60	-8.13	MgF2
MgMoO4	-6.95	-8.80	-1.85	MgMoO4
MgSeO3:6H2O	-5.03	-1.97	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.53	-12.73	-1.20	MgSeO4:6H2O
Minium	-28.79	44.74	73.52	Pb3O4
Mirabilite	-5.46	-6.57	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-12.01	-7.11	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.00	-57.71	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.69	-86.61	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-12.69	-0.19	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.74	-10.03	2.72	MnCl2:4H2O
MnS (grn)	-75.76	-75.59	0.17	MnS
MnS (pnk)	-78.93	-75.59	3.34	MnS
MnSb	-94.85	-97.76	-2.91	MnSb
MnSe	-39.24	-35.74	3.50	MnSe
MnSeO3	-5.09	-3.96	1.13	MnSeO3
MnSeO3:2H2O	-4.95	-3.97	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.68	-14.73	-2.05	MnSeO4:5H2O
MnSO4	-9.65	-7.07	2.58	MnSO4
Monteponite	-7.46	7.64	15.10	CdO
Montroydite	-7.68	-11.32	-3.64	HgO
MoO3	-14.13	-22.13	-8.00	MoO3

Morenosite	-7.60	-9.75	-2.14	NiSO4:7H2O
MoS2	-151.27	-221.53	-70.26	MoS2
Na-Jarosite	-10.13	-21.33	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.74	-48.64	-9.90	Na2Cr2O7
Na2CrO4	-21.33	-18.40	2.93	Na2CrO4
Na2Mo2O7	-15.82	-32.42	-16.60	Na2Mo2O7
Na2MoO4	-11.78	-10.29	1.49	Na2MoO4
Na2MoO4:2H2O	-11.52	-10.29	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.77	-3.47	10.30	Na2SeO3:5H2O
Na2SeO4	-15.51	-14.23	1.28	Na2SeO4
Na3Sb	-173.21	-78.76	94.45	Na3Sb
Na3VO4	-28.15	8.53	36.68	Na3VO4
Na4V2O7	-32.17	5.23	37.40	Na4V2O7
Nantokite	-5.63	-12.36	-6.73	CuCl
NaSb	-88.22	-65.05	23.17	NaSb
Natron	-8.50	-9.81	-1.31	Na2CO3:10H2O
NaVO3	-7.16	-3.31	3.86	NaVO3
Nesquehonite	-3.64	-8.31	-4.67	MgCO3:3H2O
Ni(OH)2	-4.13	8.66	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.92	-8.22	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.76	16.24	32.00	Ni4(OH)6SO4
NiCO3	-6.11	-12.98	-6.87	NiCO3
NiMoO4	-2.33	-13.47	-11.14	NiMoO4
NiS(alpha)	-72.67	-78.27	-5.60	NiS
NiS(beta)	-67.17	-78.27	-11.10	NiS
NiS(gamma)	-65.47	-78.27	-12.80	NiS
NiSe	-20.72	-38.42	-17.70	NiSe
NiSeO3:2H2O	-9.46	-6.64	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.89	-17.41	-1.52	NiSeO4:6H2O
Nsutite	-5.97	11.53	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-247.22	-308.28	-61.07	As2S3
Otavite	-2.01	-14.01	-12.00	CdCO3
Pb(BO2)2	-9.26	-2.75	6.52	Pb(BO2)2
Pb(OH)2	-1.75	6.40	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-57.16	-65.92	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-6.68	2.11	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.39	12.79	26.19	Pb2O(OH)2
Pb2O3	-22.70	38.34	61.04	Pb2O3
Pb2OCO3	-8.30	-8.85	-0.56	Pb2OCO3
Pb2V2O7	-3.76	-5.66	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.81	-15.01	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.40	0.74	6.14	Pb3(VO4)2
Pb3O2CO3	-13.48	-2.46	11.02	Pb3O2CO3
Pb3O2SO4	-9.91	0.78	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.92	7.18	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.70	7.18	21.88	Pb4O3SO4
PbCrO4	-11.24	-23.84	-12.60	PbCrO4
PbF2	-10.10	-17.54	-7.44	PbF2
Pbmetal	-23.39	-19.15	4.25	Pb
PbMoO4	-0.11	-15.73	-15.62	PbMoO4
PbO:0.3H2O	-6.58	6.40	12.98	PbO:0.33H2O
PbSeO4	-12.83	-19.67	-6.84	PbSeO4
Periclase	-8.25	13.33	21.58	MgO
Phosgenite	-10.41	-30.22	-19.81	PbCl2:PbCO3
Plattnerite	-17.66	31.94	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-126.35	-144.86	-18.51	FeS2
Pyrochroite	-3.86	11.34	15.19	Mn(OH)2
Pyrolusite	-4.50	36.88	41.38	MnO2
Realgar	-103.70	-123.45	-19.75	AsS
Retgersite	-7.71	-9.75	-2.04	NiSO4:6H2O
Rhodochrosite	0.27	-10.31	-10.58	MnCO3
Rutherfordine	-4.25	-18.75	-14.50	UO2CO3
Sb(OH)3	-12.77	-19.88	-7.11	Sb(OH)3
Sb2O4	-17.62	-14.22	3.40	Sb2O4
Sb2O5	-27.63	-37.30	-9.67	Sb2O5
Sb2Se3	-113.24	-181.00	-67.76	Sb2Se3

Sb4O6(cubic)	-61.27	-79.53	-18.26	Sb4O6
Sb4O6(orth)	-61.63	-79.53	-17.90	Sb4O6
SbCl3	-52.51	-51.93	0.57	SbCl3
SbF3	-45.56	-55.79	-10.23	SbF3
Sbmetal	-46.51	-58.20	-11.69	Sb
SbO2	-3.60	-31.42	-27.82	SbO2
Schoepite	-3.10	2.90	5.99	UO2(OH)2·H2O
Semetal(am)	-14.42	-21.53	-7.11	Se
Semetal(hex)	-13.83	-21.53	-7.71	Se
Senarmontite	-27.40	-39.77	-12.37	Sb2O3
SeO2	-15.43	-15.30	0.12	SeO2
SeO3	-47.11	-26.07	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.36	-11.36	-10.00	ZnCO3
Sphalerite	-65.19	-76.64	-11.45	ZnS
Spinel	-5.28	31.56	36.85	MgAl2O4
Stibnite	-250.09	-300.55	-50.46	Sb2S3
Sulfur	-59.24	-61.38	-2.14	S
Tenorite	0.76	8.41	7.64	CuO
Thenardite	-6.89	-6.57	0.32	Na2SO4
Thermonatrite	-10.44	-9.81	0.64	Na2CO3·H2O
Tyuyamunite	-3.57	0.51	4.08	Ca(UO2)2(VO4)2
U3O8	-10.28	10.80	21.08	U3O8
U3Sb4	-578.74	-426.36	152.38	U3Sb4
U4O9	-25.15	-28.17	-3.02	U4O9
UF4	-31.76	-61.30	-29.54	UF4
UF4:2.5H2O	-28.58	-61.30	-32.72	UF4:2.5H2O
UO2(am)	-14.36	-13.43	0.93	UO2
UO2(NO3)2	-41.67	-29.52	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.37	-29.52	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.91	-29.52	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.57	-29.52	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.71	2.90	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.92	-23.17	-2.25	UO2SeO4:4H2O
UO3	-4.80	2.90	7.70	UO3
Uraninite	-8.76	-13.43	-4.67	UO2
USb2	-219.71	-190.14	29.58	USb2
V(OH)3	-19.76	-12.17	7.59	V(OH)3
V2O5	-17.09	-18.45	-1.36	V2O5
V3O5	-42.67	-40.83	1.84	V3O5
V4O7	-53.11	-45.92	7.19	V4O7
V6O13	-45.58	-106.44	-60.86	V6O13
Valentinite	-31.29	-39.77	-8.48	Sb2O3
VC12	-65.19	-46.31	18.87	VC12
VC13	-67.66	-44.22	23.43	VC13
VF4	-67.89	-52.96	14.93	VF4
Vmetal	-94.51	-50.49	44.03	V
VO	-39.70	-24.94	14.76	VO
VO(OH)2	-10.25	-5.10	5.15	VO(OH)2
VO2Cl	-22.75	-19.91	2.84	VO2Cl
VOC1	-34.01	-22.86	11.15	VOC1
VOC12	-39.22	-26.46	12.76	VOC12
VOSO4	-27.12	-23.51	3.61	VOSO4
Witherite	-4.65	-13.22	-8.57	BaCO3
Wurtzite	-67.69	-76.64	-8.95	ZnS
Zincite	-1.04	10.29	11.33	ZnO
Zincosite	-12.05	-8.12	3.93	ZnSO4
Zn(BO2)2	-7.14	1.15	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.45	-22.13	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.91	10.29	12.20	Zn(OH)2
Zn(OH)2(am)	-2.18	10.29	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.46	10.29	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.24	10.29	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.44	10.29	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.33	2.17	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.29	9.90	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.98	-3.33	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.86	-5.95	18.91	Zn3O(SO4)2

Zn4(OH)6SO4	-5.65	22.75	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.42	30.08	38.50	Zn5(OH)8Cl2
ZnCl2	-18.13	-11.08	7.05	ZnCl2
ZnCO3:1H2O	-1.10	-11.36	-10.26	ZnCO3:1H2O
ZnF2	-13.11	-13.64	-0.53	ZnF2
Znmetal	-41.04	-15.25	25.79	Zn
ZnMoO4	-1.71	-11.84	-10.13	ZnMoO4
ZnO(active)	-0.90	10.29	11.19	ZnO
ZnS(am)	-67.59	-76.64	-9.05	ZnS
ZnSb	-84.47	-73.45	11.01	ZnSb
ZnSe	-22.39	-36.79	-14.40	ZnSe
ZnSeO4:6H2O	-14.26	-15.78	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.48	-8.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 66.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 305
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 305
USE Surface 305
USE Solution 314
SAVE Solution 315  #Initial Stage 3 Pit Water After Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 305.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

4.233e-20  Surface + diffuse layer charge, eq
3.379e-12  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
7.412e-05  m² for 1.155e-09 moles of Ferrihydrite

```

Water in diffuse layer: 7.412e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.
Donnan Layer potential, psi_DL = 7.042e-02 V.
Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is
+1).

Element	Moles
C	1.8935e-15
Ca	2.3466e-17
Cl	3.7917e-14
H	5.5856e-15
K	3.7227e-17
Mg	3.6357e-18
N	1.5350e-13
Na	1.5772e-16
O	6.8418e-12
S	1.5942e-12

Hfo_s

5.773e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.859e-12	0.668	3.859e-12	-11.414
Hfo_sOH	1.892e-12	0.328	1.892e-12	-11.723
Hfo_sO-	2.126e-14	0.004	2.126e-14	-13.672
Hfo_sOHCa+2	7.044e-17	0.000	7.044e-17	-16.152

Hfo_w

2.309e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.067e-10	0.462	1.067e-10	-9.972
Hfo_wOH	5.233e-11	0.227	5.233e-11	-10.281
Hfo_wSO4-	3.604e-11	0.156	3.604e-11	-10.443
Hfo_wOHSO4-2	3.526e-11	0.153	3.526e-11	-10.453
Hfo_wO-	5.879e-13	0.003	5.879e-13	-12.231
Hfo_wOMg+	8.309e-19	0.000	8.309e-19	-18.080
Hfo_wOCa+	2.819e-19	0.000	2.819e-19	-18.550

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 314. Solution after simulation 65.
Using surface 305.
Using pure phase assemblage 305. Pure-phase assemblage after simulation 65.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Initial	Moles in assemblage Final	Delta
Ag2Se	0.00	-48.70	-48.70	5.004e-09	5.004e-09	-2.962e-14
Alunite	-2.58	-3.98	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.88	-5.24	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	6.040e-11	5.977e-11	-6.308e-13

Barite	0.00	-9.98	-9.98	4.301e-08	4.301e-08	1.893e-12
Brochantite	0.00	15.22	15.22	1.619e-07	1.619e-07	-1.957e-11
Brucite	-3.51	13.33	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.207e-10
CaMoO4	-1.01	-8.96	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.95	-2.14	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	9.989e-04	9.989e-04	-1.106e-10
Carnotite	-1.06	-0.83	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.34	-1.50	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.34	-14.49	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	6.894e-10	6.893e-10	-1.353e-13
Cu2Se(alpha)	-4.63	-50.43	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.65	-13.72	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.95	-5.08	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.155e-09	1.155e-09	-6.454e-18
Fluorite	-0.27	-10.77	-10.50	0.000e+00	0	0.000e+00
Gummite	-4.77	2.90	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.63	-5.24	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.71	-58.40	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.46	-6.57	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.09	-3.96	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.13	8.66	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-23.92	-8.22	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.11	-12.98	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.33	-13.47	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	2.309e-14
Otavite	-2.01	-14.01	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.11	-15.73	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.25	-18.75	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.60	-31.42	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.10	2.90	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.57	0.51	4.08	0.000e+00	0	0.000e+00
U3O8	-10.28	10.80	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.71	2.90	5.61	0.000e+00	0	0.000e+00
UO3	-4.80	2.90	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.71	-11.84	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

3.543e-25 Surface + diffuse layer charge, eq
1.255e-11 Surface charge, eq
1.634e-02 sigma, C/m²
3.320e-02 psi, V
-1.292e+00 -F*psi/RT
2.747e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
7.412e-05 m² for 1.155e-09 moles of Ferrihydrite

Water in diffuse layer: 7.412e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 5.096e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.201e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	7.5284e-18
Al	3.2701e-15
As	1.8519e-19
B	2.1821e-14
Ba	2.2190e-17

C	6.2187e-13
Ca	2.1868e-12
Cd	8.1223e-18
Cl	2.5241e-12
Co	5.4624e-17
Cr	6.7681e-19
Cu	3.6443e-16
F	1.4990e-13
Fe	6.2054e-19
H	6.9289e-13
Hg	1.4589e-18
K	2.1392e-12
Mg	2.9301e-12
Mn	3.3652e-14
Mo	2.1383e-15
N	8.1216e-15
Na	5.6095e-12
Ni	6.9570e-17
O	5.6546e-11
Pb	2.4085e-18
S	1.3643e-11
Sb	2.4711e-17
Se	1.3487e-16
U	5.2986e-16
V	6.4844e-18
Zn	3.4155e-15

Hfo_s

5.773e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	1.844e-12	0.319	1.844e-12	-11.734
Hfo_sOZn+	1.769e-12	0.307	1.769e-12	-11.752
Hfo_sOPb+	1.033e-12	0.179	1.033e-12	-11.986
Hfo_sOMn+	8.065e-13	0.140	8.065e-13	-12.093
Hfo_sOCrOH+	2.706e-13	0.047	2.706e-13	-12.568
Hfo_sOHCa+2	3.109e-14	0.005	3.109e-14	-13.507
Hfo_sONi+	1.000e-14	0.002	1.000e-14	-14.000
Hfo_sOH	3.793e-15	0.001	3.793e-15	-14.421
Hfo_sO-	1.823e-15	0.000	1.823e-15	-14.739
Hfo_sOCd+	1.199e-15	0.000	1.199e-15	-14.921
Hfo_sOCO+	1.054e-15	0.000	1.054e-15	-14.977
Hfo_sOH2+	1.808e-16	0.000	1.808e-16	-15.743
Hfo_sOAg	1.117e-17	0.000	1.117e-17	-16.952
Hfo_sOHBa+2	1.763e-18	0.000	1.763e-18	-17.754
Hfo_sOFe+	1.314e-19	0.000	1.314e-19	-18.882
Hfo_sOHg+	3.939e-21	0.000	3.938e-21	-20.405

Hfo_w

2.309e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	7.645e-11	0.331	7.644e-11	-10.117
Hfo_wOMg+	4.069e-11	0.176	4.069e-11	-10.391
Hfo_wOH	3.066e-11	0.133	3.066e-11	-10.513
Hfo_wOHVO4-3	2.912e-11	0.126	2.912e-11	-10.536
Hfo_wOZn+	1.498e-11	0.065	1.497e-11	-10.825
Hfo_wO-	1.474e-11	0.064	1.474e-11	-10.832
Hfo_wHSO4-2	1.229e-11	0.053	1.229e-11	-10.911
Hfo_wOMn+	5.178e-12	0.022	5.178e-12	-11.286
Hfo_wOCa+	1.556e-12	0.007	1.556e-12	-11.808
Hfo_wOHSeO3-2	1.499e-12	0.006	1.499e-12	-11.824
Hfo_wOH2+	1.461e-12	0.006	1.461e-12	-11.835
Hfo_wOHAsO4-3	1.262e-12	0.005	1.261e-12	-11.899
Hfo_wOPb+	3.729e-13	0.002	3.729e-13	-12.428
Hfo_wSO4-	2.937e-13	0.001	2.937e-13	-12.532

Hfo_wSeO3-	1.214e-13	0.001	1.214e-13	-12.916
Hfo_wONi+	1.091e-13	0.000	1.091e-13	-12.962
Hfo_wOHMoO4-2	9.543e-14	0.000	9.543e-14	-13.020
Hfo_wOCO+	2.401e-14	0.000	2.401e-14	-13.620
Hfo_wOCd+	4.135e-15	0.000	4.135e-15	-14.384
Hfo_wH2BO3	3.431e-15	0.000	3.431e-15	-14.465
Hfo_wMoO4-	2.939e-15	0.000	2.938e-15	-14.532
Hfo_wHAsO4-	6.420e-17	0.000	6.420e-17	-16.192
Hfo_wOAg	2.376e-17	0.000	2.376e-17	-16.624
Hfo_wOHg+	1.559e-18	0.000	1.559e-18	-17.807
Hfo_wOBa+	1.275e-18	0.000	1.275e-18	-17.894
Hfo_wOFe+	6.700e-19	0.000	6.700e-19	-18.174
Hfo_wOHSeO4-2	2.771e-19	0.000	2.771e-19	-18.557
Hfo_wH2AsO4	9.902e-20	0.000	9.901e-20	-19.004
Hfo_wOHSbO(OH) 4-	5.611e-20	0.000	5.610e-20	-19.251
Hfo_wOHCrO4-2	2.356e-20	0.000	2.356e-20	-19.628
Hfo_wSeO4-	5.769e-21	0.000	5.769e-21	-20.239
Hfo_wSbO(OH) 4	1.728e-21	0.000	1.728e-21	-20.763
Hfo_wCrO4-	5.136e-22	0.000	5.136e-22	-21.289
Hfo_wH2AsO3	1.409e-29	0.000	1.409e-29	-28.851

-----Solution composition-----

Elements	Molality	Moles
Ag	1.005e-08	1.005e-08
Al	3.622e-06	3.622e-06
As	1.692e-10	1.692e-10
B	2.902e-05	2.902e-05
Ba	4.447e-08	4.447e-08
C	6.986e-04	6.986e-04
Ca	3.744e-03	3.744e-03
Cd	1.317e-08	1.317e-08
Cl	2.793e-03	2.793e-03
Co	9.603e-08	9.603e-08
Cr	1.044e-09	1.044e-09
Cu	5.183e-07	5.184e-07
F	1.757e-04	1.757e-04
Fe	9.011e-10	9.011e-10
Hg	1.968e-09	1.968e-09
K	3.463e-03	3.463e-03
Mg	5.124e-03	5.124e-03
Mn	6.007e-05	6.007e-05
Mo	1.940e-06	1.940e-06
N	9.004e-06	9.004e-06
Na	9.115e-03	9.115e-03
Ni	1.194e-07	1.194e-07
Pb	3.499e-09	3.499e-09
S	1.338e-02	1.338e-02
Sb	2.734e-08	2.734e-08
Se	1.351e-07	1.351e-07
U	3.578e-07	3.578e-07
V	6.643e-09	6.643e-09
Zn	5.619e-06	5.619e-06

-----Description of solution-----

	pH	=	8.051	Charge balance
	pe	=	4.722	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.052e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	7.248e-04	
	Total CO2 (mol/kg)	=	6.986e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.065e-06	

Percent error, $100 * (Cat - |An|) / (Cat + |An|)$ = 0.00
Iterations = 1
Total H = 1.110174e+02
Total O = 5.556404e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.370e-06	1.131e-06	-5.863	-5.947	-0.083	(0)
H+	1.068e-08	8.899e-09	-7.971	-8.051	-0.079	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.005e-08					
AgCl	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
AgCl2-	1.678e-09	1.325e-09	-8.775	-8.878	-0.103	(0)
Ag+	1.651e-09	1.376e-09	-8.782	-8.861	-0.079	(0)
AgSO4-	1.705e-10	1.346e-10	-9.768	-9.871	-0.103	(0)
AgCl3-2	7.071e-12	2.747e-12	-11.151	-11.561	-0.411	(0)
AgNO2	2.109e-12	2.109e-12	-11.676	-11.676	0.000	(0)
AgF	4.184e-13	4.184e-13	-12.378	-12.378	0.000	(0)
AgOH	1.556e-13	1.556e-13	-12.808	-12.808	0.000	(0)
AgCl4-3	1.095e-13	1.305e-14	-12.960	-13.884	-0.924	(0)
AgH2BO3	3.818e-14	3.818e-14	-13.418	-13.418	0.000	(0)
AgSeO3-	2.794e-14	2.206e-14	-13.554	-13.656	-0.103	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	9.879e-15	7.799e-15	-14.005	-14.108	-0.103	(0)
Ag(NO2) 2-	3.035e-17	2.396e-17	-16.518	-16.620	-0.103	(0)
Ag(OH) 2-	2.178e-17	1.719e-17	-16.662	-16.765	-0.103	(0)
AgNO3	7.564e-18	7.564e-18	-17.121	-17.121	0.000	(0)
Ag(NH3) 2+	2.229e-19	1.760e-19	-18.652	-18.754	-0.103	(0)
Ag(SeO3) 2-3	4.136e-20	4.927e-21	-19.383	-20.307	-0.924	(0)
Ag2MoO4	6.698e-25	6.698e-25	-24.174	-24.174	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.926	-73.926	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-81.632	-83.274	-1.643	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.931	-148.138	-0.206	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.602	-148.705	-0.103	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.151	-149.527	-0.376	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.481	-149.838	-0.357	(0)
Al	3.622e-06					
Al(OH) 4-	3.600e-06	3.000e-06	-5.444	-5.523	-0.079	(0)
Al(OH) 3	2.108e-08	2.108e-08	-7.676	-7.676	0.000	(0)
Al(OH) 2+	1.112e-09	9.341e-10	-8.954	-9.030	-0.076	(0)
AlF3	8.181e-11	8.181e-11	-10.087	-10.087	0.000	(0)
AlF2+	6.388e-11	5.367e-11	-10.195	-10.270	-0.076	(0)
AlF4-	5.956e-12	4.964e-12	-11.225	-11.304	-0.079	(0)
AlF+2	2.235e-12	1.113e-12	-11.651	-11.953	-0.303	(0)
AlOH+2	2.087e-12	1.040e-12	-11.680	-11.983	-0.303	(0)
AlSO4+	4.200e-14	3.501e-14	-13.377	-13.456	-0.079	(0)
Al+3	4.753e-15	9.196e-16	-14.323	-15.036	-0.713	(0)
Al(SO4) 2-	2.207e-15	1.840e-15	-14.656	-14.735	-0.079	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.598	-44.522	-0.924	(0)
As (3)	1.918e-24					
H3AsO3	1.787e-24	1.787e-24	-23.748	-23.748	0.000	(0)
H2AsO3-	1.305e-25	1.030e-25	-24.885	-24.987	-0.103	(0)
HAsO3-2	2.717e-29	1.056e-29	-28.566	-28.977	-0.411	(0)
H4AsO3+	9.981e-33	7.880e-33	-32.001	-32.103	-0.103	(0)
AsO3-3	3.838e-34	4.572e-35	-33.416	-34.340	-0.924	(0)
As (5)	1.692e-10					
HAsO4-2	1.625e-10	6.312e-11	-9.789	-10.200	-0.411	(0)
H2AsO4-	6.489e-12	5.123e-12	-11.188	-11.290	-0.103	(0)
AsO4-3	1.883e-13	2.243e-14	-12.725	-13.649	-0.924	(0)
H3AsO4	7.849e-18	7.922e-18	-17.105	-17.101	0.004	(0)
B	2.902e-05					
H3BO3	2.658e-05	2.683e-05	-4.575	-4.571	0.004	(0)
H2BO3-	2.145e-06	1.751e-06	-5.669	-5.757	-0.088	(0)
CaH2BO3+	1.437e-07	1.173e-07	-6.843	-6.931	-0.088	(0)
MgH2BO3+	1.273e-07	1.039e-07	-6.895	-6.983	-0.088	(0)

	NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
	BF(OH) 3-	1.588e-09	1.296e-09	-8.799	-8.887	-0.088	(0)
	H5 (BO3) 2-	4.897e-11	3.998e-11	-10.310	-10.398	-0.088	(0)
	BaH2BO3+	1.415e-12	1.155e-12	-11.849	-11.937	-0.088	(0)
	BF2 (OH) 2-	1.830e-13	1.494e-13	-12.738	-12.826	-0.088	(0)
	H8 (BO3) 3-	1.314e-13	1.073e-13	-12.881	-12.970	-0.088	(0)
	AgH2BO3	3.818e-14	3.818e-14	-13.418	-13.418	0.000	(0)
	BF3OH-	7.676e-20	6.266e-20	-19.115	-19.203	-0.088	(0)
	BF4-	4.072e-25	3.324e-25	-24.390	-24.478	-0.088	(0)
Ba		4.447e-08					
	Ba+2	4.431e-08	2.135e-08	-7.354	-7.671	-0.317	(0)
	BaHCO3+	1.304e-10	1.101e-10	-9.885	-9.958	-0.074	(0)
	BaCO3	3.115e-11	3.115e-11	-10.506	-10.506	0.000	(0)
	BaH2BO3+	1.415e-12	1.155e-12	-11.849	-11.937	-0.088	(0)
	BaOH+	1.259e-13	1.054e-13	-12.900	-12.977	-0.077	(0)
	BaNO3+	9.383e-16	7.408e-16	-15.028	-15.130	-0.103	(0)
	BaNH3+2	9.629e-17	3.741e-17	-16.016	-16.427	-0.411	(0)
C (4)		6.986e-04					
	HCO3-	6.427e-04	5.400e-04	-3.192	-3.268	-0.076	(0)
	CaHCO3+	1.386e-05	1.170e-05	-4.858	-4.932	-0.074	(0)
	MgHCO3+	1.140e-05	9.458e-06	-4.943	-5.024	-0.081	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CO3-2	5.903e-06	2.845e-06	-5.229	-5.546	-0.317	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	4.050e-06	4.050e-06	-5.393	-5.393	0.000	(0)
	NaHCO3	2.247e-06	2.247e-06	-5.648	-5.648	0.000	(0)
	NaCO3-	4.665e-07	3.919e-07	-6.331	-6.407	-0.076	(0)
	CuCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
	ZnCO3	2.531e-07	2.531e-07	-6.597	-6.597	0.000	(0)
	UO2 (CO3) 3-4	2.530e-07	5.762e-09	-6.597	-8.239	-1.643	(0)
	MnHCO3+	2.227e-07	1.864e-07	-6.652	-6.730	-0.077	(0)
	UO2 (CO3) 2-2	1.040e-07	4.042e-08	-6.983	-7.393	-0.411	(0)
	ZnHCO3+	3.345e-08	2.641e-08	-7.476	-7.578	-0.103	(0)
	Cu (CO3) 2-2	6.699e-09	2.602e-09	-8.174	-8.585	-0.411	(0)
	NiCO3	3.868e-09	3.868e-09	-8.412	-8.412	0.000	(0)
	NiHCO3+	3.073e-09	2.426e-09	-8.512	-8.615	-0.103	(0)
	PbCO3	1.689e-09	1.689e-09	-8.772	-8.772	0.000	(0)
	CoHCO3+	1.381e-09	1.090e-09	-8.860	-8.962	-0.103	(0)
	CoCO3	1.248e-09	1.248e-09	-8.904	-8.904	0.000	(0)
	CuHCO3+	8.756e-10	6.913e-10	-9.058	-9.160	-0.103	(0)
	UO2CO3	7.121e-10	7.121e-10	-9.147	-9.147	0.000	(0)
	CdCO3	2.250e-10	2.250e-10	-9.648	-9.648	0.000	(0)
	BaHCO3+	1.304e-10	1.101e-10	-9.885	-9.958	-0.074	(0)
	PbHCO3+	1.004e-10	7.924e-11	-9.998	-10.101	-0.103	(0)
	Pb (CO3) 2-2	3.567e-11	1.386e-11	-10.448	-10.858	-0.411	(0)
	BaCO3	3.115e-11	3.115e-11	-10.506	-10.506	0.000	(0)
	CdHCO3+	5.404e-12	4.267e-12	-11.267	-11.370	-0.103	(0)
	Cd (CO3) 2-2	1.222e-12	4.746e-13	-11.913	-12.324	-0.411	(0)
	HgCO3	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
	FeHCO3+	1.803e-15	1.522e-15	-14.744	-14.818	-0.074	(0)
	Hg (CO3) 2-2	4.651e-17	1.807e-17	-16.332	-16.743	-0.411	(0)
	HgHCO3+	4.216e-19	3.328e-19	-18.375	-18.478	-0.103	(0)
Ca		3.744e-03					
	Ca+2	2.415e-03	1.164e-03	-2.617	-2.934	-0.317	(0)
	CaSO4	1.308e-03	1.308e-03	-2.884	-2.884	0.000	(0)
	CaHCO3+	1.386e-05	1.170e-05	-4.858	-4.932	-0.074	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.837e-06	1.538e-06	-5.736	-5.813	-0.077	(0)
	CaH2BO3+	1.437e-07	1.173e-07	-6.843	-6.931	-0.088	(0)
	CaOH+	3.111e-08	2.626e-08	-7.507	-7.581	-0.074	(0)
	CaNO3+	3.227e-11	2.548e-11	-10.491	-10.594	-0.103	(0)
	CaNH3+2	1.047e-11	4.069e-12	-10.980	-11.391	-0.411	(0)
	Ca (NH3) 2+2	1.158e-20	4.497e-21	-19.936	-20.347	-0.411	(0)
Cd		1.317e-08					
	Cd+2	7.202e-09	3.471e-09	-8.143	-8.460	-0.317	(0)
	CdSO4	3.990e-09	3.990e-09	-8.399	-8.399	0.000	(0)
	CdCl+	9.768e-10	7.712e-10	-9.010	-9.113	-0.103	(0)
	Cd (SO4) 2-2	6.794e-10	2.639e-10	-9.168	-9.579	-0.411	(0)

CdCO3	2.250e-10	2.250e-10	-9.648	-9.648	0.000	(0)
CdOH+	3.949e-11	3.117e-11	-10.404	-10.506	-0.103	(0)
CdOHCl	3.577e-11	3.577e-11	-10.446	-10.446	0.000	(0)
CdF+	8.436e-12	6.660e-12	-11.074	-11.177	-0.103	(0)
CdCl2	7.480e-12	7.480e-12	-11.126	-11.126	0.000	(0)
CdHCO3+	5.404e-12	4.267e-12	-11.267	-11.370	-0.103	(0)
Cd(CO3) 2-2	1.222e-12	4.746e-13	-11.913	-12.324	-0.411	(0)
Cd(OH) 2	2.224e-13	2.224e-13	-12.653	-12.653	0.000	(0)
CdCl3-	1.391e-14	1.098e-14	-13.857	-13.959	-0.103	(0)
CdF2	1.609e-15	1.609e-15	-14.793	-14.793	0.000	(0)
CdNO3+	9.622e-17	7.596e-17	-16.017	-16.119	-0.103	(0)
CdSeO4	6.984e-17	6.984e-17	-16.156	-16.156	0.000	(0)
Cd(OH) 3-	1.946e-17	1.537e-17	-16.711	-16.813	-0.103	(0)
Cd(SeO3) 2-2	4.582e-18	1.780e-18	-17.339	-17.750	-0.411	(0)
Cd2OH+3	4.551e-18	5.422e-19	-17.342	-18.266	-0.924	(0)
Cd(OH) 4-2	7.322e-24	2.844e-24	-23.135	-23.546	-0.411	(0)
Cd(NO3) 2	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.228	-79.331	-0.103	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.005	-151.005	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-227.882	-227.984	-0.103	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-304.257	-304.667	-0.411	(0)
Cl	2.793e-03					
Cl-	2.793e-03	2.327e-03	-2.554	-2.633	-0.079	(0)
MnCl+	6.053e-08	5.068e-08	-7.218	-7.295	-0.077	(0)
ZnOHCl	1.338e-08	1.338e-08	-7.874	-7.874	0.000	(0)
ZnCl+	1.090e-08	9.038e-09	-7.963	-8.044	-0.081	(0)
AgCl	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
AgCl2-	1.678e-09	1.325e-09	-8.775	-8.878	-0.103	(0)
CdCl+	9.768e-10	7.712e-10	-9.010	-9.113	-0.103	(0)
CuCl	5.523e-10	5.523e-10	-9.258	-9.258	0.000	(0)
CuCl2-	3.237e-10	2.685e-10	-9.490	-9.571	-0.081	(0)
NiCl+	2.748e-10	2.170e-10	-9.561	-9.664	-0.103	(0)
CoCl+	2.647e-10	2.089e-10	-9.577	-9.680	-0.103	(0)
MnCl2	1.666e-10	1.666e-10	-9.778	-9.778	0.000	(0)
CuCl+	9.020e-11	7.482e-11	-10.045	-10.126	-0.081	(0)
CdOHCl	3.577e-11	3.577e-11	-10.446	-10.446	0.000	(0)
ZnCl2	3.333e-11	3.333e-11	-10.477	-10.477	0.000	(0)
PbCl+	2.065e-11	1.630e-11	-10.685	-10.788	-0.103	(0)
CdCl2	7.480e-12	7.480e-12	-11.126	-11.126	0.000	(0)
AgCl3-2	7.071e-12	2.747e-12	-11.151	-11.561	-0.411	(0)
HgClOH	2.741e-12	2.741e-12	-11.562	-11.562	0.000	(0)
HgCl2	3.194e-13	3.194e-13	-12.496	-12.496	0.000	(0)
CuCl3-2	2.719e-13	1.336e-13	-12.566	-12.874	-0.309	(0)
PbCl2	1.695e-13	1.695e-13	-12.771	-12.771	0.000	(0)
MnCl3-	1.275e-13	1.068e-13	-12.894	-12.972	-0.077	(0)
AgCl4-3	1.095e-13	1.305e-14	-12.960	-13.884	-0.924	(0)
ZnCl3-	7.426e-14	6.160e-14	-13.129	-13.210	-0.081	(0)
CuCl2	6.037e-14	6.037e-14	-13.219	-13.219	0.000	(0)
CdCl3-	1.391e-14	1.098e-14	-13.857	-13.959	-0.103	(0)
HgCl3-	9.414e-15	7.432e-15	-14.026	-14.129	-0.103	(0)
NiCl2	2.542e-15	2.542e-15	-14.595	-14.595	0.000	(0)
UO2Cl+	3.005e-16	2.373e-16	-15.522	-15.625	-0.103	(0)
PbCl3-	1.988e-16	1.570e-16	-15.702	-15.804	-0.103	(0)
HgCl4-2	1.772e-16	6.885e-17	-15.751	-16.162	-0.411	(0)
ZnCl4-2	1.459e-16	7.167e-17	-15.836	-16.145	-0.309	(0)
HgCl+	3.469e-17	2.739e-17	-16.460	-16.562	-0.103	(0)
CuCl3-	1.580e-18	1.311e-18	-17.801	-17.882	-0.081	(0)
CrCl+2	1.342e-18	5.214e-19	-17.872	-18.283	-0.411	(0)
PbCl4-2	4.298e-19	1.670e-19	-18.367	-18.777	-0.411	(0)
CrOHCl2	2.608e-20	2.608e-20	-19.584	-19.584	0.000	(0)
FeCl+2	1.567e-22	7.702e-23	-21.805	-22.113	-0.309	(0)
CrCl2+	1.458e-22	1.151e-22	-21.836	-21.939	-0.103	(0)
CuCl4-2	3.111e-23	1.529e-23	-22.507	-22.816	-0.309	(0)
VOCl+	5.243e-24	4.139e-24	-23.280	-23.383	-0.103	(0)
FeCl2+	9.561e-25	8.005e-25	-24.019	-24.097	-0.077	(0)
CrO3Cl-	3.470e-26	2.739e-26	-25.460	-25.562	-0.103	(0)
FeCl3	1.863e-28	1.863e-28	-27.730	-27.730	0.000	(0)
CoCl+2	6.637e-36	2.578e-36	-35.178	-35.589	-0.411	(0)

UCl+3	0.000e+00	0.000e+00	-45.641	-46.565	-0.924	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
Co (2)	9.603e-08					
Co+2	6.682e-08	2.596e-08	-7.175	-7.586	-0.411	(0)
CoSO4	2.540e-08	2.540e-08	-7.595	-7.595	0.000	(0)
CoHCO3+	1.381e-09	1.090e-09	-8.860	-8.962	-0.103	(0)
CoCO3	1.248e-09	1.248e-09	-8.904	-8.904	0.000	(0)
CoOH+	7.418e-10	5.857e-10	-9.130	-9.232	-0.103	(0)
CoCl+	2.647e-10	2.089e-10	-9.577	-9.680	-0.103	(0)
CoF+	1.259e-10	9.938e-11	-9.900	-10.003	-0.103	(0)
Co (OH) 2	5.261e-11	5.261e-11	-10.279	-10.279	0.000	(0)
CoNO2+	1.700e-12	1.342e-12	-11.770	-11.872	-0.103	(0)
Co (NH3) +2	2.230e-14	8.665e-15	-13.652	-14.062	-0.411	(0)
Co (OH) 3-	1.503e-15	1.187e-15	-14.823	-14.926	-0.103	(0)
CoSeO4	1.406e-15	1.406e-15	-14.852	-14.852	0.000	(0)
CoOH-	3.774e-16	2.980e-16	-15.423	-15.526	-0.103	(0)
CoNO3+	3.607e-16	2.848e-16	-15.443	-15.546	-0.103	(0)
Co2OH+3	6.395e-18	7.619e-19	-17.194	-18.118	-0.924	(0)
Co (NH3) 2+2	2.642e-21	1.026e-21	-20.578	-20.989	-0.411	(0)
Co (OH) 4-2	5.476e-22	2.127e-22	-21.262	-21.672	-0.411	(0)
Co (NO3) 2	4.010e-24	4.010e-24	-23.397	-23.397	0.000	(0)
Co4 (OH) 4+4	1.031e-27	2.347e-29	-26.987	-28.629	-1.643	(0)
Co (NH3) 3+2	9.234e-29	3.587e-29	-28.035	-28.445	-0.411	(0)
Co (NH3) 4+2	1.346e-36	5.227e-37	-35.871	-36.282	-0.411	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-44.618	-0.411	(0)
Co (3)	8.056e-29					
CoOH+2	8.056e-29	3.129e-29	-28.094	-28.505	-0.411	(0)
Co+3	2.815e-35	5.446e-36	-34.551	-35.264	-0.713	(0)
CoCl+2	6.637e-36	2.578e-36	-35.178	-35.589	-0.411	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.393	-66.803	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
Cr (2)	2.020e-27					
Cr+2	2.020e-27	7.849e-28	-26.695	-27.105	-0.411	(0)
Cr (3)	1.044e-09					
Cr (OH) 2+	7.466e-10	5.894e-10	-9.127	-9.230	-0.103	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.693e-11	1.337e-11	-10.771	-10.874	-0.103	(0)
Cr (OH) 4-	1.428e-11	1.127e-11	-10.845	-10.948	-0.103	(0)
Cr (OH) +2	1.103e-11	4.284e-12	-10.958	-11.368	-0.411	(0)
CrOHSO4	4.985e-12	4.985e-12	-11.302	-11.302	0.000	(0)
CrF+2	8.553e-15	3.323e-15	-14.068	-14.479	-0.411	(0)
CrSO4+	2.512e-15	1.983e-15	-14.600	-14.703	-0.103	(0)
Cr+3	1.453e-15	1.732e-16	-14.838	-15.762	-0.924	(0)
CrCl+2	1.342e-18	5.214e-19	-17.872	-18.283	-0.411	(0)
CrOHC12	2.608e-20	2.608e-20	-19.584	-19.584	0.000	(0)
Cr2 (OH) 2SO4+2	4.969e-21	1.930e-21	-20.304	-20.714	-0.411	(0)
Cr2 (OH) 2 (SO4) 2	5.623e-22	5.623e-22	-21.250	-21.250	0.000	(0)
CrCl2+	1.458e-22	1.151e-22	-21.836	-21.939	-0.103	(0)
CrNO3+2	1.349e-25	5.239e-26	-24.870	-25.281	-0.411	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.708	-44.118	-0.411	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.177	-54.101	-0.924	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
Cr (6)	1.585e-14					
CrO4-2	1.515e-14	7.300e-15	-13.820	-14.137	-0.317	(0)
NaCrO4-	3.399e-16	2.684e-16	-15.469	-15.571	-0.103	(0)
HCrO4-	2.663e-16	2.102e-16	-15.575	-15.677	-0.103	(0)
KCrO4-	9.583e-17	7.565e-17	-16.019	-16.121	-0.103	(0)
CrO3SO4-2	7.197e-24	2.796e-24	-23.143	-23.554	-0.411	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.470e-26	2.739e-26	-25.460	-25.562	-0.103	(0)
Cr2O7-2	3.946e-30	1.533e-30	-29.404	-29.814	-0.411	(0)
Cu (1)	1.115e-09					
CuCl	5.523e-10	5.523e-10	-9.258	-9.258	0.000	(0)
CuCl2-	3.237e-10	2.685e-10	-9.490	-9.571	-0.081	(0)

Cu+	2.388e-10	1.886e-10	-9.622	-9.725	-0.103	(0)
CuCl3-2	2.719e-13	1.336e-13	-12.566	-12.874	-0.309	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.625	-147.991	-0.367	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.373	-148.721	-0.348	(0)
Cu (2)	5.172e-07					
CuCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
CuOH+	8.747e-08	7.256e-08	-7.058	-7.139	-0.081	(0)
Cu+2	4.210e-08	2.029e-08	-7.376	-7.693	-0.317	(0)
CuSO4	2.279e-08	2.279e-08	-7.642	-7.642	0.000	(0)
Cu (OH) 2	1.637e-08	1.637e-08	-7.786	-7.786	0.000	(0)
Cu (CO3) 2-2	6.699e-09	2.602e-09	-8.174	-8.585	-0.411	(0)
CuHCO3+	8.756e-10	6.913e-10	-9.058	-9.160	-0.103	(0)
Cu2 (OH) 2+2	3.404e-10	1.322e-10	-9.468	-9.879	-0.411	(0)
CuF+	1.963e-10	1.550e-10	-9.707	-9.810	-0.103	(0)
CuCl+	9.020e-11	7.482e-11	-10.045	-10.126	-0.081	(0)
Cu (OH) 3-	4.810e-11	3.797e-11	-10.318	-10.421	-0.103	(0)
CuNO2+	1.974e-11	1.559e-11	-10.705	-10.807	-0.103	(0)
CuNH3+2	1.484e-12	5.765e-13	-11.829	-12.239	-0.411	(0)
CuCl2	6.037e-14	6.037e-14	-13.219	-13.219	0.000	(0)
Cu (NO2) 2	1.170e-15	1.170e-15	-14.932	-14.932	0.000	(0)
Cu (OH) 4-2	8.699e-16	3.379e-16	-15.061	-15.471	-0.411	(0)
CuNO3+	5.625e-16	4.441e-16	-15.250	-15.353	-0.103	(0)
CuCl3-	1.580e-18	1.311e-18	-17.801	-17.882	-0.081	(0)
CuCl4-2	3.111e-23	1.529e-23	-22.507	-22.816	-0.309	(0)
Cu (NO3) 2	3.870e-25	3.870e-25	-24.412	-24.412	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.328	-218.430	-0.103	(0)
F	1.757e-04					
F-	1.453e-04	1.211e-04	-3.838	-3.917	-0.079	(0)
MgF+	2.790e-05	2.325e-05	-4.554	-4.634	-0.079	(0)
CaF+	1.837e-06	1.538e-06	-5.736	-5.813	-0.077	(0)
NaF	5.652e-07	5.652e-07	-6.248	-6.248	0.000	(0)
MnF+	9.961e-08	8.340e-08	-7.002	-7.079	-0.077	(0)
ZnF+	4.732e-09	3.736e-09	-8.325	-8.428	-0.103	(0)
HF	1.594e-09	1.594e-09	-8.798	-8.798	0.000	(0)
BF (OH) 3-	1.588e-09	1.296e-09	-8.799	-8.887	-0.088	(0)
CuF+	1.963e-10	1.550e-10	-9.707	-9.810	-0.103	(0)
NiF+	1.404e-10	1.108e-10	-9.853	-9.955	-0.103	(0)
CoF+	1.259e-10	9.938e-11	-9.900	-10.003	-0.103	(0)
AlF3	8.181e-11	8.181e-11	-10.087	-10.087	0.000	(0)
AlF2+	6.388e-11	5.367e-11	-10.195	-10.270	-0.076	(0)
CdF+	8.436e-12	6.660e-12	-11.074	-11.177	-0.103	(0)
AlF4-	5.956e-12	4.964e-12	-11.225	-11.304	-0.079	(0)
AlF+2	2.235e-12	1.113e-12	-11.651	-11.953	-0.303	(0)
PbF+	2.134e-12	1.685e-12	-11.671	-11.773	-0.103	(0)
UO2F+	1.331e-12	1.051e-12	-11.876	-11.978	-0.103	(0)
HF2-	8.889e-13	7.336e-13	-12.051	-12.135	-0.083	(0)
AgF	4.184e-13	4.184e-13	-12.378	-12.378	0.000	(0)
UO2F2	3.669e-13	3.669e-13	-12.435	-12.435	0.000	(0)
BF2 (OH) 2-	1.830e-13	1.494e-13	-12.738	-12.826	-0.088	(0)
UO2F3-	1.414e-14	1.116e-14	-13.850	-13.952	-0.103	(0)
CrF+2	8.553e-15	3.323e-15	-14.068	-14.479	-0.411	(0)
PbF2	4.015e-15	4.015e-15	-14.396	-14.396	0.000	(0)
CdF2	1.609e-15	1.609e-15	-14.793	-14.793	0.000	(0)
UO2F4-2	2.763e-17	1.073e-17	-16.559	-16.969	-0.411	(0)
H2F2	6.805e-18	6.805e-18	-17.167	-17.167	0.000	(0)
PbF3-	1.168e-18	9.220e-19	-17.933	-18.035	-0.103	(0)
VO2F	1.120e-18	1.120e-18	-17.951	-17.951	0.000	(0)
FeF2+	5.631e-19	4.715e-19	-18.249	-18.327	-0.077	(0)
FeF+2	2.961e-19	1.455e-19	-18.528	-18.837	-0.309	(0)
FeF3	8.054e-20	8.054e-20	-19.094	-19.094	0.000	(0)
BF3OH-	7.676e-20	6.266e-20	-19.115	-19.203	-0.088	(0)
VO2F2-	6.234e-20	4.922e-20	-19.205	-19.308	-0.103	(0)
VOF+	5.833e-22	4.605e-22	-21.234	-21.337	-0.103	(0)
VO2F3-2	1.914e-22	7.434e-23	-21.718	-22.129	-0.411	(0)
PbF4-2	1.375e-22	5.343e-23	-21.862	-22.272	-0.411	(0)
VOF2	2.091e-23	2.091e-23	-22.680	-22.680	0.000	(0)
HgF+	3.354e-24	2.648e-24	-23.474	-23.577	-0.103	(0)
BF4-	4.072e-25	3.324e-25	-24.390	-24.478	-0.088	(0)

VOF3-	1.138e-25	8.981e-26	-24.944	-25.047	-0.103	(0)
VO2F4-3	3.717e-26	4.429e-27	-25.430	-26.354	-0.924	(0)
Sb (OH) 2F	2.201e-26	2.201e-26	-25.657	-25.657	0.000	(0)
SbOF	2.165e-26	2.165e-26	-25.665	-25.665	0.000	(0)
VOF4-2	1.130e-28	4.389e-29	-27.947	-28.358	-0.411	(0)
UF3+	2.092e-36	1.652e-36	-35.679	-35.782	-0.103	(0)
UF2+2	2.216e-37	8.607e-38	-36.655	-37.065	-0.411	(0)
UF4	2.193e-38	2.193e-38	-37.659	-37.659	0.000	(0)
UF+3	4.740e-40	0.000e+00	-39.324	-40.248	-0.924	(0)
UF5-	1.333e-40	1.052e-40	-39.875	-39.978	-0.103	(0)
UF6-2	0.000e+00	0.000e+00	-41.004	-41.415	-0.411	(0)
Fe (2)	8.596e-13					
Fe+2	5.763e-13	2.239e-13	-12.239	-12.650	-0.411	(0)
FeSO4	2.695e-13	2.695e-13	-12.569	-12.569	0.000	(0)
FeOH+	1.204e-14	1.008e-14	-13.919	-13.997	-0.077	(0)
FeHCO3+	1.803e-15	1.522e-15	-14.744	-14.818	-0.074	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.867e-18	3.237e-18	-17.413	-17.490	-0.077	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.458	-161.458	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.197	-238.300	-0.103	(0)
Fe (3)	9.002e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	4.190e-10	3.521e-10	-9.378	-9.453	-0.076	(0)
Fe (OH) 4-	5.358e-11	4.502e-11	-10.271	-10.347	-0.076	(0)
FeOH+2	1.629e-15	8.002e-16	-14.788	-15.097	-0.309	(0)
FeF2+	5.631e-19	4.715e-19	-18.249	-18.327	-0.077	(0)
FeF+2	2.961e-19	1.455e-19	-18.528	-18.837	-0.309	(0)
FeF3	8.054e-20	8.054e-20	-19.094	-19.094	0.000	(0)
FeSO4+	7.203e-20	6.031e-20	-19.142	-19.220	-0.077	(0)
Fe (SO4) 2-	8.009e-21	6.323e-21	-20.096	-20.199	-0.103	(0)
Fe+3	5.665e-21	1.096e-21	-20.247	-20.960	-0.713	(0)
FeCl+2	1.567e-22	7.702e-23	-21.805	-22.113	-0.309	(0)
FeCl2+	9.561e-25	8.005e-25	-24.019	-24.097	-0.077	(0)
FeHSeO3+2	4.158e-25	1.615e-25	-24.381	-24.792	-0.411	(0)
Fe2 (OH) 2+4	9.311e-28	2.120e-29	-27.031	-28.674	-1.643	(0)
FeNO3+2	1.953e-28	7.586e-29	-27.709	-28.120	-0.411	(0)
FeCl3	1.863e-28	1.863e-28	-27.730	-27.730	0.000	(0)
Fe3 (OH) 4+5	3.977e-35	1.079e-37	-34.400	-36.967	-2.567	(0)
H (0)	4.000e-29					
H2	2.000e-29	2.019e-29	-28.699	-28.695	0.004	(0)
Hg (0)	1.961e-09					
Hg	1.961e-09	1.961e-09	-8.708	-8.708	0.000	(0)
Hg (1)	4.043e-21					
Hg2+2	2.021e-21	7.852e-22	-20.694	-21.105	-0.411	(0)
Hg (2)	7.788e-12					
Hg (OH) 2	4.716e-12	4.760e-12	-11.326	-11.322	0.004	(0)
HgClOH	2.741e-12	2.741e-12	-11.562	-11.562	0.000	(0)
HgCl2	3.194e-13	3.194e-13	-12.496	-12.496	0.000	(0)
HgCl3-	9.414e-15	7.432e-15	-14.026	-14.129	-0.103	(0)
HgCO3	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
HgCl4-2	1.772e-16	6.885e-17	-15.751	-16.162	-0.411	(0)
Hg (CO3) 2-2	4.651e-17	1.807e-17	-16.332	-16.743	-0.411	(0)
HgCl+	3.469e-17	2.739e-17	-16.460	-16.562	-0.103	(0)
HgOH+	3.364e-17	2.656e-17	-16.473	-16.576	-0.103	(0)
Hg (OH) 3-	8.583e-19	6.776e-19	-18.066	-18.169	-0.103	(0)
HgHCO3+	4.216e-19	3.328e-19	-18.375	-18.478	-0.103	(0)
Hg (NH3) 2+2	7.387e-21	2.870e-21	-20.132	-20.542	-0.411	(0)
HgNH3+2	2.661e-21	1.034e-21	-20.575	-20.986	-0.411	(0)
Hg+2	1.519e-21	5.900e-22	-20.819	-21.229	-0.411	(0)
HgSO4	7.575e-22	7.575e-22	-21.121	-21.121	0.000	(0)
HgF+	3.354e-24	2.648e-24	-23.474	-23.577	-0.103	(0)
Hg (NH3) 3+2	8.165e-29	3.172e-29	-28.088	-28.499	-0.411	(0)
HgNO3+	1.910e-30	1.508e-30	-29.719	-29.822	-0.103	(0)
Hg (NH3) 4+2	1.801e-36	6.996e-37	-35.745	-36.155	-0.411	(0)
Hg (NO3) 2	4.338e-39	4.338e-39	-38.363	-38.363	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.906	-139.008	-0.103	(0)
HgS2-2	0.000e+00	0.000e+00	-139.255	-139.666	-0.411	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.665	-140.665	0.000	(0)

K	3.463e-03					
K+	3.348e-03	2.790e-03	-2.475	-2.554	-0.079	(0)
KSO4-	1.153e-04	9.684e-05	-3.938	-4.014	-0.076	(0)
KCrO4-	9.583e-17	7.565e-17	-16.019	-16.121	-0.103	(0)
Mg	5.124e-03					
Mg+2	3.552e-03	1.712e-03	-2.450	-2.767	-0.317	(0)
MgSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
MgF+	2.790e-05	2.325e-05	-4.554	-4.634	-0.079	(0)
MgHCO3+	1.140e-05	9.458e-06	-4.943	-5.024	-0.081	(0)
MgCO3	4.050e-06	4.050e-06	-5.393	-5.393	0.000	(0)
MgOH+	9.091e-07	7.706e-07	-6.041	-6.113	-0.072	(0)
MgH2BO3+	1.273e-07	1.039e-07	-6.895	-6.983	-0.088	(0)
Mn (2)	6.007e-05					
Mn+2	4.454e-05	1.730e-05	-4.351	-4.762	-0.411	(0)
MnSO4	1.509e-05	1.509e-05	-4.821	-4.821	0.000	(0)
MnHCO3+	2.227e-07	1.864e-07	-6.652	-6.730	-0.077	(0)
MnF+	9.961e-08	8.340e-08	-7.002	-7.079	-0.077	(0)
MnCl+	6.053e-08	5.068e-08	-7.218	-7.295	-0.077	(0)
MnOH+	5.870e-08	4.914e-08	-7.231	-7.309	-0.077	(0)
MnCl2	1.666e-10	1.666e-10	-9.778	-9.778	0.000	(0)
MnSeO4	5.033e-13	5.033e-13	-12.298	-12.298	0.000	(0)
MnNO3+	2.404e-13	1.898e-13	-12.619	-12.722	-0.103	(0)
MnCl3-	1.275e-13	1.068e-13	-12.894	-12.972	-0.077	(0)
Mn (OH) 3-	4.639e-16	3.884e-16	-15.334	-15.411	-0.077	(0)
Mn (NO3) 2	3.300e-21	3.300e-21	-20.481	-20.481	0.000	(0)
Mn (OH) 4-2	2.886e-21	1.418e-21	-20.540	-20.848	-0.309	(0)
MnSe	0.000e+00	0.000e+00	-41.124	-41.124	0.000	(0)
Mn (3)	2.105e-25					
Mn+3	2.105e-25	4.073e-26	-24.677	-25.390	-0.713	(0)
Mn (6)	2.607e-40					
MnO4-2	2.607e-40	1.281e-40	-39.584	-39.892	-0.309	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.457	-44.543	-0.086	(0)
Mo	1.940e-06					
MoO4-2	1.940e-06	9.349e-07	-5.712	-6.029	-0.317	(0)
HMoO4-	2.097e-10	1.655e-10	-9.678	-9.781	-0.103	(0)
H2MoO4	1.079e-14	1.079e-14	-13.967	-13.967	0.000	(0)
Ag2MoO4	6.698e-25	6.698e-25	-24.174	-24.174	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.598	-44.522	-0.924	(0)
Mo7O24-6	0.000e+00	0.000e+00	-49.923	-53.619	-3.696	(0)
HMo7O24-5	0.000e+00	0.000e+00	-52.716	-55.283	-2.567	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.909	-58.551	-1.643	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.432	-63.356	-0.924	(0)
N (-3)	5.859e-08					
NH4+	5.308e-08	4.334e-08	-7.275	-7.363	-0.088	(0)
NH3	2.777e-09	2.777e-09	-8.556	-8.556	0.000	(0)
NH4SO4-	2.720e-09	2.277e-09	-8.565	-8.643	-0.077	(0)
CaNH3+2	1.047e-11	4.069e-12	-10.980	-11.391	-0.411	(0)
CuNH3+2	1.484e-12	5.765e-13	-11.829	-12.239	-0.411	(0)
NiNH3+2	1.399e-13	5.435e-14	-12.854	-13.265	-0.411	(0)
Co (NH3) +2	2.230e-14	8.665e-15	-13.652	-14.062	-0.411	(0)
AgNH3+	9.879e-15	7.799e-15	-14.005	-14.108	-0.103	(0)
BaNH3+2	9.629e-17	3.741e-17	-16.016	-16.427	-0.411	(0)
Ag (NH3) 2+	2.229e-19	1.760e-19	-18.652	-18.754	-0.103	(0)
Ni (NH3) 2+2	5.614e-20	2.181e-20	-19.251	-19.661	-0.411	(0)
Ca (NH3) 2+2	1.158e-20	4.497e-21	-19.936	-20.347	-0.411	(0)
Hg (NH3) 2+2	7.387e-21	2.870e-21	-20.132	-20.542	-0.411	(0)
HgNH3+2	2.661e-21	1.034e-21	-20.575	-20.986	-0.411	(0)
Co (NH3) 2+2	2.642e-21	1.026e-21	-20.578	-20.989	-0.411	(0)
Co (NH3) 3+2	9.234e-29	3.587e-29	-28.035	-28.445	-0.411	(0)
Hg (NH3) 3+2	8.165e-29	3.172e-29	-28.088	-28.499	-0.411	(0)
Hg (NH3) 4+2	1.801e-36	6.996e-37	-35.745	-36.155	-0.411	(0)
Co (NH3) 4+2	1.346e-36	5.227e-37	-35.871	-36.282	-0.411	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.708	-44.118	-0.411	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-44.618	-0.411	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.177	-54.101	-0.924	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)

Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.393	-66.803	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
N (3)	8.937e-06					
NO2-	8.937e-06	7.337e-06	-5.049	-5.134	-0.086	(0)
CuNO2+	1.974e-11	1.559e-11	-10.705	-10.807	-0.103	(0)
AgNO2	2.109e-12	2.109e-12	-11.676	-11.676	0.000	(0)
CoNO2+	1.700e-12	1.342e-12	-11.770	-11.872	-0.103	(0)
Cu (NO2) 2	1.170e-15	1.170e-15	-14.932	-14.932	0.000	(0)
Ag (NO2) 2-	3.035e-17	2.396e-17	-16.518	-16.620	-0.103	(0)
N (5)	8.340e-09					
NO3-	8.308e-09	6.922e-09	-8.081	-8.160	-0.079	(0)
CaNO3+	3.227e-11	2.548e-11	-10.491	-10.594	-0.103	(0)
MnNO3+	2.404e-13	1.898e-13	-12.619	-12.722	-0.103	(0)
ZnNO3+	3.405e-14	2.689e-14	-13.468	-13.570	-0.103	(0)
BaNO3+	9.383e-16	7.408e-16	-15.028	-15.130	-0.103	(0)
NiNO3+	8.027e-16	6.337e-16	-15.095	-15.198	-0.103	(0)
CuNO3+	5.625e-16	4.441e-16	-15.250	-15.353	-0.103	(0)
CoNO3+	3.607e-16	2.848e-16	-15.443	-15.546	-0.103	(0)
CdNO3+	9.622e-17	7.596e-17	-16.017	-16.119	-0.103	(0)
PbNO3+	2.561e-17	2.022e-17	-16.592	-16.694	-0.103	(0)
AgNO3	7.564e-18	7.564e-18	-17.121	-17.121	0.000	(0)
Mn (NO3) 2	3.300e-21	3.300e-21	-20.481	-20.481	0.000	(0)
UO2NO3+	1.100e-21	8.683e-22	-20.959	-21.061	-0.103	(0)
Zn (NO3) 2	3.713e-23	3.713e-23	-22.430	-22.430	0.000	(0)
Co (NO3) 2	4.010e-24	4.010e-24	-23.397	-23.397	0.000	(0)
Cu (NO3) 2	3.870e-25	3.870e-25	-24.412	-24.412	0.000	(0)
Cd (NO3) 2	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
Pb (NO3) 2	2.377e-25	2.377e-25	-24.624	-24.624	0.000	(0)
CrNO3+2	1.349e-25	5.239e-26	-24.870	-25.281	-0.411	(0)
VO2NO3	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)
FeNO3+2	1.953e-28	7.586e-29	-27.709	-28.120	-0.411	(0)
HgNO3+	1.910e-30	1.508e-30	-29.719	-29.822	-0.103	(0)
Hg (NO3) 2	4.338e-39	4.338e-39	-38.363	-38.363	0.000	(0)
Na	9.115e-03					
Na+	8.880e-03	7.398e-03	-2.052	-2.131	-0.079	(0)
NaSO4-	2.319e-04	1.948e-04	-3.635	-3.710	-0.076	(0)
NaHCO3	2.247e-06	2.247e-06	-5.648	-5.648	0.000	(0)
NaF	5.652e-07	5.652e-07	-6.248	-6.248	0.000	(0)
NaCO3-	4.665e-07	3.919e-07	-6.331	-6.407	-0.076	(0)
NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
NaCrO4-	3.399e-16	2.684e-16	-15.469	-15.571	-0.103	(0)
Ni	1.194e-07					
Ni+2	7.563e-08	3.645e-08	-7.121	-7.438	-0.317	(0)
NiSO4	3.566e-08	3.566e-08	-7.448	-7.448	0.000	(0)
NiCO3	3.868e-09	3.868e-09	-8.412	-8.412	0.000	(0)
NiHCO3+	3.073e-09	2.426e-09	-8.512	-8.615	-0.103	(0)
NiOH+	6.572e-10	5.189e-10	-9.182	-9.285	-0.103	(0)
NiCl+	2.748e-10	2.170e-10	-9.561	-9.664	-0.103	(0)
NiF+	1.404e-10	1.108e-10	-9.853	-9.955	-0.103	(0)
Ni (OH) 2	4.661e-11	4.661e-11	-10.332	-10.332	0.000	(0)
Ni (SO4) 2-2	1.491e-11	5.791e-12	-10.827	-11.237	-0.411	(0)
NiNH3+2	1.399e-13	5.435e-14	-12.854	-13.265	-0.411	(0)
Ni (OH) 3-	6.676e-14	5.270e-14	-13.176	-13.278	-0.103	(0)
NiCl2	2.542e-15	2.542e-15	-14.595	-14.595	0.000	(0)
NiSeO4	1.842e-15	1.842e-15	-14.735	-14.735	0.000	(0)
NiNO3+	8.027e-16	6.337e-16	-15.095	-15.198	-0.103	(0)
Ni (NH3) 2+2	5.614e-20	2.181e-20	-19.251	-19.661	-0.411	(0)
O (0)	2.462e-35					
O2	1.231e-35	1.243e-35	-34.910	-34.906	0.004	(0)
Pb	3.499e-09					
PbCO3	1.689e-09	1.689e-09	-8.772	-8.772	0.000	(0)
PbOH+	7.106e-10	5.610e-10	-9.148	-9.251	-0.103	(0)
PbSO4	4.743e-10	4.743e-10	-9.324	-9.324	0.000	(0)
Pb+2	4.098e-10	1.975e-10	-9.387	-9.704	-0.317	(0)
PbHCO3+	1.004e-10	7.924e-11	-9.998	-10.101	-0.103	(0)
Pb (SO4) 2-2	3.608e-11	1.402e-11	-10.443	-10.853	-0.411	(0)
Pb (CO3) 2-2	3.567e-11	1.386e-11	-10.448	-10.858	-0.411	(0)

PbCl+	2.065e-11	1.630e-11	-10.685	-10.788	-0.103	(0)
Pb(OH) 2	2.006e-11	2.006e-11	-10.698	-10.698	0.000	(0)
PbF+	2.134e-12	1.685e-12	-11.671	-11.773	-0.103	(0)
PbCl2	1.695e-13	1.695e-13	-12.771	-12.771	0.000	(0)
Pb(OH) 3-	2.873e-14	2.268e-14	-13.542	-13.644	-0.103	(0)
PbF2	4.015e-15	4.015e-15	-14.396	-14.396	0.000	(0)
PbCl3-	1.988e-16	1.570e-16	-15.702	-15.804	-0.103	(0)
PbNO3+	2.561e-17	2.022e-17	-16.592	-16.694	-0.103	(0)
Pb(OH) 4-2	1.617e-17	6.282e-18	-16.791	-17.202	-0.411	(0)
Pb2OH+3	1.474e-17	1.756e-18	-16.832	-17.756	-0.924	(0)
PbF3-	1.168e-18	9.220e-19	-17.933	-18.035	-0.103	(0)
PbCl4-2	4.298e-19	1.670e-19	-18.367	-18.777	-0.411	(0)
Pb3(OH) 4+2	4.082e-21	1.586e-21	-20.389	-20.800	-0.411	(0)
PbF4-2	1.375e-22	5.343e-23	-21.862	-22.272	-0.411	(0)
Pb(NO3) 2	2.377e-25	2.377e-25	-24.624	-24.624	0.000	(0)
Pb4(OH) 4+4	1.092e-25	2.488e-27	-24.962	-26.604	-1.643	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.192	-152.192	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-229.669	-229.771	-0.103	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.926	-73.926	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.776	-78.879	-0.103	(0)
CdHS+	0.000e+00	0.000e+00	-79.228	-79.331	-0.103	(0)
S5-2	0.000e+00	0.000e+00	-79.783	-80.193	-0.411	(0)
H2S	0.000e+00	0.000e+00	-79.910	-79.910	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.299	-80.709	-0.411	(0)
S4-2	0.000e+00	0.000e+00	-80.378	-80.789	-0.411	(0)
S3-2	0.000e+00	0.000e+00	-81.184	-81.595	-0.411	(0)
S2-2	0.000e+00	0.000e+00	-82.200	-82.611	-0.411	(0)
S-2	0.000e+00	0.000e+00	-87.820	-88.128	-0.309	(0)
HgHS2-	0.000e+00	0.000e+00	-138.906	-139.008	-0.103	(0)
HgS2-2	0.000e+00	0.000e+00	-139.255	-139.666	-0.411	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.665	-140.665	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-147.625	-147.991	-0.367	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.931	-148.138	-0.206	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.373	-148.721	-0.348	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.602	-148.705	-0.103	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.605	-148.708	-0.103	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.151	-149.527	-0.376	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.481	-149.838	-0.357	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.749	-150.749	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.005	-151.005	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.192	-152.192	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-161.458	-161.458	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-218.328	-218.430	-0.103	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.245	-226.347	-0.103	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.866	-228.277	-0.411	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-227.882	-227.984	-0.103	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-229.669	-229.771	-0.103	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.197	-238.300	-0.103	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-304.257	-304.667	-0.411	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.276	-306.686	-0.411	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.584	-321.994	-0.411	(0)
S(6)	1.338e-02					
SO4-2	1.018e-02	4.904e-03	-1.992	-2.309	-0.317	(0)
MgSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
CaSO4	1.308e-03	1.308e-03	-2.884	-2.884	0.000	(0)
NaSO4-	2.319e-04	1.948e-04	-3.635	-3.710	-0.076	(0)
KSO4-	1.153e-04	9.684e-05	-3.938	-4.014	-0.076	(0)
MnSO4	1.509e-05	1.509e-05	-4.821	-4.821	0.000	(0)
ZnSO4	1.659e-06	1.659e-06	-5.780	-5.780	0.000	(0)
Zn(SO4) 2-2	1.824e-07	7.086e-08	-6.739	-7.150	-0.411	(0)
NiSO4	3.566e-08	3.566e-08	-7.448	-7.448	0.000	(0)
CoSO4	2.540e-08	2.540e-08	-7.595	-7.595	0.000	(0)
CuSO4	2.279e-08	2.279e-08	-7.642	-7.642	0.000	(0)
HSO4-	5.117e-09	4.265e-09	-8.291	-8.370	-0.079	(0)
CdSO4	3.990e-09	3.990e-09	-8.399	-8.399	0.000	(0)
NH4SO4-	2.720e-09	2.277e-09	-8.565	-8.643	-0.077	(0)
Cd(SO4) 2-2	6.794e-10	2.639e-10	-9.168	-9.579	-0.411	(0)

PbSO4	4.743e-10	4.743e-10	-9.324	-9.324	0.000	(0)
AgSO4-	1.705e-10	1.346e-10	-9.768	-9.871	-0.103	(0)
Pb (SO4) 2-2	3.608e-11	1.402e-11	-10.443	-10.853	-0.411	(0)
Ni (SO4) 2-2	1.491e-11	5.791e-12	-10.827	-11.237	-0.411	(0)
CrOHSO4	4.985e-12	4.985e-12	-11.302	-11.302	0.000	(0)
UO2SO4	4.667e-13	4.667e-13	-12.331	-12.331	0.000	(0)
FeSO4	2.695e-13	2.695e-13	-12.569	-12.569	0.000	(0)
UO2 (SO4) 2-2	7.766e-14	3.017e-14	-13.110	-13.520	-0.411	(0)
AlSO4+	4.200e-14	3.501e-14	-13.377	-13.456	-0.079	(0)
CrSO4+	2.512e-15	1.983e-15	-14.600	-14.703	-0.103	(0)
Al (SO4) 2-	2.207e-15	1.840e-15	-14.656	-14.735	-0.079	(0)
VO2SO4-	7.820e-19	6.174e-19	-18.107	-18.209	-0.103	(0)
FeSO4+	7.203e-20	6.031e-20	-19.142	-19.220	-0.077	(0)
Fe (SO4) 2-	8.009e-21	6.323e-21	-20.096	-20.199	-0.103	(0)
Cr2 (OH) 2SO4+2	4.969e-21	1.930e-21	-20.304	-20.714	-0.411	(0)
VOSO4	8.564e-22	8.564e-22	-21.067	-21.067	0.000	(0)
HgSO4	7.575e-22	7.575e-22	-21.121	-21.121	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.623e-22	5.623e-22	-21.250	-21.250	0.000	(0)
CrO3SO4-2	7.197e-24	2.796e-24	-23.143	-23.554	-0.411	(0)
VSO4+	1.388e-36	1.096e-36	-35.858	-35.960	-0.103	(0)
U (SO4) 2	1.778e-40	1.778e-40	-39.750	-39.750	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.930	-41.341	-0.411	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Sb (3)	2.583e-20					
Sb (OH) 3	1.307e-20	1.307e-20	-19.884	-19.884	0.000	(0)
HSbO2	1.276e-20	1.276e-20	-19.894	-19.894	0.000	(0)
SbO2-	2.942e-24	2.323e-24	-23.531	-23.634	-0.103	(0)
Sb (OH) 4-	1.684e-24	1.329e-24	-23.774	-23.876	-0.103	(0)
Sb (OH) 2F	2.201e-26	2.201e-26	-25.657	-25.657	0.000	(0)
SbOF	2.165e-26	2.165e-26	-25.665	-25.665	0.000	(0)
Sb (OH) 2+	3.579e-27	2.825e-27	-26.446	-26.549	-0.103	(0)
SbO+	1.235e-27	9.746e-28	-26.909	-27.011	-0.103	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.584	-321.994	-0.411	(0)
Sb (5)	2.734e-08					
SbO3-	2.731e-08	2.156e-08	-7.564	-7.666	-0.103	(0)
Sb (OH) 6-	3.022e-11	2.518e-11	-10.520	-10.599	-0.079	(0)
SbO2+	6.207e-25	4.900e-25	-24.207	-24.310	-0.103	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.188e-39	9.382e-40	-38.925	-39.028	-0.103	(0)
MnSe	0.000e+00	0.000e+00	-41.124	-41.124	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.188	-43.188	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.566	-45.977	-0.411	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.632	-83.274	-1.643	(0)
Se (4)	1.349e-07					
HSeO3-	7.064e-08	5.577e-08	-7.151	-7.254	-0.103	(0)
SeO3-2	6.422e-08	2.495e-08	-7.192	-7.603	-0.411	(0)
H2SeO3	2.117e-13	2.117e-13	-12.674	-12.674	0.000	(0)
AgSeO3-	2.794e-14	2.206e-14	-13.554	-13.656	-0.103	(0)
Cd (SeO3) 2-2	4.582e-18	1.780e-18	-17.339	-17.750	-0.411	(0)
Ag (SeO3) 2-3	4.136e-20	4.927e-21	-19.383	-20.307	-0.924	(0)
FeHSeO3+2	4.158e-25	1.615e-25	-24.381	-24.792	-0.411	(0)
Se (6)	2.248e-10					
SeO4-2	2.243e-10	1.081e-10	-9.649	-9.966	-0.317	(0)
MnSeO4	5.033e-13	5.033e-13	-12.298	-12.298	0.000	(0)
ZnSeO4	2.588e-14	2.588e-14	-13.587	-13.587	0.000	(0)
NiSeO4	1.842e-15	1.842e-15	-14.735	-14.735	0.000	(0)
CoSeO4	1.406e-15	1.406e-15	-14.852	-14.852	0.000	(0)
CdSeO4	6.984e-17	6.984e-17	-16.156	-16.156	0.000	(0)
HSeO4-	6.106e-17	4.820e-17	-16.214	-16.317	-0.103	(0)
Zn (SeO4) 2-2	7.301e-24	2.836e-24	-23.137	-23.547	-0.411	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.225	-59.149	-0.924	(0)
U (4)	4.013e-19					
U (OH) 5-	4.012e-19	3.167e-19	-18.397	-18.499	-0.103	(0)
U (OH) 4	1.181e-22	1.181e-22	-21.928	-21.928	0.000	(0)
U (OH) 3+	4.870e-27	3.845e-27	-26.312	-26.415	-0.103	(0)
U (OH) 2+2	4.075e-32	1.583e-32	-31.390	-31.800	-0.411	(0)

UF3+	2.092e-36	1.652e-36	-35.679	-35.782	-0.103	(0)
UF2+2	2.216e-37	8.607e-38	-36.655	-37.065	-0.411	(0)
UOH+3	5.573e-38	6.639e-39	-37.254	-38.178	-0.924	(0)
UF4	2.193e-38	2.193e-38	-37.659	-37.659	0.000	(0)
UF+3	4.740e-40	0.000e+00	-39.324	-40.248	-0.924	(0)
U(SO4)2	1.778e-40	1.778e-40	-39.750	-39.750	0.000	(0)
UF5-	1.333e-40	1.052e-40	-39.875	-39.978	-0.103	(0)
USO4+2	0.000e+00	0.000e+00	-40.930	-41.341	-0.411	(0)
UF6-2	0.000e+00	0.000e+00	-41.004	-41.415	-0.411	(0)
U+4	0.000e+00	0.000e+00	-43.989	-45.631	-1.643	(0)
UC1+3	0.000e+00	0.000e+00	-45.641	-46.565	-0.924	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-161.871	-170.187	-8.316	(0)
U(5)	9.211e-16					
UO2+	9.211e-16	7.272e-16	-15.036	-15.138	-0.103	(0)
U(6)	3.578e-07					
UO2(CO3)3-4	2.530e-07	5.762e-09	-6.597	-8.239	-1.643	(0)
UO2(CO3)2-2	1.040e-07	4.042e-08	-6.983	-7.393	-0.411	(0)
UO2CO3	7.121e-10	7.121e-10	-9.147	-9.147	0.000	(0)
UO2OH+	1.134e-11	8.951e-12	-10.945	-11.048	-0.103	(0)
UO2F+	1.331e-12	1.051e-12	-11.876	-11.978	-0.103	(0)
UO2SO4	4.667e-13	4.667e-13	-12.331	-12.331	0.000	(0)
UO2F2	3.669e-13	3.669e-13	-12.435	-12.435	0.000	(0)
UO2+2	1.305e-13	6.287e-14	-12.884	-13.202	-0.317	(0)
UO2(SO4)2-2	7.766e-14	3.017e-14	-13.110	-13.520	-0.411	(0)
UO2F3-	1.414e-14	1.116e-14	-13.850	-13.952	-0.103	(0)
(UO2)3(OH)5+	1.462e-15	1.154e-15	-14.835	-14.938	-0.103	(0)
(UO2)2(OH)2+2	3.423e-16	1.330e-16	-15.466	-15.876	-0.411	(0)
UO2Cl+	3.005e-16	2.373e-16	-15.522	-15.625	-0.103	(0)
UO2F4-2	2.763e-17	1.073e-17	-16.559	-16.969	-0.411	(0)
UO2NO3+	1.100e-21	8.683e-22	-20.959	-21.061	-0.103	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.691	-43.793	-0.103	(0)
V+2	0.000e+00	0.000e+00	-44.946	-45.357	-0.411	(0)
V(3)	5.523e-16					
V(OH)3	5.523e-16	5.523e-16	-15.258	-15.258	0.000	(0)
V(OH)2+	4.024e-27	3.177e-27	-26.395	-26.498	-0.103	(0)
VOH+2	6.907e-31	2.683e-31	-30.161	-30.571	-0.411	(0)
V+3	3.974e-36	4.734e-37	-35.401	-36.325	-0.924	(0)
VSO4+	1.388e-36	1.096e-36	-35.858	-35.960	-0.103	(0)
V2(OH)3+3	0.000e+00	0.000e+00	-57.693	-58.617	-0.924	(0)
V2(OH)2+4	0.000e+00	0.000e+00	-58.700	-60.343	-1.643	(0)
V(4)	1.842e-19					
V(OH)3+	1.811e-19	1.430e-19	-18.742	-18.845	-0.103	(0)
VO+2	1.632e-21	6.341e-22	-20.787	-21.198	-0.411	(0)
VOSO4	8.564e-22	8.564e-22	-21.067	-21.067	0.000	(0)
VOF+	5.833e-22	4.605e-22	-21.234	-21.337	-0.103	(0)
VOF2	2.091e-23	2.091e-23	-22.680	-22.680	0.000	(0)
VOC1+	5.243e-24	4.139e-24	-23.280	-23.383	-0.103	(0)
VOF3-	1.138e-25	8.981e-26	-24.944	-25.047	-0.103	(0)
VOF4-2	1.130e-28	4.389e-29	-27.947	-28.358	-0.411	(0)
H2V2O4+2	2.641e-33	1.026e-33	-32.578	-32.989	-0.411	(0)
V(5)	6.643e-09					
H2VO4-	4.221e-09	3.333e-09	-8.375	-8.477	-0.103	(0)
HVO4-2	2.422e-09	9.407e-10	-8.616	-9.027	-0.411	(0)
H3VO4	2.966e-13	2.966e-13	-12.528	-12.528	0.000	(0)
HV2O7-3	8.922e-15	1.063e-15	-14.050	-14.973	-0.924	(0)
H3V2O7-	8.088e-15	6.386e-15	-14.092	-14.195	-0.103	(0)
VO4-3	4.447e-15	5.298e-16	-14.352	-15.276	-0.924	(0)
V2O7-4	1.412e-16	3.215e-18	-15.850	-17.493	-1.643	(0)
VO2+	6.328e-18	5.272e-18	-17.199	-17.278	-0.079	(0)
VO2F	1.120e-18	1.120e-18	-17.951	-17.951	0.000	(0)
VO2SO4-	7.820e-19	6.174e-19	-18.107	-18.209	-0.103	(0)
V3O9-3	3.259e-19	3.883e-20	-18.487	-19.411	-0.924	(0)
VO2F2-	6.234e-20	4.922e-20	-19.205	-19.308	-0.103	(0)
VO2F3-2	1.914e-22	7.434e-23	-21.718	-22.129	-0.411	(0)
V4O12-4	2.370e-24	5.398e-26	-23.625	-25.268	-1.643	(0)
VO2F4-3	3.717e-26	4.429e-27	-25.430	-26.354	-0.924	(0)
VO2NO3	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)

V10O28-6	0.000e+00	0.000e+00	-64.370	-68.066	-3.696	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.363	-67.930	-2.567	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.130	-70.773	-1.643	(0)
Zn	5.619e-06					
Zn+2	3.209e-06	1.546e-06	-5.494	-5.811	-0.317	(0)
ZnSO4	1.659e-06	1.659e-06	-5.780	-5.780	0.000	(0)
ZnCO3	2.531e-07	2.531e-07	-6.597	-6.597	0.000	(0)
ZnOH+	2.215e-07	1.749e-07	-6.655	-6.757	-0.103	(0)
Zn(SO4) 2-2	1.824e-07	7.086e-08	-6.739	-7.150	-0.411	(0)
ZnHCO3+	3.345e-08	2.641e-08	-7.476	-7.578	-0.103	(0)
Zn(OH) 2	3.134e-08	3.134e-08	-7.504	-7.504	0.000	(0)
ZnOHCl	1.338e-08	1.338e-08	-7.874	-7.874	0.000	(0)
ZnCl+	1.090e-08	9.038e-09	-7.963	-8.044	-0.081	(0)
ZnF+	4.732e-09	3.736e-09	-8.325	-8.428	-0.103	(0)
Zn(OH) 3-	2.250e-10	1.776e-10	-9.648	-9.751	-0.103	(0)
ZnCl2	3.333e-11	3.333e-11	-10.477	-10.477	0.000	(0)
ZnCl3-	7.426e-14	6.160e-14	-13.129	-13.210	-0.081	(0)
ZnNO3+	3.405e-14	2.689e-14	-13.468	-13.570	-0.103	(0)
ZnSeO4	2.588e-14	2.588e-14	-13.587	-13.587	0.000	(0)
Zn(OH) 4-2	2.058e-14	7.996e-15	-13.686	-14.097	-0.411	(0)
ZnCl4-2	1.459e-16	7.167e-17	-15.836	-16.145	-0.309	(0)
Zn(NO3) 2	3.713e-23	3.713e-23	-22.430	-22.430	0.000	(0)
Zn(SeO4) 2-2	7.301e-24	2.836e-24	-23.137	-23.547	-0.411	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.605	-148.708	-0.103	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.749	-150.749	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.245	-226.347	-0.103	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.866	-228.277	-0.411	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.276	-306.686	-0.411	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-57.07	-50.78	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-44.24	-39.73	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.46	-39.73	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-73.55	-55.62	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-59.07	-39.04	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.27	-28.86	0.40	(NH4)2CrO4
(NH4)2SeO4	-25.14	-24.69	0.45	(NH4)2SeO4
Acanthite	-52.33	-88.55	-36.22	Ag2S
Ag2CO3	-12.18	-23.27	-11.09	Ag2CO3
Ag2CrO4	-20.27	-31.86	-11.59	Ag2CrO4
Ag2HVO4	-12.33	-10.85	1.48	Ag2HVO4
Ag2MoO4	-12.20	-23.75	-11.55	Ag2MoO4
Ag2O	-14.20	-1.62	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.21	-20.03	-4.82	Ag2SO4
Ag3AsO3	-28.34	-26.18	2.16	Ag3AsO3
Ag3AsO4	-16.75	-19.53	-2.79	Ag3AsO4
Ag3H2VO5	-16.84	-11.66	5.18	Ag3H2VO5
AgF·4H2O	-13.83	-12.78	1.05	AgF·4H2O
Agmetal	-0.08	-13.58	-13.51	Ag
AgVO3	-10.81	-10.04	0.77	AgVO3
Al(OH) 3(am)	-1.69	9.11	10.80	Al(OH) 3
Al2(MoO4) 3	-50.53	-48.16	2.37	Al2(MoO4) 3
Al2O3	-1.42	18.23	19.65	Al2O3
Al4(OH)10SO4	-4.65	18.05	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-12.79	-7.99	4.80	AlAsO4·2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-153.03	-87.40	65.62	AlSb
Alunite	-2.58	-3.98	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.88	-5.24	-4.36	CaSO4
Anilite	-55.46	-87.34	-31.88	Cu0.25Cu1.5S
Antlerite	-1.97	6.81	8.79	Cu3(OH) 4SO4

Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.23	-94.99	-2.76	As4O6
Artinite	-4.58	5.02	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-40.91	-34.20	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2(OH)3Cl
Azurite	-1.16	-18.07	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.97	8.43	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.47	-1.59	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.10	6.84	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.14	-21.81	-9.67	BaCrO4
BaF2	-9.68	-15.50	-5.82	BaF2
BaMoO4	-6.74	-13.70	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.70	-6.87	1.83	BaSeO3
BaSeO4	-10.18	-17.64	-7.46	BaSeO4
Bianchite	-6.36	-8.12	-1.76	ZnSO4:6H2O
Birnessite	-6.56	11.53	18.09	MnO2
Bixbyite	-1.83	-2.48	-0.64	Mn2O3
BlaubleiI	-55.53	-79.70	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.94	-83.22	-27.28	Cu0.6Cu0.8S
Boehmite	0.54	9.12	8.58	AlOOH
Breithauptite	-56.56	-75.08	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.51	13.33	16.84	Mg(OH)2
Bunsenite	-3.78	8.66	12.45	NiO
Ca(VO3)2	-10.95	-5.29	5.66	Ca(VO3)2
Ca2V2O7	-9.62	7.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.67	7.88	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.00	5.30	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.91	21.05	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.81	21.05	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.51	-153.53	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.46	-26.37	-17.91	Hg2Cl2
CaMoO4	-1.01	-8.96	-7.95	CaMoO4
Carnotite	-1.06	-0.83	0.23	KUO2VO4
CaSeO3:2H2O	-4.95	-2.14	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.88	-12.90	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.34	-1.50	9.84	Cd(BO2)2
Cd(OH)2	-6.00	7.64	13.64	Cd(OH)2
Cd(OH)2(am)	-6.09	7.64	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.61	-13.90	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.05	4.51	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.25	12.15	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.73	-0.66	CdCl2
CdCl2:1H2O	-12.03	-13.73	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.81	-13.73	-1.91	CdCl2:2.5H2O
CdF2	-15.08	-16.29	-1.21	CdF2
Cdmetal(alpha)	-31.42	-17.90	13.51	Cd
Cdmetal(gamma)	-31.52	-17.90	13.62	Cd
CdMoO4	-0.34	-14.49	-14.15	CdMoO4
CdOHCl	-6.58	-3.04	3.54	CdOHCl
CdSb	-75.75	-76.10	-0.35	CdSb
CdSe	-19.24	-39.44	-20.20	CdSe
CdSeO4:2H2O	-16.58	-18.43	-1.85	CdSeO4:2H2O
CdSO4	-10.60	-10.77	-0.17	CdSO4
CdSO4:1H2O	-9.04	-10.77	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.90	-10.77	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.74	-11.49	-9.75	AgCl
Cerrusite	-2.12	-15.25	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.36	-10.00	-2.64	CuSO4:5H2O
Chalcocite	-55.36	-90.28	-34.92	Cu2S
Chalcopyrite	-126.73	-162.00	-35.27	CuFeS2
Cinnabar	-52.56	-98.25	-45.69	HgS

Claudetite	-91.92	-94.99	-3.06	As4O6
Clausthalite	-13.58	-40.68	-27.10	PbSe
Co (BO2) 2	-27.70	-0.63	27.07	Co (BO2) 2
Co (OH) 2	-4.58	8.52	13.09	Co (OH) 2
Co (OH) 3	-8.80	-11.11	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-21.69	-8.66	13.03	Co3 (AsO4) 2
Co3O4	-3.21	-13.71	-10.50	Co3O4
CoCl2	-21.12	-12.85	8.27	CoCl2
CoCl2:6H2O	-15.39	-12.85	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.82	-15.42	-1.60	CoF2
CoF3	-45.56	-47.01	-1.46	CoF3
CoFe2O4	18.43	14.90	-3.53	CoFe2O4
CoMoO4	-5.85	-13.61	-7.76	CoMoO4
CoO	-5.07	8.52	13.59	CoO
CoS (alpha)	-70.97	-78.41	-7.44	CoS
CoS (beta)	-67.34	-78.41	-11.07	CoS
CoSe	-22.36	-38.56	-16.20	CoSe
CoSeO3	-8.11	-6.79	1.32	CoSeO3
CoSeO4:6H2O	-16.02	-17.55	-1.53	CoSeO4:6H2O
CoSO4	-12.70	-9.90	2.80	CoSO4
CoSO4:6H2O	-7.42	-9.90	-2.47	CoSO4:6H2O
Cotunnite	-10.19	-14.97	-4.78	PbCl2
Covellite	-56.22	-78.52	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.46	-32.37	14.09	CrCl2
CrCl3	-48.34	-33.23	15.11	CrCl3
CrF3	-25.74	-37.08	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.09	-44.93	-33.84	Na3AlF6
Cu (OH) 2	-0.27	8.41	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.48	19.73	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.65	0.61	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.90	-89.78	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.63	-50.43	-45.80	Cu2Se
Cu2SO4	-19.81	-21.76	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.08	-8.98	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.95	-101.54	-42.59	Cu3Sb
Cu3Se2	-25.60	-89.10	-63.49	Cu3Se2
CuCO3	-1.74	-13.24	-11.50	CuCO3
CuCrO4	-16.39	-21.83	-5.44	CuCrO4
CuF	-8.74	-13.64	-4.91	CuF
CuF2	-16.64	-15.53	1.12	CuF2
CuF2:2H2O	-10.98	-15.53	-4.55	CuF2:2H2O
Cumetal	-5.69	-14.45	-8.76	Cu
CuMoO4	-0.65	-13.72	-13.08	CuMoO4
CuOCuSO4	-11.90	-1.59	10.30	CuOCuSO4
Cupricferrite	8.80	14.79	5.99	CuFe2O4
Cuprite	-1.94	-3.35	-1.41	Cu2O
Cuprousferrite	10.43	1.52	-8.92	CuFeO2
CuSe	-5.57	-38.67	-33.10	CuSe
CuSe2	-26.84	-60.20	-33.37	CuSe2
CuSeO3:2H2O	-7.41	-6.90	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.22	-17.66	-2.44	CuSeO4:5H2O
CuSO4	-12.94	-10.00	2.94	CuSO4
Diaspore	2.24	9.12	6.87	AlOOH
Djurleite	-55.58	-89.50	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.25	-16.79	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.30	-16.79	-17.09	CaMg (CO3) 2
Epsomite	-2.95	-5.08	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.03	-0.01	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-11.28	-15.00	-3.72	Fe (VO3) 2

Fe2 (OH) 4SeO3	-10.48	-8.92	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.90	-39.53	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.11	-48.85	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-14.31	-13.91	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.59	-18.68	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.56	-65.16	-18.60	FeSe2
FeS (ppt)	-80.53	-83.48	-2.95	FeS
FeSe	-32.63	-43.63	-11.00	FeSe
Fix_pe	-4.72	-4.72	0.00	e-
Fluorite	-0.27	-10.77	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	0.82	9.11	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.11	-8.12	-2.01	ZnSO4:7H2O
Greenockite	-64.93	-79.29	-14.36	CdS
Greigite	-292.85	-337.88	-45.03	Fe3S4
Gummite	-4.77	2.90	7.67	UO3
Gypsum	-0.63	-5.24	-4.61	CaSO4:2H2O
H-Jarosite	-15.15	-27.25	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.25	-22.13	-12.88	H2MoO4
H2S (g)	-78.92	-86.93	-8.01	H2S
H2Se (g)	-42.12	-47.08	-4.96	H2Se
Halite	-6.37	-4.76	1.60	NaCl
Hausmannite	-1.47	59.56	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.21	21.68	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.27	-258.97	-73.71	Hg (CH3) 2
Hg (g)	-7.40	-15.27	-7.87	Hg
Hg (OH) 2	-7.83	-11.32	-3.50	Hg (OH) 2
Hg2 (g)	-15.59	-30.55	-14.96	Hg2
Hg2 (OH) 2	-10.26	-5.00	5.26	Hg2 (OH) 2
Hg2CO3	-10.60	-26.65	-16.05	Hg2CO3
Hg2CrO4	-26.54	-35.24	-8.70	Hg2CrO4
Hg2F2	-18.58	-28.94	-10.36	Hg2F2
Hg2S	-80.26	-91.93	-11.68	Hg2S
Hg2SeO3	-15.65	-20.31	-4.66	Hg2SeO3
Hg2SO4	-17.28	-23.41	-6.13	Hg2SO4
Hg3O2CO3	-25.93	-55.61	-29.68	Hg3O2CO3
HgCl (g)	-32.68	-13.19	19.50	HgCl
HgCl2	-11.43	-32.69	-21.26	HgCl2
HgF (g)	-47.15	-14.47	32.68	HgF
HgF2 (g)	-47.82	-35.26	12.57	HgF2
Hgmetal (l)	-1.82	-15.27	-13.45	Hg
HgSe	-2.71	-58.40	-55.69	HgSe
HgSeO3	-14.20	-26.63	-12.43	HgSeO3
HgSO4	-20.31	-29.73	-9.42	HgSO4
Huntite	-3.45	-33.42	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-5.33	-24.10	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.15	-19.92	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-17.04	-22.21	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.95	-21.75	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.24	-49.48	-17.24	K2Cr2O7
K2CrO4	-18.73	-19.25	-0.51	K2CrO4
K2MoO4	-14.40	-11.14	3.26	K2MoO4
K2SeO4	-14.35	-15.08	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.18	-5.62	-0.43	PbO:PbSO4
Laurionite	-4.91	-4.29	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.30	6.40	12.69	PbO
Mackinawite	-79.88	-83.48	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.86	19.72	16.86	Fe2MgO4
Magnesite	-0.85	-8.31	-7.46	MgCO3

Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.48	-4.83	-5.31	Cu2(OH)2CO3
Manganite	-1.23	24.11	25.34	MnOOH
Massicot	-6.50	6.40	12.89	PbO
Matlockite	-7.28	-16.25	-8.97	PbClF
Melanothallite	-19.22	-12.96	6.26	CuCl2
Melanterite	-12.75	-14.96	-2.21	FeSO4·7H2O
Metacinnabar	-53.16	-98.25	-45.09	HgS
Mg(OH)2(active)	-5.46	13.33	18.79	Mg(OH)2
Mg(VO3)2	-16.40	-5.12	11.28	Mg(VO3)2
Mg2Sb3	-273.71	-199.02	74.68	Mg2Sb3
Mg2V2O7	-18.15	8.21	26.36	Mg2V2O7
MgCr2O4	-5.22	10.98	16.20	MgCr2O4
MgCrO4	-22.28	-16.90	5.38	MgCrO4
MgF2	-2.47	-10.60	-8.13	MgF2
MgMoO4	-6.95	-8.80	-1.85	MgMoO4
MgSeO3·6H2O	-5.03	-1.97	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.53	-12.73	-1.20	MgSeO4·6H2O
Minium	-28.79	44.73	73.52	Pb3O4
Mirabilite	-5.46	-6.57	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.02	-7.12	4.90	Mn(VO3)2
Mn2(SO4)3	-52.00	-57.71	-5.71	Mn2(SO4)3
Mn2Sb	-147.69	-86.61	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-12.69	-0.19	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.74	-10.03	2.72	MnCl2·4H2O
MnS(grn)	-75.76	-75.59	0.17	MnS
MnS(pnk)	-78.93	-75.59	3.34	MnS
MnSb	-94.85	-97.76	-2.91	MnSb
MnSe	-39.24	-35.74	3.50	MnSe
MnSeO3	-5.09	-3.96	1.13	MnSeO3
MnSeO3·2H2O	-4.95	-3.97	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.68	-14.73	-2.05	MnSeO4·5H2O
MnSO4	-9.65	-7.07	2.58	MnSO4
Monteponite	-7.46	7.64	15.10	CdO
Montroydite	-7.68	-11.32	-3.64	HgO
MoO3	-14.13	-22.13	-8.00	MoO3
Morenosite	-7.60	-9.75	-2.14	NiSO4·7H2O
MoS2	-151.27	-221.53	-70.26	MoS2
Na-Jarosite	-10.13	-21.33	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.74	-48.64	-9.90	Na2Cr2O7
Na2CrO4	-21.33	-18.40	2.93	Na2CrO4
Na2Mo2O7	-15.82	-32.42	-16.60	Na2Mo2O7
Na2MoO4	-11.78	-10.29	1.49	Na2MoO4
Na2MoO4·2H2O	-11.52	-10.29	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.77	-3.47	10.30	Na2SeO3·5H2O
Na2SeO4	-15.51	-14.23	1.28	Na2SeO4
Na3Sb	-173.21	-78.76	94.45	Na3Sb
Na3VO4	-28.15	8.53	36.68	Na3VO4
Na4V2O7	-32.18	5.22	37.40	Na4V2O7
Nantokite	-5.63	-12.36	-6.73	CuCl
NaSb	-88.22	-65.05	23.17	NaSb
Natron	-8.50	-9.81	-1.31	Na2CO3·10H2O
NaVO3	-7.17	-3.31	3.86	NaVO3
Nesquehonite	-3.64	-8.31	-4.67	MgCO3·3H2O
Ni(OH)2	-4.13	8.66	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-23.92	-8.22	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-15.76	16.24	32.00	Ni4(OH)6SO4
NiCO3	-6.11	-12.98	-6.87	NiCO3
NiMoO4	-2.33	-13.47	-11.14	NiMoO4
NiS(alpha)	-72.67	-78.27	-5.60	NiS
NiS(beta)	-67.17	-78.27	-11.10	NiS
NiS(gamma)	-65.47	-78.27	-12.80	NiS
NiSe	-20.72	-38.42	-17.70	NiSe
NiSeO3·2H2O	-9.46	-6.64	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-15.89	-17.41	-1.52	NiSeO4·6H2O
Nsutite	-5.97	11.53	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-247.22	-308.28	-61.07	As2S3

Otavite	-2.01	-14.01	-12.00	CdCO ₃
Pb(BO ₂) ₂	-9.26	-2.75	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-1.75	6.40	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-57.16	-65.92	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-6.68	2.11	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂₀ (OH) ₂	-13.40	12.79	26.19	Pb ₂₀ (OH) ₂
Pb ₂ O ₃	-22.70	38.34	61.04	Pb ₂ O ₃
Pb ₂ OC ₃	-8.30	-8.85	-0.56	Pb ₂ OC ₃
Pb ₂ V ₂ O ₇	-3.76	-5.66	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-20.81	-15.01	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-5.41	0.73	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-13.48	-2.46	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-9.91	0.78	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-13.92	7.18	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-14.70	7.18	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-11.24	-23.84	-12.60	PbCrO ₄
PbF ₂	-10.10	-17.54	-7.44	PbF ₂
Pbmetal	-23.39	-19.15	4.25	Pb
PbMoO ₄	-0.11	-15.73	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-6.58	6.40	12.98	PbO:0.33H ₂ O
PbSeO ₄	-12.83	-19.67	-6.84	PbSeO ₄
Periclase	-8.25	13.33	21.58	MgO
Phosgenite	-10.41	-30.22	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-17.66	31.94	49.60	PbO ₂
Portlandite	-9.64	13.17	22.80	Ca(OH) ₂
Pyrite	-126.35	-144.86	-18.51	FeS ₂
Pyrochroite	-3.86	11.34	15.19	Mn(OH) ₂
Pyrolusite	-4.50	36.88	41.38	MnO ₂
Realgar	-103.70	-123.45	-19.75	AsS
Retgersite	-7.71	-9.75	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.27	-10.31	-10.58	MnCO ₃
Rutherfordine	-4.25	-18.75	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-12.77	-19.88	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-17.62	-14.22	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-27.63	-37.30	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-113.24	-181.00	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-61.27	-79.53	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-61.63	-79.53	-17.90	Sb ₄ O ₆
SbCl ₃	-52.51	-51.93	0.57	SbCl ₃
SbF ₃	-45.56	-55.79	-10.23	SbF ₃
Sbmetal	-46.51	-58.20	-11.69	Sb
SbO ₂	-3.60	-31.42	-27.82	SbO ₂
Schoepite	-3.10	2.90	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-14.42	-21.53	-7.11	Se
Semetal(hex)	-13.83	-21.53	-7.71	Se
Senarmontite	-27.40	-39.77	-12.37	Sb ₂ O ₃
SeO ₂	-15.43	-15.30	0.12	SeO ₂
SeO ₃	-47.11	-26.07	21.04	SeO ₃
Siderite	-7.96	-18.20	-10.24	FeCO ₃
Smithsonite	-1.36	-11.36	-10.00	ZnCO ₃
Sphalerite	-65.19	-76.64	-11.45	ZnS
Spinel	-5.28	31.56	36.85	MgAl ₂ O ₄
Stibnite	-250.09	-300.55	-50.46	Sb ₂ S ₃
Sulfur	-59.24	-61.38	-2.14	S
Tenorite	0.76	8.41	7.64	CuO
Thenardite	-6.89	-6.57	0.32	Na ₂ SO ₄
Thermonatrite	-10.44	-9.81	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-3.57	0.51	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-10.28	10.80	21.08	U ₃ O ₈
U ₃ Sb ₄	-578.74	-426.36	152.38	U ₃ Sb ₄
U ₄ O ₉	-25.15	-28.17	-3.02	U ₄ O ₉
UF ₄	-31.76	-61.30	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.58	-61.30	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.36	-13.43	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.67	-29.52	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.37	-29.52	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.91	-29.52	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.57	-29.52	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O

UO2(OH)2(beta)	-2.71	2.90	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.92	-23.17	-2.25	UO2SeO4:4H2O
UO3	-4.80	2.90	7.70	UO3
Uraninite	-8.76	-13.43	-4.67	UO2
USb2	-219.71	-190.14	29.58	USb2
V(OH)3	-19.76	-12.17	7.59	V(OH)3
V2O5	-17.09	-18.45	-1.36	V2O5
V3O5	-42.67	-40.84	1.84	V3O5
V4O7	-53.12	-45.93	7.19	V4O7
V6O13	-45.59	-106.45	-60.86	V6O13
Valentinite	-31.29	-39.77	-8.48	Sb2O3
VC12	-65.19	-46.31	18.87	VC12
VC13	-67.66	-44.22	23.43	VC13
VF4	-67.90	-52.97	14.93	VF4
Vmetal	-94.52	-50.49	44.03	V
VO	-39.70	-24.95	14.76	VO
VO(OH)2	-10.25	-5.10	5.15	VO(OH)2
VO2Cl	-22.75	-19.91	2.84	VO2Cl
VOC1	-34.01	-22.86	11.15	VOC1
VOC12	-39.22	-26.46	12.76	VOC12
VOSO4	-27.12	-23.51	3.61	VOSO4
Witherite	-4.65	-13.22	-8.57	BaCO3
Wurtzite	-67.69	-76.64	-8.95	ZnS
Zincite	-1.04	10.29	11.33	ZnO
Zincosite	-12.05	-8.12	3.93	ZnSO4
Zn(BO2)2	-7.14	1.15	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.45	-22.13	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.91	10.29	12.20	Zn(OH)2
Zn(OH)2(am)	-2.18	10.29	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.46	10.29	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.24	10.29	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.44	10.29	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.33	2.17	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.29	9.90	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.98	-3.33	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.86	-5.95	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.65	22.75	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.42	30.08	38.50	Zn5(OH)8Cl2
ZnCl2	-18.13	-11.08	7.05	ZnCl2
ZnCO3:1H2O	-1.10	-11.36	-10.26	ZnCO3:1H2O
ZnF2	-13.11	-13.64	-0.53	ZnF2
Znmetal	-41.04	-15.25	25.79	Zn
ZnMoO4	-1.71	-11.84	-10.13	ZnMoO4
ZnO(active)	-0.90	10.29	11.19	ZnO
ZnS(am)	-67.59	-76.64	-9.05	ZnS
ZnSb	-84.47	-73.45	11.01	ZnSb
ZnSe	-22.39	-36.79	-14.40	ZnSe
ZnSeO4:6H2O	-14.26	-15.78	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.48	-8.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 67.

Title Use solution to allow model output
REACTION 306
H2O -0.0
0 moles
USE solution 315
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 315. Solution after simulation 66.

Using reaction 306.

Reaction 306.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.005e-08	1.005e-08
Al	3.622e-06	3.622e-06
As	1.692e-10	1.692e-10
B	2.902e-05	2.902e-05
Ba	4.447e-08	4.447e-08
C	6.986e-04	6.986e-04
Ca	3.744e-03	3.744e-03
Cd	1.317e-08	1.317e-08
Cl	2.793e-03	2.793e-03
Co	9.603e-08	9.603e-08
Cr	1.044e-09	1.044e-09
Cu	5.183e-07	5.184e-07
F	1.757e-04	1.757e-04
Fe	9.011e-10	9.011e-10
Hg	1.968e-09	1.968e-09
K	3.463e-03	3.463e-03
Mg	5.124e-03	5.124e-03
Mn	6.007e-05	6.007e-05
Mo	1.940e-06	1.940e-06
N	9.004e-06	9.004e-06
Na	9.115e-03	9.115e-03
Ni	1.194e-07	1.194e-07
Pb	3.499e-09	3.499e-09
S	1.338e-02	1.338e-02
Sb	2.734e-08	2.734e-08
Se	1.351e-07	1.351e-07
U	3.578e-07	3.578e-07
V	6.643e-09	6.643e-09
Zn	5.619e-06	5.619e-06

-----Description of solution-----

	pH =	8.051	Charge balance
	pe =	4.722	Adjusted to redox
equilibrium	Activity of water =	0.999	

Ionic strength (mol/kgw) = 4.052e-02
 Mass of water (kg) = 1.000e+00
 Total alkalinity (eq/kg) = 7.248e-04
 Total CO2 (mol/kg) = 6.986e-04
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 1.065e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 0
 Total H = 1.110174e+02
 Total O = 5.556404e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.370e-06	1.131e-06	-5.863	-5.947	-0.083	(0)
H+	1.068e-08	8.899e-09	-7.971	-8.051	-0.079	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.005e-08					
AgCl	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
AgCl2-	1.678e-09	1.325e-09	-8.775	-8.878	-0.103	(0)
Ag+	1.651e-09	1.376e-09	-8.782	-8.861	-0.079	(0)
AgSO4-	1.705e-10	1.346e-10	-9.768	-9.871	-0.103	(0)
AgCl3-2	7.071e-12	2.747e-12	-11.151	-11.561	-0.411	(0)
AgNO2	2.109e-12	2.109e-12	-11.676	-11.676	0.000	(0)
AgF	4.184e-13	4.184e-13	-12.378	-12.378	0.000	(0)
AgOH	1.556e-13	1.556e-13	-12.808	-12.808	0.000	(0)
AgCl4-3	1.095e-13	1.305e-14	-12.960	-13.884	-0.924	(0)
AgH2BO3	3.818e-14	3.818e-14	-13.418	-13.418	0.000	(0)
AgSeO3-	2.794e-14	2.206e-14	-13.554	-13.656	-0.103	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	9.879e-15	7.799e-15	-14.005	-14.108	-0.103	(0)
Ag (NO2) 2-	3.035e-17	2.396e-17	-16.518	-16.620	-0.103	(0)
Ag (OH) 2-	2.178e-17	1.719e-17	-16.662	-16.765	-0.103	(0)
AgNO3	7.564e-18	7.564e-18	-17.121	-17.121	0.000	(0)
Ag (NH3) 2+	2.229e-19	1.760e-19	-18.652	-18.754	-0.103	(0)
Ag (SeO3) 2-3	4.136e-20	4.927e-21	-19.383	-20.307	-0.924	(0)
Ag2MoO4	6.698e-25	6.698e-25	-24.174	-24.174	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.926	-73.926	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.632	-83.274	-1.643	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.931	-148.138	-0.206	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.602	-148.705	-0.103	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.151	-149.527	-0.376	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.481	-149.838	-0.357	(0)
Al	3.622e-06					
Al (OH) 4-	3.600e-06	3.000e-06	-5.444	-5.523	-0.079	(0)
Al (OH) 3	2.108e-08	2.108e-08	-7.676	-7.676	0.000	(0)
Al (OH) 2+	1.112e-09	9.341e-10	-8.954	-9.030	-0.076	(0)
AlF3	8.181e-11	8.181e-11	-10.087	-10.087	0.000	(0)
AlF2+	6.388e-11	5.367e-11	-10.195	-10.270	-0.076	(0)
AlF4-	5.956e-12	4.964e-12	-11.225	-11.304	-0.079	(0)
AlF+2	2.235e-12	1.113e-12	-11.651	-11.953	-0.303	(0)
AlOH+2	2.087e-12	1.040e-12	-11.680	-11.983	-0.303	(0)
AlSO4+	4.200e-14	3.501e-14	-13.377	-13.456	-0.079	(0)
Al+3	4.753e-15	9.196e-16	-14.323	-15.036	-0.713	(0)
Al (SO4) 2-	2.207e-15	1.840e-15	-14.656	-14.735	-0.079	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.598	-44.522	-0.924	(0)
As (3)	1.918e-24					
H3AsO3	1.787e-24	1.787e-24	-23.748	-23.748	0.000	(0)
H2AsO3-	1.305e-25	1.030e-25	-24.885	-24.987	-0.103	(0)
HAsO3-2	2.717e-29	1.056e-29	-28.566	-28.977	-0.411	(0)
H4AsO3+	9.981e-33	7.880e-33	-32.001	-32.103	-0.103	(0)
AsO3-3	3.838e-34	4.572e-35	-33.416	-34.340	-0.924	(0)
As (5)	1.692e-10					
HAsO4-2	1.625e-10	6.312e-11	-9.789	-10.200	-0.411	(0)
H2AsO4-	6.489e-12	5.123e-12	-11.188	-11.290	-0.103	(0)

	AsO4-3	1.883e-13	2.243e-14	-12.725	-13.649	-0.924	(0)
	H3AsO4	7.849e-18	7.922e-18	-17.105	-17.101	0.004	(0)
B		2.902e-05					
	H3BO3	2.658e-05	2.683e-05	-4.575	-4.571	0.004	(0)
	H2BO3-	2.145e-06	1.751e-06	-5.669	-5.757	-0.088	(0)
	CaH2BO3+	1.437e-07	1.173e-07	-6.843	-6.931	-0.088	(0)
	MgH2BO3+	1.273e-07	1.039e-07	-6.895	-6.983	-0.088	(0)
	NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
	BF(OH) 3-	1.588e-09	1.296e-09	-8.799	-8.887	-0.088	(0)
	H5(BO3) 2-	4.897e-11	3.998e-11	-10.310	-10.398	-0.088	(0)
	BaH2BO3+	1.415e-12	1.155e-12	-11.849	-11.937	-0.088	(0)
	BF2(OH) 2-	1.830e-13	1.494e-13	-12.738	-12.826	-0.088	(0)
	H8(BO3) 3-	1.314e-13	1.073e-13	-12.881	-12.970	-0.088	(0)
	AgH2BO3	3.818e-14	3.818e-14	-13.418	-13.418	0.000	(0)
	BF3OH-	7.676e-20	6.266e-20	-19.115	-19.203	-0.088	(0)
	BF4-	4.072e-25	3.324e-25	-24.390	-24.478	-0.088	(0)
Ba		4.447e-08					
	Ba+2	4.431e-08	2.135e-08	-7.354	-7.671	-0.317	(0)
	BaHCO3+	1.304e-10	1.101e-10	-9.885	-9.958	-0.074	(0)
	BaCO3	3.115e-11	3.115e-11	-10.506	-10.506	0.000	(0)
	BaH2BO3+	1.415e-12	1.155e-12	-11.849	-11.937	-0.088	(0)
	BaOH+	1.259e-13	1.054e-13	-12.900	-12.977	-0.077	(0)
	BaNO3+	9.383e-16	7.408e-16	-15.028	-15.130	-0.103	(0)
	BaNH3+2	9.629e-17	3.741e-17	-16.016	-16.427	-0.411	(0)
C(4)		6.986e-04					
	HCO3-	6.427e-04	5.400e-04	-3.192	-3.268	-0.076	(0)
	CaHCO3+	1.386e-05	1.170e-05	-4.858	-4.932	-0.074	(0)
	MgHCO3+	1.140e-05	9.458e-06	-4.943	-5.024	-0.081	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CO3-2	5.903e-06	2.845e-06	-5.229	-5.546	-0.317	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	4.050e-06	4.050e-06	-5.393	-5.393	0.000	(0)
	NaHCO3	2.247e-06	2.247e-06	-5.648	-5.648	0.000	(0)
	NaCO3-	4.665e-07	3.919e-07	-6.331	-6.407	-0.076	(0)
	CuCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
	ZnCO3	2.531e-07	2.531e-07	-6.597	-6.597	0.000	(0)
	UO2(CO3) 3-4	2.530e-07	5.762e-09	-6.597	-8.239	-1.643	(0)
	MnHCO3+	2.227e-07	1.864e-07	-6.652	-6.730	-0.077	(0)
	UO2(CO3) 2-2	1.040e-07	4.042e-08	-6.983	-7.393	-0.411	(0)
	ZnHCO3+	3.345e-08	2.641e-08	-7.476	-7.578	-0.103	(0)
	Cu(CO3) 2-2	6.699e-09	2.602e-09	-8.174	-8.585	-0.411	(0)
	NiCO3	3.868e-09	3.868e-09	-8.412	-8.412	0.000	(0)
	NiHCO3+	3.073e-09	2.426e-09	-8.512	-8.615	-0.103	(0)
	PbCO3	1.689e-09	1.689e-09	-8.772	-8.772	0.000	(0)
	CoHCO3+	1.381e-09	1.090e-09	-8.860	-8.962	-0.103	(0)
	CoCO3	1.248e-09	1.248e-09	-8.904	-8.904	0.000	(0)
	CuHCO3+	8.756e-10	6.913e-10	-9.058	-9.160	-0.103	(0)
	UO2CO3	7.121e-10	7.121e-10	-9.147	-9.147	0.000	(0)
	CdCO3	2.250e-10	2.250e-10	-9.648	-9.648	0.000	(0)
	BaHCO3+	1.304e-10	1.101e-10	-9.885	-9.958	-0.074	(0)
	PbHCO3+	1.004e-10	7.924e-11	-9.998	-10.101	-0.103	(0)
	Pb(CO3) 2-2	3.567e-11	1.386e-11	-10.448	-10.858	-0.411	(0)
	BaCO3	3.115e-11	3.115e-11	-10.506	-10.506	0.000	(0)
	CdHCO3+	5.404e-12	4.267e-12	-11.267	-11.370	-0.103	(0)
	Cd(CO3) 2-2	1.222e-12	4.746e-13	-11.913	-12.324	-0.411	(0)
	HgCO3	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
	FeHCO3+	1.803e-15	1.522e-15	-14.744	-14.818	-0.074	(0)
	Hg(CO3) 2-2	4.651e-17	1.807e-17	-16.332	-16.743	-0.411	(0)
	HgHCO3+	4.216e-19	3.328e-19	-18.375	-18.478	-0.103	(0)
Ca		3.744e-03					
	Ca+2	2.415e-03	1.164e-03	-2.617	-2.934	-0.317	(0)
	CaSO4	1.308e-03	1.308e-03	-2.884	-2.884	0.000	(0)
	CaHCO3+	1.386e-05	1.170e-05	-4.858	-4.932	-0.074	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.837e-06	1.538e-06	-5.736	-5.813	-0.077	(0)
	CaH2BO3+	1.437e-07	1.173e-07	-6.843	-6.931	-0.088	(0)
	CaOH+	3.111e-08	2.626e-08	-7.507	-7.581	-0.074	(0)
	CaNO3+	3.227e-11	2.548e-11	-10.491	-10.594	-0.103	(0)

	CaNH3+2	1.047e-11	4.069e-12	-10.980	-11.391	-0.411	(0)
	Ca (NH3) 2+2	1.158e-20	4.497e-21	-19.936	-20.347	-0.411	(0)
Cd	1.317e-08						
	Cd+2	7.202e-09	3.471e-09	-8.143	-8.460	-0.317	(0)
	CdSO4	3.990e-09	3.990e-09	-8.399	-8.399	0.000	(0)
	CdCl+	9.768e-10	7.712e-10	-9.010	-9.113	-0.103	(0)
	Cd (SO4) 2-2	6.794e-10	2.639e-10	-9.168	-9.579	-0.411	(0)
	CdCO3	2.250e-10	2.250e-10	-9.648	-9.648	0.000	(0)
	CdOH+	3.949e-11	3.117e-11	-10.404	-10.506	-0.103	(0)
	CdOHC1	3.577e-11	3.577e-11	-10.446	-10.446	0.000	(0)
	CdF+	8.436e-12	6.660e-12	-11.074	-11.177	-0.103	(0)
	CdCl2	7.480e-12	7.480e-12	-11.126	-11.126	0.000	(0)
	CdHCO3+	5.404e-12	4.267e-12	-11.267	-11.370	-0.103	(0)
	Cd (CO3) 2-2	1.222e-12	4.746e-13	-11.913	-12.324	-0.411	(0)
	Cd (OH) 2	2.224e-13	2.224e-13	-12.653	-12.653	0.000	(0)
	CdCl3-	1.391e-14	1.098e-14	-13.857	-13.959	-0.103	(0)
	CdF2	1.609e-15	1.609e-15	-14.793	-14.793	0.000	(0)
	CdNO3+	9.622e-17	7.596e-17	-16.017	-16.119	-0.103	(0)
	CdSeO4	6.984e-17	6.984e-17	-16.156	-16.156	0.000	(0)
	Cd (OH) 3-	1.946e-17	1.537e-17	-16.711	-16.813	-0.103	(0)
	Cd (SeO3) 2-2	4.582e-18	1.780e-18	-17.339	-17.750	-0.411	(0)
	Cd2OH+3	4.551e-18	5.422e-19	-17.342	-18.266	-0.924	(0)
	Cd (OH) 4-2	7.322e-24	2.844e-24	-23.135	-23.546	-0.411	(0)
	Cd (NO3) 2	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.228	-79.331	-0.103	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.005	-151.005	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-227.882	-227.984	-0.103	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.257	-304.667	-0.411	(0)
Cl	2.793e-03						
	Cl-	2.793e-03	2.327e-03	-2.554	-2.633	-0.079	(0)
	MnCl+	6.053e-08	5.068e-08	-7.218	-7.295	-0.077	(0)
	ZnOHC1	1.338e-08	1.338e-08	-7.874	-7.874	0.000	(0)
	ZnCl+	1.090e-08	9.038e-09	-7.963	-8.044	-0.081	(0)
	AgCl	6.536e-09	6.536e-09	-8.185	-8.185	0.000	(0)
	AgCl2-	1.678e-09	1.325e-09	-8.775	-8.878	-0.103	(0)
	CdCl+	9.768e-10	7.712e-10	-9.010	-9.113	-0.103	(0)
	CuCl	5.523e-10	5.523e-10	-9.258	-9.258	0.000	(0)
	CuCl2-	3.237e-10	2.685e-10	-9.490	-9.571	-0.081	(0)
	NiCl+	2.748e-10	2.170e-10	-9.561	-9.664	-0.103	(0)
	CoCl+	2.647e-10	2.089e-10	-9.577	-9.680	-0.103	(0)
	MnCl2	1.666e-10	1.666e-10	-9.778	-9.778	0.000	(0)
	CuCl+	9.020e-11	7.482e-11	-10.045	-10.126	-0.081	(0)
	CdOHC1	3.577e-11	3.577e-11	-10.446	-10.446	0.000	(0)
	ZnCl2	3.333e-11	3.333e-11	-10.477	-10.477	0.000	(0)
	PbCl+	2.065e-11	1.630e-11	-10.685	-10.788	-0.103	(0)
	CdCl2	7.480e-12	7.480e-12	-11.126	-11.126	0.000	(0)
	AgCl3-2	7.071e-12	2.747e-12	-11.151	-11.561	-0.411	(0)
	HgClOH	2.741e-12	2.741e-12	-11.562	-11.562	0.000	(0)
	HgCl2	3.194e-13	3.194e-13	-12.496	-12.496	0.000	(0)
	CuCl3-2	2.719e-13	1.336e-13	-12.566	-12.874	-0.309	(0)
	PbCl2	1.695e-13	1.695e-13	-12.771	-12.771	0.000	(0)
	MnCl3-	1.275e-13	1.068e-13	-12.894	-12.972	-0.077	(0)
	AgCl4-3	1.095e-13	1.305e-14	-12.960	-13.884	-0.924	(0)
	ZnCl3-	7.426e-14	6.160e-14	-13.129	-13.210	-0.081	(0)
	CuCl2	6.037e-14	6.037e-14	-13.219	-13.219	0.000	(0)
	CdCl3-	1.391e-14	1.098e-14	-13.857	-13.959	-0.103	(0)
	HgCl3-	9.414e-15	7.432e-15	-14.026	-14.129	-0.103	(0)
	NiCl2	2.542e-15	2.542e-15	-14.595	-14.595	0.000	(0)
	UO2Cl+	3.005e-16	2.373e-16	-15.522	-15.625	-0.103	(0)
	PbCl3-	1.988e-16	1.570e-16	-15.702	-15.804	-0.103	(0)
	HgCl4-2	1.772e-16	6.885e-17	-15.751	-16.162	-0.411	(0)
	ZnCl4-2	1.459e-16	7.167e-17	-15.836	-16.145	-0.309	(0)
	HgCl+	3.469e-17	2.739e-17	-16.460	-16.562	-0.103	(0)
	CuCl3-	1.580e-18	1.311e-18	-17.801	-17.882	-0.081	(0)
	CrCl+2	1.342e-18	5.214e-19	-17.872	-18.283	-0.411	(0)
	PbCl4-2	4.298e-19	1.670e-19	-18.367	-18.777	-0.411	(0)
	CrOHC12	2.608e-20	2.608e-20	-19.584	-19.584	0.000	(0)
	FeCl+2	1.567e-22	7.702e-23	-21.805	-22.113	-0.309	(0)

CrCl2+	1.458e-22	1.151e-22	-21.836	-21.939	-0.103	(0)
CuCl4-2	3.111e-23	1.529e-23	-22.507	-22.816	-0.309	(0)
VOCl+	5.243e-24	4.139e-24	-23.280	-23.383	-0.103	(0)
FeCl2+	9.561e-25	8.005e-25	-24.019	-24.097	-0.077	(0)
CrO3Cl-	3.470e-26	2.739e-26	-25.460	-25.562	-0.103	(0)
FeCl3	1.863e-28	1.863e-28	-27.730	-27.730	0.000	(0)
CoCl+2	6.637e-36	2.578e-36	-35.178	-35.589	-0.411	(0)
UCl+3	0.000e+00	0.000e+00	-45.641	-46.565	-0.924	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
Co (2)	9.603e-08					
Co+2	6.682e-08	2.596e-08	-7.175	-7.586	-0.411	(0)
CoSO4	2.540e-08	2.540e-08	-7.595	-7.595	0.000	(0)
CoHCO3+	1.381e-09	1.090e-09	-8.860	-8.962	-0.103	(0)
CoCO3	1.248e-09	1.248e-09	-8.904	-8.904	0.000	(0)
CoOH+	7.418e-10	5.857e-10	-9.130	-9.232	-0.103	(0)
CoCl+	2.647e-10	2.089e-10	-9.577	-9.680	-0.103	(0)
CoF+	1.259e-10	9.938e-11	-9.900	-10.003	-0.103	(0)
Co (OH) 2	5.261e-11	5.261e-11	-10.279	-10.279	0.000	(0)
CoNO2+	1.700e-12	1.342e-12	-11.770	-11.872	-0.103	(0)
Co (NH3) +2	2.230e-14	8.665e-15	-13.652	-14.062	-0.411	(0)
Co (OH) 3-	1.503e-15	1.187e-15	-14.823	-14.926	-0.103	(0)
CoSeO4	1.406e-15	1.406e-15	-14.852	-14.852	0.000	(0)
CoOH-	3.774e-16	2.980e-16	-15.423	-15.526	-0.103	(0)
CoNO3+	3.607e-16	2.848e-16	-15.443	-15.546	-0.103	(0)
Co2OH+3	6.395e-18	7.619e-19	-17.194	-18.118	-0.924	(0)
Co (NH3) 2+2	2.642e-21	1.026e-21	-20.578	-20.989	-0.411	(0)
Co (OH) 4-2	5.476e-22	2.127e-22	-21.262	-21.672	-0.411	(0)
Co (NO3) 2	4.010e-24	4.010e-24	-23.397	-23.397	0.000	(0)
Co4 (OH) 4+4	1.031e-27	2.347e-29	-26.987	-28.629	-1.643	(0)
Co (NH3) 3+2	9.234e-29	3.587e-29	-28.035	-28.445	-0.411	(0)
Co (NH3) 4+2	1.346e-36	5.227e-37	-35.871	-36.282	-0.411	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-44.618	-0.411	(0)
Co (3)	8.056e-29					
CoOH+2	8.056e-29	3.129e-29	-28.094	-28.505	-0.411	(0)
Co+3	2.815e-35	5.446e-36	-34.551	-35.264	-0.713	(0)
CoCl+2	6.637e-36	2.578e-36	-35.178	-35.589	-0.411	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.393	-66.803	-0.411	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
Cr (2)	2.020e-27					
Cr+2	2.020e-27	7.849e-28	-26.695	-27.105	-0.411	(0)
Cr (3)	1.044e-09					
Cr (OH) 2+	7.466e-10	5.894e-10	-9.127	-9.230	-0.103	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.693e-11	1.337e-11	-10.771	-10.874	-0.103	(0)
Cr (OH) 4-	1.428e-11	1.127e-11	-10.845	-10.948	-0.103	(0)
Cr (OH) +2	1.103e-11	4.284e-12	-10.958	-11.368	-0.411	(0)
CrOHSO4	4.985e-12	4.985e-12	-11.302	-11.302	0.000	(0)
CrF+2	8.553e-15	3.323e-15	-14.068	-14.479	-0.411	(0)
CrSO4+	2.512e-15	1.983e-15	-14.600	-14.703	-0.103	(0)
Cr+3	1.453e-15	1.732e-16	-14.838	-15.762	-0.924	(0)
CrCl+2	1.342e-18	5.214e-19	-17.872	-18.283	-0.411	(0)
CrOHC12	2.608e-20	2.608e-20	-19.584	-19.584	0.000	(0)
Cr2 (OH) 2SO4+2	4.969e-21	1.930e-21	-20.304	-20.714	-0.411	(0)
Cr2 (OH) 2 (SO4) 2	5.623e-22	5.623e-22	-21.250	-21.250	0.000	(0)
CrCl2+	1.458e-22	1.151e-22	-21.836	-21.939	-0.103	(0)
CrNO3+2	1.349e-25	5.239e-26	-24.870	-25.281	-0.411	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.708	-44.118	-0.411	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.177	-54.101	-0.924	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
Cr (6)	1.585e-14					
CrO4-2	1.515e-14	7.300e-15	-13.820	-14.137	-0.317	(0)
NaCrO4-	3.399e-16	2.684e-16	-15.469	-15.571	-0.103	(0)
HCrO4-	2.663e-16	2.102e-16	-15.575	-15.677	-0.103	(0)
KCrO4-	9.583e-17	7.565e-17	-16.019	-16.121	-0.103	(0)

	CrO3SO4-2	7.197e-24	2.796e-24	-23.143	-23.554	-0.411	(0)
	H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
	CrO3Cl-	3.470e-26	2.739e-26	-25.460	-25.562	-0.103	(0)
	Cr2O7-2	3.946e-30	1.533e-30	-29.404	-29.814	-0.411	(0)
Cu (1)	1.115e-09						
	CuCl	5.523e-10	5.523e-10	-9.258	-9.258	0.000	(0)
	CuCl2-	3.237e-10	2.685e-10	-9.490	-9.571	-0.081	(0)
	Cu+	2.388e-10	1.886e-10	-9.622	-9.725	-0.103	(0)
	CuCl3-2	2.719e-13	1.336e-13	-12.566	-12.874	-0.309	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.625	-147.991	-0.367	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.373	-148.721	-0.348	(0)
Cu (2)	5.172e-07						
	CuCO3	3.399e-07	3.399e-07	-6.469	-6.469	0.000	(0)
	CuOH+	8.747e-08	7.256e-08	-7.058	-7.139	-0.081	(0)
	Cu+2	4.210e-08	2.029e-08	-7.376	-7.693	-0.317	(0)
	CuSO4	2.279e-08	2.279e-08	-7.642	-7.642	0.000	(0)
	Cu (OH) 2	1.637e-08	1.637e-08	-7.786	-7.786	0.000	(0)
	Cu (CO3) 2-2	6.699e-09	2.602e-09	-8.174	-8.585	-0.411	(0)
	CuHCO3+	8.756e-10	6.913e-10	-9.058	-9.160	-0.103	(0)
	Cu2 (OH) 2+2	3.404e-10	1.322e-10	-9.468	-9.879	-0.411	(0)
	CuF+	1.963e-10	1.550e-10	-9.707	-9.810	-0.103	(0)
	CuCl+	9.020e-11	7.482e-11	-10.045	-10.126	-0.081	(0)
	Cu (OH) 3-	4.810e-11	3.797e-11	-10.318	-10.421	-0.103	(0)
	CuNO2+	1.974e-11	1.559e-11	-10.705	-10.807	-0.103	(0)
	CuNH3+2	1.484e-12	5.765e-13	-11.829	-12.239	-0.411	(0)
	CuCl2	6.037e-14	6.037e-14	-13.219	-13.219	0.000	(0)
	Cu (NO2) 2	1.170e-15	1.170e-15	-14.932	-14.932	0.000	(0)
	Cu (OH) 4-2	8.699e-16	3.379e-16	-15.061	-15.471	-0.411	(0)
	CuNO3+	5.625e-16	4.441e-16	-15.250	-15.353	-0.103	(0)
	CuCl3-	1.580e-18	1.311e-18	-17.801	-17.882	-0.081	(0)
	CuCl4-2	3.111e-23	1.529e-23	-22.507	-22.816	-0.309	(0)
	Cu (NO3) 2	3.870e-25	3.870e-25	-24.412	-24.412	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.328	-218.430	-0.103	(0)
F	1.757e-04						
	F-	1.453e-04	1.211e-04	-3.838	-3.917	-0.079	(0)
	MgF+	2.790e-05	2.325e-05	-4.554	-4.634	-0.079	(0)
	CaF+	1.837e-06	1.538e-06	-5.736	-5.813	-0.077	(0)
	NaF	5.652e-07	5.652e-07	-6.248	-6.248	0.000	(0)
	MnF+	9.961e-08	8.340e-08	-7.002	-7.079	-0.077	(0)
	ZnF+	4.732e-09	3.736e-09	-8.325	-8.428	-0.103	(0)
	HF	1.594e-09	1.594e-09	-8.798	-8.798	0.000	(0)
	BF (OH) 3-	1.588e-09	1.296e-09	-8.799	-8.887	-0.088	(0)
	CuF+	1.963e-10	1.550e-10	-9.707	-9.810	-0.103	(0)
	NiF+	1.404e-10	1.108e-10	-9.853	-9.955	-0.103	(0)
	CoF+	1.259e-10	9.938e-11	-9.900	-10.003	-0.103	(0)
	AlF3	8.181e-11	8.181e-11	-10.087	-10.087	0.000	(0)
	AlF2+	6.388e-11	5.367e-11	-10.195	-10.270	-0.076	(0)
	CdF+	8.436e-12	6.660e-12	-11.074	-11.177	-0.103	(0)
	AlF4-	5.956e-12	4.964e-12	-11.225	-11.304	-0.079	(0)
	AlF+2	2.235e-12	1.113e-12	-11.651	-11.953	-0.303	(0)
	PbF+	2.134e-12	1.685e-12	-11.671	-11.773	-0.103	(0)
	UO2F+	1.331e-12	1.051e-12	-11.876	-11.978	-0.103	(0)
	HF2-	8.889e-13	7.336e-13	-12.051	-12.135	-0.083	(0)
	AgF	4.184e-13	4.184e-13	-12.378	-12.378	0.000	(0)
	UO2F2	3.669e-13	3.669e-13	-12.435	-12.435	0.000	(0)
	BF2 (OH) 2-	1.830e-13	1.494e-13	-12.738	-12.826	-0.088	(0)
	UO2F3-	1.414e-14	1.116e-14	-13.850	-13.952	-0.103	(0)
	CrF+2	8.553e-15	3.323e-15	-14.068	-14.479	-0.411	(0)
	PbF2	4.015e-15	4.015e-15	-14.396	-14.396	0.000	(0)
	CdF2	1.609e-15	1.609e-15	-14.793	-14.793	0.000	(0)
	UO2F4-2	2.763e-17	1.073e-17	-16.559	-16.969	-0.411	(0)
	H2F2	6.805e-18	6.805e-18	-17.167	-17.167	0.000	(0)
	PbF3-	1.168e-18	9.220e-19	-17.933	-18.035	-0.103	(0)
	VO2F	1.120e-18	1.120e-18	-17.951	-17.951	0.000	(0)
	FeF2+	5.631e-19	4.715e-19	-18.249	-18.327	-0.077	(0)
	FeF+2	2.961e-19	1.455e-19	-18.528	-18.837	-0.309	(0)
	FeF3	8.054e-20	8.054e-20	-19.094	-19.094	0.000	(0)
	BF3OH-	7.676e-20	6.266e-20	-19.115	-19.203	-0.088	(0)

VO2F2-	6.234e-20	4.922e-20	-19.205	-19.308	-0.103	(0)
VOF+	5.833e-22	4.605e-22	-21.234	-21.337	-0.103	(0)
VO2F3-2	1.914e-22	7.434e-23	-21.718	-22.129	-0.411	(0)
PbF4-2	1.375e-22	5.343e-23	-21.862	-22.272	-0.411	(0)
VOF2	2.091e-23	2.091e-23	-22.680	-22.680	0.000	(0)
HgF+	3.354e-24	2.648e-24	-23.474	-23.577	-0.103	(0)
BF4-	4.072e-25	3.324e-25	-24.390	-24.478	-0.088	(0)
VOF3-	1.138e-25	8.981e-26	-24.944	-25.047	-0.103	(0)
VO2F4-3	3.717e-26	4.429e-27	-25.430	-26.354	-0.924	(0)
Sb(OH) 2F	2.201e-26	2.201e-26	-25.657	-25.657	0.000	(0)
SbOF	2.165e-26	2.165e-26	-25.665	-25.665	0.000	(0)
VOF4-2	1.130e-28	4.389e-29	-27.947	-28.358	-0.411	(0)
UF3+	2.092e-36	1.652e-36	-35.679	-35.782	-0.103	(0)
UF2+2	2.216e-37	8.607e-38	-36.655	-37.065	-0.411	(0)
UF4	2.193e-38	2.193e-38	-37.659	-37.659	0.000	(0)
UF+3	4.740e-40	0.000e+00	-39.324	-40.248	-0.924	(0)
UF5-	1.333e-40	1.052e-40	-39.875	-39.978	-0.103	(0)
UF6-2	0.000e+00	0.000e+00	-41.004	-41.415	-0.411	(0)
Fe (2)	8.596e-13					
Fe+2	5.763e-13	2.239e-13	-12.239	-12.650	-0.411	(0)
FeSO4	2.695e-13	2.695e-13	-12.569	-12.569	0.000	(0)
FeOH+	1.204e-14	1.008e-14	-13.919	-13.997	-0.077	(0)
FeHCO3+	1.803e-15	1.522e-15	-14.744	-14.818	-0.074	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.867e-18	3.237e-18	-17.413	-17.490	-0.077	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.458	-161.458	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.197	-238.300	-0.103	(0)
Fe (3)	9.002e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	4.190e-10	3.521e-10	-9.378	-9.453	-0.076	(0)
Fe (OH) 4-	5.358e-11	4.502e-11	-10.271	-10.347	-0.076	(0)
FeOH+2	1.629e-15	8.002e-16	-14.788	-15.097	-0.309	(0)
FeF2+	5.631e-19	4.715e-19	-18.249	-18.327	-0.077	(0)
FeF+2	2.961e-19	1.455e-19	-18.528	-18.837	-0.309	(0)
FeF3	8.054e-20	8.054e-20	-19.094	-19.094	0.000	(0)
FeSO4+	7.203e-20	6.031e-20	-19.142	-19.220	-0.077	(0)
Fe (SO4) 2-	8.009e-21	6.323e-21	-20.096	-20.199	-0.103	(0)
Fe+3	5.665e-21	1.096e-21	-20.247	-20.960	-0.713	(0)
FeCl+2	1.567e-22	7.702e-23	-21.805	-22.113	-0.309	(0)
FeCl2+	9.561e-25	8.005e-25	-24.019	-24.097	-0.077	(0)
FeHSeO3+2	4.158e-25	1.615e-25	-24.381	-24.792	-0.411	(0)
Fe2 (OH) 2+4	9.311e-28	2.120e-29	-27.031	-28.674	-1.643	(0)
FeNO3+2	1.953e-28	7.586e-29	-27.709	-28.120	-0.411	(0)
FeCl3	1.863e-28	1.863e-28	-27.730	-27.730	0.000	(0)
Fe3 (OH) 4+5	3.977e-35	1.079e-37	-34.400	-36.967	-2.567	(0)
H (0)	4.000e-29					
H2	2.000e-29	2.019e-29	-28.699	-28.695	0.004	(0)
Hg (0)	1.961e-09					
Hg	1.961e-09	1.961e-09	-8.708	-8.708	0.000	(0)
Hg (1)	4.043e-21					
Hg2+2	2.021e-21	7.852e-22	-20.694	-21.105	-0.411	(0)
Hg (2)	7.788e-12					
Hg (OH) 2	4.716e-12	4.760e-12	-11.326	-11.322	0.004	(0)
HgClOH	2.741e-12	2.741e-12	-11.562	-11.562	0.000	(0)
HgCl2	3.194e-13	3.194e-13	-12.496	-12.496	0.000	(0)
HgCl3-	9.414e-15	7.432e-15	-14.026	-14.129	-0.103	(0)
HgCO3	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
HgCl4-2	1.772e-16	6.885e-17	-15.751	-16.162	-0.411	(0)
Hg (CO3) 2-2	4.651e-17	1.807e-17	-16.332	-16.743	-0.411	(0)
HgCl+	3.469e-17	2.739e-17	-16.460	-16.562	-0.103	(0)
HgOH+	3.364e-17	2.656e-17	-16.473	-16.576	-0.103	(0)
Hg (OH) 3-	8.583e-19	6.776e-19	-18.066	-18.169	-0.103	(0)
HgHCO3+	4.216e-19	3.328e-19	-18.375	-18.478	-0.103	(0)
Hg (NH3) 2+2	7.387e-21	2.870e-21	-20.132	-20.542	-0.411	(0)
HgNH3+2	2.661e-21	1.034e-21	-20.575	-20.986	-0.411	(0)
Hg+2	1.519e-21	5.900e-22	-20.819	-21.229	-0.411	(0)
HgSO4	7.575e-22	7.575e-22	-21.121	-21.121	0.000	(0)
HgF+	3.354e-24	2.648e-24	-23.474	-23.577	-0.103	(0)

	Hg (NH3) 3+2	8.165e-29	3.172e-29	-28.088	-28.499	-0.411	(0)
	HgNO3+	1.910e-30	1.508e-30	-29.719	-29.822	-0.103	(0)
	Hg (NH3) 4+2	1.801e-36	6.996e-37	-35.745	-36.155	-0.411	(0)
	Hg (NO3) 2	4.338e-39	4.338e-39	-38.363	-38.363	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.906	-139.008	-0.103	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.255	-139.666	-0.411	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.665	-140.665	0.000	(0)
K		3.463e-03					
	K+	3.348e-03	2.790e-03	-2.475	-2.554	-0.079	(0)
	KSO4-	1.153e-04	9.684e-05	-3.938	-4.014	-0.076	(0)
	KCrO4-	9.583e-17	7.565e-17	-16.019	-16.121	-0.103	(0)
Mg		5.124e-03					
	Mg+2	3.552e-03	1.712e-03	-2.450	-2.767	-0.317	(0)
	MgSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
	MgF+	2.790e-05	2.325e-05	-4.554	-4.634	-0.079	(0)
	MgHCO3+	1.140e-05	9.458e-06	-4.943	-5.024	-0.081	(0)
	MgCO3	4.050e-06	4.050e-06	-5.393	-5.393	0.000	(0)
	MgOH+	9.091e-07	7.706e-07	-6.041	-6.113	-0.072	(0)
	MgH2BO3+	1.273e-07	1.039e-07	-6.895	-6.983	-0.088	(0)
Mn (2)		6.007e-05					
	Mn+2	4.454e-05	1.730e-05	-4.351	-4.762	-0.411	(0)
	MnSO4	1.509e-05	1.509e-05	-4.821	-4.821	0.000	(0)
	MnHCO3+	2.227e-07	1.864e-07	-6.652	-6.730	-0.077	(0)
	MnF+	9.961e-08	8.340e-08	-7.002	-7.079	-0.077	(0)
	MnCl+	6.053e-08	5.068e-08	-7.218	-7.295	-0.077	(0)
	MnOH+	5.870e-08	4.914e-08	-7.231	-7.309	-0.077	(0)
	MnCl2	1.666e-10	1.666e-10	-9.778	-9.778	0.000	(0)
	MnSeO4	5.033e-13	5.033e-13	-12.298	-12.298	0.000	(0)
	MnNO3+	2.404e-13	1.898e-13	-12.619	-12.722	-0.103	(0)
	MnCl3-	1.275e-13	1.068e-13	-12.894	-12.972	-0.077	(0)
	Mn (OH) 3-	4.639e-16	3.884e-16	-15.334	-15.411	-0.077	(0)
	Mn (NO3) 2	3.300e-21	3.300e-21	-20.481	-20.481	0.000	(0)
	Mn (OH) 4-2	2.886e-21	1.418e-21	-20.540	-20.848	-0.309	(0)
	MnSe	0.000e+00	0.000e+00	-41.124	-41.124	0.000	(0)
Mn (3)		2.105e-25					
	Mn+3	2.105e-25	4.073e-26	-24.677	-25.390	-0.713	(0)
Mn (6)		2.607e-40					
	MnO4-2	2.607e-40	1.281e-40	-39.584	-39.892	-0.309	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.457	-44.543	-0.086	(0)
Mo		1.940e-06					
	MoO4-2	1.940e-06	9.349e-07	-5.712	-6.029	-0.317	(0)
	HMoO4-	2.097e-10	1.655e-10	-9.678	-9.781	-0.103	(0)
	H2MoO4	1.079e-14	1.079e-14	-13.967	-13.967	0.000	(0)
	Ag2MoO4	6.698e-25	6.698e-25	-24.174	-24.174	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.598	-44.522	-0.924	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-49.923	-53.619	-3.696	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-52.716	-55.283	-2.567	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-56.909	-58.551	-1.643	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-62.432	-63.356	-0.924	(0)
N (-3)		5.859e-08					
	NH4+	5.308e-08	4.334e-08	-7.275	-7.363	-0.088	(0)
	NH3	2.777e-09	2.777e-09	-8.556	-8.556	0.000	(0)
	NH4SO4-	2.720e-09	2.277e-09	-8.565	-8.643	-0.077	(0)
	CaNH3+2	1.047e-11	4.069e-12	-10.980	-11.391	-0.411	(0)
	CuNH3+2	1.484e-12	5.765e-13	-11.829	-12.239	-0.411	(0)
	NiNH3+2	1.399e-13	5.435e-14	-12.854	-13.265	-0.411	(0)
	Co (NH3) +2	2.230e-14	8.665e-15	-13.652	-14.062	-0.411	(0)
	AgNH3+	9.879e-15	7.799e-15	-14.005	-14.108	-0.103	(0)
	BaNH3+2	9.629e-17	3.741e-17	-16.016	-16.427	-0.411	(0)
	Ag (NH3) 2+	2.229e-19	1.760e-19	-18.652	-18.754	-0.103	(0)
	Ni (NH3) 2+2	5.614e-20	2.181e-20	-19.251	-19.661	-0.411	(0)
	Ca (NH3) 2+2	1.158e-20	4.497e-21	-19.936	-20.347	-0.411	(0)
	Hg (NH3) 2+2	7.387e-21	2.870e-21	-20.132	-20.542	-0.411	(0)
	HgNH3+2	2.661e-21	1.034e-21	-20.575	-20.986	-0.411	(0)
	Co (NH3) 2+2	2.642e-21	1.026e-21	-20.578	-20.989	-0.411	(0)
	Co (NH3) 3+2	9.234e-29	3.587e-29	-28.035	-28.445	-0.411	(0)
	Hg (NH3) 3+2	8.165e-29	3.172e-29	-28.088	-28.499	-0.411	(0)

	Hg (NH3) 4+2	1.801e-36	6.996e-37	-35.745	-36.155	-0.411	(0)
	Co (NH3) 4+2	1.346e-36	5.227e-37	-35.871	-36.282	-0.411	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.708	-44.118	-0.411	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-44.618	-0.411	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.007	-52.418	-0.411	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.177	-54.101	-0.924	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.221	-55.632	-0.411	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.393	-66.803	-0.411	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.279	-67.690	-0.411	(0)
N (3)	8.937e-06						
	NO2-	8.937e-06	7.337e-06	-5.049	-5.134	-0.086	(0)
	CuNO2+	1.974e-11	1.559e-11	-10.705	-10.807	-0.103	(0)
	AgNO2	2.109e-12	2.109e-12	-11.676	-11.676	0.000	(0)
	CoNO2+	1.700e-12	1.342e-12	-11.770	-11.872	-0.103	(0)
	Cu (NO2) 2	1.170e-15	1.170e-15	-14.932	-14.932	0.000	(0)
	Ag (NO2) 2-	3.035e-17	2.396e-17	-16.518	-16.620	-0.103	(0)
N (5)	8.340e-09						
	NO3-	8.308e-09	6.922e-09	-8.081	-8.160	-0.079	(0)
	CaNO3+	3.227e-11	2.548e-11	-10.491	-10.594	-0.103	(0)
	MnNO3+	2.404e-13	1.898e-13	-12.619	-12.722	-0.103	(0)
	ZnNO3+	3.405e-14	2.689e-14	-13.468	-13.570	-0.103	(0)
	BaNO3+	9.383e-16	7.408e-16	-15.028	-15.130	-0.103	(0)
	NiNO3+	8.027e-16	6.337e-16	-15.095	-15.198	-0.103	(0)
	CuNO3+	5.625e-16	4.441e-16	-15.250	-15.353	-0.103	(0)
	CoNO3+	3.607e-16	2.848e-16	-15.443	-15.546	-0.103	(0)
	CdNO3+	9.622e-17	7.596e-17	-16.017	-16.119	-0.103	(0)
	PbNO3+	2.561e-17	2.022e-17	-16.592	-16.694	-0.103	(0)
	AgNO3	7.564e-18	7.564e-18	-17.121	-17.121	0.000	(0)
	Mn (NO3) 2	3.300e-21	3.300e-21	-20.481	-20.481	0.000	(0)
	UO2NO3+	1.100e-21	8.683e-22	-20.959	-21.061	-0.103	(0)
	Zn (NO3) 2	3.713e-23	3.713e-23	-22.430	-22.430	0.000	(0)
	Co (NO3) 2	4.010e-24	4.010e-24	-23.397	-23.397	0.000	(0)
	Cu (NO3) 2	3.870e-25	3.870e-25	-24.412	-24.412	0.000	(0)
	Cd (NO3) 2	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
	Pb (NO3) 2	2.377e-25	2.377e-25	-24.624	-24.624	0.000	(0)
	CrNO3+2	1.349e-25	5.239e-26	-24.870	-25.281	-0.411	(0)
	VO2NO3	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)
	FeNO3+2	1.953e-28	7.586e-29	-27.709	-28.120	-0.411	(0)
	HgNO3+	1.910e-30	1.508e-30	-29.719	-29.822	-0.103	(0)
	Hg (NO3) 2	4.338e-39	4.338e-39	-38.363	-38.363	0.000	(0)
Na	9.115e-03						
	Na+	8.880e-03	7.398e-03	-2.052	-2.131	-0.079	(0)
	NaSO4-	2.319e-04	1.948e-04	-3.635	-3.710	-0.076	(0)
	NaHCO3	2.247e-06	2.247e-06	-5.648	-5.648	0.000	(0)
	NaF	5.652e-07	5.652e-07	-6.248	-6.248	0.000	(0)
	NaCO3-	4.665e-07	3.919e-07	-6.331	-6.407	-0.076	(0)
	NaH2BO3	2.053e-08	2.053e-08	-7.688	-7.688	0.000	(0)
	NaCrO4-	3.399e-16	2.684e-16	-15.469	-15.571	-0.103	(0)
Ni	1.194e-07						
	Ni+2	7.563e-08	3.645e-08	-7.121	-7.438	-0.317	(0)
	NiSO4	3.566e-08	3.566e-08	-7.448	-7.448	0.000	(0)
	NiCO3	3.868e-09	3.868e-09	-8.412	-8.412	0.000	(0)
	NiHCO3+	3.073e-09	2.426e-09	-8.512	-8.615	-0.103	(0)
	NiOH+	6.572e-10	5.189e-10	-9.182	-9.285	-0.103	(0)
	NiCl+	2.748e-10	2.170e-10	-9.561	-9.664	-0.103	(0)
	NiF+	1.404e-10	1.108e-10	-9.853	-9.955	-0.103	(0)
	Ni (OH) 2	4.661e-11	4.661e-11	-10.332	-10.332	0.000	(0)
	Ni (SO4) 2-2	1.491e-11	5.791e-12	-10.827	-11.237	-0.411	(0)
	NiNH3+2	1.399e-13	5.435e-14	-12.854	-13.265	-0.411	(0)
	Ni (OH) 3-	6.676e-14	5.270e-14	-13.176	-13.278	-0.103	(0)
	NiCl2	2.542e-15	2.542e-15	-14.595	-14.595	0.000	(0)
	NiSeO4	1.842e-15	1.842e-15	-14.735	-14.735	0.000	(0)
	NiNO3+	8.027e-16	6.337e-16	-15.095	-15.198	-0.103	(0)
	Ni (NH3) 2+2	5.614e-20	2.181e-20	-19.251	-19.661	-0.411	(0)
O (0)	2.462e-35						
	O2	1.231e-35	1.243e-35	-34.910	-34.906	0.004	(0)
Pb	3.499e-09						

PbCO3	1.689e-09	1.689e-09	-8.772	-8.772	0.000	(0)
PbOH+	7.106e-10	5.610e-10	-9.148	-9.251	-0.103	(0)
PbSO4	4.743e-10	4.743e-10	-9.324	-9.324	0.000	(0)
Pb+2	4.098e-10	1.975e-10	-9.387	-9.704	-0.317	(0)
PbHCO3+	1.004e-10	7.924e-11	-9.998	-10.101	-0.103	(0)
Pb (SO4) 2-2	3.608e-11	1.402e-11	-10.443	-10.853	-0.411	(0)
Pb (CO3) 2-2	3.567e-11	1.386e-11	-10.448	-10.858	-0.411	(0)
PbCl+	2.065e-11	1.630e-11	-10.685	-10.788	-0.103	(0)
Pb (OH) 2	2.006e-11	2.006e-11	-10.698	-10.698	0.000	(0)
PbF+	2.134e-12	1.685e-12	-11.671	-11.773	-0.103	(0)
PbCl2	1.695e-13	1.695e-13	-12.771	-12.771	0.000	(0)
Pb (OH) 3-	2.873e-14	2.268e-14	-13.542	-13.644	-0.103	(0)
PbF2	4.015e-15	4.015e-15	-14.396	-14.396	0.000	(0)
PbCl3-	1.988e-16	1.570e-16	-15.702	-15.804	-0.103	(0)
PbNO3+	2.561e-17	2.022e-17	-16.592	-16.694	-0.103	(0)
Pb (OH) 4-2	1.617e-17	6.282e-18	-16.791	-17.202	-0.411	(0)
Pb2OH+3	1.474e-17	1.756e-18	-16.832	-17.756	-0.924	(0)
PbF3-	1.168e-18	9.220e-19	-17.933	-18.035	-0.103	(0)
PbCl4-2	4.298e-19	1.670e-19	-18.367	-18.777	-0.411	(0)
Pb3 (OH) 4+2	4.082e-21	1.586e-21	-20.389	-20.800	-0.411	(0)
PbF4-2	1.375e-22	5.343e-23	-21.862	-22.272	-0.411	(0)
Pb (NO3) 2	2.377e-25	2.377e-25	-24.624	-24.624	0.000	(0)
Pb4 (OH) 4+4	1.092e-25	2.488e-27	-24.962	-26.604	-1.643	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.192	-152.192	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.669	-229.771	-0.103	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.926	-73.926	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.776	-78.879	-0.103	(0)
CdHS+	0.000e+00	0.000e+00	-79.228	-79.331	-0.103	(0)
S5-2	0.000e+00	0.000e+00	-79.783	-80.193	-0.411	(0)
H2S	0.000e+00	0.000e+00	-79.910	-79.910	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.299	-80.709	-0.411	(0)
S4-2	0.000e+00	0.000e+00	-80.378	-80.789	-0.411	(0)
S3-2	0.000e+00	0.000e+00	-81.184	-81.595	-0.411	(0)
S2-2	0.000e+00	0.000e+00	-82.200	-82.611	-0.411	(0)
S-2	0.000e+00	0.000e+00	-87.820	-88.128	-0.309	(0)
HgHS2-	0.000e+00	0.000e+00	-138.906	-139.008	-0.103	(0)
HgS2-2	0.000e+00	0.000e+00	-139.255	-139.666	-0.411	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.665	-140.665	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.625	-147.991	-0.367	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.931	-148.138	-0.206	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.373	-148.721	-0.348	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.602	-148.705	-0.103	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.605	-148.708	-0.103	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.151	-149.527	-0.376	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.481	-149.838	-0.357	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.749	-150.749	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.005	-151.005	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.192	-152.192	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.458	-161.458	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.328	-218.430	-0.103	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.245	-226.347	-0.103	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.866	-228.277	-0.411	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.882	-227.984	-0.103	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.669	-229.771	-0.103	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.197	-238.300	-0.103	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.257	-304.667	-0.411	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.276	-306.686	-0.411	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.584	-321.994	-0.411	(0)
S (6)	1.338e-02					
SO4-2	1.018e-02	4.904e-03	-1.992	-2.309	-0.317	(0)
MgSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
CaSO4	1.308e-03	1.308e-03	-2.884	-2.884	0.000	(0)
NaSO4-	2.319e-04	1.948e-04	-3.635	-3.710	-0.076	(0)
KSO4-	1.153e-04	9.684e-05	-3.938	-4.014	-0.076	(0)
MnSO4	1.509e-05	1.509e-05	-4.821	-4.821	0.000	(0)
ZnSO4	1.659e-06	1.659e-06	-5.780	-5.780	0.000	(0)
Zn (SO4) 2-2	1.824e-07	7.086e-08	-6.739	-7.150	-0.411	(0)

NiSO4	3.566e-08	3.566e-08	-7.448	-7.448	0.000	(0)
CoSO4	2.540e-08	2.540e-08	-7.595	-7.595	0.000	(0)
CuSO4	2.279e-08	2.279e-08	-7.642	-7.642	0.000	(0)
HSO4-	5.117e-09	4.265e-09	-8.291	-8.370	-0.079	(0)
CdSO4	3.990e-09	3.990e-09	-8.399	-8.399	0.000	(0)
NH4SO4-	2.720e-09	2.277e-09	-8.565	-8.643	-0.077	(0)
Cd (SO4) 2-2	6.794e-10	2.639e-10	-9.168	-9.579	-0.411	(0)
PbSO4	4.743e-10	4.743e-10	-9.324	-9.324	0.000	(0)
AgSO4-	1.705e-10	1.346e-10	-9.768	-9.871	-0.103	(0)
Pb (SO4) 2-2	3.608e-11	1.402e-11	-10.443	-10.853	-0.411	(0)
Ni (SO4) 2-2	1.491e-11	5.791e-12	-10.827	-11.237	-0.411	(0)
CrOHSO4	4.985e-12	4.985e-12	-11.302	-11.302	0.000	(0)
UO2SO4	4.667e-13	4.667e-13	-12.331	-12.331	0.000	(0)
FeSO4	2.695e-13	2.695e-13	-12.569	-12.569	0.000	(0)
UO2 (SO4) 2-2	7.766e-14	3.017e-14	-13.110	-13.520	-0.411	(0)
AlSO4+	4.200e-14	3.501e-14	-13.377	-13.456	-0.079	(0)
CrSO4+	2.512e-15	1.983e-15	-14.600	-14.703	-0.103	(0)
Al (SO4) 2-	2.207e-15	1.840e-15	-14.656	-14.735	-0.079	(0)
VO2SO4-	7.820e-19	6.174e-19	-18.107	-18.209	-0.103	(0)
FeSO4+	7.203e-20	6.031e-20	-19.142	-19.220	-0.077	(0)
Fe (SO4) 2-	8.009e-21	6.323e-21	-20.096	-20.199	-0.103	(0)
Cr2 (OH) 2SO4+2	4.969e-21	1.930e-21	-20.304	-20.714	-0.411	(0)
VOSO4	8.564e-22	8.564e-22	-21.067	-21.067	0.000	(0)
HgSO4	7.575e-22	7.575e-22	-21.121	-21.121	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.623e-22	5.623e-22	-21.250	-21.250	0.000	(0)
CrO3SO4-2	7.197e-24	2.796e-24	-23.143	-23.554	-0.411	(0)
VSO4+	1.388e-36	1.096e-36	-35.858	-35.960	-0.103	(0)
U (SO4) 2	1.778e-40	1.778e-40	-39.750	-39.750	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.930	-41.341	-0.411	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-62.338	-62.441	-0.103	(0)
Sb (3)	2.583e-20					
Sb (OH) 3	1.307e-20	1.307e-20	-19.884	-19.884	0.000	(0)
HSbO2	1.276e-20	1.276e-20	-19.894	-19.894	0.000	(0)
SbO2-	2.942e-24	2.323e-24	-23.531	-23.634	-0.103	(0)
Sb (OH) 4-	1.684e-24	1.329e-24	-23.774	-23.876	-0.103	(0)
Sb (OH) 2F	2.201e-26	2.201e-26	-25.657	-25.657	0.000	(0)
SbOF	2.165e-26	2.165e-26	-25.665	-25.665	0.000	(0)
Sb (OH) 2+	3.579e-27	2.825e-27	-26.446	-26.549	-0.103	(0)
SbO+	1.235e-27	9.746e-28	-26.909	-27.011	-0.103	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.584	-321.994	-0.411	(0)
Sb (5)	2.734e-08					
SbO3-	2.731e-08	2.156e-08	-7.564	-7.666	-0.103	(0)
Sb (OH) 6-	3.022e-11	2.518e-11	-10.520	-10.599	-0.079	(0)
SbO2+	6.207e-25	4.900e-25	-24.207	-24.310	-0.103	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.188e-39	9.382e-40	-38.925	-39.028	-0.103	(0)
MnSe	0.000e+00	0.000e+00	-41.124	-41.124	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.188	-43.188	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.566	-45.977	-0.411	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.632	-83.274	-1.643	(0)
Se (4)	1.349e-07					
HSeO3-	7.064e-08	5.577e-08	-7.151	-7.254	-0.103	(0)
SeO3-2	6.422e-08	2.495e-08	-7.192	-7.603	-0.411	(0)
H2SeO3	2.117e-13	2.117e-13	-12.674	-12.674	0.000	(0)
AgSeO3-	2.794e-14	2.206e-14	-13.554	-13.656	-0.103	(0)
Cd (SeO3) 2-2	4.582e-18	1.780e-18	-17.339	-17.750	-0.411	(0)
Ag (SeO3) 2-3	4.136e-20	4.927e-21	-19.383	-20.307	-0.924	(0)
FeHSeO3+2	4.158e-25	1.615e-25	-24.381	-24.792	-0.411	(0)
Se (6)	2.248e-10					
SeO4-2	2.243e-10	1.081e-10	-9.649	-9.966	-0.317	(0)
MnSeO4	5.033e-13	5.033e-13	-12.298	-12.298	0.000	(0)
ZnSeO4	2.588e-14	2.588e-14	-13.587	-13.587	0.000	(0)
NiSeO4	1.842e-15	1.842e-15	-14.735	-14.735	0.000	(0)
CoSeO4	1.406e-15	1.406e-15	-14.852	-14.852	0.000	(0)
CdSeO4	6.984e-17	6.984e-17	-16.156	-16.156	0.000	(0)
HSeO4-	6.106e-17	4.820e-17	-16.214	-16.317	-0.103	(0)
Zn (SeO4) 2-2	7.301e-24	2.836e-24	-23.137	-23.547	-0.411	(0)

U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.225	-59.149	-0.924	(0)
U (4)	4.013e-19					
U (OH) 5-	4.012e-19	3.167e-19	-18.397	-18.499	-0.103	(0)
U (OH) 4	1.181e-22	1.181e-22	-21.928	-21.928	0.000	(0)
U (OH) 3+	4.870e-27	3.845e-27	-26.312	-26.415	-0.103	(0)
U (OH) 2+2	4.075e-32	1.583e-32	-31.390	-31.800	-0.411	(0)
UF3+	2.092e-36	1.652e-36	-35.679	-35.782	-0.103	(0)
UF2+2	2.216e-37	8.607e-38	-36.655	-37.065	-0.411	(0)
UOH+3	5.573e-38	6.639e-39	-37.254	-38.178	-0.924	(0)
UF4	2.193e-38	2.193e-38	-37.659	-37.659	0.000	(0)
UF+3	4.740e-40	0.000e+00	-39.324	-40.248	-0.924	(0)
U (SO4) 2	1.778e-40	1.778e-40	-39.750	-39.750	0.000	(0)
UF5-	1.333e-40	1.052e-40	-39.875	-39.978	-0.103	(0)
USO4+2	0.000e+00	0.000e+00	-40.930	-41.341	-0.411	(0)
UF6-2	0.000e+00	0.000e+00	-41.004	-41.415	-0.411	(0)
U+4	0.000e+00	0.000e+00	-43.989	-45.631	-1.643	(0)
UC1+3	0.000e+00	0.000e+00	-45.641	-46.565	-0.924	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-161.871	-170.187	-8.316	(0)
U (5)	9.211e-16					
UO2+	9.211e-16	7.272e-16	-15.036	-15.138	-0.103	(0)
U (6)	3.578e-07					
UO2 (CO3) 3-4	2.530e-07	5.762e-09	-6.597	-8.239	-1.643	(0)
UO2 (CO3) 2-2	1.040e-07	4.042e-08	-6.983	-7.393	-0.411	(0)
UO2CO3	7.121e-10	7.121e-10	-9.147	-9.147	0.000	(0)
UO2OH+	1.134e-11	8.951e-12	-10.945	-11.048	-0.103	(0)
UO2F+	1.331e-12	1.051e-12	-11.876	-11.978	-0.103	(0)
UO2SO4	4.667e-13	4.667e-13	-12.331	-12.331	0.000	(0)
UO2F2	3.669e-13	3.669e-13	-12.435	-12.435	0.000	(0)
UO2+2	1.305e-13	6.287e-14	-12.884	-13.202	-0.317	(0)
UO2 (SO4) 2-2	7.766e-14	3.017e-14	-13.110	-13.520	-0.411	(0)
UO2F3-	1.414e-14	1.116e-14	-13.850	-13.952	-0.103	(0)
(UO2) 3 (OH) 5+	1.462e-15	1.154e-15	-14.835	-14.938	-0.103	(0)
(UO2) 2 (OH) 2+2	3.423e-16	1.330e-16	-15.466	-15.876	-0.411	(0)
UO2Cl+	3.005e-16	2.373e-16	-15.522	-15.625	-0.103	(0)
UO2F4-2	2.763e-17	1.073e-17	-16.559	-16.969	-0.411	(0)
UO2NO3+	1.100e-21	8.683e-22	-20.959	-21.061	-0.103	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.691	-43.793	-0.103	(0)
V+2	0.000e+00	0.000e+00	-44.946	-45.357	-0.411	(0)
V (3)	5.523e-16					
V (OH) 3	5.523e-16	5.523e-16	-15.258	-15.258	0.000	(0)
V (OH) 2+	4.024e-27	3.177e-27	-26.395	-26.498	-0.103	(0)
VOH+2	6.907e-31	2.683e-31	-30.161	-30.571	-0.411	(0)
V+3	3.974e-36	4.734e-37	-35.401	-36.325	-0.924	(0)
VSO4+	1.388e-36	1.096e-36	-35.858	-35.960	-0.103	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.693	-58.617	-0.924	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-58.700	-60.343	-1.643	(0)
V (4)	1.842e-19					
V (OH) 3+	1.811e-19	1.430e-19	-18.742	-18.845	-0.103	(0)
VO+2	1.632e-21	6.341e-22	-20.787	-21.198	-0.411	(0)
VOSO4	8.564e-22	8.564e-22	-21.067	-21.067	0.000	(0)
VOF+	5.833e-22	4.605e-22	-21.234	-21.337	-0.103	(0)
VOF2	2.091e-23	2.091e-23	-22.680	-22.680	0.000	(0)
VOC1+	5.243e-24	4.139e-24	-23.280	-23.383	-0.103	(0)
VOF3-	1.138e-25	8.981e-26	-24.944	-25.047	-0.103	(0)
VOF4-2	1.130e-28	4.389e-29	-27.947	-28.358	-0.411	(0)
H2V2O4+2	2.641e-33	1.026e-33	-32.578	-32.989	-0.411	(0)
V (5)	6.643e-09					
H2VO4-	4.221e-09	3.333e-09	-8.375	-8.477	-0.103	(0)
HVO4-2	2.422e-09	9.407e-10	-8.616	-9.027	-0.411	(0)
H3VO4	2.966e-13	2.966e-13	-12.528	-12.528	0.000	(0)
HV2O7-3	8.922e-15	1.063e-15	-14.050	-14.973	-0.924	(0)
H3V2O7-	8.088e-15	6.386e-15	-14.092	-14.195	-0.103	(0)
VO4-3	4.447e-15	5.298e-16	-14.352	-15.276	-0.924	(0)
V2O7-4	1.412e-16	3.215e-18	-15.850	-17.493	-1.643	(0)
VO2+	6.328e-18	5.272e-18	-17.199	-17.278	-0.079	(0)
VO2F	1.120e-18	1.120e-18	-17.951	-17.951	0.000	(0)

VO2SO4-	7.820e-19	6.174e-19	-18.107	-18.209	-0.103	(0)
V3O9-3	3.259e-19	3.883e-20	-18.487	-19.411	-0.924	(0)
VO2F2-	6.234e-20	4.922e-20	-19.205	-19.308	-0.103	(0)
VO2F3-2	1.914e-22	7.434e-23	-21.718	-22.129	-0.411	(0)
V4O12-4	2.370e-24	5.398e-26	-23.625	-25.268	-1.643	(0)
VO2F4-3	3.717e-26	4.429e-27	-25.430	-26.354	-0.924	(0)
VO2NO3	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.370	-68.066	-3.696	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.363	-67.930	-2.567	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.130	-70.773	-1.643	(0)
Zn	5.619e-06					
Zn+2	3.209e-06	1.546e-06	-5.494	-5.811	-0.317	(0)
ZnSO4	1.659e-06	1.659e-06	-5.780	-5.780	0.000	(0)
ZnCO3	2.531e-07	2.531e-07	-6.597	-6.597	0.000	(0)
ZnOH+	2.215e-07	1.749e-07	-6.655	-6.757	-0.103	(0)
Zn(SO4) 2-2	1.824e-07	7.086e-08	-6.739	-7.150	-0.411	(0)
ZnHCO3+	3.345e-08	2.641e-08	-7.476	-7.578	-0.103	(0)
Zn(OH) 2	3.134e-08	3.134e-08	-7.504	-7.504	0.000	(0)
ZnOHCl	1.338e-08	1.338e-08	-7.874	-7.874	0.000	(0)
ZnCl+	1.090e-08	9.038e-09	-7.963	-8.044	-0.081	(0)
ZnF+	4.732e-09	3.736e-09	-8.325	-8.428	-0.103	(0)
Zn(OH) 3-	2.250e-10	1.776e-10	-9.648	-9.751	-0.103	(0)
ZnCl2	3.333e-11	3.333e-11	-10.477	-10.477	0.000	(0)
ZnCl3-	7.426e-14	6.160e-14	-13.129	-13.210	-0.081	(0)
ZnNO3+	3.405e-14	2.689e-14	-13.468	-13.570	-0.103	(0)
ZnSeO4	2.588e-14	2.588e-14	-13.587	-13.587	0.000	(0)
Zn(OH) 4-2	2.058e-14	7.996e-15	-13.686	-14.097	-0.411	(0)
ZnCl4-2	1.459e-16	7.167e-17	-15.836	-16.145	-0.309	(0)
Zn(NO3) 2	3.713e-23	3.713e-23	-22.430	-22.430	0.000	(0)
Zn(SeO4) 2-2	7.301e-24	2.836e-24	-23.137	-23.547	-0.411	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.605	-148.708	-0.103	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.749	-150.749	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.245	-226.347	-0.103	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.866	-228.277	-0.411	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.276	-306.686	-0.411	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-57.07	-50.78	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-44.24	-39.73	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-51.46	-39.73	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-73.55	-55.62	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-59.07	-39.04	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.27	-28.86	0.40	(NH4)2CrO4
(NH4)2SeO4	-25.14	-24.69	0.45	(NH4)2SeO4
Acanthite	-52.33	-88.55	-36.22	Ag2S
Ag2CO3	-12.18	-23.27	-11.09	Ag2CO3
Ag2CrO4	-20.27	-31.86	-11.59	Ag2CrO4
Ag2HVO4	-12.33	-10.85	1.48	Ag2HVO4
Ag2MoO4	-12.20	-23.75	-11.55	Ag2MoO4
Ag2O	-14.20	-1.62	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.21	-20.03	-4.82	Ag2SO4
Ag3AsO3	-28.34	-26.18	2.16	Ag3AsO3
Ag3AsO4	-16.75	-19.53	-2.79	Ag3AsO4
Ag3H2VO5	-16.84	-11.66	5.18	Ag3H2VO5
AgF:4H2O	-13.83	-12.78	1.05	AgF:4H2O
Agmetal	-0.08	-13.58	-13.51	Ag
AgVO3	-10.81	-10.04	0.77	AgVO3
Al(OH)3(am)	-1.69	9.11	10.80	Al(OH)3
Al2(MoO4)3	-50.53	-48.16	2.37	Al2(MoO4)3
Al2O3	-1.42	18.23	19.65	Al2O3
Al4(OH)10SO4	-4.65	18.05	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.79	-7.99	4.80	AlAsO4:2H2O

AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-153.03	-87.40	65.62	AlSb
Alunite	-2.58	-3.98	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.88	-5.24	-4.36	CaSO4
Anilite	-55.46	-87.34	-31.88	Cu0.25Cu1.5S
Antlerite	-1.97	6.81	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.23	-94.99	-2.76	As4O6
Artinite	-4.58	5.02	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-40.91	-34.20	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2(OH)3Cl
Azurite	-1.16	-18.07	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.97	8.43	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.47	-1.59	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.10	6.84	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.14	-21.81	-9.67	BaCrO4
BaF2	-9.68	-15.50	-5.82	BaF2
BaMoO4	-6.74	-13.70	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.70	-6.87	1.83	BaSeO3
BaSeO4	-10.18	-17.64	-7.46	BaSeO4
Bianchite	-6.36	-8.12	-1.76	ZnSO4:6H2O
Birnessite	-6.56	11.53	18.09	MnO2
Bixbyite	-1.83	-2.48	-0.64	Mn2O3
BlaubleiI	-55.53	-79.70	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.94	-83.22	-27.28	Cu0.6Cu0.8S
Boehmite	0.54	9.12	8.58	AlOOH
Breithauptite	-56.56	-75.08	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.51	13.33	16.84	Mg(OH)2
Bunsenite	-3.78	8.66	12.45	NiO
Ca(VO3)2	-10.95	-5.29	5.66	Ca(VO3)2
Ca2V2O7	-9.62	7.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.67	7.88	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.00	5.30	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.91	21.05	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.81	21.05	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.51	-153.53	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.46	-26.37	-17.91	Hg2Cl2
CaMoO4	-1.01	-8.96	-7.95	CaMoO4
Carnotite	-1.06	-0.83	0.23	KUO2VO4
CaSeO3:2H2O	-4.95	-2.14	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.88	-12.90	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.34	-1.50	9.84	Cd(BO2)2
Cd(OH)2	-6.00	7.64	13.64	Cd(OH)2
Cd(OH)2(am)	-6.09	7.64	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.61	-13.90	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.05	4.51	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.25	12.15	28.40	Cd4(OH)6SO4
CdCl2	-13.07	-13.73	-0.66	CdCl2
CdCl2:1H2O	-12.03	-13.73	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.81	-13.73	-1.91	CdCl2:2.5H2O
CdF2	-15.08	-16.29	-1.21	CdF2
Cdmetal(alpha)	-31.42	-17.90	13.51	Cd
Cdmetal(gamma)	-31.52	-17.90	13.62	Cd
CdMoO4	-0.34	-14.49	-14.15	CdMoO4
CdOHCl	-6.58	-3.04	3.54	CdOHCl
CdSb	-75.75	-76.10	-0.35	CdSb
CdSe	-19.24	-39.44	-20.20	CdSe
CdSeO4:2H2O	-16.58	-18.43	-1.85	CdSeO4:2H2O
CdSO4	-10.60	-10.77	-0.17	CdSO4
CdSO4:1H2O	-9.04	-10.77	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.90	-10.77	-1.87	CdSO4:2.67H2O

Cerargyrite	-1.74	-11.49	-9.75	AgCl
Cerrusite	-2.12	-15.25	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.36	-10.00	-2.64	CuSO4:5H2O
Chalcocite	-55.36	-90.28	-34.92	Cu2S
Chalcopyrite	-126.73	-162.00	-35.27	CuFeS2
Cinnabar	-52.56	-98.25	-45.69	HgS
Claudetite	-91.92	-94.99	-3.06	As4O6
Clausthalite	-13.58	-40.68	-27.10	PbSe
Co (BO2) 2	-27.70	-0.63	27.07	Co (BO2) 2
Co (OH) 2	-4.58	8.52	13.09	Co (OH) 2
Co (OH) 3	-8.80	-11.11	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-21.69	-8.66	13.03	Co3 (AsO4) 2
Co3O4	-3.21	-13.71	-10.50	Co3O4
CoCl2	-21.12	-12.85	8.27	CoCl2
CoCl2:6H2O	-15.39	-12.85	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.82	-15.42	-1.60	CoF2
CoF3	-45.56	-47.01	-1.46	CoF3
CoFe2O4	18.43	14.90	-3.53	CoFe2O4
CoMoO4	-5.85	-13.61	-7.76	CoMoO4
CoO	-5.07	8.52	13.59	CoO
CoS (alpha)	-70.97	-78.41	-7.44	CoS
CoS (beta)	-67.34	-78.41	-11.07	CoS
CoSe	-22.36	-38.56	-16.20	CoSe
CoSeO3	-8.11	-6.79	1.32	CoSeO3
CoSeO4:6H2O	-16.02	-17.55	-1.53	CoSeO4:6H2O
CoSO4	-12.70	-9.90	2.80	CoSO4
CoSO4:6H2O	-7.42	-9.90	-2.47	CoSO4:6H2O
Cotunnite	-10.19	-14.97	-4.78	PbCl2
Covellite	-56.22	-78.52	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.46	-32.37	14.09	CrCl2
CrCl3	-48.34	-33.23	15.11	CrCl3
CrF3	-25.74	-37.08	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.09	-44.93	-33.84	Na3AlF6
Cu (OH) 2	-0.27	8.41	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.48	19.73	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.65	0.61	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.90	-89.78	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.63	-50.43	-45.80	Cu2Se
Cu2SO4	-19.81	-21.76	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.08	-8.98	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.95	-101.54	-42.59	Cu3Sb
Cu3Se2	-25.60	-89.10	-63.49	Cu3Se2
CuCO3	-1.74	-13.24	-11.50	CuCO3
CuCrO4	-16.39	-21.83	-5.44	CuCrO4
CuF	-8.74	-13.64	-4.91	CuF
CuF2	-16.64	-15.53	1.12	CuF2
CuF2:2H2O	-10.98	-15.53	-4.55	CuF2:2H2O
Cumetal	-5.69	-14.45	-8.76	Cu
CuMoO4	-0.65	-13.72	-13.08	CuMoO4
CuOCuSO4	-11.90	-1.59	10.30	CuOCuSO4
Cupricferrite	8.80	14.79	5.99	CuFe2O4
Cuprite	-1.94	-3.35	-1.41	Cu2O
Cuprousferrite	10.43	1.52	-8.92	CuFeO2
CuSe	-5.57	-38.67	-33.10	CuSe
CuSe2	-26.84	-60.20	-33.37	CuSe2
CuSeO3:2H2O	-7.41	-6.90	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.22	-17.66	-2.44	CuSeO4:5H2O
CuSO4	-12.94	-10.00	2.94	CuSO4
Diaspore	2.24	9.12	6.87	AlOOH

Djurleite	-55.58	-89.50	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.25	-16.79	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	0.30	-16.79	-17.09	CaMg(CO ₃) ₂
Epsomite	-2.95	-5.08	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.11	3.45	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.03	-0.01	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-11.28	-15.00	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-10.48	-8.92	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-18.90	-39.53	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-45.11	-48.85	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-14.31	-13.91	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.11	1.09	7.20	FeCr ₂ O ₄
FeMoO ₄	-8.59	-18.68	-10.09	FeMoO ₄
Ferrihydrite	-0.00	3.19	3.19	Fe(OH) ₃
Ferroselite	-46.56	-65.16	-18.60	FeSe ₂
FeS(ppt)	-80.53	-83.48	-2.95	FeS
FeSe	-32.63	-43.63	-11.00	FeSe
Fix_pe	-4.72	-4.72	0.00	e-
Fluorite	-0.27	-10.77	-10.50	CaF ₂
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	0.82	9.11	8.29	Al(OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.11	-8.12	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-64.93	-79.29	-14.36	CdS
Greigite	-292.85	-337.88	-45.03	Fe ₃ S ₄
Gummite	-4.77	2.90	7.67	UO ₃
Gypsum	-0.63	-5.24	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-15.15	-27.25	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-9.25	-22.13	-12.88	H ₂ MoO ₄
H ₂ S(g)	-78.92	-86.93	-8.01	H ₂ S
H ₂ Se(g)	-42.12	-47.08	-4.96	H ₂ Se
Halite	-6.37	-4.76	1.60	NaCl
Hausmannite	-1.47	59.56	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-1.21	21.68	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-185.27	-258.97	-73.71	Hg(CH ₃) ₂
Hg(g)	-7.40	-15.27	-7.87	Hg
Hg(OH) ₂	-7.83	-11.32	-3.50	Hg(OH) ₂
Hg ₂ (g)	-15.59	-30.55	-14.96	Hg ₂
Hg ₂ (OH) ₂	-10.26	-5.00	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-10.60	-26.65	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-26.54	-35.24	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-18.58	-28.94	-10.36	Hg ₂ F ₂
Hg ₂ S	-80.26	-91.93	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-15.65	-20.31	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-17.28	-23.41	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-25.93	-55.61	-29.68	Hg ₃ O ₂ CO ₃
HgCl(g)	-32.68	-13.19	19.50	HgCl
HgCl ₂	-11.43	-32.69	-21.26	HgCl ₂
HgF(g)	-47.15	-14.47	32.68	HgF
HgF ₂ (g)	-47.82	-35.26	12.57	HgF ₂
Hgmetal(1)	-1.82	-15.27	-13.45	Hg
HgSe	-2.71	-58.40	-55.69	HgSe
HgSeO ₃	-14.20	-26.63	-12.43	HgSeO ₃
HgSO ₄	-20.31	-29.73	-9.42	HgSO ₄
Huntite	-3.45	-33.42	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-5.33	-24.10	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-11.15	-19.92	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-17.04	-22.21	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-6.95	-21.75	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-32.24	-49.48	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-18.73	-19.25	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-14.40	-11.14	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-14.35	-15.08	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.18	-5.62	-0.43	PbO·PbSO ₄
Laurionite	-4.91	-4.29	0.62	PbOHCl

Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.30	6.40	12.69	PbO
Mackinawite	-79.88	-83.48	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.86	19.72	16.86	Fe ₂ MgO ₄
Magnesite	-0.85	-8.31	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	0.48	-4.83	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.23	24.11	25.34	MnOOH
Massicot	-6.50	6.40	12.89	PbO
Matlockite	-7.28	-16.25	-8.97	PbClF
Melanothallite	-19.22	-12.96	6.26	CuCl ₂
Melanterite	-12.75	-14.96	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-53.16	-98.25	-45.09	HgS
Mg(OH) ₂ (active)	-5.46	13.33	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.40	-5.12	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-273.71	-199.02	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.15	8.21	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.22	10.98	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.28	-16.90	5.38	MgCrO ₄
MgF ₂	-2.47	-10.60	-8.13	MgF ₂
MgMoO ₄	-6.95	-8.80	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.03	-1.97	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.53	-12.73	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-28.79	44.73	73.52	Pb ₃ O ₄
Mirabilite	-5.46	-6.57	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.02	-7.12	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.00	-57.71	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.69	-86.61	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-12.69	-0.19	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.74	-10.03	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-75.76	-75.59	0.17	MnS
MnS(pnk)	-78.93	-75.59	3.34	MnS
MnSb	-94.85	-97.76	-2.91	MnSb
MnSe	-39.24	-35.74	3.50	MnSe
MnSeO ₃	-5.09	-3.96	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.95	-3.97	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.68	-14.73	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.65	-7.07	2.58	MnSO ₄
Monteponite	-7.46	7.64	15.10	CdO
Montroydite	-7.68	-11.32	-3.64	HgO
MoO ₃	-14.13	-22.13	-8.00	MoO ₃
Morenosite	-7.60	-9.75	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-151.27	-221.53	-70.26	MoS ₂
Na-Jarosite	-10.13	-21.33	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.74	-48.64	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-21.33	-18.40	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.82	-32.42	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.78	-10.29	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.52	-10.29	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-13.77	-3.47	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.51	-14.23	1.28	Na ₂ SeO ₄
Na ₃ Sb	-173.21	-78.76	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.15	8.53	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.18	5.22	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.63	-12.36	-6.73	CuCl
NaSb	-88.22	-65.05	23.17	NaSb
Natron	-8.50	-9.81	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.17	-3.31	3.86	NaVO ₃
Nesquehonite	-3.64	-8.31	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-4.13	8.66	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-23.92	-8.22	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-15.76	16.24	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.11	-12.98	-6.87	NiCO ₃
NiMoO ₄	-2.33	-13.47	-11.14	NiMoO ₄
NiS(alpha)	-72.67	-78.27	-5.60	NiS
NiS(beta)	-67.17	-78.27	-11.10	NiS

NiS (gamma)	-65.47	-78.27	-12.80	NiS
NiSe	-20.72	-38.42	-17.70	NiSe
NiSeO3:2H2O	-9.46	-6.64	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.89	-17.41	-1.52	NiSeO4:6H2O
Nsutite	-5.97	11.53	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-247.22	-308.28	-61.07	As2S3
Otavite	-2.01	-14.01	-12.00	CdCO3
Pb (BO2) 2	-9.26	-2.75	6.52	Pb (BO2) 2
Pb (OH) 2	-1.75	6.40	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-57.16	-65.92	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-6.68	2.11	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.40	12.79	26.19	Pb2O (OH) 2
Pb2O3	-22.70	38.34	61.04	Pb2O3
Pb2OCO3	-8.30	-8.85	-0.56	Pb2OCO3
Pb2V2O7	-3.76	-5.66	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.81	-15.01	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.41	0.73	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.48	-2.46	11.02	Pb3O2CO3
Pb3O2SO4	-9.91	0.78	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-13.92	7.18	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-14.70	7.18	21.88	Pb4O3SO4
PbCrO4	-11.24	-23.84	-12.60	PbCrO4
PbF2	-10.10	-17.54	-7.44	PbF2
Pbmetal	-23.39	-19.15	4.25	Pb
PbMoO4	-0.11	-15.73	-15.62	PbMoO4
PbO:0.3H2O	-6.58	6.40	12.98	PbO:0.33H2O
PbSeO4	-12.83	-19.67	-6.84	PbSeO4
Periclase	-8.25	13.33	21.58	MgO
Phosgenite	-10.41	-30.22	-19.81	PbCl2:PbCO3
Plattnerite	-17.66	31.94	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.35	-144.86	-18.51	FeS2
Pyrochroite	-3.86	11.34	15.19	Mn (OH) 2
Pyrolusite	-4.50	36.88	41.38	MnO2
Realgar	-103.70	-123.45	-19.75	AsS
Retgersite	-7.71	-9.75	-2.04	NiSO4:6H2O
Rhodochrosite	0.27	-10.31	-10.58	MnCO3
Rutherfordine	-4.25	-18.75	-14.50	UO2CO3
Sb (OH) 3	-12.77	-19.88	-7.11	Sb (OH) 3
Sb2O4	-17.62	-14.22	3.40	Sb2O4
Sb2O5	-27.63	-37.30	-9.67	Sb2O5
Sb2Se3	-113.24	-181.00	-67.76	Sb2Se3
Sb4O6 (cubic)	-61.27	-79.53	-18.26	Sb4O6
Sb4O6 (orth)	-61.63	-79.53	-17.90	Sb4O6
SbCl3	-52.51	-51.93	0.57	SbCl3
SbF3	-45.56	-55.79	-10.23	SbF3
Sbmetal	-46.51	-58.20	-11.69	Sb
SbO2	-3.60	-31.42	-27.82	SbO2
Schoepite	-3.10	2.90	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.42	-21.53	-7.11	Se
Semetal (hex)	-13.83	-21.53	-7.71	Se
Senarmontite	-27.40	-39.77	-12.37	Sb2O3
SeO2	-15.43	-15.30	0.12	SeO2
SeO3	-47.11	-26.07	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.36	-11.36	-10.00	ZnCO3
Sphalerite	-65.19	-76.64	-11.45	ZnS
Spinel	-5.28	31.56	36.85	MgAl2O4
Stibnite	-250.09	-300.55	-50.46	Sb2S3
Sulfur	-59.24	-61.38	-2.14	S
Tenorite	0.76	8.41	7.64	CuO
Thenardite	-6.89	-6.57	0.32	Na2SO4
Thermonatrite	-10.44	-9.81	0.64	Na2CO3:H2O
Tyuyamunite	-3.57	0.51	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.28	10.80	21.08	U3O8
U3Sb4	-578.74	-426.36	152.38	U3Sb4
U4O9	-25.15	-28.17	-3.02	U4O9

UF4	-31.76	-61.30	-29.54	UF4
UF4:2.5H2O	-28.58	-61.30	-32.72	UF4:2.5H2O
UO2 (am)	-14.36	-13.43	0.93	UO2
UO2 (NO3) 2	-41.67	-29.52	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.37	-29.52	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.91	-29.52	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.57	-29.52	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.71	2.90	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.92	-23.17	-2.25	UO2SeO4:4H2O
UO3	-4.80	2.90	7.70	UO3
Uraninite	-8.76	-13.43	-4.67	UO2
USb2	-219.71	-190.14	29.58	USb2
V (OH) 3	-19.76	-12.17	7.59	V (OH) 3
V2O5	-17.09	-18.45	-1.36	V2O5
V3O5	-42.67	-40.84	1.84	V3O5
V4O7	-53.12	-45.93	7.19	V4O7
V6O13	-45.59	-106.45	-60.86	V6O13
Valentinite	-31.29	-39.77	-8.48	Sb2O3
VC12	-65.19	-46.31	18.87	VC12
VC13	-67.66	-44.22	23.43	VC13
VF4	-67.90	-52.97	14.93	VF4
Vmetal	-94.52	-50.49	44.03	V
VO	-39.70	-24.95	14.76	VO
VO (OH) 2	-10.25	-5.10	5.15	VO (OH) 2
VO2Cl	-22.75	-19.91	2.84	VO2Cl
VOC1	-34.01	-22.86	11.15	VOC1
VOC12	-39.22	-26.46	12.76	VOC12
VOSO4	-27.12	-23.51	3.61	VOSO4
Witherite	-4.65	-13.22	-8.57	BaCO3
Wurtzite	-67.69	-76.64	-8.95	ZnS
Zincite	-1.04	10.29	11.33	ZnO
Zincosite	-12.05	-8.12	3.93	ZnSO4
Zn (BO2) 2	-7.14	1.15	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.45	-22.13	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.91	10.29	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.18	10.29	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.46	10.29	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.24	10.29	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.44	10.29	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-5.33	2.17	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.29	9.90	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.98	-3.33	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-24.86	-5.95	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-5.65	22.75	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-8.42	30.08	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.13	-11.08	7.05	ZnCl2
ZnCO3:1H2O	-1.10	-11.36	-10.26	ZnCO3:1H2O
ZnF2	-13.11	-13.64	-0.53	ZnF2
Znmetal	-41.04	-15.25	25.79	Zn
ZnMoO4	-1.71	-11.84	-10.13	ZnMoO4
ZnO (active)	-0.90	10.29	11.19	ZnO
ZnS (am)	-67.59	-76.64	-9.05	ZnS
ZnSb	-84.47	-73.45	11.01	ZnSb
ZnSe	-22.39	-36.79	-14.40	ZnSe
ZnSeO4:6H2O	-14.26	-15.78	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.48	-8.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 68.

```

Title Stage 4 pit lake GW inflow
Title Stage 4 Groundwater mix
MIX 401
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.208742
11     1.147300
12     1.140967
13     1.357108
14     0
15     0
Save solution 401
end

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TITLE
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Stage 4 Groundwater mix

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Beginning of batch-reaction calculations.
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Reaction step 1.

Using mix 401.

Mixture 401.

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1.000e+00 Solution 2      JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.087e-01 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.147e+00 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.141e+00 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
1.357e+00 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

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-----Solution composition-----

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Elements	Molality	Moles
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Ag	1.720e-08	8.350e-08
Al	6.769e-07	3.286e-06
As	7.545e-09	3.663e-08
B	2.958e-06	1.436e-05
Ba	2.343e-07	1.137e-06
C	2.024e-03	9.826e-03
Ca	7.866e-04	3.818e-03
Cd	2.178e-09	1.057e-08
Cl	3.171e-04	1.539e-03
Co	2.799e-08	1.359e-07
Cr	2.617e-08	1.270e-07
Cu	1.480e-06	7.185e-06
F	5.632e-05	2.734e-04
Fe	5.488e-06	2.664e-05
Hg	2.777e-11	1.348e-10
K	8.167e-05	3.964e-04
Mg	2.592e-04	1.258e-03
Mn	3.559e-06	1.727e-05
Mo	6.757e-08	3.280e-07
Na	9.155e-04	4.444e-03
Ni	4.391e-08	2.131e-07
Pb	4.510e-09	2.189e-08
S	4.600e-04	2.233e-03
Sb	2.075e-09	1.007e-08
Se	6.913e-09	3.356e-08
U	1.091e-08	5.296e-08
V	1.472e-08	7.147e-08
Zn	1.802e-07	8.745e-07

-----Description of solution-----

	pH	=	7.233	Charge balance
	pe	=	4.813	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	4.363e-03	
	Mass of water (kg)	=	4.854e+00	
	Total alkalinity (eq/kg)	=	1.814e-03	
	Total CO2 (mol/kg)	=	2.024e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	-1.138e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	-0.00	
	Iterations	=	11	
	Total H	=	5.388843e+02	
	Total O	=	2.694752e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.849e-07	1.721e-07	-6.733	-6.764	-0.031	(0)
H+	6.283e-08	5.851e-08	-7.202	-7.233	-0.031	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	1.720e-08					
Ag+	1.050e-08	9.778e-09	-7.979	-8.010	-0.031	(0)
AgCl	5.895e-09	5.895e-09	-8.230	-8.230	0.000	(0)
Ag2Se	2.884e-10	2.884e-10	-9.540	-9.540	0.000	(0)
AgCl2-	1.638e-10	1.516e-10	-9.786	-9.819	-0.034	(0)
AgSO4-	6.489e-11	6.005e-11	-10.188	-10.221	-0.034	(0)
AgF	1.254e-12	1.254e-12	-11.902	-11.902	0.000	(0)
AgOH	1.683e-13	1.683e-13	-12.774	-12.774	0.000	(0)
AgCl3-2	5.441e-14	3.989e-14	-13.264	-13.399	-0.135	(0)
AgH2BO3	4.505e-15	4.505e-15	-14.346	-14.346	0.000	(0)
AgSeO3-	2.608e-15	2.414e-15	-14.584	-14.617	-0.034	(0)
AgCl4-3	4.834e-17	2.405e-17	-16.316	-16.619	-0.303	(0)
Ag(OH)2-	3.058e-18	2.830e-18	-17.515	-17.548	-0.034	(0)

	Ag (SeO3) 2-3	1.668e-23	8.300e-24	-22.778	-23.081	-0.303	(0)
	Ag2MoO4	1.838e-24	1.838e-24	-23.736	-23.736	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-67.648	-67.648	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.610	-78.149	-0.539	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-136.966	-137.000	-0.034	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-137.149	-137.251	-0.102	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-139.253	-139.458	-0.205	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-139.570	-139.769	-0.199	(0)
Al	6.769e-07						
	Al (OH) 4-	6.347e-07	5.913e-07	-6.197	-6.228	-0.031	(0)
	Al (OH) 3	2.730e-08	2.730e-08	-7.564	-7.564	0.000	(0)
	Al (OH) 2+	8.522e-09	7.950e-09	-8.069	-8.100	-0.030	(0)
	AlF2+	3.759e-09	3.506e-09	-8.425	-8.455	-0.030	(0)
	AlF3	2.253e-09	2.253e-09	-8.647	-8.647	0.000	(0)
	AlF+2	2.278e-10	1.725e-10	-9.642	-9.763	-0.121	(0)
	AlOH+2	7.679e-11	5.816e-11	-10.115	-10.235	-0.121	(0)
	AlF4-	6.187e-11	5.765e-11	-10.209	-10.239	-0.031	(0)
	AlSO4+	8.667e-13	8.076e-13	-12.062	-12.093	-0.031	(0)
	Al+3	6.417e-13	3.380e-13	-12.193	-12.471	-0.278	(0)
	Al (SO4) 2-	2.858e-15	2.663e-15	-14.544	-14.575	-0.031	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-44.338	-44.641	-0.303	(0)
As (3)	1.362e-19						
	H3AsO3	1.350e-19	1.350e-19	-18.870	-18.870	0.000	(0)
	H2AsO3-	1.278e-21	1.183e-21	-20.893	-20.927	-0.034	(0)
	HAsO3-2	2.515e-26	1.844e-26	-25.599	-25.734	-0.135	(0)
	H4AsO3+	4.228e-27	3.913e-27	-26.374	-26.408	-0.034	(0)
	AsO3-3	2.442e-32	1.215e-32	-31.612	-31.915	-0.303	(0)
As (5)	7.545e-09						
	HAsO4-2	5.303e-09	3.888e-09	-8.275	-8.410	-0.135	(0)
	H2AsO4-	2.242e-09	2.075e-09	-8.649	-8.683	-0.034	(0)
	AsO4-3	4.224e-13	2.101e-13	-12.374	-12.677	-0.303	(0)
	H3AsO4	2.108e-14	2.110e-14	-13.676	-13.676	0.000	(0)
B	2.958e-06						
	H3BO3	2.926e-06	2.929e-06	-5.534	-5.533	0.000	(0)
	H2BO3-	3.129e-08	2.907e-08	-7.505	-7.537	-0.032	(0)
	CaH2BO3+	9.863e-10	9.163e-10	-9.006	-9.038	-0.032	(0)
	MgH2BO3+	1.992e-10	1.851e-10	-9.701	-9.733	-0.032	(0)
	BF (OH) 3-	6.421e-11	5.966e-11	-10.192	-10.224	-0.032	(0)
	NaH2BO3	3.918e-11	3.918e-11	-10.407	-10.407	0.000	(0)
	BaH2BO3+	1.681e-13	1.562e-13	-12.774	-12.806	-0.032	(0)
	H5 (BO3) 2-	7.800e-14	7.247e-14	-13.108	-13.140	-0.032	(0)
	BF2 (OH) 2-	2.051e-14	1.905e-14	-13.688	-13.720	-0.032	(0)
	AgH2BO3	4.505e-15	4.505e-15	-14.346	-14.346	0.000	(0)
	H8 (BO3) 3-	2.285e-17	2.123e-17	-16.641	-16.673	-0.032	(0)
	BF3OH-	2.383e-20	2.214e-20	-19.623	-19.655	-0.032	(0)
	BF4-	3.502e-25	3.254e-25	-24.456	-24.488	-0.032	(0)
Ba	2.343e-07						
	Ba+2	2.312e-07	1.739e-07	-6.636	-6.760	-0.124	(0)
	BaHCO3+	2.952e-09	2.756e-09	-8.530	-8.560	-0.030	(0)
	BaCO3	1.186e-10	1.186e-10	-9.926	-9.926	0.000	(0)
	BaH2BO3+	1.681e-13	1.562e-13	-12.774	-12.806	-0.032	(0)
	BaOH+	1.401e-13	1.306e-13	-12.854	-12.884	-0.030	(0)
C (4)	2.024e-03						
	HCO3-	1.779e-03	1.660e-03	-2.750	-2.780	-0.030	(0)
	H2CO3	2.184e-04	2.184e-04	-3.661	-3.661	0.000	(0)
	CaHCO3+	1.813e-05	1.693e-05	-4.742	-4.771	-0.030	(0)
	MgHCO3+	3.350e-06	3.119e-06	-5.475	-5.506	-0.031	(0)
	CO3-2	1.768e-06	1.330e-06	-5.752	-5.876	-0.124	(0)
	CuCO3	1.159e-06	1.159e-06	-5.936	-5.936	0.000	(0)
	CaCO3	1.154e-06	1.154e-06	-5.938	-5.938	0.000	(0)
	NaHCO3	7.937e-07	7.937e-07	-6.100	-6.100	0.000	(0)
	MgCO3	2.031e-07	2.031e-07	-6.692	-6.692	0.000	(0)
	MnHCO3+	8.674e-08	8.088e-08	-7.062	-7.092	-0.030	(0)
	NaCO3-	2.257e-08	2.106e-08	-7.646	-7.677	-0.030	(0)
	CuHCO3+	1.675e-08	1.550e-08	-7.776	-7.810	-0.034	(0)
	UO2 (CO3) 2-2	9.116e-09	6.684e-09	-8.040	-8.175	-0.135	(0)
	ZnCO3	8.885e-09	8.885e-09	-8.051	-8.051	0.000	(0)
	ZnHCO3+	6.586e-09	6.094e-09	-8.181	-8.215	-0.034	(0)

	NiHCO3+	5.827e-09	5.392e-09	-8.235	-8.268	-0.034	(0)
	Cu (CO3) 2-2	5.656e-09	4.147e-09	-8.247	-8.382	-0.135	(0)
	BaHCO3+	2.952e-09	2.756e-09	-8.530	-8.560	-0.030	(0)
	PbCO3	2.464e-09	2.464e-09	-8.608	-8.608	0.000	(0)
	CoHCO3+	2.450e-09	2.267e-09	-8.611	-8.645	-0.034	(0)
	FeHCO3+	2.114e-09	1.974e-09	-8.675	-8.705	-0.030	(0)
	UO2 (CO3) 3-4	1.541e-09	4.455e-10	-8.812	-9.351	-0.539	(0)
	NiCO3	1.307e-09	1.307e-09	-8.884	-8.884	0.000	(0)
	PbHCO3+	8.215e-10	7.601e-10	-9.085	-9.119	-0.034	(0)
	CoCO3	3.947e-10	3.947e-10	-9.404	-9.404	0.000	(0)
	UO2CO3	2.519e-10	2.519e-10	-9.599	-9.599	0.000	(0)
	BaCO3	1.186e-10	1.186e-10	-9.926	-9.926	0.000	(0)
	CdCO3	4.492e-11	4.492e-11	-10.348	-10.348	0.000	(0)
	Pb (CO3) 2-2	1.289e-11	9.450e-12	-10.890	-11.025	-0.135	(0)
	CdHCO3+	6.052e-12	5.600e-12	-11.218	-11.252	-0.034	(0)
	Cd (CO3) 2-2	6.040e-14	4.428e-14	-13.219	-13.354	-0.135	(0)
	HgCO3	2.026e-17	2.026e-17	-16.693	-16.693	0.000	(0)
	Hg (CO3) 2-2	1.162e-19	8.520e-20	-18.935	-19.070	-0.135	(0)
	HgHCO3+	2.386e-20	2.207e-20	-19.622	-19.656	-0.034	(0)
Ca	7.866e-04						
	Ca+2	7.283e-04	5.478e-04	-3.138	-3.261	-0.124	(0)
	CaSO4	3.862e-05	3.862e-05	-4.413	-4.413	0.000	(0)
	CaHCO3+	1.813e-05	1.693e-05	-4.742	-4.771	-0.030	(0)
	CaCO3	1.154e-06	1.154e-06	-5.938	-5.938	0.000	(0)
	CaF+	3.273e-07	3.052e-07	-6.485	-6.515	-0.030	(0)
	CaOH+	2.014e-09	1.881e-09	-8.696	-8.726	-0.030	(0)
	CaH2BO3+	9.863e-10	9.163e-10	-9.006	-9.038	-0.032	(0)
Cd	2.178e-09						
	Cd+2	1.971e-09	1.482e-09	-8.705	-8.829	-0.124	(0)
	CdSO4	1.069e-10	1.069e-10	-9.971	-9.971	0.000	(0)
	CdCl+	4.516e-11	4.179e-11	-10.345	-10.379	-0.034	(0)
	CdCO3	4.492e-11	4.492e-11	-10.348	-10.348	0.000	(0)
	CdHCO3+	6.052e-12	5.600e-12	-11.218	-11.252	-0.034	(0)
	CdOH+	2.189e-12	2.026e-12	-11.660	-11.693	-0.034	(0)
	CdF+	1.296e-12	1.199e-12	-11.887	-11.921	-0.034	(0)
	Cd (SO4) 2-2	6.056e-13	4.440e-13	-12.218	-12.353	-0.135	(0)
	CdOHC1	2.950e-13	2.950e-13	-12.530	-12.530	0.000	(0)
	Cd (CO3) 2-2	6.040e-14	4.428e-14	-13.219	-13.354	-0.135	(0)
	CdCl2	5.144e-14	5.144e-14	-13.289	-13.289	0.000	(0)
	Cd (OH) 2	2.200e-15	2.200e-15	-14.658	-14.658	0.000	(0)
	CdF2	1.221e-16	1.221e-16	-15.913	-15.913	0.000	(0)
	CdCl3-	1.036e-17	9.583e-18	-16.985	-17.018	-0.034	(0)
	Cd2OH+3	3.025e-20	1.505e-20	-19.519	-19.823	-0.303	(0)
	Cd (OH) 3-	2.499e-20	2.312e-20	-19.602	-19.636	-0.034	(0)
	CdSeO4	1.619e-20	1.619e-20	-19.791	-19.791	0.000	(0)
	Cd (SeO3) 2-2	2.457e-22	1.802e-22	-21.610	-21.744	-0.135	(0)
	Cd (OH) 4-2	8.883e-28	6.513e-28	-27.051	-27.186	-0.135	(0)
	CdHS+	0.000e+00	0.000e+00	-74.240	-74.274	-0.034	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-140.522	-140.522	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-212.041	-212.074	-0.034	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-283.196	-283.331	-0.135	(0)
Cl	3.171e-04						
	Cl-	3.171e-04	2.953e-04	-3.499	-3.530	-0.031	(0)
	AgCl	5.895e-09	5.895e-09	-8.230	-8.230	0.000	(0)
	MnCl+	9.737e-10	9.079e-10	-9.012	-9.042	-0.030	(0)
	CuCl	4.142e-10	4.142e-10	-9.383	-9.383	0.000	(0)
	AgCl2-	1.638e-10	1.516e-10	-9.786	-9.819	-0.034	(0)
	ZnCl+	9.249e-11	8.612e-11	-10.034	-10.065	-0.031	(0)
	CuCl+	7.437e-11	6.925e-11	-10.129	-10.160	-0.031	(0)
	CdCl+	4.516e-11	4.179e-11	-10.345	-10.379	-0.034	(0)
	CuCl2-	2.744e-11	2.555e-11	-10.562	-10.593	-0.031	(0)
	NiCl+	2.151e-11	1.991e-11	-10.667	-10.701	-0.034	(0)
	ZnOHC1	1.940e-11	1.940e-11	-10.712	-10.712	0.000	(0)
	CoCl+	1.938e-11	1.794e-11	-10.713	-10.746	-0.034	(0)
	PbCl+	6.979e-12	6.458e-12	-11.156	-11.190	-0.034	(0)
	MnCl2	3.786e-13	3.786e-13	-12.422	-12.422	0.000	(0)
	CdOHC1	2.950e-13	2.950e-13	-12.530	-12.530	0.000	(0)
	AgCl3-2	5.441e-14	3.989e-14	-13.264	-13.399	-0.135	(0)

CdCl2	5.144e-14	5.144e-14	-13.289	-13.289	0.000	(0)
ZnCl2	4.030e-14	4.030e-14	-13.395	-13.395	0.000	(0)
PbCl2	8.517e-15	8.517e-15	-14.070	-14.070	0.000	(0)
CuCl2	7.090e-15	7.090e-15	-14.149	-14.149	0.000	(0)
CuCl3-2	2.134e-15	1.613e-15	-14.671	-14.792	-0.122	(0)
HgClOH	1.142e-15	1.142e-15	-14.942	-14.942	0.000	(0)
CrCl+2	1.424e-16	1.044e-16	-15.847	-15.981	-0.135	(0)
HgCl2	1.110e-16	1.110e-16	-15.955	-15.955	0.000	(0)
AgCl4-3	4.834e-17	2.405e-17	-16.316	-16.619	-0.303	(0)
MnCl3-	3.302e-17	3.079e-17	-16.481	-16.512	-0.030	(0)
NiCl2	2.960e-17	2.960e-17	-16.529	-16.529	0.000	(0)
UO2Cl+	2.462e-17	2.279e-17	-16.609	-16.642	-0.034	(0)
CdCl3-	1.036e-17	9.583e-18	-16.985	-17.018	-0.034	(0)
ZnCl3-	1.015e-17	9.452e-18	-16.993	-17.024	-0.031	(0)
FeCl+2	6.734e-18	5.090e-18	-17.172	-17.293	-0.122	(0)
PbCl3-	1.082e-18	1.001e-18	-17.966	-17.999	-0.034	(0)
HgCl3-	3.542e-19	3.277e-19	-18.451	-18.484	-0.034	(0)
CrOHC12	1.008e-19	1.008e-19	-18.996	-18.996	0.000	(0)
HgCl+	8.105e-20	7.500e-20	-19.091	-19.125	-0.034	(0)
CuCl3-	2.098e-20	1.954e-20	-19.678	-19.709	-0.031	(0)
FeCl2+	7.200e-21	6.713e-21	-20.143	-20.173	-0.030	(0)
VOCl+	3.325e-21	3.077e-21	-20.478	-20.512	-0.034	(0)
CrCl2+	3.161e-21	2.925e-21	-20.500	-20.534	-0.034	(0)
ZnCl4-2	1.846e-21	1.395e-21	-20.734	-20.855	-0.122	(0)
HgCl4-2	5.254e-22	3.852e-22	-21.280	-21.414	-0.135	(0)
PbCl4-2	1.843e-22	1.351e-22	-21.735	-21.869	-0.135	(0)
FeCl3	1.982e-25	1.982e-25	-24.703	-24.703	0.000	(0)
CuCl4-2	3.825e-26	2.891e-26	-25.417	-25.539	-0.122	(0)
CrO3Cl-	1.382e-28	1.279e-28	-27.860	-27.893	-0.034	(0)
CoCl+2	3.726e-37	2.732e-37	-36.429	-36.564	-0.135	(0)
UCl+3	0.000e+00	0.000e+00	-44.191	-44.494	-0.303	(0)
Co (2)	2.799e-08					
Co+2	2.395e-08	1.756e-08	-7.621	-7.755	-0.135	(0)
CoHCO3+	2.450e-09	2.267e-09	-8.611	-8.645	-0.034	(0)
CoSO4	1.078e-09	1.078e-09	-8.967	-8.967	0.000	(0)
CoCO3	3.947e-10	3.947e-10	-9.404	-9.404	0.000	(0)
CoOH+	6.515e-11	6.029e-11	-10.186	-10.220	-0.034	(0)
CoF+	3.063e-11	2.835e-11	-10.514	-10.548	-0.034	(0)
CoCl+	1.938e-11	1.794e-11	-10.713	-10.746	-0.034	(0)
Co (OH) 2	8.241e-13	8.241e-13	-12.084	-12.084	0.000	(0)
Co (OH) 3-	3.058e-18	2.829e-18	-17.515	-17.548	-0.034	(0)
CoOOH-	7.672e-19	7.100e-19	-18.115	-18.149	-0.034	(0)
CoSeO4	5.163e-19	5.163e-19	-18.287	-18.287	0.000	(0)
Co2OH+3	1.067e-19	5.306e-20	-18.972	-19.275	-0.303	(0)
Co (OH) 4-2	1.052e-25	7.717e-26	-24.978	-25.113	-0.135	(0)
Co4 (OH) 4+4	9.120e-33	2.636e-33	-32.040	-32.579	-0.539	(0)
Co (3)	5.423e-30					
CoOH+2	5.423e-30	3.976e-30	-29.266	-29.401	-0.135	(0)
Co+3	8.633e-36	4.547e-36	-35.064	-35.342	-0.278	(0)
CoCl+2	3.726e-37	2.732e-37	-36.429	-36.564	-0.135	(0)
Cr (2)	1.368e-24					
Cr+2	1.368e-24	1.003e-24	-23.864	-23.999	-0.135	(0)
Cr (3)	2.617e-08					
Cr (OH) 2+	2.327e-08	2.154e-08	-7.633	-7.667	-0.034	(0)
Cr (OH) +2	1.403e-09	1.029e-09	-8.853	-8.988	-0.135	(0)
Cr (OH) 3	1.392e-09	1.392e-09	-8.856	-8.856	0.000	(0)
CrOHSO4	7.513e-11	7.513e-11	-10.124	-10.124	0.000	(0)
CrO2-	1.221e-11	1.130e-11	-10.913	-10.947	-0.034	(0)
Cr (OH) 4-	1.031e-11	9.537e-12	-10.987	-11.021	-0.034	(0)
CrF+2	3.015e-12	2.210e-12	-11.521	-11.656	-0.135	(0)
Cr+3	5.492e-13	2.732e-13	-12.260	-12.563	-0.303	(0)
CrSO4+	2.122e-13	1.964e-13	-12.673	-12.707	-0.034	(0)
CrCl+2	1.424e-16	1.044e-16	-15.847	-15.981	-0.135	(0)
Cr2 (OH) 2SO4+2	9.526e-18	6.984e-18	-17.021	-17.156	-0.135	(0)
Cr2 (OH) 2 (SO4) 2	1.277e-19	1.277e-19	-18.894	-18.894	0.000	(0)
CrOHC12	1.008e-19	1.008e-19	-18.996	-18.996	0.000	(0)
CrCl2+	3.161e-21	2.925e-21	-20.500	-20.534	-0.034	(0)
Cr (6)	9.565e-18					

CrO4-2	8.263e-18	6.214e-18	-17.083	-17.207	-0.124	(0)
HCrO4-	1.272e-18	1.177e-18	-17.896	-17.929	-0.034	(0)
NaCrO4-	2.838e-20	2.626e-20	-19.547	-19.581	-0.034	(0)
KCrO4-	1.894e-21	1.752e-21	-20.723	-20.756	-0.034	(0)
H2CrO4	5.580e-26	5.580e-26	-25.253	-25.253	0.000	(0)
CrO3SO4-2	8.803e-27	6.455e-27	-26.055	-26.190	-0.135	(0)
CrO3Cl-	1.382e-28	1.279e-28	-27.860	-27.893	-0.034	(0)
Cr2O7-2	6.547e-35	4.801e-35	-34.184	-34.319	-0.135	(0)
Cu (1)	1.646e-09					
Cu+	1.204e-09	1.114e-09	-8.919	-8.953	-0.034	(0)
CuCl	4.142e-10	4.142e-10	-9.383	-9.383	0.000	(0)
CuCl2-	2.744e-11	2.555e-11	-10.562	-10.593	-0.031	(0)
CuCl3-2	2.134e-15	1.613e-15	-14.671	-14.792	-0.122	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-137.800	-138.002	-0.202	(0)
CuS4S5-3	0.000e+00	0.000e+00	-138.536	-138.732	-0.197	(0)
Cu (2)	1.479e-06					
CuCO3	1.159e-06	1.159e-06	-5.936	-5.936	0.000	(0)
Cu+2	1.968e-07	1.480e-07	-6.706	-6.830	-0.124	(0)
CuOH+	8.648e-08	8.052e-08	-7.063	-7.094	-0.031	(0)
CuHCO3+	1.675e-08	1.550e-08	-7.776	-7.810	-0.034	(0)
CuSO4	1.043e-08	1.043e-08	-7.982	-7.982	0.000	(0)
Cu (CO3) 2-2	5.656e-09	4.147e-09	-8.247	-8.382	-0.135	(0)
Cu (OH) 2	2.765e-09	2.765e-09	-8.558	-8.558	0.000	(0)
CuF+	5.151e-10	4.766e-10	-9.288	-9.322	-0.034	(0)
Cu2 (OH) 2+2	2.221e-10	1.629e-10	-9.653	-9.788	-0.135	(0)
CuCl+	7.437e-11	6.925e-11	-10.129	-10.160	-0.031	(0)
Cu (OH) 3-	1.055e-12	9.759e-13	-11.977	-12.011	-0.034	(0)
CuCl2	7.090e-15	7.090e-15	-14.149	-14.149	0.000	(0)
Cu (OH) 4-2	1.803e-18	1.322e-18	-17.744	-17.879	-0.135	(0)
CuCl3-	2.098e-20	1.954e-20	-19.678	-19.709	-0.031	(0)
CuCl4-2	3.825e-26	2.891e-26	-25.417	-25.539	-0.122	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-201.254	-201.288	-0.034	(0)
F	5.632e-05					
F-	5.482e-05	5.105e-05	-4.261	-4.292	-0.031	(0)
MgF+	1.129e-06	1.052e-06	-5.947	-5.978	-0.031	(0)
CaF+	3.273e-07	3.052e-07	-6.485	-6.515	-0.030	(0)
NaF	2.739e-08	2.739e-08	-7.562	-7.562	0.000	(0)
MnF+	5.323e-09	4.963e-09	-8.274	-8.304	-0.030	(0)
HF	4.418e-09	4.418e-09	-8.355	-8.355	0.000	(0)
AlF2+	3.759e-09	3.506e-09	-8.425	-8.455	-0.030	(0)
AlF3	2.253e-09	2.253e-09	-8.647	-8.647	0.000	(0)
CuF+	5.151e-10	4.766e-10	-9.288	-9.322	-0.034	(0)
AlF+2	2.278e-10	1.725e-10	-9.642	-9.763	-0.121	(0)
ZnF+	1.278e-10	1.183e-10	-9.893	-9.927	-0.034	(0)
BF (OH) 3-	6.421e-11	5.966e-11	-10.192	-10.224	-0.032	(0)
AlF4-	6.187e-11	5.765e-11	-10.209	-10.239	-0.031	(0)
NiF+	3.651e-11	3.379e-11	-10.438	-10.471	-0.034	(0)
CoF+	3.063e-11	2.835e-11	-10.514	-10.548	-0.034	(0)
CrF+2	3.015e-12	2.210e-12	-11.521	-11.656	-0.135	(0)
PbF+	2.396e-12	2.217e-12	-11.620	-11.654	-0.034	(0)
CdF+	1.296e-12	1.199e-12	-11.887	-11.921	-0.034	(0)
AgF	1.254e-12	1.254e-12	-11.902	-11.902	0.000	(0)
HF2-	9.215e-13	8.574e-13	-12.036	-12.067	-0.031	(0)
UO2F+	3.623e-13	3.353e-13	-12.441	-12.475	-0.034	(0)
UO2F2	4.936e-14	4.936e-14	-13.307	-13.307	0.000	(0)
FeF2+	4.681e-14	4.365e-14	-13.330	-13.360	-0.030	(0)
FeF+2	4.227e-14	3.195e-14	-13.374	-13.496	-0.122	(0)
BF2 (OH) 2-	2.051e-14	1.905e-14	-13.688	-13.720	-0.032	(0)
FeF3	3.143e-15	3.143e-15	-14.503	-14.503	0.000	(0)
PbF2	2.227e-15	2.227e-15	-14.652	-14.652	0.000	(0)
UO2F3-	6.840e-16	6.329e-16	-15.165	-15.199	-0.034	(0)
CdF2	1.221e-16	1.221e-16	-15.913	-15.913	0.000	(0)
VO2F	7.900e-17	7.900e-17	-16.102	-16.102	0.000	(0)
H2F2	5.229e-17	5.229e-17	-16.282	-16.282	0.000	(0)
VO2F2-	1.582e-18	1.464e-18	-17.801	-17.834	-0.034	(0)
VOF+	1.229e-18	1.137e-18	-17.910	-17.944	-0.034	(0)
UO2F4-2	3.500e-19	2.566e-19	-18.456	-18.591	-0.135	(0)
PbF3-	2.331e-19	2.157e-19	-18.633	-18.666	-0.034	(0)

BF3OH-	2.383e-20	2.214e-20	-19.623	-19.655	-0.032	(0)
VOF2	2.177e-20	2.177e-20	-19.662	-19.662	0.000	(0)
VO2F3-2	1.272e-21	9.323e-22	-20.896	-21.030	-0.135	(0)
VOF3-	4.261e-23	3.943e-23	-22.370	-22.404	-0.034	(0)
PbF4-2	7.186e-24	5.269e-24	-23.143	-23.278	-0.135	(0)
Sb(OH) 2F	1.012e-24	1.012e-24	-23.995	-23.995	0.000	(0)
SbOF	9.950e-25	9.950e-25	-24.002	-24.002	0.000	(0)
BF4-	3.502e-25	3.254e-25	-24.456	-24.488	-0.032	(0)
VO2F4-3	4.707e-26	2.342e-26	-25.327	-25.630	-0.303	(0)
HgF+	2.603e-26	2.409e-26	-25.584	-25.618	-0.034	(0)
VOF4-2	1.108e-26	8.125e-27	-25.955	-26.090	-0.135	(0)
UF3+	1.240e-34	1.148e-34	-33.906	-33.940	-0.034	(0)
UF2+2	1.935e-35	1.419e-35	-34.713	-34.848	-0.135	(0)
UF4	6.425e-37	6.425e-37	-36.192	-36.192	0.000	(0)
UF+3	4.438e-38	2.208e-38	-37.353	-37.656	-0.303	(0)
UF5-	1.405e-39	1.300e-39	-38.852	-38.886	-0.034	(0)
UF6-2	0.000e+00	0.000e+00	-40.563	-40.698	-0.135	(0)
Fe (2)	1.388e-07					
Fe+2	1.288e-07	9.446e-08	-6.890	-7.025	-0.135	(0)
FeSO4	7.137e-09	7.137e-09	-8.146	-8.146	0.000	(0)
FeHCO3+	2.114e-09	1.974e-09	-8.675	-8.705	-0.030	(0)
FeOH+	6.940e-10	6.471e-10	-9.159	-9.189	-0.030	(0)
Fe (OH) 2	8.846e-14	8.846e-14	-13.053	-13.053	0.000	(0)
Fe (OH) 3-	5.162e-15	4.813e-15	-14.287	-14.318	-0.030	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.980	-144.980	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-216.361	-216.395	-0.034	(0)
Fe (3)	5.349e-06					
Fe (OH) 2+	4.551e-06	4.246e-06	-5.342	-5.372	-0.030	(0)
Fe (OH) 3	7.847e-07	7.847e-07	-6.105	-6.105	0.000	(0)
Fe (OH) 4-	1.348e-08	1.257e-08	-7.870	-7.901	-0.030	(0)
FeOH+2	8.391e-11	6.342e-11	-10.076	-10.198	-0.122	(0)
FeF2+	4.681e-14	4.365e-14	-13.330	-13.360	-0.030	(0)
FeF+2	4.227e-14	3.195e-14	-13.374	-13.496	-0.122	(0)
FeF3	3.143e-15	3.143e-15	-14.503	-14.503	0.000	(0)
FeSO4+	2.114e-15	1.971e-15	-14.675	-14.705	-0.030	(0)
Fe+3	1.084e-15	5.708e-16	-14.965	-15.243	-0.278	(0)
Fe (SO4) 2-	1.402e-17	1.297e-17	-16.853	-16.887	-0.034	(0)
FeCl+2	6.734e-18	5.090e-18	-17.172	-17.293	-0.122	(0)
Fe2 (OH) 2+4	4.608e-19	1.332e-19	-18.336	-18.876	-0.539	(0)
FeHSeO3+2	1.161e-20	8.514e-21	-19.935	-20.070	-0.135	(0)
FeCl2+	7.200e-21	6.713e-21	-20.143	-20.173	-0.030	(0)
Fe3 (OH) 4+5	5.684e-23	8.174e-24	-22.245	-23.088	-0.842	(0)
FeCl3	1.982e-25	1.982e-25	-24.703	-24.703	0.000	(0)
H (0)	1.144e-27					
H2	5.722e-28	5.728e-28	-27.242	-27.242	0.000	(0)
Hg (0)	2.777e-11					
Hg	2.777e-11	2.777e-11	-10.556	-10.556	0.000	(0)
Hg (1)	6.547e-25					
Hg2+2	3.274e-25	2.400e-25	-24.485	-24.620	-0.135	(0)
Hg (2)	3.651e-15					
Hg (OH) 2	2.376e-15	2.379e-15	-14.624	-14.624	0.000	(0)
HgClOH	1.142e-15	1.142e-15	-14.942	-14.942	0.000	(0)
HgCl2	1.110e-16	1.110e-16	-15.955	-15.955	0.000	(0)
HgCO3	2.026e-17	2.026e-17	-16.693	-16.693	0.000	(0)
HgCl3-	3.542e-19	3.277e-19	-18.451	-18.484	-0.034	(0)
Hg (CO3) 2-2	1.162e-19	8.520e-20	-18.935	-19.070	-0.135	(0)
HgOH+	9.425e-20	8.722e-20	-19.026	-19.059	-0.034	(0)
HgCl+	8.105e-20	7.500e-20	-19.091	-19.125	-0.034	(0)
HgHCO3+	2.386e-20	2.207e-20	-19.622	-19.656	-0.034	(0)
HgCl4-2	5.254e-22	3.852e-22	-21.280	-21.414	-0.135	(0)
Hg (OH) 3-	5.569e-23	5.153e-23	-22.254	-22.288	-0.034	(0)
Hg+2	1.736e-23	1.273e-23	-22.760	-22.895	-0.135	(0)
HgSO4	1.026e-24	1.026e-24	-23.989	-23.989	0.000	(0)
HgF+	2.603e-26	2.409e-26	-25.584	-25.618	-0.034	(0)
HgHS2-	0.000e+00	0.000e+00	-130.605	-130.639	-0.034	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.478	-131.478	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.980	-132.114	-0.135	(0)
K	8.167e-05					

K+	8.149e-05	7.589e-05	-4.089	-4.120	-0.031	(0)
KSO4-	1.773e-07	1.654e-07	-6.751	-6.782	-0.030	(0)
KCrO4-	1.894e-21	1.752e-21	-20.723	-20.756	-0.034	(0)
Mg	2.592e-04					
Mg+2	2.442e-04	1.836e-04	-3.612	-3.736	-0.124	(0)
MgSO4	1.029e-05	1.029e-05	-4.988	-4.988	0.000	(0)
MgHCO3+	3.350e-06	3.119e-06	-5.475	-5.506	-0.031	(0)
MgF+	1.129e-06	1.052e-06	-5.947	-5.978	-0.031	(0)
MgCO3	2.031e-07	2.031e-07	-6.692	-6.692	0.000	(0)
MgOH+	1.347e-08	1.258e-08	-7.871	-7.900	-0.030	(0)
MgH2BO3+	1.992e-10	1.851e-10	-9.701	-9.733	-0.032	(0)
Mn (2)	3.559e-06					
Mn+2	3.331e-06	2.442e-06	-5.477	-5.612	-0.135	(0)
MnSO4	1.337e-07	1.337e-07	-6.874	-6.874	0.000	(0)
MnHCO3+	8.674e-08	8.088e-08	-7.062	-7.092	-0.030	(0)
MnF+	5.323e-09	4.963e-09	-8.274	-8.304	-0.030	(0)
MnOH+	1.132e-09	1.056e-09	-8.946	-8.976	-0.030	(0)
MnCl+	9.737e-10	9.079e-10	-9.012	-9.042	-0.030	(0)
MnCl2	3.786e-13	3.786e-13	-12.422	-12.422	0.000	(0)
MnSeO4	3.857e-17	3.857e-17	-16.414	-16.414	0.000	(0)
MnCl3-	3.302e-17	3.079e-17	-16.481	-16.512	-0.030	(0)
Mn (OH) 3-	2.072e-19	1.932e-19	-18.684	-18.714	-0.030	(0)
Mn (OH) 4-2	1.420e-25	1.073e-25	-24.848	-24.969	-0.122	(0)
MnSe	3.727e-40	3.727e-40	-39.429	-39.429	0.000	(0)
Mn (3)	1.347e-26					
Mn+3	1.347e-26	7.096e-27	-25.871	-26.149	-0.278	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.798	-46.919	-0.122	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-51.446	-51.478	-0.032	(0)
Mo	6.757e-08					
MoO4-2	6.751e-08	5.077e-08	-7.171	-7.294	-0.124	(0)
HMoO4-	6.388e-11	5.911e-11	-10.195	-10.228	-0.034	(0)
H2MoO4	2.533e-14	2.533e-14	-13.596	-13.596	0.000	(0)
Ag2MoO4	1.838e-24	1.838e-24	-23.736	-23.736	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.338	-44.641	-0.303	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.720	-55.933	-1.213	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.936	-56.779	-0.842	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.690	-59.229	-0.539	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.913	-63.216	-0.303	(0)
Na	9.155e-04					
Na+	9.132e-04	8.504e-04	-3.039	-3.070	-0.031	(0)
NaSO4-	1.507e-06	1.406e-06	-5.822	-5.852	-0.030	(0)
NaHCO3	7.937e-07	7.937e-07	-6.100	-6.100	0.000	(0)
NaF	2.739e-08	2.739e-08	-7.562	-7.562	0.000	(0)
NaCO3-	2.257e-08	2.106e-08	-7.646	-7.677	-0.030	(0)
NaH2BO3	3.918e-11	3.918e-11	-10.407	-10.407	0.000	(0)
NaCrO4-	2.838e-20	2.626e-20	-19.547	-19.581	-0.034	(0)
Ni	4.391e-08					
Ni+2	3.504e-08	2.635e-08	-7.455	-7.579	-0.124	(0)
NiHCO3+	5.827e-09	5.392e-09	-8.235	-8.268	-0.034	(0)
NiSO4	1.618e-09	1.618e-09	-8.791	-8.791	0.000	(0)
NiCO3	1.307e-09	1.307e-09	-8.884	-8.884	0.000	(0)
NiOH+	6.169e-11	5.709e-11	-10.210	-10.243	-0.034	(0)
NiF+	3.651e-11	3.379e-11	-10.438	-10.471	-0.034	(0)
NiCl+	2.151e-11	1.991e-11	-10.667	-10.701	-0.034	(0)
Ni (OH) 2	7.803e-13	7.803e-13	-12.108	-12.108	0.000	(0)
Ni (SO4) 2-2	2.249e-14	1.649e-14	-13.648	-13.783	-0.135	(0)
Ni (OH) 3-	1.451e-16	1.343e-16	-15.838	-15.872	-0.034	(0)
NiCl2	2.960e-17	2.960e-17	-16.529	-16.529	0.000	(0)
NiSeO4	7.231e-19	7.231e-19	-18.141	-18.141	0.000	(0)
O (0)	3.086e-38					
O2	1.543e-38	1.545e-38	-37.812	-37.811	0.000	(0)
Pb	4.510e-09					
PbCO3	2.464e-09	2.464e-09	-8.608	-8.608	0.000	(0)
PbHCO3+	8.215e-10	7.601e-10	-9.085	-9.119	-0.034	(0)
Pb+2	8.196e-10	6.164e-10	-9.086	-9.210	-0.124	(0)
PbOH+	2.879e-10	2.664e-10	-9.541	-9.574	-0.034	(0)

PbSO4	9.292e-11	9.292e-11	-10.032	-10.032	0.000	(0)
Pb (CO3) 2-2	1.289e-11	9.450e-12	-10.890	-11.025	-0.135	(0)
PbCl+	6.979e-12	6.458e-12	-11.156	-11.190	-0.034	(0)
PbF+	2.396e-12	2.217e-12	-11.620	-11.654	-0.034	(0)
Pb (OH) 2	1.450e-12	1.450e-12	-11.839	-11.839	0.000	(0)
Pb (SO4) 2-2	2.350e-13	1.723e-13	-12.629	-12.764	-0.135	(0)
PbCl2	8.517e-15	8.517e-15	-14.070	-14.070	0.000	(0)
PbF2	2.227e-15	2.227e-15	-14.652	-14.652	0.000	(0)
Pb (OH) 3-	2.696e-16	2.495e-16	-15.569	-15.603	-0.034	(0)
Pb2OH+3	5.232e-18	2.603e-18	-17.281	-17.585	-0.303	(0)
PbCl3-	1.082e-18	1.001e-18	-17.966	-17.999	-0.034	(0)
PbF3-	2.331e-19	2.157e-19	-18.633	-18.666	-0.034	(0)
Pb (OH) 4-2	1.434e-20	1.051e-20	-19.843	-19.978	-0.135	(0)
PbCl4-2	1.843e-22	1.351e-22	-21.735	-21.869	-0.135	(0)
Pb3 (OH) 4+2	3.526e-23	2.585e-23	-22.453	-22.587	-0.135	(0)
PbF4-2	7.186e-24	5.269e-24	-23.143	-23.278	-0.135	(0)
Pb4 (OH) 4+4	4.380e-28	1.266e-28	-27.359	-27.898	-0.539	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-140.845	-140.845	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-212.964	-212.997	-0.034	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.648	-67.648	0.000	(0)
HS-	0.000e+00	0.000e+00	-73.419	-73.452	-0.034	(0)
H2S	0.000e+00	0.000e+00	-73.665	-73.665	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.240	-74.274	-0.034	(0)
S5-2	0.000e+00	0.000e+00	-75.450	-75.585	-0.135	(0)
S6-2	0.000e+00	0.000e+00	-75.966	-76.101	-0.135	(0)
S4-2	0.000e+00	0.000e+00	-76.046	-76.180	-0.135	(0)
S3-2	0.000e+00	0.000e+00	-76.852	-76.986	-0.135	(0)
S2-2	0.000e+00	0.000e+00	-77.868	-78.002	-0.135	(0)
S-2	0.000e+00	0.000e+00	-83.398	-83.520	-0.122	(0)
HgHS2-	0.000e+00	0.000e+00	-130.605	-130.639	-0.034	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.478	-131.478	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.980	-132.114	-0.135	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.966	-137.000	-0.034	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-137.149	-137.251	-0.102	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-137.800	-138.002	-0.202	(0)
CuS4S5-3	0.000e+00	0.000e+00	-138.536	-138.732	-0.197	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-139.253	-139.458	-0.205	(0)
AgS4S5-3	0.000e+00	0.000e+00	-139.570	-139.769	-0.199	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-139.763	-139.797	-0.034	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-140.522	-140.522	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-140.845	-140.845	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-141.020	-141.020	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.980	-144.980	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-201.254	-201.288	-0.034	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-211.159	-211.192	-0.034	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-212.041	-212.074	-0.034	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-212.964	-212.997	-0.034	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-213.805	-213.940	-0.135	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-216.361	-216.395	-0.034	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-283.196	-283.331	-0.135	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-285.970	-286.105	-0.135	(0)
Sb2S4-2	0.000e+00	0.000e+00	-296.079	-296.214	-0.135	(0)
S (6)	4.600e-04					
SO4-2	4.093e-04	3.078e-04	-3.388	-3.512	-0.124	(0)
CaSO4	3.862e-05	3.862e-05	-4.413	-4.413	0.000	(0)
MgSO4	1.029e-05	1.029e-05	-4.988	-4.988	0.000	(0)
NaSO4-	1.507e-06	1.406e-06	-5.822	-5.852	-0.030	(0)
KSO4-	1.773e-07	1.654e-07	-6.751	-6.782	-0.030	(0)
MnSO4	1.337e-07	1.337e-07	-6.874	-6.874	0.000	(0)
CuSO4	1.043e-08	1.043e-08	-7.982	-7.982	0.000	(0)
ZnSO4	7.819e-09	7.819e-09	-8.107	-8.107	0.000	(0)
FeSO4	7.137e-09	7.137e-09	-8.146	-8.146	0.000	(0)
HSO4-	1.889e-09	1.760e-09	-8.724	-8.755	-0.031	(0)
NiSO4	1.618e-09	1.618e-09	-8.791	-8.791	0.000	(0)
CoSO4	1.078e-09	1.078e-09	-8.967	-8.967	0.000	(0)
CdSO4	1.069e-10	1.069e-10	-9.971	-9.971	0.000	(0)
PbSO4	9.292e-11	9.292e-11	-10.032	-10.032	0.000	(0)

CrOHSO4	7.513e-11	7.513e-11	-10.124	-10.124	0.000	(0)
AgSO4-	6.489e-11	6.005e-11	-10.188	-10.221	-0.034	(0)
Zn(SO4) 2-2	2.859e-11	2.096e-11	-10.544	-10.679	-0.135	(0)
AlSO4+	8.667e-13	8.076e-13	-12.062	-12.093	-0.031	(0)
Cd(SO4) 2-2	6.056e-13	4.440e-13	-12.218	-12.353	-0.135	(0)
Pb(SO4) 2-2	2.350e-13	1.723e-13	-12.629	-12.764	-0.135	(0)
CrSO4+	2.122e-13	1.964e-13	-12.673	-12.707	-0.034	(0)
Ni(SO4) 2-2	2.249e-14	1.649e-14	-13.648	-13.783	-0.135	(0)
UO2SO4	2.217e-14	2.217e-14	-13.654	-13.654	0.000	(0)
Al(SO4) 2-	2.858e-15	2.663e-15	-14.544	-14.575	-0.031	(0)
FeSO4+	2.114e-15	1.971e-15	-14.675	-14.705	-0.030	(0)
UO2(SO4) 2-2	1.227e-16	8.994e-17	-15.911	-16.046	-0.135	(0)
Fe(SO4) 2-	1.402e-17	1.297e-17	-16.853	-16.887	-0.034	(0)
Cr2(OH) 2SO4+2	9.526e-18	6.984e-18	-17.021	-17.156	-0.135	(0)
VO2SO4-	7.008e-18	6.485e-18	-17.154	-17.188	-0.034	(0)
VOSO4	3.149e-19	3.149e-19	-18.502	-18.502	0.000	(0)
Cr2(OH) 2(SO4) 2	1.277e-19	1.277e-19	-18.894	-18.894	0.000	(0)
HgSO4	1.026e-24	1.026e-24	-23.989	-23.989	0.000	(0)
CrO3SO4-2	8.803e-27	6.455e-27	-26.055	-26.190	-0.135	(0)
VSO4+	1.525e-32	1.411e-32	-31.817	-31.851	-0.034	(0)
U(SO4) 2	6.494e-40	6.494e-40	-39.187	-39.187	0.000	(0)
USO4+2	3.623e-40	2.656e-40	-39.441	-39.576	-0.135	(0)
Sb(3)	4.285e-19					
Sb(OH) 3	2.168e-19	2.168e-19	-18.664	-18.664	0.000	(0)
HSbO2	2.117e-19	2.117e-19	-18.674	-18.674	0.000	(0)
SbO2-	6.332e-24	5.859e-24	-23.198	-23.232	-0.034	(0)
Sb(OH) 4-	3.628e-24	3.357e-24	-23.440	-23.474	-0.034	(0)
Sb(OH) 2F	1.012e-24	1.012e-24	-23.995	-23.995	0.000	(0)
SbOF	9.950e-25	9.950e-25	-24.002	-24.002	0.000	(0)
Sb(OH) 2+	3.330e-25	3.081e-25	-24.478	-24.511	-0.034	(0)
SbO+	1.148e-25	1.062e-25	-24.940	-24.974	-0.034	(0)
Sb2S4-2	0.000e+00	0.000e+00	-296.079	-296.214	-0.135	(0)
Sb(5)	2.075e-09					
SbO3-	2.073e-09	1.918e-09	-8.683	-8.717	-0.034	(0)
Sb(OH) 6-	2.409e-12	2.243e-12	-11.618	-11.649	-0.031	(0)
SbO2+	2.035e-24	1.883e-24	-23.691	-23.725	-0.034	(0)
Se(-2)	2.884e-10					
Ag2Se	2.884e-10	2.884e-10	-9.540	-9.540	0.000	(0)
HSe-	2.341e-36	2.166e-36	-35.631	-35.664	-0.034	(0)
H2Se	9.840e-40	9.840e-40	-39.007	-39.007	0.000	(0)
MnSe	3.727e-40	3.727e-40	-39.429	-39.429	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.297	-43.431	-0.135	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.610	-78.149	-0.539	(0)
Se(4)	6.624e-09					
HSeO3-	6.100e-09	5.645e-09	-8.215	-8.248	-0.034	(0)
SeO3-2	5.238e-10	3.841e-10	-9.281	-9.416	-0.135	(0)
H2SeO3	1.409e-13	1.409e-13	-12.851	-12.851	0.000	(0)
AgSeO3-	2.608e-15	2.414e-15	-14.584	-14.617	-0.034	(0)
FeHSeO3+2	1.161e-20	8.514e-21	-19.935	-20.070	-0.135	(0)
Cd(SeO3) 2-2	2.457e-22	1.802e-22	-21.610	-21.744	-0.135	(0)
Ag(SeO3) 2-3	1.668e-23	8.300e-24	-22.778	-23.081	-0.303	(0)
Se(6)	7.805e-14					
SeO4-2	7.801e-14	5.867e-14	-13.108	-13.232	-0.124	(0)
MnSeO4	3.857e-17	3.857e-17	-16.414	-16.414	0.000	(0)
ZnSeO4	1.055e-18	1.055e-18	-17.977	-17.977	0.000	(0)
NiSeO4	7.231e-19	7.231e-19	-18.141	-18.141	0.000	(0)
CoSeO4	5.163e-19	5.163e-19	-18.287	-18.287	0.000	(0)
HSeO4-	1.859e-19	1.720e-19	-18.731	-18.764	-0.034	(0)
CdSeO4	1.619e-20	1.619e-20	-19.791	-19.791	0.000	(0)
Zn(SeO4) 2-2	8.559e-32	6.276e-32	-31.068	-31.202	-0.135	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.970	-56.273	-0.303	(0)
U(4)	2.596e-20					
U(OH) 5-	2.590e-20	2.397e-20	-19.587	-19.620	-0.034	(0)
U(OH) 4	5.874e-23	5.874e-23	-22.231	-22.231	0.000	(0)
U(OH) 3+	1.358e-26	1.257e-26	-25.867	-25.901	-0.034	(0)
U(OH) 2+2	4.637e-31	3.400e-31	-30.334	-30.469	-0.135	(0)
UF3+	1.240e-34	1.148e-34	-33.906	-33.940	-0.034	(0)

UF2+2	1.935e-35	1.419e-35	-34.713	-34.848	-0.135	(0)
UOH+3	1.883e-36	9.370e-37	-35.725	-36.028	-0.303	(0)
UF4	6.425e-37	6.425e-37	-36.192	-36.192	0.000	(0)
UF+3	4.438e-38	2.208e-38	-37.353	-37.656	-0.303	(0)
UF5-	1.405e-39	1.300e-39	-38.852	-38.886	-0.034	(0)
U(SO4)2	6.494e-40	6.494e-40	-39.187	-39.187	0.000	(0)
USO4+2	3.623e-40	2.656e-40	-39.441	-39.576	-0.135	(0)
UF6-2	0.000e+00	0.000e+00	-40.563	-40.698	-0.135	(0)
U+4	0.000e+00	0.000e+00	-42.125	-42.664	-0.539	(0)
UC1+3	0.000e+00	0.000e+00	-44.191	-44.494	-0.303	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-161.919	-164.648	-2.729	(0)
U(5)	4.819e-16					
UO2+	4.819e-16	4.459e-16	-15.317	-15.351	-0.034	(0)
U(6)	1.091e-08					
UO2(CO3)2-2	9.116e-09	6.684e-09	-8.040	-8.175	-0.135	(0)
UO2(CO3)3-4	1.541e-09	4.455e-10	-8.812	-9.351	-0.539	(0)
UO2CO3	2.519e-10	2.519e-10	-9.599	-9.599	0.000	(0)
UO2OH+	1.114e-12	1.031e-12	-11.953	-11.987	-0.034	(0)
UO2F+	3.623e-13	3.353e-13	-12.441	-12.475	-0.034	(0)
UO2+2	6.327e-14	4.758e-14	-13.199	-13.323	-0.124	(0)
UO2F2	4.936e-14	4.936e-14	-13.307	-13.307	0.000	(0)
UO2SO4	2.217e-14	2.217e-14	-13.654	-13.654	0.000	(0)
UO2F3-	6.840e-16	6.329e-16	-15.165	-15.199	-0.034	(0)
UO2(SO4)2-2	1.227e-16	8.994e-17	-15.911	-16.046	-0.135	(0)
UO2Cl+	2.462e-17	2.279e-17	-16.609	-16.642	-0.034	(0)
(UO2)2(OH)2+2	2.405e-18	1.764e-18	-17.619	-17.754	-0.135	(0)
UO2F4-2	3.500e-19	2.566e-19	-18.456	-18.591	-0.135	(0)
(UO2)3(OH)5+	4.413e-20	4.083e-20	-19.355	-19.389	-0.034	(0)
V(2)	4.399e-40					
VOH+	4.399e-40	4.071e-40	-39.357	-39.390	-0.034	(0)
V+2	0.000e+00	0.000e+00	-40.001	-40.136	-0.135	(0)
V(3)	3.991e-13					
V(OH)3	3.991e-13	3.991e-13	-12.399	-12.399	0.000	(0)
V(OH)2+	1.631e-23	1.509e-23	-22.788	-22.821	-0.034	(0)
VOH+2	1.142e-26	8.374e-27	-25.942	-26.077	-0.135	(0)
V+3	1.952e-31	9.710e-32	-30.710	-31.013	-0.303	(0)
VSO4+	1.525e-32	1.411e-32	-31.817	-31.851	-0.034	(0)
V2(OH)3+3	0.000e+00	0.000e+00	-50.143	-50.447	-0.303	(0)
V2(OH)2+4	0.000e+00	0.000e+00	-50.815	-51.354	-0.539	(0)
V(4)	1.445e-16					
V(OH)3+	1.378e-16	1.275e-16	-15.861	-15.894	-0.034	(0)
VO+2	5.066e-18	3.715e-18	-17.295	-17.430	-0.135	(0)
VOF+	1.229e-18	1.137e-18	-17.910	-17.944	-0.034	(0)
VOSO4	3.149e-19	3.149e-19	-18.502	-18.502	0.000	(0)
VOF2	2.177e-20	2.177e-20	-19.662	-19.662	0.000	(0)
VOC1+	3.325e-21	3.077e-21	-20.478	-20.512	-0.034	(0)
VOF3-	4.261e-23	3.943e-23	-22.370	-22.404	-0.034	(0)
VOF4-2	1.108e-26	8.125e-27	-25.955	-26.090	-0.135	(0)
H2V2O4+2	1.112e-27	8.153e-28	-26.954	-27.089	-0.135	(0)
V(5)	1.472e-08					
H2VO4-	1.396e-08	1.292e-08	-7.855	-7.889	-0.034	(0)
HVO4-2	7.562e-10	5.545e-10	-9.121	-9.256	-0.135	(0)
H3VO4	7.557e-12	7.557e-12	-11.122	-11.122	0.000	(0)
H3V2O7-	6.811e-13	6.303e-13	-12.167	-12.200	-0.034	(0)
HV2O7-3	4.878e-15	2.427e-15	-14.312	-14.615	-0.303	(0)
VO2+	9.476e-16	8.824e-16	-15.023	-15.054	-0.031	(0)
VO4-3	9.547e-17	4.750e-17	-16.020	-16.323	-0.303	(0)
VO2F	7.900e-17	7.900e-17	-16.102	-16.102	0.000	(0)
VO2SO4-	7.008e-18	6.485e-18	-17.154	-17.188	-0.034	(0)
V3O9-3	4.536e-18	2.257e-18	-17.343	-17.646	-0.303	(0)
V2O7-4	3.863e-18	1.116e-18	-17.413	-17.952	-0.539	(0)
VO2F2-	1.582e-18	1.464e-18	-17.801	-17.834	-0.034	(0)
VO2F3-2	1.272e-21	9.323e-22	-20.896	-21.030	-0.135	(0)
V4O12-4	4.205e-23	1.215e-23	-22.376	-22.915	-0.539	(0)
VO2F4-3	4.707e-26	2.342e-26	-25.327	-25.630	-0.303	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.117	-57.960	-0.842	(0)
V10O28-6	0.000e+00	0.000e+00	-57.701	-58.914	-1.213	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.446	-59.985	-0.539	(0)

Zn	1.802e-07					
Zn+2	1.544e-07	1.161e-07	-6.811	-6.935	-0.124	(0)
ZnCO3	8.885e-09	8.885e-09	-8.051	-8.051	0.000	(0)
ZnSO4	7.819e-09	7.819e-09	-8.107	-8.107	0.000	(0)
ZnHCO3+	6.586e-09	6.094e-09	-8.181	-8.215	-0.034	(0)
ZnOH+	2.159e-09	1.998e-09	-8.666	-8.699	-0.034	(0)
ZnF+	1.278e-10	1.183e-10	-9.893	-9.927	-0.034	(0)
ZnCl+	9.249e-11	8.612e-11	-10.034	-10.065	-0.031	(0)
Zn (OH) 2	5.449e-11	5.449e-11	-10.264	-10.264	0.000	(0)
Zn (SO4) 2-2	2.859e-11	2.096e-11	-10.544	-10.679	-0.135	(0)
ZnOHCl	1.940e-11	1.940e-11	-10.712	-10.712	0.000	(0)
Zn (OH) 3-	5.079e-14	4.700e-14	-13.294	-13.328	-0.034	(0)
ZnCl2	4.030e-14	4.030e-14	-13.395	-13.395	0.000	(0)
ZnCl3-	1.015e-17	9.452e-18	-16.993	-17.024	-0.031	(0)
ZnSeO4	1.055e-18	1.055e-18	-17.977	-17.977	0.000	(0)
Zn (OH) 4-2	4.391e-19	3.220e-19	-18.357	-18.492	-0.135	(0)
ZnCl4-2	1.846e-21	1.395e-21	-20.734	-20.855	-0.122	(0)
Zn (SeO4) 2-2	8.559e-32	6.276e-32	-31.068	-31.202	-0.135	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-139.763	-139.797	-0.034	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-141.020	-141.020	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-211.159	-211.192	-0.034	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-213.805	-213.940	-0.135	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-285.970	-286.105	-0.135	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.02	-82.24	-36.22	Ag2S
Ag2CO3	-10.81	-21.90	-11.09	Ag2CO3
Ag2CrO4	-21.64	-33.23	-11.59	Ag2CrO4
Ag2HVO4	-10.86	-9.38	1.48	Ag2HVO4
Ag2MoO4	-11.76	-23.31	-11.55	Ag2MoO4
Ag2O	-14.13	-1.55	12.57	Ag2O
Ag2Se	4.25	-44.45	-48.70	Ag2Se
Ag2SeO3	-9.89	-17.04	-7.15	Ag2SeO3
Ag2SeO4	-20.34	-29.25	-8.91	Ag2SeO4
Ag2SO4	-14.71	-19.53	-4.82	Ag2SO4
Ag3AsO3	-23.36	-21.20	2.16	Ag3AsO3
Ag3AsO4	-13.22	-16.01	-2.79	Ag3AsO4
Ag3H2VO5	-15.33	-10.15	5.18	Ag3H2VO5
AgF:4H2O	-13.35	-12.30	1.05	AgF:4H2O
Agmetal	0.68	-12.82	-13.51	Ag
AgVO3	-9.37	-8.60	0.77	AgVO3
Al (OH) 3 (am)	-1.57	9.23	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.19	-46.83	2.37	Al2 (MoO4) 3
Al2O3	-1.20	18.45	19.65	Al2O3
Al4 (OH) 10SO4	-3.77	18.93	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.25	-4.45	4.80	AlAsO4:2H2O
AlOHSO4	-5.52	-8.75	-3.23	AlOHSO4
AlSb	-147.34	-81.71	65.62	AlSb
Alunite	-3.76	-5.16	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.93	-12.72	-7.79	PbSO4
Anhydrite	-2.41	-6.77	-4.36	CaSO4
Anilite	-49.48	-81.36	-31.88	Cu0.25Cu1.5S
Antlerite	-3.86	4.93	8.79	Cu3 (OH) 4SO4
Aragonite	-0.84	-9.14	-8.30	CaCO3
Arsenolite	-72.72	-75.48	-2.76	As4O6
Artinite	-8.48	1.12	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-34.06	-27.35	6.71	As2O5
Atacamite	-2.88	4.51	7.39	Cu2 (OH) 3Cl
Azurite	-0.87	-17.78	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.69	7.71	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.10	-0.23	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	4.68	-4.23	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.47	7.47	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-14.30	-23.97	-9.67	BaCrO4
BaF2	-9.52	-15.34	-5.82	BaF2

BaMoO4	-7.09	-14.05	-6.96	BaMoO4
Barite	-0.29	-10.27	-9.98	BaSO4
BaS	-89.16	-72.98	16.18	BaS
BaSeO3	-9.61	-7.78	1.83	BaSeO3
BaSeO4	-12.53	-19.99	-7.46	BaSeO4
Bianchite	-8.68	-10.45	-1.76	ZnSO4:6H2O
Birnessite	-10.50	7.60	18.09	MnO2
Bixbyite	-8.26	-8.90	-0.64	Mn2O3
BlaubleiI	-50.00	-74.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-50.20	-77.48	-27.28	Cu0.6Cu0.8S
Boehmite	0.65	9.23	8.58	AlOOH
Breithauptite	-53.48	-72.01	-18.52	NiSb
Brochantite	-2.66	12.57	15.22	Cu4(OH)6SO4
Brucite	-6.11	10.73	16.84	Mg(OH)2
Bunsenite	-5.56	6.89	12.45	NiO
Ca(VO3)2	-10.10	-4.44	5.66	Ca(VO3)2
Ca2V2O7	-10.73	6.77	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.79	6.76	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.04	6.26	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.99	17.97	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.89	17.97	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-291.24	-148.27	142.97	Ca3Sb2
CaCrO4	-18.20	-20.47	-2.27	CaCrO4
Calcite	-0.66	-9.14	-8.48	CaCO3
Calomel	-13.77	-31.68	-17.91	Hg2Cl2
CaMoO4	-2.61	-10.56	-7.95	CaMoO4
Carnotite	-3.80	-3.57	0.23	KUO2VO4
CaSeO3:2H2O	-7.09	-4.28	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.47	-16.49	-3.02	CaSeO4:2H2O
Cd(BO2)2	-15.27	-5.43	9.84	Cd(BO2)2
Cd(OH)2	-8.01	5.64	13.64	Cd(OH)2
Cd(OH)2(am)	-8.09	5.64	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-25.76	-19.05	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-23.63	-1.07	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.83	4.57	28.40	Cd4(OH)6SO4
CdCl2	-15.23	-15.89	-0.66	CdCl2
CdCl2:1H2O	-14.20	-15.89	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.98	-15.89	-1.91	CdCl2:2.5H2O
CdF2	-16.20	-17.41	-1.21	CdF2
Cdmetal(alpha)	-31.97	-18.46	13.51	Cd
Cdmetal(gamma)	-32.07	-18.46	13.62	Cd
CdMoO4	-1.97	-16.12	-14.15	CdMoO4
CdOHCl	-8.66	-5.13	3.54	CdOHCl
CdSb	-72.91	-73.26	-0.35	CdSb
CdSe	-17.06	-37.26	-20.20	CdSe
CdSeO4:2H2O	-20.21	-22.06	-1.85	CdSeO4:2H2O
CdSO4	-12.17	-12.34	-0.17	CdSO4
CdSO4:1H2O	-10.61	-12.34	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.47	-12.34	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.79	-11.54	-9.75	AgCl
Cerrusite	-1.96	-15.09	-13.13	PbCO3
CH4(g)	-75.66	-116.71	-41.05	CH4
Chalcanthite	-7.70	-10.34	-2.64	CuSO4:5H2O
Chalcocite	-49.21	-84.13	-34.92	Cu2S
Chalcopyrite	-111.02	-146.29	-35.27	CuFeS2
Cinnabar	-49.61	-95.31	-45.69	HgS
Claudetite	-72.41	-75.48	-3.06	As4O6
Clausthalite	-10.54	-37.64	-27.10	PbSe
Co(BO2)2	-31.43	-4.36	27.07	Co(BO2)2
Co(OH)2	-6.38	6.71	13.09	Co(OH)2
Co(OH)3	-11.34	-13.64	-2.31	Co(OH)3
CO2(g)	-2.19	-20.34	-18.15	CO2
Co3(AsO4)2	-20.26	-7.22	13.03	Co3(AsO4)2
Co3O4	-10.08	-20.58	-10.50	Co3O4
CoCl2	-23.08	-14.82	8.27	CoCl2
CoCl2:6H2O	-17.35	-14.82	2.54	CoCl2:6H2O
CoCO3	-3.65	-13.63	-9.98	CoCO3
CoF2	-14.74	-16.34	-1.60	CoF2

CoF3	-46.76	-48.22	-1.46	CoF3
CoFe2O4	23.15	19.62	-3.53	CoFe2O4
CoMoO4	-7.29	-15.05	-7.76	CoMoO4
CoO	-6.88	6.71	13.59	CoO
CoS (alpha)	-66.54	-73.98	-7.44	CoS
CoS (beta)	-62.91	-73.98	-11.07	CoS
CoSe	-19.99	-36.19	-16.20	CoSe
CoSeO3	-10.09	-8.77	1.32	CoSeO3
CoSeO4:6H2O	-19.46	-20.99	-1.53	CoSeO4:6H2O
CoSO4	-14.07	-11.27	2.80	CoSO4
CoSO4:6H2O	-8.79	-11.27	-2.47	CoSO4:6H2O
Cotunnite	-11.49	-16.27	-4.78	PbCl2
Covellite	-50.75	-73.05	-22.30	CuS
Cr (OH) 2	-20.35	-9.53	10.82	Cr (OH) 2
Cr (OH) 3	-1.77	-0.43	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.32	-0.43	-0.75	Cr (OH) 3
Cr2O3	1.49	-0.87	-2.36	Cr2O3
CrCl2	-45.15	-31.06	14.09	CrCl2
CrCl3	-47.84	-32.72	15.11	CrCl3
CrF3	-23.67	-35.01	-11.34	CrF3
Crmetal	-64.11	-33.63	30.48	Cr
CrO3	-28.46	-31.67	-3.21	CrO3
Cryolite	-13.59	-47.43	-33.84	Na3AlF6
Cu (OH) 2	-1.04	7.64	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.72	18.49	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-50.14	-85.02	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.54	-46.34	-45.80	Cu2Se
Cu2SO4	-19.47	-21.42	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.54	-4.44	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.51	-96.10	-42.59	Cu3Sb
Cu3Se2	-18.11	-81.60	-63.49	Cu3Se2
CuCO3	-1.21	-12.71	-11.50	CuCO3
CuCrO4	-18.60	-24.04	-5.44	CuCrO4
CuF	-8.34	-13.25	-4.91	CuF
CuF2	-16.53	-15.41	1.12	CuF2
CuF2:2H2O	-10.86	-15.41	-4.55	CuF2:2H2O
Cumetal	-5.01	-13.77	-8.76	Cu
CuMoO4	-1.05	-14.12	-13.08	CuMoO4
CuOCuSO4	-13.01	-2.71	10.30	CuOCuSO4
Cupricferrite	14.56	20.55	5.99	CuFe2O4
Cuprite	-2.03	-3.44	-1.41	Cu2O
Cuprousferrite	13.65	4.73	-8.92	CuFeO2
CuSe	-2.16	-35.26	-33.10	CuSe
CuSe2	-20.70	-54.07	-33.37	CuSe2
CuSeO3:2H2O	-8.36	-7.85	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.62	-20.06	-2.44	CuSeO4:5H2O
CuSO4	-13.28	-10.34	2.94	CuSO4
Diaspore	2.35	9.23	6.87	AlOOH
Djurleite	-49.47	-83.39	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-2.21	-18.75	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-1.66	-18.75	-17.09	CaMg (CO3) 2
Epsomite	-5.12	-7.25	-2.13	MgSO4:7H2O
Fe (OH) 2	-6.12	7.44	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.27	3.23	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-4.48	-8.20	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-4.13	-2.57	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-12.91	-33.53	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-37.29	-41.02	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	0.13	20.35	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-7.62	-7.22	0.40	FeAsO4:2H2O
FeCr2O4	-0.63	6.57	7.20	FeCr2O4
FeMoO4	-4.23	-14.32	-10.09	FeMoO4
Ferrihydrite	3.26	6.45	3.19	Fe (OH) 3
Ferroselite	-35.67	-54.26	-18.60	FeSe2
FeS (ppt)	-70.29	-73.24	-2.95	FeS
FeSe	-24.46	-35.46	-11.00	FeSe
Fix_pe	-4.81	-4.81	0.00	e-
Fluorite	-1.35	-11.85	-10.50	CaF2

Galena	-61.46	-75.43	-13.97	PbS
Gibbsite	0.94	9.23	8.29	Al (OH) 3
Goethite	5.96	6.45	0.49	FeOOH
Goslarite	-8.44	-10.45	-2.01	ZnSO4:7H2O
Greenockite	-60.69	-75.05	-14.36	CdS
Greigite	-257.36	-302.39	-45.03	Fe3S4
Gummite	-6.53	1.14	7.67	UO3
Gypsum	-2.16	-6.77	-4.61	CaSO4:2H2O
H-Jarosite	-4.49	-16.59	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.88	-21.76	-12.88	H2MoO4
H2S (g)	-72.68	-80.69	-8.01	H2S
H2Se (g)	-37.94	-42.90	-4.96	H2Se
Halite	-8.20	-6.60	1.60	NaCl
Hausmannite	-10.38	50.65	61.03	Mn3O4
Hematite	14.33	12.91	-1.42	Fe2O3
Hercynite	3.00	25.90	22.89	FeAl2O4
Hg (CH3) 2 (g)	-174.34	-248.04	-73.71	Hg (CH3) 2
Hg (g)	-9.25	-17.12	-7.87	Hg
Hg (OH) 2	-11.13	-14.62	-3.50	Hg (OH) 2
Hg2 (g)	-19.29	-34.25	-14.96	Hg2
Hg2 (OH) 2	-15.41	-10.15	5.26	Hg2 (OH) 2
Hg2CO3	-14.45	-30.50	-16.05	Hg2CO3
Hg2CrO4	-33.13	-41.83	-8.70	Hg2CrO4
Hg2F2	-22.84	-33.20	-10.36	Hg2F2
Hg2S	-79.16	-90.84	-11.68	Hg2S
Hg2SeO3	-20.98	-25.64	-4.66	Hg2SeO3
Hg2SO4	-22.00	-28.13	-6.13	Hg2SO4
Hg3O2CO3	-34.53	-64.21	-29.68	Hg3O2CO3
HgCl (g)	-35.34	-15.84	19.50	HgCl
HgCl2	-14.89	-36.15	-21.26	HgCl2
HgF (g)	-49.28	-16.60	32.68	HgF
HgF2 (g)	-50.24	-37.67	12.57	HgF2
Hgmetal (l)	-3.67	-17.12	-13.45	Hg
HgSe	-1.83	-57.52	-55.69	HgSe
HgSeO3	-17.67	-30.10	-12.43	HgSeO3
HgSO4	-23.18	-32.60	-9.42	HgSO4
Huntite	-8.01	-37.97	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.15	-24.92	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-18.95	-27.72	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-18.44	-23.61	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	1.32	-13.48	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-39.88	-57.12	-17.24	K2Cr2O7
K2CrO4	-24.93	-25.45	-0.51	K2CrO4
K2MoO4	-18.80	-15.53	3.26	K2MoO4
K2SeO4	-20.74	-21.47	-0.73	K2SeO4
Langite	-4.92	12.57	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.03	-7.47	-0.43	PbO:PbSO4
Laurionite	-6.13	-5.51	0.62	PbOHCl
Lepidocrocite	5.08	6.45	1.37	FeOOH
Lime	-21.50	11.20	32.70	CaO
Litharge	-7.44	5.26	12.69	PbO
Mackinawite	-69.64	-73.24	-3.60	FeS
Maghemite	6.52	12.91	6.39	Fe2O3
Magnesioferrite	6.78	23.64	16.86	Fe2MgO4
Magnesite	-2.15	-9.61	-7.46	MgCO3
Magnetite	16.95	20.35	3.40	Fe3O4
Malachite	0.24	-5.07	-5.31	Cu2 (OH) 2CO3
Manganite	-4.44	20.90	25.34	MnOOH
Massicot	-7.64	5.26	12.89	PbO
Matlockite	-8.06	-17.03	-8.97	PbClF
Melanothallite	-20.15	-13.89	6.26	CuCl2
Melanterite	-8.33	-10.54	-2.21	FeSO4:7H2O
Metacinnabar	-50.21	-95.31	-45.09	HgS
Mg (OH) 2 (active)	-8.06	10.73	18.79	Mg (OH) 2
Mg (VO3) 2	-16.19	-4.91	11.28	Mg (VO3) 2
Mg2Sb3	-265.81	-191.13	74.68	Mg2Sb3
Mg2V2O7	-20.54	5.82	26.36	Mg2V2O7
MgCr2O4	-6.34	9.86	16.20	MgCr2O4

MgCrO4	-26.32	-20.94	5.38	MgCrO4
MgF2	-4.19	-12.32	-8.13	MgF2
MgMoO4	-9.18	-11.03	-1.85	MgMoO4
MgSeO3:6H2O	-7.81	-4.75	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.77	-16.97	-1.20	MgSeO4:6H2O
Minium	-33.66	39.86	73.52	Pb3O4
Mirabilite	-8.54	-9.65	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.69	-6.79	4.90	Mn(VO3)2
Mn2(SO4)3	-57.12	-62.83	-5.71	Mn2(SO4)3
Mn2Sb	-146.36	-85.28	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.29	-0.79	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.39	-12.67	2.72	MnCl2:4H2O
MnS(grn)	-72.00	-71.83	0.17	MnS
MnS(pnk)	-75.17	-71.83	3.34	MnS
MnSb	-92.48	-95.39	-2.91	MnSb
MnSe	-37.54	-34.04	3.50	MnSe
MnSeO3	-7.76	-6.63	1.13	MnSeO3
MnSeO3:2H2O	-7.61	-6.63	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.79	-18.84	-2.05	MnSeO4:5H2O
MnSO4	-11.71	-9.12	2.58	MnSO4
Monteponite	-9.47	5.64	15.10	CdO
Montroydite	-10.98	-14.62	-3.64	HgO
MoO3	-13.76	-21.76	-8.00	MoO3
Morenosite	-8.95	-11.09	-2.14	NiSO4:7H2O
MoS2	-136.96	-207.22	-70.26	MoS2
Na-Jarosite	-1.23	-12.43	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-45.12	-55.02	-9.90	Na2Cr2O7
Na2CrO4	-26.28	-23.35	2.93	Na2CrO4
Na2Mo2O7	-18.60	-35.20	-16.60	Na2Mo2O7
Na2MoO4	-14.93	-13.44	1.49	Na2MoO4
Na2MoO4:2H2O	-14.66	-13.44	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-17.46	-7.16	10.30	Na2SeO3:5H2O
Na2SeO4	-20.65	-19.37	1.28	Na2SeO4
Na3Sb	-172.90	-78.45	94.45	Na3Sb
Na3VO4	-32.02	4.67	36.68	Na3VO4
Na4V2O7	-36.39	1.01	37.40	Na4V2O7
Nantokite	-5.75	-12.48	-6.73	CuCl
NaSb	-85.85	-62.69	23.17	NaSb
Natron	-10.71	-12.02	-1.31	Na2CO3:10H2O
NaVO3	-7.52	-3.66	3.86	NaVO3
Nesquehonite	-4.94	-9.61	-4.67	MgCO3:3H2O
Ni(OH)2	-5.91	6.89	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.39	-6.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-22.43	9.57	32.00	Ni4(OH)6SO4
NiCO3	-6.59	-13.46	-6.87	NiCO3
NiMoO4	-3.73	-14.87	-11.14	NiMoO4
NiS(alpha)	-68.20	-73.80	-5.60	NiS
NiS(beta)	-62.70	-73.80	-11.10	NiS
NiS(gamma)	-61.00	-73.80	-12.80	NiS
NiSe	-18.31	-36.01	-17.70	NiSe
NiSeO3:2H2O	-11.41	-8.59	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.29	-20.81	-1.52	NiSeO4:6H2O
Nsutite	-9.91	7.60	17.50	MnO2
O2(g)	-34.91	48.18	83.09	O2
Orpiment	-218.73	-279.79	-61.07	As2S3
Otavite	-2.71	-14.71	-12.00	CdCO3
Pb(BO2)2	-12.33	-5.81	6.52	Pb(BO2)2
Pb(OH)2	-2.89	5.26	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.74	-69.50	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.04	-0.25	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.68	10.51	26.19	Pb2O(OH)2
Pb2O3	-26.44	34.60	61.04	Pb2O3
Pb2OCO3	-9.27	-9.83	-0.56	Pb2OCO3
Pb2V2O7	-3.23	-5.13	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.39	-11.59	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.02	0.12	6.14	Pb3(VO4)2
Pb3O2CO3	-15.60	-4.58	11.02	Pb3O2CO3
Pb3O2SO4	-12.90	-2.21	10.69	Pb3O2SO4

Pb4 (OH) 6SO4	-18.06	3.04	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.83	3.04	21.88	Pb4O3SO4
PbCrO4	-13.82	-26.42	-12.60	PbCrO4
PbF2	-10.35	-17.79	-7.44	PbF2
Pbmetal	-23.08	-18.84	4.25	Pb
PbMoO4	-0.88	-16.50	-15.62	PbMoO4
PbO:0.3H2O	-7.72	5.26	12.98	PbO:0.33H2O
PbSeO4	-15.60	-22.44	-6.84	PbSeO4
Periclase	-10.85	10.73	21.58	MgO
Phosgenite	-11.55	-31.36	-19.81	PbCl2:PbCO3
Plattnerite	-20.25	29.35	49.60	PbO2
Portlandite	-11.60	11.20	22.80	Ca (OH) 2
Pyrite	-111.33	-129.84	-18.51	FeS2
Pyrochroite	-6.34	8.85	15.19	Mn (OH) 2
Pyrolusite	-8.43	32.95	41.38	MnO2
Realgar	-91.85	-111.60	-19.75	AsS
Retgersite	-9.05	-11.09	-2.04	NiSO4:6H2O
Rhodochrosite	-0.91	-11.49	-10.58	MnCO3
Rutherfordine	-4.70	-19.20	-14.50	UO2CO3
Sb (OH) 3	-11.55	-18.66	-7.11	Sb (OH) 3
Sb2O4	-16.64	-13.24	3.40	Sb2O4
Sb2O5	-28.10	-37.76	-9.67	Sb2O5
Sb2Se3	-98.26	-166.02	-67.76	Sb2Se3
Sb4O6(cubic)	-56.39	-74.66	-18.26	Sb4O6
Sb4O6(orth)	-56.75	-74.66	-17.90	Sb4O6
SbCl3	-51.52	-50.95	0.57	SbCl3
SbF3	-43.01	-53.24	-10.23	SbF3
Sbmetal	-43.11	-54.80	-11.69	Sb
SbO2	-3.10	-30.93	-27.82	SbO2
Schoepite	-4.85	1.14	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.70	-18.81	-7.11	Se
Semetal (hex)	-11.10	-18.81	-7.71	Se
Senarmontite	-24.96	-37.33	-12.37	Sb2O3
SeO2	-15.61	-15.48	0.12	SeO2
SeO3	-48.74	-27.70	21.04	SeO3
Siderite	-2.66	-12.90	-10.24	FeCO3
Smithsonite	-2.81	-12.81	-10.00	ZnCO3
Sphalerite	-61.70	-73.15	-11.45	ZnS
Spinel	-7.66	29.18	36.85	MgAl2O4
Stibnite	-228.92	-279.38	-50.46	Sb2S3
Sulfur	-54.45	-56.59	-2.14	S
Tenorite	-0.01	7.64	7.64	CuO
Thenardite	-9.97	-9.65	0.32	Na2SO4
Thermonatrite	-12.65	-12.02	0.64	Na2CO3:H2O
Tyuyamunite	-6.23	-2.15	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.10	6.98	21.08	U3O8
U3Sb4	-557.34	-404.96	152.38	U3Sb4
U4O9	-27.82	-30.84	-3.02	U4O9
UF4	-30.30	-59.83	-29.54	UF4
UF4:2.5H2O	-27.11	-59.83	-32.72	UF4:2.5H2O
UO2 (am)	-14.67	-13.73	0.93	UO2
UO2 (OH) 2 (beta)	-4.47	1.14	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.30	-26.55	-2.25	UO2SeO4:4H2O
UO3	-6.56	1.14	7.70	UO3
Uraninite	-9.06	-13.73	-4.67	UO2
USb2	-210.31	-180.74	29.58	USb2
V (OH) 3	-16.91	-9.31	7.59	V (OH) 3
V2O5	-14.28	-15.64	-1.36	V2O5
V3O5	-34.82	-32.99	1.84	V3O5
V4O7	-43.14	-35.95	7.19	V4O7
V6O13	-34.25	-95.11	-60.86	V6O13
Valentinite	-28.85	-37.33	-8.48	Sb2O3
VC12	-61.76	-42.89	18.87	VC12
VC13	-65.03	-41.60	23.43	VC13
VF4	-63.99	-49.06	14.93	VF4
Vmetal	-89.48	-45.45	44.03	V
VO	-36.12	-21.36	14.76	VO
VO (OH) 2	-8.12	-2.96	5.15	VO (OH) 2

VO2Cl	-21.43	-18.58	2.84	VO2Cl
VOC1	-31.23	-20.08	11.15	VOC1
VOC12	-37.25	-24.49	12.76	VOC12
VOSO4	-24.55	-20.94	3.61	VOSO4
Witherite	-4.07	-12.64	-8.57	BaCO3
Wurtzite	-64.20	-73.15	-8.95	ZnS
Zincite	-3.80	7.53	11.33	ZnO
Zincosite	-14.38	-10.45	3.93	ZnSO4
Zn(BO2)2	-11.83	-3.54	8.29	Zn(BO2)2
Zn(OH)2	-4.67	7.53	12.20	Zn(OH)2
Zn(OH)2(am)	-4.94	7.53	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.22	7.53	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.00	7.53	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.20	7.53	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.42	-2.92	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.89	4.30	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.41	-4.76	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.28	-13.36	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-16.26	12.14	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-22.37	16.13	38.50	Zn5(OH)8Cl2
ZnCl2	-21.04	-13.99	7.05	ZnCl2
ZnCO3:1H2O	-2.55	-12.81	-10.26	ZnCO3:1H2O
ZnF2	-14.98	-15.52	-0.53	ZnF2
Znmetal	-42.35	-16.56	25.79	Zn
ZnMoO4	-4.10	-14.23	-10.13	ZnMoO4
ZnO(active)	-3.66	7.53	11.19	ZnO
ZnS(am)	-64.10	-73.15	-9.05	ZnS
ZnSb	-82.38	-71.36	11.01	ZnSb
ZnSe	-20.97	-35.37	-14.40	ZnSe
ZnSeO4:6H2O	-18.65	-20.17	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.81	-10.45	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 69.

```

REACTION 401
  H2O      -1
  213.9351 moles ### Addition step. Removes HTC water but solute mass
remains
  USE solution 401
  SAVE Solution 402
  End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 401. Solution after simulation 68.
Using reaction 401.

Reaction 401.

2.139e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.351e-08	8.350e-08
Al	3.286e-06	3.286e-06
As	3.663e-08	3.663e-08
B	1.436e-05	1.436e-05
Ba	1.137e-06	1.137e-06
C	9.827e-03	9.826e-03
Ca	3.819e-03	3.818e-03
Cd	1.057e-08	1.057e-08
Cl	1.539e-03	1.539e-03
Co	1.359e-07	1.359e-07
Cr	1.270e-07	1.270e-07
Cu	7.186e-06	7.185e-06
F	2.734e-04	2.734e-04
Fe	2.664e-05	2.664e-05
Hg	1.348e-10	1.348e-10
K	3.965e-04	3.964e-04
Mg	1.258e-03	1.258e-03
Mn	1.728e-05	1.727e-05
Mo	3.280e-07	3.280e-07
Na	4.444e-03	4.444e-03
Ni	2.132e-07	2.131e-07
Pb	2.189e-08	2.189e-08
S	2.233e-03	2.233e-03
Sb	1.007e-08	1.007e-08
Se	3.356e-08	3.356e-08
U	5.297e-08	5.296e-08
V	7.148e-08	7.147e-08
Zn	8.746e-07	8.745e-07

-----Description of solution-----

	pH =	7.189	Charge balance
	pe =	5.066	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.950e-02	
	Mass of water (kg) =	9.999e-01	
	Total alkalinity (eq/kg) =	8.805e-03	
	Total CO2 (mol/kg) =	9.827e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.247e-16	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	12	
	Total H =	1.110141e+02	
	Total O =	5.554009e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.793e-07	1.556e-07	-6.747	-6.808	-0.061	(0)
H+	7.417e-08	6.467e-08	-7.130	-7.189	-0.060	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	8.351e-08					
AgCl	5.303e-08	5.303e-08	-7.276	-7.276	0.000	(0)
Ag+	2.219e-08	1.935e-08	-7.654	-7.713	-0.060	(0)
AgCl2-	7.303e-09	6.198e-09	-8.137	-8.208	-0.071	(0)
AgSO4-	4.449e-10	3.776e-10	-9.352	-9.423	-0.071	(0)

	Ag ₂ Se	2.572e-10	2.572e-10	-9.590	-9.590	0.000	(0)
	AgCl ₃ -2	1.429e-11	7.414e-12	-10.845	-11.130	-0.285	(0)
	AgF	1.049e-11	1.049e-11	-10.979	-10.979	0.000	(0)
	AgOH	3.012e-13	3.012e-13	-12.521	-12.521	0.000	(0)
	AgCl ₄ -3	8.888e-14	2.031e-14	-13.051	-13.692	-0.641	(0)
	AgH ₂ BO ₃	3.927e-14	3.927e-14	-13.406	-13.406	0.000	(0)
	AgSeO ₃ -	2.316e-14	1.966e-14	-13.635	-13.706	-0.071	(0)
	Ag (OH) 2-	5.397e-18	4.581e-18	-17.268	-17.339	-0.071	(0)
	Ag (SeO ₃) 2-3	1.217e-21	2.782e-22	-20.915	-21.556	-0.641	(0)
	Ag ₂ MoO ₄	2.686e-23	2.686e-23	-22.571	-22.571	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-68.482	-68.482	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-78.042	-79.182	-1.140	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-138.894	-138.965	-0.071	(0)
	Ag (HS) S ₄ -2	0.000e+00	0.000e+00	-139.090	-139.259	-0.169	(0)
	Ag (S ₄) 2-3	0.000e+00	0.000e+00	-141.191	-141.510	-0.319	(0)
	AgS ₄ S ₅ -3	0.000e+00	0.000e+00	-141.516	-141.821	-0.305	(0)
Al		3.286e-06					
	Al (OH) 4-	1.999e-06	1.745e-06	-5.699	-5.758	-0.059	(0)
	AlF ₃	7.507e-07	7.507e-07	-6.125	-6.125	0.000	(0)
	AlF ₂ +	3.151e-07	2.763e-07	-6.501	-6.559	-0.057	(0)
	AlF ₄ -	9.301e-08	8.119e-08	-7.031	-7.091	-0.059	(0)
	Al (OH) 3	8.907e-08	8.907e-08	-7.050	-7.050	0.000	(0)
	Al (OH) 2+	3.271e-08	2.868e-08	-7.485	-7.542	-0.057	(0)
	AlF+2	5.442e-09	3.217e-09	-8.264	-8.493	-0.228	(0)
	AlOH+2	3.925e-10	2.320e-10	-9.406	-9.635	-0.228	(0)
	AlSO ₄ +	1.296e-11	1.132e-11	-10.887	-10.946	-0.059	(0)
	Al+3	5.116e-12	1.491e-12	-11.291	-11.827	-0.536	(0)
	Al (SO ₄) 2-	1.359e-13	1.186e-13	-12.867	-12.926	-0.059	(0)
	AlMo ₆ O ₂₁ -3	2.171e-40	0.000e+00	-39.663	-40.304	-0.641	(0)
As (3)		2.278e-19					
	H ₃ AsO ₃	2.257e-19	2.257e-19	-18.646	-18.646	0.000	(0)
	H ₂ AsO ₃ -	2.109e-21	1.790e-21	-20.676	-20.747	-0.071	(0)
	HAsO ₃ -2	4.864e-26	2.524e-26	-25.313	-25.598	-0.285	(0)
	H ₄ AsO ₃ +	8.521e-27	7.232e-27	-26.070	-26.141	-0.071	(0)
	AsO ₃ -3	6.583e-32	1.505e-32	-31.182	-31.823	-0.641	(0)
As (5)		3.663e-08					
	HAsO ₄ -2	2.692e-08	1.397e-08	-7.570	-7.855	-0.285	(0)
	H ₂ AsO ₄ -	9.707e-09	8.239e-09	-8.013	-8.084	-0.071	(0)
	AsO ₄ -3	2.989e-12	6.831e-13	-11.525	-12.166	-0.641	(0)
	H ₃ AsO ₄	9.218e-14	9.260e-14	-13.035	-13.033	0.002	(0)
B		1.436e-05					
	H ₃ BO ₃	1.419e-05	1.426e-05	-4.848	-4.846	0.002	(0)
	H ₂ BO ₃ -	1.483e-07	1.280e-07	-6.829	-6.893	-0.064	(0)
	CaH ₂ BO ₃ +	1.537e-08	1.327e-08	-7.813	-7.877	-0.064	(0)
	MgH ₂ BO ₃ +	3.193e-09	2.756e-09	-8.496	-8.560	-0.064	(0)
	BF (OH) 3-	1.422e-09	1.228e-09	-8.847	-8.911	-0.064	(0)
	NaH ₂ BO ₃	7.793e-10	7.793e-10	-9.108	-9.108	0.000	(0)
	BaH ₂ BO ₃ +	2.876e-12	2.483e-12	-11.541	-11.605	-0.064	(0)
	BF ₂ (OH) 2-	2.123e-12	1.832e-12	-11.673	-11.737	-0.064	(0)
	H ₅ (BO ₃) 2-	1.800e-12	1.554e-12	-11.745	-11.809	-0.064	(0)
	AgH ₂ BO ₃	3.927e-14	3.927e-14	-13.406	-13.406	0.000	(0)
	H ₈ (BO ₃) 3-	2.566e-15	2.215e-15	-14.591	-14.655	-0.064	(0)
	BF ₃ OH-	1.153e-17	9.951e-18	-16.938	-17.002	-0.064	(0)
	BF ₄ -	7.919e-22	6.836e-22	-21.101	-21.165	-0.064	(0)
Ba		1.137e-06					
	Ba+2	1.086e-06	6.275e-07	-5.964	-6.202	-0.238	(0)
	BaHCO ₃ +	5.003e-08	4.399e-08	-7.301	-7.357	-0.056	(0)
	BaCO ₃	1.713e-09	1.713e-09	-8.766	-8.766	0.000	(0)
	BaH ₂ BO ₃ +	2.876e-12	2.483e-12	-11.541	-11.605	-0.064	(0)
	BaOH+	4.871e-13	4.263e-13	-12.312	-12.370	-0.058	(0)
C (4)		9.827e-03					
	HCO ₃ -	8.373e-03	7.342e-03	-2.077	-2.134	-0.057	(0)
	H ₂ CO ₃	1.068e-03	1.068e-03	-2.971	-2.971	0.000	(0)
	CaHCO ₃ +	2.799e-04	2.462e-04	-3.553	-3.609	-0.056	(0)
	MgHCO ₃ +	5.357e-05	4.664e-05	-4.271	-4.331	-0.060	(0)
	NaHCO ₃	1.586e-05	1.586e-05	-4.800	-4.800	0.000	(0)
	CaCO ₃	1.519e-05	1.519e-05	-4.818	-4.818	0.000	(0)
	CO ₃ -2	9.207e-06	5.322e-06	-5.036	-5.274	-0.238	(0)

CuCO3	6.376e-06	6.376e-06	-5.195	-5.195	0.000	(0)
MgCO3	2.748e-06	2.748e-06	-5.561	-5.561	0.000	(0)
MnHCO3+	1.268e-06	1.110e-06	-5.897	-5.955	-0.058	(0)
NaCO3-	4.341e-07	3.806e-07	-6.362	-6.420	-0.057	(0)
Cu (CO3) 2-2	1.760e-07	9.133e-08	-6.754	-7.039	-0.285	(0)
CuHCO3+	1.110e-07	9.424e-08	-6.955	-7.026	-0.071	(0)
ZnCO3	1.048e-07	1.048e-07	-6.980	-6.980	0.000	(0)
ZnHCO3+	9.361e-08	7.945e-08	-7.029	-7.100	-0.071	(0)
NiHCO3+	7.097e-08	6.024e-08	-7.149	-7.220	-0.071	(0)
BaHCO3+	5.003e-08	4.399e-08	-7.301	-7.357	-0.056	(0)
UO2 (CO3) 3-4	3.470e-08	2.516e-09	-7.460	-8.599	-1.140	(0)
FeHCO3+	3.162e-08	2.780e-08	-7.500	-7.556	-0.056	(0)
CoHCO3+	3.150e-08	2.673e-08	-7.502	-7.573	-0.071	(0)
UO2 (CO3) 2-2	1.818e-08	9.433e-09	-7.740	-8.025	-0.285	(0)
PbCO3	1.366e-08	1.366e-08	-7.865	-7.865	0.000	(0)
NiCO3	1.322e-08	1.322e-08	-7.879	-7.879	0.000	(0)
PbHCO3+	5.486e-09	4.656e-09	-8.261	-8.332	-0.071	(0)
CoCO3	4.212e-09	4.212e-09	-8.376	-8.376	0.000	(0)
BaCO3	1.713e-09	1.713e-09	-8.766	-8.766	0.000	(0)
CdCO3	5.663e-10	5.663e-10	-9.247	-9.247	0.000	(0)
Pb (CO3) 2-2	4.039e-10	2.096e-10	-9.394	-9.679	-0.285	(0)
CdHCO3+	9.194e-11	7.803e-11	-10.036	-10.108	-0.071	(0)
UO2CO3	8.883e-11	8.883e-11	-10.051	-10.051	0.000	(0)
Cd (CO3) 2-2	4.306e-12	2.234e-12	-11.366	-11.651	-0.285	(0)
HgCO3	1.261e-15	1.261e-15	-14.899	-14.899	0.000	(0)
Hg (CO3) 2-2	4.091e-17	2.123e-17	-16.388	-16.673	-0.285	(0)
HgHCO3+	1.790e-18	1.519e-18	-17.747	-17.818	-0.071	(0)
Ca	3.819e-03					
Ca+2	3.115e-03	1.801e-03	-2.507	-2.745	-0.238	(0)
CaSO4	4.034e-04	4.034e-04	-3.394	-3.394	0.000	(0)
CaHCO3+	2.799e-04	2.462e-04	-3.553	-3.609	-0.056	(0)
CaCO3	1.519e-05	1.519e-05	-4.818	-4.818	0.000	(0)
CaF+	4.846e-06	4.241e-06	-5.315	-5.373	-0.058	(0)
CaH2BO3+	1.537e-08	1.327e-08	-7.813	-7.877	-0.064	(0)
CaOH+	6.359e-09	5.592e-09	-8.197	-8.252	-0.056	(0)
Cd	1.057e-08					
Cd+2	8.077e-09	4.669e-09	-8.093	-8.331	-0.238	(0)
CdSO4	1.070e-09	1.070e-09	-8.970	-8.970	0.000	(0)
CdCl+	7.050e-10	5.983e-10	-9.152	-9.223	-0.071	(0)
CdCO3	5.663e-10	5.663e-10	-9.247	-9.247	0.000	(0)
CdHCO3+	9.194e-11	7.803e-11	-10.036	-10.108	-0.071	(0)
Cd (SO4) 2-2	2.721e-11	1.412e-11	-10.565	-10.850	-0.285	(0)
CdF+	1.881e-11	1.597e-11	-10.726	-10.797	-0.071	(0)
CdOH+	6.800e-12	5.772e-12	-11.167	-11.239	-0.071	(0)
Cd (CO3) 2-2	4.306e-12	2.234e-12	-11.366	-11.651	-0.285	(0)
CdOHC1	3.820e-12	3.820e-12	-11.418	-11.418	0.000	(0)
CdCl2	3.348e-12	3.348e-12	-11.475	-11.475	0.000	(0)
CdF2	6.874e-15	6.874e-15	-14.163	-14.163	0.000	(0)
Cd (OH) 2	5.668e-15	5.668e-15	-14.247	-14.247	0.000	(0)
CdCl3-	3.340e-15	2.835e-15	-14.476	-14.548	-0.071	(0)
Cd2OH+3	5.909e-19	1.350e-19	-18.229	-18.870	-0.641	(0)
CdSeO4	5.509e-19	5.509e-19	-18.259	-18.259	0.000	(0)
Cd (OH) 3-	6.350e-20	5.389e-20	-19.197	-19.268	-0.071	(0)
Cd (SeO3) 2-2	1.852e-20	9.613e-21	-19.732	-20.017	-0.285	(0)
Cd (OH) 4-2	2.646e-27	1.373e-27	-26.577	-26.862	-0.285	(0)
CdHS+	0.000e+00	0.000e+00	-74.835	-74.906	-0.071	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.285	-142.285	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.897	-214.968	-0.071	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-287.070	-287.355	-0.285	(0)
Cl	1.539e-03					
Cl-	1.539e-03	1.342e-03	-2.813	-2.872	-0.060	(0)
AgCl	5.303e-08	5.303e-08	-7.276	-7.276	0.000	(0)
MnCl+	1.463e-08	1.280e-08	-7.835	-7.893	-0.058	(0)
AgCl2-	7.303e-09	6.198e-09	-8.137	-8.208	-0.071	(0)
CuCl	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)
ZnCl+	1.325e-09	1.154e-09	-8.878	-8.938	-0.060	(0)
CdCl+	7.050e-10	5.983e-10	-9.152	-9.223	-0.071	(0)
CuCl+	4.970e-10	4.327e-10	-9.304	-9.364	-0.060	(0)

CuCl2-	4.654e-10	4.052e-10	-9.332	-9.392	-0.060	(0)
NiCl+	2.693e-10	2.285e-10	-9.570	-9.641	-0.071	(0)
CoCl+	2.561e-10	2.173e-10	-9.592	-9.663	-0.071	(0)
ZnOHC1	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
PbCl+	4.789e-11	4.064e-11	-10.320	-10.391	-0.071	(0)
MnCl2	2.426e-11	2.426e-11	-10.615	-10.615	0.000	(0)
AgCl3-2	1.429e-11	7.414e-12	-10.845	-11.130	-0.285	(0)
CdOHC1	3.820e-12	3.820e-12	-11.418	-11.418	0.000	(0)
CdCl2	3.348e-12	3.348e-12	-11.475	-11.475	0.000	(0)
ZnCl2	2.454e-12	2.454e-12	-11.610	-11.610	0.000	(0)
PbCl2	2.437e-13	2.437e-13	-12.613	-12.613	0.000	(0)
CuCl2	2.014e-13	2.014e-13	-12.696	-12.696	0.000	(0)
CuCl3-2	1.982e-13	1.163e-13	-12.703	-12.935	-0.232	(0)
AgCl4-3	8.888e-14	2.031e-14	-13.051	-13.692	-0.641	(0)
HgClOH	7.306e-14	7.306e-14	-13.136	-13.136	0.000	(0)
HgCl2	3.567e-14	3.567e-14	-13.448	-13.448	0.000	(0)
MnCl3-	1.025e-14	8.969e-15	-13.989	-14.047	-0.058	(0)
CrCl+2	4.875e-15	2.530e-15	-14.312	-14.597	-0.285	(0)
CdCl3-	3.340e-15	2.835e-15	-14.476	-14.548	-0.071	(0)
ZnCl3-	3.005e-15	2.616e-15	-14.522	-14.582	-0.060	(0)
NiCl2	1.544e-15	1.544e-15	-14.811	-14.811	0.000	(0)
HgCl3-	5.640e-16	4.787e-16	-15.249	-15.320	-0.071	(0)
FeCl+2	2.250e-16	1.319e-16	-15.648	-15.880	-0.232	(0)
PbCl3-	1.534e-16	1.302e-16	-15.814	-15.885	-0.071	(0)
UO2Cl+	1.075e-17	9.126e-18	-16.969	-17.040	-0.071	(0)
CrOHC12	1.004e-17	1.004e-17	-16.998	-16.998	0.000	(0)
HgCl+	6.248e-18	5.303e-18	-17.204	-17.275	-0.071	(0)
HgCl4-2	4.929e-18	2.558e-18	-17.307	-17.592	-0.285	(0)
ZnCl4-2	2.993e-18	1.755e-18	-17.524	-17.756	-0.232	(0)
CuCl3-	2.897e-18	2.522e-18	-17.538	-17.598	-0.060	(0)
FeCl2+	9.038e-19	7.909e-19	-18.044	-18.102	-0.058	(0)
CrCl2+	3.795e-19	3.221e-19	-18.421	-18.492	-0.071	(0)
PbCl4-2	1.539e-19	7.986e-20	-18.813	-19.098	-0.285	(0)
VOCl+	6.065e-20	5.147e-20	-19.217	-19.288	-0.071	(0)
FeCl3	1.061e-22	1.061e-22	-21.974	-21.974	0.000	(0)
CuCl4-2	2.892e-23	1.696e-23	-22.539	-22.770	-0.232	(0)
CrO3Cl-	1.149e-26	9.750e-27	-25.940	-26.011	-0.071	(0)
CoCl+2	1.142e-35	5.929e-36	-34.942	-35.227	-0.285	(0)
UCl+3	0.000e+00	0.000e+00	-44.582	-45.223	-0.641	(0)
Co (2)	1.359e-07					
Co+2	9.021e-08	4.681e-08	-7.045	-7.330	-0.285	(0)
CoHCO3+	3.150e-08	2.673e-08	-7.502	-7.573	-0.071	(0)
CoSO4	9.136e-09	9.136e-09	-8.039	-8.039	0.000	(0)
CoCO3	4.212e-09	4.212e-09	-8.376	-8.376	0.000	(0)
CoF+	3.764e-10	3.195e-10	-9.424	-9.496	-0.071	(0)
CoCl+	2.561e-10	2.173e-10	-9.592	-9.663	-0.071	(0)
CoOH+	1.713e-10	1.454e-10	-9.766	-9.837	-0.071	(0)
Co (OH) 2	1.797e-12	1.797e-12	-11.745	-11.745	0.000	(0)
CoSeO4	1.487e-17	1.487e-17	-16.828	-16.828	0.000	(0)
Co (OH) 3-	6.576e-18	5.581e-18	-17.182	-17.253	-0.071	(0)
CoOOH-	1.651e-18	1.401e-18	-17.782	-17.854	-0.071	(0)
Co2OH+3	1.492e-18	3.411e-19	-17.826	-18.467	-0.641	(0)
Co (OH) 4-2	2.653e-25	1.377e-25	-24.576	-24.861	-0.285	(0)
Co4 (OH) 4+4	1.229e-30	8.913e-32	-29.910	-31.050	-1.140	(0)
Co (3)	3.309e-29					
CoOH+2	3.309e-29	1.717e-29	-28.480	-28.765	-0.285	(0)
Co+3	7.452e-35	2.171e-35	-34.128	-34.663	-0.536	(0)
CoCl+2	1.142e-35	5.929e-36	-34.942	-35.227	-0.285	(0)
Cr (2)	5.755e-24					
Cr+2	5.755e-24	2.987e-24	-23.240	-23.525	-0.285	(0)
Cr (3)	1.270e-07					
Cr (OH) 2+	1.107e-07	9.391e-08	-6.956	-7.027	-0.071	(0)
Cr (OH) +2	9.556e-09	4.959e-09	-8.020	-8.305	-0.285	(0)
Cr (OH) 3	5.491e-09	5.491e-09	-8.260	-8.260	0.000	(0)
CrOHSO4	1.151e-09	1.151e-09	-8.939	-8.939	0.000	(0)
CrF+2	9.599e-11	4.981e-11	-10.018	-10.303	-0.285	(0)
CrO2-	4.753e-11	4.034e-11	-10.323	-10.394	-0.071	(0)
Cr (OH) 4-	4.009e-11	3.402e-11	-10.397	-10.468	-0.071	(0)

Cr+3	6.372e-12	1.456e-12	-11.196	-11.837	-0.641	(0)
CrSO4+	3.919e-12	3.326e-12	-11.407	-11.478	-0.071	(0)
CrCl+2	4.875e-15	2.530e-15	-14.312	-14.597	-0.285	(0)
Cr2(OH)2SO4+2	9.942e-16	5.159e-16	-15.003	-15.287	-0.285	(0)
Cr2(OH)2(SO4)2	2.997e-17	2.997e-17	-16.523	-16.523	0.000	(0)
CrOHC12	1.004e-17	1.004e-17	-16.998	-16.998	0.000	(0)
CrCl2+	3.795e-19	3.221e-19	-18.421	-18.492	-0.071	(0)
Cr (6)	1.707e-16					
CrO4-2	1.476e-16	8.532e-17	-15.831	-16.069	-0.238	(0)
HCrO4-	2.104e-17	1.786e-17	-16.677	-16.748	-0.071	(0)
NaCrO4-	1.919e-18	1.628e-18	-17.717	-17.788	-0.071	(0)
KCrO4-	1.282e-19	1.088e-19	-18.892	-18.963	-0.071	(0)
H2CrO4	9.360e-25	9.360e-25	-24.029	-24.029	0.000	(0)
CrO3SO4-2	6.631e-25	3.441e-25	-24.178	-24.463	-0.285	(0)
CrO3Cl-	1.149e-26	9.750e-27	-25.940	-26.011	-0.071	(0)
Cr2O7-2	2.131e-32	1.106e-32	-31.671	-31.956	-0.285	(0)
Cu (1)	2.919e-09					
CuCl	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)
Cu+	1.008e-09	8.553e-10	-8.997	-9.068	-0.071	(0)
CuCl2-	4.654e-10	4.052e-10	-9.332	-9.392	-0.060	(0)
CuCl3-2	1.982e-13	1.163e-13	-12.703	-12.935	-0.232	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-140.153	-140.465	-0.312	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.897	-141.195	-0.299	(0)
Cu (2)	7.183e-06					
CuCO3	6.376e-06	6.376e-06	-5.195	-5.195	0.000	(0)
Cu+2	3.520e-07	2.034e-07	-6.454	-6.692	-0.238	(0)
Cu(CO3)2-2	1.760e-07	9.133e-08	-6.754	-7.039	-0.285	(0)
CuOH+	1.150e-07	1.001e-07	-6.939	-6.999	-0.060	(0)
CuHCO3+	1.110e-07	9.424e-08	-6.955	-7.026	-0.071	(0)
CuSO4	4.558e-08	4.558e-08	-7.341	-7.341	0.000	(0)
CuF+	3.264e-09	2.770e-09	-8.486	-8.558	-0.071	(0)
Cu(OH)2	3.109e-09	3.109e-09	-8.507	-8.507	0.000	(0)
CuCl+	4.970e-10	4.327e-10	-9.304	-9.364	-0.060	(0)
Cu2(OH)2+2	4.853e-10	2.518e-10	-9.314	-9.599	-0.285	(0)
Cu(OH)3-	1.170e-12	9.927e-13	-11.932	-12.003	-0.071	(0)
CuCl2	2.014e-13	2.014e-13	-12.696	-12.696	0.000	(0)
CuCl3-	2.897e-18	2.522e-18	-17.538	-17.598	-0.060	(0)
Cu(OH)4-2	2.343e-18	1.216e-18	-17.630	-17.915	-0.285	(0)
CuCl4-2	2.892e-23	1.696e-23	-22.539	-22.770	-0.232	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-204.470	-204.542	-0.071	(0)
F	2.734e-04					
F-	2.475e-04	2.158e-04	-3.606	-3.666	-0.060	(0)
MgF+	1.722e-05	1.503e-05	-4.764	-4.823	-0.059	(0)
CaF+	4.846e-06	4.241e-06	-5.315	-5.373	-0.058	(0)
AlF3	7.507e-07	7.507e-07	-6.125	-6.125	0.000	(0)
NaF	5.229e-07	5.229e-07	-6.282	-6.282	0.000	(0)
AlF2+	3.151e-07	2.763e-07	-6.501	-6.559	-0.057	(0)
AlF4-	9.301e-08	8.119e-08	-7.031	-7.091	-0.059	(0)
MnF+	7.437e-08	6.508e-08	-7.129	-7.187	-0.058	(0)
HF	2.064e-08	2.064e-08	-7.685	-7.685	0.000	(0)
AlF+2	5.442e-09	3.217e-09	-8.264	-8.493	-0.228	(0)
CuF+	3.264e-09	2.770e-09	-8.486	-8.558	-0.071	(0)
ZnF+	1.736e-09	1.473e-09	-8.760	-8.832	-0.071	(0)
BF(OH)3-	1.422e-09	1.228e-09	-8.847	-8.911	-0.064	(0)
NiF+	4.250e-10	3.608e-10	-9.372	-9.443	-0.071	(0)
CoF+	3.764e-10	3.195e-10	-9.424	-9.496	-0.071	(0)
CrF+2	9.599e-11	4.981e-11	-10.018	-10.303	-0.285	(0)
HF2-	1.950e-11	1.693e-11	-10.710	-10.771	-0.061	(0)
CdF+	1.881e-11	1.597e-11	-10.726	-10.797	-0.071	(0)
PbF+	1.529e-11	1.298e-11	-10.816	-10.887	-0.071	(0)
AgF	1.049e-11	1.049e-11	-10.979	-10.979	0.000	(0)
FeF2+	5.083e-12	4.448e-12	-11.294	-11.352	-0.058	(0)
BF2(OH)2-	2.123e-12	1.832e-12	-11.673	-11.737	-0.064	(0)
FeF3	1.354e-12	1.354e-12	-11.868	-11.868	0.000	(0)
FeF+2	1.313e-12	7.702e-13	-11.882	-12.113	-0.232	(0)
UO2F+	1.471e-13	1.249e-13	-12.832	-12.903	-0.071	(0)
UO2F2	7.772e-14	7.772e-14	-13.109	-13.109	0.000	(0)
PbF2	5.512e-14	5.512e-14	-13.259	-13.259	0.000	(0)

CdF2	6.874e-15	6.874e-15	-14.163	-14.163	0.000	(0)
UO2F3-	4.964e-15	4.213e-15	-14.304	-14.375	-0.071	(0)
VO2F	1.801e-15	1.801e-15	-14.744	-14.744	0.000	(0)
H2F2	1.141e-15	1.141e-15	-14.943	-14.943	0.000	(0)
VO2F2-	1.663e-16	1.411e-16	-15.779	-15.850	-0.071	(0)
PbF3-	2.658e-17	2.256e-17	-16.575	-16.647	-0.071	(0)
VOF+	2.085e-17	1.769e-17	-16.681	-16.752	-0.071	(0)
UO2F4-2	1.392e-17	7.221e-18	-16.857	-17.141	-0.285	(0)
BF3OH-	1.153e-17	9.951e-18	-16.938	-17.002	-0.064	(0)
VOF2	1.432e-18	1.432e-18	-17.844	-17.844	0.000	(0)
VO2F3-2	7.320e-19	3.798e-19	-18.136	-18.420	-0.285	(0)
VOF3-	1.292e-20	1.096e-20	-19.889	-19.960	-0.071	(0)
PbF4-2	4.490e-21	2.330e-21	-20.348	-20.633	-0.285	(0)
BF4-	7.919e-22	6.836e-22	-21.101	-21.165	-0.064	(0)
VO2F4-3	1.765e-22	4.033e-23	-21.753	-22.394	-0.641	(0)
VOF4-2	1.840e-23	9.548e-24	-22.735	-23.020	-0.285	(0)
Sb (OH) 2F	8.865e-24	8.865e-24	-23.052	-23.052	0.000	(0)
SbOF	8.721e-24	8.721e-24	-23.059	-23.059	0.000	(0)
HgF+	1.866e-24	1.584e-24	-23.729	-23.800	-0.071	(0)
UF3+	4.191e-34	3.557e-34	-33.378	-33.449	-0.071	(0)
UF2+2	2.004e-35	1.040e-35	-34.698	-34.983	-0.285	(0)
UF4	8.417e-36	8.417e-36	-35.075	-35.075	0.000	(0)
UF5-	8.480e-38	7.198e-38	-37.072	-37.143	-0.071	(0)
UF+3	1.675e-38	3.829e-39	-37.776	-38.417	-0.641	(0)
UF6-2	9.039e-39	4.690e-39	-38.044	-38.329	-0.285	(0)
Fe (2)	6.856e-07					
Fe+2	5.797e-07	3.008e-07	-6.237	-6.522	-0.285	(0)
FeSO4	7.222e-08	7.222e-08	-7.141	-7.141	0.000	(0)
FeHCO3+	3.162e-08	2.780e-08	-7.500	-7.556	-0.056	(0)
FeOH+	2.130e-09	1.864e-09	-8.672	-8.730	-0.058	(0)
Fe (OH) 2	2.304e-13	2.304e-13	-12.637	-12.637	0.000	(0)
Fe (OH) 3-	1.296e-14	1.134e-14	-13.887	-13.945	-0.058	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.738	-146.738	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.213	-219.284	-0.071	(0)
Fe (3)	2.596e-05					
Fe (OH) 2+	2.259e-05	1.981e-05	-4.646	-4.703	-0.057	(0)
Fe (OH) 3	3.311e-06	3.311e-06	-5.480	-5.480	0.000	(0)
Fe (OH) 4-	5.472e-08	4.798e-08	-7.262	-7.319	-0.057	(0)
FeOH+2	5.578e-10	3.271e-10	-9.254	-9.485	-0.232	(0)
FeF2+	5.083e-12	4.448e-12	-11.294	-11.352	-0.058	(0)
FeF3	1.354e-12	1.354e-12	-11.868	-11.868	0.000	(0)
FeF+2	1.313e-12	7.702e-13	-11.882	-12.113	-0.232	(0)
FeSO4+	4.082e-14	3.572e-14	-13.389	-13.447	-0.058	(0)
Fe+3	1.117e-14	3.255e-15	-13.952	-14.487	-0.536	(0)
Fe (SO4) 2-	8.801e-16	7.470e-16	-15.055	-15.127	-0.071	(0)
FeCl+2	2.250e-16	1.319e-16	-15.648	-15.880	-0.232	(0)
Fe2 (OH) 2+4	4.887e-17	3.544e-18	-16.311	-17.451	-1.140	(0)
FeCl2+	9.038e-19	7.909e-19	-18.044	-18.102	-0.058	(0)
FeHSeO3+2	4.256e-19	2.209e-19	-18.371	-18.656	-0.285	(0)
Fe3 (OH) 4+5	6.121e-20	1.015e-21	-19.213	-20.994	-1.781	(0)
FeCl3	1.061e-22	1.061e-22	-21.974	-21.974	0.000	(0)
H (0)	4.344e-28					
H2	2.172e-28	2.182e-28	-27.663	-27.661	0.002	(0)
Hg (0)	1.347e-10					
Hg	1.347e-10	1.347e-10	-9.871	-9.871	0.000	(0)
Hg (1)	6.980e-23					
Hg2+2	3.490e-23	1.811e-23	-22.457	-22.742	-0.285	(0)
Hg (2)	1.407e-13					
HgClOH	7.306e-14	7.306e-14	-13.136	-13.136	0.000	(0)
HgCl2	3.567e-14	3.567e-14	-13.448	-13.448	0.000	(0)
Hg (OH) 2	3.013e-14	3.027e-14	-13.521	-13.519	0.002	(0)
HgCO3	1.261e-15	1.261e-15	-14.899	-14.899	0.000	(0)
HgCl3-	5.640e-16	4.787e-16	-15.249	-15.320	-0.071	(0)
Hg (CO3) 2-2	4.091e-17	2.123e-17	-16.388	-16.673	-0.285	(0)
HgCl+	6.248e-18	5.303e-18	-17.204	-17.275	-0.071	(0)
HgCl4-2	4.929e-18	2.558e-18	-17.307	-17.592	-0.285	(0)
HgHCO3+	1.790e-18	1.519e-18	-17.747	-17.818	-0.071	(0)
HgOH+	1.446e-18	1.227e-18	-17.840	-17.911	-0.071	(0)

	Hg (OH) 3-	6.988e-22	5.931e-22	-21.156	-21.227	-0.071	(0)
	Hg+2	3.816e-22	1.980e-22	-21.418	-21.703	-0.285	(0)
	HgSO4	5.071e-23	5.071e-23	-22.295	-22.295	0.000	(0)
	HgF+	1.866e-24	1.584e-24	-23.729	-23.800	-0.071	(0)
	HgHS2-	0.000e+00	0.000e+00	-131.681	-131.752	-0.071	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-132.547	-132.547	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-132.986	-133.271	-0.285	(0)
K		3.965e-04					
	K+	3.938e-04	3.433e-04	-3.405	-3.464	-0.060	(0)
	KSO4-	2.711e-06	2.377e-06	-5.567	-5.624	-0.057	(0)
	KCrO4-	1.282e-19	1.088e-19	-18.892	-18.963	-0.071	(0)
Mg		1.258e-03					
	Mg+2	1.074e-03	6.208e-04	-2.969	-3.207	-0.238	(0)
	MgSO4	1.105e-04	1.105e-04	-3.957	-3.957	0.000	(0)
	MgHCO3+	5.357e-05	4.664e-05	-4.271	-4.331	-0.060	(0)
	MgF+	1.722e-05	1.503e-05	-4.764	-4.823	-0.059	(0)
	MgCO3	2.748e-06	2.748e-06	-5.561	-5.561	0.000	(0)
	MgOH+	4.365e-08	3.847e-08	-7.360	-7.415	-0.055	(0)
	MgH2BO3+	3.193e-09	2.756e-09	-8.496	-8.560	-0.064	(0)
Mn (2)		1.728e-05					
	Mn+2	1.460e-05	7.576e-06	-4.836	-5.121	-0.285	(0)
	MnSO4	1.318e-06	1.318e-06	-5.880	-5.880	0.000	(0)
	MnHCO3+	1.268e-06	1.110e-06	-5.897	-5.955	-0.058	(0)
	MnF+	7.437e-08	6.508e-08	-7.129	-7.187	-0.058	(0)
	MnCl+	1.463e-08	1.280e-08	-7.835	-7.893	-0.058	(0)
	MnOH+	3.384e-09	2.962e-09	-8.471	-8.528	-0.058	(0)
	MnCl2	2.426e-11	2.426e-11	-10.615	-10.615	0.000	(0)
	MnCl3-	1.025e-14	8.969e-15	-13.989	-14.047	-0.058	(0)
	MnSeO4	1.292e-15	1.292e-15	-14.889	-14.889	0.000	(0)
	Mn (OH) 3-	5.067e-19	4.434e-19	-18.295	-18.353	-0.058	(0)
	Mn (OH) 4-2	3.799e-25	2.228e-25	-24.420	-24.652	-0.232	(0)
	MnSe	2.631e-40	2.631e-40	-39.580	-39.580	0.000	(0)
Mn (3)		1.353e-25					
	Mn+3	1.353e-25	3.942e-26	-24.869	-25.404	-0.536	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-45.532	-45.764	-0.232	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-50.007	-50.069	-0.063	(0)
Mo		3.280e-07					
	MoO4-2	3.278e-07	1.895e-07	-6.484	-6.722	-0.238	(0)
	HMoO4-	2.872e-10	2.438e-10	-9.542	-9.613	-0.071	(0)
	H2MoO4	1.155e-13	1.155e-13	-12.937	-12.937	0.000	(0)
	Ag2MoO4	2.686e-23	2.686e-23	-22.571	-22.571	0.000	(0)
	AlMo6O21-3	2.171e-40	0.000e+00	-39.663	-40.304	-0.641	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-49.017	-51.581	-2.564	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.603	-52.384	-1.781	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.651	-54.791	-1.140	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-58.093	-58.734	-0.641	(0)
Na		4.444e-03					
	Na+	4.405e-03	3.841e-03	-2.356	-2.416	-0.060	(0)
	NaSO4-	2.301e-05	2.017e-05	-4.638	-4.695	-0.057	(0)
	NaHCO3	1.586e-05	1.586e-05	-4.800	-4.800	0.000	(0)
	NaF	5.229e-07	5.229e-07	-6.282	-6.282	0.000	(0)
	NaCO3-	4.341e-07	3.806e-07	-6.362	-6.420	-0.057	(0)
	NaH2BO3	7.793e-10	7.793e-10	-9.108	-9.108	0.000	(0)
	NaCrO4-	1.919e-18	1.628e-18	-17.717	-17.788	-0.071	(0)
Ni		2.132e-07					
	Ni+2	1.151e-07	6.656e-08	-6.939	-7.177	-0.238	(0)
	NiHCO3+	7.097e-08	6.024e-08	-7.149	-7.220	-0.071	(0)
	NiCO3	1.322e-08	1.322e-08	-7.879	-7.879	0.000	(0)
	NiSO4	1.299e-08	1.299e-08	-7.886	-7.886	0.000	(0)
	NiF+	4.250e-10	3.608e-10	-9.372	-9.443	-0.071	(0)
	NiCl+	2.693e-10	2.285e-10	-9.570	-9.641	-0.071	(0)
	NiOH+	1.536e-10	1.304e-10	-9.813	-9.885	-0.071	(0)
	Ni (OH) 2	1.612e-12	1.612e-12	-11.793	-11.793	0.000	(0)
	Ni (SO4) 2-2	8.105e-13	4.206e-13	-12.091	-12.376	-0.285	(0)
	NiCl2	1.544e-15	1.544e-15	-14.811	-14.811	0.000	(0)
	Ni (OH) 3-	2.956e-16	2.509e-16	-15.529	-15.600	-0.071	(0)

NiSeO4	1.973e-17	1.973e-17	-16.705	-16.705	0.000	(0)
O(0)	2.119e-37					
O2	1.059e-37	1.064e-37	-36.975	-36.973	0.002	(0)
Pb	2.189e-08					
PbCO3	1.366e-08	1.366e-08	-7.865	-7.865	0.000	(0)
PbHCO3+	5.486e-09	4.656e-09	-8.261	-8.332	-0.071	(0)
Pb+2	1.477e-09	8.535e-10	-8.831	-9.069	-0.238	(0)
PbSO4	4.089e-10	4.089e-10	-9.388	-9.388	0.000	(0)
Pb(CO3) 2-2	4.039e-10	2.096e-10	-9.394	-9.679	-0.285	(0)
PbOH+	3.932e-10	3.337e-10	-9.405	-9.477	-0.071	(0)
PbCl+	4.789e-11	4.064e-11	-10.320	-10.391	-0.071	(0)
PbF+	1.529e-11	1.298e-11	-10.816	-10.887	-0.071	(0)
Pb(SO4) 2-2	4.643e-12	2.410e-12	-11.333	-11.618	-0.285	(0)
Pb(OH) 2	1.642e-12	1.642e-12	-11.785	-11.785	0.000	(0)
PbCl2	2.437e-13	2.437e-13	-12.613	-12.613	0.000	(0)
PbF2	5.512e-14	5.512e-14	-13.259	-13.259	0.000	(0)
Pb(OH) 3-	3.012e-16	2.556e-16	-15.521	-15.592	-0.071	(0)
PbCl3-	1.534e-16	1.302e-16	-15.814	-15.885	-0.071	(0)
PbF3-	2.658e-17	2.256e-17	-16.575	-16.647	-0.071	(0)
Pb2OH+3	1.975e-17	4.514e-18	-16.704	-17.345	-0.641	(0)
PbCl4-2	1.539e-19	7.986e-20	-18.813	-19.098	-0.285	(0)
Pb(OH) 4-2	1.878e-20	9.744e-21	-19.726	-20.011	-0.285	(0)
PbF4-2	4.490e-21	2.330e-21	-20.348	-20.633	-0.285	(0)
Pb3(OH) 4+2	8.853e-23	4.594e-23	-22.053	-22.338	-0.285	(0)
Pb4(OH) 4+4	4.295e-27	3.115e-28	-26.367	-27.507	-1.140	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-142.965	-142.965	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-216.177	-216.248	-0.071	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-68.482	-68.482	0.000	(0)
HS-	0.000e+00	0.000e+00	-74.512	-74.583	-0.071	(0)
H2S	0.000e+00	0.000e+00	-74.752	-74.752	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.835	-74.906	-0.071	(0)
S5-2	0.000e+00	0.000e+00	-76.474	-76.759	-0.285	(0)
S6-2	0.000e+00	0.000e+00	-76.990	-77.275	-0.285	(0)
S4-2	0.000e+00	0.000e+00	-77.070	-77.355	-0.285	(0)
S3-2	0.000e+00	0.000e+00	-77.876	-78.160	-0.285	(0)
S2-2	0.000e+00	0.000e+00	-78.892	-79.177	-0.285	(0)
S-2	0.000e+00	0.000e+00	-84.462	-84.694	-0.232	(0)
HgHS2-	0.000e+00	0.000e+00	-131.681	-131.752	-0.071	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-132.547	-132.547	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.986	-133.271	-0.285	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-138.894	-138.965	-0.071	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-139.090	-139.259	-0.169	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-140.153	-140.465	-0.312	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.897	-141.195	-0.299	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-141.191	-141.510	-0.319	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.516	-141.821	-0.305	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-141.561	-141.632	-0.071	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-142.285	-142.285	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-142.812	-142.812	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-142.965	-142.965	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-146.738	-146.738	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-204.470	-204.542	-0.071	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-214.044	-214.115	-0.071	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-214.897	-214.968	-0.071	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-216.177	-216.248	-0.071	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-216.621	-216.906	-0.285	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-219.213	-219.284	-0.071	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-287.070	-287.355	-0.285	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-289.873	-290.158	-0.285	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.818	-300.103	-0.285	(0)
S(6)	2.233e-03					
SO4-2	1.692e-03	9.780e-04	-2.772	-3.010	-0.238	(0)
CaSO4	4.034e-04	4.034e-04	-3.394	-3.394	0.000	(0)
MgSO4	1.105e-04	1.105e-04	-3.957	-3.957	0.000	(0)
NaSO4-	2.301e-05	2.017e-05	-4.638	-4.695	-0.057	(0)
KSO4-	2.711e-06	2.377e-06	-5.567	-5.624	-0.057	(0)
MnSO4	1.318e-06	1.318e-06	-5.880	-5.880	0.000	(0)

ZnSO4	7.323e-08	7.323e-08	-7.135	-7.135	0.000	(0)
FeSO4	7.222e-08	7.222e-08	-7.141	-7.141	0.000	(0)
CuSO4	4.558e-08	4.558e-08	-7.341	-7.341	0.000	(0)
NiSO4	1.299e-08	1.299e-08	-7.886	-7.886	0.000	(0)
CoSO4	9.136e-09	9.136e-09	-8.039	-8.039	0.000	(0)
HSO4-	7.081e-09	6.181e-09	-8.150	-8.209	-0.059	(0)
Zn (SO4) 2-2	1.202e-09	6.238e-10	-8.920	-9.205	-0.285	(0)
CrOHSO4	1.151e-09	1.151e-09	-8.939	-8.939	0.000	(0)
CdSO4	1.070e-09	1.070e-09	-8.970	-8.970	0.000	(0)
AgSO4-	4.449e-10	3.776e-10	-9.352	-9.423	-0.071	(0)
PbSO4	4.089e-10	4.089e-10	-9.388	-9.388	0.000	(0)
Cd (SO4) 2-2	2.721e-11	1.412e-11	-10.565	-10.850	-0.285	(0)
AlSO4+	1.296e-11	1.132e-11	-10.887	-10.946	-0.059	(0)
Pb (SO4) 2-2	4.643e-12	2.410e-12	-11.333	-11.618	-0.285	(0)
CrSO4+	3.919e-12	3.326e-12	-11.407	-11.478	-0.071	(0)
Ni (SO4) 2-2	8.105e-13	4.206e-13	-12.091	-12.376	-0.285	(0)
Al (SO4) 2-	1.359e-13	1.186e-13	-12.867	-12.926	-0.059	(0)
FeSO4+	4.082e-14	3.572e-14	-13.389	-13.447	-0.058	(0)
UO2SO4	6.206e-15	6.206e-15	-14.207	-14.207	0.000	(0)
Cr2 (OH) 2SO4+2	9.942e-16	5.159e-16	-15.003	-15.287	-0.285	(0)
Fe (SO4) 2-	8.801e-16	7.470e-16	-15.055	-15.127	-0.071	(0)
UO2 (SO4) 2-2	1.542e-16	8.002e-17	-15.812	-16.097	-0.285	(0)
VO2SO4-	1.309e-16	1.111e-16	-15.883	-15.954	-0.071	(0)
Cr2 (OH) 2 (SO4) 2	2.997e-17	2.997e-17	-16.523	-16.523	0.000	(0)
VOSO4	3.683e-18	3.683e-18	-17.434	-17.434	0.000	(0)
HgSO4	5.071e-23	5.071e-23	-22.295	-22.295	0.000	(0)
CrO3SO4-2	6.631e-25	3.441e-25	-24.178	-24.463	-0.285	(0)
VSO4+	1.326e-31	1.126e-31	-30.877	-30.949	-0.071	(0)
U (SO4) 2	2.690e-40	2.690e-40	-39.570	-39.570	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.176	-40.461	-0.285	(0)
Sb (3)	8.035e-19					
Sb (OH) 3	4.065e-19	4.065e-19	-18.391	-18.391	0.000	(0)
HSbO2	3.970e-19	3.970e-19	-18.401	-18.401	0.000	(0)
SbO2-	1.171e-23	9.941e-24	-22.931	-23.003	-0.071	(0)
Sb (OH) 2F	8.865e-24	8.865e-24	-23.052	-23.052	0.000	(0)
SbOF	8.721e-24	8.721e-24	-23.059	-23.059	0.000	(0)
Sb (OH) 4-	6.707e-24	5.692e-24	-23.173	-23.245	-0.071	(0)
Sb (OH) 2+	7.524e-25	6.386e-25	-24.124	-24.195	-0.071	(0)
SbO+	2.595e-25	2.203e-25	-24.586	-24.657	-0.071	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.818	-300.103	-0.285	(0)
Sb (5)	1.007e-08					
SbO3-	1.006e-08	8.540e-09	-7.997	-8.069	-0.071	(0)
Sb (OH) 6-	1.144e-11	9.978e-12	-10.941	-11.001	-0.060	(0)
SbO2+	1.207e-23	1.025e-23	-22.918	-22.989	-0.071	(0)
Se (-2)	2.572e-10					
Ag2Se	2.572e-10	2.572e-10	-9.590	-9.590	0.000	(0)
HSe-	6.422e-37	5.451e-37	-36.192	-36.264	-0.071	(0)
H2Se	2.736e-40	2.736e-40	-39.563	-39.563	0.000	(0)
MnSe	2.631e-40	2.631e-40	-39.580	-39.580	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.789	-44.074	-0.285	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-78.042	-79.182	-1.140	(0)
Se (4)	3.330e-08					
HSeO3-	3.025e-08	2.568e-08	-7.519	-7.590	-0.071	(0)
SeO3-2	3.046e-09	1.581e-09	-8.516	-8.801	-0.285	(0)
H2SeO3	7.084e-13	7.084e-13	-12.150	-12.150	0.000	(0)
AgSeO3-	2.316e-14	1.966e-14	-13.635	-13.706	-0.071	(0)
FeHSeO3+2	4.256e-19	2.209e-19	-18.371	-18.656	-0.285	(0)
Cd (SeO3) 2-2	1.852e-20	9.613e-21	-19.732	-20.017	-0.285	(0)
Ag (SeO3) 2-3	1.217e-21	2.782e-22	-20.915	-21.556	-0.641	(0)
Se (6)	1.098e-12					
SeO4-2	1.096e-12	6.337e-13	-11.960	-12.198	-0.238	(0)
MnSeO4	1.292e-15	1.292e-15	-14.889	-14.889	0.000	(0)
ZnSeO4	3.359e-17	3.359e-17	-16.474	-16.474	0.000	(0)
NiSeO4	1.973e-17	1.973e-17	-16.705	-16.705	0.000	(0)
CoSeO4	1.487e-17	1.487e-17	-16.828	-16.828	0.000	(0)
HSeO4-	2.420e-18	2.054e-18	-17.616	-17.687	-0.071	(0)
CdSeO4	5.509e-19	5.509e-19	-18.259	-18.259	0.000	(0)
Zn (SeO4) 2-2	4.158e-29	2.158e-29	-28.381	-28.666	-0.285	(0)

U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.272	-57.913	-0.641	(0)
U (4)	7.029e-22					
U (OH) 5-	7.013e-22	5.952e-22	-21.154	-21.225	-0.071	(0)
U (OH) 4	1.613e-24	1.613e-24	-23.792	-23.792	0.000	(0)
U (OH) 3+	4.494e-28	3.814e-28	-27.347	-27.419	-0.071	(0)
U (OH) 2+2	2.199e-32	1.141e-32	-31.658	-31.943	-0.285	(0)
UF3+	4.191e-34	3.557e-34	-33.378	-33.449	-0.071	(0)
UF2+2	2.004e-35	1.040e-35	-34.698	-34.983	-0.285	(0)
UF4	8.417e-36	8.417e-36	-35.075	-35.075	0.000	(0)
UOH+3	1.521e-37	3.477e-38	-36.818	-37.459	-0.641	(0)
UF5-	8.480e-38	7.198e-38	-37.072	-37.143	-0.071	(0)
UF+3	1.675e-38	3.829e-39	-37.776	-38.417	-0.641	(0)
UF6-2	9.039e-39	4.690e-39	-38.044	-38.329	-0.285	(0)
U (SO4) 2	2.690e-40	2.690e-40	-39.570	-39.570	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.176	-40.461	-0.285	(0)
U+4	0.000e+00	0.000e+00	-42.911	-44.051	-1.140	(0)
UC1+3	0.000e+00	0.000e+00	-44.582	-45.223	-0.641	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.855	-173.624	-5.769	(0)
U (5)	2.585e-17					
UO2+	2.585e-17	2.194e-17	-16.588	-16.659	-0.071	(0)
U (6)	5.297e-08					
UO2 (CO3) 3-4	3.470e-08	2.516e-09	-7.460	-8.599	-1.140	(0)
UO2 (CO3) 2-2	1.818e-08	9.433e-09	-7.740	-8.025	-0.285	(0)
UO2CO3	8.883e-11	8.883e-11	-10.051	-10.051	0.000	(0)
UO2F+	1.471e-13	1.249e-13	-12.832	-12.903	-0.071	(0)
UO2OH+	9.679e-14	8.215e-14	-13.014	-13.085	-0.071	(0)
UO2F2	7.772e-14	7.772e-14	-13.109	-13.109	0.000	(0)
UO2+2	7.253e-15	4.193e-15	-14.139	-14.378	-0.238	(0)
UO2SO4	6.206e-15	6.206e-15	-14.207	-14.207	0.000	(0)
UO2F3-	4.964e-15	4.213e-15	-14.304	-14.375	-0.071	(0)
UO2 (SO4) 2-2	1.542e-16	8.002e-17	-15.812	-16.097	-0.285	(0)
UO2F4-2	1.392e-17	7.221e-18	-16.857	-17.141	-0.285	(0)
UO2C1+	1.075e-17	9.126e-18	-16.969	-17.040	-0.071	(0)
(UO2) 2 (OH) 2+2	2.158e-20	1.120e-20	-19.666	-19.951	-0.285	(0)
(UO2) 3 (OH) 5+	1.992e-23	1.691e-23	-22.701	-22.772	-0.071	(0)
V (2)	8.059e-40					
VOH+	6.083e-40	5.163e-40	-39.216	-39.287	-0.071	(0)
V+2	1.975e-40	1.025e-40	-39.704	-39.989	-0.285	(0)
V (3)	7.416e-13					
V (OH) 3	7.416e-13	7.416e-13	-12.130	-12.130	0.000	(0)
V (OH) 2+	3.652e-23	3.100e-23	-22.437	-22.509	-0.071	(0)
VOH+2	3.665e-26	1.902e-26	-25.436	-25.721	-0.285	(0)
V+3	1.067e-30	2.438e-31	-29.972	-30.613	-0.641	(0)
VSO4+	1.326e-31	1.126e-31	-30.877	-30.949	-0.071	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.137	-49.778	-0.641	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-49.502	-50.642	-1.140	(0)
V (4)	5.524e-16					
V (OH) 3+	5.000e-16	4.244e-16	-15.301	-15.372	-0.071	(0)
VO+2	2.634e-17	1.367e-17	-16.579	-16.864	-0.285	(0)
VOF+	2.085e-17	1.769e-17	-16.681	-16.752	-0.071	(0)
VOSO4	3.683e-18	3.683e-18	-17.434	-17.434	0.000	(0)
VOF2	1.432e-18	1.432e-18	-17.844	-17.844	0.000	(0)
VOC1+	6.065e-20	5.147e-20	-19.217	-19.288	-0.071	(0)
VOF3-	1.292e-20	1.096e-20	-19.889	-19.960	-0.071	(0)
VOF4-2	1.840e-23	9.548e-24	-22.735	-23.020	-0.285	(0)
H2V2O4+2	1.741e-26	9.033e-27	-25.759	-26.044	-0.285	(0)
V (5)	7.148e-08					
H2VO4-	6.714e-08	5.699e-08	-7.173	-7.244	-0.071	(0)
HVO4-2	4.265e-09	2.213e-09	-8.370	-8.655	-0.285	(0)
H3VO4	3.685e-11	3.685e-11	-10.434	-10.434	0.000	(0)
H3V2O7-	1.598e-11	1.356e-11	-10.796	-10.868	-0.071	(0)
HV2O7-3	1.871e-13	4.276e-14	-12.728	-13.369	-0.641	(0)
VO2+	5.458e-15	4.759e-15	-14.263	-14.322	-0.060	(0)
VO2F	1.801e-15	1.801e-15	-14.744	-14.744	0.000	(0)
V3O9-3	8.488e-16	1.940e-16	-15.071	-15.712	-0.641	(0)
VO4-3	7.505e-16	1.715e-16	-15.125	-15.766	-0.641	(0)
V2O7-4	2.454e-16	1.779e-17	-15.610	-16.750	-1.140	(0)

VO2F2-	1.663e-16	1.411e-16	-15.779	-15.850	-0.071	(0)
VO2SO4-	1.309e-16	1.111e-16	-15.883	-15.954	-0.071	(0)
VO2F3-2	7.320e-19	3.798e-19	-18.136	-18.420	-0.285	(0)
V4O12-4	6.358e-20	4.610e-21	-19.197	-20.336	-1.140	(0)
VO2F4-3	1.765e-22	4.033e-23	-21.753	-22.394	-0.641	(0)
HV10O28-5	0.000e+00	0.000e+00	-49.514	-51.294	-1.781	(0)
V10O28-6	0.000e+00	0.000e+00	-49.728	-52.292	-2.564	(0)
H2V10O28-4	0.000e+00	0.000e+00	-52.136	-53.276	-1.140	(0)
Zn	8.746e-07					
Zn+2	5.920e-07	3.422e-07	-6.228	-6.466	-0.238	(0)
ZnCO3	1.048e-07	1.048e-07	-6.980	-6.980	0.000	(0)
ZnHCO3+	9.361e-08	7.945e-08	-7.029	-7.100	-0.071	(0)
ZnSO4	7.323e-08	7.323e-08	-7.135	-7.135	0.000	(0)
ZnOH+	6.276e-09	5.326e-09	-8.202	-8.274	-0.071	(0)
ZnF+	1.736e-09	1.473e-09	-8.760	-8.832	-0.071	(0)
ZnCl+	1.325e-09	1.154e-09	-8.878	-8.938	-0.060	(0)
Zn (SO4) 2-2	1.202e-09	6.238e-10	-8.920	-9.205	-0.285	(0)
ZnOHCl	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
Zn (OH) 2	1.314e-10	1.314e-10	-9.881	-9.881	0.000	(0)
ZnCl2	2.454e-12	2.454e-12	-11.610	-11.610	0.000	(0)
Zn (OH) 3-	1.208e-13	1.025e-13	-12.918	-12.989	-0.071	(0)
ZnCl3-	3.005e-15	2.616e-15	-14.522	-14.582	-0.060	(0)
ZnSeO4	3.359e-17	3.359e-17	-16.474	-16.474	0.000	(0)
ZnCl4-2	2.993e-18	1.755e-18	-17.524	-17.756	-0.232	(0)
Zn (OH) 4-2	1.224e-18	6.350e-19	-17.912	-18.197	-0.285	(0)
Zn (SeO4) 2-2	4.158e-29	2.158e-29	-28.381	-28.666	-0.285	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.561	-141.632	-0.071	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.812	-142.812	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-214.044	-214.115	-0.071	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.621	-216.906	-0.285	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.873	-290.158	-0.285	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.60	-82.82	-36.22	Ag2S
Ag2CO3	-9.61	-20.70	-11.09	Ag2CO3
Ag2CrO4	-19.91	-31.50	-11.59	Ag2CrO4
Ag2HVO4	-9.66	-8.18	1.48	Ag2HVO4
Ag2MoO4	-10.60	-22.15	-11.55	Ag2MoO4
Ag2O	-13.62	-1.05	12.57	Ag2O
Ag2Se	4.20	-44.50	-48.70	Ag2Se
Ag2SeO3	-8.68	-15.83	-7.15	Ag2SeO3
Ag2SeO4	-18.71	-27.62	-8.91	Ag2SeO4
Ag2SO4	-13.62	-18.44	-4.82	Ag2SO4
Ag3AsO3	-22.38	-20.22	2.16	Ag3AsO3
Ag3AsO4	-11.82	-14.61	-2.79	Ag3AsO4
Ag3H2VO5	-13.89	-8.71	5.18	Ag3H2VO5
AgF:4H2O	-12.43	-11.38	1.05	AgF:4H2O
Agmetal	0.73	-12.78	-13.51	Ag
AgVO3	-8.43	-7.66	0.77	AgVO3
Al (OH) 3 (am)	-1.06	9.74	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.19	-43.82	2.37	Al2 (MoO4) 3
Al2O3	-0.17	19.48	19.65	Al2O3
Al4 (OH) 10SO4	-1.12	21.58	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-8.09	-3.29	4.80	AlAsO4:2H2O
AlOHSO4	-4.42	-7.65	-3.23	AlOHSO4
AlSb	-147.81	-82.18	65.62	AlSb
Alunite	-0.43	-1.83	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.29	-12.08	-7.79	PbSO4
Anhydrite	-1.39	-5.75	-4.36	CaSO4
Anilite	-50.79	-82.67	-31.88	Cu0.25Cu1.5S
Antlerite	-3.12	5.67	8.79	Cu3 (OH) 4SO4
Aragonite	0.28	-8.02	-8.30	CaCO3
Arsenolite	-71.82	-74.58	-2.76	As4O6
Artinite	-6.91	2.69	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-32.77	-26.07	6.71	As2O5

Atacamite	-2.08	5.31	7.39	Cu ₂ (OH) ₃ Cl
Azurite	0.66	-16.24	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-16.22	8.17	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-13.79	2.09	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	7.37	-1.54	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-22.68	10.26	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-12.60	-22.27	-9.67	BaCrO ₄
BaF ₂	-7.71	-13.53	-5.82	BaF ₂
BaMoO ₄	-5.96	-12.92	-6.96	BaMoO ₄
Barite	0.77	-9.21	-9.98	BaSO ₄
BaS	-89.78	-73.60	16.18	BaS
BaSeO ₃	-8.43	-6.60	1.83	BaSeO ₃
BaSeO ₄	-10.94	-18.40	-7.46	BaSeO ₄
Bianchite	-7.71	-9.48	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-9.67	8.42	18.09	MnO ₂
Bixbyite	-7.03	-7.67	-0.64	Mn ₂ O ₃
BlaubleiI	-51.07	-75.23	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-51.38	-78.66	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.16	9.74	8.58	AlOOH
Breithauptite	-53.94	-72.47	-18.52	NiSb
Brochantite	-1.86	13.36	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.67	11.17	16.84	Mg(OH) ₂
Bunsenite	-5.24	7.20	12.45	NiO
Ca(VO ₃) ₂	-8.29	-2.63	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.50	9.00	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-12.55	9.00	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-13.47	8.83	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-18.33	20.63	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-19.23	20.63	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-291.92	-148.95	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.55	-18.81	-2.27	CaCrO ₄
Calcite	0.46	-8.02	-8.48	CaCO ₃
Calomel	-10.58	-28.49	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.52	-9.47	-7.95	CaMoO ₄
Carnotite	-3.64	-3.41	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-5.96	-3.15	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-11.92	-14.94	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-13.48	-3.64	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.60	6.05	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.68	6.05	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.34	-16.63	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.81	0.75	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.60	6.80	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.42	-14.08	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.38	-14.08	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-12.16	-14.08	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-14.45	-15.66	-1.21	CdF ₂
Cdmetal(α)	-31.98	-18.46	13.51	Cd
Cdmetal(γ)	-32.08	-18.46	13.62	Cd
CdMoO ₄	-0.90	-15.05	-14.15	CdMoO ₄
CdOHC1	-7.55	-4.01	3.54	CdOHC1
CdSb	-73.27	-73.62	-0.35	CdSb
CdSe	-17.21	-37.41	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-18.68	-20.53	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-11.17	-11.34	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.61	-11.34	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-9.47	-11.34	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-0.84	-10.59	-9.75	AgCl
Cerrusite	-1.21	-14.34	-13.13	PbCO ₃
CH ₄ (g)	-76.65	-117.70	-41.05	CH ₄
Chalcanthite	-7.06	-9.70	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-50.61	-85.53	-34.92	Cu ₂ S
Chalcopyrite	-112.73	-148.00	-35.27	CuFeS ₂
Cinnabar	-49.60	-95.29	-45.69	HgS
Claudetite	-71.52	-74.58	-3.06	As ₄ O ₆
Clausthalite	-11.04	-38.14	-27.10	PbSe
Co(BO ₂) ₂	-29.71	-2.64	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.05	7.05	13.09	Co(OH) ₂

Co(OH) 3	-10.79	-13.10	-2.31	Co(OH) 3
CO2 (g)	-1.51	-19.65	-18.15	CO2
Co3 (AsO4) 2	-17.95	-4.92	13.03	Co3 (AsO4) 2
Co3O4	-8.65	-19.14	-10.50	Co3O4
CoCl2	-21.34	-13.07	8.27	CoCl2
CoCl2:6H2O	-15.61	-13.08	2.54	CoCl2:6H2O
CoCO3	-2.62	-12.60	-9.98	CoCO3
CoF2	-13.06	-14.66	-1.60	CoF2
CoF3	-44.20	-45.66	-1.46	CoF3
CoFe2O4	24.74	21.21	-3.53	CoFe2O4
CoMoO4	-6.29	-14.05	-7.76	CoMoO4
CoO	-6.54	7.05	13.59	CoO
CoS (alpha)	-67.28	-74.72	-7.44	CoS
CoS (beta)	-63.65	-74.72	-11.07	CoS
CoSe	-20.20	-36.40	-16.20	CoSe
CoSeO3	-9.05	-7.73	1.32	CoSeO3
CoSeO4:6H2O	-18.00	-19.53	-1.53	CoSeO4:6H2O
CoSO4	-13.14	-10.34	2.80	CoSO4
CoSO4:6H2O	-7.87	-10.34	-2.47	CoSO4:6H2O
Cotunnite	-10.03	-14.81	-4.78	PbCl2
Covellite	-51.79	-74.09	-22.30	CuS
Cr(OH) 2	-19.97	-9.15	10.82	Cr(OH) 2
Cr(OH) 3	-1.17	0.16	1.34	Cr(OH) 3
Cr(OH) 3 (am)	0.91	0.16	-0.75	Cr(OH) 3
Cr2O3	2.68	0.32	-2.36	Cr2O3
CrCl2	-43.36	-29.27	14.09	CrCl2
CrCl3	-45.14	-30.02	15.11	CrCl3
CrF3	-21.07	-32.40	-11.34	CrF3
Crmetal	-64.14	-33.66	30.48	Cr
CrO3	-27.24	-30.45	-3.21	CrO3
Cryolite	-7.23	-41.07	-33.84	Na3AlF6
Cu(OH) 2	-0.99	7.69	8.67	Cu(OH) 2
Cu(SbO3) 2	-25.28	19.93	45.21	Cu(SbO3) 2
Cu2Sb:3H2O	-51.23	-86.12	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.41	-47.21	-45.80	Cu2Se
Cu2SO4	-19.20	-21.15	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-9.11	-3.01	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-54.97	-97.56	-42.59	Cu3Sb
Cu3Se2	-19.48	-82.98	-63.49	Cu3Se2
CuCO3	-0.47	-11.97	-11.50	CuCO3
CuCrO4	-17.32	-22.76	-5.44	CuCrO4
CuF	-7.83	-12.73	-4.91	CuF
CuF2	-15.14	-14.02	1.12	CuF2
CuF2:2H2O	-9.47	-14.02	-4.55	CuF2:2H2O
Cumetal	-5.38	-14.13	-8.76	Cu
CuMoO4	-0.34	-13.41	-13.08	CuMoO4
CuOCuSO4	-12.32	-2.01	10.30	CuOCuSO4
Cupricferrite	15.86	21.85	5.99	CuFe2O4
Cuprite	-2.35	-3.76	-1.41	Cu2O
Cuprousferrite	14.12	5.20	-8.92	CuFeO2
CuSe	-2.67	-35.77	-33.10	CuSe
CuSe2	-21.34	-54.71	-33.37	CuSe2
CuSeO3:2H2O	-7.60	-7.09	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.45	-18.89	-2.44	CuSeO4:5H2O
CuSO4	-12.64	-9.70	2.94	CuSO4
Diaspore	2.87	9.74	6.87	AlOOH
Djurleite	-50.85	-84.77	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.04	-16.50	-16.54	CaMg(CO3) 2
Dolomite(ordered)	0.59	-16.50	-17.09	CaMg(CO3) 2
Epsomite	-4.09	-6.22	-2.13	MgSO4:7H2O
Fe(OH) 2	-5.71	7.86	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	7.10	4.06	-3.04	Fe(OH) 2.7Cl.3
Fe(VO3) 2	-2.69	-6.41	-3.72	Fe(VO3) 2
Fe2(OH) 4SeO3	-2.17	-0.62	1.55	Fe2(OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-9.55	-30.18	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-34.27	-38.00	-3.73	Fe2 (SO4) 3
Fe3(OH) 8	1.79	22.02	20.22	Fe3(OH) 8
FeAsO4:2H2O	-6.35	-5.95	0.40	FeAsO4:2H2O

FeCr2O4	0.98	8.18	7.20	FeCr2O4
FeMoO4	-3.15	-13.24	-10.09	FeMoO4
Ferrihydrite	3.89	7.08	3.19	Fe(OH)3
Ferroselite	-35.94	-54.54	-18.60	FeSe2
FeS(ppt)	-70.97	-73.92	-2.95	FeS
FeSe	-24.60	-35.60	-11.00	FeSe
Fix_pe	-5.07	-5.07	0.00	e-
Fluorite	0.42	-10.08	-10.50	CaF2
Galena	-62.49	-76.46	-13.97	PbS
Gibbsite	1.45	9.74	8.29	Al(OH)3
Goethite	6.59	7.08	0.49	FeOOH
Goslarite	-7.47	-9.48	-2.01	ZnSO4:7H2O
Greenockite	-61.36	-75.72	-14.36	CdS
Greigite	-260.04	-305.07	-45.03	Fe3S4
Gummite	-7.67	0.00	7.67	UO3
Gypsum	-1.14	-5.75	-4.61	CaSO4:2H2O
H-Jarosite	-1.44	-13.54	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.22	-21.10	-12.88	H2MoO4
H2S(g)	-73.76	-81.77	-8.01	H2S
H2Se(g)	-38.49	-43.45	-4.96	H2Se
Halite	-6.89	-5.29	1.60	NaCl
Hausmannite	-8.75	52.28	61.03	Mn3O4
Hematite	15.58	14.16	-1.42	Fe2O3
Hercynite	4.45	27.34	22.89	FeAl2O4
Hg(CH3)2(g)	-175.21	-248.91	-73.71	Hg(CH3)2
Hg(g)	-8.56	-16.44	-7.87	Hg
Hg(OH)2	-10.02	-13.52	-3.50	Hg(OH)2
Hg2(g)	-17.92	-32.87	-14.96	Hg2
Hg2(OH)2	-13.62	-8.36	5.26	Hg2(OH)2
Hg2CO3	-11.97	-28.02	-16.05	Hg2CO3
Hg2CrO4	-30.11	-38.81	-8.70	Hg2CrO4
Hg2F2	-19.71	-30.07	-10.36	Hg2F2
Hg2S	-78.46	-90.14	-11.68	Hg2S
Hg2SeO3	-18.49	-23.14	-4.66	Hg2SeO3
Hg2SO4	-19.62	-25.75	-6.13	Hg2SO4
Hg3O2CO3	-30.53	-60.21	-29.68	Hg3O2CO3
HgCl(g)	-33.74	-14.24	19.50	HgCl
HgCl2	-12.38	-33.64	-21.26	HgCl2
HgF(g)	-47.71	-15.04	32.68	HgF
HgF2(g)	-47.79	-35.23	12.57	HgF2
Hgmetal(l)	-2.99	-16.44	-13.45	Hg
HgSe	-1.28	-56.97	-55.69	HgSe
HgSeO3	-15.87	-28.30	-12.43	HgSeO3
HgSO4	-21.49	-30.91	-9.42	HgSO4
Huntite	-3.49	-33.46	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.61	-23.38	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.99	-22.75	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.14	-21.31	-5.17	KAl(SO4)2:12H2O
K-Jarosite	4.99	-9.81	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-36.20	-53.44	-17.24	K2Cr2O7
K2CrO4	-22.48	-23.00	-0.51	K2CrO4
K2MoO4	-16.91	-13.65	3.26	K2MoO4
K2SeO4	-18.40	-19.13	-0.73	K2SeO4
Langite	-4.13	13.36	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.33	-6.77	-0.43	PbO:PbSO4
Laurionite	-5.37	-4.75	0.62	PbOHCl
Lepidocrocite	5.71	7.08	1.37	FeOOH
Lime	-21.07	11.63	32.70	CaO
Litharge	-7.38	5.31	12.69	PbO
Mackinawite	-70.32	-73.92	-3.60	FeS
Maghemite	7.77	14.16	6.39	Fe2O3
Magnesioferrite	8.47	25.33	16.86	Fe2MgO4
Magnesite	-1.02	-8.48	-7.46	MgCO3
Magnetite	18.61	22.02	3.40	Fe3O4
Malachite	1.03	-4.28	-5.31	Cu2(OH)2CO3
Manganite	-3.83	21.51	25.34	MnOOH
Massicot	-7.58	5.31	12.89	PbO
Matlockite	-6.63	-15.61	-8.97	PbClF

Melanothallite	-18.69	-12.44	6.26	CuCl ₂
Melanterite	-7.32	-9.53	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-50.20	-95.29	-45.09	HgS
Mg(OH) ₂ (active)	-7.62	11.17	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.38	-3.10	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-266.83	-192.15	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.28	8.08	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-4.71	11.50	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.66	-19.28	5.38	MgCrO ₄
MgF ₂	-2.41	-10.54	-8.13	MgF ₂
MgMoO ₄	-8.08	-9.93	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.66	-3.61	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-14.21	-15.41	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-33.08	40.44	73.52	Pb ₃ O ₄
Mirabilite	-6.73	-7.84	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-9.91	-5.01	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-54.13	-59.84	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.74	-85.66	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.79	1.71	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.58	-10.87	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-72.68	-72.51	0.17	MnS
MnS(pnk)	-75.85	-72.51	3.34	MnS
MnSb	-92.85	-95.76	-2.91	MnSb
MnSe	-37.69	-34.19	3.50	MnSe
MnSeO ₃	-6.65	-5.52	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.50	-5.52	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-15.27	-17.32	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.71	-8.13	2.58	MnSO ₄
Monteponite	-9.06	6.05	15.10	CdO
Montroydite	-9.88	-13.52	-3.64	HgO
MoO ₃	-13.10	-21.10	-8.00	MoO ₃
Morenosite	-8.04	-10.19	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-138.90	-209.16	-70.26	MoS ₂
Na-Jarosite	2.44	-8.76	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.45	-51.35	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.83	-20.90	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-16.06	-32.65	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-13.04	-11.55	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.78	-11.55	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.53	-5.23	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-18.31	-17.03	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.05	-77.60	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.49	7.19	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.57	4.83	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.21	-11.94	-6.73	CuCl
NaSb	-85.80	-62.64	23.17	NaSb
Natron	-8.80	-10.11	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.22	-2.36	3.86	NaVO ₃
Nesquehonite	-3.81	-8.48	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.59	7.20	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-20.16	-4.46	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.58	11.42	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.58	-12.45	-6.87	NiCO ₃
NiMoO ₄	-2.76	-13.90	-11.14	NiMoO ₄
NiS(alpha)	-68.97	-74.57	-5.60	NiS
NiS(beta)	-63.47	-74.57	-11.10	NiS
NiS(gamma)	-61.77	-74.57	-12.80	NiS
NiSe	-18.55	-36.25	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.39	-7.58	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.86	-19.38	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-9.09	8.42	17.50	MnO ₂
O ₂ (g)	-34.07	49.02	83.09	O ₂
Orpiment	-221.54	-282.61	-61.07	As ₂ S ₃
Otavite	-1.60	-13.60	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.90	-4.38	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.84	5.31	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-56.06	-64.82	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.24	0.56	8.79	Pb ₂ (OH) ₃ Cl

Pb2O(OH)2	-15.57	10.62	26.19	Pb2O(OH)2
Pb2O3	-25.91	35.13	61.04	Pb2O3
Pb2OCO3	-8.48	-9.03	-0.56	Pb2OCO3
Pb2V2O7	-1.75	-3.65	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.94	-10.14	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.48	1.66	6.14	Pb3(VO4)2
Pb3O2CO3	-14.74	-3.72	11.02	Pb3O2CO3
Pb3O2SO4	-12.15	-1.46	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.25	3.85	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.03	3.85	21.88	Pb4O3SO4
PbCrO4	-12.54	-25.14	-12.60	PbCrO4
PbF2	-8.96	-16.40	-7.44	PbF2
Pbmetal	-23.45	-19.20	4.25	Pb
PbMoO4	-0.17	-15.79	-15.62	PbMoO4
PbO:0.3H2O	-7.67	5.31	12.98	PbO:0.33H2O
PbSeO4	-14.43	-21.27	-6.84	PbSeO4
Periclase	-10.41	11.17	21.58	MgO
Phosgenite	-9.35	-29.16	-19.81	PbCl2:PbCO3
Plattnerite	-19.78	29.82	49.60	PbO2
Portlandite	-11.17	11.63	22.80	Ca(OH)2
Pyrite	-112.67	-131.18	-18.51	FeS2
Pyrochroite	-5.94	9.26	15.19	Mn(OH)2
Pyrolusite	-7.61	33.77	41.38	MnO2
Realgar	-92.93	-112.67	-19.75	AsS
Retgersite	-8.15	-10.19	-2.04	NiSO4:6H2O
Rhodochrosite	0.19	-10.39	-10.58	MnCO3
Rutherfordine	-5.15	-19.65	-14.50	UO2CO3
Sb(OH)3	-11.28	-18.39	-7.11	Sb(OH)3
Sb2O4	-15.67	-12.27	3.40	Sb2O4
Sb2O5	-26.71	-36.38	-9.67	Sb2O5
Sb2Se3	-99.38	-167.14	-67.76	Sb2Se3
Sb4O6(cubic)	-55.30	-73.56	-18.26	Sb4O6
Sb4O6(orth)	-55.66	-73.56	-17.90	Sb4O6
SbCl3	-49.15	-48.57	0.57	SbCl3
SbF3	-40.73	-50.96	-10.23	SbF3
Sbmetal	-43.47	-55.16	-11.69	Sb
SbO2	-2.62	-30.45	-27.82	SbO2
Schoepite	-5.99	0.00	5.99	UO2(OH)2:H2O
Semetal(am)	-11.83	-18.94	-7.11	Se
Semetal(hex)	-11.23	-18.94	-7.71	Se
Senarmontite	-24.42	-36.78	-12.37	Sb2O3
SeO2	-14.90	-14.78	0.12	SeO2
SeO3	-47.62	-26.58	21.04	SeO3
Siderite	-1.56	-11.80	-10.24	FeCO3
Smithsonite	-1.74	-11.74	-10.00	ZnCO3
Sphalerite	-62.41	-73.86	-11.45	ZnS
Spinel	-6.19	30.65	36.85	MgAl2O4
Stibnite	-231.64	-282.10	-50.46	Sb2S3
Sulfur	-55.12	-57.26	-2.14	S
Tenorite	0.04	7.69	7.64	CuO
Thenardite	-8.16	-7.84	0.32	Na2SO4
Thermonatrite	-10.74	-10.11	0.64	Na2CO3:H2O
Tyuyamunite	-6.71	-2.63	4.08	Ca(UO2)2(VO4)2
U3O8	-17.94	3.14	21.08	U3O8
U3Sb4	-565.96	-413.58	152.38	U3Sb4
U4O9	-33.65	-36.67	-3.02	U4O9
UF4	-29.18	-58.71	-29.54	UF4
UF4:2.5H2O	-26.00	-58.72	-32.72	UF4:2.5H2O
UO2(am)	-16.23	-15.29	0.93	UO2
UO2(OH)2(beta)	-5.61	0.00	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.33	-26.58	-2.25	UO2SeO4:4H2O
UO3	-7.70	0.00	7.70	UO3
Uraninite	-10.62	-15.29	-4.67	UO2
USb2	-213.42	-183.85	29.58	USb2
V(OH)3	-16.64	-9.05	7.59	V(OH)3
V2O5	-12.91	-14.27	-1.36	V2O5
V3O5	-33.80	-31.97	1.84	V3O5
V4O7	-41.64	-34.45	7.19	V4O7

V6O13	-30.96	-91.82	-60.86	V6O13
Valentinite	-28.30	-36.78	-8.48	Sb2O3
VCl2	-60.30	-41.42	18.87	VCl2
VCl3	-62.66	-39.23	23.43	VCl3
VF4	-60.84	-45.91	14.93	VF4
Vmetal	-89.84	-45.81	44.03	V
VO	-36.06	-21.30	14.76	VO
VO(OH)2	-7.64	-2.49	5.15	VO(OH)2
VO2Cl	-20.04	-17.19	2.84	VO2Cl
VOC1	-30.26	-19.11	11.15	VOC1
VOC12	-35.37	-22.61	12.76	VOC12
VOSO4	-23.48	-19.87	3.61	VOSO4
Witherite	-2.91	-11.48	-8.57	BaCO3
Wurtzite	-64.91	-73.86	-8.95	ZnS
Zincite	-3.42	7.91	11.33	ZnO
Zincosite	-13.41	-9.48	3.93	ZnSO4
Zn(BO2)2	-10.07	-1.78	8.29	Zn(BO2)2
Zn(OH)2	-4.29	7.91	12.20	Zn(OH)2
Zn(OH)2(am)	-4.56	7.91	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.84	7.91	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.62	7.91	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.82	7.91	11.73	Zn(OH)2
Zn2(OH)2SO4	-9.06	-1.56	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.43	5.76	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-15.98	-2.33	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-29.95	-11.04	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-14.14	14.26	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.06	19.44	38.50	Zn5(OH)8Cl2
ZnCl2	-19.26	-12.21	7.05	ZnCl2
ZnCO3·1H2O	-1.48	-11.74	-10.26	ZnCO3·1H2O
ZnF2	-13.26	-13.80	-0.53	ZnF2
Znmetal	-42.39	-16.60	25.79	Zn
ZnMoO4	-3.06	-13.19	-10.13	ZnMoO4
ZnO(active)	-3.28	7.91	11.19	ZnO
ZnS(am)	-64.81	-73.86	-9.05	ZnS
ZnSb	-82.77	-71.76	11.01	ZnSb
ZnSe	-21.14	-35.54	-14.40	ZnSe
ZnSeO4·6H2O	-17.14	-18.66	-1.52	ZnSeO4·6H2O
ZnSO4·1H2O	-8.84	-9.48	-0.64	ZnSO4·1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 70.

```

Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e-=e-
  log_k      0
EQUILIBRIUM_PHASES 401
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3·2H2O 0 0

```

```

Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 402
SAVE Solution 403 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 401
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases in groundwater

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 402. Solution after simulation 69.
Using pure phase assemblage 401.

```

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.176e-08	2.176e-08
Alunite	-0.02	-1.42	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.58	-5.94	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	1.825e-08	1.825e-08
Barite	0.00	-9.98	-9.98	0.000e+00	9.220e-07	9.220e-07
Brochantite	-1.09	14.13	15.22	0.000e+00	0	0.000e+00
Brucite	-5.69	11.16	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	2.090e-03
CaMoO4	-1.73	-9.68	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.66	-3.84	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.710e-03	1.710e-03
Carnotite	-3.00	-2.77	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.50	-3.66	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.86	-15.01	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.054e-08	6.054e-08
Cu2Se(alpha)	-5.62	-51.42	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.11	-13.18	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.01	-6.14	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.664e-05	2.664e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	2.838e-05	2.838e-05
Gummite	-7.05	0.63	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.33	-5.94	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.77	-59.46	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.66	-7.78	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.07	-5.94	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.55	7.25	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-24.82	-9.12	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.72	-12.59	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.65	-13.79	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.395e-07
Otavite	-1.81	-13.81	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	2.183e-09	2.183e-09
Rutherfordine	-4.71	-19.21	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.11	-30.93	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.37	0.63	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-5.67	-1.59	4.08	0.000e+00	0	0.000e+00
U3O8	-17.10	3.98	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.99	0.63	5.61	0.000e+00	0	0.000e+00
UO3	-7.07	0.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.99	-13.11	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.998e-08	3.998e-08
Al	3.286e-06	3.286e-06
As	1.278e-10	1.278e-10
B	1.436e-05	1.436e-05
Ba	1.604e-07	1.604e-07
C	6.026e-03	6.025e-03
Ca	2.080e-03	2.079e-03
Cd	1.057e-08	1.057e-08
Cl	1.539e-03	1.539e-03
Co	1.359e-07	1.359e-07
Cr	5.947e-09	5.947e-09
Cu	7.186e-06	7.185e-06
F	2.167e-04	2.166e-04
Fe	3.476e-09	3.476e-09
Hg	1.348e-10	1.348e-10

K	3.965e-04	3.964e-04
Mg	1.258e-03	1.258e-03
Mn	1.728e-05	1.727e-05
Mo	3.258e-07	3.258e-07
Na	4.444e-03	4.444e-03
Ni	2.132e-07	2.131e-07
Pb	1.971e-08	1.971e-08
S	2.232e-03	2.232e-03
Sb	1.007e-08	1.007e-08
Se	1.180e-08	1.180e-08
U	5.297e-08	5.296e-08
V	7.147e-08	7.147e-08
Zn	8.746e-07	8.745e-07

-----Description of solution-----

	pH	=	7.169	Charge balance
	pe	=	5.603	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.517e-02	
	Mass of water (kg)	=	9.999e-01	
	Total alkalinity (eq/kg)	=	5.357e-03	
	Total CO2 (mol/kg)	=	6.026e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.202e-16	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	14	
	Total H	=	1.110140e+02	
	Total O	=	5.553070e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.688e-07	1.487e-07	-6.773	-6.828	-0.055	(0)
H+	7.659e-08	6.769e-08	-7.116	-7.169	-0.054	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.998e-08					
AgCl	2.573e-08	2.573e-08	-7.590	-7.590	0.000	(0)
Ag+	1.048e-08	9.264e-09	-7.980	-8.033	-0.054	(0)
AgCl2-	3.523e-09	3.049e-09	-8.453	-8.516	-0.063	(0)
AgSO4-	2.355e-10	2.038e-10	-9.628	-9.691	-0.063	(0)
AgCl3-2	6.593e-12	3.697e-12	-11.181	-11.432	-0.251	(0)
AgF	4.052e-12	4.052e-12	-11.392	-11.392	0.000	(0)
AgOH	1.378e-13	1.378e-13	-12.861	-12.861	0.000	(0)
AgCl4-3	3.774e-14	1.027e-14	-13.423	-13.989	-0.565	(0)
AgH2BO3	1.796e-14	1.796e-14	-13.746	-13.746	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	3.785e-15	3.276e-15	-14.422	-14.485	-0.063	(0)
Ag (OH) 2-	2.313e-18	2.002e-18	-17.636	-17.699	-0.063	(0)
Ag (SeO3) 2-3	5.931e-23	1.614e-23	-22.227	-22.792	-0.565	(0)
Ag2MoO4	6.455e-24	6.455e-24	-23.190	-23.190	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.865	-72.865	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.635	-86.640	-1.005	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.348	-147.410	-0.063	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.568	-147.725	-0.156	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.696	-149.995	-0.299	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.019	-150.306	-0.287	(0)
Al	3.286e-06					
Al (OH) 4-	2.258e-06	1.998e-06	-5.646	-5.699	-0.053	(0)
AlF3	5.420e-07	5.420e-07	-6.266	-6.266	0.000	(0)
AlF2+	2.784e-07	2.472e-07	-6.555	-6.607	-0.052	(0)
Al (OH) 3	1.067e-07	1.067e-07	-6.972	-6.972	0.000	(0)
AlF4-	5.346e-08	4.731e-08	-7.272	-7.325	-0.053	(0)
Al (OH) 2+	4.051e-08	3.598e-08	-7.392	-7.444	-0.052	(0)
AlF+2	5.734e-09	3.567e-09	-8.242	-8.448	-0.206	(0)

AlOH+2	4.896e-10	3.046e-10	-9.310	-9.516	-0.206	(0)
AlSO4+	1.981e-11	1.753e-11	-10.703	-10.756	-0.053	(0)
Al+3	6.220e-12	2.048e-12	-11.206	-11.689	-0.482	(0)
Al (SO4) 2-	2.340e-13	2.071e-13	-12.631	-12.684	-0.053	(0)
AlMo6O21-3	4.385e-40	1.193e-40	-39.358	-39.923	-0.565	(0)
As (3)	8.458e-23					
H3AsO3	8.385e-23	8.385e-23	-22.077	-22.077	0.000	(0)
H2AsO3-	7.341e-25	6.353e-25	-24.134	-24.197	-0.063	(0)
HAsO3-2	1.526e-29	8.559e-30	-28.816	-29.068	-0.251	(0)
H4AsO3+	3.250e-30	2.812e-30	-29.488	-29.551	-0.063	(0)
AsO3-3	1.791e-35	4.874e-36	-34.747	-35.312	-0.565	(0)
As (5)	1.278e-10					
HAsO4-2	9.127e-11	5.118e-11	-10.040	-10.291	-0.251	(0)
H2AsO4-	3.651e-11	3.160e-11	-10.438	-10.500	-0.063	(0)
AsO4-3	8.787e-15	2.391e-15	-14.056	-14.621	-0.565	(0)
H3AsO4	3.704e-16	3.717e-16	-15.431	-15.430	0.002	(0)
B	1.436e-05					
H3BO3	1.421e-05	1.426e-05	-4.847	-4.846	0.002	(0)
H2BO3-	1.395e-07	1.223e-07	-6.855	-6.912	-0.057	(0)
CaH2BO3+	8.371e-09	7.341e-09	-8.077	-8.134	-0.057	(0)
MgH2BO3+	3.174e-09	2.784e-09	-8.498	-8.555	-0.057	(0)
BF (OH) 3-	1.130e-09	9.907e-10	-8.947	-9.004	-0.057	(0)
NaH2BO3	7.553e-10	7.553e-10	-9.122	-9.122	0.000	(0)
H5 (BO3) 2-	1.693e-12	1.485e-12	-11.771	-11.828	-0.057	(0)
BF2 (OH) 2-	1.424e-12	1.249e-12	-11.846	-11.903	-0.057	(0)
BaH2BO3+	4.094e-13	3.591e-13	-12.388	-12.445	-0.057	(0)
AgH2BO3	1.796e-14	1.796e-14	-13.746	-13.746	0.000	(0)
H8 (BO3) 3-	2.414e-15	2.117e-15	-14.617	-14.674	-0.057	(0)
BF3OH-	6.533e-18	5.729e-18	-17.185	-17.242	-0.057	(0)
BF4-	3.790e-22	3.324e-22	-21.421	-21.478	-0.057	(0)
Ba	1.604e-07					
Ba+2	1.556e-07	9.498e-08	-6.808	-7.022	-0.214	(0)
BaHCO3+	4.672e-09	4.159e-09	-8.331	-8.381	-0.051	(0)
BaCO3	1.547e-10	1.547e-10	-9.811	-9.811	0.000	(0)
BaH2BO3+	4.094e-13	3.591e-13	-12.388	-12.445	-0.057	(0)
BaOH+	6.953e-14	6.165e-14	-13.158	-13.210	-0.052	(0)
C (4)	6.026e-03					
HCO3-	5.163e-03	4.585e-03	-2.287	-2.339	-0.052	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	1.000e-04	8.903e-05	-4.000	-4.050	-0.051	(0)
MgHCO3+	3.487e-05	3.079e-05	-4.458	-4.512	-0.054	(0)
NaHCO3	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
CuCO3	6.169e-06	6.169e-06	-5.210	-5.210	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	5.202e-06	3.175e-06	-5.284	-5.498	-0.214	(0)
MgCO3	1.733e-06	1.733e-06	-5.761	-5.761	0.000	(0)
MnHCO3+	8.517e-07	7.551e-07	-6.070	-6.122	-0.052	(0)
NaCO3-	2.594e-07	2.303e-07	-6.586	-6.638	-0.052	(0)
CuHCO3+	1.103e-07	9.544e-08	-6.957	-7.020	-0.063	(0)
Cu (CO3) 2-2	9.402e-08	5.272e-08	-7.027	-7.278	-0.251	(0)
ZnCO3	7.070e-08	7.070e-08	-7.151	-7.151	0.000	(0)
ZnHCO3+	6.483e-08	5.610e-08	-7.188	-7.251	-0.063	(0)
NiHCO3+	5.271e-08	4.562e-08	-7.278	-7.341	-0.063	(0)
UO2 (CO3) 2-2	2.771e-08	1.554e-08	-7.557	-7.809	-0.251	(0)
UO2 (CO3) 3-4	2.501e-08	2.472e-09	-7.602	-8.607	-1.005	(0)
CoHCO3+	2.254e-08	1.950e-08	-7.647	-7.710	-0.063	(0)
PbCO3	1.152e-08	1.152e-08	-7.938	-7.938	0.000	(0)
NiCO3	9.560e-09	9.560e-09	-8.020	-8.020	0.000	(0)
PbHCO3+	4.753e-09	4.113e-09	-8.323	-8.386	-0.063	(0)
BaHCO3+	4.672e-09	4.159e-09	-8.331	-8.381	-0.051	(0)
CoCO3	2.935e-09	2.935e-09	-8.532	-8.532	0.000	(0)
CdCO3	3.568e-10	3.568e-10	-9.448	-9.448	0.000	(0)
UO2CO3	2.452e-10	2.452e-10	-9.610	-9.610	0.000	(0)
Pb (CO3) 2-2	1.882e-10	1.055e-10	-9.725	-9.977	-0.251	(0)
BaCO3	1.547e-10	1.547e-10	-9.811	-9.811	0.000	(0)
CdHCO3+	5.947e-11	5.146e-11	-10.226	-10.288	-0.063	(0)
Cd (CO3) 2-2	1.498e-12	8.399e-13	-11.825	-12.076	-0.251	(0)
FeHCO3+	8.393e-13	7.471e-13	-12.076	-12.127	-0.051	(0)

		HgCO3	8.813e-15	8.813e-15	-14.055	-14.055	0.000	(0)
		Hg (CO3) 2-2	1.578e-16	8.849e-17	-15.802	-16.053	-0.251	(0)
		HgHCO3+	1.284e-17	1.111e-17	-16.892	-16.954	-0.063	(0)
Ca	2.080e-03							
		Ca+2	1.709e-03	1.043e-03	-2.767	-2.982	-0.214	(0)
		CaSO4	2.634e-04	2.634e-04	-3.579	-3.579	0.000	(0)
		CaHCO3+	1.000e-04	8.903e-05	-4.000	-4.050	-0.051	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.235e-06	1.982e-06	-5.651	-5.703	-0.052	(0)
		CaH2BO3+	8.371e-09	7.341e-09	-8.077	-8.134	-0.057	(0)
		CaOH+	3.476e-09	3.094e-09	-8.459	-8.509	-0.051	(0)
Cd	1.057e-08							
		Cd+2	8.078e-09	4.930e-09	-8.093	-8.307	-0.214	(0)
		CdSO4	1.274e-09	1.274e-09	-8.895	-8.895	0.000	(0)
		CdCl+	7.402e-10	6.406e-10	-9.131	-9.193	-0.063	(0)
		CdCO3	3.568e-10	3.568e-10	-9.448	-9.448	0.000	(0)
		CdHCO3+	5.947e-11	5.146e-11	-10.226	-10.288	-0.063	(0)
		Cd (SO4) 2-2	3.380e-11	1.895e-11	-10.471	-10.722	-0.251	(0)
		CdF+	1.572e-11	1.361e-11	-10.803	-10.866	-0.063	(0)
		CdOH+	6.730e-12	5.824e-12	-11.172	-11.235	-0.063	(0)
		CdOHCl	3.907e-12	3.907e-12	-11.408	-11.408	0.000	(0)
		CdCl2	3.633e-12	3.633e-12	-11.440	-11.440	0.000	(0)
		Cd (CO3) 2-2	1.498e-12	8.399e-13	-11.825	-12.076	-0.251	(0)
		Cd (OH) 2	5.464e-15	5.464e-15	-14.262	-14.262	0.000	(0)
		CdF2	4.728e-15	4.728e-15	-14.325	-14.325	0.000	(0)
		CdCl3-	3.603e-15	3.118e-15	-14.443	-14.506	-0.063	(0)
		CdSeO4	2.188e-18	2.188e-18	-17.660	-17.660	0.000	(0)
		Cd2OH+3	5.289e-19	1.439e-19	-18.277	-18.842	-0.565	(0)
		Cd (OH) 3-	5.737e-20	4.964e-20	-19.241	-19.304	-0.063	(0)
		Cd (SeO3) 2-2	2.193e-21	1.230e-21	-20.659	-20.910	-0.251	(0)
		Cd (OH) 4-2	2.155e-27	1.208e-27	-26.667	-26.918	-0.251	(0)
		CdHS+	0.000e+00	0.000e+00	-78.882	-78.945	-0.063	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.387	-150.387	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-227.070	-227.133	-0.063	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-303.331	-303.583	-0.251	(0)
Cl	1.539e-03							
		Cl-	1.539e-03	1.360e-03	-2.813	-2.866	-0.054	(0)
		AgCl	2.573e-08	2.573e-08	-7.590	-7.590	0.000	(0)
		MnCl+	1.595e-08	1.414e-08	-7.797	-7.850	-0.052	(0)
		AgCl2-	3.523e-09	3.049e-09	-8.453	-8.516	-0.063	(0)
		ZnCl+	1.498e-09	1.322e-09	-8.825	-8.879	-0.054	(0)
		CuCl+	8.057e-10	7.114e-10	-9.094	-9.148	-0.054	(0)
		CdCl+	7.402e-10	6.406e-10	-9.131	-9.193	-0.063	(0)
		CuCl	6.905e-10	6.905e-10	-9.161	-9.161	0.000	(0)
		NiCl+	3.246e-10	2.809e-10	-9.489	-9.551	-0.063	(0)
		CoCl+	2.974e-10	2.574e-10	-9.527	-9.589	-0.063	(0)
		ZnOHCl	2.574e-10	2.574e-10	-9.589	-9.589	0.000	(0)
		CuCl2-	2.223e-10	1.963e-10	-9.653	-9.707	-0.054	(0)
		PbCl+	6.734e-11	5.828e-11	-10.172	-10.235	-0.063	(0)
		MnCl2	2.717e-11	2.717e-11	-10.566	-10.566	0.000	(0)
		AgCl3-2	6.593e-12	3.697e-12	-11.181	-11.432	-0.251	(0)
		CdOHCl	3.907e-12	3.907e-12	-11.408	-11.408	0.000	(0)
		CdCl2	3.633e-12	3.633e-12	-11.440	-11.440	0.000	(0)
		ZnCl2	2.851e-12	2.851e-12	-11.545	-11.545	0.000	(0)
		HgClOH	8.286e-13	8.286e-13	-12.082	-12.082	0.000	(0)
		HgCl2	4.292e-13	4.292e-13	-12.367	-12.367	0.000	(0)
		PbCl2	3.541e-13	3.541e-13	-12.451	-12.451	0.000	(0)
		CuCl2	3.356e-13	3.356e-13	-12.474	-12.474	0.000	(0)
		CuCl3-2	9.236e-14	5.708e-14	-13.035	-13.244	-0.209	(0)
		AgCl4-3	3.774e-14	1.027e-14	-13.423	-13.989	-0.565	(0)
		MnCl3-	1.148e-14	1.018e-14	-13.940	-13.992	-0.052	(0)
		HgCl3-	6.748e-15	5.839e-15	-14.171	-14.234	-0.063	(0)
		CdCl3-	3.603e-15	3.118e-15	-14.443	-14.506	-0.063	(0)
		ZnCl3-	3.489e-15	3.081e-15	-14.457	-14.511	-0.054	(0)
		NiCl2	1.924e-15	1.924e-15	-14.716	-14.716	0.000	(0)
		CrCl+2	2.392e-16	1.341e-16	-15.621	-15.872	-0.251	(0)
		PbCl3-	2.216e-16	1.918e-16	-15.654	-15.717	-0.063	(0)
		HgCl+	7.275e-17	6.295e-17	-16.138	-16.201	-0.063	(0)

HgCl4-2	5.640e-17	3.163e-17	-16.249	-16.500	-0.251	(0)
UO2Cl+	4.947e-17	4.280e-17	-16.306	-16.369	-0.063	(0)
CuCl3-	4.825e-18	4.260e-18	-17.316	-17.371	-0.054	(0)
ZnCl4-2	3.391e-18	2.096e-18	-17.470	-17.679	-0.209	(0)
CrOHC12	5.157e-19	5.157e-19	-18.288	-18.288	0.000	(0)
PbCl4-2	2.127e-19	1.193e-19	-18.672	-18.923	-0.251	(0)
FeCl+2	3.204e-20	1.980e-20	-19.494	-19.703	-0.209	(0)
VOCl+	2.157e-20	1.866e-20	-19.666	-19.729	-0.063	(0)
CrCl2+	2.001e-20	1.731e-20	-19.699	-19.762	-0.063	(0)
FeCl2+	1.357e-22	1.203e-22	-21.867	-21.920	-0.052	(0)
CuCl4-2	4.700e-23	2.905e-23	-22.328	-22.537	-0.209	(0)
CrO3Cl-	1.851e-26	1.601e-26	-25.733	-25.795	-0.063	(0)
FeCl3	1.637e-26	1.637e-26	-25.786	-25.786	0.000	(0)
CoCl+2	4.308e-35	2.415e-35	-34.366	-34.617	-0.251	(0)
UCl+3	0.000e+00	0.000e+00	-44.981	-45.546	-0.565	(0)
Co (2)	1.359e-07					
Co+2	9.752e-08	5.468e-08	-7.011	-7.262	-0.251	(0)
CoHCO3+	2.254e-08	1.950e-08	-7.647	-7.710	-0.063	(0)
CoSO4	1.203e-08	1.203e-08	-7.920	-7.920	0.000	(0)
CoCO3	2.935e-09	2.935e-09	-8.532	-8.532	0.000	(0)
CoF+	3.480e-10	3.011e-10	-9.458	-9.521	-0.063	(0)
CoCl+	2.974e-10	2.574e-10	-9.527	-9.589	-0.063	(0)
CoOH+	1.875e-10	1.622e-10	-9.727	-9.790	-0.063	(0)
Co (OH) 2	1.916e-12	1.916e-12	-11.717	-11.717	0.000	(0)
CoSeO4	6.532e-17	6.532e-17	-16.185	-16.185	0.000	(0)
Co (OH) 3-	6.571e-18	5.686e-18	-17.182	-17.245	-0.063	(0)
CoOOH-	1.649e-18	1.427e-18	-17.783	-17.846	-0.063	(0)
Co2OH+3	1.634e-18	4.447e-19	-17.787	-18.352	-0.565	(0)
Co (OH) 4-2	2.390e-25	1.340e-25	-24.622	-24.873	-0.251	(0)
Co4 (OH) 4+4	1.399e-30	1.383e-31	-29.854	-30.859	-1.005	(0)
Co (3)	1.176e-28					
CoOH+2	1.176e-28	6.594e-29	-27.930	-28.181	-0.251	(0)
Co+3	2.650e-34	8.726e-35	-33.577	-34.059	-0.482	(0)
CoCl+2	4.308e-35	2.415e-35	-34.366	-34.617	-0.251	(0)
Cr (2)	8.097e-26					
Cr+2	8.097e-26	4.540e-26	-25.092	-25.343	-0.251	(0)
Cr (3)	5.947e-09					
Cr (OH) 2+	5.182e-09	4.484e-09	-8.286	-8.348	-0.063	(0)
Cr (OH) +2	4.420e-10	2.478e-10	-9.355	-9.606	-0.251	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	6.484e-11	6.484e-11	-10.188	-10.188	0.000	(0)
CrF+2	3.750e-12	2.102e-12	-11.426	-11.677	-0.251	(0)
CrO2-	2.031e-12	1.758e-12	-11.692	-11.755	-0.063	(0)
Cr (OH) 4-	1.714e-12	1.483e-12	-11.766	-11.829	-0.063	(0)
Cr+3	2.800e-13	7.618e-14	-12.553	-13.118	-0.565	(0)
CrSO4+	2.266e-13	1.961e-13	-12.645	-12.707	-0.063	(0)
CrCl+2	2.392e-16	1.341e-16	-15.621	-15.872	-0.251	(0)
Cr2 (OH) 2SO4+2	2.590e-18	1.452e-18	-17.587	-17.838	-0.251	(0)
CrOHC12	5.157e-19	5.157e-19	-18.288	-18.288	0.000	(0)
Cr2 (OH) 2 (SO4) 2	9.512e-20	9.512e-20	-19.022	-19.022	0.000	(0)
CrCl2+	2.001e-20	1.731e-20	-19.699	-19.762	-0.063	(0)
Cr (6)	2.417e-16					
CrO4-2	2.067e-16	1.262e-16	-15.685	-15.899	-0.214	(0)
HCrO4-	3.194e-17	2.764e-17	-16.496	-16.558	-0.063	(0)
NaCrO4-	2.823e-18	2.443e-18	-17.549	-17.612	-0.063	(0)
KCrO4-	1.884e-19	1.630e-19	-18.725	-18.788	-0.063	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	1.121e-24	6.285e-25	-23.950	-24.202	-0.251	(0)
CrO3Cl-	1.851e-26	1.601e-26	-25.733	-25.795	-0.063	(0)
Cr2O7-2	4.726e-32	2.650e-32	-31.325	-31.577	-0.251	(0)
Cu (1)	1.379e-09					
CuCl	6.905e-10	6.905e-10	-9.161	-9.161	0.000	(0)
Cu+	4.659e-10	4.031e-10	-9.332	-9.395	-0.063	(0)
CuCl2-	2.223e-10	1.963e-10	-9.653	-9.707	-0.054	(0)
CuCl3-2	9.236e-14	5.708e-14	-13.035	-13.244	-0.209	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.665	-148.957	-0.293	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.406	-149.687	-0.281	(0)
Cu (2)	7.184e-06					

	CuCO3	6.169e-06	6.169e-06	-5.210	-5.210	0.000	(0)
	Cu+2	5.406e-07	3.299e-07	-6.267	-6.482	-0.214	(0)
	CuOH+	1.757e-07	1.551e-07	-6.755	-6.809	-0.054	(0)
	CuHCO3+	1.103e-07	9.544e-08	-6.957	-7.020	-0.063	(0)
	Cu (CO3) 2-2	9.402e-08	5.272e-08	-7.027	-7.278	-0.251	(0)
	CuSO4	8.333e-08	8.333e-08	-7.079	-7.079	0.000	(0)
	Cu (OH) 2	4.603e-09	4.603e-09	-8.337	-8.337	0.000	(0)
	CuF+	4.189e-09	3.625e-09	-8.378	-8.441	-0.063	(0)
	Cu2 (OH) 2+2	1.078e-09	6.046e-10	-8.967	-9.219	-0.251	(0)
	CuCl+	8.057e-10	7.114e-10	-9.094	-9.148	-0.054	(0)
	Cu (OH) 3-	1.623e-12	1.404e-12	-11.790	-11.853	-0.063	(0)
	CuCl2	3.356e-13	3.356e-13	-12.474	-12.474	0.000	(0)
	CuCl3-	4.825e-18	4.260e-18	-17.316	-17.371	-0.054	(0)
	Cu (OH) 4-2	2.931e-18	1.643e-18	-17.533	-17.784	-0.251	(0)
	CuCl4-2	4.700e-23	2.905e-23	-22.328	-22.537	-0.209	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.457	-216.520	-0.063	(0)
F	2.167e-04						
	F-	1.970e-04	1.741e-04	-3.706	-3.759	-0.054	(0)
	MgF+	1.449e-05	1.282e-05	-4.839	-4.892	-0.053	(0)
	CaF+	2.235e-06	1.982e-06	-5.651	-5.703	-0.052	(0)
	AlF3	5.420e-07	5.420e-07	-6.266	-6.266	0.000	(0)
	NaF	4.280e-07	4.280e-07	-6.369	-6.369	0.000	(0)
	AlF2+	2.784e-07	2.472e-07	-6.555	-6.607	-0.052	(0)
	MnF+	6.454e-08	5.723e-08	-7.190	-7.242	-0.052	(0)
	AlF4-	5.346e-08	4.731e-08	-7.272	-7.325	-0.053	(0)
	HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
	AlF+2	5.734e-09	3.567e-09	-8.242	-8.448	-0.206	(0)
	CuF+	4.189e-09	3.625e-09	-8.378	-8.441	-0.063	(0)
	ZnF+	1.554e-09	1.344e-09	-8.809	-8.871	-0.063	(0)
	BF (OH) 3-	1.130e-09	9.907e-10	-8.947	-9.004	-0.057	(0)
	NiF+	4.079e-10	3.530e-10	-9.389	-9.452	-0.063	(0)
	CoF+	3.480e-10	3.011e-10	-9.458	-9.521	-0.063	(0)
	PbF+	1.712e-11	1.481e-11	-10.766	-10.829	-0.063	(0)
	CdF+	1.572e-11	1.361e-11	-10.803	-10.866	-0.063	(0)
	HF2-	1.310e-11	1.154e-11	-10.883	-10.938	-0.055	(0)
	AgF	4.052e-12	4.052e-12	-11.392	-11.392	0.000	(0)
	CrF+2	3.750e-12	2.102e-12	-11.426	-11.677	-0.251	(0)
	BF2 (OH) 2-	1.424e-12	1.249e-12	-11.846	-11.903	-0.057	(0)
	UO2F+	5.389e-13	4.663e-13	-12.268	-12.331	-0.063	(0)
	UO2F2	2.342e-13	2.342e-13	-12.630	-12.630	0.000	(0)
	PbF2	5.077e-14	5.077e-14	-13.294	-13.294	0.000	(0)
	UO2F3-	1.184e-14	1.024e-14	-13.927	-13.990	-0.063	(0)
	CdF2	4.728e-15	4.728e-15	-14.325	-14.325	0.000	(0)
	VO2F	1.633e-15	1.633e-15	-14.787	-14.787	0.000	(0)
	H2F2	8.145e-16	8.145e-16	-15.089	-15.089	0.000	(0)
	FeF2+	4.837e-16	4.289e-16	-15.315	-15.368	-0.052	(0)
	FeF+2	1.489e-16	9.203e-17	-15.827	-16.036	-0.209	(0)
	VO2F2-	1.193e-16	1.032e-16	-15.923	-15.986	-0.063	(0)
	FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
	UO2F4-2	2.527e-17	1.417e-17	-16.597	-16.849	-0.251	(0)
	PbF3-	1.938e-17	1.677e-17	-16.713	-16.776	-0.063	(0)
	BF3OH-	6.533e-18	5.729e-18	-17.185	-17.242	-0.057	(0)
	VOF+	5.902e-18	5.107e-18	-17.229	-17.292	-0.063	(0)
	VO2F3-2	3.999e-19	2.242e-19	-18.398	-18.649	-0.251	(0)
	VOF2	3.335e-19	3.335e-19	-18.477	-18.477	0.000	(0)
	PbF4-2	2.492e-21	1.398e-21	-20.603	-20.855	-0.251	(0)
	VOF3-	2.381e-21	2.061e-21	-20.623	-20.686	-0.063	(0)
	BF4-	3.790e-22	3.324e-22	-21.421	-21.478	-0.057	(0)
	VO2F4-3	7.062e-23	1.921e-23	-22.151	-22.716	-0.565	(0)
	HgF+	1.730e-23	1.497e-23	-22.762	-22.825	-0.063	(0)
	VOF4-2	2.583e-24	1.448e-24	-23.588	-23.839	-0.251	(0)
	Sb (OH) 2F	7.395e-25	7.395e-25	-24.131	-24.131	0.000	(0)
	SbOF	7.274e-25	7.274e-25	-24.138	-24.138	0.000	(0)
	UF3+	1.013e-34	8.770e-35	-33.994	-34.057	-0.063	(0)
	UF2+2	5.667e-36	3.178e-36	-35.247	-35.498	-0.251	(0)
	UF4	1.675e-36	1.675e-36	-35.776	-35.776	0.000	(0)
	UF5-	1.335e-38	1.156e-38	-37.874	-37.937	-0.063	(0)
	UF+3	5.328e-39	1.450e-39	-38.273	-38.839	-0.565	(0)

UF6-2	1.084e-39	6.077e-40	-38.965	-39.216	-0.251	(0)
Fe (2)	2.751e-11					
Fe+2	2.308e-11	1.294e-11	-10.637	-10.888	-0.251	(0)
FeSO4	3.503e-12	3.503e-12	-11.456	-11.456	0.000	(0)
FeHCO3+	8.393e-13	7.471e-13	-12.076	-12.127	-0.051	(0)
FeOH+	8.642e-14	7.663e-14	-13.063	-13.116	-0.052	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.800e-19	4.256e-19	-18.319	-18.371	-0.052	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.230	-159.230	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.776	-235.839	-0.063	(0)
Fe (3)	3.449e-09					
Fe (OH) 2+	3.015e-09	2.677e-09	-8.521	-8.572	-0.052	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.666e-12	5.920e-12	-11.176	-11.228	-0.052	(0)
FeOH+2	7.487e-14	4.628e-14	-13.126	-13.335	-0.209	(0)
FeF2+	4.837e-16	4.289e-16	-15.315	-15.368	-0.052	(0)
FeF+2	1.489e-16	9.203e-17	-15.827	-16.036	-0.209	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	6.724e-18	5.962e-18	-17.172	-17.225	-0.052	(0)
Fe+3	1.464e-18	4.820e-19	-17.835	-18.317	-0.482	(0)
Fe (SO4) 2-	1.624e-19	1.405e-19	-18.789	-18.852	-0.063	(0)
FeCl+2	3.204e-20	1.980e-20	-19.494	-19.703	-0.209	(0)
FeCl2+	1.357e-22	1.203e-22	-21.867	-21.920	-0.052	(0)
FeHSeO3+2	2.125e-23	1.191e-23	-22.673	-22.924	-0.251	(0)
Fe2 (OH) 2+4	7.173e-25	7.091e-26	-24.144	-25.149	-1.005	(0)
FeCl3	1.637e-26	1.637e-26	-25.786	-25.786	0.000	(0)
Fe3 (OH) 4+5	1.020e-31	2.744e-33	-30.991	-32.562	-1.570	(0)
H (0)	4.024e-29					
H2	2.012e-29	2.019e-29	-28.696	-28.695	0.002	(0)
Hg (0)	1.332e-10					
Hg	1.332e-10	1.332e-10	-9.875	-9.875	0.000	(0)
Hg (1)	7.482e-22					
Hg2+2	3.741e-22	2.098e-22	-21.427	-21.678	-0.251	(0)
Hg (2)	1.596e-12					
HgClOH	8.286e-13	8.286e-13	-12.082	-12.082	0.000	(0)
HgCl2	4.292e-13	4.292e-13	-12.367	-12.367	0.000	(0)
Hg (OH) 2	3.225e-13	3.236e-13	-12.492	-12.490	0.002	(0)
HgCO3	8.813e-15	8.813e-15	-14.055	-14.055	0.000	(0)
HgCl3-	6.748e-15	5.839e-15	-14.171	-14.234	-0.063	(0)
Hg (CO3) 2-2	1.578e-16	8.849e-17	-15.802	-16.053	-0.251	(0)
HgCl+	7.275e-17	6.295e-17	-16.138	-16.201	-0.063	(0)
HgCl4-2	5.640e-17	3.163e-17	-16.249	-16.500	-0.251	(0)
HgOH+	1.587e-17	1.373e-17	-16.800	-16.862	-0.063	(0)
HgHCO3+	1.284e-17	1.111e-17	-16.892	-16.954	-0.063	(0)
Hg (OH) 3-	7.000e-21	6.058e-21	-20.155	-20.218	-0.063	(0)
Hg+2	4.136e-21	2.319e-21	-20.383	-20.635	-0.251	(0)
HgSO4	6.694e-22	6.694e-22	-21.174	-21.174	0.000	(0)
HgF+	1.730e-23	1.497e-23	-22.762	-22.825	-0.063	(0)
HgHS2-	0.000e+00	0.000e+00	-138.766	-138.829	-0.063	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.604	-139.604	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.116	-140.368	-0.251	(0)
K	3.965e-04					
K+	3.934e-04	3.477e-04	-3.405	-3.459	-0.054	(0)
KSO4-	3.056e-06	2.714e-06	-5.515	-5.566	-0.052	(0)
KCrO4-	1.884e-19	1.630e-19	-18.725	-18.788	-0.063	(0)
Mg	1.258e-03					
Mg+2	1.075e-03	6.563e-04	-2.968	-3.183	-0.214	(0)
MgSO4	1.317e-04	1.317e-04	-3.881	-3.881	0.000	(0)
MgHCO3+	3.487e-05	3.079e-05	-4.458	-4.512	-0.054	(0)
MgF+	1.449e-05	1.282e-05	-4.839	-4.892	-0.053	(0)
MgCO3	1.733e-06	1.733e-06	-5.761	-5.761	0.000	(0)
MgOH+	4.357e-08	3.885e-08	-7.361	-7.411	-0.050	(0)
MgH2BO3+	3.174e-09	2.784e-09	-8.498	-8.555	-0.057	(0)
Mn (2)	1.728e-05					
Mn+2	1.472e-05	8.255e-06	-4.832	-5.083	-0.251	(0)
MnSO4	1.618e-06	1.618e-06	-5.791	-5.791	0.000	(0)
MnHCO3+	8.517e-07	7.551e-07	-6.070	-6.122	-0.052	(0)
MnF+	6.454e-08	5.723e-08	-7.190	-7.242	-0.052	(0)

MnCl+	1.595e-08	1.414e-08	-7.797	-7.850	-0.052	(0)
MnOH+	3.478e-09	3.083e-09	-8.459	-8.511	-0.052	(0)
MnCl2	2.717e-11	2.717e-11	-10.566	-10.566	0.000	(0)
MnCl3-	1.148e-14	1.018e-14	-13.940	-13.992	-0.052	(0)
MnSeO4	5.296e-15	5.296e-15	-14.276	-14.276	0.000	(0)
Mn (OH) 3-	4.752e-19	4.214e-19	-18.323	-18.375	-0.052	(0)
Mn (OH) 4-2	3.273e-25	2.023e-25	-24.485	-24.694	-0.209	(0)
MnSe	0.000e+00	0.000e+00	-43.102	-43.102	0.000	(0)
Mn (3)	4.489e-25					
Mn+3	4.489e-25	1.478e-25	-24.348	-24.830	-0.482	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.529	-43.738	-0.209	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.451	-47.507	-0.056	(0)
Mo	3.258e-07					
MoO4-2	3.255e-07	1.987e-07	-6.487	-6.702	-0.214	(0)
HMoO4-	3.093e-10	2.676e-10	-9.510	-9.572	-0.063	(0)
H2MoO4	1.327e-13	1.327e-13	-12.877	-12.877	0.000	(0)
Ag2MoO4	6.455e-24	6.455e-24	-23.190	-23.190	0.000	(0)
AlMo6O21-3	4.385e-40	1.193e-40	-39.358	-39.923	-0.565	(0)
Mo7O24-6	0.000e+00	0.000e+00	-49.017	-51.278	-2.261	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.490	-52.060	-1.570	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-53.443	-54.448	-1.005	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.806	-58.371	-0.565	(0)
Na	4.444e-03					
Na+	4.408e-03	3.896e-03	-2.356	-2.409	-0.054	(0)
NaSO4-	2.597e-05	2.307e-05	-4.585	-4.637	-0.052	(0)
NaHCO3	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
NaF	4.280e-07	4.280e-07	-6.369	-6.369	0.000	(0)
NaCO3-	2.594e-07	2.303e-07	-6.586	-6.638	-0.052	(0)
NaH2BO3	7.553e-10	7.553e-10	-9.122	-9.122	0.000	(0)
NaCrO4-	2.823e-18	2.443e-18	-17.549	-17.612	-0.063	(0)
Ni	2.132e-07					
Ni+2	1.322e-07	8.070e-08	-6.879	-7.093	-0.214	(0)
NiHCO3+	5.271e-08	4.562e-08	-7.278	-7.341	-0.063	(0)
NiSO4	1.775e-08	1.775e-08	-7.751	-7.751	0.000	(0)
NiCO3	9.560e-09	9.560e-09	-8.020	-8.020	0.000	(0)
NiF+	4.079e-10	3.530e-10	-9.389	-9.452	-0.063	(0)
NiCl+	3.246e-10	2.809e-10	-9.489	-9.551	-0.063	(0)
NiOH+	1.746e-10	1.511e-10	-9.758	-9.821	-0.063	(0)
Ni (OH) 2	1.785e-12	1.785e-12	-11.748	-11.748	0.000	(0)
Ni (SO4) 2-2	1.156e-12	6.481e-13	-11.937	-12.188	-0.251	(0)
NiCl2	1.924e-15	1.924e-15	-14.716	-14.716	0.000	(0)
Ni (OH) 3-	3.067e-16	2.654e-16	-15.513	-15.576	-0.063	(0)
NiSeO4	8.997e-17	8.997e-17	-16.046	-16.046	0.000	(0)
O (0)	2.476e-35					
O2	1.238e-35	1.243e-35	-34.907	-34.906	0.002	(0)
Pb	1.971e-08					
PbCO3	1.152e-08	1.152e-08	-7.938	-7.938	0.000	(0)
PbHCO3+	4.753e-09	4.113e-09	-8.323	-8.386	-0.063	(0)
Pb+2	1.978e-09	1.207e-09	-8.704	-8.918	-0.214	(0)
PbSO4	6.519e-10	6.519e-10	-9.186	-9.186	0.000	(0)
PbOH+	5.211e-10	4.510e-10	-9.283	-9.346	-0.063	(0)
Pb (CO3) 2-2	1.882e-10	1.055e-10	-9.725	-9.977	-0.251	(0)
PbCl+	6.734e-11	5.828e-11	-10.172	-10.235	-0.063	(0)
PbF+	1.712e-11	1.481e-11	-10.766	-10.829	-0.063	(0)
Pb (SO4) 2-2	7.723e-12	4.331e-12	-11.112	-11.363	-0.251	(0)
Pb (OH) 2	2.121e-12	2.121e-12	-11.674	-11.674	0.000	(0)
PbCl2	3.541e-13	3.541e-13	-12.451	-12.451	0.000	(0)
PbF2	5.077e-14	5.077e-14	-13.294	-13.294	0.000	(0)
Pb (OH) 3-	3.644e-16	3.153e-16	-15.438	-15.501	-0.063	(0)
PbCl3-	2.216e-16	1.918e-16	-15.654	-15.717	-0.063	(0)
Pb2OH+3	3.171e-17	8.629e-18	-16.499	-17.064	-0.565	(0)
PbF3-	1.938e-17	1.677e-17	-16.713	-16.776	-0.063	(0)
PbCl4-2	2.127e-19	1.193e-19	-18.672	-18.923	-0.251	(0)
Pb (OH) 4-2	2.048e-20	1.148e-20	-19.689	-19.940	-0.251	(0)
PbF4-2	2.492e-21	1.398e-21	-20.603	-20.855	-0.251	(0)
Pb3 (OH) 4+2	1.932e-22	1.083e-22	-21.714	-21.965	-0.251	(0)

Pb4 (OH) 4+4	1.051e-26	1.039e-27	-25.978	-26.983	-1.005	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.940	-150.940	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.223	-228.286	-0.063	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.865	-72.865	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.583	-78.646	-0.063	(0)
H2S	0.000e+00	0.000e+00	-78.795	-78.795	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.882	-78.945	-0.063	(0)
S5-2	0.000e+00	0.000e+00	-80.590	-80.842	-0.251	(0)
S6-2	0.000e+00	0.000e+00	-81.106	-81.357	-0.251	(0)
S4-2	0.000e+00	0.000e+00	-81.186	-81.437	-0.251	(0)
S3-2	0.000e+00	0.000e+00	-81.992	-82.243	-0.251	(0)
S2-2	0.000e+00	0.000e+00	-83.008	-83.259	-0.251	(0)
S-2	0.000e+00	0.000e+00	-88.567	-88.776	-0.209	(0)
HgHS2-	0.000e+00	0.000e+00	-138.766	-138.829	-0.063	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.604	-139.604	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.116	-140.368	-0.251	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.348	-147.410	-0.063	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.568	-147.725	-0.156	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.665	-148.957	-0.293	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.406	-149.687	-0.281	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.662	-149.725	-0.063	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.696	-149.995	-0.299	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.019	-150.306	-0.287	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.387	-150.387	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.884	-150.884	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.940	-150.940	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.230	-159.230	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.457	-216.520	-0.063	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.187	-226.250	-0.063	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.070	-227.133	-0.063	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.223	-228.286	-0.063	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.809	-229.061	-0.251	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.776	-235.839	-0.063	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.331	-303.583	-0.251	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.105	-306.356	-0.251	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.074	-318.326	-0.251	(0)
S (6)	2.232e-03					
SO4-2	1.806e-03	1.102e-03	-2.743	-2.958	-0.214	(0)
CaSO4	2.634e-04	2.634e-04	-3.579	-3.579	0.000	(0)
MgSO4	1.317e-04	1.317e-04	-3.881	-3.881	0.000	(0)
NaSO4-	2.597e-05	2.307e-05	-4.585	-4.637	-0.052	(0)
KSO4-	3.056e-06	2.714e-06	-5.515	-5.566	-0.052	(0)
MnSO4	1.618e-06	1.618e-06	-5.791	-5.791	0.000	(0)
ZnSO4	9.333e-08	9.333e-08	-7.030	-7.030	0.000	(0)
CuSO4	8.333e-08	8.333e-08	-7.079	-7.079	0.000	(0)
NiSO4	1.775e-08	1.775e-08	-7.751	-7.751	0.000	(0)
CoSO4	1.203e-08	1.203e-08	-7.920	-7.920	0.000	(0)
HSO4-	8.242e-09	7.293e-09	-8.084	-8.137	-0.053	(0)
Zn (SO4) 2-2	1.598e-09	8.962e-10	-8.796	-9.048	-0.251	(0)
CdSO4	1.274e-09	1.274e-09	-8.895	-8.895	0.000	(0)
PbSO4	6.519e-10	6.519e-10	-9.186	-9.186	0.000	(0)
AgSO4-	2.355e-10	2.038e-10	-9.628	-9.691	-0.063	(0)
CrOHSO4	6.484e-11	6.484e-11	-10.188	-10.188	0.000	(0)
Cd (SO4) 2-2	3.380e-11	1.895e-11	-10.471	-10.722	-0.251	(0)
AlSO4+	1.981e-11	1.753e-11	-10.703	-10.756	-0.053	(0)
Pb (SO4) 2-2	7.723e-12	4.331e-12	-11.112	-11.363	-0.251	(0)
FeSO4	3.503e-12	3.503e-12	-11.456	-11.456	0.000	(0)
Ni (SO4) 2-2	1.156e-12	6.481e-13	-11.937	-12.188	-0.251	(0)
Al (SO4) 2-	2.340e-13	2.071e-13	-12.631	-12.684	-0.053	(0)
CrSO4+	2.266e-13	1.961e-13	-12.645	-12.707	-0.063	(0)
UO2SO4	3.237e-14	3.237e-14	-13.490	-13.490	0.000	(0)
UO2 (SO4) 2-2	8.391e-16	4.705e-16	-15.076	-15.327	-0.251	(0)
VO2SO4-	1.626e-16	1.407e-16	-15.789	-15.852	-0.063	(0)
FeSO4+	6.724e-18	5.962e-18	-17.172	-17.225	-0.052	(0)
Cr2 (OH) 2SO4+2	2.590e-18	1.452e-18	-17.587	-17.838	-0.251	(0)
VOSO4	1.485e-18	1.485e-18	-17.828	-17.828	0.000	(0)
Fe (SO4) 2-	1.624e-19	1.405e-19	-18.789	-18.852	-0.063	(0)

Cr2(OH)2(SO4)2	9.512e-20	9.512e-20	-19.022	-19.022	0.000	(0)
HgSO4	6.694e-22	6.694e-22	-21.174	-21.174	0.000	(0)
CrO3SO4-2	1.121e-24	6.285e-25	-23.950	-24.202	-0.251	(0)
VSO4+	1.670e-32	1.445e-32	-31.777	-31.840	-0.063	(0)
U(SO4)2	1.604e-40	1.604e-40	-39.795	-39.795	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.486	-40.737	-0.251	(0)
Sb(3)	7.935e-20					
Sb(OH)3	4.015e-20	4.015e-20	-19.396	-19.396	0.000	(0)
HSbO2	3.920e-20	3.920e-20	-19.407	-19.407	0.000	(0)
SbO2-	1.084e-24	9.379e-25	-23.965	-24.028	-0.063	(0)
Sb(OH)2F	7.395e-25	7.395e-25	-24.131	-24.131	0.000	(0)
SbOF	7.274e-25	7.274e-25	-24.138	-24.138	0.000	(0)
Sb(OH)4-	6.207e-25	5.371e-25	-24.207	-24.270	-0.063	(0)
Sb(OH)2+	7.629e-26	6.602e-26	-25.118	-25.180	-0.063	(0)
SbO+	2.631e-26	2.277e-26	-25.580	-25.643	-0.063	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.074	-318.326	-0.251	(0)
Sb(5)	1.007e-08					
SbO3-	1.006e-08	8.707e-09	-7.997	-8.060	-0.063	(0)
Sb(OH)6-	1.151e-11	1.018e-11	-10.939	-10.992	-0.054	(0)
SbO2+	1.323e-23	1.145e-23	-22.879	-22.941	-0.063	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.819e-40	1.574e-40	-39.740	-39.803	-0.063	(0)
H2Se	0.000e+00	0.000e+00	-43.083	-43.083	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.102	-43.102	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.382	-47.634	-0.251	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-85.635	-86.640	-1.005	(0)
Se(4)	1.179e-08					
HSeO3-	1.081e-08	9.355e-09	-7.966	-8.029	-0.063	(0)
SeO3-2	9.812e-10	5.502e-10	-9.008	-9.260	-0.251	(0)
H2SeO3	2.701e-13	2.701e-13	-12.568	-12.568	0.000	(0)
AgSeO3-	3.785e-15	3.276e-15	-14.422	-14.485	-0.063	(0)
Cd(SeO3)2-2	2.193e-21	1.230e-21	-20.659	-20.910	-0.251	(0)
Ag(SeO3)2-3	5.931e-23	1.614e-23	-22.227	-22.792	-0.565	(0)
FeHSeO3+2	2.125e-23	1.191e-23	-22.673	-22.924	-0.251	(0)
Se(6)	3.911e-12					
SeO4-2	3.905e-12	2.383e-12	-11.408	-11.623	-0.214	(0)
MnSeO4	5.296e-15	5.296e-15	-14.276	-14.276	0.000	(0)
ZnSeO4	1.428e-16	1.428e-16	-15.845	-15.845	0.000	(0)
NiSeO4	8.997e-17	8.997e-17	-16.046	-16.046	0.000	(0)
CoSeO4	6.532e-17	6.532e-17	-16.185	-16.185	0.000	(0)
HSeO4-	9.345e-18	8.086e-18	-17.029	-17.092	-0.063	(0)
CdSeO4	2.188e-18	2.188e-18	-17.660	-17.660	0.000	(0)
Zn(SeO4)2-2	6.156e-28	3.452e-28	-27.211	-27.462	-0.251	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.213	-58.779	-0.565	(0)
U(4)	2.575e-22					
U(OH)5-	2.569e-22	2.223e-22	-21.590	-21.653	-0.063	(0)
U(OH)4	6.304e-25	6.304e-25	-24.200	-24.200	0.000	(0)
U(OH)3+	1.804e-28	1.561e-28	-27.744	-27.807	-0.063	(0)
U(OH)2+2	8.714e-33	4.886e-33	-32.060	-32.311	-0.251	(0)
UF3+	1.013e-34	8.770e-35	-33.994	-34.057	-0.063	(0)
UF2+2	5.667e-36	3.178e-36	-35.247	-35.498	-0.251	(0)
UF4	1.675e-36	1.675e-36	-35.776	-35.776	0.000	(0)
UOH+3	5.728e-38	1.558e-38	-37.242	-37.807	-0.565	(0)
UF5-	1.335e-38	1.156e-38	-37.874	-37.937	-0.063	(0)
UF+3	5.328e-39	1.450e-39	-38.273	-38.839	-0.565	(0)
UF6-2	1.084e-39	6.077e-40	-38.965	-39.216	-0.251	(0)
U(SO4)2	1.604e-40	1.604e-40	-39.795	-39.795	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.486	-40.737	-0.251	(0)
U+4	0.000e+00	0.000e+00	-43.375	-44.380	-1.005	(0)
UCl+3	0.000e+00	0.000e+00	-44.981	-45.546	-0.565	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-170.805	-175.893	-5.088	(0)
U(5)	3.409e-17					
UO2+	3.409e-17	2.950e-17	-16.467	-16.530	-0.063	(0)
U(6)	5.297e-08					
UO2(CO3)2-2	2.771e-08	1.554e-08	-7.557	-7.809	-0.251	(0)
UO2(CO3)3-4	2.501e-08	2.472e-09	-7.602	-8.607	-1.005	(0)

UO2CO3	2.452e-10	2.452e-10	-9.610	-9.610	0.000	(0)
UO2F+	5.389e-13	4.663e-13	-12.268	-12.331	-0.063	(0)
UO2OH+	4.197e-13	3.632e-13	-12.377	-12.440	-0.063	(0)
UO2F2	2.342e-13	2.342e-13	-12.630	-12.630	0.000	(0)
UO2SO4	3.237e-14	3.237e-14	-13.490	-13.490	0.000	(0)
UO2+2	3.179e-14	1.940e-14	-13.498	-13.712	-0.214	(0)
UO2F3-	1.184e-14	1.024e-14	-13.927	-13.990	-0.063	(0)
UO2 (SO4) 2-2	8.391e-16	4.705e-16	-15.076	-15.327	-0.251	(0)
UO2Cl+	4.947e-17	4.280e-17	-16.306	-16.369	-0.063	(0)
UO2F4-2	2.527e-17	1.417e-17	-16.597	-16.849	-0.251	(0)
(UO2) 2 (OH) 2+2	3.904e-19	2.189e-19	-18.408	-18.660	-0.251	(0)
(UO2) 3 (OH) 5+	1.541e-21	1.334e-21	-20.812	-20.875	-0.063	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.724	-40.787	-0.063	(0)
V+2	0.000e+00	0.000e+00	-41.218	-41.469	-0.251	(0)
V (3)	7.366e-14					
V (OH) 3	7.366e-14	7.366e-14	-13.133	-13.133	0.000	(0)
V (OH) 2+	3.724e-24	3.223e-24	-23.429	-23.492	-0.063	(0)
VOH+2	3.691e-27	2.070e-27	-26.433	-26.684	-0.251	(0)
V+3	1.021e-31	2.777e-32	-30.991	-31.556	-0.565	(0)
VSO4+	1.670e-32	1.445e-32	-31.777	-31.840	-0.063	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-51.159	-51.724	-0.565	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-51.563	-52.568	-1.005	(0)
V (4)	1.841e-16					
V (OH) 3+	1.676e-16	1.450e-16	-15.776	-15.838	-0.063	(0)
VO+2	8.721e-18	4.890e-18	-17.059	-17.311	-0.251	(0)
VOF+	5.902e-18	5.107e-18	-17.229	-17.292	-0.063	(0)
VOSO4	1.485e-18	1.485e-18	-17.828	-17.828	0.000	(0)
VOF2	3.335e-19	3.335e-19	-18.477	-18.477	0.000	(0)
VOC1+	2.157e-20	1.866e-20	-19.666	-19.729	-0.063	(0)
VOF3-	2.381e-21	2.061e-21	-20.623	-20.686	-0.063	(0)
VOF4-2	2.583e-24	1.448e-24	-23.588	-23.839	-0.251	(0)
H2V2O4+2	1.882e-27	1.055e-27	-26.725	-26.977	-0.251	(0)
V (5)	7.147e-08					
H2VO4-	6.753e-08	5.844e-08	-7.170	-7.233	-0.063	(0)
HVO4-2	3.867e-09	2.168e-09	-8.413	-8.664	-0.251	(0)
H3VO4	3.956e-11	3.956e-11	-10.403	-10.403	0.000	(0)
H3V2O7-	1.725e-11	1.493e-11	-10.763	-10.826	-0.063	(0)
HV2O7-3	1.579e-13	4.295e-14	-12.802	-13.367	-0.565	(0)
VO2+	6.049e-15	5.346e-15	-14.218	-14.272	-0.054	(0)
VO2F	1.633e-15	1.633e-15	-14.787	-14.787	0.000	(0)
V3O9-3	7.688e-16	2.092e-16	-15.114	-15.680	-0.565	(0)
VO4-3	5.901e-16	1.605e-16	-15.229	-15.794	-0.565	(0)
V2O7-4	1.728e-16	1.708e-17	-15.763	-16.768	-1.005	(0)
VO2SO4-	1.626e-16	1.407e-16	-15.789	-15.852	-0.063	(0)
VO2F2-	1.193e-16	1.032e-16	-15.923	-15.986	-0.063	(0)
VO2F3-2	3.999e-19	2.242e-19	-18.398	-18.649	-0.251	(0)
V4O12-4	5.156e-20	5.097e-21	-19.288	-20.293	-1.005	(0)
VO2F4-3	7.062e-23	1.921e-23	-22.151	-22.716	-0.565	(0)
HV10O28-5	0.000e+00	0.000e+00	-49.516	-51.086	-1.570	(0)
V10O28-6	0.000e+00	0.000e+00	-49.842	-52.104	-2.261	(0)
H2V10O28-4	0.000e+00	0.000e+00	-52.043	-53.048	-1.005	(0)
Zn	8.746e-07					
Zn+2	6.340e-07	3.870e-07	-6.198	-6.412	-0.214	(0)
ZnSO4	9.333e-08	9.333e-08	-7.030	-7.030	0.000	(0)
ZnCO3	7.070e-08	7.070e-08	-7.151	-7.151	0.000	(0)
ZnHCO3+	6.483e-08	5.610e-08	-7.188	-7.251	-0.063	(0)
ZnOH+	6.650e-09	5.754e-09	-8.177	-8.240	-0.063	(0)
Zn (SO4) 2-2	1.598e-09	8.962e-10	-8.796	-9.048	-0.251	(0)
ZnF+	1.554e-09	1.344e-09	-8.809	-8.871	-0.063	(0)
ZnCl+	1.498e-09	1.322e-09	-8.825	-8.879	-0.054	(0)
ZnOHCl	2.574e-10	2.574e-10	-9.589	-9.589	0.000	(0)
Zn (OH) 2	1.356e-10	1.356e-10	-9.868	-9.868	0.000	(0)
ZnCl2	2.851e-12	2.851e-12	-11.545	-11.545	0.000	(0)
Zn (OH) 3-	1.168e-13	1.011e-13	-12.933	-12.995	-0.063	(0)
ZnCl3-	3.489e-15	3.081e-15	-14.457	-14.511	-0.054	(0)
ZnSeO4	1.428e-16	1.428e-16	-15.845	-15.845	0.000	(0)
ZnCl4-2	3.391e-18	2.096e-18	-17.470	-17.679	-0.209	(0)

Zn(OH) 4-2	1.067e-18	5.984e-19	-17.972	-18.223	-0.251	(0)
Zn(SeO4) 2-2	6.156e-28	3.452e-28	-27.211	-27.462	-0.251	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.662	-149.725	-0.063	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.884	-150.884	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.187	-226.250	-0.063	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.809	-229.061	-0.251	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.105	-306.356	-0.251	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.32	-87.54	-36.22	Ag2S
Ag2CO3	-10.47	-21.56	-11.09	Ag2CO3
Ag2CrO4	-20.38	-31.97	-11.59	Ag2CrO4
Ag2HVO4	-10.31	-8.83	1.48	Ag2HVO4
Ag2MoO4	-11.22	-22.77	-11.55	Ag2MoO4
Ag2O	-14.30	-1.73	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.20	-19.02	-4.82	Ag2SO4
Ag3AsO3	-26.83	-24.67	2.16	Ag3AsO3
Ag3AsO4	-15.23	-18.02	-2.79	Ag3AsO4
Ag3H2VO5	-14.87	-9.69	5.18	Ag3H2VO5
AgF:4H2O	-12.84	-11.79	1.05	AgF:4H2O
Agmetal	-0.13	-13.64	-13.51	Ag
AgVO3	-8.74	-7.97	0.77	AgVO3
Al (OH) 3 (am)	-0.98	9.82	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.85	-43.48	2.37	Al2 (MoO4) 3
Al2O3	-0.01	19.64	19.65	Al2O3
Al4 (OH) 10SO4	-0.72	21.98	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.41	-5.61	4.80	AlAsO4:2H2O
AlOHSO4	-4.25	-7.48	-3.23	AlOHSO4
AlSb	-151.83	-86.21	65.62	AlSb
Alunite	-0.02	-1.42	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.09	-11.88	-7.79	PbSO4
Anhydrite	-1.58	-5.94	-4.36	CaSO4
Anilite	-55.31	-87.19	-31.88	Cu0.25Cu1.5S
Antlerite	-2.51	6.27	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-85.55	-88.31	-2.76	As4O6
Artinite	-7.13	2.47	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.57	-30.86	6.71	As2O5
Atacamite	-1.71	5.68	7.39	Cu2 (OH) 3Cl
Azurite	0.80	-16.10	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.08	7.32	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-15.44	0.43	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.20	7.74	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.25	-22.92	-9.67	BaCrO4
BaF2	-8.72	-14.54	-5.82	BaF2
BaMoO4	-6.76	-13.72	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.71	-7.88	1.83	BaSeO3
BaSeO4	-11.19	-18.65	-7.46	BaSeO4
Bianchite	-7.61	-9.37	-1.76	ZnSO4:6H2O
Birnessite	-8.64	9.45	18.09	MnO2
Bixbyite	-6.00	-6.64	-0.64	Mn2O3
BlaubleiI	-55.03	-79.19	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.60	-82.88	-27.28	Cu0.6Cu0.8S
Boehmite	1.24	9.82	8.58	AlOOH
Breithauptite	-57.49	-76.01	-18.52	NiSb
Brochantite	-1.09	14.13	15.22	Cu4 (OH) 6SO4
Brucite	-5.69	11.16	16.84	Mg (OH) 2
Bunsenite	-5.20	7.25	12.45	NiO
Ca (VO3) 2	-8.51	-2.85	5.66	Ca (VO3) 2

Ca2V2O7	-8.99	8.51	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.04	8.51	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-19.09	3.21	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.09	19.87	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-19.99	19.87	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.96	-157.99	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-9.50	-27.41	-17.91	Hg2Cl2
CaMoO4	-1.73	-9.68	-7.95	CaMoO4
Carnotite	-3.00	-2.77	0.23	KUO2VO4
CaSeO3:2H2O	-6.66	-3.84	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.58	-14.60	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.50	-3.66	9.84	Cd(BO2)2
Cd(OH)2	-7.61	6.03	13.64	Cd(OH)2
Cd(OH)2(am)	-7.70	6.03	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.21	-16.50	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.76	0.80	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.57	6.83	28.40	Cd4(OH)6SO4
CdCl2	-13.38	-14.04	-0.66	CdCl2
CdCl2:1H2O	-12.35	-14.04	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.13	-14.04	-1.91	CdCl2:2.5H2O
CdF2	-14.61	-15.83	-1.21	CdF2
Cdmetal(alpha)	-33.03	-19.51	13.51	Cd
Cdmetal(gamma)	-33.13	-19.51	13.62	Cd
CdMoO4	-0.86	-15.01	-14.15	CdMoO4
CdOHCl	-7.54	-4.00	3.54	CdOHCl
CdSb	-76.88	-77.23	-0.35	CdSb
CdSe	-20.74	-40.94	-20.20	CdSe
CdSeO4:2H2O	-18.08	-19.93	-1.85	CdSeO4:2H2O
CdSO4	-11.09	-11.26	-0.17	CdSO4
CdSO4:1H2O	-9.54	-11.26	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.39	-11.27	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.15	-10.90	-9.75	AgCl
Cerrusite	-1.29	-14.42	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.80	-9.44	-2.64	CuSO4:5H2O
Chalcocite	-55.35	-90.27	-34.92	Cu2S
Chalcopyrite	-125.05	-160.32	-35.27	CuFeS2
Cinnabar	-52.61	-98.31	-45.69	HgS
Claudetite	-85.24	-88.31	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co(BO2)2	-29.69	-2.61	27.07	Co(BO2)2
Co(OH)2	-6.02	7.08	13.09	Co(OH)2
Co(OH)3	-10.24	-12.55	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-22.66	-9.63	13.03	Co3(AsO4)2
Co3O4	-7.53	-18.03	-10.50	Co3O4
CoCl2	-21.26	-12.99	8.27	CoCl2
CoCl2:6H2O	-15.53	-13.00	2.54	CoCl2:6H2O
CoCO3	-2.78	-12.76	-9.98	CoCO3
CoF2	-13.18	-14.78	-1.60	CoF2
CoF3	-43.88	-45.34	-1.46	CoF3
CoFe2O4	16.99	13.46	-3.53	CoFe2O4
CoMoO4	-6.20	-13.96	-7.76	CoMoO4
CoO	-6.51	7.08	13.59	CoO
CoS(alpha)	-71.30	-78.74	-7.44	CoS
CoS(beta)	-67.67	-78.74	-11.07	CoS
CoSe	-23.70	-39.90	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.36	-18.89	-1.53	CoSeO4:6H2O
CoSO4	-13.02	-10.22	2.80	CoSO4
CoSO4:6H2O	-7.75	-10.22	-2.47	CoSO4:6H2O
Cotunnite	-9.87	-14.65	-4.78	PbCl2
Covellite	-55.66	-77.96	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3

Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.17	-31.08	14.09	CrCl2
CrCl3	-46.40	-31.29	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.63	-41.47	-33.84	Na3AlF6
Cu(OH)2	-0.82	7.86	8.67	Cu(OH)2
Cu(SbO3)2	-25.06	20.15	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-55.52	-90.40	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.62	-51.42	-45.80	Cu2Se
Cu2SO4	-19.80	-21.75	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.39	-7.29	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-60.11	-102.71	-42.59	Cu3Sb
Cu3Se2	-27.05	-90.54	-63.49	Cu3Se2
CuCO3	-0.48	-11.98	-11.50	CuCO3
CuCrO4	-16.94	-22.38	-5.44	CuCrO4
CuF	-8.25	-13.15	-4.91	CuF
CuF2	-15.11	-14.00	1.12	CuF2
CuF2:2H2O	-9.45	-14.00	-4.55	CuF2:2H2O
Cumetal	-6.24	-15.00	-8.76	Cu
CuMoO4	-0.11	-13.18	-13.08	CuMoO4
CuOCuSO4	-11.89	-1.58	10.30	CuOCuSO4
Cupricferrite	8.25	14.24	5.99	CuFe2O4
Cuprite	-3.04	-4.45	-1.41	Cu2O
Cuprousferrite	9.88	0.97	-8.92	CuFeO2
CuSe	-6.02	-39.12	-33.10	CuSe
CuSe2	-27.18	-60.54	-33.37	CuSe2
CuSeO3:2H2O	-7.85	-7.34	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.67	-18.11	-2.44	CuSeO4:5H2O
CuSO4	-12.38	-9.44	2.94	CuSO4
Diaspore	2.95	9.82	6.87	AlOOH
Djurleite	-55.53	-89.45	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.62	-17.16	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.07	-17.16	-17.09	CaMg(CO3)2
Epsomite	-4.01	-6.14	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	3.22	0.18	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-7.03	-10.75	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.37	-8.82	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.59	-39.21	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.77	-45.51	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.64	-12.24	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.50	-17.59	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.35	-64.95	-18.60	FeSe2
FeS(ppt)	-79.41	-82.36	-2.95	FeS
FeSe	-32.52	-43.52	-11.00	FeSe
Fix_pe	-5.60	-5.60	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	1.53	9.82	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.36	-9.37	-2.01	ZnSO4:7H2O
Greenockite	-65.42	-79.78	-14.36	CdS
Greigite	-288.39	-333.43	-45.03	Fe3S4
Gummite	-7.05	0.63	7.67	UO3
Gypsum	-1.33	-5.94	-4.61	CaSO4:2H2O
H-Jarosite	-12.92	-25.02	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.16	-21.04	-12.88	H2MoO4
H2S(g)	-77.81	-85.82	-8.01	H2S
H2Se(g)	-42.01	-46.97	-4.96	H2Se
Halite	-6.88	-5.28	1.60	NaCl
Hausmannite	-7.72	53.31	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	0.20	23.09	22.89	FeAl2O4

Hg (CH3) 2 (g)	-182.82	-256.52	-73.71	Hg (CH3) 2
Hg (g)	-8.57	-16.44	-7.87	Hg
Hg (OH) 2	-8.99	-12.49	-3.50	Hg (OH) 2
Hg2 (g)	-17.93	-32.88	-14.96	Hg2
Hg2 (OH) 2	-12.60	-7.34	5.26	Hg2 (OH) 2
Hg2CO3	-11.13	-27.18	-16.05	Hg2CO3
Hg2CrO4	-28.88	-37.58	-8.70	Hg2CrO4
Hg2F2	-18.83	-29.20	-10.36	Hg2F2
Hg2S	-81.48	-93.15	-11.68	Hg2S
Hg2SeO3	-17.88	-22.54	-4.66	Hg2SeO3
Hg2SO4	-18.51	-24.64	-6.13	Hg2SO4
Hg3O2CO3	-27.62	-57.31	-29.68	Hg3O2CO3
HgCl (g)	-33.20	-13.71	19.50	HgCl
HgCl2	-11.30	-32.56	-21.26	HgCl2
HgF (g)	-47.27	-14.60	32.68	HgF
HgF2 (g)	-46.91	-34.35	12.57	HgF2
Hgmetal (1)	-2.99	-16.44	-13.45	Hg
HgSe	-3.77	-59.46	-55.69	HgSe
HgSeO3	-15.26	-27.69	-12.43	HgSeO3
HgSO4	-20.37	-29.79	-9.42	HgSO4
Huntite	-4.56	-34.52	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.64	-23.41	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.80	-23.57	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.89	-21.06	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-6.51	-21.31	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.81	-53.05	-17.24	K2Cr2O7
K2CrO4	-22.30	-22.82	-0.51	K2CrO4
K2MoO4	-16.88	-13.62	3.26	K2MoO4
K2SeO4	-17.81	-18.54	-0.73	K2SeO4
Langite	-3.36	14.13	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.02	-6.46	-0.43	PbO : PbSO4
Laurionite	-5.24	-4.62	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.27	5.42	12.69	PbO
Mackinawite	-78.76	-82.36	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.68	17.54	16.86	Fe2MgO4
Magnesite	-1.22	-8.68	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.18	-4.12	-5.31	Cu2 (OH) 2CO3
Manganite	-3.31	22.03	25.34	MnOOH
Massicot	-7.47	5.42	12.89	PbO
Matlockite	-6.57	-15.54	-8.97	PbClF
Melanothallite	-18.47	-12.21	6.26	CuCl2
Melanterite	-11.64	-13.85	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.21	-98.31	-45.09	HgS
Mg (OH) 2 (active)	-7.64	11.16	18.79	Mg (OH) 2
Mg (VO3) 2	-14.33	-3.05	11.28	Mg (VO3) 2
Mg2Sb3	-276.60	-201.92	74.68	Mg2Sb3
Mg2V2O7	-18.25	8.11	26.36	Mg2V2O7
MgCr2O4	-7.40	8.80	16.20	MgCr2O4
MgCrO4	-24.46	-19.08	5.38	MgCrO4
MgF2	-2.57	-10.70	-8.13	MgF2
MgMoO4	-8.03	-9.88	-1.85	MgMoO4
MgSeO3 : 6H2O	-7.10	-4.04	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.61	-14.81	-1.20	MgSeO4 : 6H2O
Minium	-31.72	41.81	73.52	Pb3O4
Mirabilite	-6.66	-7.78	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.85	-4.95	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.82	-58.53	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.37	-90.29	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-15.59	-3.09	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.53	-10.82	2.72	MnCl2 : 4H2O
MnS (grn)	-76.73	-76.56	0.17	MnS
MnS (pnk)	-79.90	-76.56	3.34	MnS
MnSb	-96.44	-99.35	-2.91	MnSb
MnSe	-41.22	-37.72	3.50	MnSe

MnSeO3	-7.07	-5.94	1.13	MnSeO3
MnSeO3:2H2O	-6.93	-5.94	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.66	-16.71	-2.05	MnSeO4:5H2O
MnSO4	-10.62	-8.04	2.58	MnSO4
Montepsonite	-9.07	6.03	15.10	CdO
Montroydite	-8.85	-12.49	-3.64	HgO
MoO3	-13.04	-21.04	-8.00	MoO3
Morenosite	-7.91	-10.05	-2.14	NiSO4:7H2O
MoS2	-147.96	-218.22	-70.26	MoS2
Na-Jarosite	-9.06	-20.26	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.06	-50.96	-9.90	Na2Cr2O7
Na2CrO4	-23.65	-20.72	2.93	Na2CrO4
Na2Mo2O7	-15.96	-32.56	-16.60	Na2Mo2O7
Na2MoO4	-13.01	-11.52	1.49	Na2MoO4
Na2MoO4:2H2O	-12.74	-11.52	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.98	-5.68	10.30	Na2SeO3:5H2O
Na2SeO4	-17.72	-16.44	1.28	Na2SeO4
Na3Sb	-176.20	-81.75	94.45	Na3Sb
Na3VO4	-29.50	7.18	36.68	Na3VO4
Na4V2O7	-32.57	4.83	37.40	Na4V2O7
Nantokite	-5.53	-12.26	-6.73	CuCl
NaSb	-88.89	-65.73	23.17	NaSb
Natron	-9.01	-10.32	-1.31	Na2CO3:10H2O
NaVO3	-6.20	-2.34	3.86	NaVO3
Nesquehonite	-4.01	-8.68	-4.67	MgCO3:3H2O
Ni(OH)2	-5.55	7.25	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.82	-9.12	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.31	11.69	32.00	Ni4(OH)6SO4
NiCO3	-5.72	-12.59	-6.87	NiCO3
NiMoO4	-2.65	-13.79	-11.14	NiMoO4
NiS(alpha)	-72.97	-78.57	-5.60	NiS
NiS(beta)	-67.47	-78.57	-11.10	NiS
NiS(gamma)	-65.77	-78.57	-12.80	NiS
NiSe	-22.03	-39.73	-17.70	NiSe
NiSeO3:2H2O	-10.77	-7.95	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.20	-18.72	-1.52	NiSeO4:6H2O
Nsutite	-8.05	9.45	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-240.53	-301.60	-61.07	As2S3
Otavite	-1.81	-13.81	-12.00	CdCO3
Pb(BO2)2	-10.79	-4.27	6.52	Pb(BO2)2
Pb(OH)2	-2.73	5.42	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-56.06	-64.82	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.99	0.81	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.35	10.84	26.19	Pb2O(OH)2
Pb2O3	-24.65	36.39	61.04	Pb2O3
Pb2OCO3	-8.44	-9.00	-0.56	Pb2OCO3
Pb2V2O7	-1.46	-3.36	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.40	-14.60	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.08	2.06	6.14	Pb3(VO4)2
Pb3O2CO3	-14.60	-3.58	11.02	Pb3O2CO3
Pb3O2SO4	-11.72	-1.03	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.71	4.39	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.49	4.39	21.88	Pb4O3SO4
PbCrO4	-12.22	-24.82	-12.60	PbCrO4
PbF2	-9.00	-16.44	-7.44	PbF2
Pbmetal	-24.37	-20.12	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.56	5.42	12.98	PbO:0.33H2O
PbSeO4	-13.70	-20.54	-6.84	PbSeO4
Periclase	-10.43	11.16	21.58	MgO
Phosgenite	-9.26	-29.07	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.13	-142.63	-18.51	FeS2
Pyrochroite	-5.94	9.26	15.19	Mn(OH)2
Pyrolusite	-6.58	34.80	41.38	MnO2
Realgar	-100.92	-120.66	-19.75	AsS

Retgersite	-8.01	-10.05	-2.04	NiSO4:6H2O
Rhodochrosite	-0.00	-10.58	-10.58	MnCO3
Rutherfordine	-4.71	-19.21	-14.50	UO2CO3
Sb(OH)3	-12.29	-19.40	-7.11	Sb(OH)3
Sb2O4	-16.65	-13.25	3.40	Sb2O4
Sb2O5	-26.66	-36.32	-9.67	Sb2O5
Sb2Se3	-111.95	-179.71	-67.76	Sb2Se3
Sb4O6(cubic)	-59.32	-77.58	-18.26	Sb4O6
Sb4O6(orth)	-59.68	-77.58	-17.90	Sb4O6
SbCl3	-50.08	-49.50	0.57	SbCl3
SbF3	-41.96	-52.18	-10.23	SbF3
Sbmetal	-46.02	-57.71	-11.69	Sb
SbO2	-3.11	-30.93	-27.82	SbO2
Schoepite	-5.37	0.63	5.99	UO2(OH)2:H2O
Semetal(am)	-14.32	-21.43	-7.11	Se
Semetal(hex)	-13.72	-21.43	-7.71	Se
Senarmontite	-26.43	-38.79	-12.37	Sb2O3
SeO2	-15.32	-15.20	0.12	SeO2
SeO3	-47.01	-25.96	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.91	-11.91	-10.00	ZnCO3
Sphalerite	-66.44	-77.89	-11.45	ZnS
Spinel	-6.05	30.79	36.85	MgAl2O4
Stibnite	-245.78	-296.24	-50.46	Sb2S3
Sulfur	-58.13	-60.27	-2.14	S
Tenorite	0.21	7.86	7.64	CuO
Thenardite	-8.10	-7.78	0.32	Na2SO4
Thermonatrite	-10.95	-10.32	0.64	Na2CO3:H2O
Tyuyamunite	-5.67	-1.59	4.08	Ca(UO2)2(VO4)2
U3O8	-17.10	3.98	21.08	U3O8
U3Sb4	-583.61	-431.23	152.38	U3Sb4
U4O9	-34.24	-37.26	-3.02	U4O9
UF4	-29.88	-59.42	-29.54	UF4
UF4:2.5H2O	-26.70	-59.42	-32.72	UF4:2.5H2O
UO2(am)	-16.64	-15.70	0.93	UO2
UO2(OH)2(beta)	-4.99	0.63	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.09	-25.34	-2.25	UO2SeO4:4H2O
UO3	-7.07	0.63	7.70	UO3
Uraninite	-11.03	-15.70	-4.67	UO2
USb2	-221.01	-191.43	29.58	USb2
V(OH)3	-17.64	-10.05	7.59	V(OH)3
V2O5	-12.85	-14.21	-1.36	V2O5
V3O5	-36.30	-34.46	1.84	V3O5
V4O7	-44.62	-37.43	7.19	V4O7
V6O13	-32.84	-93.70	-60.86	V6O13
Valentinite	-30.31	-38.79	-8.48	Sb2O3
VC12	-61.77	-42.89	18.87	VC12
VC13	-63.59	-40.16	23.43	VC13
VF4	-61.62	-46.69	14.93	VF4
Vmetal	-92.39	-48.37	44.03	V
VO	-37.58	-22.82	14.76	VO
VO(OH)2	-8.12	-2.97	5.15	VO(OH)2
VO2Cl	-19.98	-17.14	2.84	VO2Cl
VOC1	-31.24	-20.08	11.15	VOC1
VOC12	-35.80	-23.04	12.76	VOC12
VOSO4	-23.88	-20.27	3.61	VOSO4
Witherite	-3.95	-12.52	-8.57	BaCO3
Wurtzite	-68.94	-77.89	-8.95	ZnS
Zincite	-3.41	7.93	11.33	ZnO
Zincosite	-13.30	-9.37	3.93	ZnSO4
Zn(BO2)2	-10.06	-1.77	8.29	Zn(BO2)2
Zn(OH)2	-4.27	7.93	12.20	Zn(OH)2
Zn(OH)2(am)	-4.55	7.93	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.83	7.93	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.61	7.93	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.81	7.93	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.94	-1.44	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.37	5.82	15.19	Zn2(OH)3Cl

Zn3(AsO4)2:2.5H2O	-20.73	-7.08	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.73	-10.81	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.99	14.41	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.94	19.56	38.50	Zn5(OH)8Cl2
ZnCl2	-19.19	-12.14	7.05	ZnCl2
ZnCO3:1H2O	-1.65	-11.91	-10.26	ZnCO3:1H2O
ZnF2	-13.40	-13.93	-0.53	ZnF2
Znmetal	-43.41	-17.62	25.79	Zn
ZnMoO4	-2.99	-13.11	-10.13	ZnMoO4
ZnO(active)	-3.26	7.93	11.19	ZnO
ZnS(am)	-68.84	-77.89	-9.05	ZnS
ZnSb	-86.35	-75.33	11.01	ZnSb
ZnSe	-24.65	-39.05	-14.40	ZnSe
ZnSeO4:6H2O	-16.52	-18.04	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.73	-9.37	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 71.

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Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 401
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 401
USE Surface 401
USE Solution 403
SAVE Solution 404  #Initial Stage 4 groundwater after Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 401.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

1.191e-15  Surface + diffuse layer charge, eq
7.795e-08  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00  -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
1.710e+00  m² for 2.664e-05 moles of Ferrihydrite

```

Water in diffuse layer: 1.710e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.
Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451\text{e-}02$ (= $c_{\text{DL}} / c_{\text{free}}$ if z is +1).

Element	Moles
C	4.3685e-11
Ca	5.4141e-13
Cl	8.7481e-10
H	1.2887e-10
K	8.5889e-13
Mg	8.3882e-14
N	3.5416e-09
Na	3.6390e-12
O	1.5785e-07
S	3.6782e-08

Hfo_s

1.332e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.903e-08	0.668	8.903e-08	-7.050
Hfo_sOH	4.366e-08	0.328	4.366e-08	-7.360
Hfo_sO-	4.906e-10	0.004	4.906e-10	-9.309
Hfo_sOHCa+2	1.625e-12	0.000	1.625e-12	-11.789

Hfo_w

5.327e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.462e-06	0.462	2.462e-06	-5.609
Hfo_wOH	1.207e-06	0.227	1.207e-06	-5.918
Hfo_wSO4-	8.314e-07	0.156	8.314e-07	-6.080
Hfo_wOHSO4-2	8.136e-07	0.153	8.136e-07	-6.090
Hfo_wO-	1.356e-08	0.003	1.356e-08	-7.868
Hfo_wOMg+	1.917e-14	0.000	1.917e-14	-13.717
Hfo_wOCa+	6.504e-15	0.000	6.504e-15	-14.187

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 403. Solution after simulation 70.
 Using surface 401.
 Using pure phase assemblage 401. Pure-phase assemblage after simulation 70.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Initial	Moles in assemblage Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.176e-08	1.729e-08	-4.467e-09

Alunite	-0.02	-1.42	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.58	-5.94	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.88	-9.79	-8.91	1.825e-08	0	-1.825e-08
Barite	0.00	-9.98	-9.98	9.220e-07	9.768e-07	5.479e-08
Brochantite	-1.76	13.46	15.22	0.000e+00	0	0.000e+00
Brucite	-5.69	11.16	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.084e-06
CaMoO4	-1.74	-9.69	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.83	-4.02	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.710e-03	1.710e-03	-5.832e-07
Carnotite	-4.97	-4.74	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.50	-3.66	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.87	-15.02	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	6.054e-08	3.446e-08	-2.608e-08
Cu2Se(alpha)	-6.13	-51.93	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.28	-13.36	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.01	-6.14	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.664e-05	2.664e-05	-5.279e-13
Fluorite	0.00	-10.50	-10.50	2.838e-05	2.839e-05	9.852e-09
Gummite	-7.05	0.63	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.33	-5.94	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.94	-59.64	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.66	-7.78	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.25	-6.12	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.55	7.24	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.71	-10.01	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.72	-12.59	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.66	-13.80	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-3.688e-09
Otavite	-1.81	-13.81	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.34	-15.96	-15.62	2.183e-09	0	-2.183e-09
Rutherfordine	-4.71	-19.21	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.11	-30.93	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.37	0.63	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-9.62	-5.54	4.08	0.000e+00	0	0.000e+00
U3O8	-17.10	3.98	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.99	0.63	5.61	0.000e+00	0	0.000e+00
UO3	-7.07	0.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.00	-13.13	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-6.036e-19 Surface + diffuse layer charge, eq
3.409e-07 Surface charge, eq
1.923e-02 sigma, C/m²
5.638e-02 psi, V
-2.195e+00 -F*psi/RT
1.114e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.710e+00 m² for 2.664e-05 moles of Ferrihydrite

Water in diffuse layer: 1.710e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.522e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.530e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	8.0235e-13
Al	8.5625e-11

As	2.2650e-15
B	2.4744e-10
Ba	8.6045e-13
C	1.7353e-07
Ca	1.4501e-08
Cd	7.9858e-14
Cl	4.7594e-08
Co	9.8595e-13
Cr	5.6855e-14
Cu	7.9936e-11
F	6.2976e-09
Fe	3.6220e-14
H	1.8599e-07
Hg	2.3055e-15
K	3.8149e-09
Mg	8.3718e-09
Mn	1.1347e-10
Mo	1.7962e-11
N	9.0125e-14
Na	4.2672e-08
Ni	1.6602e-12
O	9.5658e-07
Pb	1.3104e-13
S	1.0871e-07
Sb	3.1147e-13
Se	2.6017e-13
U	6.1254e-12
V	2.4685e-14
Zn	6.8325e-12

Hfo_s

1.332e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	6.776e-08	0.509	6.777e-08	-7.169
Hfo_sOCrOH+	5.216e-08	0.392	5.217e-08	-7.283
Hfo_sOPb+	9.837e-09	0.074	9.838e-09	-8.007
Hfo_sOZn+	1.456e-09	0.011	1.456e-09	-8.837
Hfo_sOMn+	1.281e-09	0.010	1.281e-09	-8.892
Hfo_sOHCa+2	2.864e-10	0.002	2.864e-10	-9.543
Hfo_sOH	2.370e-10	0.002	2.370e-10	-9.625
Hfo_sONi+	7.354e-11	0.001	7.355e-11	-10.133
Hfo_sO-	3.692e-11	0.000	3.692e-11	-10.433
Hfo_sOH2+	3.486e-11	0.000	3.486e-11	-10.458
Hfo_sOCo+	7.387e-12	0.000	7.388e-12	-11.131
Hfo_sOCd+	5.664e-12	0.000	5.664e-12	-11.247
Hfo_sOAg	7.561e-13	0.000	7.561e-13	-12.121
Hfo_sOHBa+2	8.056e-14	0.000	8.056e-14	-13.094
Hfo_sOFe+	2.531e-14	0.000	2.531e-14	-13.597
Hfo_sOHg+	5.158e-17	0.000	5.158e-17	-16.287

Hfo_w

5.327e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.245e-06	0.421	2.245e-06	-5.649
Hfo_wOH	1.531e-06	0.287	1.531e-06	-5.815
Hfo_wOHSO4-2	8.387e-07	0.157	8.388e-07	-6.076
Hfo_wO-	2.385e-07	0.045	2.385e-07	-6.623
Hfo_wOH2+	2.251e-07	0.042	2.251e-07	-6.648
Hfo_wOHVO4-3	7.070e-08	0.013	7.071e-08	-7.151
Hfo_wSO4-	6.184e-08	0.012	6.184e-08	-7.209
Hfo_wOMg+	4.152e-08	0.008	4.153e-08	-7.382
Hfo_wOHasO4-3	3.656e-08	0.007	3.656e-08	-7.437
Hfo_wOZn+	9.846e-09	0.002	9.847e-09	-8.007
Hfo_wOHSeO3-2	6.706e-09	0.001	6.706e-09	-8.174

Hfo_wOMn+	6.573e-09	0.001	6.573e-09	-8.182
Hfo_wOHMoO4-2	6.071e-09	0.001	6.072e-09	-8.217
Hfo_wOCa+	3.712e-09	0.001	3.712e-09	-8.430
Hfo_wOPb+	2.838e-09	0.001	2.838e-09	-8.547
Hfo_wSeO3-	1.675e-09	0.000	1.675e-09	-8.776
Hfo_wONi+	6.407e-10	0.000	6.408e-10	-9.193
Hfo_wMoO4-	5.767e-10	0.000	5.767e-10	-9.239
Hfo_wOCo+	1.345e-10	0.000	1.345e-10	-9.871
Hfo_wH2BO3	9.102e-11	0.000	9.102e-11	-10.041
Hfo_wHAsO4-	1.771e-11	0.000	1.771e-11	-10.752
Hfo_wOCd+	1.560e-11	0.000	1.561e-11	-10.807
Hfo_wOAg	1.284e-12	0.000	1.285e-12	-11.891
Hfo_wOFe+	1.031e-13	0.000	1.031e-13	-12.987
Hfo_wH2AsO4	8.427e-14	0.000	8.427e-14	-13.074
Hfo_wOHg+	1.632e-14	0.000	1.632e-14	-13.787
Hfo_wOBa+	1.509e-14	0.000	1.509e-14	-13.821
Hfo_wOHSbO(OH) 4-	2.791e-15	0.000	2.791e-15	-14.554
Hfo_wOHSeO4-2	1.239e-15	0.000	1.239e-15	-14.907
Hfo_wSbO(OH) 4	2.651e-16	0.000	2.651e-16	-15.577
Hfo_wOHCrO4-2	1.236e-16	0.000	1.236e-16	-15.908
Hfo_wSeO4-	7.958e-17	0.000	7.958e-17	-16.099
Hfo_wCrO4-	8.312e-18	0.000	8.312e-18	-17.080
Hfo_wH2AsO3	1.199e-23	0.000	1.199e-23	-22.921

-----Solution composition-----

Elements	Molality	Moles
Ag	4.892e-08	4.891e-08
Al	3.286e-06	3.285e-06
As	4.644e-11	4.643e-11
B	1.436e-05	1.436e-05
Ba	1.604e-07	1.604e-07
C	6.023e-03	6.023e-03
Ca	2.080e-03	2.080e-03
Cd	1.055e-08	1.055e-08
Cl	1.539e-03	1.539e-03
Co	1.357e-07	1.357e-07
Cr	5.948e-09	5.948e-09
Cu	4.873e-06	4.873e-06
F	2.166e-04	2.166e-04
Fe	3.477e-09	3.477e-09
Hg	1.348e-10	1.348e-10
K	3.965e-04	3.964e-04
Mg	1.258e-03	1.258e-03
Mn	1.727e-05	1.727e-05
Mo	3.214e-07	3.213e-07
N	3.542e-09	3.541e-09
Na	4.444e-03	4.444e-03
Ni	2.124e-07	2.124e-07
Pb	9.217e-09	9.217e-09
S	2.233e-03	2.233e-03
Sb	1.007e-08	1.007e-08
Se	7.882e-09	7.881e-09
U	5.296e-08	5.296e-08
V	7.650e-10	7.650e-10
Zn	8.633e-07	8.632e-07

-----Description of solution-----

	pH	=	7.169	Charge balance
	pe	=	5.603	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.517e-02	
	Mass of water (kg)	=	9.999e-01	
	Total alkalinity (eq/kg)	=	5.352e-03	
	Total CO2 (mol/kg)	=	6.023e-03	

Temperature (°C) = 25.00
 Electrical balance (eq) = 1.303e-15
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 1
 Total H = 1.110140e+02
 Total O = 5.553069e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.688e-07	1.487e-07	-6.773	-6.828	-0.055	(0)
H+	7.660e-08	6.770e-08	-7.116	-7.169	-0.054	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.892e-08					
AgCl	3.148e-08	3.148e-08	-7.502	-7.502	0.000	(0)
Ag+	1.282e-08	1.133e-08	-7.892	-7.946	-0.054	(0)
AgCl2-	4.310e-09	3.730e-09	-8.365	-8.428	-0.063	(0)
AgSO4-	2.882e-10	2.494e-10	-9.540	-9.603	-0.063	(0)
AgCl3-2	8.065e-12	4.522e-12	-11.093	-11.345	-0.251	(0)
AgF	4.957e-12	4.957e-12	-11.305	-11.305	0.000	(0)
AgOH	1.685e-13	1.685e-13	-12.773	-12.773	0.000	(0)
AgCl4-3	4.617e-14	1.256e-14	-13.336	-13.901	-0.565	(0)
AgH2BO3	2.197e-14	2.197e-14	-13.658	-13.658	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNO2	5.460e-15	5.460e-15	-14.263	-14.263	0.000	(0)
AgSeO3-	3.094e-15	2.677e-15	-14.509	-14.572	-0.063	(0)
AgNH3+	1.776e-16	1.536e-16	-15.751	-15.813	-0.063	(0)
Ag (OH) 2-	2.830e-18	2.449e-18	-17.548	-17.611	-0.063	(0)
AgNO3	1.958e-20	1.958e-20	-19.708	-19.708	0.000	(0)
Ag (SeO3) 2-3	3.239e-23	8.811e-24	-22.490	-23.055	-0.565	(0)
Ag (NO2) 2-	2.253e-23	1.949e-23	-22.647	-22.710	-0.063	(0)
Ag (NH3) 2+	9.582e-24	8.292e-24	-23.019	-23.081	-0.063	(0)
Ag2MoO4	9.529e-24	9.529e-24	-23.021	-23.021	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.777	-72.777	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.898	-86.903	-1.005	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.260	-147.323	-0.063	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.480	-147.637	-0.156	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.608	-149.907	-0.299	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.931	-150.218	-0.287	(0)
Al	3.286e-06					
Al (OH) 4-	2.258e-06	1.998e-06	-5.646	-5.699	-0.053	(0)
AlF3	5.421e-07	5.421e-07	-6.266	-6.266	0.000	(0)
AlF2+	2.785e-07	2.473e-07	-6.555	-6.607	-0.052	(0)
Al (OH) 3	1.067e-07	1.067e-07	-6.972	-6.972	0.000	(0)
AlF4-	5.346e-08	4.730e-08	-7.272	-7.325	-0.053	(0)
Al (OH) 2+	4.052e-08	3.598e-08	-7.392	-7.444	-0.052	(0)
AlF+2	5.736e-09	3.568e-09	-8.241	-8.448	-0.206	(0)
AlOH+2	4.898e-10	3.047e-10	-9.310	-9.516	-0.206	(0)
AlSO4+	1.982e-11	1.754e-11	-10.703	-10.756	-0.053	(0)
Al+3	6.223e-12	2.049e-12	-11.206	-11.688	-0.482	(0)
Al (SO4) 2-	2.342e-13	2.072e-13	-12.630	-12.684	-0.053	(0)
AlMo6O21-3	4.040e-40	1.099e-40	-39.394	-39.959	-0.565	(0)
As (3)	3.074e-23					
H3AsO3	3.047e-23	3.047e-23	-22.516	-22.516	0.000	(0)
H2AsO3-	2.668e-25	2.308e-25	-24.574	-24.637	-0.063	(0)
HAsO3-2	5.546e-30	3.110e-30	-29.256	-29.507	-0.251	(0)
H4AsO3+	1.181e-30	1.022e-30	-29.928	-29.990	-0.063	(0)
AsO3-3	6.508e-36	1.771e-36	-35.187	-35.752	-0.565	(0)
As (5)	4.644e-11					
HAsO4-2	3.316e-11	1.860e-11	-10.479	-10.731	-0.251	(0)
H2AsO4-	1.327e-11	1.148e-11	-10.877	-10.940	-0.063	(0)
AsO4-3	3.192e-15	8.686e-16	-14.496	-15.061	-0.565	(0)
H3AsO4	1.346e-16	1.351e-16	-15.871	-15.869	0.002	(0)
B	1.436e-05					
H3BO3	1.421e-05	1.426e-05	-4.847	-4.846	0.002	(0)
H2BO3-	1.395e-07	1.223e-07	-6.855	-6.913	-0.057	(0)

	CaH ₂ BO ₃ +	8.372e-09	7.342e-09	-8.077	-8.134	-0.057	(0)
	MgH ₂ BO ₃ +	3.174e-09	2.783e-09	-8.498	-8.555	-0.057	(0)
	BF (OH) 3-	1.130e-09	9.906e-10	-8.947	-9.004	-0.057	(0)
	NaH ₂ BO ₃	7.552e-10	7.552e-10	-9.122	-9.122	0.000	(0)
	H ₅ (BO ₃) 2-	1.693e-12	1.484e-12	-11.771	-11.828	-0.057	(0)
	BF ₂ (OH) 2-	1.424e-12	1.249e-12	-11.846	-11.904	-0.057	(0)
	BaH ₂ BO ₃ +	4.093e-13	3.589e-13	-12.388	-12.445	-0.057	(0)
	AgH ₂ BO ₃	2.197e-14	2.197e-14	-13.658	-13.658	0.000	(0)
	H ₈ (BO ₃) 3-	2.413e-15	2.116e-15	-14.617	-14.674	-0.057	(0)
	BF ₃ OH-	6.532e-18	5.728e-18	-17.185	-17.242	-0.057	(0)
	BF ₄ -	3.790e-22	3.323e-22	-21.421	-21.478	-0.057	(0)
Ba		1.604e-07					
	Ba+2	1.556e-07	9.496e-08	-6.808	-7.022	-0.214	(0)
	BaHCO ₃ +	4.670e-09	4.157e-09	-8.331	-8.381	-0.051	(0)
	BaCO ₃	1.546e-10	1.546e-10	-9.811	-9.811	0.000	(0)
	BaH ₂ BO ₃ +	4.093e-13	3.589e-13	-12.388	-12.445	-0.057	(0)
	BaOH+	6.951e-14	6.163e-14	-13.158	-13.210	-0.052	(0)
	BaNO ₃ +	1.196e-18	1.035e-18	-17.922	-17.985	-0.063	(0)
	BaNH ₃ +2	7.094e-19	3.978e-19	-18.149	-18.400	-0.251	(0)
C (4)		6.023e-03					
	HCO ₃ -	5.162e-03	4.584e-03	-2.287	-2.339	-0.052	(0)
	H ₂ CO ₃	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO ₃ +	1.000e-04	8.904e-05	-4.000	-4.050	-0.051	(0)
	MgHCO ₃ +	3.487e-05	3.078e-05	-4.458	-4.512	-0.054	(0)
	NaHCO ₃	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
	CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO ₃ -2	5.201e-06	3.174e-06	-5.284	-5.498	-0.214	(0)
	CuCO ₃	4.184e-06	4.184e-06	-5.378	-5.378	0.000	(0)
	MgCO ₃	1.733e-06	1.733e-06	-5.761	-5.761	0.000	(0)
	MnHCO ₃ +	8.512e-07	7.547e-07	-6.070	-6.122	-0.052	(0)
	NaCO ₃ -	2.593e-07	2.303e-07	-6.586	-6.638	-0.052	(0)
	CuHCO ₃ +	7.481e-08	6.474e-08	-7.126	-7.189	-0.063	(0)
	ZnCO ₃	6.977e-08	6.977e-08	-7.156	-7.156	0.000	(0)
	ZnHCO ₃ +	6.399e-08	5.537e-08	-7.194	-7.257	-0.063	(0)
	Cu (CO ₃) 2-2	6.375e-08	3.575e-08	-7.196	-7.447	-0.251	(0)
	NiHCO ₃ +	5.253e-08	4.546e-08	-7.280	-7.342	-0.063	(0)
	UO ₂ (CO ₃) 2-2	2.771e-08	1.554e-08	-7.557	-7.809	-0.251	(0)
	UO ₂ (CO ₃) 3-4	2.501e-08	2.472e-09	-7.602	-8.607	-1.005	(0)
	CoHCO ₃ +	2.251e-08	1.948e-08	-7.648	-7.710	-0.063	(0)
	NiCO ₃	9.526e-09	9.526e-09	-8.021	-8.021	0.000	(0)
	PbCO ₃	5.388e-09	5.388e-09	-8.269	-8.269	0.000	(0)
	BaHCO ₃ +	4.670e-09	4.157e-09	-8.331	-8.381	-0.051	(0)
	CoCO ₃	2.931e-09	2.931e-09	-8.533	-8.533	0.000	(0)
	PbHCO ₃ +	2.223e-09	1.923e-09	-8.653	-8.716	-0.063	(0)
	CdCO ₃	3.560e-10	3.560e-10	-9.449	-9.449	0.000	(0)
	UO ₂ CO ₃	2.453e-10	2.453e-10	-9.610	-9.610	0.000	(0)
	BaCO ₃	1.546e-10	1.546e-10	-9.811	-9.811	0.000	(0)
	Pb (CO ₃) 2-2	8.798e-11	4.933e-11	-10.056	-10.307	-0.251	(0)
	CdHCO ₃ +	5.934e-11	5.135e-11	-10.227	-10.289	-0.063	(0)
	Cd (CO ₃) 2-2	1.494e-12	8.378e-13	-11.826	-12.077	-0.251	(0)
	FeHCO ₃ +	8.394e-13	7.472e-13	-12.076	-12.127	-0.051	(0)
	HgCO ₃	8.812e-15	8.812e-15	-14.055	-14.055	0.000	(0)
	Hg (CO ₃) 2-2	1.578e-16	8.846e-17	-15.802	-16.053	-0.251	(0)
	HgHCO ₃ +	1.284e-17	1.111e-17	-16.892	-16.954	-0.063	(0)
Ca		2.080e-03					
	Ca+2	1.709e-03	1.043e-03	-2.767	-2.982	-0.214	(0)
	CaSO ₄	2.635e-04	2.635e-04	-3.579	-3.579	0.000	(0)
	CaHCO ₃ +	1.000e-04	8.904e-05	-4.000	-4.050	-0.051	(0)
	CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.236e-06	1.982e-06	-5.651	-5.703	-0.052	(0)
	CaH ₂ BO ₃ +	8.372e-09	7.342e-09	-8.077	-8.134	-0.057	(0)
	CaOH+	3.477e-09	3.095e-09	-8.459	-8.509	-0.051	(0)
	CaNH ₃ +2	1.555e-14	8.719e-15	-13.808	-14.060	-0.251	(0)
	CaNO ₃ +	8.291e-15	7.175e-15	-14.081	-14.144	-0.063	(0)
	Ca (NH ₃) 2+2	4.110e-26	2.305e-26	-25.386	-25.637	-0.251	(0)
Cd		1.055e-08					
	Cd+2	8.062e-09	4.920e-09	-8.094	-8.308	-0.214	(0)
	CdSO ₄	1.272e-09	1.272e-09	-8.896	-8.896	0.000	(0)

	CdCl+	7.387e-10	6.392e-10	-9.132	-9.194	-0.063	(0)
	CdCO3	3.560e-10	3.560e-10	-9.449	-9.449	0.000	(0)
	CdHCO3+	5.934e-11	5.135e-11	-10.227	-10.289	-0.063	(0)
	Cd(SO4) 2-2	3.374e-11	1.892e-11	-10.472	-10.723	-0.251	(0)
	CdF+	1.569e-11	1.358e-11	-10.804	-10.867	-0.063	(0)
	CdOH+	6.716e-12	5.811e-12	-11.173	-11.236	-0.063	(0)
	CdOHC1	3.899e-12	3.899e-12	-11.409	-11.409	0.000	(0)
	CdCl2	3.625e-12	3.625e-12	-11.441	-11.441	0.000	(0)
	Cd(CO3) 2-2	1.494e-12	8.378e-13	-11.826	-12.077	-0.251	(0)
	Cd(OH) 2	5.452e-15	5.452e-15	-14.263	-14.263	0.000	(0)
	CdF2	4.717e-15	4.717e-15	-14.326	-14.326	0.000	(0)
	CdCl3-	3.596e-15	3.111e-15	-14.444	-14.507	-0.063	(0)
	CdSeO4	1.459e-18	1.459e-18	-17.836	-17.836	0.000	(0)
	Cd2OH+3	5.267e-19	1.433e-19	-18.278	-18.844	-0.565	(0)
	Cd(OH) 3-	5.723e-20	4.952e-20	-19.242	-19.305	-0.063	(0)
	CdNO3+	3.911e-20	3.384e-20	-19.408	-19.471	-0.063	(0)
	Cd(SeO3) 2-2	9.770e-22	5.479e-22	-21.010	-21.261	-0.251	(0)
	Cd(OH) 4-2	2.149e-27	1.205e-27	-26.668	-26.919	-0.251	(0)
	Cd(NO3) 2	3.689e-32	3.689e-32	-31.433	-31.433	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.883	-78.946	-0.063	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.387	-150.387	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-227.070	-227.133	-0.063	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-303.332	-303.583	-0.251	(0)
C1		1.539e-03					
	Cl-	1.539e-03	1.360e-03	-2.813	-2.866	-0.054	(0)
	AgCl	3.148e-08	3.148e-08	-7.502	-7.502	0.000	(0)
	MnCl+	1.594e-08	1.413e-08	-7.798	-7.850	-0.052	(0)
	AgCl2-	4.310e-09	3.730e-09	-8.365	-8.428	-0.063	(0)
	ZnCl+	1.478e-09	1.305e-09	-8.830	-8.884	-0.054	(0)
	CdCl+	7.387e-10	6.392e-10	-9.132	-9.194	-0.063	(0)
	CuCl+	5.465e-10	4.826e-10	-9.262	-9.316	-0.054	(0)
	CuCl	4.683e-10	4.683e-10	-9.329	-9.329	0.000	(0)
	NiCl+	3.235e-10	2.800e-10	-9.490	-9.553	-0.063	(0)
	CoCl+	2.971e-10	2.571e-10	-9.527	-9.590	-0.063	(0)
	ZnOHC1	2.541e-10	2.541e-10	-9.595	-9.595	0.000	(0)
	CuCl2-	1.508e-10	1.331e-10	-9.822	-9.876	-0.054	(0)
	PbCl+	3.150e-11	2.725e-11	-10.502	-10.565	-0.063	(0)
	MnCl2	2.715e-11	2.715e-11	-10.566	-10.566	0.000	(0)
	AgCl3-2	8.065e-12	4.522e-12	-11.093	-11.345	-0.251	(0)
	CdOHC1	3.899e-12	3.899e-12	-11.409	-11.409	0.000	(0)
	CdCl2	3.625e-12	3.625e-12	-11.441	-11.441	0.000	(0)
	ZnCl2	2.814e-12	2.814e-12	-11.551	-11.551	0.000	(0)
	HgClOH	8.285e-13	8.285e-13	-12.082	-12.082	0.000	(0)
	HgCl2	4.292e-13	4.292e-13	-12.367	-12.367	0.000	(0)
	CuCl2	2.276e-13	2.276e-13	-12.643	-12.643	0.000	(0)
	PbCl2	1.656e-13	1.656e-13	-12.781	-12.781	0.000	(0)
	CuCl3-2	6.264e-14	3.871e-14	-13.203	-13.412	-0.209	(0)
	AgCl4-3	4.617e-14	1.256e-14	-13.336	-13.901	-0.565	(0)
	MnCl3-	1.147e-14	1.017e-14	-13.940	-13.993	-0.052	(0)
	HgCl3-	6.748e-15	5.839e-15	-14.171	-14.234	-0.063	(0)
	CdCl3-	3.596e-15	3.111e-15	-14.444	-14.507	-0.063	(0)
	ZnCl3-	3.444e-15	3.041e-15	-14.463	-14.517	-0.054	(0)
	NiCl2	1.918e-15	1.918e-15	-14.717	-14.717	0.000	(0)
	CrCl+2	2.393e-16	1.342e-16	-15.621	-15.872	-0.251	(0)
	PbCl3-	1.037e-16	8.969e-17	-15.984	-16.047	-0.063	(0)
	HgCl+	7.275e-17	6.296e-17	-16.138	-16.201	-0.063	(0)
	HgCl4-2	5.640e-17	3.162e-17	-16.249	-16.500	-0.251	(0)
	UO2Cl+	4.948e-17	4.282e-17	-16.306	-16.368	-0.063	(0)
	ZnCl4-2	3.347e-18	2.068e-18	-17.475	-17.684	-0.209	(0)
	CuCl3-	3.273e-18	2.890e-18	-17.485	-17.539	-0.054	(0)
	CrOHC12	5.158e-19	5.158e-19	-18.288	-18.288	0.000	(0)
	PbCl4-2	9.946e-20	5.577e-20	-19.002	-19.254	-0.251	(0)
	FeCl+2	3.205e-20	1.981e-20	-19.494	-19.703	-0.209	(0)
	CrCl2+	2.001e-20	1.732e-20	-19.699	-19.761	-0.063	(0)
	VOCl+	2.310e-22	1.999e-22	-21.636	-21.699	-0.063	(0)
	FeCl2+	1.358e-22	1.204e-22	-21.867	-21.919	-0.052	(0)
	CuCl4-2	3.188e-23	1.970e-23	-22.496	-22.705	-0.209	(0)
	CrO3Cl-	1.851e-26	1.601e-26	-25.733	-25.795	-0.063	(0)

FeCl3	1.637e-26	1.637e-26	-25.786	-25.786	0.000	(0)
CoCl+2	4.304e-35	2.413e-35	-34.366	-34.617	-0.251	(0)
UCl+3	0.000e+00	0.000e+00	-44.980	-45.546	-0.565	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.302	-64.554	-0.251	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.698	-68.950	-0.251	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.196	-82.447	-0.251	(0)
Co (2)	1.357e-07					
Co+2	9.742e-08	5.463e-08	-7.011	-7.263	-0.251	(0)
CoHCO3+	2.251e-08	1.948e-08	-7.648	-7.710	-0.063	(0)
CoSO4	1.202e-08	1.202e-08	-7.920	-7.920	0.000	(0)
CoCO3	2.931e-09	2.931e-09	-8.533	-8.533	0.000	(0)
CoF+	3.476e-10	3.008e-10	-9.459	-9.522	-0.063	(0)
CoCl+	2.971e-10	2.571e-10	-9.527	-9.590	-0.063	(0)
CoOH+	1.873e-10	1.621e-10	-9.728	-9.790	-0.063	(0)
Co (OH) 2	1.914e-12	1.914e-12	-11.718	-11.718	0.000	(0)
CoNO2+	1.026e-15	8.875e-16	-14.989	-15.052	-0.063	(0)
Co (NH3) +2	7.777e-17	4.361e-17	-16.109	-16.360	-0.251	(0)
CoSeO4	4.359e-17	4.359e-17	-16.361	-16.361	0.000	(0)
Co (OH) 3-	6.562e-18	5.678e-18	-17.183	-17.246	-0.063	(0)
CoOOH-	1.647e-18	1.425e-18	-17.783	-17.846	-0.063	(0)
Co2OH+3	1.631e-18	4.437e-19	-17.788	-18.353	-0.565	(0)
CoNO3+	2.176e-19	1.883e-19	-18.662	-18.725	-0.063	(0)
Co (OH) 4-2	2.386e-25	1.338e-25	-24.622	-24.874	-0.251	(0)
Co (NH3) 2+2	2.203e-26	1.235e-26	-25.657	-25.908	-0.251	(0)
Co4 (OH) 4+4	1.392e-30	1.376e-31	-29.856	-30.861	-1.005	(0)
Co (NO3) 2	8.334e-31	8.334e-31	-30.079	-30.079	0.000	(0)
Co (NH3) 3+2	1.841e-36	1.032e-36	-35.735	-35.986	-0.251	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.193	-46.444	-0.251	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.151	-57.402	-0.251	(0)
Co (3)	1.175e-28					
CoOH+2	1.175e-28	6.587e-29	-27.930	-28.181	-0.251	(0)
Co+3	2.648e-34	8.718e-35	-33.577	-34.060	-0.482	(0)
CoCl+2	4.304e-35	2.413e-35	-34.366	-34.617	-0.251	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.302	-64.554	-0.251	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.550	-77.613	-0.063	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.957	-82.208	-0.251	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.196	-82.447	-0.251	(0)
Cr (2)	8.099e-26					
Cr+2	8.099e-26	4.541e-26	-25.092	-25.343	-0.251	(0)
Cr (3)	5.948e-09					
Cr (OH) 2+	5.183e-09	4.485e-09	-8.285	-8.348	-0.063	(0)
Cr (OH) +2	4.421e-10	2.479e-10	-9.354	-9.606	-0.251	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	6.487e-11	6.487e-11	-10.188	-10.188	0.000	(0)
CrF+2	3.750e-12	2.103e-12	-11.426	-11.677	-0.251	(0)
CrO2-	2.031e-12	1.758e-12	-11.692	-11.755	-0.063	(0)
Cr (OH) 4-	1.714e-12	1.483e-12	-11.766	-11.829	-0.063	(0)
Cr+3	2.801e-13	7.621e-14	-12.553	-13.118	-0.565	(0)
CrSO4+	2.268e-13	1.962e-13	-12.644	-12.707	-0.063	(0)
CrCl+2	2.393e-16	1.342e-16	-15.621	-15.872	-0.251	(0)
Cr2 (OH) 2SO4+2	2.592e-18	1.453e-18	-17.586	-17.838	-0.251	(0)
CrOHC12	5.158e-19	5.158e-19	-18.288	-18.288	0.000	(0)
Cr2 (OH) 2 (SO4) 2	9.521e-20	9.521e-20	-19.021	-19.021	0.000	(0)
CrCl2+	2.001e-20	1.732e-20	-19.699	-19.761	-0.063	(0)
CrNO3+2	1.292e-26	7.245e-27	-25.889	-26.140	-0.251	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.211	-55.463	-0.251	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.620	-67.185	-0.565	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.698	-68.950	-0.251	(0)
Cr (6)	2.417e-16					
CrO4-2	2.067e-16	1.262e-16	-15.685	-15.899	-0.214	(0)
HCrO4-	3.194e-17	2.764e-17	-16.496	-16.558	-0.063	(0)
NaCrO4-	2.822e-18	2.442e-18	-17.549	-17.612	-0.063	(0)
KCrO4-	1.883e-19	1.630e-19	-18.725	-18.788	-0.063	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	1.121e-24	6.287e-25	-23.950	-24.202	-0.251	(0)
CrO3Cl-	1.851e-26	1.601e-26	-25.733	-25.795	-0.063	(0)
Cr2O7-2	4.725e-32	2.650e-32	-31.326	-31.577	-0.251	(0)
Cu (1)	9.351e-10					

CuCl	4.683e-10	4.683e-10	-9.329	-9.329	0.000	(0)
Cu+	3.160e-10	2.735e-10	-9.500	-9.563	-0.063	(0)
CuCl2-	1.508e-10	1.331e-10	-9.822	-9.876	-0.054	(0)
CuCl3-2	6.264e-14	3.871e-14	-13.203	-13.412	-0.209	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.833	-149.126	-0.293	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.575	-149.856	-0.281	(0)
Cu (2)	4.872e-06					
CuCO3	4.184e-06	4.184e-06	-5.378	-5.378	0.000	(0)
Cu+2	3.667e-07	2.238e-07	-6.436	-6.650	-0.214	(0)
CuOH+	1.192e-07	1.052e-07	-6.924	-6.978	-0.054	(0)
CuHCO3+	7.481e-08	6.474e-08	-7.126	-7.189	-0.063	(0)
Cu (CO3) 2-2	6.375e-08	3.575e-08	-7.196	-7.447	-0.251	(0)
CuSO4	5.654e-08	5.654e-08	-7.248	-7.248	0.000	(0)
Cu (OH) 2	3.122e-09	3.122e-09	-8.506	-8.506	0.000	(0)
CuF+	2.842e-09	2.459e-09	-8.546	-8.609	-0.063	(0)
CuCl+	5.465e-10	4.826e-10	-9.262	-9.316	-0.054	(0)
Cu2 (OH) 2+2	4.961e-10	2.782e-10	-9.304	-9.556	-0.251	(0)
Cu (OH) 3-	1.100e-12	9.522e-13	-11.958	-12.021	-0.063	(0)
CuCl2	2.276e-13	2.276e-13	-12.643	-12.643	0.000	(0)
CuNO2+	6.244e-14	5.403e-14	-13.205	-13.267	-0.063	(0)
CuNH3+2	2.712e-14	1.521e-14	-13.567	-13.818	-0.251	(0)
CuCl3-	3.273e-18	2.890e-18	-17.485	-17.539	-0.054	(0)
Cu (OH) 4-2	1.987e-18	1.114e-18	-17.702	-17.953	-0.251	(0)
CuNO3+	1.779e-18	1.539e-18	-17.750	-17.813	-0.063	(0)
Cu (NO2) 2	1.275e-21	1.275e-21	-20.895	-20.895	0.000	(0)
CuCl4-2	3.188e-23	1.970e-23	-22.496	-22.705	-0.209	(0)
Cu (NO3) 2	4.215e-31	4.215e-31	-30.375	-30.375	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.625	-216.688	-0.063	(0)
F	2.166e-04					
F-	1.970e-04	1.741e-04	-3.706	-3.759	-0.054	(0)
MgF+	1.449e-05	1.282e-05	-4.839	-4.892	-0.053	(0)
CaF+	2.236e-06	1.982e-06	-5.651	-5.703	-0.052	(0)
AlF3	5.421e-07	5.421e-07	-6.266	-6.266	0.000	(0)
NaF	4.280e-07	4.280e-07	-6.369	-6.369	0.000	(0)
AlF2+	2.785e-07	2.473e-07	-6.555	-6.607	-0.052	(0)
MnF+	6.450e-08	5.719e-08	-7.190	-7.243	-0.052	(0)
AlF4-	5.346e-08	4.730e-08	-7.272	-7.325	-0.053	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
AlF+2	5.736e-09	3.568e-09	-8.241	-8.448	-0.206	(0)
CuF+	2.842e-09	2.459e-09	-8.546	-8.609	-0.063	(0)
ZnF+	1.533e-09	1.327e-09	-8.814	-8.877	-0.063	(0)
BF (OH) 3-	1.130e-09	9.906e-10	-8.947	-9.004	-0.057	(0)
NiF+	4.065e-10	3.518e-10	-9.391	-9.454	-0.063	(0)
CoF+	3.476e-10	3.008e-10	-9.459	-9.522	-0.063	(0)
CdF+	1.569e-11	1.358e-11	-10.804	-10.867	-0.063	(0)
HF2-	1.310e-11	1.154e-11	-10.883	-10.938	-0.055	(0)
PbF+	8.006e-12	6.928e-12	-11.097	-11.159	-0.063	(0)
AgF	4.957e-12	4.957e-12	-11.305	-11.305	0.000	(0)
CrF+2	3.750e-12	2.103e-12	-11.426	-11.677	-0.251	(0)
BF2 (OH) 2-	1.424e-12	1.249e-12	-11.846	-11.904	-0.057	(0)
UO2F+	5.391e-13	4.665e-13	-12.268	-12.331	-0.063	(0)
UO2F2	2.342e-13	2.342e-13	-12.630	-12.630	0.000	(0)
PbF2	2.374e-14	2.374e-14	-13.625	-13.625	0.000	(0)
UO2F3-	1.184e-14	1.024e-14	-13.927	-13.989	-0.063	(0)
CdF2	4.717e-15	4.717e-15	-14.326	-14.326	0.000	(0)
H2F2	8.145e-16	8.145e-16	-15.089	-15.089	0.000	(0)
FeF2+	4.837e-16	4.289e-16	-15.315	-15.368	-0.052	(0)
FeF+2	1.489e-16	9.205e-17	-15.827	-16.036	-0.209	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	2.527e-17	1.417e-17	-16.597	-16.849	-0.251	(0)
VO2F	1.749e-17	1.749e-17	-16.757	-16.757	0.000	(0)
PbF3-	9.060e-18	7.840e-18	-17.043	-17.106	-0.063	(0)
BF3OH-	6.532e-18	5.728e-18	-17.185	-17.242	-0.057	(0)
VO2F2-	1.278e-18	1.105e-18	-17.894	-17.956	-0.063	(0)
VOF+	6.322e-20	5.471e-20	-19.199	-19.262	-0.063	(0)
VO2F3-2	4.282e-21	2.401e-21	-20.368	-20.620	-0.251	(0)
VOF2	3.572e-21	3.572e-21	-20.447	-20.447	0.000	(0)
PbF4-2	1.165e-21	6.533e-22	-20.934	-21.185	-0.251	(0)

BF4-	3.790e-22	3.323e-22	-21.421	-21.478	-0.057	(0)
VOF3-	2.550e-23	2.206e-23	-22.593	-22.656	-0.063	(0)
HgF+	1.730e-23	1.497e-23	-22.762	-22.825	-0.063	(0)
VO2F4-3	7.560e-25	2.057e-25	-24.121	-24.687	-0.565	(0)
Sb(OH) 2F	7.396e-25	7.396e-25	-24.131	-24.131	0.000	(0)
SbOF	7.274e-25	7.274e-25	-24.138	-24.138	0.000	(0)
VOF4-2	2.766e-26	1.551e-26	-25.558	-25.809	-0.251	(0)
UF3+	1.014e-34	8.773e-35	-33.994	-34.057	-0.063	(0)
UF2+2	5.670e-36	3.179e-36	-35.246	-35.498	-0.251	(0)
UF4	1.675e-36	1.675e-36	-35.776	-35.776	0.000	(0)
UF5-	1.335e-38	1.156e-38	-37.874	-37.937	-0.063	(0)
UF+3	5.331e-39	1.450e-39	-38.273	-38.839	-0.565	(0)
UF6-2	1.084e-39	6.076e-40	-38.965	-39.216	-0.251	(0)
Fe (2)	2.752e-11					
Fe+2	2.309e-11	1.295e-11	-10.637	-10.888	-0.251	(0)
FeSO4	3.505e-12	3.505e-12	-11.455	-11.455	0.000	(0)
FeHCO3+	8.394e-13	7.472e-13	-12.076	-12.127	-0.051	(0)
FeOH+	8.644e-14	7.664e-14	-13.063	-13.116	-0.052	(0)
Fe(OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.800e-19	4.256e-19	-18.319	-18.371	-0.052	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.229	-159.229	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.775	-235.838	-0.063	(0)
Fe (3)	3.449e-09					
Fe(OH) 2+	3.015e-09	2.678e-09	-8.521	-8.572	-0.052	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.665e-12	5.919e-12	-11.176	-11.228	-0.052	(0)
FeOH+2	7.489e-14	4.629e-14	-13.126	-13.335	-0.209	(0)
FeF2+	4.837e-16	4.289e-16	-15.315	-15.368	-0.052	(0)
FeF+2	1.489e-16	9.205e-17	-15.827	-16.036	-0.209	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	6.728e-18	5.966e-18	-17.172	-17.224	-0.052	(0)
Fe+3	1.464e-18	4.822e-19	-17.834	-18.317	-0.482	(0)
Fe(SO4) 2-	1.625e-19	1.407e-19	-18.789	-18.852	-0.063	(0)
FeCl+2	3.205e-20	1.981e-20	-19.494	-19.703	-0.209	(0)
FeCl2+	1.358e-22	1.204e-22	-21.867	-21.919	-0.052	(0)
FeHSeO3+2	1.420e-23	7.964e-24	-22.848	-23.099	-0.251	(0)
Fe2(OH) 2+4	7.177e-25	7.094e-26	-24.144	-25.149	-1.005	(0)
FeCl3	1.637e-26	1.637e-26	-25.786	-25.786	0.000	(0)
FeNO3+2	1.870e-29	1.049e-29	-28.728	-28.979	-0.251	(0)
Fe3(OH) 4+5	1.021e-31	2.746e-33	-30.991	-32.561	-1.570	(0)
H (0)	4.024e-29					
H2	2.012e-29	2.019e-29	-28.696	-28.695	0.002	(0)
Hg (0)	1.332e-10					
Hg	1.332e-10	1.332e-10	-9.875	-9.875	0.000	(0)
Hg (1)	7.482e-22					
Hg2+2	3.741e-22	2.098e-22	-21.427	-21.678	-0.251	(0)
Hg (2)	1.596e-12					
HgClOH	8.285e-13	8.285e-13	-12.082	-12.082	0.000	(0)
HgCl2	4.292e-13	4.292e-13	-12.367	-12.367	0.000	(0)
Hg(OH) 2	3.224e-13	3.235e-13	-12.492	-12.490	0.002	(0)
HgCO3	8.812e-15	8.812e-15	-14.055	-14.055	0.000	(0)
HgCl3-	6.748e-15	5.839e-15	-14.171	-14.234	-0.063	(0)
Hg(CO3) 2-2	1.578e-16	8.846e-17	-15.802	-16.053	-0.251	(0)
HgCl+	7.275e-17	6.296e-17	-16.138	-16.201	-0.063	(0)
HgCl4-2	5.640e-17	3.162e-17	-16.249	-16.500	-0.251	(0)
HgOH+	1.587e-17	1.373e-17	-16.800	-16.862	-0.063	(0)
HgHCO3+	1.284e-17	1.111e-17	-16.892	-16.954	-0.063	(0)
Hg(OH) 3-	6.999e-21	6.056e-21	-20.155	-20.218	-0.063	(0)
Hg+2	4.137e-21	2.319e-21	-20.383	-20.635	-0.251	(0)
HgSO4	6.697e-22	6.697e-22	-21.174	-21.174	0.000	(0)
HgNH3+2	1.733e-23	9.717e-24	-22.761	-23.012	-0.251	(0)
HgF+	1.730e-23	1.497e-23	-22.762	-22.825	-0.063	(0)
Hg(NH3) 2+2	1.151e-25	6.451e-26	-24.939	-25.190	-0.251	(0)
HgNO3+	2.153e-33	1.863e-33	-32.667	-32.730	-0.063	(0)
Hg(NH3) 3+2	3.041e-36	1.705e-36	-35.517	-35.768	-0.251	(0)
Hg(NO3) 2	0.000e+00	0.000e+00	-44.774	-44.774	0.000	(0)
Hg(NH3) 4+2	0.000e+00	0.000e+00	-45.795	-46.046	-0.251	(0)
HgHS2-	0.000e+00	0.000e+00	-138.766	-138.829	-0.063	(0)

	Hg (HS) 2	0.000e+00	0.000e+00	-139.604	-139.604	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-140.116	-140.367	-0.251	(0)
K		3.965e-04					
	K+	3.934e-04	3.477e-04	-3.405	-3.459	-0.054	(0)
	KSO4-	3.057e-06	2.715e-06	-5.515	-5.566	-0.052	(0)
	KCrO4-	1.883e-19	1.630e-19	-18.725	-18.788	-0.063	(0)
Mg		1.258e-03					
	Mg+2	1.075e-03	6.562e-04	-2.969	-3.183	-0.214	(0)
	MgSO4	1.317e-04	1.317e-04	-3.880	-3.880	0.000	(0)
	MgHCO3+	3.487e-05	3.078e-05	-4.458	-4.512	-0.054	(0)
	MgF+	1.449e-05	1.282e-05	-4.839	-4.892	-0.053	(0)
	MgCO3	1.733e-06	1.733e-06	-5.761	-5.761	0.000	(0)
	MgOH+	4.356e-08	3.885e-08	-7.361	-7.411	-0.050	(0)
	MgH2BO3+	3.174e-09	2.783e-09	-8.498	-8.555	-0.057	(0)
Mn (2)		1.727e-05					
	Mn+2	1.471e-05	8.251e-06	-4.832	-5.084	-0.251	(0)
	MnSO4	1.618e-06	1.618e-06	-5.791	-5.791	0.000	(0)
	MnHCO3+	8.512e-07	7.547e-07	-6.070	-6.122	-0.052	(0)
	MnF+	6.450e-08	5.719e-08	-7.190	-7.243	-0.052	(0)
	MnCl+	1.594e-08	1.413e-08	-7.798	-7.850	-0.052	(0)
	MnOH+	3.475e-09	3.082e-09	-8.459	-8.511	-0.052	(0)
	MnCl2	2.715e-11	2.715e-11	-10.566	-10.566	0.000	(0)
	MnCl3-	1.147e-14	1.017e-14	-13.940	-13.993	-0.052	(0)
	MnSeO4	3.536e-15	3.536e-15	-14.451	-14.451	0.000	(0)
	MnNO3+	3.287e-17	2.844e-17	-16.483	-16.546	-0.063	(0)
	Mn (OH) 3-	4.748e-19	4.210e-19	-18.323	-18.376	-0.052	(0)
	Mn (OH) 4-2	3.270e-25	2.021e-25	-24.485	-24.694	-0.209	(0)
	Mn (NO3) 2	1.554e-28	1.554e-28	-27.809	-27.809	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-43.277	-43.277	0.000	(0)
Mn (3)		4.487e-25					
	Mn+3	4.487e-25	1.477e-25	-24.348	-24.830	-0.482	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-43.530	-43.739	-0.209	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-47.452	-47.508	-0.056	(0)
Mo		3.214e-07					
	MoO4-2	3.211e-07	1.960e-07	-6.493	-6.708	-0.214	(0)
	HMoO4-	3.051e-10	2.640e-10	-9.516	-9.578	-0.063	(0)
	H2MoO4	1.309e-13	1.309e-13	-12.883	-12.883	0.000	(0)
	Ag2MoO4	9.529e-24	9.529e-24	-23.021	-23.021	0.000	(0)
	AlMo6O21-3	4.040e-40	1.099e-40	-39.394	-39.959	-0.565	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-49.058	-51.320	-2.261	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.532	-52.102	-1.570	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.484	-54.489	-1.005	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-57.847	-58.413	-0.565	(0)
N (-3)		9.162e-10					
	NH4+	8.990e-10	7.884e-10	-9.046	-9.103	-0.057	(0)
	NH4SO4-	1.051e-11	9.316e-12	-10.979	-11.031	-0.052	(0)
	NH3	6.640e-12	6.640e-12	-11.178	-11.178	0.000	(0)
	CuNH3+2	2.712e-14	1.521e-14	-13.567	-13.818	-0.251	(0)
	CaNH3+2	1.555e-14	8.719e-15	-13.808	-14.060	-0.251	(0)
	NiNH3+2	5.115e-16	2.868e-16	-15.291	-15.542	-0.251	(0)
	AgNH3+	1.776e-16	1.536e-16	-15.751	-15.813	-0.063	(0)
	Co (NH3) +2	7.777e-17	4.361e-17	-16.109	-16.360	-0.251	(0)
	BaNH3+2	7.094e-19	3.978e-19	-18.149	-18.400	-0.251	(0)
	HgNH3+2	1.733e-23	9.717e-24	-22.761	-23.012	-0.251	(0)
	Ag (NH3) 2+	9.582e-24	8.292e-24	-23.019	-23.081	-0.063	(0)
	Ni (NH3) 2+2	4.909e-25	2.752e-25	-24.309	-24.560	-0.251	(0)
	Hg (NH3) 2+2	1.151e-25	6.451e-26	-24.939	-25.190	-0.251	(0)
	Ca (NH3) 2+2	4.110e-26	2.305e-26	-25.386	-25.637	-0.251	(0)
	Co (NH3) 2+2	2.203e-26	1.235e-26	-25.657	-25.908	-0.251	(0)
	Hg (NH3) 3+2	3.041e-36	1.705e-36	-35.517	-35.768	-0.251	(0)
	Co (NH3) 3+2	1.841e-36	1.032e-36	-35.735	-35.986	-0.251	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.795	-46.046	-0.251	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-46.193	-46.444	-0.251	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.211	-55.463	-0.251	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-57.151	-57.402	-0.251	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.302	-64.554	-0.251	(0)

Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.620	-67.185	-0.565	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.698	-68.950	-0.251	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.550	-77.613	-0.063	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.957	-82.208	-0.251	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.196	-82.447	-0.251	(0)
N (3)	2.623e-09					
NO2-	2.623e-09	2.306e-09	-8.581	-8.637	-0.056	(0)
CuNO2+	6.244e-14	5.403e-14	-13.205	-13.267	-0.063	(0)
AgNO2	5.460e-15	5.460e-15	-14.263	-14.263	0.000	(0)
CoNO2+	1.026e-15	8.875e-16	-14.989	-15.052	-0.063	(0)
Cu (NO2) 2	1.275e-21	1.275e-21	-20.895	-20.895	0.000	(0)
Ag (NO2) 2-	2.253e-23	1.949e-23	-22.647	-22.710	-0.063	(0)
N (5)	2.469e-12					
NO3-	2.461e-12	2.175e-12	-11.609	-11.663	-0.054	(0)
CaNO3+	8.291e-15	7.175e-15	-14.081	-14.144	-0.063	(0)
MnNO3+	3.287e-17	2.844e-17	-16.483	-16.546	-0.063	(0)
ZnNO3+	2.412e-18	2.087e-18	-17.618	-17.681	-0.063	(0)
CuNO3+	1.779e-18	1.539e-18	-17.750	-17.813	-0.063	(0)
BaNO3+	1.196e-18	1.035e-18	-17.922	-17.985	-0.063	(0)
NiNO3+	5.078e-19	4.394e-19	-18.294	-18.357	-0.063	(0)
CoNO3+	2.176e-19	1.883e-19	-18.662	-18.725	-0.063	(0)
CdNO3+	3.911e-20	3.384e-20	-19.408	-19.471	-0.063	(0)
PbNO3+	2.099e-20	1.817e-20	-19.678	-19.741	-0.063	(0)
AgNO3	1.958e-20	1.958e-20	-19.708	-19.708	0.000	(0)
UO2NO3+	9.734e-26	8.423e-26	-25.012	-25.075	-0.063	(0)
CrNO3+2	1.292e-26	7.245e-27	-25.889	-26.140	-0.251	(0)
Mn (NO3) 2	1.554e-28	1.554e-28	-27.809	-27.809	0.000	(0)
VO2NO3	6.300e-29	6.300e-29	-28.201	-28.201	0.000	(0)
FeNO3+2	1.870e-29	1.049e-29	-28.728	-28.979	-0.251	(0)
Zn (NO3) 2	9.056e-31	9.056e-31	-30.043	-30.043	0.000	(0)
Co (NO3) 2	8.334e-31	8.334e-31	-30.079	-30.079	0.000	(0)
Cu (NO3) 2	4.215e-31	4.215e-31	-30.375	-30.375	0.000	(0)
Pb (NO3) 2	6.710e-32	6.710e-32	-31.173	-31.173	0.000	(0)
Cd (NO3) 2	3.689e-32	3.689e-32	-31.433	-31.433	0.000	(0)
HgNO3+	2.153e-33	1.863e-33	-32.667	-32.730	-0.063	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.774	-44.774	0.000	(0)
Na	4.444e-03					
Na+	4.407e-03	3.896e-03	-2.356	-2.409	-0.054	(0)
NaSO4-	2.598e-05	2.307e-05	-4.585	-4.637	-0.052	(0)
NaHCO3	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
NaF	4.280e-07	4.280e-07	-6.369	-6.369	0.000	(0)
NaCO3-	2.593e-07	2.303e-07	-6.586	-6.638	-0.052	(0)
NaH2BO3	7.552e-10	7.552e-10	-9.122	-9.122	0.000	(0)
NaCrO4-	2.822e-18	2.442e-18	-17.549	-17.612	-0.063	(0)
Ni	2.124e-07					
Ni+2	1.318e-07	8.043e-08	-6.880	-7.095	-0.214	(0)
NiHCO3+	5.253e-08	4.546e-08	-7.280	-7.342	-0.063	(0)
NiSO4	1.770e-08	1.770e-08	-7.752	-7.752	0.000	(0)
NiCO3	9.526e-09	9.526e-09	-8.021	-8.021	0.000	(0)
NiF+	4.065e-10	3.518e-10	-9.391	-9.454	-0.063	(0)
NiCl+	3.235e-10	2.800e-10	-9.490	-9.553	-0.063	(0)
NiOH+	1.740e-10	1.506e-10	-9.759	-9.822	-0.063	(0)
Ni (OH) 2	1.778e-12	1.778e-12	-11.750	-11.750	0.000	(0)
Ni (SO4) 2-2	1.153e-12	6.462e-13	-11.938	-12.190	-0.251	(0)
NiCl2	1.918e-15	1.918e-15	-14.717	-14.717	0.000	(0)
NiNH3+2	5.115e-16	2.868e-16	-15.291	-15.542	-0.251	(0)
Ni (OH) 3-	3.055e-16	2.644e-16	-15.515	-15.578	-0.063	(0)
NiSeO4	5.991e-17	5.991e-17	-16.223	-16.223	0.000	(0)
NiNO3+	5.078e-19	4.394e-19	-18.294	-18.357	-0.063	(0)
Ni (NH3) 2+2	4.909e-25	2.752e-25	-24.309	-24.560	-0.251	(0)
O (0)	2.476e-35					
O2	1.238e-35	1.243e-35	-34.907	-34.906	0.002	(0)
Pb	9.217e-09					
PbCO3	5.388e-09	5.388e-09	-8.269	-8.269	0.000	(0)
PbHCO3+	2.223e-09	1.923e-09	-8.653	-8.716	-0.063	(0)
Pb+2	9.251e-10	5.647e-10	-9.034	-9.248	-0.214	(0)
PbSO4	3.050e-10	3.050e-10	-9.516	-9.516	0.000	(0)
PbOH+	2.437e-10	2.109e-10	-9.613	-9.676	-0.063	(0)

Pb(CO3) 2-2	8.798e-11	4.933e-11	-10.056	-10.307	-0.251	(0)
PbCl+	3.150e-11	2.725e-11	-10.502	-10.565	-0.063	(0)
PbF+	8.006e-12	6.928e-12	-11.097	-11.159	-0.063	(0)
Pb(SO4) 2-2	3.614e-12	2.026e-12	-11.442	-11.693	-0.251	(0)
Pb(OH) 2	9.916e-13	9.916e-13	-12.004	-12.004	0.000	(0)
PbCl2	1.656e-13	1.656e-13	-12.781	-12.781	0.000	(0)
PbF2	2.374e-14	2.374e-14	-13.625	-13.625	0.000	(0)
Pb(OH) 3-	1.704e-16	1.474e-16	-15.769	-15.831	-0.063	(0)
PbCl3-	1.037e-16	8.969e-17	-15.984	-16.047	-0.063	(0)
PbF3-	9.060e-18	7.840e-18	-17.043	-17.106	-0.063	(0)
Pb2OH+3	6.937e-18	1.887e-18	-17.159	-17.724	-0.565	(0)
PbCl4-2	9.946e-20	5.577e-20	-19.002	-19.254	-0.251	(0)
PbNO3+	2.099e-20	1.817e-20	-19.678	-19.741	-0.063	(0)
Pb(OH) 4-2	9.575e-21	5.369e-21	-20.019	-20.270	-0.251	(0)
PbF4-2	1.165e-21	6.533e-22	-20.934	-21.185	-0.251	(0)
Pb3(OH) 4+2	1.976e-23	1.108e-23	-22.704	-22.956	-0.251	(0)
Pb4(OH) 4+4	5.026e-28	4.968e-29	-27.299	-28.304	-1.005	(0)
Pb(NO3) 2	6.710e-32	6.710e-32	-31.173	-31.173	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.270	-151.270	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.553	-228.615	-0.063	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.777	-72.777	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.583	-78.646	-0.063	(0)
H2S	0.000e+00	0.000e+00	-78.795	-78.795	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.883	-78.946	-0.063	(0)
S5-2	0.000e+00	0.000e+00	-80.590	-80.841	-0.251	(0)
S6-2	0.000e+00	0.000e+00	-81.106	-81.357	-0.251	(0)
S4-2	0.000e+00	0.000e+00	-81.186	-81.437	-0.251	(0)
S3-2	0.000e+00	0.000e+00	-81.992	-82.243	-0.251	(0)
S2-2	0.000e+00	0.000e+00	-83.008	-83.259	-0.251	(0)
S-2	0.000e+00	0.000e+00	-88.567	-88.776	-0.209	(0)
HgHS2-	0.000e+00	0.000e+00	-138.766	-138.829	-0.063	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-139.604	-139.604	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-140.116	-140.367	-0.251	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.260	-147.323	-0.063	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.480	-147.637	-0.156	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-148.833	-149.126	-0.293	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.575	-149.856	-0.281	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.608	-149.907	-0.299	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.667	-149.730	-0.063	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.931	-150.218	-0.287	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.387	-150.387	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.889	-150.889	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.270	-151.270	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.229	-159.229	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.625	-216.688	-0.063	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.192	-226.255	-0.063	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-227.070	-227.133	-0.063	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.553	-228.615	-0.063	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.814	-229.066	-0.251	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.775	-235.838	-0.063	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-303.332	-303.583	-0.251	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.110	-306.361	-0.251	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.074	-318.325	-0.251	(0)
S(6)	2.233e-03					
SO4-2	1.807e-03	1.103e-03	-2.743	-2.958	-0.214	(0)
CaSO4	2.635e-04	2.635e-04	-3.579	-3.579	0.000	(0)
MgSO4	1.317e-04	1.317e-04	-3.880	-3.880	0.000	(0)
NaSO4-	2.598e-05	2.307e-05	-4.585	-4.637	-0.052	(0)
KSO4-	3.057e-06	2.715e-06	-5.515	-5.566	-0.052	(0)
MnSO4	1.618e-06	1.618e-06	-5.791	-5.791	0.000	(0)
ZnSO4	9.215e-08	9.215e-08	-7.036	-7.036	0.000	(0)
CuSO4	5.654e-08	5.654e-08	-7.248	-7.248	0.000	(0)
NiSO4	1.770e-08	1.770e-08	-7.752	-7.752	0.000	(0)
CoSO4	1.202e-08	1.202e-08	-7.920	-7.920	0.000	(0)
HSO4-	8.246e-09	7.296e-09	-8.084	-8.137	-0.053	(0)
Zn(SO4) 2-2	1.578e-09	8.851e-10	-8.802	-9.053	-0.251	(0)
CdSO4	1.272e-09	1.272e-09	-8.896	-8.896	0.000	(0)

PbSO4	3.050e-10	3.050e-10	-9.516	-9.516	0.000	(0)
AgSO4-	2.882e-10	2.494e-10	-9.540	-9.603	-0.063	(0)
CrOHSO4	6.487e-11	6.487e-11	-10.188	-10.188	0.000	(0)
Cd(SO4) 2-2	3.374e-11	1.892e-11	-10.472	-10.723	-0.251	(0)
AlSO4+	1.982e-11	1.754e-11	-10.703	-10.756	-0.053	(0)
NH4SO4-	1.051e-11	9.316e-12	-10.979	-11.031	-0.052	(0)
Pb(SO4) 2-2	3.614e-12	2.026e-12	-11.442	-11.693	-0.251	(0)
FeSO4	3.505e-12	3.505e-12	-11.455	-11.455	0.000	(0)
Ni(SO4) 2-2	1.153e-12	6.462e-13	-11.938	-12.190	-0.251	(0)
Al(SO4) 2-	2.342e-13	2.072e-13	-12.630	-12.684	-0.053	(0)
CrSO4+	2.268e-13	1.962e-13	-12.644	-12.707	-0.063	(0)
UO2SO4	3.240e-14	3.240e-14	-13.490	-13.490	0.000	(0)
UO2(SO4) 2-2	8.399e-16	4.709e-16	-15.076	-15.327	-0.251	(0)
FeSO4+	6.728e-18	5.966e-18	-17.172	-17.224	-0.052	(0)
Cr2(OH) 2SO4+2	2.592e-18	1.453e-18	-17.586	-17.838	-0.251	(0)
VO2SO4-	1.743e-18	1.508e-18	-17.759	-17.822	-0.063	(0)
Fe(SO4) 2-	1.625e-19	1.407e-19	-18.789	-18.852	-0.063	(0)
Cr2(OH) 2(SO4) 2	9.521e-20	9.521e-20	-19.021	-19.021	0.000	(0)
VOSO4	1.591e-20	1.591e-20	-19.798	-19.798	0.000	(0)
HgSO4	6.697e-22	6.697e-22	-21.174	-21.174	0.000	(0)
CrO3SO4-2	1.121e-24	6.287e-25	-23.950	-24.202	-0.251	(0)
VS04+	1.790e-34	1.549e-34	-33.747	-33.810	-0.063	(0)
U(SO4) 2	1.605e-40	1.605e-40	-39.794	-39.794	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.486	-40.737	-0.251	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-77.550	-77.613	-0.063	(0)
Sb(3)	7.936e-20					
Sb(OH) 3	4.015e-20	4.015e-20	-19.396	-19.396	0.000	(0)
HSbO2	3.920e-20	3.920e-20	-19.407	-19.407	0.000	(0)
SbO2-	1.084e-24	9.379e-25	-23.965	-24.028	-0.063	(0)
Sb(OH) 2F	7.396e-25	7.396e-25	-24.131	-24.131	0.000	(0)
SbOF	7.274e-25	7.274e-25	-24.138	-24.138	0.000	(0)
Sb(OH) 4-	6.207e-25	5.371e-25	-24.207	-24.270	-0.063	(0)
Sb(OH) 2+	7.630e-26	6.603e-26	-25.117	-25.180	-0.063	(0)
SbO+	2.631e-26	2.277e-26	-25.580	-25.643	-0.063	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.074	-318.325	-0.251	(0)
Sb(5)	1.007e-08					
SbO3-	1.006e-08	8.706e-09	-7.997	-8.060	-0.063	(0)
Sb(OH) 6-	1.151e-11	1.018e-11	-10.939	-10.992	-0.054	(0)
SbO2+	1.323e-23	1.145e-23	-22.878	-22.941	-0.063	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.215e-40	1.052e-40	-39.915	-39.978	-0.063	(0)
H2Se	0.000e+00	0.000e+00	-43.258	-43.258	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.277	-43.277	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.558	-47.809	-0.251	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.898	-86.903	-1.005	(0)
Se(4)	7.879e-09					
HSeO3-	7.223e-09	6.251e-09	-8.141	-8.204	-0.063	(0)
SeO3-2	6.555e-10	3.676e-10	-9.183	-9.435	-0.251	(0)
H2SeO3	1.805e-13	1.805e-13	-12.743	-12.743	0.000	(0)
AgSeO3-	3.094e-15	2.677e-15	-14.509	-14.572	-0.063	(0)
Cd(SeO3) 2-2	9.770e-22	5.479e-22	-21.010	-21.261	-0.251	(0)
Ag(SeO3) 2-3	3.239e-23	8.811e-24	-22.490	-23.055	-0.565	(0)
FeHSeO3+2	1.420e-23	7.964e-24	-22.848	-23.099	-0.251	(0)
Se(6)	2.613e-12					
SeO4-2	2.609e-12	1.592e-12	-11.584	-11.798	-0.214	(0)
MnSeO4	3.536e-15	3.536e-15	-14.451	-14.451	0.000	(0)
ZnSeO4	9.420e-17	9.420e-17	-16.026	-16.026	0.000	(0)
NiSeO4	5.991e-17	5.991e-17	-16.223	-16.223	0.000	(0)
CoSeO4	4.359e-17	4.359e-17	-16.361	-16.361	0.000	(0)
HSeO4-	6.244e-18	5.403e-18	-17.205	-17.267	-0.063	(0)
CdSeO4	1.459e-18	1.459e-18	-17.836	-17.836	0.000	(0)
Zn(SeO4) 2-2	2.712e-28	1.521e-28	-27.567	-27.818	-0.251	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.213	-58.778	-0.565	(0)
U(4)	2.575e-22					
U(OH) 5-	2.569e-22	2.223e-22	-21.590	-21.653	-0.063	(0)
U(OH) 4	6.305e-25	6.305e-25	-24.200	-24.200	0.000	(0)

U(OH) 3+	1.804e-28	1.561e-28	-27.744	-27.807	-0.063	(0)
U(OH) 2+2	8.718e-33	4.888e-33	-32.060	-32.311	-0.251	(0)
UF3+	1.014e-34	8.773e-35	-33.994	-34.057	-0.063	(0)
UF2+2	5.670e-36	3.179e-36	-35.246	-35.498	-0.251	(0)
UF4	1.675e-36	1.675e-36	-35.776	-35.776	0.000	(0)
UOH+3	5.731e-38	1.559e-38	-37.242	-37.807	-0.565	(0)
UF5-	1.335e-38	1.156e-38	-37.874	-37.937	-0.063	(0)
UF+3	5.331e-39	1.450e-39	-38.273	-38.839	-0.565	(0)
UF6-2	1.084e-39	6.076e-40	-38.965	-39.216	-0.251	(0)
U(SO4) 2	1.605e-40	1.605e-40	-39.794	-39.794	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.486	-40.737	-0.251	(0)
U+4	0.000e+00	0.000e+00	-43.374	-44.379	-1.005	(0)
UC1+3	0.000e+00	0.000e+00	-44.980	-45.546	-0.565	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-170.804	-175.892	-5.088	(0)
U(5)	3.410e-17					
UO2+	3.410e-17	2.951e-17	-16.467	-16.530	-0.063	(0)
U(6)	5.296e-08					
UO2(CO3) 2-2	2.771e-08	1.554e-08	-7.557	-7.809	-0.251	(0)
UO2(CO3) 3-4	2.501e-08	2.472e-09	-7.602	-8.607	-1.005	(0)
UO2CO3	2.453e-10	2.453e-10	-9.610	-9.610	0.000	(0)
UO2F+	5.391e-13	4.665e-13	-12.268	-12.331	-0.063	(0)
UO2OH+	4.198e-13	3.633e-13	-12.377	-12.440	-0.063	(0)
UO2F2	2.342e-13	2.342e-13	-12.630	-12.630	0.000	(0)
UO2SO4	3.240e-14	3.240e-14	-13.490	-13.490	0.000	(0)
UO2+2	3.180e-14	1.941e-14	-13.498	-13.712	-0.214	(0)
UO2F3-	1.184e-14	1.024e-14	-13.927	-13.989	-0.063	(0)
UO2(SO4) 2-2	8.399e-16	4.709e-16	-15.076	-15.327	-0.251	(0)
UO2Cl+	4.948e-17	4.282e-17	-16.306	-16.368	-0.063	(0)
UO2F4-2	2.527e-17	1.417e-17	-16.597	-16.849	-0.251	(0)
(UO2) 2(OH) 2+2	3.907e-19	2.190e-19	-18.408	-18.659	-0.251	(0)
(UO2) 3(OH) 5+	1.542e-21	1.335e-21	-20.812	-20.875	-0.063	(0)
UO2NO3+	9.734e-26	8.423e-26	-25.012	-25.075	-0.063	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.694	-42.757	-0.063	(0)
V+2	0.000e+00	0.000e+00	-43.188	-43.440	-0.251	(0)
V(3)	7.889e-16					
V(OH) 3	7.889e-16	7.889e-16	-15.103	-15.103	0.000	(0)
V(OH) 2+	3.989e-26	3.452e-26	-25.399	-25.462	-0.063	(0)
VOH+2	3.954e-29	2.217e-29	-28.403	-28.654	-0.251	(0)
V+3	1.094e-33	2.975e-34	-32.961	-33.526	-0.565	(0)
VSO4+	1.790e-34	1.549e-34	-33.747	-33.810	-0.063	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-55.099	-55.664	-0.565	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-55.503	-56.508	-1.005	(0)
V(4)	1.972e-18					
V(OH) 3+	1.795e-18	1.554e-18	-17.746	-17.809	-0.063	(0)
VO+2	9.342e-20	5.238e-20	-19.030	-19.281	-0.251	(0)
VOF+	6.322e-20	5.471e-20	-19.199	-19.262	-0.063	(0)
VOSO4	1.591e-20	1.591e-20	-19.798	-19.798	0.000	(0)
VOF2	3.572e-21	3.572e-21	-20.447	-20.447	0.000	(0)
VOC1+	2.310e-22	1.999e-22	-21.636	-21.699	-0.063	(0)
VOF3-	2.550e-23	2.206e-23	-22.593	-22.656	-0.063	(0)
VOF4-2	2.766e-26	1.551e-26	-25.558	-25.809	-0.251	(0)
H2V2O4+2	2.159e-31	1.210e-31	-30.666	-30.917	-0.251	(0)
V(5)	7.650e-10					
H2VO4-	7.232e-10	6.258e-10	-9.141	-9.204	-0.063	(0)
HVO4-2	4.141e-11	2.322e-11	-10.383	-10.634	-0.251	(0)
H3VO4	4.237e-13	4.237e-13	-12.373	-12.373	0.000	(0)
H3V2O7-	1.979e-15	1.712e-15	-14.704	-14.766	-0.063	(0)
VO2+	6.479e-17	5.726e-17	-16.189	-16.242	-0.054	(0)
HV2O7-3	1.810e-17	4.925e-18	-16.742	-17.308	-0.565	(0)
VO2F	1.749e-17	1.749e-17	-16.757	-16.757	0.000	(0)
VO4-3	6.317e-18	1.719e-18	-17.199	-17.765	-0.565	(0)
VO2SO4-	1.743e-18	1.508e-18	-17.759	-17.822	-0.063	(0)
VO2F2-	1.278e-18	1.105e-18	-17.894	-17.956	-0.063	(0)
V2O7-4	1.981e-20	1.958e-21	-19.703	-20.708	-1.005	(0)
VO2F3-2	4.282e-21	2.401e-21	-20.368	-20.620	-0.251	(0)
V3O9-3	9.440e-22	2.568e-22	-21.025	-21.590	-0.565	(0)
VO2F4-3	7.560e-25	2.057e-25	-24.121	-24.687	-0.565	(0)

V4O12-4	6.780e-28	6.702e-29	-27.169	-28.174	-1.005	(0)
VO2NO3	6.300e-29	6.300e-29	-28.201	-28.201	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-69.218	-70.789	-1.570	(0)
V10O28-6	0.000e+00	0.000e+00	-69.545	-71.806	-2.261	(0)
H2V10O28-4	0.000e+00	0.000e+00	-71.746	-72.751	-1.005	(0)
Zn	8.633e-07					
Zn+2	6.258e-07	3.820e-07	-6.204	-6.418	-0.214	(0)
ZnSO4	9.215e-08	9.215e-08	-7.036	-7.036	0.000	(0)
ZnCO3	6.977e-08	6.977e-08	-7.156	-7.156	0.000	(0)
ZnHCO3+	6.399e-08	5.537e-08	-7.194	-7.257	-0.063	(0)
ZnOH+	6.563e-09	5.679e-09	-8.183	-8.246	-0.063	(0)
Zn(SO4) 2-2	1.578e-09	8.851e-10	-8.802	-9.053	-0.251	(0)
ZnF+	1.533e-09	1.327e-09	-8.814	-8.877	-0.063	(0)
ZnCl+	1.478e-09	1.305e-09	-8.830	-8.884	-0.054	(0)
ZnOHCl	2.541e-10	2.541e-10	-9.595	-9.595	0.000	(0)
Zn(OH) 2	1.338e-10	1.338e-10	-9.873	-9.873	0.000	(0)
ZnCl2	2.814e-12	2.814e-12	-11.551	-11.551	0.000	(0)
Zn(OH) 3-	1.153e-13	9.973e-14	-12.938	-13.001	-0.063	(0)
ZnCl3-	3.444e-15	3.041e-15	-14.463	-14.517	-0.054	(0)
ZnSeO4	9.420e-17	9.420e-17	-16.026	-16.026	0.000	(0)
ZnCl4-2	3.347e-18	2.068e-18	-17.475	-17.684	-0.209	(0)
ZnNO3+	2.412e-18	2.087e-18	-17.618	-17.681	-0.063	(0)
Zn(OH) 4-2	1.053e-18	5.903e-19	-17.978	-18.229	-0.251	(0)
Zn(SeO4) 2-2	2.712e-28	1.521e-28	-27.567	-27.818	-0.251	(0)
Zn(NO3) 2	9.056e-31	9.056e-31	-30.043	-30.043	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.667	-149.730	-0.063	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.889	-150.889	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.192	-226.255	-0.063	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.814	-229.066	-0.251	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.110	-306.361	-0.251	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-76.21	-69.92	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-56.84	-52.33	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-64.06	-52.33	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-98.58	-80.65	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-74.29	-54.26	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.51	-34.11	0.40	(NH4)2CrO4
(NH4)2SeO4	-30.45	-30.00	0.45	(NH4)2SeO4
Acanthite	-51.15	-87.37	-36.22	Ag2S
Ag2CO3	-10.30	-21.39	-11.09	Ag2CO3
Ag2CrO4	-20.20	-31.79	-11.59	Ag2CrO4
Ag2HVO4	-12.11	-10.63	1.48	Ag2HVO4
Ag2MoO4	-11.05	-22.60	-11.55	Ag2MoO4
Ag2O	-14.13	-1.55	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.03	-18.85	-4.82	Ag2SO4
Ag3AsO3	-27.00	-24.84	2.16	Ag3AsO3
Ag3AsO4	-15.41	-18.20	-2.79	Ag3AsO4
Ag3H2VO5	-16.58	-11.40	5.18	Ag3H2VO5
AgF:4H2O	-12.75	-11.71	1.05	AgF:4H2O
Agmetal	-0.04	-13.55	-13.51	Ag
AgVO3	-10.62	-9.85	0.77	AgVO3
Al(OH)3(am)	-0.98	9.82	10.80	Al(OH)3
Al2(MoO4)3	-45.87	-43.50	2.37	Al2(MoO4)3
Al2O3	-0.01	19.64	19.65	Al2O3
Al4(OH)10SO4	-0.72	21.98	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.85	-6.05	4.80	AlAsO4:2H2O
AlOHSO4	-4.25	-7.48	-3.23	AlOHSO4
AlSb	-151.83	-86.21	65.62	AlSb
Alunite	-0.02	-1.42	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.42	-12.21	-7.79	PbSO4
Anhydrite	-1.58	-5.94	-4.36	CaSO4

Anilite	-55.61	-87.48	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-3.02	5.77	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-87.30	-90.06	-2.76	As ₄ O ₆
Artinite	-7.13	2.47	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-38.44	-31.74	6.71	As ₂ O ₅
Atacamite	-2.05	5.34	7.39	Cu ₂ (OH) ₃ Cl
Azurite	0.30	-16.61	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.08	7.32	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-19.39	-3.51	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.88	-9.79	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-29.14	3.80	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.25	-22.92	-9.67	BaCrO ₄
BaF ₂	-8.72	-14.54	-5.82	BaF ₂
BaMoO ₄	-6.77	-13.73	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.89	-8.06	1.83	BaSeO ₃
BaSeO ₄	-11.36	-18.82	-7.46	BaSeO ₄
Bianchite	-7.61	-9.38	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-8.64	9.45	18.09	MnO ₂
Bixbyite	-6.00	-6.64	-0.64	Mn ₂ O ₃
BlaubleiI	-55.21	-79.37	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.84	-83.12	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.24	9.82	8.58	AlOOH
Breithauptite	-57.49	-76.01	-18.52	NiSb
Brochantite	-1.76	13.46	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.69	11.16	16.84	Mg(OH) ₂
Bunsenite	-5.20	7.24	12.45	NiO
Ca(VO ₃) ₂	-12.45	-6.79	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-12.93	4.57	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-16.98	4.57	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-19.97	2.33	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-23.03	15.93	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-23.94	15.92	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-300.96	-157.99	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-9.50	-27.41	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.74	-9.69	-7.95	CaMoO ₄
Carnotite	-4.97	-4.74	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.83	-4.02	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.76	-14.78	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.50	-3.66	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.61	6.03	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.70	6.03	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.21	-16.50	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.76	0.80	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.57	6.83	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.38	-14.04	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.35	-14.04	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.13	-14.04	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.61	-15.83	-1.21	CdF ₂
Cdmetal(alpha)	-33.03	-19.51	13.51	Cd
Cdmetal(gamma)	-33.13	-19.51	13.62	Cd
CdMoO ₄	-0.87	-15.02	-14.15	CdMoO ₄
CdOHCl	-7.54	-4.01	3.54	CdOHCl
CdSb	-76.88	-77.23	-0.35	CdSb
CdSe	-20.92	-41.12	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.26	-20.11	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-11.09	-11.27	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.54	-11.27	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.39	-11.27	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.06	-10.81	-9.75	AgCl
Cerrusite	-1.62	-14.75	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-6.97	-9.61	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.68	-90.60	-34.92	Cu ₂ S

Chalcopyrite	-125.22	-160.49	-35.27	CuFeS2
Cinnabar	-52.61	-98.30	-45.69	HgS
Claudetite	-87.00	-90.06	-3.06	As4O6
Clausthalite	-14.96	-42.06	-27.10	PbSe
Co(BO2)2	-29.69	-2.62	27.07	Co(BO2)2
Co(OH)2	-6.02	7.08	13.09	Co(OH)2
Co(OH)3	-10.24	-12.55	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-23.54	-10.51	13.03	Co3(AsO4)2
Co3O4	-7.53	-18.03	-10.50	Co3O4
CoCl2	-21.26	-13.00	8.27	CoCl2
CoCl2:6H2O	-15.53	-13.00	2.54	CoCl2:6H2O
CoCO3	-2.78	-12.76	-9.98	CoCO3
CoF2	-13.18	-14.78	-1.60	CoF2
CoF3	-43.88	-45.34	-1.46	CoF3
CoFe2O4	16.99	13.46	-3.53	CoFe2O4
CoMoO4	-6.21	-13.97	-7.76	CoMoO4
CoO	-6.51	7.08	13.59	CoO
CoS(alpha)	-71.30	-78.74	-7.44	CoS
CoS(beta)	-67.67	-78.74	-11.07	CoS
CoSe	-23.87	-40.07	-16.20	CoSe
CoSeO3	-9.62	-8.30	1.32	CoSeO3
CoSeO4:6H2O	-17.53	-19.06	-1.53	CoSeO4:6H2O
CoSO4	-13.02	-10.22	2.80	CoSO4
CoSO4:6H2O	-7.75	-10.22	-2.47	CoSO4:6H2O
Cotunnite	-10.20	-14.98	-4.78	PbCl2
Covellite	-55.83	-78.13	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.17	-31.08	14.09	CrCl2
CrCl3	-46.40	-31.29	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.63	-41.47	-33.84	Na3AlF6
Cu(OH)2	-0.99	7.69	8.67	Cu(OH)2
Cu(SbO3)2	-25.22	19.99	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-12.71	-3.45	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.85	-90.74	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.13	-51.93	-45.80	Cu2Se
Cu2SO4	-20.13	-22.08	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.77	-8.67	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-60.62	-103.21	-42.59	Cu3Sb
Cu3Se2	-27.90	-91.39	-63.49	Cu3Se2
CuCO3	-0.65	-12.15	-11.50	CuCO3
CuCrO4	-17.11	-22.55	-5.44	CuCrO4
CuF	-8.42	-13.32	-4.91	CuF
CuF2	-15.28	-14.17	1.12	CuF2
CuF2:2H2O	-9.62	-14.17	-4.55	CuF2:2H2O
Cumetal	-6.41	-15.17	-8.76	Cu
CuMoO4	-0.28	-13.36	-13.08	CuMoO4
CuOCuSO4	-12.22	-1.92	10.30	CuOCuSO4
Cupricferrite	8.08	14.07	5.99	CuFe2O4
Cuprite	-3.38	-4.79	-1.41	Cu2O
Cuprousferrite	9.71	0.80	-8.92	CuFeO2
CuSe	-6.36	-39.46	-33.10	CuSe
CuSe2	-27.70	-61.06	-33.37	CuSe2
CuSeO3:2H2O	-8.20	-7.69	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.01	-18.45	-2.44	CuSeO4:5H2O
CuSO4	-12.55	-9.61	2.94	CuSO4
Diaspore	2.95	9.82	6.87	AlOOH
Djurleite	-55.86	-89.78	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.62	-17.16	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.07	-17.16	-17.09	CaMg(CO3)2
Epsomite	-4.01	-6.14	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2

Fe (OH) 2.7Cl.3	3.22	0.18	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.97	-14.69	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.55	-8.99	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-19.11	-39.74	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.77	-45.51	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.08	-12.68	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.50	-17.60	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.70	-65.30	-18.60	FeSe2
FeS (ppt)	-79.41	-82.36	-2.95	FeS
FeSe	-32.70	-43.70	-11.00	FeSe
Fix_pe	-5.60	-5.60	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.75	-80.72	-13.97	PbS
Gibbsite	1.53	9.82	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.37	-9.38	-2.01	ZnSO4:7H2O
Greenockite	-65.42	-79.78	-14.36	CdS
Greigite	-288.39	-333.43	-45.03	Fe3S4
Gummite	-7.05	0.63	7.67	UO3
Gypsum	-1.33	-5.94	-4.61	CaSO4:2H2O
H-Jarosite	-12.92	-25.02	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.17	-21.05	-12.88	H2MoO4
H2S (g)	-77.81	-85.82	-8.01	H2S
H2Se (g)	-42.19	-47.15	-4.96	H2Se
Halite	-6.88	-5.28	1.60	NaCl
Hausmannite	-7.72	53.31	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	0.20	23.09	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.82	-256.52	-73.71	Hg (CH3) 2
Hg (g)	-8.57	-16.44	-7.87	Hg
Hg (OH) 2	-8.99	-12.49	-3.50	Hg (OH) 2
Hg2 (g)	-17.93	-32.88	-14.96	Hg2
Hg2 (OH) 2	-12.60	-7.34	5.26	Hg2 (OH) 2
Hg2CO3	-11.13	-27.18	-16.05	Hg2CO3
Hg2CrO4	-28.88	-37.58	-8.70	Hg2CrO4
Hg2F2	-18.83	-29.20	-10.36	Hg2F2
Hg2S	-81.48	-93.15	-11.68	Hg2S
Hg2SeO3	-18.06	-22.71	-4.66	Hg2SeO3
Hg2SO4	-18.51	-24.64	-6.13	Hg2SO4
Hg3O2CO3	-27.62	-57.31	-29.68	Hg3O2CO3
HgCl (g)	-33.20	-13.71	19.50	HgCl
HgCl2	-11.30	-32.56	-21.26	HgCl2
HgF (g)	-47.27	-14.60	32.68	HgF
HgF2 (g)	-46.91	-34.35	12.57	HgF2
Hgmetal (l)	-2.99	-16.44	-13.45	Hg
HgSe	-3.94	-59.64	-55.69	HgSe
HgSeO3	-15.43	-27.86	-12.43	HgSeO3
HgSO4	-20.37	-29.79	-9.42	HgSO4
Huntite	-4.56	-34.52	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.63	-24.40	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.80	-23.57	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.89	-21.06	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.51	-21.31	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.81	-53.05	-17.24	K2Cr2O7
K2CrO4	-22.30	-22.82	-0.51	K2CrO4
K2MoO4	-16.89	-13.63	3.26	K2MoO4
K2SeO4	-17.99	-18.72	-0.73	K2SeO4
Langite	-4.03	13.46	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.68	-7.12	-0.43	PbO:PbSO4
Laurionite	-5.57	-4.95	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.60	5.09	12.69	PbO
Mackinawite	-78.76	-82.36	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3

Magnesioferrite	0.68	17.54	16.86	Fe2MgO4
Magnesite	-1.22	-8.68	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.85	-4.46	-5.31	Cu2 (OH) 2CO3
Manganite	-3.31	22.03	25.34	MnOOH
Massicot	-7.80	5.09	12.89	PbO
Matlockite	-6.90	-15.87	-8.97	PbClF
Melanothallite	-18.64	-12.38	6.26	CuCl2
Melanterite	-11.64	-13.85	-2.21	FeSO4:7H2O
Metacinnabar	-53.21	-98.30	-45.09	HgS
Mg (OH) 2 (active)	-7.64	11.16	18.79	Mg (OH) 2
Mg (VO3) 2	-18.27	-6.99	11.28	Mg (VO3) 2
Mg2Sb3	-276.60	-201.92	74.68	Mg2Sb3
Mg2V2O7	-22.19	4.17	26.36	Mg2V2O7
MgCr2O4	-7.40	8.80	16.20	MgCr2O4
MgCrO4	-24.46	-19.08	5.38	MgCrO4
MgF2	-2.57	-10.70	-8.13	MgF2
MgMoO4	-8.04	-9.89	-1.85	MgMoO4
MgSeO3:6H2O	-7.27	-4.22	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.78	-14.98	-1.20	MgSeO4:6H2O
Minium	-32.71	40.82	73.52	Pb3O4
Mirabilite	-6.66	-7.78	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-13.79	-8.89	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.82	-58.53	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.37	-90.29	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-16.47	-3.97	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.53	-10.82	2.72	MnCl2:4H2O
MnS (grn)	-76.73	-76.56	0.17	MnS
MnS (pnk)	-79.90	-76.56	3.34	MnS
MnSb	-96.44	-99.35	-2.91	MnSb
MnSe	-41.39	-37.89	3.50	MnSe
MnSeO3	-7.25	-6.12	1.13	MnSeO3
MnSeO3:2H2O	-7.10	-6.12	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.83	-16.88	-2.05	MnSeO4:5H2O
MnSO4	-10.62	-8.04	2.58	MnSO4
Monteponite	-9.07	6.03	15.10	CdO
Montroydite	-8.85	-12.49	-3.64	HgO
MoO3	-13.05	-21.05	-8.00	MoO3
Morenosite	-7.91	-10.05	-2.14	NiSO4:7H2O
MoS2	-147.96	-218.22	-70.26	MoS2
Na-Jarosite	-9.06	-20.26	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.06	-50.96	-9.90	Na2Cr2O7
Na2CrO4	-23.65	-20.72	2.93	Na2CrO4
Na2Mo2O7	-15.98	-32.57	-16.60	Na2Mo2O7
Na2MoO4	-13.02	-11.53	1.49	Na2MoO4
Na2MoO4:2H2O	-12.75	-11.53	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.15	-5.85	10.30	Na2SeO3:5H2O
Na2SeO4	-17.90	-16.62	1.28	Na2SeO4
Na3Sb	-176.20	-81.75	94.45	Na3Sb
Na3VO4	-31.47	5.21	36.68	Na3VO4
Na4V2O7	-36.51	0.89	37.40	Na4V2O7
Nantokite	-5.70	-12.43	-6.73	CuCl
NaSb	-88.89	-65.73	23.17	NaSb
Natron	-9.01	-10.32	-1.31	Na2CO3:10H2O
NaVO3	-8.17	-4.31	3.86	NaVO3
Nesquehonite	-4.01	-8.68	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.55	7.24	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-25.71	-10.01	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-20.32	11.68	32.00	Ni4 (OH) 6SO4
NiCO3	-5.72	-12.59	-6.87	NiCO3
NiMoO4	-2.66	-13.80	-11.14	NiMoO4
NiS (alpha)	-72.97	-78.57	-5.60	NiS
NiS (beta)	-67.47	-78.57	-11.10	NiS
NiS (gamma)	-65.77	-78.57	-12.80	NiS
NiSe	-22.20	-39.90	-17.70	NiSe
NiSeO3:2H2O	-10.94	-8.13	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.37	-18.89	-1.52	NiSeO4:6H2O
Nsutite	-8.05	9.45	17.50	MnO2

O2(g)	-32.00	51.09	83.09	O2
Orpiment	-241.41	-302.48	-61.07	As2S3
Otavite	-1.81	-13.81	-12.00	CdCO3
Pb(BO2)2	-11.12	-4.60	6.52	Pb(BO2)2
Pb(OH)2	-3.06	5.09	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-59.36	-68.12	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.65	0.15	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-16.01	10.18	26.19	Pb2O(OH)2
Pb2O3	-25.31	35.73	61.04	Pb2O3
Pb2OCO3	-9.10	-9.66	-0.56	Pb2OCO3
Pb2V2O7	-6.06	-7.96	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.27	-16.47	5.80	Pb3(AsO4)2
Pb3(VO4)2	-9.01	-2.87	6.14	Pb3(VO4)2
Pb3O2CO3	-15.59	-4.57	11.02	Pb3O2CO3
Pb3O2SO4	-12.71	-2.02	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.03	3.07	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.81	3.07	21.88	Pb4O3SO4
PbCrO4	-12.55	-25.15	-12.60	PbCrO4
PbF2	-9.33	-16.77	-7.44	PbF2
Pbmetal	-24.70	-20.45	4.25	Pb
PbMoO4	-0.34	-15.96	-15.62	PbMoO4
PbO:0.3H2O	-7.89	5.09	12.98	PbO:0.33H2O
PbSeO4	-14.21	-21.05	-6.84	PbSeO4
Periclase	-10.43	11.16	21.58	MgO
Phosgenite	-9.92	-29.73	-19.81	PbCl2:PbCO3
Plattnerite	-18.96	30.64	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-124.13	-142.63	-18.51	FeS2
Pyrochroite	-5.94	9.26	15.19	Mn(OH)2
Pyrolusite	-6.58	34.80	41.38	MnO2
Realgar	-101.36	-121.10	-19.75	AsS
Retgersite	-8.01	-10.05	-2.04	NiSO4:6H2O
Rhodochrosite	-0.00	-10.58	-10.58	MnCO3
Rutherfordine	-4.71	-19.21	-14.50	UO2CO3
Sb(OH)3	-12.29	-19.40	-7.11	Sb(OH)3
Sb2O4	-16.65	-13.25	3.40	Sb2O4
Sb2O5	-26.66	-36.32	-9.67	Sb2O5
Sb2Se3	-112.48	-180.23	-67.76	Sb2Se3
Sb4O6(cubic)	-59.32	-77.58	-18.26	Sb4O6
Sb4O6(orth)	-59.68	-77.58	-17.90	Sb4O6
SbCl3	-50.08	-49.50	0.57	SbCl3
SbF3	-41.96	-52.18	-10.23	SbF3
Sbmetal	-46.02	-57.71	-11.69	Sb
SbO2	-3.11	-30.93	-27.82	SbO2
Schoepite	-5.37	0.63	5.99	UO2(OH)2:H2O
Semetal(am)	-14.49	-21.60	-7.11	Se
Semetal(hex)	-13.89	-21.60	-7.71	Se
Senarmontite	-26.43	-38.79	-12.37	Sb2O3
SeO2	-15.50	-15.37	0.12	SeO2
SeO3	-47.18	-26.14	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.92	-11.92	-10.00	ZnCO3
Sphalerite	-66.44	-77.89	-11.45	ZnS
Spinel	-6.05	30.79	36.85	MgAl2O4
Stibnite	-245.78	-296.24	-50.46	Sb2S3
Sulfur	-58.13	-60.27	-2.14	S
Tenorite	0.04	7.69	7.64	CuO
Thenardite	-8.10	-7.78	0.32	Na2SO4
Thermonatrite	-10.95	-10.32	0.64	Na2CO3:H2O
Tyuyamunite	-9.62	-5.54	4.08	Ca(UO2)2(VO4)2
U3O8	-17.10	3.98	21.08	U3O8
U3Sb4	-583.61	-431.23	152.38	U3Sb4
U4O9	-34.24	-37.26	-3.02	U4O9
UF4	-29.88	-59.42	-29.54	UF4
UF4:2.5H2O	-26.70	-59.42	-32.72	UF4:2.5H2O
UO2(am)	-16.64	-15.70	0.93	UO2
UO2(NO3)2	-49.18	-37.04	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.89	-37.04	4.85	UO2(NO3)2:2H2O

UO2 (NO3) 2:3H2O	-40.43	-37.04	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-39.08	-37.04	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.99	0.63	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-23.26	-25.51	-2.25	UO2SeO4:4H2O
UO3	-7.07	0.63	7.70	UO3
Uraninite	-11.03	-15.70	-4.67	UO2
USb2	-221.01	-191.43	29.58	USb2
V (OH) 3	-19.61	-12.02	7.59	V (OH) 3
V2O5	-16.79	-18.15	-1.36	V2O5
V3O5	-42.21	-40.37	1.84	V3O5
V4O7	-52.50	-45.31	7.19	V4O7
V6O13	-44.67	-105.53	-60.86	V6O13
Valentinite	-30.31	-38.79	-8.48	Sb2O3
VC12	-63.74	-44.86	18.87	VC12
VC13	-65.56	-42.13	23.43	VC13
VF4	-63.59	-48.66	14.93	VF4
Vmetal	-94.36	-50.34	44.03	V
VO	-39.55	-24.79	14.76	VO
VO (OH) 2	-10.09	-4.94	5.15	VO (OH) 2
VO2Cl	-21.95	-19.11	2.84	VO2Cl
VOC1	-33.21	-22.05	11.15	VOC1
VOC12	-37.77	-25.01	12.76	VOC12
VOSO4	-25.85	-22.24	3.61	VOSO4
Witherite	-3.95	-12.52	-8.57	BaCO3
Wurtzite	-68.94	-77.89	-8.95	ZnS
Zincite	-3.41	7.92	11.33	ZnO
Zincosite	-13.31	-9.38	3.93	ZnSO4
Zn (BO2) 2	-10.06	-1.77	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-33.06	-29.74	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-4.28	7.92	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.55	7.92	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.83	7.92	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.61	7.92	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.81	7.92	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.95	-1.45	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.39	5.81	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-21.63	-7.98	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.74	-10.83	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-14.01	14.39	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.97	19.53	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.20	-12.15	7.05	ZnCl2
ZnCO3:1H2O	-1.66	-11.92	-10.26	ZnCO3:1H2O
ZnF2	-13.40	-13.94	-0.53	ZnF2
Znmetal	-43.41	-17.62	25.79	Zn
ZnMoO4	-3.00	-13.13	-10.13	ZnMoO4
ZnO (active)	-3.27	7.92	11.19	ZnO
ZnS (am)	-68.84	-77.89	-9.05	ZnS
ZnSb	-86.35	-75.34	11.01	ZnSb
ZnSe	-24.83	-39.23	-14.40	ZnSe
ZnSeO4:6H2O	-16.70	-18.22	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.74	-9.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 72.

```

Title Stage 4 Run-off mix
Mix 402
1      1
3      0.074265
4      0.247942

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5      0.229509
6      0.031643
7      0.158786
8      0.001372
9      3.063046
10     5.756604
11     12.715171
12     48.677294
13     43.332968
14     12.624826
15     5.995291

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Save solution 405
end

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TITLE
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Stage 4 Run-off mix

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Beginning of batch-reaction calculations.
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Reaction step 1.

Using mix 402.

Mixture 402.

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1.000e+00 Solution 1      Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
7.426e-02 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
2.479e-01 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
2.295e-01 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
3.164e-02 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
1.588e-01 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
1.372e-03 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
3.063e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
5.757e+00 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.272e+01 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
4.868e+01 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
4.333e+01 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
1.262e+01 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
5.995e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

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-----Solution composition-----

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Elements	Molality	Moles
Al	1.091e-06	1.460e-04
As	6.076e-10	8.137e-08
B	4.448e-07	5.956e-05
Ba	1.311e-07	1.756e-05
C	7.279e-04	9.748e-02

Ca	3.340e-04	4.473e-02
Cd	1.132e-09	1.516e-07
Cl	3.916e-05	5.244e-03
Co	4.645e-10	6.220e-08
Cr	1.840e-10	2.463e-08
Cu	2.559e-06	3.427e-04
F	3.499e-05	4.685e-03
Fe	2.596e-07	3.477e-05
Hg	4.059e-11	5.435e-09
K	6.966e-05	9.328e-03
Mg	8.869e-05	1.188e-02
Mn	1.084e-06	1.452e-04
Mo	4.185e-08	5.604e-06
N	1.686e-07	2.258e-05
Na	1.234e-04	1.652e-02
Ni	6.929e-11	9.279e-09
Pb	3.180e-09	4.258e-07
S	2.717e-04	3.638e-02
Sb	4.668e-10	6.251e-08
Se	3.532e-09	4.730e-07
U	1.184e-08	1.586e-06
V	1.018e-08	1.363e-06
Zn	1.147e-07	1.536e-05

-----Description of solution-----

	pH =	6.490	Charge balance
	pe =	6.414	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.675e-03	
	Mass of water (kg) =	1.339e+02	
	Total alkalinity (eq/kg) =	4.322e-04	
	Total CO2 (mol/kg) =	7.279e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An) =	0.00		
	Iterations =	13	
	Total H =	1.486584e+04	
	Total O =	7.433287e+03	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.388e-07	3.237e-07	-6.470	-6.490	-0.020	0.00
OH-	3.257e-08	3.111e-08	-7.487	-7.507	-0.020	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.091e-06					
AlF2+	4.810e-07	4.599e-07	-6.318	-6.337	-0.019	(0)
Al(OH) 4-	2.267e-07	2.167e-07	-6.644	-6.664	-0.020	(0)
AlF3	1.828e-07	1.828e-07	-6.738	-6.738	0.000	(0)
Al(OH) 2+	9.322e-08	8.913e-08	-7.030	-7.050	-0.019	(0)
Al(OH) 3	5.533e-08	5.533e-08	-7.257	-7.257	0.000	(0)
AlF+2	4.378e-08	3.660e-08	-7.359	-7.437	-0.078	(0)
AlOH+2	4.315e-09	3.607e-09	-8.365	-8.443	-0.078	(0)
AlF4-	3.026e-09	2.892e-09	-8.519	-8.539	-0.020	(0)
AlSO4+	2.006e-10	1.917e-10	-9.698	-9.717	-0.020	(0)
Al+3	1.747e-10	1.159e-10	-9.758	-9.936	-0.178	(0)
Al(SO4) 2-	4.578e-13	4.375e-13	-12.339	-12.359	-0.020	(0)
AlMo6O21-3	3.513e-39	2.280e-39	-38.454	-38.642	-0.188	(0)
As (3)	2.885e-21					
H3AsO3	2.880e-21	2.880e-21	-20.541	-20.541	0.000	(0)
H2AsO3-	4.788e-24	4.563e-24	-23.320	-23.341	-0.021	(0)
H4AsO3+	4.845e-28	4.618e-28	-27.315	-27.336	-0.021	(0)
HAsO3-2	1.558e-29	1.286e-29	-28.807	-28.891	-0.083	(0)
AsO3-3	2.360e-36	1.531e-36	-35.627	-35.815	-0.188	(0)

As (5)	6.076e-10					
H2AsO4-	4.367e-10	4.162e-10	-9.360	-9.381	-0.021	(0)
HAsO4-2	1.709e-10	1.410e-10	-9.767	-9.851	-0.083	(0)
H3AsO4	2.340e-14	2.341e-14	-13.631	-13.631	0.000	(0)
AsO4-3	2.123e-15	1.378e-15	-14.673	-14.861	-0.188	(0)
B	4.448e-07					
H3BO3	4.439e-07	4.441e-07	-6.353	-6.353	0.000	(0)
H2BO3-	8.348e-10	7.969e-10	-9.078	-9.099	-0.020	(0)
CaH2BO3+	1.276e-11	1.218e-11	-10.894	-10.914	-0.020	(0)
BF(OH) 3-	5.860e-12	5.594e-12	-11.232	-11.252	-0.020	(0)
MgH2BO3+	2.059e-12	1.965e-12	-11.686	-11.707	-0.020	(0)
NaH2BO3	1.487e-13	1.487e-13	-12.828	-12.828	0.000	(0)
BF2(OH) 2-	6.401e-15	6.110e-15	-14.194	-14.214	-0.020	(0)
BaH2BO3+	2.810e-15	2.682e-15	-14.551	-14.572	-0.020	(0)
H5(BO3) 2-	3.156e-16	3.012e-16	-15.501	-15.521	-0.020	(0)
BF3OH-	2.544e-20	2.429e-20	-19.594	-19.615	-0.020	(0)
H8(BO3) 3-	1.401e-20	1.338e-20	-19.853	-19.874	-0.020	(0)
BF4-	1.279e-24	1.221e-24	-23.893	-23.913	-0.020	(0)
Ba	1.311e-07					
Ba+2	1.307e-07	1.089e-07	-6.884	-6.963	-0.079	(0)
BaHCO3+	4.444e-10	4.250e-10	-9.352	-9.372	-0.019	(0)
BaCO3	3.306e-12	3.306e-12	-11.481	-11.481	0.000	(0)
BaOH+	1.547e-14	1.479e-14	-13.810	-13.830	-0.020	(0)
BaH2BO3+	2.810e-15	2.682e-15	-14.551	-14.572	-0.020	(0)
BaNO3+	7.013e-17	6.684e-17	-16.154	-16.175	-0.021	(0)
BaNH3+2	1.316e-17	1.086e-17	-16.881	-16.964	-0.083	(0)
C (4)	7.279e-04					
HCO3-	4.274e-04	4.086e-04	-3.369	-3.389	-0.019	(0)
H2CO3	2.975e-04	2.975e-04	-3.527	-3.527	0.000	(0)
CaHCO3+	2.114e-06	2.022e-06	-5.675	-5.694	-0.019	(0)
CuCO3	5.152e-07	5.152e-07	-6.288	-6.288	0.000	(0)
MgHCO3+	3.113e-07	2.974e-07	-6.507	-6.527	-0.020	(0)
CO3-2	7.102e-08	5.919e-08	-7.149	-7.228	-0.079	(0)
CuHCO3+	3.999e-08	3.811e-08	-7.398	-7.419	-0.021	(0)
NaHCO3	2.705e-08	2.705e-08	-7.568	-7.568	0.000	(0)
CaCO3	2.492e-08	2.492e-08	-7.603	-7.603	0.000	(0)
MnHCO3+	7.342e-09	7.018e-09	-8.134	-8.154	-0.020	(0)
UO2(CO3) 2-2	6.823e-09	5.630e-09	-8.166	-8.249	-0.083	(0)
UO2CO3	4.767e-09	4.767e-09	-8.322	-8.322	0.000	(0)
MgCO3	3.502e-09	3.502e-09	-8.456	-8.456	0.000	(0)
ZnHCO3+	1.227e-09	1.169e-09	-8.911	-8.932	-0.021	(0)
PbHCO3+	5.369e-10	5.117e-10	-9.270	-9.291	-0.021	(0)
BaHCO3+	4.444e-10	4.250e-10	-9.352	-9.372	-0.019	(0)
ZnCO3	3.081e-10	3.081e-10	-9.511	-9.511	0.000	(0)
PbCO3	2.999e-10	2.999e-10	-9.523	-9.523	0.000	(0)
NaCO3-	1.357e-10	1.298e-10	-9.867	-9.887	-0.019	(0)
Cu(CO3) 2-2	9.947e-11	8.207e-11	-10.002	-10.086	-0.083	(0)
UO2(CO3) 3-4	3.603e-11	1.670e-11	-10.443	-10.777	-0.334	(0)
FeHCO3+	2.164e-11	2.070e-11	-10.665	-10.684	-0.019	(0)
CoHCO3+	1.200e-11	1.144e-11	-10.921	-10.942	-0.021	(0)
BaCO3	3.306e-12	3.306e-12	-11.481	-11.481	0.000	(0)
NiHCO3+	2.820e-12	2.687e-12	-11.550	-11.571	-0.021	(0)
CdCO3	1.215e-12	1.215e-12	-11.915	-11.915	0.000	(0)
CdHCO3+	8.791e-13	8.378e-13	-12.056	-12.077	-0.021	(0)
CoCO3	3.601e-13	3.601e-13	-12.444	-12.444	0.000	(0)
NiCO3	1.178e-13	1.178e-13	-12.929	-12.929	0.000	(0)
Pb(CO3) 2-2	6.204e-14	5.119e-14	-13.207	-13.291	-0.083	(0)
HgCO3	2.085e-15	2.085e-15	-14.681	-14.681	0.000	(0)
Cd(CO3) 2-2	6.461e-17	5.331e-17	-16.190	-16.273	-0.083	(0)
HgHCO3+	1.318e-17	1.257e-17	-16.880	-16.901	-0.021	(0)
Hg(CO3) 2-2	4.729e-19	3.902e-19	-18.325	-18.409	-0.083	(0)
Ca	3.340e-04					
Ca+2	3.188e-04	2.657e-04	-3.496	-3.576	-0.079	(0)
CaSO4	1.296e-05	1.296e-05	-4.887	-4.887	0.000	(0)
CaHCO3+	2.114e-06	2.022e-06	-5.675	-5.694	-0.019	(0)
CaF+	9.575e-08	9.153e-08	-7.019	-7.038	-0.020	(0)
CaCO3	2.492e-08	2.492e-08	-7.603	-7.603	0.000	(0)
CaOH+	1.724e-10	1.649e-10	-9.763	-9.783	-0.019	(0)

	CaH2BO3+	1.276e-11	1.218e-11	-10.894	-10.914	-0.020	(0)
	CaNO3+	1.079e-13	1.029e-13	-12.967	-12.988	-0.021	(0)
	CaNH3+2	6.406e-14	5.286e-14	-13.193	-13.277	-0.083	(0)
	Ca (NH3) 2+2	4.030e-24	3.326e-24	-23.395	-23.478	-0.083	(0)
Cd		1.132e-09					
	Cd+2	1.081e-09	9.006e-10	-8.966	-9.045	-0.079	(0)
	CdSO4	4.497e-11	4.497e-11	-10.347	-10.347	0.000	(0)
	CdCl+	3.377e-12	3.218e-12	-11.471	-11.492	-0.021	(0)
	CdCO3	1.215e-12	1.215e-12	-11.915	-11.915	0.000	(0)
	CdHCO3+	8.791e-13	8.378e-13	-12.056	-12.077	-0.021	(0)
	CdF+	4.728e-13	4.506e-13	-12.325	-12.346	-0.021	(0)
	CdOH+	2.335e-13	2.226e-13	-12.632	-12.653	-0.021	(0)
	Cd (SO4) 2-2	1.566e-13	1.292e-13	-12.805	-12.889	-0.083	(0)
	CdOHC1	4.107e-15	4.107e-15	-14.386	-14.386	0.000	(0)
	CdCl2	5.020e-16	5.020e-16	-15.299	-15.299	0.000	(0)
	Cd (CO3) 2-2	6.461e-17	5.331e-17	-16.190	-16.273	-0.083	(0)
	Cd (OH) 2	4.368e-17	4.368e-17	-16.360	-16.360	0.000	(0)
	CdF2	2.838e-17	2.838e-17	-16.547	-16.547	0.000	(0)
	CdNO3+	3.659e-19	3.487e-19	-18.437	-18.458	-0.021	(0)
	CdSeO4	5.438e-20	5.438e-20	-19.265	-19.265	0.000	(0)
	CdCl3-	1.244e-20	1.185e-20	-19.905	-19.926	-0.021	(0)
	Cd2OH+3	1.548e-21	1.005e-21	-20.810	-20.998	-0.188	(0)
	Cd (OH) 3-	8.711e-23	8.303e-23	-22.060	-22.081	-0.021	(0)
	Cd (SeO3) 2-2	1.498e-24	1.236e-24	-23.824	-23.908	-0.083	(0)
	Cd (NO3) 2	2.140e-29	2.140e-29	-28.670	-28.670	0.000	(0)
	Cd (OH) 4-2	5.124e-31	4.228e-31	-30.290	-30.374	-0.083	(0)
	CdHS+	0.000e+00	0.000e+00	-80.750	-80.771	-0.021	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-153.301	-153.301	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-231.114	-231.135	-0.021	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-308.589	-308.673	-0.083	(0)
Cl		3.916e-05					
	Cl-	3.916e-05	3.742e-05	-4.407	-4.427	-0.020	(0)
	CuCl+	9.176e-11	8.767e-11	-10.037	-10.057	-0.020	(0)
	MnCl+	4.242e-11	4.055e-11	-10.372	-10.392	-0.020	(0)
	CuCl	1.314e-11	1.314e-11	-10.881	-10.881	0.000	(0)
	ZnCl+	8.900e-12	8.503e-12	-11.051	-11.070	-0.020	(0)
	CdCl+	3.377e-12	3.218e-12	-11.471	-11.492	-0.021	(0)
	PbCl+	2.348e-12	2.238e-12	-11.629	-11.650	-0.021	(0)
	ZnOHC1	3.463e-13	3.463e-13	-12.461	-12.461	0.000	(0)
	CuCl2-	1.075e-13	1.028e-13	-12.968	-12.988	-0.020	(0)
	HgClOH	6.051e-14	6.051e-14	-13.218	-13.218	0.000	(0)
	CoCl+	4.889e-14	4.659e-14	-13.311	-13.332	-0.021	(0)
	NiCl+	5.359e-15	5.108e-15	-14.271	-14.292	-0.021	(0)
	HgCl2	4.121e-15	4.121e-15	-14.385	-14.385	0.000	(0)
	CdOHC1	4.107e-15	4.107e-15	-14.386	-14.386	0.000	(0)
	MnCl2	2.143e-15	2.143e-15	-14.669	-14.669	0.000	(0)
	UO2Cl+	1.288e-15	1.228e-15	-14.890	-14.911	-0.021	(0)
	CuCl2	1.137e-15	1.137e-15	-14.944	-14.944	0.000	(0)
	ZnCl2	5.043e-16	5.043e-16	-15.297	-15.297	0.000	(0)
	CdCl2	5.020e-16	5.020e-16	-15.299	-15.299	0.000	(0)
	PbCl2	3.740e-16	3.740e-16	-15.427	-15.427	0.000	(0)
	HgCl+	2.306e-17	2.198e-17	-16.637	-16.658	-0.021	(0)
	CrCl+2	2.999e-18	2.474e-18	-17.523	-17.607	-0.083	(0)
	HgCl3-	1.618e-18	1.542e-18	-17.791	-17.812	-0.021	(0)
	FeCl+2	1.312e-18	1.096e-18	-17.882	-17.960	-0.078	(0)
	CuCl3-2	9.843e-19	8.220e-19	-18.007	-18.085	-0.078	(0)
	MnCl3-	2.311e-20	2.209e-20	-19.636	-19.656	-0.020	(0)
	ZnCl3-	1.569e-20	1.499e-20	-19.804	-19.824	-0.020	(0)
	CdCl3-	1.244e-20	1.185e-20	-19.905	-19.926	-0.021	(0)
	VOCl+	7.125e-21	6.791e-21	-20.147	-20.168	-0.021	(0)
	PbCl3-	5.846e-21	5.572e-21	-20.233	-20.254	-0.021	(0)
	NiCl2	9.623e-22	9.623e-22	-21.017	-21.017	0.000	(0)
	CuCl3-	4.158e-22	3.972e-22	-21.381	-21.401	-0.020	(0)
	HgCl4-2	2.784e-22	2.297e-22	-21.555	-21.639	-0.083	(0)
	FeCl2+	1.916e-22	1.832e-22	-21.718	-21.737	-0.020	(0)
	CrOHC12	5.474e-23	5.474e-23	-22.262	-22.262	0.000	(0)
	CrCl2+	9.217e-24	8.785e-24	-23.035	-23.056	-0.021	(0)
	ZnCl4-2	3.358e-25	2.805e-25	-24.474	-24.552	-0.078	(0)

PbCl4-2	1.155e-25	9.530e-26	-24.937	-25.021	-0.083	(0)
FeCl3	6.855e-28	6.855e-28	-27.164	-27.164	0.000	(0)
CuCl4-2	8.920e-29	7.449e-29	-28.050	-28.128	-0.078	(0)
CrO3Cl-	7.045e-30	6.715e-30	-29.152	-29.173	-0.021	(0)
CoCl+2	3.431e-38	2.831e-38	-37.465	-37.548	-0.083	(0)
UCl+3	0.000e+00	0.000e+00	-42.805	-42.993	-0.188	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.518	-60.601	-0.083	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.341	-62.424	-0.083	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.034	-77.118	-0.083	(0)
Co (2)	4.645e-10					
Co+2	4.362e-10	3.599e-10	-9.360	-9.444	-0.083	(0)
CoSO4	1.530e-11	1.530e-11	-10.815	-10.815	0.000	(0)
CoHCO3+	1.200e-11	1.144e-11	-10.921	-10.942	-0.021	(0)
CoF+	3.770e-13	3.593e-13	-12.424	-12.445	-0.021	(0)
CoCO3	3.601e-13	3.601e-13	-12.444	-12.444	0.000	(0)
CoOH+	2.344e-13	2.234e-13	-12.630	-12.651	-0.021	(0)
CoCl+	4.889e-14	4.659e-14	-13.311	-13.332	-0.021	(0)
Co (OH) 2	5.521e-16	5.521e-16	-15.258	-15.258	0.000	(0)
CoNO2+	1.883e-16	1.795e-16	-15.725	-15.746	-0.021	(0)
Co (NH3) +2	8.288e-18	6.838e-18	-17.082	-17.165	-0.083	(0)
CoNO3+	7.329e-20	6.985e-20	-19.135	-19.156	-0.021	(0)
CoSeO4	5.849e-20	5.849e-20	-19.233	-19.233	0.000	(0)
Co (OH) 3-	3.595e-22	3.427e-22	-21.444	-21.465	-0.021	(0)
CoOOH-	9.021e-23	8.598e-23	-22.045	-22.066	-0.021	(0)
Co2OH+3	6.211e-24	4.030e-24	-23.207	-23.395	-0.188	(0)
Co (NH3) 2+2	5.587e-26	4.610e-26	-25.253	-25.336	-0.083	(0)
Co (NO3) 2	1.740e-29	1.740e-29	-28.759	-28.759	0.000	(0)
Co (OH) 4-2	2.048e-30	1.690e-30	-29.689	-29.772	-0.083	(0)
Co (NH3) 3+2	1.112e-34	9.172e-35	-33.954	-34.038	-0.083	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-41.970	-42.304	-0.334	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-43.035	-43.119	-0.083	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.617	-52.700	-0.083	(0)
Co (3)	7.124e-31					
CoOH+2	7.124e-31	5.878e-31	-30.147	-30.231	-0.083	(0)
Co+3	5.604e-36	3.718e-36	-35.251	-35.430	-0.178	(0)
CoCl+2	3.431e-38	2.831e-38	-37.465	-37.548	-0.083	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.518	-60.601	-0.083	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-71.417	-71.437	-0.021	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-75.915	-75.998	-0.083	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.034	-77.118	-0.083	(0)
Cr (2)	5.700e-27					
Cr+2	5.700e-27	4.703e-27	-26.244	-26.328	-0.083	(0)
Cr (3)	1.840e-10					
Cr (OH) 2+	1.381e-10	1.316e-10	-9.860	-9.881	-0.021	(0)
Cr (OH) +2	4.214e-11	3.477e-11	-10.375	-10.459	-0.083	(0)
CrOHSO4	1.757e-12	1.757e-12	-11.755	-11.755	0.000	(0)
Cr (OH) 3	1.538e-12	1.538e-12	-11.813	-11.813	0.000	(0)
CrF+2	3.098e-13	2.556e-13	-12.509	-12.592	-0.083	(0)
Cr+3	7.874e-14	5.109e-14	-13.104	-13.292	-0.188	(0)
CrSO4+	2.666e-14	2.541e-14	-13.574	-13.595	-0.021	(0)
CrO2-	2.368e-15	2.257e-15	-14.626	-14.646	-0.021	(0)
Cr (OH) 4-	1.999e-15	1.905e-15	-14.699	-14.720	-0.021	(0)
CrCl+2	2.999e-18	2.474e-18	-17.523	-17.607	-0.083	(0)
Cr2 (OH) 2SO4+2	6.694e-21	5.524e-21	-20.174	-20.258	-0.083	(0)
Cr2 (OH) 2 (SO4) 2	6.989e-23	6.989e-23	-22.156	-22.156	0.000	(0)
CrOHC12	5.474e-23	5.474e-23	-22.262	-22.262	0.000	(0)
CrCl2+	9.217e-24	8.785e-24	-23.035	-23.056	-0.021	(0)
CrNO3+2	3.314e-25	2.735e-25	-24.480	-24.563	-0.083	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.349	-49.433	-0.083	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.911	-59.099	-0.188	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.341	-62.424	-0.083	(0)
Cr (6)	1.936e-19					
CrO4-2	1.010e-19	8.416e-20	-18.996	-19.075	-0.079	(0)
HCrO4-	9.249e-20	8.815e-20	-19.034	-19.055	-0.021	(0)
NaCrO4-	5.166e-23	4.924e-23	-22.287	-22.308	-0.021	(0)
KCrO4-	2.180e-23	2.078e-23	-22.661	-22.682	-0.021	(0)
H2CrO4	2.313e-26	2.313e-26	-25.636	-25.636	0.000	(0)
CrO3SO4-2	2.243e-27	1.851e-27	-26.649	-26.733	-0.083	(0)

CrO3Cl-	7.045e-30	6.715e-30	-29.152	-29.173	-0.021	(0)
Cr2O7-2	3.265e-37	2.694e-37	-36.486	-36.570	-0.083	(0)
Cu (1)	3.060e-10					
Cu+	2.927e-10	2.790e-10	-9.534	-9.554	-0.021	(0)
CuCl	1.314e-11	1.314e-11	-10.881	-10.881	0.000	(0)
CuCl2-	1.075e-13	1.028e-13	-12.968	-12.988	-0.020	(0)
CuCl3-2	9.843e-19	8.220e-19	-18.007	-18.085	-0.078	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-152.509	-152.652	-0.143	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.242	-153.382	-0.141	(0)
Cu (2)	2.559e-06					
Cu+2	1.774e-06	1.478e-06	-5.751	-5.830	-0.079	(0)
CuCO3	5.152e-07	5.152e-07	-6.288	-6.288	0.000	(0)
CuOH+	1.522e-07	1.454e-07	-6.818	-6.837	-0.020	(0)
CuSO4	7.213e-08	7.213e-08	-7.142	-7.142	0.000	(0)
CuHCO3+	3.999e-08	3.811e-08	-7.398	-7.419	-0.021	(0)
CuF+	3.089e-09	2.944e-09	-8.510	-8.531	-0.021	(0)
Cu (OH) 2	9.027e-10	9.027e-10	-9.044	-9.044	0.000	(0)
Cu2 (OH) 2+2	6.438e-10	5.312e-10	-9.191	-9.275	-0.083	(0)
Cu (CO3) 2-2	9.947e-11	8.207e-11	-10.002	-10.086	-0.083	(0)
CuCl+	9.176e-11	8.767e-11	-10.037	-10.057	-0.020	(0)
CuNO2+	1.149e-11	1.096e-11	-10.939	-10.960	-0.021	(0)
CuNH3+2	2.897e-12	2.391e-12	-11.538	-11.622	-0.083	(0)
Cu (OH) 3-	6.044e-14	5.760e-14	-13.219	-13.240	-0.021	(0)
CuCl2	1.137e-15	1.137e-15	-14.944	-14.944	0.000	(0)
CuNO3+	6.006e-16	5.724e-16	-15.221	-15.242	-0.021	(0)
Cu (NO2) 2	7.934e-18	7.934e-18	-17.100	-17.100	0.000	(0)
Cu (OH) 4-2	1.709e-20	1.410e-20	-19.767	-19.851	-0.083	(0)
CuCl3-	4.158e-22	3.972e-22	-21.381	-21.401	-0.020	(0)
Cu (NO3) 2	8.824e-27	8.824e-27	-26.054	-26.054	0.000	(0)
CuCl4-2	8.920e-29	7.449e-29	-28.050	-28.128	-0.078	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.112	-219.133	-0.021	(0)
F	3.499e-05					
F-	3.304e-05	3.157e-05	-4.481	-4.501	-0.020	(0)
AlF2+	4.810e-07	4.599e-07	-6.318	-6.337	-0.019	(0)
MgF+	2.636e-07	2.519e-07	-6.579	-6.599	-0.020	(0)
AlF3	1.828e-07	1.828e-07	-6.738	-6.738	0.000	(0)
CaF+	9.575e-08	9.153e-08	-7.019	-7.038	-0.020	(0)
AlF+2	4.378e-08	3.660e-08	-7.359	-7.437	-0.078	(0)
HF	1.511e-08	1.511e-08	-7.821	-7.821	0.000	(0)
CuF+	3.089e-09	2.944e-09	-8.510	-8.531	-0.021	(0)
AlF4-	3.026e-09	2.892e-09	-8.519	-8.539	-0.020	(0)
NaF	2.345e-09	2.345e-09	-8.630	-8.630	0.000	(0)
MnF+	1.132e-09	1.082e-09	-8.946	-8.966	-0.020	(0)
UO2F+	9.250e-11	8.816e-11	-10.034	-10.055	-0.021	(0)
ZnF+	5.979e-11	5.698e-11	-10.223	-10.244	-0.021	(0)
UO2F2	8.026e-12	8.026e-12	-11.096	-11.096	0.000	(0)
BF (OH) 3-	5.860e-12	5.594e-12	-11.232	-11.252	-0.020	(0)
PbF+	3.934e-12	3.749e-12	-11.405	-11.426	-0.021	(0)
HF2-	1.899e-12	1.814e-12	-11.722	-11.741	-0.020	(0)
CdF+	4.728e-13	4.506e-13	-12.325	-12.346	-0.021	(0)
CoF+	3.770e-13	3.593e-13	-12.424	-12.445	-0.021	(0)
CrF+2	3.098e-13	2.556e-13	-12.509	-12.592	-0.083	(0)
UO2F3-	6.677e-14	6.364e-14	-13.175	-13.196	-0.021	(0)
NiF+	4.438e-14	4.230e-14	-13.353	-13.374	-0.021	(0)
FeF+2	4.020e-14	3.357e-14	-13.396	-13.474	-0.078	(0)
FeF2+	2.967e-14	2.836e-14	-13.528	-13.547	-0.020	(0)
BF2 (OH) 2-	6.401e-15	6.110e-15	-14.194	-14.214	-0.020	(0)
PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
FeF3	1.263e-15	1.263e-15	-14.899	-14.899	0.000	(0)
VO2F	1.109e-15	1.109e-15	-14.955	-14.955	0.000	(0)
H2F2	6.118e-16	6.118e-16	-15.213	-15.213	0.000	(0)
CdF2	2.838e-17	2.838e-17	-16.547	-16.547	0.000	(0)
UO2F4-2	1.934e-17	1.596e-17	-16.714	-16.797	-0.083	(0)
VO2F2-	1.334e-17	1.271e-17	-16.875	-16.896	-0.021	(0)
VOF+	1.285e-17	1.225e-17	-16.891	-16.912	-0.021	(0)
PbF3-	1.463e-19	1.394e-19	-18.835	-18.856	-0.021	(0)
VOF2	1.450e-19	1.450e-19	-18.839	-18.839	0.000	(0)
BF3OH-	2.544e-20	2.429e-20	-19.594	-19.615	-0.020	(0)

VO2F3-2	6.066e-21	5.005e-21	-20.217	-20.301	-0.083	(0)
VOF3-	1.704e-22	1.624e-22	-21.769	-21.790	-0.021	(0)
HgF+	3.614e-23	3.444e-23	-22.442	-22.463	-0.021	(0)
PbF4-2	2.553e-24	2.107e-24	-23.593	-23.676	-0.083	(0)
BF4-	1.279e-24	1.221e-24	-23.893	-23.913	-0.020	(0)
VO2F4-3	1.198e-25	7.774e-26	-24.922	-25.109	-0.188	(0)
Sb(OH) 2F	8.529e-26	8.529e-26	-25.069	-25.069	0.000	(0)
SbOF	8.387e-26	8.387e-26	-25.076	-25.076	0.000	(0)
VOF4-2	2.507e-26	2.069e-26	-25.601	-25.684	-0.083	(0)
UF3+	7.124e-33	6.790e-33	-32.147	-32.168	-0.021	(0)
UF2+2	1.645e-33	1.357e-33	-32.784	-32.867	-0.083	(0)
UF4	2.350e-35	2.350e-35	-34.629	-34.629	0.000	(0)
UF+3	5.263e-36	3.415e-36	-35.279	-35.467	-0.188	(0)
UF5-	3.084e-38	2.940e-38	-37.511	-37.532	-0.021	(0)
UF6-2	3.396e-40	2.802e-40	-39.469	-39.552	-0.083	(0)
Fe (2)	5.114e-09					
Fe+2	4.876e-09	4.024e-09	-8.312	-8.395	-0.083	(0)
FeSO4	2.104e-10	2.104e-10	-9.677	-9.677	0.000	(0)
FeHCO3+	2.164e-11	2.070e-11	-10.665	-10.684	-0.019	(0)
FeOH+	5.213e-12	4.983e-12	-11.283	-11.302	-0.020	(0)
Fe(OH) 2	1.231e-16	1.231e-16	-15.910	-15.910	0.000	(0)
Fe(OH) 3-	1.267e-18	1.211e-18	-17.897	-17.917	-0.020	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.913	-158.913	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.589	-236.610	-0.021	(0)
Fe (3)	2.545e-07					
Fe(OH) 2+	2.466e-07	2.358e-07	-6.608	-6.627	-0.019	(0)
Fe(OH) 3	7.878e-09	7.878e-09	-8.104	-8.104	0.000	(0)
Fe(OH) 4-	2.387e-11	2.282e-11	-10.622	-10.642	-0.019	(0)
FeOH+2	2.333e-11	1.948e-11	-10.632	-10.710	-0.078	(0)
FeF+2	4.020e-14	3.357e-14	-13.396	-13.474	-0.078	(0)
FeF2+	2.967e-14	2.836e-14	-13.528	-13.547	-0.020	(0)
FeSO4+	2.425e-15	2.318e-15	-14.615	-14.635	-0.020	(0)
Fe+3	1.462e-15	9.700e-16	-14.835	-15.013	-0.178	(0)
FeF3	1.263e-15	1.263e-15	-14.899	-14.899	0.000	(0)
Fe(SO4) 2-	1.108e-17	1.056e-17	-16.956	-16.977	-0.021	(0)
FeCl+2	1.312e-18	1.096e-18	-17.882	-17.960	-0.078	(0)
Fe2(OH) 2+4	2.712e-20	1.257e-20	-19.567	-19.901	-0.334	(0)
FeHSeO3+2	1.031e-20	8.505e-21	-19.987	-20.070	-0.083	(0)
FeCl2+	1.916e-22	1.832e-22	-21.718	-21.737	-0.020	(0)
FeNO3+2	1.439e-24	1.188e-24	-23.842	-23.925	-0.083	(0)
Fe3(OH) 4+5	1.424e-25	4.284e-26	-24.846	-25.368	-0.522	(0)
FeCl3	6.855e-28	6.855e-28	-27.164	-27.164	0.000	(0)
H (0)	2.202e-29					
H2	1.101e-29	1.101e-29	-28.958	-28.958	0.000	(0)
Hg (0)	4.034e-11					
Hg	4.034e-11	4.034e-11	-10.394	-10.394	0.000	(0)
Hg (1)	1.954e-21					
Hg2+2	9.770e-22	8.061e-22	-21.010	-21.094	-0.083	(0)
Hg (2)	2.465e-13					
Hg(OH) 2	1.797e-13	1.797e-13	-12.746	-12.745	0.000	(0)
HgClOH	6.051e-14	6.051e-14	-13.218	-13.218	0.000	(0)
HgCl2	4.121e-15	4.121e-15	-14.385	-14.385	0.000	(0)
HgCO3	2.085e-15	2.085e-15	-14.681	-14.681	0.000	(0)
HgOH+	3.825e-17	3.645e-17	-16.417	-16.438	-0.021	(0)
HgCl+	2.306e-17	2.198e-17	-16.637	-16.658	-0.021	(0)
HgHCO3+	1.318e-17	1.257e-17	-16.880	-16.901	-0.021	(0)
HgCl3-	1.618e-18	1.542e-18	-17.791	-17.812	-0.021	(0)
Hg(CO3) 2-2	4.729e-19	3.902e-19	-18.325	-18.409	-0.083	(0)
Hg+2	3.567e-20	2.943e-20	-19.448	-19.531	-0.083	(0)
HgNH3+2	3.557e-21	2.935e-21	-20.449	-20.532	-0.083	(0)
HgSO4	1.641e-21	1.641e-21	-20.785	-20.785	0.000	(0)
Hg(OH) 3-	7.386e-22	7.039e-22	-21.132	-21.152	-0.021	(0)
Hg(NH3) 2+2	5.621e-22	4.638e-22	-21.250	-21.334	-0.083	(0)
HgCl4-2	2.784e-22	2.297e-22	-21.555	-21.639	-0.083	(0)
HgF+	3.614e-23	3.444e-23	-22.442	-22.463	-0.021	(0)
HgNO3+	1.396e-30	1.331e-30	-29.855	-29.876	-0.021	(0)
Hg(NH3) 3+2	3.537e-31	2.918e-31	-30.451	-30.535	-0.083	(0)
Hg(NH3) 4+2	4.439e-40	3.663e-40	-39.353	-39.436	-0.083	(0)

		Hg (NO3) 2	0.000e+00	0.000e+00	-40.169	-40.169	0.000	(0)
		HgHS2-	0.000e+00	0.000e+00	-140.560	-140.581	-0.021	(0)
		Hg (HS) 2	0.000e+00	0.000e+00	-140.677	-140.677	0.000	(0)
		HgS2-2	0.000e+00	0.000e+00	-142.716	-142.799	-0.083	(0)
K	6.966e-05							
		K+	6.956e-05	6.646e-05	-4.158	-4.177	-0.020	(0)
		KSO4-	1.048e-07	1.002e-07	-6.980	-6.999	-0.019	(0)
		KCrO4-	2.180e-23	2.078e-23	-22.661	-22.682	-0.021	(0)
Mg	8.869e-05							
		Mg+2	8.536e-05	7.113e-05	-4.069	-4.148	-0.079	(0)
		MgSO4	2.757e-06	2.757e-06	-5.560	-5.560	0.000	(0)
		MgHCO3+	3.113e-07	2.974e-07	-6.507	-6.527	-0.020	(0)
		MgF+	2.636e-07	2.519e-07	-6.579	-6.599	-0.020	(0)
		MgCO3	3.502e-09	3.502e-09	-8.456	-8.456	0.000	(0)
		MgOH+	9.208e-10	8.810e-10	-9.036	-9.055	-0.019	(0)
		MgH2BO3+	2.059e-12	1.965e-12	-11.686	-11.707	-0.020	(0)
Mn (2)	1.084e-06							
		Mn+2	1.043e-06	8.608e-07	-5.982	-6.065	-0.083	(0)
		MnSO4	3.260e-08	3.260e-08	-7.487	-7.487	0.000	(0)
		MnHCO3+	7.342e-09	7.018e-09	-8.134	-8.154	-0.020	(0)
		MnF+	1.132e-09	1.082e-09	-8.946	-8.966	-0.020	(0)
		MnOH+	7.037e-11	6.727e-11	-10.153	-10.172	-0.020	(0)
		MnCl+	4.242e-11	4.055e-11	-10.372	-10.392	-0.020	(0)
		MnCl2	2.143e-15	2.143e-15	-14.669	-14.669	0.000	(0)
		MnNO3+	1.753e-16	1.671e-16	-15.756	-15.777	-0.021	(0)
		MnSeO4	7.513e-17	7.513e-17	-16.124	-16.124	0.000	(0)
		MnCl3-	2.311e-20	2.209e-20	-19.636	-19.656	-0.020	(0)
		Mn (OH) 3-	4.209e-22	4.023e-22	-21.376	-21.395	-0.020	(0)
		Mn (NO3) 2	5.138e-26	5.138e-26	-25.289	-25.289	0.000	(0)
		Mn (OH) 4-2	4.838e-29	4.041e-29	-28.315	-28.394	-0.078	(0)
		MnSe	0.000e+00	0.000e+00	-46.003	-46.003	0.000	(0)
Mn (3)	1.504e-25							
		Mn+3	1.504e-25	9.978e-26	-24.823	-25.001	-0.178	(0)
Mn (6)	0.000e+00							
		MnO4-2	0.000e+00	0.000e+00	-46.833	-46.911	-0.078	(0)
Mn (7)	0.000e+00							
		MnO4-	0.000e+00	0.000e+00	-49.849	-49.869	-0.020	(0)
Mo	4.185e-08							
		MoO4-2	4.162e-08	3.468e-08	-7.381	-7.460	-0.079	(0)
		HMoO4-	2.343e-10	2.233e-10	-9.630	-9.651	-0.021	(0)
		H2MoO4	5.295e-13	5.295e-13	-12.276	-12.276	0.000	(0)
		AlMo6O21-3	3.513e-39	2.280e-39	-38.454	-38.642	-0.188	(0)
		Mo7O24-6	0.000e+00	0.000e+00	-50.397	-51.149	-0.751	(0)
		HMo7O24-5	0.000e+00	0.000e+00	-50.730	-51.252	-0.522	(0)
		H2Mo7O24-4	0.000e+00	0.000e+00	-52.625	-52.959	-0.334	(0)
		H3Mo7O24-3	0.000e+00	0.000e+00	-56.015	-56.203	-0.188	(0)
N (-3)	9.436e-08							
		NH4+	9.398e-08	8.971e-08	-7.027	-7.047	-0.020	(0)
		NH4SO4-	2.142e-10	2.047e-10	-9.669	-9.689	-0.020	(0)
		NH3	1.580e-10	1.580e-10	-9.801	-9.801	0.000	(0)
		CuNH3+2	2.897e-12	2.391e-12	-11.538	-11.622	-0.083	(0)
		CaNH3+2	6.406e-14	5.286e-14	-13.193	-13.277	-0.083	(0)
		BaNH3+2	1.316e-17	1.086e-17	-16.881	-16.964	-0.083	(0)
		Co (NH3) +2	8.288e-18	6.838e-18	-17.082	-17.165	-0.083	(0)
		NiNH3+2	5.487e-18	4.528e-18	-17.261	-17.344	-0.083	(0)
		HgNH3+2	3.557e-21	2.935e-21	-20.449	-20.532	-0.083	(0)
		Hg (NH3) 2+2	5.621e-22	4.638e-22	-21.250	-21.334	-0.083	(0)
		Ca (NH3) 2+2	4.030e-24	3.326e-24	-23.395	-23.478	-0.083	(0)
		Ni (NH3) 2+2	1.253e-25	1.034e-25	-24.902	-24.985	-0.083	(0)
		Co (NH3) 2+2	5.587e-26	4.610e-26	-25.253	-25.336	-0.083	(0)
		Hg (NH3) 3+2	3.537e-31	2.918e-31	-30.451	-30.535	-0.083	(0)
		Co (NH3) 3+2	1.112e-34	9.172e-35	-33.954	-34.038	-0.083	(0)
		Hg (NH3) 4+2	4.439e-40	3.663e-40	-39.353	-39.436	-0.083	(0)
		Co (NH3) 4+2	0.000e+00	0.000e+00	-43.035	-43.119	-0.083	(0)
		Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.349	-49.433	-0.083	(0)
		Co (NH3) 5+2	0.000e+00	0.000e+00	-52.617	-52.700	-0.083	(0)
		Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.911	-59.099	-0.188	(0)
		Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.518	-60.601	-0.083	(0)

	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.341	-62.424	-0.083	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-71.417	-71.437	-0.021	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-75.915	-75.998	-0.083	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.034	-77.118	-0.083	(0)
N (3)	7.413e-08						
	NO2-	7.412e-08	7.078e-08	-7.130	-7.150	-0.020	(0)
	CuNO2+	1.149e-11	1.096e-11	-10.939	-10.960	-0.021	(0)
	CoNO2+	1.883e-16	1.795e-16	-15.725	-15.746	-0.021	(0)
	Cu (NO2) 2	7.934e-18	7.934e-18	-17.100	-17.100	0.000	(0)
N (5)	1.283e-10						
	NO3-	1.282e-10	1.224e-10	-9.892	-9.912	-0.020	(0)
	CaNO3+	1.079e-13	1.029e-13	-12.967	-12.988	-0.021	(0)
	CuNO3+	6.006e-16	5.724e-16	-15.221	-15.242	-0.021	(0)
	MnNO3+	1.753e-16	1.671e-16	-15.756	-15.777	-0.021	(0)
	BaNO3+	7.013e-17	6.684e-17	-16.154	-16.175	-0.021	(0)
	ZnNO3+	2.920e-17	2.783e-17	-16.535	-16.556	-0.021	(0)
	PbNO3+	3.203e-18	3.052e-18	-17.494	-17.515	-0.021	(0)
	CdNO3+	3.659e-19	3.487e-19	-18.437	-18.458	-0.021	(0)
	CoNO3+	7.329e-20	6.985e-20	-19.135	-19.156	-0.021	(0)
	NiNO3+	1.722e-20	1.641e-20	-19.764	-19.785	-0.021	(0)
	UO2NO3+	5.187e-21	4.943e-21	-20.285	-20.306	-0.021	(0)
	FeNO3+2	1.439e-24	1.188e-24	-23.842	-23.925	-0.083	(0)
	VO2NO3	1.241e-24	1.241e-24	-23.906	-23.906	0.000	(0)
	CrNO3+2	3.314e-25	2.735e-25	-24.480	-24.563	-0.083	(0)
	Mn (NO3) 2	5.138e-26	5.138e-26	-25.289	-25.289	0.000	(0)
	Cu (NO3) 2	8.824e-27	8.824e-27	-26.054	-26.054	0.000	(0)
	Zn (NO3) 2	6.798e-28	6.798e-28	-27.168	-27.168	0.000	(0)
	Pb (NO3) 2	6.348e-28	6.348e-28	-27.197	-27.197	0.000	(0)
	Cd (NO3) 2	2.140e-29	2.140e-29	-28.670	-28.670	0.000	(0)
	Co (NO3) 2	1.740e-29	1.740e-29	-28.759	-28.759	0.000	(0)
	HgNO3+	1.396e-30	1.331e-30	-29.855	-29.876	-0.021	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.169	-40.169	0.000	(0)
Na	1.234e-04						
	Na+	1.232e-04	1.177e-04	-3.909	-3.929	-0.020	(0)
	NaSO4-	1.408e-07	1.347e-07	-6.851	-6.871	-0.019	(0)
	NaHCO3	2.705e-08	2.705e-08	-7.568	-7.568	0.000	(0)
	NaF	2.345e-09	2.345e-09	-8.630	-8.630	0.000	(0)
	NaCO3-	1.357e-10	1.298e-10	-9.867	-9.887	-0.019	(0)
	NaH2BO3	1.487e-13	1.487e-13	-12.828	-12.828	0.000	(0)
	NaCrO4-	5.166e-23	4.924e-23	-22.287	-22.308	-0.021	(0)
Ni	6.929e-11						
	Ni+2	6.402e-11	5.335e-11	-10.194	-10.273	-0.079	(0)
	NiHCO3+	2.820e-12	2.687e-12	-11.550	-11.571	-0.021	(0)
	NiSO4	2.267e-12	2.267e-12	-11.645	-11.645	0.000	(0)
	NiCO3	1.178e-13	1.178e-13	-12.929	-12.929	0.000	(0)
	NiF+	4.438e-14	4.230e-14	-13.353	-13.374	-0.021	(0)
	NiOH+	2.192e-14	2.089e-14	-13.659	-13.680	-0.021	(0)
	NiCl+	5.359e-15	5.108e-15	-14.271	-14.292	-0.021	(0)
	Ni (OH) 2	5.163e-17	5.163e-17	-16.287	-16.287	0.000	(0)
	Ni (SO4) 2-2	1.938e-17	1.599e-17	-16.713	-16.796	-0.083	(0)
	NiNH3+2	5.487e-18	4.528e-18	-17.261	-17.344	-0.083	(0)
	NiNO3+	1.722e-20	1.641e-20	-19.764	-19.785	-0.021	(0)
	NiSeO4	8.091e-21	8.091e-21	-20.092	-20.092	0.000	(0)
	Ni (OH) 3-	1.685e-21	1.606e-21	-20.773	-20.794	-0.021	(0)
	NiCl2	9.623e-22	9.623e-22	-21.017	-21.017	0.000	(0)
	Ni (NH3) 2+2	1.253e-25	1.034e-25	-24.902	-24.985	-0.083	(0)
O (0)	8.355e-35						
	O2	4.177e-35	4.179e-35	-34.379	-34.379	0.000	(0)
Pb	3.180e-09						
	Pb+2	2.022e-09	1.685e-09	-8.694	-8.773	-0.079	(0)
	PbHCO3+	5.369e-10	5.117e-10	-9.270	-9.291	-0.021	(0)
	PbCO3	2.999e-10	2.999e-10	-9.523	-9.523	0.000	(0)
	PbSO4	1.758e-10	1.758e-10	-9.755	-9.755	0.000	(0)
	PbOH+	1.382e-10	1.317e-10	-9.860	-9.880	-0.021	(0)
	PbF+	3.934e-12	3.749e-12	-11.405	-11.426	-0.021	(0)
	PbCl+	2.348e-12	2.238e-12	-11.629	-11.650	-0.021	(0)
	Pb (SO4) 2-2	2.735e-13	2.257e-13	-12.563	-12.647	-0.083	(0)
	Pb (OH) 2	1.296e-13	1.296e-13	-12.888	-12.888	0.000	(0)

Pb(CO3) 2-2	6.204e-14	5.119e-14	-13.207	-13.291	-0.083	(0)
PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
PbCl2	3.740e-16	3.740e-16	-15.427	-15.427	0.000	(0)
Pb2OH+3	5.422e-18	3.518e-18	-17.266	-17.454	-0.188	(0)
Pb(OH) 3-	4.229e-18	4.031e-18	-17.374	-17.395	-0.021	(0)
PbNO3+	3.203e-18	3.052e-18	-17.494	-17.515	-0.021	(0)
PbF3-	1.463e-19	1.394e-19	-18.835	-18.856	-0.021	(0)
PbCl3-	5.846e-21	5.572e-21	-20.233	-20.254	-0.021	(0)
Pb(OH) 4-2	3.722e-23	3.071e-23	-22.429	-22.513	-0.083	(0)
PbF4-2	2.553e-24	2.107e-24	-23.593	-23.676	-0.083	(0)
Pb3(OH) 4+2	6.841e-25	5.645e-25	-24.165	-24.248	-0.083	(0)
PbCl4-2	1.155e-25	9.530e-26	-24.937	-25.021	-0.083	(0)
Pb(NO3) 2	6.348e-28	6.348e-28	-27.197	-27.197	0.000	(0)
Pb4(OH) 4+4	1.630e-29	7.557e-30	-28.788	-29.122	-0.334	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.971	-152.971	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-231.384	-231.405	-0.021	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.204	-79.204	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.713	-79.734	-0.021	(0)
CdHS+	0.000e+00	0.000e+00	-80.750	-80.771	-0.021	(0)
S5-2	0.000e+00	0.000e+00	-82.526	-82.609	-0.083	(0)
S6-2	0.000e+00	0.000e+00	-83.041	-83.125	-0.083	(0)
S4-2	0.000e+00	0.000e+00	-83.121	-83.205	-0.083	(0)
S3-2	0.000e+00	0.000e+00	-83.927	-84.011	-0.083	(0)
S2-2	0.000e+00	0.000e+00	-84.943	-85.027	-0.083	(0)
S-2	0.000e+00	0.000e+00	-90.466	-90.544	-0.078	(0)
HgHS2-	0.000e+00	0.000e+00	-140.560	-140.581	-0.021	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.677	-140.677	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-142.716	-142.799	-0.083	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-152.509	-152.652	-0.143	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.971	-152.971	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.190	-153.211	-0.021	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.242	-153.382	-0.141	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-153.301	-153.301	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-153.691	-153.691	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.913	-158.913	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-219.112	-219.133	-0.021	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-230.124	-230.145	-0.021	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-231.114	-231.135	-0.021	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-231.384	-231.405	-0.021	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.552	-233.635	-0.083	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.589	-236.610	-0.021	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-308.589	-308.673	-0.083	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-311.255	-311.339	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.987	-323.071	-0.083	(0)
S (6)	2.717e-04					
SO4-2	2.556e-04	2.130e-04	-3.592	-3.672	-0.079	(0)
CaSO4	1.296e-05	1.296e-05	-4.887	-4.887	0.000	(0)
MgSO4	2.757e-06	2.757e-06	-5.560	-5.560	0.000	(0)
NaSO4-	1.408e-07	1.347e-07	-6.851	-6.871	-0.019	(0)
KSO4-	1.048e-07	1.002e-07	-6.980	-6.999	-0.019	(0)
CuSO4	7.213e-08	7.213e-08	-7.142	-7.142	0.000	(0)
MnSO4	3.260e-08	3.260e-08	-7.487	-7.487	0.000	(0)
HSO4-	7.049e-09	6.737e-09	-8.152	-8.172	-0.020	(0)
ZnSO4	4.216e-09	4.216e-09	-8.375	-8.375	0.000	(0)
NH4SO4-	2.142e-10	2.047e-10	-9.669	-9.689	-0.020	(0)
FeSO4	2.104e-10	2.104e-10	-9.677	-9.677	0.000	(0)
AlSO4+	2.006e-10	1.917e-10	-9.698	-9.717	-0.020	(0)
PbSO4	1.758e-10	1.758e-10	-9.755	-9.755	0.000	(0)
CdSO4	4.497e-11	4.497e-11	-10.347	-10.347	0.000	(0)
CoSO4	1.530e-11	1.530e-11	-10.815	-10.815	0.000	(0)
Zn(SO4) 2-2	9.478e-12	7.821e-12	-11.023	-11.107	-0.083	(0)
UO2SO4	6.523e-12	6.523e-12	-11.186	-11.186	0.000	(0)
NiSO4	2.267e-12	2.267e-12	-11.645	-11.645	0.000	(0)
CrOHSO4	1.757e-12	1.757e-12	-11.755	-11.755	0.000	(0)
Al(SO4) 2-	4.578e-13	4.375e-13	-12.339	-12.359	-0.020	(0)
Pb(SO4) 2-2	2.735e-13	2.257e-13	-12.563	-12.647	-0.083	(0)
Cd(SO4) 2-2	1.566e-13	1.292e-13	-12.805	-12.889	-0.083	(0)

CrSO4+	2.666e-14	2.541e-14	-13.574	-13.595	-0.021	(0)
UO2(SO4) 2-2	2.220e-14	1.831e-14	-13.654	-13.737	-0.083	(0)
FeSO4+	2.425e-15	2.318e-15	-14.615	-14.635	-0.020	(0)
VO2SO4-	1.069e-16	1.019e-16	-15.971	-15.992	-0.021	(0)
Ni(SO4) 2-2	1.938e-17	1.599e-17	-16.713	-16.796	-0.083	(0)
Fe(SO4) 2-	1.108e-17	1.056e-17	-16.956	-16.977	-0.021	(0)
VOSO4	3.795e-18	3.795e-18	-17.421	-17.421	0.000	(0)
Cr2(OH) 2SO4+2	6.694e-21	5.524e-21	-20.174	-20.258	-0.083	(0)
HgSO4	1.641e-21	1.641e-21	-20.785	-20.785	0.000	(0)
Cr2(OH) 2(SO4) 2	6.989e-23	6.989e-23	-22.156	-22.156	0.000	(0)
CrO3SO4-2	2.243e-27	1.851e-27	-26.649	-26.733	-0.083	(0)
VSO4+	1.368e-31	1.304e-31	-30.864	-30.885	-0.021	(0)
U(SO4) 2	7.779e-38	7.779e-38	-37.109	-37.109	0.000	(0)
USO4+2	5.572e-38	4.598e-38	-37.254	-37.337	-0.083	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-71.417	-71.437	-0.021	(0)
Sb(3)	1.056e-20					
Sb(OH) 3	5.344e-21	5.344e-21	-20.272	-20.272	0.000	(0)
HSbO2	5.217e-21	5.217e-21	-20.283	-20.283	0.000	(0)
Sb(OH) 2F	8.529e-26	8.529e-26	-25.069	-25.069	0.000	(0)
SbOF	8.387e-26	8.387e-26	-25.076	-25.076	0.000	(0)
Sb(OH) 2+	4.407e-26	4.200e-26	-25.356	-25.377	-0.021	(0)
SbO2-	2.739e-26	2.610e-26	-25.562	-25.583	-0.021	(0)
Sb(OH) 4-	1.569e-26	1.496e-26	-25.804	-25.825	-0.021	(0)
SbO+	1.519e-26	1.448e-26	-25.818	-25.839	-0.021	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.987	-323.071	-0.083	(0)
Sb(5)	4.668e-10					
SbO3-	4.663e-10	4.444e-10	-9.331	-9.352	-0.021	(0)
Sb(OH) 6-	5.440e-13	5.198e-13	-12.264	-12.284	-0.020	(0)
SbO2+	1.401e-23	1.335e-23	-22.854	-22.874	-0.021	(0)
Se(-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.022	-41.043	-0.021	(0)
H2Se	0.000e+00	0.000e+00	-43.643	-43.643	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.003	-46.003	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.470	-49.553	-0.083	(0)
Se(4)	3.531e-09					
HSeO3-	3.482e-09	3.318e-09	-8.458	-8.479	-0.021	(0)
SeO3-2	4.946e-11	4.081e-11	-10.306	-10.389	-0.083	(0)
H2SeO3	4.581e-13	4.581e-13	-12.339	-12.339	0.000	(0)
FeHSeO3+2	1.031e-20	8.505e-21	-19.987	-20.070	-0.083	(0)
Cd(SeO3) 2-2	1.498e-24	1.236e-24	-23.824	-23.908	-0.083	(0)
Se(6)	3.892e-13					
SeO4-2	3.891e-13	3.242e-13	-12.410	-12.489	-0.079	(0)
MnSeO4	7.513e-17	7.513e-17	-16.124	-16.124	0.000	(0)
HSeO4-	5.519e-18	5.260e-18	-17.258	-17.279	-0.021	(0)
ZnSeO4	4.543e-18	4.543e-18	-17.343	-17.343	0.000	(0)
CoSeO4	5.849e-20	5.849e-20	-19.233	-19.233	0.000	(0)
CdSeO4	5.438e-20	5.438e-20	-19.265	-19.265	0.000	(0)
NiSeO4	8.091e-21	8.091e-21	-20.092	-20.092	0.000	(0)
Zn(SeO4) 2-2	1.810e-30	1.494e-30	-29.742	-29.826	-0.083	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.288	-55.476	-0.188	(0)
U(4)	1.231e-21					
U(OH) 5-	1.215e-21	1.158e-21	-20.915	-20.936	-0.021	(0)
U(OH) 4	1.569e-23	1.569e-23	-22.804	-22.804	0.000	(0)
U(OH) 3+	1.949e-26	1.857e-26	-25.710	-25.731	-0.021	(0)
U(OH) 2+2	3.369e-30	2.779e-30	-29.473	-29.556	-0.083	(0)
UF3+	7.124e-33	6.790e-33	-32.147	-32.168	-0.021	(0)
UF2+2	1.645e-33	1.357e-33	-32.784	-32.867	-0.083	(0)
UOH+3	6.530e-35	4.237e-35	-34.185	-34.373	-0.188	(0)
UF4	2.350e-35	2.350e-35	-34.629	-34.629	0.000	(0)
UF+3	5.263e-36	3.415e-36	-35.279	-35.467	-0.188	(0)
U(SO4) 2	7.779e-38	7.779e-38	-37.109	-37.109	0.000	(0)
USO4+2	5.572e-38	4.598e-38	-37.254	-37.337	-0.083	(0)
UF5-	3.084e-38	2.940e-38	-37.511	-37.532	-0.021	(0)
UF6-2	3.396e-40	2.802e-40	-39.469	-39.552	-0.083	(0)
U+4	1.170e-40	0.000e+00	-39.932	-40.266	-0.334	(0)
UCl+3	0.000e+00	0.000e+00	-42.805	-42.993	-0.188	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-159.711	-161.402	-1.691	(0)

U (5)	4.986e-15					
UO2+	4.986e-15	4.752e-15	-14.302	-14.323	-0.021	(0)
U (6)	1.184e-08					
UO2 (CO3) 2-2	6.823e-09	5.630e-09	-8.166	-8.249	-0.083	(0)
UO2CO3	4.767e-09	4.767e-09	-8.322	-8.322	0.000	(0)
UO2F+	9.250e-11	8.816e-11	-10.034	-10.055	-0.021	(0)
UO2OH+	8.314e-11	7.924e-11	-10.080	-10.101	-0.021	(0)
UO2 (CO3) 3-4	3.603e-11	1.670e-11	-10.443	-10.777	-0.334	(0)
UO2+2	2.428e-11	2.023e-11	-10.615	-10.694	-0.079	(0)
UO2F2	8.026e-12	8.026e-12	-11.096	-11.096	0.000	(0)
UO2SO4	6.523e-12	6.523e-12	-11.186	-11.186	0.000	(0)
UO2F3-	6.677e-14	6.364e-14	-13.175	-13.196	-0.021	(0)
UO2 (SO4) 2-2	2.220e-14	1.831e-14	-13.654	-13.737	-0.083	(0)
(UO2) 2 (OH) 2+2	1.263e-14	1.042e-14	-13.899	-13.982	-0.083	(0)
UO2Cl+	1.288e-15	1.228e-15	-14.890	-14.911	-0.021	(0)
(UO2) 3 (OH) 5+	6.360e-16	6.062e-16	-15.197	-15.217	-0.021	(0)
UO2F4-2	1.934e-17	1.596e-17	-16.714	-16.797	-0.083	(0)
UO2NO3+	5.187e-21	4.943e-21	-20.285	-20.306	-0.021	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.528	-40.611	-0.083	(0)
VOH+	0.000e+00	0.000e+00	-40.587	-40.608	-0.021	(0)
V (3)	3.150e-14					
V (OH) 3	3.150e-14	3.150e-14	-13.502	-13.502	0.000	(0)
V (OH) 2+	6.911e-24	6.587e-24	-23.160	-23.181	-0.021	(0)
VOH+2	2.451e-26	2.022e-26	-25.611	-25.694	-0.083	(0)
V+3	1.999e-30	1.297e-30	-29.699	-29.887	-0.188	(0)
VSO4+	1.368e-31	1.304e-31	-30.864	-30.885	-0.021	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.236	-50.424	-0.188	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.255	-50.588	-0.334	(0)
V (4)	5.165e-16					
V (OH) 3+	4.213e-16	4.015e-16	-15.375	-15.396	-0.021	(0)
VO+2	7.840e-17	6.469e-17	-16.106	-16.189	-0.083	(0)
VOF+	1.285e-17	1.225e-17	-16.891	-16.912	-0.021	(0)
VOSO4	3.795e-18	3.795e-18	-17.421	-17.421	0.000	(0)
VOF2	1.450e-19	1.450e-19	-18.839	-18.839	0.000	(0)
VOC1+	7.125e-21	6.791e-21	-20.147	-20.168	-0.021	(0)
VOF3-	1.704e-22	1.624e-22	-21.769	-21.790	-0.021	(0)
VOF4-2	2.507e-26	2.069e-26	-25.601	-25.684	-0.083	(0)
H2V2O4+2	9.793e-27	8.080e-27	-26.009	-26.093	-0.083	(0)
V (5)	1.018e-08					
H2VO4-	1.006e-08	9.584e-09	-7.998	-8.018	-0.021	(0)
HVO4-2	9.014e-11	7.438e-11	-10.045	-10.129	-0.083	(0)
H3VO4	3.102e-11	3.102e-11	-10.508	-10.508	0.000	(0)
H3V2O7-	2.014e-12	1.919e-12	-11.696	-11.717	-0.021	(0)
VO2+	2.097e-14	2.003e-14	-13.678	-13.698	-0.020	(0)
VO2F	1.109e-15	1.109e-15	-14.955	-14.955	0.000	(0)
HV2O7-3	3.722e-16	2.415e-16	-15.429	-15.617	-0.188	(0)
VO2SO4-	1.069e-16	1.019e-16	-15.971	-15.992	-0.021	(0)
VO2F2-	1.334e-17	1.271e-17	-16.875	-16.896	-0.021	(0)
VO4-3	1.775e-18	1.152e-18	-17.751	-17.939	-0.188	(0)
V3O9-3	1.421e-18	9.218e-19	-17.848	-18.035	-0.188	(0)
V2O7-4	4.333e-20	2.009e-20	-19.363	-19.697	-0.334	(0)
VO2F3-2	6.066e-21	5.005e-21	-20.217	-20.301	-0.083	(0)
V4O12-4	7.945e-24	3.683e-24	-23.100	-23.434	-0.334	(0)
VO2NO3	1.241e-24	1.241e-24	-23.906	-23.906	0.000	(0)
VO2F4-3	1.198e-25	7.774e-26	-24.922	-25.109	-0.188	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.020	-55.542	-0.522	(0)
V10O28-6	0.000e+00	0.000e+00	-56.487	-57.238	-0.751	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.490	-56.824	-0.334	(0)
Zn	1.147e-07					
Zn+2	1.086e-07	9.047e-08	-6.964	-7.043	-0.079	(0)
ZnSO4	4.216e-09	4.216e-09	-8.375	-8.375	0.000	(0)
ZnHCO3+	1.227e-09	1.169e-09	-8.911	-8.932	-0.021	(0)
ZnCO3	3.081e-10	3.081e-10	-9.511	-9.511	0.000	(0)
ZnOH+	2.953e-10	2.814e-10	-9.530	-9.551	-0.021	(0)
ZnF+	5.979e-11	5.698e-11	-10.223	-10.244	-0.021	(0)
Zn (SO4) 2-2	9.478e-12	7.821e-12	-11.023	-11.107	-0.083	(0)
ZnCl+	8.900e-12	8.503e-12	-11.051	-11.070	-0.020	(0)

Zn(OH) 2	1.388e-12	1.388e-12	-11.858	-11.858	0.000	(0)
ZnOHCl	3.463e-13	3.463e-13	-12.461	-12.461	0.000	(0)
ZnCl2	5.043e-16	5.043e-16	-15.297	-15.297	0.000	(0)
Zn(OH) 3-	2.270e-16	2.164e-16	-15.644	-15.665	-0.021	(0)
ZnNO3+	2.920e-17	2.783e-17	-16.535	-16.556	-0.021	(0)
ZnSeO4	4.543e-18	4.543e-18	-17.343	-17.343	0.000	(0)
ZnCl3-	1.569e-20	1.499e-20	-19.804	-19.824	-0.020	(0)
Zn(OH) 4-2	3.247e-22	2.680e-22	-21.488	-21.572	-0.083	(0)
ZnCl4-2	3.358e-25	2.805e-25	-24.474	-24.552	-0.078	(0)
Zn(NO3) 2	6.798e-28	6.798e-28	-27.168	-27.168	0.000	(0)
Zn(SeO4) 2-2	1.810e-30	1.494e-30	-29.742	-29.826	-0.083	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.190	-153.211	-0.021	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-153.691	-153.691	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-230.124	-230.145	-0.021	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.552	-233.635	-0.083	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-311.255	-311.339	-0.083	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-68.76	-62.47	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-56.01	-51.50	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-63.23	-51.50	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-86.44	-68.51	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-72.09	-52.05	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-33.57	-33.17	0.40	(NH4)2CrO4	
(NH4)2SeO4	-27.03	-26.58	0.45	(NH4)2SeO4	
Al(OH)3(am)	-1.27	9.53	10.80	Al(OH)3	
Al2(MoO4)3	-44.62	-42.25	2.37	Al2(MoO4)3	
Al2O3	-0.58	19.07	19.65	Al2O3	
Al4(OH)10SO4	-1.22	21.48	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-8.90	-4.10	4.80	AlAsO4:2H2O	
AlOHSO4	-3.89	-7.12	-3.23	AlOHSO4	
AlSb	-153.79	-88.16	65.62	AlSb	
Alunite	-0.99	-2.39	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.65	-12.44	-7.79	PbSO4	
Anhydrite	-2.89	-7.25	-4.36	CaSO4	
Anilite	-57.16	-89.03	-31.88	Cu0.25Cu1.5S	
Antlerite	-3.99	4.80	8.79	Cu3(OH)4SO4	
Aragonite	-2.50	-10.80	-8.30	CaCO3	
Arsenolite	-79.40	-82.16	-2.76	As4O6	
Artinite	-12.14	-2.54	9.60	MgCO3:Mg(OH)2:3H2O	
As2O5	-33.97	-27.26	6.71	As2O5	
Atacamite	-4.01	3.38	7.39	Cu2(OH)3Cl	
Azurite	-2.06	-18.97	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2:8H2O	-18.38	6.02	24.39	Ba(OH)2:8H2O	
Ba2V2O7:2H2O	-18.25	-2.38	15.87	Ba2V2O7:2H2O	
Ba3(AsO4)2	-0.30	-9.21	-8.91	Ba3(AsO4)2	
Ba3(VO4)2:4H2O	-29.31	3.63	32.94	Ba3(VO4)2:4H2O	
BaCrO4	-16.37	-26.04	-9.67	BaCrO4	
BaF2	-10.14	-15.96	-5.82	BaF2	
BaMoO4	-7.46	-14.42	-6.96	BaMoO4	
Barite	-0.65	-10.63	-9.98	BaSO4	
BaS	-96.39	-80.21	16.18	BaS	
BaSeO3	-10.78	-8.95	1.83	BaSeO3	
BaSeO4	-11.99	-19.45	-7.46	BaSeO4	
Bianchite	-8.95	-10.72	-1.76	ZnSO4:6H2O	
Birnessite	-10.72	7.37	18.09	MnO2	
Bixbyite	-10.42	-11.06	-0.64	Mn2O3	
BlaubleiI	-56.24	-80.40	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-57.11	-84.39	-27.28	Cu0.6Cu0.8S	
Boehmite	0.96	9.53	8.58	AlOOH	
Breithauptite	-63.56	-82.09	-18.52	NiSb	
Brochantite	-3.28	11.95	15.22	Cu4(OH)6SO4	
Brucite	-8.01	8.83	16.84	Mg(OH)2	
Bunsenite	-9.74	2.71	12.45	NiO	
Ca(VO3)2	-10.67	-5.01	5.66	Ca(VO3)2	

Ca2V2O7	-13.11	4.39	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.16	4.39	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-21.35	0.95	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-25.16	13.80	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-26.06	13.80	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-310.15	-167.18	142.97	Ca3Sb2
CaCrO4	-20.38	-22.65	-2.27	CaCrO4
Calcite	-2.32	-10.80	-8.48	CaCO3
Calomel	-12.04	-29.95	-17.91	Hg2Cl2
CaMoO4	-3.09	-11.04	-7.95	CaMoO4
Carnotite	-2.84	-2.61	0.23	KUO2VO4
CaSeO3:2H2O	-8.38	-5.56	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.04	-16.06	-3.02	CaSeO4:2H2O
Cd(BO2)2	-18.61	-8.77	9.84	Cd(BO2)2
Cd(OH)2	-9.71	3.93	13.64	Cd(OH)2
Cd(OH)2(am)	-9.80	3.93	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.21	-21.50	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.41	-4.85	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.31	-0.91	28.40	Cd4(OH)6SO4
CdCl2	-17.24	-17.90	-0.66	CdCl2
CdCl2:1H2O	-16.21	-17.90	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-15.99	-17.90	-1.91	CdCl2:2.5H2O
CdF2	-16.83	-18.05	-1.21	CdF2
Cdmetal(alpha)	-35.39	-21.87	13.51	Cd
Cdmetal(gamma)	-35.49	-21.87	13.62	Cd
CdMoO4	-2.36	-16.51	-14.15	CdMoO4
CdOHCl	-10.52	-6.98	3.54	CdOHCl
CdSb	-80.51	-80.86	-0.35	CdSb
CdSe	-23.40	-43.60	-20.20	CdSe
CdSeO4:2H2O	-19.68	-21.53	-1.85	CdSeO4:2H2O
CdSO4	-12.54	-12.72	-0.17	CdSO4
CdSO4:1H2O	-10.99	-12.72	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.84	-12.72	-1.87	CdSO4:2.67H2O
Cerrusite	-2.87	-16.00	-13.13	PbCO3
CH4(g)	-82.39	-123.44	-41.05	CH4
Chalcanthite	-6.86	-9.50	-2.64	CuSO4:5H2O
Chalcocite	-57.43	-92.35	-34.92	Cu2S
Chalcopyrite	-125.44	-160.71	-35.27	CuFeS2
Cinnabar	-53.28	-98.97	-45.69	HgS
Claudetite	-79.10	-82.16	-3.06	As4O6
Clausthalite	-16.23	-43.33	-27.10	PbSe
Co(BO2)2	-36.24	-9.17	27.07	Co(BO2)2
Co(OH)2	-9.56	3.54	13.09	Co(OH)2
Co(OH)3	-13.65	-15.96	-2.31	Co(OH)3
CO2(g)	-2.06	-20.21	-18.15	CO2
Co3(AsO4)2	-29.69	-16.65	13.03	Co3(AsO4)2
Co3O4	-17.89	-28.38	-10.50	Co3O4
CoCl2	-26.56	-18.30	8.27	CoCl2
CoCl2:6H2O	-20.83	-18.30	2.54	CoCl2:6H2O
CoCO3	-6.69	-16.67	-9.98	CoCO3
CoF2	-16.85	-18.45	-1.60	CoF2
CoF3	-47.47	-48.93	-1.46	CoF3
CoFe2O4	15.98	12.45	-3.53	CoFe2O4
CoMoO4	-9.14	-16.90	-7.76	CoMoO4
CoO	-10.05	3.54	13.59	CoO
CoS(alpha)	-75.25	-82.69	-7.44	CoS
CoS(beta)	-71.62	-82.69	-11.07	CoS
CoSe	-27.80	-44.00	-16.20	CoSe
CoSeO3	-12.75	-11.43	1.32	CoSeO3
CoSeO4:6H2O	-20.40	-21.93	-1.53	CoSeO4:6H2O
CoSO4	-15.92	-13.12	2.80	CoSO4
CoSO4:6H2O	-10.64	-13.12	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-56.77	-79.07	-22.30	CuS
Cr(OH)2	-24.17	-13.35	10.82	Cr(OH)2
Cr(OH)3	-4.73	-3.39	1.34	Cr(OH)3
Cr(OH)3(am)	-2.64	-3.39	-0.75	Cr(OH)3
Cr2O3	-4.42	-6.78	-2.36	Cr2O3

CrCl2	-49.27	-35.18	14.09	CrCl2
CrCl3	-51.26	-36.14	15.11	CrCl3
CrF3	-25.03	-36.36	-11.34	CrF3
Crmetal	-69.64	-39.16	30.48	Cr
CrO3	-28.84	-32.05	-3.21	CrO3
Cryolite	-14.89	-48.73	-33.84	Na3AlF6
Cu(OH)2	-1.52	7.15	8.67	Cu(OH)2
Cu(SbO3)2	-26.99	18.22	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-11.35	-2.10	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-58.73	-93.61	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-7.86	-53.66	-45.80	Cu2Se
Cu2SO4	-20.83	-22.78	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-11.91	-5.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-64.30	-106.89	-42.59	Cu3Sb
Cu3Se2	-30.55	-94.05	-63.49	Cu3Se2
CuCO3	-1.56	-13.06	-11.50	CuCO3
CuCrO4	-19.47	-24.91	-5.44	CuCrO4
CuF	-9.15	-14.06	-4.91	CuF
CuF2	-15.95	-14.83	1.12	CuF2
CuF2:2H2O	-10.28	-14.83	-4.55	CuF2:2H2O
Cumetal	-7.21	-15.97	-8.76	Cu
CuMoO4	-0.21	-13.29	-13.08	CuMoO4
CuOCuSO4	-12.66	-2.35	10.30	CuOCuSO4
Cupricferrite	10.07	16.06	5.99	CuFe2O4
Cuprite	-4.72	-6.13	-1.41	Cu2O
Cuprousferrite	10.31	1.39	-8.92	CuFeO2
CuSe	-7.28	-40.38	-33.10	CuSe
CuSe2	-28.74	-62.11	-33.37	CuSe2
CuSeO3:2H2O	-8.33	-7.82	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.88	-18.32	-2.44	CuSeO4:5H2O
CuSO4	-12.44	-9.50	2.94	CuSO4
Diaspore	2.66	9.53	6.87	AlOOH
Djurleite	-57.56	-91.48	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.64	-22.18	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.09	-22.18	-17.09	CaMg(CO3)2
Epsomite	-5.69	-7.82	-2.13	MgSO4:7H2O
Fe(OH)2	-8.98	4.58	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	4.22	1.18	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-6.11	-9.83	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-7.61	-6.06	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.37	-35.99	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.31	-41.04	-3.73	Fe2(SO4)3
Fe3(OH)8	-6.72	13.50	20.22	Fe3(OH)8
FeAsO4:2H2O	-9.57	-9.17	0.40	FeAsO4:2H2O
FeCr2O4	-9.40	-2.20	7.20	FeCr2O4
FeMoO4	-5.76	-15.86	-10.09	FeMoO4
Ferrihydrite	1.27	4.46	3.19	Fe(OH)3
Ferroselite	-46.08	-64.67	-18.60	FeSe2
FeS(ppt)	-78.69	-81.64	-2.95	FeS
FeSe	-31.95	-42.95	-11.00	FeSe
Fix_pe	-6.41	-6.41	0.00	e-
Fluorite	-2.08	-12.58	-10.50	CaF2
Galena	-68.05	-82.02	-13.97	PbS
Gibbsite	1.24	9.53	8.29	Al(OH)3
Goethite	3.97	4.46	0.49	FeOOH
Goslarite	-8.70	-10.72	-2.01	ZnSO4:7H2O
Greenockite	-67.93	-82.29	-14.36	CdS
Greigite	-286.36	-331.40	-45.03	Fe3S4
Gummite	-5.39	2.29	7.67	UO3
Gypsum	-2.64	-7.25	-4.61	CaSO4:2H2O
H-Jarosite	-7.83	-19.93	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.56	-20.44	-12.88	H2MoO4
H2S(g)	-78.21	-86.22	-8.01	H2S
H2Se(g)	-42.57	-47.53	-4.96	H2Se
Halite	-9.96	-8.36	1.60	NaCl
Hausmannite	-14.48	46.55	61.03	Mn3O4
Hematite	10.33	8.91	-1.42	Fe2O3
Hercynite	0.76	23.65	22.89	FeAl2O4

Hg (CH3) 2 (g)	-185.92	-259.63	-73.71	Hg (CH3) 2
Hg (g)	-9.09	-16.96	-7.87	Hg
Hg (OH) 2	-9.25	-12.75	-3.50	Hg (OH) 2
Hg2 (g)	-18.97	-33.92	-14.96	Hg2
Hg2 (OH) 2	-13.37	-8.11	5.26	Hg2 (OH) 2
Hg2CO3	-12.27	-28.32	-16.05	Hg2CO3
Hg2CrO4	-31.47	-40.17	-8.70	Hg2CrO4
Hg2F2	-19.73	-30.10	-10.36	Hg2F2
Hg2S	-82.66	-94.34	-11.68	Hg2S
Hg2SeO3	-18.43	-23.08	-4.66	Hg2SeO3
Hg2SO4	-18.64	-24.77	-6.13	Hg2SO4
Hg3O2CO3	-28.76	-58.44	-29.68	Hg3O2CO3
HgCl (g)	-34.47	-14.97	19.50	HgCl
HgCl2	-13.32	-34.58	-21.26	HgCl2
HgF (g)	-47.72	-15.05	32.68	HgF
HgF2 (g)	-47.29	-34.73	12.57	HgF2
Hgmetal (1)	-3.51	-16.96	-13.45	Hg
HgSe	-4.58	-60.28	-55.69	HgSe
HgSeO3	-15.28	-27.71	-12.43	HgSeO3
HgSO4	-19.98	-29.40	-9.42	HgSO4
Huntite	-14.96	-44.93	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-9.03	-27.80	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-27.91	-36.67	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.29	-21.46	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-2.82	-17.62	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-42.24	-59.48	-17.24	K2Cr2O7
K2CrO4	-26.92	-27.43	-0.51	K2CrO4
K2MoO4	-19.08	-15.81	3.26	K2MoO4
K2SeO4	-20.11	-20.84	-0.73	K2SeO4
Langite	-5.54	11.95	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.80	-8.24	-0.43	PbO : PbSO4
Laurionite	-7.33	-6.71	0.62	PbOHCl
Lepidocrocite	3.09	4.46	1.37	FeOOH
Lime	-23.30	9.40	32.70	CaO
Litharge	-8.49	4.21	12.69	PbO
Mackinawite	-78.04	-81.64	-3.60	FeS
Maghemite	2.53	8.91	6.39	Fe2O3
Magnesioferrite	0.89	17.74	16.86	Fe2MgO4
Magnesite	-3.92	-11.38	-7.46	MgCO3
Magnetite	10.09	13.50	3.40	Fe3O4
Malachite	-0.60	-5.91	-5.31	Cu2 (OH) 2CO3
Manganite	-5.52	19.82	25.34	MnOOH
Massicot	-8.69	4.21	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-20.94	-14.68	6.26	CuCl2
Melanterite	-9.86	-12.07	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.88	-98.97	-45.09	HgS
Mg (OH) 2 (active)	-9.96	8.83	18.79	Mg (OH) 2
Mg (VO3) 2	-16.86	-5.58	11.28	Mg (VO3) 2
Mg2Sb3	-285.59	-210.91	74.68	Mg2Sb3
Mg2V2O7	-23.11	3.25	26.36	Mg2V2O7
MgCr2O4	-14.15	2.05	16.20	MgCr2O4
MgCrO4	-28.60	-23.22	5.38	MgCrO4
MgF2	-5.02	-13.15	-8.13	MgF2
MgMoO4	-9.76	-11.61	-1.85	MgMoO4
MgSeO3 : 6H2O	-9.19	-6.14	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-15.44	-16.64	-1.20	MgSeO4 : 6H2O
Minium	-35.09	38.43	73.52	Pb3O4
Mirabilite	-10.42	-11.53	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-12.40	-7.50	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-55.31	-61.02	-5.71	Mn2 (SO4) 3
Mn2Sb	-157.85	-96.77	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-19.02	-6.52	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-17.63	-14.92	2.72	MnCl2 : 4H2O
MnS (grn)	-79.48	-79.31	0.17	MnS
MnS (pnk)	-82.65	-79.31	3.34	MnS
MnSb	-100.32	-103.23	-2.91	MnSb
MnSe	-44.12	-40.62	3.50	MnSe

MnSeO3	-9.18	-8.05	1.13	MnSeO3
MnSeO3:2H2O	-9.04	-8.05	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.50	-18.55	-2.05	MnSeO4:5H2O
MnSO4	-12.32	-9.74	2.58	MnSO4
Montepsonite	-11.17	3.93	15.10	CdO
Montroydite	-9.11	-12.75	-3.64	HgO
MoO3	-12.44	-20.44	-8.00	MoO3
Morenosite	-11.80	-13.94	-2.14	NiSO4:7H2O
MoS2	-148.44	-218.70	-70.26	MoS2
Na-Jarosite	-6.17	-17.37	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-49.09	-58.99	-9.90	Na2Cr2O7
Na2CrO4	-29.86	-26.93	2.93	Na2CrO4
Na2Mo2O7	-19.16	-35.76	-16.60	Na2Mo2O7
Na2MoO4	-16.81	-15.32	1.49	Na2MoO4
Na2MoO4:2H2O	-16.54	-15.32	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.15	-9.85	10.30	Na2SeO3:5H2O
Na2SeO4	-21.63	-20.35	1.28	Na2SeO4
Na3Sb	-184.47	-90.01	94.45	Na3Sb
Na3VO4	-36.21	0.47	36.68	Na3VO4
Na4V2O7	-41.57	-4.17	37.40	Na4V2O7
Nantokite	-7.25	-13.98	-6.73	CuCl
NaSb	-92.49	-69.33	23.17	NaSb
Natron	-13.78	-15.09	-1.31	Na2CO3:10H2O
NaVO3	-8.51	-4.65	3.86	NaVO3
Nesquehonite	-6.71	-11.38	-4.67	MgCO3:3H2O
Ni(OH)2	-10.09	2.71	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-34.84	-19.14	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-37.82	-5.82	32.00	Ni4(OH)6SO4
NiCO3	-10.63	-17.50	-6.87	NiCO3
NiMoO4	-6.59	-17.73	-11.14	NiMoO4
NiS(alpha)	-77.92	-83.52	-5.60	NiS
NiS(beta)	-72.42	-83.52	-11.10	NiS
NiS(gamma)	-70.72	-83.52	-12.80	NiS
NiSe	-27.13	-44.83	-17.70	NiSe
NiSeO3:2H2O	-15.08	-12.26	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-21.24	-22.76	-1.52	NiSeO4:6H2O
Nsutite	-10.13	7.37	17.50	MnO2
O2(g)	-31.47	51.62	83.09	O2
Orpiment	-238.69	-299.75	-61.07	As2S3
Otavite	-4.27	-16.27	-12.00	CdCO3
Pb(BO2)2	-15.02	-8.50	6.52	Pb(BO2)2
Pb(OH)2	-3.94	4.21	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-70.42	-79.18	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-11.30	-2.50	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.78	8.41	26.19	Pb2O(OH)2
Pb2O3	-26.82	34.22	61.04	Pb2O3
Pb2OCO3	-11.24	-11.79	-0.56	Pb2OCO3
Pb2V2O7	-4.10	-6.00	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.44	-14.64	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.94	-1.80	6.14	Pb3(VO4)2
Pb3O2CO3	-18.61	-7.59	11.02	Pb3O2CO3
Pb3O2SO4	-14.72	-4.03	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.93	0.17	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.70	0.17	21.88	Pb4O3SO4
PbCrO4	-15.25	-27.85	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.85	-21.60	4.25	Pb
PbMoO4	-0.61	-16.23	-15.62	PbMoO4
PbO:0.3H2O	-8.77	4.21	12.98	PbO:0.33H2O
PbSeO4	-14.42	-21.26	-6.84	PbSeO4
Periclase	-12.75	8.83	21.58	MgO
Phosgenite	-13.82	-33.63	-19.81	PbCl2:PbCO3
Plattnerite	-19.59	30.01	49.60	PbO2
Portlandite	-13.40	9.40	22.80	Ca(OH)2
Pyrite	-123.55	-142.05	-18.51	FeS2
Pyrochroite	-8.28	6.91	15.19	Mn(OH)2
Pyrolusite	-8.66	32.72	41.38	MnO2
Realgar	-99.92	-119.67	-19.75	AsS

Retgersite	-11.90	-13.94	-2.04	NiSO4:6H2O
Rhodochrosite	-2.71	-13.29	-10.58	MnCO3
Rutherfordine	-3.42	-17.92	-14.50	UO2CO3
Sb(OH)3	-13.16	-20.27	-7.11	Sb(OH)3
Sb2O4	-18.14	-14.74	3.40	Sb2O4
Sb2O5	-27.88	-37.55	-9.67	Sb2O5
Sb2Se3	-115.39	-183.14	-67.76	Sb2Se3
Sb4O6(cubic)	-62.83	-81.09	-18.26	Sb4O6
Sb4O6(orth)	-63.19	-81.09	-17.90	Sb4O6
SbCl3	-53.59	-53.02	0.57	SbCl3
SbF3	-43.02	-53.24	-10.23	SbF3
Sbmetal	-47.30	-58.98	-11.69	Sb
SbO2	-3.85	-31.68	-27.82	SbO2
Schoepite	-3.71	2.29	5.99	UO2(OH)2:H2O
Semetal(am)	-14.62	-21.73	-7.11	Se
Semetal(hex)	-14.02	-21.73	-7.71	Se
Senarmontite	-28.18	-40.54	-12.37	Sb2O3
SeO2	-15.09	-14.97	0.12	SeO2
SeO3	-46.51	-25.47	21.04	SeO3
Siderite	-5.38	-15.62	-10.24	FeCO3
Smithsonite	-4.27	-14.27	-10.00	ZnCO3
Sphalerite	-68.84	-80.29	-11.45	ZnS
Spinel	-8.95	27.90	36.85	MgAl2O4
Stibnite	-248.76	-299.22	-50.46	Sb2S3
Sulfur	-58.27	-60.42	-2.14	S
Tenorite	-0.49	7.15	7.64	CuO
Thenardite	-11.85	-11.53	0.32	Na2SO4
Thermonatrite	-15.72	-15.09	0.64	Na2CO3:H2O
Tyuyamunite	-4.52	-0.44	4.08	Ca(UO2)2(VO4)2
U3O8	-12.39	8.70	21.08	U3O8
U3Sb4	-586.09	-433.70	152.38	U3Sb4
U4O9	-28.40	-31.42	-3.02	U4O9
UF4	-28.73	-58.27	-29.54	UF4
UF4:2.5H2O	-25.55	-58.27	-32.72	UF4:2.5H2O
UO2(am)	-15.24	-14.31	0.93	UO2
UO2(NO3)2	-42.67	-30.52	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.37	-30.52	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.91	-30.52	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.56	-30.52	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.33	2.29	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.93	-23.18	-2.25	UO2SeO4:4H2O
UO3	-5.41	2.29	7.70	UO3
Uraninite	-9.64	-14.31	-4.67	UO2
USb2	-222.68	-193.11	29.58	USb2
V(OH)3	-18.01	-10.42	7.59	V(OH)3
V2O5	-13.06	-14.42	-1.36	V2O5
V3O5	-37.27	-35.44	1.84	V3O5
V4O7	-45.83	-38.65	7.19	V4O7
V6O13	-34.01	-94.87	-60.86	V6O13
Valentinite	-32.06	-40.54	-8.48	Sb2O3
VC12	-64.03	-45.16	18.87	VC12
VC13	-66.60	-43.17	23.43	VC13
VF4	-62.10	-47.17	14.93	VF4
Vmetal	-93.15	-49.13	44.03	V
VO	-38.08	-23.32	14.76	VO
VO(OH)2	-8.36	-3.21	5.15	VO(OH)2
VO2Cl	-20.97	-18.13	2.84	VO2Cl
VOC1	-32.49	-21.33	11.15	VOC1
VOC12	-37.80	-25.04	12.76	VOC12
VOSO4	-23.47	-19.86	3.61	VOSO4
Witherite	-5.62	-14.19	-8.57	BaCO3
Wurtzite	-71.34	-80.29	-8.95	ZnS
Zincite	-5.40	5.94	11.33	ZnO
Zincosite	-14.64	-10.72	3.93	ZnSO4
Zn(BO2)2	-15.06	-6.77	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-30.18	-26.87	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-6.26	5.94	12.20	Zn(OH)2
Zn(OH)2(am)	-6.54	5.94	12.47	Zn(OH)2

Zn(OH)2(beta)	-5.82	5.94	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.60	5.94	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.80	5.94	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.28	-4.78	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.24	0.96	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.10	-9.45	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.41	-15.49	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.31	7.09	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.65	7.85	38.50	Zn5(OH)8Cl2
ZnCl2	-22.95	-15.90	7.05	ZnCl2
ZnCO3:1H2O	-4.01	-14.27	-10.26	ZnCO3:1H2O
ZnF2	-15.51	-16.05	-0.53	ZnF2
Znmetal	-45.66	-19.87	25.79	Zn
ZnMoO4	-4.38	-14.50	-10.13	ZnMoO4
ZnO(active)	-5.25	5.94	11.19	ZnO
ZnS(am)	-71.24	-80.29	-9.05	ZnS
ZnSb	-89.87	-78.86	11.01	ZnSb
ZnSe	-27.20	-41.60	-14.40	ZnSe
ZnSeO4:6H2O	-18.01	-19.53	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.08	-10.72	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 73.

```

      REACTION 402
      H2O      -1
      7377.2675 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 405
      SAVE Solution 406
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 405. Solution after simulation 72.
Using reaction 402.

Reaction 402.

7.377e+03 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	1.458e-04	1.460e-04
As	8.126e-08	8.137e-08

B	5.948e-05	5.956e-05
Ba	1.754e-05	1.756e-05
C	9.735e-02	9.748e-02
Ca	4.467e-02	4.473e-02
Cd	1.514e-07	1.516e-07
Cl	5.237e-03	5.244e-03
Co	6.212e-08	6.220e-08
Cr	2.460e-08	2.463e-08
Cu	3.422e-04	3.427e-04
F	4.679e-03	4.685e-03
Fe	3.472e-05	3.477e-05
Hg	5.428e-09	5.435e-09
K	9.316e-03	9.328e-03
Mg	1.186e-02	1.188e-02
Mn	1.450e-04	1.452e-04
Mo	5.597e-06	5.604e-06
N	2.255e-05	2.258e-05
Na	1.650e-02	1.652e-02
Ni	9.267e-09	9.279e-09
Pb	4.253e-07	4.258e-07
S	3.633e-02	3.638e-02
Sb	6.243e-08	6.251e-08
Se	4.723e-07	4.730e-07
U	1.584e-06	1.586e-06
V	1.361e-06	1.363e-06
Zn	1.534e-05	1.536e-05

-----Description of solution-----

	pH	=	6.319	Charge balance
	pe	=	6.656	Adjusted to redox
equilibrium				
	Activity of water	=	0.997	
	Ionic strength (mol/kgw)	=	1.495e-01	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	5.780e-02	
	Total CO2 (mol/kg)	=	9.735e-02	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	30	
	Total H	=	1.113004e+02	
	Total O	=	5.601977e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	6.319e-07	4.801e-07	-6.199	-6.319	-0.119	0.00
OH-	2.862e-08	2.090e-08	-7.543	-7.680	-0.137	(0)
H2O	5.551e+01	9.966e-01	1.744	-0.001	0.000	18.07
Al	1.458e-04					
AlF4-	8.710e-05	6.524e-05	-4.060	-4.185	-0.125	(0)
AlF3	5.621e-05	5.621e-05	-4.250	-4.250	0.000	(0)
AlF2+	2.524e-06	1.928e-06	-5.598	-5.715	-0.117	(0)
AlF+2	6.143e-09	2.091e-09	-8.212	-8.680	-0.468	(0)
Al(OH) 4-	4.593e-11	3.440e-11	-10.338	-10.463	-0.125	(0)
Al(OH) 2+	4.104e-11	3.135e-11	-10.387	-10.504	-0.117	(0)
Al(OH) 3	1.307e-11	1.307e-11	-10.884	-10.884	0.000	(0)
AlSO4+	6.233e-12	4.669e-12	-11.205	-11.331	-0.125	(0)
AlOH+2	5.545e-12	1.888e-12	-11.256	-11.724	-0.468	(0)
Al+3	1.071e-12	9.032e-14	-11.970	-13.044	-1.074	(0)
Al(SO4) 2-	4.447e-13	3.331e-13	-12.352	-12.477	-0.125	(0)
AlMo6O21-3	2.666e-29	4.474e-31	-28.574	-30.349	-1.775	(0)
As (3)	2.034e-19					
H3AsO3	2.030e-19	2.030e-19	-18.692	-18.692	0.000	(0)
H2AsO3-	3.415e-22	2.169e-22	-21.467	-21.664	-0.197	(0)

		H4AsO3+	7.605e-26	4.829e-26	-25.119	-25.316	-0.197	(0)
		HAsO3-2	2.534e-27	4.120e-28	-26.596	-27.385	-0.789	(0)
		AsO3-3	1.971e-33	3.308e-35	-32.705	-34.480	-1.775	(0)
As (5)	8.126e-08							
		H2AsO4-	4.294e-08	2.727e-08	-7.367	-7.564	-0.197	(0)
		HAsO4-2	3.831e-08	6.228e-09	-7.417	-8.206	-0.789	(0)
		AsO4-3	2.444e-12	4.102e-14	-11.612	-13.387	-1.775	(0)
		H3AsO4	2.198e-12	2.275e-12	-11.658	-11.643	0.015	(0)
B	5.948e-05							
		H3BO3	5.923e-05	6.130e-05	-4.227	-4.213	0.015	(0)
		H2BO3-	1.047e-07	7.416e-08	-6.980	-7.130	-0.150	(0)
		BF(OH) 3-	7.996e-08	5.665e-08	-7.097	-7.247	-0.150	(0)
		CaH2BO3+	4.931e-08	3.494e-08	-7.307	-7.457	-0.150	(0)
		BF2(OH) 2-	9.536e-09	6.756e-09	-8.021	-8.170	-0.150	(0)
		MgH2BO3+	8.484e-09	6.011e-09	-8.071	-8.221	-0.150	(0)
		NaH2BO3	1.400e-09	1.400e-09	-8.854	-8.854	0.000	(0)
		BaH2BO3+	1.640e-11	1.162e-11	-10.785	-10.935	-0.150	(0)
		H5(BO3) 2-	5.462e-12	3.870e-12	-11.263	-11.412	-0.150	(0)
		BF3OH-	4.138e-12	2.932e-12	-11.383	-11.533	-0.150	(0)
		H8(BO3) 3-	3.349e-14	2.372e-14	-13.475	-13.625	-0.150	(0)
		BF4-	2.271e-14	1.609e-14	-13.644	-13.793	-0.150	(0)
Ba	1.754e-05							
		Ba+2	1.522e-05	5.069e-06	-4.818	-5.295	-0.477	(0)
		BaHCO3+	2.313e-06	1.788e-06	-5.636	-5.748	-0.112	(0)
		BaCO3	9.375e-09	9.375e-09	-8.028	-8.028	0.000	(0)
		BaH2BO3+	1.640e-11	1.162e-11	-10.785	-10.935	-0.150	(0)
		BaNO3+	7.185e-13	4.562e-13	-12.144	-12.341	-0.197	(0)
		BaOH+	6.105e-13	4.625e-13	-12.214	-12.335	-0.121	(0)
		BaNH3+2	1.867e-13	3.035e-14	-12.729	-13.518	-0.789	(0)
C (4)	9.735e-02							
		HCO3-	4.835e-02	3.693e-02	-1.316	-1.433	-0.117	(0)
		H2CO3	3.988e-02	3.988e-02	-1.399	-1.399	0.000	(0)
		CaHCO3+	7.285e-03	5.630e-03	-2.138	-2.250	-0.112	(0)
		MgHCO3+	1.194e-03	8.834e-04	-2.923	-3.054	-0.131	(0)
		NaHCO3	2.474e-04	2.474e-04	-3.607	-3.607	0.000	(0)
		CuCO3	2.341e-04	2.341e-04	-3.631	-3.631	0.000	(0)
		CaCO3	4.679e-05	4.679e-05	-4.330	-4.330	0.000	(0)
		CuHCO3+	4.045e-05	2.569e-05	-4.393	-4.590	-0.197	(0)
		MnHCO3+	1.672e-05	1.267e-05	-4.777	-4.897	-0.121	(0)
		Cu (CO3) 2-2	1.398e-05	2.272e-06	-4.855	-5.644	-0.789	(0)
		CO3-2	1.083e-05	3.606e-06	-4.966	-5.443	-0.477	(0)
		MgCO3	7.012e-06	7.012e-06	-5.154	-5.154	0.000	(0)
		ZnHCO3+	3.964e-06	2.517e-06	-5.402	-5.599	-0.197	(0)
		BaHCO3+	2.313e-06	1.788e-06	-5.636	-5.748	-0.112	(0)
		UO2 (CO3) 3-4	1.547e-06	1.081e-09	-5.811	-8.966	-3.156	(0)
		NaCO3-	1.047e-06	7.999e-07	-5.980	-6.097	-0.117	(0)
		ZnCO3	4.473e-07	4.473e-07	-6.349	-6.349	0.000	(0)
		FeHCO3+	2.977e-07	2.301e-07	-6.526	-6.638	-0.112	(0)
		PbHCO3+	2.946e-07	1.870e-07	-6.531	-6.728	-0.197	(0)
		PbCO3	7.389e-08	7.389e-08	-7.131	-7.131	0.000	(0)
		UO2 (CO3) 2-2	3.677e-08	5.978e-09	-7.434	-8.223	-0.789	(0)
		CoHCO3+	2.303e-08	1.462e-08	-7.638	-7.835	-0.197	(0)
		BaCO3	9.375e-09	9.375e-09	-8.028	-8.028	0.000	(0)
		NiHCO3+	5.657e-09	3.592e-09	-8.247	-8.445	-0.197	(0)
		Pb (CO3) 2-2	4.727e-09	7.686e-10	-8.325	-9.114	-0.789	(0)
		CdHCO3+	3.179e-09	2.019e-09	-8.498	-8.695	-0.197	(0)
		CdCO3	1.974e-09	1.974e-09	-8.705	-8.705	0.000	(0)
		CoCO3	3.104e-10	3.104e-10	-9.508	-9.508	0.000	(0)
		NiCO3	1.062e-10	1.062e-10	-9.974	-9.974	0.000	(0)
		UO2CO3	8.308e-11	8.308e-11	-10.081	-10.081	0.000	(0)
		Cd (CO3) 2-2	3.246e-11	5.277e-12	-10.489	-11.278	-0.789	(0)
		HgCO3	1.022e-11	1.022e-11	-10.991	-10.991	0.000	(0)
		Hg (CO3) 2-2	7.166e-13	1.165e-13	-12.145	-12.934	-0.789	(0)
		HgHCO3+	1.438e-13	9.133e-14	-12.842	-13.039	-0.197	(0)
Ca	4.467e-02							
		Ca+2	2.457e-02	8.186e-03	-1.610	-2.087	-0.477	(0)
		CaSO4	1.249e-02	1.249e-02	-1.903	-1.903	0.000	(0)
		CaHCO3+	7.285e-03	5.630e-03	-2.138	-2.250	-0.112	(0)

		CaF+	2.731e-04	2.069e-04	-3.564	-3.684	-0.121	(0)
		CaCO3	4.679e-05	4.679e-05	-4.330	-4.330	0.000	(0)
		CaH2BO3+	4.931e-08	3.494e-08	-7.307	-7.457	-0.150	(0)
		CaOH+	4.418e-09	3.414e-09	-8.355	-8.467	-0.112	(0)
		CaNO3+	7.322e-10	4.649e-10	-9.135	-9.333	-0.197	(0)
		CaNH3+2	6.016e-10	9.780e-11	-9.221	-10.010	-0.789	(0)
		Ca (NH3) 2+2	2.273e-18	3.695e-19	-17.643	-18.432	-0.789	(0)
Cd	1.514e-07							
		Cd+2	7.208e-08	2.401e-08	-7.142	-7.620	-0.477	(0)
		CdSO4	3.748e-08	3.748e-08	-7.426	-7.426	0.000	(0)
		Cd (SO4) 2-2	2.071e-08	3.367e-09	-7.684	-8.473	-0.789	(0)
		CdCl+	1.437e-08	9.123e-09	-7.843	-8.040	-0.197	(0)
		CdHCO3+	3.179e-09	2.019e-09	-8.498	-8.695	-0.197	(0)
		CdCO3	1.974e-09	1.974e-09	-8.705	-8.705	0.000	(0)
		CdF+	1.388e-09	8.813e-10	-8.858	-9.055	-0.197	(0)
		CdCl2	1.513e-10	1.513e-10	-9.820	-9.820	0.000	(0)
		Cd (CO3) 2-2	3.246e-11	5.277e-12	-10.489	-11.278	-0.789	(0)
		CdOHC1	7.823e-12	7.823e-12	-11.107	-11.107	0.000	(0)
		CdOH+	6.279e-12	3.987e-12	-11.202	-11.399	-0.197	(0)
		CdF2	4.072e-12	4.072e-12	-11.390	-11.390	0.000	(0)
		CdCl3-	5.982e-13	3.799e-13	-12.223	-12.420	-0.197	(0)
		CdNO3+	2.147e-15	1.364e-15	-14.668	-14.865	-0.197	(0)
		Cd (OH) 2	5.258e-16	5.258e-16	-15.279	-15.279	0.000	(0)
		CdSeO4	1.179e-16	1.179e-16	-15.928	-15.928	0.000	(0)
		Cd2OH+3	2.859e-17	4.798e-19	-16.544	-18.319	-1.775	(0)
		Cd (SeO3) 2-2	7.060e-19	1.148e-19	-18.151	-18.940	-0.789	(0)
		Cd (OH) 3-	1.057e-21	6.715e-22	-20.976	-21.173	-0.197	(0)
		Cd (NO3) 2	1.227e-23	1.227e-23	-22.911	-22.911	0.000	(0)
		Cd (OH) 4-2	1.413e-29	2.297e-30	-28.850	-29.639	-0.789	(0)
		CdHS+	0.000e+00	0.000e+00	-78.039	-78.237	-0.197	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-149.658	-149.658	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.186	-226.383	-0.197	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.023	-302.812	-0.789	(0)
Cl	5.237e-03							
		Cl-	5.237e-03	3.979e-03	-2.281	-2.400	-0.119	(0)
		MnCl+	1.137e-07	8.611e-08	-6.944	-7.065	-0.121	(0)
		CuCl+	9.393e-08	6.951e-08	-7.027	-7.158	-0.131	(0)
		ZnCl+	2.911e-08	2.154e-08	-7.536	-7.667	-0.131	(0)
		CdCl+	1.437e-08	9.123e-09	-7.843	-8.040	-0.197	(0)
		CuCl2-	6.711e-09	4.966e-09	-8.173	-8.304	-0.131	(0)
		CuCl	5.974e-09	5.974e-09	-8.224	-8.224	0.000	(0)
		HgCl2	3.747e-09	3.747e-09	-8.426	-8.426	0.000	(0)
		PbCl+	1.515e-09	9.622e-10	-8.819	-9.017	-0.197	(0)
		ZnOHC1	5.895e-10	5.895e-10	-9.229	-9.229	0.000	(0)
		MnCl2	4.839e-10	4.839e-10	-9.315	-9.315	0.000	(0)
		HgClOH	3.477e-10	3.477e-10	-9.459	-9.459	0.000	(0)
		HgCl3-	2.348e-10	1.491e-10	-9.629	-9.827	-0.197	(0)
		CdCl2	1.513e-10	1.513e-10	-9.820	-9.820	0.000	(0)
		ZnCl2	1.358e-10	1.358e-10	-9.867	-9.867	0.000	(0)
		CoCl+	1.104e-10	7.007e-11	-9.957	-10.154	-0.197	(0)
		CuCl2	9.589e-11	9.589e-11	-10.018	-10.018	0.000	(0)
		PbCl2	1.710e-11	1.710e-11	-10.767	-10.767	0.000	(0)
		HgCl4-2	1.453e-11	2.361e-12	-10.838	-11.627	-0.789	(0)
		CuCl3-2	1.283e-11	4.224e-12	-10.892	-11.374	-0.482	(0)
		NiCl+	1.265e-11	8.032e-12	-10.898	-11.095	-0.197	(0)
		CdOHC1	7.823e-12	7.823e-12	-11.107	-11.107	0.000	(0)
		MnCl3-	7.001e-13	5.303e-13	-12.155	-12.275	-0.121	(0)
		CdCl3-	5.982e-13	3.799e-13	-12.223	-12.420	-0.197	(0)
		ZnCl3-	5.802e-13	4.293e-13	-12.236	-12.367	-0.131	(0)
		HgCl+	2.959e-13	1.879e-13	-12.529	-12.726	-0.197	(0)
		CrCl+2	1.010e-13	1.641e-14	-12.996	-13.785	-0.789	(0)
		FeCl+2	7.593e-14	2.500e-14	-13.120	-13.602	-0.482	(0)
		PbCl3-	4.266e-14	2.709e-14	-13.370	-13.567	-0.197	(0)
		CuCl3-	4.812e-15	3.561e-15	-14.318	-14.448	-0.131	(0)
		ZnCl4-2	2.594e-15	8.541e-16	-14.586	-15.068	-0.482	(0)
		FeCl2+	5.866e-16	4.443e-16	-15.232	-15.352	-0.121	(0)
		PbCl4-2	3.030e-16	4.926e-17	-15.519	-16.307	-0.789	(0)
		VOC1+	2.678e-16	1.700e-16	-15.572	-15.770	-0.197	(0)

NiCl ₂	1.609e-16	1.609e-16	-15.793	-15.793	0.000	(0)
UO ₂ Cl ⁺	5.880e-17	3.734e-17	-16.231	-16.428	-0.197	(0)
CrOHC1 ₂	2.594e-17	2.594e-17	-16.586	-16.586	0.000	(0)
CrCl ₂ ⁺	9.758e-18	6.196e-18	-17.011	-17.208	-0.197	(0)
CuCl ₄ - ₂	2.157e-19	7.100e-20	-18.666	-19.149	-0.482	(0)
FeCl ₃	1.768e-19	1.768e-19	-18.753	-18.753	0.000	(0)
CrO ₃ Cl ⁻	3.461e-26	2.198e-26	-25.461	-25.658	-0.197	(0)
CoCl ₂ ⁺	4.568e-34	7.427e-35	-33.340	-34.129	-0.789	(0)
UCl ₃	0.000e+00	0.000e+00	-42.530	-44.305	-1.775	(0)
Cr (NH ₃) ₆ Cl ₂ ⁺	0.000e+00	0.000e+00	-47.142	-47.931	-0.789	(0)
Co (NH ₃) ₅ Cl ₂ ⁺	0.000e+00	0.000e+00	-47.501	-48.290	-0.789	(0)
Co (NH ₃) ₆ Cl ₂ ⁺	0.000e+00	0.000e+00	-62.239	-63.028	-0.789	(0)
Co (2)	6.212e-08					
Co ⁺ ₂	3.131e-08	5.091e-09	-7.504	-8.293	-0.789	(0)
CoHCO ₃ ⁺	2.303e-08	1.462e-08	-7.638	-7.835	-0.197	(0)
CoSO ₄	6.764e-09	6.764e-09	-8.170	-8.170	0.000	(0)
CoF ⁺	5.871e-10	3.728e-10	-9.231	-9.429	-0.197	(0)
CoCO ₃	3.104e-10	3.104e-10	-9.508	-9.508	0.000	(0)
CoCl ⁺	1.104e-10	7.007e-11	-9.957	-10.154	-0.197	(0)
CoOH ⁺	3.344e-12	2.123e-12	-11.476	-11.673	-0.197	(0)
CoNO ₂ ⁺	4.255e-13	2.702e-13	-12.371	-12.568	-0.197	(0)
Co (NH ₃) ₂ ⁺	3.573e-14	5.809e-15	-13.447	-14.236	-0.789	(0)
Co (OH) ₂	3.525e-15	3.525e-15	-14.453	-14.453	0.000	(0)
CoNO ₃ ⁺	2.282e-16	1.449e-16	-15.642	-15.839	-0.197	(0)
CoSeO ₄	6.729e-17	6.729e-17	-16.172	-16.172	0.000	(0)
Co ₂ OH ⁺ ₃	3.228e-20	5.418e-22	-19.491	-21.266	-1.775	(0)
Co (NH ₃) ₂ ⁺ ₂	1.446e-20	2.351e-21	-19.840	-20.629	-0.789	(0)
Co (OH) ₃ ⁻	2.316e-21	1.470e-21	-20.635	-20.833	-0.197	(0)
CoOOH ⁻	5.830e-22	3.702e-22	-21.234	-21.432	-0.197	(0)
Co (NO ₃) ₂	5.295e-24	5.295e-24	-23.276	-23.276	0.000	(0)
Co (NH ₃) ₃ ⁺ ₂	1.728e-27	2.809e-28	-26.762	-27.551	-0.789	(0)
Co (OH) ₄ ⁻ ₂	2.996e-29	4.871e-30	-28.523	-29.312	-0.789	(0)
Co (NH ₃) ₄ ⁺ ₂	8.606e-35	1.399e-35	-34.065	-34.854	-0.789	(0)
Co ₄ (OH) ₄ ⁺ ₄	5.805e-36	4.055e-39	-35.236	-38.392	-3.156	(0)
Co (NH ₃) ₅ ⁺ ₂	0.000e+00	0.000e+00	-41.868	-42.657	-0.789	(0)
Co (3)	5.994e-29					
CoOH ⁺ ₂	5.994e-29	9.745e-30	-28.222	-29.011	-0.789	(0)
Co ⁺ ₃	1.088e-33	9.175e-35	-32.963	-34.037	-1.074	(0)
CoCl ₂ ⁺	4.568e-34	7.427e-35	-33.340	-34.129	-0.789	(0)
Co (NH ₃) ₅ Cl ₂ ⁺	0.000e+00	0.000e+00	-47.501	-48.290	-0.789	(0)
Co (NH ₃) ₆ SO ₄ ⁺	0.000e+00	0.000e+00	-57.682	-57.879	-0.197	(0)
Co (NH ₃) ₆ Cl ₂ ⁺	0.000e+00	0.000e+00	-62.239	-63.028	-0.789	(0)
Co (NH ₃) ₆ OH ₂ ⁺	0.000e+00	0.000e+00	-63.318	-64.107	-0.789	(0)
Cr (2)	1.035e-24					
Cr ⁺ ₂	1.035e-24	1.682e-25	-23.985	-24.774	-0.789	(0)
Cr (3)	2.460e-08					
Cr (OH) ₂ ⁺	8.966e-09	1.458e-09	-8.047	-8.836	-0.789	(0)
CrF ⁺ ₂	7.195e-09	1.170e-09	-8.143	-8.932	-0.789	(0)
Cr (OH) ₂ ⁺	5.838e-09	3.707e-09	-8.234	-8.431	-0.197	(0)
CrOHSO ₄	2.303e-09	2.303e-09	-8.638	-8.638	0.000	(0)
Cr ⁺ ₃	1.899e-10	3.187e-12	-9.721	-11.497	-1.775	(0)
CrSO ₄ ⁺	7.805e-11	4.956e-11	-10.108	-10.305	-0.197	(0)
Cr (OH) ₃	2.911e-11	2.911e-11	-10.536	-10.536	0.000	(0)
CrCl ₂ ⁺	1.010e-13	1.641e-14	-12.996	-13.785	-0.789	(0)
CrO ₂ ⁻	4.550e-14	2.889e-14	-13.342	-13.539	-0.197	(0)
Cr (OH) ₄ ⁻	3.815e-14	2.423e-14	-13.419	-13.616	-0.197	(0)
Cr ₂ (OH) ₂ SO ₄ ⁺ ₂	1.867e-15	3.035e-16	-14.729	-15.518	-0.789	(0)
Cr ₂ (OH) ₂ (SO ₄) ₂	1.200e-16	1.200e-16	-15.921	-15.921	0.000	(0)
CrOHC1 ₂	2.594e-17	2.594e-17	-16.586	-16.586	0.000	(0)
CrCl ₂ ⁺	9.758e-18	6.196e-18	-17.011	-17.208	-0.197	(0)
CrNO ₃ ⁺ ₂	1.539e-20	2.502e-21	-19.813	-20.602	-0.789	(0)
Cr (NH ₃) ₅ OH ⁺ ₂	7.434e-39	1.209e-39	-38.129	-38.918	-0.789	(0)
Cr (NH ₃) ₆ ⁺ ₃	0.000e+00	0.000e+00	-44.858	-46.633	-1.775	(0)
Cr (NH ₃) ₆ Cl ₂ ⁺	0.000e+00	0.000e+00	-47.142	-47.931	-0.789	(0)
Cr (6)	6.551e-18					
CrO ₄ ⁻ ₂	3.523e-18	1.174e-18	-17.453	-17.930	-0.477	(0)
HCrO ₄ ⁻	2.871e-18	1.823e-18	-17.542	-17.739	-0.197	(0)
NaCrO ₄ ⁻	1.094e-19	6.947e-20	-18.961	-19.158	-0.197	(0)

KCrO4-	4.643e-20	2.948e-20	-19.333	-19.530	-0.197	(0)
CrO3SO4-2	1.096e-23	1.782e-24	-22.960	-23.749	-0.789	(0)
H2CrO4	7.096e-25	7.096e-25	-24.149	-24.149	0.000	(0)
CrO3Cl-	3.461e-26	2.198e-26	-25.461	-25.658	-0.197	(0)
Cr2O7-2	7.115e-34	1.157e-34	-33.148	-33.937	-0.789	(0)
Cu (1)	1.458e-08					
CuCl2-	6.711e-09	4.966e-09	-8.173	-8.304	-0.131	(0)
CuCl	5.974e-09	5.974e-09	-8.224	-8.224	0.000	(0)
Cu+	1.878e-09	1.193e-09	-8.726	-8.923	-0.197	(0)
CuCl3-2	1.283e-11	4.224e-12	-10.892	-11.374	-0.482	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.694	-150.146	-0.453	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.451	-150.876	-0.425	(0)
Cu (2)	3.422e-04					
CuCO3	2.341e-04	2.341e-04	-3.631	-3.631	0.000	(0)
CuHCO3+	4.045e-05	2.569e-05	-4.393	-4.590	-0.197	(0)
Cu+2	3.309e-05	1.102e-05	-4.480	-4.958	-0.477	(0)
CuSO4	1.682e-05	1.682e-05	-4.774	-4.774	0.000	(0)
Cu (CO3) 2-2	1.398e-05	2.272e-06	-4.855	-5.644	-0.789	(0)
CuF+	2.536e-06	1.611e-06	-5.596	-5.793	-0.197	(0)
CuOH+	9.847e-07	7.286e-07	-6.007	-6.137	-0.131	(0)
CuCl+	9.393e-08	6.951e-08	-7.027	-7.158	-0.131	(0)
Cu2 (OH) 2+2	8.203e-08	1.334e-08	-7.086	-7.875	-0.789	(0)
CuNO2+	1.369e-08	8.692e-09	-7.864	-8.061	-0.197	(0)
CuNH3+2	6.584e-09	1.070e-09	-8.181	-8.970	-0.789	(0)
Cu (OH) 2	3.039e-09	3.039e-09	-8.517	-8.517	0.000	(0)
CuCl2	9.589e-11	9.589e-11	-10.018	-10.018	0.000	(0)
CuNO3+	9.859e-13	6.260e-13	-12.006	-12.203	-0.197	(0)
Cu (NO2) 2	6.698e-13	6.698e-13	-12.174	-12.174	0.000	(0)
Cu (OH) 3-	2.052e-13	1.303e-13	-12.688	-12.885	-0.197	(0)
CuCl3-	4.812e-15	3.561e-15	-14.318	-14.448	-0.131	(0)
CuCl4-2	2.157e-19	7.100e-20	-18.666	-19.149	-0.482	(0)
Cu (OH) 4-2	1.318e-19	2.144e-20	-18.880	-19.669	-0.789	(0)
Cu (NO3) 2	1.415e-21	1.415e-21	-20.849	-20.849	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-214.737	-214.934	-0.197	(0)
F	4.679e-03					
F-	3.048e-03	2.316e-03	-2.516	-2.635	-0.119	(0)
MgF+	8.108e-04	6.073e-04	-3.091	-3.217	-0.125	(0)
CaF+	2.731e-04	2.069e-04	-3.564	-3.684	-0.121	(0)
AlF4-	8.710e-05	6.524e-05	-4.060	-4.185	-0.125	(0)
AlF3	5.621e-05	5.621e-05	-4.250	-4.250	0.000	(0)
NaF	1.740e-05	1.740e-05	-4.759	-4.759	0.000	(0)
CuF+	2.536e-06	1.611e-06	-5.596	-5.793	-0.197	(0)
AlF2+	2.524e-06	1.928e-06	-5.598	-5.715	-0.117	(0)
MnF+	2.092e-06	1.585e-06	-5.679	-5.800	-0.121	(0)
HF	1.644e-06	1.644e-06	-5.784	-5.784	0.000	(0)
ZnF+	1.568e-07	9.960e-08	-6.805	-7.002	-0.197	(0)
FeF3	1.070e-07	1.070e-07	-6.971	-6.971	0.000	(0)
BF (OH) 3-	7.996e-08	5.665e-08	-7.097	-7.247	-0.150	(0)
FeF2+	4.322e-08	3.274e-08	-7.364	-7.485	-0.121	(0)
HF2-	1.983e-08	1.448e-08	-7.703	-7.839	-0.137	(0)
BF2 (OH) 2-	9.536e-09	6.756e-09	-8.021	-8.170	-0.150	(0)
CrF+2	7.195e-09	1.170e-09	-8.143	-8.932	-0.789	(0)
AlF+2	6.143e-09	2.091e-09	-8.212	-8.680	-0.468	(0)
PbF+	1.752e-09	1.112e-09	-8.757	-8.954	-0.197	(0)
FeF+2	1.605e-09	5.283e-10	-8.795	-9.277	-0.482	(0)
CdF+	1.388e-09	8.813e-10	-8.858	-9.055	-0.197	(0)
CoF+	5.871e-10	3.728e-10	-9.231	-9.429	-0.197	(0)
NiF+	7.227e-11	4.589e-11	-10.141	-10.338	-0.197	(0)
PbF2	5.069e-11	5.069e-11	-10.295	-10.295	0.000	(0)
VO2F2-	2.005e-11	1.273e-11	-10.698	-10.895	-0.197	(0)
VO2F	1.514e-11	1.514e-11	-10.820	-10.820	0.000	(0)
UO2F2	1.235e-11	1.235e-11	-10.908	-10.908	0.000	(0)
UO2F3-	1.132e-11	7.186e-12	-10.946	-11.144	-0.197	(0)
H2F2	7.244e-12	7.244e-12	-11.140	-11.140	0.000	(0)
BF3OH-	4.138e-12	2.932e-12	-11.383	-11.533	-0.150	(0)
CdF2	4.072e-12	4.072e-12	-11.390	-11.390	0.000	(0)
UO2F+	2.913e-12	1.850e-12	-11.536	-11.733	-0.197	(0)
VO2F3-2	2.262e-12	3.677e-13	-11.646	-12.435	-0.789	(0)

UO2F4-2	8.130e-13	1.322e-13	-12.090	-12.879	-0.789	(0)
PbF3-	3.506e-13	2.226e-13	-12.455	-12.652	-0.197	(0)
VOF+	3.332e-13	2.116e-13	-12.477	-12.675	-0.197	(0)
VOF2	1.837e-13	1.837e-13	-12.736	-12.736	0.000	(0)
VO2F4-3	2.496e-14	4.190e-16	-13.603	-15.378	-1.775	(0)
VOF3-	2.377e-14	1.509e-14	-13.624	-13.821	-0.197	(0)
BF4-	2.271e-14	1.609e-14	-13.644	-13.793	-0.150	(0)
PbF4-2	1.518e-15	2.468e-16	-14.819	-15.608	-0.789	(0)
VOF4-2	8.678e-16	1.411e-16	-15.062	-15.850	-0.789	(0)
HgF+	3.200e-19	2.032e-19	-18.495	-18.692	-0.197	(0)
Sb(OH) 2F	8.900e-22	8.900e-22	-21.051	-21.051	0.000	(0)
SbOF	8.781e-22	8.781e-22	-21.056	-21.056	0.000	(0)
UF3+	1.933e-30	1.228e-30	-29.714	-29.911	-0.197	(0)
UF4	3.117e-31	3.117e-31	-30.506	-30.506	0.000	(0)
UF6-2	1.231e-31	2.001e-32	-30.910	-31.699	-0.789	(0)
UF5-	4.505e-32	2.861e-32	-31.346	-31.544	-0.197	(0)
UF2+2	2.058e-32	3.345e-33	-31.687	-32.476	-0.789	(0)
UF+3	6.837e-36	1.147e-37	-35.165	-36.940	-1.775	(0)
Fe (2)	4.150e-06					
Fe+2	3.043e-06	4.948e-07	-5.517	-6.306	-0.789	(0)
FeSO4	8.088e-07	8.088e-07	-6.092	-6.092	0.000	(0)
FeHCO3+	2.977e-07	2.301e-07	-6.526	-6.638	-0.112	(0)
FeOH+	5.436e-10	4.118e-10	-9.265	-9.385	-0.121	(0)
Fe (OH) 2	6.837e-15	6.837e-15	-14.165	-14.165	0.000	(0)
Fe (OH) 3-	5.966e-17	4.519e-17	-16.224	-16.345	-0.121	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-154.606	-154.606	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-230.997	-231.194	-0.197	(0)
Fe (3)	3.057e-05					
Fe (OH) 2+	2.990e-05	2.284e-05	-4.524	-4.641	-0.117	(0)
Fe (OH) 3	5.127e-07	5.127e-07	-6.290	-6.290	0.000	(0)
FeF3	1.070e-07	1.070e-07	-6.971	-6.971	0.000	(0)
FeF2+	4.322e-08	3.274e-08	-7.364	-7.485	-0.121	(0)
FeOH+2	8.529e-09	2.808e-09	-8.069	-8.552	-0.482	(0)
FeF+2	1.605e-09	5.283e-10	-8.795	-9.277	-0.482	(0)
Fe (OH) 4-	1.306e-09	9.978e-10	-8.884	-9.001	-0.117	(0)
FeSO4+	2.052e-11	1.555e-11	-10.688	-10.808	-0.121	(0)
Fe (SO4) 2-	3.486e-12	2.213e-12	-11.458	-11.655	-0.197	(0)
Fe+3	2.468e-12	2.081e-13	-11.608	-12.682	-1.074	(0)
Fe2 (OH) 2+4	3.738e-13	2.611e-16	-12.427	-15.583	-3.156	(0)
FeCl+2	7.593e-14	2.500e-14	-13.120	-13.602	-0.482	(0)
Fe3 (OH) 4+5	7.351e-15	8.619e-20	-14.134	-19.065	-4.931	(0)
FeHSeO3+2	9.821e-16	1.597e-16	-15.008	-15.797	-0.789	(0)
FeCl2+	5.866e-16	4.443e-16	-15.232	-15.352	-0.121	(0)
FeNO3+2	2.298e-19	3.737e-20	-18.639	-19.428	-0.789	(0)
FeCl3	1.768e-19	1.768e-19	-18.753	-18.753	0.000	(0)
H (0)	1.539e-29					
H2	7.693e-30	7.963e-30	-29.114	-29.099	0.015	(0)
Hg (0)	1.066e-09					
Hg	1.066e-09	1.066e-09	-8.972	-8.972	0.000	(0)
Hg (1)	2.108e-17					
Hg2+2	1.054e-17	1.713e-18	-16.977	-17.766	-0.789	(0)
Hg (2)	4.362e-09					
HgCl2	3.747e-09	3.747e-09	-8.426	-8.426	0.000	(0)
HgClOH	3.477e-10	3.477e-10	-9.459	-9.459	0.000	(0)
HgCl3-	2.348e-10	1.491e-10	-9.629	-9.827	-0.197	(0)
HgCl4-2	1.453e-11	2.361e-12	-10.838	-11.627	-0.789	(0)
HgCO3	1.022e-11	1.022e-11	-10.991	-10.991	0.000	(0)
Hg (OH) 2	6.305e-12	6.526e-12	-11.200	-11.185	0.015	(0)
Hg (CO3) 2-2	7.166e-13	1.165e-13	-12.145	-12.934	-0.789	(0)
HgCl+	2.959e-13	1.879e-13	-12.529	-12.726	-0.197	(0)
HgHCO3+	1.438e-13	9.133e-14	-12.842	-13.039	-0.197	(0)
HgOH+	3.102e-15	1.970e-15	-14.508	-14.706	-0.197	(0)
Hg (NH3) 2+2	8.273e-16	1.345e-16	-15.082	-15.871	-0.789	(0)
HgNH3+2	8.718e-17	1.417e-17	-16.060	-16.849	-0.789	(0)
Hg+2	1.456e-17	2.367e-18	-16.837	-17.626	-0.789	(0)
HgSO4	4.127e-18	4.127e-18	-17.384	-17.384	0.000	(0)
HgF+	3.200e-19	2.032e-19	-18.495	-18.692	-0.197	(0)
Hg (OH) 3-	2.704e-20	1.717e-20	-19.568	-19.765	-0.197	(0)

	Hg (NH3) 3+2	3.126e-23	5.082e-24	-22.505	-23.294	-0.789	(0)
	HgNO3+	2.472e-26	1.570e-26	-25.607	-25.804	-0.197	(0)
	Hg (NH3) 4+2	2.356e-30	3.831e-31	-29.628	-30.417	-0.789	(0)
	Hg (NO3) 2	1.172e-34	1.172e-34	-33.931	-33.931	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-136.432	-136.629	-0.197	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-136.554	-136.554	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.230	-139.019	-0.789	(0)
K		9.316e-03					
	K+	8.899e-03	6.760e-03	-2.051	-2.170	-0.119	(0)
	KSO4-	4.172e-04	3.187e-04	-3.380	-3.497	-0.117	(0)
	KCrO4-	4.643e-20	2.948e-20	-19.333	-19.530	-0.197	(0)
Mg		1.186e-02					
	Mg+2	7.017e-03	2.337e-03	-2.154	-2.631	-0.477	(0)
	MgSO4	2.832e-03	2.832e-03	-2.548	-2.548	0.000	(0)
	MgHCO3+	1.194e-03	8.834e-04	-2.923	-3.054	-0.131	(0)
	MgF+	8.108e-04	6.073e-04	-3.091	-3.217	-0.125	(0)
	MgCO3	7.012e-06	7.012e-06	-5.154	-5.154	0.000	(0)
	MgOH+	2.494e-08	1.945e-08	-7.603	-7.711	-0.108	(0)
	MgH2BO3+	8.484e-09	6.011e-09	-8.071	-8.221	-0.150	(0)
Mn (2)		1.450e-04					
	Mn+2	1.057e-04	1.719e-05	-3.976	-4.765	-0.789	(0)
	MnSO4	2.036e-05	2.036e-05	-4.691	-4.691	0.000	(0)
	MnHCO3+	1.672e-05	1.267e-05	-4.777	-4.897	-0.121	(0)
	MnF+	2.092e-06	1.585e-06	-5.679	-5.800	-0.121	(0)
	MnCl+	1.137e-07	8.611e-08	-6.944	-7.065	-0.121	(0)
	MnOH+	1.192e-09	9.026e-10	-8.924	-9.045	-0.121	(0)
	MnCl2	4.839e-10	4.839e-10	-9.315	-9.315	0.000	(0)
	MnNO3+	7.706e-13	4.893e-13	-12.113	-12.310	-0.197	(0)
	MnCl3-	7.001e-13	5.303e-13	-12.155	-12.275	-0.121	(0)
	MnSeO4	1.220e-13	1.220e-13	-12.914	-12.914	0.000	(0)
	Mn (NO3) 2	2.207e-20	2.207e-20	-19.656	-19.656	0.000	(0)
	Mn (OH) 3-	3.218e-21	2.437e-21	-20.492	-20.613	-0.121	(0)
	Mn (OH) 4-2	4.996e-28	1.645e-28	-27.301	-27.784	-0.482	(0)
	MnSe	0.000e+00	0.000e+00	-43.350	-43.350	0.000	(0)
Mn (3)		4.123e-23					
	Mn+3	4.123e-23	3.476e-24	-22.385	-23.459	-1.074	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-45.538	-46.020	-0.482	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-48.593	-48.736	-0.143	(0)
Mo		5.597e-06					
	MoO4-2	5.569e-06	1.855e-06	-5.254	-5.732	-0.477	(0)
	HMoO4-	2.791e-08	1.772e-08	-7.554	-7.752	-0.197	(0)
	H2MoO4	6.231e-11	6.231e-11	-10.205	-10.205	0.000	(0)
	AlMo6O21-3	2.666e-29	4.474e-31	-28.574	-30.349	-1.775	(0)
	Mo7O24-6	2.663e-31	2.113e-38	-30.575	-37.675	-7.100	(0)
	HMo7O24-5	2.108e-33	2.472e-38	-32.676	-37.607	-4.931	(0)
	H2Mo7O24-4	1.029e-36	7.187e-40	-35.988	-39.143	-3.156	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-40.441	-42.216	-1.775	(0)
N (-3)		1.205e-05					
	NH4+	1.128e-05	7.991e-06	-4.948	-5.097	-0.150	(0)
	NH4SO4-	7.527e-07	5.702e-07	-6.123	-6.244	-0.121	(0)
	NH3	9.490e-09	9.490e-09	-8.023	-8.023	0.000	(0)
	CuNH3+2	6.584e-09	1.070e-09	-8.181	-8.970	-0.789	(0)
	CaNH3+2	6.016e-10	9.780e-11	-9.221	-10.010	-0.789	(0)
	BaNH3+2	1.867e-13	3.035e-14	-12.729	-13.518	-0.789	(0)
	Co (NH3) +2	3.573e-14	5.809e-15	-13.447	-14.236	-0.789	(0)
	NiNH3+2	2.473e-14	4.021e-15	-13.607	-14.396	-0.789	(0)
	Hg (NH3) 2+2	8.273e-16	1.345e-16	-15.082	-15.871	-0.789	(0)
	HgNH3+2	8.718e-17	1.417e-17	-16.060	-16.849	-0.789	(0)
	Ca (NH3) 2+2	2.273e-18	3.695e-19	-17.643	-18.432	-0.789	(0)
	Ni (NH3) 2+2	3.393e-20	5.516e-21	-19.469	-20.258	-0.789	(0)
	Co (NH3) 2+2	1.446e-20	2.351e-21	-19.840	-20.629	-0.789	(0)
	Hg (NH3) 3+2	3.126e-23	5.082e-24	-22.505	-23.294	-0.789	(0)
	Co (NH3) 3+2	1.728e-27	2.809e-28	-26.762	-27.551	-0.789	(0)
	Hg (NH3) 4+2	2.356e-30	3.831e-31	-29.628	-30.417	-0.789	(0)
	Co (NH3) 4+2	8.606e-35	1.399e-35	-34.065	-34.854	-0.789	(0)
	Cr (NH3) 5OH+2	7.434e-39	1.209e-39	-38.129	-38.918	-0.789	(0)

Co (NH3) 5+2	0.000e+00	0.000e+00	-41.868	-42.657	-0.789	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-44.858	-46.633	-1.775	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-47.142	-47.931	-0.789	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.501	-48.290	-0.789	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-57.682	-57.879	-0.197	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.239	-63.028	-0.789	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.318	-64.107	-0.789	(0)
N (3)	1.048e-05					
NO2-	1.046e-05	7.530e-06	-4.980	-5.123	-0.143	(0)
CuNO2+	1.369e-08	8.692e-09	-7.864	-8.061	-0.197	(0)
Cu (NO2) 2	6.698e-13	6.698e-13	-12.174	-12.174	0.000	(0)
CoNO2+	4.255e-13	2.702e-13	-12.371	-12.568	-0.197	(0)
N (5)	2.437e-08					
NO3-	2.364e-08	1.796e-08	-7.626	-7.746	-0.119	(0)
CaNO3+	7.322e-10	4.649e-10	-9.135	-9.333	-0.197	(0)
CuNO3+	9.859e-13	6.260e-13	-12.006	-12.203	-0.197	(0)
MnNO3+	7.706e-13	4.893e-13	-12.113	-12.310	-0.197	(0)
BaNO3+	7.185e-13	4.562e-13	-12.144	-12.341	-0.197	(0)
ZnNO3+	1.531e-13	9.724e-14	-12.815	-13.012	-0.197	(0)
PbNO3+	2.851e-15	1.811e-15	-14.545	-14.742	-0.197	(0)
CdNO3+	2.147e-15	1.364e-15	-14.668	-14.865	-0.197	(0)
CoNO3+	2.282e-16	1.449e-16	-15.642	-15.839	-0.197	(0)
NiNO3+	5.605e-17	3.559e-17	-16.251	-16.449	-0.197	(0)
FeNO3+2	2.298e-19	3.737e-20	-18.639	-19.428	-0.789	(0)
VO2NO3	3.386e-20	3.386e-20	-19.470	-19.470	0.000	(0)
Mn (NO3) 2	2.207e-20	2.207e-20	-19.656	-19.656	0.000	(0)
CrNO3+2	1.539e-20	2.502e-21	-19.813	-20.602	-0.789	(0)
Cu (NO3) 2	1.415e-21	1.415e-21	-20.849	-20.849	0.000	(0)
Zn (NO3) 2	3.484e-22	3.484e-22	-21.458	-21.458	0.000	(0)
UO2NO3+	3.265e-22	2.073e-22	-21.486	-21.683	-0.197	(0)
Pb (NO3) 2	5.522e-23	5.522e-23	-22.258	-22.258	0.000	(0)
Cd (NO3) 2	1.227e-23	1.227e-23	-22.911	-22.911	0.000	(0)
Co (NO3) 2	5.295e-24	5.295e-24	-23.276	-23.276	0.000	(0)
HgNO3+	2.472e-26	1.570e-26	-25.607	-25.804	-0.197	(0)
Hg (NO3) 2	1.172e-34	1.172e-34	-33.931	-33.931	0.000	(0)
Na	1.650e-02					
Na+	1.568e-02	1.191e-02	-1.805	-1.924	-0.119	(0)
NaSO4-	5.576e-04	4.260e-04	-3.254	-3.371	-0.117	(0)
NaHCO3	2.474e-04	2.474e-04	-3.607	-3.607	0.000	(0)
NaF	1.740e-05	1.740e-05	-4.759	-4.759	0.000	(0)
NaCO3-	1.047e-06	7.999e-07	-5.980	-6.097	-0.117	(0)
NaH2BO3	1.400e-09	1.400e-09	-8.854	-8.854	0.000	(0)
NaCrO4-	1.094e-19	6.947e-20	-18.961	-19.158	-0.197	(0)
Ni	9.267e-09					
NiHCO3+	5.657e-09	3.592e-09	-8.247	-8.445	-0.197	(0)
Ni+2	2.368e-09	7.890e-10	-8.626	-9.103	-0.477	(0)
NiSO4	1.048e-09	1.048e-09	-8.980	-8.980	0.000	(0)
NiCO3	1.062e-10	1.062e-10	-9.974	-9.974	0.000	(0)
NiF+	7.227e-11	4.589e-11	-10.141	-10.338	-0.197	(0)
NiCl+	1.265e-11	8.032e-12	-10.898	-11.095	-0.197	(0)
Ni (SO4) 2-2	1.422e-12	2.312e-13	-11.847	-12.636	-0.789	(0)
NiOH+	3.270e-13	2.076e-13	-12.485	-12.683	-0.197	(0)
NiNH3+2	2.473e-14	4.021e-15	-13.607	-14.396	-0.789	(0)
Ni (OH) 2	3.447e-16	3.447e-16	-15.463	-15.463	0.000	(0)
NiCl2	1.609e-16	1.609e-16	-15.793	-15.793	0.000	(0)
NiNO3+	5.605e-17	3.559e-17	-16.251	-16.449	-0.197	(0)
NiSeO4	9.733e-18	9.733e-18	-17.012	-17.012	0.000	(0)
Ni (NH3) 2+2	3.393e-20	5.516e-21	-19.469	-20.258	-0.789	(0)
Ni (OH) 3-	1.135e-20	7.206e-21	-19.945	-20.142	-0.197	(0)
O (0)	1.534e-34					
O2	7.672e-35	7.941e-35	-34.115	-34.100	0.015	(0)
Pb	4.253e-07					
PbHCO3+	2.946e-07	1.870e-07	-6.531	-6.728	-0.197	(0)
PbCO3	7.389e-08	7.389e-08	-7.131	-7.131	0.000	(0)
PbSO4	2.223e-08	2.223e-08	-7.653	-7.653	0.000	(0)
Pb+2	2.046e-08	6.816e-09	-7.689	-8.166	-0.477	(0)
Pb (SO4) 2-2	5.487e-09	8.920e-10	-8.261	-9.050	-0.789	(0)
Pb (CO3) 2-2	4.727e-09	7.686e-10	-8.325	-9.114	-0.789	(0)

PbF+	1.752e-09	1.112e-09	-8.757	-8.954	-0.197	(0)
PbCl+	1.515e-09	9.622e-10	-8.819	-9.017	-0.197	(0)
PbOH+	5.636e-10	3.579e-10	-9.249	-9.446	-0.197	(0)
PbF2	5.069e-11	5.069e-11	-10.295	-10.295	0.000	(0)
PbCl2	1.710e-11	1.710e-11	-10.767	-10.767	0.000	(0)
PbF3-	3.506e-13	2.226e-13	-12.455	-12.652	-0.197	(0)
Pb (OH) 2	2.366e-13	2.366e-13	-12.626	-12.626	0.000	(0)
PbCl3-	4.266e-14	2.709e-14	-13.370	-13.567	-0.197	(0)
PbNO3+	2.851e-15	1.811e-15	-14.545	-14.742	-0.197	(0)
Pb2OH+3	2.303e-15	3.866e-17	-14.638	-16.413	-1.775	(0)
PbF4-2	1.518e-15	2.468e-16	-14.819	-15.608	-0.789	(0)
PbCl4-2	3.030e-16	4.926e-17	-15.519	-16.307	-0.789	(0)
Pb (OH) 3-	7.787e-18	4.945e-18	-17.109	-17.306	-0.197	(0)
Pb (OH) 4-2	1.557e-22	2.531e-23	-21.808	-22.597	-0.789	(0)
Pb (NO3) 2	5.522e-23	5.522e-23	-22.258	-22.258	0.000	(0)
Pb3 (OH) 4+2	4.681e-23	7.611e-24	-22.330	-23.119	-0.789	(0)
Pb4 (OH) 4+4	5.898e-25	4.121e-28	-24.229	-27.385	-3.156	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.147	-150.147	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.275	-227.472	-0.197	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-77.924	-77.924	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.039	-78.237	-0.197	(0)
HS-	0.000e+00	0.000e+00	-78.428	-78.625	-0.197	(0)
S5-2	0.000e+00	0.000e+00	-80.883	-81.672	-0.789	(0)
S6-2	0.000e+00	0.000e+00	-81.398	-82.187	-0.789	(0)
S4-2	0.000e+00	0.000e+00	-81.478	-82.267	-0.789	(0)
S3-2	0.000e+00	0.000e+00	-82.284	-83.073	-0.789	(0)
S2-2	0.000e+00	0.000e+00	-83.300	-84.089	-0.789	(0)
S-2	0.000e+00	0.000e+00	-89.124	-89.606	-0.482	(0)
HgHS2-	0.000e+00	0.000e+00	-136.432	-136.629	-0.197	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-136.554	-136.554	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.230	-139.019	-0.789	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.591	-149.788	-0.197	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.658	-149.658	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.694	-150.146	-0.453	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.097	-150.097	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.147	-150.147	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.451	-150.876	-0.425	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-154.606	-154.606	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-214.737	-214.934	-0.197	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.245	-225.442	-0.197	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.186	-226.383	-0.197	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.275	-227.472	-0.197	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.314	-229.103	-0.789	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-230.997	-231.194	-0.197	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.023	-302.812	-0.789	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.738	-305.527	-0.789	(0)
Sb2S4-2	0.000e+00	0.000e+00	-313.535	-314.324	-0.789	(0)
S (6)	3.633e-02					
SO4-2	1.999e-02	6.659e-03	-1.699	-2.177	-0.477	(0)
CaSO4	1.249e-02	1.249e-02	-1.903	-1.903	0.000	(0)
MgSO4	2.832e-03	2.832e-03	-2.548	-2.548	0.000	(0)
NaSO4-	5.576e-04	4.260e-04	-3.254	-3.371	-0.117	(0)
KSO4-	4.172e-04	3.187e-04	-3.380	-3.497	-0.117	(0)
MnSO4	2.036e-05	2.036e-05	-4.691	-4.691	0.000	(0)
CuSO4	1.682e-05	1.682e-05	-4.774	-4.774	0.000	(0)
ZnSO4	3.140e-06	3.140e-06	-5.503	-5.503	0.000	(0)
Zn (SO4) 2-2	1.120e-06	1.821e-07	-5.951	-6.740	-0.789	(0)
FeSO4	8.088e-07	8.088e-07	-6.092	-6.092	0.000	(0)
NH4SO4-	7.527e-07	5.702e-07	-6.123	-6.244	-0.121	(0)
HSO4-	4.171e-07	3.124e-07	-6.380	-6.505	-0.125	(0)
CdSO4	3.748e-08	3.748e-08	-7.426	-7.426	0.000	(0)
PbSO4	2.223e-08	2.223e-08	-7.653	-7.653	0.000	(0)
Cd (SO4) 2-2	2.071e-08	3.367e-09	-7.684	-8.473	-0.789	(0)
CoSO4	6.764e-09	6.764e-09	-8.170	-8.170	0.000	(0)
Pb (SO4) 2-2	5.487e-09	8.920e-10	-8.261	-9.050	-0.789	(0)
CrOHSO4	2.303e-09	2.303e-09	-8.638	-8.638	0.000	(0)
NiSO4	1.048e-09	1.048e-09	-8.980	-8.980	0.000	(0)

CrSO4+	7.805e-11	4.956e-11	-10.108	-10.305	-0.197	(0)
FeSO4+	2.052e-11	1.555e-11	-10.688	-10.808	-0.121	(0)
AlSO4+	6.233e-12	4.669e-12	-11.205	-11.331	-0.125	(0)
Fe (SO4) 2-	3.486e-12	2.213e-12	-11.458	-11.655	-0.197	(0)
Ni (SO4) 2-2	1.422e-12	2.312e-13	-11.847	-12.636	-0.789	(0)
VO2SO4-	9.334e-13	5.927e-13	-12.030	-12.227	-0.197	(0)
Al (SO4) 2-	4.447e-13	3.331e-13	-12.352	-12.477	-0.125	(0)
UO2SO4	5.832e-14	5.832e-14	-13.234	-13.234	0.000	(0)
UO2 (SO4) 2-2	3.149e-14	5.120e-15	-13.502	-14.291	-0.789	(0)
VOSO4	2.794e-14	2.794e-14	-13.554	-13.554	0.000	(0)
Cr2 (OH) 2SO4+2	1.867e-15	3.035e-16	-14.729	-15.518	-0.789	(0)
Cr2 (OH) 2 (SO4) 2	1.200e-16	1.200e-16	-15.921	-15.921	0.000	(0)
HgSO4	4.127e-18	4.127e-18	-17.384	-17.384	0.000	(0)
CrO3SO4-2	1.096e-23	1.782e-24	-22.960	-23.749	-0.789	(0)
VSO4+	1.913e-27	1.215e-27	-26.718	-26.916	-0.197	(0)
U (SO4) 2	3.483e-38	3.483e-38	-37.458	-37.458	0.000	(0)
USO4+2	4.050e-39	6.584e-40	-38.393	-39.182	-0.789	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-57.682	-57.879	-0.197	(0)
Sb (3)	1.013e-18					
Sb (OH) 3	5.107e-19	5.107e-19	-18.292	-18.292	0.000	(0)
HSbO2	5.002e-19	5.002e-19	-18.301	-18.301	0.000	(0)
Sb (OH) 2F	8.900e-22	8.900e-22	-21.051	-21.051	0.000	(0)
SbOF	8.781e-22	8.781e-22	-21.056	-21.056	0.000	(0)
Sb (OH) 2+	9.408e-24	5.974e-24	-23.026	-23.224	-0.197	(0)
SbO+	3.255e-24	2.067e-24	-23.488	-23.685	-0.197	(0)
SbO2-	2.658e-24	1.688e-24	-23.576	-23.773	-0.197	(0)
Sb (OH) 4-	1.513e-24	9.605e-25	-23.820	-24.018	-0.197	(0)
Sb2S4-2	0.000e+00	0.000e+00	-313.535	-314.324	-0.789	(0)
Sb (5)	6.243e-08					
SbO3-	6.237e-08	3.960e-08	-7.205	-7.402	-0.197	(0)
Sb (OH) 6-	6.036e-11	4.585e-11	-10.219	-10.339	-0.119	(0)
SbO2+	4.137e-21	2.627e-21	-20.383	-20.581	-0.197	(0)
Se (-2)	4.763e-40					
HSe-	4.763e-40	3.024e-40	-39.322	-39.519	-0.197	(0)
H2Se	0.000e+00	0.000e+00	-41.948	-41.948	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.350	-43.350	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.412	-48.201	-0.789	(0)
Se (4)	4.722e-07					
HSeO3-	4.574e-07	2.904e-07	-6.340	-6.537	-0.197	(0)
SeO3-2	1.481e-08	2.408e-09	-7.829	-8.618	-0.789	(0)
H2SeO3	5.948e-11	5.948e-11	-10.226	-10.226	0.000	(0)
FeHSeO3+2	9.821e-16	1.597e-16	-15.008	-15.797	-0.789	(0)
Cd (SeO3) 2-2	7.060e-19	1.148e-19	-18.151	-18.940	-0.789	(0)
Se (6)	7.930e-11					
SeO4-2	7.917e-11	2.637e-11	-10.101	-10.579	-0.477	(0)
MnSeO4	1.220e-13	1.220e-13	-12.914	-12.914	0.000	(0)
ZnSeO4	8.805e-15	8.805e-15	-14.055	-14.055	0.000	(0)
HSeO4-	9.994e-16	6.346e-16	-15.000	-15.198	-0.197	(0)
CdSeO4	1.179e-16	1.179e-16	-15.928	-15.928	0.000	(0)
CoSeO4	6.729e-17	6.729e-17	-16.172	-16.172	0.000	(0)
NiSeO4	9.733e-18	9.733e-18	-17.012	-17.012	0.000	(0)
Zn (SeO4) 2-2	1.448e-24	2.355e-25	-23.839	-24.628	-0.789	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.282	-59.057	-1.775	(0)
U (4)	1.158e-25					
U (OH) 5-	1.144e-25	7.263e-26	-24.942	-25.139	-0.197	(0)
U (OH) 4	1.465e-27	1.465e-27	-26.834	-26.834	0.000	(0)
U (OH) 3+	4.064e-30	2.580e-30	-29.391	-29.588	-0.197	(0)
UF3+	1.933e-30	1.228e-30	-29.714	-29.911	-0.197	(0)
UF4	3.117e-31	3.117e-31	-30.506	-30.506	0.000	(0)
UF6-2	1.231e-31	2.001e-32	-30.910	-31.699	-0.789	(0)
UF5-	4.505e-32	2.861e-32	-31.346	-31.544	-0.197	(0)
UF2+2	2.058e-32	3.345e-33	-31.687	-32.476	-0.789	(0)
U (OH) 2+2	3.535e-33	5.747e-34	-32.452	-33.241	-0.789	(0)
UF+3	6.837e-36	1.147e-37	-35.165	-36.940	-1.775	(0)
UOH+3	7.769e-37	1.304e-38	-36.110	-37.885	-1.775	(0)
U (SO4) 2	3.483e-38	3.483e-38	-37.458	-37.458	0.000	(0)
USO4+2	4.050e-39	6.584e-40	-38.393	-39.182	-0.789	(0)

U+4	0.000e+00	0.000e+00	-40.449	-43.605	-3.156	(0)
UC1+3	0.000e+00	0.000e+00	-42.530	-44.305	-1.775	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.051	-184.027	-15.976	(0)
U (5)	1.227e-18					
UO2+	1.227e-18	7.791e-19	-17.911	-18.108	-0.197	(0)
U (6)	1.584e-06					
UO2 (CO3) 3-4	1.547e-06	1.081e-09	-5.811	-8.966	-3.156	(0)
UO2 (CO3) 2-2	3.677e-08	5.978e-09	-7.434	-8.223	-0.789	(0)
UO2CO3	8.308e-11	8.308e-11	-10.081	-10.081	0.000	(0)
UO2F2	1.235e-11	1.235e-11	-10.908	-10.908	0.000	(0)
UO2F3-	1.132e-11	7.186e-12	-10.946	-11.144	-0.197	(0)
UO2F+	2.913e-12	1.850e-12	-11.536	-11.733	-0.197	(0)
UO2F4-2	8.130e-13	1.322e-13	-12.090	-12.879	-0.789	(0)
UO2SO4	5.832e-14	5.832e-14	-13.234	-13.234	0.000	(0)
UO2 (SO4) 2-2	3.149e-14	5.120e-15	-13.502	-14.291	-0.789	(0)
UO2OH+	2.398e-14	1.523e-14	-13.620	-13.817	-0.197	(0)
UO2+2	1.737e-14	5.786e-15	-13.760	-14.238	-0.477	(0)
UO2Cl+	5.880e-17	3.734e-17	-16.231	-16.428	-0.197	(0)
(UO2) 2 (OH) 2+2	2.367e-21	3.848e-22	-20.626	-21.415	-0.789	(0)
UO2NO3+	3.265e-22	2.073e-22	-21.486	-21.683	-0.197	(0)
(UO2) 3 (OH) 5+	3.058e-27	1.942e-27	-26.515	-26.712	-0.197	(0)
V (2)	3.017e-38					
V+2	2.572e-38	4.181e-39	-37.590	-38.379	-0.789	(0)
VOH+	4.454e-39	2.828e-39	-38.351	-38.549	-0.197	(0)
V (3)	2.847e-12					
V (OH) 3	2.847e-12	2.847e-12	-11.546	-11.546	0.000	(0)
V (OH) 2+	1.395e-21	8.861e-22	-20.855	-21.053	-0.197	(0)
VOH+2	2.490e-23	4.048e-24	-22.604	-23.393	-0.789	(0)
V+3	2.302e-26	3.864e-28	-25.638	-27.413	-1.775	(0)
VSO4+	1.913e-27	1.215e-27	-26.718	-26.916	-0.197	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-42.830	-45.985	-3.156	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-44.218	-45.993	-1.775	(0)
V (4)	7.631e-13					
VOF+	3.332e-13	2.116e-13	-12.477	-12.675	-0.197	(0)
VOF2	1.837e-13	1.837e-13	-12.736	-12.736	0.000	(0)
V (OH) 3+	9.971e-14	6.331e-14	-13.001	-13.199	-0.197	(0)
VO+2	9.369e-14	1.523e-14	-13.028	-13.817	-0.789	(0)
VOSO4	2.794e-14	2.794e-14	-13.554	-13.554	0.000	(0)
VOF3-	2.377e-14	1.509e-14	-13.624	-13.821	-0.197	(0)
VOF4-2	8.678e-16	1.411e-16	-15.062	-15.850	-0.789	(0)
VOC1+	2.678e-16	1.700e-16	-15.572	-15.770	-0.197	(0)
H2V2O4+2	1.244e-21	2.023e-22	-20.905	-21.694	-0.789	(0)
V (5)	1.361e-06					
H2VO4-	1.268e-06	8.051e-07	-5.897	-6.094	-0.197	(0)
H3V2O7-	3.175e-08	2.016e-08	-7.498	-7.696	-0.197	(0)
HVO4-2	2.591e-08	4.212e-09	-7.587	-8.375	-0.789	(0)
H3VO4	3.865e-09	3.865e-09	-8.413	-8.413	0.000	(0)
HV2O7-3	6.870e-11	1.153e-12	-10.163	-11.938	-1.775	(0)
V3O9-3	3.289e-11	5.520e-13	-10.483	-12.258	-1.775	(0)
VO2F2-	2.005e-11	1.273e-11	-10.698	-10.895	-0.197	(0)
VO2F	1.514e-11	1.514e-11	-10.820	-10.820	0.000	(0)
VO2+	4.907e-12	3.728e-12	-11.309	-11.429	-0.119	(0)
VO2F3-2	2.262e-12	3.677e-13	-11.646	-12.435	-0.789	(0)
VO2SO4-	9.334e-13	5.927e-13	-12.030	-12.227	-0.197	(0)
V4O12-4	2.661e-13	1.859e-16	-12.575	-15.731	-3.156	(0)
V2O7-4	9.253e-14	6.465e-17	-13.034	-16.189	-3.156	(0)
VO2F4-3	2.496e-14	4.190e-16	-13.603	-15.378	-1.775	(0)
VO4-3	2.620e-15	4.398e-17	-14.582	-16.357	-1.775	(0)
VO2NO3	3.386e-20	3.386e-20	-19.470	-19.470	0.000	(0)
V10O28-6	6.421e-31	5.095e-38	-30.192	-37.293	-7.100	(0)
HV10O28-5	3.206e-31	3.760e-36	-30.494	-35.425	-4.931	(0)
H2V10O28-4	4.167e-34	2.911e-37	-33.380	-36.536	-3.156	(0)
Zn	1.534e-05					
Zn+2	6.471e-06	2.156e-06	-5.189	-5.666	-0.477	(0)
ZnHCO3+	3.964e-06	2.517e-06	-5.402	-5.599	-0.197	(0)
ZnSO4	3.140e-06	3.140e-06	-5.503	-5.503	0.000	(0)
Zn (SO4) 2-2	1.120e-06	1.821e-07	-5.951	-6.740	-0.789	(0)
ZnCO3	4.473e-07	4.473e-07	-6.349	-6.349	0.000	(0)

ZnF+	1.568e-07	9.960e-08	-6.805	-7.002	-0.197	(0)
ZnCl+	2.911e-08	2.154e-08	-7.536	-7.667	-0.131	(0)
ZnOH+	7.096e-09	4.506e-09	-8.149	-8.346	-0.197	(0)
ZnOHC1	5.895e-10	5.895e-10	-9.229	-9.229	0.000	(0)
ZnCl2	1.358e-10	1.358e-10	-9.867	-9.867	0.000	(0)
Zn(OH)2	1.493e-11	1.493e-11	-10.826	-10.826	0.000	(0)
ZnCl3-	5.802e-13	4.293e-13	-12.236	-12.367	-0.131	(0)
ZnNO3+	1.531e-13	9.724e-14	-12.815	-13.012	-0.197	(0)
ZnSeO4	8.805e-15	8.805e-15	-14.055	-14.055	0.000	(0)
ZnCl4-2	2.594e-15	8.541e-16	-14.586	-15.068	-0.482	(0)
Zn(OH)3-	2.463e-15	1.564e-15	-14.609	-14.806	-0.197	(0)
Zn(OH)4-2	8.004e-21	1.301e-21	-20.097	-20.886	-0.789	(0)
Zn(NO3)2	3.484e-22	3.484e-22	-21.458	-21.458	0.000	(0)
Zn(SeO4)2-2	1.448e-24	2.355e-25	-23.839	-24.628	-0.789	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.591	-149.788	-0.197	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.097	-150.097	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.245	-225.442	-0.197	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-228.314	-229.103	-0.789	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-304.738	-305.527	-0.789	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-52.11	-45.82	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-39.64	-35.13	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-46.87	-35.13	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-67.88	-49.95	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-53.94	-33.91	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.53	-28.13	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.22	-20.77	0.45	(NH4)2SeO4
Al(OH)3(am)	-4.89	5.91	10.80	Al(OH)3
Al2(MoO4)3	-45.65	-43.28	2.37	Al2(MoO4)3
Al2O3	-7.83	11.82	19.65	Al2O3
Al4(OH)10SO4	-13.88	8.82	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.53	-5.73	4.80	AlAsO4:2H2O
AlOHSO4	-5.67	-8.90	-3.23	AlOHSO4
AlSb	-155.85	-90.22	65.62	AlSb
Alunite	-6.35	-7.75	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.55	-10.34	-7.79	PbSO4
Anhydrite	0.10	-4.26	-4.36	CaSO4
Anilite	-55.05	-86.93	-31.88	Cu0.25Cu1.5S
Antlerite	-0.57	8.22	8.79	Cu3(OH)4SO4
Aragonite	0.77	-7.53	-8.30	CaCO3
Arsenolite	-72.00	-74.76	-2.76	As4O6
Artinite	-7.68	1.92	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-29.99	-23.28	6.71	As2O5
Atacamite	-0.76	6.64	7.39	Cu2(OH)3Cl
Azurite	3.78	-13.12	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.07	7.33	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-11.41	4.46	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	7.65	-1.26	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-21.14	11.80	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.56	-23.23	-9.67	BaCrO4
BaF2	-4.75	-10.57	-5.82	BaF2
BaMoO4	-4.07	-11.03	-6.96	BaMoO4
Barite	2.51	-7.47	-9.98	BaSO4
BaS	-93.78	-77.60	16.18	BaS
BaSeO3	-7.34	-5.51	1.83	BaSeO3
BaSeO4	-8.41	-15.87	-7.46	BaSeO4
Bianchite	-6.09	-7.85	-1.76	ZnSO4:6H2O
Birnessite	-9.62	8.47	18.09	MnO2
Bixbyite	-8.37	-9.01	-0.64	Mn2O3
BlaubleiI	-54.39	-78.55	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.14	-82.42	-27.28	Cu0.6Cu0.8S
Boehmite	-2.67	5.91	8.58	AlOOH
Breithauptite	-61.10	-79.63	-18.52	NiSb
Brochantite	0.67	15.90	15.22	Cu4(OH)6SO4

Brucite	-6.84	10.00	16.84	Mg (OH) 2
Bunsenite	-8.91	3.53	12.45	NiO
Ca (VO3) 2	-5.33	0.33	5.66	Ca (VO3) 2
Ca2V2O7	-6.62	10.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.68	10.87	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-13.94	8.36	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.53	21.43	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.44	21.42	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-303.59	-160.62	142.97	Ca3Sb2
CaCrO4	-17.75	-20.02	-2.27	CaCrO4
Calcite	0.95	-7.53	-8.48	CaCO3
Calomel	-4.66	-22.57	-17.91	Hg2Cl2
CaMoO4	0.13	-7.82	-7.95	CaMoO4
Carnotite	-2.79	-2.56	0.23	KUO2VO4
CaSeO3:2H2O	-5.12	-2.31	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.65	-12.67	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.24	-3.40	9.84	Cd (BO2) 2
Cd (OH) 2	-8.63	5.01	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-8.72	5.01	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-21.29	-14.58	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-22.33	0.23	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-23.15	5.25	28.40	Cd4 (OH) 6SO4
CdCl2	-11.76	-12.42	-0.66	CdCl2
CdCl2:1H2O	-10.73	-12.42	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.51	-12.42	-1.91	CdCl2:2.5H2O
CdF2	-11.68	-12.89	-1.21	CdF2
Cdmetal (alpha)	-34.45	-20.93	13.51	Cd
Cdmetal (gamma)	-34.55	-20.93	13.62	Cd
CdMoO4	0.80	-13.35	-14.15	CdMoO4
CdOHCl	-7.24	-3.70	3.54	CdOHCl
CdSb	-77.79	-78.14	-0.35	CdSb
CdSe	-20.62	-40.82	-20.20	CdSe
CdSeO4:2H2O	-16.35	-18.20	-1.85	CdSeO4:2H2O
CdSO4	-9.62	-9.80	-0.17	CdSO4
CdSO4:1H2O	-8.07	-9.80	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.93	-9.80	-1.87	CdSO4:2.67H2O
Cerrusite	-0.48	-13.61	-13.13	PbCO3
CH4 (g)	-80.83	-121.87	-41.05	CH4
Chalcanthite	-4.50	-7.14	-2.64	CuSO4:5H2O
Chalcocite	-55.23	-90.15	-34.92	Cu2S
Chalcopyrite	-120.61	-155.88	-35.27	CuFeS2
Cinnabar	-50.43	-96.13	-45.69	HgS
Claudetite	-71.70	-74.76	-3.06	As4O6
Clausthalite	-14.27	-41.37	-27.10	PbSe
Co (BO2) 2	-31.15	-4.08	27.07	Co (BO2) 2
Co (OH) 2	-8.75	4.34	13.09	Co (OH) 2
Co (OH) 3	-12.78	-15.09	-2.31	Co (OH) 3
CO2 (g)	0.07	-18.08	-18.15	CO2
Co3 (AsO4) 2	-23.29	-10.25	13.03	Co3 (AsO4) 2
Co3O4	-15.33	-25.82	-10.50	Co3O4
CoCl2	-21.36	-13.09	8.27	CoCl2
CoCl2:6H2O	-15.64	-13.10	2.54	CoCl2:6H2O
CoCO3	-3.76	-13.74	-9.98	CoCO3
CoF2	-11.97	-13.56	-1.60	CoF2
CoF3	-40.49	-41.94	-1.46	CoF3
CoFe2O4	20.41	16.89	-3.53	CoFe2O4
CoMoO4	-6.26	-14.02	-7.76	CoMoO4
CoO	-9.24	4.34	13.59	CoO
CoS (alpha)	-73.16	-80.60	-7.44	CoS
CoS (beta)	-69.53	-80.60	-11.07	CoS
CoSe	-25.29	-41.49	-16.20	CoSe
CoSeO3	-9.83	-8.51	1.32	CoSeO3
CoSeO4:6H2O	-17.35	-18.88	-1.53	CoSeO4:6H2O
CoSO4	-13.27	-10.47	2.80	CoSO4
CoSO4:6H2O	-8.01	-10.48	-2.47	CoSO4:6H2O
Cotunnite	-8.19	-12.97	-4.78	PbCl2
Covellite	-54.96	-77.26	-22.30	CuS
Cr (OH) 2	-22.96	-12.14	10.82	Cr (OH) 2

Cr(OH)3	-3.45	-2.11	1.34	Cr(OH)3
Cr(OH)3(am)	-1.36	-2.11	-0.75	Cr(OH)3
Cr2O3	-1.87	-4.22	-2.36	Cr2O3
CrCl2	-43.67	-29.57	14.09	CrCl2
CrCl3	-43.38	-28.27	15.11	CrCl3
CrF3	-17.63	-28.97	-11.34	CrF3
Crmetal	-68.57	-38.09	30.48	Cr
CrO3	-27.36	-30.57	-3.21	CrO3
Cryolite	-0.79	-34.63	-33.84	Na3AlF6
Cu(OH)2	-1.00	7.68	8.67	Cu(OH)2
Cu(SbO3)2	-22.22	22.99	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-7.96	1.29	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.18	-91.06	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.25	-51.05	-45.80	Cu2Se
Cu2SO4	-18.07	-20.02	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-6.35	-0.25	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.35	-103.95	-42.59	Cu3Sb
Cu3Se2	-25.71	-89.21	-63.49	Cu3Se2
CuCO3	1.10	-10.40	-11.50	CuCO3
CuCrO4	-17.45	-22.89	-5.44	CuCrO4
CuF	-6.65	-11.56	-4.91	CuF
CuF2	-11.34	-10.23	1.12	CuF2
CuF2:2H2O	-5.68	-10.23	-4.55	CuF2:2H2O
Cumetal	-6.82	-15.58	-8.76	Cu
CuMoO4	2.39	-10.69	-13.08	CuMoO4
CuOCuSO4	-9.76	0.54	10.30	CuOCuSO4
Cupricferrite	14.23	20.22	5.99	CuFe2O4
Cuprite	-3.81	-5.21	-1.41	Cu2O
Cuprousferrite	12.58	3.67	-8.92	CuFeO2
CuSe	-5.06	-38.16	-33.10	CuSe
CuSe2	-24.68	-58.05	-33.37	CuSe2
CuSeO3:2H2O	-5.69	-5.18	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-13.10	-15.54	-2.44	CuSeO4:5H2O
CuSO4	-10.07	-7.13	2.94	CuSO4
Diaspore	-0.96	5.91	6.87	AlOOH
Djurleite	-55.38	-89.30	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.94	-15.60	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.49	-15.60	-17.09	CaMg(CO3)2
Epsomite	-2.69	-4.82	-2.13	MgSO4:7H2O
Fe(OH)2	-7.24	6.33	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.69	3.65	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-0.17	-3.89	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-1.87	-0.31	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-5.40	-26.02	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-28.16	-31.89	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.35	18.87	20.22	Fe3(OH)8
FeAsO4:2H2O	-5.77	-5.37	0.40	FeAsO4:2H2O
FeCr2O4	-5.09	2.11	7.20	FeCr2O4
FeMoO4	-1.95	-12.04	-10.09	FeMoO4
Ferrihydrite	3.08	6.27	3.19	Fe(OH)3
Ferroselite	-40.80	-59.40	-18.60	FeSe2
FeS(ppt)	-75.66	-78.61	-2.95	FeS
FeSe	-28.51	-39.51	-11.00	FeSe
Fix_pe	-6.66	-6.66	0.00	e-
Fluorite	3.14	-7.36	-10.50	CaF2
Galena	-66.50	-80.47	-13.97	PbS
Gibbsite	-2.38	5.91	8.29	Al(OH)3
Goethite	5.78	6.27	0.49	FeOOH
Goslarite	-5.84	-7.85	-2.01	ZnSO4:7H2O
Greenockite	-65.57	-79.93	-14.36	CdS
Greigite	-275.86	-320.89	-45.03	Fe3S4
Gummite	-9.27	-1.60	7.67	UO3
Gypsum	0.34	-4.27	-4.61	CaSO4:2H2O
H-Jarosite	1.28	-10.82	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-5.49	-18.37	-12.88	H2MoO4
H2S(g)	-76.93	-84.94	-8.01	H2S
H2Se(g)	-40.88	-45.84	-4.96	H2Se
Halite	-5.93	-4.32	1.60	NaCl

Hausmannite	-11.47	49.56	61.03	Mn3O4
Hematite	13.96	12.54	-1.42	Fe2O3
Hercynite	-4.74	18.15	22.89	FeAl2O4
Hg (CH3) 2 (g)	-181.22	-254.93	-73.71	Hg (CH3) 2
Hg (g)	-7.67	-15.54	-7.87	Hg
Hg (OH) 2	-7.69	-11.19	-3.50	Hg (OH) 2
Hg2 (g)	-16.12	-31.08	-14.96	Hg2
Hg2 (OH) 2	-10.39	-5.13	5.26	Hg2 (OH) 2
Hg2CO3	-7.16	-23.21	-16.05	Hg2CO3
Hg2CrO4	-27.00	-35.70	-8.70	Hg2CrO4
Hg2F2	-12.67	-23.04	-10.36	Hg2F2
Hg2S	-78.40	-90.07	-11.68	Hg2S
Hg2SeO3	-13.33	-17.98	-4.66	Hg2SeO3
Hg2SO4	-13.81	-19.94	-6.13	Hg2SO4
Hg3O2CO3	-21.95	-51.63	-29.68	Hg3O2CO3
HgCl (g)	-30.78	-11.28	19.50	HgCl
HgCl2	-7.36	-28.62	-21.26	HgCl2
HgF (g)	-44.19	-11.52	32.68	HgF
HgF2 (g)	-41.66	-29.09	12.57	HgF2
Hgmetal (l)	-2.09	-15.54	-13.45	Hg
HgSe	-1.33	-57.02	-55.69	HgSe
HgSeO3	-11.61	-24.04	-12.43	HgSeO3
HgSO4	-16.58	-26.00	-9.42	HgSO4
Huntite	-1.78	-31.75	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-3.98	-22.75	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.53	-22.30	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.42	-19.59	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	8.13	-6.67	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.59	-52.84	-17.24	K2Cr2O7
K2CrO4	-21.76	-22.27	-0.51	K2CrO4
K2MoO4	-13.33	-10.07	3.26	K2MoO4
K2SeO4	-14.19	-14.92	-0.73	K2SeO4
Langite	-1.59	15.89	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.44	-5.87	-0.43	PbO : PbSO4
Laurionite	-4.87	-4.25	0.62	PbOHCl
Lepidocrocite	4.90	6.27	1.37	FeOOH
Lime	-22.15	10.55	32.70	CaO
Litharge	-8.22	4.47	12.69	PbO
Mackinawite	-75.01	-78.61	-3.60	FeS
Maghemite	6.16	12.54	6.39	Fe2O3
Magnesioferrite	5.69	22.55	16.86	Fe2MgO4
Magnesite	-0.61	-8.07	-7.46	MgCO3
Magnetite	15.47	18.87	3.40	Fe3O4
Malachite	2.58	-2.72	-5.31	Cu2 (OH) 2CO3
Manganite	-4.50	20.84	25.34	MnOOH
Massicot	-8.42	4.47	12.89	PbO
Matlockite	-4.23	-13.20	-8.97	PbClF
Melanothallite	-16.02	-9.76	6.26	CuCl2
Melanterite	-6.28	-8.49	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.03	-96.13	-45.09	HgS
Mg (OH) 2 (active)	-8.79	10.00	18.79	Mg (OH) 2
Mg (VO3) 2	-11.50	-0.22	11.28	Mg (VO3) 2
Mg2Sb3	-278.20	-203.52	74.68	Mg2Sb3
Mg2V2O7	-16.57	9.79	26.36	Mg2V2O7
MgCr2O4	-10.42	5.78	16.20	MgCr2O4
MgCrO4	-25.94	-20.56	5.38	MgCrO4
MgF2	0.23	-7.90	-8.13	MgF2
MgMoO4	-6.51	-8.36	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.91	-2.86	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.02	-13.22	-1.20	MgSeO4 : 6H2O
Minium	-34.17	39.36	73.52	Pb3O4
Mirabilite	-4.93	-6.04	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-7.25	-2.35	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-47.74	-53.45	-5.71	Mn2 (SO4) 3
Mn2Sb	-154.44	-93.36	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.18	0.32	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.29	-9.57	2.72	MnCl2 : 4H2O
MnS (grn)	-77.24	-77.07	0.17	MnS

MnS (pnk)	-80.41	-77.07	3.34	MnS
MnSb	-97.73	-100.64	-2.91	MnSb
MnSe	-41.47	-37.97	3.50	MnSe
MnSeO3	-6.11	-4.98	1.13	MnSeO3
MnSeO3:2H2O	-5.97	-4.99	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.30	-15.35	-2.05	MnSeO4:5H2O
MnSO4	-9.52	-6.94	2.58	MnSO4
Monteponite	-10.09	5.02	15.10	CdO
Montroydite	-7.54	-11.18	-3.64	HgO
MoO3	-10.37	-18.37	-8.00	MoO3
Morenosite	-9.14	-11.29	-2.14	NiSO4:7H2O
MoS2	-143.94	-214.20	-70.26	MoS2
Na-Jarosite	4.78	-6.42	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-42.45	-52.34	-9.90	Na2Cr2O7
Na2CrO4	-24.71	-21.78	2.93	Na2CrO4
Na2Mo2O7	-11.35	-27.95	-16.60	Na2Mo2O7
Na2MoO4	-11.07	-9.58	1.49	Na2MoO4
Na2MoO4:2H2O	-10.81	-9.58	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.37	-4.07	10.30	Na2SeO3:5H2O
Na2SeO4	-15.71	-14.43	1.28	Na2SeO4
Na3Sb	-177.40	-82.95	94.45	Na3Sb
Na3VO4	-28.61	8.07	36.68	Na3VO4
Na4V2O7	-30.05	7.35	37.40	Na4V2O7
Nantokite	-4.59	-11.32	-6.73	CuCl
NaSb	-88.96	-65.79	23.17	NaSb
Natron	-7.99	-9.31	-1.31	Na2CO3:10H2O
NaVO3	-4.57	-0.72	3.86	NaVO3
Nesquehonite	-3.41	-8.08	-4.67	MgCO3:3H2O
Ni (OH) 2	-9.26	3.53	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-28.39	-12.69	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-32.69	-0.69	32.00	Ni4 (OH) 6SO4
NiCO3	-7.68	-14.55	-6.87	NiCO3
NiMoO4	-3.69	-14.83	-11.14	NiMoO4
NiS (alpha)	-75.81	-81.41	-5.60	NiS
NiS (beta)	-70.31	-81.41	-11.10	NiS
NiS (gamma)	-68.61	-81.41	-12.80	NiS
NiSe	-24.60	-42.30	-17.70	NiSe
NiSeO3:2H2O	-12.14	-9.32	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.17	-19.69	-1.52	NiSeO4:6H2O
Nsutite	-9.04	8.47	17.50	MnO2
O2 (g)	-31.19	51.89	83.09	O2
Orpiment	-231.14	-292.21	-61.07	As2S3
Otavite	-1.06	-13.06	-12.00	CdCO3
Pb (BO2) 2	-10.47	-3.95	6.52	Pb (BO2) 2
Pb (OH) 2	-3.68	4.47	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-55.02	-63.78	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.57	0.22	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.25	8.94	26.19	Pb2O (OH) 2
Pb2O3	-26.15	34.89	61.04	Pb2O3
Pb2OCO3	-8.58	-9.14	-0.56	Pb2OCO3
Pb2V2O7	0.62	-1.28	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-15.67	-9.87	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-2.95	3.19	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.69	-4.67	11.02	Pb3O2CO3
Pb3O2SO4	-12.09	-1.40	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-18.04	3.06	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.81	3.07	21.88	Pb4O3SO4
PbCrO4	-13.50	-26.10	-12.60	PbCrO4
PbF2	-6.00	-13.44	-7.44	PbF2
Pbmetal	-25.72	-21.48	4.25	Pb
PbMoO4	1.72	-13.90	-15.62	PbMoO4
PbO:0.3H2O	-8.51	4.47	12.98	PbO:0.33H2O
PbSeO4	-11.91	-18.75	-6.84	PbSeO4
Periclase	-11.58	10.00	21.58	MgO
Phosgenite	-6.77	-26.58	-19.81	PbCl2:PbCO3
Plattnerite	-19.18	30.42	49.60	PbO2
Portlandite	-12.26	10.55	22.80	Ca (OH) 2
Pyrite	-119.10	-137.61	-18.51	FeS2

Pyrochroite	-7.32	7.87	15.19	Mn(OH) 2
Pyrolusite	-7.56	33.82	41.38	MnO2
Realgar	-96.86	-116.61	-19.75	AsS
Retgersite	-9.25	-11.29	-2.04	NiSO4:6H2O
Rhodochrosite	0.37	-10.21	-10.58	MnCO3
Rutherfordine	-5.18	-19.68	-14.50	UO2CO3
Sb(OH) 3	-11.18	-18.29	-7.11	Sb(OH) 3
Sb2O4	-14.03	-10.63	3.40	Sb2O4
Sb2O5	-23.64	-33.30	-9.67	Sb2O5
Sb2Se3	-106.33	-174.09	-67.76	Sb2Se3
Sb4O6(cubic)	-54.90	-73.16	-18.26	Sb4O6
Sb4O6(orth)	-55.26	-73.16	-17.90	Sb4O6
SbCl3	-45.02	-44.44	0.57	SbCl3
SbF3	-34.92	-45.15	-10.23	SbF3
Sbmetal	-45.52	-57.21	-11.69	Sb
SbO2	-1.80	-29.63	-27.82	SbO2
Schoepite	-7.60	-1.60	5.99	UO2(OH) 2:H2O
Semetal(am)	-12.78	-19.89	-7.11	Se
Semetal(hex)	-12.18	-19.89	-7.71	Se
Senarmontite	-24.21	-36.58	-12.37	Sb2O3
SeO2	-12.98	-12.85	0.12	SeO2
SeO3	-44.26	-23.21	21.04	SeO3
Siderite	-1.51	-11.75	-10.24	FeCO3
Smithsonite	-1.11	-11.11	-10.00	ZnCO3
Sphalerite	-66.52	-77.97	-11.45	ZnS
Spinel	-15.02	21.82	36.85	MgAl2O4
Stibnite	-240.95	-291.41	-50.46	Sb2S3
Sulfur	-56.85	-58.99	-2.14	S
Tenorite	0.03	7.68	7.64	CuO
Thenardite	-6.35	-6.02	0.32	Na2SO4
Thermonatrite	-9.93	-9.29	0.64	Na2CO3:H2O
Tyuyamunite	-6.96	-2.88	4.08	Ca(UO2) 2(VO4) 2
U3O8	-24.19	-3.10	21.08	U3O8
U3Sb4	-591.91	-439.53	152.38	U3Sb4
U4O9	-44.37	-47.39	-3.02	U4O9
UF4	-24.61	-54.15	-29.54	UF4
UF4:2.5H2O	-21.43	-54.15	-32.72	UF4:2.5H2O
UO2(am)	-19.27	-18.33	0.93	UO2
UO2(NO3) 2	-41.88	-29.73	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-34.58	-29.73	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-33.12	-29.73	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-31.78	-29.74	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-7.21	-1.60	5.61	UO2(OH) 2
UO2SeO4:4H2O	-22.57	-24.82	-2.25	UO2SeO4:4H2O
UO3	-9.30	-1.60	7.70	UO3
Uraninite	-13.66	-18.33	-4.67	UO2
USb2	-223.44	-193.87	29.58	USb2
V(OH) 3	-16.05	-8.46	7.59	V(OH) 3
V2O5	-8.86	-10.22	-1.36	V2O5
V3O5	-31.33	-29.49	1.84	V3O5
V4O7	-37.86	-30.67	7.19	V4O7
V6O13	-21.70	-82.56	-60.86	V6O13
Valentinite	-28.10	-36.58	-8.48	Sb2O3
VC12	-57.74	-38.87	18.87	VC12
VC13	-58.05	-34.61	23.43	VC13
VF4	-51.92	-36.99	14.93	VF4
Vmetal	-91.41	-47.38	44.03	V
VO	-36.19	-21.43	14.76	VO
VO(OH) 2	-6.33	-1.18	5.15	VO(OH) 2
VO2Cl	-16.67	-13.83	2.84	VO2Cl
VOC1	-28.33	-17.18	11.15	VOC1
VOC12	-31.38	-18.62	12.76	VOC12
VOSO4	-19.60	-15.99	3.61	VOSO4
Witherite	-2.17	-10.74	-8.57	BaCO3
Wurtzite	-69.02	-77.97	-8.95	ZnS
Zincite	-4.36	6.97	11.33	ZnO
Zincosite	-11.77	-7.84	3.93	ZnSO4
Zn(BO2) 2	-9.74	-1.45	8.29	Zn(BO2) 2

Zn(NO3)2:6H2O	-24.48	-21.17	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.23	6.97	12.20	Zn(OH)2
Zn(OH)2(am)	-5.51	6.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.79	6.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.57	6.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.77	6.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.38	-0.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.97	5.22	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.03	-2.38	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.63	-8.72	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.34	13.06	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-21.10	17.40	38.50	Zn5(OH)8Cl2
ZnCl2	-17.52	-10.47	7.05	ZnCl2
ZnCO3:1H2O	-0.85	-11.11	-10.26	ZnCO3:1H2O
ZnF2	-10.40	-10.94	-0.53	ZnF2
Znmetal	-44.77	-18.98	25.79	Zn
ZnMoO4	-1.27	-11.40	-10.13	ZnMoO4
ZnO(active)	-4.22	6.97	11.19	ZnO
ZnS(am)	-68.92	-77.97	-9.05	ZnS
ZnSb	-87.20	-76.19	11.01	ZnSb
ZnSe	-24.47	-38.87	-14.40	ZnSe
ZnSeO4:6H2O	-14.73	-16.25	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.21	-7.84	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 74.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0
EQUILIBRIUM_PHASES 402
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0

```



```

MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 406
SAVE Solution 407 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 402
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 406. Solution after simulation 73.
Using pure phase assemblage 402.

```

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	4.671e-05	4.671e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	4.017e-08	4.017e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.741e-05	1.741e-05
Brochantite	-0.00	15.22	15.22	0.000e+00	8.555e-05	8.555e-05
Brucite	-3.68	13.17	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.007e+01	6.873e-02

CaMoO4	-0.32	-8.27	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.26	-1.44	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.824e-02	2.824e-02
Carnotite	0.00	0.23	0.23	0.000e+00	1.316e-06	1.316e-06
Cd(BO2)2	-11.04	-1.20	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	1.281e-07	1.281e-07
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	1.150e-08	1.150e-08
Cu2Se(alpha)	-4.25	-50.05	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.12	-13.19	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.48	-4.61	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	3.477e-05	3.477e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	2.250e-03	2.250e-03
Gummite	-4.92	2.76	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	1.291e-03	1.291e-03
HgSe	-1.57	-57.27	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.76	-5.87	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.61	-3.48	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.76	7.03	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-26.90	-11.20	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.74	-14.61	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.26	-14.41	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.861e-05
Otavite	-2.36	-14.36	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	4.240e-07	4.240e-07
Rutherfordine	-4.39	-18.89	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.10	-30.93	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.24	2.76	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-1.85	2.23	4.08	0.000e+00	0	0.000e+00
U3O8	-10.71	10.37	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.86	2.76	5.61	0.000e+00	0	0.000e+00
UO3	-4.94	2.76	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.14	-11.26	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.879e-06	5.894e-06
As	1.031e-09	1.034e-09
B	5.941e-05	5.956e-05
Ba	3.086e-08	3.094e-08
C	5.031e-04	5.043e-04
Ca	1.291e-02	1.294e-02
Cd	2.344e-08	2.350e-08
Cl	5.231e-03	5.244e-03
Co	6.205e-08	6.220e-08
Cr	1.632e-09	1.636e-09
Cu	5.120e-07	5.133e-07
F	1.838e-04	1.843e-04
Fe	1.152e-09	1.155e-09
Hg	5.422e-09	5.435e-09
K	9.257e-03	9.280e-03
Mg	1.185e-02	1.188e-02
Mn	1.449e-04	1.452e-04
Mo	5.039e-06	5.052e-06
N	2.252e-05	2.258e-05
Na	1.648e-02	1.652e-02
Ni	9.256e-09	9.279e-09
Pb	1.854e-09	1.859e-09
S	3.480e-02	3.489e-02
Sb	6.235e-08	6.251e-08
Se	4.718e-07	4.730e-07
U	2.694e-07	2.700e-07
V	4.755e-08	4.767e-08

Zn 1.532e-05 1.536e-05

-----Description of solution-----

equilibrium

pH	=	7.863	Charge balance
pe	=	4.910	Adjusted to redox
Activity of water	=	0.999	
Ionic strength (mol/kgw)	=	9.177e-02	
Mass of water (kg)	=	1.003e+00	
Total alkalinity (eq/kg)	=	5.352e-04	
Total CO2 (mol/kg)	=	5.031e-04	
Temperature (°C)	=	25.00	
Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
Iterations	=	9	
Total H	=	1.112944e+02	
Total O	=	5.578818e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.550e-07	7.335e-07	-6.020	-6.135	-0.115	(0)
H+	1.744e-08	1.371e-08	-7.758	-7.863	-0.105	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Al	5.879e-06					
Al (OH) 4-	5.825e-06	4.556e-06	-5.235	-5.341	-0.107	(0)
Al (OH) 3	4.933e-08	4.933e-08	-7.307	-7.307	0.000	(0)
Al (OH) 2+	4.248e-09	3.371e-09	-8.372	-8.472	-0.100	(0)
AlF3	4.836e-10	4.836e-10	-9.315	-9.315	0.000	(0)
AlF2+	4.527e-10	3.592e-10	-9.344	-9.445	-0.100	(0)
AlF4-	3.315e-11	2.593e-11	-10.480	-10.586	-0.107	(0)
AlF+2	2.129e-11	8.435e-12	-10.672	-11.074	-0.402	(0)
AlOH+2	1.460e-11	5.785e-12	-10.836	-11.238	-0.402	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.264	-0.107	(0)
Al+3	6.882e-14	7.886e-15	-13.162	-14.103	-0.941	(0)
Al (SO4) 2-	6.650e-14	5.201e-14	-13.177	-13.284	-0.107	(0)
AlMo6O21-3	6.435e-40	0.000e+00	-39.191	-40.582	-1.391	(0)
As (3)	1.684e-23					
H3AsO3	1.598e-23	1.598e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	8.535e-25	5.980e-25	-24.069	-24.223	-0.155	(0)
HAsO3-2	1.651e-28	3.978e-29	-27.782	-28.400	-0.618	(0)
H4AsO3+	1.549e-31	1.086e-31	-30.810	-30.964	-0.155	(0)
AsO3-3	2.749e-33	1.119e-34	-32.561	-33.951	-1.391	(0)
As (5)	1.031e-09					
HAsO4-2	9.872e-10	2.379e-10	-9.006	-9.624	-0.618	(0)
H2AsO4-	4.245e-11	2.974e-11	-10.372	-10.527	-0.155	(0)
AsO4-3	1.349e-12	5.488e-14	-11.870	-13.261	-1.391	(0)
H3AsO4	6.938e-17	7.086e-17	-16.159	-16.150	0.009	(0)
B	5.941e-05					
H3BO3	5.536e-05	5.655e-05	-4.257	-4.248	0.009	(0)
H2BO3-	3.185e-06	2.396e-06	-5.497	-5.621	-0.124	(0)
CaH2BO3+	5.066e-07	3.810e-07	-6.295	-6.419	-0.124	(0)
MgH2BO3+	3.071e-07	2.309e-07	-6.513	-6.636	-0.124	(0)
NaH2BO3	4.695e-08	4.695e-08	-7.328	-7.328	0.000	(0)
BF (OH) 3-	3.209e-09	2.413e-09	-8.494	-8.617	-0.124	(0)
H5 (BO3) 2-	1.533e-10	1.153e-10	-9.814	-9.938	-0.124	(0)
BaH2BO3+	1.158e-12	8.706e-13	-11.936	-12.060	-0.124	(0)
H8 (BO3) 3-	8.668e-13	6.519e-13	-12.062	-12.186	-0.124	(0)
BF2 (OH) 2-	5.037e-13	3.788e-13	-12.298	-12.422	-0.124	(0)
BF3OH-	2.877e-19	2.164e-19	-18.541	-18.665	-0.124	(0)
BF4-	2.078e-24	1.563e-24	-23.682	-23.806	-0.124	(0)
Ba	3.086e-08					
Ba+2	3.080e-08	1.176e-08	-7.511	-7.930	-0.418	(0)
BaHCO3+	4.915e-11	3.934e-11	-10.308	-10.405	-0.097	(0)
BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)

BaH2BO3+	1.158e-12	8.706e-13	-11.936	-12.060	-0.124	(0)
BaOH+	4.775e-14	3.765e-14	-13.321	-13.424	-0.103	(0)
BaNO3+	1.337e-15	9.364e-16	-14.874	-15.029	-0.155	(0)
BaNH3+2	3.021e-16	7.279e-17	-15.520	-16.138	-0.618	(0)
C (4)	5.031e-04					
HCO3-	4.415e-04	3.503e-04	-3.355	-3.456	-0.100	(0)
CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
MgHCO3+	1.285e-05	9.966e-06	-4.891	-5.001	-0.111	(0)
H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	3.138e-06	1.198e-06	-5.503	-5.922	-0.418	(0)
MgCO3	2.770e-06	2.770e-06	-5.557	-5.557	0.000	(0)
NaHCO3	2.436e-06	2.436e-06	-5.613	-5.613	0.000	(0)
NaCO3-	3.477e-07	2.759e-07	-6.459	-6.559	-0.100	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
MnHCO3+	2.230e-07	1.759e-07	-6.652	-6.755	-0.103	(0)
UO2 (CO3) 3-4	2.180e-07	7.353e-10	-6.662	-9.134	-2.472	(0)
ZnCO3	1.949e-07	1.949e-07	-6.710	-6.710	0.000	(0)
UO2 (CO3) 2-2	5.082e-08	1.225e-08	-7.294	-7.912	-0.618	(0)
ZnHCO3+	4.470e-08	3.132e-08	-7.350	-7.504	-0.155	(0)
Cu (CO3) 2-2	3.157e-09	7.609e-10	-8.501	-9.119	-0.618	(0)
CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
UO2CO3	5.124e-10	5.124e-10	-9.290	-9.290	0.000	(0)
PbCO3	4.490e-10	4.490e-10	-9.348	-9.348	0.000	(0)
CoHCO3+	4.000e-10	2.803e-10	-9.398	-9.552	-0.155	(0)
CoCO3	2.083e-10	2.083e-10	-9.681	-9.681	0.000	(0)
NiHCO3+	1.257e-10	8.810e-11	-9.901	-10.055	-0.155	(0)
CdCO3	1.005e-10	1.005e-10	-9.998	-9.998	0.000	(0)
NiCO3	9.118e-11	9.118e-11	-10.040	-10.040	0.000	(0)
BaHCO3+	4.915e-11	3.934e-11	-10.308	-10.405	-0.097	(0)
PbHCO3+	4.632e-11	3.245e-11	-10.334	-10.489	-0.155	(0)
BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
Pb (CO3) 2-2	6.437e-12	1.551e-12	-11.191	-11.809	-0.618	(0)
CdHCO3+	4.191e-12	2.937e-12	-11.378	-11.532	-0.155	(0)
Cd (CO3) 2-2	3.705e-13	8.929e-14	-12.431	-13.049	-0.618	(0)
HgCO3	5.513e-15	5.513e-15	-14.259	-14.259	0.000	(0)
FeHCO3+	2.933e-15	2.347e-15	-14.533	-14.629	-0.097	(0)
Hg (CO3) 2-2	8.666e-17	2.088e-17	-16.062	-16.680	-0.618	(0)
HgHCO3+	2.009e-18	1.407e-18	-17.697	-17.852	-0.155	(0)
Ca	1.291e-02					
Ca+2	7.240e-03	2.764e-03	-2.140	-2.558	-0.418	(0)
CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
CaH2BO3+	5.066e-07	3.810e-07	-6.295	-6.419	-0.124	(0)
CaOH+	5.055e-08	4.046e-08	-7.296	-7.393	-0.097	(0)
CaNO3+	1.982e-10	1.389e-10	-9.703	-9.857	-0.155	(0)
CaNH3+2	1.417e-10	3.414e-11	-9.849	-10.467	-0.618	(0)
Ca (NH3) 2+2	5.533e-19	1.333e-19	-18.257	-18.875	-0.618	(0)
Cd	2.344e-08					
Cd+2	9.645e-09	3.682e-09	-8.016	-8.434	-0.418	(0)
CdSO4	7.687e-09	7.687e-09	-8.114	-8.114	0.000	(0)
Cd (SO4) 2-2	3.831e-09	9.233e-10	-8.417	-9.035	-0.618	(0)
CdCl+	2.064e-09	1.446e-09	-8.685	-8.840	-0.155	(0)
CdCO3	1.005e-10	1.005e-10	-9.998	-9.998	0.000	(0)
CdOHC1	4.351e-11	4.351e-11	-10.361	-10.361	0.000	(0)
CdOH+	3.062e-11	2.146e-11	-10.514	-10.668	-0.155	(0)
CdCl2	2.479e-11	2.479e-11	-10.606	-10.606	0.000	(0)
CdF+	8.910e-12	6.242e-12	-11.050	-11.205	-0.155	(0)
CdHCO3+	4.191e-12	2.937e-12	-11.378	-11.532	-0.155	(0)
Cd (CO3) 2-2	3.705e-13	8.929e-14	-12.431	-13.049	-0.618	(0)
Cd (OH) 2	9.931e-14	9.931e-14	-13.003	-13.003	0.000	(0)
CdCl3-	9.179e-14	6.431e-14	-13.037	-13.192	-0.155	(0)
CdF2	1.332e-15	1.332e-15	-14.875	-14.875	0.000	(0)
CdNO3+	2.641e-16	1.850e-16	-15.578	-15.733	-0.155	(0)
CdSeO4	1.544e-16	1.544e-16	-15.811	-15.811	0.000	(0)
Cd (SeO3) 2-2	3.403e-17	8.200e-18	-16.468	-17.086	-0.618	(0)

		Cd2OH+3	9.732e-18	3.960e-19	-17.012	-18.402	-1.391	(0)
		Cd(OH) 3-	6.352e-18	4.450e-18	-17.197	-17.352	-0.155	(0)
		Cd(OH) 4-2	2.217e-24	5.343e-25	-23.654	-24.272	-0.618	(0)
		Cd(NO3) 2	1.473e-24	1.473e-24	-23.832	-23.832	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.704	-78.858	-0.155	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-150.086	-150.086	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-226.464	-226.618	-0.155	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-302.237	-302.855	-0.618	(0)
C1	5.231e-03							
		Cl-	5.231e-03	4.112e-03	-2.281	-2.386	-0.105	(0)
		MnCl+	1.652e-07	1.303e-07	-6.782	-6.885	-0.103	(0)
		ZnCl+	3.766e-08	2.920e-08	-7.424	-7.535	-0.111	(0)
		ZnOHC1	2.804e-08	2.804e-08	-7.552	-7.552	0.000	(0)
		CdCl+	2.064e-09	1.446e-09	-8.685	-8.840	-0.155	(0)
		CuCl2-	1.157e-09	8.973e-10	-8.937	-9.047	-0.111	(0)
		CuCl	1.044e-09	1.044e-09	-8.981	-8.981	0.000	(0)
		MnCl2	7.566e-10	7.566e-10	-9.121	-9.121	0.000	(0)
		CuCl+	2.812e-10	2.180e-10	-9.551	-9.661	-0.111	(0)
		CoCl+	2.088e-10	1.463e-10	-9.680	-9.835	-0.155	(0)
		ZnCl2	1.903e-10	1.903e-10	-9.721	-9.721	0.000	(0)
		CdOHC1	4.351e-11	4.351e-11	-10.361	-10.361	0.000	(0)
		NiCl+	3.063e-11	2.146e-11	-10.514	-10.668	-0.155	(0)
		PbCl+	2.596e-11	1.819e-11	-10.586	-10.740	-0.155	(0)
		CdCl2	2.479e-11	2.479e-11	-10.606	-10.606	0.000	(0)
		HgClOH	2.048e-11	2.048e-11	-10.689	-10.689	0.000	(0)
		HgCl2	6.502e-12	6.502e-12	-11.187	-11.187	0.000	(0)
		CuCl3-2	2.040e-12	7.888e-13	-11.690	-12.103	-0.413	(0)
		MnCl3-	1.087e-12	8.569e-13	-11.964	-12.067	-0.103	(0)
		ZnCl3-	8.017e-13	6.216e-13	-12.096	-12.207	-0.111	(0)
		HgCl3-	3.816e-13	2.674e-13	-12.418	-12.573	-0.155	(0)
		PbCl2	3.341e-13	3.341e-13	-12.476	-12.476	0.000	(0)
		CuCl2	3.109e-13	3.109e-13	-12.507	-12.507	0.000	(0)
		CdCl3-	9.179e-14	6.431e-14	-13.037	-13.192	-0.155	(0)
		HgCl4-2	1.816e-14	4.377e-15	-13.741	-14.359	-0.618	(0)
		ZnCl4-2	3.305e-15	1.278e-15	-14.481	-14.893	-0.413	(0)
		UO2Cl+	1.023e-15	7.165e-16	-14.990	-15.145	-0.155	(0)
		PbCl3-	7.807e-16	5.470e-16	-15.108	-15.262	-0.155	(0)
		HgCl+	4.503e-16	3.155e-16	-15.346	-15.501	-0.155	(0)
		NiCl2	4.444e-16	4.444e-16	-15.352	-15.352	0.000	(0)
		CuCl3-	1.539e-17	1.193e-17	-16.813	-16.923	-0.111	(0)
		CrCl+2	1.399e-17	3.372e-18	-16.854	-17.472	-0.618	(0)
		PbCl4-2	4.266e-18	1.028e-18	-17.370	-17.988	-0.618	(0)
		CrOHC12	1.933e-19	1.933e-19	-18.714	-18.714	0.000	(0)
		CrCl2+	1.878e-21	1.316e-21	-20.726	-20.881	-0.155	(0)
		FeCl+2	1.290e-21	4.986e-22	-20.890	-21.302	-0.413	(0)
		CuCl4-2	6.358e-22	2.458e-22	-21.197	-21.609	-0.413	(0)
		VOC1+	2.494e-22	1.747e-22	-21.603	-21.758	-0.155	(0)
		FeCl2+	1.161e-23	9.159e-24	-22.935	-23.038	-0.103	(0)
		CrO3Cl-	6.909e-26	4.841e-26	-25.161	-25.315	-0.155	(0)
		FeCl3	3.766e-27	3.766e-27	-26.424	-26.424	0.000	(0)
		CoCl+2	1.155e-35	2.782e-36	-34.938	-35.556	-0.618	(0)
		UCl+3	0.000e+00	0.000e+00	-44.318	-45.709	-1.391	(0)
		Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.026	-49.644	-0.618	(0)
		Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.914	-51.532	-0.618	(0)
		Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.750	-64.368	-0.618	(0)
Co (2)	6.205e-08							
		Co+2	4.268e-08	1.029e-08	-7.370	-7.988	-0.618	(0)
		CoSO4	1.827e-08	1.827e-08	-7.738	-7.738	0.000	(0)
		CoHCO3+	4.000e-10	2.803e-10	-9.398	-9.552	-0.155	(0)
		CoOH+	2.149e-10	1.505e-10	-9.668	-9.822	-0.155	(0)
		CoCl+	2.088e-10	1.463e-10	-9.680	-9.835	-0.155	(0)
		CoCO3	2.083e-10	2.083e-10	-9.681	-9.681	0.000	(0)
		CoF+	4.965e-11	3.479e-11	-10.304	-10.459	-0.155	(0)
		Co (OH) 2	8.772e-12	8.772e-12	-11.057	-11.057	0.000	(0)
		CoNO2+	1.742e-12	1.221e-12	-11.759	-11.913	-0.155	(0)
		Co (NH3) +2	5.034e-14	1.213e-14	-13.298	-13.916	-0.618	(0)
		CoSeO4	1.161e-15	1.161e-15	-14.935	-14.935	0.000	(0)
		CoNO3+	3.697e-16	2.590e-16	-15.432	-15.587	-0.155	(0)

Co (OH) 3-	1.832e-16	1.284e-16	-15.737	-15.892	-0.155	(0)
CoOOH-	4.604e-17	3.225e-17	-16.337	-16.491	-0.155	(0)
Co2OH+3	1.907e-18	7.761e-20	-17.720	-19.110	-1.391	(0)
Co (NH3) 2+2	2.107e-20	5.077e-21	-19.676	-20.294	-0.618	(0)
Co (OH) 4-2	6.193e-23	1.493e-23	-22.208	-22.826	-0.618	(0)
Co (NO3) 2	8.374e-24	8.374e-24	-23.077	-23.077	0.000	(0)
Co (NH3) 3+2	2.602e-27	6.271e-28	-26.585	-27.203	-0.618	(0)
Co4 (OH) 4+4	3.038e-29	1.025e-31	-28.517	-30.989	-2.472	(0)
Co (NH3) 4+2	1.340e-34	3.228e-35	-33.873	-34.491	-0.618	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.661	-42.279	-0.618	(0)
Co (3)	5.144e-29					
CoOH+2	5.144e-29	1.240e-29	-28.289	-28.907	-0.618	(0)
Co+3	2.902e-35	3.326e-36	-34.537	-35.478	-0.941	(0)
CoCl+2	1.155e-35	2.782e-36	-34.938	-35.556	-0.618	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.026	-49.644	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.952	-59.107	-0.155	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.298	-63.916	-0.618	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.750	-64.368	-0.618	(0)
Cr (2)	7.734e-27					
Cr+2	7.734e-27	1.864e-27	-26.112	-26.730	-0.618	(0)
Cr (3)	1.632e-09					
Cr (OH) 2+	1.295e-09	9.076e-10	-8.888	-9.042	-0.155	(0)
Cr (OH) 3	2.501e-10	2.501e-10	-9.602	-9.602	0.000	(0)
Cr (OH) +2	4.220e-11	1.017e-11	-10.375	-10.993	-0.618	(0)
CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
CrO2-	1.238e-11	8.676e-12	-10.907	-11.062	-0.155	(0)
Cr (OH) 4-	1.042e-11	7.304e-12	-10.982	-11.136	-0.155	(0)
CrF+2	4.457e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
CrSO4+	1.880e-14	1.318e-14	-13.726	-13.880	-0.155	(0)
Cr+3	1.557e-14	6.337e-16	-13.808	-15.198	-1.391	(0)
CrCl+2	1.399e-17	3.372e-18	-16.854	-17.472	-0.618	(0)
CrOHC12	1.933e-19	1.933e-19	-18.714	-18.714	0.000	(0)
Cr2 (OH) 2SO4+2	8.195e-20	1.975e-20	-19.086	-19.704	-0.618	(0)
Cr2 (OH) 2 (SO4) 2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
CrCl2+	1.878e-21	1.316e-21	-20.726	-20.881	-0.155	(0)
CrNO3+2	1.826e-24	4.401e-25	-23.738	-24.356	-0.618	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.384	-41.002	-0.618	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.858	-50.248	-1.391	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.914	-51.532	-0.618	(0)
Cr (6)	8.627e-15					
CrO4-2	8.051e-15	3.074e-15	-14.094	-14.512	-0.418	(0)
NaCrO4-	2.696e-16	1.889e-16	-15.569	-15.724	-0.155	(0)
HCrO4-	1.946e-16	1.364e-16	-15.711	-15.865	-0.155	(0)
KCrO4-	1.116e-16	7.822e-17	-15.952	-16.107	-0.155	(0)
CrO3SO4-2	2.107e-23	5.076e-24	-22.676	-23.294	-0.618	(0)
H2CrO4	1.515e-24	1.515e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	6.909e-26	4.841e-26	-25.161	-25.315	-0.155	(0)
Cr2O7-2	2.679e-30	6.455e-31	-29.572	-30.190	-0.618	(0)
Cu (1)	2.492e-09					
CuCl2-	1.157e-09	8.973e-10	-8.937	-9.047	-0.111	(0)
CuCl	1.044e-09	1.044e-09	-8.981	-8.981	0.000	(0)
Cu+	2.880e-10	2.018e-10	-9.541	-9.695	-0.155	(0)
CuCl3-2	2.040e-12	7.888e-13	-11.690	-12.103	-0.413	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.021	-147.444	-0.423	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.775	-148.174	-0.399	(0)
Cu (2)	5.095e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	1.001e-07	7.760e-08	-7.000	-7.110	-0.111	(0)
Cu+2	8.762e-08	3.346e-08	-7.057	-7.476	-0.418	(0)
CuSO4	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
Cu (OH) 2	1.136e-08	1.136e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	3.157e-09	7.609e-10	-8.501	-9.119	-0.618	(0)
CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
Cu2 (OH) 2+2	6.277e-10	1.513e-10	-9.202	-9.820	-0.618	(0)
CuF+	3.222e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
CuCl+	2.812e-10	2.180e-10	-9.551	-9.661	-0.111	(0)
CuNO2+	8.421e-11	5.900e-11	-10.075	-10.229	-0.155	(0)
Cu (OH) 3-	2.439e-11	1.709e-11	-10.613	-10.767	-0.155	(0)

	CuNH3+2	1.394e-11	3.359e-12	-10.856	-11.474	-0.618	(0)
	CuCl2	3.109e-13	3.109e-13	-12.507	-12.507	0.000	(0)
	Cu (NO2) 2	1.017e-14	1.017e-14	-13.993	-13.993	0.000	(0)
	CuNO3+	2.399e-15	1.681e-15	-14.620	-14.774	-0.155	(0)
	Cu (OH) 4-2	4.094e-16	9.866e-17	-15.388	-16.006	-0.618	(0)
	CuCl3-	1.539e-17	1.193e-17	-16.813	-16.923	-0.111	(0)
	CuCl4-2	6.358e-22	2.458e-22	-21.197	-21.609	-0.413	(0)
	Cu (NO3) 2	3.362e-24	3.362e-24	-23.473	-23.473	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
F	1.838e-04						
	F-	1.361e-04	1.070e-04	-3.866	-3.971	-0.105	(0)
	MgF+	4.266e-05	3.337e-05	-4.370	-4.477	-0.107	(0)
	CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
	NaF	8.346e-07	8.346e-07	-6.079	-6.079	0.000	(0)
	MnF+	1.359e-07	1.072e-07	-6.867	-6.970	-0.103	(0)
	ZnF+	8.611e-09	6.033e-09	-8.065	-8.219	-0.155	(0)
	BF (OH) 3-	3.209e-09	2.413e-09	-8.494	-8.617	-0.124	(0)
	HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
	AlF3	4.836e-10	4.836e-10	-9.315	-9.315	0.000	(0)
	AlF2+	4.527e-10	3.592e-10	-9.344	-9.445	-0.100	(0)
	CuF+	3.222e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
	CoF+	4.965e-11	3.479e-11	-10.304	-10.459	-0.155	(0)
	AlF4-	3.315e-11	2.593e-11	-10.480	-10.586	-0.107	(0)
	AlF+2	2.129e-11	8.435e-12	-10.672	-11.074	-0.402	(0)
	CdF+	8.910e-12	6.242e-12	-11.050	-11.205	-0.155	(0)
	NiF+	7.823e-12	5.481e-12	-11.107	-11.261	-0.155	(0)
	UO2F+	2.264e-12	1.586e-12	-11.645	-11.800	-0.155	(0)
	PbF+	1.341e-12	9.398e-13	-11.872	-12.027	-0.155	(0)
	HF2-	1.148e-12	8.819e-13	-11.940	-12.055	-0.115	(0)
	BF2 (OH) 2-	5.037e-13	3.788e-13	-12.298	-12.422	-0.124	(0)
	UO2F2	4.893e-13	4.893e-13	-12.310	-12.310	0.000	(0)
	CrF+2	4.457e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
	UO2F3-	1.876e-14	1.315e-14	-13.727	-13.881	-0.155	(0)
	PbF2	1.978e-15	1.978e-15	-14.704	-14.704	0.000	(0)
	CdF2	1.332e-15	1.332e-15	-14.875	-14.875	0.000	(0)
	UO2F4-2	4.635e-17	1.117e-17	-16.334	-16.952	-0.618	(0)
	VO2F	1.533e-17	1.533e-17	-16.814	-16.814	0.000	(0)
	H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
	FeF2+	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
	FeF+2	1.218e-18	4.709e-19	-17.914	-18.327	-0.413	(0)
	VO2F2-	8.497e-19	5.953e-19	-18.071	-18.225	-0.155	(0)
	PbF3-	5.728e-19	4.013e-19	-18.242	-18.397	-0.155	(0)
	BF3OH-	2.877e-19	2.164e-19	-18.541	-18.665	-0.124	(0)
	FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
	VOF+	1.387e-20	9.716e-21	-19.858	-20.013	-0.155	(0)
	VO2F3-2	3.296e-21	7.943e-22	-20.482	-21.100	-0.618	(0)
	VOF2	3.897e-22	3.897e-22	-21.409	-21.409	0.000	(0)
	PbF4-2	8.525e-23	2.054e-23	-22.069	-22.687	-0.618	(0)
	HgF+	2.176e-23	1.525e-23	-22.662	-22.817	-0.155	(0)
	VOF3-	2.111e-24	1.479e-24	-23.676	-23.830	-0.155	(0)
	BF4-	2.078e-24	1.563e-24	-23.682	-23.806	-0.124	(0)
	VO2F4-3	1.027e-24	4.180e-26	-23.988	-25.379	-1.391	(0)
	Sb (OH) 2F	9.337e-26	9.337e-26	-25.030	-25.030	0.000	(0)
	SbOF	9.194e-26	9.194e-26	-25.037	-25.037	0.000	(0)
	VOF4-2	2.649e-27	6.385e-28	-26.577	-27.195	-0.618	(0)
	UF3+	6.595e-36	4.621e-36	-35.181	-35.335	-0.155	(0)
	UF2+2	1.131e-36	2.726e-37	-35.947	-36.565	-0.618	(0)
	UF4	5.419e-38	5.419e-38	-37.266	-37.266	0.000	(0)
	UF+3	4.975e-39	2.024e-40	-38.303	-39.694	-1.391	(0)
	UF5-	3.278e-40	2.297e-40	-39.484	-39.639	-0.155	(0)
	UF6-2	0.000e+00	0.000e+00	-40.512	-41.130	-0.618	(0)
Fe (2)	3.395e-12						
	Fe+2	2.209e-12	5.322e-13	-11.656	-12.274	-0.618	(0)
	FeSO4	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
	FeOH+	1.971e-14	1.554e-14	-13.705	-13.808	-0.103	(0)
	FeHCO3+	2.933e-15	2.347e-15	-14.533	-14.629	-0.097	(0)
	Fe (OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	2.664e-18	2.101e-18	-17.574	-17.678	-0.103	(0)

Fe (HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.429	-236.583	-0.155	(0)
Fe (3)	1.148e-09					
Fe (OH) 2+	6.840e-10	5.427e-10	-9.165	-9.265	-0.100	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.681e-11	2.920e-11	-10.434	-10.535	-0.100	(0)
FeOH+2	4.919e-15	1.902e-15	-14.308	-14.721	-0.413	(0)
FeF2+	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
FeF+2	1.218e-18	4.709e-19	-17.914	-18.327	-0.413	(0)
FeSO4+	5.088e-19	4.012e-19	-18.293	-18.397	-0.103	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
Fe (SO4) 2-	1.090e-19	7.638e-20	-18.963	-19.117	-0.155	(0)
Fe+3	3.504e-20	4.016e-21	-19.455	-20.396	-0.941	(0)
FeCl+2	1.290e-21	4.986e-22	-20.890	-21.302	-0.413	(0)
FeCl2+	1.161e-23	9.159e-24	-22.935	-23.038	-0.103	(0)
FeHSeO3+2	7.881e-24	1.899e-24	-23.103	-23.721	-0.618	(0)
Fe2 (OH) 2+4	3.551e-26	1.198e-28	-25.450	-27.922	-2.472	(0)
FeCl3	3.766e-27	3.766e-27	-26.424	-26.424	0.000	(0)
FeNO3+2	2.647e-27	6.380e-28	-26.577	-27.195	-0.618	(0)
Fe3 (OH) 4+5	6.846e-33	9.395e-37	-32.165	-36.027	-3.863	(0)
H (0)	3.950e-29					
H2	1.975e-29	2.017e-29	-28.704	-28.695	0.009	(0)
Hg (0)	5.381e-09					
Hg	5.381e-09	5.381e-09	-8.269	-8.269	0.000	(0)
Hg (1)	1.166e-19					
Hg2+2	5.830e-20	1.405e-20	-19.234	-19.852	-0.618	(0)
Hg (2)	4.018e-11					
HgClOH	2.048e-11	2.048e-11	-10.689	-10.689	0.000	(0)
Hg (OH) 2	1.278e-11	1.306e-11	-10.893	-10.884	0.009	(0)
HgCl2	6.502e-12	6.502e-12	-11.187	-11.187	0.000	(0)
HgCl3-	3.816e-13	2.674e-13	-12.418	-12.573	-0.155	(0)
HgCl4-2	1.816e-14	4.377e-15	-13.741	-14.359	-0.618	(0)
HgCO3	5.513e-15	5.513e-15	-14.259	-14.259	0.000	(0)
HgCl+	4.503e-16	3.155e-16	-15.346	-15.501	-0.155	(0)
HgOH+	1.603e-16	1.123e-16	-15.795	-15.950	-0.155	(0)
Hg (CO3) 2-2	8.666e-17	2.088e-17	-16.062	-16.680	-0.618	(0)
HgHCO3+	2.009e-18	1.407e-18	-17.697	-17.852	-0.155	(0)
Hg (OH) 3-	1.721e-18	1.206e-18	-17.764	-17.919	-0.155	(0)
Hg (NH3) 2+2	9.691e-19	2.335e-19	-18.014	-18.632	-0.618	(0)
HgNH3+2	9.878e-20	2.380e-20	-19.005	-19.623	-0.618	(0)
Hg+2	1.596e-20	3.846e-21	-19.797	-20.415	-0.618	(0)
HgSO4	8.966e-21	8.966e-21	-20.047	-20.047	0.000	(0)
HgF+	2.176e-23	1.525e-23	-22.662	-22.817	-0.155	(0)
Hg (NH3) 3+2	3.785e-26	9.121e-27	-25.422	-26.040	-0.618	(0)
HgNO3+	3.220e-29	2.256e-29	-28.492	-28.647	-0.155	(0)
Hg (NH3) 4+2	2.949e-33	7.108e-34	-32.530	-33.148	-0.618	(0)
Hg (NO3) 2	1.490e-37	1.490e-37	-36.827	-36.827	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.334	-137.488	-0.155	(0)
HgS2-2	0.000e+00	0.000e+00	-137.715	-138.333	-0.618	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.957	-138.957	0.000	(0)
K	9.257e-03					
K+	8.713e-03	6.849e-03	-2.060	-2.164	-0.105	(0)
KSO4-	5.442e-04	4.317e-04	-3.264	-3.365	-0.100	(0)
KCrO4-	1.116e-16	7.822e-17	-15.952	-16.107	-0.155	(0)
Mg	1.185e-02					
Mg+2	7.282e-03	2.780e-03	-2.138	-2.556	-0.418	(0)
MgSO4	4.505e-03	4.505e-03	-2.346	-2.346	0.000	(0)
MgF+	4.266e-05	3.337e-05	-4.370	-4.477	-0.107	(0)
MgHCO3+	1.285e-05	9.966e-06	-4.891	-5.001	-0.111	(0)
MgCO3	2.770e-06	2.770e-06	-5.557	-5.557	0.000	(0)
MgOH+	1.008e-06	8.119e-07	-5.997	-6.090	-0.094	(0)
MgH2BO3+	3.071e-07	2.309e-07	-6.513	-6.636	-0.124	(0)
Mn (2)	1.449e-04					
Mn+2	1.044e-04	2.516e-05	-3.981	-4.599	-0.618	(0)
MnSO4	3.985e-05	3.985e-05	-4.400	-4.400	0.000	(0)
MnHCO3+	2.230e-07	1.759e-07	-6.652	-6.755	-0.103	(0)
MnCl+	1.652e-07	1.303e-07	-6.782	-6.885	-0.103	(0)
MnF+	1.359e-07	1.072e-07	-6.867	-6.970	-0.103	(0)

	MnOH+	5.880e-08	4.637e-08	-7.231	-7.334	-0.103	(0)
	MnCl2	7.566e-10	7.566e-10	-9.121	-9.121	0.000	(0)
	MnSeO4	1.525e-12	1.525e-12	-11.817	-11.817	0.000	(0)
	MnCl3-	1.087e-12	8.569e-13	-11.964	-12.067	-0.103	(0)
	MnNO3+	9.044e-13	6.337e-13	-12.044	-12.198	-0.155	(0)
	Mn (OH) 3-	1.955e-16	1.542e-16	-15.709	-15.812	-0.103	(0)
	Mn (NO3) 2	2.529e-20	2.529e-20	-19.597	-19.597	0.000	(0)
	Mn (OH) 4-2	9.444e-22	3.651e-22	-21.025	-21.438	-0.413	(0)
	MnSe	0.000e+00	0.000e+00	-40.642	-40.642	0.000	(0)
Mn (3)	7.967e-25						
	Mn+3	7.967e-25	9.129e-26	-24.099	-25.040	-0.941	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-40.068	-40.481	-0.413	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.824	-44.943	-0.119	(0)
Mo	5.039e-06						
	MoO4-2	5.039e-06	1.924e-06	-5.298	-5.716	-0.418	(0)
	HMoO4-	7.489e-10	5.247e-10	-9.126	-9.280	-0.155	(0)
	H2MoO4	5.269e-14	5.269e-14	-13.278	-13.278	0.000	(0)
	AlMo6O21-3	6.435e-40	0.000e+00	-39.191	-40.582	-1.391	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-44.361	-49.923	-5.562	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-47.536	-51.399	-3.863	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.008	-54.480	-2.472	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-57.706	-59.097	-1.391	(0)
N (-3)	3.521e-07						
	NH4+	3.136e-07	2.359e-07	-6.504	-6.627	-0.124	(0)
	NH4SO4-	2.854e-08	2.251e-08	-7.545	-7.648	-0.103	(0)
	NH3	9.810e-09	9.810e-09	-8.008	-8.008	0.000	(0)
	CaNH3+2	1.417e-10	3.414e-11	-9.849	-10.467	-0.618	(0)
	CuNH3+2	1.394e-11	3.359e-12	-10.856	-11.474	-0.618	(0)
	Co (NH3) +2	5.034e-14	1.213e-14	-13.298	-13.916	-0.618	(0)
	NiNH3+2	4.460e-14	1.075e-14	-13.351	-13.969	-0.618	(0)
	BaNH3+2	3.021e-16	7.279e-17	-15.520	-16.138	-0.618	(0)
	Hg (NH3) 2+2	9.691e-19	2.335e-19	-18.014	-18.632	-0.618	(0)
	Ca (NH3) 2+2	5.533e-19	1.333e-19	-18.257	-18.875	-0.618	(0)
	HgNH3+2	9.878e-20	2.380e-20	-19.005	-19.623	-0.618	(0)
	Ni (NH3) 2+2	6.325e-20	1.524e-20	-19.199	-19.817	-0.618	(0)
	Co (NH3) 2+2	2.107e-20	5.077e-21	-19.676	-20.294	-0.618	(0)
	Hg (NH3) 3+2	3.785e-26	9.121e-27	-25.422	-26.040	-0.618	(0)
	Co (NH3) 3+2	2.602e-27	6.271e-28	-26.585	-27.203	-0.618	(0)
	Hg (NH3) 4+2	2.949e-33	7.108e-34	-32.530	-33.148	-0.618	(0)
	Co (NH3) 4+2	1.340e-34	3.228e-35	-33.873	-34.491	-0.618	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.384	-41.002	-0.618	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-41.661	-42.279	-0.618	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.858	-50.248	-1.391	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.026	-49.644	-0.618	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.914	-51.532	-0.618	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.952	-59.107	-0.155	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.298	-63.916	-0.618	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.750	-64.368	-0.618	(0)
N (3)	2.215e-05						
	NO2-	2.215e-05	1.684e-05	-4.655	-4.774	-0.119	(0)
	CuNO2+	8.421e-11	5.900e-11	-10.075	-10.229	-0.155	(0)
	CoNO2+	1.742e-12	1.221e-12	-11.759	-11.913	-0.155	(0)
	Cu (NO2) 2	1.017e-14	1.017e-14	-13.993	-13.993	0.000	(0)
N (5)	2.041e-08						
	NO3-	2.021e-08	1.589e-08	-7.694	-7.799	-0.105	(0)
	CaNO3+	1.982e-10	1.389e-10	-9.703	-9.857	-0.155	(0)
	MnNO3+	9.044e-13	6.337e-13	-12.044	-12.198	-0.155	(0)
	ZnNO3+	1.610e-13	1.128e-13	-12.793	-12.948	-0.155	(0)
	CuNO3+	2.399e-15	1.681e-15	-14.620	-14.774	-0.155	(0)
	BaNO3+	1.337e-15	9.364e-16	-14.874	-15.029	-0.155	(0)
	CoNO3+	3.697e-16	2.590e-16	-15.432	-15.587	-0.155	(0)
	CdNO3+	2.641e-16	1.850e-16	-15.578	-15.733	-0.155	(0)
	NiNO3+	1.162e-16	8.142e-17	-15.935	-16.089	-0.155	(0)
	PbNO3+	4.182e-17	2.930e-17	-16.379	-16.533	-0.155	(0)
	Mn (NO3) 2	2.529e-20	2.529e-20	-19.597	-19.597	0.000	(0)
	UO2NO3+	4.862e-21	3.406e-21	-20.313	-20.468	-0.155	(0)

	Zn(NO3)2	3.577e-22	3.577e-22	-21.446	-21.446	0.000	(0)
	Co(NO3)2	8.374e-24	8.374e-24	-23.077	-23.077	0.000	(0)
	Cu(NO3)2	3.362e-24	3.362e-24	-23.473	-23.473	0.000	(0)
	CrNO3+2	1.826e-24	4.401e-25	-23.738	-24.356	-0.618	(0)
	Cd(NO3)2	1.473e-24	1.473e-24	-23.832	-23.832	0.000	(0)
	Pb(NO3)2	7.907e-25	7.907e-25	-24.102	-24.102	0.000	(0)
	VO2NO3	6.568e-25	6.568e-25	-24.183	-24.183	0.000	(0)
	FeNO3+2	2.647e-27	6.380e-28	-26.577	-27.195	-0.618	(0)
	HgNO3+	3.220e-29	2.256e-29	-28.492	-28.647	-0.155	(0)
	Hg(NO3)2	1.490e-37	1.490e-37	-36.827	-36.827	0.000	(0)
Na		1.648e-02					
	Na+	1.573e-02	1.237e-02	-1.803	-1.908	-0.105	(0)
	NaSO4-	7.454e-04	5.914e-04	-3.128	-3.228	-0.100	(0)
	NaHCO3	2.436e-06	2.436e-06	-5.613	-5.613	0.000	(0)
	NaF	8.346e-07	8.346e-07	-6.079	-6.079	0.000	(0)
	NaCO3-	3.477e-07	2.759e-07	-6.459	-6.559	-0.100	(0)
	NaH2BO3	4.695e-08	4.695e-08	-7.328	-7.328	0.000	(0)
	NaCrO4-	2.696e-16	1.889e-16	-15.569	-15.724	-0.155	(0)
Ni		9.256e-09					
	Ni+2	5.343e-09	2.040e-09	-8.272	-8.690	-0.418	(0)
	NiSO4	3.625e-09	3.625e-09	-8.441	-8.441	0.000	(0)
	NiHCO3+	1.257e-10	8.810e-11	-9.901	-10.055	-0.155	(0)
	NiCO3	9.118e-11	9.118e-11	-10.040	-10.040	0.000	(0)
	NiCl+	3.063e-11	2.146e-11	-10.514	-10.668	-0.155	(0)
	NiOH+	2.689e-11	1.884e-11	-10.570	-10.725	-0.155	(0)
	NiF+	7.823e-12	5.481e-12	-11.107	-11.261	-0.155	(0)
	Ni(SO4)2-2	4.435e-12	1.069e-12	-11.353	-11.971	-0.618	(0)
	Ni(OH)2	1.098e-12	1.098e-12	-11.960	-11.960	0.000	(0)
	NiNH3+2	4.460e-14	1.075e-14	-13.351	-13.969	-0.618	(0)
	Ni(OH)3-	1.149e-15	8.052e-16	-14.940	-15.094	-0.155	(0)
	NiCl2	4.444e-16	4.444e-16	-15.352	-15.352	0.000	(0)
	NiSeO4	2.149e-16	2.149e-16	-15.668	-15.668	0.000	(0)
	NiNO3+	1.162e-16	8.142e-17	-15.935	-16.089	-0.155	(0)
	Ni(NH3)2+2	6.325e-20	1.524e-20	-19.199	-19.817	-0.618	(0)
O(0)		2.433e-35					
	O2	1.217e-35	1.243e-35	-34.915	-34.906	0.009	(0)
Pb		1.854e-09					
	PbSO4	5.438e-10	5.438e-10	-9.265	-9.265	0.000	(0)
	PbCO3	4.490e-10	4.490e-10	-9.348	-9.348	0.000	(0)
	PbOH+	3.279e-10	2.298e-10	-9.484	-9.639	-0.155	(0)
	Pb+2	3.266e-10	1.247e-10	-9.486	-9.904	-0.418	(0)
	Pb(SO4)2-2	1.211e-10	2.918e-11	-9.917	-10.535	-0.618	(0)
	PbHCO3+	4.632e-11	3.245e-11	-10.334	-10.489	-0.155	(0)
	PbCl+	2.596e-11	1.819e-11	-10.586	-10.740	-0.155	(0)
	Pb(CO3)2-2	6.437e-12	1.551e-12	-11.191	-11.809	-0.618	(0)
	Pb(OH)2	5.329e-12	5.329e-12	-11.273	-11.273	0.000	(0)
	PbF+	1.341e-12	9.398e-13	-11.872	-12.027	-0.155	(0)
	PbCl2	3.341e-13	3.341e-13	-12.476	-12.476	0.000	(0)
	Pb(OH)3-	5.580e-15	3.909e-15	-14.253	-14.408	-0.155	(0)
	PbF2	1.978e-15	1.978e-15	-14.704	-14.704	0.000	(0)
	PbCl3-	7.807e-16	5.470e-16	-15.108	-15.262	-0.155	(0)
	PbNO3+	4.182e-17	2.930e-17	-16.379	-16.533	-0.155	(0)
	Pb2OH+3	1.116e-17	4.540e-19	-16.952	-18.343	-1.391	(0)
	PbCl4-2	4.266e-18	1.028e-18	-17.370	-17.988	-0.618	(0)
	Pb(OH)4-2	2.914e-18	7.023e-19	-17.535	-18.153	-0.618	(0)
	PbF3-	5.728e-19	4.013e-19	-18.242	-18.397	-0.155	(0)
	Pb3(OH)4+2	2.932e-22	7.066e-23	-21.533	-22.151	-0.618	(0)
	PbF4-2	8.525e-23	2.054e-23	-22.069	-22.687	-0.618	(0)
	Pb(NO3)2	7.907e-25	7.907e-25	-24.102	-24.102	0.000	(0)
	Pb4(OH)4+4	2.075e-26	6.999e-29	-25.683	-28.155	-2.472	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-151.499	-151.499	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-228.476	-228.631	-0.155	(0)
S(-2)		0.000e+00					
	HS-	0.000e+00	0.000e+00	-78.278	-78.432	-0.155	(0)
	CdHS+	0.000e+00	0.000e+00	-78.704	-78.858	-0.155	(0)
	H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.316	-79.934	-0.618	(0)
	S6-2	0.000e+00	0.000e+00	-79.832	-80.450	-0.618	(0)

S4-2	0.000e+00	0.000e+00	-79.912	-80.530	-0.618	(0)
S3-2	0.000e+00	0.000e+00	-80.718	-81.336	-0.618	(0)
S2-2	0.000e+00	0.000e+00	-81.734	-82.352	-0.618	(0)
S-2	0.000e+00	0.000e+00	-87.457	-87.869	-0.413	(0)
HgHS2-	0.000e+00	0.000e+00	-137.334	-137.488	-0.155	(0)
HgS2-2	0.000e+00	0.000e+00	-137.715	-138.333	-0.618	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.957	-138.957	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.021	-147.444	-0.423	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.586	-147.740	-0.155	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.775	-148.174	-0.399	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.593	-149.593	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.086	-150.086	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.499	-151.499	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.591	-224.745	-0.155	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.244	-226.862	-0.618	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.464	-226.618	-0.155	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.476	-228.631	-0.155	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.429	-236.583	-0.155	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.237	-302.855	-0.618	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.019	-304.637	-0.618	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.225	-318.843	-0.618	(0)
S (6)	3.480e-02					
SO4-2	2.332e-02	8.905e-03	-1.632	-2.050	-0.418	(0)
CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
MgSO4	4.505e-03	4.505e-03	-2.346	-2.346	0.000	(0)
NaSO4-	7.454e-04	5.914e-04	-3.128	-3.228	-0.100	(0)
KSO4-	5.442e-04	4.317e-04	-3.264	-3.365	-0.100	(0)
MnSO4	3.985e-05	3.985e-05	-4.400	-4.400	0.000	(0)
ZnSO4	5.508e-06	5.508e-06	-5.259	-5.259	0.000	(0)
Zn (SO4) 2-2	1.772e-06	4.271e-07	-5.751	-6.369	-0.618	(0)
CuSO4	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
NH4SO4-	2.854e-08	2.251e-08	-7.545	-7.648	-0.103	(0)
CoSO4	1.827e-08	1.827e-08	-7.738	-7.738	0.000	(0)
HSO4-	1.525e-08	1.193e-08	-7.817	-7.923	-0.107	(0)
CdSO4	7.687e-09	7.687e-09	-8.114	-8.114	0.000	(0)
Cd (SO4) 2-2	3.831e-09	9.233e-10	-8.417	-9.035	-0.618	(0)
NiSO4	3.625e-09	3.625e-09	-8.441	-8.441	0.000	(0)
PbSO4	5.438e-10	5.438e-10	-9.265	-9.265	0.000	(0)
Pb (SO4) 2-2	1.211e-10	2.918e-11	-9.917	-10.535	-0.618	(0)
CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
Ni (SO4) 2-2	4.435e-12	1.069e-12	-11.353	-11.971	-0.618	(0)
UO2SO4	1.448e-12	1.448e-12	-11.839	-11.839	0.000	(0)
FeSO4	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
UO2 (SO4) 2-2	7.054e-13	1.700e-13	-12.152	-12.770	-0.618	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.264	-0.107	(0)
Al (SO4) 2-	6.650e-14	5.201e-14	-13.177	-13.284	-0.107	(0)
CrSO4+	1.880e-14	1.318e-14	-13.726	-13.880	-0.155	(0)
VO2SO4-	2.480e-17	1.738e-17	-16.606	-16.760	-0.155	(0)
FeSO4+	5.088e-19	4.012e-19	-18.293	-18.397	-0.103	(0)
Fe (SO4) 2-	1.090e-19	7.638e-20	-18.963	-19.117	-0.155	(0)
Cr2 (OH) 2SO4+2	8.195e-20	1.975e-20	-19.086	-19.704	-0.618	(0)
VOSO4	3.714e-20	3.714e-20	-19.430	-19.430	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
HgSO4	8.966e-21	8.966e-21	-20.047	-20.047	0.000	(0)
CrO3SO4-2	2.107e-23	5.076e-24	-22.676	-23.294	-0.618	(0)
VSO4+	1.045e-34	7.325e-35	-33.981	-34.135	-0.155	(0)
U (SO4) 2	2.378e-39	2.378e-39	-38.624	-38.624	0.000	(0)
USO4+2	1.395e-40	0.000e+00	-39.855	-40.473	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.952	-59.107	-0.155	(0)
Sb (3)	8.051e-20					
Sb (OH) 3	4.071e-20	4.071e-20	-19.390	-19.390	0.000	(0)
HSbO2	3.979e-20	3.979e-20	-19.400	-19.400	0.000	(0)
SbO2-	6.710e-24	4.701e-24	-23.173	-23.328	-0.155	(0)
Sb (OH) 4-	3.835e-24	2.687e-24	-23.416	-23.571	-0.155	(0)
Sb (OH) 2F	9.337e-26	9.337e-26	-25.030	-25.030	0.000	(0)
SbOF	9.194e-26	9.194e-26	-25.037	-25.037	0.000	(0)

Sb(OH) 2+	1.937e-26	1.357e-26	-25.713	-25.867	-0.155	(0)
SbO+	6.686e-27	4.685e-27	-26.175	-26.329	-0.155	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.225	-318.843	-0.618	(0)
Sb (5)	6.235e-08					
SbO3-	6.229e-08	4.364e-08	-7.206	-7.360	-0.155	(0)
Sb(OH) 6-	6.468e-11	5.084e-11	-10.189	-10.294	-0.105	(0)
SbO2+	3.362e-24	2.355e-24	-23.473	-23.628	-0.155	(0)
Se (-2)	4.298e-39					
HSe-	4.298e-39	3.011e-39	-38.367	-38.521	-0.155	(0)
MnSe	0.000e+00	0.000e+00	-40.642	-40.642	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.494	-42.494	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.040	-45.658	-0.618	(0)
Se (4)	4.712e-07					
HSeO3-	2.555e-07	1.790e-07	-6.593	-6.747	-0.155	(0)
SeO3-2	2.157e-07	5.198e-08	-6.666	-7.284	-0.618	(0)
H2SeO3	1.047e-12	1.047e-12	-11.980	-11.980	0.000	(0)
Cd(SeO3) 2-2	3.403e-17	8.200e-18	-16.468	-17.086	-0.618	(0)
FeHSeO3+2	7.881e-24	1.899e-24	-23.103	-23.721	-0.618	(0)
Se (6)	5.914e-10					
SeO4-2	5.898e-10	2.252e-10	-9.229	-9.647	-0.418	(0)
MnSeO4	1.525e-12	1.525e-12	-11.817	-11.817	0.000	(0)
ZnSeO4	9.861e-14	9.861e-14	-13.006	-13.006	0.000	(0)
CoSeO4	1.161e-15	1.161e-15	-14.935	-14.935	0.000	(0)
HSeO4-	2.208e-16	1.547e-16	-15.656	-15.810	-0.155	(0)
NiSeO4	2.149e-16	2.149e-16	-15.668	-15.668	0.000	(0)
CdSeO4	1.544e-16	1.544e-16	-15.811	-15.811	0.000	(0)
Zn(SeO4) 2-2	9.342e-23	2.251e-23	-22.030	-22.648	-0.618	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.338	-58.729	-1.391	(0)
U (4)	2.108e-19					
U(OH) 5-	2.107e-19	1.476e-19	-18.676	-18.831	-0.155	(0)
U(OH) 4	8.487e-23	8.487e-23	-22.071	-22.071	0.000	(0)
U(OH) 3+	6.079e-27	4.259e-27	-26.216	-26.371	-0.155	(0)
U(OH) 2+2	1.122e-31	2.703e-32	-30.950	-31.568	-0.618	(0)
UF3+	6.595e-36	4.621e-36	-35.181	-35.335	-0.155	(0)
UF2+2	1.131e-36	2.726e-37	-35.947	-36.565	-0.618	(0)
UOH+3	4.295e-37	1.748e-38	-36.367	-37.758	-1.391	(0)
UF4	5.419e-38	5.419e-38	-37.266	-37.266	0.000	(0)
UF+3	4.975e-39	2.024e-40	-38.303	-39.694	-1.391	(0)
U(SO4) 2	2.378e-39	2.378e-39	-38.624	-38.624	0.000	(0)
UF5-	3.278e-40	2.297e-40	-39.484	-39.639	-0.155	(0)
USO4+2	1.395e-40	0.000e+00	-39.855	-40.473	-0.618	(0)
UF6-2	0.000e+00	0.000e+00	-40.512	-41.130	-0.618	(0)
U+4	0.000e+00	0.000e+00	-42.551	-45.023	-2.472	(0)
UCl+3	0.000e+00	0.000e+00	-44.318	-45.709	-1.391	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-156.842	-169.356	-12.515	(0)
U (5)	1.151e-15					
UO2+	1.151e-15	8.064e-16	-14.939	-15.093	-0.155	(0)
U (6)	2.694e-07					
UO2(CO3) 3-4	2.180e-07	7.353e-10	-6.662	-9.134	-2.472	(0)
UO2(CO3) 2-2	5.082e-08	1.225e-08	-7.294	-7.912	-0.618	(0)
UO2CO3	5.124e-10	5.124e-10	-9.290	-9.290	0.000	(0)
UO2OH+	1.416e-11	9.922e-12	-10.849	-11.003	-0.155	(0)
UO2F+	2.264e-12	1.586e-12	-11.645	-11.800	-0.155	(0)
UO2SO4	1.448e-12	1.448e-12	-11.839	-11.839	0.000	(0)
UO2(SO4) 2-2	7.054e-13	1.700e-13	-12.152	-12.770	-0.618	(0)
UO2F2	4.893e-13	4.893e-13	-12.310	-12.310	0.000	(0)
UO2+2	2.814e-13	1.074e-13	-12.551	-12.969	-0.418	(0)
UO2F3-	1.876e-14	1.315e-14	-13.727	-13.881	-0.155	(0)
UO2Cl+	1.023e-15	7.165e-16	-14.990	-15.145	-0.155	(0)
(UO2) 3(OH) 5+	9.444e-16	6.617e-16	-15.025	-15.179	-0.155	(0)
(UO2) 2(OH) 2+2	6.780e-16	1.634e-16	-15.169	-15.787	-0.618	(0)
UO2F4-2	4.635e-17	1.117e-17	-16.334	-16.952	-0.618	(0)
UO2NO3+	4.862e-21	3.406e-21	-20.313	-20.468	-0.155	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.449	-42.603	-0.155	(0)
V+2	0.000e+00	0.000e+00	-43.360	-43.978	-0.618	(0)
V (3)	5.548e-15					

V(OH) 3	5.548e-15	5.548e-15	-14.256	-14.256	0.000	(0)
V(OH) 2+	7.023e-26	4.921e-26	-25.153	-25.308	-0.155	(0)
VOH+2	2.658e-29	6.407e-30	-28.575	-29.193	-0.618	(0)
V+3	4.283e-34	1.743e-35	-33.368	-34.759	-1.391	(0)
VSO4+	1.045e-34	7.325e-35	-33.981	-34.135	-0.155	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.659	-56.049	-1.391	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-55.115	-57.587	-2.472	(0)
V(4)	3.274e-18					
V(OH) 3+	3.159e-18	2.214e-18	-17.500	-17.655	-0.155	(0)
VO+2	6.284e-20	1.514e-20	-19.202	-19.820	-0.618	(0)
VOSO4	3.714e-20	3.714e-20	-19.430	-19.430	0.000	(0)
VOF+	1.387e-20	9.716e-21	-19.858	-20.013	-0.155	(0)
VOF2	3.897e-22	3.897e-22	-21.409	-21.409	0.000	(0)
VOC1+	2.494e-22	1.747e-22	-21.603	-21.758	-0.155	(0)
VOF3-	2.111e-24	1.479e-24	-23.676	-23.830	-0.155	(0)
VOF4-2	2.649e-27	6.385e-28	-26.577	-27.195	-0.618	(0)
H2V2O4+2	1.022e-30	2.462e-31	-29.991	-30.609	-0.618	(0)
V(5)	4.755e-08					
H2VO4-	3.102e-08	2.174e-08	-7.508	-7.663	-0.155	(0)
HVO4-2	1.653e-08	3.983e-09	-7.782	-8.400	-0.618	(0)
H3VO4	2.980e-12	2.980e-12	-11.526	-11.526	0.000	(0)
HV2O7-3	7.219e-13	2.937e-14	-12.142	-13.532	-1.391	(0)
H3V2O7-	5.976e-13	4.187e-13	-12.224	-12.378	-0.155	(0)
VO4-3	3.578e-14	1.456e-15	-13.446	-14.837	-1.391	(0)
V2O7-4	1.710e-14	5.767e-17	-13.767	-16.239	-2.472	(0)
V3O9-3	2.653e-16	1.080e-17	-15.576	-16.967	-1.391	(0)
VO2+	1.040e-16	8.172e-17	-15.983	-16.088	-0.105	(0)
VO2SO4-	2.480e-17	1.738e-17	-16.606	-16.760	-0.155	(0)
VO2F	1.533e-17	1.533e-17	-16.814	-16.814	0.000	(0)
VO2F2-	8.497e-19	5.953e-19	-18.071	-18.225	-0.155	(0)
V4O12-4	2.904e-20	9.796e-23	-19.537	-22.009	-2.472	(0)
VO2F3-2	3.296e-21	7.943e-22	-20.482	-21.100	-0.618	(0)
VO2F4-3	1.027e-24	4.180e-26	-23.988	-25.379	-1.391	(0)
VO2NO3	6.568e-25	6.568e-25	-24.183	-24.183	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.606	-59.168	-5.562	(0)
HV10O28-5	0.000e+00	0.000e+00	-54.981	-58.844	-3.863	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.027	-61.499	-2.472	(0)
Zn	1.532e-05					
Zn+2	7.405e-06	2.827e-06	-5.130	-5.549	-0.418	(0)
ZnSO4	5.508e-06	5.508e-06	-5.259	-5.259	0.000	(0)
Zn(SO4) 2-2	1.772e-06	4.271e-07	-5.751	-6.369	-0.618	(0)
ZnOH+	2.960e-07	2.074e-07	-6.529	-6.683	-0.155	(0)
ZnCO3	1.949e-07	1.949e-07	-6.710	-6.710	0.000	(0)
ZnHCO3+	4.470e-08	3.132e-08	-7.350	-7.504	-0.155	(0)
ZnCl+	3.766e-08	2.920e-08	-7.424	-7.535	-0.111	(0)
ZnOHCl	2.804e-08	2.804e-08	-7.552	-7.552	0.000	(0)
Zn(OH) 2	2.411e-08	2.411e-08	-7.618	-7.618	0.000	(0)
ZnF+	8.611e-09	6.033e-09	-8.065	-8.219	-0.155	(0)
ZnCl2	1.903e-10	1.903e-10	-9.721	-9.721	0.000	(0)
Zn(OH) 3-	1.265e-10	8.864e-11	-9.898	-10.052	-0.155	(0)
ZnCl3-	8.017e-13	6.216e-13	-12.096	-12.207	-0.111	(0)
ZnNO3+	1.610e-13	1.128e-13	-12.793	-12.948	-0.155	(0)
ZnSeO4	9.861e-14	9.861e-14	-13.006	-13.006	0.000	(0)
Zn(OH) 4-2	1.074e-14	2.588e-15	-13.969	-14.587	-0.618	(0)
ZnCl4-2	3.305e-15	1.278e-15	-14.481	-14.893	-0.413	(0)
Zn(NO3) 2	3.577e-22	3.577e-22	-21.446	-21.446	0.000	(0)
Zn(SeO4) 2-2	9.342e-23	2.251e-23	-22.030	-22.648	-0.618	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.586	-147.740	-0.155	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.593	-149.593	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.591	-224.745	-0.155	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.244	-226.862	-0.618	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.019	-304.637	-0.618	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-53.57	-47.28	6.29	(Co(NH3)5Cl)(NO3)2

(Co (NH3) 5Cl) Cl2	-40.97	-36.46	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.19	-36.46	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-69.40	-51.46	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-55.25	-35.22	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.17	-27.77	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.35	-22.90	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.32	9.48	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.72	-45.35	2.37	Al2 (MoO4) 3
Al2O3	-0.68	18.97	19.65	Al2O3
Al4 (OH) 10SO4	-2.54	20.16	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.46	-6.66	4.80	AlAsO4:2H2O
AlOHSO4	-5.06	-8.29	-3.23	AlOHSO4
AlSb	-152.16	-86.54	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.16	-11.95	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.91	4.69	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.14	6.25	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.60	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.73	-0.86	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.00	6.94	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.69	-13.65	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.64	-6.81	1.83	BaSeO3
BaSeO4	-10.12	-17.58	-7.46	BaSeO4
Bianchite	-5.84	-7.60	-1.76	ZnSO4:6H2O
Birnessite	-6.77	11.32	18.09	MnO2
Bixbyite	-2.26	-2.90	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.91	9.48	8.58	AlOOH
Breithauptite	-57.69	-76.22	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.68	13.17	16.84	Mg (OH) 2
Bunsenite	-5.41	7.04	12.45	NiO
Ca (VO3) 2	-8.94	-3.28	5.66	Ca (VO3) 2
Ca2V2O7	-7.62	9.88	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.67	9.88	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-15.91	23.05	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-16.81	23.05	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-295.52	-152.55	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-6.71	-24.62	-17.91	Hg2Cl2
CaMoO4	-0.32	-8.27	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.26	-1.44	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.19	-12.21	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-11.04	-1.20	9.84	Cd (BO2) 2
Cd (OH) 2	-6.35	7.29	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.44	7.29	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.39	-13.68	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-18.46	4.10	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-17.01	11.39	28.40	Cd4 (OH) 6SO4
CdCl2	-12.55	-13.21	-0.66	CdCl2
CdCl2:1H2O	-11.51	-13.21	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.29	-13.21	-1.91	CdCl2:2.5H2O

CdF2	-15.16	-16.38	-1.21	CdF2
Cdmetal (alpha)	-31.77	-18.25	13.51	Cd
Cdmetal (gamma)	-31.87	-18.25	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.49	-2.96	3.54	CdOHCl
CdSb	-75.61	-75.96	-0.35	CdSb
CdSe	-18.89	-39.09	-20.20	CdSe
CdSeO4:2H2O	-16.23	-18.08	-1.85	CdSeO4:2H2O
CdSO4	-10.31	-10.48	-0.17	CdSO4
CdSO4:1H2O	-8.76	-10.48	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.61	-10.49	-1.87	CdSO4:2.67H2O
Cerrusite	-2.70	-15.83	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.48	-97.18	-45.69	HgS
Claudetite	-88.12	-91.18	-3.06	As4O6
Clausthalite	-13.46	-40.56	-27.10	PbSe
Co (BO2) 2	-27.83	-0.76	27.07	Co (BO2) 2
Co (OH) 2	-5.36	7.74	13.09	Co (OH) 2
Co (OH) 3	-9.58	-11.89	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-22.12	-9.08	13.03	Co3 (AsO4) 2
Co3O4	-5.55	-16.04	-10.50	Co3O4
CoCl2	-21.03	-12.76	8.27	CoCl2
CoCl2:6H2O	-15.30	-12.76	2.54	CoCl2:6H2O
CoCO3	-3.93	-13.91	-9.98	CoCO3
CoF2	-14.33	-15.93	-1.60	CoF2
CoF3	-45.93	-47.39	-1.46	CoF3
CoFe2O4	17.65	14.12	-3.53	CoFe2O4
CoMoO4	-5.94	-13.70	-7.76	CoMoO4
CoO	-5.85	7.74	13.59	CoO
CoS (alpha)	-71.12	-78.56	-7.44	CoS
CoS (beta)	-67.49	-78.56	-11.07	CoS
CoSe	-22.45	-38.65	-16.20	CoSe
CoSeO3	-8.19	-6.87	1.32	CoSeO3
CoSeO4:6H2O	-16.11	-17.64	-1.53	CoSeO4:6H2O
CoSO4	-12.84	-10.04	2.80	CoSO4
CoSO4:6H2O	-7.57	-10.04	-2.47	CoSO4:6H2O
Cotunnite	-9.90	-14.68	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.59	-31.50	14.09	CrCl2
CrCl3	-47.04	-31.92	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.81	-43.65	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.65	20.56	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.41	0.84	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.73	-89.61	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.25	-50.05	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-24.69	-88.18	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.12	-13.19	-13.08	CuMoO4

CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.03	-38.13	-33.10	CuSe
CuSe2	-25.61	-58.97	-33.37	CuSe2
CuSeO3:2H2O	-6.87	-6.36	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.69	-17.13	-2.44	CuSeO4:5H2O
CuSO4	-12.47	-9.53	2.94	CuSO4
Diaspore	2.61	9.48	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.42	-16.96	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.13	-16.96	-17.09	CaMg(CO3)2
Epsomite	-2.48	-4.61	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.16	0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.28	-13.00	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.78	-8.23	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.82	-37.45	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.90	-17.99	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.18	-63.77	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.93	-42.93	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.50	-80.47	-13.97	PbS
Gibbsite	1.19	9.48	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.59	-7.60	-2.01	ZnSO4:7H2O
Greenockite	-64.64	-79.00	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.92	2.76	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.57	-21.44	-12.88	H2MoO4
H2S(g)	-78.29	-86.30	-8.01	H2S
H2Se(g)	-41.42	-46.38	-4.96	H2Se
Halite	-5.90	-4.29	1.60	NaCl
Hausmannite	-2.11	58.92	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.47	22.42	22.89	FeAl2O4
Hg(CH3)2(g)	-184.83	-258.54	-73.71	Hg(CH3)2
Hg(g)	-6.96	-14.84	-7.87	Hg
Hg(OH)2	-7.39	-10.88	-3.50	Hg(OH)2
Hg2(g)	-14.72	-29.67	-14.96	Hg2
Hg2(OH)2	-9.39	-4.13	5.26	Hg2(OH)2
Hg2CO3	-9.72	-25.77	-16.05	Hg2CO3
Hg2CrO4	-25.66	-34.36	-8.70	Hg2CrO4
Hg2F2	-17.43	-27.79	-10.36	Hg2F2
Hg2S	-78.75	-90.42	-11.68	Hg2S
Hg2SeO3	-14.08	-18.74	-4.66	Hg2SeO3
Hg2SO4	-15.77	-21.90	-6.13	Hg2SO4
Hg3O2CO3	-24.62	-54.30	-29.68	Hg3O2CO3
HgCl(g)	-31.81	-12.31	19.50	HgCl
HgCl2	-10.12	-31.38	-21.26	HgCl2
HgF(g)	-46.57	-13.90	32.68	HgF
HgF2(g)	-47.12	-34.55	12.57	HgF2
Hgmetal(1)	-1.38	-14.84	-13.45	Hg
HgSe	-1.57	-57.27	-55.69	HgSe
HgSeO3	-13.06	-25.49	-12.43	HgSeO3
HgSO4	-19.24	-28.66	-9.42	HgSO4
Huntite	-3.94	-33.91	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.06	-25.83	-18.77	Pb3(OH)2(CO3)2

Hydromagnesite	-11.98	-20.74	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.21	-20.38	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.48	-20.28	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-31.84	-49.08	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-18.33	-18.84	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-13.31	-10.04	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-13.25	-13.98	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.70	-6.13	-0.43	PbO:PbSO ₄
Laurionite	-5.05	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.87	5.82	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.69	19.55	16.86	Fe ₂ MgO ₄
Magnesite	-1.02	-8.48	-7.46	MgCO ₃
Magnetite	6.43	9.84	3.40	Fe ₃ O ₄
Malachite	0.16	-5.15	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.44	23.90	25.34	MnOOH
Massicot	-7.07	5.82	12.89	PbO
Matlockite	-7.29	-16.26	-8.97	PbClF
Melanothallite	-18.50	-12.25	6.26	CuCl ₂
Melanterite	-12.12	-14.33	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.08	-97.18	-45.09	HgS
Mg(OH) ₂ (active)	-5.63	13.17	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.56	-3.28	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-272.55	-197.87	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.47	9.89	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.39	10.81	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.45	-17.07	5.38	MgCrO ₄
MgF ₂	-2.37	-10.50	-8.13	MgF ₂
MgMoO ₄	-6.42	-8.27	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.50	-1.44	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.01	-12.21	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-30.51	43.01	73.52	Pb ₃ O ₄
Mirabilite	-4.76	-5.87	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-10.22	-5.32	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.52	-56.23	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.62	-86.54	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-11.42	1.08	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.09	-9.37	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.34	-75.17	0.17	MnS
MnS (pnk)	-78.51	-75.17	3.34	MnS
MnSb	-94.57	-97.47	-2.91	MnSb
MnSe	-38.76	-35.26	3.50	MnSe
MnSeO ₃	-4.61	-3.48	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.47	-3.48	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.20	-14.25	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.23	-6.65	2.58	MnSO ₄
Monteponite	-7.81	7.29	15.10	CdO
Montroydite	-7.24	-10.88	-3.64	HgO
MoO ₃	-13.44	-21.44	-8.00	MoO ₃
Morenosite	-8.60	-10.74	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.32	-219.58	-70.26	MoS ₂
Na-Jarosite	-8.82	-20.02	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.67	-48.57	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-21.26	-18.33	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.38	-30.97	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.02	-9.53	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.76	-9.53	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-13.00	-2.70	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-14.74	-13.46	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.61	-78.16	94.45	Na ₃ Sb
Na ₃ VO ₄	-27.04	9.64	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-30.03	7.37	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.35	-12.08	-6.73	CuCl
NaSb	-87.69	-64.52	23.17	NaSb

Natron	-8.43	-9.74	-1.31	Na2CO3:10H2O
NaVO3	-6.13	-2.27	3.86	NaVO3
Nesquehonite	-3.81	-8.48	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.76	7.03	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-26.90	-11.20	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-21.64	10.36	32.00	Ni4 (OH) 6SO4
NiCO3	-7.74	-14.61	-6.87	NiCO3
NiMoO4	-3.26	-14.41	-11.14	NiMoO4
NiS (alpha)	-73.66	-79.26	-5.60	NiS
NiS (beta)	-68.16	-79.26	-11.10	NiS
NiS (gamma)	-66.46	-79.26	-12.80	NiS
NiSe	-21.65	-39.35	-17.70	NiSe
NiSeO3:2H2O	-10.39	-7.58	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.82	-18.34	-1.52	NiSeO4:6H2O
Nsutite	-6.18	11.32	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.36	-14.36	-12.00	CdCO3
Pb (BO2) 2	-9.19	-2.67	6.52	Pb (BO2) 2
Pb (OH) 2	-2.33	5.82	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-62.91	-71.67	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-7.40	1.39	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.55	11.64	26.19	Pb2O (OH) 2
Pb2O3	-23.85	37.19	61.04	Pb2O3
Pb2OCO3	-9.45	-10.00	-0.56	Pb2OCO3
Pb2V2O7	-2.91	-4.81	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.63	-14.83	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.13	1.01	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.20	-4.18	11.02	Pb3O2CO3
Pb3O2SO4	-11.00	-0.31	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.59	5.51	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.37	5.51	21.88	Pb4O3SO4
PbCrO4	-11.82	-24.42	-12.60	PbCrO4
PbF2	-10.41	-17.85	-7.44	PbF2
Pbmetal	-23.97	-19.72	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.16	5.82	12.98	PbO:0.33H2O
PbSeO4	-12.71	-19.55	-6.84	PbSeO4
Periclase	-8.41	13.17	21.58	MgO
Phosgenite	-10.69	-30.50	-19.81	PbCl2:PbCO3
Plattnerite	-18.23	31.37	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-4.07	11.13	15.19	Mn (OH) 2
Pyrolusite	-4.71	36.67	41.38	MnO2
Realgar	-102.12	-121.86	-19.75	AsS
Retgersite	-8.70	-10.74	-2.04	NiSO4:6H2O
Rhodochrosite	0.06	-10.52	-10.58	MnCO3
Rutherfordine	-4.39	-18.89	-14.50	UO2CO3
Sb (OH) 3	-12.28	-19.39	-7.11	Sb (OH) 3
Sb2O4	-16.64	-13.23	3.40	Sb2O4
Sb2O5	-26.64	-36.31	-9.67	Sb2O5
Sb2Se3	-110.17	-177.93	-67.76	Sb2Se3
Sb4O6 (cubic)	-59.30	-77.56	-18.26	Sb4O6
Sb4O6 (orth)	-59.66	-77.56	-17.90	Sb4O6
SbCl3	-50.71	-50.14	0.57	SbCl3
SbF3	-44.66	-54.89	-10.23	SbF3
Sbmetal	-46.02	-57.71	-11.69	Sb
SbO2	-3.10	-30.93	-27.82	SbO2
Schoepite	-3.24	2.76	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.73	-20.84	-7.11	Se
Semetal (hex)	-13.13	-20.84	-7.71	Se
Senarmontite	-26.41	-38.78	-12.37	Sb2O3
SeO2	-14.73	-14.61	0.12	SeO2
SeO3	-46.42	-25.37	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.47	-11.47	-10.00	ZnCO3
Sphalerite	-64.67	-76.12	-11.45	ZnS

Spinel	-4.71	32.14	36.85	MgAl ₂ O ₄
Stibnite	-247.20	-297.66	-50.46	Sb ₂ S ₃
Sulfur	-58.61	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.19	-5.87	0.32	Na ₂ SO ₄
Thermonatrite	-10.37	-9.74	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-1.85	2.23	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-10.71	10.37	21.08	U ₃ O ₈
U ₃ Sb ₄	-577.19	-424.81	152.38	U ₃ Sb ₄
U ₄ O ₉	-25.72	-28.74	-3.02	U ₄ O ₉
UF ₄	-31.37	-60.91	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.19	-60.91	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.51	-13.57	0.93	UO ₂
UO ₂ (NO ₃) ₂	-40.71	-28.57	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-33.42	-28.57	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-31.96	-28.57	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-30.62	-28.57	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-2.86	2.76	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-20.37	-22.62	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-4.94	2.76	7.70	UO ₃
Uraninite	-8.90	-13.57	-4.67	UO ₂
USb ₂	-218.87	-189.29	29.58	USb ₂
V (OH) ₃	-18.76	-11.17	7.59	V (OH) ₃
V ₂ O ₅	-15.09	-16.45	-1.36	V ₂ O ₅
V ₃ O ₅	-39.66	-37.83	1.84	V ₃ O ₅
V ₄ O ₇	-49.11	-41.92	7.19	V ₄ O ₇
V ₆ O ₁₃	-39.58	-100.44	-60.86	V ₆ O ₁₃
Valentinite	-30.30	-38.78	-8.48	Sb ₂ O ₃
VC ₁₂	-63.31	-44.44	18.87	VC ₁₂
VC ₁₃	-65.35	-41.92	23.43	VC ₁₃
VF ₄	-66.36	-51.43	14.93	VF ₄
Vmetal	-93.51	-49.49	44.03	V
VO	-38.70	-23.94	14.76	VO
VO (OH) ₂	-9.25	-4.09	5.15	VO (OH) ₂
VO ₂ Cl	-21.31	-18.47	2.84	VO ₂ Cl
VOC ₁	-32.57	-21.42	11.15	VOC ₁
VOC ₁₂	-37.35	-24.59	12.76	VOC ₁₂
VOSO ₄	-25.48	-21.87	3.61	VOSO ₄
Witherite	-5.28	-13.85	-8.57	BaCO ₃
Wurtzite	-67.17	-76.12	-8.95	ZnS
Zincite	-1.16	10.18	11.33	ZnO
Zincosite	-11.53	-7.60	3.93	ZnSO ₄
Zn (BO ₂) ₂	-6.61	1.68	8.29	Zn (BO ₂) ₂
Zn (NO ₃) ₂ :6H ₂ O	-24.47	-21.15	3.32	Zn (NO ₃) ₂ :6H ₂ O
Zn (OH) ₂	-2.02	10.18	12.20	Zn (OH) ₂
Zn (OH) ₂ (am)	-2.30	10.18	12.47	Zn (OH) ₂
Zn (OH) ₂ (beta)	-1.58	10.18	11.75	Zn (OH) ₂
Zn (OH) ₂ (epsilon)	-1.36	10.18	11.53	Zn (OH) ₂
Zn (OH) ₂ (gamma)	-1.56	10.18	11.73	Zn (OH) ₂
Zn ₂ (OH) ₂ SO ₄	-4.92	2.58	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₂ 3Cl	-5.09	10.10	15.19	Zn ₂ (OH) ₂ 3Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-15.42	-1.77	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O (SO ₄) ₂	-23.93	-5.02	18.91	Zn ₃ O (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-5.47	22.93	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-8.12	30.38	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-17.37	-10.32	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-1.21	-11.47	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-12.96	-13.49	-0.53	ZnF ₂
Znmetal	-41.16	-15.37	25.79	Zn
ZnMoO ₄	-1.14	-11.26	-10.13	ZnMoO ₄
ZnO (active)	-1.01	10.18	11.19	ZnO
ZnS (am)	-67.07	-76.12	-9.05	ZnS
ZnSb	-84.09	-73.07	11.01	ZnSb
ZnSe	-21.81	-36.21	-14.40	ZnSe
ZnSeO ₄ :6H ₂ O	-13.68	-15.20	-1.52	ZnSeO ₄ :6H ₂ O
ZnSO ₄ :1H ₂ O	-6.96	-7.60	-0.64	ZnSO ₄ :1H ₂ O

**For a gas, SI = log₁₀(fugacity). Fugacity = pressure * phi / 1 atm.

For ideal gases, $\phi = 1$.

End of simulation.

Reading input data for simulation 75.

```
Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 402
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 402
USE Surface 402
USE Solution 407
SAVE Solution 408 #Initial Stage 4 Run-off Water After Mineral
Precipitation and Sorption Loss
END
```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 402.

Diffuse Double Layer Surface-Complexation Model

Hfo

```
1.084e-15  Surface + diffuse layer charge, eq
1.017e-07  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
2.232e+00  m² for 3.477e-05 moles of Ferrihydrite
```

Water in diffuse layer: 2.232e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, $\psi_{DL} = 7.042e-02$ V.

Boltzmann factor, $\exp(-\psi_{DL} * F / RT) = 6.451e-02$ (= c_{DL} / c_{free} if z is
+1).

Element	Moles
C	5.7019e-11
Ca	7.0666e-13
Cl	1.1418e-09
H	1.6820e-10
K	1.1210e-12
Mg	1.0948e-13
N	4.6225e-09
Na	4.7497e-12
O	2.0603e-07
S	4.8008e-08

Hfo_s
1.738e-07 moles [0.005 mol/(mol Ferrihydrite)]
Mole

Log

Species	Moles	Fraction	Molality	Molality
Hfo_sOH2+	1.162e-07	0.668	1.162e-07	-6.935
Hfo_sOH	5.699e-08	0.328	5.699e-08	-7.244
Hfo_sO-	6.403e-10	0.004	6.403e-10	-9.194
Hfo_sOHCa+2	2.121e-12	0.000	2.121e-12	-11.673

Hfo_w

6.953e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	3.213e-06	0.462	3.213e-06	-5.493
Hfo_wOH	1.576e-06	0.227	1.576e-06	-5.803
Hfo_wSO4-	1.085e-06	0.156	1.085e-06	-5.965
Hfo_wOHSO4-2	1.062e-06	0.153	1.062e-06	-5.974
Hfo_wO-	1.770e-08	0.003	1.770e-08	-7.752
Hfo_wOMg+	2.502e-14	0.000	2.502e-14	-13.602
Hfo_wOCa+	8.489e-15	0.000	8.489e-15	-14.071

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 407. Solution after simulation 74.
Using surface 402.
Using pure phase assemblage 402. Pure-phase assemblage after simulation 74.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	4.671e-05	4.671e-05	2.464e-11
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.06	-8.97	-8.91	4.017e-08	0	-4.017e-08
Barite	0.00	-9.98	-9.98	1.741e-05	1.753e-05	1.205e-07
Brochantite	-0.00	15.22	15.22	8.555e-05	8.495e-05	-5.999e-07
Brucite	-3.68	13.17	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.007e+01	1.007e+01	2.737e-06
CaMoO4	-0.32	-8.27	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.34	-1.53	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.824e-02	2.824e-02	-4.499e-06
Carnotite	0.00	0.23	0.23	1.316e-06	6.836e-07	-6.320e-07
Cd(BO2)2	-11.04	-1.20	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	1.281e-07	1.280e-07	-5.291e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00

Cr2O3	-0.00	-2.36	-2.36	1.150e-08	5.117e-09	-6.382e-09
Cu2Se(alpha)	-4.33	-50.13	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.11	-13.19	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.48	-4.61	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	3.477e-05	3.477e-05	-7.987e-14
Fluorite	0.00	-10.50	-10.50	2.250e-03	2.250e-03	2.890e-09
Gummite	-4.39	3.28	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	1.291e-03	1.295e-03	3.727e-06
HgSe	-1.66	-57.35	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.76	-5.87	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.70	-3.57	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.77	7.03	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-26.97	-11.27	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.75	-14.62	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.27	-14.41	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	2.468e-09
Otavite	-2.36	-14.36	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	4.240e-07	4.067e-07	-1.728e-08
Rutherfordine	-3.87	-18.37	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.10	-30.93	-27.82	0.000e+00	0	0.000e+00
Schoepite	-2.71	3.28	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-1.85	2.23	4.08	0.000e+00	0	0.000e+00
U3O8	-9.14	11.94	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.33	3.28	5.61	0.000e+00	0	0.000e+00
UO3	-4.42	3.28	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.15	-11.28	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

1.924e-18	Surface + diffuse layer charge, eq
5.652e-07	Surface charge, eq
2.444e-02	sigma, C/m ²
3.301e-02	psi, V
-1.285e+00	-F*psi/RT
2.767e-01	exp(-F*psi/RT)
6.420e+04	specific area, m ² /mol Ferrihydrite
2.232e+00	m ² for 3.477e-05 moles of Ferrihydrite

Water in diffuse layer: 2.232e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 3.443e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.746e-01 (= c_DL / c_free if z is +1).

Element	Moles
Al	1.4985e-10
As	2.8069e-14
B	1.3340e-09
Ba	5.2699e-13
C	1.2641e-08
Ca	2.5011e-07
Cd	4.9182e-13
Cl	1.3350e-07
Co	1.1550e-12
Cr	3.2653e-14
Cu	1.0701e-11
F	4.4067e-09
Fe	2.3900e-14
H	1.7092e-08
Hg	1.2101e-13
K	1.8397e-07

Mg	2.2602e-07
Mn	2.6804e-09
Mo	1.4739e-10
N	5.7299e-10
Na	3.2621e-07
Ni	1.7568e-13
O	3.8082e-06
Pb	3.9331e-14
S	9.4094e-07
Sb	1.5913e-12
Se	1.0621e-11
U	3.2776e-11
V	3.8137e-13
Zn	3.0285e-10

Hfo_s

1.738e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	6.196e-08	0.356	6.181e-08	-7.209
Hfo_sOCu+	6.042e-08	0.348	6.027e-08	-7.220
Hfo_sOMn+	2.328e-08	0.134	2.322e-08	-7.634
Hfo_sOPb+	1.293e-08	0.074	1.290e-08	-7.890
Hfo_sOCrOH+	1.276e-08	0.073	1.273e-08	-7.895
Hfo_sOHCa+2	2.276e-09	0.013	2.271e-09	-8.644
Hfo_sOH	1.153e-10	0.001	1.150e-10	-9.939
Hfo_sO-	3.571e-11	0.000	3.562e-11	-10.448
Hfo_sOCd+	2.522e-11	0.000	2.516e-11	-10.599
Hfo_sONi+	1.098e-11	0.000	1.095e-11	-10.961
Hfo_sOH2+	8.525e-12	0.000	8.503e-12	-11.070
Hfo_sOCu+	8.272e-12	0.000	8.251e-12	-11.083
Hfo_sOHBa+2	2.993e-14	0.000	2.985e-14	-13.525
Hfo_sOFe+	6.206e-15	0.000	6.190e-15	-14.208
Hfo_sOHg+	5.101e-16	0.000	5.088e-16	-15.293

Hfo_w

6.953e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.339e-06	0.336	2.333e-06	-5.632
Hfo_wOMg+	1.226e-06	0.176	1.223e-06	-5.912
Hfo_wOH	8.702e-07	0.125	8.681e-07	-6.061
Hfo_wOHVO4-3	6.654e-07	0.096	6.637e-07	-6.178
Hfo_wOHSO4-2	6.242e-07	0.090	6.226e-07	-6.206
Hfo_wOZn+	4.898e-07	0.070	4.886e-07	-6.311
Hfo_wO-	2.696e-07	0.039	2.689e-07	-6.570
Hfo_wOMn+	1.396e-07	0.020	1.393e-07	-6.856
Hfo_wOHAsO4-3	8.039e-08	0.012	8.019e-08	-7.096
Hfo_wOHSeO3-2	7.235e-08	0.010	7.217e-08	-7.142
Hfo_wOCa+	6.858e-08	0.010	6.841e-08	-7.165
Hfo_wOH2+	6.436e-08	0.009	6.420e-08	-7.192
Hfo_wSO4-	2.317e-08	0.003	2.311e-08	-7.636
Hfo_wSeO3-	9.099e-09	0.001	9.077e-09	-8.042
Hfo_wOHMoO4-2	5.506e-09	0.001	5.493e-09	-8.260
Hfo_wOPb+	4.360e-09	0.001	4.349e-09	-8.362
Hfo_wMoO4-	2.633e-10	0.000	2.626e-10	-9.581
Hfo_wH2BO3	2.054e-10	0.000	2.049e-10	-9.688
Hfo_wOCO+	1.760e-10	0.000	1.756e-10	-9.756
Hfo_wONi+	1.118e-10	0.000	1.115e-10	-9.953
Hfo_wOCd+	8.124e-11	0.000	8.103e-11	-10.091
Hfo_wHAsO4-	9.856e-12	0.000	9.831e-12	-11.007
Hfo_wOHg+	1.886e-13	0.000	1.881e-13	-12.726
Hfo_wOFe+	2.956e-14	0.000	2.949e-14	-13.530
Hfo_wH2AsO4	2.359e-14	0.000	2.353e-14	-13.628
Hfo_wOHSeO4-2	1.337e-14	0.000	1.334e-14	-13.875
Hfo_wOBa+	1.303e-14	0.000	1.300e-14	-13.886

Hfo_wOHSbO(OH) 4-	3.195e-15	0.000	3.187e-15	-14.497
Hfo_wSeO4-	4.322e-16	0.000	4.311e-16	-15.365
Hfo_wOHCrO4-2	2.776e-16	0.000	2.769e-16	-15.558
Hfo_wSbO(OH) 4	1.528e-16	0.000	1.524e-16	-15.817
Hfo_wCrO4-	9.396e-18	0.000	9.372e-18	-17.028
Hfo_wH2AsO3	3.357e-24	0.000	3.349e-24	-23.475

-----Solution composition-----

Elements	Molality	Moles
Al	5.879e-06	5.894e-06
As	9.667e-10	9.691e-10
B	5.941e-05	5.956e-05
Ba	3.086e-08	3.094e-08
C	5.048e-04	5.061e-04
Ca	1.291e-02	1.294e-02
Cd	2.339e-08	2.345e-08
Cl	5.231e-03	5.244e-03
Co	6.186e-08	6.202e-08
Cr	1.632e-09	1.636e-09
Cu	5.120e-07	5.133e-07
F	1.838e-04	1.843e-04
Fe	1.152e-09	1.155e-09
Hg	5.421e-09	5.435e-09
K	9.257e-03	9.281e-03
Mg	1.185e-02	1.188e-02
Mn	1.447e-04	1.451e-04
Mo	5.051e-06	5.064e-06
N	2.253e-05	2.258e-05
Na	1.648e-02	1.652e-02
Ni	9.133e-09	9.156e-09
Pb	1.850e-09	1.855e-09
S	3.480e-02	3.489e-02
Sb	6.235e-08	6.251e-08
Se	3.905e-07	3.915e-07
U	8.997e-07	9.020e-07
V	1.423e-08	1.427e-08
Zn	1.477e-05	1.481e-05

-----Description of solution-----

	pH =	7.863	Charge balance
	pe =	4.910	Adjusted to redox
equilibrium			
	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	9.176e-02	
	Mass of water (kg) =	1.003e+00	
	Total alkalinity (eq/kg) =	5.387e-04	
	Total CO2 (mol/kg) =	5.048e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	1	
	Total H =	1.112943e+02	
	Total O =	5.578817e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.550e-07	7.335e-07	-6.020	-6.135	-0.115	(0)
H+	1.744e-08	1.371e-08	-7.758	-7.863	-0.105	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Al	5.879e-06					
Al(OH) 4-	5.824e-06	4.556e-06	-5.235	-5.341	-0.107	(0)
Al(OH) 3	4.933e-08	4.933e-08	-7.307	-7.307	0.000	(0)

Al(OH) 2+	4.248e-09	3.371e-09	-8.372	-8.472	-0.100	(0)
AlF3	4.836e-10	4.836e-10	-9.315	-9.315	0.000	(0)
AlF2+	4.527e-10	3.592e-10	-9.344	-9.445	-0.100	(0)
AlF4-	3.315e-11	2.593e-11	-10.480	-10.586	-0.107	(0)
AlF+2	2.129e-11	8.436e-12	-10.672	-11.074	-0.402	(0)
AlOH+2	1.460e-11	5.785e-12	-10.836	-11.238	-0.402	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.263	-0.107	(0)
Al+3	6.883e-14	7.887e-15	-13.162	-14.103	-0.941	(0)
Al(SO4) 2-	6.650e-14	5.201e-14	-13.177	-13.284	-0.107	(0)
AlMo6O21-3	6.525e-40	0.000e+00	-39.185	-40.576	-1.391	(0)
As (3)	1.579e-23					
H3AsO3	1.499e-23	1.499e-23	-22.824	-22.824	0.000	(0)
H2AsO3-	8.003e-25	5.607e-25	-24.097	-24.251	-0.155	(0)
HAsO3-2	1.548e-28	3.730e-29	-27.810	-28.428	-0.618	(0)
H4AsO3+	1.453e-31	1.018e-31	-30.838	-30.992	-0.155	(0)
AsO3-3	2.578e-33	1.049e-34	-32.589	-33.979	-1.391	(0)
As (5)	9.667e-10					
HAsO4-2	9.256e-10	2.231e-10	-9.034	-9.652	-0.618	(0)
H2AsO4-	3.980e-11	2.789e-11	-10.400	-10.555	-0.155	(0)
AsO4-3	1.265e-12	5.145e-14	-11.898	-13.289	-1.391	(0)
H3AsO4	6.505e-17	6.644e-17	-16.187	-16.178	0.009	(0)
B	5.941e-05					
H3BO3	5.536e-05	5.654e-05	-4.257	-4.248	0.009	(0)
H2BO3-	3.185e-06	2.395e-06	-5.497	-5.621	-0.124	(0)
CaH2BO3+	5.066e-07	3.811e-07	-6.295	-6.419	-0.124	(0)
MgH2BO3+	3.070e-07	2.309e-07	-6.513	-6.637	-0.124	(0)
NaH2BO3	4.695e-08	4.695e-08	-7.328	-7.328	0.000	(0)
BF(OH) 3-	3.209e-09	2.413e-09	-8.494	-8.617	-0.124	(0)
H5(BO3) 2-	1.533e-10	1.153e-10	-9.814	-9.938	-0.124	(0)
BaH2BO3+	1.158e-12	8.706e-13	-11.936	-12.060	-0.124	(0)
H8(BO3) 3-	8.667e-13	6.519e-13	-12.062	-12.186	-0.124	(0)
BF2(OH) 2-	5.036e-13	3.788e-13	-12.298	-12.422	-0.124	(0)
BF3OH-	2.877e-19	2.164e-19	-18.541	-18.665	-0.124	(0)
BF4-	2.078e-24	1.563e-24	-23.682	-23.806	-0.124	(0)
Ba	3.086e-08					
Ba+2	3.080e-08	1.176e-08	-7.511	-7.930	-0.418	(0)
BaHCO3+	4.915e-11	3.934e-11	-10.308	-10.405	-0.097	(0)
BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
BaH2BO3+	1.158e-12	8.706e-13	-11.936	-12.060	-0.124	(0)
BaOH+	4.775e-14	3.766e-14	-13.321	-13.424	-0.103	(0)
BaNO3+	1.337e-15	9.367e-16	-14.874	-15.028	-0.155	(0)
BaNH3+2	3.021e-16	7.281e-17	-15.520	-16.138	-0.618	(0)
C (4)	5.048e-04					
HCO3-	4.415e-04	3.503e-04	-3.355	-3.456	-0.100	(0)
CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
MgHCO3+	1.285e-05	9.965e-06	-4.891	-5.002	-0.111	(0)
H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	3.137e-06	1.198e-06	-5.503	-5.922	-0.418	(0)
MgCO3	2.770e-06	2.770e-06	-5.558	-5.558	0.000	(0)
NaHCO3	2.436e-06	2.436e-06	-5.613	-5.613	0.000	(0)
UO2(CO3) 3-4	7.282e-07	2.456e-09	-6.138	-8.610	-2.472	(0)
NaCO3-	3.477e-07	2.758e-07	-6.459	-6.559	-0.100	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
MnHCO3+	2.228e-07	1.757e-07	-6.652	-6.755	-0.103	(0)
ZnCO3	1.879e-07	1.879e-07	-6.726	-6.726	0.000	(0)
UO2(CO3) 2-2	1.698e-07	4.091e-08	-6.770	-7.388	-0.618	(0)
ZnHCO3+	4.309e-08	3.019e-08	-7.366	-7.520	-0.155	(0)
Cu(CO3) 2-2	3.157e-09	7.609e-10	-8.501	-9.119	-0.618	(0)
UO2CO3	1.712e-09	1.712e-09	-8.767	-8.767	0.000	(0)
CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
PbCO3	4.480e-10	4.480e-10	-9.349	-9.349	0.000	(0)
CoHCO3+	3.988e-10	2.794e-10	-9.399	-9.554	-0.155	(0)
CoCO3	2.077e-10	2.077e-10	-9.683	-9.683	0.000	(0)
NiHCO3+	1.241e-10	8.693e-11	-9.906	-10.061	-0.155	(0)
CdCO3	1.003e-10	1.003e-10	-9.999	-9.999	0.000	(0)
NiCO3	8.996e-11	8.996e-11	-10.046	-10.046	0.000	(0)
BaHCO3+	4.915e-11	3.934e-11	-10.308	-10.405	-0.097	(0)

	PbHCO3+	4.621e-11	3.238e-11	-10.335	-10.490	-0.155	(0)
	BaCO3	7.225e-12	7.225e-12	-11.141	-11.141	0.000	(0)
	Pb (CO3) 2-2	6.422e-12	1.548e-12	-11.192	-11.810	-0.618	(0)
	CdHCO3+	4.182e-12	2.930e-12	-11.379	-11.533	-0.155	(0)
	Cd (CO3) 2-2	3.696e-13	8.908e-14	-12.432	-13.050	-0.618	(0)
	HgCO3	5.513e-15	5.513e-15	-14.259	-14.259	0.000	(0)
	FeHCO3+	2.933e-15	2.347e-15	-14.533	-14.629	-0.097	(0)
	Hg (CO3) 2-2	8.665e-17	2.088e-17	-16.062	-16.680	-0.618	(0)
	HgHCO3+	2.009e-18	1.407e-18	-17.697	-17.852	-0.155	(0)
Ca	1.291e-02						
	Ca+2	7.240e-03	2.764e-03	-2.140	-2.558	-0.418	(0)
	CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
	CaHCO3+	2.253e-05	1.803e-05	-4.647	-4.744	-0.097	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
	CaH2BO3+	5.066e-07	3.811e-07	-6.295	-6.419	-0.124	(0)
	CaOH+	5.055e-08	4.046e-08	-7.296	-7.393	-0.097	(0)
	CaNO3+	1.983e-10	1.389e-10	-9.703	-9.857	-0.155	(0)
	CaNH3+2	1.417e-10	3.415e-11	-9.849	-10.467	-0.618	(0)
	Ca (NH3) 2+2	5.536e-19	1.334e-19	-18.257	-18.875	-0.618	(0)
Cd	2.339e-08						
	Cd+2	9.623e-09	3.674e-09	-8.017	-8.435	-0.418	(0)
	CdSO4	7.669e-09	7.669e-09	-8.115	-8.115	0.000	(0)
	Cd (SO4) 2-2	3.822e-09	9.211e-10	-8.418	-9.036	-0.618	(0)
	CdCl+	2.059e-09	1.443e-09	-8.686	-8.841	-0.155	(0)
	CdCO3	1.003e-10	1.003e-10	-9.999	-9.999	0.000	(0)
	CdOHC1	4.341e-11	4.341e-11	-10.362	-10.362	0.000	(0)
	CdOH+	3.055e-11	2.141e-11	-10.515	-10.669	-0.155	(0)
	CdCl2	2.473e-11	2.473e-11	-10.607	-10.607	0.000	(0)
	CdF+	8.889e-12	6.228e-12	-11.051	-11.206	-0.155	(0)
	CdHCO3+	4.182e-12	2.930e-12	-11.379	-11.533	-0.155	(0)
	Cd (CO3) 2-2	3.696e-13	8.908e-14	-12.432	-13.050	-0.618	(0)
	Cd (OH) 2	9.908e-14	9.908e-14	-13.004	-13.004	0.000	(0)
	CdCl3-	9.157e-14	6.416e-14	-13.038	-13.193	-0.155	(0)
	CdF2	1.329e-15	1.329e-15	-14.876	-14.876	0.000	(0)
	CdNO3+	2.635e-16	1.846e-16	-15.579	-15.734	-0.155	(0)
	CdSeO4	1.275e-16	1.275e-16	-15.894	-15.894	0.000	(0)
	Cd (SeO3) 2-2	2.326e-17	5.606e-18	-16.633	-17.251	-0.618	(0)
	Cd2OH+3	9.688e-18	3.942e-19	-17.014	-18.404	-1.391	(0)
	Cd (OH) 3-	6.337e-18	4.440e-18	-17.198	-17.353	-0.155	(0)
	Cd (OH) 4-2	2.212e-24	5.331e-25	-23.655	-24.273	-0.618	(0)
	Cd (NO3) 2	1.471e-24	1.471e-24	-23.833	-23.833	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.705	-78.859	-0.155	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.087	-150.087	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.465	-226.619	-0.155	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.238	-302.856	-0.618	(0)
Cl	5.231e-03						
	Cl-	5.231e-03	4.112e-03	-2.281	-2.386	-0.105	(0)
	MnCl+	1.650e-07	1.301e-07	-6.782	-6.886	-0.103	(0)
	ZnCl+	3.631e-08	2.815e-08	-7.440	-7.550	-0.111	(0)
	ZnOHC1	2.703e-08	2.703e-08	-7.568	-7.568	0.000	(0)
	CdCl+	2.059e-09	1.443e-09	-8.686	-8.841	-0.155	(0)
	CuCl2-	1.157e-09	8.973e-10	-8.937	-9.047	-0.111	(0)
	CuCl	1.044e-09	1.044e-09	-8.981	-8.981	0.000	(0)
	MnCl2	7.557e-10	7.557e-10	-9.122	-9.122	0.000	(0)
	CuCl+	2.812e-10	2.180e-10	-9.551	-9.661	-0.111	(0)
	CoCl+	2.082e-10	1.459e-10	-9.682	-9.836	-0.155	(0)
	ZnCl2	1.835e-10	1.835e-10	-9.736	-9.736	0.000	(0)
	CdOHC1	4.341e-11	4.341e-11	-10.362	-10.362	0.000	(0)
	NiCl+	3.023e-11	2.118e-11	-10.520	-10.674	-0.155	(0)
	PbCl+	2.591e-11	1.815e-11	-10.587	-10.741	-0.155	(0)
	CdCl2	2.473e-11	2.473e-11	-10.607	-10.607	0.000	(0)
	HgClOH	2.048e-11	2.048e-11	-10.689	-10.689	0.000	(0)
	HgCl2	6.502e-12	6.502e-12	-11.187	-11.187	0.000	(0)
	CuCl3-2	2.040e-12	7.888e-13	-11.690	-12.103	-0.413	(0)
	MnCl3-	1.085e-12	8.559e-13	-11.964	-12.068	-0.103	(0)
	ZnCl3-	7.728e-13	5.992e-13	-12.112	-12.222	-0.111	(0)
	HgCl3-	3.816e-13	2.673e-13	-12.418	-12.573	-0.155	(0)

PbCl2	3.334e-13	3.334e-13	-12.477	-12.477	0.000	(0)
CuCl2	3.109e-13	3.109e-13	-12.507	-12.507	0.000	(0)
CdCl3-	9.157e-14	6.416e-14	-13.038	-13.193	-0.155	(0)
HgCl4-2	1.816e-14	4.376e-15	-13.741	-14.359	-0.618	(0)
UO2Cl+	3.416e-15	2.394e-15	-14.466	-14.621	-0.155	(0)
ZnCl4-2	3.186e-15	1.232e-15	-14.497	-14.909	-0.413	(0)
PbCl3-	7.789e-16	5.457e-16	-15.109	-15.263	-0.155	(0)
HgCl+	4.503e-16	3.155e-16	-15.346	-15.501	-0.155	(0)
NiCl2	4.385e-16	4.385e-16	-15.358	-15.358	0.000	(0)
CuCl3-	1.539e-17	1.193e-17	-16.813	-16.923	-0.111	(0)
CrCl+2	1.399e-17	3.372e-18	-16.854	-17.472	-0.618	(0)
PbCl4-2	4.256e-18	1.026e-18	-17.371	-17.989	-0.618	(0)
CrOHC12	1.933e-19	1.933e-19	-18.714	-18.714	0.000	(0)
CrCl2+	1.878e-21	1.316e-21	-20.726	-20.881	-0.155	(0)
FeCl+2	1.290e-21	4.987e-22	-20.890	-21.302	-0.413	(0)
CuCl4-2	6.358e-22	2.458e-22	-21.197	-21.609	-0.413	(0)
VOCl+	7.464e-23	5.230e-23	-22.127	-22.282	-0.155	(0)
FeCl2+	1.162e-23	9.159e-24	-22.935	-23.038	-0.103	(0)
CrO3Cl-	6.909e-26	4.840e-26	-25.161	-25.315	-0.155	(0)
FeCl3	3.766e-27	3.766e-27	-26.424	-26.424	0.000	(0)
CoCl+2	1.151e-35	2.774e-36	-34.939	-35.557	-0.618	(0)
UCl+3	0.000e+00	0.000e+00	-43.795	-45.185	-1.391	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.027	-49.645	-0.618	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.913	-51.531	-0.618	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.751	-64.369	-0.618	(0)
Co (2)	6.186e-08					
Co+2	4.256e-08	1.026e-08	-7.371	-7.989	-0.618	(0)
CoSO4	1.822e-08	1.822e-08	-7.739	-7.739	0.000	(0)
CoHCO3+	3.988e-10	2.794e-10	-9.399	-9.554	-0.155	(0)
CoOH+	2.142e-10	1.501e-10	-9.669	-9.824	-0.155	(0)
CoCl+	2.082e-10	1.459e-10	-9.682	-9.836	-0.155	(0)
CoCO3	2.077e-10	2.077e-10	-9.683	-9.683	0.000	(0)
CoF+	4.951e-11	3.469e-11	-10.305	-10.460	-0.155	(0)
Co (OH) 2	8.745e-12	8.745e-12	-11.058	-11.058	0.000	(0)
CoNO2+	1.737e-12	1.217e-12	-11.760	-11.915	-0.155	(0)
Co (NH3) +2	5.020e-14	1.210e-14	-13.299	-13.917	-0.618	(0)
CoSeO4	9.581e-16	9.581e-16	-15.019	-15.019	0.000	(0)
CoNO3+	3.687e-16	2.583e-16	-15.433	-15.588	-0.155	(0)
Co (OH) 3-	1.827e-16	1.280e-16	-15.738	-15.893	-0.155	(0)
CoOOH-	4.589e-17	3.216e-17	-16.338	-16.493	-0.155	(0)
Co2OH+3	1.896e-18	7.714e-20	-17.722	-19.113	-1.391	(0)
Co (NH3) 2+2	2.101e-20	5.064e-21	-19.677	-20.295	-0.618	(0)
Co (OH) 4-2	6.174e-23	1.488e-23	-22.209	-22.827	-0.618	(0)
Co (NO3) 2	8.352e-24	8.352e-24	-23.078	-23.078	0.000	(0)
Co (NH3) 3+2	2.596e-27	6.256e-28	-26.586	-27.204	-0.618	(0)
Co4 (OH) 4+4	3.002e-29	1.013e-31	-28.523	-30.995	-2.472	(0)
Co (NH3) 4+2	1.337e-34	3.222e-35	-33.874	-34.492	-0.618	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.662	-42.280	-0.618	(0)
Co (3)	5.129e-29					
CoOH+2	5.129e-29	1.236e-29	-28.290	-28.908	-0.618	(0)
Co+3	2.894e-35	3.316e-36	-34.539	-35.479	-0.941	(0)
CoCl+2	1.151e-35	2.774e-36	-34.939	-35.557	-0.618	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.027	-49.645	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.953	-59.108	-0.155	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.299	-63.917	-0.618	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.751	-64.369	-0.618	(0)
Cr (2)	7.735e-27					
Cr+2	7.735e-27	1.864e-27	-26.112	-26.730	-0.618	(0)
Cr (3)	1.632e-09					
Cr (OH) 2+	1.295e-09	9.076e-10	-8.888	-9.042	-0.155	(0)
Cr (OH) 3	2.501e-10	2.501e-10	-9.602	-9.602	0.000	(0)
Cr (OH) +2	4.220e-11	1.017e-11	-10.375	-10.993	-0.618	(0)
CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
CrO2-	1.238e-11	8.676e-12	-10.907	-11.062	-0.155	(0)
Cr (OH) 4-	1.042e-11	7.303e-12	-10.982	-11.136	-0.155	(0)
CrF+2	4.458e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
CrSO4+	1.881e-14	1.318e-14	-13.726	-13.880	-0.155	(0)
Cr+3	1.557e-14	6.337e-16	-13.808	-15.198	-1.391	(0)

CrCl+2	1.399e-17	3.372e-18	-16.854	-17.472	-0.618	(0)
CrOHC12	1.933e-19	1.933e-19	-18.714	-18.714	0.000	(0)
Cr2 (OH) 2SO4+2	8.196e-20	1.975e-20	-19.086	-19.704	-0.618	(0)
Cr2 (OH) 2 (SO4) 2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
CrCl2+	1.878e-21	1.316e-21	-20.726	-20.881	-0.155	(0)
CrNO3+2	1.827e-24	4.402e-25	-23.738	-24.356	-0.618	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.383	-41.001	-0.618	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.857	-50.247	-1.391	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.913	-51.531	-0.618	(0)
Cr (6)	8.626e-15					
CrO4-2	8.050e-15	3.074e-15	-14.094	-14.512	-0.418	(0)
NaCrO4-	2.696e-16	1.889e-16	-15.569	-15.724	-0.155	(0)
HCrO4-	1.946e-16	1.364e-16	-15.711	-15.865	-0.155	(0)
KCrO4-	1.116e-16	7.822e-17	-15.952	-16.107	-0.155	(0)
CrO3SO4-2	2.106e-23	5.076e-24	-22.676	-23.294	-0.618	(0)
H2CrO4	1.515e-24	1.515e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	6.909e-26	4.840e-26	-25.161	-25.315	-0.155	(0)
Cr2O7-2	2.679e-30	6.455e-31	-29.572	-30.190	-0.618	(0)
Cu (1)	2.492e-09					
CuCl2-	1.157e-09	8.973e-10	-8.937	-9.047	-0.111	(0)
CuCl	1.044e-09	1.044e-09	-8.981	-8.981	0.000	(0)
Cu+	2.880e-10	2.018e-10	-9.541	-9.695	-0.155	(0)
CuCl3-2	2.040e-12	7.888e-13	-11.690	-12.103	-0.413	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.021	-147.444	-0.423	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.775	-148.174	-0.399	(0)
Cu (2)	5.095e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	1.001e-07	7.761e-08	-7.000	-7.110	-0.111	(0)
Cu+2	8.763e-08	3.346e-08	-7.057	-7.476	-0.418	(0)
CuSO4	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
Cu (OH) 2	1.136e-08	1.136e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	3.157e-09	7.609e-10	-8.501	-9.119	-0.618	(0)
CuHCO3+	1.055e-09	7.394e-10	-8.977	-9.131	-0.155	(0)
Cu2 (OH) 2+2	6.278e-10	1.513e-10	-9.202	-9.820	-0.618	(0)
CuF+	3.223e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
CuCl+	2.812e-10	2.180e-10	-9.551	-9.661	-0.111	(0)
CuNO2+	8.423e-11	5.901e-11	-10.075	-10.229	-0.155	(0)
Cu (OH) 3-	2.439e-11	1.709e-11	-10.613	-10.767	-0.155	(0)
CuNH3+2	1.394e-11	3.360e-12	-10.856	-11.474	-0.618	(0)
CuCl2	3.109e-13	3.109e-13	-12.507	-12.507	0.000	(0)
Cu (NO2) 2	1.017e-14	1.017e-14	-13.993	-13.993	0.000	(0)
CuNO3+	2.400e-15	1.681e-15	-14.620	-14.774	-0.155	(0)
Cu (OH) 4-2	4.094e-16	9.866e-17	-15.388	-16.006	-0.618	(0)
CuCl3-	1.539e-17	1.193e-17	-16.813	-16.923	-0.111	(0)
CuCl4-2	6.358e-22	2.458e-22	-21.197	-21.609	-0.413	(0)
Cu (NO3) 2	3.364e-24	3.364e-24	-23.473	-23.473	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
F	1.838e-04					
F-	1.361e-04	1.070e-04	-3.866	-3.971	-0.105	(0)
MgF+	4.266e-05	3.336e-05	-4.370	-4.477	-0.107	(0)
CaF+	4.092e-06	3.227e-06	-5.388	-5.491	-0.103	(0)
NaF	8.346e-07	8.346e-07	-6.079	-6.079	0.000	(0)
MnF+	1.357e-07	1.070e-07	-6.867	-6.970	-0.103	(0)
ZnF+	8.302e-09	5.817e-09	-8.081	-8.235	-0.155	(0)
BF (OH) 3-	3.209e-09	2.413e-09	-8.494	-8.617	-0.124	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
AlF3	4.836e-10	4.836e-10	-9.315	-9.315	0.000	(0)
AlF2+	4.527e-10	3.592e-10	-9.344	-9.445	-0.100	(0)
CuF+	3.223e-10	2.258e-10	-9.492	-9.646	-0.155	(0)
CoF+	4.951e-11	3.469e-11	-10.305	-10.460	-0.155	(0)
AlF4-	3.315e-11	2.593e-11	-10.480	-10.586	-0.107	(0)
AlF+2	2.129e-11	8.436e-12	-10.672	-11.074	-0.402	(0)
CdF+	8.889e-12	6.228e-12	-11.051	-11.206	-0.155	(0)
NiF+	7.719e-12	5.408e-12	-11.112	-11.267	-0.155	(0)
UO2F+	7.564e-12	5.300e-12	-11.121	-11.276	-0.155	(0)
UO2F2	1.635e-12	1.635e-12	-11.787	-11.787	0.000	(0)
PbF+	1.338e-12	9.377e-13	-11.873	-12.028	-0.155	(0)
HF2-	1.148e-12	8.819e-13	-11.940	-12.055	-0.115	(0)

BF2(OH) 2-	5.036e-13	3.788e-13	-12.298	-12.422	-0.124	(0)
UO2F3-	6.268e-14	4.392e-14	-13.203	-13.357	-0.155	(0)
CrF+2	4.458e-14	1.074e-14	-13.351	-13.969	-0.618	(0)
PbF2	1.974e-15	1.974e-15	-14.705	-14.705	0.000	(0)
CdF2	1.329e-15	1.329e-15	-14.876	-14.876	0.000	(0)
UO2F4-2	1.548e-16	3.731e-17	-15.810	-16.428	-0.618	(0)
H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
VO2F	4.589e-18	4.589e-18	-17.338	-17.338	0.000	(0)
FeF2+	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
FeF+2	1.218e-18	4.710e-19	-17.914	-18.327	-0.413	(0)
PbF3-	5.714e-19	4.004e-19	-18.243	-18.398	-0.155	(0)
BF3OH-	2.877e-19	2.164e-19	-18.541	-18.665	-0.124	(0)
VO2F2-	2.543e-19	1.782e-19	-18.595	-18.749	-0.155	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
VOF+	4.151e-21	2.908e-21	-20.382	-20.536	-0.155	(0)
VO2F3-2	9.865e-22	2.377e-22	-21.006	-21.624	-0.618	(0)
VOF2	1.166e-22	1.166e-22	-21.933	-21.933	0.000	(0)
PbF4-2	8.505e-23	2.050e-23	-22.070	-22.688	-0.618	(0)
HgF+	2.176e-23	1.525e-23	-22.662	-22.817	-0.155	(0)
BF4-	2.078e-24	1.563e-24	-23.682	-23.806	-0.124	(0)
VOF3-	6.318e-25	4.427e-25	-24.199	-24.354	-0.155	(0)
VO2F4-3	3.075e-25	1.251e-26	-24.512	-25.903	-1.391	(0)
Sb(OH) 2F	9.337e-26	9.337e-26	-25.030	-25.030	0.000	(0)
SbOF	9.194e-26	9.194e-26	-25.037	-25.037	0.000	(0)
VOF4-2	7.930e-28	1.911e-28	-27.101	-27.719	-0.618	(0)
UF3+	2.203e-35	1.544e-35	-34.657	-34.811	-0.155	(0)
UF2+2	3.779e-36	9.106e-37	-35.423	-36.041	-0.618	(0)
UF4	1.810e-37	1.810e-37	-36.742	-36.742	0.000	(0)
UF+3	1.662e-38	6.763e-40	-37.779	-39.170	-1.391	(0)
UF5-	1.095e-39	7.673e-40	-38.961	-39.115	-0.155	(0)
UF6-2	1.028e-40	0.000e+00	-39.988	-40.606	-0.618	(0)
Fe (2)	3.395e-12					
Fe+2	2.209e-12	5.323e-13	-11.656	-12.274	-0.618	(0)
FeSO4	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
FeOH+	1.971e-14	1.554e-14	-13.705	-13.808	-0.103	(0)
FeHCO3+	2.933e-15	2.347e-15	-14.533	-14.629	-0.097	(0)
Fe(OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	2.664e-18	2.101e-18	-17.574	-17.678	-0.103	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.429	-236.584	-0.155	(0)
Fe (3)	1.148e-09					
Fe(OH) 2+	6.841e-10	5.427e-10	-9.165	-9.265	-0.100	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	3.680e-11	2.920e-11	-10.434	-10.535	-0.100	(0)
FeOH+2	4.919e-15	1.902e-15	-14.308	-14.721	-0.413	(0)
FeF2+	1.709e-18	1.348e-18	-17.767	-17.870	-0.103	(0)
FeF+2	1.218e-18	4.710e-19	-17.914	-18.327	-0.413	(0)
FeSO4+	5.088e-19	4.012e-19	-18.293	-18.397	-0.103	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
Fe(SO4) 2-	1.090e-19	7.637e-20	-18.963	-19.117	-0.155	(0)
Fe+3	3.505e-20	4.016e-21	-19.455	-20.396	-0.941	(0)
FeCl+2	1.290e-21	4.987e-22	-20.890	-21.302	-0.413	(0)
FeCl2+	1.162e-23	9.159e-24	-22.935	-23.038	-0.103	(0)
FeHSeO3+2	6.524e-24	1.572e-24	-23.185	-23.803	-0.618	(0)
Fe2(OH) 2+4	3.551e-26	1.198e-28	-25.450	-27.922	-2.472	(0)
FeCl3	3.766e-27	3.766e-27	-26.424	-26.424	0.000	(0)
FeNO3+2	2.648e-27	6.382e-28	-26.577	-27.195	-0.618	(0)
Fe3(OH) 4+5	6.847e-33	9.397e-37	-32.165	-36.027	-3.863	(0)
H (0)	3.950e-29					
H2	1.975e-29	2.017e-29	-28.704	-28.695	0.009	(0)
Hg (0)	5.381e-09					
Hg	5.381e-09	5.381e-09	-8.269	-8.269	0.000	(0)
Hg (1)	1.166e-19					
Hg2+2	5.830e-20	1.405e-20	-19.234	-19.852	-0.618	(0)
Hg (2)	4.017e-11					
HgClOH	2.048e-11	2.048e-11	-10.689	-10.689	0.000	(0)
Hg(OH) 2	1.278e-11	1.306e-11	-10.893	-10.884	0.009	(0)
HgCl2	6.502e-12	6.502e-12	-11.187	-11.187	0.000	(0)

	HgCl3-	3.816e-13	2.673e-13	-12.418	-12.573	-0.155	(0)
	HgCl4-2	1.816e-14	4.376e-15	-13.741	-14.359	-0.618	(0)
	HgCO3	5.513e-15	5.513e-15	-14.259	-14.259	0.000	(0)
	HgCl+	4.503e-16	3.155e-16	-15.346	-15.501	-0.155	(0)
	HgOH+	1.603e-16	1.123e-16	-15.795	-15.950	-0.155	(0)
	Hg (CO3) 2-2	8.665e-17	2.088e-17	-16.062	-16.680	-0.618	(0)
	HgHCO3+	2.009e-18	1.407e-18	-17.697	-17.852	-0.155	(0)
	Hg (OH) 3-	1.721e-18	1.206e-18	-17.764	-17.919	-0.155	(0)
	Hg (NH3) 2+2	9.695e-19	2.336e-19	-18.013	-18.631	-0.618	(0)
	HgNH3+2	9.880e-20	2.381e-20	-19.005	-19.623	-0.618	(0)
	Hg+2	1.596e-20	3.846e-21	-19.797	-20.415	-0.618	(0)
	HgSO4	8.965e-21	8.965e-21	-20.047	-20.047	0.000	(0)
	HgF+	2.176e-23	1.525e-23	-22.662	-22.817	-0.155	(0)
	Hg (NH3) 3+2	3.787e-26	9.127e-27	-25.422	-26.040	-0.618	(0)
	HgNO3+	3.221e-29	2.257e-29	-28.492	-28.647	-0.155	(0)
	Hg (NH3) 4+2	2.952e-33	7.114e-34	-32.530	-33.148	-0.618	(0)
	Hg (NO3) 2	1.490e-37	1.490e-37	-36.827	-36.827	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.334	-137.488	-0.155	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.715	-138.333	-0.618	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.957	-138.957	0.000	(0)
K		9.257e-03					
	K+	8.713e-03	6.849e-03	-2.060	-2.164	-0.105	(0)
	KSO4-	5.442e-04	4.317e-04	-3.264	-3.365	-0.100	(0)
	KCrO4-	1.116e-16	7.822e-17	-15.952	-16.107	-0.155	(0)
Mg		1.185e-02					
	Mg+2	7.281e-03	2.780e-03	-2.138	-2.556	-0.418	(0)
	MgSO4	4.504e-03	4.504e-03	-2.346	-2.346	0.000	(0)
	MgF+	4.266e-05	3.336e-05	-4.370	-4.477	-0.107	(0)
	MgHCO3+	1.285e-05	9.965e-06	-4.891	-5.002	-0.111	(0)
	MgCO3	2.770e-06	2.770e-06	-5.558	-5.558	0.000	(0)
	MgOH+	1.008e-06	8.118e-07	-5.997	-6.091	-0.094	(0)
	MgH2BO3+	3.070e-07	2.309e-07	-6.513	-6.637	-0.124	(0)
Mn (2)		1.447e-04					
	Mn+2	1.043e-04	2.514e-05	-3.982	-4.600	-0.618	(0)
	MnSO4	3.980e-05	3.980e-05	-4.400	-4.400	0.000	(0)
	MnHCO3+	2.228e-07	1.757e-07	-6.652	-6.755	-0.103	(0)
	MnCl+	1.650e-07	1.301e-07	-6.782	-6.886	-0.103	(0)
	MnF+	1.357e-07	1.070e-07	-6.867	-6.970	-0.103	(0)
	MnOH+	5.873e-08	4.631e-08	-7.231	-7.334	-0.103	(0)
	MnCl2	7.557e-10	7.557e-10	-9.122	-9.122	0.000	(0)
	MnSeO4	1.261e-12	1.261e-12	-11.899	-11.899	0.000	(0)
	MnCl3-	1.085e-12	8.559e-13	-11.964	-12.068	-0.103	(0)
	MnNO3+	9.036e-13	6.331e-13	-12.044	-12.199	-0.155	(0)
	Mn (OH) 3-	1.953e-16	1.540e-16	-15.709	-15.812	-0.103	(0)
	Mn (NO3) 2	2.527e-20	2.527e-20	-19.597	-19.597	0.000	(0)
	Mn (OH) 4-2	9.432e-22	3.647e-22	-21.025	-21.438	-0.413	(0)
	MnSe	0.000e+00	0.000e+00	-40.725	-40.725	0.000	(0)
Mn (3)		7.958e-25					
	Mn+3	7.958e-25	9.119e-26	-24.099	-25.040	-0.941	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-40.069	-40.481	-0.413	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.825	-44.944	-0.119	(0)
Mo		5.051e-06					
	MoO4-2	5.050e-06	1.928e-06	-5.297	-5.715	-0.418	(0)
	HMoO4-	7.507e-10	5.260e-10	-9.125	-9.279	-0.155	(0)
	H2MoO4	5.281e-14	5.281e-14	-13.277	-13.277	0.000	(0)
	AlMo6O21-3	6.525e-40	0.000e+00	-39.185	-40.576	-1.391	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-44.354	-49.916	-5.562	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-47.529	-51.392	-3.863	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.001	-54.473	-2.472	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-57.699	-59.090	-1.391	(0)
N (-3)		3.522e-07					
	NH4+	3.137e-07	2.359e-07	-6.503	-6.627	-0.124	(0)
	NH4SO4-	2.855e-08	2.251e-08	-7.544	-7.648	-0.103	(0)
	NH3	9.813e-09	9.813e-09	-8.008	-8.008	0.000	(0)
	CaNH3+2	1.417e-10	3.415e-11	-9.849	-10.467	-0.618	(0)
	CuNH3+2	1.394e-11	3.360e-12	-10.856	-11.474	-0.618	(0)

Co (NH3) +2	5.020e-14	1.210e-14	-13.299	-13.917	-0.618	(0)
NiNH3+2	4.402e-14	1.061e-14	-13.356	-13.974	-0.618	(0)
BaNH3+2	3.021e-16	7.281e-17	-15.520	-16.138	-0.618	(0)
Hg (NH3) 2+2	9.695e-19	2.336e-19	-18.013	-18.631	-0.618	(0)
Ca (NH3) 2+2	5.536e-19	1.334e-19	-18.257	-18.875	-0.618	(0)
HgNH3+2	9.880e-20	2.381e-20	-19.005	-19.623	-0.618	(0)
Ni (NH3) 2+2	6.244e-20	1.505e-20	-19.205	-19.823	-0.618	(0)
Co (NH3) 2+2	2.101e-20	5.064e-21	-19.677	-20.295	-0.618	(0)
Hg (NH3) 3+2	3.787e-26	9.127e-27	-25.422	-26.040	-0.618	(0)
Co (NH3) 3+2	2.596e-27	6.256e-28	-26.586	-27.204	-0.618	(0)
Hg (NH3) 4+2	2.952e-33	7.114e-34	-32.530	-33.148	-0.618	(0)
Co (NH3) 4+2	1.337e-34	3.222e-35	-33.874	-34.492	-0.618	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.383	-41.001	-0.618	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.662	-42.280	-0.618	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.857	-50.247	-1.391	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.027	-49.645	-0.618	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.913	-51.531	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.953	-59.108	-0.155	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.299	-63.917	-0.618	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.751	-64.369	-0.618	(0)
N (3)	2.215e-05					
NO2-	2.215e-05	1.684e-05	-4.655	-4.774	-0.119	(0)
CuNO2+	8.423e-11	5.901e-11	-10.075	-10.229	-0.155	(0)
CoNO2+	1.737e-12	1.217e-12	-11.760	-11.915	-0.155	(0)
Cu (NO2) 2	1.017e-14	1.017e-14	-13.993	-13.993	0.000	(0)
N (5)	2.042e-08					
NO3-	2.022e-08	1.589e-08	-7.694	-7.799	-0.105	(0)
CaNO3+	1.983e-10	1.389e-10	-9.703	-9.857	-0.155	(0)
MnNO3+	9.036e-13	6.331e-13	-12.044	-12.199	-0.155	(0)
ZnNO3+	1.553e-13	1.088e-13	-12.809	-12.963	-0.155	(0)
CuNO3+	2.400e-15	1.681e-15	-14.620	-14.774	-0.155	(0)
BaNO3+	1.337e-15	9.367e-16	-14.874	-15.028	-0.155	(0)
CoNO3+	3.687e-16	2.583e-16	-15.433	-15.588	-0.155	(0)
CdNO3+	2.635e-16	1.846e-16	-15.579	-15.734	-0.155	(0)
NiNO3+	1.147e-16	8.036e-17	-15.940	-16.095	-0.155	(0)
PbNO3+	4.174e-17	2.924e-17	-16.379	-16.534	-0.155	(0)
Mn (NO3) 2	2.527e-20	2.527e-20	-19.597	-19.597	0.000	(0)
UO2NO3+	1.624e-20	1.138e-20	-19.789	-19.944	-0.155	(0)
Zn (NO3) 2	3.450e-22	3.450e-22	-21.462	-21.462	0.000	(0)
Co (NO3) 2	8.352e-24	8.352e-24	-23.078	-23.078	0.000	(0)
Cu (NO3) 2	3.364e-24	3.364e-24	-23.473	-23.473	0.000	(0)
CrNO3+2	1.827e-24	4.402e-25	-23.738	-24.356	-0.618	(0)
Cd (NO3) 2	1.471e-24	1.471e-24	-23.833	-23.833	0.000	(0)
Pb (NO3) 2	7.892e-25	7.892e-25	-24.103	-24.103	0.000	(0)
VO2NO3	1.966e-25	1.966e-25	-24.706	-24.706	0.000	(0)
FeNO3+2	2.648e-27	6.382e-28	-26.577	-27.195	-0.618	(0)
HgNO3+	3.221e-29	2.257e-29	-28.492	-28.647	-0.155	(0)
Hg (NO3) 2	1.490e-37	1.490e-37	-36.827	-36.827	0.000	(0)
Na	1.648e-02					
Na+	1.573e-02	1.237e-02	-1.803	-1.908	-0.105	(0)
NaSO4-	7.453e-04	5.913e-04	-3.128	-3.228	-0.100	(0)
NaHCO3	2.436e-06	2.436e-06	-5.613	-5.613	0.000	(0)
NaF	8.346e-07	8.346e-07	-6.079	-6.079	0.000	(0)
NaCO3-	3.477e-07	2.758e-07	-6.459	-6.559	-0.100	(0)
NaH2BO3	4.695e-08	4.695e-08	-7.328	-7.328	0.000	(0)
NaCrO4-	2.696e-16	1.889e-16	-15.569	-15.724	-0.155	(0)
Ni	9.133e-09					
Ni+2	5.273e-09	2.013e-09	-8.278	-8.696	-0.418	(0)
NiSO4	3.576e-09	3.576e-09	-8.447	-8.447	0.000	(0)
NiHCO3+	1.241e-10	8.693e-11	-9.906	-10.061	-0.155	(0)
NiCO3	8.996e-11	8.996e-11	-10.046	-10.046	0.000	(0)
NiCl+	3.023e-11	2.118e-11	-10.520	-10.674	-0.155	(0)
NiOH+	2.653e-11	1.859e-11	-10.576	-10.731	-0.155	(0)
NiF+	7.719e-12	5.408e-12	-11.112	-11.267	-0.155	(0)
Ni (SO4) 2-2	4.376e-12	1.054e-12	-11.359	-11.977	-0.618	(0)
Ni (OH) 2	1.083e-12	1.083e-12	-11.965	-11.965	0.000	(0)
NiNH3+2	4.402e-14	1.061e-14	-13.356	-13.974	-0.618	(0)
Ni (OH) 3-	1.134e-15	7.945e-16	-14.945	-15.100	-0.155	(0)

NiCl2	4.385e-16	4.385e-16	-15.358	-15.358	0.000	(0)
NiSeO4	1.755e-16	1.755e-16	-15.756	-15.756	0.000	(0)
NiNO3+	1.147e-16	8.036e-17	-15.940	-16.095	-0.155	(0)
Ni (NH3) 2+2	6.244e-20	1.505e-20	-19.205	-19.823	-0.618	(0)
O (0)	2.433e-35					
O2	1.217e-35	1.243e-35	-34.915	-34.906	0.009	(0)
Pb	1.850e-09					
PbSO4	5.426e-10	5.426e-10	-9.266	-9.266	0.000	(0)
PbCO3	4.480e-10	4.480e-10	-9.349	-9.349	0.000	(0)
PbOH+	3.272e-10	2.292e-10	-9.485	-9.640	-0.155	(0)
Pb+2	3.258e-10	1.244e-10	-9.487	-9.905	-0.418	(0)
Pb (SO4) 2-2	1.208e-10	2.911e-11	-9.918	-10.536	-0.618	(0)
PbHCO3+	4.621e-11	3.238e-11	-10.335	-10.490	-0.155	(0)
PbCl+	2.591e-11	1.815e-11	-10.587	-10.741	-0.155	(0)
Pb (CO3) 2-2	6.422e-12	1.548e-12	-11.192	-11.810	-0.618	(0)
Pb (OH) 2	5.317e-12	5.317e-12	-11.274	-11.274	0.000	(0)
PbF+	1.338e-12	9.377e-13	-11.873	-12.028	-0.155	(0)
PbCl2	3.334e-13	3.334e-13	-12.477	-12.477	0.000	(0)
Pb (OH) 3-	5.566e-15	3.900e-15	-14.254	-14.409	-0.155	(0)
PbF2	1.974e-15	1.974e-15	-14.705	-14.705	0.000	(0)
PbCl3-	7.789e-16	5.457e-16	-15.109	-15.263	-0.155	(0)
PbNO3+	4.174e-17	2.924e-17	-16.379	-16.534	-0.155	(0)
Pb2OH+3	1.111e-17	4.520e-19	-16.954	-18.345	-1.391	(0)
PbCl4-2	4.256e-18	1.026e-18	-17.371	-17.989	-0.618	(0)
Pb (OH) 4-2	2.907e-18	7.006e-19	-17.537	-18.155	-0.618	(0)
PbF3-	5.714e-19	4.004e-19	-18.243	-18.398	-0.155	(0)
Pb3 (OH) 4+2	2.912e-22	7.018e-23	-21.536	-22.154	-0.618	(0)
PbF4-2	8.505e-23	2.050e-23	-22.070	-22.688	-0.618	(0)
Pb (NO3) 2	7.892e-25	7.892e-25	-24.103	-24.103	0.000	(0)
Pb4 (OH) 4+4	2.056e-26	6.935e-29	-25.687	-28.159	-2.472	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.500	-151.500	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.477	-228.632	-0.155	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.278	-78.432	-0.155	(0)
CdHS+	0.000e+00	0.000e+00	-78.705	-78.859	-0.155	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.316	-79.934	-0.618	(0)
S6-2	0.000e+00	0.000e+00	-79.832	-80.450	-0.618	(0)
S4-2	0.000e+00	0.000e+00	-79.912	-80.530	-0.618	(0)
S3-2	0.000e+00	0.000e+00	-80.718	-81.336	-0.618	(0)
S2-2	0.000e+00	0.000e+00	-81.734	-82.352	-0.618	(0)
S-2	0.000e+00	0.000e+00	-87.457	-87.869	-0.413	(0)
HgHS2-	0.000e+00	0.000e+00	-137.334	-137.488	-0.155	(0)
HgS2-2	0.000e+00	0.000e+00	-137.715	-138.333	-0.618	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.957	-138.957	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.021	-147.444	-0.423	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.601	-147.756	-0.155	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.775	-148.174	-0.399	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.609	-149.609	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.087	-150.087	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.500	-151.500	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.719	-216.873	-0.155	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.607	-224.761	-0.155	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.260	-226.878	-0.618	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.465	-226.619	-0.155	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.477	-228.632	-0.155	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.429	-236.584	-0.155	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.238	-302.856	-0.618	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.035	-304.653	-0.618	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.225	-318.843	-0.618	(0)
S (6)	3.480e-02					
SO4-2	2.332e-02	8.904e-03	-1.632	-2.050	-0.418	(0)
CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
MgSO4	4.504e-03	4.504e-03	-2.346	-2.346	0.000	(0)
NaSO4-	7.453e-04	5.913e-04	-3.128	-3.228	-0.100	(0)
KSO4-	5.442e-04	4.317e-04	-3.264	-3.365	-0.100	(0)
MnSO4	3.980e-05	3.980e-05	-4.400	-4.400	0.000	(0)

ZnSO4	5.309e-06	5.309e-06	-5.275	-5.275	0.000	(0)
Zn (SO4) 2-2	1.709e-06	4.118e-07	-5.767	-6.385	-0.618	(0)
CuSO4	6.825e-08	6.825e-08	-7.166	-7.166	0.000	(0)
NH4SO4-	2.855e-08	2.251e-08	-7.544	-7.648	-0.103	(0)
CoSO4	1.822e-08	1.822e-08	-7.739	-7.739	0.000	(0)
HSO4-	1.525e-08	1.193e-08	-7.817	-7.923	-0.107	(0)
CdSO4	7.669e-09	7.669e-09	-8.115	-8.115	0.000	(0)
Cd (SO4) 2-2	3.822e-09	9.211e-10	-8.418	-9.036	-0.618	(0)
NiSO4	3.576e-09	3.576e-09	-8.447	-8.447	0.000	(0)
PbSO4	5.426e-10	5.426e-10	-9.266	-9.266	0.000	(0)
Pb (SO4) 2-2	1.208e-10	2.911e-11	-9.918	-10.536	-0.618	(0)
CrOHSO4	2.149e-11	2.149e-11	-10.668	-10.668	0.000	(0)
UO2SO4	4.838e-12	4.838e-12	-11.315	-11.315	0.000	(0)
Ni (SO4) 2-2	4.376e-12	1.054e-12	-11.359	-11.977	-0.618	(0)
UO2 (SO4) 2-2	2.356e-12	5.678e-13	-11.628	-12.246	-0.618	(0)
FeSO4	1.163e-12	1.163e-12	-11.934	-11.934	0.000	(0)
AlSO4+	6.970e-13	5.451e-13	-12.157	-12.263	-0.107	(0)
Al (SO4) 2-	6.650e-14	5.201e-14	-13.177	-13.284	-0.107	(0)
CrSO4+	1.881e-14	1.318e-14	-13.726	-13.880	-0.155	(0)
VO2SO4-	7.423e-18	5.201e-18	-17.129	-17.284	-0.155	(0)
FeSO4+	5.088e-19	4.012e-19	-18.293	-18.397	-0.103	(0)
Fe (SO4) 2-	1.090e-19	7.637e-20	-18.963	-19.117	-0.155	(0)
Cr2 (OH) 2SO4+2	8.196e-20	1.975e-20	-19.086	-19.704	-0.618	(0)
VOSO4	1.112e-20	1.112e-20	-19.954	-19.954	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.045e-20	1.045e-20	-19.981	-19.981	0.000	(0)
HgSO4	8.965e-21	8.965e-21	-20.047	-20.047	0.000	(0)
CrO3SO4-2	2.106e-23	5.076e-24	-22.676	-23.294	-0.618	(0)
VSO4+	3.130e-35	2.193e-35	-34.505	-34.659	-0.155	(0)
U (SO4) 2	7.945e-39	7.945e-39	-38.100	-38.100	0.000	(0)
USO4+2	4.661e-40	1.123e-40	-39.331	-39.949	-0.618	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.953	-59.108	-0.155	(0)
Sb (3)	8.051e-20					
Sb (OH) 3	4.071e-20	4.071e-20	-19.390	-19.390	0.000	(0)
HSbO2	3.979e-20	3.979e-20	-19.400	-19.400	0.000	(0)
SbO2-	6.710e-24	4.701e-24	-23.173	-23.328	-0.155	(0)
Sb (OH) 4-	3.835e-24	2.687e-24	-23.416	-23.571	-0.155	(0)
Sb (OH) 2F	9.337e-26	9.337e-26	-25.030	-25.030	0.000	(0)
SbOF	9.194e-26	9.194e-26	-25.037	-25.037	0.000	(0)
Sb (OH) 2+	1.937e-26	1.357e-26	-25.713	-25.867	-0.155	(0)
SbO+	6.686e-27	4.685e-27	-26.175	-26.329	-0.155	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.225	-318.843	-0.618	(0)
Sb (5)	6.235e-08					
SbO3-	6.229e-08	4.364e-08	-7.206	-7.360	-0.155	(0)
Sb (OH) 6-	6.468e-11	5.084e-11	-10.189	-10.294	-0.105	(0)
SbO2+	3.362e-24	2.356e-24	-23.473	-23.628	-0.155	(0)
Se (-2)	3.557e-39					
HSe-	3.557e-39	2.493e-39	-38.449	-38.603	-0.155	(0)
MnSe	0.000e+00	0.000e+00	-40.725	-40.725	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.576	-42.576	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.122	-45.740	-0.618	(0)
Se (4)	3.900e-07					
HSeO3-	2.115e-07	1.482e-07	-6.675	-6.829	-0.155	(0)
SeO3-2	1.785e-07	4.303e-08	-6.748	-7.366	-0.618	(0)
H2SeO3	8.665e-13	8.665e-13	-12.062	-12.062	0.000	(0)
Cd (SeO3) 2-2	2.326e-17	5.606e-18	-16.633	-17.251	-0.618	(0)
FeHSeO3+2	6.524e-24	1.572e-24	-23.185	-23.803	-0.618	(0)
Se (6)	4.895e-10					
SeO4-2	4.882e-10	1.864e-10	-9.311	-9.730	-0.418	(0)
MnSeO4	1.261e-12	1.261e-12	-11.899	-11.899	0.000	(0)
ZnSeO4	7.869e-14	7.869e-14	-13.104	-13.104	0.000	(0)
CoSeO4	9.581e-16	9.581e-16	-15.019	-15.019	0.000	(0)
HSeO4-	1.828e-16	1.281e-16	-15.738	-15.893	-0.155	(0)
NiSeO4	1.755e-16	1.755e-16	-15.756	-15.756	0.000	(0)
CdSeO4	1.275e-16	1.275e-16	-15.894	-15.894	0.000	(0)
Zn (SeO4) 2-2	6.171e-23	1.487e-23	-22.210	-22.828	-0.618	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.814	-58.205	-1.391	(0)
U (4)	7.041e-19					

U(OH) 5-	7.038e-19	4.931e-19	-18.153	-18.307	-0.155	(0)
U(OH) 4	2.835e-22	2.835e-22	-21.547	-21.547	0.000	(0)
U(OH) 3+	2.031e-26	1.423e-26	-25.692	-25.847	-0.155	(0)
U(OH) 2+2	3.748e-31	9.031e-32	-30.426	-31.044	-0.618	(0)
UF3+	2.203e-35	1.544e-35	-34.657	-34.811	-0.155	(0)
UF2+2	3.779e-36	9.106e-37	-35.423	-36.041	-0.618	(0)
UOH+3	1.435e-36	5.839e-38	-35.843	-37.234	-1.391	(0)
UF4	1.810e-37	1.810e-37	-36.742	-36.742	0.000	(0)
UF+3	1.662e-38	6.763e-40	-37.779	-39.170	-1.391	(0)
U(SO4) 2	7.945e-39	7.945e-39	-38.100	-38.100	0.000	(0)
UF5-	1.095e-39	7.673e-40	-38.961	-39.115	-0.155	(0)
USO4+2	4.661e-40	1.123e-40	-39.331	-39.949	-0.618	(0)
UF6-2	1.028e-40	0.000e+00	-39.988	-40.606	-0.618	(0)
U+4	0.000e+00	0.000e+00	-42.027	-44.499	-2.472	(0)
UC1+3	0.000e+00	0.000e+00	-43.795	-45.185	-1.391	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-153.699	-166.213	-12.515	(0)
U(5)	3.845e-15					
UO2+	3.845e-15	2.694e-15	-14.415	-14.570	-0.155	(0)
U(6)	8.997e-07					
UO2(CO3) 3-4	7.282e-07	2.456e-09	-6.138	-8.610	-2.472	(0)
UO2(CO3) 2-2	1.698e-07	4.091e-08	-6.770	-7.388	-0.618	(0)
UO2CO3	1.712e-09	1.712e-09	-8.767	-8.767	0.000	(0)
UO2OH+	4.731e-11	3.315e-11	-10.325	-10.480	-0.155	(0)
UO2F+	7.564e-12	5.300e-12	-11.121	-11.276	-0.155	(0)
UO2SO4	4.838e-12	4.838e-12	-11.315	-11.315	0.000	(0)
UO2(SO4) 2-2	2.356e-12	5.678e-13	-11.628	-12.246	-0.618	(0)
UO2F2	1.635e-12	1.635e-12	-11.787	-11.787	0.000	(0)
UO2+2	9.401e-13	3.590e-13	-12.027	-12.445	-0.418	(0)
UO2F3-	6.268e-14	4.392e-14	-13.203	-13.357	-0.155	(0)
(UO2) 3(OH) 5+	3.521e-14	2.467e-14	-13.453	-13.608	-0.155	(0)
(UO2) 2(OH) 2+2	7.566e-15	1.823e-15	-14.121	-14.739	-0.618	(0)
UO2C1+	3.416e-15	2.394e-15	-14.466	-14.621	-0.155	(0)
UO2F4-2	1.548e-16	3.731e-17	-15.810	-16.428	-0.618	(0)
UO2NO3+	1.624e-20	1.138e-20	-19.789	-19.944	-0.155	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.972	-43.127	-0.155	(0)
V+2	0.000e+00	0.000e+00	-43.884	-44.502	-0.618	(0)
V(3)	1.661e-15					
V(OH) 3	1.661e-15	1.661e-15	-14.780	-14.780	0.000	(0)
V(OH) 2+	2.102e-26	1.473e-26	-25.677	-25.832	-0.155	(0)
VOH+2	7.958e-30	1.918e-30	-29.099	-29.717	-0.618	(0)
V+3	1.282e-34	5.217e-36	-33.892	-35.283	-1.391	(0)
VSO4+	3.130e-35	2.193e-35	-34.505	-34.659	-0.155	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-55.707	-57.097	-1.391	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-56.162	-58.634	-2.472	(0)
V(4)	9.800e-19					
V(OH) 3+	9.458e-19	6.626e-19	-18.024	-18.179	-0.155	(0)
VO+2	1.881e-20	4.534e-21	-19.726	-20.344	-0.618	(0)
VOSO4	1.112e-20	1.112e-20	-19.954	-19.954	0.000	(0)
VOF+	4.151e-21	2.908e-21	-20.382	-20.536	-0.155	(0)
VOF2	1.166e-22	1.166e-22	-21.933	-21.933	0.000	(0)
VOC1+	7.464e-23	5.230e-23	-22.127	-22.282	-0.155	(0)
VOF3-	6.318e-25	4.427e-25	-24.199	-24.354	-0.155	(0)
VOF4-2	7.930e-28	1.911e-28	-27.101	-27.719	-0.618	(0)
H2V2O4+2	9.157e-32	2.207e-32	-31.038	-31.656	-0.618	(0)
V(5)	1.423e-08					
H2VO4-	9.286e-09	6.506e-09	-8.032	-8.187	-0.155	(0)
HVO4-2	4.947e-09	1.192e-09	-8.306	-8.924	-0.618	(0)
H3VO4	8.919e-13	8.919e-13	-12.050	-12.050	0.000	(0)
HV2O7-3	6.468e-14	2.632e-15	-13.189	-14.580	-1.391	(0)
H3V2O7-	5.355e-14	3.752e-14	-13.271	-13.426	-0.155	(0)
VO4-3	1.071e-14	4.358e-16	-13.970	-15.361	-1.391	(0)
V2O7-4	1.532e-15	5.167e-18	-14.815	-17.287	-2.472	(0)
VO2+	3.112e-17	2.446e-17	-16.507	-16.611	-0.105	(0)
VO2SO4-	7.423e-18	5.201e-18	-17.129	-17.284	-0.155	(0)
V3O9-3	7.116e-18	2.896e-19	-17.148	-18.538	-1.391	(0)
VO2F	4.589e-18	4.589e-18	-17.338	-17.338	0.000	(0)
VO2F2-	2.543e-19	1.782e-19	-18.595	-18.749	-0.155	(0)

VO2F3-2	9.865e-22	2.377e-22	-21.006	-21.624	-0.618	(0)
V4O12-4	2.332e-22	7.864e-25	-21.632	-24.104	-2.472	(0)
VO2F4-3	3.075e-25	1.251e-26	-24.512	-25.903	-1.391	(0)
VO2NO3	1.966e-25	1.966e-25	-24.706	-24.706	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-58.844	-64.406	-5.562	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.220	-64.082	-3.863	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.266	-66.738	-2.472	(0)
Zn	1.477e-05					
Zn+2	7.139e-06	2.726e-06	-5.146	-5.565	-0.418	(0)
ZnSO4	5.309e-06	5.309e-06	-5.275	-5.275	0.000	(0)
Zn(SO4) 2-2	1.709e-06	4.118e-07	-5.767	-6.385	-0.618	(0)
ZnOH+	2.853e-07	1.999e-07	-6.545	-6.699	-0.155	(0)
ZnCO3	1.879e-07	1.879e-07	-6.726	-6.726	0.000	(0)
ZnHCO3+	4.309e-08	3.019e-08	-7.366	-7.520	-0.155	(0)
ZnCl+	3.631e-08	2.815e-08	-7.440	-7.550	-0.111	(0)
ZnOHCl	2.703e-08	2.703e-08	-7.568	-7.568	0.000	(0)
Zn(OH) 2	2.324e-08	2.324e-08	-7.634	-7.634	0.000	(0)
ZnF+	8.302e-09	5.817e-09	-8.081	-8.235	-0.155	(0)
ZnCl2	1.835e-10	1.835e-10	-9.736	-9.736	0.000	(0)
Zn(OH) 3-	1.220e-10	8.545e-11	-9.914	-10.068	-0.155	(0)
ZnCl3-	7.728e-13	5.992e-13	-12.112	-12.222	-0.111	(0)
ZnNO3+	1.553e-13	1.088e-13	-12.809	-12.963	-0.155	(0)
ZnSeO4	7.869e-14	7.869e-14	-13.104	-13.104	0.000	(0)
Zn(OH) 4-2	1.035e-14	2.495e-15	-13.985	-14.603	-0.618	(0)
ZnCl4-2	3.186e-15	1.232e-15	-14.497	-14.909	-0.413	(0)
Zn(NO3) 2	3.450e-22	3.450e-22	-21.462	-21.462	0.000	(0)
Zn(SeO4) 2-2	6.171e-23	1.487e-23	-22.210	-22.828	-0.618	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.601	-147.756	-0.155	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.609	-149.609	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.607	-224.761	-0.155	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.260	-226.878	-0.618	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.035	-304.653	-0.618	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.57	-47.28	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-40.97	-36.46	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.19	-36.46	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.40	-51.46	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.25	-35.22	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.17	-27.77	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.43	-22.98	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.32	9.48	10.80	Al(OH)3
Al2(MoO4)3	-47.72	-45.35	2.37	Al2(MoO4)3
Al2O3	-0.68	18.97	19.65	Al2O3
Al4(OH)10SO4	-2.54	20.16	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.49	-6.69	4.80	AlAsO4:2H2O
AlOHSO4	-5.06	-8.29	-3.23	AlOHSO4
AlSb	-152.16	-86.54	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.17	-11.96	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.53	-91.29	-2.76	As4O6
Artinite	-4.91	4.69	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.06	-32.35	6.71	As2O5
Atacamite	-1.14	6.25	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.60	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.78	-1.91	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.06	-8.97	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-27.05	5.89	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.77	-22.44	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2

BaMoO4	-6.68	-13.64	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.73	-6.90	1.83	BaSeO3
BaSeO4	-10.20	-17.66	-7.46	BaSeO4
Bianchite	-5.85	-7.62	-1.76	ZnSO4:6H2O
Birnessite	-6.77	11.32	18.09	MnO2
Bixbyite	-2.26	-2.90	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.91	9.48	8.58	AlOOH
Breithauptite	-57.70	-76.22	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.68	13.17	16.84	Mg(OH)2
Bunsenite	-5.42	7.03	12.45	NiO
Ca(VO3)2	-9.99	-4.33	5.66	Ca(VO3)2
Ca2V2O7	-8.66	8.84	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.72	8.84	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.15	7.15	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.96	22.00	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.86	22.00	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.52	-152.55	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-6.71	-24.62	-17.91	Hg2Cl2
CaMoO4	-0.32	-8.27	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.34	-1.53	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.27	-12.29	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.04	-1.20	9.84	Cd(BO2)2
Cd(OH)2	-6.35	7.29	13.64	Cd(OH)2
Cd(OH)2(am)	-6.44	7.29	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.39	-13.68	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.47	4.09	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.02	11.38	28.40	Cd4(OH)6SO4
CdCl2	-12.55	-13.21	-0.66	CdCl2
CdCl2:1H2O	-11.51	-13.21	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.30	-13.21	-1.91	CdCl2:2.5H2O
CdF2	-15.16	-16.38	-1.21	CdF2
Cdmetal(alpha)	-31.77	-18.25	13.51	Cd
Cdmetal(gamma)	-31.87	-18.25	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.50	-2.96	3.54	CdOHCl
CdSb	-75.61	-75.96	-0.35	CdSb
CdSe	-18.98	-39.18	-20.20	CdSe
CdSeO4:2H2O	-16.32	-18.17	-1.85	CdSeO4:2H2O
CdSO4	-10.31	-10.49	-0.17	CdSO4
CdSO4:1H2O	-8.76	-10.49	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.61	-10.49	-1.87	CdSO4:2.67H2O
Cerrusite	-2.70	-15.83	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.48	-97.18	-45.69	HgS
Claudetite	-88.23	-91.29	-3.06	As4O6
Clausthalite	-13.55	-40.65	-27.10	PbSe
Co(BO2)2	-27.83	-0.76	27.07	Co(BO2)2
Co(OH)2	-5.36	7.74	13.09	Co(OH)2
Co(OH)3	-9.58	-11.89	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-22.18	-9.14	13.03	Co3(AsO4)2
Co3O4	-5.55	-16.05	-10.50	Co3O4
CoCl2	-21.03	-12.76	8.27	CoCl2
CoCl2:6H2O	-15.30	-12.76	2.54	CoCl2:6H2O
CoCO3	-3.93	-13.91	-9.98	CoCO3
CoF2	-14.33	-15.93	-1.60	CoF2
CoF3	-45.93	-47.39	-1.46	CoF3

CoFe2O4	17.65	14.12	-3.53	CoFe2O4
CoMoO4	-5.94	-13.70	-7.76	CoMoO4
CoO	-5.85	7.74	13.59	CoO
CoS (alpha)	-71.12	-78.56	-7.44	CoS
CoS (beta)	-67.49	-78.56	-11.07	CoS
CoSe	-22.53	-38.73	-16.20	CoSe
CoSeO3	-8.28	-6.96	1.32	CoSeO3
CoSeO4:6H2O	-16.19	-17.72	-1.53	CoSeO4:6H2O
CoSO4	-12.84	-10.04	2.80	CoSO4
CoSO4:6H2O	-7.57	-10.04	-2.47	CoSO4:6H2O
Cotunnite	-9.90	-14.68	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.59	-31.50	14.09	CrCl2
CrCl3	-47.04	-31.92	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.81	-43.65	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.65	20.56	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.41	0.84	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.73	-89.61	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.33	-50.13	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.70	-7.60	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-24.86	-88.35	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.11	-13.19	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.12	-38.22	-33.10	CuSe
CuSe2	-25.77	-59.14	-33.37	CuSe2
CuSeO3:2H2O	-6.95	-6.44	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.77	-17.21	-2.44	CuSeO4:5H2O
CuSO4	-12.47	-9.53	2.94	CuSO4
Diaspore	2.61	9.48	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.42	-16.96	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.13	-16.96	-17.09	CaMg (CO3) 2
Epsomite	-2.48	-4.61	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.16	0.12	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-10.33	-14.05	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.86	-8.31	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.07	-37.69	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.39	-12.99	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.90	-17.99	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.34	-63.94	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-32.01	-43.01	-11.00	FeSe
Fix_pe	-4.91	-4.91	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2

Galena	-66.50	-80.47	-13.97	PbS
Gibbsite	1.19	9.48	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.61	-7.62	-2.01	ZnSO4:7H2O
Greenockite	-64.64	-79.00	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.39	3.28	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.56	-21.44	-12.88	H2MoO4
H2S (g)	-78.29	-86.30	-8.01	H2S
H2Se (g)	-41.51	-46.47	-4.96	H2Se
Halite	-5.90	-4.29	1.60	NaCl
Hausmannite	-2.11	58.92	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.47	22.42	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.83	-258.54	-73.71	Hg (CH3) 2
Hg (g)	-6.96	-14.84	-7.87	Hg
Hg (OH) 2	-7.39	-10.88	-3.50	Hg (OH) 2
Hg2 (g)	-14.72	-29.67	-14.96	Hg2
Hg2 (OH) 2	-9.39	-4.13	5.26	Hg2 (OH) 2
Hg2CO3	-9.72	-25.77	-16.05	Hg2CO3
Hg2CrO4	-25.66	-34.36	-8.70	Hg2CrO4
Hg2F2	-17.43	-27.79	-10.36	Hg2F2
Hg2S	-78.75	-90.42	-11.68	Hg2S
Hg2SeO3	-14.16	-18.82	-4.66	Hg2SeO3
Hg2SO4	-15.77	-21.90	-6.13	Hg2SO4
Hg3O2CO3	-24.62	-54.30	-29.68	Hg3O2CO3
HgCl (g)	-31.81	-12.31	19.50	HgCl
HgCl2	-10.12	-31.38	-21.26	HgCl2
HgF (g)	-46.57	-13.90	32.68	HgF
HgF2 (g)	-47.12	-34.55	12.57	HgF2
Hgmetal (l)	-1.38	-14.84	-13.45	Hg
HgSe	-1.66	-57.35	-55.69	HgSe
HgSeO3	-13.15	-25.58	-12.43	HgSeO3
HgSO4	-19.24	-28.66	-9.42	HgSO4
Huntite	-3.94	-33.91	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.06	-25.83	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.98	-20.74	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.21	-20.38	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.48	-20.28	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.84	-49.08	-17.24	K2Cr2O7
K2CrO4	-18.33	-18.84	-0.51	K2CrO4
K2MoO4	-13.31	-10.04	3.26	K2MoO4
K2SeO4	-13.33	-14.06	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.70	-6.14	-0.43	PbO:PbSO4
Laurionite	-5.05	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.87	5.82	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.69	19.55	16.86	Fe2MgO4
Magnesite	-1.02	-8.48	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.44	23.90	25.34	MnOOH
Massicot	-7.07	5.82	12.89	PbO
Matlockite	-7.29	-16.26	-8.97	PbClF
Melanothallite	-18.50	-12.25	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-52.08	-97.18	-45.09	HgS
Mg (OH) 2 (active)	-5.63	13.17	18.79	Mg (OH) 2
Mg (VO3) 2	-15.61	-4.33	11.28	Mg (VO3) 2
Mg2Sb3	-272.55	-197.87	74.68	Mg2Sb3
Mg2V2O7	-17.52	8.84	26.36	Mg2V2O7
MgCr2O4	-5.39	10.81	16.20	MgCr2O4

MgCrO4	-22.45	-17.07	5.38	MgCrO4
MgF2	-2.37	-10.50	-8.13	MgF2
MgMoO4	-6.42	-8.27	-1.85	MgMoO4
MgSeO3:6H2O	-4.58	-1.53	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.09	-12.29	-1.20	MgSeO4:6H2O
Minium	-30.52	43.01	73.52	Pb3O4
Mirabilite	-4.76	-5.87	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.27	-6.37	4.90	Mn(VO3)2
Mn2(SO4)3	-50.52	-56.23	-5.71	Mn2(SO4)3
Mn2Sb	-147.62	-86.54	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.48	1.02	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.09	-9.37	2.72	MnCl2:4H2O
MnS(grn)	-75.34	-75.17	0.17	MnS
MnS(pnk)	-78.51	-75.17	3.34	MnS
MnSb	-94.57	-97.48	-2.91	MnSb
MnSe	-38.84	-35.34	3.50	MnSe
MnSeO3	-4.70	-3.57	1.13	MnSeO3
MnSeO3:2H2O	-4.55	-3.57	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.28	-14.33	-2.05	MnSeO4:5H2O
MnSO4	-9.23	-6.65	2.58	MnSO4
Monteponite	-7.81	7.29	15.10	CdO
Montroydite	-7.24	-10.88	-3.64	HgO
MoO3	-13.44	-21.44	-8.00	MoO3
Morenosite	-8.61	-10.75	-2.14	NiSO4:7H2O
MoS2	-149.31	-219.57	-70.26	MoS2
Na-Jarosite	-8.82	-20.02	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.67	-48.57	-9.90	Na2Cr2O7
Na2CrO4	-21.26	-18.33	2.93	Na2CrO4
Na2Mo2O7	-14.37	-30.97	-16.60	Na2Mo2O7
Na2MoO4	-11.02	-9.53	1.49	Na2MoO4
Na2MoO4:2H2O	-10.76	-9.53	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.08	-2.78	10.30	Na2SeO3:5H2O
Na2SeO4	-14.83	-13.55	1.28	Na2SeO4
Na3Sb	-172.61	-78.16	94.45	Na3Sb
Na3VO4	-27.57	9.12	36.68	Na3VO4
Na4V2O7	-31.08	6.32	37.40	Na4V2O7
Nantokite	-5.35	-12.08	-6.73	CuCl
NaSb	-87.69	-64.52	23.17	NaSb
Natron	-8.43	-9.74	-1.31	Na2CO3:10H2O
NaVO3	-6.65	-2.79	3.86	NaVO3
Nesquehonite	-3.81	-8.48	-4.67	MgCO3:3H2O
Ni(OH)2	-5.77	7.03	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-26.97	-11.27	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-21.66	10.34	32.00	Ni4(OH)6SO4
NiCO3	-7.75	-14.62	-6.87	NiCO3
NiMoO4	-3.27	-14.41	-11.14	NiMoO4
NiS(alpha)	-73.67	-79.27	-5.60	NiS
NiS(beta)	-68.17	-79.27	-11.10	NiS
NiS(gamma)	-66.47	-79.27	-12.80	NiS
NiSe	-21.74	-39.44	-17.70	NiSe
NiSeO3:2H2O	-10.48	-7.66	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.91	-18.43	-1.52	NiSeO4:6H2O
Nsutite	-6.18	11.32	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.46	-304.53	-61.07	As2S3
Otavite	-2.36	-14.36	-12.00	CdCO3
Pb(BO2)2	-9.19	-2.67	6.52	Pb(BO2)2
Pb(OH)2	-2.33	5.82	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.92	-71.68	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.40	1.39	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.55	11.64	26.19	Pb2O(OH)2
Pb2O3	-23.85	37.19	61.04	Pb2O3
Pb2OCO3	-9.45	-10.01	-0.56	Pb2OCO3
Pb2V2O7	-3.96	-5.86	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.69	-14.89	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.18	-0.04	6.14	Pb3(VO4)2
Pb3O2CO3	-15.21	-4.19	11.02	Pb3O2CO3
Pb3O2SO4	-11.00	-0.32	10.69	Pb3O2SO4

Pb4(OH)6SO4	-15.60	5.50	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.37	5.51	21.88	Pb4O3SO4
PbCrO4	-11.82	-24.42	-12.60	PbCrO4
PbF2	-10.41	-17.85	-7.44	PbF2
Pbmetal	-23.97	-19.72	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.16	5.82	12.98	PbO:0.33H2O
PbSeO4	-12.79	-19.63	-6.84	PbSeO4
Periclase	-8.41	13.17	21.58	MgO
Phosgenite	-10.69	-30.50	-19.81	PbCl2:PbCO3
Plattnerite	-18.24	31.36	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-4.07	11.13	15.19	Mn(OH)2
Pyrolusite	-4.71	36.67	41.38	MnO2
Realgar	-102.14	-121.89	-19.75	AsS
Retgersite	-8.71	-10.75	-2.04	NiSO4:6H2O
Rhodochrosite	0.06	-10.52	-10.58	MnCO3
Rutherfordine	-3.87	-18.37	-14.50	UO2CO3
Sb(OH)3	-12.28	-19.39	-7.11	Sb(OH)3
Sb2O4	-16.64	-13.23	3.40	Sb2O4
Sb2O5	-26.64	-36.31	-9.67	Sb2O5
Sb2Se3	-110.42	-178.18	-67.76	Sb2Se3
Sb4O6(cubic)	-59.30	-77.56	-18.26	Sb4O6
Sb4O6(orth)	-59.66	-77.56	-17.90	Sb4O6
SbCl3	-50.71	-50.14	0.57	SbCl3
SbF3	-44.66	-54.89	-10.23	SbF3
Sbmetal	-46.02	-57.71	-11.69	Sb
SbO2	-3.10	-30.93	-27.82	SbO2
Schoepite	-2.71	3.28	5.99	UO2(OH)2:H2O
Semetal(am)	-13.81	-20.92	-7.11	Se
Semetal(hex)	-13.21	-20.92	-7.71	Se
Senarmontite	-26.41	-38.78	-12.37	Sb2O3
SeO2	-14.82	-14.69	0.12	SeO2
SeO3	-46.50	-25.45	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.49	-11.49	-10.00	ZnCO3
Sphalerite	-64.68	-76.13	-11.45	ZnS
Spinel	-4.71	32.14	36.85	MgAl2O4
Stibnite	-247.20	-297.66	-50.46	Sb2S3
Sulfur	-58.61	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.19	-5.87	0.32	Na2SO4
Thermonatrite	-10.37	-9.74	0.64	Na2CO3:H2O
Tyuyamunite	-1.85	2.23	4.08	Ca(UO2)2(VO4)2
U3O8	-9.14	11.94	21.08	U3O8
U3Sb4	-575.62	-423.24	152.38	U3Sb4
U4O9	-23.63	-26.65	-3.02	U4O9
UF4	-30.85	-60.38	-29.54	UF4
UF4:2.5H2O	-27.67	-60.38	-32.72	UF4:2.5H2O
UO2(am)	-13.98	-13.05	0.93	UO2
UO2(NO3)2	-40.19	-28.04	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-32.89	-28.04	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-31.43	-28.04	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-30.09	-28.05	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.33	3.28	5.61	UO2(OH)2
UO2SeO4:4H2O	-19.93	-22.18	-2.25	UO2SeO4:4H2O
UO3	-4.42	3.28	7.70	UO3
Uraninite	-8.38	-13.05	-4.67	UO2
USb2	-218.34	-188.77	29.58	USb2
V(OH)3	-19.29	-11.70	7.59	V(OH)3
V2O5	-16.14	-17.50	-1.36	V2O5
V3O5	-41.24	-39.40	1.84	V3O5
V4O7	-51.20	-44.02	7.19	V4O7
V6O13	-42.72	-103.58	-60.86	V6O13
Valentinite	-30.30	-38.78	-8.48	Sb2O3
VC12	-63.84	-44.96	18.87	VC12
VC13	-65.87	-42.44	23.43	VC13

VF4	-66.88	-51.95	14.93	VF4
Vmetal	-94.04	-50.01	44.03	V
VO	-39.22	-24.47	14.76	VO
VO(OH)2	-9.77	-4.62	5.15	VO(OH)2
VO2Cl	-21.84	-19.00	2.84	VO2Cl
VOC1	-33.10	-21.94	11.15	VOC1
VOC12	-37.88	-25.12	12.76	VOC12
VOSO4	-26.00	-22.39	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.18	-76.13	-8.95	ZnS
Zincite	-1.17	10.16	11.33	ZnO
Zincosite	-11.54	-7.61	3.93	ZnSO4
Zn(BO2)2	-6.62	1.67	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.48	-21.17	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.04	10.16	12.20	Zn(OH)2
Zn(OH)2(am)	-2.31	10.16	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.59	10.16	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.37	10.16	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.57	10.16	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.95	2.55	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.12	10.07	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.52	-1.87	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.98	-5.07	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.53	22.87	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.20	30.30	38.50	Zn5(OH)8Cl2
ZnCl2	-17.39	-10.34	7.05	ZnCl2
ZnCO3:1H2O	-1.23	-11.49	-10.26	ZnCO3:1H2O
ZnF2	-12.97	-13.51	-0.53	ZnF2
Znmetal	-41.17	-15.38	25.79	Zn
ZnMoO4	-1.15	-11.28	-10.13	ZnMoO4
ZnO(active)	-1.03	10.16	11.19	ZnO
ZnS(am)	-67.08	-76.13	-9.05	ZnS
ZnSb	-84.10	-73.09	11.01	ZnSb
ZnSe	-21.90	-36.30	-14.40	ZnSe
ZnSeO4:6H2O	-13.78	-15.30	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.98	-7.62	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 76.

```

Title Stage 4 Pit lake Mix
Mix 403
404 0.301948
408 0.187454
1 0.046162
17 0.105486
16 0.000000
315 0.358949
Save solution 409
end

```

TITLE

Stage 4 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 403.

Mixture 403.

4.616e-02 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1 and PW-3 (representative of water used to rapidly re-fill pit)

1.055e-01 Solution 17 Average water quality for Background Surface Water SWQ-1 (representative of haul road and watershed run-off)

3.589e-01 Solution 315 Solution after simulation 66.

3.019e-01 Solution 404 Solution after simulation 71.

1.875e-01 Solution 408 Solution after simulation 75.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.837e-08	1.837e-08
Al	3.396e-06	3.397e-06
As	2.563e-10	2.564e-10
B	2.610e-05	2.611e-05
Ba	7.016e-08	7.019e-08
C	2.889e-03	2.890e-03
Ca	4.684e-03	4.686e-03
Cd	1.230e-08	1.231e-08
Cl	2.513e-03	2.514e-03
Co	8.703e-08	8.707e-08
Cr	2.476e-09	2.477e-09
Cu	1.753e-06	1.754e-06
F	1.646e-04	1.647e-04
Fe	1.589e-09	1.590e-09
Hg	1.765e-09	1.766e-09
K	3.106e-03	3.107e-03
Mg	4.599e-03	4.602e-03
Mn	5.394e-05	5.397e-05
Mo	1.742e-06	1.743e-06
N	8.505e-06	8.509e-06
Na	8.199e-03	8.203e-03
Ni	1.087e-07	1.087e-07
Pb	4.384e-09	4.386e-09
S	1.230e-02	1.230e-02
Sb	2.456e-08	2.457e-08
Se	1.242e-07	1.243e-07
U	3.134e-07	3.135e-07
V	5.288e-09	5.291e-09
Zn	5.051e-06	5.053e-06

-----Description of solution-----

	pH	=	7.381	Charge balance
	pe	=	5.485	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	3.947e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.719e-03	
	Total CO2 (mol/kg)	=	2.889e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.007e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	8	
	Total H	=	1.110683e+02	
	Total O	=	5.559059e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.923e-07	2.417e-07	-6.534	-6.617	-0.082	(0)
H+	4.988e-08	4.163e-08	-7.302	-7.381	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.837e-08					
AgCl	1.194e-08	1.194e-08	-7.923	-7.923	0.000	(0)
Ag+	3.341e-09	2.788e-09	-8.476	-8.555	-0.078	(0)
AgCl2-	2.755e-09	2.182e-09	-8.560	-8.661	-0.101	(0)
AgSO4-	3.134e-10	2.482e-10	-9.504	-9.605	-0.101	(0)
AgCl3-2	1.037e-11	4.079e-12	-10.984	-11.389	-0.405	(0)
AgNO2	3.921e-12	3.921e-12	-11.407	-11.407	0.000	(0)
AgF	8.030e-13	8.030e-13	-12.095	-12.095	0.000	(0)
AgCl4-3	1.426e-13	1.747e-14	-12.846	-13.758	-0.912	(0)
AgOH	6.740e-14	6.740e-14	-13.171	-13.171	0.000	(0)
AgNH3+	2.372e-14	1.878e-14	-13.625	-13.726	-0.101	(0)
AgSeO3-	1.783e-14	1.412e-14	-13.749	-13.850	-0.101	(0)
AgH2BO3	1.592e-14	1.592e-14	-13.798	-13.798	0.000	(0)
Ag2Se	5.840e-15	5.840e-15	-14.234	-14.234	0.000	(0)
Ag (NO2) 2-	5.163e-17	4.088e-17	-16.287	-16.388	-0.101	(0)
AgNO3	2.158e-17	2.158e-17	-16.666	-16.666	0.000	(0)
Ag (OH) 2-	2.011e-18	1.592e-18	-17.697	-17.798	-0.101	(0)
Ag (NH3) 2+	6.360e-19	5.037e-19	-18.197	-18.298	-0.101	(0)
Ag (SeO3) 2-3	8.134e-21	9.963e-22	-20.090	-21.002	-0.912	(0)
Ag2MoO4	2.487e-24	2.487e-24	-23.604	-23.604	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.734	-73.734	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.133	-85.754	-1.621	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.526	-148.730	-0.205	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.526	-148.627	-0.101	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.415	-150.790	-0.374	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.745	-151.101	-0.355	(0)
Al	3.396e-06					
Al (OH) 4-	3.228e-06	2.695e-06	-5.491	-5.569	-0.078	(0)
Al (OH) 3	8.855e-08	8.855e-08	-7.053	-7.053	0.000	(0)
AlF3	2.987e-08	2.987e-08	-7.525	-7.525	0.000	(0)
AlF2+	2.460e-08	2.070e-08	-7.609	-7.684	-0.075	(0)
Al (OH) 2+	2.182e-08	1.836e-08	-7.661	-7.736	-0.075	(0)
AlF4-	2.056e-09	1.717e-09	-8.687	-8.765	-0.078	(0)
AlF+2	9.042e-10	4.535e-10	-9.044	-9.343	-0.300	(0)
AlOH+2	1.906e-10	9.562e-11	-9.720	-10.019	-0.300	(0)
AlSO4+	1.640e-11	1.370e-11	-10.785	-10.863	-0.078	(0)
Al+3	2.012e-12	3.955e-13	-11.696	-12.403	-0.706	(0)
Al (SO4) 2-	7.840e-13	6.547e-13	-12.106	-12.184	-0.078	(0)
AlMo6O21-3	6.022e-38	7.376e-39	-37.220	-38.132	-0.912	(0)
As (3)	3.477e-23					
H3AsO3	3.424e-23	3.424e-23	-22.465	-22.465	0.000	(0)
H2AsO3-	5.326e-25	4.218e-25	-24.274	-24.375	-0.101	(0)
HAsO3-2	2.350e-29	9.241e-30	-28.629	-29.034	-0.405	(0)
H4AsO3+	8.917e-31	7.062e-31	-30.050	-30.151	-0.101	(0)
AsO3-3	6.986e-35	8.557e-36	-34.156	-35.068	-0.912	(0)
As (5)	2.563e-10					
HAsO4-2	2.156e-10	8.479e-11	-9.666	-10.072	-0.405	(0)
H2AsO4-	4.065e-11	3.219e-11	-10.391	-10.492	-0.101	(0)
AsO4-3	5.258e-14	6.441e-15	-13.279	-14.191	-0.912	(0)
H3AsO4	2.308e-16	2.329e-16	-15.637	-15.633	0.004	(0)
B	2.610e-05					
H3BO3	2.559e-05	2.583e-05	-4.592	-4.588	0.004	(0)
H2BO3-	4.403e-07	3.603e-07	-6.356	-6.443	-0.087	(0)
CaH2BO3+	3.786e-08	3.098e-08	-7.422	-7.509	-0.087	(0)
MgH2BO3+	2.408e-08	1.970e-08	-7.618	-7.705	-0.087	(0)
NaH2BO3	3.813e-09	3.813e-09	-8.419	-8.419	0.000	(0)
BF (OH) 3-	1.444e-09	1.182e-09	-8.840	-8.928	-0.087	(0)
H5 (BO3) 2-	9.679e-12	7.920e-12	-11.014	-11.101	-0.087	(0)
BF2 (OH) 2-	7.372e-13	6.032e-13	-12.132	-12.220	-0.087	(0)
BaH2BO3+	4.577e-13	3.745e-13	-12.339	-12.427	-0.087	(0)

	H8 (BO3) 3-	2.500e-14	2.046e-14	-13.602	-13.689	-0.087	(0)
	AgH2BO3	1.592e-14	1.592e-14	-13.798	-13.798	0.000	(0)
	BF3OH-	1.370e-18	1.121e-18	-17.863	-17.951	-0.087	(0)
	BF4-	3.218e-23	2.633e-23	-22.492	-22.579	-0.087	(0)
Ba	7.016e-08						
	Ba+2	6.930e-08	3.363e-08	-7.159	-7.473	-0.314	(0)
	BaHCO3+	8.152e-10	6.894e-10	-9.089	-9.162	-0.073	(0)
	BaCO3	4.169e-11	4.169e-11	-10.380	-10.380	0.000	(0)
	BaH2BO3+	4.577e-13	3.745e-13	-12.339	-12.427	-0.087	(0)
	BaOH+	4.232e-14	3.549e-14	-13.373	-13.450	-0.076	(0)
	BaNO3+	2.074e-15	1.642e-15	-14.683	-14.785	-0.101	(0)
	BaNH3+2	1.780e-16	7.001e-17	-15.750	-16.155	-0.405	(0)
C (4)	2.889e-03						
	HCO3-	2.550e-03	2.146e-03	-2.593	-2.668	-0.075	(0)
	H2CO3	2.009e-04	2.009e-04	-3.697	-3.697	0.000	(0)
	CaHCO3+	7.060e-05	5.970e-05	-4.151	-4.224	-0.073	(0)
	MgHCO3+	4.168e-05	3.464e-05	-4.380	-4.460	-0.080	(0)
	NaHCO3	8.058e-06	8.058e-06	-5.094	-5.094	0.000	(0)
	CaCO3	5.723e-06	5.723e-06	-5.242	-5.242	0.000	(0)
	CO3-2	4.980e-06	2.417e-06	-5.303	-5.617	-0.314	(0)
	MgCO3	3.171e-06	3.171e-06	-5.499	-5.499	0.000	(0)
	CuCO3	1.334e-06	1.334e-06	-5.875	-5.875	0.000	(0)
	MnHCO3+	8.109e-07	6.801e-07	-6.091	-6.167	-0.076	(0)
	NaCO3-	3.571e-07	3.005e-07	-6.447	-6.522	-0.075	(0)
	UO2 (CO3) 3-4	2.080e-07	4.977e-09	-6.682	-8.303	-1.621	(0)
	ZnCO3	2.066e-07	2.066e-07	-6.685	-6.685	0.000	(0)
	ZnHCO3+	1.273e-07	1.008e-07	-6.895	-6.996	-0.101	(0)
	UO2 (CO3) 2-2	1.045e-07	4.109e-08	-6.981	-7.386	-0.405	(0)
	Cu (CO3) 2-2	2.206e-08	8.675e-09	-7.656	-8.062	-0.405	(0)
	CuHCO3+	1.602e-08	1.269e-08	-7.795	-7.897	-0.101	(0)
	NiHCO3+	1.071e-08	8.482e-09	-7.970	-8.072	-0.101	(0)
	CoHCO3+	4.953e-09	3.922e-09	-8.305	-8.406	-0.101	(0)
	NiCO3	2.891e-09	2.891e-09	-8.539	-8.539	0.000	(0)
	PbCO3	2.170e-09	2.170e-09	-8.664	-8.664	0.000	(0)
	CoCO3	9.599e-10	9.599e-10	-9.018	-9.018	0.000	(0)
	UO2CO3	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
	BaHCO3+	8.152e-10	6.894e-10	-9.089	-9.162	-0.073	(0)
	PbHCO3+	6.015e-10	4.763e-10	-9.221	-9.322	-0.101	(0)
	CdCO3	1.888e-10	1.888e-10	-9.724	-9.724	0.000	(0)
	BaCO3	4.169e-11	4.169e-11	-10.380	-10.380	0.000	(0)
	Pb (CO3) 2-2	3.846e-11	1.513e-11	-10.415	-10.820	-0.405	(0)
	CdHCO3+	2.115e-11	1.675e-11	-10.675	-10.776	-0.101	(0)
	Cd (CO3) 2-2	8.603e-13	3.383e-13	-12.065	-12.471	-0.405	(0)
	FeHCO3+	8.329e-14	7.043e-14	-13.079	-13.152	-0.073	(0)
	HgCO3	5.071e-14	5.071e-14	-13.295	-13.295	0.000	(0)
	Hg (CO3) 2-2	9.854e-16	3.875e-16	-15.006	-15.412	-0.405	(0)
	HgHCO3+	4.964e-17	3.931e-17	-16.304	-16.406	-0.101	(0)
Ca	4.684e-03						
	Ca+2	3.078e-03	1.494e-03	-2.512	-2.826	-0.314	(0)
	CaSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
	CaHCO3+	7.060e-05	5.970e-05	-4.151	-4.224	-0.073	(0)
	CaCO3	5.723e-06	5.723e-06	-5.242	-5.242	0.000	(0)
	CaF+	2.229e-06	1.869e-06	-5.652	-5.728	-0.076	(0)
	CaH2BO3+	3.786e-08	3.098e-08	-7.422	-7.509	-0.087	(0)
	CaOH+	8.521e-09	7.206e-09	-8.069	-8.142	-0.073	(0)
	CaNO3+	5.813e-11	4.603e-11	-10.236	-10.337	-0.101	(0)
	CaNH3+2	1.578e-11	6.205e-12	-10.802	-11.207	-0.405	(0)
	Ca (NH3) 2+2	2.072e-20	8.150e-21	-19.684	-20.089	-0.405	(0)
Cd	1.230e-08						
	Cd+2	7.063e-09	3.428e-09	-8.151	-8.465	-0.314	(0)
	CdSO4	3.585e-09	3.585e-09	-8.446	-8.446	0.000	(0)
	CdCl+	8.671e-10	6.867e-10	-9.062	-9.163	-0.101	(0)
	Cd (SO4) 2-2	5.485e-10	2.157e-10	-9.261	-9.666	-0.405	(0)
	CdCO3	1.888e-10	1.888e-10	-9.724	-9.724	0.000	(0)
	CdHCO3+	2.115e-11	1.675e-11	-10.675	-10.776	-0.101	(0)
	CdOH+	8.312e-12	6.582e-12	-11.080	-11.182	-0.101	(0)
	CdF+	7.865e-12	6.229e-12	-11.104	-11.206	-0.101	(0)
	CdOHC1	6.809e-12	6.809e-12	-11.167	-11.167	0.000	(0)

	CdCl ₂	6.004e-12	6.004e-12	-11.222	-11.222	0.000	(0)
	Cd(CO ₃) ₂₋₂	8.603e-13	3.383e-13	-12.065	-12.471	-0.405	(0)
	Cd(OH) ₂	1.004e-14	1.004e-14	-13.998	-13.998	0.000	(0)
	CdCl ₃₋	1.003e-14	7.947e-15	-13.998	-14.100	-0.101	(0)
	CdF ₂	1.425e-15	1.425e-15	-14.846	-14.846	0.000	(0)
	CdNO ₃ +	1.334e-16	1.056e-16	-15.875	-15.976	-0.101	(0)
	CdSeO ₄	3.343e-17	3.343e-17	-16.476	-16.476	0.000	(0)
	Cd ₂ OH+3	9.232e-19	1.131e-19	-18.035	-18.947	-0.912	(0)
	Cd(SeO ₃) ₂₋₂	4.460e-19	1.754e-19	-18.351	-18.756	-0.405	(0)
	Cd(OH) ₃₋	1.872e-19	1.483e-19	-18.728	-18.829	-0.101	(0)
	Cd(NO ₃) ₂	5.158e-25	5.158e-25	-24.288	-24.288	0.000	(0)
	Cd(OH) ₄₋₂	1.492e-26	5.867e-27	-25.826	-26.232	-0.405	(0)
	CdHS+	0.000e+00	0.000e+00	-79.349	-79.451	-0.101	(0)
	Cd(HS) ₂	0.000e+00	0.000e+00	-151.240	-151.240	0.000	(0)
	Cd(HS) ₃₋	0.000e+00	0.000e+00	-228.233	-228.334	-0.101	(0)
	Cd(HS) ₄₋₂	0.000e+00	0.000e+00	-304.726	-305.132	-0.405	(0)
C1		2.513e-03					
	Cl-	2.513e-03	2.098e-03	-2.600	-2.678	-0.078	(0)
	MnCl+	5.001e-08	4.194e-08	-7.301	-7.377	-0.076	(0)
	AgCl	1.194e-08	1.194e-08	-7.923	-7.923	0.000	(0)
	ZnCl+	9.418e-09	7.827e-09	-8.026	-8.106	-0.080	(0)
	AgCl ₂₋	2.755e-09	2.182e-09	-8.560	-8.661	-0.101	(0)
	ZnOHCl	2.477e-09	2.477e-09	-8.606	-8.606	0.000	(0)
	CdCl+	8.671e-10	6.867e-10	-9.062	-9.163	-0.101	(0)
	CuCl	3.969e-10	3.969e-10	-9.401	-9.401	0.000	(0)
	CuCl+	3.748e-10	3.115e-10	-9.426	-9.507	-0.080	(0)
	NiCl+	2.173e-10	1.720e-10	-9.663	-9.764	-0.101	(0)
	CoCl+	2.153e-10	1.705e-10	-9.667	-9.768	-0.101	(0)
	CuCl ₂₋	2.093e-10	1.739e-10	-9.679	-9.760	-0.080	(0)
	MnCl ₂	1.243e-10	1.243e-10	-9.906	-9.906	0.000	(0)
	PbCl+	2.807e-11	2.223e-11	-10.552	-10.653	-0.101	(0)
	ZnCl ₂	2.602e-11	2.602e-11	-10.585	-10.585	0.000	(0)
	HgClOH	1.570e-11	1.570e-11	-10.804	-10.804	0.000	(0)
	AgCl ₃₋₂	1.037e-11	4.079e-12	-10.984	-11.389	-0.405	(0)
	HgCl ₂	7.713e-12	7.713e-12	-11.113	-11.113	0.000	(0)
	CdOHCl	6.809e-12	6.809e-12	-11.167	-11.167	0.000	(0)
	CdCl ₂	6.004e-12	6.004e-12	-11.222	-11.222	0.000	(0)
	CuCl ₂	2.266e-13	2.266e-13	-12.645	-12.645	0.000	(0)
	PbCl ₂	2.083e-13	2.083e-13	-12.681	-12.681	0.000	(0)
	HgCl ₃₋	2.043e-13	1.618e-13	-12.690	-12.791	-0.101	(0)
	CuCl ₃₋₂	1.576e-13	7.800e-14	-12.802	-13.108	-0.306	(0)
	AgCl ₄₋₃	1.426e-13	1.747e-14	-12.846	-13.758	-0.912	(0)
	MnCl ₃₋	8.560e-14	7.179e-14	-13.068	-13.144	-0.076	(0)
	ZnCl ₃₋	5.217e-14	4.335e-14	-13.283	-13.363	-0.080	(0)
	CdCl ₃₋	1.003e-14	7.947e-15	-13.998	-14.100	-0.101	(0)
	HgCl ₄₋₂	3.435e-15	1.351e-15	-14.464	-14.869	-0.405	(0)
	NiCl ₂	1.817e-15	1.817e-15	-14.741	-14.741	0.000	(0)
	HgCl+	9.265e-16	7.337e-16	-15.033	-15.134	-0.101	(0)
	UO ₂ Cl+	3.804e-16	3.012e-16	-15.420	-15.521	-0.101	(0)
	PbCl ₃₋	2.196e-16	1.739e-16	-15.658	-15.760	-0.101	(0)
	ZnCl ₄₋₂	9.190e-17	4.547e-17	-16.037	-16.342	-0.306	(0)
	CrCl+2	7.430e-17	2.922e-17	-16.129	-16.534	-0.405	(0)
	CuCl ₃₋	5.336e-18	4.435e-18	-17.273	-17.353	-0.080	(0)
	PbCl ₄₋₂	4.240e-19	1.668e-19	-18.373	-18.778	-0.405	(0)
	CrOHCl ₂	2.816e-19	2.816e-19	-18.550	-18.550	0.000	(0)
	FeCl+2	9.468e-21	4.685e-21	-20.024	-20.329	-0.306	(0)
	CrCl ₂ +	7.344e-21	5.816e-21	-20.134	-20.235	-0.101	(0)
	VOCl+	4.361e-22	3.454e-22	-21.360	-21.462	-0.101	(0)
	CuCl ₄₋₂	9.423e-23	4.663e-23	-22.026	-22.331	-0.306	(0)
	FeCl ₂ +	5.234e-23	4.389e-23	-22.281	-22.358	-0.076	(0)
	CrO ₃ Cl-	3.599e-26	2.850e-26	-25.444	-25.545	-0.101	(0)
	FeCl ₃	9.207e-27	9.207e-27	-26.036	-26.036	0.000	(0)
	CoCl+2	3.100e-35	1.219e-35	-34.509	-34.914	-0.405	(0)
	UCl+3	0.000e+00	0.000e+00	-44.395	-45.307	-0.912	(0)
	Co(NH ₃) ₅ Cl+2	0.000e+00	0.000e+00	-50.964	-51.369	-0.405	(0)
	Cr(NH ₃) ₆ Cl+2	0.000e+00	0.000e+00	-53.029	-53.434	-0.405	(0)
	Co(NH ₃) ₆ Cl+2	0.000e+00	0.000e+00	-66.161	-66.566	-0.405	(0)
Co(2)		8.703e-08					

Co+2	5.974e-08	2.349e-08	-7.224	-7.629	-0.405	(0)
CoSO4	2.091e-08	2.091e-08	-7.680	-7.680	0.000	(0)
CoHCO3+	4.953e-09	3.922e-09	-8.305	-8.406	-0.101	(0)
CoCO3	9.599e-10	9.599e-10	-9.018	-9.018	0.000	(0)
CoCl+	2.153e-10	1.705e-10	-9.667	-9.768	-0.101	(0)
CoOH+	1.431e-10	1.133e-10	-9.844	-9.946	-0.101	(0)
CoF+	1.076e-10	8.518e-11	-9.968	-10.070	-0.101	(0)
Co (OH) 2	2.176e-12	2.176e-12	-11.662	-11.662	0.000	(0)
CoNO2+	1.407e-12	1.114e-12	-11.852	-11.953	-0.101	(0)
Co (NH3) 2+	2.370e-14	9.319e-15	-13.625	-14.031	-0.405	(0)
CoSeO4	6.168e-16	6.168e-16	-15.210	-15.210	0.000	(0)
CoNO3+	4.582e-16	3.628e-16	-15.339	-15.440	-0.101	(0)
Co (OH) 3-	1.325e-17	1.050e-17	-16.878	-16.979	-0.101	(0)
CoOOH-	3.327e-18	2.635e-18	-17.478	-17.579	-0.101	(0)
Co2OH+3	1.089e-18	1.334e-19	-17.963	-18.875	-0.912	(0)
Co (NH3) 2+2	3.335e-21	1.311e-21	-20.477	-20.882	-0.405	(0)
Co (NO3) 2	7.193e-24	7.193e-24	-23.143	-23.143	0.000	(0)
Co (OH) 4-2	1.022e-24	4.021e-25	-23.990	-24.396	-0.405	(0)
Co (NH3) 3+2	1.385e-28	5.447e-29	-27.859	-28.264	-0.405	(0)
Co4 (OH) 4+4	1.375e-30	3.290e-32	-29.862	-31.483	-1.621	(0)
Co (NH3) 4+2	2.398e-36	9.431e-37	-35.620	-36.025	-0.405	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.882	-44.287	-0.405	(0)
Co (3)	8.922e-29					
CoOH+2	8.922e-29	3.509e-29	-28.050	-28.455	-0.405	(0)
Co+3	1.453e-34	2.856e-35	-33.838	-34.544	-0.706	(0)
CoCl+2	3.100e-35	1.219e-35	-34.509	-34.914	-0.405	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.964	-51.369	-0.405	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.212	-61.313	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.899	-66.304	-0.405	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.161	-66.566	-0.405	(0)
Cr (2)	2.141e-26					
Cr+2	2.141e-26	8.421e-27	-25.669	-26.075	-0.405	(0)
Cr (3)	2.476e-09					
Cr (OH) 2+	2.114e-09	1.674e-09	-8.675	-8.776	-0.101	(0)
Cr (OH) 3	1.521e-10	1.521e-10	-9.818	-9.818	0.000	(0)
Cr (OH) +2	1.448e-10	5.693e-11	-9.839	-10.245	-0.405	(0)
CrOHSO4	6.026e-11	6.026e-11	-10.220	-10.220	0.000	(0)
CrO2-	2.192e-12	1.736e-12	-11.659	-11.761	-0.101	(0)
Cr (OH) 4-	1.848e-12	1.463e-12	-11.733	-11.835	-0.101	(0)
CrF+2	4.973e-13	1.956e-13	-12.303	-12.709	-0.405	(0)
CrSO4+	1.416e-13	1.121e-13	-12.849	-12.950	-0.101	(0)
Cr+3	8.788e-14	1.076e-14	-13.056	-13.968	-0.912	(0)
CrCl+2	7.430e-17	2.922e-17	-16.129	-16.534	-0.405	(0)
Cr2 (OH) 2SO4+2	7.885e-19	3.101e-19	-18.103	-18.509	-0.405	(0)
CrOHC12	2.816e-19	2.816e-19	-18.550	-18.550	0.000	(0)
Cr2 (OH) 2 (SO4) 2	8.217e-20	8.217e-20	-19.085	-19.085	0.000	(0)
CrCl2+	7.344e-21	5.816e-21	-20.134	-20.235	-0.101	(0)
CrNO3+2	1.166e-23	4.585e-24	-22.933	-23.339	-0.405	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.215	-42.620	-0.405	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.946	-51.858	-0.912	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.029	-53.434	-0.405	(0)
Cr (6)	8.795e-16					
CrO4-2	7.933e-16	3.850e-16	-15.101	-15.415	-0.314	(0)
HCrO4-	6.549e-17	5.186e-17	-16.184	-16.285	-0.101	(0)
NaCrO4-	1.613e-17	1.277e-17	-16.792	-16.894	-0.101	(0)
KCrO4-	4.541e-18	3.596e-18	-17.343	-17.444	-0.101	(0)
CrO3SO4-2	7.463e-24	2.935e-24	-23.127	-23.532	-0.405	(0)
H2CrO4	1.750e-24	1.750e-24	-23.757	-23.757	0.000	(0)
CrO3Cl-	3.599e-26	2.850e-26	-25.444	-25.545	-0.101	(0)
Cr2O7-2	2.373e-31	9.333e-32	-30.625	-31.030	-0.405	(0)
Cu (1)	7.960e-10					
CuCl	3.969e-10	3.969e-10	-9.401	-9.401	0.000	(0)
CuCl2-	2.093e-10	1.739e-10	-9.679	-9.760	-0.080	(0)
Cu+	1.898e-10	1.503e-10	-9.722	-9.823	-0.101	(0)
CuCl3-2	1.576e-13	7.800e-14	-12.802	-13.108	-0.306	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.295	-149.659	-0.365	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.043	-150.389	-0.347	(0)
Cu (2)	1.752e-06					

	CuCO3	1.334e-06	1.334e-06	-5.875	-5.875	0.000	(0)
	Cu+2	1.931e-07	9.370e-08	-6.714	-7.028	-0.314	(0)
	CuSO4	9.575e-08	9.575e-08	-7.019	-7.019	0.000	(0)
	CuOH+	8.619e-08	7.163e-08	-7.065	-7.145	-0.080	(0)
	Cu (CO3) 2-2	2.206e-08	8.675e-09	-7.656	-8.062	-0.405	(0)
	CuHCO3+	1.602e-08	1.269e-08	-7.795	-7.897	-0.101	(0)
	Cu (OH) 2	3.455e-09	3.455e-09	-8.462	-8.462	0.000	(0)
	CuF+	8.559e-10	6.778e-10	-9.068	-9.169	-0.101	(0)
	CuCl+	3.748e-10	3.115e-10	-9.426	-9.507	-0.080	(0)
	Cu2 (OH) 2+2	3.277e-10	1.289e-10	-9.485	-9.890	-0.405	(0)
	CuNO2+	8.340e-11	6.605e-11	-10.079	-10.180	-0.101	(0)
	CuNH3+2	8.043e-12	3.163e-12	-11.095	-11.500	-0.405	(0)
	Cu (OH) 3-	2.163e-12	1.713e-12	-11.665	-11.766	-0.101	(0)
	CuCl2	2.266e-13	2.266e-13	-12.645	-12.645	0.000	(0)
	Cu (NO2) 2	4.549e-15	4.549e-15	-14.342	-14.342	0.000	(0)
	CuNO3+	3.646e-15	2.887e-15	-14.438	-14.540	-0.101	(0)
	Cu (OH) 4-2	8.287e-18	3.259e-18	-17.082	-17.487	-0.405	(0)
	CuCl3-	5.336e-18	4.435e-18	-17.273	-17.353	-0.080	(0)
	CuCl4-2	9.423e-23	4.663e-23	-22.026	-22.331	-0.306	(0)
	Cu (NO3) 2	3.541e-24	3.541e-24	-23.451	-23.451	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.009	-218.110	-0.101	(0)
F		1.646e-04					
	F-	1.374e-04	1.146e-04	-3.862	-3.941	-0.078	(0)
	MgF+	2.430e-05	2.029e-05	-4.614	-4.693	-0.078	(0)
	CaF+	2.229e-06	1.869e-06	-5.652	-5.728	-0.076	(0)
	NaF	4.830e-07	4.830e-07	-6.316	-6.316	0.000	(0)
	MnF+	8.643e-08	7.249e-08	-7.063	-7.140	-0.076	(0)
	AlF3	2.987e-08	2.987e-08	-7.525	-7.525	0.000	(0)
	AlF2+	2.460e-08	2.070e-08	-7.609	-7.684	-0.075	(0)
	HF	7.059e-09	7.059e-09	-8.151	-8.151	0.000	(0)
	ZnF+	4.291e-09	3.398e-09	-8.367	-8.469	-0.101	(0)
	AlF4-	2.056e-09	1.717e-09	-8.687	-8.765	-0.078	(0)
	BF (OH) 3-	1.444e-09	1.182e-09	-8.840	-8.928	-0.087	(0)
	AlF+2	9.042e-10	4.535e-10	-9.044	-9.343	-0.300	(0)
	CuF+	8.559e-10	6.778e-10	-9.068	-9.169	-0.101	(0)
	NiF+	1.166e-10	9.232e-11	-9.933	-10.035	-0.101	(0)
	CoF+	1.076e-10	8.518e-11	-9.968	-10.070	-0.101	(0)
	CdF+	7.865e-12	6.229e-12	-11.104	-11.206	-0.101	(0)
	HF2-	3.721e-12	3.077e-12	-11.429	-11.512	-0.082	(0)
	PbF+	3.047e-12	2.413e-12	-11.516	-11.617	-0.101	(0)
	UO2F+	1.770e-12	1.401e-12	-11.752	-11.853	-0.101	(0)
	AgF	8.030e-13	8.030e-13	-12.095	-12.095	0.000	(0)
	BF2 (OH) 2-	7.372e-13	6.032e-13	-12.132	-12.220	-0.087	(0)
	CrF+2	4.973e-13	1.956e-13	-12.303	-12.709	-0.405	(0)
	UO2F2	4.634e-13	4.634e-13	-12.334	-12.334	0.000	(0)
	UO2F3-	1.685e-14	1.334e-14	-13.773	-13.875	-0.101	(0)
	PbF2	5.445e-15	5.445e-15	-14.264	-14.264	0.000	(0)
	CdF2	1.425e-15	1.425e-15	-14.846	-14.846	0.000	(0)
	H2F2	1.335e-16	1.335e-16	-15.874	-15.874	0.000	(0)
	FeF2+	3.401e-17	2.852e-17	-16.468	-16.545	-0.076	(0)
	UO2F4-2	3.090e-17	1.215e-17	-16.510	-16.915	-0.405	(0)
	VO2F	2.599e-17	2.599e-17	-16.585	-16.585	0.000	(0)
	FeF+2	1.879e-17	9.297e-18	-16.726	-17.032	-0.306	(0)
	FeF3	4.614e-18	4.614e-18	-17.336	-17.336	0.000	(0)
	PbF3-	1.495e-18	1.184e-18	-17.825	-17.927	-0.101	(0)
	BF3OH-	1.370e-18	1.121e-18	-17.863	-17.951	-0.087	(0)
	VO2F2-	1.366e-18	1.082e-18	-17.865	-17.966	-0.101	(0)
	VOF+	5.097e-20	4.036e-20	-19.293	-19.394	-0.101	(0)
	VO2F3-2	3.933e-21	1.547e-21	-20.405	-20.811	-0.405	(0)
	VOF2	1.735e-21	1.735e-21	-20.761	-20.761	0.000	(0)
	PbF4-2	1.652e-22	6.497e-23	-21.782	-22.187	-0.405	(0)
	HgF+	9.408e-23	7.450e-23	-22.026	-22.128	-0.101	(0)
	BF4-	3.218e-23	2.633e-23	-22.492	-22.579	-0.087	(0)
	VOF3-	8.913e-24	7.058e-24	-23.050	-23.151	-0.101	(0)
	VO2F4-3	7.124e-25	8.726e-26	-24.147	-25.059	-0.912	(0)
	Sb (OH) 2F	2.678e-25	2.678e-25	-24.572	-24.572	0.000	(0)
	SbOF	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
	VOF4-2	8.305e-27	3.266e-27	-26.081	-26.486	-0.405	(0)

UF3+	3.557e-35	2.817e-35	-34.449	-34.550	-0.101	(0)
UF2+2	3.942e-36	1.550e-36	-35.404	-35.810	-0.405	(0)
UF4	3.541e-37	3.541e-37	-36.451	-36.451	0.000	(0)
UF+3	8.768e-39	1.074e-39	-38.057	-38.969	-0.912	(0)
UF5-	2.031e-39	1.609e-39	-38.692	-38.794	-0.101	(0)
UF6-2	1.416e-40	0.000e+00	-39.849	-40.254	-0.405	(0)
Fe (2)	9.596e-12					
Fe+2	6.629e-12	2.607e-12	-11.179	-11.584	-0.405	(0)
FeSO4	2.855e-12	2.855e-12	-11.544	-11.544	0.000	(0)
FeHCO3+	8.329e-14	7.043e-14	-13.079	-13.152	-0.073	(0)
FeOH+	2.991e-14	2.509e-14	-13.524	-13.601	-0.076	(0)
Fe (OH) 2	4.817e-18	4.817e-18	-17.317	-17.317	0.000	(0)
Fe (OH) 3-	4.391e-19	3.683e-19	-18.357	-18.434	-0.076	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.621	-160.621	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.476	-237.578	-0.101	(0)
Fe (3)	1.579e-09					
Fe (OH) 2+	1.290e-09	1.086e-09	-8.889	-8.964	-0.075	(0)
Fe (OH) 3	2.818e-10	2.818e-10	-9.550	-9.550	0.000	(0)
Fe (OH) 4-	7.538e-12	6.343e-12	-11.123	-11.198	-0.075	(0)
FeOH+2	2.333e-14	1.154e-14	-13.632	-13.938	-0.306	(0)
FeF2+	3.401e-17	2.852e-17	-16.468	-16.545	-0.076	(0)
FeF+2	1.879e-17	9.297e-18	-16.726	-17.032	-0.306	(0)
FeF3	4.614e-18	4.614e-18	-17.336	-17.336	0.000	(0)
FeSO4+	4.413e-18	3.701e-18	-17.355	-17.432	-0.076	(0)
Fe (SO4) 2-	4.458e-19	3.530e-19	-18.351	-18.452	-0.101	(0)
Fe+3	3.762e-19	7.395e-20	-18.425	-19.131	-0.706	(0)
FeCl+2	9.468e-21	4.685e-21	-20.024	-20.329	-0.306	(0)
FeCl2+	5.234e-23	4.389e-23	-22.281	-22.358	-0.076	(0)
FeHSeO3+2	4.094e-23	1.610e-23	-22.388	-22.793	-0.405	(0)
Fe2 (OH) 2+4	1.844e-25	4.412e-27	-24.734	-26.355	-1.621	(0)
FeNO3+2	1.832e-26	7.206e-27	-25.737	-26.142	-0.405	(0)
FeCl3	9.207e-27	9.207e-27	-26.036	-26.036	0.000	(0)
Fe3 (OH) 4+5	2.362e-32	6.922e-35	-31.627	-34.160	-2.533	(0)
H (0)	2.607e-29					
H2	1.304e-29	1.316e-29	-28.885	-28.881	0.004	(0)
Hg (0)	1.735e-09					
Hg	1.735e-09	1.735e-09	-8.761	-8.761	0.000	(0)
Hg (1)	1.050e-19					
Hg2+2	5.251e-20	2.065e-20	-19.280	-19.685	-0.405	(0)
Hg (2)	3.008e-11					
HgClOH	1.570e-11	1.570e-11	-10.804	-10.804	0.000	(0)
HgCl2	7.713e-12	7.713e-12	-11.113	-11.113	0.000	(0)
Hg (OH) 2	6.405e-12	6.464e-12	-11.193	-11.190	0.004	(0)
HgCl3-	2.043e-13	1.618e-13	-12.690	-12.791	-0.101	(0)
HgCO3	5.071e-14	5.071e-14	-13.295	-13.295	0.000	(0)
HgCl4-2	3.435e-15	1.351e-15	-14.464	-14.869	-0.405	(0)
Hg (CO3) 2-2	9.854e-16	3.875e-16	-15.006	-15.412	-0.405	(0)
HgCl+	9.265e-16	7.337e-16	-15.033	-15.134	-0.101	(0)
HgOH+	2.130e-16	1.687e-16	-15.672	-15.773	-0.101	(0)
HgHCO3+	4.964e-17	3.931e-17	-16.304	-16.406	-0.101	(0)
Hg (NH3) 2+2	3.061e-19	1.204e-19	-18.514	-18.919	-0.405	(0)
Hg (OH) 3-	2.484e-19	1.967e-19	-18.605	-18.706	-0.101	(0)
HgNH3+2	9.279e-20	3.649e-20	-19.033	-19.438	-0.405	(0)
Hg+2	4.458e-20	1.753e-20	-19.351	-19.756	-0.405	(0)
HgSO4	2.047e-20	2.047e-20	-19.689	-19.689	0.000	(0)
HgF+	9.408e-23	7.450e-23	-22.026	-22.128	-0.101	(0)
Hg (NH3) 3+2	4.021e-27	1.581e-27	-26.396	-26.801	-0.405	(0)
HgNO3+	7.964e-29	6.307e-29	-28.099	-28.200	-0.101	(0)
Hg (NH3) 4+2	1.054e-34	4.144e-35	-33.977	-34.383	-0.405	(0)
Hg (NO3) 2	2.554e-37	2.554e-37	-36.593	-36.593	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.334	-138.435	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.357	-139.762	-0.405	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.421	-139.421	0.000	(0)
K	3.106e-03					
K+	3.012e-03	2.514e-03	-2.521	-2.600	-0.078	(0)
KSO4-	9.433e-05	7.938e-05	-4.025	-4.100	-0.075	(0)
KCrO4-	4.541e-18	3.596e-18	-17.343	-17.444	-0.101	(0)
Mg	4.599e-03					

Mg+2	3.250e-03	1.577e-03	-2.488	-2.802	-0.314	(0)
MgSO4	1.280e-03	1.280e-03	-2.893	-2.893	0.000	(0)
MgHCO3+	4.168e-05	3.464e-05	-4.380	-4.460	-0.080	(0)
MgF+	2.430e-05	2.029e-05	-4.614	-4.693	-0.078	(0)
MgCO3	3.171e-06	3.171e-06	-5.499	-5.499	0.000	(0)
MgOH+	1.788e-07	1.518e-07	-6.748	-6.819	-0.071	(0)
MgH2BO3+	2.408e-08	1.970e-08	-7.618	-7.705	-0.087	(0)
Mn (2)	5.394e-05					
Mn+2	4.038e-05	1.588e-05	-4.394	-4.799	-0.405	(0)
MnSO4	1.260e-05	1.260e-05	-4.900	-4.900	0.000	(0)
MnHCO3+	8.109e-07	6.801e-07	-6.091	-6.167	-0.076	(0)
MnF+	8.643e-08	7.249e-08	-7.063	-7.140	-0.076	(0)
MnCl+	5.001e-08	4.194e-08	-7.301	-7.377	-0.076	(0)
MnOH+	1.150e-08	9.644e-09	-7.939	-8.016	-0.076	(0)
MnCl2	1.243e-10	1.243e-10	-9.906	-9.906	0.000	(0)
MnNO3+	3.097e-13	2.453e-13	-12.509	-12.610	-0.101	(0)
MnSeO4	2.239e-13	2.239e-13	-12.650	-12.650	0.000	(0)
MnCl3-	8.560e-14	7.179e-14	-13.068	-13.144	-0.076	(0)
Mn (OH) 3-	4.153e-18	3.483e-18	-17.382	-17.458	-0.076	(0)
Mn (NO3) 2	6.003e-21	6.003e-21	-20.222	-20.222	0.000	(0)
Mn (OH) 4-2	5.494e-24	2.718e-24	-23.260	-23.566	-0.306	(0)
MnSe	0.000e+00	0.000e+00	-42.219	-42.219	0.000	(0)
Mn (3)	1.102e-24					
Mn+3	1.102e-24	2.166e-25	-23.958	-24.664	-0.706	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.932	-42.238	-0.306	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.040	-46.125	-0.085	(0)
Mo	1.742e-06					
MoO4-2	1.741e-06	8.449e-07	-5.759	-6.073	-0.314	(0)
HMoO4-	8.838e-10	6.999e-10	-9.054	-9.155	-0.101	(0)
H2MoO4	2.134e-13	2.134e-13	-12.671	-12.671	0.000	(0)
Ag2MoO4	2.487e-24	2.487e-24	-23.604	-23.604	0.000	(0)
AlMo6O21-3	6.022e-38	7.376e-39	-37.220	-38.132	-0.912	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.918	-48.566	-3.648	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.027	-49.560	-2.533	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.537	-52.158	-1.621	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.381	-56.293	-0.912	(0)
N (-3)	3.114e-07					
NH4+	2.944e-07	2.409e-07	-6.531	-6.618	-0.087	(0)
NH4SO4-	1.373e-08	1.151e-08	-7.862	-7.939	-0.076	(0)
NH3	3.299e-09	3.299e-09	-8.482	-8.482	0.000	(0)
CaNH3+2	1.578e-11	6.205e-12	-10.802	-11.207	-0.405	(0)
CuNH3+2	8.043e-12	3.163e-12	-11.095	-11.500	-0.405	(0)
NiNH3+2	1.444e-13	5.680e-14	-12.840	-13.246	-0.405	(0)
AgNH3+	2.372e-14	1.878e-14	-13.625	-13.726	-0.101	(0)
Co (NH3) +2	2.370e-14	9.319e-15	-13.625	-14.031	-0.405	(0)
BaNH3+2	1.780e-16	7.001e-17	-15.750	-16.155	-0.405	(0)
Ag (NH3) 2+	6.360e-19	5.037e-19	-18.197	-18.298	-0.101	(0)
Hg (NH3) 2+2	3.061e-19	1.204e-19	-18.514	-18.919	-0.405	(0)
HgNH3+2	9.279e-20	3.649e-20	-19.033	-19.438	-0.405	(0)
Ni (NH3) 2+2	6.887e-20	2.708e-20	-19.162	-19.567	-0.405	(0)
Ca (NH3) 2+2	2.072e-20	8.150e-21	-19.684	-20.089	-0.405	(0)
Co (NH3) 2+2	3.335e-21	1.311e-21	-20.477	-20.882	-0.405	(0)
Hg (NH3) 3+2	4.021e-27	1.581e-27	-26.396	-26.801	-0.405	(0)
Co (NH3) 3+2	1.385e-28	5.447e-29	-27.859	-28.264	-0.405	(0)
Hg (NH3) 4+2	1.054e-34	4.144e-35	-33.977	-34.383	-0.405	(0)
Co (NH3) 4+2	2.398e-36	9.431e-37	-35.620	-36.025	-0.405	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.215	-42.620	-0.405	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.882	-44.287	-0.405	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.946	-51.858	-0.912	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.964	-51.369	-0.405	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.029	-53.434	-0.405	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.212	-61.313	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.899	-66.304	-0.405	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.161	-66.566	-0.405	(0)
N (3)	8.182e-06					
NO2-	8.181e-06	6.731e-06	-5.087	-5.172	-0.085	(0)

CuNO2+	8.340e-11	6.605e-11	-10.079	-10.180	-0.101	(0)
AgNO2	3.921e-12	3.921e-12	-11.407	-11.407	0.000	(0)
CoNO2+	1.407e-12	1.114e-12	-11.852	-11.953	-0.101	(0)
Cu (NO2) 2	4.549e-15	4.549e-15	-14.342	-14.342	0.000	(0)
Ag (NO2) 2-	5.163e-17	4.088e-17	-16.287	-16.388	-0.101	(0)
N (5)	1.173e-08					
NO3-	1.167e-08	9.743e-09	-7.933	-8.011	-0.078	(0)
CaNO3+	5.813e-11	4.603e-11	-10.236	-10.337	-0.101	(0)
MnNO3+	3.097e-13	2.453e-13	-12.509	-12.610	-0.101	(0)
ZnNO3+	4.591e-14	3.636e-14	-13.338	-13.439	-0.101	(0)
CuNO3+	3.646e-15	2.887e-15	-14.438	-14.540	-0.101	(0)
BaNO3+	2.074e-15	1.642e-15	-14.683	-14.785	-0.101	(0)
NiNO3+	9.908e-16	7.846e-16	-15.004	-15.105	-0.101	(0)
CoNO3+	4.582e-16	3.628e-16	-15.339	-15.440	-0.101	(0)
CdNO3+	1.334e-16	1.056e-16	-15.875	-15.976	-0.101	(0)
PbNO3+	5.436e-17	4.305e-17	-16.265	-16.366	-0.101	(0)
AgNO3	2.158e-17	2.158e-17	-16.666	-16.666	0.000	(0)
Mn (NO3) 2	6.003e-21	6.003e-21	-20.222	-20.222	0.000	(0)
UO2NO3+	2.174e-21	1.721e-21	-20.663	-20.764	-0.101	(0)
Zn (NO3) 2	7.068e-23	7.068e-23	-22.151	-22.151	0.000	(0)
CrNO3+2	1.166e-23	4.585e-24	-22.933	-23.339	-0.405	(0)
Co (NO3) 2	7.193e-24	7.193e-24	-23.143	-23.143	0.000	(0)
Cu (NO3) 2	3.541e-24	3.541e-24	-23.451	-23.451	0.000	(0)
Pb (NO3) 2	7.123e-25	7.123e-25	-24.147	-24.147	0.000	(0)
VO2NO3	6.369e-25	6.369e-25	-24.196	-24.196	0.000	(0)
Cd (NO3) 2	5.158e-25	5.158e-25	-24.288	-24.288	0.000	(0)
FeNO3+2	1.832e-26	7.206e-27	-25.737	-26.142	-0.405	(0)
HgNO3+	7.964e-29	6.307e-29	-28.099	-28.200	-0.101	(0)
Hg (NO3) 2	2.554e-37	2.554e-37	-36.593	-36.593	0.000	(0)
Na	8.199e-03					
Na+	8.000e-03	6.677e-03	-2.097	-2.175	-0.078	(0)
NaSO4-	1.901e-04	1.600e-04	-3.721	-3.796	-0.075	(0)
NaHCO3	8.058e-06	8.058e-06	-5.094	-5.094	0.000	(0)
NaF	4.830e-07	4.830e-07	-6.316	-6.316	0.000	(0)
NaCO3-	3.571e-07	3.005e-07	-6.447	-6.522	-0.075	(0)
NaH2BO3	3.813e-09	3.813e-09	-8.419	-8.419	0.000	(0)
NaCrO4-	1.613e-17	1.277e-17	-16.792	-16.894	-0.101	(0)
Ni	1.087e-07					
Ni+2	6.605e-08	3.206e-08	-7.180	-7.494	-0.314	(0)
NiSO4	2.853e-08	2.853e-08	-7.545	-7.545	0.000	(0)
NiHCO3+	1.071e-08	8.482e-09	-7.970	-8.072	-0.101	(0)
NiCO3	2.891e-09	2.891e-09	-8.539	-8.539	0.000	(0)
NiCl+	2.173e-10	1.720e-10	-9.663	-9.764	-0.101	(0)
NiOH+	1.232e-10	9.756e-11	-9.909	-10.011	-0.101	(0)
NiF+	1.166e-10	9.232e-11	-9.933	-10.035	-0.101	(0)
Ni (SO4) 2-2	1.072e-11	4.215e-12	-10.970	-11.375	-0.405	(0)
Ni (OH) 2	1.873e-12	1.873e-12	-11.727	-11.727	0.000	(0)
NiNH3+2	1.444e-13	5.680e-14	-12.840	-13.246	-0.405	(0)
NiCl2	1.817e-15	1.817e-15	-14.741	-14.741	0.000	(0)
NiNO3+	9.908e-16	7.846e-16	-15.004	-15.105	-0.101	(0)
NiSeO4	7.854e-16	7.854e-16	-15.105	-15.105	0.000	(0)
Ni (OH) 3-	5.718e-16	4.529e-16	-15.243	-15.344	-0.101	(0)
Ni (NH3) 2+2	6.887e-20	2.708e-20	-19.162	-19.567	-0.405	(0)
O (0)	5.797e-35					
O2	2.899e-35	2.925e-35	-34.538	-34.534	0.004	(0)
Pb	4.384e-09					
PbCO3	2.170e-09	2.170e-09	-8.664	-8.664	0.000	(0)
PbSO4	6.526e-10	6.526e-10	-9.185	-9.185	0.000	(0)
Pb+2	6.155e-10	2.987e-10	-9.211	-9.525	-0.314	(0)
PbHCO3+	6.015e-10	4.763e-10	-9.221	-9.322	-0.101	(0)
PbOH+	2.290e-10	1.814e-10	-9.640	-9.741	-0.101	(0)
Pb (SO4) 2-2	4.460e-11	1.754e-11	-10.351	-10.756	-0.405	(0)
Pb (CO3) 2-2	3.846e-11	1.513e-11	-10.415	-10.820	-0.405	(0)
PbCl+	2.807e-11	2.223e-11	-10.552	-10.653	-0.101	(0)
PbF+	3.047e-12	2.413e-12	-11.516	-11.617	-0.101	(0)
Pb (OH) 2	1.386e-12	1.386e-12	-11.858	-11.858	0.000	(0)
PbCl2	2.083e-13	2.083e-13	-12.681	-12.681	0.000	(0)
PbF2	5.445e-15	5.445e-15	-14.264	-14.264	0.000	(0)

Pb(OH) 3-	4.232e-16	3.352e-16	-15.373	-15.475	-0.101	(0)
PbCl3-	2.196e-16	1.739e-16	-15.658	-15.760	-0.101	(0)
PbNO3+	5.436e-17	4.305e-17	-16.265	-16.366	-0.101	(0)
Pb2OH+3	7.010e-18	8.586e-19	-17.154	-18.066	-0.912	(0)
PbF3-	1.495e-18	1.184e-18	-17.825	-17.927	-0.101	(0)
PbCl4-2	4.240e-19	1.668e-19	-18.373	-18.778	-0.405	(0)
Pb(OH) 4-2	5.045e-20	1.984e-20	-19.297	-19.702	-0.405	(0)
PbF4-2	1.652e-22	6.497e-23	-21.782	-22.187	-0.405	(0)
Pb3(OH) 4+2	2.913e-23	1.146e-23	-22.536	-22.941	-0.405	(0)
Pb(NO3) 2	7.123e-25	7.123e-25	-24.147	-24.147	0.000	(0)
Pb4(OH) 4+4	1.136e-27	2.718e-29	-26.945	-28.566	-1.621	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.242	-152.242	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-229.834	-229.936	-0.101	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.734	-73.734	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.892	-78.994	-0.101	(0)
CdHS+	0.000e+00	0.000e+00	-79.349	-79.451	-0.101	(0)
H2S	0.000e+00	0.000e+00	-79.354	-79.354	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.573	-80.978	-0.405	(0)
S6-2	0.000e+00	0.000e+00	-81.089	-81.494	-0.405	(0)
S4-2	0.000e+00	0.000e+00	-81.169	-81.574	-0.405	(0)
S3-2	0.000e+00	0.000e+00	-81.974	-82.380	-0.405	(0)
S2-2	0.000e+00	0.000e+00	-82.991	-83.396	-0.405	(0)
S-2	0.000e+00	0.000e+00	-88.607	-88.913	-0.306	(0)
HgHS2-	0.000e+00	0.000e+00	-138.334	-138.435	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.357	-139.762	-0.405	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-139.421	-139.421	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-148.526	-148.730	-0.205	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-148.526	-148.627	-0.101	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.295	-149.659	-0.365	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.524	-149.625	-0.101	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.043	-150.389	-0.347	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-150.415	-150.790	-0.374	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.745	-151.101	-0.355	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.995	-150.995	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.240	-151.240	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.242	-152.242	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.621	-160.621	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-218.009	-218.110	-0.101	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.608	-226.709	-0.101	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-228.233	-228.334	-0.101	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.903	-229.308	-0.405	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-229.834	-229.936	-0.101	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-237.476	-237.578	-0.101	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-304.726	-305.132	-0.405	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.757	-307.163	-0.405	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.830	-320.235	-0.405	(0)
S(6)	1.230e-02					
SO4-2	9.191e-03	4.461e-03	-2.037	-2.351	-0.314	(0)
CaSO4	1.527e-03	1.527e-03	-2.816	-2.816	0.000	(0)
MgSO4	1.280e-03	1.280e-03	-2.893	-2.893	0.000	(0)
NaSO4-	1.901e-04	1.600e-04	-3.721	-3.796	-0.075	(0)
KSO4-	9.433e-05	7.938e-05	-4.025	-4.100	-0.075	(0)
MnSO4	1.260e-05	1.260e-05	-4.900	-4.900	0.000	(0)
ZnSO4	1.450e-06	1.450e-06	-5.839	-5.839	0.000	(0)
Zn(SO4) 2-2	1.432e-07	5.632e-08	-6.844	-7.249	-0.405	(0)
CuSO4	9.575e-08	9.575e-08	-7.019	-7.019	0.000	(0)
NiSO4	2.853e-08	2.853e-08	-7.545	-7.545	0.000	(0)
HSO4-	2.173e-08	1.815e-08	-7.663	-7.741	-0.078	(0)
CoSO4	2.091e-08	2.091e-08	-7.680	-7.680	0.000	(0)
NH4SO4-	1.373e-08	1.151e-08	-7.862	-7.939	-0.076	(0)
CdSO4	3.585e-09	3.585e-09	-8.446	-8.446	0.000	(0)
PbSO4	6.526e-10	6.526e-10	-9.185	-9.185	0.000	(0)
Cd(SO4) 2-2	5.485e-10	2.157e-10	-9.261	-9.666	-0.405	(0)
AgSO4-	3.134e-10	2.482e-10	-9.504	-9.605	-0.101	(0)
CrOHSO4	6.026e-11	6.026e-11	-10.220	-10.220	0.000	(0)
Pb(SO4) 2-2	4.460e-11	1.754e-11	-10.351	-10.756	-0.405	(0)
AlSO4+	1.640e-11	1.370e-11	-10.785	-10.863	-0.078	(0)

Ni (SO4) 2-2	1.072e-11	4.215e-12	-10.970	-11.375	-0.405	(0)
FeSO4	2.855e-12	2.855e-12	-11.544	-11.544	0.000	(0)
Al (SO4) 2-	7.840e-13	6.547e-13	-12.106	-12.184	-0.078	(0)
UO2SO4	5.979e-13	5.979e-13	-12.223	-12.223	0.000	(0)
CrSO4+	1.416e-13	1.121e-13	-12.849	-12.950	-0.101	(0)
UO2 (SO4) 2-2	8.939e-14	3.516e-14	-13.049	-13.454	-0.405	(0)
VO2SO4-	1.738e-17	1.376e-17	-16.760	-16.861	-0.101	(0)
FeSO4+	4.413e-18	3.701e-18	-17.355	-17.432	-0.076	(0)
Cr2 (OH) 2SO4+2	7.885e-19	3.101e-19	-18.103	-18.509	-0.405	(0)
Fe (SO4) 2-	4.458e-19	3.530e-19	-18.351	-18.452	-0.101	(0)
Cr2 (OH) 2 (SO4) 2	8.217e-20	8.217e-20	-19.085	-19.085	0.000	(0)
VOSO4	7.211e-20	7.211e-20	-19.142	-19.142	0.000	(0)
HgSO4	2.047e-20	2.047e-20	-19.689	-19.689	0.000	(0)
CrO3SO4-2	7.463e-24	2.935e-24	-23.127	-23.532	-0.405	(0)
VSO4+	4.401e-34	3.485e-34	-33.356	-33.458	-0.101	(0)
U (SO4) 2	2.954e-39	2.954e-39	-38.530	-38.530	0.000	(0)
USO4+2	2.120e-40	0.000e+00	-39.674	-40.079	-0.405	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.212	-61.313	-0.101	(0)
Sb (3)	7.096e-20					
Sb (OH) 3	3.590e-20	3.590e-20	-19.445	-19.445	0.000	(0)
HSbO2	3.506e-20	3.506e-20	-19.455	-19.455	0.000	(0)
SbO2-	1.723e-24	1.364e-24	-23.764	-23.865	-0.101	(0)
Sb (OH) 4-	9.859e-25	7.808e-25	-24.006	-24.107	-0.101	(0)
Sb (OH) 2F	2.678e-25	2.678e-25	-24.572	-24.572	0.000	(0)
SbOF	2.635e-25	2.635e-25	-24.579	-24.579	0.000	(0)
Sb (OH) 2+	4.585e-26	3.631e-26	-25.339	-25.440	-0.101	(0)
SbO+	1.582e-26	1.253e-26	-25.801	-25.902	-0.101	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.830	-320.235	-0.405	(0)
Sb (5)	2.456e-08					
SbO3-	2.453e-08	1.943e-08	-7.610	-7.712	-0.101	(0)
Sb (OH) 6-	2.718e-11	2.269e-11	-10.566	-10.644	-0.078	(0)
SbO2+	1.220e-23	9.663e-24	-22.914	-23.015	-0.101	(0)
Se (-2)	5.840e-15					
Ag2Se	5.840e-15	5.840e-15	-14.234	-14.234	0.000	(0)
HSe-	4.846e-40	3.838e-40	-39.315	-39.416	-0.101	(0)
MnSe	0.000e+00	0.000e+00	-42.219	-42.219	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.907	-42.907	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.630	-47.035	-0.405	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.133	-85.754	-1.621	(0)
Se (4)	1.241e-07					
HSeO3-	1.041e-07	8.240e-08	-6.983	-7.084	-0.101	(0)
SeO3-2	2.004e-08	7.880e-09	-7.698	-8.103	-0.405	(0)
H2SeO3	1.463e-12	1.463e-12	-11.835	-11.835	0.000	(0)
AgSeO3-	1.783e-14	1.412e-14	-13.749	-13.850	-0.101	(0)
Cd (SeO3) 2-2	4.460e-19	1.754e-19	-18.351	-18.756	-0.405	(0)
Ag (SeO3) 2-3	8.134e-21	9.963e-22	-20.090	-21.002	-0.912	(0)
FeHSeO3+2	4.094e-23	1.610e-23	-22.388	-22.793	-0.405	(0)
Se (6)	1.082e-10					
SeO4-2	1.079e-10	5.238e-11	-9.967	-10.281	-0.314	(0)
MnSeO4	2.239e-13	2.239e-13	-12.650	-12.650	0.000	(0)
ZnSeO4	1.205e-14	1.205e-14	-13.919	-13.919	0.000	(0)
NiSeO4	7.854e-16	7.854e-16	-15.105	-15.105	0.000	(0)
CoSeO4	6.168e-16	6.168e-16	-15.210	-15.210	0.000	(0)
HSeO4-	1.380e-16	1.093e-16	-15.860	-15.961	-0.101	(0)
CdSeO4	3.343e-17	3.343e-17	-16.476	-16.476	0.000	(0)
Zn (SeO4) 2-2	1.627e-24	6.399e-25	-23.789	-24.194	-0.405	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.697	-58.609	-0.912	(0)
U (4)	3.591e-21					
U (OH) 5-	3.586e-21	2.840e-21	-20.445	-20.547	-0.101	(0)
U (OH) 4	4.954e-24	4.954e-24	-23.305	-23.305	0.000	(0)
U (OH) 3+	9.527e-28	7.545e-28	-27.021	-27.122	-0.101	(0)
U (OH) 2+2	3.695e-32	1.453e-32	-31.432	-31.838	-0.405	(0)
UF3+	3.557e-35	2.817e-35	-34.449	-34.550	-0.101	(0)
UF2+2	3.942e-36	1.550e-36	-35.404	-35.810	-0.405	(0)
UF4	3.541e-37	3.541e-37	-36.451	-36.451	0.000	(0)
UOH+3	2.327e-37	2.851e-38	-36.633	-37.545	-0.912	(0)
UF+3	8.768e-39	1.074e-39	-38.057	-38.969	-0.912	(0)

U(SO4)2	2.954e-39	2.954e-39	-38.530	-38.530	0.000	(0)
UF5-	2.031e-39	1.609e-39	-38.692	-38.794	-0.101	(0)
USO4+2	2.120e-40	0.000e+00	-39.674	-40.079	-0.405	(0)
UF6-2	1.416e-40	0.000e+00	-39.849	-40.254	-0.405	(0)
U+4	0.000e+00	0.000e+00	-42.707	-44.328	-1.621	(0)
UC1+3	0.000e+00	0.000e+00	-44.395	-45.307	-0.912	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-164.213	-172.420	-8.207	(0)
U(5)	2.232e-16					
UO2+	2.232e-16	1.767e-16	-15.651	-15.753	-0.101	(0)
U(6)	3.134e-07					
UO2(CO3)3-4	2.080e-07	4.977e-09	-6.682	-8.303	-1.621	(0)
UO2(CO3)2-2	1.045e-07	4.109e-08	-6.981	-7.386	-0.405	(0)
UO2CO3	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
UO2OH+	3.403e-12	2.695e-12	-11.468	-11.569	-0.101	(0)
UO2F+	1.770e-12	1.401e-12	-11.752	-11.853	-0.101	(0)
UO2SO4	5.979e-13	5.979e-13	-12.223	-12.223	0.000	(0)
UO2F2	4.634e-13	4.634e-13	-12.334	-12.334	0.000	(0)
UO2+2	1.825e-13	8.855e-14	-12.739	-13.053	-0.314	(0)
UO2(SO4)2-2	8.939e-14	3.516e-14	-13.049	-13.454	-0.405	(0)
UO2F3-	1.685e-14	1.334e-14	-13.773	-13.875	-0.101	(0)
UO2Cl+	3.804e-16	3.012e-16	-15.420	-15.521	-0.101	(0)
UO2F4-2	3.090e-17	1.215e-17	-16.510	-16.915	-0.405	(0)
(UO2)2(OH)2+2	3.064e-17	1.205e-17	-16.514	-16.919	-0.405	(0)
(UO2)3(OH)5+	1.818e-18	1.440e-18	-17.740	-17.842	-0.101	(0)
UO2NO3+	2.174e-21	1.721e-21	-20.663	-20.764	-0.101	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.581	-42.683	-0.101	(0)
V+2	0.000e+00	0.000e+00	-43.171	-43.576	-0.405	(0)
V(3)	1.886e-15					
V(OH)3	1.886e-15	1.886e-15	-14.724	-14.724	0.000	(0)
V(OH)2+	6.409e-26	5.076e-26	-25.193	-25.295	-0.101	(0)
VOH+2	5.098e-29	2.005e-29	-28.293	-28.698	-0.405	(0)
V+3	1.351e-33	1.655e-34	-32.869	-33.781	-0.912	(0)
VSO4+	4.401e-34	3.485e-34	-33.356	-33.458	-0.101	(0)
V2(OH)3+3	0.000e+00	0.000e+00	-54.629	-55.540	-0.912	(0)
V2(OH)2+4	0.000e+00	0.000e+00	-54.975	-56.596	-1.621	(0)
V(4)	3.847e-18					
V(OH)3+	3.573e-18	2.829e-18	-17.447	-17.548	-0.101	(0)
VO+2	1.492e-19	5.869e-20	-18.826	-19.231	-0.405	(0)
VOSO4	7.211e-20	7.211e-20	-19.142	-19.142	0.000	(0)
VOF+	5.097e-20	4.036e-20	-19.293	-19.394	-0.101	(0)
VOF2	1.735e-21	1.735e-21	-20.761	-20.761	0.000	(0)
VOC1+	4.361e-22	3.454e-22	-21.360	-21.462	-0.101	(0)
VOF3-	8.913e-24	7.058e-24	-23.050	-23.151	-0.101	(0)
VOF4-2	8.305e-27	3.266e-27	-26.081	-26.486	-0.405	(0)
H2V2O4+2	1.021e-30	4.016e-31	-29.991	-30.396	-0.405	(0)
V(5)	5.288e-09					
H2VO4-	4.714e-09	3.733e-09	-8.327	-8.428	-0.101	(0)
HVO4-2	5.727e-10	2.252e-10	-9.242	-9.647	-0.405	(0)
H3VO4	1.554e-12	1.554e-12	-11.809	-11.809	0.000	(0)
H3V2O7-	4.732e-14	3.747e-14	-13.325	-13.426	-0.101	(0)
HV2O7-3	2.327e-15	2.851e-16	-14.633	-15.545	-0.912	(0)
VO4-3	2.214e-16	2.712e-17	-15.655	-16.567	-0.912	(0)
VO2+	1.548e-16	1.292e-16	-15.810	-15.889	-0.078	(0)
VO2F	2.599e-17	2.599e-17	-16.585	-16.585	0.000	(0)
VO2SO4-	1.738e-17	1.376e-17	-16.760	-16.861	-0.101	(0)
V2O7-4	7.704e-18	1.843e-19	-17.113	-18.734	-1.621	(0)
VO2F2-	1.366e-18	1.082e-18	-17.865	-17.966	-0.101	(0)
V3O9-3	4.455e-19	5.456e-20	-18.351	-19.263	-0.912	(0)
VO2F3-2	3.933e-21	1.547e-21	-20.405	-20.811	-0.405	(0)
V4O12-4	3.551e-24	8.496e-26	-23.450	-25.071	-1.621	(0)
VO2F4-3	7.124e-25	8.726e-26	-24.147	-25.059	-0.912	(0)
VO2NO3	6.369e-25	6.369e-25	-24.196	-24.196	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.246	-64.893	-3.648	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.554	-64.087	-2.533	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.639	-66.260	-1.621	(0)
Zn	5.051e-06					
Zn+2	3.061e-06	1.485e-06	-5.514	-5.828	-0.314	(0)

ZnSO4	1.450e-06	1.450e-06	-5.839	-5.839	0.000	(0)
ZnCO3	2.066e-07	2.066e-07	-6.685	-6.685	0.000	(0)
Zn (SO4) 2-2	1.432e-07	5.632e-08	-6.844	-7.249	-0.405	(0)
ZnHCO3+	1.273e-07	1.008e-07	-6.895	-6.996	-0.101	(0)
ZnOH+	4.535e-08	3.591e-08	-7.343	-7.445	-0.101	(0)
ZnCl+	9.418e-09	7.827e-09	-8.026	-8.106	-0.080	(0)
ZnF+	4.291e-09	3.398e-09	-8.367	-8.469	-0.101	(0)
ZnOHCl	2.477e-09	2.477e-09	-8.606	-8.606	0.000	(0)
Zn (OH) 2	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
ZnCl2	2.602e-11	2.602e-11	-10.585	-10.585	0.000	(0)
Zn (OH) 3-	2.105e-12	1.667e-12	-11.677	-11.778	-0.101	(0)
ZnCl3-	5.217e-14	4.335e-14	-13.283	-13.363	-0.080	(0)
ZnNO3+	4.591e-14	3.636e-14	-13.338	-13.439	-0.101	(0)
ZnSeO4	1.205e-14	1.205e-14	-13.919	-13.919	0.000	(0)
ZnCl4-2	9.190e-17	4.547e-17	-16.037	-16.342	-0.306	(0)
Zn (OH) 4-2	4.079e-17	1.604e-17	-16.389	-16.795	-0.405	(0)
Zn (NO3) 2	7.068e-23	7.068e-23	-22.151	-22.151	0.000	(0)
Zn (SeO4) 2-2	1.627e-24	6.399e-25	-23.789	-24.194	-0.405	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.524	-149.625	-0.101	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.995	-150.995	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.608	-226.709	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.903	-229.308	-0.405	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.757	-307.163	-0.405	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.72	-49.43	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-43.28	-38.77	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-50.50	-38.77	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.94	-54.00	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-58.04	-38.00	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.06	-28.65	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.97	-23.52	0.45	(NH4) 2SeO4
Acanthite	-52.50	-88.72	-36.22	Ag2S
Ag2CO3	-11.64	-22.73	-11.09	Ag2CO3
Ag2CrO4	-20.93	-32.52	-11.59	Ag2CrO4
Ag2HVO4	-12.34	-10.86	1.48	Ag2HVO4
Ag2MoO4	-11.63	-23.18	-11.55	Ag2MoO4
Ag2O	-14.92	-2.35	12.57	Ag2O
Ag2Se	-0.44	-49.14	-48.70	Ag2Se
Ag2SeO3	-9.66	-16.81	-7.15	Ag2SeO3
Ag2SeO4	-18.48	-27.39	-8.91	Ag2SeO4
Ag2SO4	-14.64	-19.46	-4.82	Ag2SO4
Ag3AsO3	-28.14	-25.99	2.16	Ag3AsO3
Ag3AsO4	-16.37	-19.16	-2.79	Ag3AsO4
Ag3H2VO5	-17.21	-12.03	5.18	Ag3H2VO5
AgF:4H2O	-13.55	-12.50	1.05	AgF:4H2O
Agmetal	-0.53	-14.04	-13.51	Ag
AgVO3	-10.45	-9.68	0.77	AgVO3
Al (OH) 3 (am)	-1.06	9.74	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.39	-43.03	2.37	Al2 (MoO4) 3
Al2O3	-0.18	19.48	19.65	Al2O3
Al4 (OH) 10SO4	-0.86	21.84	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.69	-5.89	4.80	AlAsO4:2H2O
AlOHSO4	-4.14	-7.37	-3.23	AlOHSO4
AlSb	-152.52	-86.90	65.62	AlSb
Alunite	1.17	-0.23	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.09	-11.88	-7.79	PbSO4
Anhydrite	-0.82	-5.18	-4.36	CaSO4
Anilite	-56.23	-88.10	-31.88	Cu0.25Cu1.5S
Antlerite	-2.70	6.09	8.79	Cu3 (OH) 4SO4
Aragonite	-0.14	-8.44	-8.30	CaCO3
Arsenolite	-87.10	-89.86	-2.76	As4O6
Artinite	-6.06	3.54	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.97	-31.26	6.71	As2O5
Atacamite	-1.98	5.41	7.39	Cu2 (OH) 3Cl

Azurite	-0.65	-17.56	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-17.11	7.29	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-18.31	-2.44	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.49	-9.40	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-28.09	4.85	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-13.22	-22.89	-9.67	BaCrO ₄
BaF ₂	-9.53	-15.35	-5.82	BaF ₂
BaMoO ₄	-6.59	-13.55	-6.96	BaMoO ₄
Barite	0.16	-9.82	-9.98	BaSO ₄
BaS	-95.27	-79.09	16.18	BaS
BaSeO ₃	-9.01	-7.18	1.83	BaSeO ₃
BaSeO ₄	-10.29	-17.75	-7.46	BaSeO ₄
Bianchite	-6.42	-8.18	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-7.75	10.34	18.09	MnO ₂
Bixbyite	-4.40	-5.05	-0.64	Mn ₂ O ₃
BlaubleiI	-55.74	-79.90	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiIII	-56.41	-83.69	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.16	9.74	8.58	AlOOH
Breithauptite	-57.98	-76.50	-18.52	NiSb
Brochantite	-1.40	13.82	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.89	11.96	16.84	Mg(OH) ₂
Bunsenite	-5.18	7.27	12.45	NiO
Ca(VO ₃) ₂	-10.74	-5.08	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.65	6.85	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-14.70	6.85	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-17.76	4.54	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-20.17	18.79	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-21.07	18.79	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-300.44	-157.47	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.97	-18.24	-2.27	CaCrO ₄
Calcite	0.04	-8.44	-8.48	CaCO ₃
Calomel	-7.13	-25.04	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.95	-8.90	-7.95	CaMoO ₄
Carnotite	-2.25	-2.02	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-5.34	-2.53	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-10.09	-13.11	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-12.72	-2.88	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.35	6.30	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.43	6.30	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.05	-15.34	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.78	1.78	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.33	8.07	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.16	-13.82	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.13	-13.82	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.91	-13.82	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.13	-16.35	-1.21	CdF ₂
Cdmetal(α)	-32.95	-19.43	13.51	Cd
Cdmetal(γ)	-33.05	-19.43	13.62	Cd
CdMoO ₄	-0.39	-14.54	-14.15	CdMoO ₄
CdOHC1	-7.30	-3.76	3.54	CdOHC1
CdSb	-77.12	-77.48	-0.35	CdSb
CdSe	-20.30	-40.50	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.90	-18.75	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.64	-10.82	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.09	-10.82	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-8.94	-10.82	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.48	-11.23	-9.75	AgCl
Cerrusite	-2.01	-15.14	-13.13	PbCO ₃
CH ₄ (g)	-82.26	-123.30	-41.05	CH ₄
Chalcanthite	-6.74	-9.38	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-56.34	-91.26	-34.92	Cu ₂ S
Chalcopyrite	-126.57	-161.84	-35.27	CuFeS ₂
Cinnabar	-51.87	-97.56	-45.69	HgS
Claudetite	-86.80	-89.86	-3.06	As ₄ O ₆
Clausthalite	-14.46	-41.56	-27.10	PbSe
Co(BO ₂) ₂	-29.11	-2.04	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.96	7.13	13.09	Co(OH) ₂
Co(OH) ₃	-10.09	-12.40	-2.31	Co(OH) ₃

CO2(g)	-2.23	-20.38	-18.15	CO2
Co3(AsO4)2	-22.90	-9.87	13.03	Co3(AsO4)2
Co3O4	-7.18	-17.67	-10.50	Co3O4
CoCl2	-21.25	-12.99	8.27	CoCl2
CoCl2:6H2O	-15.52	-12.99	2.54	CoCl2:6H2O
CoCO3	-3.27	-13.25	-9.98	CoCO3
CoF2	-13.91	-15.51	-1.60	CoF2
CoF3	-44.91	-46.37	-1.46	CoF3
CoFe2O4	16.68	13.15	-3.53	CoFe2O4
CoMoO4	-5.94	-13.70	-7.76	CoMoO4
CoO	-6.45	7.13	13.59	CoO
CoS(alpha)	-71.80	-79.24	-7.44	CoS
CoS(beta)	-68.17	-79.24	-11.07	CoS
CoSe	-23.46	-39.66	-16.20	CoSe
CoSeO3	-8.65	-7.33	1.32	CoSeO3
CoSeO4:6H2O	-16.38	-17.91	-1.53	CoSeO4:6H2O
CoSO4	-12.78	-9.98	2.80	CoSO4
CoSO4:6H2O	-7.51	-9.98	-2.47	CoSO4:6H2O
Cotunnite	-10.10	-14.88	-4.78	PbCl2
Covellite	-56.34	-78.64	-22.30	CuS
Cr(OH)2	-22.13	-11.31	10.82	Cr(OH)2
Cr(OH)3	-2.73	-1.40	1.34	Cr(OH)3
Cr(OH)3(am)	-0.65	-1.40	-0.75	Cr(OH)3
Cr2O3	-0.43	-2.79	-2.36	Cr2O3
CrCl2	-45.52	-31.43	14.09	CrCl2
CrCl3	-46.69	-31.57	15.11	CrCl3
CrF3	-24.02	-35.36	-11.34	CrF3
Crmetal	-67.53	-37.04	30.48	Cr
CrO3	-26.96	-30.18	-3.21	CrO3
Cryolite	-8.73	-42.57	-33.84	Na3AlF6
Cu(OH)2	-0.94	7.73	8.67	Cu(OH)2
Cu(SbO3)2	-24.91	20.30	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.18	0.07	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.46	-91.35	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.88	-51.68	-45.80	Cu2Se
Cu2SO4	-20.05	-22.00	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.17	-8.07	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.37	-103.96	-42.59	Cu3Sb
Cu3Se2	-27.25	-90.75	-63.49	Cu3Se2
CuCO3	-1.14	-12.64	-11.50	CuCO3
CuCrO4	-17.00	-22.44	-5.44	CuCrO4
CuF	-8.86	-13.76	-4.91	CuF
CuF2	-16.02	-14.91	1.12	CuF2
CuF2:2H2O	-10.36	-14.91	-4.55	CuF2:2H2O
Cumetal	-6.55	-15.31	-8.76	Cu
CuMoO4	-0.03	-13.10	-13.08	CuMoO4
CuOCuSO4	-11.95	-1.65	10.30	CuOCuSO4
Cupricferrite	7.77	13.75	5.99	CuFe2O4
Cuprite	-3.48	-4.89	-1.41	Cu2O
Cuprousferrite	9.48	0.57	-8.92	CuFeO2
CuSe	-5.96	-39.06	-33.10	CuSe
CuSe2	-26.76	-60.13	-33.37	CuSe2
CuSeO3:2H2O	-7.24	-6.73	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.87	-17.31	-2.44	CuSeO4:5H2O
CuSO4	-12.32	-9.38	2.94	CuSO4
Diaspore	2.87	9.74	6.87	AlOOH
Djurleite	-56.51	-90.43	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.32	-16.86	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.23	-16.86	-17.09	CaMg(CO3)2
Epsomite	-3.03	-5.15	-2.13	MgSO4:7H2O
Fe(OH)2	-10.39	3.18	13.56	Fe(OH)2
Fe(OH)2:7Cl.3	3.03	-0.01	-3.04	Fe(OH)2:7Cl.3
Fe(VO3)2	-10.12	-13.84	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.00	-8.44	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.75	-37.37	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.58	-45.31	-3.73	Fe2(SO4)3
Fe3(OH)8	-11.03	9.20	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.02	-12.62	0.40	FeAsO4:2H2O

FeCr2O4	-6.81	0.39	7.20	FeCr2O4
FeMoO4	-7.57	-17.66	-10.09	FeMoO4
Ferrihydrite	-0.18	3.01	3.19	Fe(OH)3
Ferroselite	-46.09	-64.68	-18.60	FeSe2
FeS(ppt)	-80.25	-83.20	-2.95	FeS
FeSe	-32.62	-43.62	-11.00	FeSe
Fix_pe	-5.48	-5.48	0.00	e-
Fluorite	-0.21	-10.71	-10.50	CaF2
Galena	-67.17	-81.14	-13.97	PbS
Gibbsite	1.45	9.74	8.29	Al(OH)3
Goethite	2.52	3.01	0.49	FeOOH
Goslarite	-6.17	-8.18	-2.01	ZnSO4:7H2O
Greenockite	-65.72	-80.08	-14.36	CdS
Greigite	-291.26	-336.30	-45.03	Fe3S4
Gummite	-5.96	1.71	7.67	UO3
Gypsum	-0.57	-5.18	-4.61	CaSO4:2H2O
H-Jarosite	-13.09	-25.19	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.96	-20.83	-12.88	H2MoO4
H2S(g)	-78.36	-86.37	-8.01	H2S
H2Se(g)	-41.84	-46.80	-4.96	H2Se
Halite	-6.46	-4.85	1.60	NaCl
Hausmannite	-5.41	55.62	61.03	Mn3O4
Hematite	7.44	6.02	-1.42	Fe2O3
Hercynite	-0.24	22.65	22.89	FeAl2O4
Hg(CH3)2(g)	-184.08	-257.79	-73.71	Hg(CH3)2
Hg(g)	-7.45	-15.33	-7.87	Hg
Hg(OH)2	-7.69	-11.19	-3.50	Hg(OH)2
Hg2(g)	-15.70	-30.65	-14.96	Hg2
Hg2(OH)2	-10.18	-4.92	5.26	Hg2(OH)2
Hg2CO3	-9.25	-25.30	-16.05	Hg2CO3
Hg2CrO4	-26.40	-35.10	-8.70	Hg2CrO4
Hg2F2	-17.20	-27.57	-10.36	Hg2F2
Hg2S	-79.62	-91.30	-11.68	Hg2S
Hg2SeO3	-14.73	-19.39	-4.66	Hg2SeO3
Hg2SO4	-15.91	-22.04	-6.13	Hg2SO4
Hg3O2CO3	-24.26	-53.95	-29.68	Hg3O2CO3
HgCl(g)	-32.02	-12.52	19.50	HgCl
HgCl2	-10.04	-31.31	-21.26	HgCl2
HgF(g)	-46.46	-13.78	32.68	HgF
HgF2(g)	-46.40	-33.83	12.57	HgF2
Hgmetal(l)	-1.88	-15.33	-13.45	Hg
HgSe	-2.29	-57.99	-55.69	HgSe
HgSeO3	-13.22	-25.65	-12.43	HgSeO3
HgSO4	-18.88	-28.30	-9.42	HgSO4
Huntite	-3.73	-33.70	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.28	-25.05	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.95	-21.72	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-14.54	-19.71	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.61	-20.41	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-33.55	-50.79	-17.24	K2Cr2O7
K2CrO4	-20.10	-20.61	-0.51	K2CrO4
K2MoO4	-14.53	-11.27	3.26	K2MoO4
K2SeO4	-14.75	-15.48	-0.73	K2SeO4
Langite	-3.67	13.82	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.20	-6.64	-0.43	PbO:PbSO4
Laurionite	-5.45	-4.82	0.62	PbOHCl
Lepidocrocite	1.64	3.01	1.37	FeOOH
Lime	-20.76	11.94	32.70	CaO
Litharge	-7.46	5.24	12.69	PbO
Mackinawite	-79.60	-83.20	-3.60	FeS
Maghemite	-0.37	6.02	6.39	Fe2O3
Magnesioferrite	1.12	17.98	16.86	Fe2MgO4
Magnesite	-0.96	-8.42	-7.46	MgCO3
Magnetite	5.80	9.20	3.40	Fe3O4
Malachite	0.39	-4.91	-5.31	Cu2(OH)2CO3
Manganite	-2.51	22.83	25.34	MnOOH
Massicot	-7.66	5.24	12.89	PbO
Matlockite	-7.17	-16.14	-8.97	PbClF

Melanothallite	-18.64	-12.38	6.26	CuCl ₂
Melanterite	-11.73	-13.94	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.47	-97.56	-45.09	HgS
Mg(OH) ₂ (active)	-6.84	11.96	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.34	-5.06	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.35	-201.66	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-19.46	6.90	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.03	9.17	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.60	-18.22	5.38	MgCrO ₄
MgF ₂	-2.55	-10.68	-8.13	MgF ₂
MgMoO ₄	-7.03	-8.88	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.56	-2.51	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.88	-13.08	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.08	41.44	73.52	Pb ₃ O ₄
Mirabilite	-5.59	-6.70	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.95	-7.05	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.67	-56.38	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-150.66	-89.58	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.88	-1.38	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.87	-10.16	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.58	-76.41	0.17	MnS
MnS (pnk)	-79.75	-76.41	3.34	MnS
MnSb	-96.25	-99.16	-2.91	MnSb
MnSe	-40.33	-36.83	3.50	MnSe
MnSeO ₃	-5.63	-4.50	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.49	-4.50	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.03	-15.08	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.73	-7.15	2.58	MnSO ₄
Monteponite	-8.81	6.30	15.10	CdO
Montroydite	-7.55	-11.19	-3.64	HgO
MoO ₃	-12.83	-20.83	-8.00	MoO ₃
Morenosite	-7.70	-9.85	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.05	-219.31	-70.26	MoS ₂
Na-Jarosite	-8.79	-19.99	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-40.05	-49.94	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.70	-19.77	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.66	-31.26	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.91	-10.42	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.65	-10.42	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.36	-4.06	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.91	-14.63	1.28	Na ₂ SeO ₄
Na ₃ Sb	-175.47	-81.02	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.57	7.11	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-33.60	3.80	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.77	-12.50	-6.73	CuCl
NaSb	-88.87	-65.70	23.17	NaSb
Natron	-8.66	-9.97	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.16	-3.30	3.86	NaVO ₃
Nesquehonite	-3.75	-8.42	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.53	7.27	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-25.17	-9.47	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.04	11.96	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.24	-13.11	-6.87	NiCO ₃
NiMoO ₄	-2.43	-13.57	-11.14	NiMoO ₄
NiS (alpha)	-73.51	-79.11	-5.60	NiS
NiS (beta)	-68.01	-79.11	-11.10	NiS
NiS (gamma)	-66.31	-79.11	-12.80	NiS
NiSe	-21.83	-39.53	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.01	-7.20	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-16.26	-17.78	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-7.16	10.34	17.50	MnO ₂
O ₂ (g)	-31.63	51.46	83.09	O ₂
Orpiment	-242.99	-304.05	-61.07	As ₂ S ₃
Otavite	-2.08	-14.08	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.46	-3.94	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.91	5.24	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-61.15	-69.91	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.38	0.41	8.79	Pb ₂ (OH) ₃ Cl

Pb2O(OH) 2	-15.72	10.47	26.19	Pb2O(OH) 2
Pb2O3	-24.84	36.20	61.04	Pb2O3
Pb2OCO3	-9.35	-9.91	-0.56	Pb2OCO3
Pb2V2O7	-4.64	-6.54	-1.90	Pb2V2O7
Pb3(AsO4) 2	-21.36	-15.56	5.80	Pb3(AsO4) 2
Pb3(VO4) 2	-7.45	-1.31	6.14	Pb3(VO4) 2
Pb3O2CO3	-15.69	-4.67	11.02	Pb3O2CO3
Pb3O2SO4	-12.09	-1.40	10.69	Pb3O2SO4
Pb4(OH) 6SO4	-17.27	3.83	21.10	Pb4(OH) 6SO4
Pb4O3SO4	-18.04	3.83	21.88	Pb4O3SO4
PbCrO4	-12.34	-24.94	-12.60	PbCrO4
PbF2	-9.97	-17.41	-7.44	PbF2
Pbmetal	-24.74	-20.49	4.25	Pb
PbMoO4	0.02	-15.60	-15.62	PbMoO4
PbO:0.3H2O	-7.74	5.24	12.98	PbO:0.33H2O
PbSeO4	-12.97	-19.81	-6.84	PbSeO4
Periclase	-9.63	11.96	21.58	MgO
Phosgenite	-10.21	-30.02	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-10.87	11.94	22.80	Ca(OH) 2
Pyrite	-125.33	-143.84	-18.51	FeS2
Pyrochroite	-5.23	9.96	15.19	Mn(OH) 2
Pyrolusite	-5.69	35.69	41.38	MnO2
Realgar	-101.96	-121.70	-19.75	AsS
Retgersite	-7.81	-9.85	-2.04	NiSO4:6H2O
Rhodochrosite	0.16	-10.42	-10.58	MnCO3
Rutherfordine	-4.17	-18.67	-14.50	UO2CO3
Sb(OH) 3	-12.34	-19.44	-7.11	Sb(OH) 3
Sb2O4	-16.56	-13.16	3.40	Sb2O4
Sb2O5	-26.38	-36.05	-9.67	Sb2O5
Sb2Se3	-111.52	-179.28	-67.76	Sb2Se3
Sb4O6(cubic)	-59.52	-77.78	-18.26	Sb4O6
Sb4O6(orth)	-59.88	-77.78	-17.90	Sb4O6
SbCl3	-50.19	-49.62	0.57	SbCl3
SbF3	-43.18	-53.41	-10.23	SbF3
Sbmetal	-46.35	-58.04	-11.69	Sb
SbO2	-3.07	-30.89	-27.82	SbO2
Schoepite	-4.29	1.71	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.96	-21.07	-7.11	Se
Semetal(hex)	-13.36	-21.07	-7.71	Se
Senarmontite	-26.52	-38.89	-12.37	Sb2O3
SeO2	-14.59	-14.46	0.12	SeO2
SeO3	-46.09	-25.04	21.04	SeO3
Siderite	-6.96	-17.20	-10.24	FeCO3
Smithsonite	-1.44	-11.44	-10.00	ZnCO3
Sphalerite	-65.99	-77.44	-11.45	ZnS
Spinel	-5.41	31.44	36.85	MgAl2O4
Stibnite	-247.55	-298.01	-50.46	Sb2S3
Sulfur	-58.50	-60.64	-2.14	S
Tenorite	0.09	7.73	7.64	CuO
Thenardite	-7.02	-6.70	0.32	Na2SO4
Thermonatrite	-10.60	-9.97	0.64	Na2CO3:H2O
Tyuyamunite	-5.74	-1.66	4.08	Ca(UO2) 2(VO4) 2
U3O8	-14.04	7.04	21.08	U3O8
U3Sb4	-583.35	-430.96	152.38	U3Sb4
U4O9	-30.48	-33.50	-3.02	U4O9
UF4	-30.55	-60.09	-29.54	UF4
UF4:2.5H2O	-27.37	-60.09	-32.72	UF4:2.5H2O
UO2(am)	-15.74	-14.81	0.93	UO2
UO2(NO3) 2	-41.22	-29.08	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-33.93	-29.08	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-32.47	-29.08	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-31.12	-29.08	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-3.90	1.71	5.61	UO2(OH) 2
UO2SeO4:4H2O	-21.08	-23.33	-2.25	UO2SeO4:4H2O
UO3	-5.99	1.71	7.70	UO3
Uraninite	-10.14	-14.81	-4.67	UO2
USb2	-221.14	-191.56	29.58	USb2

V(OH)3	-19.23	-11.64	7.59	V(OH)3
V2O5	-15.66	-17.02	-1.36	V2O5
V3O5	-40.98	-39.14	1.84	V3O5
V4O7	-50.80	-43.61	7.19	V4O7
V6O13	-41.65	-102.51	-60.86	V6O13
Valentinite	-30.41	-38.89	-8.48	Sb2O3
VC12	-63.50	-44.62	18.87	VC12
VC13	-65.25	-41.82	23.43	VC13
VF4	-64.68	-49.75	14.93	VF4
Vmetal	-94.26	-50.24	44.03	V
VO	-39.26	-24.51	14.76	VO
VO(OH)2	-9.62	-4.47	5.15	VO(OH)2
VO2Cl	-21.41	-18.57	2.84	VO2Cl
VOC1	-32.85	-21.70	11.15	VOC1
VOC12	-37.35	-24.59	12.76	VOC12
VOSO4	-25.19	-21.58	3.61	VOSO4
Witherite	-4.52	-13.09	-8.57	BaCO3
Wurtzite	-68.49	-77.44	-8.95	ZnS
Zincite	-2.40	8.93	11.33	ZnO
Zincosite	-12.11	-8.18	3.93	ZnSO4
Zn(BO2)2	-8.53	-0.24	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.17	-21.85	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.27	8.93	12.20	Zn(OH)2
Zn(OH)2(am)	-3.54	8.93	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.82	8.93	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.60	8.93	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.80	8.93	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.75	0.75	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.38	7.81	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.12	-4.47	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.34	-7.42	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.78	18.62	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.95	24.55	38.50	Zn5(OH)8Cl2
ZnCl2	-18.23	-11.18	7.05	ZnCl2
ZnCO3:1H2O	-1.19	-11.45	-10.26	ZnCO3:1H2O
ZnF2	-13.18	-13.71	-0.53	ZnF2
Znmetal	-42.59	-16.80	25.79	Zn
ZnMoO4	-1.78	-11.90	-10.13	ZnMoO4
ZnO(active)	-2.26	8.93	11.19	ZnO
ZnS(am)	-68.39	-77.44	-9.05	ZnS
ZnSb	-85.85	-74.84	11.01	ZnSb
ZnSe	-23.46	-37.86	-14.40	ZnSe
ZnSeO4:6H2O	-14.59	-16.11	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.54	-8.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 77.

```

Title Stage 4 Pit wall interaction mix calculator
MIX 404
409 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000493
11 0.002707

```

```

12      0.002692
13      0.003203
14      0
15      0
Save solution 410
end

```

```

-----
TITLE
-----

```

Stage 4 Pit wall interaction mix calculator

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

Using mix 404.

Mixture 404.

```

      0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
      0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
      0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
      0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
      0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
      0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
      0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
      4.930e-04 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
      2.707e-03 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
      2.692e-03 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
      3.203e-03 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
      0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
      0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
      1.000e+00 Solution 409     Solution after simulation 76.

```

```

-----Solution composition-----

```

Elements	Molality	Moles
Ag	1.820e-08	1.837e-08
Al	3.370e-06	3.402e-06
As	2.678e-10	2.703e-10
B	2.587e-05	2.612e-05
Ba	7.067e-08	7.135e-08
C	2.870e-03	2.898e-03
Ca	4.645e-03	4.690e-03
Cd	1.220e-08	1.232e-08
Cl	2.491e-03	2.515e-03
Co	8.625e-08	8.707e-08
Cr	2.454e-09	2.477e-09
Cu	1.754e-06	1.770e-06
F	1.635e-04	1.651e-04
Fe	1.852e-09	1.869e-09

Hg	1.750e-09	1.766e-09
K	3.079e-03	3.108e-03
Mg	4.559e-03	4.603e-03
Mn	5.347e-05	5.398e-05
Mo	1.727e-06	1.743e-06
N	8.428e-06	8.509e-06
Na	8.126e-03	8.204e-03
Ni	1.077e-07	1.087e-07
Pb	4.368e-09	4.410e-09
S	1.219e-02	1.231e-02
Sb	2.435e-08	2.458e-08
Se	1.231e-07	1.243e-07
U	3.107e-07	3.136e-07
V	5.366e-09	5.417e-09
Zn	5.006e-06	5.054e-06

-----Description of solution-----

	pH	=	7.377	Charge balance
	pe	=	5.489	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	3.916e-02	
	Mass of water (kg)	=	1.010e+00	
	Total alkalinity (eq/kg)	=	2.700e-03	
	Total CO2 (mol/kg)	=	2.870e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.007e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	4	
	Total H	=	1.120780e+02	
	Total O	=	5.609546e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.899e-07	2.399e-07	-6.538	-6.620	-0.082	(0)
H+	5.023e-08	4.195e-08	-7.299	-7.377	-0.078	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.820e-08					
AgCl	1.183e-08	1.183e-08	-7.927	-7.927	0.000	(0)
Ag+	3.337e-09	2.786e-09	-8.477	-8.555	-0.078	(0)
AgCl2-	2.705e-09	2.144e-09	-8.568	-8.669	-0.101	(0)
AgSO4-	3.111e-10	2.466e-10	-9.507	-9.608	-0.101	(0)
AgCl3-2	1.007e-11	3.974e-12	-10.997	-11.401	-0.404	(0)
AgNO2	3.886e-12	3.886e-12	-11.411	-11.411	0.000	(0)
AgF	7.982e-13	7.982e-13	-12.098	-12.098	0.000	(0)
AgCl4-3	1.367e-13	1.688e-14	-12.864	-13.773	-0.908	(0)
AgOH	6.684e-14	6.684e-14	-13.175	-13.175	0.000	(0)
AgNH3+	2.332e-14	1.849e-14	-13.632	-13.733	-0.101	(0)
AgSeO3-	1.756e-14	1.392e-14	-13.756	-13.856	-0.101	(0)
AgH2BO3	1.565e-14	1.565e-14	-13.805	-13.805	0.000	(0)
Ag2Se	5.669e-15	5.669e-15	-14.246	-14.246	0.000	(0)
Ag (NO2) 2-	5.068e-17	4.017e-17	-16.295	-16.396	-0.101	(0)
AgNO3	2.149e-17	2.149e-17	-16.668	-16.668	0.000	(0)
Ag (OH) 2-	1.977e-18	1.567e-18	-17.704	-17.805	-0.101	(0)
Ag (NH3) 2+	6.160e-19	4.883e-19	-18.210	-18.311	-0.101	(0)
Ag (SeO3) 2-3	7.841e-21	9.684e-22	-20.106	-21.014	-0.908	(0)
Ag2MoO4	2.467e-24	2.467e-24	-23.608	-23.608	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.742	-73.742	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.167	-85.782	-1.615	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.542	-148.643	-0.101	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.545	-148.749	-0.204	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.438	-150.812	-0.374	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.768	-151.123	-0.355	(0)

Al	3.370e-06					
Al (OH) 4-	3.201e-06	2.675e-06	-5.495	-5.573	-0.078	(0)
Al (OH) 3	8.856e-08	8.856e-08	-7.053	-7.053	0.000	(0)
AlF3	3.009e-08	3.009e-08	-7.522	-7.522	0.000	(0)
AlF2+	2.489e-08	2.096e-08	-7.604	-7.679	-0.075	(0)
Al (OH) 2+	2.197e-08	1.850e-08	-7.658	-7.733	-0.075	(0)
AlF4-	2.058e-09	1.720e-09	-8.686	-8.765	-0.078	(0)
AlF+2	9.184e-10	4.616e-10	-9.037	-9.336	-0.299	(0)
AlOH+2	1.932e-10	9.709e-11	-9.714	-10.013	-0.299	(0)
AlSO4+	1.668e-11	1.393e-11	-10.778	-10.856	-0.078	(0)
Al+3	2.049e-12	4.047e-13	-11.688	-12.393	-0.704	(0)
Al (SO4) 2-	7.925e-13	6.621e-13	-12.101	-12.179	-0.078	(0)
AlMo6O21-3	6.147e-38	7.592e-39	-37.211	-38.120	-0.908	(0)
As (3)	3.678e-23					
H3AsO3	3.622e-23	3.622e-23	-22.441	-22.441	0.000	(0)
H2AsO3-	5.587e-25	4.429e-25	-24.253	-24.354	-0.101	(0)
HAsO3-2	2.439e-29	9.628e-30	-28.613	-29.016	-0.404	(0)
H4AsO3+	9.498e-31	7.528e-31	-30.022	-30.123	-0.101	(0)
AsO3-3	7.164e-35	8.848e-36	-34.145	-35.053	-0.908	(0)
As (5)	2.678e-10					
HAsO4-2	2.249e-10	8.877e-11	-9.648	-10.052	-0.404	(0)
H2AsO4-	4.284e-11	3.396e-11	-10.368	-10.469	-0.101	(0)
AsO4-3	5.418e-14	6.692e-15	-13.266	-14.174	-0.908	(0)
H3AsO4	2.453e-16	2.476e-16	-15.610	-15.606	0.004	(0)
B	2.587e-05					
H3BO3	2.537e-05	2.560e-05	-4.596	-4.592	0.004	(0)
H2BO3-	4.329e-07	3.544e-07	-6.364	-6.450	-0.087	(0)
CaH2BO3+	3.704e-08	3.033e-08	-7.431	-7.518	-0.087	(0)
MgH2BO3+	2.354e-08	1.928e-08	-7.628	-7.715	-0.087	(0)
NaH2BO3	3.720e-09	3.720e-09	-8.429	-8.429	0.000	(0)
BF (OH) 3-	1.423e-09	1.165e-09	-8.847	-8.934	-0.087	(0)
H5 (BO3) 2-	9.432e-12	7.723e-12	-11.025	-11.112	-0.087	(0)
BF2 (OH) 2-	7.281e-13	5.962e-13	-12.138	-12.225	-0.087	(0)
BaH2BO3+	4.542e-13	3.719e-13	-12.343	-12.430	-0.087	(0)
H8 (BO3) 3-	2.415e-14	1.977e-14	-13.617	-13.704	-0.087	(0)
AgH2BO3	1.565e-14	1.565e-14	-13.805	-13.805	0.000	(0)
BF3OH-	1.356e-18	1.110e-18	-17.868	-17.955	-0.087	(0)
BF4-	3.194e-23	2.615e-23	-22.496	-22.583	-0.087	(0)
Ba	7.067e-08					
Ba+2	6.981e-08	3.395e-08	-7.156	-7.469	-0.313	(0)
BaHCO3+	8.173e-10	6.915e-10	-9.088	-9.160	-0.073	(0)
BaCO3	4.150e-11	4.150e-11	-10.382	-10.382	0.000	(0)
BaH2BO3+	4.542e-13	3.719e-13	-12.343	-12.430	-0.087	(0)
BaOH+	4.237e-14	3.556e-14	-13.373	-13.449	-0.076	(0)
BaNO3+	2.084e-15	1.652e-15	-14.681	-14.782	-0.101	(0)
BaNH3+2	1.764e-16	6.961e-17	-15.754	-16.157	-0.404	(0)
C (4)	2.870e-03					
HCO3-	2.533e-03	2.133e-03	-2.596	-2.671	-0.075	(0)
H2CO3	2.012e-04	2.012e-04	-3.696	-3.696	0.000	(0)
CaHCO3+	6.979e-05	5.904e-05	-4.156	-4.229	-0.073	(0)
MgHCO3+	4.116e-05	3.423e-05	-4.386	-4.466	-0.080	(0)
NaHCO3	7.942e-06	7.942e-06	-5.100	-5.100	0.000	(0)
CaCO3	5.616e-06	5.616e-06	-5.251	-5.251	0.000	(0)
CO3-2	4.900e-06	2.383e-06	-5.310	-5.623	-0.313	(0)
MgCO3	3.109e-06	3.109e-06	-5.507	-5.507	0.000	(0)
CuCO3	1.332e-06	1.332e-06	-5.876	-5.876	0.000	(0)
MnHCO3+	8.016e-07	6.727e-07	-6.096	-6.172	-0.076	(0)
NaCO3-	3.491e-07	2.939e-07	-6.457	-6.532	-0.075	(0)
UO2 (CO3) 3-4	2.045e-07	4.964e-09	-6.689	-8.304	-1.615	(0)
ZnCO3	2.028e-07	2.028e-07	-6.693	-6.693	0.000	(0)
ZnHCO3+	1.258e-07	9.972e-08	-6.900	-7.001	-0.101	(0)
UO2 (CO3) 2-2	1.053e-07	4.156e-08	-6.978	-7.381	-0.404	(0)
Cu (CO3) 2-2	2.164e-08	8.542e-09	-7.665	-8.068	-0.404	(0)
CuHCO3+	1.611e-08	1.277e-08	-7.793	-7.894	-0.101	(0)
NiHCO3+	1.058e-08	8.385e-09	-7.976	-8.076	-0.101	(0)
CoHCO3+	4.895e-09	3.880e-09	-8.310	-8.411	-0.101	(0)
NiCO3	2.836e-09	2.836e-09	-8.547	-8.547	0.000	(0)
PbCO3	2.153e-09	2.153e-09	-8.667	-8.667	0.000	(0)

	CoCO3	9.423e-10	9.423e-10	-9.026	-9.026	0.000	(0)
	UO2CO3	8.740e-10	8.740e-10	-9.059	-9.059	0.000	(0)
	BaHCO3+	8.173e-10	6.915e-10	-9.088	-9.160	-0.073	(0)
	PbHCO3+	6.008e-10	4.762e-10	-9.221	-9.322	-0.101	(0)
	CdCO3	1.855e-10	1.855e-10	-9.732	-9.732	0.000	(0)
	BaCO3	4.150e-11	4.150e-11	-10.382	-10.382	0.000	(0)
	Pb (CO3) 2-2	3.750e-11	1.480e-11	-10.426	-10.830	-0.404	(0)
	CdHCO3+	2.092e-11	1.658e-11	-10.680	-10.780	-0.101	(0)
	Cd (CO3) 2-2	8.302e-13	3.277e-13	-12.081	-12.484	-0.404	(0)
	FeHCO3+	9.709e-14	8.214e-14	-13.013	-13.085	-0.073	(0)
	HgCO3	5.056e-14	5.056e-14	-13.296	-13.296	0.000	(0)
	Hg (CO3) 2-2	9.654e-16	3.811e-16	-15.015	-15.419	-0.404	(0)
	HgHCO3+	4.983e-17	3.949e-17	-16.303	-16.403	-0.101	(0)
Ca	4.645e-03						
	Ca+2	3.057e-03	1.487e-03	-2.515	-2.828	-0.313	(0)
	CaSO4	1.511e-03	1.511e-03	-2.821	-2.821	0.000	(0)
	CaHCO3+	6.979e-05	5.904e-05	-4.156	-4.229	-0.073	(0)
	CaCO3	5.616e-06	5.616e-06	-5.251	-5.251	0.000	(0)
	CaF+	2.206e-06	1.851e-06	-5.656	-5.733	-0.076	(0)
	CaH2BO3+	3.704e-08	3.033e-08	-7.431	-7.518	-0.087	(0)
	CaOH+	8.412e-09	7.117e-09	-8.075	-8.148	-0.073	(0)
	CaNO3+	5.759e-11	4.565e-11	-10.240	-10.341	-0.101	(0)
	CaNH3+2	1.541e-11	6.083e-12	-10.812	-11.216	-0.404	(0)
	Ca (NH3) 2+2	1.993e-20	7.869e-21	-19.700	-20.104	-0.404	(0)
Cd	1.220e-08						
	Cd+2	7.021e-09	3.415e-09	-8.154	-8.467	-0.313	(0)
	CdSO4	3.550e-09	3.550e-09	-8.450	-8.450	0.000	(0)
	CdCl+	8.558e-10	6.783e-10	-9.068	-9.169	-0.101	(0)
	Cd (SO4) 2-2	5.380e-10	2.124e-10	-9.269	-9.673	-0.404	(0)
	CdCO3	1.855e-10	1.855e-10	-9.732	-9.732	0.000	(0)
	CdHCO3+	2.092e-11	1.658e-11	-10.680	-10.780	-0.101	(0)
	CdOH+	8.209e-12	6.507e-12	-11.086	-11.187	-0.101	(0)
	CdF+	7.786e-12	6.172e-12	-11.109	-11.210	-0.101	(0)
	CdOHC1	6.675e-12	6.675e-12	-11.176	-11.176	0.000	(0)
	CdCl2	5.882e-12	5.882e-12	-11.230	-11.230	0.000	(0)
	Cd (CO3) 2-2	8.302e-13	3.277e-13	-12.081	-12.484	-0.404	(0)
	Cd (OH) 2	9.849e-15	9.849e-15	-14.007	-14.007	0.000	(0)
	CdCl3-	9.739e-15	7.720e-15	-14.011	-14.112	-0.101	(0)
	CdF2	1.404e-15	1.404e-15	-14.853	-14.853	0.000	(0)
	CdNO3+	1.322e-16	1.048e-16	-15.879	-15.980	-0.101	(0)
	CdSeO4	3.300e-17	3.300e-17	-16.481	-16.481	0.000	(0)
	Cd2OH+3	9.016e-19	1.114e-19	-18.045	-18.953	-0.908	(0)
	Cd (SeO3) 2-2	4.306e-19	1.700e-19	-18.366	-18.770	-0.404	(0)
	Cd (OH) 3-	1.821e-19	1.444e-19	-18.740	-18.841	-0.101	(0)
	Cd (NO3) 2	5.100e-25	5.100e-25	-24.292	-24.292	0.000	(0)
	Cd (OH) 4-2	1.436e-26	5.668e-27	-25.843	-26.247	-0.404	(0)
	CdHS+	0.000e+00	0.000e+00	-79.359	-79.460	-0.101	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.257	-151.257	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.257	-228.358	-0.101	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.760	-305.163	-0.404	(0)
Cl	2.491e-03						
	Cl-	2.491e-03	2.080e-03	-2.604	-2.682	-0.078	(0)
	MnCl+	4.934e-08	4.140e-08	-7.307	-7.383	-0.076	(0)
	AgCl	1.183e-08	1.183e-08	-7.927	-7.927	0.000	(0)
	ZnCl+	9.291e-09	7.726e-09	-8.032	-8.112	-0.080	(0)
	AgCl2-	2.705e-09	2.144e-09	-8.568	-8.669	-0.101	(0)
	ZnOHC1	2.427e-09	2.427e-09	-8.615	-8.615	0.000	(0)
	CdCl+	8.558e-10	6.783e-10	-9.068	-9.169	-0.101	(0)
	CuCl	3.945e-10	3.945e-10	-9.404	-9.404	0.000	(0)
	CuCl+	3.762e-10	3.128e-10	-9.425	-9.505	-0.080	(0)
	NiCl+	2.142e-10	1.697e-10	-9.669	-9.770	-0.101	(0)
	CoCl+	2.123e-10	1.683e-10	-9.673	-9.774	-0.101	(0)
	CuCl2-	2.062e-10	1.715e-10	-9.686	-9.766	-0.080	(0)
	MnCl2	1.216e-10	1.216e-10	-9.915	-9.915	0.000	(0)
	PbCl+	2.799e-11	2.218e-11	-10.553	-10.654	-0.101	(0)
	ZnCl2	2.547e-11	2.547e-11	-10.594	-10.594	0.000	(0)
	HgClOH	1.562e-11	1.562e-11	-10.806	-10.806	0.000	(0)
	AgCl3-2	1.007e-11	3.974e-12	-10.997	-11.401	-0.404	(0)

HgCl2	7.670e-12	7.670e-12	-11.115	-11.115	0.000	(0)
CdOHC1	6.675e-12	6.675e-12	-11.176	-11.176	0.000	(0)
CdCl2	5.882e-12	5.882e-12	-11.230	-11.230	0.000	(0)
CuCl2	2.256e-13	2.256e-13	-12.647	-12.647	0.000	(0)
PbCl2	2.061e-13	2.061e-13	-12.686	-12.686	0.000	(0)
HgCl3-	2.013e-13	1.595e-13	-12.696	-12.797	-0.101	(0)
CuCl3-2	1.538e-13	7.625e-14	-12.813	-13.118	-0.305	(0)
AgCl4-3	1.367e-13	1.688e-14	-12.864	-13.773	-0.908	(0)
MnCl3-	8.305e-14	6.969e-14	-13.081	-13.157	-0.076	(0)
ZnCl3-	5.061e-14	4.208e-14	-13.296	-13.376	-0.080	(0)
CdCl3-	9.739e-15	7.720e-15	-14.011	-14.112	-0.101	(0)
HgCl4-2	3.347e-15	1.321e-15	-14.475	-14.879	-0.404	(0)
NiCl2	1.778e-15	1.778e-15	-14.750	-14.750	0.000	(0)
HgCl+	9.282e-16	7.357e-16	-15.032	-15.133	-0.101	(0)
UO2Cl+	3.920e-16	3.107e-16	-15.407	-15.508	-0.101	(0)
PbCl3-	2.153e-16	1.707e-16	-15.667	-15.768	-0.101	(0)
ZnCl4-2	8.828e-17	4.377e-17	-16.054	-16.359	-0.305	(0)
CrCl+2	7.395e-17	2.919e-17	-16.131	-16.535	-0.404	(0)
CuCl3-	5.267e-18	4.380e-18	-17.278	-17.359	-0.080	(0)
PbCl4-2	4.111e-19	1.623e-19	-18.386	-18.790	-0.404	(0)
CrOHC12	2.768e-19	2.768e-19	-18.558	-18.558	0.000	(0)
FeCl+2	1.111e-20	5.507e-21	-19.954	-20.259	-0.305	(0)
CrCl2+	7.268e-21	5.761e-21	-20.139	-20.240	-0.101	(0)
VOC1+	4.485e-22	3.555e-22	-21.348	-21.449	-0.101	(0)
CuCl4-2	9.209e-23	4.566e-23	-22.036	-22.340	-0.305	(0)
FeCl2+	6.098e-23	5.117e-23	-22.215	-22.291	-0.076	(0)
CrO3Cl-	3.535e-26	2.802e-26	-25.452	-25.552	-0.101	(0)
FeCl3	1.064e-26	1.064e-26	-25.973	-25.973	0.000	(0)
CoCl+2	3.080e-35	1.216e-35	-34.512	-34.915	-0.404	(0)
UCl+3	0.000e+00	0.000e+00	-44.380	-45.289	-0.908	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.999	-51.403	-0.404	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.070	-53.474	-0.404	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.203	-66.607	-0.404	(0)
Co (2)	8.625e-08					
Co+2	5.925e-08	2.339e-08	-7.227	-7.631	-0.404	(0)
CoSO4	2.070e-08	2.070e-08	-7.684	-7.684	0.000	(0)
CoHCO3+	4.895e-09	3.880e-09	-8.310	-8.411	-0.101	(0)
CoCO3	9.423e-10	9.423e-10	-9.026	-9.026	0.000	(0)
CoCl+	2.123e-10	1.683e-10	-9.673	-9.774	-0.101	(0)
CoOH+	1.412e-10	1.120e-10	-9.850	-9.951	-0.101	(0)
CoF+	1.064e-10	8.435e-11	-9.973	-10.074	-0.101	(0)
Co (OH) 2	2.133e-12	2.133e-12	-11.671	-11.671	0.000	(0)
CoNO2+	1.388e-12	1.100e-12	-11.858	-11.959	-0.101	(0)
Co (NH3) +2	2.315e-14	9.137e-15	-13.635	-14.039	-0.404	(0)
CoSeO4	6.084e-16	6.084e-16	-15.216	-15.216	0.000	(0)
CoNO3+	4.540e-16	3.599e-16	-15.343	-15.444	-0.101	(0)
Co (OH) 3-	1.288e-17	1.021e-17	-16.890	-16.991	-0.101	(0)
CoOOH-	3.234e-18	2.564e-18	-17.490	-17.591	-0.101	(0)
Co2OH+3	1.063e-18	1.312e-19	-17.974	-18.882	-0.908	(0)
Co (NH3) 2+2	3.209e-21	1.267e-21	-20.494	-20.897	-0.404	(0)
Co (NO3) 2	7.108e-24	7.108e-24	-23.148	-23.148	0.000	(0)
Co (OH) 4-2	9.836e-25	3.883e-25	-24.007	-24.411	-0.404	(0)
Co (NH3) 3+2	1.313e-28	5.182e-29	-27.882	-28.286	-0.404	(0)
Co4 (OH) 4+4	1.291e-30	3.134e-32	-29.889	-31.504	-1.615	(0)
Co (NH3) 4+2	2.239e-36	8.836e-37	-35.650	-36.054	-0.404	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.918	-44.322	-0.404	(0)
Co (3)	8.870e-29					
CoOH+2	8.870e-29	3.501e-29	-28.052	-28.456	-0.404	(0)
Co+3	1.454e-34	2.872e-35	-33.837	-34.542	-0.704	(0)
CoCl+2	3.080e-35	1.216e-35	-34.512	-34.915	-0.404	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.999	-51.403	-0.404	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.252	-61.353	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.941	-66.345	-0.404	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.203	-66.607	-0.404	(0)
Cr (2)	2.127e-26					
Cr+2	2.127e-26	8.397e-27	-25.672	-26.076	-0.404	(0)
Cr (3)	2.454e-09					
Cr (OH) 2+	2.096e-09	1.661e-09	-8.679	-8.780	-0.101	(0)

Cr (OH) 3	1.497e-10	1.497e-10	-9.825	-9.825	0.000	(0)
Cr (OH) +2	1.442e-10	5.691e-11	-9.841	-10.245	-0.404	(0)
CrOHSO4	5.989e-11	5.989e-11	-10.223	-10.223	0.000	(0)
CrO2-	2.139e-12	1.696e-12	-11.670	-11.771	-0.101	(0)
Cr (OH) 4-	1.804e-12	1.430e-12	-11.744	-11.845	-0.101	(0)
CrF+2	4.965e-13	1.960e-13	-12.304	-12.708	-0.404	(0)
CrSO4+	1.417e-13	1.123e-13	-12.849	-12.950	-0.101	(0)
Cr+3	8.779e-14	1.084e-14	-13.057	-13.965	-0.908	(0)
CrCl+2	7.395e-17	2.919e-17	-16.131	-16.535	-0.404	(0)
Cr2 (OH) 2SO4+2	7.803e-19	3.080e-19	-18.108	-18.511	-0.404	(0)
CrOHC12	2.768e-19	2.768e-19	-18.558	-18.558	0.000	(0)
Cr2 (OH) 2 (SO4) 2	8.115e-20	8.115e-20	-19.091	-19.091	0.000	(0)
CrCl2+	7.268e-21	5.761e-21	-20.139	-20.240	-0.101	(0)
CrNO3+2	1.166e-23	4.601e-24	-22.933	-23.337	-0.404	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.250	-42.653	-0.404	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.986	-51.894	-0.908	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.070	-53.474	-0.404	(0)
Cr (6)	8.574e-16					
CrO4-2	7.730e-16	3.760e-16	-15.112	-15.425	-0.313	(0)
HCrO4-	6.438e-17	5.103e-17	-16.191	-16.292	-0.101	(0)
NaCrO4-	1.561e-17	1.237e-17	-16.807	-16.908	-0.101	(0)
KCrO4-	4.394e-18	3.483e-18	-17.357	-17.458	-0.101	(0)
CrO3SO4-2	7.330e-24	2.893e-24	-23.135	-23.539	-0.404	(0)
H2CrO4	1.735e-24	1.735e-24	-23.761	-23.761	0.000	(0)
CrO3Cl-	3.535e-26	2.802e-26	-25.452	-25.552	-0.101	(0)
Cr2O7-2	2.289e-31	9.036e-32	-30.640	-31.044	-0.404	(0)
Cu (1)	7.910e-10					
CuCl	3.945e-10	3.945e-10	-9.404	-9.404	0.000	(0)
CuCl2-	2.062e-10	1.715e-10	-9.686	-9.766	-0.080	(0)
Cu+	1.901e-10	1.507e-10	-9.721	-9.822	-0.101	(0)
CuCl3-2	1.538e-13	7.625e-14	-12.813	-13.118	-0.305	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.316	-149.680	-0.364	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.064	-150.410	-0.346	(0)
Cu (2)	1.753e-06					
CuCO3	1.332e-06	1.332e-06	-5.876	-5.876	0.000	(0)
Cu+2	1.951e-07	9.488e-08	-6.710	-7.023	-0.313	(0)
CuSO4	9.640e-08	9.640e-08	-7.016	-7.016	0.000	(0)
CuOH+	8.656e-08	7.198e-08	-7.063	-7.143	-0.080	(0)
Cu (CO3) 2-2	2.164e-08	8.542e-09	-7.665	-8.068	-0.404	(0)
CuHCO3+	1.611e-08	1.277e-08	-7.793	-7.894	-0.101	(0)
Cu (OH) 2	3.445e-09	3.445e-09	-8.463	-8.463	0.000	(0)
CuF+	8.614e-10	6.828e-10	-9.065	-9.166	-0.101	(0)
CuCl+	3.762e-10	3.128e-10	-9.425	-9.505	-0.080	(0)
Cu2 (OH) 2+2	3.297e-10	1.301e-10	-9.482	-9.886	-0.404	(0)
CuNO2+	8.367e-11	6.632e-11	-10.077	-10.178	-0.101	(0)
CuNH3+2	7.993e-12	3.155e-12	-11.097	-11.501	-0.404	(0)
Cu (OH) 3-	2.139e-12	1.695e-12	-11.670	-11.771	-0.101	(0)
CuCl2	2.256e-13	2.256e-13	-12.647	-12.647	0.000	(0)
Cu (NO2) 2	4.530e-15	4.530e-15	-14.344	-14.344	0.000	(0)
CuNO3+	3.675e-15	2.913e-15	-14.435	-14.536	-0.101	(0)
Cu (OH) 4-2	8.110e-18	3.201e-18	-17.091	-17.495	-0.404	(0)
CuCl3-	5.267e-18	4.380e-18	-17.278	-17.359	-0.080	(0)
CuCl4-2	9.209e-23	4.566e-23	-22.036	-22.340	-0.305	(0)
Cu (NO3) 2	3.560e-24	3.560e-24	-23.449	-23.449	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.026	-218.127	-0.101	(0)
F	1.635e-04					
F-	1.366e-04	1.140e-04	-3.865	-3.943	-0.078	(0)
MgF+	2.402e-05	2.007e-05	-4.619	-4.697	-0.078	(0)
CaF+	2.206e-06	1.851e-06	-5.656	-5.733	-0.076	(0)
NaF	4.765e-07	4.765e-07	-6.322	-6.322	0.000	(0)
MnF+	8.554e-08	7.178e-08	-7.068	-7.144	-0.076	(0)
AlF3	3.009e-08	3.009e-08	-7.522	-7.522	0.000	(0)
AlF2+	2.489e-08	2.096e-08	-7.604	-7.679	-0.075	(0)
HF	7.076e-09	7.076e-09	-8.150	-8.150	0.000	(0)
ZnF+	4.245e-09	3.365e-09	-8.372	-8.473	-0.101	(0)
AlF4-	2.058e-09	1.720e-09	-8.686	-8.765	-0.078	(0)
BF (OH) 3-	1.423e-09	1.165e-09	-8.847	-8.934	-0.087	(0)
AlF+2	9.184e-10	4.616e-10	-9.037	-9.336	-0.299	(0)

CuF+	8.614e-10	6.828e-10	-9.065	-9.166	-0.101	(0)
NiF+	1.153e-10	9.137e-11	-9.938	-10.039	-0.101	(0)
CoF+	1.064e-10	8.435e-11	-9.973	-10.074	-0.101	(0)
CdF+	7.786e-12	6.172e-12	-11.109	-11.210	-0.101	(0)
HF2-	3.707e-12	3.068e-12	-11.431	-11.513	-0.082	(0)
PbF+	3.047e-12	2.416e-12	-11.516	-11.617	-0.101	(0)
UO2F+	1.829e-12	1.450e-12	-11.738	-11.839	-0.101	(0)
AgF	7.982e-13	7.982e-13	-12.098	-12.098	0.000	(0)
BF2 (OH) 2-	7.281e-13	5.962e-13	-12.138	-12.225	-0.087	(0)
CrF+2	4.965e-13	1.960e-13	-12.304	-12.708	-0.404	(0)
UO2F2	4.769e-13	4.769e-13	-12.322	-12.322	0.000	(0)
UO2F3-	1.724e-14	1.366e-14	-13.764	-13.864	-0.101	(0)
PbF2	5.421e-15	5.421e-15	-14.266	-14.266	0.000	(0)
CdF2	1.404e-15	1.404e-15	-14.853	-14.853	0.000	(0)
H2F2	1.341e-16	1.341e-16	-15.872	-15.872	0.000	(0)
FeF2+	3.987e-17	3.346e-17	-16.399	-16.475	-0.076	(0)
UO2F4-2	3.135e-17	1.238e-17	-16.504	-16.907	-0.404	(0)
VO2F	2.669e-17	2.669e-17	-16.574	-16.574	0.000	(0)
FeF+2	2.211e-17	1.096e-17	-16.655	-16.960	-0.305	(0)
FeF3	5.384e-18	5.384e-18	-17.269	-17.269	0.000	(0)
PbF3-	1.479e-18	1.173e-18	-17.830	-17.931	-0.101	(0)
VO2F2-	1.394e-18	1.105e-18	-17.856	-17.957	-0.101	(0)
BF3OH-	1.356e-18	1.110e-18	-17.868	-17.955	-0.087	(0)
VOF+	5.257e-20	4.167e-20	-19.279	-19.380	-0.101	(0)
VO2F3-2	3.982e-21	1.572e-21	-20.400	-20.804	-0.404	(0)
VOF2	1.782e-21	1.782e-21	-20.749	-20.749	0.000	(0)
PbF4-2	1.622e-22	6.401e-23	-21.790	-22.194	-0.404	(0)
HgF+	9.454e-23	7.494e-23	-22.024	-22.125	-0.101	(0)
BF4-	3.194e-23	2.615e-23	-22.496	-22.583	-0.087	(0)
VOF3-	9.097e-24	7.210e-24	-23.041	-23.142	-0.101	(0)
VO2F4-3	7.143e-25	8.821e-26	-24.146	-25.054	-0.908	(0)
Sb (OH) 2F	2.671e-25	2.671e-25	-24.573	-24.573	0.000	(0)
SbOF	2.628e-25	2.628e-25	-24.580	-24.580	0.000	(0)
VOF4-2	8.409e-27	3.319e-27	-26.075	-26.479	-0.404	(0)
UF3+	3.677e-35	2.914e-35	-34.435	-34.535	-0.101	(0)
UF2+2	4.085e-36	1.612e-36	-35.389	-35.793	-0.404	(0)
UF4	3.644e-37	3.644e-37	-36.438	-36.438	0.000	(0)
UF+3	9.093e-39	1.123e-39	-38.041	-38.950	-0.908	(0)
UF5-	2.078e-39	1.647e-39	-38.682	-38.783	-0.101	(0)
UF6-2	1.437e-40	0.000e+00	-39.843	-40.246	-0.404	(0)
Fe (2)	1.121e-11					
Fe+2	7.751e-12	3.060e-12	-11.111	-11.514	-0.404	(0)
FeSO4	3.331e-12	3.331e-12	-11.477	-11.477	0.000	(0)
FeHCO3+	9.709e-14	8.214e-14	-13.013	-13.085	-0.073	(0)
FeOH+	3.482e-14	2.922e-14	-13.458	-13.534	-0.076	(0)
Fe (OH) 2	5.568e-18	5.568e-18	-17.254	-17.254	0.000	(0)
Fe (OH) 3-	5.034e-19	4.224e-19	-18.298	-18.374	-0.076	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.567	-160.567	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.430	-237.531	-0.101	(0)
Fe (3)	1.841e-09					
Fe (OH) 2+	1.505e-09	1.267e-09	-8.822	-8.897	-0.075	(0)
Fe (OH) 3	3.265e-10	3.265e-10	-9.486	-9.486	0.000	(0)
Fe (OH) 4-	8.663e-12	7.294e-12	-11.062	-11.137	-0.075	(0)
FeOH+2	2.739e-14	1.358e-14	-13.562	-13.867	-0.305	(0)
FeF2+	3.987e-17	3.346e-17	-16.399	-16.475	-0.076	(0)
FeF+2	2.211e-17	1.096e-17	-16.655	-16.960	-0.305	(0)
FeF3	5.384e-18	5.384e-18	-17.269	-17.269	0.000	(0)
FeSO4+	5.199e-18	4.363e-18	-17.284	-17.360	-0.076	(0)
Fe (SO4) 2-	5.219e-19	4.136e-19	-18.282	-18.383	-0.101	(0)
Fe+3	4.438e-19	8.767e-20	-18.353	-19.057	-0.704	(0)
FeCl+2	1.111e-20	5.507e-21	-19.954	-20.259	-0.305	(0)
FeCl2+	6.098e-23	5.117e-23	-22.215	-22.291	-0.076	(0)
FeHSeO3+2	4.806e-23	1.897e-23	-22.318	-22.722	-0.404	(0)
Fe2 (OH) 2+4	2.515e-25	6.106e-27	-24.599	-26.214	-1.615	(0)
FeNO3+2	2.156e-26	8.511e-27	-25.666	-26.070	-0.404	(0)
FeCl3	1.064e-26	1.064e-26	-25.973	-25.973	0.000	(0)
Fe3 (OH) 4+5	3.731e-32	1.119e-34	-31.428	-33.951	-2.523	(0)
H (0)	2.595e-29					

H2	1.298e-29	1.309e-29	-28.887	-28.883	0.004	(0)
Hg (0)	1.720e-09					
Hg	1.720e-09	1.720e-09	-8.765	-8.765	0.000	(0)
Hg (1)	1.049e-19					
Hg2+2	5.243e-20	2.070e-20	-19.280	-19.684	-0.404	(0)
Hg (2)	2.993e-11					
HgClOH	1.562e-11	1.562e-11	-10.806	-10.806	0.000	(0)
HgCl2	7.670e-12	7.670e-12	-11.115	-11.115	0.000	(0)
Hg (OH) 2	6.379e-12	6.437e-12	-11.195	-11.191	0.004	(0)
HgCl3-	2.013e-13	1.595e-13	-12.696	-12.797	-0.101	(0)
HgCO3	5.056e-14	5.056e-14	-13.296	-13.296	0.000	(0)
HgCl4-2	3.347e-15	1.321e-15	-14.475	-14.879	-0.404	(0)
Hg (CO3) 2-2	9.654e-16	3.811e-16	-15.015	-15.419	-0.404	(0)
HgCl+	9.282e-16	7.357e-16	-15.032	-15.133	-0.101	(0)
HgOH+	2.136e-16	1.693e-16	-15.670	-15.771	-0.101	(0)
HgHCO3+	4.983e-17	3.949e-17	-16.303	-16.403	-0.101	(0)
Hg (NH3) 2+2	2.992e-19	1.181e-19	-18.524	-18.928	-0.404	(0)
Hg (OH) 3-	2.453e-19	1.944e-19	-18.610	-18.711	-0.101	(0)
HgNH3+2	9.208e-20	3.635e-20	-19.036	-19.440	-0.404	(0)
Hg+2	4.491e-20	1.773e-20	-19.348	-19.751	-0.404	(0)
HgSO4	2.058e-20	2.058e-20	-19.686	-19.686	0.000	(0)
HgF+	9.454e-23	7.494e-23	-22.024	-22.125	-0.101	(0)
Hg (NH3) 3+2	3.871e-27	1.528e-27	-26.412	-26.816	-0.404	(0)
HgNO3+	8.016e-29	6.354e-29	-28.096	-28.197	-0.101	(0)
Hg (NH3) 4+2	9.991e-35	3.944e-35	-34.000	-34.404	-0.404	(0)
Hg (NO3) 2	2.564e-37	2.564e-37	-36.591	-36.591	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.348	-138.448	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.375	-139.779	-0.404	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.432	-139.432	0.000	(0)
K	3.079e-03					
K+	2.986e-03	2.493e-03	-2.525	-2.603	-0.078	(0)
KSO4-	9.298e-05	7.829e-05	-4.032	-4.106	-0.075	(0)
KCrO4-	4.394e-18	3.483e-18	-17.357	-17.458	-0.101	(0)
Mg	4.559e-03					
Mg+2	3.225e-03	1.568e-03	-2.491	-2.805	-0.313	(0)
MgSO4	1.266e-03	1.266e-03	-2.898	-2.898	0.000	(0)
MgHCO3+	4.116e-05	3.423e-05	-4.386	-4.466	-0.080	(0)
MgF+	2.402e-05	2.007e-05	-4.619	-4.697	-0.078	(0)
MgCO3	3.109e-06	3.109e-06	-5.507	-5.507	0.000	(0)
MgOH+	1.764e-07	1.498e-07	-6.754	-6.825	-0.071	(0)
MgH2BO3+	2.354e-08	1.928e-08	-7.628	-7.715	-0.087	(0)
Mn (2)	5.347e-05					
Mn+2	4.005e-05	1.581e-05	-4.397	-4.801	-0.404	(0)
MnSO4	1.247e-05	1.247e-05	-4.904	-4.904	0.000	(0)
MnHCO3+	8.016e-07	6.727e-07	-6.096	-6.172	-0.076	(0)
MnF+	8.554e-08	7.178e-08	-7.068	-7.144	-0.076	(0)
MnCl+	4.934e-08	4.140e-08	-7.307	-7.383	-0.076	(0)
MnOH+	1.135e-08	9.527e-09	-7.945	-8.021	-0.076	(0)
MnCl2	1.216e-10	1.216e-10	-9.915	-9.915	0.000	(0)
MnNO3+	3.069e-13	2.432e-13	-12.513	-12.614	-0.101	(0)
MnSeO4	2.209e-13	2.209e-13	-12.656	-12.656	0.000	(0)
MnCl3-	8.305e-14	6.969e-14	-13.081	-13.157	-0.076	(0)
Mn (OH) 3-	4.038e-18	3.388e-18	-17.394	-17.470	-0.076	(0)
Mn (NO3) 2	5.932e-21	5.932e-21	-20.227	-20.227	0.000	(0)
Mn (OH) 4-2	5.293e-24	2.624e-24	-23.276	-23.581	-0.305	(0)
MnSe	0.000e+00	0.000e+00	-42.234	-42.234	0.000	(0)
Mn (3)	1.103e-24					
Mn+3	1.103e-24	2.178e-25	-23.958	-24.662	-0.704	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.944	-42.249	-0.305	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.047	-46.132	-0.084	(0)
Mo	1.727e-06					
MoO4-2	1.726e-06	8.393e-07	-5.763	-6.076	-0.313	(0)
HMoO4-	8.838e-10	7.006e-10	-9.054	-9.155	-0.101	(0)
H2MoO4	2.153e-13	2.153e-13	-12.667	-12.667	0.000	(0)
Ag2MoO4	2.467e-24	2.467e-24	-23.608	-23.608	0.000	(0)
AlMo6O21-3	6.147e-38	7.592e-39	-37.211	-38.120	-0.908	(0)

Mo7O24-6	0.000e+00	0.000e+00	-44.926	-48.560	-3.633	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.027	-49.550	-2.523	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.530	-52.145	-1.615	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.368	-56.277	-0.908	(0)
N (-3)	3.088e-07					
NH4+	2.920e-07	2.391e-07	-6.535	-6.621	-0.087	(0)
NH4SO4-	1.354e-08	1.136e-08	-7.868	-7.945	-0.076	(0)
NH3	3.249e-09	3.249e-09	-8.488	-8.488	0.000	(0)
CaNH3+2	1.541e-11	6.083e-12	-10.812	-11.216	-0.404	(0)
CuNH3+2	7.993e-12	3.155e-12	-11.097	-11.501	-0.404	(0)
NiNH3+2	1.410e-13	5.566e-14	-12.851	-13.254	-0.404	(0)
AgNH3+	2.332e-14	1.849e-14	-13.632	-13.733	-0.101	(0)
Co (NH3) +2	2.315e-14	9.137e-15	-13.635	-14.039	-0.404	(0)
BaNH3+2	1.764e-16	6.961e-17	-15.754	-16.157	-0.404	(0)
Ag (NH3) 2+	6.160e-19	4.883e-19	-18.210	-18.311	-0.101	(0)
Hg (NH3) 2+2	2.992e-19	1.181e-19	-18.524	-18.928	-0.404	(0)
HgNH3+2	9.208e-20	3.635e-20	-19.036	-19.440	-0.404	(0)
Ni (NH3) 2+2	6.623e-20	2.614e-20	-19.179	-19.583	-0.404	(0)
Ca (NH3) 2+2	1.993e-20	7.869e-21	-19.700	-20.104	-0.404	(0)
Co (NH3) 2+2	3.209e-21	1.267e-21	-20.494	-20.897	-0.404	(0)
Hg (NH3) 3+2	3.871e-27	1.528e-27	-26.412	-26.816	-0.404	(0)
Co (NH3) 3+2	1.313e-28	5.182e-29	-27.882	-28.286	-0.404	(0)
Hg (NH3) 4+2	9.991e-35	3.944e-35	-34.000	-34.404	-0.404	(0)
Co (NH3) 4+2	2.239e-36	8.836e-37	-35.650	-36.054	-0.404	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.250	-42.653	-0.404	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.918	-44.322	-0.404	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.986	-51.894	-0.908	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.999	-51.403	-0.404	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.070	-53.474	-0.404	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.252	-61.353	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.941	-66.345	-0.404	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.203	-66.607	-0.404	(0)
N (3)	8.108e-06					
NO2-	8.108e-06	6.675e-06	-5.091	-5.176	-0.084	(0)
CuNO2+	8.367e-11	6.632e-11	-10.077	-10.178	-0.101	(0)
AgNO2	3.886e-12	3.886e-12	-11.411	-11.411	0.000	(0)
CoNO2+	1.388e-12	1.100e-12	-11.858	-11.959	-0.101	(0)
Cu (NO2) 2	4.530e-15	4.530e-15	-14.344	-14.344	0.000	(0)
Ag (NO2) 2-	5.068e-17	4.017e-17	-16.295	-16.396	-0.101	(0)
N (5)	1.168e-08					
NO3-	1.162e-08	9.708e-09	-7.935	-8.013	-0.078	(0)
CaNO3+	5.759e-11	4.565e-11	-10.240	-10.341	-0.101	(0)
MnNO3+	3.069e-13	2.432e-13	-12.513	-12.614	-0.101	(0)
ZnNO3+	4.549e-14	3.606e-14	-13.342	-13.443	-0.101	(0)
CuNO3+	3.675e-15	2.913e-15	-14.435	-14.536	-0.101	(0)
BaNO3+	2.084e-15	1.652e-15	-14.681	-14.782	-0.101	(0)
NiNO3+	9.812e-16	7.778e-16	-15.008	-15.109	-0.101	(0)
CoNO3+	4.540e-16	3.599e-16	-15.343	-15.444	-0.101	(0)
CdNO3+	1.322e-16	1.048e-16	-15.879	-15.980	-0.101	(0)
PbNO3+	5.445e-17	4.316e-17	-16.264	-16.365	-0.101	(0)
AgNO3	2.149e-17	2.149e-17	-16.668	-16.668	0.000	(0)
Mn (NO3) 2	5.932e-21	5.932e-21	-20.227	-20.227	0.000	(0)
UO2NO3+	2.251e-21	1.784e-21	-20.648	-20.749	-0.101	(0)
Zn (NO3) 2	6.984e-23	6.984e-23	-22.156	-22.156	0.000	(0)
CrNO3+2	1.166e-23	4.601e-24	-22.933	-23.337	-0.404	(0)
Co (NO3) 2	7.108e-24	7.108e-24	-23.148	-23.148	0.000	(0)
Cu (NO3) 2	3.560e-24	3.560e-24	-23.449	-23.449	0.000	(0)
Pb (NO3) 2	7.115e-25	7.115e-25	-24.148	-24.148	0.000	(0)
VO2NO3	6.552e-25	6.552e-25	-24.184	-24.184	0.000	(0)
Cd (NO3) 2	5.100e-25	5.100e-25	-24.292	-24.292	0.000	(0)
FeNO3+2	2.156e-26	8.511e-27	-25.666	-26.070	-0.404	(0)
HgNO3+	8.016e-29	6.354e-29	-28.096	-28.197	-0.101	(0)
Hg (NO3) 2	2.564e-37	2.564e-37	-36.591	-36.591	0.000	(0)
Na	8.126e-03					
Na+	7.930e-03	6.622e-03	-2.101	-2.179	-0.078	(0)
NaSO4-	1.873e-04	1.577e-04	-3.727	-3.802	-0.075	(0)
NaHCO3	7.942e-06	7.942e-06	-5.100	-5.100	0.000	(0)
NaF	4.765e-07	4.765e-07	-6.322	-6.322	0.000	(0)

	NaCO3-	3.491e-07	2.939e-07	-6.457	-6.532	-0.075	(0)
	NaH2BO3	3.720e-09	3.720e-09	-8.429	-8.429	0.000	(0)
	NaCrO4-	1.561e-17	1.237e-17	-16.807	-16.908	-0.101	(0)
Ni		1.077e-07					
	Ni+2	6.558e-08	3.189e-08	-7.183	-7.496	-0.313	(0)
	NiSO4	2.822e-08	2.822e-08	-7.549	-7.549	0.000	(0)
	NiHCO3+	1.058e-08	8.385e-09	-7.976	-8.076	-0.101	(0)
	NiCO3	2.836e-09	2.836e-09	-8.547	-8.547	0.000	(0)
	NiCl+	2.142e-10	1.697e-10	-9.669	-9.770	-0.101	(0)
	NiOH+	1.215e-10	9.633e-11	-9.915	-10.016	-0.101	(0)
	NiF+	1.153e-10	9.137e-11	-9.938	-10.039	-0.101	(0)
	Ni(SO4)2-2	1.050e-11	4.145e-12	-10.979	-11.383	-0.404	(0)
	Ni(OH)2	1.836e-12	1.836e-12	-11.736	-11.736	0.000	(0)
	NiNH3+2	1.410e-13	5.566e-14	-12.851	-13.254	-0.404	(0)
	NiCl2	1.778e-15	1.778e-15	-14.750	-14.750	0.000	(0)
	NiNO3+	9.812e-16	7.778e-16	-15.008	-15.109	-0.101	(0)
	NiSeO4	7.743e-16	7.743e-16	-15.111	-15.111	0.000	(0)
	Ni(OH)3-	5.555e-16	4.403e-16	-15.255	-15.356	-0.101	(0)
	Ni(NH3)2+2	6.623e-20	2.614e-20	-19.179	-19.583	-0.404	(0)
O(0)		5.854e-35					
	O2	2.927e-35	2.953e-35	-34.534	-34.530	0.004	(0)
Pb		4.368e-09					
	PbCO3	2.153e-09	2.153e-09	-8.667	-8.667	0.000	(0)
	PbSO4	6.529e-10	6.529e-10	-9.185	-9.185	0.000	(0)
	Pb+2	6.180e-10	3.006e-10	-9.209	-9.522	-0.313	(0)
	PbHCO3+	6.008e-10	4.762e-10	-9.221	-9.322	-0.101	(0)
	PbOH+	2.285e-10	1.811e-10	-9.641	-9.742	-0.101	(0)
	Pb(SO4)2-2	4.420e-11	1.745e-11	-10.355	-10.758	-0.404	(0)
	Pb(CO3)2-2	3.750e-11	1.480e-11	-10.426	-10.830	-0.404	(0)
	PbCl+	2.799e-11	2.218e-11	-10.553	-10.654	-0.101	(0)
	PbF+	3.047e-12	2.416e-12	-11.516	-11.617	-0.101	(0)
	Pb(OH)2	1.374e-12	1.374e-12	-11.862	-11.862	0.000	(0)
	PbCl2	2.061e-13	2.061e-13	-12.686	-12.686	0.000	(0)
	PbF2	5.421e-15	5.421e-15	-14.266	-14.266	0.000	(0)
	Pb(OH)3-	4.159e-16	3.296e-16	-15.381	-15.482	-0.101	(0)
	PbCl3-	2.153e-16	1.707e-16	-15.667	-15.768	-0.101	(0)
	PbNO3+	5.445e-17	4.316e-17	-16.264	-16.365	-0.101	(0)
	Pb2OH+3	6.986e-18	8.628e-19	-17.156	-18.064	-0.908	(0)
	PbF3-	1.479e-18	1.173e-18	-17.830	-17.931	-0.101	(0)
	PbCl4-2	4.111e-19	1.623e-19	-18.386	-18.790	-0.404	(0)
	Pb(OH)4-2	4.906e-20	1.937e-20	-19.309	-19.713	-0.404	(0)
	PbF4-2	1.622e-22	6.401e-23	-21.790	-22.194	-0.404	(0)
	Pb3(OH)4+2	2.868e-23	1.132e-23	-22.542	-22.946	-0.404	(0)
	Pb(NO3)2	7.115e-25	7.115e-25	-24.148	-24.148	0.000	(0)
	Pb4(OH)4+4	1.113e-27	2.703e-29	-26.953	-28.568	-1.615	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-152.254	-152.254	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-229.855	-229.956	-0.101	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.742	-73.742	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.900	-79.001	-0.101	(0)
	H2S	0.000e+00	0.000e+00	-79.358	-79.358	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.359	-79.460	-0.101	(0)
	S5-2	0.000e+00	0.000e+00	-80.585	-80.989	-0.404	(0)
	S6-2	0.000e+00	0.000e+00	-81.101	-81.505	-0.404	(0)
	S4-2	0.000e+00	0.000e+00	-81.181	-81.585	-0.404	(0)
	S3-2	0.000e+00	0.000e+00	-81.987	-82.391	-0.404	(0)
	S2-2	0.000e+00	0.000e+00	-83.003	-83.407	-0.404	(0)
	S-2	0.000e+00	0.000e+00	-88.619	-88.924	-0.305	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.348	-138.448	-0.101	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.375	-139.779	-0.404	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-139.432	-139.432	0.000	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-148.542	-148.643	-0.101	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-148.545	-148.749	-0.204	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-149.316	-149.680	-0.364	(0)
	ZnS(HS)-	0.000e+00	0.000e+00	-149.544	-149.645	-0.101	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-150.064	-150.410	-0.346	(0)
	Ag(S4)2-3	0.000e+00	0.000e+00	-150.438	-150.812	-0.374	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.768	-151.123	-0.355	(0)

Zn (HS) 2	0.000e+00	0.000e+00	-151.012	-151.012	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.257	-151.257	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.254	-152.254	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.567	-160.567	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.026	-218.127	-0.101	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.633	-226.734	-0.101	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.257	-228.358	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.933	-229.336	-0.404	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.855	-229.956	-0.101	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.430	-237.531	-0.101	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.760	-305.163	-0.404	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.791	-307.195	-0.404	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.860	-320.263	-0.404	(0)
S (6)	1.219e-02					
SO4-2	9.119e-03	4.435e-03	-2.040	-2.353	-0.313	(0)
CaSO4	1.511e-03	1.511e-03	-2.821	-2.821	0.000	(0)
MgSO4	1.266e-03	1.266e-03	-2.898	-2.898	0.000	(0)
NaSO4-	1.873e-04	1.577e-04	-3.727	-3.802	-0.075	(0)
KSO4-	9.298e-05	7.829e-05	-4.032	-4.106	-0.075	(0)
MnSO4	1.247e-05	1.247e-05	-4.904	-4.904	0.000	(0)
ZnSO4	1.435e-06	1.435e-06	-5.843	-5.843	0.000	(0)
Zn (SO4) 2-2	1.404e-07	5.542e-08	-6.853	-7.256	-0.404	(0)
CuSO4	9.640e-08	9.640e-08	-7.016	-7.016	0.000	(0)
NiSO4	2.822e-08	2.822e-08	-7.549	-7.549	0.000	(0)
HSO4-	2.176e-08	1.818e-08	-7.662	-7.740	-0.078	(0)
CoSO4	2.070e-08	2.070e-08	-7.684	-7.684	0.000	(0)
NH4SO4-	1.354e-08	1.136e-08	-7.868	-7.945	-0.076	(0)
CdSO4	3.550e-09	3.550e-09	-8.450	-8.450	0.000	(0)
PbSO4	6.529e-10	6.529e-10	-9.185	-9.185	0.000	(0)
Cd (SO4) 2-2	5.380e-10	2.124e-10	-9.269	-9.673	-0.404	(0)
AgSO4-	3.111e-10	2.466e-10	-9.507	-9.608	-0.101	(0)
CrOHSO4	5.989e-11	5.989e-11	-10.223	-10.223	0.000	(0)
Pb (SO4) 2-2	4.420e-11	1.745e-11	-10.355	-10.758	-0.404	(0)
AlSO4+	1.668e-11	1.393e-11	-10.778	-10.856	-0.078	(0)
Ni (SO4) 2-2	1.050e-11	4.145e-12	-10.979	-11.383	-0.404	(0)
FeSO4	3.331e-12	3.331e-12	-11.477	-11.477	0.000	(0)
Al (SO4) 2-	7.925e-13	6.621e-13	-12.101	-12.179	-0.078	(0)
UO2SO4	6.183e-13	6.183e-13	-12.209	-12.209	0.000	(0)
CrSO4+	1.417e-13	1.123e-13	-12.849	-12.950	-0.101	(0)
UO2 (SO4) 2-2	9.157e-14	3.615e-14	-13.038	-13.442	-0.404	(0)
VO2SO4-	1.783e-17	1.413e-17	-16.749	-16.850	-0.101	(0)
FeSO4+	5.199e-18	4.363e-18	-17.284	-17.360	-0.076	(0)
Cr2 (OH) 2SO4+2	7.803e-19	3.080e-19	-18.108	-18.511	-0.404	(0)
Fe (SO4) 2-	5.219e-19	4.136e-19	-18.282	-18.383	-0.101	(0)
Cr2 (OH) 2 (SO4) 2	8.115e-20	8.115e-20	-19.091	-19.091	0.000	(0)
VOSO4	7.441e-20	7.441e-20	-19.128	-19.128	0.000	(0)
HgSO4	2.058e-20	2.058e-20	-19.686	-19.686	0.000	(0)
CrO3SO4-2	7.330e-24	2.893e-24	-23.135	-23.539	-0.404	(0)
VSO4+	4.561e-34	3.615e-34	-33.341	-33.442	-0.101	(0)
U (SO4) 2	3.070e-39	3.070e-39	-38.513	-38.513	0.000	(0)
USO4+2	2.207e-40	0.000e+00	-39.656	-40.060	-0.404	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.252	-61.353	-0.101	(0)
Sb (3)	7.061e-20					
Sb (OH) 3	3.572e-20	3.572e-20	-19.447	-19.447	0.000	(0)
HSbO2	3.489e-20	3.489e-20	-19.457	-19.457	0.000	(0)
SbO2-	1.699e-24	1.347e-24	-23.770	-23.871	-0.101	(0)
Sb (OH) 4-	9.726e-25	7.709e-25	-24.012	-24.113	-0.101	(0)
Sb (OH) 2F	2.671e-25	2.671e-25	-24.573	-24.573	0.000	(0)
SbOF	2.628e-25	2.628e-25	-24.580	-24.580	0.000	(0)
Sb (OH) 2+	4.593e-26	3.641e-26	-25.338	-25.439	-0.101	(0)
SbO+	1.584e-26	1.256e-26	-25.800	-25.901	-0.101	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.860	-320.263	-0.404	(0)
Sb (5)	2.435e-08					
SbO3-	2.432e-08	1.928e-08	-7.614	-7.715	-0.101	(0)
Sb (OH) 6-	2.695e-11	2.251e-11	-10.569	-10.648	-0.078	(0)
SbO2+	1.228e-23	9.735e-24	-22.911	-23.012	-0.101	(0)
Se (-2)	5.669e-15					
Ag2Se	5.669e-15	5.669e-15	-14.246	-14.246	0.000	(0)

HSe-	4.743e-40	3.760e-40	-39.324	-39.425	-0.101	(0)
MnSe	0.000e+00	0.000e+00	-42.234	-42.234	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.912	-42.912	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.644	-47.048	-0.404	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.167	-85.782	-1.615	(0)
Se (4)	1.230e-07					
HSeO3-	1.033e-07	8.189e-08	-6.986	-7.087	-0.101	(0)
SeO3-2	1.969e-08	7.772e-09	-7.706	-8.109	-0.404	(0)
H2SeO3	1.465e-12	1.465e-12	-11.834	-11.834	0.000	(0)
AgSeO3-	1.756e-14	1.392e-14	-13.756	-13.856	-0.101	(0)
Cd (SeO3) 2-2	4.306e-19	1.700e-19	-18.366	-18.770	-0.404	(0)
Ag (SeO3) 2-3	7.841e-21	9.684e-22	-20.106	-21.014	-0.908	(0)
FeHSeO3+2	4.806e-23	1.897e-23	-22.318	-22.722	-0.404	(0)
Se (6)	1.070e-10					
SeO4-2	1.067e-10	5.191e-11	-9.972	-10.285	-0.313	(0)
MnSeO4	2.209e-13	2.209e-13	-12.656	-12.656	0.000	(0)
ZnSeO4	1.189e-14	1.189e-14	-13.925	-13.925	0.000	(0)
NiSeO4	7.743e-16	7.743e-16	-15.111	-15.111	0.000	(0)
CoSeO4	6.084e-16	6.084e-16	-15.216	-15.216	0.000	(0)
HSeO4-	1.377e-16	1.091e-16	-15.861	-15.962	-0.101	(0)
CdSeO4	3.300e-17	3.300e-17	-16.481	-16.481	0.000	(0)
Zn (SeO4) 2-2	1.585e-24	6.256e-25	-23.800	-24.204	-0.404	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.684	-58.592	-0.908	(0)
U (4)	3.631e-21					
U (OH) 5-	3.625e-21	2.874e-21	-20.441	-20.542	-0.101	(0)
U (OH) 4	5.051e-24	5.051e-24	-23.297	-23.297	0.000	(0)
U (OH) 3+	9.779e-28	7.752e-28	-27.010	-27.111	-0.101	(0)
U (OH) 2+2	3.811e-32	1.504e-32	-31.419	-31.823	-0.404	(0)
UF3+	3.677e-35	2.914e-35	-34.435	-34.535	-0.101	(0)
UF2+2	4.085e-36	1.612e-36	-35.389	-35.793	-0.404	(0)
UF4	3.644e-37	3.644e-37	-36.438	-36.438	0.000	(0)
UOH+3	2.408e-37	2.974e-38	-36.618	-37.527	-0.908	(0)
UF+3	9.093e-39	1.123e-39	-38.041	-38.950	-0.908	(0)
U (SO4) 2	3.070e-39	3.070e-39	-38.513	-38.513	0.000	(0)
UF5-	2.078e-39	1.647e-39	-38.682	-38.783	-0.101	(0)
USO4+2	2.207e-40	0.000e+00	-39.656	-40.060	-0.404	(0)
UF6-2	1.437e-40	0.000e+00	-39.843	-40.246	-0.404	(0)
U+4	0.000e+00	0.000e+00	-42.692	-44.307	-1.615	(0)
UC1+3	0.000e+00	0.000e+00	-44.380	-45.289	-0.908	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.165	-172.340	-8.175	(0)
U (5)	2.296e-16					
UO2+	2.296e-16	1.820e-16	-15.639	-15.740	-0.101	(0)
U (6)	3.107e-07					
UO2 (CO3) 3-4	2.045e-07	4.964e-09	-6.689	-8.304	-1.615	(0)
UO2 (CO3) 2-2	1.053e-07	4.156e-08	-6.978	-7.381	-0.404	(0)
UO2CO3	8.740e-10	8.740e-10	-9.059	-9.059	0.000	(0)
UO2OH+	3.510e-12	2.782e-12	-11.455	-11.556	-0.101	(0)
UO2F+	1.829e-12	1.450e-12	-11.738	-11.839	-0.101	(0)
UO2SO4	6.183e-13	6.183e-13	-12.209	-12.209	0.000	(0)
UO2F2	4.769e-13	4.769e-13	-12.322	-12.322	0.000	(0)
UO2+2	1.894e-13	9.211e-14	-12.723	-13.036	-0.313	(0)
UO2 (SO4) 2-2	9.157e-14	3.615e-14	-13.038	-13.442	-0.404	(0)
UO2F3-	1.724e-14	1.366e-14	-13.764	-13.864	-0.101	(0)
UO2Cl+	3.920e-16	3.107e-16	-15.407	-15.508	-0.101	(0)
(UO2) 2 (OH) 2+2	3.254e-17	1.284e-17	-16.488	-16.891	-0.404	(0)
UO2F4-2	3.135e-17	1.238e-17	-16.504	-16.907	-0.404	(0)
(UO2) 3 (OH) 5+	1.968e-18	1.560e-18	-17.706	-17.807	-0.101	(0)
UO2NO3+	2.251e-21	1.784e-21	-20.648	-20.749	-0.101	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.571	-42.672	-0.101	(0)
V+2	0.000e+00	0.000e+00	-43.158	-43.562	-0.404	(0)
V (3)	1.923e-15					
V (OH) 3	1.923e-15	1.923e-15	-14.716	-14.716	0.000	(0)
V (OH) 2+	6.580e-26	5.215e-26	-25.182	-25.283	-0.101	(0)
VOH+2	5.260e-29	2.076e-29	-28.279	-28.683	-0.404	(0)
V+3	1.398e-33	1.727e-34	-32.854	-33.763	-0.908	(0)
VSO4+	4.561e-34	3.615e-34	-33.341	-33.442	-0.101	(0)

V2 (OH) 3+3	0.000e+00	0.000e+00	-54.605	-55.514	-0.908	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.951	-56.565	-1.615	(0)
V (4)	3.960e-18					
V (OH) 3+	3.676e-18	2.914e-18	-17.435	-17.535	-0.101	(0)
VO+2	1.543e-19	6.092e-20	-18.812	-19.215	-0.404	(0)
VOSO4	7.441e-20	7.441e-20	-19.128	-19.128	0.000	(0)
VOF+	5.257e-20	4.167e-20	-19.279	-19.380	-0.101	(0)
VOF2	1.782e-21	1.782e-21	-20.749	-20.749	0.000	(0)
VOC1+	4.485e-22	3.555e-22	-21.348	-21.449	-0.101	(0)
VOF3-	9.097e-24	7.210e-24	-23.041	-23.142	-0.101	(0)
VOF4-2	8.409e-27	3.319e-27	-26.075	-26.479	-0.404	(0)
H2V2O4+2	1.080e-30	4.261e-31	-29.967	-30.370	-0.404	(0)
V (5)	5.366e-09					
H2VO4-	4.789e-09	3.796e-09	-8.320	-8.421	-0.101	(0)
HVO4-2	5.758e-10	2.273e-10	-9.240	-9.643	-0.404	(0)
H3VO4	1.592e-12	1.592e-12	-11.798	-11.798	0.000	(0)
H3V2O7-	4.926e-14	3.904e-14	-13.308	-13.408	-0.101	(0)
HV2O7-3	2.368e-15	2.925e-16	-14.626	-15.534	-0.908	(0)
VO4-3	2.199e-16	2.716e-17	-15.658	-16.566	-0.908	(0)
VO2+	1.598e-16	1.334e-16	-15.797	-15.875	-0.078	(0)
VO2F	2.669e-17	2.669e-17	-16.574	-16.574	0.000	(0)
VO2SO4-	1.783e-17	1.413e-17	-16.749	-16.850	-0.101	(0)
V2O7-4	7.731e-18	1.877e-19	-17.112	-18.727	-1.615	(0)
VO2F2-	1.394e-18	1.105e-18	-17.856	-17.957	-0.101	(0)
V3O9-3	4.645e-19	5.736e-20	-18.333	-19.241	-0.908	(0)
VO2F3-2	3.982e-21	1.572e-21	-20.400	-20.804	-0.404	(0)
V4O12-4	3.741e-24	9.082e-26	-23.427	-25.042	-1.615	(0)
VO2F4-3	7.143e-25	8.821e-26	-24.146	-25.054	-0.908	(0)
VO2NO3	6.552e-25	6.552e-25	-24.184	-24.184	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.174	-64.807	-3.633	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.475	-63.998	-2.523	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.553	-66.168	-1.615	(0)
Zn	5.006e-06					
Zn+2	3.040e-06	1.479e-06	-5.517	-5.830	-0.313	(0)
ZnSO4	1.435e-06	1.435e-06	-5.843	-5.843	0.000	(0)
ZnCO3	2.028e-07	2.028e-07	-6.693	-6.693	0.000	(0)
Zn (SO4) 2-2	1.404e-07	5.542e-08	-6.853	-7.256	-0.404	(0)
ZnHCO3+	1.258e-07	9.972e-08	-6.900	-7.001	-0.101	(0)
ZnOH+	4.475e-08	3.547e-08	-7.349	-7.450	-0.101	(0)
ZnCl+	9.291e-09	7.726e-09	-8.032	-8.112	-0.080	(0)
ZnF+	4.245e-09	3.365e-09	-8.372	-8.473	-0.101	(0)
ZnOHC1	2.427e-09	2.427e-09	-8.615	-8.615	0.000	(0)
Zn (OH) 2	1.349e-09	1.349e-09	-8.870	-8.870	0.000	(0)
ZnCl2	2.547e-11	2.547e-11	-10.594	-10.594	0.000	(0)
Zn (OH) 3-	2.046e-12	1.622e-12	-11.689	-11.790	-0.101	(0)
ZnCl3-	5.061e-14	4.208e-14	-13.296	-13.376	-0.080	(0)
ZnNO3+	4.549e-14	3.606e-14	-13.342	-13.443	-0.101	(0)
ZnSeO4	1.189e-14	1.189e-14	-13.925	-13.925	0.000	(0)
ZnCl4-2	8.828e-17	4.377e-17	-16.054	-16.359	-0.305	(0)
Zn (OH) 4-2	3.924e-17	1.549e-17	-16.406	-16.810	-0.404	(0)
Zn (NO3) 2	6.984e-23	6.984e-23	-22.156	-22.156	0.000	(0)
Zn (SeO4) 2-2	1.585e-24	6.256e-25	-23.800	-24.204	-0.404	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.544	-149.645	-0.101	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.012	-151.012	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.633	-226.734	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.933	-229.336	-0.404	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.791	-307.195	-0.404	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl1) (NO3) 2	-55.76	-49.47	6.29	(Co (NH3) 5Cl1) (NO3) 2	
(Co (NH3) 5Cl1) Cl2	-43.32	-38.81	4.51	(Co (NH3) 5Cl1) Cl2	
(Co (NH3) 5OH2) Cl3	-50.54	-38.81	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-71.98	-54.05	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-58.08	-38.05	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.07	-28.67	0.40	(NH4) 2CrO4	

(NH4)2SeO4	-23.98	-23.53	0.45	(NH4)2SeO4
Acanthite	-52.51	-88.73	-36.22	Ag2S
Ag2CO3	-11.64	-22.73	-11.09	Ag2CO3
Ag2CrO4	-20.94	-32.53	-11.59	Ag2CrO4
Ag2HVO4	-12.33	-10.85	1.48	Ag2HVO4
Ag2MoO4	-11.64	-23.19	-11.55	Ag2MoO4
Ag2O	-14.93	-2.36	12.57	Ag2O
Ag2Se	-0.46	-49.16	-48.70	Ag2Se
Ag2SeO3	-9.67	-16.82	-7.15	Ag2SeO3
Ag2SeO4	-18.48	-27.39	-8.91	Ag2SeO4
Ag2SO4	-14.64	-19.46	-4.82	Ag2SO4
Ag3AsO3	-28.13	-25.97	2.16	Ag3AsO3
Ag3AsO4	-16.35	-19.14	-2.79	Ag3AsO4
Ag3H2VO5	-17.21	-12.03	5.18	Ag3H2VO5
AgF·4H2O	-13.55	-12.50	1.05	AgF·4H2O
Agmetal	-0.54	-14.04	-13.51	Ag
AgVO3	-10.45	-9.68	0.77	AgVO3
Al(OH)3(am)	-1.06	9.74	10.80	Al(OH)3
Al2(MoO4)3	-45.38	-43.01	2.37	Al2(MoO4)3
Al2O3	-0.18	19.48	19.65	Al2O3
Al4(OH)10SO4	-0.85	21.85	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-10.67	-5.87	4.80	AlAsO4·2H2O
AlOHSO4	-4.14	-7.37	-3.23	AlOHSO4
AlSb	-152.53	-86.91	65.62	AlSb
Alunite	1.17	-0.23	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.09	-11.88	-7.79	PbSO4
Anhydrite	-0.82	-5.18	-4.36	CaSO4
Anilite	-56.23	-88.11	-31.88	Cu0.25Cu1.5S
Antlerite	-2.70	6.09	8.79	Cu3(OH)4SO4
Aragonite	-0.15	-8.45	-8.30	CaCO3
Arsenolite	-87.00	-89.76	-2.76	As4O6
Artinite	-6.08	3.52	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-37.92	-31.21	6.71	As2O5
Atacamite	-1.99	5.40	7.39	Cu2(OH)3Cl
Azurite	-0.65	-17.56	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-17.11	7.28	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-18.30	-2.43	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.45	-9.36	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-28.08	4.86	32.94	Ba3(VO4)2·4H2O
BaCrO4	-13.22	-22.89	-9.67	BaCrO4
BaF2	-9.53	-15.35	-5.82	BaF2
BaMoO4	-6.58	-13.55	-6.96	BaMoO4
Barite	0.16	-9.82	-9.98	BaSO4
BaS	-95.27	-79.09	16.18	BaS
BaSeO3	-9.01	-7.18	1.83	BaSeO3
BaSeO4	-10.29	-17.75	-7.46	BaSeO4
Bianchite	-6.42	-8.18	-1.76	ZnSO4·6H2O
Birnessite	-7.76	10.34	18.09	MnO2
Bixbyite	-4.42	-5.06	-0.64	Mn2O3
BlaubleiI	-55.75	-79.91	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.42	-83.70	-27.28	Cu0.6Cu0.8S
Boehmite	1.16	9.74	8.58	AlOOH
Breithauptite	-58.00	-76.52	-18.52	NiSb
Brochantite	-1.40	13.82	15.22	Cu4(OH)6SO4
Brucite	-4.89	11.95	16.84	Mg(OH)2
Bunsenite	-5.19	7.26	12.45	NiO
Ca(VO3)2	-10.73	-5.07	5.66	Ca(VO3)2
Ca2V2O7	-10.64	6.86	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.69	6.86	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-17.73	4.57	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-20.18	18.78	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-21.08	18.78	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-300.48	-157.51	142.97	Ca3Sb2
CaCrO4	-15.99	-18.25	-2.27	CaCrO4
Calcite	0.03	-8.45	-8.48	CaCO3
Calomel	-7.14	-25.05	-17.91	Hg2Cl2
CaMoO4	-0.95	-8.90	-7.95	CaMoO4
Carnotite	-2.24	-2.01	0.23	KUO2VO4

CaSeO3:2H2O	-5.35	-2.54	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.09	-13.11	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.74	-2.90	9.84	Cd(BO2)2
Cd(OH)2	-7.36	6.29	13.64	Cd(OH)2
Cd(OH)2(am)	-7.44	6.29	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.06	-15.35	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.80	1.76	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.36	8.04	28.40	Cd4(OH)6SO4
CdCl2	-13.17	-13.83	-0.66	CdCl2
CdCl2:1H2O	-12.14	-13.83	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.92	-13.83	-1.91	CdCl2:2.5H2O
CdF2	-15.14	-16.35	-1.21	CdF2
Cdmetal(alpha)	-32.96	-19.45	13.51	Cd
Cdmetal(gamma)	-33.06	-19.45	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-7.31	-3.77	3.54	CdOHCl
CdSb	-77.14	-77.49	-0.35	CdSb
CdSe	-20.31	-40.51	-20.20	CdSe
CdSeO4:2H2O	-16.90	-18.75	-1.85	CdSeO4:2H2O
CdSO4	-10.65	-10.82	-0.17	CdSO4
CdSO4:1H2O	-9.09	-10.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.95	-10.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-2.01	-15.14	-13.13	PbCO3
CH4(g)	-82.26	-123.31	-41.05	CH4
Chalcanthite	-6.74	-9.38	-2.64	CuSO4:5H2O
Chalcocite	-56.35	-91.27	-34.92	Cu2S
Chalcopyrite	-126.51	-161.78	-35.27	CuFeS2
Cinnabar	-51.88	-97.57	-45.69	HgS
Claudetite	-86.70	-89.76	-3.06	As4O6
Clausthalite	-14.47	-41.57	-27.10	PbSe
Co(BO2)2	-29.13	-2.06	27.07	Co(BO2)2
Co(OH)2	-5.97	7.12	13.09	Co(OH)2
Co(OH)3	-10.10	-12.41	-2.31	Co(OH)3
CO2(g)	-2.23	-20.38	-18.15	CO2
Co3(AsO4)2	-22.88	-9.84	13.03	Co3(AsO4)2
Co3O4	-7.20	-17.70	-10.50	Co3O4
CoCl2	-21.26	-12.99	8.27	CoCl2
CoCl2:6H2O	-15.53	-13.00	2.54	CoCl2:6H2O
CoCO3	-3.27	-13.25	-9.98	CoCO3
CoF2	-13.92	-15.52	-1.60	CoF2
CoF3	-44.91	-46.37	-1.46	CoF3
CoFe2O4	16.80	13.27	-3.53	CoFe2O4
CoMoO4	-5.95	-13.71	-7.76	CoMoO4
CoO	-6.46	7.12	13.59	CoO
CoS(alpha)	-71.81	-79.25	-7.44	CoS
CoS(beta)	-68.18	-79.25	-11.07	CoS
CoSe	-23.48	-39.68	-16.20	CoSe
CoSeO3	-8.66	-7.34	1.32	CoSeO3
CoSeO4:6H2O	-16.39	-17.92	-1.53	CoSeO4:6H2O
CoSO4	-12.79	-9.98	2.80	CoSO4
CoSO4:6H2O	-7.51	-9.99	-2.47	CoSO4:6H2O
Cotunnite	-10.11	-14.89	-4.78	PbCl2
Covellite	-56.35	-78.65	-22.30	CuS
Cr(OH)2	-22.14	-11.32	10.82	Cr(OH)2
Cr(OH)3	-2.74	-1.40	1.34	Cr(OH)3
Cr(OH)3(am)	-0.65	-1.40	-0.75	Cr(OH)3
Cr2O3	-0.45	-2.80	-2.36	Cr2O3
CrCl2	-45.53	-31.44	14.09	CrCl2
CrCl3	-46.69	-31.58	15.11	CrCl3
CrF3	-24.03	-35.36	-11.34	CrF3
Crmetal	-67.54	-37.05	30.48	Cr
CrO3	-26.97	-30.18	-3.21	CrO3
Cryolite	-8.75	-42.59	-33.84	Na3AlF6
Cu(OH)2	-0.94	7.73	8.67	Cu(OH)2
Cu(SbO3)2	-24.91	20.30	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.18	0.07	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.48	-91.36	-34.88	Cu2Sb:3H2O

Cu ₂ Se (alpha)	-5.89	-51.69	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-20.05	-22.00	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-14.12	-8.02	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-61.39	-103.98	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-27.27	-90.76	-63.49	Cu ₃ Se ₂
CuCO ₃	-1.15	-12.65	-11.50	CuCO ₃
CuCrO ₄	-17.01	-22.45	-5.44	CuCrO ₄
CuF	-8.86	-13.76	-4.91	CuF
CuF ₂	-16.02	-14.91	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-10.36	-14.91	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-6.56	-15.31	-8.76	Cu
CuMoO ₄	-0.02	-13.10	-13.08	CuMoO ₄
CuOCuSO ₄	-11.95	-1.64	10.30	CuOCuSO ₄
Cupricferrite	7.89	13.88	5.99	CuFe ₂ O ₄
Cuprite	-3.48	-4.89	-1.41	Cu ₂ O
Cuprousferrite	9.55	0.63	-8.92	CuFeO ₂
CuSe	-5.97	-39.07	-33.10	CuSe
CuSe ₂	-26.77	-60.14	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-7.24	-6.73	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-14.87	-17.31	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.32	-9.38	2.94	CuSO ₄
Diaspore	2.87	9.74	6.87	AlOOH
Djurleite	-56.51	-90.43	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite (disordered)	-0.34	-16.88	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	0.21	-16.88	-17.09	CaMg (CO ₃) ₂
Epsomite	-3.03	-5.16	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-10.32	3.24	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl _{1.3}	3.10	0.06	-3.04	Fe (OH) ₂ ·7Cl _{1.3}
Fe (VO ₃) ₂	-10.04	-13.76	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.87	-8.32	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-16.62	-37.24	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-41.44	-45.17	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.83	9.39	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-12.93	-12.53	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.76	0.44	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.50	-17.59	-10.09	FeMoO ₄
Ferrihydrite	-0.12	3.07	3.19	Fe (OH) ₃
Ferroselite	-46.04	-64.63	-18.60	FeSe ₂
FeS (ppt)	-80.19	-83.14	-2.95	FeS
FeSe	-32.56	-43.56	-11.00	FeSe
Fix_pe	-5.49	-5.49	0.00	e-
Fluorite	-0.21	-10.71	-10.50	CaF ₂
Galena	-67.18	-81.15	-13.97	PbS
Gibbsite	1.45	9.74	8.29	Al (OH) ₃
Goethite	2.58	3.07	0.49	FeOOH
Goslarite	-6.17	-8.19	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-65.73	-80.09	-14.36	CdS
Greigite	-291.09	-336.12	-45.03	Fe ₃ S ₄
Gummite	-5.95	1.72	7.67	UO ₃
Gypsum	-0.57	-5.18	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-12.89	-24.99	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-7.95	-20.83	-12.88	H ₂ MoO ₄
H ₂ S (g)	-78.37	-86.38	-8.01	H ₂ S
H ₂ Se (g)	-41.84	-46.80	-4.96	H ₂ Se
Halite	-6.46	-4.86	1.60	NaCl
Hausmannite	-5.44	55.59	61.03	Mn ₃ O ₄
Hematite	7.57	6.15	-1.42	Fe ₂ O ₃
Hercynite	-0.18	22.72	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-184.10	-257.81	-73.71	Hg (CH ₃) ₂
Hg (g)	-7.46	-15.33	-7.87	Hg
Hg (OH) ₂	-7.70	-11.19	-3.50	Hg (OH) ₂
Hg ₂ (g)	-15.71	-30.66	-14.96	Hg ₂
Hg ₂ (OH) ₂	-10.19	-4.93	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-9.26	-25.31	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-26.41	-35.11	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-17.21	-27.57	-10.36	Hg ₂ F ₂
Hg ₂ S	-79.63	-91.31	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-14.74	-19.39	-4.66	Hg ₂ SeO ₃

Hg2SO4	-15.91	-22.04	-6.13	Hg2SO4
Hg3O2CO3	-24.27	-53.95	-29.68	Hg3O2CO3
HgCl (g)	-32.02	-12.52	19.50	HgCl
HgCl2	-10.05	-31.31	-21.26	HgCl2
HgF (g)	-46.46	-13.78	32.68	HgF
HgF2 (g)	-46.40	-33.83	12.57	HgF2
Hgmetal (l)	-1.88	-15.33	-13.45	Hg
HgSe	-2.30	-57.99	-55.69	HgSe
HgSeO3	-13.22	-25.65	-12.43	HgSeO3
HgSO4	-18.88	-28.30	-9.42	HgSO4
Huntite	-3.76	-33.73	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.29	-25.06	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.99	-21.76	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.54	-19.71	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.42	-20.22	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.57	-50.81	-17.24	K2Cr2O7
K2CrO4	-20.12	-20.63	-0.51	K2CrO4
K2MoO4	-14.54	-11.28	3.26	K2MoO4
K2SeO4	-14.76	-15.49	-0.73	K2SeO4
Langite	-3.67	13.82	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.21	-6.64	-0.43	PbO : PbSO4
Laurionite	-5.45	-4.83	0.62	PbOHCl
Lepidocrocite	1.70	3.07	1.37	FeOOH
Lime	-20.77	11.93	32.70	CaO
Litharge	-7.46	5.23	12.69	PbO
Mackinawite	-79.54	-83.14	-3.60	FeS
Maghemite	-0.24	6.15	6.39	Fe2O3
Magnesioferrite	1.24	18.10	16.86	Fe2MgO4
Magnesite	-0.97	-8.43	-7.46	MgCO3
Magnetite	5.99	9.39	3.40	Fe3O4
Malachite	0.39	-4.91	-5.31	Cu2 (OH) 2CO3
Manganite	-2.52	22.82	25.34	MnOOH
Massicot	-7.66	5.23	12.89	PbO
Matlockite	-7.17	-16.15	-8.97	PbClF
Melanothallite	-18.64	-12.39	6.26	CuCl2
Melanterite	-11.66	-13.87	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.48	-97.57	-45.09	HgS
Mg (OH) 2 (active)	-6.84	11.95	18.79	Mg (OH) 2
Mg (VO3) 2	-16.33	-5.05	11.28	Mg (VO3) 2
Mg2Sb3	-276.39	-201.70	74.68	Mg2Sb3
Mg2V2O7	-19.46	6.90	26.36	Mg2V2O7
MgCr2O4	-7.06	9.15	16.20	MgCr2O4
MgCrO4	-23.61	-18.23	5.38	MgCrO4
MgF2	-2.56	-10.69	-8.13	MgF2
MgMoO4	-7.03	-8.88	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.57	-2.52	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.89	-13.09	-1.20	MgSeO4 : 6H2O
Minium	-32.09	41.43	73.52	Pb3O4
Mirabilite	-5.60	-6.71	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.94	-7.04	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.67	-56.38	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.68	-89.60	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.85	-1.35	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.88	-10.17	2.72	MnCl2 : 4H2O
MnS (grn)	-76.59	-76.42	0.17	MnS
MnS (pnk)	-79.76	-76.42	3.34	MnS
MnSb	-96.27	-99.18	-2.91	MnSb
MnSe	-40.35	-36.85	3.50	MnSe
MnSeO3	-5.64	-4.51	1.13	MnSeO3
MnSeO3 : 2H2O	-5.49	-4.51	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.04	-15.09	-2.05	MnSeO4 : 5H2O
MnSO4	-9.74	-7.15	2.58	MnSO4
Monteponite	-8.82	6.29	15.10	CdO
Montroydite	-7.55	-11.19	-3.64	HgO
MoO3	-12.83	-20.83	-8.00	MoO3
Morenosite	-7.71	-9.85	-2.14	NiSO4 : 7H2O
MoS2	-149.06	-219.32	-70.26	MoS2
Na-Jarosite	-8.59	-19.79	-11.20	NaFe3 (SO4) 2 (OH) 6

Na2Cr2O7	-40.07	-49.96	-9.90	Na2Cr2O7
Na2CrO4	-22.71	-19.78	2.93	Na2CrO4
Na2Mo2O7	-14.67	-31.26	-16.60	Na2Mo2O7
Na2MoO4	-11.92	-10.43	1.49	Na2MoO4
Na2MoO4:2H2O	-11.66	-10.43	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.37	-4.07	10.30	Na2SeO3:5H2O
Na2SeO4	-15.92	-14.64	1.28	Na2SeO4
Na3Sb	-175.50	-81.05	94.45	Na3Sb
Na3VO4	-29.58	7.10	36.68	Na3VO4
Na4V2O7	-33.60	3.80	37.40	Na4V2O7
Nantokite	-5.77	-12.50	-6.73	CuCl
NaSb	-88.88	-65.71	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-7.16	-3.30	3.86	NaVO3
Nesquehonite	-3.76	-8.43	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.54	7.26	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-25.14	-9.44	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-20.08	11.92	32.00	Ni4 (OH) 6SO4
NiCO3	-6.25	-13.12	-6.87	NiCO3
NiMoO4	-2.43	-13.57	-11.14	NiMoO4
NiS (alpha)	-73.52	-79.12	-5.60	NiS
NiS (beta)	-68.02	-79.12	-11.10	NiS
NiS (gamma)	-66.32	-79.12	-12.80	NiS
NiSe	-21.84	-39.54	-17.70	NiSe
NiSeO3:2H2O	-10.02	-7.21	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.26	-17.78	-1.52	NiSeO4:6H2O
Nsutite	-7.17	10.34	17.50	MnO2
O2 (g)	-31.62	51.47	83.09	O2
Orpiment	-242.95	-304.02	-61.07	As2S3
Otavite	-2.09	-14.09	-12.00	CdCO3
Pb (BO2) 2	-10.47	-3.95	6.52	Pb (BO2) 2
Pb (OH) 2	-2.92	5.23	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-61.18	-69.94	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.39	0.41	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.72	10.46	26.19	Pb2O (OH) 2
Pb2O3	-24.84	36.20	61.04	Pb2O3
Pb2OCO3	-9.35	-9.91	-0.56	Pb2OCO3
Pb2V2O7	-4.63	-6.53	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.32	-15.52	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.44	-1.30	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.70	-4.68	11.02	Pb3O2CO3
Pb3O2SO4	-12.10	-1.41	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.28	3.82	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.06	3.82	21.88	Pb4O3SO4
PbCrO4	-12.35	-24.95	-12.60	PbCrO4
PbF2	-9.97	-17.41	-7.44	PbF2
Pbmetal	-24.75	-20.50	4.25	Pb
PbMoO4	0.02	-15.60	-15.62	PbMoO4
PbO:0.3H2O	-7.75	5.23	12.98	PbO:0.33H2O
PbSeO4	-12.97	-19.81	-6.84	PbSeO4
Periclase	-9.63	11.95	21.58	MgO
Phosgenite	-10.22	-30.03	-19.81	PbCl2:PbCO3
Plattnerite	-18.64	30.96	49.60	PbO2
Portlandite	-10.88	11.93	22.80	Ca (OH) 2
Pyrite	-125.28	-143.78	-18.51	FeS2
Pyrochroite	-5.24	9.95	15.19	Mn (OH) 2
Pyrolusite	-5.69	35.69	41.38	MnO2
Realgar	-101.94	-121.69	-19.75	AsS
Retgersite	-7.81	-9.85	-2.04	NiSO4:6H2O
Rhodochrosite	0.16	-10.42	-10.58	MnCO3
Rutherfordine	-4.16	-18.66	-14.50	UO2CO3
Sb (OH) 3	-12.34	-19.45	-7.11	Sb (OH) 3
Sb2O4	-16.56	-13.16	3.40	Sb2O4
Sb2O5	-26.38	-36.05	-9.67	Sb2O5
Sb2Se3	-111.54	-179.30	-67.76	Sb2Se3
Sb4O6 (cubic)	-59.53	-77.79	-18.26	Sb4O6
Sb4O6 (orth)	-59.89	-77.79	-17.90	Sb4O6
SbCl3	-50.20	-49.62	0.57	SbCl3

SbF3	-43.18	-53.41	-10.23	SbF3
Sbmetal	-46.36	-58.05	-11.69	Sb
SbO2	-3.07	-30.89	-27.82	SbO2
Schoepite	-4.28	1.72	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.96	-21.07	-7.11	Se
Semetal (hex)	-13.36	-21.07	-7.71	Se
Senarmontite	-26.53	-38.89	-12.37	Sb2O3
SeO2	-14.59	-14.46	0.12	SeO2
SeO3	-46.08	-25.04	21.04	SeO3
Siderite	-6.90	-17.14	-10.24	FeCO3
Smithsonite	-1.45	-11.45	-10.00	ZnCO3
Sphalerite	-66.00	-77.45	-11.45	ZnS
Spinel	-5.42	31.43	36.85	MgAl2O4
Stibnite	-247.57	-298.03	-50.46	Sb2S3
Sulfur	-58.50	-60.65	-2.14	S
Tenorite	0.09	7.73	7.64	CuO
Thenardite	-7.03	-6.71	0.32	Na2SO4
Thermonatrite	-10.62	-9.98	0.64	Na2CO3:H2O
Tyuyamunite	-5.71	-1.63	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.01	7.07	21.08	U3O8
U3Sb4	-583.36	-430.97	152.38	U3Sb4
U4O9	-30.44	-33.46	-3.02	U4O9
UF4	-30.54	-60.08	-29.54	UF4
UF4:2.5H2O	-27.36	-60.08	-32.72	UF4:2.5H2O
UO2 (am)	-15.73	-14.80	0.93	UO2
UO2 (NO3) 2	-41.21	-29.06	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.91	-29.06	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.45	-29.06	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.11	-29.06	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.89	1.72	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.07	-23.32	-2.25	UO2SeO4:4H2O
UO3	-5.98	1.72	7.70	UO3
Uraninite	-10.13	-14.80	-4.67	UO2
USb2	-221.15	-191.57	29.58	USb2
V (OH) 3	-19.22	-11.63	7.59	V (OH) 3
V2O5	-15.64	-17.00	-1.36	V2O5
V3O5	-40.95	-39.12	1.84	V3O5
V4O7	-50.76	-43.58	7.19	V4O7
V6O13	-41.59	-102.45	-60.86	V6O13
Valentinite	-30.41	-38.89	-8.48	Sb2O3
VC12	-63.49	-44.62	18.87	VC12
VC13	-65.24	-41.81	23.43	VC13
VF4	-64.67	-49.74	14.93	VF4
Vmetal	-94.26	-50.23	44.03	V
VO	-39.25	-24.50	14.76	VO
VO (OH) 2	-9.61	-4.46	5.15	VO (OH) 2
VO2Cl	-21.40	-18.56	2.84	VO2Cl
VOC1	-32.84	-21.69	11.15	VOC1
VOC12	-37.34	-24.58	12.76	VOC12
VOSO4	-25.18	-21.57	3.61	VOSO4
Witherite	-4.52	-13.09	-8.57	BaCO3
Wurtzite	-68.50	-77.45	-8.95	ZnS
Zincite	-2.41	8.92	11.33	ZnO
Zincosite	-12.11	-8.18	3.93	ZnSO4
Zn (BO2) 2	-8.55	-0.26	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.17	-21.86	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-3.28	8.92	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.55	8.92	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.83	8.92	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.61	8.92	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.81	8.92	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.76	0.74	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-7.40	7.79	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-18.09	-4.44	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.36	-7.44	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-9.81	18.59	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-14.00	24.50	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.24	-11.19	7.05	ZnCl2

ZnCO3:1H2O	-1.19	-11.45	-10.26	ZnCO3:1H2O
ZnF2	-13.18	-13.72	-0.53	ZnF2
Znmetal	-42.60	-16.81	25.79	Zn
ZnMoO4	-1.78	-11.91	-10.13	ZnMoO4
ZnO(active)	-2.26	8.92	11.19	ZnO
ZnS(am)	-68.40	-77.45	-9.05	ZnS
ZnSb	-85.87	-74.85	11.01	ZnSb
ZnSe	-23.48	-37.88	-14.40	ZnSe
ZnSeO4:6H2O	-14.60	-16.12	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.55	-8.18	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 78.

REACTION 404
H2O -1
0.5550 moles ### Addition step. Removes HTC water but solute mass remains
USE solution 410
SAVE Solution 411
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 410. Solution after simulation 77.
Using reaction 404.

Reaction 404.

5.550e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.838e-08	1.837e-08
Al	3.404e-06	3.402e-06
As	2.705e-10	2.703e-10
B	2.613e-05	2.612e-05
Ba	7.138e-08	7.135e-08
C	2.899e-03	2.898e-03
Ca	4.692e-03	4.690e-03
Cd	1.232e-08	1.232e-08
Cl	2.516e-03	2.515e-03
Co	8.711e-08	8.707e-08
Cr	2.479e-09	2.477e-09
Cu	1.771e-06	1.770e-06

F	1.652e-04	1.651e-04
Fe	1.870e-09	1.869e-09
Hg	1.767e-09	1.766e-09
K	3.110e-03	3.108e-03
Mg	4.605e-03	4.603e-03
Mn	5.400e-05	5.398e-05
Mo	1.744e-06	1.743e-06
N	8.512e-06	8.509e-06
Na	8.207e-03	8.204e-03
Ni	1.088e-07	1.087e-07
Pb	4.412e-09	4.410e-09
S	1.231e-02	1.231e-02
Sb	2.459e-08	2.458e-08
Se	1.243e-07	1.243e-07
U	3.138e-07	3.136e-07
V	5.420e-09	5.417e-09
Zn	5.056e-06	5.054e-06

-----Description of solution-----

equilibrium	pH	=	7.377	Charge balance
	pe	=	5.490	Adjusted to redox
Activity of water = 0.999				
Ionic strength (mol/kgw) = 3.951e-02				
Mass of water (kg) = 9.996e-01				
Total alkalinity (eq/kg) = 2.727e-03				
Total CO2 (mol/kg) = 2.899e-03				
Temperature (°C) = 25.00				
Pressure (atm) = 1.00				
Electrical balance (eq) = 1.007e-06				
Percent error, 100*(Cat- An)/(Cat+ An) = 0.00				
Iterations = 3				
Total H = 1.109680e+02				
Total O = 5.554046e+01				

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.898e-07	2.396e-07	-6.538	-6.620	-0.083	(0)
H+	5.032e-08	4.199e-08	-7.298	-7.377	-0.079	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.838e-08					
AgCl	1.195e-08	1.195e-08	-7.923	-7.923	0.000	(0)
Ag+	3.341e-09	2.788e-09	-8.476	-8.555	-0.079	(0)
AgCl2-	2.760e-09	2.186e-09	-8.559	-8.660	-0.101	(0)
AgSO4-	3.136e-10	2.483e-10	-9.504	-9.605	-0.101	(0)
AgCl3-2	1.041e-11	4.090e-12	-10.983	-11.388	-0.406	(0)
AgNO2	3.924e-12	3.924e-12	-11.406	-11.406	0.000	(0)
AgF	8.054e-13	8.054e-13	-12.094	-12.094	0.000	(0)
AgCl4-3	1.433e-13	1.753e-14	-12.844	-13.756	-0.912	(0)
AgOH	6.682e-14	6.682e-14	-13.175	-13.175	0.000	(0)
AgNH3+	2.355e-14	1.864e-14	-13.628	-13.729	-0.101	(0)
AgSeO3-	1.772e-14	1.403e-14	-13.752	-13.853	-0.101	(0)
AgH2BO3	1.580e-14	1.580e-14	-13.801	-13.801	0.000	(0)
Ag2Se	5.705e-15	5.705e-15	-14.244	-14.244	0.000	(0)
Ag(NO2)2-	5.171e-17	4.094e-17	-16.286	-16.388	-0.101	(0)
AgNO3	2.172e-17	2.172e-17	-16.663	-16.663	0.000	(0)
Ag(OH)2-	1.976e-18	1.565e-18	-17.704	-17.806	-0.101	(0)
Ag(NH3)2+	6.268e-19	4.963e-19	-18.203	-18.304	-0.101	(0)
Ag(SeO3)2-3	8.041e-21	9.837e-22	-20.095	-21.007	-0.912	(0)
Ag2MoO4	2.489e-24	2.489e-24	-23.604	-23.604	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.739	-73.739	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-84.156	-85.778	-1.622	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-148.537	-148.639	-0.101	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.541	-148.745	-0.205	(0)

	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.434	-150.809	-0.374	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.764	-151.120	-0.355	(0)
Al	3.404e-06						
	Al (OH) 4-	3.232e-06	2.698e-06	-5.491	-5.569	-0.078	(0)
	Al (OH) 3	8.944e-08	8.944e-08	-7.048	-7.048	0.000	(0)
	AlF3	3.125e-08	3.125e-08	-7.505	-7.505	0.000	(0)
	AlF2+	2.565e-08	2.159e-08	-7.591	-7.666	-0.075	(0)
	Al (OH) 2+	2.223e-08	1.871e-08	-7.653	-7.728	-0.075	(0)
	AlF4-	2.157e-09	1.801e-09	-8.666	-8.744	-0.078	(0)
	AlF+2	9.405e-10	4.716e-10	-9.027	-9.326	-0.300	(0)
	AlOH+2	1.960e-10	9.827e-11	-9.708	-10.008	-0.300	(0)
	AlSO4+	1.702e-11	1.421e-11	-10.769	-10.847	-0.078	(0)
	Al+3	2.087e-12	4.101e-13	-11.680	-12.387	-0.707	(0)
	Al (SO4) 2-	8.140e-13	6.796e-13	-12.089	-12.168	-0.078	(0)
	AlMo6O21-3	6.621e-38	8.099e-39	-37.179	-38.092	-0.912	(0)
As (3)	3.706e-23						
	H3AsO3	3.649e-23	3.649e-23	-22.438	-22.438	0.000	(0)
	H2AsO3-	5.629e-25	4.457e-25	-24.250	-24.351	-0.101	(0)
	HAsO3-2	2.462e-29	9.679e-30	-28.609	-29.014	-0.406	(0)
	H4AsO3+	9.589e-31	7.592e-31	-30.018	-30.120	-0.101	(0)
	AsO3-3	7.263e-35	8.885e-36	-34.139	-35.051	-0.912	(0)
As (5)	2.705e-10						
	HAsO4-2	2.272e-10	8.931e-11	-9.644	-10.049	-0.406	(0)
	H2AsO4-	4.320e-11	3.420e-11	-10.365	-10.466	-0.101	(0)
	AsO4-3	5.497e-14	6.725e-15	-13.260	-14.172	-0.912	(0)
	H3AsO4	2.473e-16	2.496e-16	-15.607	-15.603	0.004	(0)
B	2.613e-05						
	H3BO3	2.562e-05	2.586e-05	-4.591	-4.587	0.004	(0)
	H2BO3-	4.371e-07	3.576e-07	-6.359	-6.447	-0.087	(0)
	CaH2BO3+	3.763e-08	3.078e-08	-7.425	-7.512	-0.087	(0)
	MgH2BO3+	2.392e-08	1.957e-08	-7.621	-7.708	-0.087	(0)
	NaH2BO3	3.788e-09	3.788e-09	-8.422	-8.422	0.000	(0)
	BF (OH) 3-	1.450e-09	1.187e-09	-8.839	-8.926	-0.087	(0)
	H5 (BO3) 2-	9.620e-12	7.871e-12	-11.017	-11.104	-0.087	(0)
	BF2 (OH) 2-	7.491e-13	6.129e-13	-12.125	-12.213	-0.087	(0)
	BaH2BO3+	4.620e-13	3.780e-13	-12.335	-12.422	-0.087	(0)
	H8 (BO3) 3-	2.488e-14	2.035e-14	-13.604	-13.691	-0.087	(0)
	AgH2BO3	1.580e-14	1.580e-14	-13.801	-13.801	0.000	(0)
	BF3OH-	1.408e-18	1.152e-18	-17.851	-17.939	-0.087	(0)
	BF4-	3.348e-23	2.739e-23	-22.475	-22.562	-0.087	(0)
Ba	7.138e-08						
	Ba+2	7.050e-08	3.421e-08	-7.152	-7.466	-0.314	(0)
	BaHCO3+	8.313e-10	7.030e-10	-9.080	-9.153	-0.073	(0)
	BaCO3	4.215e-11	4.215e-11	-10.375	-10.375	0.000	(0)
	BaH2BO3+	4.620e-13	3.780e-13	-12.335	-12.422	-0.087	(0)
	BaOH+	4.267e-14	3.578e-14	-13.370	-13.446	-0.076	(0)
	BaNO3+	2.123e-15	1.681e-15	-14.673	-14.774	-0.101	(0)
	BaNH3+2	1.798e-16	7.069e-17	-15.745	-16.151	-0.406	(0)
C (4)	2.899e-03						
	HCO3-	2.557e-03	2.152e-03	-2.592	-2.667	-0.075	(0)
	H2CO3	2.032e-04	2.032e-04	-3.692	-3.692	0.000	(0)
	CaHCO3+	7.089e-05	5.994e-05	-4.149	-4.222	-0.073	(0)
	MgHCO3+	4.182e-05	3.476e-05	-4.379	-4.459	-0.080	(0)
	NaHCO3	8.088e-06	8.088e-06	-5.092	-5.092	0.000	(0)
	CaCO3	5.696e-06	5.696e-06	-5.244	-5.244	0.000	(0)
	CO3-2	4.952e-06	2.402e-06	-5.305	-5.619	-0.314	(0)
	MgCO3	3.154e-06	3.154e-06	-5.501	-5.501	0.000	(0)
	CuCO3	1.346e-06	1.346e-06	-5.871	-5.871	0.000	(0)
	MnHCO3+	8.136e-07	6.823e-07	-6.090	-6.166	-0.076	(0)
	NaCO3-	3.553e-07	2.990e-07	-6.449	-6.524	-0.075	(0)
	UO2 (CO3) 3-4	2.080e-07	4.965e-09	-6.682	-8.304	-1.622	(0)
	ZnCO3	2.056e-07	2.056e-07	-6.687	-6.687	0.000	(0)
	ZnHCO3+	1.278e-07	1.012e-07	-6.894	-6.995	-0.101	(0)
	UO2 (CO3) 2-2	1.049e-07	4.123e-08	-6.979	-7.385	-0.406	(0)
	Cu (CO3) 2-2	2.215e-08	8.705e-09	-7.655	-8.060	-0.406	(0)
	CuHCO3+	1.632e-08	1.292e-08	-7.787	-7.889	-0.101	(0)
	NiHCO3+	1.075e-08	8.508e-09	-7.969	-8.070	-0.101	(0)
	CoHCO3+	4.968e-09	3.934e-09	-8.304	-8.405	-0.101	(0)

		NiCO3	2.875e-09	2.875e-09	-8.541	-8.541	0.000	(0)
		PbCO3	2.177e-09	2.177e-09	-8.662	-8.662	0.000	(0)
		CoCO3	9.544e-10	9.544e-10	-9.020	-9.020	0.000	(0)
		UO2CO3	8.602e-10	8.602e-10	-9.065	-9.065	0.000	(0)
		BaHCO3+	8.313e-10	7.030e-10	-9.080	-9.153	-0.073	(0)
		PbHCO3+	6.087e-10	4.820e-10	-9.216	-9.317	-0.101	(0)
		CdCO3	1.879e-10	1.879e-10	-9.726	-9.726	0.000	(0)
		BaCO3	4.215e-11	4.215e-11	-10.375	-10.375	0.000	(0)
		Pb(CO3) 2-2	3.837e-11	1.508e-11	-10.416	-10.822	-0.406	(0)
		CdHCO3+	2.123e-11	1.681e-11	-10.673	-10.774	-0.101	(0)
		Cd(CO3) 2-2	8.514e-13	3.347e-13	-12.070	-12.475	-0.406	(0)
		FeHCO3+	9.905e-14	8.375e-14	-13.004	-13.077	-0.073	(0)
		HgCO3	5.162e-14	5.162e-14	-13.287	-13.287	0.000	(0)
		Hg(CO3) 2-2	9.977e-16	3.921e-16	-15.001	-15.407	-0.406	(0)
		HgHCO3+	5.098e-17	4.036e-17	-16.293	-16.394	-0.101	(0)
Ca	4.692e-03							
		Ca+2	3.083e-03	1.496e-03	-2.511	-2.825	-0.314	(0)
		CaSO4	1.530e-03	1.530e-03	-2.815	-2.815	0.000	(0)
		CaHCO3+	7.089e-05	5.994e-05	-4.149	-4.222	-0.073	(0)
		CaCO3	5.696e-06	5.696e-06	-5.244	-5.244	0.000	(0)
		CaF+	2.239e-06	1.878e-06	-5.650	-5.726	-0.076	(0)
		CaH2BO3+	3.763e-08	3.078e-08	-7.425	-7.512	-0.087	(0)
		CaOH+	8.459e-09	7.153e-09	-8.073	-8.146	-0.073	(0)
		CaNO3+	5.858e-11	4.639e-11	-10.232	-10.334	-0.101	(0)
		CaNH3+2	1.569e-11	6.168e-12	-10.804	-11.210	-0.406	(0)
		Ca (NH3) 2+2	2.046e-20	8.042e-21	-19.689	-20.095	-0.406	(0)
Cd	1.232e-08							
		Cd+2	7.073e-09	3.432e-09	-8.150	-8.464	-0.314	(0)
		CdSO4	3.591e-09	3.591e-09	-8.445	-8.445	0.000	(0)
		CdCl+	8.690e-10	6.881e-10	-9.061	-9.162	-0.101	(0)
		Cd(SO4) 2-2	5.501e-10	2.162e-10	-9.260	-9.665	-0.406	(0)
		CdCO3	1.879e-10	1.879e-10	-9.726	-9.726	0.000	(0)
		CdHCO3+	2.123e-11	1.681e-11	-10.673	-10.774	-0.101	(0)
		CdOH+	8.250e-12	6.532e-12	-11.084	-11.185	-0.101	(0)
		CdF+	7.899e-12	6.254e-12	-11.102	-11.204	-0.101	(0)
		CdOHC1	6.764e-12	6.764e-12	-11.170	-11.170	0.000	(0)
		CdCl2	6.023e-12	6.023e-12	-11.220	-11.220	0.000	(0)
		Cd(CO3) 2-2	8.514e-13	3.347e-13	-12.070	-12.475	-0.406	(0)
		CdCl3-	1.008e-14	7.979e-15	-13.997	-14.098	-0.101	(0)
		Cd(OH) 2	9.877e-15	9.877e-15	-14.005	-14.005	0.000	(0)
		CdF2	1.435e-15	1.435e-15	-14.843	-14.843	0.000	(0)
		CdNO3+	1.344e-16	1.064e-16	-15.872	-15.973	-0.101	(0)
		CdSeO4	3.345e-17	3.345e-17	-16.476	-16.476	0.000	(0)
		Cd2OH+3	9.184e-19	1.124e-19	-18.037	-18.949	-0.912	(0)
		Cd(SeO3) 2-2	4.412e-19	1.734e-19	-18.355	-18.761	-0.406	(0)
		Cd(OH) 3-	1.826e-19	1.446e-19	-18.738	-18.840	-0.101	(0)
		Cd(NO3) 2	5.230e-25	5.230e-25	-24.282	-24.282	0.000	(0)
		Cd(OH) 4-2	1.443e-26	5.672e-27	-25.841	-26.246	-0.406	(0)
		CdHS+	0.000e+00	0.000e+00	-79.354	-79.456	-0.101	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-151.251	-151.251	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-228.249	-228.350	-0.101	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-304.748	-305.154	-0.406	(0)
Cl	2.516e-03							
		Cl-	2.516e-03	2.100e-03	-2.599	-2.678	-0.079	(0)
		MnCl+	5.009e-08	4.200e-08	-7.300	-7.377	-0.076	(0)
		AgCl	1.195e-08	1.195e-08	-7.923	-7.923	0.000	(0)
		ZnCl+	9.436e-09	7.842e-09	-8.025	-8.106	-0.080	(0)
		AgCl2-	2.760e-09	2.186e-09	-8.559	-8.660	-0.101	(0)
		ZnOHC1	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
		CdCl+	8.690e-10	6.881e-10	-9.061	-9.162	-0.101	(0)
		CuCl	3.988e-10	3.988e-10	-9.399	-9.399	0.000	(0)
		CuCl+	3.811e-10	3.167e-10	-9.419	-9.499	-0.080	(0)
		NiCl+	2.176e-10	1.723e-10	-9.662	-9.764	-0.101	(0)
		CoCl+	2.156e-10	1.707e-10	-9.666	-9.768	-0.101	(0)
		CuCl2-	2.105e-10	1.750e-10	-9.677	-9.757	-0.080	(0)
		MnCl2	1.246e-10	1.246e-10	-9.905	-9.905	0.000	(0)
		PbCl+	2.836e-11	2.246e-11	-10.547	-10.649	-0.101	(0)
		ZnCl2	2.609e-11	2.609e-11	-10.583	-10.583	0.000	(0)

HgClOH	1.595e-11	1.595e-11	-10.797	-10.797	0.000	(0)
AgCl3-2	1.041e-11	4.090e-12	-10.983	-11.388	-0.406	(0)
HgCl2	7.915e-12	7.915e-12	-11.102	-11.102	0.000	(0)
CdOHC1	6.764e-12	6.764e-12	-11.170	-11.170	0.000	(0)
CdCl2	6.023e-12	6.023e-12	-11.220	-11.220	0.000	(0)
CuCl2	2.305e-13	2.305e-13	-12.637	-12.637	0.000	(0)
PbCl2	2.106e-13	2.106e-13	-12.677	-12.677	0.000	(0)
HgCl3-	2.099e-13	1.662e-13	-12.678	-12.779	-0.101	(0)
CuCl3-2	1.588e-13	7.853e-14	-12.799	-13.105	-0.306	(0)
AgCl4-3	1.433e-13	1.753e-14	-12.844	-13.756	-0.912	(0)
MnCl3-	8.590e-14	7.204e-14	-13.066	-13.142	-0.076	(0)
ZnCl3-	5.237e-14	4.352e-14	-13.281	-13.361	-0.080	(0)
CdCl3-	1.008e-14	7.979e-15	-13.997	-14.098	-0.101	(0)
HgCl4-2	3.534e-15	1.389e-15	-14.452	-14.857	-0.406	(0)
NiCl2	1.821e-15	1.821e-15	-14.740	-14.740	0.000	(0)
HgCl+	9.499e-16	7.521e-16	-15.022	-15.124	-0.101	(0)
UO2Cl+	3.868e-16	3.063e-16	-15.413	-15.514	-0.101	(0)
PbCl3-	2.223e-16	1.760e-16	-15.653	-15.754	-0.101	(0)
ZnCl4-2	9.237e-17	4.569e-17	-16.034	-16.340	-0.306	(0)
CrCl+2	7.577e-17	2.978e-17	-16.121	-16.526	-0.406	(0)
CuCl3-	5.436e-18	4.517e-18	-17.265	-17.345	-0.080	(0)
PbCl4-2	4.298e-19	1.690e-19	-18.367	-18.772	-0.406	(0)
CrOHC12	2.848e-19	2.848e-19	-18.545	-18.545	0.000	(0)
FeCl+2	1.137e-20	5.625e-21	-19.944	-20.250	-0.306	(0)
CrCl2+	7.493e-21	5.933e-21	-20.125	-20.227	-0.101	(0)
VOCl+	4.584e-22	3.630e-22	-21.339	-21.440	-0.101	(0)
CuCl4-2	9.611e-23	4.754e-23	-22.017	-22.323	-0.306	(0)
FeCl2+	6.291e-23	5.276e-23	-22.201	-22.278	-0.076	(0)
CrO3Cl-	3.604e-26	2.854e-26	-25.443	-25.545	-0.101	(0)
FeCl3	1.108e-26	1.108e-26	-25.956	-25.956	0.000	(0)
CoCl+2	3.141e-35	1.235e-35	-34.503	-34.908	-0.406	(0)
UCl+3	0.000e+00	0.000e+00	-44.382	-45.294	-0.912	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.974	-51.379	-0.406	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.039	-53.445	-0.406	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.174	-66.579	-0.406	(0)
Co (2)	8.711e-08					
Co+2	5.979e-08	2.350e-08	-7.223	-7.629	-0.406	(0)
CoSO4	2.093e-08	2.093e-08	-7.679	-7.679	0.000	(0)
CoHCO3+	4.968e-09	3.934e-09	-8.304	-8.405	-0.101	(0)
CoCO3	9.544e-10	9.544e-10	-9.020	-9.020	0.000	(0)
CoCl+	2.156e-10	1.707e-10	-9.666	-9.768	-0.101	(0)
CoOH+	1.419e-10	1.124e-10	-9.848	-9.949	-0.101	(0)
CoF+	1.079e-10	8.546e-11	-9.967	-10.068	-0.101	(0)
Co (OH) 2	2.139e-12	2.139e-12	-11.670	-11.670	0.000	(0)
CoNO2+	1.409e-12	1.116e-12	-11.851	-11.952	-0.101	(0)
Co (NH3) +2	2.354e-14	9.254e-15	-13.628	-14.034	-0.406	(0)
CoSeO4	6.165e-16	6.165e-16	-15.210	-15.210	0.000	(0)
CoNO3+	4.613e-16	3.652e-16	-15.336	-15.437	-0.101	(0)
Co (OH) 3-	1.292e-17	1.023e-17	-16.889	-16.990	-0.101	(0)
CoOOH-	3.243e-18	2.568e-18	-17.489	-17.590	-0.101	(0)
Co2OH+3	1.082e-18	1.324e-19	-17.966	-18.878	-0.912	(0)
Co (NH3) 2+2	3.289e-21	1.293e-21	-20.483	-20.888	-0.406	(0)
Co (NO3) 2	7.287e-24	7.287e-24	-23.137	-23.137	0.000	(0)
Co (OH) 4-2	9.882e-25	3.884e-25	-24.005	-24.411	-0.406	(0)
Co (NH3) 3+2	1.356e-28	5.331e-29	-27.868	-28.273	-0.406	(0)
Co4 (OH) 4+4	1.333e-30	3.181e-32	-29.875	-31.497	-1.622	(0)
Co (NH3) 4+2	2.331e-36	9.162e-37	-35.632	-36.038	-0.406	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.897	-44.303	-0.406	(0)
Co (3)	8.954e-29					
CoOH+2	8.954e-29	3.520e-29	-28.048	-28.454	-0.406	(0)
Co+3	1.471e-34	2.890e-35	-33.832	-34.539	-0.707	(0)
CoCl+2	3.141e-35	1.235e-35	-34.503	-34.908	-0.406	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.974	-51.379	-0.406	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.225	-61.327	-0.101	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.916	-66.322	-0.406	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.174	-66.579	-0.406	(0)
Cr (2)	2.156e-26					
Cr+2	2.156e-26	8.476e-27	-25.666	-26.072	-0.406	(0)

Cr (3)	2.479e-09					
Cr (OH) 2+	2.116e-09	1.675e-09	-8.674	-8.776	-0.101	(0)
Cr (OH) 3	1.508e-10	1.508e-10	-9.822	-9.822	0.000	(0)
Cr (OH) +2	1.462e-10	5.746e-11	-9.835	-10.241	-0.406	(0)
CrOHSO4	6.086e-11	6.086e-11	-10.216	-10.216	0.000	(0)
CrO2-	2.155e-12	1.707e-12	-11.666	-11.768	-0.101	(0)
Cr (OH) 4-	1.817e-12	1.439e-12	-11.741	-11.842	-0.101	(0)
CrF+2	5.082e-13	1.997e-13	-12.294	-12.700	-0.406	(0)
CrSO4+	1.443e-13	1.142e-13	-12.841	-12.942	-0.101	(0)
Cr+3	8.959e-14	1.096e-14	-13.048	-13.960	-0.912	(0)
CrCl+2	7.577e-17	2.978e-17	-16.121	-16.526	-0.406	(0)
Cr2 (OH) 2SO4+2	8.042e-19	3.161e-19	-18.095	-18.500	-0.406	(0)
CrOHC12	2.848e-19	2.848e-19	-18.545	-18.545	0.000	(0)
Cr2 (OH) 2 (SO4) 2	8.382e-20	8.382e-20	-19.077	-19.077	0.000	(0)
CrCl2+	7.493e-21	5.933e-21	-20.125	-20.227	-0.101	(0)
CrNO3+2	1.195e-23	4.698e-24	-22.923	-23.328	-0.406	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-42.227	-42.632	-0.406	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.956	-51.869	-0.912	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-53.039	-53.445	-0.406	(0)
Cr (6)	8.653e-16					
CrO4-2	7.800e-16	3.785e-16	-15.108	-15.422	-0.314	(0)
HCrO4-	6.495e-17	5.143e-17	-16.187	-16.289	-0.101	(0)
NaCrO4-	1.587e-17	1.257e-17	-16.799	-16.901	-0.101	(0)
KCrO4-	4.469e-18	3.538e-18	-17.350	-17.451	-0.101	(0)
CrO3SO4-2	7.474e-24	2.938e-24	-23.126	-23.532	-0.406	(0)
H2CrO4	1.751e-24	1.751e-24	-23.757	-23.757	0.000	(0)
CrO3Cl-	3.604e-26	2.854e-26	-25.443	-25.545	-0.101	(0)
Cr2O7-2	2.334e-31	9.176e-32	-30.632	-31.037	-0.406	(0)
Cu (1)	8.001e-10					
CuCl	3.988e-10	3.988e-10	-9.399	-9.399	0.000	(0)
CuCl2-	2.105e-10	1.750e-10	-9.677	-9.757	-0.080	(0)
Cu+	1.906e-10	1.509e-10	-9.720	-9.821	-0.101	(0)
CuCl3-2	1.588e-13	7.853e-14	-12.799	-13.105	-0.306	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.312	-149.676	-0.365	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.060	-150.406	-0.347	(0)
Cu (2)	1.770e-06					
CuCO3	1.346e-06	1.346e-06	-5.871	-5.871	0.000	(0)
Cu+2	1.961e-07	9.516e-08	-6.707	-7.022	-0.314	(0)
CuSO4	9.731e-08	9.731e-08	-7.012	-7.012	0.000	(0)
CuOH+	8.678e-08	7.211e-08	-7.062	-7.142	-0.080	(0)
Cu (CO3) 2-2	2.215e-08	8.705e-09	-7.655	-8.060	-0.406	(0)
CuHCO3+	1.632e-08	1.292e-08	-7.787	-7.889	-0.101	(0)
Cu (OH) 2	3.448e-09	3.448e-09	-8.462	-8.462	0.000	(0)
CuF+	8.720e-10	6.905e-10	-9.059	-9.161	-0.101	(0)
CuCl+	3.811e-10	3.167e-10	-9.419	-9.499	-0.080	(0)
Cu2 (OH) 2+2	3.323e-10	1.306e-10	-9.478	-9.884	-0.406	(0)
CuNO2+	8.478e-11	6.713e-11	-10.072	-10.173	-0.101	(0)
CuNH3+2	8.114e-12	3.189e-12	-11.091	-11.496	-0.406	(0)
Cu (OH) 3-	2.141e-12	1.695e-12	-11.669	-11.771	-0.101	(0)
CuCl2	2.305e-13	2.305e-13	-12.637	-12.637	0.000	(0)
Cu (NO2) 2	4.627e-15	4.627e-15	-14.335	-14.335	0.000	(0)
CuNO3+	3.727e-15	2.951e-15	-14.429	-14.530	-0.101	(0)
Cu (OH) 4-2	8.133e-18	3.197e-18	-17.090	-17.495	-0.406	(0)
CuCl3-	5.436e-18	4.517e-18	-17.265	-17.345	-0.080	(0)
CuCl4-2	9.611e-23	4.754e-23	-22.017	-22.323	-0.306	(0)
Cu (NO3) 2	3.643e-24	3.643e-24	-23.439	-23.439	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.019	-218.120	-0.101	(0)
F	1.652e-04					
F-	1.378e-04	1.150e-04	-3.861	-3.939	-0.079	(0)
MgF+	2.439e-05	2.036e-05	-4.613	-4.691	-0.078	(0)
CaF+	2.239e-06	1.878e-06	-5.650	-5.726	-0.076	(0)
NaF	4.849e-07	4.849e-07	-6.314	-6.314	0.000	(0)
MnF+	8.674e-08	7.275e-08	-7.062	-7.138	-0.076	(0)
AlF3	3.125e-08	3.125e-08	-7.505	-7.505	0.000	(0)
AlF2+	2.565e-08	2.159e-08	-7.591	-7.666	-0.075	(0)
HF	7.142e-09	7.142e-09	-8.146	-8.146	0.000	(0)
ZnF+	4.308e-09	3.411e-09	-8.366	-8.467	-0.101	(0)
AlF4-	2.157e-09	1.801e-09	-8.666	-8.744	-0.078	(0)

BF(OH) 3-	1.450e-09	1.187e-09	-8.839	-8.926	-0.087	(0)
AlF+2	9.405e-10	4.716e-10	-9.027	-9.326	-0.300	(0)
CuF+	8.720e-10	6.905e-10	-9.059	-9.161	-0.101	(0)
NiF+	1.170e-10	9.264e-11	-9.932	-10.033	-0.101	(0)
CoF+	1.079e-10	8.546e-11	-9.967	-10.068	-0.101	(0)
CdF+	7.899e-12	6.254e-12	-11.102	-11.204	-0.101	(0)
HF2-	3.776e-12	3.123e-12	-11.423	-11.505	-0.083	(0)
PbF+	3.085e-12	2.443e-12	-11.511	-11.612	-0.101	(0)
UO2F+	1.803e-12	1.428e-12	-11.744	-11.845	-0.101	(0)
AgF	8.054e-13	8.054e-13	-12.094	-12.094	0.000	(0)
BF2(OH) 2-	7.491e-13	6.129e-13	-12.125	-12.213	-0.087	(0)
CrF+2	5.082e-13	1.997e-13	-12.294	-12.700	-0.406	(0)
UO2F2	4.735e-13	4.735e-13	-12.325	-12.325	0.000	(0)
UO2F3-	1.727e-14	1.368e-14	-13.763	-13.864	-0.101	(0)
PbF2	5.528e-15	5.528e-15	-14.257	-14.257	0.000	(0)
CdF2	1.435e-15	1.435e-15	-14.843	-14.843	0.000	(0)
H2F2	1.367e-16	1.367e-16	-15.864	-15.864	0.000	(0)
FeF2+	4.105e-17	3.442e-17	-16.387	-16.463	-0.076	(0)
UO2F4-2	3.178e-17	1.249e-17	-16.498	-16.903	-0.406	(0)
VO2F	2.720e-17	2.720e-17	-16.565	-16.565	0.000	(0)
FeF+2	2.261e-17	1.119e-17	-16.646	-16.951	-0.306	(0)
FeF3	5.585e-18	5.585e-18	-17.253	-17.253	0.000	(0)
PbF3-	1.523e-18	1.206e-18	-17.817	-17.919	-0.101	(0)
VO2F2-	1.434e-18	1.136e-18	-17.843	-17.945	-0.101	(0)
BF3OH-	1.408e-18	1.152e-18	-17.851	-17.939	-0.087	(0)
VOF+	5.368e-20	4.250e-20	-19.270	-19.372	-0.101	(0)
VO2F3-2	4.145e-21	1.629e-21	-20.383	-20.788	-0.406	(0)
VOF2	1.833e-21	1.833e-21	-20.737	-20.737	0.000	(0)
PbF4-2	1.688e-22	6.635e-23	-21.773	-22.178	-0.406	(0)
HgF+	9.665e-23	7.653e-23	-22.015	-22.116	-0.101	(0)
BF4-	3.348e-23	2.739e-23	-22.475	-22.562	-0.087	(0)
VOF3-	9.443e-24	7.477e-24	-23.025	-23.126	-0.101	(0)
VO2F4-3	7.535e-25	9.218e-26	-24.123	-25.035	-0.912	(0)
Sb(OH) 2F	2.721e-25	2.721e-25	-24.565	-24.565	0.000	(0)
SbOF	2.677e-25	2.677e-25	-24.572	-24.572	0.000	(0)
VOF4-2	8.829e-27	3.471e-27	-26.054	-26.460	-0.406	(0)
UF3+	3.689e-35	2.921e-35	-34.433	-34.534	-0.101	(0)
UF2+2	4.078e-36	1.603e-36	-35.390	-35.795	-0.406	(0)
UF4	3.683e-37	3.683e-37	-36.434	-36.434	0.000	(0)
UF+3	9.050e-39	1.107e-39	-38.043	-38.956	-0.912	(0)
UF5-	2.120e-39	1.678e-39	-38.674	-38.775	-0.101	(0)
UF6-2	1.483e-40	0.000e+00	-39.829	-40.234	-0.406	(0)
Fe (2)	1.139e-11					
Fe+2	7.865e-12	3.091e-12	-11.104	-11.510	-0.406	(0)
FeSO4	3.387e-12	3.387e-12	-11.470	-11.470	0.000	(0)
FeHCO3+	9.905e-14	8.375e-14	-13.004	-13.077	-0.073	(0)
FeOH+	3.517e-14	2.949e-14	-13.454	-13.530	-0.076	(0)
Fe(OH) 2	5.614e-18	5.614e-18	-17.251	-17.251	0.000	(0)
Fe(OH) 3-	5.073e-19	4.254e-19	-18.295	-18.371	-0.076	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.558	-160.558	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-237.419	-237.521	-0.101	(0)
Fe (3)	1.859e-09					
Fe(OH) 2+	1.521e-09	1.280e-09	-8.818	-8.893	-0.075	(0)
Fe(OH) 3	3.294e-10	3.294e-10	-9.482	-9.482	0.000	(0)
Fe(OH) 4-	8.733e-12	7.349e-12	-11.059	-11.134	-0.075	(0)
FeOH+2	2.775e-14	1.373e-14	-13.557	-13.862	-0.306	(0)
FeF2+	4.105e-17	3.442e-17	-16.387	-16.463	-0.076	(0)
FeF+2	2.261e-17	1.119e-17	-16.646	-16.951	-0.306	(0)
FeF3	5.585e-18	5.585e-18	-17.253	-17.253	0.000	(0)
FeSO4+	5.298e-18	4.443e-18	-17.276	-17.352	-0.076	(0)
Fe(SO4) 2-	5.355e-19	4.240e-19	-18.271	-18.373	-0.101	(0)
Fe+3	4.516e-19	8.871e-20	-18.345	-19.052	-0.707	(0)
FeCl+2	1.137e-20	5.625e-21	-19.944	-20.250	-0.306	(0)
FeCl2+	6.291e-23	5.276e-23	-22.201	-22.278	-0.076	(0)
FeHSeO3+2	4.926e-23	1.936e-23	-22.308	-22.713	-0.406	(0)
Fe2(OH) 2+4	2.614e-25	6.239e-27	-24.583	-26.205	-1.622	(0)
FeNO3+2	2.213e-26	8.699e-27	-25.655	-26.061	-0.406	(0)
FeCl3	1.108e-26	1.108e-26	-25.956	-25.956	0.000	(0)

Fe3 (OH) 4+5	3.952e-32	1.154e-34	-31.403	-33.938	-2.535	(0)
H (0)	2.593e-29					
H2	1.296e-29	1.308e-29	-28.887	-28.883	0.004	(0)
Hg (0)	1.737e-09					
Hg	1.737e-09	1.737e-09	-8.760	-8.760	0.000	(0)
Hg (1)	1.077e-19					
Hg2+2	5.385e-20	2.117e-20	-19.269	-19.674	-0.406	(0)
Hg (2)	3.058e-11					
HgClOH	1.595e-11	1.595e-11	-10.797	-10.797	0.000	(0)
HgCl2	7.915e-12	7.915e-12	-11.102	-11.102	0.000	(0)
Hg (OH) 2	6.446e-12	6.505e-12	-11.191	-11.187	0.004	(0)
HgCl3-	2.099e-13	1.662e-13	-12.678	-12.779	-0.101	(0)
HgCO3	5.162e-14	5.162e-14	-13.287	-13.287	0.000	(0)
HgCl4-2	3.534e-15	1.389e-15	-14.452	-14.857	-0.406	(0)
Hg (CO3) 2-2	9.977e-16	3.921e-16	-15.001	-15.407	-0.406	(0)
HgCl+	9.499e-16	7.521e-16	-15.022	-15.124	-0.101	(0)
HgOH+	2.163e-16	1.713e-16	-15.665	-15.766	-0.101	(0)
HgHCO3+	5.098e-17	4.036e-17	-16.293	-16.394	-0.101	(0)
Hg (NH3) 2+2	3.091e-19	1.215e-19	-18.510	-18.915	-0.406	(0)
Hg (OH) 3-	2.479e-19	1.963e-19	-18.606	-18.707	-0.101	(0)
HgNH3+2	9.439e-20	3.710e-20	-19.025	-19.431	-0.406	(0)
Hg+2	4.568e-20	1.795e-20	-19.340	-19.746	-0.406	(0)
HgSO4	2.098e-20	2.098e-20	-19.678	-19.678	0.000	(0)
HgF+	9.665e-23	7.653e-23	-22.015	-22.116	-0.101	(0)
Hg (NH3) 3+2	4.030e-27	1.584e-27	-26.395	-26.800	-0.406	(0)
HgNO3+	8.209e-29	6.500e-29	-28.086	-28.187	-0.101	(0)
Hg (NH3) 4+2	1.049e-34	4.121e-35	-33.979	-34.385	-0.406	(0)
Hg (NO3) 2	2.649e-37	2.649e-37	-36.577	-36.577	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.338	-138.440	-0.101	(0)
HgS2-2	0.000e+00	0.000e+00	-139.365	-139.771	-0.406	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.422	-139.422	0.000	(0)
K	3.110e-03					
K+	3.015e-03	2.516e-03	-2.521	-2.599	-0.079	(0)
KSO4-	9.450e-05	7.952e-05	-4.025	-4.100	-0.075	(0)
KCrO4-	4.469e-18	3.538e-18	-17.350	-17.451	-0.101	(0)
Mg	4.605e-03					
Mg+2	3.253e-03	1.578e-03	-2.488	-2.802	-0.314	(0)
MgSO4	1.282e-03	1.282e-03	-2.892	-2.892	0.000	(0)
MgHCO3+	4.182e-05	3.476e-05	-4.379	-4.459	-0.080	(0)
MgF+	2.439e-05	2.036e-05	-4.613	-4.691	-0.078	(0)
MgCO3	3.154e-06	3.154e-06	-5.501	-5.501	0.000	(0)
MgOH+	1.774e-07	1.506e-07	-6.751	-6.822	-0.071	(0)
MgH2BO3+	2.392e-08	1.957e-08	-7.621	-7.708	-0.087	(0)
Mn (2)	5.400e-05					
Mn+2	4.043e-05	1.589e-05	-4.393	-4.799	-0.406	(0)
MnSO4	1.261e-05	1.261e-05	-4.899	-4.899	0.000	(0)
MnHCO3+	8.136e-07	6.823e-07	-6.090	-6.166	-0.076	(0)
MnF+	8.674e-08	7.275e-08	-7.062	-7.138	-0.076	(0)
MnCl+	5.009e-08	4.200e-08	-7.300	-7.377	-0.076	(0)
MnOH+	1.141e-08	9.565e-09	-7.943	-8.019	-0.076	(0)
MnCl2	1.246e-10	1.246e-10	-9.905	-9.905	0.000	(0)
MnNO3+	3.119e-13	2.470e-13	-12.506	-12.607	-0.101	(0)
MnSeO4	2.238e-13	2.238e-13	-12.650	-12.650	0.000	(0)
MnCl3-	8.590e-14	7.204e-14	-13.066	-13.142	-0.076	(0)
Mn (OH) 3-	4.048e-18	3.395e-18	-17.393	-17.469	-0.076	(0)
Mn (NO3) 2	6.083e-21	6.083e-21	-20.216	-20.216	0.000	(0)
Mn (OH) 4-2	5.310e-24	2.626e-24	-23.275	-23.581	-0.306	(0)
MnSe	0.000e+00	0.000e+00	-42.229	-42.229	0.000	(0)
Mn (3)	1.116e-24					
Mn+3	1.116e-24	2.193e-25	-23.952	-24.659	-0.707	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.942	-42.248	-0.306	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.045	-46.130	-0.085	(0)
Mo	1.744e-06					
MoO4-2	1.743e-06	8.457e-07	-5.759	-6.073	-0.314	(0)
HMoO4-	8.924e-10	7.066e-10	-9.049	-9.151	-0.101	(0)
H2MoO4	2.174e-13	2.174e-13	-12.663	-12.663	0.000	(0)

Ag ₂ MoO ₄	2.489e-24	2.489e-24	-23.604	-23.604	0.000	(0)
AlMo ₆ O ₂₁ -3	6.621e-38	8.099e-39	-37.179	-38.092	-0.912	(0)
Mo ₇ O ₂₄ -6	0.000e+00	0.000e+00	-44.883	-48.533	-3.650	(0)
HMo ₇ O ₂₄ -5	0.000e+00	0.000e+00	-46.989	-49.523	-2.535	(0)
H ₂ Mo ₇ O ₂₄ -4	0.000e+00	0.000e+00	-50.496	-52.118	-1.622	(0)
H ₃ Mo ₇ O ₂₄ -3	0.000e+00	0.000e+00	-55.336	-56.249	-0.912	(0)
N (-3)	3.119e-07					
NH ₄ ⁺	2.948e-07	2.412e-07	-6.530	-6.618	-0.087	(0)
NH ₄ SO ₄ -	1.376e-08	1.154e-08	-7.861	-7.938	-0.076	(0)
NH ₃	3.275e-09	3.275e-09	-8.485	-8.485	0.000	(0)
CaNH ₃ +2	1.569e-11	6.168e-12	-10.804	-11.210	-0.406	(0)
CuNH ₃ +2	8.114e-12	3.189e-12	-11.091	-11.496	-0.406	(0)
NiNH ₃ +2	1.435e-13	5.641e-14	-12.843	-13.249	-0.406	(0)
AgNH ₃ ⁺	2.355e-14	1.864e-14	-13.628	-13.729	-0.101	(0)
Co (NH ₃) +2	2.354e-14	9.254e-15	-13.628	-14.034	-0.406	(0)
BaNH ₃ +2	1.798e-16	7.069e-17	-15.745	-16.151	-0.406	(0)
Ag (NH ₃) 2+	6.268e-19	4.963e-19	-18.203	-18.304	-0.101	(0)
Hg (NH ₃) 2+2	3.091e-19	1.215e-19	-18.510	-18.915	-0.406	(0)
HgNH ₃ +2	9.439e-20	3.710e-20	-19.025	-19.431	-0.406	(0)
Ni (NH ₃) 2+2	6.794e-20	2.670e-20	-19.168	-19.573	-0.406	(0)
Ca (NH ₃) 2+2	2.046e-20	8.042e-21	-19.689	-20.095	-0.406	(0)
Co (NH ₃) 2+2	3.289e-21	1.293e-21	-20.483	-20.888	-0.406	(0)
Hg (NH ₃) 3+2	4.030e-27	1.584e-27	-26.395	-26.800	-0.406	(0)
Co (NH ₃) 3+2	1.356e-28	5.331e-29	-27.868	-28.273	-0.406	(0)
Hg (NH ₃) 4+2	1.049e-34	4.121e-35	-33.979	-34.385	-0.406	(0)
Co (NH ₃) 4+2	2.331e-36	9.162e-37	-35.632	-36.038	-0.406	(0)
Cr (NH ₃) 5OH+2	0.000e+00	0.000e+00	-42.227	-42.632	-0.406	(0)
Co (NH ₃) 5+2	0.000e+00	0.000e+00	-43.897	-44.303	-0.406	(0)
Cr (NH ₃) 6+3	0.000e+00	0.000e+00	-50.956	-51.869	-0.912	(0)
Co (NH ₃) 5Cl+2	0.000e+00	0.000e+00	-50.974	-51.379	-0.406	(0)
Cr (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-53.039	-53.445	-0.406	(0)
Co (NH ₃) 6SO ₄ ⁺	0.000e+00	0.000e+00	-61.225	-61.327	-0.101	(0)
Co (NH ₃) 6OH+2	0.000e+00	0.000e+00	-65.916	-66.322	-0.406	(0)
Co (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-66.174	-66.579	-0.406	(0)
N (3)	8.189e-06					
NO ₂ ⁻	8.189e-06	6.737e-06	-5.087	-5.172	-0.085	(0)
CuNO ₂ ⁺	8.478e-11	6.713e-11	-10.072	-10.173	-0.101	(0)
AgNO ₂	3.924e-12	3.924e-12	-11.406	-11.406	0.000	(0)
CoNO ₂ ⁺	1.409e-12	1.116e-12	-11.851	-11.952	-0.101	(0)
Cu (NO ₂) 2	4.627e-15	4.627e-15	-14.335	-14.335	0.000	(0)
Ag (NO ₂) 2-	5.171e-17	4.094e-17	-16.286	-16.388	-0.101	(0)
N (5)	1.181e-08					
NO ₃ ⁻	1.175e-08	9.806e-09	-7.930	-8.009	-0.079	(0)
CaNO ₃ ⁺	5.858e-11	4.639e-11	-10.232	-10.334	-0.101	(0)
MnNO ₃ ⁺	3.119e-13	2.470e-13	-12.506	-12.607	-0.101	(0)
ZnNO ₃ ⁺	4.625e-14	3.662e-14	-13.335	-13.436	-0.101	(0)
CuNO ₃ ⁺	3.727e-15	2.951e-15	-14.429	-14.530	-0.101	(0)
BaNO ₃ ⁺	2.123e-15	1.681e-15	-14.673	-14.774	-0.101	(0)
NiNO ₃ ⁺	9.977e-16	7.899e-16	-15.001	-15.102	-0.101	(0)
CoNO ₃ ⁺	4.613e-16	3.652e-16	-15.336	-15.437	-0.101	(0)
CdNO ₃ ⁺	1.344e-16	1.064e-16	-15.872	-15.973	-0.101	(0)
PbNO ₃ ⁺	5.521e-17	4.372e-17	-16.258	-16.359	-0.101	(0)
AgNO ₃	2.172e-17	2.172e-17	-16.663	-16.663	0.000	(0)
Mn (NO ₃) 2	6.083e-21	6.083e-21	-20.216	-20.216	0.000	(0)
UO ₂ NO ₃ ⁺	2.222e-21	1.760e-21	-20.653	-20.755	-0.101	(0)
Zn (NO ₃) 2	7.165e-23	7.165e-23	-22.145	-22.145	0.000	(0)
CrNO ₃ +2	1.195e-23	4.698e-24	-22.923	-23.328	-0.406	(0)
Co (NO ₃) 2	7.287e-24	7.287e-24	-23.137	-23.137	0.000	(0)
Cu (NO ₃) 2	3.643e-24	3.643e-24	-23.439	-23.439	0.000	(0)
Pb (NO ₃) 2	7.280e-25	7.280e-25	-24.138	-24.138	0.000	(0)
VO ₂ NO ₃	6.690e-25	6.690e-25	-24.175	-24.175	0.000	(0)
Cd (NO ₃) 2	5.230e-25	5.230e-25	-24.282	-24.282	0.000	(0)
FeNO ₃ +2	2.213e-26	8.699e-27	-25.655	-26.061	-0.406	(0)
HgNO ₃ ⁺	8.209e-29	6.500e-29	-28.086	-28.187	-0.101	(0)
Hg (NO ₃) 2	2.649e-37	2.649e-37	-36.577	-36.577	0.000	(0)
Na	8.207e-03					
Na ⁺	8.008e-03	6.684e-03	-2.096	-2.175	-0.079	(0)
NaSO ₄ ⁻	1.904e-04	1.602e-04	-3.720	-3.795	-0.075	(0)

	NaHCO3	8.088e-06	8.088e-06	-5.092	-5.092	0.000	(0)
	NaF	4.849e-07	4.849e-07	-6.314	-6.314	0.000	(0)
	NaCO3-	3.553e-07	2.990e-07	-6.449	-6.524	-0.075	(0)
	NaH2BO3	3.788e-09	3.788e-09	-8.422	-8.422	0.000	(0)
	NaCrO4-	1.587e-17	1.257e-17	-16.799	-16.901	-0.101	(0)
Ni		1.088e-07					
	Ni+2	6.610e-08	3.207e-08	-7.180	-7.494	-0.314	(0)
	NiSO4	2.856e-08	2.856e-08	-7.544	-7.544	0.000	(0)
	NiHCO3+	1.075e-08	8.508e-09	-7.969	-8.070	-0.101	(0)
	NiCO3	2.875e-09	2.875e-09	-8.541	-8.541	0.000	(0)
	NiCl+	2.176e-10	1.723e-10	-9.662	-9.764	-0.101	(0)
	NiOH+	1.222e-10	9.676e-11	-9.913	-10.014	-0.101	(0)
	NiF+	1.170e-10	9.264e-11	-9.932	-10.033	-0.101	(0)
	Ni (SO4) 2-2	1.074e-11	4.222e-12	-10.969	-11.374	-0.406	(0)
	Ni (OH) 2	1.842e-12	1.842e-12	-11.735	-11.735	0.000	(0)
	NiNH3+2	1.435e-13	5.641e-14	-12.843	-13.249	-0.406	(0)
	NiCl2	1.821e-15	1.821e-15	-14.740	-14.740	0.000	(0)
	NiNO3+	9.977e-16	7.899e-16	-15.001	-15.102	-0.101	(0)
	NiSeO4	7.851e-16	7.851e-16	-15.105	-15.105	0.000	(0)
	Ni (OH) 3-	5.574e-16	4.414e-16	-15.254	-15.355	-0.101	(0)
	Ni (NH3) 2+2	6.794e-20	2.670e-20	-19.168	-19.573	-0.406	(0)
O (0)		5.863e-35					
	O2	2.931e-35	2.958e-35	-34.533	-34.529	0.004	(0)
Pb		4.412e-09					
	PbCO3	2.177e-09	2.177e-09	-8.662	-8.662	0.000	(0)
	PbSO4	6.590e-10	6.590e-10	-9.181	-9.181	0.000	(0)
	Pb+2	6.213e-10	3.014e-10	-9.207	-9.521	-0.314	(0)
	PbHCO3+	6.087e-10	4.820e-10	-9.216	-9.317	-0.101	(0)
	PbOH+	2.292e-10	1.814e-10	-9.640	-9.741	-0.101	(0)
	Pb (SO4) 2-2	4.509e-11	1.773e-11	-10.346	-10.751	-0.406	(0)
	Pb (CO3) 2-2	3.837e-11	1.508e-11	-10.416	-10.822	-0.406	(0)
	PbCl+	2.836e-11	2.246e-11	-10.547	-10.649	-0.101	(0)
	PbF+	3.085e-12	2.443e-12	-11.511	-11.612	-0.101	(0)
	Pb (OH) 2	1.375e-12	1.375e-12	-11.862	-11.862	0.000	(0)
	PbCl2	2.106e-13	2.106e-13	-12.677	-12.677	0.000	(0)
	PbF2	5.528e-15	5.528e-15	-14.257	-14.257	0.000	(0)
	Pb (OH) 3-	4.162e-16	3.295e-16	-15.381	-15.482	-0.101	(0)
	PbCl3-	2.223e-16	1.760e-16	-15.653	-15.754	-0.101	(0)
	PbNO3+	5.521e-17	4.372e-17	-16.258	-16.359	-0.101	(0)
	Pb2OH+3	7.086e-18	8.668e-19	-17.150	-18.062	-0.912	(0)
	PbF3-	1.523e-18	1.206e-18	-17.817	-17.919	-0.101	(0)
	PbCl4-2	4.298e-19	1.690e-19	-18.367	-18.772	-0.406	(0)
	Pb (OH) 4-2	4.920e-20	1.934e-20	-19.308	-19.714	-0.406	(0)
	PbF4-2	1.688e-22	6.635e-23	-21.773	-22.178	-0.406	(0)
	Pb3 (OH) 4+2	2.893e-23	1.137e-23	-22.539	-22.944	-0.406	(0)
	Pb (NO3) 2	7.280e-25	7.280e-25	-24.138	-24.138	0.000	(0)
	Pb4 (OH) 4+4	1.141e-27	2.723e-29	-26.943	-28.565	-1.622	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-152.249	-152.249	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-229.847	-229.949	-0.101	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.739	-73.739	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.898	-78.999	-0.101	(0)
	CdHS+	0.000e+00	0.000e+00	-79.354	-79.456	-0.101	(0)
	H2S	0.000e+00	0.000e+00	-79.356	-79.356	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-80.582	-80.988	-0.406	(0)
	S6-2	0.000e+00	0.000e+00	-81.098	-81.503	-0.406	(0)
	S4-2	0.000e+00	0.000e+00	-81.178	-81.583	-0.406	(0)
	S3-2	0.000e+00	0.000e+00	-81.984	-82.389	-0.406	(0)
	S2-2	0.000e+00	0.000e+00	-83.000	-83.405	-0.406	(0)
	S-2	0.000e+00	0.000e+00	-88.617	-88.922	-0.306	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.338	-138.440	-0.101	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.365	-139.771	-0.406	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.422	-139.422	0.000	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.537	-148.639	-0.101	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.541	-148.745	-0.205	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-149.312	-149.676	-0.365	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-149.538	-149.639	-0.101	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-150.060	-150.406	-0.347	(0)

Ag (S4) 2-3	0.000e+00	0.000e+00	-150.434	-150.809	-0.374	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.764	-151.120	-0.355	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.006	-151.006	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.251	-151.251	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.249	-152.249	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.558	-160.558	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.019	-218.120	-0.101	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.624	-226.726	-0.101	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.249	-228.350	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.923	-229.329	-0.406	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.847	-229.949	-0.101	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.419	-237.521	-0.101	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.748	-305.154	-0.406	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.779	-307.185	-0.406	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.841	-320.247	-0.406	(0)
S (6)	1.231e-02					
SO4-2	9.200e-03	4.464e-03	-2.036	-2.350	-0.314	(0)
CaSO4	1.530e-03	1.530e-03	-2.815	-2.815	0.000	(0)
MgSO4	1.282e-03	1.282e-03	-2.892	-2.892	0.000	(0)
NaSO4-	1.904e-04	1.602e-04	-3.720	-3.795	-0.075	(0)
KSO4-	9.450e-05	7.952e-05	-4.025	-4.100	-0.075	(0)
MnSO4	1.261e-05	1.261e-05	-4.899	-4.899	0.000	(0)
ZnSO4	1.452e-06	1.452e-06	-5.838	-5.838	0.000	(0)
Zn (SO4) 2-2	1.436e-07	5.645e-08	-6.843	-7.248	-0.406	(0)
CuSO4	9.731e-08	9.731e-08	-7.012	-7.012	0.000	(0)
NiSO4	2.856e-08	2.856e-08	-7.544	-7.544	0.000	(0)
HSO4-	2.194e-08	1.832e-08	-7.659	-7.737	-0.078	(0)
CoSO4	2.093e-08	2.093e-08	-7.679	-7.679	0.000	(0)
NH4SO4-	1.376e-08	1.154e-08	-7.861	-7.938	-0.076	(0)
CdSO4	3.591e-09	3.591e-09	-8.445	-8.445	0.000	(0)
PbSO4	6.590e-10	6.590e-10	-9.181	-9.181	0.000	(0)
Cd (SO4) 2-2	5.501e-10	2.162e-10	-9.260	-9.665	-0.406	(0)
AgSO4-	3.136e-10	2.483e-10	-9.504	-9.605	-0.101	(0)
CrOHSO4	6.086e-11	6.086e-11	-10.216	-10.216	0.000	(0)
Pb (SO4) 2-2	4.509e-11	1.773e-11	-10.346	-10.751	-0.406	(0)
AlSO4+	1.702e-11	1.421e-11	-10.769	-10.847	-0.078	(0)
Ni (SO4) 2-2	1.074e-11	4.222e-12	-10.969	-11.374	-0.406	(0)
FeSO4	3.387e-12	3.387e-12	-11.470	-11.470	0.000	(0)
Al (SO4) 2-	8.140e-13	6.796e-13	-12.089	-12.168	-0.078	(0)
UO2SO4	6.077e-13	6.077e-13	-12.216	-12.216	0.000	(0)
CrSO4+	1.443e-13	1.142e-13	-12.841	-12.942	-0.101	(0)
UO2 (SO4) 2-2	9.097e-14	3.576e-14	-13.041	-13.447	-0.406	(0)
VO2SO4-	1.816e-17	1.438e-17	-16.741	-16.842	-0.101	(0)
FeSO4+	5.298e-18	4.443e-18	-17.276	-17.352	-0.076	(0)
Cr2 (OH) 2SO4+2	8.042e-19	3.161e-19	-18.095	-18.500	-0.406	(0)
Fe (SO4) 2-	5.355e-19	4.240e-19	-18.271	-18.373	-0.101	(0)
Cr2 (OH) 2 (SO4) 2	8.382e-20	8.382e-20	-19.077	-19.077	0.000	(0)
VOSO4	7.576e-20	7.576e-20	-19.121	-19.121	0.000	(0)
HgSO4	2.098e-20	2.098e-20	-19.678	-19.678	0.000	(0)
CrO3SO4-2	7.474e-24	2.938e-24	-23.126	-23.532	-0.406	(0)
VSO4+	4.652e-34	3.683e-34	-33.332	-33.434	-0.101	(0)
U (SO4) 2	3.041e-39	3.041e-39	-38.517	-38.517	0.000	(0)
USO4+2	2.182e-40	0.000e+00	-39.661	-40.067	-0.406	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.225	-61.327	-0.101	(0)
Sb (3)	7.126e-20					
Sb (OH) 3	3.605e-20	3.605e-20	-19.443	-19.443	0.000	(0)
HSbO2	3.521e-20	3.521e-20	-19.453	-19.453	0.000	(0)
SbO2-	1.715e-24	1.358e-24	-23.766	-23.867	-0.101	(0)
Sb (OH) 4-	9.816e-25	7.772e-25	-24.008	-24.109	-0.101	(0)
Sb (OH) 2F	2.721e-25	2.721e-25	-24.565	-24.565	0.000	(0)
SbOF	2.677e-25	2.677e-25	-24.572	-24.572	0.000	(0)
Sb (OH) 2+	4.645e-26	3.678e-26	-25.333	-25.434	-0.101	(0)
SbO+	1.602e-26	1.269e-26	-25.795	-25.897	-0.101	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.841	-320.247	-0.406	(0)
Sb (5)	2.459e-08					
SbO3-	2.456e-08	1.945e-08	-7.610	-7.711	-0.101	(0)
Sb (OH) 6-	2.721e-11	2.271e-11	-10.565	-10.644	-0.079	(0)
SbO2+	1.243e-23	9.843e-24	-22.905	-23.007	-0.101	(0)

Se (-2)	5.705e-15					
Ag2Se	5.705e-15	5.705e-15	-14.244	-14.244	0.000	(0)
HSe-	4.778e-40	3.783e-40	-39.321	-39.422	-0.101	(0)
MnSe	0.000e+00	0.000e+00	-42.229	-42.229	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.909	-42.909	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.640	-47.045	-0.406	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.156	-85.778	-1.622	(0)
Se (4)	1.242e-07					
HSeO3-	1.043e-07	8.260e-08	-6.982	-7.083	-0.101	(0)
SeO3-2	1.992e-08	7.830e-09	-7.701	-8.106	-0.406	(0)
H2SeO3	1.480e-12	1.480e-12	-11.830	-11.830	0.000	(0)
AgSeO3-	1.772e-14	1.403e-14	-13.752	-13.853	-0.101	(0)
Cd (SeO3) 2-2	4.412e-19	1.734e-19	-18.355	-18.761	-0.406	(0)
Ag (SeO3) 2-3	8.041e-21	9.837e-22	-20.095	-21.007	-0.912	(0)
FeHSeO3+2	4.926e-23	1.936e-23	-22.308	-22.713	-0.406	(0)
Se (6)	1.081e-10					
SeO4-2	1.079e-10	5.234e-11	-9.967	-10.281	-0.314	(0)
MnSeO4	2.238e-13	2.238e-13	-12.650	-12.650	0.000	(0)
ZnSeO4	1.205e-14	1.205e-14	-13.919	-13.919	0.000	(0)
NiSeO4	7.851e-16	7.851e-16	-15.105	-15.105	0.000	(0)
CoSeO4	6.165e-16	6.165e-16	-15.210	-15.210	0.000	(0)
HSeO4-	1.391e-16	1.102e-16	-15.857	-15.958	-0.101	(0)
CdSeO4	3.345e-17	3.345e-17	-16.476	-16.476	0.000	(0)
Zn (SeO4) 2-2	1.627e-24	6.396e-25	-23.789	-24.194	-0.406	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.690	-58.602	-0.912	(0)
U (4)	3.534e-21					
U (OH) 5-	3.530e-21	2.795e-21	-20.452	-20.554	-0.101	(0)
U (OH) 4	4.918e-24	4.918e-24	-23.308	-23.308	0.000	(0)
U (OH) 3+	9.541e-28	7.555e-28	-27.020	-27.122	-0.101	(0)
U (OH) 2+2	3.734e-32	1.468e-32	-31.428	-31.833	-0.406	(0)
UF3+	3.689e-35	2.921e-35	-34.433	-34.534	-0.101	(0)
UF2+2	4.078e-36	1.603e-36	-35.390	-35.795	-0.406	(0)
UF4	3.683e-37	3.683e-37	-36.434	-36.434	0.000	(0)
UOH+3	2.374e-37	2.905e-38	-36.624	-37.537	-0.912	(0)
UF+3	9.050e-39	1.107e-39	-38.043	-38.956	-0.912	(0)
U (SO4) 2	3.041e-39	3.041e-39	-38.517	-38.517	0.000	(0)
UF5-	2.120e-39	1.678e-39	-38.674	-38.775	-0.101	(0)
USO4+2	2.182e-40	0.000e+00	-39.661	-40.067	-0.406	(0)
UF6-2	1.483e-40	0.000e+00	-39.829	-40.234	-0.406	(0)
U+4	0.000e+00	0.000e+00	-42.694	-44.316	-1.622	(0)
UCl+3	0.000e+00	0.000e+00	-44.382	-45.294	-0.912	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.193	-172.405	-8.212	(0)
U (5)	2.241e-16					
UO2+	2.241e-16	1.775e-16	-15.649	-15.751	-0.101	(0)
U (6)	3.138e-07					
UO2 (CO3) 3-4	2.080e-07	4.965e-09	-6.682	-8.304	-1.622	(0)
UO2 (CO3) 2-2	1.049e-07	4.123e-08	-6.979	-7.385	-0.406	(0)
UO2CO3	8.602e-10	8.602e-10	-9.065	-9.065	0.000	(0)
UO2OH+	3.427e-12	2.713e-12	-11.465	-11.566	-0.101	(0)
UO2F+	1.803e-12	1.428e-12	-11.744	-11.845	-0.101	(0)
UO2SO4	6.077e-13	6.077e-13	-12.216	-12.216	0.000	(0)
UO2F2	4.735e-13	4.735e-13	-12.325	-12.325	0.000	(0)
UO2+2	1.854e-13	8.994e-14	-12.732	-13.046	-0.314	(0)
UO2 (SO4) 2-2	9.097e-14	3.576e-14	-13.041	-13.447	-0.406	(0)
UO2F3-	1.727e-14	1.368e-14	-13.763	-13.864	-0.101	(0)
UO2Cl+	3.868e-16	3.063e-16	-15.413	-15.514	-0.101	(0)
UO2F4-2	3.178e-17	1.249e-17	-16.498	-16.903	-0.406	(0)
(UO2) 2 (OH) 2+2	3.109e-17	1.222e-17	-16.507	-16.913	-0.406	(0)
(UO2) 3 (OH) 5+	1.824e-18	1.444e-18	-17.739	-17.840	-0.101	(0)
UO2NO3+	2.222e-21	1.760e-21	-20.653	-20.755	-0.101	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.566	-42.668	-0.101	(0)
V+2	0.000e+00	0.000e+00	-43.152	-43.557	-0.406	(0)
V (3)	1.940e-15					
V (OH) 3	1.940e-15	1.940e-15	-14.712	-14.712	0.000	(0)
V (OH) 2+	6.653e-26	5.268e-26	-25.177	-25.278	-0.101	(0)
VOH+2	5.341e-29	2.099e-29	-28.272	-28.678	-0.406	(0)

V+3	1.429e-33	1.748e-34	-32.845	-33.757	-0.912	(0)
VS04+	4.652e-34	3.683e-34	-33.332	-33.434	-0.101	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.592	-55.504	-0.912	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.934	-56.556	-1.622	(0)
V (4)	4.007e-18					
V (OH) 3+	3.719e-18	2.945e-18	-17.430	-17.531	-0.101	(0)
VO+2	1.568e-19	6.162e-20	-18.805	-19.210	-0.406	(0)
VOSO4	7.576e-20	7.576e-20	-19.121	-19.121	0.000	(0)
VOF+	5.368e-20	4.250e-20	-19.270	-19.372	-0.101	(0)
VOF2	1.833e-21	1.833e-21	-20.737	-20.737	0.000	(0)
VOC1+	4.584e-22	3.630e-22	-21.339	-21.440	-0.101	(0)
VOF3-	9.443e-24	7.477e-24	-23.025	-23.126	-0.101	(0)
VOF4-2	8.829e-27	3.471e-27	-26.054	-26.460	-0.406	(0)
H2V2O4+2	1.107e-30	4.351e-31	-29.956	-30.361	-0.406	(0)
V (5)	5.420e-09					
H2VO4-	4.835e-09	3.829e-09	-8.316	-8.417	-0.101	(0)
HVO4-2	5.827e-10	2.290e-10	-9.235	-9.640	-0.406	(0)
H3VO4	1.608e-12	1.608e-12	-11.794	-11.794	0.000	(0)
H3V2O7-	5.023e-14	3.977e-14	-13.299	-13.400	-0.101	(0)
HV2O7-3	2.430e-15	2.973e-16	-14.614	-15.527	-0.912	(0)
VO4-3	2.234e-16	2.733e-17	-15.651	-16.563	-0.912	(0)
VO2+	1.616e-16	1.349e-16	-15.792	-15.870	-0.079	(0)
VO2F	2.720e-17	2.720e-17	-16.565	-16.565	0.000	(0)
VO2SO4-	1.816e-17	1.438e-17	-16.741	-16.842	-0.101	(0)
V2O7-4	7.982e-18	1.906e-19	-17.098	-18.720	-1.622	(0)
VO2F2-	1.434e-18	1.136e-18	-17.843	-17.945	-0.101	(0)
V3O9-3	4.813e-19	5.888e-20	-18.318	-19.230	-0.912	(0)
VO2F3-2	4.145e-21	1.629e-21	-20.383	-20.788	-0.406	(0)
V4O12-4	3.939e-24	9.403e-26	-23.405	-25.027	-1.622	(0)
VO2F4-3	7.535e-25	9.218e-26	-24.123	-25.035	-0.912	(0)
VO2NO3	6.690e-25	6.690e-25	-24.175	-24.175	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.118	-64.768	-3.650	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.423	-63.958	-2.535	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.505	-66.127	-1.622	(0)
Zn	5.056e-06					
Zn+2	3.065e-06	1.487e-06	-5.514	-5.828	-0.314	(0)
ZnSO4	1.452e-06	1.452e-06	-5.838	-5.838	0.000	(0)
ZnCO3	2.056e-07	2.056e-07	-6.687	-6.687	0.000	(0)
Zn (SO4) 2-2	1.436e-07	5.645e-08	-6.843	-7.248	-0.406	(0)
ZnHCO3+	1.278e-07	1.012e-07	-6.894	-6.995	-0.101	(0)
ZnOH+	4.500e-08	3.563e-08	-7.347	-7.448	-0.101	(0)
ZnCl+	9.436e-09	7.842e-09	-8.025	-8.106	-0.080	(0)
ZnF+	4.308e-09	3.411e-09	-8.366	-8.467	-0.101	(0)
ZnOHCl	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
Zn (OH) 2	1.353e-09	1.353e-09	-8.869	-8.869	0.000	(0)
ZnCl2	2.609e-11	2.609e-11	-10.583	-10.583	0.000	(0)
Zn (OH) 3-	2.053e-12	1.625e-12	-11.688	-11.789	-0.101	(0)
ZnCl3-	5.237e-14	4.352e-14	-13.281	-13.361	-0.080	(0)
ZnNO3+	4.625e-14	3.662e-14	-13.335	-13.436	-0.101	(0)
ZnSeO4	1.205e-14	1.205e-14	-13.919	-13.919	0.000	(0)
ZnCl4-2	9.237e-17	4.569e-17	-16.034	-16.340	-0.306	(0)
Zn (OH) 4-2	3.945e-17	1.551e-17	-16.404	-16.809	-0.406	(0)
Zn (NO3) 2	7.165e-23	7.165e-23	-22.145	-22.145	0.000	(0)
Zn (SeO4) 2-2	1.627e-24	6.396e-25	-23.789	-24.194	-0.406	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.538	-149.639	-0.101	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.006	-151.006	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.624	-226.726	-0.101	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.923	-229.329	-0.406	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.779	-307.185	-0.406	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.73	-49.44	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-43.29	-38.78	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-50.51	-38.78	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.94	-54.01	17.93	(Co (NH3) 6) (NO3) 3

(Co (NH3) 6) Cl3	-58.05	-38.02	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.06	-28.66	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.97	-23.52	0.45	(NH4) 2SeO4
Acanthite	-52.51	-88.73	-36.22	Ag2S
Ag2CO3	-11.64	-22.73	-11.09	Ag2CO3
Ag2CrO4	-20.94	-32.53	-11.59	Ag2CrO4
Ag2HVO4	-12.33	-10.85	1.48	Ag2HVO4
Ag2MoO4	-11.63	-23.18	-11.55	Ag2MoO4
Ag2O	-14.93	-2.36	12.57	Ag2O
Ag2Se	-0.45	-49.15	-48.70	Ag2Se
Ag2SeO3	-9.67	-16.82	-7.15	Ag2SeO3
Ag2SeO4	-18.48	-27.39	-8.91	Ag2SeO4
Ag2SO4	-14.64	-19.46	-4.82	Ag2SO4
Ag3AsO3	-28.13	-25.97	2.16	Ag3AsO3
Ag3AsO4	-16.35	-19.14	-2.79	Ag3AsO4
Ag3H2VO5	-17.21	-12.03	5.18	Ag3H2VO5
AgF·4H2O	-13.54	-12.50	1.05	AgF·4H2O
Agmetal	-0.54	-14.04	-13.51	Ag
AgVO3	-10.44	-9.67	0.77	AgVO3
Al (OH) 3 (am)	-1.06	9.74	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.36	-42.99	2.37	Al2 (MoO4) 3
Al2O3	-0.17	19.49	19.65	Al2O3
Al4 (OH) 10SO4	-0.83	21.87	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.66	-5.86	4.80	AlAsO4·2H2O
AlOHSO4	-4.13	-7.36	-3.23	AlOHSO4
AlSb	-152.52	-86.90	65.62	AlSb
Alunite	1.20	-0.20	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.08	-11.87	-7.79	PbSO4
Anhydrite	-0.82	-5.18	-4.36	CaSO4
Anilite	-56.23	-88.11	-31.88	Cu0.25Cu1.5S
Antlerite	-2.70	6.09	8.79	Cu3 (OH) 4SO4
Aragonite	-0.14	-8.44	-8.30	CaCO3
Arsenolite	-86.99	-89.75	-2.76	As4O6
Artinite	-6.07	3.53	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.91	-31.20	6.71	As2O5
Atacamite	-1.98	5.41	7.39	Cu2 (OH) 3Cl
Azurite	-0.64	-17.55	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-17.11	7.29	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-18.28	-2.41	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-0.43	-9.34	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-28.07	4.87	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-13.22	-22.89	-9.67	BaCrO4
BaF2	-9.52	-15.34	-5.82	BaF2
BaMoO4	-6.58	-13.54	-6.96	BaMoO4
Barite	0.16	-9.82	-9.98	BaSO4
BaS	-95.27	-79.09	16.18	BaS
BaSeO3	-9.00	-7.17	1.83	BaSeO3
BaSeO4	-10.29	-17.75	-7.46	BaSeO4
Bianchite	-6.41	-8.18	-1.76	ZnSO4·6H2O
Birnessite	-7.75	10.34	18.09	MnO2
Bixbyite	-4.41	-5.06	-0.64	Mn2O3
BlaubleiI	-55.74	-79.91	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.41	-83.69	-27.28	Cu0.6Cu0.8S
Boehmite	1.16	9.74	8.58	AlOOH
Breithauptite	-57.99	-76.52	-18.52	NiSb
Brochantite	-1.40	13.82	15.22	Cu4 (OH) 6SO4
Brucite	-4.89	11.95	16.84	Mg (OH) 2
Bunsenite	-5.19	7.26	12.45	NiO
Ca (VO3) 2	-10.72	-5.06	5.66	Ca (VO3) 2
Ca2V2O7	-10.63	6.87	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.68	6.87	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-17.72	4.58	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-20.16	18.80	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-21.06	18.80	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-300.47	-157.50	142.97	Ca3Sb2
CaCrO4	-15.98	-18.25	-2.27	CaCrO4
Calcite	0.04	-8.44	-8.48	CaCO3
Calomel	-7.12	-25.03	-17.91	Hg2Cl2

CaMoO4	-0.95	-8.90	-7.95	CaMoO4
Carnotite	-2.24	-2.01	0.23	KUO2VO4
CaSeO3:2H2O	-5.35	-2.53	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.09	-13.11	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.73	-2.89	9.84	Cd(BO2)2
Cd(OH)2	-7.36	6.29	13.64	Cd(OH)2
Cd(OH)2(am)	-7.44	6.29	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.05	-15.34	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.80	1.76	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.35	8.05	28.40	Cd4(OH)6SO4
CdCl2	-13.16	-13.82	-0.66	CdCl2
CdCl2:1H2O	-12.13	-13.82	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.91	-13.82	-1.91	CdCl2:2.5H2O
CdF2	-15.13	-16.34	-1.21	CdF2
Cdmetal(alpha)	-32.96	-19.44	13.51	Cd
Cdmetal(gamma)	-33.06	-19.44	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-7.30	-3.77	3.54	CdOHCl
CdSb	-77.14	-77.49	-0.35	CdSb
CdSe	-20.31	-40.51	-20.20	CdSe
CdSeO4:2H2O	-16.90	-18.75	-1.85	CdSeO4:2H2O
CdSO4	-10.64	-10.81	-0.17	CdSO4
CdSO4:1H2O	-9.09	-10.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.94	-10.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.48	-11.23	-9.75	AgCl
Cerrusite	-2.01	-15.14	-13.13	PbCO3
CH4(g)	-82.26	-123.31	-41.05	CH4
Chalcanthite	-6.73	-9.37	-2.64	CuSO4:5H2O
Chalcocite	-56.35	-91.27	-34.92	Cu2S
Chalcopyrite	-126.51	-161.78	-35.27	CuFeS2
Cinnabar	-51.87	-97.56	-45.69	HgS
Claudetite	-86.68	-89.75	-3.06	As4O6
Clausthalite	-14.47	-41.57	-27.10	PbSe
Co(BO2)2	-29.12	-2.05	27.07	Co(BO2)2
Co(OH)2	-5.97	7.12	13.09	Co(OH)2
Co(OH)3	-10.10	-12.41	-2.31	Co(OH)3
CO2(g)	-2.23	-20.37	-18.15	CO2
Co3(AsO4)2	-22.87	-9.83	13.03	Co3(AsO4)2
Co3O4	-7.20	-17.69	-10.50	Co3O4
CoCl2	-21.25	-12.98	8.27	CoCl2
CoCl2:6H2O	-15.52	-12.99	2.54	CoCl2:6H2O
CoCO3	-3.27	-13.25	-9.98	CoCO3
CoF2	-13.91	-15.51	-1.60	CoF2
CoF3	-44.90	-46.36	-1.46	CoF3
CoFe2O4	16.81	13.28	-3.53	CoFe2O4
CoMoO4	-5.94	-13.70	-7.76	CoMoO4
CoO	-6.46	7.12	13.59	CoO
CoS(alpha)	-71.81	-79.25	-7.44	CoS
CoS(beta)	-68.18	-79.25	-11.07	CoS
CoSe	-23.47	-39.67	-16.20	CoSe
CoSeO3	-8.66	-7.34	1.32	CoSeO3
CoSeO4:6H2O	-16.38	-17.91	-1.53	CoSeO4:6H2O
CoSO4	-12.78	-9.98	2.80	CoSO4
CoSO4:6H2O	-7.51	-9.98	-2.47	CoSO4:6H2O
Cotunnite	-10.10	-14.88	-4.78	PbCl2
Covellite	-56.34	-78.64	-22.30	CuS
Cr(OH)2	-22.14	-11.32	10.82	Cr(OH)2
Cr(OH)3	-2.73	-1.40	1.34	Cr(OH)3
Cr(OH)3(am)	-0.65	-1.40	-0.75	Cr(OH)3
Cr2O3	-0.44	-2.80	-2.36	Cr2O3
CrCl2	-45.52	-31.43	14.09	CrCl2
CrCl3	-46.68	-31.56	15.11	CrCl3
CrF3	-24.01	-35.35	-11.34	CrF3
Crmetal	-67.53	-37.05	30.48	Cr
CrO3	-26.96	-30.18	-3.21	CrO3
Cryolite	-8.71	-42.55	-33.84	Na3AlF6
Cu(OH)2	-0.94	7.73	8.67	Cu(OH)2
Cu(SbO3)2	-24.90	20.31	45.21	Cu(SbO3)2

Cu2(OH)3NO3	-9.17	0.08	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.47	-91.36	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.89	-51.69	-45.80	Cu2Se
Cu2SO4	-20.04	-21.99	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.11	-8.01	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.38	-103.98	-42.59	Cu3Sb
Cu3Se2	-27.26	-90.75	-63.49	Cu3Se2
CuCO3	-1.14	-12.64	-11.50	CuCO3
CuCrO4	-17.00	-22.44	-5.44	CuCrO4
CuF	-8.86	-13.76	-4.91	CuF
CuF2	-16.02	-14.90	1.12	CuF2
CuF2:2H2O	-10.35	-14.90	-4.55	CuF2:2H2O
Cumetal	-6.56	-15.31	-8.76	Cu
CuMoO4	-0.02	-13.09	-13.08	CuMoO4
CuOCuSO4	-11.94	-1.64	10.30	CuOCuSO4
Cupricferrite	7.90	13.89	5.99	CuFe2O4
Cuprite	-3.48	-4.89	-1.41	Cu2O
Cuprousferrite	9.55	0.63	-8.92	CuFeO2
CuSe	-5.97	-39.07	-33.10	CuSe
CuSe2	-26.77	-60.13	-33.37	CuSe2
CuSeO3:2H2O	-7.24	-6.73	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.86	-17.30	-2.44	CuSeO4:5H2O
CuSO4	-12.31	-9.37	2.94	CuSO4
Diaspore	2.87	9.74	6.87	AlOOH
Djurleite	-56.51	-90.43	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.33	-16.87	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.22	-16.87	-17.09	CaMg(CO3)2
Epsomite	-3.03	-5.15	-2.13	MgSO4:7H2O
Fe(OH)2	-10.32	3.24	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.10	0.06	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.02	-13.74	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.86	-8.30	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.60	-37.22	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.42	-45.15	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.82	9.40	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.92	-12.52	0.40	FeAsO4:2H2O
FeCr2O4	-6.75	0.45	7.20	FeCr2O4
FeMoO4	-7.49	-17.58	-10.09	FeMoO4
Ferrihydrite	-0.11	3.08	3.19	Fe(OH)3
Ferroselite	-46.02	-64.62	-18.60	FeSe2
FeS(ppt)	-80.18	-83.13	-2.95	FeS
FeSe	-32.56	-43.56	-11.00	FeSe
Fix_pe	-5.49	-5.49	0.00	e-
Fluorite	-0.20	-10.70	-10.50	CaF2
Galena	-67.17	-81.14	-13.97	PbS
Gibbsite	1.45	9.74	8.29	Al(OH)3
Goethite	2.59	3.08	0.49	FeOOH
Goslarite	-6.17	-8.18	-2.01	ZnSO4:7H2O
Greenockite	-65.73	-80.09	-14.36	CdS
Greigite	-291.07	-336.10	-45.03	Fe3S4
Gummite	-5.96	1.71	7.67	UO3
Gypsum	-0.57	-5.18	-4.61	CaSO4:2H2O
H-Jarosite	-12.87	-24.97	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.95	-20.83	-12.88	H2MoO4
H2S(g)	-78.37	-86.38	-8.01	H2S
H2Se(g)	-41.84	-46.80	-4.96	H2Se
Halite	-6.46	-4.85	1.60	NaCl
Hausmannite	-5.43	55.60	61.03	Mn3O4
Hematite	7.57	6.16	-1.42	Fe2O3
Hercynite	-0.16	22.73	22.89	FeAl2O4
Hg(CH3)2(g)	-184.09	-257.80	-73.71	Hg(CH3)2
Hg(g)	-7.45	-15.33	-7.87	Hg
Hg(OH)2	-7.69	-11.19	-3.50	Hg(OH)2
Hg2(g)	-15.70	-30.65	-14.96	Hg2
Hg2(OH)2	-10.18	-4.92	5.26	Hg2(OH)2
Hg2CO3	-9.24	-25.29	-16.05	Hg2CO3
Hg2CrO4	-26.40	-35.10	-8.70	Hg2CrO4
Hg2F2	-17.19	-27.55	-10.36	Hg2F2

Hg2S	-79.62	-91.30	-11.68	Hg2S
Hg2SeO3	-14.72	-19.38	-4.66	Hg2SeO3
Hg2SO4	-15.89	-22.02	-6.13	Hg2SO4
Hg3O2CO3	-24.25	-53.93	-29.68	Hg3O2CO3
HgCl(g)	-32.01	-12.52	19.50	HgCl
HgCl2	-10.03	-31.30	-21.26	HgCl2
HgF(g)	-46.45	-13.78	32.68	HgF
HgF2(g)	-46.38	-33.82	12.57	HgF2
Hgmetal(l)	-1.88	-15.33	-13.45	Hg
HgSe	-2.29	-57.99	-55.69	HgSe
HgSeO3	-13.22	-25.65	-12.43	HgSeO3
HgSO4	-18.87	-28.29	-9.42	HgSO4
Huntite	-3.74	-33.71	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.28	-25.05	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.97	-21.73	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-14.52	-19.69	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.40	-20.20	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-33.55	-50.80	-17.24	K2Cr2O7
K2CrO4	-20.11	-20.62	-0.51	K2CrO4
K2MoO4	-14.53	-11.27	3.26	K2MoO4
K2SeO4	-14.75	-15.48	-0.73	K2SeO4
Langite	-3.67	13.82	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.20	-6.64	-0.43	PbO:PbSO4
Laurionite	-5.45	-4.82	0.62	PbOHCl
Lepidocrocite	1.71	3.08	1.37	FeOOH
Lime	-20.77	11.93	32.70	CaO
Litharge	-7.46	5.23	12.69	PbO
Mackinawite	-79.53	-83.13	-3.60	FeS
Maghemite	-0.23	6.16	6.39	Fe2O3
Magnesioferrite	1.25	18.11	16.86	Fe2MgO4
Magnesite	-0.96	-8.42	-7.46	MgCO3
Magnetite	6.00	9.40	3.40	Fe3O4
Malachite	0.40	-4.91	-5.31	Cu2(OH)2CO3
Manganite	-2.52	22.82	25.34	MnOOH
Massicot	-7.66	5.23	12.89	PbO
Matlockite	-7.16	-16.14	-8.97	PbClF
Melanothallite	-18.63	-12.38	6.26	CuCl2
Melanterite	-11.65	-13.86	-2.21	FeSO4·7H2O
Metacinnabar	-52.47	-97.56	-45.09	HgS
Mg(OH)2(active)	-6.84	11.95	18.79	Mg(OH)2
Mg(VO3)2	-16.32	-5.04	11.28	Mg(VO3)2
Mg2Sb3	-276.37	-201.69	74.68	Mg2Sb3
Mg2V2O7	-19.44	6.92	26.36	Mg2V2O7
MgCr2O4	-7.05	9.15	16.20	MgCr2O4
MgCrO4	-23.60	-18.22	5.38	MgCrO4
MgF2	-2.55	-10.68	-8.13	MgF2
MgMoO4	-7.02	-8.87	-1.85	MgMoO4
MgSeO3·6H2O	-5.57	-2.51	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.88	-13.08	-1.20	MgSeO4·6H2O
Minium	-32.09	41.43	73.52	Pb3O4
Mirabilite	-5.59	-6.70	-1.11	Na2SO4·10H2O
Mn(VO3)2	-11.93	-7.03	4.90	Mn(VO3)2
Mn2(SO4)3	-50.66	-56.37	-5.71	Mn2(SO4)3
Mn2Sb	-150.68	-89.60	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-13.84	-1.34	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.87	-10.16	2.72	MnCl2·4H2O
MnS(grn)	-76.59	-76.42	0.17	MnS
MnS(pnk)	-79.76	-76.42	3.34	MnS
MnSb	-96.26	-99.17	-2.91	MnSb
MnSe	-40.34	-36.84	3.50	MnSe
MnSeO3	-5.64	-4.51	1.13	MnSeO3
MnSeO3·2H2O	-5.49	-4.51	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-13.03	-15.08	-2.05	MnSeO4·5H2O
MnSO4	-9.73	-7.15	2.58	MnSO4
Monteponite	-8.81	6.29	15.10	CdO
Montroydite	-7.55	-11.19	-3.64	HgO
MoO3	-12.83	-20.83	-8.00	MoO3
Morenosite	-7.70	-9.85	-2.14	NiSO4·7H2O

MoS2	-149.05	-219.31	-70.26	MoS2
Na-Jarosite	-8.57	-19.77	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.05	-49.95	-9.90	Na2Cr2O7
Na2CrO4	-22.70	-19.77	2.93	Na2CrO4
Na2Mo2O7	-14.65	-31.25	-16.60	Na2Mo2O7
Na2MoO4	-11.91	-10.42	1.49	Na2MoO4
Na2MoO4·2H2O	-11.65	-10.42	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-14.36	-4.06	10.30	Na2SeO3·5H2O
Na2SeO4	-15.91	-14.63	1.28	Na2SeO4
Na3Sb	-175.49	-81.04	94.45	Na3Sb
Na3VO4	-29.57	7.11	36.68	Na3VO4
Na4V2O7	-33.58	3.82	37.40	Na4V2O7
Nantokite	-5.77	-12.50	-6.73	CuCl
NaSb	-88.87	-65.71	23.17	NaSb
Natron	-8.66	-9.97	-1.31	Na2CO3·10H2O
NaVO3	-7.15	-3.29	3.86	NaVO3
Nesquehonite	-3.75	-8.42	-4.67	MgCO3·3H2O
Ni(OH)2	-5.53	7.26	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-25.13	-9.43	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-20.07	11.93	32.00	Ni4(OH)6SO4
NiCO3	-6.24	-13.11	-6.87	NiCO3
NiMoO4	-2.42	-13.57	-11.14	NiMoO4
NiS(alpha)	-73.52	-79.12	-5.60	NiS
NiS(beta)	-68.02	-79.12	-11.10	NiS
NiS(gamma)	-66.32	-79.12	-12.80	NiS
NiSe	-21.84	-39.54	-17.70	NiSe
NiSeO3·2H2O	-10.02	-7.20	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-16.26	-17.78	-1.52	NiSeO4·6H2O
Nsutite	-7.17	10.34	17.50	MnO2
O2(g)	-31.62	51.47	83.09	O2
Orpiment	-242.94	-304.00	-61.07	As2S3
Otavite	-2.08	-14.08	-12.00	CdCO3
Pb(BO2)2	-10.46	-3.94	6.52	Pb(BO2)2
Pb(OH)2	-2.92	5.23	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-61.15	-69.91	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.38	0.41	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.72	10.46	26.19	Pb2O(OH)2
Pb2O3	-24.84	36.20	61.04	Pb2O3
Pb2OCO3	-9.35	-9.91	-0.56	Pb2OCO3
Pb2V2O7	-4.62	-6.52	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.31	-15.51	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.43	-1.29	6.14	Pb3(VO4)2
Pb3O2CO3	-15.70	-4.68	11.02	Pb3O2CO3
Pb3O2SO4	-12.09	-1.41	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.27	3.83	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.05	3.83	21.88	Pb4O3SO4
PbCrO4	-12.34	-24.94	-12.60	PbCrO4
PbF2	-9.96	-17.40	-7.44	PbF2
Pbmetal	-24.75	-20.50	4.25	Pb
PbMoO4	0.03	-15.59	-15.62	PbMoO4
PbO·0.3H2O	-7.75	5.23	12.98	PbO·0.33H2O
PbSeO4	-12.96	-19.80	-6.84	PbSeO4
Periclase	-9.63	11.95	21.58	MgO
Phosgenite	-10.21	-30.02	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-10.88	11.93	22.80	Ca(OH)2
Pyrite	-125.27	-143.78	-18.51	FeS2
Pyrochroite	-5.24	9.95	15.19	Mn(OH)2
Pyrolusite	-5.69	35.69	41.38	MnO2
Realgar	-101.93	-121.68	-19.75	AsS
Retgersite	-7.81	-9.85	-2.04	NiSO4·6H2O
Rhodochrosite	0.16	-10.42	-10.58	MnCO3
Rutherfordine	-4.17	-18.67	-14.50	UO2CO3
Sb(OH)3	-12.33	-19.44	-7.11	Sb(OH)3
Sb2O4	-16.55	-13.15	3.40	Sb2O4
Sb2O5	-26.37	-36.04	-9.67	Sb2O5
Sb2Se3	-111.52	-179.28	-67.76	Sb2Se3
Sb4O6(cubic)	-59.51	-77.77	-18.26	Sb4O6

Sb4O6(orth)	-59.87	-77.77	-17.90	Sb4O6
SbCl3	-50.18	-49.61	0.57	SbCl3
SbF3	-43.17	-53.39	-10.23	SbF3
Sbmetal	-46.35	-58.04	-11.69	Sb
SbO2	-3.06	-30.89	-27.82	SbO2
Schoepite	-4.29	1.71	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.96	-21.07	-7.11	Se
Semetal(hex)	-13.36	-21.07	-7.71	Se
Senarmontite	-26.52	-38.89	-12.37	Sb2O3
SeO2	-14.58	-14.46	0.12	SeO2
SeO3	-46.08	-25.03	21.04	SeO3
Siderite	-6.89	-17.13	-10.24	FeCO3
Smithsonite	-1.45	-11.45	-10.00	ZnCO3
Sphalerite	-66.00	-77.45	-11.45	ZnS
Spinel	-5.41	31.44	36.85	MgAl2O4
Stibnite	-247.55	-298.01	-50.46	Sb2S3
Sulfur	-58.50	-60.64	-2.14	S
Tenorite	0.09	7.73	7.64	CuO
Thenardite	-7.02	-6.70	0.32	Na2SO4
Thermonatrite	-10.61	-9.97	0.64	Na2CO3:H2O
Tyuyamunite	-5.72	-1.64	4.08	Ca(UO2) 2(VO4) 2
U3O8	-14.05	7.04	21.08	U3O8
U3Sb4	-583.38	-431.00	152.38	U3Sb4
U4O9	-30.49	-33.51	-3.02	U4O9
UF4	-30.54	-60.07	-29.54	UF4
UF4:2.5H2O	-27.36	-60.07	-32.72	UF4:2.5H2O
UO2(am)	-15.74	-14.81	0.93	UO2
UO2(NO3) 2	-41.21	-29.06	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-33.91	-29.06	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-32.45	-29.06	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-31.11	-29.06	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-3.90	1.71	5.61	UO2(OH) 2
UO2SeO4:4H2O	-21.08	-23.33	-2.25	UO2SeO4:4H2O
UO3	-5.99	1.71	7.70	UO3
Uraninite	-10.14	-14.81	-4.67	UO2
USb2	-221.15	-191.58	29.58	USb2
V(OH) 3	-19.22	-11.63	7.59	V(OH) 3
V2O5	-15.63	-16.99	-1.36	V2O5
V3O5	-40.94	-39.10	1.84	V3O5
V4O7	-50.75	-43.56	7.19	V4O7
V6O13	-41.57	-102.43	-60.86	V6O13
Valentinite	-30.40	-38.89	-8.48	Sb2O3
VC12	-63.48	-44.60	18.87	VC12
VC13	-65.22	-41.79	23.43	VC13
VF4	-64.65	-49.72	14.93	VF4
Vmetal	-94.25	-50.23	44.03	V
VO	-39.25	-24.49	14.76	VO
VO(OH) 2	-9.61	-4.46	5.15	VO(OH) 2
VO2Cl	-21.39	-18.55	2.84	VO2Cl
VOC1	-32.83	-21.68	11.15	VOC1
VOC12	-37.33	-24.57	12.76	VOC12
VOSO4	-25.17	-21.56	3.61	VOSO4
Witherite	-4.52	-13.09	-8.57	BaCO3
Wurtzite	-68.50	-77.45	-8.95	ZnS
Zincite	-2.41	8.93	11.33	ZnO
Zincosite	-12.11	-8.18	3.93	ZnSO4
Zn(BO2) 2	-8.54	-0.25	8.29	Zn(BO2) 2
Zn(NO3) 2:6H2O	-25.16	-21.85	3.32	Zn(NO3) 2:6H2O
Zn(OH) 2	-3.27	8.93	12.20	Zn(OH) 2
Zn(OH) 2(am)	-3.55	8.93	12.47	Zn(OH) 2
Zn(OH) 2(beta)	-2.83	8.93	11.75	Zn(OH) 2
Zn(OH) 2(epsilon)	-2.61	8.93	11.53	Zn(OH) 2
Zn(OH) 2(gamma)	-2.81	8.93	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-6.75	0.75	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-7.39	7.80	15.19	Zn2(OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-18.08	-4.43	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-26.34	-7.43	18.91	Zn3O(SO4) 2
Zn4(OH) 6SO4	-9.80	18.60	28.40	Zn4(OH) 6SO4

Zn5(OH)8Cl2	-13.98	24.52	38.50	Zn5(OH)8Cl2
ZnCl2	-18.23	-11.18	7.05	ZnCl2
ZnCO3:1H2O	-1.19	-11.45	-10.26	ZnCO3:1H2O
ZnF2	-13.17	-13.71	-0.53	ZnF2
Znmetal	-42.60	-16.81	25.79	Zn
ZnMoO4	-1.78	-11.90	-10.13	ZnMoO4
ZnO(active)	-2.26	8.93	11.19	ZnO
ZnS(am)	-68.40	-77.45	-9.05	ZnS
ZnSb	-85.86	-74.85	11.01	ZnSb
ZnSe	-23.47	-37.87	-14.40	ZnSe
ZnSeO4:6H2O	-14.59	-16.11	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.54	-8.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 79.

```

Title Evaporate Stage 4 lake water to produce initial Stage 5 Lake water
REACTION 405
      H2O      -1
      9.99 moles      ## Removes x m3 water, but solute mass remains the same
USE solution 411
Save Solution 412
END

```

TITLE

Evaporate Stage 4 lake water to produce initial Stage 5 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 411. Solution after simulation 78.
Using reaction 405.

Reaction 405.

9.990e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.242e-08	1.837e-08
Al	4.151e-06	3.402e-06
As	3.298e-10	2.703e-10
B	3.187e-05	2.612e-05

Ba	8.705e-08	7.135e-08
C	3.536e-03	2.898e-03
Ca	5.722e-03	4.690e-03
Cd	1.503e-08	1.232e-08
Cl	3.068e-03	2.515e-03
Co	1.062e-07	8.707e-08
Cr	3.023e-09	2.477e-09
Cu	2.160e-06	1.770e-06
F	2.014e-04	1.651e-04
Fe	2.281e-09	1.869e-09
Hg	2.155e-09	1.766e-09
K	3.792e-03	3.108e-03
Mg	5.616e-03	4.603e-03
Mn	6.586e-05	5.398e-05
Mo	2.127e-06	1.743e-06
N	1.038e-05	8.509e-06
Na	1.001e-02	8.204e-03
Ni	1.326e-07	1.087e-07
Pb	5.380e-09	4.410e-09
S	1.502e-02	1.231e-02
Sb	2.999e-08	2.458e-08
Se	1.516e-07	1.243e-07
U	3.827e-07	3.136e-07
V	6.610e-09	5.417e-09
Zn	6.166e-06	5.054e-06

-----Description of solution-----

	pH	=	7.367	Charge balance
	pe	=	5.503	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.732e-02	
	Mass of water (kg)	=	8.196e-01	
	Total alkalinity (eq/kg)	=	3.325e-03	
	Total CO2 (mol/kg)	=	3.536e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.007e-06	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	5	
	Total H	=	9.098802e+01	
	Total O	=	4.555046e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.876e-07	2.344e-07	-6.541	-6.630	-0.089	(0)
H+	5.207e-08	4.292e-08	-7.283	-7.367	-0.084	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	2.242e-08					
AgCl	1.450e-08	1.450e-08	-7.839	-7.839	0.000	(0)
AgCl2-	4.123e-09	3.194e-09	-8.385	-8.496	-0.111	(0)
Ag+	3.405e-09	2.807e-09	-8.468	-8.552	-0.084	(0)
AgSO4-	3.671e-10	2.843e-10	-9.435	-9.546	-0.111	(0)
AgCl3-2	2.000e-11	7.199e-12	-10.699	-11.143	-0.444	(0)
AgNO2	4.746e-12	4.746e-12	-11.324	-11.324	0.000	(0)
AgF	9.552e-13	9.552e-13	-12.020	-12.020	0.000	(0)
AgCl4-3	3.705e-13	3.718e-14	-12.431	-13.430	-0.998	(0)
AgOH	6.581e-14	6.581e-14	-13.182	-13.182	0.000	(0)
AgNH3+	2.831e-14	2.193e-14	-13.548	-13.659	-0.111	(0)
AgSeO3-	2.114e-14	1.637e-14	-13.675	-13.786	-0.111	(0)
AgH2BO3	1.902e-14	1.902e-14	-13.721	-13.721	0.000	(0)
Ag2Se	6.377e-15	6.377e-15	-14.195	-14.195	0.000	(0)
Ag(NO2)2-	7.680e-17	5.949e-17	-16.115	-16.226	-0.111	(0)
AgNO3	2.671e-17	2.671e-17	-16.573	-16.573	0.000	(0)

	Ag (OH) 2-	1.946e-18	1.508e-18	-17.711	-17.822	-0.111	(0)
	Ag (NH3) 2+	8.802e-19	6.818e-19	-18.055	-18.166	-0.111	(0)
	Ag (SeO3) 2-3	1.325e-20	1.330e-21	-19.878	-20.876	-0.998	(0)
	Ag2MoO4	2.929e-24	2.929e-24	-23.533	-23.533	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.700	-73.700	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.925	-85.700	-1.775	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.452	-148.563	-0.111	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.465	-148.679	-0.214	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.363	-150.752	-0.388	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.695	-151.063	-0.368	(0)
Al	4.151e-06						
	Al (OH) 4-	3.894e-06	3.210e-06	-5.410	-5.494	-0.084	(0)
	Al (OH) 3	1.088e-07	1.088e-07	-6.964	-6.964	0.000	(0)
	AlF3	6.635e-08	6.635e-08	-7.178	-7.178	0.000	(0)
	AlF2+	4.679e-08	3.891e-08	-7.330	-7.410	-0.080	(0)
	Al (OH) 2+	2.796e-08	2.325e-08	-7.553	-7.634	-0.080	(0)
	AlF4-	5.465e-09	4.505e-09	-8.262	-8.346	-0.084	(0)
	AlF+2	1.508e-09	7.215e-10	-8.822	-9.142	-0.320	(0)
	AlOH+2	2.610e-10	1.249e-10	-9.583	-9.904	-0.320	(0)
	AlSO4+	2.546e-11	2.099e-11	-10.594	-10.678	-0.084	(0)
	Al+3	3.030e-12	5.327e-13	-11.519	-12.274	-0.755	(0)
	Al (SO4) 2-	1.385e-12	1.141e-12	-11.859	-11.943	-0.084	(0)
	AlMo6O21-3	2.927e-37	2.937e-38	-36.534	-37.532	-0.998	(0)
As (3)	4.282e-23						
	H3AsO3	4.217e-23	4.217e-23	-22.375	-22.375	0.000	(0)
	H2AsO3-	6.505e-25	5.038e-25	-24.187	-24.298	-0.111	(0)
	HAsO3-2	2.974e-29	1.071e-29	-28.527	-28.970	-0.444	(0)
	H4AsO3+	1.158e-30	8.967e-31	-29.936	-30.047	-0.111	(0)
	AsO3-3	9.581e-35	9.615e-36	-34.019	-35.017	-0.998	(0)
As (5)	3.298e-10						
	HAsO4-2	2.790e-10	1.004e-10	-9.554	-9.998	-0.444	(0)
	H2AsO4-	5.076e-11	3.931e-11	-10.295	-10.405	-0.111	(0)
	AsO4-3	7.373e-14	7.399e-15	-13.132	-14.131	-0.998	(0)
	H3AsO4	2.901e-16	2.932e-16	-15.538	-15.533	0.005	(0)
B	3.187e-05						
	H3BO3	3.124e-05	3.159e-05	-4.505	-4.501	0.005	(0)
	H2BO3-	5.308e-07	4.274e-07	-6.275	-6.369	-0.094	(0)
	CaH2BO3+	5.153e-08	4.149e-08	-7.288	-7.382	-0.094	(0)
	MgH2BO3+	3.290e-08	2.649e-08	-7.483	-7.577	-0.094	(0)
	NaH2BO3	5.435e-09	5.435e-09	-8.265	-8.265	0.000	(0)
	BF (OH) 3-	2.120e-09	1.707e-09	-8.674	-8.768	-0.094	(0)
	H5 (BO3) 2-	1.427e-11	1.149e-11	-10.846	-10.940	-0.094	(0)
	BF2 (OH) 2-	1.319e-12	1.062e-12	-11.880	-11.974	-0.094	(0)
	BaH2BO3+	6.502e-13	5.235e-13	-12.187	-12.281	-0.094	(0)
	H8 (BO3) 3-	4.507e-14	3.629e-14	-13.346	-13.440	-0.094	(0)
	AgH2BO3	1.902e-14	1.902e-14	-13.721	-13.721	0.000	(0)
	BF3OH-	2.985e-18	2.404e-18	-17.525	-17.619	-0.094	(0)
	BF4-	8.547e-23	6.881e-23	-22.068	-22.162	-0.094	(0)
Ba	8.705e-08						
	Ba+2	8.583e-08	3.964e-08	-7.066	-7.402	-0.336	(0)
	BaHCO3+	1.166e-09	9.753e-10	-8.933	-9.011	-0.078	(0)
	BaCO3	5.721e-11	5.721e-11	-10.243	-10.243	0.000	(0)
	BaH2BO3+	6.502e-13	5.235e-13	-12.187	-12.281	-0.094	(0)
	BaOH+	4.896e-14	4.056e-14	-13.310	-13.392	-0.082	(0)
	BaNO3+	3.071e-15	2.379e-15	-14.513	-14.624	-0.111	(0)
	BaNH3+2	2.658e-16	9.567e-17	-15.575	-16.019	-0.444	(0)
C (4)	3.536e-03						
	HCO3-	3.098e-03	2.577e-03	-2.509	-2.589	-0.080	(0)
	H2CO3	2.487e-04	2.487e-04	-3.604	-3.604	0.000	(0)
	CaHCO3+	9.679e-05	8.094e-05	-4.014	-4.092	-0.078	(0)
	MgHCO3+	5.748e-05	4.713e-05	-4.240	-4.327	-0.086	(0)
	NaHCO3	1.163e-05	1.163e-05	-4.935	-4.935	0.000	(0)
	CaCO3	7.525e-06	7.525e-06	-5.123	-5.123	0.000	(0)
	CO3-2	6.094e-06	2.814e-06	-5.215	-5.551	-0.336	(0)
	MgCO3	4.184e-06	4.184e-06	-5.378	-5.378	0.000	(0)
	CuCO3	1.670e-06	1.670e-06	-5.777	-5.777	0.000	(0)
	MnHCO3+	1.089e-06	9.020e-07	-5.963	-6.045	-0.082	(0)
	NaCO3-	5.056e-07	4.205e-07	-6.296	-6.376	-0.080	(0)

UO2 (CO3) 3-4	2.871e-07	4.819e-09	-6.542	-8.317	-1.775	(0)
ZnCO3	2.682e-07	2.682e-07	-6.572	-6.572	0.000	(0)
ZnHCO3+	1.742e-07	1.349e-07	-6.759	-6.870	-0.111	(0)
UO2 (CO3) 2-2	9.492e-08	3.417e-08	-7.023	-7.466	-0.444	(0)
Cu (CO3) 2-2	3.515e-08	1.265e-08	-7.454	-7.898	-0.444	(0)
CuHCO3+	2.115e-08	1.639e-08	-7.675	-7.786	-0.111	(0)
NiHCO3+	1.466e-08	1.136e-08	-7.834	-7.945	-0.111	(0)
CoHCO3+	6.672e-09	5.168e-09	-8.176	-8.287	-0.111	(0)
NiCO3	3.754e-09	3.754e-09	-8.426	-8.426	0.000	(0)
PbCO3	2.697e-09	2.697e-09	-8.569	-8.569	0.000	(0)
CoCO3	1.227e-09	1.227e-09	-8.911	-8.911	0.000	(0)
BaHCO3+	1.166e-09	9.753e-10	-8.933	-9.011	-0.078	(0)
PbHCO3+	7.879e-10	6.103e-10	-9.104	-9.214	-0.111	(0)
UO2CO3	6.084e-10	6.084e-10	-9.216	-9.216	0.000	(0)
CdCO3	2.425e-10	2.425e-10	-9.615	-9.615	0.000	(0)
Pb (CO3) 2-2	6.081e-11	2.189e-11	-10.216	-10.660	-0.444	(0)
BaCO3	5.721e-11	5.721e-11	-10.243	-10.243	0.000	(0)
CdHCO3+	2.863e-11	2.218e-11	-10.543	-10.654	-0.111	(0)
Cd (CO3) 2-2	1.406e-12	5.059e-13	-11.852	-12.296	-0.444	(0)
FeHCO3+	1.473e-13	1.232e-13	-12.832	-12.909	-0.078	(0)
HgCO3	7.796e-14	7.796e-14	-13.108	-13.108	0.000	(0)
Hg (CO3) 2-2	1.928e-15	6.939e-16	-14.715	-15.159	-0.444	(0)
HgHCO3+	8.045e-17	6.231e-17	-16.094	-16.205	-0.111	(0)
Ca	5.722e-03					
Ca+2	3.653e-03	1.687e-03	-2.437	-2.773	-0.336	(0)
CaSO4	1.962e-03	1.962e-03	-2.707	-2.707	0.000	(0)
CaHCO3+	9.679e-05	8.094e-05	-4.014	-4.092	-0.078	(0)
CaCO3	7.525e-06	7.525e-06	-5.123	-5.123	0.000	(0)
CaF+	3.011e-06	2.494e-06	-5.521	-5.603	-0.082	(0)
CaH2BO3+	5.153e-08	4.149e-08	-7.288	-7.382	-0.094	(0)
CaOH+	9.436e-09	7.891e-09	-8.025	-8.103	-0.078	(0)
CaNO3+	8.249e-11	6.389e-11	-10.084	-10.195	-0.111	(0)
CaNH3+2	2.257e-11	8.125e-12	-10.646	-11.090	-0.444	(0)
Ca (NH3) 2+2	3.438e-20	1.237e-20	-19.464	-19.908	-0.444	(0)
Cd	1.503e-08					
Cd+2	8.185e-09	3.780e-09	-8.087	-8.422	-0.336	(0)
CdSO4	4.498e-09	4.498e-09	-8.347	-8.347	0.000	(0)
CdCl+	1.179e-09	9.131e-10	-8.929	-9.039	-0.111	(0)
Cd (SO4) 2-2	8.556e-10	3.080e-10	-9.068	-9.511	-0.444	(0)
CdCO3	2.425e-10	2.425e-10	-9.615	-9.615	0.000	(0)
CdHCO3+	2.863e-11	2.218e-11	-10.543	-10.654	-0.111	(0)
CdF+	1.048e-11	8.115e-12	-10.980	-11.091	-0.111	(0)
CdCl2	9.628e-12	9.628e-12	-11.016	-11.016	0.000	(0)
CdOH+	9.088e-12	7.039e-12	-11.042	-11.152	-0.111	(0)
CdOHC1	8.780e-12	8.780e-12	-11.056	-11.056	0.000	(0)
Cd (CO3) 2-2	1.406e-12	5.059e-13	-11.852	-12.296	-0.444	(0)
CdCl3-	1.984e-14	1.536e-14	-13.703	-13.813	-0.111	(0)
Cd (OH) 2	1.041e-14	1.041e-14	-13.982	-13.982	0.000	(0)
CdF2	2.193e-15	2.193e-15	-14.659	-14.659	0.000	(0)
CdNO3+	1.848e-16	1.432e-16	-15.733	-15.844	-0.111	(0)
CdSeO4	4.341e-17	4.341e-17	-16.362	-16.362	0.000	(0)
Cd2OH+3	1.329e-18	1.334e-19	-17.876	-18.875	-0.998	(0)
Cd (SeO3) 2-2	7.126e-19	2.565e-19	-18.147	-18.591	-0.444	(0)
Cd (OH) 3-	1.925e-19	1.491e-19	-18.716	-18.826	-0.111	(0)
Cd (NO3) 2	8.593e-25	8.593e-25	-24.066	-24.066	0.000	(0)
Cd (OH) 4-2	1.590e-26	5.722e-27	-25.799	-26.242	-0.444	(0)
CdHS+	0.000e+00	0.000e+00	-79.266	-79.377	-0.111	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.136	-151.136	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.088	-228.199	-0.111	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.522	-304.966	-0.444	(0)
Cl	3.068e-03					
Cl-	3.068e-03	2.529e-03	-2.513	-2.597	-0.084	(0)
MnCl+	6.743e-08	5.586e-08	-7.171	-7.253	-0.082	(0)
AgCl	1.450e-08	1.450e-08	-7.839	-7.839	0.000	(0)
ZnCl+	1.283e-08	1.052e-08	-7.892	-7.978	-0.086	(0)
AgCl2-	4.123e-09	3.194e-09	-8.385	-8.496	-0.111	(0)
ZnOHCl	3.229e-09	3.229e-09	-8.491	-8.491	0.000	(0)
CdCl+	1.179e-09	9.131e-10	-8.929	-9.039	-0.111	(0)

CuCl	4.937e-10	4.937e-10	-9.307	-9.307	0.000	(0)
CuCl+	4.928e-10	4.040e-10	-9.307	-9.394	-0.086	(0)
CuCl2-	3.182e-10	2.609e-10	-9.497	-9.584	-0.086	(0)
NiCl+	2.987e-10	2.313e-10	-9.525	-9.636	-0.111	(0)
CoCl+	2.913e-10	2.256e-10	-9.536	-9.647	-0.111	(0)
MnCl2	1.996e-10	1.996e-10	-9.700	-9.700	0.000	(0)
ZnCl2	4.218e-11	4.218e-11	-10.375	-10.375	0.000	(0)
PbCl+	3.693e-11	2.861e-11	-10.433	-10.544	-0.111	(0)
HgClOH	2.424e-11	2.424e-11	-10.615	-10.615	0.000	(0)
AgCl3-2	2.000e-11	7.199e-12	-10.699	-11.143	-0.444	(0)
HgCl2	1.481e-11	1.481e-11	-10.829	-10.829	0.000	(0)
CdCl2	9.628e-12	9.628e-12	-11.016	-11.016	0.000	(0)
CdOHCl	8.780e-12	8.780e-12	-11.056	-11.056	0.000	(0)
HgCl3-	4.836e-13	3.746e-13	-12.316	-12.426	-0.111	(0)
AgCl4-3	3.705e-13	3.718e-14	-12.431	-13.430	-0.998	(0)
CuCl2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
PbCl2	3.232e-13	3.232e-13	-12.491	-12.491	0.000	(0)
CuCl3-2	2.995e-13	1.411e-13	-12.524	-12.851	-0.327	(0)
MnCl3-	1.678e-13	1.390e-13	-12.775	-12.857	-0.082	(0)
ZnCl3-	1.034e-13	8.473e-14	-12.986	-13.072	-0.086	(0)
CdCl3-	1.984e-14	1.536e-14	-13.703	-13.813	-0.111	(0)
HgCl4-2	1.048e-14	3.772e-15	-13.980	-14.423	-0.444	(0)
NiCl2	2.946e-15	2.946e-15	-14.531	-14.531	0.000	(0)
HgCl+	1.508e-15	1.168e-15	-14.822	-14.932	-0.111	(0)
PbCl3-	4.202e-16	3.254e-16	-15.377	-15.488	-0.111	(0)
UO2Cl+	2.876e-16	2.228e-16	-15.541	-15.652	-0.111	(0)
ZnCl4-2	2.275e-16	1.072e-16	-15.643	-15.970	-0.327	(0)
CrCl+2	1.235e-16	4.445e-17	-15.908	-16.352	-0.444	(0)
CuCl3-	1.020e-17	8.364e-18	-16.991	-17.078	-0.086	(0)
PbCl4-2	1.045e-18	3.762e-19	-17.981	-18.425	-0.444	(0)
CrOHCl2	5.010e-19	5.010e-19	-18.300	-18.300	0.000	(0)
FeCl+2	1.822e-20	8.582e-21	-19.739	-20.066	-0.327	(0)
CrCl2+	1.377e-20	1.067e-20	-19.861	-19.972	-0.111	(0)
VOCl+	7.100e-22	5.499e-22	-21.149	-21.260	-0.111	(0)
CuCl4-2	2.251e-22	1.060e-22	-21.648	-21.975	-0.327	(0)
FeCl2+	1.170e-22	9.695e-23	-21.932	-22.013	-0.082	(0)
CrO3Cl-	5.278e-26	4.088e-26	-25.278	-25.388	-0.111	(0)
FeCl3	2.452e-26	2.452e-26	-25.610	-25.610	0.000	(0)
CoCl+2	4.673e-35	1.682e-35	-34.330	-34.774	-0.444	(0)
UCl+3	0.000e+00	0.000e+00	-44.422	-45.421	-0.998	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.464	-50.908	-0.444	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.422	-52.866	-0.444	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.597	-66.041	-0.444	(0)
Co (2)	1.062e-07					
Co+2	7.164e-08	2.578e-08	-7.145	-7.589	-0.444	(0)
CoSO4	2.611e-08	2.611e-08	-7.583	-7.583	0.000	(0)
CoHCO3+	6.672e-09	5.168e-09	-8.176	-8.287	-0.111	(0)
CoCO3	1.227e-09	1.227e-09	-8.911	-8.911	0.000	(0)
CoCl+	2.913e-10	2.256e-10	-9.536	-9.647	-0.111	(0)
CoOH+	1.557e-10	1.206e-10	-9.808	-9.919	-0.111	(0)
CoF+	1.426e-10	1.104e-10	-9.846	-9.957	-0.111	(0)
Co (OH) 2	2.246e-12	2.246e-12	-11.649	-11.649	0.000	(0)
CoNO2+	1.898e-12	1.470e-12	-11.722	-11.833	-0.111	(0)
Co (NH3) +2	3.295e-14	1.186e-14	-13.482	-13.926	-0.444	(0)
CoSeO4	7.969e-16	7.969e-16	-15.099	-15.099	0.000	(0)
CoNO3+	6.318e-16	4.894e-16	-15.199	-15.310	-0.111	(0)
Co (OH) 3-	1.356e-17	1.050e-17	-16.868	-16.979	-0.111	(0)
CoOOH-	3.405e-18	2.637e-18	-17.468	-17.579	-0.111	(0)
Co2OH+3	1.553e-18	1.559e-19	-17.809	-18.807	-0.998	(0)
Co (NH3) 2+2	5.376e-21	1.935e-21	-20.270	-20.713	-0.444	(0)
Co (NO3) 2	1.193e-23	1.193e-23	-22.924	-22.924	0.000	(0)
Co (OH) 4-2	1.084e-24	3.903e-25	-23.965	-24.409	-0.444	(0)
Co (NH3) 3+2	2.589e-28	9.319e-29	-27.587	-28.031	-0.444	(0)
Co4 (OH) 4+4	2.515e-30	4.221e-32	-29.599	-31.375	-1.775	(0)
Co (NH3) 4+2	5.198e-36	1.871e-36	-35.284	-35.728	-0.444	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.481	-43.925	-0.444	(0)
Co (3)	1.082e-28					
CoOH+2	1.082e-28	3.893e-29	-27.966	-28.410	-0.444	(0)

Co+3	1.859e-34	3.268e-35	-33.731	-34.486	-0.755	(0)
CoCl+2	4.673e-35	1.682e-35	-34.330	-34.774	-0.444	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.464	-50.908	-0.444	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.702	-60.813	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.430	-65.873	-0.444	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.597	-66.041	-0.444	(0)
Cr (2)	2.831e-26					
Cr+2	2.831e-26	1.019e-26	-25.548	-25.992	-0.444	(0)
Cr (3)	3.023e-09					
Cr (OH) 2+	2.565e-09	1.987e-09	-8.591	-8.702	-0.111	(0)
Cr (OH) +2	1.935e-10	6.965e-11	-9.713	-10.157	-0.444	(0)
Cr (OH) 3	1.749e-10	1.749e-10	-9.757	-9.757	0.000	(0)
CrOHSO4	8.389e-11	8.389e-11	-10.076	-10.076	0.000	(0)
CrO2-	2.501e-12	1.937e-12	-11.602	-11.713	-0.111	(0)
Cr (OH) 4-	2.108e-12	1.633e-12	-11.676	-11.787	-0.111	(0)
CrF+2	8.100e-13	2.915e-13	-12.092	-12.535	-0.444	(0)
CrSO4+	2.078e-13	1.610e-13	-12.682	-12.793	-0.111	(0)
Cr+3	1.353e-13	1.358e-14	-12.869	-13.867	-0.998	(0)
CrCl+2	1.235e-16	4.445e-17	-15.908	-16.352	-0.444	(0)
Cr2 (OH) 2SO4+2	1.467e-18	5.281e-19	-17.834	-18.277	-0.444	(0)
CrOHC12	5.010e-19	5.010e-19	-18.300	-18.300	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.592e-19	1.592e-19	-18.798	-18.798	0.000	(0)
CrCl2+	1.377e-20	1.067e-20	-19.861	-19.972	-0.111	(0)
CrNO3+2	1.975e-23	7.109e-24	-22.704	-23.148	-0.444	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.768	-42.211	-0.444	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.373	-51.371	-0.998	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.422	-52.866	-0.444	(0)
Cr (6)	1.038e-15					
CrO4-2	9.328e-16	4.308e-16	-15.030	-15.366	-0.336	(0)
HCrO4-	7.725e-17	5.983e-17	-16.112	-16.223	-0.111	(0)
NaCrO4-	2.218e-17	1.718e-17	-16.654	-16.765	-0.111	(0)
KCrO4-	6.238e-18	4.832e-18	-17.205	-17.316	-0.111	(0)
CrO3SO4-2	1.104e-23	3.973e-24	-22.957	-23.401	-0.444	(0)
H2CrO4	2.082e-24	2.082e-24	-23.682	-23.682	0.000	(0)
CrO3Cl-	5.278e-26	4.088e-26	-25.278	-25.388	-0.111	(0)
Cr2O7-2	3.451e-31	1.242e-31	-30.462	-30.906	-0.444	(0)
Cu (1)	1.012e-09					
CuCl	4.937e-10	4.937e-10	-9.307	-9.307	0.000	(0)
CuCl2-	3.182e-10	2.609e-10	-9.497	-9.584	-0.086	(0)
Cu+	2.002e-10	1.550e-10	-9.699	-9.810	-0.111	(0)
CuCl3-2	2.995e-13	1.411e-13	-12.524	-12.851	-0.327	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.233	-149.611	-0.378	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.982	-150.341	-0.358	(0)
Cu (2)	2.159e-06					
CuCO3	1.670e-06	1.670e-06	-5.777	-5.777	0.000	(0)
Cu+2	2.182e-07	1.008e-07	-6.661	-6.997	-0.336	(0)
CuSO4	1.172e-07	1.172e-07	-6.931	-6.931	0.000	(0)
CuOH+	9.114e-08	7.471e-08	-7.040	-7.127	-0.086	(0)
Cu (CO3) 2-2	3.515e-08	1.265e-08	-7.454	-7.898	-0.444	(0)
CuHCO3+	2.115e-08	1.639e-08	-7.675	-7.786	-0.111	(0)
Cu (OH) 2	3.495e-09	3.495e-09	-8.457	-8.457	0.000	(0)
CuF+	1.112e-09	8.614e-10	-8.954	-9.065	-0.111	(0)
CuCl+	4.928e-10	4.040e-10	-9.307	-9.394	-0.086	(0)
Cu2 (OH) 2+2	3.896e-10	1.402e-10	-9.409	-9.853	-0.444	(0)
CuNO2+	1.103e-10	8.540e-11	-9.958	-10.069	-0.111	(0)
CuNH3+2	1.096e-11	3.945e-12	-10.960	-11.404	-0.444	(0)
Cu (OH) 3-	2.169e-12	1.680e-12	-11.664	-11.775	-0.111	(0)
CuCl2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
Cu (NO2) 2	7.072e-15	7.072e-15	-14.150	-14.150	0.000	(0)
CuNO3+	4.928e-15	3.817e-15	-14.307	-14.418	-0.111	(0)
CuCl3-	1.020e-17	8.364e-18	-16.991	-17.078	-0.086	(0)
Cu (OH) 4-2	8.614e-18	3.100e-18	-17.065	-17.509	-0.444	(0)
CuCl4-2	2.251e-22	1.060e-22	-21.648	-21.975	-0.327	(0)
Cu (NO3) 2	5.755e-24	5.755e-24	-23.240	-23.240	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.875	-217.986	-0.111	(0)
F	2.014e-04					
F-	1.643e-04	1.355e-04	-3.784	-3.868	-0.084	(0)
MgF+	3.296e-05	2.716e-05	-4.482	-4.566	-0.084	(0)

CaF+	3.011e-06	2.494e-06	-5.521	-5.603	-0.082	(0)
NaF	6.858e-07	6.858e-07	-6.164	-6.164	0.000	(0)
MnF+	1.142e-07	9.461e-08	-6.942	-7.024	-0.082	(0)
AlF3	6.635e-08	6.635e-08	-7.178	-7.178	0.000	(0)
AlF2+	4.679e-08	3.891e-08	-7.330	-7.410	-0.080	(0)
HF	8.600e-09	8.600e-09	-8.066	-8.066	0.000	(0)
ZnF+	5.778e-09	4.476e-09	-8.238	-8.349	-0.111	(0)
AlF4-	5.465e-09	4.505e-09	-8.262	-8.346	-0.084	(0)
BF(OH) 3-	2.120e-09	1.707e-09	-8.674	-8.768	-0.094	(0)
AlF+2	1.508e-09	7.215e-10	-8.822	-9.142	-0.320	(0)
CuF+	1.112e-09	8.614e-10	-8.954	-9.065	-0.111	(0)
NiF+	1.570e-10	1.216e-10	-9.804	-9.915	-0.111	(0)
CoF+	1.426e-10	1.104e-10	-9.846	-9.957	-0.111	(0)
CdF+	1.048e-11	8.115e-12	-10.980	-11.091	-0.111	(0)
HF2-	5.433e-12	4.429e-12	-11.265	-11.354	-0.089	(0)
PbF+	3.928e-12	3.043e-12	-11.406	-11.517	-0.111	(0)
BF2(OH) 2-	1.319e-12	1.062e-12	-11.880	-11.974	-0.094	(0)
UO2F+	1.311e-12	1.015e-12	-11.882	-11.993	-0.111	(0)
AgF	9.552e-13	9.552e-13	-12.020	-12.020	0.000	(0)
CrF+2	8.100e-13	2.915e-13	-12.092	-12.535	-0.444	(0)
UO2F2	3.967e-13	3.967e-13	-12.402	-12.402	0.000	(0)
UO2F3-	1.743e-14	1.350e-14	-13.759	-13.870	-0.111	(0)
PbF2	8.111e-15	8.111e-15	-14.091	-14.091	0.000	(0)
CdF2	2.193e-15	2.193e-15	-14.659	-14.659	0.000	(0)
H2F2	1.981e-16	1.981e-16	-15.703	-15.703	0.000	(0)
FeF2+	7.301e-17	6.049e-17	-16.137	-16.218	-0.082	(0)
UO2F4-2	4.035e-17	1.452e-17	-16.394	-16.838	-0.444	(0)
VO2F	3.976e-17	3.976e-17	-16.401	-16.401	0.000	(0)
FeF+2	3.543e-17	1.669e-17	-16.451	-16.778	-0.327	(0)
FeF3	1.156e-17	1.156e-17	-16.937	-16.937	0.000	(0)
BF3OH-	2.985e-18	2.404e-18	-17.525	-17.619	-0.094	(0)
PbF3-	2.690e-18	2.084e-18	-17.570	-17.681	-0.111	(0)
VO2F2-	2.524e-18	1.955e-18	-17.598	-17.709	-0.111	(0)
VOF+	8.129e-20	6.297e-20	-19.090	-19.201	-0.111	(0)
VO2F3-2	9.179e-21	3.304e-21	-20.037	-20.481	-0.444	(0)
VOF2	3.198e-21	3.198e-21	-20.495	-20.495	0.000	(0)
PbF4-2	3.754e-22	1.351e-22	-21.426	-21.869	-0.444	(0)
HgF+	1.501e-22	1.162e-22	-21.824	-21.935	-0.111	(0)
BF4-	8.547e-23	6.881e-23	-22.068	-22.162	-0.094	(0)
VOF3-	1.985e-23	1.537e-23	-22.702	-22.813	-0.111	(0)
VO2F4-3	2.194e-24	2.202e-25	-23.659	-24.657	-0.998	(0)
Sb(OH) 2F	3.929e-25	3.929e-25	-24.406	-24.406	0.000	(0)
SbOF	3.866e-25	3.866e-25	-24.413	-24.413	0.000	(0)
VOF4-2	2.335e-26	8.405e-27	-25.632	-26.075	-0.444	(0)
UF3+	3.825e-35	2.963e-35	-34.417	-34.528	-0.111	(0)
UF2+2	3.834e-36	1.380e-36	-35.416	-35.860	-0.444	(0)
UF4	4.400e-37	4.400e-37	-36.357	-36.357	0.000	(0)
UF+3	8.064e-39	8.092e-40	-38.093	-39.092	-0.998	(0)
UF5-	3.049e-39	2.362e-39	-38.516	-38.627	-0.111	(0)
UF6-2	2.684e-40	0.000e+00	-39.571	-40.015	-0.444	(0)
Fe (2)	1.548e-11					
Fe+2	1.055e-11	3.798e-12	-10.977	-11.420	-0.444	(0)
FeSO4	4.733e-12	4.733e-12	-11.325	-11.325	0.000	(0)
FeHCO3+	1.473e-13	1.232e-13	-12.832	-12.909	-0.078	(0)
FeOH+	4.279e-14	3.545e-14	-13.369	-13.450	-0.082	(0)
Fe(OH) 2	6.601e-18	6.601e-18	-17.180	-17.180	0.000	(0)
Fe(OH) 3-	5.907e-19	4.893e-19	-18.229	-18.310	-0.082	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.396	-160.396	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-237.211	-237.322	-0.111	(0)
Fe (3)	2.266e-09					
Fe(OH) 2+	1.865e-09	1.551e-09	-8.729	-8.809	-0.080	(0)
Fe(OH) 3	3.905e-10	3.905e-10	-9.408	-9.408	0.000	(0)
Fe(OH) 4-	1.025e-11	8.523e-12	-10.989	-11.069	-0.080	(0)
FeOH+2	3.610e-14	1.700e-14	-13.442	-13.769	-0.327	(0)
FeF2+	7.301e-17	6.049e-17	-16.137	-16.218	-0.082	(0)
FeF+2	3.543e-17	1.669e-17	-16.451	-16.778	-0.327	(0)
FeF3	1.156e-17	1.156e-17	-16.937	-16.937	0.000	(0)
FeSO4+	7.723e-18	6.398e-18	-17.112	-17.194	-0.082	(0)

	Fe (SO4) 2-	8.964e-19	6.943e-19	-18.047	-18.158	-0.111	(0)
	Fe+3	6.390e-19	1.123e-19	-18.194	-18.949	-0.755	(0)
	FeCl+2	1.822e-20	8.582e-21	-19.739	-20.066	-0.327	(0)
	FeCl2+	1.170e-22	9.695e-23	-21.932	-22.013	-0.082	(0)
	FeHSeO3+2	8.069e-23	2.904e-23	-22.093	-22.537	-0.444	(0)
	Fe2 (OH) 2+4	5.705e-25	9.575e-27	-24.244	-26.019	-1.775	(0)
	FeNO3+2	3.738e-26	1.345e-26	-25.427	-25.871	-0.444	(0)
	FeCl3	2.452e-26	2.452e-26	-25.610	-25.610	0.000	(0)
	Fe3 (OH) 4+5	1.274e-31	2.146e-34	-30.895	-33.668	-2.774	(0)
H (0)	2.545e-29						
	H2	1.273e-29	1.287e-29	-28.895	-28.891	0.005	(0)
Hg (0)	2.108e-09						
	Hg	2.108e-09	2.108e-09	-8.676	-8.676	0.000	(0)
Hg (1)	1.840e-19						
	Hg2+2	9.202e-20	3.312e-20	-19.036	-19.480	-0.444	(0)
Hg (2)	4.756e-11						
	HgClOH	2.424e-11	2.424e-11	-10.615	-10.615	0.000	(0)
	HgCl2	1.481e-11	1.481e-11	-10.829	-10.829	0.000	(0)
	Hg (OH) 2	7.939e-12	8.026e-12	-11.100	-11.095	0.005	(0)
	HgCl3-	4.836e-13	3.746e-13	-12.316	-12.426	-0.111	(0)
	HgCO3	7.796e-14	7.796e-14	-13.108	-13.108	0.000	(0)
	HgCl4-2	1.048e-14	3.772e-15	-13.980	-14.423	-0.444	(0)
	Hg (CO3) 2-2	1.928e-15	6.939e-16	-14.715	-15.159	-0.444	(0)
	HgCl+	1.508e-15	1.168e-15	-14.822	-14.932	-0.111	(0)
	HgOH+	2.789e-16	2.160e-16	-15.555	-15.665	-0.111	(0)
	HgHCO3+	8.045e-17	6.231e-17	-16.094	-16.205	-0.111	(0)
	Hg (NH3) 2+2	5.938e-19	2.137e-19	-18.226	-18.670	-0.444	(0)
	Hg (OH) 3-	3.058e-19	2.369e-19	-18.515	-18.625	-0.111	(0)
	HgNH3+2	1.552e-19	5.587e-20	-18.809	-19.253	-0.444	(0)
	Hg+2	6.431e-20	2.315e-20	-19.192	-19.635	-0.444	(0)
	HgSO4	3.076e-20	3.076e-20	-19.512	-19.512	0.000	(0)
	HgF+	1.501e-22	1.162e-22	-21.824	-21.935	-0.111	(0)
	Hg (NH3) 3+2	9.043e-27	3.255e-27	-26.044	-26.487	-0.444	(0)
	HgNO3+	1.321e-28	1.024e-28	-27.879	-27.990	-0.111	(0)
	Hg (NH3) 4+2	2.748e-34	9.890e-35	-33.561	-34.005	-0.444	(0)
	Hg (NO3) 2	5.095e-37	5.095e-37	-36.293	-36.293	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.155	-138.266	-0.111	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.163	-139.606	-0.444	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.239	-139.239	0.000	(0)
K	3.792e-03						
	K+	3.662e-03	3.019e-03	-2.436	-2.520	-0.084	(0)
	KSO4-	1.304e-04	1.085e-04	-3.885	-3.965	-0.080	(0)
	KCrO4-	6.238e-18	4.832e-18	-17.205	-17.316	-0.111	(0)
Mg	5.616e-03						
	Mg+2	3.870e-03	1.787e-03	-2.412	-2.748	-0.336	(0)
	MgSO4	1.651e-03	1.651e-03	-2.782	-2.782	0.000	(0)
	MgHCO3+	5.748e-05	4.713e-05	-4.240	-4.327	-0.086	(0)
	MgF+	3.296e-05	2.716e-05	-4.482	-4.566	-0.084	(0)
	MgCO3	4.184e-06	4.184e-06	-5.378	-5.378	0.000	(0)
	MgOH+	1.986e-07	1.668e-07	-6.702	-6.778	-0.076	(0)
	MgH2BO3+	3.290e-08	2.649e-08	-7.483	-7.577	-0.094	(0)
Mn (2)	6.586e-05						
	Mn+2	4.874e-05	1.754e-05	-4.312	-4.756	-0.444	(0)
	MnSO4	1.584e-05	1.584e-05	-4.800	-4.800	0.000	(0)
	MnHCO3+	1.089e-06	9.020e-07	-5.963	-6.045	-0.082	(0)
	MnF+	1.142e-07	9.461e-08	-6.942	-7.024	-0.082	(0)
	MnCl+	6.743e-08	5.586e-08	-7.171	-7.253	-0.082	(0)
	MnOH+	1.247e-08	1.033e-08	-7.904	-7.986	-0.082	(0)
	MnCl2	1.996e-10	1.996e-10	-9.700	-9.700	0.000	(0)
	MnNO3+	4.299e-13	3.330e-13	-12.367	-12.478	-0.111	(0)
	MnSeO4	2.912e-13	2.912e-13	-12.536	-12.536	0.000	(0)
	MnCl3-	1.678e-13	1.390e-13	-12.775	-12.857	-0.082	(0)
	Mn (OH) 3-	4.235e-18	3.509e-18	-17.373	-17.455	-0.082	(0)
	Mn (NO3) 2	1.002e-20	1.002e-20	-19.999	-19.999	0.000	(0)
	Mn (OH) 4-2	5.638e-24	2.656e-24	-23.249	-23.576	-0.327	(0)
	MnSe	0.000e+00	0.000e+00	-42.144	-42.144	0.000	(0)
Mn (3)	1.419e-24						
	Mn+3	1.419e-24	2.495e-25	-23.848	-24.603	-0.755	(0)

Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.902	-42.229	-0.327	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.006	-46.098	-0.091	(0)
Mo	2.127e-06					
MoO4-2	2.126e-06	9.817e-07	-5.672	-6.008	-0.336	(0)
HMoO4-	1.082e-09	8.384e-10	-8.966	-9.077	-0.111	(0)
H2MoO4	2.636e-13	2.636e-13	-12.579	-12.579	0.000	(0)
Ag2MoO4	2.929e-24	2.929e-24	-23.533	-23.533	0.000	(0)
AlMo6O21-3	2.927e-37	2.937e-38	-36.534	-37.532	-0.998	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.009	-48.003	-3.994	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.210	-48.984	-2.774	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-49.794	-51.569	-1.775	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-54.692	-55.690	-0.998	(0)
N (-3)	3.804e-07					
NH4+	3.577e-07	2.880e-07	-6.447	-6.541	-0.094	(0)
NH4SO4-	1.891e-08	1.566e-08	-7.723	-7.805	-0.082	(0)
NH3	3.825e-09	3.825e-09	-8.417	-8.417	0.000	(0)
CaNH3+2	2.257e-11	8.125e-12	-10.646	-11.090	-0.444	(0)
CuNH3+2	1.096e-11	3.945e-12	-10.960	-11.404	-0.444	(0)
NiNH3+2	2.040e-13	7.344e-14	-12.690	-13.134	-0.444	(0)
Co (NH3) +2	3.295e-14	1.186e-14	-13.482	-13.926	-0.444	(0)
AgNH3+	2.831e-14	2.193e-14	-13.548	-13.659	-0.111	(0)
BaNH3+2	2.658e-16	9.567e-17	-15.575	-16.019	-0.444	(0)
Ag (NH3) 2+	8.802e-19	6.818e-19	-18.055	-18.166	-0.111	(0)
Hg (NH3) 2+2	5.938e-19	2.137e-19	-18.226	-18.670	-0.444	(0)
HgNH3+2	1.552e-19	5.587e-20	-18.809	-19.253	-0.444	(0)
Ni (NH3) 2+2	1.128e-19	4.061e-20	-18.948	-19.391	-0.444	(0)
Ca (NH3) 2+2	3.438e-20	1.237e-20	-19.464	-19.908	-0.444	(0)
Co (NH3) 2+2	5.376e-21	1.935e-21	-20.270	-20.713	-0.444	(0)
Hg (NH3) 3+2	9.043e-27	3.255e-27	-26.044	-26.487	-0.444	(0)
Co (NH3) 3+2	2.589e-28	9.319e-29	-27.587	-28.031	-0.444	(0)
Hg (NH3) 4+2	2.748e-34	9.890e-35	-33.561	-34.005	-0.444	(0)
Co (NH3) 4+2	5.198e-36	1.871e-36	-35.284	-35.728	-0.444	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.768	-42.211	-0.444	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.481	-43.925	-0.444	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.373	-51.371	-0.998	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.464	-50.908	-0.444	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.422	-52.866	-0.444	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.702	-60.813	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.430	-65.873	-0.444	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.597	-66.041	-0.444	(0)
N (3)	9.987e-06					
NO2-	9.987e-06	8.092e-06	-5.001	-5.092	-0.091	(0)
CuNO2+	1.103e-10	8.540e-11	-9.958	-10.069	-0.111	(0)
AgNO2	4.746e-12	4.746e-12	-11.324	-11.324	0.000	(0)
CoNO2+	1.898e-12	1.470e-12	-11.722	-11.833	-0.111	(0)
Cu (NO2) 2	7.072e-15	7.072e-15	-14.150	-14.150	0.000	(0)
Ag (NO2) 2-	7.680e-17	5.949e-17	-16.115	-16.226	-0.111	(0)
N (5)	1.461e-08					
NO3-	1.453e-08	1.198e-08	-7.838	-7.922	-0.084	(0)
CaNO3+	8.249e-11	6.389e-11	-10.084	-10.195	-0.111	(0)
MnNO3+	4.299e-13	3.330e-13	-12.367	-12.478	-0.111	(0)
ZnNO3+	6.431e-14	4.982e-14	-13.192	-13.303	-0.111	(0)
CuNO3+	4.928e-15	3.817e-15	-14.307	-14.418	-0.111	(0)
BaNO3+	3.071e-15	2.379e-15	-14.513	-14.624	-0.111	(0)
NiNO3+	1.388e-15	1.075e-15	-14.857	-14.968	-0.111	(0)
CoNO3+	6.318e-16	4.894e-16	-15.199	-15.310	-0.111	(0)
CdNO3+	1.848e-16	1.432e-16	-15.733	-15.844	-0.111	(0)
PbNO3+	7.290e-17	5.646e-17	-16.137	-16.248	-0.111	(0)
AgNO3	2.671e-17	2.671e-17	-16.573	-16.573	0.000	(0)
Mn (NO3) 2	1.002e-20	1.002e-20	-19.999	-19.999	0.000	(0)
UO2NO3+	1.675e-21	1.298e-21	-20.776	-20.887	-0.111	(0)
Zn (NO3) 2	1.190e-22	1.190e-22	-21.924	-21.924	0.000	(0)
CrNO3+2	1.975e-23	7.109e-24	-22.704	-23.148	-0.444	(0)
Co (NO3) 2	1.193e-23	1.193e-23	-22.924	-22.924	0.000	(0)
Cu (NO3) 2	5.755e-24	5.755e-24	-23.240	-23.240	0.000	(0)
Pb (NO3) 2	1.148e-24	1.148e-24	-23.940	-23.940	0.000	(0)

	VO2NO3	1.014e-24	1.014e-24	-23.994	-23.994	0.000	(0)
	Cd(NO3)2	8.593e-25	8.593e-25	-24.066	-24.066	0.000	(0)
	FeNO3+2	3.738e-26	1.345e-26	-25.427	-25.871	-0.444	(0)
	HgNO3+	1.321e-28	1.024e-28	-27.879	-27.990	-0.111	(0)
	Hg(NO3)2	5.095e-37	5.095e-37	-36.293	-36.293	0.000	(0)
Na	1.001e-02						
	Na+	9.734e-03	8.024e-03	-2.012	-2.096	-0.084	(0)
	NaSO4-	2.630e-04	2.187e-04	-3.580	-3.660	-0.080	(0)
	NaHCO3	1.163e-05	1.163e-05	-4.935	-4.935	0.000	(0)
	NaF	6.858e-07	6.858e-07	-6.164	-6.164	0.000	(0)
	NaCO3-	5.056e-07	4.205e-07	-6.296	-6.376	-0.080	(0)
	NaH2BO3	5.435e-09	5.435e-09	-8.265	-8.265	0.000	(0)
	NaCrO4-	2.218e-17	1.718e-17	-16.654	-16.765	-0.111	(0)
Ni	1.326e-07						
	Ni+2	7.741e-08	3.575e-08	-7.111	-7.447	-0.336	(0)
	NiSO4	3.620e-08	3.620e-08	-7.441	-7.441	0.000	(0)
	NiHCO3+	1.466e-08	1.136e-08	-7.834	-7.945	-0.111	(0)
	NiCO3	3.754e-09	3.754e-09	-8.426	-8.426	0.000	(0)
	NiCl+	2.987e-10	2.313e-10	-9.525	-9.636	-0.111	(0)
	NiF+	1.570e-10	1.216e-10	-9.804	-9.915	-0.111	(0)
	NiOH+	1.362e-10	1.055e-10	-9.866	-9.977	-0.111	(0)
	Ni(SO4)2-2	1.691e-11	6.085e-12	-10.772	-11.216	-0.444	(0)
	Ni(OH)2	1.965e-12	1.965e-12	-11.707	-11.707	0.000	(0)
	NiNH3+2	2.040e-13	7.344e-14	-12.690	-13.134	-0.444	(0)
	NiCl2	2.946e-15	2.946e-15	-14.531	-14.531	0.000	(0)
	NiNO3+	1.388e-15	1.075e-15	-14.857	-14.968	-0.111	(0)
	NiSeO4	1.031e-15	1.031e-15	-14.987	-14.987	0.000	(0)
	Ni(OH)3-	5.946e-16	4.605e-16	-15.226	-15.337	-0.111	(0)
	Ni(NH3)2+2	1.128e-19	4.061e-20	-18.948	-19.391	-0.444	(0)
O(0)	6.050e-35						
	O2	3.025e-35	3.058e-35	-34.519	-34.515	0.005	(0)
Pb	5.380e-09						
	PbCO3	2.697e-09	2.697e-09	-8.569	-8.569	0.000	(0)
	PbSO4	7.924e-10	7.924e-10	-9.101	-9.101	0.000	(0)
	PbHCO3+	7.879e-10	6.103e-10	-9.104	-9.214	-0.111	(0)
	Pb+2	6.902e-10	3.188e-10	-9.161	-9.497	-0.336	(0)
	PbOH+	2.423e-10	1.877e-10	-9.616	-9.727	-0.111	(0)
	Pb(SO4)2-2	6.733e-11	2.424e-11	-10.172	-10.616	-0.444	(0)
	Pb(CO3)2-2	6.081e-11	2.189e-11	-10.216	-10.660	-0.444	(0)
	PbCl+	3.693e-11	2.861e-11	-10.433	-10.544	-0.111	(0)
	PbF+	3.928e-12	3.043e-12	-11.406	-11.517	-0.111	(0)
	Pb(OH)2	1.391e-12	1.391e-12	-11.857	-11.857	0.000	(0)
	PbCl2	3.232e-13	3.232e-13	-12.491	-12.491	0.000	(0)
	PbF2	8.111e-15	8.111e-15	-14.091	-14.091	0.000	(0)
	Pb(OH)3-	4.211e-16	3.262e-16	-15.376	-15.487	-0.111	(0)
	PbCl3-	4.202e-16	3.254e-16	-15.377	-15.488	-0.111	(0)
	PbNO3+	7.290e-17	5.646e-17	-16.137	-16.248	-0.111	(0)
	Pb2OH+3	9.450e-18	9.483e-19	-17.025	-18.023	-0.998	(0)
	PbF3-	2.690e-18	2.084e-18	-17.570	-17.681	-0.111	(0)
	PbCl4-2	1.045e-18	3.762e-19	-17.981	-18.425	-0.444	(0)
	Pb(OH)4-2	5.203e-20	1.873e-20	-19.284	-19.728	-0.444	(0)
	PbF4-2	3.754e-22	1.351e-22	-21.426	-21.869	-0.444	(0)
	Pb3(OH)4+2	3.421e-23	1.231e-23	-22.466	-22.910	-0.444	(0)
	Pb(NO3)2	1.148e-24	1.148e-24	-23.940	-23.940	0.000	(0)
	Pb4(OH)4+4	1.858e-27	3.118e-29	-26.731	-28.506	-1.775	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-152.152	-152.152	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-229.704	-229.815	-0.111	(0)
S(-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.700	-73.700	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.852	-78.963	-0.111	(0)
	CdHS+	0.000e+00	0.000e+00	-79.266	-79.377	-0.111	(0)
	H2S	0.000e+00	0.000e+00	-79.310	-79.310	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-80.517	-80.961	-0.444	(0)
	S6-2	0.000e+00	0.000e+00	-81.033	-81.476	-0.444	(0)
	S4-2	0.000e+00	0.000e+00	-81.113	-81.556	-0.444	(0)
	S3-2	0.000e+00	0.000e+00	-81.918	-82.362	-0.444	(0)
	S2-2	0.000e+00	0.000e+00	-82.935	-83.378	-0.444	(0)
	S-2	0.000e+00	0.000e+00	-88.569	-88.895	-0.327	(0)

HgHS2-	0.000e+00	0.000e+00	-138.155	-138.266	-0.111	(0)
HgS2-2	0.000e+00	0.000e+00	-139.163	-139.606	-0.444	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.239	-139.239	0.000	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.452	-148.563	-0.111	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.465	-148.679	-0.214	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.233	-149.611	-0.378	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.418	-149.529	-0.111	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.982	-150.341	-0.358	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.363	-150.752	-0.388	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.695	-151.063	-0.368	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.887	-150.887	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.136	-151.136	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.152	-152.152	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.396	-160.396	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.875	-217.986	-0.111	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.458	-226.569	-0.111	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.088	-228.199	-0.111	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.738	-229.182	-0.444	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.704	-229.815	-0.111	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.211	-237.322	-0.111	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.522	-304.966	-0.444	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.548	-306.992	-0.444	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.480	-319.924	-0.444	(0)
S (6)	1.502e-02					
SO4-2	1.099e-02	5.076e-03	-1.959	-2.294	-0.336	(0)
CaSO4	1.962e-03	1.962e-03	-2.707	-2.707	0.000	(0)
MgSO4	1.651e-03	1.651e-03	-2.782	-2.782	0.000	(0)
NaSO4-	2.630e-04	2.187e-04	-3.580	-3.660	-0.080	(0)
KSO4-	1.304e-04	1.085e-04	-3.885	-3.965	-0.080	(0)
MnSO4	1.584e-05	1.584e-05	-4.800	-4.800	0.000	(0)
ZnSO4	1.839e-06	1.839e-06	-5.735	-5.735	0.000	(0)
Zn (SO4) 2-2	2.259e-07	8.129e-08	-6.646	-7.090	-0.444	(0)
CuSO4	1.172e-07	1.172e-07	-6.931	-6.931	0.000	(0)
NiSO4	3.620e-08	3.620e-08	-7.441	-7.441	0.000	(0)
CoSO4	2.611e-08	2.611e-08	-7.583	-7.583	0.000	(0)
HSO4-	2.583e-08	2.129e-08	-7.588	-7.672	-0.084	(0)
NH4SO4-	1.891e-08	1.566e-08	-7.723	-7.805	-0.082	(0)
CdSO4	4.498e-09	4.498e-09	-8.347	-8.347	0.000	(0)
Cd (SO4) 2-2	8.556e-10	3.080e-10	-9.068	-9.511	-0.444	(0)
PbSO4	7.924e-10	7.924e-10	-9.101	-9.101	0.000	(0)
AgSO4-	3.671e-10	2.843e-10	-9.435	-9.546	-0.111	(0)
CrOHSO4	8.389e-11	8.389e-11	-10.076	-10.076	0.000	(0)
Pb (SO4) 2-2	6.733e-11	2.424e-11	-10.172	-10.616	-0.444	(0)
AlSO4+	2.546e-11	2.099e-11	-10.594	-10.678	-0.084	(0)
Ni (SO4) 2-2	1.691e-11	6.085e-12	-10.772	-11.216	-0.444	(0)
FeSO4	4.733e-12	4.733e-12	-11.325	-11.325	0.000	(0)
Al (SO4) 2-	1.385e-12	1.141e-12	-11.859	-11.943	-0.084	(0)
UO2SO4	4.172e-13	4.172e-13	-12.380	-12.380	0.000	(0)
CrSO4+	2.078e-13	1.610e-13	-12.682	-12.793	-0.111	(0)
UO2 (SO4) 2-2	7.756e-14	2.792e-14	-13.110	-13.554	-0.444	(0)
VO2SO4-	2.618e-17	2.028e-17	-16.582	-16.693	-0.111	(0)
FeSO4+	7.723e-18	6.398e-18	-17.112	-17.194	-0.082	(0)
Cr2 (OH) 2SO4+2	1.467e-18	5.281e-19	-17.834	-18.277	-0.444	(0)
Fe (SO4) 2-	8.964e-19	6.943e-19	-18.047	-18.158	-0.111	(0)
Cr2 (OH) 2 (SO4) 2	1.592e-19	1.592e-19	-18.798	-18.798	0.000	(0)
VOSO4	1.083e-19	1.083e-19	-18.965	-18.965	0.000	(0)
HgSO4	3.076e-20	3.076e-20	-19.512	-19.512	0.000	(0)
CrO3SO4-2	1.104e-23	3.973e-24	-22.957	-23.401	-0.444	(0)
VSO4+	6.894e-34	5.340e-34	-33.162	-33.272	-0.111	(0)
U (SO4) 2	2.439e-39	2.439e-39	-38.613	-38.613	0.000	(0)
USO4+2	1.681e-40	0.000e+00	-39.774	-40.218	-0.444	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.702	-60.813	-0.111	(0)
Sb (3)	8.546e-20					
Sb (OH) 3	4.323e-20	4.323e-20	-19.364	-19.364	0.000	(0)
HSbO2	4.223e-20	4.223e-20	-19.374	-19.374	0.000	(0)
SbO2-	2.057e-24	1.593e-24	-23.687	-23.798	-0.111	(0)
Sb (OH) 4-	1.177e-24	9.118e-25	-23.929	-24.040	-0.111	(0)
Sb (OH) 2F	3.929e-25	3.929e-25	-24.406	-24.406	0.000	(0)

SbOF	3.866e-25	3.866e-25	-24.413	-24.413	0.000	(0)
Sb(OH) 2+	5.821e-26	4.509e-26	-25.235	-25.346	-0.111	(0)
SbO+	2.008e-26	1.556e-26	-25.697	-25.808	-0.111	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.480	-319.924	-0.444	(0)
Sb (5)	2.999e-08					
SbO3-	2.996e-08	2.320e-08	-7.523	-7.634	-0.111	(0)
Sb(OH) 6-	3.285e-11	2.708e-11	-10.483	-10.567	-0.084	(0)
SbO2+	1.584e-23	1.227e-23	-22.800	-22.911	-0.111	(0)
Se (-2)	6.377e-15					
Ag2Se	6.377e-15	6.377e-15	-14.195	-14.195	0.000	(0)
HSe-	5.504e-40	4.263e-40	-39.259	-39.370	-0.111	(0)
MnSe	0.000e+00	0.000e+00	-42.144	-42.144	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.848	-42.848	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.559	-47.003	-0.444	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.925	-85.700	-1.775	(0)
Se (4)	1.515e-07					
HSeO3-	1.263e-07	9.783e-08	-6.899	-7.010	-0.111	(0)
SeO3-2	2.521e-08	9.074e-09	-7.598	-8.042	-0.444	(0)
H2SeO3	1.791e-12	1.791e-12	-11.747	-11.747	0.000	(0)
AgSeO3-	2.114e-14	1.637e-14	-13.675	-13.786	-0.111	(0)
Cd (SeO3) 2-2	7.126e-19	2.565e-19	-18.147	-18.591	-0.444	(0)
Ag (SeO3) 2-3	1.325e-20	1.330e-21	-19.878	-20.876	-0.998	(0)
FeHSeO3+2	8.069e-23	2.904e-23	-22.093	-22.537	-0.444	(0)
Se (6)	1.338e-10					
SeO4-2	1.335e-10	6.167e-11	-9.874	-10.210	-0.336	(0)
MnSeO4	2.912e-13	2.912e-13	-12.536	-12.536	0.000	(0)
ZnSeO4	1.582e-14	1.582e-14	-13.801	-13.801	0.000	(0)
NiSeO4	1.031e-15	1.031e-15	-14.987	-14.987	0.000	(0)
CoSeO4	7.969e-16	7.969e-16	-15.099	-15.099	0.000	(0)
HSeO4-	1.713e-16	1.327e-16	-15.766	-15.877	-0.111	(0)
CdSeO4	4.341e-17	4.341e-17	-16.362	-16.362	0.000	(0)
Zn (SeO4) 2-2	2.747e-24	9.889e-25	-23.561	-24.005	-0.444	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.824	-58.823	-0.998	(0)
U (4)	2.008e-21					
U (OH) 5-	2.006e-21	1.553e-21	-20.698	-20.809	-0.111	(0)
U (OH) 4	2.794e-24	2.794e-24	-23.554	-23.554	0.000	(0)
U (OH) 3+	5.665e-28	4.388e-28	-27.247	-27.358	-0.111	(0)
U (OH) 2+2	2.421e-32	8.715e-33	-31.616	-32.060	-0.444	(0)
UF3+	3.825e-35	2.963e-35	-34.417	-34.528	-0.111	(0)
UF2+2	3.834e-36	1.380e-36	-35.416	-35.860	-0.444	(0)
UF4	4.400e-37	4.400e-37	-36.357	-36.357	0.000	(0)
UOH+3	1.757e-37	1.763e-38	-36.755	-37.754	-0.998	(0)
UF+3	8.064e-39	8.092e-40	-38.093	-39.092	-0.998	(0)
UF5-	3.049e-39	2.362e-39	-38.516	-38.627	-0.111	(0)
U (SO4) 2	2.439e-39	2.439e-39	-38.613	-38.613	0.000	(0)
UF6-2	2.684e-40	0.000e+00	-39.571	-40.015	-0.444	(0)
USO4+2	1.681e-40	0.000e+00	-39.774	-40.218	-0.444	(0)
U+4	0.000e+00	0.000e+00	-42.749	-44.524	-1.775	(0)
UC1+3	0.000e+00	0.000e+00	-44.422	-45.421	-0.998	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.806	-173.792	-8.986	(0)
U (5)	1.342e-16					
UO2+	1.342e-16	1.040e-16	-15.872	-15.983	-0.111	(0)
U (6)	3.827e-07					
UO2 (CO3) 3-4	2.871e-07	4.819e-09	-6.542	-8.317	-1.775	(0)
UO2 (CO3) 2-2	9.492e-08	3.417e-08	-7.023	-7.466	-0.444	(0)
UO2CO3	6.084e-10	6.084e-10	-9.216	-9.216	0.000	(0)
UO2OH+	2.069e-12	1.603e-12	-11.684	-11.795	-0.111	(0)
UO2F+	1.311e-12	1.015e-12	-11.882	-11.993	-0.111	(0)
UO2SO4	4.172e-13	4.172e-13	-12.380	-12.380	0.000	(0)
UO2F2	3.967e-13	3.967e-13	-12.402	-12.402	0.000	(0)
UO2+2	1.176e-13	5.431e-14	-12.930	-13.265	-0.336	(0)
UO2 (SO4) 2-2	7.756e-14	2.792e-14	-13.110	-13.554	-0.444	(0)
UO2F3-	1.743e-14	1.350e-14	-13.759	-13.870	-0.111	(0)
UO2Cl+	2.876e-16	2.228e-16	-15.541	-15.652	-0.111	(0)
UO2F4-2	4.035e-17	1.452e-17	-16.394	-16.838	-0.444	(0)
(UO2) 2 (OH) 2+2	1.184e-17	4.263e-18	-16.927	-17.370	-0.444	(0)
(UO2) 3 (OH) 5+	3.677e-19	2.848e-19	-18.434	-18.545	-0.111	(0)

UO2NO3+	1.675e-21	1.298e-21	-20.776	-20.887	-0.111	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.474	-42.585	-0.111	(0)
V+2	0.000e+00	0.000e+00	-43.021	-43.465	-0.444	(0)
V(3)	2.316e-15					
V(OH) 3	2.316e-15	2.316e-15	-14.635	-14.635	0.000	(0)
V(OH) 2+	8.298e-26	6.427e-26	-25.081	-25.192	-0.111	(0)
VOH+2	7.275e-29	2.618e-29	-28.138	-28.582	-0.444	(0)
V+3	2.221e-33	2.229e-34	-32.653	-33.652	-0.998	(0)
VSO4+	6.894e-34	5.340e-34	-33.162	-33.272	-0.111	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.324	-55.322	-0.998	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-54.589	-56.364	-1.775	(0)
V(4)	5.086e-18					
V(OH) 3+	4.677e-18	3.622e-18	-17.330	-17.441	-0.111	(0)
VO+2	2.153e-19	7.750e-20	-18.667	-19.111	-0.444	(0)
VOSO4	1.083e-19	1.083e-19	-18.965	-18.965	0.000	(0)
VOF+	8.129e-20	6.297e-20	-19.090	-19.201	-0.111	(0)
VOF2	3.198e-21	3.198e-21	-20.495	-20.495	0.000	(0)
VOC1+	7.100e-22	5.499e-22	-21.149	-21.260	-0.111	(0)
VOF3-	1.985e-23	1.537e-23	-22.702	-22.813	-0.111	(0)
VOF4-2	2.335e-26	8.405e-27	-25.632	-26.075	-0.444	(0)
H2V2O4+2	1.830e-30	6.586e-31	-29.738	-30.181	-0.444	(0)
V(5)	6.610e-09					
H2VO4-	5.869e-09	4.546e-09	-8.231	-8.342	-0.111	(0)
HVO4-2	7.391e-10	2.660e-10	-9.131	-9.575	-0.444	(0)
H3VO4	1.951e-12	1.951e-12	-11.710	-11.710	0.000	(0)
H3V2O7-	7.399e-14	5.731e-14	-13.131	-13.242	-0.111	(0)
HV2O7-3	4.086e-15	4.101e-16	-14.389	-15.387	-0.998	(0)
VO4-3	3.096e-16	3.106e-17	-15.509	-16.508	-0.998	(0)
VO2+	2.030e-16	1.673e-16	-15.693	-15.776	-0.084	(0)
VO2F	3.976e-17	3.976e-17	-16.401	-16.401	0.000	(0)
VO2SO4-	2.618e-17	2.028e-17	-16.582	-16.693	-0.111	(0)
V2O7-4	1.532e-17	2.571e-19	-16.815	-18.590	-1.775	(0)
VO2F2-	2.524e-18	1.955e-18	-17.598	-17.709	-0.111	(0)
V3O9-3	9.823e-19	9.858e-20	-18.008	-19.006	-0.998	(0)
VO2F3-2	9.179e-21	3.304e-21	-20.037	-20.481	-0.444	(0)
V4O12-4	1.114e-23	1.869e-25	-22.953	-24.728	-1.775	(0)
VO2F4-3	2.194e-24	2.202e-25	-23.659	-24.657	-0.998	(0)
VO2NO3	1.014e-24	1.014e-24	-23.994	-23.994	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.990	-63.984	-3.994	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.391	-63.164	-2.774	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.549	-65.324	-1.775	(0)
Zn	6.166e-06					
Zn+2	3.586e-06	1.656e-06	-5.445	-5.781	-0.336	(0)
ZnSO4	1.839e-06	1.839e-06	-5.735	-5.735	0.000	(0)
ZnCO3	2.682e-07	2.682e-07	-6.572	-6.572	0.000	(0)
Zn(SO4) 2-2	2.259e-07	8.129e-08	-6.646	-7.090	-0.444	(0)
ZnHCO3+	1.742e-07	1.349e-07	-6.759	-6.870	-0.111	(0)
ZnOH+	5.012e-08	3.882e-08	-7.300	-7.411	-0.111	(0)
ZnCl+	1.283e-08	1.052e-08	-7.892	-7.978	-0.086	(0)
ZnF+	5.778e-09	4.476e-09	-8.238	-8.349	-0.111	(0)
ZnOHCl	3.229e-09	3.229e-09	-8.491	-8.491	0.000	(0)
Zn(OH) 2	1.442e-09	1.442e-09	-8.841	-8.841	0.000	(0)
ZnCl2	4.218e-11	4.218e-11	-10.375	-10.375	0.000	(0)
Zn(OH) 3-	2.188e-12	1.695e-12	-11.660	-11.771	-0.111	(0)
ZnCl3-	1.034e-13	8.473e-14	-12.986	-13.072	-0.086	(0)
ZnNO3+	6.431e-14	4.982e-14	-13.192	-13.303	-0.111	(0)
ZnSeO4	1.582e-14	1.582e-14	-13.801	-13.801	0.000	(0)
ZnCl4-2	2.275e-16	1.072e-16	-15.643	-15.970	-0.327	(0)
Zn(OH) 4-2	4.394e-17	1.582e-17	-16.357	-16.801	-0.444	(0)
Zn(NO3) 2	1.190e-22	1.190e-22	-21.924	-21.924	0.000	(0)
Zn(SeO4) 2-2	2.747e-24	9.889e-25	-23.561	-24.005	-0.444	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.418	-149.529	-0.111	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.887	-150.887	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.458	-226.569	-0.111	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.738	-229.182	-0.444	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.548	-306.992	-0.444	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.08	-48.79	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.65	-38.14	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.88	-38.14	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.23	-53.29	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-57.35	-37.32	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.85	-28.45	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.74	-23.29	0.45	(NH4) 2SeO4
Acanthite	-52.48	-88.70	-36.22	Ag2S
Ag2CO3	-11.56	-22.65	-11.09	Ag2CO3
Ag2CrO4	-20.88	-32.47	-11.59	Ag2CrO4
Ag2HVO4	-12.26	-10.78	1.48	Ag2HVO4
Ag2MoO4	-11.56	-23.11	-11.55	Ag2MoO4
Ag2O	-14.94	-2.37	12.57	Ag2O
Ag2Se	-0.41	-49.11	-48.70	Ag2Se
Ag2SeO3	-9.60	-16.75	-7.15	Ag2SeO3
Ag2SeO4	-18.40	-27.31	-8.91	Ag2SeO4
Ag2SO4	-14.58	-19.40	-4.82	Ag2SO4
Ag3AsO3	-28.09	-25.93	2.16	Ag3AsO3
Ag3AsO4	-16.30	-19.09	-2.79	Ag3AsO4
Ag3H2VO5	-17.14	-11.96	5.18	Ag3H2VO5
AgF:4H2O	-13.47	-12.42	1.05	AgF:4H2O
Agmetal	-0.55	-14.05	-13.51	Ag
AgVO3	-10.36	-9.59	0.77	AgVO3
Al (OH) 3 (am)	-0.97	9.83	10.80	Al (OH) 3
Al2 (MoO4) 3	-44.94	-42.57	2.37	Al2 (MoO4) 3
Al2O3	0.00	19.66	19.65	Al2O3
Al4 (OH) 10SO4	-0.42	22.28	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.51	-5.71	4.80	AlAsO4:2H2O
AlOHSO4	-3.97	-7.20	-3.23	AlOHSO4
AlSb	-152.38	-86.76	65.62	AlSb
Alunite	1.67	0.27	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.00	-11.79	-7.79	PbSO4
Anhydrite	-0.71	-5.07	-4.36	CaSO4
Anilite	-56.18	-88.06	-31.88	Cu0.25Cu1.5S
Antlerite	-2.60	6.18	8.79	Cu3 (OH) 4SO4
Aragonite	-0.02	-8.32	-8.30	CaCO3
Arsenolite	-86.74	-89.50	-2.76	As4O6
Artinite	-5.91	3.69	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.77	-31.06	6.71	As2O5
Atacamite	-1.88	5.51	7.39	Cu2 (OH) 3Cl
Azurite	-0.45	-17.36	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.06	7.33	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.03	-2.15	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.16	-9.07	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.76	5.18	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.10	-22.77	-9.67	BaCrO4
BaF2	-9.32	-15.14	-5.82	BaF2
BaMoO4	-6.45	-13.41	-6.96	BaMoO4
Barite	0.28	-9.70	-9.98	BaSO4
BaS	-95.18	-79.00	16.18	BaS
BaSeO3	-8.87	-7.04	1.83	BaSeO3
BaSeO4	-10.15	-17.61	-7.46	BaSeO4
Bianchite	-6.31	-8.08	-1.76	ZnSO4:6H2O
Birnessite	-7.72	10.37	18.09	MnO2
Bixbyite	-4.36	-5.00	-0.64	Mn2O3
BlaubleiI	-55.69	-79.85	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.36	-83.64	-27.28	Cu0.6Cu0.8S
Boehmite	1.25	9.83	8.58	AlOOH
Breithauptite	-57.90	-76.43	-18.52	NiSb
Brochantite	-1.30	13.92	15.22	Cu4 (OH) 6SO4
Brucite	-4.86	11.99	16.84	Mg (OH) 2
Bunsenite	-5.16	7.29	12.45	NiO
Ca (VO3) 2	-10.52	-4.86	5.66	Ca (VO3) 2
Ca2V2O7	-10.40	7.10	17.50	Ca2V2O7

Ca ₂ V ₂ O ₇ ·2H ₂ O	-14.45	7.10	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-17.48	4.82	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-19.89	19.07	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-20.80	19.06	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-300.26	-157.28	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.87	-18.14	-2.27	CaCrO ₄
Calcite	0.16	-8.32	-8.48	CaCO ₃
Calomel	-6.76	-24.67	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.83	-8.78	-7.95	CaMoO ₄
Carnotite	-2.32	-2.09	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-5.23	-2.42	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-9.96	-12.98	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-12.53	-2.69	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.33	6.31	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.42	6.31	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-21.83	-15.12	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.65	1.91	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.18	8.22	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.96	-13.62	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-11.92	-13.62	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.70	-13.62	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-14.95	-16.16	-1.21	CdF ₂
Cdmetal(alpha)	-32.94	-19.43	13.51	Cd
Cdmetal(gamma)	-33.05	-19.43	13.62	Cd
CdMoO ₄	-0.28	-14.43	-14.15	CdMoO ₄
CdOHCl	-7.19	-3.65	3.54	CdOHCl
CdSb	-77.05	-77.40	-0.35	CdSb
CdSe	-20.23	-40.43	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.78	-18.63	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.54	-10.72	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-8.99	-10.72	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-8.84	-10.72	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.40	-11.15	-9.75	AgCl
Cerrusite	-1.92	-15.05	-13.13	PbCO ₃
CH ₄ (g)	-82.20	-123.25	-41.05	CH ₄
Chalcanthite	-6.65	-9.29	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-56.29	-91.21	-34.92	Cu ₂ S
Chalcocpyrite	-126.34	-161.61	-35.27	CuFeS ₂
Cinnabar	-51.73	-97.42	-45.69	HgS
Claudetite	-86.43	-89.50	-3.06	As ₄ O ₆
Clausthalite	-14.40	-41.50	-27.10	PbSe
Co(BO ₂) ₂	-28.92	-1.85	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.95	7.15	13.09	Co(OH) ₂
Co(OH) ₃	-10.08	-12.38	-2.31	Co(OH) ₃
CO ₂ (g)	-2.14	-20.28	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.66	-9.63	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.13	-17.62	-10.50	Co ₃ O ₄
CoCl ₂	-21.05	-12.78	8.27	CoCl ₂
CoCl ₂ ·6H ₂ O	-15.32	-12.78	2.54	CoCl ₂ ·6H ₂ O
CoCO ₃	-3.16	-13.14	-9.98	CoCO ₃
CoF ₂	-13.73	-15.33	-1.60	CoF ₂
CoF ₃	-44.63	-46.09	-1.46	CoF ₃
CoFe ₂ O ₄	16.98	13.45	-3.53	CoFe ₂ O ₄
CoMoO ₄	-5.84	-13.60	-7.76	CoMoO ₄
CoO	-6.44	7.15	13.59	CoO
CoS(alpha)	-71.74	-79.18	-7.44	CoS
CoS(beta)	-68.11	-79.18	-11.07	CoS
CoSe	-23.39	-39.59	-16.20	CoSe
CoSeO ₃	-8.55	-7.23	1.32	CoSeO ₃
CoSeO ₄ ·6H ₂ O	-16.27	-17.80	-1.53	CoSeO ₄ ·6H ₂ O
CoSO ₄	-12.69	-9.88	2.80	CoSO ₄
CoSO ₄ ·6H ₂ O	-7.41	-9.89	-2.47	CoSO ₄ ·6H ₂ O
Cotunnite	-9.91	-14.69	-4.78	PbCl ₂
Covellite	-56.29	-78.59	-22.30	CuS
Cr(OH) ₂	-22.08	-11.26	10.82	Cr(OH) ₂
Cr(OH) ₃	-2.67	-1.33	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	-0.58	-1.33	-0.75	Cr(OH) ₃
Cr ₂ O ₃	-0.31	-2.67	-2.36	Cr ₂ O ₃

CrCl2	-45.28	-31.19	14.09	CrCl2
CrCl3	-46.34	-31.23	15.11	CrCl3
CrF3	-23.70	-35.04	-11.34	CrF3
Crmetal	-67.48	-37.00	30.48	Cr
CrO3	-26.89	-30.10	-3.21	CrO3
Cryolite	-7.93	-41.77	-33.84	Na3AlF6
Cu(OH)2	-0.94	7.74	8.67	Cu(OH)2
Cu(SbO3)2	-24.72	20.49	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.06	0.19	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.41	-91.29	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.82	-51.62	-45.80	Cu2Se
Cu2SO4	-19.96	-21.91	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.95	-7.85	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.32	-103.91	-42.59	Cu3Sb
Cu3Se2	-27.13	-90.62	-63.49	Cu3Se2
CuCO3	-1.05	-12.55	-11.50	CuCO3
CuCrO4	-16.92	-22.36	-5.44	CuCrO4
CuF	-8.77	-13.68	-4.91	CuF
CuF2	-15.85	-14.73	1.12	CuF2
CuF2:2H2O	-10.18	-14.73	-4.55	CuF2:2H2O
Cumetal	-6.56	-15.31	-8.76	Cu
CuMoO4	0.07	-13.00	-13.08	CuMoO4
CuOCuSO4	-11.86	-1.55	10.30	CuOCuSO4
Cupricferrite	8.05	14.04	5.99	CuFe2O4
Cuprite	-3.48	-4.88	-1.41	Cu2O
Cuprousferrite	9.63	0.71	-8.92	CuFeO2
CuSe	-5.90	-39.00	-33.10	CuSe
CuSe2	-26.63	-60.00	-33.37	CuSe2
CuSeO3:2H2O	-7.15	-6.64	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.77	-17.21	-2.44	CuSeO4:5H2O
CuSO4	-12.23	-9.29	2.94	CuSO4
Diaspore	2.95	9.83	6.87	AlOOH
Djurleite	-56.46	-90.38	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.08	-16.62	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.47	-16.62	-17.09	CaMg(CO3)2
Epsomite	-2.92	-5.04	-2.13	MgSO4:7H2O
Fe(OH)2	-10.25	3.31	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	3.20	0.16	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-9.78	-13.50	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.63	-8.07	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.20	-36.83	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.05	-44.78	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.61	9.62	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.78	-12.38	0.40	FeAsO4:2H2O
FeCr2O4	-6.56	0.65	7.20	FeCr2O4
FeMoO4	-7.34	-17.43	-10.09	FeMoO4
Ferrihydrite	-0.04	3.15	3.19	Fe(OH)3
Ferroselite	-45.82	-64.42	-18.60	FeSe2
FeS(ppt)	-80.07	-83.02	-2.95	FeS
FeSe	-32.42	-43.42	-11.00	FeSe
Fix_pe	-5.50	-5.50	0.00	e-
Fluorite	-0.01	-10.51	-10.50	CaF2
Galena	-67.12	-81.09	-13.97	PbS
Gibbsite	1.54	9.83	8.29	Al(OH)3
Goethite	2.66	3.15	0.49	FeOOH
Goslarite	-6.07	-8.08	-2.01	ZnSO4:7H2O
Greenockite	-65.66	-80.02	-14.36	CdS
Greigite	-290.67	-335.70	-45.03	Fe3S4
Gummite	-6.20	1.47	7.67	UO3
Gypsum	-0.46	-5.07	-4.61	CaSO4:2H2O
H-Jarosite	-12.50	-24.60	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.87	-20.74	-12.88	H2MoO4
H2S(g)	-78.32	-86.33	-8.01	H2S
H2Se(g)	-41.78	-46.74	-4.96	H2Se
Halite	-6.30	-4.69	1.60	NaCl
Hausmannite	-5.35	55.68	61.03	Mn3O4
Hematite	7.72	6.30	-1.42	Fe2O3
Hercynite	0.08	22.97	22.89	FeAl2O4

Hg (CH3) 2 (g)	-183.88	-257.59	-73.71	Hg (CH3) 2
Hg (g)	-7.37	-15.24	-7.87	Hg
Hg (OH) 2	-7.60	-11.10	-3.50	Hg (OH) 2
Hg2 (g)	-15.53	-30.49	-14.96	Hg2
Hg2 (OH) 2	-10.01	-4.75	5.26	Hg2 (OH) 2
Hg2CO3	-8.98	-25.03	-16.05	Hg2CO3
Hg2CrO4	-26.15	-34.85	-8.70	Hg2CrO4
Hg2F2	-16.85	-27.22	-10.36	Hg2F2
Hg2S	-79.40	-91.08	-11.68	Hg2S
Hg2SeO3	-14.47	-19.12	-4.66	Hg2SeO3
Hg2SO4	-15.64	-21.77	-6.13	Hg2SO4
Hg3O2CO3	-23.89	-53.57	-29.68	Hg3O2CO3
HgCl (g)	-31.83	-12.34	19.50	HgCl
HgCl2	-9.76	-31.02	-21.26	HgCl2
HgF (g)	-46.28	-13.61	32.68	HgF
HgF2 (g)	-46.13	-33.57	12.57	HgF2
Hgmetal (1)	-1.79	-15.24	-13.45	Hg
HgSe	-2.14	-57.83	-55.69	HgSe
HgSeO3	-13.04	-25.47	-12.43	HgSeO3
HgSO4	-18.71	-28.12	-9.42	HgSO4
Huntite	-3.25	-33.22	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.09	-24.86	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.44	-21.21	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.22	-19.39	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.96	-19.76	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.26	-50.51	-17.24	K2Cr2O7
K2CrO4	-19.89	-20.41	-0.51	K2CrO4
K2MoO4	-14.31	-11.05	3.26	K2MoO4
K2SeO4	-14.52	-15.25	-0.73	K2SeO4
Langite	-3.57	13.92	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.12	-6.55	-0.43	PbO : PbSO4
Laurionite	-5.35	-4.73	0.62	PbOHCl
Lepidocrocite	1.78	3.15	1.37	FeOOH
Lime	-20.74	11.96	32.70	CaO
Litharge	-7.46	5.24	12.69	PbO
Mackinawite	-79.42	-83.02	-3.60	FeS
Maghemite	-0.08	6.30	6.39	Fe2O3
Magnesioferrite	1.43	18.29	16.86	Fe2MgO4
Magnesite	-0.84	-8.30	-7.46	MgCO3
Magnetite	6.22	9.62	3.40	Fe3O4
Malachite	0.50	-4.81	-5.31	Cu2 (OH) 2CO3
Manganite	-2.49	22.85	25.34	MnOOH
Massicot	-7.66	5.24	12.89	PbO
Matlockite	-6.99	-15.96	-8.97	PbClF
Melanothallite	-18.45	-12.19	6.26	CuCl2
Melanterite	-11.51	-13.72	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.33	-97.42	-45.09	HgS
Mg (OH) 2 (active)	-6.81	11.99	18.79	Mg (OH) 2
Mg (VO3) 2	-16.11	-4.83	11.28	Mg (VO3) 2
Mg2Sb3	-276.11	-201.43	74.68	Mg2Sb3
Mg2V2O7	-19.21	7.15	26.36	Mg2V2O7
MgCr2O4	-6.88	9.32	16.20	MgCr2O4
MgCrO4	-23.49	-18.11	5.38	MgCrO4
MgF2	-2.35	-10.48	-8.13	MgF2
MgMoO4	-6.91	-8.76	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.45	-2.39	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.76	-12.96	-1.20	MgSeO4 : 6H2O
Minium	-32.07	41.45	73.52	Pb3O4
Mirabilite	-5.37	-6.49	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.74	-6.84	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.38	-56.09	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.58	-89.50	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.63	-1.13	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.67	-9.95	2.72	MnCl2 : 4H2O
MnS (grn)	-76.52	-76.35	0.17	MnS
MnS (pnk)	-79.69	-76.35	3.34	MnS
MnSb	-96.18	-99.09	-2.91	MnSb
MnSe	-40.26	-36.76	3.50	MnSe

MnSeO3	-5.53	-4.40	1.13	MnSeO3
MnSeO3:2H2O	-5.38	-4.40	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.92	-14.97	-2.05	MnSeO4:5H2O
MnSO4	-9.63	-7.05	2.58	MnSO4
Montepontite	-8.79	6.31	15.10	CdO
Montroydite	-7.46	-11.10	-3.64	HgO
MoO3	-12.74	-20.74	-8.00	MoO3
Morenosite	-7.60	-9.74	-2.14	NiSO4:7H2O
MoS2	-148.88	-219.14	-70.26	MoS2
Na-Jarosite	-8.13	-19.33	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.76	-49.66	-9.90	Na2Cr2O7
Na2CrO4	-22.49	-19.56	2.93	Na2CrO4
Na2Mo2O7	-14.34	-30.94	-16.60	Na2Mo2O7
Na2MoO4	-11.69	-10.20	1.49	Na2MoO4
Na2MoO4:2H2O	-11.42	-10.20	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.13	-3.83	10.30	Na2SeO3:5H2O
Na2SeO4	-15.68	-14.40	1.28	Na2SeO4
Na3Sb	-175.22	-80.77	94.45	Na3Sb
Na3VO4	-29.28	7.41	36.68	Na3VO4
Na4V2O7	-33.13	4.27	37.40	Na4V2O7
Nantokite	-5.68	-12.41	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.43	-9.74	-1.31	Na2CO3:10H2O
NaVO3	-7.00	-3.14	3.86	NaVO3
Nesquehonite	-3.63	-8.30	-4.67	MgCO3:3H2O
Ni(OH)2	-5.51	7.29	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.90	-9.20	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.88	12.12	32.00	Ni4(OH)6SO4
NiCO3	-6.13	-13.00	-6.87	NiCO3
NiMoO4	-2.31	-13.45	-11.14	NiMoO4
NiS(alpha)	-73.44	-79.04	-5.60	NiS
NiS(beta)	-67.94	-79.04	-11.10	NiS
NiS(gamma)	-66.24	-79.04	-12.80	NiS
NiSe	-21.75	-39.45	-17.70	NiSe
NiSeO3:2H2O	-9.90	-7.09	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.14	-17.66	-1.52	NiSeO4:6H2O
Nsutite	-7.14	10.37	17.50	MnO2
O2(g)	-31.61	51.48	83.09	O2
Orpiment	-242.67	-303.74	-61.07	As2S3
Otavite	-1.97	-13.97	-12.00	CdCO3
Pb(BO2)2	-10.28	-3.76	6.52	Pb(BO2)2
Pb(OH)2	-2.91	5.24	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.57	-69.33	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.28	0.51	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.71	10.48	26.19	Pb2O(OH)2
Pb2O3	-24.82	36.22	61.04	Pb2O3
Pb2OCO3	-9.25	-9.81	-0.56	Pb2OCO3
Pb2V2O7	-4.44	-6.34	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.15	-15.35	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.25	-1.11	6.14	Pb3(VO4)2
Pb3O2CO3	-15.59	-4.57	11.02	Pb3O2CO3
Pb3O2SO4	-12.00	-1.32	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.18	3.92	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.95	3.92	21.88	Pb4O3SO4
PbCrO4	-12.26	-24.86	-12.60	PbCrO4
PbF2	-9.79	-17.23	-7.44	PbF2
Pbmetal	-24.75	-20.50	4.25	Pb
PbMoO4	0.12	-15.50	-15.62	PbMoO4
PbO:0.3H2O	-7.74	5.24	12.98	PbO:0.33H2O
PbSeO4	-12.87	-19.71	-6.84	PbSeO4
Periclase	-9.60	11.99	21.58	MgO
Phosgenite	-9.93	-29.74	-19.81	PbCl2:PbCO3
Plattnerite	-18.62	30.98	49.60	PbO2
Portlandite	-10.84	11.96	22.80	Ca(OH)2
Pyrite	-125.10	-143.61	-18.51	FeS2
Pyrochroite	-5.22	9.98	15.19	Mn(OH)2
Pyrolusite	-5.66	35.72	41.38	MnO2
Realgar	-101.83	-121.57	-19.75	AsS

Retgersite	-7.70	-9.74	-2.04	NiSO4:6H2O
Rhodochrosite	0.27	-10.31	-10.58	MnCO3
Rutherfordine	-4.32	-18.82	-14.50	UO2CO3
Sb(OH)3	-12.25	-19.36	-7.11	Sb(OH)3
Sb2O4	-16.39	-12.99	3.40	Sb2O4
Sb2O5	-26.20	-35.87	-9.67	Sb2O5
Sb2Se3	-111.18	-178.94	-67.76	Sb2Se3
Sb4O6(cubic)	-59.19	-77.46	-18.26	Sb4O6
Sb4O6(orth)	-59.55	-77.46	-17.90	Sb4O6
SbCl3	-49.83	-49.26	0.57	SbCl3
SbF3	-42.84	-53.07	-10.23	SbF3
Sbmetal	-46.29	-57.97	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-4.53	1.47	5.99	UO2(OH)2:H2O
Semetal(am)	-13.89	-21.00	-7.11	Se
Semetal(hex)	-13.29	-21.00	-7.71	Se
Senarmontite	-26.36	-38.73	-12.37	Sb2O3
SeO2	-14.50	-14.38	0.12	SeO2
SeO3	-45.99	-24.94	21.04	SeO3
Siderite	-6.73	-16.97	-10.24	FeCO3
Smithsonite	-1.33	-11.33	-10.00	ZnCO3
Sphalerite	-65.93	-77.38	-11.45	ZnS
Spinel	-5.21	31.64	36.85	MgAl2O4
Stibnite	-247.26	-297.72	-50.46	Sb2S3
Sulfur	-58.44	-60.59	-2.14	S
Tenorite	0.09	7.74	7.64	CuO
Thenardite	-6.81	-6.49	0.32	Na2SO4
Thermonatrite	-10.38	-9.74	0.64	Na2CO3:H2O
Tyuyamunite	-6.00	-1.92	4.08	Ca(UO2)2(VO4)2
U3O8	-14.77	6.32	21.08	U3O8
U3Sb4	-583.89	-431.50	152.38	U3Sb4
U4O9	-31.46	-34.48	-3.02	U4O9
UF4	-30.46	-60.00	-29.54	UF4
UF4:2.5H2O	-27.28	-60.00	-32.72	UF4:2.5H2O
UO2(am)	-15.99	-15.06	0.93	UO2
UO2(NO3)2	-41.26	-29.11	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.96	-29.11	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.50	-29.11	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.16	-29.11	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.14	1.47	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.23	-23.48	-2.25	UO2SeO4:4H2O
UO3	-6.23	1.47	7.70	UO3
Uraninite	-10.39	-15.06	-4.67	UO2
USb2	-221.28	-191.70	29.58	USb2
V(OH)3	-19.14	-11.55	7.59	V(OH)3
V2O5	-15.46	-16.82	-1.36	V2O5
V3O5	-40.71	-38.87	1.84	V3O5
V4O7	-50.43	-43.25	7.19	V4O7
V6O13	-41.08	-101.94	-60.86	V6O13
Valentinite	-30.25	-38.73	-8.48	Sb2O3
VC12	-63.22	-44.35	18.87	VC12
VC13	-64.88	-41.44	23.43	VC13
VF4	-64.25	-49.32	14.93	VF4
Vmetal	-94.19	-50.16	44.03	V
VO	-39.18	-24.42	14.76	VO
VO(OH)2	-9.53	-4.38	5.15	VO(OH)2
VO2Cl	-21.21	-18.37	2.84	VO2Cl
VOC1	-32.67	-21.51	11.15	VOC1
VOC12	-37.06	-24.30	12.76	VOC12
VOSO4	-25.01	-21.41	3.61	VOSO4
Witherite	-4.38	-12.95	-8.57	BaCO3
Wurtzite	-68.43	-77.38	-8.95	ZnS
Zincite	-2.38	8.95	11.33	ZnO
Zincosite	-12.01	-8.08	3.93	ZnSO4
Zn(BO2)2	-8.34	-0.05	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.94	-21.63	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-3.25	8.95	12.20	Zn(OH)2
Zn(OH)2(am)	-3.52	8.95	12.47	Zn(OH)2

Zn(OH)2(beta)	-2.80	8.95	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.58	8.95	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.78	8.95	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.62	0.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.25	7.94	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.86	-4.21	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.11	-7.20	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.62	18.78	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.66	24.84	38.50	Zn5(OH)8Cl2
ZnCl2	-18.02	-10.97	7.05	ZnCl2
ZnCO3:1H2O	-1.07	-11.33	-10.26	ZnCO3:1H2O
ZnF2	-12.98	-13.52	-0.53	ZnF2
Znmetal	-42.58	-16.79	25.79	Zn
ZnMoO4	-1.66	-11.79	-10.13	ZnMoO4
ZnO(active)	-2.24	8.95	11.19	ZnO
ZnS(am)	-68.32	-77.38	-9.05	ZnS
ZnSb	-85.77	-74.76	11.01	ZnSb
ZnSe	-23.38	-37.78	-14.40	ZnSe
ZnSeO4:6H2O	-14.47	-15.99	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.44	-8.08	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 80.

Title Return solution back to 1L
Mix 405
412 1.2192
save solution 413
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 405.

Mixture 405.

1.219e+00 Solution 412 Solution after simulation 79.

-----Solution composition-----

Elements	Molality	Moles
Ag	2.242e-08	2.240e-08
Al	4.151e-06	4.148e-06
As	3.298e-10	3.296e-10
B	3.187e-05	3.184e-05
Ba	8.705e-08	8.698e-08
C	3.536e-03	3.533e-03
Ca	5.722e-03	5.718e-03
Cd	1.503e-08	1.502e-08
Cl	3.068e-03	3.066e-03

Co	1.062e-07	1.062e-07
Cr	3.023e-09	3.021e-09
Cu	2.160e-06	2.158e-06
F	2.014e-04	2.013e-04
Fe	2.281e-09	2.279e-09
Hg	2.155e-09	2.154e-09
K	3.792e-03	3.790e-03
Mg	5.616e-03	5.612e-03
Mn	6.586e-05	6.581e-05
Mo	2.127e-06	2.125e-06
N	1.038e-05	1.037e-05
Na	1.001e-02	1.000e-02
Ni	1.326e-07	1.325e-07
Pb	5.380e-09	5.376e-09
S	1.502e-02	1.500e-02
Sb	2.999e-08	2.997e-08
Se	1.516e-07	1.515e-07
U	3.827e-07	3.824e-07
V	6.610e-09	6.605e-09
Zn	6.166e-06	6.162e-06

-----Description of solution-----

	pH	=	7.367	Charge balance
	pe	=	5.503	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.732e-02	
	Mass of water (kg)	=	9.992e-01	
	Total alkalinity (eq/kg)	=	3.325e-03	
	Total CO2 (mol/kg)	=	3.536e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.227e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.109326e+02	
	Total O	=	5.553512e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.876e-07	2.344e-07	-6.541	-6.630	-0.089	(0)
H+	5.207e-08	4.292e-08	-7.283	-7.367	-0.084	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	2.242e-08					
AgCl	1.450e-08	1.450e-08	-7.839	-7.839	0.000	(0)
AgCl2-	4.123e-09	3.194e-09	-8.385	-8.496	-0.111	(0)
Ag+	3.405e-09	2.807e-09	-8.468	-8.552	-0.084	(0)
AgSO4-	3.671e-10	2.843e-10	-9.435	-9.546	-0.111	(0)
AgCl3-2	2.000e-11	7.199e-12	-10.699	-11.143	-0.444	(0)
AgNO2	4.746e-12	4.746e-12	-11.324	-11.324	0.000	(0)
AgF	9.552e-13	9.552e-13	-12.020	-12.020	0.000	(0)
AgCl4-3	3.705e-13	3.718e-14	-12.431	-13.430	-0.998	(0)
AgOH	6.581e-14	6.581e-14	-13.182	-13.182	0.000	(0)
AgNH3+	2.831e-14	2.193e-14	-13.548	-13.659	-0.111	(0)
AgSeO3-	2.114e-14	1.637e-14	-13.675	-13.786	-0.111	(0)
AgH2BO3	1.902e-14	1.902e-14	-13.721	-13.721	0.000	(0)
Ag2Se	6.377e-15	6.377e-15	-14.195	-14.195	0.000	(0)
Ag (NO2) 2-	7.680e-17	5.949e-17	-16.115	-16.226	-0.111	(0)
AgNO3	2.671e-17	2.671e-17	-16.573	-16.573	0.000	(0)
Ag (OH) 2-	1.946e-18	1.508e-18	-17.711	-17.822	-0.111	(0)
Ag (NH3) 2+	8.802e-19	6.818e-19	-18.055	-18.166	-0.111	(0)
Ag (SeO3) 2-3	1.325e-20	1.330e-21	-19.878	-20.876	-0.998	(0)
Ag2MoO4	2.929e-24	2.929e-24	-23.533	-23.533	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.700	-73.700	0.000	(0)

	AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.925	-85.700	-1.775	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.452	-148.563	-0.111	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.465	-148.679	-0.214	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.363	-150.752	-0.388	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.695	-151.063	-0.368	(0)
Al	4.151e-06						
	Al (OH) 4-	3.894e-06	3.210e-06	-5.410	-5.494	-0.084	(0)
	Al (OH) 3	1.088e-07	1.088e-07	-6.964	-6.964	0.000	(0)
	AlF3	6.635e-08	6.635e-08	-7.178	-7.178	0.000	(0)
	AlF2+	4.679e-08	3.891e-08	-7.330	-7.410	-0.080	(0)
	Al (OH) 2+	2.796e-08	2.325e-08	-7.553	-7.634	-0.080	(0)
	AlF4-	5.465e-09	4.505e-09	-8.262	-8.346	-0.084	(0)
	AlF+2	1.508e-09	7.215e-10	-8.822	-9.142	-0.320	(0)
	AlOH+2	2.610e-10	1.249e-10	-9.583	-9.904	-0.320	(0)
	AlSO4+	2.546e-11	2.099e-11	-10.594	-10.678	-0.084	(0)
	Al+3	3.030e-12	5.327e-13	-11.519	-12.274	-0.755	(0)
	Al (SO4) 2-	1.385e-12	1.141e-12	-11.859	-11.943	-0.084	(0)
	AlMo6O21-3	2.927e-37	2.937e-38	-36.534	-37.532	-0.998	(0)
As (3)	4.282e-23						
	H3AsO3	4.217e-23	4.217e-23	-22.375	-22.375	0.000	(0)
	H2AsO3-	6.505e-25	5.038e-25	-24.187	-24.298	-0.111	(0)
	HAsO3-2	2.974e-29	1.071e-29	-28.527	-28.970	-0.444	(0)
	H4AsO3+	1.158e-30	8.967e-31	-29.936	-30.047	-0.111	(0)
	AsO3-3	9.581e-35	9.615e-36	-34.019	-35.017	-0.998	(0)
As (5)	3.298e-10						
	HAsO4-2	2.790e-10	1.004e-10	-9.554	-9.998	-0.444	(0)
	H2AsO4-	5.076e-11	3.931e-11	-10.295	-10.405	-0.111	(0)
	AsO4-3	7.373e-14	7.399e-15	-13.132	-14.131	-0.998	(0)
	H3AsO4	2.901e-16	2.932e-16	-15.538	-15.533	0.005	(0)
B	3.187e-05						
	H3BO3	3.124e-05	3.159e-05	-4.505	-4.501	0.005	(0)
	H2BO3-	5.308e-07	4.274e-07	-6.275	-6.369	-0.094	(0)
	CaH2BO3+	5.153e-08	4.149e-08	-7.288	-7.382	-0.094	(0)
	MgH2BO3+	3.290e-08	2.649e-08	-7.483	-7.577	-0.094	(0)
	NaH2BO3	5.435e-09	5.435e-09	-8.265	-8.265	0.000	(0)
	BF (OH) 3-	2.120e-09	1.707e-09	-8.674	-8.768	-0.094	(0)
	H5 (BO3) 2-	1.427e-11	1.149e-11	-10.846	-10.940	-0.094	(0)
	BF2 (OH) 2-	1.319e-12	1.062e-12	-11.880	-11.974	-0.094	(0)
	BaH2BO3+	6.502e-13	5.235e-13	-12.187	-12.281	-0.094	(0)
	H8 (BO3) 3-	4.507e-14	3.629e-14	-13.346	-13.440	-0.094	(0)
	AgH2BO3	1.902e-14	1.902e-14	-13.721	-13.721	0.000	(0)
	BF3OH-	2.985e-18	2.404e-18	-17.525	-17.619	-0.094	(0)
	BF4-	8.547e-23	6.881e-23	-22.068	-22.162	-0.094	(0)
Ba	8.705e-08						
	Ba+2	8.583e-08	3.964e-08	-7.066	-7.402	-0.336	(0)
	BaHCO3+	1.166e-09	9.753e-10	-8.933	-9.011	-0.078	(0)
	BaCO3	5.721e-11	5.721e-11	-10.243	-10.243	0.000	(0)
	BaH2BO3+	6.502e-13	5.235e-13	-12.187	-12.281	-0.094	(0)
	BaOH+	4.896e-14	4.056e-14	-13.310	-13.392	-0.082	(0)
	BaNO3+	3.071e-15	2.379e-15	-14.513	-14.624	-0.111	(0)
	BaNH3+2	2.658e-16	9.567e-17	-15.575	-16.019	-0.444	(0)
C (4)	3.536e-03						
	HCO3-	3.098e-03	2.577e-03	-2.509	-2.589	-0.080	(0)
	H2CO3	2.487e-04	2.487e-04	-3.604	-3.604	0.000	(0)
	CaHCO3+	9.679e-05	8.094e-05	-4.014	-4.092	-0.078	(0)
	MgHCO3+	5.748e-05	4.713e-05	-4.240	-4.327	-0.086	(0)
	NaHCO3	1.163e-05	1.163e-05	-4.935	-4.935	0.000	(0)
	CaCO3	7.525e-06	7.525e-06	-5.123	-5.123	0.000	(0)
	CO3-2	6.094e-06	2.814e-06	-5.215	-5.551	-0.336	(0)
	MgCO3	4.184e-06	4.184e-06	-5.378	-5.378	0.000	(0)
	CuCO3	1.670e-06	1.670e-06	-5.777	-5.777	0.000	(0)
	MnHCO3+	1.089e-06	9.020e-07	-5.963	-6.045	-0.082	(0)
	NaCO3-	5.056e-07	4.205e-07	-6.296	-6.376	-0.080	(0)
	UO2 (CO3) 3-4	2.871e-07	4.819e-09	-6.542	-8.317	-1.775	(0)
	ZnCO3	2.682e-07	2.682e-07	-6.572	-6.572	0.000	(0)
	ZnHCO3+	1.742e-07	1.349e-07	-6.759	-6.870	-0.111	(0)
	UO2 (CO3) 2-2	9.492e-08	3.417e-08	-7.023	-7.466	-0.444	(0)
	Cu (CO3) 2-2	3.515e-08	1.265e-08	-7.454	-7.898	-0.444	(0)

		CuHCO3+	2.115e-08	1.639e-08	-7.675	-7.786	-0.111	(0)
		NiHCO3+	1.466e-08	1.136e-08	-7.834	-7.945	-0.111	(0)
		CoHCO3+	6.672e-09	5.168e-09	-8.176	-8.287	-0.111	(0)
		NiCO3	3.754e-09	3.754e-09	-8.426	-8.426	0.000	(0)
		PbCO3	2.697e-09	2.697e-09	-8.569	-8.569	0.000	(0)
		CoCO3	1.227e-09	1.227e-09	-8.911	-8.911	0.000	(0)
		BaHCO3+	1.166e-09	9.753e-10	-8.933	-9.011	-0.078	(0)
		PbHCO3+	7.879e-10	6.103e-10	-9.104	-9.214	-0.111	(0)
		UO2CO3	6.084e-10	6.084e-10	-9.216	-9.216	0.000	(0)
		CdCO3	2.425e-10	2.425e-10	-9.615	-9.615	0.000	(0)
		Pb (CO3) 2-2	6.081e-11	2.189e-11	-10.216	-10.660	-0.444	(0)
		BaCO3	5.721e-11	5.721e-11	-10.243	-10.243	0.000	(0)
		CdHCO3+	2.863e-11	2.218e-11	-10.543	-10.654	-0.111	(0)
		Cd (CO3) 2-2	1.406e-12	5.059e-13	-11.852	-12.296	-0.444	(0)
		FeHCO3+	1.473e-13	1.232e-13	-12.832	-12.909	-0.078	(0)
		HgCO3	7.796e-14	7.796e-14	-13.108	-13.108	0.000	(0)
		Hg (CO3) 2-2	1.928e-15	6.939e-16	-14.715	-15.159	-0.444	(0)
		HgHCO3+	8.045e-17	6.231e-17	-16.094	-16.205	-0.111	(0)
Ca	5.722e-03							
		Ca+2	3.653e-03	1.687e-03	-2.437	-2.773	-0.336	(0)
		CaSO4	1.962e-03	1.962e-03	-2.707	-2.707	0.000	(0)
		CaHCO3+	9.679e-05	8.094e-05	-4.014	-4.092	-0.078	(0)
		CaCO3	7.525e-06	7.525e-06	-5.123	-5.123	0.000	(0)
		CaF+	3.011e-06	2.494e-06	-5.521	-5.603	-0.082	(0)
		CaH2BO3+	5.153e-08	4.149e-08	-7.288	-7.382	-0.094	(0)
		CaOH+	9.436e-09	7.891e-09	-8.025	-8.103	-0.078	(0)
		CaNO3+	8.249e-11	6.389e-11	-10.084	-10.195	-0.111	(0)
		CaNH3+2	2.257e-11	8.125e-12	-10.646	-11.090	-0.444	(0)
		Ca (NH3) 2+2	3.438e-20	1.237e-20	-19.464	-19.908	-0.444	(0)
Cd	1.503e-08							
		Cd+2	8.185e-09	3.780e-09	-8.087	-8.422	-0.336	(0)
		CdSO4	4.498e-09	4.498e-09	-8.347	-8.347	0.000	(0)
		CdCl+	1.179e-09	9.131e-10	-8.929	-9.039	-0.111	(0)
		Cd (SO4) 2-2	8.556e-10	3.080e-10	-9.068	-9.511	-0.444	(0)
		CdCO3	2.425e-10	2.425e-10	-9.615	-9.615	0.000	(0)
		CdHCO3+	2.863e-11	2.218e-11	-10.543	-10.654	-0.111	(0)
		CdF+	1.048e-11	8.115e-12	-10.980	-11.091	-0.111	(0)
		CdCl2	9.628e-12	9.628e-12	-11.016	-11.016	0.000	(0)
		CdOH+	9.088e-12	7.039e-12	-11.042	-11.152	-0.111	(0)
		CdOHC1	8.780e-12	8.780e-12	-11.056	-11.056	0.000	(0)
		Cd (CO3) 2-2	1.406e-12	5.059e-13	-11.852	-12.296	-0.444	(0)
		CdCl3-	1.984e-14	1.536e-14	-13.703	-13.813	-0.111	(0)
		Cd (OH) 2	1.041e-14	1.041e-14	-13.982	-13.982	0.000	(0)
		CdF2	2.193e-15	2.193e-15	-14.659	-14.659	0.000	(0)
		CdNO3+	1.848e-16	1.432e-16	-15.733	-15.844	-0.111	(0)
		CdSeO4	4.341e-17	4.341e-17	-16.362	-16.362	0.000	(0)
		Cd2OH+3	1.329e-18	1.334e-19	-17.876	-18.875	-0.998	(0)
		Cd (SeO3) 2-2	7.126e-19	2.565e-19	-18.147	-18.591	-0.444	(0)
		Cd (OH) 3-	1.925e-19	1.491e-19	-18.716	-18.826	-0.111	(0)
		Cd (NO3) 2	8.593e-25	8.593e-25	-24.066	-24.066	0.000	(0)
		Cd (OH) 4-2	1.590e-26	5.722e-27	-25.799	-26.242	-0.444	(0)
		CdHS+	0.000e+00	0.000e+00	-79.266	-79.377	-0.111	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.136	-151.136	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-228.088	-228.199	-0.111	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-304.522	-304.966	-0.444	(0)
Cl	3.068e-03							
		Cl-	3.068e-03	2.529e-03	-2.513	-2.597	-0.084	(0)
		MnCl+	6.743e-08	5.586e-08	-7.171	-7.253	-0.082	(0)
		AgCl	1.450e-08	1.450e-08	-7.839	-7.839	0.000	(0)
		ZnCl+	1.283e-08	1.052e-08	-7.892	-7.978	-0.086	(0)
		AgCl2-	4.123e-09	3.194e-09	-8.385	-8.496	-0.111	(0)
		ZnOHC1	3.229e-09	3.229e-09	-8.491	-8.491	0.000	(0)
		CdCl+	1.179e-09	9.131e-10	-8.929	-9.039	-0.111	(0)
		CuCl	4.937e-10	4.937e-10	-9.307	-9.307	0.000	(0)
		CuCl+	4.928e-10	4.040e-10	-9.307	-9.394	-0.086	(0)
		CuCl2-	3.182e-10	2.609e-10	-9.497	-9.584	-0.086	(0)
		NiCl+	2.987e-10	2.313e-10	-9.525	-9.636	-0.111	(0)
		CoCl+	2.913e-10	2.256e-10	-9.536	-9.647	-0.111	(0)

MnCl2	1.996e-10	1.996e-10	-9.700	-9.700	0.000	(0)
ZnCl2	4.218e-11	4.218e-11	-10.375	-10.375	0.000	(0)
PbCl+	3.693e-11	2.861e-11	-10.433	-10.544	-0.111	(0)
HgClOH	2.424e-11	2.424e-11	-10.615	-10.615	0.000	(0)
AgCl3-2	2.000e-11	7.199e-12	-10.699	-11.143	-0.444	(0)
HgCl2	1.481e-11	1.481e-11	-10.829	-10.829	0.000	(0)
CdCl2	9.628e-12	9.628e-12	-11.016	-11.016	0.000	(0)
CdOHC1	8.780e-12	8.780e-12	-11.056	-11.056	0.000	(0)
HgCl3-	4.836e-13	3.746e-13	-12.316	-12.426	-0.111	(0)
AgCl4-3	3.705e-13	3.718e-14	-12.431	-13.430	-0.998	(0)
CuCl2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
PbCl2	3.232e-13	3.232e-13	-12.491	-12.491	0.000	(0)
CuCl3-2	2.995e-13	1.411e-13	-12.524	-12.851	-0.327	(0)
MnCl3-	1.678e-13	1.390e-13	-12.775	-12.857	-0.082	(0)
ZnCl3-	1.034e-13	8.473e-14	-12.986	-13.072	-0.086	(0)
CdCl3-	1.984e-14	1.536e-14	-13.703	-13.813	-0.111	(0)
HgCl4-2	1.048e-14	3.772e-15	-13.980	-14.423	-0.444	(0)
NiCl2	2.946e-15	2.946e-15	-14.531	-14.531	0.000	(0)
HgCl+	1.508e-15	1.168e-15	-14.822	-14.932	-0.111	(0)
PbCl3-	4.202e-16	3.254e-16	-15.377	-15.488	-0.111	(0)
UO2Cl+	2.876e-16	2.228e-16	-15.541	-15.652	-0.111	(0)
ZnCl4-2	2.275e-16	1.072e-16	-15.643	-15.970	-0.327	(0)
CrCl+2	1.235e-16	4.445e-17	-15.908	-16.352	-0.444	(0)
CuCl3-	1.020e-17	8.364e-18	-16.991	-17.078	-0.086	(0)
PbCl4-2	1.045e-18	3.762e-19	-17.981	-18.425	-0.444	(0)
CrOHC12	5.010e-19	5.010e-19	-18.300	-18.300	0.000	(0)
FeCl+2	1.822e-20	8.582e-21	-19.739	-20.066	-0.327	(0)
CrCl2+	1.377e-20	1.067e-20	-19.861	-19.972	-0.111	(0)
VOCl+	7.100e-22	5.499e-22	-21.149	-21.260	-0.111	(0)
CuCl4-2	2.251e-22	1.060e-22	-21.648	-21.975	-0.327	(0)
FeCl2+	1.170e-22	9.695e-23	-21.932	-22.013	-0.082	(0)
CrO3Cl-	5.278e-26	4.088e-26	-25.278	-25.388	-0.111	(0)
FeCl3	2.452e-26	2.452e-26	-25.610	-25.610	0.000	(0)
CoCl+2	4.673e-35	1.682e-35	-34.330	-34.774	-0.444	(0)
UCl+3	0.000e+00	0.000e+00	-44.422	-45.421	-0.998	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.464	-50.908	-0.444	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.422	-52.866	-0.444	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.597	-66.041	-0.444	(0)
Co (2)	1.062e-07					
Co+2	7.164e-08	2.578e-08	-7.145	-7.589	-0.444	(0)
CoSO4	2.611e-08	2.611e-08	-7.583	-7.583	0.000	(0)
CoHCO3+	6.672e-09	5.168e-09	-8.176	-8.287	-0.111	(0)
CoCO3	1.227e-09	1.227e-09	-8.911	-8.911	0.000	(0)
CoCl+	2.913e-10	2.256e-10	-9.536	-9.647	-0.111	(0)
CoOH+	1.557e-10	1.206e-10	-9.808	-9.919	-0.111	(0)
CoF+	1.426e-10	1.104e-10	-9.846	-9.957	-0.111	(0)
Co (OH) 2	2.246e-12	2.246e-12	-11.649	-11.649	0.000	(0)
CoNO2+	1.898e-12	1.470e-12	-11.722	-11.833	-0.111	(0)
Co (NH3) +2	3.295e-14	1.186e-14	-13.482	-13.926	-0.444	(0)
CoSeO4	7.969e-16	7.969e-16	-15.099	-15.099	0.000	(0)
CoNO3+	6.318e-16	4.894e-16	-15.199	-15.310	-0.111	(0)
Co (OH) 3-	1.356e-17	1.050e-17	-16.868	-16.979	-0.111	(0)
CoOOH-	3.405e-18	2.637e-18	-17.468	-17.579	-0.111	(0)
Co2OH+3	1.553e-18	1.559e-19	-17.809	-18.807	-0.998	(0)
Co (NH3) 2+2	5.376e-21	1.935e-21	-20.270	-20.713	-0.444	(0)
Co (NO3) 2	1.193e-23	1.193e-23	-22.924	-22.924	0.000	(0)
Co (OH) 4-2	1.084e-24	3.903e-25	-23.965	-24.409	-0.444	(0)
Co (NH3) 3+2	2.589e-28	9.319e-29	-27.587	-28.031	-0.444	(0)
Co4 (OH) 4+4	2.515e-30	4.221e-32	-29.599	-31.375	-1.775	(0)
Co (NH3) 4+2	5.198e-36	1.871e-36	-35.284	-35.728	-0.444	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.481	-43.925	-0.444	(0)
Co (3)	1.082e-28					
CoOH+2	1.082e-28	3.893e-29	-27.966	-28.410	-0.444	(0)
Co+3	1.859e-34	3.268e-35	-33.731	-34.486	-0.755	(0)
CoCl+2	4.673e-35	1.682e-35	-34.330	-34.774	-0.444	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.464	-50.908	-0.444	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.702	-60.813	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.430	-65.873	-0.444	(0)

Co(NH3)6Cl+2	0.000e+00	0.000e+00	-65.597	-66.041	-0.444	(0)
Cr(2)	2.831e-26					
Cr+2	2.831e-26	1.019e-26	-25.548	-25.992	-0.444	(0)
Cr(3)	3.023e-09					
Cr(OH)2+	2.565e-09	1.987e-09	-8.591	-8.702	-0.111	(0)
Cr(OH)+2	1.935e-10	6.965e-11	-9.713	-10.157	-0.444	(0)
Cr(OH)3	1.749e-10	1.749e-10	-9.757	-9.757	0.000	(0)
CrOHSO4	8.389e-11	8.389e-11	-10.076	-10.076	0.000	(0)
CrO2-	2.501e-12	1.937e-12	-11.602	-11.713	-0.111	(0)
Cr(OH)4-	2.108e-12	1.633e-12	-11.676	-11.787	-0.111	(0)
CrF+2	8.100e-13	2.915e-13	-12.092	-12.535	-0.444	(0)
CrSO4+	2.078e-13	1.610e-13	-12.682	-12.793	-0.111	(0)
Cr+3	1.353e-13	1.358e-14	-12.869	-13.867	-0.998	(0)
CrCl+2	1.235e-16	4.445e-17	-15.908	-16.352	-0.444	(0)
Cr2(OH)2SO4+2	1.467e-18	5.281e-19	-17.834	-18.277	-0.444	(0)
CrOHC12	5.010e-19	5.010e-19	-18.300	-18.300	0.000	(0)
Cr2(OH)2(SO4)2	1.592e-19	1.592e-19	-18.798	-18.798	0.000	(0)
CrCl2+	1.377e-20	1.067e-20	-19.861	-19.972	-0.111	(0)
CrNO3+2	1.975e-23	7.109e-24	-22.704	-23.148	-0.444	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-41.768	-42.211	-0.444	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-50.373	-51.371	-0.998	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-52.422	-52.866	-0.444	(0)
Cr(6)	1.038e-15					
CrO4-2	9.328e-16	4.308e-16	-15.030	-15.366	-0.336	(0)
HCrO4-	7.725e-17	5.983e-17	-16.112	-16.223	-0.111	(0)
NaCrO4-	2.218e-17	1.718e-17	-16.654	-16.765	-0.111	(0)
KCrO4-	6.238e-18	4.832e-18	-17.205	-17.316	-0.111	(0)
CrO3SO4-2	1.104e-23	3.973e-24	-22.957	-23.401	-0.444	(0)
H2CrO4	2.082e-24	2.082e-24	-23.682	-23.682	0.000	(0)
CrO3Cl-	5.278e-26	4.088e-26	-25.278	-25.388	-0.111	(0)
Cr2O7-2	3.451e-31	1.242e-31	-30.462	-30.906	-0.444	(0)
Cu(1)	1.012e-09					
CuCl	4.937e-10	4.937e-10	-9.307	-9.307	0.000	(0)
CuCl2-	3.182e-10	2.609e-10	-9.497	-9.584	-0.086	(0)
Cu+	2.002e-10	1.550e-10	-9.699	-9.810	-0.111	(0)
CuCl3-2	2.995e-13	1.411e-13	-12.524	-12.851	-0.327	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.233	-149.611	-0.378	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.982	-150.341	-0.358	(0)
Cu(2)	2.159e-06					
CuCO3	1.670e-06	1.670e-06	-5.777	-5.777	0.000	(0)
Cu+2	2.182e-07	1.008e-07	-6.661	-6.997	-0.336	(0)
CuSO4	1.172e-07	1.172e-07	-6.931	-6.931	0.000	(0)
CuOH+	9.114e-08	7.471e-08	-7.040	-7.127	-0.086	(0)
Cu(CO3)2-2	3.515e-08	1.265e-08	-7.454	-7.898	-0.444	(0)
CuHCO3+	2.115e-08	1.639e-08	-7.675	-7.786	-0.111	(0)
Cu(OH)2	3.495e-09	3.495e-09	-8.457	-8.457	0.000	(0)
CuF+	1.112e-09	8.614e-10	-8.954	-9.065	-0.111	(0)
CuCl+	4.928e-10	4.040e-10	-9.307	-9.394	-0.086	(0)
Cu2(OH)2+2	3.896e-10	1.402e-10	-9.409	-9.853	-0.444	(0)
CuNO2+	1.103e-10	8.540e-11	-9.958	-10.069	-0.111	(0)
CuNH3+2	1.096e-11	3.945e-12	-10.960	-11.404	-0.444	(0)
Cu(OH)3-	2.169e-12	1.680e-12	-11.664	-11.775	-0.111	(0)
CuCl2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
Cu(NO2)2	7.072e-15	7.072e-15	-14.150	-14.150	0.000	(0)
CuNO3+	4.928e-15	3.817e-15	-14.307	-14.418	-0.111	(0)
CuCl3-	1.020e-17	8.364e-18	-16.991	-17.078	-0.086	(0)
Cu(OH)4-2	8.614e-18	3.100e-18	-17.065	-17.509	-0.444	(0)
CuCl4-2	2.251e-22	1.060e-22	-21.648	-21.975	-0.327	(0)
Cu(NO3)2	5.755e-24	5.755e-24	-23.240	-23.240	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-217.875	-217.986	-0.111	(0)
F	2.014e-04					
F-	1.643e-04	1.355e-04	-3.784	-3.868	-0.084	(0)
MgF+	3.296e-05	2.716e-05	-4.482	-4.566	-0.084	(0)
CaF+	3.011e-06	2.494e-06	-5.521	-5.603	-0.082	(0)
NaF	6.858e-07	6.858e-07	-6.164	-6.164	0.000	(0)
MnF+	1.142e-07	9.461e-08	-6.942	-7.024	-0.082	(0)
AlF3	6.635e-08	6.635e-08	-7.178	-7.178	0.000	(0)
AlF2+	4.679e-08	3.891e-08	-7.330	-7.410	-0.080	(0)

HF	8.600e-09	8.600e-09	-8.066	-8.066	0.000	(0)
ZnF+	5.778e-09	4.476e-09	-8.238	-8.349	-0.111	(0)
AlF4-	5.465e-09	4.505e-09	-8.262	-8.346	-0.084	(0)
BF(OH) 3-	2.120e-09	1.707e-09	-8.674	-8.768	-0.094	(0)
AlF+2	1.508e-09	7.215e-10	-8.822	-9.142	-0.320	(0)
CuF+	1.112e-09	8.614e-10	-8.954	-9.065	-0.111	(0)
NiF+	1.570e-10	1.216e-10	-9.804	-9.915	-0.111	(0)
CoF+	1.426e-10	1.104e-10	-9.846	-9.957	-0.111	(0)
CdF+	1.048e-11	8.115e-12	-10.980	-11.091	-0.111	(0)
HF2-	5.433e-12	4.429e-12	-11.265	-11.354	-0.089	(0)
PbF+	3.928e-12	3.043e-12	-11.406	-11.517	-0.111	(0)
BF2(OH) 2-	1.319e-12	1.062e-12	-11.880	-11.974	-0.094	(0)
UO2F+	1.311e-12	1.015e-12	-11.882	-11.993	-0.111	(0)
AgF	9.552e-13	9.552e-13	-12.020	-12.020	0.000	(0)
CrF+2	8.100e-13	2.915e-13	-12.092	-12.535	-0.444	(0)
UO2F2	3.967e-13	3.967e-13	-12.402	-12.402	0.000	(0)
UO2F3-	1.743e-14	1.350e-14	-13.759	-13.870	-0.111	(0)
PbF2	8.111e-15	8.111e-15	-14.091	-14.091	0.000	(0)
CdF2	2.193e-15	2.193e-15	-14.659	-14.659	0.000	(0)
H2F2	1.981e-16	1.981e-16	-15.703	-15.703	0.000	(0)
FeF2+	7.301e-17	6.049e-17	-16.137	-16.218	-0.082	(0)
UO2F4-2	4.035e-17	1.452e-17	-16.394	-16.838	-0.444	(0)
VO2F	3.976e-17	3.976e-17	-16.401	-16.401	0.000	(0)
FeF+2	3.543e-17	1.669e-17	-16.451	-16.778	-0.327	(0)
FeF3	1.156e-17	1.156e-17	-16.937	-16.937	0.000	(0)
BF3OH-	2.985e-18	2.404e-18	-17.525	-17.619	-0.094	(0)
PbF3-	2.690e-18	2.084e-18	-17.570	-17.681	-0.111	(0)
VO2F2-	2.524e-18	1.955e-18	-17.598	-17.709	-0.111	(0)
VOF+	8.129e-20	6.297e-20	-19.090	-19.201	-0.111	(0)
VO2F3-2	9.179e-21	3.304e-21	-20.037	-20.481	-0.444	(0)
VOF2	3.198e-21	3.198e-21	-20.495	-20.495	0.000	(0)
PbF4-2	3.754e-22	1.351e-22	-21.426	-21.869	-0.444	(0)
HgF+	1.501e-22	1.162e-22	-21.824	-21.935	-0.111	(0)
BF4-	8.547e-23	6.881e-23	-22.068	-22.162	-0.094	(0)
VOF3-	1.985e-23	1.537e-23	-22.702	-22.813	-0.111	(0)
VO2F4-3	2.194e-24	2.202e-25	-23.659	-24.657	-0.998	(0)
Sb(OH) 2F	3.929e-25	3.929e-25	-24.406	-24.406	0.000	(0)
SbOF	3.866e-25	3.866e-25	-24.413	-24.413	0.000	(0)
VOF4-2	2.335e-26	8.405e-27	-25.632	-26.075	-0.444	(0)
UF3+	3.825e-35	2.963e-35	-34.417	-34.528	-0.111	(0)
UF2+2	3.834e-36	1.380e-36	-35.416	-35.860	-0.444	(0)
UF4	4.400e-37	4.400e-37	-36.357	-36.357	0.000	(0)
UF+3	8.064e-39	8.092e-40	-38.093	-39.092	-0.998	(0)
UF5-	3.049e-39	2.362e-39	-38.516	-38.627	-0.111	(0)
UF6-2	2.684e-40	0.000e+00	-39.571	-40.015	-0.444	(0)
Fe (2)	1.548e-11					
Fe+2	1.055e-11	3.798e-12	-10.977	-11.420	-0.444	(0)
FeSO4	4.733e-12	4.733e-12	-11.325	-11.325	0.000	(0)
FeHCO3+	1.473e-13	1.232e-13	-12.832	-12.909	-0.078	(0)
FeOH+	4.279e-14	3.545e-14	-13.369	-13.450	-0.082	(0)
Fe(OH) 2	6.601e-18	6.601e-18	-17.180	-17.180	0.000	(0)
Fe(OH) 3-	5.907e-19	4.893e-19	-18.229	-18.310	-0.082	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.396	-160.396	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-237.211	-237.322	-0.111	(0)
Fe (3)	2.266e-09					
Fe(OH) 2+	1.865e-09	1.551e-09	-8.729	-8.809	-0.080	(0)
Fe(OH) 3	3.905e-10	3.905e-10	-9.408	-9.408	0.000	(0)
Fe(OH) 4-	1.025e-11	8.523e-12	-10.989	-11.069	-0.080	(0)
FeOH+2	3.610e-14	1.700e-14	-13.442	-13.769	-0.327	(0)
FeF2+	7.301e-17	6.049e-17	-16.137	-16.218	-0.082	(0)
FeF+2	3.543e-17	1.669e-17	-16.451	-16.778	-0.327	(0)
FeF3	1.156e-17	1.156e-17	-16.937	-16.937	0.000	(0)
FeSO4+	7.723e-18	6.398e-18	-17.112	-17.194	-0.082	(0)
Fe(SO4) 2-	8.964e-19	6.943e-19	-18.047	-18.158	-0.111	(0)
Fe+3	6.390e-19	1.123e-19	-18.194	-18.949	-0.755	(0)
FeCl+2	1.822e-20	8.582e-21	-19.739	-20.066	-0.327	(0)
FeCl2+	1.170e-22	9.695e-23	-21.932	-22.013	-0.082	(0)
FeHSeO3+2	8.069e-23	2.904e-23	-22.093	-22.537	-0.444	(0)

	Fe2 (OH) 2+4	5.705e-25	9.575e-27	-24.244	-26.019	-1.775	(0)
	FeNO3+2	3.738e-26	1.345e-26	-25.427	-25.871	-0.444	(0)
	FeCl3	2.452e-26	2.452e-26	-25.610	-25.610	0.000	(0)
	Fe3 (OH) 4+5	1.274e-31	2.146e-34	-30.895	-33.668	-2.774	(0)
H (0)	2.545e-29						
	H2	1.273e-29	1.287e-29	-28.895	-28.891	0.005	(0)
Hg (0)	2.108e-09						
	Hg	2.108e-09	2.108e-09	-8.676	-8.676	0.000	(0)
Hg (1)	1.840e-19						
	Hg2+2	9.202e-20	3.312e-20	-19.036	-19.480	-0.444	(0)
Hg (2)	4.756e-11						
	HgClOH	2.424e-11	2.424e-11	-10.615	-10.615	0.000	(0)
	HgCl2	1.481e-11	1.481e-11	-10.829	-10.829	0.000	(0)
	Hg (OH) 2	7.939e-12	8.026e-12	-11.100	-11.095	0.005	(0)
	HgCl3-	4.836e-13	3.746e-13	-12.316	-12.426	-0.111	(0)
	HgCO3	7.796e-14	7.796e-14	-13.108	-13.108	0.000	(0)
	HgCl4-2	1.048e-14	3.772e-15	-13.980	-14.423	-0.444	(0)
	Hg (CO3) 2-2	1.928e-15	6.939e-16	-14.715	-15.159	-0.444	(0)
	HgCl+	1.508e-15	1.168e-15	-14.822	-14.932	-0.111	(0)
	HgOH+	2.789e-16	2.160e-16	-15.555	-15.665	-0.111	(0)
	HgHCO3+	8.045e-17	6.231e-17	-16.094	-16.205	-0.111	(0)
	Hg (NH3) 2+2	5.938e-19	2.137e-19	-18.226	-18.670	-0.444	(0)
	Hg (OH) 3-	3.058e-19	2.369e-19	-18.515	-18.625	-0.111	(0)
	HgNH3+2	1.552e-19	5.587e-20	-18.809	-19.253	-0.444	(0)
	Hg+2	6.431e-20	2.315e-20	-19.192	-19.635	-0.444	(0)
	HgSO4	3.076e-20	3.076e-20	-19.512	-19.512	0.000	(0)
	HgF+	1.501e-22	1.162e-22	-21.824	-21.935	-0.111	(0)
	Hg (NH3) 3+2	9.043e-27	3.255e-27	-26.044	-26.487	-0.444	(0)
	HgNO3+	1.321e-28	1.024e-28	-27.879	-27.990	-0.111	(0)
	Hg (NH3) 4+2	2.748e-34	9.890e-35	-33.561	-34.005	-0.444	(0)
	Hg (NO3) 2	5.095e-37	5.095e-37	-36.293	-36.293	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.155	-138.266	-0.111	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.163	-139.606	-0.444	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.239	-139.239	0.000	(0)
K	3.792e-03						
	K+	3.662e-03	3.019e-03	-2.436	-2.520	-0.084	(0)
	KSO4-	1.304e-04	1.085e-04	-3.885	-3.965	-0.080	(0)
	KCrO4-	6.238e-18	4.832e-18	-17.205	-17.316	-0.111	(0)
Mg	5.616e-03						
	Mg+2	3.870e-03	1.787e-03	-2.412	-2.748	-0.336	(0)
	MgSO4	1.651e-03	1.651e-03	-2.782	-2.782	0.000	(0)
	MgHCO3+	5.748e-05	4.713e-05	-4.240	-4.327	-0.086	(0)
	MgF+	3.296e-05	2.716e-05	-4.482	-4.566	-0.084	(0)
	MgCO3	4.184e-06	4.184e-06	-5.378	-5.378	0.000	(0)
	MgOH+	1.986e-07	1.668e-07	-6.702	-6.778	-0.076	(0)
	MgH2BO3+	3.290e-08	2.649e-08	-7.483	-7.577	-0.094	(0)
Mn (2)	6.586e-05						
	Mn+2	4.874e-05	1.754e-05	-4.312	-4.756	-0.444	(0)
	MnSO4	1.584e-05	1.584e-05	-4.800	-4.800	0.000	(0)
	MnHCO3+	1.089e-06	9.020e-07	-5.963	-6.045	-0.082	(0)
	MnF+	1.142e-07	9.461e-08	-6.942	-7.024	-0.082	(0)
	MnCl+	6.743e-08	5.586e-08	-7.171	-7.253	-0.082	(0)
	MnOH+	1.247e-08	1.033e-08	-7.904	-7.986	-0.082	(0)
	MnCl2	1.996e-10	1.996e-10	-9.700	-9.700	0.000	(0)
	MnNO3+	4.299e-13	3.330e-13	-12.367	-12.478	-0.111	(0)
	MnSeO4	2.912e-13	2.912e-13	-12.536	-12.536	0.000	(0)
	MnCl3-	1.678e-13	1.390e-13	-12.775	-12.857	-0.082	(0)
	Mn (OH) 3-	4.235e-18	3.509e-18	-17.373	-17.455	-0.082	(0)
	Mn (NO3) 2	1.002e-20	1.002e-20	-19.999	-19.999	0.000	(0)
	Mn (OH) 4-2	5.638e-24	2.656e-24	-23.249	-23.576	-0.327	(0)
	MnSe	0.000e+00	0.000e+00	-42.144	-42.144	0.000	(0)
Mn (3)	1.419e-24						
	Mn+3	1.419e-24	2.495e-25	-23.848	-24.603	-0.755	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.902	-42.229	-0.327	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-46.006	-46.098	-0.091	(0)
Mo	2.127e-06						

MoO4-2	2.126e-06	9.817e-07	-5.672	-6.008	-0.336	(0)
HMoO4-	1.082e-09	8.384e-10	-8.966	-9.077	-0.111	(0)
H2MoO4	2.636e-13	2.636e-13	-12.579	-12.579	0.000	(0)
Ag2MoO4	2.929e-24	2.929e-24	-23.533	-23.533	0.000	(0)
AlMo6O21-3	2.927e-37	2.937e-38	-36.534	-37.532	-0.998	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.009	-48.003	-3.994	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.210	-48.984	-2.774	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-49.794	-51.569	-1.775	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-54.692	-55.690	-0.998	(0)
N (-3)	3.804e-07					
NH4+	3.577e-07	2.880e-07	-6.447	-6.541	-0.094	(0)
NH4SO4-	1.891e-08	1.566e-08	-7.723	-7.805	-0.082	(0)
NH3	3.825e-09	3.825e-09	-8.417	-8.417	0.000	(0)
CaNH3+2	2.257e-11	8.125e-12	-10.646	-11.090	-0.444	(0)
CuNH3+2	1.096e-11	3.945e-12	-10.960	-11.404	-0.444	(0)
NiNH3+2	2.040e-13	7.344e-14	-12.690	-13.134	-0.444	(0)
Co (NH3) +2	3.295e-14	1.186e-14	-13.482	-13.926	-0.444	(0)
AgNH3+	2.831e-14	2.193e-14	-13.548	-13.659	-0.111	(0)
BaNH3+2	2.658e-16	9.567e-17	-15.575	-16.019	-0.444	(0)
Ag (NH3) 2+	8.802e-19	6.818e-19	-18.055	-18.166	-0.111	(0)
Hg (NH3) 2+2	5.938e-19	2.137e-19	-18.226	-18.670	-0.444	(0)
HgNH3+2	1.552e-19	5.587e-20	-18.809	-19.253	-0.444	(0)
Ni (NH3) 2+2	1.128e-19	4.061e-20	-18.948	-19.391	-0.444	(0)
Ca (NH3) 2+2	3.438e-20	1.237e-20	-19.464	-19.908	-0.444	(0)
Co (NH3) 2+2	5.376e-21	1.935e-21	-20.270	-20.713	-0.444	(0)
Hg (NH3) 3+2	9.043e-27	3.255e-27	-26.044	-26.487	-0.444	(0)
Co (NH3) 3+2	2.589e-28	9.319e-29	-27.587	-28.031	-0.444	(0)
Hg (NH3) 4+2	2.748e-34	9.890e-35	-33.561	-34.005	-0.444	(0)
Co (NH3) 4+2	5.198e-36	1.871e-36	-35.284	-35.728	-0.444	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.768	-42.211	-0.444	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.481	-43.925	-0.444	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.373	-51.371	-0.998	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.464	-50.908	-0.444	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.422	-52.866	-0.444	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.702	-60.813	-0.111	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.430	-65.873	-0.444	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.597	-66.041	-0.444	(0)
N (3)	9.987e-06					
NO2-	9.987e-06	8.092e-06	-5.001	-5.092	-0.091	(0)
CuNO2+	1.103e-10	8.540e-11	-9.958	-10.069	-0.111	(0)
AgNO2	4.746e-12	4.746e-12	-11.324	-11.324	0.000	(0)
CoNO2+	1.898e-12	1.470e-12	-11.722	-11.833	-0.111	(0)
Cu (NO2) 2	7.072e-15	7.072e-15	-14.150	-14.150	0.000	(0)
Ag (NO2) 2-	7.680e-17	5.949e-17	-16.115	-16.226	-0.111	(0)
N (5)	1.461e-08					
NO3-	1.453e-08	1.198e-08	-7.838	-7.922	-0.084	(0)
CaNO3+	8.249e-11	6.389e-11	-10.084	-10.195	-0.111	(0)
MnNO3+	4.299e-13	3.330e-13	-12.367	-12.478	-0.111	(0)
ZnNO3+	6.431e-14	4.982e-14	-13.192	-13.303	-0.111	(0)
CuNO3+	4.928e-15	3.817e-15	-14.307	-14.418	-0.111	(0)
BaNO3+	3.071e-15	2.379e-15	-14.513	-14.624	-0.111	(0)
NiNO3+	1.388e-15	1.075e-15	-14.857	-14.968	-0.111	(0)
CoNO3+	6.318e-16	4.894e-16	-15.199	-15.310	-0.111	(0)
CdNO3+	1.848e-16	1.432e-16	-15.733	-15.844	-0.111	(0)
PbNO3+	7.290e-17	5.646e-17	-16.137	-16.248	-0.111	(0)
AgNO3	2.671e-17	2.671e-17	-16.573	-16.573	0.000	(0)
Mn (NO3) 2	1.002e-20	1.002e-20	-19.999	-19.999	0.000	(0)
UO2NO3+	1.675e-21	1.298e-21	-20.776	-20.887	-0.111	(0)
Zn (NO3) 2	1.190e-22	1.190e-22	-21.924	-21.924	0.000	(0)
CrNO3+2	1.975e-23	7.109e-24	-22.704	-23.148	-0.444	(0)
Co (NO3) 2	1.193e-23	1.193e-23	-22.924	-22.924	0.000	(0)
Cu (NO3) 2	5.755e-24	5.755e-24	-23.240	-23.240	0.000	(0)
Pb (NO3) 2	1.148e-24	1.148e-24	-23.940	-23.940	0.000	(0)
VO2NO3	1.014e-24	1.014e-24	-23.994	-23.994	0.000	(0)
Cd (NO3) 2	8.593e-25	8.593e-25	-24.066	-24.066	0.000	(0)
FeNO3+2	3.738e-26	1.345e-26	-25.427	-25.871	-0.444	(0)
HgNO3+	1.321e-28	1.024e-28	-27.879	-27.990	-0.111	(0)
Hg (NO3) 2	5.095e-37	5.095e-37	-36.293	-36.293	0.000	(0)

Na	1.001e-02					
Na+	9.734e-03	8.024e-03	-2.012	-2.096	-0.084	(0)
NaSO4-	2.630e-04	2.187e-04	-3.580	-3.660	-0.080	(0)
NaHCO3	1.163e-05	1.163e-05	-4.935	-4.935	0.000	(0)
NaF	6.858e-07	6.858e-07	-6.164	-6.164	0.000	(0)
NaCO3-	5.056e-07	4.205e-07	-6.296	-6.376	-0.080	(0)
NaH2BO3	5.435e-09	5.435e-09	-8.265	-8.265	0.000	(0)
NaCrO4-	2.218e-17	1.718e-17	-16.654	-16.765	-0.111	(0)
Ni	1.326e-07					
Ni+2	7.741e-08	3.575e-08	-7.111	-7.447	-0.336	(0)
NiSO4	3.620e-08	3.620e-08	-7.441	-7.441	0.000	(0)
NiHCO3+	1.466e-08	1.136e-08	-7.834	-7.945	-0.111	(0)
NiCO3	3.754e-09	3.754e-09	-8.426	-8.426	0.000	(0)
NiCl+	2.987e-10	2.313e-10	-9.525	-9.636	-0.111	(0)
NiF+	1.570e-10	1.216e-10	-9.804	-9.915	-0.111	(0)
NiOH+	1.362e-10	1.055e-10	-9.866	-9.977	-0.111	(0)
Ni (SO4) 2-2	1.691e-11	6.085e-12	-10.772	-11.216	-0.444	(0)
Ni (OH) 2	1.965e-12	1.965e-12	-11.707	-11.707	0.000	(0)
NiNH3+2	2.040e-13	7.344e-14	-12.690	-13.134	-0.444	(0)
NiCl2	2.946e-15	2.946e-15	-14.531	-14.531	0.000	(0)
NiNO3+	1.388e-15	1.075e-15	-14.857	-14.968	-0.111	(0)
NiSeO4	1.031e-15	1.031e-15	-14.987	-14.987	0.000	(0)
Ni (OH) 3-	5.946e-16	4.605e-16	-15.226	-15.337	-0.111	(0)
Ni (NH3) 2+2	1.128e-19	4.061e-20	-18.948	-19.391	-0.444	(0)
O (0)	6.050e-35					
O2	3.025e-35	3.058e-35	-34.519	-34.515	0.005	(0)
Pb	5.380e-09					
PbCO3	2.697e-09	2.697e-09	-8.569	-8.569	0.000	(0)
PbSO4	7.924e-10	7.924e-10	-9.101	-9.101	0.000	(0)
PbHCO3+	7.879e-10	6.103e-10	-9.104	-9.214	-0.111	(0)
Pb+2	6.902e-10	3.188e-10	-9.161	-9.497	-0.336	(0)
PbOH+	2.423e-10	1.877e-10	-9.616	-9.727	-0.111	(0)
Pb (SO4) 2-2	6.733e-11	2.424e-11	-10.172	-10.616	-0.444	(0)
Pb (CO3) 2-2	6.081e-11	2.189e-11	-10.216	-10.660	-0.444	(0)
PbCl+	3.693e-11	2.861e-11	-10.433	-10.544	-0.111	(0)
PbF+	3.928e-12	3.043e-12	-11.406	-11.517	-0.111	(0)
Pb (OH) 2	1.391e-12	1.391e-12	-11.857	-11.857	0.000	(0)
PbCl2	3.232e-13	3.232e-13	-12.491	-12.491	0.000	(0)
PbF2	8.111e-15	8.111e-15	-14.091	-14.091	0.000	(0)
Pb (OH) 3-	4.211e-16	3.262e-16	-15.376	-15.487	-0.111	(0)
PbCl3-	4.202e-16	3.254e-16	-15.377	-15.488	-0.111	(0)
PbNO3+	7.290e-17	5.646e-17	-16.137	-16.248	-0.111	(0)
Pb2OH+3	9.450e-18	9.483e-19	-17.025	-18.023	-0.998	(0)
PbF3-	2.690e-18	2.084e-18	-17.570	-17.681	-0.111	(0)
PbCl4-2	1.045e-18	3.762e-19	-17.981	-18.425	-0.444	(0)
Pb (OH) 4-2	5.203e-20	1.873e-20	-19.284	-19.728	-0.444	(0)
PbF4-2	3.754e-22	1.351e-22	-21.426	-21.869	-0.444	(0)
Pb3 (OH) 4+2	3.421e-23	1.231e-23	-22.466	-22.910	-0.444	(0)
Pb (NO3) 2	1.148e-24	1.148e-24	-23.940	-23.940	0.000	(0)
Pb4 (OH) 4+4	1.858e-27	3.118e-29	-26.731	-28.506	-1.775	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.152	-152.152	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.704	-229.815	-0.111	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.700	-73.700	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.852	-78.963	-0.111	(0)
CdHS+	0.000e+00	0.000e+00	-79.266	-79.377	-0.111	(0)
H2S	0.000e+00	0.000e+00	-79.310	-79.310	0.000	(0)
S5-2	0.000e+00	0.000e+00	-80.517	-80.961	-0.444	(0)
S6-2	0.000e+00	0.000e+00	-81.033	-81.476	-0.444	(0)
S4-2	0.000e+00	0.000e+00	-81.113	-81.556	-0.444	(0)
S3-2	0.000e+00	0.000e+00	-81.918	-82.362	-0.444	(0)
S2-2	0.000e+00	0.000e+00	-82.935	-83.378	-0.444	(0)
S-2	0.000e+00	0.000e+00	-88.569	-88.895	-0.327	(0)
HgHS2-	0.000e+00	0.000e+00	-138.155	-138.266	-0.111	(0)
HgS2-2	0.000e+00	0.000e+00	-139.163	-139.606	-0.444	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.239	-139.239	0.000	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.452	-148.563	-0.111	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.465	-148.679	-0.214	(0)

Cu (S4) 2-3	0.000e+00	0.000e+00	-149.233	-149.611	-0.378	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.418	-149.529	-0.111	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.982	-150.341	-0.358	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.363	-150.752	-0.388	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.695	-151.063	-0.368	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.887	-150.887	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.136	-151.136	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.152	-152.152	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.396	-160.396	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.875	-217.986	-0.111	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.458	-226.569	-0.111	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.088	-228.199	-0.111	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.738	-229.182	-0.444	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.704	-229.815	-0.111	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.211	-237.322	-0.111	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.522	-304.966	-0.444	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.548	-306.992	-0.444	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.480	-319.924	-0.444	(0)
S (6)	1.502e-02					
SO4-2	1.099e-02	5.076e-03	-1.959	-2.294	-0.336	(0)
CaSO4	1.962e-03	1.962e-03	-2.707	-2.707	0.000	(0)
MgSO4	1.651e-03	1.651e-03	-2.782	-2.782	0.000	(0)
NaSO4-	2.630e-04	2.187e-04	-3.580	-3.660	-0.080	(0)
KSO4-	1.304e-04	1.085e-04	-3.885	-3.965	-0.080	(0)
MnSO4	1.584e-05	1.584e-05	-4.800	-4.800	0.000	(0)
ZnSO4	1.839e-06	1.839e-06	-5.735	-5.735	0.000	(0)
Zn (SO4) 2-2	2.259e-07	8.129e-08	-6.646	-7.090	-0.444	(0)
CuSO4	1.172e-07	1.172e-07	-6.931	-6.931	0.000	(0)
NiSO4	3.620e-08	3.620e-08	-7.441	-7.441	0.000	(0)
CoSO4	2.611e-08	2.611e-08	-7.583	-7.583	0.000	(0)
HSO4-	2.583e-08	2.129e-08	-7.588	-7.672	-0.084	(0)
NH4SO4-	1.891e-08	1.566e-08	-7.723	-7.805	-0.082	(0)
CdSO4	4.498e-09	4.498e-09	-8.347	-8.347	0.000	(0)
Cd (SO4) 2-2	8.556e-10	3.080e-10	-9.068	-9.511	-0.444	(0)
PbSO4	7.924e-10	7.924e-10	-9.101	-9.101	0.000	(0)
AgSO4-	3.671e-10	2.843e-10	-9.435	-9.546	-0.111	(0)
CrOHSO4	8.389e-11	8.389e-11	-10.076	-10.076	0.000	(0)
Pb (SO4) 2-2	6.733e-11	2.424e-11	-10.172	-10.616	-0.444	(0)
AlSO4+	2.546e-11	2.099e-11	-10.594	-10.678	-0.084	(0)
Ni (SO4) 2-2	1.691e-11	6.085e-12	-10.772	-11.216	-0.444	(0)
FeSO4	4.733e-12	4.733e-12	-11.325	-11.325	0.000	(0)
Al (SO4) 2-	1.385e-12	1.141e-12	-11.859	-11.943	-0.084	(0)
UO2SO4	4.172e-13	4.172e-13	-12.380	-12.380	0.000	(0)
CrSO4+	2.078e-13	1.610e-13	-12.682	-12.793	-0.111	(0)
UO2 (SO4) 2-2	7.756e-14	2.792e-14	-13.110	-13.554	-0.444	(0)
VO2SO4-	2.618e-17	2.028e-17	-16.582	-16.693	-0.111	(0)
FeSO4+	7.723e-18	6.398e-18	-17.112	-17.194	-0.082	(0)
Cr2 (OH) 2SO4+2	1.467e-18	5.281e-19	-17.834	-18.277	-0.444	(0)
Fe (SO4) 2-	8.964e-19	6.943e-19	-18.047	-18.158	-0.111	(0)
Cr2 (OH) 2 (SO4) 2	1.592e-19	1.592e-19	-18.798	-18.798	0.000	(0)
VOSO4	1.083e-19	1.083e-19	-18.965	-18.965	0.000	(0)
HgSO4	3.076e-20	3.076e-20	-19.512	-19.512	0.000	(0)
CrO3SO4-2	1.104e-23	3.973e-24	-22.957	-23.401	-0.444	(0)
VSO4+	6.894e-34	5.340e-34	-33.162	-33.272	-0.111	(0)
U (SO4) 2	2.439e-39	2.439e-39	-38.613	-38.613	0.000	(0)
USO4+2	1.681e-40	0.000e+00	-39.774	-40.218	-0.444	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.702	-60.813	-0.111	(0)
Sb (3)	8.546e-20					
Sb (OH) 3	4.323e-20	4.323e-20	-19.364	-19.364	0.000	(0)
HSbO2	4.223e-20	4.223e-20	-19.374	-19.374	0.000	(0)
SbO2-	2.057e-24	1.593e-24	-23.687	-23.798	-0.111	(0)
Sb (OH) 4-	1.177e-24	9.118e-25	-23.929	-24.040	-0.111	(0)
Sb (OH) 2F	3.929e-25	3.929e-25	-24.406	-24.406	0.000	(0)
SbOF	3.866e-25	3.866e-25	-24.413	-24.413	0.000	(0)
Sb (OH) 2+	5.821e-26	4.509e-26	-25.235	-25.346	-0.111	(0)
SbO+	2.008e-26	1.556e-26	-25.697	-25.808	-0.111	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.480	-319.924	-0.444	(0)
Sb (5)	2.999e-08					

SbO3-	2.996e-08	2.320e-08	-7.523	-7.634	-0.111	(0)
Sb (OH) 6-	3.285e-11	2.708e-11	-10.483	-10.567	-0.084	(0)
SbO2+	1.584e-23	1.227e-23	-22.800	-22.911	-0.111	(0)
Se (-2)	6.377e-15					
Ag2Se	6.377e-15	6.377e-15	-14.195	-14.195	0.000	(0)
HSe-	5.504e-40	4.263e-40	-39.259	-39.370	-0.111	(0)
MnSe	0.000e+00	0.000e+00	-42.144	-42.144	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.848	-42.848	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.559	-47.003	-0.444	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.925	-85.700	-1.775	(0)
Se (4)	1.515e-07					
HSeO3-	1.263e-07	9.783e-08	-6.899	-7.010	-0.111	(0)
SeO3-2	2.521e-08	9.074e-09	-7.598	-8.042	-0.444	(0)
H2SeO3	1.791e-12	1.791e-12	-11.747	-11.747	0.000	(0)
AgSeO3-	2.114e-14	1.637e-14	-13.675	-13.786	-0.111	(0)
Cd (SeO3) 2-2	7.126e-19	2.565e-19	-18.147	-18.591	-0.444	(0)
Ag (SeO3) 2-3	1.325e-20	1.330e-21	-19.878	-20.876	-0.998	(0)
FeHSeO3+2	8.069e-23	2.904e-23	-22.093	-22.537	-0.444	(0)
Se (6)	1.338e-10					
SeO4-2	1.335e-10	6.167e-11	-9.874	-10.210	-0.336	(0)
MnSeO4	2.912e-13	2.912e-13	-12.536	-12.536	0.000	(0)
ZnSeO4	1.582e-14	1.582e-14	-13.801	-13.801	0.000	(0)
NiSeO4	1.031e-15	1.031e-15	-14.987	-14.987	0.000	(0)
CoSeO4	7.969e-16	7.969e-16	-15.099	-15.099	0.000	(0)
HSeO4-	1.713e-16	1.327e-16	-15.766	-15.877	-0.111	(0)
CdSeO4	4.341e-17	4.341e-17	-16.362	-16.362	0.000	(0)
Zn (SeO4) 2-2	2.747e-24	9.889e-25	-23.561	-24.005	-0.444	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.824	-58.823	-0.998	(0)
U (4)	2.008e-21					
U (OH) 5-	2.006e-21	1.553e-21	-20.698	-20.809	-0.111	(0)
U (OH) 4	2.794e-24	2.794e-24	-23.554	-23.554	0.000	(0)
U (OH) 3+	5.665e-28	4.388e-28	-27.247	-27.358	-0.111	(0)
U (OH) 2+2	2.421e-32	8.715e-33	-31.616	-32.060	-0.444	(0)
UF3+	3.825e-35	2.963e-35	-34.417	-34.528	-0.111	(0)
UF2+2	3.834e-36	1.380e-36	-35.416	-35.860	-0.444	(0)
UF4	4.400e-37	4.400e-37	-36.357	-36.357	0.000	(0)
UOH+3	1.757e-37	1.763e-38	-36.755	-37.754	-0.998	(0)
UF+3	8.064e-39	8.092e-40	-38.093	-39.092	-0.998	(0)
UF5-	3.049e-39	2.362e-39	-38.516	-38.627	-0.111	(0)
U (SO4) 2	2.439e-39	2.439e-39	-38.613	-38.613	0.000	(0)
UF6-2	2.684e-40	0.000e+00	-39.571	-40.015	-0.444	(0)
USO4+2	1.681e-40	0.000e+00	-39.774	-40.218	-0.444	(0)
U+4	0.000e+00	0.000e+00	-42.749	-44.524	-1.775	(0)
UCl+3	0.000e+00	0.000e+00	-44.422	-45.421	-0.998	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.806	-173.792	-8.986	(0)
U (5)	1.342e-16					
UO2+	1.342e-16	1.040e-16	-15.872	-15.983	-0.111	(0)
U (6)	3.827e-07					
UO2 (CO3) 3-4	2.871e-07	4.819e-09	-6.542	-8.317	-1.775	(0)
UO2 (CO3) 2-2	9.492e-08	3.417e-08	-7.023	-7.466	-0.444	(0)
UO2CO3	6.084e-10	6.084e-10	-9.216	-9.216	0.000	(0)
UO2OH+	2.069e-12	1.603e-12	-11.684	-11.795	-0.111	(0)
UO2F+	1.311e-12	1.015e-12	-11.882	-11.993	-0.111	(0)
UO2SO4	4.172e-13	4.172e-13	-12.380	-12.380	0.000	(0)
UO2F2	3.967e-13	3.967e-13	-12.402	-12.402	0.000	(0)
UO2+2	1.176e-13	5.431e-14	-12.930	-13.265	-0.336	(0)
UO2 (SO4) 2-2	7.756e-14	2.792e-14	-13.110	-13.554	-0.444	(0)
UO2F3-	1.743e-14	1.350e-14	-13.759	-13.870	-0.111	(0)
UO2Cl+	2.876e-16	2.228e-16	-15.541	-15.652	-0.111	(0)
UO2F4-2	4.035e-17	1.452e-17	-16.394	-16.838	-0.444	(0)
(UO2) 2 (OH) 2+2	1.184e-17	4.263e-18	-16.927	-17.370	-0.444	(0)
(UO2) 3 (OH) 5+	3.677e-19	2.848e-19	-18.434	-18.545	-0.111	(0)
UO2NO3+	1.675e-21	1.298e-21	-20.776	-20.887	-0.111	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.474	-42.585	-0.111	(0)
V+2	0.000e+00	0.000e+00	-43.021	-43.465	-0.444	(0)
V (3)	2.316e-15					

V(OH) 3	2.316e-15	2.316e-15	-14.635	-14.635	0.000	(0)
V(OH) 2+	8.298e-26	6.427e-26	-25.081	-25.192	-0.111	(0)
VOH+2	7.275e-29	2.618e-29	-28.138	-28.582	-0.444	(0)
V+3	2.221e-33	2.229e-34	-32.653	-33.652	-0.998	(0)
VSO4+	6.894e-34	5.340e-34	-33.162	-33.272	-0.111	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.324	-55.322	-0.998	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-54.589	-56.364	-1.775	(0)
V(4)	5.086e-18					
V(OH) 3+	4.677e-18	3.622e-18	-17.330	-17.441	-0.111	(0)
VO+2	2.153e-19	7.750e-20	-18.667	-19.111	-0.444	(0)
VOSO4	1.083e-19	1.083e-19	-18.965	-18.965	0.000	(0)
VOF+	8.129e-20	6.297e-20	-19.090	-19.201	-0.111	(0)
VOF2	3.198e-21	3.198e-21	-20.495	-20.495	0.000	(0)
VOC1+	7.100e-22	5.499e-22	-21.149	-21.260	-0.111	(0)
VOF3-	1.985e-23	1.537e-23	-22.702	-22.813	-0.111	(0)
VOF4-2	2.335e-26	8.405e-27	-25.632	-26.075	-0.444	(0)
H2V2O4+2	1.830e-30	6.586e-31	-29.738	-30.181	-0.444	(0)
V(5)	6.610e-09					
H2VO4-	5.869e-09	4.546e-09	-8.231	-8.342	-0.111	(0)
HVO4-2	7.391e-10	2.660e-10	-9.131	-9.575	-0.444	(0)
H3VO4	1.951e-12	1.951e-12	-11.710	-11.710	0.000	(0)
H3V2O7-	7.399e-14	5.731e-14	-13.131	-13.242	-0.111	(0)
HV2O7-3	4.086e-15	4.101e-16	-14.389	-15.387	-0.998	(0)
VO4-3	3.096e-16	3.106e-17	-15.509	-16.508	-0.998	(0)
VO2+	2.030e-16	1.673e-16	-15.693	-15.776	-0.084	(0)
VO2F	3.976e-17	3.976e-17	-16.401	-16.401	0.000	(0)
VO2SO4-	2.618e-17	2.028e-17	-16.582	-16.693	-0.111	(0)
V2O7-4	1.532e-17	2.571e-19	-16.815	-18.590	-1.775	(0)
VO2F2-	2.524e-18	1.955e-18	-17.598	-17.709	-0.111	(0)
V3O9-3	9.823e-19	9.858e-20	-18.008	-19.006	-0.998	(0)
VO2F3-2	9.179e-21	3.304e-21	-20.037	-20.481	-0.444	(0)
V4O12-4	1.114e-23	1.869e-25	-22.953	-24.728	-1.775	(0)
VO2F4-3	2.194e-24	2.202e-25	-23.659	-24.657	-0.998	(0)
VO2NO3	1.014e-24	1.014e-24	-23.994	-23.994	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.990	-63.984	-3.994	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.391	-63.164	-2.774	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.549	-65.324	-1.775	(0)
Zn	6.166e-06					
Zn+2	3.586e-06	1.656e-06	-5.445	-5.781	-0.336	(0)
ZnSO4	1.839e-06	1.839e-06	-5.735	-5.735	0.000	(0)
ZnCO3	2.682e-07	2.682e-07	-6.572	-6.572	0.000	(0)
Zn(SO4) 2-2	2.259e-07	8.129e-08	-6.646	-7.090	-0.444	(0)
ZnHCO3+	1.742e-07	1.349e-07	-6.759	-6.870	-0.111	(0)
ZnOH+	5.012e-08	3.882e-08	-7.300	-7.411	-0.111	(0)
ZnCl+	1.283e-08	1.052e-08	-7.892	-7.978	-0.086	(0)
ZnF+	5.778e-09	4.476e-09	-8.238	-8.349	-0.111	(0)
ZnOHCl	3.229e-09	3.229e-09	-8.491	-8.491	0.000	(0)
Zn(OH) 2	1.442e-09	1.442e-09	-8.841	-8.841	0.000	(0)
ZnCl2	4.218e-11	4.218e-11	-10.375	-10.375	0.000	(0)
Zn(OH) 3-	2.188e-12	1.695e-12	-11.660	-11.771	-0.111	(0)
ZnCl3-	1.034e-13	8.473e-14	-12.986	-13.072	-0.086	(0)
ZnNO3+	6.431e-14	4.982e-14	-13.192	-13.303	-0.111	(0)
ZnSeO4	1.582e-14	1.582e-14	-13.801	-13.801	0.000	(0)
ZnCl4-2	2.275e-16	1.072e-16	-15.643	-15.970	-0.327	(0)
Zn(OH) 4-2	4.394e-17	1.582e-17	-16.357	-16.801	-0.444	(0)
Zn(NO3) 2	1.190e-22	1.190e-22	-21.924	-21.924	0.000	(0)
Zn(SeO4) 2-2	2.747e-24	9.889e-25	-23.561	-24.005	-0.444	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.418	-149.529	-0.111	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.887	-150.887	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.458	-226.569	-0.111	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.738	-229.182	-0.444	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.548	-306.992	-0.444	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-55.08	-48.79	6.29	(Co(NH3)5Cl)(NO3)2

(Co (NH3) 5Cl) Cl2	-42.65	-38.14	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.88	-38.14	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.23	-53.29	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-57.35	-37.32	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.85	-28.45	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.74	-23.29	0.45	(NH4) 2SeO4
Acanthite	-52.48	-88.70	-36.22	Ag2S
Ag2CO3	-11.56	-22.65	-11.09	Ag2CO3
Ag2CrO4	-20.88	-32.47	-11.59	Ag2CrO4
Ag2HVO4	-12.26	-10.78	1.48	Ag2HVO4
Ag2MoO4	-11.56	-23.11	-11.55	Ag2MoO4
Ag2O	-14.94	-2.37	12.57	Ag2O
Ag2Se	-0.41	-49.11	-48.70	Ag2Se
Ag2SeO3	-9.60	-16.75	-7.15	Ag2SeO3
Ag2SeO4	-18.40	-27.31	-8.91	Ag2SeO4
Ag2SO4	-14.58	-19.40	-4.82	Ag2SO4
Ag3AsO3	-28.09	-25.93	2.16	Ag3AsO3
Ag3AsO4	-16.30	-19.09	-2.79	Ag3AsO4
Ag3H2VO5	-17.14	-11.96	5.18	Ag3H2VO5
AgF:4H2O	-13.47	-12.42	1.05	AgF:4H2O
Agmetal	-0.55	-14.05	-13.51	Ag
AgVO3	-10.36	-9.59	0.77	AgVO3
Al (OH) 3 (am)	-0.97	9.83	10.80	Al (OH) 3
Al2 (MoO4) 3	-44.94	-42.57	2.37	Al2 (MoO4) 3
Al2O3	0.00	19.66	19.65	Al2O3
Al4 (OH) 10SO4	-0.42	22.28	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.51	-5.71	4.80	AlAsO4:2H2O
AlOHSO4	-3.97	-7.20	-3.23	AlOHSO4
AlSb	-152.38	-86.76	65.62	AlSb
Alunite	1.67	0.27	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.00	-11.79	-7.79	PbSO4
Anhydrite	-0.71	-5.07	-4.36	CaSO4
Anilite	-56.18	-88.06	-31.88	Cu0.25Cu1.5S
Antlerite	-2.60	6.18	8.79	Cu3 (OH) 4SO4
Aragonite	-0.02	-8.32	-8.30	CaCO3
Arsenolite	-86.74	-89.50	-2.76	As4O6
Artinite	-5.91	3.69	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.77	-31.06	6.71	As2O5
Atacamite	-1.88	5.51	7.39	Cu2 (OH) 3Cl
Azurite	-0.45	-17.36	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.06	7.33	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.03	-2.15	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.16	-9.07	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.76	5.18	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.10	-22.77	-9.67	BaCrO4
BaF2	-9.32	-15.14	-5.82	BaF2
BaMoO4	-6.45	-13.41	-6.96	BaMoO4
Barite	0.28	-9.70	-9.98	BaSO4
BaS	-95.18	-79.00	16.18	BaS
BaSeO3	-8.87	-7.04	1.83	BaSeO3
BaSeO4	-10.15	-17.61	-7.46	BaSeO4
Bianchite	-6.31	-8.08	-1.76	ZnSO4:6H2O
Birnessite	-7.72	10.37	18.09	MnO2
Bixbyite	-4.36	-5.00	-0.64	Mn2O3
BlaubleiI	-55.69	-79.85	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.36	-83.64	-27.28	Cu0.6Cu0.8S
Boehmite	1.25	9.83	8.58	AlOOH
Breithauptite	-57.90	-76.43	-18.52	NiSb
Brochantite	-1.30	13.92	15.22	Cu4 (OH) 6SO4
Brucite	-4.86	11.99	16.84	Mg (OH) 2
Bunsenite	-5.16	7.29	12.45	NiO
Ca (VO3) 2	-10.52	-4.86	5.66	Ca (VO3) 2
Ca2V2O7	-10.40	7.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.45	7.10	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.48	4.82	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.89	19.07	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.80	19.06	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.26	-157.28	142.97	Ca3Sb2

CaCrO4	-15.87	-18.14	-2.27	CaCrO4
Calcite	0.16	-8.32	-8.48	CaCO3
Calomel	-6.76	-24.67	-17.91	Hg2Cl2
CaMoO4	-0.83	-8.78	-7.95	CaMoO4
Carnotite	-2.32	-2.09	0.23	KUO2VO4
CaSeO3:2H2O	-5.23	-2.42	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.96	-12.98	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.53	-2.69	9.84	Cd(BO2)2
Cd(OH)2	-7.33	6.31	13.64	Cd(OH)2
Cd(OH)2(am)	-7.42	6.31	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.83	-15.12	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.65	1.91	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.18	8.22	28.40	Cd4(OH)6SO4
CdCl2	-12.96	-13.62	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.62	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.62	-1.91	CdCl2:2.5H2O
CdF2	-14.95	-16.16	-1.21	CdF2
Cdmetal(alpha)	-32.94	-19.43	13.51	Cd
Cdmetal(gamma)	-33.05	-19.43	13.62	Cd
CdMoO4	-0.28	-14.43	-14.15	CdMoO4
CdOHCl	-7.19	-3.65	3.54	CdOHCl
CdSb	-77.05	-77.40	-0.35	CdSb
CdSe	-20.23	-40.43	-20.20	CdSe
CdSeO4:2H2O	-16.78	-18.63	-1.85	CdSeO4:2H2O
CdSO4	-10.54	-10.72	-0.17	CdSO4
CdSO4:1H2O	-8.99	-10.72	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.84	-10.72	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.40	-11.15	-9.75	AgCl
Cerrusite	-1.92	-15.05	-13.13	PbCO3
CH4(g)	-82.20	-123.25	-41.05	CH4
Chalcanthite	-6.65	-9.29	-2.64	CuSO4:5H2O
Chalcocite	-56.29	-91.21	-34.92	Cu2S
Chalcopyrite	-126.34	-161.61	-35.27	CuFeS2
Cinnabar	-51.73	-97.42	-45.69	HgS
Claudetite	-86.43	-89.50	-3.06	As4O6
Clausthalite	-14.40	-41.50	-27.10	PbSe
Co(BO2)2	-28.92	-1.85	27.07	Co(BO2)2
Co(OH)2	-5.95	7.15	13.09	Co(OH)2
Co(OH)3	-10.08	-12.38	-2.31	Co(OH)3
CO2(g)	-2.14	-20.28	-18.15	CO2
Co3(AsO4)2	-22.66	-9.63	13.03	Co3(AsO4)2
Co3O4	-7.13	-17.62	-10.50	Co3O4
CoCl2	-21.05	-12.78	8.27	CoCl2
CoCl2:6H2O	-15.32	-12.78	2.54	CoCl2:6H2O
CoCO3	-3.16	-13.14	-9.98	CoCO3
CoF2	-13.73	-15.33	-1.60	CoF2
CoF3	-44.63	-46.09	-1.46	CoF3
CoFe2O4	16.98	13.45	-3.53	CoFe2O4
CoMoO4	-5.84	-13.60	-7.76	CoMoO4
CoO	-6.44	7.15	13.59	CoO
CoS(alpha)	-71.74	-79.18	-7.44	CoS
CoS(beta)	-68.11	-79.18	-11.07	CoS
CoSe	-23.39	-39.59	-16.20	CoSe
CoSeO3	-8.55	-7.23	1.32	CoSeO3
CoSeO4:6H2O	-16.27	-17.80	-1.53	CoSeO4:6H2O
CoSO4	-12.69	-9.88	2.80	CoSO4
CoSO4:6H2O	-7.41	-9.89	-2.47	CoSO4:6H2O
Cotunnite	-9.91	-14.69	-4.78	PbCl2
Covellite	-56.29	-78.59	-22.30	CuS
Cr(OH)2	-22.08	-11.26	10.82	Cr(OH)2
Cr(OH)3	-2.67	-1.33	1.34	Cr(OH)3
Cr(OH)3(am)	-0.58	-1.33	-0.75	Cr(OH)3
Cr2O3	-0.31	-2.67	-2.36	Cr2O3
CrCl2	-45.28	-31.19	14.09	CrCl2
CrCl3	-46.34	-31.23	15.11	CrCl3
CrF3	-23.70	-35.04	-11.34	CrF3
Crmetal	-67.48	-37.00	30.48	Cr
CrO3	-26.89	-30.10	-3.21	CrO3

Cryolite	-7.93	-41.77	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.94	7.74	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-24.72	20.49	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-9.06	0.19	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb:3H ₂ O	-56.41	-91.29	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se(alpha)	-5.82	-51.62	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.96	-21.91	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ :2H ₂ O	-13.95	-7.85	6.10	Cu ₃ (AsO ₄) ₂ :2H ₂ O
Cu ₃ Sb	-61.32	-103.91	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-27.13	-90.62	-63.49	Cu ₃ Se ₂
CuCO ₃	-1.05	-12.55	-11.50	CuCO ₃
CuCrO ₄	-16.92	-22.36	-5.44	CuCrO ₄
CuF	-8.77	-13.68	-4.91	CuF
CuF ₂	-15.85	-14.73	1.12	CuF ₂
CuF ₂ :2H ₂ O	-10.18	-14.73	-4.55	CuF ₂ :2H ₂ O
Cumetal	-6.56	-15.31	-8.76	Cu
CuMoO ₄	0.07	-13.00	-13.08	CuMoO ₄
CuOCuSO ₄	-11.86	-1.55	10.30	CuOCuSO ₄
Cupricferrite	8.05	14.04	5.99	CuFe ₂ O ₄
Cuprite	-3.48	-4.88	-1.41	Cu ₂ O
Cuprousferrite	9.63	0.71	-8.92	CuFeO ₂
CuSe	-5.90	-39.00	-33.10	CuSe
CuSe ₂	-26.63	-60.00	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-7.15	-6.64	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-14.77	-17.21	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-12.23	-9.29	2.94	CuSO ₄
Diaspore	2.95	9.83	6.87	AlOOH
Djurleite	-56.46	-90.38	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.08	-16.62	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	0.47	-16.62	-17.09	CaMg(CO ₃) ₂
Epsomite	-2.92	-5.04	-2.13	MgSO ₄ :7H ₂ O
Fe(OH) ₂	-10.25	3.31	13.56	Fe(OH) ₂
Fe(OH) ₂ .7Cl.3	3.20	0.16	-3.04	Fe(OH) ₂ .7Cl.3
Fe(VO ₃) ₂	-9.78	-13.50	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.63	-8.07	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ :2H ₂ O	-16.20	-36.83	-20.63	Fe ₂ (SeO ₃) ₃ :2H ₂ O
Fe ₂ (SO ₄) ₃	-41.05	-44.78	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.61	9.62	20.22	Fe ₃ (OH) ₈
FeAsO ₄ :2H ₂ O	-12.78	-12.38	0.40	FeAsO ₄ :2H ₂ O
FeCr ₂ O ₄	-6.56	0.65	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.34	-17.43	-10.09	FeMoO ₄
Ferrihydrite	-0.04	3.15	3.19	Fe(OH) ₃
Ferroselite	-45.82	-64.42	-18.60	FeSe ₂
FeS(ppt)	-80.07	-83.02	-2.95	FeS
FeSe	-32.42	-43.42	-11.00	FeSe
Fix_pe	-5.50	-5.50	0.00	e-
Fluorite	-0.01	-10.51	-10.50	CaF ₂
Galena	-67.12	-81.09	-13.97	PbS
Gibbsite	1.54	9.83	8.29	Al(OH) ₃
Goethite	2.66	3.15	0.49	FeOOH
Goslarite	-6.07	-8.08	-2.01	ZnSO ₄ :7H ₂ O
Greenockite	-65.66	-80.02	-14.36	CdS
Greigite	-290.67	-335.70	-45.03	Fe ₃ S ₄
Gummite	-6.20	1.47	7.67	UO ₃
Gypsum	-0.46	-5.07	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-12.50	-24.60	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-7.87	-20.74	-12.88	H ₂ MoO ₄
H ₂ S(g)	-78.32	-86.33	-8.01	H ₂ S
H ₂ Se(g)	-41.78	-46.74	-4.96	H ₂ Se
Halite	-6.30	-4.69	1.60	NaCl
Hausmannite	-5.35	55.68	61.03	Mn ₃ O ₄
Hematite	7.72	6.30	-1.42	Fe ₂ O ₃
Hercynite	0.08	22.97	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-183.88	-257.59	-73.71	Hg(CH ₃) ₂
Hg(g)	-7.37	-15.24	-7.87	Hg
Hg(OH) ₂	-7.60	-11.10	-3.50	Hg(OH) ₂
Hg ₂ (g)	-15.53	-30.49	-14.96	Hg ₂
Hg ₂ (OH) ₂	-10.01	-4.75	5.26	Hg ₂ (OH) ₂

Hg2CO3	-8.98	-25.03	-16.05	Hg2CO3
Hg2CrO4	-26.15	-34.85	-8.70	Hg2CrO4
Hg2F2	-16.85	-27.22	-10.36	Hg2F2
Hg2S	-79.40	-91.08	-11.68	Hg2S
Hg2SeO3	-14.47	-19.12	-4.66	Hg2SeO3
Hg2SO4	-15.64	-21.77	-6.13	Hg2SO4
Hg3O2CO3	-23.89	-53.57	-29.68	Hg3O2CO3
HgCl (g)	-31.83	-12.34	19.50	HgCl
HgCl2	-9.76	-31.02	-21.26	HgCl2
HgF (g)	-46.28	-13.61	32.68	HgF
HgF2 (g)	-46.13	-33.57	12.57	HgF2
Hgmetal (l)	-1.79	-15.24	-13.45	Hg
HgSe	-2.14	-57.83	-55.69	HgSe
HgSeO3	-13.04	-25.47	-12.43	HgSeO3
HgSO4	-18.71	-28.12	-9.42	HgSO4
Huntite	-3.25	-33.22	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.09	-24.86	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.44	-21.21	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.22	-19.39	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.96	-19.76	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.26	-50.51	-17.24	K2Cr2O7
K2CrO4	-19.89	-20.41	-0.51	K2CrO4
K2MoO4	-14.31	-11.05	3.26	K2MoO4
K2SeO4	-14.52	-15.25	-0.73	K2SeO4
Langite	-3.57	13.92	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.12	-6.55	-0.43	PbO : PbSO4
Laurionite	-5.35	-4.73	0.62	PbOHCl
Lepidocrocite	1.78	3.15	1.37	FeOOH
Lime	-20.74	11.96	32.70	CaO
Litharge	-7.46	5.24	12.69	PbO
Mackinawite	-79.42	-83.02	-3.60	FeS
Maghemite	-0.08	6.30	6.39	Fe2O3
Magnesioferrite	1.43	18.29	16.86	Fe2MgO4
Magnesite	-0.84	-8.30	-7.46	MgCO3
Magnetite	6.22	9.62	3.40	Fe3O4
Malachite	0.50	-4.81	-5.31	Cu2 (OH) 2CO3
Manganite	-2.49	22.85	25.34	MnOOH
Massicot	-7.66	5.24	12.89	PbO
Matlockite	-6.99	-15.96	-8.97	PbClF
Melanothallite	-18.45	-12.19	6.26	CuCl2
Melanterite	-11.51	-13.72	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.33	-97.42	-45.09	HgS
Mg (OH) 2 (active)	-6.81	11.99	18.79	Mg (OH) 2
Mg (VO3) 2	-16.11	-4.83	11.28	Mg (VO3) 2
Mg2Sb3	-276.11	-201.43	74.68	Mg2Sb3
Mg2V2O7	-19.21	7.15	26.36	Mg2V2O7
MgCr2O4	-6.88	9.32	16.20	MgCr2O4
MgCrO4	-23.49	-18.11	5.38	MgCrO4
MgF2	-2.35	-10.48	-8.13	MgF2
MgMoO4	-6.91	-8.76	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.45	-2.39	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.76	-12.96	-1.20	MgSeO4 : 6H2O
Minium	-32.07	41.45	73.52	Pb3O4
Mirabilite	-5.37	-6.49	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.74	-6.84	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.38	-56.09	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.58	-89.50	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.63	-1.13	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.67	-9.95	2.72	MnCl2 : 4H2O
MnS (grn)	-76.52	-76.35	0.17	MnS
MnS (pnk)	-79.69	-76.35	3.34	MnS
MnSb	-96.18	-99.09	-2.91	MnSb
MnSe	-40.26	-36.76	3.50	MnSe
MnSeO3	-5.53	-4.40	1.13	MnSeO3
MnSeO3 : 2H2O	-5.38	-4.40	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.92	-14.97	-2.05	MnSeO4 : 5H2O
MnSO4	-9.63	-7.05	2.58	MnSO4
Monteponite	-8.79	6.31	15.10	CdO

Montroydite	-7.46	-11.10	-3.64	HgO
MoO3	-12.74	-20.74	-8.00	MoO3
Morenosite	-7.60	-9.74	-2.14	NiSO4:7H2O
MoS2	-148.88	-219.14	-70.26	MoS2
Na-Jarosite	-8.13	-19.33	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.76	-49.66	-9.90	Na2Cr2O7
Na2CrO4	-22.49	-19.56	2.93	Na2CrO4
Na2Mo2O7	-14.34	-30.94	-16.60	Na2Mo2O7
Na2MoO4	-11.69	-10.20	1.49	Na2MoO4
Na2MoO4:2H2O	-11.42	-10.20	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.13	-3.83	10.30	Na2SeO3:5H2O
Na2SeO4	-15.68	-14.40	1.28	Na2SeO4
Na3Sb	-175.22	-80.77	94.45	Na3Sb
Na3VO4	-29.28	7.41	36.68	Na3VO4
Na4V2O7	-33.13	4.27	37.40	Na4V2O7
Nantokite	-5.68	-12.41	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.43	-9.74	-1.31	Na2CO3:10H2O
NaVO3	-7.00	-3.14	3.86	NaVO3
Nesquehonite	-3.63	-8.30	-4.67	MgCO3:3H2O
Ni(OH)2	-5.51	7.29	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.90	-9.20	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.88	12.12	32.00	Ni4(OH)6SO4
NiCO3	-6.13	-13.00	-6.87	NiCO3
NiMoO4	-2.31	-13.45	-11.14	NiMoO4
NiS(alpha)	-73.44	-79.04	-5.60	NiS
NiS(beta)	-67.94	-79.04	-11.10	NiS
NiS(gamma)	-66.24	-79.04	-12.80	NiS
NiSe	-21.75	-39.45	-17.70	NiSe
NiSeO3:2H2O	-9.90	-7.09	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.14	-17.66	-1.52	NiSeO4:6H2O
Nsutite	-7.14	10.37	17.50	MnO2
O2(g)	-31.61	51.48	83.09	O2
Orpiment	-242.67	-303.74	-61.07	As2S3
Otavite	-1.97	-13.97	-12.00	CdCO3
Pb(BO2)2	-10.28	-3.76	6.52	Pb(BO2)2
Pb(OH)2	-2.91	5.24	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-60.57	-69.33	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.28	0.51	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.71	10.48	26.19	Pb2O(OH)2
Pb2O3	-24.82	36.22	61.04	Pb2O3
Pb2OCO3	-9.25	-9.81	-0.56	Pb2OCO3
Pb2V2O7	-4.44	-6.34	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.15	-15.35	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.25	-1.11	6.14	Pb3(VO4)2
Pb3O2CO3	-15.59	-4.57	11.02	Pb3O2CO3
Pb3O2SO4	-12.00	-1.32	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.18	3.92	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.95	3.92	21.88	Pb4O3SO4
PbCrO4	-12.26	-24.86	-12.60	PbCrO4
PbF2	-9.79	-17.23	-7.44	PbF2
Pbmetal	-24.75	-20.50	4.25	Pb
PbMoO4	0.12	-15.50	-15.62	PbMoO4
PbO:0.3H2O	-7.74	5.24	12.98	PbO:0.33H2O
PbSeO4	-12.87	-19.71	-6.84	PbSeO4
Periclase	-9.60	11.99	21.58	MgO
Phosgenite	-9.93	-29.74	-19.81	PbCl2:PbCO3
Plattnerite	-18.62	30.98	49.60	PbO2
Portlandite	-10.84	11.96	22.80	Ca(OH)2
Pyrite	-125.10	-143.61	-18.51	FeS2
Pyrochroite	-5.22	9.98	15.19	Mn(OH)2
Pyrolusite	-5.66	35.72	41.38	MnO2
Realgar	-101.83	-121.57	-19.75	AsS
Retgersite	-7.70	-9.74	-2.04	NiSO4:6H2O
Rhodochrosite	0.27	-10.31	-10.58	MnCO3
Rutherfordine	-4.32	-18.82	-14.50	UO2CO3
Sb(OH)3	-12.25	-19.36	-7.11	Sb(OH)3
Sb2O4	-16.39	-12.99	3.40	Sb2O4

Sb2O5	-26.20	-35.87	-9.67	Sb2O5
Sb2Se3	-111.18	-178.94	-67.76	Sb2Se3
Sb4O6 (cubic)	-59.19	-77.46	-18.26	Sb4O6
Sb4O6 (orth)	-59.55	-77.46	-17.90	Sb4O6
SbCl3	-49.83	-49.26	0.57	SbCl3
SbF3	-42.84	-53.07	-10.23	SbF3
Sbmetal	-46.29	-57.97	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-4.53	1.47	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.89	-21.00	-7.11	Se
Semetal (hex)	-13.29	-21.00	-7.71	Se
Senarmontite	-26.36	-38.73	-12.37	Sb2O3
SeO2	-14.50	-14.38	0.12	SeO2
SeO3	-45.99	-24.94	21.04	SeO3
Siderite	-6.73	-16.97	-10.24	FeCO3
Smithsonite	-1.33	-11.33	-10.00	ZnCO3
Sphalerite	-65.93	-77.38	-11.45	ZnS
Spinel	-5.21	31.64	36.85	MgAl2O4
Stibnite	-247.26	-297.72	-50.46	Sb2S3
Sulfur	-58.44	-60.59	-2.14	S
Tenorite	0.09	7.74	7.64	CuO
Thenardite	-6.81	-6.49	0.32	Na2SO4
Thermonatrite	-10.38	-9.74	0.64	Na2CO3:H2O
Tyuyamunite	-6.00	-1.92	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.77	6.32	21.08	U3O8
U3Sb4	-583.89	-431.50	152.38	U3Sb4
U4O9	-31.46	-34.48	-3.02	U4O9
UF4	-30.46	-60.00	-29.54	UF4
UF4:2.5H2O	-27.28	-60.00	-32.72	UF4:2.5H2O
UO2 (am)	-15.99	-15.06	0.93	UO2
UO2 (NO3) 2	-41.26	-29.11	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.96	-29.11	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.50	-29.11	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.16	-29.11	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.14	1.47	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.23	-23.48	-2.25	UO2SeO4:4H2O
UO3	-6.23	1.47	7.70	UO3
Uraninite	-10.39	-15.06	-4.67	UO2
USb2	-221.28	-191.70	29.58	USb2
V (OH) 3	-19.14	-11.55	7.59	V (OH) 3
V2O5	-15.46	-16.82	-1.36	V2O5
V3O5	-40.71	-38.87	1.84	V3O5
V4O7	-50.43	-43.25	7.19	V4O7
V6O13	-41.08	-101.94	-60.86	V6O13
Valentinite	-30.25	-38.73	-8.48	Sb2O3
VC12	-63.22	-44.35	18.87	VC12
VC13	-64.88	-41.44	23.43	VC13
VF4	-64.25	-49.32	14.93	VF4
Vmetal	-94.19	-50.16	44.03	V
VO	-39.18	-24.42	14.76	VO
VO (OH) 2	-9.53	-4.38	5.15	VO (OH) 2
VO2Cl	-21.21	-18.37	2.84	VO2Cl
VOC1	-32.67	-21.51	11.15	VOC1
VOC12	-37.06	-24.30	12.76	VOC12
VOSO4	-25.01	-21.41	3.61	VOSO4
Witherite	-4.38	-12.95	-8.57	BaCO3
Wurtzite	-68.43	-77.38	-8.95	ZnS
Zincite	-2.38	8.95	11.33	ZnO
Zincosite	-12.01	-8.08	3.93	ZnSO4
Zn (BO2) 2	-8.34	-0.05	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.94	-21.63	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-3.25	8.95	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.52	8.95	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.80	8.95	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.58	8.95	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.78	8.95	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.62	0.88	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-7.25	7.94	15.19	Zn2 (OH) 3Cl

Zn3(AsO4)2:2.5H2O	-17.86	-4.21	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.11	-7.20	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.62	18.78	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.66	24.84	38.50	Zn5(OH)8Cl2
ZnCl2	-18.02	-10.97	7.05	ZnCl2
ZnCO3:1H2O	-1.07	-11.33	-10.26	ZnCO3:1H2O
ZnF2	-12.98	-13.52	-0.53	ZnF2
Znmetal	-42.58	-16.79	25.79	Zn
ZnMoO4	-1.66	-11.79	-10.13	ZnMoO4
ZnO(active)	-2.24	8.95	11.19	ZnO
ZnS(am)	-68.32	-77.38	-9.05	ZnS
ZnSb	-85.77	-74.76	11.01	ZnSb
ZnSe	-23.38	-37.78	-14.40	ZnSe
ZnSeO4:6H2O	-14.47	-15.99	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.44	-8.08	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 81.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 405

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

```

Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 413
SAVE Solution 414 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 405
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 413. Solution after simulation 80.
Using pure phase assemblage 405.

```

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-0.00	-48.70	-48.70	0.000e+00	5.743e-09	5.743e-09
Alunite	-2.16	-3.56	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.80	-5.16	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	5.937e-11	5.937e-11
Barite	0.00	-9.98	-9.98	0.000e+00	4.443e-08	4.443e-08
Brochantite	0.00	15.22	15.22	0.000e+00	4.121e-07	4.121e-07
Brucite	-3.54	13.30	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.554e-03
CaMoO4	-0.93	-8.88	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.89	-2.08	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.314e-03	1.314e-03
Carnotite	-0.98	-0.75	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.27	-1.43	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.28	-14.43	-14.15	0.000e+00	0	0.000e+00
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	0.000e+00	9.600e-10	9.600e-10
Cu2Se(alpha)	-4.61	-50.41	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.59	-13.66	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.90	-5.02	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.353e-09	1.353e-09

Fluorite	-0.11	-10.61	-10.50	0.000e+00	0	0.000e+00
Gummite	-4.72	2.95	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.55	-5.16	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.61	-58.30	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.35	-6.47	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.07	-3.94	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.15	8.64	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.73	-8.03	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.14	-13.01	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.27	-13.41	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-4.450e-07
Otavite	-2.02	-14.02	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	1.331e-09	1.331e-09
Rutherfordine	-4.20	-18.70	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.54	-31.36	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.04	2.95	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.42	0.66	4.08	0.000e+00	0	0.000e+00
U3O8	-10.13	10.96	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.66	2.95	5.61	0.000e+00	0	0.000e+00
UO3	-4.75	2.95	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.66	-11.79	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	1.093e-08	1.092e-08
Al	4.151e-06	4.148e-06
As	2.110e-10	2.108e-10
B	3.187e-05	3.184e-05
Ba	4.241e-08	4.238e-08
C	6.655e-04	6.650e-04
Ca	4.407e-03	4.404e-03
Cd	1.503e-08	1.502e-08
Cl	3.068e-03	3.066e-03
Co	1.062e-07	1.062e-07
Cr	1.101e-09	1.101e-09
Cu	5.106e-07	5.102e-07
F	2.014e-04	2.013e-04
Fe	9.271e-10	9.265e-10
Hg	2.155e-09	2.154e-09
K	3.792e-03	3.790e-03
Mg	5.616e-03	5.612e-03
Mn	6.586e-05	6.581e-05
Mo	2.125e-06	2.124e-06
N	1.038e-05	1.037e-05
Na	1.001e-02	1.000e-02
Ni	1.326e-07	1.325e-07
Pb	4.048e-09	4.045e-09
S	1.501e-02	1.500e-02
Sb	2.999e-08	2.997e-08
Se	1.459e-07	1.458e-07
U	3.826e-07	3.824e-07
V	6.610e-09	6.605e-09
Zn	6.166e-06	6.162e-06

-----Description of solution-----

	pH	=	8.025	Charge balance
	pe	=	4.748	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.479e-02	
	Mass of water (kg)	=	9.993e-01	
	Total alkalinity (eq/kg)	=	6.931e-04	

Total CO2 (mol/kg) = 6.655e-04
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 1.227e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 9
 Total H = 1.109326e+02
 Total O = 5.552806e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.301e-06	1.065e-06	-5.886	-5.973	-0.087	(0)
H+	1.142e-08	9.446e-09	-7.943	-8.025	-0.082	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	1.093e-08					
AgCl	7.074e-09	7.074e-09	-8.150	-8.150	0.000	(0)
AgCl2-	2.006e-09	1.564e-09	-8.698	-8.806	-0.108	(0)
Ag+	1.649e-09	1.365e-09	-8.783	-8.865	-0.082	(0)
AgSO4-	1.845e-10	1.439e-10	-9.734	-9.842	-0.108	(0)
AgCl3-2	9.565e-12	3.539e-12	-11.019	-11.451	-0.432	(0)
AgNO2	2.390e-12	2.390e-12	-11.622	-11.622	0.000	(0)
AgF	4.679e-13	4.679e-13	-12.330	-12.330	0.000	(0)
AgCl4-3	1.718e-13	1.835e-14	-12.765	-13.736	-0.971	(0)
AgOH	1.454e-13	1.454e-13	-12.838	-12.838	0.000	(0)
AgH2BO3	3.934e-14	3.934e-14	-13.405	-13.405	0.000	(0)
AgSeO3-	2.851e-14	2.224e-14	-13.545	-13.653	-0.108	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	1.203e-14	9.381e-15	-13.920	-14.028	-0.108	(0)
Ag (NO2) 2-	3.978e-17	3.102e-17	-16.400	-16.508	-0.108	(0)
Ag (OH) 2-	1.940e-17	1.513e-17	-16.712	-16.820	-0.108	(0)
AgNO3	8.571e-18	8.571e-18	-17.067	-17.067	0.000	(0)
Ag (NH3) 2+	3.291e-19	2.567e-19	-18.483	-18.591	-0.108	(0)
Ag (SeO3) 2-3	4.727e-20	5.049e-21	-19.325	-20.297	-0.971	(0)
Ag2MoO4	7.024e-25	7.024e-25	-24.153	-24.153	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.871	-73.871	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.563	-83.290	-1.727	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.839	-148.050	-0.211	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.484	-148.592	-0.108	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.082	-149.466	-0.384	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.413	-149.777	-0.364	(0)
Al	4.151e-06					
Al (OH) 4-	4.124e-06	3.413e-06	-5.385	-5.467	-0.082	(0)
Al (OH) 3	2.545e-08	2.545e-08	-7.594	-7.594	0.000	(0)
Al (OH) 2+	1.434e-09	1.197e-09	-8.843	-8.922	-0.078	(0)
AlF3	1.693e-10	1.693e-10	-9.771	-9.771	0.000	(0)
AlF2+	1.180e-10	9.852e-11	-9.928	-10.006	-0.078	(0)
AlF4-	1.400e-11	1.158e-11	-10.854	-10.936	-0.082	(0)
AlF+2	3.735e-12	1.813e-12	-11.428	-11.742	-0.314	(0)
AlOH+2	2.915e-12	1.415e-12	-11.535	-11.849	-0.314	(0)
AlSO4+	6.583e-14	5.448e-14	-13.182	-13.264	-0.082	(0)
Al+3	7.301e-15	1.328e-15	-14.137	-14.877	-0.740	(0)
Al (SO4) 2-	3.727e-15	3.084e-15	-14.429	-14.511	-0.082	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.069	-44.041	-0.971	(0)
As (3)	2.557e-24					
H3AsO3	2.390e-24	2.390e-24	-23.622	-23.622	0.000	(0)
H2AsO3-	1.664e-25	1.298e-25	-24.779	-24.887	-0.108	(0)
HAsO3-2	3.386e-29	1.253e-29	-28.470	-28.902	-0.432	(0)
H4AsO3+	1.434e-32	1.119e-32	-31.843	-31.951	-0.108	(0)
AsO3-3	4.788e-34	5.113e-35	-33.320	-34.291	-0.971	(0)
As (5)	2.110e-10					
HAsO4-2	2.025e-10	7.493e-11	-9.694	-10.125	-0.432	(0)
H2AsO4-	8.277e-12	6.455e-12	-11.082	-11.190	-0.108	(0)
AsO4-3	2.349e-13	2.508e-14	-12.629	-13.601	-0.971	(0)
H3AsO4	1.049e-17	1.060e-17	-16.979	-16.975	0.004	(0)
B	3.187e-05					

H3BO3	2.928e-05	2.959e-05	-4.533	-4.529	0.004	(0)
H2BO3-	2.248e-06	1.819e-06	-5.648	-5.740	-0.092	(0)
CaH2BO3+	1.697e-07	1.373e-07	-6.770	-6.862	-0.092	(0)
MgH2BO3+	1.402e-07	1.135e-07	-6.853	-6.945	-0.092	(0)
NaH2BO3	2.322e-08	2.322e-08	-7.634	-7.634	0.000	(0)
BF(OH) 3-	1.991e-09	1.611e-09	-8.701	-8.793	-0.092	(0)
H5(BO3) 2-	5.661e-11	4.580e-11	-10.247	-10.339	-0.092	(0)
BaH2BO3+	1.377e-12	1.114e-12	-11.861	-11.953	-0.092	(0)
BF2(OH) 2-	2.747e-13	2.223e-13	-12.561	-12.653	-0.092	(0)
H8(BO3) 3-	1.675e-13	1.355e-13	-12.776	-12.868	-0.092	(0)
AgH2BO3	3.934e-14	3.934e-14	-13.405	-13.405	0.000	(0)
BF3OH-	1.379e-19	1.116e-19	-18.861	-18.952	-0.092	(0)
BF4-	8.753e-25	7.083e-25	-24.058	-24.150	-0.092	(0)
Ba	4.241e-08					
Ba+2	4.227e-08	1.982e-08	-7.374	-7.703	-0.329	(0)
BaHCO3+	1.147e-10	9.628e-11	-9.940	-10.016	-0.076	(0)
BaCO3	2.566e-11	2.566e-11	-10.591	-10.591	0.000	(0)
BaH2BO3+	1.377e-12	1.114e-12	-11.861	-11.953	-0.092	(0)
BaOH+	1.108e-13	9.216e-14	-12.955	-13.035	-0.080	(0)
BaNO3+	1.007e-15	7.854e-16	-14.997	-15.105	-0.108	(0)
BaNH3+2	1.138e-16	4.210e-17	-15.944	-16.376	-0.432	(0)
C(4)	6.655e-04					
HCO3-	6.094e-04	5.087e-04	-3.215	-3.294	-0.078	(0)
CaHCO3+	1.481e-05	1.242e-05	-4.830	-4.906	-0.076	(0)
MgHCO3+	1.137e-05	9.364e-06	-4.944	-5.029	-0.084	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	5.384e-06	2.525e-06	-5.269	-5.598	-0.329	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	3.778e-06	3.778e-06	-5.423	-5.423	0.000	(0)
NaHCO3	2.304e-06	2.304e-06	-5.638	-5.638	0.000	(0)
NaCO3-	4.536e-07	3.786e-07	-6.343	-6.422	-0.078	(0)
CuCO3	3.238e-07	3.238e-07	-6.490	-6.490	0.000	(0)
UO2(CO3) 3-4	2.726e-07	5.112e-09	-6.564	-8.291	-1.727	(0)
ZnCO3	2.374e-07	2.374e-07	-6.624	-6.624	0.000	(0)
MnHCO3+	2.192e-07	1.822e-07	-6.659	-6.739	-0.080	(0)
UO2(CO3) 2-2	1.092e-07	4.040e-08	-6.962	-7.394	-0.432	(0)
ZnHCO3+	3.371e-08	2.629e-08	-7.472	-7.580	-0.108	(0)
Cu(CO3) 2-2	5.946e-09	2.200e-09	-8.226	-8.658	-0.432	(0)
NiCO3	3.682e-09	3.682e-09	-8.434	-8.434	0.000	(0)
NiHCO3+	3.143e-09	2.451e-09	-8.503	-8.611	-0.108	(0)
PbCO3	1.827e-09	1.827e-09	-8.738	-8.738	0.000	(0)
CoHCO3+	1.383e-09	1.079e-09	-8.859	-8.967	-0.108	(0)
CoCO3	1.164e-09	1.164e-09	-8.934	-8.934	0.000	(0)
CuHCO3+	8.964e-10	6.991e-10	-9.048	-9.155	-0.108	(0)
UO2CO3	8.021e-10	8.021e-10	-9.096	-9.096	0.000	(0)
CdCO3	2.158e-10	2.158e-10	-9.666	-9.666	0.000	(0)
PbHCO3+	1.167e-10	9.098e-11	-9.933	-10.041	-0.108	(0)
BaHCO3+	1.147e-10	9.628e-11	-9.940	-10.016	-0.076	(0)
Pb(CO3) 2-2	3.595e-11	1.330e-11	-10.444	-10.876	-0.432	(0)
BaCO3	2.566e-11	2.566e-11	-10.591	-10.591	0.000	(0)
CdHCO3+	5.569e-12	4.344e-12	-11.254	-11.362	-0.108	(0)
Cd(CO3) 2-2	1.092e-12	4.039e-13	-11.962	-12.394	-0.432	(0)
HgCO3	2.199e-15	2.199e-15	-14.658	-14.658	0.000	(0)
FeHCO3+	1.925e-15	1.616e-15	-14.715	-14.792	-0.076	(0)
Hg(CO3) 2-2	4.743e-17	1.755e-17	-16.324	-16.756	-0.432	(0)
HgHCO3+	4.958e-19	3.867e-19	-18.305	-18.413	-0.108	(0)
Ca	4.407e-03					
Ca+2	2.797e-03	1.312e-03	-2.553	-2.882	-0.329	(0)
CaSO4	1.588e-03	1.588e-03	-2.799	-2.799	0.000	(0)
CaHCO3+	1.481e-05	1.242e-05	-4.830	-4.906	-0.076	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.350e-06	1.954e-06	-5.629	-5.709	-0.080	(0)
CaH2BO3+	1.697e-07	1.373e-07	-6.770	-6.862	-0.092	(0)
CaOH+	3.322e-08	2.788e-08	-7.479	-7.555	-0.076	(0)
CaNO3+	4.205e-11	3.280e-11	-10.376	-10.484	-0.108	(0)
CaNH3+2	1.502e-11	5.559e-12	-10.823	-11.255	-0.432	(0)
Ca(NH3) 2+2	2.014e-20	7.451e-21	-19.696	-20.128	-0.432	(0)
Cd	1.503e-08					

	Cd+2	7.999e-09	3.751e-09	-8.097	-8.426	-0.329	(0)
	CdSO4	4.645e-09	4.645e-09	-8.333	-8.333	0.000	(0)
	CdCl+	1.166e-09	9.093e-10	-8.933	-9.041	-0.108	(0)
	Cd(SO4) 2-2	8.948e-10	3.311e-10	-9.048	-9.480	-0.432	(0)
	CdCO3	2.158e-10	2.158e-10	-9.666	-9.666	0.000	(0)
	CdOH+	4.069e-11	3.174e-11	-10.391	-10.498	-0.108	(0)
	CdOHC1	3.974e-11	3.974e-11	-10.401	-10.401	0.000	(0)
	CdF+	1.040e-11	8.114e-12	-10.983	-11.091	-0.108	(0)
	CdCl2	9.624e-12	9.624e-12	-11.017	-11.017	0.000	(0)
	CdHCO3+	5.569e-12	4.344e-12	-11.254	-11.362	-0.108	(0)
	Cd(CO3) 2-2	1.092e-12	4.039e-13	-11.962	-12.394	-0.432	(0)
	Cd(OH) 2	2.133e-13	2.133e-13	-12.671	-12.671	0.000	(0)
	CdCl3-	1.977e-14	1.542e-14	-13.704	-13.812	-0.108	(0)
	CdF2	2.210e-15	2.210e-15	-14.656	-14.656	0.000	(0)
	CdNO3+	1.202e-16	9.379e-17	-15.920	-16.028	-0.108	(0)
	CdSeO4	7.671e-17	7.671e-17	-16.115	-16.115	0.000	(0)
	Cd(OH) 3-	1.780e-17	1.388e-17	-16.750	-16.858	-0.108	(0)
	Cd2OH+3	5.586e-18	5.965e-19	-17.253	-18.224	-0.971	(0)
	Cd(SeO3) 2-2	5.370e-18	1.987e-18	-17.270	-17.702	-0.432	(0)
	Cd(OH) 4-2	6.541e-24	2.420e-24	-23.184	-23.616	-0.432	(0)
	Cd(NO3) 2	3.717e-25	3.717e-25	-24.430	-24.430	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.131	-79.239	-0.108	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.855	-150.855	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-227.668	-227.776	-0.108	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-303.969	-304.400	-0.432	(0)
C1		3.068e-03					
	C1-	3.068e-03	2.539e-03	-2.513	-2.595	-0.082	(0)
	MnCl+	6.902e-08	5.739e-08	-7.161	-7.241	-0.080	(0)
	ZnOHC1	1.453e-08	1.453e-08	-7.838	-7.838	0.000	(0)
	ZnCl+	1.266e-08	1.042e-08	-7.898	-7.982	-0.084	(0)
	AgCl	7.074e-09	7.074e-09	-8.150	-8.150	0.000	(0)
	AgCl2-	2.006e-09	1.564e-09	-8.698	-8.806	-0.108	(0)
	CdCl+	1.166e-09	9.093e-10	-8.933	-9.041	-0.108	(0)
	CuCl	6.095e-10	6.095e-10	-9.215	-9.215	0.000	(0)
	CuCl2-	3.927e-10	3.233e-10	-9.406	-9.490	-0.084	(0)
	NiCl+	3.256e-10	2.539e-10	-9.487	-9.595	-0.108	(0)
	CoCl+	3.071e-10	2.395e-10	-9.513	-9.621	-0.108	(0)
	MnCl2	2.058e-10	2.058e-10	-9.687	-9.687	0.000	(0)
	CuCl+	1.065e-10	8.765e-11	-9.973	-10.057	-0.084	(0)
	ZnCl2	4.194e-11	4.194e-11	-10.377	-10.377	0.000	(0)
	CdOHC1	3.974e-11	3.974e-11	-10.401	-10.401	0.000	(0)
	PbCl+	2.780e-11	2.168e-11	-10.556	-10.664	-0.108	(0)
	CdCl2	9.624e-12	9.624e-12	-11.017	-11.017	0.000	(0)
	AgCl3-2	9.565e-12	3.539e-12	-11.019	-11.451	-0.432	(0)
	HgClOH	3.476e-12	3.476e-12	-11.459	-11.459	0.000	(0)
	HgCl2	4.690e-13	4.690e-13	-12.329	-12.329	0.000	(0)
	CuCl3-2	3.670e-13	1.755e-13	-12.435	-12.756	-0.320	(0)
	PbCl2	2.459e-13	2.459e-13	-12.609	-12.609	0.000	(0)
	MnCl3-	1.731e-13	1.439e-13	-12.762	-12.842	-0.080	(0)
	AgCl4-3	1.718e-13	1.835e-14	-12.765	-13.736	-0.971	(0)
	ZnCl3-	1.027e-13	8.457e-14	-12.988	-13.073	-0.084	(0)
	CuCl2	7.716e-14	7.716e-14	-13.113	-13.113	0.000	(0)
	CdCl3-	1.977e-14	1.542e-14	-13.704	-13.812	-0.108	(0)
	HgCl3-	1.527e-14	1.191e-14	-13.816	-13.924	-0.108	(0)
	NiCl2	3.246e-15	3.246e-15	-14.489	-14.489	0.000	(0)
	UO2Cl+	4.213e-16	3.286e-16	-15.375	-15.483	-0.108	(0)
	HgCl4-2	3.253e-16	1.204e-16	-15.488	-15.920	-0.432	(0)
	PbCl3-	3.187e-16	2.486e-16	-15.497	-15.605	-0.108	(0)
	ZnCl4-2	2.245e-16	1.074e-16	-15.649	-15.969	-0.320	(0)
	HgCl+	4.726e-17	3.686e-17	-16.325	-16.433	-0.108	(0)
	CuCl3-	2.221e-18	1.828e-18	-17.654	-17.738	-0.084	(0)
	CrCl+2	1.839e-18	6.805e-19	-17.735	-18.167	-0.432	(0)
	PbCl4-2	7.795e-19	2.885e-19	-18.108	-18.540	-0.432	(0)
	CrOHC12	3.498e-20	3.498e-20	-19.456	-19.456	0.000	(0)
	FeCl+2	2.102e-22	1.005e-22	-21.677	-21.998	-0.320	(0)
	CrCl2+	2.102e-22	1.639e-22	-21.677	-21.785	-0.108	(0)
	CuCl4-2	4.864e-23	2.326e-23	-22.313	-22.633	-0.320	(0)
	VOCl+	6.866e-24	5.355e-24	-23.163	-23.271	-0.108	(0)

FeCl2+	1.371e-24	1.140e-24	-23.863	-23.943	-0.080	(0)
CrO3Cl-	3.832e-26	2.989e-26	-25.417	-25.525	-0.108	(0)
FeCl3	2.894e-28	2.894e-28	-27.538	-27.538	0.000	(0)
CoCl+2	8.478e-36	3.137e-36	-35.072	-35.503	-0.432	(0)
UCl+3	0.000e+00	0.000e+00	-45.400	-46.371	-0.971	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.483	-51.914	-0.432	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.582	-55.014	-0.432	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.671	-67.103	-0.432	(0)
Co (2)	1.062e-07					
Co+2	7.369e-08	2.727e-08	-7.133	-7.564	-0.432	(0)
CoSO4	2.875e-08	2.875e-08	-7.541	-7.541	0.000	(0)
CoHCO3+	1.383e-09	1.079e-09	-8.859	-8.967	-0.108	(0)
CoCO3	1.164e-09	1.164e-09	-8.934	-8.934	0.000	(0)
CoOH+	7.431e-10	5.796e-10	-9.129	-9.237	-0.108	(0)
CoCl+	3.071e-10	2.395e-10	-9.513	-9.621	-0.108	(0)
CoF+	1.509e-10	1.177e-10	-9.821	-9.929	-0.108	(0)
Co (OH) 2	4.904e-11	4.904e-11	-10.309	-10.309	0.000	(0)
CoNO2+	2.065e-12	1.611e-12	-11.685	-11.793	-0.108	(0)
Co (NH3) +2	2.983e-14	1.104e-14	-13.525	-13.957	-0.432	(0)
CoSeO4	1.501e-15	1.501e-15	-14.824	-14.824	0.000	(0)
Co (OH) 3-	1.336e-15	1.042e-15	-14.874	-14.982	-0.108	(0)
CoNO3+	4.382e-16	3.418e-16	-15.358	-15.466	-0.108	(0)
CoOOH-	3.355e-16	2.617e-16	-15.474	-15.582	-0.108	(0)
Co2OH+3	7.417e-18	7.921e-19	-17.130	-18.101	-0.971	(0)
Co (NH3) 2+2	4.284e-21	1.585e-21	-20.368	-20.800	-0.432	(0)
Co (OH) 4-2	4.756e-22	1.760e-22	-21.323	-21.755	-0.432	(0)
Co (NO3) 2	5.499e-24	5.499e-24	-23.260	-23.260	0.000	(0)
Co4 (OH) 4+4	1.201e-27	2.252e-29	-26.921	-28.648	-1.727	(0)
Co (NH3) 3+2	1.816e-28	6.719e-29	-27.741	-28.173	-0.432	(0)
Co (NH3) 4+2	3.208e-36	1.187e-36	-35.494	-35.925	-0.432	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.746	-44.178	-0.432	(0)
Co (3)	8.884e-29					
CoOH+2	8.884e-29	3.288e-29	-28.051	-28.483	-0.432	(0)
Co+3	3.338e-35	6.073e-36	-34.476	-35.217	-0.740	(0)
CoCl+2	8.478e-36	3.137e-36	-35.072	-35.503	-0.432	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.483	-51.914	-0.432	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.751	-61.859	-0.108	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.848	-66.280	-0.432	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.671	-67.103	-0.432	(0)
Cr (2)	2.390e-27					
Cr+2	2.390e-27	8.844e-28	-26.622	-27.053	-0.432	(0)
Cr (3)	1.101e-09					
Cr (OH) 2+	8.021e-10	6.256e-10	-9.096	-9.204	-0.108	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.615e-11	1.259e-11	-10.792	-10.900	-0.108	(0)
Cr (OH) 4-	1.361e-11	1.062e-11	-10.866	-10.974	-0.108	(0)
Cr (OH) +2	1.304e-11	4.827e-12	-10.885	-11.316	-0.432	(0)
CrOHSO4	6.052e-12	6.052e-12	-11.218	-11.218	0.000	(0)
CrF+2	1.211e-14	4.481e-15	-13.917	-14.349	-0.432	(0)
CrSO4+	3.276e-15	2.555e-15	-14.485	-14.593	-0.108	(0)
Cr+3	1.939e-15	2.071e-16	-14.712	-15.684	-0.971	(0)
CrCl+2	1.839e-18	6.805e-19	-17.735	-18.167	-0.432	(0)
CrOHC12	3.498e-20	3.498e-20	-19.456	-19.456	0.000	(0)
Cr2 (OH) 2SO4+2	7.135e-21	2.640e-21	-20.147	-20.578	-0.432	(0)
Cr2 (OH) 2 (SO4) 2	8.287e-22	8.287e-22	-21.082	-21.082	0.000	(0)
CrCl2+	2.102e-22	1.639e-22	-21.677	-21.785	-0.108	(0)
CrNO3+2	1.935e-25	7.159e-26	-24.713	-25.145	-0.432	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.216	-43.648	-0.432	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.549	-53.520	-0.971	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.582	-55.014	-0.432	(0)
Cr (6)	1.450e-14					
CrO4-2	1.382e-14	6.478e-15	-13.860	-14.189	-0.329	(0)
NaCrO4-	3.324e-16	2.593e-16	-15.478	-15.586	-0.108	(0)
HCrO4-	2.539e-16	1.980e-16	-15.595	-15.703	-0.108	(0)
KCrO4-	9.338e-17	7.283e-17	-16.030	-16.138	-0.108	(0)
CrO3SO4-2	8.140e-24	3.012e-24	-23.089	-23.521	-0.432	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.832e-26	2.989e-26	-25.417	-25.525	-0.108	(0)

Cr2O7-2	3.677e-30	1.360e-30	-29.435	-29.866	-0.432	(0)
Cu (1)	1.247e-09					
CuCl	6.095e-10	6.095e-10	-9.215	-9.215	0.000	(0)
CuCl2-	3.927e-10	3.233e-10	-9.406	-9.490	-0.084	(0)
Cu+	2.445e-10	1.907e-10	-9.612	-9.720	-0.108	(0)
CuCl3-2	3.670e-13	1.755e-13	-12.435	-12.756	-0.320	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.548	-147.921	-0.374	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.297	-148.651	-0.355	(0)
Cu (2)	5.093e-07					
CuCO3	3.238e-07	3.238e-07	-6.490	-6.490	0.000	(0)
CuOH+	8.912e-08	7.337e-08	-7.050	-7.134	-0.084	(0)
Cu+2	4.645e-08	2.178e-08	-7.333	-7.662	-0.329	(0)
CuSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
Cu (OH) 2	1.560e-08	1.560e-08	-7.807	-7.807	0.000	(0)
Cu (CO3) 2-2	5.946e-09	2.200e-09	-8.226	-8.658	-0.432	(0)
CuHCO3+	8.964e-10	6.991e-10	-9.048	-9.155	-0.108	(0)
Cu2 (OH) 2+2	3.655e-10	1.352e-10	-9.437	-9.869	-0.432	(0)
CuF+	2.405e-10	1.876e-10	-9.619	-9.727	-0.108	(0)
CuCl+	1.065e-10	8.765e-11	-9.973	-10.057	-0.084	(0)
Cu (OH) 3-	4.369e-11	3.408e-11	-10.360	-10.468	-0.108	(0)
CuNO2+	2.451e-11	1.912e-11	-10.611	-10.719	-0.108	(0)
CuNH3+2	2.028e-12	7.504e-13	-11.693	-12.125	-0.432	(0)
CuCl2	7.716e-14	7.716e-14	-13.113	-13.113	0.000	(0)
Cu (NO2) 2	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
Cu (OH) 4-2	7.721e-16	2.857e-16	-15.112	-15.544	-0.432	(0)
CuNO3+	6.984e-16	5.447e-16	-15.156	-15.264	-0.108	(0)
CuCl3-	2.221e-18	1.828e-18	-17.654	-17.738	-0.084	(0)
CuCl4-2	4.864e-23	2.326e-23	-22.313	-22.633	-0.320	(0)
Cu (NO3) 2	5.422e-25	5.422e-25	-24.266	-24.266	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.117	-218.225	-0.108	(0)
F	2.014e-04					
F-	1.649e-04	1.365e-04	-3.783	-3.865	-0.082	(0)
MgF+	3.329e-05	2.755e-05	-4.478	-4.560	-0.082	(0)
CaF+	2.350e-06	1.954e-06	-5.629	-5.709	-0.080	(0)
NaF	6.936e-07	6.936e-07	-6.159	-6.159	0.000	(0)
MnF+	1.173e-07	9.757e-08	-6.931	-7.011	-0.080	(0)
ZnF+	5.707e-09	4.451e-09	-8.244	-8.352	-0.108	(0)
BF (OH) 3-	1.991e-09	1.611e-09	-8.701	-8.793	-0.092	(0)
HF	1.907e-09	1.907e-09	-8.720	-8.720	0.000	(0)
CuF+	2.405e-10	1.876e-10	-9.619	-9.727	-0.108	(0)
NiF+	1.718e-10	1.340e-10	-9.765	-9.873	-0.108	(0)
AlF3	1.693e-10	1.693e-10	-9.771	-9.771	0.000	(0)
CoF+	1.509e-10	1.177e-10	-9.821	-9.929	-0.108	(0)
AlF2+	1.180e-10	9.852e-11	-9.928	-10.006	-0.078	(0)
AlF4-	1.400e-11	1.158e-11	-10.854	-10.936	-0.082	(0)
CdF+	1.040e-11	8.114e-12	-10.983	-11.091	-0.108	(0)
AlF+2	3.735e-12	1.813e-12	-11.428	-11.742	-0.314	(0)
PbF+	2.969e-12	2.315e-12	-11.527	-11.635	-0.108	(0)
UO2F+	1.928e-12	1.504e-12	-11.715	-11.823	-0.108	(0)
HF2-	1.209e-12	9.897e-13	-11.918	-12.005	-0.087	(0)
UO2F2	5.919e-13	5.919e-13	-12.228	-12.228	0.000	(0)
AgF	4.679e-13	4.679e-13	-12.330	-12.330	0.000	(0)
BF2 (OH) 2-	2.747e-13	2.223e-13	-12.561	-12.653	-0.092	(0)
UO2F3-	2.602e-14	2.029e-14	-13.585	-13.693	-0.108	(0)
CrF+2	1.211e-14	4.481e-15	-13.917	-14.349	-0.432	(0)
PbF2	6.219e-15	6.219e-15	-14.206	-14.206	0.000	(0)
CdF2	2.210e-15	2.210e-15	-14.656	-14.656	0.000	(0)
UO2F4-2	5.946e-17	2.200e-17	-16.226	-16.658	-0.432	(0)
H2F2	9.744e-18	9.744e-18	-17.011	-17.011	0.000	(0)
PbF3-	2.064e-18	1.610e-18	-17.685	-17.793	-0.108	(0)
VO2F	1.410e-18	1.410e-18	-17.851	-17.851	0.000	(0)
FeF2+	8.619e-19	7.168e-19	-18.065	-18.145	-0.080	(0)
FeF+2	4.103e-19	1.962e-19	-18.387	-18.707	-0.320	(0)
FeF3	1.380e-19	1.380e-19	-18.860	-18.860	0.000	(0)
BF3OH-	1.379e-19	1.116e-19	-18.861	-18.952	-0.092	(0)
VO2F2-	8.959e-20	6.987e-20	-19.048	-19.156	-0.108	(0)
VOF+	7.892e-22	6.155e-22	-21.103	-21.211	-0.108	(0)
VO2F3-2	3.215e-22	1.190e-22	-21.493	-21.925	-0.432	(0)

PbF4-2	2.843e-22	1.052e-22	-21.546	-21.978	-0.432	(0)
VOF2	3.150e-23	3.150e-23	-22.502	-22.502	0.000	(0)
HgF+	4.721e-24	3.682e-24	-23.326	-23.434	-0.108	(0)
BF4-	8.753e-25	7.083e-25	-24.058	-24.150	-0.092	(0)
VOF3-	1.956e-25	1.526e-25	-24.709	-24.817	-0.108	(0)
VO2F4-3	7.481e-26	7.990e-27	-25.126	-26.097	-0.971	(0)
Sb (OH) 2F	3.029e-26	3.029e-26	-25.519	-25.519	0.000	(0)
SbOF	2.980e-26	2.980e-26	-25.526	-25.526	0.000	(0)
VOF4-2	2.272e-28	8.406e-29	-27.644	-28.075	-0.432	(0)
UF3+	4.339e-36	3.384e-36	-35.363	-35.471	-0.108	(0)
UF2+2	4.228e-37	1.564e-37	-36.374	-36.806	-0.432	(0)
UF4	5.065e-38	5.065e-38	-37.295	-37.295	0.000	(0)
UF+3	8.525e-40	0.000e+00	-39.069	-40.041	-0.971	(0)
UF5-	3.513e-40	2.740e-40	-39.454	-39.562	-0.108	(0)
UF6-2	0.000e+00	0.000e+00	-40.515	-40.947	-0.432	(0)
Fe (2)	1.024e-12					
Fe+2	6.818e-13	2.523e-13	-12.166	-12.598	-0.432	(0)
FeSO4	3.272e-13	3.272e-13	-12.485	-12.485	0.000	(0)
FeOH+	1.287e-14	1.070e-14	-13.891	-13.971	-0.080	(0)
FeHCO3+	1.925e-15	1.616e-15	-14.715	-14.792	-0.076	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.667e-18	3.050e-18	-17.436	-17.516	-0.080	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.289	-161.289	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.965	-238.073	-0.108	(0)
Fe (3)	9.261e-10					
Fe (OH) 2+	4.477e-10	3.737e-10	-9.349	-9.427	-0.078	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	5.081e-11	4.241e-11	-10.294	-10.373	-0.078	(0)
FeOH+2	1.886e-15	9.018e-16	-14.725	-15.045	-0.320	(0)
FeF2+	8.619e-19	7.168e-19	-18.065	-18.145	-0.080	(0)
FeF+2	4.103e-19	1.962e-19	-18.387	-18.707	-0.320	(0)
FeF3	1.380e-19	1.380e-19	-18.860	-18.860	0.000	(0)
FeSO4+	9.347e-20	7.773e-20	-19.029	-19.109	-0.080	(0)
Fe (SO4) 2-	1.126e-20	8.780e-21	-19.949	-20.056	-0.108	(0)
Fe+3	7.207e-21	1.311e-21	-20.142	-20.882	-0.740	(0)
FeCl+2	2.102e-22	1.005e-22	-21.677	-21.998	-0.320	(0)
FeCl2+	1.371e-24	1.140e-24	-23.863	-23.943	-0.080	(0)
FeHSeO3+2	5.633e-25	2.084e-25	-24.249	-24.681	-0.432	(0)
Fe2 (OH) 2+4	1.436e-27	2.693e-29	-26.843	-28.570	-1.727	(0)
FeCl3	2.894e-28	2.894e-28	-27.538	-27.538	0.000	(0)
FeNO3+2	2.802e-28	1.037e-28	-27.553	-27.984	-0.432	(0)
Fe3 (OH) 4+5	7.264e-35	1.455e-37	-34.139	-36.837	-2.698	(0)
H (0)	3.995e-29					
H2	1.998e-29	2.018e-29	-28.699	-28.695	0.004	(0)
Hg (0)	2.146e-09					
Hg	2.146e-09	2.146e-09	-8.668	-8.668	0.000	(0)
Hg (1)	5.730e-21					
Hg2+2	2.865e-21	1.060e-21	-20.543	-20.975	-0.432	(0)
Hg (2)	9.119e-12					
Hg (OH) 2	5.157e-12	5.210e-12	-11.288	-11.283	0.004	(0)
HgClOH	3.476e-12	3.476e-12	-11.459	-11.459	0.000	(0)
HgCl2	4.690e-13	4.690e-13	-12.329	-12.329	0.000	(0)
HgCl3-	1.527e-14	1.191e-14	-13.816	-13.924	-0.108	(0)
HgCO3	2.199e-15	2.199e-15	-14.658	-14.658	0.000	(0)
HgCl4-2	3.253e-16	1.204e-16	-15.488	-15.920	-0.432	(0)
Hg (CO3) 2-2	4.743e-17	1.755e-17	-16.324	-16.756	-0.432	(0)
HgCl+	4.726e-17	3.686e-17	-16.325	-16.433	-0.108	(0)
HgOH+	3.957e-17	3.086e-17	-16.403	-16.511	-0.108	(0)
Hg (OH) 3-	8.958e-19	6.987e-19	-18.048	-18.156	-0.108	(0)
HgHCO3+	4.958e-19	3.867e-19	-18.305	-18.413	-0.108	(0)
Hg (NH3) 2+2	1.406e-20	5.204e-21	-19.852	-20.284	-0.432	(0)
HgNH3+2	4.177e-21	1.546e-21	-20.379	-20.811	-0.432	(0)
Hg+2	1.966e-21	7.277e-22	-20.706	-21.138	-0.432	(0)
HgSO4	1.007e-21	1.007e-21	-20.997	-20.997	0.000	(0)
HgF+	4.721e-24	3.682e-24	-23.326	-23.434	-0.108	(0)
Hg (NH3) 3+2	1.885e-28	6.976e-29	-27.725	-28.156	-0.432	(0)
HgNO3+	2.724e-30	2.125e-30	-29.565	-29.673	-0.108	(0)
Hg (NH3) 4+2	5.041e-36	1.866e-36	-35.297	-35.729	-0.432	(0)

	Hg (NO3) 2	6.983e-39	6.983e-39	-38.156	-38.156	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.719	-138.827	-0.108	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.078	-139.510	-0.432	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.457	-140.457	0.000	(0)
K		3.792e-03					
	K+	3.657e-03	3.026e-03	-2.437	-2.519	-0.082	(0)
	KSO4-	1.356e-04	1.132e-04	-3.868	-3.946	-0.078	(0)
	KCrO4-	9.338e-17	7.283e-17	-16.030	-16.138	-0.108	(0)
Mg		5.616e-03					
	Mg+2	3.837e-03	1.799e-03	-2.416	-2.745	-0.329	(0)
	MgSO4	1.730e-03	1.730e-03	-2.762	-2.762	0.000	(0)
	MgF+	3.329e-05	2.755e-05	-4.478	-4.560	-0.082	(0)
	MgHCO3+	1.137e-05	9.364e-06	-4.944	-5.029	-0.084	(0)
	MgCO3	3.778e-06	3.778e-06	-5.423	-5.423	0.000	(0)
	MgOH+	9.053e-07	7.629e-07	-6.043	-6.118	-0.074	(0)
	MgH2BO3+	1.402e-07	1.135e-07	-6.853	-6.945	-0.092	(0)
Mn (2)		6.586e-05					
	Mn+2	4.852e-05	1.796e-05	-4.314	-4.746	-0.432	(0)
	MnSO4	1.687e-05	1.687e-05	-4.773	-4.773	0.000	(0)
	MnHCO3+	2.192e-07	1.822e-07	-6.659	-6.739	-0.080	(0)
	MnF+	1.173e-07	9.757e-08	-6.931	-7.011	-0.080	(0)
	MnCl+	6.902e-08	5.739e-08	-7.161	-7.241	-0.080	(0)
	MnOH+	5.778e-08	4.805e-08	-7.238	-7.318	-0.080	(0)
	MnCl2	2.058e-10	2.058e-10	-9.687	-9.687	0.000	(0)
	MnSeO4	5.309e-13	5.309e-13	-12.275	-12.275	0.000	(0)
	MnNO3+	2.885e-13	2.250e-13	-12.540	-12.648	-0.108	(0)
	MnCl3-	1.731e-13	1.439e-13	-12.762	-12.842	-0.080	(0)
	Mn (OH) 3-	4.052e-16	3.369e-16	-15.392	-15.472	-0.080	(0)
	Mn (NO3) 2	4.470e-21	4.470e-21	-20.350	-20.350	0.000	(0)
	Mn (OH) 4-2	2.423e-21	1.159e-21	-20.616	-20.936	-0.320	(0)
	MnSe	0.000e+00	0.000e+00	-41.101	-41.101	0.000	(0)
Mn (3)		2.466e-25					
	Mn+3	2.466e-25	4.487e-26	-24.608	-25.348	-0.740	(0)
Mn (6)		2.190e-40					
	MnO4-2	2.190e-40	1.047e-40	-39.660	-39.980	-0.320	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.515	-44.604	-0.089	(0)
Mo		2.125e-06					
	MoO4-2	2.125e-06	9.965e-07	-5.673	-6.002	-0.329	(0)
	HMoO4-	2.401e-10	1.873e-10	-9.620	-9.727	-0.108	(0)
	H2MoO4	1.296e-14	1.296e-14	-13.887	-13.887	0.000	(0)
	Ag2MoO4	7.024e-25	7.024e-25	-24.153	-24.153	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.069	-44.041	-0.971	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-49.332	-53.217	-3.886	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-52.157	-54.855	-2.698	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-56.371	-58.098	-1.727	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-61.905	-62.877	-0.971	(0)
N (-3)		7.612e-08					
	NH4+	6.893e-08	5.578e-08	-7.162	-7.254	-0.092	(0)
	NH4SO4-	3.798e-09	3.158e-09	-8.420	-8.501	-0.080	(0)
	NH3	3.367e-09	3.367e-09	-8.473	-8.473	0.000	(0)
	CaNH3+2	1.502e-11	5.559e-12	-10.823	-11.255	-0.432	(0)
	CuNH3+2	2.028e-12	7.504e-13	-11.693	-12.125	-0.432	(0)
	NiNH3+2	1.910e-13	7.068e-14	-12.719	-13.151	-0.432	(0)
	Co (NH3) +2	2.983e-14	1.104e-14	-13.525	-13.957	-0.432	(0)
	AgNH3+	1.203e-14	9.381e-15	-13.920	-14.028	-0.108	(0)
	BaNH3+2	1.138e-16	4.210e-17	-15.944	-16.376	-0.432	(0)
	Ag (NH3) 2+	3.291e-19	2.567e-19	-18.483	-18.591	-0.108	(0)
	Ni (NH3) 2+2	9.295e-20	3.440e-20	-19.032	-19.463	-0.432	(0)
	Ca (NH3) 2+2	2.014e-20	7.451e-21	-19.696	-20.128	-0.432	(0)
	Hg (NH3) 2+2	1.406e-20	5.204e-21	-19.852	-20.284	-0.432	(0)
	Co (NH3) 2+2	4.284e-21	1.585e-21	-20.368	-20.800	-0.432	(0)
	HgNH3+2	4.177e-21	1.546e-21	-20.379	-20.811	-0.432	(0)
	Hg (NH3) 3+2	1.885e-28	6.976e-29	-27.725	-28.156	-0.432	(0)
	Co (NH3) 3+2	1.816e-28	6.719e-29	-27.741	-28.173	-0.432	(0)
	Hg (NH3) 4+2	5.041e-36	1.866e-36	-35.297	-35.729	-0.432	(0)
	Co (NH3) 4+2	3.208e-36	1.187e-36	-35.494	-35.925	-0.432	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.216	-43.648	-0.432	(0)

Co (NH3) 5+2	0.000e+00	0.000e+00	-43.746	-44.178	-0.432	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.483	-51.914	-0.432	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.549	-53.520	-0.971	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.582	-55.014	-0.432	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.751	-61.859	-0.108	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.848	-66.280	-0.432	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.671	-67.103	-0.432	(0)
N (3)	1.030e-05					
NO2-	1.030e-05	8.382e-06	-4.987	-5.077	-0.089	(0)
CuNO2+	2.451e-11	1.912e-11	-10.611	-10.719	-0.108	(0)
AgNO2	2.390e-12	2.390e-12	-11.622	-11.622	0.000	(0)
CoNO2+	2.065e-12	1.611e-12	-11.685	-11.793	-0.108	(0)
Cu (NO2) 2	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
Ag (NO2) 2-	3.978e-17	3.102e-17	-16.400	-16.508	-0.108	(0)
N (5)	9.598e-09					
NO3-	9.556e-09	7.908e-09	-8.020	-8.102	-0.082	(0)
CaNO3+	4.205e-11	3.280e-11	-10.376	-10.484	-0.108	(0)
MnNO3+	2.885e-13	2.250e-13	-12.540	-12.648	-0.108	(0)
ZnNO3+	4.162e-14	3.246e-14	-13.381	-13.489	-0.108	(0)
BaNO3+	1.007e-15	7.854e-16	-14.997	-15.105	-0.108	(0)
NiNO3+	9.955e-16	7.764e-16	-15.002	-15.110	-0.108	(0)
CuNO3+	6.984e-16	5.447e-16	-15.156	-15.264	-0.108	(0)
CoNO3+	4.382e-16	3.418e-16	-15.358	-15.466	-0.108	(0)
CdNO3+	1.202e-16	9.379e-17	-15.920	-16.028	-0.108	(0)
PbNO3+	3.610e-17	2.816e-17	-16.443	-16.550	-0.108	(0)
AgNO3	8.571e-18	8.571e-18	-17.067	-17.067	0.000	(0)
Mn (NO3) 2	4.470e-21	4.470e-21	-20.350	-20.350	0.000	(0)
UO2NO3+	1.614e-21	1.259e-21	-20.792	-20.900	-0.108	(0)
Zn (NO3) 2	5.122e-23	5.122e-23	-22.291	-22.291	0.000	(0)
Co (NO3) 2	5.499e-24	5.499e-24	-23.260	-23.260	0.000	(0)
Cu (NO3) 2	5.422e-25	5.422e-25	-24.266	-24.266	0.000	(0)
Pb (NO3) 2	3.781e-25	3.781e-25	-24.422	-24.422	0.000	(0)
Cd (NO3) 2	3.717e-25	3.717e-25	-24.430	-24.430	0.000	(0)
CrNO3+2	1.935e-25	7.159e-26	-24.713	-25.145	-0.432	(0)
VO2NO3	2.356e-26	2.356e-26	-25.628	-25.628	0.000	(0)
FeNO3+2	2.802e-28	1.037e-28	-27.553	-27.984	-0.432	(0)
HgNO3+	2.724e-30	2.125e-30	-29.565	-29.673	-0.108	(0)
Hg (NO3) 2	6.983e-39	6.983e-39	-38.156	-38.156	0.000	(0)
Na	1.001e-02					
Na+	9.732e-03	8.053e-03	-2.012	-2.094	-0.082	(0)
NaSO4-	2.738e-04	2.285e-04	-3.563	-3.641	-0.078	(0)
NaHCO3	2.304e-06	2.304e-06	-5.638	-5.638	0.000	(0)
NaF	6.936e-07	6.936e-07	-6.159	-6.159	0.000	(0)
NaCO3-	4.536e-07	3.786e-07	-6.343	-6.422	-0.078	(0)
NaH2BO3	2.322e-08	2.322e-08	-7.634	-7.634	0.000	(0)
NaCrO4-	3.324e-16	2.593e-16	-15.478	-15.586	-0.108	(0)
Ni	1.326e-07					
Ni+2	8.337e-08	3.909e-08	-7.079	-7.408	-0.329	(0)
NiSO4	4.121e-08	4.121e-08	-7.385	-7.385	0.000	(0)
NiCO3	3.682e-09	3.682e-09	-8.434	-8.434	0.000	(0)
NiHCO3+	3.143e-09	2.451e-09	-8.503	-8.611	-0.108	(0)
NiOH+	6.721e-10	5.242e-10	-9.173	-9.280	-0.108	(0)
NiCl+	3.256e-10	2.539e-10	-9.487	-9.595	-0.108	(0)
NiF+	1.718e-10	1.340e-10	-9.765	-9.873	-0.108	(0)
Ni (OH) 2	4.436e-11	4.436e-11	-10.353	-10.353	0.000	(0)
Ni (SO4) 2-2	1.948e-11	7.210e-12	-10.710	-11.142	-0.432	(0)
NiNH3+2	1.910e-13	7.068e-14	-12.719	-13.151	-0.432	(0)
Ni (OH) 3-	6.058e-14	4.725e-14	-13.218	-13.326	-0.108	(0)
NiCl2	3.246e-15	3.246e-15	-14.489	-14.489	0.000	(0)
NiSeO4	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
NiNO3+	9.955e-16	7.764e-16	-15.002	-15.110	-0.108	(0)
Ni (NH3) 2+2	9.295e-20	3.440e-20	-19.032	-19.463	-0.432	(0)
O (0)	2.460e-35					
O2	1.230e-35	1.243e-35	-34.910	-34.906	0.004	(0)
Pb	4.048e-09					
PbCO3	1.827e-09	1.827e-09	-8.738	-8.738	0.000	(0)
PbOH+	8.259e-10	6.441e-10	-9.083	-9.191	-0.108	(0)
PbSO4	6.229e-10	6.229e-10	-9.206	-9.206	0.000	(0)

Pb+2	5.134e-10	2.407e-10	-9.290	-9.618	-0.329	(0)
PbHCO3+	1.167e-10	9.098e-11	-9.933	-10.041	-0.108	(0)
Pb (SO4) 2-2	5.360e-11	1.983e-11	-10.271	-10.703	-0.432	(0)
Pb (CO3) 2-2	3.595e-11	1.330e-11	-10.444	-10.876	-0.432	(0)
PbCl+	2.780e-11	2.168e-11	-10.556	-10.664	-0.108	(0)
Pb (OH) 2	2.170e-11	2.170e-11	-10.664	-10.664	0.000	(0)
PbF+	2.969e-12	2.315e-12	-11.527	-11.635	-0.108	(0)
PbCl2	2.459e-13	2.459e-13	-12.609	-12.609	0.000	(0)
Pb (OH) 3-	2.964e-14	2.311e-14	-13.528	-13.636	-0.108	(0)
PbF2	6.219e-15	6.219e-15	-14.206	-14.206	0.000	(0)
PbCl3-	3.187e-16	2.486e-16	-15.497	-15.605	-0.108	(0)
PbNO3+	3.610e-17	2.816e-17	-16.443	-16.550	-0.108	(0)
Pb2OH+3	2.301e-17	2.457e-18	-16.638	-17.610	-0.971	(0)
Pb (OH) 4-2	1.630e-17	6.030e-18	-16.788	-17.220	-0.432	(0)
PbF3-	2.064e-18	1.610e-18	-17.685	-17.793	-0.108	(0)
PbCl4-2	7.795e-19	2.885e-19	-18.108	-18.540	-0.432	(0)
Pb3 (OH) 4+2	6.111e-21	2.261e-21	-20.214	-20.646	-0.432	(0)
PbF4-2	2.843e-22	1.052e-22	-21.546	-21.978	-0.432	(0)
Pb (NO3) 2	3.781e-25	3.781e-25	-24.422	-24.422	0.000	(0)
Pb4 (OH) 4+4	2.306e-25	4.324e-27	-24.637	-26.364	-1.727	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.990	-151.990	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.402	-229.510	-0.108	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.871	-73.871	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.713	-78.821	-0.108	(0)
CdHS+	0.000e+00	0.000e+00	-79.131	-79.239	-0.108	(0)
S5-2	0.000e+00	0.000e+00	-79.729	-80.161	-0.432	(0)
H2S	0.000e+00	0.000e+00	-79.825	-79.825	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.245	-80.677	-0.432	(0)
S4-2	0.000e+00	0.000e+00	-80.325	-80.757	-0.432	(0)
S3-2	0.000e+00	0.000e+00	-81.131	-81.563	-0.432	(0)
S2-2	0.000e+00	0.000e+00	-82.147	-82.579	-0.432	(0)
S-2	0.000e+00	0.000e+00	-87.775	-88.096	-0.320	(0)
HgHS2-	0.000e+00	0.000e+00	-138.719	-138.827	-0.108	(0)
HgS2-2	0.000e+00	0.000e+00	-139.078	-139.510	-0.432	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.457	-140.457	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.548	-147.921	-0.374	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.839	-148.050	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.297	-148.651	-0.355	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.484	-148.592	-0.108	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.485	-148.593	-0.108	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.082	-149.466	-0.384	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.413	-149.777	-0.364	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.608	-150.608	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.855	-150.855	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.990	-151.990	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.289	-161.289	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.117	-218.225	-0.108	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.041	-226.149	-0.108	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.668	-227.776	-0.108	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.672	-228.104	-0.432	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.402	-229.510	-0.108	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.965	-238.073	-0.108	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.969	-304.400	-0.432	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.997	-306.429	-0.432	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.156	-321.588	-0.432	(0)
S (6)	1.501e-02					
SO4-2	1.127e-02	5.284e-03	-1.948	-2.277	-0.329	(0)
MgSO4	1.730e-03	1.730e-03	-2.762	-2.762	0.000	(0)
CaSO4	1.588e-03	1.588e-03	-2.799	-2.799	0.000	(0)
NaSO4-	2.738e-04	2.285e-04	-3.563	-3.641	-0.078	(0)
KSO4-	1.356e-04	1.132e-04	-3.868	-3.946	-0.078	(0)
MnSO4	1.687e-05	1.687e-05	-4.773	-4.773	0.000	(0)
ZnSO4	1.889e-06	1.889e-06	-5.724	-5.724	0.000	(0)
Zn (SO4) 2-2	2.349e-07	8.693e-08	-6.629	-7.061	-0.432	(0)
NiSO4	4.121e-08	4.121e-08	-7.385	-7.385	0.000	(0)
CoSO4	2.875e-08	2.875e-08	-7.541	-7.541	0.000	(0)
CuSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)

HSO4-	5.894e-09	4.877e-09	-8.230	-8.312	-0.082	(0)
CdSO4	4.645e-09	4.645e-09	-8.333	-8.333	0.000	(0)
NH4SO4-	3.798e-09	3.158e-09	-8.420	-8.501	-0.080	(0)
Cd(SO4) 2-2	8.948e-10	3.311e-10	-9.048	-9.480	-0.432	(0)
PbSO4	6.229e-10	6.229e-10	-9.206	-9.206	0.000	(0)
AgSO4-	1.845e-10	1.439e-10	-9.734	-9.842	-0.108	(0)
Pb(SO4) 2-2	5.360e-11	1.983e-11	-10.271	-10.703	-0.432	(0)
Ni(SO4) 2-2	1.948e-11	7.210e-12	-10.710	-11.142	-0.432	(0)
CrOHSO4	6.052e-12	6.052e-12	-11.218	-11.218	0.000	(0)
UO2SO4	6.382e-13	6.382e-13	-12.195	-12.195	0.000	(0)
FeSO4	3.272e-13	3.272e-13	-12.485	-12.485	0.000	(0)
UO2(SO4) 2-2	1.201e-13	4.445e-14	-12.920	-13.352	-0.432	(0)
AlSO4+	6.583e-14	5.448e-14	-13.182	-13.264	-0.082	(0)
Al(SO4) 2-	3.727e-15	3.084e-15	-14.429	-14.511	-0.082	(0)
CrSO4+	3.276e-15	2.555e-15	-14.485	-14.593	-0.108	(0)
VO2SO4-	9.527e-19	7.430e-19	-18.021	-18.129	-0.108	(0)
FeSO4+	9.347e-20	7.773e-20	-19.029	-19.109	-0.080	(0)
Fe(SO4) 2-	1.126e-20	8.780e-21	-19.949	-20.056	-0.108	(0)
Cr2(OH) 2SO4+2	7.135e-21	2.640e-21	-20.147	-20.578	-0.432	(0)
VOSO4	1.094e-21	1.094e-21	-20.961	-20.961	0.000	(0)
HgSO4	1.007e-21	1.007e-21	-20.997	-20.997	0.000	(0)
Cr2(OH) 2(SO4) 2	8.287e-22	8.287e-22	-21.082	-21.082	0.000	(0)
CrO3SO4-2	8.140e-24	3.012e-24	-23.089	-23.521	-0.432	(0)
VSO4+	1.906e-36	1.486e-36	-35.720	-35.828	-0.108	(0)
U(SO4) 2	2.951e-40	2.951e-40	-39.530	-39.530	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.721	-41.153	-0.432	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-61.751	-61.859	-0.108	(0)
Sb(3)	2.971e-20					
Sb(OH) 3	1.503e-20	1.503e-20	-19.823	-19.823	0.000	(0)
HSbO2	1.468e-20	1.468e-20	-19.833	-19.833	0.000	(0)
SbO2-	3.227e-24	2.517e-24	-23.491	-23.599	-0.108	(0)
Sb(OH) 4-	1.847e-24	1.440e-24	-23.734	-23.842	-0.108	(0)
Sb(OH) 2F	3.029e-26	3.029e-26	-25.519	-25.519	0.000	(0)
SbOF	2.980e-26	2.980e-26	-25.526	-25.526	0.000	(0)
Sb(OH) 2+	4.423e-27	3.450e-27	-26.354	-26.462	-0.108	(0)
SbO+	1.526e-27	1.190e-27	-26.817	-26.924	-0.108	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.156	-321.588	-0.432	(0)
Sb(5)	2.999e-08					
SbO3-	2.996e-08	2.336e-08	-7.524	-7.631	-0.108	(0)
Sb(OH) 6-	3.296e-11	2.728e-11	-10.482	-10.564	-0.082	(0)
SbO2+	7.672e-25	5.984e-25	-24.115	-24.223	-0.108	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.298e-39	1.012e-39	-38.887	-38.995	-0.108	(0)
MnSe	0.000e+00	0.000e+00	-41.101	-41.101	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.129	-43.129	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.538	-45.970	-0.432	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-81.563	-83.290	-1.727	(0)
Se(4)	1.457e-07					
HSeO3-	7.714e-08	6.016e-08	-7.113	-7.221	-0.108	(0)
SeO3-2	6.852e-08	2.536e-08	-7.164	-7.596	-0.432	(0)
H2SeO3	2.424e-13	2.424e-13	-12.615	-12.615	0.000	(0)
AgSeO3-	2.851e-14	2.224e-14	-13.545	-13.653	-0.108	(0)
Cd(SeO3) 2-2	5.370e-18	1.987e-18	-17.270	-17.702	-0.432	(0)
Ag(SeO3) 2-3	4.727e-20	5.049e-21	-19.325	-20.297	-0.971	(0)
FeHSeO3+2	5.633e-25	2.084e-25	-24.249	-24.681	-0.432	(0)
Se(6)	2.348e-10					
SeO4-2	2.343e-10	1.098e-10	-9.630	-9.959	-0.329	(0)
MnSeO4	5.309e-13	5.309e-13	-12.275	-12.275	0.000	(0)
ZnSeO4	2.780e-14	2.780e-14	-13.556	-13.556	0.000	(0)
NiSeO4	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
CoSeO4	1.501e-15	1.501e-15	-14.824	-14.824	0.000	(0)
CdSeO4	7.671e-17	7.671e-17	-16.115	-16.115	0.000	(0)
HSeO4-	6.668e-17	5.200e-17	-16.176	-16.284	-0.108	(0)
Zn(SeO4) 2-2	8.368e-24	3.097e-24	-23.077	-23.509	-0.432	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.048	-59.020	-0.971	(0)
U(4)	4.310e-19					

U(OH) 5-	4.308e-19	3.360e-19	-18.366	-18.474	-0.108	(0)
U(OH) 4	1.330e-22	1.330e-22	-21.876	-21.876	0.000	(0)
U(OH) 3+	5.894e-27	4.597e-27	-26.230	-26.338	-0.108	(0)
U(OH) 2+2	5.430e-32	2.009e-32	-31.265	-31.697	-0.432	(0)
UF3+	4.339e-36	3.384e-36	-35.363	-35.471	-0.108	(0)
UF2+2	4.228e-37	1.564e-37	-36.374	-36.806	-0.432	(0)
UOH+3	8.376e-38	8.945e-39	-37.077	-38.048	-0.971	(0)
UF4	5.065e-38	5.065e-38	-37.295	-37.295	0.000	(0)
UF+3	8.525e-40	0.000e+00	-39.069	-40.041	-0.971	(0)
UF5-	3.513e-40	2.740e-40	-39.454	-39.562	-0.108	(0)
U(SO4) 2	2.951e-40	2.951e-40	-39.530	-39.530	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.515	-40.947	-0.432	(0)
USO4+2	0.000e+00	0.000e+00	-40.721	-41.153	-0.432	(0)
U+4	0.000e+00	0.000e+00	-43.749	-45.476	-1.727	(0)
UC1+3	0.000e+00	0.000e+00	-45.400	-46.371	-0.971	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-160.900	-169.643	-8.743	(0)
U(5)	1.115e-15					
UO2+	1.115e-15	8.695e-16	-14.953	-15.061	-0.108	(0)
U(6)	3.826e-07					
UO2(CO3) 3-4	2.726e-07	5.112e-09	-6.564	-8.291	-1.727	(0)
UO2(CO3) 2-2	1.092e-07	4.040e-08	-6.962	-7.394	-0.432	(0)
UO2CO3	8.021e-10	8.021e-10	-9.096	-9.096	0.000	(0)
UO2OH+	1.372e-11	1.070e-11	-10.863	-10.971	-0.108	(0)
UO2F+	1.928e-12	1.504e-12	-11.715	-11.823	-0.108	(0)
UO2SO4	6.382e-13	6.382e-13	-12.195	-12.195	0.000	(0)
UO2F2	5.919e-13	5.919e-13	-12.228	-12.228	0.000	(0)
UO2+2	1.702e-13	7.980e-14	-12.769	-13.098	-0.329	(0)
UO2(SO4) 2-2	1.201e-13	4.445e-14	-12.920	-13.352	-0.432	(0)
UO2F3-	2.602e-14	2.029e-14	-13.585	-13.693	-0.108	(0)
(UO2) 3(OH) 5+	2.245e-15	1.751e-15	-14.649	-14.757	-0.108	(0)
(UO2) 2(OH) 2+2	5.137e-16	1.901e-16	-15.289	-15.721	-0.432	(0)
UO2Cl+	4.213e-16	3.286e-16	-15.375	-15.483	-0.108	(0)
UO2F4-2	5.946e-17	2.200e-17	-16.226	-16.658	-0.432	(0)
UO2NO3+	1.614e-21	1.259e-21	-20.792	-20.900	-0.108	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.637	-43.745	-0.108	(0)
V+2	0.000e+00	0.000e+00	-44.851	-45.283	-0.432	(0)
V(3)	5.811e-16					
V(OH) 3	5.811e-16	5.811e-16	-15.236	-15.236	0.000	(0)
V(OH) 2+	4.550e-27	3.549e-27	-26.342	-26.450	-0.108	(0)
VOH+2	8.598e-31	3.182e-31	-30.066	-30.497	-0.432	(0)
V+3	5.580e-36	5.959e-37	-35.253	-36.225	-0.971	(0)
VSO4+	1.906e-36	1.486e-36	-35.720	-35.828	-0.108	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-57.524	-58.495	-0.971	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-58.468	-60.195	-1.727	(0)
V(4)	2.087e-19					
V(OH) 3+	2.048e-19	1.597e-19	-18.689	-18.797	-0.108	(0)
VO+2	2.032e-21	7.518e-22	-20.692	-21.124	-0.432	(0)
VOSO4	1.094e-21	1.094e-21	-20.961	-20.961	0.000	(0)
VOF+	7.892e-22	6.155e-22	-21.103	-21.211	-0.108	(0)
VOF2	3.150e-23	3.150e-23	-22.502	-22.502	0.000	(0)
VOC1+	6.866e-24	5.355e-24	-23.163	-23.271	-0.108	(0)
VOF3-	1.956e-25	1.526e-25	-24.709	-24.817	-0.108	(0)
VOF4-2	2.272e-28	8.406e-29	-27.644	-28.075	-0.432	(0)
H2V2O4+2	3.459e-33	1.280e-33	-32.461	-32.893	-0.432	(0)
V(5)	6.610e-09					
H2VO4-	4.236e-09	3.304e-09	-8.373	-8.481	-0.108	(0)
HVO4-2	2.374e-09	8.784e-10	-8.625	-9.056	-0.432	(0)
H3VO4	3.121e-13	3.121e-13	-12.506	-12.506	0.000	(0)
HV2O7-3	9.213e-15	9.840e-16	-14.036	-15.007	-0.971	(0)
H3V2O7-	8.540e-15	6.660e-15	-14.069	-14.177	-0.108	(0)
VO4-3	4.364e-15	4.661e-16	-14.360	-15.332	-0.971	(0)
V2O7-4	1.495e-16	2.804e-18	-15.825	-17.552	-1.727	(0)
VO2+	7.117e-18	5.889e-18	-17.148	-17.230	-0.082	(0)
VO2F	1.410e-18	1.410e-18	-17.851	-17.851	0.000	(0)
VO2SO4-	9.527e-19	7.430e-19	-18.021	-18.129	-0.108	(0)
V3O9-3	3.542e-19	3.783e-20	-18.451	-19.422	-0.971	(0)
VO2F2-	8.959e-20	6.987e-20	-19.048	-19.156	-0.108	(0)

VO2F3-2	3.215e-22	1.190e-22	-21.493	-21.925	-0.432	(0)
V4O12-4	2.780e-24	5.213e-26	-23.556	-25.283	-1.727	(0)
VO2F4-3	7.481e-26	7.990e-27	-25.126	-26.097	-0.971	(0)
VO2NO3	2.356e-26	2.356e-26	-25.628	-25.628	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.114	-68.000	-3.886	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.140	-67.838	-2.698	(0)
H2V10O28-4	0.000e+00	0.000e+00	-68.928	-70.655	-1.727	(0)
Zn	6.166e-06					
Zn+2	3.485e-06	1.634e-06	-5.458	-5.787	-0.329	(0)
ZnSO4	1.889e-06	1.889e-06	-5.724	-5.724	0.000	(0)
ZnCO3	2.374e-07	2.374e-07	-6.624	-6.624	0.000	(0)
Zn(SO4) 2-2	2.349e-07	8.693e-08	-6.629	-7.061	-0.432	(0)
ZnOH+	2.232e-07	1.741e-07	-6.651	-6.759	-0.108	(0)
ZnHCO3+	3.371e-08	2.629e-08	-7.472	-7.580	-0.108	(0)
Zn(OH) 2	2.939e-08	2.939e-08	-7.532	-7.532	0.000	(0)
ZnOHCl	1.453e-08	1.453e-08	-7.838	-7.838	0.000	(0)
ZnCl+	1.266e-08	1.042e-08	-7.898	-7.982	-0.084	(0)
ZnF+	5.707e-09	4.451e-09	-8.244	-8.352	-0.108	(0)
Zn(OH) 3-	2.012e-10	1.569e-10	-9.696	-9.804	-0.108	(0)
ZnCl2	4.194e-11	4.194e-11	-10.377	-10.377	0.000	(0)
ZnCl3-	1.027e-13	8.457e-14	-12.988	-13.073	-0.084	(0)
ZnNO3+	4.162e-14	3.246e-14	-13.381	-13.489	-0.108	(0)
ZnSeO4	2.780e-14	2.780e-14	-13.556	-13.556	0.000	(0)
Zn(OH) 4-2	1.798e-14	6.655e-15	-13.745	-14.177	-0.432	(0)
ZnCl4-2	2.245e-16	1.074e-16	-15.649	-15.969	-0.320	(0)
Zn(NO3) 2	5.122e-23	5.122e-23	-22.291	-22.291	0.000	(0)
Zn(SeO4) 2-2	8.368e-24	3.097e-24	-23.077	-23.509	-0.432	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.485	-148.593	-0.108	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.608	-150.608	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.041	-226.149	-0.108	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.672	-228.104	-0.432	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.997	-306.429	-0.432	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-56.45	-50.16	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-43.66	-39.15	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-50.88	-39.15	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-72.83	-54.90	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-58.41	-38.38	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.10	-28.70	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.92	-24.47	0.45	(NH4)2SeO4
Acanthite	-52.31	-88.53	-36.22	Ag2S
Ag2CO3	-12.24	-23.33	-11.09	Ag2CO3
Ag2CrO4	-20.33	-31.92	-11.59	Ag2CrO4
Ag2HVO4	-12.37	-10.89	1.48	Ag2HVO4
Ag2MoO4	-12.18	-23.73	-11.55	Ag2MoO4
Ag2O	-14.25	-1.68	12.57	Ag2O
Ag2Se	-0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.19	-20.01	-4.82	Ag2SO4
Ag3AsO3	-28.30	-26.14	2.16	Ag3AsO3
Ag3AsO4	-16.71	-19.50	-2.79	Ag3AsO4
Ag3H2VO5	-16.91	-11.73	5.18	Ag3H2VO5
AgF·4H2O	-13.78	-12.73	1.05	AgF·4H2O
Agmetal	-0.11	-13.61	-13.51	Ag
AgVO3	-10.82	-10.05	0.77	AgVO3
Al(OH)3(am)	-1.60	9.20	10.80	Al(OH)3
Al2(MoO4)3	-50.13	-47.76	2.37	Al2(MoO4)3
Al2O3	-1.26	18.39	19.65	Al2O3
Al4(OH)10SO4	-4.24	18.46	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-12.58	-7.78	4.80	AlAsO4·2H2O
AlOHSO4	-5.90	-9.13	-3.23	AlOHSO4
AlSb	-152.88	-87.26	65.62	AlSb
Alunite	-2.16	-3.56	-1.40	KAl3(SO4)2(OH)6

Anglesite	-4.11	-11.90	-7.79	PbSO4
Anhydrite	-0.80	-5.16	-4.36	CaSO4
Anilite	-55.41	-87.29	-31.88	Cu0.25Cu1.5S
Antlerite	-1.95	6.84	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-91.72	-94.48	-2.76	As4O6
Artinite	-4.64	4.96	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-40.65	-33.95	6.71	As2O5
Atacamite	-1.24	6.15	7.39	Cu2(OH)3Cl
Azurite	-1.23	-18.13	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.05	8.34	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.59	-1.72	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.31	6.63	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.22	-21.89	-9.67	BaCrO4
BaF2	-9.61	-15.43	-5.82	BaF2
BaMoO4	-6.74	-13.70	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.73	-6.90	1.83	BaSeO3
BaSeO4	-10.20	-17.66	-7.46	BaSeO4
Bianchite	-6.30	-8.07	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.55	-0.64	Mn2O3
BlaubleiI	-55.47	-79.64	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.89	-83.17	-27.28	Cu0.6Cu0.8S
Boehmite	0.62	9.20	8.58	AlOOH
Breithauptite	-56.52	-75.04	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.54	13.30	16.84	Mg(OH)2
Bunsenite	-3.80	8.64	12.45	NiO
Ca(VO3)2	-10.90	-5.24	5.66	Ca(VO3)2
Ca2V2O7	-9.58	7.92	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.63	7.92	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.75	5.55	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.87	21.09	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.77	21.09	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.39	-153.41	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.26	-26.17	-17.91	Hg2Cl2
CaMoO4	-0.93	-8.88	-7.95	CaMoO4
Carnotite	-0.98	-0.75	0.23	KUO2VO4
CaSeO3:2H2O	-4.89	-2.08	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.82	-12.84	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.27	-1.43	9.84	Cd(BO2)2
Cd(OH)2	-6.02	7.62	13.64	Cd(OH)2
Cd(OH)2(am)	-6.11	7.62	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.49	-13.78	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.02	4.54	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.23	12.17	28.40	Cd4(OH)6SO4
CdCl2	-12.96	-13.62	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.62	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.62	-1.91	CdCl2:2.5H2O
CdF2	-14.94	-16.16	-1.21	CdF2
Cdmetal(alpha)	-31.44	-17.92	13.51	Cd
Cdmetal(gamma)	-31.54	-17.92	13.62	Cd
CdMoO4	-0.28	-14.43	-14.15	CdMoO4
CdOHCl	-6.53	-3.00	3.54	CdOHCl
CdSb	-75.71	-76.06	-0.35	CdSb
CdSe	-19.20	-39.40	-20.20	CdSe
CdSeO4:2H2O	-16.54	-18.39	-1.85	CdSeO4:2H2O
CdSO4	-10.53	-10.70	-0.17	CdSO4
CdSO4:1H2O	-8.98	-10.70	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.83	-10.70	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.71	-11.46	-9.75	AgCl
Cerrusite	-2.09	-15.22	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4

Chalcanthite	-7.30	-9.94	-2.64	CuSO4:5H2O
Chalcocite	-55.32	-90.24	-34.92	Cu2S
Chalcopyrite	-126.58	-161.85	-35.27	CuFeS2
Cinnabar	-52.43	-98.13	-45.69	HgS
Claudetite	-91.42	-94.48	-3.06	As4O6
Clausthalite	-13.49	-40.59	-27.10	PbSe
Co(BO2)2	-27.64	-0.57	27.07	Co(BO2)2
Co(OH)2	-4.61	8.48	13.09	Co(OH)2
Co(OH)3	-8.83	-11.14	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.53	-8.49	13.03	Co3(AsO4)2
Co3O4	-3.31	-13.80	-10.50	Co3O4
CoCl2	-21.02	-12.76	8.27	CoCl2
CoCl2:6H2O	-15.29	-12.76	2.54	CoCl2:6H2O
CoCO3	-3.18	-13.16	-9.98	CoCO3
CoF2	-13.70	-15.29	-1.60	CoF2
CoF3	-45.35	-46.81	-1.46	CoF3
CoFe2O4	18.40	14.87	-3.53	CoFe2O4
CoMoO4	-5.80	-13.57	-7.76	CoMoO4
CoO	-5.10	8.48	13.59	CoO
CoS(alpha)	-70.92	-78.36	-7.44	CoS
CoS(beta)	-67.29	-78.36	-11.07	CoS
CoSe	-22.33	-38.53	-16.20	CoSe
CoSeO3	-8.08	-6.76	1.32	CoSeO3
CoSeO4:6H2O	-16.00	-17.53	-1.53	CoSeO4:6H2O
CoSO4	-12.64	-9.84	2.80	CoSO4
CoSO4:6H2O	-7.37	-9.84	-2.47	CoSO4:6H2O
Cotunnite	-10.03	-14.81	-4.78	PbCl2
Covellite	-56.16	-78.46	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.34	-32.24	14.09	CrCl2
CrCl3	-48.15	-33.04	15.11	CrCl3
CrF3	-25.51	-36.85	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-10.51	-44.35	-33.84	Na3AlF6
Cu(OH)2	-0.29	8.39	8.67	Cu(OH)2
Cu(SbO3)2	-25.38	19.83	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.60	0.65	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.88	-89.77	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.61	-50.41	-45.80	Cu2Se
Cu2SO4	-19.77	-21.72	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.89	-8.79	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.95	-101.54	-42.59	Cu3Sb
Cu3Se2	-25.55	-89.04	-63.49	Cu3Se2
CuCO3	-1.76	-13.26	-11.50	CuCO3
CuCrO4	-16.41	-21.85	-5.44	CuCrO4
CuF	-8.68	-13.58	-4.91	CuF
CuF2	-16.51	-15.39	1.12	CuF2
CuF2:2H2O	-10.84	-15.39	-4.55	CuF2:2H2O
Cumetal	-5.71	-14.47	-8.76	Cu
CuMoO4	-0.59	-13.66	-13.08	CuMoO4
CuOCuSO4	-11.85	-1.55	10.30	CuOCuSO4
Cupricferrite	8.78	14.77	5.99	CuFe2O4
Cuprite	-1.98	-3.39	-1.41	Cu2O
Cuprousferrite	10.41	1.50	-8.92	CuFeO2
CuSe	-5.53	-38.63	-33.10	CuSe
CuSe2	-26.74	-60.11	-33.37	CuSe2
CuSeO3:2H2O	-7.37	-6.86	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.18	-17.62	-2.44	CuSeO4:5H2O
CuSO4	-12.88	-9.94	2.94	CuSO4
Diaspore	2.32	9.20	6.87	AlOOH
Djurleite	-55.54	-89.46	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.28	-16.82	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.27	-16.82	-17.09	CaMg(CO3)2

Epsomite	-2.90	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.05	0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.24	-14.96	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.42	-8.86	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.73	-39.35	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-44.86	-48.60	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.18	-13.78	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.51	-18.60	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.45	-65.04	-18.60	FeSe2
FeS(ppt)	-80.44	-83.39	-2.95	FeS
FeSe	-32.57	-43.57	-11.00	FeSe
Fix_pe	-4.75	-4.75	0.00	e-
Fluorite	-0.11	-10.61	-10.50	CaF2
Galena	-66.44	-80.41	-13.97	PbS
Gibbsite	0.91	9.20	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.05	-8.07	-2.01	ZnSO4:7H2O
Greenockite	-64.86	-79.22	-14.36	CdS
Greigite	-292.51	-337.55	-45.03	Fe3S4
Gummite	-4.72	2.95	7.67	UO3
Gypsum	-0.55	-5.16	-4.61	CaSO4:2H2O
H-Jarosite	-14.98	-27.08	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.17	-22.05	-12.88	H2MoO4
H2S(g)	-78.84	-86.85	-8.01	H2S
H2Se(g)	-42.06	-47.02	-4.96	H2Se
Halite	-6.29	-4.69	1.60	NaCl
Hausmannite	-1.58	59.45	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.05	21.85	22.89	FeAl2O4
Hg(CH3)2(g)	-185.23	-258.94	-73.71	Hg(CH3)2
Hg(g)	-7.36	-15.24	-7.87	Hg
Hg(OH)2	-7.79	-11.28	-3.50	Hg(OH)2
Hg2(g)	-15.51	-30.47	-14.96	Hg2
Hg2(OH)2	-10.19	-4.93	5.26	Hg2(OH)2
Hg2CO3	-10.52	-26.57	-16.05	Hg2CO3
Hg2CrO4	-26.46	-35.16	-8.70	Hg2CrO4
Hg2F2	-18.34	-28.70	-10.36	Hg2F2
Hg2S	-80.09	-91.77	-11.68	Hg2S
Hg2SeO3	-15.51	-20.17	-4.66	Hg2SeO3
Hg2SO4	-17.12	-23.25	-6.13	Hg2SO4
Hg3O2CO3	-25.81	-55.50	-29.68	Hg3O2CO3
HgCl(g)	-32.58	-13.08	19.50	HgCl
HgCl2	-11.26	-32.52	-21.26	HgCl2
HgF(g)	-47.03	-14.35	32.68	HgF
HgF2(g)	-47.63	-35.06	12.57	HgF2
Hgmetal(l)	-1.78	-15.24	-13.45	Hg
HgSe	-2.61	-58.30	-55.69	HgSe
HgSeO3	-14.10	-26.53	-12.43	HgSeO3
HgSO4	-20.19	-29.61	-9.42	HgSO4
Huntite	-3.54	-33.51	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.23	-24.00	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.30	-20.07	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.78	-21.95	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.77	-21.57	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.22	-49.46	-17.24	K2Cr2O7
K2CrO4	-18.71	-19.23	-0.51	K2CrO4
K2MoO4	-14.30	-11.04	3.26	K2MoO4
K2SeO4	-14.27	-15.00	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.03	-5.46	-0.43	PbO:PbSO4
Laurionite	-4.81	-4.19	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.26	6.43	12.69	PbO

Mackinawite	-79.79	-83.39	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.83	19.69	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.43	-4.87	-5.31	Cu2(OH)2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-6.46	6.43	12.89	PbO
Matlockite	-7.11	-16.08	-8.97	PbClF
Melanothallite	-19.11	-12.85	6.26	CuCl2
Melanterite	-12.67	-14.88	-2.21	FeSO4·7H2O
Metacinnabar	-53.03	-98.13	-45.09	HgS
Mg(OH)2 (active)	-5.49	13.30	18.79	Mg(OH)2
Mg(VO3)2	-16.39	-5.11	11.28	Mg(VO3)2
Mg2Sb3	-273.58	-198.90	74.68	Mg2Sb3
Mg2V2O7	-18.16	8.20	26.36	Mg2V2O7
MgCr2O4	-5.25	10.95	16.20	MgCr2O4
MgCrO4	-22.31	-16.93	5.38	MgCrO4
MgF2	-2.34	-10.47	-8.13	MgF2
MgMoO4	-6.90	-8.75	-1.85	MgMoO4
MgSeO3·6H2O	-5.00	-1.94	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.51	-12.71	-1.20	MgSeO4·6H2O
Minium	-28.69	44.84	73.52	Pb3O4
Mirabilite	-5.35	-6.47	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.01	-7.11	4.90	Mn(VO3)2
Mn2(SO4)3	-51.82	-57.53	-5.71	Mn2(SO4)3
Mn2Sb	-147.70	-86.62	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-12.54	-0.04	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.65	-9.94	2.72	MnCl2·4H2O
MnS (grn)	-75.71	-75.54	0.17	MnS
MnS (pnk)	-78.88	-75.54	3.34	MnS
MnSb	-94.82	-97.73	-2.91	MnSb
MnSe	-39.22	-35.72	3.50	MnSe
MnSeO3	-5.07	-3.94	1.13	MnSeO3
MnSeO3·2H2O	-4.92	-3.94	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.66	-14.71	-2.05	MnSeO4·5H2O
MnSO4	-9.61	-7.02	2.58	MnSO4
Monteponite	-7.48	7.62	15.10	CdO
Montroydite	-7.64	-11.28	-3.64	HgO
MoO3	-14.05	-22.05	-8.00	MoO3
Morenosite	-7.54	-9.69	-2.14	NiSO4·7H2O
MoS2	-151.03	-221.29	-70.26	MoS2
Na-Jarosite	-9.95	-21.15	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.72	-48.61	-9.90	Na2Cr2O7
Na2CrO4	-21.31	-18.38	2.93	Na2CrO4
Na2Mo2O7	-15.64	-32.24	-16.60	Na2Mo2O7
Na2MoO4	-11.68	-10.19	1.49	Na2MoO4
Na2MoO4·2H2O	-11.41	-10.19	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.69	-3.39	10.30	Na2SeO3·5H2O
Na2SeO4	-15.43	-14.15	1.28	Na2SeO4
Na3Sb	-173.12	-78.67	94.45	Na3Sb
Na3VO4	-28.09	8.59	36.68	Na3VO4
Na4V2O7	-32.09	5.31	37.40	Na4V2O7
Nantokite	-5.59	-12.32	-6.73	CuCl
NaSb	-88.15	-64.98	23.17	NaSb
Natron	-8.48	-9.79	-1.31	Na2CO3·10H2O
NaVO3	-7.13	-3.27	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3·3H2O
Ni(OH)2	-4.15	8.64	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-23.73	-8.03	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-15.76	16.24	32.00	Ni4(OH)6SO4
NiCO3	-6.14	-13.01	-6.87	NiCO3
NiMoO4	-2.27	-13.41	-11.14	NiMoO4
NiS (alpha)	-72.60	-78.20	-5.60	NiS
NiS (beta)	-67.10	-78.20	-11.10	NiS
NiS (gamma)	-65.40	-78.20	-12.80	NiS
NiSe	-20.68	-38.38	-17.70	NiSe
NiSeO3·2H2O	-9.42	-6.60	2.81	NiSeO3·2H2O

NiSeO4:6H2O	-15.85	-17.37	-1.52	NiSeO4:6H2O
Nsutite	-6.01	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-246.71	-307.78	-61.07	As2S3
Otavite	-2.02	-14.02	-12.00	CdCO3
Pb(BO2)2	-9.15	-2.63	6.52	Pb(BO2)2
Pb(OH)2	-1.72	6.43	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-56.82	-65.58	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-6.55	2.24	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.33	12.86	26.19	Pb2O(OH)2
Pb2O3	-22.63	38.41	61.04	Pb2O3
Pb2OCO3	-8.23	-8.79	-0.56	Pb2OCO3
Pb2V2O7	-3.65	-5.55	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.46	-14.66	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.26	0.88	6.14	Pb3(VO4)2
Pb3O2CO3	-13.37	-2.35	11.02	Pb3O2CO3
Pb3O2SO4	-9.72	0.97	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.70	7.40	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.48	7.40	21.88	Pb4O3SO4
PbCrO4	-11.21	-23.81	-12.60	PbCrO4
PbF2	-9.91	-17.35	-7.44	PbF2
Pbmetal	-23.36	-19.11	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.55	6.43	12.98	PbO:0.33H2O
PbSeO4	-12.74	-19.58	-6.84	PbSeO4
Periclase	-8.28	13.30	21.58	MgO
Phosgenite	-10.22	-30.03	-19.81	PbCl2:PbCO3
Plattnerite	-17.62	31.98	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-126.19	-144.69	-18.51	FeS2
Pyrochroite	-3.89	11.30	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-103.49	-123.24	-19.75	AsS
Retgersite	-7.65	-9.69	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.20	-18.70	-14.50	UO2CO3
Sb(OH)3	-12.71	-19.82	-7.11	Sb(OH)3
Sb2O4	-17.50	-14.10	3.40	Sb2O4
Sb2O5	-27.51	-37.18	-9.67	Sb2O5
Sb2Se3	-112.95	-180.70	-67.76	Sb2Se3
Sb4O6(cubic)	-61.03	-79.29	-18.26	Sb4O6
Sb4O6(orth)	-61.39	-79.29	-17.90	Sb4O6
SbCl3	-52.25	-51.68	0.57	SbCl3
SbF3	-45.27	-55.49	-10.23	SbF3
Sbmetal	-46.45	-58.14	-11.69	Sb
SbO2	-3.54	-31.36	-27.82	SbO2
Schoepite	-3.04	2.95	5.99	UO2(OH)2:H2O
Semetal(am)	-14.36	-21.47	-7.11	Se
Semetal(hex)	-13.77	-21.47	-7.71	Se
Senarmontite	-27.28	-39.65	-12.37	Sb2O3
SeO2	-15.37	-15.25	0.12	SeO2
SeO3	-47.05	-26.01	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.38	-11.38	-10.00	ZnCO3
Sphalerite	-65.13	-76.58	-11.45	ZnS
Spinel	-5.15	31.70	36.85	MgAl2O4
Stibnite	-249.72	-300.18	-50.46	Sb2S3
Sulfur	-59.16	-61.30	-2.14	S
Tenorite	0.74	8.39	7.64	CuO
Thenardite	-6.79	-6.47	0.32	Na2SO4
Thermonatrite	-10.42	-9.79	0.64	Na2CO3:H2O
Tyuyamunite	-3.42	0.66	4.08	Ca(UO2)2(VO4)2
U3O8	-10.13	10.96	21.08	U3O8
U3Sb4	-578.34	-425.96	152.38	U3Sb4
U4O9	-24.95	-27.97	-3.02	U4O9
UF4	-31.40	-60.94	-29.54	UF4
UF4:2.5H2O	-28.22	-60.94	-32.72	UF4:2.5H2O
UO2(am)	-14.31	-13.38	0.93	UO2

UO2(NO3)2	-41.45	-29.30	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.15	-29.30	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.69	-29.30	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.35	-29.30	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.66	2.95	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.81	-23.06	-2.25	UO2SeO4:4H2O
UO3	-4.75	2.95	7.70	UO3
Uraninite	-8.71	-13.38	-4.67	UO2
USb2	-219.54	-189.96	29.58	USb2
V(OH)3	-19.74	-12.15	7.59	V(OH)3
V2O5	-17.05	-18.41	-1.36	V2O5
V3O5	-42.60	-40.77	1.84	V3O5
V4O7	-53.03	-45.84	7.19	V4O7
V6O13	-45.46	-106.32	-60.86	V6O13
Valentinite	-31.16	-39.65	-8.48	Sb2O3
VC12	-65.04	-46.16	18.87	VC12
VC13	-67.44	-44.01	23.43	VC13
VF4	-67.56	-52.63	14.93	VF4
Vmetal	-94.49	-50.47	44.03	V
VO	-39.68	-24.92	14.76	VO
VO(OH)2	-10.23	-5.07	5.15	VO(OH)2
VO2Cl	-22.67	-19.83	2.84	VO2Cl
VOC1	-33.92	-22.77	11.15	VOC1
VOC12	-39.07	-26.31	12.76	VOC12
VOSO4	-27.01	-23.40	3.61	VOSO4
Witherite	-4.73	-13.30	-8.57	BaCO3
Wurtzite	-67.63	-76.58	-8.95	ZnS
Zincite	-1.07	10.26	11.33	ZnO
Zincosite	-11.99	-8.06	3.93	ZnSO4
Zn(BO2)2	-7.08	1.21	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.31	-21.99	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.94	10.26	12.20	Zn(OH)2
Zn(OH)2(am)	-2.21	10.26	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.49	10.26	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.27	10.26	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.47	10.26	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.30	2.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.29	9.90	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.81	-3.16	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.78	-5.86	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.68	22.72	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.43	30.07	38.50	Zn5(OH)8Cl2
ZnCl2	-18.03	-10.98	7.05	ZnCl2
ZnCO3:1H2O	-1.12	-11.38	-10.26	ZnCO3:1H2O
ZnF2	-12.98	-13.52	-0.53	ZnF2
Znmetal	-41.07	-15.28	25.79	Zn
ZnMoO4	-1.66	-11.79	-10.13	ZnMoO4
ZnO(active)	-0.93	10.26	11.19	ZnO
ZnS(am)	-67.53	-76.58	-9.05	ZnS
ZnSb	-84.44	-73.42	11.01	ZnSb
ZnSe	-22.36	-36.76	-14.40	ZnSe
ZnSeO4:6H2O	-14.23	-15.75	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.43	-8.06	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 82.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 405
equilibrate with solution 1

```

        Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
        Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
        donnan 1e-008
    USE EQUILIBRIUM_PHASES 405
    USE Surface 405
    USE Solution 414
    SAVE Solution 415 #Initial Stage 5 Pit Water After Mineral Precipitation
and Sorption Loss
    END

```

```

-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

```

-----
Beginning of initial surface-composition calculations.
-----

```

Surface 405.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

    5.785e-20  Surface + diffuse layer charge, eq
    3.959e-12  Surface charge, eq
    4.399e-03  sigma, C/m²
    1.213e-01  psi, V
    -4.722e+00 -F*psi/RT
    8.900e-03  exp(-F*psi/RT)
    6.420e+04  specific area, m²/mol Ferrihydrite
    8.685e-05  m² for 1.353e-09 moles of Ferrihydrite

```

Water in diffuse layer: 8.685e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451\text{e-}02$ (= c_DL / c_free if z is +1).

Element	Moles
C	2.2186e-15
Ca	2.7497e-17
Cl	4.4429e-14
H	6.5449e-15
K	4.3620e-17
Mg	4.2601e-18
N	1.7987e-13
Na	1.8481e-16
O	8.0168e-12
S	1.8680e-12

Hfo_s

6.764e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	4.521e-12	0.668	4.521e-12	-11.345
Hfo_sOH	2.218e-12	0.328	2.218e-12	-11.654
Hfo_sO-	2.491e-14	0.004	2.491e-14	-13.604
Hfo_sOHCa+2	8.254e-17	0.000	8.254e-17	-16.083

Hfo_w

2.706e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.250e-10	0.462	1.250e-10	-9.903

Hfo_wOH	6.131e-11	0.227	6.131e-11	-10.212
Hfo_wSO4-	4.222e-11	0.156	4.222e-11	-10.374
Hfo_wOHSO4-2	4.132e-11	0.153	4.132e-11	-10.384
Hfo_wO-	6.889e-13	0.003	6.889e-13	-12.162
Hfo_wOMg+	9.736e-19	0.000	9.736e-19	-18.012
Hfo_wOCa+	3.303e-19	0.000	3.303e-19	-18.481

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 414. Solution after simulation 81.
Using surface 405.
Using pure phase assemblage 405. Pure-phase assemblage after simulation 81.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	5.743e-09	5.742e-09	-3.752e-14
Alunite	-2.16	-3.56	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.80	-5.16	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	5.937e-11	5.848e-11	-8.878e-13
Barite	0.00	-9.98	-9.98	4.443e-08	4.443e-08	2.663e-12
Brochantite	0.00	15.22	15.22	4.121e-07	4.120e-07	-2.304e-11
Brucite	-3.54	13.30	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.382e-10
CaMoO4	-0.93	-8.88	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.89	-2.08	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.314e-03	1.314e-03	-1.295e-10
Carnotite	-0.98	-0.75	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.27	-1.43	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.28	-14.43	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	9.600e-10	9.598e-10	-1.635e-13
Cu2Se(alpha)	-4.61	-50.41	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.59	-13.66	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.90	-5.02	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.353e-09	1.353e-09	-7.144e-18
Fluorite	-0.11	-10.61	-10.50	0.000e+00	0	0.000e+00
Gummite	-4.72	2.95	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.55	-5.16	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.61	-58.30	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.35	-6.47	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.07	-3.94	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.15	8.64	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-23.73	-8.03	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.14	-13.01	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.27	-13.41	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	4.974e-14

Otavite	-2.02	-14.02	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	1.331e-09	1.329e-09	-1.846e-12
Rutherfordine	-4.20	-18.70	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.54	-31.36	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.04	2.95	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2 (am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.43	0.65	4.08	0.000e+00	0	0.000e+00
U3O8	-10.13	10.96	21.08	0.000e+00	0	0.000e+00
UO2 (OH)2 (beta)	-2.66	2.95	5.61	0.000e+00	0	0.000e+00
UO3	-4.75	2.95	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.66	-11.79	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

6.772e-26 Surface + diffuse layer charge, eq
1.573e-11 Surface charge, eq
1.747e-02 sigma, C/m²
3.370e-02 psi, V
-1.312e+00 -F*psi/RT
2.694e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
8.685e-05 m² for 1.353e-09 moles of Ferrihydrite

Water in diffuse layer: 8.685e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 4.941e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.250e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	9.6457e-18
Al	4.3646e-15
As	2.6744e-19
B	2.8042e-14
Ba	2.5092e-17
C	6.8938e-13
Ca	3.0495e-12
Cd	1.1013e-17
Cl	3.2298e-12
Co	7.1438e-17
Cr	8.3653e-19
Cu	4.1908e-16
F	1.9987e-13
Fe	7.4634e-19
H	7.8294e-13
Hg	1.8717e-18
K	2.7629e-12
Mg	3.8062e-12
Mn	4.3670e-14
Mo	2.7119e-15
N	1.0904e-14
Na	7.2648e-12
Ni	9.1425e-17
O	7.3032e-11
Pb	3.2619e-18
S	1.7706e-11
Sb	3.1569e-17
Se	1.6893e-16
U	6.5109e-16
V	7.4516e-18
Zn	4.4427e-15

Hfo_s

6.764e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	2.123e-12	0.314	2.125e-12	-11.673
Hfo_sOZn+	2.006e-12	0.297	2.007e-12	-11.697
Hfo_sOPb+	1.350e-12	0.200	1.351e-12	-11.869
Hfo_sOMn+	8.977e-13	0.133	8.984e-13	-12.047
Hfo_sOCrOH+	3.270e-13	0.048	3.273e-13	-12.485
Hfo_sOHCa+2	3.912e-14	0.006	3.915e-14	-13.407
Hfo_sONi+	1.151e-14	0.002	1.152e-14	-13.939
Hfo_sOH	4.403e-15	0.001	4.407e-15	-14.356
Hfo_sO-	2.033e-15	0.000	2.035e-15	-14.692
Hfo_sOCd+	1.390e-15	0.000	1.391e-15	-14.857
Hfo_sOCa+	1.187e-15	0.000	1.188e-15	-14.925
Hfo_sOH2+	2.185e-16	0.000	2.187e-16	-15.660
Hfo_sOAg	1.212e-17	0.000	1.213e-17	-16.916
Hfo_sOHBa+2	1.827e-18	0.000	1.828e-18	-17.738
Hfo_sOFe+	1.588e-19	0.000	1.589e-19	-18.799
Hfo_sOHg+	5.210e-21	0.000	5.214e-21	-20.283

Hfo_w

2.706e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	9.002e-11	0.333	9.009e-11	-10.045
Hfo_wOMg+	4.691e-11	0.173	4.694e-11	-10.328
Hfo_wOH	3.640e-11	0.135	3.643e-11	-10.439
Hfo_wOHVO4-3	3.208e-11	0.119	3.211e-11	-10.493
Hfo_wOZn+	1.736e-11	0.064	1.737e-11	-10.760
Hfo_wO-	1.681e-11	0.062	1.682e-11	-10.774
Hfo_wOHSO4-2	1.634e-11	0.060	1.635e-11	-10.786
Hfo_wOMn+	5.895e-12	0.022	5.899e-12	-11.229
Hfo_wOCa+	1.923e-12	0.007	1.925e-12	-11.716
Hfo_wOHSeO3-2	1.881e-12	0.007	1.882e-12	-11.725
Hfo_wOH2+	1.806e-12	0.007	1.808e-12	-11.743
Hfo_wOHAsO4-3	1.775e-12	0.007	1.777e-12	-11.750
Hfo_wOPb+	4.986e-13	0.002	4.990e-13	-12.302
Hfo_wSO4-	4.066e-13	0.002	4.069e-13	-12.390
Hfo_wSeO3-	1.586e-13	0.001	1.587e-13	-12.799
Hfo_wONi+	1.283e-13	0.000	1.284e-13	-12.891
Hfo_wOHMoO4-2	1.255e-13	0.000	1.256e-13	-12.901
Hfo_wOCO+	2.766e-14	0.000	2.768e-14	-13.558
Hfo_wOCd+	4.902e-15	0.000	4.905e-15	-14.309
Hfo_wH2BO3	4.492e-15	0.000	4.496e-15	-14.347
Hfo_wMoO4-	4.025e-15	0.000	4.028e-15	-14.395
Hfo_wHAsO4-	9.793e-17	0.000	9.800e-17	-16.009
Hfo_wOAg	2.636e-17	0.000	2.637e-17	-16.579
Hfo_wOHg+	2.110e-18	0.000	2.111e-18	-17.675
Hfo_wOBa+	1.298e-18	0.000	1.299e-18	-17.886
Hfo_wOFe+	8.282e-19	0.000	8.288e-19	-18.082
Hfo_wOHSeO4-2	3.476e-19	0.000	3.479e-19	-18.459
Hfo_wH2AsO4	1.572e-19	0.000	1.574e-19	-18.803
Hfo_wOHSbO(OH) 4-	7.358e-20	0.000	7.364e-20	-19.133
Hfo_wOHCrO4-2	2.581e-20	0.000	2.583e-20	-19.588
Hfo_wSeO4-	7.534e-21	0.000	7.540e-21	-20.123
Hfo_wSbO(OH) 4	2.359e-21	0.000	2.361e-21	-20.627
Hfo_wCrO4-	5.857e-22	0.000	5.862e-22	-21.232
Hfo_wH2AsO3	2.238e-29	0.000	2.240e-29	-28.650

-----Solution composition-----

Elements	Molality	Moles
Ag	1.093e-08	1.092e-08
Al	4.151e-06	4.148e-06
As	2.110e-10	2.108e-10

B	3.187e-05	3.184e-05
Ba	4.241e-08	4.238e-08
C	6.655e-04	6.650e-04
Ca	4.407e-03	4.404e-03
Cd	1.503e-08	1.502e-08
Cl	3.068e-03	3.066e-03
Co	1.062e-07	1.062e-07
Cr	1.101e-09	1.101e-09
Cu	5.106e-07	5.102e-07
F	2.014e-04	2.013e-04
Fe	9.271e-10	9.265e-10
Hg	2.155e-09	2.154e-09
K	3.792e-03	3.790e-03
Mg	5.616e-03	5.612e-03
Mn	6.586e-05	6.581e-05
Mo	2.125e-06	2.124e-06
N	1.038e-05	1.037e-05
Na	1.001e-02	1.000e-02
Ni	1.326e-07	1.325e-07
Pb	4.048e-09	4.045e-09
S	1.501e-02	1.500e-02
Sb	2.999e-08	2.997e-08
Se	1.459e-07	1.458e-07
U	3.826e-07	3.824e-07
V	6.578e-09	6.573e-09
Zn	6.166e-06	6.162e-06

-----Description of solution-----

	pH	=	8.025	Charge balance
	pe	=	4.748	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.479e-02	
	Mass of water (kg)	=	9.993e-01	
	Total alkalinity (eq/kg)	=	6.931e-04	
	Total CO2 (mol/kg)	=	6.655e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.227e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.109326e+02	
	Total O	=	5.552806e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.301e-06	1.065e-06	-5.886	-5.973	-0.087	(0)
H+	1.142e-08	9.446e-09	-7.943	-8.025	-0.082	0.00
H2O	5.551e+01	9.993e-01	1.744	-0.000	0.000	18.07
Ag	1.093e-08					
AgCl	7.074e-09	7.074e-09	-8.150	-8.150	0.000	(0)
AgCl2-	2.006e-09	1.564e-09	-8.698	-8.806	-0.108	(0)
Ag+	1.649e-09	1.365e-09	-8.783	-8.865	-0.082	(0)
AgSO4-	1.845e-10	1.439e-10	-9.734	-9.842	-0.108	(0)
AgCl3-2	9.565e-12	3.539e-12	-11.019	-11.451	-0.432	(0)
AgNO2	2.390e-12	2.390e-12	-11.622	-11.622	0.000	(0)
AgF	4.679e-13	4.679e-13	-12.330	-12.330	0.000	(0)
AgCl4-3	1.718e-13	1.835e-14	-12.765	-13.736	-0.971	(0)
AgOH	1.454e-13	1.454e-13	-12.838	-12.838	0.000	(0)
AgH2BO3	3.934e-14	3.934e-14	-13.405	-13.405	0.000	(0)
AgSeO3-	2.851e-14	2.224e-14	-13.545	-13.653	-0.108	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	1.203e-14	9.381e-15	-13.920	-14.028	-0.108	(0)
Ag(NO2) 2-	3.978e-17	3.102e-17	-16.400	-16.508	-0.108	(0)

	Ag (OH) 2-	1.940e-17	1.513e-17	-16.712	-16.820	-0.108	(0)
	AgNO3	8.572e-18	8.572e-18	-17.067	-17.067	0.000	(0)
	Ag (NH3) 2+	3.291e-19	2.567e-19	-18.483	-18.591	-0.108	(0)
	Ag (SeO3) 2-3	4.727e-20	5.048e-21	-19.325	-20.297	-0.971	(0)
	Ag2MoO4	7.024e-25	7.024e-25	-24.153	-24.153	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.871	-73.871	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.563	-83.290	-1.727	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.839	-148.050	-0.211	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.484	-148.592	-0.108	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.082	-149.466	-0.384	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.413	-149.777	-0.364	(0)
Al	4.151e-06						
	Al (OH) 4-	4.124e-06	3.413e-06	-5.385	-5.467	-0.082	(0)
	Al (OH) 3	2.545e-08	2.545e-08	-7.594	-7.594	0.000	(0)
	Al (OH) 2+	1.434e-09	1.197e-09	-8.843	-8.922	-0.078	(0)
	AlF3	1.693e-10	1.693e-10	-9.771	-9.771	0.000	(0)
	AlF2+	1.180e-10	9.852e-11	-9.928	-10.006	-0.078	(0)
	AlF4-	1.400e-11	1.158e-11	-10.854	-10.936	-0.082	(0)
	AlF+2	3.735e-12	1.813e-12	-11.428	-11.742	-0.314	(0)
	AlOH+2	2.915e-12	1.415e-12	-11.535	-11.849	-0.314	(0)
	AlSO4+	6.583e-14	5.448e-14	-13.182	-13.264	-0.082	(0)
	Al+3	7.301e-15	1.328e-15	-14.137	-14.877	-0.740	(0)
	Al (SO4) 2-	3.727e-15	3.084e-15	-14.429	-14.511	-0.082	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.069	-44.041	-0.971	(0)
As (3)	2.557e-24						
	H3AsO3	2.390e-24	2.390e-24	-23.622	-23.622	0.000	(0)
	H2AsO3-	1.664e-25	1.298e-25	-24.779	-24.887	-0.108	(0)
	HAsO3-2	3.386e-29	1.253e-29	-28.470	-28.902	-0.432	(0)
	H4AsO3+	1.434e-32	1.119e-32	-31.843	-31.951	-0.108	(0)
	AsO3-3	4.788e-34	5.113e-35	-33.320	-34.291	-0.971	(0)
As (5)	2.110e-10						
	HAsO4-2	2.025e-10	7.493e-11	-9.694	-10.125	-0.432	(0)
	H2AsO4-	8.277e-12	6.455e-12	-11.082	-11.190	-0.108	(0)
	AsO4-3	2.349e-13	2.508e-14	-12.629	-13.601	-0.971	(0)
	H3AsO4	1.049e-17	1.060e-17	-16.979	-16.975	0.004	(0)
B	3.187e-05						
	H3BO3	2.928e-05	2.959e-05	-4.533	-4.529	0.004	(0)
	H2BO3-	2.248e-06	1.819e-06	-5.648	-5.740	-0.092	(0)
	CaH2BO3+	1.697e-07	1.373e-07	-6.770	-6.862	-0.092	(0)
	MgH2BO3+	1.402e-07	1.135e-07	-6.853	-6.945	-0.092	(0)
	NaH2BO3	2.322e-08	2.322e-08	-7.634	-7.634	0.000	(0)
	BF (OH) 3-	1.991e-09	1.611e-09	-8.701	-8.793	-0.092	(0)
	H5 (BO3) 2-	5.661e-11	4.580e-11	-10.247	-10.339	-0.092	(0)
	BaH2BO3+	1.377e-12	1.114e-12	-11.861	-11.953	-0.092	(0)
	BF2 (OH) 2-	2.747e-13	2.223e-13	-12.561	-12.653	-0.092	(0)
	H8 (BO3) 3-	1.675e-13	1.355e-13	-12.776	-12.868	-0.092	(0)
	AgH2BO3	3.934e-14	3.934e-14	-13.405	-13.405	0.000	(0)
	BF3OH-	1.379e-19	1.116e-19	-18.861	-18.952	-0.092	(0)
	BF4-	8.753e-25	7.083e-25	-24.058	-24.150	-0.092	(0)
Ba	4.241e-08						
	Ba+2	4.227e-08	1.982e-08	-7.374	-7.703	-0.329	(0)
	BaHCO3+	1.147e-10	9.628e-11	-9.940	-10.016	-0.076	(0)
	BaCO3	2.566e-11	2.566e-11	-10.591	-10.591	0.000	(0)
	BaH2BO3+	1.377e-12	1.114e-12	-11.861	-11.953	-0.092	(0)
	BaOH+	1.108e-13	9.216e-14	-12.955	-13.035	-0.080	(0)
	BaNO3+	1.007e-15	7.854e-16	-14.997	-15.105	-0.108	(0)
	BaNH3+2	1.138e-16	4.210e-17	-15.944	-16.376	-0.432	(0)
C (4)	6.655e-04						
	HCO3-	6.094e-04	5.087e-04	-3.215	-3.294	-0.078	(0)
	CaHCO3+	1.481e-05	1.242e-05	-4.830	-4.906	-0.076	(0)
	MgHCO3+	1.137e-05	9.364e-06	-4.944	-5.029	-0.084	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CO3-2	5.384e-06	2.525e-06	-5.269	-5.598	-0.329	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	3.778e-06	3.778e-06	-5.423	-5.423	0.000	(0)
	NaHCO3	2.304e-06	2.304e-06	-5.638	-5.638	0.000	(0)
	NaCO3-	4.536e-07	3.786e-07	-6.343	-6.422	-0.078	(0)
	CuCO3	3.238e-07	3.238e-07	-6.490	-6.490	0.000	(0)

UO2 (CO3) 3-4	2.726e-07	5.112e-09	-6.564	-8.291	-1.727	(0)
ZnCO3	2.374e-07	2.374e-07	-6.624	-6.624	0.000	(0)
MnHCO3+	2.192e-07	1.822e-07	-6.659	-6.739	-0.080	(0)
UO2 (CO3) 2-2	1.092e-07	4.040e-08	-6.962	-7.394	-0.432	(0)
ZnHCO3+	3.371e-08	2.629e-08	-7.472	-7.580	-0.108	(0)
Cu (CO3) 2-2	5.946e-09	2.200e-09	-8.226	-8.658	-0.432	(0)
NiCO3	3.682e-09	3.682e-09	-8.434	-8.434	0.000	(0)
NiHCO3+	3.143e-09	2.451e-09	-8.503	-8.611	-0.108	(0)
PbCO3	1.827e-09	1.827e-09	-8.738	-8.738	0.000	(0)
CoHCO3+	1.383e-09	1.079e-09	-8.859	-8.967	-0.108	(0)
CoCO3	1.164e-09	1.164e-09	-8.934	-8.934	0.000	(0)
CuHCO3+	8.964e-10	6.991e-10	-9.048	-9.155	-0.108	(0)
UO2CO3	8.021e-10	8.021e-10	-9.096	-9.096	0.000	(0)
CdCO3	2.158e-10	2.158e-10	-9.666	-9.666	0.000	(0)
PbHCO3+	1.167e-10	9.098e-11	-9.933	-10.041	-0.108	(0)
BaHCO3+	1.147e-10	9.628e-11	-9.940	-10.016	-0.076	(0)
Pb (CO3) 2-2	3.595e-11	1.330e-11	-10.444	-10.876	-0.432	(0)
BaCO3	2.566e-11	2.566e-11	-10.591	-10.591	0.000	(0)
CdHCO3+	5.569e-12	4.344e-12	-11.254	-11.362	-0.108	(0)
Cd (CO3) 2-2	1.092e-12	4.039e-13	-11.962	-12.394	-0.432	(0)
HgCO3	2.199e-15	2.199e-15	-14.658	-14.658	0.000	(0)
FeHCO3+	1.925e-15	1.616e-15	-14.715	-14.792	-0.076	(0)
Hg (CO3) 2-2	4.743e-17	1.755e-17	-16.324	-16.756	-0.432	(0)
HgHCO3+	4.958e-19	3.867e-19	-18.305	-18.413	-0.108	(0)
Ca	4.407e-03					
Ca+2	2.797e-03	1.312e-03	-2.553	-2.882	-0.329	(0)
CaSO4	1.588e-03	1.588e-03	-2.799	-2.799	0.000	(0)
CaHCO3+	1.481e-05	1.242e-05	-4.830	-4.906	-0.076	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.350e-06	1.954e-06	-5.629	-5.709	-0.080	(0)
CaH2BO3+	1.697e-07	1.373e-07	-6.770	-6.862	-0.092	(0)
CaOH+	3.322e-08	2.788e-08	-7.479	-7.555	-0.076	(0)
CaNO3+	4.205e-11	3.280e-11	-10.376	-10.484	-0.108	(0)
CaNH3+2	1.502e-11	5.559e-12	-10.823	-11.255	-0.432	(0)
Ca (NH3) 2+2	2.014e-20	7.451e-21	-19.696	-20.128	-0.432	(0)
Cd	1.503e-08					
Cd+2	7.999e-09	3.751e-09	-8.097	-8.426	-0.329	(0)
CdSO4	4.645e-09	4.645e-09	-8.333	-8.333	0.000	(0)
CdCl+	1.166e-09	9.093e-10	-8.933	-9.041	-0.108	(0)
Cd (SO4) 2-2	8.948e-10	3.311e-10	-9.048	-9.480	-0.432	(0)
CdCO3	2.158e-10	2.158e-10	-9.666	-9.666	0.000	(0)
CdOH+	4.069e-11	3.174e-11	-10.391	-10.498	-0.108	(0)
CdOHC1	3.974e-11	3.974e-11	-10.401	-10.401	0.000	(0)
CdF+	1.040e-11	8.114e-12	-10.983	-11.091	-0.108	(0)
CdCl2	9.624e-12	9.624e-12	-11.017	-11.017	0.000	(0)
CdHCO3+	5.569e-12	4.344e-12	-11.254	-11.362	-0.108	(0)
Cd (CO3) 2-2	1.092e-12	4.039e-13	-11.962	-12.394	-0.432	(0)
Cd (OH) 2	2.133e-13	2.133e-13	-12.671	-12.671	0.000	(0)
CdCl3-	1.977e-14	1.542e-14	-13.704	-13.812	-0.108	(0)
CdF2	2.210e-15	2.210e-15	-14.656	-14.656	0.000	(0)
CdNO3+	1.202e-16	9.379e-17	-15.920	-16.028	-0.108	(0)
CdSeO4	7.671e-17	7.671e-17	-16.115	-16.115	0.000	(0)
Cd (OH) 3-	1.780e-17	1.388e-17	-16.750	-16.858	-0.108	(0)
Cd2OH+3	5.586e-18	5.965e-19	-17.253	-18.224	-0.971	(0)
Cd (SeO3) 2-2	5.370e-18	1.987e-18	-17.270	-17.702	-0.432	(0)
Cd (OH) 4-2	6.541e-24	2.420e-24	-23.184	-23.616	-0.432	(0)
Cd (NO3) 2	3.717e-25	3.717e-25	-24.430	-24.430	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.131	-79.239	-0.108	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.855	-150.855	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.668	-227.776	-0.108	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.969	-304.400	-0.432	(0)
Cl	3.068e-03					
Cl-	3.068e-03	2.539e-03	-2.513	-2.595	-0.082	(0)
MnCl+	6.902e-08	5.739e-08	-7.161	-7.241	-0.080	(0)
ZnOHC1	1.453e-08	1.453e-08	-7.838	-7.838	0.000	(0)
ZnCl+	1.266e-08	1.042e-08	-7.898	-7.982	-0.084	(0)
AgCl	7.074e-09	7.074e-09	-8.150	-8.150	0.000	(0)
AgCl2-	2.006e-09	1.564e-09	-8.698	-8.806	-0.108	(0)

CdCl+	1.166e-09	9.093e-10	-8.933	-9.041	-0.108	(0)
CuCl	6.095e-10	6.095e-10	-9.215	-9.215	0.000	(0)
CuCl2-	3.927e-10	3.233e-10	-9.406	-9.490	-0.084	(0)
NiCl+	3.256e-10	2.539e-10	-9.487	-9.595	-0.108	(0)
CoCl+	3.071e-10	2.395e-10	-9.513	-9.621	-0.108	(0)
MnCl2	2.058e-10	2.058e-10	-9.687	-9.687	0.000	(0)
CuCl+	1.065e-10	8.765e-11	-9.973	-10.057	-0.084	(0)
ZnCl2	4.194e-11	4.194e-11	-10.377	-10.377	0.000	(0)
CdOHC1	3.974e-11	3.974e-11	-10.401	-10.401	0.000	(0)
PbCl+	2.780e-11	2.168e-11	-10.556	-10.664	-0.108	(0)
CdCl2	9.624e-12	9.624e-12	-11.017	-11.017	0.000	(0)
AgCl3-2	9.565e-12	3.539e-12	-11.019	-11.451	-0.432	(0)
HgClOH	3.476e-12	3.476e-12	-11.459	-11.459	0.000	(0)
HgCl2	4.690e-13	4.690e-13	-12.329	-12.329	0.000	(0)
CuCl3-2	3.670e-13	1.755e-13	-12.435	-12.756	-0.320	(0)
PbCl2	2.459e-13	2.459e-13	-12.609	-12.609	0.000	(0)
MnCl3-	1.731e-13	1.439e-13	-12.762	-12.842	-0.080	(0)
AgCl4-3	1.718e-13	1.835e-14	-12.765	-13.736	-0.971	(0)
ZnCl3-	1.027e-13	8.457e-14	-12.988	-13.073	-0.084	(0)
CuCl2	7.716e-14	7.716e-14	-13.113	-13.113	0.000	(0)
CdCl3-	1.977e-14	1.542e-14	-13.704	-13.812	-0.108	(0)
HgCl3-	1.527e-14	1.191e-14	-13.816	-13.924	-0.108	(0)
NiCl2	3.246e-15	3.246e-15	-14.489	-14.489	0.000	(0)
UO2Cl+	4.213e-16	3.286e-16	-15.375	-15.483	-0.108	(0)
HgCl4-2	3.253e-16	1.204e-16	-15.488	-15.920	-0.432	(0)
PbCl3-	3.187e-16	2.486e-16	-15.497	-15.605	-0.108	(0)
ZnCl4-2	2.245e-16	1.074e-16	-15.649	-15.969	-0.320	(0)
HgCl+	4.726e-17	3.686e-17	-16.325	-16.433	-0.108	(0)
CuCl3-	2.221e-18	1.828e-18	-17.654	-17.738	-0.084	(0)
CrCl+2	1.839e-18	6.805e-19	-17.735	-18.167	-0.432	(0)
PbCl4-2	7.795e-19	2.885e-19	-18.108	-18.540	-0.432	(0)
CrOHC12	3.498e-20	3.498e-20	-19.456	-19.456	0.000	(0)
FeCl+2	2.102e-22	1.005e-22	-21.677	-21.998	-0.320	(0)
CrCl2+	2.102e-22	1.639e-22	-21.677	-21.785	-0.108	(0)
CuCl4-2	4.864e-23	2.326e-23	-22.313	-22.633	-0.320	(0)
VOCl+	6.833e-24	5.329e-24	-23.165	-23.273	-0.108	(0)
FeCl2+	1.371e-24	1.140e-24	-23.863	-23.943	-0.080	(0)
CrO3Cl-	3.832e-26	2.989e-26	-25.417	-25.525	-0.108	(0)
FeCl3	2.894e-28	2.894e-28	-27.538	-27.538	0.000	(0)
CoCl+2	8.478e-36	3.137e-36	-35.072	-35.503	-0.432	(0)
UCl+3	0.000e+00	0.000e+00	-45.400	-46.371	-0.971	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.483	-51.914	-0.432	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.582	-55.014	-0.432	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.671	-67.103	-0.432	(0)
Co (2)	1.062e-07					
Co+2	7.369e-08	2.727e-08	-7.133	-7.564	-0.432	(0)
CoSO4	2.875e-08	2.875e-08	-7.541	-7.541	0.000	(0)
CoHCO3+	1.383e-09	1.079e-09	-8.859	-8.967	-0.108	(0)
CoCO3	1.164e-09	1.164e-09	-8.934	-8.934	0.000	(0)
CoOH+	7.431e-10	5.796e-10	-9.129	-9.237	-0.108	(0)
CoCl+	3.071e-10	2.395e-10	-9.513	-9.621	-0.108	(0)
CoF+	1.509e-10	1.177e-10	-9.821	-9.929	-0.108	(0)
Co (OH) 2	4.904e-11	4.904e-11	-10.309	-10.309	0.000	(0)
CoNO2+	2.065e-12	1.611e-12	-11.685	-11.793	-0.108	(0)
Co (NH3) +2	2.983e-14	1.104e-14	-13.525	-13.957	-0.432	(0)
CoSeO4	1.501e-15	1.501e-15	-14.824	-14.824	0.000	(0)
Co (OH) 3-	1.336e-15	1.042e-15	-14.874	-14.982	-0.108	(0)
CoNO3+	4.382e-16	3.418e-16	-15.358	-15.466	-0.108	(0)
CoOOH-	3.355e-16	2.617e-16	-15.474	-15.582	-0.108	(0)
Co2OH+3	7.417e-18	7.921e-19	-17.130	-18.101	-0.971	(0)
Co (NH3) 2+2	4.284e-21	1.585e-21	-20.368	-20.800	-0.432	(0)
Co (OH) 4-2	4.756e-22	1.760e-22	-21.323	-21.755	-0.432	(0)
Co (NO3) 2	5.499e-24	5.499e-24	-23.260	-23.260	0.000	(0)
Co4 (OH) 4+4	1.201e-27	2.252e-29	-26.921	-28.648	-1.727	(0)
Co (NH3) 3+2	1.816e-28	6.719e-29	-27.741	-28.173	-0.432	(0)
Co (NH3) 4+2	3.208e-36	1.187e-36	-35.494	-35.925	-0.432	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.746	-44.178	-0.432	(0)
Co (3)	8.884e-29					

CoOH+2	8.884e-29	3.288e-29	-28.051	-28.483	-0.432	(0)
Co+3	3.338e-35	6.073e-36	-34.476	-35.217	-0.740	(0)
CoCl+2	8.478e-36	3.137e-36	-35.072	-35.503	-0.432	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-51.483	-51.914	-0.432	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-61.751	-61.859	-0.108	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-65.848	-66.280	-0.432	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-66.671	-67.103	-0.432	(0)
Cr(2)	2.390e-27					
Cr+2	2.390e-27	8.844e-28	-26.622	-27.053	-0.432	(0)
Cr(3)	1.101e-09					
Cr(OH)2+	8.021e-10	6.256e-10	-9.096	-9.204	-0.108	(0)
Cr(OH)3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	1.615e-11	1.259e-11	-10.792	-10.900	-0.108	(0)
Cr(OH)4-	1.361e-11	1.062e-11	-10.866	-10.974	-0.108	(0)
Cr(OH)+2	1.304e-11	4.827e-12	-10.885	-11.316	-0.432	(0)
CrOHSO4	6.052e-12	6.052e-12	-11.218	-11.218	0.000	(0)
CrF+2	1.211e-14	4.481e-15	-13.917	-14.349	-0.432	(0)
CrSO4+	3.276e-15	2.555e-15	-14.485	-14.593	-0.108	(0)
Cr+3	1.939e-15	2.071e-16	-14.712	-15.684	-0.971	(0)
CrCl+2	1.839e-18	6.805e-19	-17.735	-18.167	-0.432	(0)
CrOHC12	3.498e-20	3.498e-20	-19.456	-19.456	0.000	(0)
Cr2(OH)2SO4+2	7.135e-21	2.640e-21	-20.147	-20.578	-0.432	(0)
Cr2(OH)2(SO4)2	8.287e-22	8.287e-22	-21.082	-21.082	0.000	(0)
CrCl2+	2.102e-22	1.639e-22	-21.677	-21.785	-0.108	(0)
CrNO3+2	1.935e-25	7.159e-26	-24.713	-25.145	-0.432	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-43.216	-43.648	-0.432	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-52.549	-53.520	-0.971	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-54.582	-55.014	-0.432	(0)
Cr(6)	1.450e-14					
CrO4-2	1.382e-14	6.478e-15	-13.860	-14.189	-0.329	(0)
NaCrO4-	3.324e-16	2.593e-16	-15.478	-15.586	-0.108	(0)
HCrO4-	2.539e-16	1.980e-16	-15.595	-15.703	-0.108	(0)
KCrO4-	9.338e-17	7.283e-17	-16.030	-16.138	-0.108	(0)
CrO3SO4-2	8.140e-24	3.012e-24	-23.089	-23.521	-0.432	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.832e-26	2.989e-26	-25.417	-25.525	-0.108	(0)
Cr2O7-2	3.677e-30	1.360e-30	-29.435	-29.866	-0.432	(0)
Cu(1)	1.247e-09					
CuCl	6.095e-10	6.095e-10	-9.215	-9.215	0.000	(0)
CuCl2-	3.927e-10	3.233e-10	-9.406	-9.490	-0.084	(0)
Cu+	2.445e-10	1.907e-10	-9.612	-9.720	-0.108	(0)
CuCl3-2	3.670e-13	1.755e-13	-12.435	-12.756	-0.320	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-147.548	-147.921	-0.374	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.297	-148.651	-0.355	(0)
Cu(2)	5.093e-07					
CuCO3	3.238e-07	3.238e-07	-6.490	-6.490	0.000	(0)
CuOH+	8.912e-08	7.337e-08	-7.050	-7.134	-0.084	(0)
Cu+2	4.645e-08	2.178e-08	-7.333	-7.662	-0.329	(0)
CuSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
Cu(OH)2	1.560e-08	1.560e-08	-7.807	-7.807	0.000	(0)
Cu(CO3)2-2	5.946e-09	2.200e-09	-8.226	-8.658	-0.432	(0)
CuHCO3+	8.964e-10	6.991e-10	-9.048	-9.155	-0.108	(0)
Cu2(OH)2+2	3.655e-10	1.352e-10	-9.437	-9.869	-0.432	(0)
CuF+	2.405e-10	1.876e-10	-9.619	-9.727	-0.108	(0)
CuCl+	1.065e-10	8.765e-11	-9.973	-10.057	-0.084	(0)
Cu(OH)3-	4.369e-11	3.408e-11	-10.360	-10.468	-0.108	(0)
CuNO2+	2.451e-11	1.912e-11	-10.611	-10.719	-0.108	(0)
CuNH3+2	2.028e-12	7.504e-13	-11.693	-12.125	-0.432	(0)
CuCl2	7.716e-14	7.716e-14	-13.113	-13.113	0.000	(0)
Cu(NO2)2	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
Cu(OH)4-2	7.721e-16	2.857e-16	-15.112	-15.544	-0.432	(0)
CuNO3+	6.984e-16	5.447e-16	-15.156	-15.264	-0.108	(0)
CuCl3-	2.221e-18	1.828e-18	-17.654	-17.738	-0.084	(0)
CuCl4-2	4.864e-23	2.326e-23	-22.313	-22.633	-0.320	(0)
Cu(NO3)2	5.422e-25	5.422e-25	-24.266	-24.266	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-218.117	-218.225	-0.108	(0)
F	2.014e-04					
F-	1.649e-04	1.365e-04	-3.783	-3.865	-0.082	(0)

MgF+	3.329e-05	2.755e-05	-4.478	-4.560	-0.082	(0)
CaF+	2.350e-06	1.954e-06	-5.629	-5.709	-0.080	(0)
NaF	6.936e-07	6.936e-07	-6.159	-6.159	0.000	(0)
MnF+	1.173e-07	9.757e-08	-6.931	-7.011	-0.080	(0)
ZnF+	5.707e-09	4.451e-09	-8.244	-8.352	-0.108	(0)
BF (OH) 3-	1.991e-09	1.611e-09	-8.701	-8.793	-0.092	(0)
HF	1.907e-09	1.907e-09	-8.720	-8.720	0.000	(0)
CuF+	2.405e-10	1.876e-10	-9.619	-9.727	-0.108	(0)
NiF+	1.718e-10	1.340e-10	-9.765	-9.873	-0.108	(0)
AlF3	1.693e-10	1.693e-10	-9.771	-9.771	0.000	(0)
CoF+	1.509e-10	1.177e-10	-9.821	-9.929	-0.108	(0)
AlF2+	1.180e-10	9.852e-11	-9.928	-10.006	-0.078	(0)
AlF4-	1.400e-11	1.158e-11	-10.854	-10.936	-0.082	(0)
CdF+	1.040e-11	8.114e-12	-10.983	-11.091	-0.108	(0)
AlF+2	3.735e-12	1.813e-12	-11.428	-11.742	-0.314	(0)
PbF+	2.969e-12	2.315e-12	-11.527	-11.635	-0.108	(0)
UO2F+	1.928e-12	1.504e-12	-11.715	-11.823	-0.108	(0)
HF2-	1.209e-12	9.897e-13	-11.918	-12.005	-0.087	(0)
UO2F2	5.919e-13	5.919e-13	-12.228	-12.228	0.000	(0)
AgF	4.679e-13	4.679e-13	-12.330	-12.330	0.000	(0)
BF2 (OH) 2-	2.747e-13	2.223e-13	-12.561	-12.653	-0.092	(0)
UO2F3-	2.602e-14	2.029e-14	-13.585	-13.693	-0.108	(0)
CrF+2	1.211e-14	4.481e-15	-13.917	-14.349	-0.432	(0)
PbF2	6.219e-15	6.219e-15	-14.206	-14.206	0.000	(0)
CdF2	2.210e-15	2.210e-15	-14.656	-14.656	0.000	(0)
UO2F4-2	5.946e-17	2.200e-17	-16.226	-16.658	-0.432	(0)
H2F2	9.744e-18	9.744e-18	-17.011	-17.011	0.000	(0)
PbF3-	2.064e-18	1.610e-18	-17.685	-17.793	-0.108	(0)
VO2F	1.403e-18	1.403e-18	-17.853	-17.853	0.000	(0)
FeF2+	8.619e-19	7.168e-19	-18.065	-18.145	-0.080	(0)
FeF+2	4.103e-19	1.962e-19	-18.387	-18.707	-0.320	(0)
FeF3	1.380e-19	1.380e-19	-18.860	-18.860	0.000	(0)
BF3OH-	1.379e-19	1.116e-19	-18.861	-18.952	-0.092	(0)
VO2F2-	8.915e-20	6.953e-20	-19.050	-19.158	-0.108	(0)
VOF+	7.854e-22	6.125e-22	-21.105	-21.213	-0.108	(0)
VO2F3-2	3.199e-22	1.184e-22	-21.495	-21.927	-0.432	(0)
PbF4-2	2.843e-22	1.052e-22	-21.546	-21.978	-0.432	(0)
VOF2	3.135e-23	3.135e-23	-22.504	-22.504	0.000	(0)
HgF+	4.721e-24	3.682e-24	-23.326	-23.434	-0.108	(0)
BF4-	8.753e-25	7.083e-25	-24.058	-24.150	-0.092	(0)
VOF3-	1.947e-25	1.518e-25	-24.711	-24.819	-0.108	(0)
VO2F4-3	7.445e-26	7.951e-27	-25.128	-26.100	-0.971	(0)
Sb (OH) 2F	3.029e-26	3.029e-26	-25.519	-25.519	0.000	(0)
SbOF	2.980e-26	2.980e-26	-25.526	-25.526	0.000	(0)
VOF4-2	2.261e-28	8.365e-29	-27.646	-28.078	-0.432	(0)
UF3+	4.339e-36	3.384e-36	-35.363	-35.471	-0.108	(0)
UF2+2	4.228e-37	1.564e-37	-36.374	-36.806	-0.432	(0)
UF4	5.065e-38	5.065e-38	-37.295	-37.295	0.000	(0)
UF+3	8.525e-40	0.000e+00	-39.069	-40.041	-0.971	(0)
UF5-	3.513e-40	2.740e-40	-39.454	-39.562	-0.108	(0)
UF6-2	0.000e+00	0.000e+00	-40.515	-40.947	-0.432	(0)
Fe (2)	1.024e-12					
Fe+2	6.818e-13	2.523e-13	-12.166	-12.598	-0.432	(0)
FeSO4	3.272e-13	3.272e-13	-12.485	-12.485	0.000	(0)
FeOH+	1.287e-14	1.070e-14	-13.891	-13.971	-0.080	(0)
FeHCO3+	1.925e-15	1.616e-15	-14.715	-14.792	-0.076	(0)
Fe (OH) 2	9.053e-18	9.053e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.667e-18	3.050e-18	-17.436	-17.516	-0.080	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.289	-161.289	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.965	-238.073	-0.108	(0)
Fe (3)	9.261e-10					
Fe (OH) 2+	4.477e-10	3.737e-10	-9.349	-9.427	-0.078	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	5.081e-11	4.241e-11	-10.294	-10.373	-0.078	(0)
FeOH+2	1.886e-15	9.018e-16	-14.725	-15.045	-0.320	(0)
FeF2+	8.619e-19	7.168e-19	-18.065	-18.145	-0.080	(0)
FeF+2	4.103e-19	1.962e-19	-18.387	-18.707	-0.320	(0)
FeF3	1.380e-19	1.380e-19	-18.860	-18.860	0.000	(0)

FeSO4+	9.347e-20	7.773e-20	-19.029	-19.109	-0.080	(0)
Fe(SO4) 2-	1.126e-20	8.780e-21	-19.949	-20.056	-0.108	(0)
Fe+3	7.207e-21	1.311e-21	-20.142	-20.882	-0.740	(0)
FeCl+2	2.102e-22	1.005e-22	-21.677	-21.998	-0.320	(0)
FeCl2+	1.371e-24	1.140e-24	-23.863	-23.943	-0.080	(0)
FeHSeO3+2	5.633e-25	2.084e-25	-24.249	-24.681	-0.432	(0)
Fe2(OH) 2+4	1.436e-27	2.693e-29	-26.843	-28.570	-1.727	(0)
FeCl3	2.894e-28	2.894e-28	-27.538	-27.538	0.000	(0)
FeNO3+2	2.802e-28	1.037e-28	-27.553	-27.984	-0.432	(0)
Fe3(OH) 4+5	7.264e-35	1.455e-37	-34.139	-36.837	-2.698	(0)
H (0)	3.995e-29					
H2	1.998e-29	2.018e-29	-28.699	-28.695	0.004	(0)
Hg (0)	2.146e-09					
Hg	2.146e-09	2.146e-09	-8.668	-8.668	0.000	(0)
Hg (1)	5.730e-21					
Hg2+2	2.865e-21	1.060e-21	-20.543	-20.975	-0.432	(0)
Hg (2)	9.119e-12					
Hg(OH) 2	5.157e-12	5.210e-12	-11.288	-11.283	0.004	(0)
HgClOH	3.476e-12	3.476e-12	-11.459	-11.459	0.000	(0)
HgCl2	4.690e-13	4.690e-13	-12.329	-12.329	0.000	(0)
HgCl3-	1.527e-14	1.191e-14	-13.816	-13.924	-0.108	(0)
HgCO3	2.199e-15	2.199e-15	-14.658	-14.658	0.000	(0)
HgCl4-2	3.253e-16	1.204e-16	-15.488	-15.920	-0.432	(0)
Hg(CO3) 2-2	4.743e-17	1.755e-17	-16.324	-16.756	-0.432	(0)
HgCl+	4.726e-17	3.686e-17	-16.325	-16.433	-0.108	(0)
HgOH+	3.957e-17	3.086e-17	-16.403	-16.511	-0.108	(0)
Hg(OH) 3-	8.958e-19	6.987e-19	-18.048	-18.156	-0.108	(0)
HgHCO3+	4.958e-19	3.867e-19	-18.305	-18.413	-0.108	(0)
Hg(NH3) 2+2	1.406e-20	5.204e-21	-19.852	-20.284	-0.432	(0)
HgNH3+2	4.177e-21	1.546e-21	-20.379	-20.811	-0.432	(0)
Hg+2	1.966e-21	7.277e-22	-20.706	-21.138	-0.432	(0)
HgSO4	1.007e-21	1.007e-21	-20.997	-20.997	0.000	(0)
HgF+	4.721e-24	3.682e-24	-23.326	-23.434	-0.108	(0)
Hg(NH3) 3+2	1.885e-28	6.976e-29	-27.725	-28.156	-0.432	(0)
HgNO3+	2.724e-30	2.125e-30	-29.565	-29.673	-0.108	(0)
Hg(NH3) 4+2	5.041e-36	1.866e-36	-35.297	-35.729	-0.432	(0)
Hg(NO3) 2	6.983e-39	6.983e-39	-38.156	-38.156	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.719	-138.827	-0.108	(0)
HgS2-2	0.000e+00	0.000e+00	-139.078	-139.510	-0.432	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.457	-140.457	0.000	(0)
K	3.792e-03					
K+	3.657e-03	3.026e-03	-2.437	-2.519	-0.082	(0)
KSO4-	1.356e-04	1.132e-04	-3.868	-3.946	-0.078	(0)
KCrO4-	9.338e-17	7.283e-17	-16.030	-16.138	-0.108	(0)
Mg	5.616e-03					
Mg+2	3.837e-03	1.799e-03	-2.416	-2.745	-0.329	(0)
MgSO4	1.730e-03	1.730e-03	-2.762	-2.762	0.000	(0)
MgF+	3.329e-05	2.755e-05	-4.478	-4.560	-0.082	(0)
MgHCO3+	1.137e-05	9.364e-06	-4.944	-5.029	-0.084	(0)
MgCO3	3.778e-06	3.778e-06	-5.423	-5.423	0.000	(0)
MgOH+	9.053e-07	7.629e-07	-6.043	-6.118	-0.074	(0)
MgH2BO3+	1.402e-07	1.135e-07	-6.853	-6.945	-0.092	(0)
Mn (2)	6.586e-05					
Mn+2	4.852e-05	1.796e-05	-4.314	-4.746	-0.432	(0)
MnSO4	1.687e-05	1.687e-05	-4.773	-4.773	0.000	(0)
MnHCO3+	2.192e-07	1.822e-07	-6.659	-6.739	-0.080	(0)
MnF+	1.173e-07	9.757e-08	-6.931	-7.011	-0.080	(0)
MnCl+	6.902e-08	5.739e-08	-7.161	-7.241	-0.080	(0)
MnOH+	5.778e-08	4.805e-08	-7.238	-7.318	-0.080	(0)
MnCl2	2.058e-10	2.058e-10	-9.687	-9.687	0.000	(0)
MnSeO4	5.309e-13	5.309e-13	-12.275	-12.275	0.000	(0)
MnNO3+	2.885e-13	2.250e-13	-12.540	-12.648	-0.108	(0)
MnCl3-	1.731e-13	1.439e-13	-12.762	-12.842	-0.080	(0)
Mn(OH) 3-	4.052e-16	3.369e-16	-15.392	-15.472	-0.080	(0)
Mn(NO3) 2	4.470e-21	4.470e-21	-20.350	-20.350	0.000	(0)
Mn(OH) 4-2	2.423e-21	1.159e-21	-20.616	-20.936	-0.320	(0)
MnSe	0.000e+00	0.000e+00	-41.101	-41.101	0.000	(0)
Mn (3)	2.466e-25					

Mn+3	2.466e-25	4.487e-26	-24.608	-25.348	-0.740	(0)
Mn (6)	2.190e-40					
MnO4-2	2.190e-40	1.047e-40	-39.660	-39.980	-0.320	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.515	-44.604	-0.089	(0)
Mo	2.125e-06					
MoO4-2	2.125e-06	9.965e-07	-5.673	-6.002	-0.329	(0)
HMoO4-	2.401e-10	1.873e-10	-9.620	-9.727	-0.108	(0)
H2MoO4	1.296e-14	1.296e-14	-13.887	-13.887	0.000	(0)
Ag2MoO4	7.024e-25	7.024e-25	-24.153	-24.153	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.069	-44.041	-0.971	(0)
Mo7O24-6	0.000e+00	0.000e+00	-49.332	-53.217	-3.886	(0)
HMo7O24-5	0.000e+00	0.000e+00	-52.157	-54.855	-2.698	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.371	-58.098	-1.727	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-61.905	-62.877	-0.971	(0)
N (-3)	7.612e-08					
NH4+	6.893e-08	5.578e-08	-7.162	-7.254	-0.092	(0)
NH4SO4-	3.798e-09	3.158e-09	-8.420	-8.501	-0.080	(0)
NH3	3.367e-09	3.367e-09	-8.473	-8.473	0.000	(0)
CaNH3+2	1.502e-11	5.559e-12	-10.823	-11.255	-0.432	(0)
CuNH3+2	2.028e-12	7.504e-13	-11.693	-12.125	-0.432	(0)
NiNH3+2	1.910e-13	7.068e-14	-12.719	-13.151	-0.432	(0)
Co (NH3) +2	2.983e-14	1.104e-14	-13.525	-13.957	-0.432	(0)
AgNH3+	1.203e-14	9.381e-15	-13.920	-14.028	-0.108	(0)
BaNH3+2	1.138e-16	4.210e-17	-15.944	-16.376	-0.432	(0)
Ag (NH3) 2+	3.291e-19	2.567e-19	-18.483	-18.591	-0.108	(0)
Ni (NH3) 2+2	9.295e-20	3.440e-20	-19.032	-19.464	-0.432	(0)
Ca (NH3) 2+2	2.014e-20	7.451e-21	-19.696	-20.128	-0.432	(0)
Hg (NH3) 2+2	1.406e-20	5.204e-21	-19.852	-20.284	-0.432	(0)
Co (NH3) 2+2	4.284e-21	1.585e-21	-20.368	-20.800	-0.432	(0)
HgNH3+2	4.177e-21	1.546e-21	-20.379	-20.811	-0.432	(0)
Hg (NH3) 3+2	1.885e-28	6.976e-29	-27.725	-28.156	-0.432	(0)
Co (NH3) 3+2	1.816e-28	6.719e-29	-27.741	-28.173	-0.432	(0)
Hg (NH3) 4+2	5.041e-36	1.866e-36	-35.297	-35.729	-0.432	(0)
Co (NH3) 4+2	3.208e-36	1.187e-36	-35.494	-35.925	-0.432	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.216	-43.648	-0.432	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.746	-44.178	-0.432	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.483	-51.914	-0.432	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.549	-53.520	-0.971	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.582	-55.014	-0.432	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.751	-61.859	-0.108	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.848	-66.280	-0.432	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.671	-67.103	-0.432	(0)
N (3)	1.030e-05					
NO2-	1.030e-05	8.382e-06	-4.987	-5.077	-0.089	(0)
CuNO2+	2.451e-11	1.912e-11	-10.611	-10.719	-0.108	(0)
AgNO2	2.390e-12	2.390e-12	-11.622	-11.622	0.000	(0)
CoNO2+	2.065e-12	1.611e-12	-11.685	-11.793	-0.108	(0)
Cu (NO2) 2	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
Ag (NO2) 2-	3.978e-17	3.102e-17	-16.400	-16.508	-0.108	(0)
N (5)	9.598e-09					
NO3-	9.556e-09	7.908e-09	-8.020	-8.102	-0.082	(0)
CaNO3+	4.205e-11	3.280e-11	-10.376	-10.484	-0.108	(0)
MnNO3+	2.885e-13	2.250e-13	-12.540	-12.648	-0.108	(0)
ZnNO3+	4.162e-14	3.246e-14	-13.381	-13.489	-0.108	(0)
BaNO3+	1.007e-15	7.854e-16	-14.997	-15.105	-0.108	(0)
NiNO3+	9.955e-16	7.764e-16	-15.002	-15.110	-0.108	(0)
CuNO3+	6.984e-16	5.447e-16	-15.156	-15.264	-0.108	(0)
CoNO3+	4.382e-16	3.418e-16	-15.358	-15.466	-0.108	(0)
CdNO3+	1.202e-16	9.379e-17	-15.920	-16.028	-0.108	(0)
PbNO3+	3.610e-17	2.816e-17	-16.443	-16.550	-0.108	(0)
AgNO3	8.572e-18	8.572e-18	-17.067	-17.067	0.000	(0)
Mn (NO3) 2	4.470e-21	4.470e-21	-20.350	-20.350	0.000	(0)
UO2NO3+	1.614e-21	1.259e-21	-20.792	-20.900	-0.108	(0)
Zn (NO3) 2	5.122e-23	5.122e-23	-22.291	-22.291	0.000	(0)
Co (NO3) 2	5.499e-24	5.499e-24	-23.260	-23.260	0.000	(0)
Cu (NO3) 2	5.422e-25	5.422e-25	-24.266	-24.266	0.000	(0)
Pb (NO3) 2	3.781e-25	3.781e-25	-24.422	-24.422	0.000	(0)

	Cd(NO3)2	3.717e-25	3.717e-25	-24.430	-24.430	0.000	(0)
	CrNO3+2	1.935e-25	7.159e-26	-24.713	-25.145	-0.432	(0)
	VO2NO3	2.344e-26	2.344e-26	-25.630	-25.630	0.000	(0)
	FeNO3+2	2.802e-28	1.037e-28	-27.553	-27.984	-0.432	(0)
	HgNO3+	2.724e-30	2.125e-30	-29.565	-29.673	-0.108	(0)
	Hg(NO3)2	6.983e-39	6.983e-39	-38.156	-38.156	0.000	(0)
Na	1.001e-02						
	Na+	9.732e-03	8.053e-03	-2.012	-2.094	-0.082	(0)
	NaSO4-	2.738e-04	2.285e-04	-3.563	-3.641	-0.078	(0)
	NaHCO3	2.304e-06	2.304e-06	-5.638	-5.638	0.000	(0)
	NaF	6.936e-07	6.936e-07	-6.159	-6.159	0.000	(0)
	NaCO3-	4.536e-07	3.786e-07	-6.343	-6.422	-0.078	(0)
	NaH2BO3	2.322e-08	2.322e-08	-7.634	-7.634	0.000	(0)
	NaCrO4-	3.324e-16	2.593e-16	-15.478	-15.586	-0.108	(0)
Ni	1.326e-07						
	Ni+2	8.337e-08	3.909e-08	-7.079	-7.408	-0.329	(0)
	NiSO4	4.121e-08	4.121e-08	-7.385	-7.385	0.000	(0)
	NiCO3	3.682e-09	3.682e-09	-8.434	-8.434	0.000	(0)
	NiHCO3+	3.143e-09	2.451e-09	-8.503	-8.611	-0.108	(0)
	NiOH+	6.721e-10	5.242e-10	-9.173	-9.280	-0.108	(0)
	NiCl+	3.256e-10	2.539e-10	-9.487	-9.595	-0.108	(0)
	NiF+	1.718e-10	1.340e-10	-9.765	-9.873	-0.108	(0)
	Ni(OH)2	4.436e-11	4.436e-11	-10.353	-10.353	0.000	(0)
	Ni(SO4)2-2	1.948e-11	7.210e-12	-10.710	-11.142	-0.432	(0)
	NiNH3+2	1.910e-13	7.068e-14	-12.719	-13.151	-0.432	(0)
	Ni(OH)3-	6.058e-14	4.725e-14	-13.218	-13.326	-0.108	(0)
	NiCl2	3.246e-15	3.246e-15	-14.489	-14.489	0.000	(0)
	NiSeO4	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
	NiNO3+	9.955e-16	7.764e-16	-15.002	-15.110	-0.108	(0)
	Ni(NH3)2+2	9.295e-20	3.440e-20	-19.032	-19.464	-0.432	(0)
O(0)	2.460e-35						
	O2	1.230e-35	1.243e-35	-34.910	-34.906	0.004	(0)
Pb	4.048e-09						
	PbCO3	1.827e-09	1.827e-09	-8.738	-8.738	0.000	(0)
	PbOH+	8.259e-10	6.441e-10	-9.083	-9.191	-0.108	(0)
	PbSO4	6.229e-10	6.229e-10	-9.206	-9.206	0.000	(0)
	Pb+2	5.134e-10	2.407e-10	-9.290	-9.618	-0.329	(0)
	PbHCO3+	1.167e-10	9.098e-11	-9.933	-10.041	-0.108	(0)
	Pb(SO4)2-2	5.360e-11	1.983e-11	-10.271	-10.703	-0.432	(0)
	Pb(CO3)2-2	3.595e-11	1.330e-11	-10.444	-10.876	-0.432	(0)
	PbCl+	2.780e-11	2.168e-11	-10.556	-10.664	-0.108	(0)
	Pb(OH)2	2.170e-11	2.170e-11	-10.664	-10.664	0.000	(0)
	PbF+	2.969e-12	2.315e-12	-11.527	-11.635	-0.108	(0)
	PbCl2	2.459e-13	2.459e-13	-12.609	-12.609	0.000	(0)
	Pb(OH)3-	2.964e-14	2.311e-14	-13.528	-13.636	-0.108	(0)
	PbF2	6.219e-15	6.219e-15	-14.206	-14.206	0.000	(0)
	PbCl3-	3.187e-16	2.486e-16	-15.497	-15.605	-0.108	(0)
	PbNO3+	3.610e-17	2.816e-17	-16.443	-16.550	-0.108	(0)
	Pb2OH+3	2.301e-17	2.457e-18	-16.638	-17.610	-0.971	(0)
	Pb(OH)4-2	1.630e-17	6.030e-18	-16.788	-17.220	-0.432	(0)
	PbF3-	2.064e-18	1.610e-18	-17.685	-17.793	-0.108	(0)
	PbCl4-2	7.795e-19	2.885e-19	-18.108	-18.540	-0.432	(0)
	Pb3(OH)4+2	6.111e-21	2.261e-21	-20.214	-20.646	-0.432	(0)
	PbF4-2	2.843e-22	1.052e-22	-21.546	-21.978	-0.432	(0)
	Pb(NO3)2	3.781e-25	3.781e-25	-24.422	-24.422	0.000	(0)
	Pb4(OH)4+4	2.306e-25	4.324e-27	-24.637	-26.364	-1.727	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-151.990	-151.990	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-229.402	-229.510	-0.108	(0)
S(-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.871	-73.871	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.713	-78.821	-0.108	(0)
	CdHS+	0.000e+00	0.000e+00	-79.131	-79.239	-0.108	(0)
	S5-2	0.000e+00	0.000e+00	-79.729	-80.161	-0.432	(0)
	H2S	0.000e+00	0.000e+00	-79.825	-79.825	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-80.245	-80.677	-0.432	(0)
	S4-2	0.000e+00	0.000e+00	-80.325	-80.757	-0.432	(0)
	S3-2	0.000e+00	0.000e+00	-81.131	-81.563	-0.432	(0)
	S2-2	0.000e+00	0.000e+00	-82.147	-82.579	-0.432	(0)

S-2	0.000e+00	0.000e+00	-87.775	-88.096	-0.320	(0)
HgHS2-	0.000e+00	0.000e+00	-138.719	-138.827	-0.108	(0)
HgS2-2	0.000e+00	0.000e+00	-139.078	-139.510	-0.432	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.457	-140.457	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.548	-147.921	-0.374	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.839	-148.050	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.297	-148.651	-0.355	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.484	-148.592	-0.108	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.485	-148.593	-0.108	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.082	-149.466	-0.384	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.413	-149.777	-0.364	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.608	-150.608	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.855	-150.855	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.990	-151.990	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.289	-161.289	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.117	-218.225	-0.108	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.041	-226.149	-0.108	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.668	-227.776	-0.108	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.672	-228.104	-0.432	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.402	-229.510	-0.108	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.965	-238.073	-0.108	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.969	-304.400	-0.432	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.997	-306.429	-0.432	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.156	-321.588	-0.432	(0)
S (6)	1.501e-02					
SO4-2	1.127e-02	5.284e-03	-1.948	-2.277	-0.329	(0)
MgSO4	1.730e-03	1.730e-03	-2.762	-2.762	0.000	(0)
CaSO4	1.588e-03	1.588e-03	-2.799	-2.799	0.000	(0)
NaSO4-	2.738e-04	2.285e-04	-3.563	-3.641	-0.078	(0)
KSO4-	1.356e-04	1.132e-04	-3.868	-3.946	-0.078	(0)
MnSO4	1.687e-05	1.687e-05	-4.773	-4.773	0.000	(0)
ZnSO4	1.889e-06	1.889e-06	-5.724	-5.724	0.000	(0)
Zn (SO4) 2-2	2.349e-07	8.693e-08	-6.629	-7.061	-0.432	(0)
NiSO4	4.121e-08	4.121e-08	-7.385	-7.385	0.000	(0)
CoSO4	2.875e-08	2.875e-08	-7.541	-7.541	0.000	(0)
CuSO4	2.636e-08	2.636e-08	-7.579	-7.579	0.000	(0)
HSO4-	5.894e-09	4.877e-09	-8.230	-8.312	-0.082	(0)
CdSO4	4.645e-09	4.645e-09	-8.333	-8.333	0.000	(0)
NH4SO4-	3.798e-09	3.158e-09	-8.420	-8.501	-0.080	(0)
Cd (SO4) 2-2	8.948e-10	3.311e-10	-9.048	-9.480	-0.432	(0)
PbSO4	6.229e-10	6.229e-10	-9.206	-9.206	0.000	(0)
AgSO4-	1.845e-10	1.439e-10	-9.734	-9.842	-0.108	(0)
Pb (SO4) 2-2	5.360e-11	1.983e-11	-10.271	-10.703	-0.432	(0)
Ni (SO4) 2-2	1.948e-11	7.210e-12	-10.710	-11.142	-0.432	(0)
CrOHSO4	6.052e-12	6.052e-12	-11.218	-11.218	0.000	(0)
UO2SO4	6.382e-13	6.382e-13	-12.195	-12.195	0.000	(0)
FeSO4	3.272e-13	3.272e-13	-12.485	-12.485	0.000	(0)
UO2 (SO4) 2-2	1.201e-13	4.445e-14	-12.920	-13.352	-0.432	(0)
AlSO4+	6.583e-14	5.448e-14	-13.182	-13.264	-0.082	(0)
Al (SO4) 2-	3.727e-15	3.084e-15	-14.429	-14.511	-0.082	(0)
CrSO4+	3.276e-15	2.555e-15	-14.485	-14.593	-0.108	(0)
VO2SO4-	9.480e-19	7.394e-19	-18.023	-18.131	-0.108	(0)
FeSO4+	9.347e-20	7.773e-20	-19.029	-19.109	-0.080	(0)
Fe (SO4) 2-	1.126e-20	8.780e-21	-19.949	-20.056	-0.108	(0)
Cr2 (OH) 2SO4+2	7.135e-21	2.640e-21	-20.147	-20.578	-0.432	(0)
VOSO4	1.089e-21	1.089e-21	-20.963	-20.963	0.000	(0)
HgSO4	1.007e-21	1.007e-21	-20.997	-20.997	0.000	(0)
Cr2 (OH) 2 (SO4) 2	8.287e-22	8.287e-22	-21.082	-21.082	0.000	(0)
CrO3SO4-2	8.140e-24	3.012e-24	-23.089	-23.521	-0.432	(0)
VSO4+	1.896e-36	1.479e-36	-35.722	-35.830	-0.108	(0)
U (SO4) 2	2.951e-40	2.951e-40	-39.530	-39.530	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.721	-41.153	-0.432	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.751	-61.859	-0.108	(0)
Sb (3)	2.971e-20					
Sb (OH) 3	1.503e-20	1.503e-20	-19.823	-19.823	0.000	(0)
HSbO2	1.468e-20	1.468e-20	-19.833	-19.833	0.000	(0)
SbO2-	3.227e-24	2.517e-24	-23.491	-23.599	-0.108	(0)
Sb (OH) 4-	1.847e-24	1.440e-24	-23.734	-23.842	-0.108	(0)

Sb(OH) 2F	3.029e-26	3.029e-26	-25.519	-25.519	0.000	(0)
SbOF	2.980e-26	2.980e-26	-25.526	-25.526	0.000	(0)
Sb(OH) 2+	4.423e-27	3.450e-27	-26.354	-26.462	-0.108	(0)
SbO+	1.526e-27	1.190e-27	-26.817	-26.924	-0.108	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.156	-321.588	-0.432	(0)
Sb (5)	2.999e-08					
SbO3-	2.996e-08	2.336e-08	-7.524	-7.631	-0.108	(0)
Sb(OH) 6-	3.296e-11	2.728e-11	-10.482	-10.564	-0.082	(0)
SbO2+	7.672e-25	5.984e-25	-24.115	-24.223	-0.108	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.298e-39	1.012e-39	-38.887	-38.995	-0.108	(0)
MnSe	0.000e+00	0.000e+00	-41.101	-41.101	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.130	-43.130	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.538	-45.970	-0.432	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-81.563	-83.290	-1.727	(0)
Se (4)	1.457e-07					
HSeO3-	7.714e-08	6.016e-08	-7.113	-7.221	-0.108	(0)
SeO3-2	6.852e-08	2.536e-08	-7.164	-7.596	-0.432	(0)
H2SeO3	2.424e-13	2.424e-13	-12.615	-12.615	0.000	(0)
AgSeO3-	2.851e-14	2.224e-14	-13.545	-13.653	-0.108	(0)
Cd(SeO3) 2-2	5.370e-18	1.987e-18	-17.270	-17.702	-0.432	(0)
Ag(SeO3) 2-3	4.727e-20	5.048e-21	-19.325	-20.297	-0.971	(0)
FeHSeO3+2	5.633e-25	2.084e-25	-24.249	-24.681	-0.432	(0)
Se (6)	2.348e-10					
SeO4-2	2.343e-10	1.098e-10	-9.630	-9.959	-0.329	(0)
MnSeO4	5.309e-13	5.309e-13	-12.275	-12.275	0.000	(0)
ZnSeO4	2.780e-14	2.780e-14	-13.556	-13.556	0.000	(0)
NiSeO4	2.008e-15	2.008e-15	-14.697	-14.697	0.000	(0)
CoSeO4	1.501e-15	1.501e-15	-14.824	-14.824	0.000	(0)
CdSeO4	7.671e-17	7.671e-17	-16.115	-16.115	0.000	(0)
HSeO4-	6.668e-17	5.200e-17	-16.176	-16.284	-0.108	(0)
Zn(SeO4) 2-2	8.368e-24	3.096e-24	-23.077	-23.509	-0.432	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.048	-59.020	-0.971	(0)
U (4)	4.310e-19					
U(OH) 5-	4.308e-19	3.360e-19	-18.366	-18.474	-0.108	(0)
U(OH) 4	1.330e-22	1.330e-22	-21.876	-21.876	0.000	(0)
U(OH) 3+	5.894e-27	4.597e-27	-26.230	-26.338	-0.108	(0)
U(OH) 2+2	5.430e-32	2.009e-32	-31.265	-31.697	-0.432	(0)
UF3+	4.339e-36	3.384e-36	-35.363	-35.471	-0.108	(0)
UF2+2	4.228e-37	1.564e-37	-36.374	-36.806	-0.432	(0)
UOH+3	8.376e-38	8.945e-39	-37.077	-38.048	-0.971	(0)
UF4	5.065e-38	5.065e-38	-37.295	-37.295	0.000	(0)
UF+3	8.525e-40	0.000e+00	-39.069	-40.041	-0.971	(0)
UF5-	3.513e-40	2.740e-40	-39.454	-39.562	-0.108	(0)
U(SO4) 2	2.951e-40	2.951e-40	-39.530	-39.530	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.515	-40.947	-0.432	(0)
USO4+2	0.000e+00	0.000e+00	-40.721	-41.153	-0.432	(0)
U+4	0.000e+00	0.000e+00	-43.749	-45.476	-1.727	(0)
UCl+3	0.000e+00	0.000e+00	-45.400	-46.371	-0.971	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-160.900	-169.643	-8.743	(0)
U (5)	1.115e-15					
UO2+	1.115e-15	8.695e-16	-14.953	-15.061	-0.108	(0)
U (6)	3.826e-07					
UO2(CO3) 3-4	2.726e-07	5.112e-09	-6.564	-8.291	-1.727	(0)
UO2(CO3) 2-2	1.092e-07	4.040e-08	-6.962	-7.394	-0.432	(0)
UO2CO3	8.021e-10	8.021e-10	-9.096	-9.096	0.000	(0)
UO2OH+	1.372e-11	1.070e-11	-10.863	-10.971	-0.108	(0)
UO2F+	1.928e-12	1.504e-12	-11.715	-11.823	-0.108	(0)
UO2SO4	6.382e-13	6.382e-13	-12.195	-12.195	0.000	(0)
UO2F2	5.919e-13	5.919e-13	-12.228	-12.228	0.000	(0)
UO2+2	1.702e-13	7.980e-14	-12.769	-13.098	-0.329	(0)
UO2(SO4) 2-2	1.201e-13	4.445e-14	-12.920	-13.352	-0.432	(0)
UO2F3-	2.602e-14	2.029e-14	-13.585	-13.693	-0.108	(0)
(UO2) 3(OH) 5+	2.245e-15	1.751e-15	-14.649	-14.757	-0.108	(0)
(UO2) 2(OH) 2+2	5.137e-16	1.901e-16	-15.289	-15.721	-0.432	(0)
UO2Cl+	4.213e-16	3.286e-16	-15.375	-15.483	-0.108	(0)

UO2F4-2	5.946e-17	2.200e-17	-16.226	-16.658	-0.432	(0)
UO2NO3+	1.614e-21	1.259e-21	-20.792	-20.900	-0.108	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.639	-43.747	-0.108	(0)
V+2	0.000e+00	0.000e+00	-44.853	-45.285	-0.432	(0)
V (3)	5.783e-16					
V (OH) 3	5.783e-16	5.783e-16	-15.238	-15.238	0.000	(0)
V (OH) 2+	4.528e-27	3.532e-27	-26.344	-26.452	-0.108	(0)
VOH+2	8.556e-31	3.166e-31	-30.068	-30.499	-0.432	(0)
V+3	5.553e-36	5.930e-37	-35.255	-36.227	-0.971	(0)
VSO4+	1.896e-36	1.479e-36	-35.722	-35.830	-0.108	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.528	-58.500	-0.971	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-58.472	-60.199	-1.727	(0)
V (4)	2.077e-19					
V (OH) 3+	2.038e-19	1.589e-19	-18.691	-18.799	-0.108	(0)
VO+2	2.022e-21	7.482e-22	-20.694	-21.126	-0.432	(0)
VOSO4	1.089e-21	1.089e-21	-20.963	-20.963	0.000	(0)
VOF+	7.854e-22	6.125e-22	-21.105	-21.213	-0.108	(0)
VOF2	3.135e-23	3.135e-23	-22.504	-22.504	0.000	(0)
VOC1+	6.833e-24	5.329e-24	-23.165	-23.273	-0.108	(0)
VOF3-	1.947e-25	1.518e-25	-24.711	-24.819	-0.108	(0)
VOF4-2	2.261e-28	8.365e-29	-27.646	-28.078	-0.432	(0)
H2V2O4+2	3.425e-33	1.267e-33	-32.465	-32.897	-0.432	(0)
V (5)	6.578e-09					
H2VO4-	4.215e-09	3.287e-09	-8.375	-8.483	-0.108	(0)
HVO4-2	2.362e-09	8.742e-10	-8.627	-9.058	-0.432	(0)
H3VO4	3.105e-13	3.105e-13	-12.508	-12.508	0.000	(0)
HV2O7-3	9.124e-15	9.744e-16	-14.040	-15.011	-0.971	(0)
H3V2O7-	8.457e-15	6.596e-15	-14.073	-14.181	-0.108	(0)
VO4-3	4.343e-15	4.638e-16	-14.362	-15.334	-0.971	(0)
V2O7-4	1.481e-16	2.776e-18	-15.830	-17.557	-1.727	(0)
VO2+	7.083e-18	5.861e-18	-17.150	-17.232	-0.082	(0)
VO2F	1.403e-18	1.403e-18	-17.853	-17.853	0.000	(0)
VO2SO4-	9.480e-19	7.394e-19	-18.023	-18.131	-0.108	(0)
V3O9-3	3.491e-19	3.728e-20	-18.457	-19.429	-0.971	(0)
VO2F2-	8.915e-20	6.953e-20	-19.050	-19.158	-0.108	(0)
VO2F3-2	3.199e-22	1.184e-22	-21.495	-21.927	-0.432	(0)
V4O12-4	2.727e-24	5.112e-26	-23.564	-25.291	-1.727	(0)
VO2F4-3	7.445e-26	7.951e-27	-25.128	-26.100	-0.971	(0)
VO2NO3	2.344e-26	2.344e-26	-25.630	-25.630	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-64.135	-68.021	-3.886	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.161	-67.859	-2.698	(0)
H2V10O28-4	0.000e+00	0.000e+00	-68.949	-70.676	-1.727	(0)
Zn	6.166e-06					
Zn+2	3.485e-06	1.634e-06	-5.458	-5.787	-0.329	(0)
ZnSO4	1.889e-06	1.889e-06	-5.724	-5.724	0.000	(0)
ZnCO3	2.374e-07	2.374e-07	-6.624	-6.624	0.000	(0)
Zn (SO4) 2-2	2.349e-07	8.693e-08	-6.629	-7.061	-0.432	(0)
ZnOH+	2.232e-07	1.741e-07	-6.651	-6.759	-0.108	(0)
ZnHCO3+	3.371e-08	2.629e-08	-7.472	-7.580	-0.108	(0)
Zn (OH) 2	2.939e-08	2.939e-08	-7.532	-7.532	0.000	(0)
ZnOHC1	1.453e-08	1.453e-08	-7.838	-7.838	0.000	(0)
ZnCl+	1.266e-08	1.042e-08	-7.898	-7.982	-0.084	(0)
ZnF+	5.707e-09	4.451e-09	-8.244	-8.352	-0.108	(0)
Zn (OH) 3-	2.012e-10	1.569e-10	-9.696	-9.804	-0.108	(0)
ZnCl2	4.194e-11	4.194e-11	-10.377	-10.377	0.000	(0)
ZnCl3-	1.027e-13	8.457e-14	-12.988	-13.073	-0.084	(0)
ZnNO3+	4.162e-14	3.246e-14	-13.381	-13.489	-0.108	(0)
ZnSeO4	2.780e-14	2.780e-14	-13.556	-13.556	0.000	(0)
Zn (OH) 4-2	1.798e-14	6.655e-15	-13.745	-14.177	-0.432	(0)
ZnCl4-2	2.245e-16	1.074e-16	-15.649	-15.969	-0.320	(0)
Zn (NO3) 2	5.122e-23	5.122e-23	-22.291	-22.291	0.000	(0)
Zn (SeO4) 2-2	8.368e-24	3.096e-24	-23.077	-23.509	-0.432	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.485	-148.593	-0.108	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.608	-150.608	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.041	-226.149	-0.108	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.672	-228.104	-0.432	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.997	-306.429	-0.432	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-56.45	-50.16	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-43.66	-39.15	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-50.88	-39.15	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-72.83	-54.90	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-58.41	-38.38	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.10	-28.70	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.92	-24.47	0.45	(NH4) 2SeO4
Acanthite	-52.31	-88.53	-36.22	Ag2S
Ag2CO3	-12.24	-23.33	-11.09	Ag2CO3
Ag2CrO4	-20.33	-31.92	-11.59	Ag2CrO4
Ag2HVO4	-12.37	-10.89	1.48	Ag2HVO4
Ag2MoO4	-12.18	-23.73	-11.55	Ag2MoO4
Ag2O	-14.25	-1.68	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.19	-20.01	-4.82	Ag2SO4
Ag3AsO3	-28.30	-26.14	2.16	Ag3AsO3
Ag3AsO4	-16.71	-19.50	-2.79	Ag3AsO4
Ag3H2VO5	-16.91	-11.73	5.18	Ag3H2VO5
AgF:4H2O	-13.78	-12.73	1.05	AgF:4H2O
Agmetal	-0.11	-13.61	-13.51	Ag
AgVO3	-10.82	-10.05	0.77	AgVO3
Al (OH) 3 (am)	-1.60	9.20	10.80	Al (OH) 3
Al2 (MoO4) 3	-50.13	-47.76	2.37	Al2 (MoO4) 3
Al2O3	-1.26	18.39	19.65	Al2O3
Al4 (OH) 10SO4	-4.24	18.46	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.58	-7.78	4.80	AlAsO4:2H2O
AlOHSO4	-5.90	-9.13	-3.23	AlOHSO4
AlSb	-152.88	-87.26	65.62	AlSb
Alunite	-2.16	-3.56	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.11	-11.90	-7.79	PbSO4
Anhydrite	-0.80	-5.16	-4.36	CaSO4
Anilite	-55.41	-87.29	-31.88	Cu0.25Cu1.5S
Antlerite	-1.95	6.84	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-91.72	-94.48	-2.76	As4O6
Artinite	-4.64	4.96	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.65	-33.95	6.71	As2O5
Atacamite	-1.24	6.15	7.39	Cu2 (OH) 3Cl
Azurite	-1.23	-18.13	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.05	8.34	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.59	-1.72	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.32	6.62	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.22	-21.89	-9.67	BaCrO4
BaF2	-9.61	-15.43	-5.82	BaF2
BaMoO4	-6.74	-13.70	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.73	-6.90	1.83	BaSeO3
BaSeO4	-10.20	-17.66	-7.46	BaSeO4
Bianchite	-6.30	-8.07	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.55	-0.64	Mn2O3
BlaubleiI	-55.47	-79.64	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.89	-83.17	-27.28	Cu0.6Cu0.8S
Boehmite	0.62	9.20	8.58	AlOOH
Breithauptite	-56.52	-75.04	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.54	13.30	16.84	Mg (OH) 2
Bunsenite	-3.80	8.64	12.45	NiO
Ca (VO3) 2	-10.91	-5.25	5.66	Ca (VO3) 2

Ca2V2O7	-9.58	7.92	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.63	7.92	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.75	5.55	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.87	21.09	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.78	21.08	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.39	-153.41	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.26	-26.17	-17.91	Hg2Cl2
CaMoO4	-0.93	-8.88	-7.95	CaMoO4
Carnotite	-0.98	-0.75	0.23	KUO2VO4
CaSeO3:2H2O	-4.89	-2.08	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.82	-12.84	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.27	-1.43	9.84	Cd(BO2)2
Cd(OH)2	-6.02	7.62	13.64	Cd(OH)2
Cd(OH)2(am)	-6.11	7.62	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.49	-13.78	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.02	4.54	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.23	12.17	28.40	Cd4(OH)6SO4
CdCl2	-12.96	-13.62	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.62	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.62	-1.91	CdCl2:2.5H2O
CdF2	-14.94	-16.16	-1.21	CdF2
Cdmetal(alpha)	-31.44	-17.92	13.51	Cd
Cdmetal(gamma)	-31.54	-17.92	13.62	Cd
CdMoO4	-0.28	-14.43	-14.15	CdMoO4
CdOHCl	-6.53	-3.00	3.54	CdOHCl
CdSb	-75.71	-76.06	-0.35	CdSb
CdSe	-19.20	-39.40	-20.20	CdSe
CdSeO4:2H2O	-16.54	-18.39	-1.85	CdSeO4:2H2O
CdSO4	-10.53	-10.70	-0.17	CdSO4
CdSO4:1H2O	-8.98	-10.70	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.83	-10.70	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.71	-11.46	-9.75	AgCl
Cerrusite	-2.09	-15.22	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.30	-9.94	-2.64	CuSO4:5H2O
Chalcocite	-55.32	-90.24	-34.92	Cu2S
Chalcopyrite	-126.58	-161.85	-35.27	CuFeS2
Cinnabar	-52.43	-98.13	-45.69	HgS
Claudetite	-91.42	-94.48	-3.06	As4O6
Clausthalite	-13.49	-40.59	-27.10	PbSe
Co(BO2)2	-27.64	-0.57	27.07	Co(BO2)2
Co(OH)2	-4.61	8.48	13.09	Co(OH)2
Co(OH)3	-8.83	-11.14	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.53	-8.49	13.03	Co3(AsO4)2
Co3O4	-3.31	-13.80	-10.50	Co3O4
CoCl2	-21.02	-12.76	8.27	CoCl2
CoCl2:6H2O	-15.29	-12.76	2.54	CoCl2:6H2O
CoCO3	-3.18	-13.16	-9.98	CoCO3
CoF2	-13.70	-15.29	-1.60	CoF2
CoF3	-45.35	-46.81	-1.46	CoF3
CoFe2O4	18.40	14.87	-3.53	CoFe2O4
CoMoO4	-5.80	-13.57	-7.76	CoMoO4
CoO	-5.10	8.48	13.59	CoO
CoS(alpha)	-70.92	-78.36	-7.44	CoS
CoS(beta)	-67.29	-78.36	-11.07	CoS
CoSe	-22.33	-38.53	-16.20	CoSe
CoSeO3	-8.08	-6.76	1.32	CoSeO3
CoSeO4:6H2O	-16.00	-17.53	-1.53	CoSeO4:6H2O
CoSO4	-12.64	-9.84	2.80	CoSO4
CoSO4:6H2O	-7.37	-9.84	-2.47	CoSO4:6H2O
Cotunnite	-10.03	-14.81	-4.78	PbCl2
Covellite	-56.16	-78.46	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3

Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.34	-32.24	14.09	CrCl2
CrCl3	-48.15	-33.04	15.11	CrCl3
CrF3	-25.51	-36.85	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-10.51	-44.35	-33.84	Na3AlF6
Cu(OH)2	-0.29	8.39	8.67	Cu(OH)2
Cu(SbO3)2	-25.38	19.83	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.60	0.65	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.88	-89.77	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.61	-50.41	-45.80	Cu2Se
Cu2SO4	-19.77	-21.72	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.89	-8.79	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.95	-101.54	-42.59	Cu3Sb
Cu3Se2	-25.55	-89.04	-63.49	Cu3Se2
CuCO3	-1.76	-13.26	-11.50	CuCO3
CuCrO4	-16.41	-21.85	-5.44	CuCrO4
CuF	-8.68	-13.58	-4.91	CuF
CuF2	-16.51	-15.39	1.12	CuF2
CuF2:2H2O	-10.84	-15.39	-4.55	CuF2:2H2O
Cumetal	-5.71	-14.47	-8.76	Cu
CuMoO4	-0.59	-13.66	-13.08	CuMoO4
CuOCuSO4	-11.85	-1.55	10.30	CuOCuSO4
Cupricferrite	8.78	14.77	5.99	CuFe2O4
Cuprite	-1.98	-3.39	-1.41	Cu2O
Cuprousferrite	10.41	1.50	-8.92	CuFeO2
CuSe	-5.53	-38.63	-33.10	CuSe
CuSe2	-26.74	-60.11	-33.37	CuSe2
CuSeO3:2H2O	-7.37	-6.86	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.18	-17.62	-2.44	CuSeO4:5H2O
CuSO4	-12.88	-9.94	2.94	CuSO4
Diaspore	2.32	9.20	6.87	AlOOH
Djurleite	-55.54	-89.46	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.28	-16.82	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.27	-16.82	-17.09	CaMg(CO3)2
Epsomite	-2.90	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.05	0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.24	-14.96	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.42	-8.86	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.73	-39.35	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-44.86	-48.60	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.18	-13.78	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.51	-18.60	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.45	-65.04	-18.60	FeSe2
FeS(ppt)	-80.44	-83.39	-2.95	FeS
FeSe	-32.57	-43.57	-11.00	FeSe
Fix_pe	-4.75	-4.75	0.00	e-
Fluorite	-0.11	-10.61	-10.50	CaF2
Galena	-66.44	-80.41	-13.97	PbS
Gibbsite	0.91	9.20	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.05	-8.07	-2.01	ZnSO4:7H2O
Greenockite	-64.86	-79.22	-14.36	CdS
Greigite	-292.51	-337.55	-45.03	Fe3S4
Gummite	-4.72	2.95	7.67	UO3
Gypsum	-0.55	-5.16	-4.61	CaSO4:2H2O
H-Jarosite	-14.98	-27.08	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.17	-22.05	-12.88	H2MoO4
H2S(g)	-78.84	-86.85	-8.01	H2S
H2Se(g)	-42.06	-47.02	-4.96	H2Se
Halite	-6.29	-4.69	1.60	NaCl
Hausmannite	-1.58	59.45	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3

Hercynite	-1.05	21.85	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-185.23	-258.94	-73.71	Hg (CH ₃) ₂
Hg (g)	-7.36	-15.24	-7.87	Hg
Hg (OH) ₂	-7.79	-11.28	-3.50	Hg (OH) ₂
Hg ₂ (g)	-15.51	-30.47	-14.96	Hg ₂
Hg ₂ (OH) ₂	-10.19	-4.93	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-10.52	-26.57	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-26.46	-35.16	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-18.34	-28.70	-10.36	Hg ₂ F ₂
Hg ₂ S	-80.09	-91.77	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-15.51	-20.17	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-17.12	-23.25	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-25.81	-55.50	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-32.58	-13.08	19.50	HgCl
HgCl ₂	-11.26	-32.52	-21.26	HgCl ₂
HgF (g)	-47.03	-14.35	32.68	HgF
HgF ₂ (g)	-47.63	-35.06	12.57	HgF ₂
Hgmetal (l)	-1.78	-15.24	-13.45	Hg
HgSe	-2.61	-58.30	-55.69	HgSe
HgSeO ₃	-14.10	-26.53	-12.43	HgSeO ₃
HgSO ₄	-20.19	-29.61	-9.42	HgSO ₄
Huntite	-3.54	-33.51	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-5.23	-24.00	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-11.30	-20.07	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-16.78	-21.95	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-6.77	-21.57	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-32.22	-49.46	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-18.71	-19.23	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-14.30	-11.04	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-14.27	-15.00	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-5.03	-5.46	-0.43	PbO : PbSO ₄
Laurionite	-4.81	-4.19	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.26	6.43	12.69	PbO
Mackinawite	-79.79	-83.39	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.83	19.69	16.86	Fe ₂ MgO ₄
Magnesite	-0.88	-8.34	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	0.43	-4.87	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-6.46	6.43	12.89	PbO
Matlockite	-7.11	-16.08	-8.97	PbClF
Melanothallite	-19.11	-12.85	6.26	CuCl ₂
Melanterite	-12.67	-14.88	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-53.03	-98.13	-45.09	HgS
Mg (OH) ₂ (active)	-5.49	13.30	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-16.39	-5.11	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-273.58	-198.90	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.17	8.19	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.25	10.95	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.31	-16.93	5.38	MgCrO ₄
MgF ₂	-2.34	-10.47	-8.13	MgF ₂
MgMoO ₄	-6.90	-8.75	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-5.00	-1.94	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-11.51	-12.71	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-28.69	44.84	73.52	Pb ₃ O ₄
Mirabilite	-5.35	-6.47	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-12.01	-7.11	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-51.82	-57.53	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.70	-86.62	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-12.54	-0.04	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O
MnCl ₂ : 4H ₂ O	-12.65	-9.94	2.72	MnCl ₂ : 4H ₂ O
MnS (grn)	-75.71	-75.54	0.17	MnS
MnS (pnk)	-78.88	-75.54	3.34	MnS
MnSb	-94.82	-97.73	-2.91	MnSb

MnSe	-39.22	-35.72	3.50	MnSe
MnSeO3	-5.07	-3.94	1.13	MnSeO3
MnSeO3:2H2O	-4.92	-3.94	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.66	-14.71	-2.05	MnSeO4:5H2O
MnSO4	-9.61	-7.02	2.58	MnSO4
Monteponite	-7.48	7.62	15.10	CdO
Montroydite	-7.64	-11.28	-3.64	HgO
MoO3	-14.05	-22.05	-8.00	MoO3
Morenosite	-7.54	-9.69	-2.14	NiSO4:7H2O
MoS2	-151.03	-221.29	-70.26	MoS2
Na-Jarosite	-9.95	-21.15	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.72	-48.61	-9.90	Na2Cr2O7
Na2CrO4	-21.31	-18.38	2.93	Na2CrO4
Na2Mo2O7	-15.64	-32.24	-16.60	Na2Mo2O7
Na2MoO4	-11.68	-10.19	1.49	Na2MoO4
Na2MoO4:2H2O	-11.41	-10.19	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.69	-3.39	10.30	Na2SeO3:5H2O
Na2SeO4	-15.43	-14.15	1.28	Na2SeO4
Na3Sb	-173.12	-78.67	94.45	Na3Sb
Na3VO4	-28.10	8.58	36.68	Na3VO4
Na4V2O7	-32.09	5.31	37.40	Na4V2O7
Nantokite	-5.59	-12.32	-6.73	CuCl
NaSb	-88.15	-64.98	23.17	NaSb
Natron	-8.48	-9.79	-1.31	Na2CO3:10H2O
NaVO3	-7.14	-3.28	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-4.15	8.64	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.73	-8.03	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-15.76	16.24	32.00	Ni4(OH)6SO4
NiCO3	-6.14	-13.01	-6.87	NiCO3
NiMoO4	-2.27	-13.41	-11.14	NiMoO4
NiS(alpha)	-72.60	-78.20	-5.60	NiS
NiS(beta)	-67.10	-78.20	-11.10	NiS
NiS(gamma)	-65.40	-78.20	-12.80	NiS
NiSe	-20.68	-38.38	-17.70	NiSe
NiSeO3:2H2O	-9.42	-6.60	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.85	-17.37	-1.52	NiSeO4:6H2O
Nsutite	-6.01	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-246.71	-307.78	-61.07	As2S3
Otavite	-2.02	-14.02	-12.00	CdCO3
Pb(BO2)2	-9.15	-2.63	6.52	Pb(BO2)2
Pb(OH)2	-1.72	6.43	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-56.82	-65.58	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-6.55	2.24	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.33	12.86	26.19	Pb2O(OH)2
Pb2O3	-22.63	38.41	61.04	Pb2O3
Pb2OCO3	-8.23	-8.79	-0.56	Pb2OCO3
Pb2V2O7	-3.65	-5.55	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.46	-14.66	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.26	0.88	6.14	Pb3(VO4)2
Pb3O2CO3	-13.37	-2.35	11.02	Pb3O2CO3
Pb3O2SO4	-9.72	0.97	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.70	7.40	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.48	7.40	21.88	Pb4O3SO4
PbCrO4	-11.21	-23.81	-12.60	PbCrO4
PbF2	-9.91	-17.35	-7.44	PbF2
Pbmetal	-23.36	-19.11	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.55	6.43	12.98	PbO:0.33H2O
PbSeO4	-12.74	-19.58	-6.84	PbSeO4
Periclase	-8.28	13.30	21.58	MgO
Phosgenite	-10.22	-30.03	-19.81	PbCl2:PbCO3
Plattnerite	-17.62	31.98	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-126.19	-144.69	-18.51	FeS2
Pyrochroite	-3.89	11.30	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2

Realgar	-103.49	-123.24	-19.75	AsS
Retgersite	-7.65	-9.69	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.20	-18.70	-14.50	UO2CO3
Sb(OH)3	-12.71	-19.82	-7.11	Sb(OH)3
Sb2O4	-17.50	-14.10	3.40	Sb2O4
Sb2O5	-27.51	-37.18	-9.67	Sb2O5
Sb2Se3	-112.95	-180.70	-67.76	Sb2Se3
Sb4O6(cubic)	-61.03	-79.29	-18.26	Sb4O6
Sb4O6(orth)	-61.39	-79.29	-17.90	Sb4O6
SbCl3	-52.25	-51.68	0.57	SbCl3
SbF3	-45.27	-55.49	-10.23	SbF3
Sbmetal	-46.45	-58.14	-11.69	Sb
SbO2	-3.54	-31.36	-27.82	SbO2
Schoepite	-3.04	2.95	5.99	UO2(OH)2:H2O
Semetal(am)	-14.36	-21.47	-7.11	Se
Semetal(hex)	-13.77	-21.47	-7.71	Se
Senarmontite	-27.28	-39.65	-12.37	Sb2O3
SeO2	-15.37	-15.25	0.12	SeO2
SeO3	-47.05	-26.01	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.38	-11.38	-10.00	ZnCO3
Sphalerite	-65.13	-76.58	-11.45	ZnS
Spinel	-5.15	31.70	36.85	MgAl2O4
Stibnite	-249.72	-300.18	-50.46	Sb2S3
Sulfur	-59.16	-61.30	-2.14	S
Tenorite	0.74	8.39	7.64	CuO
Thenardite	-6.79	-6.47	0.32	Na2SO4
Thermonatrite	-10.42	-9.79	0.64	Na2CO3:H2O
Tyuyamunite	-3.43	0.65	4.08	Ca(UO2)2(VO4)2
U3O8	-10.13	10.96	21.08	U3O8
U3Sb4	-578.34	-425.96	152.38	U3Sb4
U4O9	-24.95	-27.97	-3.02	U4O9
UF4	-31.40	-60.94	-29.54	UF4
UF4:2.5H2O	-28.22	-60.94	-32.72	UF4:2.5H2O
UO2(am)	-14.31	-13.38	0.93	UO2
UO2(NO3)2	-41.45	-29.30	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.15	-29.30	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.69	-29.30	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.35	-29.30	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.66	2.95	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.81	-23.06	-2.25	UO2SeO4:4H2O
UO3	-4.75	2.95	7.70	UO3
Uraninite	-8.71	-13.38	-4.67	UO2
USb2	-219.54	-189.96	29.58	USb2
V(OH)3	-19.74	-12.15	7.59	V(OH)3
V2O5	-17.05	-18.41	-1.36	V2O5
V3O5	-42.61	-40.78	1.84	V3O5
V4O7	-53.04	-45.85	7.19	V4O7
V6O13	-45.47	-106.33	-60.86	V6O13
Valentinite	-31.16	-39.65	-8.48	Sb2O3
VC12	-65.04	-46.17	18.87	VC12
VC13	-67.45	-44.01	23.43	VC13
VF4	-67.56	-52.63	14.93	VF4
Vmetal	-94.50	-50.47	44.03	V
VO	-39.68	-24.93	14.76	VO
VO(OH)2	-10.23	-5.08	5.15	VO(OH)2
VO2Cl	-22.67	-19.83	2.84	VO2Cl
VOC1	-33.93	-22.77	11.15	VOC1
VOC12	-39.08	-26.32	12.76	VOC12
VOSO4	-27.01	-23.40	3.61	VOSO4
Witherite	-4.73	-13.30	-8.57	BaCO3
Wurtzite	-67.63	-76.58	-8.95	ZnS
Zincite	-1.07	10.26	11.33	ZnO
Zincosite	-11.99	-8.06	3.93	ZnSO4
Zn(BO2)2	-7.08	1.21	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.31	-21.99	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.94	10.26	12.20	Zn(OH)2

Zn(OH)2(am)	-2.21	10.26	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.49	10.26	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.27	10.26	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.47	10.26	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.30	2.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.29	9.90	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.81	-3.16	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.78	-5.86	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.68	22.72	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.43	30.07	38.50	Zn5(OH)8Cl2
ZnCl2	-18.03	-10.98	7.05	ZnCl2
ZnCO3:1H2O	-1.12	-11.38	-10.26	ZnCO3:1H2O
ZnF2	-12.98	-13.52	-0.53	ZnF2
Znmetal	-41.07	-15.28	25.79	Zn
ZnMoO4	-1.66	-11.79	-10.13	ZnMoO4
ZnO(active)	-0.93	10.26	11.19	ZnO
ZnS(am)	-67.53	-76.58	-9.05	ZnS
ZnSb	-84.44	-73.42	11.01	ZnSb
ZnSe	-22.36	-36.76	-14.40	ZnSe
ZnSeO4:6H2O	-14.23	-15.75	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.43	-8.06	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
 For ideal gases, phi = 1.

 End of simulation.

Appendix I(iii) – Reclaimed Pit Model with Rapid Fill

Input file: P:\U3939 Copper Flat Scoping Study\Project\Data\Geochemical
modelling\Pit Lake models\Future pit lake predictions\Revised rapid fill July
2017\Reclaimed pit\1. No FeOx
addn\Copper_Flat_rapid_refill_July2017_Rev03_reclaimed.pqi
Output file: P:\U3939 Copper Flat Scoping Study\Project\Data\Geochemical
modelling\Pit Lake models\Future pit lake predictions\Revised rapid fill July
2017\Reclaimed pit\1. No FeOx
addn\Copper_Flat_rapid_refill_July2017_Rev03_reclaimed.pqi
Database file: C:\Program Files (x86)\USGS\Phreeqc Interactive 3.3.12-
12704\database\minteq.v8.dat

Reading data base.

SOLUTION_MASTER_SPECIES
SOLUTION_SPECIES
SOLUTION_SPECIES
PHASES
PHASES
SURFACE_MASTER_SPECIES
SURFACE_SPECIES
END

Reading input data for simulation 1.

DATABASE C:\Program Files (x86)\USGS\Phreeqc Interactive 3.3.12-
12704\database\minteq.v8.dat
Title Copper_Flat_rapid_refill_July2017_Rev03_reclaimed
KNOBS
 iterations 10000
 convergence_tolerance 1e-007
 tolerance 1e-016
 step_size 100
 pe_step_size 5
end

TITLE

Copper_Flat_rapid_refill_July2017_Rev03_reclaimed

End of simulation.

Reading input data for simulation 2.

SELECTED_OUTPUT
file
Copper_Flat_rapid_refill_July2017_Rev03_reclaimed.xls
 selected_out true
 high_precision true
 simulation true
 state true
 solution true
 distance false
 time false
 step false
 ph true
 pe true
 alkalinity true
 ionic_strength false
 water false
 charge_balance false

```

totals          C(4)  Ag Al  As  B  Ba Ca  Cd  Co  Cr
                Cu  F  Fe  Hg  K  Mg  Mn  Mo
                Na  Ni  Pb  Sb  Se  U  V
                Zn S(6) Cl  N(3) N(5)
saturation_indices Gypsum
end
-----
End of simulation.
-----

-----
Reading input data for simulation 3.
-----

SOLUTION 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila
Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric
Deposition Program.
temp          25
pH            4.93
pe            4
redox         N(-3)/N(5)
units         mg/l
density       1
Ca            0.209
Mg 0.021
Na 0.075
K            0.030
Cl 0.117
CO2(g)       -3.5
S(6)         0.862 as SO4
N(-3)        0.167 as NH4
N(5)         0.826 as NO3
C(4)         0.1
water        1 # kg
end
WARNING: Could not find element in database, CO2(g).
Concentration is set to zero.
-----
Beginning of initial solution calculations.
-----

Initial solution 1. Average rainwater chemistry (1985-2011) - Station NM01 (Gila
Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric
Deposition Program.

-----Solution composition-----

Elements          Molality          Moles
C(4)              1.666e-06      1.666e-06
Ca                5.215e-06      5.215e-06
Cl               3.300e-06      3.300e-06
K                7.673e-07      7.673e-07
Mg              8.640e-07      8.640e-07
N(-3)            9.258e-06      9.258e-06
N(5)            1.332e-05      1.332e-05
Na              3.262e-06      3.262e-06
S(6)            8.973e-06      8.973e-06

-----Description of solution-----

pH = 4.930
pe = 4.000
Activity of water = 1.000
Ionic strength (mol/kgw) = 5.095e-05
Mass of water (kg) = 1.000e+00
Total alkalinity (eq/kg) = -1.179e-05
Total CO2 (mol/kg) = 1.666e-06

```

Temperature (°C) = 25.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 3.72
 Iterations = 8
 Total H = 1.110137e+02
 Total O = 5.550691e+01

-----Redox couples-----

Redox couple pe Eh (volts)

N(-3)/N(5) 8.7419 0.5171

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.185e-05	1.175e-05	-4.926	-4.930	-0.004	0.00
OH-	8.642e-10	8.570e-10	-9.063	-9.067	-0.004	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
C(4)	1.666e-06					
H2CO3	1.605e-06	1.605e-06	-5.794	-5.794	0.000	(0)
HCO3-	6.125e-08	6.074e-08	-7.213	-7.216	-0.004	(0)
CaHCO3+	5.742e-12	5.695e-12	-11.241	-11.245	-0.004	(0)
MgHCO3+	5.231e-13	5.187e-13	-12.281	-12.285	-0.004	(0)
CO3-2	2.506e-13	2.424e-13	-12.601	-12.615	-0.014	(0)
NaHCO3	1.105e-13	1.105e-13	-12.957	-12.957	0.000	(0)
CaCO3	1.934e-15	1.934e-15	-14.714	-14.714	0.000	(0)
MgCO3	1.682e-16	1.682e-16	-15.774	-15.774	0.000	(0)
NaCO3-	1.472e-17	1.460e-17	-16.832	-16.836	-0.004	(0)
Ca	5.215e-06					
Ca+2	5.205e-06	5.035e-06	-5.284	-5.298	-0.014	(0)
CaSO4	9.986e-09	9.986e-09	-8.001	-8.001	0.000	(0)
CaNO3+	2.121e-10	2.103e-10	-9.673	-9.677	-0.004	(0)
CaHCO3+	5.742e-12	5.695e-12	-11.241	-11.245	-0.004	(0)
CaOH+	8.681e-14	8.609e-14	-13.061	-13.065	-0.004	(0)
CaNH3+2	2.920e-15	2.824e-15	-14.535	-14.549	-0.015	(0)
CaCO3	1.934e-15	1.934e-15	-14.714	-14.714	0.000	(0)
Ca (NH3) 2+2	5.179e-25	5.008e-25	-24.286	-24.300	-0.015	(0)
Cl	3.300e-06					
Cl-	3.300e-06	3.273e-06	-5.481	-5.485	-0.004	(0)
H(0)	6.416e-31					
H2	3.208e-31	3.208e-31	-30.494	-30.494	0.000	(0)
K	7.673e-07					
K+	7.673e-07	7.609e-07	-6.115	-6.119	-0.004	(0)
KSO4-	4.703e-11	4.664e-11	-10.328	-10.331	-0.004	(0)
Mg	8.640e-07					
Mg+2	8.627e-07	8.345e-07	-6.064	-6.079	-0.014	(0)
MgSO4	1.315e-09	1.315e-09	-8.881	-8.881	0.000	(0)
MgHCO3+	5.231e-13	5.187e-13	-12.281	-12.285	-0.004	(0)
MgOH+	2.871e-13	2.847e-13	-12.542	-12.546	-0.004	(0)
MgCO3	1.682e-16	1.682e-16	-15.774	-15.774	0.000	(0)
N(-3)	9.258e-06					
NH4+	9.257e-06	9.180e-06	-5.034	-5.037	-0.004	(0)
NH4SO4-	8.587e-10	8.517e-10	-9.066	-9.070	-0.004	(0)
NH3	4.455e-10	4.455e-10	-9.351	-9.351	0.000	(0)
CaNH3+2	2.920e-15	2.824e-15	-14.535	-14.549	-0.015	(0)
Ca (NH3) 2+2	5.179e-25	5.008e-25	-24.286	-24.300	-0.015	(0)
N(5)	1.332e-05					
NO3-	1.332e-05	1.321e-05	-4.875	-4.879	-0.004	(0)
CaNO3+	2.121e-10	2.103e-10	-9.673	-9.677	-0.004	(0)
Na	3.262e-06					
Na+	3.262e-06	3.235e-06	-5.486	-5.490	-0.004	(0)
NaSO4-	1.517e-10	1.504e-10	-9.819	-9.823	-0.004	(0)
NaHCO3	1.105e-13	1.105e-13	-12.957	-12.957	0.000	(0)
NaCO3-	1.472e-17	1.460e-17	-16.832	-16.836	-0.004	(0)
O(0)	9.851e-32					

O2	4.926e-32	4.926e-32	-31.308	-31.308	0.000	(0)
S(6)	8.973e-06					
SO4-2	8.951e-06	8.658e-06	-5.048	-5.063	-0.014	(0)
HSO4-	1.002e-08	9.941e-09	-7.999	-8.003	-0.004	(0)
CaSO4	9.986e-09	9.986e-09	-8.001	-8.001	0.000	(0)
MgSO4	1.315e-09	1.315e-09	-8.881	-8.881	0.000	(0)
NH4SO4-	8.587e-10	8.517e-10	-9.066	-9.070	-0.004	(0)
NaSO4-	1.517e-10	1.504e-10	-9.819	-9.823	-0.004	(0)
KSO4-	4.703e-11	4.664e-11	-10.328	-10.331	-0.004	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
Anhydrite	-6.00	-10.36	-4.36		CaSO4
Aragonite	-9.61	-17.91	-8.30		CaCO3
Artinite	-24.51	-14.91	9.60		MgCO3:Mg(OH)2:3H2O
Brucite	-13.06	3.78	16.84		Mg(OH)2
Calcite	-9.43	-17.91	-8.48		CaCO3
CH4(g)	-90.81	-131.85	-41.05		CH4
CO2(g)	-4.33	-22.48	-18.15		CO2
Dolomite(disordered)	-20.07	-36.61	-16.54		CaMg(CO3)2
Dolomite(ordered)	-19.52	-36.61	-17.09		CaMg(CO3)2
Epsomite	-9.01	-11.14	-2.13		MgSO4:7H2O
Gypsum	-5.75	-10.36	-4.61		CaSO4:2H2O
Halite	-12.58	-10.98	1.60		NaCl
Huntite	-44.03	-74.00	-29.97		CaMg3(CO3)4
Hydromagnesite	-62.23	-70.99	-8.77		Mg5(CO3)4(OH)2:4H2O
Lime	-28.14	4.56	32.70		CaO
Magnesite	-11.23	-18.69	-7.46		MgCO3
Mg(OH)2(active)	-15.01	3.78	18.79		Mg(OH)2
Mirabilite	-14.93	-16.04	-1.11		Na2SO4:10H2O
Natron	-22.28	-23.60	-1.31		Na2CO3:10H2O
Nesquehonite	-14.02	-18.69	-4.67		MgCO3:3H2O
O2(g)	-28.40	54.69	83.09		O2
Periclase	-17.80	3.78	21.58		MgO
Portlandite	-18.24	4.56	22.80		Ca(OH)2
Thenardite	-16.36	-16.04	0.32		Na2SO4
Thermonatrite	-24.23	-23.60	0.64		Na2CO3:H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 4.

SOLUTION 2 JSAI September 2015 average groundwater chemistry for wells
GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected between 1996
and 2013

```

temp      25
pH        7.85
units     mg/l
density   1
Alkalinity 408 as HCO3
Ag 0.009
Al 0.029
As 0.0023
B         0.136
Ba 0.089
Ca 85.8
Cd 0.0008
Cl 49
Co 0.008

```

```

Cr 0.0066
Cu 0.0061
F      2.1
Fe 1.48
Hg 0.000002
K      2.96
Mg 19.3
Mn 0.66
Mo 0.012
Na 119 charge
Ni 0.0125
Pb 0.0025
S(6)    84 as SO4
Sb 0.0009
Se 0.0015
U      0.0015
V      0.0009
Zn 0.03
water   1 # kg

```

end

Beginning of initial solution calculations.

Initial solution 2. JSAI September 2015 average groundwater chemistry for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected between 1996 and 2013

-----Solution composition-----

Elements	Molality	Moles	
Ag	8.350e-08	8.350e-08	
Al	1.076e-06	1.076e-06	
Alkalinity	6.692e-03	6.692e-03	
As	3.072e-08	3.072e-08	
B	1.259e-05	1.259e-05	
Ba	6.486e-07	6.486e-07	
Ca	2.142e-03	2.142e-03	
Cd	7.122e-09	7.122e-09	
Cl	1.383e-03	1.383e-03	
Co	1.359e-07	1.359e-07	
Cr	1.270e-07	1.270e-07	
Cu	9.607e-08	9.607e-08	
F	1.106e-04	1.106e-04	
Fe	2.652e-05	2.652e-05	
Hg	9.978e-12	9.978e-12	
K	7.577e-05	7.577e-05	
Mg	7.947e-04	7.947e-04	
Mn	1.202e-05	1.202e-05	
Mo	1.252e-07	1.252e-07	
Na	3.928e-03	3.928e-03	Charge balance
Ni	2.131e-07	2.131e-07	
Pb	1.207e-08	1.207e-08	
S(6)	8.751e-04	8.751e-04	
Sb	7.398e-09	7.398e-09	
Se	1.901e-08	1.901e-08	
U	6.307e-09	6.307e-09	
V	1.768e-08	1.768e-08	
Zn	4.591e-07	4.591e-07	

-----Description of solution-----

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pH = 7.850
pe = 4.000
Activity of water = 1.000
Ionic strength (mol/kgw) = 1.264e-02
Mass of water (kg) = 1.000e+00

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Total carbon (mol/kg) = 6.781e-03
 Total CO2 (mol/kg) = 6.781e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 1.173e-17
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 11
 Total H = 1.110207e+02
 Total O = 5.553078e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.010e-07	7.127e-07	-6.096	-6.147	-0.051	(0)
H+	1.583e-08	1.413e-08	-7.800	-7.850	-0.050	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	8.350e-08					
AgCl	3.403e-08	3.403e-08	-7.468	-7.468	0.000	(0)
Ag+	1.514e-08	1.351e-08	-7.820	-7.869	-0.050	(0)
Ag2Se	1.500e-08	1.500e-08	-7.824	-7.824	0.000	(0)
AgCl2-	4.173e-09	3.657e-09	-8.380	-8.437	-0.057	(0)
AgSO4-	1.379e-10	1.208e-10	-9.861	-9.918	-0.057	(0)
AgCl3-2	6.818e-12	4.021e-12	-11.166	-11.396	-0.229	(0)
AgF	3.142e-12	3.142e-12	-11.503	-11.503	0.000	(0)
AgOH	9.627e-13	9.627e-13	-12.017	-12.017	0.000	(0)
AgH2BO3	1.058e-13	1.058e-13	-12.976	-12.976	0.000	(0)
AgCl4-3	3.324e-14	1.013e-14	-13.478	-13.994	-0.516	(0)
AgSeO3-	6.912e-15	6.057e-15	-14.160	-14.218	-0.057	(0)
Ag (OH) 2-	7.650e-17	6.704e-17	-16.116	-16.174	-0.057	(0)
Ag (SeO3) 2-3	1.241e-22	3.784e-23	-21.906	-22.422	-0.516	(0)
Ag2MoO4	5.474e-24	5.474e-24	-23.262	-23.262	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-73.603	-74.520	-0.917	(0)
Al	1.076e-06					
Al (OH) 4-	1.064e-06	9.502e-07	-5.973	-6.022	-0.049	(0)
Al (OH) 3	1.059e-08	1.059e-08	-7.975	-7.975	0.000	(0)
Al (OH) 2+	8.315e-10	7.448e-10	-9.080	-9.128	-0.048	(0)
AlF3	7.345e-11	7.345e-11	-10.134	-10.134	0.000	(0)
AlF2+	7.034e-11	6.301e-11	-10.153	-10.201	-0.048	(0)
AlF4-	3.817e-12	3.408e-12	-11.418	-11.467	-0.049	(0)
AlF+2	2.655e-12	1.709e-12	-11.576	-11.767	-0.191	(0)
AlOH+2	2.043e-12	1.316e-12	-11.690	-11.881	-0.191	(0)
AlSO4+	7.193e-15	6.423e-15	-14.143	-14.192	-0.049	(0)
Al+3	5.161e-15	1.846e-15	-14.287	-14.734	-0.446	(0)
Al (SO4) 2-	3.455e-17	3.085e-17	-16.462	-16.511	-0.049	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-48.931	-49.447	-0.516	(0)
As (3)	8.661e-20					
H3AsO3	8.317e-20	8.317e-20	-19.080	-19.080	0.000	(0)
H2AsO3-	3.446e-21	3.020e-21	-20.463	-20.520	-0.057	(0)
HAsO3-2	3.306e-25	1.950e-25	-24.481	-24.710	-0.229	(0)
H4AsO3+	6.642e-28	5.820e-28	-27.178	-27.235	-0.057	(0)
AsO3-3	1.746e-30	5.321e-31	-29.758	-30.274	-0.516	(0)
As (5)	3.072e-08					
HAsO4-2	2.826e-08	1.667e-08	-7.549	-7.778	-0.229	(0)
H2AsO4-	2.450e-09	2.147e-09	-8.611	-8.668	-0.057	(0)
AsO4-3	1.224e-11	3.731e-12	-10.912	-11.428	-0.516	(0)
H3AsO4	5.255e-15	5.270e-15	-14.279	-14.278	0.001	(0)
B	1.259e-05					
H3BO3	1.198e-05	1.202e-05	-4.921	-4.920	0.001	(0)
H2BO3-	5.576e-07	4.941e-07	-6.254	-6.306	-0.052	(0)
CaH2BO3+	3.755e-08	3.327e-08	-7.425	-7.478	-0.052	(0)
MgH2BO3+	8.762e-09	7.764e-09	-8.057	-8.110	-0.052	(0)
NaH2BO3	2.729e-09	2.729e-09	-8.564	-8.564	0.000	(0)
BF (OH) 3-	5.011e-10	4.440e-10	-9.300	-9.353	-0.052	(0)
BaH2BO3+	6.776e-12	6.005e-12	-11.169	-11.222	-0.052	(0)
H5 (BO3) 2-	5.704e-12	5.055e-12	-11.244	-11.296	-0.052	(0)
AgH2BO3	1.058e-13	1.058e-13	-12.976	-12.976	0.000	(0)
BF2 (OH) 2-	7.008e-14	6.210e-14	-13.154	-13.207	-0.052	(0)

	H8 (BO3) 3-	6.855e-15	6.075e-15	-14.164	-14.216	-0.052	(0)
	BF3OH-	3.567e-20	3.161e-20	-19.448	-19.500	-0.052	(0)
	BF4-	2.296e-25	2.035e-25	-24.639	-24.692	-0.052	(0)
Ba	6.486e-07						
	Ba+2	6.210e-07	3.932e-07	-6.207	-6.405	-0.198	(0)
	BaHCO3+	2.379e-08	2.135e-08	-7.624	-7.671	-0.047	(0)
	BaCO3	3.805e-09	3.805e-09	-8.420	-8.420	0.000	(0)
	BaH2BO3+	6.776e-12	6.005e-12	-11.169	-11.222	-0.052	(0)
	BaOH+	1.368e-12	1.223e-12	-11.864	-11.912	-0.048	(0)
C (4)	6.781e-03						
	HCO3-	6.347e-03	5.685e-03	-2.197	-2.245	-0.048	(0)
	H2CO3	1.806e-04	1.806e-04	-3.743	-3.743	0.000	(0)
	CaHCO3+	1.380e-04	1.239e-04	-3.860	-3.907	-0.047	(0)
	CaCO3	3.500e-05	3.500e-05	-4.456	-4.456	0.000	(0)
	CO3-2	2.980e-05	1.887e-05	-4.526	-4.724	-0.198	(0)
	MgHCO3+	2.958e-05	2.636e-05	-4.529	-4.579	-0.050	(0)
	NaHCO3	1.114e-05	1.114e-05	-4.953	-4.953	0.000	(0)
	MgCO3	7.112e-06	7.112e-06	-5.148	-5.148	0.000	(0)
	NaCO3-	1.367e-06	1.224e-06	-5.864	-5.912	-0.048	(0)
	MnHCO3+	7.982e-07	7.140e-07	-6.098	-6.146	-0.048	(0)
	ZnCO3	1.626e-07	1.626e-07	-6.789	-6.789	0.000	(0)
	CuCO3	8.486e-08	8.486e-08	-7.071	-7.071	0.000	(0)
	NiHCO3+	5.345e-08	4.684e-08	-7.272	-7.329	-0.057	(0)
	NiCO3	4.705e-08	4.705e-08	-7.327	-7.327	0.000	(0)
	ZnHCO3+	3.072e-08	2.692e-08	-7.513	-7.570	-0.057	(0)
	CoHCO3+	2.603e-08	2.281e-08	-7.585	-7.642	-0.057	(0)
	BaHCO3+	2.379e-08	2.135e-08	-7.624	-7.671	-0.047	(0)
	CoCO3	1.645e-08	1.645e-08	-7.784	-7.784	0.000	(0)
	PbCO3	9.685e-09	9.685e-09	-8.014	-8.014	0.000	(0)
	FeHCO3+	9.130e-09	8.194e-09	-8.040	-8.086	-0.047	(0)
	Cu (CO3) 2-2	7.308e-09	4.310e-09	-8.136	-8.366	-0.229	(0)
	UO2 (CO3) 3-4	5.181e-09	6.267e-10	-8.286	-9.203	-0.917	(0)
	BaCO3	3.805e-09	3.805e-09	-8.420	-8.420	0.000	(0)
	CdCO3	1.339e-09	1.339e-09	-8.873	-8.873	0.000	(0)
	UO2 (CO3) 2-2	1.124e-09	6.627e-10	-8.949	-9.179	-0.229	(0)
	Pb (CO3) 2-2	8.937e-10	5.271e-10	-9.049	-9.278	-0.229	(0)
	PbHCO3+	8.231e-10	7.213e-10	-9.085	-9.142	-0.057	(0)
	CuHCO3+	3.126e-10	2.740e-10	-9.505	-9.562	-0.057	(0)
	CdHCO3+	4.600e-11	4.031e-11	-10.337	-10.395	-0.057	(0)
	Cd (CO3) 2-2	3.177e-11	1.874e-11	-10.498	-10.727	-0.229	(0)
	UO2CO3	1.760e-12	1.760e-12	-11.754	-11.754	0.000	(0)
	HgCO3	2.441e-18	2.441e-18	-17.612	-17.612	0.000	(0)
	Hg (CO3) 2-2	2.470e-19	1.457e-19	-18.607	-18.837	-0.229	(0)
	HgHCO3+	7.327e-22	6.421e-22	-21.135	-21.192	-0.057	(0)
Ca	2.142e-03						
	Ca+2	1.848e-03	1.170e-03	-2.733	-2.932	-0.198	(0)
	CaHCO3+	1.380e-04	1.239e-04	-3.860	-3.907	-0.047	(0)
	CaSO4	1.202e-04	1.202e-04	-3.920	-3.920	0.000	(0)
	CaCO3	3.500e-05	3.500e-05	-4.456	-4.456	0.000	(0)
	CaF+	1.322e-06	1.183e-06	-5.879	-5.927	-0.048	(0)
	CaH2BO3+	3.755e-08	3.327e-08	-7.425	-7.478	-0.052	(0)
	CaOH+	1.854e-08	1.664e-08	-7.732	-7.779	-0.047	(0)
Cd	7.122e-09						
	Cd+2	4.918e-09	3.114e-09	-8.308	-8.507	-0.198	(0)
	CdCO3	1.339e-09	1.339e-09	-8.873	-8.873	0.000	(0)
	CdCl+	4.187e-10	3.669e-10	-9.378	-9.435	-0.057	(0)
	CdSO4	3.272e-10	3.272e-10	-9.485	-9.485	0.000	(0)
	CdHCO3+	4.600e-11	4.031e-11	-10.337	-10.395	-0.057	(0)
	Cd (CO3) 2-2	3.177e-11	1.874e-11	-10.498	-10.727	-0.229	(0)
	CdOH+	2.012e-11	1.763e-11	-10.696	-10.754	-0.057	(0)
	CdOHC1	1.073e-11	1.073e-11	-10.970	-10.970	0.000	(0)
	CdF+	5.215e-12	4.570e-12	-11.283	-11.340	-0.057	(0)
	Cd (SO4) 2-2	3.355e-12	1.978e-12	-11.474	-11.704	-0.229	(0)
	CdCl2	1.887e-12	1.887e-12	-11.724	-11.724	0.000	(0)
	Cd (OH) 2	7.927e-14	7.927e-14	-13.101	-13.101	0.000	(0)
	CdCl3-	1.677e-15	1.469e-15	-14.776	-14.833	-0.057	(0)
	CdF2	8.443e-16	8.443e-16	-15.074	-15.074	0.000	(0)
	Cd (OH) 3-	3.939e-18	3.451e-18	-17.405	-17.462	-0.057	(0)

	Cd2OH+3	9.028e-19	2.752e-19	-18.044	-18.560	-0.516	(0)
	CdSeO4	2.506e-20	2.506e-20	-19.601	-19.601	0.000	(0)
	Cd (SeO3) 2-2	2.118e-21	1.249e-21	-20.674	-20.903	-0.229	(0)
	Cd (OH) 4-2	6.827e-25	4.026e-25	-24.166	-24.395	-0.229	(0)
Cl	1.383e-03						
	Cl-	1.383e-03	1.234e-03	-2.859	-2.909	-0.050	(0)
	AgCl	3.403e-08	3.403e-08	-7.468	-7.468	0.000	(0)
	MnCl+	1.093e-08	9.777e-09	-7.961	-8.010	-0.048	(0)
	AgCl2-	4.173e-09	3.657e-09	-8.380	-8.437	-0.057	(0)
	ZnCl+	5.206e-10	4.640e-10	-9.284	-9.333	-0.050	(0)
	ZnOHC1	4.329e-10	4.329e-10	-9.364	-9.364	0.000	(0)
	CdCl+	4.187e-10	3.669e-10	-9.378	-9.435	-0.057	(0)
	CoCl+	2.512e-10	2.201e-10	-9.600	-9.657	-0.057	(0)
	NiCl+	2.407e-10	2.110e-10	-9.618	-9.676	-0.057	(0)
	CuCl	5.811e-11	5.811e-11	-10.236	-10.236	0.000	(0)
	MnCl2	1.704e-11	1.704e-11	-10.769	-10.769	0.000	(0)
	CuCl2-	1.680e-11	1.498e-11	-10.775	-10.825	-0.050	(0)
	CdOHC1	1.073e-11	1.073e-11	-10.970	-10.970	0.000	(0)
	PbCl+	8.530e-12	7.475e-12	-11.069	-11.126	-0.057	(0)
	AgCl3-2	6.818e-12	4.021e-12	-11.166	-11.396	-0.229	(0)
	CdCl2	1.887e-12	1.887e-12	-11.724	-11.724	0.000	(0)
	CuCl+	1.676e-12	1.494e-12	-11.776	-11.826	-0.050	(0)
	ZnCl2	9.074e-13	9.074e-13	-12.042	-12.042	0.000	(0)
	PbCl2	4.120e-14	4.120e-14	-13.385	-13.385	0.000	(0)
	AgCl4-3	3.324e-14	1.013e-14	-13.478	-13.994	-0.516	(0)
	MnCl3-	6.473e-15	5.791e-15	-14.189	-14.237	-0.048	(0)
	CuCl3-2	6.170e-15	3.951e-15	-14.210	-14.403	-0.194	(0)
	CdCl3-	1.677e-15	1.469e-15	-14.776	-14.833	-0.057	(0)
	NiCl2	1.311e-15	1.311e-15	-14.883	-14.883	0.000	(0)
	ZnCl3-	9.977e-16	8.893e-16	-15.001	-15.051	-0.050	(0)
	CuCl2	6.390e-16	6.390e-16	-15.195	-15.195	0.000	(0)
	CrCl+2	1.756e-16	1.036e-16	-15.755	-15.985	-0.229	(0)
	HgClOH	1.679e-16	1.679e-16	-15.775	-15.775	0.000	(0)
	PbCl3-	2.309e-17	2.024e-17	-16.637	-16.694	-0.057	(0)
	HgCl2	1.646e-17	1.646e-17	-16.784	-16.784	0.000	(0)
	FeCl+2	6.189e-18	3.963e-18	-17.208	-17.402	-0.194	(0)
	CrOHC12	1.731e-18	1.731e-18	-17.762	-17.762	0.000	(0)
	ZnCl4-2	8.568e-19	5.486e-19	-18.067	-18.261	-0.194	(0)
	HgCl3-	2.317e-19	2.030e-19	-18.635	-18.692	-0.057	(0)
	UO2Cl+	5.351e-20	4.689e-20	-19.272	-19.329	-0.057	(0)
	FeCl2+	2.442e-20	2.184e-20	-19.612	-19.661	-0.048	(0)
	PbCl4-2	1.935e-20	1.141e-20	-19.713	-19.943	-0.229	(0)
	CrCl2+	1.384e-20	1.213e-20	-19.859	-19.916	-0.057	(0)
	CuCl3-	8.254e-21	7.357e-21	-20.083	-20.133	-0.050	(0)
	HgCl+	3.037e-21	2.661e-21	-20.518	-20.575	-0.057	(0)
	HgCl4-2	1.691e-21	9.974e-22	-20.772	-21.001	-0.229	(0)
	VOCl+	3.078e-22	2.697e-22	-21.512	-21.569	-0.057	(0)
	FeCl3	2.695e-24	2.695e-24	-23.569	-23.569	0.000	(0)
	CuCl4-2	7.105e-26	4.550e-26	-25.148	-25.342	-0.194	(0)
	CrO3Cl-	2.655e-27	2.326e-27	-26.576	-26.633	-0.057	(0)
	CoCl+2	8.741e-37	5.155e-37	-36.058	-36.288	-0.229	(0)
	UCl+3	0.000e+00	0.000e+00	-47.507	-48.023	-0.516	(0)
Co (2)	1.359e-07						
	Co+2	8.746e-08	5.158e-08	-7.058	-7.288	-0.229	(0)
	CoHCO3+	2.603e-08	2.281e-08	-7.585	-7.642	-0.057	(0)
	CoCO3	1.645e-08	1.645e-08	-7.784	-7.784	0.000	(0)
	CoSO4	4.613e-09	4.613e-09	-8.336	-8.336	0.000	(0)
	CoOH+	8.369e-10	7.334e-10	-9.077	-9.135	-0.057	(0)
	CoCl+	2.512e-10	2.201e-10	-9.600	-9.657	-0.057	(0)
	CoF+	1.723e-10	1.510e-10	-9.764	-9.821	-0.057	(0)
	Co (OH) 2	4.152e-11	4.152e-11	-10.382	-10.382	0.000	(0)
	Co (OH) 3-	6.737e-16	5.904e-16	-15.172	-15.229	-0.057	(0)
	CoOOH-	1.691e-16	1.482e-16	-15.772	-15.829	-0.057	(0)
	Co2OH+3	6.220e-18	1.896e-18	-17.206	-17.722	-0.516	(0)
	CoSeO4	1.117e-18	1.117e-18	-17.952	-17.952	0.000	(0)
	Co (OH) 4-2	1.131e-22	6.668e-23	-21.947	-22.176	-0.229	(0)
	Co4 (OH) 4+4	4.772e-28	5.773e-29	-27.321	-28.239	-0.917	(0)
Co (3)	1.261e-29						

CoOH+2	1.261e-29	7.436e-30	-28.899	-29.129	-0.229	(0)
Co+3	5.740e-36	2.053e-36	-35.241	-35.688	-0.446	(0)
CoCl+2	8.741e-37	5.155e-37	-36.058	-36.288	-0.229	(0)
Cr (2)	2.627e-24					
Cr+2	2.627e-24	1.550e-24	-23.580	-23.810	-0.229	(0)
Cr (3)	1.270e-07					
Cr (OH) 2+	1.001e-07	8.769e-08	-7.000	-7.057	-0.057	(0)
Cr (OH) 3	2.348e-08	2.348e-08	-7.629	-7.629	0.000	(0)
Cr (OH) +2	1.715e-09	1.011e-09	-8.766	-8.995	-0.229	(0)
CrO2-	9.009e-10	7.895e-10	-9.045	-9.103	-0.057	(0)
Cr (OH) 4-	7.601e-10	6.661e-10	-9.119	-9.176	-0.057	(0)
CrOHSO4	1.076e-10	1.076e-10	-9.968	-9.968	0.000	(0)
CrF+2	1.614e-12	9.518e-13	-11.792	-12.021	-0.229	(0)
Cr+3	2.128e-13	6.486e-14	-12.672	-13.188	-0.516	(0)
CrSO4+	7.747e-14	6.789e-14	-13.111	-13.168	-0.057	(0)
CrCl+2	1.756e-16	1.036e-16	-15.755	-15.985	-0.229	(0)
Cr2 (OH) 2SO4+2	1.667e-17	9.832e-18	-16.778	-17.007	-0.229	(0)
CrOHCl2	1.731e-18	1.731e-18	-17.762	-17.762	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.618e-19	2.618e-19	-18.582	-18.582	0.000	(0)
CrCl2+	1.384e-20	1.213e-20	-19.859	-19.916	-0.057	(0)
Cr (6)	7.666e-16					
CrO4-2	7.331e-16	4.642e-16	-15.135	-15.333	-0.198	(0)
HCrO4-	2.421e-17	2.122e-17	-16.616	-16.673	-0.057	(0)
NaCrO4-	9.173e-18	8.039e-18	-17.037	-17.095	-0.057	(0)
KCrO4-	1.326e-19	1.162e-19	-18.877	-18.935	-0.057	(0)
H2CrO4	2.430e-25	2.430e-25	-24.614	-24.614	0.000	(0)
CrO3SO4-2	6.940e-26	4.093e-26	-25.159	-25.388	-0.229	(0)
CrO3Cl-	2.655e-27	2.326e-27	-26.576	-26.633	-0.057	(0)
Cr2O7-2	2.648e-32	1.562e-32	-31.577	-31.806	-0.229	(0)
Cu (1)	1.176e-10					
CuCl	5.811e-11	5.811e-11	-10.236	-10.236	0.000	(0)
Cu+	4.269e-11	3.741e-11	-10.370	-10.427	-0.057	(0)
CuCl2-	1.680e-11	1.498e-11	-10.775	-10.825	-0.050	(0)
CuCl3-2	6.170e-15	3.951e-15	-14.210	-14.403	-0.194	(0)
Cu (2)	9.595e-08					
CuCO3	8.486e-08	8.486e-08	-7.071	-7.071	0.000	(0)
Cu (CO3) 2-2	7.308e-09	4.310e-09	-8.136	-8.366	-0.229	(0)
CuOH+	1.931e-09	1.721e-09	-8.714	-8.764	-0.050	(0)
Cu+2	1.206e-09	7.638e-10	-8.919	-9.117	-0.198	(0)
CuHCO3+	3.126e-10	2.740e-10	-9.505	-9.562	-0.057	(0)
Cu (OH) 2	2.448e-10	2.448e-10	-9.611	-9.611	0.000	(0)
CuSO4	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)
CuF+	5.092e-12	4.462e-12	-11.293	-11.350	-0.057	(0)
CuCl+	1.676e-12	1.494e-12	-11.776	-11.826	-0.050	(0)
Cu (OH) 3-	4.083e-13	3.578e-13	-12.389	-12.446	-0.057	(0)
Cu2 (OH) 2+2	1.262e-13	7.442e-14	-12.899	-13.128	-0.229	(0)
CuCl2	6.390e-16	6.390e-16	-15.195	-15.195	0.000	(0)
Cu (OH) 4-2	3.403e-18	2.007e-18	-17.468	-17.698	-0.229	(0)
CuCl3-	8.254e-21	7.357e-21	-20.083	-20.133	-0.050	(0)
CuCl4-2	7.105e-26	4.550e-26	-25.148	-25.342	-0.194	(0)
F	1.106e-04					
F-	1.038e-04	9.259e-05	-3.984	-4.033	-0.050	(0)
MgF+	5.272e-06	4.708e-06	-5.278	-5.327	-0.049	(0)
CaF+	1.322e-06	1.183e-06	-5.879	-5.927	-0.048	(0)
NaF	2.036e-07	2.036e-07	-6.691	-6.691	0.000	(0)
MnF+	2.594e-08	2.320e-08	-7.586	-7.634	-0.048	(0)
HF	1.934e-09	1.934e-09	-8.713	-8.713	0.000	(0)
BF (OH) 3-	5.011e-10	4.440e-10	-9.300	-9.353	-0.052	(0)
ZnF+	3.156e-10	2.766e-10	-9.501	-9.558	-0.057	(0)
NiF+	1.774e-10	1.554e-10	-9.751	-9.808	-0.057	(0)
CoF+	1.723e-10	1.510e-10	-9.764	-9.821	-0.057	(0)
AlF3	7.345e-11	7.345e-11	-10.134	-10.134	0.000	(0)
AlF2+	7.034e-11	6.301e-11	-10.153	-10.201	-0.048	(0)
CdF+	5.215e-12	4.570e-12	-11.283	-11.340	-0.057	(0)
CuF+	5.092e-12	4.462e-12	-11.293	-11.350	-0.057	(0)
AlF4-	3.817e-12	3.408e-12	-11.418	-11.467	-0.049	(0)
AgF	3.142e-12	3.142e-12	-11.503	-11.503	0.000	(0)
AlF+2	2.655e-12	1.709e-12	-11.576	-11.767	-0.191	(0)

CrF+2	1.614e-12	9.518e-13	-11.792	-12.021	-0.229	(0)
PbF+	1.271e-12	1.114e-12	-11.896	-11.953	-0.057	(0)
HF2-	7.654e-13	6.810e-13	-12.116	-12.167	-0.051	(0)
BF2(OH) 2-	7.008e-14	6.210e-14	-13.154	-13.207	-0.052	(0)
FeF2+	2.991e-14	2.675e-14	-13.524	-13.573	-0.048	(0)
FeF+2	1.686e-14	1.080e-14	-13.773	-13.967	-0.194	(0)
FeF3	3.495e-15	3.495e-15	-14.457	-14.457	0.000	(0)
PbF2	2.030e-15	2.030e-15	-14.693	-14.693	0.000	(0)
CdF2	8.443e-16	8.443e-16	-15.074	-15.074	0.000	(0)
UO2F+	3.418e-16	2.995e-16	-15.466	-15.524	-0.057	(0)
UO2F2	7.998e-17	7.998e-17	-16.097	-16.097	0.000	(0)
H2F2	1.003e-17	1.003e-17	-16.999	-16.999	0.000	(0)
VO2F	7.927e-18	7.927e-18	-17.101	-17.101	0.000	(0)
UO2F3-	2.123e-18	1.860e-18	-17.673	-17.730	-0.057	(0)
PbF3-	4.068e-19	3.565e-19	-18.391	-18.448	-0.057	(0)
VO2F2-	3.041e-19	2.665e-19	-18.517	-18.574	-0.057	(0)
VOF+	4.938e-20	4.327e-20	-19.306	-19.364	-0.057	(0)
BF3OH-	3.567e-20	3.161e-20	-19.448	-19.500	-0.052	(0)
UO2F4-2	2.320e-21	1.368e-21	-20.635	-20.864	-0.229	(0)
VOF2	1.502e-21	1.502e-21	-20.823	-20.823	0.000	(0)
VO2F3-2	5.219e-22	3.078e-22	-21.282	-21.512	-0.229	(0)
PbF4-2	2.679e-23	1.580e-23	-22.572	-22.801	-0.229	(0)
VOF3-	5.632e-24	4.936e-24	-23.249	-23.307	-0.057	(0)
Sb(OH) 2F	8.908e-25	8.908e-25	-24.050	-24.050	0.000	(0)
SbOF	8.761e-25	8.761e-25	-24.057	-24.057	0.000	(0)
BF4-	2.296e-25	2.035e-25	-24.639	-24.692	-0.052	(0)
VO2F4-3	4.600e-26	1.402e-26	-25.337	-25.853	-0.516	(0)
VOF4-2	3.128e-27	1.845e-27	-26.505	-26.734	-0.229	(0)
HgF+	4.234e-28	3.710e-28	-27.373	-27.431	-0.057	(0)
UF3+	5.535e-38	4.850e-38	-37.257	-37.314	-0.057	(0)
UF2+2	5.604e-39	3.305e-39	-38.251	-38.481	-0.229	(0)
UF4	4.924e-40	4.924e-40	-39.308	-39.308	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.031	-41.547	-0.516	(0)
UF5-	0.000e+00	0.000e+00	-41.686	-41.743	-0.057	(0)
UF6-2	0.000e+00	0.000e+00	-43.067	-43.297	-0.229	(0)
Fe (2)	2.195e-07					
Fe+2	1.941e-07	1.145e-07	-6.712	-6.941	-0.229	(0)
FeSO4	1.260e-08	1.260e-08	-7.900	-7.900	0.000	(0)
FeHCO3+	9.130e-09	8.194e-09	-8.040	-8.086	-0.047	(0)
FeOH+	3.631e-09	3.248e-09	-8.440	-8.488	-0.048	(0)
Fe (OH) 2	1.839e-12	1.839e-12	-11.735	-11.735	0.000	(0)
Fe (OH) 3-	4.633e-13	4.144e-13	-12.334	-12.383	-0.048	(0)
Fe (3)	2.630e-05					
Fe (OH) 2+	1.515e-05	1.357e-05	-4.820	-4.867	-0.048	(0)
Fe (OH) 3	1.039e-05	1.039e-05	-4.984	-4.984	0.000	(0)
Fe (OH) 4-	7.693e-07	6.891e-07	-6.114	-6.162	-0.048	(0)
FeOH+2	7.643e-11	4.894e-11	-10.117	-10.310	-0.194	(0)
FeF2+	2.991e-14	2.675e-14	-13.524	-13.573	-0.048	(0)
FeF+2	1.686e-14	1.080e-14	-13.773	-13.967	-0.194	(0)
FeF3	3.495e-15	3.495e-15	-14.457	-14.457	0.000	(0)
FeSO4+	5.979e-16	5.349e-16	-15.223	-15.272	-0.048	(0)
Fe+3	2.973e-16	1.064e-16	-15.527	-15.973	-0.446	(0)
FeCl+2	6.189e-18	3.963e-18	-17.208	-17.402	-0.194	(0)
Fe (SO4) 2-	5.849e-18	5.126e-18	-17.233	-17.290	-0.057	(0)
Fe2 (OH) 2+4	6.556e-19	7.930e-20	-18.183	-19.101	-0.917	(0)
FeCl2+	2.442e-20	2.184e-20	-19.612	-19.661	-0.048	(0)
FeHSeO3+2	1.180e-21	6.957e-22	-20.928	-21.158	-0.229	(0)
Fe3 (OH) 4+5	4.219e-22	1.555e-23	-21.375	-22.808	-1.433	(0)
FeCl3	2.695e-24	2.695e-24	-23.569	-23.569	0.000	(0)
H (0)	2.817e-27					
H2	1.408e-27	1.413e-27	-26.851	-26.850	0.001	(0)
Hg (0)	9.978e-12					
Hg	9.978e-12	9.978e-12	-11.001	-11.001	0.000	(0)
Hg (1)	2.483e-27					
Hg2+2	1.242e-27	7.323e-28	-26.906	-27.135	-0.229	(0)
Hg (2)	5.327e-16					
Hg (OH) 2	3.454e-16	3.464e-16	-15.462	-15.460	0.001	(0)
HgClOH	1.679e-16	1.679e-16	-15.775	-15.775	0.000	(0)

	HgCl ₂	1.646e-17	1.646e-17	-16.784	-16.784	0.000	(0)
	HgCO ₃	2.441e-18	2.441e-18	-17.612	-17.612	0.000	(0)
	Hg (CO ₃) ₂₋₂	2.470e-19	1.457e-19	-18.607	-18.837	-0.229	(0)
	HgCl ₃₋	2.317e-19	2.030e-19	-18.635	-18.692	-0.057	(0)
	HgOH+	3.500e-21	3.067e-21	-20.456	-20.513	-0.057	(0)
	HgCl+	3.037e-21	2.661e-21	-20.518	-20.575	-0.057	(0)
	HgCl ₄₋₂	1.691e-21	9.974e-22	-20.772	-21.001	-0.229	(0)
	HgHCO ₃₊	7.327e-22	6.421e-22	-21.135	-21.192	-0.057	(0)
	Hg (OH) ₃₋	3.547e-23	3.108e-23	-22.450	-22.508	-0.057	(0)
	Hg+ ₂	1.833e-25	1.081e-25	-24.737	-24.966	-0.229	(0)
	HgSO ₄	1.269e-26	1.269e-26	-25.897	-25.897	0.000	(0)
	HgF+	4.234e-28	3.710e-28	-27.373	-27.431	-0.057	(0)
K		7.577e-05					
	K+	7.553e-05	6.737e-05	-4.122	-4.172	-0.050	(0)
	KSO ₄₋	2.387e-07	2.138e-07	-6.622	-6.670	-0.048	(0)
	KCrO ₄₋	1.326e-19	1.162e-19	-18.877	-18.935	-0.057	(0)
Mg		7.947e-04					
	Mg+ ₂	7.156e-04	4.532e-04	-3.145	-3.344	-0.198	(0)
	MgSO ₄	3.696e-05	3.696e-05	-4.432	-4.432	0.000	(0)
	MgHCO ₃₊	2.958e-05	2.636e-05	-4.529	-4.579	-0.050	(0)
	MgCO ₃	7.112e-06	7.112e-06	-5.148	-5.148	0.000	(0)
	MgF+	5.272e-06	4.708e-06	-5.278	-5.327	-0.049	(0)
	MgOH+	1.430e-07	1.286e-07	-6.845	-6.891	-0.046	(0)
	MgH ₂ BO ₃₊	8.762e-09	7.764e-09	-8.057	-8.110	-0.052	(0)
Mn (2)		1.202e-05					
	Mn+ ₂	1.067e-05	6.295e-06	-4.972	-5.201	-0.229	(0)
	MnHCO ₃₊	7.982e-07	7.140e-07	-6.098	-6.146	-0.048	(0)
	MnSO ₄	5.017e-07	5.017e-07	-6.300	-6.300	0.000	(0)
	MnF+	2.594e-08	2.320e-08	-7.586	-7.634	-0.048	(0)
	MnOH+	1.260e-08	1.127e-08	-7.900	-7.948	-0.048	(0)
	MnCl+	1.093e-08	9.777e-09	-7.961	-8.010	-0.048	(0)
	MnCl ₂	1.704e-11	1.704e-11	-10.769	-10.769	0.000	(0)
	MnCl ₃₋	6.473e-15	5.791e-15	-14.189	-14.237	-0.048	(0)
	MnSeO ₄	7.320e-17	7.320e-17	-16.135	-16.135	0.000	(0)
	Mn (OH) ₃₋	3.954e-17	3.537e-17	-16.403	-16.451	-0.048	(0)
	Mn (OH) ₄₋₂	1.271e-22	8.138e-23	-21.896	-22.089	-0.194	(0)
	MnSe	2.618e-38	2.618e-38	-37.582	-37.582	0.000	(0)
Mn (3)		7.860e-27					
	Mn+ ₃	7.860e-27	2.812e-27	-26.105	-26.551	-0.446	(0)
Mn (6)		0.000e+00					
	MnO ₄₋₂	0.000e+00	0.000e+00	-44.630	-44.823	-0.194	(0)
Mn (7)		0.000e+00					
	MnO ₄₋	0.000e+00	0.000e+00	-50.144	-50.195	-0.052	(0)
Mo		1.252e-07					
	MoO ₄₋₂	1.251e-07	7.925e-08	-6.903	-7.101	-0.198	(0)
	HMoO ₄₋	2.542e-11	2.227e-11	-10.595	-10.652	-0.057	(0)
	H ₂ MoO ₄	2.305e-15	2.305e-15	-14.637	-14.637	0.000	(0)
	Ag ₂ MoO ₄	5.474e-24	5.474e-24	-23.262	-23.262	0.000	(0)
	AlMo ₆ O ₂₁₋₃	0.000e+00	0.000e+00	-48.931	-49.447	-0.516	(0)
	Mo ₇ O ₂₄₋₆	0.000e+00	0.000e+00	-57.452	-59.517	-2.064	(0)
	HMo ₇ O ₂₄₋₅	0.000e+00	0.000e+00	-59.546	-60.980	-1.433	(0)
	H ₂ Mo ₇ O ₂₄₋₄	0.000e+00	0.000e+00	-63.130	-64.048	-0.917	(0)
	H ₃ Mo ₇ O ₂₄₋₃	0.000e+00	0.000e+00	-68.136	-68.652	-0.516	(0)
Na		3.928e-03					
	Na+	3.906e-03	3.485e-03	-2.408	-2.458	-0.050	(0)
	NaHCO ₃	1.114e-05	1.114e-05	-4.953	-4.953	0.000	(0)
	NaSO ₄₋	9.364e-06	8.388e-06	-5.029	-5.076	-0.048	(0)
	NaCO ₃₋	1.367e-06	1.224e-06	-5.864	-5.912	-0.048	(0)
	NaF	2.036e-07	2.036e-07	-6.691	-6.691	0.000	(0)
	NaH ₂ BO ₃	2.729e-09	2.729e-09	-8.564	-8.564	0.000	(0)
	NaCrO ₄₋	9.173e-18	8.039e-18	-17.037	-17.095	-0.057	(0)
Ni		2.131e-07					
	Ni+ ₂	1.055e-07	6.683e-08	-6.977	-7.175	-0.198	(0)
	NiHCO ₃₊	5.345e-08	4.684e-08	-7.272	-7.329	-0.057	(0)
	NiCO ₃	4.705e-08	4.705e-08	-7.327	-7.327	0.000	(0)
	NiSO ₄	5.977e-09	5.977e-09	-8.224	-8.224	0.000	(0)
	NiOH+	6.842e-10	5.996e-10	-9.165	-9.222	-0.057	(0)
	NiCl+	2.407e-10	2.110e-10	-9.618	-9.676	-0.057	(0)

NiF+	1.774e-10	1.554e-10	-9.751	-9.808	-0.057	(0)
Ni(OH)2	3.394e-11	3.394e-11	-10.469	-10.469	0.000	(0)
Ni(SO4)2-2	1.504e-13	8.871e-14	-12.823	-13.052	-0.229	(0)
Ni(OH)3-	2.760e-14	2.419e-14	-13.559	-13.616	-0.057	(0)
NiCl2	1.311e-15	1.311e-15	-14.883	-14.883	0.000	(0)
NiSeO4	1.351e-18	1.351e-18	-17.869	-17.869	0.000	(0)
O(0)	5.064e-39					
O2	2.532e-39	2.539e-39	-38.597	-38.595	0.001	(0)
Pb	1.207e-08					
PbCO3	9.685e-09	9.685e-09	-8.014	-8.014	0.000	(0)
Pb(CO3)2-2	8.937e-10	5.271e-10	-9.049	-9.278	-0.229	(0)
PbHCO3+	8.231e-10	7.213e-10	-9.085	-9.142	-0.057	(0)
PbOH+	3.488e-10	3.057e-10	-9.457	-9.515	-0.057	(0)
Pb+2	2.696e-10	1.708e-10	-9.569	-9.768	-0.198	(0)
PbSO4	3.748e-11	3.748e-11	-10.426	-10.426	0.000	(0)
PbCl+	8.530e-12	7.475e-12	-11.069	-11.126	-0.057	(0)
Pb(OH)2	6.889e-12	6.889e-12	-11.162	-11.162	0.000	(0)
PbF+	1.271e-12	1.114e-12	-11.896	-11.953	-0.057	(0)
Pb(SO4)2-2	1.717e-13	1.012e-13	-12.765	-12.995	-0.229	(0)
PbCl2	4.120e-14	4.120e-14	-13.385	-13.385	0.000	(0)
Pb(OH)3-	5.602e-15	4.909e-15	-14.252	-14.309	-0.057	(0)
PbF2	2.030e-15	2.030e-15	-14.693	-14.693	0.000	(0)
PbCl3-	2.309e-17	2.024e-17	-16.637	-16.694	-0.057	(0)
Pb2OH+3	2.714e-18	8.272e-19	-17.566	-18.082	-0.516	(0)
Pb(OH)4-2	1.453e-18	8.568e-19	-17.838	-18.067	-0.229	(0)
PbF3-	4.068e-19	3.565e-19	-18.391	-18.448	-0.057	(0)
PbCl4-2	1.935e-20	1.141e-20	-19.713	-19.943	-0.229	(0)
Pb3(OH)4+2	2.741e-22	1.617e-22	-21.562	-21.791	-0.229	(0)
PbF4-2	2.679e-23	1.580e-23	-22.572	-22.801	-0.229	(0)
Pb4(OH)4+4	1.813e-27	2.193e-28	-26.742	-27.659	-0.917	(0)
S(6)	8.751e-04					
SO4-2	7.078e-04	4.482e-04	-3.150	-3.349	-0.198	(0)
CaSO4	1.202e-04	1.202e-04	-3.920	-3.920	0.000	(0)
MgSO4	3.696e-05	3.696e-05	-4.432	-4.432	0.000	(0)
NaSO4-	9.364e-06	8.388e-06	-5.029	-5.076	-0.048	(0)
MnSO4	5.017e-07	5.017e-07	-6.300	-6.300	0.000	(0)
KSO4-	2.387e-07	2.138e-07	-6.622	-6.670	-0.048	(0)
ZnSO4	1.468e-08	1.468e-08	-7.833	-7.833	0.000	(0)
FeSO4	1.260e-08	1.260e-08	-7.900	-7.900	0.000	(0)
NiSO4	5.977e-09	5.977e-09	-8.224	-8.224	0.000	(0)
CoSO4	4.613e-09	4.613e-09	-8.336	-8.336	0.000	(0)
HSO4-	6.929e-10	6.187e-10	-9.159	-9.209	-0.049	(0)
CdSO4	3.272e-10	3.272e-10	-9.485	-9.485	0.000	(0)
AgSO4-	1.379e-10	1.208e-10	-9.861	-9.918	-0.057	(0)
CrOHSO4	1.076e-10	1.076e-10	-9.968	-9.968	0.000	(0)
Zn(SO4)2-2	9.718e-11	5.731e-11	-10.012	-10.242	-0.229	(0)
CuSO4	7.842e-11	7.842e-11	-10.106	-10.106	0.000	(0)
PbSO4	3.748e-11	3.748e-11	-10.426	-10.426	0.000	(0)
Cd(SO4)2-2	3.355e-12	1.978e-12	-11.474	-11.704	-0.229	(0)
Pb(SO4)2-2	1.717e-13	1.012e-13	-12.765	-12.995	-0.229	(0)
Ni(SO4)2-2	1.504e-13	8.871e-14	-12.823	-13.052	-0.229	(0)
CrSO4+	7.747e-14	6.789e-14	-13.111	-13.168	-0.057	(0)
AlSO4+	7.193e-15	6.423e-15	-14.143	-14.192	-0.049	(0)
FeSO4+	5.979e-16	5.349e-16	-15.223	-15.272	-0.048	(0)
Al(SO4)2-	3.455e-17	3.085e-17	-16.462	-16.511	-0.049	(0)
Cr2(OH)2SO4+2	1.667e-17	9.832e-18	-16.778	-17.007	-0.229	(0)
UO2SO4	1.590e-17	1.590e-17	-16.799	-16.799	0.000	(0)
Fe(SO4)2-	5.849e-18	5.126e-18	-17.233	-17.290	-0.057	(0)
VO2SO4-	5.962e-19	5.224e-19	-18.225	-18.282	-0.057	(0)
Cr2(OH)2(SO4)2	2.618e-19	2.618e-19	-18.582	-18.582	0.000	(0)
UO2(SO4)2-2	1.593e-19	9.393e-20	-18.798	-19.027	-0.229	(0)
VOSO4	9.619e-21	9.619e-21	-20.017	-20.017	0.000	(0)
CrO3SO4-2	6.940e-26	4.093e-26	-25.159	-25.388	-0.229	(0)
HgSO4	1.269e-26	1.269e-26	-25.897	-25.897	0.000	(0)
VSO4+	1.865e-34	1.634e-34	-33.729	-33.787	-0.057	(0)
U(SO4)2	0.000e+00	0.000e+00	-43.011	-43.011	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.333	-43.562	-0.229	(0)
Sb(3)	8.616e-19					

Sb(OH) 3	4.359e-19	4.359e-19	-18.361	-18.361	0.000	(0)
HSbo2	4.256e-19	4.256e-19	-18.371	-18.371	0.000	(0)
SbO2-	5.568e-23	4.880e-23	-22.254	-22.312	-0.057	(0)
Sb(OH) 4-	3.189e-23	2.795e-23	-22.496	-22.554	-0.057	(0)
Sb(OH) 2F	8.908e-25	8.908e-25	-24.050	-24.050	0.000	(0)
SbOF	8.761e-25	8.761e-25	-24.057	-24.057	0.000	(0)
Sb(OH) 2+	1.707e-25	1.496e-25	-24.768	-24.825	-0.057	(0)
SbO+	5.885e-26	5.157e-26	-25.230	-25.288	-0.057	(0)
Sb(5)	7.398e-09					
SbO3-	7.389e-09	6.476e-09	-8.131	-8.189	-0.057	(0)
Sb(OH) 6-	8.485e-12	7.569e-12	-11.071	-11.121	-0.050	(0)
SbO2+	4.230e-25	3.707e-25	-24.374	-24.431	-0.057	(0)
Se(-2)	1.500e-08					
Ag2Se	1.500e-08	1.500e-08	-7.824	-7.824	0.000	(0)
HSe-	1.627e-35	1.426e-35	-34.789	-34.846	-0.057	(0)
MnSe	2.618e-38	2.618e-38	-37.582	-37.582	0.000	(0)
H2Se	1.563e-39	1.563e-39	-38.806	-38.806	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.767	-41.996	-0.229	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-73.603	-74.520	-0.917	(0)
Se(4)	4.008e-09					
HSeO3-	2.825e-09	2.476e-09	-8.549	-8.606	-0.057	(0)
SeO3-2	1.183e-09	6.977e-10	-8.927	-9.156	-0.229	(0)
H2SeO3	1.492e-14	1.492e-14	-13.826	-13.826	0.000	(0)
AgSeO3-	6.912e-15	6.057e-15	-14.160	-14.218	-0.057	(0)
Cd(SeO3) 2-2	2.118e-21	1.249e-21	-20.674	-20.903	-0.229	(0)
FeHSeO3+2	1.180e-21	6.957e-22	-20.928	-21.158	-0.229	(0)
Ag(SeO3) 2-3	1.241e-22	3.784e-23	-21.906	-22.422	-0.516	(0)
Se(6)	6.831e-14					
SeO4-2	6.823e-14	4.321e-14	-13.166	-13.364	-0.198	(0)
MnSeO4	7.320e-17	7.320e-17	-16.135	-16.135	0.000	(0)
NiSeO4	1.351e-18	1.351e-18	-17.869	-17.869	0.000	(0)
CoSeO4	1.117e-18	1.117e-18	-17.952	-17.952	0.000	(0)
ZnSeO4	1.002e-18	1.002e-18	-17.999	-17.999	0.000	(0)
HSeO4-	3.491e-20	3.059e-20	-19.457	-19.514	-0.057	(0)
CdSeO4	2.506e-20	2.506e-20	-19.601	-19.601	0.000	(0)
Zn(SeO4) 2-2	7.442e-32	4.389e-32	-31.128	-31.358	-0.229	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.094	-59.610	-0.516	(0)
U(4)	2.361e-21					
U(OH) 5-	2.359e-21	2.068e-21	-20.627	-20.685	-0.057	(0)
U(OH) 4	1.223e-24	1.223e-24	-23.912	-23.912	0.000	(0)
U(OH) 3+	7.212e-29	6.320e-29	-28.142	-28.199	-0.057	(0)
U(OH) 2+2	7.001e-34	4.129e-34	-33.155	-33.384	-0.229	(0)
UF3+	5.535e-38	4.850e-38	-37.257	-37.314	-0.057	(0)
UF2+2	5.604e-39	3.305e-39	-38.251	-38.481	-0.229	(0)
UOH+3	9.015e-40	2.748e-40	-39.045	-39.561	-0.516	(0)
UF4	4.924e-40	4.924e-40	-39.308	-39.308	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.031	-41.547	-0.516	(0)
UF5-	0.000e+00	0.000e+00	-41.686	-41.743	-0.057	(0)
U(SO4) 2	0.000e+00	0.000e+00	-43.011	-43.011	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-43.067	-43.297	-0.229	(0)
USO4+2	0.000e+00	0.000e+00	-43.333	-43.562	-0.229	(0)
U+4	0.000e+00	0.000e+00	-45.897	-46.814	-0.917	(0)
UCl+3	0.000e+00	0.000e+00	-47.507	-48.023	-0.516	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-175.646	-180.290	-4.644	(0)
U(5)	1.630e-18					
UO2+	1.630e-18	1.428e-18	-17.788	-17.845	-0.057	(0)
U(6)	6.307e-09					
UO2(CO3) 3-4	5.181e-09	6.267e-10	-8.286	-9.203	-0.917	(0)
UO2(CO3) 2-2	1.124e-09	6.627e-10	-8.949	-9.179	-0.229	(0)
UO2CO3	1.760e-12	1.760e-12	-11.754	-11.754	0.000	(0)
UO2OH+	2.399e-15	2.102e-15	-14.620	-14.677	-0.057	(0)
UO2F+	3.418e-16	2.995e-16	-15.466	-15.524	-0.057	(0)
UO2F2	7.998e-17	7.998e-17	-16.097	-16.097	0.000	(0)
UO2+2	3.700e-17	2.343e-17	-16.432	-16.630	-0.198	(0)
UO2SO4	1.590e-17	1.590e-17	-16.799	-16.799	0.000	(0)
UO2F3-	2.123e-18	1.860e-18	-17.673	-17.730	-0.057	(0)
UO2(SO4) 2-2	1.593e-19	9.393e-20	-18.798	-19.027	-0.229	(0)

UO2Cl+	5.351e-20	4.689e-20	-19.272	-19.329	-0.057	(0)
UO2F4-2	2.320e-21	1.368e-21	-20.635	-20.864	-0.229	(0)
(UO2) 2 (OH) 2+2	1.244e-23	7.335e-24	-22.905	-23.135	-0.229	(0)
(UO2) 3 (OH) 5+	6.780e-27	5.942e-27	-26.169	-26.226	-0.057	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.002	-40.059	-0.057	(0)
V+2	0.000e+00	0.000e+00	-41.193	-41.422	-0.229	(0)
V (3)	2.255e-13					
V (OH) 3	2.255e-13	2.255e-13	-12.647	-12.647	0.000	(0)
V (OH) 2+	2.349e-24	2.058e-24	-23.629	-23.686	-0.057	(0)
VOH+2	4.677e-28	2.758e-28	-27.330	-27.559	-0.229	(0)
V+3	2.534e-33	7.723e-34	-32.596	-33.112	-0.516	(0)
VSO4+	1.865e-34	1.634e-34	-33.729	-33.787	-0.057	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-52.278	-52.794	-0.516	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.401	-54.319	-0.917	(0)
V (4)	1.283e-17					
V (OH) 3+	1.264e-17	1.108e-17	-16.898	-16.956	-0.057	(0)
VO+2	1.321e-19	7.792e-20	-18.879	-19.108	-0.229	(0)
VOF+	4.938e-20	4.327e-20	-19.306	-19.364	-0.057	(0)
VOSO4	9.619e-21	9.619e-21	-20.017	-20.017	0.000	(0)
VOF2	1.502e-21	1.502e-21	-20.823	-20.823	0.000	(0)
VOC1+	3.078e-22	2.697e-22	-21.512	-21.569	-0.057	(0)
VOF3-	5.632e-24	4.936e-24	-23.249	-23.307	-0.057	(0)
VOF4-2	3.128e-27	1.845e-27	-26.505	-26.734	-0.229	(0)
H2V2O4+2	1.043e-29	6.153e-30	-28.982	-29.211	-0.229	(0)
V (5)	1.768e-08					
H2VO4-	1.398e-08	1.225e-08	-7.854	-7.912	-0.057	(0)
HVO4-2	3.695e-09	2.179e-09	-8.432	-8.662	-0.229	(0)
H3VO4	1.731e-12	1.731e-12	-11.762	-11.762	0.000	(0)
H3V2O7-	1.563e-13	1.370e-13	-12.806	-12.863	-0.057	(0)
HV2O7-3	2.970e-14	9.051e-15	-13.527	-14.043	-0.516	(0)
VO4-3	2.537e-15	7.732e-16	-14.596	-15.112	-0.516	(0)
V2O7-4	1.426e-16	1.725e-17	-15.846	-16.763	-0.917	(0)
VO2+	5.472e-17	4.881e-17	-16.262	-16.311	-0.050	(0)
VO2F	7.927e-18	7.927e-18	-17.101	-17.101	0.000	(0)
V3O9-3	6.328e-18	1.929e-18	-17.199	-17.715	-0.516	(0)
VO2SO4-	5.962e-19	5.224e-19	-18.225	-18.282	-0.057	(0)
VO2F2-	3.041e-19	2.665e-19	-18.517	-18.574	-0.057	(0)
VO2F3-2	5.219e-22	3.078e-22	-21.282	-21.512	-0.229	(0)
V4O12-4	8.147e-23	9.855e-24	-22.089	-23.006	-0.917	(0)
VO2F4-3	4.600e-26	1.402e-26	-25.337	-25.853	-0.516	(0)
V10O28-6	0.000e+00	0.000e+00	-59.546	-61.610	-2.064	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.840	-61.273	-1.433	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.998	-63.916	-0.917	(0)
Zn	4.591e-07					
Zn+2	2.364e-07	1.497e-07	-6.626	-6.825	-0.198	(0)
ZnCO3	1.626e-07	1.626e-07	-6.789	-6.789	0.000	(0)
ZnHCO3+	3.072e-08	2.692e-08	-7.513	-7.570	-0.057	(0)
ZnSO4	1.468e-08	1.468e-08	-7.833	-7.833	0.000	(0)
ZnOH+	1.218e-08	1.067e-08	-7.915	-7.972	-0.057	(0)
Zn (OH) 2	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
ZnCl+	5.206e-10	4.640e-10	-9.284	-9.333	-0.050	(0)
ZnOHC1	4.329e-10	4.329e-10	-9.364	-9.364	0.000	(0)
ZnF+	3.156e-10	2.766e-10	-9.501	-9.558	-0.057	(0)
Zn (SO4) 2-2	9.718e-11	5.731e-11	-10.012	-10.242	-0.229	(0)
Zn (OH) 3-	4.912e-12	4.305e-12	-11.309	-11.366	-0.057	(0)
ZnCl2	9.074e-13	9.074e-13	-12.042	-12.042	0.000	(0)
ZnCl3-	9.977e-16	8.893e-16	-15.001	-15.051	-0.050	(0)
Zn (OH) 4-2	2.071e-16	1.221e-16	-15.684	-15.913	-0.229	(0)
ZnSeO4	1.002e-18	1.002e-18	-17.999	-17.999	0.000	(0)
ZnCl4-2	8.568e-19	5.486e-19	-18.067	-18.261	-0.194	(0)
Zn (SeO4) 2-2	7.442e-32	4.389e-32	-31.128	-31.358	-0.229	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Ag2CO3	-9.37	-20.46	-11.09	Ag2CO3

Ag2CrO4	-19.48	-31.07	-11.59	Ag2CrO4
Ag2HVO4	-9.98	-8.50	1.48	Ag2HVO4
Ag2MoO4	-11.29	-22.84	-11.55	Ag2MoO4
Ag2O	-12.61	-0.04	12.57	Ag2O
Ag2Se	5.97	-42.73	-48.70	Ag2Se
Ag2SeO3	-9.35	-16.50	-7.15	Ag2SeO3
Ag2SeO4	-20.19	-29.10	-8.91	Ag2SeO4
Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-21.30	-19.14	2.16	Ag3AsO3
Ag3AsO4	-11.55	-14.34	-2.79	Ag3AsO4
Ag3H2VO5	-13.70	-8.52	5.18	Ag3H2VO5
AgF·4H2O	-12.95	-11.90	1.05	AgF·4H2O
Agmetal	1.64	-11.87	-13.51	Ag
AgVO3	-9.25	-8.48	0.77	AgVO3
Al (OH) 3 (am)	-1.98	8.82	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.14	-50.77	2.37	Al2 (MoO4) 3
Al2O3	-2.02	17.63	19.65	Al2O3
Al4 (OH) 10SO4	-6.48	16.22	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.26	-5.46	4.80	AlAsO4·2H2O
AlOHSO4	-7.00	-10.23	-3.23	AlOHSO4
AlSb	-146.27	-80.64	65.62	AlSb
Alunite	-6.57	-7.97	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.33	-13.12	-7.79	PbSO4
Anhydrite	-1.92	-6.28	-4.36	CaSO4
Antlerite	-8.09	0.70	8.79	Cu3 (OH) 4SO4
Aragonite	0.64	-7.66	-8.30	CaCO3
Arsenolite	-73.56	-76.32	-2.76	As4O6
Artinite	-5.31	4.29	9.60	MgCO3:Mg (OH) 2·3H2O
As2O5	-35.26	-28.56	6.71	As2O5
Atacamite	-4.98	2.41	7.39	Cu2 (OH) 3Cl
Azurite	-4.19	-21.10	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-15.10	9.29	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-14.21	1.67	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	8.24	-0.67	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-21.98	10.96	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-12.07	-21.74	-9.67	BaCrO4
BaF2	-8.65	-14.47	-5.82	BaF2
BaMoO4	-6.55	-13.51	-6.96	BaMoO4
Barite	0.23	-9.75	-9.98	BaSO4
BaSeO3	-8.99	-7.16	1.83	BaSeO3
BaSeO4	-12.31	-19.77	-7.46	BaSeO4
Bianchite	-8.41	-10.17	-1.76	ZnSO4·6H2O
Birnessite	-9.24	8.85	18.09	MnO2
Bixbyite	-5.36	-6.00	-0.64	Mn2O3
Boehmite	0.24	8.82	8.58	AlOOH
Breithauptite	-50.56	-69.09	-18.52	NiSb
Brochantite	-7.94	7.28	15.22	Cu4 (OH) 6SO4
Brucite	-4.49	12.36	16.84	Mg (OH) 2
Bunsenite	-3.92	8.52	12.45	NiO
Ca (VO3) 2	-9.81	-4.15	5.66	Ca (VO3) 2
Ca2V2O7	-8.89	8.61	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.94	8.61	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-12.55	9.75	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-17.58	21.38	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-18.48	21.38	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-283.59	-140.62	142.97	Ca3Sb2
CaCrO4	-16.00	-18.27	-2.27	CaCrO4
Calcite	0.82	-7.66	-8.48	CaCO3
Calomel	-15.04	-32.95	-17.91	Hg2Cl2
CaMoO4	-2.08	-10.03	-7.95	CaMoO4
Carnotite	-5.94	-5.71	0.23	KUO2VO4
CaSeO3·2H2O	-6.50	-3.69	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-13.28	-16.30	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-12.49	-2.65	9.84	Cd (BO2) 2
Cd (OH) 2	-6.45	7.19	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.54	7.19	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.23	-16.52	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.03	2.53	22.56	Cd3 (OH) 4SO4

Cd4 (OH) 6SO4	-18.68	9.72	28.40	Cd4 (OH) 6SO4
CdCl2	-13.67	-14.32	-0.66	CdCl2
CdCl2:1H2O	-12.63	-14.32	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.41	-14.32	-1.91	CdCl2:2.5H2O
CdF2	-15.36	-16.57	-1.21	CdF2
Cdmetal (alpha)	-30.02	-16.51	13.51	Cd
Cdmetal (gamma)	-30.12	-16.51	13.62	Cd
CdMoO4	-1.46	-15.61	-14.15	CdMoO4
CdOHCl	-7.10	-3.57	3.54	CdOHCl
CdSb	-70.07	-70.42	-0.35	CdSb
CdSe	-15.30	-35.50	-20.20	CdSe
CdSeO4:2H2O	-20.02	-21.87	-1.85	CdSeO4:2H2O
CdSO4	-11.68	-11.86	-0.17	CdSO4
CdSO4:1H2O	-10.13	-11.86	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.98	-11.86	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.03	-10.78	-9.75	AgCl
Cerrusite	-1.36	-14.49	-13.13	PbCO3
CH4 (g)	-74.18	-115.22	-41.05	CH4
Chalcanthite	-9.83	-12.47	-2.64	CuSO4:5H2O
Claudetite	-73.25	-76.32	-3.06	As4O6
Clausthalite	-9.66	-36.76	-27.10	PbSe
Co (BO2) 2	-28.50	-1.43	27.07	Co (BO2) 2
Co (OH) 2	-4.68	8.41	13.09	Co (OH) 2
Co (OH) 3	-9.83	-12.14	-2.31	Co (OH) 3
CO2 (g)	-2.28	-20.42	-18.15	CO2
Co3 (AsO4) 2	-16.35	-3.32	13.03	Co3 (AsO4) 2
Co3O4	-5.37	-15.86	-10.50	Co3O4
CoCl2	-21.37	-13.11	8.27	CoCl2
CoCl2:6H2O	-15.64	-13.11	2.54	CoCl2:6H2O
CoCO3	-2.03	-12.01	-9.98	CoCO3
CoF2	-13.76	-15.35	-1.60	CoF2
CoF3	-46.33	-47.79	-1.46	CoF3
CoFe2O4	27.09	23.57	-3.53	CoFe2O4
CoMoO4	-6.63	-14.39	-7.76	CoMoO4
CoO	-5.17	8.41	13.59	CoO
CoSe	-18.08	-34.28	-16.20	CoSe
CoSeO3	-9.36	-8.04	1.32	CoSeO3
CoSeO4:6H2O	-19.12	-20.65	-1.53	CoSeO4:6H2O
CoSO4	-13.44	-10.64	2.80	CoSO4
CoSO4:6H2O	-8.16	-10.64	-2.47	CoSO4:6H2O
Cotunnite	-10.81	-15.59	-4.78	PbCl2
Cr (OH) 2	-18.93	-8.11	10.82	Cr (OH) 2
Cr (OH) 3	-0.54	0.79	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.54	0.79	-0.75	Cr (OH) 3
Cr2O3	3.94	1.59	-2.36	Cr2O3
CrCl2	-43.72	-29.63	14.09	CrCl2
CrCl3	-46.60	-31.48	15.11	CrCl3
CrF3	-23.52	-34.86	-11.34	CrF3
Crmetal	-62.29	-31.81	30.48	Cr
CrO3	-27.82	-31.03	-3.21	CrO3
Cryolite	-12.47	-46.31	-33.84	Na3AlF6
Cu (OH) 2	-2.09	6.58	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.95	17.26	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-50.57	-85.45	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-2.05	-47.85	-45.80	Cu2Se
Cu2SO4	-22.25	-24.20	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.91	-8.81	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-54.60	-97.19	-42.59	Cu3Sb
Cu3Se2	-20.47	-83.96	-63.49	Cu3Se2
CuCO3	-2.34	-13.84	-11.50	CuCO3
CuCrO4	-19.01	-24.45	-5.44	CuCrO4
CuF	-9.55	-14.46	-4.91	CuF
CuF2	-18.30	-17.18	1.12	CuF2
CuF2:2H2O	-12.63	-17.18	-4.55	CuF2:2H2O
Cumetal	-5.67	-14.43	-8.76	Cu
CuMoO4	-3.14	-16.22	-13.08	CuMoO4
CuOCuSO4	-16.19	-5.88	10.30	CuOCuSO4
Cupricferrite	15.75	21.74	5.99	CuFe2O4

Cuprite	-3.75	-5.15	-1.41	Cu ₂ O
Cuprousferrite	13.92	5.00	-8.92	CuFeO ₂
CuSe	-3.01	-36.11	-33.10	CuSe
CuSe ₂	-21.74	-55.11	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-10.39	-9.87	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-20.04	-22.48	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-15.41	-12.47	2.94	CuSO ₄
Diaspore	1.94	8.82	6.87	AlOOH
Dolomite (disordered)	0.82	-15.72	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	1.37	-15.72	-17.09	CaMg (CO ₃) ₂
Epsomite	-4.57	-6.69	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-4.81	8.76	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl ₂ ·3	7.39	4.35	-3.04	Fe (OH) ₂ ·7Cl ₂ ·3
Fe (VO ₃) ₂	-4.44	-8.16	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-2.86	-1.30	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-13.59	-34.22	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-38.26	-41.99	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	3.69	23.91	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-7.10	-6.70	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	3.14	10.34	7.20	FeCr ₂ O ₄
FeMoO ₄	-3.95	-14.04	-10.09	FeMoO ₄
Ferrihydrite	4.39	7.58	3.19	Fe (OH) ₃
Ferroselite	-34.34	-52.93	-18.60	FeSe ₂
FeSe	-22.94	-33.94	-11.00	FeSe
Fluorite	-0.50	-11.00	-10.50	CaF ₂
Gibbsite	0.52	8.82	8.29	Al (OH) ₃
Goethite	7.09	7.58	0.49	FeOOH
Goslarite	-8.16	-10.17	-2.01	ZnSO ₄ ·7H ₂ O
Gummite	-8.60	-0.93	7.67	UO ₃
Gypsum	-1.67	-6.28	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-3.27	-15.37	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-9.92	-22.80	-12.88	H ₂ MoO ₄
H ₂ Se (g)	-37.74	-42.70	-4.96	H ₂ Se
Halite	-6.97	-5.37	1.60	NaCl
Hausmannite	-5.83	55.20	61.03	Mn ₃ O ₄
Hematite	16.57	15.15	-1.42	Fe ₂ O ₃
Hercynite	3.50	26.39	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-172.20	-245.91	-73.71	Hg (CH ₃) ₂
Hg (g)	-9.69	-17.57	-7.87	Hg
Hg (OH) ₂	-11.96	-15.46	-3.50	Hg (OH) ₂
Hg ₂ (g)	-20.18	-35.14	-14.96	Hg ₂
Hg ₂ (OH) ₂	-16.70	-11.44	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-15.81	-31.86	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-33.77	-42.47	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-24.84	-35.20	-10.36	Hg ₂ F ₂
Hg ₂ SeO ₃	-23.23	-27.89	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-24.35	-30.48	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-37.12	-66.80	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-35.97	-16.48	19.50	HgCl
HgCl ₂	-15.72	-36.98	-21.26	HgCl ₂
HgF (g)	-50.28	-17.60	32.68	HgF
HgF ₂ (g)	-51.79	-39.23	12.57	HgF ₂
Hgmetal (1)	-4.12	-17.57	-13.45	Hg
HgSe	-2.46	-58.16	-55.69	HgSe
HgSeO ₃	-19.49	-31.92	-12.43	HgSeO ₃
HgSO ₄	-25.09	-34.51	-9.42	HgSO ₄
Huntite	-1.89	-31.86	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-4.28	-23.05	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-11.15	-19.92	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-20.43	-25.60	-5.17	KAl (SO ₄) ₂ ·12H ₂ O
K-Jarosite	3.11	-11.69	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-37.47	-54.71	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-23.16	-23.68	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-18.71	-15.44	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-20.98	-21.71	-0.73	K ₂ SeO ₄
Langite	-10.21	7.28	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-6.75	-7.18	-0.43	PbO·PbSO ₄
Laurionite	-5.45	-4.83	0.62	PbOHCl

Lepidocrocite	6.21	7.58	1.37	FeOOH
Lime	-19.93	12.77	32.70	CaO
Litharge	-6.76	5.93	12.69	PbO
Maghemite	8.77	15.15	6.39	Fe ₂ O ₃
Magnesioferrite	10.65	27.51	16.86	Fe ₂ MgO ₄
Magnesite	-0.61	-8.07	-7.46	MgCO ₃
Magnetite	20.51	23.91	3.40	Fe ₃ O ₄
Malachite	-1.95	-7.26	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.99	22.35	25.34	MnOOH
Massicot	-6.96	5.93	12.89	PbO
Matlockite	-7.74	-16.71	-8.97	PbClF
Melanothallite	-21.19	-14.93	6.26	CuCl ₂
Melanterite	-8.08	-10.29	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-6.44	12.36	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-15.85	-4.57	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-259.10	-184.42	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.57	7.79	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-2.26	13.94	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.06	-18.68	5.38	MgCrO ₄
MgF ₂	-3.28	-11.41	-8.13	MgF ₂
MgMoO ₄	-8.59	-10.44	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-7.16	-4.10	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-15.51	-16.71	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.03	41.50	73.52	Pb ₃ O ₄
Mirabilite	-7.15	-8.27	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.32	-6.42	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.44	-63.15	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-141.39	-80.31	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-9.56	2.94	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.73	-11.02	2.72	MnCl ₂ ·4H ₂ O
MnSb	-89.55	-92.46	-2.91	MnSb
MnSe	-35.70	-32.20	3.50	MnSe
MnSeO ₃	-7.09	-5.96	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.94	-5.96	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.52	-18.57	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.13	-8.55	2.58	MnSO ₄
Monteponite	-7.91	7.19	15.10	CdO
Montroydite	-11.82	-15.46	-3.64	HgO
MoO ₃	-14.80	-22.80	-8.00	MoO ₃
Morenosite	-8.38	-10.52	-2.14	NiSO ₄ ·7H ₂ O
Na-Jarosite	1.22	-9.98	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.39	-51.28	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.18	-20.25	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-18.22	-34.82	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-13.51	-12.02	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-13.24	-12.02	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.97	-5.67	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-19.56	-18.28	1.28	Na ₂ SeO ₄
Na ₃ Sb	-167.74	-73.28	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.97	7.71	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.75	4.65	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.61	-13.34	-6.73	CuCl
NaSb	-83.53	-60.37	23.17	NaSb
Natron	-8.33	-9.64	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.93	-3.07	3.86	NaVO ₃
Nesquehonite	-3.40	-8.07	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-4.27	8.52	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-18.68	-2.98	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-16.95	15.05	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.03	-11.90	-6.87	NiCO ₃
NiMoO ₄	-3.13	-14.28	-11.14	NiMoO ₄
NiSe	-16.47	-34.17	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.75	-7.93	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-19.02	-20.54	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-8.66	8.85	17.50	MnO ₂
O ₂ (g)	-35.69	47.40	83.09	O ₂
Otavite	-1.23	-13.23	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.43	-3.91	6.52	Pb(BO ₂) ₂

Pb(OH) 2	-2.22	5.93	8.15	Pb(OH) 2
Pb10(OH) 60(CO3) 6	-54.46	-63.22	-8.76	Pb10(OH) 60(CO3) 6
Pb2(OH) 3Cl	-7.69	1.11	8.79	Pb2(OH) 3Cl
Pb2O(OH) 2	-14.32	11.86	26.19	Pb2O(OH) 2
Pb2O3	-25.48	35.56	61.04	Pb2O3
Pb2OCO3	-8.00	-8.56	-0.56	Pb2OCO3
Pb2V2O7	-3.16	-5.06	-1.90	Pb2V2O7
Pb3(AsO4) 2	-16.56	-10.76	5.80	Pb3(AsO4) 2
Pb3(VO4) 2	-5.27	0.87	6.14	Pb3(VO4) 2
Pb3O2CO3	-13.65	-2.63	11.02	Pb3O2CO3
Pb3O2SO4	-11.94	-1.25	10.69	Pb3O2SO4
Pb4(OH) 6SO4	-16.42	4.68	21.10	Pb4(OH) 6SO4
Pb4O3SO4	-17.20	4.68	21.88	Pb4O3SO4
PbCrO4	-12.50	-25.10	-12.60	PbCrO4
PbF2	-10.39	-17.83	-7.44	PbF2
Pbmetal	-22.01	-17.77	4.25	Pb
PbMoO4	-1.25	-16.87	-15.62	PbMoO4
PbO:0.3H2O	-7.05	5.93	12.98	PbO:0.33H2O
PbSeO4	-16.29	-23.13	-6.84	PbSeO4
Periclase	-9.23	12.36	21.58	MgO
Phosgenite	-10.27	-30.08	-19.81	PbCl2:PbCO3
Plattnerite	-19.97	29.63	49.60	PbO2
Portlandite	-10.04	12.77	22.80	Ca(OH) 2
Pyrochroite	-4.70	10.50	15.19	Mn(OH) 2
Pyrolusite	-7.18	34.20	41.38	MnO2
Retgersite	-8.48	-10.52	-2.04	NiSO4:6H2O
Rhodochrosite	0.65	-9.93	-10.58	MnCO3
Rutherfordine	-6.85	-21.35	-14.50	UO2CO3
Sb(OH) 3	-11.25	-18.36	-7.11	Sb(OH) 3
Sb2O4	-16.42	-13.02	3.40	Sb2O4
Sb2O5	-28.27	-37.94	-9.67	Sb2O5
Sb2Se3	-97.05	-164.81	-67.76	Sb2Se3
Sb4O6(cubic)	-55.18	-73.44	-18.26	Sb4O6
Sb4O6(orth)	-55.54	-73.44	-17.90	Sb4O6
SbCl3	-51.21	-50.64	0.57	SbCl3
SbF3	-43.79	-54.01	-10.23	SbF3
Sbmetal	-42.22	-53.91	-11.69	Sb
SbO2	-3.00	-30.82	-27.82	SbO2
Schoepite	-6.92	-0.93	5.99	UO2(OH) 2:H2O
Semetal(am)	-11.89	-19.00	-7.11	Se
Semetal(hex)	-11.29	-19.00	-7.71	Se
Senarmontite	-24.36	-36.72	-12.37	Sb2O3
SeO2	-16.58	-16.46	0.12	SeO2
SeO3	-50.11	-29.06	21.04	SeO3
Siderite	-1.43	-11.67	-10.24	FeCO3
Smithsonite	-1.55	-11.55	-10.00	ZnCO3
Spinel	-6.86	29.99	36.85	MgAl2O4
Tenorite	-1.06	6.58	7.64	CuO
Thenardite	-8.59	-8.26	0.32	Na2SO4
Thermonatrite	-10.28	-9.64	0.64	Na2CO3:H2O
Tyuyamunite	-10.10	-6.02	4.08	Ca(UO2) 2(VO4) 2
U3O8	-19.93	1.16	21.08	U3O8
U3Sb4	-556.47	-404.08	152.38	U3Sb4
U4O9	-34.94	-37.96	-3.02	U4O9
UF4	-33.41	-62.95	-29.54	UF4
UF4:2.5H2O	-30.23	-62.95	-32.72	UF4:2.5H2O
UO2(am)	-16.35	-15.41	0.93	UO2
UO2(OH) 2(beta)	-6.54	-0.93	5.61	UO2(OH) 2
UO2SeO4:4H2O	-27.75	-30.00	-2.25	UO2SeO4:4H2O
UO3	-8.63	-0.93	7.70	UO3
Uraninite	-10.74	-15.41	-4.67	UO2
USb2	-209.43	-179.85	29.58	USb2
V(OH) 3	-17.15	-9.56	7.59	V(OH) 3
V2O5	-15.56	-16.92	-1.36	V2O5
V3O5	-35.76	-33.93	1.84	V3O5
V4O7	-44.52	-37.33	7.19	V4O7
V6O13	-37.31	-98.17	-60.86	V6O13
Valentinite	-28.24	-36.72	-8.48	Sb2O3

VC12	-61.80	-42.93	18.87	VC12
VC13	-65.27	-41.84	23.43	VC13
VF4	-65.87	-50.94	14.93	VF4
Vmetal	-89.14	-45.11	44.03	V
VO	-36.17	-21.41	14.76	VO
VO(OH)2	-8.56	-3.41	5.15	VO(OH)2
VO2Cl	-22.06	-19.22	2.84	VO2Cl
VOC1	-31.47	-20.32	11.15	VOC1
VOC12	-37.69	-24.93	12.76	VOC12
VOSO4	-26.07	-22.46	3.61	VOSO4
Witherite	-2.56	-11.13	-8.57	BaCO3
Zincite	-2.46	8.88	11.33	ZnO
Zincosite	-14.10	-10.17	3.93	ZnSO4
Zn(BO2)2	-9.25	-0.96	8.29	Zn(BO2)2
Zn(OH)2	-3.32	8.88	12.20	Zn(OH)2
Zn(OH)2(am)	-3.60	8.88	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.88	8.88	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.66	8.88	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.86	8.88	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.80	-1.30	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-8.20	6.99	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.58	-1.93	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.38	-11.47	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-11.95	16.45	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-15.64	22.86	38.50	Zn5(OH)8Cl2
ZnCl2	-19.69	-12.64	7.05	ZnCl2
ZnCO3:1H2O	-1.29	-11.55	-10.26	ZnCO3:1H2O
ZnF2	-14.36	-14.89	-0.53	ZnF2
Znmetal	-40.61	-14.82	25.79	Zn
ZnMoO4	-3.80	-13.93	-10.13	ZnMoO4
ZnO(active)	-2.31	8.88	11.19	ZnO
ZnSb	-79.75	-68.74	11.01	ZnSb
ZnSe	-19.42	-33.82	-14.40	ZnSe
ZnSeO4:6H2O	-18.67	-20.19	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.54	-10.17	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 5.

TITLE Average HCT data
SOLUTION 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

```

temp      25
pH        7.31754
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F         0.42526
Fe 0.00138
K         0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge

```

```

        S(6)      20.27695 as SO4
        Se 0.00023
        V        0.00046
        water    1 # kg
END
-----
TITLE
-----

Average HCT data

-----
Beginning of initial solution calculations.
-----

Initial solution 3. Average HCT data for andesite oxide material (cells SRK 0864
and SRK 0866)

-----Solution composition-----

      Elements      Molality      Moles
Al      3.343e-07    3.343e-07
Alkalinity      1.740e-04    1.740e-04
Ba      2.439e-08    2.439e-08
Ca      2.085e-04    2.085e-04
Cl      1.996e-05    1.996e-05
F       2.238e-05    2.238e-05
Fe      2.471e-08    2.471e-08
K       2.491e-05    2.491e-05
Mg      5.243e-05    5.243e-05
Mn      1.727e-07    1.727e-07
Mo      4.795e-09    4.795e-09
Na      9.030e-05    9.030e-05    Charge balance
S(6)    2.111e-04    2.111e-04
Se      2.913e-09    2.913e-09
V       9.031e-09    9.031e-09

-----Description of solution-----

                        pH = 7.318
                        pe = 4.000
                Activity of water = 1.000
        Ionic strength (mol/kgw) = 1.075e-03
            Mass of water (kg) = 1.000e+00
            Total carbon (mol/kg) = 1.902e-04
            Total CO2 (mol/kg) = 1.902e-04
            Temperature (°C) = 25.00
            Electrical balance (eq) = -1.213e-18
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
                        Iterations = 10
                        Total H = 1.110139e+02
                        Total O = 5.550825e+01

-----Distribution of species-----

      Species      Molality      Activity      Log      Log      Log      mole V
                        Molality      Activity      Molality      Activity      Gamma      cm³/mol
OH-      2.171e-07    2.092e-07    -6.663    -6.679    -0.016    (0)
H+       4.994e-08    4.813e-08    -7.302    -7.318    -0.016    0.00
H2O      5.551e+01    1.000e+00    1.744    -0.000    0.000    18.07
Al      3.343e-07
Al(OH) 4-      3.195e-07    3.080e-07    -6.496    -6.511    -0.016    (0)
Al(OH) 3       1.169e-08    1.169e-08    -7.932    -7.932    0.000    (0)
Al(OH) 2+      2.906e-09    2.802e-09    -8.537    -8.553    -0.016    (0)
AlF2+         1.528e-10    1.473e-10    -9.816    -9.832    -0.016    (0)
AlF3          3.973e-11    3.973e-11   -10.401   -10.401    0.000    (0)

```

	AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
	AlOH+2	1.950e-11	1.686e-11	-10.710	-10.773	-0.063	(0)
	AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
	AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
	Al+3	1.124e-13	8.061e-14	-12.949	-13.094	-0.144	(0)
	Al (SO4) 2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)
Ba		2.439e-08					
	Ba+2	2.436e-08	2.102e-08	-7.613	-7.677	-0.064	(0)
	BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
	BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
	BaOH+	1.990e-14	1.919e-14	-13.701	-13.717	-0.016	(0)
C (4)		1.902e-04					
	HCO3-	1.714e-04	1.653e-04	-3.766	-3.782	-0.016	(0)
	H2CO3	1.790e-05	1.790e-05	-4.747	-4.747	0.000	(0)
	CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
	CO3-2	1.866e-07	1.610e-07	-6.729	-6.793	-0.064	(0)
	MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
	CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
	NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
	MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
	MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
	NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)
	BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
	FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
	BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
Ca		2.085e-04					
	Ca+2	2.010e-04	1.734e-04	-3.697	-3.761	-0.064	(0)
	CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
	CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
	CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
	CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
	CaOH+	7.503e-10	7.237e-10	-9.125	-9.140	-0.016	(0)
Cl		1.996e-05					
	Cl-	1.996e-05	1.924e-05	-4.700	-4.716	-0.016	(0)
	MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
	MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
	FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
	MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
	VOCl+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
	FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
	FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
F		2.238e-05					
	F-	2.223e-05	2.142e-05	-4.653	-4.669	-0.016	(0)
	MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
	CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
	HF	1.525e-09	1.525e-09	-8.817	-8.817	0.000	(0)
	NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
	AlF2+	1.528e-10	1.473e-10	-9.816	-9.832	-0.016	(0)
	MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
	AlF3	3.973e-11	3.973e-11	-10.401	-10.401	0.000	(0)
	AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
	AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
	HF2-	1.289e-13	1.243e-13	-12.890	-12.906	-0.016	(0)
	FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
	FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
	VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
	H2F2	6.234e-18	6.234e-18	-17.205	-17.205	0.000	(0)
	VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
	FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
	VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
	VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
	VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
	VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
	VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
	VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
Fe (2)		2.131e-09					
	Fe+2	2.037e-09	1.746e-09	-8.691	-8.758	-0.067	(0)

FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
FeOH+	1.508e-11	1.454e-11	-10.821	-10.837	-0.016	(0)
FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
Fe (OH) 2	2.417e-15	2.417e-15	-14.617	-14.617	0.000	(0)
Fe (OH) 3-	1.658e-16	1.599e-16	-15.780	-15.796	-0.016	(0)
Fe (3)	2.258e-08					
Fe (OH) 2+	1.849e-08	1.783e-08	-7.733	-7.749	-0.016	(0)
Fe (OH) 3	4.006e-09	4.006e-09	-8.397	-8.397	0.000	(0)
Fe (OH) 4-	8.092e-11	7.803e-11	-10.092	-10.108	-0.016	(0)
FeOH+2	2.536e-13	2.191e-13	-12.596	-12.659	-0.063	(0)
FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
Fe+3	2.261e-18	1.622e-18	-17.646	-17.790	-0.144	(0)
FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)
Fe2 (OH) 2+4	2.944e-24	1.590e-24	-23.531	-23.799	-0.268	(0)
FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
Fe3 (OH) 4+5	1.073e-30	4.098e-31	-29.969	-30.387	-0.418	(0)
FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
H (0)	3.280e-26					
H2	1.640e-26	1.640e-26	-25.785	-25.785	0.000	(0)
K	2.491e-05					
K+	2.488e-05	2.398e-05	-4.604	-4.620	-0.016	(0)
KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
Mg	5.243e-05					
Mg+2	5.084e-05	4.386e-05	-4.294	-4.358	-0.064	(0)
MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
MgOH+	3.787e-09	3.653e-09	-8.422	-8.437	-0.016	(0)
Mn (2)	1.727e-07					
Mn+2	1.676e-07	1.437e-07	-6.776	-6.843	-0.067	(0)
MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
MnOH+	7.830e-11	7.549e-11	-10.106	-10.122	-0.016	(0)
MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
Mn (OH) 3-	2.117e-20	2.041e-20	-19.674	-19.690	-0.016	(0)
MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
Mn (OH) 4-2	1.596e-26	1.379e-26	-25.797	-25.861	-0.063	(0)
MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Mn (3)	8.945e-29					
Mn+3	8.945e-29	6.417e-29	-28.048	-28.193	-0.144	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-50.661	-50.724	-0.063	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-56.080	-56.096	-0.016	(0)
Mo	4.795e-09					
MoO4-2	4.791e-09	4.133e-09	-8.320	-8.384	-0.064	(0)
HMoO4-	4.114e-12	3.959e-12	-11.386	-11.402	-0.017	(0)
H2MoO4	1.396e-15	1.396e-15	-14.855	-14.855	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)
Mo7O24-6	0.000e+00	0.000e+00	-63.634	-64.236	-0.602	(0)
HMo7O24-5	0.000e+00	0.000e+00	-64.749	-65.167	-0.418	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-67.435	-67.702	-0.268	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-71.623	-71.774	-0.150	(0)
Na	9.030e-05					
Na+	9.020e-05	8.694e-05	-4.045	-4.061	-0.016	(0)
NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)
NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)

O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-40.725	-40.725	0.000	(0)
S (6)	2.111e-04					
SO4-2	2.026e-04	1.748e-04	-3.693	-3.757	-0.064	(0)
CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)
KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
HSO4-	8.531e-10	8.223e-10	-9.069	-9.085	-0.016	(0)
FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
Al (SO4) 2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
Se (-2)	2.403e-32					
HSe-	2.402e-32	2.311e-32	-31.619	-31.636	-0.017	(0)
H2Se	8.636e-36	8.636e-36	-35.064	-35.064	0.000	(0)
MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Se-2	5.601e-40	4.801e-40	-39.252	-39.319	-0.067	(0)
Se (4)	2.913e-09					
HSeO3-	2.665e-09	2.565e-09	-8.574	-8.591	-0.017	(0)
SeO3-2	2.474e-10	2.121e-10	-9.607	-9.673	-0.067	(0)
H2SeO3	5.266e-14	5.266e-14	-13.278	-13.278	0.000	(0)
FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)
Se (6)	1.312e-15					
SeO4-2	1.312e-15	1.132e-15	-14.882	-14.946	-0.064	(0)
MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
HSeO4-	2.837e-21	2.730e-21	-20.547	-20.564	-0.017	(0)
V (2)	3.247e-38					
VOH+	2.785e-38	2.680e-38	-37.555	-37.572	-0.017	(0)
V+2	4.618e-39	3.959e-39	-38.336	-38.402	-0.067	(0)
V (3)	5.968e-12					
V (OH) 3	5.968e-12	5.968e-12	-11.224	-11.224	0.000	(0)
V (OH) 2+	1.929e-22	1.856e-22	-21.715	-21.731	-0.017	(0)
VOH+2	9.885e-26	8.474e-26	-25.005	-25.072	-0.067	(0)
V+3	1.143e-30	8.083e-31	-29.942	-30.092	-0.150	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.201	-48.351	-0.150	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-49.076	-49.344	-0.268	(0)
V (4)	3.142e-16					
V (OH) 3+	3.047e-16	2.932e-16	-15.516	-15.533	-0.017	(0)
VO+2	8.194e-18	7.025e-18	-17.086	-17.153	-0.067	(0)
VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
VOC1+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
H2V2O4+2	5.026e-27	4.309e-27	-26.299	-26.366	-0.067	(0)
VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
V (5)	9.025e-09					
H2VO4-	8.521e-09	8.199e-09	-8.070	-8.086	-0.017	(0)
HVO4-2	4.991e-10	4.279e-10	-9.302	-9.369	-0.067	(0)
H3VO4	3.947e-12	3.947e-12	-11.404	-11.404	0.000	(0)
H3V2O7-	2.171e-13	2.089e-13	-12.663	-12.680	-0.017	(0)
HV2O7-3	1.681e-15	1.189e-15	-14.774	-14.925	-0.150	(0)
VO2+	3.933e-16	3.791e-16	-15.405	-15.421	-0.016	(0)
VO4-3	6.300e-17	4.455e-17	-16.201	-16.351	-0.150	(0)
VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
V2O7-4	1.231e-18	6.647e-19	-17.910	-18.177	-0.268	(0)
V3O9-3	8.163e-19	5.772e-19	-18.088	-18.239	-0.150	(0)
VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
V4O12-4	3.653e-24	1.973e-24	-23.437	-23.705	-0.268	(0)

VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
HV10028-5	0.000e+00	0.000e+00	-59.939	-60.357	-0.418	(0)
V10028-6	0.000e+00	0.000e+00	-60.625	-61.227	-0.602	(0)
H2V10028-4	0.000e+00	0.000e+00	-62.200	-62.467	-0.268	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-1.94	8.86	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.71	-51.34	2.37	Al2 (MoO4) 3
Al2O3	-1.93	17.72	19.65	Al2O3
Al4 (OH) 10SO4	-5.66	17.04	22.70	Al4 (OH) 10SO4
AlOHSO4	-6.30	-9.53	-3.23	AlOHSO4
Alunite	-6.11	-7.51	-1.40	KAl3 (SO4) 2 (OH) 6
Anhydrite	-3.16	-7.52	-4.36	CaSO4
Aragonite	-2.25	-10.55	-8.30	CaCO3
Artinite	-10.47	-0.87	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.44	6.96	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.16	-2.29	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.27	4.67	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.20	-17.02	-5.82	BaF2
BaMoO4	-9.10	-16.06	-6.96	BaMoO4
Barite	-1.45	-11.43	-9.98	BaSO4
BaSeO3	-10.78	-8.95	1.83	BaSeO3
BaSeO4	-15.16	-22.62	-7.46	BaSeO4
Birnessite	-13.01	5.08	18.09	MnO2
Bixbyite	-11.84	-12.48	-0.64	Mn2O3
Boehmite	0.28	8.86	8.58	AlOOH
Brucite	-6.57	10.28	16.84	Mg (OH) 2
Ca (VO3) 2	-10.99	-5.33	5.66	Ca (VO3) 2
Ca2V2O7	-11.96	5.54	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.01	5.54	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-22.55	16.41	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.45	16.41	39.86	Ca3 (VO4) 2:4H2O
Calcite	-2.07	-10.55	-8.48	CaCO3
CaMoO4	-4.19	-12.14	-7.95	CaMoO4
CaSeO3:2H2O	-7.85	-5.03	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-15.69	-18.71	-3.02	CaSeO4:2H2O
CH4 (g)	-70.92	-111.97	-41.05	CH4
CO2 (g)	-3.28	-21.43	-18.15	CO2
Cryolite	-19.45	-53.29	-33.84	Na3AlF6
Diaspore	1.99	8.86	6.87	AlOOH
Dolomite (disordered)	-5.17	-21.71	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-4.62	-21.71	-17.09	CaMg (CO3) 2
Epsomite	-5.99	-8.12	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.69	5.88	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.59	0.55	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-6.61	-10.33	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.14	-7.58	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.77	-39.40	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.12	-46.85	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-6.02	14.20	20.22	Fe3 (OH) 8
FeMoO4	-7.05	-17.14	-10.09	FeMoO4
Ferrihydrite	0.97	4.16	3.19	Fe (OH) 3
Ferroselite	-30.80	-49.40	-18.60	FeSe2
FeSe	-22.08	-33.08	-11.00	FeSe
Fluorite	-2.60	-13.10	-10.50	CaF2
Gibbsite	0.57	8.86	8.29	Al (OH) 3
Goethite	3.67	4.16	0.49	FeOOH
Gypsum	-2.91	-7.52	-4.61	CaSO4:2H2O
H-Jarosite	-12.20	-24.30	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.14	-23.02	-12.88	H2MoO4
H2Se (g)	-33.99	-38.95	-4.96	H2Se
Halite	-10.38	-8.78	1.60	NaCl
Hausmannite	-15.02	46.01	61.03	Mn3O4
Hematite	9.74	8.33	-1.42	Fe2O3
Hercynite	0.70	23.60	22.89	FeAl2O4

Huntite	-14.04	-44.01	-29.97	CaMg ₃ (CO ₃) ₄
Hydromagnesite	-25.56	-34.33	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-20.06	-25.23	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-6.80	-21.60	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ MoO ₄	-20.89	-17.62	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-23.46	-24.19	-0.73	K ₂ SeO ₄
Lepidocrocite	2.79	4.16	1.37	FeOOH
Lime	-21.83	10.87	32.70	CaO
Maghemite	1.94	8.33	6.39	Fe ₂ O ₃
Magnesioferrite	1.74	18.60	16.86	Fe ₂ MgO ₄
Magnesite	-3.69	-11.15	-7.46	MgCO ₃
Magnetite	10.80	14.20	3.40	Fe ₃ O ₄
Manganite	-6.23	19.11	25.34	MnOOH
Melanterite	-10.31	-12.52	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-8.52	10.28	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.21	-5.93	11.28	Mg(VO ₃) ₂
Mg ₂ V ₂ O ₇	-22.01	4.35	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-5.57	-13.70	-8.13	MgF ₂
MgMoO ₄	-10.89	-12.74	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-8.69	-5.63	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-18.10	-19.30	-1.20	MgSeO ₄ ·6H ₂ O
Mirabilite	-10.77	-11.88	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-13.32	-8.42	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-61.95	-67.66	-5.71	Mn ₂ (SO ₄) ₃
MnCl ₂ ·4H ₂ O	-18.99	-16.27	2.72	MnCl ₂ ·4H ₂ O
MnSe	-34.66	-31.16	3.50	MnSe
MnSeO ₃	-9.25	-8.12	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-9.10	-8.12	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-19.74	-21.79	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-13.18	-10.60	2.58	MnSO ₄
MoO ₃	-15.02	-23.02	-8.00	MoO ₃
Na-Jarosite	-9.84	-21.04	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-22.93	-39.52	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-18.00	-16.51	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-17.73	-16.51	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-19.70	-9.40	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-24.35	-23.07	1.28	Na ₂ SeO ₄
Na ₃ VO ₄	-35.01	1.67	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-40.58	-3.18	37.40	Na ₄ V ₂ O ₇
Natron	-13.60	-14.91	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.71	-4.85	3.86	NaVO ₃
Nesquehonite	-6.48	-11.15	-4.67	MgCO ₃ ·3H ₂ O
Nsutite	-12.43	5.08	17.50	MnO ₂
O ₂ (g)	-37.82	45.27	83.09	O ₂
Periclase	-11.31	10.28	21.58	MgO
Portlandite	-11.93	10.87	22.80	Ca(OH) ₂
Pyrochroite	-7.40	7.79	15.19	Mn(OH) ₂
Pyrolusite	-10.95	30.43	41.38	MnO ₂
Rhodochrosite	-3.06	-13.64	-10.58	MnCO ₃
Semetal(am)	-9.21	-16.32	-7.11	Se
Semetal(hex)	-8.61	-16.32	-7.71	Se
SeO ₂	-16.03	-15.91	0.12	SeO ₂
SeO ₃	-50.63	-29.58	21.04	SeO ₃
Siderite	-5.31	-15.55	-10.24	FeCO ₃
Spinel	-8.85	28.00	36.85	MgAl ₂ O ₄
Thenardite	-12.20	-11.88	0.32	Na ₂ SO ₄
Thermonatrite	-15.55	-14.91	0.64	Na ₂ CO ₃ ·H ₂ O
V(OH) ₃	-15.73	-8.14	7.59	V(OH) ₃
V ₂ O ₅	-14.85	-16.21	-1.36	V ₂ O ₅
V ₃ O ₅	-32.03	-30.19	1.84	V ₃ O ₅
V ₄ O ₇	-39.89	-32.71	7.19	V ₄ O ₇
V ₆ O ₁₃	-33.03	-93.89	-60.86	V ₆ O ₁₃
VC12	-62.40	-43.52	18.87	VC12
VC13	-67.67	-44.24	23.43	VC13
VF ₄	-65.39	-50.46	14.93	VF ₄
Vmetal	-86.12	-42.09	44.03	V
VO	-34.21	-19.46	14.76	VO
VO(OH) ₂	-7.67	-2.52	5.15	VO(OH) ₂

VO2Cl	-22.98	-20.14	2.84	VO2Cl
VOC1	-31.33	-20.17	11.15	VOC1
VOC12	-39.35	-26.58	12.76	VOC12
VOSO4	-24.52	-20.91	3.61	VOSO4
Witherite	-5.90	-14.47	-8.57	BaCO3

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 6.

SOLUTION 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

```

temp      25
pH         5.50170
pe         4
redox      pe
units      mg/l
density    1
Alkalinity 3.43795 as HCO3
Al 0.23659
As 0.00101
Ba 0.01096
Ca 20.93261
Cd 0.00068
Cl 0.64738
Co 0.00070
Cu 9.10668
F          0.28887
Fe 0.39994
K          0.95011
Mg 1.29789
Mn 0.24814
Mo 0.03969
Na 0.52994 charge
Ni 0.00047
Pb 0.00207
S(6)      87.02664 as SO4
Sb 0.00040
Se 0.00024
U          0.00133
V          0.00047
Zn 0.04452
water     1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 4. Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

-----Solution composition-----

Elements	Molality	Moles
Al	8.770e-06	8.770e-06
Alkalinity	5.635e-05	5.635e-05
As	1.348e-08	1.348e-08
Ba	7.982e-08	7.982e-08
Ca	5.224e-04	5.224e-04
Cd	6.050e-09	6.050e-09

Cl	1.826e-05	1.826e-05	
Co	1.188e-08	1.188e-08	
Cu	1.433e-04	1.433e-04	
F	1.521e-05	1.521e-05	
Fe	7.162e-06	7.162e-06	
K	2.430e-05	2.430e-05	
Mg	5.341e-05	5.341e-05	
Mn	4.517e-06	4.517e-06	
Mo	4.137e-07	4.137e-07	
Na	3.940e-04	3.940e-04	Charge balance
Ni	8.009e-09	8.009e-09	
Pb	9.992e-09	9.992e-09	
S (6)	9.060e-04	9.060e-04	
Sb	3.286e-09	3.286e-09	
Se	3.040e-09	3.040e-09	
U	5.588e-09	5.588e-09	
V	9.228e-09	9.228e-09	
Zn	6.809e-07	6.809e-07	

-----Description of solution-----

pH	=	5.502
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	3.224e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	4.266e-04
Total CO2 (mol/kg)	=	4.266e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	2.099e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	12
Total H	=	1.110145e+02
Total O	=	5.551174e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.351e-06	3.150e-06	-5.475	-5.502	-0.027	0.00
OH-	3.403e-09	3.197e-09	-8.468	-8.495	-0.027	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	8.770e-06					
AlF2+	3.822e-06	3.597e-06	-5.418	-5.444	-0.026	(0)
AlF+2	3.280e-06	2.574e-06	-5.484	-5.589	-0.105	(0)
Al(OH) 2+	6.326e-07	5.954e-07	-6.199	-6.225	-0.026	(0)
AlSO4+	3.922e-07	3.688e-07	-6.406	-6.433	-0.027	(0)
AlOH+2	2.988e-07	2.345e-07	-6.525	-6.630	-0.105	(0)
AlF3	1.589e-07	1.589e-07	-6.799	-6.799	0.000	(0)
Al+3	1.281e-07	7.335e-08	-6.892	-7.135	-0.242	(0)
Al(OH) 3	3.797e-08	3.797e-08	-7.421	-7.421	0.000	(0)
Al(OH) 4-	1.625e-08	1.528e-08	-7.789	-7.816	-0.027	(0)
Al(SO4) 2-	2.722e-09	2.560e-09	-8.565	-8.592	-0.027	(0)
AlF4-	2.973e-10	2.795e-10	-9.527	-9.554	-0.027	(0)
AlMo6O21-3	1.065e-24	5.844e-25	-23.973	-24.233	-0.261	(0)
As (3)	5.192e-12					
H3AsO3	5.191e-12	5.191e-12	-11.285	-11.285	0.000	(0)
H2AsO3-	9.035e-16	8.452e-16	-15.044	-15.073	-0.029	(0)
H4AsO3+	8.660e-18	8.101e-18	-17.062	-17.091	-0.029	(0)
HAsO3-2	3.195e-22	2.447e-22	-21.495	-21.611	-0.116	(0)
AsO3-3	5.458e-30	2.995e-30	-29.263	-29.524	-0.261	(0)
As (5)	1.348e-08					
H2AsO4-	1.292e-08	1.209e-08	-7.889	-7.918	-0.029	(0)
HAsO4-2	5.494e-10	4.208e-10	-9.260	-9.376	-0.116	(0)
H3AsO4	6.612e-12	6.617e-12	-11.180	-11.179	0.000	(0)
AsO4-3	7.698e-16	4.224e-16	-15.114	-15.374	-0.261	(0)
Ba	7.982e-08					

Ba+2	7.978e-08	6.227e-08	-7.098	-7.206	-0.108	(0)
BaHCO3+	3.297e-11	3.105e-11	-10.482	-10.508	-0.026	(0)
BaCO3	2.482e-14	2.482e-14	-13.605	-13.605	0.000	(0)
BaOH+	9.235e-16	8.689e-16	-15.035	-15.061	-0.026	(0)
C (4)	4.266e-04					
H2CO3	3.699e-04	3.699e-04	-3.432	-3.432	0.000	(0)
HCO3-	5.548e-05	5.222e-05	-4.256	-4.282	-0.026	(0)
CuCO3	4.365e-07	4.365e-07	-6.360	-6.360	0.000	(0)
CaHCO3+	3.769e-07	3.550e-07	-6.424	-6.450	-0.026	(0)
CuHCO3+	3.359e-07	3.142e-07	-6.474	-6.503	-0.029	(0)
MgHCO3+	2.169e-08	2.038e-08	-7.664	-7.691	-0.027	(0)
NaHCO3	1.084e-08	1.084e-08	-7.965	-7.965	0.000	(0)
MnHCO3+	3.518e-09	3.309e-09	-8.454	-8.480	-0.026	(0)
FeHCO3+	3.405e-09	3.207e-09	-8.468	-8.494	-0.026	(0)
UO2CO3	2.681e-09	2.681e-09	-8.572	-8.572	0.000	(0)
CO3-2	9.958e-10	7.772e-10	-9.002	-9.109	-0.108	(0)
ZnHCO3+	8.427e-10	7.883e-10	-9.074	-9.103	-0.029	(0)
CaCO3	4.497e-10	4.497e-10	-9.347	-9.347	0.000	(0)
PbHCO3+	2.506e-10	2.345e-10	-9.601	-9.630	-0.029	(0)
UO2 (CO3) 2-2	5.429e-11	4.158e-11	-10.265	-10.381	-0.116	(0)
NiHCO3+	3.888e-11	3.637e-11	-10.410	-10.439	-0.029	(0)
CoHCO3+	3.583e-11	3.352e-11	-10.446	-10.475	-0.029	(0)
BaHCO3+	3.297e-11	3.105e-11	-10.482	-10.508	-0.026	(0)
MgCO3	2.466e-11	2.466e-11	-10.608	-10.608	0.000	(0)
ZnCO3	2.135e-11	2.135e-11	-10.671	-10.671	0.000	(0)
PbCO3	1.412e-11	1.412e-11	-10.850	-10.850	0.000	(0)
NaCO3-	5.675e-12	5.341e-12	-11.246	-11.272	-0.026	(0)
Cu (CO3) 2-2	1.192e-12	9.130e-13	-11.924	-12.040	-0.116	(0)
CdHCO3+	5.351e-13	5.006e-13	-12.272	-12.301	-0.029	(0)
NiCO3	1.638e-13	1.638e-13	-12.786	-12.786	0.000	(0)
CoCO3	1.084e-13	1.084e-13	-12.965	-12.965	0.000	(0)
CdCO3	7.459e-14	7.459e-14	-13.127	-13.127	0.000	(0)
BaCO3	2.482e-14	2.482e-14	-13.605	-13.605	0.000	(0)
UO2 (CO3) 3-4	4.707e-15	1.620e-15	-14.327	-14.791	-0.463	(0)
Pb (CO3) 2-2	4.132e-17	3.164e-17	-16.384	-16.500	-0.116	(0)
Cd (CO3) 2-2	5.611e-20	4.297e-20	-19.251	-19.367	-0.116	(0)
Ca	5.224e-04					
Ca+2	4.678e-04	3.651e-04	-3.330	-3.438	-0.108	(0)
CaSO4	5.417e-05	5.417e-05	-4.266	-4.266	0.000	(0)
CaHCO3+	3.769e-07	3.550e-07	-6.424	-6.450	-0.026	(0)
CaF+	1.486e-08	1.399e-08	-7.828	-7.854	-0.026	(0)
CaCO3	4.497e-10	4.497e-10	-9.347	-9.347	0.000	(0)
CaOH+	2.473e-11	2.329e-11	-10.607	-10.633	-0.026	(0)
Cd	6.050e-09					
Cd+2	5.395e-09	4.211e-09	-8.268	-8.376	-0.108	(0)
CdSO4	6.393e-10	6.393e-10	-9.194	-9.194	0.000	(0)
CdCl+	7.336e-12	6.863e-12	-11.135	-11.163	-0.029	(0)
Cd (SO4) 2-2	7.294e-12	5.586e-12	-11.137	-11.253	-0.116	(0)
CdHCO3+	5.351e-13	5.006e-13	-12.272	-12.301	-0.029	(0)
CdF+	2.504e-13	2.342e-13	-12.601	-12.630	-0.029	(0)
CdOH+	1.143e-13	1.069e-13	-12.942	-12.971	-0.029	(0)
CdCO3	7.459e-14	7.459e-14	-13.127	-13.127	0.000	(0)
CdOHC1	8.999e-16	8.999e-16	-15.046	-15.046	0.000	(0)
CdCl2	4.883e-16	4.883e-16	-15.311	-15.311	0.000	(0)
Cd (OH) 2	2.156e-18	2.156e-18	-17.666	-17.666	0.000	(0)
CdF2	1.640e-18	1.640e-18	-17.785	-17.785	0.000	(0)
Cd (CO3) 2-2	5.611e-20	4.297e-20	-19.251	-19.367	-0.116	(0)
CdCl3-	5.621e-21	5.259e-21	-20.250	-20.279	-0.029	(0)
Cd2OH+3	4.112e-21	2.256e-21	-20.386	-20.647	-0.261	(0)
Cd (OH) 3-	4.502e-25	4.211e-25	-24.347	-24.376	-0.029	(0)
Cd (SeO3) 2-2	5.821e-26	4.458e-26	-25.235	-25.351	-0.116	(0)
CdSeO4	3.500e-27	3.500e-27	-26.456	-26.456	0.000	(0)
Cd (OH) 4-2	2.877e-34	2.203e-34	-33.541	-33.657	-0.116	(0)
Cl	1.826e-05					
Cl-	1.816e-05	1.707e-05	-4.741	-4.768	-0.027	(0)
CuCl	1.004e-07	1.004e-07	-6.998	-6.998	0.000	(0)
CuCl+	2.745e-09	2.580e-09	-8.561	-8.588	-0.027	(0)
CuCl2-	3.808e-10	3.579e-10	-9.419	-9.446	-0.027	(0)

MnCl+	7.254e-11	6.825e-11	-10.139	-10.166	-0.026	(0)
ZnCl+	2.178e-11	2.047e-11	-10.662	-10.689	-0.027	(0)
CdCl+	7.336e-12	6.863e-12	-11.135	-11.163	-0.029	(0)
PbCl+	3.912e-12	3.659e-12	-11.408	-11.437	-0.029	(0)
CoCl+	5.208e-13	4.872e-13	-12.283	-12.312	-0.029	(0)
NiCl+	2.637e-13	2.467e-13	-12.579	-12.608	-0.029	(0)
ZnOHC1	8.565e-14	8.565e-14	-13.067	-13.067	0.000	(0)
UO2Cl+	2.564e-14	2.399e-14	-13.591	-13.620	-0.029	(0)
CuCl2	1.527e-14	1.527e-14	-13.816	-13.816	0.000	(0)
CuCl3-2	1.667e-15	1.306e-15	-14.778	-14.884	-0.106	(0)
MnCl2	1.645e-15	1.645e-15	-14.784	-14.784	0.000	(0)
CdOHC1	8.999e-16	8.999e-16	-15.046	-15.046	0.000	(0)
ZnCl2	5.536e-16	5.536e-16	-15.257	-15.257	0.000	(0)
CdCl2	4.883e-16	4.883e-16	-15.311	-15.311	0.000	(0)
PbCl2	2.790e-16	2.790e-16	-15.554	-15.554	0.000	(0)
VOCl+	3.618e-17	3.384e-17	-16.442	-16.471	-0.029	(0)
FeCl+2	2.981e-18	2.336e-18	-17.526	-17.632	-0.106	(0)
NiCl2	2.120e-20	2.120e-20	-19.674	-19.674	0.000	(0)
MnCl3-	8.221e-21	7.735e-21	-20.085	-20.112	-0.026	(0)
ZnCl3-	7.986e-21	7.506e-21	-20.098	-20.125	-0.027	(0)
CdCl3-	5.621e-21	5.259e-21	-20.250	-20.279	-0.029	(0)
CuCl3-	2.587e-21	2.432e-21	-20.587	-20.614	-0.027	(0)
PbCl3-	2.026e-21	1.896e-21	-20.693	-20.722	-0.029	(0)
FeCl2+	1.893e-22	1.781e-22	-21.723	-21.749	-0.026	(0)
ZnCl4-2	8.176e-26	6.406e-26	-25.087	-25.193	-0.106	(0)
PbCl4-2	1.931e-26	1.479e-26	-25.714	-25.830	-0.116	(0)
FeCl3	3.040e-28	3.040e-28	-27.517	-27.517	0.000	(0)
CuCl4-2	2.655e-28	2.080e-28	-27.576	-27.682	-0.106	(0)
UCl+3	2.187e-33	1.200e-33	-32.660	-32.921	-0.261	(0)
CoCl+2	1.490e-39	1.141e-39	-38.827	-38.943	-0.116	(0)
Co (2)	1.188e-08					
Co+2	1.077e-08	8.252e-09	-7.968	-8.083	-0.116	(0)
CoSO4	1.066e-09	1.066e-09	-8.972	-8.972	0.000	(0)
CoHCO3+	3.583e-11	3.352e-11	-10.446	-10.475	-0.029	(0)
CoF+	9.790e-13	9.159e-13	-12.009	-12.038	-0.029	(0)
CoOH+	5.626e-13	5.263e-13	-12.250	-12.279	-0.029	(0)
CoCl+	5.208e-13	4.872e-13	-12.283	-12.312	-0.029	(0)
CoCO3	1.084e-13	1.084e-13	-12.965	-12.965	0.000	(0)
Co (OH) 2	1.336e-16	1.336e-16	-15.874	-15.874	0.000	(0)
Co2OH+3	3.967e-22	2.177e-22	-21.402	-21.662	-0.261	(0)
Co (OH) 3-	9.111e-24	8.524e-24	-23.040	-23.069	-0.029	(0)
CoOOH-	2.286e-24	2.139e-24	-23.641	-23.670	-0.029	(0)
CoSeO4	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)
Co (OH) 4-2	5.638e-33	4.318e-33	-32.249	-32.365	-0.116	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.352	-40.815	-0.463	(0)
Co (3)	6.968e-33					
CoOH+2	6.968e-33	5.336e-33	-32.157	-32.273	-0.116	(0)
Co+3	5.738e-37	3.285e-37	-36.241	-36.483	-0.242	(0)
CoCl+2	1.490e-39	1.141e-39	-38.827	-38.943	-0.116	(0)
Cu (1)	5.094e-06					
Cu+	4.993e-06	4.671e-06	-5.302	-5.331	-0.029	(0)
CuCl	1.004e-07	1.004e-07	-6.998	-6.998	0.000	(0)
CuCl2-	3.808e-10	3.579e-10	-9.419	-9.446	-0.027	(0)
CuCl3-2	1.667e-15	1.306e-15	-14.778	-14.884	-0.106	(0)
Cu (2)	1.382e-04					
Cu+2	1.222e-04	9.537e-05	-3.913	-4.021	-0.108	(0)
CuSO4	1.415e-05	1.415e-05	-4.849	-4.849	0.000	(0)
CuOH+	1.026e-06	9.640e-07	-5.989	-6.016	-0.027	(0)
CuCO3	4.365e-07	4.365e-07	-6.360	-6.360	0.000	(0)
CuHCO3+	3.359e-07	3.142e-07	-6.474	-6.503	-0.029	(0)
Cu2 (OH) 2+2	3.048e-08	2.335e-08	-7.516	-7.632	-0.116	(0)
CuF+	2.258e-08	2.112e-08	-7.646	-7.675	-0.029	(0)
CuCl+	2.745e-09	2.580e-09	-8.561	-8.588	-0.027	(0)
Cu (OH) 2	6.149e-10	6.149e-10	-9.211	-9.211	0.000	(0)
Cu (CO3) 2-2	1.192e-12	9.130e-13	-11.924	-12.040	-0.116	(0)
CuCl2	1.527e-14	1.527e-14	-13.816	-13.816	0.000	(0)
Cu (OH) 3-	4.309e-15	4.031e-15	-14.366	-14.395	-0.029	(0)
CuCl3-	2.587e-21	2.432e-21	-20.587	-20.614	-0.027	(0)

	Cu (OH) 4-2	1.324e-22	1.014e-22	-21.878	-21.994	-0.116	(0)
	CuCl4-2	2.655e-28	2.080e-28	-27.576	-27.682	-0.106	(0)
F	1.521e-05						
	AlF2+	3.822e-06	3.597e-06	-5.418	-5.444	-0.026	(0)
	F-	3.734e-06	3.510e-06	-5.428	-5.455	-0.027	(0)
	AlF+2	3.280e-06	2.574e-06	-5.484	-5.589	-0.105	(0)
	AlF3	1.589e-07	1.589e-07	-6.799	-6.799	0.000	(0)
	CuF+	2.258e-08	2.112e-08	-7.646	-7.675	-0.029	(0)
	HF	1.635e-08	1.635e-08	-7.786	-7.786	0.000	(0)
	MgF+	1.597e-08	1.502e-08	-7.797	-7.823	-0.027	(0)
	CaF+	1.486e-08	1.399e-08	-7.828	-7.854	-0.026	(0)
	NaF	8.173e-10	8.173e-10	-9.088	-9.088	0.000	(0)
	MnF+	4.717e-10	4.438e-10	-9.326	-9.353	-0.026	(0)
	UO2F+	4.488e-10	4.199e-10	-9.348	-9.377	-0.029	(0)
	AlF4-	2.973e-10	2.795e-10	-9.527	-9.554	-0.027	(0)
	ZnF+	3.574e-11	3.343e-11	-10.447	-10.476	-0.029	(0)
	UO2F2	4.250e-12	4.250e-12	-11.372	-11.372	0.000	(0)
	PbF+	1.598e-12	1.495e-12	-11.797	-11.825	-0.029	(0)
	CoF+	9.790e-13	9.159e-13	-12.009	-12.038	-0.029	(0)
	NiF+	5.324e-13	4.981e-13	-12.274	-12.303	-0.029	(0)
	CdF+	2.504e-13	2.342e-13	-12.601	-12.630	-0.029	(0)
	HF2-	2.323e-13	2.182e-13	-12.634	-12.661	-0.027	(0)
	FeF+2	2.226e-14	1.744e-14	-13.652	-13.758	-0.106	(0)
	VOF+	1.590e-14	1.488e-14	-13.798	-13.827	-0.029	(0)
	UO2F3-	4.005e-15	3.746e-15	-14.397	-14.426	-0.029	(0)
	FeF2+	1.741e-15	1.638e-15	-14.759	-14.786	-0.026	(0)
	H2F2	7.163e-16	7.163e-16	-15.145	-15.145	0.000	(0)
	PbF2	1.032e-16	1.032e-16	-15.986	-15.986	0.000	(0)
	VO2F	5.482e-17	5.482e-17	-16.261	-16.261	0.000	(0)
	Sb (OH) 2F	3.952e-17	3.952e-17	-16.403	-16.403	0.000	(0)
	SbOF	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
	VOF2	1.958e-17	1.958e-17	-16.708	-16.708	0.000	(0)
	FeF3	8.111e-18	8.111e-18	-17.091	-17.091	0.000	(0)
	CdF2	1.640e-18	1.640e-18	-17.785	-17.785	0.000	(0)
	UO2F4-2	1.364e-19	1.044e-19	-18.865	-18.981	-0.116	(0)
	VO2F2-	7.467e-20	6.986e-20	-19.127	-19.156	-0.029	(0)
	VOF3-	2.606e-21	2.438e-21	-20.584	-20.613	-0.029	(0)
	PbF3-	7.345e-22	6.871e-22	-21.134	-21.163	-0.029	(0)
	VO2F3-2	3.993e-24	3.058e-24	-23.399	-23.515	-0.116	(0)
	UF2+2	5.668e-25	4.341e-25	-24.247	-24.362	-0.116	(0)
	UF3+	2.581e-25	2.415e-25	-24.588	-24.617	-0.029	(0)
	VOF4-2	4.510e-26	3.454e-26	-25.346	-25.462	-0.116	(0)
	UF+3	1.791e-26	9.825e-27	-25.747	-26.008	-0.261	(0)
	PbF4-2	1.507e-27	1.154e-27	-26.822	-26.938	-0.116	(0)
	UF4	9.292e-29	9.292e-29	-28.032	-28.032	0.000	(0)
	VO2F4-3	9.624e-30	5.281e-30	-29.017	-29.277	-0.261	(0)
	UF5-	1.381e-32	1.292e-32	-31.860	-31.889	-0.029	(0)
	UF6-2	1.788e-35	1.370e-35	-34.748	-34.863	-0.116	(0)
Fe (2)	7.150e-06						
	Fe+2	6.370e-06	4.879e-06	-5.196	-5.312	-0.116	(0)
	FeSO4	7.757e-07	7.757e-07	-6.110	-6.110	0.000	(0)
	FeHCO3+	3.405e-09	3.207e-09	-8.468	-8.494	-0.026	(0)
	FeOH+	6.599e-10	6.209e-10	-9.181	-9.207	-0.026	(0)
	Fe (OH) 2	1.576e-15	1.576e-15	-14.802	-14.802	0.000	(0)
	Fe (OH) 3-	1.694e-18	1.593e-18	-17.771	-17.798	-0.026	(0)
Fe (3)	1.241e-08						
	Fe (OH) 2+	1.236e-08	1.163e-08	-7.908	-7.934	-0.026	(0)
	Fe (OH) 3	3.993e-11	3.993e-11	-10.399	-10.399	0.000	(0)
	FeOH+2	1.194e-11	9.354e-12	-10.923	-11.029	-0.106	(0)
	FeSO4+	3.501e-14	3.294e-14	-13.456	-13.482	-0.026	(0)
	FeF+2	2.226e-14	1.744e-14	-13.652	-13.758	-0.106	(0)
	Fe (OH) 4-	1.263e-14	1.189e-14	-13.899	-13.925	-0.026	(0)
	Fe+3	7.916e-15	4.532e-15	-14.102	-14.344	-0.242	(0)
	FeF2+	1.741e-15	1.638e-15	-14.759	-14.786	-0.026	(0)
	Fe (SO4) 2-	4.876e-16	4.561e-16	-15.312	-15.341	-0.029	(0)
	FeF3	8.111e-18	8.111e-18	-17.091	-17.091	0.000	(0)
	FeCl+2	2.981e-18	2.336e-18	-17.526	-17.632	-0.106	(0)
	FeHSeO3+2	4.434e-20	3.396e-20	-19.353	-19.469	-0.116	(0)

	Fe2 (OH) 2+4	8.420e-21	2.897e-21	-20.075	-20.538	-0.463	(0)
	FeCl2+	1.893e-22	1.781e-22	-21.723	-21.749	-0.026	(0)
	Fe3 (OH) 4+5	2.580e-27	4.871e-28	-26.588	-27.312	-0.724	(0)
	FeCl3	3.040e-28	3.040e-28	-27.517	-27.517	0.000	(0)
H (0)	1.404e-22						
	H2	7.019e-23	7.024e-23	-22.154	-22.153	0.000	(0)
K	2.430e-05						
	K+	2.419e-05	2.274e-05	-4.616	-4.643	-0.027	(0)
	KSO4-	1.108e-07	1.043e-07	-6.956	-6.982	-0.026	(0)
Mg	5.341e-05						
	Mg+2	4.887e-05	3.814e-05	-4.311	-4.419	-0.108	(0)
	MgSO4	4.496e-06	4.496e-06	-5.347	-5.347	0.000	(0)
	MgHCO3+	2.169e-08	2.038e-08	-7.664	-7.691	-0.027	(0)
	MgF+	1.597e-08	1.502e-08	-7.797	-7.823	-0.027	(0)
	MgOH+	5.152e-11	4.854e-11	-10.288	-10.314	-0.026	(0)
	MgCO3	2.466e-11	2.466e-11	-10.608	-10.608	0.000	(0)
Mn (2)	4.517e-06						
	Mn+2	4.147e-06	3.176e-06	-5.382	-5.498	-0.116	(0)
	MnSO4	3.659e-07	3.659e-07	-6.437	-6.437	0.000	(0)
	MnHCO3+	3.518e-09	3.309e-09	-8.454	-8.480	-0.026	(0)
	MnF+	4.717e-10	4.438e-10	-9.326	-9.353	-0.026	(0)
	MnCl+	7.254e-11	6.825e-11	-10.139	-10.166	-0.026	(0)
	MnOH+	2.711e-11	2.550e-11	-10.567	-10.593	-0.026	(0)
	MnCl2	1.645e-15	1.645e-15	-14.784	-14.784	0.000	(0)
	MnCl3-	8.221e-21	7.735e-21	-20.085	-20.112	-0.026	(0)
	MnSeO4	3.817e-24	3.817e-24	-23.418	-23.418	0.000	(0)
	Mn (OH) 3-	1.712e-24	1.611e-24	-23.767	-23.793	-0.026	(0)
	MnSe	8.340e-27	8.340e-27	-26.079	-26.079	0.000	(0)
	Mn (OH) 4-2	2.121e-32	1.662e-32	-31.673	-31.779	-0.106	(0)
Mn (3)	2.478e-27						
	Mn+3	2.478e-27	1.419e-27	-26.606	-26.848	-0.242	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-63.801	-63.907	-0.106	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-69.251	-69.279	-0.027	(0)
Mo	4.137e-07						
	MoO4-2	3.928e-07	3.065e-07	-6.406	-6.514	-0.108	(0)
	HMoO4-	2.054e-08	1.921e-08	-7.687	-7.716	-0.029	(0)
	H2MoO4	4.433e-10	4.433e-10	-9.353	-9.353	0.000	(0)
	AlMo6O21-3	1.065e-24	5.844e-25	-23.973	-24.233	-0.261	(0)
	HMo7O24-5	9.795e-36	1.849e-36	-35.009	-35.733	-0.724	(0)
	Mo7O24-6	2.658e-36	2.409e-37	-35.576	-36.618	-1.043	(0)
	H2Mo7O24-4	1.025e-36	3.528e-37	-35.989	-36.452	-0.463	(0)
	H3Mo7O24-3	3.568e-39	1.958e-39	-38.448	-38.708	-0.261	(0)
Na	3.940e-04						
	Na+	3.927e-04	3.691e-04	-3.406	-3.433	-0.027	(0)
	NaSO4-	1.364e-06	1.284e-06	-5.865	-5.892	-0.026	(0)
	NaHCO3	1.084e-08	1.084e-08	-7.965	-7.965	0.000	(0)
	NaF	8.173e-10	8.173e-10	-9.088	-9.088	0.000	(0)
	NaCO3-	5.675e-12	5.341e-12	-11.246	-11.272	-0.026	(0)
Ni	8.009e-09						
	Ni+2	7.239e-09	5.650e-09	-8.140	-8.248	-0.108	(0)
	NiSO4	7.302e-10	7.302e-10	-9.137	-9.137	0.000	(0)
	NiHCO3+	3.888e-11	3.637e-11	-10.410	-10.439	-0.029	(0)
	NiF+	5.324e-13	4.981e-13	-12.274	-12.303	-0.029	(0)
	NiCl+	2.637e-13	2.467e-13	-12.579	-12.608	-0.029	(0)
	NiOH+	2.430e-13	2.274e-13	-12.614	-12.643	-0.029	(0)
	NiCO3	1.638e-13	1.638e-13	-12.786	-12.786	0.000	(0)
	Ni (SO4) 2-2	2.045e-14	1.566e-14	-13.689	-13.805	-0.116	(0)
	Ni (OH) 2	5.773e-17	5.773e-17	-16.239	-16.239	0.000	(0)
	NiCl2	2.120e-20	2.120e-20	-19.674	-19.674	0.000	(0)
	Ni (OH) 3-	1.973e-22	1.845e-22	-21.705	-21.734	-0.029	(0)
	NiSeO4	1.180e-26	1.180e-26	-25.928	-25.928	0.000	(0)
O (0)	0.000e+00						
	O2	0.000e+00	0.000e+00	-47.989	-47.988	0.000	(0)
Pb	9.992e-09						
	Pb+2	7.743e-09	6.043e-09	-8.111	-8.219	-0.108	(0)
	PbSO4	1.917e-09	1.917e-09	-8.717	-8.717	0.000	(0)

PbHCO3+	2.506e-10	2.345e-10	-9.601	-9.630	-0.029	(0)
PbOH+	5.187e-11	4.852e-11	-10.285	-10.314	-0.029	(0)
PbCO3	1.412e-11	1.412e-11	-10.850	-10.850	0.000	(0)
Pb (SO4) 2-2	9.769e-12	7.482e-12	-11.010	-11.126	-0.116	(0)
PbCl+	3.912e-12	3.659e-12	-11.408	-11.437	-0.029	(0)
PbF+	1.598e-12	1.495e-12	-11.797	-11.825	-0.029	(0)
Pb (OH) 2	4.905e-15	4.905e-15	-14.309	-14.309	0.000	(0)
PbCl2	2.790e-16	2.790e-16	-15.554	-15.554	0.000	(0)
PbF2	1.032e-16	1.032e-16	-15.986	-15.986	0.000	(0)
Pb (CO3) 2-2	4.132e-17	3.164e-17	-16.384	-16.500	-0.116	(0)
Pb2OH+3	8.469e-18	4.647e-18	-17.072	-17.333	-0.261	(0)
Pb (OH) 3-	1.676e-20	1.568e-20	-19.776	-19.805	-0.029	(0)
PbCl3-	2.026e-21	1.896e-21	-20.693	-20.722	-0.029	(0)
PbF3-	7.345e-22	6.871e-22	-21.134	-21.163	-0.029	(0)
PbCl4-2	1.931e-26	1.479e-26	-25.714	-25.830	-0.116	(0)
Pb (OH) 4-2	1.603e-26	1.227e-26	-25.795	-25.911	-0.116	(0)
Pb3 (OH) 4+2	3.787e-27	2.901e-27	-26.422	-26.538	-0.116	(0)
PbF4-2	1.507e-27	1.154e-27	-26.822	-26.938	-0.116	(0)
Pb4 (OH) 4+4	4.046e-31	1.392e-31	-30.393	-30.856	-0.463	(0)
S (6)	9.060e-04					
SO4-2	8.299e-04	6.477e-04	-3.081	-3.189	-0.108	(0)
CaSO4	5.417e-05	5.417e-05	-4.266	-4.266	0.000	(0)
CuSO4	1.415e-05	1.415e-05	-4.849	-4.849	0.000	(0)
MgSO4	4.496e-06	4.496e-06	-5.347	-5.347	0.000	(0)
NaSO4-	1.364e-06	1.284e-06	-5.865	-5.892	-0.026	(0)
FeSO4	7.757e-07	7.757e-07	-6.110	-6.110	0.000	(0)
AlSO4+	3.922e-07	3.688e-07	-6.406	-6.433	-0.027	(0)
MnSO4	3.659e-07	3.659e-07	-6.437	-6.437	0.000	(0)
HSO4-	2.120e-07	1.994e-07	-6.674	-6.700	-0.027	(0)
KSO4-	1.108e-07	1.043e-07	-6.956	-6.982	-0.026	(0)
ZnSO4	6.765e-08	6.765e-08	-7.170	-7.170	0.000	(0)
Al (SO4) 2-	2.722e-09	2.560e-09	-8.565	-8.592	-0.027	(0)
PbSO4	1.917e-09	1.917e-09	-8.717	-8.717	0.000	(0)
CoSO4	1.066e-09	1.066e-09	-8.972	-8.972	0.000	(0)
UO2SO4	8.496e-10	8.496e-10	-9.071	-9.071	0.000	(0)
NiSO4	7.302e-10	7.302e-10	-9.137	-9.137	0.000	(0)
CdSO4	6.393e-10	6.393e-10	-9.194	-9.194	0.000	(0)
Zn (SO4) 2-2	4.983e-10	3.816e-10	-9.303	-9.418	-0.116	(0)
Pb (SO4) 2-2	9.769e-12	7.482e-12	-11.010	-11.126	-0.116	(0)
UO2 (SO4) 2-2	9.472e-12	7.255e-12	-11.024	-11.139	-0.116	(0)
Cd (SO4) 2-2	7.294e-12	5.586e-12	-11.137	-11.253	-0.116	(0)
VOSO4	1.261e-13	1.261e-13	-12.899	-12.899	0.000	(0)
FeSO4+	3.501e-14	3.294e-14	-13.456	-13.482	-0.026	(0)
Ni (SO4) 2-2	2.045e-14	1.566e-14	-13.689	-13.805	-0.116	(0)
Fe (SO4) 2-	4.876e-16	4.561e-16	-15.312	-15.341	-0.029	(0)
VO2SO4-	1.472e-16	1.377e-16	-15.832	-15.861	-0.029	(0)
VSO4+	1.138e-22	1.065e-22	-21.944	-21.973	-0.029	(0)
U (SO4) 2	1.861e-26	1.861e-26	-25.730	-25.730	0.000	(0)
USO4+2	4.724e-27	3.618e-27	-26.326	-26.442	-0.116	(0)
Sb (3)	4.523e-12					
Sb (OH) 3	2.289e-12	2.289e-12	-11.640	-11.640	0.000	(0)
HSbO2	2.234e-12	2.234e-12	-11.651	-11.651	0.000	(0)
Sb (OH) 2+	1.871e-16	1.751e-16	-15.728	-15.757	-0.029	(0)
SbO+	6.452e-17	6.036e-17	-16.190	-16.219	-0.029	(0)
Sb (OH) 2F	3.952e-17	3.952e-17	-16.403	-16.403	0.000	(0)
SbOF	3.887e-17	3.887e-17	-16.410	-16.410	0.000	(0)
SbO2-	1.228e-18	1.149e-18	-17.911	-17.940	-0.029	(0)
Sb (OH) 4-	7.036e-19	6.582e-19	-18.153	-18.182	-0.029	(0)
Sb (5)	3.281e-09					
SbO3-	3.277e-09	3.066e-09	-8.484	-8.513	-0.029	(0)
Sb (OH) 6-	3.815e-12	3.586e-12	-11.418	-11.445	-0.027	(0)
SbO2+	9.327e-21	8.726e-21	-20.030	-20.059	-0.029	(0)
Se (-2)	2.194e-21					
HSe-	2.145e-21	2.007e-21	-20.669	-20.697	-0.029	(0)
H2Se	4.907e-23	4.907e-23	-22.309	-22.309	0.000	(0)
MnSe	8.340e-27	8.340e-27	-26.079	-26.079	0.000	(0)
Se-2	8.319e-31	6.371e-31	-30.080	-30.196	-0.116	(0)
Se (4)	3.040e-09					

HSeO3-	3.031e-09	2.836e-09	-8.518	-8.547	-0.029	(0)
SeO3-2	4.680e-12	3.584e-12	-11.330	-11.446	-0.116	(0)
H2SeO3	3.811e-12	3.811e-12	-11.419	-11.419	0.000	(0)
FeHSeO3+2	4.434e-20	3.396e-20	-19.353	-19.469	-0.116	(0)
Cd (SeO3) 2-2	5.821e-26	4.458e-26	-25.235	-25.351	-0.116	(0)
Se (6)	5.725e-21					
SeO4-2	5.720e-21	4.464e-21	-20.243	-20.350	-0.108	(0)
MnSeO4	3.817e-24	3.817e-24	-23.418	-23.418	0.000	(0)
HSeO4-	7.534e-25	7.048e-25	-24.123	-24.152	-0.029	(0)
ZnSeO4	3.301e-25	3.301e-25	-24.481	-24.481	0.000	(0)
CoSeO4	1.846e-26	1.846e-26	-25.734	-25.734	0.000	(0)
NiSeO4	1.180e-26	1.180e-26	-25.928	-25.928	0.000	(0)
CdSeO4	3.500e-27	3.500e-27	-26.456	-26.456	0.000	(0)
Zn (SeO4) 2-2	0.000e+00	0.000e+00	-44.710	-44.826	-0.116	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-42.388	-42.649	-0.261	(0)
U (4)	4.127e-16					
U (OH) 5-	3.668e-16	3.432e-16	-15.436	-15.464	-0.029	(0)
U (OH) 4	4.527e-17	4.527e-17	-16.344	-16.344	0.000	(0)
U (OH) 3+	5.573e-19	5.214e-19	-18.254	-18.283	-0.029	(0)
U (OH) 2+2	9.915e-22	7.594e-22	-21.004	-21.120	-0.116	(0)
UF2+2	5.668e-25	4.341e-25	-24.247	-24.362	-0.116	(0)
UF3+	2.581e-25	2.415e-25	-24.588	-24.617	-0.029	(0)
UOH+3	2.053e-25	1.127e-25	-24.688	-24.948	-0.261	(0)
U (SO4) 2	1.861e-26	1.861e-26	-25.730	-25.730	0.000	(0)
UF+3	1.791e-26	9.825e-27	-25.747	-26.008	-0.261	(0)
USO4+2	4.724e-27	3.618e-27	-26.326	-26.442	-0.116	(0)
UF4	9.292e-29	9.292e-29	-28.032	-28.032	0.000	(0)
U+4	4.078e-30	1.403e-30	-29.390	-29.853	-0.463	(0)
UF5-	1.381e-32	1.292e-32	-31.860	-31.889	-0.029	(0)
UCl+3	2.187e-33	1.200e-33	-32.660	-32.921	-0.261	(0)
UF6-2	1.788e-35	1.370e-35	-34.748	-34.863	-0.116	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-111.401	-113.747	-2.346	(0)
U (5)	5.647e-11					
UO2+	5.647e-11	5.283e-11	-10.248	-10.277	-0.029	(0)
U (6)	5.532e-09					
UO2CO3	2.681e-09	2.681e-09	-8.572	-8.572	0.000	(0)
UO2+2	1.110e-09	8.667e-10	-8.955	-9.062	-0.108	(0)
UO2SO4	8.496e-10	8.496e-10	-9.071	-9.071	0.000	(0)
UO2F+	4.488e-10	4.199e-10	-9.348	-9.377	-0.029	(0)
UO2OH+	3.728e-10	3.488e-10	-9.429	-9.457	-0.029	(0)
UO2 (CO3) 2-2	5.429e-11	4.158e-11	-10.265	-10.381	-0.116	(0)
UO2 (SO4) 2-2	9.472e-12	7.255e-12	-11.024	-11.139	-0.116	(0)
UO2F2	4.250e-12	4.250e-12	-11.372	-11.372	0.000	(0)
(UO2) 2 (OH) 2+2	2.636e-13	2.019e-13	-12.579	-12.695	-0.116	(0)
UO2Cl+	2.564e-14	2.399e-14	-13.591	-13.620	-0.029	(0)
UO2 (CO3) 3-4	4.707e-15	1.620e-15	-14.327	-14.791	-0.463	(0)
UO2F3-	4.005e-15	3.746e-15	-14.397	-14.426	-0.029	(0)
(UO2) 3 (OH) 5+	5.834e-16	5.457e-16	-15.234	-15.263	-0.029	(0)
UO2F4-2	1.364e-19	1.044e-19	-18.865	-18.981	-0.116	(0)
V (2)	2.416e-30					
V+2	2.227e-30	1.706e-30	-29.652	-29.768	-0.116	(0)
VOH+	1.886e-31	1.764e-31	-30.724	-30.753	-0.029	(0)
V (3)	9.177e-09					
V (OH) 3	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
V (OH) 2+	1.996e-17	1.868e-17	-16.700	-16.729	-0.029	(0)
VOH+2	7.285e-19	5.580e-19	-18.138	-18.253	-0.116	(0)
V+3	6.347e-22	3.483e-22	-21.197	-21.458	-0.261	(0)
VSO4+	1.138e-22	1.065e-22	-21.944	-21.973	-0.029	(0)
V2 (OH) 2+4	5.709e-36	1.964e-36	-35.243	-35.707	-0.463	(0)
V2 (OH) 3+3	5.376e-37	2.950e-37	-36.270	-36.530	-0.261	(0)
V (4)	1.547e-12					
VO+2	9.229e-13	7.068e-13	-12.035	-12.151	-0.116	(0)
V (OH) 3+	4.819e-13	4.508e-13	-12.317	-12.346	-0.029	(0)
VOSO4	1.261e-13	1.261e-13	-12.899	-12.899	0.000	(0)
VOF+	1.590e-14	1.488e-14	-13.798	-13.827	-0.029	(0)
VOCl+	3.618e-17	3.384e-17	-16.442	-16.471	-0.029	(0)
VOF2	1.958e-17	1.958e-17	-16.708	-16.708	0.000	(0)

H2V2O4+2	1.330e-20	1.019e-20	-19.876	-19.992	-0.116	(0)
VOF3-	2.606e-21	2.438e-21	-20.584	-20.613	-0.029	(0)
VOF4-2	4.510e-26	3.454e-26	-25.346	-25.462	-0.116	(0)
V(5)	4.956e-11					
H2VO4-	4.809e-11	4.498e-11	-10.318	-10.347	-0.029	(0)
H3VO4	1.417e-12	1.417e-12	-11.849	-11.849	0.000	(0)
HVO4-2	4.684e-14	3.587e-14	-13.329	-13.445	-0.116	(0)
VO2+	9.476e-15	8.906e-15	-14.023	-14.050	-0.027	(0)
H3V2O7-	4.400e-16	4.116e-16	-15.357	-15.386	-0.029	(0)
VO2SO4-	1.472e-16	1.377e-16	-15.832	-15.861	-0.029	(0)
VO2F	5.482e-17	5.482e-17	-16.261	-16.261	0.000	(0)
VO2F2-	7.467e-20	6.986e-20	-19.127	-19.156	-0.029	(0)
HV2O7-3	9.965e-22	5.468e-22	-21.002	-21.262	-0.261	(0)
VO4-3	1.040e-22	5.708e-23	-21.983	-22.244	-0.261	(0)
VO2F3-2	3.993e-24	3.058e-24	-23.399	-23.515	-0.116	(0)
V3O9-3	1.737e-25	9.533e-26	-24.760	-25.021	-0.261	(0)
V2O7-4	1.358e-26	4.672e-27	-25.867	-26.330	-0.463	(0)
VO2F4-3	9.624e-30	5.281e-30	-29.017	-29.277	-0.261	(0)
V4O12-4	5.196e-33	1.788e-33	-32.284	-32.748	-0.463	(0)
HV10O28-5	0.000e+00	0.000e+00	-73.161	-73.885	-0.724	(0)
H2V10O28-4	0.000e+00	0.000e+00	-73.716	-74.179	-0.463	(0)
V10O28-6	0.000e+00	0.000e+00	-75.528	-76.570	-1.043	(0)
Zn	6.809e-07					
Zn+2	6.117e-07	4.774e-07	-6.213	-6.321	-0.108	(0)
ZnSO4	6.765e-08	6.765e-08	-7.170	-7.170	0.000	(0)
ZnHCO3+	8.427e-10	7.883e-10	-9.074	-9.103	-0.029	(0)
Zn(SO4) 2-2	4.983e-10	3.816e-10	-9.303	-9.418	-0.116	(0)
ZnOH+	1.631e-10	1.526e-10	-9.787	-9.816	-0.029	(0)
ZnF+	3.574e-11	3.343e-11	-10.447	-10.476	-0.029	(0)
ZnCl+	2.178e-11	2.047e-11	-10.662	-10.689	-0.027	(0)
ZnCO3	2.135e-11	2.135e-11	-10.671	-10.671	0.000	(0)
ZnOHCl	8.565e-14	8.565e-14	-13.067	-13.067	0.000	(0)
Zn(OH) 2	7.731e-14	7.731e-14	-13.112	-13.112	0.000	(0)
ZnCl2	5.536e-16	5.536e-16	-15.257	-15.257	0.000	(0)
Zn(OH) 3-	1.324e-18	1.239e-18	-17.878	-17.907	-0.029	(0)
ZnCl3-	7.986e-21	7.506e-21	-20.098	-20.125	-0.027	(0)
ZnSeO4	3.301e-25	3.301e-25	-24.481	-24.481	0.000	(0)
Zn(OH) 4-2	2.058e-25	1.576e-25	-24.687	-24.802	-0.116	(0)
ZnCl4-2	8.176e-26	6.406e-26	-25.087	-25.193	-0.106	(0)
Zn(SeO4) 2-2	0.000e+00	0.000e+00	-44.710	-44.826	-0.116	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH) 3(am)	-1.43	9.37	10.80	Al(OH) 3
Al2(MoO4) 3	-36.18	-33.81	2.37	Al2(MoO4) 3
Al2O3	-0.91	18.74	19.65	Al2O3
Al4(OH) 10SO4	0.59	23.29	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-6.61	-1.81	4.80	AlAsO4:2H2O
AlOHSO4	-1.59	-4.82	-3.23	AlOHSO4
AlSb	-124.90	-59.28	65.62	AlSb
Alunite	1.99	0.59	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-3.62	-11.41	-7.79	PbSO4
Anhydrite	-2.27	-6.63	-4.36	CaSO4
Antlerite	-2.03	6.76	8.79	Cu3(OH) 4SO4
Aragonite	-4.25	-12.55	-8.30	CaCO3
Arsenolite	-42.38	-45.14	-2.76	As4O6
Artinite	-16.54	-6.94	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-29.06	-22.36	6.71	As2O5
Atacamite	-3.69	3.70	7.39	Cu2(OH) 3Cl
Azurite	-2.37	-19.28	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-20.60	3.80	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-25.37	-9.50	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-2.06	-10.97	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-38.64	-5.70	32.94	Ba3(VO4) 2:4H2O
BaF2	-12.30	-18.12	-5.82	BaF2
BaMoO4	-6.76	-13.72	-6.96	BaMoO4

Barite	-0.41	-10.39	-9.98	BaSO ₄
BaSeO ₃	-12.08	-10.25	1.83	BaSeO ₃
BaSeO ₄	-20.10	-27.56	-7.46	BaSeO ₄
Bianchite	-7.74	-9.51	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-18.93	-0.84	18.09	MnO ₂
Bixbyite	-20.04	-20.69	-0.64	Mn ₂ O ₃
Boehmite	0.79	9.37	8.58	AlOOH
Breithauptite	-37.87	-56.39	-18.52	NiSb
Brochantite	-1.48	13.74	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-10.26	6.58	16.84	Mg(OH) ₂
Bunsenite	-9.69	2.76	12.45	NiO
Ca(VO ₃) ₂	-15.19	-9.53	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-19.47	-1.97	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-23.52	-1.97	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-21.96	0.34	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-33.36	5.60	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-34.26	5.60	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-257.58	-114.60	142.97	Ca ₃ Sb ₂
Calcite	-4.07	-12.55	-8.48	CaCO ₃
CaMoO ₄	-2.00	-9.95	-7.95	CaMoO ₄
Carnotite	-5.98	-5.75	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-9.30	-6.48	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-20.77	-23.79	-3.02	CaSeO ₄ :2H ₂ O
Cd(OH) ₂	-11.02	2.63	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-11.10	2.63	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-27.21	-20.50	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-28.87	-6.31	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-32.08	-3.68	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-17.25	-17.91	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-16.22	-17.91	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-16.00	-17.91	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-18.07	-19.29	-1.21	CdF ₂
Cdmetal(alpha)	-29.89	-16.38	13.51	Cd
Cdmetal(gamma)	-29.99	-16.38	13.62	Cd
CdMoO ₄	-0.74	-14.89	-14.15	CdMoO ₄
CdOHCl	-11.18	-7.64	3.54	CdOHCl
CdSb	-56.17	-56.52	-0.35	CdSb
CdSe	-3.37	-23.57	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-26.88	-28.73	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-11.39	-11.56	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.84	-11.56	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.69	-11.56	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-4.20	-17.33	-13.13	PbCO ₃
CH ₄ (g)	-55.08	-96.13	-41.05	CH ₄
Chalcantite	-4.57	-7.21	-2.64	CuSO ₄ :5H ₂ O
Claudetite	-42.07	-45.14	-3.06	As ₄ O ₆
Clausthalite	3.69	-23.41	-27.10	PbSe
Co(OH) ₂	-10.17	2.92	13.09	Co(OH) ₂
Co(OH) ₃	-17.67	-19.98	-2.31	Co(OH) ₃
CO ₂ (g)	-1.97	-20.11	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-26.63	-13.60	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-26.54	-37.04	-10.50	Co ₃ O ₄
CoCl ₂	-25.89	-17.62	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-20.16	-17.62	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-7.21	-17.19	-9.98	CoCO ₃
CoF ₂	-17.40	-18.99	-1.60	CoF ₂
CoF ₃	-51.39	-52.85	-1.46	CoF ₃
CoFe ₂ O ₄	10.77	7.24	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.84	-14.60	-7.76	CoMoO ₄
CoO	-10.67	2.92	13.59	CoO
CoSe	-7.08	-23.28	-16.20	CoSe
CoSeO ₃	-12.45	-11.13	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-26.90	-28.43	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-14.07	-11.27	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-8.80	-11.27	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-12.97	-17.75	-4.78	PbCl ₂
Cryolite	-16.32	-50.16	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-1.69	6.98	8.67	Cu(OH) ₂

Cu(SbO3)2	-23.50	21.71	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-26.61	-61.50	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	19.94	-25.86	-45.80	Cu2Se
Cu2SO4	-11.90	-13.85	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-7.51	-1.41	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-25.54	-68.14	-42.59	Cu3Sb
Cu3Se2	18.42	-45.07	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuF	-5.88	-10.79	-4.91	CuF
CuF2	-16.05	-14.93	1.12	CuF2
CuF2:2H2O	-10.38	-14.93	-4.55	CuF2:2H2O
Cumetal	-0.57	-9.33	-8.76	Cu
CuMoO4	2.54	-10.53	-13.08	CuMoO4
CuOCuSO4	-10.53	-0.23	10.30	CuOCuSO4
Cupricferrite	5.32	11.31	5.99	CuFe2O4
Cuprite	1.75	0.34	-1.41	Cu2O
Cuprousferrite	11.25	2.33	-8.92	CuFeO2
CuSe	13.88	-19.22	-33.10	CuSe
CuSe2	6.95	-26.41	-33.37	CuSe2
CuSeO3:2H2O	-7.58	-7.07	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-21.93	-24.37	-2.44	CuSeO4:5H2O
CuSO4	-10.15	-7.21	2.94	CuSO4
Diaspore	2.50	9.37	6.87	AlOOH
Dolomite(disordered)	-9.54	-26.08	-16.54	CaMg(CO3)2
Dolomite(ordered)	-8.99	-26.08	-17.09	CaMg(CO3)2
Epsomite	-5.48	-7.61	-2.13	MgSO4:7H2O
Fe(OH)2	-7.87	5.69	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.12	-0.92	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-7.69	-11.41	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.28	-9.73	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.20	-37.82	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-34.52	-38.25	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.21	10.01	20.22	Fe3(OH)8
FeAsO4:2H2O	-9.42	-9.02	0.40	FeAsO4:2H2O
FeMoO4	-1.73	-11.83	-10.09	FeMoO4
Ferrihydrite	-1.03	2.16	3.19	Fe(OH)3
Ferroselite	-9.11	-27.70	-18.60	FeSe2
FeSe	-9.51	-20.51	-11.00	FeSe
Fluorite	-3.85	-14.35	-10.50	CaF2
Gibbsite	1.08	9.37	8.29	Al(OH)3
Goethite	1.67	2.16	0.49	FeOOH
Goslarite	-7.50	-9.51	-2.01	ZnSO4:7H2O
Gummite	-5.73	1.94	7.67	UO3
Gypsum	-2.02	-6.63	-4.61	CaSO4:2H2O
H-Jarosite	-9.80	-21.90	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-4.64	-17.52	-12.88	H2MoO4
H2Se(g)	-21.24	-26.20	-4.96	H2Se
Halite	-9.80	-8.20	1.60	NaCl
Hausmannite	-25.51	35.52	61.03	Mn3O4
Hematite	5.74	4.32	-1.42	Fe2O3
Hercynite	1.54	24.43	22.89	FeAl2O4
Huntite	-23.16	-53.13	-29.97	CaMg3(CO3)4
Hydrocerrusite	-13.10	-31.87	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-38.76	-47.53	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-12.99	-18.16	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.24	-21.04	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-19.06	-15.80	3.26	K2MoO4
K2SeO4	-28.91	-29.64	-0.73	K2SeO4
Langite	-3.75	13.74	17.49	Cu4(OH)6SO4:H2O
Larnakite	-8.19	-8.62	-0.43	PbO:PbSO4
Laurionite	-8.11	-7.48	0.62	PbOHCl
Lepidocrocite	0.79	2.16	1.37	FeOOH
Lime	-25.13	7.57	32.70	CaO
Litharge	-9.91	2.78	12.69	PbO
Maghemite	-2.06	4.32	6.39	Fe2O3
Magnesioferrite	-5.95	10.91	16.86	Fe2MgO4
Magnesite	-6.07	-13.53	-7.46	MgCO3
Magnetite	6.61	10.01	3.40	Fe3O4

Malachite	-0.84	-6.15	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-10.33	15.01	25.34	MnOOH
Massicot	-10.11	2.78	12.89	PbO
Matlockite	-9.47	-18.44	-8.97	PbClF
Melanothallite	-19.81	-13.56	6.26	CuCl ₂
Melanterite	-6.29	-8.50	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-12.21	6.58	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-21.79	-10.51	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-219.96	-145.27	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-30.29	-3.93	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-7.20	-15.33	-8.13	MgF ₂
MgMoO ₄	-9.08	-10.93	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-10.52	-7.46	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-23.57	-24.77	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-46.16	27.36	73.52	Pb ₃ O ₄
Mirabilite	-8.94	-10.05	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-16.49	-11.59	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.55	-63.26	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-128.22	-67.14	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-18.34	-5.84	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-17.75	-15.03	2.72	MnCl ₂ ·4H ₂ O
MnSb	-76.08	-78.99	-2.91	MnSb
MnSe	-24.19	-20.69	3.50	MnSe
MnSeO ₃	-9.67	-8.54	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-9.53	-8.54	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-23.80	-25.85	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.27	-8.69	2.58	MnSO ₄
Monteponite	-12.48	2.63	15.10	CdO
MoO ₃	-9.52	-17.52	-8.00	MoO ₃
Morenosite	-9.29	-11.44	-2.14	NiSO ₄ ·7H ₂ O
Na-Jarosite	-8.63	-19.83	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-14.30	-30.90	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-14.87	-13.38	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-14.60	-13.38	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-20.21	-9.91	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-28.50	-27.22	1.28	Na ₂ SeO ₄
Na ₃ Sb	-156.90	-62.44	94.45	Na ₃ Sb
Na ₃ VO ₄	-39.02	-2.34	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-46.22	-8.82	37.40	Na ₄ V ₂ O ₇
Nantokite	-3.37	-10.10	-6.73	CuCl
NaSb	-70.74	-47.58	23.17	NaSb
Natron	-14.66	-15.98	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-10.34	-6.48	3.86	NaVO ₃
Nesquehonite	-8.86	-13.53	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-10.04	2.76	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-29.79	-14.09	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-35.17	-3.17	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-10.49	-17.36	-6.87	NiCO ₃
NiMoO ₄	-3.62	-14.76	-11.14	NiMoO ₄
NiSe	-5.74	-23.44	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-14.11	-11.29	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-27.08	-28.60	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-18.35	-0.84	17.50	MnO ₂
O ₂ (g)	-45.08	38.01	83.09	O ₂
Otavite	-5.49	-17.49	-12.00	CdCO ₃
Pb(OH) ₂	-5.37	2.78	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆ O(CO ₃) ₆	-84.07	-92.83	-8.76	Pb ₁₀ (OH) ₆ O(CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-13.49	-4.70	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-20.62	5.57	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-36.47	24.57	61.04	Pb ₂ O ₃
Pb ₂ OOCO ₃	-13.99	-14.54	-0.56	Pb ₂ OOCO ₃
Pb ₂ V ₂ O ₇	-9.63	-11.53	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-19.80	-14.00	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-14.88	-8.74	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-22.78	-11.76	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-16.52	-5.84	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-24.15	-3.05	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-24.93	-3.05	21.88	Pb ₄ O ₃ SO ₄

PbF2	-11.69	-19.13	-7.44	PbF2
Pbmetal	-20.46	-16.22	4.25	Pb
PbMoO4	0.89	-14.73	-15.62	PbMoO4
PbO:0.3H2O	-10.20	2.78	12.98	PbO:0.33H2O
PbSeO4	-21.73	-28.57	-6.84	PbSeO4
Periclase	-15.00	6.58	21.58	MgO
Phosgenite	-15.27	-35.08	-19.81	PbCl2:PbCO3
Plattnerite	-27.81	21.79	49.60	PbO2
Portlandite	-15.24	7.57	22.80	Ca(OH)2
Pyrochroite	-9.69	5.51	15.19	Mn(OH)2
Pyrolusite	-16.87	24.51	41.38	MnO2
Retgersite	-9.40	-11.44	-2.04	NiSO4:6H2O
Rhodochrosite	-4.03	-14.61	-10.58	MnCO3
Rutherfordine	-3.67	-18.17	-14.50	UO2CO3
Sb(OH)3	-4.53	-11.64	-7.11	Sb(OH)3
Sb2O4	-7.68	-4.28	3.40	Sb2O4
Sb2O5	-24.23	-33.89	-9.67	Sb2O5
Sb2Se3	-34.12	-101.88	-67.76	Sb2Se3
Sb4O6(cubic)	-28.30	-46.56	-18.26	Sb4O6
Sb4O6(orth)	-28.66	-46.56	-17.90	Sb4O6
SbCl3	-43.02	-42.45	0.57	SbCl3
SbF3	-34.28	-44.51	-10.23	SbF3
Sbmetal	-28.46	-40.15	-11.69	Sb
SbO2	1.38	-26.45	-27.82	SbO2
Schoepite	-4.05	1.94	5.99	UO2(OH)2:H2O
Semetal(am)	-0.09	-7.20	-7.11	Se
Semetal(hex)	0.51	-7.20	-7.71	Se
Senarmontite	-10.92	-23.28	-12.37	Sb2O3
SeO2	-14.17	-14.05	0.12	SeO2
SeO3	-52.40	-31.35	21.04	SeO3
Siderite	-4.18	-14.42	-10.24	FeCO3
Smithsonite	-5.43	-15.43	-10.00	ZnCO3
Spinel	-11.52	25.33	36.85	MgAl2O4
Tenorite	-0.66	6.98	7.64	CuO
Thenardite	-10.38	-10.05	0.32	Na2SO4
Thermonatrite	-16.61	-15.98	0.64	Na2CO3:H2O
Tyuyamunite	-9.73	-5.65	4.08	Ca(UO2)2(VO4)2
U3O8	-6.62	14.47	21.08	U3O8
U3Sb4	-450.52	-298.14	152.38	U3Sb4
U4O9	-9.36	-12.38	-3.02	U4O9
UF4	-22.13	-51.67	-29.54	UF4
UF4:2.5H2O	-18.95	-51.67	-32.72	UF4:2.5H2O
UO2(am)	-8.78	-7.85	0.93	UO2
UO2(OH)2(beta)	-3.67	1.94	5.61	UO2(OH)2
UO2SeO4:4H2O	-27.16	-29.41	-2.25	UO2SeO4:4H2O
UO3	-5.76	1.94	7.70	UO3
Uraninite	-3.18	-7.85	-4.67	UO2
USb2	-164.94	-135.36	29.58	USb2
V(OH)3	-12.54	-4.95	7.59	V(OH)3
V2O5	-15.74	-17.10	-1.36	V2O5
V3O5	-24.28	-22.45	1.84	V3O5
V4O7	-30.78	-23.59	7.19	V4O7
V6O13	-28.44	-89.30	-60.86	V6O13
Valentinite	-14.80	-23.28	-8.48	Sb2O3
VC12	-53.87	-34.99	18.87	VC12
VC13	-59.19	-35.76	23.43	VC13
VF4	-59.90	-44.97	14.93	VF4
Vmetal	-77.48	-33.46	44.03	V
VO	-29.21	-14.45	14.76	VO
VO(OH)2	-6.30	-1.15	5.15	VO(OH)2
VO2Cl	-21.66	-18.82	2.84	VO2Cl
VOC1	-26.37	-15.22	11.15	VOC1
VOC12	-34.45	-21.69	12.76	VOC12
VOSO4	-18.95	-15.34	3.61	VOSO4
Witherite	-7.75	-16.32	-8.57	BaCO3
Zincite	-6.65	4.68	11.33	ZnO
Zincosite	-13.44	-9.51	3.93	ZnSO4
Zn(OH)2	-7.52	4.68	12.20	Zn(OH)2

Zn(OH)2(am)	-7.79	4.68	12.47	Zn(OH)2
Zn(OH)2(beta)	-7.07	4.68	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-6.85	4.68	11.53	Zn(OH)2
Zn(OH)2(gamma)	-7.05	4.68	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.33	-4.83	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-16.10	-0.91	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-21.96	-8.31	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-33.25	-14.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-23.86	4.54	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-35.63	2.87	38.50	Zn5(OH)8Cl2
ZnCl2	-22.91	-15.86	7.05	ZnCl2
ZnCO3:1H2O	-5.17	-15.43	-10.26	ZnCO3:1H2O
ZnF2	-16.70	-17.23	-0.53	ZnF2
Znmetal	-40.11	-14.32	25.79	Zn
ZnMoO4	-2.71	-12.83	-10.13	ZnMoO4
ZnO(active)	-6.51	4.68	11.19	ZnO
ZnSb	-65.48	-54.47	11.01	ZnSb
ZnSe	-7.12	-21.52	-14.40	ZnSe
ZnSeO4:6H2O	-25.15	-26.67	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.87	-9.51	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 7.

SOLUTION 5 Average HCT data for quartz monzonite - oxide/transitional
(waste) (cells SRK 0858 and 604569)

temp	25
pH	2.99113
pe	4
redox	pe
units	mg/l
density	1
Al	2.96315
As	0.00036
B	0.01802
Ba	0.00214
Ca	9.58689
Cd	0.00139
Cl	1.26131 charge
Cr	0.00558
Co	0.01515
Cu	2.40842
F	1.98157
Fe	6.75362
K	1.66188
Mg	1.63786
Mn	0.12532
Mo	0.00180
Na	1.97851
Ni	0.00180
Pb	0.00187
S(6)	89.14415 as SO4
Se	0.00023
U	0.00512
V	0.00180
Zn	0.01701
water	1 # kg

END

Beginning of initial solution calculations.

Initial solution 5. Average HCT data for quartz monzonite - oxide/transitional
(waste) (cells SRK 0858 and 604569)

-----Solution composition-----

Elements	Molality	Moles	
Al	1.098e-04	1.098e-04	
As	4.806e-09	4.806e-09	
B	1.667e-06	1.667e-06	
Ba	1.558e-08	1.558e-08	
Ca	2.392e-04	2.392e-04	
Cd	1.237e-08	1.237e-08	
Cl	5.882e-04	5.882e-04	Charge balance
Co	2.571e-07	2.571e-07	
Cr	1.073e-07	1.073e-07	
Cu	3.790e-05	3.790e-05	
F	1.043e-04	1.043e-04	
Fe	1.209e-04	1.209e-04	
K	4.251e-05	4.251e-05	
Mg	6.740e-05	6.740e-05	
Mn	2.281e-06	2.281e-06	
Mo	1.876e-08	1.876e-08	
Na	8.607e-05	8.607e-05	
Ni	3.067e-08	3.067e-08	
Pb	9.026e-09	9.026e-09	
S(6)	9.281e-04	9.281e-04	
Se	2.913e-09	2.913e-09	
U	2.151e-08	2.151e-08	
V	3.534e-08	3.534e-08	
Zn	2.602e-07	2.602e-07	

-----Description of solution-----

pH	=	2.991
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	3.544e-03
Mass of water (kg)	=	1.000e+00
Total alkalinity (eq/kg)	=	-1.156e-03
Total carbon (mol/kg)	=	0.000e+00
Total CO2 (mol/kg)	=	0.000e+00
Temperature (°C)	=	25.00
Electrical balance (eq)	=	1.604e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	13
Total H	=	1.110148e+02
Total O	=	5.551055e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.089e-03	1.021e-03	-2.963	-2.991	-0.028	0.00
OH-	1.053e-11	9.865e-12	-10.977	-11.006	-0.028	(0)
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Al	1.098e-04					
AlF+2	5.909e-05	4.588e-05	-4.229	-4.338	-0.110	(0)
AlSO4+	2.178e-05	2.042e-05	-4.662	-4.690	-0.028	(0)
AlF2+	2.083e-05	1.955e-05	-4.681	-4.709	-0.027	(0)
Al+3	7.675e-06	4.286e-06	-5.115	-5.368	-0.253	(0)
AlF3	2.635e-07	2.635e-07	-6.579	-6.579	0.000	(0)
Al(SO4)2-	1.433e-07	1.344e-07	-6.844	-6.872	-0.028	(0)
AlOH+2	5.445e-08	4.228e-08	-7.264	-7.374	-0.110	(0)
Al(OH)2+	3.530e-10	3.313e-10	-9.452	-9.480	-0.027	(0)

	AlF4-	1.508e-10	1.414e-10	-9.822	-9.850	-0.028	(0)
	Al(OH) 3	6.522e-14	6.522e-14	-13.186	-13.186	0.000	(0)
	Al(OH) 4-	8.638e-17	8.100e-17	-16.064	-16.092	-0.028	(0)
	AlMo6O21-3	1.363e-28	7.263e-29	-27.866	-28.139	-0.273	(0)
As (3)	4.805e-09						
	H3AsO3	4.803e-09	4.803e-09	-8.319	-8.319	0.000	(0)
	H4AsO3+	2.604e-12	2.429e-12	-11.584	-11.615	-0.030	(0)
	H2AsO3-	2.588e-15	2.413e-15	-14.587	-14.617	-0.030	(0)
	HAsO3-2	2.852e-24	2.156e-24	-23.545	-23.666	-0.121	(0)
	AsO3-3	1.528e-34	8.145e-35	-33.816	-34.089	-0.273	(0)
As (5)	4.108e-13						
	H2AsO4-	3.525e-13	3.287e-13	-12.453	-12.483	-0.030	(0)
	H3AsO4	5.826e-14	5.831e-14	-13.235	-13.234	0.000	(0)
	HAsO4-2	4.671e-17	3.532e-17	-16.331	-16.452	-0.121	(0)
	AsO4-3	2.053e-25	1.094e-25	-24.688	-24.961	-0.273	(0)
B	1.667e-06						
	H3BO3	1.667e-06	1.669e-06	-5.778	-5.778	0.000	(0)
	H2BO3-	1.015e-12	9.494e-13	-11.994	-12.023	-0.029	(0)
	BF(OH) 3-	7.618e-13	7.127e-13	-12.118	-12.147	-0.029	(0)
	BF2(OH) 2-	8.899e-14	8.325e-14	-13.051	-13.080	-0.029	(0)
	CaH2BO3+	9.728e-15	9.101e-15	-14.012	-14.041	-0.029	(0)
	MgH2BO3+	1.685e-15	1.576e-15	-14.773	-14.802	-0.029	(0)
	NaH2BO3	1.210e-16	1.210e-16	-15.917	-15.917	0.000	(0)
	BF3OH-	3.783e-17	3.539e-17	-16.422	-16.451	-0.029	(0)
	H5(BO3) 2-	1.441e-18	1.348e-18	-17.841	-17.870	-0.029	(0)
	BaH2BO3+	3.773e-19	3.529e-19	-18.423	-18.452	-0.029	(0)
	BF4-	2.034e-19	1.903e-19	-18.692	-18.721	-0.029	(0)
	H8(BO3) 3-	2.405e-22	2.250e-22	-21.619	-21.648	-0.029	(0)
Ba	1.558e-08						
	Ba+2	1.558e-08	1.203e-08	-7.807	-7.920	-0.112	(0)
	BaOH+	5.521e-19	5.180e-19	-18.258	-18.286	-0.028	(0)
	BaH2BO3+	3.773e-19	3.529e-19	-18.423	-18.452	-0.029	(0)
Ca	2.392e-04						
	Ca+2	2.158e-04	1.666e-04	-3.666	-3.778	-0.112	(0)
	CaSO4	2.343e-05	2.343e-05	-4.630	-4.630	0.000	(0)
	CaF+	2.074e-09	1.946e-09	-8.683	-8.711	-0.028	(0)
	CaOH+	3.491e-14	3.279e-14	-13.457	-13.484	-0.027	(0)
	CaH2BO3+	9.728e-15	9.101e-15	-14.012	-14.041	-0.029	(0)
Cd	1.237e-08						
	Cd+2	1.070e-08	8.258e-09	-7.971	-8.083	-0.112	(0)
	CdSO4	1.188e-09	1.188e-09	-8.925	-8.925	0.000	(0)
	CdCl+	4.654e-10	4.340e-10	-9.332	-9.362	-0.030	(0)
	Cd(SO4) 2-2	1.302e-11	9.842e-12	-10.885	-11.007	-0.121	(0)
	CdCl2	9.957e-13	9.957e-13	-12.002	-12.002	0.000	(0)
	CdF+	1.503e-13	1.401e-13	-12.823	-12.854	-0.030	(0)
	CdOH+	6.940e-16	6.471e-16	-15.159	-15.189	-0.030	(0)
	CdCl3-	3.708e-16	3.457e-16	-15.431	-15.461	-0.030	(0)
	CdOHC1	1.756e-16	1.756e-16	-15.755	-15.755	0.000	(0)
	CdF2	2.993e-19	2.993e-19	-18.524	-18.524	0.000	(0)
	Cd2OH+3	5.025e-23	2.678e-23	-22.299	-22.572	-0.273	(0)
	Cd(OH) 2	4.028e-23	4.028e-23	-22.395	-22.395	0.000	(0)
	Cd(OH) 3-	2.604e-32	2.428e-32	-31.584	-31.615	-0.030	(0)
	CdSeO4	2.813e-38	2.813e-38	-37.551	-37.551	0.000	(0)
	Cd(SeO3) 2-2	2.141e-38	1.619e-38	-37.669	-37.791	-0.121	(0)
	Cd(OH) 4-2	0.000e+00	0.000e+00	-43.285	-43.407	-0.121	(0)
Cl	5.882e-04						
	Cl-	5.871e-04	5.503e-04	-3.231	-3.259	-0.028	(0)
	CuCl	8.418e-07	8.418e-07	-6.075	-6.075	0.000	(0)
	CuCl2-	1.033e-07	9.679e-08	-6.986	-7.014	-0.028	(0)
	CuCl+	2.309e-08	2.164e-08	-7.637	-7.665	-0.028	(0)
	MnCl+	1.176e-09	1.103e-09	-8.930	-8.957	-0.028	(0)
	CdCl+	4.654e-10	4.340e-10	-9.332	-9.362	-0.030	(0)
	CoCl+	3.627e-10	3.382e-10	-9.440	-9.471	-0.030	(0)
	ZnCl+	2.679e-10	2.511e-10	-9.572	-9.600	-0.028	(0)
	PbCl+	1.168e-10	1.089e-10	-9.933	-9.963	-0.030	(0)
	NiCl+	3.263e-11	3.042e-11	-10.486	-10.517	-0.030	(0)
	CrCl+2	2.556e-11	1.932e-11	-10.592	-10.714	-0.121	(0)
	CuCl3-2	1.469e-11	1.139e-11	-10.833	-10.944	-0.111	(0)

UO2Cl+	8.366e-12	7.801e-12	-11.077	-11.108	-0.030	(0)
CuCl2	4.129e-12	4.129e-12	-11.384	-11.384	0.000	(0)
VOC1+	1.408e-12	1.313e-12	-11.852	-11.882	-0.030	(0)
CdCl2	9.957e-13	9.957e-13	-12.002	-12.002	0.000	(0)
MnCl2	8.576e-13	8.576e-13	-12.067	-12.067	0.000	(0)
PbCl2	2.676e-13	2.676e-13	-12.572	-12.572	0.000	(0)
ZnCl2	2.190e-13	2.190e-13	-12.660	-12.660	0.000	(0)
ZnOHC1	3.243e-15	3.243e-15	-14.489	-14.489	0.000	(0)
FeCl+2	1.635e-15	1.267e-15	-14.786	-14.897	-0.111	(0)
CrCl2+	1.082e-15	1.009e-15	-14.966	-14.996	-0.030	(0)
CdCl3-	3.708e-16	3.457e-16	-15.431	-15.461	-0.030	(0)
CdOHC1	1.756e-16	1.756e-16	-15.755	-15.755	0.000	(0)
MnCl3-	1.385e-16	1.300e-16	-15.858	-15.886	-0.028	(0)
ZnCl3-	1.021e-16	9.573e-17	-15.991	-16.019	-0.028	(0)
NiCl2	8.430e-17	8.430e-17	-16.074	-16.074	0.000	(0)
PbCl3-	6.288e-17	5.864e-17	-16.201	-16.232	-0.030	(0)
CuCl3-	2.263e-17	2.121e-17	-16.645	-16.674	-0.028	(0)
FeCl2+	3.320e-18	3.115e-18	-17.479	-17.506	-0.028	(0)
CrOHC12	1.994e-18	1.994e-18	-17.700	-17.700	0.000	(0)
ZnCl4-2	3.399e-20	2.634e-20	-19.469	-19.579	-0.111	(0)
PbCl4-2	1.951e-20	1.475e-20	-19.710	-19.831	-0.121	(0)
UCl+3	8.071e-21	4.302e-21	-20.093	-20.366	-0.273	(0)
FeCl3	1.714e-22	1.714e-22	-21.766	-21.766	0.000	(0)
CuCl4-2	7.546e-23	5.849e-23	-22.122	-22.233	-0.111	(0)
CoCl+2	1.047e-36	7.919e-37	-35.980	-36.101	-0.121	(0)
CrO3Cl-	0.000e+00	0.000e+00	-50.485	-50.515	-0.030	(0)
Co (2)	2.571e-07					
Co+2	2.350e-07	1.777e-07	-6.629	-6.750	-0.121	(0)
CoSO4	2.176e-08	2.176e-08	-7.662	-7.662	0.000	(0)
CoCl+	3.627e-10	3.382e-10	-9.440	-9.471	-0.030	(0)
CoF+	6.449e-12	6.014e-12	-11.190	-11.221	-0.030	(0)
CoOH+	3.750e-14	3.497e-14	-13.426	-13.456	-0.030	(0)
Co (OH) 2	2.740e-20	2.740e-20	-19.562	-19.562	0.000	(0)
Co2OH+3	5.841e-22	3.113e-22	-21.233	-21.507	-0.273	(0)
Co (OH) 3-	5.784e-30	5.394e-30	-29.238	-29.268	-0.030	(0)
CoOOH-	1.451e-30	1.353e-30	-29.838	-29.869	-0.030	(0)
CoSeO4	1.629e-36	1.629e-36	-35.788	-35.788	0.000	(0)
Co (OH) 4-2	0.000e+00	0.000e+00	-40.953	-41.074	-0.121	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-45.040	-45.525	-0.486	(0)
Co (3)	4.827e-34					
CoOH+2	4.689e-34	3.545e-34	-33.329	-33.450	-0.121	(0)
Co+3	1.266e-35	7.072e-36	-34.897	-35.150	-0.253	(0)
CoCl+2	1.047e-36	7.919e-37	-35.980	-36.101	-0.121	(0)
Cr (2)	8.573e-19					
Cr+2	8.573e-19	6.481e-19	-18.067	-18.188	-0.121	(0)
Cr (3)	1.073e-07					
Cr+3	5.090e-08	2.713e-08	-7.293	-7.567	-0.273	(0)
CrSO4+	4.171e-08	3.889e-08	-7.380	-7.410	-0.030	(0)
Cr (OH) +2	7.745e-09	5.856e-09	-8.111	-8.232	-0.121	(0)
CrF+2	6.088e-09	4.603e-09	-8.216	-8.337	-0.121	(0)
CrHSO4	8.530e-10	8.530e-10	-9.069	-9.069	0.000	(0)
CrCl+2	2.556e-11	1.932e-11	-10.592	-10.714	-0.121	(0)
Cr (OH) 2+	7.538e-12	7.029e-12	-11.123	-11.153	-0.030	(0)
CrCl2+	1.082e-15	1.009e-15	-14.966	-14.996	-0.030	(0)
Cr2 (OH) 2SO4+2	5.972e-16	4.515e-16	-15.224	-15.345	-0.121	(0)
Cr (OH) 3	2.605e-17	2.605e-17	-16.584	-16.584	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.646e-17	1.646e-17	-16.783	-16.783	0.000	(0)
CrOHC12	1.994e-18	1.994e-18	-17.700	-17.700	0.000	(0)
CrO2-	1.300e-23	1.212e-23	-22.886	-22.916	-0.030	(0)
Cr (OH) 4-	1.097e-23	1.023e-23	-22.960	-22.990	-0.030	(0)
Cr (6)	0.000e+00					
HCrO4-	0.000e+00	0.000e+00	-45.033	-45.064	-0.030	(0)
H2CrO4	0.000e+00	0.000e+00	-48.146	-48.146	0.000	(0)
CrO4-2	0.000e+00	0.000e+00	-48.470	-48.582	-0.112	(0)
CrO3SO4-2	0.000e+00	0.000e+00	-48.661	-48.783	-0.121	(0)
CrO3Cl-	0.000e+00	0.000e+00	-50.485	-50.515	-0.030	(0)
NaCrO4-	0.000e+00	0.000e+00	-51.950	-51.981	-0.030	(0)
KCrO4-	0.000e+00	0.000e+00	-52.384	-52.414	-0.030	(0)

Cr2O7-2	0.000e+00	0.000e+00	-88.466	-88.587	-0.121	(0)
Cu (1)	2.248e-06					
Cu+	1.303e-06	1.215e-06	-5.885	-5.915	-0.030	(0)
CuCl	8.418e-07	8.418e-07	-6.075	-6.075	0.000	(0)
CuCl2-	1.033e-07	9.679e-08	-6.986	-7.014	-0.028	(0)
CuCl3-2	1.469e-11	1.139e-11	-10.833	-10.944	-0.111	(0)
Cu (2)	3.566e-05					
Cu+2	3.214e-05	2.481e-05	-4.493	-4.605	-0.112	(0)
CuSO4	3.489e-06	3.489e-06	-5.457	-5.457	0.000	(0)
CuCl+	2.309e-08	2.164e-08	-7.637	-7.665	-0.028	(0)
CuF+	1.797e-09	1.676e-09	-8.745	-8.776	-0.030	(0)
CuOH+	8.258e-10	7.740e-10	-9.083	-9.111	-0.028	(0)
CuCl2	4.129e-12	4.129e-12	-11.384	-11.384	0.000	(0)
Cu2 (OH) 2+2	1.990e-14	1.505e-14	-13.701	-13.823	-0.121	(0)
Cu (OH) 2	1.523e-15	1.523e-15	-14.817	-14.817	0.000	(0)
CuCl3-	2.263e-17	2.121e-17	-16.645	-16.674	-0.028	(0)
CuCl4-2	7.546e-23	5.849e-23	-22.122	-22.233	-0.111	(0)
Cu (OH) 3-	3.306e-23	3.083e-23	-22.481	-22.511	-0.030	(0)
Cu (OH) 4-2	3.166e-33	2.394e-33	-32.500	-32.621	-0.121	(0)
F	1.043e-04					
AlF+2	5.909e-05	4.588e-05	-4.229	-4.338	-0.110	(0)
AlF2+	2.083e-05	1.955e-05	-4.681	-4.709	-0.027	(0)
HF	1.616e-06	1.616e-06	-5.792	-5.792	0.000	(0)
F-	1.142e-06	1.070e-06	-5.942	-5.970	-0.028	(0)
AlF3	2.635e-07	2.635e-07	-6.579	-6.579	0.000	(0)
MgF+	6.133e-09	5.752e-09	-8.212	-8.240	-0.028	(0)
CrF+2	6.088e-09	4.603e-09	-8.216	-8.337	-0.121	(0)
CaF+	2.074e-09	1.946e-09	-8.683	-8.711	-0.028	(0)
CuF+	1.797e-09	1.676e-09	-8.745	-8.776	-0.030	(0)
UO2F+	1.385e-09	1.292e-09	-8.859	-8.889	-0.030	(0)
AlF4-	1.508e-10	1.414e-10	-9.822	-9.850	-0.028	(0)
MnF+	7.233e-11	6.787e-11	-10.141	-10.168	-0.028	(0)
NaF	5.431e-11	5.431e-11	-10.265	-10.265	0.000	(0)
HF2-	7.022e-12	6.577e-12	-11.154	-11.182	-0.028	(0)
H2F2	6.997e-12	6.997e-12	-11.155	-11.155	0.000	(0)
CoF+	6.449e-12	6.014e-12	-11.190	-11.221	-0.030	(0)
VOF+	5.854e-12	5.458e-12	-11.233	-11.263	-0.030	(0)
ZnF+	4.161e-12	3.880e-12	-11.381	-11.411	-0.030	(0)
UO2F2	3.987e-12	3.987e-12	-11.399	-11.399	0.000	(0)
BF (OH) 3-	7.618e-13	7.127e-13	-12.118	-12.147	-0.029	(0)
NiF+	6.231e-13	5.810e-13	-12.205	-12.236	-0.030	(0)
PbF+	4.511e-13	4.206e-13	-12.346	-12.376	-0.030	(0)
CdF+	1.503e-13	1.401e-13	-12.823	-12.854	-0.030	(0)
FeF+2	1.155e-13	8.951e-14	-12.938	-13.048	-0.111	(0)
BF2 (OH) 2-	8.899e-14	8.325e-14	-13.051	-13.080	-0.029	(0)
UF2+2	5.938e-15	4.490e-15	-14.226	-14.348	-0.121	(0)
FeF2+	2.733e-15	2.564e-15	-14.563	-14.591	-0.028	(0)
VOF2	2.191e-15	2.191e-15	-14.659	-14.659	0.000	(0)
UO2F3-	1.150e-15	1.072e-15	-14.939	-14.970	-0.030	(0)
UF3+	8.169e-16	7.617e-16	-15.088	-15.118	-0.030	(0)
UF+3	6.250e-16	3.332e-16	-15.204	-15.477	-0.273	(0)
BF3OH-	3.783e-17	3.539e-17	-16.422	-16.451	-0.029	(0)
PbF2	8.861e-18	8.861e-18	-17.053	-17.053	0.000	(0)
FeF3	3.873e-18	3.873e-18	-17.412	-17.412	0.000	(0)
CdF2	2.993e-19	2.993e-19	-18.524	-18.524	0.000	(0)
BF4-	2.034e-19	1.903e-19	-18.692	-18.721	-0.029	(0)
VO2F	1.916e-19	1.916e-19	-18.718	-18.718	0.000	(0)
UF4	8.941e-20	8.941e-20	-19.049	-19.049	0.000	(0)
VOF3-	8.925e-20	8.322e-20	-19.049	-19.080	-0.030	(0)
UO2F4-2	1.206e-20	9.117e-21	-19.919	-20.040	-0.121	(0)
VO2F2-	7.985e-23	7.445e-23	-22.098	-22.128	-0.030	(0)
PbF3-	1.929e-23	1.799e-23	-22.715	-22.745	-0.030	(0)
UF5-	4.068e-24	3.793e-24	-23.391	-23.421	-0.030	(0)
VOF4-2	4.756e-25	3.596e-25	-24.323	-24.444	-0.121	(0)
UF6-2	1.622e-27	1.226e-27	-26.790	-26.911	-0.121	(0)
VO2F3-2	1.315e-27	9.942e-28	-26.881	-27.003	-0.121	(0)
PbF4-2	1.219e-29	9.218e-30	-28.914	-29.035	-0.121	(0)
VO2F4-3	9.824e-34	5.237e-34	-33.008	-33.281	-0.273	(0)

Fe (2)	1.209e-04					
Fe+2	1.086e-04	8.209e-05	-3.964	-4.086	-0.121	(0)
FeSO4	1.237e-05	1.237e-05	-4.908	-4.908	0.000	(0)
FeOH+	3.436e-11	3.224e-11	-10.464	-10.492	-0.028	(0)
Fe (OH) 2	2.526e-19	2.526e-19	-18.598	-18.598	0.000	(0)
Fe (OH) 3-	8.400e-25	7.881e-25	-24.076	-24.103	-0.028	(0)
Fe (3)	3.436e-12					
Fe (OH) 2+	1.986e-12	1.864e-12	-11.702	-11.730	-0.027	(0)
FeOH+2	6.266e-13	4.857e-13	-12.203	-12.314	-0.111	(0)
FeSO4+	5.598e-13	5.253e-13	-12.252	-12.280	-0.028	(0)
Fe+3	1.366e-13	7.626e-14	-12.865	-13.118	-0.253	(0)
FeF+2	1.155e-13	8.951e-14	-12.938	-13.048	-0.111	(0)
Fe (SO4) 2-	7.393e-15	6.894e-15	-14.131	-14.162	-0.030	(0)
FeF2+	2.733e-15	2.564e-15	-14.563	-14.591	-0.028	(0)
FeCl+2	1.635e-15	1.267e-15	-14.786	-14.897	-0.111	(0)
Fe (OH) 3	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
FeF3	3.873e-18	3.873e-18	-17.412	-17.412	0.000	(0)
FeCl2+	3.320e-18	3.115e-18	-17.479	-17.506	-0.028	(0)
FeCl3	1.714e-22	1.714e-22	-21.766	-21.766	0.000	(0)
FeHSeO3+2	1.054e-22	7.967e-23	-21.977	-22.099	-0.121	(0)
Fe2 (OH) 2+4	2.391e-23	7.812e-24	-22.621	-23.107	-0.486	(0)
Fe (OH) 4-	1.933e-23	1.814e-23	-22.714	-22.741	-0.027	(0)
Fe3 (OH) 4+5	1.209e-33	2.105e-34	-32.918	-33.677	-0.759	(0)
H (0)	1.474e-17					
H2	7.369e-18	7.375e-18	-17.133	-17.132	0.000	(0)
K	4.251e-05					
K+	4.233e-05	3.967e-05	-4.373	-4.401	-0.028	(0)
KSO4-	1.837e-07	1.724e-07	-6.736	-6.763	-0.027	(0)
KCrO4-	0.000e+00	0.000e+00	-52.384	-52.414	-0.030	(0)
Mg	6.740e-05					
Mg+2	6.204e-05	4.789e-05	-4.207	-4.320	-0.112	(0)
MgSO4	5.349e-06	5.349e-06	-5.272	-5.272	0.000	(0)
MgF+	6.133e-09	5.752e-09	-8.212	-8.240	-0.028	(0)
MgOH+	2.001e-13	1.881e-13	-12.699	-12.726	-0.027	(0)
MgH2BO3+	1.685e-15	1.576e-15	-14.773	-14.802	-0.029	(0)
Mn (2)	2.281e-06					
Mn+2	2.106e-06	1.592e-06	-5.676	-5.798	-0.121	(0)
MnSO4	1.738e-07	1.738e-07	-6.760	-6.760	0.000	(0)
MnCl+	1.176e-09	1.103e-09	-8.930	-8.957	-0.028	(0)
MnF+	7.233e-11	6.787e-11	-10.141	-10.168	-0.028	(0)
MnCl2	8.576e-13	8.576e-13	-12.067	-12.067	0.000	(0)
MnOH+	4.206e-14	3.946e-14	-13.376	-13.404	-0.028	(0)
MnCl3-	1.385e-16	1.300e-16	-15.858	-15.886	-0.028	(0)
MnSe	2.082e-18	2.082e-18	-17.682	-17.682	0.000	(0)
Mn (OH) 3-	2.530e-32	2.374e-32	-31.597	-31.625	-0.028	(0)
MnSeO4	7.842e-36	7.842e-36	-35.106	-35.106	0.000	(0)
Mn (OH) 4-2	0.000e+00	0.000e+00	-42.011	-42.122	-0.111	(0)
Mn (3)	1.274e-27					
Mn+3	1.274e-27	7.113e-28	-26.895	-27.148	-0.253	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-84.180	-84.291	-0.111	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-89.634	-89.663	-0.029	(0)
Mo	1.876e-08					
H2MoO4	1.629e-08	1.629e-08	-7.788	-7.788	0.000	(0)
HMoO4-	2.337e-09	2.179e-09	-8.631	-8.662	-0.030	(0)
MoO4-2	1.390e-10	1.073e-10	-9.857	-9.969	-0.112	(0)
AlMo6O21-3	1.363e-28	7.263e-29	-27.866	-28.139	-0.273	(0)
H3Mo7O24-3	9.766e-36	5.205e-36	-35.010	-35.284	-0.273	(0)
H2Mo7O24-4	8.859e-36	2.895e-36	-35.053	-35.538	-0.486	(0)
HMo7O24-5	2.689e-37	4.683e-38	-36.570	-37.329	-0.759	(0)
Mo7O24-6	2.333e-40	0.000e+00	-39.632	-40.725	-1.093	(0)
Na	8.607e-05					
Na+	8.579e-05	8.041e-05	-4.067	-4.095	-0.028	(0)
NaSO4-	2.824e-07	2.651e-07	-6.549	-6.577	-0.027	(0)
NaF	5.431e-11	5.431e-11	-10.265	-10.265	0.000	(0)
NaH2BO3	1.210e-16	1.210e-16	-15.917	-15.917	0.000	(0)
NaCrO4-	0.000e+00	0.000e+00	-51.950	-51.981	-0.030	(0)

Ni	3.067e-08					
Ni+2	2.799e-08	2.161e-08	-7.553	-7.665	-0.112	(0)
NiSO4	2.647e-09	2.647e-09	-8.577	-8.577	0.000	(0)
NiCl+	3.263e-11	3.042e-11	-10.486	-10.517	-0.030	(0)
NiF+	6.231e-13	5.810e-13	-12.205	-12.236	-0.030	(0)
Ni (SO4) 2-2	7.116e-14	5.380e-14	-13.148	-13.269	-0.121	(0)
NiOH+	2.878e-15	2.684e-15	-14.541	-14.571	-0.030	(0)
NiCl2	8.430e-17	8.430e-17	-16.074	-16.074	0.000	(0)
Ni (OH) 2	2.103e-21	2.103e-21	-20.677	-20.677	0.000	(0)
Ni (OH) 3-	2.225e-29	2.075e-29	-28.653	-28.683	-0.030	(0)
NiSeO4	1.849e-37	1.849e-37	-36.733	-36.733	0.000	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-58.031	-58.031	0.000	(0)
Pb	9.026e-09					
Pb+2	7.224e-09	5.576e-09	-8.141	-8.254	-0.112	(0)
PbSO4	1.677e-09	1.677e-09	-8.776	-8.776	0.000	(0)
PbCl+	1.168e-10	1.089e-10	-9.933	-9.963	-0.030	(0)
Pb (SO4) 2-2	8.202e-12	6.201e-12	-11.086	-11.208	-0.121	(0)
PbF+	4.511e-13	4.206e-13	-12.346	-12.376	-0.030	(0)
PbCl2	2.676e-13	2.676e-13	-12.572	-12.572	0.000	(0)
PbOH+	1.482e-13	1.382e-13	-12.829	-12.860	-0.030	(0)
PbCl3-	6.288e-17	5.864e-17	-16.201	-16.232	-0.030	(0)
PbF2	8.861e-18	8.861e-18	-17.053	-17.053	0.000	(0)
Pb (OH) 2	4.310e-20	4.310e-20	-19.365	-19.365	0.000	(0)
Pb2OH+3	2.291e-20	1.221e-20	-19.640	-19.913	-0.273	(0)
PbCl4-2	1.951e-20	1.475e-20	-19.710	-19.831	-0.121	(0)
PbF3-	1.929e-23	1.799e-23	-22.715	-22.745	-0.030	(0)
Pb (OH) 3-	4.560e-28	4.252e-28	-27.341	-27.371	-0.030	(0)
PbF4-2	1.219e-29	9.218e-30	-28.914	-29.035	-0.121	(0)
Pb (OH) 4-2	1.359e-36	1.027e-36	-35.867	-35.988	-0.121	(0)
Pb3 (OH) 4+2	2.734e-37	2.067e-37	-36.563	-36.685	-0.121	(0)
Pb4 (OH) 4+4	0.000e+00	0.000e+00	-40.553	-41.038	-0.486	(0)
S (6)	9.281e-04					
SO4-2	7.953e-04	6.139e-04	-3.099	-3.212	-0.112	(0)
HSO4-	6.529e-05	6.123e-05	-4.185	-4.213	-0.028	(0)
CaSO4	2.343e-05	2.343e-05	-4.630	-4.630	0.000	(0)
AlSO4+	2.178e-05	2.042e-05	-4.662	-4.690	-0.028	(0)
FeSO4	1.237e-05	1.237e-05	-4.908	-4.908	0.000	(0)
MgSO4	5.349e-06	5.349e-06	-5.272	-5.272	0.000	(0)
CuSO4	3.489e-06	3.489e-06	-5.457	-5.457	0.000	(0)
NaSO4-	2.824e-07	2.651e-07	-6.549	-6.577	-0.027	(0)
KSO4-	1.837e-07	1.724e-07	-6.736	-6.763	-0.027	(0)
MnSO4	1.738e-07	1.738e-07	-6.760	-6.760	0.000	(0)
Al (SO4) 2-	1.433e-07	1.344e-07	-6.844	-6.872	-0.028	(0)
CrSO4+	4.171e-08	3.889e-08	-7.380	-7.410	-0.030	(0)
ZnSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
CoSO4	2.176e-08	2.176e-08	-7.662	-7.662	0.000	(0)
UO2SO4	8.121e-09	8.121e-09	-8.090	-8.090	0.000	(0)
NiSO4	2.647e-09	2.647e-09	-8.577	-8.577	0.000	(0)
PbSO4	1.677e-09	1.677e-09	-8.776	-8.776	0.000	(0)
CdSO4	1.188e-09	1.188e-09	-8.925	-8.925	0.000	(0)
CrOHSO4	8.530e-10	8.530e-10	-9.069	-9.069	0.000	(0)
Zn (SO4) 2-2	1.725e-10	1.304e-10	-9.763	-9.885	-0.121	(0)
VOSO4	1.437e-10	1.437e-10	-9.842	-9.842	0.000	(0)
UO2 (SO4) 2-2	8.693e-11	6.572e-11	-10.061	-10.182	-0.121	(0)
Cd (SO4) 2-2	1.302e-11	9.842e-12	-10.885	-11.007	-0.121	(0)
Pb (SO4) 2-2	8.202e-12	6.201e-12	-11.086	-11.208	-0.121	(0)
FeSO4+	5.598e-13	5.253e-13	-12.252	-12.280	-0.028	(0)
Ni (SO4) 2-2	7.116e-14	5.380e-14	-13.148	-13.269	-0.121	(0)
VSO4+	1.367e-14	1.275e-14	-13.864	-13.895	-0.030	(0)
Fe (SO4) 2-	7.393e-15	6.894e-15	-14.131	-14.162	-0.030	(0)
U (SO4) 2	1.859e-15	1.859e-15	-14.731	-14.731	0.000	(0)
Cr2 (OH) 2SO4+2	5.972e-16	4.515e-16	-15.224	-15.345	-0.121	(0)
USO4+2	5.042e-16	3.812e-16	-15.297	-15.419	-0.121	(0)
Cr2 (OH) 2 (SO4) 2	1.646e-17	1.646e-17	-16.783	-16.783	0.000	(0)
VO2SO4-	1.604e-18	1.496e-18	-17.795	-17.825	-0.030	(0)
CrO3SO4-2	0.000e+00	0.000e+00	-48.661	-48.783	-0.121	(0)
Se (-2)	2.913e-09					

H2Se	2.565e-09	2.565e-09	-8.591	-8.591	0.000	(0)
HSe-	3.472e-10	3.238e-10	-9.459	-9.490	-0.030	(0)
MnSe	2.082e-18	2.082e-18	-17.682	-17.682	0.000	(0)
Se-2	4.196e-22	3.173e-22	-21.377	-21.499	-0.121	(0)
Se (4)	5.961e-13					
HSeO3-	4.240e-13	3.954e-13	-12.373	-12.403	-0.030	(0)
H2SeO3	1.721e-13	1.721e-13	-12.764	-12.764	0.000	(0)
SeO3-2	2.040e-18	1.542e-18	-17.690	-17.812	-0.121	(0)
FeHSeO3+2	1.054e-22	7.967e-23	-21.977	-22.099	-0.121	(0)
Cd (SeO3) 2-2	2.141e-38	1.619e-38	-37.669	-37.791	-0.121	(0)
Se (6)	2.472e-32					
SeO4-2	2.370e-32	1.830e-32	-31.625	-31.738	-0.112	(0)
HSeO4-	1.004e-33	9.359e-34	-32.998	-33.029	-0.030	(0)
MnSeO4	7.842e-36	7.842e-36	-35.106	-35.106	0.000	(0)
CoSeO4	1.629e-36	1.629e-36	-35.788	-35.788	0.000	(0)
ZnSeO4	5.147e-37	5.147e-37	-36.288	-36.288	0.000	(0)
NiSeO4	1.849e-37	1.849e-37	-36.733	-36.733	0.000	(0)
CdSeO4	2.813e-38	2.813e-38	-37.551	-37.551	0.000	(0)
Zn (SeO4) 2-2	0.000e+00	0.000e+00	-67.899	-68.020	-0.121	(0)
U (3)	4.681e-32					
U+3	4.681e-32	2.495e-32	-31.330	-31.603	-0.273	(0)
U (4)	1.318e-14					
UF2+2	5.938e-15	4.490e-15	-14.226	-14.348	-0.121	(0)
U (SO4) 2	1.859e-15	1.859e-15	-14.731	-14.731	0.000	(0)
U (OH) 3+	1.827e-15	1.704e-15	-14.738	-14.769	-0.030	(0)
U (OH) 2+2	1.063e-15	8.040e-16	-14.973	-15.095	-0.121	(0)
UF3+	8.169e-16	7.617e-16	-15.088	-15.118	-0.030	(0)
UF+3	6.250e-16	3.332e-16	-15.204	-15.477	-0.273	(0)
USO4+2	5.042e-16	3.812e-16	-15.297	-15.419	-0.121	(0)
U (OH) 4	4.566e-16	4.566e-16	-15.341	-15.341	0.000	(0)
UOH+3	7.252e-17	3.865e-17	-16.140	-16.413	-0.273	(0)
U (OH) 5-	1.145e-17	1.068e-17	-16.941	-16.971	-0.030	(0)
U+4	4.774e-19	1.560e-19	-18.321	-18.807	-0.486	(0)
UF4	8.941e-20	8.941e-20	-19.049	-19.049	0.000	(0)
UC1+3	8.071e-21	4.302e-21	-20.093	-20.366	-0.273	(0)
UF5-	4.068e-24	3.793e-24	-23.391	-23.421	-0.030	(0)
UF6-2	1.622e-27	1.226e-27	-26.790	-26.911	-0.121	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-82.671	-85.130	-2.459	(0)
U (5)	5.713e-10					
UO2+	5.713e-10	5.328e-10	-9.243	-9.273	-0.030	(0)
U (6)	2.094e-08					
UO2+2	1.132e-08	8.741e-09	-7.946	-8.058	-0.112	(0)
UO2SO4	8.121e-09	8.121e-09	-8.090	-8.090	0.000	(0)
UO2F+	1.385e-09	1.292e-09	-8.859	-8.889	-0.030	(0)
UO2 (SO4) 2-2	8.693e-11	6.572e-11	-10.061	-10.182	-0.121	(0)
UO2OH+	1.164e-11	1.086e-11	-10.934	-10.964	-0.030	(0)
UO2C1+	8.366e-12	7.801e-12	-11.077	-11.108	-0.030	(0)
UO2F2	3.987e-12	3.987e-12	-11.399	-11.399	0.000	(0)
UO2F3-	1.150e-15	1.072e-15	-14.939	-14.970	-0.030	(0)
(UO2) 2 (OH) 2+2	2.587e-16	1.956e-16	-15.587	-15.709	-0.121	(0)
UO2F4-2	1.206e-20	9.117e-21	-19.919	-20.040	-0.121	(0)
(UO2) 3 (OH) 5+	1.681e-25	1.567e-25	-24.774	-24.805	-0.030	(0)
V (2)	2.850e-22					
V+2	2.849e-22	2.154e-22	-21.545	-21.667	-0.121	(0)
VOH+	7.374e-26	6.876e-26	-25.132	-25.163	-0.030	(0)
V (3)	3.406e-08					
V (OH) 3	3.406e-08	3.406e-08	-7.468	-7.468	0.000	(0)
VOH+2	2.876e-13	2.175e-13	-12.541	-12.663	-0.121	(0)
V+3	8.251e-14	4.398e-14	-13.083	-13.357	-0.273	(0)
V (OH) 2+	2.409e-14	2.246e-14	-13.618	-13.649	-0.030	(0)
VSO4+	1.367e-14	1.275e-14	-13.864	-13.895	-0.030	(0)
V2 (OH) 2+4	9.131e-25	2.983e-25	-24.039	-24.525	-0.486	(0)
V2 (OH) 3+3	2.594e-28	1.383e-28	-27.586	-27.859	-0.273	(0)
V (4)	1.277e-09					
VO+2	1.124e-09	8.501e-10	-8.949	-9.071	-0.121	(0)
VOSO4	1.437e-10	1.437e-10	-9.842	-9.842	0.000	(0)
VOF+	5.854e-12	5.458e-12	-11.233	-11.263	-0.030	(0)
V (OH) 3+	1.794e-12	1.673e-12	-11.746	-11.776	-0.030	(0)

VOC1+	1.408e-12	1.313e-12	-11.852	-11.882	-0.030	(0)
VOF2	2.191e-15	2.191e-15	-14.659	-14.659	0.000	(0)
H2V2O4+2	1.856e-19	1.403e-19	-18.731	-18.853	-0.121	(0)
VOF3-	8.925e-20	8.322e-20	-19.049	-19.080	-0.030	(0)
VOF4-2	4.756e-25	3.596e-25	-24.323	-24.444	-0.121	(0)
V (5)	1.660e-16					
VO2+	1.089e-16	1.020e-16	-15.963	-15.991	-0.028	(0)
H3VO4	5.010e-17	5.010e-17	-16.300	-16.300	0.000	(0)
H2VO4-	5.264e-18	4.908e-18	-17.279	-17.309	-0.030	(0)
VO2SO4-	1.604e-18	1.496e-18	-17.795	-17.825	-0.030	(0)
VO2F	1.916e-19	1.916e-19	-18.718	-18.718	0.000	(0)
VO2F2-	7.985e-23	7.445e-23	-22.098	-22.128	-0.030	(0)
HVO4-2	1.598e-23	1.208e-23	-22.796	-22.918	-0.121	(0)
H3V2O7-	1.703e-27	1.588e-27	-26.769	-26.799	-0.030	(0)
VO2F3-2	1.315e-27	9.942e-28	-26.881	-27.003	-0.121	(0)
VO2F4-3	9.824e-34	5.237e-34	-33.008	-33.281	-0.273	(0)
VO4-3	1.113e-34	5.932e-35	-33.954	-34.227	-0.273	(0)
HV2O7-3	3.770e-38	2.009e-38	-37.424	-37.697	-0.273	(0)
V2O7-4	0.000e+00	0.000e+00	-44.790	-45.276	-0.486	(0)
V3O9-3	0.000e+00	0.000e+00	-45.634	-45.907	-0.273	(0)
V4O12-4	0.000e+00	0.000e+00	-60.110	-60.596	-0.486	(0)
H2V10O28-4	0.000e+00	0.000e+00	-128.251	-128.737	-0.486	(0)
HV10O28-5	0.000e+00	0.000e+00	-130.195	-130.954	-0.759	(0)
V10O28-6	0.000e+00	0.000e+00	-135.056	-136.149	-1.093	(0)
Zn	2.602e-07					
Zn+2	2.353e-07	1.816e-07	-6.628	-6.741	-0.112	(0)
ZnSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
ZnCl+	2.679e-10	2.511e-10	-9.572	-9.600	-0.028	(0)
Zn (SO4) 2-2	1.725e-10	1.304e-10	-9.763	-9.885	-0.121	(0)
ZnF+	4.161e-12	3.880e-12	-11.381	-11.411	-0.030	(0)
ZnCl2	2.190e-13	2.190e-13	-12.660	-12.660	0.000	(0)
ZnOH+	1.922e-13	1.792e-13	-12.716	-12.747	-0.030	(0)
ZnOHCl	3.243e-15	3.243e-15	-14.489	-14.489	0.000	(0)
ZnCl3-	1.021e-16	9.573e-17	-15.991	-16.019	-0.028	(0)
Zn (OH) 2	2.802e-19	2.802e-19	-18.553	-18.553	0.000	(0)
ZnCl4-2	3.399e-20	2.634e-20	-19.469	-19.579	-0.111	(0)
Zn (OH) 3-	1.486e-26	1.385e-26	-25.828	-25.858	-0.030	(0)
Zn (OH) 4-2	7.196e-36	5.440e-36	-35.143	-35.264	-0.121	(0)
ZnSeO4	5.147e-37	5.147e-37	-36.288	-36.288	0.000	(0)
Zn (SeO4) 2-2	0.000e+00	0.000e+00	-67.899	-68.020	-0.121	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al (OH) 3 (am)	-7.19	3.61	10.80	Al (OH) 3
Al2 (MoO4) 3	-43.01	-40.64	2.37	Al2 (MoO4) 3
Al2O3	-12.44	7.21	19.65	Al2O3
Al4 (OH) 10SO4	-17.47	5.23	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-14.43	-9.63	4.80	AlAsO4:2H2O
AlOHSO4	-2.36	-5.59	-3.23	AlOHSO4
Alunite	-7.58	-8.98	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.68	-11.47	-7.79	PbSO4
Anhydrite	-2.63	-6.99	-4.36	CaSO4
Antlerite	-13.85	-5.06	8.79	Cu3 (OH) 4SO4
Arsenolite	-30.51	-33.27	-2.76	As4O6
As2O5	-33.17	-26.47	6.71	As2O5
Atacamite	-10.89	-3.50	7.39	Cu2 (OH) 3Cl
Ba (OH) 2:8H2O	-26.33	-1.94	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-45.75	-29.88	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-23.37	-32.28	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-64.75	-31.81	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-46.83	-56.50	-9.67	BaCrO4
BaF2	-14.04	-19.86	-5.82	BaF2
BaMoO4	-10.93	-17.89	-6.96	BaMoO4
Barite	-1.15	-11.13	-9.98	BaSO4
BaSeO3	-19.16	-17.33	1.83	BaSeO3
BaSeO4	-32.20	-39.66	-7.46	BaSeO4

Bianchite	-8.19	-9.95	-1.76	ZnSO4:6H2O
Birnessite	-29.27	-11.18	18.09	MnO2
Bixbyite	-35.70	-36.35	-0.64	Mn2O3
Boehmite	-4.97	3.61	8.58	AlOOH
Brochantite	-18.91	-3.69	15.22	Cu4(OH)6SO4
Brucite	-15.18	1.66	16.84	Mg(OH)2
Bunsenite	-14.13	-1.68	12.45	NiO
Ca(VO3)2	-29.46	-23.80	5.66	Ca(VO3)2
Ca2V2O7	-39.09	-21.59	17.50	Ca2V2O7
Ca2V2O7:2H2O	-43.14	-21.59	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-42.16	-19.86	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-58.35	-19.39	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-59.25	-19.39	39.86	Ca3(VO4)2:4H2O
CaCrO4	-50.10	-52.36	-2.27	CaCrO4
CaMoO4	-5.80	-13.75	-7.95	CaMoO4
Carnotite	-16.72	-16.49	0.23	KUO2VO4
CaSeO3:2H2O	-16.00	-13.19	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-32.50	-35.52	-3.02	CaSeO4:2H2O
Cd(BO2)2	-23.50	-13.66	9.84	Cd(BO2)2
Cd(OH)2	-15.74	-2.10	13.64	Cd(OH)2
Cd(OH)2(am)	-15.83	-2.10	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-31.40	-24.69	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-38.06	-15.50	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-46.00	-17.60	28.40	Cd4(OH)6SO4
CdCl2	-13.94	-14.60	-0.66	CdCl2
CdCl2:1H2O	-12.91	-14.60	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.69	-14.60	-1.91	CdCl2:2.5H2O
CdF2	-18.81	-20.02	-1.21	CdF2
Cdmetal(alpha)	-29.60	-16.08	13.51	Cd
Cdmetal(gamma)	-29.70	-16.08	13.62	Cd
CdMoO4	-3.90	-18.05	-14.15	CdMoO4
CdOHCl	-11.89	-8.35	3.54	CdOHCl
CdSe	5.62	-14.58	-20.20	CdSe
CdSeO4:2H2O	-37.97	-39.82	-1.85	CdSeO4:2H2O
CdSO4	-11.12	-11.30	-0.17	CdSO4
CdSO4:1H2O	-9.57	-11.30	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.42	-11.30	-1.87	CdSO4:2.67H2O
Chalcanthite	-5.18	-7.82	-2.64	CuSO4:5H2O
Claudetite	-30.21	-33.27	-3.06	As4O6
Clausthalite	12.35	-14.75	-27.10	PbSe
Co(BO2)2	-39.39	-12.32	27.07	Co(BO2)2
Co(OH)2	-13.86	-0.77	13.09	Co(OH)2
Co(OH)3	-23.87	-26.18	-2.31	Co(OH)3
Co3(AsO4)2	-41.81	-28.77	13.03	Co3(AsO4)2
Co3O4	-42.63	-53.12	-10.50	Co3O4
CoCl2	-21.54	-13.27	8.27	CoCl2
CoCl2:6H2O	-15.81	-13.27	2.54	CoCl2:6H2O
CoF2	-17.09	-18.69	-1.60	CoF2
CoF3	-51.60	-53.06	-1.46	CoF3
CoFe2O4	-5.53	-9.06	-3.53	CoFe2O4
CoMoO4	-8.96	-16.72	-7.76	CoMoO4
CoO	-14.35	-0.77	13.59	CoO
CoSe	2.95	-13.25	-16.20	CoSe
CoSeO3	-17.48	-16.16	1.32	CoSeO3
CoSeO4:6H2O	-36.96	-38.49	-1.53	CoSeO4:6H2O
CoSO4	-12.76	-9.96	2.80	CoSO4
CoSO4:6H2O	-7.49	-9.96	-2.47	CoSO4:6H2O
Cotunnite	-9.99	-14.77	-4.78	PbCl2
Cr(OH)2	-23.03	-12.21	10.82	Cr(OH)2
Cr(OH)3	-9.50	-8.16	1.34	Cr(OH)3
Cr(OH)3(am)	-7.41	-8.16	-0.75	Cr(OH)3
Cr2O3	-13.97	-16.32	-2.36	Cr2O3
CrCl2	-38.80	-24.71	14.09	CrCl2
CrCl3	-42.03	-26.91	15.11	CrCl3
CrF3	-23.71	-35.05	-11.34	CrF3
Crmetal	-56.67	-26.19	30.48	Cr
CrO3	-51.35	-54.56	-3.21	CrO3
Cryolite	-19.63	-53.47	-33.84	Na3AlF6

Cu(OH)2	-7.30	1.38	8.67	Cu(OH)2
Cu2Se(alpha)	27.47	-18.33	-45.80	Cu2Se
Cu2SO4	-13.09	-15.04	-1.95	Cu2SO4
Cu3(AsO4)2·2H2O	-28.44	-22.34	6.10	Cu3(AsO4)2·2H2O
Cu3Se2	34.06	-29.43	-63.49	Cu3Se2
CuCrO4	-47.75	-53.19	-5.44	CuCrO4
CuF	-6.98	-11.89	-4.91	CuF
CuF2	-17.66	-16.55	1.12	CuF2
CuF2·2H2O	-12.00	-16.55	-4.55	CuF2·2H2O
Cumetal	-1.16	-9.92	-8.76	Cu
CuMoO4	-1.50	-14.57	-13.08	CuMoO4
CuOCuSO4	-16.74	-6.44	10.30	CuOCuSO4
Cupricferrite	-12.90	-6.91	5.99	CuFe2O4
Cuprite	-4.44	-5.85	-1.41	Cu2O
Cuprousferrite	1.85	-7.07	-8.92	CuFeO2
CuSe	22.00	-11.10	-33.10	CuSe
CuSe2	23.76	-9.60	-33.37	CuSe2
CuSeO3·2H2O	-14.53	-14.02	0.51	CuSeO3·2H2O
CuSeO4·5H2O	-33.90	-36.34	-2.44	CuSeO4·5H2O
CuSO4	-10.76	-7.82	2.94	CuSO4
Diaspore	-3.27	3.61	6.87	AlOOH
Epsomite	-5.41	-7.53	-2.13	MgSO4·7H2O
Fe(OH)2	-11.67	1.90	13.56	Fe(OH)2
Fe(OH)2·7Cl.3	-2.98	-6.02	-3.04	Fe(OH)2·7Cl.3
Fe(VO3)2	-20.38	-24.10	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-25.24	-23.68	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3·2H2O	-33.84	-54.47	-20.63	Fe2(SeO3)3·2H2O
Fe2(SO4)3	-32.14	-35.87	-3.73	Fe2(SO4)3
Fe3(OH)8	-26.61	-6.39	20.22	Fe3(OH)8
FeAsO4·2H2O	-17.78	-17.38	0.40	FeAsO4·2H2O
FeCr2O4	-21.63	-14.43	7.20	FeCr2O4
FeMoO4	-3.96	-14.06	-10.09	FeMoO4
Ferrihydrite	-7.34	-4.14	3.19	Fe(OH)3
Ferroselite	9.51	-9.08	-18.60	FeSe2
FeSe	0.42	-10.58	-11.00	FeSe
Fluorite	-5.22	-15.72	-10.50	CaF2
Gibbsite	-4.69	3.61	8.29	Al(OH)3
Goethite	-4.64	-4.14	0.49	FeOOH
Goslarite	-7.94	-9.95	-2.01	ZnSO4·7H2O
Gummite	-9.75	-2.08	7.67	UO3
Gypsum	-2.38	-6.99	-4.61	CaSO4·2H2O
H-Jarosite	-18.72	-30.82	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-3.08	-15.95	-12.88	H2MoO4
H2Se(g)	-7.52	-12.48	-4.96	H2Se
Halite	-8.96	-7.35	1.60	NaCl
Hausmannite	-46.49	14.54	61.03	Mn3O4
Hematite	-6.87	-8.29	-1.42	Fe2O3
Hercynite	-13.79	9.11	22.89	FeAl2O4
K-Alum	-11.02	-16.19	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-17.43	-32.23	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-94.71	-111.95	-17.24	K2Cr2O7
K2CrO4	-56.87	-57.39	-0.51	K2CrO4
K2MoO4	-22.03	-18.77	3.26	K2MoO4
K2SeO4	-39.81	-40.54	-0.73	K2SeO4
Langite	-21.18	-3.69	17.49	Cu4(OH)6SO4·H2O
Larnakite	-13.30	-13.74	-0.43	PbO·PbSO4
Laurionite	-9.14	-8.52	0.62	PbOHCl
Lepidocrocite	-5.52	-4.14	1.37	FeOOH
Lime	-30.50	2.20	32.70	CaO
Litharge	-14.97	-2.27	12.69	PbO
Maghemite	-14.67	-8.29	6.39	Fe2O3
Magnesioferrite	-23.49	-6.63	16.86	Fe2MgO4
Magnetite	-9.80	-6.39	3.40	Fe3O4
Manganite	-18.16	7.18	25.34	MnOOH
Massicot	-15.17	-2.27	12.89	PbO
Matlockite	-8.51	-17.48	-8.97	PbClF
Melanothallite	-17.38	-11.12	6.26	CuCl2
Melanterite	-5.09	-7.30	-2.21	FeSO4·7H2O

Mg(OH)2(active)	-17.13	1.66	18.79	Mg(OH)2
Mg(VO3)2	-35.62	-24.34	11.28	Mg(VO3)2
Mg2V2O7	-49.04	-22.68	26.36	Mg2V2O7
MgCr2O4	-30.86	-14.66	16.20	MgCr2O4
MgCrO4	-58.28	-52.90	5.38	MgCrO4
MgF2	-8.13	-16.26	-8.13	MgF2
MgMoO4	-12.44	-14.29	-1.85	MgMoO4
MgSeO3:6H2O	-16.79	-13.73	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-34.86	-36.06	-1.20	MgSeO4:6H2O
Minium	-66.35	7.17	73.52	Pb3O4
Mirabilite	-10.29	-11.40	-1.11	Na2SO4:10H2O
Mn(VO3)2	-30.72	-25.82	4.90	Mn(VO3)2
Mn2(SO4)3	-58.22	-63.93	-5.71	Mn2(SO4)3
Mn3(AsO4)2:8H2O	-38.42	-25.92	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.03	-12.32	2.72	MnCl2:4H2O
MnSe	-15.80	-12.30	3.50	MnSe
MnSeO3	-16.34	-15.21	1.13	MnSeO3
MnSeO3:2H2O	-16.19	-15.21	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-35.49	-37.54	-2.05	MnSeO4:5H2O
MnSO4	-11.59	-9.01	2.58	MnSO4
Monteponite	-17.20	-2.10	15.10	CdO
MoO3	-7.95	-15.95	-8.00	MoO3
Morenosite	-8.73	-10.88	-2.14	NiSO4:7H2O
Na-Jarosite	-20.73	-31.93	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-101.44	-111.34	-9.90	Na2Cr2O7
Na2CrO4	-59.70	-56.77	2.93	Na2CrO4
Na2Mo2O7	-17.51	-34.11	-16.60	Na2Mo2O7
Na2MoO4	-19.65	-18.16	1.49	Na2MoO4
Na2MoO4:2H2O	-19.38	-18.16	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-27.90	-17.60	10.30	Na2SeO3:5H2O
Na2SeO4	-41.21	-39.93	1.28	Na2SeO4
Na3VO4	-52.99	-16.31	36.68	Na3VO4
Na4V2O7	-67.81	-30.41	37.40	Na4V2O7
Nantokite	-2.44	-9.17	-6.73	CuCl
NaVO3	-17.96	-14.10	3.86	NaVO3
Ni(OH)2	-14.48	-1.68	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-47.22	-31.52	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-47.93	-15.93	32.00	Ni4(OH)6SO4
NiMoO4	-6.49	-17.63	-11.14	NiMoO4
NiSe	3.54	-14.16	-17.70	NiSe
NiSeO3:2H2O	-19.89	-17.08	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-37.88	-39.40	-1.52	NiSeO4:6H2O
Nsutite	-28.69	-11.18	17.50	MnO2
O2(g)	-55.12	27.96	83.09	O2
Pb(BO2)2	-20.35	-13.83	6.52	Pb(BO2)2
Pb(OH)2	-10.42	-2.27	8.15	Pb(OH)2
Pb2(OH)3Cl	-19.59	-10.79	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-30.73	-4.54	26.19	Pb2O(OH)2
Pb2O3	-51.60	9.44	61.04	Pb2O3
Pb2V2O7	-28.64	-30.54	-1.90	Pb2V2O7
Pb3(AsO4)2	-39.08	-33.28	5.80	Pb3(AsO4)2
Pb3(VO4)2	-38.95	-32.81	6.14	Pb3(VO4)2
Pb3O2SO4	-26.69	-16.01	10.69	Pb3O2SO4
Pb4(OH)6SO4	-39.38	-18.28	21.10	Pb4(OH)6SO4
Pb4O3SO4	-40.16	-18.28	21.88	Pb4O3SO4
PbCrO4	-44.24	-56.84	-12.60	PbCrO4
PbF2	-12.75	-20.19	-7.44	PbF2
Pbmetal	-20.50	-16.25	4.25	Pb
PbMoO4	-2.60	-18.22	-15.62	PbMoO4
PbO:0.3H2O	-15.25	-2.27	12.98	PbO:0.33H2O
PbSeO4	-33.15	-39.99	-6.84	PbSeO4
Periclase	-19.92	1.66	21.58	MgO
Plattnerite	-37.89	11.71	49.60	PbO2
Portlandite	-20.60	2.20	22.80	Ca(OH)2
Pyrochroite	-15.01	0.18	15.19	Mn(OH)2
Pyrolusite	-27.21	14.17	41.38	MnO2
Retgersite	-8.84	-10.88	-2.04	NiSO4:6H2O
Schoepite	-8.07	-2.08	5.99	UO2(OH)2:H2O

Semetal (am)	8.61	1.50	-7.11	Se
Semetal (hex)	9.21	1.50	-7.71	Se
SeO2	-15.52	-15.39	0.12	SeO2
SeO3	-58.76	-37.72	21.04	SeO3
Spinel	-27.97	8.87	36.85	MgAl2O4
Tenorite	-6.27	1.38	7.64	CuO
Thenardite	-11.72	-11.40	0.32	Na2SO4
Tyuyamunite	-32.03	-27.95	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.65	7.44	21.08	U3O8
U4O9	-10.37	-13.39	-3.02	U4O9
UF4	-13.15	-42.69	-29.54	UF4
UF4:2.5H2O	-9.97	-42.69	-32.72	UF4:2.5H2O
UO2 (am)	-7.78	-6.84	0.93	UO2
UO2 (OH) 2 (beta)	-7.69	-2.08	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-37.55	-39.80	-2.25	UO2SeO4:4H2O
UO3	-9.78	-2.08	7.70	UO3
Uraninite	-2.17	-6.84	-4.67	UO2
V (OH) 3	-11.97	-4.38	7.59	V (OH) 3
V2O5	-24.64	-26.00	-1.36	V2O5
V3O5	-25.08	-23.25	1.84	V3O5
V4O7	-33.52	-26.34	7.19	V4O7
V6O13	-45.11	-105.97	-60.86	V6O13
VC12	-42.75	-23.88	18.87	VC12
VC13	-46.57	-23.13	23.43	VC13
VF4	-53.86	-38.93	14.93	VF4
Vmetal	-69.38	-25.36	44.03	V
VO	-26.13	-11.37	14.76	VO
VO (OH) 2	-8.24	-3.09	5.15	VO (OH) 2
VO2Cl	-22.09	-19.25	2.84	VO2Cl
VOC1	-21.79	-10.63	11.15	VOC1
VOC12	-28.35	-15.59	12.76	VOC12
VOSO4	-15.89	-12.28	3.61	VOSO4
Zincite	-12.09	-0.76	11.33	ZnO
Zincosite	-13.88	-9.95	3.93	ZnSO4
Zn (BO2) 2	-20.60	-12.31	8.29	Zn (BO2) 2
Zn (OH) 2	-12.96	-0.76	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-13.23	-0.76	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-12.51	-0.76	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-12.29	-0.76	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-12.49	-0.76	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-18.21	-10.71	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-22.96	-7.77	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-42.39	-28.74	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-39.58	-20.66	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-40.63	-12.23	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-54.79	-16.29	38.50	Zn5 (OH) 8Cl2
ZnCl2	-20.31	-13.26	7.05	ZnCl2
ZnF2	-18.15	-18.68	-0.53	ZnF2
Znmetal	-40.53	-14.74	25.79	Zn
ZnMoO4	-6.58	-16.71	-10.13	ZnMoO4
ZnO (active)	-11.95	-0.76	11.19	ZnO
ZnSe	1.16	-13.24	-14.40	ZnSe
ZnSeO4:6H2O	-36.96	-38.48	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.31	-9.95	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 8.

SOLUTION 6 Average HCT data for quartz monzonite - oxide/transitional (ore)
(cell SRK 0867)

```

temp      25
pH        6.90391
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 9.27214 as HCO3
Al 0.06988
B         0.00472
Ba 0.00751
Ca 25.90591
Cd 0.00005
Cl 0.73852
Co 0.00047
Cu 0.00563
F         0.55791
Fe 0.09893
K         1.07782
Mg 2.23925
Mn 0.46844
Mo 0.00506
Na 0.93238 charge
Ni 0.00047
S(6)      72.31791 as SO4
Sb 0.00297
Se 0.00024
U         0.00047
V         0.00047
Zn 0.00163
water     1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 6. Average HCT data for quartz monzonite - oxide/transitional
(ore) (cell SRK 0867)

-----Solution composition-----

Elements	Molality	Moles	
Al	2.590e-06	2.590e-06	
Alkalinity	1.520e-04	1.520e-04	
B	4.367e-07	4.367e-07	
Ba	5.469e-08	5.469e-08	
Ca	6.465e-04	6.465e-04	
Cd	4.449e-10	4.449e-10	
Cl	2.083e-05	2.083e-05	
Co	7.976e-09	7.976e-09	
Cu	8.861e-08	8.861e-08	
F	2.937e-05	2.937e-05	
Fe	1.772e-06	1.772e-06	
K	2.757e-05	2.757e-05	
Mg	9.214e-05	9.214e-05	
Mn	8.528e-06	8.528e-06	
Mo	5.275e-08	5.275e-08	
Na	1.755e-04	1.755e-04	Charge balance
Ni	8.009e-09	8.009e-09	
S(6)	7.529e-04	7.529e-04	
Sb	2.440e-08	2.440e-08	
Se	3.040e-09	3.040e-09	
U	1.975e-09	1.975e-09	
V	9.228e-09	9.228e-09	
Zn	2.493e-08	2.493e-08	

-----Description of solution-----

pH = 6.904
 pe = 4.000
 Activity of water = 1.000
 Ionic strength (mol/kgw) = 2.937e-03
 Mass of water (kg) = 1.000e+00
 Total carbon (mol/kg) = 1.797e-04
 Total CO2 (mol/kg) = 1.797e-04
 Temperature (°C) = 25.00
 Electrical balance (eq) = -2.055e-18
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
 Iterations = 11
 Total H = 1.110139e+02
 Total O = 5.551040e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.324e-07	1.248e-07	-6.878	-6.904	-0.026	0.00
OH-	8.569e-08	8.070e-08	-7.067	-7.093	-0.026	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	2.590e-06					
Al(OH) 4-	2.150e-06	2.027e-06	-5.668	-5.693	-0.026	(0)
Al(OH) 3	1.995e-07	1.995e-07	-6.700	-6.700	0.000	(0)
Al(OH) 2+	1.313e-07	1.239e-07	-6.882	-6.907	-0.025	(0)
AlF2+	7.424e-08	7.005e-08	-7.129	-7.155	-0.025	(0)
AlF3	2.390e-08	2.390e-08	-7.622	-7.622	0.000	(0)
AlF+2	8.189e-09	6.492e-09	-8.087	-8.188	-0.101	(0)
AlOH+2	2.438e-09	1.933e-09	-8.613	-8.714	-0.101	(0)
AlF4-	3.444e-10	3.247e-10	-9.463	-9.488	-0.026	(0)
AlSO4+	1.069e-10	1.008e-10	-9.971	-9.997	-0.026	(0)
Al+3	4.085e-11	2.395e-11	-10.389	-10.621	-0.232	(0)
Al(SO4) 2-	6.211e-13	5.855e-13	-12.207	-12.232	-0.026	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.094	-41.342	-0.249	(0)
B	4.367e-07					
H3BO3	4.345e-07	4.348e-07	-6.362	-6.362	0.000	(0)
H2BO3-	2.151e-09	2.024e-09	-8.667	-8.694	-0.026	(0)
CaH2BO3+	5.735e-11	5.396e-11	-10.241	-10.268	-0.026	(0)
MgH2BO3+	5.011e-12	4.715e-12	-11.300	-11.327	-0.026	(0)
BF(OH) 3-	4.998e-12	4.702e-12	-11.301	-11.328	-0.026	(0)
NaH2BO3	5.290e-13	5.290e-13	-12.277	-12.277	0.000	(0)
BaH2BO3+	2.864e-15	2.695e-15	-14.543	-14.569	-0.026	(0)
BF2(OH) 2-	1.807e-15	1.700e-15	-14.743	-14.770	-0.026	(0)
H5(BO3) 2-	7.959e-16	7.489e-16	-15.099	-15.126	-0.026	(0)
H8(BO3) 3-	3.460e-20	3.256e-20	-19.461	-19.487	-0.026	(0)
BF3OH-	2.377e-21	2.237e-21	-20.624	-20.650	-0.026	(0)
BF4-	3.956e-26	3.722e-26	-25.403	-25.429	-0.026	(0)
Ba	5.469e-08					
Ba+2	5.463e-08	4.309e-08	-7.263	-7.366	-0.103	(0)
BaHCO3+	5.794e-11	5.471e-11	-10.237	-10.262	-0.025	(0)
BaCO3	1.104e-12	1.104e-12	-11.957	-11.957	0.000	(0)
BaOH+	1.609e-14	1.518e-14	-13.793	-13.819	-0.025	(0)
BaH2BO3+	2.864e-15	2.695e-15	-14.543	-14.569	-0.026	(0)
C(4)	1.797e-04					
HCO3-	1.409e-04	1.329e-04	-3.851	-3.876	-0.025	(0)
H2CO3	3.730e-05	3.730e-05	-4.428	-4.428	0.000	(0)
CaHCO3+	1.215e-06	1.147e-06	-5.915	-5.940	-0.025	(0)
MgHCO3+	9.700e-08	9.141e-08	-7.013	-7.039	-0.026	(0)
CO3-2	6.334e-08	4.995e-08	-7.198	-7.301	-0.103	(0)
CaCO3	3.669e-08	3.669e-08	-7.435	-7.435	0.000	(0)
MnHCO3+	1.725e-08	1.627e-08	-7.763	-7.789	-0.025	(0)
CuCO3	1.287e-08	1.287e-08	-7.891	-7.891	0.000	(0)
NaHCO3	1.233e-08	1.233e-08	-7.909	-7.909	0.000	(0)
MgCO3	2.792e-09	2.792e-09	-8.554	-8.554	0.000	(0)
UO2(CO3) 2-2	1.067e-09	8.272e-10	-8.972	-9.082	-0.111	(0)
FeHCO3+	9.902e-10	9.349e-10	-9.004	-9.029	-0.025	(0)
UO2CO3	8.299e-10	8.299e-10	-9.081	-9.081	0.000	(0)

		CuHCO3+	3.910e-10	3.669e-10	-9.408	-9.435	-0.028	(0)
		NaCO3-	1.626e-10	1.534e-10	-9.789	-9.814	-0.025	(0)
		NiHCO3+	1.001e-10	9.394e-11	-9.999	-10.027	-0.028	(0)
		ZnHCO3+	7.956e-11	7.465e-11	-10.099	-10.127	-0.028	(0)
		CoHCO3+	6.222e-11	5.839e-11	-10.206	-10.234	-0.028	(0)
		BaHCO3+	5.794e-11	5.471e-11	-10.237	-10.262	-0.025	(0)
		ZnCO3	5.104e-11	5.104e-11	-10.292	-10.292	0.000	(0)
		NiCO3	1.068e-11	1.068e-11	-10.971	-10.971	0.000	(0)
		UO2 (CO3) 3-4	5.734e-12	2.071e-12	-11.242	-11.684	-0.442	(0)
		CoCO3	4.768e-12	4.768e-12	-11.322	-11.322	0.000	(0)
		Cu (CO3) 2-2	2.232e-12	1.730e-12	-11.651	-11.762	-0.111	(0)
		BaCO3	1.104e-12	1.104e-12	-11.957	-11.957	0.000	(0)
		CdCO3	3.616e-13	3.616e-13	-12.442	-12.442	0.000	(0)
		CdHCO3+	1.024e-13	9.612e-14	-12.990	-13.017	-0.028	(0)
		Cd (CO3) 2-2	1.727e-17	1.339e-17	-16.763	-16.873	-0.111	(0)
Ca	6.465e-04							
		Ca+2	5.875e-04	4.634e-04	-3.231	-3.334	-0.103	(0)
		CaSO4	5.755e-05	5.755e-05	-4.240	-4.240	0.000	(0)
		CaHCO3+	1.215e-06	1.147e-06	-5.915	-5.940	-0.025	(0)
		CaF+	1.453e-07	1.371e-07	-6.838	-6.863	-0.025	(0)
		CaCO3	3.669e-08	3.669e-08	-7.435	-7.435	0.000	(0)
		CaOH+	7.903e-10	7.461e-10	-9.102	-9.127	-0.025	(0)
		CaH2BO3+	5.735e-11	5.396e-11	-10.241	-10.268	-0.026	(0)
Cd	4.449e-10							
		Cd+2	4.026e-10	3.176e-10	-9.395	-9.498	-0.103	(0)
		CdSO4	4.036e-11	4.036e-11	-10.394	-10.394	0.000	(0)
		CdCl+	6.345e-13	5.954e-13	-12.198	-12.225	-0.028	(0)
		Cd (SO4) 2-2	3.808e-13	2.952e-13	-12.419	-12.530	-0.111	(0)
		CdCO3	3.616e-13	3.616e-13	-12.442	-12.442	0.000	(0)
		CdOH+	2.170e-13	2.036e-13	-12.664	-12.691	-0.028	(0)
		CdF+	1.454e-13	1.364e-13	-12.837	-12.865	-0.028	(0)
		CdHCO3+	1.024e-13	9.612e-14	-12.990	-13.017	-0.028	(0)
		CdOHC1	1.971e-15	1.971e-15	-14.705	-14.705	0.000	(0)
		Cd (OH) 2	1.037e-16	1.037e-16	-15.984	-15.984	0.000	(0)
		CdCl2	4.873e-17	4.873e-17	-16.312	-16.312	0.000	(0)
		Cd (CO3) 2-2	1.727e-17	1.339e-17	-16.763	-16.873	-0.111	(0)
		CdF2	7.378e-18	7.378e-18	-17.132	-17.132	0.000	(0)
		CdCl3-	6.433e-22	6.036e-22	-21.192	-21.219	-0.028	(0)
		Cd2OH+3	5.746e-22	3.240e-22	-21.241	-21.489	-0.249	(0)
		Cd (OH) 3-	5.447e-22	5.111e-22	-21.264	-21.291	-0.028	(0)
		CdSeO4	4.114e-24	4.114e-24	-23.386	-23.386	0.000	(0)
		Cd (SeO3) 2-2	2.592e-24	2.010e-24	-23.586	-23.697	-0.111	(0)
		Cd (OH) 4-2	8.709e-30	6.752e-30	-29.060	-29.171	-0.111	(0)
Cl	2.083e-05							
		Cl-	2.083e-05	1.963e-05	-4.681	-4.707	-0.026	(0)
		MnCl+	1.607e-10	1.516e-10	-9.794	-9.819	-0.025	(0)
		CuCl	5.295e-11	5.295e-11	-10.276	-10.276	0.000	(0)
		CuCl+	1.444e-12	1.361e-12	-11.840	-11.866	-0.026	(0)
		ZnCl+	9.293e-13	8.757e-13	-12.032	-12.058	-0.026	(0)
		CdCl+	6.345e-13	5.954e-13	-12.198	-12.225	-0.028	(0)
		CoCl+	4.087e-13	3.835e-13	-12.389	-12.416	-0.028	(0)
		NiCl+	3.068e-13	2.879e-13	-12.513	-12.541	-0.028	(0)
		CuCl2-	2.305e-13	2.172e-13	-12.637	-12.663	-0.026	(0)
		ZnOHC1	9.252e-14	9.252e-14	-13.034	-13.034	0.000	(0)
		MnCl2	4.203e-15	4.203e-15	-14.376	-14.376	0.000	(0)
		CdOHC1	1.971e-15	1.971e-15	-14.705	-14.705	0.000	(0)
		UO2Cl+	1.416e-16	1.329e-16	-15.849	-15.877	-0.028	(0)
		CdCl2	4.873e-17	4.873e-17	-16.312	-16.312	0.000	(0)
		ZnCl2	2.725e-17	2.725e-17	-16.565	-16.565	0.000	(0)
		CuCl2	9.266e-18	9.266e-18	-17.033	-17.033	0.000	(0)
		CuCl3-2	1.152e-18	9.117e-19	-17.939	-18.040	-0.102	(0)
		FeCl+2	3.887e-19	3.077e-19	-18.410	-18.512	-0.102	(0)
		NiCl2	2.846e-20	2.846e-20	-19.546	-19.546	0.000	(0)
		MnCl3-	2.410e-20	2.273e-20	-19.618	-19.643	-0.025	(0)
		VOCl+	1.894e-20	1.778e-20	-19.723	-19.750	-0.028	(0)
		CdCl3-	6.433e-22	6.036e-22	-21.192	-21.219	-0.028	(0)
		ZnCl3-	4.510e-22	4.249e-22	-21.346	-21.372	-0.026	(0)
		FeCl2+	2.860e-23	2.698e-23	-22.544	-22.569	-0.025	(0)

CuCl3-	1.802e-24	1.698e-24	-23.744	-23.770	-0.026	(0)
ZnCl4-2	5.270e-27	4.172e-27	-26.278	-26.380	-0.102	(0)
FeCl3	5.297e-29	5.297e-29	-28.276	-28.276	0.000	(0)
CuCl4-2	2.110e-31	1.670e-31	-30.676	-30.777	-0.102	(0)
CoCl+2	1.158e-39	8.979e-40	-38.936	-39.047	-0.111	(0)
UCl+3	0.000e+00	0.000e+00	-40.537	-40.786	-0.249	(0)
Co (2)	7.976e-09					
Co+2	7.283e-09	5.646e-09	-8.138	-8.248	-0.111	(0)
CoSO4	6.108e-10	6.108e-10	-9.214	-9.214	0.000	(0)
CoHCO3+	6.222e-11	5.839e-11	-10.206	-10.234	-0.028	(0)
CoOH+	9.689e-12	9.092e-12	-11.014	-11.041	-0.028	(0)
CoF+	5.158e-12	4.839e-12	-11.288	-11.315	-0.028	(0)
CoCO3	4.768e-12	4.768e-12	-11.322	-11.322	0.000	(0)
CoCl+	4.087e-13	3.835e-13	-12.389	-12.416	-0.028	(0)
Co (OH) 2	5.828e-14	5.828e-14	-13.234	-13.234	0.000	(0)
Co (OH) 3-	1.000e-19	9.385e-20	-19.000	-19.028	-0.028	(0)
CoOOH-	2.509e-20	2.355e-20	-19.600	-19.628	-0.028	(0)
Co2OH+3	4.562e-21	2.573e-21	-20.341	-20.590	-0.249	(0)
CoSeO4	1.969e-22	1.969e-22	-21.706	-21.706	0.000	(0)
Co (OH) 4-2	1.548e-27	1.200e-27	-26.810	-26.921	-0.111	(0)
Co4 (OH) 4+4	3.774e-36	1.363e-36	-35.423	-35.865	-0.442	(0)
Co (3)	1.189e-31					
CoOH+2	1.189e-31	9.218e-32	-30.925	-31.035	-0.111	(0)
Co+3	3.834e-37	2.248e-37	-36.416	-36.648	-0.232	(0)
CoCl+2	1.158e-39	8.979e-40	-38.936	-39.047	-0.111	(0)
Cu (1)	2.336e-09					
Cu+	2.283e-09	2.142e-09	-8.641	-8.669	-0.028	(0)
CuCl	5.295e-11	5.295e-11	-10.276	-10.276	0.000	(0)
CuCl2-	2.305e-13	2.172e-13	-12.637	-12.663	-0.026	(0)
CuCl3-2	1.152e-18	9.117e-19	-17.939	-18.040	-0.102	(0)
Cu (2)	8.627e-08					
Cu+2	5.546e-08	4.374e-08	-7.256	-7.359	-0.103	(0)
CuCO3	1.287e-08	1.287e-08	-7.891	-7.891	0.000	(0)
CuOH+	1.185e-08	1.116e-08	-7.926	-7.952	-0.026	(0)
CuSO4	5.433e-09	5.433e-09	-8.265	-8.265	0.000	(0)
CuHCO3+	3.910e-10	3.669e-10	-9.408	-9.435	-0.028	(0)
Cu (OH) 2	1.798e-10	1.798e-10	-9.745	-9.745	0.000	(0)
CuF+	7.973e-11	7.481e-11	-10.098	-10.126	-0.028	(0)
Cu2 (OH) 2+2	4.038e-12	3.130e-12	-11.394	-11.504	-0.111	(0)
Cu (CO3) 2-2	2.232e-12	1.730e-12	-11.651	-11.762	-0.111	(0)
CuCl+	1.444e-12	1.361e-12	-11.840	-11.866	-0.026	(0)
Cu (OH) 3-	3.171e-14	2.976e-14	-13.499	-13.526	-0.028	(0)
CuCl2	9.266e-18	9.266e-18	-17.033	-17.033	0.000	(0)
Cu (OH) 4-2	2.438e-20	1.890e-20	-19.613	-19.724	-0.111	(0)
CuCl3-	1.802e-24	1.698e-24	-23.744	-23.770	-0.026	(0)
CuCl4-2	2.110e-31	1.670e-31	-30.676	-30.777	-0.102	(0)
F	2.937e-05					
F-	2.876e-05	2.711e-05	-4.541	-4.567	-0.026	(0)
MgF+	2.168e-07	2.044e-07	-6.664	-6.690	-0.026	(0)
CaF+	1.453e-07	1.371e-07	-6.838	-6.863	-0.025	(0)
AlF2+	7.424e-08	7.005e-08	-7.129	-7.155	-0.025	(0)
AlF3	2.390e-08	2.390e-08	-7.622	-7.622	0.000	(0)
AlF+2	8.189e-09	6.492e-09	-8.087	-8.188	-0.101	(0)
MnF+	7.016e-09	6.618e-09	-8.154	-8.179	-0.025	(0)
HF	5.002e-09	5.002e-09	-8.301	-8.301	0.000	(0)
NaF	2.821e-09	2.821e-09	-8.550	-8.550	0.000	(0)
AlF4-	3.444e-10	3.247e-10	-9.463	-9.488	-0.026	(0)
CuF+	7.973e-11	7.481e-11	-10.098	-10.126	-0.028	(0)
UO2F+	1.664e-11	1.561e-11	-10.779	-10.806	-0.028	(0)
ZnF+	1.023e-11	9.604e-12	-10.990	-11.018	-0.028	(0)
CoF+	5.158e-12	4.839e-12	-11.288	-11.315	-0.028	(0)
BF (OH) 3-	4.998e-12	4.702e-12	-11.301	-11.328	-0.026	(0)
NiF+	4.159e-12	3.903e-12	-11.381	-11.409	-0.028	(0)
UO2F2	1.221e-12	1.221e-12	-11.913	-11.913	0.000	(0)
HF2-	5.473e-13	5.155e-13	-12.262	-12.288	-0.026	(0)
CdF+	1.454e-13	1.364e-13	-12.837	-12.865	-0.028	(0)
FeF+2	1.948e-14	1.542e-14	-13.710	-13.812	-0.102	(0)
FeF2+	1.186e-14	1.119e-14	-13.926	-13.951	-0.025	(0)

UO2F3-	8.857e-15	8.311e-15	-14.053	-14.080	-0.028	(0)
BF2(OH) 2-	1.807e-15	1.700e-15	-14.743	-14.770	-0.026	(0)
FeF3	4.278e-16	4.278e-16	-15.369	-15.369	0.000	(0)
VO2F	1.232e-16	1.232e-16	-15.909	-15.909	0.000	(0)
H2F2	6.703e-17	6.703e-17	-16.174	-16.174	0.000	(0)
VOF+	5.592e-17	5.247e-17	-16.252	-16.280	-0.028	(0)
CdF2	7.378e-18	7.378e-18	-17.132	-17.132	0.000	(0)
UO2F4-2	2.308e-18	1.789e-18	-17.637	-17.747	-0.111	(0)
VO2F2-	1.292e-18	1.213e-18	-17.889	-17.916	-0.028	(0)
VOF2	5.333e-19	5.333e-19	-18.273	-18.273	0.000	(0)
Sb(OH) 2F	5.603e-21	5.603e-21	-20.252	-20.252	0.000	(0)
SbOF	5.510e-21	5.510e-21	-20.259	-20.259	0.000	(0)
BF3OH-	2.377e-21	2.237e-21	-20.624	-20.650	-0.026	(0)
VOF3-	5.466e-22	5.129e-22	-21.262	-21.290	-0.028	(0)
VO2F3-2	5.289e-22	4.100e-22	-21.277	-21.387	-0.111	(0)
VOF4-2	7.238e-26	5.611e-26	-25.140	-25.251	-0.111	(0)
BF4-	3.956e-26	3.722e-26	-25.403	-25.429	-0.026	(0)
VO2F4-3	9.697e-27	5.468e-27	-26.013	-26.262	-0.249	(0)
UF3+	1.405e-30	1.318e-30	-29.852	-29.880	-0.028	(0)
UF2+2	3.959e-31	3.069e-31	-30.402	-30.513	-0.111	(0)
UF4	3.918e-33	3.918e-33	-32.407	-32.407	0.000	(0)
UF+3	1.595e-33	8.993e-34	-32.797	-33.046	-0.249	(0)
UF5-	4.485e-36	4.209e-36	-35.348	-35.376	-0.028	(0)
UF6-2	4.444e-38	3.445e-38	-37.352	-37.463	-0.111	(0)
Fe (2)	7.978e-07					
Fe+2	7.205e-07	5.586e-07	-6.142	-6.253	-0.111	(0)
FeSO4	7.434e-08	7.434e-08	-7.129	-7.129	0.000	(0)
FeOH+	1.903e-09	1.795e-09	-8.721	-8.746	-0.025	(0)
FeHCO3+	9.902e-10	9.349e-10	-9.004	-9.029	-0.025	(0)
Fe (OH) 2	1.150e-13	1.150e-13	-12.939	-12.939	0.000	(0)
Fe (OH) 3-	3.113e-15	2.936e-15	-14.507	-14.532	-0.025	(0)
Fe (3)	9.739e-07					
Fe (OH) 2+	8.997e-07	8.489e-07	-6.046	-6.071	-0.025	(0)
Fe (OH) 3	7.358e-08	7.358e-08	-7.133	-7.133	0.000	(0)
Fe (OH) 4-	5.860e-10	5.529e-10	-9.232	-9.257	-0.025	(0)
FeOH+2	3.416e-11	2.704e-11	-10.466	-10.568	-0.102	(0)
FeF+2	1.948e-14	1.542e-14	-13.710	-13.812	-0.102	(0)
FeF2+	1.186e-14	1.119e-14	-13.926	-13.951	-0.025	(0)
FeSO4+	3.346e-15	3.157e-15	-14.475	-14.501	-0.025	(0)
Fe+3	8.852e-16	5.189e-16	-15.053	-15.285	-0.232	(0)
FeF3	4.278e-16	4.278e-16	-15.369	-15.369	0.000	(0)
Fe (SO4) 2-	3.899e-17	3.659e-17	-16.409	-16.437	-0.028	(0)
FeCl+2	3.887e-19	3.077e-19	-18.410	-18.512	-0.102	(0)
Fe2 (OH) 2+4	6.702e-20	2.421e-20	-19.174	-19.616	-0.442	(0)
FeHSeO3+2	4.857e-21	3.765e-21	-20.314	-20.424	-0.111	(0)
FeCl2+	2.860e-23	2.698e-23	-22.544	-22.569	-0.025	(0)
Fe3 (OH) 4+5	1.458e-24	2.970e-25	-23.836	-24.527	-0.691	(0)
FeCl3	5.297e-29	5.297e-29	-28.276	-28.276	0.000	(0)
H (0)	2.203e-25					
H2	1.101e-25	1.102e-25	-24.958	-24.958	0.000	(0)
K	2.757e-05					
K+	2.746e-05	2.588e-05	-4.561	-4.587	-0.026	(0)
KSO4-	1.053e-07	9.934e-08	-6.978	-7.003	-0.025	(0)
Mg	9.214e-05					
Mg+2	8.519e-05	6.719e-05	-4.070	-4.173	-0.103	(0)
MgSO4	6.629e-06	6.629e-06	-5.179	-5.179	0.000	(0)
MgF+	2.168e-07	2.044e-07	-6.664	-6.690	-0.026	(0)
MgHCO3+	9.700e-08	9.141e-08	-7.013	-7.039	-0.026	(0)
MgCO3	2.792e-09	2.792e-09	-8.554	-8.554	0.000	(0)
MgOH+	2.286e-09	2.159e-09	-8.641	-8.666	-0.025	(0)
MgH2BO3+	5.011e-12	4.715e-12	-11.300	-11.327	-0.026	(0)
Mn (2)	8.528e-06					
Mn+2	7.911e-06	6.133e-06	-5.102	-5.212	-0.111	(0)
MnSO4	5.912e-07	5.912e-07	-6.228	-6.228	0.000	(0)
MnHCO3+	1.725e-08	1.627e-08	-7.763	-7.789	-0.025	(0)
MnF+	7.016e-09	6.618e-09	-8.154	-8.179	-0.025	(0)
MnOH+	1.318e-09	1.243e-09	-8.880	-8.905	-0.025	(0)
MnCl+	1.607e-10	1.516e-10	-9.794	-9.819	-0.025	(0)

MnCl2	4.203e-15	4.203e-15	-14.376	-14.376	0.000	(0)
MnSeO4	1.148e-19	1.148e-19	-18.940	-18.940	0.000	(0)
Mn (OH) 3-	5.305e-20	5.004e-20	-19.275	-19.301	-0.025	(0)
MnCl3-	2.410e-20	2.273e-20	-19.618	-19.643	-0.025	(0)
Mn (OH) 4-2	1.647e-26	1.304e-26	-25.783	-25.885	-0.102	(0)
MnSe	1.520e-33	1.520e-33	-32.818	-32.818	0.000	(0)
Mn (3)	4.673e-27					
Mn+3	4.673e-27	2.739e-27	-26.330	-26.562	-0.232	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-52.302	-52.403	-0.102	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-57.749	-57.775	-0.026	(0)
Mo	5.275e-08					
MoO4-2	5.264e-08	4.152e-08	-7.279	-7.382	-0.103	(0)
HMoO4-	1.098e-10	1.031e-10	-9.959	-9.987	-0.028	(0)
H2MoO4	9.419e-14	9.419e-14	-13.026	-13.026	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.094	-41.342	-0.249	(0)
Mo7O24-6	0.000e+00	0.000e+00	-52.919	-53.914	-0.995	(0)
HMo7O24-5	0.000e+00	0.000e+00	-53.740	-54.431	-0.691	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.110	-56.553	-0.442	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-59.962	-60.211	-0.249	(0)
Na	1.755e-04					
Na+	1.750e-04	1.649e-04	-3.757	-3.783	-0.026	(0)
NaSO4-	5.089e-07	4.802e-07	-6.293	-6.319	-0.025	(0)
NaHCO3	1.233e-08	1.233e-08	-7.909	-7.909	0.000	(0)
NaF	2.821e-09	2.821e-09	-8.550	-8.550	0.000	(0)
NaCO3-	1.626e-10	1.534e-10	-9.789	-9.814	-0.025	(0)
NaH2BO3	5.290e-13	5.290e-13	-12.277	-12.277	0.000	(0)
Ni	8.009e-09					
Ni+2	7.268e-09	5.732e-09	-8.139	-8.242	-0.103	(0)
NiSO4	6.200e-10	6.200e-10	-9.208	-9.208	0.000	(0)
NiHCO3+	1.001e-10	9.394e-11	-9.999	-10.027	-0.028	(0)
NiCO3	1.068e-11	1.068e-11	-10.971	-10.971	0.000	(0)
NiOH+	6.206e-12	5.824e-12	-11.207	-11.235	-0.028	(0)
NiF+	4.159e-12	3.903e-12	-11.381	-11.409	-0.028	(0)
NiCl+	3.068e-13	2.879e-13	-12.513	-12.541	-0.028	(0)
Ni (OH) 2	3.733e-14	3.733e-14	-13.428	-13.428	0.000	(0)
Ni (SO4) 2-2	1.436e-14	1.113e-14	-13.843	-13.953	-0.111	(0)
Ni (OH) 3-	3.211e-18	3.013e-18	-17.493	-17.521	-0.028	(0)
NiCl2	2.846e-20	2.846e-20	-19.546	-19.546	0.000	(0)
NiSeO4	1.865e-22	1.865e-22	-21.729	-21.729	0.000	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-42.380	-42.379	0.000	(0)
S (6)	7.529e-04					
SO4-2	6.874e-04	5.422e-04	-3.163	-3.266	-0.103	(0)
CaSO4	5.755e-05	5.755e-05	-4.240	-4.240	0.000	(0)
MgSO4	6.629e-06	6.629e-06	-5.179	-5.179	0.000	(0)
MnSO4	5.912e-07	5.912e-07	-6.228	-6.228	0.000	(0)
NaSO4-	5.089e-07	4.802e-07	-6.293	-6.319	-0.025	(0)
KSO4-	1.053e-07	9.934e-08	-6.978	-7.003	-0.025	(0)
FeSO4	7.434e-08	7.434e-08	-7.129	-7.129	0.000	(0)
HSO4-	7.011e-09	6.610e-09	-8.154	-8.180	-0.026	(0)
CuSO4	5.433e-09	5.433e-09	-8.265	-8.265	0.000	(0)
ZnSO4	2.106e-09	2.106e-09	-8.676	-8.676	0.000	(0)
NiSO4	6.200e-10	6.200e-10	-9.208	-9.208	0.000	(0)
CoSO4	6.108e-10	6.108e-10	-9.214	-9.214	0.000	(0)
AlSO4+	1.069e-10	1.008e-10	-9.971	-9.997	-0.026	(0)
CdSO4	4.036e-11	4.036e-11	-10.394	-10.394	0.000	(0)
Zn (SO4) 2-2	1.283e-11	9.946e-12	-10.892	-11.002	-0.111	(0)
UO2SO4	3.424e-12	3.424e-12	-11.465	-11.465	0.000	(0)
Al (SO4) 2-	6.211e-13	5.855e-13	-12.207	-12.232	-0.026	(0)
Cd (SO4) 2-2	3.808e-13	2.952e-13	-12.419	-12.530	-0.111	(0)
UO2 (SO4) 2-2	3.157e-14	2.447e-14	-13.501	-13.611	-0.111	(0)
Ni (SO4) 2-2	1.436e-14	1.113e-14	-13.843	-13.953	-0.111	(0)
FeSO4+	3.346e-15	3.157e-15	-14.475	-14.501	-0.025	(0)
VOSO4	4.819e-17	4.819e-17	-16.317	-16.317	0.000	(0)
Fe (SO4) 2-	3.899e-17	3.659e-17	-16.409	-16.437	-0.028	(0)
VO2SO4-	3.576e-17	3.356e-17	-16.447	-16.474	-0.028	(0)

VSO4+	6.804e-29	6.385e-29	-28.167	-28.195	-0.028	(0)
U(SO4) 2	1.546e-34	1.546e-34	-33.811	-33.811	0.000	(0)
USO4+2	4.630e-35	3.589e-35	-34.334	-34.445	-0.111	(0)
Sb (3)	2.096e-15					
Sb(OH) 3	1.061e-15	1.061e-15	-14.974	-14.974	0.000	(0)
HSbO2	1.035e-15	1.035e-15	-14.985	-14.985	0.000	(0)
SbO2-	1.432e-20	1.344e-20	-19.844	-19.872	-0.028	(0)
Sb(OH) 4-	8.207e-21	7.701e-21	-20.086	-20.113	-0.028	(0)
Sb(OH) 2F	5.603e-21	5.603e-21	-20.252	-20.252	0.000	(0)
SbOF	5.510e-21	5.510e-21	-20.259	-20.259	0.000	(0)
Sb(OH) 2+	3.425e-21	3.213e-21	-20.465	-20.493	-0.028	(0)
SbO+	1.181e-21	1.108e-21	-20.928	-20.956	-0.028	(0)
Sb (5)	2.440e-08					
SbO3-	2.437e-08	2.287e-08	-7.613	-7.641	-0.028	(0)
Sb(OH) 6-	2.838e-11	2.675e-11	-10.547	-10.573	-0.026	(0)
SbO2+	1.088e-22	1.021e-22	-21.963	-21.991	-0.028	(0)
Se (-2)	8.006e-30					
HSe-	7.998e-30	7.504e-30	-29.097	-29.125	-0.028	(0)
H2Se	7.268e-33	7.268e-33	-32.139	-32.139	0.000	(0)
MnSe	1.520e-33	1.520e-33	-32.818	-32.818	0.000	(0)
Se-2	7.759e-38	6.015e-38	-37.110	-37.221	-0.111	(0)
Se (4)	3.040e-09					
HSeO3-	2.927e-09	2.746e-09	-8.534	-8.561	-0.028	(0)
SeO3-2	1.130e-10	8.763e-11	-9.947	-10.057	-0.111	(0)
H2SeO3	1.462e-13	1.462e-13	-12.835	-12.835	0.000	(0)
FeHSeO3+2	4.857e-21	3.765e-21	-20.314	-20.424	-0.111	(0)
Cd(SeO3) 2-2	2.592e-24	2.010e-24	-23.586	-23.697	-0.111	(0)
Se (6)	8.833e-17					
SeO4-2	8.821e-17	6.957e-17	-16.054	-16.158	-0.103	(0)
MnSeO4	1.148e-19	1.148e-19	-18.940	-18.940	0.000	(0)
HSeO4-	4.636e-22	4.350e-22	-21.334	-21.361	-0.028	(0)
CoSeO4	1.969e-22	1.969e-22	-21.706	-21.706	0.000	(0)
ZnSeO4	1.913e-22	1.913e-22	-21.718	-21.718	0.000	(0)
NiSeO4	1.865e-22	1.865e-22	-21.729	-21.729	0.000	(0)
CdSeO4	4.114e-24	4.114e-24	-23.386	-23.386	0.000	(0)
Zn(SeO4) 2-2	1.741e-38	1.350e-38	-37.759	-37.870	-0.111	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-50.326	-50.575	-0.249	(0)
U (4)	4.468e-17					
U(OH) 5-	4.446e-17	4.172e-17	-16.352	-16.380	-0.028	(0)
U(OH) 4	2.180e-19	2.180e-19	-18.662	-18.662	0.000	(0)
U(OH) 3+	1.060e-22	9.944e-23	-21.975	-22.002	-0.028	(0)
U(OH) 2+2	7.400e-27	5.736e-27	-26.131	-26.241	-0.111	(0)
UF3+	1.405e-30	1.318e-30	-29.852	-29.880	-0.028	(0)
UF2+2	3.959e-31	3.069e-31	-30.402	-30.513	-0.111	(0)
UOH+3	5.978e-32	3.371e-32	-31.223	-31.472	-0.249	(0)
UF4	3.918e-33	3.918e-33	-32.407	-32.407	0.000	(0)
UF+3	1.595e-33	8.993e-34	-32.797	-33.046	-0.249	(0)
U(SO4) 2	1.546e-34	1.546e-34	-33.811	-33.811	0.000	(0)
USO4+2	4.630e-35	3.589e-35	-34.334	-34.445	-0.111	(0)
UF5-	4.485e-36	4.209e-36	-35.348	-35.376	-0.028	(0)
U+4	4.604e-38	1.663e-38	-37.337	-37.779	-0.442	(0)
UF6-2	4.444e-38	3.445e-38	-37.352	-37.463	-0.111	(0)
UC1+3	0.000e+00	0.000e+00	-40.537	-40.786	-0.249	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-138.032	-140.271	-2.239	(0)
U (5)	2.711e-13					
UO2+	2.711e-13	2.544e-13	-12.567	-12.595	-0.028	(0)
U (6)	1.975e-09					
UO2(CO3) 2-2	1.067e-09	8.272e-10	-8.972	-9.082	-0.111	(0)
UO2CO3	8.299e-10	8.299e-10	-9.081	-9.081	0.000	(0)
UO2OH+	4.519e-11	4.240e-11	-10.345	-10.373	-0.028	(0)
UO2F+	1.664e-11	1.561e-11	-10.779	-10.806	-0.028	(0)
UO2(CO3) 3-4	5.734e-12	2.071e-12	-11.242	-11.684	-0.442	(0)
UO2+2	5.291e-12	4.173e-12	-11.276	-11.380	-0.103	(0)
UO2SO4	3.424e-12	3.424e-12	-11.465	-11.465	0.000	(0)
UO2F2	1.221e-12	1.221e-12	-11.913	-11.913	0.000	(0)
UO2(SO4) 2-2	3.157e-14	2.447e-14	-13.501	-13.611	-0.111	(0)
UO2F3-	8.857e-15	8.311e-15	-14.053	-14.080	-0.028	(0)

	(UO2) 2 (OH) 2+2	3.849e-15	2.983e-15	-14.415	-14.525	-0.111	(0)
	(UO2) 3 (OH) 5+	6.661e-16	6.250e-16	-15.176	-15.204	-0.028	(0)
	UO2Cl+	1.416e-16	1.329e-16	-15.849	-15.877	-0.028	(0)
	UO2F4-2	2.308e-18	1.789e-18	-17.637	-17.747	-0.111	(0)
V (2)	4.977e-36						
	VOH+	3.401e-36	3.191e-36	-35.468	-35.496	-0.028	(0)
	V+2	1.576e-36	1.222e-36	-35.802	-35.913	-0.111	(0)
V (3)	1.058e-10						
	V (OH) 3	1.058e-10	1.058e-10	-9.976	-9.976	0.000	(0)
	V (OH) 2+	9.088e-21	8.527e-21	-20.042	-20.069	-0.028	(0)
	VOH+2	1.302e-23	1.009e-23	-22.886	-22.996	-0.111	(0)
	V+3	4.424e-28	2.495e-28	-27.354	-27.603	-0.249	(0)
	VSO4+	6.804e-29	6.385e-29	-28.167	-28.195	-0.028	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-44.365	-44.613	-0.249	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-44.750	-45.192	-0.442	(0)
V (4)	6.059e-15						
	V (OH) 3+	5.538e-15	5.197e-15	-14.257	-14.284	-0.028	(0)
	VO+2	4.163e-16	3.227e-16	-15.381	-15.491	-0.111	(0)
	VOF+	5.592e-17	5.247e-17	-16.252	-16.280	-0.028	(0)
	VOSO4	4.819e-17	4.819e-17	-16.317	-16.317	0.000	(0)
	VOF2	5.333e-19	5.333e-19	-18.273	-18.273	0.000	(0)
	VOC1+	1.894e-20	1.778e-20	-19.723	-19.750	-0.028	(0)
	VOF3-	5.466e-22	5.129e-22	-21.262	-21.290	-0.028	(0)
	H2V2O4+2	1.746e-24	1.353e-24	-23.758	-23.869	-0.111	(0)
	VOF4-2	7.238e-26	5.611e-26	-25.140	-25.251	-0.111	(0)
V (5)	9.122e-09						
	H2VO4-	8.893e-09	8.345e-09	-8.051	-8.079	-0.028	(0)
	HVO4-2	2.167e-10	1.680e-10	-9.664	-9.775	-0.111	(0)
	H3VO4	1.041e-11	1.041e-11	-10.982	-10.982	0.000	(0)
	H3V2O7-	5.979e-13	5.610e-13	-12.223	-12.251	-0.028	(0)
	VO2+	2.750e-15	2.592e-15	-14.561	-14.586	-0.026	(0)
	HV2O7-3	8.425e-16	4.751e-16	-15.074	-15.323	-0.249	(0)
	VO2F	1.232e-16	1.232e-16	-15.909	-15.909	0.000	(0)
	VO2SO4-	3.576e-17	3.356e-17	-16.447	-16.474	-0.028	(0)
	VO4-3	1.197e-17	6.749e-18	-16.922	-17.171	-0.249	(0)
	VO2F2-	1.292e-18	1.213e-18	-17.889	-17.916	-0.028	(0)
	V3O9-3	1.079e-18	6.086e-19	-17.967	-18.216	-0.249	(0)
	V2O7-4	2.838e-19	1.025e-19	-18.547	-18.989	-0.442	(0)
	VO2F3-2	5.289e-22	4.100e-22	-21.277	-21.387	-0.111	(0)
	V4O12-4	5.862e-24	2.117e-24	-23.232	-23.674	-0.442	(0)
	VO2F4-3	9.697e-27	5.468e-27	-26.013	-26.262	-0.249	(0)
	HV10O28-5	0.000e+00	0.000e+00	-57.522	-58.213	-0.691	(0)
	V10O28-6	0.000e+00	0.000e+00	-58.500	-59.495	-0.995	(0)
	H2V10O28-4	0.000e+00	0.000e+00	-59.467	-59.909	-0.442	(0)
Zn	2.493e-08						
	Zn+2	2.251e-08	1.776e-08	-7.648	-7.751	-0.103	(0)
	ZnSO4	2.106e-09	2.106e-09	-8.676	-8.676	0.000	(0)
	ZnOH+	1.527e-10	1.433e-10	-9.816	-9.844	-0.028	(0)
	ZnHCO3+	7.956e-11	7.465e-11	-10.099	-10.127	-0.028	(0)
	ZnCO3	5.104e-11	5.104e-11	-10.292	-10.292	0.000	(0)
	Zn (SO4) 2-2	1.283e-11	9.946e-12	-10.892	-11.002	-0.111	(0)
	ZnF+	1.023e-11	9.604e-12	-10.990	-11.018	-0.028	(0)
	Zn (OH) 2	1.833e-12	1.833e-12	-11.737	-11.737	0.000	(0)
	ZnCl+	9.293e-13	8.757e-13	-12.032	-12.058	-0.026	(0)
	ZnOHC1	9.252e-14	9.252e-14	-13.034	-13.034	0.000	(0)
	Zn (OH) 3-	7.902e-16	7.414e-16	-15.102	-15.130	-0.028	(0)
	ZnCl2	2.725e-17	2.725e-17	-16.565	-16.565	0.000	(0)
	Zn (OH) 4-2	3.073e-21	2.382e-21	-20.512	-20.623	-0.111	(0)
	ZnCl3-	4.510e-22	4.249e-22	-21.346	-21.372	-0.026	(0)
	ZnSeO4	1.913e-22	1.913e-22	-21.718	-21.718	0.000	(0)
	ZnCl4-2	5.270e-27	4.172e-27	-26.278	-26.380	-0.102	(0)
	Zn (SeO4) 2-2	1.741e-38	1.350e-38	-37.759	-37.870	-0.111	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-0.71	10.09	10.80	Al (OH) 3

Al ₂ (MoO ₄) ₃	-45.75	-43.39	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	0.53	20.18	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	0.59	23.29	22.70	Al ₄ (OH) ₁₀ SO ₄
AlOHSO ₄	-3.75	-6.98	-3.23	AlOHSO ₄
AlSb	-135.93	-70.31	65.62	AlSb
Alunite	-0.16	-1.56	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anhydrite	-2.24	-6.60	-4.36	CaSO ₄
Antlerite	-6.52	2.27	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-2.34	-10.64	-8.30	CaCO ₃
Artinite	-11.44	-1.84	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
Atacamite	-6.10	1.29	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-5.97	-22.87	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.95	6.44	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-18.35	-2.48	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (VO ₄) ₂ :4H ₂ O	-28.98	3.96	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaF ₂	-10.68	-16.50	-5.82	BaF ₂
BaMoO ₄	-7.79	-14.75	-6.96	BaMoO ₄
Barite	-0.65	-10.63	-9.98	BaSO ₄
BaSeO ₃	-10.85	-9.02	1.83	BaSeO ₃
BaSeO ₄	-16.06	-23.52	-7.46	BaSeO ₄
Bianchite	-9.25	-11.02	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-13.04	5.05	18.09	MnO ₂
Bixbyite	-11.06	-11.70	-0.64	Mn ₂ O ₃
Boehmite	1.51	10.09	8.58	AlOOH
Breithauptite	-45.41	-63.93	-18.52	NiSb
Brochantite	-6.50	8.72	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-7.21	9.64	16.84	Mg(OH) ₂
Bunsenite	-6.88	5.57	12.45	NiO
Ca(VO ₃) ₂	-10.55	-4.89	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-11.92	5.58	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-15.97	5.58	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (VO ₄) ₂	-22.90	16.06	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-23.80	16.06	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-272.35	-129.37	142.97	Ca ₃ Sb ₂
Calcite	-2.16	-10.64	-8.48	CaCO ₃
CaMoO ₄	-2.77	-10.72	-7.95	CaMoO ₄
Carnotite	-3.17	-2.94	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.81	-4.99	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-16.47	-19.49	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-18.25	-8.41	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-9.33	4.31	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-9.42	4.31	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-27.93	-21.22	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-26.70	-4.14	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-28.24	0.16	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-18.25	-18.91	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-17.22	-18.91	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-17.00	-18.91	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-17.42	-18.63	-1.21	CdF ₂
Cdmetal(alpha)	-31.01	-17.50	13.51	Cd
Cdmetal(gamma)	-31.12	-17.50	13.62	Cd
CdMoO ₄	-2.73	-16.88	-14.15	CdMoO ₄
CdOHC1	-10.84	-7.30	3.54	CdOHC1
CdSb	-64.83	-65.18	-0.35	CdSb
CdSe	-11.52	-31.72	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-23.81	-25.66	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-12.59	-12.76	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.04	-12.76	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-10.89	-12.76	-1.87	CdSO ₄ :2.67H ₂ O
CH ₄ (g)	-67.30	-108.34	-41.05	CH ₄
Chalcanthite	-7.99	-10.63	-2.64	CuSO ₄ :5H ₂ O
Co(BO ₂) ₂	-34.23	-7.16	27.07	Co(BO ₂) ₂
Co(OH) ₂	-7.53	5.56	13.09	Co(OH) ₂
Co(OH) ₃	-13.63	-15.94	-2.31	Co(OH) ₃
CO ₂ (g)	-2.96	-21.11	-18.15	CO ₂
Co ₃ O ₄	-15.82	-26.31	-10.50	Co ₃ O ₄
CoCl ₂	-25.93	-17.66	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-20.20	-17.66	2.54	CoCl ₂ :6H ₂ O

CoCO3	-5.57	-15.55	-9.98	CoCO3
CoF2	-15.79	-17.38	-1.60	CoF2
CoF3	-48.89	-50.35	-1.46	CoF3
CoFe2O4	19.94	16.41	-3.53	CoFe2O4
CoMoO4	-7.87	-15.63	-7.76	CoMoO4
CoO	-8.03	5.56	13.59	CoO
CoSe	-14.27	-30.47	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-22.88	-24.41	-1.53	CoSeO4:6H2O
CoSO4	-14.32	-11.51	2.80	CoSO4
CoSO4:6H2O	-9.04	-11.51	-2.47	CoSO4:6H2O
Cryolite	-15.53	-49.37	-33.84	Na3AlF6
Cu (OH) 2	-2.23	6.45	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.10	20.12	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-40.83	-75.71	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	6.24	-39.56	-45.80	Cu2Se
Cu2SO4	-18.65	-20.60	-1.95	Cu2SO4
Cu3Sb	-43.10	-85.69	-42.59	Cu3Sb
Cu3Se2	-5.65	-69.14	-63.49	Cu3Se2
CuCO3	-3.16	-14.66	-11.50	CuCO3
CuF	-8.33	-13.24	-4.91	CuF
CuF2	-17.61	-16.49	1.12	CuF2
CuF2:2H2O	-11.94	-16.49	-4.55	CuF2:2H2O
Cumetal	-3.91	-12.67	-8.76	Cu
CuMoO4	-1.66	-14.74	-13.08	CuMoO4
CuOCuSO4	-14.48	-4.18	10.30	CuOCuSO4
Cupricferrite	11.31	17.30	5.99	CuFe2O4
Cuprite	-2.12	-3.53	-1.41	Cu2O
Cuprousferrite	12.58	3.66	-8.92	CuFeO2
CuSe	3.52	-29.58	-33.10	CuSe
CuSe2	-10.44	-43.80	-33.37	CuSe2
CuSeO3:2H2O	-9.53	-9.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-21.08	-23.52	-2.44	CuSeO4:5H2O
CuSO4	-13.56	-10.62	2.94	CuSO4
Diaspore	3.22	10.09	6.87	AlOOH
Dolomite (disordered)	-5.57	-22.11	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-5.02	-22.11	-17.09	CaMg (CO3) 2
Epsomite	-5.31	-7.44	-2.13	MgSO4:7H2O
Fe (OH) 2	-6.01	7.55	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	4.98	1.94	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-4.09	-7.81	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-6.17	-4.61	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-14.92	-35.54	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-36.63	-40.37	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-1.81	18.41	20.22	Fe3 (OH) 8
FeMoO4	-3.54	-13.63	-10.09	FeMoO4
Ferrihydrite	2.24	5.43	3.19	Fe (OH) 3
Ferroselite	-24.10	-42.69	-18.60	FeSe2
FeSe	-17.47	-28.47	-11.00	FeSe
Fluorite	-1.97	-12.47	-10.50	CaF2
Gibbsite	1.80	10.09	8.29	Al (OH) 3
Goethite	4.94	5.43	0.49	FeOOH
Goslarite	-9.01	-11.02	-2.01	ZnSO4:7H2O
Gummite	-5.24	2.43	7.67	UO3
Gypsum	-1.99	-6.60	-4.61	CaSO4:2H2O
H-Jarosite	-5.77	-17.87	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.31	-21.19	-12.88	H2MoO4
H2Se (g)	-31.07	-36.03	-4.96	H2Se
Halite	-10.09	-8.49	1.60	NaCl
Hausmannite	-13.44	47.59	61.03	Mn3O4
Hematite	12.27	10.85	-1.42	Fe2O3
Hercynite	4.84	27.74	22.89	FeAl2O4
Huntite	-15.09	-45.06	-29.97	CaMg3 (CO3) 4
Hydromagnesite	-27.50	-36.26	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.57	-21.74	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-0.75	-15.55	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-19.82	-16.56	3.26	K2MoO4
K2SeO4	-24.60	-25.33	-0.73	K2SeO4

Langite	-8.77	8.72	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Lepidocrocite	4.06	5.43	1.37	FeOOH
Lime	-22.23	10.47	32.70	CaO
Maghemite	4.47	10.85	6.39	Fe ₂ O ₃
Magnesioferrite	3.63	20.49	16.86	Fe ₂ MgO ₄
Magnesite	-4.01	-11.47	-7.46	MgCO ₃
Magnetite	15.01	18.41	3.40	Fe ₃ O ₄
Malachite	-2.91	-8.21	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-5.84	19.50	25.34	MnOOH
Melanothallite	-23.03	-16.77	6.26	CuCl ₂
Melanterite	-7.31	-9.52	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-9.16	9.64	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.01	-5.73	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-242.09	-167.40	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-22.45	3.91	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-5.18	-13.31	-8.13	MgF ₂
MgMoO ₄	-9.70	-11.55	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-8.89	-5.83	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-19.13	-20.33	-1.20	MgSeO ₄ ·6H ₂ O
Mirabilite	-9.72	-10.83	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.67	-6.77	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.21	-62.92	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-135.19	-74.11	61.08	Mn ₂ Sb
MnCl ₂ ·4H ₂ O	-17.34	-14.63	2.72	MnCl ₂ ·4H ₂ O
MnSb	-83.34	-86.25	-2.91	MnSb
MnSe	-30.93	-27.43	3.50	MnSe
MnSeO ₃	-8.00	-6.87	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-7.85	-6.87	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-19.32	-21.37	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.06	-8.48	2.58	MnSO ₄
Monteponite	-10.79	4.31	15.10	CdO
MoO ₃	-13.19	-21.19	-8.00	MoO ₃
Morenosite	-9.36	-11.51	-2.14	NiSO ₄ ·7H ₂ O
Na-Jarosite	-3.55	-14.75	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-19.54	-36.14	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.44	-14.95	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-16.17	-14.95	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-19.52	-9.22	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-25.00	-23.72	1.28	Na ₂ SeO ₄
Na ₃ Sb	-165.49	-71.03	94.45	Na ₃ Sb
Na ₃ VO ₄	-35.00	1.68	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-40.28	-2.88	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.65	-13.38	-6.73	CuCl
NaSb	-78.63	-55.47	23.17	NaSb
Natron	-13.56	-14.87	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.42	-4.56	3.86	NaVO ₃
Nesquehonite	-6.80	-11.47	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-7.23	5.57	12.79	Ni(OH) ₂
Ni ₄ (OH) ₆ SO ₄	-26.81	5.19	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-8.67	-15.54	-6.87	NiCO ₃
NiMoO ₄	-4.48	-15.62	-11.14	NiMoO ₄
NiSe	-12.76	-30.46	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-12.71	-9.90	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-22.88	-24.40	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-12.45	5.05	17.50	MnO ₂
O ₂ (g)	-39.47	43.62	83.09	O ₂
Otavite	-4.80	-16.80	-12.00	CdCO ₃
Periclase	-11.95	9.64	21.58	MgO
Portlandite	-12.33	10.47	22.80	Ca(OH) ₂
Pyrochroite	-6.60	8.60	15.19	Mn(OH) ₂
Pyrolusite	-10.98	30.40	41.38	MnO ₂
Retgersite	-9.47	-11.51	-2.04	NiSO ₄ ·6H ₂ O
Rhodochrosite	-1.93	-12.51	-10.58	MnCO ₃
Rutherfordine	-4.18	-18.68	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-7.86	-14.97	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-11.54	-8.14	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-25.29	-34.95	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-70.28	-138.03	-67.76	Sb ₂ Se ₃

Sb4O6(cubic)	-41.64	-59.90	-18.26	Sb4O6
Sb4O6(orth)	-42.00	-59.90	-17.90	Sb4O6
SbCl3	-50.38	-49.81	0.57	SbCl3
SbF3	-39.16	-49.39	-10.23	SbF3
Sbmetal	-36.00	-47.69	-11.69	Sb
SbO2	-0.56	-28.38	-27.82	SbO2
Schoepite	-3.57	2.43	5.99	UO2(OH)2·H2O
Semetal(am)	-7.11	-14.22	-7.11	Se
Semetal(hex)	-6.51	-14.22	-7.71	Se
Senarmontite	-17.58	-29.95	-12.37	Sb2O3
SeO2	-15.59	-15.47	0.12	SeO2
SeO3	-51.01	-29.97	21.04	SeO3
Siderite	-3.31	-13.55	-10.24	FeCO3
Smithsonite	-5.05	-15.05	-10.00	ZnCO3
Spinel	-7.03	29.82	36.85	MgAl2O4
Tenorite	-1.20	6.45	7.64	CuO
Thenardite	-11.15	-10.83	0.32	Na2SO4
Thermonatrite	-15.50	-14.87	0.64	Na2CO3·H2O
Tyuyamunite	-4.11	-0.03	4.08	Ca(UO2)2(VO4)2
U3O8	-7.96	13.13	21.08	U3O8
U3Sb4	-504.46	-352.08	152.38	U3Sb4
U4O9	-15.83	-18.85	-3.02	U4O9
UF4	-26.51	-56.05	-29.54	UF4
UF4:2.5H2O	-23.33	-56.05	-32.72	UF4:2.5H2O
UO2(am)	-11.10	-10.16	0.93	UO2
UO2(OH)2(beta)	-3.18	2.43	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.29	-27.54	-2.25	UO2SeO4:4H2O
UO3	-5.27	2.43	7.70	UO3
Uraninite	-5.49	-10.16	-4.67	UO2
USb2	-187.94	-158.37	29.58	USb2
V(OH)3	-14.48	-6.89	7.59	V(OH)3
V2O5	-14.00	-15.36	-1.36	V2O5
V3O5	-28.69	-26.86	1.84	V3O5
V4O7	-35.73	-28.54	7.19	V4O7
V6O13	-28.85	-89.71	-60.86	V6O13
Valentinite	-21.47	-29.95	-8.48	Sb2O3
VC12	-59.89	-41.02	18.87	VC12
VC13	-65.16	-41.72	23.43	VC13
VF4	-62.50	-47.57	14.93	VF4
Vmetal	-83.63	-39.60	44.03	V
VO	-32.55	-17.80	14.76	VO
VO(OH)2	-6.83	-1.68	5.15	VO(OH)2
VO2Cl	-22.13	-19.29	2.84	VO2Cl
VOC1	-29.65	-18.50	11.15	VOC1
VOC12	-37.67	-24.91	12.76	VOC12
VOSO4	-22.37	-18.76	3.61	VOSO4
Witherite	-6.10	-14.67	-8.57	BaCO3
Zincite	-5.28	6.06	11.33	ZnO
Zincosite	-14.95	-11.02	3.93	ZnSO4
Zn(BO2)2	-14.96	-6.67	8.29	Zn(BO2)2
Zn(OH)2	-6.14	6.06	12.20	Zn(OH)2
Zn(OH)2(am)	-6.42	6.06	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.70	6.06	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.48	6.06	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.68	6.06	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.46	-4.96	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.69	0.50	15.19	Zn2(OH)3Cl
Zn3O(SO4)2	-34.89	-15.98	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.24	7.16	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-31.44	7.06	38.50	Zn5(OH)8Cl2
ZnCl2	-24.21	-17.16	7.05	ZnCl2
ZnCO3:1H2O	-4.79	-15.05	-10.26	ZnCO3:1H2O
ZnF2	-16.35	-16.88	-0.53	ZnF2
Znmetal	-41.54	-15.75	25.79	Zn
ZnMoO4	-5.01	-15.13	-10.13	ZnMoO4
ZnO(active)	-5.13	6.06	11.19	ZnO
ZnSb	-74.45	-63.44	11.01	ZnSb
ZnSe	-15.57	-29.97	-14.40	ZnSe

ZnSeO4:6H2O	-22.39	-23.91	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.38	-11.02	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 9.

SOLUTION 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

```

temp      25
pH        7.91874
pe        4
redox     pe
units     mg/l
density   1
Alkalinity 30.14978 as HCO3
Al 0.01854
B         0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939
F         0.81954
Fe 0.00248
Hg 0.000010
K         2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049
Na 2.31042 charge
Pb 0.00012
S(6)     12.05373 as SO4
Se 0.00024
U        0.00243
V        0.00049
water    1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 7. Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

-----Solution composition-----

Elements	Molality	Moles
Al	6.872e-07	6.872e-07
Alkalinity	4.941e-04	4.941e-04
B	4.496e-07	4.496e-07
Ba	3.568e-09	3.568e-09
Ca	2.482e-04	2.482e-04
Cl	2.819e-05	2.819e-05
F	4.314e-05	4.314e-05
Fe	4.441e-08	4.441e-08
Hg	4.986e-11	4.986e-11
K	5.578e-05	5.578e-05
Mg	7.149e-05	7.149e-05
Mn	3.470e-07	3.470e-07
Mo	5.108e-09	5.108e-09
Na	1.185e-04	1.185e-04
		Charge balance

Pb	5.792e-10	5.792e-10
S(6)	1.255e-04	1.255e-04
Se	3.040e-09	3.040e-09
U	1.021e-08	1.021e-08
V	9.620e-09	9.620e-09

-----Description of solution-----

pH	=	7.919
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.231e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	5.002e-04
Total CO2 (mol/kg)	=	5.002e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	7.330e-20
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	11
Total H	=	1.110142e+02
Total O	=	5.550884e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.688e-07	8.351e-07	-6.061	-6.078	-0.017	(0)
H+	1.254e-08	1.206e-08	-7.902	-7.919	-0.017	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	6.872e-07					
Al(OH) 4-	6.806e-07	6.544e-07	-6.167	-6.184	-0.017	(0)
Al(OH) 3	6.225e-09	6.225e-09	-8.206	-8.206	0.000	(0)
Al(OH) 2+	3.884e-10	3.736e-10	-9.411	-9.428	-0.017	(0)
AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)
AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
AlOH+2	6.577e-13	5.632e-13	-12.182	-12.249	-0.067	(0)
AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
Al+3	9.612e-16	6.744e-16	-15.017	-15.171	-0.154	(0)
AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
Al(SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
B	4.496e-07					
H3BO3	4.278e-07	4.280e-07	-6.369	-6.369	0.000	(0)
H2BO3-	2.146e-08	2.061e-08	-7.668	-7.686	-0.017	(0)
CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
BF(OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
H5(BO3) 2-	7.815e-15	7.509e-15	-14.107	-14.124	-0.017	(0)
BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
BF2(OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
H8(BO3) 3-	3.345e-19	3.213e-19	-18.476	-18.493	-0.017	(0)
BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)
BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
Ba	3.568e-09					
Ba+2	3.551e-09	3.034e-09	-8.450	-8.518	-0.068	(0)
BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
BaOH+	1.150e-14	1.106e-14	-13.939	-13.956	-0.017	(0)
BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
C(4)	5.002e-04					
HCO3-	4.827e-04	4.643e-04	-3.316	-3.333	-0.017	(0)
H2CO3	1.259e-05	1.259e-05	-4.900	-4.900	0.000	(0)
CO3-2	2.113e-06	1.805e-06	-5.675	-5.743	-0.068	(0)
CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)

	MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
	MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
	NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
	UO2 (CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
	NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
	MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
	UO2 (CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)
	PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
	UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
	PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
	BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
	BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
	Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
	FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
	HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
	Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
	HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
Ca	2.482e-04						
	Ca+2	2.409e-04	2.058e-04	-3.618	-3.687	-0.068	(0)
	CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
	CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
	CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)
	CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
	CaOH+	3.563e-09	3.428e-09	-8.448	-8.465	-0.017	(0)
	CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
Cl	2.819e-05						
	Cl-	2.819e-05	2.710e-05	-4.550	-4.567	-0.017	(0)
	MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)
	PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
	MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
	HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
	PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
	UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
	HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
	MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)
	HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
	FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
	PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
	HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
	VOCl+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
	FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
	HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
	PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
	FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
	UCl+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
F	4.314e-05						
	F-	4.275e-05	4.110e-05	-4.369	-4.386	-0.017	(0)
	MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
	CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
	NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
	HF	7.331e-10	7.331e-10	-9.135	-9.135	0.000	(0)
	MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
	BF (OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
	AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)
	AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
	AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
	PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
	UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
	HF2-	1.192e-13	1.146e-13	-12.924	-12.941	-0.017	(0)
	AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
	UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
	BF2 (OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
	UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
	PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
	FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
	FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
	VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)
	H2F2	1.440e-18	1.440e-18	-17.842	-17.842	0.000	(0)

FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)
UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)
VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
Fe (2)	1.685e-10					
Fe+2	1.596e-10	1.353e-10	-9.797	-9.869	-0.072	(0)
FeOH+	4.678e-12	4.499e-12	-11.330	-11.347	-0.017	(0)
FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
Fe (OH) 2	2.984e-15	2.984e-15	-14.525	-14.525	0.000	(0)
Fe (OH) 3-	8.194e-16	7.881e-16	-15.086	-15.103	-0.017	(0)
Fe (3)	4.424e-08					
Fe (OH) 2+	2.289e-08	2.202e-08	-7.640	-7.657	-0.017	(0)
Fe (OH) 3	1.975e-08	1.975e-08	-7.704	-7.704	0.000	(0)
Fe (OH) 4-	1.597e-09	1.536e-09	-8.797	-8.814	-0.017	(0)
FeOH+2	7.922e-14	6.778e-14	-13.101	-13.169	-0.068	(0)
FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)
Fe+3	1.792e-19	1.257e-19	-18.747	-18.901	-0.154	(0)
FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
Fe (SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
Fe2 (OH) 2+4	2.942e-25	1.521e-25	-24.531	-24.818	-0.286	(0)
FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
Fe3 (OH) 4+5	1.357e-31	4.843e-32	-30.868	-31.315	-0.447	(0)
FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
H (0)	2.058e-27					
H2	1.029e-27	1.029e-27	-26.988	-26.987	0.000	(0)
Hg (0)	4.985e-11					
Hg	4.985e-11	4.985e-11	-10.302	-10.302	0.000	(0)
Hg (1)	4.311e-26					
Hg2+2	2.156e-26	1.828e-26	-25.666	-25.738	-0.072	(0)
Hg (2)	2.399e-15					
Hg (OH) 2	2.376e-15	2.377e-15	-14.624	-14.624	0.000	(0)
HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
HgOH+	1.871e-20	1.796e-20	-19.728	-19.746	-0.018	(0)
Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
Hg (OH) 3-	2.604e-22	2.499e-22	-21.584	-21.602	-0.018	(0)
HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
Hg+2	6.369e-25	5.401e-25	-24.196	-24.268	-0.072	(0)
HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
K	5.578e-05					
K+	5.574e-05	5.358e-05	-4.254	-4.271	-0.017	(0)
KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)

Mg	7.149e-05					
Mg+2	6.969e-05	5.954e-05	-4.157	-4.225	-0.068	(0)
MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
MgOH+	2.057e-08	1.979e-08	-7.687	-7.703	-0.017	(0)
MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
Mn (2)	3.470e-07					
Mn+2	3.379e-07	2.865e-07	-6.471	-6.543	-0.072	(0)
MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
MnOH+	6.249e-10	6.011e-10	-9.204	-9.221	-0.017	(0)
MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)
MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)
Mn (OH) 3-	2.693e-18	2.590e-18	-17.570	-17.587	-0.017	(0)
MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)
Mn (OH) 4-2	8.162e-24	6.984e-24	-23.088	-23.156	-0.068	(0)
MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
Mn (3)	1.824e-28					
Mn+3	1.824e-28	1.280e-28	-27.739	-27.893	-0.154	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.547	-45.615	-0.068	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.970	-50.987	-0.017	(0)
Mo	5.108e-09					
MoO4-2	5.107e-09	4.362e-09	-8.292	-8.360	-0.068	(0)
HMoO4-	1.091e-12	1.047e-12	-11.962	-11.980	-0.018	(0)
H2MoO4	9.244e-17	9.244e-17	-16.034	-16.034	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
Mo7O24-6	0.000e+00	0.000e+00	-68.238	-68.882	-0.644	(0)
HMo7O24-5	0.000e+00	0.000e+00	-69.966	-70.414	-0.447	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-73.264	-73.550	-0.286	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-78.062	-78.223	-0.161	(0)
Na	1.185e-04					
Na+	1.184e-04	1.138e-04	-3.927	-3.944	-0.017	(0)
NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
O (0)	9.567e-39					
O2	4.783e-39	4.785e-39	-38.320	-38.320	0.000	(0)
Pb	5.792e-10					
PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
PbOH+	1.363e-10	1.308e-10	-9.865	-9.883	-0.018	(0)
Pb+2	7.302e-11	6.238e-11	-10.137	-10.205	-0.068	(0)
PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
Pb (OH) 2	3.455e-12	3.455e-12	-11.462	-11.462	0.000	(0)
PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
Pb (OH) 3-	3.007e-15	2.885e-15	-14.522	-14.540	-0.018	(0)
Pb (SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
Pb (OH) 4-2	6.959e-19	5.901e-19	-18.157	-18.229	-0.072	(0)
Pb2OH+3	1.874e-19	1.294e-19	-18.727	-18.888	-0.161	(0)
PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
Pb3 (OH) 4+2	1.752e-23	1.486e-23	-22.756	-22.828	-0.072	(0)
PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
Pb4 (OH) 4+4	1.423e-29	7.362e-30	-28.847	-29.133	-0.286	(0)
S (6)	1.255e-04					

SO4-2	1.195e-04	1.020e-04	-3.923	-3.991	-0.068	(0)
CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)
MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
HSO4-	1.250e-10	1.202e-10	-9.903	-9.920	-0.017	(0)
FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
Pb(SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
UO2(SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
Al(SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
Fe(SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
U(SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
Se (-2)	4.927e-36					
HSe-	4.927e-36	4.728e-36	-35.307	-35.325	-0.018	(0)
MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
H2Se	4.425e-40	4.425e-40	-39.354	-39.354	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.335	-42.407	-0.072	(0)
Se (4)	3.040e-09					
HSeO3-	2.213e-09	2.124e-09	-8.655	-8.673	-0.018	(0)
SeO3-2	8.268e-10	7.011e-10	-9.083	-9.154	-0.072	(0)
H2SeO3	1.092e-14	1.092e-14	-13.962	-13.962	0.000	(0)
FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
Se (6)	6.977e-14					
SeO4-2	6.977e-14	5.960e-14	-13.156	-13.225	-0.068	(0)
MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)
HSeO4-	3.753e-20	3.602e-20	-19.426	-19.443	-0.018	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.639	-56.800	-0.161	(0)
U (4)	3.077e-18					
U(OH) 5-	3.076e-18	2.952e-18	-17.512	-17.530	-0.018	(0)
U(OH) 4	1.490e-21	1.490e-21	-20.827	-20.827	0.000	(0)
U(OH) 3+	6.847e-26	6.570e-26	-25.165	-25.182	-0.018	(0)
U(OH) 2+2	4.319e-31	3.663e-31	-30.365	-30.436	-0.072	(0)
UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
UOH+3	3.014e-37	2.080e-37	-36.521	-36.682	-0.161	(0)
UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
U(SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
U+4	0.000e+00	0.000e+00	-43.717	-44.004	-0.286	(0)
UCl+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-160.946	-162.396	-1.449	(0)
U (5)	1.812e-15					
UO2+	1.812e-15	1.739e-15	-14.742	-14.760	-0.018	(0)
U (6)	1.021e-08					
UO2(CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
UO2(CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)
UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
UO2OH+	3.126e-12	3.000e-12	-11.505	-11.523	-0.018	(0)
UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
UO2+2	3.340e-14	2.853e-14	-13.476	-13.545	-0.068	(0)
UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
(UO2) 3(OH) 5+	2.469e-17	2.370e-17	-16.607	-16.625	-0.018	(0)

(UO2) 2 (OH) 2+2	1.761e-17	1.493e-17	-16.754	-16.826	-0.072	(0)
UO2 (SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.600	-40.618	-0.018	(0)
V+2	0.000e+00	0.000e+00	-41.979	-42.050	-0.072	(0)
V (3)	8.546e-14					
V (OH) 3	8.546e-14	8.546e-14	-13.068	-13.068	0.000	(0)
V (OH) 2+	6.938e-25	6.658e-25	-24.159	-24.177	-0.018	(0)
VOH+2	8.978e-29	7.614e-29	-28.047	-28.118	-0.072	(0)
V+3	2.636e-34	1.819e-34	-33.579	-33.740	-0.161	(0)
VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.682	-53.843	-0.161	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.150	-55.437	-0.286	(0)
V (4)	4.412e-18					
V (OH) 3+	4.375e-18	4.198e-18	-17.359	-17.377	-0.018	(0)
VO+2	2.971e-20	2.520e-20	-19.527	-19.599	-0.072	(0)
VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
VOC1+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
H2V2O4+2	1.042e-30	8.835e-31	-29.982	-30.054	-0.072	(0)
V (5)	9.620e-09					
H2VO4-	7.784e-09	7.470e-09	-8.109	-8.127	-0.018	(0)
HVO4-2	1.835e-09	1.556e-09	-8.736	-8.808	-0.072	(0)
H3VO4	9.006e-13	9.006e-13	-12.045	-12.045	0.000	(0)
H3V2O7-	4.526e-14	4.344e-14	-13.344	-13.362	-0.018	(0)
HV2O7-3	5.707e-15	3.939e-15	-14.244	-14.405	-0.161	(0)
VO4-3	9.372e-16	6.468e-16	-15.028	-15.189	-0.161	(0)
VO2+	2.254e-17	2.167e-17	-16.647	-16.664	-0.017	(0)
V2O7-4	1.700e-17	8.792e-18	-16.770	-17.056	-0.286	(0)
VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)
V3O9-3	6.324e-19	4.364e-19	-18.199	-18.360	-0.161	(0)
VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
V4O12-4	2.627e-24	1.359e-24	-23.580	-23.867	-0.286	(0)
VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.321	-63.768	-0.447	(0)
V10O28-6	0.000e+00	0.000e+00	-63.392	-64.036	-0.644	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.193	-66.479	-0.286	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-2.21	8.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-57.79	-55.42	2.37	Al2 (MoO4) 3
Al2O3	-2.48	17.17	19.65	Al2O3
Al4 (OH) 10SO4	-8.19	14.51	22.70	Al4 (OH) 10SO4
AlOHSO4	-8.01	-11.24	-3.23	AlOHSO4
Alunite	-8.85	-10.25	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-6.41	-14.20	-7.79	PbSO4
Anhydrite	-3.32	-7.68	-4.36	CaSO4
Aragonite	-1.13	-9.43	-8.30	CaCO3
Artinite	-7.96	1.64	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.07	7.32	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.72	-2.85	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.47	4.47	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.47	-17.29	-5.82	BaF2
BaMoO4	-9.92	-16.88	-6.96	BaMoO4
Barite	-2.53	-12.51	-9.98	BaSO4
BaSeO3	-11.10	-9.27	1.83	BaSeO3
BaSeO4	-14.28	-21.74	-7.46	BaSeO4
Birnessite	-10.31	7.78	18.09	MnO2

Bixbyite	-7.63	-8.27	-0.64	Mn2O3
Boehmite	0.01	8.59	8.58	AlOOH
Brucite	-5.23	11.61	16.84	Mg(OH)2
Ca(VO3)2	-11.00	-5.34	5.66	Ca(VO3)2
Ca2V2O7	-10.69	6.81	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.74	6.81	21.55	Ca2V2O7:2H2O
Ca3(VO4)2	-20.00	18.96	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.90	18.96	39.86	Ca3(VO4)2:4H2O
Calcite	-0.95	-9.43	-8.48	CaCO3
Calomel	-16.96	-34.87	-17.91	Hg2Cl2
CaMoO4	-4.10	-12.05	-7.95	CaMoO4
Carnotite	-3.03	-2.80	0.23	KUO2VO4
CaSeO3:2H2O	-7.25	-4.44	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.89	-16.91	-3.02	CaSeO4:2H2O
Cerrusite	-2.82	-15.95	-13.13	PbCO3
CH4(g)	-75.89	-116.93	-41.05	CH4
Clausthalite	-10.51	-37.61	-27.10	PbSe
CO2(g)	-3.43	-21.58	-18.15	CO2
Cotunnite	-14.56	-19.34	-4.78	PbCl2
Cryolite	-19.48	-53.32	-33.84	Na3AlF6
Diaspore	1.71	8.59	6.87	AlOOH
Dolomite(disordered)	-2.86	-19.40	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.31	-19.40	-17.09	CaMg(CO3)2
Epsomite	-6.09	-8.22	-2.13	MgSO4:7H2O
Fe(OH)2	-7.60	5.97	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	4.15	1.11	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-7.80	-11.52	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-8.43	-6.88	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.44	-40.06	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-46.04	-49.77	-3.73	Fe2(SO4)3
Fe3(OH)8	-4.54	15.68	20.22	Fe3(OH)8
FeMoO4	-8.14	-18.23	-10.09	FeMoO4
Ferrihydrite	1.66	4.86	3.19	Fe(OH)3
Ferroselite	-38.09	-56.68	-18.60	FeSe2
FeSe	-26.28	-37.28	-11.00	FeSe
Fluorite	-1.96	-12.46	-10.50	CaF2
Gibbsite	0.29	8.59	8.29	Al(OH)3
Goethite	4.36	4.86	0.49	FeOOH
Gummite	-5.38	2.29	7.67	UO3
Gypsum	-3.07	-7.68	-4.61	CaSO4:2H2O
H-Jarosite	-12.99	-25.09	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.32	-24.20	-12.88	H2MoO4
H2Se(g)	-38.28	-43.24	-4.96	H2Se
Halite	-10.11	-8.51	1.60	NaCl
Hausmannite	-9.31	51.72	61.03	Mn3O4
Hematite	11.13	9.71	-1.42	Fe2O3
Hercynite	0.25	23.14	22.89	FeAl2O4
Hg(CH3)2(g)	-174.78	-248.49	-73.71	Hg(CH3)2
Hg(g)	-9.00	-16.87	-7.87	Hg
Hg(OH)2	-11.13	-14.62	-3.50	Hg(OH)2
Hg2(g)	-18.78	-33.74	-14.96	Hg2
Hg2(OH)2	-15.16	-9.90	5.26	Hg2(OH)2
Hg2CO3	-15.43	-31.48	-16.05	Hg2CO3
Hg2F2	-24.15	-34.51	-10.36	Hg2F2
Hg2SeO3	-21.84	-26.49	-4.66	Hg2SeO3
Hg2SO4	-23.60	-29.73	-6.13	Hg2SO4
Hg3O2CO3	-35.77	-65.45	-29.68	Hg3O2CO3
HgCl(g)	-36.93	-17.44	19.50	HgCl
HgCl2	-18.33	-39.60	-21.26	HgCl2
HgF(g)	-49.93	-17.26	32.68	HgF
HgF2(g)	-51.80	-39.23	12.57	HgF2
Hgmetal(l)	-3.42	-16.87	-13.45	Hg
HgSe	-2.17	-57.87	-55.69	HgSe
HgSeO3	-18.79	-31.22	-12.43	HgSeO3
HgSO4	-25.03	-34.45	-9.42	HgSO4
Huntite	-9.37	-39.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.49	-26.26	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-19.50	-28.26	-8.77	Mg5(CO3)4(OH)2:4H2O

K-Alum	-22.25	-27.42	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-6.64	-21.44	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ MoO ₄	-20.16	-16.90	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-21.04	-21.77	-0.73	K ₂ SeO ₄
Larnakite	-8.13	-8.56	-0.43	PbO:PbSO ₄
Laurionite	-7.48	-6.85	0.62	PbOHCl
Lepidocrocite	3.48	4.86	1.37	FeOOH
Lime	-20.55	12.15	32.70	CaO
Litharge	-7.06	5.63	12.69	PbO
Maghemite	3.33	9.71	6.39	Fe ₂ O ₃
Magnesioferrite	4.46	21.32	16.86	Fe ₂ MgO ₄
Magnesite	-2.51	-9.97	-7.46	MgCO ₃
Magnetite	12.28	15.68	3.40	Fe ₃ O ₄
Manganite	-4.13	21.21	25.34	MnOOH
Massicot	-7.26	5.63	12.89	PbO
Matlockite	-10.18	-19.16	-8.97	PbClF
Melanterite	-11.65	-13.86	-2.21	FeSO ₄ ·7H ₂ O
Mg(OH) ₂ (active)	-7.18	11.61	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.16	-5.88	11.28	Mg(VO ₃) ₂
Mg ₂ V ₂ O ₇	-20.63	5.73	26.36	Mg ₂ V ₂ O ₇
MgF ₂	-4.87	-13.00	-8.13	MgF ₂
MgMoO ₄	-10.74	-12.59	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-8.03	-4.98	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-16.25	-17.45	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.79	40.73	73.52	Pb ₃ O ₄
Mirabilite	-10.77	-11.88	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-13.10	-8.20	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-62.05	-67.76	-5.71	Mn ₂ (SO ₄) ₃
MnCl ₂ ·4H ₂ O	-18.39	-15.68	2.72	MnCl ₂ ·4H ₂ O
MnSe	-37.45	-33.95	3.50	MnSe
MnSeO ₃	-8.43	-7.30	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-8.28	-7.30	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-17.72	-19.77	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-13.12	-10.53	2.58	MnSO ₄
Montroydite	-10.98	-14.62	-3.64	HgO
MoO ₃	-16.20	-24.20	-8.00	MoO ₃
Na-Jarosite	-9.92	-21.12	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Mo ₂ O ₇	-23.85	-40.45	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-17.74	-16.25	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-17.47	-16.25	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-18.94	-8.64	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-22.39	-21.11	1.28	Na ₂ SeO ₄
Na ₃ VO ₄	-33.50	3.18	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-38.99	-1.59	37.40	Na ₄ V ₂ O ₇
Natron	-12.32	-13.63	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.63	-4.77	3.86	NaVO ₃
Nesquehonite	-5.30	-9.97	-4.67	MgCO ₃ ·3H ₂ O
Nsutite	-9.72	7.78	17.50	MnO ₂
O ₂ (g)	-35.41	47.67	83.09	O ₂
Pb(BO ₂) ₂	-13.62	-7.10	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.52	5.63	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-64.40	-73.16	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-10.01	-1.22	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-14.92	11.26	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-25.94	35.10	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-9.76	-10.32	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-4.33	-6.23	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (VO ₄) ₂	-6.73	-0.59	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-15.70	-4.68	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-13.62	-2.93	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-18.40	2.70	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-19.18	2.70	21.88	Pb ₄ O ₃ SO ₄
PbF ₂	-11.54	-18.98	-7.44	PbF ₂
Pbmetal	-22.45	-18.20	4.25	Pb
PbMoO ₄	-2.95	-18.57	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-7.35	5.63	12.98	PbO:0.33H ₂ O
PbSeO ₄	-16.59	-23.43	-6.84	PbSeO ₄
Periclase	-9.97	11.61	21.58	MgO

Phosgenite	-15.48	-35.29	-19.81	PbCl2:PbCO3
Plattnerite	-20.13	29.47	49.60	PbO2
Portlandite	-10.65	12.15	22.80	Ca (OH) 2
Pyrochroite	-5.90	9.29	15.19	Mn (OH) 2
Pyrolusite	-8.25	33.13	41.38	MnO2
Rhodochrosite	-1.71	-12.29	-10.58	MnCO3
Rutherfordine	-4.79	-19.29	-14.50	UO2CO3
Schoepite	-3.70	2.29	5.99	UO2 (OH) 2:H2O
Semetal (am)	-12.30	-19.41	-7.11	Se
Semetal (hex)	-11.70	-19.41	-7.71	Se
SeO2	-16.72	-16.59	0.12	SeO2
SeO3	-50.11	-29.06	21.04	SeO3
Siderite	-5.37	-15.61	-10.24	FeCO3
Spinel	-8.07	28.78	36.85	MgAl2O4
Thenardite	-12.20	-11.88	0.32	Na2SO4
Thermonatrite	-14.27	-13.63	0.64	Na2CO3:H2O
Tyuyamunite	-4.83	-0.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.39	10.69	21.08	U3O8
U4O9	-22.46	-25.48	-3.02	U4O9
UF4	-32.01	-61.55	-29.54	UF4
UF4:2.5H2O	-28.83	-61.55	-32.72	UF4:2.5H2O
UO2 (am)	-13.26	-12.33	0.93	UO2
UO2 (OH) 2 (beta)	-3.32	2.29	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.52	-26.77	-2.25	UO2SeO4:4H2O
UO3	-5.41	2.29	7.70	UO3
Uraninite	-7.66	-12.33	-4.67	UO2
V (OH) 3	-17.57	-9.98	7.59	V (OH) 3
V2O5	-16.13	-17.49	-1.36	V2O5
V3O5	-36.96	-35.12	1.84	V3O5
V4O7	-46.07	-38.88	7.19	V4O7
V6O13	-39.29	-100.15	-60.86	V6O13
VC12	-65.75	-46.87	18.87	VC12
VC13	-70.87	-47.44	23.43	VC13
VF4	-67.91	-52.98	14.93	VF4
Vmetal	-89.77	-45.74	44.03	V
VO	-36.66	-21.90	14.76	VO
VO (OH) 2	-8.91	-3.76	5.15	VO (OH) 2
VO2Cl	-24.07	-21.23	2.84	VO2Cl
VOC1	-33.62	-22.47	11.15	VOC1
VOC12	-41.49	-28.73	12.76	VOC12
VOSO4	-27.20	-23.59	3.61	VOSO4
Witherite	-5.69	-14.26	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 10.

SOLUTION 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

temp 25
pH 7.91874
pe 4
redox pe
units mg/l
density 1
Alkalinity 30.14978 as HCO3
Al 0.01854
B 0.00486
Ba 0.00049
Ca 9.94682
Cl 0.99939

```

F          0.81954
Fe 0.00248
Hg 0.000010
K          2.18064
Mg 1.73747
Mn 0.01906
Mo 0.00049
Na 2.31042 charge
Pb 0.00012
S(6)      12.05373 as SO4
Se 0.00024
U          0.00243
V          0.00049
water     1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 8. Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

-----Solution composition-----

Elements	Molality	Moles	
Al	6.872e-07	6.872e-07	
Alkalinity	4.941e-04	4.941e-04	
B	4.496e-07	4.496e-07	
Ba	3.568e-09	3.568e-09	
Ca	2.482e-04	2.482e-04	
Cl	2.819e-05	2.819e-05	
F	4.314e-05	4.314e-05	
Fe	4.441e-08	4.441e-08	
Hg	4.986e-11	4.986e-11	
K	5.578e-05	5.578e-05	
Mg	7.149e-05	7.149e-05	
Mn	3.470e-07	3.470e-07	
Mo	5.108e-09	5.108e-09	
Na	1.185e-04	1.185e-04	Charge balance
Pb	5.792e-10	5.792e-10	
S(6)	1.255e-04	1.255e-04	
Se	3.040e-09	3.040e-09	
U	1.021e-08	1.021e-08	
V	9.620e-09	9.620e-09	

-----Description of solution-----

```

pH = 7.919
pe = 4.000
Activity of water = 1.000
Ionic strength (mol/kgw) = 1.231e-03
Mass of water (kg) = 1.000e+00
Total carbon (mol/kg) = 5.002e-04
Total CO2 (mol/kg) = 5.002e-04
Temperature (°C) = 25.00
Electrical balance (eq) = 7.330e-20
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 11
Total H = 1.110142e+02
Total O = 5.550884e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.688e-07	8.351e-07	-6.061	-6.078	-0.017	(0)

	H+	1.254e-08	1.206e-08	-7.902	-7.919	-0.017	0.00
	H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al		6.872e-07					
	Al (OH) 4-	6.806e-07	6.544e-07	-6.167	-6.184	-0.017	(0)
	Al (OH) 3	6.225e-09	6.225e-09	-8.206	-8.206	0.000	(0)
	Al (OH) 2+	3.884e-10	3.736e-10	-9.411	-9.428	-0.017	(0)
	AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)
	AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
	AlOH+2	6.577e-13	5.632e-13	-12.182	-12.249	-0.067	(0)
	AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
	AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
	Al+3	9.612e-16	6.744e-16	-15.017	-15.171	-0.154	(0)
	AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
	Al (SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
B		4.496e-07					
	H3BO3	4.278e-07	4.280e-07	-6.369	-6.369	0.000	(0)
	H2BO3-	2.146e-08	2.061e-08	-7.668	-7.686	-0.017	(0)
	CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
	MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
	BF (OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
	NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
	H5 (BO3) 2-	7.815e-15	7.509e-15	-14.107	-14.124	-0.017	(0)
	BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
	BF2 (OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
	H8 (BO3) 3-	3.345e-19	3.213e-19	-18.476	-18.493	-0.017	(0)
	BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)
	BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
Ba		3.568e-09					
	Ba+2	3.551e-09	3.034e-09	-8.450	-8.518	-0.068	(0)
	BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
	BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
	BaOH+	1.150e-14	1.106e-14	-13.939	-13.956	-0.017	(0)
	BaH2BO3+	2.012e-15	1.933e-15	-14.696	-14.714	-0.017	(0)
C (4)		5.002e-04					
	HCO3-	4.827e-04	4.643e-04	-3.316	-3.333	-0.017	(0)
	H2CO3	1.259e-05	1.259e-05	-4.900	-4.900	0.000	(0)
	CO3-2	2.113e-06	1.805e-06	-5.675	-5.743	-0.068	(0)
	CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
	CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)
	MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
	MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
	NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
	UO2 (CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
	NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
	MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
	UO2 (CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)
	PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
	UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
	PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
	BaHCO3+	1.398e-11	1.345e-11	-10.854	-10.871	-0.017	(0)
	BaCO3	2.809e-12	2.809e-12	-11.551	-11.551	0.000	(0)
	Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
	FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
	HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
	Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
	HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
Ca		2.482e-04					
	Ca+2	2.409e-04	2.058e-04	-3.618	-3.687	-0.068	(0)
	CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
	CaHCO3+	1.849e-06	1.779e-06	-5.733	-5.750	-0.017	(0)
	CaCO3	5.887e-07	5.887e-07	-6.230	-6.230	0.000	(0)
	CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
	CaOH+	3.563e-09	3.428e-09	-8.448	-8.465	-0.017	(0)
	CaH2BO3+	2.540e-10	2.441e-10	-9.595	-9.612	-0.017	(0)
Cl		2.819e-05					
	Cl-	2.819e-05	2.710e-05	-4.550	-4.567	-0.017	(0)
	MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)

PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)
HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
VOCl+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
UCl+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
F	4.314e-05					
F-	4.275e-05	4.110e-05	-4.369	-4.386	-0.017	(0)
MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
CaF+	9.597e-08	9.231e-08	-7.018	-7.035	-0.017	(0)
NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
HF	7.331e-10	7.331e-10	-9.135	-9.135	0.000	(0)
MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
BF(OH) 3-	7.306e-12	7.019e-12	-11.136	-11.154	-0.017	(0)
AlF2+	4.716e-12	4.536e-12	-11.326	-11.343	-0.017	(0)
AlF3	2.347e-12	2.347e-12	-11.629	-11.629	0.000	(0)
AlF+2	3.237e-13	2.772e-13	-12.490	-12.557	-0.067	(0)
PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
HF2-	1.192e-13	1.146e-13	-12.924	-12.941	-0.017	(0)
AlF4-	5.029e-14	4.836e-14	-13.299	-13.316	-0.017	(0)
UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
BF2(OH) 2-	3.871e-16	3.719e-16	-15.412	-15.430	-0.017	(0)
UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)
H2F2	1.440e-18	1.440e-18	-17.842	-17.842	0.000	(0)
FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)
UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
BF3OH-	7.464e-23	7.171e-23	-22.127	-22.144	-0.017	(0)
VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
BF4-	1.820e-28	1.749e-28	-27.740	-27.757	-0.017	(0)
VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
Fe (2)	1.685e-10					
Fe+2	1.596e-10	1.353e-10	-9.797	-9.869	-0.072	(0)
FeOH+	4.678e-12	4.499e-12	-11.330	-11.347	-0.017	(0)
FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
FeHCO3+	8.221e-13	7.910e-13	-12.085	-12.102	-0.017	(0)
Fe (OH) 2	2.984e-15	2.984e-15	-14.525	-14.525	0.000	(0)
Fe (OH) 3-	8.194e-16	7.881e-16	-15.086	-15.103	-0.017	(0)
Fe (3)	4.424e-08					

Fe (OH) 2+	2.289e-08	2.202e-08	-7.640	-7.657	-0.017	(0)
Fe (OH) 3	1.975e-08	1.975e-08	-7.704	-7.704	0.000	(0)
Fe (OH) 4-	1.597e-09	1.536e-09	-8.797	-8.814	-0.017	(0)
FeOH+2	7.922e-14	6.778e-14	-13.101	-13.169	-0.068	(0)
FeF+2	6.622e-18	5.666e-18	-17.179	-17.247	-0.068	(0)
FeF2+	6.480e-18	6.232e-18	-17.188	-17.205	-0.017	(0)
FeF3	3.614e-19	3.614e-19	-18.442	-18.442	0.000	(0)
Fe+3	1.792e-19	1.257e-19	-18.747	-18.901	-0.154	(0)
FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
Fe (SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
FeCl+2	1.203e-22	1.029e-22	-21.920	-21.988	-0.068	(0)
FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
Fe2 (OH) 2+4	2.942e-25	1.521e-25	-24.531	-24.818	-0.286	(0)
FeCl2+	1.295e-26	1.246e-26	-25.888	-25.905	-0.017	(0)
Fe3 (OH) 4+5	1.357e-31	4.843e-32	-30.868	-31.315	-0.447	(0)
FeCl3	3.376e-32	3.376e-32	-31.472	-31.472	0.000	(0)
H (0)	2.058e-27					
H2	1.029e-27	1.029e-27	-26.988	-26.987	0.000	(0)
Hg (0)	4.985e-11					
Hg	4.985e-11	4.985e-11	-10.302	-10.302	0.000	(0)
Hg (1)	4.311e-26					
Hg2+2	2.156e-26	1.828e-26	-25.666	-25.738	-0.072	(0)
Hg (2)	2.399e-15					
Hg (OH) 2	2.376e-15	2.377e-15	-14.624	-14.624	0.000	(0)
HgClOH	2.159e-17	2.159e-17	-16.666	-16.666	0.000	(0)
HgCO3	1.167e-18	1.167e-18	-17.933	-17.933	0.000	(0)
HgCl2	3.967e-20	3.967e-20	-19.401	-19.401	0.000	(0)
HgOH+	1.871e-20	1.796e-20	-19.728	-19.746	-0.018	(0)
Hg (CO3) 2-2	7.855e-21	6.661e-21	-20.105	-20.176	-0.072	(0)
HgCl+	3.044e-22	2.921e-22	-21.517	-21.534	-0.018	(0)
HgHCO3+	2.730e-22	2.620e-22	-21.564	-21.582	-0.018	(0)
Hg (OH) 3-	2.604e-22	2.499e-22	-21.584	-21.602	-0.018	(0)
HgCl3-	1.121e-23	1.075e-23	-22.951	-22.968	-0.018	(0)
Hg+2	6.369e-25	5.401e-25	-24.196	-24.268	-0.072	(0)
HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
HgCl4-2	1.368e-27	1.160e-27	-26.864	-26.935	-0.072	(0)
HgF+	8.576e-28	8.230e-28	-27.067	-27.085	-0.018	(0)
K	5.578e-05					
K+	5.574e-05	5.358e-05	-4.254	-4.271	-0.017	(0)
KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)
Mg	7.149e-05					
Mg+2	6.969e-05	5.954e-05	-4.157	-4.225	-0.068	(0)
MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
MgHCO3+	2.942e-07	2.829e-07	-6.531	-6.548	-0.017	(0)
MgF+	2.856e-07	2.746e-07	-6.544	-6.561	-0.017	(0)
MgCO3	8.940e-08	8.940e-08	-7.049	-7.049	0.000	(0)
MgOH+	2.057e-08	1.979e-08	-7.687	-7.703	-0.017	(0)
MgH2BO3+	4.429e-11	4.256e-11	-10.354	-10.371	-0.017	(0)
Mn (2)	3.470e-07					
Mn+2	3.379e-07	2.865e-07	-6.471	-6.543	-0.072	(0)
MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
MnHCO3+	2.760e-09	2.654e-09	-8.559	-8.576	-0.017	(0)
MnOH+	6.249e-10	6.011e-10	-9.204	-9.221	-0.017	(0)
MnF+	4.875e-10	4.689e-10	-9.312	-9.329	-0.017	(0)
MnCl+	1.017e-11	9.777e-12	-10.993	-11.010	-0.017	(0)
MnCl2	3.743e-16	3.743e-16	-15.427	-15.427	0.000	(0)
MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)
Mn (OH) 3-	2.693e-18	2.590e-18	-17.570	-17.587	-0.017	(0)
MnCl3-	2.905e-21	2.794e-21	-20.537	-20.554	-0.017	(0)
Mn (OH) 4-2	8.162e-24	6.984e-24	-23.088	-23.156	-0.068	(0)
MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
Mn (3)	1.824e-28					
Mn+3	1.824e-28	1.280e-28	-27.739	-27.893	-0.154	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.547	-45.615	-0.068	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.970	-50.987	-0.017	(0)
Mo	5.108e-09					

	MoO4-2	5.107e-09	4.362e-09	-8.292	-8.360	-0.068	(0)
	HMoO4-	1.091e-12	1.047e-12	-11.962	-11.980	-0.018	(0)
	H2MoO4	9.244e-17	9.244e-17	-16.034	-16.034	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.692	-57.853	-0.161	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-68.238	-68.882	-0.644	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-69.966	-70.414	-0.447	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-73.264	-73.550	-0.286	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-78.062	-78.223	-0.161	(0)
Na	1.185e-04						
	Na+	1.184e-04	1.138e-04	-3.927	-3.944	-0.017	(0)
	NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
	NaHCO3	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
	NaCO3-	3.976e-09	3.825e-09	-8.401	-8.417	-0.017	(0)
	NaF	2.951e-09	2.951e-09	-8.530	-8.530	0.000	(0)
	NaH2BO3	3.718e-12	3.718e-12	-11.430	-11.430	0.000	(0)
O (0)	9.567e-39						
	O2	4.783e-39	4.785e-39	-38.320	-38.320	0.000	(0)
Pb	5.792e-10						
	PbCO3	3.385e-10	3.385e-10	-9.470	-9.470	0.000	(0)
	PbOH+	1.363e-10	1.308e-10	-9.865	-9.883	-0.018	(0)
	Pb+2	7.302e-11	6.238e-11	-10.137	-10.205	-0.068	(0)
	PbHCO3+	2.242e-11	2.152e-11	-10.649	-10.667	-0.018	(0)
	Pb (OH) 2	3.455e-12	3.455e-12	-11.462	-11.462	0.000	(0)
	PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
	Pb (CO3) 2-2	2.078e-12	1.762e-12	-11.682	-11.754	-0.072	(0)
	PbF+	1.883e-13	1.807e-13	-12.725	-12.743	-0.018	(0)
	PbCl+	6.251e-14	5.998e-14	-13.204	-13.222	-0.018	(0)
	Pb (OH) 3-	3.007e-15	2.885e-15	-14.522	-14.540	-0.018	(0)
	Pb (SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
	PbF2	1.461e-16	1.461e-16	-15.835	-15.835	0.000	(0)
	PbCl2	7.262e-18	7.262e-18	-17.139	-17.139	0.000	(0)
	Pb (OH) 4-2	6.959e-19	5.901e-19	-18.157	-18.229	-0.072	(0)
	Pb2OH+3	1.874e-19	1.294e-19	-18.727	-18.888	-0.161	(0)
	PbF3-	1.187e-20	1.139e-20	-19.925	-19.943	-0.018	(0)
	PbCl3-	8.165e-23	7.835e-23	-22.088	-22.106	-0.018	(0)
	Pb3 (OH) 4+2	1.752e-23	1.486e-23	-22.756	-22.828	-0.072	(0)
	PbF4-2	2.643e-25	2.241e-25	-24.578	-24.649	-0.072	(0)
	PbCl4-2	1.145e-27	9.706e-28	-26.941	-27.013	-0.072	(0)
	Pb4 (OH) 4+4	1.423e-29	7.362e-30	-28.847	-29.133	-0.286	(0)
S (6)	1.255e-04						
	SO4-2	1.195e-04	1.020e-04	-3.923	-3.991	-0.068	(0)
	CaSO4	4.810e-06	4.810e-06	-5.318	-5.318	0.000	(0)
	MgSO4	1.106e-06	1.106e-06	-5.956	-5.956	0.000	(0)
	NaSO4-	6.483e-08	6.236e-08	-7.188	-7.205	-0.017	(0)
	KSO4-	4.024e-08	3.871e-08	-7.395	-7.412	-0.017	(0)
	MnSO4	5.200e-09	5.200e-09	-8.284	-8.284	0.000	(0)
	HSO4-	1.250e-10	1.202e-10	-9.903	-9.920	-0.017	(0)
	FeSO4	3.390e-12	3.390e-12	-11.470	-11.470	0.000	(0)
	PbSO4	3.118e-12	3.118e-12	-11.506	-11.506	0.000	(0)
	UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
	Pb (SO4) 2-2	2.261e-15	1.917e-15	-14.646	-14.717	-0.072	(0)
	AlSO4+	5.556e-16	5.342e-16	-15.255	-15.272	-0.017	(0)
	UO2 (SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
	Al (SO4) 2-	6.075e-19	5.842e-19	-18.216	-18.233	-0.017	(0)
	FeSO4+	1.497e-19	1.439e-19	-18.825	-18.842	-0.017	(0)
	VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
	VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
	Fe (SO4) 2-	3.273e-22	3.141e-22	-21.485	-21.503	-0.018	(0)
	HgSO4	1.443e-26	1.443e-26	-25.841	-25.841	0.000	(0)
	VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
	USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
Se (-2)	4.927e-36						
	HSe-	4.927e-36	4.728e-36	-35.307	-35.325	-0.018	(0)
	MnSe	4.630e-40	4.630e-40	-39.334	-39.334	0.000	(0)
	H2Se	4.425e-40	4.425e-40	-39.354	-39.354	0.000	(0)
	Se-2	0.000e+00	0.000e+00	-42.335	-42.407	-0.072	(0)
Se (4)	3.040e-09						

HSeO3-	2.213e-09	2.124e-09	-8.655	-8.673	-0.018	(0)
SeO3-2	8.268e-10	7.011e-10	-9.083	-9.154	-0.072	(0)
H2SeO3	1.092e-14	1.092e-14	-13.962	-13.962	0.000	(0)
FeHSeO3+2	8.318e-25	7.054e-25	-24.080	-24.152	-0.072	(0)
Se (6)	6.977e-14					
SeO4-2	6.977e-14	5.960e-14	-13.156	-13.225	-0.068	(0)
MnSeO4	4.597e-18	4.597e-18	-17.338	-17.338	0.000	(0)
HSeO4-	3.753e-20	3.602e-20	-19.426	-19.443	-0.018	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.639	-56.800	-0.161	(0)
U (4)	3.077e-18					
U (OH) 5-	3.076e-18	2.952e-18	-17.512	-17.530	-0.018	(0)
U (OH) 4	1.490e-21	1.490e-21	-20.827	-20.827	0.000	(0)
U (OH) 3+	6.847e-26	6.570e-26	-25.165	-25.182	-0.018	(0)
U (OH) 2+2	4.319e-31	3.663e-31	-30.365	-30.436	-0.072	(0)
UF3+	2.857e-36	2.742e-36	-35.544	-35.562	-0.018	(0)
UF2+2	4.963e-37	4.209e-37	-36.304	-36.376	-0.072	(0)
UOH+3	3.014e-37	2.080e-37	-36.521	-36.682	-0.161	(0)
UF4	1.236e-38	1.236e-38	-37.908	-37.908	0.000	(0)
UF+3	1.178e-39	8.133e-40	-38.929	-39.090	-0.161	(0)
UF5-	0.000e+00	0.000e+00	-40.678	-40.696	-0.018	(0)
USO4+2	0.000e+00	0.000e+00	-41.323	-41.395	-0.072	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.486	-41.486	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.531	-42.602	-0.072	(0)
U+4	0.000e+00	0.000e+00	-43.717	-44.004	-0.286	(0)
UCl+3	0.000e+00	0.000e+00	-46.710	-46.871	-0.161	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-160.946	-162.396	-1.449	(0)
U (5)	1.812e-15					
UO2+	1.812e-15	1.739e-15	-14.742	-14.760	-0.018	(0)
U (6)	1.021e-08					
UO2 (CO3) 2-2	8.709e-09	7.386e-09	-8.060	-8.132	-0.072	(0)
UO2 (CO3) 3-4	1.292e-09	6.682e-10	-8.889	-9.175	-0.286	(0)
UO2CO3	2.051e-10	2.051e-10	-9.688	-9.688	0.000	(0)
UO2OH+	3.126e-12	3.000e-12	-11.505	-11.523	-0.018	(0)
UO2F+	1.687e-13	1.619e-13	-12.773	-12.791	-0.018	(0)
UO2+2	3.340e-14	2.853e-14	-13.476	-13.545	-0.068	(0)
UO2F2	1.919e-14	1.919e-14	-13.717	-13.717	0.000	(0)
UO2SO4	4.407e-15	4.407e-15	-14.356	-14.356	0.000	(0)
UO2F3-	2.065e-16	1.981e-16	-15.685	-15.703	-0.018	(0)
(UO2) 3 (OH) 5+	2.469e-17	2.370e-17	-16.607	-16.625	-0.018	(0)
(UO2) 2 (OH) 2+2	1.761e-17	1.493e-17	-16.754	-16.826	-0.072	(0)
UO2 (SO4) 2-2	6.991e-18	5.929e-18	-17.155	-17.227	-0.072	(0)
UO2Cl+	1.307e-18	1.254e-18	-17.884	-17.902	-0.018	(0)
UO2F4-2	7.628e-20	6.469e-20	-19.118	-19.189	-0.072	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.600	-40.618	-0.018	(0)
V+2	0.000e+00	0.000e+00	-41.979	-42.050	-0.072	(0)
V (3)	8.546e-14					
V (OH) 3	8.546e-14	8.546e-14	-13.068	-13.068	0.000	(0)
V (OH) 2+	6.938e-25	6.658e-25	-24.159	-24.177	-0.018	(0)
VOH+2	8.978e-29	7.614e-29	-28.047	-28.118	-0.072	(0)
V+3	2.636e-34	1.819e-34	-33.579	-33.740	-0.161	(0)
VSO4+	9.133e-36	8.764e-36	-35.039	-35.057	-0.018	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.682	-53.843	-0.161	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.150	-55.437	-0.286	(0)
V (4)	4.412e-18					
V (OH) 3+	4.375e-18	4.198e-18	-17.359	-17.377	-0.018	(0)
VO+2	2.971e-20	2.520e-20	-19.527	-19.599	-0.072	(0)
VOF+	6.473e-21	6.212e-21	-20.189	-20.207	-0.018	(0)
VOSO4	7.082e-22	7.082e-22	-21.150	-21.150	0.000	(0)
VOF2	9.575e-23	9.575e-23	-22.019	-22.019	0.000	(0)
VOC1+	1.996e-24	1.916e-24	-23.700	-23.718	-0.018	(0)
VOF3-	1.455e-25	1.396e-25	-24.837	-24.855	-0.018	(0)
VOF4-2	2.732e-29	2.317e-29	-28.564	-28.635	-0.072	(0)
H2V2O4+2	1.042e-30	8.835e-31	-29.982	-30.054	-0.072	(0)
V (5)	9.620e-09					
H2VO4-	7.784e-09	7.470e-09	-8.109	-8.127	-0.018	(0)
HVO4-2	1.835e-09	1.556e-09	-8.736	-8.808	-0.072	(0)

H3VO4	9.006e-13	9.006e-13	-12.045	-12.045	0.000	(0)
H3V2O7-	4.526e-14	4.344e-14	-13.344	-13.362	-0.018	(0)
HV2O7-3	5.707e-15	3.939e-15	-14.244	-14.405	-0.161	(0)
VO4-3	9.372e-16	6.468e-16	-15.028	-15.189	-0.161	(0)
VO2+	2.254e-17	2.167e-17	-16.647	-16.664	-0.017	(0)
V2O7-4	1.700e-17	8.792e-18	-16.770	-17.056	-0.286	(0)
VO2F	1.562e-18	1.562e-18	-17.806	-17.806	0.000	(0)
V3O9-3	6.324e-19	4.364e-19	-18.199	-18.360	-0.161	(0)
VO2SO4-	5.502e-20	5.280e-20	-19.259	-19.277	-0.018	(0)
VO2F2-	2.429e-20	2.331e-20	-19.615	-19.632	-0.018	(0)
VO2F3-2	1.409e-23	1.195e-23	-22.851	-22.923	-0.072	(0)
V4O12-4	2.627e-24	1.359e-24	-23.580	-23.867	-0.286	(0)
VO2F4-3	3.503e-28	2.417e-28	-27.456	-27.617	-0.161	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.321	-63.768	-0.447	(0)
V10O28-6	0.000e+00	0.000e+00	-63.392	-64.036	-0.644	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.193	-66.479	-0.286	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-2.21	8.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-57.79	-55.42	2.37	Al2 (MoO4) 3
Al2O3	-2.48	17.17	19.65	Al2O3
Al4 (OH) 10SO4	-8.19	14.51	22.70	Al4 (OH) 10SO4
AlOHSO4	-8.01	-11.24	-3.23	AlOHSO4
Alunite	-8.85	-10.25	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-6.41	-14.20	-7.79	PbSO4
Anhydrite	-3.32	-7.68	-4.36	CaSO4
Aragonite	-1.13	-9.43	-8.30	CaCO3
Artinite	-7.96	1.64	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.07	7.32	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.72	-2.85	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.47	4.47	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.47	-17.29	-5.82	BaF2
BaMoO4	-9.92	-16.88	-6.96	BaMoO4
Barite	-2.53	-12.51	-9.98	BaSO4
BaSeO3	-11.10	-9.27	1.83	BaSeO3
BaSeO4	-14.28	-21.74	-7.46	BaSeO4
Birnessite	-10.31	7.78	18.09	MnO2
Bixbyite	-7.63	-8.27	-0.64	Mn2O3
Boehmite	0.01	8.59	8.58	AlOOH
Brucite	-5.23	11.61	16.84	Mg (OH) 2
Ca (VO3) 2	-11.00	-5.34	5.66	Ca (VO3) 2
Ca2V2O7	-10.69	6.81	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.74	6.81	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-20.00	18.96	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.90	18.96	39.86	Ca3 (VO4) 2:4H2O
Calcite	-0.95	-9.43	-8.48	CaCO3
Calomel	-16.96	-34.87	-17.91	Hg2Cl2
CaMoO4	-4.10	-12.05	-7.95	CaMoO4
Carnotite	-3.03	-2.80	0.23	KUO2VO4
CaSeO3:2H2O	-7.25	-4.44	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.89	-16.91	-3.02	CaSeO4:2H2O
Cerrusite	-2.82	-15.95	-13.13	PbCO3
CH4 (g)	-75.89	-116.93	-41.05	CH4
Clausthalite	-10.51	-37.61	-27.10	PbSe
CO2 (g)	-3.43	-21.58	-18.15	CO2
Cotunnite	-14.56	-19.34	-4.78	PbCl2
Cryolite	-19.48	-53.32	-33.84	Na3AlF6
Diaspore	1.71	8.59	6.87	AlOOH
Dolomite (disordered)	-2.86	-19.40	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-2.31	-19.40	-17.09	CaMg (CO3) 2
Epsomite	-6.09	-8.22	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.60	5.97	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	4.15	1.11	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-7.80	-11.52	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-8.43	-6.88	1.55	Fe2 (OH) 4SeO3

Fe2 (SeO3) 3:2H2O	-19.44	-40.06	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-46.04	-49.77	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-4.54	15.68	20.22	Fe3 (OH) 8
FeMoO4	-8.14	-18.23	-10.09	FeMoO4
Ferrihydrite	1.66	4.86	3.19	Fe (OH) 3
Ferroselite	-38.09	-56.68	-18.60	FeSe2
FeSe	-26.28	-37.28	-11.00	FeSe
Fluorite	-1.96	-12.46	-10.50	CaF2
Gibbsite	0.29	8.59	8.29	Al (OH) 3
Goethite	4.36	4.86	0.49	FeOOH
Gummite	-5.38	2.29	7.67	UO3
Gypsum	-3.07	-7.68	-4.61	CaSO4:2H2O
H-Jarosite	-12.99	-25.09	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-11.32	-24.20	-12.88	H2MoO4
H2Se (g)	-38.28	-43.24	-4.96	H2Se
Halite	-10.11	-8.51	1.60	NaCl
Hausmannite	-9.31	51.72	61.03	Mn3O4
Hematite	11.13	9.71	-1.42	Fe2O3
Hercynite	0.25	23.14	22.89	FeAl2O4
Hg (CH3) 2 (g)	-174.78	-248.49	-73.71	Hg (CH3) 2
Hg (g)	-9.00	-16.87	-7.87	Hg
Hg (OH) 2	-11.13	-14.62	-3.50	Hg (OH) 2
Hg2 (g)	-18.78	-33.74	-14.96	Hg2
Hg2 (OH) 2	-15.16	-9.90	5.26	Hg2 (OH) 2
Hg2CO3	-15.43	-31.48	-16.05	Hg2CO3
Hg2F2	-24.15	-34.51	-10.36	Hg2F2
Hg2SeO3	-21.84	-26.49	-4.66	Hg2SeO3
Hg2SO4	-23.60	-29.73	-6.13	Hg2SO4
Hg3O2CO3	-35.77	-65.45	-29.68	Hg3O2CO3
HgCl (g)	-36.93	-17.44	19.50	HgCl
HgCl2	-18.33	-39.60	-21.26	HgCl2
HgF (g)	-49.93	-17.26	32.68	HgF
HgF2 (g)	-51.80	-39.23	12.57	HgF2
Hgmetal (l)	-3.42	-16.87	-13.45	Hg
HgSe	-2.17	-57.87	-55.69	HgSe
HgSeO3	-18.79	-31.22	-12.43	HgSeO3
HgSO4	-25.03	-34.45	-9.42	HgSO4
Huntite	-9.37	-39.34	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.49	-26.26	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-19.50	-28.26	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-22.25	-27.42	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.64	-21.44	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-20.16	-16.90	3.26	K2MoO4
K2SeO4	-21.04	-21.77	-0.73	K2SeO4
Larnakite	-8.13	-8.56	-0.43	PbO:PbSO4
Laurionite	-7.48	-6.85	0.62	PbOHCl
Lepidocrocite	3.48	4.86	1.37	FeOOH
Lime	-20.55	12.15	32.70	CaO
Litharge	-7.06	5.63	12.69	PbO
Maghemite	3.33	9.71	6.39	Fe2O3
Magnesioferrite	4.46	21.32	16.86	Fe2MgO4
Magnesite	-2.51	-9.97	-7.46	MgCO3
Magnetite	12.28	15.68	3.40	Fe3O4
Manganite	-4.13	21.21	25.34	MnOOH
Massicot	-7.26	5.63	12.89	PbO
Matlockite	-10.18	-19.16	-8.97	PbClF
Melanterite	-11.65	-13.86	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-7.18	11.61	18.79	Mg (OH) 2
Mg (VO3) 2	-17.16	-5.88	11.28	Mg (VO3) 2
Mg2V2O7	-20.63	5.73	26.36	Mg2V2O7
MgF2	-4.87	-13.00	-8.13	MgF2
MgMoO4	-10.74	-12.59	-1.85	MgMoO4
MgSeO3:6H2O	-8.03	-4.98	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.25	-17.45	-1.20	MgSeO4:6H2O
Minium	-32.79	40.73	73.52	Pb3O4
Mirabilite	-10.77	-11.88	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-13.10	-8.20	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-62.05	-67.76	-5.71	Mn2 (SO4) 3

MnCl2:4H2O	-18.39	-15.68	2.72	MnCl2:4H2O
MnSe	-37.45	-33.95	3.50	MnSe
MnSeO3	-8.43	-7.30	1.13	MnSeO3
MnSeO3:2H2O	-8.28	-7.30	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.72	-19.77	-2.05	MnSeO4:5H2O
MnSO4	-13.12	-10.53	2.58	MnSO4
Montroydite	-10.98	-14.62	-3.64	HgO
MoO3	-16.20	-24.20	-8.00	MoO3
Na-Jarosite	-9.92	-21.12	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-23.85	-40.45	-16.60	Na2Mo2O7
Na2MoO4	-17.74	-16.25	1.49	Na2MoO4
Na2MoO4:2H2O	-17.47	-16.25	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.94	-8.64	10.30	Na2SeO3:5H2O
Na2SeO4	-22.39	-21.11	1.28	Na2SeO4
Na3VO4	-33.50	3.18	36.68	Na3VO4
Na4V2O7	-38.99	-1.59	37.40	Na4V2O7
Natron	-12.32	-13.63	-1.31	Na2CO3:10H2O
NaVO3	-8.63	-4.77	3.86	NaVO3
Nesquehonite	-5.30	-9.97	-4.67	MgCO3:3H2O
Nsutite	-9.72	7.78	17.50	MnO2
O2(g)	-35.41	47.67	83.09	O2
Pb(BO2)2	-13.62	-7.10	6.52	Pb(BO2)2
Pb(OH)2	-2.52	5.63	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-64.40	-73.16	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-10.01	-1.22	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.92	11.26	26.19	Pb2O(OH)2
Pb2O3	-25.94	35.10	61.04	Pb2O3
Pb2OCO3	-9.76	-10.32	-0.56	Pb2OCO3
Pb2V2O7	-4.33	-6.23	-1.90	Pb2V2O7
Pb3(VO4)2	-6.73	-0.59	6.14	Pb3(VO4)2
Pb3O2CO3	-15.70	-4.68	11.02	Pb3O2CO3
Pb3O2SO4	-13.62	-2.93	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.40	2.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.18	2.70	21.88	Pb4O3SO4
PbF2	-11.54	-18.98	-7.44	PbF2
Pbmetal	-22.45	-18.20	4.25	Pb
PbMoO4	-2.95	-18.57	-15.62	PbMoO4
PbO:0.3H2O	-7.35	5.63	12.98	PbO:0.33H2O
PbSeO4	-16.59	-23.43	-6.84	PbSeO4
Periclase	-9.97	11.61	21.58	MgO
Phosgenite	-15.48	-35.29	-19.81	PbCl2:PbCO3
Plattnerite	-20.13	29.47	49.60	PbO2
Portlandite	-10.65	12.15	22.80	Ca(OH)2
Pyrochroite	-5.90	9.29	15.19	Mn(OH)2
Pyrolusite	-8.25	33.13	41.38	MnO2
Rhodochrosite	-1.71	-12.29	-10.58	MnCO3
Rutherfordine	-4.79	-19.29	-14.50	UO2CO3
Schoepite	-3.70	2.29	5.99	UO2(OH)2:H2O
Semetal(am)	-12.30	-19.41	-7.11	Se
Semetal(hex)	-11.70	-19.41	-7.71	Se
SeO2	-16.72	-16.59	0.12	SeO2
SeO3	-50.11	-29.06	21.04	SeO3
Siderite	-5.37	-15.61	-10.24	FeCO3
Spinel	-8.07	28.78	36.85	MgAl2O4
Thenardite	-12.20	-11.88	0.32	Na2SO4
Thermonatrite	-14.27	-13.63	0.64	Na2CO3:H2O
Tyuyamunite	-4.83	-0.75	4.08	Ca(UO2)2(VO4)2
U3O8	-10.39	10.69	21.08	U3O8
U4O9	-22.46	-25.48	-3.02	U4O9
UF4	-32.01	-61.55	-29.54	UF4
UF4:2.5H2O	-28.83	-61.55	-32.72	UF4:2.5H2O
UO2(am)	-13.26	-12.33	0.93	UO2
UO2(OH)2(beta)	-3.32	2.29	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.52	-26.77	-2.25	UO2SeO4:4H2O
UO3	-5.41	2.29	7.70	UO3
Uraninite	-7.66	-12.33	-4.67	UO2
V(OH)3	-17.57	-9.98	7.59	V(OH)3
V2O5	-16.13	-17.49	-1.36	V2O5

V3O5	-36.96	-35.12	1.84	V3O5
V4O7	-46.07	-38.88	7.19	V4O7
V6O13	-39.29	-100.15	-60.86	V6O13
VC12	-65.75	-46.87	18.87	VC12
VC13	-70.87	-47.44	23.43	VC13
VF4	-67.91	-52.98	14.93	VF4
Vmetal	-89.77	-45.74	44.03	V
VO	-36.66	-21.90	14.76	VO
VO(OH)2	-8.91	-3.76	5.15	VO(OH)2
VO2Cl	-24.07	-21.23	2.84	VO2Cl
VOC1	-33.62	-22.47	11.15	VOC1
VOC12	-41.49	-28.73	12.76	VOC12
VOSO4	-27.20	-23.59	3.61	VOSO4
Witherite	-5.69	-14.26	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 11.

SOLUTION 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

```

temp      25
pH        7.31754
pe         4
redox     pe
units     mg/l
density   1
Alkalinity 10.61928 as HCO3
Al 0.00902
Ba 0.00335
Ca 8.35748
Cl 0.70776
F         0.42526
Fe 0.00138
K         0.97402
Mg 1.27427
Mn 0.00949
Mo 0.00046
Na 1.71069 charge
S(6)      20.27695 as SO4
Se 0.00023
V         0.00046
water     1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 9. Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

-----Solution composition-----

Elements	Molality	Moles
Al	3.343e-07	3.343e-07
Alkalinity	1.740e-04	1.740e-04
Ba	2.439e-08	2.439e-08
Ca	2.085e-04	2.085e-04
Cl	1.996e-05	1.996e-05
F	2.238e-05	2.238e-05

Fe	2.471e-08	2.471e-08	
K	2.491e-05	2.491e-05	
Mg	5.243e-05	5.243e-05	
Mn	1.727e-07	1.727e-07	
Mo	4.795e-09	4.795e-09	
Na	9.030e-05	9.030e-05	Charge balance
S (6)	2.111e-04	2.111e-04	
Se	2.913e-09	2.913e-09	
V	9.031e-09	9.031e-09	

-----Description of solution-----

pH	=	7.318
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.075e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	1.902e-04
Total CO2 (mol/kg)	=	1.902e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	-1.213e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110139e+02
Total O	=	5.550825e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.171e-07	2.092e-07	-6.663	-6.679	-0.016	(0)
H+	4.994e-08	4.813e-08	-7.302	-7.318	-0.016	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	3.343e-07					
Al (OH) 4-	3.195e-07	3.080e-07	-6.496	-6.511	-0.016	(0)
Al (OH) 3	1.169e-08	1.169e-08	-7.932	-7.932	0.000	(0)
Al (OH) 2+	2.906e-09	2.802e-09	-8.537	-8.553	-0.016	(0)
AlF2+	1.528e-10	1.473e-10	-9.816	-9.832	-0.016	(0)
AlF3	3.973e-11	3.973e-11	-10.401	-10.401	0.000	(0)
AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
AlOH+2	1.950e-11	1.686e-11	-10.710	-10.773	-0.063	(0)
AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
Al+3	1.124e-13	8.061e-14	-12.949	-13.094	-0.144	(0)
Al (SO4) 2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)
Ba	2.439e-08					
Ba+2	2.436e-08	2.102e-08	-7.613	-7.677	-0.064	(0)
BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
BaOH+	1.990e-14	1.919e-14	-13.701	-13.717	-0.016	(0)
C (4)	1.902e-04					
HCO3-	1.714e-04	1.653e-04	-3.766	-3.782	-0.016	(0)
H2CO3	1.790e-05	1.790e-05	-4.747	-4.747	0.000	(0)
CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
CO3-2	1.866e-07	1.610e-07	-6.729	-6.793	-0.064	(0)
MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)
BaHCO3+	3.440e-11	3.318e-11	-10.463	-10.479	-0.016	(0)
FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
BaCO3	1.735e-12	1.735e-12	-11.761	-11.761	0.000	(0)
Ca	2.085e-04					
Ca+2	2.010e-04	1.734e-04	-3.697	-3.761	-0.064	(0)

	CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
	CaHCO3+	5.534e-07	5.337e-07	-6.257	-6.273	-0.016	(0)
	CaCO3	4.424e-08	4.424e-08	-7.354	-7.354	0.000	(0)
	CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
	CaOH+	7.503e-10	7.237e-10	-9.125	-9.140	-0.016	(0)
Cl		1.996e-05					
	Cl-	1.996e-05	1.924e-05	-4.700	-4.716	-0.016	(0)
	MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
	MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
	FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
	MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
	VOCl+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
	FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
	FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
F		2.238e-05					
	F-	2.223e-05	2.142e-05	-4.653	-4.669	-0.016	(0)
	MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
	CaF+	4.205e-08	4.054e-08	-7.376	-7.392	-0.016	(0)
	HF	1.525e-09	1.525e-09	-8.817	-8.817	0.000	(0)
	NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
	AlF2+	1.528e-10	1.473e-10	-9.816	-9.832	-0.016	(0)
	MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
	AlF3	3.973e-11	3.973e-11	-10.401	-10.401	0.000	(0)
	AlF+2	1.998e-11	1.727e-11	-10.700	-10.763	-0.063	(0)
	AlF4-	4.426e-13	4.266e-13	-12.354	-12.370	-0.016	(0)
	HF2-	1.289e-13	1.243e-13	-12.890	-12.906	-0.016	(0)
	FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
	FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
	VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
	H2F2	6.234e-18	6.234e-18	-17.205	-17.205	0.000	(0)
	VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
	FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
	VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
	VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
	VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
	VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
	VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
	VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
Fe (2)		2.131e-09					
	Fe+2	2.037e-09	1.746e-09	-8.691	-8.758	-0.067	(0)
	FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
	FeOH+	1.508e-11	1.454e-11	-10.821	-10.837	-0.016	(0)
	FeHCO3+	3.768e-12	3.634e-12	-11.424	-11.440	-0.016	(0)
	Fe (OH) 2	2.417e-15	2.417e-15	-14.617	-14.617	0.000	(0)
	Fe (OH) 3-	1.658e-16	1.599e-16	-15.780	-15.796	-0.016	(0)
Fe (3)		2.258e-08					
	Fe (OH) 2+	1.849e-08	1.783e-08	-7.733	-7.749	-0.016	(0)
	Fe (OH) 3	4.006e-09	4.006e-09	-8.397	-8.397	0.000	(0)
	Fe (OH) 4-	8.092e-11	7.803e-11	-10.092	-10.108	-0.016	(0)
	FeOH+2	2.536e-13	2.191e-13	-12.596	-12.659	-0.063	(0)
	FeF+2	4.411e-17	3.811e-17	-16.355	-16.419	-0.063	(0)
	FeF2+	2.266e-17	2.185e-17	-16.645	-16.661	-0.016	(0)
	FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
	Fe+3	2.261e-18	1.622e-18	-17.646	-17.790	-0.144	(0)
	FeF3	6.605e-19	6.605e-19	-18.180	-18.180	0.000	(0)
	Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
	FeCl+2	1.091e-21	9.427e-22	-20.962	-21.026	-0.063	(0)
	FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)
	Fe2 (OH) 2+4	2.944e-24	1.590e-24	-23.531	-23.799	-0.268	(0)
	FeCl2+	8.403e-26	8.102e-26	-25.076	-25.091	-0.016	(0)
	Fe3 (OH) 4+5	1.073e-30	4.098e-31	-29.969	-30.387	-0.418	(0)
	FeCl3	1.559e-31	1.559e-31	-30.807	-30.807	0.000	(0)
H (0)		3.280e-26					
	H2	1.640e-26	1.640e-26	-25.785	-25.785	0.000	(0)
K		2.491e-05					
	K+	2.488e-05	2.398e-05	-4.604	-4.620	-0.016	(0)
	KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
Mg		5.243e-05					

Mg+2	5.084e-05	4.386e-05	-4.294	-4.358	-0.064	(0)
MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
MgF+	1.094e-07	1.054e-07	-6.961	-6.977	-0.016	(0)
MgHCO3+	7.699e-08	7.420e-08	-7.114	-7.130	-0.016	(0)
MgCO3	5.874e-09	5.874e-09	-8.231	-8.231	0.000	(0)
MgOH+	3.787e-09	3.653e-09	-8.422	-8.437	-0.016	(0)
Mn (2)	1.727e-07					
Mn+2	1.676e-07	1.437e-07	-6.776	-6.843	-0.067	(0)
MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
MnHCO3+	4.915e-10	4.738e-10	-9.308	-9.324	-0.016	(0)
MnF+	1.271e-10	1.225e-10	-9.896	-9.912	-0.016	(0)
MnOH+	7.830e-11	7.549e-11	-10.106	-10.122	-0.016	(0)
MnCl+	3.609e-12	3.480e-12	-11.443	-11.458	-0.016	(0)
MnCl2	9.458e-17	9.458e-17	-16.024	-16.024	0.000	(0)
MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
Mn (OH) 3-	2.117e-20	2.041e-20	-19.674	-19.690	-0.016	(0)
MnCl3-	5.199e-22	5.012e-22	-21.284	-21.300	-0.016	(0)
Mn (OH) 4-2	1.596e-26	1.379e-26	-25.797	-25.861	-0.063	(0)
MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Mn (3)	8.945e-29					
Mn+3	8.945e-29	6.417e-29	-28.048	-28.193	-0.144	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-50.661	-50.724	-0.063	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-56.080	-56.096	-0.016	(0)
Mo	4.795e-09					
MoO4-2	4.791e-09	4.133e-09	-8.320	-8.384	-0.064	(0)
HMoO4-	4.114e-12	3.959e-12	-11.386	-11.402	-0.017	(0)
H2MoO4	1.396e-15	1.396e-15	-14.855	-14.855	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-52.158	-52.309	-0.150	(0)
Mo7O24-6	0.000e+00	0.000e+00	-63.634	-64.236	-0.602	(0)
HMo7O24-5	0.000e+00	0.000e+00	-64.749	-65.167	-0.418	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-67.435	-67.702	-0.268	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-71.623	-71.774	-0.150	(0)
Na	9.030e-05					
Na+	9.020e-05	8.694e-05	-4.045	-4.061	-0.016	(0)
NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)
NaHCO3	8.082e-09	8.082e-09	-8.093	-8.093	0.000	(0)
NaF	1.175e-09	1.175e-09	-8.930	-8.930	0.000	(0)
NaCO3-	2.703e-10	2.606e-10	-9.568	-9.584	-0.016	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-40.725	-40.725	0.000	(0)
S (6)	2.111e-04					
SO4-2	2.026e-04	1.748e-04	-3.693	-3.757	-0.064	(0)
CaSO4	6.944e-06	6.944e-06	-5.158	-5.158	0.000	(0)
MgSO4	1.395e-06	1.395e-06	-5.855	-5.855	0.000	(0)
NaSO4-	8.464e-08	8.162e-08	-7.072	-7.088	-0.016	(0)
KSO4-	3.078e-08	2.968e-08	-7.512	-7.528	-0.016	(0)
MnSO4	4.466e-09	4.466e-09	-8.350	-8.350	0.000	(0)
HSO4-	8.531e-10	8.223e-10	-9.069	-9.085	-0.016	(0)
FeSO4	7.494e-11	7.494e-11	-10.125	-10.125	0.000	(0)
AlSO4+	1.135e-13	1.094e-13	-12.945	-12.961	-0.016	(0)
Al (SO4) 2-	2.126e-16	2.049e-16	-15.673	-15.688	-0.016	(0)
FeSO4+	3.301e-18	3.182e-18	-17.481	-17.497	-0.016	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
Fe (SO4) 2-	1.236e-20	1.189e-20	-19.908	-19.925	-0.017	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
Se (-2)	2.403e-32					
HSe-	2.402e-32	2.311e-32	-31.619	-31.636	-0.017	(0)
H2Se	8.636e-36	8.636e-36	-35.064	-35.064	0.000	(0)
MnSe	2.843e-37	2.843e-37	-36.546	-36.546	0.000	(0)
Se-2	5.601e-40	4.801e-40	-39.252	-39.319	-0.067	(0)
Se (4)	2.913e-09					
HSeO3-	2.665e-09	2.565e-09	-8.574	-8.591	-0.017	(0)
SeO3-2	2.474e-10	2.121e-10	-9.607	-9.673	-0.067	(0)
H2SeO3	5.266e-14	5.266e-14	-13.278	-13.278	0.000	(0)
FeHSeO3+2	1.283e-23	1.100e-23	-22.892	-22.959	-0.067	(0)

Se (6)	1.312e-15					
SeO4-2	1.312e-15	1.132e-15	-14.882	-14.946	-0.064	(0)
MnSeO4	4.375e-20	4.375e-20	-19.359	-19.359	0.000	(0)
HSeO4-	2.837e-21	2.730e-21	-20.547	-20.564	-0.017	(0)
V (2)	3.247e-38					
VOH+	2.785e-38	2.680e-38	-37.555	-37.572	-0.017	(0)
V+2	4.618e-39	3.959e-39	-38.336	-38.402	-0.067	(0)
V (3)	5.968e-12					
V (OH) 3	5.968e-12	5.968e-12	-11.224	-11.224	0.000	(0)
V (OH) 2+	1.929e-22	1.856e-22	-21.715	-21.731	-0.017	(0)
VOH+2	9.885e-26	8.474e-26	-25.005	-25.072	-0.067	(0)
V+3	1.143e-30	8.083e-31	-29.942	-30.092	-0.150	(0)
VSO4+	6.932e-32	6.670e-32	-31.159	-31.176	-0.017	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.201	-48.351	-0.150	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-49.076	-49.344	-0.268	(0)
V (4)	3.142e-16					
V (OH) 3+	3.047e-16	2.932e-16	-15.516	-15.533	-0.017	(0)
VO+2	8.194e-18	7.025e-18	-17.086	-17.153	-0.067	(0)
VOF+	9.382e-19	9.027e-19	-18.028	-18.044	-0.017	(0)
VOSO4	3.382e-19	3.382e-19	-18.471	-18.471	0.000	(0)
VOF2	7.252e-21	7.252e-21	-20.140	-20.140	0.000	(0)
VOC1+	3.941e-22	3.792e-22	-21.404	-21.421	-0.017	(0)
VOF3-	5.729e-24	5.513e-24	-23.242	-23.259	-0.017	(0)
H2V2O4+2	5.026e-27	4.309e-27	-26.299	-26.366	-0.067	(0)
VOF4-2	5.562e-28	4.768e-28	-27.255	-27.322	-0.067	(0)
V (5)	9.025e-09					
H2VO4-	8.521e-09	8.199e-09	-8.070	-8.086	-0.017	(0)
HVO4-2	4.991e-10	4.279e-10	-9.302	-9.369	-0.067	(0)
H3VO4	3.947e-12	3.947e-12	-11.404	-11.404	0.000	(0)
H3V2O7-	2.171e-13	2.089e-13	-12.663	-12.680	-0.017	(0)
HV2O7-3	1.681e-15	1.189e-15	-14.774	-14.925	-0.150	(0)
VO2+	3.933e-16	3.791e-16	-15.405	-15.421	-0.016	(0)
VO4-3	6.300e-17	4.455e-17	-16.201	-16.351	-0.150	(0)
VO2F	1.424e-17	1.424e-17	-16.846	-16.846	0.000	(0)
VO2SO4-	1.644e-18	1.582e-18	-17.784	-17.801	-0.017	(0)
V2O7-4	1.231e-18	6.647e-19	-17.910	-18.177	-0.268	(0)
V3O9-3	8.163e-19	5.772e-19	-18.088	-18.239	-0.150	(0)
VO2F2-	1.152e-19	1.108e-19	-18.939	-18.955	-0.017	(0)
VO2F3-2	3.454e-23	2.961e-23	-22.462	-22.529	-0.067	(0)
V4O12-4	3.653e-24	1.973e-24	-23.437	-23.705	-0.268	(0)
VO2F4-3	4.414e-28	3.122e-28	-27.355	-27.506	-0.150	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.939	-60.357	-0.418	(0)
V10O28-6	0.000e+00	0.000e+00	-60.625	-61.227	-0.602	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.200	-62.467	-0.268	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-1.94	8.86	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.71	-51.34	2.37	Al2 (MoO4) 3
Al2O3	-1.93	17.72	19.65	Al2O3
Al4 (OH) 10SO4	-5.66	17.04	22.70	Al4 (OH) 10SO4
AlOHSO4	-6.30	-9.53	-3.23	AlOHSO4
Alunite	-6.11	-7.51	-1.40	KAl3 (SO4) 2 (OH) 6
Anhydrite	-3.16	-7.52	-4.36	CaSO4
Aragonite	-2.25	-10.55	-8.30	CaCO3
Artinite	-10.47	-0.87	9.60	MgCO3:Mg (OH) 2:3H2O
Ba (OH) 2:8H2O	-17.44	6.96	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.16	-2.29	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-28.27	4.67	32.94	Ba3 (VO4) 2:4H2O
BaF2	-11.20	-17.02	-5.82	BaF2
BaMoO4	-9.10	-16.06	-6.96	BaMoO4
Barite	-1.45	-11.43	-9.98	BaSO4
BaSeO3	-10.78	-8.95	1.83	BaSeO3
BaSeO4	-15.16	-22.62	-7.46	BaSeO4
Birnessite	-13.01	5.08	18.09	MnO2
Bixbyite	-11.84	-12.48	-0.64	Mn2O3

Boehmite	0.28	8.86	8.58	AlOOH
Brucite	-6.57	10.28	16.84	Mg(OH)2
Ca(VO3)2	-10.99	-5.33	5.66	Ca(VO3)2
Ca2V2O7	-11.96	5.54	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.01	5.54	21.55	Ca2V2O7:2H2O
Ca3(VO4)2	-22.55	16.41	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-23.45	16.41	39.86	Ca3(VO4)2:4H2O
Calcite	-2.07	-10.55	-8.48	CaCO3
CaMoO4	-4.19	-12.14	-7.95	CaMoO4
CaSeO3:2H2O	-7.85	-5.03	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-15.69	-18.71	-3.02	CaSeO4:2H2O
CH4(g)	-70.92	-111.97	-41.05	CH4
CO2(g)	-3.28	-21.43	-18.15	CO2
Cryolite	-19.45	-53.29	-33.84	Na3AlF6
Diaspore	1.99	8.86	6.87	AlOOH
Dolomite(disordered)	-5.17	-21.71	-16.54	CaMg(CO3)2
Dolomite(ordered)	-4.62	-21.71	-17.09	CaMg(CO3)2
Epsomite	-5.99	-8.12	-2.13	MgSO4:7H2O
Fe(OH)2	-7.69	5.88	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.59	0.55	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.61	-10.33	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.14	-7.58	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.77	-39.40	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.12	-46.85	-3.73	Fe2(SO4)3
Fe3(OH)8	-6.02	14.20	20.22	Fe3(OH)8
FeMoO4	-7.05	-17.14	-10.09	FeMoO4
Ferrihydrite	0.97	4.16	3.19	Fe(OH)3
Ferroselite	-30.80	-49.40	-18.60	FeSe2
FeSe	-22.08	-33.08	-11.00	FeSe
Fluorite	-2.60	-13.10	-10.50	CaF2
Gibbsite	0.57	8.86	8.29	Al(OH)3
Goethite	3.67	4.16	0.49	FeOOH
Gypsum	-2.91	-7.52	-4.61	CaSO4:2H2O
H-Jarosite	-12.20	-24.30	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.14	-23.02	-12.88	H2MoO4
H2Se(g)	-33.99	-38.95	-4.96	H2Se
Halite	-10.38	-8.78	1.60	NaCl
Hausmannite	-15.02	46.01	61.03	Mn3O4
Hematite	9.74	8.33	-1.42	Fe2O3
Hercynite	0.70	23.60	22.89	FeAl2O4
Huntite	-14.04	-44.01	-29.97	CaMg3(CO3)4
Hydromagnesite	-25.56	-34.33	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-20.06	-25.23	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.80	-21.60	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-20.89	-17.62	3.26	K2MoO4
K2SeO4	-23.46	-24.19	-0.73	K2SeO4
Lepidocrocite	2.79	4.16	1.37	FeOOH
Lime	-21.83	10.87	32.70	CaO
Maghemite	1.94	8.33	6.39	Fe2O3
Magnesioferrite	1.74	18.60	16.86	Fe2MgO4
Magnesite	-3.69	-11.15	-7.46	MgCO3
Magnetite	10.80	14.20	3.40	Fe3O4
Manganite	-6.23	19.11	25.34	MnOOH
Melanterite	-10.31	-12.52	-2.21	FeSO4:7H2O
Mg(OH)2(active)	-8.52	10.28	18.79	Mg(OH)2
Mg(VO3)2	-17.21	-5.93	11.28	Mg(VO3)2
Mg2V2O7	-22.01	4.35	26.36	Mg2V2O7
MgF2	-5.57	-13.70	-8.13	MgF2
MgMoO4	-10.89	-12.74	-1.85	MgMoO4
MgSeO3:6H2O	-8.69	-5.63	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-18.10	-19.30	-1.20	MgSeO4:6H2O
Mirabilite	-10.77	-11.88	-1.11	Na2SO4:10H2O
Mn(VO3)2	-13.32	-8.42	4.90	Mn(VO3)2
Mn2(SO4)3	-61.95	-67.66	-5.71	Mn2(SO4)3
MnCl2:4H2O	-18.99	-16.27	2.72	MnCl2:4H2O
MnSe	-34.66	-31.16	3.50	MnSe
MnSeO3	-9.25	-8.12	1.13	MnSeO3
MnSeO3:2H2O	-9.10	-8.12	0.98	MnSeO3:2H2O

MnSeO4:5H2O	-19.74	-21.79	-2.05	MnSeO4:5H2O
MnSO4	-13.18	-10.60	2.58	MnSO4
MoO3	-15.02	-23.02	-8.00	MoO3
Na-Jarosite	-9.84	-21.04	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-22.93	-39.52	-16.60	Na2Mo2O7
Na2MoO4	-18.00	-16.51	1.49	Na2MoO4
Na2MoO4:2H2O	-17.73	-16.51	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-19.70	-9.40	10.30	Na2SeO3:5H2O
Na2SeO4	-24.35	-23.07	1.28	Na2SeO4
Na3VO4	-35.01	1.67	36.68	Na3VO4
Na4V2O7	-40.58	-3.18	37.40	Na4V2O7
Natron	-13.60	-14.91	-1.31	Na2CO3:10H2O
NaVO3	-8.71	-4.85	3.86	NaVO3
Nesquehonite	-6.48	-11.15	-4.67	MgCO3:3H2O
Nsutite	-12.43	5.08	17.50	MnO2
O2(g)	-37.82	45.27	83.09	O2
Periclase	-11.31	10.28	21.58	MgO
Portlandite	-11.93	10.87	22.80	Ca(OH)2
Pyrochroite	-7.40	7.79	15.19	Mn(OH)2
Pyrolusite	-10.95	30.43	41.38	MnO2
Rhodochrosite	-3.06	-13.64	-10.58	MnCO3
Semetal(am)	-9.21	-16.32	-7.11	Se
Semetal(hex)	-8.61	-16.32	-7.71	Se
SeO2	-16.03	-15.91	0.12	SeO2
SeO3	-50.63	-29.58	21.04	SeO3
Siderite	-5.31	-15.55	-10.24	FeCO3
Spinel	-8.85	28.00	36.85	MgAl2O4
Thenardite	-12.20	-11.88	0.32	Na2SO4
Thermonatrite	-15.55	-14.91	0.64	Na2CO3:H2O
V(OH)3	-15.73	-8.14	7.59	V(OH)3
V2O5	-14.85	-16.21	-1.36	V2O5
V3O5	-32.03	-30.19	1.84	V3O5
V4O7	-39.89	-32.71	7.19	V4O7
V6O13	-33.03	-93.89	-60.86	V6O13
VC12	-62.40	-43.52	18.87	VC12
VC13	-67.67	-44.24	23.43	VC13
VF4	-65.39	-50.46	14.93	VF4
Vmetal	-86.12	-42.09	44.03	V
VO	-34.21	-19.46	14.76	VO
VO(OH)2	-7.67	-2.52	5.15	VO(OH)2
VO2Cl	-22.98	-20.14	2.84	VO2Cl
VOC1	-31.33	-20.17	11.15	VOC1
VOC12	-39.35	-26.58	12.76	VOC12
VOSO4	-24.52	-20.91	3.61	VOSO4
Witherite	-5.90	-14.47	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 12.

SOLUTION 10 Average HCT data for biotite breccia - sulfide (waste) (cells
604811, 604854, 604862, 604867 and 605033)
temp 25
pH 7.90750
pe 4
redox pe
units mg/l
density 1
Alkalinity 54.86006 as HCO3
Al 0.00593
As 0.00025

```

B          0.00493
Ba 0.00624
Ca 28.03913
Cl 1.33518
Cu 0.01261
F          1.19649
Fe 0.00074
K          4.43350
Mg 3.99652
Mn 0.04279
Mo 0.00556
Na 2.60160 charge
S(6)      47.33747 as SO4
Sb 0.00012
Se 0.00035
U          0.00169
V          0.00149
Zn 0.00145
water     1 # kg

```

END

Beginning of initial solution calculations.

Initial solution 10. Average HCT data for biotite breccia - sulfide (waste)
(cells 604811, 604854, 604862, 604867 and 605033)

-----Solution composition-----

Elements	Molality	Moles
Al	2.198e-07	2.198e-07
Alkalinity	8.992e-04	8.992e-04
As	3.337e-09	3.337e-09
B	4.561e-07	4.561e-07
Ba	4.544e-08	4.544e-08
Ca	6.997e-04	6.997e-04
Cl	3.767e-05	3.767e-05
Cu	1.985e-07	1.985e-07
F	6.299e-05	6.299e-05
Fe	1.325e-08	1.325e-08
K	1.134e-04	1.134e-04
Mg	1.645e-04	1.645e-04
Mn	7.790e-07	7.790e-07
Mo	5.796e-08	5.796e-08
Na	1.411e-04	1.411e-04
S(6)	4.928e-04	4.928e-04
Sb	9.858e-10	9.858e-10
Se	4.433e-09	4.433e-09
U	7.101e-09	7.101e-09
V	2.925e-08	2.925e-08
Zn	2.218e-08	2.218e-08
Charge balance		

-----Description of solution-----

```

pH = 7.907
pe = 4.000
Activity of water = 1.000
Ionic strength (mol/kgw) = 3.123e-03
Mass of water (kg) = 1.000e+00
Total carbon (mol/kg) = 9.133e-04
Total CO2 (mol/kg) = 9.133e-04
Temperature (°C) = 25.00
Electrical balance (eq) = -5.028e-18
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
Iterations = 11
Total H = 1.110146e+02
Total O = 5.551155e+01

```


-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	8.655e-07	8.137e-07	-6.063	-6.090	-0.027	(0)
H+	1.315e-08	1.237e-08	-7.881	-7.907	-0.027	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	2.198e-07					
Al(OH) 4-	2.177e-07	2.049e-07	-6.662	-6.689	-0.026	(0)
Al(OH) 3	2.000e-09	2.000e-09	-8.699	-8.699	0.000	(0)
Al(OH) 2+	1.308e-10	1.232e-10	-9.884	-9.909	-0.026	(0)
AlF2+	3.345e-12	3.151e-12	-11.476	-11.502	-0.026	(0)
AlF3	2.307e-12	2.307e-12	-11.637	-11.637	0.000	(0)
AlOH+2	2.420e-13	1.906e-13	-12.616	-12.720	-0.104	(0)
AlF+2	1.729e-13	1.362e-13	-12.762	-12.866	-0.104	(0)
AlF4-	7.141e-14	6.721e-14	-13.146	-13.173	-0.026	(0)
AlSO4+	6.719e-16	6.324e-16	-15.173	-15.199	-0.026	(0)
Al+3	4.057e-16	2.342e-16	-15.392	-15.630	-0.239	(0)
Al(SO4) 2-	2.505e-18	2.357e-18	-17.601	-17.628	-0.026	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.884	-52.141	-0.257	(0)
As (3)	7.204e-21					
H3AsO3	6.899e-21	6.899e-21	-20.161	-20.161	0.000	(0)
H2AsO3-	3.053e-22	2.859e-22	-21.515	-21.544	-0.029	(0)
HAsO3-2	2.740e-26	2.108e-26	-25.562	-25.676	-0.114	(0)
H4AsO3+	4.516e-29	4.229e-29	-28.345	-28.374	-0.029	(0)
AsO3-3	1.185e-31	6.566e-32	-30.926	-31.183	-0.257	(0)
As (5)	3.337e-09					
HAsO4-2	3.053e-09	2.348e-09	-8.515	-8.629	-0.114	(0)
H2AsO4-	2.830e-10	2.650e-10	-9.548	-9.577	-0.029	(0)
AsO4-3	1.083e-12	6.001e-13	-11.965	-12.222	-0.257	(0)
H3AsO4	5.694e-16	5.698e-16	-15.245	-15.244	0.000	(0)
B	4.561e-07					
H3BO3	4.337e-07	4.340e-07	-6.363	-6.363	0.000	(0)
H2BO3-	2.169e-08	2.037e-08	-7.664	-7.691	-0.027	(0)
CaH2BO3+	6.337e-10	5.951e-10	-9.198	-9.225	-0.027	(0)
MgH2BO3+	9.102e-11	8.549e-11	-10.041	-10.068	-0.027	(0)
BF(OH) 3-	1.072e-11	1.007e-11	-10.970	-10.997	-0.027	(0)
NaH2BO3	4.276e-12	4.276e-12	-11.369	-11.369	0.000	(0)
BaH2BO3+	2.368e-14	2.224e-14	-13.626	-13.653	-0.027	(0)
H5(BO3) 2-	8.012e-15	7.525e-15	-14.096	-14.124	-0.027	(0)
BF2(OH) 2-	8.245e-16	7.744e-16	-15.084	-15.111	-0.027	(0)
H8(BO3) 3-	3.477e-19	3.266e-19	-18.459	-18.486	-0.027	(0)
BF3OH-	2.308e-22	2.167e-22	-21.637	-21.664	-0.027	(0)
BF4-	8.169e-28	7.672e-28	-27.088	-27.115	-0.027	(0)
Ba	4.544e-08					
Ba+2	4.509e-08	3.532e-08	-7.346	-7.452	-0.106	(0)
BaHCO3+	2.946e-10	2.777e-10	-9.531	-9.556	-0.026	(0)
BaCO3	5.651e-11	5.651e-11	-10.248	-10.248	0.000	(0)
BaOH+	1.332e-13	1.255e-13	-12.875	-12.901	-0.026	(0)
BaH2BO3+	2.368e-14	2.224e-14	-13.626	-13.653	-0.027	(0)
C (4)	9.133e-04					
HCO3-	8.739e-04	8.233e-04	-3.059	-3.084	-0.026	(0)
H2CO3	2.291e-05	2.291e-05	-4.640	-4.640	0.000	(0)
CaHCO3+	8.257e-06	7.783e-06	-5.083	-5.109	-0.026	(0)
CO3-2	3.982e-06	3.119e-06	-5.400	-5.506	-0.106	(0)
CaCO3	2.510e-06	2.510e-06	-5.600	-5.600	0.000	(0)
MgHCO3+	1.084e-06	1.020e-06	-5.965	-5.992	-0.027	(0)
MgCO3	3.140e-07	3.140e-07	-6.503	-6.503	0.000	(0)
CuCO3	1.572e-07	1.572e-07	-6.804	-6.804	0.000	(0)
NaHCO3	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
MnHCO3+	9.817e-09	9.245e-09	-8.008	-8.034	-0.026	(0)
NaCO3-	8.167e-09	7.694e-09	-8.088	-8.114	-0.026	(0)
UO2(CO3) 2-2	5.236e-09	4.027e-09	-8.281	-8.395	-0.114	(0)
ZnCO3	2.399e-09	2.399e-09	-8.620	-8.620	0.000	(0)
UO2(CO3) 3-4	1.799e-09	6.296e-10	-8.745	-9.201	-0.456	(0)
Cu(CO3) 2-2	1.715e-09	1.319e-09	-8.766	-8.880	-0.114	(0)

		CuHCO3+	4.746e-10	4.445e-10	-9.324	-9.352	-0.029	(0)
		ZnHCO3+	3.716e-10	3.480e-10	-9.430	-9.458	-0.029	(0)
		BaHCO3+	2.946e-10	2.777e-10	-9.531	-9.556	-0.026	(0)
		UO2CO3	6.471e-11	6.471e-11	-10.189	-10.189	0.000	(0)
		BaCO3	5.651e-11	5.651e-11	-10.248	-10.248	0.000	(0)
		FeHCO3+	4.680e-13	4.412e-13	-12.330	-12.355	-0.026	(0)
Ca	6.997e-04							
		Ca+2	6.481e-04	5.077e-04	-3.188	-3.294	-0.106	(0)
		CaSO4	4.046e-05	4.046e-05	-4.393	-4.393	0.000	(0)
		CaHCO3+	8.257e-06	7.783e-06	-5.083	-5.109	-0.026	(0)
		CaCO3	2.510e-06	2.510e-06	-5.600	-5.600	0.000	(0)
		CaF+	3.421e-07	3.222e-07	-6.466	-6.492	-0.026	(0)
		CaOH+	8.745e-09	8.243e-09	-8.058	-8.084	-0.026	(0)
		CaH2BO3+	6.337e-10	5.951e-10	-9.198	-9.225	-0.027	(0)
Cl	3.767e-05							
		Cl-	3.767e-05	3.544e-05	-4.424	-4.451	-0.027	(0)
		MnCl+	2.666e-11	2.511e-11	-10.574	-10.600	-0.026	(0)
		CuCl	1.869e-11	1.869e-11	-10.728	-10.728	0.000	(0)
		ZnOHC1	1.267e-12	1.267e-12	-11.897	-11.897	0.000	(0)
		ZnCl+	1.265e-12	1.190e-12	-11.898	-11.925	-0.027	(0)
		CuCl+	5.108e-13	4.805e-13	-12.292	-12.318	-0.027	(0)
		CuCl2-	1.471e-13	1.384e-13	-12.832	-12.859	-0.027	(0)
		MnCl2	1.257e-15	1.257e-15	-14.901	-14.901	0.000	(0)
		ZnCl2	6.682e-17	6.682e-17	-16.175	-16.175	0.000	(0)
		CuCl2	5.904e-18	5.904e-18	-17.229	-17.229	0.000	(0)
		CuCl3-2	1.334e-18	1.049e-18	-17.875	-17.979	-0.104	(0)
		UO2Cl+	3.198e-19	2.995e-19	-18.495	-18.524	-0.029	(0)
		MnCl3-	1.302e-20	1.226e-20	-19.885	-19.911	-0.026	(0)
		ZnCl3-	1.999e-21	1.881e-21	-20.699	-20.726	-0.027	(0)
		FeCl+2	5.382e-23	4.231e-23	-22.269	-22.374	-0.104	(0)
		VOCl+	8.724e-24	8.169e-24	-23.059	-23.088	-0.029	(0)
		CuCl3-	2.076e-24	1.952e-24	-23.683	-23.709	-0.027	(0)
		ZnCl4-2	4.238e-26	3.332e-26	-25.373	-25.477	-0.104	(0)
		FeCl2+	7.113e-27	6.698e-27	-26.148	-26.174	-0.026	(0)
		CuCl4-2	4.410e-31	3.467e-31	-30.356	-30.460	-0.104	(0)
		FeCl3	2.373e-32	2.373e-32	-31.625	-31.625	0.000	(0)
		UCl+3	0.000e+00	0.000e+00	-47.191	-47.448	-0.257	(0)
Cu (1)	4.663e-10							
		Cu+	4.475e-10	4.191e-10	-9.349	-9.378	-0.029	(0)
		CuCl	1.869e-11	1.869e-11	-10.728	-10.728	0.000	(0)
		CuCl2-	1.471e-13	1.384e-13	-12.832	-12.859	-0.027	(0)
		CuCl3-2	1.334e-18	1.049e-18	-17.875	-17.979	-0.104	(0)
Cu (2)	1.980e-07							
		CuCO3	1.572e-07	1.572e-07	-6.804	-6.804	0.000	(0)
		CuOH+	2.341e-08	2.202e-08	-7.631	-7.657	-0.027	(0)
		Cu+2	1.092e-08	8.556e-09	-7.962	-8.068	-0.106	(0)
		Cu (OH) 2	3.575e-09	3.575e-09	-8.447	-8.447	0.000	(0)
		Cu (CO3) 2-2	1.715e-09	1.319e-09	-8.766	-8.880	-0.114	(0)
		CuSO4	6.819e-10	6.819e-10	-9.166	-9.166	0.000	(0)
		CuHCO3+	4.746e-10	4.445e-10	-9.324	-9.352	-0.029	(0)
		CuF+	3.352e-11	3.139e-11	-10.475	-10.503	-0.029	(0)
		Cu2 (OH) 2+2	1.583e-11	1.218e-11	-10.800	-10.914	-0.114	(0)
		Cu (OH) 3-	6.371e-12	5.966e-12	-11.196	-11.224	-0.029	(0)
		CuCl+	5.108e-13	4.805e-13	-12.292	-12.318	-0.027	(0)
		Cu (OH) 4-2	4.968e-17	3.821e-17	-16.304	-16.418	-0.114	(0)
		CuCl2	5.904e-18	5.904e-18	-17.229	-17.229	0.000	(0)
		CuCl3-	2.076e-24	1.952e-24	-23.683	-23.709	-0.027	(0)
		CuCl4-2	4.410e-31	3.467e-31	-30.356	-30.460	-0.104	(0)
F	6.299e-05							
		F-	6.180e-05	5.814e-05	-4.209	-4.236	-0.027	(0)
		MgF+	8.389e-07	7.895e-07	-6.076	-6.103	-0.026	(0)
		CaF+	3.421e-07	3.222e-07	-6.466	-6.492	-0.026	(0)
		NaF	4.859e-09	4.859e-09	-8.313	-8.313	0.000	(0)
		MnF+	1.383e-09	1.303e-09	-8.859	-8.885	-0.026	(0)
		HF	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
		CuF+	3.352e-11	3.139e-11	-10.475	-10.503	-0.029	(0)
		ZnF+	1.656e-11	1.551e-11	-10.781	-10.810	-0.029	(0)
		BF (OH) 3-	1.072e-11	1.007e-11	-10.970	-10.997	-0.027	(0)

AlF2+	3.345e-12	3.151e-12	-11.476	-11.502	-0.026	(0)
AlF3	2.307e-12	2.307e-12	-11.637	-11.637	0.000	(0)
HF2-	2.502e-13	2.352e-13	-12.602	-12.629	-0.027	(0)
AlF+2	1.729e-13	1.362e-13	-12.762	-12.866	-0.104	(0)
AlF4-	7.141e-14	6.721e-14	-13.146	-13.173	-0.026	(0)
UO2F+	4.466e-14	4.182e-14	-13.350	-13.379	-0.029	(0)
UO2F2	7.012e-15	7.012e-15	-14.154	-14.154	0.000	(0)
BF2 (OH) 2-	8.245e-16	7.744e-16	-15.084	-15.111	-0.027	(0)
UO2F3-	1.093e-16	1.024e-16	-15.961	-15.990	-0.029	(0)
VO2F	6.842e-18	6.842e-18	-17.165	-17.165	0.000	(0)
FeF2+	4.165e-18	3.922e-18	-17.380	-17.407	-0.026	(0)
FeF+2	3.206e-18	2.521e-18	-17.494	-17.598	-0.104	(0)
H2F2	3.033e-18	3.033e-18	-17.518	-17.518	0.000	(0)
FeF3	3.217e-19	3.217e-19	-18.493	-18.493	0.000	(0)
VO2F2-	1.542e-19	1.444e-19	-18.812	-18.840	-0.029	(0)
UO2F4-2	6.149e-20	4.729e-20	-19.211	-19.325	-0.114	(0)
VOF+	3.060e-20	2.866e-20	-19.514	-19.543	-0.029	(0)
VOF2	6.247e-22	6.247e-22	-21.204	-21.204	0.000	(0)
BF3OH-	2.308e-22	2.167e-22	-21.637	-21.664	-0.027	(0)
VO2F3-2	1.362e-22	1.047e-22	-21.866	-21.980	-0.114	(0)
VOF3-	1.376e-24	1.289e-24	-23.861	-23.890	-0.029	(0)
Sb (OH) 2F	4.689e-26	4.689e-26	-25.329	-25.329	0.000	(0)
SbOF	4.611e-26	4.611e-26	-25.336	-25.336	0.000	(0)
VO2F4-3	5.409e-27	2.996e-27	-26.267	-26.523	-0.257	(0)
BF4-	8.169e-28	7.672e-28	-27.088	-27.115	-0.027	(0)
VOF4-2	3.932e-28	3.024e-28	-27.405	-27.519	-0.114	(0)
UF3+	1.678e-36	1.572e-36	-35.775	-35.804	-0.029	(0)
UF2+2	2.218e-37	1.706e-37	-36.654	-36.768	-0.114	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	4.207e-40	2.330e-40	-39.376	-39.633	-0.257	(0)
UF5-	0.000e+00	0.000e+00	-40.608	-40.637	-0.029	(0)
UF6-2	0.000e+00	0.000e+00	-42.278	-42.392	-0.114	(0)
Fe (2)	6.091e-11					
Fe+2	5.534e-11	4.256e-11	-10.257	-10.371	-0.114	(0)
FeSO4	3.635e-12	3.635e-12	-11.440	-11.440	0.000	(0)
FeOH+	1.464e-12	1.379e-12	-11.834	-11.860	-0.026	(0)
FeHCO3+	4.680e-13	4.412e-13	-12.330	-12.355	-0.026	(0)
Fe (OH) 2	8.913e-16	8.913e-16	-15.050	-15.050	0.000	(0)
Fe (OH) 3-	2.436e-16	2.293e-16	-15.613	-15.640	-0.026	(0)
Fe (3)	1.319e-08					
Fe (OH) 2+	6.981e-09	6.577e-09	-8.156	-8.182	-0.026	(0)
Fe (OH) 3	5.748e-09	5.748e-09	-8.241	-8.241	0.000	(0)
Fe (OH) 4-	4.623e-10	4.355e-10	-9.335	-9.361	-0.026	(0)
FeOH+2	2.642e-14	2.077e-14	-13.578	-13.682	-0.104	(0)
FeF2+	4.165e-18	3.922e-18	-17.380	-17.407	-0.026	(0)
FeF+2	3.206e-18	2.521e-18	-17.494	-17.598	-0.104	(0)
FeF3	3.217e-19	3.217e-19	-18.493	-18.493	0.000	(0)
FeSO4+	1.639e-19	1.543e-19	-18.785	-18.812	-0.026	(0)
Fe+3	6.850e-20	3.954e-20	-19.164	-19.403	-0.239	(0)
Fe (SO4) 2-	1.226e-21	1.148e-21	-20.912	-20.940	-0.029	(0)
FeCl+2	5.382e-23	4.231e-23	-22.269	-22.374	-0.104	(0)
FeHSeO3+2	4.052e-25	3.117e-25	-24.392	-24.506	-0.114	(0)
Fe2 (OH) 2+4	4.084e-26	1.429e-26	-25.389	-25.845	-0.456	(0)
FeCl2+	7.113e-27	6.698e-27	-26.148	-26.174	-0.026	(0)
FeCl3	2.373e-32	2.373e-32	-31.625	-31.625	0.000	(0)
Fe3 (OH) 4+5	7.009e-33	1.359e-33	-32.154	-32.867	-0.713	(0)
H (0)	2.166e-27					
H2	1.083e-27	1.084e-27	-26.965	-26.965	0.000	(0)
K	1.134e-04					
K+	1.131e-04	1.064e-04	-3.946	-3.973	-0.027	(0)
KSO4-	2.783e-07	2.621e-07	-6.556	-6.581	-0.026	(0)
Mg	1.645e-04					
Mg+2	1.545e-04	1.210e-04	-3.811	-3.917	-0.106	(0)
MgSO4	7.662e-06	7.662e-06	-5.116	-5.116	0.000	(0)
MgHCO3+	1.084e-06	1.020e-06	-5.965	-5.992	-0.027	(0)
MgF+	8.389e-07	7.895e-07	-6.076	-6.103	-0.026	(0)
MgCO3	3.140e-07	3.140e-07	-6.503	-6.503	0.000	(0)
MgOH+	4.158e-08	3.921e-08	-7.381	-7.407	-0.025	(0)

MgH2BO3+	9.102e-11	8.549e-11	-10.041	-10.068	-0.027	(0)
Mn (2)	7.790e-07					
Mn+2	7.317e-07	5.628e-07	-6.136	-6.250	-0.114	(0)
MnSO4	3.482e-08	3.482e-08	-7.458	-7.458	0.000	(0)
MnHCO3+	9.817e-09	9.245e-09	-8.008	-8.034	-0.026	(0)
MnF+	1.383e-09	1.303e-09	-8.859	-8.885	-0.026	(0)
MnOH+	1.222e-09	1.150e-09	-8.913	-8.939	-0.026	(0)
MnCl+	2.666e-11	2.511e-11	-10.574	-10.600	-0.026	(0)
MnCl2	1.257e-15	1.257e-15	-14.901	-14.901	0.000	(0)
MnSeO4	1.173e-17	1.173e-17	-16.931	-16.931	0.000	(0)
Mn (OH) 3-	4.999e-18	4.707e-18	-17.301	-17.327	-0.026	(0)
MnCl3-	1.302e-20	1.226e-20	-19.885	-19.911	-0.026	(0)
Mn (OH) 4-2	1.573e-23	1.237e-23	-22.803	-22.908	-0.104	(0)
MnSe	1.454e-39	1.454e-39	-38.837	-38.837	0.000	(0)
Mn (3)	4.355e-28					
Mn+3	4.355e-28	2.514e-28	-27.361	-27.600	-0.239	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.307	-45.412	-0.104	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.757	-50.784	-0.027	(0)
Mo	5.796e-08					
MoO4-2	5.795e-08	4.539e-08	-7.237	-7.343	-0.106	(0)
HMoO4-	1.193e-11	1.118e-11	-10.923	-10.952	-0.029	(0)
H2MoO4	1.013e-15	1.013e-15	-14.994	-14.994	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.884	-52.141	-0.257	(0)
Mo7O24-6	0.000e+00	0.000e+00	-60.645	-61.671	-1.026	(0)
HMo7O24-5	0.000e+00	0.000e+00	-62.479	-63.192	-0.713	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-65.861	-66.317	-0.456	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-70.722	-70.979	-0.257	(0)
Na	1.411e-04					
Na+	1.408e-04	1.325e-04	-3.851	-3.878	-0.027	(0)
NaSO4-	2.627e-07	2.475e-07	-6.581	-6.606	-0.026	(0)
NaHCO3	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
NaCO3-	8.167e-09	7.694e-09	-8.088	-8.114	-0.026	(0)
NaF	4.859e-09	4.859e-09	-8.313	-8.313	0.000	(0)
NaH2BO3	4.276e-12	4.276e-12	-11.369	-11.369	0.000	(0)
O (0)	8.622e-39					
O2	4.311e-39	4.314e-39	-38.365	-38.365	0.000	(0)
S (6)	4.928e-04					
SO4-2	4.441e-04	3.479e-04	-3.352	-3.459	-0.106	(0)
CaSO4	4.046e-05	4.046e-05	-4.393	-4.393	0.000	(0)
MgSO4	7.662e-06	7.662e-06	-5.116	-5.116	0.000	(0)
KSO4-	2.783e-07	2.621e-07	-6.556	-6.581	-0.026	(0)
NaSO4-	2.627e-07	2.475e-07	-6.581	-6.606	-0.026	(0)
MnSO4	3.482e-08	3.482e-08	-7.458	-7.458	0.000	(0)
ZnSO4	1.017e-09	1.017e-09	-8.993	-8.993	0.000	(0)
CuSO4	6.819e-10	6.819e-10	-9.166	-9.166	0.000	(0)
HSO4-	4.470e-10	4.207e-10	-9.350	-9.376	-0.026	(0)
Zn (SO4) 2-2	4.008e-12	3.083e-12	-11.397	-11.511	-0.114	(0)
FeSO4	3.635e-12	3.635e-12	-11.440	-11.440	0.000	(0)
UO2SO4	2.744e-15	2.744e-15	-14.562	-14.562	0.000	(0)
AlSO4+	6.719e-16	6.324e-16	-15.173	-15.199	-0.026	(0)
UO2 (SO4) 2-2	1.636e-17	1.258e-17	-16.786	-16.900	-0.114	(0)
Al (SO4) 2-	2.505e-18	2.357e-18	-17.601	-17.628	-0.026	(0)
VO2SO4-	5.952e-19	5.574e-19	-18.225	-18.254	-0.029	(0)
FeSO4+	1.639e-19	1.543e-19	-18.785	-18.812	-0.026	(0)
VOSO4	7.874e-21	7.874e-21	-20.104	-20.104	0.000	(0)
Fe (SO4) 2-	1.226e-21	1.148e-21	-20.912	-20.940	-0.029	(0)
VSO4+	1.096e-34	1.026e-34	-33.960	-33.989	-0.029	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.114	-41.114	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.442	-41.556	-0.114	(0)
Sb (3)	8.246e-20					
Sb (OH) 3	4.172e-20	4.172e-20	-19.380	-19.380	0.000	(0)
HSbO2	4.073e-20	4.073e-20	-19.390	-19.390	0.000	(0)
SbO2-	5.692e-24	5.331e-24	-23.245	-23.273	-0.029	(0)
Sb (OH) 4-	3.262e-24	3.055e-24	-23.487	-23.515	-0.029	(0)
Sb (OH) 2F	4.689e-26	4.689e-26	-25.329	-25.329	0.000	(0)
SbOF	4.611e-26	4.611e-26	-25.336	-25.336	0.000	(0)

Sb(OH) 2+	1.339e-26	1.254e-26	-25.873	-25.902	-0.029	(0)
SbO+	4.615e-27	4.322e-27	-26.336	-26.364	-0.029	(0)
Sb (5)	9.858e-10					
SbO3-	9.846e-10	9.221e-10	-9.007	-9.035	-0.029	(0)
Sb(OH) 6-	1.146e-12	1.078e-12	-11.941	-11.967	-0.027	(0)
SbO2+	4.324e-26	4.049e-26	-25.364	-25.393	-0.029	(0)
Se (-2)	8.286e-36					
HSe-	8.283e-36	7.757e-36	-35.082	-35.110	-0.029	(0)
MnSe	1.454e-39	1.454e-39	-38.837	-38.837	0.000	(0)
H2Se	7.451e-40	7.451e-40	-39.128	-39.128	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.089	-42.203	-0.114	(0)
Se (4)	4.433e-09					
HSeO3-	3.185e-09	2.983e-09	-8.497	-8.525	-0.029	(0)
SeO3-2	1.248e-09	9.597e-10	-8.904	-9.018	-0.114	(0)
H2SeO3	1.575e-14	1.575e-14	-13.803	-13.803	0.000	(0)
FeHSeO3+2	4.052e-25	3.117e-25	-24.392	-24.506	-0.114	(0)
Se (6)	9.891e-14					
SeO4-2	9.890e-14	7.747e-14	-13.005	-13.111	-0.106	(0)
MnSeO4	1.173e-17	1.173e-17	-16.931	-16.931	0.000	(0)
ZnSeO4	1.604e-19	1.604e-19	-18.795	-18.795	0.000	(0)
HSeO4-	5.130e-20	4.804e-20	-19.290	-19.318	-0.029	(0)
Zn (SeO4) 2-2	1.638e-32	1.260e-32	-31.786	-31.900	-0.114	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.237	-57.493	-0.257	(0)
U (4)	5.611e-19					
U(OH) 5-	5.609e-19	5.252e-19	-18.251	-18.280	-0.029	(0)
U(OH) 4	2.722e-22	2.722e-22	-21.565	-21.565	0.000	(0)
U(OH) 3+	1.315e-26	1.231e-26	-25.881	-25.910	-0.029	(0)
U(OH) 2+2	9.161e-32	7.046e-32	-31.038	-31.152	-0.114	(0)
UF3+	1.678e-36	1.572e-36	-35.775	-35.804	-0.029	(0)
UF2+2	2.218e-37	1.706e-37	-36.654	-36.768	-0.114	(0)
UOH+3	7.412e-38	4.106e-38	-37.130	-37.387	-0.257	(0)
UF4	1.002e-38	1.002e-38	-37.999	-37.999	0.000	(0)
UF+3	4.207e-40	2.330e-40	-39.376	-39.633	-0.257	(0)
UF5-	0.000e+00	0.000e+00	-40.608	-40.637	-0.029	(0)
U(SO4) 2	0.000e+00	0.000e+00	-41.114	-41.114	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.442	-41.556	-0.114	(0)
UF6-2	0.000e+00	0.000e+00	-42.278	-42.392	-0.114	(0)
U+4	0.000e+00	0.000e+00	-44.241	-44.697	-0.456	(0)
UC1+3	0.000e+00	0.000e+00	-47.191	-47.448	-0.257	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-164.416	-166.725	-2.309	(0)
U (5)	3.392e-16					
UO2+	3.392e-16	3.176e-16	-15.470	-15.498	-0.029	(0)
U (6)	7.101e-09					
UO2 (CO3) 2-2	5.236e-09	4.027e-09	-8.281	-8.395	-0.114	(0)
UO2 (CO3) 3-4	1.799e-09	6.296e-10	-8.745	-9.201	-0.456	(0)
UO2CO3	6.471e-11	6.471e-11	-10.189	-10.189	0.000	(0)
UO2OH+	5.700e-13	5.338e-13	-12.244	-12.273	-0.029	(0)
UO2F+	4.466e-14	4.182e-14	-13.350	-13.379	-0.029	(0)
UO2F2	7.012e-15	7.012e-15	-14.154	-14.154	0.000	(0)
UO2+2	6.652e-15	5.211e-15	-14.177	-14.283	-0.106	(0)
UO2SO4	2.744e-15	2.744e-15	-14.562	-14.562	0.000	(0)
UO2F3-	1.093e-16	1.024e-16	-15.961	-15.990	-0.029	(0)
UO2 (SO4) 2-2	1.636e-17	1.258e-17	-16.786	-16.900	-0.114	(0)
(UO2) 2 (OH) 2+2	6.149e-19	4.729e-19	-18.211	-18.325	-0.114	(0)
UO2C1+	3.198e-19	2.995e-19	-18.495	-18.524	-0.029	(0)
(UO2) 3 (OH) 5+	1.354e-19	1.268e-19	-18.868	-18.897	-0.029	(0)
UO2F4-2	6.149e-20	4.729e-20	-19.211	-19.325	-0.114	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.065	-40.094	-0.029	(0)
V+2	0.000e+00	0.000e+00	-41.400	-41.514	-0.114	(0)
V (3)	2.716e-13					
V(OH) 3	2.716e-13	2.716e-13	-12.566	-12.566	0.000	(0)
V(OH) 2+	2.319e-24	2.171e-24	-23.635	-23.663	-0.029	(0)
VOH+2	3.313e-28	2.548e-28	-27.480	-27.594	-0.114	(0)
V+3	1.128e-33	6.249e-34	-32.948	-33.204	-0.257	(0)
VSO4+	1.096e-34	1.026e-34	-33.960	-33.989	-0.029	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-52.549	-52.805	-0.257	(0)

V2 (OH) 2+4	0.000e+00	0.000e+00	-53.931	-54.387	-0.456	(0)
V (4)	1.439e-17					
V (OH) 3+	1.425e-17	1.334e-17	-16.846	-16.875	-0.029	(0)
VO+2	1.068e-19	8.218e-20	-18.971	-19.085	-0.114	(0)
VOF+	3.060e-20	2.866e-20	-19.514	-19.543	-0.029	(0)
VOSO4	7.874e-21	7.874e-21	-20.104	-20.104	0.000	(0)
VOF2	6.247e-22	6.247e-22	-21.204	-21.204	0.000	(0)
VOC1+	8.724e-24	8.169e-24	-23.059	-23.088	-0.029	(0)
VOF3-	1.376e-24	1.289e-24	-23.861	-23.890	-0.029	(0)
VOF4-2	3.932e-28	3.024e-28	-27.405	-27.519	-0.114	(0)
H2V2O4+2	1.160e-29	8.922e-30	-28.936	-29.050	-0.114	(0)
V (5)	2.925e-08					
H2VO4-	2.345e-08	2.196e-08	-7.630	-7.658	-0.029	(0)
HVO4-2	5.797e-09	4.459e-09	-8.237	-8.351	-0.114	(0)
H3VO4	2.718e-12	2.718e-12	-11.566	-11.566	0.000	(0)
H3V2O7-	4.116e-13	3.854e-13	-12.386	-12.414	-0.029	(0)
HV2O7-3	5.990e-14	3.318e-14	-13.223	-13.479	-0.257	(0)
VO4-3	3.260e-15	1.806e-15	-14.487	-14.743	-0.257	(0)
V2O7-4	2.063e-16	7.218e-17	-15.686	-16.142	-0.456	(0)
VO2+	7.133e-17	6.710e-17	-16.147	-16.173	-0.027	(0)
V3O9-3	2.003e-17	1.110e-17	-16.698	-16.955	-0.257	(0)
VO2F	6.842e-18	6.842e-18	-17.165	-17.165	0.000	(0)
VO2SO4-	5.952e-19	5.574e-19	-18.225	-18.254	-0.029	(0)
VO2F2-	1.542e-19	1.444e-19	-18.812	-18.840	-0.029	(0)
V4O12-4	2.903e-22	1.016e-22	-21.537	-21.993	-0.456	(0)
VO2F3-2	1.362e-22	1.047e-22	-21.866	-21.980	-0.114	(0)
VO2F4-3	5.409e-27	2.996e-27	-26.267	-26.523	-0.257	(0)
V10O28-6	0.000e+00	0.000e+00	-58.281	-59.307	-1.026	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.315	-59.028	-0.713	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.272	-61.728	-0.456	(0)
Zn	2.218e-08					
Zn+2	1.706e-08	1.337e-08	-7.768	-7.874	-0.106	(0)
ZnCO3	2.399e-09	2.399e-09	-8.620	-8.620	0.000	(0)
ZnOH+	1.161e-09	1.088e-09	-8.935	-8.963	-0.029	(0)
ZnSO4	1.017e-09	1.017e-09	-8.993	-8.993	0.000	(0)
ZnHCO3+	3.716e-10	3.480e-10	-9.430	-9.458	-0.029	(0)
Zn (OH) 2	1.403e-10	1.403e-10	-9.853	-9.853	0.000	(0)
ZnF+	1.656e-11	1.551e-11	-10.781	-10.810	-0.029	(0)
Zn (SO4) 2-2	4.008e-12	3.083e-12	-11.397	-11.511	-0.114	(0)
ZnOHC1	1.267e-12	1.267e-12	-11.897	-11.897	0.000	(0)
ZnCl+	1.265e-12	1.190e-12	-11.898	-11.925	-0.027	(0)
Zn (OH) 3-	6.109e-13	5.721e-13	-12.214	-12.243	-0.029	(0)
ZnCl2	6.682e-17	6.682e-17	-16.175	-16.175	0.000	(0)
Zn (OH) 4-2	2.410e-17	1.853e-17	-16.618	-16.732	-0.114	(0)
ZnSeO4	1.604e-19	1.604e-19	-18.795	-18.795	0.000	(0)
ZnCl3-	1.999e-21	1.881e-21	-20.699	-20.726	-0.027	(0)
ZnCl4-2	4.238e-26	3.332e-26	-25.373	-25.477	-0.104	(0)
Zn (SeO4) 2-2	1.638e-32	1.260e-32	-31.786	-31.900	-0.114	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al (OH) 3 (am)	-2.71	8.09	10.80	Al (OH) 3
Al2 (MoO4) 3	-55.66	-53.29	2.37	Al2 (MoO4) 3
Al2O3	-3.47	16.18	19.65	Al2O3
Al4 (OH) 10SO4	-9.61	13.09	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.95	-7.15	4.80	AlAsO4:2H2O
AlOHSO4	-7.95	-11.18	-3.23	AlOHSO4
AlSb	-148.36	-82.73	65.62	AlSb
Alunite	-8.94	-10.34	-1.40	KAl3 (SO4) 2 (OH) 6
Anhydrite	-2.39	-6.75	-4.36	CaSO4
Antlerite	-4.82	3.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.50	-8.80	-8.30	CaCO3
Arsenolite	-77.88	-80.64	-2.76	As4O6
Artinite	-7.13	2.47	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.19	-30.49	6.71	As2O5
Atacamite	-4.25	3.14	7.39	Cu2 (OH) 3Cl

Azurite	-2.49	-19.40	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-16.03	8.36	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-15.68	0.19	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	3.51	-5.40	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-24.38	8.56	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaF ₂	-10.10	-15.92	-5.82	BaF ₂
BaMoO ₄	-7.83	-14.79	-6.96	BaMoO ₄
Barite	-0.93	-10.91	-9.98	BaSO ₄
BaSeO ₃	-9.90	-8.07	1.83	BaSeO ₃
BaSeO ₄	-13.10	-20.56	-7.46	BaSeO ₄
Bianchite	-9.57	-11.33	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-10.06	8.03	18.09	MnO ₂
Bixbyite	-7.11	-7.75	-0.64	Mn ₂ O ₃
Boehmite	-0.49	8.09	8.58	AlOOH
Brochantite	-3.51	11.72	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.95	11.90	16.84	Mg(OH) ₂
Ca(VO ₃) ₂	-9.67	-4.01	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.99	8.51	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-13.04	8.51	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-15.23	7.07	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-17.93	21.03	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-18.83	21.03	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-287.06	-144.09	142.97	Ca ₃ Sb ₂
Calcite	-0.32	-8.80	-8.48	CaCO ₃
CaMoO ₄	-2.69	-10.64	-7.95	CaMoO ₄
Carnotite	-3.03	-2.80	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-6.73	-3.91	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-13.39	-16.41	-3.02	CaSeO ₄ ·2H ₂ O
CH ₄ (g)	-75.54	-116.58	-41.05	CH ₄
Chalcanthite	-8.89	-11.53	-2.64	CuSO ₄ ·5H ₂ O
Claudetite	-77.58	-80.64	-3.06	As ₄ O ₆
CO ₂ (g)	-3.17	-21.32	-18.15	CO ₂
Cryolite	-18.84	-52.68	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.93	7.75	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-28.59	16.62	45.21	Cu(SbO ₃) ₂
Cu ₂ Sb·3H ₂ O	-49.66	-84.55	-34.88	Cu ₂ Sb·3H ₂ O
Cu ₂ Se(alpha)	-0.16	-45.96	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-20.26	-22.21	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-13.35	-7.25	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-52.64	-95.24	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-17.74	-81.23	-63.49	Cu ₃ Se ₂
CuCO ₃	-2.07	-13.57	-11.50	CuCO ₃
CuF	-8.71	-13.61	-4.91	CuF
CuF ₂	-17.65	-16.54	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-11.99	-16.54	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-4.62	-13.38	-8.76	Cu
CuMoO ₄	-2.33	-15.41	-13.08	CuMoO ₄
CuOCuSO ₄	-14.08	-3.78	10.30	CuOCuSO ₄
Cupricferrite	10.40	16.39	5.99	CuFe ₂ O ₄
Cuprite	-1.53	-2.94	-1.41	Cu ₂ O
Cuprousferrite	11.77	2.85	-8.92	CuFeO ₂
CuSe	-2.17	-35.27	-33.10	CuSe
CuSe ₂	-21.11	-54.47	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-9.20	-8.69	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-18.74	-21.18	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-14.47	-11.53	2.94	CuSO ₄
Diaspore	1.22	8.09	6.87	AlOOH
Dolomite(disordered)	-1.68	-18.22	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	-1.13	-18.22	-17.09	CaMg(CO ₃) ₂
Epsomite	-5.25	-7.38	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-8.12	5.44	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.65	0.61	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-7.37	-11.09	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.35	-7.79	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-20.03	-40.66	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-45.45	-49.18	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-6.14	14.08	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-11.32	-10.92	0.40	FeAsO ₄ ·2H ₂ O

FeMoO4	-7.62	-17.71	-10.09	FeMoO4
Ferrihydrite	1.13	4.32	3.19	Fe(OH)3
Ferroselite	-38.18	-56.78	-18.60	FeSe2
FeSe	-26.57	-37.57	-11.00	FeSe
Fluorite	-1.27	-11.77	-10.50	CaF2
Gibbsite	-0.20	8.09	8.29	Al(OH)3
Goethite	3.83	4.32	0.49	FeOOH
Goslarite	-9.32	-11.33	-2.01	ZnSO4·7H2O
Gummite	-6.14	1.53	7.67	UO3
Gypsum	-2.14	-6.75	-4.61	CaSO4·2H2O
H-Jarosite	-13.49	-25.59	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.28	-23.16	-12.88	H2MoO4
H2Se(g)	-38.06	-43.02	-4.96	H2Se
Halite	-9.93	-8.33	1.60	NaCl
Hausmannite	-8.52	52.51	61.03	Mn3O4
Hematite	10.06	8.64	-1.42	Fe2O3
Hercynite	-1.26	21.63	22.89	FeAl2O4
Huntite	-7.10	-37.07	-29.97	CaMg3(CO3)4
Hydromagnesite	-17.03	-25.79	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-21.35	-26.52	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-6.85	-21.65	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-18.55	-15.29	3.26	K2MoO4
K2SeO4	-20.33	-21.06	-0.73	K2SeO4
Langite	-5.77	11.72	17.49	Cu4(OH)6SO4·H2O
Lepidocrocite	2.95	4.32	1.37	FeOOH
Lime	-20.18	12.52	32.70	CaO
Maghemite	2.25	8.64	6.39	Fe2O3
Magnesioferrite	3.68	20.54	16.86	Fe2MgO4
Magnesite	-1.96	-9.42	-7.46	MgCO3
Magnetite	10.68	14.08	3.40	Fe3O4
Malachite	-0.52	-5.83	-5.31	Cu2(OH)2CO3
Manganite	-3.87	21.47	25.34	MnOOH
Melanothallite	-23.23	-16.97	6.26	CuCl2
Melanterite	-11.62	-13.83	-2.21	FeSO4·7H2O
Mg(OH)2(active)	-6.90	11.90	18.79	Mg(OH)2
Mg(VO3)2	-15.91	-4.63	11.28	Mg(VO3)2
Mg2Sb3	-263.82	-189.14	74.68	Mg2Sb3
Mg2V2O7	-19.10	7.26	26.36	Mg2V2O7
MgF2	-4.26	-12.39	-8.13	MgF2
MgMoO4	-9.41	-11.26	-1.85	MgMoO4
MgSeO3·6H2O	-7.59	-4.54	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-15.83	-17.03	-1.20	MgSeO4·6H2O
Mirabilite	-10.10	-11.21	-1.11	Na2SO4·10H2O
Mn(VO3)2	-11.87	-6.97	4.90	Mn(VO3)2
Mn2(SO4)3	-59.86	-65.57	-5.71	Mn2(SO4)3
Mn2Sb	-144.68	-83.60	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-14.29	-1.79	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-17.87	-15.15	2.72	MnCl2·4H2O
MnSb	-91.79	-94.70	-2.91	MnSb
MnSe	-36.95	-33.45	3.50	MnSe
MnSeO3	-8.00	-6.87	1.13	MnSeO3
MnSeO3·2H2O	-7.85	-6.87	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-17.31	-19.36	-2.05	MnSeO4·5H2O
MnSO4	-12.29	-9.71	2.58	MnSO4
MoO3	-15.16	-23.16	-8.00	MoO3
Na-Jarosite	-10.36	-21.56	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-21.66	-38.26	-16.60	Na2Mo2O7
Na2MoO4	-16.59	-15.10	1.49	Na2MoO4
Na2MoO4·2H2O	-16.32	-15.10	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-18.67	-8.37	10.30	Na2SeO3·5H2O
Na2SeO4	-22.15	-20.87	1.28	Na2SeO4
Na3Sb	-173.19	-78.74	94.45	Na3Sb
Na3VO4	-32.86	3.82	36.68	Na3VO4
Na4V2O7	-37.81	-0.41	37.40	Na4V2O7
Nantokite	-7.10	-13.83	-6.73	CuCl
NaSb	-86.15	-62.98	23.17	NaSb
Natron	-11.95	-13.26	-1.31	Na2CO3·10H2O
NaVO3	-8.09	-4.24	3.86	NaVO3

Nesquehonite	-4.75	-9.42	-4.67	MgCO3:3H2O
Nsutite	-9.47	8.03	17.50	MnO2
O2(g)	-35.46	47.63	83.09	O2
Periclase	-9.69	11.90	21.58	MgO
Portlandite	-10.28	12.52	22.80	Ca(OH)2
Pyrochroite	-5.63	9.57	15.19	Mn(OH)2
Pyrolusite	-8.00	33.38	41.38	MnO2
Rhodochrosite	-1.18	-11.76	-10.58	MnCO3
Rutherfordine	-5.29	-19.79	-14.50	UO2CO3
Sb(OH)3	-12.27	-19.38	-7.11	Sb(OH)3
Sb2O4	-18.35	-14.94	3.40	Sb2O4
Sb2O5	-30.08	-39.75	-9.67	Sb2O5
Sb2Se3	-100.06	-167.81	-67.76	Sb2Se3
Sb4O6(cubic)	-59.26	-77.52	-18.26	Sb4O6
Sb4O6(orth)	-59.62	-77.52	-17.90	Sb4O6
SbCl3	-57.03	-56.45	0.57	SbCl3
SbF3	-45.58	-55.81	-10.23	SbF3
Sbmetal	-43.41	-55.10	-11.69	Sb
SbO2	-3.96	-31.78	-27.82	SbO2
Schoepite	-4.46	1.53	5.99	UO2(OH)2:H2O
Semetal(am)	-12.09	-19.20	-7.11	Se
Semetal(hex)	-11.49	-19.20	-7.71	Se
Senarmontite	-26.39	-38.76	-12.37	Sb2O3
SeO2	-16.56	-16.43	0.12	SeO2
SeO3	-49.97	-28.93	21.04	SeO3
Siderite	-5.64	-15.88	-10.24	FeCO3
Smithsonite	-3.38	-13.38	-10.00	ZnCO3
Spinel	-8.77	28.08	36.85	MgAl2O4
Tenorite	0.10	7.75	7.64	CuO
Thenardite	-11.54	-11.21	0.32	Na2SO4
Thermonatrite	-13.90	-13.26	0.64	Na2CO3:H2O
Tyuyamunite	-5.03	-0.95	4.08	Ca(UO2)2(VO4)2
U3O8	-12.65	8.43	21.08	U3O8
U3Sb4	-554.88	-402.50	152.38	U3Sb4
U4O9	-25.43	-28.45	-3.02	U4O9
UF4	-32.10	-61.64	-29.54	UF4
UF4:2.5H2O	-28.92	-61.64	-32.72	UF4:2.5H2O
UO2(am)	-14.00	-13.07	0.93	UO2
UO2(OH)2(beta)	-4.08	1.53	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.14	-27.39	-2.25	UO2SeO4:4H2O
UO3	-6.17	1.53	7.70	UO3
Uraninite	-8.40	-13.07	-4.67	UO2
USb2	-209.69	-180.12	29.58	USb2
V(OH)3	-17.07	-9.48	7.59	V(OH)3
V2O5	-15.17	-16.53	-1.36	V2O5
V3O5	-35.46	-33.63	1.84	V3O5
V4O7	-44.08	-36.90	7.19	V4O7
V6O13	-36.36	-97.22	-60.86	V6O13
Valentinite	-30.28	-38.76	-8.48	Sb2O3
VC12	-64.98	-46.11	18.87	VC12
VC13	-69.99	-46.56	23.43	VC13
VF4	-66.77	-51.84	14.93	VF4
Vmetal	-89.23	-45.20	44.03	V
VO	-36.15	-21.39	14.76	VO
VO(OH)2	-8.42	-3.27	5.15	VO(OH)2
VO2Cl	-23.47	-20.62	2.84	VO2Cl
VOC1	-32.99	-21.84	11.15	VOC1
VOC12	-40.75	-27.99	12.76	VOC12
VOSO4	-26.15	-22.54	3.61	VOSO4
Witherite	-4.39	-12.96	-8.57	BaCO3
Zincite	-3.39	7.94	11.33	ZnO
Zincosite	-15.26	-11.33	3.93	ZnSO4
Zn(BO2)2	-13.07	-4.78	8.29	Zn(BO2)2
Zn(OH)2	-4.26	7.94	12.20	Zn(OH)2
Zn(OH)2(am)	-4.53	7.94	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.81	7.94	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.59	7.94	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.79	7.94	11.73	Zn(OH)2

Zn2(OH)2SO4	-10.89	-3.39	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.67	3.52	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-20.32	-6.67	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-33.64	-14.72	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.91	12.49	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-23.51	14.99	38.50	Zn5(OH)8Cl2
ZnCl2	-23.83	-16.78	7.05	ZnCl2
ZnCO3:1H2O	-3.12	-13.38	-10.26	ZnCO3:1H2O
ZnF2	-15.81	-16.35	-0.53	ZnF2
Znmetal	-41.66	-15.87	25.79	Zn
ZnMoO4	-5.09	-15.22	-10.13	ZnMoO4
ZnO(active)	-3.25	7.94	11.19	ZnO
ZnSb	-81.99	-70.98	11.01	ZnSb
ZnSe	-20.68	-35.08	-14.40	ZnSe
ZnSeO4:6H2O	-19.46	-20.98	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.69	-11.33	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 13.

SOLUTION 11 Average HCT data for biotite breccia - sulfide (ore) (cells
604767, 604797, 604811, 604854, 604862, 604867 and 605033)

temp 25
pH 7.86290
pe 4
redox pe
units mg/l
density 1
Alkalinity 44.99190 as HCO3
Al 0.00457
As 0.00034
B 0.00498
Ba 0.00905
Ca 24.11789
Cl 1.30010
Cu 0.00845
F 1.09342
Fe 0.00069
K 3.75232
Mg 3.96764
Mn 0.07221
Mo 0.00520
Na 2.41114 charge
S(6) 44.45388 as SO4
Sb 0.00012
Se 0.00031
U 0.00331
V 0.00104
Zn 0.00272
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 11. Average HCT data for biotite breccia - sulfide (ore)
(cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

-----Solution composition-----

Elements	Molality	Moles
Al	1.694e-07	1.694e-07
Alkalinity	7.374e-04	7.374e-04
As	4.539e-09	4.539e-09
B	4.607e-07	4.607e-07
Ba	6.591e-08	6.591e-08
Ca	6.018e-04	6.018e-04
Cl	3.668e-05	3.668e-05
Cu	1.330e-07	1.330e-07
F	5.756e-05	5.756e-05
Fe	1.236e-08	1.236e-08
K	9.598e-05	9.598e-05
Mg	1.633e-04	1.633e-04
Mn	1.315e-06	1.315e-06
Mo	5.421e-08	5.421e-08
Na	1.275e-04	1.275e-04
S (6)	4.628e-04	4.628e-04
Sb	9.858e-10	9.858e-10
Se	3.927e-09	3.927e-09
U	1.391e-08	1.391e-08
V	2.042e-08	2.042e-08
Zn	4.160e-08	4.160e-08

Charge balance

-----Description of solution-----

pH = 7.863
 pe = 4.000
 Activity of water = 1.000
 Ionic strength (mol/kgw) = 2.801e-03
 Mass of water (kg) = 1.000e+00
 Total carbon (mol/kg) = 7.519e-04
 Total CO2 (mol/kg) = 7.519e-04
 Temperature (°C) = 25.00
 Electrical balance (eq) = -8.708e-19
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
 Iterations = 10
 Total H = 1.110144e+02
 Total O = 5.551094e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	7.786e-07	7.343e-07	-6.109	-6.134	-0.025	(0)
H+	1.453e-08	1.371e-08	-7.838	-7.863	-0.025	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.694e-07					
Al (OH) 4-	1.676e-07	1.582e-07	-6.776	-6.801	-0.025	(0)
Al (OH) 3	1.711e-09	1.711e-09	-8.767	-8.767	0.000	(0)
Al (OH) 2+	1.236e-10	1.168e-10	-9.908	-9.933	-0.025	(0)
AlF2+	3.266e-12	3.086e-12	-11.486	-11.511	-0.025	(0)
AlF3	2.071e-12	2.071e-12	-11.684	-11.684	0.000	(0)
AlOH+2	2.513e-13	2.002e-13	-12.600	-12.699	-0.099	(0)
AlF+2	1.825e-13	1.454e-13	-12.739	-12.838	-0.099	(0)
AlF4-	5.864e-14	5.535e-14	-13.232	-13.257	-0.025	(0)
AlSO4+	7.482e-16	7.063e-16	-15.126	-15.151	-0.025	(0)
Al+3	4.597e-16	2.726e-16	-15.338	-15.564	-0.227	(0)
Al (SO4) 2-	2.675e-18	2.526e-18	-17.573	-17.598	-0.025	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.708	-51.950	-0.243	(0)
As (3)	1.477e-20					
H3AsO3	1.420e-20	1.420e-20	-19.848	-19.848	0.000	(0)
H2AsO3-	5.653e-22	5.312e-22	-21.248	-21.275	-0.027	(0)
HAsO3-2	4.530e-26	3.533e-26	-25.344	-25.452	-0.108	(0)
H4AsO3+	1.027e-28	9.649e-29	-27.989	-28.016	-0.027	(0)
AsO3-3	1.738e-31	9.933e-32	-30.760	-31.003	-0.243	(0)
As (5)	4.539e-09					

	HAsO4-2	4.111e-09	3.206e-09	-8.386	-8.494	-0.108	(0)
	H2AsO4-	4.266e-10	4.009e-10	-9.370	-9.397	-0.027	(0)
	AsO4-3	1.294e-12	7.394e-13	-11.888	-12.131	-0.243	(0)
	H3AsO4	9.547e-16	9.553e-16	-15.020	-15.020	0.000	(0)
B	4.607e-07						
	H3BO3	4.403e-07	4.406e-07	-6.356	-6.356	0.000	(0)
	H2BO3-	1.981e-08	1.866e-08	-7.703	-7.729	-0.026	(0)
	CaH2BO3+	5.061e-10	4.768e-10	-9.296	-9.322	-0.026	(0)
	MgH2BO3+	8.380e-11	7.896e-11	-10.077	-10.103	-0.026	(0)
	BF(OH) 3-	9.950e-12	9.375e-12	-11.002	-11.028	-0.026	(0)
	NaH2BO3	3.552e-12	3.552e-12	-11.450	-11.450	0.000	(0)
	BaH2BO3+	3.178e-14	2.994e-14	-13.498	-13.524	-0.026	(0)
	H5(BO3) 2-	7.428e-15	6.999e-15	-14.129	-14.155	-0.026	(0)
	BF2(OH) 2-	7.777e-16	7.327e-16	-15.109	-15.135	-0.026	(0)
	H8(BO3) 3-	3.273e-19	3.084e-19	-18.485	-18.511	-0.026	(0)
	BF3OH-	2.212e-22	2.084e-22	-21.655	-21.681	-0.026	(0)
	BF4-	7.959e-28	7.498e-28	-27.099	-27.125	-0.026	(0)
Ba	6.591e-08						
	Ba+2	6.549e-08	5.192e-08	-7.184	-7.285	-0.101	(0)
	BaHCO3+	3.564e-10	3.369e-10	-9.448	-9.473	-0.024	(0)
	BaCO3	6.185e-11	6.185e-11	-10.209	-10.209	0.000	(0)
	BaOH+	1.762e-13	1.664e-13	-12.754	-12.779	-0.025	(0)
	BaH2BO3+	3.178e-14	2.994e-14	-13.498	-13.524	-0.026	(0)
C (4)	7.519e-04						
	HCO3-	7.191e-04	6.794e-04	-3.143	-3.168	-0.025	(0)
	H2CO3	2.095e-05	2.095e-05	-4.679	-4.679	0.000	(0)
	CaHCO3+	5.942e-06	5.617e-06	-5.226	-5.250	-0.024	(0)
	CO3-2	2.930e-06	2.323e-06	-5.533	-5.634	-0.101	(0)
	CaCO3	1.635e-06	1.635e-06	-5.787	-5.787	0.000	(0)
	MgHCO3+	8.991e-07	8.483e-07	-6.046	-6.071	-0.025	(0)
	MgCO3	2.357e-07	2.357e-07	-6.628	-6.628	0.000	(0)
	CuCO3	1.009e-07	1.009e-07	-6.996	-6.996	0.000	(0)
	NaHCO3	4.588e-08	4.588e-08	-7.338	-7.338	0.000	(0)
	MnHCO3+	1.387e-08	1.310e-08	-7.858	-7.883	-0.025	(0)
	UO2(CO3) 2-2	1.102e-08	8.592e-09	-7.958	-8.066	-0.108	(0)
	NaCO3-	5.498e-09	5.194e-09	-8.260	-8.284	-0.025	(0)
	ZnCO3	3.521e-09	3.521e-09	-8.453	-8.453	0.000	(0)
	UO2(CO3) 3-4	2.704e-09	1.000e-09	-8.568	-9.000	-0.432	(0)
	Cu(CO3) 2-2	8.086e-10	6.306e-10	-9.092	-9.200	-0.108	(0)
	ZnHCO3+	6.023e-10	5.660e-10	-9.220	-9.247	-0.027	(0)
	BaHCO3+	3.564e-10	3.369e-10	-9.448	-9.473	-0.024	(0)
	CuHCO3+	3.364e-10	3.161e-10	-9.473	-9.500	-0.027	(0)
	UO2CO3	1.854e-10	1.854e-10	-9.732	-9.732	0.000	(0)
	BaCO3	6.185e-11	6.185e-11	-10.209	-10.209	0.000	(0)
	FeHCO3+	4.639e-13	4.385e-13	-12.334	-12.358	-0.024	(0)
Ca	6.018e-04						
	Ca+2	5.600e-04	4.440e-04	-3.252	-3.353	-0.101	(0)
	CaSO4	3.395e-05	3.395e-05	-4.469	-4.469	0.000	(0)
	CaHCO3+	5.942e-06	5.617e-06	-5.226	-5.250	-0.024	(0)
	CaCO3	1.635e-06	1.635e-06	-5.787	-5.787	0.000	(0)
	CaF+	2.736e-07	2.584e-07	-6.563	-6.588	-0.025	(0)
	CaOH+	6.882e-09	6.505e-09	-8.162	-8.187	-0.024	(0)
	CaH2BO3+	5.061e-10	4.768e-10	-9.296	-9.322	-0.026	(0)
Cl	3.668e-05						
	Cl-	3.668e-05	3.461e-05	-4.436	-4.461	-0.025	(0)
	MnCl+	4.458e-11	4.211e-11	-10.351	-10.376	-0.025	(0)
	CuCl	1.574e-11	1.574e-11	-10.803	-10.803	0.000	(0)
	ZnCl+	2.427e-12	2.290e-12	-11.615	-11.640	-0.025	(0)
	ZnOHCl	2.202e-12	2.202e-12	-11.657	-11.657	0.000	(0)
	CuCl+	4.287e-13	4.045e-13	-12.368	-12.393	-0.025	(0)
	CuCl2-	1.206e-13	1.138e-13	-12.919	-12.944	-0.025	(0)
	MnCl2	2.058e-15	2.058e-15	-14.686	-14.686	0.000	(0)
	ZnCl2	1.256e-16	1.256e-16	-15.901	-15.901	0.000	(0)
	CuCl2	4.854e-18	4.854e-18	-17.314	-17.314	0.000	(0)
	UO2Cl+	1.197e-18	1.125e-18	-17.922	-17.949	-0.027	(0)
	CuCl3-2	1.058e-18	8.419e-19	-17.975	-18.075	-0.099	(0)
	MnCl3-	2.077e-20	1.962e-20	-19.682	-19.707	-0.025	(0)
	ZnCl3-	3.660e-21	3.453e-21	-20.437	-20.462	-0.025	(0)

FeCl+2	6.257e-23	4.978e-23	-22.204	-22.303	-0.099	(0)
VOCl+	9.161e-24	8.609e-24	-23.038	-23.065	-0.027	(0)
CuCl3-	1.662e-24	1.568e-24	-23.779	-23.805	-0.025	(0)
ZnCl4-2	7.511e-26	5.975e-26	-25.124	-25.224	-0.099	(0)
FeCl2+	8.148e-27	7.695e-27	-26.089	-26.114	-0.025	(0)
CuCl4-2	3.418e-31	2.719e-31	-30.466	-30.566	-0.099	(0)
FeCl3	2.663e-32	2.663e-32	-31.575	-31.575	0.000	(0)
UCl+3	0.000e+00	0.000e+00	-46.451	-46.694	-0.243	(0)
Cu (1)	4.002e-10					
Cu+	3.844e-10	3.612e-10	-9.415	-9.442	-0.027	(0)
CuCl	1.574e-11	1.574e-11	-10.803	-10.803	0.000	(0)
CuCl2-	1.206e-13	1.138e-13	-12.919	-12.944	-0.025	(0)
CuCl3-2	1.058e-18	8.419e-19	-17.975	-18.075	-0.099	(0)
Cu (2)	1.326e-07					
CuCO3	1.009e-07	1.009e-07	-6.996	-6.996	0.000	(0)
CuOH+	1.815e-08	1.713e-08	-7.741	-7.766	-0.025	(0)
Cu+2	9.302e-09	7.375e-09	-8.031	-8.132	-0.101	(0)
Cu (OH) 2	2.509e-09	2.509e-09	-8.600	-8.600	0.000	(0)
Cu (CO3) 2-2	8.086e-10	6.306e-10	-9.092	-9.200	-0.108	(0)
CuSO4	5.638e-10	5.638e-10	-9.249	-9.249	0.000	(0)
CuHCO3+	3.364e-10	3.161e-10	-9.473	-9.500	-0.027	(0)
CuF+	2.640e-11	2.481e-11	-10.578	-10.605	-0.027	(0)
Cu2 (OH) 2+2	9.446e-12	7.367e-12	-11.025	-11.133	-0.108	(0)
Cu (OH) 3-	4.022e-12	3.779e-12	-11.396	-11.423	-0.027	(0)
CuCl+	4.287e-13	4.045e-13	-12.368	-12.393	-0.025	(0)
Cu (OH) 4-2	2.801e-17	2.184e-17	-16.553	-16.661	-0.108	(0)
CuCl2	4.854e-18	4.854e-18	-17.314	-17.314	0.000	(0)
CuCl3-	1.662e-24	1.568e-24	-23.779	-23.805	-0.025	(0)
CuCl4-2	3.418e-31	2.719e-31	-30.466	-30.566	-0.099	(0)
F	5.756e-05					
F-	5.651e-05	5.332e-05	-4.248	-4.273	-0.025	(0)
MgF+	7.733e-07	7.300e-07	-6.112	-6.137	-0.025	(0)
CaF+	2.736e-07	2.584e-07	-6.563	-6.588	-0.025	(0)
NaF	4.040e-09	4.040e-09	-8.394	-8.394	0.000	(0)
MnF+	2.172e-09	2.051e-09	-8.663	-8.688	-0.025	(0)
HF	1.081e-09	1.081e-09	-8.966	-8.966	0.000	(0)
ZnF+	2.982e-11	2.803e-11	-10.525	-10.552	-0.027	(0)
CuF+	2.640e-11	2.481e-11	-10.578	-10.605	-0.027	(0)
BF (OH) 3-	9.950e-12	9.375e-12	-11.002	-11.028	-0.026	(0)
AlF2+	3.266e-12	3.086e-12	-11.486	-11.511	-0.025	(0)
AlF3	2.071e-12	2.071e-12	-11.684	-11.684	0.000	(0)
HF2-	2.324e-13	2.192e-13	-12.634	-12.659	-0.025	(0)
AlF+2	1.825e-13	1.454e-13	-12.739	-12.838	-0.099	(0)
UO2F+	1.570e-13	1.475e-13	-12.804	-12.831	-0.027	(0)
AlF4-	5.864e-14	5.535e-14	-13.232	-13.257	-0.025	(0)
UO2F2	2.269e-14	2.269e-14	-13.644	-13.644	0.000	(0)
BF2 (OH) 2-	7.777e-16	7.327e-16	-15.109	-15.135	-0.026	(0)
UO2F3-	3.234e-16	3.039e-16	-15.490	-15.517	-0.027	(0)
VO2F	5.514e-18	5.514e-18	-17.259	-17.259	0.000	(0)
FeF2+	4.207e-18	3.973e-18	-17.376	-17.401	-0.025	(0)
FeF+2	3.500e-18	2.785e-18	-17.456	-17.555	-0.099	(0)
H2F2	3.133e-18	3.133e-18	-17.504	-17.504	0.000	(0)
FeF3	2.989e-19	2.989e-19	-18.524	-18.524	0.000	(0)
UO2F4-2	1.650e-19	1.287e-19	-18.782	-18.890	-0.108	(0)
VO2F2-	1.136e-19	1.067e-19	-18.945	-18.972	-0.027	(0)
VOF+	3.018e-20	2.836e-20	-19.520	-19.547	-0.027	(0)
VOF2	5.670e-22	5.670e-22	-21.246	-21.246	0.000	(0)
BF3OH-	2.212e-22	2.084e-22	-21.655	-21.681	-0.026	(0)
VO2F3-2	9.104e-23	7.100e-23	-22.041	-22.149	-0.108	(0)
VOF3-	1.141e-24	1.073e-24	-23.943	-23.970	-0.027	(0)
Sb (OH) 2F	6.507e-26	6.507e-26	-25.187	-25.187	0.000	(0)
SbOF	6.399e-26	6.399e-26	-25.194	-25.194	0.000	(0)
VO2F4-3	3.259e-27	1.863e-27	-26.487	-26.730	-0.243	(0)
BF4-	7.959e-28	7.498e-28	-27.099	-27.125	-0.026	(0)
VOF4-2	2.960e-28	2.309e-28	-27.529	-27.637	-0.108	(0)
UF3+	7.484e-36	7.033e-36	-35.126	-35.153	-0.027	(0)
UF2+2	1.067e-36	8.322e-37	-35.972	-36.080	-0.108	(0)
UF4	4.112e-38	4.112e-38	-37.386	-37.386	0.000	(0)

UF+3	2.169e-39	1.240e-39	-38.664	-38.907	-0.243	(0)
UF5-	0.000e+00	0.000e+00	-40.034	-40.061	-0.027	(0)
UF6-2	0.000e+00	0.000e+00	-41.746	-41.854	-0.108	(0)
Fe (2)	7.200e-11					
Fe+2	6.574e-11	5.127e-11	-10.182	-10.290	-0.108	(0)
FeSO4	4.200e-12	4.200e-12	-11.377	-11.377	0.000	(0)
FeOH+	1.587e-12	1.499e-12	-11.799	-11.824	-0.025	(0)
FeHCO3+	4.639e-13	4.385e-13	-12.334	-12.358	-0.024	(0)
Fe (OH) 2	8.743e-16	8.743e-16	-15.058	-15.058	0.000	(0)
Fe (OH) 3-	2.150e-16	2.030e-16	-15.668	-15.692	-0.025	(0)
Fe (3)	1.228e-08					
Fe (OH) 2+	6.829e-09	6.451e-09	-8.166	-8.190	-0.025	(0)
Fe (OH) 3	5.088e-09	5.088e-09	-8.293	-8.293	0.000	(0)
Fe (OH) 4-	3.682e-10	3.479e-10	-9.434	-9.459	-0.025	(0)
FeOH+2	2.839e-14	2.258e-14	-13.547	-13.646	-0.099	(0)
FeF2+	4.207e-18	3.973e-18	-17.376	-17.401	-0.025	(0)
FeF+2	3.500e-18	2.785e-18	-17.456	-17.555	-0.099	(0)
FeF3	2.989e-19	2.989e-19	-18.524	-18.524	0.000	(0)
FeSO4+	1.888e-19	1.784e-19	-18.724	-18.749	-0.025	(0)
Fe+3	8.031e-20	4.763e-20	-19.095	-19.322	-0.227	(0)
Fe (SO4) 2-	1.354e-21	1.272e-21	-20.868	-20.895	-0.027	(0)
FeCl+2	6.257e-23	4.978e-23	-22.204	-22.303	-0.099	(0)
FeHSeO3+2	4.411e-25	3.440e-25	-24.355	-24.463	-0.108	(0)
Fe2 (OH) 2+4	4.565e-26	1.689e-26	-25.341	-25.772	-0.432	(0)
FeCl2+	8.148e-27	7.695e-27	-26.089	-26.114	-0.025	(0)
FeCl3	2.663e-32	2.663e-32	-31.575	-31.575	0.000	(0)
Fe3 (OH) 4+5	7.447e-33	1.575e-33	-32.128	-32.803	-0.675	(0)
H (0)	2.660e-27					
H2	1.330e-27	1.331e-27	-26.876	-26.876	0.000	(0)
K	9.598e-05					
K+	9.576e-05	9.036e-05	-4.019	-4.044	-0.025	(0)
KSO4-	2.260e-07	2.135e-07	-6.646	-6.671	-0.025	(0)
Mg	1.633e-04					
Mg+2	1.539e-04	1.220e-04	-3.813	-3.914	-0.101	(0)
MgSO4	7.410e-06	7.410e-06	-5.130	-5.130	0.000	(0)
MgHCO3+	8.991e-07	8.483e-07	-6.046	-6.071	-0.025	(0)
MgF+	7.733e-07	7.300e-07	-6.112	-6.137	-0.025	(0)
MgCO3	2.357e-07	2.357e-07	-6.628	-6.628	0.000	(0)
MgOH+	3.772e-08	3.567e-08	-7.423	-7.448	-0.024	(0)
MgH2BO3+	8.380e-11	7.896e-11	-10.077	-10.103	-0.026	(0)
Mn (2)	1.315e-06					
Mn+2	1.239e-06	9.665e-07	-5.907	-6.015	-0.108	(0)
MnSO4	5.735e-08	5.735e-08	-7.241	-7.241	0.000	(0)
MnHCO3+	1.387e-08	1.310e-08	-7.858	-7.883	-0.025	(0)
MnF+	2.172e-09	2.051e-09	-8.663	-8.688	-0.025	(0)
MnOH+	1.888e-09	1.783e-09	-8.724	-8.749	-0.025	(0)
MnCl+	4.458e-11	4.211e-11	-10.351	-10.376	-0.025	(0)
MnCl2	2.058e-15	2.058e-15	-14.686	-14.686	0.000	(0)
MnSeO4	1.357e-17	1.357e-17	-16.867	-16.867	0.000	(0)
Mn (OH) 3-	6.290e-18	5.941e-18	-17.201	-17.226	-0.025	(0)
MnCl3-	2.077e-20	1.962e-20	-19.682	-19.707	-0.025	(0)
Mn (OH) 4-2	1.770e-23	1.408e-23	-22.752	-22.851	-0.099	(0)
MnSe	3.823e-39	3.823e-39	-38.418	-38.418	0.000	(0)
Mn (3)	7.279e-28					
Mn+3	7.279e-28	4.317e-28	-27.138	-27.365	-0.227	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.434	-45.534	-0.099	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.880	-50.906	-0.026	(0)
Mo	5.421e-08					
MoO4-2	5.419e-08	4.297e-08	-7.266	-7.367	-0.101	(0)
HMoO4-	1.247e-11	1.172e-11	-10.904	-10.931	-0.027	(0)
H2MoO4	1.177e-15	1.177e-15	-14.929	-14.929	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.708	-51.950	-0.243	(0)
Mo7O24-6	0.000e+00	0.000e+00	-60.509	-61.481	-0.972	(0)
HMo7O24-5	0.000e+00	0.000e+00	-62.283	-62.957	-0.675	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-65.606	-66.038	-0.432	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-70.412	-70.655	-0.243	(0)

Na	1.275e-04					
Na+	1.273e-04	1.201e-04	-3.895	-3.921	-0.025	(0)
NaSO4-	2.278e-07	2.152e-07	-6.642	-6.667	-0.025	(0)
NaHCO3	4.588e-08	4.588e-08	-7.338	-7.338	0.000	(0)
NaCO3-	5.498e-09	5.194e-09	-8.260	-8.284	-0.025	(0)
NaF	4.040e-09	4.040e-09	-8.394	-8.394	0.000	(0)
NaH2BO3	3.552e-12	3.552e-12	-11.450	-11.450	0.000	(0)
O (0)	5.718e-39					
O2	2.859e-39	2.861e-39	-38.544	-38.544	0.000	(0)
S (6)	4.628e-04					
SO4-2	4.209e-04	3.337e-04	-3.376	-3.477	-0.101	(0)
CaSO4	3.395e-05	3.395e-05	-4.469	-4.469	0.000	(0)
MgSO4	7.410e-06	7.410e-06	-5.130	-5.130	0.000	(0)
NaSO4-	2.278e-07	2.152e-07	-6.642	-6.667	-0.025	(0)
KSO4-	2.260e-07	2.135e-07	-6.646	-6.671	-0.025	(0)
MnSO4	5.735e-08	5.735e-08	-7.241	-7.241	0.000	(0)
ZnSO4	1.923e-09	1.923e-09	-8.716	-8.716	0.000	(0)
CuSO4	5.638e-10	5.638e-10	-9.249	-9.249	0.000	(0)
HSO4-	4.737e-10	4.472e-10	-9.324	-9.350	-0.025	(0)
Zn (SO4) 2-2	7.168e-12	5.591e-12	-11.145	-11.253	-0.108	(0)
FeSO4	4.200e-12	4.200e-12	-11.377	-11.377	0.000	(0)
UO2SO4	1.013e-14	1.013e-14	-13.995	-13.995	0.000	(0)
AlSO4+	7.482e-16	7.063e-16	-15.126	-15.151	-0.025	(0)
UO2 (SO4) 2-2	5.712e-17	4.455e-17	-16.243	-16.351	-0.108	(0)
Al (SO4) 2-	2.675e-18	2.526e-18	-17.573	-17.598	-0.025	(0)
VO2SO4-	5.000e-19	4.699e-19	-18.301	-18.328	-0.027	(0)
FeSO4+	1.888e-19	1.784e-19	-18.724	-18.749	-0.025	(0)
VOSO4	8.151e-21	8.151e-21	-20.089	-20.089	0.000	(0)
Fe (SO4) 2-	1.354e-21	1.272e-21	-20.868	-20.895	-0.027	(0)
VSO4+	1.388e-34	1.304e-34	-33.858	-33.885	-0.027	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.387	-40.387	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.702	-40.810	-0.108	(0)
Sb (3)	1.126e-19					
Sb (OH) 3	5.697e-20	5.697e-20	-19.244	-19.244	0.000	(0)
HSbo2	5.561e-20	5.561e-20	-19.255	-19.255	0.000	(0)
Sbo2-	6.990e-24	6.569e-24	-23.156	-23.183	-0.027	(0)
Sb (OH) 4-	4.005e-24	3.764e-24	-23.397	-23.424	-0.027	(0)
Sb (OH) 2F	6.507e-26	6.507e-26	-25.187	-25.187	0.000	(0)
SboF	6.399e-26	6.399e-26	-25.194	-25.194	0.000	(0)
Sb (OH) 2+	2.019e-26	1.897e-26	-25.695	-25.722	-0.027	(0)
Sbo+	6.960e-27	6.540e-27	-26.157	-26.184	-0.027	(0)
Sb (5)	9.858e-10					
Sbo3-	9.846e-10	9.253e-10	-9.007	-9.034	-0.027	(0)
Sb (OH) 6-	1.147e-12	1.082e-12	-11.940	-11.966	-0.025	(0)
Sbo2+	5.310e-26	4.990e-26	-25.275	-25.302	-0.027	(0)
Se (-2)	1.401e-35					
HSe-	1.401e-35	1.316e-35	-34.854	-34.881	-0.027	(0)
MnSe	3.823e-39	3.823e-39	-38.418	-38.418	0.000	(0)
H2Se	1.401e-39	1.401e-39	-38.854	-38.854	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.910	-42.018	-0.108	(0)
Se (4)	3.926e-09					
HSeO3-	2.909e-09	2.734e-09	-8.536	-8.563	-0.027	(0)
SeO3-2	1.018e-09	7.936e-10	-8.992	-9.100	-0.108	(0)
H2SeO3	1.599e-14	1.599e-14	-13.796	-13.796	0.000	(0)
FeHSeO3+2	4.411e-25	3.440e-25	-24.355	-24.463	-0.108	(0)
Se (6)	6.582e-14					
SeO4-2	6.580e-14	5.217e-14	-13.182	-13.283	-0.101	(0)
MnSeO4	1.357e-17	1.357e-17	-16.867	-16.867	0.000	(0)
ZnSeO4	2.129e-19	2.129e-19	-18.672	-18.672	0.000	(0)
HSeO4-	3.815e-20	3.585e-20	-19.419	-19.445	-0.027	(0)
Zn (SeO4) 2-2	1.444e-32	1.126e-32	-31.841	-31.948	-0.108	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-56.487	-56.730	-0.243	(0)
U (4)	1.941e-18					
U (OH) 5-	1.940e-18	1.823e-18	-17.712	-17.739	-0.027	(0)
U (OH) 4	1.047e-21	1.047e-21	-20.980	-20.980	0.000	(0)
U (OH) 3+	5.586e-26	5.250e-26	-25.253	-25.280	-0.027	(0)
U (OH) 2+2	4.268e-31	3.328e-31	-30.370	-30.478	-0.108	(0)

UF3+	7.484e-36	7.033e-36	-35.126	-35.153	-0.027	(0)
UF2+2	1.067e-36	8.322e-37	-35.972	-36.080	-0.108	(0)
UOH+3	3.761e-37	2.150e-37	-36.425	-36.668	-0.243	(0)
UF4	4.112e-38	4.112e-38	-37.386	-37.386	0.000	(0)
UF+3	2.169e-39	1.240e-39	-38.664	-38.907	-0.243	(0)
UF5-	0.000e+00	0.000e+00	-40.034	-40.061	-0.027	(0)
U(SO4)2	0.000e+00	0.000e+00	-40.387	-40.387	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.702	-40.810	-0.108	(0)
UF6-2	0.000e+00	0.000e+00	-41.746	-41.854	-0.108	(0)
U+4	0.000e+00	0.000e+00	-43.502	-43.934	-0.432	(0)
UC1+3	0.000e+00	0.000e+00	-46.451	-46.694	-0.243	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-160.627	-162.813	-2.186	(0)
U(5)	1.300e-15					
UO2+	1.300e-15	1.222e-15	-14.886	-14.913	-0.027	(0)
U(6)	1.391e-08					
UO2(CO3)2-2	1.102e-08	8.592e-09	-7.958	-8.066	-0.108	(0)
UO2(CO3)3-4	2.704e-09	1.000e-09	-8.568	-9.000	-0.432	(0)
UO2CO3	1.854e-10	1.854e-10	-9.732	-9.732	0.000	(0)
UO2OH+	1.972e-12	1.853e-12	-11.705	-11.732	-0.027	(0)
UO2F+	1.570e-13	1.475e-13	-12.804	-12.831	-0.027	(0)
UO2+2	2.529e-14	2.005e-14	-13.597	-13.698	-0.101	(0)
UO2F2	2.269e-14	2.269e-14	-13.644	-13.644	0.000	(0)
UO2SO4	1.013e-14	1.013e-14	-13.995	-13.995	0.000	(0)
UO2F3-	3.234e-16	3.039e-16	-15.490	-15.517	-0.027	(0)
UO2(SO4)2-2	5.712e-17	4.455e-17	-16.243	-16.351	-0.108	(0)
(UO2)2(OH)2+2	7.308e-18	5.700e-18	-17.136	-17.244	-0.108	(0)
(UO2)3(OH)5+	4.598e-18	4.320e-18	-17.337	-17.364	-0.027	(0)
UO2Cl+	1.197e-18	1.125e-18	-17.922	-17.949	-0.027	(0)
UO2F4-2	1.650e-19	1.287e-19	-18.782	-18.890	-0.108	(0)
V(2)	1.025e-40					
VOH+	1.025e-40	0.000e+00	-39.989	-40.016	-0.027	(0)
V+2	0.000e+00	0.000e+00	-41.284	-41.392	-0.108	(0)
V(3)	2.645e-13					
V(OH)3	2.645e-13	2.645e-13	-12.578	-12.578	0.000	(0)
V(OH)2+	2.493e-24	2.343e-24	-23.603	-23.630	-0.027	(0)
VOH+2	3.907e-28	3.047e-28	-27.408	-27.516	-0.108	(0)
V+3	1.449e-33	8.280e-34	-32.839	-33.082	-0.243	(0)
VSO4+	1.388e-34	1.304e-34	-33.858	-33.885	-0.027	(0)
V2(OH)3+3	0.000e+00	0.000e+00	-52.451	-52.694	-0.243	(0)
V2(OH)2+4	0.000e+00	0.000e+00	-53.800	-54.232	-0.432	(0)
V(4)	1.398e-17					
V(OH)3+	1.382e-17	1.299e-17	-16.859	-16.886	-0.027	(0)
VO+2	1.137e-19	8.868e-20	-18.944	-19.052	-0.108	(0)
VOF+	3.018e-20	2.836e-20	-19.520	-19.547	-0.027	(0)
VOSO4	8.151e-21	8.151e-21	-20.089	-20.089	0.000	(0)
VOF2	5.670e-22	5.670e-22	-21.246	-21.246	0.000	(0)
VOC1+	9.161e-24	8.609e-24	-23.038	-23.065	-0.027	(0)
VOF3-	1.141e-24	1.073e-24	-23.943	-23.970	-0.027	(0)
VOF4-2	2.960e-28	2.309e-28	-27.529	-27.637	-0.108	(0)
H2V2O4+2	1.085e-29	8.460e-30	-28.965	-29.073	-0.108	(0)
V(5)	2.042e-08					
H2VO4-	1.672e-08	1.572e-08	-7.777	-7.804	-0.027	(0)
HVO4-2	3.692e-09	2.879e-09	-8.433	-8.541	-0.108	(0)
H3VO4	2.155e-12	2.155e-12	-11.667	-11.667	0.000	(0)
H3V2O7-	2.327e-13	2.187e-13	-12.633	-12.660	-0.027	(0)
HV2O7-3	2.683e-14	1.533e-14	-13.571	-13.814	-0.243	(0)
VO4-3	1.841e-15	1.052e-15	-14.735	-14.978	-0.243	(0)
V2O7-4	8.136e-17	3.010e-17	-16.090	-16.521	-0.432	(0)
VO2+	6.249e-17	5.896e-17	-16.204	-16.229	-0.025	(0)
V3O9-3	7.113e-18	4.065e-18	-17.148	-17.391	-0.243	(0)
VO2F	5.514e-18	5.514e-18	-17.259	-17.259	0.000	(0)
VO2SO4-	5.000e-19	4.699e-19	-18.301	-18.328	-0.027	(0)
VO2F2-	1.136e-19	1.067e-19	-18.945	-18.972	-0.027	(0)
VO2F3-2	9.104e-23	7.100e-23	-22.041	-22.149	-0.108	(0)
V4O12-4	7.200e-23	2.664e-23	-22.143	-22.575	-0.432	(0)
VO2F4-3	3.259e-27	1.863e-27	-26.487	-26.730	-0.243	(0)
HV10O28-5	0.000e+00	0.000e+00	-59.584	-60.258	-0.675	(0)
V10O28-6	0.000e+00	0.000e+00	-59.610	-60.582	-0.972	(0)

H2V10O28-4	0.000e+00	0.000e+00	-62.482	-62.914	-0.432	(0)
Zn	4.160e-08					
Zn+2	3.323e-08	2.634e-08	-7.478	-7.579	-0.101	(0)
ZnCO3	3.521e-09	3.521e-09	-8.453	-8.453	0.000	(0)
ZnOH+	2.059e-09	1.935e-09	-8.686	-8.713	-0.027	(0)
ZnSO4	1.923e-09	1.923e-09	-8.716	-8.716	0.000	(0)
ZnHCO3+	6.023e-10	5.660e-10	-9.220	-9.247	-0.027	(0)
Zn(OH)2	2.251e-10	2.251e-10	-9.648	-9.648	0.000	(0)
ZnF+	2.982e-11	2.803e-11	-10.525	-10.552	-0.027	(0)
Zn(SO4)2-2	7.168e-12	5.591e-12	-11.145	-11.253	-0.108	(0)
ZnCl+	2.427e-12	2.290e-12	-11.615	-11.640	-0.025	(0)
ZnOHCl	2.202e-12	2.202e-12	-11.657	-11.657	0.000	(0)
Zn(OH)3-	8.817e-13	8.286e-13	-12.055	-12.082	-0.027	(0)
ZnCl2	1.256e-16	1.256e-16	-15.901	-15.901	0.000	(0)
Zn(OH)4-2	3.106e-17	2.422e-17	-16.508	-16.616	-0.108	(0)
ZnSeO4	2.129e-19	2.129e-19	-18.672	-18.672	0.000	(0)
ZnCl3-	3.660e-21	3.453e-21	-20.437	-20.462	-0.025	(0)
ZnCl4-2	7.511e-26	5.975e-26	-25.124	-25.224	-0.099	(0)
Zn(SeO4)2-2	1.444e-32	1.126e-32	-31.841	-31.948	-0.108	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Al(OH)3(am)	-2.78	8.02	10.80	Al(OH)3
Al2(MoO4)3	-55.60	-53.23	2.37	Al2(MoO4)3
Al2O3	-3.60	16.05	19.65	Al2O3
Al4(OH)10SO4	-9.81	12.89	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.80	-7.00	4.80	AlAsO4:2H2O
AlOHSO4	-7.95	-11.18	-3.23	AlOHSO4
AlSb	-148.02	-82.40	65.62	AlSb
Alunite	-9.11	-10.51	-1.40	KAl3(SO4)2(OH)6
Anhydrite	-2.47	-6.83	-4.36	CaSO4
Antlerite	-5.21	3.58	8.79	Cu3(OH)4SO4
Aragonite	-0.69	-8.99	-8.30	CaCO3
Arsenolite	-76.63	-79.39	-2.76	As4O6
Artinite	-7.34	2.26	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-36.75	-30.04	6.71	As2O5
Atacamite	-4.53	2.86	7.39	Cu2(OH)3Cl
Azurite	-3.03	-19.94	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.95	8.44	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.72	0.15	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	4.19	-4.72	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-24.35	8.59	32.94	Ba3(VO4)2:4H2O
BaF2	-10.01	-15.83	-5.82	BaF2
BaMoO4	-7.69	-14.65	-6.96	BaMoO4
Barite	-0.78	-10.76	-9.98	BaSO4
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-13.11	-20.57	-7.46	BaSeO4
Bianchite	-9.29	-11.06	-1.76	ZnSO4:6H2O
Birnessite	-10.00	8.09	18.09	MnO2
Bixbyite	-6.91	-7.55	-0.64	Mn2O3
Boehmite	-0.55	8.02	8.58	AlOOH
Brochantite	-4.05	11.17	15.22	Cu4(OH)6SO4
Brucite	-5.03	11.81	16.84	Mg(OH)2
Ca(VO3)2	-10.02	-4.36	5.66	Ca(VO3)2
Ca2V2O7	-9.49	8.01	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.54	8.01	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.22	7.08	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.57	20.39	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-19.47	20.39	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-286.70	-143.72	142.97	Ca3Sb2
Calcite	-0.51	-8.99	-8.48	CaCO3
CaMoO4	-2.77	-10.72	-7.95	CaMoO4
Carnotite	-2.75	-2.52	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.05	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.62	-16.64	-3.02	CaSeO4:2H2O
CH4(g)	-75.22	-116.26	-41.05	CH4

Chalcanthite	-8.97	-11.61	-2.64	CuSO4:5H2O
Claudetite	-76.33	-79.39	-3.06	As4O6
CO2 (g)	-3.21	-21.36	-18.15	CO2
Cryolite	-19.12	-52.96	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.59	8.67	Cu (OH) 2
Cu (SbO3) 2	-28.65	16.56	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.52	-84.41	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.10	-45.90	-45.80	Cu2Se
Cu2SO4	-20.41	-22.36	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.36	-7.26	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-52.57	-95.16	-42.59	Cu3Sb
Cu3Se2	-17.56	-81.05	-63.49	Cu3Se2
CuCO3	-2.27	-13.77	-11.50	CuCO3
CuF	-8.81	-13.72	-4.91	CuF
CuF2	-17.79	-16.68	1.12	CuF2
CuF2:2H2O	-12.13	-16.68	-4.55	CuF2:2H2O
Cumetal	-4.69	-13.44	-8.76	Cu
CuMoO4	-2.42	-15.50	-13.08	CuMoO4
CuOCuSO4	-14.32	-4.02	10.30	CuOCuSO4
Cupricferrite	10.14	16.13	5.99	CuFe2O4
Cuprite	-1.75	-3.16	-1.41	Cu2O
Cuprousferrite	11.60	2.69	-8.92	CuFeO2
CuSe	-2.05	-35.15	-33.10	CuSe
CuSe2	-20.80	-54.17	-33.37	CuSe2
CuSeO3:2H2O	-9.34	-8.83	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.97	-21.41	-2.44	CuSeO4:5H2O
CuSO4	-14.55	-11.61	2.94	CuSO4
Diaspore	1.15	8.02	6.87	AlOOH
Dolomite (disordered)	-1.99	-18.53	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-1.44	-18.53	-17.09	CaMg (CO3) 2
Epsomite	-5.26	-7.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-8.13	5.44	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.61	0.57	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-7.58	-11.30	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.45	-7.89	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-20.12	-40.75	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.34	-49.07	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-6.25	13.97	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-11.15	-10.75	0.40	FeAsO4:2H2O
FeMoO4	-7.57	-17.66	-10.09	FeMoO4
Ferrihydrite	1.08	4.27	3.19	Fe (OH) 3
Ferroselite	-37.73	-56.33	-18.60	FeSe2
FeSe	-26.31	-37.31	-11.00	FeSe
Fluorite	-1.40	-11.90	-10.50	CaF2
Gibbsite	-0.27	8.02	8.29	Al (OH) 3
Goethite	3.78	4.27	0.49	FeOOH
Goslarite	-9.04	-11.06	-2.01	ZnSO4:7H2O
Gummite	-5.64	2.03	7.67	UO3
Gypsum	-2.22	-6.83	-4.61	CaSO4:2H2O
H-Jarosite	-13.51	-25.61	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.22	-23.09	-12.88	H2MoO4
H2Se (g)	-37.78	-42.74	-4.96	H2Se
Halite	-9.98	-8.38	1.60	NaCl
Hausmannite	-8.17	52.86	61.03	Mn3O4
Hematite	9.95	8.53	-1.42	Fe2O3
Hercynite	-1.41	21.48	22.89	FeAl2O4
Huntite	-7.66	-37.63	-29.97	CaMg3 (CO3) 4
Hydromagnesite	-17.61	-26.38	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-21.39	-26.56	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.99	-21.79	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-18.72	-15.45	3.26	K2MoO4
K2SeO4	-20.64	-21.37	-0.73	K2SeO4
Langite	-6.32	11.17	17.49	Cu4 (OH) 6SO4:H2O
Lepidocrocite	2.90	4.27	1.37	FeOOH
Lime	-20.33	12.37	32.70	CaO
Maghemite	2.15	8.53	6.39	Fe2O3
Magnesioferrite	3.49	20.35	16.86	Fe2MgO4
Magnesite	-2.09	-9.55	-7.46	MgCO3

Magnetite	10.57	13.97	3.40	Fe3O4
Malachite	-0.87	-6.17	-5.31	Cu2(OH)2CO3
Manganite	-3.77	21.57	25.34	MnOOH
Melanothallite	-23.31	-17.05	6.26	CuCl2
Melanterite	-11.56	-13.77	-2.21	FeSO4·7H2O
Mg(OH)2(active)	-6.98	11.81	18.79	Mg(OH)2
Mg(VO3)2	-16.20	-4.92	11.28	Mg(VO3)2
Mg2Sb3	-263.01	-188.33	74.68	Mg2Sb3
Mg2V2O7	-19.47	6.89	26.36	Mg2V2O7
MgF2	-4.33	-12.46	-8.13	MgF2
MgMoO4	-9.43	-11.28	-1.85	MgMoO4
MgSeO3·6H2O	-7.67	-4.61	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-16.00	-17.20	-1.20	MgSeO4·6H2O
Mirabilite	-10.20	-11.32	-1.11	Na2SO4·10H2O
Mn(VO3)2	-11.92	-7.02	4.90	Mn(VO3)2
Mn2(SO4)3	-59.45	-65.16	-5.71	Mn2(SO4)3
Mn2Sb	-143.94	-82.86	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-13.41	-0.91	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-17.65	-14.94	2.72	MnCl2·4H2O
MnSb	-91.29	-94.20	-2.91	MnSb
MnSe	-36.53	-33.03	3.50	MnSe
MnSeO3	-7.85	-6.72	1.13	MnSeO3
MnSeO3·2H2O	-7.70	-6.72	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-17.25	-19.30	-2.05	MnSeO4·5H2O
MnSO4	-12.07	-9.49	2.58	MnSO4
MoO3	-15.09	-23.09	-8.00	MoO3
Na-Jarosite	-10.46	-21.66	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-21.70	-38.30	-16.60	Na2Mo2O7
Na2MoO4	-16.70	-15.21	1.49	Na2MoO4
Na2MoO4·2H2O	-16.43	-15.21	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-18.84	-8.54	10.30	Na2SeO3·5H2O
Na2SeO4	-22.40	-21.12	1.28	Na2SeO4
Na3Sb	-173.05	-78.59	94.45	Na3Sb
Na3VO4	-33.22	3.46	36.68	Na3VO4
Na4V2O7	-38.36	-0.96	37.40	Na4V2O7
Nantokite	-7.17	-13.90	-6.73	CuCl
NaSb	-85.92	-62.75	23.17	NaSb
Natron	-12.16	-13.48	-1.31	Na2CO3·10H2O
NaVO3	-8.28	-4.42	3.86	NaVO3
Nesquehonite	-4.88	-9.55	-4.67	MgCO3·3H2O
Nsutite	-9.42	8.09	17.50	MnO2
O2(g)	-35.64	47.45	83.09	O2
Periclase	-9.77	11.81	21.58	MgO
Portlandite	-10.43	12.37	22.80	Ca(OH)2
Pyrochroite	-5.48	9.71	15.19	Mn(OH)2
Pyrolusite	-7.94	33.44	41.38	MnO2
Rhodochrosite	-1.07	-11.65	-10.58	MnCO3
Rutherfordine	-4.83	-19.33	-14.50	UO2CO3
Sb(OH)3	-12.13	-19.24	-7.11	Sb(OH)3
Sb2O4	-18.16	-14.76	3.40	Sb2O4
Sb2O5	-29.99	-39.66	-9.67	Sb2O5
Sb2Se3	-98.96	-166.72	-67.76	Sb2Se3
Sb4O6(cubic)	-58.72	-76.98	-18.26	Sb4O6
Sb4O6(orth)	-59.08	-76.98	-17.90	Sb4O6
SbCl3	-56.79	-56.22	0.57	SbCl3
SbF3	-45.43	-55.65	-10.23	SbF3
Sbmetal	-43.14	-54.83	-11.69	Sb
SbO2	-3.87	-31.69	-27.82	SbO2
Schoepite	-3.97	2.03	5.99	UO2(OH)2·H2O
Semetal(am)	-11.91	-19.02	-7.11	Se
Semetal(hex)	-11.31	-19.02	-7.71	Se
Senarmontite	-26.12	-38.49	-12.37	Sb2O3
SeO2	-16.55	-16.43	0.12	SeO2
SeO3	-50.05	-29.01	21.04	SeO3
Siderite	-5.68	-15.92	-10.24	FeCO3
Smithsonite	-3.21	-13.21	-10.00	ZnCO3
Spinel	-8.99	27.86	36.85	MgAl2O4
Tenorite	-0.05	7.59	7.64	CuO

Thenardite	-11.64	-11.32	0.32	Na2SO4
Thermonatrite	-14.11	-13.48	0.64	Na2CO3:H2O
Tyuyamunite	-4.38	-0.30	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.08	10.01	21.08	U3O8
U3Sb4	-551.52	-399.13	152.38	U3Sb4
U4O9	-23.18	-26.20	-3.02	U4O9
UF4	-31.49	-61.03	-29.54	UF4
UF4:2.5H2O	-28.31	-61.03	-32.72	UF4:2.5H2O
UO2 (am)	-13.42	-12.48	0.93	UO2
UO2 (OH) 2 (beta)	-3.58	2.03	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.73	-26.98	-2.25	UO2SeO4:4H2O
UO3	-5.67	2.03	7.70	UO3
Uraninite	-7.81	-12.48	-4.67	UO2
USb2	-208.39	-178.82	29.58	USb2
V (OH) 3	-17.08	-9.49	7.59	V (OH) 3
V2O5	-15.37	-16.73	-1.36	V2O5
V3O5	-35.54	-33.71	1.84	V3O5
V4O7	-44.22	-37.03	7.19	V4O7
V6O13	-36.79	-97.65	-60.86	V6O13
Valentinite	-30.01	-38.49	-8.48	Sb2O3
VC12	-64.88	-46.00	18.87	VC12
VC13	-69.90	-46.46	23.43	VC13
VF4	-66.80	-51.87	14.93	VF4
Vmetal	-89.11	-45.08	44.03	V
VO	-36.11	-21.36	14.76	VO
VO (OH) 2	-8.48	-3.33	5.15	VO (OH) 2
VO2Cl	-23.53	-20.69	2.84	VO2Cl
VOC1	-32.97	-21.82	11.15	VOC1
VOC12	-40.73	-27.97	12.76	VOC12
VOSO4	-26.14	-22.53	3.61	VOSO4
Witherite	-4.35	-12.92	-8.57	BaCO3
Zincite	-3.19	8.15	11.33	ZnO
Zincosite	-14.99	-11.06	3.93	ZnSO4
Zn (BO2) 2	-12.86	-4.57	8.29	Zn (BO2) 2
Zn (OH) 2	-4.05	8.15	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.33	8.15	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.61	8.15	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.39	8.15	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.59	8.15	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.41	-2.91	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.22	3.97	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.25	-5.60	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-32.88	-13.97	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.02	13.38	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-22.42	16.08	38.50	Zn5 (OH) 8Cl2
ZnCl2	-23.55	-16.50	7.05	ZnCl2
ZnCO3:1H2O	-2.95	-13.21	-10.26	ZnCO3:1H2O
ZnF2	-15.59	-16.13	-0.53	ZnF2
Znmetal	-41.37	-15.58	25.79	Zn
ZnMoO4	-4.82	-14.95	-10.13	ZnMoO4
ZnO (active)	-3.04	8.15	11.19	ZnO
ZnSb	-81.43	-70.41	11.01	ZnSb
ZnSe	-20.20	-34.60	-14.40	ZnSe
ZnSeO4:6H2O	-19.34	-20.86	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.42	-11.06	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 14.

SOLUTION 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

temp 25
pH 5.74453
pe 4
redox pe
units mg/l
density 1
Alkalinity 12.24514 as HCO3
Al 0.03731
B 0.00502
Ba 0.03480
Ca 6.31963
Cd 0.00034
Cl 0.71113
Cu 0.38402
F 0.43171
Fe 0.00394
Hg 0.000016
K 1.83523
Mg 0.97828
Mn 0.01787
Mo 0.00203
Na 1.69417 charge
Pb 0.00164
S(6) 14.90873 as SO4
Se 0.00025
U 0.00462
V 0.00050
Zn 0.01538
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 12. Average HCT data for quartz monzonite - sulfide (waste)
(cells 604673 and 605153)

-----Solution composition-----

Elements	Molality	Moles
Al	1.383e-06	1.383e-06
Alkalinity	2.007e-04	2.007e-04
B	4.644e-07	4.644e-07
Ba	2.534e-07	2.534e-07
Ca	1.577e-04	1.577e-04
Cd	3.025e-09	3.025e-09
Cl	2.006e-05	2.006e-05
Cu	6.043e-06	6.043e-06
F	2.272e-05	2.272e-05
Fe	7.055e-08	7.055e-08
Hg	7.977e-11	7.977e-11
K	4.694e-05	4.694e-05
Mg	4.025e-05	4.025e-05
Mn	3.253e-07	3.253e-07
Mo	2.116e-08	2.116e-08
Na	9.327e-05	9.327e-05
Pb	7.915e-09	7.915e-09
S(6)	1.552e-04	1.552e-04
Se	3.166e-09	3.166e-09
U	1.941e-08	1.941e-08
V	9.816e-09	9.816e-09
Zn	2.352e-07	2.352e-07

Charge balance

-----Description of solution-----

pH = 5.745
 pe = 4.000
 Activity of water = 1.000
 Ionic strength (mol/kgw) = 8.906e-04
 Mass of water (kg) = 1.000e+00
 Total carbon (mol/kg) = 9.917e-04
 Total CO2 (mol/kg) = 9.917e-04
 Temperature (°C) = 25.00
 Electrical balance (eq) = -3.346e-19
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
 Iterations = 14
 Total H = 1.110155e+02
 Total O = 5.551043e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	1.863e-06	1.801e-06	-5.730	-5.745	-0.015	0.00
OH-	5.784e-09	5.591e-09	-8.238	-8.252	-0.015	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.383e-06					
AlF2+	9.833e-07	9.511e-07	-6.007	-6.022	-0.014	(0)
AlF3	2.287e-07	2.287e-07	-6.641	-6.641	0.000	(0)
AlF+2	1.429e-07	1.251e-07	-6.845	-6.903	-0.058	(0)
Al(OH)2+	1.681e-08	1.626e-08	-7.774	-7.789	-0.014	(0)
AlOH+2	4.183e-09	3.662e-09	-8.378	-8.436	-0.058	(0)
AlF4-	2.264e-09	2.189e-09	-8.645	-8.660	-0.015	(0)
Al(OH)3	1.814e-09	1.814e-09	-8.741	-8.741	0.000	(0)
Al(OH)4-	1.321e-09	1.277e-09	-8.879	-8.894	-0.015	(0)
Al+3	8.871e-10	6.549e-10	-9.052	-9.184	-0.132	(0)
AlSO4+	6.894e-10	6.667e-10	-9.162	-9.176	-0.015	(0)
Al(SO4)2-	9.687e-13	9.367e-13	-12.014	-12.028	-0.015	(0)
AlMo6O21-3	9.907e-36	7.227e-36	-35.004	-35.141	-0.137	(0)
B	4.644e-07					
H3BO3	4.642e-07	4.643e-07	-6.333	-6.333	0.000	(0)
H2BO3-	1.550e-10	1.497e-10	-9.810	-9.825	-0.015	(0)
BF(OH)3-	3.662e-12	3.539e-12	-11.436	-11.451	-0.015	(0)
CaH2BO3+	1.193e-12	1.153e-12	-11.923	-11.938	-0.015	(0)
MgH2BO3+	1.845e-13	1.782e-13	-12.734	-12.749	-0.015	(0)
NaH2BO3	2.138e-14	2.138e-14	-13.670	-13.670	0.000	(0)
BF2(OH)2-	1.347e-14	1.301e-14	-13.871	-13.886	-0.015	(0)
BaH2BO3+	1.059e-15	1.023e-15	-14.975	-14.990	-0.015	(0)
H5(BO3)2-	6.124e-17	5.918e-17	-16.213	-16.228	-0.015	(0)
BF3OH-	1.802e-19	1.741e-19	-18.744	-18.759	-0.015	(0)
H8(BO3)3-	2.844e-21	2.748e-21	-20.546	-20.561	-0.015	(0)
BF4-	3.050e-23	2.947e-23	-22.516	-22.531	-0.015	(0)
Ba	2.534e-07					
Ba+2	2.530e-07	2.211e-07	-6.597	-6.655	-0.059	(0)
BaHCO3+	4.253e-10	4.115e-10	-9.371	-9.386	-0.014	(0)
BaCO3	5.753e-13	5.753e-13	-12.240	-12.240	0.000	(0)
BaOH+	5.579e-15	5.396e-15	-14.253	-14.268	-0.015	(0)
BaH2BO3+	1.059e-15	1.023e-15	-14.975	-14.990	-0.015	(0)
C(4)	9.917e-04					
H2CO3	7.894e-04	7.894e-04	-3.103	-3.103	0.000	(0)
HCO3-	2.015e-04	1.949e-04	-3.696	-3.710	-0.014	(0)
CaHCO3+	5.020e-07	4.857e-07	-6.299	-6.314	-0.014	(0)
CuCO3	1.401e-07	1.401e-07	-6.853	-6.853	0.000	(0)
MgHCO3+	7.082e-08	6.847e-08	-7.150	-7.165	-0.015	(0)
CuHCO3+	5.973e-08	5.767e-08	-7.224	-7.239	-0.015	(0)
UO2CO3	1.422e-08	1.422e-08	-7.847	-7.847	0.000	(0)
NaHCO3	9.876e-09	9.876e-09	-8.005	-8.005	0.000	(0)
CO3-2	5.807e-09	5.074e-09	-8.236	-8.295	-0.059	(0)
UO2(CO3)2-2	1.657e-09	1.440e-09	-8.781	-8.842	-0.061	(0)
ZnHCO3+	1.272e-09	1.228e-09	-8.896	-8.911	-0.015	(0)
MnHCO3+	1.110e-09	1.073e-09	-8.955	-8.969	-0.015	(0)
CaCO3	1.076e-09	1.076e-09	-8.968	-8.968	0.000	(0)

	PbHCO3+	8.538e-10	8.244e-10	-9.069	-9.084	-0.015	(0)
	BaHCO3+	4.253e-10	4.115e-10	-9.371	-9.386	-0.014	(0)
	FeHCO3+	1.500e-10	1.451e-10	-9.824	-9.838	-0.014	(0)
	MgCO3	1.449e-10	1.449e-10	-9.839	-9.839	0.000	(0)
	PbCO3	8.682e-11	8.682e-11	-10.061	-10.061	0.000	(0)
	ZnCO3	5.816e-11	5.816e-11	-10.235	-10.235	0.000	(0)
	NaCO3-	8.801e-12	8.513e-12	-11.055	-11.070	-0.014	(0)
	Cu (CO3) 2-2	2.202e-12	1.914e-12	-11.657	-11.718	-0.061	(0)
	CdHCO3+	1.180e-12	1.139e-12	-11.928	-11.943	-0.015	(0)
	UO2 (CO3) 3-4	6.416e-13	3.662e-13	-12.193	-12.436	-0.244	(0)
	BaCO3	5.753e-13	5.753e-13	-12.240	-12.240	0.000	(0)
	CdCO3	2.970e-13	2.970e-13	-12.527	-12.527	0.000	(0)
	Pb (CO3) 2-2	1.462e-15	1.271e-15	-14.835	-14.896	-0.061	(0)
	Cd (CO3) 2-2	1.285e-18	1.117e-18	-17.891	-17.952	-0.061	(0)
	HgCO3	5.248e-21	5.248e-21	-20.280	-20.280	0.000	(0)
	HgHCO3+	1.823e-22	1.760e-22	-21.739	-21.755	-0.015	(0)
	Hg (CO3) 2-2	9.688e-26	8.421e-26	-25.014	-25.075	-0.061	(0)
Ca	1.577e-04						
	Ca+2	1.531e-04	1.338e-04	-3.815	-3.873	-0.059	(0)
	CaSO4	4.020e-06	4.020e-06	-5.396	-5.396	0.000	(0)
	CaHCO3+	5.020e-07	4.857e-07	-6.299	-6.314	-0.014	(0)
	CaF+	2.884e-08	2.790e-08	-7.540	-7.554	-0.015	(0)
	CaCO3	1.076e-09	1.076e-09	-8.968	-8.968	0.000	(0)
	CaOH+	1.543e-11	1.493e-11	-10.812	-10.826	-0.014	(0)
	CaH2BO3+	1.193e-12	1.153e-12	-11.923	-11.938	-0.015	(0)
Cd	3.025e-09						
	Cd+2	2.938e-09	2.568e-09	-8.532	-8.590	-0.059	(0)
	CdSO4	7.893e-11	7.893e-11	-10.103	-10.103	0.000	(0)
	CdCl+	4.924e-12	4.754e-12	-11.308	-11.323	-0.015	(0)
	CdHCO3+	1.180e-12	1.139e-12	-11.928	-11.943	-0.015	(0)
	CdF+	8.050e-13	7.772e-13	-12.094	-12.109	-0.015	(0)
	CdCO3	2.970e-13	2.970e-13	-12.527	-12.527	0.000	(0)
	Cd (SO4) 2-2	1.606e-13	1.396e-13	-12.794	-12.855	-0.061	(0)
	CdOH+	1.181e-13	1.140e-13	-12.928	-12.943	-0.015	(0)
	CdOHC1	1.090e-15	1.090e-15	-14.962	-14.962	0.000	(0)
	CdCl2	3.843e-16	3.843e-16	-15.415	-15.415	0.000	(0)
	CdF2	2.962e-17	2.962e-17	-16.528	-16.528	0.000	(0)
	Cd (OH) 2	4.023e-18	4.023e-18	-17.395	-17.395	0.000	(0)
	Cd (CO3) 2-2	1.285e-18	1.117e-18	-17.891	-17.952	-0.061	(0)
	CdCl3-	4.868e-21	4.701e-21	-20.313	-20.328	-0.015	(0)
	Cd2OH+3	2.012e-21	1.468e-21	-20.696	-20.833	-0.137	(0)
	Cd (OH) 3-	1.423e-24	1.374e-24	-23.847	-23.862	-0.015	(0)
	Cd (SeO3) 2-2	1.105e-25	9.605e-26	-24.957	-25.018	-0.061	(0)
	CdSeO4	1.228e-26	1.228e-26	-25.911	-25.911	0.000	(0)
	Cd (OH) 4-2	1.447e-33	1.258e-33	-32.840	-32.900	-0.061	(0)
Cl	2.006e-05						
	Cl-	2.005e-05	1.939e-05	-4.698	-4.712	-0.015	(0)
	CuCl	5.607e-09	5.607e-09	-8.251	-8.251	0.000	(0)
	CuCl+	1.491e-10	1.441e-10	-9.827	-9.841	-0.015	(0)
	CuCl2-	2.349e-11	2.271e-11	-10.629	-10.644	-0.015	(0)
	ZnCl+	1.003e-11	9.701e-12	-10.999	-11.013	-0.015	(0)
	MnCl+	6.965e-12	6.736e-12	-11.157	-11.172	-0.015	(0)
	CdCl+	4.924e-12	4.754e-12	-11.308	-11.323	-0.015	(0)
	PbCl+	4.055e-12	3.916e-12	-11.392	-11.407	-0.015	(0)
	ZnOHC1	7.101e-14	7.101e-14	-13.149	-13.149	0.000	(0)
	UO2Cl+	2.293e-14	2.214e-14	-13.640	-13.655	-0.015	(0)
	CdOHC1	1.090e-15	1.090e-15	-14.962	-14.962	0.000	(0)
	CuCl2	9.688e-16	9.688e-16	-15.014	-15.014	0.000	(0)
	CdCl2	3.843e-16	3.843e-16	-15.415	-15.415	0.000	(0)
	PbCl2	3.391e-16	3.391e-16	-15.470	-15.470	0.000	(0)
	ZnCl2	2.981e-16	2.981e-16	-15.526	-15.526	0.000	(0)
	MnCl2	1.845e-16	1.845e-16	-15.734	-15.734	0.000	(0)
	CuCl3-2	1.076e-16	9.414e-17	-15.968	-16.026	-0.058	(0)
	VOCl+	2.369e-17	2.287e-17	-16.625	-16.641	-0.015	(0)
	HgClOH	1.655e-19	1.655e-19	-18.781	-18.781	0.000	(0)
	FeCl+2	3.677e-20	3.217e-20	-19.435	-19.493	-0.058	(0)
	HgCl2	3.249e-20	3.249e-20	-19.488	-19.488	0.000	(0)
	CdCl3-	4.868e-21	4.701e-21	-20.313	-20.328	-0.015	(0)

ZnCl3-	4.749e-21	4.591e-21	-20.323	-20.338	-0.015	(0)
PbCl3-	2.711e-21	2.618e-21	-20.567	-20.582	-0.015	(0)
MnCl3-	1.019e-21	9.852e-22	-20.992	-21.006	-0.015	(0)
HgCl+	3.463e-22	3.343e-22	-21.461	-21.476	-0.015	(0)
CuCl3-	1.813e-22	1.753e-22	-21.742	-21.756	-0.015	(0)
HgCl3-	6.523e-24	6.299e-24	-23.186	-23.201	-0.015	(0)
FeCl2+	2.880e-24	2.786e-24	-23.541	-23.555	-0.015	(0)
ZnCl4-2	5.087e-26	4.451e-26	-25.294	-25.352	-0.058	(0)
PbCl4-2	2.669e-26	2.320e-26	-25.574	-25.635	-0.061	(0)
HgCl4-2	5.594e-28	4.862e-28	-27.252	-27.313	-0.061	(0)
CuCl4-2	1.947e-29	1.703e-29	-28.711	-28.769	-0.058	(0)
FeCl3	5.401e-30	5.401e-30	-29.268	-29.268	0.000	(0)
UCl+3	1.622e-34	1.183e-34	-33.790	-33.927	-0.137	(0)
Cu (1)	2.435e-07					
Cu+	2.379e-07	2.297e-07	-6.624	-6.639	-0.015	(0)
CuCl	5.607e-09	5.607e-09	-8.251	-8.251	0.000	(0)
CuCl2-	2.349e-11	2.271e-11	-10.629	-10.644	-0.015	(0)
CuCl3-2	1.076e-16	9.414e-17	-15.968	-16.026	-0.058	(0)
Cu (2)	5.800e-06					
Cu+2	5.367e-06	4.690e-06	-5.270	-5.329	-0.059	(0)
CuSO4	1.409e-07	1.409e-07	-6.851	-6.851	0.000	(0)
CuCO3	1.401e-07	1.401e-07	-6.853	-6.853	0.000	(0)
CuOH+	8.577e-08	8.292e-08	-7.067	-7.081	-0.015	(0)
CuHCO3+	5.973e-08	5.767e-08	-7.224	-7.239	-0.015	(0)
CuF+	5.853e-09	5.652e-09	-8.233	-8.248	-0.015	(0)
Cu2 (OH) 2+2	1.987e-10	1.727e-10	-9.702	-9.763	-0.061	(0)
CuCl+	1.491e-10	1.441e-10	-9.827	-9.841	-0.015	(0)
Cu (OH) 2	9.251e-11	9.251e-11	-10.034	-10.034	0.000	(0)
Cu (CO3) 2-2	2.202e-12	1.914e-12	-11.657	-11.718	-0.061	(0)
Cu (OH) 3-	1.099e-15	1.061e-15	-14.959	-14.974	-0.015	(0)
CuCl2	9.688e-16	9.688e-16	-15.014	-15.014	0.000	(0)
CuCl3-	1.813e-22	1.753e-22	-21.742	-21.756	-0.015	(0)
Cu (OH) 4-2	5.372e-23	4.669e-23	-22.270	-22.331	-0.061	(0)
CuCl4-2	1.947e-29	1.703e-29	-28.711	-28.769	-0.058	(0)
F	2.272e-05					
F-	1.975e-05	1.910e-05	-4.704	-4.719	-0.015	(0)
AlF2+	9.833e-07	9.511e-07	-6.007	-6.022	-0.014	(0)
AlF3	2.287e-07	2.287e-07	-6.641	-6.641	0.000	(0)
AlF+2	1.429e-07	1.251e-07	-6.845	-6.903	-0.058	(0)
MgF+	7.608e-08	7.357e-08	-7.119	-7.133	-0.015	(0)
HF	5.087e-08	5.087e-08	-7.294	-7.294	0.000	(0)
CaF+	2.884e-08	2.790e-08	-7.540	-7.554	-0.015	(0)
CuF+	5.853e-09	5.652e-09	-8.233	-8.248	-0.015	(0)
AlF4-	2.264e-09	2.189e-09	-8.645	-8.660	-0.015	(0)
UO2F+	1.923e-09	1.856e-09	-8.716	-8.731	-0.015	(0)
NaF	1.086e-09	1.086e-09	-8.964	-8.964	0.000	(0)
MnF+	2.170e-10	2.098e-10	-9.664	-9.678	-0.015	(0)
UO2F2	1.023e-10	1.023e-10	-9.990	-9.990	0.000	(0)
ZnF+	7.862e-11	7.591e-11	-10.104	-10.120	-0.015	(0)
PbF+	7.935e-12	7.661e-12	-11.100	-11.116	-0.015	(0)
HF2-	3.822e-12	3.694e-12	-11.418	-11.432	-0.015	(0)
BF (OH) 3-	3.662e-12	3.539e-12	-11.436	-11.451	-0.015	(0)
CdF+	8.050e-13	7.772e-13	-12.094	-12.109	-0.015	(0)
UO2F3-	5.081e-13	4.906e-13	-12.294	-12.309	-0.015	(0)
VOF+	4.990e-14	4.818e-14	-13.302	-13.317	-0.015	(0)
BF2 (OH) 2-	1.347e-14	1.301e-14	-13.871	-13.886	-0.015	(0)
H2F2	6.934e-15	6.934e-15	-14.159	-14.159	0.000	(0)
PbF2	2.880e-15	2.880e-15	-14.541	-14.541	0.000	(0)
FeF+2	1.315e-15	1.150e-15	-14.881	-14.939	-0.058	(0)
FeF2+	6.080e-16	5.880e-16	-15.216	-15.231	-0.015	(0)
VO2F	5.431e-16	5.431e-16	-15.265	-15.265	0.000	(0)
VOF2	3.450e-16	3.450e-16	-15.462	-15.462	0.000	(0)
UO2F4-2	8.563e-17	7.443e-17	-16.067	-16.128	-0.061	(0)
CdF2	2.962e-17	2.962e-17	-16.528	-16.528	0.000	(0)
FeF3	1.585e-17	1.585e-17	-16.800	-16.800	0.000	(0)
VO2F2-	3.901e-18	3.766e-18	-17.409	-17.424	-0.015	(0)
VOF3-	2.422e-19	2.338e-19	-18.616	-18.631	-0.015	(0)
BF3OH-	1.802e-19	1.741e-19	-18.744	-18.759	-0.015	(0)

PbF3-	1.080e-19	1.043e-19	-18.966	-18.982	-0.015	(0)
VO2F3-2	1.032e-21	8.973e-22	-20.986	-21.047	-0.061	(0)
BF4-	3.050e-23	2.947e-23	-22.516	-22.531	-0.015	(0)
VOF4-2	2.074e-23	1.803e-23	-22.683	-22.744	-0.061	(0)
UF3+	3.498e-24	3.378e-24	-23.456	-23.471	-0.015	(0)
UF2+2	1.284e-24	1.116e-24	-23.892	-23.952	-0.061	(0)
PbF4-2	1.097e-24	9.536e-25	-23.960	-24.021	-0.061	(0)
VO2F4-3	1.156e-26	8.433e-27	-25.937	-26.074	-0.137	(0)
UF4	7.073e-27	7.073e-27	-26.150	-26.150	0.000	(0)
UF+3	6.361e-27	4.640e-27	-26.196	-26.333	-0.137	(0)
HgF+	6.337e-28	6.119e-28	-27.198	-27.213	-0.015	(0)
UF5-	5.545e-30	5.354e-30	-29.256	-29.271	-0.015	(0)
UF6-2	3.553e-32	3.088e-32	-31.449	-31.510	-0.061	(0)
Fe (2)	7.010e-08					
Fe+2	6.804e-08	5.914e-08	-7.167	-7.228	-0.061	(0)
FeSO4	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
FeHCO3+	1.500e-10	1.451e-10	-9.824	-9.838	-0.014	(0)
FeOH+	1.361e-11	1.316e-11	-10.866	-10.881	-0.015	(0)
Fe (OH) 2	5.847e-17	5.847e-17	-16.233	-16.233	0.000	(0)
Fe (OH) 3-	1.069e-19	1.034e-19	-18.971	-18.986	-0.015	(0)
Fe (3)	4.488e-10					
Fe (OH) 2+	4.460e-10	4.314e-10	-9.351	-9.365	-0.014	(0)
Fe (OH) 3	2.591e-12	2.591e-12	-11.587	-11.587	0.000	(0)
FeOH+2	2.267e-13	1.983e-13	-12.645	-12.703	-0.058	(0)
Fe (OH) 4-	1.394e-15	1.349e-15	-14.856	-14.870	-0.014	(0)
FeF+2	1.315e-15	1.150e-15	-14.881	-14.939	-0.058	(0)
FeF2+	6.080e-16	5.880e-16	-15.216	-15.231	-0.015	(0)
FeSO4+	8.358e-17	8.083e-17	-16.078	-16.092	-0.015	(0)
Fe+3	7.441e-17	5.494e-17	-16.128	-16.260	-0.132	(0)
FeF3	1.585e-17	1.585e-17	-16.800	-16.800	0.000	(0)
Fe (SO4) 2-	2.347e-19	2.266e-19	-18.629	-18.645	-0.015	(0)
FeCl+2	3.677e-20	3.217e-20	-19.435	-19.493	-0.058	(0)
FeHSeO3+2	5.090e-22	4.424e-22	-21.293	-21.354	-0.061	(0)
FeCl2+	2.880e-24	2.786e-24	-23.541	-23.555	-0.015	(0)
Fe2 (OH) 2+4	2.282e-24	1.302e-24	-23.642	-23.885	-0.244	(0)
FeCl3	5.401e-30	5.401e-30	-29.268	-29.268	0.000	(0)
Fe3 (OH) 4+5	1.951e-32	8.122e-33	-31.710	-32.090	-0.381	(0)
H (0)	4.591e-23					
H2	2.295e-23	2.296e-23	-22.639	-22.639	0.000	(0)
Hg (0)	7.977e-11					
Hg	7.977e-11	7.977e-11	-10.098	-10.098	0.000	(0)
Hg (1)	1.077e-25					
Hg2+2	5.384e-26	4.680e-26	-25.269	-25.330	-0.061	(0)
Hg (2)	3.744e-19					
Hg (OH) 2	1.704e-19	1.705e-19	-18.768	-18.768	0.000	(0)
HgClOH	1.655e-19	1.655e-19	-18.781	-18.781	0.000	(0)
HgCl2	3.249e-20	3.249e-20	-19.488	-19.488	0.000	(0)
HgCO3	5.248e-21	5.248e-21	-20.280	-20.280	0.000	(0)
HgCl+	3.463e-22	3.343e-22	-21.461	-21.476	-0.015	(0)
HgOH+	1.992e-22	1.924e-22	-21.701	-21.716	-0.015	(0)
HgHCO3+	1.823e-22	1.760e-22	-21.739	-21.755	-0.015	(0)
HgCl3-	6.523e-24	6.299e-24	-23.186	-23.201	-0.015	(0)
Hg+2	9.943e-25	8.642e-25	-24.002	-24.063	-0.061	(0)
Hg (CO3) 2-2	9.688e-26	8.421e-26	-25.014	-25.075	-0.061	(0)
HgSO4	2.967e-26	2.967e-26	-25.528	-25.528	0.000	(0)
HgF+	6.337e-28	6.119e-28	-27.198	-27.213	-0.015	(0)
HgCl4-2	5.594e-28	4.862e-28	-27.252	-27.313	-0.061	(0)
Hg (OH) 3-	1.243e-28	1.200e-28	-27.906	-27.921	-0.015	(0)
K	4.694e-05					
K+	4.690e-05	4.534e-05	-4.329	-4.343	-0.015	(0)
KSO4-	4.352e-08	4.209e-08	-7.361	-7.376	-0.014	(0)
Mg	4.025e-05					
Mg+2	3.929e-05	3.433e-05	-4.406	-4.464	-0.059	(0)
MgSO4	8.192e-07	8.192e-07	-6.087	-6.087	0.000	(0)
MgF+	7.608e-08	7.357e-08	-7.119	-7.133	-0.015	(0)
MgHCO3+	7.082e-08	6.847e-08	-7.150	-7.165	-0.015	(0)
MgCO3	1.449e-10	1.449e-10	-9.839	-9.839	0.000	(0)
MgOH+	7.897e-11	7.641e-11	-10.103	-10.117	-0.014	(0)

MgH2BO3+	1.845e-13	1.782e-13	-12.734	-12.749	-0.015	(0)
Mn (2)	3.253e-07					
Mn+2	3.175e-07	2.760e-07	-6.498	-6.559	-0.061	(0)
MnSO4	6.436e-09	6.436e-09	-8.191	-8.191	0.000	(0)
MnHCO3+	1.110e-09	1.073e-09	-8.955	-8.969	-0.015	(0)
MnF+	2.170e-10	2.098e-10	-9.664	-9.678	-0.015	(0)
MnCl+	6.965e-12	6.736e-12	-11.157	-11.172	-0.015	(0)
MnOH+	4.008e-12	3.876e-12	-11.397	-11.412	-0.015	(0)
MnCl2	1.845e-16	1.845e-16	-15.734	-15.734	0.000	(0)
MnCl3-	1.019e-21	9.852e-22	-20.992	-21.006	-0.015	(0)
MnSeO4	1.907e-24	1.907e-24	-23.720	-23.720	0.000	(0)
Mn (OH) 3-	7.744e-25	7.489e-25	-24.111	-24.126	-0.015	(0)
MnSe	4.756e-29	4.756e-29	-28.323	-28.323	0.000	(0)
Mn (OH) 4-2	1.545e-32	1.352e-32	-31.811	-31.869	-0.058	(0)
Mn (3)	1.670e-28					
Mn+3	1.670e-28	1.233e-28	-27.777	-27.909	-0.132	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-62.967	-63.025	-0.058	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-68.382	-68.397	-0.015	(0)
Mo	2.116e-08					
MoO4-2	2.049e-08	1.790e-08	-7.689	-7.747	-0.059	(0)
HMoO4-	6.644e-10	6.415e-10	-9.178	-9.193	-0.015	(0)
H2MoO4	8.462e-12	8.462e-12	-11.073	-11.073	0.000	(0)
AlMo6O21-3	9.907e-36	7.227e-36	-35.004	-35.141	-0.137	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.173	-46.554	-0.381	(0)
Mo7O24-6	0.000e+00	0.000e+00	-46.648	-47.196	-0.548	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-47.272	-47.516	-0.244	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-49.877	-50.014	-0.137	(0)
Na	9.327e-05					
Na+	9.319e-05	9.010e-05	-4.031	-4.045	-0.015	(0)
NaSO4-	6.560e-08	6.345e-08	-7.183	-7.198	-0.014	(0)
NaHCO3	9.876e-09	9.876e-09	-8.005	-8.005	0.000	(0)
NaF	1.086e-09	1.086e-09	-8.964	-8.964	0.000	(0)
NaCO3-	8.801e-12	8.513e-12	-11.055	-11.070	-0.014	(0)
NaH2BO3	2.138e-14	2.138e-14	-13.670	-13.670	0.000	(0)
O (0)	0.000e+00					
O2	0.000e+00	0.000e+00	-47.017	-47.017	0.000	(0)
Pb	7.915e-09					
Pb+2	6.514e-09	5.692e-09	-8.186	-8.245	-0.059	(0)
PbHCO3+	8.538e-10	8.244e-10	-9.069	-9.084	-0.015	(0)
PbSO4	3.656e-10	3.656e-10	-9.437	-9.437	0.000	(0)
PbCO3	8.682e-11	8.682e-11	-10.061	-10.061	0.000	(0)
PbOH+	8.280e-11	7.995e-11	-10.082	-10.097	-0.015	(0)
PbF+	7.935e-12	7.661e-12	-11.100	-11.116	-0.015	(0)
PbCl+	4.055e-12	3.916e-12	-11.392	-11.407	-0.015	(0)
Pb (SO4) 2-2	3.324e-13	2.889e-13	-12.478	-12.539	-0.061	(0)
Pb (OH) 2	1.414e-14	1.414e-14	-13.850	-13.850	0.000	(0)
PbF2	2.880e-15	2.880e-15	-14.541	-14.541	0.000	(0)
Pb (CO3) 2-2	1.462e-15	1.271e-15	-14.835	-14.896	-0.061	(0)
PbCl2	3.391e-16	3.391e-16	-15.470	-15.470	0.000	(0)
Pb2OH+3	9.887e-18	7.212e-18	-17.005	-17.142	-0.137	(0)
PbF3-	1.080e-19	1.043e-19	-18.966	-18.982	-0.015	(0)
Pb (OH) 3-	8.186e-20	7.904e-20	-19.087	-19.102	-0.015	(0)
PbCl3-	2.711e-21	2.618e-21	-20.567	-20.582	-0.015	(0)
PbF4-2	1.097e-24	9.536e-25	-23.960	-24.021	-0.061	(0)
Pb (OH) 4-2	1.245e-25	1.082e-25	-24.905	-24.966	-0.061	(0)
PbCl4-2	2.669e-26	2.320e-26	-25.574	-25.635	-0.061	(0)
Pb3 (OH) 4+2	2.611e-26	2.269e-26	-25.583	-25.644	-0.061	(0)
Pb4 (OH) 4+4	1.798e-30	1.026e-30	-29.745	-29.989	-0.244	(0)
S (6)	1.552e-04					
SO4-2	1.501e-04	1.311e-04	-3.824	-3.882	-0.059	(0)
CaSO4	4.020e-06	4.020e-06	-5.396	-5.396	0.000	(0)
MgSO4	8.192e-07	8.192e-07	-6.087	-6.087	0.000	(0)
CuSO4	1.409e-07	1.409e-07	-6.851	-6.851	0.000	(0)
NaSO4-	6.560e-08	6.345e-08	-7.183	-7.198	-0.014	(0)
KSO4-	4.352e-08	4.209e-08	-7.361	-7.376	-0.014	(0)
HSO4-	2.387e-08	2.308e-08	-7.622	-7.637	-0.015	(0)

MnSO4	6.436e-09	6.436e-09	-8.191	-8.191	0.000	(0)
ZnSO4	5.715e-09	5.715e-09	-8.243	-8.243	0.000	(0)
FeSO4	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
AlSO4+	6.894e-10	6.667e-10	-9.162	-9.176	-0.015	(0)
PbSO4	3.656e-10	3.656e-10	-9.437	-9.437	0.000	(0)
UO2SO4	1.398e-10	1.398e-10	-9.855	-9.855	0.000	(0)
CdSO4	7.893e-11	7.893e-11	-10.103	-10.103	0.000	(0)
Zn(SO4) 2-2	7.509e-12	6.527e-12	-11.124	-11.185	-0.061	(0)
Al(SO4) 2-	9.687e-13	9.367e-13	-12.014	-12.028	-0.015	(0)
Pb(SO4) 2-2	3.324e-13	2.889e-13	-12.478	-12.539	-0.061	(0)
UO2(SO4) 2-2	2.779e-13	2.416e-13	-12.556	-12.617	-0.061	(0)
Cd(SO4) 2-2	1.606e-13	1.396e-13	-12.794	-12.855	-0.061	(0)
VOSO4	1.519e-14	1.519e-14	-13.818	-13.818	0.000	(0)
FeSO4+	8.358e-17	8.083e-17	-16.078	-16.092	-0.015	(0)
VO2SO4-	5.258e-17	5.077e-17	-16.279	-16.294	-0.015	(0)
Fe(SO4) 2-	2.347e-19	2.266e-19	-18.629	-18.645	-0.015	(0)
VSO4+	4.342e-24	4.193e-24	-23.362	-23.378	-0.015	(0)
HgSO4	2.967e-26	2.967e-26	-25.528	-25.528	0.000	(0)
USO4+2	7.314e-29	6.357e-29	-28.136	-28.197	-0.061	(0)
U(SO4) 2	6.622e-29	6.622e-29	-28.179	-28.179	0.000	(0)
Se(-2)	7.904e-23					
HSe-	7.799e-23	7.530e-23	-22.108	-22.123	-0.015	(0)
H2Se	1.053e-24	1.053e-24	-23.978	-23.978	0.000	(0)
MnSe	4.756e-29	4.756e-29	-28.323	-28.323	0.000	(0)
Se-2	4.811e-32	4.181e-32	-31.318	-31.379	-0.061	(0)
Se(4)	3.166e-09					
HSeO3-	3.156e-09	3.047e-09	-8.501	-8.516	-0.015	(0)
SeO3-2	7.751e-12	6.737e-12	-11.111	-11.172	-0.061	(0)
H2SeO3	2.341e-12	2.341e-12	-11.631	-11.631	0.000	(0)
FeHSeO3+2	5.090e-22	4.424e-22	-21.293	-21.354	-0.061	(0)
Cd(SeO3) 2-2	1.105e-25	9.605e-26	-24.957	-25.018	-0.061	(0)
Se(6)	2.939e-20					
SeO4-2	2.938e-20	2.568e-20	-19.532	-19.590	-0.059	(0)
HSeO4-	2.400e-24	2.317e-24	-23.620	-23.635	-0.015	(0)
MnSeO4	1.907e-24	1.907e-24	-23.720	-23.720	0.000	(0)
ZnSeO4	7.921e-25	7.921e-25	-24.101	-24.101	0.000	(0)
CdSeO4	1.228e-26	1.228e-26	-25.911	-25.911	0.000	(0)
Zn(SeO4) 2-2	0.000e+00	0.000e+00	-43.625	-43.686	-0.061	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-43.573	-43.710	-0.137	(0)
U(4)	5.421e-16					
U(OH) 5-	5.051e-16	4.877e-16	-15.297	-15.312	-0.015	(0)
U(OH) 4	3.678e-17	3.678e-17	-16.434	-16.434	0.000	(0)
U(OH) 3+	2.508e-19	2.422e-19	-18.601	-18.616	-0.015	(0)
U(OH) 2+2	2.320e-22	2.016e-22	-21.635	-21.695	-0.061	(0)
UF3+	3.498e-24	3.378e-24	-23.456	-23.471	-0.015	(0)
UF2+2	1.284e-24	1.116e-24	-23.892	-23.952	-0.061	(0)
UOH+3	2.344e-26	1.710e-26	-25.630	-25.767	-0.137	(0)
UF4	7.073e-27	7.073e-27	-26.150	-26.150	0.000	(0)
UF+3	6.361e-27	4.640e-27	-26.196	-26.333	-0.137	(0)
USO4+2	7.314e-29	6.357e-29	-28.136	-28.197	-0.061	(0)
U(SO4) 2	6.622e-29	6.622e-29	-28.179	-28.179	0.000	(0)
UF5-	5.545e-30	5.354e-30	-29.256	-29.271	-0.015	(0)
U+4	2.133e-31	1.218e-31	-30.671	-30.914	-0.244	(0)
UF6-2	3.553e-32	3.088e-32	-31.449	-31.510	-0.061	(0)
UCl+3	1.622e-34	1.183e-34	-33.790	-33.927	-0.137	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-115.241	-116.474	-1.233	(0)
U(5)	4.445e-11					
UO2+	4.445e-11	4.292e-11	-10.352	-10.367	-0.015	(0)
U(6)	1.937e-08					
UO2CO3	1.422e-08	1.422e-08	-7.847	-7.847	0.000	(0)
UO2F+	1.923e-09	1.856e-09	-8.716	-8.731	-0.015	(0)
UO2(CO3) 2-2	1.657e-09	1.440e-09	-8.781	-8.842	-0.061	(0)
UO2+2	8.058e-10	7.041e-10	-9.094	-9.152	-0.059	(0)
UO2OH+	5.133e-10	4.956e-10	-9.290	-9.305	-0.015	(0)
UO2SO4	1.398e-10	1.398e-10	-9.855	-9.855	0.000	(0)
UO2F2	1.023e-10	1.023e-10	-9.990	-9.990	0.000	(0)
UO2(CO3) 3-4	6.416e-13	3.662e-13	-12.193	-12.436	-0.244	(0)

UO2F3-	5.081e-13	4.906e-13	-12.294	-12.309	-0.015	(0)
(UO2) 2 (OH) 2+2	4.690e-13	4.077e-13	-12.329	-12.390	-0.061	(0)
UO2 (SO4) 2-2	2.779e-13	2.416e-13	-12.556	-12.617	-0.061	(0)
UO2Cl+	2.293e-14	2.214e-14	-13.640	-13.655	-0.015	(0)
(UO2) 3 (OH) 5+	4.963e-15	4.792e-15	-14.304	-14.320	-0.015	(0)
UO2F4-2	8.563e-17	7.443e-17	-16.067	-16.128	-0.061	(0)
V (2)	4.438e-31					
V+2	3.816e-31	3.317e-31	-30.418	-30.479	-0.061	(0)
VOH+	6.216e-32	6.002e-32	-31.206	-31.222	-0.015	(0)
V (3)	9.550e-09					
V (OH) 3	9.550e-09	9.550e-09	-8.020	-8.020	0.000	(0)
V (OH) 2+	1.151e-17	1.111e-17	-16.939	-16.954	-0.015	(0)
VOH+2	2.184e-19	1.898e-19	-18.661	-18.722	-0.061	(0)
V+3	9.284e-23	6.773e-23	-22.032	-22.169	-0.137	(0)
VSO4+	4.342e-24	4.193e-24	-23.362	-23.378	-0.015	(0)
V2 (OH) 2+4	3.982e-37	2.273e-37	-36.400	-36.643	-0.244	(0)
V2 (OH) 3+3	8.184e-38	5.970e-38	-37.087	-37.224	-0.137	(0)
V (4)	1.035e-12					
V (OH) 3+	4.859e-13	4.692e-13	-12.313	-12.329	-0.015	(0)
VO+2	4.838e-13	4.205e-13	-12.315	-12.376	-0.061	(0)
VOF+	4.990e-14	4.818e-14	-13.302	-13.317	-0.015	(0)
VOSO4	1.519e-14	1.519e-14	-13.818	-13.818	0.000	(0)
VOF2	3.450e-16	3.450e-16	-15.462	-15.462	0.000	(0)
VOC1+	2.369e-17	2.287e-17	-16.625	-16.641	-0.015	(0)
VOF3-	2.422e-19	2.338e-19	-18.616	-18.631	-0.015	(0)
H2V2O4+2	1.269e-20	1.103e-20	-19.896	-19.957	-0.061	(0)
VOF4-2	2.074e-23	1.803e-23	-22.683	-22.744	-0.061	(0)
V (5)	2.644e-10					
H2VO4-	2.595e-10	2.506e-10	-9.586	-9.601	-0.015	(0)
H3VO4	4.512e-12	4.512e-12	-11.346	-11.346	0.000	(0)
HVO4-2	4.021e-13	3.495e-13	-12.396	-12.457	-0.061	(0)
VO2+	1.677e-14	1.621e-14	-13.775	-13.790	-0.015	(0)
H3V2O7-	7.560e-15	7.299e-15	-14.121	-14.137	-0.015	(0)
VO2F	5.431e-16	5.431e-16	-15.265	-15.265	0.000	(0)
VO2SO4-	5.258e-17	5.077e-17	-16.279	-16.294	-0.015	(0)
VO2F2-	3.901e-18	3.766e-18	-17.409	-17.424	-0.015	(0)
HV2O7-3	4.067e-20	2.967e-20	-19.391	-19.528	-0.137	(0)
VO4-3	1.333e-21	9.727e-22	-20.875	-21.012	-0.137	(0)
VO2F3-2	1.032e-21	8.973e-22	-20.986	-21.047	-0.061	(0)
V3O9-3	2.258e-23	1.647e-23	-22.646	-22.783	-0.137	(0)
V2O7-4	7.770e-25	4.435e-25	-24.110	-24.353	-0.244	(0)
VO2F4-3	1.156e-26	8.433e-27	-25.937	-26.074	-0.137	(0)
V4O12-4	3.014e-30	1.720e-30	-29.521	-29.764	-0.244	(0)
HV10O28-5	0.000e+00	0.000e+00	-67.261	-67.641	-0.381	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.935	-68.178	-0.244	(0)
V10O28-6	0.000e+00	0.000e+00	-69.535	-70.083	-0.548	(0)
Zn	2.352e-07					
Zn+2	2.280e-07	1.992e-07	-6.642	-6.701	-0.059	(0)
ZnSO4	5.715e-09	5.715e-09	-8.243	-8.243	0.000	(0)
ZnHCO3+	1.272e-09	1.228e-09	-8.896	-8.911	-0.015	(0)
ZnOH+	1.154e-10	1.114e-10	-9.938	-9.953	-0.015	(0)
ZnF+	7.862e-11	7.591e-11	-10.104	-10.120	-0.015	(0)
ZnCO3	5.816e-11	5.816e-11	-10.235	-10.235	0.000	(0)
ZnCl+	1.003e-11	9.701e-12	-10.999	-11.013	-0.015	(0)
Zn (SO4) 2-2	7.509e-12	6.527e-12	-11.124	-11.185	-0.061	(0)
Zn (OH) 2	9.870e-14	9.870e-14	-13.006	-13.006	0.000	(0)
ZnOHC1	7.101e-14	7.101e-14	-13.149	-13.149	0.000	(0)
ZnCl2	2.981e-16	2.981e-16	-15.526	-15.526	0.000	(0)
Zn (OH) 3-	2.865e-18	2.766e-18	-17.543	-17.558	-0.015	(0)
ZnCl3-	4.749e-21	4.591e-21	-20.323	-20.338	-0.015	(0)
ZnSeO4	7.921e-25	7.921e-25	-24.101	-24.101	0.000	(0)
Zn (OH) 4-2	7.083e-25	6.157e-25	-24.150	-24.211	-0.061	(0)
ZnCl4-2	5.087e-26	4.451e-26	-25.294	-25.352	-0.058	(0)
Zn (SeO4) 2-2	0.000e+00	0.000e+00	-43.625	-43.686	-0.061	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

Al (OH) 3 (am)	-2.75	8.05	10.80	Al (OH) 3
Al2 (MoO4) 3	-43.98	-41.61	2.37	Al2 (MoO4) 3
Al2O3	-3.55	16.10	19.65	Al2O3
Al4 (OH) 10SO4	-5.87	16.83	22.70	Al4 (OH) 10SO4
AlOHSO4	-4.09	-7.32	-3.23	AlOHSO4
Alunite	-3.79	-5.19	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.34	-12.13	-7.79	PbSO4
Anhydrite	-3.40	-7.76	-4.36	CaSO4
Antlerite	-5.68	3.11	8.79	Cu3 (OH) 4SO4
Aragonite	-3.87	-12.17	-8.30	CaCO3
Artinite	-15.33	-5.73	9.60	MgCO3:Mg (OH) 2:3H2O
Atacamite	-5.53	1.86	7.39	Cu2 (OH) 3Cl
Azurite	-4.18	-21.09	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-19.56	4.83	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-22.30	-6.42	15.87	Ba2V2O7:2H2O
Ba3 (VO4) 2:4H2O	-34.53	-1.59	32.94	Ba3 (VO4) 2:4H2O
BaF2	-10.27	-16.09	-5.82	BaF2
BaMoO4	-7.44	-14.40	-6.96	BaMoO4
Barite	-0.56	-10.54	-9.98	BaSO4
BaSeO3	-11.26	-9.43	1.83	BaSeO3
BaSeO4	-18.79	-26.25	-7.46	BaSeO4
Bianchite	-8.82	-10.58	-1.76	ZnSO4:6H2O
Birnessite	-19.02	-0.93	18.09	MnO2
Bixbyite	-20.71	-21.35	-0.64	Mn2O3
Boehmite	-0.53	8.05	8.58	AlOOH
Brochantite	-5.95	9.27	15.22	Cu4 (OH) 6SO4
Brucite	-9.82	7.02	16.84	Mg (OH) 2
Ca (VO3) 2	-14.14	-8.48	5.66	Ca (VO3) 2
Ca2V2O7	-18.36	-0.86	17.50	Ca2V2O7
Ca2V2O7:2H2O	-22.41	-0.86	21.55	Ca2V2O7:2H2O
Ca3 (VO4) 2	-32.20	6.76	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-33.10	6.76	39.86	Ca3 (VO4) 2:4H2O
Calcite	-3.69	-12.17	-8.48	CaCO3
Calomel	-16.84	-34.75	-17.91	Hg2Cl2
CaMoO4	-3.67	-11.62	-7.95	CaMoO4
Carnotite	-4.54	-4.31	0.23	KUO2VO4
CaSeO3:2H2O	-9.46	-6.65	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-20.44	-23.46	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-19.61	-9.77	9.84	Cd (BO2) 2
Cd (OH) 2	-10.75	2.90	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-10.83	2.90	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-28.76	-22.05	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-29.24	-6.68	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-32.18	-3.78	28.40	Cd4 (OH) 6SO4
CdCl2	-17.36	-18.02	-0.66	CdCl2
CdCl2:1H2O	-16.32	-18.02	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.10	-18.02	-1.91	CdCl2:2.5H2O
CdF2	-16.82	-18.03	-1.21	CdF2
Cdmetal (alpha)	-30.11	-16.59	13.51	Cd
Cdmetal (gamma)	-30.21	-16.59	13.62	Cd
CdMoO4	-2.19	-16.34	-14.15	CdMoO4
CdOHC1	-11.10	-7.56	3.54	CdOHC1
CdSe	-4.77	-24.97	-20.20	CdSe
CdSeO4:2H2O	-26.33	-28.18	-1.85	CdSeO4:2H2O
CdSO4	-12.30	-12.47	-0.17	CdSO4
CdSO4:1H2O	-10.75	-12.47	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.60	-12.47	-1.87	CdSO4:2.67H2O
Cerrusite	-3.41	-16.54	-13.13	PbCO3
CH4 (g)	-56.69	-97.74	-41.05	CH4
Chalcanthite	-6.57	-9.21	-2.64	CuSO4:5H2O
Clausthalite	2.48	-24.62	-27.10	PbSe
CO2 (g)	-1.64	-19.78	-18.15	CO2
Cotunnite	-12.89	-17.67	-4.78	PbCl2
Cryolite	-15.79	-49.63	-33.84	Na3AlF6
Cu (OH) 2	-2.51	6.16	8.67	Cu (OH) 2
Cu2Se (alpha)	16.14	-29.66	-45.80	Cu2Se
Cu2SO4	-15.21	-17.16	-1.95	Cu2SO4

Cu3Se2	12.13	-51.36	-63.49	Cu3Se2
CuCO3	-2.12	-13.62	-11.50	CuCO3
CuF	-6.45	-11.36	-4.91	CuF
CuF2	-15.88	-14.77	1.12	CuF2
CuF2:2H2O	-10.22	-14.77	-4.55	CuF2:2H2O
Cumetal	-1.88	-10.64	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-13.35	-3.05	10.30	CuOCuSO4
Cupricferrite	2.12	8.11	5.99	CuFe2O4
Cuprite	-0.38	-1.79	-1.41	Cu2O
Cuprousferrite	9.00	0.08	-8.92	CuFeO2
CuSe	11.39	-21.71	-33.10	CuSe
CuSe2	3.28	-30.09	-33.37	CuSe2
CuSeO3:2H2O	-8.61	-8.10	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-22.48	-24.92	-2.44	CuSeO4:5H2O
CuSO4	-12.15	-9.21	2.94	CuSO4
Diaspore	1.18	8.05	6.87	AlOOH
Dolomite(disordered)	-8.39	-24.93	-16.54	CaMg(CO3)2
Dolomite(ordered)	-7.84	-24.93	-17.09	CaMg(CO3)2
Epsomite	-6.22	-8.35	-2.13	MgSO4:7H2O
Fe(OH)2	-9.30	4.26	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	0.88	-2.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-8.11	-11.83	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-13.87	-12.31	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.21	-40.83	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-40.43	-44.17	-3.73	Fe2(SO4)3
Fe3(OH)8	-14.01	6.21	20.22	Fe3(OH)8
FeMoO4	-4.88	-14.98	-10.09	FeMoO4
Ferrihydrite	-2.22	0.97	3.19	Fe(OH)3
Ferroselite	-13.39	-31.99	-18.60	FeSe2
FeSe	-12.61	-23.61	-11.00	FeSe
Fluorite	-2.81	-13.31	-10.50	CaF2
Gibbsite	-0.24	8.05	8.29	Al(OH)3
Goethite	0.48	0.97	0.49	FeOOH
Goslarite	-8.57	-10.58	-2.01	ZnSO4:7H2O
Gummite	-5.34	2.34	7.67	UO3
Gypsum	-3.15	-7.76	-4.61	CaSO4:2H2O
H-Jarosite	-15.72	-27.82	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-6.36	-19.24	-12.88	H2MoO4
H2Se(g)	-22.91	-27.87	-4.96	H2Se
Halite	-10.36	-8.76	1.60	NaCl
Hausmannite	-26.75	34.28	61.03	Mn3O4
Hematite	3.36	1.95	-1.42	Fe2O3
Hercynite	-2.53	20.36	22.89	FeAl2O4
Hg(CH3)2(g)	-140.54	-214.25	-73.71	Hg(CH3)2
Hg(g)	-8.79	-16.66	-7.87	Hg
Hg(OH)2	-15.27	-18.77	-3.50	Hg(OH)2
Hg2(g)	-18.37	-33.33	-14.96	Hg2
Hg2(OH)2	-19.10	-13.84	5.26	Hg2(OH)2
Hg2CO3	-17.57	-33.62	-16.05	Hg2CO3
Hg2F2	-24.41	-34.77	-10.36	Hg2F2
Hg2SeO3	-23.44	-28.10	-4.66	Hg2SeO3
Hg2SO4	-23.08	-29.21	-6.13	Hg2SO4
Hg3O2CO3	-46.41	-76.09	-29.68	Hg3O2CO3
HgCl(g)	-36.87	-17.38	19.50	HgCl
HgCl2	-18.42	-39.68	-21.26	HgCl2
HgF(g)	-50.06	-17.38	32.68	HgF
HgF2(g)	-52.26	-39.70	12.57	HgF2
Hgmetal(l)	-3.21	-16.66	-13.45	Hg
HgSe	9.06	-46.64	-55.69	HgSe
HgSeO3	-20.60	-33.03	-12.43	HgSeO3
HgSO4	-24.72	-34.14	-9.42	HgSO4
Huntite	-20.48	-50.45	-29.97	CaMg3(CO3)4
Hydrocerrusite	-11.06	-29.83	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-35.25	-44.01	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.12	-21.29	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-11.62	-26.42	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-19.70	-16.43	3.26	K2MoO4

K2SeO4	-27.55	-28.28	-0.73	K2SeO4
Langite	-8.22	9.27	17.49	Cu4(OH)6SO4·H2O
Larnakite	-8.45	-8.88	-0.43	PbO:PbSO4
Laurionite	-7.84	-7.21	0.62	PbOHCl
Lepidocrocite	-0.40	0.97	1.37	FeOOH
Lime	-25.08	7.62	32.70	CaO
Litharge	-9.45	3.24	12.69	PbO
Maghemite	-4.44	1.95	6.39	Fe2O3
Magnesioferrite	-7.89	8.97	16.86	Fe2MgO4
Magnesite	-5.30	-12.76	-7.46	MgCO3
Magnetite	2.80	6.21	3.40	Fe3O4
Malachite	-2.16	-7.46	-5.31	Cu2(OH)2CO3
Manganite	-10.67	14.67	25.34	MnOOH
Massicot	-9.65	3.24	12.89	PbO
Matlockite	-8.70	-17.68	-8.97	PbClF
Melanothallite	-21.01	-14.75	6.26	CuCl2
Melanterite	-8.90	-11.11	-2.21	FeSO4·7H2O
Mg(OH)2 (active)	-11.77	7.02	18.79	Mg(OH)2
Mg(VO3)2	-20.35	-9.07	11.28	Mg(VO3)2
Mg2V2O7	-28.40	-2.04	26.36	Mg2V2O7
MgF2	-5.77	-13.90	-8.13	MgF2
MgMoO4	-10.36	-12.21	-1.85	MgMoO4
MgSeO3·6H2O	-10.29	-7.24	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-22.85	-24.05	-1.20	MgSeO4·6H2O
Minium	-44.30	29.22	73.52	Pb3O4
Mirabilite	-10.86	-11.97	-1.11	Na2SO4·10H2O
Mn(VO3)2	-16.06	-11.16	4.90	Mn(VO3)2
Mn2(SO4)3	-61.75	-67.47	-5.71	Mn2(SO4)3
MnCl2·4H2O	-18.70	-15.98	2.72	MnCl2·4H2O
MnSe	-26.44	-22.94	3.50	MnSe
MnSeO3	-10.46	-9.33	1.13	MnSeO3
MnSeO3·2H2O	-10.31	-9.33	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-24.10	-26.15	-2.05	MnSeO4·5H2O
MnSO4	-13.02	-10.44	2.58	MnSO4
Monteponite	-12.20	2.90	15.10	CdO
Montroydite	-15.13	-18.77	-3.64	HgO
MoO3	-11.24	-19.24	-8.00	MoO3
Na-Jarosite	-14.92	-26.12	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-18.48	-35.07	-16.60	Na2Mo2O7
Na2MoO4	-17.33	-15.84	1.49	Na2MoO4
Na2MoO4·2H2O	-17.06	-15.84	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-21.16	-10.86	10.30	Na2SeO3·5H2O
Na2SeO4	-28.96	-27.68	1.28	Na2SeO4
Na3VO4	-39.63	-2.95	36.68	Na3VO4
Na4V2O7	-46.69	-9.29	37.40	Na4V2O7
Nantokite	-4.62	-11.35	-6.73	CuCl
Natron	-15.07	-16.39	-1.31	Na2CO3·10H2O
NaVO3	-10.20	-6.35	3.86	NaVO3
Nesquehonite	-8.09	-12.76	-4.67	MgCO3·3H2O
Nsutite	-18.44	-0.93	17.50	MnO2
O2(g)	-44.11	38.98	83.09	O2
Otavite	-4.89	-16.89	-12.00	CdCO3
Pb(BO2)2	-15.94	-9.42	6.52	Pb(BO2)2
Pb(OH)2	-4.91	3.24	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-77.50	-86.26	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-12.76	-3.97	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-19.70	6.49	26.19	Pb2O(OH)2
Pb2O3	-35.06	25.98	61.04	Pb2O3
Pb2OCO3	-12.74	-13.30	-0.56	Pb2OCO3
Pb2V2O7	-7.70	-9.60	-1.90	Pb2V2O7
Pb3(VO4)2	-12.50	-6.36	6.14	Pb3(VO4)2
Pb3O2CO3	-21.07	-10.05	11.02	Pb3O2CO3
Pb3O2SO4	-16.32	-5.64	10.69	Pb3O2SO4
Pb4(OH)6SO4	-23.49	-2.39	21.10	Pb4(OH)6SO4
Pb4O3SO4	-24.27	-2.39	21.88	Pb4O3SO4
PbF2	-10.24	-17.68	-7.44	PbF2
Pbmetal	-20.49	-16.24	4.25	Pb
PbMoO4	-0.37	-15.99	-15.62	PbMoO4

PbO:0.3H2O	-9.74	3.24	12.98	PbO:0.33H2O
PbSeO4	-21.00	-27.84	-6.84	PbSeO4
Periclase	-14.56	7.02	21.58	MgO
Phosgenite	-14.40	-34.21	-19.81	PbCl2:PbCO3
Plattnerite	-26.87	22.73	49.60	PbO2
Portlandite	-15.19	7.62	22.80	Ca(OH)2
Pyrochroite	-10.26	4.93	15.19	Mn(OH)2
Pyrolusite	-16.96	24.42	41.38	MnO2
Rhodochrosite	-4.27	-14.85	-10.58	MnCO3
Rutherfordine	-2.95	-17.45	-14.50	UO2CO3
Schoepite	-3.66	2.34	5.99	UO2(OH)2:H2O
Semetal(am)	-1.27	-8.38	-7.11	Se
Semetal(hex)	-0.67	-8.38	-7.71	Se
SeO2	-14.39	-14.26	0.12	SeO2
SeO3	-52.12	-31.08	21.04	SeO3
Siderite	-5.28	-15.52	-10.24	FeCO3
Smithsonite	-5.00	-15.00	-10.00	ZnCO3
Spinel	-13.72	23.12	36.85	MgAl2O4
Tenorite	-1.48	6.16	7.64	CuO
Thenardite	-12.29	-11.97	0.32	Na2SO4
Thermonatrite	-17.02	-16.39	0.64	Na2CO3:H2O
Tyuyamunite	-7.88	-3.80	4.08	Ca(UO2)2(VO4)2
U3O8	-5.91	15.17	21.08	U3O8
U4O9	-9.24	-12.26	-3.02	U4O9
UF4	-20.25	-49.79	-29.54	UF4
UF4:2.5H2O	-17.07	-49.79	-32.72	UF4:2.5H2O
UO2(am)	-8.87	-7.94	0.93	UO2
UO2(OH)2(beta)	-3.27	2.34	5.61	UO2(OH)2
UO2SeO4:4H2O	-26.49	-28.74	-2.25	UO2SeO4:4H2O
UO3	-5.36	2.34	7.70	UO3
Uraninite	-3.27	-7.94	-4.67	UO2
V(OH)3	-12.53	-4.94	7.59	V(OH)3
V2O5	-14.73	-16.09	-1.36	V2O5
V3O5	-23.99	-22.15	1.84	V3O5
V4O7	-30.22	-23.04	7.19	V4O7
V6O13	-26.39	-87.25	-60.86	V6O13
VC12	-54.47	-35.59	18.87	VC12
VC13	-59.74	-36.31	23.43	VC13
VF4	-57.67	-42.74	14.93	VF4
Vmetal	-78.19	-34.17	44.03	V
VO	-29.44	-14.68	14.76	VO
VO(OH)2	-6.04	-0.89	5.15	VO(OH)2
VO2Cl	-21.34	-18.50	2.84	VO2Cl
VOC1	-26.55	-15.39	11.15	VOC1
VOC12	-34.56	-21.80	12.76	VOC12
VOSO4	-19.87	-16.26	3.61	VOSO4
Witherite	-6.38	-14.95	-8.57	BaCO3
Zincite	-6.55	4.79	11.33	ZnO
Zincosite	-14.51	-10.58	3.93	ZnSO4
Zn(BO2)2	-16.17	-7.88	8.29	Zn(BO2)2
Zn(OH)2	-7.41	4.79	12.20	Zn(OH)2
Zn(OH)2(am)	-7.69	4.79	12.47	Zn(OH)2
Zn(OH)2(beta)	-6.97	4.79	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-6.75	4.79	11.53	Zn(OH)2
Zn(OH)2(gamma)	-6.95	4.79	11.73	Zn(OH)2
Zn2(OH)2SO4	-13.29	-5.79	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-16.07	-0.88	15.19	Zn2(OH)3Cl
Zn3O(SO4)2	-35.29	-16.38	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-24.62	3.78	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-35.47	3.03	38.50	Zn5(OH)8Cl2
ZnCl2	-23.18	-16.13	7.05	ZnCl2
ZnCO3:1H2O	-4.74	-15.00	-10.26	ZnCO3:1H2O
ZnF2	-15.60	-16.14	-0.53	ZnF2
Znmetal	-40.49	-14.70	25.79	Zn
ZnMoO4	-4.32	-14.45	-10.13	ZnMoO4
ZnO(active)	-6.40	4.79	11.19	ZnO
ZnSe	-8.68	-23.08	-14.40	ZnSe
ZnSeO4:6H2O	-24.77	-26.29	-1.52	ZnSeO4:6H2O

ZnSO4:1H2O -9.95 -10.58 -0.64 ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 15.

SOLUTION 13 Average HCT data for quartz monzonite - sulfide (ore) (cells
604562, 604606, 604653, 604656 and 604669)

temp 25
pH 7.95176
pe 4
redox pe
units mg/l
density 1
Alkalinity 38.19771 as HCO3
Al 0.00779
B 0.00491
Ba 0.01157
Ca 19.46534
Cl 2.17054
F 0.80723
Fe 0.00087
Hg 0.000005
K 3.84048
Mg 3.50503
Mn 0.12993
Mo 0.00738
Na 3.46033 charge
Pb 0.00012
S(6) 38.71501 as SO4
Sb 0.00012
Se 0.00032
U 0.00124
V 0.00049
Zn 0.00456
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 13. Average HCT data for quartz monzonite - sulfide (ore)
(cells 604562, 604606, 604653, 604656 and 604669)

-----Solution composition-----

Elements	Molality	Moles
Al	2.887e-07	2.887e-07
Alkalinity	6.261e-04	6.261e-04
B	4.543e-07	4.543e-07
Ba	8.426e-08	8.426e-08
Ca	4.857e-04	4.857e-04
Cl	6.123e-05	6.123e-05
F	4.249e-05	4.249e-05
Fe	1.558e-08	1.558e-08
Hg	2.493e-11	2.493e-11
K	9.824e-05	9.824e-05
Mg	1.442e-04	1.442e-04
Mn	2.365e-06	2.365e-06
Mo	7.693e-08	7.693e-08

Na	1.720e-04	1.720e-04	Charge balance
Pb	5.792e-10	5.792e-10	
S (6)	4.030e-04	4.030e-04	
Sb	9.857e-10	9.857e-10	
Se	4.053e-09	4.053e-09	
U	5.210e-09	5.210e-09	
V	9.620e-09	9.620e-09	
Zn	6.974e-08	6.974e-08	

-----Description of solution-----

pH	=	7.952
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	2.432e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	6.337e-04
Total CO2 (mol/kg)	=	6.337e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	1.602e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	10
Total H	=	1.110143e+02
Total O	=	5.551035e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.518e-07	9.010e-07	-6.021	-6.045	-0.024	(0)
H+	1.180e-08	1.117e-08	-7.928	-7.952	-0.024	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	2.887e-07					
Al (OH) 4-	2.862e-07	2.712e-07	-6.543	-6.567	-0.023	(0)
Al (OH) 3	2.391e-09	2.391e-09	-8.621	-8.621	0.000	(0)
Al (OH) 2+	1.402e-10	1.330e-10	-9.853	-9.876	-0.023	(0)
AlF2+	1.357e-12	1.287e-12	-11.867	-11.891	-0.023	(0)
AlF3	6.414e-13	6.414e-13	-12.193	-12.193	0.000	(0)
AlOH+2	2.299e-13	1.858e-13	-12.638	-12.731	-0.093	(0)
AlF+2	1.010e-13	8.164e-14	-12.996	-13.088	-0.093	(0)
AlF4-	1.343e-14	1.273e-14	-13.872	-13.895	-0.023	(0)
AlSO4+	5.049e-16	4.783e-16	-15.297	-15.320	-0.023	(0)
Al+3	3.362e-16	2.062e-16	-15.473	-15.686	-0.212	(0)
Al (SO4) 2-	1.617e-18	1.532e-18	-17.791	-17.815	-0.023	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.428	-51.654	-0.226	(0)
B	4.543e-07					
H3BO3	4.300e-07	4.303e-07	-6.367	-6.366	0.000	(0)
H2BO3-	2.364e-08	2.236e-08	-7.626	-7.651	-0.024	(0)
CaH2BO3+	4.980e-10	4.710e-10	-9.303	-9.327	-0.024	(0)
MgH2BO3+	9.021e-11	8.533e-11	-10.045	-10.069	-0.024	(0)
BF (OH) 3-	7.186e-12	6.797e-12	-11.143	-11.168	-0.024	(0)
NaH2BO3	5.760e-12	5.760e-12	-11.240	-11.240	0.000	(0)
BaH2BO3+	4.925e-14	4.659e-14	-13.308	-13.332	-0.024	(0)
H5 (BO3) 2-	8.657e-15	8.189e-15	-14.063	-14.087	-0.024	(0)
BF2 (OH) 2-	3.399e-16	3.215e-16	-15.469	-15.493	-0.024	(0)
H8 (BO3) 3-	3.725e-19	3.523e-19	-18.429	-18.453	-0.024	(0)
BF3OH-	5.851e-23	5.535e-23	-22.233	-22.257	-0.024	(0)
BF4-	1.274e-28	1.205e-28	-27.895	-27.919	-0.024	(0)
Ba	8.426e-08					
Ba+2	8.378e-08	6.742e-08	-7.077	-7.171	-0.094	(0)
BaHCO3+	3.923e-10	3.721e-10	-9.406	-9.429	-0.023	(0)
BaCO3	8.384e-11	8.384e-11	-10.077	-10.077	0.000	(0)
BaOH+	2.798e-13	2.652e-13	-12.553	-12.576	-0.023	(0)
BaH2BO3+	4.925e-14	4.659e-14	-13.308	-13.332	-0.024	(0)
C (4)	6.337e-04					
HCO3-	6.096e-04	5.780e-04	-3.215	-3.238	-0.023	(0)
H2CO3	1.453e-05	1.453e-05	-4.838	-4.838	0.000	(0)

		CaHCO3+	4.154e-06	3.940e-06	-5.382	-5.405	-0.023	(0)
		CO3-2	3.014e-06	2.425e-06	-5.521	-5.615	-0.094	(0)
		CaCO3	1.407e-06	1.407e-06	-5.852	-5.852	0.000	(0)
		MgHCO3+	6.873e-07	6.509e-07	-6.163	-6.186	-0.024	(0)
		MgCO3	2.220e-07	2.220e-07	-6.654	-6.654	0.000	(0)
		NaHCO3	5.283e-08	5.283e-08	-7.277	-7.277	0.000	(0)
		MnHCO3+	2.164e-08	2.051e-08	-7.665	-7.688	-0.023	(0)
		NaCO3-	7.741e-09	7.339e-09	-8.111	-8.134	-0.023	(0)
		ZnCO3	6.172e-09	6.172e-09	-8.210	-8.210	0.000	(0)
		UO2 (CO3) 2-2	4.135e-09	3.280e-09	-8.384	-8.484	-0.101	(0)
		UO2 (CO3) 3-4	1.007e-09	3.986e-10	-8.997	-9.399	-0.402	(0)
		ZnHCO3+	8.566e-10	8.084e-10	-9.067	-9.092	-0.025	(0)
		BaHCO3+	3.923e-10	3.721e-10	-9.406	-9.429	-0.023	(0)
		PbCO3	3.619e-10	3.619e-10	-9.441	-9.441	0.000	(0)
		BaCO3	8.384e-11	8.384e-11	-10.077	-10.077	0.000	(0)
		UO2CO3	6.778e-11	6.778e-11	-10.169	-10.169	0.000	(0)
		PbHCO3+	2.259e-11	2.132e-11	-10.646	-10.671	-0.025	(0)
		Pb (CO3) 2-2	3.191e-12	2.531e-12	-11.496	-11.597	-0.101	(0)
		FeHCO3+	2.982e-13	2.829e-13	-12.525	-12.548	-0.023	(0)
		HgCO3	7.838e-19	7.838e-19	-18.106	-18.106	0.000	(0)
		Hg (CO3) 2-2	7.577e-21	6.010e-21	-20.121	-20.221	-0.101	(0)
		HgHCO3+	1.728e-22	1.631e-22	-21.762	-21.788	-0.025	(0)
Ca	4.857e-04							
		Ca+2	4.549e-04	3.661e-04	-3.342	-3.436	-0.094	(0)
		CaSO4	2.506e-05	2.506e-05	-4.601	-4.601	0.000	(0)
		CaHCO3+	4.154e-06	3.940e-06	-5.382	-5.405	-0.023	(0)
		CaCO3	1.407e-06	1.407e-06	-5.852	-5.852	0.000	(0)
		CaF+	1.669e-07	1.582e-07	-6.778	-6.801	-0.023	(0)
		CaOH+	6.938e-09	6.581e-09	-8.159	-8.182	-0.023	(0)
		CaH2BO3+	4.980e-10	4.710e-10	-9.303	-9.327	-0.024	(0)
Cl	6.123e-05							
		Cl-	6.123e-05	5.799e-05	-4.213	-4.237	-0.024	(0)
		MnCl+	1.370e-10	1.298e-10	-9.863	-9.887	-0.023	(0)
		ZnOHC1	7.600e-12	7.600e-12	-11.119	-11.119	0.000	(0)
		ZnCl+	6.803e-12	6.443e-12	-11.167	-11.191	-0.024	(0)
		PbCl+	1.082e-13	1.022e-13	-12.966	-12.991	-0.025	(0)
		MnCl2	1.063e-14	1.063e-14	-13.973	-13.973	0.000	(0)
		ZnCl2	5.922e-16	5.922e-16	-15.228	-15.228	0.000	(0)
		PbCl2	2.646e-17	2.646e-17	-16.577	-16.577	0.000	(0)
		HgClOH	2.492e-17	2.492e-17	-16.603	-16.603	0.000	(0)
		UO2Cl+	6.997e-19	6.604e-19	-18.155	-18.180	-0.025	(0)
		MnCl3-	1.792e-19	1.699e-19	-18.747	-18.770	-0.023	(0)
		HgCl2	9.083e-20	9.083e-20	-19.042	-19.042	0.000	(0)
		ZnCl3-	2.880e-20	2.728e-20	-19.541	-19.564	-0.024	(0)
		PbCl3-	6.474e-22	6.109e-22	-21.189	-21.214	-0.025	(0)
		HgCl+	3.311e-22	3.125e-22	-21.480	-21.505	-0.025	(0)
		FeCl+2	7.837e-23	6.325e-23	-22.106	-22.199	-0.093	(0)
		HgCl3-	5.581e-23	5.267e-23	-22.253	-22.278	-0.025	(0)
		VOC1+	3.073e-24	2.900e-24	-23.512	-23.538	-0.025	(0)
		ZnCl4-2	9.800e-25	7.910e-25	-24.009	-24.102	-0.093	(0)
		PbCl4-2	2.042e-26	1.619e-26	-25.690	-25.791	-0.101	(0)
		FeCl2+	1.729e-26	1.638e-26	-25.762	-25.786	-0.023	(0)
		HgCl4-2	1.533e-26	1.216e-26	-25.814	-25.915	-0.101	(0)
		FeCl3	9.501e-32	9.501e-32	-31.022	-31.022	0.000	(0)
		UCl+3	0.000e+00	0.000e+00	-47.055	-47.281	-0.226	(0)
F	4.249e-05							
		F-	4.180e-05	3.959e-05	-4.379	-4.402	-0.024	(0)
		MgF+	5.160e-07	4.889e-07	-6.287	-6.311	-0.023	(0)
		CaF+	1.669e-07	1.582e-07	-6.778	-6.801	-0.023	(0)
		NaF	4.060e-09	4.060e-09	-8.391	-8.391	0.000	(0)
		MnF+	2.957e-09	2.803e-09	-8.529	-8.552	-0.023	(0)
		HF	6.544e-10	6.544e-10	-9.184	-9.184	0.000	(0)
		ZnF+	3.702e-11	3.494e-11	-10.432	-10.457	-0.025	(0)
		BF (OH) 3-	7.186e-12	6.797e-12	-11.143	-11.168	-0.024	(0)
		AlF2+	1.357e-12	1.287e-12	-11.867	-11.891	-0.023	(0)
		AlF3	6.414e-13	6.414e-13	-12.193	-12.193	0.000	(0)
		PbF+	1.468e-13	1.385e-13	-12.833	-12.858	-0.025	(0)
		HF2-	1.041e-13	9.851e-14	-12.983	-13.007	-0.024	(0)

AlF+2	1.010e-13	8.164e-14	-12.996	-13.088	-0.093	(0)
UO2F+	4.066e-14	3.837e-14	-13.391	-13.416	-0.025	(0)
AlF4-	1.343e-14	1.273e-14	-13.872	-13.895	-0.023	(0)
UO2F2	4.382e-15	4.382e-15	-14.358	-14.358	0.000	(0)
BF2 (OH) 2-	3.399e-16	3.215e-16	-15.469	-15.493	-0.024	(0)
PbF2	1.079e-16	1.079e-16	-15.967	-15.967	0.000	(0)
UO2F3-	4.618e-17	4.358e-17	-16.336	-16.361	-0.025	(0)
FeF+2	1.943e-18	1.568e-18	-17.712	-17.805	-0.093	(0)
FeF2+	1.753e-18	1.661e-18	-17.756	-17.780	-0.023	(0)
VO2F	1.239e-18	1.239e-18	-17.907	-17.907	0.000	(0)
H2F2	1.147e-18	1.147e-18	-17.940	-17.940	0.000	(0)
FeF3	9.280e-20	9.280e-20	-19.032	-19.032	0.000	(0)
VO2F2-	1.888e-20	1.782e-20	-19.724	-19.749	-0.025	(0)
UO2F4-2	1.728e-20	1.370e-20	-19.763	-19.863	-0.101	(0)
PbF3-	8.588e-21	8.105e-21	-20.066	-20.091	-0.025	(0)
VOF+	4.486e-21	4.233e-21	-20.348	-20.373	-0.025	(0)
VOF2	6.285e-23	6.285e-23	-22.202	-22.202	0.000	(0)
BF3OH-	5.851e-23	5.535e-23	-22.233	-22.257	-0.024	(0)
VO2F3-2	1.109e-23	8.799e-24	-22.955	-23.056	-0.101	(0)
PbF4-2	1.936e-25	1.536e-25	-24.713	-24.814	-0.101	(0)
VOF3-	9.355e-26	8.829e-26	-25.029	-25.054	-0.025	(0)
Sb (OH) 2F	2.140e-26	2.140e-26	-25.670	-25.670	0.000	(0)
SbOF	2.105e-26	2.105e-26	-25.677	-25.677	0.000	(0)
HgF+	4.200e-28	3.964e-28	-27.377	-27.402	-0.025	(0)
VO2F4-3	2.887e-28	1.714e-28	-27.540	-27.766	-0.226	(0)
BF4-	1.274e-28	1.205e-28	-27.895	-27.919	-0.024	(0)
VOF4-2	1.779e-29	1.411e-29	-28.750	-28.850	-0.101	(0)
UF3+	4.714e-37	4.449e-37	-36.327	-36.352	-0.025	(0)
UF2+2	8.938e-38	7.090e-38	-37.049	-37.149	-0.101	(0)
UF4	1.931e-39	1.931e-39	-38.714	-38.714	0.000	(0)
UF+3	2.396e-40	1.422e-40	-39.621	-39.847	-0.226	(0)
UF5-	0.000e+00	0.000e+00	-41.493	-41.519	-0.025	(0)
UF6-2	0.000e+00	0.000e+00	-43.340	-43.441	-0.101	(0)
Fe (2)	5.364e-11					
Fe+2	4.901e-11	3.888e-11	-10.310	-10.410	-0.101	(0)
FeSO4	2.852e-12	2.852e-12	-11.545	-11.545	0.000	(0)
FeOH+	1.471e-12	1.395e-12	-11.832	-11.856	-0.023	(0)
FeHCO3+	2.982e-13	2.829e-13	-12.525	-12.548	-0.023	(0)
Fe (OH) 2	9.981e-16	9.981e-16	-15.001	-15.001	0.000	(0)
Fe (OH) 3-	3.001e-16	2.844e-16	-15.523	-15.546	-0.023	(0)
Fe (3)	1.553e-08					
Fe (OH) 2+	7.768e-09	7.365e-09	-8.110	-8.133	-0.023	(0)
Fe (OH) 3	7.127e-09	7.127e-09	-8.147	-8.147	0.000	(0)
Fe (OH) 4-	6.307e-10	5.980e-10	-9.200	-9.223	-0.023	(0)
FeOH+2	2.603e-14	2.101e-14	-13.584	-13.678	-0.093	(0)
FeF+2	1.943e-18	1.568e-18	-17.712	-17.805	-0.093	(0)
FeF2+	1.753e-18	1.661e-18	-17.756	-17.780	-0.023	(0)
FeSO4+	1.278e-19	1.211e-19	-18.894	-18.917	-0.023	(0)
FeF3	9.280e-20	9.280e-20	-19.032	-19.032	0.000	(0)
Fe+3	5.890e-20	3.612e-20	-19.230	-19.442	-0.212	(0)
Fe (SO4) 2-	8.200e-22	7.738e-22	-21.086	-21.111	-0.025	(0)
FeCl+2	7.837e-23	6.325e-23	-22.106	-22.199	-0.093	(0)
FeHSeO3+2	3.232e-25	2.564e-25	-24.491	-24.591	-0.101	(0)
Fe2 (OH) 2+4	3.693e-26	1.462e-26	-25.433	-25.835	-0.402	(0)
FeCl2+	1.729e-26	1.638e-26	-25.762	-25.786	-0.023	(0)
FeCl3	9.501e-32	9.501e-32	-31.022	-31.022	0.000	(0)
Fe3 (OH) 4+5	6.621e-33	1.556e-33	-32.179	-32.808	-0.629	(0)
H (0)	1.767e-27					
H2	8.836e-28	8.841e-28	-27.054	-27.054	0.000	(0)
Hg (0)	2.493e-11					
Hg	2.493e-11	2.493e-11	-10.603	-10.603	0.000	(0)
Hg (1)	1.152e-26					
Hg2+2	5.762e-27	4.571e-27	-26.239	-26.340	-0.101	(0)
Hg (2)	1.409e-15					
Hg (OH) 2	1.383e-15	1.383e-15	-14.859	-14.859	0.000	(0)
HgClOH	2.492e-17	2.492e-17	-16.603	-16.603	0.000	(0)
HgCO3	7.838e-19	7.838e-19	-18.106	-18.106	0.000	(0)
HgCl2	9.083e-20	9.083e-20	-19.042	-19.042	0.000	(0)

	HgOH+	1.027e-20	9.688e-21	-19.989	-20.014	-0.025	(0)
	Hg (CO3) 2-2	7.577e-21	6.010e-21	-20.121	-20.221	-0.101	(0)
	HgCl+	3.311e-22	3.125e-22	-21.480	-21.505	-0.025	(0)
	HgHCO3+	1.728e-22	1.631e-22	-21.762	-21.788	-0.025	(0)
	Hg (OH) 3-	1.663e-22	1.569e-22	-21.779	-21.804	-0.025	(0)
	HgCl3-	5.581e-23	5.267e-23	-22.253	-22.278	-0.025	(0)
	Hg+2	3.405e-25	2.701e-25	-24.468	-24.569	-0.101	(0)
	HgSO4	2.113e-26	2.113e-26	-25.675	-25.675	0.000	(0)
	HgCl4-2	1.533e-26	1.216e-26	-25.814	-25.915	-0.101	(0)
	HgF+	4.200e-28	3.964e-28	-27.377	-27.402	-0.025	(0)
K		9.824e-05					
	K+	9.803e-05	9.285e-05	-4.009	-4.032	-0.024	(0)
	KSO4-	2.072e-07	1.964e-07	-6.684	-6.707	-0.023	(0)
Mg		1.442e-04					
	Mg+2	1.368e-04	1.101e-04	-3.864	-3.958	-0.094	(0)
	MgSO4	5.985e-06	5.985e-06	-5.223	-5.223	0.000	(0)
	MgHCO3+	6.873e-07	6.509e-07	-6.163	-6.186	-0.024	(0)
	MgF+	5.160e-07	4.889e-07	-6.287	-6.311	-0.023	(0)
	MgCO3	2.220e-07	2.220e-07	-6.654	-6.654	0.000	(0)
	MgOH+	4.160e-08	3.948e-08	-7.381	-7.404	-0.023	(0)
	MgH2BO3+	9.021e-11	8.533e-11	-10.045	-10.069	-0.024	(0)
Mn (2)		2.365e-06					
	Mn+2	2.242e-06	1.778e-06	-5.649	-5.750	-0.101	(0)
	MnSO4	9.451e-08	9.451e-08	-7.025	-7.025	0.000	(0)
	MnHCO3+	2.164e-08	2.051e-08	-7.665	-7.688	-0.023	(0)
	MnOH+	4.246e-09	4.025e-09	-8.372	-8.395	-0.023	(0)
	MnF+	2.957e-09	2.803e-09	-8.529	-8.552	-0.023	(0)
	MnCl+	1.370e-10	1.298e-10	-9.863	-9.887	-0.023	(0)
	MnCl2	1.063e-14	1.063e-14	-13.973	-13.973	0.000	(0)
	MnSeO4	4.533e-17	4.533e-17	-16.344	-16.344	0.000	(0)
	Mn (OH) 3-	2.131e-17	2.019e-17	-16.672	-16.695	-0.023	(0)
	MnCl3-	1.792e-19	1.699e-19	-18.747	-18.770	-0.023	(0)
	Mn (OH) 4-2	7.278e-23	5.874e-23	-22.138	-22.231	-0.093	(0)
	MnSe	2.485e-39	2.485e-39	-38.605	-38.605	0.000	(0)
Mn (3)		1.295e-27					
	Mn+3	1.295e-27	7.943e-28	-26.888	-27.100	-0.212	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-44.465	-44.558	-0.093	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-49.906	-49.930	-0.024	(0)
Mo		7.693e-08					
	MoO4-2	7.692e-08	6.189e-08	-7.114	-7.208	-0.094	(0)
	HMoO4-	1.458e-11	1.376e-11	-10.836	-10.861	-0.025	(0)
	H2MoO4	1.126e-15	1.126e-15	-14.948	-14.948	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-51.428	-51.654	-0.226	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-60.177	-61.083	-0.905	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-62.019	-62.648	-0.629	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-65.415	-65.817	-0.402	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-70.297	-70.523	-0.226	(0)
Na		1.720e-04					
	Na+	1.716e-04	1.625e-04	-3.765	-3.789	-0.024	(0)
	NaSO4-	2.751e-07	2.609e-07	-6.560	-6.584	-0.023	(0)
	NaHCO3	5.283e-08	5.283e-08	-7.277	-7.277	0.000	(0)
	NaCO3-	7.741e-09	7.339e-09	-8.111	-8.134	-0.023	(0)
	NaF	4.060e-09	4.060e-09	-8.391	-8.391	0.000	(0)
	NaH2BO3	5.760e-12	5.760e-12	-11.240	-11.240	0.000	(0)
O (0)		1.296e-38					
	O2	6.482e-39	6.485e-39	-38.188	-38.188	0.000	(0)
Pb		5.792e-10					
	PbCO3	3.619e-10	3.619e-10	-9.441	-9.441	0.000	(0)
	PbOH+	1.191e-10	1.124e-10	-9.924	-9.949	-0.025	(0)
	Pb+2	6.170e-11	4.965e-11	-10.210	-10.304	-0.094	(0)
	PbHCO3+	2.259e-11	2.132e-11	-10.646	-10.671	-0.025	(0)
	PbSO4	7.267e-12	7.267e-12	-11.139	-11.139	0.000	(0)
	Pb (OH) 2	3.202e-12	3.202e-12	-11.495	-11.495	0.000	(0)
	Pb (CO3) 2-2	3.191e-12	2.531e-12	-11.496	-11.597	-0.101	(0)
	PbF+	1.468e-13	1.385e-13	-12.833	-12.858	-0.025	(0)
	PbCl+	1.082e-13	1.022e-13	-12.966	-12.991	-0.025	(0)

Pb(SO4) 2-2	1.650e-14	1.309e-14	-13.783	-13.883	-0.101	(0)
Pb(OH) 3-	3.057e-15	2.885e-15	-14.515	-14.540	-0.025	(0)
PbF2	1.079e-16	1.079e-16	-15.967	-15.967	0.000	(0)
PbCl2	2.646e-17	2.646e-17	-16.577	-16.577	0.000	(0)
Pb(OH) 4-2	8.026e-19	6.366e-19	-18.096	-18.196	-0.101	(0)
Pb2OH+3	1.489e-19	8.842e-20	-18.827	-19.053	-0.226	(0)
PbF3-	8.588e-21	8.105e-21	-20.066	-20.091	-0.025	(0)
PbCl3-	6.474e-22	6.109e-22	-21.189	-21.214	-0.025	(0)
Pb3(OH) 4+2	1.280e-23	1.016e-23	-22.893	-22.993	-0.101	(0)
PbF4-2	1.936e-25	1.536e-25	-24.713	-24.814	-0.101	(0)
PbCl4-2	2.042e-26	1.619e-26	-25.690	-25.791	-0.101	(0)
Pb4(OH) 4+4	1.012e-29	4.005e-30	-28.995	-29.397	-0.402	(0)
S (6)	4.030e-04					
SO4-2	3.714e-04	2.989e-04	-3.430	-3.525	-0.094	(0)
CaSO4	2.506e-05	2.506e-05	-4.601	-4.601	0.000	(0)
MgSO4	5.985e-06	5.985e-06	-5.223	-5.223	0.000	(0)
NaSO4-	2.751e-07	2.609e-07	-6.560	-6.584	-0.023	(0)
KSO4-	2.072e-07	1.964e-07	-6.684	-6.707	-0.023	(0)
MnSO4	9.451e-08	9.451e-08	-7.025	-7.025	0.000	(0)
ZnSO4	2.892e-09	2.892e-09	-8.539	-8.539	0.000	(0)
HSO4-	3.445e-10	3.264e-10	-9.463	-9.486	-0.023	(0)
Zn(SO4) 2-2	9.490e-12	7.528e-12	-11.023	-11.123	-0.101	(0)
PbSO4	7.267e-12	7.267e-12	-11.139	-11.139	0.000	(0)
FeSO4	2.852e-12	2.852e-12	-11.545	-11.545	0.000	(0)
Pb(SO4) 2-2	1.650e-14	1.309e-14	-13.783	-13.883	-0.101	(0)
UO2SO4	3.176e-15	3.176e-15	-14.498	-14.498	0.000	(0)
AlSO4+	5.049e-16	4.783e-16	-15.297	-15.320	-0.023	(0)
UO2(SO4) 2-2	1.578e-17	1.251e-17	-16.802	-16.903	-0.101	(0)
Al(SO4) 2-	1.617e-18	1.532e-18	-17.791	-17.815	-0.023	(0)
VO2SO4-	1.350e-19	1.274e-19	-18.870	-18.895	-0.025	(0)
FeSO4+	1.278e-19	1.211e-19	-18.894	-18.917	-0.023	(0)
VOSO4	1.467e-21	1.467e-21	-20.833	-20.833	0.000	(0)
Fe(SO4) 2-	8.200e-22	7.738e-22	-21.086	-21.111	-0.025	(0)
HgSO4	2.113e-26	2.113e-26	-25.675	-25.675	0.000	(0)
VSO4+	1.653e-35	1.560e-35	-34.782	-34.807	-0.025	(0)
U(SO4) 2	0.000e+00	0.000e+00	-41.294	-41.294	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.569	-41.669	-0.101	(0)
Sb (3)	6.121e-20					
Sb(OH) 3	3.097e-20	3.097e-20	-19.509	-19.509	0.000	(0)
HSbO2	3.023e-20	3.023e-20	-19.520	-19.520	0.000	(0)
SbO2-	4.642e-24	4.381e-24	-23.333	-23.358	-0.025	(0)
Sb(OH) 4-	2.660e-24	2.511e-24	-23.575	-23.600	-0.025	(0)
Sb(OH) 2F	2.140e-26	2.140e-26	-25.670	-25.670	0.000	(0)
SbOF	2.105e-26	2.105e-26	-25.677	-25.677	0.000	(0)
Sb(OH) 2+	8.905e-27	8.404e-27	-26.050	-26.076	-0.025	(0)
SbO+	3.070e-27	2.897e-27	-26.513	-26.538	-0.025	(0)
Sb (5)	9.857e-10					
SbO3-	9.846e-10	9.292e-10	-9.007	-9.032	-0.025	(0)
Sb(OH) 6-	1.148e-12	1.087e-12	-11.940	-11.964	-0.024	(0)
SbO2+	3.527e-26	3.328e-26	-25.453	-25.478	-0.025	(0)
Se (-2)	4.019e-36					
HSe-	4.016e-36	3.790e-36	-35.396	-35.421	-0.025	(0)
MnSe	2.485e-39	2.485e-39	-38.605	-38.605	0.000	(0)
H2Se	3.288e-40	3.288e-40	-39.483	-39.483	0.000	(0)
Se-2	0.000e+00	0.000e+00	-42.369	-42.470	-0.101	(0)
Se (4)	4.053e-09					
HSeO3-	2.846e-09	2.686e-09	-8.546	-8.571	-0.025	(0)
SeO3-2	1.207e-09	9.570e-10	-8.918	-9.019	-0.101	(0)
H2SeO3	1.281e-14	1.281e-14	-13.893	-13.893	0.000	(0)
FeHSeO3+2	3.232e-25	2.564e-25	-24.491	-24.591	-0.101	(0)
Se (6)	1.178e-13					
SeO4-2	1.177e-13	9.472e-14	-12.929	-13.024	-0.094	(0)
MnSeO4	4.533e-17	4.533e-17	-16.344	-16.344	0.000	(0)
ZnSeO4	6.488e-19	6.488e-19	-18.188	-18.188	0.000	(0)
HSeO4-	5.621e-20	5.305e-20	-19.250	-19.275	-0.025	(0)
Zn(SeO4) 2-2	7.855e-32	6.231e-32	-31.105	-31.205	-0.101	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.314	-57.541	-0.226	(0)

U (4)	8.308e-19					
U (OH) 5-	8.304e-19	7.837e-19	-18.081	-18.106	-0.025	(0)
U (OH) 4	3.668e-22	3.668e-22	-21.436	-21.436	0.000	(0)
U (OH) 3+	1.588e-26	1.498e-26	-25.799	-25.824	-0.025	(0)
U (OH) 2+2	9.761e-32	7.743e-32	-31.010	-31.111	-0.101	(0)
UF3+	4.714e-37	4.449e-37	-36.327	-36.352	-0.025	(0)
UF2+2	8.938e-38	7.090e-38	-37.049	-37.149	-0.101	(0)
UOH+3	6.863e-38	4.075e-38	-37.163	-37.390	-0.226	(0)
UF4	1.931e-39	1.931e-39	-38.714	-38.714	0.000	(0)
UF+3	2.396e-40	1.422e-40	-39.621	-39.847	-0.226	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.294	-41.294	0.000	(0)
UF5-	0.000e+00	0.000e+00	-41.493	-41.519	-0.025	(0)
USO4+2	0.000e+00	0.000e+00	-41.569	-41.669	-0.101	(0)
UF6-2	0.000e+00	0.000e+00	-43.340	-43.441	-0.101	(0)
U+4	0.000e+00	0.000e+00	-44.342	-44.745	-0.402	(0)
UC1+3	0.000e+00	0.000e+00	-47.055	-47.281	-0.226	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-164.309	-166.346	-2.037	(0)
U (5)	4.535e-16					
UO2+	4.535e-16	4.280e-16	-15.343	-15.369	-0.025	(0)
U (6)	5.210e-09					
UO2 (CO3) 2-2	4.135e-09	3.280e-09	-8.384	-8.484	-0.101	(0)
UO2 (CO3) 3-4	1.007e-09	3.986e-10	-8.997	-9.399	-0.402	(0)
UO2CO3	6.778e-11	6.778e-11	-10.169	-10.169	0.000	(0)
UO2OH+	8.440e-13	7.965e-13	-12.074	-12.099	-0.025	(0)
UO2F+	4.066e-14	3.837e-14	-13.391	-13.416	-0.025	(0)
UO2+2	8.726e-15	7.021e-15	-14.059	-14.154	-0.094	(0)
UO2F2	4.382e-15	4.382e-15	-14.358	-14.358	0.000	(0)
UO2SO4	3.176e-15	3.176e-15	-14.498	-14.498	0.000	(0)
UO2F3-	4.618e-17	4.358e-17	-16.336	-16.361	-0.025	(0)
UO2 (SO4) 2-2	1.578e-17	1.251e-17	-16.802	-16.903	-0.101	(0)
(UO2) 2 (OH) 2+2	1.327e-18	1.053e-18	-17.877	-17.978	-0.101	(0)
UO2C1+	6.997e-19	6.604e-19	-18.155	-18.180	-0.025	(0)
(UO2) 3 (OH) 5+	5.472e-19	5.164e-19	-18.262	-18.287	-0.025	(0)
UO2F4-2	1.728e-20	1.370e-20	-19.763	-19.863	-0.101	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.777	-40.802	-0.025	(0)
V+2	0.000e+00	0.000e+00	-42.166	-42.266	-0.101	(0)
V (3)	6.524e-14					
V (OH) 3	6.524e-14	6.524e-14	-13.186	-13.186	0.000	(0)
V (OH) 2+	4.991e-25	4.710e-25	-24.302	-24.327	-0.025	(0)
VOH+2	6.294e-29	4.992e-29	-28.201	-28.302	-0.101	(0)
V+3	1.862e-34	1.106e-34	-33.730	-33.956	-0.226	(0)
VSO4+	1.653e-35	1.560e-35	-34.782	-34.807	-0.025	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.950	-54.177	-0.226	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.401	-55.803	-0.402	(0)
V (4)	3.424e-18					
V (OH) 3+	3.396e-18	3.205e-18	-17.469	-17.494	-0.025	(0)
VO+2	2.247e-20	1.783e-20	-19.648	-19.749	-0.101	(0)
VOF+	4.486e-21	4.233e-21	-20.348	-20.373	-0.025	(0)
VOSO4	1.467e-21	1.467e-21	-20.833	-20.833	0.000	(0)
VOF2	6.285e-23	6.285e-23	-22.202	-22.202	0.000	(0)
VOC1+	3.073e-24	2.900e-24	-23.512	-23.538	-0.025	(0)
VOF3-	9.355e-26	8.829e-26	-25.029	-25.054	-0.025	(0)
VOF4-2	1.779e-29	1.411e-29	-28.750	-28.850	-0.101	(0)
H2V2O4+2	6.490e-31	5.148e-31	-30.188	-30.288	-0.101	(0)
V (5)	9.620e-09					
H2VO4-	7.590e-09	7.162e-09	-8.120	-8.145	-0.025	(0)
HVO4-2	2.030e-09	1.610e-09	-8.693	-8.793	-0.101	(0)
H3VO4	8.004e-13	8.004e-13	-12.097	-12.097	0.000	(0)
H3V2O7-	3.922e-14	3.702e-14	-13.406	-13.432	-0.025	(0)
HV2O7-3	6.581e-15	3.908e-15	-14.182	-14.408	-0.226	(0)
VO4-3	1.216e-15	7.221e-16	-14.915	-15.141	-0.226	(0)
V2O7-4	2.377e-17	9.412e-18	-16.624	-17.026	-0.402	(0)
VO2+	1.884e-17	1.785e-17	-16.725	-16.748	-0.024	(0)
VO2F	1.239e-18	1.239e-18	-17.907	-17.907	0.000	(0)
V3O9-3	6.480e-19	3.848e-19	-18.188	-18.415	-0.226	(0)
VO2SO4-	1.350e-19	1.274e-19	-18.870	-18.895	-0.025	(0)
VO2F2-	1.888e-20	1.782e-20	-19.724	-19.749	-0.025	(0)

VO2F3-2	1.109e-23	8.799e-24	-22.955	-23.056	-0.101	(0)
V4O12-4	2.902e-24	1.149e-24	-23.537	-23.940	-0.402	(0)
VO2F4-3	2.887e-28	1.714e-28	-27.540	-27.766	-0.226	(0)
V10O28-6	0.000e+00	0.000e+00	-63.445	-64.351	-0.905	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.487	-64.116	-0.629	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.457	-66.860	-0.402	(0)
Zn	6.974e-08					
Zn+2	5.497e-08	4.423e-08	-7.260	-7.354	-0.094	(0)
ZnCO3	6.172e-09	6.172e-09	-8.210	-8.210	0.000	(0)
ZnOH+	4.223e-09	3.985e-09	-8.374	-8.400	-0.025	(0)
ZnSO4	2.892e-09	2.892e-09	-8.539	-8.539	0.000	(0)
ZnHCO3+	8.566e-10	8.084e-10	-9.067	-9.092	-0.025	(0)
Zn(OH)2	5.691e-10	5.691e-10	-9.245	-9.245	0.000	(0)
ZnF+	3.702e-11	3.494e-11	-10.432	-10.457	-0.025	(0)
Zn(SO4)2-2	9.490e-12	7.528e-12	-11.023	-11.123	-0.101	(0)
ZnOHCl	7.600e-12	7.600e-12	-11.119	-11.119	0.000	(0)
ZnCl+	6.803e-12	6.443e-12	-11.167	-11.191	-0.024	(0)
Zn(OH)3-	2.723e-12	2.570e-12	-11.565	-11.590	-0.025	(0)
ZnCl2	5.922e-16	5.922e-16	-15.228	-15.228	0.000	(0)
Zn(OH)4-2	1.162e-16	9.219e-17	-15.935	-16.035	-0.101	(0)
ZnSeO4	6.488e-19	6.488e-19	-18.188	-18.188	0.000	(0)
ZnCl3-	2.880e-20	2.728e-20	-19.541	-19.564	-0.024	(0)
ZnCl4-2	9.800e-25	7.910e-25	-24.009	-24.102	-0.093	(0)
Zn(SeO4)2-2	7.855e-32	6.231e-32	-31.105	-31.205	-0.101	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al(OH)3(am)	-2.63	8.17	10.80	Al(OH)3
Al2(MoO4)3	-55.36	-53.00	2.37	Al2(MoO4)3
Al2O3	-3.31	16.34	19.65	Al2O3
Al4(OH)10SO4	-9.45	13.25	22.70	Al4(OH)10SO4
AlOHSO4	-8.03	-11.26	-3.23	AlOHSO4
AlSb	-148.67	-83.05	65.62	AlSb
Alunite	-9.03	-10.43	-1.40	KAl3(SO4)2(OH)6
Anglesite	-6.04	-13.83	-7.79	PbSO4
Anhydrite	-2.60	-6.96	-4.36	CaSO4
Aragonite	-0.75	-9.05	-8.30	CaCO3
Artinite	-7.23	2.37	9.60	MgCO3:Mg(OH)2:3H2O
Ba(OH)2:8H2O	-15.66	8.73	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.00	-0.13	15.87	Ba2V2O7:2H2O
Ba3(VO4)2:4H2O	-24.34	8.60	32.94	Ba3(VO4)2:4H2O
BaF2	-10.16	-15.98	-5.82	BaF2
BaMoO4	-7.42	-14.38	-6.96	BaMoO4
Barite	-0.72	-10.70	-9.98	BaSO4
BaSeO3	-9.62	-7.79	1.83	BaSeO3
BaSeO4	-12.73	-20.19	-7.46	BaSeO4
Bianchite	-9.11	-10.88	-1.76	ZnSO4:6H2O
Birnessite	-9.38	8.71	18.09	MnO2
Bixbyite	-5.85	-6.49	-0.64	Mn2O3
Boehmite	-0.41	8.17	8.58	AlOOH
Brucite	-4.90	11.95	16.84	Mg(OH)2
Ca(VO3)2	-10.79	-5.13	5.66	Ca(VO3)2
Ca2V2O7	-10.16	7.34	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.21	7.34	21.55	Ca2V2O7:2H2O
Ca3(VO4)2	-19.15	19.81	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.05	19.81	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-288.01	-145.04	142.97	Ca3Sb2
Calcite	-0.57	-9.05	-8.48	CaCO3
Calomel	-16.90	-34.81	-17.91	Hg2Cl2
CaMoO4	-2.69	-10.64	-7.95	CaMoO4
Carnotite	-3.36	-3.13	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.06	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.44	-16.46	-3.02	CaSeO4:2H2O
Cerrusite	-2.79	-15.92	-13.13	PbCO3
CH4(g)	-76.09	-117.13	-41.05	CH4
Clausthalite	-10.67	-37.77	-27.10	PbSe

CO2(g)	-3.37	-21.52	-18.15	CO2
Cotunnite	-14.00	-18.78	-4.78	PbCl2
Cryolite	-19.63	-53.47	-33.84	Na3AlF6
Diaspore	1.30	8.17	6.87	AlOOH
Dolomite(disordered)	-2.09	-18.63	-16.54	CaMg(CO3)2
Dolomite(ordered)	-1.54	-18.63	-17.09	CaMg(CO3)2
Epsomite	-5.36	-7.48	-2.13	MgSO4:7H2O
Fe(OH)2	-8.07	5.49	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.80	0.76	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-8.38	-12.10	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.25	-7.70	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.12	-40.74	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.72	-49.46	-3.73	Fe2(SO4)3
Fe3(OH)8	-5.90	14.32	20.22	Fe3(OH)8
FeMoO4	-7.53	-17.62	-10.09	FeMoO4
Ferrihydrite	1.22	4.41	3.19	Fe(OH)3
Ferroselite	-38.75	-57.35	-18.60	FeSe2
FeSe	-26.88	-37.88	-11.00	FeSe
Fluorite	-1.74	-12.24	-10.50	CaF2
Gibbsite	-0.12	8.17	8.29	Al(OH)3
Goethite	3.92	4.41	0.49	FeOOH
Goslarite	-8.87	-10.88	-2.01	ZnSO4:7H2O
Gummite	-5.92	1.75	7.67	UO3
Gypsum	-2.35	-6.96	-4.61	CaSO4:2H2O
H-Jarosite	-13.52	-25.62	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.24	-23.11	-12.88	H2MoO4
H2Se(g)	-38.41	-43.37	-4.96	H2Se
Halite	-9.63	-8.03	1.60	NaCl
Hausmannite	-6.67	54.36	61.03	Mn3O4
Hematite	10.24	8.83	-1.42	Fe2O3
Hercynite	-1.06	21.83	22.89	FeAl2O4
Hg(CH3)2(g)	-175.42	-249.12	-73.71	Hg(CH3)2
Hg(g)	-9.30	-17.17	-7.87	Hg
Hg(OH)2	-11.36	-14.86	-3.50	Hg(OH)2
Hg2(g)	-19.38	-34.34	-14.96	Hg2
Hg2(OH)2	-15.70	-10.44	5.26	Hg2(OH)2
Hg2CO3	-15.91	-31.96	-16.05	Hg2CO3
Hg2F2	-24.78	-35.14	-10.36	Hg2F2
Hg2SeO3	-22.30	-26.96	-4.66	Hg2SeO3
Hg2SO4	-23.73	-29.86	-6.13	Hg2SO4
Hg3O2CO3	-36.41	-66.10	-29.68	Hg3O2CO3
HgCl(g)	-36.90	-17.41	19.50	HgCl
HgCl2	-17.97	-39.24	-21.26	HgCl2
HgF(g)	-50.25	-17.57	32.68	HgF
HgF2(g)	-52.13	-39.57	12.57	HgF2
Hgmetal(l)	-3.72	-17.17	-13.45	Hg
HgSe	-2.54	-58.23	-55.69	HgSe
HgSeO3	-18.95	-31.38	-12.43	HgSeO3
HgSO4	-24.87	-34.29	-9.42	HgSO4
Huntite	-7.80	-37.77	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.47	-26.24	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-17.58	-26.35	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-21.60	-26.77	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.90	-21.70	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-18.53	-15.27	3.26	K2MoO4
K2SeO4	-20.36	-21.09	-0.73	K2SeO4
Larnakite	-7.79	-8.23	-0.43	PbO:PbSO4
Laurionite	-7.21	-6.59	0.62	PbOHCl
Lepidocrocite	3.04	4.41	1.37	FeOOH
Lime	-20.23	12.47	32.70	CaO
Litharge	-7.09	5.60	12.69	PbO
Maghemite	2.44	8.83	6.39	Fe2O3
Magnesioferrite	3.91	20.77	16.86	Fe2MgO4
Magnesite	-2.11	-9.57	-7.46	MgCO3
Magnetite	10.92	14.32	3.40	Fe3O4
Manganite	-3.23	22.11	25.34	MnOOH
Massicot	-7.29	5.60	12.89	PbO
Matlockite	-9.97	-18.94	-8.97	PbClF

Melanterite	-11.73	-13.93	-2.21	FeSO4:7H2O
Mg(OH)2(active)	-6.85	11.95	18.79	Mg(OH)2
Mg(VO3)2	-16.93	-5.65	11.28	Mg(VO3)2
Mg2Sb3	-264.69	-190.01	74.68	Mg2Sb3
Mg2V2O7	-20.06	6.30	26.36	Mg2V2O7
MgF2	-4.63	-12.76	-8.13	MgF2
MgMoO4	-9.32	-11.17	-1.85	MgMoO4
MgSeO3:6H2O	-7.63	-4.58	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.78	-16.98	-1.20	MgSeO4:6H2O
Minium	-32.82	40.70	73.52	Pb3O4
Mirabilite	-9.99	-11.10	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.34	-7.44	4.90	Mn(VO3)2
Mn2(SO4)3	-59.06	-64.77	-5.71	Mn2(SO4)3
Mn2Sb	-143.94	-82.86	61.08	Mn2Sb
MnCl2:4H2O	-16.94	-14.22	2.72	MnCl2:4H2O
MnSb	-91.55	-94.46	-2.91	MnSb
MnSe	-36.72	-33.22	3.50	MnSe
MnSeO3	-7.50	-6.37	1.13	MnSeO3
MnSeO3:2H2O	-7.35	-6.37	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.72	-18.77	-2.05	MnSeO4:5H2O
MnSO4	-11.86	-9.27	2.58	MnSO4
Montroydite	-11.22	-14.86	-3.64	HgO
MoO3	-15.11	-23.11	-8.00	MoO3
Na-Jarosite	-10.25	-21.45	-11.20	NaFe3(SO4)2(OH)6
Na2Mo2O7	-21.30	-37.90	-16.60	Na2Mo2O7
Na2MoO4	-16.28	-14.79	1.49	Na2MoO4
Na2MoO4:2H2O	-16.01	-14.79	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.50	-8.20	10.30	Na2SeO3:5H2O
Na2SeO4	-21.88	-20.60	1.28	Na2SeO4
Na3Sb	-173.18	-78.73	94.45	Na3Sb
Na3VO4	-32.99	3.69	36.68	Na3VO4
Na4V2O7	-38.34	-0.94	37.40	Na4V2O7
NaSb	-86.32	-63.15	23.17	NaSb
Natron	-11.88	-13.19	-1.31	Na2CO3:10H2O
NaVO3	-8.49	-4.63	3.86	NaVO3
Nesquehonite	-4.90	-9.57	-4.67	MgCO3:3H2O
Nsutite	-8.80	8.71	17.50	MnO2
O2(g)	-35.28	47.81	83.09	O2
Pb(BO2)2	-13.65	-7.13	6.52	Pb(BO2)2
Pb(OH)2	-2.55	5.60	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.36	-73.12	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.78	-0.99	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.99	11.20	26.19	Pb2O(OH)2
Pb2O3	-25.94	35.10	61.04	Pb2O3
Pb2OCO3	-9.76	-10.32	-0.56	Pb2OCO3
Pb2V2O7	-4.49	-6.39	-1.90	Pb2V2O7
Pb3(VO4)2	-6.94	-0.80	6.14	Pb3(VO4)2
Pb3O2CO3	-15.74	-4.72	11.02	Pb3O2CO3
Pb3O2SO4	-13.32	-2.63	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.13	2.97	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.97	21.88	Pb4O3SO4
PbF2	-11.67	-19.11	-7.44	PbF2
Pbmetal	-22.55	-18.30	4.25	Pb
PbMoO4	-1.89	-17.51	-15.62	PbMoO4
PbO:0.3H2O	-7.38	5.60	12.98	PbO:0.33H2O
PbSeO4	-16.49	-23.33	-6.84	PbSeO4
Periclase	-9.64	11.95	21.58	MgO
Phosgenite	-14.89	-34.70	-19.81	PbCl2:PbCO3
Plattnerite	-20.10	29.50	49.60	PbO2
Portlandite	-10.34	12.47	22.80	Ca(OH)2
Pyrochroite	-5.04	10.15	15.19	Mn(OH)2
Pyrolusite	-7.32	34.06	41.38	MnO2
Rhodochrosite	-0.79	-11.37	-10.58	MnCO3
Rutherfordine	-5.27	-19.77	-14.50	UO2CO3
Sb(OH)3	-12.40	-19.51	-7.11	Sb(OH)3
Sb2O4	-18.52	-15.11	3.40	Sb2O4
Sb2O5	-30.16	-39.83	-9.67	Sb2O5
Sb2Se3	-101.38	-169.14	-67.76	Sb2Se3

Sb4O6(cubic)	-59.78	-78.04	-18.26	Sb4O6
Sb4O6(orth)	-60.14	-78.04	-17.90	Sb4O6
SbCl3	-56.65	-56.07	0.57	SbCl3
SbF3	-46.35	-56.57	-10.23	SbF3
Sbmetal	-43.68	-55.36	-11.69	Sb
SbO2	-4.04	-31.87	-27.82	SbO2
Schoepite	-4.24	1.75	5.99	UO2 (OH) 2:H2O
Semetal (am)	-12.36	-19.47	-7.11	Se
Semetal (hex)	-11.76	-19.47	-7.71	Se
Senarmontite	-26.65	-39.02	-12.37	Sb2O3
SeO2	-16.65	-16.52	0.12	SeO2
SeO3	-49.97	-28.93	21.04	SeO3
Siderite	-5.79	-16.03	-10.24	FeCO3
Smithsonite	-2.97	-12.97	-10.00	ZnCO3
Spinel	-8.56	28.28	36.85	MgAl2O4
Thenardite	-11.42	-11.10	0.32	Na2SO4
Thermonatrite	-13.83	-13.19	0.64	Na2CO3:H2O
Tyuyamunite	-5.71	-1.63	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.09	8.99	21.08	U3O8
U3Sb4	-556.07	-403.69	152.38	U3Sb4
U4O9	-24.83	-27.85	-3.02	U4O9
UF4	-32.82	-62.35	-29.54	UF4
UF4:2.5H2O	-29.64	-62.35	-32.72	UF4:2.5H2O
UO2 (am)	-13.87	-12.94	0.93	UO2
UO2 (OH) 2 (beta)	-3.86	1.75	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.93	-27.18	-2.25	UO2SeO4:4H2O
UO3	-5.95	1.75	7.70	UO3
Uraninite	-8.27	-12.94	-4.67	UO2
USb2	-210.27	-180.69	29.58	USb2
V (OH) 3	-17.69	-10.10	7.59	V (OH) 3
V2O5	-16.23	-17.59	-1.36	V2O5
V3O5	-37.28	-35.44	1.84	V3O5
V4O7	-46.47	-39.29	7.19	V4O7
V6O13	-39.73	-100.59	-60.86	V6O13
Valentinite	-30.54	-39.02	-8.48	Sb2O3
VC12	-65.30	-46.43	18.87	VC12
VC13	-70.10	-46.67	23.43	VC13
VF4	-68.19	-53.26	14.93	VF4
Vmetal	-89.98	-45.96	44.03	V
VO	-36.81	-22.05	14.76	VO
VO (OH) 2	-9.00	-3.85	5.15	VO (OH) 2
VO2Cl	-23.83	-20.99	2.84	VO2Cl
VOC1	-33.44	-22.29	11.15	VOC1
VOC12	-40.98	-28.22	12.76	VOC12
VOSO4	-26.88	-23.27	3.61	VOSO4
Witherite	-4.22	-12.79	-8.57	BaCO3
Zincite	-2.78	8.55	11.33	ZnO
Zincosite	-14.81	-10.88	3.93	ZnSO4
Zn (BO2) 2	-12.47	-4.18	8.29	Zn (BO2) 2
Zn (OH) 2	-3.65	8.55	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.92	8.55	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.20	8.55	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.98	8.55	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.18	8.55	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-9.83	-2.33	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-10.28	4.91	15.19	Zn2 (OH) 3Cl
Zn3O (SO4) 2	-32.12	-13.21	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.63	14.77	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-20.13	18.37	38.50	Zn5 (OH) 8Cl2
ZnCl2	-22.88	-15.83	7.05	ZnCl2
ZnCO3:1H2O	-2.71	-12.97	-10.26	ZnCO3:1H2O
ZnF2	-15.62	-16.16	-0.53	ZnF2
Znmetal	-41.14	-15.35	25.79	Zn
ZnMoO4	-4.44	-14.56	-10.13	ZnMoO4
ZnO (active)	-2.64	8.55	11.19	ZnO
ZnSb	-81.73	-70.72	11.01	ZnSb
ZnSe	-20.42	-34.82	-14.40	ZnSe
ZnSeO4:6H2O	-18.86	-20.38	-1.52	ZnSeO4:6H2O

ZnSO4:1H2O -10.24 -10.88 -0.64 ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 16.

SOLUTION 14 Average HCT data for coarse crystalline porphyry - sulfide
(waste) (cell CF-11-02, 367-408)

temp 25
pH 7.74339
pe 4
redox pe
units mg/l
density 1
Alkalinity 19.90015 as HCO3
Al 0.04951
B 0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495
F 0.54795
Fe 0.00225
Hg 0.000005
K 1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6) 7.66320 as SO4
Se 0.00024
U 0.00242
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 14. Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	1.835e-06	1.835e-06
Alkalinity	3.261e-04	3.261e-04
B	4.468e-07	4.468e-07
Ba	2.003e-08	2.003e-08
Ca	1.836e-04	1.836e-04
Cl	3.872e-05	3.872e-05
Cu	7.790e-08	7.790e-08
F	2.884e-05	2.884e-05
Fe	4.029e-08	4.029e-08
Hg	2.493e-11	2.493e-11
K	4.343e-05	4.343e-05
Mg	2.345e-05	2.345e-05
Mn	1.707e-07	1.707e-07
Mo	5.003e-09	5.003e-09
Na	8.965e-05	8.965e-05 Charge balance

Pb	5.792e-10	5.792e-10
S(6)	7.977e-05	7.977e-05
Se	3.040e-09	3.040e-09
U	1.017e-08	1.017e-08

-----Description of solution-----

pH	=	7.743
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	8.218e-04
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	3.294e-04
Total CO2 (mol/kg)	=	3.294e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	-1.403e-17
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110140e+02
Total O	=	5.550815e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.762e-07	5.577e-07	-6.239	-6.254	-0.014	(0)
H+	1.865e-08	1.806e-08	-7.729	-7.743	-0.014	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.835e-06					
Al(OH)4-	1.808e-06	1.750e-06	-5.743	-5.757	-0.014	(0)
Al(OH)3	2.493e-08	2.493e-08	-7.603	-7.603	0.000	(0)
Al(OH)2+	2.313e-09	2.240e-09	-8.636	-8.650	-0.014	(0)
AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
AlOH+2	5.749e-12	5.058e-12	-11.240	-11.296	-0.056	(0)
AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
Al+3	1.214e-14	9.069e-15	-13.916	-14.042	-0.127	(0)
AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
Al(SO4)2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
B	4.468e-07					
H3BO3	4.323e-07	4.324e-07	-6.364	-6.364	0.000	(0)
H2BO3-	1.437e-08	1.391e-08	-7.842	-7.857	-0.014	(0)
CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
MgH2BO3+	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
BF(OH)3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
NaH2BO3	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
H5(BO3)2-	5.290e-15	5.118e-15	-14.277	-14.291	-0.014	(0)
BF2(OH)2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
H8(BO3)3-	2.287e-19	2.213e-19	-18.641	-18.655	-0.014	(0)
BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)
BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)
Ba	2.003e-08					
Ba+2	1.997e-08	1.754e-08	-7.700	-7.756	-0.056	(0)
BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)
BaOH+	4.408e-14	4.269e-14	-13.356	-13.370	-0.014	(0)
BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
C(4)	3.294e-04					
HCO3-	3.148e-04	3.049e-04	-3.502	-3.516	-0.014	(0)
H2CO3	1.238e-05	1.238e-05	-4.907	-4.907	0.000	(0)
CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
CO3-2	9.014e-07	7.917e-07	-6.045	-6.101	-0.056	(0)
CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
MgHCO3+	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)

		CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
		NaHCO3	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
		MgCO3	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
		UO2 (CO3) 2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
		NaCO3-	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
		MnHCO3+	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
		UO2 (CO3) 3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
		UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
		PbCO3	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
		CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
		Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
		BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
		PbHCO3+	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
		BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)
		FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)
		Pb (CO3) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
		HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)
		Hg (CO3) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
		HgHCO3+	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
Ca	1.836e-04							
		Ca+2	1.800e-04	1.581e-04	-3.745	-3.801	-0.056	(0)
		CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
		CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
		CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
		CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
		CaOH+	1.816e-09	1.759e-09	-8.741	-8.755	-0.014	(0)
		CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
Cl	3.872e-05							
		Cl-	3.872e-05	3.748e-05	-4.412	-4.426	-0.014	(0)
		CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
		MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
		CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
		CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
		PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
		MnCl2	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
		PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
		UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
		HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
		CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
		CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
		HgCl2	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
		MnCl3-	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
		FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)
		PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
		HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
		HgCl3-	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
		CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
		FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)
		PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
		HgCl4-2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
		CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)
		FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)
		UCl+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
Cu (1)	5.210e-10							
		Cu+	4.981e-10	4.816e-10	-9.303	-9.317	-0.015	(0)
		CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
		CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
		CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
Cu (2)	7.738e-08							
		CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
		CuOH+	1.791e-08	1.734e-08	-7.747	-7.761	-0.014	(0)
		Cu+2	1.120e-08	9.833e-09	-7.951	-8.007	-0.056	(0)
		Cu (OH) 2	1.930e-09	1.930e-09	-8.715	-8.715	0.000	(0)
		CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
		CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
		Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
		CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
		Cu2 (OH) 2+2	8.642e-12	7.554e-12	-11.063	-11.122	-0.058	(0)

F	Cu (OH) 3-	2.283e-12	2.207e-12	-11.642	-11.656	-0.015	(0)
	CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
	Cu (OH) 4-2	1.108e-17	9.688e-18	-16.955	-17.014	-0.058	(0)
	CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
	CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
	CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)
	2.884e-05						
	F-	2.873e-05	2.781e-05	-4.542	-4.556	-0.014	(0)
	MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
	CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
	NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
	HF	7.427e-10	7.427e-10	-9.129	-9.129	0.000	(0)
	MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
	AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
	CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
	AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
	BF (OH) 3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
	AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
	UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
	PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)
	AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
	HF2-	8.112e-14	7.852e-14	-13.091	-13.105	-0.014	(0)
	UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
	UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
	BF2 (OH) 2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
	PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
	FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)
	FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)
	H2F2	1.478e-18	1.478e-18	-17.830	-17.830	0.000	(0)
	FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)
	UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)
	PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)	
PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)	
HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)	
BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)	
UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)	
UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)	
UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)	
UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)	
UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)	
UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)	
Fe (2)	3.925e-10						
Fe+2	3.781e-10	3.305e-10	-9.422	-9.481	-0.058	(0)	
FeOH+	7.577e-12	7.337e-12	-11.121	-11.134	-0.014	(0)	
FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)	
FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)	
Fe (OH) 2	3.250e-15	3.250e-15	-14.488	-14.488	0.000	(0)	
Fe (OH) 3-	5.919e-16	5.732e-16	-15.228	-15.242	-0.014	(0)	
Fe (3)	3.990e-08						
Fe (OH) 2+	2.476e-08	2.398e-08	-7.606	-7.620	-0.014	(0)	
Fe (OH) 3	1.436e-08	1.436e-08	-7.843	-7.843	0.000	(0)	
Fe (OH) 4-	7.702e-10	7.459e-10	-9.113	-9.127	-0.014	(0)	
FeOH+2	1.257e-13	1.105e-13	-12.901	-12.956	-0.056	(0)	
FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)	
FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)	
Fe+3	4.111e-19	3.070e-19	-18.386	-18.513	-0.127	(0)	
FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)	
FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)	
FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)	
Fe (SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)	
FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)	
Fe2 (OH) 2+4	6.934e-25	4.046e-25	-24.159	-24.393	-0.234	(0)	
FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)	
Fe3 (OH) 4+5	3.254e-31	1.403e-31	-30.488	-30.853	-0.366	(0)	
FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)	
H (0)	4.615e-27						
H2	2.307e-27	2.308e-27	-26.637	-26.637	0.000	(0)	

Hg (0)	2.493e-11					
Hg	2.493e-11	2.493e-11	-10.603	-10.603	0.000	(0)
Hg (1)	1.046e-26					
Hg2+2	5.229e-27	4.570e-27	-26.282	-26.340	-0.058	(0)
Hg (2)	5.401e-16					
Hg (OH) 2	5.299e-16	5.300e-16	-15.276	-15.276	0.000	(0)
HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)
HgCl2	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
HgOH+	6.201e-21	5.996e-21	-20.208	-20.222	-0.015	(0)
Hg (CO3) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
HgHCO3+	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
Hg (OH) 3-	3.848e-23	3.721e-23	-22.415	-22.429	-0.015	(0)
HgCl3-	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
Hg+2	3.090e-25	2.701e-25	-24.510	-24.569	-0.058	(0)
HgSO4	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
HgCl4-2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)
K	4.343e-05					
K+	4.341e-05	4.202e-05	-4.362	-4.376	-0.014	(0)
KSO4-	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
Mg	2.345e-05					
Mg+2	2.305e-05	2.025e-05	-4.637	-4.694	-0.056	(0)
MgSO4	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
MgHCO3+	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
MgCO3	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
MgOH+	4.640e-09	4.496e-09	-8.333	-8.347	-0.014	(0)
MgH2BO3+	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
Mn (2)	1.707e-07					
Mn+2	1.677e-07	1.465e-07	-6.776	-6.834	-0.058	(0)
MnSO4	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
MnHCO3+	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
MnOH+	2.120e-10	2.053e-10	-9.674	-9.688	-0.014	(0)
MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
MnCl2	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
MnSeO4	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
Mn (OH) 3-	4.075e-19	3.946e-19	-18.390	-18.404	-0.014	(0)
MnCl3-	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
Mn (OH) 4-2	8.079e-25	7.104e-25	-24.093	-24.148	-0.056	(0)
MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
Mn (3)	8.765e-29					
Mn+3	8.765e-29	6.546e-29	-28.057	-28.184	-0.127	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.253	-47.309	-0.056	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-52.667	-52.681	-0.014	(0)
Mo	5.003e-09					
MoO4-2	5.002e-09	4.393e-09	-8.301	-8.357	-0.056	(0)
HMoO4-	1.632e-12	1.578e-12	-11.787	-11.802	-0.015	(0)
H2MoO4	2.087e-16	2.087e-16	-15.680	-15.680	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
Mo7O24-6	0.000e+00	0.000e+00	-66.931	-67.458	-0.526	(0)
HMo7O24-5	0.000e+00	0.000e+00	-68.449	-68.814	-0.366	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-71.542	-71.776	-0.234	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-76.141	-76.273	-0.132	(0)
Na	8.965e-05					
Na+	8.960e-05	8.674e-05	-4.048	-4.062	-0.014	(0)
NaSO4-	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
NaHCO3	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
NaCO3-	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
NaH2BO3	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
O (0)	1.903e-39					
O2	9.515e-40	9.516e-40	-39.022	-39.022	0.000	(0)
Pb	5.792e-10					

PbCO3	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
PbOH+	1.592e-10	1.540e-10	-9.798	-9.813	-0.015	(0)
Pb+2	1.251e-10	1.099e-10	-9.903	-9.959	-0.056	(0)
PbHCO3+	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
PbSO4	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
Pb (OH) 2	2.715e-12	2.715e-12	-11.566	-11.566	0.000	(0)
Pb (CO3) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)
PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
Pb (SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
Pb (OH) 3-	1.566e-15	1.514e-15	-14.805	-14.820	-0.015	(0)
PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
Pb2OH+3	3.632e-19	2.682e-19	-18.440	-18.571	-0.132	(0)
Pb (OH) 4-2	2.366e-19	2.068e-19	-18.626	-18.684	-0.058	(0)
PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
Pb3 (OH) 4+2	1.850e-23	1.617e-23	-22.733	-22.791	-0.058	(0)
PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)
PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
Pb4 (OH) 4+4	2.420e-29	1.412e-29	-28.616	-28.850	-0.234	(0)
S (6)	7.977e-05					
SO4-2	7.702e-05	6.765e-05	-4.113	-4.170	-0.056	(0)
CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
MgSO4	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
NaSO4-	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
KSO4-	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
MnSO4	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
HSO4-	1.233e-10	1.194e-10	-9.909	-9.923	-0.014	(0)
FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)
PbSO4	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
Pb (SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
UO2 (SO4) 2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
Al (SO4) 2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)
Fe (SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)
HgSO4	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
Se (-2)	6.134e-35					
HSe-	6.133e-35	5.930e-35	-34.212	-34.227	-0.015	(0)
H2Se	8.312e-39	8.312e-39	-38.080	-38.080	0.000	(0)
MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
Se-2	0.000e+00	0.000e+00	-41.425	-41.484	-0.058	(0)
Se (4)	3.040e-09					
HSeO3-	2.444e-09	2.363e-09	-8.612	-8.627	-0.015	(0)
SeO3-2	5.960e-10	5.209e-10	-9.225	-9.283	-0.058	(0)
H2SeO3	1.820e-14	1.820e-14	-13.740	-13.740	0.000	(0)
FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)
Se (6)	2.249e-14					
SeO4-2	2.249e-14	1.975e-14	-13.648	-13.704	-0.056	(0)
MnSeO4	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
HSeO4-	1.848e-20	1.787e-20	-19.733	-19.748	-0.015	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.218	-55.350	-0.132	(0)
U (4)	1.143e-17					
U (OH) 5-	1.142e-17	1.105e-17	-16.942	-16.957	-0.015	(0)
U (OH) 4	8.353e-21	8.353e-21	-20.078	-20.078	0.000	(0)
U (OH) 3+	5.703e-25	5.514e-25	-24.244	-24.259	-0.015	(0)
U (OH) 2+2	5.267e-30	4.603e-30	-29.278	-29.337	-0.058	(0)
UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)
UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)
UOH+3	5.300e-36	3.915e-36	-35.276	-35.407	-0.132	(0)
UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)
UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)

USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)
U(SO4)2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)
U+4	0.000e+00	0.000e+00	-42.320	-42.554	-0.234	(0)
UCl+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-155.142	-156.326	-1.184	(0)
U(5)	1.008e-14					
UO2+	1.008e-14	9.747e-15	-13.997	-14.011	-0.015	(0)
U(6)	1.017e-08					
UO2(CO3)2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
UO2(CO3)3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
UO2OH+	1.161e-11	1.123e-11	-10.935	-10.950	-0.015	(0)
UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
UO2+2	1.821e-13	1.599e-13	-12.740	-12.796	-0.056	(0)
UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
(UO2)3(OH)5+	5.729e-16	5.540e-16	-15.242	-15.257	-0.015	(0)
UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
(UO2)2(OH)2+2	2.393e-16	2.092e-16	-15.621	-15.680	-0.058	(0)
UO2(SO4)2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Al(OH)3(am)	-1.61	9.19	10.80	Al(OH)3
Al2(MoO4)3	-55.52	-53.16	2.37	Al2(MoO4)3
Al2O3	-1.28	18.38	19.65	Al2O3
Al4(OH)10SO4	-5.61	17.09	22.70	Al4(OH)10SO4
AlOHSO4	-7.24	-10.47	-3.23	AlOHSO4
Alunite	-6.98	-8.38	-1.40	KAl3(SO4)2(OH)6
Anglesite	-6.34	-14.13	-7.79	PbSO4
Anhydrite	-3.61	-7.97	-4.36	CaSO4
Antlerite	-6.01	2.78	8.79	Cu3(OH)4SO4
Aragonite	-1.60	-9.90	-8.30	CaCO3
Artinite	-9.60	-0.00	9.60	MgCO3:Mg(OH)2:3H2O
Atacamite	-4.60	2.79	7.39	Cu2(OH)3Cl
Azurite	-3.83	-20.74	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.66	7.73	24.39	Ba(OH)2:8H2O
BaF2	-11.05	-16.87	-5.82	BaF2
BaMoO4	-9.15	-16.11	-6.96	BaMoO4
Barite	-1.95	-11.93	-9.98	BaSO4
BaSeO3	-10.47	-8.64	1.83	BaSeO3
BaSeO4	-14.00	-21.46	-7.46	BaSeO4
Birnessite	-11.30	6.79	18.09	MnO2
Bixbyite	-9.26	-9.91	-0.64	Mn2O3
Boehmite	0.61	9.19	8.58	AlOOH
Brochantite	-4.96	10.26	15.22	Cu4(OH)6SO4
Brucite	-6.05	10.79	16.84	Mg(OH)2
Calcite	-1.42	-9.90	-8.48	CaCO3
Calomel	-17.28	-35.19	-17.91	Hg2Cl2
CaMoO4	-4.21	-12.16	-7.95	CaMoO4
CaSeO3:2H2O	-7.50	-4.68	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-14.49	-17.51	-3.02	CaSeO4:2H2O
Cerrusite	-2.93	-16.06	-13.13	PbCO3
CH4(g)	-74.49	-115.54	-41.05	CH4
Chalcanthite	-9.54	-12.18	-2.64	CuSO4:5H2O
Clausthalite	-9.34	-36.44	-27.10	PbSe
CO2(g)	-3.44	-21.59	-18.15	CO2
Cotunnite	-14.03	-18.81	-4.78	PbCl2
Cryolite	-19.72	-53.56	-33.84	Na3AlF6
Cu(OH)2	-1.19	7.48	8.67	Cu(OH)2
Cu2Se(alpha)	0.68	-45.12	-45.80	Cu2Se
Cu2SO4	-20.85	-22.80	-1.95	Cu2SO4

Cu3Se2	-16.12	-79.61	-63.49	Cu3Se2
CuCO3	-2.61	-14.11	-11.50	CuCO3
CuF	-8.97	-13.87	-4.91	CuF
CuF2	-18.23	-17.12	1.12	CuF2
CuF2:2H2O	-12.57	-17.12	-4.55	CuF2:2H2O
Cumetal	-4.56	-13.32	-8.76	Cu
CuMoO4	-3.29	-16.36	-13.08	CuMoO4
CuOCuSO4	-15.00	-4.70	10.30	CuOCuSO4
Cupricferrite	10.93	16.91	5.99	CuFe2O4
Cuprite	-1.74	-3.15	-1.41	Cu2O
Cuprousferrite	12.06	3.14	-8.92	CuFeO2
CuSe	-1.39	-34.49	-33.10	CuSe
CuSe2	-19.61	-52.97	-33.37	CuSe2
CuSeO3:2H2O	-9.40	-8.89	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-19.27	-21.71	-2.44	CuSeO4:5H2O
CuSO4	-15.12	-12.18	2.94	CuSO4
Diaspore	2.31	9.19	6.87	AlOOH
Dolomite(disordered)	-4.16	-20.70	-16.54	CaMg(CO3)2
Dolomite(ordered)	-3.61	-20.70	-17.09	CaMg(CO3)2
Epsomite	-6.74	-8.86	-2.13	MgSO4:7H2O
Fe(OH)2	-7.56	6.01	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	4.11	1.07	-3.04	Fe(OH)2.7Cl.3
Fe2(OH)4SeO3	-8.49	-6.94	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.05	-39.68	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.80	-49.53	-3.73	Fe2(SO4)3
Fe3(OH)8	-4.78	15.44	20.22	Fe3(OH)8
FeMoO4	-7.75	-17.84	-10.09	FeMoO4
Ferrihydrite	1.53	4.72	3.19	Fe(OH)3
Ferroselite	-35.85	-54.45	-18.60	FeSe2
FeSe	-24.96	-35.96	-11.00	FeSe
Fluorite	-2.41	-12.91	-10.50	CaF2
Gibbsite	0.90	9.19	8.29	Al(OH)3
Goethite	4.23	4.72	0.49	FeOOH
Gummite	-4.98	2.69	7.67	UO3
Gypsum	-3.36	-7.97	-4.61	CaSO4:2H2O
H-Jarosite	-13.06	-25.16	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.97	-23.84	-12.88	H2MoO4
H2Se(g)	-37.01	-41.97	-4.96	H2Se
Halite	-10.09	-8.49	1.60	NaCl
Hausmannite	-11.58	49.45	61.03	Mn3O4
Hematite	10.85	9.43	-1.42	Fe2O3
Hercynite	1.49	24.38	22.89	FeAl2O4
Hg(CH3)2(g)	-172.64	-246.35	-73.71	Hg(CH3)2
Hg(g)	-9.30	-17.17	-7.87	Hg
Hg(OH)2	-11.78	-15.28	-3.50	Hg(OH)2
Hg2(g)	-19.38	-34.34	-14.96	Hg2
Hg2(OH)2	-16.11	-10.85	5.26	Hg2(OH)2
Hg2CO3	-16.39	-32.44	-16.05	Hg2CO3
Hg2F2	-25.09	-35.45	-10.36	Hg2F2
Hg2SeO3	-22.57	-27.22	-4.66	Hg2SeO3
Hg2SO4	-24.38	-30.51	-6.13	Hg2SO4
Hg3O2CO3	-37.73	-67.42	-29.68	Hg3O2CO3
HgCl(g)	-37.09	-17.60	19.50	HgCl
HgCl2	-18.35	-39.61	-21.26	HgCl2
HgF(g)	-50.40	-17.73	32.68	HgF
HgF2(g)	-52.44	-39.87	12.57	HgF2
Hgmetal(l)	-3.72	-17.17	-13.45	Hg
HgSe	-1.55	-57.25	-55.69	HgSe
HgSeO3	-19.22	-31.65	-12.43	HgSeO3
HgSO4	-25.51	-34.93	-9.42	HgSO4
Huntite	-12.32	-42.29	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.82	-26.59	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-23.62	-32.39	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-21.59	-26.76	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.99	-21.79	-14.80	KFe3(SO4)2(OH)6
K2MoO4	-20.37	-17.11	3.26	K2MoO4
K2SeO4	-21.73	-22.46	-0.73	K2SeO4
Langite	-7.23	10.26	17.49	Cu4(OH)6SO4:H2O

Larnakite	-8.17	-8.60	-0.43	PbO:PbSO4
Laurionite	-7.26	-6.64	0.62	PbOHCl
Lepidocrocite	3.35	4.72	1.37	FeOOH
Lime	-21.01	11.69	32.70	CaO
Litharge	-7.17	5.53	12.69	PbO
Maghemite	3.05	9.43	6.39	Fe2O3
Magnesioferrite	3.37	20.23	16.86	Fe2MgO4
Magnesite	-3.34	-10.80	-7.46	MgCO3
Magnetite	12.04	15.44	3.40	Fe3O4
Malachite	-1.32	-6.63	-5.31	Cu2 (OH) 2CO3
Manganite	-4.94	20.40	25.34	MnOOH
Massicot	-7.37	5.53	12.89	PbO
Matlockite	-9.97	-18.94	-8.97	PbClF
Melanothallite	-23.12	-16.86	6.26	CuCl2
Melanterite	-11.44	-13.65	-2.21	FeSO4:7H2O
Mg (OH) 2 (active)	-8.00	10.79	18.79	Mg (OH) 2
MgF2	-5.68	-13.81	-8.13	MgF2
MgMoO4	-11.20	-13.05	-1.85	MgMoO4
MgSeO3:6H2O	-8.63	-5.58	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-17.20	-18.40	-1.20	MgSeO4:6H2O
Minium	-33.45	40.07	73.52	Pb3O4
Mirabilite	-11.18	-12.29	-1.11	Na2SO4:10H2O
Mn2 (SO4) 3	-63.17	-68.88	-5.71	Mn2 (SO4) 3
MnCl2:4H2O	-18.40	-15.69	2.72	MnCl2:4H2O
MnSe	-36.82	-33.32	3.50	MnSe
MnSeO3	-8.85	-7.72	1.13	MnSeO3
MnSeO3:2H2O	-8.70	-7.72	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-18.49	-20.54	-2.05	MnSeO4:5H2O
MnSO4	-13.59	-11.00	2.58	MnSO4
Montroydite	-11.64	-15.28	-3.64	HgO
MoO3	-15.84	-23.84	-8.00	MoO3
Na-Jarosite	-10.28	-21.48	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-23.73	-40.32	-16.60	Na2Mo2O7
Na2MoO4	-17.97	-16.48	1.49	Na2MoO4
Na2MoO4:2H2O	-17.70	-16.48	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-19.31	-9.01	10.30	Na2SeO3:5H2O
Na2SeO4	-23.11	-21.83	1.28	Na2SeO4
Nantokite	-7.01	-13.74	-6.73	CuCl
Natron	-12.91	-14.23	-1.31	Na2CO3:10H2O
Nesquehonite	-6.13	-10.80	-4.67	MgCO3:3H2O
Nsutite	-10.71	6.79	17.50	MnO2
O2 (g)	-36.12	46.97	83.09	O2
Pb (BO2) 2	-13.72	-7.20	6.52	Pb (BO2) 2
Pb (OH) 2	-2.62	5.53	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-65.49	-74.25	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.91	-1.11	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.13	11.06	26.19	Pb2O (OH) 2
Pb2O3	-26.50	34.54	61.04	Pb2O3
Pb2OCO3	-9.97	-10.53	-0.56	Pb2OCO3
Pb3O2CO3	-16.02	-5.00	11.02	Pb3O2CO3
Pb3O2SO4	-13.76	-3.07	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-18.65	2.45	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-19.42	2.45	21.88	Pb4O3SO4
PbF2	-11.63	-19.07	-7.44	PbF2
Pbmetal	-22.21	-17.96	4.25	Pb
PbMoO4	-2.70	-18.32	-15.62	PbMoO4
PbO:0.3H2O	-7.45	5.53	12.98	PbO:0.33H2O
PbSeO4	-16.82	-23.66	-6.84	PbSeO4
Periclase	-10.79	10.79	21.58	MgO
Phosgenite	-15.06	-34.87	-19.81	PbCl2:PbCO3
Plattnerite	-20.59	29.01	49.60	PbO2
Portlandite	-11.12	11.69	22.80	Ca (OH) 2
Pyrochroite	-6.54	8.65	15.19	Mn (OH) 2
Pyrolusite	-9.24	32.14	41.38	MnO2
Rhodochrosite	-2.36	-12.94	-10.58	MnCO3
Rutherfordine	-4.40	-18.90	-14.50	UO2CO3
Schoepite	-3.30	2.69	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.37	-18.48	-7.11	Se

Semetal(hex	-10.78	-18.48	-7.71	Se
SeO2	-16.49	-16.37	0.12	SeO2
SeO3	-50.24	-29.19	21.04	SeO3
Siderite	-5.34	-15.58	-10.24	FeCO3
Spinel	-7.68	29.17	36.85	MgAl2O4
Tenorite	-0.16	7.48	7.64	CuO
Thenardite	-12.61	-12.29	0.32	Na2SO4
Thermonatrite	-14.86	-14.22	0.64	Na2CO3:H2O
U3O8	-8.85	12.23	21.08	U3O8
U4O9	-19.81	-22.83	-3.02	U4O9
UF4	-31.24	-60.78	-29.54	UF4
UF4:2.5H2O	-28.06	-60.78	-32.72	UF4:2.5H2O
UO2(am)	-12.51	-11.58	0.93	UO2
UO2(OH)2(beta)	-2.92	2.69	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.25	-26.50	-2.25	UO2SeO4:4H2O
UO3	-5.01	2.69	7.70	UO3
Uraninite	-6.91	-11.58	-4.67	UO2
Witherite	-5.29	-13.86	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 17.

SOLUTION 15 Average HCT data for coarse crystalline porphyry - sulfide (ore)
(cell CF-11-02, 367-408)

temp 25
pH 7.74339
pe 4
redox pe
units mg/l
density 1
Alkalinity 19.90015 as HCO3
Al 0.04951
B 0.00483
Ba 0.00275
Ca 7.35746
Cl 1.37265
Cu 0.00495
F 0.54795
Fe 0.00225
Hg 0.000005
K 1.69801
Mg 0.56998
Mn 0.00938
Mo 0.00048
Na 2.03935 charge
Pb 0.00012
S(6) 7.66320 as SO4
Se 0.00024
U 0.00242
water 1 # kg

END

Beginning of initial solution calculations.

Initial solution 15. Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	1.835e-06	1.835e-06
Alkalinity	3.261e-04	3.261e-04
B	4.468e-07	4.468e-07
Ba	2.003e-08	2.003e-08
Ca	1.836e-04	1.836e-04
Cl	3.872e-05	3.872e-05
Cu	7.790e-08	7.790e-08
F	2.884e-05	2.884e-05
Fe	4.029e-08	4.029e-08
Hg	2.493e-11	2.493e-11
K	4.343e-05	4.343e-05
Mg	2.345e-05	2.345e-05
Mn	1.707e-07	1.707e-07
Mo	5.003e-09	5.003e-09
Na	8.965e-05	8.965e-05
Pb	5.792e-10	5.792e-10
S (6)	7.977e-05	7.977e-05
Se	3.040e-09	3.040e-09
U	1.017e-08	1.017e-08

Charge balance

-----Description of solution-----

pH	=	7.743
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	8.218e-04
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	3.294e-04
Total CO2 (mol/kg)	=	3.294e-04
Temperature (°C)	=	25.00
Electrical balance (eq)	=	-1.403e-17
Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
Iterations	=	10
Total H	=	1.110140e+02
Total O	=	5.550815e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.762e-07	5.577e-07	-6.239	-6.254	-0.014	(0)
H+	1.865e-08	1.806e-08	-7.729	-7.743	-0.014	0.00
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	1.835e-06					
Al (OH) 4-	1.808e-06	1.750e-06	-5.743	-5.757	-0.014	(0)
Al (OH) 3	2.493e-08	2.493e-08	-7.603	-7.603	0.000	(0)
Al (OH) 2+	2.313e-09	2.240e-09	-8.636	-8.650	-0.014	(0)
AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
AlOH+2	5.749e-12	5.058e-12	-11.240	-11.296	-0.056	(0)
AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
Al+3	1.214e-14	9.069e-15	-13.916	-14.042	-0.127	(0)
AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
Al (SO4) 2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
B	4.468e-07					
H3BO3	4.323e-07	4.324e-07	-6.364	-6.364	0.000	(0)
H2BO3-	1.437e-08	1.391e-08	-7.842	-7.857	-0.014	(0)
CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
MgH2BO3+	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
BF (OH) 3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
NaH2BO3	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
H5 (BO3) 2-	5.290e-15	5.118e-15	-14.277	-14.291	-0.014	(0)

	BF2 (OH) 2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
	H8 (BO3) 3-	2.287e-19	2.213e-19	-18.641	-18.655	-0.014	(0)
	BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)
	BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)
Ba	2.003e-08						
	Ba+2	1.997e-08	1.754e-08	-7.700	-7.756	-0.056	(0)
	BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
	BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)
	BaOH+	4.408e-14	4.269e-14	-13.356	-13.370	-0.014	(0)
	BaH2BO3+	7.789e-15	7.537e-15	-14.109	-14.123	-0.014	(0)
C (4)	3.294e-04						
	HCO3-	3.148e-04	3.049e-04	-3.502	-3.516	-0.014	(0)
	H2CO3	1.238e-05	1.238e-05	-4.907	-4.907	0.000	(0)
	CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
	CO3-2	9.014e-07	7.917e-07	-6.045	-6.101	-0.056	(0)
	CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
	MgHCO3+	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
	CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
	NaHCO3	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
	MgCO3	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
	UO2 (CO3) 2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
	NaCO3-	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
	MnHCO3+	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
	UO2 (CO3) 3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
	UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
	PbCO3	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
	CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
	Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
	BaHCO3+	5.272e-11	5.106e-11	-10.278	-10.292	-0.014	(0)
	PbHCO3+	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
	BaCO3	7.121e-12	7.121e-12	-11.147	-11.147	0.000	(0)
	FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)
	Pb (CO3) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
	HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)
	Hg (CO3) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
	HgHCO3+	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
Ca	1.836e-04						
	Ca+2	1.800e-04	1.581e-04	-3.745	-3.801	-0.056	(0)
	CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
	CaHCO3+	9.265e-07	8.975e-07	-6.033	-6.047	-0.014	(0)
	CaCO3	1.983e-07	1.983e-07	-6.703	-6.703	0.000	(0)
	CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
	CaOH+	1.816e-09	1.759e-09	-8.741	-8.755	-0.014	(0)
	CaH2BO3+	1.307e-10	1.265e-10	-9.884	-9.898	-0.014	(0)
Cl	3.872e-05						
	Cl-	3.872e-05	3.748e-05	-4.412	-4.426	-0.014	(0)
	CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
	MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
	CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
	CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
	PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
	MnCl2	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
	PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
	UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
	HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
	CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
	CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
	HgCl2	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
	MnCl3-	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
	FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)
	PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
	HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
	HgCl3-	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
	CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
	FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)
	PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
	HgCl4-2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
	CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)

FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)
UCl+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
Cu (1)	5.210e-10					
Cu+	4.981e-10	4.816e-10	-9.303	-9.317	-0.015	(0)
CuCl	2.273e-11	2.273e-11	-10.643	-10.643	0.000	(0)
CuCl2-	1.838e-13	1.780e-13	-12.736	-12.750	-0.014	(0)
CuCl3-2	1.622e-18	1.426e-18	-17.790	-17.846	-0.056	(0)
Cu (2)	7.738e-08					
CuCO3	4.584e-08	4.584e-08	-7.339	-7.339	0.000	(0)
CuOH+	1.791e-08	1.734e-08	-7.747	-7.761	-0.014	(0)
Cu+2	1.120e-08	9.833e-09	-7.951	-8.007	-0.056	(0)
Cu (OH) 2	1.930e-09	1.930e-09	-8.715	-8.715	0.000	(0)
CuHCO3+	1.957e-10	1.892e-10	-9.708	-9.723	-0.015	(0)
CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
Cu (CO3) 2-2	1.118e-10	9.769e-11	-9.952	-10.010	-0.058	(0)
CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
Cu2 (OH) 2+2	8.642e-12	7.554e-12	-11.063	-11.122	-0.058	(0)
Cu (OH) 3-	2.283e-12	2.207e-12	-11.642	-11.656	-0.015	(0)
CuCl+	6.034e-13	5.842e-13	-12.219	-12.233	-0.014	(0)
Cu (OH) 4-2	1.108e-17	9.688e-18	-16.955	-17.014	-0.058	(0)
CuCl2	7.592e-18	7.592e-18	-17.120	-17.120	0.000	(0)
CuCl3-	2.743e-24	2.656e-24	-23.562	-23.576	-0.014	(0)
CuCl4-2	5.674e-31	4.989e-31	-30.246	-30.302	-0.056	(0)
F	2.884e-05					
F-	2.873e-05	2.781e-05	-4.542	-4.556	-0.014	(0)
MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
CaF+	4.954e-08	4.797e-08	-7.305	-7.319	-0.014	(0)
NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
HF	7.427e-10	7.427e-10	-9.129	-9.129	0.000	(0)
MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
AlF2+	2.883e-11	2.792e-11	-10.540	-10.554	-0.014	(0)
CuF+	1.784e-11	1.725e-11	-10.749	-10.763	-0.015	(0)
AlF3	9.775e-12	9.775e-12	-11.010	-11.010	0.000	(0)
BF (OH) 3-	4.958e-12	4.798e-12	-11.305	-11.319	-0.014	(0)
AlF+2	2.867e-12	2.522e-12	-11.543	-11.598	-0.056	(0)
UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)
AlF4-	1.407e-13	1.362e-13	-12.852	-12.866	-0.014	(0)
HF2-	8.112e-14	7.852e-14	-13.091	-13.105	-0.014	(0)
UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
BF2 (OH) 2-	2.662e-16	2.575e-16	-15.575	-15.589	-0.014	(0)
PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)
FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)
H2F2	1.478e-18	1.478e-18	-17.830	-17.830	0.000	(0)
FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)
UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)
PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
BF3OH-	5.199e-23	5.031e-23	-22.284	-22.298	-0.014	(0)
PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)
HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)
BF4-	1.285e-28	1.243e-28	-27.891	-27.906	-0.014	(0)
UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)
UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)
UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)
UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)
UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)
UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)
Fe (2)	3.925e-10					
Fe+2	3.781e-10	3.305e-10	-9.422	-9.481	-0.058	(0)
FeOH+	7.577e-12	7.337e-12	-11.121	-11.134	-0.014	(0)
FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)
FeHCO3+	1.310e-12	1.269e-12	-11.883	-11.897	-0.014	(0)
Fe (OH) 2	3.250e-15	3.250e-15	-14.488	-14.488	0.000	(0)
Fe (OH) 3-	5.919e-16	5.732e-16	-15.228	-15.242	-0.014	(0)
Fe (3)	3.990e-08					
Fe (OH) 2+	2.476e-08	2.398e-08	-7.606	-7.620	-0.014	(0)

Fe (OH) 3	1.436e-08	1.436e-08	-7.843	-7.843	0.000	(0)
Fe (OH) 4-	7.702e-10	7.459e-10	-9.113	-9.127	-0.014	(0)
FeOH+2	1.257e-13	1.105e-13	-12.901	-12.956	-0.056	(0)
FeF+2	1.065e-17	9.361e-18	-16.973	-17.029	-0.056	(0)
FeF2+	7.194e-18	6.966e-18	-17.143	-17.157	-0.014	(0)
Fe+3	4.111e-19	3.070e-19	-18.386	-18.513	-0.127	(0)
FeF3	2.733e-19	2.733e-19	-18.563	-18.563	0.000	(0)
FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)
FeCl+2	3.952e-22	3.475e-22	-21.403	-21.459	-0.056	(0)
Fe (SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)
FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)
Fe2 (OH) 2+4	6.934e-25	4.046e-25	-24.159	-24.393	-0.234	(0)
FeCl2+	6.008e-26	5.818e-26	-25.221	-25.235	-0.014	(0)
Fe3 (OH) 4+5	3.254e-31	1.403e-31	-30.488	-30.853	-0.366	(0)
FeCl3	2.181e-31	2.181e-31	-30.661	-30.661	0.000	(0)
H (0)	4.615e-27					
H2	2.307e-27	2.308e-27	-26.637	-26.637	0.000	(0)
Hg (0)	2.493e-11					
Hg	2.493e-11	2.493e-11	-10.603	-10.603	0.000	(0)
Hg (1)	1.046e-26					
Hg2+2	5.229e-27	4.570e-27	-26.282	-26.340	-0.058	(0)
Hg (2)	5.401e-16					
Hg (OH) 2	5.299e-16	5.300e-16	-15.276	-15.276	0.000	(0)
HgClOH	9.970e-18	9.970e-18	-17.001	-17.001	0.000	(0)
HgCO3	2.559e-19	2.559e-19	-18.592	-18.592	0.000	(0)
HgCl2	3.794e-20	3.794e-20	-19.421	-19.421	0.000	(0)
HgOH+	6.201e-21	5.996e-21	-20.208	-20.222	-0.015	(0)
Hg (CO3) 2-2	7.330e-22	6.407e-22	-21.135	-21.193	-0.058	(0)
HgCl+	2.089e-22	2.020e-22	-21.680	-21.695	-0.015	(0)
HgHCO3+	8.898e-23	8.603e-23	-22.051	-22.065	-0.015	(0)
Hg (OH) 3-	3.848e-23	3.721e-23	-22.415	-22.429	-0.015	(0)
HgCl3-	1.471e-23	1.422e-23	-22.832	-22.847	-0.015	(0)
Hg+2	3.090e-25	2.701e-25	-24.510	-24.569	-0.058	(0)
HgSO4	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
HgCl4-2	2.428e-27	2.122e-27	-26.615	-26.673	-0.058	(0)
HgF+	2.879e-28	2.784e-28	-27.541	-27.555	-0.015	(0)
K	4.343e-05					
K+	4.341e-05	4.202e-05	-4.362	-4.376	-0.014	(0)
KSO4-	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
Mg	2.345e-05					
Mg+2	2.305e-05	2.025e-05	-4.637	-4.694	-0.056	(0)
MgSO4	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
MgHCO3+	6.526e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
MgF+	6.525e-08	6.318e-08	-7.185	-7.199	-0.014	(0)
MgCO3	1.333e-08	1.333e-08	-7.875	-7.875	0.000	(0)
MgOH+	4.640e-09	4.496e-09	-8.333	-8.347	-0.014	(0)
MgH2BO3+	1.009e-11	9.765e-12	-10.996	-11.010	-0.014	(0)
Mn (2)	1.707e-07					
Mn+2	1.677e-07	1.465e-07	-6.776	-6.834	-0.058	(0)
MnSO4	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
MnHCO3+	9.207e-10	8.916e-10	-9.036	-9.050	-0.014	(0)
MnOH+	2.120e-10	2.053e-10	-9.674	-9.688	-0.014	(0)
MnF+	1.675e-10	1.622e-10	-9.776	-9.790	-0.014	(0)
MnCl+	7.141e-12	6.915e-12	-11.146	-11.160	-0.014	(0)
MnCl2	3.661e-16	3.661e-16	-15.436	-15.436	0.000	(0)
MnSeO4	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
Mn (OH) 3-	4.075e-19	3.946e-19	-18.390	-18.404	-0.014	(0)
MnCl3-	3.904e-21	3.780e-21	-20.409	-20.423	-0.014	(0)
Mn (OH) 4-2	8.079e-25	7.104e-25	-24.093	-24.148	-0.056	(0)
MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
Mn (3)	8.765e-29					
Mn+3	8.765e-29	6.546e-29	-28.057	-28.184	-0.127	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.253	-47.309	-0.056	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-52.667	-52.681	-0.014	(0)
Mo	5.003e-09					
MoO4-2	5.002e-09	4.393e-09	-8.301	-8.357	-0.056	(0)

	HMoO4-	1.632e-12	1.578e-12	-11.787	-11.802	-0.015	(0)
	H2MoO4	2.087e-16	2.087e-16	-15.680	-15.680	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-55.522	-55.654	-0.132	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-66.931	-67.458	-0.526	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-68.449	-68.814	-0.366	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-71.542	-71.776	-0.234	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-76.141	-76.273	-0.132	(0)
Na		8.965e-05					
	Na+	8.960e-05	8.674e-05	-4.048	-4.062	-0.014	(0)
	NaSO4-	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
	NaHCO3	1.487e-08	1.487e-08	-7.828	-7.828	0.000	(0)
	NaF	1.522e-09	1.522e-09	-8.818	-8.818	0.000	(0)
	NaCO3-	1.320e-09	1.279e-09	-8.879	-8.893	-0.014	(0)
	NaH2BO3	1.912e-12	1.912e-12	-11.718	-11.718	0.000	(0)
O (0)		1.903e-39					
	O2	9.515e-40	9.516e-40	-39.022	-39.022	0.000	(0)
Pb		5.792e-10					
	PbCO3	2.616e-10	2.616e-10	-9.582	-9.582	0.000	(0)
	PbOH+	1.592e-10	1.540e-10	-9.798	-9.813	-0.015	(0)
	Pb+2	1.251e-10	1.099e-10	-9.903	-9.959	-0.056	(0)
	PbHCO3+	2.576e-11	2.490e-11	-10.589	-10.604	-0.015	(0)
	PbSO4	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
	Pb (OH) 2	2.715e-12	2.715e-12	-11.566	-11.566	0.000	(0)
	Pb (CO3) 2-2	6.834e-13	5.973e-13	-12.165	-12.224	-0.058	(0)
	PbF+	2.228e-13	2.154e-13	-12.652	-12.667	-0.015	(0)
	PbCl+	1.512e-13	1.462e-13	-12.820	-12.835	-0.015	(0)
	Pb (SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
	Pb (OH) 3-	1.566e-15	1.514e-15	-14.805	-14.820	-0.015	(0)
	PbF2	1.179e-16	1.179e-16	-15.929	-15.929	0.000	(0)
	PbCl2	2.448e-17	2.448e-17	-16.611	-16.611	0.000	(0)
	Pb2OH+3	3.632e-19	2.682e-19	-18.440	-18.571	-0.132	(0)
	Pb (OH) 4-2	2.366e-19	2.068e-19	-18.626	-18.684	-0.058	(0)
	PbF3-	6.430e-21	6.218e-21	-20.192	-20.206	-0.015	(0)
	PbCl3-	3.777e-22	3.652e-22	-21.423	-21.437	-0.015	(0)
	Pb3 (OH) 4+2	1.850e-23	1.617e-23	-22.733	-22.791	-0.058	(0)
	PbF4-2	9.469e-26	8.276e-26	-25.024	-25.082	-0.058	(0)
	PbCl4-2	7.160e-27	6.258e-27	-26.145	-26.204	-0.058	(0)
	Pb4 (OH) 4+4	2.420e-29	1.412e-29	-28.616	-28.850	-0.234	(0)
S (6)		7.977e-05					
	SO4-2	7.702e-05	6.765e-05	-4.113	-4.170	-0.056	(0)
	CaSO4	2.449e-06	2.449e-06	-5.611	-5.611	0.000	(0)
	MgSO4	2.493e-07	2.493e-07	-6.603	-6.603	0.000	(0)
	NaSO4-	3.254e-08	3.151e-08	-7.488	-7.502	-0.014	(0)
	KSO4-	2.078e-08	2.013e-08	-7.682	-7.696	-0.014	(0)
	MnSO4	1.763e-09	1.763e-09	-8.754	-8.754	0.000	(0)
	CuSO4	1.524e-10	1.524e-10	-9.817	-9.817	0.000	(0)
	HSO4-	1.233e-10	1.194e-10	-9.909	-9.923	-0.014	(0)
	FeSO4	5.488e-12	5.488e-12	-11.261	-11.261	0.000	(0)
	PbSO4	3.642e-12	3.642e-12	-11.439	-11.439	0.000	(0)
	UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
	AlSO4+	4.919e-15	4.762e-15	-14.308	-14.322	-0.014	(0)
	Pb (SO4) 2-2	1.698e-15	1.484e-15	-14.770	-14.828	-0.058	(0)
	UO2 (SO4) 2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
	Al (SO4) 2-	3.565e-18	3.452e-18	-17.448	-17.462	-0.014	(0)
	FeSO4+	2.406e-19	2.330e-19	-18.619	-18.633	-0.014	(0)
	Fe (SO4) 2-	3.485e-22	3.370e-22	-21.458	-21.472	-0.015	(0)
	HgSO4	4.783e-27	4.783e-27	-26.320	-26.320	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
Se (-2)		6.134e-35					
	HSe-	6.133e-35	5.930e-35	-34.212	-34.227	-0.015	(0)
	H2Se	8.312e-39	8.312e-39	-38.080	-38.080	0.000	(0)
	MnSe	1.984e-39	1.984e-39	-38.703	-38.703	0.000	(0)
	Se-2	0.000e+00	0.000e+00	-41.425	-41.484	-0.058	(0)
Se (4)		3.040e-09					
	HSeO3-	2.444e-09	2.363e-09	-8.612	-8.627	-0.015	(0)
	SeO3-2	5.960e-10	5.209e-10	-9.225	-9.283	-0.058	(0)
	H2SeO3	1.820e-14	1.820e-14	-13.740	-13.740	0.000	(0)

FeHSeO3+2	2.193e-24	1.917e-24	-23.659	-23.717	-0.058	(0)
Se (6)	2.249e-14					
SeO4-2	2.249e-14	1.975e-14	-13.648	-13.704	-0.056	(0)
MnSeO4	7.790e-19	7.790e-19	-18.108	-18.108	0.000	(0)
HSeO4-	1.848e-20	1.787e-20	-19.733	-19.748	-0.015	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.218	-55.350	-0.132	(0)
U (4)	1.143e-17					
U (OH) 5-	1.142e-17	1.105e-17	-16.942	-16.957	-0.015	(0)
U (OH) 4	8.353e-21	8.353e-21	-20.078	-20.078	0.000	(0)
U (OH) 3+	5.703e-25	5.514e-25	-24.244	-24.259	-0.015	(0)
U (OH) 2+2	5.267e-30	4.603e-30	-29.278	-29.337	-0.058	(0)
UF3+	2.474e-35	2.393e-35	-34.607	-34.621	-0.015	(0)
UF2+2	6.211e-36	5.428e-36	-35.207	-35.265	-0.058	(0)
UOH+3	5.300e-36	3.915e-36	-35.276	-35.407	-0.132	(0)
UF4	7.295e-38	7.295e-38	-37.137	-37.137	0.000	(0)
UF+3	2.099e-38	1.551e-38	-37.678	-37.810	-0.132	(0)
USO4+2	0.000e+00	0.000e+00	-40.065	-40.123	-0.058	(0)
UF5-	0.000e+00	0.000e+00	-40.080	-40.095	-0.015	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.393	-40.393	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.112	-42.171	-0.058	(0)
U+4	0.000e+00	0.000e+00	-42.320	-42.554	-0.234	(0)
UCl+3	0.000e+00	0.000e+00	-45.148	-45.280	-0.132	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.142	-156.326	-1.184	(0)
U (5)	1.008e-14					
UO2+	1.008e-14	9.747e-15	-13.997	-14.011	-0.015	(0)
U (6)	1.017e-08					
UO2 (CO3) 2-2	9.109e-09	7.962e-09	-8.041	-8.099	-0.058	(0)
UO2 (CO3) 3-4	5.414e-10	3.159e-10	-9.266	-9.500	-0.234	(0)
UO2CO3	5.040e-10	5.040e-10	-9.298	-9.298	0.000	(0)
UO2OH+	1.161e-11	1.123e-11	-10.935	-10.950	-0.015	(0)
UO2F+	6.348e-13	6.138e-13	-12.197	-12.212	-0.015	(0)
UO2+2	1.821e-13	1.599e-13	-12.740	-12.796	-0.056	(0)
UO2F2	4.923e-14	4.923e-14	-13.308	-13.308	0.000	(0)
UO2SO4	1.637e-14	1.637e-14	-13.786	-13.786	0.000	(0)
(UO2) 3 (OH) 5+	5.729e-16	5.540e-16	-15.242	-15.257	-0.015	(0)
UO2F3-	3.557e-16	3.439e-16	-15.449	-15.464	-0.015	(0)
(UO2) 2 (OH) 2+2	2.393e-16	2.092e-16	-15.621	-15.680	-0.058	(0)
UO2 (SO4) 2-2	1.670e-17	1.460e-17	-16.777	-16.836	-0.058	(0)
UO2Cl+	1.005e-17	9.721e-18	-16.998	-17.012	-0.015	(0)
UO2F4-2	8.691e-20	7.596e-20	-19.061	-19.119	-0.058	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K (298 K, 1 atm)	
Al (OH) 3 (am)	-1.61	9.19	10.80	Al (OH) 3
Al2 (MoO4) 3	-55.52	-53.16	2.37	Al2 (MoO4) 3
Al2O3	-1.28	18.38	19.65	Al2O3
Al4 (OH) 10SO4	-5.61	17.09	22.70	Al4 (OH) 10SO4
AlOHSO4	-7.24	-10.47	-3.23	AlOHSO4
Alunite	-6.98	-8.38	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-6.34	-14.13	-7.79	PbSO4
Anhydrite	-3.61	-7.97	-4.36	CaSO4
Antlerite	-6.01	2.78	8.79	Cu3 (OH) 4SO4
Aragonite	-1.60	-9.90	-8.30	CaCO3
Artinite	-9.60	-0.00	9.60	MgCO3:Mg (OH) 2:3H2O
Atacamite	-4.60	2.79	7.39	Cu2 (OH) 3Cl
Azurite	-3.83	-20.74	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.66	7.73	24.39	Ba (OH) 2:8H2O
BaF2	-11.05	-16.87	-5.82	BaF2
BaMoO4	-9.15	-16.11	-6.96	BaMoO4
Barite	-1.95	-11.93	-9.98	BaSO4
BaSeO3	-10.47	-8.64	1.83	BaSeO3
BaSeO4	-14.00	-21.46	-7.46	BaSeO4
Birnessite	-11.30	6.79	18.09	MnO2
Bixbyite	-9.26	-9.91	-0.64	Mn2O3
Boehmite	0.61	9.19	8.58	AlOOH

Brochantite	-4.96	10.26	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-6.05	10.79	16.84	Mg (OH) 2
Calcite	-1.42	-9.90	-8.48	CaCO ₃
Calomel	-17.28	-35.19	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-4.21	-12.16	-7.95	CaMoO ₄
CaSeO ₃ :2H ₂ O	-7.50	-4.68	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-14.49	-17.51	-3.02	CaSeO ₄ :2H ₂ O
Cerrusite	-2.93	-16.06	-13.13	PbCO ₃
CH ₄ (g)	-74.49	-115.54	-41.05	CH ₄
Chalcanthite	-9.54	-12.18	-2.64	CuSO ₄ :5H ₂ O
Clausthalite	-9.34	-36.44	-27.10	PbSe
CO ₂ (g)	-3.44	-21.59	-18.15	CO ₂
Cotunnite	-14.03	-18.81	-4.78	PbCl ₂
Cryolite	-19.72	-53.56	-33.84	Na ₃ AlF ₆
Cu (OH) 2	-1.19	7.48	8.67	Cu (OH) 2
Cu ₂ Se (alpha)	0.68	-45.12	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-20.85	-22.80	-1.95	Cu ₂ SO ₄
Cu ₃ Se ₂	-16.12	-79.61	-63.49	Cu ₃ Se ₂
CuCO ₃	-2.61	-14.11	-11.50	CuCO ₃
CuF	-8.97	-13.87	-4.91	CuF
CuF ₂	-18.23	-17.12	1.12	CuF ₂
CuF ₂ :2H ₂ O	-12.57	-17.12	-4.55	CuF ₂ :2H ₂ O
Cumetal	-4.56	-13.32	-8.76	Cu
CuMoO ₄	-3.29	-16.36	-13.08	CuMoO ₄
CuOCuSO ₄	-15.00	-4.70	10.30	CuOCuSO ₄
Cupricferrite	10.93	16.91	5.99	CuFe ₂ O ₄
Cuprite	-1.74	-3.15	-1.41	Cu ₂ O
Cuprousferrite	12.06	3.14	-8.92	CuFeO ₂
CuSe	-1.39	-34.49	-33.10	CuSe
CuSe ₂	-19.61	-52.97	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-9.40	-8.89	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-19.27	-21.71	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-15.12	-12.18	2.94	CuSO ₄
Diaspore	2.31	9.19	6.87	AlOOH
Dolomite (disordered)	-4.16	-20.70	-16.54	CaMg (CO ₃) 2
Dolomite (ordered)	-3.61	-20.70	-17.09	CaMg (CO ₃) 2
Epsomite	-6.74	-8.86	-2.13	MgSO ₄ :7H ₂ O
Fe (OH) 2	-7.56	6.01	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	4.11	1.07	-3.04	Fe (OH) 2.7Cl.3
Fe ₂ (OH) 4SeO ₃	-8.49	-6.94	1.55	Fe ₂ (OH) 4SeO ₃
Fe ₂ (SeO ₃) 3:2H ₂ O	-19.05	-39.68	-20.63	Fe ₂ (SeO ₃) 3:2H ₂ O
Fe ₂ (SO ₄) 3	-45.80	-49.53	-3.73	Fe ₂ (SO ₄) 3
Fe ₃ (OH) 8	-4.78	15.44	20.22	Fe ₃ (OH) 8
FeMoO ₄	-7.75	-17.84	-10.09	FeMoO ₄
Ferrihydrite	1.53	4.72	3.19	Fe (OH) 3
Ferroselite	-35.85	-54.45	-18.60	FeSe ₂
FeSe	-24.96	-35.96	-11.00	FeSe
Fluorite	-2.41	-12.91	-10.50	CaF ₂
Gibbsite	0.90	9.19	8.29	Al (OH) 3
Goethite	4.23	4.72	0.49	FeOOH
Gummite	-4.98	2.69	7.67	UO ₃
Gypsum	-3.36	-7.97	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-13.06	-25.16	-12.10	(H ₃ O) Fe ₃ (SO ₄) 2 (OH) 6
H ₂ MoO ₄	-10.97	-23.84	-12.88	H ₂ MoO ₄
H ₂ Se (g)	-37.01	-41.97	-4.96	H ₂ Se
Halite	-10.09	-8.49	1.60	NaCl
Hausmannite	-11.58	49.45	61.03	Mn ₃ O ₄
Hematite	10.85	9.43	-1.42	Fe ₂ O ₃
Hercynite	1.49	24.38	22.89	FeAl ₂ O ₄
Hg (CH ₃) 2 (g)	-172.64	-246.35	-73.71	Hg (CH ₃) 2
Hg (g)	-9.30	-17.17	-7.87	Hg
Hg (OH) 2	-11.78	-15.28	-3.50	Hg (OH) 2
Hg ₂ (g)	-19.38	-34.34	-14.96	Hg ₂
Hg ₂ (OH) 2	-16.11	-10.85	5.26	Hg ₂ (OH) 2
Hg ₂ CO ₃	-16.39	-32.44	-16.05	Hg ₂ CO ₃
Hg ₂ F ₂	-25.09	-35.45	-10.36	Hg ₂ F ₂
Hg ₂ SeO ₃	-22.57	-27.22	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-24.38	-30.51	-6.13	Hg ₂ SO ₄

Hg3O2CO3	-37.73	-67.42	-29.68	Hg3O2CO3
HgCl (g)	-37.09	-17.60	19.50	HgCl
HgCl2	-18.35	-39.61	-21.26	HgCl2
HgF (g)	-50.40	-17.73	32.68	HgF
HgF2 (g)	-52.44	-39.87	12.57	HgF2
Hgmetal (l)	-3.72	-17.17	-13.45	Hg
HgSe	-1.55	-57.25	-55.69	HgSe
HgSeO3	-19.22	-31.65	-12.43	HgSeO3
HgSO4	-25.51	-34.93	-9.42	HgSO4
Huntite	-12.32	-42.29	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-7.82	-26.59	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-23.62	-32.39	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-21.59	-26.76	-5.17	KA1 (SO4) 2 : 12H2O
K-Jarosite	-6.99	-21.79	-14.80	KFe3 (SO4) 2 (OH) 6
K2MoO4	-20.37	-17.11	3.26	K2MoO4
K2SeO4	-21.73	-22.46	-0.73	K2SeO4
Langite	-7.23	10.26	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-8.17	-8.60	-0.43	PbO : PbSO4
Laurionite	-7.26	-6.64	0.62	PbOHCl
Lepidocrocite	3.35	4.72	1.37	FeOOH
Lime	-21.01	11.69	32.70	CaO
Litharge	-7.17	5.53	12.69	PbO
Maghemite	3.05	9.43	6.39	Fe2O3
Magnesioferrite	3.37	20.23	16.86	Fe2MgO4
Magnesite	-3.34	-10.80	-7.46	MgCO3
Magnetite	12.04	15.44	3.40	Fe3O4
Malachite	-1.32	-6.63	-5.31	Cu2 (OH) 2CO3
Manganite	-4.94	20.40	25.34	MnOOH
Massicot	-7.37	5.53	12.89	PbO
Matlockite	-9.97	-18.94	-8.97	PbClF
Melanothallite	-23.12	-16.86	6.26	CuCl2
Melanterite	-11.44	-13.65	-2.21	FeSO4 : 7H2O
Mg (OH) 2 (active)	-8.00	10.79	18.79	Mg (OH) 2
MgF2	-5.68	-13.81	-8.13	MgF2
MgMoO4	-11.20	-13.05	-1.85	MgMoO4
MgSeO3 : 6H2O	-8.63	-5.58	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-17.20	-18.40	-1.20	MgSeO4 : 6H2O
Minium	-33.45	40.07	73.52	Pb3O4
Mirabilite	-11.18	-12.29	-1.11	Na2SO4 : 10H2O
Mn2 (SO4) 3	-63.17	-68.88	-5.71	Mn2 (SO4) 3
MnCl2 : 4H2O	-18.40	-15.69	2.72	MnCl2 : 4H2O
MnSe	-36.82	-33.32	3.50	MnSe
MnSeO3	-8.85	-7.72	1.13	MnSeO3
MnSeO3 : 2H2O	-8.70	-7.72	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-18.49	-20.54	-2.05	MnSeO4 : 5H2O
MnSO4	-13.59	-11.00	2.58	MnSO4
Montroydite	-11.64	-15.28	-3.64	HgO
MoO3	-15.84	-23.84	-8.00	MoO3
Na-Jarosite	-10.28	-21.48	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Mo2O7	-23.73	-40.32	-16.60	Na2Mo2O7
Na2MoO4	-17.97	-16.48	1.49	Na2MoO4
Na2MoO4 : 2H2O	-17.70	-16.48	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-19.31	-9.01	10.30	Na2SeO3 : 5H2O
Na2SeO4	-23.11	-21.83	1.28	Na2SeO4
Nantokite	-7.01	-13.74	-6.73	CuCl
Natron	-12.91	-14.23	-1.31	Na2CO3 : 10H2O
Nesquehonite	-6.13	-10.80	-4.67	MgCO3 : 3H2O
Nsutite	-10.71	6.79	17.50	MnO2
O2 (g)	-36.12	46.97	83.09	O2
Pb (BO2) 2	-13.72	-7.20	6.52	Pb (BO2) 2
Pb (OH) 2	-2.62	5.53	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-65.49	-74.25	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.91	-1.11	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.13	11.06	26.19	Pb2O (OH) 2
Pb2O3	-26.50	34.54	61.04	Pb2O3
Pb2OCO3	-9.97	-10.53	-0.56	Pb2OCO3
Pb3O2CO3	-16.02	-5.00	11.02	Pb3O2CO3
Pb3O2SO4	-13.76	-3.07	10.69	Pb3O2SO4

Pb4(OH)6SO4	-18.65	2.45	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.42	2.45	21.88	Pb4O3SO4
PbF2	-11.63	-19.07	-7.44	PbF2
Pbmetal	-22.21	-17.96	4.25	Pb
PbMoO4	-2.70	-18.32	-15.62	PbMoO4
PbO:0.3H2O	-7.45	5.53	12.98	PbO:0.33H2O
PbSeO4	-16.82	-23.66	-6.84	PbSeO4
Periclase	-10.79	10.79	21.58	MgO
Phosgenite	-15.06	-34.87	-19.81	PbCl2:PbCO3
Plattnerite	-20.59	29.01	49.60	PbO2
Portlandite	-11.12	11.69	22.80	Ca(OH)2
Pyrochroite	-6.54	8.65	15.19	Mn(OH)2
Pyrolusite	-9.24	32.14	41.38	MnO2
Rhodochrosite	-2.36	-12.94	-10.58	MnCO3
Rutherfordine	-4.40	-18.90	-14.50	UO2CO3
Schoepite	-3.30	2.69	5.99	UO2(OH)2:H2O
Semetal(am)	-11.37	-18.48	-7.11	Se
Semetal(hex)	-10.78	-18.48	-7.71	Se
SeO2	-16.49	-16.37	0.12	SeO2
SeO3	-50.24	-29.19	21.04	SeO3
Siderite	-5.34	-15.58	-10.24	FeCO3
Spinel	-7.68	29.17	36.85	MgAl2O4
Tenorite	-0.16	7.48	7.64	CuO
Thenardite	-12.61	-12.29	0.32	Na2SO4
Thermonatrite	-14.86	-14.22	0.64	Na2CO3:H2O
U3O8	-8.85	12.23	21.08	U3O8
U4O9	-19.81	-22.83	-3.02	U4O9
UF4	-31.24	-60.78	-29.54	UF4
UF4:2.5H2O	-28.06	-60.78	-32.72	UF4:2.5H2O
UO2(am)	-12.51	-11.58	0.93	UO2
UO2(OH)2(beta)	-2.92	2.69	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.25	-26.50	-2.25	UO2SeO4:4H2O
UO3	-5.01	2.69	7.70	UO3
Uraninite	-6.91	-11.58	-4.67	UO2
Witherite	-5.29	-13.86	-8.57	BaCO3

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 18.

SOLUTION 16 Average water quality for Water Supply Wells PW-1 and PW-3
(representative of water used to rapidly re-fill pit)

temp 25
pH 8.03
pe 4
redox pe
units mg/l
density 1
Alkalinity 135 as HCO3
As 0.0054
B 0.08
Ba 0.0094
Ca 28
Cl 41 charge
Cr 0.006
F 1.45
Fe 0.053
K 3.35
Mg 2.05
Mn 0.0025
Na 69.5

S(6) 27 as SO4
 Si 19
 U 0.0023
 Zn 0.023
 water 1 # kg

END

 Beginning of initial solution calculations.

Initial solution 16. Average water quality for Water Supply Wells PW-1 and PW-3 (representative of water used to rapidly re-fill pit)

-----Solution composition-----

Elements	Molality	Moles	
Alkalinity	2.213e-03	2.213e-03	
As	7.210e-08	7.210e-08	
B	7.403e-06	7.403e-06	
Ba	6.847e-08	6.847e-08	
Ca	6.989e-04	6.989e-04	
Cl	1.826e-03	1.826e-03	Charge balance
Cr	1.154e-07	1.154e-07	
F	7.635e-05	7.635e-05	
Fe	9.493e-07	9.493e-07	
K	8.571e-05	8.571e-05	
Mg	8.437e-05	8.437e-05	
Mn	4.552e-08	4.552e-08	
Na	3.024e-03	3.024e-03	
S(6)	2.811e-04	2.811e-04	
Si	3.163e-04	3.163e-04	
U	9.666e-09	9.666e-09	
Zn	3.519e-07	3.519e-07	

-----Description of solution-----

pH	=	8.030
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	5.591e-03
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	2.225e-03
Total CO2 (mol/kg)	=	2.225e-03
Temperature (°C)	=	25.00
Electrical balance (eq)	=	7.314e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	11
Total H	=	1.110172e+02
Total O	=	5.551592e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.170e-06	1.079e-06	-5.932	-5.967	-0.035	(0)
H+	1.011e-08	9.333e-09	-7.995	-8.030	-0.035	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
As(3)	4.798e-20					
H3AsO3	4.526e-20	4.526e-20	-19.344	-19.344	0.000	(0)
H2AsO3-	2.716e-21	2.487e-21	-20.566	-20.604	-0.038	(0)
HAsO3-2	3.454e-25	2.431e-25	-24.462	-24.614	-0.153	(0)
H4AsO3+	2.285e-28	2.093e-28	-27.641	-27.679	-0.038	(0)
AsO3-3	2.213e-30	1.004e-30	-29.655	-29.998	-0.343	(0)
As(5)	7.210e-08					
HAsO4-2	6.764e-08	4.760e-08	-7.170	-7.322	-0.153	(0)
H2AsO4-	4.424e-09	4.052e-09	-8.354	-8.392	-0.038	(0)

	AsO4-3	3.555e-11	1.613e-11	-10.449	-10.792	-0.343	(0)
	H3AsO4	6.563e-15	6.571e-15	-14.183	-14.182	0.001	(0)
B	7.403e-06						
	H3BO3	6.919e-06	6.928e-06	-5.160	-5.159	0.001	(0)
	H2BO3-	4.683e-07	4.311e-07	-6.329	-6.365	-0.036	(0)
	CaH2BO3+	1.277e-08	1.176e-08	-7.894	-7.930	-0.036	(0)
	NaH2BO3	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
	MgH2BO3+	9.457e-10	8.706e-10	-9.024	-9.060	-0.036	(0)
	BF(OH) 3-	2.089e-10	1.923e-10	-9.680	-9.716	-0.036	(0)
	H5(BO3) 2-	2.761e-12	2.542e-12	-11.559	-11.595	-0.036	(0)
	BaH2BO3+	7.072e-13	6.510e-13	-12.150	-12.186	-0.036	(0)
	BF2(OH) 2-	1.450e-14	1.335e-14	-13.839	-13.875	-0.036	(0)
	H8(BO3) 3-	1.913e-15	1.761e-15	-14.718	-14.754	-0.036	(0)
	BF3OH-	3.663e-21	3.372e-21	-20.436	-20.472	-0.036	(0)
	BF4-	1.170e-26	1.078e-26	-25.932	-25.968	-0.036	(0)
Ba	6.847e-08						
	Ba+2	6.722e-08	4.887e-08	-7.172	-7.311	-0.139	(0)
	BaHCO3+	9.966e-10	9.232e-10	-9.001	-9.035	-0.033	(0)
	BaCO3	2.491e-10	2.491e-10	-9.604	-9.604	0.000	(0)
	BaH2BO3+	7.072e-13	6.510e-13	-12.150	-12.186	-0.036	(0)
	BaOH+	2.488e-13	2.301e-13	-12.604	-12.638	-0.034	(0)
C(4)	2.225e-03						
	HCO3-	2.138e-03	1.978e-03	-2.670	-2.704	-0.034	(0)
	H2CO3	4.152e-05	4.152e-05	-4.382	-4.382	0.000	(0)
	CaHCO3+	1.885e-05	1.746e-05	-4.725	-4.758	-0.033	(0)
	CO3-2	1.367e-05	9.938e-06	-4.864	-5.003	-0.139	(0)
	CaCO3	7.464e-06	7.464e-06	-5.127	-5.127	0.000	(0)
	NaHCO3	3.099e-06	3.099e-06	-5.509	-5.509	0.000	(0)
	MgHCO3+	1.277e-06	1.179e-06	-5.894	-5.928	-0.035	(0)
	NaCO3-	5.571e-07	5.155e-07	-6.254	-6.288	-0.034	(0)
	MgCO3	4.814e-07	4.814e-07	-6.317	-6.317	0.000	(0)
	ZnCO3	9.125e-08	9.125e-08	-7.040	-7.040	0.000	(0)
	ZnHCO3+	1.090e-08	9.982e-09	-7.963	-8.001	-0.038	(0)
	UO2(CO3) 3-4	5.678e-09	1.393e-09	-8.246	-8.856	-0.610	(0)
	UO2(CO3) 2-2	3.974e-09	2.797e-09	-8.401	-8.553	-0.153	(0)
	MnHCO3+	1.291e-09	1.194e-09	-8.889	-8.923	-0.034	(0)
	BaHCO3+	9.966e-10	9.232e-10	-9.001	-9.035	-0.033	(0)
	BaCO3	2.491e-10	2.491e-10	-9.604	-9.604	0.000	(0)
	FeHCO3+	3.965e-11	3.672e-11	-10.402	-10.435	-0.033	(0)
	UO2CO3	1.411e-11	1.411e-11	-10.851	-10.851	0.000	(0)
Ca	6.989e-04						
	Ca+2	6.520e-04	4.739e-04	-3.186	-3.324	-0.139	(0)
	CaSO4	2.019e-05	2.019e-05	-4.695	-4.695	0.000	(0)
	CaHCO3+	1.885e-05	1.746e-05	-4.725	-4.758	-0.033	(0)
	CaCO3	7.464e-06	7.464e-06	-5.127	-5.127	0.000	(0)
	CaF+	3.891e-07	3.598e-07	-6.410	-6.444	-0.034	(0)
	CaH2BO3+	1.277e-08	1.176e-08	-7.894	-7.930	-0.036	(0)
	CaOH+	1.101e-08	1.020e-08	-7.958	-7.991	-0.033	(0)
Cl	1.826e-03						
	Cl-	1.826e-03	1.686e-03	-2.738	-2.773	-0.035	(0)
	ZnOHC1	9.547e-10	9.547e-10	-9.020	-9.020	0.000	(0)
	ZnCl+	7.322e-10	6.759e-10	-9.135	-9.170	-0.035	(0)
	MnCl+	6.945e-11	6.422e-11	-10.158	-10.192	-0.034	(0)
	ZnCl2	1.807e-12	1.807e-12	-11.743	-11.743	0.000	(0)
	MnCl2	1.530e-13	1.530e-13	-12.815	-12.815	0.000	(0)
	ZnCl3-	2.622e-15	2.420e-15	-14.581	-14.616	-0.035	(0)
	MnCl3-	7.684e-17	7.106e-17	-16.114	-16.148	-0.034	(0)
	CrCl+2	7.456e-17	5.248e-17	-16.127	-16.280	-0.153	(0)
	ZnCl4-2	2.790e-18	2.041e-18	-17.554	-17.690	-0.136	(0)
	CrOHC12	1.815e-18	1.815e-18	-17.741	-17.741	0.000	(0)
	UO2Cl+	1.065e-18	9.752e-19	-17.973	-18.011	-0.038	(0)
	FeCl+2	9.539e-20	6.977e-20	-19.020	-19.156	-0.136	(0)
	CrCl2+	9.168e-21	8.397e-21	-20.038	-20.076	-0.038	(0)
	FeCl2+	5.683e-22	5.255e-22	-21.245	-21.279	-0.034	(0)
	FeCl3	8.863e-26	8.863e-26	-25.052	-25.052	0.000	(0)
	CrO3Cl-	1.548e-26	1.418e-26	-25.810	-25.848	-0.038	(0)
	UCl+3	0.000e+00	0.000e+00	-47.082	-47.425	-0.343	(0)
Cr(2)	8.161e-25						

Cr+2	8.161e-25	5.744e-25	-24.088	-24.241	-0.153	(0)
Cr (3)	1.154e-07					
Cr (OH) 2+	8.132e-08	7.448e-08	-7.090	-7.128	-0.038	(0)
Cr (OH) 3	3.019e-08	3.019e-08	-7.520	-7.520	0.000	(0)
CrO2-	1.677e-09	1.536e-09	-8.775	-8.814	-0.038	(0)
Cr (OH) 4-	1.415e-09	1.296e-09	-8.849	-8.887	-0.038	(0)
Cr (OH) +2	8.063e-10	5.675e-10	-9.094	-9.246	-0.153	(0)
CrOHSO4	2.504e-11	2.504e-11	-10.601	-10.601	0.000	(0)
CrF+2	3.767e-13	2.651e-13	-12.424	-12.577	-0.153	(0)
Cr+3	5.299e-14	2.404e-14	-13.276	-13.619	-0.343	(0)
CrSO4+	1.140e-14	1.044e-14	-13.943	-13.981	-0.038	(0)
CrCl+2	7.456e-17	5.248e-17	-16.127	-16.280	-0.153	(0)
Cr2 (OH) 2SO4+2	1.825e-18	1.285e-18	-17.739	-17.891	-0.153	(0)
CrOHC12	1.815e-18	1.815e-18	-17.741	-17.741	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.419e-20	1.419e-20	-19.848	-19.848	0.000	(0)
CrCl2+	9.168e-21	8.397e-21	-20.038	-20.076	-0.038	(0)
Cr (6)	6.753e-15					
CrO4-2	6.523e-15	4.742e-15	-14.186	-14.324	-0.139	(0)
HCrO4-	1.563e-16	1.432e-16	-15.806	-15.844	-0.038	(0)
NaCrO4-	7.167e-17	6.565e-17	-16.145	-16.183	-0.038	(0)
KCrO4-	1.520e-18	1.392e-18	-17.818	-17.856	-0.038	(0)
H2CrO4	1.083e-24	1.083e-24	-23.965	-23.965	0.000	(0)
CrO3SO4-2	1.076e-25	7.572e-26	-24.968	-25.121	-0.153	(0)
CrO3Cl-	1.548e-26	1.418e-26	-25.810	-25.848	-0.038	(0)
Cr2O7-2	1.010e-30	7.111e-31	-29.996	-30.148	-0.153	(0)
F	7.635e-05					
F-	7.534e-05	6.957e-05	-4.123	-4.158	-0.035	(0)
MgF+	4.920e-07	4.546e-07	-6.308	-6.342	-0.034	(0)
CaF+	3.891e-07	3.598e-07	-6.410	-6.444	-0.034	(0)
NaF	1.223e-07	1.223e-07	-6.913	-6.913	0.000	(0)
HF	9.603e-10	9.603e-10	-9.018	-9.018	0.000	(0)
ZnF+	2.418e-10	2.215e-10	-9.617	-9.655	-0.038	(0)
BF (OH) 3-	2.089e-10	1.923e-10	-9.680	-9.716	-0.036	(0)
MnF+	9.059e-11	8.378e-11	-10.043	-10.077	-0.034	(0)
CrF+2	3.767e-13	2.651e-13	-12.424	-12.577	-0.153	(0)
HF2-	2.754e-13	2.540e-13	-12.560	-12.595	-0.035	(0)
BF2 (OH) 2-	1.450e-14	1.335e-14	-13.839	-13.875	-0.036	(0)
UO2F+	3.738e-15	3.424e-15	-14.427	-14.465	-0.038	(0)
UO2F2	6.870e-16	6.870e-16	-15.163	-15.163	0.000	(0)
FeF2+	2.104e-16	1.945e-16	-15.677	-15.711	-0.034	(0)
FeF+2	1.429e-16	1.045e-16	-15.845	-15.981	-0.136	(0)
FeF3	1.909e-17	1.909e-17	-16.719	-16.719	0.000	(0)
UO2F3-	1.311e-17	1.200e-17	-16.883	-16.921	-0.038	(0)
H2F2	2.471e-18	2.471e-18	-17.607	-17.607	0.000	(0)
UO2F4-2	9.425e-21	6.634e-21	-20.026	-20.178	-0.153	(0)
BF3OH-	3.663e-21	3.372e-21	-20.436	-20.472	-0.036	(0)
BF4-	1.170e-26	1.078e-26	-25.932	-25.968	-0.036	(0)
SiF6-2	5.547e-31	4.057e-31	-30.256	-30.392	-0.136	(0)
UF3+	6.510e-38	5.963e-38	-37.186	-37.225	-0.038	(0)
UF2+2	7.684e-39	5.408e-39	-38.114	-38.267	-0.153	(0)
UF4	4.549e-40	4.549e-40	-39.342	-39.342	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.866	-41.209	-0.343	(0)
UF5-	0.000e+00	0.000e+00	-41.864	-41.902	-0.038	(0)
UF6-2	0.000e+00	0.000e+00	-43.427	-43.579	-0.153	(0)
Fe (2)	2.271e-09					
Fe+2	2.095e-09	1.475e-09	-8.679	-8.831	-0.153	(0)
FeOH+	6.848e-11	6.333e-11	-10.164	-10.198	-0.034	(0)
FeSO4	6.732e-11	6.732e-11	-10.172	-10.172	0.000	(0)
FeHCO3+	3.965e-11	3.672e-11	-10.402	-10.435	-0.033	(0)
Fe (OH) 2	5.427e-14	5.427e-14	-13.265	-13.265	0.000	(0)
Fe (OH) 3-	2.002e-14	1.851e-14	-13.699	-13.733	-0.034	(0)
Fe (3)	9.471e-07					
Fe (OH) 3	4.640e-07	4.640e-07	-6.334	-6.334	0.000	(0)
Fe (OH) 2+	4.327e-07	4.005e-07	-6.364	-6.397	-0.034	(0)
Fe (OH) 4-	5.036e-08	4.660e-08	-7.298	-7.332	-0.034	(0)
FeOH+2	1.305e-12	9.541e-13	-11.885	-12.020	-0.136	(0)
FeF2+	2.104e-16	1.945e-16	-15.677	-15.711	-0.034	(0)
FeF+2	1.429e-16	1.045e-16	-15.845	-15.981	-0.136	(0)

	FeF3	1.909e-17	1.909e-17	-16.719	-16.719	0.000	(0)
	FeSO4+	3.091e-18	2.859e-18	-17.510	-17.544	-0.034	(0)
	Fe+3	2.808e-18	1.370e-18	-17.552	-17.863	-0.312	(0)
	FeCl+2	9.539e-20	6.977e-20	-19.020	-19.156	-0.136	(0)
	Fe (SO4) 2-	1.241e-20	1.137e-20	-19.906	-19.944	-0.038	(0)
	FeCl2+	5.683e-22	5.255e-22	-21.245	-21.279	-0.034	(0)
	Fe2 (OH) 2+4	1.229e-22	3.015e-23	-21.911	-22.521	-0.610	(0)
	FeCl3	8.863e-26	8.863e-26	-25.052	-25.052	0.000	(0)
	Fe3 (OH) 4+5	1.567e-27	1.745e-28	-26.805	-27.758	-0.953	(0)
H (0)	1.232e-27						
	H2	6.158e-28	6.166e-28	-27.211	-27.210	0.001	(0)
K	8.571e-05						
	K+	8.560e-05	7.904e-05	-4.068	-4.102	-0.035	(0)
	KSO4-	1.125e-07	1.041e-07	-6.949	-6.983	-0.034	(0)
	KCrO4-	1.520e-18	1.392e-18	-17.818	-17.856	-0.038	(0)
Mg	8.437e-05						
	Mg+2	8.012e-05	5.824e-05	-4.096	-4.235	-0.139	(0)
	MgSO4	1.971e-06	1.971e-06	-5.705	-5.705	0.000	(0)
	MgHCO3+	1.277e-06	1.179e-06	-5.894	-5.928	-0.035	(0)
	MgF+	4.920e-07	4.546e-07	-6.308	-6.342	-0.034	(0)
	MgCO3	4.814e-07	4.814e-07	-6.317	-6.317	0.000	(0)
	MgOH+	2.698e-08	2.501e-08	-7.569	-7.602	-0.033	(0)
	MgH2BO3+	9.457e-10	8.706e-10	-9.024	-9.060	-0.036	(0)
Mn (2)	4.552e-08						
	Mn+2	4.298e-08	3.025e-08	-7.367	-7.519	-0.153	(0)
	MnHCO3+	1.291e-09	1.194e-09	-8.889	-8.923	-0.034	(0)
	MnSO4	1.000e-09	1.000e-09	-9.000	-9.000	0.000	(0)
	MnF+	9.059e-11	8.378e-11	-10.043	-10.077	-0.034	(0)
	MnOH+	8.864e-11	8.197e-11	-10.052	-10.086	-0.034	(0)
	MnCl+	6.945e-11	6.422e-11	-10.158	-10.192	-0.034	(0)
	MnCl2	1.530e-13	1.530e-13	-12.815	-12.815	0.000	(0)
	MnCl3-	7.684e-17	7.106e-17	-16.114	-16.148	-0.034	(0)
	Mn (OH) 3-	6.375e-19	5.896e-19	-18.196	-18.229	-0.034	(0)
	Mn (OH) 4-2	2.808e-24	2.053e-24	-23.552	-23.688	-0.136	(0)
Mn (3)	2.769e-29						
	Mn+3	2.769e-29	1.351e-29	-28.558	-28.869	-0.312	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-45.566	-45.702	-0.136	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-51.038	-51.074	-0.036	(0)
Na	3.024e-03						
	Na+	3.017e-03	2.786e-03	-2.520	-2.555	-0.035	(0)
	NaHCO3	3.099e-06	3.099e-06	-5.509	-5.509	0.000	(0)
	NaSO4-	3.007e-06	2.783e-06	-5.522	-5.556	-0.034	(0)
	NaCO3-	5.571e-07	5.155e-07	-6.254	-6.288	-0.034	(0)
	NaF	1.223e-07	1.223e-07	-6.913	-6.913	0.000	(0)
	NaH2BO3	1.904e-09	1.904e-09	-8.720	-8.720	0.000	(0)
	NaCrO4-	7.167e-17	6.565e-17	-16.145	-16.183	-0.038	(0)
O (0)	2.662e-38						
	O2	1.331e-38	1.333e-38	-37.876	-37.875	0.001	(0)
S (6)	2.811e-04						
	SO4-2	2.559e-04	1.860e-04	-3.592	-3.731	-0.139	(0)
	CaSO4	2.019e-05	2.019e-05	-4.695	-4.695	0.000	(0)
	NaSO4-	3.007e-06	2.783e-06	-5.522	-5.556	-0.034	(0)
	MgSO4	1.971e-06	1.971e-06	-5.705	-5.705	0.000	(0)
	KSO4-	1.125e-07	1.041e-07	-6.949	-6.983	-0.034	(0)
	ZnSO4	6.493e-09	6.493e-09	-8.188	-8.188	0.000	(0)
	MnSO4	1.000e-09	1.000e-09	-9.000	-9.000	0.000	(0)
	HSO4-	1.836e-10	1.696e-10	-9.736	-9.771	-0.034	(0)
	FeSO4	6.732e-11	6.732e-11	-10.172	-10.172	0.000	(0)
	CrOHSO4	2.504e-11	2.504e-11	-10.601	-10.601	0.000	(0)
	Zn (SO4) 2-2	1.494e-11	1.052e-11	-10.826	-10.978	-0.153	(0)
	CrSO4+	1.140e-14	1.044e-14	-13.943	-13.981	-0.038	(0)
	UO2SO4	1.004e-16	1.004e-16	-15.998	-15.998	0.000	(0)
	FeSO4+	3.091e-18	2.859e-18	-17.510	-17.544	-0.034	(0)
	Cr2 (OH) 2SO4+2	1.825e-18	1.285e-18	-17.739	-17.891	-0.153	(0)
	UO2 (SO4) 2-2	3.497e-19	2.461e-19	-18.456	-18.609	-0.153	(0)
	Cr2 (OH) 2 (SO4) 2	1.419e-20	1.419e-20	-19.848	-19.848	0.000	(0)

	Fe(SO4) 2-	1.241e-20	1.137e-20	-19.906	-19.944	-0.038	(0)
	CrO3SO4-2	1.076e-25	7.572e-26	-24.968	-25.121	-0.153	(0)
	U(SO4) 2	0.000e+00	0.000e+00	-43.313	-43.313	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-43.330	-43.482	-0.153	(0)
Si	3.163e-04						
	H4SiO4	3.111e-04	3.115e-04	-3.507	-3.507	0.001	(0)
	H3SiO4-	5.226e-06	4.825e-06	-5.282	-5.317	-0.035	(0)
	H2SiO4-2	4.448e-11	3.262e-11	-10.352	-10.487	-0.135	(0)
	UO2H3SiO4+	1.594e-13	1.460e-13	-12.797	-12.836	-0.038	(0)
	SiF6-2	5.547e-31	4.057e-31	-30.256	-30.392	-0.136	(0)
U(3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-58.805	-59.148	-0.343	(0)
U(4)	5.203e-20						
	U(OH) 5-	5.201e-20	4.763e-20	-19.284	-19.322	-0.038	(0)
	U(OH) 4	1.862e-23	1.862e-23	-22.730	-22.730	0.000	(0)
	U(OH) 3+	6.937e-28	6.354e-28	-27.159	-27.197	-0.038	(0)
	U(OH) 2+2	3.896e-33	2.742e-33	-32.409	-32.562	-0.153	(0)
	UF3+	6.510e-38	5.963e-38	-37.186	-37.225	-0.038	(0)
	UF2+2	7.684e-39	5.408e-39	-38.114	-38.267	-0.153	(0)
	UOH+3	2.657e-39	1.206e-39	-38.576	-38.919	-0.343	(0)
	UF4	4.549e-40	4.549e-40	-39.342	-39.342	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.866	-41.209	-0.343	(0)
	UF5-	0.000e+00	0.000e+00	-41.864	-41.902	-0.038	(0)
	U(SO4) 2	0.000e+00	0.000e+00	-43.313	-43.313	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-43.330	-43.482	-0.153	(0)
	UF6-2	0.000e+00	0.000e+00	-43.427	-43.579	-0.153	(0)
	U+4	0.000e+00	0.000e+00	-45.742	-46.352	-0.610	(0)
	UCl+3	0.000e+00	0.000e+00	-47.082	-47.425	-0.343	(0)
	U6(OH) 15+9	0.000e+00	0.000e+00	-171.727	-174.816	-3.089	(0)
U(5)	2.373e-17						
	UO2+	2.373e-17	2.173e-17	-16.625	-16.663	-0.038	(0)
U(6)	9.666e-09						
	UO2(CO3) 3-4	5.678e-09	1.393e-09	-8.246	-8.856	-0.610	(0)
	UO2(CO3) 2-2	3.974e-09	2.797e-09	-8.401	-8.553	-0.153	(0)
	UO2CO3	1.411e-11	1.411e-11	-10.851	-10.851	0.000	(0)
	UO2H3SiO4+	1.594e-13	1.460e-13	-12.797	-12.836	-0.038	(0)
	UO2OH+	5.287e-14	4.842e-14	-13.277	-13.315	-0.038	(0)
	UO2F+	3.738e-15	3.424e-15	-14.427	-14.465	-0.038	(0)
	UO2F2	6.870e-16	6.870e-16	-15.163	-15.163	0.000	(0)
	UO2+2	4.905e-16	3.565e-16	-15.309	-15.448	-0.139	(0)
	UO2SO4	1.004e-16	1.004e-16	-15.998	-15.998	0.000	(0)
	UO2F3-	1.311e-17	1.200e-17	-16.883	-16.921	-0.038	(0)
	UO2Cl+	1.065e-18	9.752e-19	-17.973	-18.011	-0.038	(0)
	UO2(SO4) 2-2	3.497e-19	2.461e-19	-18.456	-18.609	-0.153	(0)
	UO2F4-2	9.425e-21	6.634e-21	-20.026	-20.178	-0.153	(0)
	(UO2) 2 (OH) 2+2	5.529e-21	3.891e-21	-20.257	-20.410	-0.153	(0)
	(UO2) 3 (OH) 5+	1.816e-22	1.664e-22	-21.741	-21.779	-0.038	(0)
Zn	3.519e-07						
	Zn+2	2.195e-07	1.596e-07	-6.659	-6.797	-0.139	(0)
	ZnCO3	9.125e-08	9.125e-08	-7.040	-7.040	0.000	(0)
	ZnOH+	1.879e-08	1.721e-08	-7.726	-7.764	-0.038	(0)
	ZnHCO3+	1.090e-08	9.982e-09	-7.963	-8.001	-0.038	(0)
	ZnSO4	6.493e-09	6.493e-09	-8.188	-8.188	0.000	(0)
	Zn(OH) 2	2.943e-09	2.943e-09	-8.531	-8.531	0.000	(0)
	ZnOHCl	9.547e-10	9.547e-10	-9.020	-9.020	0.000	(0)
	ZnCl+	7.322e-10	6.759e-10	-9.135	-9.170	-0.035	(0)
	ZnF+	2.418e-10	2.215e-10	-9.617	-9.655	-0.038	(0)
	Zn(OH) 3-	1.737e-11	1.591e-11	-10.760	-10.798	-0.038	(0)
	Zn(SO4) 2-2	1.494e-11	1.052e-11	-10.826	-10.978	-0.153	(0)
	ZnCl2	1.807e-12	1.807e-12	-11.743	-11.743	0.000	(0)
	ZnCl3-	2.622e-15	2.420e-15	-14.581	-14.616	-0.035	(0)
	Zn(OH) 4-2	9.710e-16	6.834e-16	-15.013	-15.165	-0.153	(0)
	ZnCl4-2	2.790e-18	2.041e-18	-17.554	-17.690	-0.136	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

Anhydrite	-2.69	-7.05	-4.36	CaSO4
Aragonite	-0.03	-8.33	-8.30	CaCO3
Arsenolite	-74.62	-77.38	-2.76	As4O6
Artinite	-7.01	2.59	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-35.07	-28.36	6.71	As2O5
Ba(OH)2:8H2O	-15.65	8.75	24.39	Ba(OH)2:8H2O
Ba3(AsO4)2	6.79	-2.12	-8.91	Ba3(AsO4)2
BaCrO4	-11.97	-21.64	-9.67	BaCrO4
BaF2	-9.81	-15.63	-5.82	BaF2
Barite	-1.06	-11.04	-9.98	BaSO4
Bianchite	-8.76	-10.53	-1.76	ZnSO4:6H2O
Birnessite	-10.84	7.25	18.09	MnO2
Bixbyite	-8.91	-9.56	-0.64	Mn2O3
Brucite	-5.02	11.83	16.84	Mg(OH)2
Ca3(AsO4)2:4H2O	-12.46	9.84	22.30	Ca3(AsO4)2:4H2O
CaCrO4	-15.38	-17.65	-2.27	CaCrO4
Calcite	0.15	-8.33	-8.48	CaCO3
CH4(g)	-76.26	-117.30	-41.05	CH4
Chalcedony	0.04	-3.51	-3.55	SiO2
Chrysotile	-3.74	28.46	32.20	Mg3Si2O5(OH)4
Claudetite	-74.31	-77.38	-3.06	As4O6
CO2(g)	-2.92	-21.06	-18.15	CO2
Cr(OH)2	-19.00	-8.18	10.82	Cr(OH)2
Cr(OH)3	-0.43	0.90	1.34	Cr(OH)3
Cr(OH)3(am)	1.65	0.90	-0.75	Cr(OH)3
Cr2O3	4.16	1.80	-2.36	Cr2O3
CrCl2	-43.88	-29.79	14.09	CrCl2
CrCl3	-46.62	-31.51	15.11	CrCl3
CrF3	-24.32	-35.66	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-62.72	-32.24	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Dolomite(disordered)	-1.02	-17.56	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.47	-17.56	-17.09	CaMg(CO3)2
Epsomite	-5.84	-7.97	-2.13	MgSO4:7H2O
Fe(OH)2	-6.34	7.23	13.56	Fe(OH)2
Fe(OH)2:7Cl.3	6.03	2.99	-3.04	Fe(OH)2:7Cl.3
Fe2(SO4)3	-43.18	-46.92	-3.73	Fe2(SO4)3
Fe3(OH)8	-0.54	19.68	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.36	-7.96	0.40	FeAsO4:2H2O
FeCr2O4	1.83	9.03	7.20	FeCr2O4
Ferrihydrite	3.04	6.23	3.19	Fe(OH)3
Fluorite	-1.14	-11.64	-10.50	CaF2
Goethite	5.74	6.23	0.49	FeOOH
Goslarite	-8.52	-10.53	-2.01	ZnSO4:7H2O
Greenalite	-6.14	14.67	20.81	Fe3Si2O5(OH)4
Gummite	-7.06	0.61	7.67	UO3
Gypsum	-2.44	-7.05	-4.61	CaSO4:2H2O
H-Jarosite	-8.80	-20.90	-12.10	(H3O)Fe3(SO4)2(OH)6
Halite	-6.93	-5.33	1.60	NaCl
Hausmannite	-11.35	49.68	61.03	Mn3O4
Hematite	13.87	12.45	-1.42	Fe2O3
Huntite	-6.07	-36.04	-29.97	CaMg3(CO3)4
Hydromagnesite	-16.36	-25.13	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Jarosite	-2.17	-16.97	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.67	-52.91	-17.24	K2Cr2O7
K2CrO4	-22.02	-22.53	-0.51	K2CrO4
Lepidocrocite	4.86	6.23	1.37	FeOOH
Lime	-19.96	12.74	32.70	CaO
Maghemite	6.07	12.45	6.39	Fe2O3
Magnesioferrite	7.42	24.28	16.86	Fe2MgO4
Magnesite	-1.78	-9.24	-7.46	MgCO3
Magnetite	16.28	19.68	3.40	Fe3O4
Manganite	-4.77	20.57	25.34	MnOOH
Melanterite	-10.35	-12.56	-2.21	FeSO4:7H2O
Mg(OH)2(active)	-6.97	11.83	18.79	Mg(OH)2
MgCr2O4	-2.57	13.63	16.20	MgCr2O4
MgCrO4	-23.94	-18.56	5.38	MgCrO4

MgF2	-4.42	-12.55	-8.13	MgF2
Mirabilite	-7.73	-8.84	-1.11	Na2SO4:10H2O
Mn2(SO4)3	-63.22	-68.93	-5.71	Mn2(SO4)3
Mn3(AsO4)2:8H2O	-15.24	-2.74	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.78	-13.07	2.72	MnCl2:4H2O
MnSO4	-13.83	-11.25	2.58	MnSO4
Na-Jarosite	-4.23	-15.43	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.92	-49.82	-9.90	Na2Cr2O7
Na2CrO4	-22.36	-19.43	2.93	Na2CrO4
Natron	-8.80	-10.11	-1.31	Na2CO3:10H2O
Nesquehonite	-4.57	-9.24	-4.67	MgCO3:3H2O
Nsutite	-10.25	7.25	17.50	MnO2
O2(g)	-34.97	48.12	83.09	O2
Periclase	-9.76	11.83	21.58	MgO
Portlandite	-10.07	12.74	22.80	Ca(OH)2
Pyrochroite	-6.65	8.54	15.19	Mn(OH)2
Pyrolusite	-8.78	32.60	41.38	MnO2
Quartz	0.49	-3.51	-4.00	SiO2
Rhodochrosite	-1.94	-12.52	-10.58	MnCO3
Rutherfordine	-5.95	-20.45	-14.50	UO2CO3
Schoepite	-5.38	0.61	5.99	UO2(OH)2:H2O
Sepiolite	-2.63	13.13	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-5.65	13.13	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-3.59	-13.83	-10.24	FeCO3
SiO2(am-gel)	-0.80	-3.51	-2.71	SiO2
SiO2(am-ppt)	-0.77	-3.51	-2.74	SiO2
Smithsonite	-1.80	-11.80	-10.00	ZnCO3
Thenardite	-9.16	-8.84	0.32	Na2SO4
Thermonatrite	-10.75	-10.11	0.64	Na2CO3:H2O
U3O8	-15.66	5.42	21.08	U3O8
U4O9	-29.85	-32.87	-3.02	U4O9
UF4	-33.45	-62.98	-29.54	UF4
UF4:2.5H2O	-30.26	-62.98	-32.72	UF4:2.5H2O
UO2(am)	-15.17	-14.23	0.93	UO2
UO2(OH)2(beta)	-5.00	0.61	5.61	UO2(OH)2
UO3	-7.09	0.61	7.70	UO3
Uraninite	-9.56	-14.23	-4.67	UO2
Witherite	-3.74	-12.31	-8.57	BaCO3
Zincite	-2.07	9.26	11.33	ZnO
Zincosite	-14.46	-10.53	3.93	ZnSO4
Zn(BO2)2	-9.35	-1.06	8.29	Zn(BO2)2
Zn(OH)2	-2.94	9.26	12.20	Zn(OH)2
Zn(OH)2(am)	-3.21	9.26	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.49	9.26	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.27	9.26	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.47	9.26	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.76	-1.26	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.47	7.72	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.23	-0.58	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.71	-11.79	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-11.14	17.26	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.79	24.71	38.50	Zn5(OH)8Cl2
ZnCl2	-19.39	-12.34	7.05	ZnCl2
ZnCO3:1H2O	-1.54	-11.80	-10.26	ZnCO3:1H2O
ZnF2	-14.58	-15.11	-0.53	ZnF2
Znmetal	-40.59	-14.80	25.79	Zn
ZnO(active)	-1.93	9.26	11.19	ZnO
ZnSO4:1H2O	-9.89	-10.53	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 19.

 SOLUTION 17 Average water quality for Background Surface Water SWQ-1
 (representative of haul road and watershed run-off)

temp 25
 pH 8.3
 pe 4
 redox pe
 units mg/l
 density 1
 Alkalinity 430 as HCO3
 B 0.02
 Ca 109
 Cl 30 charge
 F 0.3
 K 1.8
 Mg 36
 Na 107
 S(6) 261 as SO4
 water 1 # kg

END

 Beginning of initial solution calculations.

Initial solution 17. Average water quality for Background Surface Water SWQ-1
 (representative of haul road and watershed run-off)

-----Solution composition-----

Elements	Molality	Moles	
Alkalinity	7.054e-03	7.054e-03	
B	1.852e-06	1.852e-06	
Ca	2.722e-03	2.722e-03	
Cl	6.061e-04	6.061e-04	Charge balance
F	1.581e-05	1.581e-05	
K	4.608e-05	4.608e-05	
Mg	1.483e-03	1.483e-03	
Na	4.659e-03	4.659e-03	
S(6)	2.720e-03	2.720e-03	

-----Description of solution-----

pH	=	8.300
pe	=	4.000
Activity of water	=	1.000
Ionic strength (mol/kgw)	=	1.709e-02
Mass of water (kg)	=	1.000e+00
Total carbon (mol/kg)	=	6.884e-03
Total CO2 (mol/kg)	=	6.884e-03
Temperature (°C)	=	25.00
Electrical balance (eq)	=	6.072e-18
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	9
Total H	=	1.110204e+02
Total O	=	5.553837e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.295e-06	2.008e-06	-5.639	-5.697	-0.058	(0)
H+	5.706e-09	5.012e-09	-8.244	-8.300	-0.056	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
B	1.852e-06					
H3BO3	1.614e-06	1.620e-06	-5.792	-5.790	0.002	(0)

	H2BO3-	2.157e-07	1.878e-07	-6.666	-6.726	-0.060	(0)
	CaH2BO3+	1.553e-08	1.352e-08	-7.809	-7.869	-0.060	(0)
	MgH2BO3+	5.475e-09	4.766e-09	-8.262	-8.322	-0.060	(0)
	NaH2BO3	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
	BF(OH) 3-	9.392e-12	8.176e-12	-11.027	-11.087	-0.060	(0)
	H5(BO3) 2-	2.975e-13	2.590e-13	-12.527	-12.587	-0.060	(0)
	BF2(OH) 2-	6.365e-17	5.541e-17	-16.196	-16.256	-0.060	(0)
	H8(BO3) 3-	4.820e-17	4.196e-17	-16.317	-16.377	-0.060	(0)
	BF3OH-	1.570e-24	1.367e-24	-23.804	-23.864	-0.060	(0)
	BF4-	4.896e-31	4.263e-31	-30.310	-30.370	-0.060	(0)
C (4)	6.884e-03						
	HCO3-	6.382e-03	5.634e-03	-2.195	-2.249	-0.054	(0)
	CaHCO3+	1.483e-04	1.313e-04	-3.829	-3.882	-0.053	(0)
	CaCO3	1.045e-04	1.045e-04	-3.981	-3.981	0.000	(0)
	CO3-2	8.856e-05	5.270e-05	-4.053	-4.278	-0.225	(0)
	H2CO3	6.351e-05	6.351e-05	-4.197	-4.197	0.000	(0)
	MgHCO3+	4.811e-05	4.221e-05	-4.318	-4.375	-0.057	(0)
	MgCO3	3.209e-05	3.209e-05	-4.494	-4.494	0.000	(0)
	NaHCO3	1.283e-05	1.283e-05	-4.892	-4.892	0.000	(0)
	NaCO3-	4.501e-06	3.974e-06	-5.347	-5.401	-0.054	(0)
Ca	2.722e-03						
	Ca+2	2.102e-03	1.251e-03	-2.677	-2.903	-0.225	(0)
	CaSO4	3.668e-04	3.668e-04	-3.436	-3.436	0.000	(0)
	CaHCO3+	1.483e-04	1.313e-04	-3.829	-3.882	-0.053	(0)
	CaCO3	1.045e-04	1.045e-04	-3.981	-3.981	0.000	(0)
	CaF+	1.959e-07	1.727e-07	-6.708	-6.763	-0.055	(0)
	CaOH+	5.665e-08	5.014e-08	-7.247	-7.300	-0.053	(0)
	CaH2BO3+	1.553e-08	1.352e-08	-7.809	-7.869	-0.060	(0)
Cl	6.061e-04						
	Cl-	6.061e-04	5.323e-04	-3.217	-3.274	-0.056	(0)
F	1.581e-05						
	F-	1.440e-05	1.264e-05	-4.842	-4.898	-0.056	(0)
	MgF+	1.181e-06	1.039e-06	-5.928	-5.984	-0.056	(0)
	CaF+	1.959e-07	1.727e-07	-6.708	-6.763	-0.055	(0)
	NaF	3.230e-08	3.230e-08	-7.491	-7.491	0.000	(0)
	HF	9.374e-11	9.374e-11	-10.028	-10.028	0.000	(0)
	BF(OH) 3-	9.392e-12	8.176e-12	-11.027	-11.087	-0.060	(0)
	HF2-	5.150e-15	4.506e-15	-14.288	-14.346	-0.058	(0)
	BF2(OH) 2-	6.365e-17	5.541e-17	-16.196	-16.256	-0.060	(0)
	H2F2	2.354e-20	2.354e-20	-19.628	-19.628	0.000	(0)
	BF3OH-	1.570e-24	1.367e-24	-23.804	-23.864	-0.060	(0)
	BF4-	4.896e-31	4.263e-31	-30.310	-30.370	-0.060	(0)
H (0)	3.543e-28						
	H2	1.771e-28	1.778e-28	-27.752	-27.750	0.002	(0)
K	4.608e-05						
	K+	4.567e-05	4.011e-05	-4.340	-4.397	-0.056	(0)
	KSO4-	4.116e-07	3.634e-07	-6.385	-6.440	-0.054	(0)
Mg	1.483e-03						
	Mg+2	1.230e-03	7.320e-04	-2.910	-3.135	-0.225	(0)
	MgSO4	1.705e-04	1.705e-04	-3.768	-3.768	0.000	(0)
	MgHCO3+	4.811e-05	4.221e-05	-4.318	-4.375	-0.057	(0)
	MgCO3	3.209e-05	3.209e-05	-4.494	-4.494	0.000	(0)
	MgF+	1.181e-06	1.039e-06	-5.928	-5.984	-0.056	(0)
	MgOH+	6.600e-07	5.853e-07	-6.180	-6.233	-0.052	(0)
	MgH2BO3+	5.475e-09	4.766e-09	-8.262	-8.322	-0.060	(0)
Na	4.659e-03						
	Na+	4.610e-03	4.049e-03	-2.336	-2.393	-0.056	(0)
	NaSO4-	3.152e-05	2.783e-05	-4.501	-4.556	-0.054	(0)
	NaHCO3	1.283e-05	1.283e-05	-4.892	-4.892	0.000	(0)
	NaCO3-	4.501e-06	3.974e-06	-5.347	-5.401	-0.054	(0)
	NaF	3.230e-08	3.230e-08	-7.491	-7.491	0.000	(0)
	NaH2BO3	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
O (0)	3.191e-37						
	O2	1.596e-37	1.602e-37	-36.797	-36.795	0.002	(0)
S (6)	2.720e-03						
	SO4-2	2.150e-03	1.280e-03	-2.667	-2.893	-0.225	(0)
	CaSO4	3.668e-04	3.668e-04	-3.436	-3.436	0.000	(0)
	MgSO4	1.705e-04	1.705e-04	-3.768	-3.768	0.000	(0)

NaSO4-	3.152e-05	2.783e-05	-4.501	-4.556	-0.054	(0)
KSO4-	4.116e-07	3.634e-07	-6.385	-6.440	-0.054	(0)
HSO4-	7.128e-10	6.268e-10	-9.147	-9.203	-0.056	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
Anhydrite	-1.44	-5.80	-4.36		CaSO4
Aragonite	1.12	-7.18	-8.30		CaCO3
Artinite	-3.55	6.05	9.60		MgCO3:Mg(OH)2:3H2O
Brucite	-3.38	13.46	16.84		Mg(OH)2
Calcite	1.30	-7.18	-8.48		CaCO3
CH4(g)	-78.23	-119.28	-41.05		CH4
CO2(g)	-2.73	-20.88	-18.15		CO2
Dolomite(disordered)	1.95	-14.59	-16.54		CaMg(CO3)2
Dolomite(ordered)	2.50	-14.59	-17.09		CaMg(CO3)2
Epsomite	-3.90	-6.03	-2.13		MgSO4:7H2O
Fluorite	-2.20	-12.70	-10.50		CaF2
Gypsum	-1.19	-5.80	-4.61		CaSO4:2H2O
Halite	-7.27	-5.67	1.60		NaCl
Huntite	0.55	-29.42	-29.97		CaMg3(CO3)4
Hydromagnesite	-7.42	-16.19	-8.77		Mg5(CO3)4(OH)2:4H2O
Lime	-19.00	13.70	32.70		CaO
Magnesite	0.05	-7.41	-7.46		MgCO3
Mg(OH)2(active)	-5.33	13.46	18.79		Mg(OH)2
MgF2	-4.80	-12.93	-8.13		MgF2
Mirabilite	-6.57	-7.68	-1.11		Na2SO4:10H2O
Natron	-7.75	-9.06	-1.31		Na2CO3:10H2O
Nesquehonite	-2.74	-7.41	-4.67		MgCO3:3H2O
O2(g)	-33.89	49.20	83.09		O2
Periclase	-8.12	13.46	21.58		MgO
Portlandite	-9.11	13.70	22.80		Ca(OH)2
Thenardite	-8.00	-7.68	0.32		Na2SO4
Thermonatrite	-9.70	-9.06	0.64		Na2CO3:H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 20.

WARNING: Unknown input, no keyword has been specified.

Title Stage 1 Groundwater mix

MIX 101

2	1
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0.350634
11	2.834068
12	2.067624
13	4.849646
14	0
15	0

Save solution 101

end

TITLE

Stage 1 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 101.

Mixture 101.

1.000e+00 Solution 2 JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)

0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)

0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)

3.506e-01 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)

2.834e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

2.068e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)

4.850e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)

0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)

0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	7.521e-09	8.350e-08
Al	5.307e-07	5.892e-06
As	4.031e-09	4.476e-08
B	1.551e-06	1.722e-05
Ba	1.607e-07	1.784e-06
C	1.293e-03	1.436e-02
Ca	6.103e-04	6.775e-03
Cd	1.205e-09	1.338e-08
Cl	1.656e-04	1.839e-03
Co	1.224e-08	1.359e-07
Cr	1.144e-08	1.270e-07
Cu	1.174e-06	1.304e-05
F	4.944e-05	5.489e-04
Fe	2.412e-06	2.678e-05
Hg	2.664e-11	2.958e-10
K	8.656e-05	9.610e-04
Mg	1.890e-04	2.098e-03
Mn	2.537e-06	2.816e-05

Mo	6.449e-08	7.160e-07
Na	4.833e-04	5.366e-03
Ni	1.920e-08	2.131e-07
Pb	2.815e-09	3.125e-08
S	4.175e-04	4.635e-03
Sb	1.380e-09	1.532e-08
Se	5.215e-09	5.790e-08
U	1.023e-08	1.136e-07
V	1.376e-08	1.528e-07
Zn	1.269e-07	1.409e-06

-----Description of solution-----

	pH	=	7.148	Charge balance
	pe	=	4.817	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	3.219e-03	
	Mass of water (kg)	=	1.110e+01	
	Total alkalinity (eq/kg)	=	1.130e-03	
	Total CO2 (mol/kg)	=	1.293e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	5.236e-18	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	10	
	Total H	=	1.232487e+03	
	Total O	=	6.162971e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.506e-07	1.415e-07	-6.822	-6.849	-0.027	(0)
H+	7.572e-08	7.117e-08	-7.121	-7.148	-0.027	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	7.521e-09					
Ag+	5.501e-09	5.171e-09	-8.260	-8.286	-0.027	(0)
AgCl	1.643e-09	1.643e-09	-8.784	-8.784	0.000	(0)
Ag2Se	1.599e-10	1.599e-10	-9.796	-9.796	0.000	(0)
AgSO4-	3.260e-11	3.050e-11	-10.487	-10.516	-0.029	(0)
AgCl2-	2.382e-11	2.228e-11	-10.623	-10.652	-0.029	(0)
AgF	5.910e-13	5.910e-13	-12.228	-12.228	0.000	(0)
AgOH	7.315e-14	7.315e-14	-13.136	-13.136	0.000	(0)
AgCl3-2	4.036e-15	3.092e-15	-14.394	-14.510	-0.116	(0)
AgH2BO3	1.029e-15	1.029e-15	-14.988	-14.988	0.000	(0)
AgSeO3-	8.795e-16	8.228e-16	-15.056	-15.085	-0.029	(0)
AgCl4-3	1.790e-18	9.827e-19	-17.747	-18.008	-0.260	(0)
Ag (OH) 2-	1.081e-18	1.011e-18	-17.966	-17.995	-0.029	(0)
Ag (SeO3) 2-3	3.323e-24	1.824e-24	-23.479	-23.739	-0.260	(0)
Ag2MoO4	5.089e-25	5.089e-25	-24.293	-24.293	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.206	-67.206	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.453	-77.916	-0.463	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-135.812	-135.840	-0.029	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.086	-136.176	-0.090	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.284	-138.469	-0.185	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.600	-138.780	-0.180	(0)
Al	5.307e-07					
Al (OH) 4-	4.871e-07	4.581e-07	-6.312	-6.339	-0.027	(0)
Al (OH) 3	2.572e-08	2.572e-08	-7.590	-7.590	0.000	(0)
Al (OH) 2+	9.681e-09	9.112e-09	-8.014	-8.040	-0.026	(0)
AlF2+	5.019e-09	4.725e-09	-8.299	-8.326	-0.026	(0)
AlF3	2.706e-09	2.706e-09	-8.568	-8.568	0.000	(0)
AlF+2	3.323e-10	2.608e-10	-9.478	-9.584	-0.105	(0)
AlOH+2	1.033e-10	8.109e-11	-9.986	-10.091	-0.105	(0)
AlF4-	6.563e-11	6.172e-11	-10.183	-10.210	-0.027	(0)
AlSO4+	1.399e-12	1.316e-12	-11.854	-11.881	-0.027	(0)
Al+3	1.001e-12	5.732e-13	-12.000	-12.242	-0.242	(0)

Al (SO4) 2-	4.432e-15	4.168e-15	-14.353	-14.380	-0.027	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.666	-43.927	-0.260	(0)
As (3)	1.518e-19					
H3AsO3	1.506e-19	1.506e-19	-18.822	-18.822	0.000	(0)
H2AsO3-	1.160e-21	1.085e-21	-20.936	-20.964	-0.029	(0)
HAsO3-2	1.815e-26	1.391e-26	-25.741	-25.857	-0.116	(0)
H4AsO3+	5.677e-27	5.311e-27	-26.246	-26.275	-0.029	(0)
AsO3-3	1.372e-32	7.532e-33	-31.863	-32.123	-0.260	(0)
As (5)	4.031e-09					
HAsO4-2	2.632e-09	2.016e-09	-8.580	-8.695	-0.116	(0)
H2AsO4-	1.399e-09	1.309e-09	-8.854	-8.883	-0.029	(0)
AsO4-3	1.632e-13	8.958e-14	-12.787	-13.048	-0.260	(0)
H3AsO4	1.618e-14	1.619e-14	-13.791	-13.791	0.000	(0)
B	1.551e-06					
H3BO3	1.537e-06	1.538e-06	-5.813	-5.813	0.000	(0)
H2BO3-	1.338e-08	1.255e-08	-7.874	-7.901	-0.028	(0)
CaH2BO3+	3.426e-10	3.215e-10	-9.465	-9.493	-0.028	(0)
MgH2BO3+	6.481e-11	6.081e-11	-10.188	-10.216	-0.028	(0)
BF (OH) 3-	2.977e-11	2.793e-11	-10.526	-10.554	-0.028	(0)
NaH2BO3	9.019e-12	9.019e-12	-11.045	-11.045	0.000	(0)
BaH2BO3+	5.141e-14	4.824e-14	-13.289	-13.317	-0.028	(0)
H5 (BO3) 2-	1.752e-14	1.644e-14	-13.757	-13.784	-0.028	(0)
BF2 (OH) 2-	1.031e-14	9.670e-15	-13.987	-14.015	-0.028	(0)
AgH2BO3	1.029e-15	1.029e-15	-14.988	-14.988	0.000	(0)
H8 (BO3) 3-	2.695e-18	2.528e-18	-17.570	-17.597	-0.028	(0)
BF3OH-	1.299e-20	1.218e-20	-19.887	-19.914	-0.028	(0)
BF4-	2.069e-25	1.942e-25	-24.684	-24.712	-0.028	(0)
Ba	1.607e-07					
Ba+2	1.593e-07	1.244e-07	-6.798	-6.905	-0.108	(0)
BaHCO3+	1.320e-09	1.243e-09	-8.879	-8.905	-0.026	(0)
BaCO3	4.398e-11	4.398e-11	-10.357	-10.357	0.000	(0)
BaOH+	8.163e-14	7.680e-14	-13.088	-13.115	-0.026	(0)
BaH2BO3+	5.141e-14	4.824e-14	-13.289	-13.317	-0.028	(0)
C (4)	1.293e-03					
HCO3-	1.112e-03	1.047e-03	-2.954	-2.980	-0.026	(0)
H2CO3	1.676e-04	1.676e-04	-3.776	-3.776	0.000	(0)
CaHCO3+	9.212e-06	8.676e-06	-5.036	-5.062	-0.026	(0)
MgHCO3+	1.592e-06	1.497e-06	-5.798	-5.825	-0.027	(0)
CO3-2	8.833e-07	6.895e-07	-6.054	-6.161	-0.108	(0)
CuCO3	7.956e-07	7.956e-07	-6.099	-6.099	0.000	(0)
CaCO3	4.864e-07	4.864e-07	-6.313	-6.313	0.000	(0)
NaHCO3	2.669e-07	2.669e-07	-6.574	-6.574	0.000	(0)
MgCO3	8.013e-08	8.013e-08	-7.096	-7.096	0.000	(0)
MnHCO3+	4.073e-08	3.832e-08	-7.390	-7.417	-0.026	(0)
CuHCO3+	1.383e-08	1.294e-08	-7.859	-7.888	-0.029	(0)
UO2 (CO3) 2-2	9.031e-09	6.918e-09	-8.044	-8.160	-0.116	(0)
NaCO3-	6.184e-09	5.820e-09	-8.209	-8.235	-0.026	(0)
ZnCO3	3.503e-09	3.503e-09	-8.456	-8.456	0.000	(0)
ZnHCO3+	3.124e-09	2.922e-09	-8.505	-8.534	-0.029	(0)
Cu (CO3) 2-2	1.927e-09	1.476e-09	-8.715	-8.831	-0.116	(0)
NiHCO3+	1.757e-09	1.644e-09	-8.755	-8.784	-0.029	(0)
BaHCO3+	1.320e-09	1.243e-09	-8.879	-8.905	-0.026	(0)
PbCO3	1.234e-09	1.234e-09	-8.909	-8.909	0.000	(0)
FeHCO3+	8.728e-10	8.220e-10	-9.059	-9.085	-0.026	(0)
CoHCO3+	7.254e-10	6.786e-10	-9.139	-9.168	-0.029	(0)
UO2 (CO3) 3-4	6.943e-10	2.391e-10	-9.158	-9.621	-0.463	(0)
UO2CO3	5.029e-10	5.029e-10	-9.299	-9.299	0.000	(0)
PbHCO3+	4.951e-10	4.632e-10	-9.305	-9.334	-0.029	(0)
NiCO3	3.277e-10	3.277e-10	-9.485	-9.485	0.000	(0)
CoCO3	9.714e-11	9.714e-11	-10.013	-10.013	0.000	(0)
BaCO3	4.398e-11	4.398e-11	-10.357	-10.357	0.000	(0)
CdCO3	1.365e-11	1.365e-11	-10.865	-10.865	0.000	(0)
Pb (CO3) 2-2	3.204e-12	2.455e-12	-11.494	-11.610	-0.116	(0)
CdHCO3+	2.213e-12	2.070e-12	-11.655	-11.684	-0.029	(0)
Cd (CO3) 2-2	9.109e-15	6.978e-15	-14.041	-14.156	-0.116	(0)
HgCO3	1.025e-17	1.025e-17	-16.989	-16.989	0.000	(0)
Hg (CO3) 2-2	2.919e-20	2.236e-20	-19.535	-19.651	-0.116	(0)
HgHCO3+	1.453e-20	1.359e-20	-19.838	-19.867	-0.029	(0)

Ca	6.103e-04					
Ca+2	5.702e-04	4.451e-04	-3.244	-3.352	-0.108	(0)
CaSO4	3.015e-05	3.015e-05	-4.521	-4.521	0.000	(0)
CaHCO3+	9.212e-06	8.676e-06	-5.036	-5.062	-0.026	(0)
CaCO3	4.864e-07	4.864e-07	-6.313	-6.313	0.000	(0)
CaF+	2.349e-07	2.210e-07	-6.629	-6.656	-0.026	(0)
CaOH+	1.334e-09	1.256e-09	-8.875	-8.901	-0.026	(0)
CaH2BO3+	3.426e-10	3.215e-10	-9.465	-9.493	-0.028	(0)
Cd	1.205e-09					
Cd+2	1.113e-09	8.687e-10	-8.954	-9.061	-0.108	(0)
CdSO4	6.021e-11	6.021e-11	-10.220	-10.220	0.000	(0)
CdCl+	1.381e-11	1.292e-11	-10.860	-10.889	-0.029	(0)
CdCO3	1.365e-11	1.365e-11	-10.865	-10.865	0.000	(0)
CdHCO3+	2.213e-12	2.070e-12	-11.655	-11.684	-0.029	(0)
CdOH+	1.043e-12	9.762e-13	-11.982	-12.010	-0.029	(0)
CdF+	6.696e-13	6.265e-13	-12.174	-12.203	-0.029	(0)
Cd(SO4) 2-2	3.135e-13	2.401e-13	-12.504	-12.620	-0.116	(0)
CdOHC1	7.495e-14	7.495e-14	-13.125	-13.125	0.000	(0)
Cd(CO3) 2-2	9.109e-15	6.978e-15	-14.041	-14.156	-0.116	(0)
CdCl2	8.382e-15	8.382e-15	-14.077	-14.077	0.000	(0)
Cd(OH) 2	8.713e-16	8.713e-16	-15.060	-15.060	0.000	(0)
CdF2	5.688e-17	5.688e-17	-16.245	-16.245	0.000	(0)
CdCl3-	8.800e-19	8.233e-19	-18.056	-18.084	-0.029	(0)
Cd(OH) 3-	8.050e-21	7.531e-21	-20.094	-20.123	-0.029	(0)
Cd2OH+3	7.742e-21	4.250e-21	-20.111	-20.372	-0.260	(0)
CdSeO4	4.207e-21	4.207e-21	-20.376	-20.376	0.000	(0)
Cd(SeO3) 2-2	5.730e-23	4.389e-23	-22.242	-22.358	-0.116	(0)
Cd(OH) 4-2	2.276e-28	1.744e-28	-27.643	-27.759	-0.116	(0)
CdHS+	0.000e+00	0.000e+00	-73.758	-73.787	-0.029	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-139.318	-139.318	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-210.123	-210.152	-0.029	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-280.574	-280.690	-0.116	(0)
Cl	1.656e-04					
Cl-	1.656e-04	1.557e-04	-3.781	-3.808	-0.027	(0)
AgCl	1.643e-09	1.643e-09	-8.784	-8.784	0.000	(0)
MnCl+	3.822e-10	3.596e-10	-9.418	-9.444	-0.026	(0)
CuCl	2.867e-10	2.867e-10	-9.543	-9.543	0.000	(0)
CuCl+	5.144e-11	4.835e-11	-10.289	-10.316	-0.027	(0)
ZnCl+	3.673e-11	3.452e-11	-10.435	-10.462	-0.027	(0)
AgCl2-	2.382e-11	2.228e-11	-10.623	-10.652	-0.029	(0)
CdCl+	1.381e-11	1.292e-11	-10.860	-10.889	-0.029	(0)
CuCl2-	9.920e-12	9.324e-12	-11.003	-11.030	-0.027	(0)
ZnOHC1	6.394e-12	6.394e-12	-11.194	-11.194	0.000	(0)
NiCl+	5.423e-12	5.074e-12	-11.266	-11.295	-0.029	(0)
CoCl+	4.798e-12	4.488e-12	-11.319	-11.348	-0.029	(0)
PbCl+	3.516e-12	3.290e-12	-11.454	-11.483	-0.029	(0)
MnCl2	7.907e-14	7.907e-14	-13.102	-13.102	0.000	(0)
CdOHC1	7.495e-14	7.495e-14	-13.125	-13.125	0.000	(0)
ZnCl2	8.518e-15	8.518e-15	-14.070	-14.070	0.000	(0)
CdCl2	8.382e-15	8.382e-15	-14.077	-14.077	0.000	(0)
AgCl3-2	4.036e-15	3.092e-15	-14.394	-14.510	-0.116	(0)
CuCl2	2.610e-15	2.610e-15	-14.583	-14.583	0.000	(0)
PbCl2	2.288e-15	2.288e-15	-14.641	-14.641	0.000	(0)
HgClOH	4.834e-16	4.834e-16	-15.316	-15.316	0.000	(0)
CuCl3-2	3.960e-16	3.103e-16	-15.402	-15.508	-0.106	(0)
UO2Cl+	4.944e-17	4.625e-17	-16.306	-16.335	-0.029	(0)
CrCl+2	4.696e-17	3.598e-17	-16.328	-16.444	-0.116	(0)
HgCl2	3.012e-17	3.012e-17	-16.521	-16.521	0.000	(0)
NiCl2	3.977e-18	3.977e-18	-17.400	-17.400	0.000	(0)
MnCl3-	3.603e-18	3.390e-18	-17.443	-17.470	-0.026	(0)
FeCl+2	2.281e-18	1.788e-18	-17.642	-17.748	-0.106	(0)
AgCl4-3	1.790e-18	9.827e-19	-17.747	-18.008	-0.260	(0)
ZnCl3-	1.121e-18	1.053e-18	-17.951	-17.977	-0.027	(0)
CdCl3-	8.800e-19	8.233e-19	-18.056	-18.084	-0.029	(0)
PbCl3-	1.515e-19	1.418e-19	-18.819	-18.848	-0.029	(0)
HgCl3-	5.012e-20	4.689e-20	-19.300	-19.329	-0.029	(0)
HgCl+	4.126e-20	3.860e-20	-19.384	-19.413	-0.029	(0)
CrOHC12	1.506e-20	1.506e-20	-19.822	-19.822	0.000	(0)

CuCl3-	4.034e-21	3.792e-21	-20.394	-20.421	-0.027	(0)
VOC1+	3.593e-21	3.362e-21	-20.444	-20.473	-0.029	(0)
FeCl2+	1.321e-21	1.243e-21	-20.879	-20.906	-0.026	(0)
CrCl2+	5.680e-22	5.314e-22	-21.246	-21.275	-0.029	(0)
ZnCl4-2	1.046e-22	8.200e-23	-21.980	-22.086	-0.106	(0)
HgCl4-2	3.793e-23	2.906e-23	-22.421	-22.537	-0.116	(0)
PbCl4-2	1.317e-23	1.009e-23	-22.880	-22.996	-0.116	(0)
FeCl3	1.935e-26	1.935e-26	-25.713	-25.713	0.000	(0)
CuCl4-2	3.775e-27	2.958e-27	-26.423	-26.529	-0.106	(0)
CrO3Cl-	1.492e-29	1.396e-29	-28.826	-28.855	-0.029	(0)
CoCl+2	9.002e-38	6.896e-38	-37.046	-37.161	-0.116	(0)
UCl+3	0.000e+00	0.000e+00	-43.593	-43.854	-0.260	(0)
Co (2)	1.224e-08					
Co+2	1.088e-08	8.334e-09	-7.963	-8.079	-0.116	(0)
CoHCO3+	7.254e-10	6.786e-10	-9.139	-9.168	-0.029	(0)
CoSO4	4.917e-10	4.917e-10	-9.308	-9.308	0.000	(0)
CoCO3	9.714e-11	9.714e-11	-10.013	-10.013	0.000	(0)
CoOH+	2.515e-11	2.352e-11	-10.600	-10.628	-0.029	(0)
CoF+	1.282e-11	1.199e-11	-10.892	-10.921	-0.029	(0)
CoCl+	4.798e-12	4.488e-12	-11.319	-11.348	-0.029	(0)
Co (OH) 2	2.643e-13	2.643e-13	-12.578	-12.578	0.000	(0)
Co (OH) 3-	7.976e-19	7.461e-19	-18.098	-18.127	-0.029	(0)
CoOOH-	2.001e-19	1.872e-19	-18.699	-18.728	-0.029	(0)
CoSeO4	1.086e-19	1.086e-19	-18.964	-18.964	0.000	(0)
Co2OH+3	1.790e-20	9.826e-21	-19.747	-20.008	-0.260	(0)
Co (OH) 4-2	2.184e-26	1.673e-26	-25.661	-25.777	-0.116	(0)
Co4 (OH) 4+4	1.774e-34	6.110e-35	-33.751	-34.214	-0.463	(0)
Co (3)	2.043e-30					
CoOH+2	2.043e-30	1.565e-30	-29.690	-29.805	-0.116	(0)
Co+3	3.801e-36	2.177e-36	-35.420	-35.662	-0.242	(0)
CoCl+2	9.002e-38	6.896e-38	-37.046	-37.161	-0.116	(0)
Cr (2)	8.486e-25					
Cr+2	8.486e-25	6.501e-25	-24.071	-24.187	-0.116	(0)
Cr (3)	1.144e-08					
Cr (OH) 2+	1.017e-08	9.512e-09	-7.993	-8.022	-0.029	(0)
Cr (OH) +2	7.214e-10	5.526e-10	-9.142	-9.258	-0.116	(0)
Cr (OH) 3	5.055e-10	5.055e-10	-9.296	-9.296	0.000	(0)
CrOHSO4	3.877e-11	3.877e-11	-10.411	-10.411	0.000	(0)
CrO2-	3.606e-12	3.373e-12	-11.443	-11.472	-0.029	(0)
Cr (OH) 4-	3.043e-12	2.847e-12	-11.517	-11.546	-0.029	(0)
CrF+2	1.681e-12	1.288e-12	-11.774	-11.890	-0.116	(0)
Cr+3	3.252e-13	1.786e-13	-12.488	-12.748	-0.260	(0)
CrSO4+	1.318e-13	1.233e-13	-12.880	-12.909	-0.029	(0)
CrCl+2	4.696e-17	3.598e-17	-16.328	-16.444	-0.116	(0)
Cr2 (OH) 2SO4+2	2.528e-18	1.937e-18	-17.597	-17.713	-0.116	(0)
Cr2 (OH) 2 (SO4) 2	3.401e-20	3.401e-20	-19.468	-19.468	0.000	(0)
CrOHC12	1.506e-20	1.506e-20	-19.822	-19.822	0.000	(0)
CrCl2+	5.680e-22	5.314e-22	-21.246	-21.275	-0.029	(0)
Cr (6)	1.330e-18					
CrO4-2	1.114e-18	8.696e-19	-17.953	-18.061	-0.108	(0)
HCrO4-	2.141e-19	2.003e-19	-18.669	-18.698	-0.029	(0)
NaCrO4-	2.094e-21	1.959e-21	-20.679	-20.708	-0.029	(0)
KCrO4-	2.804e-22	2.623e-22	-21.552	-21.581	-0.029	(0)
H2CrO4	1.155e-26	1.155e-26	-25.937	-25.937	0.000	(0)
CrO3SO4-2	1.676e-27	1.284e-27	-26.776	-26.892	-0.116	(0)
CrO3Cl-	1.492e-29	1.396e-29	-28.826	-28.855	-0.029	(0)
Cr2O7-2	1.816e-36	1.391e-36	-35.741	-35.857	-0.116	(0)
Cu (1)	1.860e-09					
Cu+	1.563e-09	1.463e-09	-8.806	-8.835	-0.029	(0)
CuCl	2.867e-10	2.867e-10	-9.543	-9.543	0.000	(0)
CuCl2-	9.920e-12	9.324e-12	-11.003	-11.030	-0.027	(0)
CuCl3-2	3.960e-16	3.103e-16	-15.402	-15.508	-0.106	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.436	-136.618	-0.182	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.170	-137.348	-0.178	(0)
Cu (2)	1.173e-06					
CuCO3	7.956e-07	7.956e-07	-6.099	-6.099	0.000	(0)
Cu+2	2.510e-07	1.960e-07	-6.600	-6.708	-0.108	(0)
CuOH+	9.327e-08	8.766e-08	-7.030	-7.057	-0.027	(0)

	CuHCO3+	1.383e-08	1.294e-08	-7.859	-7.888	-0.029	(0)
	CuSO4	1.327e-08	1.327e-08	-7.877	-7.877	0.000	(0)
	Cu (OH) 2	2.474e-09	2.474e-09	-8.607	-8.607	0.000	(0)
	Cu (CO3) 2-2	1.927e-09	1.476e-09	-8.715	-8.831	-0.116	(0)
	CuF+	6.013e-10	5.626e-10	-9.221	-9.250	-0.029	(0)
	Cu2 (OH) 2+2	2.520e-10	1.930e-10	-9.599	-9.714	-0.116	(0)
	CuCl+	5.144e-11	4.835e-11	-10.289	-10.316	-0.027	(0)
	Cu (OH) 3-	7.674e-13	7.180e-13	-12.115	-12.144	-0.029	(0)
	CuCl2	2.610e-15	2.610e-15	-14.583	-14.583	0.000	(0)
	Cu (OH) 4-2	1.044e-18	7.994e-19	-17.981	-18.097	-0.116	(0)
	CuCl3-	4.034e-21	3.792e-21	-20.394	-20.421	-0.027	(0)
	CuCl4-2	3.775e-27	2.958e-27	-26.423	-26.529	-0.106	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-198.983	-199.012	-0.029	(0)
F		4.944e-05					
	F-	4.841e-05	4.550e-05	-4.315	-4.342	-0.027	(0)
	MgF+	7.586e-07	7.133e-07	-6.120	-6.147	-0.027	(0)
	CaF+	2.349e-07	2.210e-07	-6.629	-6.656	-0.026	(0)
	NaF	1.302e-08	1.302e-08	-7.886	-7.886	0.000	(0)
	AlF2+	5.019e-09	4.725e-09	-8.299	-8.326	-0.026	(0)
	HF	4.790e-09	4.790e-09	-8.320	-8.320	0.000	(0)
	MnF+	3.532e-09	3.324e-09	-8.452	-8.478	-0.026	(0)
	AlF3	2.706e-09	2.706e-09	-8.568	-8.568	0.000	(0)
	CuF+	6.013e-10	5.626e-10	-9.221	-9.250	-0.029	(0)
	AlF+2	3.323e-10	2.608e-10	-9.478	-9.584	-0.105	(0)
	ZnF+	8.568e-11	8.015e-11	-10.067	-10.096	-0.029	(0)
	AlF4-	6.563e-11	6.172e-11	-10.183	-10.210	-0.027	(0)
	BF (OH) 3-	2.977e-11	2.793e-11	-10.526	-10.554	-0.028	(0)
	NiF+	1.556e-11	1.456e-11	-10.808	-10.837	-0.029	(0)
	CoF+	1.282e-11	1.199e-11	-10.892	-10.921	-0.029	(0)
	PbF+	2.041e-12	1.910e-12	-11.690	-11.719	-0.029	(0)
	CrF+2	1.681e-12	1.288e-12	-11.774	-11.890	-0.116	(0)
	UO2F+	1.230e-12	1.151e-12	-11.910	-11.939	-0.029	(0)
	HF2-	8.821e-13	8.286e-13	-12.054	-12.082	-0.027	(0)
	CdF+	6.696e-13	6.265e-13	-12.174	-12.203	-0.029	(0)
	AgF	5.910e-13	5.910e-13	-12.228	-12.228	0.000	(0)
	UO2F2	1.510e-13	1.510e-13	-12.821	-12.821	0.000	(0)
	FeF2+	2.455e-14	2.310e-14	-13.610	-13.636	-0.026	(0)
	FeF+2	2.421e-14	1.897e-14	-13.616	-13.722	-0.106	(0)
	BF2 (OH) 2-	1.031e-14	9.670e-15	-13.987	-14.015	-0.028	(0)
	UO2F3-	1.845e-15	1.726e-15	-14.734	-14.763	-0.029	(0)
	PbF2	1.710e-15	1.710e-15	-14.767	-14.767	0.000	(0)
	FeF3	1.483e-15	1.483e-15	-14.829	-14.829	0.000	(0)
	VO2F	9.947e-17	9.947e-17	-16.002	-16.002	0.000	(0)
	H2F2	6.147e-17	6.147e-17	-16.211	-16.211	0.000	(0)
	CdF2	5.688e-17	5.688e-17	-16.245	-16.245	0.000	(0)
	VOF+	2.245e-18	2.101e-18	-17.649	-17.678	-0.029	(0)
	VO2F2-	1.757e-18	1.643e-18	-17.755	-17.784	-0.029	(0)
	UO2F4-2	8.143e-19	6.238e-19	-18.089	-18.205	-0.116	(0)
	PbF3-	1.577e-19	1.476e-19	-18.802	-18.831	-0.029	(0)
	VOF2	3.584e-20	3.584e-20	-19.446	-19.446	0.000	(0)
	BF3OH-	1.299e-20	1.218e-20	-19.887	-19.914	-0.028	(0)
	VO2F3-2	1.218e-21	9.327e-22	-20.914	-21.030	-0.116	(0)
	VOF3-	6.185e-23	5.786e-23	-22.209	-22.238	-0.029	(0)
	PbF4-2	4.195e-24	3.214e-24	-23.377	-23.493	-0.116	(0)
	Sb (OH) 2F	1.305e-24	1.305e-24	-23.885	-23.885	0.000	(0)
	SbOF	1.283e-24	1.283e-24	-23.892	-23.892	0.000	(0)
	BF4-	2.069e-25	1.942e-25	-24.684	-24.712	-0.028	(0)
	VO2F4-3	3.804e-26	2.088e-26	-25.420	-25.680	-0.260	(0)
	HgF+	2.241e-26	2.096e-26	-25.650	-25.679	-0.029	(0)
	VOF4-2	1.387e-26	1.063e-26	-25.858	-25.974	-0.116	(0)
	UF3+	7.199e-34	6.735e-34	-33.143	-33.172	-0.029	(0)
	UF2+2	1.219e-34	9.339e-35	-33.914	-34.030	-0.116	(0)
	UF4	3.360e-36	3.360e-36	-35.474	-35.474	0.000	(0)
	UF+3	2.970e-37	1.630e-37	-36.527	-36.788	-0.260	(0)
	UF5-	6.476e-39	6.058e-39	-38.189	-38.218	-0.029	(0)
	UF6-2	1.087e-40	0.000e+00	-39.964	-40.080	-0.116	(0)
Fe (2)		8.720e-08					
	Fe+2	8.143e-08	6.238e-08	-7.089	-7.205	-0.116	(0)

FeSO4	4.527e-09	4.527e-09	-8.344	-8.344	0.000	(0)
FeHCO3+	8.728e-10	8.220e-10	-9.059	-9.085	-0.026	(0)
FeOH+	3.734e-10	3.513e-10	-9.428	-9.454	-0.026	(0)
Fe (OH) 2	3.948e-14	3.948e-14	-13.404	-13.404	0.000	(0)
Fe (OH) 3-	1.877e-15	1.766e-15	-14.727	-14.753	-0.026	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-143.723	-143.723	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-214.392	-214.421	-0.029	(0)
Fe (3)	2.325e-06					
Fe (OH) 2+	2.031e-06	1.911e-06	-5.692	-5.719	-0.026	(0)
Fe (OH) 3	2.904e-07	2.904e-07	-6.537	-6.537	0.000	(0)
Fe (OH) 4-	4.064e-09	3.825e-09	-8.391	-8.417	-0.026	(0)
FeOH+2	4.432e-11	3.473e-11	-10.353	-10.459	-0.106	(0)
FeF2+	2.455e-14	2.310e-14	-13.610	-13.636	-0.026	(0)
FeF+2	2.421e-14	1.897e-14	-13.616	-13.722	-0.106	(0)
FeF3	1.483e-15	1.483e-15	-14.829	-14.829	0.000	(0)
FeSO4+	1.341e-15	1.261e-15	-14.873	-14.899	-0.026	(0)
Fe+3	6.638e-16	3.802e-16	-15.178	-15.420	-0.242	(0)
Fe (SO4) 2-	8.523e-18	7.973e-18	-17.069	-17.098	-0.029	(0)
FeCl+2	2.281e-18	1.788e-18	-17.642	-17.748	-0.106	(0)
Fe2 (OH) 2+4	1.160e-19	3.994e-20	-18.936	-19.399	-0.463	(0)
FeHSeO3+2	5.806e-21	4.448e-21	-20.236	-20.352	-0.116	(0)
FeCl2+	1.321e-21	1.243e-21	-20.879	-20.906	-0.026	(0)
Fe3 (OH) 4+5	5.837e-24	1.103e-24	-23.234	-23.957	-0.723	(0)
FeCl3	1.935e-26	1.935e-26	-25.713	-25.713	0.000	(0)
H (0)	1.665e-27					
H2	8.324e-28	8.330e-28	-27.080	-27.079	0.000	(0)
Hg (0)	2.664e-11					
Hg	2.664e-11	2.664e-11	-10.574	-10.574	0.000	(0)
Hg (1)	5.869e-25					
Hg2+2	2.934e-25	2.248e-25	-24.532	-24.648	-0.116	(0)
Hg (2)	2.092e-15					
Hg (OH) 2	1.568e-15	1.569e-15	-14.805	-14.804	0.000	(0)
HgClOH	4.834e-16	4.834e-16	-15.316	-15.316	0.000	(0)
HgCl2	3.012e-17	3.012e-17	-16.521	-16.521	0.000	(0)
HgCO3	1.025e-17	1.025e-17	-16.989	-16.989	0.000	(0)
HgOH+	7.481e-20	6.999e-20	-19.126	-19.155	-0.029	(0)
HgCl3-	5.012e-20	4.689e-20	-19.300	-19.329	-0.029	(0)
HgCl+	4.126e-20	3.860e-20	-19.384	-19.413	-0.029	(0)
Hg (CO3) 2-2	2.919e-20	2.236e-20	-19.535	-19.651	-0.116	(0)
HgHCO3+	1.453e-20	1.359e-20	-19.838	-19.867	-0.029	(0)
HgCl4-2	3.793e-23	2.906e-23	-22.421	-22.537	-0.116	(0)
Hg (OH) 3-	2.987e-23	2.795e-23	-22.525	-22.554	-0.029	(0)
Hg+2	1.622e-23	1.243e-23	-22.790	-22.906	-0.116	(0)
HgSO4	9.620e-25	9.620e-25	-24.017	-24.017	0.000	(0)
HgF+	2.241e-26	2.096e-26	-25.650	-25.679	-0.029	(0)
HgHS2-	0.000e+00	0.000e+00	-129.270	-129.298	-0.029	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.052	-130.052	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-130.743	-130.859	-0.116	(0)
K	8.656e-05					
K+	8.638e-05	8.120e-05	-4.064	-4.090	-0.027	(0)
KSO4-	1.806e-07	1.700e-07	-6.743	-6.770	-0.026	(0)
KCrO4-	2.804e-22	2.623e-22	-21.552	-21.581	-0.029	(0)
Mg	1.890e-04					
Mg+2	1.790e-04	1.397e-04	-3.747	-3.855	-0.108	(0)
MgSO4	7.517e-06	7.517e-06	-5.124	-5.124	0.000	(0)
MgHCO3+	1.592e-06	1.497e-06	-5.798	-5.825	-0.027	(0)
MgF+	7.586e-07	7.133e-07	-6.120	-6.147	-0.027	(0)
MgCO3	8.013e-08	8.013e-08	-7.096	-7.096	0.000	(0)
MgOH+	8.351e-09	7.869e-09	-8.078	-8.104	-0.026	(0)
MgH2BO3+	6.481e-11	6.081e-11	-10.188	-10.216	-0.028	(0)
Mn (2)	2.537e-06					
Mn+2	2.395e-06	1.835e-06	-5.621	-5.736	-0.116	(0)
MnSO4	9.647e-08	9.647e-08	-7.016	-7.016	0.000	(0)
MnHCO3+	4.073e-08	3.832e-08	-7.390	-7.417	-0.026	(0)
MnF+	3.532e-09	3.324e-09	-8.452	-8.478	-0.026	(0)
MnOH+	6.930e-10	6.520e-10	-9.159	-9.186	-0.026	(0)
MnCl+	3.822e-10	3.596e-10	-9.418	-9.444	-0.026	(0)
MnCl2	7.907e-14	7.907e-14	-13.102	-13.102	0.000	(0)

MnSeO4	1.284e-17	1.284e-17	-16.891	-16.891	0.000	(0)
MnCl3-	3.603e-18	3.390e-18	-17.443	-17.470	-0.026	(0)
Mn (OH) 3-	8.571e-20	8.064e-20	-19.067	-19.093	-0.026	(0)
Mn (OH) 4-2	4.700e-26	3.683e-26	-25.328	-25.434	-0.106	(0)
MnSe	5.550e-40	5.550e-40	-39.256	-39.256	0.000	(0)
Mn (3)	9.389e-27					
Mn+3	9.389e-27	5.378e-27	-26.027	-26.269	-0.242	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.603	-47.709	-0.106	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-52.237	-52.264	-0.027	(0)
Mo	6.449e-08					
MoO4-2	6.441e-08	5.028e-08	-7.191	-7.299	-0.108	(0)
HMoO4-	7.612e-11	7.121e-11	-10.119	-10.147	-0.029	(0)
H2MoO4	3.712e-14	3.712e-14	-13.430	-13.430	0.000	(0)
Ag2MoO4	5.089e-25	5.089e-25	-24.293	-24.293	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.666	-43.927	-0.260	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.240	-55.281	-1.042	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.319	-56.042	-0.723	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-57.945	-58.408	-0.463	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.049	-62.309	-0.260	(0)
Na	4.833e-04					
Na+	4.823e-04	4.533e-04	-3.317	-3.344	-0.027	(0)
NaSO4-	7.647e-07	7.198e-07	-6.116	-6.143	-0.026	(0)
NaHCO3	2.669e-07	2.669e-07	-6.574	-6.574	0.000	(0)
NaF	1.302e-08	1.302e-08	-7.886	-7.886	0.000	(0)
NaCO3-	6.184e-09	5.820e-09	-8.209	-8.235	-0.026	(0)
NaH2BO3	9.019e-12	9.019e-12	-11.045	-11.045	0.000	(0)
NaCrO4-	2.094e-21	1.959e-21	-20.679	-20.708	-0.029	(0)
Ni	1.920e-08					
Ni+2	1.632e-08	1.274e-08	-7.787	-7.895	-0.108	(0)
NiHCO3+	1.757e-09	1.644e-09	-8.755	-8.784	-0.029	(0)
NiSO4	7.514e-10	7.514e-10	-9.124	-9.124	0.000	(0)
NiCO3	3.277e-10	3.277e-10	-9.485	-9.485	0.000	(0)
NiOH+	2.425e-11	2.269e-11	-10.615	-10.644	-0.029	(0)
NiF+	1.556e-11	1.456e-11	-10.808	-10.837	-0.029	(0)
NiCl+	5.423e-12	5.074e-12	-11.266	-11.295	-0.029	(0)
Ni (OH) 2	2.549e-13	2.549e-13	-12.594	-12.594	0.000	(0)
Ni (SO4) 2-2	9.604e-15	7.357e-15	-14.018	-14.133	-0.116	(0)
Ni (OH) 3-	3.855e-17	3.606e-17	-16.414	-16.443	-0.029	(0)
NiCl2	3.977e-18	3.977e-18	-17.400	-17.400	0.000	(0)
NiSeO4	1.550e-19	1.550e-19	-18.810	-18.810	0.000	(0)
O (0)	1.460e-38					
O2	7.299e-39	7.305e-39	-38.137	-38.136	0.000	(0)
Pb	2.815e-09					
PbCO3	1.234e-09	1.234e-09	-8.909	-8.909	0.000	(0)
Pb+2	7.629e-10	5.956e-10	-9.118	-9.225	-0.108	(0)
PbHCO3+	4.951e-10	4.632e-10	-9.305	-9.334	-0.029	(0)
PbOH+	2.262e-10	2.116e-10	-9.645	-9.674	-0.029	(0)
PbSO4	8.624e-11	8.624e-11	-10.064	-10.064	0.000	(0)
PbCl+	3.516e-12	3.290e-12	-11.454	-11.483	-0.029	(0)
Pb (CO3) 2-2	3.204e-12	2.455e-12	-11.494	-11.610	-0.116	(0)
PbF+	2.041e-12	1.910e-12	-11.690	-11.719	-0.029	(0)
Pb (OH) 2	9.467e-13	9.467e-13	-12.024	-12.024	0.000	(0)
Pb (SO4) 2-2	2.006e-13	1.536e-13	-12.698	-12.813	-0.116	(0)
PbCl2	2.288e-15	2.288e-15	-14.641	-14.641	0.000	(0)
PbF2	1.710e-15	1.710e-15	-14.767	-14.767	0.000	(0)
Pb (OH) 3-	1.432e-16	1.339e-16	-15.844	-15.873	-0.029	(0)
Pb2OH+3	3.639e-18	1.998e-18	-17.439	-17.700	-0.260	(0)
PbF3-	1.577e-19	1.476e-19	-18.802	-18.831	-0.029	(0)
PbCl3-	1.515e-19	1.418e-19	-18.819	-18.848	-0.029	(0)
Pb (OH) 4-2	6.057e-21	4.640e-21	-20.218	-20.333	-0.116	(0)
Pb3 (OH) 4+2	1.390e-23	1.065e-23	-22.857	-22.973	-0.116	(0)
PbCl4-2	1.317e-23	1.009e-23	-22.880	-22.996	-0.116	(0)
PbF4-2	4.195e-24	3.214e-24	-23.377	-23.493	-0.116	(0)
Pb4 (OH) 4+4	1.463e-28	5.038e-29	-27.835	-28.298	-0.463	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.424	-139.424	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-210.829	-210.858	-0.029	(0)

S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.206	-67.206	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.705	-72.734	-0.029	(0)
H2S	0.000e+00	0.000e+00	-72.862	-72.862	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.758	-73.787	-0.029	(0)
S5-2	0.000e+00	0.000e+00	-74.836	-74.952	-0.116	(0)
S6-2	0.000e+00	0.000e+00	-75.352	-75.468	-0.116	(0)
S4-2	0.000e+00	0.000e+00	-75.432	-75.547	-0.116	(0)
S3-2	0.000e+00	0.000e+00	-76.238	-76.353	-0.116	(0)
S2-2	0.000e+00	0.000e+00	-77.254	-77.369	-0.116	(0)
S-2	0.000e+00	0.000e+00	-82.781	-82.887	-0.106	(0)
HgHS2-	0.000e+00	0.000e+00	-129.270	-129.298	-0.029	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.052	-130.052	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-130.743	-130.859	-0.116	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-135.812	-135.840	-0.029	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.086	-136.176	-0.090	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.436	-136.618	-0.182	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.170	-137.348	-0.178	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.284	-138.469	-0.185	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.536	-138.565	-0.029	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.600	-138.780	-0.180	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.318	-139.318	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.424	-139.424	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-139.703	-139.703	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-143.723	-143.723	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-198.983	-199.012	-0.029	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.128	-209.157	-0.029	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.123	-210.152	-0.029	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-210.829	-210.858	-0.029	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-211.873	-211.989	-0.116	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-214.392	-214.421	-0.029	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-280.574	-280.690	-0.116	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-283.235	-283.351	-0.116	(0)
Sb2S4-2	0.000e+00	0.000e+00	-292.905	-293.021	-0.116	(0)
S (6)	4.175e-04					
SO4-2	3.788e-04	2.957e-04	-3.422	-3.529	-0.108	(0)
CaSO4	3.015e-05	3.015e-05	-4.521	-4.521	0.000	(0)
MgSO4	7.517e-06	7.517e-06	-5.124	-5.124	0.000	(0)
NaSO4-	7.647e-07	7.198e-07	-6.116	-6.143	-0.026	(0)
KSO4-	1.806e-07	1.700e-07	-6.743	-6.770	-0.026	(0)
MnSO4	9.647e-08	9.647e-08	-7.016	-7.016	0.000	(0)
CuSO4	1.327e-08	1.327e-08	-7.877	-7.877	0.000	(0)
ZnSO4	5.711e-09	5.711e-09	-8.243	-8.243	0.000	(0)
FeSO4	4.527e-09	4.527e-09	-8.344	-8.344	0.000	(0)
HSO4-	2.187e-09	2.056e-09	-8.660	-8.687	-0.027	(0)
NiSO4	7.514e-10	7.514e-10	-9.124	-9.124	0.000	(0)
CoSO4	4.917e-10	4.917e-10	-9.308	-9.308	0.000	(0)
PbSO4	8.624e-11	8.624e-11	-10.064	-10.064	0.000	(0)
CdSO4	6.021e-11	6.021e-11	-10.220	-10.220	0.000	(0)
CrOHSO4	3.877e-11	3.877e-11	-10.411	-10.411	0.000	(0)
AgSO4-	3.260e-11	3.050e-11	-10.487	-10.516	-0.029	(0)
Zn (SO4) 2-2	1.920e-11	1.471e-11	-10.717	-10.833	-0.116	(0)
AlSO4+	1.399e-12	1.316e-12	-11.854	-11.881	-0.027	(0)
Cd (SO4) 2-2	3.135e-13	2.401e-13	-12.504	-12.620	-0.116	(0)
Pb (SO4) 2-2	2.006e-13	1.536e-13	-12.698	-12.813	-0.116	(0)
CrSO4+	1.318e-13	1.233e-13	-12.880	-12.909	-0.029	(0)
UO2SO4	8.198e-14	8.198e-14	-13.086	-13.086	0.000	(0)
Ni (SO4) 2-2	9.604e-15	7.357e-15	-14.018	-14.133	-0.116	(0)
Al (SO4) 2-	4.432e-15	4.168e-15	-14.353	-14.380	-0.027	(0)
FeSO4+	1.341e-15	1.261e-15	-14.873	-14.899	-0.026	(0)
UO2 (SO4) 2-2	4.171e-16	3.195e-16	-15.380	-15.495	-0.116	(0)
VO2SO4-	9.406e-18	8.800e-18	-17.027	-17.056	-0.029	(0)
Fe (SO4) 2-	8.523e-18	7.973e-18	-17.069	-17.098	-0.029	(0)
Cr2 (OH) 2SO4+2	2.528e-18	1.937e-18	-17.597	-17.713	-0.116	(0)
VOSO4	6.268e-19	6.268e-19	-18.203	-18.203	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.401e-20	3.401e-20	-19.468	-19.468	0.000	(0)
HgSO4	9.620e-25	9.620e-25	-24.017	-24.017	0.000	(0)
CrO3SO4-2	1.676e-27	1.284e-27	-26.776	-26.892	-0.116	(0)

VSO4+	4.403e-32	4.119e-32	-31.356	-31.385	-0.029	(0)
U(SO4) 2	4.964e-39	4.964e-39	-38.304	-38.304	0.000	(0)
USO4+2	2.759e-39	2.114e-39	-38.559	-38.675	-0.116	(0)
Sb (3)	5.096e-19					
Sb(OH) 3	2.579e-19	2.579e-19	-18.589	-18.589	0.000	(0)
HSbO2	2.517e-19	2.517e-19	-18.599	-18.599	0.000	(0)
SbO2-	6.123e-24	5.728e-24	-23.213	-23.242	-0.029	(0)
Sb(OH) 4-	3.508e-24	3.282e-24	-23.455	-23.484	-0.029	(0)
Sb(OH) 2F	1.305e-24	1.305e-24	-23.885	-23.885	0.000	(0)
SbOF	1.283e-24	1.283e-24	-23.892	-23.892	0.000	(0)
Sb(OH) 2+	4.764e-25	4.457e-25	-24.322	-24.351	-0.029	(0)
SbO+	1.643e-25	1.537e-25	-24.784	-24.813	-0.029	(0)
Sb2S4-2	0.000e+00	0.000e+00	-292.905	-293.021	-0.116	(0)
Sb (5)	1.380e-09					
SbO3-	1.378e-09	1.289e-09	-8.861	-8.890	-0.029	(0)
Sb(OH) 6-	1.604e-12	1.508e-12	-11.795	-11.822	-0.027	(0)
SbO2+	2.002e-24	1.873e-24	-23.698	-23.727	-0.029	(0)
Se (-2)	1.599e-10					
Ag2Se	1.599e-10	1.599e-10	-9.796	-9.796	0.000	(0)
HSe-	5.585e-36	5.225e-36	-35.253	-35.282	-0.029	(0)
H2Se	2.886e-39	2.886e-39	-38.540	-38.540	0.000	(0)
MnSe	5.550e-40	5.550e-40	-39.256	-39.256	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.019	-43.134	-0.116	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.453	-77.916	-0.463	(0)
Se (4)	5.055e-09					
HSeO3-	4.732e-09	4.427e-09	-8.325	-8.354	-0.029	(0)
SeO3-2	3.232e-10	2.476e-10	-9.490	-9.606	-0.116	(0)
H2SeO3	1.344e-13	1.344e-13	-12.872	-12.872	0.000	(0)
AgSeO3-	8.795e-16	8.228e-16	-15.056	-15.085	-0.029	(0)
FeHSeO3+2	5.806e-21	4.448e-21	-20.236	-20.352	-0.116	(0)
Cd(SeO3) 2-2	5.730e-23	4.389e-23	-22.242	-22.358	-0.116	(0)
Ag(SeO3) 2-3	3.323e-24	1.824e-24	-23.479	-23.739	-0.260	(0)
Se (6)	3.333e-14					
SeO4-2	3.332e-14	2.601e-14	-13.477	-13.585	-0.108	(0)
MnSeO4	1.284e-17	1.284e-17	-16.891	-16.891	0.000	(0)
ZnSeO4	3.556e-19	3.556e-19	-18.449	-18.449	0.000	(0)
NiSeO4	1.550e-19	1.550e-19	-18.810	-18.810	0.000	(0)
CoSeO4	1.086e-19	1.086e-19	-18.964	-18.964	0.000	(0)
HSeO4-	9.917e-20	9.277e-20	-19.004	-19.033	-0.029	(0)
CdSeO4	4.207e-21	4.207e-21	-20.376	-20.376	0.000	(0)
Zn(SeO4) 2-2	1.224e-32	9.378e-33	-31.912	-32.028	-0.116	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.098	-55.359	-0.260	(0)
U (4)	7.992e-20					
U(OH) 5-	7.970e-20	7.456e-20	-19.099	-19.127	-0.029	(0)
U(OH) 4	2.223e-22	2.223e-22	-21.653	-21.653	0.000	(0)
U(OH) 3+	6.182e-26	5.784e-26	-25.209	-25.238	-0.029	(0)
U(OH) 2+2	2.485e-30	1.904e-30	-29.605	-29.720	-0.116	(0)
UF3+	7.199e-34	6.735e-34	-33.143	-33.172	-0.029	(0)
UF2+2	1.219e-34	9.339e-35	-33.914	-34.030	-0.116	(0)
UOH+3	1.162e-35	6.381e-36	-34.935	-35.195	-0.260	(0)
UF4	3.360e-36	3.360e-36	-35.474	-35.474	0.000	(0)
UF+3	2.970e-37	1.630e-37	-36.527	-36.788	-0.260	(0)
UF5-	6.476e-39	6.058e-39	-38.189	-38.218	-0.029	(0)
U(SO4) 2	4.964e-39	4.964e-39	-38.304	-38.304	0.000	(0)
USO4+2	2.759e-39	2.114e-39	-38.559	-38.675	-0.116	(0)
UF6-2	1.087e-40	0.000e+00	-39.964	-40.080	-0.116	(0)
U+4	0.000e+00	0.000e+00	-41.283	-41.746	-0.463	(0)
UCl+3	0.000e+00	0.000e+00	-43.593	-43.854	-0.260	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-158.071	-160.415	-2.344	(0)
U (5)	1.819e-15					
UO2+	1.819e-15	1.702e-15	-14.740	-14.769	-0.029	(0)
U (6)	1.023e-08					
UO2(CO3) 2-2	9.031e-09	6.918e-09	-8.044	-8.160	-0.116	(0)
UO2(CO3) 3-4	6.943e-10	2.391e-10	-9.158	-9.621	-0.463	(0)
UO2CO3	5.029e-10	5.029e-10	-9.299	-9.299	0.000	(0)
UO2OH+	3.488e-12	3.263e-12	-11.457	-11.486	-0.029	(0)
UO2F+	1.230e-12	1.151e-12	-11.910	-11.939	-0.029	(0)

UO2+2	2.347e-13	1.832e-13	-12.630	-12.737	-0.108	(0)
UO2F2	1.510e-13	1.510e-13	-12.821	-12.821	0.000	(0)
UO2SO4	8.198e-14	8.198e-14	-13.086	-13.086	0.000	(0)
UO2F3-	1.845e-15	1.726e-15	-14.734	-14.763	-0.029	(0)
UO2 (SO4) 2-2	4.171e-16	3.195e-16	-15.380	-15.495	-0.116	(0)
UO2Cl+	4.944e-17	4.625e-17	-16.306	-16.335	-0.029	(0)
(UO2) 2 (OH) 2+2	2.306e-17	1.767e-17	-16.637	-16.753	-0.116	(0)
(UO2) 3 (OH) 5+	9.354e-19	8.751e-19	-18.029	-18.058	-0.029	(0)
UO2F4-2	8.143e-19	6.238e-19	-18.089	-18.205	-0.116	(0)
V (2)	1.366e-39					
VOH+	1.078e-39	1.008e-39	-38.967	-38.996	-0.029	(0)
V+2	2.876e-40	2.203e-40	-39.541	-39.657	-0.116	(0)
V (3)	6.740e-13					
V (OH) 3	6.740e-13	6.740e-13	-12.171	-12.171	0.000	(0)
V (OH) 2+	3.313e-23	3.100e-23	-22.480	-22.509	-0.029	(0)
VOH+2	2.732e-26	2.092e-26	-25.564	-25.679	-0.116	(0)
V+3	5.376e-31	2.951e-31	-30.270	-30.530	-0.260	(0)
VSO4+	4.403e-32	4.119e-32	-31.356	-31.385	-0.029	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.476	-49.736	-0.260	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.096	-50.559	-0.463	(0)
V (4)	2.452e-16					
V (OH) 3+	2.322e-16	2.173e-16	-15.634	-15.663	-0.029	(0)
VO+2	1.005e-17	7.697e-18	-16.998	-17.114	-0.116	(0)
VOF+	2.245e-18	2.101e-18	-17.649	-17.678	-0.029	(0)
VOSO4	6.268e-19	6.268e-19	-18.203	-18.203	0.000	(0)
VOF2	3.584e-20	3.584e-20	-19.446	-19.446	0.000	(0)
VOC1+	3.593e-21	3.362e-21	-20.444	-20.473	-0.029	(0)
VOF3-	6.185e-23	5.786e-23	-22.209	-22.238	-0.029	(0)
VOF4-2	1.387e-26	1.063e-26	-25.858	-25.974	-0.116	(0)
H2V2O4+2	3.089e-27	2.366e-27	-26.510	-26.626	-0.116	(0)
V (5)	1.376e-08					
H2VO4-	1.318e-08	1.233e-08	-7.880	-7.909	-0.029	(0)
HVO4-2	5.681e-10	4.352e-10	-9.246	-9.361	-0.116	(0)
H3VO4	8.776e-12	8.776e-12	-11.057	-11.057	0.000	(0)
H3V2O7-	7.469e-13	6.988e-13	-12.127	-12.156	-0.029	(0)
HV2O7-3	3.312e-15	1.818e-15	-14.480	-14.740	-0.260	(0)
VO2+	1.326e-15	1.246e-15	-14.877	-14.904	-0.027	(0)
VO2F	9.947e-17	9.947e-17	-16.002	-16.002	0.000	(0)
VO4-3	5.582e-17	3.064e-17	-16.253	-16.514	-0.260	(0)
VO2SO4-	9.406e-18	8.800e-18	-17.027	-17.056	-0.029	(0)
V3O9-3	3.577e-18	1.964e-18	-17.447	-17.707	-0.260	(0)
V2O7-4	1.997e-18	6.876e-19	-17.700	-18.163	-0.463	(0)
VO2F2-	1.757e-18	1.643e-18	-17.755	-17.784	-0.029	(0)
VO2F3-2	1.218e-21	9.327e-22	-20.914	-21.030	-0.116	(0)
V4O12-4	2.931e-23	1.009e-23	-22.533	-22.996	-0.463	(0)
VO2F4-3	3.804e-26	2.088e-26	-25.420	-25.680	-0.260	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.012	-57.736	-0.723	(0)
V10O28-6	0.000e+00	0.000e+00	-57.733	-58.775	-1.042	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.213	-59.676	-0.463	(0)
Zn	1.269e-07					
Zn+2	1.131e-07	8.829e-08	-6.947	-7.054	-0.108	(0)
ZnSO4	5.711e-09	5.711e-09	-8.243	-8.243	0.000	(0)
ZnCO3	3.503e-09	3.503e-09	-8.456	-8.456	0.000	(0)
ZnHCO3+	3.124e-09	2.922e-09	-8.505	-8.534	-0.029	(0)
ZnOH+	1.335e-09	1.249e-09	-8.875	-8.903	-0.029	(0)
ZnF+	8.568e-11	8.015e-11	-10.067	-10.096	-0.029	(0)
ZnCl+	3.673e-11	3.452e-11	-10.435	-10.462	-0.027	(0)
Zn (OH) 2	2.800e-11	2.800e-11	-10.553	-10.553	0.000	(0)
Zn (SO4) 2-2	1.920e-11	1.471e-11	-10.717	-10.833	-0.116	(0)
ZnOHCl	6.394e-12	6.394e-12	-11.194	-11.194	0.000	(0)
Zn (OH) 3-	2.122e-14	1.985e-14	-13.673	-13.702	-0.029	(0)
ZnCl2	8.518e-15	8.518e-15	-14.070	-14.070	0.000	(0)
ZnCl3-	1.121e-18	1.053e-18	-17.951	-17.977	-0.027	(0)
ZnSeO4	3.556e-19	3.556e-19	-18.449	-18.449	0.000	(0)
Zn (OH) 4-2	1.460e-19	1.118e-19	-18.836	-18.951	-0.116	(0)
ZnCl4-2	1.046e-22	8.200e-23	-21.980	-22.086	-0.106	(0)
Zn (SeO4) 2-2	1.224e-32	9.378e-33	-31.912	-32.028	-0.116	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.536	-138.565	-0.029	(0)

Zn (HS) 2	0.000e+00	0.000e+00	-139.703	-139.703	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.128	-209.157	-0.029	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-211.873	-211.989	-0.116	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-283.235	-283.351	-0.116	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.94	-82.16	-36.22	Ag2S
Ag2CO3	-11.64	-22.73	-11.09	Ag2CO3
Ag2CrO4	-23.04	-34.63	-11.59	Ag2CrO4
Ag2HVO4	-11.51	-10.03	1.48	Ag2HVO4
Ag2MoO4	-12.32	-23.87	-11.55	Ag2MoO4
Ag2O	-14.85	-2.28	12.57	Ag2O
Ag2Se	3.99	-44.71	-48.70	Ag2Se
Ag2SeO3	-10.63	-17.78	-7.15	Ag2SeO3
Ag2SeO4	-21.25	-30.16	-8.91	Ag2SeO4
Ag2SO4	-15.28	-20.10	-4.82	Ag2SO4
Ag3AsO3	-24.40	-22.24	2.16	Ag3AsO3
Ag3AsO4	-14.42	-17.21	-2.79	Ag3AsO4
Ag3H2VO5	-16.35	-11.17	5.18	Ag3H2VO5
AgF:4H2O	-13.68	-12.63	1.05	AgF:4H2O
Agmetal	0.40	-13.10	-13.51	Ag
AgVO3	-9.67	-8.90	0.77	AgVO3
Al (OH) 3 (am)	-1.60	9.20	10.80	Al (OH) 3
Al2 (MoO4) 3	-48.75	-46.38	2.37	Al2 (MoO4) 3
Al2O3	-1.25	18.40	19.65	Al2O3
Al4 (OH) 10SO4	-3.72	18.98	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.39	-4.59	4.80	AlAsO4:2H2O
AlOHSO4	-5.39	-8.62	-3.23	AlOHSO4
AlSb	-146.80	-81.18	65.62	AlSb
Alunite	-3.59	-4.99	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.96	-12.75	-7.79	PbSO4
Anhydrite	-2.52	-6.88	-4.36	CaSO4
Anilite	-48.64	-80.52	-31.88	Cu0.25Cu1.5S
Antlerite	-3.85	4.94	8.79	Cu3 (OH) 4SO4
Aragonite	-1.21	-9.51	-8.30	CaCO3
Arsenolite	-72.53	-75.29	-2.76	As4O6
Artinite	-9.18	0.42	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-34.29	-27.58	6.71	As2O5
Atacamite	-3.17	4.22	7.39	Cu2 (OH) 3Cl
Azurite	-1.25	-18.15	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.00	7.39	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.61	-0.73	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	3.50	-5.41	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.28	6.66	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-15.30	-24.97	-9.67	BaCrO4
BaF2	-9.77	-15.59	-5.82	BaF2
BaMoO4	-7.24	-14.20	-6.96	BaMoO4
Barite	-0.45	-10.43	-9.98	BaSO4
BaS	-88.67	-72.49	16.18	BaS
BaSeO3	-9.94	-8.11	1.83	BaSeO3
BaSeO4	-13.03	-20.49	-7.46	BaSeO4
Bianchite	-8.82	-10.58	-1.76	ZnSO4:6H2O
Birnessite	-10.95	7.14	18.09	MnO2
Bixbyite	-9.01	-9.65	-0.64	Mn2O3
BlaubleiI	-49.23	-73.39	-24.16	Cu0.9Cu0.2S
BlaubleiII	-49.40	-76.68	-27.28	Cu0.6Cu0.8S
Boehmite	0.62	9.20	8.58	AlOOH
Breithauptite	-53.49	-72.01	-18.52	NiSb
Brochantite	-2.70	12.53	15.22	Cu4 (OH) 6SO4
Brucite	-6.40	10.44	16.84	Mg (OH) 2
Bunsenite	-6.05	6.40	12.45	NiO
Ca (VO3) 2	-10.23	-4.57	5.66	Ca (VO3) 2
Ca2V2O7	-11.13	6.37	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.18	6.37	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.05	5.25	22.30	Ca3 (AsO4) 2:4H2O

Ca3(VO4)2	-21.64	17.32	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.54	17.32	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-290.90	-147.92	142.97	Ca3Sb2
CaCrO4	-19.15	-21.41	-2.27	CaCrO4
Calcite	-1.03	-9.51	-8.48	CaCO3
Calomel	-14.35	-32.26	-17.91	Hg2Cl2
CaMoO4	-2.70	-10.65	-7.95	CaMoO4
Carnotite	-3.37	-3.14	0.23	KUO2VO4
CaSeO3:2H2O	-7.37	-4.56	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.92	-16.94	-3.02	CaSeO4:2H2O
Cd(BO2)2	-16.23	-6.39	9.84	Cd(BO2)2
Cd(OH)2	-8.41	5.23	13.64	Cd(OH)2
Cd(OH)2(am)	-8.50	5.23	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.66	-19.95	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.68	-2.12	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-25.29	3.11	28.40	Cd4(OH)6SO4
CdCl2	-16.02	-16.68	-0.66	CdCl2
CdCl2:1H2O	-14.98	-16.68	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-14.76	-16.68	-1.91	CdCl2:2.5H2O
CdF2	-16.53	-17.75	-1.21	CdF2
Cdmetal(alpha)	-32.21	-18.70	13.51	Cd
Cdmetal(gamma)	-32.31	-18.70	13.62	Cd
CdMoO4	-2.21	-16.36	-14.15	CdMoO4
CdOHCl	-9.26	-5.72	3.54	CdOHCl
CdSb	-72.83	-73.18	-0.35	CdSb
CdSe	-17.00	-37.20	-20.20	CdSe
CdSeO4:2H2O	-20.80	-22.65	-1.85	CdSeO4:2H2O
CdSO4	-12.42	-12.59	-0.17	CdSO4
CdSO4:1H2O	-10.86	-12.59	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.72	-12.59	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.34	-12.09	-9.75	AgCl
Cerrusite	-2.26	-15.39	-13.13	PbCO3
CH4(g)	-75.13	-116.17	-41.05	CH4
Chalcanthite	-7.60	-10.24	-2.64	CuSO4:5H2O
Chalcocite	-48.34	-83.26	-34.92	Cu2S
Chalcopyrite	-109.82	-145.09	-35.27	CuFeS2
Cinnabar	-48.99	-94.69	-45.69	HgS
Claudetite	-72.22	-75.29	-3.06	As4O6
Clausthalite	-10.26	-37.36	-27.10	PbSe
Co(BO2)2	-32.48	-5.41	27.07	Co(BO2)2
Co(OH)2	-6.88	6.22	13.09	Co(OH)2
Co(OH)3	-11.91	-14.22	-2.31	Co(OH)3
CO2(g)	-2.31	-20.46	-18.15	CO2
Co3(AsO4)2	-21.97	-8.93	13.03	Co3(AsO4)2
Co3O4	-11.73	-22.22	-10.50	Co3O4
CoCl2	-23.96	-15.69	8.27	CoCl2
CoCl2:6H2O	-18.23	-15.69	2.54	CoCl2:6H2O
CoCO3	-4.26	-14.24	-9.98	CoCO3
CoF2	-15.17	-16.76	-1.60	CoF2
CoF3	-47.23	-48.69	-1.46	CoF3
CoFe2O4	21.79	18.26	-3.53	CoFe2O4
CoMoO4	-7.62	-15.38	-7.76	CoMoO4
CoO	-7.37	6.22	13.59	CoO
CoS(alpha)	-66.23	-73.67	-7.44	CoS
CoS(beta)	-62.60	-73.67	-11.07	CoS
CoSe	-20.01	-36.21	-16.20	CoSe
CoSeO3	-10.61	-9.29	1.32	CoSeO3
CoSeO4:6H2O	-20.13	-21.66	-1.53	CoSeO4:6H2O
CoSO4	-14.41	-11.61	2.80	CoSO4
CoSO4:6H2O	-9.14	-11.61	-2.47	CoSO4:6H2O
Cotunnite	-12.06	-16.84	-4.78	PbCl2
Covellite	-49.99	-72.29	-22.30	CuS
Cr(OH)2	-20.71	-9.89	10.82	Cr(OH)2
Cr(OH)3	-2.21	-0.87	1.34	Cr(OH)3
Cr(OH)3(am)	-0.12	-0.87	-0.75	Cr(OH)3
Cr2O3	0.61	-1.75	-2.36	Cr2O3
CrCl2	-45.89	-31.80	14.09	CrCl2
CrCl3	-48.85	-33.74	15.11	CrCl3

CrF3	-24.01	-35.34	-11.34	CrF3
Crmetal	-64.30	-33.82	30.48	Cr
CrO3	-29.15	-32.36	-3.21	CrO3
Cryolite	-14.48	-48.32	-33.84	Na3AlF6
Cu(OH)2	-1.09	7.59	8.67	Cu(OH)2
Cu(SbO3)2	-26.94	18.27	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-49.59	-84.48	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-0.00	-45.80	-45.80	Cu2Se
Cu2SO4	-19.25	-21.20	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-10.92	-4.82	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-52.84	-95.44	-42.59	Cu3Sb
Cu3Se2	-17.16	-80.65	-63.49	Cu3Se2
CuCO3	-1.37	-12.87	-11.50	CuCO3
CuCrO4	-19.33	-24.77	-5.44	CuCrO4
CuF	-8.27	-13.18	-4.91	CuF
CuF2	-16.51	-15.39	1.12	CuF2
CuF2:2H2O	-10.84	-15.39	-4.55	CuF2:2H2O
Cumetal	-4.90	-13.65	-8.76	Cu
CuMoO4	-0.93	-14.01	-13.08	CuMoO4
CuOCuSO4	-12.95	-2.65	10.30	CuOCuSO4
Cupricferrite	13.65	19.63	5.99	CuFe2O4
Cuprite	-1.97	-3.37	-1.41	Cu2O
Cuprousferrite	13.25	4.34	-8.92	CuFeO2
CuSe	-1.74	-34.84	-33.10	CuSe
CuSe2	-19.98	-53.34	-33.37	CuSe2
CuSeO3:2H2O	-8.43	-7.91	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.85	-20.29	-2.44	CuSeO4:5H2O
CuSO4	-13.18	-10.24	2.94	CuSO4
Diaspore	2.33	9.20	6.87	AlOOH
Djurleite	-48.61	-82.53	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-2.99	-19.53	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.44	-19.53	-17.09	CaMg(CO3)2
Epsomite	-5.26	-7.38	-2.13	MgSO4:7H2O
Fe(OH)2	-6.47	7.09	13.56	Fe(OH)2
Fe(OH)2:7Cl.3	5.78	2.74	-3.04	Fe(OH)2:7Cl.3
Fe(VO3)2	-4.70	-8.42	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-5.01	-3.46	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-13.83	-34.46	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.69	-41.43	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.09	19.14	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.17	-7.77	0.40	FeAsO4:2H2O
FeCr2O4	-1.86	5.34	7.20	FeCr2O4
FeMoO4	-4.41	-14.50	-10.09	FeMoO4
Ferrihydrite	2.83	6.02	3.19	Fe(OH)3
Ferroselite	-35.24	-53.84	-18.60	FeSe2
FeS(ppt)	-69.84	-72.79	-2.95	FeS
FeSe	-24.34	-35.34	-11.00	FeSe
Fluorite	-1.54	-12.04	-10.50	CaF2
Galena	-60.84	-74.81	-13.97	PbS
Gibbsite	0.91	9.20	8.29	Al(OH)3
Goethite	5.53	6.02	0.49	FeOOH
Goslarite	-8.57	-10.58	-2.01	ZnSO4:7H2O
Greenockite	-60.29	-74.65	-14.36	CdS
Greigite	-255.36	-300.39	-45.03	Fe3S4
Gummite	-6.11	1.56	7.67	UO3
Gypsum	-2.27	-6.88	-4.61	CaSO4:2H2O
H-Jarosite	-5.48	-17.58	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.72	-21.59	-12.88	H2MoO4
H2S(g)	-71.87	-79.88	-8.01	H2S
H2Se(g)	-37.47	-42.43	-4.96	H2Se
Halite	-8.75	-7.15	1.60	NaCl
Hausmannite	-11.42	49.61	61.03	Mn3O4
Hematite	13.46	12.05	-1.42	Fe2O3
Hercynite	2.60	25.49	22.89	FeAl2O4
Hg(CH3)2(g)	-173.45	-247.15	-73.71	Hg(CH3)2
Hg(g)	-9.27	-17.14	-7.87	Hg
Hg(OH)2	-11.31	-14.80	-3.50	Hg(OH)2
Hg2(g)	-19.33	-34.28	-14.96	Hg2

Hg ₂ (OH) ₂	-15.61	-10.35	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-14.76	-30.81	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-34.01	-42.71	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-22.97	-33.33	-10.36	Hg ₂ F ₂
Hg ₂ S	-78.56	-90.23	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-21.20	-25.85	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-22.05	-28.18	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-35.19	-64.87	-29.68	Hg ₃ O ₂ CO ₃
HgCl(g)	-35.63	-16.13	19.50	HgCl
HgCl ₂	-15.45	-36.72	-21.26	HgCl ₂
HgF(g)	-49.34	-16.67	32.68	HgF
HgF ₂ (g)	-50.35	-37.78	12.57	HgF ₂
Hgmetal(l)	-3.69	-17.14	-13.45	Hg
HgSe	-1.54	-57.23	-55.69	HgSe
HgSeO ₃	-17.88	-30.31	-12.43	HgSeO ₃
HgSO ₄	-23.21	-32.63	-9.42	HgSO ₄
Huntite	-9.59	-39.56	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-6.93	-25.70	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-20.86	-29.62	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-18.22	-23.39	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	0.28	-14.52	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-41.36	-58.60	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-25.73	-26.24	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-18.74	-15.48	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-21.04	-21.77	-0.73	K ₂ SeO ₄
Langite	-4.96	12.53	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-7.25	-7.68	-0.43	PbO·PbSO ₄
Laurionite	-6.51	-5.89	0.62	PbOHCl
Lepidocrocite	4.65	6.02	1.37	FeOOH
Lime	-21.76	10.94	32.70	CaO
Litharge	-7.62	5.07	12.69	PbO
Mackinawite	-69.19	-72.79	-3.60	FeS
Maghemite	5.66	12.05	6.39	Fe ₂ O ₃
Magnesioferrite	5.63	22.49	16.86	Fe ₂ MgO ₄
Magnesite	-2.56	-10.02	-7.46	MgCO ₃
Magnetite	15.73	19.14	3.40	Fe ₃ O ₄
Malachite	0.02	-5.28	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-4.82	20.52	25.34	MnOOH
Massicot	-7.82	5.07	12.89	PbO
Matlockite	-8.40	-17.37	-8.97	PbClF
Melanothallite	-20.58	-14.32	6.26	CuCl ₂
Melanterite	-8.53	-10.73	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-49.59	-94.69	-45.09	HgS
Mg(OH) ₂ (active)	-8.35	10.44	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.35	-5.07	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-265.11	-190.43	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.99	5.37	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.51	8.69	16.20	MgCr ₂ O ₄
MgCrO ₄	-27.30	-21.92	5.38	MgCrO ₄
MgF ₂	-4.41	-12.54	-8.13	MgF ₂
MgMoO ₄	-9.30	-11.15	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-8.12	-5.06	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-16.24	-17.44	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-34.38	39.14	73.52	Pb ₃ O ₄
Mirabilite	-9.10	-10.22	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.85	-6.95	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.42	-63.13	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.30	-85.22	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-14.40	-1.90	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-16.07	-13.35	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-71.49	-71.32	0.17	MnS
MnS(pnk)	-74.66	-71.32	3.34	MnS
MnSb	-92.29	-95.20	-2.91	MnSb
MnSe	-37.37	-33.87	3.50	MnSe
MnSeO ₃	-8.07	-6.94	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-7.92	-6.94	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-17.27	-19.32	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.85	-9.27	2.58	MnSO ₄

Monteponite	-9.87	5.23	15.10	CdO
Montroydite	-11.16	-14.80	-3.64	HgO
MoO3	-13.59	-21.59	-8.00	MoO3
Morenosite	-9.28	-11.42	-2.14	NiSO4:7H2O
MoS2	-135.03	-205.29	-70.26	MoS2
Na-Jarosite	-2.58	-13.78	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-47.21	-57.10	-9.90	Na2Cr2O7
Na2CrO4	-27.68	-24.75	2.93	Na2CrO4
Na2Mo2O7	-18.98	-35.58	-16.60	Na2Mo2O7
Na2MoO4	-15.48	-13.99	1.49	Na2MoO4
Na2MoO4:2H2O	-15.21	-13.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-18.19	-7.89	10.30	Na2SeO3:5H2O
Na2SeO4	-21.55	-20.27	1.28	Na2SeO4
Na3Sb	-173.42	-78.96	94.45	Na3Sb
Na3VO4	-33.03	3.66	36.68	Na3VO4
Na4V2O7	-37.70	-0.30	37.40	Na4V2O7
Nantokite	-5.91	-12.64	-6.73	CuCl
NaSb	-85.81	-62.64	23.17	NaSb
Natron	-11.54	-12.85	-1.31	Na2CO3:10H2O
NaVO3	-7.81	-3.95	3.86	NaVO3
Nesquehonite	-5.35	-10.02	-4.67	MgCO3:3H2O
Ni(OH)2	-6.39	6.40	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.08	-8.38	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-24.22	7.78	32.00	Ni4(OH)6SO4
NiCO3	-7.19	-14.06	-6.87	NiCO3
NiMoO4	-4.05	-15.19	-11.14	NiMoO4
NiS(alpha)	-67.88	-73.48	-5.60	NiS
NiS(beta)	-62.38	-73.48	-11.10	NiS
NiS(gamma)	-60.68	-73.48	-12.80	NiS
NiSe	-18.33	-36.03	-17.70	NiSe
NiSeO3:2H2O	-11.92	-9.10	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.96	-21.48	-1.52	NiSeO4:6H2O
Nsutite	-10.37	7.14	17.50	MnO2
O2(g)	-35.23	47.86	83.09	O2
Orpiment	-216.22	-277.29	-61.07	As2S3
Otavite	-3.22	-15.22	-12.00	CdCO3
Pb(BO2)2	-13.07	-6.56	6.52	Pb(BO2)2
Pb(OH)2	-3.08	5.07	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-63.28	-72.04	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.61	-0.81	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-16.05	10.14	26.19	Pb2O(OH)2
Pb2O3	-26.97	34.07	61.04	Pb2O3
Pb2OCO3	-9.76	-10.32	-0.56	Pb2OCO3
Pb2V2O7	-3.47	-5.37	-1.90	Pb2V2O7
Pb3(AsO4)2	-18.17	-12.37	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.44	-0.30	6.14	Pb3(VO4)2
Pb3O2CO3	-16.27	-5.25	11.02	Pb3O2CO3
Pb3O2SO4	-13.30	-2.61	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.64	2.46	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.42	2.46	21.88	Pb4O3SO4
PbCrO4	-14.69	-27.29	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.11	-18.86	4.25	Pb
PbMoO4	-0.90	-16.52	-15.62	PbMoO4
PbO:0.3H2O	-7.91	5.07	12.98	PbO:0.33H2O
PbSeO4	-15.97	-22.81	-6.84	PbSeO4
Periclase	-11.14	10.44	21.58	MgO
Phosgenite	-12.42	-32.23	-19.81	PbCl2:PbCO3
Plattnerite	-20.60	29.00	49.60	PbO2
Portlandite	-11.86	10.94	22.80	Ca(OH)2
Pyrite	-110.24	-128.74	-18.51	FeS2
Pyrochroite	-6.64	8.56	15.19	Mn(OH)2
Pyrolusite	-8.89	32.49	41.38	MnO2
Realgar	-90.92	-110.67	-19.75	AsS
Retgersite	-9.38	-11.42	-2.04	NiSO4:6H2O
Rhodochrosite	-1.32	-11.90	-10.58	MnCO3
Rutherfordine	-4.40	-18.90	-14.50	UO2CO3
Sb(OH)3	-11.48	-18.59	-7.11	Sb(OH)3

Sb2O4	-16.65	-13.25	3.40	Sb2O4
Sb2O5	-28.27	-37.94	-9.67	Sb2O5
Sb2Se3	-96.71	-164.47	-67.76	Sb2Se3
Sb4O6(cubic)	-56.09	-74.35	-18.26	Sb4O6
Sb4O6(orth)	-56.45	-74.35	-17.90	Sb4O6
SbCl3	-52.03	-51.45	0.57	SbCl3
SbF3	-42.83	-53.06	-10.23	SbF3
Sbmetal	-42.79	-54.48	-11.69	Sb
SbO2	-3.11	-30.93	-27.82	SbO2
Schoepite	-4.44	1.56	5.99	UO2(OH)2·H2O
Semetal(am)	-11.39	-18.50	-7.11	Se
Semetal(hex)	-10.79	-18.50	-7.71	Se
Senarmontite	-24.81	-37.18	-12.37	Sb2O3
SeO2	-15.63	-15.50	0.12	SeO2
SeO3	-48.92	-27.88	21.04	SeO3
Siderite	-3.13	-13.37	-10.24	FeCO3
Smithsonite	-3.22	-13.22	-10.00	ZnCO3
Sphalerite	-61.19	-72.64	-11.45	ZnS
Spinel	-8.00	28.84	36.85	MgAl2O4
Stibnite	-226.36	-276.82	-50.46	Sb2S3
Sulfur	-53.81	-55.95	-2.14	S
Tenorite	-0.06	7.59	7.64	CuO
Thenardite	-10.54	-10.22	0.32	Na2SO4
Thermonatrite	-13.49	-12.85	0.64	Na2CO3·H2O
Tyuyamunite	-5.53	-1.45	4.08	Ca(UO2)2(VO4)2
U3O8	-12.69	8.39	21.08	U3O8
U3Sb4	-553.35	-400.97	152.38	U3Sb4
U4O9	-25.67	-28.69	-3.02	U4O9
UF4	-29.58	-59.11	-29.54	UF4
UF4·2.5H2O	-26.40	-59.11	-32.72	UF4·2.5H2O
UO2(am)	-14.09	-13.16	0.93	UO2
UO2(OH)2(beta)	-4.05	1.56	5.61	UO2(OH)2
UO2SeO4·4H2O	-24.07	-26.32	-2.25	UO2SeO4·4H2O
UO3	-6.14	1.56	7.70	UO3
Uraninite	-8.49	-13.16	-4.67	UO2
USb2	-208.77	-179.19	29.58	USb2
V(OH)3	-16.68	-9.09	7.59	V(OH)3
V2O5	-14.15	-15.51	-1.36	V2O5
V3O5	-34.22	-32.38	1.84	V3O5
V4O7	-42.39	-35.20	7.19	V4O7
V6O13	-33.54	-94.40	-60.86	V6O13
Valentinite	-28.70	-37.18	-8.48	Sb2O3
VC12	-61.84	-42.96	18.87	VC12
VC13	-65.39	-41.95	23.43	VC13
VF4	-63.71	-48.78	14.93	VF4
Vmetal	-89.01	-44.98	44.03	V
VO	-35.81	-21.05	14.76	VO
VO(OH)2	-7.97	-2.82	5.15	VO(OH)2
VO2Cl	-21.55	-18.71	2.84	VO2Cl
VOC1	-31.19	-20.04	11.15	VOC1
VOC12	-37.49	-24.73	12.76	VOC12
VOSO4	-24.25	-20.64	3.61	VOSO4
Witherite	-4.50	-13.07	-8.57	BaCO3
Wurtzite	-63.69	-72.64	-8.95	ZnS
Zincite	-4.09	7.24	11.33	ZnO
Zincosite	-14.51	-10.58	3.93	ZnSO4
Zn(BO2)2	-12.67	-4.38	8.29	Zn(BO2)2
Zn(OH)2	-4.96	7.24	12.20	Zn(OH)2
Zn(OH)2(am)	-5.23	7.24	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.51	7.24	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.29	7.24	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.49	7.24	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.84	-3.34	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.66	3.53	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-19.51	-5.86	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-32.84	-13.93	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-17.26	11.14	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-24.20	14.30	38.50	Zn5(OH)8Cl2

ZnCl2	-21.72	-14.67	7.05	ZnCl2
ZnCO3:1H2O	-2.96	-13.22	-10.26	ZnCO3:1H2O
ZnF2	-15.20	-15.74	-0.53	ZnF2
Znmetal	-42.48	-16.69	25.79	Zn
ZnMoO4	-4.23	-14.35	-10.13	ZnMoO4
ZnO(active)	-3.95	7.24	11.19	ZnO
ZnS(am)	-63.59	-72.64	-9.05	ZnS
ZnSb	-82.18	-71.17	11.01	ZnSb
ZnSe	-20.79	-35.19	-14.40	ZnSe
ZnSeO4:6H2O	-19.12	-20.64	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.95	-10.58	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 21.

```

      REACTION 101
      H2O      -1
      560.6500 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 101
      SAVE Solution 102
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 101. Solution after simulation 20.
Using reaction 101.

Reaction 101.

5.606e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.338e-08	8.350e-08
Al	5.884e-06	5.892e-06
As	4.469e-08	4.476e-08
B	1.720e-05	1.722e-05
Ba	1.781e-06	1.784e-06
C	1.434e-02	1.436e-02
Ca	6.766e-03	6.775e-03
Cd	1.336e-08	1.338e-08
Cl	1.836e-03	1.839e-03
Co	1.357e-07	1.359e-07
Cr	1.269e-07	1.270e-07

Cu	1.302e-05	1.304e-05
F	5.481e-04	5.489e-04
Fe	2.674e-05	2.678e-05
Hg	2.954e-10	2.958e-10
K	9.597e-04	9.610e-04
Mg	2.095e-03	2.098e-03
Mn	2.813e-05	2.816e-05
Mo	7.150e-07	7.160e-07
Na	5.359e-03	5.366e-03
Ni	2.128e-07	2.131e-07
Pb	3.121e-08	3.125e-08
S	4.628e-03	4.635e-03
Sb	1.530e-08	1.532e-08
Se	5.782e-08	5.790e-08
U	1.135e-07	1.136e-07
V	1.525e-07	1.528e-07
Zn	1.407e-06	1.409e-06

-----Description of solution-----

```

                                pH = 7.082      Charge balance
                                pe = 5.215      Adjusted to redox
equilibrium
      Activity of water = 0.999
      Ionic strength (mol/kgw) = 3.075e-02
      Mass of water (kg) = 1.001e+00
      Total alkalinity (eq/kg) = 1.253e-02
      Total CO2 (mol/kg) = 1.434e-02
      Temperature (°C) = 25.00
      Electrical balance (eq) = -3.026e-17
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
      Iterations = 17
      Total H = 1.111869e+02
      Total O = 5.564705e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.444e-07	1.217e-07	-6.840	-6.915	-0.074	(0)
H+	9.748e-08	8.270e-08	-7.011	-7.082	-0.071	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	8.338e-08					
AgCl	5.357e-08	5.357e-08	-7.271	-7.271	0.000	(0)
Ag+	1.985e-08	1.684e-08	-7.702	-7.774	-0.071	(0)
AgCl2-	8.930e-09	7.268e-09	-8.049	-8.139	-0.089	(0)
AgSO4-	6.994e-10	5.693e-10	-9.155	-9.245	-0.089	(0)
Ag2Se	1.435e-10	1.435e-10	-9.843	-9.843	0.000	(0)
AgCl3-2	2.300e-11	1.009e-11	-10.638	-10.996	-0.358	(0)
AgF	1.693e-11	1.693e-11	-10.771	-10.771	0.000	(0)
AgOH	2.050e-13	2.050e-13	-12.688	-12.688	0.000	(0)
AgCl4-3	2.048e-13	3.209e-14	-12.689	-13.494	-0.805	(0)
AgH2BO3	3.213e-14	3.213e-14	-13.493	-13.493	0.000	(0)
AgSeO3-	2.759e-14	2.245e-14	-13.559	-13.649	-0.089	(0)
Ag(OH) 2-	2.994e-18	2.437e-18	-17.524	-17.613	-0.089	(0)
Ag(SeO3) 2-3	2.661e-21	4.170e-22	-20.575	-21.380	-0.805	(0)
Ag2MoO4	3.974e-23	3.974e-23	-22.401	-22.401	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.531	-68.531	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-78.184	-79.614	-1.431	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-138.914	-139.003	-0.089	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-139.212	-139.404	-0.192	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-141.407	-141.762	-0.355	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.735	-142.073	-0.338	(0)
Al	5.884e-06					
AlF3	3.578e-06	3.578e-06	-5.446	-5.446	0.000	(0)
AlF4-	8.449e-07	7.174e-07	-6.073	-6.144	-0.071	(0)
AlF2+	8.312e-07	7.104e-07	-6.080	-6.149	-0.068	(0)

Al (OH) 4-	5.743e-07	4.877e-07	-6.241	-6.312	-0.071	(0)
Al (OH) 3	3.183e-08	3.183e-08	-7.497	-7.497	0.000	(0)
Al (OH) 2+	1.534e-08	1.311e-08	-7.814	-7.882	-0.068	(0)
AlF+2	8.360e-09	4.460e-09	-8.078	-8.351	-0.273	(0)
AlOH+2	2.543e-10	1.357e-10	-9.595	-9.868	-0.273	(0)
AlSO4+	1.726e-11	1.466e-11	-10.763	-10.834	-0.071	(0)
Al+3	4.894e-12	1.115e-12	-11.310	-11.953	-0.642	(0)
Al (SO4) 2-	3.133e-13	2.661e-13	-12.504	-12.575	-0.071	(0)
AlMo6O21-3	5.757e-38	9.022e-39	-37.240	-38.045	-0.805	(0)
As (3)	3.062e-19					
H3AsO3	3.039e-19	3.039e-19	-18.517	-18.517	0.000	(0)
H2AsO3-	2.315e-21	1.884e-21	-20.635	-20.725	-0.089	(0)
HAsO3-2	4.736e-26	2.078e-26	-25.325	-25.682	-0.358	(0)
H4AsO3+	1.530e-26	1.245e-26	-25.815	-25.905	-0.089	(0)
AsO3-3	6.180e-32	9.686e-33	-31.209	-32.014	-0.805	(0)
As (5)	4.469e-08					
HAsO4-2	3.177e-08	1.394e-08	-7.498	-7.856	-0.358	(0)
H2AsO4-	1.292e-08	1.051e-08	-7.889	-7.978	-0.089	(0)
AsO4-3	3.401e-12	5.330e-13	-11.468	-12.273	-0.805	(0)
H3AsO4	1.501e-13	1.511e-13	-12.824	-12.821	0.003	(0)
B	1.720e-05					
H3BO3	1.702e-05	1.714e-05	-4.769	-4.766	0.003	(0)
H2BO3-	1.441e-07	1.204e-07	-6.841	-6.919	-0.078	(0)
CaH2BO3+	2.201e-08	1.838e-08	-7.657	-7.736	-0.078	(0)
MgH2BO3+	4.331e-09	3.618e-09	-8.363	-8.442	-0.078	(0)
BF (OH) 3-	3.276e-09	2.736e-09	-8.485	-8.563	-0.078	(0)
NaH2BO3	8.553e-10	8.553e-10	-9.068	-9.068	0.000	(0)
BF2 (OH) 2-	1.160e-11	9.685e-12	-10.936	-11.014	-0.078	(0)
BaH2BO3+	3.881e-12	3.242e-12	-11.411	-11.489	-0.078	(0)
H5 (BO3) 2-	2.103e-12	1.756e-12	-11.677	-11.755	-0.078	(0)
AgH2BO3	3.213e-14	3.213e-14	-13.493	-13.493	0.000	(0)
H8 (BO3) 3-	3.604e-15	3.010e-15	-14.443	-14.521	-0.078	(0)
BF3OH-	1.493e-16	1.247e-16	-15.826	-15.904	-0.078	(0)
BF4-	2.433e-20	2.032e-20	-19.614	-19.692	-0.078	(0)
Ba	1.781e-06					
Ba+2	1.682e-06	8.714e-07	-5.774	-6.060	-0.286	(0)
BaHCO3+	9.707e-08	8.330e-08	-7.013	-7.079	-0.066	(0)
BaCO3	2.536e-09	2.536e-09	-8.596	-8.596	0.000	(0)
BaH2BO3+	3.881e-12	3.242e-12	-11.411	-11.489	-0.078	(0)
BaOH+	5.431e-13	4.629e-13	-12.265	-12.335	-0.069	(0)
C (4)	1.434e-02					
HCO3-	1.171e-02	1.001e-02	-1.931	-2.000	-0.068	(0)
H2CO3	1.862e-03	1.862e-03	-2.730	-2.730	0.000	(0)
CaHCO3+	5.765e-04	4.947e-04	-3.239	-3.306	-0.066	(0)
MgHCO3+	1.049e-04	8.878e-05	-3.979	-4.052	-0.073	(0)
NaHCO3	2.523e-05	2.523e-05	-4.598	-4.598	0.000	(0)
CaCO3	2.387e-05	2.387e-05	-4.622	-4.622	0.000	(0)
CuCO3	1.139e-05	1.139e-05	-4.943	-4.943	0.000	(0)
CO3-2	1.095e-05	5.674e-06	-4.961	-5.246	-0.286	(0)
MgCO3	4.090e-06	4.090e-06	-5.388	-5.388	0.000	(0)
MnHCO3+	2.324e-06	1.981e-06	-5.634	-5.703	-0.069	(0)
NaCO3-	5.542e-07	4.737e-07	-6.256	-6.325	-0.068	(0)
Cu (CO3) 2-2	3.965e-07	1.740e-07	-6.402	-6.759	-0.358	(0)
CuHCO3+	2.646e-07	2.153e-07	-6.577	-6.667	-0.089	(0)
ZnHCO3+	1.790e-07	1.456e-07	-6.747	-6.837	-0.089	(0)
ZnCO3	1.502e-07	1.502e-07	-6.823	-6.823	0.000	(0)
BaHCO3+	9.707e-08	8.330e-08	-7.013	-7.079	-0.066	(0)
UO2 (CO3) 3-4	8.739e-08	3.240e-09	-7.059	-8.489	-1.431	(0)
NiHCO3+	8.038e-08	6.542e-08	-7.095	-7.184	-0.089	(0)
FeHCO3+	5.122e-08	4.396e-08	-7.291	-7.357	-0.066	(0)
CoHCO3+	3.513e-08	2.859e-08	-7.454	-7.544	-0.089	(0)
UO2 (CO3) 2-2	2.596e-08	1.139e-08	-7.586	-7.943	-0.358	(0)
PbCO3	1.769e-08	1.769e-08	-7.752	-7.752	0.000	(0)
NiCO3	1.122e-08	1.122e-08	-7.950	-7.950	0.000	(0)
PbHCO3+	9.477e-09	7.713e-09	-8.023	-8.113	-0.089	(0)
CoCO3	3.522e-09	3.522e-09	-8.453	-8.453	0.000	(0)
BaCO3	2.536e-09	2.536e-09	-8.596	-8.596	0.000	(0)
Pb (CO3) 2-2	6.597e-10	2.895e-10	-9.181	-9.538	-0.358	(0)

	CdCO3	6.399e-10	6.399e-10	-9.194	-9.194	0.000	(0)
	CdHCO3+	1.385e-10	1.128e-10	-9.858	-9.948	-0.089	(0)
	UO2CO3	1.006e-10	1.006e-10	-9.997	-9.997	0.000	(0)
	Cd(CO3) 2-2	6.134e-12	2.691e-12	-11.212	-11.570	-0.358	(0)
	HgCO3	5.836e-15	5.836e-15	-14.234	-14.234	0.000	(0)
	Hg(CO3) 2-2	2.387e-16	1.047e-16	-15.622	-15.980	-0.358	(0)
	HgHCO3+	1.104e-17	8.988e-18	-16.957	-17.046	-0.089	(0)
Ca		6.766e-03					
	Ca+2	5.122e-03	2.654e-03	-2.291	-2.576	-0.286	(0)
	CaSO4	1.030e-03	1.030e-03	-2.987	-2.987	0.000	(0)
	CaHCO3+	5.765e-04	4.947e-04	-3.239	-3.306	-0.066	(0)
	CaCO3	2.387e-05	2.387e-05	-4.622	-4.622	0.000	(0)
	CaF+	1.360e-05	1.159e-05	-4.867	-4.936	-0.069	(0)
	CaH2BO3+	2.201e-08	1.838e-08	-7.657	-7.736	-0.078	(0)
	CaOH+	7.509e-09	6.443e-09	-8.124	-8.191	-0.066	(0)
Cd		1.336e-08					
	Cd+2	9.549e-09	4.948e-09	-8.020	-8.306	-0.286	(0)
	CdSO4	1.965e-09	1.965e-09	-8.707	-8.707	0.000	(0)
	CdCl+	9.044e-10	7.360e-10	-9.044	-9.133	-0.089	(0)
	CdCO3	6.399e-10	6.399e-10	-9.194	-9.194	0.000	(0)
	CdHCO3+	1.385e-10	1.128e-10	-9.858	-9.948	-0.089	(0)
	Cd(SO4) 2-2	1.023e-10	4.489e-11	-9.990	-10.348	-0.358	(0)
	CdF+	3.855e-11	3.137e-11	-10.414	-10.503	-0.089	(0)
	Cd(CO3) 2-2	6.134e-12	2.691e-12	-11.212	-11.570	-0.358	(0)
	CdOH+	5.876e-12	4.782e-12	-11.231	-11.320	-0.089	(0)
	CdCl2	4.780e-12	4.780e-12	-11.321	-11.321	0.000	(0)
	CdOHC1	3.674e-12	3.674e-12	-11.435	-11.435	0.000	(0)
	CdF2	2.504e-14	2.504e-14	-13.601	-13.601	0.000	(0)
	CdCl3-	5.772e-15	4.698e-15	-14.239	-14.328	-0.089	(0)
	Cd(OH) 2	3.672e-15	3.672e-15	-14.435	-14.435	0.000	(0)
	CdSeO4	9.287e-19	9.287e-19	-18.032	-18.032	0.000	(0)
	Cd2OH+3	7.567e-19	1.186e-19	-18.121	-18.926	-0.805	(0)
	Cd(SeO3) 2-2	3.998e-20	1.754e-20	-19.398	-19.756	-0.358	(0)
	Cd(OH) 3-	3.354e-20	2.730e-20	-19.474	-19.564	-0.089	(0)
	Cd(OH) 4-2	1.239e-27	5.436e-28	-26.907	-27.265	-0.358	(0)
	CdHS+	0.000e+00	0.000e+00	-74.780	-74.870	-0.089	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-142.238	-142.238	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-214.821	-214.910	-0.089	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-286.928	-287.286	-0.358	(0)
Cl		1.836e-03					
	Cl-	1.836e-03	1.558e-03	-2.736	-2.808	-0.071	(0)
	AgCl	5.357e-08	5.357e-08	-7.271	-7.271	0.000	(0)
	MnCl+	2.282e-08	1.945e-08	-7.642	-7.711	-0.069	(0)
	AgCl2-	8.930e-09	7.268e-09	-8.049	-8.139	-0.089	(0)
	ZnCl+	2.128e-09	1.800e-09	-8.672	-8.745	-0.073	(0)
	CuCl	1.996e-09	1.996e-09	-8.700	-8.700	0.000	(0)
	CuCl+	9.952e-10	8.418e-10	-9.002	-9.075	-0.073	(0)
	CdCl+	9.044e-10	7.360e-10	-9.044	-9.133	-0.089	(0)
	CuCl2-	7.681e-10	6.498e-10	-9.115	-9.187	-0.073	(0)
	ZnOHC1	2.868e-10	2.868e-10	-9.542	-9.542	0.000	(0)
	NiCl+	2.596e-10	2.113e-10	-9.586	-9.675	-0.089	(0)
	CoCl+	2.431e-10	1.979e-10	-9.614	-9.704	-0.089	(0)
	PbCl+	7.043e-11	5.732e-11	-10.152	-10.242	-0.089	(0)
	MnCl2	4.280e-11	4.280e-11	-10.369	-10.369	0.000	(0)
	AgCl3-2	2.300e-11	1.009e-11	-10.638	-10.996	-0.358	(0)
	CdCl2	4.780e-12	4.780e-12	-11.321	-11.321	0.000	(0)
	ZnCl2	4.445e-12	4.445e-12	-11.352	-11.352	0.000	(0)
	CdOHC1	3.674e-12	3.674e-12	-11.435	-11.435	0.000	(0)
	CuCl2	4.547e-13	4.547e-13	-12.342	-12.342	0.000	(0)
	CuCl3-2	4.102e-13	2.164e-13	-12.387	-12.665	-0.278	(0)
	PbCl2	3.989e-13	3.989e-13	-12.399	-12.399	0.000	(0)
	HgClOH	2.877e-13	2.877e-13	-12.541	-12.541	0.000	(0)
	HgCl2	2.086e-13	2.086e-13	-12.681	-12.681	0.000	(0)
	AgCl4-3	2.048e-13	3.209e-14	-12.689	-13.494	-0.805	(0)
	MnCl3-	2.155e-14	1.836e-14	-13.667	-13.736	-0.069	(0)
	CrCl+2	1.013e-14	4.444e-15	-13.994	-14.352	-0.358	(0)
	ZnCl3-	6.502e-15	5.500e-15	-14.187	-14.260	-0.073	(0)
	CdCl3-	5.772e-15	4.698e-15	-14.239	-14.328	-0.089	(0)

HgCl3-	3.992e-15	3.249e-15	-14.399	-14.488	-0.089	(0)
NiCl2	1.657e-15	1.657e-15	-14.781	-14.781	0.000	(0)
FeCl+2	4.740e-16	2.501e-16	-15.324	-15.602	-0.278	(0)
PbCl3-	3.039e-16	2.474e-16	-15.517	-15.607	-0.089	(0)
HgCl4-2	4.592e-17	2.015e-17	-16.338	-16.696	-0.358	(0)
HgCl+	3.282e-17	2.671e-17	-16.484	-16.573	-0.089	(0)
CrOHC12	1.601e-17	1.601e-17	-16.796	-16.796	0.000	(0)
UO2Cl+	1.383e-17	1.126e-17	-16.859	-16.949	-0.089	(0)
ZnCl4-2	8.121e-18	4.284e-18	-17.090	-17.368	-0.278	(0)
CuCl3-	7.815e-18	6.610e-18	-17.107	-17.180	-0.073	(0)
FeCl2+	2.042e-18	1.740e-18	-17.690	-17.759	-0.069	(0)
CrCl2+	8.071e-19	6.569e-19	-18.093	-18.183	-0.089	(0)
PbCl4-2	4.014e-19	1.761e-19	-18.396	-18.754	-0.358	(0)
VOCl+	2.872e-19	2.337e-19	-18.542	-18.631	-0.089	(0)
FeCl3	2.711e-22	2.711e-22	-21.567	-21.567	0.000	(0)
CuCl4-2	9.783e-23	5.161e-23	-22.010	-22.287	-0.278	(0)
CrO3Cl-	1.343e-26	1.093e-26	-25.872	-25.961	-0.089	(0)
CoCl+2	1.732e-35	7.601e-36	-34.761	-35.119	-0.358	(0)
UCl+3	0.000e+00	0.000e+00	-44.197	-45.002	-0.805	(0)
Co (2)	1.357e-07					
Co+2	8.368e-08	3.672e-08	-7.077	-7.435	-0.358	(0)
CoHCO3+	3.513e-08	2.859e-08	-7.454	-7.544	-0.089	(0)
CoSO4	1.241e-08	1.241e-08	-7.906	-7.906	0.000	(0)
CoCO3	3.522e-09	3.522e-09	-8.453	-8.453	0.000	(0)
CoF+	5.708e-10	4.645e-10	-9.244	-9.333	-0.089	(0)
CoCl+	2.431e-10	1.979e-10	-9.614	-9.704	-0.089	(0)
CoOH+	1.095e-10	8.915e-11	-9.960	-10.050	-0.089	(0)
Co (OH) 2	8.617e-13	8.617e-13	-12.065	-12.065	0.000	(0)
CoSeO4	1.855e-17	1.855e-17	-16.732	-16.732	0.000	(0)
Co (OH) 3-	2.570e-18	2.092e-18	-17.590	-17.679	-0.089	(0)
Co2OH+3	1.047e-18	1.641e-19	-17.980	-18.785	-0.805	(0)
CoOOH-	6.453e-19	5.252e-19	-18.190	-18.280	-0.089	(0)
Co (OH) 4-2	9.194e-26	4.034e-26	-25.036	-25.394	-0.358	(0)
Co4 (OH) 4+4	3.399e-31	1.260e-32	-30.469	-31.900	-1.431	(0)
Co (3)	3.379e-29					
CoOH+2	3.379e-29	1.483e-29	-28.471	-28.829	-0.358	(0)
Co+3	1.053e-34	2.398e-35	-33.978	-34.620	-0.642	(0)
CoCl+2	1.732e-35	7.601e-36	-34.761	-35.119	-0.358	(0)
Cr (2)	7.316e-24					
Cr+2	7.316e-24	3.210e-24	-23.136	-23.493	-0.358	(0)
Cr (3)	1.269e-07					
Cr (OH) 2+	1.068e-07	8.689e-08	-6.972	-7.061	-0.089	(0)
Cr (OH) +2	1.337e-08	5.868e-09	-7.874	-8.231	-0.358	(0)
Cr (OH) 3	3.972e-09	3.972e-09	-8.401	-8.401	0.000	(0)
CrOHSO4	2.359e-09	2.359e-09	-8.627	-8.627	0.000	(0)
CrF+2	3.185e-10	1.398e-10	-9.497	-9.855	-0.358	(0)
CrO2-	2.804e-11	2.282e-11	-10.552	-10.642	-0.089	(0)
Cr (OH) 4-	2.364e-11	1.924e-11	-10.626	-10.716	-0.089	(0)
Cr+3	1.407e-11	2.204e-12	-10.852	-11.657	-0.805	(0)
CrSO4+	1.071e-11	8.719e-12	-10.970	-11.060	-0.089	(0)
CrCl+2	1.013e-14	4.444e-15	-13.994	-14.352	-0.358	(0)
Cr2 (OH) 2SO4+2	2.851e-15	1.251e-15	-14.545	-14.903	-0.358	(0)
Cr2 (OH) 2 (SO4) 2	1.259e-16	1.259e-16	-15.900	-15.900	0.000	(0)
CrOHC12	1.601e-17	1.601e-17	-16.796	-16.796	0.000	(0)
CrCl2+	8.071e-19	6.569e-19	-18.093	-18.183	-0.089	(0)
Cr (6)	1.153e-16					
CrO4-2	9.722e-17	5.037e-17	-16.012	-16.298	-0.286	(0)
HCrO4-	1.656e-17	1.348e-17	-16.781	-16.870	-0.089	(0)
NaCrO4-	1.379e-18	1.122e-18	-17.860	-17.950	-0.089	(0)
KCrO4-	1.850e-19	1.506e-19	-18.733	-18.822	-0.089	(0)
CrO3SO4-2	1.312e-24	5.755e-25	-23.882	-24.240	-0.358	(0)
H2CrO4	9.037e-25	9.037e-25	-24.044	-24.044	0.000	(0)
CrO3Cl-	1.343e-26	1.093e-26	-25.872	-25.961	-0.089	(0)
Cr2O7-2	1.437e-32	6.305e-33	-31.843	-32.200	-0.358	(0)
Cu (1)	4.016e-09					
CuCl	1.996e-09	1.996e-09	-8.700	-8.700	0.000	(0)
Cu+	1.251e-09	1.018e-09	-8.903	-8.992	-0.089	(0)
CuCl2-	7.681e-10	6.498e-10	-9.115	-9.187	-0.073	(0)

	CuCl3-2	4.102e-13	2.164e-13	-12.387	-12.665	-0.278	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-140.235	-140.582	-0.346	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-140.982	-141.312	-0.330	(0)
Cu (2)	1.302e-05						
	CuCO3	1.139e-05	1.139e-05	-4.943	-4.943	0.000	(0)
	Cu+2	6.581e-07	3.410e-07	-6.182	-6.467	-0.286	(0)
	Cu (CO3) 2-2	3.965e-07	1.740e-07	-6.402	-6.759	-0.358	(0)
	CuHCO3+	2.646e-07	2.153e-07	-6.577	-6.667	-0.089	(0)
	CuOH+	1.551e-07	1.312e-07	-6.809	-6.882	-0.073	(0)
	CuSO4	1.323e-07	1.323e-07	-6.878	-6.878	0.000	(0)
	CuF+	1.058e-08	8.607e-09	-7.976	-8.065	-0.089	(0)
	Cu (OH) 2	3.185e-09	3.185e-09	-8.497	-8.497	0.000	(0)
	CuCl+	9.952e-10	8.418e-10	-9.002	-9.075	-0.073	(0)
	Cu2 (OH) 2+2	9.854e-10	4.324e-10	-9.006	-9.364	-0.358	(0)
	Cu (OH) 3-	9.769e-13	7.951e-13	-12.010	-12.100	-0.089	(0)
	CuCl2	4.547e-13	4.547e-13	-12.342	-12.342	0.000	(0)
	CuCl3-	7.815e-18	6.610e-18	-17.107	-17.180	-0.073	(0)
	Cu (OH) 4-2	1.735e-18	7.614e-19	-17.761	-18.118	-0.358	(0)
	CuCl4-2	9.783e-23	5.161e-23	-22.010	-22.287	-0.278	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-204.195	-204.285	-0.089	(0)
F	5.481e-04						
	F-	4.715e-04	4.001e-04	-3.326	-3.398	-0.071	(0)
	MgF+	4.582e-05	3.891e-05	-4.339	-4.410	-0.071	(0)
	CaF+	1.360e-05	1.159e-05	-4.867	-4.936	-0.069	(0)
	AlF3	3.578e-06	3.578e-06	-5.446	-5.446	0.000	(0)
	NaF	1.132e-06	1.132e-06	-5.946	-5.946	0.000	(0)
	AlF4-	8.449e-07	7.174e-07	-6.073	-6.144	-0.071	(0)
	AlF2+	8.312e-07	7.104e-07	-6.080	-6.149	-0.068	(0)
	MnF+	1.853e-07	1.580e-07	-6.732	-6.801	-0.069	(0)
	HF	4.894e-08	4.894e-08	-7.310	-7.310	0.000	(0)
	CuF+	1.058e-08	8.607e-09	-7.976	-8.065	-0.089	(0)
	AlF+2	8.360e-09	4.460e-09	-8.078	-8.351	-0.273	(0)
	ZnF+	4.513e-09	3.673e-09	-8.346	-8.435	-0.089	(0)
	BF (OH) 3-	3.276e-09	2.736e-09	-8.485	-8.563	-0.078	(0)
	NiF+	6.546e-10	5.328e-10	-9.184	-9.273	-0.089	(0)
	CoF+	5.708e-10	4.645e-10	-9.244	-9.333	-0.089	(0)
	CrF+2	3.185e-10	1.398e-10	-9.497	-9.855	-0.358	(0)
	HF2-	8.835e-11	7.444e-11	-10.054	-10.128	-0.074	(0)
	CdF+	3.855e-11	3.137e-11	-10.414	-10.503	-0.089	(0)
	PbF+	3.592e-11	2.924e-11	-10.445	-10.534	-0.089	(0)
	FeF2+	2.929e-11	2.497e-11	-10.533	-10.603	-0.069	(0)
	AgF	1.693e-11	1.693e-11	-10.771	-10.771	0.000	(0)
	FeF3	1.409e-11	1.409e-11	-10.851	-10.851	0.000	(0)
	BF2 (OH) 2-	1.160e-11	9.685e-12	-10.936	-11.014	-0.078	(0)
	FeF+2	4.420e-12	2.332e-12	-11.355	-11.632	-0.278	(0)
	UO2F+	3.023e-13	2.460e-13	-12.520	-12.609	-0.089	(0)
	UO2F2	2.839e-13	2.839e-13	-12.547	-12.547	0.000	(0)
	PbF2	2.302e-13	2.302e-13	-12.638	-12.638	0.000	(0)
	UO2F3-	3.505e-14	2.853e-14	-13.455	-13.545	-0.089	(0)
	CdF2	2.504e-14	2.504e-14	-13.601	-13.601	0.000	(0)
	VO2F	1.125e-14	1.125e-14	-13.949	-13.949	0.000	(0)
	H2F2	6.417e-15	6.417e-15	-14.193	-14.193	0.000	(0)
	VO2F2-	2.007e-15	1.634e-15	-14.697	-14.787	-0.089	(0)
	PbF3-	2.146e-16	1.747e-16	-15.668	-15.758	-0.089	(0)
	UO2F4-2	2.066e-16	9.066e-17	-15.685	-16.043	-0.358	(0)
	VOF+	1.577e-16	1.283e-16	-15.802	-15.892	-0.089	(0)
	BF3OH-	1.493e-16	1.247e-16	-15.826	-15.904	-0.078	(0)
	VOF2	1.925e-17	1.925e-17	-16.715	-16.715	0.000	(0)
	VO2F3-2	1.858e-17	8.153e-18	-16.731	-17.089	-0.358	(0)
	VOF3-	3.358e-19	2.733e-19	-18.474	-18.563	-0.089	(0)
	PbF4-2	7.622e-20	3.345e-20	-19.118	-19.476	-0.358	(0)
	BF4-	2.433e-20	2.032e-20	-19.614	-19.692	-0.078	(0)
	VO2F4-3	1.024e-20	1.605e-21	-19.990	-20.795	-0.805	(0)
	VOF4-2	1.006e-21	4.413e-22	-20.997	-21.355	-0.358	(0)
	Sb (OH) 2F	3.229e-23	3.229e-23	-22.491	-22.491	0.000	(0)
	SbOF	3.177e-23	3.177e-23	-22.498	-22.498	0.000	(0)
	HgF+	1.566e-23	1.275e-23	-22.805	-22.895	-0.089	(0)
	UF3+	3.994e-33	3.250e-33	-32.399	-32.488	-0.089	(0)

UF4	1.426e-34	1.426e-34	-33.846	-33.846	0.000	(0)
UF2+2	1.168e-34	5.126e-35	-33.932	-34.290	-0.358	(0)
UF5-	2.777e-36	2.260e-36	-35.556	-35.646	-0.089	(0)
UF6-2	6.224e-37	2.731e-37	-36.206	-36.564	-0.358	(0)
UF+3	6.494e-38	1.018e-38	-37.187	-37.992	-0.805	(0)
Fe (2)	9.932e-07					
Fe+2	7.949e-07	3.488e-07	-6.100	-6.457	-0.358	(0)
FeSO4	1.450e-07	1.450e-07	-6.839	-6.839	0.000	(0)
FeHCO3+	5.122e-08	4.396e-08	-7.291	-7.357	-0.066	(0)
FeOH+	1.983e-09	1.690e-09	-8.703	-8.772	-0.069	(0)
Fe (OH) 2	1.633e-13	1.633e-13	-12.787	-12.787	0.000	(0)
Fe (OH) 3-	7.374e-15	6.285e-15	-14.132	-14.202	-0.069	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.652	-146.652	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.097	-219.187	-0.089	(0)
Fe (3)	2.575e-05					
Fe (OH) 2+	2.313e-05	1.977e-05	-4.636	-4.704	-0.068	(0)
Fe (OH) 3	2.584e-06	2.584e-06	-5.588	-5.588	0.000	(0)
Fe (OH) 4-	3.425e-08	2.927e-08	-7.465	-7.534	-0.068	(0)
FeOH+2	7.916e-10	4.176e-10	-9.101	-9.379	-0.278	(0)
FeF2+	2.929e-11	2.497e-11	-10.533	-10.603	-0.069	(0)
FeF3	1.409e-11	1.409e-11	-10.851	-10.851	0.000	(0)
FeF+2	4.420e-12	2.332e-12	-11.355	-11.632	-0.278	(0)
FeSO4+	1.185e-13	1.010e-13	-12.926	-12.996	-0.069	(0)
Fe+3	2.334e-14	5.316e-15	-13.632	-14.274	-0.642	(0)
Fe (SO4) 2-	4.495e-15	3.659e-15	-14.347	-14.437	-0.089	(0)
FeCl+2	4.740e-16	2.501e-16	-15.324	-15.602	-0.278	(0)
Fe2 (OH) 2+4	1.558e-16	5.775e-18	-15.808	-17.238	-1.431	(0)
FeCl2+	2.042e-18	1.740e-18	-17.690	-17.759	-0.069	(0)
FeHSeO3+2	1.379e-18	6.052e-19	-17.860	-18.218	-0.358	(0)
Fe3 (OH) 4+5	2.840e-19	1.650e-21	-18.547	-20.782	-2.236	(0)
FeCl3	2.711e-22	2.711e-22	-21.567	-21.567	0.000	(0)
H (0)	3.573e-28					
H2	1.787e-28	1.799e-28	-27.748	-27.745	0.003	(0)
Hg (0)	2.948e-10					
Hg	2.948e-10	2.948e-10	-9.530	-9.530	0.000	(0)
Hg (1)	7.840e-22					
Hg2+2	3.920e-22	1.720e-22	-21.407	-21.764	-0.358	(0)
Hg (2)	5.862e-13					
HgClOH	2.877e-13	2.877e-13	-12.541	-12.541	0.000	(0)
HgCl2	2.086e-13	2.086e-13	-12.681	-12.681	0.000	(0)
Hg (OH) 2	7.973e-14	8.030e-14	-13.098	-13.095	0.003	(0)
HgCO3	5.836e-15	5.836e-15	-14.234	-14.234	0.000	(0)
HgCl3-	3.992e-15	3.249e-15	-14.399	-14.488	-0.089	(0)
Hg (CO3) 2-2	2.387e-16	1.047e-16	-15.622	-15.980	-0.358	(0)
HgCl4-2	4.592e-17	2.015e-17	-16.338	-16.696	-0.358	(0)
HgCl+	3.282e-17	2.671e-17	-16.484	-16.573	-0.089	(0)
HgHCO3+	1.104e-17	8.988e-18	-16.957	-17.046	-0.089	(0)
HgOH+	5.116e-18	4.164e-18	-17.291	-17.381	-0.089	(0)
Hg+2	1.959e-21	8.595e-22	-20.708	-21.066	-0.358	(0)
Hg (OH) 3-	1.511e-21	1.230e-21	-20.821	-20.910	-0.089	(0)
HgSO4	3.812e-22	3.812e-22	-21.419	-21.419	0.000	(0)
HgF+	1.566e-23	1.275e-23	-22.805	-22.895	-0.089	(0)
HgHS2-	0.000e+00	0.000e+00	-131.110	-131.200	-0.089	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.888	-131.888	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.467	-132.825	-0.358	(0)
K	9.597e-04					
K+	9.484e-04	8.046e-04	-3.023	-3.094	-0.071	(0)
KSO4-	1.129e-05	9.649e-06	-4.947	-5.016	-0.068	(0)
KCrO4-	1.850e-19	1.506e-19	-18.733	-18.822	-0.089	(0)
Mg	2.095e-03					
Mg+2	1.673e-03	8.667e-04	-2.777	-3.062	-0.286	(0)
MgSO4	2.671e-04	2.671e-04	-3.573	-3.573	0.000	(0)
MgHCO3+	1.049e-04	8.878e-05	-3.979	-4.052	-0.073	(0)
MgF+	4.582e-05	3.891e-05	-4.339	-4.410	-0.071	(0)
MgCO3	4.090e-06	4.090e-06	-5.388	-5.388	0.000	(0)
MgOH+	4.877e-08	4.199e-08	-7.312	-7.377	-0.065	(0)
MgH2BO3+	4.331e-09	3.618e-09	-8.363	-8.442	-0.078	(0)
Mn (2)	2.813e-05					

Mn+2	2.260e-05	9.918e-06	-4.646	-5.004	-0.358	(0)
MnSO4	2.987e-06	2.987e-06	-5.525	-5.525	0.000	(0)
MnHCO3+	2.324e-06	1.981e-06	-5.634	-5.703	-0.069	(0)
MnF+	1.853e-07	1.580e-07	-6.732	-6.801	-0.069	(0)
MnCl+	2.282e-08	1.945e-08	-7.642	-7.711	-0.069	(0)
MnOH+	3.557e-09	3.031e-09	-8.449	-8.518	-0.069	(0)
MnCl2	4.280e-11	4.280e-11	-10.369	-10.369	0.000	(0)
MnCl3-	2.155e-14	1.836e-14	-13.667	-13.736	-0.069	(0)
MnSeO4	2.691e-15	2.691e-15	-14.570	-14.570	0.000	(0)
Mn (OH) 3-	3.255e-19	2.774e-19	-18.487	-18.557	-0.069	(0)
Mn (OH) 4-2	2.066e-25	1.090e-25	-24.685	-24.963	-0.278	(0)
MnSe	2.537e-40	2.537e-40	-39.596	-39.596	0.000	(0)
Mn (3)	3.190e-25					
Mn+3	3.190e-25	7.267e-26	-24.496	-25.139	-0.642	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.629	-45.907	-0.278	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.988	-50.064	-0.076	(0)
Mo	7.150e-07					
MoO4-2	7.142e-07	3.701e-07	-6.146	-6.432	-0.286	(0)
HMoO4-	7.482e-10	6.090e-10	-9.126	-9.215	-0.089	(0)
H2MoO4	3.689e-13	3.689e-13	-12.433	-12.433	0.000	(0)
Ag2MoO4	3.974e-23	3.974e-23	-22.401	-22.401	0.000	(0)
AlMo6O21-3	5.757e-38	9.022e-39	-37.240	-38.045	-0.805	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.471	-48.691	-3.220	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.151	-49.387	-2.236	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.256	-51.687	-1.431	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-54.718	-55.523	-0.805	(0)
Na	5.359e-03					
Na+	5.284e-03	4.483e-03	-2.277	-2.348	-0.071	(0)
NaSO4-	4.772e-05	4.078e-05	-4.321	-4.390	-0.068	(0)
NaHCO3	2.523e-05	2.523e-05	-4.598	-4.598	0.000	(0)
NaF	1.132e-06	1.132e-06	-5.946	-5.946	0.000	(0)
NaCO3-	5.542e-07	4.737e-07	-6.256	-6.325	-0.068	(0)
NaH2BO3	8.553e-10	8.553e-10	-9.068	-9.068	0.000	(0)
NaCrO4-	1.379e-18	1.122e-18	-17.860	-17.950	-0.089	(0)
Ni	2.128e-07					
Ni+2	1.023e-07	5.301e-08	-6.990	-7.276	-0.286	(0)
NiHCO3+	8.038e-08	6.542e-08	-7.095	-7.184	-0.089	(0)
NiSO4	1.792e-08	1.792e-08	-7.747	-7.747	0.000	(0)
NiCO3	1.122e-08	1.122e-08	-7.950	-7.950	0.000	(0)
NiF+	6.546e-10	5.328e-10	-9.184	-9.273	-0.089	(0)
NiCl+	2.596e-10	2.113e-10	-9.586	-9.675	-0.089	(0)
NiOH+	9.978e-11	8.121e-11	-10.001	-10.090	-0.089	(0)
Ni (SO4) 2-2	2.290e-12	1.005e-12	-11.640	-11.998	-0.358	(0)
Ni (OH) 2	7.850e-13	7.850e-13	-12.105	-12.105	0.000	(0)
NiCl2	1.657e-15	1.657e-15	-14.781	-14.781	0.000	(0)
Ni (OH) 3-	1.174e-16	9.551e-17	-15.931	-16.020	-0.089	(0)
NiSeO4	2.500e-17	2.500e-17	-16.602	-16.602	0.000	(0)
O (0)	3.106e-37					
O2	1.553e-37	1.564e-37	-36.809	-36.806	0.003	(0)
Pb	3.121e-08					
PbCO3	1.769e-08	1.769e-08	-7.752	-7.752	0.000	(0)
PbHCO3+	9.477e-09	7.713e-09	-8.023	-8.113	-0.089	(0)
Pb+2	2.002e-09	1.037e-09	-8.699	-8.984	-0.286	(0)
PbSO4	8.604e-10	8.604e-10	-9.065	-9.065	0.000	(0)
Pb (CO3) 2-2	6.597e-10	2.895e-10	-9.181	-9.538	-0.358	(0)
PbOH+	3.895e-10	3.170e-10	-9.410	-9.499	-0.089	(0)
PbCl+	7.043e-11	5.732e-11	-10.152	-10.242	-0.089	(0)
PbF+	3.592e-11	2.924e-11	-10.445	-10.534	-0.089	(0)
Pb (SO4) 2-2	2.001e-11	8.782e-12	-10.699	-11.056	-0.358	(0)
Pb (OH) 2	1.220e-12	1.220e-12	-11.914	-11.914	0.000	(0)
PbCl2	3.989e-13	3.989e-13	-12.399	-12.399	0.000	(0)
PbF2	2.302e-13	2.302e-13	-12.638	-12.638	0.000	(0)
PbCl3-	3.039e-16	2.474e-16	-15.517	-15.607	-0.089	(0)
PbF3-	2.146e-16	1.747e-16	-15.668	-15.758	-0.089	(0)
Pb (OH) 3-	1.824e-16	1.484e-16	-15.739	-15.828	-0.089	(0)
Pb2OH+3	3.325e-17	5.210e-18	-16.478	-17.283	-0.805	(0)

PbCl4-2	4.014e-19	1.761e-19	-18.396	-18.754	-0.358	(0)
PbF4-2	7.622e-20	3.345e-20	-19.118	-19.476	-0.358	(0)
Pb (OH) 4-2	1.008e-20	4.423e-21	-19.997	-20.354	-0.358	(0)
Pb3 (OH) 4+2	7.016e-23	3.079e-23	-22.154	-22.512	-0.358	(0)
Pb4 (OH) 4+4	6.841e-27	2.536e-28	-26.165	-27.596	-1.431	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.858	-142.858	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.041	-216.131	-0.089	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-68.531	-68.531	0.000	(0)
HS-	0.000e+00	0.000e+00	-74.483	-74.572	-0.089	(0)
H2S	0.000e+00	0.000e+00	-74.635	-74.635	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.780	-74.870	-0.089	(0)
S5-2	0.000e+00	0.000e+00	-76.497	-76.855	-0.358	(0)
S6-2	0.000e+00	0.000e+00	-77.013	-77.371	-0.358	(0)
S4-2	0.000e+00	0.000e+00	-77.093	-77.450	-0.358	(0)
S3-2	0.000e+00	0.000e+00	-77.899	-78.256	-0.358	(0)
S2-2	0.000e+00	0.000e+00	-78.915	-79.272	-0.358	(0)
S-2	0.000e+00	0.000e+00	-84.512	-84.790	-0.278	(0)
HgHS2-	0.000e+00	0.000e+00	-131.110	-131.200	-0.089	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-131.888	-131.888	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.467	-132.825	-0.358	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.914	-139.003	-0.089	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.212	-139.404	-0.192	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.235	-140.582	-0.346	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.982	-141.312	-0.330	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.407	-141.762	-0.355	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.499	-141.589	-0.089	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.735	-142.073	-0.338	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.238	-142.238	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.661	-142.661	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.858	-142.858	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.652	-146.652	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.195	-204.285	-0.089	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.864	-213.953	-0.089	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.821	-214.910	-0.089	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.041	-216.131	-0.089	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.493	-216.851	-0.358	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.097	-219.187	-0.089	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.928	-287.286	-0.358	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.628	-289.986	-0.358	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.115	-299.473	-0.358	(0)
S (6)	4.628e-03					
SO4-2	3.269e-03	1.694e-03	-2.486	-2.771	-0.286	(0)
CaSO4	1.030e-03	1.030e-03	-2.987	-2.987	0.000	(0)
MgSO4	2.671e-04	2.671e-04	-3.573	-3.573	0.000	(0)
NaSO4-	4.772e-05	4.078e-05	-4.321	-4.390	-0.068	(0)
KSO4-	1.129e-05	9.649e-06	-4.947	-5.016	-0.068	(0)
MnSO4	2.987e-06	2.987e-06	-5.525	-5.525	0.000	(0)
ZnSO4	1.705e-07	1.705e-07	-6.768	-6.768	0.000	(0)
FeSO4	1.450e-07	1.450e-07	-6.839	-6.839	0.000	(0)
CuSO4	1.323e-07	1.323e-07	-6.878	-6.878	0.000	(0)
NiSO4	1.792e-08	1.792e-08	-7.747	-7.747	0.000	(0)
HSO4-	1.612e-08	1.369e-08	-7.793	-7.864	-0.071	(0)
CoSO4	1.241e-08	1.241e-08	-7.906	-7.906	0.000	(0)
Zn (SO4) 2-2	5.733e-09	2.516e-09	-8.242	-8.599	-0.358	(0)
CrOHSO4	2.359e-09	2.359e-09	-8.627	-8.627	0.000	(0)
CdSO4	1.965e-09	1.965e-09	-8.707	-8.707	0.000	(0)
PbSO4	8.604e-10	8.604e-10	-9.065	-9.065	0.000	(0)
AgSO4-	6.994e-10	5.693e-10	-9.155	-9.245	-0.089	(0)
Cd (SO4) 2-2	1.023e-10	4.489e-11	-9.990	-10.348	-0.358	(0)
Pb (SO4) 2-2	2.001e-11	8.782e-12	-10.699	-11.056	-0.358	(0)
AlSO4+	1.726e-11	1.466e-11	-10.763	-10.834	-0.071	(0)
CrSO4+	1.071e-11	8.719e-12	-10.970	-11.060	-0.089	(0)
Ni (SO4) 2-2	2.290e-12	1.005e-12	-11.640	-11.998	-0.358	(0)
Al (SO4) 2-	3.133e-13	2.661e-13	-12.504	-12.575	-0.071	(0)
FeSO4+	1.185e-13	1.010e-13	-12.926	-12.996	-0.069	(0)
UO2SO4	1.142e-14	1.142e-14	-13.942	-13.942	0.000	(0)
Fe (SO4) 2-	4.495e-15	3.659e-15	-14.347	-14.437	-0.089	(0)

Cr2(OH)2SO4+2	2.851e-15	1.251e-15	-14.545	-14.903	-0.358	(0)
VO2SO4-	7.965e-16	6.483e-16	-15.099	-15.188	-0.089	(0)
UO2(SO4)2-2	5.812e-16	2.550e-16	-15.236	-15.593	-0.358	(0)
Cr2(OH)2(SO4)2	1.259e-16	1.259e-16	-15.900	-15.900	0.000	(0)
VOSO4	2.495e-17	2.495e-17	-16.603	-16.603	0.000	(0)
HgSO4	3.812e-22	3.812e-22	-21.419	-21.419	0.000	(0)
CrO3SO4-2	1.312e-24	5.755e-25	-23.882	-24.240	-0.358	(0)
VSO4+	1.089e-30	8.860e-31	-29.963	-30.053	-0.089	(0)
U(SO4)2	1.157e-39	1.157e-39	-38.937	-38.937	0.000	(0)
USO4+2	1.959e-40	0.000e+00	-39.708	-40.066	-0.358	(0)
Sb(3)	1.234e-18					
Sb(OH)3	6.243e-19	6.243e-19	-18.205	-18.205	0.000	(0)
HSbO2	6.098e-19	6.098e-19	-18.215	-18.215	0.000	(0)
Sb(OH)2F	3.229e-23	3.229e-23	-22.491	-22.491	0.000	(0)
SbOF	3.177e-23	3.177e-23	-22.498	-22.498	0.000	(0)
SbO2-	1.467e-23	1.194e-23	-22.834	-22.923	-0.089	(0)
Sb(OH)4-	8.398e-24	6.835e-24	-23.076	-23.165	-0.089	(0)
Sb(OH)2+	1.541e-24	1.255e-24	-23.812	-23.902	-0.089	(0)
SbO+	5.317e-25	4.327e-25	-24.274	-24.364	-0.089	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.115	-299.473	-0.358	(0)
Sb(5)	1.530e-08					
SbO3-	1.528e-08	1.244e-08	-7.816	-7.905	-0.089	(0)
Sb(OH)6-	1.712e-11	1.452e-11	-10.767	-10.838	-0.071	(0)
SbO2+	2.999e-23	2.441e-23	-22.523	-22.612	-0.089	(0)
Se(-2)	1.435e-10					
Ag2Se	1.435e-10	1.435e-10	-9.843	-9.843	0.000	(0)
HSe-	6.308e-37	5.134e-37	-36.200	-36.290	-0.089	(0)
H2Se	3.296e-40	3.296e-40	-39.482	-39.482	0.000	(0)
MnSe	2.537e-40	2.537e-40	-39.596	-39.596	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.849	-44.207	-0.358	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-78.184	-79.614	-1.431	(0)
Se(4)	5.767e-08					
HSeO3-	5.294e-08	4.309e-08	-7.276	-7.366	-0.089	(0)
SeO3-2	4.727e-09	2.074e-09	-8.325	-8.683	-0.358	(0)
H2SeO3	1.520e-12	1.520e-12	-11.818	-11.818	0.000	(0)
AgSeO3-	2.759e-14	2.245e-14	-13.559	-13.649	-0.089	(0)
FeHSeO3+2	1.379e-18	6.052e-19	-17.860	-18.218	-0.358	(0)
Cd(SeO3)2-2	3.998e-20	1.754e-20	-19.398	-19.756	-0.358	(0)
Ag(SeO3)2-3	2.661e-21	4.170e-22	-20.575	-21.380	-0.805	(0)
Se(6)	1.948e-12					
SeO4-2	1.945e-12	1.008e-12	-11.711	-11.997	-0.286	(0)
MnSeO4	2.691e-15	2.691e-15	-14.570	-14.570	0.000	(0)
ZnSeO4	7.184e-17	7.184e-17	-16.144	-16.144	0.000	(0)
NiSeO4	2.500e-17	2.500e-17	-16.602	-16.602	0.000	(0)
CoSeO4	1.855e-17	1.855e-17	-16.732	-16.732	0.000	(0)
HSeO4-	5.134e-18	4.178e-18	-17.290	-17.379	-0.089	(0)
CdSeO4	9.287e-19	9.287e-19	-18.032	-18.032	0.000	(0)
Zn(SeO4)2-2	1.673e-28	7.342e-29	-27.776	-28.134	-0.358	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.101	-57.905	-0.805	(0)
U(4)	3.071e-22					
U(OH)5-	3.063e-22	2.493e-22	-21.514	-21.603	-0.089	(0)
U(OH)4	8.638e-25	8.638e-25	-24.064	-24.064	0.000	(0)
U(OH)3+	3.211e-28	2.613e-28	-27.493	-27.583	-0.089	(0)
U(OH)2+2	2.279e-32	9.999e-33	-31.642	-32.000	-0.358	(0)
UF3+	3.994e-33	3.250e-33	-32.399	-32.488	-0.089	(0)
UF4	1.426e-34	1.426e-34	-33.846	-33.846	0.000	(0)
UF2+2	1.168e-34	5.126e-35	-33.932	-34.290	-0.358	(0)
UF5-	2.777e-36	2.260e-36	-35.556	-35.646	-0.089	(0)
UF6-2	6.224e-37	2.731e-37	-36.206	-36.564	-0.358	(0)
UOH+3	2.487e-37	3.897e-38	-36.604	-37.409	-0.805	(0)
UF+3	6.494e-38	1.018e-38	-37.187	-37.992	-0.805	(0)
U(SO4)2	1.157e-39	1.157e-39	-38.937	-38.937	0.000	(0)
USO4+2	1.959e-40	0.000e+00	-39.708	-40.066	-0.358	(0)
U+4	0.000e+00	0.000e+00	-42.464	-43.894	-1.431	(0)
UCl+3	0.000e+00	0.000e+00	-44.197	-45.002	-0.805	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-167.045	-174.288	-7.244	(0)
U(5)	2.034e-17					

UO2+	2.034e-17	1.655e-17	-16.692	-16.781	-0.089	(0)
U(6)	1.135e-07					
UO2 (CO3) 3-4	8.739e-08	3.240e-09	-7.059	-8.489	-1.431	(0)
UO2 (CO3) 2-2	2.596e-08	1.139e-08	-7.586	-7.943	-0.358	(0)
UO2CO3	1.006e-10	1.006e-10	-9.997	-9.997	0.000	(0)
UO2F+	3.023e-13	2.460e-13	-12.520	-12.609	-0.089	(0)
UO2F2	2.839e-13	2.839e-13	-12.547	-12.547	0.000	(0)
UO2OH+	8.385e-14	6.825e-14	-13.076	-13.166	-0.089	(0)
UO2F3-	3.505e-14	2.853e-14	-13.455	-13.545	-0.089	(0)
UO2SO4	1.142e-14	1.142e-14	-13.942	-13.942	0.000	(0)
UO2+2	8.598e-15	4.455e-15	-14.066	-14.351	-0.286	(0)
UO2 (SO4) 2-2	5.812e-16	2.550e-16	-15.236	-15.593	-0.358	(0)
UO2F4-2	2.066e-16	9.066e-17	-15.685	-16.043	-0.358	(0)
UO2Cl+	1.383e-17	1.126e-17	-16.859	-16.949	-0.089	(0)
(UO2) 2 (OH) 2+2	1.762e-20	7.730e-21	-19.754	-20.112	-0.358	(0)
(UO2) 3 (OH) 5+	7.280e-24	5.925e-24	-23.138	-23.227	-0.089	(0)
V(2)	2.354e-39					
VOH+	1.601e-39	1.303e-39	-38.796	-38.885	-0.089	(0)
V+2	7.539e-40	3.308e-40	-39.123	-39.480	-0.358	(0)
V(3)	1.610e-12					
V(OH) 3	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
V(OH) 2+	1.058e-22	8.610e-23	-21.976	-22.065	-0.089	(0)
VOH+2	1.540e-25	6.758e-26	-24.812	-25.170	-0.358	(0)
V+3	7.071e-30	1.108e-30	-29.151	-29.955	-0.805	(0)
VSO4+	1.089e-30	8.860e-31	-29.963	-30.053	-0.089	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-47.978	-48.783	-0.805	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.110	-49.540	-1.431	(0)
V(4)	1.919e-15					
V(OH) 3+	1.595e-15	1.298e-15	-14.797	-14.887	-0.089	(0)
VOF+	1.577e-16	1.283e-16	-15.802	-15.892	-0.089	(0)
VO+2	1.219e-16	5.349e-17	-15.914	-16.272	-0.358	(0)
VOSO4	2.495e-17	2.495e-17	-16.603	-16.603	0.000	(0)
VOF2	1.925e-17	1.925e-17	-16.715	-16.715	0.000	(0)
VOF3-	3.358e-19	2.733e-19	-18.474	-18.563	-0.089	(0)
VOC1+	2.872e-19	2.337e-19	-18.542	-18.631	-0.089	(0)
VOF4-2	1.006e-21	4.413e-22	-20.997	-21.355	-0.358	(0)
H2V2O4+2	1.926e-25	8.451e-26	-24.715	-25.073	-0.358	(0)
V(5)	1.525e-07					
H2VO4-	1.441e-07	1.173e-07	-6.841	-6.931	-0.089	(0)
HVO4-2	8.120e-09	3.563e-09	-8.090	-8.448	-0.358	(0)
H3VO4	9.702e-11	9.702e-11	-10.013	-10.013	0.000	(0)
H3V2O7-	9.035e-11	7.353e-11	-10.044	-10.134	-0.089	(0)
HV2O7-3	9.043e-13	1.417e-13	-12.044	-12.849	-0.805	(0)
VO2+	1.889e-14	1.603e-14	-13.724	-13.795	-0.071	(0)
VO2F	1.125e-14	1.125e-14	-13.949	-13.949	0.000	(0)
V3O9-3	1.081e-14	1.694e-15	-13.966	-14.771	-0.805	(0)
VO2F2-	2.007e-15	1.634e-15	-14.697	-14.787	-0.089	(0)
VO4-3	1.378e-15	2.159e-16	-14.861	-15.666	-0.805	(0)
V2O7-4	1.244e-15	4.612e-17	-14.905	-16.336	-1.431	(0)
VO2SO4-	7.965e-16	6.483e-16	-15.099	-15.188	-0.089	(0)
VO2F3-2	1.858e-17	8.153e-18	-16.731	-17.089	-0.358	(0)
V4O12-4	2.235e-18	8.288e-20	-17.651	-19.082	-1.431	(0)
VO2F4-3	1.024e-20	1.605e-21	-19.990	-20.795	-0.805	(0)
HV10O28-5	0.000e+00	0.000e+00	-45.388	-47.623	-2.236	(0)
V10O28-6	0.000e+00	0.000e+00	-45.508	-48.728	-3.220	(0)
H2V10O28-4	0.000e+00	0.000e+00	-48.067	-49.498	-1.431	(0)
Zn	1.407e-06					
Zn+2	8.880e-07	4.601e-07	-6.052	-6.337	-0.286	(0)
ZnHCO3+	1.790e-07	1.456e-07	-6.747	-6.837	-0.089	(0)
ZnSO4	1.705e-07	1.705e-07	-6.768	-6.768	0.000	(0)
ZnCO3	1.502e-07	1.502e-07	-6.823	-6.823	0.000	(0)
ZnOH+	6.879e-09	5.599e-09	-8.162	-8.252	-0.089	(0)
Zn (SO4) 2-2	5.733e-09	2.516e-09	-8.242	-8.599	-0.358	(0)
ZnF+	4.513e-09	3.673e-09	-8.346	-8.435	-0.089	(0)
ZnCl+	2.128e-09	1.800e-09	-8.672	-8.745	-0.073	(0)
ZnOHC1	2.868e-10	2.868e-10	-9.542	-9.542	0.000	(0)
Zn(OH) 2	1.080e-10	1.080e-10	-9.967	-9.967	0.000	(0)
ZnCl2	4.445e-12	4.445e-12	-11.352	-11.352	0.000	(0)

Zn(OH) 3-	8.091e-14	6.585e-14	-13.092	-13.181	-0.089	(0)
ZnCl3-	6.502e-15	5.500e-15	-14.187	-14.260	-0.073	(0)
ZnSeO4	7.184e-17	7.184e-17	-16.144	-16.144	0.000	(0)
ZnCl4-2	8.121e-18	4.284e-18	-17.090	-17.368	-0.278	(0)
Zn(OH) 4-2	7.270e-19	3.190e-19	-18.138	-18.496	-0.358	(0)
Zn(SeO4) 2-2	1.673e-28	7.342e-29	-27.776	-28.134	-0.358	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-141.499	-141.589	-0.089	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-142.661	-142.661	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-213.864	-213.953	-0.089	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-216.493	-216.851	-0.358	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-289.628	-289.986	-0.358	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.82	-83.04	-36.22	Ag2S
Ag2CO3	-9.70	-20.79	-11.09	Ag2CO3
Ag2CrO4	-20.25	-31.84	-11.59	Ag2CrO4
Ag2HVO4	-9.58	-8.10	1.48	Ag2HVO4
Ag2MoO4	-10.43	-21.98	-11.55	Ag2MoO4
Ag2O	-13.96	-1.38	12.57	Ag2O
Ag2Se	3.95	-44.75	-48.70	Ag2Se
Ag2SeO3	-8.68	-15.83	-7.15	Ag2SeO3
Ag2SeO4	-18.63	-27.54	-8.91	Ag2SeO4
Ag2SO4	-13.50	-18.32	-4.82	Ag2SO4
Ag3AsO3	-22.75	-20.59	2.16	Ag3AsO3
Ag3AsO4	-12.11	-14.89	-2.79	Ag3AsO4
Ag3H2VO5	-13.97	-8.79	5.18	Ag3H2VO5
AgF:4H2O	-12.22	-11.17	1.05	AgF:4H2O
Agmetal	0.52	-12.99	-13.51	Ag
AgVO3	-8.17	-7.40	0.77	AgVO3
Al(OH) 3 (am)	-1.51	9.29	10.80	Al(OH) 3
Al2(MoO4) 3	-45.57	-43.20	2.37	Al2(MoO4) 3
Al2O3	-1.06	18.59	19.65	Al2O3
Al4(OH) 10SO4	-2.46	20.24	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-8.33	-3.53	4.80	AlAsO4:2H2O
AlOHSO4	-4.41	-7.64	-3.23	AlOHSO4
AlSb	-148.32	-82.69	65.62	AlSb
Alunite	-0.60	-2.00	-1.40	KA13(SO4) 2(OH) 6
Anglesite	-3.97	-11.76	-7.79	PbSO4
Anhydrite	-0.99	-5.35	-4.36	CaSO4
Anilite	-50.72	-82.59	-31.88	Cu0.25Cu1.5S
Antlerite	-2.63	6.16	8.79	Cu3(OH) 4SO4
Aragonite	0.48	-7.82	-8.30	CaCO3
Arsenolite	-71.31	-74.07	-2.76	As4O6
Artinite	-6.81	2.79	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-32.35	-25.64	6.71	As2O5
Atacamite	-1.89	5.50	7.39	Cu2(OH) 3Cl
Azurite	1.18	-15.73	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-16.29	8.10	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-13.09	2.78	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	7.58	-1.33	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-22.05	10.89	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-12.69	-22.36	-9.67	BaCrO4
BaF2	-7.04	-12.86	-5.82	BaF2
BaMoO4	-5.53	-12.49	-6.96	BaMoO4
Barite	1.15	-8.83	-9.98	BaSO4
BaS	-89.73	-73.55	16.18	BaS
BaSeO3	-8.17	-6.34	1.83	BaSeO3
BaSeO4	-10.60	-18.06	-7.46	BaSeO4
Bianchite	-7.34	-9.11	-1.76	ZnSO4:6H2O
Birnessite	-9.69	8.41	18.09	MnO2
Bixbyite	-7.14	-7.78	-0.64	Mn2O3
BlaubleiI	-50.95	-75.11	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.28	-78.56	-27.28	Cu0.6Cu0.8S
Boehmite	0.72	9.29	8.58	AlOOH
Breithauptite	-54.28	-72.80	-18.52	NiSb

Brochantite	-1.37	13.85	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.74	11.10	16.84	Mg(OH) ₂
Bunsenite	-5.56	6.89	12.45	NiO
Ca(VO ₃) ₂	-7.50	-1.84	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-7.75	9.75	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-11.80	9.75	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-13.18	9.12	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-17.62	21.34	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-18.52	21.34	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-292.18	-149.21	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.61	-18.87	-2.27	CaCrO ₄
Calcite	0.66	-7.82	-8.48	CaCO ₃
Calomel	-9.47	-27.38	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.06	-9.01	-7.95	CaMoO ₄
Carnotite	-3.14	-2.91	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.67	-2.86	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.55	-14.57	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.51	-3.67	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.79	5.86	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.87	5.86	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.00	-16.29	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.92	0.64	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.90	6.50	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.26	-13.92	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.23	-13.92	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.01	-13.92	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-13.89	-15.10	-1.21	CdF ₂
Cdmetal(alpha)	-32.25	-18.74	13.51	Cd
Cdmetal(gamma)	-32.35	-18.74	13.62	Cd
CdMoO ₄	-0.59	-14.74	-14.15	CdMoO ₄
CdOHCl	-7.57	-4.03	3.54	CdOHCl
CdSb	-73.48	-73.83	-0.35	CdSb
CdSe	-17.31	-37.51	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.45	-20.30	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.90	-11.08	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.35	-11.08	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.20	-11.08	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.10	-14.23	-13.13	PbCO ₃
CH ₄ (g)	-76.74	-117.79	-41.05	CH ₄
Chalcanthite	-6.60	-9.24	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-50.55	-85.47	-34.92	Cu ₂ S
Chalcopyrite	-112.63	-147.90	-35.27	CuFeS ₂
Cinnabar	-49.06	-94.75	-45.69	HgS
Claudetite	-71.00	-74.07	-3.06	As ₄ O ₆
Clausthalite	-11.09	-38.19	-27.10	PbSe
Co(BO ₂) ₂	-29.87	-2.80	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.36	6.73	13.09	Co(OH) ₂
Co(OH) ₃	-11.06	-13.37	-2.31	Co(OH) ₃
CO ₂ (g)	-1.26	-19.41	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-18.49	-5.45	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-9.52	-20.02	-10.50	Co ₃ O ₄
CoCl ₂	-21.32	-13.05	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.59	-13.05	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.70	-12.68	-9.98	CoCO ₃
CoF ₂	-12.63	-14.23	-1.60	CoF ₂
CoF ₃	-43.36	-44.81	-1.46	CoF ₃
CoFe ₂ O ₄	24.20	20.67	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.11	-13.87	-7.76	CoMoO ₄
CoO	-6.86	6.73	13.59	CoO
CoS(alpha)	-67.48	-74.92	-7.44	CoS
CoS(beta)	-63.85	-74.92	-11.07	CoS
CoSe	-20.44	-36.64	-16.20	CoSe
CoSeO ₃	-9.04	-7.72	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-17.90	-19.43	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-13.01	-10.21	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.74	-10.21	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-9.82	-14.60	-4.78	PbCl ₂

Covellite	-51.66	-73.96	-22.30	CuS
Cr(OH)2	-20.15	-9.33	10.82	Cr(OH)2
Cr(OH)3	-1.31	0.02	1.34	Cr(OH)3
Cr(OH)3(am)	0.77	0.02	-0.75	Cr(OH)3
Cr2O3	2.40	0.04	-2.36	Cr2O3
CrCl2	-43.20	-29.11	14.09	CrCl2
CrCl3	-44.76	-29.65	15.11	CrCl3
CrF3	-20.08	-31.42	-11.34	CrF3
Crmetal	-64.41	-33.92	30.48	Cr
CrO3	-27.25	-30.46	-3.21	CrO3
Cryolite	-5.55	-39.39	-33.84	Na3AlF6
Cu(OH)2	-0.98	7.70	8.67	Cu(OH)2
Cu(SbO3)2	-24.73	20.48	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-51.32	-86.20	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-1.39	-47.19	-45.80	Cu2Se
Cu2SO4	-18.81	-20.76	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-8.65	-2.55	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-55.12	-97.72	-42.59	Cu3Sb
Cu3Se2	-19.37	-82.87	-63.49	Cu3Se2
CuCO3	-0.21	-11.71	-11.50	CuCO3
CuCrO4	-17.33	-22.77	-5.44	CuCrO4
CuF	-7.48	-12.39	-4.91	CuF
CuF2	-14.38	-13.26	1.12	CuF2
CuF2:2H2O	-8.71	-13.26	-4.55	CuF2:2H2O
Cumetal	-5.45	-14.21	-8.76	Cu
CuMoO4	0.18	-12.90	-13.08	CuMoO4
CuOCuSO4	-11.84	-1.54	10.30	CuOCuSO4
Cupricferrite	15.65	21.64	5.99	CuFe2O4
Cuprite	-2.41	-3.82	-1.41	Cu2O
Cuprousferrite	13.98	5.06	-8.92	CuFeO2
CuSe	-2.57	-35.67	-33.10	CuSe
CuSe2	-21.09	-54.45	-33.37	CuSe2
CuSeO3:2H2O	-7.26	-6.75	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.03	-18.47	-2.44	CuSeO4:5H2O
CuSO4	-12.18	-9.24	2.94	CuSO4
Diaspore	2.42	9.29	6.87	AlOOH
Djurleite	-50.79	-84.71	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.41	-16.13	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.96	-16.13	-17.09	CaMg(CO3)2
Epsomite	-3.71	-5.84	-2.13	MgSO4:7H2O
Fe(OH)2	-5.86	7.71	13.56	Fe(OH)2
Fe(OH)2:7Cl.3	7.05	4.01	-3.04	Fe(OH)2:7Cl.3
Fe(VO3)2	-2.00	-5.72	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.06	-0.50	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-8.77	-29.40	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.13	-36.86	-3.73	Fe2(SO4)3
Fe3(OH)8	1.43	21.65	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.25	-5.85	0.40	FeAsO4:2H2O
FeCr2O4	0.55	7.75	7.20	FeCr2O4
FeMoO4	-2.80	-12.89	-10.09	FeMoO4
Ferrihydrite	3.78	6.97	3.19	Fe(OH)3
Ferroselite	-35.85	-54.44	-18.60	FeSe2
FeS(ppt)	-71.00	-73.95	-2.95	FeS
FeSe	-24.66	-35.66	-11.00	FeSe
Fluorite	1.13	-9.37	-10.50	CaF2
Galena	-62.50	-76.47	-13.97	PbS
Gibbsite	1.00	9.29	8.29	Al(OH)3
Goethite	6.48	6.97	0.49	FeOOH
Goslarite	-7.10	-9.11	-2.01	ZnSO4:7H2O
Greenockite	-61.44	-75.80	-14.36	CdS
Greigite	-259.93	-304.96	-45.03	Fe3S4
Gummite	-7.86	-0.19	7.67	UO3
Gypsum	-0.74	-5.35	-4.61	CaSO4:2H2O
H-Jarosite	-0.85	-12.95	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.72	-20.60	-12.88	H2MoO4
H2S(g)	-73.64	-81.65	-8.01	H2S
H2Se(g)	-38.41	-43.37	-4.96	H2Se
Halite	-6.76	-5.16	1.60	NaCl

Hausmannite	-8.95	52.08	61.03	Mn3O4
Hematite	15.36	13.95	-1.42	Fe2O3
Hercynite	3.40	26.30	22.89	FeAl2O4
Hg (CH3) 2 (g)	-174.97	-248.67	-73.71	Hg (CH3) 2
Hg (g)	-8.22	-16.10	-7.87	Hg
Hg (OH) 2	-9.60	-13.10	-3.50	Hg (OH) 2
Hg2 (g)	-17.24	-32.19	-14.96	Hg2
Hg2 (OH) 2	-12.86	-7.60	5.26	Hg2 (OH) 2
Hg2CO3	-10.96	-27.01	-16.05	Hg2CO3
Hg2CrO4	-29.36	-38.06	-8.70	Hg2CrO4
Hg2F2	-18.20	-28.56	-10.36	Hg2F2
Hg2S	-77.58	-89.25	-11.68	Hg2S
Hg2SeO3	-17.39	-22.05	-4.66	Hg2SeO3
Hg2SO4	-18.41	-24.54	-6.13	Hg2SO4
Hg3O2CO3	-29.01	-58.70	-29.68	Hg3O2CO3
HgCl (g)	-33.19	-13.69	19.50	HgCl
HgCl2	-11.61	-32.87	-21.26	HgCl2
HgF (g)	-46.96	-14.28	32.68	HgF
HgF2 (g)	-46.62	-34.06	12.57	HgF2
Hgmetal (l)	-2.65	-16.10	-13.45	Hg
HgSe	-0.77	-56.47	-55.69	HgSe
HgSeO3	-15.11	-27.54	-12.43	HgSeO3
HgSO4	-20.61	-30.03	-9.42	HgSO4
Huntite	-2.78	-32.75	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.51	-23.28	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.37	-22.13	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.42	-20.59	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	5.83	-8.97	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.71	-52.95	-17.24	K2Cr2O7
K2CrO4	-21.97	-22.49	-0.51	K2CrO4
K2MoO4	-15.88	-12.62	3.26	K2MoO4
K2SeO4	-17.46	-18.19	-0.73	K2SeO4
Langite	-3.64	13.85	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.14	-6.57	-0.43	PbO : PbSO4
Laurionite	-5.33	-4.71	0.62	PbOHCl
Lepidocrocite	5.60	6.97	1.37	FeOOH
Lime	-21.11	11.59	32.70	CaO
Litharge	-7.51	5.18	12.69	PbO
Mackinawite	-70.35	-73.95	-3.60	FeS
Maghemite	7.56	13.95	6.39	Fe2O3
Magnesioferrite	8.19	25.05	16.86	Fe2MgO4
Magnesite	-0.85	-8.31	-7.46	MgCO3
Magnetite	18.25	21.65	3.40	Fe3O4
Malachite	1.29	-4.02	-5.31	Cu2 (OH) 2CO3
Manganite	-3.88	21.46	25.34	MnOOH
Massicot	-7.71	5.18	12.89	PbO
Matlockite	-6.22	-15.19	-8.97	PbClF
Melanothallite	-18.34	-12.08	6.26	CuCl2
Melanterite	-7.02	-9.23	-2.21	FeSO4 : 7H2O
Metacinnabar	-49.66	-94.75	-45.09	HgS
Mg (OH) 2 (active)	-7.69	11.10	18.79	Mg (OH) 2
Mg (VO3) 2	-13.60	-2.32	11.28	Mg (VO3) 2
Mg2Sb3	-266.96	-192.27	74.68	Mg2Sb3
Mg2V2O7	-17.58	8.78	26.36	Mg2V2O7
MgCr2O4	-5.06	11.15	16.20	MgCr2O4
MgCrO4	-24.74	-19.36	5.38	MgCrO4
MgF2	-1.73	-9.86	-8.13	MgF2
MgMoO4	-7.64	-9.49	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.40	-3.35	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.86	-15.06	-1.20	MgSeO4 : 6H2O
Minium	-33.39	40.14	73.52	Pb3O4
Mirabilite	-6.36	-7.47	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.16	-4.26	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.88	-58.59	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.04	-85.96	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.66	1.84	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.33	-10.62	2.72	MnCl2 : 4H2O
MnS (grn)	-72.66	-72.49	0.17	MnS

MnS (pnk)	-75.83	-72.49	3.34	MnS
MnSb	-92.97	-95.88	-2.91	MnSb
MnSe	-37.71	-34.21	3.50	MnSe
MnSeO3	-6.42	-5.29	1.13	MnSeO3
MnSeO3:2H2O	-6.27	-5.29	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.95	-17.00	-2.05	MnSeO4:5H2O
MnSO4	-10.36	-7.77	2.58	MnSO4
Monteponite	-9.24	5.86	15.10	CdO
Montroydite	-9.46	-13.10	-3.64	HgO
MoO3	-12.60	-20.60	-8.00	MoO3
Morenosite	-7.90	-10.05	-2.14	NiSO4:7H2O
MoS2	-138.24	-208.50	-70.26	MoS2
Na-Jarosite	2.98	-8.22	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.56	-51.46	-9.90	Na2Cr2O7
Na2CrO4	-23.92	-20.99	2.93	Na2CrO4
Na2Mo2O7	-15.13	-31.72	-16.60	Na2Mo2O7
Na2MoO4	-12.62	-11.13	1.49	Na2MoO4
Na2MoO4:2H2O	-12.35	-11.13	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.28	-4.98	10.30	Na2SeO3:5H2O
Na2SeO4	-17.97	-16.69	1.28	Na2SeO4
Na3Sb	-172.24	-77.79	94.45	Na3Sb
Na3VO4	-29.19	7.49	36.68	Na3VO4
Na4V2O7	-31.89	5.51	37.40	Na4V2O7
Nantokite	-5.07	-11.80	-6.73	CuCl
NaSb	-85.83	-62.66	23.17	NaSb
Natron	-8.63	-9.95	-1.31	Na2CO3:10H2O
NaVO3	-5.84	-1.98	3.86	NaVO3
Nesquehonite	-3.64	-8.31	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.91	6.89	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-20.68	-4.98	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-21.38	10.62	32.00	Ni4 (OH) 6SO4
NiCO3	-5.65	-12.52	-6.87	NiCO3
NiMoO4	-2.57	-13.71	-11.14	NiMoO4
NiS (alpha)	-69.17	-74.77	-5.60	NiS
NiS (beta)	-63.67	-74.77	-11.10	NiS
NiS (gamma)	-61.97	-74.77	-12.80	NiS
NiSe	-18.78	-36.48	-17.70	NiSe
NiSeO3:2H2O	-10.37	-7.56	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.75	-19.27	-1.52	NiSeO4:6H2O
Nsutite	-9.10	8.41	17.50	MnO2
O2 (g)	-33.90	49.19	83.09	O2
Orpiment	-220.93	-282.00	-61.07	As2S3
Otavite	-1.55	-13.55	-12.00	CdCO3
Pb (BO2) 2	-10.87	-4.35	6.52	Pb (BO2) 2
Pb (OH) 2	-2.97	5.18	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-55.90	-64.66	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.32	0.47	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.83	10.36	26.19	Pb2O (OH) 2
Pb2O3	-26.08	34.96	61.04	Pb2O3
Pb2OCO3	-8.49	-9.05	-0.56	Pb2OCO3
Pb2V2O7	-1.16	-3.06	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-15.90	-10.10	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.02	2.12	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.89	-3.87	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.39	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.31	3.79	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.09	3.79	21.88	Pb4O3SO4
PbCrO4	-12.68	-25.28	-12.60	PbCrO4
PbF2	-8.34	-15.78	-7.44	PbF2
Pbmetal	-23.66	-19.41	4.25	Pb
PbMoO4	0.20	-15.42	-15.62	PbMoO4
PbO:0.3H2O	-7.80	5.18	12.98	PbO:0.33H2O
PbSeO4	-14.14	-20.98	-6.84	PbSeO4
Periclase	-10.48	11.10	21.58	MgO
Phosgenite	-9.02	-28.83	-19.81	PbCl2:PbCO3
Plattnerite	-19.82	29.78	49.60	PbO2
Portlandite	-11.22	11.59	22.80	Ca (OH) 2
Pyrite	-112.50	-131.01	-18.51	FeS2

Pyrochroite	-6.03	9.16	15.19	Mn(OH)2
Pyrolusite	-7.62	33.76	41.38	MnO2
Realgar	-92.72	-112.47	-19.75	AsS
Retgersite	-8.01	-10.05	-2.04	NiSO4:6H2O
Rhodochrosite	0.33	-10.25	-10.58	MnCO3
Rutherfordine	-5.10	-19.60	-14.50	UO2CO3
Sb(OH)3	-11.09	-18.20	-7.11	Sb(OH)3
Sb2O4	-15.22	-11.81	3.40	Sb2O4
Sb2O5	-26.17	-35.84	-9.67	Sb2O5
Sb2Se3	-98.77	-166.52	-67.76	Sb2Se3
Sb4O6(cubic)	-54.56	-72.82	-18.26	Sb4O6
Sb4O6(orth)	-54.92	-72.82	-17.90	Sb4O6
SbCl3	-48.45	-47.87	0.57	SbCl3
SbF3	-39.42	-49.64	-10.23	SbF3
Sbmetal	-43.41	-55.10	-11.69	Sb
SbO2	-2.39	-30.22	-27.82	SbO2
Schoepite	-6.18	-0.19	5.99	UO2(OH)2:H2O
Semetal(am)	-11.67	-18.78	-7.11	Se
Semetal(hex)	-11.07	-18.78	-7.71	Se
Senarmontite	-24.04	-36.41	-12.37	Sb2O3
SeO2	-14.57	-14.45	0.12	SeO2
SeO3	-47.21	-26.16	21.04	SeO3
Siderite	-1.46	-11.70	-10.24	FeCO3
Smithsonite	-1.58	-11.58	-10.00	ZnCO3
Sphalerite	-62.38	-73.83	-11.45	ZnS
Spinel	-7.16	29.69	36.85	MgAl2O4
Stibnite	-230.91	-281.37	-50.46	Sb2S3
Sulfur	-54.91	-57.06	-2.14	S
Tenorite	0.05	7.70	7.64	CuO
Thenardite	-7.79	-7.47	0.32	Na2SO4
Thermonatrite	-10.58	-9.94	0.64	Na2CO3:H2O
Tyuyamunite	-6.29	-2.21	4.08	Ca(UO2)2(VO4)2
U3O8	-18.59	2.49	21.08	U3O8
U3Sb4	-567.03	-414.65	152.38	U3Sb4
U4O9	-34.65	-37.67	-3.02	U4O9
UF4	-27.95	-57.49	-29.54	UF4
UF4:2.5H2O	-24.77	-57.49	-32.72	UF4:2.5H2O
UO2(am)	-16.50	-15.57	0.93	UO2
UO2(OH)2(beta)	-5.80	-0.19	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.10	-26.35	-2.25	UO2SeO4:4H2O
UO3	-7.89	-0.19	7.70	UO3
Uraninite	-10.90	-15.57	-4.67	UO2
USb2	-213.74	-184.16	29.58	USb2
V(OH)3	-16.30	-8.71	7.59	V(OH)3
V2O5	-12.07	-13.43	-1.36	V2O5
V3O5	-32.75	-30.92	1.84	V3O5
V4O7	-40.21	-33.02	7.19	V4O7
V6O13	-28.61	-89.47	-60.86	V6O13
Valentinite	-27.93	-36.41	-8.48	Sb2O3
VC12	-59.66	-40.79	18.87	VC12
VC13	-61.81	-38.38	23.43	VC13
VF4	-58.96	-44.03	14.93	VF4
Vmetal	-89.63	-45.60	44.03	V
VO	-35.76	-21.01	14.76	VO
VO(OH)2	-7.26	-2.11	5.15	VO(OH)2
VO2Cl	-19.44	-16.60	2.84	VO2Cl
VOC1	-29.75	-18.60	11.15	VOC1
VOC12	-34.65	-21.89	12.76	VOC12
VOSO4	-22.65	-19.04	3.61	VOSO4
Witherite	-2.74	-11.31	-8.57	BaCO3
Wurtzite	-64.88	-73.83	-8.95	ZnS
Zincite	-3.51	7.83	11.33	ZnO
Zincosite	-13.04	-9.11	3.93	ZnSO4
Zn(BO2)2	-9.99	-1.70	8.29	Zn(BO2)2
Zn(OH)2	-4.37	7.83	12.20	Zn(OH)2
Zn(OH)2(am)	-4.65	7.83	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.93	7.83	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.71	7.83	11.53	Zn(OH)2

Zn(OH)2(gamma)	-3.91	7.83	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.78	-1.28	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.43	5.76	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-15.81	-2.16	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-29.30	-10.39	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-14.03	14.37	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-19.14	19.36	38.50	Zn5(OH)8Cl2
ZnCl2	-19.00	-11.95	7.05	ZnCl2
ZnCO3·1H2O	-1.32	-11.58	-10.26	ZnCO3·1H2O
ZnF2	-12.60	-13.13	-0.53	ZnF2
Znmetal	-42.56	-16.77	25.79	Zn
ZnMoO4	-2.64	-12.77	-10.13	ZnMoO4
ZnO(active)	-3.36	7.83	11.19	ZnO
ZnS(am)	-64.77	-73.83	-9.05	ZnS
ZnSb	-82.88	-71.86	11.01	ZnSb
ZnSe	-21.14	-35.54	-14.40	ZnSe
ZnSeO4·6H2O	-16.82	-18.34	-1.52	ZnSeO4·6H2O
ZnSO4·1H2O	-8.47	-9.11	-0.64	ZnSO4·1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 22.

Title Precipitate oversaturated phases in groundwater
PHASES

```

Fix_pe
e--e-
log_k      0
EQUILIBRIUM_PHASES 101
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3·2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0

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Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
Sb2O3 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 102
SAVE Solution 103 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 101
END

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TITLE
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```

Precipitate oversaturated phases in groundwater

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 102. Solution after simulation 21.
Using pure phase assemblage 101.

```

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.669e-08	2.669e-08
Alunite	0.00	-1.40	-1.40	0.000e+00	1.468e-06	1.468e-06
Anhydrite	-1.24	-5.60	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.218e-08	2.218e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.624e-06	1.624e-06
Brochantite	0.00	15.22	15.22	0.000e+00	2.653e-07	2.653e-07
Brucite	-5.60	11.24	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	4.896e-03
CaMoO4	-1.81	-9.76	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.21	-3.40	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	3.722e-03	3.722e-03
Carnotite	-1.99	-1.76	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.39	-3.55	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.98	-15.13	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	0.000e+00	6.012e-08	6.012e-08
Cu2Se(alpha)	-4.80	-50.60	-45.80	0.000e+00	0	0.000e+00

CuMoO4	0.00	-13.08	-13.08	0.000e+00	4.624e-07	4.624e-07
Epsomite	-3.59	-5.72	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	2.678e-05	2.678e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.700e-04	1.700e-04
Gummite	-6.73	0.94	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.99	-5.60	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.98	-58.68	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.26	-7.37	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.56	-5.43	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.66	7.13	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-24.15	-8.45	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.84	-12.71	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.85	-13.99	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.092e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	5.095e-09	5.095e-09
Rutherfordine	-4.39	-18.89	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.90	-30.73	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.05	0.94	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.34	-0.26	4.08	0.000e+00	0	0.000e+00
U3O8	-16.15	4.93	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.67	0.94	5.61	0.000e+00	0	0.000e+00
UO3	-6.76	0.94	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.99	-13.12	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.007e-08	3.011e-08
Al	1.485e-06	1.487e-06
As	3.920e-10	3.926e-10
B	1.719e-05	1.722e-05
Ba	9.333e-08	9.347e-08
C	5.729e-03	5.737e-03
Ca	2.878e-03	2.883e-03
Cd	1.336e-08	1.338e-08
Cl	1.836e-03	1.839e-03
Co	1.356e-07	1.359e-07
Cr	6.780e-09	6.790e-09
Cu	1.150e-05	1.151e-05
F	2.086e-04	2.090e-04
Fe	3.811e-09	3.816e-09
Hg	2.954e-10	2.958e-10
K	9.581e-04	9.596e-04
Mg	2.095e-03	2.098e-03
Mn	2.812e-05	2.816e-05
Mo	2.481e-07	2.484e-07
Na	5.358e-03	5.366e-03
Ni	2.128e-07	2.131e-07
Pb	2.612e-08	2.615e-08
S	4.623e-03	4.630e-03
Sb	1.529e-08	1.532e-08
Se	3.116e-08	3.120e-08
U	1.134e-07	1.136e-07
V	1.525e-07	1.528e-07
Zn	1.407e-06	1.409e-06

-----Description of solution-----

	pH =	7.133	Charge balance
	pe =	5.639	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	2.169e-02	

Mass of water (kg) = 1.002e+00
 Total alkalinity (eq/kg) = 5.058e-03
 Total CO2 (mol/kg) = 5.729e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = -3.120e-17
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = -0.00
 Iterations = 17
 Total H = 1.111869e+02
 Total O = 5.562598e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.586e-07	1.368e-07	-6.800	-6.864	-0.064	(0)
H+	8.489e-08	7.357e-08	-7.071	-7.133	-0.062	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	3.007e-08					
AgCl	1.958e-08	1.958e-08	-7.708	-7.708	0.000	(0)
Ag+	6.955e-09	6.028e-09	-8.158	-8.220	-0.062	(0)
AgCl2-	3.226e-09	2.714e-09	-8.491	-8.566	-0.075	(0)
AgSO4-	2.920e-10	2.456e-10	-9.535	-9.610	-0.075	(0)
AgCl3-2	7.687e-12	3.848e-12	-11.114	-11.415	-0.300	(0)
AgF	2.426e-12	2.426e-12	-11.615	-11.615	0.000	(0)
AgOH	8.247e-14	8.247e-14	-13.084	-13.084	0.000	(0)
AgCl4-3	5.929e-14	1.250e-14	-13.227	-13.903	-0.676	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgH2BO3	1.290e-14	1.290e-14	-13.889	-13.889	0.000	(0)
AgSeO3-	5.985e-15	5.034e-15	-14.223	-14.298	-0.075	(0)
Ag (OH) 2-	1.311e-18	1.103e-18	-17.882	-17.958	-0.075	(0)
Ag (SeO3) 2-3	2.778e-22	5.857e-23	-21.556	-22.232	-0.676	(0)
Ag2MoO4	1.923e-24	1.923e-24	-23.716	-23.716	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.747	-72.747	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.914	-86.116	-1.202	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.914	-146.989	-0.075	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.165	-147.340	-0.174	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.319	-149.646	-0.327	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.644	-149.957	-0.313	(0)
Al	1.485e-06					
Al (OH) 4-	9.898e-07	8.587e-07	-6.004	-6.066	-0.062	(0)
AlF3	2.532e-07	2.532e-07	-6.597	-6.597	0.000	(0)
AlF2+	1.440e-07	1.255e-07	-6.842	-6.901	-0.060	(0)
Al (OH) 3	4.986e-08	4.986e-08	-7.302	-7.302	0.000	(0)
AlF4-	2.343e-08	2.033e-08	-7.630	-7.692	-0.062	(0)
Al (OH) 2+	2.095e-08	1.826e-08	-7.679	-7.738	-0.060	(0)
AlF+2	3.406e-09	1.968e-09	-8.468	-8.706	-0.238	(0)
AlOH+2	2.909e-10	1.681e-10	-9.536	-9.775	-0.238	(0)
AlSO4+	2.244e-11	1.947e-11	-10.649	-10.711	-0.062	(0)
Al+3	4.454e-12	1.228e-12	-11.351	-11.911	-0.559	(0)
Al (SO4) 2-	4.911e-13	4.261e-13	-12.309	-12.371	-0.062	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.168	-40.844	-0.676	(0)
As (3)	2.736e-22					
H3AsO3	2.714e-22	2.714e-22	-21.566	-21.566	0.000	(0)
H2AsO3-	2.249e-24	1.892e-24	-23.648	-23.723	-0.075	(0)
HAsO3-2	4.684e-29	2.345e-29	-28.329	-28.630	-0.300	(0)
H4AsO3+	1.176e-29	9.891e-30	-28.930	-29.005	-0.075	(0)
AsO3-3	5.827e-35	1.229e-35	-34.235	-34.911	-0.676	(0)
As (5)	3.920e-10					
HAsO4-2	2.801e-10	1.402e-10	-9.553	-9.853	-0.300	(0)
H2AsO4-	1.119e-10	9.409e-11	-9.951	-10.026	-0.075	(0)
AsO4-3	2.859e-14	6.027e-15	-13.544	-14.220	-0.676	(0)
H3AsO4	1.197e-15	1.203e-15	-14.922	-14.920	0.002	(0)
B	1.719e-05					
H3BO3	1.702e-05	1.710e-05	-4.769	-4.767	0.002	(0)
H2BO3-	1.575e-07	1.350e-07	-6.803	-6.870	-0.067	(0)
CaH2BO3+	1.117e-08	9.571e-09	-7.952	-8.019	-0.067	(0)
MgH2BO3+	5.160e-09	4.422e-09	-8.287	-8.354	-0.067	(0)

	BF(OH) 3-	1.276e-09	1.093e-09	-8.894	-8.961	-0.067	(0)
	NaH2BO3	9.808e-10	9.808e-10	-9.008	-9.008	0.000	(0)
	H5 (BO3) 2-	2.293e-12	1.965e-12	-11.640	-11.707	-0.067	(0)
	BF2(OH) 2-	1.608e-12	1.378e-12	-11.794	-11.861	-0.067	(0)
	BaH2BO3+	2.496e-13	2.139e-13	-12.603	-12.670	-0.067	(0)
	AgH2BO3	1.290e-14	1.290e-14	-13.889	-13.889	0.000	(0)
	H8 (BO3) 3-	3.922e-15	3.361e-15	-14.406	-14.474	-0.067	(0)
	BF3OH-	7.378e-18	6.323e-18	-17.132	-17.199	-0.067	(0)
	BF4-	4.281e-22	3.669e-22	-21.368	-21.435	-0.067	(0)
Ba		9.333e-08					
	Ba+2	9.090e-08	5.128e-08	-7.041	-7.290	-0.249	(0)
	BaHCO3+	2.362e-09	2.066e-09	-8.627	-8.685	-0.058	(0)
	BaCO3	7.069e-11	7.069e-11	-10.151	-10.151	0.000	(0)
	BaH2BO3+	2.496e-13	2.139e-13	-12.603	-12.670	-0.067	(0)
	BaOH+	3.520e-14	3.062e-14	-13.453	-13.514	-0.060	(0)
C (4)		5.729e-03					
	HCO3-	4.838e-03	4.218e-03	-2.315	-2.375	-0.060	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.106e-04	9.676e-05	-3.956	-4.014	-0.058	(0)
	MgHCO3+	4.714e-05	4.078e-05	-4.327	-4.390	-0.063	(0)
	NaHCO3	1.087e-05	1.087e-05	-4.964	-4.964	0.000	(0)
	CuCO3	9.500e-06	9.500e-06	-5.022	-5.022	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.765e-06	2.688e-06	-5.322	-5.571	-0.249	(0)
	MgCO3	2.112e-06	2.112e-06	-5.675	-5.675	0.000	(0)
	MnHCO3+	1.103e-06	9.593e-07	-5.958	-6.018	-0.060	(0)
	NaCO3-	2.631e-07	2.294e-07	-6.580	-6.639	-0.060	(0)
	CuHCO3+	1.899e-07	1.597e-07	-6.721	-6.797	-0.075	(0)
	Cu (CO3) 2-2	1.373e-07	6.873e-08	-6.862	-7.163	-0.300	(0)
	ZnHCO3+	8.669e-08	7.292e-08	-7.062	-7.137	-0.075	(0)
	ZnCO3	8.456e-08	8.456e-08	-7.073	-7.073	0.000	(0)
	UO2 (CO3) 3-4	5.847e-08	3.673e-09	-7.233	-8.435	-1.202	(0)
	UO2 (CO3) 2-2	5.446e-08	2.727e-08	-7.264	-7.564	-0.300	(0)
	NiHCO3+	4.521e-08	3.803e-08	-7.345	-7.420	-0.075	(0)
	CoHCO3+	1.853e-08	1.558e-08	-7.732	-7.807	-0.075	(0)
	PbCO3	1.386e-08	1.386e-08	-7.858	-7.858	0.000	(0)
	NiCO3	7.333e-09	7.333e-09	-8.135	-8.135	0.000	(0)
	PbHCO3+	6.393e-09	5.378e-09	-8.194	-8.269	-0.075	(0)
	BaHCO3+	2.362e-09	2.066e-09	-8.627	-8.685	-0.058	(0)
	CoCO3	2.158e-09	2.158e-09	-8.666	-8.666	0.000	(0)
	UO2CO3	5.084e-10	5.084e-10	-9.294	-9.294	0.000	(0)
	CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
	Pb (CO3) 2-2	2.147e-10	1.075e-10	-9.668	-9.969	-0.300	(0)
	BaCO3	7.069e-11	7.069e-11	-10.151	-10.151	0.000	(0)
	CdHCO3+	6.009e-11	5.055e-11	-10.221	-10.296	-0.075	(0)
	Cd (CO3) 2-2	1.283e-12	6.426e-13	-11.892	-12.192	-0.300	(0)
	FeHCO3+	9.286e-13	8.121e-13	-12.032	-12.090	-0.058	(0)
	HgCO3	1.923e-14	1.923e-14	-13.716	-13.716	0.000	(0)
	Hg (CO3) 2-2	3.266e-16	1.635e-16	-15.486	-15.786	-0.300	(0)
	HgHCO3+	3.133e-17	2.635e-17	-16.504	-16.579	-0.075	(0)
Ca		2.878e-03					
	Ca+2	2.184e-03	1.232e-03	-2.661	-2.909	-0.249	(0)
	CaSO4	5.763e-04	5.763e-04	-3.239	-3.239	0.000	(0)
	CaHCO3+	1.106e-04	9.676e-05	-3.956	-4.014	-0.058	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.476e-06	2.154e-06	-5.606	-5.667	-0.060	(0)
	CaH2BO3+	1.117e-08	9.571e-09	-7.952	-8.019	-0.067	(0)
	CaOH+	3.845e-09	3.363e-09	-8.415	-8.473	-0.058	(0)
Cd		1.336e-08					
	Cd+2	9.331e-09	5.264e-09	-8.030	-8.279	-0.249	(0)
	CdSO4	2.520e-09	2.520e-09	-8.599	-8.599	0.000	(0)
	CdCl+	9.508e-10	7.998e-10	-9.022	-9.097	-0.075	(0)
	CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
	Cd (SO4) 2-2	1.386e-10	6.941e-11	-9.858	-10.159	-0.300	(0)
	CdHCO3+	6.009e-11	5.055e-11	-10.221	-10.296	-0.075	(0)
	CdF+	1.589e-11	1.337e-11	-10.799	-10.874	-0.075	(0)
	CdOH+	6.800e-12	5.720e-12	-11.167	-11.243	-0.075	(0)
	CdCl2	5.305e-12	5.305e-12	-11.275	-11.275	0.000	(0)

CdOHC1	4.489e-12	4.489e-12	-11.348	-11.348	0.000	(0)
Cd (CO3) 2-2	1.283e-12	6.426e-13	-11.892	-12.192	-0.300	(0)
CdCl3-	6.332e-15	5.326e-15	-14.198	-14.274	-0.075	(0)
Cd (OH) 2	4.938e-15	4.938e-15	-14.306	-14.306	0.000	(0)
CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
CdSeO4	5.518e-18	5.518e-18	-17.258	-17.258	0.000	(0)
Cd2OH+3	7.157e-19	1.509e-19	-18.145	-18.821	-0.676	(0)
Cd (OH) 3-	4.907e-20	4.127e-20	-19.309	-19.384	-0.075	(0)
Cd (SeO3) 2-2	1.463e-20	7.326e-21	-19.835	-20.135	-0.300	(0)
Cd (OH) 4-2	1.846e-27	9.243e-28	-26.734	-27.034	-0.300	(0)
CdHS+	0.000e+00	0.000e+00	-78.538	-78.613	-0.075	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.751	-149.751	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.118	-226.193	-0.075	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.038	-302.339	-0.300	(0)
Cl	1.836e-03					
Cl-	1.836e-03	1.591e-03	-2.736	-2.798	-0.062	(0)
MnCl+	2.624e-08	2.283e-08	-7.581	-7.641	-0.060	(0)
AgCl	1.958e-08	1.958e-08	-7.708	-7.708	0.000	(0)
AgCl2-	3.226e-09	2.714e-09	-8.491	-8.566	-0.075	(0)
ZnCl+	2.526e-09	2.185e-09	-8.598	-8.661	-0.063	(0)
CuCl+	1.750e-09	1.514e-09	-8.757	-8.820	-0.063	(0)
CuCl	1.352e-09	1.352e-09	-8.869	-8.869	0.000	(0)
CdCl+	9.508e-10	7.998e-10	-9.022	-9.097	-0.075	(0)
CuCl2-	5.194e-10	4.493e-10	-9.285	-9.347	-0.063	(0)
ZnOHC1	3.913e-10	3.913e-10	-9.407	-9.407	0.000	(0)
NiCl+	3.539e-10	2.977e-10	-9.451	-9.526	-0.075	(0)
CoCl+	3.108e-10	2.614e-10	-9.508	-9.583	-0.075	(0)
PbCl+	1.152e-10	9.687e-11	-9.939	-10.014	-0.075	(0)
MnCl2	5.131e-11	5.131e-11	-10.290	-10.290	0.000	(0)
AgCl3-2	7.687e-12	3.848e-12	-11.114	-11.415	-0.300	(0)
ZnCl2	5.510e-12	5.510e-12	-11.259	-11.259	0.000	(0)
CdCl2	5.305e-12	5.305e-12	-11.275	-11.275	0.000	(0)
CdOHC1	4.489e-12	4.489e-12	-11.348	-11.348	0.000	(0)
HgClOH	2.299e-12	2.299e-12	-11.638	-11.638	0.000	(0)
HgCl2	1.514e-12	1.514e-12	-11.820	-11.820	0.000	(0)
CuCl2	8.350e-13	8.350e-13	-12.078	-12.078	0.000	(0)
PbCl2	6.885e-13	6.885e-13	-12.162	-12.162	0.000	(0)
CuCl3-2	2.668e-13	1.528e-13	-12.574	-12.816	-0.242	(0)
AgCl4-3	5.929e-14	1.250e-14	-13.227	-13.903	-0.676	(0)
HgCl3-	2.863e-14	2.409e-14	-13.543	-13.618	-0.075	(0)
MnCl3-	2.585e-14	2.249e-14	-13.588	-13.648	-0.060	(0)
ZnCl3-	8.050e-15	6.964e-15	-14.094	-14.157	-0.063	(0)
CdCl3-	6.332e-15	5.326e-15	-14.198	-14.274	-0.075	(0)
NiCl2	2.385e-15	2.385e-15	-14.623	-14.623	0.000	(0)
PbCl3-	5.185e-16	4.361e-16	-15.285	-15.360	-0.075	(0)
CrCl+2	4.023e-16	2.014e-16	-15.395	-15.696	-0.300	(0)
HgCl4-2	3.048e-16	1.526e-16	-15.516	-15.817	-0.300	(0)
HgCl+	2.257e-16	1.898e-16	-15.647	-15.722	-0.075	(0)
UO2Cl+	1.458e-16	1.226e-16	-15.836	-15.911	-0.075	(0)
CuCl3-	1.433e-17	1.240e-17	-16.844	-16.907	-0.063	(0)
ZnCl4-2	9.671e-18	5.540e-18	-17.015	-17.256	-0.242	(0)
CrOHC12	8.333e-19	8.333e-19	-18.079	-18.079	0.000	(0)
PbCl4-2	6.335e-19	3.172e-19	-18.198	-18.499	-0.300	(0)
VOCl+	6.907e-20	5.810e-20	-19.161	-19.236	-0.075	(0)
FeCl+2	5.191e-20	2.974e-20	-19.285	-19.527	-0.242	(0)
CrCl2+	3.615e-20	3.041e-20	-19.442	-19.517	-0.075	(0)
FeCl2+	2.429e-22	2.114e-22	-21.614	-21.675	-0.060	(0)
CuCl4-2	1.726e-22	9.888e-23	-21.763	-22.005	-0.242	(0)
FeCl3	3.363e-26	3.363e-26	-25.473	-25.473	0.000	(0)
CrO3Cl1-	2.227e-26	1.873e-26	-25.652	-25.727	-0.075	(0)
CoCl+2	5.326e-35	2.667e-35	-34.274	-34.574	-0.300	(0)
UCl+3	0.000e+00	0.000e+00	-44.341	-45.017	-0.676	(0)
Co (2)	1.356e-07					
Co+2	9.486e-08	4.749e-08	-7.023	-7.323	-0.300	(0)
CoSO4	1.935e-08	1.935e-08	-7.713	-7.713	0.000	(0)
CoHCO3+	1.853e-08	1.558e-08	-7.732	-7.807	-0.075	(0)
CoCO3	2.158e-09	2.158e-09	-8.666	-8.666	0.000	(0)
CoCl+	3.108e-10	2.614e-10	-9.508	-9.583	-0.075	(0)

CoF+	2.861e-10	2.406e-10	-9.544	-9.619	-0.075	(0)
CoOH+	1.541e-10	1.296e-10	-9.812	-9.887	-0.075	(0)
Co (OH) 2	1.409e-12	1.409e-12	-11.851	-11.851	0.000	(0)
CoSeO4	1.340e-16	1.340e-16	-15.873	-15.873	0.000	(0)
Co (OH) 3-	4.572e-18	3.846e-18	-17.340	-17.415	-0.075	(0)
Co2OH+3	1.464e-18	3.086e-19	-17.835	-18.511	-0.676	(0)
CoOOH-	1.148e-18	9.653e-19	-17.940	-18.015	-0.075	(0)
Co (OH) 4-2	1.666e-25	8.339e-26	-24.778	-25.079	-0.300	(0)
Co4 (OH) 4+4	8.971e-31	5.636e-32	-30.047	-31.249	-1.202	(0)
Co (3)	1.144e-28					
CoOH+2	1.144e-28	5.727e-29	-27.942	-28.242	-0.300	(0)
Co+3	2.986e-34	8.237e-35	-33.525	-34.084	-0.559	(0)
CoCl+2	5.326e-35	2.667e-35	-34.274	-34.574	-0.300	(0)
Cr (2)	1.071e-25					
Cr+2	1.071e-25	5.363e-26	-24.970	-25.271	-0.300	(0)
Cr (3)	6.780e-09					
Cr (OH) 2+	5.794e-09	4.873e-09	-8.237	-8.312	-0.075	(0)
Cr (OH) +2	5.847e-10	2.928e-10	-9.233	-9.533	-0.300	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.419e-10	1.419e-10	-9.848	-9.848	0.000	(0)
CrF+2	4.961e-12	2.484e-12	-11.304	-11.605	-0.300	(0)
CrO2-	1.923e-12	1.617e-12	-11.716	-11.791	-0.075	(0)
Cr (OH) 4-	1.622e-12	1.364e-12	-11.790	-11.865	-0.075	(0)
CrSO4+	5.545e-13	4.664e-13	-12.256	-12.331	-0.075	(0)
Cr+3	4.639e-13	9.781e-14	-12.334	-13.010	-0.676	(0)
CrCl+2	4.023e-16	2.014e-16	-15.395	-15.696	-0.300	(0)
Cr2 (OH) 2SO4+2	7.498e-18	3.754e-18	-17.125	-17.426	-0.300	(0)
CrOHC12	8.333e-19	8.333e-19	-18.079	-18.079	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.554e-19	4.554e-19	-18.342	-18.342	0.000	(0)
CrCl2+	3.615e-20	3.041e-20	-19.442	-19.517	-0.075	(0)
Cr (6)	2.229e-16					
CrO4-2	1.894e-16	1.068e-16	-15.723	-15.971	-0.249	(0)
HCrO4-	3.023e-17	2.543e-17	-16.520	-16.595	-0.075	(0)
NaCrO4-	2.893e-18	2.433e-18	-17.539	-17.614	-0.075	(0)
KCrO4-	3.862e-19	3.249e-19	-18.413	-18.488	-0.075	(0)
CrO3SO4-2	2.325e-24	1.164e-24	-23.634	-23.934	-0.300	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.227e-26	1.873e-26	-25.652	-25.727	-0.075	(0)
Cr2O7-2	4.481e-32	2.243e-32	-31.349	-31.649	-0.300	(0)
Cu (1)	2.673e-09					
CuCl	1.352e-09	1.352e-09	-8.869	-8.869	0.000	(0)
Cu+	8.022e-10	6.748e-10	-9.096	-9.171	-0.075	(0)
CuCl2-	5.194e-10	4.493e-10	-9.285	-9.347	-0.063	(0)
CuCl3-2	2.668e-13	1.528e-13	-12.574	-12.816	-0.242	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.878	-148.198	-0.320	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.622	-148.928	-0.306	(0)
Cu (2)	1.149e-05					
CuCO3	9.500e-06	9.500e-06	-5.022	-5.022	0.000	(0)
Cu+2	1.064e-06	6.002e-07	-5.973	-6.222	-0.249	(0)
CuOH+	3.002e-07	2.597e-07	-6.523	-6.586	-0.063	(0)
CuSO4	2.808e-07	2.808e-07	-6.552	-6.552	0.000	(0)
CuHCO3+	1.899e-07	1.597e-07	-6.721	-6.797	-0.075	(0)
Cu (CO3) 2-2	1.373e-07	6.873e-08	-6.862	-7.163	-0.300	(0)
CuF+	7.213e-09	6.067e-09	-8.142	-8.217	-0.075	(0)
Cu (OH) 2	7.088e-09	7.088e-09	-8.149	-8.149	0.000	(0)
Cu2 (OH) 2+2	3.383e-09	1.694e-09	-8.471	-8.771	-0.300	(0)
CuCl+	1.750e-09	1.514e-09	-8.757	-8.820	-0.063	(0)
Cu (OH) 3-	2.365e-12	1.989e-12	-11.626	-11.701	-0.075	(0)
CuCl2	8.350e-13	8.350e-13	-12.078	-12.078	0.000	(0)
CuCl3-	1.433e-17	1.240e-17	-16.844	-16.907	-0.063	(0)
Cu (OH) 4-2	4.278e-18	2.142e-18	-17.369	-17.669	-0.300	(0)
CuCl4-2	1.726e-22	9.888e-23	-21.763	-22.005	-0.242	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.274	-215.349	-0.075	(0)
F	2.086e-04					
F-	1.849e-04	1.602e-04	-3.733	-3.795	-0.062	(0)
MgF+	1.957e-05	1.698e-05	-4.708	-4.770	-0.062	(0)
CaF+	2.476e-06	2.154e-06	-5.606	-5.667	-0.060	(0)
NaF	4.634e-07	4.634e-07	-6.334	-6.334	0.000	(0)

AlF3	2.532e-07	2.532e-07	-6.597	-6.597	0.000	(0)
AlF2+	1.440e-07	1.255e-07	-6.842	-6.901	-0.060	(0)
MnF+	8.356e-08	7.270e-08	-7.078	-7.138	-0.060	(0)
AlF4-	2.343e-08	2.033e-08	-7.630	-7.692	-0.062	(0)
HF	1.743e-08	1.743e-08	-7.759	-7.759	0.000	(0)
CuF+	7.213e-09	6.067e-09	-8.142	-8.217	-0.075	(0)
AlF+2	3.406e-09	1.968e-09	-8.468	-8.706	-0.238	(0)
ZnF+	2.078e-09	1.748e-09	-8.682	-8.758	-0.075	(0)
BF(OH) 3-	1.276e-09	1.093e-09	-8.894	-8.961	-0.067	(0)
NiF+	3.499e-10	2.943e-10	-9.456	-9.531	-0.075	(0)
CoF+	2.861e-10	2.406e-10	-9.544	-9.619	-0.075	(0)
PbF+	2.303e-11	1.937e-11	-10.638	-10.713	-0.075	(0)
CdF+	1.589e-11	1.337e-11	-10.799	-10.874	-0.075	(0)
HF2-	1.231e-11	1.062e-11	-10.910	-10.974	-0.064	(0)
CrF+2	4.961e-12	2.484e-12	-11.304	-11.605	-0.300	(0)
AgF	2.426e-12	2.426e-12	-11.615	-11.615	0.000	(0)
BF2(OH) 2-	1.608e-12	1.378e-12	-11.794	-11.861	-0.067	(0)
UO2F+	1.249e-12	1.051e-12	-11.903	-11.978	-0.075	(0)
UO2F2	4.855e-13	4.855e-13	-12.314	-12.314	0.000	(0)
PbF2	6.108e-14	6.108e-14	-13.214	-13.214	0.000	(0)
UO2F3-	2.323e-14	1.954e-14	-13.634	-13.709	-0.075	(0)
CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
VO2F	3.679e-15	3.679e-15	-14.434	-14.434	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.358e-16	4.662e-16	-15.271	-15.331	-0.060	(0)
VO2F2-	2.544e-16	2.140e-16	-15.594	-15.670	-0.075	(0)
FeF+2	1.898e-16	1.087e-16	-15.722	-15.964	-0.242	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	4.967e-17	2.487e-17	-16.304	-16.604	-0.300	(0)
PbF3-	2.207e-17	1.856e-17	-16.656	-16.731	-0.075	(0)
VOF+	1.487e-17	1.251e-17	-16.828	-16.903	-0.075	(0)
BF3OH-	7.378e-18	6.323e-18	-17.132	-17.199	-0.067	(0)
VO2F3-2	8.543e-19	4.277e-19	-18.068	-18.369	-0.300	(0)
VOF2	7.514e-19	7.514e-19	-18.124	-18.124	0.000	(0)
VOF3-	5.078e-21	4.272e-21	-20.294	-20.369	-0.075	(0)
PbF4-2	2.843e-21	1.423e-21	-20.546	-20.847	-0.300	(0)
BF4-	4.281e-22	3.669e-22	-21.368	-21.435	-0.067	(0)
VO2F4-3	1.599e-22	3.372e-23	-21.796	-22.472	-0.676	(0)
HgF+	4.222e-23	3.551e-23	-22.374	-22.450	-0.075	(0)
VOF4-2	5.518e-24	2.762e-24	-23.258	-23.559	-0.300	(0)
Sb(OH) 2F	1.186e-24	1.186e-24	-23.926	-23.926	0.000	(0)
SbOF	1.167e-24	1.167e-24	-23.933	-23.933	0.000	(0)
UF3+	2.349e-34	1.976e-34	-33.629	-33.704	-0.075	(0)
UF2+2	1.554e-35	7.782e-36	-34.808	-35.109	-0.300	(0)
UF4	3.471e-36	3.471e-36	-35.459	-35.459	0.000	(0)
UF5-	2.620e-38	2.204e-38	-37.582	-37.657	-0.075	(0)
UF+3	1.830e-38	3.858e-39	-37.738	-38.414	-0.676	(0)
UF6-2	2.130e-39	1.066e-39	-38.672	-38.972	-0.300	(0)
Fe (2)	3.924e-11					
Fe+2	3.055e-11	1.529e-11	-10.515	-10.816	-0.300	(0)
FeSO4	7.666e-12	7.666e-12	-11.115	-11.115	0.000	(0)
FeHCO3+	9.286e-13	8.121e-13	-12.032	-12.090	-0.058	(0)
FeOH+	9.574e-14	8.329e-14	-13.019	-13.079	-0.060	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.501e-19	3.916e-19	-18.347	-18.407	-0.060	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.550	-158.550	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-234.779	-234.855	-0.075	(0)
Fe (3)	3.771e-09					
Fe(OH) 2+	3.338e-09	2.910e-09	-8.477	-8.536	-0.060	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.247e-12	5.447e-12	-11.204	-11.264	-0.060	(0)
FeOH+2	9.543e-14	5.467e-14	-13.020	-13.262	-0.242	(0)
FeF2+	5.358e-16	4.662e-16	-15.271	-15.331	-0.060	(0)
FeF+2	1.898e-16	1.087e-16	-15.722	-15.964	-0.242	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.630e-17	1.418e-17	-16.788	-16.848	-0.060	(0)
Fe+3	2.244e-18	6.189e-19	-17.649	-18.208	-0.559	(0)
Fe(SO4) 2-	7.360e-19	6.191e-19	-18.133	-18.208	-0.075	(0)

	FeCl+2	5.191e-20	2.974e-20	-19.285	-19.527	-0.242	(0)
	FeCl2+	2.429e-22	2.114e-22	-21.614	-21.675	-0.060	(0)
	FeHSeO3+2	7.845e-23	3.927e-23	-22.105	-22.406	-0.300	(0)
	Fe2 (OH) 2+4	1.575e-24	9.897e-26	-23.803	-25.004	-1.202	(0)
	FeCl3	3.363e-26	3.363e-26	-25.473	-25.473	0.000	(0)
	Fe3 (OH) 4+5	3.143e-31	4.163e-33	-30.503	-32.381	-1.878	(0)
H (0)	4.018e-29						
	H2	2.009e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.908e-10						
	Hg	2.908e-10	2.908e-10	-9.536	-9.536	0.000	(0)
Hg (1)	4.716e-21						
	Hg2+2	2.358e-21	1.181e-21	-20.627	-20.928	-0.300	(0)
Hg (2)	4.564e-12						
	HgClOH	2.299e-12	2.299e-12	-11.638	-11.638	0.000	(0)
	HgCl2	1.514e-12	1.514e-12	-11.820	-11.820	0.000	(0)
	Hg (OH) 2	7.027e-13	7.062e-13	-12.153	-12.151	0.002	(0)
	HgCl3-	2.863e-14	2.409e-14	-13.543	-13.618	-0.075	(0)
	HgCO3	1.923e-14	1.923e-14	-13.716	-13.716	0.000	(0)
	Hg (CO3) 2-2	3.266e-16	1.635e-16	-15.486	-15.786	-0.300	(0)
	HgCl4-2	3.048e-16	1.526e-16	-15.516	-15.817	-0.300	(0)
	HgCl+	2.257e-16	1.898e-16	-15.647	-15.722	-0.075	(0)
	HgOH+	3.872e-17	3.257e-17	-16.412	-16.487	-0.075	(0)
	HgHCO3+	3.133e-17	2.635e-17	-16.504	-16.579	-0.075	(0)
	Hg (OH) 3-	1.446e-20	1.216e-20	-19.840	-19.915	-0.075	(0)
	Hg+2	1.194e-20	5.980e-21	-19.923	-20.223	-0.300	(0)
	HgSO4	3.197e-21	3.197e-21	-20.495	-20.495	0.000	(0)
	HgF+	4.222e-23	3.551e-23	-22.374	-22.450	-0.075	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.771	-137.846	-0.075	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.585	-138.585	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.120	-139.421	-0.300	(0)
K	9.581e-04						
	K+	9.445e-04	8.186e-04	-3.025	-3.087	-0.062	(0)
	KSO4-	1.357e-05	1.183e-05	-4.867	-4.927	-0.060	(0)
	KCrO4-	3.862e-19	3.249e-19	-18.413	-18.488	-0.075	(0)
Mg	2.095e-03						
	Mg+2	1.675e-03	9.447e-04	-2.776	-3.025	-0.249	(0)
	MgSO4	3.511e-04	3.511e-04	-3.455	-3.455	0.000	(0)
	MgHCO3+	4.714e-05	4.078e-05	-4.327	-4.390	-0.063	(0)
	MgF+	1.957e-05	1.698e-05	-4.708	-4.770	-0.062	(0)
	MgCO3	2.112e-06	2.112e-06	-5.675	-5.675	0.000	(0)
	MgOH+	5.869e-08	5.145e-08	-7.231	-7.289	-0.057	(0)
	MgH2BO3+	5.160e-09	4.422e-09	-8.287	-8.354	-0.067	(0)
Mn (2)	2.812e-05						
	Mn+2	2.277e-05	1.140e-05	-4.643	-4.943	-0.300	(0)
	MnSO4	4.139e-06	4.139e-06	-5.383	-5.383	0.000	(0)
	MnHCO3+	1.103e-06	9.593e-07	-5.958	-6.018	-0.060	(0)
	MnF+	8.356e-08	7.270e-08	-7.078	-7.138	-0.060	(0)
	MnCl+	2.624e-08	2.283e-08	-7.581	-7.641	-0.060	(0)
	MnOH+	4.502e-09	3.917e-09	-8.347	-8.407	-0.060	(0)
	MnCl2	5.131e-11	5.131e-11	-10.290	-10.290	0.000	(0)
	MnCl3-	2.585e-14	2.249e-14	-13.588	-13.648	-0.060	(0)
	MnSeO4	1.727e-14	1.727e-14	-13.763	-13.763	0.000	(0)
	Mn (OH) 3-	5.208e-19	4.531e-19	-18.283	-18.344	-0.060	(0)
	Mn (OH) 4-2	3.494e-25	2.001e-25	-24.457	-24.699	-0.242	(0)
	MnSe	0.000e+00	0.000e+00	-42.588	-42.588	0.000	(0)
Mn (3)	8.042e-25						
	Mn+3	8.042e-25	2.218e-25	-24.095	-24.654	-0.559	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-43.501	-43.743	-0.242	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.410	-47.476	-0.066	(0)
Mo	2.481e-07						
	MoO4-2	2.478e-07	1.398e-07	-6.606	-6.854	-0.249	(0)
	HMoO4-	2.433e-10	2.047e-10	-9.614	-9.689	-0.075	(0)
	H2MoO4	1.103e-13	1.103e-13	-12.957	-12.957	0.000	(0)
	Ag2MoO4	1.923e-24	1.923e-24	-23.716	-23.716	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-40.168	-40.844	-0.676	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-49.353	-52.057	-2.704	(0)

	HMo7O24-5	0.000e+00	0.000e+00	-50.926	-52.804	-1.878	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.953	-55.155	-1.202	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-58.366	-59.042	-0.676	(0)
Na	5.358e-03						
	Na+	5.289e-03	4.584e-03	-2.277	-2.339	-0.062	(0)
	NaSO4-	5.766e-05	5.027e-05	-4.239	-4.299	-0.060	(0)
	NaHCO3	1.087e-05	1.087e-05	-4.964	-4.964	0.000	(0)
	NaF	4.634e-07	4.634e-07	-6.334	-6.334	0.000	(0)
	NaCO3-	2.631e-07	2.294e-07	-6.580	-6.639	-0.060	(0)
	NaH2BO3	9.808e-10	9.808e-10	-9.008	-9.008	0.000	(0)
	NaCrO4-	2.893e-18	2.433e-18	-17.539	-17.614	-0.075	(0)
Ni	2.128e-07						
	Ni+2	1.296e-07	7.313e-08	-6.887	-7.136	-0.249	(0)
	NiHCO3+	4.521e-08	3.803e-08	-7.345	-7.420	-0.075	(0)
	NiSO4	2.980e-08	2.980e-08	-7.526	-7.526	0.000	(0)
	NiCO3	7.333e-09	7.333e-09	-8.135	-8.135	0.000	(0)
	NiCl+	3.539e-10	2.977e-10	-9.451	-9.526	-0.075	(0)
	NiF+	3.499e-10	2.943e-10	-9.456	-9.531	-0.075	(0)
	NiOH+	1.497e-10	1.260e-10	-9.825	-9.900	-0.075	(0)
	Ni (SO4) 2-2	4.024e-12	2.015e-12	-11.395	-11.696	-0.300	(0)
	Ni (OH) 2	1.369e-12	1.369e-12	-11.864	-11.864	0.000	(0)
	NiCl2	2.385e-15	2.385e-15	-14.623	-14.623	0.000	(0)
	Ni (OH) 3-	2.226e-16	1.873e-16	-15.652	-15.728	-0.075	(0)
	NiSeO4	1.926e-16	1.926e-16	-15.715	-15.715	0.000	(0)
O (0)	2.473e-35						
	O2	1.236e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.612e-08						
	PbCO3	1.386e-08	1.386e-08	-7.858	-7.858	0.000	(0)
	PbHCO3+	6.393e-09	5.378e-09	-8.194	-8.269	-0.075	(0)
	Pb+2	3.042e-09	1.716e-09	-8.517	-8.766	-0.249	(0)
	PbSO4	1.716e-09	1.716e-09	-8.765	-8.765	0.000	(0)
	PbOH+	7.010e-10	5.897e-10	-9.154	-9.229	-0.075	(0)
	Pb (CO3) 2-2	2.147e-10	1.075e-10	-9.668	-9.969	-0.300	(0)
	PbCl+	1.152e-10	9.687e-11	-9.939	-10.014	-0.075	(0)
	Pb (SO4) 2-2	4.218e-11	2.112e-11	-10.375	-10.675	-0.300	(0)
	PbF+	2.303e-11	1.937e-11	-10.638	-10.713	-0.075	(0)
	Pb (OH) 2	2.551e-12	2.551e-12	-11.593	-11.593	0.000	(0)
	PbCl2	6.885e-13	6.885e-13	-12.162	-12.162	0.000	(0)
	PbF2	6.108e-14	6.108e-14	-13.214	-13.214	0.000	(0)
	PbCl3-	5.185e-16	4.361e-16	-15.285	-15.360	-0.075	(0)
	Pb (OH) 3-	4.149e-16	3.490e-16	-15.382	-15.457	-0.075	(0)
	Pb2OH+3	7.606e-17	1.604e-17	-16.119	-16.795	-0.676	(0)
	PbF3-	2.207e-17	1.856e-17	-16.656	-16.731	-0.075	(0)
	PbCl4-2	6.335e-19	3.172e-19	-18.198	-18.499	-0.300	(0)
	Pb (OH) 4-2	2.336e-20	1.169e-20	-19.632	-19.932	-0.300	(0)
	PbF4-2	2.843e-21	1.423e-21	-20.546	-20.847	-0.300	(0)
	Pb3 (OH) 4+2	4.451e-22	2.228e-22	-21.352	-21.652	-0.300	(0)
	Pb4 (OH) 4+4	4.834e-26	3.037e-27	-25.316	-26.518	-1.202	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.180	-150.180	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.146	-227.222	-0.075	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-72.747	-72.747	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.267	-78.342	-0.075	(0)
	H2S	0.000e+00	0.000e+00	-78.455	-78.455	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.538	-78.613	-0.075	(0)
	S5-2	0.000e+00	0.000e+00	-80.273	-80.574	-0.300	(0)
	S6-2	0.000e+00	0.000e+00	-80.789	-81.090	-0.300	(0)
	S4-2	0.000e+00	0.000e+00	-80.869	-81.170	-0.300	(0)
	S3-2	0.000e+00	0.000e+00	-81.675	-81.975	-0.300	(0)
	S2-2	0.000e+00	0.000e+00	-82.691	-82.992	-0.300	(0)
	S-2	0.000e+00	0.000e+00	-88.267	-88.509	-0.242	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.771	-137.846	-0.075	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.585	-138.585	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.120	-139.421	-0.300	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-146.914	-146.989	-0.075	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.165	-147.340	-0.174	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.878	-148.198	-0.320	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.622	-148.928	-0.306	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-148.928	-149.003	-0.075	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.319	-149.646	-0.327	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.644	-149.957	-0.313	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.751	-149.751	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.126	-150.126	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.180	-150.180	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.550	-158.550	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.274	-215.349	-0.075	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.113	-225.188	-0.075	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.118	-226.193	-0.075	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.146	-227.222	-0.075	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.735	-228.035	-0.300	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-234.779	-234.855	-0.075	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.038	-302.339	-0.300	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.690	-304.990	-0.300	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.327	-316.627	-0.300	(0)
S (6)	4.623e-03					
SO4-2	3.620e-03	2.042e-03	-2.441	-2.690	-0.249	(0)
CaSO4	5.763e-04	5.763e-04	-3.239	-3.239	0.000	(0)
MgSO4	3.511e-04	3.511e-04	-3.455	-3.455	0.000	(0)
NaSO4-	5.766e-05	5.027e-05	-4.239	-4.299	-0.060	(0)
KSO4-	1.357e-05	1.183e-05	-4.867	-4.927	-0.060	(0)
MnSO4	4.139e-06	4.139e-06	-5.383	-5.383	0.000	(0)
CuSO4	2.808e-07	2.808e-07	-6.552	-6.552	0.000	(0)
ZnSO4	2.442e-07	2.442e-07	-6.612	-6.612	0.000	(0)
NiSO4	2.980e-08	2.980e-08	-7.526	-7.526	0.000	(0)
CoSO4	1.935e-08	1.935e-08	-7.713	-7.713	0.000	(0)
HSO4-	1.692e-08	1.468e-08	-7.772	-7.833	-0.062	(0)
Zn (SO4) 2-2	8.677e-09	4.344e-09	-8.062	-8.362	-0.300	(0)
CdSO4	2.520e-09	2.520e-09	-8.599	-8.599	0.000	(0)
PbSO4	1.716e-09	1.716e-09	-8.765	-8.765	0.000	(0)
AgSO4-	2.920e-10	2.456e-10	-9.535	-9.610	-0.075	(0)
CrOHSO4	1.419e-10	1.419e-10	-9.848	-9.848	0.000	(0)
Cd (SO4) 2-2	1.386e-10	6.941e-11	-9.858	-10.159	-0.300	(0)
Pb (SO4) 2-2	4.218e-11	2.112e-11	-10.375	-10.675	-0.300	(0)
AlSO4+	2.244e-11	1.947e-11	-10.649	-10.711	-0.062	(0)
FeSO4	7.666e-12	7.666e-12	-11.115	-11.115	0.000	(0)
Ni (SO4) 2-2	4.024e-12	2.015e-12	-11.395	-11.696	-0.300	(0)
CrSO4+	5.545e-13	4.664e-13	-12.256	-12.331	-0.075	(0)
Al (SO4) 2-	4.911e-13	4.261e-13	-12.309	-12.371	-0.062	(0)
UO2SO4	1.469e-13	1.469e-13	-12.833	-12.833	0.000	(0)
UO2 (SO4) 2-2	7.896e-15	3.953e-15	-14.103	-14.403	-0.300	(0)
VO2SO4-	7.590e-16	6.384e-16	-15.120	-15.195	-0.075	(0)
FeSO4+	1.630e-17	1.418e-17	-16.788	-16.848	-0.060	(0)
Cr2 (OH) 2SO4+2	7.498e-18	3.754e-18	-17.125	-17.426	-0.300	(0)
VOSO4	7.321e-18	7.321e-18	-17.135	-17.135	0.000	(0)
Fe (SO4) 2-	7.360e-19	6.191e-19	-18.133	-18.208	-0.075	(0)
Cr2 (OH) 2 (SO4) 2	4.554e-19	4.554e-19	-18.342	-18.342	0.000	(0)
HgSO4	3.197e-21	3.197e-21	-20.495	-20.495	0.000	(0)
CrO3SO4-2	2.325e-24	1.164e-24	-23.634	-23.934	-0.300	(0)
VSO4+	9.207e-32	7.744e-32	-31.036	-31.111	-0.075	(0)
U (SO4) 2	1.592e-39	1.592e-39	-38.798	-38.798	0.000	(0)
USO4+2	1.960e-40	0.000e+00	-39.708	-40.008	-0.300	(0)
Sb (3)	1.273e-19					
Sb (OH) 3	6.440e-20	6.440e-20	-19.191	-19.191	0.000	(0)
HSbO2	6.288e-20	6.288e-20	-19.201	-19.201	0.000	(0)
SbO2-	1.646e-24	1.384e-24	-23.784	-23.859	-0.075	(0)
Sb (OH) 2F	1.186e-24	1.186e-24	-23.926	-23.926	0.000	(0)
SbOF	1.167e-24	1.167e-24	-23.933	-23.933	0.000	(0)
Sb (OH) 4-	9.424e-25	7.927e-25	-24.026	-24.101	-0.075	(0)
Sb (OH) 2+	1.368e-25	1.151e-25	-24.864	-24.939	-0.075	(0)
SbO+	4.719e-26	3.969e-26	-25.326	-25.401	-0.075	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.327	-316.627	-0.300	(0)
Sb (5)	1.529e-08					
SbO3-	1.528e-08	1.285e-08	-7.816	-7.891	-0.075	(0)
Sb (OH) 6-	1.733e-11	1.502e-11	-10.761	-10.823	-0.062	(0)
SbO2+	2.373e-23	1.996e-23	-22.625	-22.700	-0.075	(0)
Se (-2)	1.626e-14					

Ag ₂ Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	4.803e-40	4.040e-40	-39.318	-39.394	-0.075	(0)
MnSe	0.000e+00	0.000e+00	-42.588	-42.588	0.000	(0)
H ₂ Se	0.000e+00	0.000e+00	-42.637	-42.637	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.960	-47.260	-0.300	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.914	-86.116	-1.202	(0)
Se (4)	3.115e-08					
HSeO ₃ -	2.855e-08	2.402e-08	-7.544	-7.620	-0.075	(0)
SeO ₃ -2	2.596e-09	1.299e-09	-8.586	-8.886	-0.300	(0)
H ₂ SeO ₃	7.537e-13	7.537e-13	-12.123	-12.123	0.000	(0)
AgSeO ₃ -	5.985e-15	5.034e-15	-14.223	-14.298	-0.075	(0)
Cd (SeO ₃) 2-2	1.463e-20	7.326e-21	-19.835	-20.135	-0.300	(0)
Ag (SeO ₃) 2-3	2.778e-22	5.857e-23	-21.556	-22.232	-0.676	(0)
FeHSeO ₃ +2	7.845e-23	3.927e-23	-22.105	-22.406	-0.300	(0)
Se (6)	9.997e-12					
SeO ₄ -2	9.979e-12	5.630e-12	-11.001	-11.250	-0.249	(0)
MnSeO ₄	1.727e-14	1.727e-14	-13.763	-13.763	0.000	(0)
ZnSeO ₄	4.767e-16	4.767e-16	-15.322	-15.322	0.000	(0)
NiSeO ₄	1.926e-16	1.926e-16	-15.715	-15.715	0.000	(0)
CoSeO ₄	1.340e-16	1.340e-16	-15.873	-15.873	0.000	(0)
HSeO ₄ -	2.468e-17	2.076e-17	-16.608	-16.683	-0.075	(0)
CdSeO ₄	5.518e-18	5.518e-18	-17.258	-17.258	0.000	(0)
Zn (SeO ₄) 2-2	5.434e-27	2.721e-27	-26.265	-26.565	-0.300	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.677	-58.353	-0.676	(0)
U (4)	5.053e-22					
U (OH) 5-	5.040e-22	4.239e-22	-21.298	-21.373	-0.075	(0)
U (OH) 4	1.307e-24	1.307e-24	-23.884	-23.884	0.000	(0)
U (OH) 3+	4.180e-28	3.516e-28	-27.379	-27.454	-0.075	(0)
U (OH) 2+2	2.390e-32	1.197e-32	-31.622	-31.922	-0.300	(0)
UF ₃ +	2.349e-34	1.976e-34	-33.629	-33.704	-0.075	(0)
UF ₂ +2	1.554e-35	7.782e-36	-34.808	-35.109	-0.300	(0)
UF ₄	3.471e-36	3.471e-36	-35.459	-35.459	0.000	(0)
UOH+3	1.967e-37	4.148e-38	-36.706	-37.382	-0.676	(0)
UF ₅ -	2.620e-38	2.204e-38	-37.582	-37.657	-0.075	(0)
UF+3	1.830e-38	3.858e-39	-37.738	-38.414	-0.676	(0)
UF ₆ -2	2.130e-39	1.066e-39	-38.672	-38.972	-0.300	(0)
U (SO ₄) 2	1.592e-39	1.592e-39	-38.798	-38.798	0.000	(0)
USO ₄ +2	1.960e-40	0.000e+00	-39.708	-40.008	-0.300	(0)
U+4	0.000e+00	0.000e+00	-42.716	-43.918	-1.202	(0)
UCl+3	0.000e+00	0.000e+00	-44.341	-45.017	-0.676	(0)
U ₆ (OH) 15+9	0.000e+00	0.000e+00	-167.584	-173.668	-6.084	(0)
U (5)	7.903e-17					
UO ₂ +	7.903e-17	6.648e-17	-16.102	-16.177	-0.075	(0)
U (6)	1.134e-07					
UO ₂ (CO ₃) 3-4	5.847e-08	3.673e-09	-7.233	-8.435	-1.202	(0)
UO ₂ (CO ₃) 2-2	5.446e-08	2.727e-08	-7.264	-7.564	-0.300	(0)
UO ₂ CO ₃	5.084e-10	5.084e-10	-9.294	-9.294	0.000	(0)
UO ₂ F+	1.249e-12	1.051e-12	-11.903	-11.978	-0.075	(0)
UO ₂ OH+	9.728e-13	8.183e-13	-12.012	-12.087	-0.075	(0)
UO ₂ F ₂	4.855e-13	4.855e-13	-12.314	-12.314	0.000	(0)
UO ₂ SO ₄	1.469e-13	1.469e-13	-12.833	-12.833	0.000	(0)
UO ₂ +2	8.422e-14	4.751e-14	-13.075	-13.323	-0.249	(0)
UO ₂ F ₃ -	2.323e-14	1.954e-14	-13.634	-13.709	-0.075	(0)
UO ₂ (SO ₄) 2-2	7.896e-15	3.953e-15	-14.103	-14.403	-0.300	(0)
UO ₂ Cl+	1.458e-16	1.226e-16	-15.836	-15.911	-0.075	(0)
UO ₂ F ₄ -2	4.967e-17	2.487e-17	-16.304	-16.604	-0.300	(0)
(UO ₂) ₂ (OH) 2+2	2.220e-18	1.111e-18	-17.654	-17.954	-0.300	(0)
(UO ₂) ₃ (OH) 5+	1.535e-20	1.291e-20	-19.814	-19.889	-0.075	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.323	-40.398	-0.075	(0)
V+2	0.000e+00	0.000e+00	-40.744	-41.044	-0.300	(0)
V (3)	1.660e-13					
V (OH) 3	1.660e-13	1.660e-13	-12.780	-12.780	0.000	(0)
V (OH) 2+	9.382e-24	7.892e-24	-23.028	-23.103	-0.075	(0)
VOH+2	1.100e-26	5.509e-27	-25.958	-26.259	-0.300	(0)
V+3	3.810e-31	8.034e-32	-30.419	-31.095	-0.676	(0)
VSO ₄ +	9.207e-32	7.744e-32	-31.036	-31.111	-0.075	(0)

V2 (OH) 3+3	0.000e+00	0.000e+00	-50.234	-50.910	-0.676	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.516	-51.718	-1.202	(0)
V (4)	4.712e-16					
V (OH) 3+	4.222e-16	3.552e-16	-15.374	-15.450	-0.075	(0)
VO+2	2.600e-17	1.302e-17	-16.585	-16.886	-0.300	(0)
VOF+	1.487e-17	1.251e-17	-16.828	-16.903	-0.075	(0)
VOSO4	7.321e-18	7.321e-18	-17.135	-17.135	0.000	(0)
VOF2	7.514e-19	7.514e-19	-18.124	-18.124	0.000	(0)
VOC1+	6.907e-20	5.810e-20	-19.161	-19.236	-0.075	(0)
VOF3-	5.078e-21	4.272e-21	-20.294	-20.369	-0.075	(0)
VOF4-2	5.518e-24	2.762e-24	-23.258	-23.559	-0.300	(0)
H2V2O4+2	1.264e-26	6.327e-27	-25.898	-26.199	-0.300	(0)
V (5)	1.525e-07					
H2VO4-	1.440e-07	1.211e-07	-6.842	-6.917	-0.075	(0)
HVO4-2	8.261e-09	4.136e-09	-8.083	-8.383	-0.300	(0)
H3VO4	8.912e-11	8.912e-11	-10.050	-10.050	0.000	(0)
H3V2O7-	8.290e-11	6.973e-11	-10.081	-10.157	-0.075	(0)
HV2O7-3	8.055e-13	1.698e-13	-12.094	-12.770	-0.676	(0)
VO2+	1.511e-14	1.309e-14	-13.821	-13.883	-0.062	(0)
V3O9-3	8.839e-15	1.864e-15	-14.054	-14.730	-0.676	(0)
VO2F	3.679e-15	3.679e-15	-14.434	-14.434	0.000	(0)
VO4-3	1.336e-15	2.817e-16	-14.874	-15.550	-0.676	(0)
V2O7-4	9.889e-16	6.213e-17	-15.005	-16.207	-1.202	(0)
VO2SO4-	7.590e-16	6.384e-16	-15.120	-15.195	-0.075	(0)
VO2F2-	2.544e-16	2.140e-16	-15.594	-15.670	-0.075	(0)
V4O12-4	1.498e-18	9.414e-20	-17.824	-19.026	-1.202	(0)
VO2F3-2	8.543e-19	4.277e-19	-18.068	-18.369	-0.300	(0)
VO2F4-3	1.599e-22	3.372e-23	-21.796	-22.472	-0.676	(0)
HV10O28-5	0.000e+00	0.000e+00	-45.861	-47.739	-1.878	(0)
V10O28-6	0.000e+00	0.000e+00	-46.088	-48.793	-2.704	(0)
H2V10O28-4	0.000e+00	0.000e+00	-48.463	-49.665	-1.202	(0)
Zn	1.407e-06					
Zn+2	9.691e-07	5.467e-07	-6.014	-6.262	-0.249	(0)
ZnSO4	2.442e-07	2.442e-07	-6.612	-6.612	0.000	(0)
ZnHCO3+	8.669e-08	7.292e-08	-7.062	-7.137	-0.075	(0)
ZnCO3	8.456e-08	8.456e-08	-7.073	-7.073	0.000	(0)
ZnOH+	8.891e-09	7.479e-09	-8.051	-8.126	-0.075	(0)
Zn (SO4) 2-2	8.677e-09	4.344e-09	-8.062	-8.362	-0.300	(0)
ZnCl+	2.526e-09	2.185e-09	-8.598	-8.661	-0.063	(0)
ZnF+	2.078e-09	1.748e-09	-8.682	-8.758	-0.075	(0)
ZnOHCl	3.913e-10	3.913e-10	-9.407	-9.407	0.000	(0)
Zn (OH) 2	1.622e-10	1.622e-10	-9.790	-9.790	0.000	(0)
ZnCl2	5.510e-12	5.510e-12	-11.259	-11.259	0.000	(0)
Zn (OH) 3-	1.322e-13	1.112e-13	-12.879	-12.954	-0.075	(0)
ZnCl3-	8.050e-15	6.964e-15	-14.094	-14.157	-0.063	(0)
ZnSeO4	4.767e-16	4.767e-16	-15.322	-15.322	0.000	(0)
ZnCl4-2	9.671e-18	5.540e-18	-17.015	-17.256	-0.242	(0)
Zn (OH) 4-2	1.210e-18	6.057e-19	-17.917	-18.218	-0.300	(0)
Zn (SeO4) 2-2	5.434e-27	2.721e-27	-26.265	-26.565	-0.300	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.928	-149.003	-0.075	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.126	-150.126	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.113	-225.188	-0.075	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.735	-228.035	-0.300	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.690	-304.990	-0.300	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.43	-87.65	-36.22	Ag2S
Ag2CO3	-10.92	-22.01	-11.09	Ag2CO3
Ag2CrO4	-20.82	-32.41	-11.59	Ag2CrO4
Ag2HVO4	-10.40	-8.92	1.48	Ag2HVO4
Ag2MoO4	-11.74	-23.29	-11.55	Ag2MoO4
Ag2O	-14.75	-2.17	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4

Ag2SO4	-14.31	-19.13	-4.82	Ag2SO4
Ag3AsO3	-26.98	-24.83	2.16	Ag3AsO3
Ag3AsO4	-15.39	-18.18	-2.79	Ag3AsO4
Ag3H2VO5	-15.19	-10.01	5.18	Ag3H2VO5
AgF·4H2O	-13.06	-12.02	1.05	AgF·4H2O
Agmetal	-0.35	-13.86	-13.51	Ag
AgVO3	-8.61	-7.84	0.77	AgVO3
Al(OH)3(am)	-1.31	9.49	10.80	Al(OH)3
Al2(MoO4)3	-46.75	-44.38	2.37	Al2(MoO4)3
Al2O3	-0.67	18.98	19.65	Al2O3
Al4(OH)10SO4	-1.70	21.00	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-10.23	-5.43	4.80	AlAsO4·2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.96	-86.34	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.67	-11.46	-7.79	PbSO4
Anhydrite	-1.24	-5.60	-4.36	CaSO4
Anilite	-54.64	-86.52	-31.88	Cu0.25Cu1.5S
Antlerite	-1.61	7.18	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-83.50	-86.26	-2.76	As4O6
Artinite	-6.95	2.65	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-36.55	-29.84	6.71	As2O5
Atacamite	-1.23	6.16	7.39	Cu2(OH)3Cl
Azurite	1.37	-15.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-17.42	6.97	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-15.42	0.45	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-25.51	7.43	32.94	Ba3(VO4)2·4H2O
BaCrO4	-13.59	-23.26	-9.67	BaCrO4
BaF2	-9.06	-14.88	-5.82	BaF2
BaMoO4	-7.18	-14.14	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.61	-7.78	1.83	BaSeO3
BaSeO4	-11.08	-18.54	-7.46	BaSeO4
Bianchite	-7.19	-8.95	-1.76	ZnSO4·6H2O
Birnessite	-8.57	9.52	18.09	MnO2
Bixbyite	-5.86	-6.51	-0.64	Mn2O3
BlaubleiI	-54.48	-78.64	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.00	-82.28	-27.28	Cu0.6Cu0.8S
Boehmite	0.91	9.49	8.58	AlOOH
Breithauptite	-57.40	-75.92	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-5.60	11.24	16.84	Mg(OH)2
Bunsenite	-5.32	7.13	12.45	NiO
Ca(VO3)2	-7.80	-2.14	5.66	Ca(VO3)2
Ca2V2O7	-8.29	9.21	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.34	9.21	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-18.07	4.23	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-18.39	20.57	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-19.29	20.57	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-300.55	-157.58	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.61	-26.52	-17.91	Hg2Cl2
CaMoO4	-1.81	-9.76	-7.95	CaMoO4
Carnotite	-1.99	-1.76	0.23	KUO2VO4
CaSeO3·2H2O	-6.21	-3.40	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.14	-14.16	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.39	-3.55	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.66	-15.95	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.55	1.01	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.41	6.99	28.40	Cd4(OH)6SO4
CdCl2	-13.22	-13.88	-0.66	CdCl2
CdCl2·1H2O	-12.18	-13.88	-1.69	CdCl2·1H2O

CdCl2:2.5H2O	-11.96	-13.88	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal (alpha)	-33.07	-19.56	13.51	Cd
Cdmetal (gamma)	-33.17	-19.56	13.62	Cd
CdMoO4	-0.98	-15.13	-14.15	CdMoO4
CdOHCl	-7.48	-3.94	3.54	CdOHCl
CdSb	-76.71	-77.06	-0.35	CdSb
CdSe	-20.34	-40.54	-20.20	CdSe
CdSeO4:2H2O	-17.68	-19.53	-1.85	CdSeO4:2H2O
CdSO4	-10.80	-10.97	-0.17	CdSO4
CdSO4:1H2O	-9.24	-10.97	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.10	-10.97	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.27	-11.02	-9.75	AgCl
Cerrusite	-1.21	-14.34	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.27	-8.91	-2.64	CuSO4:5H2O
Chalcocite	-54.63	-89.55	-34.92	Cu2S
Chalcopyrite	-124.18	-159.45	-35.27	CuFeS2
Cinnabar	-51.93	-97.63	-45.69	HgS
Claudetite	-83.20	-86.26	-3.06	As4O6
Clausthalite	-13.93	-41.03	-27.10	PbSe
Co (BO2) 2	-29.66	-2.59	27.07	Co (BO2) 2
Co (OH) 2	-6.15	6.94	13.09	Co (OH) 2
Co (OH) 3	-10.38	-12.68	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-22.04	-9.01	13.03	Co3 (AsO4) 2
Co3O4	-7.93	-18.43	-10.50	Co3O4
CoCl2	-21.19	-12.92	8.27	CoCl2
CoCl2:6H2O	-15.46	-12.92	2.54	CoCl2:6H2O
CoCO3	-2.91	-12.89	-9.98	CoCO3
CoF2	-13.32	-14.91	-1.60	CoF2
CoF3	-44.01	-45.47	-1.46	CoF3
CoFe2O4	16.85	13.33	-3.53	CoFe2O4
CoMoO4	-6.42	-14.18	-7.76	CoMoO4
CoO	-6.64	6.94	13.59	CoO
CoS (alpha)	-71.09	-78.53	-7.44	CoS
CoS (beta)	-67.46	-78.53	-11.07	CoS
CoSe	-23.38	-39.58	-16.20	CoSe
CoSeO3	-9.13	-7.81	1.32	CoSeO3
CoSeO4:6H2O	-17.04	-18.57	-1.53	CoSeO4:6H2O
CoSO4	-12.82	-10.01	2.80	CoSO4
CoSO4:6H2O	-7.54	-10.01	-2.47	CoSO4:6H2O
Cotunnite	-9.58	-14.36	-4.78	PbCl2
Covellite	-55.13	-77.43	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-44.96	-30.87	14.09	CrCl2
CrCl3	-46.09	-30.97	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.86	-41.70	-33.84	Na3AlF6
Cu (OH) 2	-0.63	8.04	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.46	20.75	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-54.94	-89.82	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.80	-50.60	-45.80	Cu2Se
Cu2SO4	-19.08	-21.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-11.81	-5.71	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.34	-101.94	-42.59	Cu3Sb
Cu3Se2	-25.59	-89.08	-63.49	Cu3Se2
CuCO3	-0.29	-11.79	-11.50	CuCO3
CuCrO4	-16.75	-22.19	-5.44	CuCrO4
CuF	-8.06	-12.97	-4.91	CuF
CuF2	-14.93	-13.81	1.12	CuF2
CuF2:2H2O	-9.26	-13.81	-4.55	CuF2:2H2O
Cumetal	-6.05	-14.81	-8.76	Cu

CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.17	-0.87	10.30	CuOCuSO4
Cupricferrite	8.44	14.43	5.99	CuFe2O4
Cuprite	-2.67	-4.08	-1.41	Cu2O
Cuprousferrite	10.07	1.15	-8.92	CuFeO2
CuSe	-5.38	-38.48	-33.10	CuSe
CuSe2	-26.10	-59.46	-33.37	CuSe2
CuSeO3:2H2O	-7.22	-6.71	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.03	-17.47	-2.44	CuSeO4:5H2O
CuSO4	-11.85	-8.91	2.94	CuSO4
Diaspore	2.62	9.49	6.87	AlOOH
Djurleite	-54.83	-88.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.54	-17.08	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.01	-17.08	-17.09	CaMg(CO3)2
Epsomite	-3.59	-5.72	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.25	0.21	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.33	-10.05	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.92	-8.37	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.25	-37.88	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-40.75	-44.49	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.13	-11.73	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.58	-17.67	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.46	-64.06	-18.60	FeSe2
FeS(ppt)	-79.07	-82.02	-2.95	FeS
FeSe	-32.08	-43.08	-11.00	FeSe
Fix_pe	-5.64	-5.64	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.00	-79.97	-13.97	PbS
Gibbsite	1.20	9.49	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.94	-8.95	-2.01	ZnSO4:7H2O
Greenockite	-65.13	-79.49	-14.36	CdS
Greigite	-287.03	-332.07	-45.03	Fe3S4
Gummite	-6.73	0.94	7.67	UO3
Gypsum	-0.99	-5.60	-4.61	CaSO4:2H2O
H-Jarosite	-12.24	-24.34	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.24	-21.12	-12.88	H2MoO4
H2S(g)	-77.47	-85.48	-8.01	H2S
H2Se(g)	-41.57	-46.53	-4.96	H2Se
Halite	-6.74	-5.14	1.60	NaCl
Hausmannite	-7.52	53.51	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.46	22.43	22.89	FeAl2O4
Hg(CH3)2(g)	-182.48	-256.18	-73.71	Hg(CH3)2
Hg(g)	-8.23	-16.10	-7.87	Hg
Hg(OH)2	-8.65	-12.15	-3.50	Hg(OH)2
Hg2(g)	-17.25	-32.21	-14.96	Hg2
Hg2(OH)2	-11.92	-6.66	5.26	Hg2(OH)2
Hg2CO3	-10.45	-26.50	-16.05	Hg2CO3
Hg2CrO4	-28.20	-36.90	-8.70	Hg2CrO4
Hg2F2	-18.16	-28.52	-10.36	Hg2F2
Hg2S	-80.46	-92.14	-11.68	Hg2S
Hg2SeO3	-16.76	-21.41	-4.66	Hg2SeO3
Hg2SO4	-17.49	-23.62	-6.13	Hg2SO4
Hg3O2CO3	-26.61	-56.29	-29.68	Hg3O2CO3
HgCl(g)	-32.76	-13.26	19.50	HgCl
HgCl2	-10.75	-32.01	-21.26	HgCl2
HgF(g)	-46.93	-14.26	32.68	HgF
HgF2(g)	-46.57	-34.01	12.57	HgF2
Hgmetal(l)	-2.65	-16.10	-13.45	Hg
HgSe	-2.98	-58.68	-55.69	HgSe
HgSeO3	-14.47	-26.90	-12.43	HgSeO3
HgSO4	-19.69	-29.11	-9.42	HgSO4
Huntite	-4.30	-34.27	-29.97	CaMg3(CO3)4

Hydrocerrusite	-4.40	-23.17	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.37	-23.14	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-15.21	-20.38	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.49	-20.29	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.14	-52.38	-17.24	K2Cr2O7
K2CrO4	-21.63	-22.15	-0.51	K2CrO4
K2MoO4	-16.29	-13.03	3.26	K2MoO4
K2SeO4	-16.69	-17.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4·H2O
Larnakite	-5.52	-5.95	-0.43	PbO:PbSO4
Laurionite	-5.05	-4.43	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.19	5.50	12.69	PbO
Mackinawite	-78.42	-82.02	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.76	17.62	16.86	Fe2MgO4
Magnesite	-1.14	-8.60	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.56	-3.75	-5.31	Cu2(OH)2CO3
Manganite	-3.24	22.10	25.34	MnOOH
Massicot	-7.39	5.50	12.89	PbO
Matlockite	-6.39	-15.36	-8.97	PbClF
Melanothallite	-18.08	-11.82	6.26	CuCl2
Melanterite	-11.30	-13.51	-2.21	FeSO4·7H2O
Metacinnabar	-52.53	-97.63	-45.09	HgS
Mg(OH)2(active)	-7.55	11.24	18.79	Mg(OH)2
Mg(VO3)2	-13.54	-2.26	11.28	Mg(VO3)2
Mg2Sb3	-275.81	-201.13	74.68	Mg2Sb3
Mg2V2O7	-17.38	8.98	26.36	Mg2V2O7
MgCr2O4	-7.32	8.88	16.20	MgCr2O4
MgCrO4	-24.38	-19.00	5.38	MgCrO4
MgF2	-2.49	-10.62	-8.13	MgF2
MgMoO4	-8.03	-9.88	-1.85	MgMoO4
MgSeO3·6H2O	-6.57	-3.51	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-13.08	-14.28	-1.20	MgSeO4·6H2O
Minium	-31.47	42.05	73.52	Pb3O4
Mirabilite	-6.26	-7.37	-1.11	Na2SO4·10H2O
Mn(VO3)2	-9.08	-4.18	4.90	Mn(VO3)2
Mn2(SO4)3	-51.67	-57.38	-5.71	Mn2(SO4)3
Mn2Sb	-151.03	-89.95	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-14.37	-1.87	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.26	-10.54	2.72	MnCl2·4H2O
MnS(grn)	-76.32	-76.15	0.17	MnS
MnS(pnk)	-79.49	-76.15	3.34	MnS
MnSb	-96.17	-99.08	-2.91	MnSb
MnSe	-40.70	-37.20	3.50	MnSe
MnSeO3	-6.56	-5.43	1.13	MnSeO3
MnSeO3·2H2O	-6.41	-5.43	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.14	-16.19	-2.05	MnSeO4·5H2O
MnSO4	-10.22	-7.63	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.51	-12.15	-3.64	HgO
MoO3	-13.12	-21.12	-8.00	MoO3
Morenosite	-7.68	-9.83	-2.14	NiSO4·7H2O
MoS2	-147.36	-217.62	-70.26	MoS2
Na-Jarosite	-8.35	-19.55	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.99	-50.89	-9.90	Na2Cr2O7
Na2CrO4	-23.58	-20.65	2.93	Na2CrO4
Na2Mo2O7	-16.06	-32.65	-16.60	Na2Mo2O7
Na2MoO4	-13.02	-11.53	1.49	Na2MoO4
Na2MoO4·2H2O	-12.76	-11.53	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.46	-5.16	10.30	Na2SeO3·5H2O
Na2SeO4	-17.21	-15.93	1.28	Na2SeO4
Na3Sb	-175.89	-81.44	94.45	Na3Sb
Na3VO4	-29.05	7.63	36.68	Na3VO4
Na4V2O7	-31.72	5.68	37.40	Na4V2O7
Nantokite	-5.24	-11.97	-6.73	CuCl

NaSb	-88.65	-65.49	23.17	NaSb
Natron	-8.94	-10.25	-1.31	Na2CO3:10H2O
NaVO3	-5.81	-1.96	3.86	NaVO3
Nesquehonite	-3.93	-8.60	-4.67	MgCO3:3H2O
Ni(OH)2	-5.66	7.13	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.15	-8.45	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.43	11.57	32.00	Ni4(OH)6SO4
NiCO3	-5.84	-12.71	-6.87	NiCO3
NiMoO4	-2.85	-13.99	-11.14	NiMoO4
NiS(alpha)	-72.74	-78.34	-5.60	NiS
NiS(beta)	-67.24	-78.34	-11.10	NiS
NiS(gamma)	-65.54	-78.34	-12.80	NiS
NiSe	-21.70	-39.40	-17.70	NiSe
NiSeO3:2H2O	-10.44	-7.62	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.87	-18.39	-1.52	NiSeO4:6H2O
Nsutite	-7.99	9.52	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-238.49	-299.56	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.55	-4.03	6.52	Pb(BO2)2
Pb(OH)2	-2.65	5.50	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.25	-64.01	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.72	1.07	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.19	11.00	26.19	Pb2O(OH)2
Pb2O3	-24.49	36.55	61.04	Pb2O3
Pb2OCO3	-8.28	-8.84	-0.56	Pb2OCO3
Pb2V2O7	-0.60	-2.50	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.14	-13.34	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.14	3.00	6.14	Pb3(VO4)2
Pb3O2CO3	-14.35	-3.33	11.02	Pb3O2CO3
Pb3O2SO4	-11.14	-0.45	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.05	5.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.83	5.05	21.88	Pb4O3SO4
PbCrO4	-12.14	-24.74	-12.60	PbCrO4
PbF2	-8.92	-16.36	-7.44	PbF2
Pbmetal	-24.29	-20.04	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.48	5.50	12.98	PbO:0.33H2O
PbSeO4	-13.18	-20.02	-6.84	PbSeO4
Periclase	-10.34	11.24	21.58	MgO
Phosgenite	-8.89	-28.70	-19.81	PbCl2:PbCO3
Plattnerite	-18.55	31.05	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.45	-141.95	-18.51	FeS2
Pyrochroite	-5.87	9.32	15.19	Mn(OH)2
Pyrolusite	-6.51	34.87	41.38	MnO2
Realgar	-100.07	-119.81	-19.75	AsS
Retgersite	-7.79	-9.83	-2.04	NiSO4:6H2O
Rhodochrosite	0.07	-10.51	-10.58	MnCO3
Rutherfordine	-4.39	-18.89	-14.50	UO2CO3
Sb(OH)3	-12.08	-19.19	-7.11	Sb(OH)3
Sb2O4	-16.24	-12.84	3.40	Sb2O4
Sb2O5	-26.24	-35.91	-9.67	Sb2O5
Sb2Se3	-110.20	-177.96	-67.76	Sb2Se3
Sb4O6(cubic)	-58.50	-76.76	-18.26	Sb4O6
Sb4O6(orth)	-58.86	-76.76	-17.90	Sb4O6
SbCl3	-49.56	-48.99	0.57	SbCl3
SbF3	-41.75	-51.98	-10.23	SbF3
Sbmetal	-45.82	-57.51	-11.69	Sb
SbO2	-2.90	-30.73	-27.82	SbO2
Schoepite	-5.05	0.94	5.99	UO2(OH)2:H2O
Semetal(am)	-13.87	-20.98	-7.11	Se
Semetal(hex)	-13.27	-20.98	-7.71	Se
Senarmontite	-26.02	-38.38	-12.37	Sb2O3
SeO2	-14.88	-14.75	0.12	SeO2
SeO3	-46.56	-25.52	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.83	-11.83	-10.00	ZnCO3

Sphalerite	-66.02	-77.47	-11.45	ZnS
Spinel	-6.63	30.22	36.85	MgAl2O4
Stibnite	-244.35	-294.81	-50.46	Sb2S3
Sulfur	-57.79	-59.93	-2.14	S
Tenorite	0.40	8.04	7.64	CuO
Thenardite	-7.69	-7.37	0.32	Na2SO4
Thermonatrite	-10.89	-10.25	0.64	Na2CO3:H2O
Tyuyamunite	-4.34	-0.26	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.15	4.93	21.08	U3O8
U3Sb4	-581.84	-429.46	152.38	U3Sb4
U4O9	-32.98	-36.00	-3.02	U4O9
UF4	-29.56	-59.10	-29.54	UF4
UF4:2.5H2O	-26.38	-59.10	-32.72	UF4:2.5H2O
UO2 (am)	-16.32	-15.39	0.93	UO2
UO2 (OH) 2 (beta)	-4.67	0.94	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.32	-24.57	-2.25	UO2SeO4:4H2O
UO3	-6.76	0.94	7.70	UO3
Uraninite	-10.72	-15.39	-4.67	UO2
USb2	-220.28	-190.71	29.58	USb2
V (OH) 3	-17.29	-9.70	7.59	V (OH) 3
V2O5	-12.14	-13.50	-1.36	V2O5
V3O5	-35.24	-33.40	1.84	V3O5
V4O7	-43.21	-36.02	7.19	V4O7
V6O13	-30.73	-91.59	-60.86	V6O13
Valentinite	-29.90	-38.38	-8.48	Sb2O3
VC12	-61.21	-42.33	18.87	VC12
VC13	-62.92	-39.49	23.43	VC13
VF4	-61.26	-46.33	14.93	VF4
Vmetal	-92.04	-48.01	44.03	V
VO	-37.22	-22.47	14.76	VO
VO (OH) 2	-7.77	-2.62	5.15	VO (OH) 2
VO2Cl	-19.52	-16.68	2.84	VO2Cl
VOC1	-30.78	-19.63	11.15	VOC1
VOC12	-35.24	-22.48	12.76	VOC12
VOSO4	-23.19	-19.58	3.61	VOSO4
Witherite	-4.29	-12.86	-8.57	BaCO3
Wurtzite	-68.52	-77.47	-8.95	ZnS
Zincite	-3.33	8.00	11.33	ZnO
Zincosite	-12.88	-8.95	3.93	ZnSO4
Zn (BO2) 2	-9.82	-1.53	8.29	Zn (BO2) 2
Zn (OH) 2	-4.20	8.00	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.47	8.00	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.75	8.00	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.53	8.00	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.73	8.00	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.45	-0.95	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.11	6.08	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.48	-5.83	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-28.81	-9.90	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.34	15.06	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.34	20.16	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.91	-11.86	7.05	ZnCl2
ZnCO3:1H2O	-1.57	-11.83	-10.26	ZnCO3:1H2O
ZnF2	-13.32	-13.85	-0.53	ZnF2
Znmetal	-43.33	-17.54	25.79	Zn
ZnMoO4	-2.99	-13.12	-10.13	ZnMoO4
ZnO (active)	-3.18	8.00	11.19	ZnO
ZnS (am)	-68.42	-77.47	-9.05	ZnS
ZnSb	-86.06	-75.05	11.01	ZnSb
ZnSe	-24.12	-38.52	-14.40	ZnSe
ZnSeO4:6H2O	-15.99	-17.51	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.31	-8.95	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 23.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 101
 equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 donnan 1e-008
USE EQUILIBRIUM_PHASES 101
USE Surface 101
USE Solution 103
SAVE Solution 104 #Initial Stage 1 groundwater after Mineral Precipitation
and Sorption Loss
END

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 101.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.091e-15 Surface + diffuse layer charge, eq
7.837e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.719e+00 m² for 2.678e-05 moles of Ferrihydrite

Water in diffuse layer: 1.719e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is
+1).

Element	Moles
C	4.3919e-11
Ca	5.4430e-13
Cl	8.7948e-10
H	1.2956e-10
K	8.6347e-13
Mg	8.4330e-14
N	3.5605e-09
Na	3.6584e-12
O	1.5869e-07
S	3.6978e-08

Hfo_s

Species	Moles	Mole Fraction	Molality	Log Molality
1.339e-07 moles [0.005 mol/(mol Ferrihydrite)]				
Hfo_sOH2+	8.950e-08	0.668	8.950e-08	-7.048
Hfo_sOH	4.390e-08	0.328	4.390e-08	-7.358

Hfo_sO-	4.932e-10	0.004	4.932e-10	-9.307
Hfo_sOHCa+2	1.634e-12	0.000	1.634e-12	-11.787

Hfo_w

5.356e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.475e-06	0.462	2.475e-06	-5.606
Hfo_wOH	1.214e-06	0.227	1.214e-06	-5.916
Hfo_wSO4-	8.358e-07	0.156	8.358e-07	-6.078
Hfo_wOHSO4-2	8.179e-07	0.153	8.179e-07	-6.087
Hfo_wO-	1.364e-08	0.003	1.364e-08	-7.865
Hfo_wOMg+	1.927e-14	0.000	1.927e-14	-13.715
Hfo_wOCa+	6.539e-15	0.000	6.539e-15	-14.185

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 103. Solution after simulation 22.
 Using surface 101.
 Using pure phase assemblage 101. Pure-phase assemblage after simulation 22.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.669e-08	2.359e-08	-3.103e-09
Alunite	-0.00	-1.40	-1.40	1.468e-06	1.469e-06	1.051e-10
Anhydrite	-1.24	-5.60	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.10	-10.01	-8.91	2.218e-08	0	-2.218e-08
Barite	0.00	-9.98	-9.98	1.624e-06	1.690e-06	6.655e-08
Brochantite	-0.30	14.92	15.22	2.653e-07	0	-2.653e-07
Brucite	-5.60	11.24	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	2.624e-06
CaMoO4	-1.74	-9.69	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.37	-3.56	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	3.722e-03	3.722e-03	-7.126e-07
Carnotite	-3.68	-3.45	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.39	-3.55	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.91	-15.06	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.012e-08	4.286e-08	-1.726e-08
Cu2Se(alpha)	-5.11	-50.91	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	4.624e-07	4.177e-07	-4.475e-08
Epsomite	-3.59	-5.72	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.678e-05	2.678e-05	-4.893e-13
Fluorite	0.00	-10.50	-10.50	1.700e-04	1.700e-04	8.591e-09
Gummite	-6.73	0.94	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.99	-5.60	-4.61	0.000e+00	0	0.000e+00

HgSe	-3.15	-58.84	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.26	-7.37	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.72	-5.59	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.66	7.13	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-25.25	-9.55	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.84	-12.71	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.77	-13.92	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.430e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.11	-15.73	-15.62	5.095e-09	0	-5.095e-09
Rutherfordine	-4.39	-18.89	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.90	-30.73	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.05	0.94	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-7.71	-3.63	4.08	0.000e+00	0	0.000e+00
U3O8	-16.15	4.93	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.67	0.94	5.61	0.000e+00	0	0.000e+00
UO3	-6.76	0.94	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.92	-13.05	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-8.272e-21 Surface + diffuse layer charge, eq
4.118e-07 Surface charge, eq
2.312e-02 sigma, C/m²
5.659e-02 psi, V
-2.203e+00 -F*psi/RT
1.105e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.719e+00 m² for 2.678e-05 moles of Ferrihydrite

Water in diffuse layer: 1.719e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.266e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.109e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	6.1402e-13
Al	3.5469e-11
As	4.5085e-15
B	2.9722e-10
Ba	6.0922e-13
C	1.5052e-07
Ca	2.5206e-08
Cd	1.2609e-13
Cl	5.1663e-08
Co	1.1804e-12
Cr	7.1496e-14
Cu	1.5737e-10
F	5.4613e-09
Fe	4.2925e-14
H	1.6300e-07
Hg	5.0777e-15
K	1.0303e-08
Mg	1.7519e-08
Mn	2.2999e-10
Mo	1.3550e-11
N	8.2040e-14
Na	5.7374e-08
Ni	1.9508e-12
O	1.1918e-06

Pb	2.4572e-13
S	1.8479e-07
Sb	4.3038e-13
Se	6.3487e-13
U	9.7312e-12
V	9.1436e-14
Zn	1.3248e-11

Hfo_s

1.339e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	8.581e-08	0.641	8.568e-08	-7.067
Hfo_sOCrOH+	3.452e-08	0.258	3.447e-08	-7.463
Hfo_sOPb+	1.097e-08	0.082	1.095e-08	-7.960
Hfo_sOZn+	1.160e-09	0.009	1.158e-09	-8.936
Hfo_sOMn+	9.913e-10	0.007	9.898e-10	-9.004
Hfo_sOHCa+2	2.043e-10	0.002	2.040e-10	-9.690
Hfo_sOH	1.455e-10	0.001	1.453e-10	-9.838
Hfo_sONi+	3.740e-11	0.000	3.734e-11	-10.428
Hfo_sOH2+	2.307e-11	0.000	2.303e-11	-10.638
Hfo_sO-	2.102e-11	0.000	2.099e-11	-10.678
Hfo_sOCu+	3.597e-12	0.000	3.591e-12	-11.445
Hfo_sOCd+	3.391e-12	0.000	3.386e-12	-11.470
Hfo_sOAg	2.739e-13	0.000	2.735e-13	-12.563
Hfo_sOHBa+2	2.628e-14	0.000	2.624e-14	-13.581
Hfo_sOFe+	1.675e-14	0.000	1.673e-14	-13.777
Hfo_sOHg+	7.451e-17	0.000	7.440e-17	-16.128

Hfo_w

5.356e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.832e-06	0.529	2.827e-06	-5.549
Hfo_wOHSO4-2	9.650e-07	0.180	9.635e-07	-6.016
Hfo_wOH	9.360e-07	0.175	9.346e-07	-6.029
Hfo_wOHVO4-3	1.496e-07	0.028	1.494e-07	-6.826
Hfo_wOH2+	1.484e-07	0.028	1.482e-07	-6.829
Hfo_wO-	1.352e-07	0.025	1.350e-07	-6.870
Hfo_wSO4-	7.671e-08	0.014	7.660e-08	-7.116
Hfo_wOHasO4-3	4.462e-08	0.008	4.455e-08	-7.351
Hfo_wOMg+	3.336e-08	0.006	3.331e-08	-7.477
Hfo_wOHSeO3-2	1.012e-08	0.002	1.011e-08	-7.995
Hfo_wOZn+	7.815e-09	0.001	7.803e-09	-8.108
Hfo_wOMn+	5.066e-09	0.001	5.059e-09	-8.296
Hfo_wOHMoO4-2	3.192e-09	0.001	3.188e-09	-8.497
Hfo_wOPb+	3.153e-09	0.001	3.148e-09	-8.502
Hfo_wSeO3-	2.727e-09	0.001	2.723e-09	-8.565
Hfo_wOCa+	2.447e-09	0.000	2.443e-09	-8.612
Hfo_wMoO4-	3.269e-10	0.000	3.265e-10	-9.486
Hfo_wONi+	3.246e-10	0.000	3.241e-10	-9.489
Hfo_wH2BO3	6.676e-11	0.000	6.666e-11	-10.176
Hfo_wOCu+	6.522e-11	0.000	6.512e-11	-10.186
Hfo_wHAsO4-	2.512e-11	0.000	2.509e-11	-10.601
Hfo_wOCd+	9.307e-12	0.000	9.293e-12	-11.032
Hfo_wOAg	4.635e-13	0.000	4.628e-13	-12.335
Hfo_wH2AsO4	1.289e-13	0.000	1.287e-13	-12.890
Hfo_wOFe+	6.800e-14	0.000	6.790e-14	-13.168
Hfo_wOHg+	2.348e-14	0.000	2.344e-14	-13.630
Hfo_wOBa+	4.548e-15	0.000	4.541e-15	-14.343
Hfo_wOHSbO(OH) 4-	2.538e-15	0.000	2.534e-15	-14.596
Hfo_wOHSeO4-2	1.871e-15	0.000	1.868e-15	-14.729
Hfo_wSbO(OH) 4	2.599e-16	0.000	2.595e-16	-15.586
Hfo_wSeO4-	1.296e-16	0.000	1.294e-16	-15.888
Hfo_wOHCrO4-2	6.501e-17	0.000	6.491e-17	-16.188
Hfo_wCrO4-	4.713e-18	0.000	4.706e-18	-17.327

Hfo_wH2AsO3 1.835e-23 0.000 1.832e-23 -22.737

-----Solution composition-----

Elements	Molality	Moles
Ag	3.626e-08	3.632e-08
Al	1.485e-06	1.487e-06
As	1.101e-10	1.103e-10
B	1.719e-05	1.722e-05
Ba	9.332e-08	9.346e-08
C	5.727e-03	5.735e-03
Ca	2.879e-03	2.883e-03
Cd	1.334e-08	1.336e-08
Cl	1.836e-03	1.839e-03
Co	1.356e-07	1.358e-07
Cr	6.781e-09	6.791e-09
Cu	9.688e-06	9.703e-06
F	2.086e-04	2.089e-04
Fe	3.811e-09	3.817e-09
Hg	2.953e-10	2.958e-10
K	9.581e-04	9.595e-04
Mg	2.095e-03	2.098e-03
Mn	2.812e-05	2.816e-05
Mo	2.943e-07	2.947e-07
N	3.555e-09	3.560e-09
Na	5.358e-03	5.366e-03
Ni	2.125e-07	2.128e-07
Pb	1.710e-08	1.713e-08
S	4.624e-03	4.631e-03
Sb	1.529e-08	1.532e-08
Se	2.142e-08	2.145e-08
U	1.134e-07	1.136e-07
V	3.142e-09	3.146e-09
Zn	1.398e-06	1.400e-06

-----Description of solution-----

	pH	=	7.133	Charge balance
	pe	=	5.639	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	2.169e-02	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	5.054e-03	
	Total CO2 (mol/kg)	=	5.727e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.057e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	2	
	Total H	=	1.111869e+02	
	Total O	=	5.562598e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.586e-07	1.368e-07	-6.800	-6.864	-0.064	(0)
H+	8.490e-08	7.358e-08	-7.071	-7.133	-0.062	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	3.626e-08					
AgCl	2.362e-08	2.362e-08	-7.627	-7.627	0.000	(0)
Ag+	8.389e-09	7.270e-09	-8.076	-8.138	-0.062	(0)
AgCl2-	3.891e-09	3.273e-09	-8.410	-8.485	-0.075	(0)
AgSO4-	3.522e-10	2.963e-10	-9.453	-9.528	-0.075	(0)
AgCl3-2	9.270e-12	4.641e-12	-11.033	-11.333	-0.300	(0)
AgF	2.926e-12	2.926e-12	-11.534	-11.534	0.000	(0)

	AgOH	9.945e-14	9.945e-14	-13.002	-13.002	0.000	(0)
	AgCl4-3	7.151e-14	1.508e-14	-13.146	-13.822	-0.676	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgH2BO3	1.555e-14	1.555e-14	-13.808	-13.808	0.000	(0)
	AgSeO3-	4.962e-15	4.174e-15	-14.304	-14.379	-0.075	(0)
	AgNO2	3.275e-15	3.275e-15	-14.485	-14.485	0.000	(0)
	AgNH3+	1.191e-16	1.002e-16	-15.924	-15.999	-0.075	(0)
	Ag (OH) 2-	1.581e-18	1.330e-18	-17.801	-17.876	-0.075	(0)
	AgNO3	1.175e-20	1.175e-20	-19.930	-19.930	0.000	(0)
	Ag (SeO3) 2-3	1.584e-22	3.339e-23	-21.800	-22.476	-0.676	(0)
	Ag (NO2) 2-	1.300e-23	1.094e-23	-22.886	-22.961	-0.075	(0)
	Ag (NH3) 2+	6.531e-24	5.494e-24	-23.185	-23.260	-0.075	(0)
	Ag2MoO4	3.318e-24	3.318e-24	-23.479	-23.479	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.666	-72.666	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.159	-86.361	-1.202	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-146.833	-146.908	-0.075	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.084	-147.258	-0.174	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.237	-149.565	-0.327	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.563	-149.876	-0.313	(0)
Al		1.485e-06					
	Al (OH) 4-	9.895e-07	8.585e-07	-6.005	-6.066	-0.062	(0)
	AlF3	2.532e-07	2.532e-07	-6.597	-6.597	0.000	(0)
	AlF2+	1.440e-07	1.255e-07	-6.842	-6.901	-0.060	(0)
	Al (OH) 3	4.985e-08	4.985e-08	-7.302	-7.302	0.000	(0)
	AlF4-	2.343e-08	2.033e-08	-7.630	-7.692	-0.062	(0)
	Al (OH) 2+	2.095e-08	1.826e-08	-7.679	-7.738	-0.060	(0)
	AlF+2	3.406e-09	1.968e-09	-8.468	-8.706	-0.238	(0)
	AlOH+2	2.909e-10	1.681e-10	-9.536	-9.775	-0.238	(0)
	AlSO4+	2.245e-11	1.948e-11	-10.649	-10.710	-0.062	(0)
	Al+3	4.455e-12	1.229e-12	-11.351	-11.911	-0.559	(0)
	Al (SO4) 2-	4.913e-13	4.262e-13	-12.309	-12.370	-0.062	(0)
	AlMo6O21-3	1.894e-40	0.000e+00	-39.723	-40.399	-0.676	(0)
As (3)		7.687e-23					
	H3AsO3	7.624e-23	7.624e-23	-22.118	-22.118	0.000	(0)
	H2AsO3-	6.317e-25	5.314e-25	-24.199	-24.275	-0.075	(0)
	HAsO3-2	1.316e-29	6.586e-30	-28.881	-29.181	-0.300	(0)
	H4AsO3+	3.304e-30	2.779e-30	-29.481	-29.556	-0.075	(0)
	AsO3-3	1.637e-35	3.451e-36	-34.786	-35.462	-0.676	(0)
As (5)		1.101e-10					
	HAsO4-2	7.867e-11	3.939e-11	-10.104	-10.405	-0.300	(0)
	H2AsO4-	3.142e-11	2.643e-11	-10.503	-10.578	-0.075	(0)
	AsO4-3	8.029e-15	1.693e-15	-14.095	-14.771	-0.676	(0)
	H3AsO4	3.363e-16	3.380e-16	-15.473	-15.471	0.002	(0)
B		1.719e-05					
	H3BO3	1.702e-05	1.710e-05	-4.769	-4.767	0.002	(0)
	H2BO3-	1.575e-07	1.350e-07	-6.803	-6.870	-0.067	(0)
	CaH2BO3+	1.117e-08	9.572e-09	-7.952	-8.019	-0.067	(0)
	MgH2BO3+	5.159e-09	4.422e-09	-8.287	-8.354	-0.067	(0)
	BF (OH) 3-	1.276e-09	1.093e-09	-8.894	-8.961	-0.067	(0)
	NaH2BO3	9.806e-10	9.806e-10	-9.008	-9.008	0.000	(0)
	H5 (BO3) 2-	2.293e-12	1.965e-12	-11.640	-11.707	-0.067	(0)
	BF2 (OH) 2-	1.608e-12	1.378e-12	-11.794	-11.861	-0.067	(0)
	BaH2BO3+	2.496e-13	2.139e-13	-12.603	-12.670	-0.067	(0)
	AgH2BO3	1.555e-14	1.555e-14	-13.808	-13.808	0.000	(0)
	H8 (BO3) 3-	3.921e-15	3.361e-15	-14.407	-14.474	-0.067	(0)
	BF3OH-	7.377e-18	6.323e-18	-17.132	-17.199	-0.067	(0)
	BF4-	4.280e-22	3.668e-22	-21.369	-21.436	-0.067	(0)
Ba		9.332e-08					
	Ba+2	9.089e-08	5.127e-08	-7.042	-7.290	-0.249	(0)
	BaHCO3+	2.361e-09	2.065e-09	-8.627	-8.685	-0.058	(0)
	BaCO3	7.066e-11	7.066e-11	-10.151	-10.151	0.000	(0)
	BaH2BO3+	2.496e-13	2.139e-13	-12.603	-12.670	-0.067	(0)
	BaOH+	3.519e-14	3.062e-14	-13.454	-13.514	-0.060	(0)
	BaNO3+	6.214e-19	5.227e-19	-18.207	-18.282	-0.075	(0)
	BaNH3+2	4.360e-19	2.183e-19	-18.360	-18.661	-0.300	(0)
C (4)		5.727e-03					
	HCO3-	4.838e-03	4.218e-03	-2.315	-2.375	-0.060	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)

		CaHCO3+	1.107e-04	9.677e-05	-3.956	-4.014	-0.058	(0)
		MgHCO3+	4.713e-05	4.077e-05	-4.327	-4.390	-0.063	(0)
		NaHCO3	1.087e-05	1.087e-05	-4.964	-4.964	0.000	(0)
		CuCO3	8.006e-06	8.006e-06	-5.097	-5.097	0.000	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CO3-2	4.764e-06	2.687e-06	-5.322	-5.571	-0.249	(0)
		MgCO3	2.112e-06	2.112e-06	-5.675	-5.675	0.000	(0)
		MnHCO3+	1.102e-06	9.590e-07	-5.958	-6.018	-0.060	(0)
		NaCO3-	2.631e-07	2.294e-07	-6.580	-6.639	-0.060	(0)
		CuHCO3+	1.601e-07	1.346e-07	-6.796	-6.871	-0.075	(0)
		Cu (CO3) 2-2	1.157e-07	5.791e-08	-6.937	-7.237	-0.300	(0)
		ZnHCO3+	8.613e-08	7.245e-08	-7.065	-7.140	-0.075	(0)
		ZnCO3	8.400e-08	8.400e-08	-7.076	-7.076	0.000	(0)
		UO2 (CO3) 3-4	5.846e-08	3.672e-09	-7.233	-8.435	-1.202	(0)
		UO2 (CO3) 2-2	5.446e-08	2.727e-08	-7.264	-7.564	-0.300	(0)
		NiHCO3+	4.513e-08	3.796e-08	-7.346	-7.421	-0.075	(0)
		CoHCO3+	1.851e-08	1.557e-08	-7.733	-7.808	-0.075	(0)
		PbCO3	9.079e-09	9.079e-09	-8.042	-8.042	0.000	(0)
		NiCO3	7.319e-09	7.319e-09	-8.136	-8.136	0.000	(0)
		PbHCO3+	4.187e-09	3.522e-09	-8.378	-8.453	-0.075	(0)
		BaHCO3+	2.361e-09	2.065e-09	-8.627	-8.685	-0.058	(0)
		CoCO3	2.156e-09	2.156e-09	-8.666	-8.666	0.000	(0)
		UO2CO3	5.085e-10	5.085e-10	-9.294	-9.294	0.000	(0)
		CdCO3	3.221e-10	3.221e-10	-9.492	-9.492	0.000	(0)
		Pb (CO3) 2-2	1.405e-10	7.036e-11	-9.852	-10.153	-0.300	(0)
		BaCO3	7.066e-11	7.066e-11	-10.151	-10.151	0.000	(0)
		CdHCO3+	6.003e-11	5.049e-11	-10.222	-10.297	-0.075	(0)
		Cd (CO3) 2-2	1.282e-12	6.417e-13	-11.892	-12.193	-0.300	(0)
		FeHCO3+	9.287e-13	8.122e-13	-12.032	-12.090	-0.058	(0)
		HgCO3	1.923e-14	1.923e-14	-13.716	-13.716	0.000	(0)
		Hg (CO3) 2-2	3.265e-16	1.634e-16	-15.486	-15.787	-0.300	(0)
		HgHCO3+	3.133e-17	2.635e-17	-16.504	-16.579	-0.075	(0)
Ca	2.879e-03							
		Ca+2	2.184e-03	1.232e-03	-2.661	-2.909	-0.249	(0)
		CaSO4	5.765e-04	5.765e-04	-3.239	-3.239	0.000	(0)
		CaHCO3+	1.107e-04	9.677e-05	-3.956	-4.014	-0.058	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.476e-06	2.154e-06	-5.606	-5.667	-0.060	(0)
		CaH2BO3+	1.117e-08	9.572e-09	-7.952	-8.019	-0.067	(0)
		CaOH+	3.846e-09	3.363e-09	-8.415	-8.473	-0.058	(0)
		CaNH3+2	2.091e-14	1.047e-14	-13.680	-13.980	-0.300	(0)
		CaNO3+	9.423e-15	7.926e-15	-14.026	-14.101	-0.075	(0)
		Ca (NH3) 2+2	5.617e-26	2.812e-26	-25.251	-25.551	-0.300	(0)
Cd	1.334e-08							
		Cd+2	9.322e-09	5.259e-09	-8.031	-8.279	-0.249	(0)
		CdSO4	2.518e-09	2.518e-09	-8.599	-8.599	0.000	(0)
		CdCl+	9.499e-10	7.990e-10	-9.022	-9.097	-0.075	(0)
		CdCO3	3.221e-10	3.221e-10	-9.492	-9.492	0.000	(0)
		Cd (SO4) 2-2	1.385e-10	6.936e-11	-9.858	-10.159	-0.300	(0)
		CdHCO3+	6.003e-11	5.049e-11	-10.222	-10.297	-0.075	(0)
		CdF+	1.587e-11	1.335e-11	-10.799	-10.874	-0.075	(0)
		CdOH+	6.793e-12	5.714e-12	-11.168	-11.243	-0.075	(0)
		CdCl2	5.300e-12	5.300e-12	-11.276	-11.276	0.000	(0)
		CdOHC1	4.484e-12	4.484e-12	-11.348	-11.348	0.000	(0)
		Cd (CO3) 2-2	1.282e-12	6.417e-13	-11.892	-12.193	-0.300	(0)
		CdCl3-	6.325e-15	5.320e-15	-14.199	-14.274	-0.075	(0)
		Cd (OH) 2	4.932e-15	4.932e-15	-14.307	-14.307	0.000	(0)
		CdF2	4.268e-15	4.268e-15	-14.370	-14.370	0.000	(0)
		CdSeO4	3.790e-18	3.790e-18	-17.421	-17.421	0.000	(0)
		Cd2OH+3	7.143e-19	1.506e-19	-18.146	-18.822	-0.676	(0)
		Cd (OH) 3-	4.900e-20	4.122e-20	-19.310	-19.385	-0.075	(0)
		CdNO3+	4.021e-20	3.383e-20	-19.396	-19.471	-0.075	(0)
		Cd (SeO3) 2-2	6.908e-21	3.459e-21	-20.161	-20.461	-0.300	(0)
		Cd (OH) 4-2	1.844e-27	9.230e-28	-26.734	-27.035	-0.300	(0)
		Cd (NO3) 2	3.448e-32	3.448e-32	-31.462	-31.462	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.538	-78.613	-0.075	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-149.751	-149.751	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.118	-226.193	-0.075	(0)

Cd (HS) 4-2	0.000e+00	0.000e+00	-302.038	-302.339	-0.300	(0)
C1	1.836e-03					
Cl-	1.836e-03	1.591e-03	-2.736	-2.798	-0.062	(0)
MnCl+	2.624e-08	2.282e-08	-7.581	-7.642	-0.060	(0)
AgCl	2.362e-08	2.362e-08	-7.627	-7.627	0.000	(0)
AgCl2-	3.891e-09	3.273e-09	-8.410	-8.485	-0.075	(0)
ZnCl+	2.509e-09	2.171e-09	-8.600	-8.663	-0.063	(0)
CuCl+	1.475e-09	1.276e-09	-8.831	-8.894	-0.063	(0)
CuCl	1.139e-09	1.139e-09	-8.943	-8.943	0.000	(0)
CdCl+	9.499e-10	7.990e-10	-9.022	-9.097	-0.075	(0)
CuCl2-	4.377e-10	3.787e-10	-9.359	-9.422	-0.063	(0)
ZnOHCl	3.888e-10	3.888e-10	-9.410	-9.410	0.000	(0)
NiCl+	3.533e-10	2.972e-10	-9.452	-9.527	-0.075	(0)
CoCl+	3.106e-10	2.613e-10	-9.508	-9.583	-0.075	(0)
PbCl+	7.542e-11	6.344e-11	-10.122	-10.198	-0.075	(0)
MnCl2	5.130e-11	5.130e-11	-10.290	-10.290	0.000	(0)
AgCl3-2	9.270e-12	4.641e-12	-11.033	-11.333	-0.300	(0)
ZnCl2	5.474e-12	5.474e-12	-11.262	-11.262	0.000	(0)
CdCl2	5.300e-12	5.300e-12	-11.276	-11.276	0.000	(0)
CdOHCl	4.484e-12	4.484e-12	-11.348	-11.348	0.000	(0)
HgClOH	2.299e-12	2.299e-12	-11.639	-11.639	0.000	(0)
HgCl2	1.514e-12	1.514e-12	-11.820	-11.820	0.000	(0)
CuCl2	7.038e-13	7.038e-13	-12.153	-12.153	0.000	(0)
PbCl2	4.509e-13	4.509e-13	-12.346	-12.346	0.000	(0)
CuCl3-2	2.248e-13	1.288e-13	-12.648	-12.890	-0.242	(0)
AgCl4-3	7.151e-14	1.508e-14	-13.146	-13.822	-0.676	(0)
HgCl3-	2.864e-14	2.409e-14	-13.543	-13.618	-0.075	(0)
MnCl3-	2.584e-14	2.248e-14	-13.588	-13.648	-0.060	(0)
ZnCl3-	7.997e-15	6.918e-15	-14.097	-14.160	-0.063	(0)
CdCl3-	6.325e-15	5.320e-15	-14.199	-14.274	-0.075	(0)
NiCl2	2.381e-15	2.381e-15	-14.623	-14.623	0.000	(0)
CrCl+2	4.024e-16	2.015e-16	-15.395	-15.696	-0.300	(0)
PbCl3-	3.395e-16	2.856e-16	-15.469	-15.544	-0.075	(0)
HgCl4-2	3.048e-16	1.526e-16	-15.516	-15.817	-0.300	(0)
HgCl+	2.257e-16	1.899e-16	-15.646	-15.722	-0.075	(0)
UO2Cl+	1.458e-16	1.226e-16	-15.836	-15.911	-0.075	(0)
CuCl3-	1.208e-17	1.045e-17	-16.918	-16.981	-0.063	(0)
ZnCl4-2	9.608e-18	5.504e-18	-17.017	-17.259	-0.242	(0)
CrOHCl2	8.334e-19	8.334e-19	-18.079	-18.079	0.000	(0)
PbCl4-2	4.149e-19	2.077e-19	-18.382	-18.683	-0.300	(0)
FeCl+2	5.193e-20	2.975e-20	-19.285	-19.527	-0.242	(0)
CrCl2+	3.616e-20	3.041e-20	-19.442	-19.517	-0.075	(0)
VOCl+	1.425e-21	1.198e-21	-20.846	-20.921	-0.075	(0)
FeCl2+	2.430e-22	2.114e-22	-21.614	-21.675	-0.060	(0)
CuCl4-2	1.455e-22	8.333e-23	-21.837	-22.079	-0.242	(0)
FeCl3	3.364e-26	3.364e-26	-25.473	-25.473	0.000	(0)
CrO3Cl-	2.227e-26	1.873e-26	-25.652	-25.727	-0.075	(0)
CoCl+2	5.324e-35	2.665e-35	-34.274	-34.574	-0.300	(0)
UCl+3	0.000e+00	0.000e+00	-44.340	-45.016	-0.676	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.175	-64.475	-0.300	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.430	-68.731	-0.300	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.061	-82.362	-0.300	(0)
Co (2)	1.356e-07					
Co+2	9.481e-08	4.747e-08	-7.023	-7.324	-0.300	(0)
CoSO4	1.934e-08	1.934e-08	-7.713	-7.713	0.000	(0)
CoHCO3+	1.851e-08	1.557e-08	-7.733	-7.808	-0.075	(0)
CoCO3	2.156e-09	2.156e-09	-8.666	-8.666	0.000	(0)
CoCl+	3.106e-10	2.613e-10	-9.508	-9.583	-0.075	(0)
CoF+	2.859e-10	2.405e-10	-9.544	-9.619	-0.075	(0)
CoOH+	1.540e-10	1.296e-10	-9.812	-9.888	-0.075	(0)
Co (OH) 2	1.408e-12	1.408e-12	-11.851	-11.851	0.000	(0)
CoNO2+	8.574e-16	7.212e-16	-15.067	-15.142	-0.075	(0)
CoSeO4	9.207e-17	9.207e-17	-16.036	-16.036	0.000	(0)
Co (NH3) +2	7.692e-17	3.851e-17	-16.114	-16.414	-0.300	(0)
Co (OH) 3-	4.568e-18	3.843e-18	-17.340	-17.415	-0.075	(0)
Co2OH+3	1.462e-18	3.082e-19	-17.835	-18.511	-0.676	(0)
CoOOH-	1.147e-18	9.645e-19	-17.941	-18.016	-0.075	(0)
CoNO3+	1.819e-19	1.530e-19	-18.740	-18.815	-0.075	(0)

Co (OH) 4-2	1.664e-25	8.331e-26	-24.779	-25.079	-0.300	(0)
Co (NH3) 2+2	2.214e-26	1.108e-26	-25.655	-25.955	-0.300	(0)
Co4 (OH) 4+4	8.949e-31	5.622e-32	-30.048	-31.250	-1.202	(0)
Co (NO3) 2	6.334e-31	6.334e-31	-30.198	-30.198	0.000	(0)
Co (NH3) 3+2	1.881e-36	9.417e-37	-35.726	-36.026	-0.300	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.176	-46.477	-0.300	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.127	-57.428	-0.300	(0)
Co (3)	1.143e-28					
CoOH+2	1.143e-28	5.724e-29	-27.942	-28.242	-0.300	(0)
Co+3	2.985e-34	8.233e-35	-33.525	-34.084	-0.559	(0)
CoCl+2	5.324e-35	2.665e-35	-34.274	-34.574	-0.300	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.175	-64.475	-0.300	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.253	-77.328	-0.075	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.927	-82.227	-0.300	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.061	-82.362	-0.300	(0)
Cr (2)	1.072e-25					
Cr+2	1.072e-25	5.364e-26	-24.970	-25.270	-0.300	(0)
Cr (3)	6.781e-09					
Cr (OH) 2+	5.794e-09	4.874e-09	-8.237	-8.312	-0.075	(0)
Cr (OH) +2	5.849e-10	2.928e-10	-9.233	-9.533	-0.300	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.419e-10	1.419e-10	-9.848	-9.848	0.000	(0)
CrF+2	4.962e-12	2.484e-12	-11.304	-11.605	-0.300	(0)
CrO2-	1.923e-12	1.617e-12	-11.716	-11.791	-0.075	(0)
Cr (OH) 4-	1.622e-12	1.364e-12	-11.790	-11.865	-0.075	(0)
CrSO4+	5.547e-13	4.666e-13	-12.256	-12.331	-0.075	(0)
Cr+3	4.641e-13	9.784e-14	-12.333	-13.009	-0.676	(0)
CrCl+2	4.024e-16	2.015e-16	-15.395	-15.696	-0.300	(0)
Cr2 (OH) 2SO4+2	7.502e-18	3.756e-18	-17.125	-17.425	-0.300	(0)
CrOHC12	8.334e-19	8.334e-19	-18.079	-18.079	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.557e-19	4.557e-19	-18.341	-18.341	0.000	(0)
CrCl2+	3.616e-20	3.041e-20	-19.442	-19.517	-0.075	(0)
CrNO3+2	1.738e-26	8.699e-27	-25.760	-26.061	-0.300	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.055	-55.355	-0.300	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.358	-67.034	-0.676	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.430	-68.731	-0.300	(0)
Cr (6)	2.228e-16					
CrO4-2	1.893e-16	1.068e-16	-15.723	-15.971	-0.249	(0)
HCrO4-	3.023e-17	2.543e-17	-16.520	-16.595	-0.075	(0)
NaCrO4-	2.892e-18	2.433e-18	-17.539	-17.614	-0.075	(0)
KCrO4-	3.861e-19	3.248e-19	-18.413	-18.488	-0.075	(0)
CrO3SO4-2	2.326e-24	1.164e-24	-23.633	-23.934	-0.300	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.227e-26	1.873e-26	-25.652	-25.727	-0.075	(0)
Cr2O7-2	4.480e-32	2.243e-32	-31.349	-31.649	-0.300	(0)
Cu (1)	2.253e-09					
CuCl	1.139e-09	1.139e-09	-8.943	-8.943	0.000	(0)
Cu+	6.761e-10	5.687e-10	-9.170	-9.245	-0.075	(0)
CuCl2-	4.377e-10	3.787e-10	-9.359	-9.422	-0.063	(0)
CuCl3-2	2.248e-13	1.288e-13	-12.648	-12.890	-0.242	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.952	-148.272	-0.320	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.696	-149.002	-0.306	(0)
Cu (2)	9.686e-06					
CuCO3	8.006e-06	8.006e-06	-5.097	-5.097	0.000	(0)
Cu+2	8.968e-07	5.059e-07	-6.047	-6.296	-0.249	(0)
CuOH+	2.530e-07	2.188e-07	-6.597	-6.660	-0.063	(0)
CuSO4	2.367e-07	2.367e-07	-6.626	-6.626	0.000	(0)
CuHCO3+	1.601e-07	1.346e-07	-6.796	-6.871	-0.075	(0)
Cu (CO3) 2-2	1.157e-07	5.791e-08	-6.937	-7.237	-0.300	(0)
CuF+	6.079e-09	5.114e-09	-8.216	-8.291	-0.075	(0)
Cu (OH) 2	5.973e-09	5.973e-09	-8.224	-8.224	0.000	(0)
Cu2 (OH) 2+2	2.403e-09	1.203e-09	-8.619	-8.920	-0.300	(0)
CuCl+	1.475e-09	1.276e-09	-8.831	-8.894	-0.063	(0)
Cu (OH) 3-	1.993e-12	1.676e-12	-11.701	-11.776	-0.075	(0)
CuCl2	7.038e-13	7.038e-13	-12.153	-12.153	0.000	(0)
CuNO2+	1.358e-13	1.142e-13	-12.867	-12.942	-0.075	(0)
CuNH3+2	6.978e-14	3.493e-14	-13.156	-13.457	-0.300	(0)
CuCl3-	1.208e-17	1.045e-17	-16.918	-16.981	-0.063	(0)

	CuNO3+	3.869e-18	3.254e-18	-17.412	-17.488	-0.075	(0)
	Cu (OH) 4-2	3.605e-18	1.805e-18	-17.443	-17.744	-0.300	(0)
	Cu (NO2) 2	2.520e-21	2.520e-21	-20.599	-20.599	0.000	(0)
	CuCl4-2	1.455e-22	8.333e-23	-21.837	-22.079	-0.242	(0)
	Cu (NO3) 2	8.334e-31	8.334e-31	-30.079	-30.079	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.348	-215.423	-0.075	(0)
F	2.086e-04						
	F-	1.848e-04	1.602e-04	-3.733	-3.795	-0.062	(0)
	MgF+	1.957e-05	1.698e-05	-4.708	-4.770	-0.062	(0)
	CaF+	2.476e-06	2.154e-06	-5.606	-5.667	-0.060	(0)
	NaF	4.633e-07	4.633e-07	-6.334	-6.334	0.000	(0)
	AlF3	2.532e-07	2.532e-07	-6.597	-6.597	0.000	(0)
	AlF2+	1.440e-07	1.255e-07	-6.842	-6.901	-0.060	(0)
	MnF+	8.354e-08	7.267e-08	-7.078	-7.139	-0.060	(0)
	AlF4-	2.343e-08	2.033e-08	-7.630	-7.692	-0.062	(0)
	HF	1.743e-08	1.743e-08	-7.759	-7.759	0.000	(0)
	CuF+	6.079e-09	5.114e-09	-8.216	-8.291	-0.075	(0)
	AlF+2	3.406e-09	1.968e-09	-8.468	-8.706	-0.238	(0)
	ZnF+	2.064e-09	1.736e-09	-8.685	-8.760	-0.075	(0)
	BF (OH) 3-	1.276e-09	1.093e-09	-8.894	-8.961	-0.067	(0)
	NiF+	3.492e-10	2.938e-10	-9.457	-9.532	-0.075	(0)
	CoF+	2.859e-10	2.405e-10	-9.544	-9.619	-0.075	(0)
	CdF+	1.587e-11	1.335e-11	-10.799	-10.874	-0.075	(0)
	PbF+	1.508e-11	1.269e-11	-10.822	-10.897	-0.075	(0)
	HF2-	1.231e-11	1.062e-11	-10.910	-10.974	-0.064	(0)
	CrF+2	4.962e-12	2.484e-12	-11.304	-11.605	-0.300	(0)
	AgF	2.926e-12	2.926e-12	-11.534	-11.534	0.000	(0)
	BF2 (OH) 2-	1.608e-12	1.378e-12	-11.794	-11.861	-0.067	(0)
	UO2F+	1.250e-12	1.051e-12	-11.903	-11.978	-0.075	(0)
	UO2F2	4.856e-13	4.856e-13	-12.314	-12.314	0.000	(0)
	PbF2	4.000e-14	4.000e-14	-13.398	-13.398	0.000	(0)
	UO2F3-	2.323e-14	1.954e-14	-13.634	-13.709	-0.075	(0)
	CdF2	4.268e-15	4.268e-15	-14.370	-14.370	0.000	(0)
	H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
	FeF2+	5.359e-16	4.662e-16	-15.271	-15.331	-0.060	(0)
	FeF+2	1.898e-16	1.087e-16	-15.722	-15.964	-0.242	(0)
	FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
	VO2F	7.587e-17	7.587e-17	-16.120	-16.120	0.000	(0)
	UO2F4-2	4.967e-17	2.487e-17	-16.304	-16.604	-0.300	(0)
	PbF3-	1.445e-17	1.215e-17	-16.840	-16.915	-0.075	(0)
	BF3OH-	7.377e-18	6.323e-18	-17.132	-17.199	-0.067	(0)
	VO2F2-	5.246e-18	4.413e-18	-17.280	-17.355	-0.075	(0)
	VOF+	3.067e-19	2.579e-19	-18.513	-18.588	-0.075	(0)
	VO2F3-2	1.761e-20	8.818e-21	-19.754	-20.055	-0.300	(0)
	VOF2	1.550e-20	1.550e-20	-19.810	-19.810	0.000	(0)
	PbF4-2	1.861e-21	9.319e-22	-20.730	-21.031	-0.300	(0)
	BF4-	4.280e-22	3.668e-22	-21.369	-21.436	-0.067	(0)
	VOF3-	1.047e-22	8.808e-23	-21.980	-22.055	-0.075	(0)
	HgF+	4.222e-23	3.551e-23	-22.374	-22.450	-0.075	(0)
	VO2F4-3	3.297e-24	6.951e-25	-23.482	-24.158	-0.676	(0)
	Sb (OH) 2F	1.186e-24	1.186e-24	-23.926	-23.926	0.000	(0)
	SbOF	1.167e-24	1.167e-24	-23.933	-23.933	0.000	(0)
	VOF4-2	1.138e-25	5.695e-26	-24.944	-25.244	-0.300	(0)
	UF3+	2.350e-34	1.977e-34	-33.629	-33.704	-0.075	(0)
	UF2+2	1.555e-35	7.785e-36	-34.808	-35.109	-0.300	(0)
	UF4	3.472e-36	3.472e-36	-35.459	-35.459	0.000	(0)
	UF5-	2.620e-38	2.204e-38	-37.582	-37.657	-0.075	(0)
	UF+3	1.831e-38	3.860e-39	-37.737	-38.413	-0.676	(0)
	UF6-2	2.130e-39	1.066e-39	-38.672	-38.972	-0.300	(0)
Fe (2)	3.925e-11						
	Fe+2	3.055e-11	1.530e-11	-10.515	-10.815	-0.300	(0)
	FeSO4	7.668e-12	7.668e-12	-11.115	-11.115	0.000	(0)
	FeHCO3+	9.287e-13	8.122e-13	-12.032	-12.090	-0.058	(0)
	FeOH+	9.575e-14	8.330e-14	-13.019	-13.079	-0.060	(0)
	Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	4.501e-19	3.916e-19	-18.347	-18.407	-0.060	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-158.549	-158.549	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-234.779	-234.854	-0.075	(0)

Fe (3)	3.772e-09					
Fe (OH) 2+	3.338e-09	2.910e-09	-8.477	-8.536	-0.060	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.247e-12	5.446e-12	-11.204	-11.264	-0.060	(0)
FeOH+2	9.545e-14	5.468e-14	-13.020	-13.262	-0.242	(0)
FeF2+	5.359e-16	4.662e-16	-15.271	-15.331	-0.060	(0)
FeF+2	1.898e-16	1.087e-16	-15.722	-15.964	-0.242	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.631e-17	1.419e-17	-16.788	-16.848	-0.060	(0)
Fe+3	2.245e-18	6.191e-19	-17.649	-18.208	-0.559	(0)
Fe (SO4) 2-	7.364e-19	6.195e-19	-18.133	-18.208	-0.075	(0)
FeCl+2	5.193e-20	2.975e-20	-19.285	-19.527	-0.242	(0)
FeCl2+	2.430e-22	2.114e-22	-21.614	-21.675	-0.060	(0)
FeHSeO3+2	5.395e-23	2.701e-23	-22.268	-22.568	-0.300	(0)
Fe2 (OH) 2+4	1.576e-24	9.901e-26	-23.802	-25.004	-1.202	(0)
FeCl3	3.364e-26	3.364e-26	-25.473	-25.473	0.000	(0)
FeNO3+2	2.515e-29	1.259e-29	-28.599	-28.900	-0.300	(0)
Fe3 (OH) 4+5	3.145e-31	4.165e-33	-30.502	-32.380	-1.878	(0)
H (0)	4.018e-29					
H2	2.009e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.908e-10					
Hg	2.908e-10	2.908e-10	-9.536	-9.536	0.000	(0)
Hg (1)	4.716e-21					
Hg2+2	2.358e-21	1.181e-21	-20.627	-20.928	-0.300	(0)
Hg (2)	4.564e-12					
HgClOH	2.299e-12	2.299e-12	-11.639	-11.639	0.000	(0)
HgCl2	1.514e-12	1.514e-12	-11.820	-11.820	0.000	(0)
Hg (OH) 2	7.026e-13	7.061e-13	-12.153	-12.151	0.002	(0)
HgCl3-	2.864e-14	2.409e-14	-13.543	-13.618	-0.075	(0)
HgCO3	1.923e-14	1.923e-14	-13.716	-13.716	0.000	(0)
Hg (CO3) 2-2	3.265e-16	1.634e-16	-15.486	-15.787	-0.300	(0)
HgCl4-2	3.048e-16	1.526e-16	-15.516	-15.817	-0.300	(0)
HgCl+	2.257e-16	1.899e-16	-15.646	-15.722	-0.075	(0)
HgOH+	3.872e-17	3.257e-17	-16.412	-16.487	-0.075	(0)
HgHCO3+	3.133e-17	2.635e-17	-16.504	-16.579	-0.075	(0)
Hg (OH) 3-	1.446e-20	1.216e-20	-19.840	-19.915	-0.075	(0)
Hg+2	1.195e-20	5.980e-21	-19.923	-20.223	-0.300	(0)
HgSO4	3.198e-21	3.198e-21	-20.495	-20.495	0.000	(0)
HgNH3+2	5.086e-23	2.546e-23	-22.294	-22.594	-0.300	(0)
HgF+	4.222e-23	3.551e-23	-22.374	-22.450	-0.075	(0)
Hg (NH3) 2+2	3.432e-25	1.718e-25	-24.464	-24.765	-0.300	(0)
HgNO3+	5.340e-33	4.492e-33	-32.272	-32.348	-0.075	(0)
Hg (NH3) 3+2	9.219e-36	4.616e-36	-35.035	-35.336	-0.300	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.421	-44.421	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.306	-45.607	-0.300	(0)
HgHS2-	0.000e+00	0.000e+00	-137.771	-137.846	-0.075	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.585	-138.585	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.120	-139.421	-0.300	(0)
K	9.581e-04					
K+	9.445e-04	8.186e-04	-3.025	-3.087	-0.062	(0)
KSO4-	1.358e-05	1.184e-05	-4.867	-4.927	-0.060	(0)
KCrO4-	3.861e-19	3.248e-19	-18.413	-18.488	-0.075	(0)
Mg	2.095e-03					
Mg+2	1.675e-03	9.447e-04	-2.776	-3.025	-0.249	(0)
MgSO4	3.511e-04	3.511e-04	-3.455	-3.455	0.000	(0)
MgHCO3+	4.713e-05	4.077e-05	-4.327	-4.390	-0.063	(0)
MgF+	1.957e-05	1.698e-05	-4.708	-4.770	-0.062	(0)
MgCO3	2.112e-06	2.112e-06	-5.675	-5.675	0.000	(0)
MgOH+	5.868e-08	5.145e-08	-7.231	-7.289	-0.057	(0)
MgH2BO3+	5.159e-09	4.422e-09	-8.287	-8.354	-0.067	(0)
Mn (2)	2.812e-05					
Mn+2	2.276e-05	1.140e-05	-4.643	-4.943	-0.300	(0)
MnSO4	4.139e-06	4.139e-06	-5.383	-5.383	0.000	(0)
MnHCO3+	1.102e-06	9.590e-07	-5.958	-6.018	-0.060	(0)
MnF+	8.354e-08	7.267e-08	-7.078	-7.139	-0.060	(0)
MnCl+	2.624e-08	2.282e-08	-7.581	-7.642	-0.060	(0)
MnOH+	4.501e-09	3.916e-09	-8.347	-8.407	-0.060	(0)
MnCl2	5.130e-11	5.130e-11	-10.290	-10.290	0.000	(0)

MnCl3-	2.584e-14	2.248e-14	-13.588	-13.648	-0.060	(0)
MnSeO4	1.187e-14	1.187e-14	-13.926	-13.926	0.000	(0)
MnNO3+	4.367e-17	3.674e-17	-16.360	-16.435	-0.075	(0)
Mn (OH) 3-	5.205e-19	4.529e-19	-18.284	-18.344	-0.060	(0)
Mn (OH) 4-2	3.491e-25	2.000e-25	-24.457	-24.699	-0.242	(0)
Mn (NO3) 2	1.877e-28	1.877e-28	-27.727	-27.727	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.751	-42.751	0.000	(0)
Mn (3)	8.041e-25					
Mn+3	8.041e-25	2.218e-25	-24.095	-24.654	-0.559	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.501	-43.743	-0.242	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.410	-47.476	-0.066	(0)
Mo	2.943e-07					
MoO4-2	2.940e-07	1.659e-07	-6.532	-6.780	-0.249	(0)
HMoO4-	2.887e-10	2.428e-10	-9.540	-9.615	-0.075	(0)
H2MoO4	1.309e-13	1.309e-13	-12.883	-12.883	0.000	(0)
Ag2MoO4	3.318e-24	3.318e-24	-23.479	-23.479	0.000	(0)
AlMo6O21-3	1.894e-40	0.000e+00	-39.723	-40.399	-0.676	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.833	-51.537	-2.704	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.406	-52.284	-1.878	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-53.433	-54.635	-1.202	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.846	-58.522	-0.676	(0)
N (-3)	1.045e-09					
NH4+	1.016e-09	8.708e-10	-8.993	-9.060	-0.067	(0)
NH4SO4-	2.190e-11	1.906e-11	-10.659	-10.720	-0.060	(0)
NH3	6.748e-12	6.748e-12	-11.171	-11.171	0.000	(0)
CuNH3+2	6.978e-14	3.493e-14	-13.156	-13.457	-0.300	(0)
CaNH3+2	2.091e-14	1.047e-14	-13.680	-13.980	-0.300	(0)
NiNH3+2	5.284e-16	2.646e-16	-15.277	-15.577	-0.300	(0)
AgNH3+	1.191e-16	1.002e-16	-15.924	-15.999	-0.075	(0)
Co (NH3) +2	7.692e-17	3.851e-17	-16.114	-16.414	-0.300	(0)
BaNH3+2	4.360e-19	2.183e-19	-18.360	-18.661	-0.300	(0)
HgNH3+2	5.086e-23	2.546e-23	-22.294	-22.594	-0.300	(0)
Ag (NH3) 2+	6.531e-24	5.494e-24	-23.185	-23.260	-0.075	(0)
Ni (NH3) 2+2	5.154e-25	2.580e-25	-24.288	-24.588	-0.300	(0)
Hg (NH3) 2+2	3.432e-25	1.718e-25	-24.464	-24.765	-0.300	(0)
Ca (NH3) 2+2	5.617e-26	2.812e-26	-25.251	-25.551	-0.300	(0)
Co (NH3) 2+2	2.214e-26	1.108e-26	-25.655	-25.955	-0.300	(0)
Hg (NH3) 3+2	9.219e-36	4.616e-36	-35.035	-35.336	-0.300	(0)
Co (NH3) 3+2	1.881e-36	9.417e-37	-35.726	-36.026	-0.300	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.306	-45.607	-0.300	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.176	-46.477	-0.300	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.055	-55.355	-0.300	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.127	-57.428	-0.300	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.175	-64.475	-0.300	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.358	-67.034	-0.676	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.430	-68.731	-0.300	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.253	-77.328	-0.075	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.927	-82.227	-0.300	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.061	-82.362	-0.300	(0)
N (3)	2.508e-09					
NO2-	2.508e-09	2.156e-09	-8.601	-8.666	-0.066	(0)
CuNO2+	1.358e-13	1.142e-13	-12.867	-12.942	-0.075	(0)
AgNO2	3.275e-15	3.275e-15	-14.485	-14.485	0.000	(0)
CoNO2+	8.574e-16	7.212e-16	-15.067	-15.142	-0.075	(0)
Cu (NO2) 2	2.520e-21	2.520e-21	-20.599	-20.599	0.000	(0)
Ag (NO2) 2-	1.300e-23	1.094e-23	-22.886	-22.961	-0.075	(0)
N (5)	2.357e-12					
NO3-	2.347e-12	2.034e-12	-11.629	-11.692	-0.062	(0)
CaNO3+	9.423e-15	7.926e-15	-14.026	-14.101	-0.075	(0)
MnNO3+	4.367e-17	3.674e-17	-16.360	-16.435	-0.075	(0)
CuNO3+	3.869e-18	3.254e-18	-17.412	-17.488	-0.075	(0)
ZnNO3+	3.299e-18	2.775e-18	-17.482	-17.557	-0.075	(0)
BaNO3+	6.214e-19	5.227e-19	-18.207	-18.282	-0.075	(0)
NiNO3+	4.435e-19	3.730e-19	-18.353	-18.428	-0.075	(0)
CoNO3+	1.819e-19	1.530e-19	-18.740	-18.815	-0.075	(0)
CdNO3+	4.021e-20	3.383e-20	-19.396	-19.471	-0.075	(0)

	PbNO3+	4.020e-20	3.381e-20	-19.396	-19.471	-0.075	(0)
	AgNO3	1.175e-20	1.175e-20	-19.930	-19.930	0.000	(0)
	UO2NO3+	2.293e-25	1.929e-25	-24.640	-24.715	-0.075	(0)
	CrNO3+2	1.738e-26	8.699e-27	-25.760	-26.061	-0.300	(0)
	VO2NO3	2.778e-28	2.778e-28	-27.556	-27.556	0.000	(0)
	Mn(NO3) 2	1.877e-28	1.877e-28	-27.727	-27.727	0.000	(0)
	FeNO3+2	2.515e-29	1.259e-29	-28.599	-28.900	-0.300	(0)
	Zn(NO3) 2	1.126e-30	1.126e-30	-29.948	-29.948	0.000	(0)
	Cu(NO3) 2	8.334e-31	8.334e-31	-30.079	-30.079	0.000	(0)
	Co(NO3) 2	6.334e-31	6.334e-31	-30.198	-30.198	0.000	(0)
	Pb(NO3) 2	1.168e-31	1.168e-31	-30.933	-30.933	0.000	(0)
	Cd(NO3) 2	3.448e-32	3.448e-32	-31.462	-31.462	0.000	(0)
	HgNO3+	5.340e-33	4.492e-33	-32.272	-32.348	-0.075	(0)
	Hg(NO3) 2	0.000e+00	0.000e+00	-44.421	-44.421	0.000	(0)
Na	5.358e-03						
	Na+	5.289e-03	4.584e-03	-2.277	-2.339	-0.062	(0)
	NaSO4-	5.766e-05	5.027e-05	-4.239	-4.299	-0.060	(0)
	NaHCO3	1.087e-05	1.087e-05	-4.964	-4.964	0.000	(0)
	NaF	4.633e-07	4.633e-07	-6.334	-6.334	0.000	(0)
	NaCO3-	2.631e-07	2.294e-07	-6.580	-6.639	-0.060	(0)
	NaH2BO3	9.806e-10	9.806e-10	-9.008	-9.008	0.000	(0)
	NaCrO4-	2.892e-18	2.433e-18	-17.539	-17.614	-0.075	(0)
Ni	2.125e-07						
	Ni+2	1.294e-07	7.300e-08	-6.888	-7.137	-0.249	(0)
	NiHCO3+	4.513e-08	3.796e-08	-7.346	-7.421	-0.075	(0)
	NiSO4	2.975e-08	2.975e-08	-7.527	-7.527	0.000	(0)
	NiCO3	7.319e-09	7.319e-09	-8.136	-8.136	0.000	(0)
	NiCl+	3.533e-10	2.972e-10	-9.452	-9.527	-0.075	(0)
	NiF+	3.492e-10	2.938e-10	-9.457	-9.532	-0.075	(0)
	NiOH+	1.495e-10	1.257e-10	-9.825	-9.901	-0.075	(0)
	Ni(SO4) 2-2	4.019e-12	2.012e-12	-11.396	-11.696	-0.300	(0)
	Ni(OH) 2	1.366e-12	1.366e-12	-11.864	-11.864	0.000	(0)
	NiCl2	2.381e-15	2.381e-15	-14.623	-14.623	0.000	(0)
	NiNH3+2	5.284e-16	2.646e-16	-15.277	-15.577	-0.300	(0)
	Ni(OH) 3-	2.222e-16	1.869e-16	-15.653	-15.728	-0.075	(0)
	NiSeO4	1.321e-16	1.321e-16	-15.879	-15.879	0.000	(0)
	NiNO3+	4.435e-19	3.730e-19	-18.353	-18.428	-0.075	(0)
	Ni(NH3) 2+2	5.154e-25	2.580e-25	-24.288	-24.588	-0.300	(0)
O(0)	2.473e-35						
	O2	1.236e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	1.710e-08						
	PbCO3	9.079e-09	9.079e-09	-8.042	-8.042	0.000	(0)
	PbHCO3+	4.187e-09	3.522e-09	-8.378	-8.453	-0.075	(0)
	Pb+2	1.992e-09	1.124e-09	-8.701	-8.949	-0.249	(0)
	PbSO4	1.124e-09	1.124e-09	-8.949	-8.949	0.000	(0)
	PbOH+	4.591e-10	3.862e-10	-9.338	-9.413	-0.075	(0)
	Pb(CO3) 2-2	1.405e-10	7.036e-11	-9.852	-10.153	-0.300	(0)
	PbCl+	7.542e-11	6.344e-11	-10.122	-10.198	-0.075	(0)
	Pb(SO4) 2-2	2.763e-11	1.383e-11	-10.559	-10.859	-0.300	(0)
	PbF+	1.508e-11	1.269e-11	-10.822	-10.897	-0.075	(0)
	Pb(OH) 2	1.671e-12	1.671e-12	-11.777	-11.777	0.000	(0)
	PbCl2	4.509e-13	4.509e-13	-12.346	-12.346	0.000	(0)
	PbF2	4.000e-14	4.000e-14	-13.398	-13.398	0.000	(0)
	PbCl3-	3.395e-16	2.856e-16	-15.469	-15.544	-0.075	(0)
	Pb(OH) 3-	2.717e-16	2.285e-16	-15.566	-15.641	-0.075	(0)
	Pb2OH+3	3.262e-17	6.878e-18	-16.486	-17.163	-0.676	(0)
	PbF3-	1.445e-17	1.215e-17	-16.840	-16.915	-0.075	(0)
	PbCl4-2	4.149e-19	2.077e-19	-18.382	-18.683	-0.300	(0)
	PbNO3+	4.020e-20	3.381e-20	-19.396	-19.471	-0.075	(0)
	Pb(OH) 4-2	1.529e-20	7.656e-21	-19.816	-20.116	-0.300	(0)
	PbF4-2	1.861e-21	9.319e-22	-20.730	-21.031	-0.300	(0)
	Pb3(OH) 4+2	1.250e-22	6.258e-23	-21.903	-22.204	-0.300	(0)
	Pb4(OH) 4+4	8.892e-27	5.586e-28	-26.051	-27.253	-1.202	(0)
	Pb(NO3) 2	1.168e-31	1.168e-31	-30.933	-30.933	0.000	(0)
	Pb(HS) 2	0.000e+00	0.000e+00	-150.363	-150.363	0.000	(0)
	Pb(HS) 3-	0.000e+00	0.000e+00	-227.330	-227.405	-0.075	(0)
S(-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-72.666	-72.666	0.000	(0)

HS-	0.000e+00	0.000e+00	-78.267	-78.342	-0.075	(0)
H2S	0.000e+00	0.000e+00	-78.455	-78.455	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.538	-78.613	-0.075	(0)
S5-2	0.000e+00	0.000e+00	-80.273	-80.574	-0.300	(0)
S6-2	0.000e+00	0.000e+00	-80.789	-81.090	-0.300	(0)
S4-2	0.000e+00	0.000e+00	-80.869	-81.169	-0.300	(0)
S3-2	0.000e+00	0.000e+00	-81.675	-81.975	-0.300	(0)
S2-2	0.000e+00	0.000e+00	-82.691	-82.991	-0.300	(0)
S-2	0.000e+00	0.000e+00	-88.267	-88.509	-0.242	(0)
HgHS2-	0.000e+00	0.000e+00	-137.771	-137.846	-0.075	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.585	-138.585	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.120	-139.421	-0.300	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.833	-146.908	-0.075	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.084	-147.258	-0.174	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.952	-148.272	-0.320	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.696	-149.002	-0.306	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.931	-149.006	-0.075	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.237	-149.565	-0.327	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.563	-149.876	-0.313	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.751	-149.751	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.129	-150.129	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.363	-150.363	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.549	-158.549	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.348	-215.423	-0.075	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.116	-225.191	-0.075	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.118	-226.193	-0.075	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.330	-227.405	-0.075	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.737	-228.038	-0.300	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-234.779	-234.854	-0.075	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.038	-302.339	-0.300	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.692	-304.993	-0.300	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.326	-316.627	-0.300	(0)
S (6)	4.624e-03					
SO4-2	3.620e-03	2.042e-03	-2.441	-2.690	-0.249	(0)
CaSO4	5.765e-04	5.765e-04	-3.239	-3.239	0.000	(0)
MgSO4	3.511e-04	3.511e-04	-3.455	-3.455	0.000	(0)
NaSO4-	5.766e-05	5.027e-05	-4.239	-4.299	-0.060	(0)
KSO4-	1.358e-05	1.184e-05	-4.867	-4.927	-0.060	(0)
MnSO4	4.139e-06	4.139e-06	-5.383	-5.383	0.000	(0)
ZnSO4	2.427e-07	2.427e-07	-6.615	-6.615	0.000	(0)
CuSO4	2.367e-07	2.367e-07	-6.626	-6.626	0.000	(0)
NiSO4	2.975e-08	2.975e-08	-7.527	-7.527	0.000	(0)
CoSO4	1.934e-08	1.934e-08	-7.713	-7.713	0.000	(0)
HSO4-	1.693e-08	1.469e-08	-7.771	-7.833	-0.062	(0)
Zn (SO4) 2-2	8.623e-09	4.317e-09	-8.064	-8.365	-0.300	(0)
CdSO4	2.518e-09	2.518e-09	-8.599	-8.599	0.000	(0)
PbSO4	1.124e-09	1.124e-09	-8.949	-8.949	0.000	(0)
AgSO4-	3.522e-10	2.963e-10	-9.453	-9.528	-0.075	(0)
CrOHSO4	1.419e-10	1.419e-10	-9.848	-9.848	0.000	(0)
Cd (SO4) 2-2	1.385e-10	6.936e-11	-9.858	-10.159	-0.300	(0)
Pb (SO4) 2-2	2.763e-11	1.383e-11	-10.559	-10.859	-0.300	(0)
AlSO4+	2.245e-11	1.948e-11	-10.649	-10.710	-0.062	(0)
NH4SO4-	2.190e-11	1.906e-11	-10.659	-10.720	-0.060	(0)
FeSO4	7.668e-12	7.668e-12	-11.115	-11.115	0.000	(0)
Ni (SO4) 2-2	4.019e-12	2.012e-12	-11.396	-11.696	-0.300	(0)
CrSO4+	5.547e-13	4.666e-13	-12.256	-12.331	-0.075	(0)
Al (SO4) 2-	4.913e-13	4.262e-13	-12.309	-12.370	-0.062	(0)
UO2SO4	1.469e-13	1.469e-13	-12.833	-12.833	0.000	(0)
UO2 (SO4) 2-2	7.901e-15	3.956e-15	-14.102	-14.403	-0.300	(0)
FeSO4+	1.631e-17	1.419e-17	-16.788	-16.848	-0.060	(0)
VO2SO4-	1.565e-17	1.317e-17	-16.805	-16.880	-0.075	(0)
Cr2 (OH) 2SO4+2	7.502e-18	3.756e-18	-17.125	-17.425	-0.300	(0)
Fe (SO4) 2-	7.364e-19	6.195e-19	-18.133	-18.208	-0.075	(0)
Cr2 (OH) 2 (SO4) 2	4.557e-19	4.557e-19	-18.341	-18.341	0.000	(0)
VOSO4	1.510e-19	1.510e-19	-18.821	-18.821	0.000	(0)
HgSO4	3.198e-21	3.198e-21	-20.495	-20.495	0.000	(0)
CrO3SO4-2	2.326e-24	1.164e-24	-23.633	-23.934	-0.300	(0)
VSO4+	1.899e-33	1.598e-33	-32.721	-32.797	-0.075	(0)

U(SO4)2	1.593e-39	1.593e-39	-38.798	-38.798	0.000	(0)
USO4+2	1.961e-40	0.000e+00	-39.707	-40.008	-0.300	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-77.253	-77.328	-0.075	(0)
Sb(3)	1.273e-19					
Sb(OH)3	6.440e-20	6.440e-20	-19.191	-19.191	0.000	(0)
HSbO2	6.289e-20	6.289e-20	-19.201	-19.201	0.000	(0)
SbO2-	1.646e-24	1.384e-24	-23.784	-23.859	-0.075	(0)
Sb(OH)2F	1.186e-24	1.186e-24	-23.926	-23.926	0.000	(0)
SbOF	1.167e-24	1.167e-24	-23.933	-23.933	0.000	(0)
Sb(OH)4-	9.423e-25	7.927e-25	-24.026	-24.101	-0.075	(0)
Sb(OH)2+	1.369e-25	1.151e-25	-24.864	-24.939	-0.075	(0)
SbO+	4.720e-26	3.970e-26	-25.326	-25.401	-0.075	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.326	-316.627	-0.300	(0)
Sb(5)	1.529e-08					
SbO3-	1.528e-08	1.285e-08	-7.816	-7.891	-0.075	(0)
Sb(OH)6-	1.733e-11	1.501e-11	-10.761	-10.823	-0.062	(0)
SbO2+	2.373e-23	1.996e-23	-22.625	-22.700	-0.075	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.302e-40	2.778e-40	-39.481	-39.556	-0.075	(0)
MnSe	0.000e+00	0.000e+00	-42.751	-42.751	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.800	-42.800	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.123	-47.423	-0.300	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-85.159	-86.361	-1.202	(0)
Se(4)	2.141e-08					
HSeO3-	1.963e-08	1.651e-08	-7.707	-7.782	-0.075	(0)
SeO3-2	1.784e-09	8.933e-10	-8.749	-9.049	-0.300	(0)
H2SeO3	5.182e-13	5.182e-13	-12.285	-12.285	0.000	(0)
AgSeO3-	4.962e-15	4.174e-15	-14.304	-14.379	-0.075	(0)
Cd(SeO3)2-2	6.908e-21	3.459e-21	-20.161	-20.461	-0.300	(0)
Ag(SeO3)2-3	1.584e-22	3.339e-23	-21.800	-22.476	-0.676	(0)
FeHSeO3+2	5.395e-23	2.701e-23	-22.268	-22.568	-0.300	(0)
Se(6)	6.873e-12					
SeO4-2	6.860e-12	3.870e-12	-11.164	-11.412	-0.249	(0)
MnSeO4	1.187e-14	1.187e-14	-13.926	-13.926	0.000	(0)
ZnSeO4	3.256e-16	3.256e-16	-15.487	-15.487	0.000	(0)
NiSeO4	1.321e-16	1.321e-16	-15.879	-15.879	0.000	(0)
CoSeO4	9.207e-17	9.207e-17	-16.036	-16.036	0.000	(0)
HSeO4-	1.697e-17	1.427e-17	-16.770	-16.846	-0.075	(0)
CdSeO4	3.790e-18	3.790e-18	-17.421	-17.421	0.000	(0)
Zn(SeO4)2-2	2.552e-27	1.278e-27	-26.593	-26.894	-0.300	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.677	-58.353	-0.676	(0)
U(4)	5.053e-22					
U(OH)5-	5.040e-22	4.240e-22	-21.298	-21.373	-0.075	(0)
U(OH)4	1.307e-24	1.307e-24	-23.884	-23.884	0.000	(0)
U(OH)3+	4.181e-28	3.517e-28	-27.379	-27.454	-0.075	(0)
U(OH)2+2	2.391e-32	1.197e-32	-31.621	-31.922	-0.300	(0)
UF3+	2.350e-34	1.977e-34	-33.629	-33.704	-0.075	(0)
UF2+2	1.555e-35	7.785e-36	-34.808	-35.109	-0.300	(0)
UF4	3.472e-36	3.472e-36	-35.459	-35.459	0.000	(0)
UOH+3	1.968e-37	4.150e-38	-36.706	-37.382	-0.676	(0)
UF5-	2.620e-38	2.204e-38	-37.582	-37.657	-0.075	(0)
UF+3	1.831e-38	3.860e-39	-37.737	-38.413	-0.676	(0)
UF6-2	2.130e-39	1.066e-39	-38.672	-38.972	-0.300	(0)
U(SO4)2	1.593e-39	1.593e-39	-38.798	-38.798	0.000	(0)
USO4+2	1.961e-40	0.000e+00	-39.707	-40.008	-0.300	(0)
U+4	0.000e+00	0.000e+00	-42.716	-43.918	-1.202	(0)
UCl+3	0.000e+00	0.000e+00	-44.340	-45.016	-0.676	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-167.583	-173.667	-6.085	(0)
U(5)	7.905e-17					
UO2+	7.905e-17	6.649e-17	-16.102	-16.177	-0.075	(0)
U(6)	1.134e-07					
UO2(CO3)3-4	5.846e-08	3.672e-09	-7.233	-8.435	-1.202	(0)
UO2(CO3)2-2	5.446e-08	2.727e-08	-7.264	-7.564	-0.300	(0)
UO2CO3	5.085e-10	5.085e-10	-9.294	-9.294	0.000	(0)
UO2F+	1.250e-12	1.051e-12	-11.903	-11.978	-0.075	(0)
UO2OH+	9.731e-13	8.186e-13	-12.012	-12.087	-0.075	(0)

UO2F2	4.856e-13	4.856e-13	-12.314	-12.314	0.000	(0)
UO2SO4	1.469e-13	1.469e-13	-12.833	-12.833	0.000	(0)
UO2+2	8.425e-14	4.753e-14	-13.074	-13.323	-0.249	(0)
UO2F3-	2.323e-14	1.954e-14	-13.634	-13.709	-0.075	(0)
UO2 (SO4) 2-2	7.901e-15	3.956e-15	-14.102	-14.403	-0.300	(0)
UO2Cl+	1.458e-16	1.226e-16	-15.836	-15.911	-0.075	(0)
UO2F4-2	4.967e-17	2.487e-17	-16.304	-16.604	-0.300	(0)
(UO2) 2 (OH) 2+2	2.221e-18	1.112e-18	-17.653	-17.954	-0.300	(0)
(UO2) 3 (OH) 5+	1.536e-20	1.292e-20	-19.814	-19.889	-0.075	(0)
UO2NO3+	2.293e-25	1.929e-25	-24.640	-24.715	-0.075	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.009	-42.084	-0.075	(0)
V+2	0.000e+00	0.000e+00	-42.429	-42.730	-0.300	(0)
V (3)	3.422e-15					
V (OH) 3	3.422e-15	3.422e-15	-14.466	-14.466	0.000	(0)
V (OH) 2+	1.935e-25	1.627e-25	-24.713	-24.788	-0.075	(0)
VOH+2	2.269e-28	1.136e-28	-27.644	-27.945	-0.300	(0)
V+3	7.860e-33	1.657e-33	-32.105	-32.781	-0.676	(0)
VSO4+	1.899e-33	1.598e-33	-32.721	-32.797	-0.075	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.605	-54.281	-0.676	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.887	-55.089	-1.202	(0)
V (4)	9.719e-18					
V (OH) 3+	8.708e-18	7.325e-18	-17.060	-17.135	-0.075	(0)
VO+2	5.362e-19	2.685e-19	-18.271	-18.571	-0.300	(0)
VOF+	3.067e-19	2.579e-19	-18.513	-18.588	-0.075	(0)
VOSO4	1.510e-19	1.510e-19	-18.821	-18.821	0.000	(0)
VOF2	1.550e-20	1.550e-20	-19.810	-19.810	0.000	(0)
VOC1+	1.425e-21	1.198e-21	-20.846	-20.921	-0.075	(0)
VOF3-	1.047e-22	8.808e-23	-21.980	-22.055	-0.075	(0)
VOF4-2	1.138e-25	5.695e-26	-24.944	-25.244	-0.300	(0)
H2V2O4+2	5.375e-30	2.691e-30	-29.270	-29.570	-0.300	(0)
V (5)	3.142e-09					
H2VO4-	2.969e-09	2.498e-09	-8.527	-8.602	-0.075	(0)
HVO4-2	1.703e-10	8.527e-11	-9.769	-10.069	-0.300	(0)
H3VO4	1.838e-12	1.838e-12	-11.736	-11.736	0.000	(0)
H3V2O7-	3.525e-14	2.965e-14	-13.453	-13.528	-0.075	(0)
HV2O7-3	3.424e-16	7.219e-17	-15.465	-16.142	-0.676	(0)
VO2+	3.116e-16	2.700e-16	-15.506	-15.569	-0.062	(0)
VO2F	7.587e-17	7.587e-17	-16.120	-16.120	0.000	(0)
VO4-3	2.755e-17	5.808e-18	-16.560	-17.236	-0.676	(0)
VO2SO4-	1.565e-17	1.317e-17	-16.805	-16.880	-0.075	(0)
VO2F2-	5.246e-18	4.413e-18	-17.280	-17.355	-0.075	(0)
V2O7-4	4.204e-19	2.641e-20	-18.376	-19.578	-1.202	(0)
V3O9-3	7.748e-20	1.634e-20	-19.111	-19.787	-0.676	(0)
VO2F3-2	1.761e-20	8.818e-21	-19.754	-20.055	-0.300	(0)
VO2F4-3	3.297e-24	6.951e-25	-23.482	-24.158	-0.676	(0)
V4O12-4	2.709e-25	1.702e-26	-24.567	-25.769	-1.202	(0)
VO2NO3	2.778e-28	2.778e-28	-27.556	-27.556	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-62.718	-64.596	-1.878	(0)
V10O28-6	0.000e+00	0.000e+00	-62.946	-65.650	-2.704	(0)
H2V10O28-4	0.000e+00	0.000e+00	-65.320	-66.522	-1.202	(0)
Zn	1.398e-06					
Zn+2	9.629e-07	5.432e-07	-6.016	-6.265	-0.249	(0)
ZnSO4	2.427e-07	2.427e-07	-6.615	-6.615	0.000	(0)
ZnHCO3+	8.613e-08	7.245e-08	-7.065	-7.140	-0.075	(0)
ZnCO3	8.400e-08	8.400e-08	-7.076	-7.076	0.000	(0)
ZnOH+	8.834e-09	7.431e-09	-8.054	-8.129	-0.075	(0)
Zn (SO4) 2-2	8.623e-09	4.317e-09	-8.064	-8.365	-0.300	(0)
ZnCl+	2.509e-09	2.171e-09	-8.600	-8.663	-0.063	(0)
ZnF+	2.064e-09	1.736e-09	-8.685	-8.760	-0.075	(0)
ZnOHC1	3.888e-10	3.888e-10	-9.410	-9.410	0.000	(0)
Zn (OH) 2	1.611e-10	1.611e-10	-9.793	-9.793	0.000	(0)
ZnCl2	5.474e-12	5.474e-12	-11.262	-11.262	0.000	(0)
Zn (OH) 3-	1.313e-13	1.105e-13	-12.882	-12.957	-0.075	(0)
ZnCl3-	7.997e-15	6.918e-15	-14.097	-14.160	-0.063	(0)
ZnSeO4	3.256e-16	3.256e-16	-15.487	-15.487	0.000	(0)
ZnCl4-2	9.608e-18	5.504e-18	-17.017	-17.259	-0.242	(0)
ZnNO3+	3.299e-18	2.775e-18	-17.482	-17.557	-0.075	(0)

Zn(OH) 4-2	1.202e-18	6.015e-19	-17.920	-18.221	-0.300	(0)
Zn(SeO4) 2-2	2.552e-27	1.278e-27	-26.593	-26.894	-0.300	(0)
Zn(NO3) 2	1.126e-30	1.126e-30	-29.948	-29.948	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.931	-149.006	-0.075	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.129	-150.129	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.116	-225.191	-0.075	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.737	-228.038	-0.300	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.692	-304.993	-0.300	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-76.19	-69.90	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-56.62	-52.11	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-63.85	-52.11	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-98.65	-80.72	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-74.07	-54.04	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.50	-34.09	0.40	(NH4)2CrO4
(NH4)2SeO4	-29.98	-29.53	0.45	(NH4)2SeO4
Acanthite	-51.27	-87.49	-36.22	Ag2S
Ag2CO3	-10.76	-21.85	-11.09	Ag2CO3
Ag2CrO4	-20.66	-32.25	-11.59	Ag2CrO4
Ag2HVO4	-11.93	-10.45	1.48	Ag2HVO4
Ag2MoO4	-11.51	-23.06	-11.55	Ag2MoO4
Ag2O	-14.58	-2.01	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.15	-18.97	-4.82	Ag2SO4
Ag3AsO3	-27.29	-25.13	2.16	Ag3AsO3
Ag3AsO4	-15.70	-18.49	-2.79	Ag3AsO4
Ag3H2VO5	-16.63	-11.45	5.18	Ag3H2VO5
AgF:4H2O	-12.98	-11.93	1.05	AgF:4H2O
Agmetal	-0.27	-13.78	-13.51	Ag
AgVO3	-10.21	-9.44	0.77	AgVO3
Al(OH) 3(am)	-1.31	9.49	10.80	Al(OH) 3
Al2(MoO4) 3	-46.53	-44.16	2.37	Al2(MoO4) 3
Al2O3	-0.67	18.98	19.65	Al2O3
Al4(OH)10SO4	-1.70	21.00	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.78	-5.98	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.96	-86.34	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-3.85	-11.64	-7.79	PbSO4
Anhydrite	-1.24	-5.60	-4.36	CaSO4
Anilite	-54.77	-86.65	-31.88	Cu0.25Cu1.5S
Antlerite	-1.83	6.95	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-85.71	-88.47	-2.76	As4O6
Artinite	-6.95	2.65	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-37.65	-30.94	6.71	As2O5
Atacamite	-1.38	6.01	7.39	Cu2(OH) 3Cl
Azurite	1.14	-15.76	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-17.42	6.97	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-18.79	-2.92	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-1.10	-10.01	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-28.88	4.06	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-13.59	-23.26	-9.67	BaCrO4
BaF2	-9.06	-14.88	-5.82	BaF2
BaMoO4	-7.11	-14.07	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.77	-7.94	1.83	BaSeO3
BaSeO4	-11.24	-18.70	-7.46	BaSeO4
Bianchite	-7.19	-8.96	-1.76	ZnSO4:6H2O
Birnessite	-8.57	9.52	18.09	MnO2
Bixbyite	-5.86	-6.51	-0.64	Mn2O3

BlaubleiI	-54.56	-78.72	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.10	-82.38	-27.28	Cu0.6Cu0.8S
Boehmite	0.91	9.49	8.58	AlOOH
Breithauptite	-57.40	-75.92	-18.52	NiSb
Brochantite	-0.30	14.92	15.22	Cu4(OH)6SO4
Brucite	-5.60	11.24	16.84	Mg(OH)2
Bunsenite	-5.32	7.13	12.45	NiO
Ca(VO3)2	-11.17	-5.51	5.66	Ca(VO3)2
Ca2V2O7	-11.66	5.84	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.71	5.84	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-19.17	3.13	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.76	17.20	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.66	17.20	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.55	-157.58	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.61	-26.52	-17.91	Hg2Cl2
CaMoO4	-1.74	-9.69	-7.95	CaMoO4
Carnotite	-3.68	-3.45	0.23	KUO2VO4
CaSeO3:2H2O	-6.37	-3.56	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.30	-14.32	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.39	-3.55	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.66	-15.95	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.55	1.01	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.41	6.99	28.40	Cd4(OH)6SO4
CdCl2	-13.22	-13.88	-0.66	CdCl2
CdCl2:1H2O	-12.18	-13.88	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.96	-13.88	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO4	-0.91	-15.06	-14.15	CdMoO4
CdOHCl	-7.48	-3.94	3.54	CdOHCl
CdSb	-76.72	-77.07	-0.35	CdSb
CdSe	-20.50	-40.70	-20.20	CdSe
CdSeO4:2H2O	-17.84	-19.69	-1.85	CdSeO4:2H2O
CdSO4	-10.80	-10.97	-0.17	CdSO4
CdSO4:1H2O	-9.24	-10.97	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.10	-10.97	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.19	-10.94	-9.75	AgCl
Cerrusite	-1.39	-14.52	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.35	-8.99	-2.64	CuSO4:5H2O
Chalcocite	-54.78	-89.70	-34.92	Cu2S
Chalcopyrite	-124.26	-159.53	-35.27	CuFeS2
Cinnabar	-51.93	-97.63	-45.69	HgS
Claudetite	-85.41	-88.47	-3.06	As4O6
Clausthalite	-14.27	-41.37	-27.10	PbSe
Co(BO2)2	-29.66	-2.59	27.07	Co(BO2)2
Co(OH)2	-6.15	6.94	13.09	Co(OH)2
Co(OH)3	-10.38	-12.69	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-23.15	-10.11	13.03	Co3(AsO4)2
Co3O4	-7.93	-18.43	-10.50	Co3O4
CoCl2	-21.19	-12.92	8.27	CoCl2
CoCl2:6H2O	-15.46	-12.92	2.54	CoCl2:6H2O
CoCO3	-2.91	-12.89	-9.98	CoCO3
CoF2	-13.32	-14.91	-1.60	CoF2
CoF3	-44.01	-45.47	-1.46	CoF3
CoFe2O4	16.85	13.33	-3.53	CoFe2O4
CoMoO4	-6.34	-14.10	-7.76	CoMoO4
CoO	-6.64	6.94	13.59	CoO
CoS(alpha)	-71.09	-78.53	-7.44	CoS
CoS(beta)	-67.46	-78.53	-11.07	CoS
CoSe	-23.55	-39.75	-16.20	CoSe
CoSeO3	-9.29	-7.97	1.32	CoSeO3

CoSeO4:6H2O	-17.21	-18.74	-1.53	CoSeO4:6H2O
CoSO4	-12.82	-10.01	2.80	CoSO4
CoSO4:6H2O	-7.54	-10.01	-2.47	CoSO4:6H2O
Cotunnite	-9.77	-14.55	-4.78	PbCl2
Covellite	-55.20	-77.50	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-44.96	-30.87	14.09	CrCl2
CrCl3	-46.09	-30.97	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.86	-41.70	-33.84	Na3AlF6
Cu (OH) 2	-0.70	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.53	20.68	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.14	-2.88	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.08	-89.97	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.11	-50.91	-45.80	Cu2Se
Cu2SO4	-19.23	-21.18	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.13	-7.03	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.57	-102.16	-42.59	Cu3Sb
Cu3Se2	-26.14	-89.63	-63.49	Cu3Se2
CuCO3	-0.37	-11.87	-11.50	CuCO3
CuCrO4	-16.83	-22.27	-5.44	CuCrO4
CuF	-8.13	-13.04	-4.91	CuF
CuF2	-15.00	-13.89	1.12	CuF2
CuF2:2H2O	-9.34	-13.89	-4.55	CuF2:2H2O
Cumetal	-6.13	-14.88	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.32	-1.02	10.30	CuOCuSO4
Cupricferrite	8.36	14.35	5.99	CuFe2O4
Cuprite	-2.82	-4.22	-1.41	Cu2O
Cuprousferrite	10.00	1.08	-8.92	CuFeO2
CuSe	-5.62	-38.72	-33.10	CuSe
CuSe2	-26.50	-59.86	-33.37	CuSe2
CuSeO3:2H2O	-7.46	-6.95	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.27	-17.71	-2.44	CuSeO4:5H2O
CuSO4	-11.93	-8.99	2.94	CuSO4
Diaspore	2.62	9.49	6.87	AlOOH
Djurleite	-54.97	-88.89	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.54	-17.08	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.01	-17.08	-17.09	CaMg (CO3) 2
Epsomite	-3.59	-5.72	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.25	0.21	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.70	-13.42	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.09	-8.53	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.74	-38.36	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-40.75	-44.49	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.68	-12.28	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.50	-17.60	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.79	-64.38	-18.60	FeSe2
FeS (ppt)	-79.07	-82.02	-2.95	FeS
FeSe	-32.24	-43.24	-11.00	FeSe
Fix_pe	-5.64	-5.64	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.19	-80.16	-13.97	PbS
Gibbsite	1.20	9.49	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.94	-8.96	-2.01	ZnSO4:7H2O
Greenockite	-65.13	-79.49	-14.36	CdS
Greigite	-287.03	-332.07	-45.03	Fe3S4
Gummite	-6.73	0.94	7.67	UO3

Gypsum	-0.99	-5.60	-4.61	CaSO4:2H2O
H-Jarosite	-12.24	-24.34	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.17	-21.05	-12.88	H2MoO4
H2S (g)	-77.47	-85.48	-8.01	H2S
H2Se (g)	-41.73	-46.69	-4.96	H2Se
Halite	-6.74	-5.14	1.60	NaCl
Hausmannite	-7.52	53.51	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.46	22.43	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.48	-256.18	-73.71	Hg (CH3) 2
Hg (g)	-8.23	-16.10	-7.87	Hg
Hg (OH) 2	-8.65	-12.15	-3.50	Hg (OH) 2
Hg2 (g)	-17.25	-32.21	-14.96	Hg2
Hg2 (OH) 2	-11.92	-6.66	5.26	Hg2 (OH) 2
Hg2CO3	-10.45	-26.50	-16.05	Hg2CO3
Hg2CrO4	-28.20	-36.90	-8.70	Hg2CrO4
Hg2F2	-18.16	-28.52	-10.36	Hg2F2
Hg2S	-80.46	-92.14	-11.68	Hg2S
Hg2SeO3	-16.92	-21.58	-4.66	Hg2SeO3
Hg2SO4	-17.49	-23.62	-6.13	Hg2SO4
Hg3O2CO3	-26.61	-56.29	-29.68	Hg3O2CO3
HgCl (g)	-32.76	-13.26	19.50	HgCl
HgCl2	-10.75	-32.01	-21.26	HgCl2
HgF (g)	-46.93	-14.26	32.68	HgF
HgF2 (g)	-46.57	-34.01	12.57	HgF2
Hgmetal (l)	-2.65	-16.10	-13.45	Hg
HgSe	-3.15	-58.84	-55.69	HgSe
HgSeO3	-14.64	-27.07	-12.43	HgSeO3
HgSO4	-19.69	-29.11	-9.42	HgSO4
Huntite	-4.30	-34.27	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.95	-23.72	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.37	-23.14	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.21	-20.38	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.49	-20.29	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.14	-52.38	-17.24	K2Cr2O7
K2CrO4	-21.63	-22.15	-0.51	K2CrO4
K2MoO4	-16.22	-12.95	3.26	K2MoO4
K2SeO4	-16.86	-17.59	-0.73	K2SeO4
Langite	-2.56	14.92	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.89	-6.32	-0.43	PbO:PbSO4
Laurionite	-5.24	-4.61	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.38	5.32	12.69	PbO
Mackinawite	-78.42	-82.02	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.76	17.62	16.86	Fe2MgO4
Magnesite	-1.14	-8.60	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.41	-3.90	-5.31	Cu2 (OH) 2CO3
Manganite	-3.24	22.10	25.34	MnOOH
Massicot	-7.58	5.32	12.89	PbO
Matlockite	-6.57	-15.54	-8.97	PbClF
Melanothallite	-18.15	-11.89	6.26	CuCl2
Melanterite	-11.30	-13.51	-2.21	FeSO4:7H2O
Metacinnabar	-52.53	-97.63	-45.09	HgS
Mg (OH) 2 (active)	-7.55	11.24	18.79	Mg (OH) 2
Mg (VO3) 2	-16.91	-5.63	11.28	Mg (VO3) 2
Mg2Sb3	-275.81	-201.13	74.68	Mg2Sb3
Mg2V2O7	-20.75	5.61	26.36	Mg2V2O7
MgCr2O4	-7.32	8.88	16.20	MgCr2O4
MgCrO4	-24.38	-19.00	5.38	MgCrO4
MgF2	-2.49	-10.62	-8.13	MgF2
MgMoO4	-7.95	-9.80	-1.85	MgMoO4
MgSeO3:6H2O	-6.73	-3.67	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.24	-14.44	-1.20	MgSeO4:6H2O
Minium	-32.03	41.50	73.52	Pb3O4
Mirabilite	-6.26	-7.37	-1.11	Na2SO4:10H2O

Mn(VO3)2	-12.45	-7.55	4.90	Mn(VO3)2
Mn2(SO4)3	-51.67	-57.38	-5.71	Mn2(SO4)3
Mn2Sb	-151.03	-89.95	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-15.47	-2.97	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.26	-10.54	2.72	MnCl2·4H2O
MnS(grn)	-76.32	-76.15	0.17	MnS
MnS(pnk)	-79.49	-76.15	3.34	MnS
MnSb	-96.17	-99.08	-2.91	MnSb
MnSe	-40.87	-37.37	3.50	MnSe
MnSeO3	-6.72	-5.59	1.13	MnSeO3
MnSeO3·2H2O	-6.57	-5.59	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.31	-16.36	-2.05	MnSeO4·5H2O
MnSO4	-10.22	-7.63	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.51	-12.15	-3.64	HgO
MoO3	-13.05	-21.05	-8.00	MoO3
Morenosite	-7.68	-9.83	-2.14	NiSO4·7H2O
MoS2	-147.28	-217.54	-70.26	MoS2
Na-Jarosite	-8.34	-19.54	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.99	-50.89	-9.90	Na2Cr2O7
Na2CrO4	-23.58	-20.65	2.93	Na2CrO4
Na2Mo2O7	-15.91	-32.50	-16.60	Na2Mo2O7
Na2MoO4	-12.95	-11.46	1.49	Na2MoO4
Na2MoO4·2H2O	-12.68	-11.46	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.63	-5.33	10.30	Na2SeO3·5H2O
Na2SeO4	-17.37	-16.09	1.28	Na2SeO4
Na3Sb	-175.89	-81.44	94.45	Na3Sb
Na3VO4	-30.73	5.95	36.68	Na3VO4
Na4V2O7	-35.09	2.31	37.40	Na4V2O7
Nantokite	-5.31	-12.04	-6.73	CuCl
NaSb	-88.65	-65.49	23.17	NaSb
Natron	-8.94	-10.25	-1.31	Na2CO3·10H2O
NaVO3	-7.50	-3.64	3.86	NaVO3
Nesquehonite	-3.93	-8.60	-4.67	MgCO3·3H2O
Ni(OH)2	-5.66	7.13	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-25.25	-9.55	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-20.44	11.56	32.00	Ni4(OH)6SO4
NiCO3	-5.84	-12.71	-6.87	NiCO3
NiMoO4	-2.77	-13.92	-11.14	NiMoO4
NiS(alpha)	-72.75	-78.35	-5.60	NiS
NiS(beta)	-67.25	-78.35	-11.10	NiS
NiS(gamma)	-65.55	-78.35	-12.80	NiS
NiSe	-21.86	-39.56	-17.70	NiSe
NiSeO3·2H2O	-10.60	-7.79	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-17.03	-18.55	-1.52	NiSeO4·6H2O
Nsutite	-7.99	9.52	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-239.59	-300.66	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.74	-4.22	6.52	Pb(BO2)2
Pb(OH)2	-2.83	5.32	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-57.09	-65.85	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.09	0.70	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.55	10.63	26.19	Pb2O(OH)2
Pb2O3	-24.86	36.18	61.04	Pb2O3
Pb2OCO3	-8.65	-9.20	-0.56	Pb2OCO3
Pb2V2O7	-4.34	-6.24	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.06	-0.92	6.14	Pb3(VO4)2
Pb3O2CO3	-14.91	-3.89	11.02	Pb3O2CO3
Pb3O2SO4	-11.69	-1.01	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.79	4.31	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.57	4.31	21.88	Pb4O3SO4
PbCrO4	-12.32	-24.92	-12.60	PbCrO4
PbF2	-9.10	-16.54	-7.44	PbF2
Pbmetal	-24.47	-20.23	4.25	Pb
PbMoO4	-0.11	-15.73	-15.62	PbMoO4
PbO:0.3H2O	-7.66	5.32	12.98	PbO:0.33H2O

PbSeO4	-13.52	-20.36	-6.84	PbSeO4
Periclase	-10.34	11.24	21.58	MgO
Phosgenite	-9.26	-29.07	-19.81	PbCl2:PbCO3
Plattnerite	-18.74	30.86	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.45	-141.95	-18.51	FeS2
Pyrochroite	-5.87	9.32	15.19	Mn(OH)2
Pyrolusite	-6.51	34.87	41.38	MnO2
Realgar	-100.62	-120.36	-19.75	AsS
Retgersite	-7.79	-9.83	-2.04	NiSO4:6H2O
Rhodochrosite	0.07	-10.51	-10.58	MnCO3
Rutherfordine	-4.39	-18.89	-14.50	UO2CO3
Sb(OH)3	-12.08	-19.19	-7.11	Sb(OH)3
Sb2O4	-16.24	-12.84	3.40	Sb2O4
Sb2O5	-26.24	-35.91	-9.67	Sb2O5
Sb2Se3	-110.69	-178.45	-67.76	Sb2Se3
Sb4O6(cubic)	-58.50	-76.76	-18.26	Sb4O6
Sb4O6(orth)	-58.86	-76.76	-17.90	Sb4O6
SbCl3	-49.56	-48.99	0.57	SbCl3
SbF3	-41.75	-51.98	-10.23	SbF3
Sbmetal	-45.82	-57.51	-11.69	Sb
SbO2	-2.90	-30.73	-27.82	SbO2
Schoepite	-5.05	0.94	5.99	UO2(OH)2:H2O
Semetal(am)	-14.03	-21.14	-7.11	Se
Semetal(hex)	-13.44	-21.14	-7.71	Se
Senarmontite	-26.02	-38.38	-12.37	Sb2O3
SeO2	-15.04	-14.92	0.12	SeO2
SeO3	-46.72	-25.68	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.84	-11.84	-10.00	ZnCO3
Sphalerite	-66.02	-77.47	-11.45	ZnS
Spinel	-6.63	30.22	36.85	MgAl2O4
Stibnite	-244.35	-294.81	-50.46	Sb2S3
Sulfur	-57.79	-59.93	-2.14	S
Tenorite	0.33	7.97	7.64	CuO
Thenardite	-7.69	-7.37	0.32	Na2SO4
Thermonatrite	-10.89	-10.25	0.64	Na2CO3:H2O
Tyuyamunite	-7.71	-3.63	4.08	Ca(UO2)2(VO4)2
U3O8	-16.15	4.93	21.08	U3O8
U3Sb4	-581.84	-429.46	152.38	U3Sb4
U4O9	-32.98	-36.00	-3.02	U4O9
UF4	-29.56	-59.10	-29.54	UF4
UF4:2.5H2O	-26.38	-59.10	-32.72	UF4:2.5H2O
UO2(am)	-16.32	-15.39	0.93	UO2
UO2(NO3)2	-48.85	-36.71	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.56	-36.71	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.10	-36.71	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.75	-36.71	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.67	0.94	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.49	-24.74	-2.25	UO2SeO4:4H2O
UO3	-6.76	0.94	7.70	UO3
Uraninite	-10.72	-15.39	-4.67	UO2
USb2	-220.28	-190.71	29.58	USb2
V(OH)3	-18.97	-11.38	7.59	V(OH)3
V2O5	-15.51	-16.87	-1.36	V2O5
V3O5	-40.30	-38.46	1.84	V3O5
V4O7	-49.95	-42.76	7.19	V4O7
V6O13	-40.84	-101.70	-60.86	V6O13
Valentinite	-29.90	-38.38	-8.48	Sb2O3
VC12	-62.89	-44.02	18.87	VC12
VC13	-64.61	-41.18	23.43	VC13
VF4	-62.95	-48.02	14.93	VF4
Vmetal	-93.72	-49.70	44.03	V
VO	-38.91	-24.15	14.76	VO
VO(OH)2	-9.46	-4.30	5.15	VO(OH)2
VO2Cl	-21.21	-18.37	2.84	VO2Cl
VOC1	-32.47	-21.31	11.15	VOC1
VOC12	-36.93	-24.17	12.76	VOC12

VOSO4	-24.87	-21.26	3.61	VOSO4
Witherite	-4.29	-12.86	-8.57	BaCO3
Wurtzite	-68.52	-77.47	-8.95	ZnS
Zincite	-3.33	8.00	11.33	ZnO
Zincosite	-12.88	-8.95	3.93	ZnSO4
Zn(BO2)2	-9.82	-1.53	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-32.96	-29.65	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.20	8.00	12.20	Zn(OH)2
Zn(OH)2(am)	-4.47	8.00	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.75	8.00	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.53	8.00	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.73	8.00	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.45	-0.95	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.12	6.07	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-20.59	-6.94	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.82	-9.91	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.35	15.05	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.36	20.14	38.50	Zn5(OH)8Cl2
ZnCl2	-18.91	-11.86	7.05	ZnCl2
ZnCO3:1H2O	-1.58	-11.84	-10.26	ZnCO3:1H2O
ZnF2	-13.32	-13.86	-0.53	ZnF2
Znmetal	-43.33	-17.54	25.79	Zn
ZnMoO4	-2.92	-13.05	-10.13	ZnMoO4
ZnO(active)	-3.19	8.00	11.19	ZnO
ZnS(am)	-68.42	-77.47	-9.05	ZnS
ZnSb	-86.07	-75.05	11.01	ZnSb
ZnSe	-24.29	-38.69	-14.40	ZnSe
ZnSeO4:6H2O	-16.16	-17.68	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.32	-8.96	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 24.

```

Title Stage 1 Run-off mix
Mix 102
1      1
3      0.003657
4      0.038411
5      0.020843
6      0.000000
7      0.069884
8      0.000000
9      10.521681
10     16.471143
11     31.861298
12     170.832300
13     132.050553
14     52.801148
15     26.730607
Save solution 105
end

```

TITLE

Stage 1 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 102.

Mixture 102.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

3.657e-03 Solution 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

3.841e-02 Solution 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

2.084e-02 Solution 5 Average HCT data for quartz monzonite - oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

6.988e-02 Solution 7 Average HCT data for coarse crystalline porphyry - oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry - oxide/transitional (ore) (cell CF-11-02, 0-27)

1.052e+01 Solution 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

1.647e+01 Solution 10 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

3.186e+01 Solution 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

1.708e+02 Solution 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

1.321e+02 Solution 13 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

5.280e+01 Solution 14 Average HCT data for coarse crystalline porphyry - sulfide (waste) (cell CF-11-02, 367-408)

2.673e+01 Solution 15 Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	9.844e-07	4.355e-04
As	4.525e-10	2.002e-07
B	4.456e-07	1.971e-04
Ba	1.336e-07	5.912e-05
C	7.241e-04	3.204e-01
Ca	3.133e-04	1.386e-01
Cd	1.169e-09	5.172e-07
Cl	3.754e-05	1.661e-02
Co	1.314e-11	5.815e-09
Cr	5.057e-12	2.237e-09
Cu	2.379e-06	1.052e-03
F	3.368e-05	1.490e-02
Fe	4.744e-08	2.099e-05
Hg	4.273e-11	1.890e-08
K	6.700e-05	2.964e-02
Mg	8.196e-05	3.626e-02
Mn	9.907e-07	4.383e-04
Mo	3.825e-08	1.692e-05
N	5.104e-08	2.258e-05
Na	1.201e-04	5.314e-02
Ni	2.141e-12	9.470e-10
Pb	3.335e-09	1.475e-06
S	2.514e-04	1.112e-01
Sb	4.022e-10	1.779e-07
Se	3.497e-09	1.547e-06
U	1.215e-08	5.374e-06
V	9.440e-09	4.176e-06

Zn 1.155e-07 5.111e-05

-----Description of solution-----

equilibrium

pH	=	6.452	Charge balance
pe	=	6.437	Adjusted to redox
Activity of water	=	1.000	
Ionic strength (mol/kgw)	=	1.574e-03	
Mass of water (kg)	=	4.424e+02	
Total alkalinity (eq/kg)	=	4.138e-04	
Total CO2 (mol/kg)	=	7.241e-04	
Temperature (°C)	=	25.00	
Pressure (atm)	=	1.00	
Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
Iterations	=	12	
Total H	=	4.911308e+04	
Total O	=	2.455772e+04	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.692e-07	3.532e-07	-6.433	-6.452	-0.019	0.00
OH-	2.981e-08	2.851e-08	-7.526	-7.545	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.844e-07					
AlF2+	4.680e-07	4.480e-07	-6.330	-6.349	-0.019	(0)
AlF3	1.718e-07	1.718e-07	-6.765	-6.765	0.000	(0)
Al (OH) 4-	1.671e-07	1.599e-07	-6.777	-6.796	-0.019	(0)
Al (OH) 2+	8.183e-08	7.835e-08	-7.087	-7.106	-0.019	(0)
Al (OH) 3	4.456e-08	4.456e-08	-7.351	-7.351	0.000	(0)
AlF+2	4.399e-08	3.696e-08	-7.357	-7.432	-0.076	(0)
AlOH+2	4.118e-09	3.460e-09	-8.385	-8.461	-0.076	(0)
AlF4-	2.739e-09	2.621e-09	-8.562	-8.582	-0.019	(0)
AlSO4+	1.957e-10	1.873e-10	-9.708	-9.728	-0.019	(0)
Al+3	1.808e-10	1.214e-10	-9.743	-9.916	-0.173	(0)
Al (SO4) 2-	4.169e-13	3.989e-13	-12.380	-12.399	-0.019	(0)
AlMo6O21-3	3.675e-39	2.416e-39	-38.435	-38.617	-0.182	(0)
As (3)	2.585e-21					
H3AsO3	2.581e-21	2.581e-21	-20.588	-20.588	0.000	(0)
H2AsO3-	3.927e-24	3.748e-24	-23.406	-23.426	-0.020	(0)
H4AsO3+	4.733e-28	4.517e-28	-27.325	-27.345	-0.020	(0)
HAsO3-2	1.166e-29	9.678e-30	-28.933	-29.014	-0.081	(0)
AsO3-3	1.606e-36	1.056e-36	-35.794	-35.976	-0.182	(0)
As (5)	4.525e-10					
H2AsO4-	3.335e-10	3.183e-10	-9.477	-9.497	-0.020	(0)
HAsO4-2	1.190e-10	9.880e-11	-9.924	-10.005	-0.081	(0)
H3AsO4	1.953e-14	1.954e-14	-13.709	-13.709	0.000	(0)
AsO4-3	1.345e-15	8.846e-16	-14.871	-15.053	-0.182	(0)
B	4.456e-07					
H3BO3	4.448e-07	4.449e-07	-6.352	-6.352	0.000	(0)
H2BO3-	7.653e-10	7.316e-10	-9.116	-9.136	-0.020	(0)
CaH2BO3+	1.106e-11	1.058e-11	-10.956	-10.976	-0.020	(0)
BF (OH) 3-	5.656e-12	5.406e-12	-11.248	-11.267	-0.020	(0)
MgH2BO3+	1.757e-12	1.680e-12	-11.755	-11.775	-0.020	(0)
NaH2BO3	1.331e-13	1.331e-13	-12.876	-12.876	0.000	(0)
BF2 (OH) 2-	6.503e-15	6.216e-15	-14.187	-14.206	-0.020	(0)
BaH2BO3+	2.639e-15	2.523e-15	-14.579	-14.598	-0.020	(0)
H5 (BO3) 2-	2.898e-16	2.771e-16	-15.538	-15.557	-0.020	(0)
BF3OH-	2.721e-20	2.601e-20	-19.565	-19.585	-0.020	(0)
H8 (BO3) 3-	1.290e-20	1.233e-20	-19.890	-19.909	-0.020	(0)
BF4-	1.440e-24	1.377e-24	-23.842	-23.861	-0.020	(0)
Ba	1.336e-07					
Ba+2	1.332e-07	1.116e-07	-6.876	-6.952	-0.077	(0)
BaHCO3+	4.365e-10	4.180e-10	-9.360	-9.379	-0.019	(0)

BaCO3	2.980e-12	2.980e-12	-11.526	-11.526	0.000	(0)
BaOH+	1.451e-14	1.389e-14	-13.838	-13.857	-0.019	(0)
BaH2BO3+	2.639e-15	2.523e-15	-14.579	-14.598	-0.020	(0)
BaNO3+	1.599e-17	1.526e-17	-16.796	-16.816	-0.020	(0)
BaNH3+2	4.341e-18	3.603e-18	-17.362	-17.443	-0.081	(0)
C (4)	7.241e-04					
HCO3-	4.097e-04	3.923e-04	-3.388	-3.406	-0.019	(0)
H2CO3	3.116e-04	3.116e-04	-3.506	-3.506	0.000	(0)
CaHCO3+	1.916e-06	1.835e-06	-5.718	-5.736	-0.019	(0)
CuCO3	4.369e-07	4.369e-07	-6.360	-6.360	0.000	(0)
MgHCO3+	2.778e-07	2.658e-07	-6.556	-6.575	-0.019	(0)
CO3-2	6.215e-08	5.206e-08	-7.207	-7.283	-0.077	(0)
CuHCO3+	3.695e-08	3.527e-08	-7.432	-7.453	-0.020	(0)
NaHCO3	2.532e-08	2.532e-08	-7.597	-7.597	0.000	(0)
CaCO3	2.073e-08	2.073e-08	-7.683	-7.683	0.000	(0)
UO2 (CO3) 2-2	6.594e-09	5.473e-09	-8.181	-8.262	-0.081	(0)
MnHCO3+	6.481e-09	6.204e-09	-8.188	-8.207	-0.019	(0)
UO2CO3	5.268e-09	5.268e-09	-8.278	-8.278	0.000	(0)
MgCO3	2.868e-09	2.868e-09	-8.542	-8.542	0.000	(0)
ZnHCO3+	1.195e-09	1.140e-09	-8.923	-8.943	-0.020	(0)
PbHCO3+	5.559e-10	5.306e-10	-9.255	-9.275	-0.020	(0)
BaHCO3+	4.365e-10	4.180e-10	-9.360	-9.379	-0.019	(0)
PbCO3	2.849e-10	2.849e-10	-9.545	-9.545	0.000	(0)
ZnCO3	2.754e-10	2.754e-10	-9.560	-9.560	0.000	(0)
NaCO3-	1.162e-10	1.113e-10	-9.935	-9.954	-0.019	(0)
Cu (CO3) 2-2	7.376e-11	6.122e-11	-10.132	-10.213	-0.081	(0)
UO2 (CO3) 3-4	3.009e-11	1.428e-11	-10.522	-10.845	-0.324	(0)
FeHCO3+	4.293e-12	4.112e-12	-11.367	-11.386	-0.019	(0)
BaCO3	2.980e-12	2.980e-12	-11.526	-11.526	0.000	(0)
CdCO3	1.113e-12	1.113e-12	-11.954	-11.954	0.000	(0)
CdHCO3+	8.773e-13	8.374e-13	-12.057	-12.077	-0.020	(0)
CoHCO3+	3.285e-13	3.136e-13	-12.483	-12.504	-0.020	(0)
NiHCO3+	8.425e-14	8.042e-14	-13.074	-13.095	-0.020	(0)
Pb (CO3) 2-2	5.155e-14	4.279e-14	-13.288	-13.369	-0.081	(0)
CoCO3	9.044e-15	9.044e-15	-14.044	-14.044	0.000	(0)
NiCO3	3.230e-15	3.230e-15	-14.491	-14.491	0.000	(0)
HgCO3	2.141e-15	2.141e-15	-14.669	-14.669	0.000	(0)
Cd (CO3) 2-2	5.174e-17	4.295e-17	-16.286	-16.367	-0.081	(0)
HgHCO3+	1.475e-17	1.408e-17	-16.831	-16.851	-0.020	(0)
Hg (CO3) 2-2	4.248e-19	3.525e-19	-18.372	-18.453	-0.081	(0)
Ca	3.133e-04					
Ca+2	2.999e-04	2.512e-04	-3.523	-3.600	-0.077	(0)
CaSO4	1.144e-05	1.144e-05	-4.942	-4.942	0.000	(0)
CaHCO3+	1.916e-06	1.835e-06	-5.718	-5.736	-0.019	(0)
CaF+	8.723e-08	8.350e-08	-7.059	-7.078	-0.019	(0)
CaCO3	2.073e-08	2.073e-08	-7.683	-7.683	0.000	(0)
CaOH+	1.492e-10	1.429e-10	-9.826	-9.845	-0.019	(0)
CaH2BO3+	1.106e-11	1.058e-11	-10.956	-10.976	-0.020	(0)
CaNO3+	2.271e-14	2.168e-14	-13.644	-13.664	-0.020	(0)
CaNH3+2	1.950e-14	1.619e-14	-13.710	-13.791	-0.081	(0)
Ca (NH3) 2+2	3.973e-25	3.297e-25	-24.401	-24.482	-0.081	(0)
Cd	1.169e-09					
Cd+2	1.119e-09	9.376e-10	-8.951	-9.028	-0.077	(0)
CdSO4	4.369e-11	4.369e-11	-10.360	-10.360	0.000	(0)
CdCl+	3.370e-12	3.216e-12	-11.472	-11.493	-0.020	(0)
CdCO3	1.113e-12	1.113e-12	-11.954	-11.954	0.000	(0)
CdHCO3+	8.773e-13	8.374e-13	-12.057	-12.077	-0.020	(0)
CdF+	4.741e-13	4.525e-13	-12.324	-12.344	-0.020	(0)
CdOH+	2.224e-13	2.123e-13	-12.653	-12.673	-0.020	(0)
Cd (SO4) 2-2	1.412e-13	1.172e-13	-12.850	-12.931	-0.081	(0)
CdOHC1	3.761e-15	3.761e-15	-14.425	-14.425	0.000	(0)
CdCl2	4.816e-16	4.816e-16	-15.317	-15.317	0.000	(0)
Cd (CO3) 2-2	5.174e-17	4.295e-17	-16.286	-16.367	-0.081	(0)
Cd (OH) 2	3.819e-17	3.819e-17	-16.418	-16.418	0.000	(0)
CdF2	2.749e-17	2.749e-17	-16.561	-16.561	0.000	(0)
CdNO3+	8.477e-20	8.091e-20	-19.072	-19.092	-0.020	(0)
CdSeO4	4.795e-20	4.795e-20	-19.319	-19.319	0.000	(0)
CdCl3-	1.143e-20	1.091e-20	-19.942	-19.962	-0.020	(0)

	Cd2OH+3	1.517e-21	9.978e-22	-20.819	-21.001	-0.182	(0)
	Cd (OH) 3-	6.968e-23	6.651e-23	-22.157	-22.177	-0.020	(0)
	Cd (SeO3) 2-2	1.284e-24	1.065e-24	-23.892	-23.973	-0.081	(0)
	Cd (NO3) 2	1.107e-30	1.107e-30	-29.956	-29.956	0.000	(0)
	Cd (OH) 4-2	3.739e-31	3.103e-31	-30.427	-30.508	-0.081	(0)
	CdHS+	0.000e+00	0.000e+00	-80.601	-80.621	-0.020	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-153.019	-153.019	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-230.700	-230.721	-0.020	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-308.045	-308.126	-0.081	(0)
C1		3.754e-05					
	Cl-	3.754e-05	3.592e-05	-4.425	-4.445	-0.019	(0)
	CuCl+	8.479e-11	8.111e-11	-10.072	-10.091	-0.019	(0)
	MnCl+	3.745e-11	3.584e-11	-10.427	-10.446	-0.019	(0)
	CuCl	1.155e-11	1.155e-11	-10.937	-10.937	0.000	(0)
	ZnCl+	8.668e-12	8.293e-12	-11.062	-11.081	-0.019	(0)
	CdCl+	3.370e-12	3.216e-12	-11.472	-11.493	-0.020	(0)
	PbCl+	2.431e-12	2.320e-12	-11.614	-11.634	-0.020	(0)
	ZnOHC1	3.095e-13	3.095e-13	-12.509	-12.509	0.000	(0)
	CuCl2-	9.059e-14	8.667e-14	-13.043	-13.062	-0.019	(0)
	HgClOH	6.214e-14	6.214e-14	-13.207	-13.207	0.000	(0)
	HgCl2	4.433e-15	4.433e-15	-14.353	-14.353	0.000	(0)
	CdOHC1	3.761e-15	3.761e-15	-14.425	-14.425	0.000	(0)
	MnCl2	1.818e-15	1.818e-15	-14.740	-14.740	0.000	(0)
	UO2Cl+	1.551e-15	1.481e-15	-14.809	-14.830	-0.020	(0)
	CoCl+	1.338e-15	1.277e-15	-14.874	-14.894	-0.020	(0)
	CuCl2	1.010e-15	1.010e-15	-14.996	-14.996	0.000	(0)
	CdCl2	4.816e-16	4.816e-16	-15.317	-15.317	0.000	(0)
	ZnCl2	4.721e-16	4.721e-16	-15.326	-15.326	0.000	(0)
	PbCl2	3.722e-16	3.722e-16	-15.429	-15.429	0.000	(0)
	NiCl+	1.601e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
	HgCl+	2.580e-17	2.463e-17	-16.588	-16.609	-0.020	(0)
	HgCl3-	1.668e-18	1.592e-18	-17.778	-17.798	-0.020	(0)
	CuCl3-2	7.928e-19	6.655e-19	-18.101	-18.177	-0.076	(0)
	FeCl+2	2.730e-19	2.292e-19	-18.564	-18.640	-0.076	(0)
	CrCl+2	9.200e-20	7.636e-20	-19.036	-19.117	-0.081	(0)
	MnCl3-	1.879e-20	1.799e-20	-19.726	-19.745	-0.019	(0)
	ZnCl3-	1.408e-20	1.347e-20	-19.851	-19.871	-0.019	(0)
	CdCl3-	1.143e-20	1.091e-20	-19.942	-19.962	-0.020	(0)
	VOCl+	8.546e-21	8.157e-21	-20.068	-20.088	-0.020	(0)
	PbCl3-	5.577e-21	5.323e-21	-20.254	-20.274	-0.020	(0)
	CuCl3-	3.539e-22	3.386e-22	-21.451	-21.470	-0.019	(0)
	HgCl4-2	2.743e-22	2.277e-22	-21.562	-21.643	-0.081	(0)
	FeCl2+	3.842e-23	3.678e-23	-22.415	-22.434	-0.019	(0)
	NiCl2	2.764e-23	2.764e-23	-22.559	-22.559	0.000	(0)
	CrOHC12	1.486e-24	1.486e-24	-23.828	-23.828	0.000	(0)
	ZnCl4-2	2.881e-25	2.419e-25	-24.540	-24.616	-0.076	(0)
	CrCl2+	2.726e-25	2.602e-25	-24.564	-24.585	-0.020	(0)
	PbCl4-2	1.053e-25	8.738e-26	-24.978	-25.059	-0.081	(0)
	FeCl3	1.321e-28	1.321e-28	-27.879	-27.879	0.000	(0)
	CuCl4-2	7.261e-29	6.095e-29	-28.139	-28.215	-0.076	(0)
	CrO3Cl-	1.501e-31	1.432e-31	-30.824	-30.844	-0.020	(0)
	CoCl+2	9.842e-40	8.169e-40	-39.007	-39.088	-0.081	(0)
	UCl+3	0.000e+00	0.000e+00	-42.622	-42.804	-0.182	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.509	-64.589	-0.081	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.792	-66.873	-0.081	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-81.515	-81.596	-0.081	(0)
Co (2)		1.314e-11					
	Co+2	1.238e-11	1.028e-11	-10.907	-10.988	-0.081	(0)
	CoSO4	4.076e-13	4.076e-13	-12.390	-12.390	0.000	(0)
	CoHCO3+	3.285e-13	3.136e-13	-12.483	-12.504	-0.020	(0)
	CoF+	1.037e-14	9.895e-15	-13.984	-14.005	-0.020	(0)
	CoCO3	9.044e-15	9.044e-15	-14.044	-14.044	0.000	(0)
	CoOH+	6.124e-15	5.845e-15	-14.213	-14.233	-0.020	(0)
	CoCl+	1.338e-15	1.277e-15	-14.874	-14.894	-0.020	(0)
	Co (OH) 2	1.324e-17	1.324e-17	-16.878	-16.878	0.000	(0)
	CoNO2+	1.285e-18	1.227e-18	-17.891	-17.911	-0.020	(0)
	Co (NH3) +2	7.618e-20	6.322e-20	-19.118	-19.199	-0.081	(0)
	CoSeO4	1.414e-21	1.414e-21	-20.849	-20.849	0.000	(0)

CoNO3+	4.656e-22	4.444e-22	-21.332	-21.352	-0.020	(0)
Co (OH) 3-	7.887e-24	7.528e-24	-23.103	-23.123	-0.020	(0)
CoOOH-	1.979e-24	1.889e-24	-23.704	-23.724	-0.020	(0)
Co2OH+3	4.578e-27	3.010e-27	-26.339	-26.521	-0.182	(0)
Co (NH3) 2+2	1.663e-28	1.380e-28	-27.779	-27.860	-0.081	(0)
Co (OH) 4-2	4.098e-32	3.401e-32	-31.387	-31.468	-0.081	(0)
Co (NO3) 2	2.468e-32	2.468e-32	-31.608	-31.608	0.000	(0)
Co (NH3) 3+2	1.071e-37	8.892e-38	-36.970	-37.051	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.541	-46.622	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.309	-48.633	-0.324	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.612	-56.693	-0.081	(0)
Co (3)	1.951e-32					
CoOH+2	1.951e-32	1.619e-32	-31.710	-31.791	-0.081	(0)
Co+3	1.665e-37	1.118e-37	-36.779	-36.952	-0.173	(0)
CoCl+2	9.842e-40	8.169e-40	-39.007	-39.088	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.509	-64.589	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.907	-75.928	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-80.415	-80.496	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-81.515	-81.596	-0.081	(0)
Cr (2)	1.730e-28					
Cr+2	1.730e-28	1.436e-28	-27.762	-27.843	-0.081	(0)
Cr (3)	5.057e-12					
Cr (OH) 2+	3.723e-12	3.554e-12	-11.429	-11.449	-0.020	(0)
Cr (OH) +2	1.234e-12	1.024e-12	-11.909	-11.989	-0.081	(0)
CrOHSO4	4.833e-14	4.833e-14	-13.316	-13.316	0.000	(0)
Cr (OH) 3	3.805e-14	3.805e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.552e-15	7.928e-15	-14.020	-14.101	-0.081	(0)
Cr+3	2.498e-15	1.643e-15	-14.602	-14.784	-0.182	(0)
CrSO4+	7.988e-16	7.625e-16	-15.098	-15.118	-0.020	(0)
CrO2-	5.361e-17	5.117e-17	-16.271	-16.291	-0.020	(0)
Cr (OH) 4-	4.525e-17	4.319e-17	-16.344	-16.365	-0.020	(0)
CrCl+2	9.200e-20	7.636e-20	-19.036	-19.117	-0.081	(0)
Cr2 (OH) 2SO4+2	5.392e-24	4.475e-24	-23.268	-23.349	-0.081	(0)
CrOHC12	1.486e-24	1.486e-24	-23.828	-23.828	0.000	(0)
CrCl2+	2.726e-25	2.602e-25	-24.564	-24.585	-0.020	(0)
Cr2 (OH) 2 (SO4) 2	5.284e-26	5.284e-26	-25.277	-25.277	0.000	(0)
CrNO3+2	2.361e-27	1.959e-27	-26.627	-26.708	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.331	-53.412	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-63.348	-63.530	-0.182	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.792	-66.873	-0.081	(0)
Cr (6)	3.756e-21					
HCrO4-	1.881e-21	1.795e-21	-20.726	-20.746	-0.020	(0)
CrO4-2	1.875e-21	1.570e-21	-20.727	-20.804	-0.077	(0)
NaCrO4-	9.383e-25	8.956e-25	-24.028	-24.048	-0.020	(0)
KCrO4-	3.913e-25	3.735e-25	-24.408	-24.428	-0.020	(0)
H2CrO4	5.139e-28	5.139e-28	-27.289	-27.289	0.000	(0)
CrO3SO4-2	4.625e-29	3.839e-29	-28.335	-28.416	-0.081	(0)
CrO3Cl-	1.501e-31	1.432e-31	-30.824	-30.844	-0.020	(0)
Cr2O7-2	1.346e-40	1.117e-40	-39.871	-39.952	-0.081	(0)
Cu (1)	2.792e-10					
Cu+	2.676e-10	2.554e-10	-9.573	-9.593	-0.020	(0)
CuCl	1.155e-11	1.155e-11	-10.937	-10.937	0.000	(0)
CuCl2-	9.059e-14	8.667e-14	-13.043	-13.062	-0.019	(0)
CuCl3-2	7.928e-19	6.655e-19	-18.101	-18.177	-0.076	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-152.362	-152.502	-0.140	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.095	-153.232	-0.137	(0)
Cu (2)	2.379e-06					
Cu+2	1.701e-06	1.425e-06	-5.769	-5.846	-0.077	(0)
CuCO3	4.369e-07	4.369e-07	-6.360	-6.360	0.000	(0)
CuOH+	1.343e-07	1.285e-07	-6.872	-6.891	-0.019	(0)
CuSO4	6.489e-08	6.489e-08	-7.188	-7.188	0.000	(0)
CuHCO3+	3.695e-08	3.527e-08	-7.432	-7.453	-0.020	(0)
CuF+	2.868e-09	2.738e-09	-8.542	-8.563	-0.020	(0)
Cu (OH) 2	7.306e-10	7.306e-10	-9.136	-9.136	0.000	(0)
Cu2 (OH) 2+2	4.994e-10	4.145e-10	-9.302	-9.383	-0.081	(0)
CuCl+	8.479e-11	8.111e-11	-10.072	-10.091	-0.019	(0)
Cu (CO3) 2-2	7.376e-11	6.122e-11	-10.132	-10.213	-0.081	(0)
CuNO2+	2.648e-12	2.528e-12	-11.577	-11.597	-0.020	(0)

	CuNH3+2	8.990e-13	7.462e-13	-12.046	-12.127	-0.081	(0)
	Cu (OH) 3-	4.476e-14	4.272e-14	-13.349	-13.369	-0.020	(0)
	CuCl2	1.010e-15	1.010e-15	-14.996	-14.996	0.000	(0)
	CuNO3+	1.288e-16	1.230e-16	-15.890	-15.910	-0.020	(0)
	Cu (NO2) 2	4.383e-19	4.383e-19	-18.358	-18.358	0.000	(0)
	Cu (OH) 4-2	1.155e-20	9.585e-21	-19.937	-20.018	-0.081	(0)
	CuCl3-	3.539e-22	3.386e-22	-21.451	-21.470	-0.019	(0)
	Cu (NO3) 2	4.224e-28	4.224e-28	-27.374	-27.374	0.000	(0)
	CuCl4-2	7.261e-29	6.095e-29	-28.139	-28.215	-0.076	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.732	-218.752	-0.020	(0)
F		3.368e-05					
	F-	3.183e-05	3.045e-05	-4.497	-4.516	-0.019	(0)
	AlF2+	4.680e-07	4.480e-07	-6.330	-6.349	-0.019	(0)
	MgF+	2.364e-07	2.263e-07	-6.626	-6.645	-0.019	(0)
	AlF3	1.718e-07	1.718e-07	-6.765	-6.765	0.000	(0)
	CaF+	8.723e-08	8.350e-08	-7.059	-7.078	-0.019	(0)
	AlF+2	4.399e-08	3.696e-08	-7.357	-7.432	-0.076	(0)
	HF	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
	CuF+	2.868e-09	2.738e-09	-8.542	-8.563	-0.020	(0)
	AlF4-	2.739e-09	2.621e-09	-8.562	-8.582	-0.019	(0)
	NaF	2.205e-09	2.205e-09	-8.657	-8.657	0.000	(0)
	MnF+	1.004e-09	9.609e-10	-8.998	-9.017	-0.019	(0)
	UO2F+	1.119e-10	1.068e-10	-9.951	-9.971	-0.020	(0)
	ZnF+	5.851e-11	5.585e-11	-10.233	-10.253	-0.020	(0)
	UO2F2	9.382e-12	9.382e-12	-11.028	-11.028	0.000	(0)
	BF (OH) 3-	5.656e-12	5.406e-12	-11.248	-11.267	-0.020	(0)
	PbF+	4.093e-12	3.907e-12	-11.388	-11.408	-0.020	(0)
	HF2-	1.926e-12	1.842e-12	-11.715	-11.735	-0.019	(0)
	CdF+	4.741e-13	4.525e-13	-12.324	-12.344	-0.020	(0)
	UO2F3-	7.519e-14	7.176e-14	-13.124	-13.144	-0.020	(0)
	CoF+	1.037e-14	9.895e-15	-13.984	-14.005	-0.020	(0)
	CrF+2	9.552e-15	7.928e-15	-14.020	-14.101	-0.081	(0)
	FeF+2	8.405e-15	7.056e-15	-14.075	-14.151	-0.076	(0)
	BF2 (OH) 2-	6.503e-15	6.216e-15	-14.187	-14.206	-0.020	(0)
	FeF2+	6.007e-15	5.750e-15	-14.221	-14.240	-0.019	(0)
	PbF2	2.341e-15	2.341e-15	-14.631	-14.631	0.000	(0)
	NiF+	1.333e-15	1.272e-15	-14.875	-14.896	-0.020	(0)
	VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
	H2F2	6.780e-16	6.780e-16	-15.169	-15.169	0.000	(0)
	FeF3	2.470e-16	2.470e-16	-15.607	-15.607	0.000	(0)
	CdF2	2.749e-17	2.749e-17	-16.561	-16.561	0.000	(0)
	UO2F4-2	2.091e-17	1.736e-17	-16.680	-16.761	-0.081	(0)
	VOF+	1.549e-17	1.479e-17	-16.810	-16.830	-0.020	(0)
	VO2F2-	1.371e-17	1.309e-17	-16.863	-16.883	-0.020	(0)
	VOF2	1.688e-19	1.688e-19	-18.773	-18.773	0.000	(0)
	PbF3-	1.417e-19	1.352e-19	-18.849	-18.869	-0.020	(0)
	BF3OH-	2.721e-20	2.601e-20	-19.565	-19.585	-0.020	(0)
	VO2F3-2	5.990e-21	4.971e-21	-20.223	-20.304	-0.081	(0)
	VOF3-	1.911e-22	1.824e-22	-21.719	-21.739	-0.020	(0)
	HgF+	4.064e-23	3.879e-23	-22.391	-22.411	-0.020	(0)
	PbF4-2	2.374e-24	1.971e-24	-23.624	-23.705	-0.081	(0)
	BF4-	1.440e-24	1.377e-24	-23.842	-23.861	-0.020	(0)
	VO2F4-3	1.133e-25	7.448e-26	-24.946	-25.128	-0.182	(0)
	Sb (OH) 2F	9.082e-26	9.082e-26	-25.042	-25.042	0.000	(0)
	SbOF	8.931e-26	8.931e-26	-25.049	-25.049	0.000	(0)
	VOF4-2	2.701e-26	2.242e-26	-25.568	-25.649	-0.081	(0)
	UF3+	1.026e-32	9.795e-33	-31.989	-32.009	-0.020	(0)
	UF2+2	2.445e-33	2.030e-33	-32.612	-32.693	-0.081	(0)
	UF4	3.270e-35	3.270e-35	-34.485	-34.485	0.000	(0)
	UF+3	8.052e-36	5.294e-36	-35.094	-35.276	-0.182	(0)
	UF5-	4.135e-38	3.946e-38	-37.384	-37.404	-0.020	(0)
	UF6-2	4.372e-40	3.629e-40	-39.359	-39.440	-0.081	(0)
Fe (2)		1.049e-09					
	Fe+2	1.003e-09	8.326e-10	-8.999	-9.080	-0.081	(0)
	FeSO4	4.063e-11	4.063e-11	-10.391	-10.391	0.000	(0)
	FeHCO3+	4.293e-12	4.112e-12	-11.367	-11.386	-0.019	(0)
	FeOH+	9.871e-13	9.449e-13	-12.006	-12.025	-0.019	(0)
	Fe (OH) 2	2.140e-17	2.140e-17	-16.670	-16.670	0.000	(0)

Fe (OH) 3-	2.015e-19	1.929e-19	-18.696	-18.715	-0.019	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.333	-159.333	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.877	-236.897	-0.020	(0)
Fe (3)	4.639e-08					
Fe (OH) 2+	4.506e-08	4.314e-08	-7.346	-7.365	-0.019	(0)
Fe (OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
FeOH+2	4.633e-12	3.890e-12	-11.334	-11.410	-0.076	(0)
Fe (OH) 4-	3.662e-12	3.506e-12	-11.436	-11.455	-0.019	(0)
FeF+2	8.405e-15	7.056e-15	-14.075	-14.151	-0.076	(0)
FeF2+	6.007e-15	5.750e-15	-14.221	-14.240	-0.019	(0)
FeSO4+	4.924e-16	4.713e-16	-15.308	-15.327	-0.019	(0)
Fe+3	3.147e-16	2.113e-16	-15.502	-15.675	-0.173	(0)
FeF3	2.470e-16	2.470e-16	-15.607	-15.607	0.000	(0)
Fe (SO4) 2-	2.099e-18	2.003e-18	-17.678	-17.698	-0.020	(0)
FeCl+2	2.730e-19	2.292e-19	-18.564	-18.640	-0.076	(0)
FeHSeO3+2	2.216e-21	1.840e-21	-20.654	-20.735	-0.081	(0)
Fe2 (OH) 2+4	1.056e-21	5.010e-22	-20.976	-21.300	-0.324	(0)
FeCl2+	3.842e-23	3.678e-23	-22.415	-22.434	-0.019	(0)
FeNO3+2	6.948e-26	5.767e-26	-25.158	-25.239	-0.081	(0)
Fe3 (OH) 4+5	1.001e-27	3.124e-28	-27.000	-27.505	-0.506	(0)
FeCl3	1.321e-28	1.321e-28	-27.879	-27.879	0.000	(0)
H (0)	2.365e-29					
H2	1.183e-29	1.183e-29	-28.927	-28.927	0.000	(0)
Hg (0)	4.249e-11					
Hg	4.249e-11	4.249e-11	-10.372	-10.372	0.000	(0)
Hg (1)	2.389e-21					
Hg2+2	1.194e-21	9.913e-22	-20.923	-21.004	-0.081	(0)
Hg (2)	2.449e-13					
Hg (OH) 2	1.761e-13	1.762e-13	-12.754	-12.754	0.000	(0)
HgClOH	6.214e-14	6.214e-14	-13.207	-13.207	0.000	(0)
HgCl2	4.433e-15	4.433e-15	-14.353	-14.353	0.000	(0)
HgCO3	2.141e-15	2.141e-15	-14.669	-14.669	0.000	(0)
HgOH+	4.086e-17	3.900e-17	-16.389	-16.409	-0.020	(0)
HgCl+	2.580e-17	2.463e-17	-16.588	-16.609	-0.020	(0)
HgHCO3+	1.475e-17	1.408e-17	-16.831	-16.851	-0.020	(0)
HgCl3-	1.668e-18	1.592e-18	-17.778	-17.798	-0.020	(0)
Hg (CO3) 2-2	4.248e-19	3.525e-19	-18.372	-18.453	-0.081	(0)
Hg+2	4.141e-20	3.437e-20	-19.383	-19.464	-0.081	(0)
HgSO4	1.789e-21	1.789e-21	-20.747	-20.747	0.000	(0)
HgNH3+2	1.337e-21	1.110e-21	-20.874	-20.955	-0.081	(0)
Hg (OH) 3-	6.625e-22	6.324e-22	-21.179	-21.199	-0.020	(0)
HgCl4-2	2.743e-22	2.277e-22	-21.562	-21.643	-0.081	(0)
Hg (NH3) 2+2	6.842e-23	5.678e-23	-22.165	-22.246	-0.081	(0)
HgF+	4.064e-23	3.879e-23	-22.391	-22.411	-0.020	(0)
HgNO3+	3.628e-31	3.462e-31	-30.440	-30.461	-0.020	(0)
Hg (NH3) 3+2	1.394e-32	1.157e-32	-31.856	-31.937	-0.081	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.247	-41.328	-0.081	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-41.406	-41.406	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-140.267	-140.287	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.345	-140.345	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-142.462	-142.543	-0.081	(0)
K	6.700e-05					
K+	6.690e-05	6.401e-05	-4.175	-4.194	-0.019	(0)
KSO4-	9.408e-08	9.008e-08	-7.026	-7.045	-0.019	(0)
KCrO4-	3.913e-25	3.735e-25	-24.408	-24.428	-0.020	(0)
Mg	8.196e-05					
Mg+2	7.904e-05	6.622e-05	-4.102	-4.179	-0.077	(0)
MgSO4	2.395e-06	2.395e-06	-5.621	-5.621	0.000	(0)
MgHCO3+	2.778e-07	2.658e-07	-6.556	-6.575	-0.019	(0)
MgF+	2.364e-07	2.263e-07	-6.626	-6.645	-0.019	(0)
MgCO3	2.868e-09	2.868e-09	-8.542	-8.542	0.000	(0)
MgOH+	7.845e-10	7.515e-10	-9.105	-9.124	-0.019	(0)
MgH2BO3+	1.757e-12	1.680e-12	-11.755	-11.775	-0.020	(0)
Mn (2)	9.907e-07					
Mn+2	9.550e-07	7.927e-07	-6.020	-6.101	-0.081	(0)
MnSO4	2.802e-08	2.802e-08	-7.553	-7.553	0.000	(0)
MnHCO3+	6.481e-09	6.204e-09	-8.188	-8.207	-0.019	(0)
MnF+	1.004e-09	9.609e-10	-8.998	-9.017	-0.019	(0)

MnOH+	5.930e-11	5.676e-11	-10.227	-10.246	-0.019	(0)
MnCl+	3.745e-11	3.584e-11	-10.427	-10.446	-0.019	(0)
MnCl2	1.818e-15	1.818e-15	-14.740	-14.740	0.000	(0)
MnSeO4	5.859e-17	5.859e-17	-16.232	-16.232	0.000	(0)
MnNO3+	3.592e-17	3.428e-17	-16.445	-16.465	-0.020	(0)
MnCl3-	1.879e-20	1.799e-20	-19.726	-19.745	-0.019	(0)
Mn (OH) 3-	2.978e-22	2.851e-22	-21.526	-21.545	-0.019	(0)
Mn (NO3) 2	2.350e-27	2.350e-27	-26.629	-26.629	0.000	(0)
Mn (OH) 4-2	3.125e-29	2.624e-29	-28.505	-28.581	-0.076	(0)
MnSe	0.000e+00	0.000e+00	-45.987	-45.987	0.000	(0)
Mn (3)	1.441e-25					
Mn+3	1.441e-25	9.675e-26	-24.841	-25.014	-0.173	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.085	-47.161	-0.076	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-50.077	-50.097	-0.019	(0)
Mo	3.825e-08					
MoO4-2	3.801e-08	3.185e-08	-7.420	-7.497	-0.077	(0)
HMoO4-	2.345e-10	2.238e-10	-9.630	-9.650	-0.020	(0)
H2MoO4	5.790e-13	5.790e-13	-12.237	-12.237	0.000	(0)
AlMo6O21-3	3.675e-39	2.416e-39	-38.435	-38.617	-0.182	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.376	-51.104	-0.728	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.664	-51.170	-0.506	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.516	-52.839	-0.324	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.863	-56.045	-0.182	(0)
N (-3)	3.329e-08					
NH4+	3.316e-08	3.170e-08	-7.479	-7.499	-0.020	(0)
NH4SO4-	7.054e-11	6.752e-11	-10.152	-10.171	-0.019	(0)
NH3	5.117e-11	5.117e-11	-10.291	-10.291	0.000	(0)
CuNH3+2	8.990e-13	7.462e-13	-12.046	-12.127	-0.081	(0)
CaNH3+2	1.950e-14	1.619e-14	-13.710	-13.791	-0.081	(0)
BaNH3+2	4.341e-18	3.603e-18	-17.362	-17.443	-0.081	(0)
Co (NH3) +2	7.618e-20	6.322e-20	-19.118	-19.199	-0.081	(0)
NiNH3+2	5.506e-20	4.570e-20	-19.259	-19.340	-0.081	(0)
HgNH3+2	1.337e-21	1.110e-21	-20.874	-20.955	-0.081	(0)
Hg (NH3) 2+2	6.842e-23	5.678e-23	-22.165	-22.246	-0.081	(0)
Ca (NH3) 2+2	3.973e-25	3.297e-25	-24.401	-24.482	-0.081	(0)
Ni (NH3) 2+2	4.073e-28	3.380e-28	-27.390	-27.471	-0.081	(0)
Co (NH3) 2+2	1.663e-28	1.380e-28	-27.779	-27.860	-0.081	(0)
Hg (NH3) 3+2	1.394e-32	1.157e-32	-31.856	-31.937	-0.081	(0)
Co (NH3) 3+2	1.071e-37	8.892e-38	-36.970	-37.051	-0.081	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.247	-41.328	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.541	-46.622	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.331	-53.412	-0.081	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.612	-56.693	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-63.348	-63.530	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.509	-64.589	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.792	-66.873	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.907	-75.928	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-80.415	-80.496	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-81.515	-81.596	-0.081	(0)
N (3)	1.772e-08					
NO2-	1.772e-08	1.694e-08	-7.752	-7.771	-0.019	(0)
CuNO2+	2.648e-12	2.528e-12	-11.577	-11.597	-0.020	(0)
CoNO2+	1.285e-18	1.227e-18	-17.891	-17.911	-0.020	(0)
Cu (NO2) 2	4.383e-19	4.383e-19	-18.358	-18.358	0.000	(0)
N (5)	2.854e-11					
NO3-	2.852e-11	2.729e-11	-10.545	-10.564	-0.019	(0)
CaNO3+	2.271e-14	2.168e-14	-13.644	-13.664	-0.020	(0)
CuNO3+	1.288e-16	1.230e-16	-15.890	-15.910	-0.020	(0)
MnNO3+	3.592e-17	3.428e-17	-16.445	-16.465	-0.020	(0)
BaNO3+	1.599e-17	1.526e-17	-16.796	-16.816	-0.020	(0)
ZnNO3+	6.601e-18	6.300e-18	-17.180	-17.201	-0.020	(0)
PbNO3+	7.699e-19	7.348e-19	-18.114	-18.134	-0.020	(0)
CdNO3+	8.477e-20	8.091e-20	-19.072	-19.092	-0.020	(0)
UO2NO3+	1.450e-21	1.384e-21	-20.839	-20.859	-0.020	(0)
CoNO3+	4.656e-22	4.444e-22	-21.332	-21.352	-0.020	(0)
NiNO3+	1.194e-22	1.140e-22	-21.923	-21.943	-0.020	(0)

	VO2NO3	3.059e-25	3.059e-25	-24.514	-24.514	0.000	(0)
	FeNO3+2	6.948e-26	5.767e-26	-25.158	-25.239	-0.081	(0)
	CrNO3+2	2.361e-27	1.959e-27	-26.627	-26.708	-0.081	(0)
	Mn (NO3) 2	2.350e-27	2.350e-27	-26.629	-26.629	0.000	(0)
	Cu (NO3) 2	4.224e-28	4.224e-28	-27.374	-27.374	0.000	(0)
	Zn (NO3) 2	3.430e-29	3.430e-29	-28.465	-28.465	0.000	(0)
	Pb (NO3) 2	3.405e-29	3.405e-29	-28.468	-28.468	0.000	(0)
	Cd (NO3) 2	1.107e-30	1.107e-30	-29.956	-29.956	0.000	(0)
	HgNO3+	3.628e-31	3.462e-31	-30.440	-30.461	-0.020	(0)
	Co (NO3) 2	2.468e-32	2.468e-32	-31.608	-31.608	0.000	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-41.406	-41.406	0.000	(0)
Na	1.201e-04						
	Na+	1.200e-04	1.148e-04	-3.921	-3.940	-0.019	(0)
	NaSO4-	1.280e-07	1.225e-07	-6.893	-6.912	-0.019	(0)
	NaHCO3	2.532e-08	2.532e-08	-7.597	-7.597	0.000	(0)
	NaF	2.205e-09	2.205e-09	-8.657	-8.657	0.000	(0)
	NaCO3-	1.162e-10	1.113e-10	-9.935	-9.954	-0.019	(0)
	NaH2BO3	1.331e-13	1.331e-13	-12.876	-12.876	0.000	(0)
	NaCrO4-	9.383e-25	8.956e-25	-24.028	-24.048	-0.020	(0)
Ni	2.141e-12						
	Ni+2	1.985e-12	1.663e-12	-11.702	-11.779	-0.077	(0)
	NiHCO3+	8.425e-14	8.042e-14	-13.074	-13.095	-0.020	(0)
	NiSO4	6.596e-14	6.596e-14	-13.181	-13.181	0.000	(0)
	NiCO3	3.230e-15	3.230e-15	-14.491	-14.491	0.000	(0)
	NiF+	1.333e-15	1.272e-15	-14.875	-14.896	-0.020	(0)
	NiOH+	6.253e-16	5.968e-16	-15.204	-15.224	-0.020	(0)
	NiCl+	1.601e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
	Ni (OH) 2	1.351e-18	1.351e-18	-17.869	-17.869	0.000	(0)
	Ni (SO4) 2-2	5.231e-19	4.341e-19	-18.281	-18.362	-0.081	(0)
	NiNH3+2	5.506e-20	4.570e-20	-19.259	-19.340	-0.081	(0)
	NiSeO4	2.136e-22	2.136e-22	-21.670	-21.670	0.000	(0)
	NiNO3+	1.194e-22	1.140e-22	-21.923	-21.943	-0.020	(0)
	Ni (OH) 3-	4.036e-23	3.852e-23	-22.394	-22.414	-0.020	(0)
	NiCl2	2.764e-23	2.764e-23	-22.559	-22.559	0.000	(0)
	Ni (NH3) 2+2	4.073e-28	3.380e-28	-27.390	-27.471	-0.081	(0)
O (0)	7.240e-35						
	O2	3.620e-35	3.622e-35	-34.441	-34.441	0.000	(0)
Pb	3.335e-09						
	Pb+2	2.173e-09	1.821e-09	-8.663	-8.740	-0.077	(0)
	PbHCO3+	5.559e-10	5.306e-10	-9.255	-9.275	-0.020	(0)
	PbCO3	2.849e-10	2.849e-10	-9.545	-9.545	0.000	(0)
	PbSO4	1.773e-10	1.773e-10	-9.751	-9.751	0.000	(0)
	PbOH+	1.366e-10	1.304e-10	-9.865	-9.885	-0.020	(0)
	PbF+	4.093e-12	3.907e-12	-11.388	-11.408	-0.020	(0)
	PbCl+	2.431e-12	2.320e-12	-11.614	-11.634	-0.020	(0)
	Pb (SO4) 2-2	2.558e-13	2.123e-13	-12.592	-12.673	-0.081	(0)
	Pb (OH) 2	1.175e-13	1.175e-13	-12.930	-12.930	0.000	(0)
	Pb (CO3) 2-2	5.155e-14	4.279e-14	-13.288	-13.369	-0.081	(0)
	PbF2	2.341e-15	2.341e-15	-14.631	-14.631	0.000	(0)
	PbCl2	3.722e-16	3.722e-16	-15.429	-15.429	0.000	(0)
	Pb2OH+3	5.721e-18	3.762e-18	-17.243	-17.425	-0.182	(0)
	Pb (OH) 3-	3.510e-18	3.350e-18	-17.455	-17.475	-0.020	(0)
	PbNO3+	7.699e-19	7.348e-19	-18.114	-18.134	-0.020	(0)
	PbF3-	1.417e-19	1.352e-19	-18.849	-18.869	-0.020	(0)
	PbCl3-	5.577e-21	5.323e-21	-20.254	-20.274	-0.020	(0)
	Pb (OH) 4-2	2.818e-23	2.339e-23	-22.550	-22.631	-0.081	(0)
	PbF4-2	2.374e-24	1.971e-24	-23.624	-23.705	-0.081	(0)
	Pb3 (OH) 4+2	6.045e-25	5.017e-25	-24.219	-24.300	-0.081	(0)
	PbCl4-2	1.053e-25	8.738e-26	-24.978	-25.059	-0.081	(0)
	Pb (NO3) 2	3.405e-29	3.405e-29	-28.468	-28.468	0.000	(0)
	Pb4 (OH) 4+4	1.529e-29	7.256e-30	-28.816	-29.139	-0.324	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-152.673	-152.673	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-230.954	-230.974	-0.020	(0)
S (-2)	0.000e+00						
	H2S	0.000e+00	0.000e+00	-79.033	-79.033	0.000	(0)
	HS-	0.000e+00	0.000e+00	-79.581	-79.602	-0.020	(0)
	CdHS+	0.000e+00	0.000e+00	-80.601	-80.621	-0.020	(0)
	S5-2	0.000e+00	0.000e+00	-82.434	-82.515	-0.081	(0)

S6-2	0.000e+00	0.000e+00	-82.950	-83.031	-0.081	(0)
S4-2	0.000e+00	0.000e+00	-83.029	-83.110	-0.081	(0)
S3-2	0.000e+00	0.000e+00	-83.835	-83.916	-0.081	(0)
S2-2	0.000e+00	0.000e+00	-84.851	-84.932	-0.081	(0)
S-2	0.000e+00	0.000e+00	-90.374	-90.450	-0.076	(0)
HgHS2-	0.000e+00	0.000e+00	-140.267	-140.287	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.345	-140.345	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-142.462	-142.543	-0.081	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-152.362	-152.502	-0.140	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.673	-152.673	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.957	-152.978	-0.020	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-153.019	-153.019	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-153.095	-153.232	-0.137	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-153.420	-153.420	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.333	-159.333	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.732	-218.752	-0.020	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-229.721	-229.741	-0.020	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-230.700	-230.721	-0.020	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.954	-230.974	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.188	-233.269	-0.081	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.877	-236.897	-0.020	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-308.045	-308.126	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-310.722	-310.803	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.375	-322.456	-0.081	(0)
S (6)	2.514e-04					
SO4-2	2.373e-04	1.988e-04	-3.625	-3.702	-0.077	(0)
CaSO4	1.144e-05	1.144e-05	-4.942	-4.942	0.000	(0)
MgSO4	2.395e-06	2.395e-06	-5.621	-5.621	0.000	(0)
NaSO4-	1.280e-07	1.225e-07	-6.893	-6.912	-0.019	(0)
KSO4-	9.408e-08	9.008e-08	-7.026	-7.045	-0.019	(0)
CuSO4	6.489e-08	6.489e-08	-7.188	-7.188	0.000	(0)
MnSO4	2.802e-08	2.802e-08	-7.553	-7.553	0.000	(0)
HSO4-	7.170e-09	6.861e-09	-8.144	-8.164	-0.019	(0)
ZnSO4	3.997e-09	3.997e-09	-8.398	-8.398	0.000	(0)
AlSO4+	1.957e-10	1.873e-10	-9.708	-9.728	-0.019	(0)
PbSO4	1.773e-10	1.773e-10	-9.751	-9.751	0.000	(0)
NH4SO4-	7.054e-11	6.752e-11	-10.152	-10.171	-0.019	(0)
CdSO4	4.369e-11	4.369e-11	-10.360	-10.360	0.000	(0)
FeSO4	4.063e-11	4.063e-11	-10.391	-10.391	0.000	(0)
Zn (SO4) 2-2	8.338e-12	6.921e-12	-11.079	-11.160	-0.081	(0)
UO2SO4	7.647e-12	7.647e-12	-11.116	-11.116	0.000	(0)
Al (SO4) 2-	4.169e-13	3.989e-13	-12.380	-12.399	-0.019	(0)
CoSO4	4.076e-13	4.076e-13	-12.390	-12.390	0.000	(0)
Pb (SO4) 2-2	2.558e-13	2.123e-13	-12.592	-12.673	-0.081	(0)
Cd (SO4) 2-2	1.412e-13	1.172e-13	-12.850	-12.931	-0.081	(0)
NiSO4	6.596e-14	6.596e-14	-13.181	-13.181	0.000	(0)
CrOHSO4	4.833e-14	4.833e-14	-13.316	-13.316	0.000	(0)
UO2 (SO4) 2-2	2.414e-14	2.004e-14	-13.617	-13.698	-0.081	(0)
CrSO4+	7.988e-16	7.625e-16	-15.098	-15.118	-0.020	(0)
FeSO4+	4.924e-16	4.713e-16	-15.308	-15.327	-0.019	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VOSO4	4.432e-18	4.432e-18	-17.353	-17.353	0.000	(0)
Fe (SO4) 2-	2.099e-18	2.003e-18	-17.678	-17.698	-0.020	(0)
Ni (SO4) 2-2	5.231e-19	4.341e-19	-18.281	-18.362	-0.081	(0)
HgSO4	1.789e-21	1.789e-21	-20.747	-20.747	0.000	(0)
Cr2 (OH) 2SO4+2	5.392e-24	4.475e-24	-23.268	-23.349	-0.081	(0)
Cr2 (OH) 2 (SO4) 2	5.284e-26	5.284e-26	-25.277	-25.277	0.000	(0)
CrO3SO4-2	4.625e-29	3.839e-29	-28.335	-28.416	-0.081	(0)
VSO4+	1.805e-31	1.723e-31	-30.744	-30.764	-0.020	(0)
U (SO4) 2	1.089e-37	1.089e-37	-36.963	-36.963	0.000	(0)
USO4+2	8.309e-38	6.896e-38	-37.080	-37.161	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.907	-75.928	-0.020	(0)
Sb (3)	1.068e-20					
Sb (OH) 3	5.406e-21	5.406e-21	-20.267	-20.267	0.000	(0)
HSbO2	5.277e-21	5.277e-21	-20.278	-20.278	0.000	(0)
Sb (OH) 2F	9.082e-26	9.082e-26	-25.042	-25.042	0.000	(0)
SbOF	8.931e-26	8.931e-26	-25.049	-25.049	0.000	(0)
Sb (OH) 2+	4.858e-26	4.637e-26	-25.314	-25.334	-0.020	(0)

SbO2-	2.535e-26	2.420e-26	-25.596	-25.616	-0.020	(0)
SbO+	1.675e-26	1.598e-26	-25.776	-25.796	-0.020	(0)
Sb (OH) 4-	1.453e-26	1.386e-26	-25.838	-25.858	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.375	-322.456	-0.081	(0)
Sb (5)	4.022e-10					
SbO3-	4.017e-10	3.835e-10	-9.396	-9.416	-0.020	(0)
Sb (OH) 6-	4.688e-13	4.485e-13	-12.329	-12.348	-0.019	(0)
SbO2+	1.438e-23	1.372e-23	-22.842	-22.863	-0.020	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-40.933	-40.953	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.515	-43.515	0.000	(0)
MnSe	0.000e+00	0.000e+00	-45.987	-45.987	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.420	-49.501	-0.081	(0)
Se (4)	3.497e-09					
HSeO3-	3.451e-09	3.294e-09	-8.462	-8.482	-0.020	(0)
SeO3-2	4.474e-11	3.713e-11	-10.349	-10.430	-0.081	(0)
H2SeO3	4.964e-13	4.964e-13	-12.304	-12.304	0.000	(0)
FeHSeO3+2	2.216e-21	1.840e-21	-20.654	-20.735	-0.081	(0)
Cd (SeO3) 2-2	1.284e-24	1.065e-24	-23.892	-23.973	-0.081	(0)
Se (6)	3.278e-13					
SeO4-2	3.278e-13	2.746e-13	-12.484	-12.561	-0.077	(0)
MnSeO4	5.859e-17	5.859e-17	-16.232	-16.232	0.000	(0)
HSeO4-	5.093e-18	4.861e-18	-17.293	-17.313	-0.020	(0)
ZnSeO4	3.909e-18	3.909e-18	-17.408	-17.408	0.000	(0)
CdSeO4	4.795e-20	4.795e-20	-19.319	-19.319	0.000	(0)
CoSeO4	1.414e-21	1.414e-21	-20.849	-20.849	0.000	(0)
NiSeO4	2.136e-22	2.136e-22	-21.670	-21.670	0.000	(0)
Zn (SeO4) 2-2	1.311e-30	1.088e-30	-29.882	-29.963	-0.081	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.110	-55.292	-0.182	(0)
U (4)	1.277e-21					
U (OH) 5-	1.260e-21	1.202e-21	-20.900	-20.920	-0.020	(0)
U (OH) 4	1.778e-23	1.778e-23	-22.750	-22.750	0.000	(0)
U (OH) 3+	2.406e-26	2.297e-26	-25.619	-25.639	-0.020	(0)
U (OH) 2+2	4.519e-30	3.751e-30	-29.345	-29.426	-0.081	(0)
UF3+	1.026e-32	9.795e-33	-31.989	-32.009	-0.020	(0)
UF2+2	2.445e-33	2.030e-33	-32.612	-32.693	-0.081	(0)
UOH+3	9.490e-35	6.240e-35	-34.023	-34.205	-0.182	(0)
UF4	3.270e-35	3.270e-35	-34.485	-34.485	0.000	(0)
UF+3	8.052e-36	5.294e-36	-35.094	-35.276	-0.182	(0)
U (SO4) 2	1.089e-37	1.089e-37	-36.963	-36.963	0.000	(0)
USO4+2	8.309e-38	6.896e-38	-37.080	-37.161	-0.081	(0)
UF5-	4.135e-38	3.946e-38	-37.384	-37.404	-0.020	(0)
UF6-2	4.372e-40	3.629e-40	-39.359	-39.440	-0.081	(0)
U+4	1.836e-40	0.000e+00	-39.736	-40.060	-0.324	(0)
UCl+3	0.000e+00	0.000e+00	-42.622	-42.804	-0.182	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.096	-160.734	-1.639	(0)
U (5)	5.940e-15					
UO2+	5.940e-15	5.670e-15	-14.226	-14.246	-0.020	(0)
U (6)	1.215e-08					
UO2 (CO3) 2-2	6.594e-09	5.473e-09	-8.181	-8.262	-0.081	(0)
UO2CO3	5.268e-09	5.268e-09	-8.278	-8.278	0.000	(0)
UO2F+	1.119e-10	1.068e-10	-9.951	-9.971	-0.020	(0)
UO2OH+	9.557e-11	9.122e-11	-10.020	-10.040	-0.020	(0)
UO2+2	3.034e-11	2.542e-11	-10.518	-10.595	-0.077	(0)
UO2 (CO3) 3-4	3.009e-11	1.428e-11	-10.522	-10.845	-0.324	(0)
UO2F2	9.382e-12	9.382e-12	-11.028	-11.028	0.000	(0)
UO2SO4	7.647e-12	7.647e-12	-11.116	-11.116	0.000	(0)
UO2F3-	7.519e-14	7.176e-14	-13.124	-13.144	-0.020	(0)
UO2 (SO4) 2-2	2.414e-14	2.004e-14	-13.617	-13.698	-0.081	(0)
(UO2) 2 (OH) 2+2	1.664e-14	1.381e-14	-13.779	-13.860	-0.081	(0)
UO2Cl+	1.551e-15	1.481e-15	-14.809	-14.830	-0.020	(0)
(UO2) 3 (OH) 5+	8.135e-16	7.765e-16	-15.090	-15.110	-0.020	(0)
UO2F4-2	2.091e-17	1.736e-17	-16.680	-16.761	-0.081	(0)
UO2NO3+	1.450e-21	1.384e-21	-20.839	-20.859	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.402	-40.483	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.498	-40.518	-0.020	(0)

V (3)	3.430e-14					
V (OH) 3	3.430e-14	3.430e-14	-13.465	-13.465	0.000	(0)
V (OH) 2+	8.202e-24	7.829e-24	-23.086	-23.106	-0.020	(0)
VOH+2	3.160e-26	2.623e-26	-25.500	-25.581	-0.081	(0)
V+3	2.792e-30	1.836e-30	-29.554	-29.736	-0.182	(0)
VSO4+	1.805e-31	1.723e-31	-30.744	-30.764	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.039	-50.363	-0.324	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.054	-50.236	-0.182	(0)
V (4)	6.000e-16					
V (OH) 3+	4.824e-16	4.604e-16	-15.317	-15.337	-0.020	(0)
VO+2	9.754e-17	8.095e-17	-16.011	-16.092	-0.081	(0)
VOF+	1.549e-17	1.479e-17	-16.810	-16.830	-0.020	(0)
VOSO4	4.432e-18	4.432e-18	-17.353	-17.353	0.000	(0)
VOF2	1.688e-19	1.688e-19	-18.773	-18.773	0.000	(0)
VOC1+	8.546e-21	8.157e-21	-20.068	-20.088	-0.020	(0)
VOF3-	1.911e-22	1.824e-22	-21.719	-21.739	-0.020	(0)
VOF4-2	2.701e-26	2.242e-26	-25.568	-25.649	-0.081	(0)
H2V2O4+2	1.280e-26	1.063e-26	-25.893	-25.974	-0.081	(0)
V (5)	9.440e-09					
H2VO4-	9.329e-09	8.904e-09	-8.030	-8.050	-0.020	(0)
HVO4-2	7.629e-11	6.332e-11	-10.118	-10.198	-0.081	(0)
H3VO4	3.145e-11	3.145e-11	-10.502	-10.502	0.000	(0)
H3V2O7-	1.894e-12	1.808e-12	-11.723	-11.743	-0.020	(0)
VO2+	2.317e-14	2.217e-14	-13.635	-13.654	-0.019	(0)
VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
HV2O7-3	2.906e-16	1.911e-16	-15.537	-15.719	-0.182	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VO2F2-	1.371e-17	1.309e-17	-16.863	-16.883	-0.020	(0)
VO4-3	1.367e-18	8.985e-19	-17.864	-18.046	-0.182	(0)
V3O9-3	1.124e-18	7.393e-19	-17.949	-18.131	-0.182	(0)
V2O7-4	3.068e-20	1.456e-20	-19.513	-19.837	-0.324	(0)
VO2F3-2	5.990e-21	4.971e-21	-20.223	-20.304	-0.081	(0)
V4O12-4	5.783e-24	2.744e-24	-23.238	-23.562	-0.324	(0)
VO2NO3	3.059e-25	3.059e-25	-24.514	-24.514	0.000	(0)
VO2F4-3	1.133e-25	7.448e-26	-24.946	-25.128	-0.182	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.166	-55.671	-0.506	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.592	-56.916	-0.324	(0)
V10O28-6	0.000e+00	0.000e+00	-56.678	-57.406	-0.728	(0)
Zn	1.155e-07					
Zn+2	1.097e-07	9.192e-08	-6.960	-7.037	-0.077	(0)
ZnSO4	3.997e-09	3.997e-09	-8.398	-8.398	0.000	(0)
ZnHCO3+	1.195e-09	1.140e-09	-8.923	-8.943	-0.020	(0)
ZnCO3	2.754e-10	2.754e-10	-9.560	-9.560	0.000	(0)
ZnOH+	2.745e-10	2.620e-10	-9.561	-9.582	-0.020	(0)
ZnF+	5.851e-11	5.585e-11	-10.233	-10.253	-0.020	(0)
ZnCl+	8.668e-12	8.293e-12	-11.062	-11.081	-0.019	(0)
Zn (SO4) 2-2	8.338e-12	6.921e-12	-11.079	-11.160	-0.081	(0)
Zn (OH) 2	1.184e-12	1.184e-12	-11.927	-11.927	0.000	(0)
ZnOHCl	3.095e-13	3.095e-13	-12.509	-12.509	0.000	(0)
ZnCl2	4.721e-16	4.721e-16	-15.326	-15.326	0.000	(0)
Zn (OH) 3-	1.772e-16	1.691e-16	-15.752	-15.772	-0.020	(0)
ZnNO3+	6.601e-18	6.300e-18	-17.180	-17.201	-0.020	(0)
ZnSeO4	3.909e-18	3.909e-18	-17.408	-17.408	0.000	(0)
ZnCl3-	1.408e-20	1.347e-20	-19.851	-19.871	-0.019	(0)
Zn (OH) 4-2	2.313e-22	1.920e-22	-21.636	-21.717	-0.081	(0)
ZnCl4-2	2.881e-25	2.419e-25	-24.540	-24.616	-0.076	(0)
Zn (NO3) 2	3.430e-29	3.430e-29	-28.465	-28.465	0.000	(0)
Zn (SeO4) 2-2	1.311e-30	1.088e-30	-29.882	-29.963	-0.081	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.957	-152.978	-0.020	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-153.420	-153.420	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-229.721	-229.741	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.188	-233.269	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-310.722	-310.803	-0.081	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co(NH3)5Cl)(NO3)2	-74.05	-67.76	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-60.03	-55.52	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-67.26	-55.52	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-92.86	-74.93	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-76.60	-56.57	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-36.21	-35.80	0.40	(NH4)2CrO4
(NH4)2SeO4	-28.01	-27.56	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.36	9.44	10.80	Al(OH)3
Al2(MoO4)3	-44.69	-42.32	2.37	Al2(MoO4)3
Al2O3	-0.77	18.88	19.65	Al2O3
Al4(OH)10SO4	-1.55	21.15	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-9.07	-4.27	4.80	AlAsO4·2H2O
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4
AlSb	-153.78	-88.16	65.62	AlSb
Alunite	-1.23	-2.63	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.65	-12.44	-7.79	PbSO4
Anhydrite	-2.94	-7.30	-4.36	CaSO4
Anilite	-57.12	-89.00	-31.88	Cu0.25Cu1.5S
Antlerite	-4.22	4.57	8.79	Cu3(OH)4SO4
Aragonite	-2.58	-10.88	-8.30	CaCO3
Arsenolite	-79.59	-82.35	-2.76	As4O6
Artinite	-12.34	-2.74	9.60	MgCO3·Mg(OH)2·3H2O
As2O5	-34.12	-27.42	6.71	As2O5
Atacamite	-4.17	3.22	7.39	Cu2(OH)3Cl
Azurite	-2.30	-19.20	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-18.44	5.95	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-18.37	-2.50	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.65	-9.56	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-29.49	3.45	32.94	Ba3(VO4)2·4H2O
BaCrO4	-18.09	-27.76	-9.67	BaCrO4
BaF2	-10.17	-15.99	-5.82	BaF2
BaMoO4	-7.49	-14.45	-6.96	BaMoO4
Barite	-0.67	-10.65	-9.98	BaSO4
BaS	-96.28	-80.10	16.18	BaS
BaSeO3	-10.81	-8.98	1.83	BaSeO3
BaSeO4	-12.05	-19.51	-7.46	BaSeO4
Bianchite	-8.97	-10.74	-1.76	ZnSO4·6H2O
Birnessite	-10.86	7.23	18.09	MnO2
Bixbyite	-10.67	-11.32	-0.64	Mn2O3
BlaubleiI	-56.17	-80.33	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.05	-84.33	-27.28	Cu0.6Cu0.8S
Boehmite	0.86	9.44	8.58	AlOOH
Breithauptite	-65.06	-83.58	-18.52	NiSb
Brochantite	-3.60	11.63	15.22	Cu4(OH)6SO4
Brucite	-8.12	8.72	16.84	Mg(OH)2
Bunsenite	-11.32	1.12	12.45	NiO
Ca(VO3)2	-10.76	-5.10	5.66	Ca(VO3)2
Ca2V2O7	-13.30	4.20	17.50	Ca2V2O7
Ca2V2O7·2H2O	-17.35	4.20	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-21.81	0.49	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-25.45	13.51	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-26.35	13.51	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-310.26	-167.28	142.97	Ca3Sb2
CaCrO4	-22.14	-24.40	-2.27	CaCrO4
Calcite	-2.40	-10.88	-8.48	CaCO3
Calomel	-11.98	-29.89	-17.91	Hg2Cl2
CaMoO4	-3.15	-11.10	-7.95	CaMoO4
Carnotite	-2.87	-2.64	0.23	KUO2VO4
CaSeO3·2H2O	-8.44	-5.63	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-13.14	-16.16	-3.02	CaSeO4·2H2O
Cd(BO2)2	-18.67	-8.83	9.84	Cd(BO2)2
Cd(OH)2	-9.77	3.88	13.64	Cd(OH)2
Cd(OH)2(am)	-9.85	3.88	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.29	-21.58	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.54	-4.98	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.50	-1.10	28.40	Cd4(OH)6SO4
CdCl2	-17.26	-17.92	-0.66	CdCl2
CdCl2·1H2O	-16.22	-17.92	-1.69	CdCl2·1H2O

CdCl2:2.5H2O	-16.00	-17.92	-1.91	CdCl2:2.5H2O
CdF2	-16.85	-18.06	-1.21	CdF2
Cdmetal (alpha)	-35.42	-21.90	13.51	Cd
Cdmetal (gamma)	-35.52	-21.90	13.62	Cd
CdMoO4	-2.38	-16.52	-14.15	CdMoO4
CdOHCl	-10.56	-7.02	3.54	CdOHCl
CdSb	-80.48	-80.83	-0.35	CdSb
CdSe	-23.33	-43.53	-20.20	CdSe
CdSeO4:2H2O	-19.74	-21.59	-1.85	CdSeO4:2H2O
CdSO4	-12.56	-12.73	-0.17	CdSO4
CdSO4:1H2O	-11.00	-12.73	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.86	-12.73	-1.87	CdSO4:2.67H2O
Cerrusite	-2.89	-16.02	-13.13	PbCO3
CH4 (g)	-82.25	-123.30	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-57.42	-92.34	-34.92	Cu2S
Chalcocopyrite	-125.95	-161.22	-35.27	CuFeS2
Cinnabar	-53.11	-98.81	-45.69	HgS
Claudetite	-79.29	-82.35	-3.06	As4O6
Clausthalite	-16.14	-43.24	-27.10	PbSe
Co (BO2) 2	-37.86	-10.79	27.07	Co (BO2) 2
Co (OH) 2	-11.18	1.92	13.09	Co (OH) 2
Co (OH) 3	-15.29	-17.60	-2.31	Co (OH) 3
CO2 (g)	-2.04	-20.19	-18.15	CO2
Co3 (AsO4) 2	-34.71	-21.67	13.03	Co3 (AsO4) 2
Co3O4	-22.78	-33.28	-10.50	Co3O4
CoCl2	-28.14	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.41	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.42	-20.02	-1.60	CoF2
CoF3	-49.04	-50.50	-1.46	CoF3
CoFe2O4	12.81	9.28	-3.53	CoFe2O4
CoMoO4	-10.72	-18.49	-7.76	CoMoO4
CoO	-11.67	1.92	13.59	CoO
CoS (alpha)	-76.70	-84.14	-7.44	CoS
CoS (beta)	-73.07	-84.14	-11.07	CoS
CoSe	-29.29	-45.49	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-22.02	-23.55	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-56.70	-79.00	-22.30	CuS
Cr (OH) 2	-25.76	-14.94	10.82	Cr (OH) 2
Cr (OH) 3	-6.33	-5.00	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-4.25	-5.00	-0.75	Cr (OH) 3
Cr2O3	-7.64	-9.99	-2.36	Cr2O3
CrCl2	-50.82	-36.73	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.20	-40.72	30.48	Cr
CrO3	-30.50	-33.71	-3.21	CrO3
Cryolite	-14.99	-48.83	-33.84	Na3AlF6
Cu (OH) 2	-1.62	7.06	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.13	18.08	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.15	-2.90	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-58.80	-93.68	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-7.89	-53.69	-45.80	Cu2Se
Cu2SO4	-20.94	-22.89	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-64.43	-107.02	-42.59	Cu3Sb
Cu3Se2	-30.54	-94.03	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.21	-26.65	-5.44	CuCrO4
CuF	-9.20	-14.11	-4.91	CuF
CuF2	-15.99	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.27	-16.03	-8.76	Cu

CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.79	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-4.88	-6.28	-1.41	Cu2O
Cuprousferrite	9.46	0.54	-8.92	CuFeO2
CuSe	-7.25	-40.35	-33.10	CuSe
CuSe2	-28.61	-61.98	-33.37	CuSe2
CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.97	-18.41	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-57.53	-91.45	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.81	-22.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.26	-22.35	-17.09	CaMg(CO3)2
Epsomite	-5.75	-7.88	-2.13	MgSO4:7H2O
Fe(OH)2	-9.74	3.82	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.45	0.41	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.86	-10.58	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.13	-7.57	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.81	-37.44	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.72	-42.45	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.04	11.19	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.37	-6.17	7.20	FeCr2O4
FeMoO4	-6.49	-16.58	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe(OH)3
Ferroselite	-46.61	-65.21	-18.60	FeSe2
FeS(ppt)	-79.28	-82.23	-2.95	FeS
FeSe	-32.58	-43.58	-11.00	FeSe
Fix_pe	-6.44	-6.44	0.00	e-
Fluorite	-2.13	-12.63	-10.50	CaF2
Galena	-67.92	-81.89	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al(OH)3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4:7H2O
Greenockite	-67.82	-82.18	-14.36	CdS
Greigite	-287.99	-333.03	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.69	-7.30	-4.61	CaSO4:2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.52	-20.40	-12.88	H2MoO4
H2S(g)	-78.04	-86.05	-8.01	H2S
H2Se(g)	-42.45	-47.41	-4.96	H2Se
Halite	-9.99	-8.38	1.60	NaCl
Hausmannite	-14.84	46.19	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3
Hercynite	-0.19	22.70	22.89	FeAl2O4
Hg(CH3)2(g)	-185.64	-259.34	-73.71	Hg(CH3)2
Hg(g)	-9.07	-16.94	-7.87	Hg
Hg(OH)2	-9.26	-12.75	-3.50	Hg(OH)2
Hg2(g)	-18.92	-33.88	-14.96	Hg2
Hg2(OH)2	-13.36	-8.10	5.26	Hg2(OH)2
Hg2CO3	-12.24	-28.29	-16.05	Hg2CO3
Hg2CrO4	-33.11	-41.81	-8.70	Hg2CrO4
Hg2F2	-19.67	-30.04	-10.36	Hg2F2
Hg2S	-82.48	-94.15	-11.68	Hg2S
Hg2SeO3	-18.38	-23.03	-4.66	Hg2SeO3
Hg2SO4	-18.58	-24.71	-6.13	Hg2SO4
Hg3O2CO3	-28.77	-58.45	-29.68	Hg3O2CO3
HgCl(g)	-34.44	-14.95	19.50	HgCl
HgCl2	-13.29	-34.55	-21.26	HgCl2
HgF(g)	-47.69	-15.02	32.68	HgF
HgF2(g)	-47.26	-34.69	12.57	HgF2
Hgmetal(l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.47	-60.16	-55.69	HgSe
HgSeO3	-15.26	-27.69	-12.43	HgSeO3
HgSO4	-19.94	-29.36	-9.42	HgSO4
Huntite	-15.30	-45.27	-29.97	CaMg3(CO3)4

Hydrocerrusite	-9.11	-27.88	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-28.36	-37.12	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-16.34	-21.51	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.11	-19.91	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-45.66	-62.90	-17.24	K2Cr2O7
K2CrO4	-28.68	-29.19	-0.51	K2CrO4
K2MoO4	-19.15	-15.88	3.26	K2MoO4
K2SeO4	-20.22	-20.95	-0.73	K2SeO4
Langite	-5.86	11.63	17.49	Cu4(OH)6SO4·H2O
Larnakite	-7.84	-8.28	-0.43	PbO:PbSO4
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-78.63	-82.23	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe2O3
Magnesioferrite	-0.77	16.09	16.86	Fe2MgO4
Magnetite	-4.00	-11.46	-7.46	MgCO3
Magnetite	7.78	11.19	3.40	Fe3O4
Malachite	-0.77	-6.07	-5.31	Cu2(OH)2CO3
Manganite	-5.65	19.69	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-20.99	-14.74	6.26	CuCl2
Melanterite	-10.57	-12.78	-2.21	FeSO4·7H2O
Metacinnabar	-53.71	-98.81	-45.09	HgS
Mg(OH)2(active)	-10.07	8.72	18.79	Mg(OH)2
Mg(VO3)2	-16.96	-5.68	11.28	Mg(VO3)2
Mg2Sb3	-285.59	-210.90	74.68	Mg2Sb3
Mg2V2O7	-23.31	3.05	26.36	Mg2V2O7
MgCr2O4	-17.47	-1.27	16.20	MgCr2O4
MgCrO4	-30.36	-24.98	5.38	MgCrO4
MgF2	-5.08	-13.21	-8.13	MgF2
MgMoO4	-9.83	-11.68	-1.85	MgMoO4
MgSeO3·6H2O	-9.26	-6.21	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-15.54	-16.74	-1.20	MgSeO4·6H2O
Minium	-35.25	38.27	73.52	Pb3O4
Mirabilite	-10.47	-11.58	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.50	-7.60	4.90	Mn(VO3)2
Mn2(SO4)3	-55.42	-61.13	-5.71	Mn2(SO4)3
Mn2Sb	-157.96	-96.88	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-19.51	-7.01	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-17.71	-14.99	2.72	MnCl2·4H2O
MnS(grn)	-79.42	-79.25	0.17	MnS
MnS(pnk)	-82.59	-79.25	3.34	MnS
MnSb	-100.35	-103.26	-2.91	MnSb
MnSe	-44.10	-40.60	3.50	MnSe
MnSeO3	-9.26	-8.13	1.13	MnSeO3
MnSeO3·2H2O	-9.11	-8.13	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-16.61	-18.66	-2.05	MnSeO4·5H2O
MnSO4	-12.39	-9.80	2.58	MnSO4
Monteponite	-11.23	3.88	15.10	CdO
Montroydite	-9.11	-12.75	-3.64	HgO
MoO3	-12.40	-20.40	-8.00	MoO3
Morenosite	-13.34	-15.48	-2.14	NiSO4·7H2O
MoS2	-148.03	-218.28	-70.26	MoS2
Na-Jarosite	-8.46	-19.66	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-52.50	-62.39	-9.90	Na2Cr2O7
Na2CrO4	-31.61	-28.68	2.93	Na2CrO4
Na2Mo2O7	-19.18	-35.78	-16.60	Na2Mo2O7
Na2MoO4	-16.87	-15.38	1.49	Na2MoO4
Na2MoO4·2H2O	-16.60	-15.38	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-20.21	-9.91	10.30	Na2SeO3·5H2O
Na2SeO4	-21.72	-20.44	1.28	Na2SeO4
Na3Sb	-184.51	-90.06	94.45	Na3Sb
Na3VO4	-36.35	0.33	36.68	Na3VO4
Na4V2O7	-41.76	-4.36	37.40	Na4V2O7
Nantokite	-7.31	-14.04	-6.73	CuCl

NaSb	-92.48	-69.31	23.17	NaSb
Natron	-13.85	-15.16	-1.31	Na2CO3:10H2O
NaVO3	-8.55	-4.69	3.86	NaVO3
Nesquehonite	-6.79	-11.46	-4.67	MgCO3:3H2O
Ni(OH)2	-11.67	1.12	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-39.74	-24.04	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-44.11	-12.11	32.00	Ni4(OH)6SO4
NiCO3	-12.19	-19.06	-6.87	NiCO3
NiMoO4	-8.13	-19.28	-11.14	NiMoO4
NiS(alpha)	-79.33	-84.93	-5.60	NiS
NiS(beta)	-73.83	-84.93	-11.10	NiS
NiS(gamma)	-72.13	-84.93	-12.80	NiS
NiSe	-28.58	-46.28	-17.70	NiSe
NiSeO3:2H2O	-16.62	-13.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-22.82	-24.34	-1.52	NiSeO4:6H2O
Nsutite	-10.27	7.23	17.50	MnO2
O2(g)	-31.54	51.55	83.09	O2
Orpiment	-238.27	-299.34	-61.07	As2S3
Otavite	-4.31	-16.31	-12.00	CdCO3
Pb(BO2)2	-15.06	-8.54	6.52	Pb(BO2)2
Pb(OH)2	-3.99	4.16	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-70.72	-79.48	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-11.36	-2.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.86	8.33	26.19	Pb2O(OH)2
Pb2O3	-26.93	34.11	61.04	Pb2O3
Pb2OCO3	-11.30	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.73	-14.93	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.05	-1.91	6.14	Pb3(VO4)2
Pb3O2CO3	-18.71	-7.69	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.11	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.05	0.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.05	21.88	Pb4O3SO4
PbCrO4	-16.94	-29.54	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.86	-21.61	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.46	-21.30	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.84	-33.65	-19.81	PbCl2:PbCO3
Plattnerite	-19.66	29.94	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-124.00	-142.51	-18.51	FeS2
Pyrochroite	-8.39	6.80	15.19	Mn(OH)2
Pyrolusite	-8.80	32.58	41.38	MnO2
Realgar	-99.78	-119.53	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.80	-13.38	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb(OH)3	-13.16	-20.27	-7.11	Sb(OH)3
Sb2O4	-18.16	-14.76	3.40	Sb2O4
Sb2O5	-27.93	-37.60	-9.67	Sb2O5
Sb2Se3	-114.99	-182.75	-67.76	Sb2Se3
Sb4O6(cubic)	-62.81	-81.07	-18.26	Sb4O6
Sb4O6(orth)	-63.17	-81.07	-17.90	Sb4O6
SbCl3	-53.53	-52.96	0.57	SbCl3
SbF3	-42.95	-53.17	-10.23	SbF3
Sbmetal	-47.24	-58.93	-11.69	Sb
SbO2	-3.86	-31.69	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2(OH)2:H2O
Semetal(am)	-14.52	-21.63	-7.11	Se
Semetal(hex)	-13.92	-21.63	-7.71	Se
Senarmontite	-28.17	-40.53	-12.37	Sb2O3
SeO2	-15.06	-14.93	0.12	SeO2
SeO3	-46.51	-25.47	21.04	SeO3
Siderite	-6.12	-16.36	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3

Sphalerite	-68.74	-80.19	-11.45	ZnS
Spinel	-9.24	27.60	36.85	MgAl ₂ O ₄
Stibnite	-248.23	-298.69	-50.46	Sb ₂ S ₃
Sulfur	-58.13	-60.28	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.90	-11.58	0.32	Na ₂ SO ₄
Thermonatrite	-15.80	-15.16	0.64	Na ₂ CO ₃ ·H ₂ O
Tyuyamunite	-4.56	-0.48	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-12.29	8.80	21.08	U ₃ O ₈
U ₃ Sb ₄	-585.53	-433.15	152.38	U ₃ Sb ₄
U ₄ O ₉	-28.21	-31.23	-3.02	U ₄ O ₉
UF ₄	-28.59	-58.13	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-25.41	-58.13	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-15.19	-14.25	0.93	UO ₂
UO ₂ (NO ₃) ₂	-43.87	-31.72	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ ·2H ₂ O	-36.57	-31.72	4.85	UO ₂ (NO ₃) ₂ ·2H ₂ O
UO ₂ (NO ₃) ₂ ·3H ₂ O	-35.11	-31.72	3.39	UO ₂ (NO ₃) ₂ ·3H ₂ O
UO ₂ (NO ₃) ₂ ·6H ₂ O	-33.77	-31.72	2.05	UO ₂ (NO ₃) ₂ ·6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.30	2.31	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ ·4H ₂ O	-20.91	-23.16	-2.25	UO ₂ SeO ₄ ·4H ₂ O
UO ₃	-5.39	2.31	7.70	UO ₃
Uraninite	-9.58	-14.25	-4.67	UO ₂
USb ₂	-222.46	-192.89	29.58	USb ₂
V (OH) ₃	-17.97	-10.38	7.59	V (OH) ₃
V ₂ O ₅	-13.04	-14.40	-1.36	V ₂ O ₅
V ₃ O ₅	-37.18	-35.34	1.84	V ₃ O ₅
V ₄ O ₇	-45.71	-38.53	7.19	V ₄ O ₇
V ₆ O ₁₃	-33.91	-94.77	-60.86	V ₆ O ₁₃
Valentinite	-32.05	-40.53	-8.48	Sb ₂ O ₃
VC ₁₂	-63.94	-45.06	18.87	VC ₁₂
VC ₁₃	-66.50	-43.07	23.43	VC ₁₃
VF ₄	-61.99	-47.06	14.93	VF ₄
Vmetal	-93.07	-49.05	44.03	V
VO	-38.03	-23.27	14.76	VO
VO (OH) ₂	-8.34	-3.19	5.15	VO (OH) ₂
VO ₂ Cl	-20.94	-18.10	2.84	VO ₂ Cl
VOC ₁	-32.43	-21.28	11.15	VOC ₁
VOC ₁₂	-37.74	-24.98	12.76	VOC ₁₂
VOSO ₄	-23.40	-19.79	3.61	VOSO ₄
Witherite	-5.67	-14.24	-8.57	BaCO ₃
Wurtzite	-71.24	-80.19	-8.95	ZnS
Zincite	-5.47	5.87	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO ₄
Zn (BO ₂) ₂	-15.13	-6.84	8.29	Zn (BO ₂) ₂
Zn (NO ₃) ₂ ·6H ₂ O	-31.48	-28.16	3.32	Zn (NO ₃) ₂ ·6H ₂ O
Zn (OH) ₂	-6.33	5.87	12.20	Zn (OH) ₂
Zn (OH) ₂ (am)	-6.61	5.87	12.47	Zn (OH) ₂
Zn (OH) ₂ (beta)	-5.89	5.87	11.75	Zn (OH) ₂
Zn (OH) ₂ (epsilon)	-5.67	5.87	11.53	Zn (OH) ₂
Zn (OH) ₂ (gamma)	-5.87	5.87	11.73	Zn (OH) ₂
Zn ₂ (OH) ₂ SO ₄	-12.37	-4.87	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-14.35	0.84	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O	-23.47	-9.82	13.65	Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O
Zn ₃ O (SO ₄) ₂	-34.52	-15.61	18.91	Zn ₃ O (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-21.54	6.86	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-30.96	7.54	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-22.98	-15.93	7.05	ZnCl ₂
ZnCO ₃ ·1H ₂ O	-4.06	-14.32	-10.26	ZnCO ₃ ·1H ₂ O
ZnF ₂	-15.54	-16.07	-0.53	ZnF ₂
Znmetal	-45.70	-19.91	25.79	Zn
ZnMoO ₄	-4.41	-14.53	-10.13	ZnMoO ₄
ZnO (active)	-5.32	5.87	11.19	ZnO
ZnS (am)	-71.13	-80.19	-9.05	ZnS
ZnSb	-89.86	-78.84	11.01	ZnSb
ZnSe	-27.14	-41.54	-14.40	ZnSe
ZnSeO ₄ ·6H ₂ O	-18.08	-19.60	-1.52	ZnSeO ₄ ·6H ₂ O
ZnSO ₄ ·1H ₂ O	-10.10	-10.74	-0.64	ZnSO ₄ ·1H ₂ O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 25.

REACTION 102
H2O -1
24500.7 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 105
SAVE Solution 106
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 105. Solution after simulation 24.
Using reaction 102.

Reaction 102.

2.450e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	4.347e-04	4.355e-04
As	1.998e-07	2.002e-07
B	1.968e-04	1.971e-04
Ba	5.901e-05	5.912e-05
C	3.198e-01	3.204e-01
Ca	1.384e-01	1.386e-01
Cd	5.163e-07	5.172e-07
Cl	1.658e-02	1.661e-02
Co	5.804e-09	5.815e-09
Cr	2.233e-09	2.237e-09
Cu	1.050e-03	1.052e-03
F	1.487e-02	1.490e-02
Fe	2.095e-05	2.099e-05
Hg	1.887e-08	1.890e-08
K	2.959e-02	2.964e-02
Mg	3.619e-02	3.626e-02
Mn	4.375e-04	4.383e-04
Mo	1.689e-05	1.692e-05
N	2.254e-05	2.258e-05
Na	5.304e-02	5.314e-02
Ni	9.452e-10	9.470e-10
Pb	1.473e-06	1.475e-06
S	1.110e-01	1.112e-01

Sb	1.776e-07	1.779e-07
Se	1.544e-06	1.547e-06
U	5.364e-06	5.374e-06
V	4.169e-06	4.176e-06
Zn	5.102e-05	5.111e-05

-----Description of solution-----

	pH	=	6.191	Charge balance
	pe	=	6.809	Adjusted to redox
equilibrium	Activity of water	=	0.990	
	Ionic strength (mol/kgw)	=	3.772e-01	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	1.827e-01	
	Total CO2 (mol/kg)	=	3.198e-01	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	37	
	Total H	=	1.116754e+02	
	Total O	=	5.701532e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	8.818e-07	6.442e-07	-6.055	-6.191	-0.136	0.00
OH-	2.361e-08	1.547e-08	-7.627	-7.811	-0.184	(0)
H2O	5.551e+01	9.897e-01	1.744	-0.004	0.000	18.07
Al	4.347e-04					
AlF4-	3.486e-04	2.389e-04	-3.458	-3.622	-0.164	(0)
AlF3	8.440e-05	8.440e-05	-4.074	-4.074	0.000	(0)
AlF2+	1.677e-06	1.187e-06	-5.776	-5.925	-0.150	(0)
AlF+2	2.101e-09	5.281e-10	-8.678	-9.277	-0.600	(0)
Al(OH)2+	2.511e-12	1.778e-12	-11.600	-11.750	-0.150	(0)
Al(OH)4-	1.560e-12	1.069e-12	-11.807	-11.971	-0.164	(0)
AlSO4+	1.430e-12	9.795e-13	-11.845	-12.009	-0.164	(0)
AlOH+2	5.755e-13	1.447e-13	-12.240	-12.840	-0.600	(0)
Al(OH)3	5.487e-13	5.487e-13	-12.261	-12.261	0.000	(0)
Al(SO4)2-	2.067e-13	1.416e-13	-12.685	-12.849	-0.164	(0)
Al+3	1.577e-13	9.351e-15	-12.802	-14.029	-1.227	(0)
AlMo6O21-3	5.298e-26	8.033e-29	-25.276	-28.095	-2.819	(0)
As (3)	3.504e-19					
H3AsO3	3.498e-19	3.498e-19	-18.456	-18.456	0.000	(0)
H2AsO3-	5.729e-22	2.785e-22	-21.242	-21.555	-0.313	(0)
H4AsO3+	2.297e-25	1.117e-25	-24.639	-24.952	-0.313	(0)
HAsO3-2	7.060e-27	3.943e-28	-26.151	-27.404	-1.253	(0)
AsO3-3	1.556e-32	2.360e-35	-31.808	-34.627	-2.819	(0)
As (5)	1.998e-07					
HAsO4-2	1.193e-07	6.662e-09	-6.923	-8.176	-1.253	(0)
H2AsO4-	8.052e-08	3.914e-08	-7.094	-7.407	-0.313	(0)
AsO4-3	2.157e-11	3.270e-14	-10.666	-13.485	-2.819	(0)
H3AsO4	4.017e-12	4.382e-12	-11.396	-11.358	0.038	(0)
B	1.968e-04					
H3BO3	1.950e-04	2.127e-04	-3.710	-3.672	0.038	(0)
BF(OH)3-	7.743e-07	4.794e-07	-6.111	-6.319	-0.208	(0)
H2BO3-	3.098e-07	1.918e-07	-6.509	-6.717	-0.208	(0)
BF2(OH)2-	3.043e-07	1.884e-07	-6.517	-6.725	-0.208	(0)
CaH2BO3+	2.692e-07	1.667e-07	-6.570	-6.778	-0.208	(0)
MgH2BO3+	4.655e-08	2.882e-08	-7.332	-7.540	-0.208	(0)
NaH2BO3	1.055e-08	1.055e-08	-7.977	-7.977	0.000	(0)
BF3OH-	4.351e-10	2.694e-10	-9.361	-9.570	-0.208	(0)
BaH2BO3+	1.183e-10	7.322e-11	-9.927	-10.135	-0.208	(0)
H5(BO3)2-	5.609e-11	3.473e-11	-10.251	-10.459	-0.208	(0)
BF4-	7.869e-12	4.872e-12	-11.104	-11.312	-0.208	(0)

	H8 (BO3) 3-	1.193e-12	7.388e-13	-11.923	-12.131	-0.208	(0)
Ba	5.901e-05						
	Ba+2	4.337e-05	1.235e-05	-4.363	-4.908	-0.545	(0)
	BaHCO3+	1.560e-05	1.126e-05	-4.807	-4.949	-0.142	(0)
	BaCO3	4.399e-08	4.399e-08	-7.357	-7.357	0.000	(0)
	BaH2BO3+	1.183e-10	7.322e-11	-9.927	-10.135	-0.208	(0)
	BaNO3+	1.887e-12	9.172e-13	-11.724	-12.038	-0.313	(0)
	BaOH+	1.195e-12	8.343e-13	-11.923	-12.079	-0.156	(0)
	BaNH3+2	9.330e-13	5.211e-14	-12.030	-13.283	-1.253	(0)
C (4)	3.198e-01						
	H2CO3	1.382e-01	1.382e-01	-0.859	-0.859	0.000	(0)
	HCO3-	1.347e-01	9.541e-02	-0.871	-1.020	-0.150	(0)
	CaHCO3+	3.718e-02	2.683e-02	-1.430	-1.571	-0.142	(0)
	MgHCO3+	6.306e-03	4.231e-03	-2.200	-2.374	-0.173	(0)
	NaHCO3	1.862e-03	1.862e-03	-2.730	-2.730	0.000	(0)
	CuCO3	5.771e-04	5.771e-04	-3.239	-3.239	0.000	(0)
	Cu (CO3) 2-2	1.931e-04	1.078e-05	-3.714	-4.967	-1.253	(0)
	CuHCO3+	1.748e-04	8.497e-05	-3.757	-4.071	-0.313	(0)
	CaCO3	1.662e-04	1.662e-04	-3.779	-3.779	0.000	(0)
	MnHCO3+	5.102e-05	3.563e-05	-4.292	-4.448	-0.156	(0)
	MgCO3	2.503e-05	2.503e-05	-4.602	-4.602	0.000	(0)
	CO3-2	2.437e-05	6.943e-06	-4.613	-5.158	-0.545	(0)
	ZnHCO3+	1.619e-05	7.869e-06	-4.791	-5.104	-0.313	(0)
	BaHCO3+	1.560e-05	1.126e-05	-4.807	-4.949	-0.142	(0)
	NaCO3-	6.336e-06	4.486e-06	-5.198	-5.348	-0.150	(0)
	UO2 (CO3) 3-4	5.361e-06	5.216e-11	-5.271	-10.283	-5.012	(0)
	PbHCO3+	1.097e-06	5.333e-07	-5.960	-6.273	-0.313	(0)
	ZnCO3	1.042e-06	1.042e-06	-5.982	-5.982	0.000	(0)
	FeHCO3+	4.380e-07	3.160e-07	-6.359	-6.500	-0.142	(0)
	PbCO3	1.570e-07	1.570e-07	-6.804	-6.804	0.000	(0)
	Pb (CO3) 2-2	5.629e-08	3.144e-09	-7.250	-8.503	-1.253	(0)
	BaCO3	4.399e-08	4.399e-08	-7.357	-7.357	0.000	(0)
	CdHCO3+	1.140e-08	5.544e-09	-7.943	-8.256	-0.313	(0)
	CdCO3	4.039e-09	4.039e-09	-8.394	-8.394	0.000	(0)
	UO2 (CO3) 2-2	2.684e-09	1.499e-10	-8.571	-9.824	-1.253	(0)
	CoHCO3+	2.432e-09	1.182e-09	-8.614	-8.927	-0.313	(0)
	NiHCO3+	7.369e-10	3.582e-10	-9.133	-9.446	-0.313	(0)
	Cd (CO3) 2-2	3.722e-10	2.079e-11	-9.429	-10.682	-1.253	(0)
	CoCO3	1.870e-11	1.870e-11	-10.728	-10.728	0.000	(0)
	NiCO3	7.890e-12	7.890e-12	-11.103	-11.103	0.000	(0)
	HgCO3	7.678e-12	7.678e-12	-11.115	-11.115	0.000	(0)
	Hg (CO3) 2-2	3.018e-12	1.686e-13	-11.520	-12.773	-1.253	(0)
	UO2CO3	1.082e-12	1.082e-12	-11.966	-11.966	0.000	(0)
	HgHCO3+	1.895e-13	9.210e-14	-12.722	-13.036	-0.313	(0)
Ca	1.384e-01						
	Ca+2	5.301e-02	1.510e-02	-1.276	-1.821	-0.545	(0)
	CaSO4	4.668e-02	4.668e-02	-1.331	-1.331	0.000	(0)
	CaHCO3+	3.718e-02	2.683e-02	-1.430	-1.571	-0.142	(0)
	CaF+	1.333e-03	9.308e-04	-2.875	-3.031	-0.156	(0)
	CaCO3	1.662e-04	1.662e-04	-3.779	-3.779	0.000	(0)
	CaH2BO3+	2.692e-07	1.667e-07	-6.570	-6.778	-0.208	(0)
	CaOH+	6.460e-09	4.661e-09	-8.190	-8.331	-0.142	(0)
	CaNH3+2	2.276e-09	1.271e-10	-8.643	-9.896	-1.253	(0)
	CaNO3+	1.455e-09	7.074e-10	-8.837	-9.150	-0.313	(0)
	Ca (NH3) 2+2	6.056e-18	3.382e-19	-17.218	-18.471	-1.253	(0)
Cd	5.163e-07						
	Cd (SO4) 2-2	2.631e-07	1.470e-08	-6.580	-7.833	-1.253	(0)
	Cd+2	8.960e-08	2.552e-08	-7.048	-7.593	-0.545	(0)
	CdSO4	8.073e-08	8.073e-08	-7.093	-7.093	0.000	(0)
	CdCl+	6.072e-08	2.952e-08	-7.217	-7.530	-0.313	(0)
	CdHCO3+	1.140e-08	5.544e-09	-7.943	-8.256	-0.313	(0)
	CdF+	4.699e-09	2.284e-09	-8.328	-8.641	-0.313	(0)
	CdCO3	4.039e-09	4.039e-09	-8.394	-8.394	0.000	(0)
	CdCl2	1.490e-09	1.490e-09	-8.827	-8.827	0.000	(0)
	Cd (CO3) 2-2	3.722e-10	2.079e-11	-9.429	-10.682	-1.253	(0)
	CdF2	2.574e-11	2.574e-11	-10.589	-10.589	0.000	(0)
	CdCl3-	2.342e-11	1.139e-11	-10.630	-10.944	-0.313	(0)
	CdOHC1	1.873e-11	1.873e-11	-10.727	-10.727	0.000	(0)

	CdOH+	6.451e-12	3.136e-12	-11.190	-11.504	-0.313	(0)
	CdNO3+	2.459e-15	1.196e-15	-14.609	-14.922	-0.313	(0)
	Cd (OH) 2	3.061e-16	3.061e-16	-15.514	-15.514	0.000	(0)
	Cd2OH+3	2.646e-16	4.012e-19	-15.577	-18.397	-2.819	(0)
	CdSeO4	2.560e-16	2.560e-16	-15.592	-15.592	0.000	(0)
	Cd (SeO3) 2-2	7.296e-18	4.075e-19	-17.137	-18.390	-1.253	(0)
	Cd (OH) 3-	5.952e-22	2.893e-22	-21.225	-21.539	-0.313	(0)
	Cd (NO3) 2	8.876e-24	8.876e-24	-23.052	-23.052	0.000	(0)
	Cd (OH) 4-2	1.312e-29	7.327e-31	-28.882	-30.135	-1.253	(0)
	CdHS+	0.000e+00	0.000e+00	-77.656	-77.969	-0.313	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.149	-149.149	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.320	-225.633	-0.313	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-300.568	-301.821	-1.253	(0)
Cl		1.658e-02					
	Cl-	1.658e-02	1.211e-02	-1.780	-1.917	-0.136	(0)
	MnCl+	4.086e-07	2.853e-07	-6.389	-6.545	-0.156	(0)
	CuCl+	4.038e-07	2.709e-07	-6.394	-6.567	-0.173	(0)
	ZnCl+	1.183e-07	7.934e-08	-6.927	-7.101	-0.173	(0)
	CuCl2-	6.169e-08	4.139e-08	-7.210	-7.383	-0.173	(0)
	CdCl+	6.072e-08	2.952e-08	-7.217	-7.530	-0.313	(0)
	CuCl	1.636e-08	1.636e-08	-7.786	-7.786	0.000	(0)
	HgCl2	1.355e-08	1.355e-08	-7.868	-7.868	0.000	(0)
	PbCl+	6.649e-09	3.232e-09	-8.177	-8.490	-0.313	(0)
	MnCl2	4.881e-09	4.881e-09	-8.311	-8.311	0.000	(0)
	HgCl3-	3.376e-09	1.641e-09	-8.472	-8.785	-0.313	(0)
	ZnOHCl	1.607e-09	1.607e-09	-8.794	-8.794	0.000	(0)
	ZnCl2	1.523e-09	1.523e-09	-8.817	-8.817	0.000	(0)
	CdCl2	1.490e-09	1.490e-09	-8.827	-8.827	0.000	(0)
	HgCl4-2	1.417e-09	7.914e-11	-8.849	-10.102	-1.253	(0)
	CuCl2	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
	CuCl3-2	4.506e-10	1.072e-10	-9.346	-9.970	-0.624	(0)
	HgClOH	3.057e-10	3.057e-10	-9.515	-9.515	0.000	(0)
	PbCl2	1.749e-10	1.749e-10	-9.757	-9.757	0.000	(0)
	CdCl3-	2.342e-11	1.139e-11	-10.630	-10.944	-0.313	(0)
	MnCl3-	2.332e-11	1.628e-11	-10.632	-10.788	-0.156	(0)
	ZnCl3-	2.184e-11	1.465e-11	-10.661	-10.834	-0.173	(0)
	CdOHCl	1.873e-11	1.873e-11	-10.727	-10.727	0.000	(0)
	CoCl+	1.373e-11	6.674e-12	-10.862	-11.176	-0.313	(0)
	NiCl+	1.941e-12	9.438e-13	-11.712	-12.025	-0.313	(0)
	PbCl3-	1.734e-12	8.431e-13	-11.761	-12.074	-0.313	(0)
	HgCl+	4.593e-13	2.233e-13	-12.338	-12.651	-0.313	(0)
	ZnCl4-2	3.730e-13	8.872e-14	-12.428	-13.052	-0.624	(0)
	FeCl+2	2.422e-13	5.761e-14	-12.616	-13.240	-0.624	(0)
	CuCl3-	1.917e-13	1.286e-13	-12.717	-12.891	-0.173	(0)
	PbCl4-2	8.357e-14	4.667e-15	-13.078	-14.331	-1.253	(0)
	CrCl+2	2.486e-14	1.388e-15	-13.605	-14.857	-1.253	(0)
	VOCl+	5.254e-15	2.554e-15	-14.280	-14.593	-0.313	(0)
	FeCl2+	4.462e-15	3.116e-15	-14.350	-14.506	-0.156	(0)
	NiCl2	5.755e-17	5.755e-17	-16.240	-16.240	0.000	(0)
	CuCl4-2	3.282e-17	7.805e-18	-16.484	-17.108	-0.624	(0)
	CrOHCl2	4.944e-18	4.944e-18	-17.306	-17.306	0.000	(0)
	FeCl3	3.774e-18	3.774e-18	-17.423	-17.423	0.000	(0)
	CrCl2+	3.282e-18	1.595e-18	-17.484	-17.797	-0.313	(0)
	UO2Cl+	1.582e-18	7.689e-19	-17.801	-18.114	-0.313	(0)
	CrO3Cl-	1.851e-27	8.999e-28	-26.733	-27.046	-0.313	(0)
	CoCl+2	1.803e-34	1.007e-35	-33.744	-34.997	-1.253	(0)
	UCl+3	0.000e+00	0.000e+00	-42.962	-45.781	-2.819	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.664	-49.917	-1.253	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.665	-49.918	-1.253	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.556	-64.809	-1.253	(0)
Co (2)		5.804e-09					
	Co+2	2.852e-09	1.593e-10	-8.545	-9.798	-1.253	(0)
	CoHCO3+	2.432e-09	1.182e-09	-8.614	-8.927	-0.313	(0)
	CoSO4	4.289e-10	4.289e-10	-9.368	-9.368	0.000	(0)
	CoF+	5.852e-11	2.845e-11	-10.233	-10.546	-0.313	(0)
	CoCO3	1.870e-11	1.870e-11	-10.728	-10.728	0.000	(0)
	CoCl+	1.373e-11	6.674e-12	-10.862	-11.176	-0.313	(0)
	CoOH+	1.012e-13	4.917e-14	-12.995	-13.308	-0.313	(0)

CoNO2+	1.283e-14	6.239e-15	-13.892	-14.205	-0.313	(0)
Co(NH3)+2	2.293e-15	1.280e-16	-14.640	-15.893	-1.253	(0)
Co(OH)2	6.043e-17	6.043e-17	-16.219	-16.219	0.000	(0)
CoNO3+	7.693e-18	3.740e-18	-17.114	-17.427	-0.313	(0)
CoSeO4	4.301e-18	4.301e-18	-17.366	-17.366	0.000	(0)
Co(NH3)2+2	6.538e-22	3.651e-23	-21.185	-22.438	-1.253	(0)
Co2OH+3	2.589e-22	3.926e-25	-21.587	-24.406	-2.819	(0)
Co(OH)3-	3.837e-23	1.865e-23	-22.416	-22.729	-0.313	(0)
CoOOH-	9.727e-24	4.728e-24	-23.012	-23.325	-0.313	(0)
Co(NO3)2	1.127e-25	1.127e-25	-24.948	-24.948	0.000	(0)
Co(NH3)3+2	5.502e-29	3.073e-30	-28.259	-29.512	-1.253	(0)
Co(OH)4-2	8.189e-31	4.573e-32	-30.087	-31.340	-1.253	(0)
Co(NH3)4+2	1.930e-36	1.078e-37	-35.714	-36.967	-1.253	(0)
Co4(OH)4+4	1.199e-40	0.000e+00	-39.921	-44.933	-5.012	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-43.669	-44.922	-1.253	(0)
Co(3)	5.753e-30					
CoOH+2	5.753e-30	3.213e-31	-29.240	-30.493	-1.253	(0)
CoCl+2	1.803e-34	1.007e-35	-33.744	-34.997	-1.253	(0)
Co+3	6.894e-35	4.087e-36	-34.162	-35.389	-1.227	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-48.665	-49.918	-1.253	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-59.523	-59.836	-0.313	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-63.556	-64.809	-1.253	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-65.249	-66.502	-1.253	(0)
Cr(2)	5.880e-26					
Cr+2	5.880e-26	3.284e-27	-25.231	-26.484	-1.253	(0)
Cr(3)	2.233e-09					
CrF+2	1.420e-09	7.928e-11	-8.848	-10.101	-1.253	(0)
Cr(OH)+2	5.368e-10	2.998e-11	-9.270	-10.523	-1.253	(0)
Cr(OH)2+	1.161e-10	5.643e-11	-9.935	-10.248	-0.313	(0)
CrOHSO4	9.600e-11	9.600e-11	-10.018	-10.018	0.000	(0)
Cr+3	5.842e-11	8.858e-14	-10.233	-13.053	-2.819	(0)
CrSO4+	5.742e-12	2.791e-12	-11.241	-11.554	-0.313	(0)
Cr(OH)3	3.280e-13	3.280e-13	-12.484	-12.484	0.000	(0)
CrCl+2	2.486e-14	1.388e-15	-13.605	-14.857	-1.253	(0)
CrO2-	5.025e-16	2.443e-16	-15.299	-15.612	-0.313	(0)
Cr(OH)4-	4.155e-16	2.020e-16	-15.381	-15.695	-0.313	(0)
CrOHC12	4.944e-18	4.944e-18	-17.306	-17.306	0.000	(0)
Cr2(OH)2SO4+2	4.658e-18	2.601e-19	-17.332	-18.585	-1.253	(0)
CrCl2+	3.282e-18	1.595e-18	-17.484	-17.797	-0.313	(0)
Cr2(OH)2(SO4)2	2.085e-19	2.085e-19	-18.681	-18.681	0.000	(0)
CrNO3+2	1.027e-21	5.736e-23	-20.988	-22.241	-1.253	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-40.112	-41.365	-1.253	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-46.283	-49.102	-2.819	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-48.664	-49.917	-1.253	(0)
Cr(6)	7.230e-20					
HCrO4-	3.734e-20	1.815e-20	-19.428	-19.741	-0.313	(0)
CrO4-2	3.057e-20	8.707e-21	-19.515	-20.060	-0.545	(0)
NaCrO4-	3.089e-21	1.501e-21	-20.510	-20.823	-0.313	(0)
KCrO4-	1.309e-21	6.365e-22	-20.883	-21.196	-0.313	(0)
CrO3SO4-2	8.694e-25	4.856e-26	-24.061	-25.314	-1.253	(0)
H2CrO4	9.478e-27	9.478e-27	-26.023	-26.023	0.000	(0)
CrO3Cl-	1.851e-27	8.999e-28	-26.733	-27.046	-0.313	(0)
Cr2O7-2	2.067e-37	1.154e-38	-36.685	-37.938	-1.253	(0)
Cu(1)	8.071e-08					
CuCl2-	6.169e-08	4.139e-08	-7.210	-7.383	-0.173	(0)
CuCl	1.636e-08	1.636e-08	-7.786	-7.786	0.000	(0)
Cu+	2.207e-09	1.073e-09	-8.656	-8.969	-0.313	(0)
CuCl3-2	4.506e-10	1.072e-10	-9.346	-9.970	-0.624	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-149.465	-149.965	-0.500	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.229	-150.695	-0.466	(0)
Cu(2)	1.050e-03					
CuCO3	5.771e-04	5.771e-04	-3.239	-3.239	0.000	(0)
Cu(CO3)2-2	1.931e-04	1.078e-05	-3.714	-4.967	-1.253	(0)
CuHCO3+	1.748e-04	8.497e-05	-3.757	-4.071	-0.313	(0)
Cu+2	4.955e-05	1.412e-05	-4.305	-4.850	-0.545	(0)
CuSO4	4.363e-05	4.363e-05	-4.360	-4.360	0.000	(0)
CuF+	1.035e-05	5.029e-06	-4.985	-5.298	-0.313	(0)
CuOH+	1.029e-06	6.905e-07	-5.987	-6.161	-0.173	(0)

	CuCl+	4.038e-07	2.709e-07	-6.394	-6.567	-0.173	(0)
	Cu2(OH) 2+2	2.145e-07	1.198e-08	-6.669	-7.922	-1.253	(0)
	CuNH3+2	1.729e-08	9.656e-10	-7.762	-9.015	-1.253	(0)
	CuNO2+	1.690e-08	8.214e-09	-7.772	-8.085	-0.313	(0)
	Cu(OH) 2	2.131e-09	2.131e-09	-8.671	-8.671	0.000	(0)
	CuCl2	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
	CuNO3+	1.360e-12	6.612e-13	-11.866	-12.180	-0.313	(0)
	Cu(NO2) 2	4.671e-13	4.671e-13	-12.331	-12.331	0.000	(0)
	CuCl3-	1.917e-13	1.286e-13	-12.717	-12.891	-0.173	(0)
	Cu(OH) 3-	1.391e-13	6.764e-14	-12.857	-13.170	-0.313	(0)
	CuCl4-2	3.282e-17	7.805e-18	-16.484	-17.108	-0.624	(0)
	Cu(OH) 4-2	1.475e-19	8.235e-21	-18.831	-20.084	-1.253	(0)
	Cu(NO3) 2	1.233e-21	1.233e-21	-20.909	-20.909	0.000	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-213.790	-214.103	-0.313	(0)
F		1.487e-02					
	F-	7.730e-03	5.647e-03	-2.112	-2.248	-0.136	(0)
	MgF+	4.007e-03	2.746e-03	-2.397	-2.561	-0.164	(0)
	CaF+	1.333e-03	9.308e-04	-2.875	-3.031	-0.156	(0)
	AlF4-	3.486e-04	2.389e-04	-3.458	-3.622	-0.164	(0)
	NaF	1.236e-04	1.236e-04	-3.908	-3.908	0.000	(0)
	AlF3	8.440e-05	8.440e-05	-4.074	-4.074	0.000	(0)
	CuF+	1.035e-05	5.029e-06	-4.985	-5.298	-0.313	(0)
	MnF+	6.025e-06	4.207e-06	-5.220	-5.376	-0.156	(0)
	HF	5.381e-06	5.381e-06	-5.269	-5.269	0.000	(0)
	AlF2+	1.677e-06	1.187e-06	-5.776	-5.925	-0.150	(0)
	FeF3	1.174e-06	1.174e-06	-5.930	-5.930	0.000	(0)
	BF(OH) 3-	7.743e-07	4.794e-07	-6.111	-6.319	-0.208	(0)
	ZnF+	6.045e-07	2.939e-07	-6.219	-6.532	-0.313	(0)
	BF2(OH) 2-	3.043e-07	1.884e-07	-6.517	-6.725	-0.208	(0)
	FeF2+	2.111e-07	1.474e-07	-6.676	-6.832	-0.156	(0)
	HF2-	1.763e-07	1.155e-07	-6.754	-6.937	-0.184	(0)
	PbF+	6.158e-09	2.994e-09	-8.211	-8.524	-0.313	(0)
	CdF+	4.699e-09	2.284e-09	-8.328	-8.641	-0.313	(0)
	FeF+2	4.101e-09	9.753e-10	-8.387	-9.011	-0.624	(0)
	AlF+2	2.101e-09	5.281e-10	-8.678	-9.277	-0.600	(0)
	CrF+2	1.420e-09	7.928e-11	-8.848	-10.101	-1.253	(0)
	VO2F2-	6.034e-10	2.933e-10	-9.219	-9.533	-0.313	(0)
	BF3OH-	4.351e-10	2.694e-10	-9.361	-9.570	-0.208	(0)
	VO2F3-2	3.700e-10	2.066e-11	-9.432	-10.685	-1.253	(0)
	PbF2	3.327e-10	3.327e-10	-9.478	-9.478	0.000	(0)
	VO2F	1.431e-10	1.431e-10	-9.844	-9.844	0.000	(0)
	H2F2	7.757e-11	7.757e-11	-10.110	-10.110	0.000	(0)
	CoF+	5.852e-11	2.845e-11	-10.233	-10.546	-0.313	(0)
	VO2F4-3	3.786e-11	5.741e-14	-10.422	-13.241	-2.819	(0)
	CdF2	2.574e-11	2.574e-11	-10.589	-10.589	0.000	(0)
	NiF+	8.887e-12	4.320e-12	-11.051	-11.364	-0.313	(0)
	BF4-	7.869e-12	4.872e-12	-11.104	-11.312	-0.208	(0)
	PbF3-	7.330e-12	3.563e-12	-11.135	-11.448	-0.313	(0)
	VOF2	5.392e-12	5.392e-12	-11.268	-11.268	0.000	(0)
	VOF+	5.238e-12	2.546e-12	-11.281	-11.594	-0.313	(0)
	VOF3-	2.222e-12	1.080e-12	-11.653	-11.966	-0.313	(0)
	UO2F3-	1.450e-12	7.050e-13	-11.839	-12.152	-0.313	(0)
	UO2F4-2	5.662e-13	3.162e-14	-12.247	-13.500	-1.253	(0)
	UO2F2	4.970e-13	4.970e-13	-12.304	-12.304	0.000	(0)
	VOF4-2	4.409e-13	2.463e-14	-12.356	-13.609	-1.253	(0)
	PbF4-2	1.725e-13	9.632e-15	-12.763	-14.016	-1.253	(0)
	UO2F+	6.277e-14	3.052e-14	-13.202	-13.515	-0.313	(0)
	HgF+	3.979e-19	1.934e-19	-18.400	-18.713	-0.313	(0)
	Sb(OH) 2F	7.617e-21	7.617e-21	-20.118	-20.118	0.000	(0)
	SbOF	7.568e-21	7.568e-21	-20.121	-20.121	0.000	(0)
	UF6-2	8.268e-31	4.618e-32	-30.083	-31.336	-1.253	(0)
	UF3+	4.020e-31	1.954e-31	-30.396	-30.709	-0.313	(0)
	UF4	1.210e-31	1.210e-31	-30.917	-30.917	0.000	(0)
	UF5-	5.570e-32	2.708e-32	-31.254	-31.567	-0.313	(0)
	UF2+2	3.909e-33	2.183e-34	-32.408	-33.661	-1.253	(0)
	UF+3	2.025e-36	3.071e-39	-35.694	-38.513	-2.819	(0)
Fe(2)		6.021e-06					
	Fe+2	4.711e-06	2.631e-07	-5.327	-6.580	-1.253	(0)

FeSO4	8.716e-07	8.716e-07	-6.060	-6.060	0.000	(0)
FeHCO3+	4.380e-07	3.160e-07	-6.359	-6.500	-0.142	(0)
FeOH+	2.321e-10	1.620e-10	-9.634	-9.790	-0.156	(0)
Fe (OH) 2	1.991e-15	1.991e-15	-14.701	-14.701	0.000	(0)
Fe (OH) 3-	1.395e-17	9.742e-18	-16.855	-17.011	-0.156	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-154.398	-154.398	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-230.431	-230.745	-0.313	(0)
Fe (3)	1.493e-05					
Fe (OH) 2+	1.337e-05	9.469e-06	-4.874	-5.024	-0.150	(0)
FeF3	1.174e-06	1.174e-06	-5.930	-5.930	0.000	(0)
FeF2+	2.111e-07	1.474e-07	-6.676	-6.832	-0.156	(0)
Fe (OH) 3	1.573e-07	1.573e-07	-6.803	-6.803	0.000	(0)
FeOH+2	6.615e-09	1.573e-09	-8.179	-8.803	-0.624	(0)
FeF+2	4.101e-09	9.753e-10	-8.387	-9.011	-0.624	(0)
Fe (OH) 4-	3.200e-10	2.266e-10	-9.495	-9.645	-0.150	(0)
FeSO4+	3.415e-11	2.385e-11	-10.467	-10.623	-0.156	(0)
Fe (SO4) 2-	1.415e-11	6.880e-12	-10.849	-11.162	-0.313	(0)
Fe2 (OH) 2+4	8.424e-12	8.196e-17	-11.074	-16.086	-5.012	(0)
Fe+3	2.657e-12	1.575e-13	-11.576	-12.803	-1.227	(0)
Fe3 (OH) 4+5	7.604e-13	1.122e-20	-12.119	-19.950	-7.831	(0)
FeCl+2	2.422e-13	5.761e-14	-12.616	-13.240	-0.624	(0)
FeHSeO3+2	5.307e-15	2.964e-16	-14.275	-15.528	-1.253	(0)
FeCl2+	4.462e-15	3.116e-15	-14.350	-14.506	-0.156	(0)
FeCl3	3.774e-18	3.774e-18	-17.423	-17.423	0.000	(0)
FeNO3+2	4.178e-19	2.333e-20	-18.379	-19.632	-1.253	(0)
H (0)	1.297e-29					
H2	6.487e-30	7.075e-30	-29.188	-29.150	0.038	(0)
Hg (0)	2.054e-10					
Hg	2.054e-10	2.054e-10	-9.687	-9.687	0.000	(0)
Hg (1)	4.614e-18					
Hg2+2	2.307e-18	1.289e-19	-17.637	-18.890	-1.253	(0)
Hg (2)	1.866e-08					
HgCl2	1.355e-08	1.355e-08	-7.868	-7.868	0.000	(0)
HgCl3-	3.376e-09	1.641e-09	-8.472	-8.785	-0.313	(0)
HgCl4-2	1.417e-09	7.914e-11	-8.849	-10.102	-1.253	(0)
HgClOH	3.057e-10	3.057e-10	-9.515	-9.515	0.000	(0)
HgCO3	7.678e-12	7.678e-12	-11.115	-11.115	0.000	(0)
Hg (CO3) 2-2	3.018e-12	1.686e-13	-11.520	-12.773	-1.253	(0)
Hg (OH) 2	1.279e-12	1.395e-12	-11.893	-11.855	0.038	(0)
HgCl+	4.593e-13	2.233e-13	-12.338	-12.651	-0.313	(0)
HgHCO3+	1.895e-13	9.210e-14	-12.722	-13.036	-0.313	(0)
HgOH+	1.171e-15	5.691e-16	-14.932	-15.245	-0.313	(0)
Hg (NH3) 2+2	4.665e-16	2.606e-17	-15.331	-16.584	-1.253	(0)
HgNH3+2	6.979e-17	3.898e-18	-16.156	-17.409	-1.253	(0)
Hg+2	1.655e-17	9.241e-19	-16.781	-18.034	-1.253	(0)
HgSO4	3.265e-18	3.265e-18	-17.486	-17.486	0.000	(0)
HgF+	3.979e-19	1.934e-19	-18.400	-18.713	-0.313	(0)
Hg (OH) 3-	5.590e-21	2.718e-21	-20.253	-20.566	-0.313	(0)
Hg (NH3) 3+2	1.242e-23	6.934e-25	-22.906	-24.159	-1.253	(0)
HgNO3+	1.040e-26	5.054e-27	-25.983	-26.296	-0.313	(0)
Hg (NH3) 4+2	6.593e-31	3.682e-32	-30.181	-31.434	-1.253	(0)
Hg (NO3) 2	3.112e-35	3.112e-35	-34.507	-34.507	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-136.370	-136.683	-0.313	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-136.480	-136.480	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-137.947	-139.200	-1.253	(0)
K	2.959e-02					
K+	2.693e-02	1.968e-02	-1.570	-1.706	-0.136	(0)
KSO4-	2.654e-03	1.880e-03	-2.576	-2.726	-0.150	(0)
KCrO4-	1.309e-21	6.365e-22	-20.883	-21.196	-0.313	(0)
Mg	3.619e-02					
Mg+2	1.521e-02	4.333e-03	-1.818	-2.363	-0.545	(0)
MgSO4	1.064e-02	1.064e-02	-1.973	-1.973	0.000	(0)
MgHCO3+	6.306e-03	4.231e-03	-2.200	-2.374	-0.173	(0)
MgF+	4.007e-03	2.746e-03	-2.397	-2.561	-0.164	(0)
MgCO3	2.503e-05	2.503e-05	-4.602	-4.602	0.000	(0)
MgH2BO3+	4.655e-08	2.882e-08	-7.332	-7.540	-0.208	(0)
MgOH+	3.646e-08	2.669e-08	-7.438	-7.574	-0.136	(0)
Mn (2)	4.375e-04					

Mn+2	3.351e-04	1.872e-05	-3.475	-4.728	-1.253	(0)
MnHCO3+	5.102e-05	3.563e-05	-4.292	-4.448	-0.156	(0)
MnSO4	4.491e-05	4.491e-05	-4.348	-4.348	0.000	(0)
MnF+	6.025e-06	4.207e-06	-5.220	-5.376	-0.156	(0)
MnCl+	4.086e-07	2.853e-07	-6.389	-6.545	-0.156	(0)
MnCl2	4.881e-09	4.881e-09	-8.311	-8.311	0.000	(0)
MnOH+	1.041e-09	7.273e-10	-8.982	-9.138	-0.156	(0)
MnCl3-	2.332e-11	1.628e-11	-10.632	-10.788	-0.156	(0)
MnNO3+	9.038e-13	4.394e-13	-12.044	-12.357	-0.313	(0)
MnSeO4	2.714e-13	2.714e-13	-12.566	-12.566	0.000	(0)
Mn (NO3) 2	1.635e-20	1.635e-20	-19.787	-19.787	0.000	(0)
Mn (OH) 3-	1.540e-21	1.076e-21	-20.812	-20.968	-0.156	(0)
Mn (OH) 4-2	2.259e-28	5.373e-29	-27.646	-28.270	-0.624	(0)
MnSe	0.000e+00	0.000e+00	-43.197	-43.197	0.000	(0)
Mn (3)	9.087e-23					
Mn+3	9.087e-23	5.387e-24	-22.042	-23.269	-1.227	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.780	-46.403	-0.624	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.771	-48.966	-0.195	(0)
Mo	1.689e-05					
MoO4-2	1.676e-05	4.775e-06	-4.776	-5.321	-0.545	(0)
HMoO4-	1.259e-07	6.121e-08	-6.900	-7.213	-0.313	(0)
H2MoO4	2.888e-10	2.888e-10	-9.539	-9.539	0.000	(0)
Mo7O24-6	3.235e-23	1.710e-34	-22.490	-33.767	-11.277	(0)
AlMo6O21-3	5.298e-26	8.033e-29	-25.276	-28.095	-2.819	(0)
HMo7O24-5	1.820e-26	2.684e-34	-25.740	-33.571	-7.831	(0)
H2Mo7O24-4	1.076e-30	1.047e-35	-29.968	-34.980	-5.012	(0)
H3Mo7O24-3	7.839e-36	1.189e-38	-35.106	-37.925	-2.819	(0)
N (-3)	1.379e-05					
NH4+	1.220e-05	7.553e-06	-4.914	-5.122	-0.208	(0)
NH4SO4-	1.564e-06	1.092e-06	-5.806	-5.962	-0.156	(0)
CuNH3+2	1.729e-08	9.656e-10	-7.762	-9.015	-1.253	(0)
NH3	6.685e-09	6.685e-09	-8.175	-8.175	0.000	(0)
CaNH3+2	2.276e-09	1.271e-10	-8.643	-9.896	-1.253	(0)
BaNH3+2	9.330e-13	5.211e-14	-12.030	-13.283	-1.253	(0)
Co (NH3) +2	2.293e-15	1.280e-16	-14.640	-15.893	-1.253	(0)
NiNH3+2	1.958e-15	1.093e-16	-14.708	-15.961	-1.253	(0)
Hg (NH3) 2+2	4.665e-16	2.606e-17	-15.331	-16.584	-1.253	(0)
HgNH3+2	6.979e-17	3.898e-18	-16.156	-17.409	-1.253	(0)
Ca (NH3) 2+2	6.056e-18	3.382e-19	-17.218	-18.471	-1.253	(0)
Ni (NH3) 2+2	1.892e-21	1.057e-22	-20.723	-21.976	-1.253	(0)
Co (NH3) 2+2	6.538e-22	3.651e-23	-21.185	-22.438	-1.253	(0)
Hg (NH3) 3+2	1.242e-23	6.934e-25	-22.906	-24.159	-1.253	(0)
Co (NH3) 3+2	5.502e-29	3.073e-30	-28.259	-29.512	-1.253	(0)
Hg (NH3) 4+2	6.593e-31	3.682e-32	-30.181	-31.434	-1.253	(0)
Co (NH3) 4+2	1.930e-36	1.078e-37	-35.714	-36.967	-1.253	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.112	-41.365	-1.253	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.669	-44.922	-1.253	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.283	-49.102	-2.819	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.664	-49.917	-1.253	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.665	-49.918	-1.253	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.523	-59.836	-0.313	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.556	-64.809	-1.253	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.249	-66.502	-1.253	(0)
N (3)	8.727e-06					
NO2-	8.710e-06	5.557e-06	-5.060	-5.255	-0.195	(0)
CuNO2+	1.690e-08	8.214e-09	-7.772	-8.085	-0.313	(0)
Cu (NO2) 2	4.671e-13	4.671e-13	-12.331	-12.331	0.000	(0)
CoNO2+	1.283e-14	6.239e-15	-13.892	-14.205	-0.313	(0)
N (5)	2.174e-08					
NO3-	2.028e-08	1.481e-08	-7.693	-7.829	-0.136	(0)
CaNO3+	1.455e-09	7.074e-10	-8.837	-9.150	-0.313	(0)
BaNO3+	1.887e-12	9.172e-13	-11.724	-12.038	-0.313	(0)
CuNO3+	1.360e-12	6.612e-13	-11.866	-12.180	-0.313	(0)
MnNO3+	9.038e-13	4.394e-13	-12.044	-12.357	-0.313	(0)
ZnNO3+	1.996e-13	9.704e-14	-12.700	-13.013	-0.313	(0)
PbNO3+	3.390e-15	1.648e-15	-14.470	-14.783	-0.313	(0)

	CdNO3+	2.459e-15	1.196e-15	-14.609	-14.922	-0.313	(0)
	CoNO3+	7.693e-18	3.740e-18	-17.114	-17.427	-0.313	(0)
	NiNO3+	2.331e-18	1.133e-18	-17.632	-17.946	-0.313	(0)
	FeNO3+2	4.178e-19	2.333e-20	-18.379	-19.632	-1.253	(0)
	VO2NO3	1.082e-19	1.082e-19	-18.966	-18.966	0.000	(0)
	Mn(NO3)2	1.635e-20	1.635e-20	-19.787	-19.787	0.000	(0)
	Cu(NO3)2	1.233e-21	1.233e-21	-20.909	-20.909	0.000	(0)
	CrNO3+2	1.027e-21	5.736e-23	-20.988	-22.241	-1.253	(0)
	Zn(NO3)2	2.868e-22	2.868e-22	-21.542	-21.542	0.000	(0)
	Pb(NO3)2	4.146e-23	4.146e-23	-22.382	-22.382	0.000	(0)
	Cd(NO3)2	8.876e-24	8.876e-24	-23.052	-23.052	0.000	(0)
	UO2NO3+	2.380e-24	1.157e-24	-23.623	-23.937	-0.313	(0)
	Co(NO3)2	1.127e-25	1.127e-25	-24.948	-24.948	0.000	(0)
	HgNO3+	1.040e-26	5.054e-27	-25.983	-26.296	-0.313	(0)
	Hg(NO3)2	3.112e-35	3.112e-35	-34.507	-34.507	0.000	(0)
Na		5.304e-02					
	Na+	4.750e-02	3.470e-02	-1.323	-1.460	-0.136	(0)
	NaSO4-	3.551e-03	2.515e-03	-2.450	-2.600	-0.150	(0)
	NaHCO3	1.862e-03	1.862e-03	-2.730	-2.730	0.000	(0)
	NaF	1.236e-04	1.236e-04	-3.908	-3.908	0.000	(0)
	NaCO3-	6.336e-06	4.486e-06	-5.198	-5.348	-0.150	(0)
	NaH2BO3	1.055e-08	1.055e-08	-7.977	-7.977	0.000	(0)
	NaCrO4-	3.089e-21	1.501e-21	-20.510	-20.823	-0.313	(0)
Ni		9.452e-10					
	NiHCO3+	7.369e-10	3.582e-10	-9.133	-9.446	-0.313	(0)
	Ni+2	1.069e-10	3.046e-11	-9.971	-10.516	-0.545	(0)
	NiSO4	8.201e-11	8.201e-11	-10.086	-10.086	0.000	(0)
	NiF+	8.887e-12	4.320e-12	-11.051	-11.364	-0.313	(0)
	NiCO3	7.890e-12	7.890e-12	-11.103	-11.103	0.000	(0)
	NiCl+	1.941e-12	9.438e-13	-11.712	-12.025	-0.313	(0)
	Ni(SO4)2-2	6.561e-13	3.664e-14	-12.183	-13.436	-1.253	(0)
	NiOH+	1.220e-14	5.932e-15	-13.914	-14.227	-0.313	(0)
	NiNH3+2	1.958e-15	1.093e-16	-14.708	-15.961	-1.253	(0)
	NiCl2	5.755e-17	5.755e-17	-16.240	-16.240	0.000	(0)
	Ni(OH)2	7.289e-18	7.289e-18	-17.137	-17.137	0.000	(0)
	NiNO3+	2.331e-18	1.133e-18	-17.632	-17.946	-0.313	(0)
	NiSeO4	7.674e-19	7.674e-19	-18.115	-18.115	0.000	(0)
	Ni(NH3)2+2	1.892e-21	1.057e-22	-20.723	-21.976	-1.253	(0)
	Ni(OH)3-	2.320e-22	1.128e-22	-21.635	-21.948	-0.313	(0)
O(0)		1.819e-34					
	O2	9.094e-35	9.919e-35	-34.041	-34.004	0.038	(0)
Pb		1.473e-06					
	PbHCO3+	1.097e-06	5.333e-07	-5.960	-6.273	-0.313	(0)
	PbCO3	1.570e-07	1.570e-07	-6.804	-6.804	0.000	(0)
	Pb(SO4)2-2	7.238e-08	4.043e-09	-7.140	-8.393	-1.253	(0)
	Pb(CO3)2-2	5.629e-08	3.144e-09	-7.250	-8.503	-1.253	(0)
	PbSO4	4.972e-08	4.972e-08	-7.303	-7.303	0.000	(0)
	Pb+2	2.641e-08	7.522e-09	-7.578	-8.124	-0.545	(0)
	PbCl+	6.649e-09	3.232e-09	-8.177	-8.490	-0.313	(0)
	PbF+	6.158e-09	2.994e-09	-8.211	-8.524	-0.313	(0)
	PbOH+	6.013e-10	2.923e-10	-9.221	-9.534	-0.313	(0)
	PbF2	3.327e-10	3.327e-10	-9.478	-9.478	0.000	(0)
	PbCl2	1.749e-10	1.749e-10	-9.757	-9.757	0.000	(0)
	PbF3-	7.330e-12	3.563e-12	-11.135	-11.448	-0.313	(0)
	PbCl3-	1.734e-12	8.431e-13	-11.761	-12.074	-0.313	(0)
	PbF4-2	1.725e-13	9.632e-15	-12.763	-14.016	-1.253	(0)
	Pb(OH)2	1.430e-13	1.430e-13	-12.845	-12.845	0.000	(0)
	PbCl4-2	8.357e-14	4.667e-15	-13.078	-14.331	-1.253	(0)
	Pb2OH+3	2.298e-14	3.485e-17	-13.639	-16.458	-2.819	(0)
	PbNO3+	3.390e-15	1.648e-15	-14.470	-14.783	-0.313	(0)
	Pb(OH)3-	4.551e-18	2.212e-18	-17.342	-17.655	-0.313	(0)
	Pb(OH)4-2	1.501e-22	8.382e-24	-21.824	-23.077	-1.253	(0)
	Pb3(OH)4+2	5.496e-23	3.070e-24	-22.260	-23.513	-1.253	(0)
	Pb(NO3)2	4.146e-23	4.146e-23	-22.382	-22.382	0.000	(0)
	Pb4(OH)4+4	1.885e-23	1.834e-28	-22.725	-27.737	-5.012	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-149.621	-149.621	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-226.392	-226.705	-0.313	(0)
S(-2)		0.000e+00					

H2S	0.000e+00	0.000e+00	-77.555	-77.555	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-77.656	-77.969	-0.313	(0)
HS-	0.000e+00	0.000e+00	-78.071	-78.384	-0.313	(0)
S5-2	0.000e+00	0.000e+00	-80.305	-81.558	-1.253	(0)
S6-2	0.000e+00	0.000e+00	-80.821	-82.074	-1.253	(0)
S4-2	0.000e+00	0.000e+00	-80.901	-82.154	-1.253	(0)
S3-2	0.000e+00	0.000e+00	-81.707	-82.960	-1.253	(0)
S2-2	0.000e+00	0.000e+00	-82.723	-83.976	-1.253	(0)
S-2	0.000e+00	0.000e+00	-88.869	-89.493	-0.624	(0)
HgHS2-	0.000e+00	0.000e+00	-136.370	-136.683	-0.313	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-136.480	-136.480	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-137.947	-139.200	-1.253	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.037	-149.351	-0.313	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.149	-149.149	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.465	-149.965	-0.500	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.532	-149.532	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-149.621	-149.621	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.229	-150.695	-0.466	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-154.398	-154.398	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-213.790	-214.103	-0.313	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.322	-224.635	-0.313	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.320	-225.633	-0.313	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-226.392	-226.705	-0.313	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.171	-228.424	-1.253	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-230.431	-230.745	-0.313	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-300.568	-301.821	-1.253	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.226	-304.479	-1.253	(0)
Sb2S4-2	0.000e+00	0.000e+00	-311.004	-312.257	-1.253	(0)
S (6)	1.110e-01					
SO4-2	4.737e-02	1.349e-02	-1.324	-1.870	-0.545	(0)
CaSO4	4.668e-02	4.668e-02	-1.331	-1.331	0.000	(0)
MgSO4	1.064e-02	1.064e-02	-1.973	-1.973	0.000	(0)
NaSO4-	3.551e-03	2.515e-03	-2.450	-2.600	-0.150	(0)
KSO4-	2.654e-03	1.880e-03	-2.576	-2.726	-0.150	(0)
MnSO4	4.491e-05	4.491e-05	-4.348	-4.348	0.000	(0)
CuSO4	4.363e-05	4.363e-05	-4.360	-4.360	0.000	(0)
Zn (SO4) 2-2	1.620e-05	9.049e-07	-4.790	-6.043	-1.253	(0)
ZnSO4	7.700e-06	7.700e-06	-5.114	-5.114	0.000	(0)
NH4SO4-	1.564e-06	1.092e-06	-5.806	-5.962	-0.156	(0)
HSO4-	1.240e-06	8.495e-07	-5.907	-6.071	-0.164	(0)
FeSO4	8.716e-07	8.716e-07	-6.060	-6.060	0.000	(0)
Cd (SO4) 2-2	2.631e-07	1.470e-08	-6.580	-7.833	-1.253	(0)
CdSO4	8.073e-08	8.073e-08	-7.093	-7.093	0.000	(0)
Pb (SO4) 2-2	7.238e-08	4.043e-09	-7.140	-8.393	-1.253	(0)
PbSO4	4.972e-08	4.972e-08	-7.303	-7.303	0.000	(0)
CoSO4	4.289e-10	4.289e-10	-9.368	-9.368	0.000	(0)
CrOHSO4	9.600e-11	9.600e-11	-10.018	-10.018	0.000	(0)
NiSO4	8.201e-11	8.201e-11	-10.086	-10.086	0.000	(0)
FeSO4+	3.415e-11	2.385e-11	-10.467	-10.623	-0.156	(0)
Fe (SO4) 2-	1.415e-11	6.880e-12	-10.849	-11.162	-0.313	(0)
VO2SO4-	9.574e-12	4.654e-12	-11.019	-11.332	-0.313	(0)
CrSO4+	5.742e-12	2.791e-12	-11.241	-11.554	-0.313	(0)
AlSO4+	1.430e-12	9.795e-13	-11.845	-12.009	-0.164	(0)
Ni (SO4) 2-2	6.561e-13	3.664e-14	-12.183	-13.436	-1.253	(0)
VOSO4	2.794e-13	2.794e-13	-12.554	-12.554	0.000	(0)
Al (SO4) 2-	2.067e-13	1.416e-13	-12.685	-12.849	-0.164	(0)
UO2 (SO4) 2-2	2.547e-15	1.422e-16	-14.594	-15.847	-1.253	(0)
UO2SO4	7.995e-16	7.995e-16	-15.097	-15.097	0.000	(0)
Cr2 (OH) 2SO4+2	4.658e-18	2.601e-19	-17.332	-18.585	-1.253	(0)
HgSO4	3.265e-18	3.265e-18	-17.486	-17.486	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.085e-19	2.085e-19	-18.681	-18.681	0.000	(0)
CrO3SO4-2	8.694e-25	4.856e-26	-24.061	-25.314	-1.253	(0)
VSO4+	3.183e-26	1.547e-26	-25.497	-25.810	-0.313	(0)
U (SO4) 2	1.569e-39	1.569e-39	-38.804	-38.804	0.000	(0)
USO4+2	2.622e-40	0.000e+00	-39.581	-40.834	-1.253	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.523	-59.836	-0.313	(0)
Sb (3)	2.650e-18					
Sb (OH) 3	1.327e-18	1.327e-18	-17.877	-17.877	0.000	(0)

HSbO2	1.308e-18	1.308e-18	-17.883	-17.883	0.000	(0)
Sb(OH) 2F	7.617e-21	7.617e-21	-20.118	-20.118	0.000	(0)
SbOF	7.568e-21	7.568e-21	-20.121	-20.121	0.000	(0)
Sb(OH) 2+	4.313e-23	2.097e-23	-22.365	-22.678	-0.313	(0)
SbO+	1.502e-23	7.304e-24	-22.823	-23.136	-0.313	(0)
SbO2-	6.767e-24	3.289e-24	-23.170	-23.483	-0.313	(0)
Sb(OH) 4-	3.798e-24	1.847e-24	-23.420	-23.734	-0.313	(0)
Sb2S4-2	0.000e+00	0.000e+00	-311.004	-312.257	-1.253	(0)
Sb (5)	1.776e-07					
SbO3-	1.775e-07	8.628e-08	-6.751	-7.064	-0.313	(0)
Sb(OH) 6-	1.339e-10	9.785e-11	-9.873	-10.009	-0.136	(0)
SbO2+	2.134e-20	1.038e-20	-19.671	-19.984	-0.313	(0)
Se (-2)	1.093e-39					
HSe-	1.093e-39	5.312e-40	-38.961	-39.275	-0.313	(0)
H2Se	0.000e+00	0.000e+00	-41.576	-41.576	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.197	-43.197	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.831	-48.084	-1.253	(0)
Se (4)	1.544e-06					
HSeO3-	1.465e-06	7.122e-07	-5.834	-6.147	-0.313	(0)
SeO3-2	7.881e-08	4.401e-09	-7.103	-8.356	-1.253	(0)
H2SeO3	1.957e-10	1.957e-10	-9.708	-9.708	0.000	(0)
FeHSeO3+2	5.307e-15	2.964e-16	-14.275	-15.528	-1.253	(0)
Cd(SeO3) 2-2	7.296e-18	4.075e-19	-17.137	-18.390	-1.253	(0)
Se (6)	1.894e-10					
SeO4-2	1.891e-10	5.387e-11	-9.723	-10.269	-0.545	(0)
MnSeO4	2.714e-13	2.714e-13	-12.566	-12.566	0.000	(0)
ZnSeO4	2.176e-14	2.176e-14	-13.662	-13.662	0.000	(0)
HSeO4-	3.578e-15	1.739e-15	-14.446	-14.760	-0.313	(0)
CdSeO4	2.560e-16	2.560e-16	-15.592	-15.592	0.000	(0)
CoSeO4	4.301e-18	4.301e-18	-17.366	-17.366	0.000	(0)
NiSeO4	7.674e-19	7.674e-19	-18.115	-18.115	0.000	(0)
Zn(SeO4) 2-2	2.128e-23	1.189e-24	-22.672	-23.925	-1.253	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.350	-61.170	-2.819	(0)
U (4)	3.703e-28					
U(OH) 5-	3.641e-28	1.770e-28	-27.439	-27.752	-0.313	(0)
U(OH) 4	4.824e-30	4.824e-30	-29.317	-29.317	0.000	(0)
UF6-2	8.268e-31	4.618e-32	-30.083	-31.336	-1.253	(0)
UF3+	4.020e-31	1.954e-31	-30.396	-30.709	-0.313	(0)
UF4	1.210e-31	1.210e-31	-30.917	-30.917	0.000	(0)
UF5-	5.570e-32	2.708e-32	-31.254	-31.567	-0.313	(0)
U(OH) 3+	2.361e-32	1.148e-32	-31.627	-31.940	-0.313	(0)
UF2+2	3.909e-33	2.183e-34	-32.408	-33.661	-1.253	(0)
U(OH) 2+2	6.186e-35	3.455e-36	-34.209	-35.462	-1.253	(0)
UF+3	2.025e-36	3.071e-39	-35.694	-38.513	-2.819	(0)
UOH+3	6.985e-38	1.059e-40	-37.156	-39.975	-2.819	(0)
U(SO4) 2	1.569e-39	1.569e-39	-38.804	-38.804	0.000	(0)
USO4+2	2.622e-40	0.000e+00	-39.581	-40.834	-1.253	(0)
U+4	0.000e+00	0.000e+00	-40.553	-45.565	-5.012	(0)
UC1+3	0.000e+00	0.000e+00	-42.962	-45.781	-2.819	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-172.372	-197.745	-25.373	(0)
U (5)	7.617e-21					
UO2+	7.617e-21	3.703e-21	-20.118	-20.431	-0.313	(0)
U (6)	5.364e-06					
UO2 (CO3) 3-4	5.361e-06	5.216e-11	-5.271	-10.283	-5.012	(0)
UO2 (CO3) 2-2	2.684e-09	1.499e-10	-8.571	-9.824	-1.253	(0)
UO2F3-	1.450e-12	7.050e-13	-11.839	-12.152	-0.313	(0)
UO2CO3	1.082e-12	1.082e-12	-11.966	-11.966	0.000	(0)
UO2F4-2	5.662e-13	3.162e-14	-12.247	-13.500	-1.253	(0)
UO2F2	4.970e-13	4.970e-13	-12.304	-12.304	0.000	(0)
UO2F+	6.277e-14	3.052e-14	-13.202	-13.515	-0.313	(0)
UO2 (SO4) 2-2	2.547e-15	1.422e-16	-14.594	-15.847	-1.253	(0)
UO2SO4	7.995e-16	7.995e-16	-15.097	-15.097	0.000	(0)
UO2OH+	1.568e-16	7.624e-17	-15.805	-16.118	-0.313	(0)
UO2+2	1.374e-16	3.915e-17	-15.862	-16.407	-0.545	(0)
UO2C1+	1.582e-18	7.689e-19	-17.801	-18.114	-0.313	(0)
UO2NO3+	2.380e-24	1.157e-24	-23.623	-23.937	-0.313	(0)
(UO2) 2 (OH) 2+2	1.727e-25	9.646e-27	-24.763	-26.016	-1.253	(0)

(UO2) 3 (OH) 5+	2.747e-34	1.335e-34	-33.561	-33.874	-0.313	(0)
V (2)	3.496e-37					
V+2	3.306e-37	1.846e-38	-36.481	-37.734	-1.253	(0)
VOH+	1.901e-38	9.243e-39	-37.721	-38.034	-0.313	(0)
V (3)	7.255e-12					
V (OH) 3	7.255e-12	7.255e-12	-11.139	-11.139	0.000	(0)
V (OH) 2+	6.276e-21	3.051e-21	-20.202	-20.516	-0.313	(0)
VOH+2	3.372e-22	1.883e-23	-21.472	-22.725	-1.253	(0)
V+3	1.602e-24	2.429e-27	-23.795	-26.615	-2.819	(0)
VSO4+	3.183e-26	1.547e-26	-25.497	-25.810	-0.313	(0)
V2 (OH) 2+4	2.300e-40	0.000e+00	-39.638	-44.650	-5.012	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-41.970	-44.789	-2.819	(0)
V (4)	1.540e-11					
VOF2	5.392e-12	5.392e-12	-11.268	-11.268	0.000	(0)
VOF+	5.238e-12	2.546e-12	-11.281	-11.594	-0.313	(0)
VOF3-	2.222e-12	1.080e-12	-11.653	-11.966	-0.313	(0)
VO+2	1.346e-12	7.517e-14	-11.871	-13.124	-1.253	(0)
V (OH) 3+	4.724e-13	2.297e-13	-12.326	-12.639	-0.313	(0)
VOF4-2	4.409e-13	2.463e-14	-12.356	-13.609	-1.253	(0)
VOSO4	2.794e-13	2.794e-13	-12.554	-12.554	0.000	(0)
VOCl+	5.254e-15	2.554e-15	-14.280	-14.593	-0.313	(0)
H2V2O4+2	4.832e-20	2.699e-21	-19.316	-20.569	-1.253	(0)
V (5)	4.169e-06					
H2VO4-	3.515e-06	1.709e-06	-5.454	-5.767	-0.313	(0)
H3V2O7-	2.524e-07	1.227e-07	-6.598	-6.911	-0.313	(0)
HVO4-2	1.193e-07	6.663e-09	-6.923	-8.176	-1.253	(0)
H3VO4	1.101e-08	1.101e-08	-7.958	-7.958	0.000	(0)
V3O9-3	3.554e-09	5.389e-12	-8.449	-11.268	-2.819	(0)
HV2O7-3	2.571e-09	3.898e-12	-8.590	-11.409	-2.819	(0)
VO2F2-	6.034e-10	2.933e-10	-9.219	-9.533	-0.313	(0)
V4O12-4	3.987e-10	3.879e-15	-9.399	-14.411	-5.012	(0)
VO2F3-2	3.700e-10	2.066e-11	-9.432	-10.685	-1.253	(0)
VO2F	1.431e-10	1.431e-10	-9.844	-9.844	0.000	(0)
VO2F4-3	3.786e-11	5.741e-14	-10.422	-13.241	-2.819	(0)
VO2+	1.977e-11	1.444e-11	-10.704	-10.840	-0.136	(0)
V2O7-4	1.674e-11	1.629e-16	-10.776	-15.788	-5.012	(0)
VO2SO4-	9.574e-12	4.654e-12	-11.019	-11.332	-0.313	(0)
VO4-3	3.419e-14	5.184e-17	-13.466	-16.285	-2.819	(0)
VO2NO3	1.082e-19	1.082e-19	-18.966	-18.966	0.000	(0)
V10O28-6	6.299e-23	3.330e-34	-22.201	-33.478	-11.277	(0)
HV10O28-5	2.235e-24	3.297e-32	-23.651	-31.482	-7.831	(0)
H2V10O28-4	3.521e-28	3.426e-33	-27.453	-32.465	-5.012	(0)
Zn	5.102e-05					
Zn (SO4) 2-2	1.620e-05	9.049e-07	-4.790	-6.043	-1.253	(0)
ZnHCO3+	1.619e-05	7.869e-06	-4.791	-5.104	-0.313	(0)
Zn+2	9.156e-06	2.608e-06	-5.038	-5.584	-0.545	(0)
ZnSO4	7.700e-06	7.700e-06	-5.114	-5.114	0.000	(0)
ZnCO3	1.042e-06	1.042e-06	-5.982	-5.982	0.000	(0)
ZnF+	6.045e-07	2.939e-07	-6.219	-6.532	-0.313	(0)
ZnCl+	1.183e-07	7.934e-08	-6.927	-7.101	-0.173	(0)
ZnOH+	8.300e-09	4.035e-09	-8.081	-8.394	-0.313	(0)
ZnOHCl	1.607e-09	1.607e-09	-8.794	-8.794	0.000	(0)
ZnCl2	1.523e-09	1.523e-09	-8.817	-8.817	0.000	(0)
ZnCl3-	2.184e-11	1.465e-11	-10.661	-10.834	-0.173	(0)
Zn (OH) 2	9.893e-12	9.893e-12	-11.005	-11.005	0.000	(0)
ZnCl4-2	3.730e-13	8.872e-14	-12.428	-13.052	-0.624	(0)
ZnNO3+	1.996e-13	9.704e-14	-12.700	-13.013	-0.313	(0)
ZnSeO4	2.176e-14	2.176e-14	-13.662	-13.662	0.000	(0)
Zn (OH) 3-	1.578e-15	7.670e-16	-14.802	-15.115	-0.313	(0)
Zn (OH) 4-2	8.459e-21	4.724e-22	-20.073	-21.326	-1.253	(0)
Zn (NO3) 2	2.868e-22	2.868e-22	-21.542	-21.542	0.000	(0)
Zn (SeO4) 2-2	2.128e-23	1.189e-24	-22.672	-23.925	-1.253	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.037	-149.351	-0.313	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.532	-149.532	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.322	-224.635	-0.313	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.171	-228.424	-1.253	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.226	-304.479	-1.253	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.91	-47.62	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-40.30	-35.79	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-47.53	-35.80	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-70.40	-52.46	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-54.76	-34.72	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.71	-30.30	0.40	(NH4)2CrO4
(NH4)2SeO4	-20.96	-20.51	0.45	(NH4)2SeO4
Al(OH)3(am)	-6.27	4.53	10.80	Al(OH)3
Al2(MoO4)3	-46.39	-44.02	2.37	Al2(MoO4)3
Al2O3	-10.58	9.07	19.65	Al2O3
Al4(OH)10SO4	-18.82	3.88	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.62	-6.82	4.80	AlAsO4:2H2O
AlOHSO4	-6.48	-9.71	-3.23	AlOHSO4
AlSb	-156.94	-91.32	65.62	AlSb
Alunite	-9.01	-10.41	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.20	-9.99	-7.79	PbSO4
Anhydrite	0.67	-3.69	-4.36	CaSO4
Anilite	-54.98	-86.86	-31.88	Cu0.25Cu1.5S
Antlerite	-0.46	8.33	8.79	Cu3(OH)4SO4
Aragonite	1.32	-6.98	-8.30	CaCO3
Arsenolite	-71.04	-73.80	-2.76	As4O6
Artinite	-7.13	2.47	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-29.41	-22.70	6.71	As2O5
Atacamite	-0.45	6.94	7.39	Cu2(OH)3Cl
Azurite	4.41	-12.49	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.97	7.43	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-10.25	5.63	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	8.61	-0.30	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-19.85	13.09	32.94	Ba3(VO4)2:4H2O
BaCrO4	-15.30	-24.97	-9.67	BaCrO4
BaF2	-3.58	-9.40	-5.82	BaF2
BaMoO4	-3.27	-10.23	-6.96	BaMoO4
Barite	3.20	-6.78	-9.98	BaSO4
BaS	-93.28	-77.10	16.18	BaS
BaSeO3	-6.69	-4.86	1.83	BaSeO3
BaSeO4	-7.72	-15.18	-7.46	BaSeO4
Bianchite	-5.72	-7.48	-1.76	ZnSO4:6H2O
Birnessite	-9.80	8.30	18.09	MnO2
Bixbyite	-8.76	-9.40	-0.64	Mn2O3
BlaubleiI	-54.19	-78.35	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.00	-82.28	-27.28	Cu0.6Cu0.8S
Boehmite	-4.04	4.53	8.58	AlOOH
Breithauptite	-62.48	-81.00	-18.52	NiSb
Brochantite	0.63	15.85	15.22	Cu4(OH)6SO4
Brucite	-6.83	10.01	16.84	Mg(OH)2
Bunsenite	-10.58	1.86	12.45	NiO
Ca(VO3)2	-4.41	1.25	5.66	Ca(VO3)2
Ca2V2O7	-5.69	11.81	17.50	Ca2V2O7
Ca2V2O7:2H2O	-9.75	11.80	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.35	8.95	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.59	22.37	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.51	22.35	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-303.02	-160.05	142.97	Ca3Sb2
CaCrO4	-19.62	-21.88	-2.27	CaCrO4
Calcite	1.50	-6.98	-8.48	CaCO3
Calomel	-4.81	-22.72	-17.91	Hg2Cl2
CaMoO4	0.81	-7.14	-7.95	CaMoO4
Carnotite	-4.43	-4.20	0.23	KUO2VO4
CaSeO3:2H2O	-4.60	-1.79	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.08	-12.10	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.39	-2.55	9.84	Cd(BO2)2
Cd(OH)2	-8.86	4.78	13.64	Cd(OH)2
Cd(OH)2(am)	-8.95	4.78	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.86	-14.15	6.71	Cd3(OH)2(SO4)2

Cd3(OH)4SO4	-22.46	0.10	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.52	4.88	28.40	Cd4(OH)6SO4
CdCl2	-10.77	-11.43	-0.66	CdCl2
CdCl2:1H2O	-9.74	-11.43	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-9.52	-11.44	-1.91	CdCl2:2.5H2O
CdF2	-10.88	-12.09	-1.21	CdF2
Cdmetal(alpha)	-34.73	-21.21	13.51	Cd
Cdmetal(gamma)	-34.83	-21.21	13.62	Cd
CdMoO4	1.24	-12.91	-14.15	CdMoO4
CdOHCl	-6.86	-3.32	3.54	CdOHCl
CdSb	-77.73	-78.08	-0.35	CdSb
CdSe	-20.48	-40.68	-20.20	CdSe
CdSeO4:2H2O	-16.02	-17.87	-1.85	CdSeO4:2H2O
CdSO4	-9.29	-9.46	-0.17	CdSO4
CdSO4:1H2O	-7.74	-9.47	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.60	-9.47	-1.87	CdSO4:2.67H2O
Cerrusite	-0.15	-13.28	-13.13	PbCO3
CH4(g)	-80.48	-121.53	-41.05	CH4
Chalcanthite	-4.10	-6.74	-2.64	CuSO4:5H2O
Chalcocite	-55.21	-90.13	-34.92	Cu2S
Chalcopyrite	-120.55	-155.82	-35.27	CuFeS2
Cinnabar	-50.73	-96.42	-45.69	HgS
Claudetite	-70.73	-73.80	-3.06	As4O6
Clausthalite	-14.11	-41.21	-27.10	PbSe
Co(BO2)2	-31.82	-4.75	27.07	Co(BO2)2
Co(OH)2	-10.52	2.58	13.09	Co(OH)2
Co(OH)3	-14.52	-16.83	-2.31	Co(OH)3
CO2(g)	0.61	-17.54	-18.15	CO2
Co3(AsO4)2	-28.00	-14.96	13.03	Co3(AsO4)2
Co3O4	-20.57	-31.07	-10.50	Co3O4
CoCl2	-21.90	-13.63	8.27	CoCl2
CoCl2:6H2O	-16.19	-13.66	2.54	CoCl2:6H2O
CoCO3	-4.98	-14.96	-9.98	CoCO3
CoF2	-12.70	-14.29	-1.60	CoF2
CoF3	-40.68	-42.13	-1.46	CoF3
CoFe2O4	17.63	14.11	-3.53	CoFe2O4
CoMoO4	-7.36	-15.12	-7.76	CoMoO4
CoO	-11.01	2.58	13.59	CoO
CoS(alpha)	-74.55	-81.99	-7.44	CoS
CoS(beta)	-70.92	-81.99	-11.07	CoS
CoSe	-26.68	-42.88	-16.20	CoSe
CoSeO3	-11.07	-9.75	1.32	CoSeO3
CoSeO4:6H2O	-18.56	-20.09	-1.53	CoSeO4:6H2O
CoSO4	-14.47	-11.67	2.80	CoSO4
CoSO4:6H2O	-9.22	-11.69	-2.47	CoSO4:6H2O
Cotunnite	-7.18	-11.96	-4.78	PbCl2
Covellite	-54.74	-77.04	-22.30	CuS
Cr(OH)2	-24.93	-14.11	10.82	Cr(OH)2
Cr(OH)3	-5.40	-4.06	1.34	Cr(OH)3
Cr(OH)3(am)	-3.31	-4.06	-0.75	Cr(OH)3
Cr2O3	-5.75	-8.11	-2.36	Cr2O3
CrCl2	-44.41	-30.32	14.09	CrCl2
CrCl3	-43.49	-28.37	15.11	CrCl3
CrF3	-18.03	-29.37	-11.34	CrF3
Crmetal	-70.58	-40.10	30.48	Cr
CrO3	-29.23	-32.44	-3.21	CrO3
Cryolite	1.94	-31.90	-33.84	Na3AlF6
Cu(OH)2	-1.15	7.52	8.67	Cu(OH)2
Cu(SbO3)2	-21.43	23.78	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.22	1.03	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-56.24	-91.12	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.22	-51.02	-45.80	Cu2Se
Cu2SO4	-17.86	-19.81	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-6.23	-0.13	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.61	-104.20	-42.59	Cu3Sb
Cu3Se2	-25.47	-88.96	-63.49	Cu3Se2
CuCO3	1.49	-10.01	-11.50	CuCO3
CuCrO4	-19.47	-24.91	-5.44	CuCrO4

CuF	-6.31	-11.22	-4.91	CuF
CuF2	-10.46	-9.35	1.12	CuF2
CuF2:2H2O	-4.81	-9.36	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.78	-8.76	Cu
CuMoO4	2.90	-10.17	-13.08	CuMoO4
CuOCuSO4	-9.50	0.81	10.30	CuOCuSO4
Cupricferrite	13.07	19.05	5.99	CuFe2O4
Cuprite	-4.16	-5.56	-1.41	Cu2O
Cuprousferrite	11.90	2.98	-8.92	CuFeO2
CuSe	-4.83	-37.93	-33.10	CuSe
CuSe2	-24.03	-57.40	-33.37	CuSe2
CuSeO3:2H2O	-5.33	-4.82	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.70	-15.14	-2.44	CuSeO4:5H2O
CuSO4	-9.66	-6.72	2.94	CuSO4
Diaspore	-2.34	4.53	6.87	AlOOH
Djurleite	-55.35	-89.27	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	2.04	-14.50	-16.54	CaMg(CO3)2
Dolomite(ordered)	2.59	-14.50	-17.09	CaMg(CO3)2
Epsomite	-2.14	-4.26	-2.13	MgSO4:7H2O
Fe(OH)2	-7.77	5.79	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.37	3.33	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	0.21	-3.51	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.37	-0.82	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-4.86	-25.48	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-27.48	-31.21	-3.73	Fe2(SO4)3
Fe3(OH)8	-2.92	17.31	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.00	-5.60	0.40	FeAsO4:2H2O
FeCr2O4	-9.51	-2.31	7.20	FeCr2O4
FeMoO4	-1.81	-11.90	-10.09	FeMoO4
Ferrihydrite	2.57	5.76	3.19	Fe(OH)3
Ferroselite	-40.53	-59.13	-18.60	FeSe2
FeS(ppt)	-75.82	-78.77	-2.95	FeS
FeSe	-28.66	-39.66	-11.00	FeSe
Fix_pe	-6.81	-6.81	0.00	e-
Fluorite	4.18	-6.32	-10.50	CaF2
Galena	-66.35	-80.32	-13.97	PbS
Gibbsite	-3.76	4.53	8.29	Al(OH)3
Goethite	5.27	5.76	0.49	FeOOH
Goslarite	-5.47	-7.48	-2.01	ZnSO4:7H2O
Greenockite	-65.43	-79.79	-14.36	CdS
Greigite	-275.92	-320.96	-45.03	Fe3S4
Gummite	-11.70	-4.03	7.67	UO3
Gypsum	0.91	-3.70	-4.61	CaSO4:2H2O
H-Jarosite	0.88	-11.22	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-4.83	-17.70	-12.88	H2MoO4
H2S(g)	-76.56	-84.57	-8.01	H2S
H2Se(g)	-40.51	-45.47	-4.96	H2Se
Halite	-4.98	-3.38	1.60	NaCl
Hausmannite	-12.09	48.94	61.03	Mn3O4
Hematite	12.95	11.53	-1.42	Fe2O3
Hercynite	-8.02	14.87	22.89	FeAl2O4
Hg(CH3)2(g)	-181.20	-254.90	-73.71	Hg(CH3)2
Hg(g)	-8.38	-16.25	-7.87	Hg
Hg(OH)2	-8.36	-11.86	-3.50	Hg(OH)2
Hg2(g)	-17.55	-32.51	-14.96	Hg2
Hg2(OH)2	-11.78	-6.52	5.26	Hg2(OH)2
Hg2CO3	-8.00	-24.05	-16.05	Hg2CO3
Hg2CrO4	-30.25	-38.95	-8.70	Hg2CrO4
Hg2F2	-13.02	-23.39	-10.36	Hg2F2
Hg2S	-79.41	-91.08	-11.68	Hg2S
Hg2SeO3	-14.19	-18.85	-4.66	Hg2SeO3
Hg2SO4	-14.63	-20.76	-6.13	Hg2SO4
Hg3O2CO3	-23.41	-53.09	-29.68	Hg3O2CO3
HgCl(g)	-30.86	-11.36	19.50	HgCl
HgCl2	-6.80	-28.06	-21.26	HgCl2
HgF(g)	-44.37	-11.69	32.68	HgF
HgF2(g)	-41.29	-28.72	12.57	HgF2
Hgmetal(1)	-2.80	-16.25	-13.45	Hg

HgSe	-1.62	-57.31	-55.69	HgSe
HgSeO3	-11.75	-24.18	-12.43	HgSeO3
HgSO4	-16.68	-26.10	-9.42	HgSO4
Huntite	0.42	-29.54	-29.97	CaMg3(CO3)4
Hydrocerrusite	-3.54	-22.31	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.33	-20.09	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-14.36	-19.53	-5.17	KAl(SO4)2·12H2O
K-Jarosite	8.07	-6.73	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-38.67	-55.91	-17.24	K2Cr2O7
K2CrO4	-22.96	-23.47	-0.51	K2CrO4
K2MoO4	-12.00	-8.73	3.26	K2MoO4
K2SeO4	-12.95	-13.68	-0.73	K2SeO4
Langite	-1.65	15.84	17.49	Cu4(OH)6SO4·H2O
Larnakite	-5.31	-5.74	-0.43	PbO·PbSO4
Laurionite	-4.48	-3.85	0.62	PbOHCl
Lepidocrocite	4.39	5.76	1.37	FeOOH
Lime	-22.14	10.56	32.70	CaO
Litharge	-8.44	4.25	12.69	PbO
Mackinawite	-75.17	-78.77	-3.60	FeS
Maghemite	5.14	11.53	6.39	Fe2O3
Magnesioferrite	4.68	21.54	16.86	Fe2MgO4
Magnesite	-0.06	-7.52	-7.46	MgCO3
Magnetite	13.92	17.32	3.40	Fe3O4
Malachite	2.82	-2.49	-5.31	Cu2(OH)2CO3
Manganite	-4.69	20.65	25.34	MnOOH
Massicot	-8.64	4.25	12.89	PbO
Matlockite	-3.32	-12.29	-8.97	PbClF
Melanothallite	-14.94	-8.68	6.26	CuCl2
Melanterite	-6.27	-8.48	-2.21	FeSO4·7H2O
Metacinnabar	-51.33	-96.42	-45.09	HgS
Mg(OH)2(active)	-8.78	10.01	18.79	Mg(OH)2
Mg(VO3)2	-10.57	0.71	11.28	Mg(VO3)2
Mg2Sb3	-277.24	-202.56	74.68	Mg2Sb3
Mg2V2O7	-15.63	10.73	26.36	Mg2V2O7
MgCr2O4	-14.30	1.90	16.20	MgCr2O4
MgCrO4	-27.80	-22.42	5.38	MgCrO4
MgF2	1.27	-6.86	-8.13	MgF2
MgMoO4	-5.83	-7.68	-1.85	MgMoO4
MgSeO3·6H2O	-5.40	-2.35	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.46	-12.66	-1.20	MgSeO4·6H2O
Minium	-34.76	38.76	73.52	Pb3O4
Mirabilite	-3.72	-4.83	-1.11	Na2SO4·10H2O
Mn(VO3)2	-6.55	-1.65	4.90	Mn(VO3)2
Mn2(SO4)3	-46.44	-52.15	-5.71	Mn2(SO4)3
Mn2Sb	-154.64	-93.56	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-12.29	0.21	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-11.29	-8.58	2.72	MnCl2·4H2O
MnS(grn)	-77.09	-76.92	0.17	MnS
MnS(pnk)	-80.26	-76.92	3.34	MnS
MnSb	-97.65	-100.56	-2.91	MnSb
MnSe	-41.31	-37.81	3.50	MnSe
MnSeO3	-5.81	-4.68	1.13	MnSeO3
MnSeO3·2H2O	-5.68	-4.69	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.97	-15.02	-2.05	MnSeO4·5H2O
MnSO4	-9.18	-6.60	2.58	MnSO4
Monteponite	-10.32	4.78	15.10	CdO
Montroydite	-8.21	-11.85	-3.64	HgO
MoO3	-9.70	-17.70	-8.00	MoO3
Morenosite	-10.27	-12.42	-2.14	NiSO4·7H2O
MoS2	-142.58	-212.84	-70.26	MoS2
Na-Jarosite	4.71	-6.49	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-45.52	-55.42	-9.90	Na2Cr2O7
Na2CrO4	-25.91	-22.98	2.93	Na2CrO4
Na2Mo2O7	-9.34	-25.94	-16.60	Na2Mo2O7
Na2MoO4	-9.73	-8.24	1.49	Na2MoO4
Na2MoO4·2H2O	-9.47	-8.25	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.20	-2.90	10.30	Na2SeO3·5H2O
Na2SeO4	-14.47	-13.19	1.28	Na2SeO4

Na3Sb	-176.12	-81.67	94.45	Na3Sb
Na3VO4	-27.15	9.54	36.68	Na3VO4
Na4V2O7	-27.79	9.61	37.40	Na4V2O7
Nantokite	-4.16	-10.89	-6.73	CuCl
NaSb	-88.30	-65.13	23.17	NaSb
Natron	-6.81	-8.12	-1.31	Na2CO3:10H2O
NaVO3	-3.78	0.08	3.86	NaVO3
Nesquehonite	-2.87	-7.54	-4.67	MgCO3:3H2O
Ni(OH)2	-10.94	1.86	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-32.86	-17.16	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-38.82	-6.82	32.00	Ni4(OH)6SO4
NiCO3	-8.80	-15.67	-6.87	NiCO3
NiMoO4	-4.70	-15.84	-11.14	NiMoO4
NiS(alpha)	-77.11	-82.71	-5.60	NiS
NiS(beta)	-71.61	-82.71	-11.10	NiS
NiS(gamma)	-69.91	-82.71	-12.80	NiS
NiSe	-25.90	-43.60	-17.70	NiSe
NiSeO3:2H2O	-13.30	-10.48	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.29	-20.81	-1.52	NiSeO4:6H2O
Nsutite	-9.21	8.30	17.50	MnO2
O2(g)	-31.10	51.99	83.09	O2
Orpiment	-229.54	-290.61	-61.07	As2S3
Otavite	-0.75	-12.75	-12.00	CdCO3
Pb(BO2)2	-9.60	-3.08	6.52	Pb(BO2)2
Pb(OH)2	-3.90	4.25	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-53.93	-62.69	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.40	0.40	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.68	8.50	26.19	Pb2O(OH)2
Pb2O3	-26.54	34.50	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	1.10	-0.80	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.74	-9.94	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.68	3.46	6.14	Pb3(VO4)2
Pb3O2CO3	-15.79	-4.77	11.02	Pb3O2CO3
Pb3O2SO4	-12.17	-1.49	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.35	2.75	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.11	2.77	21.88	Pb4O3SO4
PbCrO4	-15.58	-28.18	-12.60	PbCrO4
PbF2	-5.18	-12.62	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	2.18	-13.44	-15.62	PbMoO4
PbO:0.3H2O	-8.73	4.25	12.98	PbO:0.3H2O
PbSeO4	-11.55	-18.39	-6.84	PbSeO4
Periclase	-11.57	10.01	21.58	MgO
Phosgenite	-5.43	-25.24	-19.81	PbCl2:PbCO3
Plattnerite	-19.35	30.25	49.60	PbO2
Portlandite	-12.25	10.55	22.80	Ca(OH)2
Pyrite	-118.84	-137.35	-18.51	FeS2
Pyrochroite	-7.55	7.65	15.19	Mn(OH)2
Pyrolusite	-7.73	33.65	41.38	MnO2
Realgar	-96.27	-116.02	-19.75	AsS
Retgersite	-10.37	-12.41	-2.04	NiSO4:6H2O
Rhodochrosite	0.69	-9.89	-10.58	MnCO3
Rutherfordine	-7.07	-21.57	-14.50	UO2CO3
Sb(OH)3	-10.77	-17.88	-7.11	Sb(OH)3
Sb2O4	-13.15	-9.75	3.40	Sb2O4
Sb2O5	-22.70	-32.37	-9.67	Sb2O5
Sb2Se3	-104.37	-172.12	-67.76	Sb2Se3
Sb4O6(cubic)	-53.22	-71.48	-18.26	Sb4O6
Sb4O6(orth)	-53.58	-71.48	-17.90	Sb4O6
SbCl3	-42.76	-42.19	0.57	SbCl3
SbF3	-32.96	-43.18	-10.23	SbF3
Sbmetal	-45.18	-56.86	-11.69	Sb
SbO2	-1.36	-29.18	-27.82	SbO2
Schoepite	-10.03	-4.04	5.99	UO2(OH)2:H2O
Semetal(am)	-12.36	-19.47	-7.11	Se
Semetal(hex)	-11.76	-19.47	-7.71	Se
Senarmontite	-23.38	-35.74	-12.37	Sb2O3

SeO2	-12.46	-12.33	0.12	SeO2
SeO3	-43.69	-22.65	21.04	SeO3
Siderite	-1.50	-11.74	-10.24	FeCO3
Smithsonite	-0.74	-10.74	-10.00	ZnCO3
Sphalerite	-66.33	-77.78	-11.45	ZnS
Spinel	-17.76	19.09	36.85	MgAl2O4
Stibnite	-238.99	-289.45	-50.46	Sb2S3
Sulfur	-56.43	-58.57	-2.14	S
Tenorite	-0.12	7.53	7.64	CuO
Thenardite	-5.11	-4.79	0.32	Na2SO4
Thermonatrite	-8.72	-8.08	0.64	Na2CO3:H2O
Tyuyamunite	-10.89	-6.81	4.08	Ca(UO2)2(VO4)2
U3O8	-31.52	-10.44	21.08	U3O8
U3Sb4	-598.24	-445.86	152.38	U3Sb4
U4O9	-54.22	-57.24	-3.02	U4O9
UF4	-25.02	-54.56	-29.54	UF4
UF4:2.5H2O	-21.85	-54.57	-32.72	UF4:2.5H2O
UO2(am)	-21.74	-20.81	0.93	UO2
UO2(NO3)2	-44.21	-32.07	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-36.93	-32.08	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-35.47	-32.08	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.14	-32.09	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-9.65	-4.03	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.44	-26.69	-2.25	UO2SeO4:4H2O
UO3	-11.73	-4.03	7.70	UO3
Uraninite	-16.14	-20.81	-4.67	UO2
USb2	-225.32	-195.75	29.58	USb2
V(OH)3	-15.65	-8.06	7.59	V(OH)3
V2O5	-7.94	-9.30	-1.36	V2O5
V3O5	-30.07	-28.24	1.84	V3O5
V4O7	-36.17	-28.98	7.19	V4O7
V6O13	-19.04	-79.90	-60.86	V6O13
Valentinite	-27.26	-35.74	-8.48	Sb2O3
VC12	-56.13	-37.26	18.87	VC12
VC13	-55.80	-32.37	23.43	VC13
VF4	-49.42	-34.49	14.93	VF4
Vmetal	-91.07	-47.04	44.03	V
VO	-35.80	-21.05	14.76	VO
VO(OH)2	-5.90	-0.75	5.15	VO(OH)2
VO2Cl	-15.60	-12.76	2.84	VO2Cl
VOC1	-27.31	-16.15	11.15	VOC1
VOC12	-29.72	-16.96	12.76	VOC12
VOSO4	-18.60	-14.99	3.61	VOSO4
Witherite	-1.50	-10.07	-8.57	BaCO3
Wurtzite	-68.83	-77.78	-8.95	ZnS
Zincite	-4.54	6.79	11.33	ZnO
Zincosite	-11.38	-7.45	3.93	ZnSO4
Zn(BO2)2	-8.83	-0.54	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.58	-21.27	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.41	6.79	12.20	Zn(OH)2
Zn(OH)2(am)	-5.68	6.79	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.96	6.79	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.74	6.79	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.94	6.79	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.16	-0.66	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.72	5.48	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.98	-2.33	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.03	-8.11	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.49	12.91	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.76	17.74	38.50	Zn5(OH)8Cl2
ZnCl2	-16.47	-9.42	7.05	ZnCl2
ZnCO3:1H2O	-0.49	-10.75	-10.26	ZnCO3:1H2O
ZnF2	-9.55	-10.08	-0.53	ZnF2
Znmetal	-44.99	-19.20	25.79	Zn
ZnMoO4	-0.78	-10.90	-10.13	ZnMoO4
ZnO(active)	-4.39	6.79	11.19	ZnO
ZnS(am)	-68.72	-77.78	-9.05	ZnS
ZnSb	-87.08	-76.07	11.01	ZnSb

ZnSe	-24.27	-38.67	-14.40	ZnSe
ZnSeO4:6H2O	-14.36	-15.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.82	-7.46	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 26.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 102

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 106

SAVE Solution 107 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 102
END

TITLE

Precipitate oversaturated phases

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 106. Solution after simulation 25.
Using pure phase assemblage 102.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	1.434e-04	1.434e-04
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	9.836e-08	9.836e-08
Barite	0.00	-9.98	-9.98	0.000e+00	5.880e-05	5.880e-05
Brochantite	0.00	15.22	15.22	0.000e+00	2.628e-04	2.628e-04
Brucite	-3.11	13.74	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.023e+01	2.297e-01
CaMoO4	-0.21	-8.16	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.13	-1.31	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	8.989e-02	8.989e-02
Carnotite	-0.00	0.23	0.23	0.000e+00	3.979e-06	3.979e-06
Cd(BO2)2	-10.13	-0.29	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.00	-14.15	-14.15	0.000e+00	4.923e-07	4.923e-07
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	0.000e+00	3.578e-10	3.578e-10
Cu2Se(alpha)	-4.12	-49.92	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	8.527e-07	8.527e-07
Epsomite	-1.92	-4.04	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.098e-05	2.098e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	7.287e-03	7.287e-03
Gummite	-5.77	1.90	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	3.059e-02	3.059e-02
HgSe	-0.91	-56.60	-55.69	0.000e+00	0	0.000e+00

Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-3.59	-4.70	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.04	-2.91	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-6.67	6.12	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-29.64	-13.94	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.66	-15.53	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.06	-15.21	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.191e-05
Otavite	-2.47	-14.47	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	1.474e-06	1.474e-06
Rutherfordine	-5.24	-19.74	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.84	-30.67	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.09	1.90	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.01	1.07	4.08	0.000e+00	0	0.000e+00
U3O8	-13.27	7.81	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.71	1.90	5.61	0.000e+00	0	0.000e+00
UO3	-5.80	1.90	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.56	-10.69	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.289e-06	5.315e-06
As	3.465e-09	3.482e-09
B	1.962e-04	1.971e-04
Ba	2.172e-08	2.183e-08
C	7.253e-04	7.288e-04
Ca	1.080e-02	1.086e-02
Cd	2.478e-08	2.490e-08
Cl	1.653e-02	1.661e-02
Co	5.787e-09	5.815e-09
Cr	1.514e-09	1.521e-09
Cu	4.851e-07	4.874e-07
F	3.247e-04	3.262e-04
Fe	1.035e-09	1.040e-09
Hg	1.881e-08	1.890e-08
K	2.935e-02	2.949e-02
Mg	3.608e-02	3.626e-02
Mn	4.362e-04	4.383e-04
Mo	1.403e-05	1.410e-05
N	2.247e-05	2.258e-05
Na	5.288e-02	5.314e-02
Ni	9.424e-10	9.470e-10
Pb	1.582e-09	1.589e-09
S	7.965e-02	8.004e-02
Sb	1.771e-07	1.779e-07
Se	1.540e-06	1.547e-06
U	1.389e-06	1.395e-06
V	1.969e-07	1.979e-07
Zn	5.087e-05	5.111e-05

-----Description of solution-----

	pH =	7.984	Charge balance
	pe =	4.789	Adjusted to redox
equilibrium			
	Activity of water =	0.997	
	Ionic strength (mol/kgw) =	1.992e-01	
	Mass of water (kg) =	1.005e+00	
	Total alkalinity (eq/kg) =	7.918e-04	
	Total CO2 (mol/kg) =	7.253e-04	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	

Iterations = 20
Total H = 1.115506e+02
Total O = 5.609769e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.367e-06	9.664e-07	-5.864	-6.015	-0.150	(0)
H+	1.391e-08	1.038e-08	-7.857	-7.984	-0.127	0.00
H2O	5.551e+01	9.966e-01	1.744	-0.001	0.000	18.07
Al	5.289e-06					
Al (OH) 4-	5.255e-06	3.832e-06	-5.279	-5.417	-0.137	(0)
Al (OH) 3	3.149e-08	3.149e-08	-7.502	-7.502	0.000	(0)
Al (OH) 2+	2.188e-09	1.633e-09	-8.660	-8.787	-0.127	(0)
AlF3	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
AlF2+	2.337e-10	1.744e-10	-9.631	-9.758	-0.127	(0)
AlF4-	3.003e-11	2.189e-11	-10.523	-10.660	-0.137	(0)
AlF+2	1.001e-11	3.105e-12	-11.000	-11.508	-0.508	(0)
AlOH+2	6.856e-12	2.128e-12	-11.164	-11.672	-0.508	(0)
AlSO4+	3.644e-13	2.657e-13	-12.438	-12.576	-0.137	(0)
Al (SO4) 2-	6.072e-14	4.428e-14	-13.217	-13.354	-0.137	(0)
Al+3	3.054e-14	2.201e-15	-13.515	-14.657	-1.142	(0)
AlMo6O21-3	2.106e-38	1.883e-40	-37.677	-39.725	-2.049	(0)
As (3)	1.737e-23					
H3AsO3	1.603e-23	1.603e-23	-22.795	-22.795	0.000	(0)
H2AsO3-	1.337e-24	7.918e-25	-23.874	-24.101	-0.228	(0)
HAsO3-2	5.660e-28	6.954e-29	-27.247	-28.158	-0.911	(0)
H4AsO3+	1.393e-31	8.248e-32	-30.856	-31.084	-0.228	(0)
AsO3-3	2.888e-32	2.582e-34	-31.539	-33.588	-2.049	(0)
As (5)	3.465e-09					
HAsO4-2	3.384e-09	4.159e-10	-8.471	-9.381	-0.911	(0)
H2AsO4-	6.652e-11	3.938e-11	-10.177	-10.405	-0.228	(0)
AsO4-3	1.417e-11	1.266e-13	-10.849	-12.897	-2.049	(0)
H3AsO4	6.788e-17	7.107e-17	-16.168	-16.148	0.020	(0)
B	1.962e-04					
H3BO3	1.759e-04	1.842e-04	-3.755	-3.735	0.020	(0)
H2BO3-	1.512e-05	1.030e-05	-4.820	-4.987	-0.167	(0)
MgH2BO3+	3.112e-06	2.120e-06	-5.507	-5.674	-0.167	(0)
CaH2BO3+	1.383e-06	9.421e-07	-5.859	-6.026	-0.167	(0)
NaH2BO3	5.948e-07	5.948e-07	-6.226	-6.226	0.000	(0)
BF (OH) 3-	1.522e-08	1.037e-08	-7.818	-7.984	-0.167	(0)
H5 (BO3) 2-	2.370e-09	1.615e-09	-8.625	-8.792	-0.167	(0)
H8 (BO3) 3-	4.366e-11	2.975e-11	-10.360	-10.526	-0.167	(0)
BaH2BO3+	3.146e-12	2.144e-12	-11.502	-11.669	-0.167	(0)
BF2 (OH) 2-	2.391e-12	1.629e-12	-11.621	-11.788	-0.167	(0)
BF3OH-	1.367e-18	9.314e-19	-17.864	-18.031	-0.167	(0)
BF4-	9.885e-24	6.736e-24	-23.005	-23.172	-0.167	(0)
Ba	2.172e-08					
Ba+2	2.167e-08	6.734e-09	-7.664	-8.172	-0.508	(0)
BaHCO3+	3.922e-11	2.968e-11	-10.406	-10.528	-0.121	(0)
BaCO3	7.196e-12	7.196e-12	-11.143	-11.143	0.000	(0)
BaH2BO3+	3.146e-12	2.144e-12	-11.502	-11.669	-0.167	(0)
BaOH+	3.844e-14	2.841e-14	-13.415	-13.547	-0.131	(0)
BaNO3+	8.309e-16	4.919e-16	-15.080	-15.308	-0.228	(0)
BaNH3+2	2.353e-16	2.891e-17	-15.628	-16.539	-0.911	(0)
C (4)	7.253e-04					
HCO3-	6.183e-04	4.615e-04	-3.209	-3.336	-0.127	(0)
MgHCO3+	3.901e-05	2.803e-05	-4.409	-4.552	-0.143	(0)
CaHCO3+	1.805e-05	1.366e-05	-4.744	-4.865	-0.121	(0)
H2CO3	1.078e-05	1.078e-05	-4.967	-4.967	0.000	(0)
MgCO3	1.029e-05	1.029e-05	-4.988	-4.988	0.000	(0)
NaHCO3	9.454e-06	9.454e-06	-5.024	-5.024	0.000	(0)
CO3-2	6.706e-06	2.084e-06	-5.174	-5.681	-0.508	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaCO3-	1.894e-06	1.413e-06	-5.723	-5.850	-0.127	(0)
UO2 (CO3) 3-4	1.364e-06	3.110e-10	-5.865	-9.507	-3.642	(0)

		ZnCO3	5.658e-07	5.658e-07	-6.247	-6.247	0.000	(0)
		MnHCO3+	4.964e-07	3.668e-07	-6.304	-6.436	-0.131	(0)
		CuCO3	2.361e-07	2.361e-07	-6.627	-6.627	0.000	(0)
		ZnHCO3+	1.163e-07	6.886e-08	-6.934	-7.162	-0.228	(0)
		UO2 (CO3) 2-2	2.424e-08	2.979e-09	-7.615	-8.526	-0.911	(0)
		Cu (CO3) 2-2	1.078e-08	1.324e-09	-7.968	-8.878	-0.911	(0)
		CuHCO3+	9.465e-10	5.604e-10	-9.024	-9.252	-0.228	(0)
		PbCO3	3.446e-10	3.446e-10	-9.463	-9.463	0.000	(0)
		CdCO3	7.716e-11	7.716e-11	-10.113	-10.113	0.000	(0)
		UO2CO3	7.165e-11	7.165e-11	-10.145	-10.145	0.000	(0)
		BaHCO3+	3.922e-11	2.968e-11	-10.406	-10.528	-0.121	(0)
		PbHCO3+	3.186e-11	1.887e-11	-10.497	-10.724	-0.228	(0)
		CoHCO3+	3.064e-11	1.814e-11	-10.514	-10.741	-0.228	(0)
		CoCO3	1.780e-11	1.780e-11	-10.750	-10.750	0.000	(0)
		Pb (CO3) 2-2	1.685e-11	2.071e-12	-10.773	-11.684	-0.911	(0)
		NiHCO3+	1.375e-11	8.138e-12	-10.862	-11.089	-0.228	(0)
		NiCO3	1.112e-11	1.112e-11	-10.954	-10.954	0.000	(0)
		BaCO3	7.196e-12	7.196e-12	-11.143	-11.143	0.000	(0)
		CdHCO3+	2.883e-12	1.707e-12	-11.540	-11.768	-0.228	(0)
		Cd (CO3) 2-2	9.700e-13	1.192e-13	-12.013	-12.924	-0.911	(0)
		HgCO3	1.892e-14	1.892e-14	-13.723	-13.723	0.000	(0)
		FeHCO3+	2.357e-15	1.783e-15	-14.628	-14.749	-0.121	(0)
		Hg (CO3) 2-2	1.014e-15	1.246e-16	-14.994	-15.904	-0.911	(0)
		HgHCO3+	6.178e-18	3.658e-18	-17.209	-17.437	-0.228	(0)
Ca	1.080e-02							
		CaSO4	5.661e-03	5.661e-03	-2.247	-2.247	0.000	(0)
		Ca+2	5.115e-03	1.589e-03	-2.291	-2.799	-0.508	(0)
		CaHCO3+	1.805e-05	1.366e-05	-4.744	-4.865	-0.121	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.311e-06	2.447e-06	-5.480	-5.611	-0.131	(0)
		CaH2BO3+	1.383e-06	9.421e-07	-5.859	-6.026	-0.167	(0)
		CaOH+	4.050e-08	3.065e-08	-7.393	-7.514	-0.121	(0)
		CaNO3+	1.237e-10	7.325e-11	-9.908	-10.135	-0.228	(0)
		CaNH3+2	1.108e-10	1.361e-11	-9.956	-10.866	-0.911	(0)
		Ca (NH3) 2+2	3.000e-19	3.687e-20	-18.523	-19.433	-0.911	(0)
Cd	2.478e-08							
		Cd (SO4) 2-2	1.011e-08	1.242e-09	-7.995	-8.906	-0.911	(0)
		CdSO4	5.923e-09	5.923e-09	-8.227	-8.227	0.000	(0)
		Cd+2	5.229e-09	1.625e-09	-8.282	-8.789	-0.508	(0)
		CdCl+	3.234e-09	1.915e-09	-8.490	-8.718	-0.228	(0)
		CdCl2	9.850e-11	9.850e-11	-10.007	-10.007	0.000	(0)
		CdCO3	7.716e-11	7.716e-11	-10.113	-10.113	0.000	(0)
		CdOHC1	7.591e-11	7.591e-11	-10.120	-10.120	0.000	(0)
		CdOH+	2.107e-11	1.247e-11	-10.676	-10.904	-0.228	(0)
		CdF+	6.135e-12	3.633e-12	-11.212	-11.440	-0.228	(0)
		CdHCO3+	2.883e-12	1.707e-12	-11.540	-11.768	-0.228	(0)
		CdCl3-	1.295e-12	7.669e-13	-11.888	-12.115	-0.228	(0)
		Cd (CO3) 2-2	9.700e-13	1.192e-13	-12.013	-12.924	-0.911	(0)
		Cd (OH) 2	7.606e-14	7.606e-14	-13.119	-13.119	0.000	(0)
		CdF2	1.022e-15	1.022e-15	-14.990	-14.990	0.000	(0)
		Cd (SeO3) 2-2	1.638e-16	2.013e-17	-15.786	-16.696	-0.911	(0)
		CdSeO4	1.607e-16	1.607e-16	-15.794	-15.794	0.000	(0)
		CdNO3+	1.265e-16	7.489e-17	-15.898	-16.126	-0.228	(0)
		Cd2OH+3	1.136e-17	1.016e-19	-16.945	-18.993	-2.049	(0)
		Cd (OH) 3-	7.585e-18	4.491e-18	-17.120	-17.348	-0.228	(0)
		Cd (OH) 4-2	5.781e-24	7.104e-25	-23.238	-24.148	-0.911	(0)
		Cd (NO3) 2	5.471e-25	5.471e-25	-24.262	-24.262	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.864	-79.092	-0.228	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.199	-150.199	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.382	-226.609	-0.228	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-301.813	-302.724	-0.911	(0)
Cl	1.653e-02							
		Cl-	1.653e-02	1.234e-02	-1.782	-1.909	-0.127	(0)
		MnCl+	8.375e-07	6.189e-07	-6.077	-6.208	-0.131	(0)
		ZnCl+	2.035e-07	1.463e-07	-6.691	-6.835	-0.143	(0)
		ZnOHC1	1.851e-07	1.851e-07	-6.733	-6.733	0.000	(0)
		MnCl2	1.079e-08	1.079e-08	-7.967	-7.967	0.000	(0)
		CuCl2-	8.530e-09	6.130e-09	-8.069	-8.213	-0.143	(0)

CdCl+	3.234e-09	1.915e-09	-8.490	-8.718	-0.228	(0)
ZnCl2	2.860e-09	2.860e-09	-8.544	-8.544	0.000	(0)
CuCl	2.378e-09	2.378e-09	-8.624	-8.624	0.000	(0)
CuCl+	5.237e-10	3.764e-10	-9.281	-9.424	-0.143	(0)
HgClOH	1.598e-10	1.598e-10	-9.796	-9.796	0.000	(0)
HgCl2	1.155e-10	1.155e-10	-9.937	-9.937	0.000	(0)
CdCl2	9.850e-11	9.850e-11	-10.007	-10.007	0.000	(0)
CdOHC1	7.591e-11	7.591e-11	-10.120	-10.120	0.000	(0)
CuCl3-2	5.422e-11	1.617e-11	-10.266	-10.791	-0.525	(0)
MnCl3-	4.961e-11	3.666e-11	-10.304	-10.436	-0.131	(0)
PbCl+	4.069e-11	2.409e-11	-10.391	-10.618	-0.228	(0)
ZnCl3-	3.901e-11	2.804e-11	-10.409	-10.552	-0.143	(0)
CoCl+	3.644e-11	2.157e-11	-10.438	-10.666	-0.228	(0)
HgCl3-	2.408e-11	1.426e-11	-10.618	-10.846	-0.228	(0)
NiCl+	7.628e-12	4.516e-12	-11.118	-11.345	-0.228	(0)
HgCl4-2	5.699e-12	7.003e-13	-11.244	-12.155	-0.911	(0)
CuCl2	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
PbCl2	1.328e-12	1.328e-12	-11.877	-11.877	0.000	(0)
CdCl3-	1.295e-12	7.669e-13	-11.888	-12.115	-0.228	(0)
ZnCl4-2	5.800e-13	1.730e-13	-12.237	-12.762	-0.525	(0)
PbCl3-	1.102e-14	6.523e-15	-13.958	-14.186	-0.228	(0)
HgCl+	3.155e-15	1.868e-15	-14.501	-14.729	-0.228	(0)
PbCl4-2	2.994e-16	3.679e-17	-15.524	-16.434	-0.911	(0)
UO2Cl+	2.920e-16	1.729e-16	-15.535	-15.762	-0.228	(0)
NiCl2	2.806e-16	2.806e-16	-15.552	-15.552	0.000	(0)
CuCl3-	2.581e-16	1.855e-16	-15.588	-15.732	-0.143	(0)
CrCl+2	3.590e-17	4.412e-18	-16.445	-17.355	-0.911	(0)
CrOHC12	9.999e-19	9.999e-19	-18.000	-18.000	0.000	(0)
CuCl4-2	3.845e-20	1.147e-20	-19.415	-19.940	-0.525	(0)
CrCl2+	8.724e-21	5.165e-21	-20.059	-20.287	-0.228	(0)
FeCl+2	2.194e-21	6.543e-22	-20.659	-21.184	-0.525	(0)
VOCl+	9.579e-22	5.671e-22	-21.019	-21.246	-0.228	(0)
FeCl2+	4.880e-23	3.607e-23	-22.312	-22.443	-0.131	(0)
CrO3Cl-	2.454e-25	1.453e-25	-24.610	-24.838	-0.228	(0)
FeCl3	4.450e-26	4.450e-26	-25.352	-25.352	0.000	(0)
CoCl+2	2.532e-36	3.111e-37	-35.597	-36.507	-0.911	(0)
UCl+3	0.000e+00	0.000e+00	-44.518	-46.567	-2.049	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.480	-51.390	-0.911	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.458	-52.369	-0.911	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.363	-66.273	-0.911	(0)
Co (2)	5.787e-09					
Co+2	4.113e-09	5.054e-10	-8.386	-9.296	-0.911	(0)
CoSO4	1.568e-09	1.568e-09	-8.805	-8.805	0.000	(0)
CoCl+	3.644e-11	2.157e-11	-10.438	-10.666	-0.228	(0)
CoHCO3+	3.064e-11	1.814e-11	-10.514	-10.741	-0.228	(0)
CoCO3	1.780e-11	1.780e-11	-10.750	-10.750	0.000	(0)
CoOH+	1.646e-11	9.746e-12	-10.784	-11.011	-0.228	(0)
CoF+	3.808e-12	2.254e-12	-11.419	-11.647	-0.228	(0)
Co (OH) 2	7.482e-13	7.482e-13	-12.126	-12.126	0.000	(0)
CoNO2+	9.294e-14	5.503e-14	-13.032	-13.259	-0.228	(0)
Co (NH3) +2	3.364e-15	4.134e-16	-14.473	-15.384	-0.911	(0)
CoSeO4	1.345e-16	1.345e-16	-15.871	-15.871	0.000	(0)
Co (OH) 3-	2.437e-17	1.443e-17	-16.613	-16.841	-0.228	(0)
CoNO3+	1.972e-17	1.168e-17	-16.705	-16.933	-0.228	(0)
CoOOH-	6.134e-18	3.632e-18	-17.212	-17.440	-0.228	(0)
Co2OH+3	2.761e-20	2.469e-22	-19.559	-21.608	-2.049	(0)
Co (NH3) 2+2	9.764e-22	1.200e-22	-21.010	-21.921	-0.911	(0)
Co (OH) 4-2	1.798e-23	2.210e-24	-22.745	-23.656	-0.911	(0)
Co (NO3) 2	3.463e-25	3.463e-25	-24.461	-24.461	0.000	(0)
Co (NH3) 3+2	8.363e-29	1.028e-29	-28.078	-28.988	-0.911	(0)
Co4 (OH) 4+4	7.895e-33	1.800e-36	-32.103	-35.745	-3.642	(0)
Co (NH3) 4+2	2.986e-36	3.669e-37	-35.525	-36.435	-0.911	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.472	-44.383	-0.911	(0)
Co (3)	4.952e-30					
CoOH+2	4.952e-30	6.085e-31	-29.305	-30.216	-0.911	(0)
CoCl+2	2.532e-36	3.111e-37	-35.597	-36.507	-0.911	(0)
Co+3	1.719e-36	1.239e-37	-35.765	-36.907	-1.142	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.480	-51.390	-0.911	(0)

Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.020	-61.247	-0.228	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.269	-66.179	-0.911	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.363	-66.273	-0.911	(0)
Cr (2)	8.721e-27					
Cr+2	8.721e-27	1.072e-27	-26.059	-26.970	-0.911	(0)
Cr (3)	1.514e-09					
Cr (OH) 2+	1.160e-09	6.868e-10	-8.936	-9.163	-0.228	(0)
Cr (OH) 3	2.494e-10	2.494e-10	-9.603	-9.603	0.000	(0)
Cr (OH) +2	4.753e-11	5.841e-12	-10.323	-11.234	-0.911	(0)
CrOHSO4	2.155e-11	2.155e-11	-10.667	-10.667	0.000	(0)
CrO2-	1.933e-11	1.144e-11	-10.714	-10.941	-0.228	(0)
Cr (OH) 4-	1.620e-11	9.594e-12	-10.790	-11.018	-0.228	(0)
CrF+2	5.026e-14	6.176e-15	-13.299	-14.209	-0.911	(0)
Cr+3	3.090e-14	2.762e-16	-13.510	-15.559	-2.049	(0)
CrSO4+	1.694e-14	1.003e-14	-13.771	-13.999	-0.228	(0)
CrCl+2	3.590e-17	4.412e-18	-16.445	-17.355	-0.911	(0)
CrOHC12	9.999e-19	9.999e-19	-18.000	-18.000	0.000	(0)
Cr2 (OH) 2SO4+2	9.259e-20	1.138e-20	-19.033	-19.944	-0.911	(0)
Cr2 (OH) 2 (SO4) 2	1.051e-20	1.051e-20	-19.978	-19.978	0.000	(0)
CrCl2+	8.724e-21	5.165e-21	-20.059	-20.287	-0.228	(0)
CrNO3+2	1.432e-24	1.760e-25	-23.844	-24.754	-0.911	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.127	-42.038	-0.911	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.514	-51.562	-2.049	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.458	-52.369	-0.911	(0)
Cr (6)	1.981e-14					
CrO4-2	1.721e-14	5.346e-15	-13.764	-14.272	-0.508	(0)
NaCrO4-	1.635e-15	9.678e-16	-14.787	-15.014	-0.228	(0)
KCrO4-	6.623e-16	3.921e-16	-15.179	-15.407	-0.228	(0)
HCrO4-	3.034e-16	1.796e-16	-15.518	-15.746	-0.228	(0)
CrO3SO4-2	7.214e-23	8.865e-24	-22.142	-23.052	-0.911	(0)
H2CrO4	1.512e-24	1.512e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	2.454e-25	1.453e-25	-24.610	-24.838	-0.228	(0)
Cr2O7-2	9.138e-30	1.123e-30	-29.039	-29.950	-0.911	(0)
Cu (1)	1.122e-08					
CuCl2-	8.530e-09	6.130e-09	-8.069	-8.213	-0.143	(0)
CuCl	2.378e-09	2.378e-09	-8.624	-8.624	0.000	(0)
Cu+	2.585e-10	1.531e-10	-9.588	-9.815	-0.228	(0)
CuCl3-2	5.422e-11	1.617e-11	-10.266	-10.791	-0.525	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.611	-147.079	-0.469	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.370	-147.809	-0.439	(0)
Cu (2)	4.738e-07					
CuCO3	2.361e-07	2.361e-07	-6.627	-6.627	0.000	(0)
CuOH+	8.184e-08	5.881e-08	-7.087	-7.231	-0.143	(0)
CuSO4	6.855e-08	6.855e-08	-7.164	-7.164	0.000	(0)
Cu+2	6.194e-08	1.924e-08	-7.208	-7.716	-0.508	(0)
Cu (OH) 2	1.134e-08	1.134e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	1.078e-08	1.324e-09	-7.968	-8.878	-0.911	(0)
CuHCO3+	9.465e-10	5.604e-10	-9.024	-9.252	-0.228	(0)
Cu2 (OH) 2+2	7.071e-10	8.689e-11	-9.151	-10.061	-0.911	(0)
CuCl+	5.237e-10	3.764e-10	-9.281	-9.424	-0.143	(0)
CuF+	2.893e-10	1.713e-10	-9.539	-9.766	-0.228	(0)
CuNO2+	5.259e-11	3.113e-11	-10.279	-10.507	-0.228	(0)
Cu (OH) 3-	3.797e-11	2.248e-11	-10.421	-10.648	-0.228	(0)
CuNH3+2	1.090e-11	1.340e-12	-10.962	-11.873	-0.911	(0)
CuCl2	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
Cu (NO2) 2	4.922e-15	4.922e-15	-14.308	-14.308	0.000	(0)
CuNO3+	1.498e-15	8.870e-16	-14.824	-15.052	-0.228	(0)
Cu (OH) 4-2	1.392e-15	1.710e-16	-14.856	-15.767	-0.911	(0)
CuCl3-	2.581e-16	1.855e-16	-15.588	-15.732	-0.143	(0)
CuCl4-2	3.845e-20	1.147e-20	-19.415	-19.940	-0.525	(0)
Cu (NO3) 2	1.628e-24	1.628e-24	-23.788	-23.788	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.521	-216.749	-0.228	(0)
F	3.247e-04					
F-	1.889e-04	1.411e-04	-3.724	-3.851	-0.127	(0)
MgF+	1.288e-04	9.395e-05	-3.890	-4.027	-0.137	(0)
CaF+	3.311e-06	2.447e-06	-5.480	-5.611	-0.131	(0)
NaF	3.242e-06	3.242e-06	-5.489	-5.489	0.000	(0)
MnF+	3.027e-07	2.237e-07	-6.519	-6.650	-0.131	(0)

ZnF+	2.243e-08	1.328e-08	-7.649	-7.877	-0.228	(0)
BF(OH) 3-	1.522e-08	1.037e-08	-7.818	-7.984	-0.167	(0)
HF	2.167e-09	2.167e-09	-8.664	-8.664	0.000	(0)
AlF3	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
CuF+	2.893e-10	1.713e-10	-9.539	-9.766	-0.228	(0)
AlF2+	2.337e-10	1.744e-10	-9.631	-9.758	-0.127	(0)
AlF4-	3.003e-11	2.189e-11	-10.523	-10.660	-0.137	(0)
AlF+2	1.001e-11	3.105e-12	-11.000	-11.508	-0.508	(0)
CdF+	6.135e-12	3.633e-12	-11.212	-11.440	-0.228	(0)
CoF+	3.808e-12	2.254e-12	-11.419	-11.647	-0.228	(0)
BF2(OH) 2-	2.391e-12	1.629e-12	-11.621	-11.788	-0.167	(0)
HF2-	1.643e-12	1.162e-12	-11.784	-11.935	-0.150	(0)
PbF+	9.237e-13	5.469e-13	-12.034	-12.262	-0.228	(0)
NiF+	8.560e-13	5.068e-13	-12.068	-12.295	-0.228	(0)
UO2F+	2.841e-13	1.682e-13	-12.547	-12.774	-0.228	(0)
UO2F2	6.842e-14	6.842e-14	-13.165	-13.165	0.000	(0)
CrF+2	5.026e-14	6.176e-15	-13.299	-14.209	-0.911	(0)
UO2F3-	4.095e-15	2.424e-15	-14.388	-14.615	-0.228	(0)
PbF2	1.518e-15	1.518e-15	-14.819	-14.819	0.000	(0)
CdF2	1.022e-15	1.022e-15	-14.990	-14.990	0.000	(0)
VO2F	2.884e-17	2.884e-17	-16.540	-16.540	0.000	(0)
UO2F4-2	2.211e-17	2.717e-18	-16.655	-17.566	-0.911	(0)
H2F2	1.258e-17	1.258e-17	-16.900	-16.900	0.000	(0)
VO2F2-	2.495e-18	1.477e-18	-17.603	-17.831	-0.228	(0)
FeF2+	1.387e-18	1.025e-18	-17.858	-17.989	-0.131	(0)
BF3OH-	1.367e-18	9.314e-19	-17.864	-18.031	-0.167	(0)
FeF+2	9.105e-19	2.716e-19	-18.041	-18.566	-0.525	(0)
PbF3-	6.860e-19	4.062e-19	-18.164	-18.391	-0.228	(0)
FeF3	2.040e-19	2.040e-19	-18.690	-18.690	0.000	(0)
VOF+	2.341e-20	1.386e-20	-19.631	-19.858	-0.228	(0)
VO2F3-2	2.115e-20	2.599e-21	-19.675	-20.585	-0.911	(0)
VOF2	7.331e-22	7.331e-22	-21.135	-21.135	0.000	(0)
PbF4-2	2.232e-22	2.742e-23	-21.651	-22.562	-0.911	(0)
HgF+	6.700e-23	3.967e-23	-22.174	-22.402	-0.228	(0)
VO2F4-3	2.018e-23	1.804e-25	-22.695	-24.744	-2.049	(0)
BF4-	9.885e-24	6.736e-24	-23.005	-23.172	-0.167	(0)
VOF3-	6.198e-24	3.669e-24	-23.208	-23.435	-0.228	(0)
Sb(OH) 2F	1.696e-25	1.696e-25	-24.771	-24.771	0.000	(0)
SbOF	1.673e-25	1.673e-25	-24.776	-24.776	0.000	(0)
VOF4-2	1.700e-26	2.089e-27	-25.769	-26.680	-0.911	(0)
UF3+	8.274e-37	4.899e-37	-36.082	-36.310	-0.228	(0)
UF2+2	1.783e-37	2.191e-38	-36.749	-37.659	-0.911	(0)
UF4	7.577e-39	7.577e-39	-38.120	-38.120	0.000	(0)
UF+3	1.380e-39	0.000e+00	-38.860	-40.909	-2.049	(0)
UF5-	0.000e+00	0.000e+00	-40.145	-40.373	-0.228	(0)
UF6-2	0.000e+00	0.000e+00	-40.833	-41.744	-0.911	(0)
Fe (2)	3.688e-12					
Fe+2	2.498e-12	3.069e-13	-11.602	-12.513	-0.911	(0)
FeSO4	1.172e-12	1.172e-12	-11.931	-11.931	0.000	(0)
FeOH+	1.598e-14	1.181e-14	-13.796	-13.928	-0.131	(0)
FeHCO3+	2.357e-15	1.783e-15	-14.628	-14.749	-0.121	(0)
Fe(OH) 2	9.065e-18	9.065e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	3.749e-18	2.770e-18	-17.426	-17.557	-0.131	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.184	-160.184	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.230	-236.458	-0.228	(0)
Fe (3)	1.031e-09					
Fe(OH) 2+	5.519e-10	4.119e-10	-9.258	-9.385	-0.127	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	5.155e-11	3.847e-11	-10.288	-10.415	-0.127	(0)
FeOH+2	3.673e-15	1.096e-15	-14.435	-14.960	-0.525	(0)
FeF2+	1.387e-18	1.025e-18	-17.858	-17.989	-0.131	(0)
FeF+2	9.105e-19	2.716e-19	-18.041	-18.566	-0.525	(0)
FeSO4+	4.145e-19	3.063e-19	-18.382	-18.514	-0.131	(0)
FeF3	2.040e-19	2.040e-19	-18.690	-18.690	0.000	(0)
Fe(SO4) 2-	1.720e-19	1.018e-19	-18.764	-18.992	-0.228	(0)
Fe+3	2.436e-20	1.756e-21	-19.613	-20.756	-1.142	(0)
FeCl+2	2.194e-21	6.543e-22	-20.659	-21.184	-0.525	(0)
FeCl2+	4.880e-23	3.607e-23	-22.312	-22.443	-0.131	(0)

	FeHSeO3+2	1.207e-23	1.484e-24	-22.918	-23.829	-0.911	(0)
	Fe2(OH)2+4	1.743e-25	3.975e-29	-24.759	-28.401	-3.642	(0)
	FeCl3	4.450e-26	4.450e-26	-25.352	-25.352	0.000	(0)
	FeNO3+2	2.083e-27	2.559e-28	-26.681	-27.592	-0.911	(0)
	Fe3(OH)4+5	1.161e-31	2.367e-37	-30.935	-36.626	-5.691	(0)
H(0)	3.845e-29						
	H2	1.923e-29	2.013e-29	-28.716	-28.696	0.020	(0)
Hg(0)	1.847e-08						
	Hg	1.847e-08	1.847e-08	-7.734	-7.734	0.000	(0)
Hg(1)	1.548e-18						
	Hg2+2	7.741e-19	9.511e-20	-18.111	-19.022	-0.911	(0)
Hg(2)	3.478e-10						
	HgClOH	1.598e-10	1.598e-10	-9.796	-9.796	0.000	(0)
	HgCl2	1.155e-10	1.155e-10	-9.937	-9.937	0.000	(0)
	Hg(OH)2	4.271e-11	4.471e-11	-10.369	-10.350	0.020	(0)
	HgCl3-	2.408e-11	1.426e-11	-10.618	-10.846	-0.228	(0)
	HgCl4-2	5.699e-12	7.003e-13	-11.244	-12.155	-0.911	(0)
	HgCO3	1.892e-14	1.892e-14	-13.723	-13.723	0.000	(0)
	HgCl+	3.155e-15	1.868e-15	-14.501	-14.729	-0.228	(0)
	Hg(CO3)2-2	1.014e-15	1.246e-16	-14.994	-15.904	-0.911	(0)
	HgOH+	4.930e-16	2.919e-16	-15.307	-15.535	-0.228	(0)
	Hg(OH)3-	9.188e-18	5.440e-18	-17.037	-17.264	-0.228	(0)
	HgHCO3+	6.178e-18	3.658e-18	-17.209	-17.437	-0.228	(0)
	Hg(NH3)2+2	1.803e-18	2.216e-19	-17.744	-18.654	-0.911	(0)
	HgNH3+2	2.651e-19	3.257e-20	-18.577	-19.487	-0.911	(0)
	Hg+2	6.174e-20	7.587e-21	-19.209	-20.120	-0.911	(0)
	HgSO4	3.089e-20	3.089e-20	-19.510	-19.510	0.000	(0)
	HgF+	6.700e-23	3.967e-23	-22.174	-22.402	-0.228	(0)
	Hg(NH3)3+2	4.884e-26	6.002e-27	-25.311	-26.222	-0.911	(0)
	HgNO3+	6.897e-29	4.083e-29	-28.161	-28.389	-0.228	(0)
	Hg(NH3)4+2	2.640e-33	3.244e-34	-32.578	-33.489	-0.911	(0)
	Hg(NO3)2	2.474e-37	2.474e-37	-36.607	-36.607	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-136.602	-136.830	-0.228	(0)
	HgS2-2	0.000e+00	0.000e+00	-136.644	-137.554	-0.911	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-138.419	-138.419	0.000	(0)
K	2.935e-02						
	K+	2.644e-02	1.974e-02	-1.578	-1.705	-0.127	(0)
	KSO4-	2.912e-03	2.173e-03	-2.536	-2.663	-0.127	(0)
	KCrO4-	6.623e-16	3.921e-16	-15.179	-15.407	-0.228	(0)
Mg	3.608e-02						
	Mg+2	1.910e-02	5.936e-03	-1.719	-2.227	-0.508	(0)
	MgSO4	1.680e-02	1.680e-02	-1.775	-1.775	0.000	(0)
	MgF+	1.288e-04	9.395e-05	-3.890	-4.027	-0.137	(0)
	MgHCO3+	3.901e-05	2.803e-05	-4.409	-4.552	-0.143	(0)
	MgCO3	1.029e-05	1.029e-05	-4.988	-4.988	0.000	(0)
	MgH2BO3+	3.112e-06	2.120e-06	-5.507	-5.674	-0.167	(0)
	MgOH+	2.987e-06	2.284e-06	-5.525	-5.641	-0.117	(0)
Mn(2)	4.362e-04						
	Mn+2	3.242e-04	3.984e-05	-3.489	-4.400	-0.911	(0)
	MnSO4	1.102e-04	1.102e-04	-3.958	-3.958	0.000	(0)
	MnCl+	8.375e-07	6.189e-07	-6.077	-6.208	-0.131	(0)
	MnHCO3+	4.964e-07	3.668e-07	-6.304	-6.436	-0.131	(0)
	MnF+	3.027e-07	2.237e-07	-6.519	-6.650	-0.131	(0)
	MnOH+	1.309e-07	9.671e-08	-6.883	-7.015	-0.131	(0)
	MnCl2	1.079e-08	1.079e-08	-7.967	-7.967	0.000	(0)
	MnCl3-	4.961e-11	3.666e-11	-10.304	-10.436	-0.131	(0)
	MnSeO4	5.695e-12	5.695e-12	-11.244	-11.244	0.000	(0)
	MnNO3+	1.554e-12	9.203e-13	-11.808	-12.036	-0.228	(0)
	Mn(OH)3-	7.554e-16	5.583e-16	-15.122	-15.253	-0.131	(0)
	Mn(NO3)2	3.370e-20	3.370e-20	-19.472	-19.472	0.000	(0)
	Mn(OH)4-2	5.840e-21	1.742e-21	-20.234	-20.759	-0.525	(0)
	MnSe	0.000e+00	0.000e+00	-40.070	-40.070	0.000	(0)
Mn(3)	1.520e-24						
	Mn+3	1.520e-24	1.096e-25	-23.818	-24.960	-1.142	(0)
Mn(6)	5.305e-40						
	MnO4-2	5.305e-40	1.582e-40	-39.275	-39.801	-0.525	(0)
Mn(7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.225	-44.383	-0.158	(0)

Mo	1.403e-05						
MoO4-2	1.403e-05	4.360e-06	-4.853	-5.361	-0.508	(0)	
HMoO4-	1.522e-09	9.009e-10	-8.818	-9.045	-0.228	(0)	
H2MoO4	6.852e-14	6.852e-14	-13.164	-13.164	0.000	(0)	
AlMo6O21-3	2.106e-38	1.883e-40	-37.677	-39.725	-2.049	(0)	
Mo7O24-6	0.000e+00	0.000e+00	-40.202	-48.397	-8.195	(0)	
HMo7O24-5	0.000e+00	0.000e+00	-44.303	-49.994	-5.691	(0)	
H2Mo7O24-4	0.000e+00	0.000e+00	-49.553	-53.195	-3.642	(0)	
H3Mo7O24-3	0.000e+00	0.000e+00	-55.884	-57.933	-2.049	(0)	
N (-3)	2.167e-07						
NH4+	1.818e-07	1.239e-07	-6.740	-6.907	-0.167	(0)	
NH4SO4-	2.794e-08	2.065e-08	-7.554	-7.685	-0.131	(0)	
NH3	6.804e-09	6.804e-09	-8.167	-8.167	0.000	(0)	
CaNH3+2	1.108e-10	1.361e-11	-9.956	-10.866	-0.911	(0)	
CuNH3+2	1.090e-11	1.340e-12	-10.962	-11.873	-0.911	(0)	
NiNH3+2	4.253e-15	5.226e-16	-14.371	-15.282	-0.911	(0)	
Co (NH3) +2	3.364e-15	4.134e-16	-14.473	-15.384	-0.911	(0)	
BaNH3+2	2.353e-16	2.891e-17	-15.628	-16.539	-0.911	(0)	
Hg (NH3) 2+2	1.803e-18	2.216e-19	-17.744	-18.654	-0.911	(0)	
Ca (NH3) 2+2	3.000e-19	3.687e-20	-18.523	-19.433	-0.911	(0)	
HgNH3+2	2.651e-19	3.257e-20	-18.577	-19.487	-0.911	(0)	
Ni (NH3) 2+2	4.183e-21	5.140e-22	-20.379	-21.289	-0.911	(0)	
Co (NH3) 2+2	9.764e-22	1.200e-22	-21.010	-21.921	-0.911	(0)	
Hg (NH3) 3+2	4.884e-26	6.002e-27	-25.311	-26.222	-0.911	(0)	
Co (NH3) 3+2	8.363e-29	1.028e-29	-28.078	-28.988	-0.911	(0)	
Hg (NH3) 4+2	2.640e-33	3.244e-34	-32.578	-33.489	-0.911	(0)	
Co (NH3) 4+2	2.986e-36	3.669e-37	-35.525	-36.435	-0.911	(0)	
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.127	-42.038	-0.911	(0)	
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.472	-44.383	-0.911	(0)	
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.514	-51.562	-2.049	(0)	
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.480	-51.390	-0.911	(0)	
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.458	-52.369	-0.911	(0)	
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.020	-61.247	-0.228	(0)	
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.269	-66.179	-0.911	(0)	
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.363	-66.273	-0.911	(0)	
N (3)	2.223e-05						
NO2-	2.223e-05	1.545e-05	-4.653	-4.811	-0.158	(0)	
CuNO2+	5.259e-11	3.113e-11	-10.279	-10.507	-0.228	(0)	
CoNO2+	9.294e-14	5.503e-14	-13.032	-13.259	-0.228	(0)	
Cu (NO2) 2	4.922e-15	4.922e-15	-14.308	-14.308	0.000	(0)	
N (5)	1.965e-08						
NO3-	1.952e-08	1.458e-08	-7.709	-7.836	-0.127	(0)	
CaNO3+	1.237e-10	7.325e-11	-9.908	-10.135	-0.228	(0)	
MnNO3+	1.554e-12	9.203e-13	-11.808	-12.036	-0.228	(0)	
ZnNO3+	2.918e-13	1.728e-13	-12.535	-12.763	-0.228	(0)	
CuNO3+	1.498e-15	8.870e-16	-14.824	-15.052	-0.228	(0)	
BaNO3+	8.309e-16	4.919e-16	-15.080	-15.308	-0.228	(0)	
CdNO3+	1.265e-16	7.489e-17	-15.898	-16.126	-0.228	(0)	
PbNO3+	2.003e-17	1.186e-17	-16.698	-16.926	-0.228	(0)	
CoNO3+	1.972e-17	1.168e-17	-16.705	-16.933	-0.228	(0)	
NiNO3+	8.845e-18	5.237e-18	-17.053	-17.281	-0.228	(0)	
Mn (NO3) 2	3.370e-20	3.370e-20	-19.472	-19.472	0.000	(0)	
Zn (NO3) 2	5.024e-22	5.024e-22	-21.299	-21.299	0.000	(0)	
UO2NO3+	4.243e-22	2.512e-22	-21.372	-21.600	-0.228	(0)	
Cu (NO3) 2	1.628e-24	1.628e-24	-23.788	-23.788	0.000	(0)	
CrNO3+2	1.432e-24	1.760e-25	-23.844	-24.754	-0.911	(0)	
VO2NO3	8.595e-25	8.595e-25	-24.066	-24.066	0.000	(0)	
Cd (NO3) 2	5.471e-25	5.471e-25	-24.262	-24.262	0.000	(0)	
Co (NO3) 2	3.463e-25	3.463e-25	-24.461	-24.461	0.000	(0)	
Pb (NO3) 2	2.936e-25	2.936e-25	-24.532	-24.532	0.000	(0)	
FeNO3+2	2.083e-27	2.559e-28	-26.681	-27.592	-0.911	(0)	
HgNO3+	6.897e-29	4.083e-29	-28.161	-28.389	-0.228	(0)	
Hg (NO3) 2	2.474e-37	2.474e-37	-36.607	-36.607	0.000	(0)	
Na	5.288e-02						
Na+	4.879e-02	3.643e-02	-1.312	-1.439	-0.127	(0)	
NaSO4-	4.076e-03	3.042e-03	-2.390	-2.517	-0.127	(0)	
NaHCO3	9.454e-06	9.454e-06	-5.024	-5.024	0.000	(0)	
NaF	3.242e-06	3.242e-06	-5.489	-5.489	0.000	(0)	

	NaCO3-	1.894e-06	1.413e-06	-5.723	-5.850	-0.127	(0)
	NaH2BO3	5.948e-07	5.948e-07	-6.226	-6.226	0.000	(0)
	NaCrO4-	1.635e-15	9.678e-16	-14.787	-15.014	-0.228	(0)
Ni		9.424e-10					
	Ni+2	4.603e-10	1.430e-10	-9.337	-9.845	-0.508	(0)
	NiSO4	4.438e-10	4.438e-10	-9.353	-9.353	0.000	(0)
	NiHCO3+	1.375e-11	8.138e-12	-10.862	-11.089	-0.228	(0)
	NiCO3	1.112e-11	1.112e-11	-10.954	-10.954	0.000	(0)
	NiCl+	7.628e-12	4.516e-12	-11.118	-11.345	-0.228	(0)
	NiOH+	2.939e-12	1.740e-12	-11.532	-11.759	-0.228	(0)
	Ni (SO4) 2-2	1.860e-12	2.285e-13	-11.731	-12.641	-0.911	(0)
	NiF+	8.560e-13	5.068e-13	-12.068	-12.295	-0.228	(0)
	Ni (OH) 2	1.336e-13	1.336e-13	-12.874	-12.874	0.000	(0)
	NiNH3+2	4.253e-15	5.226e-16	-14.371	-15.282	-0.911	(0)
	NiCl2	2.806e-16	2.806e-16	-15.552	-15.552	0.000	(0)
	Ni (OH) 3-	2.181e-16	1.291e-16	-15.661	-15.889	-0.228	(0)
	NiSeO4	3.553e-17	3.553e-17	-16.449	-16.449	0.000	(0)
	NiNO3+	8.845e-18	5.237e-18	-17.053	-17.281	-0.228	(0)
	Ni (NH3) 2+2	4.183e-21	5.140e-22	-20.379	-21.289	-0.911	(0)
O (0)		2.374e-35					
	O2	1.187e-35	1.243e-35	-34.926	-34.906	0.020	(0)
Pb		1.582e-09					
	PbSO4	4.190e-10	4.190e-10	-9.378	-9.378	0.000	(0)
	PbCO3	3.446e-10	3.446e-10	-9.463	-9.463	0.000	(0)
	Pb (SO4) 2-2	3.195e-10	3.926e-11	-9.496	-10.406	-0.911	(0)
	PbOH+	2.256e-10	1.336e-10	-9.647	-9.874	-0.228	(0)
	Pb+2	1.771e-10	5.502e-11	-9.752	-10.259	-0.508	(0)
	PbCl+	4.069e-11	2.409e-11	-10.391	-10.618	-0.228	(0)
	PbHCO3+	3.186e-11	1.887e-11	-10.497	-10.724	-0.228	(0)
	Pb (CO3) 2-2	1.685e-11	2.071e-12	-10.773	-11.684	-0.911	(0)
	Pb (OH) 2	4.082e-12	4.082e-12	-11.389	-11.389	0.000	(0)
	PbCl2	1.328e-12	1.328e-12	-11.877	-11.877	0.000	(0)
	PbF+	9.237e-13	5.469e-13	-12.034	-12.262	-0.228	(0)
	PbCl3-	1.102e-14	6.523e-15	-13.958	-14.186	-0.228	(0)
	Pb (OH) 3-	6.663e-15	3.945e-15	-14.176	-14.404	-0.228	(0)
	PbF2	1.518e-15	1.518e-15	-14.819	-14.819	0.000	(0)
	PbCl4-2	2.994e-16	3.679e-17	-15.524	-16.434	-0.911	(0)
	PbNO3+	2.003e-17	1.186e-17	-16.698	-16.926	-0.228	(0)
	Pb2OH+3	1.303e-17	1.165e-19	-16.885	-18.934	-2.049	(0)
	Pb (OH) 4-2	7.599e-18	9.337e-19	-17.119	-18.030	-0.911	(0)
	PbF3-	6.860e-19	4.062e-19	-18.164	-18.391	-0.228	(0)
	PbF4-2	2.232e-22	2.742e-23	-21.651	-22.562	-0.911	(0)
	Pb3 (OH) 4+2	1.488e-22	1.829e-23	-21.827	-22.738	-0.911	(0)
	Pb (NO3) 2	2.936e-25	2.936e-25	-24.532	-24.532	0.000	(0)
	Pb4 (OH) 4+4	3.506e-26	7.993e-30	-25.455	-29.097	-3.642	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.611	-151.611	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.394	-228.622	-0.228	(0)
S (-2)		0.000e+00					
	HS-	0.000e+00	0.000e+00	-78.083	-78.311	-0.228	(0)
	S5-2	0.000e+00	0.000e+00	-78.782	-79.692	-0.911	(0)
	CdHS+	0.000e+00	0.000e+00	-78.864	-79.092	-0.228	(0)
	H2S	0.000e+00	0.000e+00	-79.274	-79.274	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-79.298	-80.208	-0.911	(0)
	S4-2	0.000e+00	0.000e+00	-79.377	-80.288	-0.911	(0)
	S3-2	0.000e+00	0.000e+00	-80.183	-81.094	-0.911	(0)
	S2-2	0.000e+00	0.000e+00	-81.199	-82.110	-0.911	(0)
	S-2	0.000e+00	0.000e+00	-87.102	-87.627	-0.525	(0)
	HgHS2-	0.000e+00	0.000e+00	-136.602	-136.830	-0.228	(0)
	HgS2-2	0.000e+00	0.000e+00	-136.644	-137.554	-0.911	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.419	-138.419	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-146.611	-147.079	-0.469	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-146.926	-147.154	-0.228	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.370	-147.809	-0.439	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-149.128	-149.128	0.000	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.199	-150.199	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.611	-151.611	0.000	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-160.184	-160.184	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.521	-216.749	-0.228	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-223.931	-224.158	-0.228	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.244	-226.155	-0.911	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.382	-226.609	-0.228	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.394	-228.622	-0.228	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.230	-236.458	-0.228	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.813	-302.724	-0.911	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.018	-303.929	-0.911	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.165	-318.076	-0.911	(0)
S (6)	7.965e-02					
SO4-2	5.005e-02	1.555e-02	-1.301	-1.808	-0.508	(0)
MgSO4	1.680e-02	1.680e-02	-1.775	-1.775	0.000	(0)
CaSO4	5.661e-03	5.661e-03	-2.247	-2.247	0.000	(0)
NaSO4-	4.076e-03	3.042e-03	-2.390	-2.517	-0.127	(0)
KSO4-	2.912e-03	2.173e-03	-2.536	-2.663	-0.127	(0)
MnSO4	1.102e-04	1.102e-04	-3.958	-3.958	0.000	(0)
Zn (SO4) 2-2	1.769e-05	2.174e-06	-4.752	-5.663	-0.911	(0)
ZnSO4	1.605e-05	1.605e-05	-4.794	-4.794	0.000	(0)
CuSO4	6.855e-08	6.855e-08	-7.164	-7.164	0.000	(0)
NH4SO4-	2.794e-08	2.065e-08	-7.554	-7.685	-0.131	(0)
HSO4-	2.164e-08	1.578e-08	-7.665	-7.802	-0.137	(0)
Cd (SO4) 2-2	1.011e-08	1.242e-09	-7.995	-8.906	-0.911	(0)
CdSO4	5.923e-09	5.923e-09	-8.227	-8.227	0.000	(0)
CoSO4	1.568e-09	1.568e-09	-8.805	-8.805	0.000	(0)
NiSO4	4.438e-10	4.438e-10	-9.353	-9.353	0.000	(0)
PbSO4	4.190e-10	4.190e-10	-9.378	-9.378	0.000	(0)
Pb (SO4) 2-2	3.195e-10	3.926e-11	-9.496	-10.406	-0.911	(0)
CrOHSO4	2.155e-11	2.155e-11	-10.667	-10.667	0.000	(0)
Ni (SO4) 2-2	1.860e-12	2.285e-13	-11.731	-12.641	-0.911	(0)
FeSO4	1.172e-12	1.172e-12	-11.931	-11.931	0.000	(0)
AlSO4+	3.644e-13	2.657e-13	-12.438	-12.576	-0.137	(0)
UO2 (SO4) 2-2	3.391e-13	4.167e-14	-12.470	-13.380	-0.911	(0)
UO2SO4	2.033e-13	2.033e-13	-12.692	-12.692	0.000	(0)
Al (SO4) 2-	6.072e-14	4.428e-14	-13.217	-13.354	-0.137	(0)
CrSO4+	1.694e-14	1.003e-14	-13.771	-13.999	-0.228	(0)
VO2SO4-	7.311e-17	4.329e-17	-16.136	-16.364	-0.228	(0)
FeSO4+	4.145e-19	3.063e-19	-18.382	-18.514	-0.131	(0)
Fe (SO4) 2-	1.720e-19	1.018e-19	-18.764	-18.992	-0.228	(0)
Cr2 (OH) 2SO4+2	9.259e-20	1.138e-20	-19.033	-19.944	-0.911	(0)
VOSO4	7.016e-20	7.016e-20	-19.154	-19.154	0.000	(0)
HgSO4	3.089e-20	3.089e-20	-19.510	-19.510	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.051e-20	1.051e-20	-19.978	-19.978	0.000	(0)
CrO3SO4-2	7.214e-23	8.865e-24	-22.142	-23.052	-0.911	(0)
VSO4+	1.772e-34	1.049e-34	-33.752	-33.979	-0.228	(0)
U (SO4) 2	3.352e-40	3.352e-40	-39.475	-39.475	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.656	-41.566	-0.911	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.020	-61.247	-0.228	(0)
Sb (3)	1.462e-19					
Sb (OH) 3	7.387e-20	7.387e-20	-19.132	-19.132	0.000	(0)
HSbO2	7.235e-20	7.235e-20	-19.141	-19.141	0.000	(0)
SbO2-	1.906e-23	1.128e-23	-22.720	-22.948	-0.228	(0)
Sb (OH) 4-	1.085e-23	6.423e-24	-22.965	-23.192	-0.228	(0)
Sb (OH) 2F	1.696e-25	1.696e-25	-24.771	-24.771	0.000	(0)
SbOF	1.673e-25	1.673e-25	-24.776	-24.776	0.000	(0)
Sb (OH) 2+	3.157e-26	1.869e-26	-25.501	-25.728	-0.228	(0)
SbO+	1.092e-26	6.465e-27	-25.962	-26.189	-0.228	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.165	-318.076	-0.911	(0)
Sb (5)	1.771e-07					
SbO3-	1.769e-07	1.047e-07	-6.752	-6.980	-0.228	(0)
Sb (OH) 6-	1.625e-10	1.213e-10	-9.789	-9.916	-0.127	(0)
SbO2+	5.490e-24	3.250e-24	-23.260	-23.488	-0.228	(0)
Se (-2)	9.087e-39					
HSe-	9.087e-39	5.380e-39	-38.042	-38.269	-0.228	(0)
MnSe	0.000e+00	0.000e+00	-40.070	-40.070	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.363	-42.363	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.375	-45.286	-0.911	(0)
Se (4)	1.538e-06					
SeO3-2	9.978e-07	1.226e-07	-6.001	-6.911	-0.911	(0)
HSeO3-	5.401e-07	3.198e-07	-6.267	-6.495	-0.228	(0)

H2SeO3	1.417e-12	1.417e-12	-11.849	-11.849	0.000	(0)
Cd (SeO3) 2-2	1.638e-16	2.013e-17	-15.786	-16.696	-0.911	(0)
FeHSeO3+2	1.207e-23	1.484e-24	-22.918	-23.829	-0.911	(0)
Se (6)	1.715e-09					
SeO4-2	1.709e-09	5.311e-10	-8.767	-9.275	-0.508	(0)
MnSeO4	5.695e-12	5.695e-12	-11.244	-11.244	0.000	(0)
ZnSeO4	3.882e-13	3.882e-13	-12.411	-12.411	0.000	(0)
HSeO4-	4.669e-16	2.764e-16	-15.331	-15.558	-0.228	(0)
CdSeO4	1.607e-16	1.607e-16	-15.794	-15.794	0.000	(0)
CoSeO4	1.345e-16	1.345e-16	-15.871	-15.871	0.000	(0)
NiSeO4	3.553e-17	3.553e-17	-16.449	-16.449	0.000	(0)
Zn (SeO4) 2-2	1.701e-21	2.090e-22	-20.769	-21.680	-0.911	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.895	-59.944	-2.049	(0)
U (4)	4.576e-20					
U (OH) 5-	4.575e-20	2.709e-20	-19.340	-19.567	-0.228	(0)
U (OH) 4	1.182e-23	1.182e-23	-22.927	-22.927	0.000	(0)
U (OH) 3+	7.604e-28	4.502e-28	-27.119	-27.347	-0.228	(0)
U (OH) 2+2	1.765e-32	2.169e-33	-31.753	-32.664	-0.911	(0)
UF3+	8.274e-37	4.899e-37	-36.082	-36.310	-0.228	(0)
UF2+2	1.783e-37	2.191e-38	-36.749	-37.659	-0.911	(0)
UOH+3	1.191e-37	1.064e-39	-36.924	-38.973	-2.049	(0)
UF4	7.577e-39	7.577e-39	-38.120	-38.120	0.000	(0)
UF+3	1.380e-39	0.000e+00	-38.860	-40.909	-2.049	(0)
U (SO4) 2	3.352e-40	3.352e-40	-39.475	-39.475	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.145	-40.373	-0.228	(0)
USO4+2	0.000e+00	0.000e+00	-40.656	-41.566	-0.911	(0)
UF6-2	0.000e+00	0.000e+00	-40.833	-41.744	-0.911	(0)
U+4	0.000e+00	0.000e+00	-42.716	-46.358	-3.642	(0)
UC1+3	0.000e+00	0.000e+00	-44.518	-46.567	-2.049	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-157.133	-175.571	-18.438	(0)
U (5)	1.444e-16					
UO2+	1.444e-16	8.550e-17	-15.840	-16.068	-0.228	(0)
U (6)	1.389e-06					
UO2 (CO3) 3-4	1.364e-06	3.110e-10	-5.865	-9.507	-3.642	(0)
UO2 (CO3) 2-2	2.424e-08	2.979e-09	-7.615	-8.526	-0.911	(0)
UO2CO3	7.165e-11	7.165e-11	-10.145	-10.145	0.000	(0)
UO2OH+	1.775e-12	1.051e-12	-11.751	-11.978	-0.228	(0)
UO2 (SO4) 2-2	3.391e-13	4.167e-14	-12.470	-13.380	-0.911	(0)
UO2F+	2.841e-13	1.682e-13	-12.547	-12.774	-0.228	(0)
UO2SO4	2.033e-13	2.033e-13	-12.692	-12.692	0.000	(0)
UO2F2	6.842e-14	6.842e-14	-13.165	-13.165	0.000	(0)
UO2+2	2.780e-14	8.638e-15	-13.556	-14.064	-0.508	(0)
UO2F3-	4.095e-15	2.424e-15	-14.388	-14.615	-0.228	(0)
UO2C1+	2.920e-16	1.729e-16	-15.535	-15.762	-0.228	(0)
UO2F4-2	2.211e-17	2.717e-18	-16.655	-17.566	-0.911	(0)
(UO2) 2 (OH) 2+2	1.492e-17	1.833e-18	-16.826	-17.737	-0.911	(0)
(UO2) 3 (OH) 5+	2.305e-18	1.365e-18	-17.637	-17.865	-0.228	(0)
UO2NO3+	4.243e-22	2.512e-22	-21.372	-21.600	-0.228	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.222	-42.449	-0.228	(0)
V+2	0.000e+00	0.000e+00	-43.034	-43.944	-0.911	(0)
V (3)	1.041e-14					
V (OH) 3	1.041e-14	1.041e-14	-13.983	-13.983	0.000	(0)
V (OH) 2+	1.183e-25	7.006e-26	-24.927	-25.155	-0.228	(0)
VOH+2	5.634e-29	6.923e-30	-28.249	-29.160	-0.911	(0)
V+3	1.599e-33	1.429e-35	-32.796	-34.845	-2.049	(0)
VSO4+	1.772e-34	1.049e-34	-33.752	-33.979	-0.228	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.814	-55.862	-2.049	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.877	-57.519	-3.642	(0)
V (4)	5.546e-18					
V (OH) 3+	5.318e-18	3.148e-18	-17.274	-17.502	-0.228	(0)
VO+2	1.333e-19	1.638e-20	-18.875	-19.786	-0.911	(0)
VOSO4	7.016e-20	7.016e-20	-19.154	-19.154	0.000	(0)
VOF+	2.341e-20	1.386e-20	-19.631	-19.858	-0.228	(0)
VOC1+	9.579e-22	5.671e-22	-21.019	-21.246	-0.228	(0)
VOF2	7.331e-22	7.331e-22	-21.135	-21.135	0.000	(0)
VOF3-	6.198e-24	3.669e-24	-23.208	-23.435	-0.228	(0)

VOF4-2	1.700e-26	2.089e-27	-25.769	-26.680	-0.911	(0)
H2V2O4+2	4.070e-30	5.002e-31	-29.390	-30.301	-0.911	(0)
V (5)	1.969e-07					
HVO4-2	1.060e-07	1.302e-08	-6.975	-7.885	-0.911	(0)
H2VO4-	9.091e-08	5.383e-08	-7.041	-7.269	-0.228	(0)
HV2O7-3	2.665e-11	2.383e-13	-10.574	-12.623	-2.049	(0)
H3VO4	5.589e-12	5.589e-12	-11.253	-11.253	0.000	(0)
H3V2O7-	3.292e-12	1.949e-12	-11.483	-11.710	-0.228	(0)
V2O7-4	2.709e-12	6.176e-16	-11.567	-15.209	-3.642	(0)
VO4-3	7.030e-13	6.284e-15	-12.153	-14.202	-2.049	(0)
V3O9-3	1.845e-14	1.649e-16	-13.734	-15.783	-2.049	(0)
VO2+	1.562e-16	1.166e-16	-15.806	-15.933	-0.127	(0)
VO2SO4-	7.311e-17	4.329e-17	-16.136	-16.364	-0.228	(0)
VO2F	2.884e-17	2.884e-17	-16.540	-16.540	0.000	(0)
V4O12-4	1.629e-17	3.714e-21	-16.788	-20.430	-3.642	(0)
VO2F2-	2.495e-18	1.477e-18	-17.603	-17.831	-0.228	(0)
VO2F3-2	2.115e-20	2.599e-21	-19.675	-20.585	-0.911	(0)
VO2F4-3	2.018e-23	1.804e-25	-22.695	-24.744	-2.049	(0)
VO2NO3	8.595e-25	8.595e-25	-24.066	-24.066	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-47.507	-55.701	-8.195	(0)
HV10O28-5	0.000e+00	0.000e+00	-49.808	-55.498	-5.691	(0)
H2V10O28-4	0.000e+00	0.000e+00	-54.632	-58.274	-3.642	(0)
Zn	5.087e-05					
Zn (SO4) 2-2	1.769e-05	2.174e-06	-4.752	-5.663	-0.911	(0)
ZnSO4	1.605e-05	1.605e-05	-4.794	-4.794	0.000	(0)
Zn+2	1.519e-05	4.719e-06	-4.819	-5.326	-0.508	(0)
ZnOH+	7.702e-07	4.560e-07	-6.113	-6.341	-0.228	(0)
ZnCO3	5.658e-07	5.658e-07	-6.247	-6.247	0.000	(0)
ZnCl+	2.035e-07	1.463e-07	-6.691	-6.835	-0.143	(0)
ZnOHCl	1.851e-07	1.851e-07	-6.733	-6.733	0.000	(0)
ZnHCO3+	1.163e-07	6.886e-08	-6.934	-7.162	-0.228	(0)
Zn (OH) 2	6.985e-08	6.985e-08	-7.156	-7.156	0.000	(0)
ZnF+	2.243e-08	1.328e-08	-7.649	-7.877	-0.228	(0)
ZnCl2	2.860e-09	2.860e-09	-8.544	-8.544	0.000	(0)
Zn (OH) 3-	5.714e-10	3.383e-10	-9.243	-9.471	-0.228	(0)
ZnCl3-	3.901e-11	2.804e-11	-10.409	-10.552	-0.143	(0)
ZnCl4-2	5.800e-13	1.730e-13	-12.237	-12.762	-0.525	(0)
ZnSeO4	3.882e-13	3.882e-13	-12.411	-12.411	0.000	(0)
ZnNO3+	2.918e-13	1.728e-13	-12.535	-12.763	-0.228	(0)
Zn (OH) 4-2	1.059e-13	1.302e-14	-12.975	-13.885	-0.911	(0)
Zn (SeO4) 2-2	1.701e-21	2.090e-22	-20.769	-21.680	-0.911	(0)
Zn (NO3) 2	5.024e-22	5.024e-22	-21.299	-21.299	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-146.926	-147.154	-0.228	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.128	-149.128	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.931	-224.158	-0.228	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.244	-226.155	-0.911	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.018	-303.929	-0.911	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.39	-49.10	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.76	-37.25	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.99	-37.25	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.89	-53.96	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-56.20	-36.17	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.49	-28.09	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.54	-23.09	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.51	9.29	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.76	-45.40	2.37	Al2 (MoO4) 3
Al2O3	-1.07	18.58	19.65	Al2O3
Al4 (OH) 10SO4	-3.32	19.38	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.66	-6.86	4.80	AlAsO4:2H2O
AlOHSO4	-5.25	-8.48	-3.23	AlOHSO4
AlSb	-152.10	-86.47	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.28	-12.07	-7.79	PbSO4

Anhydrite	-0.25	-4.61	-4.36	CaSO ₄
Anilite	-55.10	-86.98	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-1.81	6.97	8.79	Cu ₃ (OH) 4SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-88.41	-91.17	-2.76	As ₄ O ₆
Artinite	-3.77	5.83	9.60	MgCO ₃ :Mg(OH) 2:3H ₂ O
As ₂ O ₅	-39.00	-32.29	6.71	As ₂ O ₅
Atacamite	-0.78	6.61	7.39	Cu ₂ (OH) 3Cl
Azurite	-1.64	-18.55	-16.91	Cu ₃ (OH) 2 (CO ₃) 2
Ba(OH) 2:8H ₂ O	-16.61	7.78	24.39	Ba(OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-16.19	-0.32	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	-0.00	-8.91	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-25.46	7.48	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-12.77	-22.44	-9.67	BaCrO ₄
BaF ₂	-10.05	-15.87	-5.82	BaF ₂
BaMoO ₄	-6.57	-13.53	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-8.51	-6.68	1.83	BaSeO ₃
BaSeO ₄	-9.99	-17.45	-7.46	BaSeO ₄
Bianchite	-5.38	-7.14	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-6.33	11.76	18.09	MnO ₂
Bixbyite	-1.38	-2.02	-0.64	Mn ₂ O ₃
BlaubleiI	-55.07	-79.23	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.53	-82.81	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.71	9.29	8.58	AlOOH
Breithauptite	-58.35	-76.87	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-3.11	13.74	16.84	Mg(OH) 2
Bunsenite	-6.32	6.12	12.45	NiO
Ca(VO ₃) 2	-8.39	-2.73	5.66	Ca(VO ₃) 2
Ca ₂ V ₂ O ₇	-7.07	10.43	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-11.12	10.43	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-15.10	7.20	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-15.36	23.60	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-16.27	23.59	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-295.00	-152.03	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-4.93	-22.84	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.21	-8.16	-7.95	CaMoO ₄
Carnotite	-0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.13	-1.31	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.06	-12.08	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) 2	-10.13	-0.29	9.84	Cd(BO ₂) 2
Cd(OH) 2	-6.47	7.18	13.64	Cd(OH) 2
Cd(OH) 2 (am)	-6.55	7.18	13.73	Cd(OH) 2
Cd ₃ (OH) 2 (SO ₄) 2	-20.73	-14.02	6.71	Cd ₃ (OH) 2 (SO ₄) 2
Cd ₃ (OH) 4SO ₄	-18.81	3.75	22.56	Cd ₃ (OH) 4SO ₄
Cd ₄ (OH) 6SO ₄	-17.47	10.93	28.40	Cd ₄ (OH) 6SO ₄
CdCl ₂	-11.95	-12.61	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-10.91	-12.61	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-10.70	-12.61	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.28	-16.49	-1.21	CdF ₂
Cdmetal (alpha)	-31.88	-18.37	13.51	Cd
Cdmetal (gamma)	-31.99	-18.37	13.62	Cd
CdMoO ₄	-0.00	-14.15	-14.15	CdMoO ₄
CdOHCl	-6.25	-2.72	3.54	CdOHCl
CdSb	-75.46	-75.81	-0.35	CdSb
CdSe	-18.87	-39.07	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.22	-18.07	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.43	-10.60	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.87	-10.60	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.73	-10.60	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-2.81	-15.94	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-6.89	-9.53	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.04	-89.96	-34.92	Cu ₂ S

Chalcopyrite	-125.61	-160.88	-35.27	CuFeS2
Cinnabar	-50.95	-96.64	-45.69	HgS
Claudetite	-88.11	-91.17	-3.06	As4O6
Clausthalite	-13.45	-40.55	-27.10	PbSe
Co(BO2)2	-27.87	-0.80	27.07	Co(BO2)2
Co(OH)2	-6.43	6.67	13.09	Co(OH)2
Co(OH)3	-10.65	-12.96	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-25.32	-12.28	13.03	Co3(AsO4)2
Co3O4	-8.75	-19.25	-10.50	Co3O4
CoCl2	-21.38	-13.11	8.27	CoCl2
CoCl2:6H2O	-15.66	-13.12	2.54	CoCl2:6H2O
CoCO3	-5.00	-14.98	-9.98	CoCO3
CoF2	-15.40	-17.00	-1.60	CoF2
CoF3	-47.00	-48.46	-1.46	CoF3
CoFe2O4	16.58	13.06	-3.53	CoFe2O4
CoMoO4	-6.90	-14.66	-7.76	CoMoO4
CoO	-6.92	6.67	13.59	CoO
CoS(alpha)	-72.18	-79.62	-7.44	CoS
CoS(beta)	-68.55	-79.62	-11.07	CoS
CoSe	-23.38	-39.58	-16.20	CoSe
CoSeO3	-9.13	-7.81	1.32	CoSeO3
CoSeO4:6H2O	-17.05	-18.58	-1.53	CoSeO4:6H2O
CoSO4	-13.91	-11.10	2.80	CoSO4
CoSO4:6H2O	-8.64	-11.11	-2.47	CoSO4:6H2O
Cotunnite	-9.30	-14.08	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-21.82	-11.01	10.82	Cr(OH)2
Cr(OH)3	-2.52	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-45.97	-30.85	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.24	-42.08	-33.84	Na3AlF6
Cu(OH)2	-0.43	8.25	8.67	Cu(OH)2
Cu(SbO3)2	-24.13	21.08	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.57	0.68	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.47	-89.35	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.12	-49.92	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.64	-7.54	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.67	-101.26	-42.59	Cu3Sb
Cu3Se2	-24.43	-87.92	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.55	-21.99	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.27	10.30	CuOCuSO4
Cupricferrite	8.65	14.64	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.90	-38.00	-33.10	CuSe
CuSe2	-25.34	-58.71	-33.37	CuSe2
CuSeO3:2H2O	-6.74	-6.23	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.56	-17.00	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.52	2.94	CuSO4
Diaspore	2.42	9.29	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.15	-16.39	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.70	-16.39	-17.09	CaMg(CO3)2
Epsomite	-1.92	-4.04	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2

Fe (OH) 2.7Cl.3	3.26	0.22	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-8.73	-12.45	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.65	-8.09	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.42	-37.05	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.20	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.10	7.20	FeCr2O4
FeMoO4	-7.78	-17.87	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-44.91	-63.51	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.80	-42.80	-11.00	FeSe
Fix_pe	-4.79	-4.79	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.62	-80.59	-13.97	PbS
Gibbsite	1.00	9.29	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.13	-7.14	-2.01	ZnSO4:7H2O
Greenockite	-64.76	-79.12	-14.36	CdS
Greigite	-290.30	-335.33	-45.03	Fe3S4
Gummite	-5.77	1.90	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.45	-21.33	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.29	-46.25	-4.96	H2Se
Halite	-4.95	-3.35	1.60	NaCl
Hausmannite	-0.79	60.24	61.03	Mn3O4
Hematite	7.80	6.39	-1.42	Fe2O3
Hercynite	-0.86	22.04	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.30	-258.00	-73.71	Hg (CH3) 2
Hg (g)	-6.43	-14.30	-7.87	Hg
Hg (OH) 2	-6.85	-10.35	-3.50	Hg (OH) 2
Hg2 (g)	-13.65	-28.60	-14.96	Hg2
Hg2 (OH) 2	-8.32	-3.06	5.26	Hg2 (OH) 2
Hg2CO3	-8.65	-24.70	-16.05	Hg2CO3
Hg2CrO4	-24.59	-33.29	-8.70	Hg2CrO4
Hg2F2	-16.36	-26.72	-10.36	Hg2F2
Hg2S	-77.67	-89.35	-11.68	Hg2S
Hg2SeO3	-12.88	-17.53	-4.66	Hg2SeO3
Hg2SO4	-14.70	-20.83	-6.13	Hg2SO4
Hg3O2CO3	-23.01	-52.69	-29.68	Hg3O2CO3
HgCl (g)	-30.92	-11.42	19.50	HgCl
HgCl2	-8.87	-30.13	-21.26	HgCl2
HgF (g)	-46.04	-13.36	32.68	HgF
HgF2 (g)	-46.58	-34.02	12.57	HgF2
Hgmetal (l)	-0.85	-14.30	-13.45	Hg
HgSe	-0.91	-56.60	-55.69	HgSe
HgSeO3	-12.40	-24.83	-12.43	HgSeO3
HgSO4	-18.70	-28.12	-9.42	HgSO4
Huntite	-2.24	-32.20	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.41	-26.18	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.13	-17.90	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-14.83	-20.00	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-4.89	-19.69	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-30.68	-47.92	-17.24	K2Cr2O7
K2CrO4	-17.17	-17.68	-0.51	K2CrO4
K2MoO4	-12.03	-8.77	3.26	K2MoO4
K2SeO4	-11.95	-12.68	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.93	-6.36	-0.43	PbO:PbSO4
Laurionite	-4.81	-4.19	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.99	5.71	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	0.00	6.39	6.39	Fe2O3

Magnesioferrite	3.27	20.13	16.86	Fe2MgO4
Magnesite	-0.45	-7.91	-7.46	MgCO3
Magnetite	6.44	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.00	24.34	25.34	MnOOH
Massicot	-7.19	5.71	12.89	PbO
Matlockite	-7.05	-16.02	-8.97	PbClF
Melanothallite	-17.79	-11.53	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-51.55	-96.64	-45.09	HgS
Mg (OH) 2 (active)	-5.06	13.74	18.79	Mg (OH) 2
Mg (VO3) 2	-13.44	-2.16	11.28	Mg (VO3) 2
Mg2Sb3	-270.63	-195.95	74.68	Mg2Sb3
Mg2V2O7	-14.78	11.58	26.36	Mg2V2O7
MgCr2O4	-4.82	11.38	16.20	MgCr2O4
MgCrO4	-21.88	-16.50	5.38	MgCrO4
MgF2	-1.80	-9.93	-8.13	MgF2
MgMoO4	-5.74	-7.59	-1.85	MgMoO4
MgSeO3:6H2O	-3.80	-0.75	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.31	-11.51	-1.20	MgSeO4:6H2O
Minium	-30.86	42.66	73.52	Pb3O4
Mirabilite	-3.59	-4.70	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-9.23	-4.33	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.63	-55.35	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.48	-85.40	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.11	2.39	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-10.94	-8.22	2.72	MnCl2:4H2O
MnS (grn)	-74.90	-74.73	0.17	MnS
MnS (pnk)	-78.07	-74.73	3.34	MnS
MnSb	-93.87	-96.77	-2.91	MnSb
MnSe	-38.19	-34.69	3.50	MnSe
MnSeO3	-4.04	-2.91	1.13	MnSeO3
MnSeO3:2H2O	-3.90	-2.91	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.63	-13.68	-2.05	MnSeO4:5H2O
MnSO4	-8.79	-6.21	2.58	MnSO4
Monteponite	-7.93	7.18	15.10	CdO
Montroydite	-6.71	-10.35	-3.64	HgO
MoO3	-13.33	-21.33	-8.00	MoO3
Morenosite	-9.52	-11.66	-2.14	NiSO4:7H2O
MoS2	-149.20	-219.46	-70.26	MoS2
Na-Jarosite	-8.23	-19.43	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-37.49	-47.39	-9.90	Na2Cr2O7
Na2CrO4	-20.08	-17.15	2.93	Na2CrO4
Na2Mo2O7	-12.97	-29.56	-16.60	Na2Mo2O7
Na2MoO4	-9.73	-8.24	1.49	Na2MoO4
Na2MoO4:2H2O	-9.46	-8.24	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-11.70	-1.40	10.30	Na2SeO3:5H2O
Na2SeO4	-13.43	-12.15	1.28	Na2SeO4
Na3Sb	-170.58	-76.13	94.45	Na3Sb
Na3VO4	-25.00	11.68	36.68	Na3VO4
Na4V2O7	-27.12	10.28	37.40	Na4V2O7
Nantokite	-4.99	-11.72	-6.73	CuCl
NaSb	-86.84	-63.67	23.17	NaSb
Natron	-7.26	-8.57	-1.31	Na2CO3:10H2O
NaVO3	-5.26	-1.41	3.86	NaVO3
Nesquehonite	-3.24	-7.91	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.67	6.12	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-29.64	-13.94	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-25.29	6.71	32.00	Ni4 (OH) 6SO4
NiCO3	-8.66	-15.53	-6.87	NiCO3
NiMoO4	-4.06	-15.21	-11.14	NiMoO4
NiS (alpha)	-74.57	-80.17	-5.60	NiS
NiS (beta)	-69.07	-80.17	-11.10	NiS
NiS (gamma)	-67.37	-80.17	-12.80	NiS
NiSe	-22.43	-40.13	-17.70	NiSe
NiSeO3:2H2O	-11.17	-8.36	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.61	-19.13	-1.52	NiSeO4:6H2O
Nsutite	-5.74	11.76	17.50	MnO2

O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.40	-304.46	-61.07	As2S3
Otavite	-2.47	-14.47	-12.00	CdCO3
Pb(BO2)2	-8.28	-1.76	6.52	Pb(BO2)2
Pb(OH)2	-2.45	5.70	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-64.06	-72.82	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.27	1.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.78	11.41	26.19	Pb2O(OH)2
Pb2O3	-24.08	36.96	61.04	Pb2O3
Pb2OCO3	-9.68	-10.23	-0.56	Pb2OCO3
Pb2V2O7	-2.59	-4.49	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.97	-15.17	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.92	1.22	6.14	Pb3(VO4)2
Pb3O2CO3	-15.55	-4.53	11.02	Pb3O2CO3
Pb3O2SO4	-11.34	-0.66	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.05	5.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.83	5.05	21.88	Pb4O3SO4
PbCrO4	-11.93	-24.53	-12.60	PbCrO4
PbF2	-10.52	-17.96	-7.44	PbF2
Pbmetal	-24.08	-19.84	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.27	5.71	12.98	PbO:0.33H2O
PbSeO4	-12.69	-19.53	-6.84	PbSeO4
Periclase	-7.84	13.74	21.58	MgO
Phosgenite	-10.21	-30.02	-19.81	PbCl2:PbCO3
Plattnerite	-18.35	31.25	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.63	11.56	15.19	Mn(OH)2
Pyrolusite	-4.27	37.11	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.62	-11.66	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-5.24	-19.74	-14.50	UO2CO3
Sb(OH)3	-12.02	-19.13	-7.11	Sb(OH)3
Sb2O4	-16.12	-12.71	3.40	Sb2O4
Sb2O5	-26.12	-35.79	-9.67	Sb2O5
Sb2Se3	-109.26	-177.01	-67.76	Sb2Se3
Sb4O6(cubic)	-58.26	-76.52	-18.26	Sb4O6
Sb4O6(orth)	-58.62	-76.52	-17.90	Sb4O6
SbCl3	-49.38	-48.80	0.57	SbCl3
SbF3	-44.40	-54.63	-10.23	SbF3
Sbmetal	-45.76	-57.45	-11.69	Sb
SbO2	-2.84	-30.67	-27.82	SbO2
Schoepite	-4.09	1.90	5.99	UO2(OH)2:H2O
Semetal(am)	-13.60	-20.71	-7.11	Se
Semetal(hex)	-13.00	-20.71	-7.71	Se
Senarmontite	-25.89	-38.26	-12.37	Sb2O3
SeO2	-14.60	-14.48	0.12	SeO2
SeO3	-46.28	-25.24	21.04	SeO3
Siderite	-7.95	-18.19	-10.24	FeCO3
Smithsonite	-1.01	-11.01	-10.00	ZnCO3
Sphalerite	-64.20	-75.65	-11.45	ZnS
Spinel	-4.53	32.32	36.85	MgAl2O4
Stibnite	-246.68	-297.14	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.01	-4.69	0.32	Na2SO4
Thermonatrite	-9.20	-8.56	0.64	Na2CO3:H2O
Tyuyamunite	-3.01	1.07	4.08	Ca(UO2)2(VO4)2
U3O8	-13.27	7.81	21.08	U3O8
U3Sb4	-578.72	-426.33	152.38	U3Sb4
U4O9	-29.14	-32.16	-3.02	U4O9
UF4	-32.22	-61.76	-29.54	UF4
UF4:2.5H2O	-29.05	-61.76	-32.72	UF4:2.5H2O
UO2(am)	-15.36	-14.43	0.93	UO2
UO2(NO3)2	-41.88	-29.74	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.59	-29.74	4.85	UO2(NO3)2:2H2O

UO2(NO3)2:3H2O	-33.13	-29.74	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.79	-29.75	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.71	1.90	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.09	-23.34	-2.25	UO2SeO4:4H2O
UO3	-5.80	1.90	7.70	UO3
Uraninite	-9.76	-14.43	-4.67	UO2
USb2	-219.20	-189.62	29.58	USb2
V(OH)3	-18.49	-10.90	7.59	V(OH)3
V2O5	-14.54	-15.90	-1.36	V2O5
V3O5	-38.84	-37.00	1.84	V3O5
V4O7	-48.01	-40.82	7.19	V4O7
V6O13	-37.93	-98.79	-60.86	V6O13
Valentinite	-29.78	-38.26	-8.48	Sb2O3
VC12	-62.33	-43.45	18.87	VC12
VC13	-64.00	-40.57	23.43	VC13
VF4	-66.08	-51.15	14.93	VF4
Vmetal	-93.24	-49.21	44.03	V
VO	-38.42	-23.67	14.76	VO
VO(OH)2	-8.97	-3.82	5.15	VO(OH)2
VO2Cl	-20.68	-17.84	2.84	VO2Cl
VOC1	-31.94	-20.79	11.15	VOC1
VOC12	-36.36	-23.60	12.76	VOC12
VOSO4	-25.20	-21.59	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.70	-75.65	-8.95	ZnS
Zincite	-0.69	10.64	11.33	ZnO
Zincosite	-11.06	-7.13	3.93	ZnSO4
Zn(BO2)2	-5.12	3.17	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.32	-21.01	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.56	10.64	12.20	Zn(OH)2
Zn(OH)2(am)	-1.84	10.64	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.12	10.64	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-0.90	10.64	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.10	10.64	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.00	3.50	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-3.81	11.39	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.03	-0.38	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-22.54	-3.63	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-3.62	24.78	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-5.09	33.41	38.50	Zn5(OH)8Cl2
ZnCl2	-16.19	-9.14	7.05	ZnCl2
ZnCO3:1H2O	-0.75	-11.01	-10.26	ZnCO3:1H2O
ZnF2	-12.49	-13.03	-0.53	ZnF2
Znmetal	-40.69	-14.91	25.79	Zn
ZnMoO4	-0.56	-10.69	-10.13	ZnMoO4
ZnO(active)	-0.55	10.64	11.19	ZnO
ZnS(am)	-66.60	-75.65	-9.05	ZnS
ZnSb	-83.37	-72.35	11.01	ZnSb
ZnSe	-21.21	-35.61	-14.40	ZnSe
ZnSeO4:6H2O	-13.09	-14.61	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.50	-7.14	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 27.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 102
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite    equilibrium_phase 0.2

```

```

        donnan 1e-008
    USE EQUILIBRIUM_PHASES 102
    USE Surface 102
    USE Solution 107
    SAVE Solution 108 #Initial Stage 1 Run-off Water After Mineral
Precipitation and Sorption Loss
    END

```

```

-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

```

-----
Beginning of initial surface-composition calculations.
-----

```

Surface 102.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

    9.622e-16 Surface + diffuse layer charge, eq
    6.141e-08 Surface charge, eq
    4.399e-03 sigma, C/m²
    1.213e-01 psi, V
   -4.722e+00 -F*psi/RT
    8.900e-03 exp(-F*psi/RT)
    6.420e+04 specific area, m²/mol Ferrihydrite
    1.347e+00 m² for 2.098e-05 moles of Ferrihydrite

```

Water in diffuse layer: 1.347e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is +1).

Element	Moles
C	3.4416e-11
Ca	4.2653e-13
Cl	6.8918e-10
H	1.0152e-10
K	6.7664e-13
Mg	6.6083e-14
N	2.7901e-09
Na	2.8668e-12
O	1.2436e-07
S	2.8977e-08

Hfo_s

1.049e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	7.014e-08	0.668	7.014e-08	-7.154
Hfo_sOH	3.440e-08	0.328	3.440e-08	-7.463
Hfo_sO-	3.865e-10	0.004	3.865e-10	-9.413
Hfo_sOHCa+2	1.280e-12	0.000	1.280e-12	-11.893

Hfo_w

4.197e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.939e-06	0.462	1.939e-06	-5.712
Hfo_wOH	9.511e-07	0.227	9.511e-07	-6.022
Hfo_wSO4-	6.550e-07	0.156	6.550e-07	-6.184

Hfo_wOHSO4-2	6.409e-07	0.153	6.409e-07	-6.193
Hfo_wO-	1.069e-08	0.003	1.069e-08	-7.971
Hfo_wOMg+	1.510e-14	0.000	1.510e-14	-13.821
Hfo_wOCa+	5.124e-15	0.000	5.124e-15	-14.290

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 107. Solution after simulation 26.
Using surface 102.
Using pure phase assemblage 102. Pure-phase assemblage after simulation 26.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	1.434e-04	1.434e-04	2.003e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	9.836e-08	8.771e-08	-1.064e-08
Barite	0.00	-9.98	-9.98	5.880e-05	5.883e-05	3.193e-08
Brochantite	-0.00	15.22	15.22	2.628e-04	2.626e-04	-1.978e-07
Brucite	-3.11	13.74	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.023e+01	1.023e+01	2.302e-06
CaMoO4	-0.21	-8.16	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-4.14	-1.32	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	8.989e-02	8.989e-02	-4.211e-06
Carnotite	0.00	0.23	0.23	3.979e-06	3.335e-06	-6.437e-07
Cd(BO2)2	-10.13	-0.29	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.00	-14.15	-14.15	4.923e-07	4.923e-07	-2.695e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-0.80	-3.16	-2.36	3.578e-10	0	-3.578e-10
Cu2Se(alpha)	-4.13	-49.93	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.00	-13.08	-13.08	8.527e-07	8.553e-07	2.590e-09
Epsomite	-1.92	-4.05	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	2.098e-05	2.098e-05	-3.327e-14
Fluorite	0.00	-10.50	-10.50	7.287e-03	7.287e-03	3.107e-09
Gummite	-5.60	2.07	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	3.059e-02	3.060e-02	3.885e-06
HgSe	-0.92	-56.61	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-3.59	-4.70	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.05	-2.92	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-6.68	6.12	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-29.65	-13.95	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.66	-15.53	-6.87	0.000e+00	0	0.000e+00

NiMoO4	-4.07	-15.21	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	1.446e-09
Otavite	-2.47	-14.47	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	1.474e-06	1.470e-06	-4.294e-09
Rutherfordine	-5.08	-19.58	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.84	-30.67	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.93	2.06	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-3.01	1.07	4.08	0.000e+00	0	0.000e+00
U3O8	-12.78	8.30	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.55	2.07	5.61	0.000e+00	0	0.000e+00
UO3	-5.63	2.07	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.57	-10.69	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.942e-21 Surface + diffuse layer charge, eq
 3.551e-07 Surface charge, eq
 2.543e-02 sigma, C/m²
 2.407e-02 psi, V
 -9.368e-01 -F*psi/RT
 3.919e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.347e+00 m² for 2.098e-05 moles of Ferrihydrite

Water in diffuse layer: 1.347e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.675e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.369e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Al	7.6022e-11
As	5.3132e-14
B	2.6527e-09
Ba	2.5692e-13
C	1.0348e-08
Ca	1.3711e-07
Cd	3.4143e-13
Cl	2.3768e-07
Co	7.1052e-14
Cr	7.7162e-15
Cu	6.3871e-12
F	4.4327e-09
Fe	1.3513e-14
H	1.8113e-08
Hg	2.5349e-13
K	3.7559e-07
Mg	4.5449e-07
Mn	5.3387e-09
Mo	2.1539e-10
N	3.2283e-10
Na	6.7464e-07
Ni	1.1858e-14
O	4.7343e-06
Pb	2.1392e-14
S	1.1733e-06
Sb	2.5463e-12
Se	2.2586e-11
U	3.5407e-11
V	2.0079e-12
Zn	6.8523e-10

Hfo_s

1.049e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	5.926e-08	0.565	5.898e-08	-7.229
Hfo_sOMn+	2.059e-08	0.196	2.049e-08	-7.688
Hfo_sOCu+	1.940e-08	0.185	1.931e-08	-7.714
Hfo_sOPb+	3.192e-09	0.030	3.177e-09	-8.498
Hfo_sOCrOH+	1.631e-09	0.016	1.623e-09	-8.790
Hfo_sOHCa+2	7.840e-10	0.007	7.802e-10	-9.108
Hfo_sOH	3.442e-11	0.000	3.425e-11	-10.465
Hfo_sO-	9.937e-12	0.000	9.889e-12	-11.005
Hfo_sOCd+	6.229e-12	0.000	6.199e-12	-11.208
Hfo_sOH2+	2.731e-12	0.000	2.718e-12	-11.566
Hfo_sONi+	4.333e-13	0.000	4.312e-13	-12.365
Hfo_sOCo+	2.274e-13	0.000	2.263e-13	-12.645
Hfo_sOHBa+2	1.027e-14	0.000	1.022e-14	-13.991
Hfo_sOFe+	1.998e-15	0.000	1.988e-15	-14.701
Hfo_sOHg+	5.619e-16	0.000	5.592e-16	-15.252

Hfo_w

4.197e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOMg+	1.497e-06	0.357	1.490e-06	-5.827
Hfo_wOCu+	7.692e-07	0.183	7.655e-07	-6.116
Hfo_wOHVO4-3	7.062e-07	0.168	7.028e-07	-6.153
Hfo_wOZn+	4.797e-07	0.114	4.773e-07	-6.321
Hfo_wOH	2.660e-07	0.063	2.647e-07	-6.577
Hfo_wOHSO4-2	1.661e-07	0.040	1.653e-07	-6.782
Hfo_wOMn+	1.264e-07	0.030	1.258e-07	-6.900
Hfo_wO-	7.680e-08	0.018	7.644e-08	-7.117
Hfo_wOHSeO3-2	3.070e-08	0.007	3.056e-08	-7.515
Hfo_wOCa+	2.254e-08	0.005	2.243e-08	-7.649
Hfo_wOHAsO4-3	2.128e-08	0.005	2.118e-08	-7.674
Hfo_wOH2+	2.111e-08	0.005	2.101e-08	-7.678
Hfo_wSO4-	6.627e-09	0.002	6.595e-09	-8.181
Hfo_wSeO3-	4.151e-09	0.001	4.131e-09	-8.384
Hfo_wOHMoO4-2	1.897e-09	0.000	1.888e-09	-8.724
Hfo_wOPb+	1.102e-09	0.000	1.097e-09	-8.960
Hfo_wH2BO3	2.050e-10	0.000	2.040e-10	-9.690
Hfo_wMoO4-	9.751e-11	0.000	9.705e-11	-10.013
Hfo_wOCd+	2.054e-11	0.000	2.044e-11	-10.690
Hfo_wOCo+	4.954e-12	0.000	4.930e-12	-11.307
Hfo_wONi+	4.517e-12	0.000	4.496e-12	-11.347
Hfo_wHAsO4-	3.010e-12	0.000	2.995e-12	-11.524
Hfo_wOHg+	2.127e-13	0.000	2.117e-13	-12.674
Hfo_wOFe+	9.744e-15	0.000	9.697e-15	-14.013
Hfo_wH2AsO4	7.728e-15	0.000	7.691e-15	-14.114
Hfo_wOHSeO4-2	5.674e-15	0.000	5.647e-15	-14.248
Hfo_wOBa+	4.266e-15	0.000	4.245e-15	-14.372
Hfo_wOHSbO(OH) 4-	1.648e-15	0.000	1.641e-15	-14.785
Hfo_wSeO4-	1.972e-16	0.000	1.962e-16	-15.707
Hfo_wSbO(OH) 4	8.474e-17	0.000	8.433e-17	-16.074
Hfo_wOHCrO4-2	2.931e-17	0.000	2.917e-17	-16.535
Hfo_wCrO4-	1.067e-18	0.000	1.061e-18	-17.974
Hfo_wH2AsO3	1.100e-24	0.000	1.095e-24	-23.961

-----Solution composition-----

Elements	Molality	Moles
Al	5.289e-06	5.315e-06
As	3.465e-09	3.482e-09
B	1.962e-04	1.971e-04
Ba	2.172e-08	2.183e-08

C	7.272e-04	7.307e-04
Ca	1.080e-02	1.086e-02
Cd	2.478e-08	2.490e-08
Cl	1.653e-02	1.661e-02
Co	5.782e-09	5.810e-09
Cr	6.033e-10	6.062e-10
Cu	4.851e-07	4.874e-07
F	3.247e-04	3.262e-04
Fe	1.035e-09	1.040e-09
Hg	1.881e-08	1.890e-08
K	2.935e-02	2.949e-02
Mg	3.608e-02	3.626e-02
Mn	4.360e-04	4.381e-04
Mo	1.403e-05	1.410e-05
N	2.247e-05	2.258e-05
Na	5.288e-02	5.314e-02
Ni	9.375e-10	9.420e-10
Pb	1.582e-09	1.589e-09
S	7.965e-02	8.003e-02
Sb	1.771e-07	1.779e-07
Se	1.505e-06	1.512e-06
U	2.029e-06	2.039e-06
V	1.347e-07	1.354e-07
Zn	5.033e-05	5.057e-05

-----Description of solution-----

	pH	=	7.984	Charge balance
	pe	=	4.789	Adjusted to redox
equilibrium				
	Activity of water	=	0.997	
	Ionic strength (mol/kgw)	=	1.992e-01	
	Mass of water (kg)	=	1.005e+00	
	Total alkalinity (eq/kg)	=	7.955e-04	
	Total CO2 (mol/kg)	=	7.272e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.115506e+02	
	Total O	=	5.609768e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.366e-06	9.664e-07	-5.864	-6.015	-0.150	(0)
H+	1.391e-08	1.038e-08	-7.857	-7.984	-0.127	0.00
H2O	5.551e+01	9.966e-01	1.744	-0.001	0.000	18.07
Al	5.289e-06					
Al(OH)4-	5.255e-06	3.832e-06	-5.279	-5.417	-0.137	(0)
Al(OH)3	3.150e-08	3.150e-08	-7.502	-7.502	0.000	(0)
Al(OH)2+	2.188e-09	1.633e-09	-8.660	-8.787	-0.127	(0)
AlF3	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
AlF2+	2.337e-10	1.744e-10	-9.631	-9.758	-0.127	(0)
AlF4-	3.002e-11	2.189e-11	-10.523	-10.660	-0.137	(0)
AlF+2	1.001e-11	3.106e-12	-11.000	-11.508	-0.508	(0)
AlOH+2	6.856e-12	2.128e-12	-11.164	-11.672	-0.508	(0)
AlSO4+	3.644e-13	2.657e-13	-12.438	-12.576	-0.137	(0)
Al(SO4)2-	6.072e-14	4.428e-14	-13.217	-13.354	-0.137	(0)
Al+3	3.054e-14	2.202e-15	-13.515	-14.657	-1.142	(0)
AlMo6O21-3	2.106e-38	1.883e-40	-37.677	-39.725	-2.049	(0)
As(3)	1.737e-23					
H3AsO3	1.603e-23	1.603e-23	-22.795	-22.795	0.000	(0)
H2AsO3-	1.337e-24	7.918e-25	-23.874	-24.101	-0.228	(0)
HAsO3-2	5.659e-28	6.954e-29	-27.247	-28.158	-0.911	(0)

	H4AsO3+	1.393e-31	8.248e-32	-30.856	-31.084	-0.228	(0)
	AsO3-3	2.888e-32	2.581e-34	-31.539	-33.588	-2.049	(0)
As (5)	3.465e-09						
	HAsO4-2	3.384e-09	4.159e-10	-8.471	-9.381	-0.911	(0)
	H2AsO4-	6.652e-11	3.938e-11	-10.177	-10.405	-0.228	(0)
	AsO4-3	1.417e-11	1.266e-13	-10.849	-12.897	-2.049	(0)
	H3AsO4	6.788e-17	7.107e-17	-16.168	-16.148	0.020	(0)
B	1.962e-04						
	H3BO3	1.759e-04	1.842e-04	-3.755	-3.735	0.020	(0)
	H2BO3-	1.512e-05	1.030e-05	-4.821	-4.987	-0.167	(0)
	MgH2BO3+	3.111e-06	2.120e-06	-5.507	-5.674	-0.167	(0)
	CaH2BO3+	1.383e-06	9.421e-07	-5.859	-6.026	-0.167	(0)
	NaH2BO3	5.948e-07	5.948e-07	-6.226	-6.226	0.000	(0)
	BF(OH) 3-	1.521e-08	1.037e-08	-7.818	-7.984	-0.167	(0)
	H5 (BO3) 2-	2.370e-09	1.615e-09	-8.625	-8.792	-0.167	(0)
	H8 (BO3) 3-	4.366e-11	2.975e-11	-10.360	-10.527	-0.167	(0)
	BaH2BO3+	3.146e-12	2.144e-12	-11.502	-11.669	-0.167	(0)
	BF2 (OH) 2-	2.391e-12	1.629e-12	-11.622	-11.788	-0.167	(0)
	BF3OH-	1.367e-18	9.314e-19	-17.864	-18.031	-0.167	(0)
	BF4-	9.884e-24	6.736e-24	-23.005	-23.172	-0.167	(0)
Ba	2.172e-08						
	Ba+2	2.167e-08	6.734e-09	-7.664	-8.172	-0.508	(0)
	BaHCO3+	3.922e-11	2.968e-11	-10.406	-10.528	-0.121	(0)
	BaCO3	7.196e-12	7.196e-12	-11.143	-11.143	0.000	(0)
	BaH2BO3+	3.146e-12	2.144e-12	-11.502	-11.669	-0.167	(0)
	BaOH+	3.844e-14	2.841e-14	-13.415	-13.547	-0.131	(0)
	BaNO3+	8.310e-16	4.920e-16	-15.080	-15.308	-0.228	(0)
	BaNH3+2	2.353e-16	2.891e-17	-15.628	-16.539	-0.911	(0)
C (4)	7.272e-04						
	HCO3-	6.183e-04	4.615e-04	-3.209	-3.336	-0.127	(0)
	MgHCO3+	3.901e-05	2.803e-05	-4.409	-4.552	-0.143	(0)
	CaHCO3+	1.805e-05	1.366e-05	-4.744	-4.865	-0.121	(0)
	H2CO3	1.078e-05	1.078e-05	-4.967	-4.967	0.000	(0)
	MgCO3	1.029e-05	1.029e-05	-4.988	-4.988	0.000	(0)
	NaHCO3	9.454e-06	9.454e-06	-5.024	-5.024	0.000	(0)
	CO3-2	6.705e-06	2.084e-06	-5.174	-5.681	-0.508	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	UO2 (CO3) 3-4	1.994e-06	4.545e-10	-5.700	-9.342	-3.642	(0)
	NaCO3-	1.894e-06	1.413e-06	-5.723	-5.850	-0.127	(0)
	ZnCO3	5.598e-07	5.598e-07	-6.252	-6.252	0.000	(0)
	MnHCO3+	4.962e-07	3.667e-07	-6.304	-6.436	-0.131	(0)
	CuCO3	2.361e-07	2.361e-07	-6.627	-6.627	0.000	(0)
	ZnHCO3+	1.151e-07	6.814e-08	-6.939	-7.167	-0.228	(0)
	UO2 (CO3) 2-2	3.542e-08	4.353e-09	-7.451	-8.361	-0.911	(0)
	Cu (CO3) 2-2	1.078e-08	1.324e-09	-7.968	-8.878	-0.911	(0)
	CuHCO3+	9.465e-10	5.604e-10	-9.024	-9.252	-0.228	(0)
	PbCO3	3.446e-10	3.446e-10	-9.463	-9.463	0.000	(0)
	UO2CO3	1.047e-10	1.047e-10	-9.980	-9.980	0.000	(0)
	CdCO3	7.716e-11	7.716e-11	-10.113	-10.113	0.000	(0)
	BaHCO3+	3.922e-11	2.968e-11	-10.406	-10.528	-0.121	(0)
	PbHCO3+	3.187e-11	1.887e-11	-10.497	-10.724	-0.228	(0)
	CoHCO3+	3.062e-11	1.813e-11	-10.514	-10.742	-0.228	(0)
	CoCO3	1.778e-11	1.778e-11	-10.750	-10.750	0.000	(0)
	Pb (CO3) 2-2	1.685e-11	2.071e-12	-10.773	-11.684	-0.911	(0)
	NiHCO3+	1.367e-11	8.095e-12	-10.864	-11.092	-0.228	(0)
	NiCO3	1.106e-11	1.106e-11	-10.956	-10.956	0.000	(0)
	BaCO3	7.196e-12	7.196e-12	-11.143	-11.143	0.000	(0)
	CdHCO3+	2.883e-12	1.707e-12	-11.540	-11.768	-0.228	(0)
	Cd (CO3) 2-2	9.699e-13	1.192e-13	-12.013	-12.924	-0.911	(0)
	HgCO3	1.892e-14	1.892e-14	-13.723	-13.723	0.000	(0)
	FeHCO3+	2.357e-15	1.783e-15	-14.628	-14.749	-0.121	(0)
	Hg (CO3) 2-2	1.014e-15	1.246e-16	-14.994	-15.904	-0.911	(0)
	HgHCO3+	6.178e-18	3.658e-18	-17.209	-17.437	-0.228	(0)
Ca	1.080e-02						
	CaSO4	5.661e-03	5.661e-03	-2.247	-2.247	0.000	(0)
	Ca+2	5.115e-03	1.589e-03	-2.291	-2.799	-0.508	(0)
	CaHCO3+	1.805e-05	1.366e-05	-4.744	-4.865	-0.121	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)

	CaF+	3.311e-06	2.447e-06	-5.480	-5.611	-0.131	(0)
	CaH2BO3+	1.383e-06	9.421e-07	-5.859	-6.026	-0.167	(0)
	CaOH+	4.050e-08	3.065e-08	-7.393	-7.514	-0.121	(0)
	CaNO3+	1.237e-10	7.326e-11	-9.907	-10.135	-0.228	(0)
	CaNH3+2	1.108e-10	1.361e-11	-9.955	-10.866	-0.911	(0)
	Ca (NH3) 2+2	3.001e-19	3.688e-20	-18.523	-19.433	-0.911	(0)
Cd		2.478e-08					
	Cd (SO4) 2-2	1.011e-08	1.242e-09	-7.995	-8.906	-0.911	(0)
	CdSO4	5.923e-09	5.923e-09	-8.227	-8.227	0.000	(0)
	Cd+2	5.229e-09	1.625e-09	-8.282	-8.789	-0.508	(0)
	CdCl+	3.234e-09	1.915e-09	-8.490	-8.718	-0.228	(0)
	CdCl2	9.850e-11	9.850e-11	-10.007	-10.007	0.000	(0)
	CdCO3	7.716e-11	7.716e-11	-10.113	-10.113	0.000	(0)
	CdOHC1	7.591e-11	7.591e-11	-10.120	-10.120	0.000	(0)
	CdOH+	2.107e-11	1.247e-11	-10.676	-10.904	-0.228	(0)
	CdF+	6.135e-12	3.633e-12	-11.212	-11.440	-0.228	(0)
	CdHCO3+	2.883e-12	1.707e-12	-11.540	-11.768	-0.228	(0)
	CdCl3-	1.295e-12	7.669e-13	-11.888	-12.115	-0.228	(0)
	Cd (CO3) 2-2	9.699e-13	1.192e-13	-12.013	-12.924	-0.911	(0)
	Cd (OH) 2	7.606e-14	7.606e-14	-13.119	-13.119	0.000	(0)
	CdF2	1.022e-15	1.022e-15	-14.990	-14.990	0.000	(0)
	CdSeO4	1.571e-16	1.571e-16	-15.804	-15.804	0.000	(0)
	Cd (SeO3) 2-2	1.565e-16	1.923e-17	-15.805	-16.716	-0.911	(0)
	CdNO3+	1.265e-16	7.490e-17	-15.898	-16.126	-0.228	(0)
	Cd2OH+3	1.136e-17	1.016e-19	-16.945	-18.993	-2.049	(0)
	Cd (OH) 3-	7.585e-18	4.491e-18	-17.120	-17.348	-0.228	(0)
	Cd (OH) 4-2	5.781e-24	7.104e-25	-23.238	-24.149	-0.911	(0)
	Cd (NO3) 2	5.472e-25	5.472e-25	-24.262	-24.262	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.864	-79.092	-0.228	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.199	-150.199	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.382	-226.609	-0.228	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.814	-302.724	-0.911	(0)
Cl		1.653e-02					
	Cl-	1.653e-02	1.234e-02	-1.782	-1.909	-0.127	(0)
	MnCl+	8.372e-07	6.187e-07	-6.077	-6.209	-0.131	(0)
	ZnCl+	2.014e-07	1.447e-07	-6.696	-6.839	-0.143	(0)
	ZnOHC1	1.831e-07	1.831e-07	-6.737	-6.737	0.000	(0)
	MnCl2	1.078e-08	1.078e-08	-7.967	-7.967	0.000	(0)
	CuCl2-	8.530e-09	6.130e-09	-8.069	-8.213	-0.143	(0)
	CdCl+	3.234e-09	1.915e-09	-8.490	-8.718	-0.228	(0)
	ZnCl2	2.830e-09	2.830e-09	-8.548	-8.548	0.000	(0)
	CuCl	2.378e-09	2.378e-09	-8.624	-8.624	0.000	(0)
	CuCl+	5.237e-10	3.764e-10	-9.281	-9.424	-0.143	(0)
	HgClOH	1.598e-10	1.598e-10	-9.796	-9.796	0.000	(0)
	HgCl2	1.155e-10	1.155e-10	-9.937	-9.937	0.000	(0)
	CdCl2	9.850e-11	9.850e-11	-10.007	-10.007	0.000	(0)
	CdOHC1	7.591e-11	7.591e-11	-10.120	-10.120	0.000	(0)
	CuCl3-2	5.422e-11	1.617e-11	-10.266	-10.791	-0.525	(0)
	MnCl3-	4.959e-11	3.665e-11	-10.305	-10.436	-0.131	(0)
	PbCl+	4.069e-11	2.409e-11	-10.391	-10.618	-0.228	(0)
	ZnCl3-	3.860e-11	2.774e-11	-10.413	-10.557	-0.143	(0)
	CoCl+	3.641e-11	2.156e-11	-10.439	-10.666	-0.228	(0)
	HgCl3-	2.408e-11	1.426e-11	-10.618	-10.846	-0.228	(0)
	NiCl+	7.588e-12	4.492e-12	-11.120	-11.348	-0.228	(0)
	HgCl4-2	5.699e-12	7.003e-13	-11.244	-12.155	-0.911	(0)
	CuCl2	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
	PbCl2	1.328e-12	1.328e-12	-11.877	-11.877	0.000	(0)
	CdCl3-	1.295e-12	7.669e-13	-11.888	-12.115	-0.228	(0)
	ZnCl4-2	5.739e-13	1.712e-13	-12.241	-12.767	-0.525	(0)
	PbCl3-	1.102e-14	6.523e-15	-13.958	-14.186	-0.228	(0)
	HgCl+	3.155e-15	1.868e-15	-14.501	-14.729	-0.228	(0)
	UO2Cl+	4.267e-16	2.526e-16	-15.370	-15.598	-0.228	(0)
	PbCl4-2	2.994e-16	3.679e-17	-15.524	-16.434	-0.911	(0)
	NiCl2	2.791e-16	2.791e-16	-15.554	-15.554	0.000	(0)
	CuCl3-	2.581e-16	1.854e-16	-15.588	-15.732	-0.143	(0)
	CrCl+2	1.431e-17	1.758e-18	-16.844	-17.755	-0.911	(0)
	CrOHC12	3.984e-19	3.984e-19	-18.400	-18.400	0.000	(0)
	CuCl4-2	3.845e-20	1.147e-20	-19.415	-19.940	-0.525	(0)

CrCl2+	3.476e-21	2.058e-21	-20.459	-20.687	-0.228	(0)
FeCl+2	2.194e-21	6.543e-22	-20.659	-21.184	-0.525	(0)
VOCl+	6.555e-22	3.881e-22	-21.183	-21.411	-0.228	(0)
FeCl2+	4.880e-23	3.607e-23	-22.312	-22.443	-0.131	(0)
CrO3Cl-	9.776e-26	5.788e-26	-25.010	-25.237	-0.228	(0)
FeCl3	4.450e-26	4.450e-26	-25.352	-25.352	0.000	(0)
CoCl+2	2.529e-36	3.108e-37	-35.597	-36.507	-0.911	(0)
UCl+3	0.000e+00	0.000e+00	-44.353	-46.402	-2.049	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.480	-51.390	-0.911	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.858	-52.768	-0.911	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.363	-66.273	-0.911	(0)
Co (2)	5.782e-09					
Co+2	4.109e-09	5.050e-10	-8.386	-9.297	-0.911	(0)
CoSO4	1.567e-09	1.567e-09	-8.805	-8.805	0.000	(0)
CoCl+	3.641e-11	2.156e-11	-10.439	-10.666	-0.228	(0)
CoHCO3+	3.062e-11	1.813e-11	-10.514	-10.742	-0.228	(0)
CoCO3	1.778e-11	1.778e-11	-10.750	-10.750	0.000	(0)
CoOH+	1.645e-11	9.737e-12	-10.784	-11.012	-0.228	(0)
CoF+	3.804e-12	2.252e-12	-11.420	-11.647	-0.228	(0)
Co (OH) 2	7.475e-13	7.475e-13	-12.126	-12.126	0.000	(0)
CoNO2+	9.287e-14	5.498e-14	-13.032	-13.260	-0.228	(0)
Co (NH3) +2	3.362e-15	4.131e-16	-14.473	-15.384	-0.911	(0)
CoSeO4	1.314e-16	1.314e-16	-15.881	-15.881	0.000	(0)
Co (OH) 3-	2.434e-17	1.441e-17	-16.614	-16.841	-0.228	(0)
CoNO3+	1.970e-17	1.167e-17	-16.705	-16.933	-0.228	(0)
CoOOH-	6.128e-18	3.628e-18	-17.213	-17.440	-0.228	(0)
Co2OH+3	2.756e-20	2.464e-22	-19.560	-21.608	-2.049	(0)
Co (NH3) 2+2	9.758e-22	1.199e-22	-21.011	-21.921	-0.911	(0)
Co (OH) 4-2	1.797e-23	2.208e-24	-22.746	-23.656	-0.911	(0)
Co (NO3) 2	3.460e-25	3.460e-25	-24.461	-24.461	0.000	(0)
Co (NH3) 3+2	8.359e-29	1.027e-29	-28.078	-28.988	-0.911	(0)
Co4 (OH) 4+4	7.867e-33	1.793e-36	-32.104	-35.746	-3.642	(0)
Co (NH3) 4+2	2.985e-36	3.668e-37	-35.525	-36.436	-0.911	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.472	-44.383	-0.911	(0)
Co (3)	4.948e-30					
CoOH+2	4.948e-30	6.080e-31	-29.306	-30.216	-0.911	(0)
CoCl+2	2.529e-36	3.108e-37	-35.597	-36.507	-0.911	(0)
Co+3	1.717e-36	1.238e-37	-35.765	-36.907	-1.142	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.480	-51.390	-0.911	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.020	-61.247	-0.228	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.269	-66.179	-0.911	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.363	-66.273	-0.911	(0)
Cr (2)	3.475e-27					
Cr+2	3.475e-27	4.270e-28	-26.459	-27.370	-0.911	(0)
Cr (3)	6.033e-10					
Cr (OH) 2+	4.622e-10	2.737e-10	-9.335	-9.563	-0.228	(0)
Cr (OH) 3	9.935e-11	9.935e-11	-10.003	-10.003	0.000	(0)
Cr (OH) +2	1.894e-11	2.327e-12	-10.723	-11.633	-0.911	(0)
CrOHSO4	8.587e-12	8.587e-12	-11.066	-11.066	0.000	(0)
CrO2-	7.700e-12	4.559e-12	-11.114	-11.341	-0.228	(0)
Cr (OH) 4-	6.456e-12	3.823e-12	-11.190	-11.418	-0.228	(0)
CrF+2	2.003e-14	2.461e-15	-13.698	-14.609	-0.911	(0)
Cr+3	1.231e-14	1.101e-16	-13.910	-15.958	-2.049	(0)
CrSO4+	6.750e-15	3.997e-15	-14.171	-14.398	-0.228	(0)
CrCl+2	1.431e-17	1.758e-18	-16.844	-17.755	-0.911	(0)
CrOHC12	3.984e-19	3.984e-19	-18.400	-18.400	0.000	(0)
Cr2 (OH) 2SO4+2	1.470e-20	1.806e-21	-19.833	-20.743	-0.911	(0)
CrCl2+	3.476e-21	2.058e-21	-20.459	-20.687	-0.228	(0)
Cr2 (OH) 2 (SO4) 2	1.668e-21	1.668e-21	-20.778	-20.778	0.000	(0)
CrNO3+2	5.708e-25	7.014e-26	-24.244	-25.154	-0.911	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.526	-42.437	-0.911	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.913	-51.962	-2.049	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.858	-52.768	-0.911	(0)
Cr (6)	7.892e-15					
CrO4-2	6.856e-15	2.130e-15	-14.164	-14.672	-0.508	(0)
NaCrO4-	6.513e-16	3.856e-16	-15.186	-15.414	-0.228	(0)
KCrO4-	2.639e-16	1.562e-16	-15.579	-15.806	-0.228	(0)
HCrO4-	1.209e-16	7.158e-17	-15.918	-16.145	-0.228	(0)

	CrO3SO4-2	2.874e-23	3.532e-24	-22.541	-23.452	-0.911	(0)
	H2CrO4	6.025e-25	6.025e-25	-24.220	-24.220	0.000	(0)
	CrO3Cl-	9.776e-26	5.788e-26	-25.010	-25.237	-0.228	(0)
	Cr2O7-2	1.451e-30	1.783e-31	-29.838	-30.749	-0.911	(0)
Cu (1)	1.122e-08						
	CuCl2-	8.530e-09	6.130e-09	-8.069	-8.213	-0.143	(0)
	CuCl	2.378e-09	2.378e-09	-8.624	-8.624	0.000	(0)
	Cu+	2.585e-10	1.531e-10	-9.588	-9.815	-0.228	(0)
	CuCl3-2	5.422e-11	1.617e-11	-10.266	-10.791	-0.525	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-146.611	-147.079	-0.469	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.370	-147.809	-0.439	(0)
Cu (2)	4.738e-07						
	CuCO3	2.361e-07	2.361e-07	-6.627	-6.627	0.000	(0)
	CuOH+	8.184e-08	5.881e-08	-7.087	-7.231	-0.143	(0)
	CuSO4	6.855e-08	6.855e-08	-7.164	-7.164	0.000	(0)
	Cu+2	6.194e-08	1.925e-08	-7.208	-7.716	-0.508	(0)
	Cu (OH) 2	1.134e-08	1.134e-08	-7.945	-7.945	0.000	(0)
	Cu (CO3) 2-2	1.078e-08	1.324e-09	-7.968	-8.878	-0.911	(0)
	CuHCO3+	9.465e-10	5.604e-10	-9.024	-9.252	-0.228	(0)
	Cu2 (OH) 2+2	7.071e-10	8.689e-11	-9.151	-10.061	-0.911	(0)
	CuCl+	5.237e-10	3.764e-10	-9.281	-9.424	-0.143	(0)
	CuF+	2.893e-10	1.713e-10	-9.539	-9.766	-0.228	(0)
	CuNO2+	5.259e-11	3.114e-11	-10.279	-10.507	-0.228	(0)
	Cu (OH) 3-	3.797e-11	2.248e-11	-10.421	-10.648	-0.228	(0)
	CuNH3+2	1.091e-11	1.340e-12	-10.962	-11.873	-0.911	(0)
	CuCl2	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
	Cu (NO2) 2	4.924e-15	4.924e-15	-14.308	-14.308	0.000	(0)
	CuNO3+	1.498e-15	8.871e-16	-14.824	-15.052	-0.228	(0)
	Cu (OH) 4-2	1.392e-15	1.710e-16	-14.856	-15.767	-0.911	(0)
	CuCl3-	2.581e-16	1.854e-16	-15.588	-15.732	-0.143	(0)
	CuCl4-2	3.845e-20	1.147e-20	-19.415	-19.940	-0.525	(0)
	Cu (NO3) 2	1.628e-24	1.628e-24	-23.788	-23.788	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.521	-216.749	-0.228	(0)
F	3.247e-04						
	F-	1.889e-04	1.411e-04	-3.724	-3.851	-0.127	(0)
	MgF+	1.288e-04	9.394e-05	-3.890	-4.027	-0.137	(0)
	CaF+	3.311e-06	2.447e-06	-5.480	-5.611	-0.131	(0)
	NaF	3.242e-06	3.242e-06	-5.489	-5.489	0.000	(0)
	MnF+	3.026e-07	2.236e-07	-6.519	-6.650	-0.131	(0)
	ZnF+	2.219e-08	1.314e-08	-7.654	-7.881	-0.228	(0)
	BF (OH) 3-	1.521e-08	1.037e-08	-7.818	-7.984	-0.167	(0)
	HF	2.167e-09	2.167e-09	-8.664	-8.664	0.000	(0)
	AlF3	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
	CuF+	2.893e-10	1.713e-10	-9.539	-9.766	-0.228	(0)
	AlF2+	2.337e-10	1.744e-10	-9.631	-9.758	-0.127	(0)
	AlF4-	3.002e-11	2.189e-11	-10.523	-10.660	-0.137	(0)
	AlF+2	1.001e-11	3.106e-12	-11.000	-11.508	-0.508	(0)
	CdF+	6.135e-12	3.633e-12	-11.212	-11.440	-0.228	(0)
	CoF+	3.804e-12	2.252e-12	-11.420	-11.647	-0.228	(0)
	BF2 (OH) 2-	2.391e-12	1.629e-12	-11.622	-11.788	-0.167	(0)
	HF2-	1.643e-12	1.162e-12	-11.784	-11.935	-0.150	(0)
	PbF+	9.237e-13	5.469e-13	-12.034	-12.262	-0.228	(0)
	NiF+	8.515e-13	5.042e-13	-12.070	-12.297	-0.228	(0)
	UO2F+	4.151e-13	2.458e-13	-12.382	-12.609	-0.228	(0)
	UO2F2	9.999e-14	9.999e-14	-13.000	-13.000	0.000	(0)
	CrF+2	2.003e-14	2.461e-15	-13.698	-14.609	-0.911	(0)
	UO2F3-	5.984e-15	3.543e-15	-14.223	-14.451	-0.228	(0)
	PbF2	1.518e-15	1.518e-15	-14.819	-14.819	0.000	(0)
	CdF2	1.022e-15	1.022e-15	-14.990	-14.990	0.000	(0)
	UO2F4-2	3.231e-17	3.970e-18	-16.491	-17.401	-0.911	(0)
	VO2F	1.974e-17	1.974e-17	-16.705	-16.705	0.000	(0)
	H2F2	1.258e-17	1.258e-17	-16.900	-16.900	0.000	(0)
	VO2F2-	1.707e-18	1.011e-18	-17.768	-17.995	-0.228	(0)
	FeF2+	1.387e-18	1.025e-18	-17.858	-17.989	-0.131	(0)
	BF3OH-	1.367e-18	9.314e-19	-17.864	-18.031	-0.167	(0)
	FeF+2	9.105e-19	2.716e-19	-18.041	-18.566	-0.525	(0)
	PbF3-	6.860e-19	4.062e-19	-18.164	-18.391	-0.228	(0)
	FeF3	2.040e-19	2.040e-19	-18.690	-18.690	0.000	(0)

VOF+	1.602e-20	9.485e-21	-19.795	-20.023	-0.228	(0)
VO2F3-2	1.447e-20	1.779e-21	-19.839	-20.750	-0.911	(0)
VOF2	5.017e-22	5.017e-22	-21.300	-21.300	0.000	(0)
PbF4-2	2.232e-22	2.742e-23	-21.651	-22.562	-0.911	(0)
HgF+	6.700e-23	3.967e-23	-22.174	-22.402	-0.228	(0)
VO2F4-3	1.381e-23	1.234e-25	-22.860	-24.909	-2.049	(0)
BF4-	9.884e-24	6.736e-24	-23.005	-23.172	-0.167	(0)
VOF3-	4.241e-24	2.511e-24	-23.373	-23.600	-0.228	(0)
Sb(OH) 2F	1.696e-25	1.696e-25	-24.771	-24.771	0.000	(0)
SbOF	1.673e-25	1.673e-25	-24.776	-24.776	0.000	(0)
VOF4-2	1.163e-26	1.430e-27	-25.934	-26.845	-0.911	(0)
UF3+	1.209e-36	7.159e-37	-35.917	-36.145	-0.228	(0)
UF2+2	2.606e-37	3.202e-38	-36.584	-37.495	-0.911	(0)
UF4	1.107e-38	1.107e-38	-37.956	-37.956	0.000	(0)
UF+3	2.017e-39	0.000e+00	-38.695	-40.744	-2.049	(0)
UF5-	1.045e-40	0.000e+00	-39.981	-40.208	-0.228	(0)
UF6-2	0.000e+00	0.000e+00	-40.668	-41.579	-0.911	(0)
Fe (2)	3.688e-12					
Fe+2	2.498e-12	3.069e-13	-11.602	-12.513	-0.911	(0)
FeSO4	1.172e-12	1.172e-12	-11.931	-11.931	0.000	(0)
FeOH+	1.598e-14	1.181e-14	-13.796	-13.928	-0.131	(0)
FeHCO3+	2.357e-15	1.783e-15	-14.628	-14.749	-0.121	(0)
Fe(OH) 2	9.065e-18	9.065e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	3.749e-18	2.770e-18	-17.426	-17.557	-0.131	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.184	-160.184	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.230	-236.458	-0.228	(0)
Fe (3)	1.031e-09					
Fe(OH) 2+	5.519e-10	4.119e-10	-9.258	-9.385	-0.127	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	5.155e-11	3.847e-11	-10.288	-10.415	-0.127	(0)
FeOH+2	3.673e-15	1.096e-15	-14.435	-14.960	-0.525	(0)
FeF2+	1.387e-18	1.025e-18	-17.858	-17.989	-0.131	(0)
FeF+2	9.105e-19	2.716e-19	-18.041	-18.566	-0.525	(0)
FeSO4+	4.145e-19	3.063e-19	-18.382	-18.514	-0.131	(0)
FeF3	2.040e-19	2.040e-19	-18.690	-18.690	0.000	(0)
Fe(SO4) 2-	1.720e-19	1.018e-19	-18.764	-18.992	-0.228	(0)
Fe+3	2.436e-20	1.756e-21	-19.613	-20.756	-1.142	(0)
FeCl+2	2.194e-21	6.543e-22	-20.659	-21.184	-0.525	(0)
FeCl2+	4.880e-23	3.607e-23	-22.312	-22.443	-0.131	(0)
FeHSeO3+2	1.180e-23	1.450e-24	-22.928	-23.839	-0.911	(0)
Fe2(OH) 2+4	1.743e-25	3.975e-29	-24.759	-28.401	-3.642	(0)
FeCl3	4.450e-26	4.450e-26	-25.352	-25.352	0.000	(0)
FeNO3+2	2.083e-27	2.560e-28	-26.681	-27.592	-0.911	(0)
Fe3(OH) 4+5	1.161e-31	2.367e-37	-30.935	-36.626	-5.691	(0)
H (0)	3.845e-29					
H2	1.923e-29	2.013e-29	-28.716	-28.696	0.020	(0)
Hg (0)	1.847e-08					
Hg	1.847e-08	1.847e-08	-7.734	-7.734	0.000	(0)
Hg (1)	1.548e-18					
Hg2+2	7.740e-19	9.511e-20	-18.111	-19.022	-0.911	(0)
Hg (2)	3.478e-10					
HgClOH	1.598e-10	1.598e-10	-9.796	-9.796	0.000	(0)
HgCl2	1.155e-10	1.155e-10	-9.937	-9.937	0.000	(0)
Hg(OH) 2	4.271e-11	4.471e-11	-10.370	-10.350	0.020	(0)
HgCl3-	2.408e-11	1.426e-11	-10.618	-10.846	-0.228	(0)
HgCl4-2	5.699e-12	7.003e-13	-11.244	-12.155	-0.911	(0)
HgCO3	1.892e-14	1.892e-14	-13.723	-13.723	0.000	(0)
HgCl+	3.155e-15	1.868e-15	-14.501	-14.729	-0.228	(0)
Hg(CO3) 2-2	1.014e-15	1.246e-16	-14.994	-15.904	-0.911	(0)
HgOH+	4.930e-16	2.919e-16	-15.307	-15.535	-0.228	(0)
Hg(OH) 3-	9.188e-18	5.440e-18	-17.037	-17.264	-0.228	(0)
HgHCO3+	6.178e-18	3.658e-18	-17.209	-17.437	-0.228	(0)
Hg(NH3) 2+2	1.804e-18	2.216e-19	-17.744	-18.654	-0.911	(0)
HgNH3+2	2.651e-19	3.257e-20	-18.577	-19.487	-0.911	(0)
Hg+2	6.174e-20	7.587e-21	-19.209	-20.120	-0.911	(0)
HgSO4	3.089e-20	3.089e-20	-19.510	-19.510	0.000	(0)
HgF+	6.700e-23	3.967e-23	-22.174	-22.402	-0.228	(0)
Hg(NH3) 3+2	4.886e-26	6.004e-27	-25.311	-26.222	-0.911	(0)

	HgNO3+	6.897e-29	4.084e-29	-28.161	-28.389	-0.228	(0)
	Hg (NH3) 4+2	2.641e-33	3.245e-34	-32.578	-33.489	-0.911	(0)
	Hg (NO3) 2	2.474e-37	2.474e-37	-36.607	-36.607	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-136.602	-136.830	-0.228	(0)
	HgS2-2	0.000e+00	0.000e+00	-136.644	-137.554	-0.911	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.419	-138.419	0.000	(0)
K	2.935e-02						
	K+	2.644e-02	1.974e-02	-1.578	-1.705	-0.127	(0)
	KSO4-	2.911e-03	2.173e-03	-2.536	-2.663	-0.127	(0)
	KCrO4-	2.639e-16	1.562e-16	-15.579	-15.806	-0.228	(0)
Mg	3.608e-02						
	Mg+2	1.910e-02	5.936e-03	-1.719	-2.227	-0.508	(0)
	MgSO4	1.680e-02	1.680e-02	-1.775	-1.775	0.000	(0)
	MgF+	1.288e-04	9.394e-05	-3.890	-4.027	-0.137	(0)
	MgHCO3+	3.901e-05	2.803e-05	-4.409	-4.552	-0.143	(0)
	MgCO3	1.029e-05	1.029e-05	-4.988	-4.988	0.000	(0)
	MgH2BO3+	3.111e-06	2.120e-06	-5.507	-5.674	-0.167	(0)
	MgOH+	2.987e-06	2.284e-06	-5.525	-5.641	-0.117	(0)
Mn (2)	4.360e-04						
	Mn+2	3.241e-04	3.983e-05	-3.489	-4.400	-0.911	(0)
	MnSO4	1.101e-04	1.101e-04	-3.958	-3.958	0.000	(0)
	MnCl+	8.372e-07	6.187e-07	-6.077	-6.209	-0.131	(0)
	MnHCO3+	4.962e-07	3.667e-07	-6.304	-6.436	-0.131	(0)
	MnF+	3.026e-07	2.236e-07	-6.519	-6.650	-0.131	(0)
	MnOH+	1.308e-07	9.668e-08	-6.883	-7.015	-0.131	(0)
	MnCl2	1.078e-08	1.078e-08	-7.967	-7.967	0.000	(0)
	MnCl3-	4.959e-11	3.665e-11	-10.305	-10.436	-0.131	(0)
	MnSeO4	5.565e-12	5.565e-12	-11.255	-11.255	0.000	(0)
	MnNO3+	1.554e-12	9.201e-13	-11.809	-12.036	-0.228	(0)
	Mn (OH) 3-	7.551e-16	5.580e-16	-15.122	-15.253	-0.131	(0)
	Mn (NO3) 2	3.369e-20	3.369e-20	-19.472	-19.472	0.000	(0)
	Mn (OH) 4-2	5.838e-21	1.741e-21	-20.234	-20.759	-0.525	(0)
	MnSe	0.000e+00	0.000e+00	-40.080	-40.080	0.000	(0)
Mn (3)	1.520e-24						
	Mn+3	1.520e-24	1.096e-25	-23.818	-24.960	-1.142	(0)
Mn (6)	5.303e-40						
	MnO4-2	5.303e-40	1.582e-40	-39.275	-39.801	-0.525	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.225	-44.383	-0.158	(0)
Mo	1.403e-05						
	MoO4-2	1.403e-05	4.360e-06	-4.853	-5.361	-0.508	(0)
	HMoO4-	1.522e-09	9.009e-10	-8.818	-9.045	-0.228	(0)
	H2MoO4	6.852e-14	6.852e-14	-13.164	-13.164	0.000	(0)
	AlMo6O21-3	2.106e-38	1.883e-40	-37.677	-39.725	-2.049	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-40.202	-48.397	-8.195	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-44.303	-49.994	-5.691	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-49.553	-53.195	-3.642	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-55.884	-57.933	-2.049	(0)
N (-3)	2.167e-07						
	NH4+	1.819e-07	1.239e-07	-6.740	-6.907	-0.167	(0)
	NH4SO4-	2.794e-08	2.065e-08	-7.554	-7.685	-0.131	(0)
	NH3	6.804e-09	6.804e-09	-8.167	-8.167	0.000	(0)
	CaNH3+2	1.108e-10	1.361e-11	-9.955	-10.866	-0.911	(0)
	CuNH3+2	1.091e-11	1.340e-12	-10.962	-11.873	-0.911	(0)
	NiNH3+2	4.231e-15	5.200e-16	-14.374	-15.284	-0.911	(0)
	Co (NH3) +2	3.362e-15	4.131e-16	-14.473	-15.384	-0.911	(0)
	BaNH3+2	2.353e-16	2.891e-17	-15.628	-16.539	-0.911	(0)
	Hg (NH3) 2+2	1.804e-18	2.216e-19	-17.744	-18.654	-0.911	(0)
	Ca (NH3) 2+2	3.001e-19	3.688e-20	-18.523	-19.433	-0.911	(0)
	HgNH3+2	2.651e-19	3.257e-20	-18.577	-19.487	-0.911	(0)
	Ni (NH3) 2+2	4.162e-21	5.114e-22	-20.381	-21.291	-0.911	(0)
	Co (NH3) 2+2	9.758e-22	1.199e-22	-21.011	-21.921	-0.911	(0)
	Hg (NH3) 3+2	4.886e-26	6.004e-27	-25.311	-26.222	-0.911	(0)
	Co (NH3) 3+2	8.359e-29	1.027e-29	-28.078	-28.988	-0.911	(0)
	Hg (NH3) 4+2	2.641e-33	3.245e-34	-32.578	-33.489	-0.911	(0)
	Co (NH3) 4+2	2.985e-36	3.668e-37	-35.525	-36.436	-0.911	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.526	-42.437	-0.911	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-43.472	-44.383	-0.911	(0)

Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.913	-51.962	-2.049	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.480	-51.390	-0.911	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.858	-52.768	-0.911	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.020	-61.247	-0.228	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.269	-66.179	-0.911	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.363	-66.273	-0.911	(0)
N (3)	2.224e-05					
NO2-	2.224e-05	1.545e-05	-4.653	-4.811	-0.158	(0)
CuNO2+	5.259e-11	3.114e-11	-10.279	-10.507	-0.228	(0)
CoNO2+	9.287e-14	5.498e-14	-13.032	-13.260	-0.228	(0)
Cu (NO2) 2	4.924e-15	4.924e-15	-14.308	-14.308	0.000	(0)
N (5)	1.965e-08					
NO3-	1.952e-08	1.458e-08	-7.709	-7.836	-0.127	(0)
CaNO3+	1.237e-10	7.326e-11	-9.907	-10.135	-0.228	(0)
MnNO3+	1.554e-12	9.201e-13	-11.809	-12.036	-0.228	(0)
ZnNO3+	2.888e-13	1.710e-13	-12.539	-12.767	-0.228	(0)
CuNO3+	1.498e-15	8.871e-16	-14.824	-15.052	-0.228	(0)
BaNO3+	8.310e-16	4.920e-16	-15.080	-15.308	-0.228	(0)
CdNO3+	1.265e-16	7.490e-17	-15.898	-16.126	-0.228	(0)
PbNO3+	2.004e-17	1.186e-17	-16.698	-16.926	-0.228	(0)
CoNO3+	1.970e-17	1.167e-17	-16.705	-16.933	-0.228	(0)
NiNO3+	8.800e-18	5.210e-18	-17.056	-17.283	-0.228	(0)
Mn (NO3) 2	3.369e-20	3.369e-20	-19.472	-19.472	0.000	(0)
UO2NO3+	6.201e-22	3.672e-22	-21.208	-21.435	-0.228	(0)
Zn (NO3) 2	4.973e-22	4.973e-22	-21.303	-21.303	0.000	(0)
Cu (NO3) 2	1.628e-24	1.628e-24	-23.788	-23.788	0.000	(0)
VO2NO3	5.882e-25	5.882e-25	-24.230	-24.230	0.000	(0)
CrNO3+2	5.708e-25	7.014e-26	-24.244	-25.154	-0.911	(0)
Cd (NO3) 2	5.472e-25	5.472e-25	-24.262	-24.262	0.000	(0)
Co (NO3) 2	3.460e-25	3.460e-25	-24.461	-24.461	0.000	(0)
Pb (NO3) 2	2.937e-25	2.937e-25	-24.532	-24.532	0.000	(0)
FeNO3+2	2.083e-27	2.560e-28	-26.681	-27.592	-0.911	(0)
HgNO3+	6.897e-29	4.084e-29	-28.161	-28.389	-0.228	(0)
Hg (NO3) 2	2.474e-37	2.474e-37	-36.607	-36.607	0.000	(0)
Na	5.288e-02					
Na+	4.879e-02	3.643e-02	-1.312	-1.439	-0.127	(0)
NaSO4-	4.076e-03	3.042e-03	-2.390	-2.517	-0.127	(0)
NaHCO3	9.454e-06	9.454e-06	-5.024	-5.024	0.000	(0)
NaF	3.242e-06	3.242e-06	-5.489	-5.489	0.000	(0)
NaCO3-	1.894e-06	1.413e-06	-5.723	-5.850	-0.127	(0)
NaH2BO3	5.948e-07	5.948e-07	-6.226	-6.226	0.000	(0)
NaCrO4-	6.513e-16	3.856e-16	-15.186	-15.414	-0.228	(0)
Ni	9.375e-10					
Ni+2	4.579e-10	1.423e-10	-9.339	-9.847	-0.508	(0)
NiSO4	4.415e-10	4.415e-10	-9.355	-9.355	0.000	(0)
NiHCO3+	1.367e-11	8.095e-12	-10.864	-11.092	-0.228	(0)
NiCO3	1.106e-11	1.106e-11	-10.956	-10.956	0.000	(0)
NiCl+	7.588e-12	4.492e-12	-11.120	-11.348	-0.228	(0)
NiOH+	2.924e-12	1.731e-12	-11.534	-11.762	-0.228	(0)
Ni (SO4) 2-2	1.850e-12	2.273e-13	-11.733	-12.643	-0.911	(0)
NiF+	8.515e-13	5.042e-13	-12.070	-12.297	-0.228	(0)
Ni (OH) 2	1.329e-13	1.329e-13	-12.876	-12.876	0.000	(0)
NiNH3+2	4.231e-15	5.200e-16	-14.374	-15.284	-0.911	(0)
NiCl2	2.791e-16	2.791e-16	-15.554	-15.554	0.000	(0)
Ni (OH) 3-	2.169e-16	1.284e-16	-15.664	-15.891	-0.228	(0)
NiSeO4	3.455e-17	3.455e-17	-16.462	-16.462	0.000	(0)
NiNO3+	8.800e-18	5.210e-18	-17.056	-17.283	-0.228	(0)
Ni (NH3) 2+2	4.162e-21	5.114e-22	-20.381	-21.291	-0.911	(0)
O (0)	2.374e-35					
O2	1.187e-35	1.243e-35	-34.926	-34.906	0.020	(0)
Pb	1.582e-09					
PbSO4	4.190e-10	4.190e-10	-9.378	-9.378	0.000	(0)
PbCO3	3.446e-10	3.446e-10	-9.463	-9.463	0.000	(0)
Pb (SO4) 2-2	3.195e-10	3.926e-11	-9.496	-10.406	-0.911	(0)
PbOH+	2.256e-10	1.336e-10	-9.647	-9.874	-0.228	(0)
Pb+2	1.771e-10	5.502e-11	-9.752	-10.259	-0.508	(0)
PbCl+	4.069e-11	2.409e-11	-10.391	-10.618	-0.228	(0)
PbHCO3+	3.187e-11	1.887e-11	-10.497	-10.724	-0.228	(0)

Pb (CO3) 2-2	1.685e-11	2.071e-12	-10.773	-11.684	-0.911	(0)
Pb (OH) 2	4.082e-12	4.082e-12	-11.389	-11.389	0.000	(0)
PbCl2	1.328e-12	1.328e-12	-11.877	-11.877	0.000	(0)
PbF+	9.237e-13	5.469e-13	-12.034	-12.262	-0.228	(0)
PbCl3-	1.102e-14	6.523e-15	-13.958	-14.186	-0.228	(0)
Pb (OH) 3-	6.663e-15	3.945e-15	-14.176	-14.404	-0.228	(0)
PbF2	1.518e-15	1.518e-15	-14.819	-14.819	0.000	(0)
PbCl4-2	2.994e-16	3.679e-17	-15.524	-16.434	-0.911	(0)
PbNO3+	2.004e-17	1.186e-17	-16.698	-16.926	-0.228	(0)
Pb2OH+3	1.303e-17	1.165e-19	-16.885	-18.934	-2.049	(0)
Pb (OH) 4-2	7.598e-18	9.337e-19	-17.119	-18.030	-0.911	(0)
PbF3-	6.860e-19	4.062e-19	-18.164	-18.391	-0.228	(0)
PbF4-2	2.232e-22	2.742e-23	-21.651	-22.562	-0.911	(0)
Pb3 (OH) 4+2	1.489e-22	1.829e-23	-21.827	-22.738	-0.911	(0)
Pb (NO3) 2	2.937e-25	2.937e-25	-24.532	-24.532	0.000	(0)
Pb4 (OH) 4+4	3.506e-26	7.994e-30	-25.455	-29.097	-3.642	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.611	-151.611	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.394	-228.622	-0.228	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.083	-78.311	-0.228	(0)
S5-2	0.000e+00	0.000e+00	-78.782	-79.692	-0.911	(0)
CdHS+	0.000e+00	0.000e+00	-78.864	-79.092	-0.228	(0)
H2S	0.000e+00	0.000e+00	-79.274	-79.274	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.298	-80.208	-0.911	(0)
S4-2	0.000e+00	0.000e+00	-79.377	-80.288	-0.911	(0)
S3-2	0.000e+00	0.000e+00	-80.183	-81.094	-0.911	(0)
S2-2	0.000e+00	0.000e+00	-81.199	-82.110	-0.911	(0)
S-2	0.000e+00	0.000e+00	-87.102	-87.627	-0.525	(0)
HgHS2-	0.000e+00	0.000e+00	-136.602	-136.830	-0.228	(0)
HgS2-2	0.000e+00	0.000e+00	-136.644	-137.554	-0.911	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.419	-138.419	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.611	-147.079	-0.469	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-146.931	-147.159	-0.228	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.370	-147.809	-0.439	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.132	-149.132	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.199	-150.199	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.611	-151.611	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.184	-160.184	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.521	-216.749	-0.228	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.935	-224.163	-0.228	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.249	-226.159	-0.911	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.382	-226.609	-0.228	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.394	-228.622	-0.228	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.230	-236.458	-0.228	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.814	-302.724	-0.911	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.023	-303.934	-0.911	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.165	-318.076	-0.911	(0)
S (6)	7.965e-02					
SO4-2	5.004e-02	1.555e-02	-1.301	-1.808	-0.508	(0)
MgSO4	1.680e-02	1.680e-02	-1.775	-1.775	0.000	(0)
CaSO4	5.661e-03	5.661e-03	-2.247	-2.247	0.000	(0)
NaSO4-	4.076e-03	3.042e-03	-2.390	-2.517	-0.127	(0)
KSO4-	2.911e-03	2.173e-03	-2.536	-2.663	-0.127	(0)
MnSO4	1.101e-04	1.101e-04	-3.958	-3.958	0.000	(0)
Zn (SO4) 2-2	1.751e-05	2.151e-06	-4.757	-5.667	-0.911	(0)
ZnSO4	1.588e-05	1.588e-05	-4.799	-4.799	0.000	(0)
CuSO4	6.855e-08	6.855e-08	-7.164	-7.164	0.000	(0)
NH4SO4-	2.794e-08	2.065e-08	-7.554	-7.685	-0.131	(0)
HSO4-	2.164e-08	1.578e-08	-7.665	-7.802	-0.137	(0)
Cd (SO4) 2-2	1.011e-08	1.242e-09	-7.995	-8.906	-0.911	(0)
CdSO4	5.923e-09	5.923e-09	-8.227	-8.227	0.000	(0)
CoSO4	1.567e-09	1.567e-09	-8.805	-8.805	0.000	(0)
NiSO4	4.415e-10	4.415e-10	-9.355	-9.355	0.000	(0)
PbSO4	4.190e-10	4.190e-10	-9.378	-9.378	0.000	(0)
Pb (SO4) 2-2	3.195e-10	3.926e-11	-9.496	-10.406	-0.911	(0)
CrOHSO4	8.587e-12	8.587e-12	-11.066	-11.066	0.000	(0)
Ni (SO4) 2-2	1.850e-12	2.273e-13	-11.733	-12.643	-0.911	(0)
FeSO4	1.172e-12	1.172e-12	-11.931	-11.931	0.000	(0)

UO2 (SO4) 2-2	4.956e-13	6.090e-14	-12.305	-13.215	-0.911	(0)
AlSO4+	3.644e-13	2.657e-13	-12.438	-12.576	-0.137	(0)
UO2SO4	2.971e-13	2.971e-13	-12.527	-12.527	0.000	(0)
Al (SO4) 2-	6.072e-14	4.428e-14	-13.217	-13.354	-0.137	(0)
CrSO4+	6.750e-15	3.997e-15	-14.171	-14.398	-0.228	(0)
VO2SO4-	5.003e-17	2.962e-17	-16.301	-16.528	-0.228	(0)
FeSO4+	4.145e-19	3.063e-19	-18.382	-18.514	-0.131	(0)
Fe (SO4) 2-	1.720e-19	1.018e-19	-18.764	-18.992	-0.228	(0)
VOSO4	4.801e-20	4.801e-20	-19.319	-19.319	0.000	(0)
HgSO4	3.089e-20	3.089e-20	-19.510	-19.510	0.000	(0)
Cr2 (OH) 2SO4+2	1.470e-20	1.806e-21	-19.833	-20.743	-0.911	(0)
Cr2 (OH) 2 (SO4) 2	1.668e-21	1.668e-21	-20.778	-20.778	0.000	(0)
CrO3SO4-2	2.874e-23	3.532e-24	-22.541	-23.452	-0.911	(0)
VSO4+	1.213e-34	7.180e-35	-33.916	-34.144	-0.228	(0)
U (SO4) 2	4.899e-40	4.899e-40	-39.310	-39.310	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.491	-41.402	-0.911	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.020	-61.247	-0.228	(0)
Sb (3)	1.462e-19					
Sb (OH) 3	7.387e-20	7.387e-20	-19.132	-19.132	0.000	(0)
HSbO2	7.235e-20	7.235e-20	-19.141	-19.141	0.000	(0)
SbO2-	1.906e-23	1.128e-23	-22.720	-22.948	-0.228	(0)
Sb (OH) 4-	1.085e-23	6.423e-24	-22.965	-23.192	-0.228	(0)
Sb (OH) 2F	1.696e-25	1.696e-25	-24.771	-24.771	0.000	(0)
SbOF	1.673e-25	1.673e-25	-24.776	-24.776	0.000	(0)
Sb (OH) 2+	3.157e-26	1.869e-26	-25.501	-25.728	-0.228	(0)
SbO+	1.092e-26	6.465e-27	-25.962	-26.189	-0.228	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.165	-318.076	-0.911	(0)
Sb (5)	1.771e-07					
SbO3-	1.769e-07	1.047e-07	-6.752	-6.980	-0.228	(0)
Sb (OH) 6-	1.625e-10	1.213e-10	-9.789	-9.916	-0.127	(0)
SbO2+	5.490e-24	3.250e-24	-23.260	-23.488	-0.228	(0)
Se (-2)	8.882e-39					
HSe-	8.882e-39	5.259e-39	-38.051	-38.279	-0.228	(0)
MnSe	0.000e+00	0.000e+00	-40.080	-40.080	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.373	-42.373	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.385	-45.296	-0.911	(0)
Se (4)	1.503e-06					
SeO3-2	9.753e-07	1.198e-07	-6.011	-6.921	-0.911	(0)
HSeO3-	5.280e-07	3.126e-07	-6.277	-6.505	-0.228	(0)
H2SeO3	1.385e-12	1.385e-12	-11.859	-11.859	0.000	(0)
Cd (SeO3) 2-2	1.565e-16	1.923e-17	-15.805	-16.716	-0.911	(0)
FeHSeO3+2	1.180e-23	1.450e-24	-22.928	-23.839	-0.911	(0)
Se (6)	1.677e-09					
SeO4-2	1.671e-09	5.192e-10	-8.777	-9.285	-0.508	(0)
MnSeO4	5.565e-12	5.565e-12	-11.255	-11.255	0.000	(0)
ZnSeO4	3.754e-13	3.754e-13	-12.425	-12.425	0.000	(0)
HSeO4-	4.564e-16	2.702e-16	-15.341	-15.568	-0.228	(0)
CdSeO4	1.571e-16	1.571e-16	-15.804	-15.804	0.000	(0)
CoSeO4	1.314e-16	1.314e-16	-15.881	-15.881	0.000	(0)
NiSeO4	3.455e-17	3.455e-17	-16.462	-16.462	0.000	(0)
Zn (SeO4) 2-2	1.608e-21	1.976e-22	-20.794	-21.704	-0.911	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.730	-59.779	-2.049	(0)
U (4)	6.688e-20					
U (OH) 5-	6.686e-20	3.958e-20	-19.175	-19.402	-0.228	(0)
U (OH) 4	1.727e-23	1.727e-23	-22.763	-22.763	0.000	(0)
U (OH) 3+	1.111e-27	6.579e-28	-26.954	-27.182	-0.228	(0)
U (OH) 2+2	2.580e-32	3.170e-33	-31.588	-32.499	-0.911	(0)
UF3+	1.209e-36	7.159e-37	-35.917	-36.145	-0.228	(0)
UF2+2	2.606e-37	3.202e-38	-36.584	-37.495	-0.911	(0)
UOH+3	1.740e-37	1.555e-39	-36.759	-38.808	-2.049	(0)
UF4	1.107e-38	1.107e-38	-37.956	-37.956	0.000	(0)
UF+3	2.017e-39	0.000e+00	-38.695	-40.744	-2.049	(0)
U (SO4) 2	4.899e-40	4.899e-40	-39.310	-39.310	0.000	(0)
UF5-	1.045e-40	0.000e+00	-39.981	-40.208	-0.228	(0)
USO4+2	0.000e+00	0.000e+00	-40.491	-41.402	-0.911	(0)
UF6-2	0.000e+00	0.000e+00	-40.668	-41.579	-0.911	(0)
U+4	0.000e+00	0.000e+00	-42.551	-46.193	-3.642	(0)

UC1+3	0.000e+00	0.000e+00	-44.353	-46.402	-2.049	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-156.144	-174.582	-18.438	(0)
U (5)	2.110e-16					
UO2+	2.110e-16	1.249e-16	-15.676	-15.903	-0.228	(0)
U (6)	2.029e-06					
UO2 (CO3) 3-4	1.994e-06	4.545e-10	-5.700	-9.342	-3.642	(0)
UO2 (CO3) 2-2	3.542e-08	4.353e-09	-7.451	-8.361	-0.911	(0)
UO2CO3	1.047e-10	1.047e-10	-9.980	-9.980	0.000	(0)
UO2OH+	2.594e-12	1.536e-12	-11.586	-11.814	-0.228	(0)
UO2 (SO4) 2-2	4.956e-13	6.090e-14	-12.305	-13.215	-0.911	(0)
UO2F+	4.151e-13	2.458e-13	-12.382	-12.609	-0.228	(0)
UO2SO4	2.971e-13	2.971e-13	-12.527	-12.527	0.000	(0)
UO2F2	9.999e-14	9.999e-14	-13.000	-13.000	0.000	(0)
UO2+2	4.063e-14	1.262e-14	-13.391	-13.899	-0.508	(0)
UO2F3-	5.984e-15	3.543e-15	-14.223	-14.451	-0.228	(0)
UO2Cl+	4.267e-16	2.526e-16	-15.370	-15.598	-0.228	(0)
UO2F4-2	3.231e-17	3.970e-18	-16.491	-17.401	-0.911	(0)
(UO2) 2 (OH) 2+2	3.186e-17	3.915e-18	-16.497	-17.407	-0.911	(0)
(UO2) 3 (OH) 5+	7.195e-18	4.260e-18	-17.143	-17.371	-0.228	(0)
UO2NO3+	6.201e-22	3.672e-22	-21.208	-21.435	-0.228	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.386	-42.614	-0.228	(0)
V+2	0.000e+00	0.000e+00	-43.199	-44.109	-0.911	(0)
V (3)	7.122e-15					
V (OH) 3	7.122e-15	7.122e-15	-14.147	-14.147	0.000	(0)
V (OH) 2+	8.097e-26	4.794e-26	-25.092	-25.319	-0.228	(0)
VOH+2	3.855e-29	4.738e-30	-28.414	-29.324	-0.911	(0)
V+3	1.094e-33	9.781e-36	-32.961	-35.010	-2.049	(0)
VSO4+	1.213e-34	7.180e-35	-33.916	-34.144	-0.228	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.143	-56.192	-2.049	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.207	-57.849	-3.642	(0)
V (4)	3.795e-18					
V (OH) 3+	3.639e-18	2.154e-18	-17.439	-17.667	-0.228	(0)
VO+2	9.123e-20	1.121e-20	-19.040	-19.950	-0.911	(0)
VOSO4	4.801e-20	4.801e-20	-19.319	-19.319	0.000	(0)
VOF+	1.602e-20	9.485e-21	-19.795	-20.023	-0.228	(0)
VOC1+	6.555e-22	3.881e-22	-21.183	-21.411	-0.228	(0)
VOF2	5.017e-22	5.017e-22	-21.300	-21.300	0.000	(0)
VOF3-	4.241e-24	2.511e-24	-23.373	-23.600	-0.228	(0)
VOF4-2	1.163e-26	1.430e-27	-25.934	-26.845	-0.911	(0)
H2V2O4+2	1.906e-30	2.342e-31	-29.720	-30.630	-0.911	(0)
V (5)	1.347e-07					
HVO4-2	7.250e-08	8.909e-09	-7.140	-8.050	-0.911	(0)
H2VO4-	6.221e-08	3.683e-08	-7.206	-7.434	-0.228	(0)
HV2O7-3	1.248e-11	1.116e-13	-10.904	-12.952	-2.049	(0)
H3VO4	3.825e-12	3.825e-12	-11.417	-11.417	0.000	(0)
H3V2O7-	1.541e-12	9.126e-13	-11.812	-12.040	-0.228	(0)
V2O7-4	1.268e-12	2.892e-16	-11.897	-15.539	-3.642	(0)
VO4-3	4.810e-13	4.300e-15	-12.318	-14.367	-2.049	(0)
V3O9-3	5.912e-15	5.285e-17	-14.228	-16.277	-2.049	(0)
VO2+	1.069e-16	7.978e-17	-15.971	-16.098	-0.127	(0)
VO2SO4-	5.003e-17	2.962e-17	-16.301	-16.528	-0.228	(0)
VO2F	1.974e-17	1.974e-17	-16.705	-16.705	0.000	(0)
V4O12-4	3.571e-18	8.141e-22	-17.447	-21.089	-3.642	(0)
VO2F2-	1.707e-18	1.011e-18	-17.768	-17.995	-0.228	(0)
VO2F3-2	1.447e-20	1.779e-21	-19.839	-20.750	-0.911	(0)
VO2F4-3	1.381e-23	1.234e-25	-22.860	-24.909	-2.049	(0)
VO2NO3	5.882e-25	5.882e-25	-24.230	-24.230	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-49.154	-57.349	-8.195	(0)
HV10O28-5	0.000e+00	0.000e+00	-51.455	-57.146	-5.691	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.280	-59.922	-3.642	(0)
Zn	5.033e-05					
Zn (SO4) 2-2	1.751e-05	2.151e-06	-4.757	-5.667	-0.911	(0)
ZnSO4	1.588e-05	1.588e-05	-4.799	-4.799	0.000	(0)
Zn+2	1.503e-05	4.669e-06	-4.823	-5.331	-0.508	(0)
ZnOH+	7.621e-07	4.512e-07	-6.118	-6.346	-0.228	(0)
ZnCO3	5.598e-07	5.598e-07	-6.252	-6.252	0.000	(0)
ZnCl+	2.014e-07	1.447e-07	-6.696	-6.839	-0.143	(0)

ZnOHCl	1.831e-07	1.831e-07	-6.737	-6.737	0.000	(0)
ZnHCO3+	1.151e-07	6.814e-08	-6.939	-7.167	-0.228	(0)
Zn(OH)2	6.911e-08	6.911e-08	-7.160	-7.160	0.000	(0)
ZnF+	2.219e-08	1.314e-08	-7.654	-7.881	-0.228	(0)
ZnCl2	2.830e-09	2.830e-09	-8.548	-8.548	0.000	(0)
Zn(OH)3-	5.654e-10	3.348e-10	-9.248	-9.475	-0.228	(0)
ZnCl3-	3.860e-11	2.774e-11	-10.413	-10.557	-0.143	(0)
ZnCl4-2	5.739e-13	1.712e-13	-12.241	-12.767	-0.525	(0)
ZnSeO4	3.754e-13	3.754e-13	-12.425	-12.425	0.000	(0)
ZnNO3+	2.888e-13	1.710e-13	-12.539	-12.767	-0.228	(0)
Zn(OH)4-2	1.048e-13	1.288e-14	-12.980	-13.890	-0.911	(0)
Zn(SeO4)2-2	1.608e-21	1.976e-22	-20.794	-21.704	-0.911	(0)
Zn(NO3)2	4.973e-22	4.973e-22	-21.303	-21.303	0.000	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-146.931	-147.159	-0.228	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.132	-149.132	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-223.935	-224.163	-0.228	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.249	-226.159	-0.911	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.023	-303.934	-0.911	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.39	-49.10	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.76	-37.25	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.99	-37.25	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.89	-53.96	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-56.20	-36.17	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.89	-28.49	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.55	-23.10	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.51	9.29	10.80	Al(OH)3
Al2(MoO4)3	-47.76	-45.40	2.37	Al2(MoO4)3
Al2O3	-1.07	18.58	19.65	Al2O3
Al4(OH)10SO4	-3.32	19.38	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.66	-6.86	4.80	AlAsO4:2H2O
AlOHSO4	-5.25	-8.48	-3.23	AlOHSO4
AlSb	-152.10	-86.47	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.28	-12.07	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.81	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.41	-91.17	-2.76	As4O6
Artinite	-3.77	5.83	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.29	6.71	As2O5
Atacamite	-0.78	6.61	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.55	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.61	7.78	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.52	-0.65	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.79	7.15	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.17	-22.84	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.57	-13.53	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.52	-6.69	1.83	BaSeO3
BaSeO4	-10.00	-17.46	-7.46	BaSeO4
Bianchite	-5.38	-7.15	-1.76	ZnSO4:6H2O
Birnessite	-6.33	11.76	18.09	MnO2
Bixbyite	-1.38	-2.02	-0.64	Mn2O3
BlaubleiI	-55.07	-79.23	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.71	9.29	8.58	AlOOH
Breithauptite	-58.35	-76.87	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.11	13.74	16.84	Mg(OH)2

Bunsenite	-6.33	6.12	12.45	NiO
Ca (VO3) 2	-8.72	-3.06	5.66	Ca (VO3) 2
Ca2V2O7	-7.40	10.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.45	10.10	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-15.69	23.27	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-16.60	23.26	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-295.00	-152.03	142.97	Ca3Sb2
CaCrO4	-15.20	-17.47	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-4.93	-22.84	-17.91	Hg2Cl2
CaMoO4	-0.21	-8.16	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.14	-1.32	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.07	-12.09	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.13	-0.29	9.84	Cd (BO2) 2
Cd (OH) 2	-6.47	7.18	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.55	7.18	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.73	-14.02	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-18.81	3.75	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-17.47	10.93	28.40	Cd4 (OH) 6SO4
CdCl2	-11.95	-12.61	-0.66	CdCl2
CdCl2:1H2O	-10.91	-12.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.70	-12.61	-1.91	CdCl2:2.5H2O
CdF2	-15.28	-16.49	-1.21	CdF2
Cdmetal (alpha)	-31.88	-18.37	13.51	Cd
Cdmetal (gamma)	-31.99	-18.37	13.62	Cd
CdMoO4	-0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.25	-2.72	3.54	CdOHCl
CdSb	-75.46	-75.81	-0.35	CdSb
CdSe	-18.88	-39.08	-20.20	CdSe
CdSeO4:2H2O	-16.23	-18.08	-1.85	CdSeO4:2H2O
CdSO4	-10.43	-10.60	-0.17	CdSO4
CdSO4:1H2O	-8.87	-10.60	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.73	-10.60	-1.87	CdSO4:2.67H2O
Cerrusite	-2.81	-15.94	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.61	-160.88	-35.27	CuFeS2
Cinnabar	-50.95	-96.64	-45.69	HgS
Claudetite	-88.11	-91.17	-3.06	As4O6
Clausthalite	-13.45	-40.55	-27.10	PbSe
Co (BO2) 2	-27.87	-0.80	27.07	Co (BO2) 2
Co (OH) 2	-6.43	6.67	13.09	Co (OH) 2
Co (OH) 3	-10.65	-12.96	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-25.32	-12.29	13.03	Co3 (AsO4) 2
Co3O4	-8.75	-19.25	-10.50	Co3O4
CoCl2	-21.38	-13.11	8.27	CoCl2
CoCl2:6H2O	-15.66	-13.12	2.54	CoCl2:6H2O
CoCO3	-5.00	-14.98	-9.98	CoCO3
CoF2	-15.40	-17.00	-1.60	CoF2
CoF3	-47.00	-48.46	-1.46	CoF3
CoFe2O4	16.58	13.06	-3.53	CoFe2O4
CoMoO4	-6.90	-14.66	-7.76	CoMoO4
CoO	-6.92	6.67	13.59	CoO
CoS (alpha)	-72.18	-79.62	-7.44	CoS
CoS (beta)	-68.55	-79.62	-11.07	CoS
CoSe	-23.39	-39.59	-16.20	CoSe
CoSeO3	-9.14	-7.82	1.32	CoSeO3
CoSeO4:6H2O	-17.06	-18.59	-1.53	CoSeO4:6H2O
CoSO4	-13.91	-11.11	2.80	CoSO4
CoSO4:6H2O	-8.64	-11.11	-2.47	CoSO4:6H2O
Cotunnite	-9.30	-14.08	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-22.22	-11.41	10.82	Cr (OH) 2
Cr (OH) 3	-2.92	-1.58	1.34	Cr (OH) 3

Cr(OH)3(am)	-0.83	-1.58	-0.75	Cr(OH)3
Cr2O3	-0.80	-3.16	-2.36	Cr2O3
CrCl2	-45.28	-31.19	14.09	CrCl2
CrCl3	-46.37	-31.25	15.11	CrCl3
CrF3	-25.74	-37.08	-11.34	CrF3
Crmetal	-67.43	-36.95	30.48	Cr
CrO3	-27.43	-30.64	-3.21	CrO3
Cryolite	-8.24	-42.08	-33.84	Na3AlF6
Cu(OH)2	-0.43	8.25	8.67	Cu(OH)2
Cu(SbO3)2	-24.13	21.08	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.57	0.68	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.47	-89.35	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.13	-49.93	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.64	-7.54	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.67	-101.26	-42.59	Cu3Sb
Cu3Se2	-24.45	-87.94	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.95	-22.39	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.27	10.30	CuOCuSO4
Cupricferrite	8.65	14.64	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.91	-38.01	-33.10	CuSe
CuSe2	-25.36	-58.73	-33.37	CuSe2
CuSeO3:2H2O	-6.75	-6.24	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.57	-17.01	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.52	2.94	CuSO4
Diaspore	2.42	9.29	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.15	-16.39	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.70	-16.39	-17.09	CaMg(CO3)2
Epsomite	-1.92	-4.05	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.26	0.22	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.06	-12.78	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.66	-8.10	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.45	-37.08	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.20	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.90	0.30	7.20	FeCr2O4
FeMoO4	-7.78	-17.87	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.93	-63.53	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.81	-42.81	-11.00	FeSe
Fix_pe	-4.79	-4.79	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.62	-80.59	-13.97	PbS
Gibbsite	1.00	9.29	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.14	-7.15	-2.01	ZnSO4:7H2O
Greenockite	-64.76	-79.12	-14.36	CdS
Greigite	-290.30	-335.33	-45.03	Fe3S4
Gummite	-5.60	2.07	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.45	-21.33	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.30	-46.26	-4.96	H2Se
Halite	-4.95	-3.35	1.60	NaCl
Hausmannite	-0.79	60.24	61.03	Mn3O4

Hematite	7.80	6.39	-1.42	Fe2O3
Hercynite	-0.86	22.04	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.30	-258.00	-73.71	Hg (CH3) 2
Hg (g)	-6.43	-14.30	-7.87	Hg
Hg (OH) 2	-6.85	-10.35	-3.50	Hg (OH) 2
Hg2 (g)	-13.65	-28.60	-14.96	Hg2
Hg2 (OH) 2	-8.32	-3.06	5.26	Hg2 (OH) 2
Hg2CO3	-8.65	-24.70	-16.05	Hg2CO3
Hg2CrO4	-24.99	-33.69	-8.70	Hg2CrO4
Hg2F2	-16.36	-26.72	-10.36	Hg2F2
Hg2S	-77.67	-89.35	-11.68	Hg2S
Hg2SeO3	-12.89	-17.54	-4.66	Hg2SeO3
Hg2SO4	-14.70	-20.83	-6.13	Hg2SO4
Hg3O2CO3	-23.01	-52.69	-29.68	Hg3O2CO3
HgCl (g)	-30.92	-11.42	19.50	HgCl
HgCl2	-8.87	-30.13	-21.26	HgCl2
HgF (g)	-46.04	-13.36	32.68	HgF
HgF2 (g)	-46.58	-34.02	12.57	HgF2
Hgmetal (l)	-0.85	-14.30	-13.45	Hg
HgSe	-0.92	-56.61	-55.69	HgSe
HgSeO3	-12.41	-24.84	-12.43	HgSeO3
HgSO4	-18.70	-28.12	-9.42	HgSO4
Huntite	-2.24	-32.20	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-7.41	-26.18	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.13	-17.90	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.83	-20.00	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.89	-19.69	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.48	-48.72	-17.24	K2Cr2O7
K2CrO4	-17.57	-18.08	-0.51	K2CrO4
K2MoO4	-12.03	-8.77	3.26	K2MoO4
K2SeO4	-11.96	-12.69	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.93	-6.36	-0.43	PbO : PbSO4
Laurionite	-4.81	-4.19	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.99	5.71	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	0.00	6.39	6.39	Fe2O3
Magnesioferrite	3.27	20.13	16.86	Fe2MgO4
Magnesite	-0.45	-7.91	-7.46	MgCO3
Magnetite	6.44	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.00	24.34	25.34	MnOOH
Massicot	-7.19	5.71	12.89	PbO
Matlockite	-7.05	-16.02	-8.97	PbClF
Melanothallite	-17.79	-11.53	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.55	-96.64	-45.09	HgS
Mg (OH) 2 (active)	-5.06	13.74	18.79	Mg (OH) 2
Mg (VO3) 2	-13.77	-2.49	11.28	Mg (VO3) 2
Mg2Sb3	-270.63	-195.95	74.68	Mg2Sb3
Mg2V2O7	-15.11	11.25	26.36	Mg2V2O7
MgCr2O4	-5.62	10.58	16.20	MgCr2O4
MgCrO4	-22.28	-16.90	5.38	MgCrO4
MgF2	-1.80	-9.93	-8.13	MgF2
MgMoO4	-5.74	-7.59	-1.85	MgMoO4
MgSeO3 : 6H2O	-3.81	-0.76	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.32	-11.52	-1.20	MgSeO4 : 6H2O
Minium	-30.86	42.66	73.52	Pb3O4
Mirabilite	-3.59	-4.70	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.56	-4.66	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.63	-55.35	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.48	-85.40	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.11	2.39	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-10.94	-8.22	2.72	MnCl2 : 4H2O
MnS (grn)	-74.90	-74.73	0.17	MnS
MnS (pnk)	-78.07	-74.73	3.34	MnS

MnSb	-93.87	-96.78	-2.91	MnSb
MnSe	-38.20	-34.70	3.50	MnSe
MnSeO3	-4.05	-2.92	1.13	MnSeO3
MnSeO3:2H2O	-3.91	-2.92	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.64	-13.69	-2.05	MnSeO4:5H2O
MnSO4	-8.79	-6.21	2.58	MnSO4
Monteponite	-7.93	7.18	15.10	CdO
Montroydite	-6.71	-10.35	-3.64	HgO
MoO3	-13.33	-21.33	-8.00	MoO3
Morenosite	-9.52	-11.67	-2.14	NiSO4:7H2O
MoS2	-149.20	-219.46	-70.26	MoS2
Na-Jarosite	-8.23	-19.43	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.29	-48.19	-9.90	Na2Cr2O7
Na2CrO4	-20.48	-17.55	2.93	Na2CrO4
Na2Mo2O7	-12.97	-29.56	-16.60	Na2Mo2O7
Na2MoO4	-9.73	-8.24	1.49	Na2MoO4
Na2MoO4:2H2O	-9.46	-8.24	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-11.71	-1.41	10.30	Na2SeO3:5H2O
Na2SeO4	-13.44	-12.16	1.28	Na2SeO4
Na3Sb	-170.58	-76.13	94.45	Na3Sb
Na3VO4	-25.16	11.52	36.68	Na3VO4
Na4V2O7	-27.45	9.95	37.40	Na4V2O7
Nantokite	-4.99	-11.72	-6.73	CuCl
NaSb	-86.84	-63.67	23.17	NaSb
Natron	-7.26	-8.57	-1.31	Na2CO3:10H2O
NaVO3	-5.43	-1.57	3.86	NaVO3
Nesquehonite	-3.24	-7.91	-4.67	MgCO3:3H2O
Ni(OH)2	-6.68	6.12	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-29.65	-13.95	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-25.30	6.70	32.00	Ni4(OH)6SO4
NiCO3	-8.66	-15.53	-6.87	NiCO3
NiMoO4	-4.07	-15.21	-11.14	NiMoO4
NiS(alpha)	-74.57	-80.17	-5.60	NiS
NiS(beta)	-69.07	-80.17	-11.10	NiS
NiS(gamma)	-67.37	-80.17	-12.80	NiS
NiSe	-22.44	-40.14	-17.70	NiSe
NiSeO3:2H2O	-11.19	-8.37	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.62	-19.14	-1.52	NiSeO4:6H2O
Nsutite	-5.74	11.76	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.40	-304.46	-61.07	As2S3
Otavite	-2.47	-14.47	-12.00	CdCO3
Pb(BO2)2	-8.28	-1.76	6.52	Pb(BO2)2
Pb(OH)2	-2.45	5.70	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-64.06	-72.82	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.27	1.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.78	11.41	26.19	Pb2O(OH)2
Pb2O3	-24.08	36.96	61.04	Pb2O3
Pb2OCO3	-9.68	-10.23	-0.56	Pb2OCO3
Pb2V2O7	-2.92	-4.82	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.97	-15.17	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.25	0.89	6.14	Pb3(VO4)2
Pb3O2CO3	-15.55	-4.53	11.02	Pb3O2CO3
Pb3O2SO4	-11.34	-0.66	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.05	5.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.83	5.05	21.88	Pb4O3SO4
PbCrO4	-12.33	-24.93	-12.60	PbCrO4
PbF2	-10.52	-17.96	-7.44	PbF2
Pbmetal	-24.08	-19.84	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.27	5.71	12.98	PbO:0.33H2O
PbSeO4	-12.70	-19.54	-6.84	PbSeO4
Periclase	-7.84	13.74	21.58	MgO
Phosgenite	-10.21	-30.02	-19.81	PbCl2:PbCO3
Plattnerite	-18.35	31.25	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.63	11.56	15.19	Mn(OH)2

Pyrolusite	-4.27	37.11	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.62	-11.66	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-5.08	-19.58	-14.50	UO2CO3
Sb(OH)3	-12.02	-19.13	-7.11	Sb(OH)3
Sb2O4	-16.12	-12.71	3.40	Sb2O4
Sb2O5	-26.12	-35.79	-9.67	Sb2O5
Sb2Se3	-109.29	-177.04	-67.76	Sb2Se3
Sb4O6(cubic)	-58.26	-76.52	-18.26	Sb4O6
Sb4O6(orth)	-58.62	-76.52	-17.90	Sb4O6
SbCl3	-49.38	-48.80	0.57	SbCl3
SbF3	-44.40	-54.63	-10.23	SbF3
Sbmetal	-45.76	-57.45	-11.69	Sb
SbO2	-2.84	-30.67	-27.82	SbO2
Schoepite	-3.93	2.06	5.99	UO2(OH)2:H2O
Semetal(am)	-13.61	-20.72	-7.11	Se
Semetal(hex)	-13.01	-20.72	-7.71	Se
Senarmontite	-25.89	-38.26	-12.37	Sb2O3
SeO2	-14.61	-14.49	0.12	SeO2
SeO3	-46.29	-25.25	21.04	SeO3
Siderite	-7.95	-18.19	-10.24	FeCO3
Smithsonite	-1.01	-11.01	-10.00	ZnCO3
Sphalerite	-64.21	-75.66	-11.45	ZnS
Spinel	-4.53	32.32	36.85	MgAl2O4
Stibnite	-246.68	-297.14	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.01	-4.69	0.32	Na2SO4
Thermonatrite	-9.20	-8.56	0.64	Na2CO3:H2O
Tyuyamunite	-3.01	1.07	4.08	Ca(UO2)2(VO4)2
U3O8	-12.78	8.30	21.08	U3O8
U3Sb4	-578.22	-425.84	152.38	U3Sb4
U4O9	-28.48	-31.50	-3.02	U4O9
UF4	-32.06	-61.60	-29.54	UF4
UF4:2.5H2O	-28.88	-61.60	-32.72	UF4:2.5H2O
UO2(am)	-15.20	-14.26	0.93	UO2
UO2(NO3)2	-41.72	-29.57	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.43	-29.57	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.97	-29.58	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.63	-29.58	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.55	2.07	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.94	-23.19	-2.25	UO2SeO4:4H2O
UO3	-5.63	2.07	7.70	UO3
Uraninite	-9.59	-14.26	-4.67	UO2
USb2	-219.04	-189.46	29.58	USb2
V(OH)3	-18.65	-11.06	7.59	V(OH)3
V2O5	-14.87	-16.23	-1.36	V2O5
V3O5	-39.33	-37.50	1.84	V3O5
V4O7	-48.67	-41.48	7.19	V4O7
V6O13	-38.92	-99.78	-60.86	V6O13
Valentinite	-29.78	-38.26	-8.48	Sb2O3
VC12	-62.49	-43.62	18.87	VC12
VC13	-64.17	-40.74	23.43	VC13
VF4	-66.25	-51.32	14.93	VF4
Vmetal	-93.40	-49.38	44.03	V
VO	-38.59	-23.83	14.76	VO
VO(OH)2	-9.14	-3.99	5.15	VO(OH)2
VO2Cl	-20.85	-18.01	2.84	VO2Cl
VOC1	-32.10	-20.95	11.15	VOC1
VOC12	-36.53	-23.77	12.76	VOC12
VOSO4	-25.37	-21.76	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.71	-75.66	-8.95	ZnS
Zincite	-0.70	10.64	11.33	ZnO
Zincosite	-11.07	-7.14	3.93	ZnSO4
Zn(BO2)2	-5.12	3.17	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.33	-21.01	3.32	Zn(NO3)2:6H2O

Zn(OH) 2	-1.57	10.63	12.20	Zn(OH) 2
Zn(OH) 2 (am)	-1.84	10.63	12.47	Zn(OH) 2
Zn(OH) 2 (beta)	-1.12	10.63	11.75	Zn(OH) 2
Zn(OH) 2 (epsilon)	-0.90	10.63	11.53	Zn(OH) 2
Zn(OH) 2 (gamma)	-1.10	10.63	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-4.01	3.49	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-3.81	11.38	15.19	Zn2(OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-14.04	-0.39	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-22.56	-3.64	18.91	Zn3O(SO4) 2
Zn4(OH) 6SO4	-3.64	24.76	28.40	Zn4(OH) 6SO4
Zn5(OH) 8Cl2	-5.11	33.39	38.50	Zn5(OH) 8Cl2
ZnCl2	-16.20	-9.15	7.05	ZnCl2
ZnCO3:1H2O	-0.75	-11.01	-10.26	ZnCO3:1H2O
ZnF2	-12.50	-13.03	-0.53	ZnF2
Znmetal	-40.70	-14.91	25.79	Zn
ZnMoO4	-0.57	-10.69	-10.13	ZnMoO4
ZnO(active)	-0.55	10.64	11.19	ZnO
ZnS(am)	-66.61	-75.66	-9.05	ZnS
ZnSb	-83.37	-72.36	11.01	ZnSb
ZnSe	-21.23	-35.63	-14.40	ZnSe
ZnSeO4:6H2O	-13.10	-14.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.50	-7.14	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 28.

```

Title Stage 1 Pit lake Mix
Mix 103
104    0.005764
108    0.001108
1      0.001817
17     0.002835
16     0.988476
Save solution 109
end

```

TITLE

Stage 1 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 103.

Mixture 103.

1.817e-03 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

9.885e-01 Solution 16 Average water quality for Water Supply Wells PW-1 and PW-3 (representative of water used to rapidly re-fill pit)

2.835e-03 Solution 17 Average water quality for Background Surface Water SWQ-1 (representative of haul road and watershed run-off)

5.764e-03 Solution 104 Solution after simulation 23.

1.108e-03 Solution 108 Solution after simulation 27.

-----Solution composition-----

Elements	Molality	Moles
Ag	2.093e-10	2.093e-10
Al	1.446e-08	1.446e-08
As	7.127e-08	7.127e-08
B	7.640e-06	7.641e-06
Ba	6.824e-08	6.824e-08
C	2.252e-03	2.253e-03
Ca	7.272e-04	7.272e-04
Cd	1.046e-10	1.046e-10
Cl	1.836e-03	1.836e-03
Co	7.891e-10	7.891e-10
Cr	1.141e-07	1.141e-07
Cu	5.647e-08	5.647e-08
F	7.708e-05	7.708e-05
Fe	9.384e-07	9.384e-07
Hg	2.265e-11	2.265e-11
K	1.231e-04	1.231e-04
Mg	1.399e-04	1.399e-04
Mn	6.927e-07	6.927e-07
Mo	1.732e-08	1.732e-08
N	6.607e-08	6.607e-08
Na	3.092e-03	3.092e-03
Ni	1.228e-09	1.228e-09
Pb	1.005e-10	1.005e-10
S	4.010e-04	4.010e-04
Sb	2.854e-10	2.854e-10
Se	1.799e-09	1.799e-09
Si	3.127e-04	3.127e-04
U	1.247e-08	1.247e-08
V	1.682e-10	1.682e-10
Zn	4.119e-07	4.119e-07

-----Description of solution-----

	pH	=	8.007	Charge balance
	pe	=	4.544	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.018e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.238e-03	
	Total CO2 (mol/kg)	=	2.252e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.817e-09	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	13	
	Total H	=	1.110188e+02	
	Total O	=	5.551725e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.113e-06	1.024e-06	-5.954	-5.990	-0.036	(0)
H+	1.068e-08	9.835e-09	-7.971	-8.007	-0.036	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.093e-10					
AgCl	1.416e-10	1.416e-10	-9.849	-9.849	0.000	(0)
Ag+	4.455e-11	4.103e-11	-10.351	-10.387	-0.036	(0)
AgCl2-	2.285e-11	2.086e-11	-10.641	-10.681	-0.040	(0)
AgSO4-	2.341e-13	2.137e-13	-12.631	-12.670	-0.040	(0)
AgCl3-2	4.525e-14	3.143e-14	-13.344	-13.503	-0.158	(0)
AgF	7.188e-15	7.188e-15	-14.143	-14.143	0.000	(0)

	AgOH	4.200e-15	4.200e-15	-14.377	-14.377	0.000	(0)
	AgNO2	4.474e-16	4.474e-16	-15.349	-15.349	0.000	(0)
	AgH2BO3	2.754e-16	2.754e-16	-15.560	-15.560	0.000	(0)
	AgCl4-3	2.463e-16	1.085e-16	-15.608	-15.965	-0.356	(0)
	AgNH3+	4.274e-17	3.902e-17	-16.369	-16.409	-0.040	(0)
	AgSeO3-	1.253e-17	1.144e-17	-16.902	-16.942	-0.040	(0)
	Ag2Se	5.362e-18	5.362e-18	-17.271	-17.271	0.000	(0)
	Ag (OH) 2-	4.602e-19	4.202e-19	-18.337	-18.377	-0.040	(0)
	AgNO3	5.786e-22	5.786e-22	-21.238	-21.238	0.000	(0)
	Ag (NH3) 2+	1.618e-22	1.478e-22	-21.791	-21.830	-0.040	(0)
	Ag (NO2) 2-	3.962e-23	3.617e-23	-22.402	-22.442	-0.040	(0)
	Ag (SeO3) 2-3	1.008e-25	4.442e-26	-24.996	-25.352	-0.356	(0)
	Ag2MoO4	7.936e-30	7.936e-30	-29.100	-29.100	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.910	-74.910	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.071	-85.704	-0.633	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.509	-148.623	-0.114	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-149.107	-149.147	-0.040	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.828	-150.056	-0.228	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.146	-150.367	-0.221	(0)
Al		1.446e-08					
	Al (OH) 4-	1.435e-08	1.322e-08	-7.843	-7.879	-0.035	(0)
	Al (OH) 3	1.026e-10	1.026e-10	-9.989	-9.989	0.000	(0)
	Al (OH) 2+	5.442e-12	5.024e-12	-11.264	-11.299	-0.035	(0)
	AlF2+	1.266e-13	1.169e-13	-12.897	-12.932	-0.035	(0)
	AlF3	1.027e-13	1.027e-13	-12.989	-12.989	0.000	(0)
	AlOH+2	8.511e-15	6.178e-15	-14.070	-14.209	-0.139	(0)
	AlF+2	5.799e-15	4.210e-15	-14.237	-14.376	-0.139	(0)
	AlF4-	3.894e-15	3.589e-15	-14.410	-14.445	-0.035	(0)
	AlSO4+	1.327e-17	1.223e-17	-16.877	-16.913	-0.035	(0)
	Al+3	1.267e-17	6.035e-18	-16.897	-17.219	-0.322	(0)
	Al (SO4) 2-	3.713e-20	3.422e-20	-19.430	-19.466	-0.035	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.342	-57.698	-0.356	(0)
As (3)		4.696e-21					
	H3AsO3	4.442e-21	4.442e-21	-20.352	-20.352	0.000	(0)
	H2AsO3-	2.538e-22	2.317e-22	-21.596	-21.635	-0.040	(0)
	HAsO3-2	3.093e-26	2.148e-26	-25.510	-25.668	-0.158	(0)
	H4AsO3+	2.371e-29	2.165e-29	-28.625	-28.665	-0.040	(0)
	AsO3-3	1.912e-31	8.420e-32	-30.719	-31.075	-0.356	(0)
As (5)		7.127e-08					
	HAsO4-2	6.669e-08	4.632e-08	-7.176	-7.334	-0.158	(0)
	H2AsO4-	4.551e-09	4.155e-09	-8.342	-8.381	-0.040	(0)
	AsO4-3	3.381e-11	1.489e-11	-10.471	-10.827	-0.356	(0)
	H3AsO4	7.091e-15	7.101e-15	-14.149	-14.149	0.001	(0)
B		7.640e-06					
	H3BO3	7.163e-06	7.173e-06	-5.145	-5.144	0.001	(0)
	H2BO3-	4.614e-07	4.236e-07	-6.336	-6.373	-0.037	(0)
	CaH2BO3+	1.282e-08	1.176e-08	-7.892	-7.929	-0.037	(0)
	NaH2BO3	1.906e-09	1.906e-09	-8.720	-8.720	0.000	(0)
	MgH2BO3+	1.515e-09	1.391e-09	-8.820	-8.857	-0.037	(0)
	BF (OH) 3-	2.175e-10	1.996e-10	-9.663	-9.700	-0.037	(0)
	H5 (BO3) 2-	2.817e-12	2.586e-12	-11.550	-11.587	-0.037	(0)
	BaH2BO3+	6.872e-13	6.308e-13	-12.163	-12.200	-0.037	(0)
	BF2 (OH) 2-	1.595e-14	1.464e-14	-13.797	-13.834	-0.037	(0)
	H8 (BO3) 3-	2.020e-15	1.855e-15	-14.695	-14.732	-0.037	(0)
	AgH2BO3	2.754e-16	2.754e-16	-15.560	-15.560	0.000	(0)
	BF3OH-	4.258e-21	3.909e-21	-20.371	-20.408	-0.037	(0)
	BF4-	1.438e-26	1.320e-26	-25.842	-25.880	-0.037	(0)
Ba		6.824e-08					
	Ba+2	6.701e-08	4.819e-08	-7.174	-7.317	-0.143	(0)
	BaHCO3+	9.938e-10	9.183e-10	-9.003	-9.037	-0.034	(0)
	BaCO3	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
	BaH2BO3+	6.872e-13	6.308e-13	-12.163	-12.200	-0.037	(0)
	BaOH+	2.335e-13	2.154e-13	-12.632	-12.667	-0.035	(0)
	BaNH3+2	2.039e-17	1.416e-17	-16.691	-16.849	-0.158	(0)
	BaNO3+	4.697e-18	4.288e-18	-17.328	-17.368	-0.040	(0)
C (4)		2.252e-03					
	HCO3-	2.162e-03	1.995e-03	-2.665	-2.700	-0.035	(0)
	H2CO3	4.413e-05	4.413e-05	-4.355	-4.355	0.000	(0)

		CaHCO3+	1.941e-05	1.793e-05	-4.712	-4.746	-0.034	(0)
		CO3-2	1.323e-05	9.511e-06	-4.879	-5.022	-0.143	(0)
		CaCO3	7.276e-06	7.276e-06	-5.138	-5.138	0.000	(0)
		NaHCO3	3.187e-06	3.187e-06	-5.497	-5.497	0.000	(0)
		MgHCO3+	2.100e-06	1.933e-06	-5.678	-5.714	-0.036	(0)
		MgCO3	7.491e-07	7.491e-07	-6.125	-6.125	0.000	(0)
		NaCO3-	5.449e-07	5.030e-07	-6.264	-6.298	-0.035	(0)
		ZnCO3	1.022e-07	1.022e-07	-6.990	-6.990	0.000	(0)
		CuCO3	4.949e-08	4.949e-08	-7.305	-7.305	0.000	(0)
		MnHCO3+	1.945e-08	1.794e-08	-7.711	-7.746	-0.035	(0)
		ZnHCO3+	1.291e-08	1.179e-08	-7.889	-7.929	-0.040	(0)
		UO2 (CO3) 3-4	7.310e-09	1.702e-09	-8.136	-8.769	-0.633	(0)
		UO2 (CO3) 2-2	5.139e-09	3.570e-09	-8.289	-8.447	-0.158	(0)
		Cu (CO3) 2-2	1.824e-09	1.267e-09	-8.739	-8.897	-0.158	(0)
		BaHCO3+	9.938e-10	9.183e-10	-9.003	-9.037	-0.034	(0)
		BaCO3	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
		NiCO3	2.085e-10	2.085e-10	-9.681	-9.681	0.000	(0)
		NiHCO3+	1.583e-10	1.446e-10	-9.800	-9.840	-0.040	(0)
		CuHCO3+	1.219e-10	1.112e-10	-9.914	-9.954	-0.040	(0)
		PbCO3	8.017e-11	8.017e-11	-10.096	-10.096	0.000	(0)
		CoHCO3+	7.230e-11	6.601e-11	-10.141	-10.180	-0.040	(0)
		CoCO3	6.838e-11	6.838e-11	-10.165	-10.165	0.000	(0)
		UO2CO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
		FeHCO3+	1.298e-11	1.200e-11	-10.887	-10.921	-0.034	(0)
		CdCO3	1.212e-11	1.212e-11	-10.916	-10.916	0.000	(0)
		PbHCO3+	4.554e-12	4.157e-12	-11.342	-11.381	-0.040	(0)
		Pb (CO3) 2-2	3.166e-12	2.199e-12	-11.499	-11.658	-0.158	(0)
		CdHCO3+	2.782e-13	2.540e-13	-12.556	-12.595	-0.040	(0)
		Cd (CO3) 2-2	1.230e-13	8.547e-14	-12.910	-13.068	-0.158	(0)
		HgCO3	3.411e-17	3.411e-17	-16.467	-16.467	0.000	(0)
		Hg (CO3) 2-2	1.477e-18	1.026e-18	-17.831	-17.989	-0.158	(0)
		HgHCO3+	6.842e-21	6.246e-21	-20.165	-20.204	-0.040	(0)
Ca	7.272e-04							
		Ca+2	6.712e-04	4.827e-04	-3.173	-3.316	-0.143	(0)
		CaSO4	2.887e-05	2.887e-05	-4.540	-4.540	0.000	(0)
		CaHCO3+	1.941e-05	1.793e-05	-4.712	-4.746	-0.034	(0)
		CaCO3	7.276e-06	7.276e-06	-5.138	-5.138	0.000	(0)
		CaF+	3.984e-07	3.675e-07	-6.400	-6.435	-0.035	(0)
		CaH2BO3+	1.282e-08	1.176e-08	-7.892	-7.929	-0.037	(0)
		CaOH+	1.067e-08	9.859e-09	-7.972	-8.006	-0.034	(0)
		CaNH3+2	4.075e-13	2.831e-13	-12.390	-12.548	-0.158	(0)
		CaNO3+	2.969e-14	2.710e-14	-13.527	-13.567	-0.040	(0)
		Ca (NH3) 2+2	7.558e-23	5.250e-23	-22.122	-22.280	-0.158	(0)
Cd	1.046e-10							
		Cd+2	7.775e-11	5.591e-11	-10.109	-10.252	-0.143	(0)
		CdCO3	1.212e-11	1.212e-11	-10.916	-10.916	0.000	(0)
		CdCl+	9.890e-12	9.028e-12	-11.005	-11.044	-0.040	(0)
		CdSO4	3.422e-12	3.422e-12	-11.466	-11.466	0.000	(0)
		CdOH+	4.980e-13	4.547e-13	-12.303	-12.342	-0.040	(0)
		CdOHC1	3.791e-13	3.791e-13	-12.421	-12.421	0.000	(0)
		CdHCO3+	2.782e-13	2.540e-13	-12.556	-12.595	-0.040	(0)
		Cd (CO3) 2-2	1.230e-13	8.547e-14	-12.910	-13.068	-0.158	(0)
		CdF+	6.771e-14	6.181e-14	-13.169	-13.209	-0.040	(0)
		CdCl2	6.364e-14	6.364e-14	-13.196	-13.196	0.000	(0)
		Cd (SO4) 2-2	1.735e-14	1.205e-14	-13.761	-13.919	-0.158	(0)
		Cd (OH) 2	2.937e-15	2.937e-15	-14.532	-14.532	0.000	(0)
		CdCl3-	7.436e-17	6.789e-17	-16.129	-16.168	-0.040	(0)
		CdF2	8.603e-18	8.603e-18	-17.065	-17.065	0.000	(0)
		Cd (OH) 3-	2.012e-19	1.837e-19	-18.696	-18.736	-0.040	(0)
		CdSeO4	7.054e-21	7.054e-21	-20.152	-20.152	0.000	(0)
		CdNO3+	3.439e-21	3.139e-21	-20.464	-20.503	-0.040	(0)
		Cd2OH+3	2.893e-22	1.274e-22	-21.539	-21.895	-0.356	(0)
		Cd (SeO3) 2-2	1.248e-23	8.669e-24	-22.904	-23.062	-0.158	(0)
		Cd (OH) 4-2	4.431e-26	3.078e-26	-25.354	-25.512	-0.158	(0)
		Cd (NO3) 2	2.793e-32	2.793e-32	-31.554	-31.554	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-80.542	-80.582	-0.040	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.715	-151.715	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-228.113	-228.152	-0.040	(0)

Cd(HS) 4-2	0.000e+00	0.000e+00	-304.135	-304.293	-0.158	(0)
C1	1.836e-03					
Cl-	1.836e-03	1.691e-03	-2.736	-2.772	-0.036	(0)
ZnOHC1	1.063e-09	1.063e-09	-8.973	-8.973	0.000	(0)
MnCl+	1.040e-09	9.591e-10	-8.983	-9.018	-0.035	(0)
ZnCl+	8.618e-10	7.934e-10	-9.065	-9.101	-0.036	(0)
AgCl	1.416e-10	1.416e-10	-9.849	-9.849	0.000	(0)
CuCl	2.635e-11	2.635e-11	-10.579	-10.579	0.000	(0)
AgCl2-	2.285e-11	2.086e-11	-10.641	-10.681	-0.040	(0)
CuCl2-	1.011e-11	9.307e-12	-10.995	-11.031	-0.036	(0)
CdCl+	9.890e-12	9.028e-12	-11.005	-11.044	-0.040	(0)
NiCl+	2.785e-12	2.542e-12	-11.555	-11.595	-0.040	(0)
CoCl+	2.725e-12	2.488e-12	-11.565	-11.604	-0.040	(0)
CuCl+	2.572e-12	2.368e-12	-11.590	-11.626	-0.036	(0)
MnCl2	2.291e-12	2.291e-12	-11.640	-11.640	0.000	(0)
ZnCl2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
CdOHC1	3.791e-13	3.791e-13	-12.421	-12.421	0.000	(0)
PbCl+	1.843e-13	1.682e-13	-12.735	-12.774	-0.040	(0)
CdCl2	6.364e-14	6.364e-14	-13.196	-13.196	0.000	(0)
AgCl3-2	4.525e-14	3.143e-14	-13.344	-13.503	-0.158	(0)
HgClOH	9.159e-15	9.159e-15	-14.038	-14.038	0.000	(0)
CuCl3-2	4.648e-15	3.364e-15	-14.333	-14.473	-0.140	(0)
ZnCl3-	3.101e-15	2.855e-15	-14.508	-14.544	-0.036	(0)
CuCl2	1.388e-15	1.388e-15	-14.858	-14.858	0.000	(0)
PbCl2	1.270e-15	1.270e-15	-14.896	-14.896	0.000	(0)
MnCl3-	1.156e-15	1.067e-15	-14.937	-14.972	-0.035	(0)
HgCl2	8.566e-16	8.566e-16	-15.067	-15.067	0.000	(0)
AgCl4-3	2.463e-16	1.085e-16	-15.608	-15.965	-0.356	(0)
CrCl+2	8.427e-17	5.854e-17	-16.074	-16.233	-0.158	(0)
CdCl3-	7.436e-17	6.789e-17	-16.129	-16.168	-0.040	(0)
NiCl2	2.164e-17	2.164e-17	-16.665	-16.665	0.000	(0)
HgCl3-	1.586e-17	1.448e-17	-16.800	-16.839	-0.040	(0)
ZnCl4-2	3.335e-18	2.414e-18	-17.477	-17.617	-0.140	(0)
CrOHC12	1.926e-18	1.926e-18	-17.715	-17.715	0.000	(0)
UO2Cl+	1.492e-18	1.362e-18	-17.826	-17.866	-0.040	(0)
PbCl3-	9.367e-19	8.552e-19	-18.028	-18.068	-0.040	(0)
HgCl4-2	1.404e-19	9.749e-20	-18.853	-19.011	-0.158	(0)
HgCl+	1.107e-19	1.011e-19	-18.956	-18.995	-0.040	(0)
FeCl+2	1.094e-19	7.920e-20	-18.961	-19.101	-0.140	(0)
CuCl3-	2.379e-20	2.190e-20	-19.624	-19.659	-0.036	(0)
CrCl2+	1.029e-20	9.391e-21	-19.988	-20.027	-0.040	(0)
PbCl4-2	9.515e-22	6.609e-22	-21.022	-21.180	-0.158	(0)
FeCl2+	6.485e-22	5.982e-22	-21.188	-21.223	-0.035	(0)
CrO3Cl-	5.407e-25	4.936e-25	-24.267	-24.307	-0.040	(0)
CuCl4-2	2.564e-25	1.856e-25	-24.591	-24.731	-0.140	(0)
VOCl+	2.551e-25	2.329e-25	-24.593	-24.633	-0.040	(0)
FeCl3	1.011e-25	1.011e-25	-24.995	-24.995	0.000	(0)
CoCl+2	2.932e-38	2.037e-38	-37.533	-37.691	-0.158	(0)
UCl+3	0.000e+00	0.000e+00	-47.920	-48.276	-0.356	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
Co (2)	7.891e-10					
Co+2	6.123e-10	4.253e-10	-9.213	-9.371	-0.158	(0)
CoHCO3+	7.230e-11	6.601e-11	-10.141	-10.180	-0.040	(0)
CoCO3	6.838e-11	6.838e-11	-10.165	-10.165	0.000	(0)
CoSO4	2.215e-11	2.215e-11	-10.655	-10.655	0.000	(0)
CoOH+	9.515e-12	8.686e-12	-11.022	-11.061	-0.040	(0)
CoCl+	2.725e-12	2.488e-12	-11.565	-11.604	-0.040	(0)
CoF+	1.028e-12	9.381e-13	-11.988	-12.028	-0.040	(0)
Co (OH) 2	7.063e-13	7.063e-13	-12.151	-12.151	0.000	(0)
CoNO2+	1.713e-16	1.564e-16	-15.766	-15.806	-0.040	(0)
Co (NH3) +2	3.429e-17	2.382e-17	-16.465	-16.623	-0.158	(0)
Co (OH) 3-	1.580e-17	1.443e-17	-16.801	-16.841	-0.040	(0)
CoOOH-	3.966e-18	3.620e-18	-17.402	-17.441	-0.040	(0)
CoSeO4	1.444e-19	1.444e-19	-18.840	-18.840	0.000	(0)
CoNO3+	1.311e-20	1.197e-20	-19.882	-19.922	-0.040	(0)
Co2OH+3	4.204e-22	1.851e-22	-21.376	-21.732	-0.356	(0)

Co (OH) 4-2	3.370e-24	2.341e-24	-23.472	-23.631	-0.158	(0)
Co (NH3) 2+2	6.814e-25	4.733e-25	-24.167	-24.325	-0.158	(0)
Co (NO3) 2	4.323e-31	4.323e-31	-30.364	-30.364	0.000	(0)
Co (NH3) 3+2	3.996e-33	2.776e-33	-32.398	-32.557	-0.158	(0)
Co4 (OH) 4+4	4.880e-36	1.136e-36	-35.312	-35.945	-0.633	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-41.010	-41.168	-0.158	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.122	-50.280	-0.158	(0)
Co (3)	4.434e-31					
CoOH+2	4.434e-31	3.080e-31	-30.353	-30.512	-0.158	(0)
Co+3	1.243e-37	5.920e-38	-36.906	-37.228	-0.322	(0)
CoCl+2	2.932e-38	2.037e-38	-37.533	-37.691	-0.158	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.304	-73.462	-0.158	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
Cr (2)	2.631e-25					
Cr+2	2.631e-25	1.828e-25	-24.580	-24.738	-0.158	(0)
Cr (3)	1.141e-07					
Cr (OH) 2+	8.174e-08	7.462e-08	-7.088	-7.127	-0.040	(0)
Cr (OH) 3	2.870e-08	2.870e-08	-7.542	-7.542	0.000	(0)
CrO2-	1.518e-09	1.386e-09	-8.819	-8.858	-0.040	(0)
Cr (OH) 4-	1.281e-09	1.170e-09	-8.892	-8.932	-0.040	(0)
Cr (OH) +2	8.625e-10	5.991e-10	-9.064	-9.222	-0.158	(0)
CrOHSO4	3.712e-11	3.712e-11	-10.430	-10.430	0.000	(0)
CrF+2	4.258e-13	2.957e-13	-12.371	-12.529	-0.158	(0)
Cr+3	6.073e-14	2.675e-14	-13.217	-13.573	-0.356	(0)
CrSO4+	1.786e-14	1.631e-14	-13.748	-13.788	-0.040	(0)
CrCl+2	8.427e-17	5.854e-17	-16.074	-16.233	-0.158	(0)
Cr2 (OH) 2SO4+2	2.894e-18	2.010e-18	-17.539	-17.697	-0.158	(0)
CrOHC12	1.926e-18	1.926e-18	-17.715	-17.715	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.117e-20	3.117e-20	-19.506	-19.506	0.000	(0)
CrCl2+	1.029e-20	9.391e-21	-19.988	-20.027	-0.040	(0)
CrNO3+2	2.989e-26	2.076e-26	-25.524	-25.683	-0.158	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.691	-45.849	-0.158	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.207	-56.563	-0.356	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Cr (6)	2.137e-13					
CrO4-2	2.062e-13	1.483e-13	-12.686	-12.829	-0.143	(0)
HCrO4-	5.169e-15	4.719e-15	-14.287	-14.326	-0.040	(0)
NaCrO4-	2.292e-15	2.093e-15	-14.640	-14.679	-0.040	(0)
KCrO4-	6.826e-17	6.232e-17	-16.166	-16.205	-0.040	(0)
H2CrO4	3.762e-23	3.762e-23	-22.425	-22.425	0.000	(0)
CrO3SO4-2	5.314e-24	3.691e-24	-23.275	-23.433	-0.158	(0)
CrO3Cl-	5.407e-25	4.936e-25	-24.267	-24.307	-0.040	(0)
Cr2O7-2	1.112e-27	7.723e-28	-26.954	-27.112	-0.158	(0)
Cu (1)	5.002e-11					
CuCl	2.635e-11	2.635e-11	-10.579	-10.579	0.000	(0)
Cu+	1.356e-11	1.238e-11	-10.868	-10.907	-0.040	(0)
CuCl2-	1.011e-11	9.307e-12	-10.995	-11.031	-0.036	(0)
CuCl3-2	4.648e-15	3.364e-15	-14.333	-14.473	-0.140	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.953	-148.177	-0.225	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.690	-148.907	-0.218	(0)
Cu (2)	5.642e-08					
CuCO3	4.949e-08	4.949e-08	-7.305	-7.305	0.000	(0)
CuOH+	3.107e-09	2.860e-09	-8.508	-8.544	-0.036	(0)
Cu (CO3) 2-2	1.824e-09	1.267e-09	-8.739	-8.897	-0.158	(0)
Cu+2	1.229e-09	8.836e-10	-8.911	-9.054	-0.143	(0)
Cu (OH) 2	5.843e-10	5.843e-10	-9.233	-9.233	0.000	(0)
CuHCO3+	1.219e-10	1.112e-10	-9.914	-9.954	-0.040	(0)
CuSO4	5.285e-11	5.285e-11	-10.277	-10.277	0.000	(0)
CuF+	4.260e-12	3.889e-12	-11.371	-11.410	-0.040	(0)
CuCl+	2.572e-12	2.368e-12	-11.590	-11.626	-0.036	(0)
Cu (OH) 3-	1.344e-12	1.227e-12	-11.872	-11.911	-0.040	(0)
Cu2 (OH) 2+2	2.959e-13	2.055e-13	-12.529	-12.687	-0.158	(0)
CuNH3+2	6.064e-15	4.212e-15	-14.217	-14.375	-0.158	(0)
CuNO2+	5.290e-15	4.829e-15	-14.277	-14.316	-0.040	(0)
CuCl2	1.388e-15	1.388e-15	-14.858	-14.858	0.000	(0)
Cu (OH) 4-2	1.423e-17	9.884e-18	-16.847	-17.005	-0.158	(0)

	CuNO3+	5.434e-20	4.961e-20	-19.265	-19.304	-0.040	(0)
	CuCl3-	2.379e-20	2.190e-20	-19.624	-19.659	-0.036	(0)
	Cu (NO2) 2	2.579e-21	2.579e-21	-20.589	-20.589	0.000	(0)
	CuCl4-2	2.564e-25	1.856e-25	-24.591	-24.731	-0.140	(0)
	Cu (NO3) 2	1.109e-31	1.109e-31	-30.955	-30.955	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.127	-218.166	-0.040	(0)
F		7.708e-05					
	F-	7.575e-05	6.975e-05	-4.121	-4.156	-0.036	(0)
	MgF+	8.042e-07	7.411e-07	-6.095	-6.130	-0.035	(0)
	CaF+	3.984e-07	3.675e-07	-6.400	-6.435	-0.035	(0)
	NaF	1.250e-07	1.250e-07	-6.903	-6.903	0.000	(0)
	MnF+	1.357e-09	1.251e-09	-8.868	-8.903	-0.035	(0)
	HF	1.015e-09	1.015e-09	-8.994	-8.994	0.000	(0)
	ZnF+	2.848e-10	2.600e-10	-9.545	-9.585	-0.040	(0)
	BF (OH) 3-	2.175e-10	1.996e-10	-9.663	-9.700	-0.037	(0)
	CuF+	4.260e-12	3.889e-12	-11.371	-11.410	-0.040	(0)
	NiF+	1.128e-12	1.030e-12	-11.948	-11.987	-0.040	(0)
	CoF+	1.028e-12	9.381e-13	-11.988	-12.028	-0.040	(0)
	CrF+2	4.258e-13	2.957e-13	-12.371	-12.529	-0.158	(0)
	HF2-	2.926e-13	2.691e-13	-12.534	-12.570	-0.036	(0)
	AlF2+	1.266e-13	1.169e-13	-12.897	-12.932	-0.035	(0)
	AlF3	1.027e-13	1.027e-13	-12.989	-12.989	0.000	(0)
	CdF+	6.771e-14	6.181e-14	-13.169	-13.209	-0.040	(0)
	BF2 (OH) 2-	1.595e-14	1.464e-14	-13.797	-13.834	-0.037	(0)
	PbF+	1.510e-14	1.378e-14	-13.821	-13.861	-0.040	(0)
	AgF	7.188e-15	7.188e-15	-14.143	-14.143	0.000	(0)
	AlF+2	5.799e-15	4.210e-15	-14.237	-14.376	-0.139	(0)
	UO2F+	5.239e-15	4.783e-15	-14.281	-14.320	-0.040	(0)
	AlF4-	3.894e-15	3.589e-15	-14.410	-14.445	-0.035	(0)
	UO2F2	9.622e-16	9.622e-16	-15.017	-15.017	0.000	(0)
	FeF2+	2.401e-16	2.215e-16	-15.620	-15.655	-0.035	(0)
	FeF+2	1.639e-16	1.186e-16	-15.785	-15.926	-0.140	(0)
	FeF3	2.179e-17	2.179e-17	-16.662	-16.662	0.000	(0)
	PbF2	1.892e-17	1.892e-17	-16.723	-16.723	0.000	(0)
	UO2F3-	1.847e-17	1.686e-17	-16.734	-16.773	-0.040	(0)
	CdF2	8.603e-18	8.603e-18	-17.065	-17.065	0.000	(0)
	H2F2	2.758e-18	2.758e-18	-17.559	-17.559	0.000	(0)
	VO2F	2.714e-20	2.714e-20	-19.566	-19.566	0.000	(0)
	UO2F4-2	1.345e-20	9.341e-21	-19.871	-20.030	-0.158	(0)
	BF3OH-	4.258e-21	3.909e-21	-20.371	-20.408	-0.037	(0)
	PbF3-	2.742e-21	2.503e-21	-20.562	-20.602	-0.040	(0)
	VO2F2-	7.529e-22	6.874e-22	-21.123	-21.163	-0.040	(0)
	VOF+	2.250e-23	2.054e-23	-22.648	-22.687	-0.040	(0)
	VO2F3-2	8.610e-25	5.981e-25	-24.065	-24.223	-0.158	(0)
	VOF2	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
	PbF4-2	1.203e-25	8.357e-26	-24.920	-25.078	-0.158	(0)
	BF4-	1.438e-26	1.320e-26	-25.842	-25.880	-0.037	(0)
	HgF+	8.486e-27	7.747e-27	-26.071	-26.111	-0.040	(0)
	VOF3-	1.456e-27	1.330e-27	-26.837	-26.876	-0.040	(0)
	Sb (OH) 2F	5.184e-28	5.184e-28	-27.285	-27.285	0.000	(0)
	SbOF	5.098e-28	5.098e-28	-27.293	-27.293	0.000	(0)
	VO2F4-3	4.660e-29	2.053e-29	-28.332	-28.688	-0.356	(0)
	SiF6-2	6.949e-31	5.029e-31	-30.158	-30.298	-0.140	(0)
	VOF4-2	5.389e-31	3.743e-31	-30.268	-30.427	-0.158	(0)
	UF3+	9.253e-39	8.448e-39	-38.034	-38.073	-0.040	(0)
	UF2+2	1.100e-39	7.641e-40	-38.959	-39.117	-0.158	(0)
	UF4	0.000e+00	0.000e+00	-40.190	-40.190	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-41.704	-42.060	-0.356	(0)
	UF5-	0.000e+00	0.000e+00	-42.709	-42.748	-0.040	(0)
	UF6-2	0.000e+00	0.000e+00	-44.266	-44.425	-0.158	(0)
Fe (2)		7.522e-10					
	Fe+2	6.875e-10	4.776e-10	-9.163	-9.321	-0.158	(0)
	FeSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
	FeOH+	2.110e-11	1.946e-11	-10.676	-10.711	-0.035	(0)
	FeHCO3+	1.298e-11	1.200e-11	-10.887	-10.921	-0.034	(0)
	Fe (OH) 2	1.583e-14	1.583e-14	-13.801	-13.801	0.000	(0)
	Fe (OH) 3-	5.554e-15	5.123e-15	-14.255	-14.290	-0.035	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-157.045	-157.045	0.000	(0)

Fe (HS) 3-	0.000e+00	0.000e+00	-233.306	-233.346	-0.040	(0)
Fe (3)	9.376e-07					
Fe (OH) 3	4.489e-07	4.489e-07	-6.348	-6.348	0.000	(0)
Fe (OH) 2+	4.424e-07	4.083e-07	-6.354	-6.389	-0.035	(0)
Fe (OH) 4-	4.636e-08	4.279e-08	-7.334	-7.369	-0.035	(0)
FeOH+2	1.416e-12	1.025e-12	-11.849	-11.989	-0.140	(0)
FeF2+	2.401e-16	2.215e-16	-15.620	-15.655	-0.035	(0)
FeF+2	1.639e-16	1.186e-16	-15.785	-15.926	-0.140	(0)
FeF3	2.179e-17	2.179e-17	-16.662	-16.662	0.000	(0)
FeSO4+	4.927e-18	4.544e-18	-17.307	-17.343	-0.035	(0)
Fe+3	3.257e-18	1.551e-18	-17.487	-17.809	-0.322	(0)
FeCl+2	1.094e-19	7.920e-20	-18.961	-19.101	-0.140	(0)
Fe (SO4) 2-	2.778e-20	2.536e-20	-19.556	-19.596	-0.040	(0)
FeCl2+	6.485e-22	5.982e-22	-21.188	-21.223	-0.035	(0)
Fe2 (OH) 2+4	1.495e-22	3.481e-23	-21.825	-22.458	-0.633	(0)
FeHSeO3+2	6.323e-24	4.392e-24	-23.199	-23.357	-0.158	(0)
FeCl3	1.011e-25	1.011e-25	-24.995	-24.995	0.000	(0)
Fe3 (OH) 4+5	2.004e-27	2.054e-28	-26.698	-27.687	-0.989	(0)
FeNO3+2	3.965e-28	2.754e-28	-27.402	-27.560	-0.158	(0)
H (0)	1.119e-28					
H2	5.593e-29	5.601e-29	-28.252	-28.252	0.001	(0)
Hg (0)	2.262e-11					
Hg	2.262e-11	2.262e-11	-10.645	-10.645	0.000	(0)
Hg (1)	1.325e-25					
Hg2+2	6.625e-26	4.602e-26	-25.179	-25.337	-0.158	(0)
Hg (2)	2.985e-14					
Hg (OH) 2	1.978e-14	1.981e-14	-13.704	-13.703	0.001	(0)
HgClOH	9.159e-15	9.159e-15	-14.038	-14.038	0.000	(0)
HgCl2	8.566e-16	8.566e-16	-15.067	-15.067	0.000	(0)
HgCO3	3.411e-17	3.411e-17	-16.467	-16.467	0.000	(0)
HgCl3-	1.586e-17	1.448e-17	-16.800	-16.839	-0.040	(0)
Hg (CO3) 2-2	1.477e-18	1.026e-18	-17.831	-17.989	-0.158	(0)
HgCl4-2	1.404e-19	9.749e-20	-18.853	-19.011	-0.158	(0)
HgOH+	1.338e-19	1.221e-19	-18.874	-18.913	-0.040	(0)
HgCl+	1.107e-19	1.011e-19	-18.956	-18.995	-0.040	(0)
HgHCO3+	6.842e-21	6.246e-21	-20.165	-20.204	-0.040	(0)
Hg (OH) 3-	2.797e-21	2.553e-21	-20.553	-20.593	-0.040	(0)
Hg+2	4.314e-24	2.996e-24	-23.365	-23.523	-0.158	(0)
HgNH3+2	1.268e-24	8.807e-25	-23.897	-24.055	-0.158	(0)
Hg (NH3) 2+2	5.907e-25	4.103e-25	-24.229	-24.387	-0.158	(0)
HgSO4	2.048e-25	2.048e-25	-24.689	-24.689	0.000	(0)
HgF+	8.486e-27	7.747e-27	-26.071	-26.111	-0.040	(0)
Hg (NH3) 3+2	1.095e-33	7.609e-34	-32.960	-33.119	-0.158	(0)
HgNO3+	2.152e-35	1.964e-35	-34.667	-34.707	-0.040	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.392	-41.550	-0.158	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.839	-45.839	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-140.223	-140.263	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.805	-140.963	-0.158	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.876	-141.876	0.000	(0)
K	1.231e-04					
K+	1.228e-04	1.131e-04	-3.911	-3.946	-0.036	(0)
KSO4-	2.265e-07	2.091e-07	-6.645	-6.680	-0.035	(0)
KCrO4-	6.826e-17	6.232e-17	-16.166	-16.205	-0.040	(0)
Mg	1.399e-04					
Mg+2	1.317e-04	9.469e-05	-3.881	-4.024	-0.143	(0)
MgSO4	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
MgHCO3+	2.100e-06	1.933e-06	-5.678	-5.714	-0.036	(0)
MgF+	8.042e-07	7.411e-07	-6.095	-6.130	-0.035	(0)
MgCO3	7.491e-07	7.491e-07	-6.125	-6.125	0.000	(0)
MgOH+	4.173e-08	3.859e-08	-7.380	-7.414	-0.034	(0)
MgH2BO3+	1.515e-09	1.391e-09	-8.820	-8.857	-0.037	(0)
Mn (2)	6.927e-07					
Mn+2	6.487e-07	4.506e-07	-6.188	-6.346	-0.158	(0)
MnSO4	2.092e-08	2.092e-08	-7.679	-7.679	0.000	(0)
MnHCO3+	1.945e-08	1.794e-08	-7.711	-7.746	-0.035	(0)
MnF+	1.357e-09	1.251e-09	-8.868	-8.903	-0.035	(0)
MnOH+	1.256e-09	1.159e-09	-8.901	-8.936	-0.035	(0)
MnCl+	1.040e-09	9.591e-10	-8.983	-9.018	-0.035	(0)

MnCl2	2.291e-12	2.291e-12	-11.640	-11.640	0.000	(0)
MnCl3-	1.156e-15	1.067e-15	-14.937	-14.972	-0.035	(0)
MnSeO4	8.217e-17	8.217e-17	-16.085	-16.085	0.000	(0)
MnNO3+	1.389e-17	1.268e-17	-16.857	-16.897	-0.040	(0)
Mn (OH) 3-	8.135e-18	7.504e-18	-17.090	-17.125	-0.035	(0)
Mn (OH) 4-2	3.426e-23	2.480e-23	-22.465	-22.606	-0.140	(0)
Mn (NO3) 2	5.654e-28	5.654e-28	-27.248	-27.248	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.139	-43.139	0.000	(0)
Mn (3)	1.478e-27					
Mn+3	1.478e-27	7.038e-28	-26.830	-27.153	-0.322	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-42.396	-42.536	-0.140	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.328	-47.364	-0.037	(0)
Mo	1.732e-08					
MoO4-2	1.732e-08	1.246e-08	-7.761	-7.905	-0.143	(0)
HMoO4-	2.670e-12	2.437e-12	-11.574	-11.613	-0.040	(0)
H2MoO4	1.756e-16	1.756e-16	-15.756	-15.756	0.000	(0)
Ag2MoO4	7.936e-30	7.936e-30	-29.100	-29.100	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.342	-57.698	-0.356	(0)
Mo7O24-6	0.000e+00	0.000e+00	-64.976	-66.400	-1.424	(0)
HMo7O24-5	0.000e+00	0.000e+00	-67.031	-68.021	-0.989	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-70.613	-71.246	-0.633	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-75.651	-76.007	-0.356	(0)
N (-3)	9.244e-09					
NH4+	8.754e-09	8.035e-09	-8.058	-8.095	-0.037	(0)
NH3	4.658e-10	4.658e-10	-9.332	-9.332	0.000	(0)
NH4SO4-	2.437e-11	2.248e-11	-10.613	-10.648	-0.035	(0)
CaNH3+2	4.075e-13	2.831e-13	-12.390	-12.548	-0.158	(0)
CuNH3+2	6.064e-15	4.212e-15	-14.217	-14.375	-0.158	(0)
NiNH3+2	2.117e-16	1.470e-16	-15.674	-15.833	-0.158	(0)
AgNH3+	4.274e-17	3.902e-17	-16.369	-16.409	-0.040	(0)
Co (NH3) +2	3.429e-17	2.382e-17	-16.465	-16.623	-0.158	(0)
BaNH3+2	2.039e-17	1.416e-17	-16.691	-16.849	-0.158	(0)
Ag (NH3) 2+	1.618e-22	1.478e-22	-21.791	-21.830	-0.040	(0)
Ca (NH3) 2+2	7.558e-23	5.250e-23	-22.122	-22.280	-0.158	(0)
Ni (NH3) 2+2	1.425e-23	9.899e-24	-22.846	-23.004	-0.158	(0)
HgNH3+2	1.268e-24	8.807e-25	-23.897	-24.055	-0.158	(0)
Co (NH3) 2+2	6.814e-25	4.733e-25	-24.167	-24.325	-0.158	(0)
Hg (NH3) 2+2	5.907e-25	4.103e-25	-24.229	-24.387	-0.158	(0)
Co (NH3) 3+2	3.996e-33	2.776e-33	-32.398	-32.557	-0.158	(0)
Hg (NH3) 3+2	1.095e-33	7.609e-34	-32.960	-33.119	-0.158	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-41.010	-41.168	-0.158	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.392	-41.550	-0.158	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.691	-45.849	-0.158	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.122	-50.280	-0.158	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.207	-56.563	-0.356	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.304	-73.462	-0.158	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
N (3)	5.680e-08					
NO2-	5.680e-08	5.219e-08	-7.246	-7.282	-0.037	(0)
CuNO2+	5.290e-15	4.829e-15	-14.277	-14.316	-0.040	(0)
AgNO2	4.474e-16	4.474e-16	-15.349	-15.349	0.000	(0)
CoNO2+	1.713e-16	1.564e-16	-15.766	-15.806	-0.040	(0)
Cu (NO2) 2	2.579e-21	2.579e-21	-20.589	-20.589	0.000	(0)
Ag (NO2) 2-	3.962e-23	3.617e-23	-22.402	-22.442	-0.040	(0)
N (5)	1.931e-11					
NO3-	1.928e-11	1.775e-11	-10.715	-10.751	-0.036	(0)
CaNO3+	2.969e-14	2.710e-14	-13.527	-13.567	-0.040	(0)
MnNO3+	1.389e-17	1.268e-17	-16.857	-16.897	-0.040	(0)
ZnNO3+	9.126e-18	8.331e-18	-17.040	-17.079	-0.040	(0)
BaNO3+	4.697e-18	4.288e-18	-17.328	-17.368	-0.040	(0)
CuNO3+	5.434e-20	4.961e-20	-19.265	-19.304	-0.040	(0)
NiNO3+	2.871e-20	2.621e-20	-19.542	-19.582	-0.040	(0)
CoNO3+	1.311e-20	1.197e-20	-19.882	-19.922	-0.040	(0)

CdNO3+	3.439e-21	3.139e-21	-20.464	-20.503	-0.040	(0)
PbNO3+	8.066e-22	7.364e-22	-21.093	-21.133	-0.040	(0)
AgNO3	5.786e-22	5.786e-22	-21.238	-21.238	0.000	(0)
CrNO3+2	2.989e-26	2.076e-26	-25.524	-25.683	-0.158	(0)
UO2NO3+	1.928e-26	1.760e-26	-25.715	-25.755	-0.040	(0)
Mn(NO3)2	5.654e-28	5.654e-28	-27.248	-27.248	0.000	(0)
FeNO3+2	3.965e-28	2.754e-28	-27.402	-27.560	-0.158	(0)
Zn(NO3)2	2.951e-29	2.951e-29	-28.530	-28.530	0.000	(0)
VO2NO3	1.992e-30	1.992e-30	-29.701	-29.701	0.000	(0)
Co(NO3)2	4.323e-31	4.323e-31	-30.364	-30.364	0.000	(0)
Cu(NO3)2	1.109e-31	1.109e-31	-30.955	-30.955	0.000	(0)
Cd(NO3)2	2.793e-32	2.793e-32	-31.554	-31.554	0.000	(0)
Pb(NO3)2	2.220e-32	2.220e-32	-31.654	-31.654	0.000	(0)
HgNO3+	2.152e-35	1.964e-35	-34.667	-34.707	-0.040	(0)
Hg(NO3)2	0.000e+00	0.000e+00	-45.839	-45.839	0.000	(0)
Na	3.092e-03					
Na+	3.084e-03	2.840e-03	-2.511	-2.547	-0.036	(0)
NaSO4-	4.314e-06	3.982e-06	-5.365	-5.400	-0.035	(0)
NaHCO3	3.187e-06	3.187e-06	-5.497	-5.497	0.000	(0)
NaCO3-	5.449e-07	5.030e-07	-6.264	-6.298	-0.035	(0)
NaF	1.250e-07	1.250e-07	-6.903	-6.903	0.000	(0)
NaH2BO3	1.906e-09	1.906e-09	-8.720	-8.720	0.000	(0)
NaCrO4-	2.292e-15	2.093e-15	-14.640	-14.679	-0.040	(0)
Ni	1.228e-09					
Ni+2	8.172e-10	5.877e-10	-9.088	-9.231	-0.143	(0)
NiCO3	2.085e-10	2.085e-10	-9.681	-9.681	0.000	(0)
NiHCO3+	1.583e-10	1.446e-10	-9.800	-9.840	-0.040	(0)
NiSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
NiOH+	8.296e-12	7.574e-12	-11.081	-11.121	-0.040	(0)
NiCl+	2.785e-12	2.542e-12	-11.555	-11.595	-0.040	(0)
NiF+	1.128e-12	1.030e-12	-11.948	-11.987	-0.040	(0)
Ni(OH)2	6.159e-13	6.159e-13	-12.211	-12.211	0.000	(0)
Ni(OH)3-	6.906e-16	6.304e-16	-15.161	-15.200	-0.040	(0)
Ni(SO4)2-2	3.810e-16	2.647e-16	-15.419	-15.577	-0.158	(0)
NiNH3+2	2.117e-16	1.470e-16	-15.674	-15.833	-0.158	(0)
NiCl2	2.164e-17	2.164e-17	-16.665	-16.665	0.000	(0)
NiSeO4	1.862e-19	1.862e-19	-18.730	-18.730	0.000	(0)
NiNO3+	2.871e-20	2.621e-20	-19.542	-19.582	-0.040	(0)
Ni(NH3)2+2	1.425e-23	9.899e-24	-22.846	-23.004	-0.158	(0)
O(0)	3.227e-36					
O2	1.613e-36	1.616e-36	-35.792	-35.792	0.001	(0)
Pb	1.005e-10					
PbCO3	8.017e-11	8.017e-11	-10.096	-10.096	0.000	(0)
PbOH+	7.898e-12	7.210e-12	-11.102	-11.142	-0.040	(0)
PbHCO3+	4.554e-12	4.157e-12	-11.342	-11.381	-0.040	(0)
Pb+2	3.899e-12	2.804e-12	-11.409	-11.552	-0.143	(0)
Pb(CO3)2-2	3.166e-12	2.199e-12	-11.499	-11.658	-0.158	(0)
PbSO4	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
Pb(OH)2	2.334e-13	2.334e-13	-12.632	-12.632	0.000	(0)
PbCl+	1.843e-13	1.682e-13	-12.735	-12.774	-0.040	(0)
PbF+	1.510e-14	1.378e-14	-13.821	-13.861	-0.040	(0)
PbCl2	1.270e-15	1.270e-15	-14.896	-14.896	0.000	(0)
Pb(SO4)2-2	8.121e-16	5.641e-16	-15.090	-15.249	-0.158	(0)
Pb(OH)3-	2.617e-16	2.389e-16	-15.582	-15.622	-0.040	(0)
PbF2	1.892e-17	1.892e-17	-16.723	-16.723	0.000	(0)
PbCl3-	9.367e-19	8.552e-19	-18.028	-18.068	-0.040	(0)
Pb(OH)4-2	8.624e-20	5.991e-20	-19.064	-19.223	-0.158	(0)
PbF3-	2.742e-21	2.503e-21	-20.562	-20.602	-0.040	(0)
PbCl4-2	9.515e-22	6.609e-22	-21.022	-21.180	-0.158	(0)
PbNO3+	8.066e-22	7.364e-22	-21.093	-21.133	-0.040	(0)
Pb2OH+3	7.275e-22	3.204e-22	-21.138	-21.494	-0.356	(0)
PbF4-2	1.203e-25	8.357e-26	-24.920	-25.078	-0.158	(0)
Pb3(OH)4+2	4.388e-27	3.048e-27	-26.358	-26.516	-0.158	(0)
Pb(NO3)2	2.220e-32	2.220e-32	-31.654	-31.654	0.000	(0)
Pb4(OH)4+4	2.917e-34	6.789e-35	-33.535	-34.168	-0.633	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.957	-152.957	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-229.954	-229.994	-0.040	(0)
S(-2)	0.000e+00					

AgHS	0.000e+00	0.000e+00	-74.910	-74.910	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.298	-78.337	-0.040	(0)
H2S	0.000e+00	0.000e+00	-79.324	-79.324	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.537	-79.695	-0.158	(0)
S6-2	0.000e+00	0.000e+00	-80.053	-80.211	-0.158	(0)
S4-2	0.000e+00	0.000e+00	-80.133	-80.291	-0.158	(0)
CdHS+	0.000e+00	0.000e+00	-80.542	-80.582	-0.040	(0)
S3-2	0.000e+00	0.000e+00	-80.938	-81.097	-0.158	(0)
S2-2	0.000e+00	0.000e+00	-81.955	-82.113	-0.158	(0)
S-2	0.000e+00	0.000e+00	-87.490	-87.630	-0.140	(0)
HgHS2-	0.000e+00	0.000e+00	-140.223	-140.263	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.805	-140.963	-0.158	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.876	-141.876	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.953	-148.177	-0.225	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.509	-148.623	-0.114	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.546	-148.586	-0.040	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.690	-148.907	-0.218	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.107	-149.147	-0.040	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.828	-150.056	-0.228	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.146	-150.367	-0.221	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.583	-150.583	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.715	-151.715	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.957	-152.957	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.045	-157.045	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.127	-218.166	-0.040	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.601	-225.640	-0.040	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.455	-227.613	-0.158	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.113	-228.152	-0.040	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.954	-229.994	-0.040	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.306	-233.346	-0.040	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.135	-304.293	-0.158	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.279	-305.437	-0.158	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.447	-322.605	-0.158	(0)
S (6)	4.010e-04					
SO4-2	3.631e-04	2.611e-04	-3.440	-3.583	-0.143	(0)
CaSO4	2.887e-05	2.887e-05	-4.540	-4.540	0.000	(0)
MgSO4	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
NaSO4-	4.314e-06	3.982e-06	-5.365	-5.400	-0.035	(0)
KSO4-	2.265e-07	2.091e-07	-6.645	-6.680	-0.035	(0)
MnSO4	2.092e-08	2.092e-08	-7.679	-7.679	0.000	(0)
ZnSO4	1.067e-08	1.067e-08	-7.972	-7.972	0.000	(0)
HSO4-	2.723e-10	2.509e-10	-9.565	-9.600	-0.035	(0)
CuSO4	5.285e-11	5.285e-11	-10.277	-10.277	0.000	(0)
CrOHSO4	3.712e-11	3.712e-11	-10.430	-10.430	0.000	(0)
Zn (SO4) 2-2	3.493e-11	2.426e-11	-10.457	-10.615	-0.158	(0)
NiSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
FeSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
NH4SO4-	2.437e-11	2.248e-11	-10.613	-10.648	-0.035	(0)
CoSO4	2.215e-11	2.215e-11	-10.655	-10.655	0.000	(0)
CdSO4	3.422e-12	3.422e-12	-11.466	-11.466	0.000	(0)
PbSO4	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
AgSO4-	2.341e-13	2.137e-13	-12.631	-12.670	-0.040	(0)
CrSO4+	1.786e-14	1.631e-14	-13.748	-13.788	-0.040	(0)
Cd (SO4) 2-2	1.735e-14	1.205e-14	-13.761	-13.919	-0.158	(0)
Pb (SO4) 2-2	8.121e-16	5.641e-16	-15.090	-15.249	-0.158	(0)
Ni (SO4) 2-2	3.810e-16	2.647e-16	-15.419	-15.577	-0.158	(0)
UO2SO4	1.963e-16	1.963e-16	-15.707	-15.707	0.000	(0)
AlSO4+	1.327e-17	1.223e-17	-16.877	-16.913	-0.035	(0)
FeSO4+	4.927e-18	4.544e-18	-17.307	-17.343	-0.035	(0)
Cr2 (OH) 2SO4+2	2.894e-18	2.010e-18	-17.539	-17.697	-0.158	(0)
UO2 (SO4) 2-2	9.727e-19	6.756e-19	-18.012	-18.170	-0.158	(0)
Al (SO4) 2-	3.713e-20	3.422e-20	-19.430	-19.466	-0.035	(0)
Cr2 (OH) 2 (SO4) 2	3.117e-20	3.117e-20	-19.506	-19.506	0.000	(0)
Fe (SO4) 2-	2.778e-20	2.536e-20	-19.556	-19.596	-0.040	(0)
VO2SO4-	1.515e-21	1.383e-21	-20.820	-20.859	-0.040	(0)
CrO3SO4-2	5.314e-24	3.691e-24	-23.275	-23.433	-0.158	(0)
VOSO4	3.530e-24	3.530e-24	-23.452	-23.452	0.000	(0)
HgSO4	2.048e-25	2.048e-25	-24.689	-24.689	0.000	(0)

VSO4+	9.106e-39	8.313e-39	-38.041	-38.080	-0.040	(0)
U(SO4)2	0.000e+00	0.000e+00	-43.870	-43.870	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.029	-44.187	-0.158	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Sb(3)	9.560e-22					
Sb(OH)3	4.837e-22	4.837e-22	-21.315	-21.315	0.000	(0)
HSbO2	4.722e-22	4.722e-22	-21.326	-21.326	0.000	(0)
SbO2-	8.518e-26	7.776e-26	-25.070	-25.109	-0.040	(0)
Sb(OH)4-	4.880e-26	4.455e-26	-25.312	-25.351	-0.040	(0)
Sb(OH)2F	5.184e-28	5.184e-28	-27.285	-27.285	0.000	(0)
SbOF	5.098e-28	5.098e-28	-27.293	-27.293	0.000	(0)
Sb(OH)2+	1.265e-28	1.155e-28	-27.898	-27.937	-0.040	(0)
SbO+	4.363e-29	3.983e-29	-28.360	-28.400	-0.040	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.447	-322.605	-0.158	(0)
Sb(5)	2.854e-10					
SbO3-	2.851e-10	2.603e-10	-9.545	-9.585	-0.040	(0)
Sb(OH)6-	3.305e-13	3.043e-13	-12.481	-12.517	-0.036	(0)
SbO2+	7.910e-27	7.222e-27	-26.102	-26.141	-0.040	(0)
Se(-2)	5.362e-18					
Ag2Se	5.362e-18	5.362e-18	-17.271	-17.271	0.000	(0)
HSe-	4.212e-40	3.845e-40	-39.376	-39.415	-0.040	(0)
MnSe	0.000e+00	0.000e+00	-43.139	-43.139	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.532	-43.532	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.250	-46.408	-0.158	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-85.071	-85.704	-0.633	(0)
Se(4)	1.798e-09					
HSeO3-	1.174e-09	1.072e-09	-8.930	-8.970	-0.040	(0)
SeO3-2	6.244e-10	4.337e-10	-9.205	-9.363	-0.158	(0)
H2SeO3	4.495e-15	4.495e-15	-14.347	-14.347	0.000	(0)
AgSeO3-	1.253e-17	1.144e-17	-16.902	-16.942	-0.040	(0)
Cd(SeO3)2-2	1.248e-23	8.669e-24	-22.904	-23.062	-0.158	(0)
FeHSeO3+2	6.323e-24	4.392e-24	-23.199	-23.357	-0.158	(0)
Ag(SeO3)2-3	1.008e-25	4.442e-26	-24.996	-25.352	-0.356	(0)
Se(6)	9.422e-13					
SeO4-2	9.421e-13	6.775e-13	-12.026	-12.169	-0.143	(0)
MnSeO4	8.217e-17	8.217e-17	-16.085	-16.085	0.000	(0)
ZnSeO4	1.960e-17	1.960e-17	-16.708	-16.708	0.000	(0)
HSeO4-	3.658e-19	3.340e-19	-18.437	-18.476	-0.040	(0)
NiSeO4	1.862e-19	1.862e-19	-18.730	-18.730	0.000	(0)
CoSeO4	1.444e-19	1.444e-19	-18.840	-18.840	0.000	(0)
CdSeO4	7.054e-21	7.054e-21	-20.152	-20.152	0.000	(0)
Zn(SeO4)2-2	1.939e-29	1.347e-29	-28.713	-28.871	-0.158	(0)
Si	3.127e-04					
H4SiO4	3.078e-04	3.082e-04	-3.512	-3.511	0.001	(0)
H3SiO4-	4.920e-06	4.529e-06	-5.308	-5.344	-0.036	(0)
H2SiO4-2	4.003e-11	2.906e-11	-10.398	-10.537	-0.139	(0)
UO2H3SiO4+	2.092e-13	1.910e-13	-12.679	-12.719	-0.040	(0)
SiF6-2	6.949e-31	5.029e-31	-30.158	-30.298	-0.140	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.188	-60.544	-0.356	(0)
U(4)	5.644e-21					
U(OH)5-	5.642e-21	5.151e-21	-20.249	-20.288	-0.040	(0)
U(OH)4	2.122e-24	2.122e-24	-23.673	-23.673	0.000	(0)
U(OH)3+	8.358e-29	7.630e-29	-28.078	-28.117	-0.040	(0)
U(OH)2+2	4.996e-34	3.470e-34	-33.301	-33.460	-0.158	(0)
UF3+	9.253e-39	8.448e-39	-38.034	-38.073	-0.040	(0)
UF2+2	1.100e-39	7.641e-40	-38.959	-39.117	-0.158	(0)
UOH+3	3.650e-40	1.608e-40	-39.438	-39.794	-0.356	(0)
UF4	0.000e+00	0.000e+00	-40.190	-40.190	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.704	-42.060	-0.356	(0)
UF5-	0.000e+00	0.000e+00	-42.709	-42.748	-0.040	(0)
U(SO4)2	0.000e+00	0.000e+00	-43.870	-43.870	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.029	-44.187	-0.158	(0)
UF6-2	0.000e+00	0.000e+00	-44.266	-44.425	-0.158	(0)
U+4	0.000e+00	0.000e+00	-46.571	-47.204	-0.633	(0)
UCl+3	0.000e+00	0.000e+00	-47.920	-48.276	-0.356	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-177.066	-180.271	-3.205	(0)
U(5)	9.486e-18					

UO2+	9.486e-18	8.660e-18	-17.023	-17.063	-0.040	(0)
U(6)	1.247e-08					
UO2 (CO3) 3-4	7.310e-09	1.702e-09	-8.136	-8.769	-0.633	(0)
UO2 (CO3) 2-2	5.139e-09	3.570e-09	-8.289	-8.447	-0.158	(0)
UO2CO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
UO2H3SiO4+	2.092e-13	1.910e-13	-12.679	-12.719	-0.040	(0)
UO2OH+	7.013e-14	6.402e-14	-13.154	-13.194	-0.040	(0)
UO2F+	5.239e-15	4.783e-15	-14.281	-14.320	-0.040	(0)
UO2F2	9.622e-16	9.622e-16	-15.017	-15.017	0.000	(0)
UO2+2	6.908e-16	4.968e-16	-15.161	-15.304	-0.143	(0)
UO2SO4	1.963e-16	1.963e-16	-15.707	-15.707	0.000	(0)
UO2F3-	1.847e-17	1.686e-17	-16.734	-16.773	-0.040	(0)
UO2Cl+	1.492e-18	1.362e-18	-17.826	-17.866	-0.040	(0)
UO2 (SO4) 2-2	9.727e-19	6.756e-19	-18.012	-18.170	-0.158	(0)
UO2F4-2	1.345e-20	9.341e-21	-19.871	-20.030	-0.158	(0)
(UO2) 2 (OH) 2+2	9.792e-21	6.802e-21	-20.009	-20.167	-0.158	(0)
(UO2) 3 (OH) 5+	3.792e-22	3.462e-22	-21.421	-21.461	-0.040	(0)
UO2NO3+	1.928e-26	1.760e-26	-25.715	-25.755	-0.040	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.465	-44.505	-0.040	(0)
V+2	0.000e+00	0.000e+00	-45.866	-46.025	-0.158	(0)
V(3)	5.837e-17					
V (OH) 3	5.837e-17	5.837e-17	-16.234	-16.234	0.000	(0)
V (OH) 2+	4.063e-28	3.709e-28	-27.391	-27.431	-0.040	(0)
VOH+2	4.982e-32	3.461e-32	-31.303	-31.461	-0.158	(0)
V+3	1.531e-37	6.745e-38	-36.815	-37.171	-0.356	(0)
VSO4+	9.106e-39	8.313e-39	-38.041	-38.080	-0.040	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-60.084	-60.440	-0.356	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-61.489	-62.122	-0.633	(0)
V(4)	1.108e-20					
V (OH) 3+	1.098e-20	1.003e-20	-19.959	-19.999	-0.040	(0)
VO+2	7.068e-23	4.909e-23	-22.151	-22.309	-0.158	(0)
VOF+	2.250e-23	2.054e-23	-22.648	-22.687	-0.040	(0)
VOSO4	3.530e-24	3.530e-24	-23.452	-23.452	0.000	(0)
VOF2	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
VOC1+	2.551e-25	2.329e-25	-24.593	-24.633	-0.040	(0)
VOF3-	1.456e-27	1.330e-27	-26.837	-26.876	-0.040	(0)
VOF4-2	5.389e-31	3.743e-31	-30.268	-30.427	-0.158	(0)
H2V2O4+2	7.255e-36	5.039e-36	-35.139	-35.298	-0.158	(0)
V(5)	1.682e-10					
H2VO4-	1.259e-10	1.149e-10	-9.900	-9.940	-0.040	(0)
HVO4-2	4.226e-11	2.935e-11	-10.374	-10.532	-0.158	(0)
H3VO4	1.130e-14	1.130e-14	-13.947	-13.947	0.000	(0)
VO4-3	3.396e-17	1.496e-17	-16.469	-16.825	-0.356	(0)
H3V2O7-	9.188e-18	8.388e-18	-17.037	-17.076	-0.040	(0)
HV2O7-3	2.595e-18	1.143e-18	-17.586	-17.942	-0.356	(0)
VO2+	2.409e-19	2.219e-19	-18.618	-18.654	-0.036	(0)
VO2F	2.714e-20	2.714e-20	-19.566	-19.566	0.000	(0)
V2O7-4	1.344e-20	3.129e-21	-19.872	-20.505	-0.633	(0)
VO2SO4-	1.515e-21	1.383e-21	-20.820	-20.859	-0.040	(0)
VO2F2-	7.529e-22	6.874e-22	-21.123	-21.163	-0.040	(0)
V3O9-3	3.610e-24	1.590e-24	-23.442	-23.799	-0.356	(0)
VO2F3-2	8.610e-25	5.981e-25	-24.065	-24.223	-0.158	(0)
VO2F4-3	4.660e-29	2.053e-29	-28.332	-28.688	-0.356	(0)
VO2NO3	1.992e-30	1.992e-30	-29.701	-29.701	0.000	(0)
V4O12-4	3.273e-31	7.619e-32	-30.485	-31.118	-0.633	(0)
V10O28-6	0.000e+00	0.000e+00	-81.094	-82.518	-1.424	(0)
HV10O28-5	0.000e+00	0.000e+00	-81.350	-82.339	-0.989	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.505	-85.139	-0.633	(0)
Zn	4.119e-07					
Zn+2	2.598e-07	1.868e-07	-6.585	-6.729	-0.143	(0)
ZnCO3	1.022e-07	1.022e-07	-6.990	-6.990	0.000	(0)
ZnOH+	2.095e-08	1.912e-08	-7.679	-7.718	-0.040	(0)
ZnHCO3+	1.291e-08	1.179e-08	-7.889	-7.929	-0.040	(0)
ZnSO4	1.067e-08	1.067e-08	-7.972	-7.972	0.000	(0)
Zn (OH) 2	3.103e-09	3.103e-09	-8.508	-8.508	0.000	(0)
ZnOHCl	1.063e-09	1.063e-09	-8.973	-8.973	0.000	(0)
ZnCl+	8.618e-10	7.934e-10	-9.065	-9.101	-0.036	(0)

ZnF+	2.848e-10	2.600e-10	-9.545	-9.585	-0.040	(0)
Zn(SO4)2-2	3.493e-11	2.426e-11	-10.457	-10.615	-0.158	(0)
Zn(OH)3-	1.744e-11	1.592e-11	-10.759	-10.798	-0.040	(0)
ZnCl2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
ZnCl3-	3.101e-15	2.855e-15	-14.508	-14.544	-0.036	(0)
Zn(OH)4-2	9.340e-16	6.487e-16	-15.030	-15.188	-0.158	(0)
ZnSeO4	1.960e-17	1.960e-17	-16.708	-16.708	0.000	(0)
ZnNO3+	9.126e-18	8.331e-18	-17.040	-17.079	-0.040	(0)
ZnCl4-2	3.335e-18	2.414e-18	-17.477	-17.617	-0.140	(0)
Zn(NO3)2	2.951e-29	2.951e-29	-28.530	-28.530	0.000	(0)
Zn(SeO4)2-2	1.939e-29	1.347e-29	-28.713	-28.871	-0.158	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-148.546	-148.586	-0.040	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.583	-150.583	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.601	-225.640	-0.040	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-227.455	-227.613	-0.158	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-305.279	-305.437	-0.158	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-68.23	-61.94	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-50.49	-45.98	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-57.72	-45.98	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-87.94	-70.01	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-66.10	-46.07	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.42	-29.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-28.81	-28.36	0.45	(NH4)2SeO4
Acanthite	-54.88	-91.10	-36.22	Ag2S
Ag2CO3	-14.71	-25.80	-11.09	Ag2CO3
Ag2CrO4	-22.01	-33.60	-11.59	Ag2CrO4
Ag2HVO4	-16.89	-15.41	1.48	Ag2HVO4
Ag2MoO4	-17.13	-28.68	-11.55	Ag2MoO4
Ag2O	-17.33	-4.76	12.57	Ag2O
Ag2Se	-3.48	-52.18	-48.70	Ag2Se
Ag2SeO3	-14.59	-21.74	-7.15	Ag2SeO3
Ag2SeO4	-24.03	-32.94	-8.91	Ag2SeO4
Ag2SO4	-19.54	-24.36	-4.82	Ag2SO4
Ag3AsO3	-29.65	-27.49	2.16	Ag3AsO3
Ag3AsO4	-18.50	-21.29	-2.79	Ag3AsO4
Ag3H2VO5	-22.97	-17.79	5.18	Ag3H2VO5
AgF:4H2O	-15.59	-14.54	1.05	AgF:4H2O
Agmetal	-1.42	-14.93	-13.51	Ag
AgVO3	-13.80	-13.03	0.77	AgVO3
Al(OH)3(am)	-4.00	6.80	10.80	Al(OH)3
Al2(MoO4)3	-60.52	-58.15	2.37	Al2(MoO4)3
Al2O3	-6.05	13.60	19.65	Al2O3
Al4(OH)10SO4	-15.09	7.61	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.15	-7.35	4.80	AlAsO4:2H2O
AlOHSO4	-9.57	-12.80	-3.23	AlOHSO4
AlSb	-155.44	-89.82	65.62	AlSb
Alunite	-13.33	-14.73	-1.40	KAl3(SO4)2(OH)6
Anglesite	-7.35	-15.14	-7.79	PbSO4
Anhydrite	-2.54	-6.90	-4.36	CaSO4
Anilite	-57.08	-88.95	-31.88	Cu0.25Cu1.5S
Antlerite	-7.50	1.28	8.79	Cu3(OH)4SO4
Aragonite	-0.04	-8.34	-8.30	CaCO3
Arsenolite	-78.65	-81.41	-2.76	As4O6
Artinite	-6.66	2.94	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-35.00	-28.30	6.71	As2O5
Atacamite	-4.25	3.14	7.39	Cu2(OH)3Cl
Azurite	-4.28	-21.19	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.70	8.70	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-19.77	-3.90	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	6.70	-2.21	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-28.14	4.80	32.94	Ba3(VO4)2:4H2O
BaCrO4	-10.48	-20.15	-9.67	BaCrO4
BaF2	-9.81	-15.63	-5.82	BaF2

BaMoO4	-8.26	-15.22	-6.96	BaMoO4
Barite	-0.92	-10.90	-9.98	BaSO4
BaS	-93.83	-77.65	16.18	BaS
BaSeO3	-10.11	-8.28	1.83	BaSeO3
BaSeO4	-12.03	-19.49	-7.46	BaSeO4
Bianchite	-8.55	-10.31	-1.76	ZnSO4:6H2O
Birnessite	-8.67	9.42	18.09	MnO2
Bixbyite	-5.62	-6.26	-0.64	Mn2O3
BlaubleiI	-56.50	-80.66	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.21	-84.49	-27.28	Cu0.6Cu0.8S
Boehmite	-1.78	6.80	8.58	AlOOH
Breithauptite	-58.76	-77.29	-18.52	NiSb
Brochantite	-6.98	8.24	15.22	Cu4(OH)6SO4
Brucite	-4.85	11.99	16.84	Mg(OH)2
Bunsenite	-5.66	6.78	12.45	NiO
Ca(VO3)2	-14.26	-8.60	5.66	Ca(VO3)2
Ca2V2O7	-13.40	4.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.45	4.10	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-12.50	9.80	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-22.16	16.80	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-23.06	16.80	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.12	-155.15	142.97	Ca3Sb2
CaCrO4	-13.88	-16.15	-2.27	CaCrO4
Calcite	0.14	-8.34	-8.48	CaCO3
Calomel	-12.97	-30.88	-17.91	Hg2Cl2
CaMoO4	-3.27	-11.22	-7.95	CaMoO4
Carnotite	-6.11	-5.88	0.23	KUO2VO4
CaSeO3:2H2O	-7.09	-4.28	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.47	-15.49	-3.02	CaSeO4:2H2O
Cd(BO2)2	-14.37	-4.53	9.84	Cd(BO2)2
Cd(OH)2	-7.88	5.76	13.64	Cd(OH)2
Cd(OH)2(am)	-7.97	5.76	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.62	-21.91	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.87	-2.31	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.95	3.45	28.40	Cd4(OH)6SO4
CdCl2	-15.14	-15.80	-0.66	CdCl2
CdCl2:1H2O	-14.10	-15.80	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.88	-15.80	-1.91	CdCl2:2.5H2O
CdF2	-17.35	-18.57	-1.21	CdF2
Cdmetal(alpha)	-32.85	-19.34	13.51	Cd
Cdmetal(gamma)	-32.96	-19.34	13.62	Cd
CdMoO4	-4.01	-18.16	-14.15	CdMoO4
CdOHCl	-8.55	-5.02	3.54	CdOHCl
CdSb	-77.96	-78.31	-0.35	CdSb
CdSe	-21.46	-41.66	-20.20	CdSe
CdSeO4:2H2O	-20.57	-22.42	-1.85	CdSeO4:2H2O
CdSO4	-13.66	-13.84	-0.17	CdSO4
CdSO4:1H2O	-12.11	-13.84	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.96	-13.84	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.41	-13.16	-9.75	AgCl
Cerrusite	-3.44	-16.57	-13.13	PbCO3
CH4(g)	-80.40	-121.44	-41.05	CH4
Chalcanthite	-10.00	-12.64	-2.64	CuSO4:5H2O
Chalcedony	0.04	-3.51	-3.55	SiO2
Chalcocite	-57.22	-92.14	-34.92	Cu2S
Chalcopyrite	-123.76	-159.03	-35.27	CuFeS2
Chrysotile	-3.25	28.95	32.20	Mg3Si2O5(OH)4
Cinnabar	-54.35	-100.05	-45.69	HgS
Claudetite	-78.34	-81.41	-3.06	As4O6
Clausthalite	-15.86	-42.96	-27.10	PbSe
Co(BO2)2	-30.72	-3.65	27.07	Co(BO2)2
Co(OH)2	-6.45	6.64	13.09	Co(OH)2
Co(OH)3	-10.90	-13.21	-2.31	Co(OH)3
CO2(g)	-2.89	-21.04	-18.15	CO2
Co3(AsO4)2	-21.40	-8.37	13.03	Co3(AsO4)2
Co3O4	-9.27	-19.77	-10.50	Co3O4
CoCl2	-23.18	-14.92	8.27	CoCl2
CoCl2:6H2O	-17.45	-14.92	2.54	CoCl2:6H2O

CoCO3	-4.41	-14.39	-9.98	CoCO3
CoF2	-16.09	-17.68	-1.60	CoF2
CoF3	-48.24	-49.70	-1.46	CoF3
CoFe2O4	22.60	19.07	-3.53	CoFe2O4
CoMoO4	-9.52	-17.28	-7.76	CoMoO4
CoO	-6.94	6.64	13.59	CoO
CoS (alpha)	-72.26	-79.70	-7.44	CoS
CoS (beta)	-68.63	-79.70	-11.07	CoS
CoSe	-24.58	-40.78	-16.20	CoSe
CoSeO3	-11.65	-10.33	1.32	CoSeO3
CoSeO4:6H2O	-20.01	-21.54	-1.53	CoSeO4:6H2O
CoSO4	-15.76	-12.95	2.80	CoSO4
CoSO4:6H2O	-10.48	-12.95	-2.47	CoSO4:6H2O
Cotunnite	-12.32	-17.10	-4.78	PbCl2
Covellite	-57.08	-79.38	-22.30	CuS
Cr (OH) 2	-19.54	-8.72	10.82	Cr (OH) 2
Cr (OH) 3	-0.46	0.88	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.63	0.88	-0.75	Cr (OH) 3
Cr2O3	4.12	1.76	-2.36	Cr2O3
CrCl2	-44.37	-30.28	14.09	CrCl2
CrCl3	-46.57	-31.46	15.11	CrCl3
CrF3	-24.27	-35.61	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-64.31	-33.83	30.48	Cr
CrO3	-25.63	-28.84	-3.21	CrO3
Cryolite	-15.96	-49.80	-33.84	Na3AlF6
Cu (OH) 2	-1.71	6.96	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.68	14.53	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-14.09	-4.84	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.68	-92.56	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-7.42	-53.22	-45.80	Cu2Se
Cu2SO4	-23.45	-25.40	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.52	-7.42	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.73	-105.32	-42.59	Cu3Sb
Cu3Se2	-30.19	-93.68	-63.49	Cu3Se2
CuCO3	-2.58	-14.08	-11.50	CuCO3
CuCrO4	-16.44	-21.88	-5.44	CuCrO4
CuF	-10.16	-15.06	-4.91	CuF
CuF2	-18.48	-17.37	1.12	CuF2
CuF2:2H2O	-12.82	-17.37	-4.55	CuF2:2H2O
Cumetal	-6.70	-15.45	-8.76	Cu
CuMoO4	-3.88	-16.96	-13.08	CuMoO4
CuOCuSO4	-15.98	-5.68	10.30	CuOCuSO4
Cupricferrite	13.40	19.39	5.99	CuFe2O4
Cuprite	-4.39	-5.80	-1.41	Cu2O
Cuprousferrite	12.23	3.31	-8.92	CuFeO2
CuSe	-7.36	-40.46	-33.10	CuSe
CuSe2	-29.42	-62.78	-33.37	CuSe2
CuSeO3:2H2O	-10.53	-10.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.78	-21.22	-2.44	CuSeO4:5H2O
CuSO4	-15.58	-12.64	2.94	CuSO4
Diaspore	-0.07	6.80	6.87	AlOOH
Djurleite	-57.38	-91.30	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.84	-17.38	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.29	-17.38	-17.09	CaMg (CO3) 2
Epsomite	-5.48	-7.61	-2.13	MgSO4:7H2O
Fe (OH) 2	-6.87	6.69	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.02	2.98	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.88	-14.60	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-6.11	-4.55	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.88	-38.51	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-42.63	-46.37	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-1.10	19.12	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-8.34	-7.94	0.40	FeAsO4:2H2O
FeCr2O4	1.25	8.45	7.20	FeCr2O4
FeMoO4	-7.13	-17.23	-10.09	FeMoO4
Ferrihydrite	3.02	6.21	3.19	Fe (OH) 3
Ferroselite	-44.45	-63.05	-18.60	FeSe2

FeS (ppt)	-76.70	-79.65	-2.95	FeS
FeSe	-29.73	-40.73	-11.00	FeSe
Fix_pe	-4.54	-4.54	0.00	e-
Fluorite	-1.13	-11.63	-10.50	CaF2
Galena	-67.91	-81.88	-13.97	PbS
Gibbsite	-1.49	6.80	8.29	Al (OH) 3
Goethite	5.72	6.21	0.49	FeOOH
Goslarite	-8.30	-10.31	-2.01	ZnSO4:7H2O
Greenalite	-7.75	13.06	20.81	Fe3Si2O5 (OH) 4
Greenockite	-66.22	-80.58	-14.36	CdS
Greigite	-281.22	-326.26	-45.03	Fe3S4
Gummite	-6.96	0.71	7.67	UO3
Gypsum	-2.29	-6.90	-4.61	CaSO4:2H2O
H-Jarosite	-8.46	-20.56	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-11.04	-23.92	-12.88	H2MoO4
H2S (g)	-78.33	-86.34	-8.01	H2S
H2Se (g)	-42.46	-47.42	-4.96	H2Se
Halite	-6.92	-5.32	1.60	NaCl
Halloysite	-2.99	6.58	9.57	Al2Si2O5 (OH) 4
Hausmannite	-6.92	54.11	61.03	Mn3O4
Hematite	13.84	12.42	-1.42	Fe2O3
Hercynite	-2.60	20.30	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.88	-256.59	-73.71	Hg (CH3) 2
Hg (g)	-9.34	-17.21	-7.87	Hg
Hg (OH) 2	-10.21	-13.70	-3.50	Hg (OH) 2
Hg2 (g)	-19.47	-34.42	-14.96	Hg2
Hg2 (OH) 2	-14.58	-9.32	5.26	Hg2 (OH) 2
Hg2CO3	-14.31	-30.36	-16.05	Hg2CO3
Hg2CrO4	-29.47	-38.17	-8.70	Hg2CrO4
Hg2F2	-23.29	-33.65	-10.36	Hg2F2
Hg2S	-83.99	-95.67	-11.68	Hg2S
Hg2SeO3	-21.64	-26.30	-4.66	Hg2SeO3
Hg2SO4	-22.79	-28.92	-6.13	Hg2SO4
Hg3O2CO3	-32.46	-62.15	-29.68	Hg3O2CO3
HgCl (g)	-34.94	-15.44	19.50	HgCl
HgCl2	-14.00	-35.26	-21.26	HgCl2
HgF (g)	-49.50	-16.82	32.68	HgF
HgF2 (g)	-50.60	-38.03	12.57	HgF2
Hgmetal (l)	-3.76	-17.21	-13.45	Hg
HgSe	-5.43	-61.13	-55.69	HgSe
HgSeO3	-18.25	-30.68	-12.43	HgSeO3
HgSO4	-23.88	-33.30	-9.42	HgSO4
Huntite	-5.51	-35.47	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-9.92	-28.69	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.43	-24.19	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-23.16	-28.33	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-1.70	-16.50	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.32	-49.57	-17.24	K2Cr2O7
K2CrO4	-20.21	-20.72	-0.51	K2CrO4
K2MoO4	-19.06	-15.80	3.26	K2MoO4
K2SeO4	-19.33	-20.06	-0.73	K2SeO4
Kaolinite	-0.85	6.58	7.43	Al2Si2O5 (OH) 4
Langite	-9.24	8.24	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-10.24	-10.67	-0.43	PbO:PbSO4
Laurionite	-6.94	-6.32	0.62	PbOHCl
Lepidocrocite	4.84	6.21	1.37	FeOOH
Lime	-20.00	12.70	32.70	CaO
Litharge	-8.23	4.46	12.69	PbO
Mackinawite	-76.05	-79.65	-3.60	FeS
Maghemite	6.04	12.42	6.39	Fe2O3
Magnesioferrite	7.56	24.42	16.86	Fe2MgO4
Magnesite	-1.59	-9.05	-7.46	MgCO3
Magnetite	15.72	19.12	3.40	Fe3O4
Malachite	-1.81	-7.11	-5.31	Cu2 (OH) 2CO3
Manganite	-3.12	22.22	25.34	MnOOH
Massicot	-8.43	4.46	12.89	PbO
Matlockite	-9.51	-18.48	-8.97	PbClF
Melanothallite	-20.85	-14.60	6.26	CuCl2

Melanterite	-10.70	-12.90	-2.21	FeSO4:7H2O
Metacinnabar	-54.95	-100.05	-45.09	HgS
Mg(OH)2(active)	-6.80	11.99	18.79	Mg(OH)2
Mg(VO3)2	-20.58	-9.30	11.28	Mg(VO3)2
Mg2Sb3	-277.81	-203.13	74.68	Mg2Sb3
Mg2V2O7	-23.67	2.69	26.36	Mg2V2O7
MgCr2O4	-2.45	13.75	16.20	MgCr2O4
MgCrO4	-22.23	-16.85	5.38	MgCrO4
MgF2	-4.21	-12.34	-8.13	MgF2
MgMoO4	-10.08	-11.93	-1.85	MgMoO4
MgSeO3:6H2O	-8.04	-4.99	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-14.99	-16.19	-1.20	MgSeO4:6H2O
Minium	-35.03	38.49	73.52	Pb3O4
Mirabilite	-7.56	-8.68	-1.11	Na2SO4:10H2O
Mn(VO3)2	-16.53	-11.63	4.90	Mn(VO3)2
Mn2(SO4)3	-59.34	-65.05	-5.71	Mn2(SO4)3
Mn2Sb	-150.91	-89.83	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.79	0.71	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.61	-11.89	2.72	MnCl2:4H2O
MnS(grn)	-76.85	-76.68	0.17	MnS
MnS(pnk)	-80.02	-76.68	3.34	MnS
MnSb	-96.84	-99.75	-2.91	MnSb
MnSe	-41.25	-37.75	3.50	MnSe
MnSeO3	-8.44	-7.31	1.13	MnSeO3
MnSeO3:2H2O	-8.29	-7.31	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.47	-18.52	-2.05	MnSeO4:5H2O
MnSO4	-12.51	-9.93	2.58	MnSO4
Monteponite	-9.34	5.76	15.10	CdO
Montroydite	-10.06	-13.70	-3.64	HgO
MoO3	-15.92	-23.92	-8.00	MoO3
Morenosite	-10.67	-12.81	-2.14	NiSO4:7H2O
MoS2	-151.45	-221.71	-70.26	MoS2
Na-Jarosite	-3.90	-15.10	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-36.87	-46.77	-9.90	Na2Cr2O7
Na2CrO4	-20.85	-17.92	2.93	Na2CrO4
Na2Mo2O7	-20.32	-36.92	-16.60	Na2Mo2O7
Na2MoO4	-14.49	-13.00	1.49	Na2MoO4
Na2MoO4:2H2O	-14.22	-13.00	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.36	-6.06	10.30	Na2SeO3:5H2O
Na2SeO4	-18.54	-17.26	1.28	Na2SeO4
Na3Sb	-174.69	-80.24	94.45	Na3Sb
Na3VO4	-30.95	5.73	36.68	Na3VO4
Na4V2O7	-36.85	0.55	37.40	Na4V2O7
Nantokite	-6.95	-13.68	-6.73	CuCl
NaSb	-89.22	-66.06	23.17	NaSb
Natron	-8.80	-10.12	-1.31	Na2CO3:10H2O
NaVO3	-9.04	-5.19	3.86	NaVO3
Nesquehonite	-4.38	-9.05	-4.67	MgCO3:3H2O
Ni(OH)2	-6.01	6.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.65	-7.95	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-24.46	7.54	32.00	Ni4(OH)6SO4
NiCO3	-7.38	-14.25	-6.87	NiCO3
NiMoO4	-5.99	-17.14	-11.14	NiMoO4
NiS(alpha)	-73.96	-79.56	-5.60	NiS
NiS(beta)	-68.46	-79.56	-11.10	NiS
NiS(gamma)	-66.76	-79.56	-12.80	NiS
NiSe	-22.94	-40.64	-17.70	NiSe
NiSeO3:2H2O	-13.01	-10.19	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.88	-21.40	-1.52	NiSeO4:6H2O
Nsutite	-8.08	9.42	17.50	MnO2
O2(g)	-32.89	50.20	83.09	O2
Orpiment	-238.67	-299.74	-61.07	As2S3
Otavite	-3.27	-15.27	-12.00	CdCO3
Pb(BO2)2	-12.35	-5.83	6.52	Pb(BO2)2
Pb(OH)2	-3.69	4.46	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-72.84	-81.60	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-10.65	-1.85	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.26	8.92	26.19	Pb2O(OH)2

Pb2O3	-27.01	34.03	61.04	Pb2O3
Pb2OCO3	-11.55	-12.11	-0.56	Pb2OCO3
Pb2V2O7	-10.47	-12.37	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.71	-14.91	5.80	Pb3(AsO4)2
Pb3(VO4)2	-14.05	-7.91	6.14	Pb3(VO4)2
Pb3O2CO3	-18.67	-7.65	11.02	Pb3O2CO3
Pb3O2SO4	-16.90	-6.21	10.69	Pb3O2SO4
Pb4(OH)6SO4	-22.85	-1.75	21.10	Pb4(OH)6SO4
Pb4O3SO4	-23.63	-1.75	21.88	Pb4O3SO4
PbCrO4	-11.78	-24.38	-12.60	PbCrO4
PbF2	-12.43	-19.87	-7.44	PbF2
Pbmetal	-24.89	-20.64	4.25	Pb
PbMoO4	-3.84	-19.46	-15.62	PbMoO4
PbO:0.3H2O	-8.52	4.46	12.98	PbO:0.33H2O
PbSeO4	-16.88	-23.72	-6.84	PbSeO4
Periclase	-9.59	11.99	21.58	MgO
Phosgenite	-13.86	-33.67	-19.81	PbCl2:PbCO3
Plattnerite	-20.04	29.56	49.60	PbO2
Portlandite	-10.11	12.70	22.80	Ca(OH)2
Pyrite	-122.39	-140.89	-18.51	FeS2
Pyrochroite	-5.53	9.67	15.19	Mn(OH)2
Pyrolusite	-6.61	34.77	41.38	MnO2
Quartz	0.49	-3.51	-4.00	SiO2
Realgar	-99.50	-119.25	-19.75	AsS
Retgersite	-10.77	-12.81	-2.04	NiSO4:6H2O
Rhodochrosite	-0.79	-11.37	-10.58	MnCO3
Rutherfordine	-5.83	-20.33	-14.50	UO2CO3
Sb(OH)3	-14.21	-21.32	-7.11	Sb(OH)3
Sb2O4	-20.93	-17.53	3.40	Sb2O4
Sb2O5	-31.38	-41.05	-9.67	Sb2O5
Sb2Se3	-117.14	-184.90	-67.76	Sb2Se3
Sb4O6(cubic)	-67.00	-85.26	-18.26	Sb4O6
Sb4O6(orth)	-67.36	-85.26	-17.90	Sb4O6
SbCl3	-54.22	-53.65	0.57	SbCl3
SbF3	-47.58	-57.81	-10.23	SbF3
Sbmetal	-47.28	-58.97	-11.69	Sb
SbO2	-5.25	-33.07	-27.82	SbO2
Schoepite	-5.28	0.71	5.99	UO2(OH)2:H2O
Semetal(am)	-15.21	-22.32	-7.11	Se
Semetal(hex)	-14.61	-22.32	-7.71	Se
Senarmontite	-30.27	-42.63	-12.37	Sb2O3
SeO2	-17.10	-16.98	0.12	SeO2
SeO3	-49.23	-28.18	21.04	SeO3
Sepiolite	-2.31	13.45	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-5.33	13.45	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-4.10	-14.34	-10.24	FeCO3
SiO2(am-gel)	-0.80	-3.51	-2.71	SiO2
SiO2(am-ppt)	-0.77	-3.51	-2.74	SiO2
Smithsonite	-1.75	-11.75	-10.00	ZnCO3
Sphalerite	-65.61	-77.06	-11.45	ZnS
Spinel	-11.25	25.60	36.85	MgAl2O4
Stibnite	-251.20	-301.66	-50.46	Sb2S3
Sulfur	-59.10	-61.24	-2.14	S
Tenorite	-0.68	6.96	7.64	CuO
Thenardite	-9.00	-8.68	0.32	Na2SO4
Thermonatrite	-10.75	-10.12	0.64	Na2CO3:H2O
Tyuyamunite	-11.25	-7.17	4.08	Ca(UO2)2(VO4)2
U3O8	-16.41	4.68	21.08	U3O8
U3Sb4	-584.39	-432.01	152.38	U3Sb4
U4O9	-32.58	-35.60	-3.02	U4O9
UF4	-34.29	-63.83	-29.54	UF4
UF4:2.5H2O	-31.11	-63.83	-32.72	UF4:2.5H2O
UO2(am)	-16.11	-15.18	0.93	UO2
UO2(NO3)2	-48.95	-36.81	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.66	-36.81	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.20	-36.81	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.85	-36.81	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.90	0.71	5.61	UO2(OH)2

UO2SeO4:4H2O	-25.22	-27.47	-2.25	UO2SeO4:4H2O
UO3	-6.99	0.71	7.70	UO3
Uraninite	-10.51	-15.18	-4.67	UO2
USb2	-222.11	-192.53	29.58	USb2
V(OH)3	-20.74	-13.15	7.59	V(OH)3
V2O5	-19.93	-21.29	-1.36	V2O5
V3O5	-45.82	-43.99	1.84	V3O5
V4O7	-57.47	-50.28	7.19	V4O7
V6O13	-53.22	-114.08	-60.86	V6O13
Valentinite	-34.15	-42.63	-8.48	Sb2O3
VC12	-66.13	-47.26	18.87	VC12
VC13	-68.92	-45.49	23.43	VC13
VF4	-69.88	-54.95	14.93	VF4
Vmetal	-94.83	-50.80	44.03	V
VO	-40.46	-25.70	14.76	VO
VO(OH)2	-11.45	-6.29	5.15	VO(OH)2
VO2Cl	-24.27	-21.43	2.84	VO2Cl
VOC1	-35.08	-23.93	11.15	VOC1
VOC12	-40.61	-27.85	12.76	VOC12
VOSO4	-29.50	-25.89	3.61	VOSO4
Witherite	-3.77	-12.34	-8.57	BaCO3
Wurtzite	-68.11	-77.06	-8.95	ZnS
Zincite	-2.05	9.29	11.33	ZnO
Zincosite	-14.24	-10.31	3.93	ZnSO4
Zn(BO2)2	-9.29	-1.00	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-31.55	-28.23	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.91	9.29	12.20	Zn(OH)2
Zn(OH)2(am)	-3.19	9.29	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.47	9.29	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.25	9.29	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.45	9.29	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.53	-1.03	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.40	7.79	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.09	-0.44	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.25	-11.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-10.85	17.55	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.63	24.87	38.50	Zn5(OH)8Cl2
ZnCl2	-19.32	-12.27	7.05	ZnCl2
ZnCO3:1H2O	-1.49	-11.75	-10.26	ZnCO3:1H2O
ZnF2	-14.51	-15.04	-0.53	ZnF2
Znmetal	-41.60	-15.82	25.79	Zn
ZnMoO4	-4.51	-14.63	-10.13	ZnMoO4
ZnO(active)	-1.90	9.29	11.19	ZnO
ZnS(am)	-68.01	-77.06	-9.05	ZnS
ZnSb	-85.80	-74.78	11.01	ZnSb
ZnSe	-23.74	-38.14	-14.40	ZnSe
ZnSeO4:6H2O	-17.38	-18.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.67	-10.31	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 29.

```

Title Stage 1 Pit wall interaction mix calculator
MIX 104
109      1
3         0
4         0
5         0
6         0
7         0

```

```

      8      0
      9      0
     10      0
     11      0
     12      0
     13      0
     14      0
     15      0
    Save solution 110
    end
-----
TITLE
-----

    Stage 1 Pit wall interaction mix calculator

-----
Beginning of batch-reaction calculations.
-----

Reaction step 1.

Using mix 104.

Mixture 104.

      0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
      0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
      0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
      0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
      0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
      0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
      0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
      0.000e+00 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
      0.000e+00 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
      0.000e+00 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
      0.000e+00 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
      0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
      0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
      1.000e+00 Solution 109    Solution after simulation 28.

-----Solution composition-----

      Elements          Molality          Moles
      Ag                2.093e-10      2.093e-10
      Al                1.446e-08      1.446e-08
      As                7.127e-08      7.127e-08
      B                 7.640e-06      7.641e-06
      Ba                6.824e-08      6.824e-08
      C                 2.252e-03      2.253e-03
      Ca                7.272e-04      7.272e-04
      Cd                1.046e-10      1.046e-10
      Cl                1.836e-03      1.836e-03
      Co                7.891e-10      7.891e-10

```

Cr	1.141e-07	1.141e-07
Cu	5.647e-08	5.647e-08
F	7.708e-05	7.708e-05
Fe	9.384e-07	9.384e-07
Hg	2.265e-11	2.265e-11
K	1.231e-04	1.231e-04
Mg	1.399e-04	1.399e-04
Mn	6.927e-07	6.927e-07
Mo	1.732e-08	1.732e-08
N	6.607e-08	6.607e-08
Na	3.092e-03	3.092e-03
Ni	1.228e-09	1.228e-09
Pb	1.005e-10	1.005e-10
S	4.010e-04	4.010e-04
Sb	2.854e-10	2.854e-10
Se	1.799e-09	1.799e-09
Si	3.127e-04	3.127e-04
U	1.247e-08	1.247e-08
V	1.682e-10	1.682e-10
Zn	4.119e-07	4.119e-07

-----Description of solution-----

	pH	=	8.007	Charge balance
	pe	=	4.544	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.018e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.238e-03	
	Total CO2 (mol/kg)	=	2.252e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.817e-09	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110188e+02	
	Total O	=	5.551725e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.113e-06	1.024e-06	-5.954	-5.990	-0.036	(0)
H+	1.068e-08	9.835e-09	-7.971	-8.007	-0.036	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.093e-10					
AgCl	1.416e-10	1.416e-10	-9.849	-9.849	0.000	(0)
Ag+	4.455e-11	4.103e-11	-10.351	-10.387	-0.036	(0)
AgCl2-	2.285e-11	2.086e-11	-10.641	-10.681	-0.040	(0)
AgSO4-	2.341e-13	2.137e-13	-12.631	-12.670	-0.040	(0)
AgCl3-2	4.525e-14	3.143e-14	-13.344	-13.503	-0.158	(0)
AgF	7.188e-15	7.188e-15	-14.143	-14.143	0.000	(0)
AgOH	4.200e-15	4.200e-15	-14.377	-14.377	0.000	(0)
AgNO2	4.474e-16	4.474e-16	-15.349	-15.349	0.000	(0)
AgH2BO3	2.754e-16	2.754e-16	-15.560	-15.560	0.000	(0)
AgCl4-3	2.463e-16	1.085e-16	-15.608	-15.965	-0.356	(0)
AgNH3+	4.274e-17	3.902e-17	-16.369	-16.409	-0.040	(0)
AgSeO3-	1.253e-17	1.144e-17	-16.902	-16.942	-0.040	(0)
Ag2Se	5.362e-18	5.362e-18	-17.271	-17.271	0.000	(0)
Ag(OH) 2-	4.602e-19	4.202e-19	-18.337	-18.377	-0.040	(0)
AgNO3	5.786e-22	5.786e-22	-21.238	-21.238	0.000	(0)
Ag(NH3) 2+	1.618e-22	1.478e-22	-21.791	-21.830	-0.040	(0)
Ag(NO2) 2-	3.962e-23	3.617e-23	-22.402	-22.442	-0.040	(0)
Ag(SeO3) 2-3	1.008e-25	4.442e-26	-24.996	-25.352	-0.356	(0)
Ag2MoO4	7.936e-30	7.936e-30	-29.100	-29.100	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.910	-74.910	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.071	-85.704	-0.633	(0)

	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.509	-148.623	-0.114	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-149.107	-149.147	-0.040	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.828	-150.056	-0.228	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.146	-150.367	-0.221	(0)
Al	1.446e-08						
	Al (OH) 4-	1.435e-08	1.322e-08	-7.843	-7.879	-0.035	(0)
	Al (OH) 3	1.026e-10	1.026e-10	-9.989	-9.989	0.000	(0)
	Al (OH) 2+	5.442e-12	5.024e-12	-11.264	-11.299	-0.035	(0)
	AlF2+	1.266e-13	1.169e-13	-12.897	-12.932	-0.035	(0)
	AlF3	1.027e-13	1.027e-13	-12.989	-12.989	0.000	(0)
	AlOH+2	8.511e-15	6.178e-15	-14.070	-14.209	-0.139	(0)
	AlF+2	5.799e-15	4.210e-15	-14.237	-14.376	-0.139	(0)
	AlF4-	3.894e-15	3.589e-15	-14.410	-14.445	-0.035	(0)
	AlSO4+	1.327e-17	1.223e-17	-16.877	-16.913	-0.035	(0)
	Al+3	1.267e-17	6.035e-18	-16.897	-17.219	-0.322	(0)
	Al (SO4) 2-	3.713e-20	3.422e-20	-19.430	-19.466	-0.035	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.342	-57.698	-0.356	(0)
As (3)	4.696e-21						
	H3AsO3	4.442e-21	4.442e-21	-20.352	-20.352	0.000	(0)
	H2AsO3-	2.538e-22	2.317e-22	-21.596	-21.635	-0.040	(0)
	HAsO3-2	3.093e-26	2.148e-26	-25.510	-25.668	-0.158	(0)
	H4AsO3+	2.371e-29	2.165e-29	-28.625	-28.665	-0.040	(0)
	AsO3-3	1.912e-31	8.420e-32	-30.719	-31.075	-0.356	(0)
As (5)	7.127e-08						
	HAsO4-2	6.669e-08	4.632e-08	-7.176	-7.334	-0.158	(0)
	H2AsO4-	4.551e-09	4.155e-09	-8.342	-8.381	-0.040	(0)
	AsO4-3	3.381e-11	1.489e-11	-10.471	-10.827	-0.356	(0)
	H3AsO4	7.091e-15	7.101e-15	-14.149	-14.149	0.001	(0)
B	7.640e-06						
	H3BO3	7.163e-06	7.173e-06	-5.145	-5.144	0.001	(0)
	H2BO3-	4.614e-07	4.236e-07	-6.336	-6.373	-0.037	(0)
	CaH2BO3+	1.282e-08	1.176e-08	-7.892	-7.929	-0.037	(0)
	NaH2BO3	1.906e-09	1.906e-09	-8.720	-8.720	0.000	(0)
	MgH2BO3+	1.515e-09	1.391e-09	-8.820	-8.857	-0.037	(0)
	BF (OH) 3-	2.175e-10	1.996e-10	-9.663	-9.700	-0.037	(0)
	H5 (BO3) 2-	2.817e-12	2.586e-12	-11.550	-11.587	-0.037	(0)
	BaH2BO3+	6.872e-13	6.308e-13	-12.163	-12.200	-0.037	(0)
	BF2 (OH) 2-	1.595e-14	1.464e-14	-13.797	-13.834	-0.037	(0)
	H8 (BO3) 3-	2.020e-15	1.855e-15	-14.695	-14.732	-0.037	(0)
	AgH2BO3	2.754e-16	2.754e-16	-15.560	-15.560	0.000	(0)
	BF3OH-	4.258e-21	3.909e-21	-20.371	-20.408	-0.037	(0)
	BF4-	1.438e-26	1.320e-26	-25.842	-25.880	-0.037	(0)
Ba	6.824e-08						
	Ba+2	6.701e-08	4.819e-08	-7.174	-7.317	-0.143	(0)
	BaHCO3+	9.938e-10	9.183e-10	-9.003	-9.037	-0.034	(0)
	BaCO3	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
	BaH2BO3+	6.872e-13	6.308e-13	-12.163	-12.200	-0.037	(0)
	BaOH+	2.335e-13	2.154e-13	-12.632	-12.667	-0.035	(0)
	BaNH3+2	2.039e-17	1.416e-17	-16.691	-16.849	-0.158	(0)
	BaNO3+	4.697e-18	4.288e-18	-17.328	-17.368	-0.040	(0)
C (4)	2.252e-03						
	HCO3-	2.162e-03	1.995e-03	-2.665	-2.700	-0.035	(0)
	H2CO3	4.413e-05	4.413e-05	-4.355	-4.355	0.000	(0)
	CaHCO3+	1.941e-05	1.793e-05	-4.712	-4.746	-0.034	(0)
	CO3-2	1.323e-05	9.511e-06	-4.879	-5.022	-0.143	(0)
	CaCO3	7.276e-06	7.276e-06	-5.138	-5.138	0.000	(0)
	NaHCO3	3.187e-06	3.187e-06	-5.497	-5.497	0.000	(0)
	MgHCO3+	2.100e-06	1.933e-06	-5.678	-5.714	-0.036	(0)
	MgCO3	7.491e-07	7.491e-07	-6.125	-6.125	0.000	(0)
	NaCO3-	5.449e-07	5.030e-07	-6.264	-6.298	-0.035	(0)
	ZnCO3	1.022e-07	1.022e-07	-6.990	-6.990	0.000	(0)
	CuCO3	4.949e-08	4.949e-08	-7.305	-7.305	0.000	(0)
	MnHCO3+	1.945e-08	1.794e-08	-7.711	-7.746	-0.035	(0)
	ZnHCO3+	1.291e-08	1.179e-08	-7.889	-7.929	-0.040	(0)
	UO2 (CO3) 3-4	7.310e-09	1.702e-09	-8.136	-8.769	-0.633	(0)
	UO2 (CO3) 2-2	5.139e-09	3.570e-09	-8.289	-8.447	-0.158	(0)
	Cu (CO3) 2-2	1.824e-09	1.267e-09	-8.739	-8.897	-0.158	(0)
	BaHCO3+	9.938e-10	9.183e-10	-9.003	-9.037	-0.034	(0)

		BaCO3	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
		NiCO3	2.085e-10	2.085e-10	-9.681	-9.681	0.000	(0)
		NiHCO3+	1.583e-10	1.446e-10	-9.800	-9.840	-0.040	(0)
		CuHCO3+	1.219e-10	1.112e-10	-9.914	-9.954	-0.040	(0)
		PbCO3	8.017e-11	8.017e-11	-10.096	-10.096	0.000	(0)
		CoHCO3+	7.230e-11	6.601e-11	-10.141	-10.180	-0.040	(0)
		CoCO3	6.838e-11	6.838e-11	-10.165	-10.165	0.000	(0)
		UO2CO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
		FeHCO3+	1.298e-11	1.200e-11	-10.887	-10.921	-0.034	(0)
		CdCO3	1.212e-11	1.212e-11	-10.916	-10.916	0.000	(0)
		PbHCO3+	4.554e-12	4.157e-12	-11.342	-11.381	-0.040	(0)
		Pb(CO3) 2-2	3.166e-12	2.199e-12	-11.499	-11.658	-0.158	(0)
		CdHCO3+	2.782e-13	2.540e-13	-12.556	-12.595	-0.040	(0)
		Cd(CO3) 2-2	1.230e-13	8.547e-14	-12.910	-13.068	-0.158	(0)
		HgCO3	3.411e-17	3.411e-17	-16.467	-16.467	0.000	(0)
		Hg(CO3) 2-2	1.477e-18	1.026e-18	-17.831	-17.989	-0.158	(0)
		HgHCO3+	6.842e-21	6.246e-21	-20.165	-20.204	-0.040	(0)
Ca	7.272e-04							
		Ca+2	6.712e-04	4.827e-04	-3.173	-3.316	-0.143	(0)
		CaSO4	2.887e-05	2.887e-05	-4.540	-4.540	0.000	(0)
		CaHCO3+	1.941e-05	1.793e-05	-4.712	-4.746	-0.034	(0)
		CaCO3	7.276e-06	7.276e-06	-5.138	-5.138	0.000	(0)
		CaF+	3.984e-07	3.675e-07	-6.400	-6.435	-0.035	(0)
		CaH2BO3+	1.282e-08	1.176e-08	-7.892	-7.929	-0.037	(0)
		CaOH+	1.067e-08	9.859e-09	-7.972	-8.006	-0.034	(0)
		CaNH3+2	4.075e-13	2.831e-13	-12.390	-12.548	-0.158	(0)
		CaNO3+	2.969e-14	2.710e-14	-13.527	-13.567	-0.040	(0)
		Ca(NH3) 2+2	7.558e-23	5.250e-23	-22.122	-22.280	-0.158	(0)
Cd	1.046e-10							
		Cd+2	7.775e-11	5.591e-11	-10.109	-10.252	-0.143	(0)
		CdCO3	1.212e-11	1.212e-11	-10.916	-10.916	0.000	(0)
		CdCl+	9.890e-12	9.028e-12	-11.005	-11.044	-0.040	(0)
		CdSO4	3.422e-12	3.422e-12	-11.466	-11.466	0.000	(0)
		CdOH+	4.980e-13	4.547e-13	-12.303	-12.342	-0.040	(0)
		CdOHC1	3.791e-13	3.791e-13	-12.421	-12.421	0.000	(0)
		CdHCO3+	2.782e-13	2.540e-13	-12.556	-12.595	-0.040	(0)
		Cd(CO3) 2-2	1.230e-13	8.547e-14	-12.910	-13.068	-0.158	(0)
		CdF+	6.771e-14	6.181e-14	-13.169	-13.209	-0.040	(0)
		CdCl2	6.364e-14	6.364e-14	-13.196	-13.196	0.000	(0)
		Cd(SO4) 2-2	1.735e-14	1.205e-14	-13.761	-13.919	-0.158	(0)
		Cd(OH) 2	2.937e-15	2.937e-15	-14.532	-14.532	0.000	(0)
		CdCl3-	7.436e-17	6.789e-17	-16.129	-16.168	-0.040	(0)
		CdF2	8.603e-18	8.603e-18	-17.065	-17.065	0.000	(0)
		Cd(OH) 3-	2.012e-19	1.837e-19	-18.696	-18.736	-0.040	(0)
		CdSeO4	7.054e-21	7.054e-21	-20.152	-20.152	0.000	(0)
		CdNO3+	3.439e-21	3.139e-21	-20.464	-20.503	-0.040	(0)
		Cd2OH+3	2.893e-22	1.274e-22	-21.539	-21.895	-0.356	(0)
		Cd(SeO3) 2-2	1.248e-23	8.669e-24	-22.904	-23.062	-0.158	(0)
		Cd(OH) 4-2	4.431e-26	3.078e-26	-25.354	-25.512	-0.158	(0)
		Cd(NO3) 2	2.793e-32	2.793e-32	-31.554	-31.554	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-80.542	-80.582	-0.040	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-151.715	-151.715	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-228.113	-228.152	-0.040	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-304.135	-304.293	-0.158	(0)
Cl	1.836e-03							
		Cl-	1.836e-03	1.691e-03	-2.736	-2.772	-0.036	(0)
		ZnOHC1	1.063e-09	1.063e-09	-8.973	-8.973	0.000	(0)
		MnCl+	1.040e-09	9.591e-10	-8.983	-9.018	-0.035	(0)
		ZnCl+	8.618e-10	7.934e-10	-9.065	-9.101	-0.036	(0)
		AgCl	1.416e-10	1.416e-10	-9.849	-9.849	0.000	(0)
		CuCl	2.635e-11	2.635e-11	-10.579	-10.579	0.000	(0)
		AgCl2-	2.285e-11	2.086e-11	-10.641	-10.681	-0.040	(0)
		CuCl2-	1.011e-11	9.307e-12	-10.995	-11.031	-0.036	(0)
		CdCl+	9.890e-12	9.028e-12	-11.005	-11.044	-0.040	(0)
		NiCl+	2.785e-12	2.542e-12	-11.555	-11.595	-0.040	(0)
		CoCl+	2.725e-12	2.488e-12	-11.565	-11.604	-0.040	(0)
		CuCl+	2.572e-12	2.368e-12	-11.590	-11.626	-0.036	(0)
		MnCl2	2.291e-12	2.291e-12	-11.640	-11.640	0.000	(0)

ZnCl2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
CdOHC1	3.791e-13	3.791e-13	-12.421	-12.421	0.000	(0)
PbCl+	1.843e-13	1.682e-13	-12.735	-12.774	-0.040	(0)
CdCl2	6.364e-14	6.364e-14	-13.196	-13.196	0.000	(0)
AgCl3-2	4.525e-14	3.143e-14	-13.344	-13.503	-0.158	(0)
HgClOH	9.159e-15	9.159e-15	-14.038	-14.038	0.000	(0)
CuCl3-2	4.648e-15	3.364e-15	-14.333	-14.473	-0.140	(0)
ZnCl3-	3.101e-15	2.855e-15	-14.508	-14.544	-0.036	(0)
CuCl2	1.388e-15	1.388e-15	-14.858	-14.858	0.000	(0)
PbCl2	1.270e-15	1.270e-15	-14.896	-14.896	0.000	(0)
MnCl3-	1.156e-15	1.067e-15	-14.937	-14.972	-0.035	(0)
HgCl2	8.566e-16	8.566e-16	-15.067	-15.067	0.000	(0)
AgCl4-3	2.463e-16	1.085e-16	-15.608	-15.965	-0.356	(0)
CrCl+2	8.427e-17	5.854e-17	-16.074	-16.233	-0.158	(0)
CdCl3-	7.436e-17	6.789e-17	-16.129	-16.168	-0.040	(0)
NiCl2	2.164e-17	2.164e-17	-16.665	-16.665	0.000	(0)
HgCl3-	1.586e-17	1.448e-17	-16.800	-16.839	-0.040	(0)
ZnCl4-2	3.335e-18	2.414e-18	-17.477	-17.617	-0.140	(0)
CrOHC12	1.926e-18	1.926e-18	-17.715	-17.715	0.000	(0)
UO2Cl+	1.492e-18	1.362e-18	-17.826	-17.866	-0.040	(0)
PbCl3-	9.367e-19	8.552e-19	-18.028	-18.068	-0.040	(0)
HgCl4-2	1.404e-19	9.749e-20	-18.853	-19.011	-0.158	(0)
HgCl+	1.107e-19	1.011e-19	-18.956	-18.995	-0.040	(0)
FeCl+2	1.094e-19	7.920e-20	-18.961	-19.101	-0.140	(0)
CuCl3-	2.379e-20	2.190e-20	-19.624	-19.659	-0.036	(0)
CrCl2+	1.029e-20	9.391e-21	-19.988	-20.027	-0.040	(0)
PbCl4-2	9.515e-22	6.609e-22	-21.022	-21.180	-0.158	(0)
FeCl2+	6.485e-22	5.982e-22	-21.188	-21.223	-0.035	(0)
CrO3Cl-	5.407e-25	4.936e-25	-24.267	-24.307	-0.040	(0)
CuCl4-2	2.564e-25	1.856e-25	-24.591	-24.731	-0.140	(0)
VOCl+	2.551e-25	2.329e-25	-24.593	-24.633	-0.040	(0)
FeCl3	1.011e-25	1.011e-25	-24.995	-24.995	0.000	(0)
CoCl+2	2.932e-38	2.037e-38	-37.533	-37.691	-0.158	(0)
UCl+3	0.000e+00	0.000e+00	-47.920	-48.276	-0.356	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
Co (2)	7.891e-10					
Co+2	6.123e-10	4.253e-10	-9.213	-9.371	-0.158	(0)
CoHCO3+	7.230e-11	6.601e-11	-10.141	-10.180	-0.040	(0)
CoCO3	6.838e-11	6.838e-11	-10.165	-10.165	0.000	(0)
CoSO4	2.215e-11	2.215e-11	-10.655	-10.655	0.000	(0)
CoOH+	9.515e-12	8.686e-12	-11.022	-11.061	-0.040	(0)
CoCl+	2.725e-12	2.488e-12	-11.565	-11.604	-0.040	(0)
CoF+	1.028e-12	9.381e-13	-11.988	-12.028	-0.040	(0)
Co (OH) 2	7.063e-13	7.063e-13	-12.151	-12.151	0.000	(0)
CoNO2+	1.713e-16	1.564e-16	-15.766	-15.806	-0.040	(0)
Co (NH3) +2	3.429e-17	2.382e-17	-16.465	-16.623	-0.158	(0)
Co (OH) 3-	1.580e-17	1.443e-17	-16.801	-16.841	-0.040	(0)
CoOOH-	3.966e-18	3.620e-18	-17.402	-17.441	-0.040	(0)
CoSeO4	1.444e-19	1.444e-19	-18.840	-18.840	0.000	(0)
CoNO3+	1.311e-20	1.197e-20	-19.882	-19.922	-0.040	(0)
Co2OH+3	4.204e-22	1.851e-22	-21.376	-21.732	-0.356	(0)
Co (OH) 4-2	3.370e-24	2.341e-24	-23.472	-23.631	-0.158	(0)
Co (NH3) 2+2	6.814e-25	4.733e-25	-24.167	-24.325	-0.158	(0)
Co (NO3) 2	4.323e-31	4.323e-31	-30.364	-30.364	0.000	(0)
Co (NH3) 3+2	3.996e-33	2.776e-33	-32.398	-32.557	-0.158	(0)
Co4 (OH) 4+4	4.880e-36	1.136e-36	-35.312	-35.945	-0.633	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-41.010	-41.168	-0.158	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.122	-50.280	-0.158	(0)
Co (3)	4.434e-31					
CoOH+2	4.434e-31	3.080e-31	-30.353	-30.512	-0.158	(0)
Co+3	1.243e-37	5.920e-38	-36.906	-37.228	-0.322	(0)
CoCl+2	2.932e-38	2.037e-38	-37.533	-37.691	-0.158	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.304	-73.462	-0.158	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)

Cr (2)	2.631e-25					
Cr+2	2.631e-25	1.828e-25	-24.580	-24.738	-0.158	(0)
Cr (3)	1.141e-07					
Cr (OH) 2+	8.174e-08	7.462e-08	-7.088	-7.127	-0.040	(0)
Cr (OH) 3	2.870e-08	2.870e-08	-7.542	-7.542	0.000	(0)
CrO2-	1.518e-09	1.386e-09	-8.819	-8.858	-0.040	(0)
Cr (OH) 4-	1.281e-09	1.170e-09	-8.892	-8.932	-0.040	(0)
Cr (OH) +2	8.625e-10	5.991e-10	-9.064	-9.222	-0.158	(0)
CrOHSO4	3.712e-11	3.712e-11	-10.430	-10.430	0.000	(0)
CrF+2	4.258e-13	2.957e-13	-12.371	-12.529	-0.158	(0)
Cr+3	6.073e-14	2.675e-14	-13.217	-13.573	-0.356	(0)
CrSO4+	1.786e-14	1.631e-14	-13.748	-13.788	-0.040	(0)
CrCl+2	8.427e-17	5.854e-17	-16.074	-16.233	-0.158	(0)
Cr2 (OH) 2SO4+2	2.894e-18	2.010e-18	-17.539	-17.697	-0.158	(0)
CrOHC12	1.926e-18	1.926e-18	-17.715	-17.715	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.117e-20	3.117e-20	-19.506	-19.506	0.000	(0)
CrCl2+	1.029e-20	9.391e-21	-19.988	-20.027	-0.040	(0)
CrNO3+2	2.989e-26	2.076e-26	-25.524	-25.683	-0.158	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.691	-45.849	-0.158	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.207	-56.563	-0.356	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Cr (6)	2.137e-13					
CrO4-2	2.062e-13	1.483e-13	-12.686	-12.829	-0.143	(0)
HCrO4-	5.169e-15	4.719e-15	-14.287	-14.326	-0.040	(0)
NaCrO4-	2.292e-15	2.093e-15	-14.640	-14.679	-0.040	(0)
KCrO4-	6.826e-17	6.232e-17	-16.166	-16.205	-0.040	(0)
H2CrO4	3.762e-23	3.762e-23	-22.425	-22.425	0.000	(0)
CrO3SO4-2	5.314e-24	3.691e-24	-23.275	-23.433	-0.158	(0)
CrO3Cl-	5.407e-25	4.936e-25	-24.267	-24.307	-0.040	(0)
Cr2O7-2	1.112e-27	7.723e-28	-26.954	-27.112	-0.158	(0)
Cu (1)	5.002e-11					
CuCl	2.635e-11	2.635e-11	-10.579	-10.579	0.000	(0)
Cu+	1.356e-11	1.238e-11	-10.868	-10.907	-0.040	(0)
CuCl2-	1.011e-11	9.307e-12	-10.995	-11.031	-0.036	(0)
CuCl3-2	4.648e-15	3.364e-15	-14.333	-14.473	-0.140	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.953	-148.177	-0.225	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.690	-148.907	-0.218	(0)
Cu (2)	5.642e-08					
CuCO3	4.949e-08	4.949e-08	-7.305	-7.305	0.000	(0)
CuOH+	3.107e-09	2.860e-09	-8.508	-8.544	-0.036	(0)
Cu (CO3) 2-2	1.824e-09	1.267e-09	-8.739	-8.897	-0.158	(0)
Cu+2	1.229e-09	8.836e-10	-8.911	-9.054	-0.143	(0)
Cu (OH) 2	5.843e-10	5.843e-10	-9.233	-9.233	0.000	(0)
CuHCO3+	1.219e-10	1.112e-10	-9.914	-9.954	-0.040	(0)
CuSO4	5.285e-11	5.285e-11	-10.277	-10.277	0.000	(0)
CuF+	4.260e-12	3.889e-12	-11.371	-11.410	-0.040	(0)
CuCl+	2.572e-12	2.368e-12	-11.590	-11.626	-0.036	(0)
Cu (OH) 3-	1.344e-12	1.227e-12	-11.872	-11.911	-0.040	(0)
Cu2 (OH) 2+2	2.959e-13	2.055e-13	-12.529	-12.687	-0.158	(0)
CuNH3+2	6.064e-15	4.212e-15	-14.217	-14.375	-0.158	(0)
CuNO2+	5.290e-15	4.829e-15	-14.277	-14.316	-0.040	(0)
CuCl2	1.388e-15	1.388e-15	-14.858	-14.858	0.000	(0)
Cu (OH) 4-2	1.423e-17	9.884e-18	-16.847	-17.005	-0.158	(0)
CuNO3+	5.434e-20	4.961e-20	-19.265	-19.304	-0.040	(0)
CuCl3-	2.379e-20	2.190e-20	-19.624	-19.659	-0.036	(0)
Cu (NO2) 2	2.579e-21	2.579e-21	-20.589	-20.589	0.000	(0)
CuCl4-2	2.564e-25	1.856e-25	-24.591	-24.731	-0.140	(0)
Cu (NO3) 2	1.109e-31	1.109e-31	-30.955	-30.955	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.127	-218.166	-0.040	(0)
F	7.708e-05					
F-	7.575e-05	6.975e-05	-4.121	-4.156	-0.036	(0)
MgF+	8.042e-07	7.411e-07	-6.095	-6.130	-0.035	(0)
CaF+	3.984e-07	3.675e-07	-6.400	-6.435	-0.035	(0)
NaF	1.250e-07	1.250e-07	-6.903	-6.903	0.000	(0)
MnF+	1.357e-09	1.251e-09	-8.868	-8.903	-0.035	(0)
HF	1.015e-09	1.015e-09	-8.994	-8.994	0.000	(0)
ZnF+	2.848e-10	2.600e-10	-9.545	-9.585	-0.040	(0)
BF (OH) 3-	2.175e-10	1.996e-10	-9.663	-9.700	-0.037	(0)

CuF+	4.260e-12	3.889e-12	-11.371	-11.410	-0.040	(0)
NiF+	1.128e-12	1.030e-12	-11.948	-11.987	-0.040	(0)
CoF+	1.028e-12	9.381e-13	-11.988	-12.028	-0.040	(0)
CrF+2	4.258e-13	2.957e-13	-12.371	-12.529	-0.158	(0)
HF2-	2.926e-13	2.691e-13	-12.534	-12.570	-0.036	(0)
AlF2+	1.266e-13	1.169e-13	-12.897	-12.932	-0.035	(0)
AlF3	1.027e-13	1.027e-13	-12.989	-12.989	0.000	(0)
CdF+	6.771e-14	6.181e-14	-13.169	-13.209	-0.040	(0)
BF2 (OH) 2-	1.595e-14	1.464e-14	-13.797	-13.834	-0.037	(0)
PbF+	1.510e-14	1.378e-14	-13.821	-13.861	-0.040	(0)
AgF	7.188e-15	7.188e-15	-14.143	-14.143	0.000	(0)
AlF+2	5.799e-15	4.210e-15	-14.237	-14.376	-0.139	(0)
UO2F+	5.239e-15	4.783e-15	-14.281	-14.320	-0.040	(0)
AlF4-	3.894e-15	3.589e-15	-14.410	-14.445	-0.035	(0)
UO2F2	9.622e-16	9.622e-16	-15.017	-15.017	0.000	(0)
FeF2+	2.401e-16	2.215e-16	-15.620	-15.655	-0.035	(0)
FeF+2	1.639e-16	1.186e-16	-15.785	-15.926	-0.140	(0)
FeF3	2.179e-17	2.179e-17	-16.662	-16.662	0.000	(0)
PbF2	1.892e-17	1.892e-17	-16.723	-16.723	0.000	(0)
UO2F3-	1.847e-17	1.686e-17	-16.734	-16.773	-0.040	(0)
CdF2	8.603e-18	8.603e-18	-17.065	-17.065	0.000	(0)
H2F2	2.758e-18	2.758e-18	-17.559	-17.559	0.000	(0)
VO2F	2.714e-20	2.714e-20	-19.566	-19.566	0.000	(0)
UO2F4-2	1.345e-20	9.341e-21	-19.871	-20.030	-0.158	(0)
BF3OH-	4.258e-21	3.909e-21	-20.371	-20.408	-0.037	(0)
PbF3-	2.742e-21	2.503e-21	-20.562	-20.602	-0.040	(0)
VO2F2-	7.529e-22	6.874e-22	-21.123	-21.163	-0.040	(0)
VOF+	2.250e-23	2.054e-23	-22.648	-22.687	-0.040	(0)
VO2F3-2	8.610e-25	5.981e-25	-24.065	-24.223	-0.158	(0)
VOF2	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
PbF4-2	1.203e-25	8.357e-26	-24.920	-25.078	-0.158	(0)
BF4-	1.438e-26	1.320e-26	-25.842	-25.880	-0.037	(0)
HgF+	8.486e-27	7.747e-27	-26.071	-26.111	-0.040	(0)
VOF3-	1.456e-27	1.330e-27	-26.837	-26.876	-0.040	(0)
Sb (OH) 2F	5.184e-28	5.184e-28	-27.285	-27.285	0.000	(0)
SbOF	5.098e-28	5.098e-28	-27.293	-27.293	0.000	(0)
VO2F4-3	4.660e-29	2.053e-29	-28.332	-28.688	-0.356	(0)
SiF6-2	6.949e-31	5.029e-31	-30.158	-30.298	-0.140	(0)
VOF4-2	5.389e-31	3.743e-31	-30.268	-30.427	-0.158	(0)
UF3+	9.253e-39	8.448e-39	-38.034	-38.073	-0.040	(0)
UF2+2	1.100e-39	7.641e-40	-38.959	-39.117	-0.158	(0)
UF4	0.000e+00	0.000e+00	-40.190	-40.190	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.704	-42.060	-0.356	(0)
UF5-	0.000e+00	0.000e+00	-42.709	-42.748	-0.040	(0)
UF6-2	0.000e+00	0.000e+00	-44.266	-44.425	-0.158	(0)
Fe (2)	7.522e-10					
Fe+2	6.875e-10	4.776e-10	-9.163	-9.321	-0.158	(0)
FeSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
FeOH+	2.110e-11	1.946e-11	-10.676	-10.711	-0.035	(0)
FeHCO3+	1.298e-11	1.200e-11	-10.887	-10.921	-0.034	(0)
Fe (OH) 2	1.583e-14	1.583e-14	-13.801	-13.801	0.000	(0)
Fe (OH) 3-	5.554e-15	5.123e-15	-14.255	-14.290	-0.035	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.045	-157.045	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.306	-233.346	-0.040	(0)
Fe (3)	9.376e-07					
Fe (OH) 3	4.489e-07	4.489e-07	-6.348	-6.348	0.000	(0)
Fe (OH) 2+	4.424e-07	4.083e-07	-6.354	-6.389	-0.035	(0)
Fe (OH) 4-	4.636e-08	4.279e-08	-7.334	-7.369	-0.035	(0)
FeOH+2	1.416e-12	1.025e-12	-11.849	-11.989	-0.140	(0)
FeF2+	2.401e-16	2.215e-16	-15.620	-15.655	-0.035	(0)
FeF+2	1.639e-16	1.186e-16	-15.785	-15.926	-0.140	(0)
FeF3	2.179e-17	2.179e-17	-16.662	-16.662	0.000	(0)
FeSO4+	4.927e-18	4.544e-18	-17.307	-17.343	-0.035	(0)
Fe+3	3.257e-18	1.551e-18	-17.487	-17.809	-0.322	(0)
FeCl+2	1.094e-19	7.920e-20	-18.961	-19.101	-0.140	(0)
Fe (SO4) 2-	2.778e-20	2.536e-20	-19.556	-19.596	-0.040	(0)
FeCl2+	6.485e-22	5.982e-22	-21.188	-21.223	-0.035	(0)
Fe2 (OH) 2+4	1.495e-22	3.481e-23	-21.825	-22.458	-0.633	(0)

	FeHSeO3+2	6.323e-24	4.392e-24	-23.199	-23.357	-0.158	(0)
	FeCl3	1.011e-25	1.011e-25	-24.995	-24.995	0.000	(0)
	Fe3 (OH) 4+5	2.004e-27	2.054e-28	-26.698	-27.687	-0.989	(0)
	FeNO3+2	3.965e-28	2.754e-28	-27.402	-27.560	-0.158	(0)
H (0)	1.119e-28						
	H2	5.593e-29	5.601e-29	-28.252	-28.252	0.001	(0)
Hg (0)	2.262e-11						
	Hg	2.262e-11	2.262e-11	-10.645	-10.645	0.000	(0)
Hg (1)	1.325e-25						
	Hg2+2	6.625e-26	4.602e-26	-25.179	-25.337	-0.158	(0)
Hg (2)	2.985e-14						
	Hg (OH) 2	1.978e-14	1.981e-14	-13.704	-13.703	0.001	(0)
	HgClOH	9.159e-15	9.159e-15	-14.038	-14.038	0.000	(0)
	HgCl2	8.566e-16	8.566e-16	-15.067	-15.067	0.000	(0)
	HgCO3	3.411e-17	3.411e-17	-16.467	-16.467	0.000	(0)
	HgCl3-	1.586e-17	1.448e-17	-16.800	-16.839	-0.040	(0)
	Hg (CO3) 2-2	1.477e-18	1.026e-18	-17.831	-17.989	-0.158	(0)
	HgCl4-2	1.404e-19	9.749e-20	-18.853	-19.011	-0.158	(0)
	HgOH+	1.338e-19	1.221e-19	-18.874	-18.913	-0.040	(0)
	HgCl+	1.107e-19	1.011e-19	-18.956	-18.995	-0.040	(0)
	HgHCO3+	6.842e-21	6.246e-21	-20.165	-20.204	-0.040	(0)
	Hg (OH) 3-	2.797e-21	2.553e-21	-20.553	-20.593	-0.040	(0)
	Hg+2	4.314e-24	2.996e-24	-23.365	-23.523	-0.158	(0)
	HgNH3+2	1.268e-24	8.807e-25	-23.897	-24.055	-0.158	(0)
	Hg (NH3) 2+2	5.907e-25	4.103e-25	-24.229	-24.387	-0.158	(0)
	HgSO4	2.048e-25	2.048e-25	-24.689	-24.689	0.000	(0)
	HgF+	8.486e-27	7.747e-27	-26.071	-26.111	-0.040	(0)
	Hg (NH3) 3+2	1.095e-33	7.609e-34	-32.960	-33.119	-0.158	(0)
	HgNO3+	2.152e-35	1.964e-35	-34.667	-34.707	-0.040	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.392	-41.550	-0.158	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.839	-45.839	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-140.223	-140.263	-0.040	(0)
	HgS2-2	0.000e+00	0.000e+00	-140.805	-140.963	-0.158	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.876	-141.876	0.000	(0)
K	1.231e-04						
	K+	1.228e-04	1.131e-04	-3.911	-3.946	-0.036	(0)
	KSO4-	2.265e-07	2.091e-07	-6.645	-6.680	-0.035	(0)
	KCrO4-	6.826e-17	6.232e-17	-16.166	-16.205	-0.040	(0)
Mg	1.399e-04						
	Mg+2	1.317e-04	9.469e-05	-3.881	-4.024	-0.143	(0)
	MgSO4	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
	MgHCO3+	2.100e-06	1.933e-06	-5.678	-5.714	-0.036	(0)
	MgF+	8.042e-07	7.411e-07	-6.095	-6.130	-0.035	(0)
	MgCO3	7.491e-07	7.491e-07	-6.125	-6.125	0.000	(0)
	MgOH+	4.173e-08	3.859e-08	-7.380	-7.414	-0.034	(0)
	MgH2BO3+	1.515e-09	1.391e-09	-8.820	-8.857	-0.037	(0)
Mn (2)	6.927e-07						
	Mn+2	6.487e-07	4.506e-07	-6.188	-6.346	-0.158	(0)
	MnSO4	2.092e-08	2.092e-08	-7.679	-7.679	0.000	(0)
	MnHCO3+	1.945e-08	1.794e-08	-7.711	-7.746	-0.035	(0)
	MnF+	1.357e-09	1.251e-09	-8.868	-8.903	-0.035	(0)
	MnOH+	1.256e-09	1.159e-09	-8.901	-8.936	-0.035	(0)
	MnCl+	1.040e-09	9.591e-10	-8.983	-9.018	-0.035	(0)
	MnCl2	2.291e-12	2.291e-12	-11.640	-11.640	0.000	(0)
	MnCl3-	1.156e-15	1.067e-15	-14.937	-14.972	-0.035	(0)
	MnSeO4	8.217e-17	8.217e-17	-16.085	-16.085	0.000	(0)
	MnNO3+	1.389e-17	1.268e-17	-16.857	-16.897	-0.040	(0)
	Mn (OH) 3-	8.135e-18	7.504e-18	-17.090	-17.125	-0.035	(0)
	Mn (OH) 4-2	3.426e-23	2.480e-23	-22.465	-22.606	-0.140	(0)
	Mn (NO3) 2	5.654e-28	5.654e-28	-27.248	-27.248	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-43.139	-43.139	0.000	(0)
Mn (3)	1.478e-27						
	Mn+3	1.478e-27	7.038e-28	-26.830	-27.153	-0.322	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-42.396	-42.536	-0.140	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.328	-47.364	-0.037	(0)
Mo	1.732e-08						

MoO4-2	1.732e-08	1.246e-08	-7.761	-7.905	-0.143	(0)
HMoO4-	2.670e-12	2.437e-12	-11.574	-11.613	-0.040	(0)
H2MoO4	1.756e-16	1.756e-16	-15.756	-15.756	0.000	(0)
Ag2MoO4	7.936e-30	7.936e-30	-29.100	-29.100	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.342	-57.698	-0.356	(0)
Mo7O24-6	0.000e+00	0.000e+00	-64.976	-66.400	-1.424	(0)
HMo7O24-5	0.000e+00	0.000e+00	-67.031	-68.021	-0.989	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-70.613	-71.246	-0.633	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-75.651	-76.007	-0.356	(0)
N(-3)	9.244e-09					
NH4+	8.754e-09	8.035e-09	-8.058	-8.095	-0.037	(0)
NH3	4.658e-10	4.658e-10	-9.332	-9.332	0.000	(0)
NH4SO4-	2.437e-11	2.248e-11	-10.613	-10.648	-0.035	(0)
CaNH3+2	4.075e-13	2.831e-13	-12.390	-12.548	-0.158	(0)
CuNH3+2	6.064e-15	4.212e-15	-14.217	-14.375	-0.158	(0)
NiNH3+2	2.117e-16	1.470e-16	-15.674	-15.833	-0.158	(0)
AgNH3+	4.274e-17	3.902e-17	-16.369	-16.409	-0.040	(0)
Co(NH3)+2	3.429e-17	2.382e-17	-16.465	-16.623	-0.158	(0)
BaNH3+2	2.039e-17	1.416e-17	-16.691	-16.849	-0.158	(0)
Ag(NH3)2+	1.618e-22	1.478e-22	-21.791	-21.830	-0.040	(0)
Ca(NH3)2+2	7.558e-23	5.250e-23	-22.122	-22.280	-0.158	(0)
Ni(NH3)2+2	1.425e-23	9.899e-24	-22.846	-23.004	-0.158	(0)
HgNH3+2	1.268e-24	8.807e-25	-23.897	-24.055	-0.158	(0)
Co(NH3)2+2	6.814e-25	4.733e-25	-24.167	-24.325	-0.158	(0)
Hg(NH3)2+2	5.907e-25	4.103e-25	-24.229	-24.387	-0.158	(0)
Co(NH3)3+2	3.996e-33	2.776e-33	-32.398	-32.557	-0.158	(0)
Hg(NH3)3+2	1.095e-33	7.609e-34	-32.960	-33.119	-0.158	(0)
Co(NH3)4+2	0.000e+00	0.000e+00	-41.010	-41.168	-0.158	(0)
Hg(NH3)4+2	0.000e+00	0.000e+00	-41.392	-41.550	-0.158	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-45.691	-45.849	-0.158	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-50.122	-50.280	-0.158	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-56.207	-56.563	-0.356	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-73.304	-73.462	-0.158	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
N(3)	5.680e-08					
NO2-	5.680e-08	5.219e-08	-7.246	-7.282	-0.037	(0)
CuNO2+	5.290e-15	4.829e-15	-14.277	-14.316	-0.040	(0)
AgNO2	4.474e-16	4.474e-16	-15.349	-15.349	0.000	(0)
CoNO2+	1.713e-16	1.564e-16	-15.766	-15.806	-0.040	(0)
Cu(NO2)2	2.579e-21	2.579e-21	-20.589	-20.589	0.000	(0)
Ag(NO2)2-	3.962e-23	3.617e-23	-22.402	-22.442	-0.040	(0)
N(5)	1.931e-11					
NO3-	1.928e-11	1.775e-11	-10.715	-10.751	-0.036	(0)
CaNO3+	2.969e-14	2.710e-14	-13.527	-13.567	-0.040	(0)
MnNO3+	1.389e-17	1.268e-17	-16.857	-16.897	-0.040	(0)
ZnNO3+	9.126e-18	8.331e-18	-17.040	-17.079	-0.040	(0)
BaNO3+	4.697e-18	4.288e-18	-17.328	-17.368	-0.040	(0)
CuNO3+	5.434e-20	4.961e-20	-19.265	-19.304	-0.040	(0)
NiNO3+	2.871e-20	2.621e-20	-19.542	-19.582	-0.040	(0)
CoNO3+	1.311e-20	1.197e-20	-19.882	-19.922	-0.040	(0)
CdNO3+	3.439e-21	3.139e-21	-20.464	-20.503	-0.040	(0)
PbNO3+	8.066e-22	7.364e-22	-21.093	-21.133	-0.040	(0)
AgNO3	5.786e-22	5.786e-22	-21.238	-21.238	0.000	(0)
CrNO3+2	2.989e-26	2.076e-26	-25.524	-25.683	-0.158	(0)
UO2NO3+	1.928e-26	1.760e-26	-25.715	-25.755	-0.040	(0)
Mn(NO3)2	5.654e-28	5.654e-28	-27.248	-27.248	0.000	(0)
FeNO3+2	3.965e-28	2.754e-28	-27.402	-27.560	-0.158	(0)
Zn(NO3)2	2.951e-29	2.951e-29	-28.530	-28.530	0.000	(0)
VO2NO3	1.992e-30	1.992e-30	-29.701	-29.701	0.000	(0)
Co(NO3)2	4.323e-31	4.323e-31	-30.364	-30.364	0.000	(0)
Cu(NO3)2	1.109e-31	1.109e-31	-30.955	-30.955	0.000	(0)
Cd(NO3)2	2.793e-32	2.793e-32	-31.554	-31.554	0.000	(0)
Pb(NO3)2	2.220e-32	2.220e-32	-31.654	-31.654	0.000	(0)
HgNO3+	2.152e-35	1.964e-35	-34.667	-34.707	-0.040	(0)
Hg(NO3)2	0.000e+00	0.000e+00	-45.839	-45.839	0.000	(0)

Na	3.092e-03					
Na+	3.084e-03	2.840e-03	-2.511	-2.547	-0.036	(0)
NaSO4-	4.314e-06	3.982e-06	-5.365	-5.400	-0.035	(0)
NaHCO3	3.187e-06	3.187e-06	-5.497	-5.497	0.000	(0)
NaCO3-	5.449e-07	5.030e-07	-6.264	-6.298	-0.035	(0)
NaF	1.250e-07	1.250e-07	-6.903	-6.903	0.000	(0)
NaH2BO3	1.906e-09	1.906e-09	-8.720	-8.720	0.000	(0)
NaCrO4-	2.292e-15	2.093e-15	-14.640	-14.679	-0.040	(0)
Ni	1.228e-09					
Ni+2	8.172e-10	5.877e-10	-9.088	-9.231	-0.143	(0)
NiCO3	2.085e-10	2.085e-10	-9.681	-9.681	0.000	(0)
NiHCO3+	1.583e-10	1.446e-10	-9.800	-9.840	-0.040	(0)
NiSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
NiOH+	8.296e-12	7.574e-12	-11.081	-11.121	-0.040	(0)
NiCl+	2.785e-12	2.542e-12	-11.555	-11.595	-0.040	(0)
NiF+	1.128e-12	1.030e-12	-11.948	-11.987	-0.040	(0)
Ni (OH) 2	6.159e-13	6.159e-13	-12.211	-12.211	0.000	(0)
Ni (OH) 3-	6.906e-16	6.304e-16	-15.161	-15.200	-0.040	(0)
Ni (SO4) 2-2	3.810e-16	2.647e-16	-15.419	-15.577	-0.158	(0)
NiNH3+2	2.117e-16	1.470e-16	-15.674	-15.833	-0.158	(0)
NiCl2	2.164e-17	2.164e-17	-16.665	-16.665	0.000	(0)
NiSeO4	1.862e-19	1.862e-19	-18.730	-18.730	0.000	(0)
NiNO3+	2.871e-20	2.621e-20	-19.542	-19.582	-0.040	(0)
Ni (NH3) 2+2	1.425e-23	9.899e-24	-22.846	-23.004	-0.158	(0)
O (0)	3.227e-36					
O2	1.613e-36	1.616e-36	-35.792	-35.792	0.001	(0)
Pb	1.005e-10					
PbCO3	8.017e-11	8.017e-11	-10.096	-10.096	0.000	(0)
PbOH+	7.898e-12	7.210e-12	-11.102	-11.142	-0.040	(0)
PbHCO3+	4.554e-12	4.157e-12	-11.342	-11.381	-0.040	(0)
Pb+2	3.899e-12	2.804e-12	-11.409	-11.552	-0.143	(0)
Pb (CO3) 2-2	3.166e-12	2.199e-12	-11.499	-11.658	-0.158	(0)
PbSO4	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
Pb (OH) 2	2.334e-13	2.334e-13	-12.632	-12.632	0.000	(0)
PbCl+	1.843e-13	1.682e-13	-12.735	-12.774	-0.040	(0)
PbF+	1.510e-14	1.378e-14	-13.821	-13.861	-0.040	(0)
PbCl2	1.270e-15	1.270e-15	-14.896	-14.896	0.000	(0)
Pb (SO4) 2-2	8.121e-16	5.641e-16	-15.090	-15.249	-0.158	(0)
Pb (OH) 3-	2.617e-16	2.389e-16	-15.582	-15.622	-0.040	(0)
PbF2	1.892e-17	1.892e-17	-16.723	-16.723	0.000	(0)
PbCl3-	9.367e-19	8.552e-19	-18.028	-18.068	-0.040	(0)
Pb (OH) 4-2	8.624e-20	5.991e-20	-19.064	-19.223	-0.158	(0)
PbF3-	2.742e-21	2.503e-21	-20.562	-20.602	-0.040	(0)
PbCl4-2	9.515e-22	6.609e-22	-21.022	-21.180	-0.158	(0)
PbNO3+	8.066e-22	7.364e-22	-21.093	-21.133	-0.040	(0)
Pb2OH+3	7.275e-22	3.204e-22	-21.138	-21.494	-0.356	(0)
PbF4-2	1.203e-25	8.357e-26	-24.920	-25.078	-0.158	(0)
Pb3 (OH) 4+2	4.388e-27	3.048e-27	-26.358	-26.516	-0.158	(0)
Pb (NO3) 2	2.220e-32	2.220e-32	-31.654	-31.654	0.000	(0)
Pb4 (OH) 4+4	2.917e-34	6.789e-35	-33.535	-34.168	-0.633	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.957	-152.957	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.954	-229.994	-0.040	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.910	-74.910	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.298	-78.337	-0.040	(0)
H2S	0.000e+00	0.000e+00	-79.324	-79.324	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.537	-79.695	-0.158	(0)
S6-2	0.000e+00	0.000e+00	-80.053	-80.211	-0.158	(0)
S4-2	0.000e+00	0.000e+00	-80.133	-80.291	-0.158	(0)
CdHS+	0.000e+00	0.000e+00	-80.542	-80.582	-0.040	(0)
S3-2	0.000e+00	0.000e+00	-80.938	-81.097	-0.158	(0)
S2-2	0.000e+00	0.000e+00	-81.955	-82.113	-0.158	(0)
S-2	0.000e+00	0.000e+00	-87.490	-87.630	-0.140	(0)
HgHS2-	0.000e+00	0.000e+00	-140.223	-140.263	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.805	-140.963	-0.158	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.876	-141.876	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.953	-148.177	-0.225	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.509	-148.623	-0.114	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-148.546	-148.586	-0.040	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.690	-148.907	-0.218	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.107	-149.147	-0.040	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.828	-150.056	-0.228	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.146	-150.367	-0.221	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.583	-150.583	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.715	-151.715	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.957	-152.957	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.045	-157.045	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.127	-218.166	-0.040	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.601	-225.640	-0.040	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.455	-227.613	-0.158	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.113	-228.152	-0.040	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.954	-229.994	-0.040	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.306	-233.346	-0.040	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.135	-304.293	-0.158	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.279	-305.437	-0.158	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.447	-322.605	-0.158	(0)
S (6)	4.010e-04					
SO4-2	3.631e-04	2.611e-04	-3.440	-3.583	-0.143	(0)
CaSO4	2.887e-05	2.887e-05	-4.540	-4.540	0.000	(0)
MgSO4	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
NaSO4-	4.314e-06	3.982e-06	-5.365	-5.400	-0.035	(0)
KSO4-	2.265e-07	2.091e-07	-6.645	-6.680	-0.035	(0)
MnSO4	2.092e-08	2.092e-08	-7.679	-7.679	0.000	(0)
ZnSO4	1.067e-08	1.067e-08	-7.972	-7.972	0.000	(0)
HSO4-	2.723e-10	2.509e-10	-9.565	-9.600	-0.035	(0)
CuSO4	5.285e-11	5.285e-11	-10.277	-10.277	0.000	(0)
CrOHSO4	3.712e-11	3.712e-11	-10.430	-10.430	0.000	(0)
Zn (SO4) 2-2	3.493e-11	2.426e-11	-10.457	-10.615	-0.158	(0)
NiSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
FeSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
NH4SO4-	2.437e-11	2.248e-11	-10.613	-10.648	-0.035	(0)
CoSO4	2.215e-11	2.215e-11	-10.655	-10.655	0.000	(0)
CdSO4	3.422e-12	3.422e-12	-11.466	-11.466	0.000	(0)
PbSO4	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
AgSO4-	2.341e-13	2.137e-13	-12.631	-12.670	-0.040	(0)
CrSO4+	1.786e-14	1.631e-14	-13.748	-13.788	-0.040	(0)
Cd (SO4) 2-2	1.735e-14	1.205e-14	-13.761	-13.919	-0.158	(0)
Pb (SO4) 2-2	8.121e-16	5.641e-16	-15.090	-15.249	-0.158	(0)
Ni (SO4) 2-2	3.810e-16	2.647e-16	-15.419	-15.577	-0.158	(0)
UO2SO4	1.963e-16	1.963e-16	-15.707	-15.707	0.000	(0)
AlSO4+	1.327e-17	1.223e-17	-16.877	-16.913	-0.035	(0)
FeSO4+	4.927e-18	4.544e-18	-17.307	-17.343	-0.035	(0)
Cr2 (OH) 2SO4+2	2.894e-18	2.010e-18	-17.539	-17.697	-0.158	(0)
UO2 (SO4) 2-2	9.727e-19	6.756e-19	-18.012	-18.170	-0.158	(0)
Al (SO4) 2-	3.713e-20	3.422e-20	-19.430	-19.466	-0.035	(0)
Cr2 (OH) 2 (SO4) 2	3.117e-20	3.117e-20	-19.506	-19.506	0.000	(0)
Fe (SO4) 2-	2.778e-20	2.536e-20	-19.556	-19.596	-0.040	(0)
VO2SO4-	1.515e-21	1.383e-21	-20.820	-20.859	-0.040	(0)
CrO3SO4-2	5.314e-24	3.691e-24	-23.275	-23.433	-0.158	(0)
VOSO4	3.530e-24	3.530e-24	-23.452	-23.452	0.000	(0)
HgSO4	2.048e-25	2.048e-25	-24.689	-24.689	0.000	(0)
VSO4+	9.106e-39	8.313e-39	-38.041	-38.080	-0.040	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.870	-43.870	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.029	-44.187	-0.158	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Sb (3)	9.560e-22					
Sb (OH) 3	4.837e-22	4.837e-22	-21.315	-21.315	0.000	(0)
HSbO2	4.722e-22	4.722e-22	-21.326	-21.326	0.000	(0)
SbO2-	8.518e-26	7.776e-26	-25.070	-25.109	-0.040	(0)
Sb (OH) 4-	4.880e-26	4.455e-26	-25.312	-25.351	-0.040	(0)
Sb (OH) 2F	5.184e-28	5.184e-28	-27.285	-27.285	0.000	(0)
SbOF	5.098e-28	5.098e-28	-27.293	-27.293	0.000	(0)
Sb (OH) 2+	1.265e-28	1.155e-28	-27.898	-27.937	-0.040	(0)
SbO+	4.363e-29	3.983e-29	-28.360	-28.400	-0.040	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.447	-322.605	-0.158	(0)
Sb (5)	2.854e-10					

SbO3-	2.851e-10	2.603e-10	-9.545	-9.585	-0.040	(0)
Sb(OH) 6-	3.305e-13	3.043e-13	-12.481	-12.517	-0.036	(0)
SbO2+	7.910e-27	7.222e-27	-26.102	-26.141	-0.040	(0)
Se (-2)	5.362e-18					
Ag2Se	5.362e-18	5.362e-18	-17.271	-17.271	0.000	(0)
HSe-	4.212e-40	3.845e-40	-39.376	-39.415	-0.040	(0)
MnSe	0.000e+00	0.000e+00	-43.139	-43.139	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.532	-43.532	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.250	-46.408	-0.158	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.071	-85.704	-0.633	(0)
Se (4)	1.798e-09					
HSeO3-	1.174e-09	1.072e-09	-8.930	-8.970	-0.040	(0)
SeO3-2	6.244e-10	4.337e-10	-9.205	-9.363	-0.158	(0)
H2SeO3	4.495e-15	4.495e-15	-14.347	-14.347	0.000	(0)
AgSeO3-	1.253e-17	1.144e-17	-16.902	-16.942	-0.040	(0)
Cd(SeO3) 2-2	1.248e-23	8.669e-24	-22.904	-23.062	-0.158	(0)
FeHSeO3+2	6.323e-24	4.392e-24	-23.199	-23.357	-0.158	(0)
Ag(SeO3) 2-3	1.008e-25	4.442e-26	-24.996	-25.352	-0.356	(0)
Se (6)	9.422e-13					
SeO4-2	9.421e-13	6.775e-13	-12.026	-12.169	-0.143	(0)
MnSeO4	8.217e-17	8.217e-17	-16.085	-16.085	0.000	(0)
ZnSeO4	1.960e-17	1.960e-17	-16.708	-16.708	0.000	(0)
HSeO4-	3.658e-19	3.340e-19	-18.437	-18.476	-0.040	(0)
NiSeO4	1.862e-19	1.862e-19	-18.730	-18.730	0.000	(0)
CoSeO4	1.444e-19	1.444e-19	-18.840	-18.840	0.000	(0)
CdSeO4	7.054e-21	7.054e-21	-20.152	-20.152	0.000	(0)
Zn(SeO4) 2-2	1.939e-29	1.347e-29	-28.713	-28.871	-0.158	(0)
Si	3.127e-04					
H4SiO4	3.078e-04	3.082e-04	-3.512	-3.511	0.001	(0)
H3SiO4-	4.920e-06	4.529e-06	-5.308	-5.344	-0.036	(0)
H2SiO4-2	4.003e-11	2.906e-11	-10.398	-10.537	-0.139	(0)
UO2H3SiO4+	2.092e-13	1.910e-13	-12.679	-12.719	-0.040	(0)
SiF6-2	6.949e-31	5.029e-31	-30.158	-30.298	-0.140	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.188	-60.544	-0.356	(0)
U (4)	5.644e-21					
U(OH) 5-	5.642e-21	5.151e-21	-20.249	-20.288	-0.040	(0)
U(OH) 4	2.122e-24	2.122e-24	-23.673	-23.673	0.000	(0)
U(OH) 3+	8.358e-29	7.630e-29	-28.078	-28.117	-0.040	(0)
U(OH) 2+2	4.996e-34	3.470e-34	-33.301	-33.460	-0.158	(0)
UF3+	9.253e-39	8.448e-39	-38.034	-38.073	-0.040	(0)
UF2+2	1.100e-39	7.641e-40	-38.959	-39.117	-0.158	(0)
UOH+3	3.650e-40	1.608e-40	-39.438	-39.794	-0.356	(0)
UF4	0.000e+00	0.000e+00	-40.190	-40.190	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.704	-42.060	-0.356	(0)
UF5-	0.000e+00	0.000e+00	-42.709	-42.748	-0.040	(0)
U(SO4) 2	0.000e+00	0.000e+00	-43.870	-43.870	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.029	-44.187	-0.158	(0)
UF6-2	0.000e+00	0.000e+00	-44.266	-44.425	-0.158	(0)
U+4	0.000e+00	0.000e+00	-46.571	-47.204	-0.633	(0)
UCl+3	0.000e+00	0.000e+00	-47.920	-48.276	-0.356	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-177.066	-180.271	-3.205	(0)
U (5)	9.486e-18					
UO2+	9.486e-18	8.660e-18	-17.023	-17.063	-0.040	(0)
U (6)	1.247e-08					
UO2(CO3) 3-4	7.310e-09	1.702e-09	-8.136	-8.769	-0.633	(0)
UO2(CO3) 2-2	5.139e-09	3.570e-09	-8.289	-8.447	-0.158	(0)
UO2CO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
UO2H3SiO4+	2.092e-13	1.910e-13	-12.679	-12.719	-0.040	(0)
UO2OH+	7.013e-14	6.402e-14	-13.154	-13.194	-0.040	(0)
UO2F+	5.239e-15	4.783e-15	-14.281	-14.320	-0.040	(0)
UO2F2	9.622e-16	9.622e-16	-15.017	-15.017	0.000	(0)
UO2+2	6.908e-16	4.968e-16	-15.161	-15.304	-0.143	(0)
UO2SO4	1.963e-16	1.963e-16	-15.707	-15.707	0.000	(0)
UO2F3-	1.847e-17	1.686e-17	-16.734	-16.773	-0.040	(0)
UO2Cl+	1.492e-18	1.362e-18	-17.826	-17.866	-0.040	(0)
UO2(SO4) 2-2	9.727e-19	6.756e-19	-18.012	-18.170	-0.158	(0)
UO2F4-2	1.345e-20	9.341e-21	-19.871	-20.030	-0.158	(0)

(UO2) 2 (OH) 2+2	9.792e-21	6.802e-21	-20.009	-20.167	-0.158	(0)
(UO2) 3 (OH) 5+	3.792e-22	3.462e-22	-21.421	-21.461	-0.040	(0)
UO2NO3+	1.928e-26	1.760e-26	-25.715	-25.755	-0.040	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.465	-44.505	-0.040	(0)
V+2	0.000e+00	0.000e+00	-45.866	-46.025	-0.158	(0)
V (3)	5.837e-17					
V (OH) 3	5.837e-17	5.837e-17	-16.234	-16.234	0.000	(0)
V (OH) 2+	4.063e-28	3.709e-28	-27.391	-27.431	-0.040	(0)
VOH+2	4.982e-32	3.461e-32	-31.303	-31.461	-0.158	(0)
V+3	1.531e-37	6.745e-38	-36.815	-37.171	-0.356	(0)
VSO4+	9.106e-39	8.313e-39	-38.041	-38.080	-0.040	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-60.084	-60.440	-0.356	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-61.489	-62.122	-0.633	(0)
V (4)	1.108e-20					
V (OH) 3+	1.098e-20	1.003e-20	-19.959	-19.999	-0.040	(0)
VO+2	7.068e-23	4.909e-23	-22.151	-22.309	-0.158	(0)
VOF+	2.250e-23	2.054e-23	-22.648	-22.687	-0.040	(0)
VOSO4	3.530e-24	3.530e-24	-23.452	-23.452	0.000	(0)
VOF2	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
VOCl+	2.551e-25	2.329e-25	-24.593	-24.633	-0.040	(0)
VOF3-	1.456e-27	1.330e-27	-26.837	-26.876	-0.040	(0)
VOF4-2	5.389e-31	3.743e-31	-30.268	-30.427	-0.158	(0)
H2V2O4+2	7.255e-36	5.039e-36	-35.139	-35.298	-0.158	(0)
V (5)	1.682e-10					
H2VO4-	1.259e-10	1.149e-10	-9.900	-9.940	-0.040	(0)
HVO4-2	4.226e-11	2.935e-11	-10.374	-10.532	-0.158	(0)
H3VO4	1.130e-14	1.130e-14	-13.947	-13.947	0.000	(0)
VO4-3	3.396e-17	1.496e-17	-16.469	-16.825	-0.356	(0)
H3V2O7-	9.188e-18	8.388e-18	-17.037	-17.076	-0.040	(0)
HV2O7-3	2.595e-18	1.143e-18	-17.586	-17.942	-0.356	(0)
VO2+	2.409e-19	2.219e-19	-18.618	-18.654	-0.036	(0)
VO2F	2.714e-20	2.714e-20	-19.566	-19.566	0.000	(0)
V2O7-4	1.344e-20	3.129e-21	-19.872	-20.505	-0.633	(0)
VO2SO4-	1.515e-21	1.383e-21	-20.820	-20.859	-0.040	(0)
VO2F2-	7.529e-22	6.874e-22	-21.123	-21.163	-0.040	(0)
V3O9-3	3.610e-24	1.590e-24	-23.442	-23.799	-0.356	(0)
VO2F3-2	8.610e-25	5.981e-25	-24.065	-24.223	-0.158	(0)
VO2F4-3	4.660e-29	2.053e-29	-28.332	-28.688	-0.356	(0)
VO2NO3	1.992e-30	1.992e-30	-29.701	-29.701	0.000	(0)
V4O12-4	3.273e-31	7.619e-32	-30.485	-31.118	-0.633	(0)
V10O28-6	0.000e+00	0.000e+00	-81.094	-82.518	-1.424	(0)
HV10O28-5	0.000e+00	0.000e+00	-81.350	-82.339	-0.989	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.505	-85.139	-0.633	(0)
Zn	4.119e-07					
Zn+2	2.598e-07	1.868e-07	-6.585	-6.729	-0.143	(0)
ZnCO3	1.022e-07	1.022e-07	-6.990	-6.990	0.000	(0)
ZnOH+	2.095e-08	1.912e-08	-7.679	-7.718	-0.040	(0)
ZnHCO3+	1.291e-08	1.179e-08	-7.889	-7.929	-0.040	(0)
ZnSO4	1.067e-08	1.067e-08	-7.972	-7.972	0.000	(0)
Zn (OH) 2	3.103e-09	3.103e-09	-8.508	-8.508	0.000	(0)
ZnOHC1	1.063e-09	1.063e-09	-8.973	-8.973	0.000	(0)
ZnCl+	8.618e-10	7.934e-10	-9.065	-9.101	-0.036	(0)
ZnF+	2.848e-10	2.600e-10	-9.545	-9.585	-0.040	(0)
Zn (SO4) 2-2	3.493e-11	2.426e-11	-10.457	-10.615	-0.158	(0)
Zn (OH) 3-	1.744e-11	1.592e-11	-10.759	-10.798	-0.040	(0)
ZnCl2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
ZnCl3-	3.101e-15	2.855e-15	-14.508	-14.544	-0.036	(0)
Zn (OH) 4-2	9.340e-16	6.487e-16	-15.030	-15.188	-0.158	(0)
ZnSeO4	1.960e-17	1.960e-17	-16.708	-16.708	0.000	(0)
ZnNO3+	9.126e-18	8.331e-18	-17.040	-17.079	-0.040	(0)
ZnCl4-2	3.335e-18	2.414e-18	-17.477	-17.617	-0.140	(0)
Zn (NO3) 2	2.951e-29	2.951e-29	-28.530	-28.530	0.000	(0)
Zn (SeO4) 2-2	1.939e-29	1.347e-29	-28.713	-28.871	-0.158	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.546	-148.586	-0.040	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.583	-150.583	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.601	-225.640	-0.040	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.455	-227.613	-0.158	(0)

Zn(HS)4-2 0.000e+00 0.000e+00 -305.279 -305.437 -0.158 (0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-68.23	-61.94	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-50.49	-45.98	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-57.72	-45.98	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-87.94	-70.01	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-66.10	-46.07	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.42	-29.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-28.81	-28.36	0.45	(NH4)2SeO4
Acanthite	-54.88	-91.10	-36.22	Ag2S
Ag2CO3	-14.71	-25.80	-11.09	Ag2CO3
Ag2CrO4	-22.01	-33.60	-11.59	Ag2CrO4
Ag2HVO4	-16.89	-15.41	1.48	Ag2HVO4
Ag2MoO4	-17.13	-28.68	-11.55	Ag2MoO4
Ag2O	-17.33	-4.76	12.57	Ag2O
Ag2Se	-3.48	-52.18	-48.70	Ag2Se
Ag2SeO3	-14.59	-21.74	-7.15	Ag2SeO3
Ag2SeO4	-24.03	-32.94	-8.91	Ag2SeO4
Ag2SO4	-19.54	-24.36	-4.82	Ag2SO4
Ag3AsO3	-29.65	-27.49	2.16	Ag3AsO3
Ag3AsO4	-18.50	-21.29	-2.79	Ag3AsO4
Ag3H2VO5	-22.97	-17.79	5.18	Ag3H2VO5
AgF:4H2O	-15.59	-14.54	1.05	AgF:4H2O
Agmetal	-1.42	-14.93	-13.51	Ag
AgVO3	-13.80	-13.03	0.77	AgVO3
Al(OH)3(am)	-4.00	6.80	10.80	Al(OH)3
Al2(MoO4)3	-60.52	-58.15	2.37	Al2(MoO4)3
Al2O3	-6.05	13.60	19.65	Al2O3
Al4(OH)10SO4	-15.09	7.61	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.15	-7.35	4.80	AlAsO4:2H2O
AlOHSO4	-9.57	-12.80	-3.23	AlOHSO4
AlSb	-155.44	-89.82	65.62	AlSb
Alunite	-13.33	-14.73	-1.40	KAl3(SO4)2(OH)6
Anglesite	-7.35	-15.14	-7.79	PbSO4
Anhydrite	-2.54	-6.90	-4.36	CaSO4
Anilite	-57.08	-88.95	-31.88	Cu0.25Cu1.5S
Antlerite	-7.50	1.28	8.79	Cu3(OH)4SO4
Aragonite	-0.04	-8.34	-8.30	CaCO3
Arsenolite	-78.65	-81.41	-2.76	As4O6
Artinite	-6.66	2.94	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-35.00	-28.30	6.71	As2O5
Atacamite	-4.25	3.14	7.39	Cu2(OH)3Cl
Azurite	-4.28	-21.19	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.70	8.70	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-19.77	-3.90	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	6.70	-2.21	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-28.14	4.80	32.94	Ba3(VO4)2:4H2O
BaCrO4	-10.48	-20.15	-9.67	BaCrO4
BaF2	-9.81	-15.63	-5.82	BaF2
BaMoO4	-8.26	-15.22	-6.96	BaMoO4
Barite	-0.92	-10.90	-9.98	BaSO4
BaS	-93.83	-77.65	16.18	BaS
BaSeO3	-10.11	-8.28	1.83	BaSeO3
BaSeO4	-12.03	-19.49	-7.46	BaSeO4
Bianchite	-8.55	-10.31	-1.76	ZnSO4:6H2O
Birnessite	-8.67	9.42	18.09	MnO2
Bixbyite	-5.62	-6.26	-0.64	Mn2O3
BlaubleiI	-56.50	-80.66	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.21	-84.49	-27.28	Cu0.6Cu0.8S
Boehmite	-1.78	6.80	8.58	AlOOH
Breithauptite	-58.76	-77.29	-18.52	NiSb
Brochantite	-6.98	8.24	15.22	Cu4(OH)6SO4
Brucite	-4.85	11.99	16.84	Mg(OH)2
Bunsenite	-5.66	6.78	12.45	NiO

Ca (VO3) 2	-14.26	-8.60	5.66	Ca (VO3) 2
Ca2V2O7	-13.40	4.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.45	4.10	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-12.50	9.80	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-22.16	16.80	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.06	16.80	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-298.12	-155.15	142.97	Ca3Sb2
CaCrO4	-13.88	-16.15	-2.27	CaCrO4
Calcite	0.14	-8.34	-8.48	CaCO3
Calomel	-12.97	-30.88	-17.91	Hg2Cl2
CaMoO4	-3.27	-11.22	-7.95	CaMoO4
Carnotite	-6.11	-5.88	0.23	KUO2VO4
CaSeO3:2H2O	-7.09	-4.28	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.47	-15.49	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-14.37	-4.53	9.84	Cd (BO2) 2
Cd (OH) 2	-7.88	5.76	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.97	5.76	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-28.62	-21.91	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-24.87	-2.31	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-24.95	3.45	28.40	Cd4 (OH) 6SO4
CdCl2	-15.14	-15.80	-0.66	CdCl2
CdCl2:1H2O	-14.10	-15.80	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.88	-15.80	-1.91	CdCl2:2.5H2O
CdF2	-17.35	-18.57	-1.21	CdF2
Cdmetal (alpha)	-32.85	-19.34	13.51	Cd
Cdmetal (gamma)	-32.96	-19.34	13.62	Cd
CdMoO4	-4.01	-18.16	-14.15	CdMoO4
CdOHC1	-8.55	-5.02	3.54	CdOHC1
CdSb	-77.96	-78.31	-0.35	CdSb
CdSe	-21.46	-41.66	-20.20	CdSe
CdSeO4:2H2O	-20.57	-22.42	-1.85	CdSeO4:2H2O
CdSO4	-13.66	-13.84	-0.17	CdSO4
CdSO4:1H2O	-12.11	-13.84	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.96	-13.84	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.41	-13.16	-9.75	AgCl
Cerrusite	-3.44	-16.57	-13.13	PbCO3
CH4 (g)	-80.40	-121.44	-41.05	CH4
Chalcanthite	-10.00	-12.64	-2.64	CuSO4:5H2O
Chalcedony	0.04	-3.51	-3.55	SiO2
Chalcocite	-57.22	-92.14	-34.92	Cu2S
Chalcopyrite	-123.76	-159.03	-35.27	CuFeS2
Chrysotile	-3.25	28.95	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-54.35	-100.05	-45.69	HgS
Claudetite	-78.34	-81.41	-3.06	As4O6
Clausthalite	-15.86	-42.96	-27.10	PbSe
Co (BO2) 2	-30.72	-3.65	27.07	Co (BO2) 2
Co (OH) 2	-6.45	6.64	13.09	Co (OH) 2
Co (OH) 3	-10.90	-13.21	-2.31	Co (OH) 3
CO2 (g)	-2.89	-21.04	-18.15	CO2
Co3 (AsO4) 2	-21.40	-8.37	13.03	Co3 (AsO4) 2
Co3O4	-9.27	-19.77	-10.50	Co3O4
CoCl2	-23.18	-14.92	8.27	CoCl2
CoCl2:6H2O	-17.45	-14.92	2.54	CoCl2:6H2O
CoCO3	-4.41	-14.39	-9.98	CoCO3
CoF2	-16.09	-17.68	-1.60	CoF2
CoF3	-48.24	-49.70	-1.46	CoF3
CoFe2O4	22.60	19.07	-3.53	CoFe2O4
CoMoO4	-9.52	-17.28	-7.76	CoMoO4
CoO	-6.94	6.64	13.59	CoO
CoS (alpha)	-72.26	-79.70	-7.44	CoS
CoS (beta)	-68.63	-79.70	-11.07	CoS
CoSe	-24.58	-40.78	-16.20	CoSe
CoSeO3	-11.65	-10.33	1.32	CoSeO3
CoSeO4:6H2O	-20.01	-21.54	-1.53	CoSeO4:6H2O
CoSO4	-15.76	-12.95	2.80	CoSO4
CoSO4:6H2O	-10.48	-12.95	-2.47	CoSO4:6H2O
Cotunnite	-12.32	-17.10	-4.78	PbCl2
Covellite	-57.08	-79.38	-22.30	CuS

Cr(OH)2	-19.54	-8.72	10.82	Cr(OH)2
Cr(OH)3	-0.46	0.88	1.34	Cr(OH)3
Cr(OH)3(am)	1.63	0.88	-0.75	Cr(OH)3
Cr2O3	4.12	1.76	-2.36	Cr2O3
CrCl2	-44.37	-30.28	14.09	CrCl2
CrCl3	-46.57	-31.46	15.11	CrCl3
CrF3	-24.27	-35.61	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-64.31	-33.83	30.48	Cr
CrO3	-25.63	-28.84	-3.21	CrO3
Cryolite	-15.96	-49.80	-33.84	Na3AlF6
Cu(OH)2	-1.71	6.96	8.67	Cu(OH)2
Cu(SbO3)2	-30.68	14.53	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-14.09	-4.84	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.68	-92.56	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-7.42	-53.22	-45.80	Cu2Se
Cu2SO4	-23.45	-25.40	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.52	-7.42	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-62.73	-105.32	-42.59	Cu3Sb
Cu3Se2	-30.19	-93.68	-63.49	Cu3Se2
CuCO3	-2.58	-14.08	-11.50	CuCO3
CuCrO4	-16.44	-21.88	-5.44	CuCrO4
CuF	-10.16	-15.06	-4.91	CuF
CuF2	-18.48	-17.37	1.12	CuF2
CuF2:2H2O	-12.82	-17.37	-4.55	CuF2:2H2O
Cumetal	-6.70	-15.45	-8.76	Cu
CuMoO4	-3.88	-16.96	-13.08	CuMoO4
CuOCuSO4	-15.98	-5.68	10.30	CuOCuSO4
Cupricferrite	13.40	19.39	5.99	CuFe2O4
Cuprite	-4.39	-5.80	-1.41	Cu2O
Cuprousferrite	12.23	3.31	-8.92	CuFeO2
CuSe	-7.36	-40.46	-33.10	CuSe
CuSe2	-29.42	-62.78	-33.37	CuSe2
CuSeO3:2H2O	-10.53	-10.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.78	-21.22	-2.44	CuSeO4:5H2O
CuSO4	-15.58	-12.64	2.94	CuSO4
Diaspore	-0.07	6.80	6.87	AlOOH
Djurleite	-57.38	-91.30	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.84	-17.38	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.29	-17.38	-17.09	CaMg(CO3)2
Epsomite	-5.48	-7.61	-2.13	MgSO4:7H2O
Fe(OH)2	-6.87	6.69	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.02	2.98	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.88	-14.60	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-6.11	-4.55	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.88	-38.51	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.63	-46.37	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.10	19.12	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.34	-7.94	0.40	FeAsO4:2H2O
FeCr2O4	1.25	8.45	7.20	FeCr2O4
FeMoO4	-7.13	-17.23	-10.09	FeMoO4
Ferrihydrite	3.02	6.21	3.19	Fe(OH)3
Ferroselite	-44.45	-63.05	-18.60	FeSe2
FeS(ppt)	-76.70	-79.65	-2.95	FeS
FeSe	-29.73	-40.73	-11.00	FeSe
Fix_pe	-4.54	-4.54	0.00	e-
Fluorite	-1.13	-11.63	-10.50	CaF2
Galena	-67.91	-81.88	-13.97	PbS
Gibbsite	-1.49	6.80	8.29	Al(OH)3
Goethite	5.72	6.21	0.49	FeOOH
Goslarite	-8.30	-10.31	-2.01	ZnSO4:7H2O
Greenalite	-7.75	13.06	20.81	Fe3Si2O5(OH)4
Greenockite	-66.22	-80.58	-14.36	Cds
Greigite	-281.22	-326.26	-45.03	Fe3S4
Gummite	-6.96	0.71	7.67	UO3
Gypsum	-2.29	-6.90	-4.61	CaSO4:2H2O
H-Jarosite	-8.46	-20.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.04	-23.92	-12.88	H2MoO4

H2S(g)	-78.33	-86.34	-8.01	H2S
H2Se(g)	-42.46	-47.42	-4.96	H2Se
Halite	-6.92	-5.32	1.60	NaCl
Halloysite	-2.99	6.58	9.57	Al2Si2O5(OH)4
Hausmannite	-6.92	54.11	61.03	Mn3O4
Hematite	13.84	12.42	-1.42	Fe2O3
Hercynite	-2.60	20.30	22.89	FeAl2O4
Hg(CH3)2(g)	-182.88	-256.59	-73.71	Hg(CH3)2
Hg(g)	-9.34	-17.21	-7.87	Hg
Hg(OH)2	-10.21	-13.70	-3.50	Hg(OH)2
Hg2(g)	-19.47	-34.42	-14.96	Hg2
Hg2(OH)2	-14.58	-9.32	5.26	Hg2(OH)2
Hg2CO3	-14.31	-30.36	-16.05	Hg2CO3
Hg2CrO4	-29.47	-38.17	-8.70	Hg2CrO4
Hg2F2	-23.29	-33.65	-10.36	Hg2F2
Hg2S	-83.99	-95.67	-11.68	Hg2S
Hg2SeO3	-21.64	-26.30	-4.66	Hg2SeO3
Hg2SO4	-22.79	-28.92	-6.13	Hg2SO4
Hg3O2CO3	-32.46	-62.15	-29.68	Hg3O2CO3
HgCl(g)	-34.94	-15.44	19.50	HgCl
HgCl2	-14.00	-35.26	-21.26	HgCl2
HgF(g)	-49.50	-16.82	32.68	HgF
HgF2(g)	-50.60	-38.03	12.57	HgF2
Hgmetal(l)	-3.76	-17.21	-13.45	Hg
HgSe	-5.43	-61.13	-55.69	HgSe
HgSeO3	-18.25	-30.68	-12.43	HgSeO3
HgSO4	-23.88	-33.30	-9.42	HgSO4
Huntite	-5.51	-35.47	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.92	-28.69	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-15.43	-24.19	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-23.16	-28.33	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-1.70	-16.50	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.32	-49.57	-17.24	K2Cr2O7
K2CrO4	-20.21	-20.72	-0.51	K2CrO4
K2MoO4	-19.06	-15.80	3.26	K2MoO4
K2SeO4	-19.33	-20.06	-0.73	K2SeO4
Kaolinite	-0.85	6.58	7.43	Al2Si2O5(OH)4
Langite	-9.24	8.24	17.49	Cu4(OH)6SO4:H2O
Larnakite	-10.24	-10.67	-0.43	PbO:PbSO4
Laurionite	-6.94	-6.32	0.62	PbOHCl
Lepidocrocite	4.84	6.21	1.37	FeOOH
Lime	-20.00	12.70	32.70	CaO
Litharge	-8.23	4.46	12.69	PbO
Mackinawite	-76.05	-79.65	-3.60	FeS
Maghemite	6.04	12.42	6.39	Fe2O3
Magnesioferrite	7.56	24.42	16.86	Fe2MgO4
Magnesite	-1.59	-9.05	-7.46	MgCO3
Magnetite	15.72	19.12	3.40	Fe3O4
Malachite	-1.81	-7.11	-5.31	Cu2(OH)2CO3
Manganite	-3.12	22.22	25.34	MnOOH
Massicot	-8.43	4.46	12.89	PbO
Matlockite	-9.51	-18.48	-8.97	PbClF
Melanothallite	-20.85	-14.60	6.26	CuCl2
Melanterite	-10.70	-12.90	-2.21	FeSO4:7H2O
Metacinnabar	-54.95	-100.05	-45.09	HgS
Mg(OH)2(active)	-6.80	11.99	18.79	Mg(OH)2
Mg(VO3)2	-20.58	-9.30	11.28	Mg(VO3)2
Mg2Sb3	-277.81	-203.13	74.68	Mg2Sb3
Mg2V2O7	-23.67	2.69	26.36	Mg2V2O7
MgCr2O4	-2.45	13.75	16.20	MgCr2O4
MgCrO4	-22.23	-16.85	5.38	MgCrO4
MgF2	-4.21	-12.34	-8.13	MgF2
MgMoO4	-10.08	-11.93	-1.85	MgMoO4
MgSeO3:6H2O	-8.04	-4.99	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-14.99	-16.19	-1.20	MgSeO4:6H2O
Minium	-35.03	38.49	73.52	Pb3O4
Mirabilite	-7.56	-8.68	-1.11	Na2SO4:10H2O
Mn(VO3)2	-16.53	-11.63	4.90	Mn(VO3)2

Mn2 (SO4) 3	-59.34	-65.05	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.91	-89.83	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-11.79	0.71	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-14.61	-11.89	2.72	MnCl2:4H2O
MnS (grn)	-76.85	-76.68	0.17	MnS
MnS (pnk)	-80.02	-76.68	3.34	MnS
MnSb	-96.84	-99.75	-2.91	MnSb
MnSe	-41.25	-37.75	3.50	MnSe
MnSeO3	-8.44	-7.31	1.13	MnSeO3
MnSeO3:2H2O	-8.29	-7.31	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.47	-18.52	-2.05	MnSeO4:5H2O
MnSO4	-12.51	-9.93	2.58	MnSO4
Monteponite	-9.34	5.76	15.10	CdO
Montroydite	-10.06	-13.70	-3.64	HgO
MoO3	-15.92	-23.92	-8.00	MoO3
Morenosite	-10.67	-12.81	-2.14	NiSO4:7H2O
MoS2	-151.45	-221.71	-70.26	MoS2
Na-Jarosite	-3.90	-15.10	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-36.87	-46.77	-9.90	Na2Cr2O7
Na2CrO4	-20.85	-17.92	2.93	Na2CrO4
Na2Mo2O7	-20.32	-36.92	-16.60	Na2Mo2O7
Na2MoO4	-14.49	-13.00	1.49	Na2MoO4
Na2MoO4:2H2O	-14.22	-13.00	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.36	-6.06	10.30	Na2SeO3:5H2O
Na2SeO4	-18.54	-17.26	1.28	Na2SeO4
Na3Sb	-174.69	-80.24	94.45	Na3Sb
Na3VO4	-30.95	5.73	36.68	Na3VO4
Na4V2O7	-36.85	0.55	37.40	Na4V2O7
Nantokite	-6.95	-13.68	-6.73	CuCl
NaSb	-89.22	-66.06	23.17	NaSb
Natron	-8.80	-10.12	-1.31	Na2CO3:10H2O
NaVO3	-9.04	-5.19	3.86	NaVO3
Nesquehonite	-4.38	-9.05	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.01	6.78	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.65	-7.95	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-24.46	7.54	32.00	Ni4 (OH) 6SO4
NiCO3	-7.38	-14.25	-6.87	NiCO3
NiMoO4	-5.99	-17.14	-11.14	NiMoO4
NiS (alpha)	-73.96	-79.56	-5.60	NiS
NiS (beta)	-68.46	-79.56	-11.10	NiS
NiS (gamma)	-66.76	-79.56	-12.80	NiS
NiSe	-22.94	-40.64	-17.70	NiSe
NiSeO3:2H2O	-13.01	-10.19	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.88	-21.40	-1.52	NiSeO4:6H2O
Nsutite	-8.08	9.42	17.50	MnO2
O2 (g)	-32.89	50.20	83.09	O2
Orpiment	-238.67	-299.74	-61.07	As2S3
Otavite	-3.27	-15.27	-12.00	CdCO3
Pb (BO2) 2	-12.35	-5.83	6.52	Pb (BO2) 2
Pb (OH) 2	-3.69	4.46	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-72.84	-81.60	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-10.65	-1.85	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.26	8.92	26.19	Pb2O (OH) 2
Pb2O3	-27.01	34.03	61.04	Pb2O3
Pb2OCO3	-11.55	-12.11	-0.56	Pb2OCO3
Pb2V2O7	-10.47	-12.37	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.71	-14.91	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-14.05	-7.91	6.14	Pb3 (VO4) 2
Pb3O2CO3	-18.67	-7.65	11.02	Pb3O2CO3
Pb3O2SO4	-16.90	-6.21	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-22.85	-1.75	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-23.63	-1.75	21.88	Pb4O3SO4
PbCrO4	-11.78	-24.38	-12.60	PbCrO4
PbF2	-12.43	-19.87	-7.44	PbF2
Pbmetal	-24.89	-20.64	4.25	Pb
PbMoO4	-3.84	-19.46	-15.62	PbMoO4
PbO:0.3H2O	-8.52	4.46	12.98	PbO:0.33H2O
PbSeO4	-16.88	-23.72	-6.84	PbSeO4

Periclase	-9.59	11.99	21.58	MgO
Phosgenite	-13.86	-33.67	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-20.04	29.56	49.60	PbO ₂
Portlandite	-10.11	12.70	22.80	Ca (OH) ₂
Pyrite	-122.39	-140.89	-18.51	FeS ₂
Pyrochroite	-5.53	9.67	15.19	Mn (OH) ₂
Pyrolusite	-6.61	34.77	41.38	MnO ₂
Quartz	0.49	-3.51	-4.00	SiO ₂
Realgar	-99.50	-119.25	-19.75	AsS
Retgersite	-10.77	-12.81	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	-0.79	-11.37	-10.58	MnCO ₃
Rutherfordine	-5.83	-20.33	-14.50	UO ₂ CO ₃
Sb (OH) ₃	-14.21	-21.32	-7.11	Sb (OH) ₃
Sb ₂ O ₄	-20.93	-17.53	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-31.38	-41.05	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-117.14	-184.90	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-67.00	-85.26	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-67.36	-85.26	-17.90	Sb ₄ O ₆
SbCl ₃	-54.22	-53.65	0.57	SbCl ₃
SbF ₃	-47.58	-57.81	-10.23	SbF ₃
Sbmetal	-47.28	-58.97	-11.69	Sb
SbO ₂	-5.25	-33.07	-27.82	SbO ₂
Schoepite	-5.28	0.71	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal (am)	-15.21	-22.32	-7.11	Se
Semetal (hex)	-14.61	-22.32	-7.71	Se
Senarmontite	-30.27	-42.63	-12.37	Sb ₂ O ₃
SeO ₂	-17.10	-16.98	0.12	SeO ₂
SeO ₃	-49.23	-28.18	21.04	SeO ₃
Sepiolite	-2.31	13.45	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite (A)	-5.33	13.45	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-4.10	-14.34	-10.24	FeCO ₃
SiO ₂ (am-gel)	-0.80	-3.51	-2.71	SiO ₂
SiO ₂ (am-ppt)	-0.77	-3.51	-2.74	SiO ₂
Smithsonite	-1.75	-11.75	-10.00	ZnCO ₃
Sphalerite	-65.61	-77.06	-11.45	ZnS
Spinel	-11.25	25.60	36.85	MgAl ₂ O ₄
Stibnite	-251.20	-301.66	-50.46	Sb ₂ S ₃
Sulfur	-59.10	-61.24	-2.14	S
Tenorite	-0.68	6.96	7.64	CuO
Thenardite	-9.00	-8.68	0.32	Na ₂ SO ₄
Thermonatrite	-10.75	-10.12	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-11.25	-7.17	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-16.41	4.68	21.08	U ₃ O ₈
U ₃ Sb ₄	-584.39	-432.01	152.38	U ₃ Sb ₄
U ₄ O ₉	-32.58	-35.60	-3.02	U ₄ O ₉
UF ₄	-34.29	-63.83	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-31.11	-63.83	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.11	-15.18	0.93	UO ₂
UO ₂ (NO ₃) ₂	-48.95	-36.81	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-41.66	-36.81	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-40.20	-36.81	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-38.85	-36.81	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.90	0.71	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-25.22	-27.47	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.99	0.71	7.70	UO ₃
Uraninite	-10.51	-15.18	-4.67	UO ₂
USb ₂	-222.11	-192.53	29.58	USb ₂
V (OH) ₃	-20.74	-13.15	7.59	V (OH) ₃
V ₂ O ₅	-19.93	-21.29	-1.36	V ₂ O ₅
V ₃ O ₅	-45.82	-43.99	1.84	V ₃ O ₅
V ₄ O ₇	-57.47	-50.28	7.19	V ₄ O ₇
V ₆ O ₁₃	-53.22	-114.08	-60.86	V ₆ O ₁₃
Valentinite	-34.15	-42.63	-8.48	Sb ₂ O ₃
VC ₁₂	-66.13	-47.26	18.87	VC ₁₂
VC ₁₃	-68.92	-45.49	23.43	VC ₁₃
VF ₄	-69.88	-54.95	14.93	VF ₄
Vmetal	-94.83	-50.80	44.03	V
VO	-40.46	-25.70	14.76	VO

VO(OH)2	-11.45	-6.29	5.15	VO(OH)2
VO2Cl	-24.27	-21.43	2.84	VO2Cl
VOC1	-35.08	-23.93	11.15	VOC1
VOC12	-40.61	-27.85	12.76	VOC12
VOSO4	-29.50	-25.89	3.61	VOSO4
Witherite	-3.77	-12.34	-8.57	BaCO3
Wurtzite	-68.11	-77.06	-8.95	ZnS
Zincite	-2.05	9.29	11.33	ZnO
Zincosite	-14.24	-10.31	3.93	ZnSO4
Zn(BO2)2	-9.29	-1.00	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-31.55	-28.23	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.91	9.29	12.20	Zn(OH)2
Zn(OH)2(am)	-3.19	9.29	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.47	9.29	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.25	9.29	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.45	9.29	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.53	-1.03	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.40	7.79	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.09	-0.44	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.25	-11.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-10.85	17.55	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.63	24.87	38.50	Zn5(OH)8Cl2
ZnCl2	-19.32	-12.27	7.05	ZnCl2
ZnCO3:1H2O	-1.49	-11.75	-10.26	ZnCO3:1H2O
ZnF2	-14.51	-15.04	-0.53	ZnF2
Znmetal	-41.60	-15.82	25.79	Zn
ZnMoO4	-4.51	-14.63	-10.13	ZnMoO4
ZnO(active)	-1.90	9.29	11.19	ZnO
ZnS(am)	-68.01	-77.06	-9.05	ZnS
ZnSb	-85.80	-74.78	11.01	ZnSb
ZnSe	-23.74	-38.14	-14.40	ZnSe
ZnSeO4:6H2O	-17.38	-18.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.67	-10.31	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 30.

```

REACTION 104
  H2O      -1
  0 moles ### Addition step. Removes HTC water but solute mass remains
USE solution 110
SAVE Solution 111
End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 110. Solution after simulation 29.
Using reaction 104.

Reaction 104.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.093e-10	2.093e-10
Al	1.446e-08	1.446e-08
As	7.127e-08	7.127e-08
B	7.640e-06	7.641e-06
Ba	6.824e-08	6.824e-08
C	2.252e-03	2.253e-03
Ca	7.272e-04	7.272e-04
Cd	1.046e-10	1.046e-10
Cl	1.836e-03	1.836e-03
Co	7.891e-10	7.891e-10
Cr	1.141e-07	1.141e-07
Cu	5.647e-08	5.647e-08
F	7.708e-05	7.708e-05
Fe	9.384e-07	9.384e-07
Hg	2.265e-11	2.265e-11
K	1.231e-04	1.231e-04
Mg	1.399e-04	1.399e-04
Mn	6.927e-07	6.927e-07
Mo	1.732e-08	1.732e-08
N	6.607e-08	6.607e-08
Na	3.092e-03	3.092e-03
Ni	1.228e-09	1.228e-09
Pb	1.005e-10	1.005e-10
S	4.010e-04	4.010e-04
Sb	2.854e-10	2.854e-10
Se	1.799e-09	1.799e-09
Si	3.127e-04	3.127e-04
U	1.247e-08	1.247e-08
V	1.682e-10	1.682e-10
Zn	4.119e-07	4.119e-07

-----Description of solution-----

	pH	=	8.007	Charge balance
	pe	=	4.544	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.018e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.238e-03	
	Total CO2 (mol/kg)	=	2.252e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.817e-09	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110188e+02	
	Total O	=	5.551725e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.113e-06	1.024e-06	-5.954	-5.990	-0.036	(0)
H+	1.068e-08	9.835e-09	-7.971	-8.007	-0.036	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.093e-10					
AgCl	1.416e-10	1.416e-10	-9.849	-9.849	0.000	(0)

	Ag+	4.455e-11	4.103e-11	-10.351	-10.387	-0.036	(0)
	AgCl2-	2.285e-11	2.086e-11	-10.641	-10.681	-0.040	(0)
	AgSO4-	2.341e-13	2.137e-13	-12.631	-12.670	-0.040	(0)
	AgCl3-2	4.525e-14	3.143e-14	-13.344	-13.503	-0.158	(0)
	AgF	7.188e-15	7.188e-15	-14.143	-14.143	0.000	(0)
	AgOH	4.200e-15	4.200e-15	-14.377	-14.377	0.000	(0)
	AgNO2	4.474e-16	4.474e-16	-15.349	-15.349	0.000	(0)
	AgH2BO3	2.754e-16	2.754e-16	-15.560	-15.560	0.000	(0)
	AgCl4-3	2.463e-16	1.085e-16	-15.608	-15.965	-0.356	(0)
	AgNH3+	4.274e-17	3.902e-17	-16.369	-16.409	-0.040	(0)
	AgSeO3-	1.253e-17	1.144e-17	-16.902	-16.942	-0.040	(0)
	Ag2Se	5.362e-18	5.362e-18	-17.271	-17.271	0.000	(0)
	Ag (OH) 2-	4.602e-19	4.202e-19	-18.337	-18.377	-0.040	(0)
	AgNO3	5.786e-22	5.786e-22	-21.238	-21.238	0.000	(0)
	Ag (NH3) 2+	1.618e-22	1.478e-22	-21.791	-21.830	-0.040	(0)
	Ag (NO2) 2-	3.962e-23	3.617e-23	-22.402	-22.442	-0.040	(0)
	Ag (SeO3) 2-3	1.008e-25	4.442e-26	-24.996	-25.352	-0.356	(0)
	Ag2MoO4	7.936e-30	7.936e-30	-29.100	-29.100	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.910	-74.910	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.071	-85.704	-0.633	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.509	-148.623	-0.114	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-149.107	-149.147	-0.040	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.828	-150.056	-0.228	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.146	-150.367	-0.221	(0)
Al		1.446e-08					
	Al (OH) 4-	1.435e-08	1.322e-08	-7.843	-7.879	-0.035	(0)
	Al (OH) 3	1.026e-10	1.026e-10	-9.989	-9.989	0.000	(0)
	Al (OH) 2+	5.442e-12	5.024e-12	-11.264	-11.299	-0.035	(0)
	AlF2+	1.266e-13	1.169e-13	-12.897	-12.932	-0.035	(0)
	AlF3	1.027e-13	1.027e-13	-12.989	-12.989	0.000	(0)
	AlOH+2	8.511e-15	6.178e-15	-14.070	-14.209	-0.139	(0)
	AlF+2	5.799e-15	4.210e-15	-14.237	-14.376	-0.139	(0)
	AlF4-	3.894e-15	3.589e-15	-14.410	-14.445	-0.035	(0)
	AlSO4+	1.327e-17	1.223e-17	-16.877	-16.913	-0.035	(0)
	Al+3	1.267e-17	6.035e-18	-16.897	-17.219	-0.322	(0)
	Al (SO4) 2-	3.713e-20	3.422e-20	-19.430	-19.466	-0.035	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.342	-57.698	-0.356	(0)
As (3)		4.696e-21					
	H3AsO3	4.442e-21	4.442e-21	-20.352	-20.352	0.000	(0)
	H2AsO3-	2.538e-22	2.317e-22	-21.596	-21.635	-0.040	(0)
	HAsO3-2	3.093e-26	2.148e-26	-25.510	-25.668	-0.158	(0)
	H4AsO3+	2.371e-29	2.165e-29	-28.625	-28.665	-0.040	(0)
	AsO3-3	1.912e-31	8.420e-32	-30.719	-31.075	-0.356	(0)
As (5)		7.127e-08					
	HAsO4-2	6.669e-08	4.632e-08	-7.176	-7.334	-0.158	(0)
	H2AsO4-	4.551e-09	4.155e-09	-8.342	-8.381	-0.040	(0)
	AsO4-3	3.381e-11	1.489e-11	-10.471	-10.827	-0.356	(0)
	H3AsO4	7.091e-15	7.101e-15	-14.149	-14.149	0.001	(0)
B		7.640e-06					
	H3BO3	7.163e-06	7.173e-06	-5.145	-5.144	0.001	(0)
	H2BO3-	4.614e-07	4.236e-07	-6.336	-6.373	-0.037	(0)
	CaH2BO3+	1.282e-08	1.176e-08	-7.892	-7.929	-0.037	(0)
	NaH2BO3	1.906e-09	1.906e-09	-8.720	-8.720	0.000	(0)
	MgH2BO3+	1.515e-09	1.391e-09	-8.820	-8.857	-0.037	(0)
	BF (OH) 3-	2.175e-10	1.996e-10	-9.663	-9.700	-0.037	(0)
	H5 (BO3) 2-	2.817e-12	2.586e-12	-11.550	-11.587	-0.037	(0)
	BaH2BO3+	6.872e-13	6.308e-13	-12.163	-12.200	-0.037	(0)
	BF2 (OH) 2-	1.595e-14	1.464e-14	-13.797	-13.834	-0.037	(0)
	H8 (BO3) 3-	2.020e-15	1.855e-15	-14.695	-14.732	-0.037	(0)
	AgH2BO3	2.754e-16	2.754e-16	-15.560	-15.560	0.000	(0)
	BF3OH-	4.258e-21	3.909e-21	-20.371	-20.408	-0.037	(0)
	BF4-	1.438e-26	1.320e-26	-25.842	-25.880	-0.037	(0)
Ba		6.824e-08					
	Ba+2	6.701e-08	4.819e-08	-7.174	-7.317	-0.143	(0)
	BaHCO3+	9.938e-10	9.183e-10	-9.003	-9.037	-0.034	(0)
	BaCO3	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
	BaH2BO3+	6.872e-13	6.308e-13	-12.163	-12.200	-0.037	(0)
	BaOH+	2.335e-13	2.154e-13	-12.632	-12.667	-0.035	(0)

BaNH3+2	2.039e-17	1.416e-17	-16.691	-16.849	-0.158	(0)
BaNO3+	4.697e-18	4.288e-18	-17.328	-17.368	-0.040	(0)
C (4)	2.252e-03					
HCO3-	2.162e-03	1.995e-03	-2.665	-2.700	-0.035	(0)
H2CO3	4.413e-05	4.413e-05	-4.355	-4.355	0.000	(0)
CaHCO3+	1.941e-05	1.793e-05	-4.712	-4.746	-0.034	(0)
CO3-2	1.323e-05	9.511e-06	-4.879	-5.022	-0.143	(0)
CaCO3	7.276e-06	7.276e-06	-5.138	-5.138	0.000	(0)
NaHCO3	3.187e-06	3.187e-06	-5.497	-5.497	0.000	(0)
MgHCO3+	2.100e-06	1.933e-06	-5.678	-5.714	-0.036	(0)
MgCO3	7.491e-07	7.491e-07	-6.125	-6.125	0.000	(0)
NaCO3-	5.449e-07	5.030e-07	-6.264	-6.298	-0.035	(0)
ZnCO3	1.022e-07	1.022e-07	-6.990	-6.990	0.000	(0)
CuCO3	4.949e-08	4.949e-08	-7.305	-7.305	0.000	(0)
MnHCO3+	1.945e-08	1.794e-08	-7.711	-7.746	-0.035	(0)
ZnHCO3+	1.291e-08	1.179e-08	-7.889	-7.929	-0.040	(0)
UO2 (CO3) 3-4	7.310e-09	1.702e-09	-8.136	-8.769	-0.633	(0)
UO2 (CO3) 2-2	5.139e-09	3.570e-09	-8.289	-8.447	-0.158	(0)
Cu (CO3) 2-2	1.824e-09	1.267e-09	-8.739	-8.897	-0.158	(0)
BaHCO3+	9.938e-10	9.183e-10	-9.003	-9.037	-0.034	(0)
BaCO3	2.351e-10	2.351e-10	-9.629	-9.629	0.000	(0)
NiCO3	2.085e-10	2.085e-10	-9.681	-9.681	0.000	(0)
NiHCO3+	1.583e-10	1.446e-10	-9.800	-9.840	-0.040	(0)
CuHCO3+	1.219e-10	1.112e-10	-9.914	-9.954	-0.040	(0)
PbCO3	8.017e-11	8.017e-11	-10.096	-10.096	0.000	(0)
CoHCO3+	7.230e-11	6.601e-11	-10.141	-10.180	-0.040	(0)
CoCO3	6.838e-11	6.838e-11	-10.165	-10.165	0.000	(0)
UO2CO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
FeHCO3+	1.298e-11	1.200e-11	-10.887	-10.921	-0.034	(0)
CdCO3	1.212e-11	1.212e-11	-10.916	-10.916	0.000	(0)
PbHCO3+	4.554e-12	4.157e-12	-11.342	-11.381	-0.040	(0)
Pb (CO3) 2-2	3.166e-12	2.199e-12	-11.499	-11.658	-0.158	(0)
CdHCO3+	2.782e-13	2.540e-13	-12.556	-12.595	-0.040	(0)
Cd (CO3) 2-2	1.230e-13	8.547e-14	-12.910	-13.068	-0.158	(0)
HgCO3	3.411e-17	3.411e-17	-16.467	-16.467	0.000	(0)
Hg (CO3) 2-2	1.477e-18	1.026e-18	-17.831	-17.989	-0.158	(0)
HgHCO3+	6.842e-21	6.246e-21	-20.165	-20.204	-0.040	(0)
Ca	7.272e-04					
Ca+2	6.712e-04	4.827e-04	-3.173	-3.316	-0.143	(0)
CaSO4	2.887e-05	2.887e-05	-4.540	-4.540	0.000	(0)
CaHCO3+	1.941e-05	1.793e-05	-4.712	-4.746	-0.034	(0)
CaCO3	7.276e-06	7.276e-06	-5.138	-5.138	0.000	(0)
CaF+	3.984e-07	3.675e-07	-6.400	-6.435	-0.035	(0)
CaH2BO3+	1.282e-08	1.176e-08	-7.892	-7.929	-0.037	(0)
CaOH+	1.067e-08	9.859e-09	-7.972	-8.006	-0.034	(0)
CaNH3+2	4.075e-13	2.831e-13	-12.390	-12.548	-0.158	(0)
CaNO3+	2.969e-14	2.710e-14	-13.527	-13.567	-0.040	(0)
Ca (NH3) 2+2	7.558e-23	5.250e-23	-22.122	-22.280	-0.158	(0)
Cd	1.046e-10					
Cd+2	7.775e-11	5.591e-11	-10.109	-10.252	-0.143	(0)
CdCO3	1.212e-11	1.212e-11	-10.916	-10.916	0.000	(0)
CdCl+	9.890e-12	9.028e-12	-11.005	-11.044	-0.040	(0)
CdSO4	3.422e-12	3.422e-12	-11.466	-11.466	0.000	(0)
CdOH+	4.980e-13	4.547e-13	-12.303	-12.342	-0.040	(0)
CdOHC1	3.791e-13	3.791e-13	-12.421	-12.421	0.000	(0)
CdHCO3+	2.782e-13	2.540e-13	-12.556	-12.595	-0.040	(0)
Cd (CO3) 2-2	1.230e-13	8.547e-14	-12.910	-13.068	-0.158	(0)
CdF+	6.771e-14	6.181e-14	-13.169	-13.209	-0.040	(0)
CdCl2	6.364e-14	6.364e-14	-13.196	-13.196	0.000	(0)
Cd (SO4) 2-2	1.735e-14	1.205e-14	-13.761	-13.919	-0.158	(0)
Cd (OH) 2	2.937e-15	2.937e-15	-14.532	-14.532	0.000	(0)
CdCl3-	7.436e-17	6.789e-17	-16.129	-16.168	-0.040	(0)
CdF2	8.603e-18	8.603e-18	-17.065	-17.065	0.000	(0)
Cd (OH) 3-	2.012e-19	1.837e-19	-18.696	-18.736	-0.040	(0)
CdSeO4	7.054e-21	7.054e-21	-20.152	-20.152	0.000	(0)
CdNO3+	3.439e-21	3.139e-21	-20.464	-20.503	-0.040	(0)
Cd2OH+3	2.893e-22	1.274e-22	-21.539	-21.895	-0.356	(0)
Cd (SeO3) 2-2	1.248e-23	8.669e-24	-22.904	-23.062	-0.158	(0)

	Cd(OH) 4-2	4.431e-26	3.078e-26	-25.354	-25.512	-0.158	(0)
	Cd(NO3) 2	2.793e-32	2.793e-32	-31.554	-31.554	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-80.542	-80.582	-0.040	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-151.715	-151.715	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-228.113	-228.152	-0.040	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-304.135	-304.293	-0.158	(0)
Cl	1.836e-03						
	Cl-	1.836e-03	1.691e-03	-2.736	-2.772	-0.036	(0)
	ZnOHCl	1.063e-09	1.063e-09	-8.973	-8.973	0.000	(0)
	MnCl+	1.040e-09	9.591e-10	-8.983	-9.018	-0.035	(0)
	ZnCl+	8.618e-10	7.934e-10	-9.065	-9.101	-0.036	(0)
	AgCl	1.416e-10	1.416e-10	-9.849	-9.849	0.000	(0)
	CuCl	2.635e-11	2.635e-11	-10.579	-10.579	0.000	(0)
	AgCl2-	2.285e-11	2.086e-11	-10.641	-10.681	-0.040	(0)
	CuCl2-	1.011e-11	9.307e-12	-10.995	-11.031	-0.036	(0)
	CdCl+	9.890e-12	9.028e-12	-11.005	-11.044	-0.040	(0)
	NiCl+	2.785e-12	2.542e-12	-11.555	-11.595	-0.040	(0)
	CoCl+	2.725e-12	2.488e-12	-11.565	-11.604	-0.040	(0)
	CuCl+	2.572e-12	2.368e-12	-11.590	-11.626	-0.036	(0)
	MnCl2	2.291e-12	2.291e-12	-11.640	-11.640	0.000	(0)
	ZnCl2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
	CdOHCl	3.791e-13	3.791e-13	-12.421	-12.421	0.000	(0)
	PbCl+	1.843e-13	1.682e-13	-12.735	-12.774	-0.040	(0)
	CdCl2	6.364e-14	6.364e-14	-13.196	-13.196	0.000	(0)
	AgCl3-2	4.525e-14	3.143e-14	-13.344	-13.503	-0.158	(0)
	HgClOH	9.159e-15	9.159e-15	-14.038	-14.038	0.000	(0)
	CuCl3-2	4.648e-15	3.364e-15	-14.333	-14.473	-0.140	(0)
	ZnCl3-	3.101e-15	2.855e-15	-14.508	-14.544	-0.036	(0)
	CuCl2	1.388e-15	1.388e-15	-14.858	-14.858	0.000	(0)
	PbCl2	1.270e-15	1.270e-15	-14.896	-14.896	0.000	(0)
	MnCl3-	1.156e-15	1.067e-15	-14.937	-14.972	-0.035	(0)
	HgCl2	8.566e-16	8.566e-16	-15.067	-15.067	0.000	(0)
	AgCl4-3	2.463e-16	1.085e-16	-15.608	-15.965	-0.356	(0)
	CrCl+2	8.427e-17	5.854e-17	-16.074	-16.233	-0.158	(0)
	CdCl3-	7.436e-17	6.789e-17	-16.129	-16.168	-0.040	(0)
	NiCl2	2.164e-17	2.164e-17	-16.665	-16.665	0.000	(0)
	HgCl3-	1.586e-17	1.448e-17	-16.800	-16.839	-0.040	(0)
	ZnCl4-2	3.335e-18	2.414e-18	-17.477	-17.617	-0.140	(0)
	CrOHCl2	1.926e-18	1.926e-18	-17.715	-17.715	0.000	(0)
	UO2Cl+	1.492e-18	1.362e-18	-17.826	-17.866	-0.040	(0)
	PbCl3-	9.367e-19	8.552e-19	-18.028	-18.068	-0.040	(0)
	HgCl4-2	1.404e-19	9.749e-20	-18.853	-19.011	-0.158	(0)
	HgCl+	1.107e-19	1.011e-19	-18.956	-18.995	-0.040	(0)
	FeCl+2	1.094e-19	7.920e-20	-18.961	-19.101	-0.140	(0)
	CuCl3-	2.379e-20	2.190e-20	-19.624	-19.659	-0.036	(0)
	CrCl2+	1.029e-20	9.391e-21	-19.988	-20.027	-0.040	(0)
	PbCl4-2	9.515e-22	6.609e-22	-21.022	-21.180	-0.158	(0)
	FeCl2+	6.485e-22	5.982e-22	-21.188	-21.223	-0.035	(0)
	CrO3Cl-	5.407e-25	4.936e-25	-24.267	-24.307	-0.040	(0)
	CuCl4-2	2.564e-25	1.856e-25	-24.591	-24.731	-0.140	(0)
	VOC1+	2.551e-25	2.329e-25	-24.593	-24.633	-0.040	(0)
	FeCl3	1.011e-25	1.011e-25	-24.995	-24.995	0.000	(0)
	CoCl+2	2.932e-38	2.037e-38	-37.533	-37.691	-0.158	(0)
	UCl+3	0.000e+00	0.000e+00	-47.920	-48.276	-0.356	(0)
	Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
	Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
	Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
Co(2)	7.891e-10						
	Co+2	6.123e-10	4.253e-10	-9.213	-9.371	-0.158	(0)
	CoHCO3+	7.230e-11	6.601e-11	-10.141	-10.180	-0.040	(0)
	CoCO3	6.838e-11	6.838e-11	-10.165	-10.165	0.000	(0)
	CoSO4	2.215e-11	2.215e-11	-10.655	-10.655	0.000	(0)
	CoOH+	9.515e-12	8.686e-12	-11.022	-11.061	-0.040	(0)
	CoCl+	2.725e-12	2.488e-12	-11.565	-11.604	-0.040	(0)
	CoF+	1.028e-12	9.381e-13	-11.988	-12.028	-0.040	(0)
	Co(OH) 2	7.063e-13	7.063e-13	-12.151	-12.151	0.000	(0)
	CoNO2+	1.713e-16	1.564e-16	-15.766	-15.806	-0.040	(0)
	Co(NH3) +2	3.429e-17	2.382e-17	-16.465	-16.623	-0.158	(0)

Co (OH) 3-	1.580e-17	1.443e-17	-16.801	-16.841	-0.040	(0)
CoOH-	3.966e-18	3.620e-18	-17.402	-17.441	-0.040	(0)
CoSeO4	1.444e-19	1.444e-19	-18.840	-18.840	0.000	(0)
CoNO3+	1.311e-20	1.197e-20	-19.882	-19.922	-0.040	(0)
Co2OH+3	4.204e-22	1.851e-22	-21.376	-21.732	-0.356	(0)
Co (OH) 4-2	3.370e-24	2.341e-24	-23.472	-23.631	-0.158	(0)
Co (NH3) 2+2	6.814e-25	4.733e-25	-24.167	-24.325	-0.158	(0)
Co (NO3) 2	4.323e-31	4.323e-31	-30.364	-30.364	0.000	(0)
Co (NH3) 3+2	3.996e-33	2.776e-33	-32.398	-32.557	-0.158	(0)
Co4 (OH) 4+4	4.880e-36	1.136e-36	-35.312	-35.945	-0.633	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-41.010	-41.168	-0.158	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.122	-50.280	-0.158	(0)
Co (3)	4.434e-31					
CoOH+2	4.434e-31	3.080e-31	-30.353	-30.512	-0.158	(0)
Co+3	1.243e-37	5.920e-38	-36.906	-37.228	-0.322	(0)
CoCl+2	2.932e-38	2.037e-38	-37.533	-37.691	-0.158	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.304	-73.462	-0.158	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
Cr (2)	2.631e-25					
Cr+2	2.631e-25	1.828e-25	-24.580	-24.738	-0.158	(0)
Cr (3)	1.141e-07					
Cr (OH) 2+	8.174e-08	7.462e-08	-7.088	-7.127	-0.040	(0)
Cr (OH) 3	2.870e-08	2.870e-08	-7.542	-7.542	0.000	(0)
CrO2-	1.518e-09	1.386e-09	-8.819	-8.858	-0.040	(0)
Cr (OH) 4-	1.281e-09	1.170e-09	-8.892	-8.932	-0.040	(0)
Cr (OH) +2	8.625e-10	5.991e-10	-9.064	-9.222	-0.158	(0)
CrOHSO4	3.712e-11	3.712e-11	-10.430	-10.430	0.000	(0)
CrF+2	4.258e-13	2.957e-13	-12.371	-12.529	-0.158	(0)
Cr+3	6.073e-14	2.675e-14	-13.217	-13.573	-0.356	(0)
CrSO4+	1.786e-14	1.631e-14	-13.748	-13.788	-0.040	(0)
CrCl+2	8.427e-17	5.854e-17	-16.074	-16.233	-0.158	(0)
Cr2 (OH) 2SO4+2	2.894e-18	2.010e-18	-17.539	-17.697	-0.158	(0)
CrOHC12	1.926e-18	1.926e-18	-17.715	-17.715	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.117e-20	3.117e-20	-19.506	-19.506	0.000	(0)
CrCl2+	1.029e-20	9.391e-21	-19.988	-20.027	-0.040	(0)
CrNO3+2	2.989e-26	2.076e-26	-25.524	-25.683	-0.158	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.691	-45.849	-0.158	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.207	-56.563	-0.356	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Cr (6)	2.137e-13					
CrO4-2	2.062e-13	1.483e-13	-12.686	-12.829	-0.143	(0)
HCrO4-	5.169e-15	4.719e-15	-14.287	-14.326	-0.040	(0)
NaCrO4-	2.292e-15	2.093e-15	-14.640	-14.679	-0.040	(0)
KCrO4-	6.826e-17	6.232e-17	-16.166	-16.205	-0.040	(0)
H2CrO4	3.762e-23	3.762e-23	-22.425	-22.425	0.000	(0)
CrO3SO4-2	5.314e-24	3.691e-24	-23.275	-23.433	-0.158	(0)
CrO3Cl-	5.407e-25	4.936e-25	-24.267	-24.307	-0.040	(0)
Cr2O7-2	1.112e-27	7.723e-28	-26.954	-27.112	-0.158	(0)
Cu (1)	5.002e-11					
CuCl	2.635e-11	2.635e-11	-10.579	-10.579	0.000	(0)
Cu+	1.356e-11	1.238e-11	-10.868	-10.907	-0.040	(0)
CuCl2-	1.011e-11	9.307e-12	-10.995	-11.031	-0.036	(0)
CuCl3-2	4.648e-15	3.364e-15	-14.333	-14.473	-0.140	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.953	-148.177	-0.225	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.690	-148.907	-0.218	(0)
Cu (2)	5.642e-08					
CuCO3	4.949e-08	4.949e-08	-7.305	-7.305	0.000	(0)
CuOH+	3.107e-09	2.860e-09	-8.508	-8.544	-0.036	(0)
Cu (CO3) 2-2	1.824e-09	1.267e-09	-8.739	-8.897	-0.158	(0)
Cu+2	1.229e-09	8.836e-10	-8.911	-9.054	-0.143	(0)
Cu (OH) 2	5.843e-10	5.843e-10	-9.233	-9.233	0.000	(0)
CuHCO3+	1.219e-10	1.112e-10	-9.914	-9.954	-0.040	(0)
CuSO4	5.285e-11	5.285e-11	-10.277	-10.277	0.000	(0)
CuF+	4.260e-12	3.889e-12	-11.371	-11.410	-0.040	(0)
CuCl+	2.572e-12	2.368e-12	-11.590	-11.626	-0.036	(0)
Cu (OH) 3-	1.344e-12	1.227e-12	-11.872	-11.911	-0.040	(0)

	Cu ₂ (OH) 2+2	2.959e-13	2.055e-13	-12.529	-12.687	-0.158	(0)
	CuNH ₃ +2	6.064e-15	4.212e-15	-14.217	-14.375	-0.158	(0)
	CuNO ₂ +	5.290e-15	4.829e-15	-14.277	-14.316	-0.040	(0)
	CuCl ₂	1.388e-15	1.388e-15	-14.858	-14.858	0.000	(0)
	Cu(OH) 4-2	1.423e-17	9.884e-18	-16.847	-17.005	-0.158	(0)
	CuNO ₃ +	5.434e-20	4.961e-20	-19.265	-19.304	-0.040	(0)
	CuCl ₃ -	2.379e-20	2.190e-20	-19.624	-19.659	-0.036	(0)
	Cu(NO ₂) 2	2.579e-21	2.579e-21	-20.589	-20.589	0.000	(0)
	CuCl ₄ -2	2.564e-25	1.856e-25	-24.591	-24.731	-0.140	(0)
	Cu(NO ₃) 2	1.109e-31	1.109e-31	-30.955	-30.955	0.000	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-218.127	-218.166	-0.040	(0)
F	7.708e-05						
	F-	7.575e-05	6.975e-05	-4.121	-4.156	-0.036	(0)
	MgF+	8.042e-07	7.411e-07	-6.095	-6.130	-0.035	(0)
	CaF+	3.984e-07	3.675e-07	-6.400	-6.435	-0.035	(0)
	NaF	1.250e-07	1.250e-07	-6.903	-6.903	0.000	(0)
	MnF+	1.357e-09	1.251e-09	-8.868	-8.903	-0.035	(0)
	HF	1.015e-09	1.015e-09	-8.994	-8.994	0.000	(0)
	ZnF+	2.848e-10	2.600e-10	-9.545	-9.585	-0.040	(0)
	BF(OH) 3-	2.175e-10	1.996e-10	-9.663	-9.700	-0.037	(0)
	CuF+	4.260e-12	3.889e-12	-11.371	-11.410	-0.040	(0)
	NiF+	1.128e-12	1.030e-12	-11.948	-11.987	-0.040	(0)
	CoF+	1.028e-12	9.381e-13	-11.988	-12.028	-0.040	(0)
	CrF+2	4.258e-13	2.957e-13	-12.371	-12.529	-0.158	(0)
	HF ₂ -	2.926e-13	2.691e-13	-12.534	-12.570	-0.036	(0)
	AlF ₂ +	1.266e-13	1.169e-13	-12.897	-12.932	-0.035	(0)
	AlF ₃	1.027e-13	1.027e-13	-12.989	-12.989	0.000	(0)
	CdF+	6.771e-14	6.181e-14	-13.169	-13.209	-0.040	(0)
	BF ₂ (OH) 2-	1.595e-14	1.464e-14	-13.797	-13.834	-0.037	(0)
	PbF+	1.510e-14	1.378e-14	-13.821	-13.861	-0.040	(0)
	AgF	7.188e-15	7.188e-15	-14.143	-14.143	0.000	(0)
	AlF+2	5.799e-15	4.210e-15	-14.237	-14.376	-0.139	(0)
	UO ₂ F+	5.239e-15	4.783e-15	-14.281	-14.320	-0.040	(0)
	AlF ₄ -	3.894e-15	3.589e-15	-14.410	-14.445	-0.035	(0)
	UO ₂ F ₂	9.622e-16	9.622e-16	-15.017	-15.017	0.000	(0)
	FeF ₂ +	2.401e-16	2.215e-16	-15.620	-15.655	-0.035	(0)
	FeF+2	1.639e-16	1.186e-16	-15.785	-15.926	-0.140	(0)
	FeF ₃	2.179e-17	2.179e-17	-16.662	-16.662	0.000	(0)
	PbF ₂	1.892e-17	1.892e-17	-16.723	-16.723	0.000	(0)
	UO ₂ F ₃ -	1.847e-17	1.686e-17	-16.734	-16.773	-0.040	(0)
	CdF ₂	8.603e-18	8.603e-18	-17.065	-17.065	0.000	(0)
	H ₂ F ₂	2.758e-18	2.758e-18	-17.559	-17.559	0.000	(0)
	VO ₂ F	2.714e-20	2.714e-20	-19.566	-19.566	0.000	(0)
	UO ₂ F ₄ -2	1.345e-20	9.341e-21	-19.871	-20.030	-0.158	(0)
	BF ₃ OH-	4.258e-21	3.909e-21	-20.371	-20.408	-0.037	(0)
	PbF ₃ -	2.742e-21	2.503e-21	-20.562	-20.602	-0.040	(0)
	VO ₂ F ₂ -	7.529e-22	6.874e-22	-21.123	-21.163	-0.040	(0)
	VOF+	2.250e-23	2.054e-23	-22.648	-22.687	-0.040	(0)
	VO ₂ F ₃ -2	8.610e-25	5.981e-25	-24.065	-24.223	-0.158	(0)
	VOF ₂	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
	PbF ₄ -2	1.203e-25	8.357e-26	-24.920	-25.078	-0.158	(0)
	BF ₄ -	1.438e-26	1.320e-26	-25.842	-25.880	-0.037	(0)
	HgF+	8.486e-27	7.747e-27	-26.071	-26.111	-0.040	(0)
	VOF ₃ -	1.456e-27	1.330e-27	-26.837	-26.876	-0.040	(0)
	Sb(OH) 2F	5.184e-28	5.184e-28	-27.285	-27.285	0.000	(0)
	SbOF	5.098e-28	5.098e-28	-27.293	-27.293	0.000	(0)
	VO ₂ F ₄ -3	4.660e-29	2.053e-29	-28.332	-28.688	-0.356	(0)
	SiF ₆ -2	6.949e-31	5.029e-31	-30.158	-30.298	-0.140	(0)
	VOF ₄ -2	5.389e-31	3.743e-31	-30.268	-30.427	-0.158	(0)
	UF ₃ +	9.253e-39	8.448e-39	-38.034	-38.073	-0.040	(0)
	UF ₂ +2	1.100e-39	7.641e-40	-38.959	-39.117	-0.158	(0)
	UF ₄	0.000e+00	0.000e+00	-40.190	-40.190	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-41.704	-42.060	-0.356	(0)
	UF ₅ -	0.000e+00	0.000e+00	-42.709	-42.748	-0.040	(0)
	UF ₆ -2	0.000e+00	0.000e+00	-44.266	-44.425	-0.158	(0)
Fe (2)	7.522e-10						
	Fe+2	6.875e-10	4.776e-10	-9.163	-9.321	-0.158	(0)
	FeSO ₄	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)

FeOH+	2.110e-11	1.946e-11	-10.676	-10.711	-0.035	(0)
FeHCO3+	1.298e-11	1.200e-11	-10.887	-10.921	-0.034	(0)
Fe (OH) 2	1.583e-14	1.583e-14	-13.801	-13.801	0.000	(0)
Fe (OH) 3-	5.554e-15	5.123e-15	-14.255	-14.290	-0.035	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.045	-157.045	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.306	-233.346	-0.040	(0)
Fe (3)	9.376e-07					
Fe (OH) 3	4.489e-07	4.489e-07	-6.348	-6.348	0.000	(0)
Fe (OH) 2+	4.424e-07	4.083e-07	-6.354	-6.389	-0.035	(0)
Fe (OH) 4-	4.636e-08	4.279e-08	-7.334	-7.369	-0.035	(0)
FeOH+2	1.416e-12	1.025e-12	-11.849	-11.989	-0.140	(0)
FeF2+	2.401e-16	2.215e-16	-15.620	-15.655	-0.035	(0)
FeF+2	1.639e-16	1.186e-16	-15.785	-15.926	-0.140	(0)
FeF3	2.179e-17	2.179e-17	-16.662	-16.662	0.000	(0)
FeSO4+	4.927e-18	4.544e-18	-17.307	-17.343	-0.035	(0)
Fe+3	3.257e-18	1.551e-18	-17.487	-17.809	-0.322	(0)
FeCl+2	1.094e-19	7.920e-20	-18.961	-19.101	-0.140	(0)
Fe (SO4) 2-	2.778e-20	2.536e-20	-19.556	-19.596	-0.040	(0)
FeCl2+	6.485e-22	5.982e-22	-21.188	-21.223	-0.035	(0)
Fe2 (OH) 2+4	1.495e-22	3.481e-23	-21.825	-22.458	-0.633	(0)
FeHSeO3+2	6.323e-24	4.392e-24	-23.199	-23.357	-0.158	(0)
FeCl3	1.011e-25	1.011e-25	-24.995	-24.995	0.000	(0)
Fe3 (OH) 4+5	2.004e-27	2.054e-28	-26.698	-27.687	-0.989	(0)
FeNO3+2	3.965e-28	2.754e-28	-27.402	-27.560	-0.158	(0)
H (0)	1.119e-28					
H2	5.593e-29	5.601e-29	-28.252	-28.252	0.001	(0)
Hg (0)	2.262e-11					
Hg	2.262e-11	2.262e-11	-10.645	-10.645	0.000	(0)
Hg (1)	1.325e-25					
Hg2+2	6.625e-26	4.602e-26	-25.179	-25.337	-0.158	(0)
Hg (2)	2.985e-14					
Hg (OH) 2	1.978e-14	1.981e-14	-13.704	-13.703	0.001	(0)
HgClOH	9.159e-15	9.159e-15	-14.038	-14.038	0.000	(0)
HgCl2	8.566e-16	8.566e-16	-15.067	-15.067	0.000	(0)
HgCO3	3.411e-17	3.411e-17	-16.467	-16.467	0.000	(0)
HgCl3-	1.586e-17	1.448e-17	-16.800	-16.839	-0.040	(0)
Hg (CO3) 2-2	1.477e-18	1.026e-18	-17.831	-17.989	-0.158	(0)
HgCl4-2	1.404e-19	9.749e-20	-18.853	-19.011	-0.158	(0)
HgOH+	1.338e-19	1.221e-19	-18.874	-18.913	-0.040	(0)
HgCl+	1.107e-19	1.011e-19	-18.956	-18.995	-0.040	(0)
HgHCO3+	6.842e-21	6.246e-21	-20.165	-20.204	-0.040	(0)
Hg (OH) 3-	2.797e-21	2.553e-21	-20.553	-20.593	-0.040	(0)
Hg+2	4.314e-24	2.996e-24	-23.365	-23.523	-0.158	(0)
HgNH3+2	1.268e-24	8.807e-25	-23.897	-24.055	-0.158	(0)
Hg (NH3) 2+2	5.907e-25	4.103e-25	-24.229	-24.387	-0.158	(0)
HgSO4	2.048e-25	2.048e-25	-24.689	-24.689	0.000	(0)
HgF+	8.486e-27	7.747e-27	-26.071	-26.111	-0.040	(0)
Hg (NH3) 3+2	1.095e-33	7.609e-34	-32.960	-33.119	-0.158	(0)
HgNO3+	2.152e-35	1.964e-35	-34.667	-34.707	-0.040	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.392	-41.550	-0.158	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.839	-45.839	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-140.223	-140.263	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.805	-140.963	-0.158	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.876	-141.876	0.000	(0)
K	1.231e-04					
K+	1.228e-04	1.131e-04	-3.911	-3.946	-0.036	(0)
KSO4-	2.265e-07	2.091e-07	-6.645	-6.680	-0.035	(0)
KCrO4-	6.826e-17	6.232e-17	-16.166	-16.205	-0.040	(0)
Mg	1.399e-04					
Mg+2	1.317e-04	9.469e-05	-3.881	-4.024	-0.143	(0)
MgSO4	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
MgHCO3+	2.100e-06	1.933e-06	-5.678	-5.714	-0.036	(0)
MgF+	8.042e-07	7.411e-07	-6.095	-6.130	-0.035	(0)
MgCO3	7.491e-07	7.491e-07	-6.125	-6.125	0.000	(0)
MgOH+	4.173e-08	3.859e-08	-7.380	-7.414	-0.034	(0)
MgH2BO3+	1.515e-09	1.391e-09	-8.820	-8.857	-0.037	(0)
Mn (2)	6.927e-07					
Mn+2	6.487e-07	4.506e-07	-6.188	-6.346	-0.158	(0)

MnSO4	2.092e-08	2.092e-08	-7.679	-7.679	0.000	(0)
MnHCO3+	1.945e-08	1.794e-08	-7.711	-7.746	-0.035	(0)
MnF+	1.357e-09	1.251e-09	-8.868	-8.903	-0.035	(0)
MnOH+	1.256e-09	1.159e-09	-8.901	-8.936	-0.035	(0)
MnCl+	1.040e-09	9.591e-10	-8.983	-9.018	-0.035	(0)
MnCl2	2.291e-12	2.291e-12	-11.640	-11.640	0.000	(0)
MnCl3-	1.156e-15	1.067e-15	-14.937	-14.972	-0.035	(0)
MnSeO4	8.217e-17	8.217e-17	-16.085	-16.085	0.000	(0)
MnNO3+	1.389e-17	1.268e-17	-16.857	-16.897	-0.040	(0)
Mn (OH) 3-	8.135e-18	7.504e-18	-17.090	-17.125	-0.035	(0)
Mn (OH) 4-2	3.426e-23	2.480e-23	-22.465	-22.606	-0.140	(0)
Mn (NO3) 2	5.654e-28	5.654e-28	-27.248	-27.248	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.139	-43.139	0.000	(0)
Mn (3)	1.478e-27					
Mn+3	1.478e-27	7.038e-28	-26.830	-27.153	-0.322	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-42.396	-42.536	-0.140	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.328	-47.364	-0.037	(0)
Mo	1.732e-08					
MoO4-2	1.732e-08	1.246e-08	-7.761	-7.905	-0.143	(0)
HMoO4-	2.670e-12	2.437e-12	-11.574	-11.613	-0.040	(0)
H2MoO4	1.756e-16	1.756e-16	-15.756	-15.756	0.000	(0)
Ag2MoO4	7.936e-30	7.936e-30	-29.100	-29.100	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.342	-57.698	-0.356	(0)
Mo7O24-6	0.000e+00	0.000e+00	-64.976	-66.400	-1.424	(0)
HMo7O24-5	0.000e+00	0.000e+00	-67.031	-68.021	-0.989	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-70.613	-71.246	-0.633	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-75.651	-76.007	-0.356	(0)
N (-3)	9.244e-09					
NH4+	8.754e-09	8.035e-09	-8.058	-8.095	-0.037	(0)
NH3	4.658e-10	4.658e-10	-9.332	-9.332	0.000	(0)
NH4SO4-	2.437e-11	2.248e-11	-10.613	-10.648	-0.035	(0)
CaNH3+2	4.075e-13	2.831e-13	-12.390	-12.548	-0.158	(0)
CuNH3+2	6.064e-15	4.212e-15	-14.217	-14.375	-0.158	(0)
NiNH3+2	2.117e-16	1.470e-16	-15.674	-15.833	-0.158	(0)
AgNH3+	4.274e-17	3.902e-17	-16.369	-16.409	-0.040	(0)
Co (NH3) +2	3.429e-17	2.382e-17	-16.465	-16.623	-0.158	(0)
BaNH3+2	2.039e-17	1.416e-17	-16.691	-16.849	-0.158	(0)
Ag (NH3) 2+	1.618e-22	1.478e-22	-21.791	-21.830	-0.040	(0)
Ca (NH3) 2+2	7.558e-23	5.250e-23	-22.122	-22.280	-0.158	(0)
Ni (NH3) 2+2	1.425e-23	9.899e-24	-22.846	-23.004	-0.158	(0)
HgNH3+2	1.268e-24	8.807e-25	-23.897	-24.055	-0.158	(0)
Co (NH3) 2+2	6.814e-25	4.733e-25	-24.167	-24.325	-0.158	(0)
Hg (NH3) 2+2	5.907e-25	4.103e-25	-24.229	-24.387	-0.158	(0)
Co (NH3) 3+2	3.996e-33	2.776e-33	-32.398	-32.557	-0.158	(0)
Hg (NH3) 3+2	1.095e-33	7.609e-34	-32.960	-33.119	-0.158	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-41.010	-41.168	-0.158	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.392	-41.550	-0.158	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.691	-45.849	-0.158	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.122	-50.280	-0.158	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.207	-56.563	-0.356	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.075	-58.233	-0.158	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.239	-58.397	-0.158	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.304	-73.462	-0.158	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.286	-74.444	-0.158	(0)
N (3)	5.680e-08					
NO2-	5.680e-08	5.219e-08	-7.246	-7.282	-0.037	(0)
CuNO2+	5.290e-15	4.829e-15	-14.277	-14.316	-0.040	(0)
AgNO2	4.474e-16	4.474e-16	-15.349	-15.349	0.000	(0)
CoNO2+	1.713e-16	1.564e-16	-15.766	-15.806	-0.040	(0)
Cu (NO2) 2	2.579e-21	2.579e-21	-20.589	-20.589	0.000	(0)
Ag (NO2) 2-	3.962e-23	3.617e-23	-22.402	-22.442	-0.040	(0)
N (5)	1.931e-11					
NO3-	1.928e-11	1.775e-11	-10.715	-10.751	-0.036	(0)
CaNO3+	2.969e-14	2.710e-14	-13.527	-13.567	-0.040	(0)
MnNO3+	1.389e-17	1.268e-17	-16.857	-16.897	-0.040	(0)

	ZnNO3+	9.126e-18	8.331e-18	-17.040	-17.079	-0.040	(0)
	BaNO3+	4.697e-18	4.288e-18	-17.328	-17.368	-0.040	(0)
	CuNO3+	5.434e-20	4.961e-20	-19.265	-19.304	-0.040	(0)
	NiNO3+	2.871e-20	2.621e-20	-19.542	-19.582	-0.040	(0)
	CoNO3+	1.311e-20	1.197e-20	-19.882	-19.922	-0.040	(0)
	CdNO3+	3.439e-21	3.139e-21	-20.464	-20.503	-0.040	(0)
	PbNO3+	8.066e-22	7.364e-22	-21.093	-21.133	-0.040	(0)
	AgNO3	5.786e-22	5.786e-22	-21.238	-21.238	0.000	(0)
	CrNO3+2	2.989e-26	2.076e-26	-25.524	-25.683	-0.158	(0)
	UO2NO3+	1.928e-26	1.760e-26	-25.715	-25.755	-0.040	(0)
	Mn(NO3)2	5.654e-28	5.654e-28	-27.248	-27.248	0.000	(0)
	FeNO3+2	3.965e-28	2.754e-28	-27.402	-27.560	-0.158	(0)
	Zn(NO3)2	2.951e-29	2.951e-29	-28.530	-28.530	0.000	(0)
	VO2NO3	1.992e-30	1.992e-30	-29.701	-29.701	0.000	(0)
	Co(NO3)2	4.323e-31	4.323e-31	-30.364	-30.364	0.000	(0)
	Cu(NO3)2	1.109e-31	1.109e-31	-30.955	-30.955	0.000	(0)
	Cd(NO3)2	2.793e-32	2.793e-32	-31.554	-31.554	0.000	(0)
	Pb(NO3)2	2.220e-32	2.220e-32	-31.654	-31.654	0.000	(0)
	HgNO3+	2.152e-35	1.964e-35	-34.667	-34.707	-0.040	(0)
	Hg(NO3)2	0.000e+00	0.000e+00	-45.839	-45.839	0.000	(0)
Na		3.092e-03					
	Na+	3.084e-03	2.840e-03	-2.511	-2.547	-0.036	(0)
	NaSO4-	4.314e-06	3.982e-06	-5.365	-5.400	-0.035	(0)
	NaHCO3	3.187e-06	3.187e-06	-5.497	-5.497	0.000	(0)
	NaCO3-	5.449e-07	5.030e-07	-6.264	-6.298	-0.035	(0)
	NaF	1.250e-07	1.250e-07	-6.903	-6.903	0.000	(0)
	NaH2BO3	1.906e-09	1.906e-09	-8.720	-8.720	0.000	(0)
	NaCrO4-	2.292e-15	2.093e-15	-14.640	-14.679	-0.040	(0)
Ni		1.228e-09					
	Ni+2	8.172e-10	5.877e-10	-9.088	-9.231	-0.143	(0)
	NiCO3	2.085e-10	2.085e-10	-9.681	-9.681	0.000	(0)
	NiHCO3+	1.583e-10	1.446e-10	-9.800	-9.840	-0.040	(0)
	NiSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
	NiOH+	8.296e-12	7.574e-12	-11.081	-11.121	-0.040	(0)
	NiCl+	2.785e-12	2.542e-12	-11.555	-11.595	-0.040	(0)
	NiF+	1.128e-12	1.030e-12	-11.948	-11.987	-0.040	(0)
	Ni(OH)2	6.159e-13	6.159e-13	-12.211	-12.211	0.000	(0)
	Ni(OH)3-	6.906e-16	6.304e-16	-15.161	-15.200	-0.040	(0)
	Ni(SO4)2-2	3.810e-16	2.647e-16	-15.419	-15.577	-0.158	(0)
	NiNH3+2	2.117e-16	1.470e-16	-15.674	-15.833	-0.158	(0)
	NiCl2	2.164e-17	2.164e-17	-16.665	-16.665	0.000	(0)
	NiSeO4	1.862e-19	1.862e-19	-18.730	-18.730	0.000	(0)
	NiNO3+	2.871e-20	2.621e-20	-19.542	-19.582	-0.040	(0)
	Ni(NH3)2+2	1.425e-23	9.899e-24	-22.846	-23.004	-0.158	(0)
O(0)		3.227e-36					
	O2	1.613e-36	1.616e-36	-35.792	-35.792	0.001	(0)
Pb		1.005e-10					
	PbCO3	8.017e-11	8.017e-11	-10.096	-10.096	0.000	(0)
	PbOH+	7.898e-12	7.210e-12	-11.102	-11.142	-0.040	(0)
	PbHCO3+	4.554e-12	4.157e-12	-11.342	-11.381	-0.040	(0)
	Pb+2	3.899e-12	2.804e-12	-11.409	-11.552	-0.143	(0)
	Pb(CO3)2-2	3.166e-12	2.199e-12	-11.499	-11.658	-0.158	(0)
	PbSO4	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
	Pb(OH)2	2.334e-13	2.334e-13	-12.632	-12.632	0.000	(0)
	PbCl+	1.843e-13	1.682e-13	-12.735	-12.774	-0.040	(0)
	PbF+	1.510e-14	1.378e-14	-13.821	-13.861	-0.040	(0)
	PbCl2	1.270e-15	1.270e-15	-14.896	-14.896	0.000	(0)
	Pb(SO4)2-2	8.121e-16	5.641e-16	-15.090	-15.249	-0.158	(0)
	Pb(OH)3-	2.617e-16	2.389e-16	-15.582	-15.622	-0.040	(0)
	PbF2	1.892e-17	1.892e-17	-16.723	-16.723	0.000	(0)
	PbCl3-	9.367e-19	8.552e-19	-18.028	-18.068	-0.040	(0)
	Pb(OH)4-2	8.624e-20	5.991e-20	-19.064	-19.223	-0.158	(0)
	PbF3-	2.742e-21	2.503e-21	-20.562	-20.602	-0.040	(0)
	PbCl4-2	9.515e-22	6.609e-22	-21.022	-21.180	-0.158	(0)
	PbNO3+	8.066e-22	7.364e-22	-21.093	-21.133	-0.040	(0)
	Pb2OH+3	7.275e-22	3.204e-22	-21.138	-21.494	-0.356	(0)
	PbF4-2	1.203e-25	8.357e-26	-24.920	-25.078	-0.158	(0)
	Pb3(OH)4+2	4.388e-27	3.048e-27	-26.358	-26.516	-0.158	(0)

Pb(NO3)2	2.220e-32	2.220e-32	-31.654	-31.654	0.000	(0)
Pb4(OH)4+4	2.917e-34	6.789e-35	-33.535	-34.168	-0.633	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.957	-152.957	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-229.954	-229.994	-0.040	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.910	-74.910	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.298	-78.337	-0.040	(0)
H2S	0.000e+00	0.000e+00	-79.324	-79.324	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.537	-79.695	-0.158	(0)
S6-2	0.000e+00	0.000e+00	-80.053	-80.211	-0.158	(0)
S4-2	0.000e+00	0.000e+00	-80.133	-80.291	-0.158	(0)
CdHS+	0.000e+00	0.000e+00	-80.542	-80.582	-0.040	(0)
S3-2	0.000e+00	0.000e+00	-80.938	-81.097	-0.158	(0)
S2-2	0.000e+00	0.000e+00	-81.955	-82.113	-0.158	(0)
S-2	0.000e+00	0.000e+00	-87.490	-87.630	-0.140	(0)
HgHS2-	0.000e+00	0.000e+00	-140.223	-140.263	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.805	-140.963	-0.158	(0)
Hg(HS)2	0.000e+00	0.000e+00	-141.876	-141.876	0.000	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-147.953	-148.177	-0.225	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.509	-148.623	-0.114	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-148.546	-148.586	-0.040	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.690	-148.907	-0.218	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-149.107	-149.147	-0.040	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-149.828	-150.056	-0.228	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.146	-150.367	-0.221	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.583	-150.583	0.000	(0)
Cd(HS)2	0.000e+00	0.000e+00	-151.715	-151.715	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.957	-152.957	0.000	(0)
Fe(HS)2	0.000e+00	0.000e+00	-157.045	-157.045	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-218.127	-218.166	-0.040	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.601	-225.640	-0.040	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-227.455	-227.613	-0.158	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-228.113	-228.152	-0.040	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-229.954	-229.994	-0.040	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-233.306	-233.346	-0.040	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-304.135	-304.293	-0.158	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-305.279	-305.437	-0.158	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.447	-322.605	-0.158	(0)
S(6)	4.010e-04					
SO4-2	3.631e-04	2.611e-04	-3.440	-3.583	-0.143	(0)
CaSO4	2.887e-05	2.887e-05	-4.540	-4.540	0.000	(0)
MgSO4	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
NaSO4-	4.314e-06	3.982e-06	-5.365	-5.400	-0.035	(0)
KSO4-	2.265e-07	2.091e-07	-6.645	-6.680	-0.035	(0)
MnSO4	2.092e-08	2.092e-08	-7.679	-7.679	0.000	(0)
ZnSO4	1.067e-08	1.067e-08	-7.972	-7.972	0.000	(0)
HSO4-	2.723e-10	2.509e-10	-9.565	-9.600	-0.035	(0)
CuSO4	5.285e-11	5.285e-11	-10.277	-10.277	0.000	(0)
CrOHSO4	3.712e-11	3.712e-11	-10.430	-10.430	0.000	(0)
Zn(SO4)2-2	3.493e-11	2.426e-11	-10.457	-10.615	-0.158	(0)
NiSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
FeSO4	3.061e-11	3.061e-11	-10.514	-10.514	0.000	(0)
NH4SO4-	2.437e-11	2.248e-11	-10.613	-10.648	-0.035	(0)
CoSO4	2.215e-11	2.215e-11	-10.655	-10.655	0.000	(0)
CdSO4	3.422e-12	3.422e-12	-11.466	-11.466	0.000	(0)
PbSO4	3.586e-13	3.586e-13	-12.445	-12.445	0.000	(0)
AgSO4-	2.341e-13	2.137e-13	-12.631	-12.670	-0.040	(0)
CrSO4+	1.786e-14	1.631e-14	-13.748	-13.788	-0.040	(0)
Cd(SO4)2-2	1.735e-14	1.205e-14	-13.761	-13.919	-0.158	(0)
Pb(SO4)2-2	8.121e-16	5.641e-16	-15.090	-15.249	-0.158	(0)
Ni(SO4)2-2	3.810e-16	2.647e-16	-15.419	-15.577	-0.158	(0)
UO2SO4	1.963e-16	1.963e-16	-15.707	-15.707	0.000	(0)
AlSO4+	1.327e-17	1.223e-17	-16.877	-16.913	-0.035	(0)
FeSO4+	4.927e-18	4.544e-18	-17.307	-17.343	-0.035	(0)
Cr2(OH)2SO4+2	2.894e-18	2.010e-18	-17.539	-17.697	-0.158	(0)
UO2(SO4)2-2	9.727e-19	6.756e-19	-18.012	-18.170	-0.158	(0)
Al(SO4)2-	3.713e-20	3.422e-20	-19.430	-19.466	-0.035	(0)
Cr2(OH)2(SO4)2	3.117e-20	3.117e-20	-19.506	-19.506	0.000	(0)

Fe (SO4) 2-	2.778e-20	2.536e-20	-19.556	-19.596	-0.040	(0)
VO2SO4-	1.515e-21	1.383e-21	-20.820	-20.859	-0.040	(0)
CrO3SO4-2	5.314e-24	3.691e-24	-23.275	-23.433	-0.158	(0)
VOSO4	3.530e-24	3.530e-24	-23.452	-23.452	0.000	(0)
HgSO4	2.048e-25	2.048e-25	-24.689	-24.689	0.000	(0)
VSO4+	9.106e-39	8.313e-39	-38.041	-38.080	-0.040	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.870	-43.870	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.029	-44.187	-0.158	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.291	-70.330	-0.040	(0)
Sb (3)	9.560e-22					
Sb (OH) 3	4.837e-22	4.837e-22	-21.315	-21.315	0.000	(0)
HSbO2	4.722e-22	4.722e-22	-21.326	-21.326	0.000	(0)
SbO2-	8.518e-26	7.776e-26	-25.070	-25.109	-0.040	(0)
Sb (OH) 4-	4.880e-26	4.455e-26	-25.312	-25.351	-0.040	(0)
Sb (OH) 2F	5.184e-28	5.184e-28	-27.285	-27.285	0.000	(0)
SbOF	5.098e-28	5.098e-28	-27.293	-27.293	0.000	(0)
Sb (OH) 2+	1.265e-28	1.155e-28	-27.898	-27.937	-0.040	(0)
SbO+	4.363e-29	3.983e-29	-28.360	-28.400	-0.040	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.447	-322.605	-0.158	(0)
Sb (5)	2.854e-10					
SbO3-	2.851e-10	2.603e-10	-9.545	-9.585	-0.040	(0)
Sb (OH) 6-	3.305e-13	3.043e-13	-12.481	-12.517	-0.036	(0)
SbO2+	7.910e-27	7.222e-27	-26.102	-26.141	-0.040	(0)
Se (-2)	5.362e-18					
Ag2Se	5.362e-18	5.362e-18	-17.271	-17.271	0.000	(0)
HSe-	4.212e-40	3.845e-40	-39.376	-39.415	-0.040	(0)
MnSe	0.000e+00	0.000e+00	-43.139	-43.139	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.532	-43.532	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.250	-46.408	-0.158	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.071	-85.704	-0.633	(0)
Se (4)	1.798e-09					
HSeO3-	1.174e-09	1.072e-09	-8.930	-8.970	-0.040	(0)
SeO3-2	6.244e-10	4.337e-10	-9.205	-9.363	-0.158	(0)
H2SeO3	4.495e-15	4.495e-15	-14.347	-14.347	0.000	(0)
AgSeO3-	1.253e-17	1.144e-17	-16.902	-16.942	-0.040	(0)
Cd (SeO3) 2-2	1.248e-23	8.669e-24	-22.904	-23.062	-0.158	(0)
FeHSeO3+2	6.323e-24	4.392e-24	-23.199	-23.357	-0.158	(0)
Ag (SeO3) 2-3	1.008e-25	4.442e-26	-24.996	-25.352	-0.356	(0)
Se (6)	9.422e-13					
SeO4-2	9.421e-13	6.775e-13	-12.026	-12.169	-0.143	(0)
MnSeO4	8.217e-17	8.217e-17	-16.085	-16.085	0.000	(0)
ZnSeO4	1.960e-17	1.960e-17	-16.708	-16.708	0.000	(0)
HSeO4-	3.658e-19	3.340e-19	-18.437	-18.476	-0.040	(0)
NiSeO4	1.862e-19	1.862e-19	-18.730	-18.730	0.000	(0)
CoSeO4	1.444e-19	1.444e-19	-18.840	-18.840	0.000	(0)
CdSeO4	7.054e-21	7.054e-21	-20.152	-20.152	0.000	(0)
Zn (SeO4) 2-2	1.939e-29	1.347e-29	-28.713	-28.871	-0.158	(0)
Si	3.127e-04					
H4SiO4	3.078e-04	3.082e-04	-3.512	-3.511	0.001	(0)
H3SiO4-	4.920e-06	4.529e-06	-5.308	-5.344	-0.036	(0)
H2SiO4-2	4.003e-11	2.906e-11	-10.398	-10.537	-0.139	(0)
UO2H3SiO4+	2.092e-13	1.910e-13	-12.679	-12.719	-0.040	(0)
SiF6-2	6.949e-31	5.029e-31	-30.158	-30.298	-0.140	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.188	-60.544	-0.356	(0)
U (4)	5.644e-21					
U (OH) 5-	5.642e-21	5.151e-21	-20.249	-20.288	-0.040	(0)
U (OH) 4	2.122e-24	2.122e-24	-23.673	-23.673	0.000	(0)
U (OH) 3+	8.358e-29	7.630e-29	-28.078	-28.117	-0.040	(0)
U (OH) 2+2	4.996e-34	3.470e-34	-33.301	-33.460	-0.158	(0)
UF3+	9.253e-39	8.448e-39	-38.034	-38.073	-0.040	(0)
UF2+2	1.100e-39	7.641e-40	-38.959	-39.117	-0.158	(0)
UOH+3	3.650e-40	1.608e-40	-39.438	-39.794	-0.356	(0)
UF4	0.000e+00	0.000e+00	-40.190	-40.190	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.704	-42.060	-0.356	(0)
UF5-	0.000e+00	0.000e+00	-42.709	-42.748	-0.040	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.870	-43.870	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.029	-44.187	-0.158	(0)

UF6-2	0.000e+00	0.000e+00	-44.266	-44.425	-0.158	(0)
U+4	0.000e+00	0.000e+00	-46.571	-47.204	-0.633	(0)
UCl+3	0.000e+00	0.000e+00	-47.920	-48.276	-0.356	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-177.066	-180.271	-3.205	(0)
U (5)	9.486e-18					
UO2+	9.486e-18	8.660e-18	-17.023	-17.063	-0.040	(0)
U (6)	1.247e-08					
UO2 (CO3) 3-4	7.310e-09	1.702e-09	-8.136	-8.769	-0.633	(0)
UO2 (CO3) 2-2	5.139e-09	3.570e-09	-8.289	-8.447	-0.158	(0)
UO2CO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
UO2H3SiO4+	2.092e-13	1.910e-13	-12.679	-12.719	-0.040	(0)
UO2OH+	7.013e-14	6.402e-14	-13.154	-13.194	-0.040	(0)
UO2F+	5.239e-15	4.783e-15	-14.281	-14.320	-0.040	(0)
UO2F2	9.622e-16	9.622e-16	-15.017	-15.017	0.000	(0)
UO2+2	6.908e-16	4.968e-16	-15.161	-15.304	-0.143	(0)
UO2SO4	1.963e-16	1.963e-16	-15.707	-15.707	0.000	(0)
UO2F3-	1.847e-17	1.686e-17	-16.734	-16.773	-0.040	(0)
UO2Cl+	1.492e-18	1.362e-18	-17.826	-17.866	-0.040	(0)
UO2 (SO4) 2-2	9.727e-19	6.756e-19	-18.012	-18.170	-0.158	(0)
UO2F4-2	1.345e-20	9.341e-21	-19.871	-20.030	-0.158	(0)
(UO2) 2 (OH) 2+2	9.792e-21	6.802e-21	-20.009	-20.167	-0.158	(0)
(UO2) 3 (OH) 5+	3.792e-22	3.462e-22	-21.421	-21.461	-0.040	(0)
UO2NO3+	1.928e-26	1.760e-26	-25.715	-25.755	-0.040	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.465	-44.505	-0.040	(0)
V+2	0.000e+00	0.000e+00	-45.866	-46.025	-0.158	(0)
V (3)	5.837e-17					
V (OH) 3	5.837e-17	5.837e-17	-16.234	-16.234	0.000	(0)
V (OH) 2+	4.063e-28	3.709e-28	-27.391	-27.431	-0.040	(0)
VOH+2	4.982e-32	3.461e-32	-31.303	-31.461	-0.158	(0)
V+3	1.531e-37	6.745e-38	-36.815	-37.171	-0.356	(0)
VSO4+	9.106e-39	8.313e-39	-38.041	-38.080	-0.040	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-60.084	-60.440	-0.356	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-61.489	-62.122	-0.633	(0)
V (4)	1.108e-20					
V (OH) 3+	1.098e-20	1.003e-20	-19.959	-19.999	-0.040	(0)
VO+2	7.068e-23	4.909e-23	-22.151	-22.309	-0.158	(0)
VOF+	2.250e-23	2.054e-23	-22.648	-22.687	-0.040	(0)
VOSO4	3.530e-24	3.530e-24	-23.452	-23.452	0.000	(0)
VOF2	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
VOC1+	2.551e-25	2.329e-25	-24.593	-24.633	-0.040	(0)
VOF3-	1.456e-27	1.330e-27	-26.837	-26.876	-0.040	(0)
VOF4-2	5.389e-31	3.743e-31	-30.268	-30.427	-0.158	(0)
H2V2O4+2	7.255e-36	5.039e-36	-35.139	-35.298	-0.158	(0)
V (5)	1.682e-10					
H2VO4-	1.259e-10	1.149e-10	-9.900	-9.940	-0.040	(0)
HVO4-2	4.226e-11	2.935e-11	-10.374	-10.532	-0.158	(0)
H3VO4	1.130e-14	1.130e-14	-13.947	-13.947	0.000	(0)
VO4-3	3.396e-17	1.496e-17	-16.469	-16.825	-0.356	(0)
H3V2O7-	9.188e-18	8.388e-18	-17.037	-17.076	-0.040	(0)
HV2O7-3	2.595e-18	1.143e-18	-17.586	-17.942	-0.356	(0)
VO2+	2.409e-19	2.219e-19	-18.618	-18.654	-0.036	(0)
VO2F	2.714e-20	2.714e-20	-19.566	-19.566	0.000	(0)
V2O7-4	1.344e-20	3.129e-21	-19.872	-20.505	-0.633	(0)
VO2SO4-	1.515e-21	1.383e-21	-20.820	-20.859	-0.040	(0)
VO2F2-	7.529e-22	6.874e-22	-21.123	-21.163	-0.040	(0)
V3O9-3	3.610e-24	1.590e-24	-23.442	-23.799	-0.356	(0)
VO2F3-2	8.610e-25	5.981e-25	-24.065	-24.223	-0.158	(0)
VO2F4-3	4.660e-29	2.053e-29	-28.332	-28.688	-0.356	(0)
VO2NO3	1.992e-30	1.992e-30	-29.701	-29.701	0.000	(0)
V4O12-4	3.273e-31	7.619e-32	-30.485	-31.118	-0.633	(0)
V10O28-6	0.000e+00	0.000e+00	-81.094	-82.518	-1.424	(0)
HV10O28-5	0.000e+00	0.000e+00	-81.350	-82.339	-0.989	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.505	-85.139	-0.633	(0)
Zn	4.119e-07					
Zn+2	2.598e-07	1.868e-07	-6.585	-6.729	-0.143	(0)
ZnCO3	1.022e-07	1.022e-07	-6.990	-6.990	0.000	(0)
ZnOH+	2.095e-08	1.912e-08	-7.679	-7.718	-0.040	(0)

ZnHCO3+	1.291e-08	1.179e-08	-7.889	-7.929	-0.040	(0)
ZnSO4	1.067e-08	1.067e-08	-7.972	-7.972	0.000	(0)
Zn(OH)2	3.103e-09	3.103e-09	-8.508	-8.508	0.000	(0)
ZnOHCl	1.063e-09	1.063e-09	-8.973	-8.973	0.000	(0)
ZnCl+	8.618e-10	7.934e-10	-9.065	-9.101	-0.036	(0)
ZnF+	2.848e-10	2.600e-10	-9.545	-9.585	-0.040	(0)
Zn(SO4)2-2	3.493e-11	2.426e-11	-10.457	-10.615	-0.158	(0)
Zn(OH)3-	1.744e-11	1.592e-11	-10.759	-10.798	-0.040	(0)
ZnCl2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
ZnCl3-	3.101e-15	2.855e-15	-14.508	-14.544	-0.036	(0)
Zn(OH)4-2	9.340e-16	6.487e-16	-15.030	-15.188	-0.158	(0)
ZnSeO4	1.960e-17	1.960e-17	-16.708	-16.708	0.000	(0)
ZnNO3+	9.126e-18	8.331e-18	-17.040	-17.079	-0.040	(0)
ZnCl4-2	3.335e-18	2.414e-18	-17.477	-17.617	-0.140	(0)
Zn(NO3)2	2.951e-29	2.951e-29	-28.530	-28.530	0.000	(0)
Zn(SeO4)2-2	1.939e-29	1.347e-29	-28.713	-28.871	-0.158	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-148.546	-148.586	-0.040	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.583	-150.583	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.601	-225.640	-0.040	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-227.455	-227.613	-0.158	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-305.279	-305.437	-0.158	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-68.23	-61.94	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-50.49	-45.98	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-57.72	-45.98	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-87.94	-70.01	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-66.10	-46.07	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.42	-29.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-28.81	-28.36	0.45	(NH4)2SeO4
Acanthite	-54.88	-91.10	-36.22	Ag2S
Ag2CO3	-14.71	-25.80	-11.09	Ag2CO3
Ag2CrO4	-22.01	-33.60	-11.59	Ag2CrO4
Ag2HVO4	-16.89	-15.41	1.48	Ag2HVO4
Ag2MoO4	-17.13	-28.68	-11.55	Ag2MoO4
Ag2O	-17.33	-4.76	12.57	Ag2O
Ag2Se	-3.48	-52.18	-48.70	Ag2Se
Ag2SeO3	-14.59	-21.74	-7.15	Ag2SeO3
Ag2SeO4	-24.03	-32.94	-8.91	Ag2SeO4
Ag2SO4	-19.54	-24.36	-4.82	Ag2SO4
Ag3AsO3	-29.65	-27.49	2.16	Ag3AsO3
Ag3AsO4	-18.50	-21.29	-2.79	Ag3AsO4
Ag3H2VO5	-22.97	-17.79	5.18	Ag3H2VO5
AgF·4H2O	-15.59	-14.54	1.05	AgF·4H2O
Agmetal	-1.42	-14.93	-13.51	Ag
AgVO3	-13.80	-13.03	0.77	AgVO3
Al(OH)3(am)	-4.00	6.80	10.80	Al(OH)3
Al2(MoO4)3	-60.52	-58.15	2.37	Al2(MoO4)3
Al2O3	-6.05	13.60	19.65	Al2O3
Al4(OH)10SO4	-15.09	7.61	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-12.15	-7.35	4.80	AlAsO4·2H2O
AlOHSO4	-9.57	-12.80	-3.23	AlOHSO4
AlSb	-155.44	-89.82	65.62	AlSb
Alunite	-13.33	-14.73	-1.40	KAl3(SO4)2(OH)6
Anglesite	-7.35	-15.14	-7.79	PbSO4
Anhydrite	-2.54	-6.90	-4.36	CaSO4
Anilite	-57.08	-88.95	-31.88	Cu0.25Cu1.5S
Antlerite	-7.50	1.28	8.79	Cu3(OH)4SO4
Aragonite	-0.04	-8.34	-8.30	CaCO3
Arsenolite	-78.65	-81.41	-2.76	As4O6
Artinite	-6.66	2.94	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-35.00	-28.30	6.71	As2O5
Atacamite	-4.25	3.14	7.39	Cu2(OH)3Cl
Azurite	-4.28	-21.19	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-15.70	8.70	24.39	Ba(OH)2·8H2O

Ba2V2O7:2H2O	-19.77	-3.90	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	6.70	-2.21	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-28.14	4.80	32.94	Ba3(VO4)2:4H2O
BaCrO4	-10.48	-20.15	-9.67	BaCrO4
BaF2	-9.81	-15.63	-5.82	BaF2
BaMoO4	-8.26	-15.22	-6.96	BaMoO4
Barite	-0.92	-10.90	-9.98	BaSO4
BaS	-93.83	-77.65	16.18	BaS
BaSeO3	-10.11	-8.28	1.83	BaSeO3
BaSeO4	-12.03	-19.49	-7.46	BaSeO4
Bianchite	-8.55	-10.31	-1.76	ZnSO4:6H2O
Birnessite	-8.67	9.42	18.09	MnO2
Bixbyite	-5.62	-6.26	-0.64	Mn2O3
BlaubleiI	-56.50	-80.66	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.21	-84.49	-27.28	Cu0.6Cu0.8S
Boehmite	-1.78	6.80	8.58	AlOOH
Breithauptite	-58.76	-77.29	-18.52	NiSb
Brochantite	-6.98	8.24	15.22	Cu4(OH)6SO4
Brucite	-4.85	11.99	16.84	Mg(OH)2
Bunsenite	-5.66	6.78	12.45	NiO
Ca(VO3)2	-14.26	-8.60	5.66	Ca(VO3)2
Ca2V2O7	-13.40	4.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.45	4.10	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-12.50	9.80	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-22.16	16.80	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-23.06	16.80	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.12	-155.15	142.97	Ca3Sb2
CaCrO4	-13.88	-16.15	-2.27	CaCrO4
Calcite	0.14	-8.34	-8.48	CaCO3
Calomel	-12.97	-30.88	-17.91	Hg2Cl2
CaMoO4	-3.27	-11.22	-7.95	CaMoO4
Carnotite	-6.11	-5.88	0.23	KUO2VO4
CaSeO3:2H2O	-7.09	-4.28	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.47	-15.49	-3.02	CaSeO4:2H2O
Cd(BO2)2	-14.37	-4.53	9.84	Cd(BO2)2
Cd(OH)2	-7.88	5.76	13.64	Cd(OH)2
Cd(OH)2(am)	-7.97	5.76	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.62	-21.91	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.87	-2.31	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.95	3.45	28.40	Cd4(OH)6SO4
CdCl2	-15.14	-15.80	-0.66	CdCl2
CdCl2:1H2O	-14.10	-15.80	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.88	-15.80	-1.91	CdCl2:2.5H2O
CdF2	-17.35	-18.57	-1.21	CdF2
Cdmetal(alpha)	-32.85	-19.34	13.51	Cd
Cdmetal(gamma)	-32.96	-19.34	13.62	Cd
CdMoO4	-4.01	-18.16	-14.15	CdMoO4
CdOHCl	-8.55	-5.02	3.54	CdOHCl
CdSb	-77.96	-78.31	-0.35	CdSb
CdSe	-21.46	-41.66	-20.20	CdSe
CdSeO4:2H2O	-20.57	-22.42	-1.85	CdSeO4:2H2O
CdSO4	-13.66	-13.84	-0.17	CdSO4
CdSO4:1H2O	-12.11	-13.84	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.96	-13.84	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.41	-13.16	-9.75	AgCl
Cerrusite	-3.44	-16.57	-13.13	PbCO3
CH4(g)	-80.40	-121.44	-41.05	CH4
Chalcanthite	-10.00	-12.64	-2.64	CuSO4:5H2O
Chalcedony	0.04	-3.51	-3.55	SiO2
Chalcocite	-57.22	-92.14	-34.92	Cu2S
Chalcopyrite	-123.76	-159.03	-35.27	CuFeS2
Chrysotile	-3.25	28.95	32.20	Mg3Si2O5(OH)4
Cinnabar	-54.35	-100.05	-45.69	HgS
Claudetite	-78.34	-81.41	-3.06	As4O6
Clausthalite	-15.86	-42.96	-27.10	PbSe
Co(BO2)2	-30.72	-3.65	27.07	Co(BO2)2
Co(OH)2	-6.45	6.64	13.09	Co(OH)2
Co(OH)3	-10.90	-13.21	-2.31	Co(OH)3

CO2(g)	-2.89	-21.04	-18.15	CO2
Co3(AsO4)2	-21.40	-8.37	13.03	Co3(AsO4)2
Co3O4	-9.27	-19.77	-10.50	Co3O4
CoCl2	-23.18	-14.92	8.27	CoCl2
CoCl2:6H2O	-17.45	-14.92	2.54	CoCl2:6H2O
CoCO3	-4.41	-14.39	-9.98	CoCO3
CoF2	-16.09	-17.68	-1.60	CoF2
CoF3	-48.24	-49.70	-1.46	CoF3
CoFe2O4	22.60	19.07	-3.53	CoFe2O4
CoMoO4	-9.52	-17.28	-7.76	CoMoO4
CoO	-6.94	6.64	13.59	CoO
CoS(alpha)	-72.26	-79.70	-7.44	CoS
CoS(beta)	-68.63	-79.70	-11.07	CoS
CoSe	-24.58	-40.78	-16.20	CoSe
CoSeO3	-11.65	-10.33	1.32	CoSeO3
CoSeO4:6H2O	-20.01	-21.54	-1.53	CoSeO4:6H2O
CoSO4	-15.76	-12.95	2.80	CoSO4
CoSO4:6H2O	-10.48	-12.95	-2.47	CoSO4:6H2O
Cotunnite	-12.32	-17.10	-4.78	PbCl2
Covellite	-57.08	-79.38	-22.30	CuS
Cr(OH)2	-19.54	-8.72	10.82	Cr(OH)2
Cr(OH)3	-0.46	0.88	1.34	Cr(OH)3
Cr(OH)3(am)	1.63	0.88	-0.75	Cr(OH)3
Cr2O3	4.12	1.76	-2.36	Cr2O3
CrCl2	-44.37	-30.28	14.09	CrCl2
CrCl3	-46.57	-31.46	15.11	CrCl3
CrF3	-24.27	-35.61	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-64.31	-33.83	30.48	Cr
CrO3	-25.63	-28.84	-3.21	CrO3
Cryolite	-15.96	-49.80	-33.84	Na3AlF6
Cu(OH)2	-1.71	6.96	8.67	Cu(OH)2
Cu(SbO3)2	-30.68	14.53	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-14.09	-4.84	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.68	-92.56	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-7.42	-53.22	-45.80	Cu2Se
Cu2SO4	-23.45	-25.40	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.52	-7.42	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-62.73	-105.32	-42.59	Cu3Sb
Cu3Se2	-30.19	-93.68	-63.49	Cu3Se2
CuCO3	-2.58	-14.08	-11.50	CuCO3
CuCrO4	-16.44	-21.88	-5.44	CuCrO4
CuF	-10.16	-15.06	-4.91	CuF
CuF2	-18.48	-17.37	1.12	CuF2
CuF2:2H2O	-12.82	-17.37	-4.55	CuF2:2H2O
Cumetal	-6.70	-15.45	-8.76	Cu
CuMoO4	-3.88	-16.96	-13.08	CuMoO4
CuOCuSO4	-15.98	-5.68	10.30	CuOCuSO4
Cupricferrite	13.40	19.39	5.99	CuFe2O4
Cuprite	-4.39	-5.80	-1.41	Cu2O
Cuprousferrite	12.23	3.31	-8.92	CuFeO2
CuSe	-7.36	-40.46	-33.10	CuSe
CuSe2	-29.42	-62.78	-33.37	CuSe2
CuSeO3:2H2O	-10.53	-10.02	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.78	-21.22	-2.44	CuSeO4:5H2O
CuSO4	-15.58	-12.64	2.94	CuSO4
Diaspore	-0.07	6.80	6.87	AlOOH
Djurleite	-57.38	-91.30	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.84	-17.38	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.29	-17.38	-17.09	CaMg(CO3)2
Epsomite	-5.48	-7.61	-2.13	MgSO4:7H2O
Fe(OH)2	-6.87	6.69	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.02	2.98	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.88	-14.60	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-6.11	-4.55	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.88	-38.51	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.63	-46.37	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.10	19.12	20.22	Fe3(OH)8

FeAsO4:2H2O	-8.34	-7.94	0.40	FeAsO4:2H2O
FeCr2O4	1.25	8.45	7.20	FeCr2O4
FeMoO4	-7.13	-17.23	-10.09	FeMoO4
Ferrihydrite	3.02	6.21	3.19	Fe(OH)3
Ferroselite	-44.45	-63.05	-18.60	FeSe2
FeS (ppt)	-76.70	-79.65	-2.95	FeS
FeSe	-29.73	-40.73	-11.00	FeSe
Fix_pe	-4.54	-4.54	0.00	e-
Fluorite	-1.13	-11.63	-10.50	CaF2
Galena	-67.91	-81.88	-13.97	PbS
Gibbsite	-1.49	6.80	8.29	Al(OH)3
Goethite	5.72	6.21	0.49	FeOOH
Goslarite	-8.30	-10.31	-2.01	ZnSO4:7H2O
Greenalite	-7.75	13.06	20.81	Fe3Si2O5(OH)4
Greenockite	-66.22	-80.58	-14.36	CdS
Greigite	-281.22	-326.26	-45.03	Fe3S4
Gummite	-6.96	0.71	7.67	UO3
Gypsum	-2.29	-6.90	-4.61	CaSO4:2H2O
H-Jarosite	-8.46	-20.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.04	-23.92	-12.88	H2MoO4
H2S(g)	-78.33	-86.34	-8.01	H2S
H2Se(g)	-42.46	-47.42	-4.96	H2Se
Halite	-6.92	-5.32	1.60	NaCl
Halloysite	-2.99	6.58	9.57	Al2Si2O5(OH)4
Hausmannite	-6.92	54.11	61.03	Mn3O4
Hematite	13.84	12.42	-1.42	Fe2O3
Hercynite	-2.60	20.30	22.89	FeAl2O4
Hg(CH3)2(g)	-182.88	-256.59	-73.71	Hg(CH3)2
Hg(g)	-9.34	-17.21	-7.87	Hg
Hg(OH)2	-10.21	-13.70	-3.50	Hg(OH)2
Hg2(g)	-19.47	-34.42	-14.96	Hg2
Hg2(OH)2	-14.58	-9.32	5.26	Hg2(OH)2
Hg2CO3	-14.31	-30.36	-16.05	Hg2CO3
Hg2CrO4	-29.47	-38.17	-8.70	Hg2CrO4
Hg2F2	-23.29	-33.65	-10.36	Hg2F2
Hg2S	-83.99	-95.67	-11.68	Hg2S
Hg2SeO3	-21.64	-26.30	-4.66	Hg2SeO3
Hg2SO4	-22.79	-28.92	-6.13	Hg2SO4
Hg3O2CO3	-32.46	-62.15	-29.68	Hg3O2CO3
HgCl(g)	-34.94	-15.44	19.50	HgCl
HgCl2	-14.00	-35.26	-21.26	HgCl2
HgF(g)	-49.50	-16.82	32.68	HgF
HgF2(g)	-50.60	-38.03	12.57	HgF2
Hgmetal(l)	-3.76	-17.21	-13.45	Hg
HgSe	-5.43	-61.13	-55.69	HgSe
HgSeO3	-18.25	-30.68	-12.43	HgSeO3
HgSO4	-23.88	-33.30	-9.42	HgSO4
Huntite	-5.51	-35.47	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.92	-28.69	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-15.43	-24.19	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-23.16	-28.33	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-1.70	-16.50	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.32	-49.57	-17.24	K2Cr2O7
K2CrO4	-20.21	-20.72	-0.51	K2CrO4
K2MoO4	-19.06	-15.80	3.26	K2MoO4
K2SeO4	-19.33	-20.06	-0.73	K2SeO4
Kaolinite	-0.85	6.58	7.43	Al2Si2O5(OH)4
Langite	-9.24	8.24	17.49	Cu4(OH)6SO4:H2O
Larnakite	-10.24	-10.67	-0.43	PbO:PbSO4
Laurionite	-6.94	-6.32	0.62	PbOHCl
Lepidocrocite	4.84	6.21	1.37	FeOOH
Lime	-20.00	12.70	32.70	CaO
Litharge	-8.23	4.46	12.69	PbO
Mackinawite	-76.05	-79.65	-3.60	FeS
Maghemite	6.04	12.42	6.39	Fe2O3
Magnesioferrite	7.56	24.42	16.86	Fe2MgO4
Magnesite	-1.59	-9.05	-7.46	MgCO3
Magnetite	15.72	19.12	3.40	Fe3O4

Malachite	-1.81	-7.11	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-3.12	22.22	25.34	MnOOH
Massicot	-8.43	4.46	12.89	PbO
Matlockite	-9.51	-18.48	-8.97	PbClF
Melanothallite	-20.85	-14.60	6.26	CuCl ₂
Melanterite	-10.70	-12.90	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-54.95	-100.05	-45.09	HgS
Mg(OH) ₂ (active)	-6.80	11.99	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-20.58	-9.30	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-277.81	-203.13	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.67	2.69	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-2.45	13.75	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.23	-16.85	5.38	MgCrO ₄
MgF ₂	-4.21	-12.34	-8.13	MgF ₂
MgMoO ₄	-10.08	-11.93	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-8.04	-4.99	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-14.99	-16.19	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-35.03	38.49	73.52	Pb ₃ O ₄
Mirabilite	-7.56	-8.68	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-16.53	-11.63	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-59.34	-65.05	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-150.91	-89.83	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-11.79	0.71	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-14.61	-11.89	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.85	-76.68	0.17	MnS
MnS (pnk)	-80.02	-76.68	3.34	MnS
MnSb	-96.84	-99.75	-2.91	MnSb
MnSe	-41.25	-37.75	3.50	MnSe
MnSeO ₃	-8.44	-7.31	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-8.29	-7.31	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.47	-18.52	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-12.51	-9.93	2.58	MnSO ₄
Monteponite	-9.34	5.76	15.10	CdO
Montroydite	-10.06	-13.70	-3.64	HgO
MoO ₃	-15.92	-23.92	-8.00	MoO ₃
Morenosite	-10.67	-12.81	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-151.45	-221.71	-70.26	MoS ₂
Na-Jarosite	-3.90	-15.10	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-36.87	-46.77	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.85	-17.92	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-20.32	-36.92	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-14.49	-13.00	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-14.22	-13.00	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-16.36	-6.06	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-18.54	-17.26	1.28	Na ₂ SeO ₄
Na ₃ Sb	-174.69	-80.24	94.45	Na ₃ Sb
Na ₃ VO ₄	-30.95	5.73	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-36.85	0.55	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.95	-13.68	-6.73	CuCl
NaSb	-89.22	-66.06	23.17	NaSb
Natron	-8.80	-10.12	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-9.04	-5.19	3.86	NaVO ₃
Nesquehonite	-4.38	-9.05	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-6.01	6.78	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-23.65	-7.95	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-24.46	7.54	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-7.38	-14.25	-6.87	NiCO ₃
NiMoO ₄	-5.99	-17.14	-11.14	NiMoO ₄
NiS (alpha)	-73.96	-79.56	-5.60	NiS
NiS (beta)	-68.46	-79.56	-11.10	NiS
NiS (gamma)	-66.76	-79.56	-12.80	NiS
NiSe	-22.94	-40.64	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-13.01	-10.19	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-19.88	-21.40	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-8.08	9.42	17.50	MnO ₂
O ₂ (g)	-32.89	50.20	83.09	O ₂
Orpiment	-238.67	-299.74	-61.07	As ₂ S ₃
Otavite	-3.27	-15.27	-12.00	CdCO ₃

Pb(BO ₂) ₂	-12.35	-5.83	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.69	4.46	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-72.84	-81.60	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-10.65	-1.85	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-17.26	8.92	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-27.01	34.03	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-11.55	-12.11	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-10.47	-12.37	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-20.71	-14.91	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-14.05	-7.91	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-18.67	-7.65	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-16.90	-6.21	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-22.85	-1.75	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-23.63	-1.75	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-11.78	-24.38	-12.60	PbCrO ₄
PbF ₂	-12.43	-19.87	-7.44	PbF ₂
Pbmetal	-24.89	-20.64	4.25	Pb
PbMoO ₄	-3.84	-19.46	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-8.52	4.46	12.98	PbO:0.3H ₂ O
PbSeO ₄	-16.88	-23.72	-6.84	PbSeO ₄
Periclase	-9.59	11.99	21.58	MgO
Phosgenite	-13.86	-33.67	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-20.04	29.56	49.60	PbO ₂
Portlandite	-10.11	12.70	22.80	Ca(OH) ₂
Pyrite	-122.39	-140.89	-18.51	FeS ₂
Pyrochroite	-5.53	9.67	15.19	Mn(OH) ₂
Pyrolusite	-6.61	34.77	41.38	MnO ₂
Quartz	0.49	-3.51	-4.00	SiO ₂
Realgar	-99.50	-119.25	-19.75	AsS
Retgersite	-10.77	-12.81	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	-0.79	-11.37	-10.58	MnCO ₃
Rutherfordine	-5.83	-20.33	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-14.21	-21.32	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-20.93	-17.53	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-31.38	-41.05	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-117.14	-184.90	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-67.00	-85.26	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-67.36	-85.26	-17.90	Sb ₄ O ₆
SbCl ₃	-54.22	-53.65	0.57	SbCl ₃
SbF ₃	-47.58	-57.81	-10.23	SbF ₃
Sbmetal	-47.28	-58.97	-11.69	Sb
SbO ₂	-5.25	-33.07	-27.82	SbO ₂
Schoepite	-5.28	0.71	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-15.21	-22.32	-7.11	Se
Semetal(hex)	-14.61	-22.32	-7.71	Se
Senarmontite	-30.27	-42.63	-12.37	Sb ₂ O ₃
SeO ₂	-17.10	-16.98	0.12	SeO ₂
SeO ₃	-49.23	-28.18	21.04	SeO ₃
Sepiolite	-2.31	13.45	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-5.33	13.45	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-4.10	-14.34	-10.24	FeCO ₃
SiO ₂ (am-gel)	-0.80	-3.51	-2.71	SiO ₂
SiO ₂ (am-ppt)	-0.77	-3.51	-2.74	SiO ₂
Smithsonite	-1.75	-11.75	-10.00	ZnCO ₃
Sphalerite	-65.61	-77.06	-11.45	ZnS
Spinel	-11.25	25.60	36.85	MgAl ₂ O ₄
Stibnite	-251.20	-301.66	-50.46	Sb ₂ S ₃
Sulfur	-59.10	-61.24	-2.14	S
Tenorite	-0.68	6.96	7.64	CuO
Thenardite	-9.00	-8.68	0.32	Na ₂ SO ₄
Thermonatrite	-10.75	-10.12	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-11.25	-7.17	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-16.41	4.68	21.08	U ₃ O ₈
U ₃ Sb ₄	-584.39	-432.01	152.38	U ₃ Sb ₄
U ₄ O ₉	-32.58	-35.60	-3.02	U ₄ O ₉
UF ₄	-34.29	-63.83	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-31.11	-63.83	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.11	-15.18	0.93	UO ₂

UO2(NO3)2	-48.95	-36.81	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.66	-36.81	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.20	-36.81	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.85	-36.81	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.90	0.71	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.22	-27.47	-2.25	UO2SeO4:4H2O
UO3	-6.99	0.71	7.70	UO3
Uraninite	-10.51	-15.18	-4.67	UO2
USb2	-222.11	-192.53	29.58	USb2
V(OH)3	-20.74	-13.15	7.59	V(OH)3
V2O5	-19.93	-21.29	-1.36	V2O5
V3O5	-45.82	-43.99	1.84	V3O5
V4O7	-57.47	-50.28	7.19	V4O7
V6O13	-53.22	-114.08	-60.86	V6O13
Valentinite	-34.15	-42.63	-8.48	Sb2O3
VC12	-66.13	-47.26	18.87	VC12
VC13	-68.92	-45.49	23.43	VC13
VF4	-69.88	-54.95	14.93	VF4
Vmetal	-94.83	-50.80	44.03	V
VO	-40.46	-25.70	14.76	VO
VO(OH)2	-11.45	-6.29	5.15	VO(OH)2
VO2Cl	-24.27	-21.43	2.84	VO2Cl
VOC1	-35.08	-23.93	11.15	VOC1
VOC12	-40.61	-27.85	12.76	VOC12
VOSO4	-29.50	-25.89	3.61	VOSO4
Witherite	-3.77	-12.34	-8.57	BaCO3
Wurtzite	-68.11	-77.06	-8.95	ZnS
Zincite	-2.05	9.29	11.33	ZnO
Zincosite	-14.24	-10.31	3.93	ZnSO4
Zn(BO2)2	-9.29	-1.00	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-31.55	-28.23	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.91	9.29	12.20	Zn(OH)2
Zn(OH)2(am)	-3.19	9.29	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.47	9.29	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.25	9.29	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.45	9.29	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.53	-1.03	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.40	7.79	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.09	-0.44	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.25	-11.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-10.85	17.55	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.63	24.87	38.50	Zn5(OH)8Cl2
ZnCl2	-19.32	-12.27	7.05	ZnCl2
ZnCO3:1H2O	-1.49	-11.75	-10.26	ZnCO3:1H2O
ZnF2	-14.51	-15.04	-0.53	ZnF2
Znmetal	-41.60	-15.82	25.79	Zn
ZnMoO4	-4.51	-14.63	-10.13	ZnMoO4
ZnO(active)	-1.90	9.29	11.19	ZnO
ZnS(am)	-68.01	-77.06	-9.05	ZnS
ZnSb	-85.80	-74.78	11.01	ZnSb
ZnSe	-23.74	-38.14	-14.40	ZnSe
ZnSeO4:6H2O	-17.38	-18.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.67	-10.31	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 31.

Title Evaporate Stage 1 lake water to produce initial Stage 2 Lake water
REACTION 105
H2O -1

```

1.11 moles      ## Removes x m3 water, but solute mass remains the same
USE solution 111
Save Solution 112
END

```

```

-----
TITLE
-----

```

Evaporate Stage 1 lake water to produce initial Stage 2 Lake water

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

Using solution 111. Solution after simulation 30.
Using reaction 105.

Reaction 105.

1.110e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000
Element	Relative moles
H	-2.00000
O	-1.00000

```

-----Solution composition-----

```

Elements	Molality	Moles
Ag	2.136e-10	2.093e-10
Al	1.475e-08	1.446e-08
As	7.273e-08	7.127e-08
B	7.796e-06	7.641e-06
Ba	6.964e-08	6.824e-08
C	2.298e-03	2.253e-03
Ca	7.420e-04	7.272e-04
Cd	1.068e-10	1.046e-10
Cl	1.874e-03	1.836e-03
Co	8.052e-10	7.891e-10
Cr	1.165e-07	1.141e-07
Cu	5.762e-08	5.647e-08
F	7.865e-05	7.708e-05
Fe	9.575e-07	9.384e-07
Hg	2.311e-11	2.265e-11
K	1.256e-04	1.231e-04
Mg	1.427e-04	1.399e-04
Mn	7.069e-07	6.927e-07
Mo	1.768e-08	1.732e-08
N	6.741e-08	6.607e-08
Na	3.155e-03	3.092e-03
Ni	1.253e-09	1.228e-09
Pb	1.025e-10	1.005e-10
S	4.092e-04	4.010e-04
Sb	2.913e-10	2.854e-10
Se	1.836e-09	1.799e-09
Si	3.191e-04	3.127e-04
U	1.272e-08	1.247e-08
V	1.716e-10	1.682e-10
Zn	4.203e-07	4.119e-07

-----Description of solution-----

```

                                pH = 8.006      Charge balance
                                pe = 4.545      Adjusted to redox
equilibrium
      Activity of water = 1.000
      Ionic strength (mol/kgw) = 6.138e-03
      Mass of water (kg) = 9.800e-01
      Total alkalinity (eq/kg) = 2.283e-03
      Total CO2 (mol/kg) = 2.298e-03
      Temperature (°C) = 25.00
      Electrical balance (eq) = 7.817e-09
      Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
      Iterations = 3
      Total H = 1.087988e+02
      Total O = 5.440725e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.111e-06	1.021e-06	-5.954	-5.991	-0.037	(0)
H+	1.071e-08	9.860e-09	-7.970	-8.006	-0.036	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.136e-10					
AgCl	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
Ag+	4.469e-11	4.113e-11	-10.350	-10.386	-0.036	(0)
AgCl2-	2.383e-11	2.174e-11	-10.623	-10.663	-0.040	(0)
AgSO4-	2.387e-13	2.177e-13	-12.622	-12.662	-0.040	(0)
AgCl3-2	4.826e-14	3.340e-14	-13.316	-13.476	-0.160	(0)
AgF	7.345e-15	7.345e-15	-14.134	-14.134	0.000	(0)
AgOH	4.199e-15	4.199e-15	-14.377	-14.377	0.000	(0)
AgNO2	4.573e-16	4.573e-16	-15.340	-15.340	0.000	(0)
AgH2BO3	2.810e-16	2.810e-16	-15.551	-15.551	0.000	(0)
AgCl4-3	2.691e-16	1.176e-16	-15.570	-15.930	-0.360	(0)
AgNH3+	4.362e-17	3.978e-17	-16.360	-16.400	-0.040	(0)
AgSeO3-	1.278e-17	1.166e-17	-16.893	-16.933	-0.040	(0)
Ag2Se	5.451e-18	5.451e-18	-17.264	-17.264	0.000	(0)
Ag (OH) 2-	4.594e-19	4.190e-19	-18.338	-18.378	-0.040	(0)
AgNO3	5.924e-22	5.924e-22	-21.227	-21.227	0.000	(0)
Ag (NH3) 2+	1.680e-22	1.532e-22	-21.775	-21.815	-0.040	(0)
Ag (NO2) 2-	4.132e-23	3.769e-23	-22.384	-22.424	-0.040	(0)
Ag (SeO3) 2-3	1.054e-25	4.603e-26	-24.977	-25.337	-0.360	(0)
Ag2MoO4	8.114e-30	8.114e-30	-29.091	-29.091	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.904	-74.904	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.055	-85.694	-0.639	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.498	-148.613	-0.115	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.096	-149.136	-0.040	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.817	-150.047	-0.230	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.136	-150.358	-0.222	(0)
Al	1.475e-08					
Al (OH) 4-	1.464e-08	1.348e-08	-7.834	-7.870	-0.036	(0)
Al (OH) 3	1.049e-10	1.049e-10	-9.979	-9.979	0.000	(0)
Al (OH) 2+	5.582e-12	5.149e-12	-11.253	-11.288	-0.035	(0)
AlF2+	1.357e-13	1.251e-13	-12.868	-12.903	-0.035	(0)
AlF3	1.120e-13	1.120e-13	-12.951	-12.951	0.000	(0)
AlOH+2	8.769e-15	6.348e-15	-14.057	-14.197	-0.140	(0)
AlF+2	6.106e-15	4.420e-15	-14.214	-14.355	-0.140	(0)
AlF4-	4.335e-15	3.991e-15	-14.363	-14.399	-0.036	(0)
AlSO4+	1.390e-17	1.280e-17	-16.857	-16.893	-0.036	(0)
Al+3	1.314e-17	6.217e-18	-16.881	-17.206	-0.325	(0)
Al (SO4) 2-	3.952e-20	3.639e-20	-19.403	-19.439	-0.036	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.274	-57.633	-0.360	(0)
As (3)	4.791e-21					
H3AsO3	4.532e-21	4.532e-21	-20.344	-20.344	0.000	(0)
H2AsO3-	2.585e-22	2.357e-22	-21.588	-21.628	-0.040	(0)
HAsO3-2	3.151e-26	2.180e-26	-25.502	-25.661	-0.160	(0)

	H4AsO3+	2.427e-29	2.214e-29	-28.615	-28.655	-0.040	(0)
	AsO3-3	1.951e-31	8.525e-32	-30.710	-31.069	-0.360	(0)
As (5)	7.273e-08						
	HAsO4-2	6.805e-08	4.710e-08	-7.167	-7.327	-0.160	(0)
	H2AsO4-	4.643e-09	4.235e-09	-8.333	-8.373	-0.040	(0)
	AsO4-3	3.457e-11	1.510e-11	-10.461	-10.821	-0.360	(0)
	H3AsO4	7.246e-15	7.256e-15	-14.140	-14.139	0.001	(0)
B	7.796e-06						
	H3BO3	7.309e-06	7.320e-06	-5.136	-5.136	0.001	(0)
	H2BO3-	4.701e-07	4.311e-07	-6.328	-6.365	-0.038	(0)
	CaH2BO3+	1.327e-08	1.217e-08	-7.877	-7.915	-0.038	(0)
	NaH2BO3	1.979e-09	1.979e-09	-8.704	-8.704	0.000	(0)
	MgH2BO3+	1.569e-09	1.439e-09	-8.804	-8.842	-0.038	(0)
	BF(OH) 3-	2.264e-10	2.077e-10	-9.645	-9.683	-0.038	(0)
	H5(BO3) 2-	2.928e-12	2.686e-12	-11.533	-11.571	-0.038	(0)
	BaH2BO3+	7.120e-13	6.531e-13	-12.147	-12.185	-0.038	(0)
	BF2(OH) 2-	1.697e-14	1.557e-14	-13.770	-13.808	-0.038	(0)
	H8(BO3) 3-	2.144e-15	1.966e-15	-14.669	-14.706	-0.038	(0)
	AgH2BO3	2.810e-16	2.810e-16	-15.551	-15.551	0.000	(0)
	BF3OH-	4.630e-21	4.247e-21	-20.334	-20.372	-0.038	(0)
	BF4-	1.597e-26	1.465e-26	-25.797	-25.834	-0.038	(0)
Ba	6.964e-08						
	Ba+2	6.836e-08	4.902e-08	-7.165	-7.310	-0.144	(0)
	BaHCO3+	1.031e-09	9.521e-10	-8.987	-9.021	-0.035	(0)
	BaCO3	2.431e-10	2.431e-10	-9.614	-9.614	0.000	(0)
	BaH2BO3+	7.120e-13	6.531e-13	-12.147	-12.185	-0.038	(0)
	BaOH+	2.370e-13	2.185e-13	-12.625	-12.661	-0.035	(0)
	BaNH3+2	2.117e-17	1.465e-17	-16.674	-16.834	-0.160	(0)
	BaNO3+	4.884e-18	4.455e-18	-17.311	-17.351	-0.040	(0)
C (4)	2.298e-03						
	HCO3-	2.205e-03	2.034e-03	-2.657	-2.692	-0.035	(0)
	H2CO3	4.511e-05	4.511e-05	-4.346	-4.346	0.000	(0)
	CaHCO3+	2.012e-05	1.858e-05	-4.696	-4.731	-0.035	(0)
	CO3-2	1.349e-05	9.671e-06	-4.870	-5.015	-0.144	(0)
	CaCO3	7.519e-06	7.519e-06	-5.124	-5.124	0.000	(0)
	NaHCO3	3.312e-06	3.312e-06	-5.480	-5.480	0.000	(0)
	MgHCO3+	2.178e-06	2.003e-06	-5.662	-5.698	-0.036	(0)
	MgCO3	7.743e-07	7.743e-07	-6.111	-6.111	0.000	(0)
	NaCO3-	5.654e-07	5.215e-07	-6.248	-6.283	-0.035	(0)
	ZnCO3	1.053e-07	1.053e-07	-6.977	-6.977	0.000	(0)
	CuCO3	5.054e-08	5.054e-08	-7.296	-7.296	0.000	(0)
	MnHCO3+	2.015e-08	1.858e-08	-7.696	-7.731	-0.035	(0)
	ZnHCO3+	1.335e-08	1.217e-08	-7.875	-7.915	-0.040	(0)
	UO2(CO3) 3-4	7.544e-09	1.731e-09	-8.122	-8.762	-0.639	(0)
	UO2(CO3) 2-2	5.160e-09	3.571e-09	-8.287	-8.447	-0.160	(0)
	Cu(CO3) 2-2	1.901e-09	1.316e-09	-8.721	-8.881	-0.160	(0)
	BaHCO3+	1.031e-09	9.521e-10	-8.987	-9.021	-0.035	(0)
	BaCO3	2.431e-10	2.431e-10	-9.614	-9.614	0.000	(0)
	NiCO3	2.147e-10	2.147e-10	-9.668	-9.668	0.000	(0)
	NiHCO3+	1.636e-10	1.492e-10	-9.786	-9.826	-0.040	(0)
	CuHCO3+	1.249e-10	1.139e-10	-9.904	-9.943	-0.040	(0)
	PbCO3	8.191e-11	8.191e-11	-10.087	-10.087	0.000	(0)
	CoHCO3+	7.478e-11	6.821e-11	-10.126	-10.166	-0.040	(0)
	CoCO3	7.048e-11	7.048e-11	-10.152	-10.152	0.000	(0)
	UO2CO3	1.851e-11	1.851e-11	-10.733	-10.733	0.000	(0)
	FeHCO3+	1.355e-11	1.251e-11	-10.868	-10.903	-0.035	(0)
	CdCO3	1.249e-11	1.249e-11	-10.903	-10.903	0.000	(0)
	PbHCO3+	4.668e-12	4.258e-12	-11.331	-11.371	-0.040	(0)
	Pb(CO3) 2-2	3.301e-12	2.285e-12	-11.481	-11.641	-0.160	(0)
	CdHCO3+	2.877e-13	2.624e-13	-12.541	-12.581	-0.040	(0)
	Cd(CO3) 2-2	1.294e-13	8.956e-14	-12.888	-13.048	-0.160	(0)
	HgCO3	3.563e-17	3.563e-17	-16.448	-16.448	0.000	(0)
	Hg(CO3) 2-2	1.574e-18	1.090e-18	-17.803	-17.963	-0.160	(0)
	HgHCO3+	7.172e-21	6.541e-21	-20.144	-20.184	-0.040	(0)
Ca	7.420e-04						
	Ca+2	6.841e-04	4.905e-04	-3.165	-3.309	-0.144	(0)
	CaSO4	2.981e-05	2.981e-05	-4.526	-4.526	0.000	(0)
	CaHCO3+	2.012e-05	1.858e-05	-4.696	-4.731	-0.035	(0)

	CaCO3	7.519e-06	7.519e-06	-5.124	-5.124	0.000	(0)
	CaF+	4.130e-07	3.807e-07	-6.384	-6.419	-0.035	(0)
	CaH2BO3+	1.327e-08	1.217e-08	-7.877	-7.915	-0.038	(0)
	CaOH+	1.082e-08	9.994e-09	-7.966	-8.000	-0.035	(0)
	CaNH3+2	4.227e-13	2.926e-13	-12.374	-12.534	-0.160	(0)
	CaNO3+	3.084e-14	2.813e-14	-13.511	-13.551	-0.040	(0)
	Ca (NH3) 2+2	7.973e-23	5.518e-23	-22.098	-22.258	-0.160	(0)
Cd		1.068e-10					
	Cd+2	7.903e-11	5.667e-11	-10.102	-10.247	-0.144	(0)
	CdCO3	1.249e-11	1.249e-11	-10.903	-10.903	0.000	(0)
	CdCl+	1.023e-11	9.330e-12	-10.990	-11.030	-0.040	(0)
	CdSO4	3.524e-12	3.524e-12	-11.453	-11.453	0.000	(0)
	CdOH+	5.039e-13	4.596e-13	-12.298	-12.338	-0.040	(0)
	CdOHC1	3.908e-13	3.908e-13	-12.408	-12.408	0.000	(0)
	CdHCO3+	2.877e-13	2.624e-13	-12.541	-12.581	-0.040	(0)
	Cd (CO3) 2-2	1.294e-13	8.956e-14	-12.888	-13.048	-0.160	(0)
	CdF+	7.002e-14	6.386e-14	-13.155	-13.195	-0.040	(0)
	CdCl2	6.706e-14	6.706e-14	-13.174	-13.174	0.000	(0)
	Cd (SO4) 2-2	1.822e-14	1.261e-14	-13.739	-13.899	-0.160	(0)
	Cd (OH) 2	2.961e-15	2.961e-15	-14.529	-14.529	0.000	(0)
	CdCl3-	7.997e-17	7.294e-17	-16.097	-16.137	-0.040	(0)
	CdF2	9.060e-18	9.060e-18	-17.043	-17.043	0.000	(0)
	Cd (OH) 3-	2.025e-19	1.847e-19	-18.694	-18.733	-0.040	(0)
	CdSeO4	7.282e-21	7.282e-21	-20.138	-20.138	0.000	(0)
	CdNO3+	3.563e-21	3.250e-21	-20.448	-20.488	-0.040	(0)
	Cd2OH+3	2.988e-22	1.305e-22	-21.525	-21.884	-0.360	(0)
	Cd (SeO3) 2-2	1.313e-23	9.085e-24	-22.882	-23.042	-0.160	(0)
	Cd (OH) 4-2	4.461e-26	3.087e-26	-25.351	-25.510	-0.160	(0)
	Cd (NO3) 2	2.953e-32	2.953e-32	-31.530	-31.530	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-80.531	-80.571	-0.040	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.699	-151.699	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.091	-228.131	-0.040	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.107	-304.267	-0.160	(0)
Cl		1.874e-03					
	Cl-	1.874e-03	1.724e-03	-2.727	-2.763	-0.036	(0)
	ZnOHC1	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
	MnCl+	1.078e-09	9.934e-10	-8.967	-9.003	-0.035	(0)
	ZnCl+	8.910e-10	8.197e-10	-9.050	-9.086	-0.036	(0)
	AgCl	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
	CuCl	2.689e-11	2.689e-11	-10.570	-10.570	0.000	(0)
	AgCl2-	2.383e-11	2.174e-11	-10.623	-10.663	-0.040	(0)
	CuCl2-	1.053e-11	9.686e-12	-10.978	-11.014	-0.036	(0)
	CdCl+	1.023e-11	9.330e-12	-10.990	-11.030	-0.040	(0)
	NiCl+	2.877e-12	2.624e-12	-11.541	-11.581	-0.040	(0)
	CoCl+	2.819e-12	2.571e-12	-11.550	-11.590	-0.040	(0)
	CuCl+	2.636e-12	2.425e-12	-11.579	-11.615	-0.036	(0)
	MnCl2	2.419e-12	2.419e-12	-11.616	-11.616	0.000	(0)
	ZnCl2	2.240e-12	2.240e-12	-11.650	-11.650	0.000	(0)
	CdOHC1	3.908e-13	3.908e-13	-12.408	-12.408	0.000	(0)
	PbCl+	1.889e-13	1.723e-13	-12.724	-12.764	-0.040	(0)
	CdCl2	6.706e-14	6.706e-14	-13.174	-13.174	0.000	(0)
	AgCl3-2	4.826e-14	3.340e-14	-13.316	-13.476	-0.160	(0)
	HgClOH	9.570e-15	9.570e-15	-14.019	-14.019	0.000	(0)
	CuCl3-2	4.946e-15	3.570e-15	-14.306	-14.447	-0.142	(0)
	ZnCl3-	3.334e-15	3.067e-15	-14.477	-14.513	-0.036	(0)
	CuCl2	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
	PbCl2	1.327e-15	1.327e-15	-14.877	-14.877	0.000	(0)
	MnCl3-	1.246e-15	1.149e-15	-14.904	-14.940	-0.035	(0)
	HgCl2	9.150e-16	9.150e-16	-15.039	-15.039	0.000	(0)
	AgCl4-3	2.691e-16	1.176e-16	-15.570	-15.930	-0.360	(0)
	CrCl+2	8.846e-17	6.122e-17	-16.053	-16.213	-0.160	(0)
	CdCl3-	7.997e-17	7.294e-17	-16.097	-16.137	-0.040	(0)
	NiCl2	2.278e-17	2.278e-17	-16.642	-16.642	0.000	(0)
	HgCl3-	1.729e-17	1.577e-17	-16.762	-16.802	-0.040	(0)
	ZnCl4-2	3.663e-18	2.644e-18	-17.436	-17.578	-0.142	(0)
	CrOHC12	2.048e-18	2.048e-18	-17.689	-17.689	0.000	(0)
	UO2Cl+	1.473e-18	1.344e-18	-17.832	-17.872	-0.040	(0)
	PbCl3-	9.987e-19	9.109e-19	-18.001	-18.041	-0.040	(0)

HgCl4-2	1.564e-19	1.083e-19	-18.806	-18.966	-0.160	(0)
HgCl+	1.161e-19	1.059e-19	-18.935	-18.975	-0.040	(0)
FeCl+2	1.149e-19	8.292e-20	-18.940	-19.081	-0.142	(0)
CuCl3-	2.535e-20	2.332e-20	-19.596	-19.632	-0.036	(0)
CrCl2+	1.098e-20	1.001e-20	-19.959	-19.999	-0.040	(0)
PbCl4-2	1.037e-21	7.178e-22	-20.984	-21.144	-0.160	(0)
FeCl2+	6.928e-22	6.386e-22	-21.159	-21.195	-0.035	(0)
CrO3Cl-	5.631e-25	5.136e-25	-24.249	-24.289	-0.040	(0)
CuCl4-2	2.792e-25	2.015e-25	-24.554	-24.696	-0.142	(0)
VOCl+	2.672e-25	2.437e-25	-24.573	-24.613	-0.040	(0)
FeCl3	1.101e-25	1.101e-25	-24.958	-24.958	0.000	(0)
CoCl+2	3.052e-38	2.112e-38	-37.515	-37.675	-0.160	(0)
UCl+3	0.000e+00	0.000e+00	-47.921	-48.280	-0.360	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.010	-58.170	-0.160	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.184	-58.344	-0.160	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.224	-74.384	-0.160	(0)
Co (2)	8.052e-10					
Co+2	6.229e-10	4.311e-10	-9.206	-9.365	-0.160	(0)
CoHCO3+	7.478e-11	6.821e-11	-10.126	-10.166	-0.040	(0)
CoCO3	7.048e-11	7.048e-11	-10.152	-10.152	0.000	(0)
CoSO4	2.282e-11	2.282e-11	-10.642	-10.642	0.000	(0)
CoOH+	9.629e-12	8.783e-12	-11.016	-11.056	-0.040	(0)
CoCl+	2.819e-12	2.571e-12	-11.550	-11.590	-0.040	(0)
CoF+	1.063e-12	9.693e-13	-11.974	-12.014	-0.040	(0)
Co (OH) 2	7.123e-13	7.123e-13	-12.147	-12.147	0.000	(0)
CoNO2+	1.772e-16	1.617e-16	-15.751	-15.791	-0.040	(0)
Co (NH3) +2	3.548e-17	2.455e-17	-16.450	-16.610	-0.160	(0)
Co (OH) 3-	1.591e-17	1.451e-17	-16.798	-16.838	-0.040	(0)
CoOOH-	3.993e-18	3.642e-18	-17.399	-17.439	-0.040	(0)
CoSeO4	1.491e-19	1.491e-19	-18.827	-18.827	0.000	(0)
CoNO3+	1.358e-20	1.239e-20	-19.867	-19.907	-0.040	(0)
Co2OH+3	4.343e-22	1.898e-22	-21.362	-21.722	-0.360	(0)
Co (OH) 4-2	3.393e-24	2.349e-24	-23.469	-23.629	-0.160	(0)
Co (NH3) 2+2	7.170e-25	4.963e-25	-24.144	-24.304	-0.160	(0)
Co (NO3) 2	4.571e-31	4.571e-31	-30.340	-30.340	0.000	(0)
Co (NH3) 3+2	4.277e-33	2.960e-33	-32.369	-32.529	-0.160	(0)
Co4 (OH) 4+4	5.174e-36	1.187e-36	-35.286	-35.925	-0.639	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.973	-41.133	-0.160	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.078	-50.238	-0.160	(0)
Co (3)	4.514e-31					
CoOH+2	4.514e-31	3.124e-31	-30.345	-30.505	-0.160	(0)
Co+3	1.273e-37	6.021e-38	-36.895	-37.220	-0.325	(0)
CoCl+2	3.052e-38	2.112e-38	-37.515	-37.675	-0.160	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.184	-58.344	-0.160	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.232	-70.272	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.252	-73.412	-0.160	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.224	-74.384	-0.160	(0)
Cr (2)	2.699e-25					
Cr+2	2.699e-25	1.868e-25	-24.569	-24.729	-0.160	(0)
Cr (3)	1.165e-07					
Cr (OH) 2+	8.349e-08	7.615e-08	-7.078	-7.118	-0.040	(0)
Cr (OH) 3	2.921e-08	2.921e-08	-7.534	-7.534	0.000	(0)
CrO2-	1.543e-09	1.407e-09	-8.812	-8.852	-0.040	(0)
Cr (OH) 4-	1.302e-09	1.187e-09	-8.885	-8.925	-0.040	(0)
Cr (OH) +2	8.856e-10	6.129e-10	-9.053	-9.213	-0.160	(0)
CrOHSO4	3.859e-11	3.859e-11	-10.414	-10.414	0.000	(0)
CrF+2	4.468e-13	3.092e-13	-12.350	-12.510	-0.160	(0)
Cr+3	6.280e-14	2.744e-14	-13.202	-13.562	-0.360	(0)
CrSO4+	1.863e-14	1.700e-14	-13.730	-13.770	-0.040	(0)
CrCl+2	8.846e-17	6.122e-17	-16.053	-16.213	-0.160	(0)
Cr2 (OH) 2SO4+2	3.089e-18	2.138e-18	-17.510	-17.670	-0.160	(0)
CrOHC12	2.048e-18	2.048e-18	-17.689	-17.689	0.000	(0)
Cr2 (OH) 2 (SO4) 2	3.369e-20	3.369e-20	-19.473	-19.473	0.000	(0)
CrCl2+	1.098e-20	1.001e-20	-19.959	-19.999	-0.040	(0)
CrNO3+2	3.142e-26	2.175e-26	-25.503	-25.663	-0.160	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.643	-45.802	-0.160	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.149	-56.508	-0.360	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.010	-58.170	-0.160	(0)

Cr (6)	2.177e-13					
CrO4-2	2.100e-13	1.505e-13	-12.678	-12.822	-0.144	(0)
HCrO4-	5.266e-15	4.803e-15	-14.279	-14.318	-0.040	(0)
NaCrO4-	2.375e-15	2.166e-15	-14.624	-14.664	-0.040	(0)
KCrO4-	7.073e-17	6.451e-17	-16.150	-16.190	-0.040	(0)
H2CrO4	3.839e-23	3.839e-23	-22.416	-22.416	0.000	(0)
CrO3SO4-2	5.530e-24	3.827e-24	-23.257	-23.417	-0.160	(0)
CrO3Cl-	5.631e-25	5.136e-25	-24.249	-24.289	-0.040	(0)
Cr2O7-2	1.156e-27	8.001e-28	-26.937	-27.097	-0.160	(0)
Cu (1)	5.101e-11					
CuCl	2.689e-11	2.689e-11	-10.570	-10.570	0.000	(0)
Cu+	1.358e-11	1.239e-11	-10.867	-10.907	-0.040	(0)
CuCl2-	1.053e-11	9.686e-12	-10.978	-11.014	-0.036	(0)
CuCl3-2	4.946e-15	3.570e-15	-14.306	-14.447	-0.142	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.943	-148.169	-0.226	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.680	-148.899	-0.219	(0)
Cu (2)	5.757e-08					
CuCO3	5.054e-08	5.054e-08	-7.296	-7.296	0.000	(0)
CuOH+	3.115e-09	2.866e-09	-8.507	-8.543	-0.036	(0)
Cu (CO3) 2-2	1.901e-09	1.316e-09	-8.721	-8.881	-0.160	(0)
Cu+2	1.238e-09	8.875e-10	-8.907	-9.052	-0.144	(0)
Cu (OH) 2	5.838e-10	5.838e-10	-9.234	-9.234	0.000	(0)
CuHCO3+	1.249e-10	1.139e-10	-9.904	-9.943	-0.040	(0)
CuSO4	5.394e-11	5.394e-11	-10.268	-10.268	0.000	(0)
CuF+	4.365e-12	3.982e-12	-11.360	-11.400	-0.040	(0)
CuCl+	2.636e-12	2.425e-12	-11.579	-11.615	-0.036	(0)
Cu (OH) 3-	1.341e-12	1.223e-12	-11.873	-11.913	-0.040	(0)
Cu2 (OH) 2+2	2.981e-13	2.063e-13	-12.526	-12.686	-0.160	(0)
CuNH3+2	6.217e-15	4.303e-15	-14.206	-14.366	-0.160	(0)
CuNO2+	5.422e-15	4.946e-15	-14.266	-14.306	-0.040	(0)
CuCl2	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
Cu (OH) 4-2	1.420e-17	9.827e-18	-16.848	-17.008	-0.160	(0)
CuNO3+	5.580e-20	5.089e-20	-19.253	-19.293	-0.040	(0)
CuCl3-	2.535e-20	2.332e-20	-19.596	-19.632	-0.036	(0)
Cu (NO2) 2	2.693e-21	2.693e-21	-20.570	-20.570	0.000	(0)
CuCl4-2	2.792e-25	2.015e-25	-24.554	-24.696	-0.142	(0)
Cu (NO3) 2	1.162e-31	1.162e-31	-30.935	-30.935	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.109	-218.149	-0.040	(0)
F	7.865e-05					
F-	7.727e-05	7.110e-05	-4.112	-4.148	-0.036	(0)
MgF+	8.339e-07	7.679e-07	-6.079	-6.115	-0.036	(0)
CaF+	4.130e-07	3.807e-07	-6.384	-6.419	-0.035	(0)
NaF	1.299e-07	1.299e-07	-6.886	-6.886	0.000	(0)
MnF+	1.406e-09	1.296e-09	-8.852	-8.888	-0.035	(0)
HF	1.037e-09	1.037e-09	-8.984	-8.984	0.000	(0)
ZnF+	2.944e-10	2.685e-10	-9.531	-9.571	-0.040	(0)
BF (OH) 3-	2.264e-10	2.077e-10	-9.645	-9.683	-0.038	(0)
CuF+	4.365e-12	3.982e-12	-11.360	-11.400	-0.040	(0)
NiF+	1.165e-12	1.063e-12	-11.934	-11.974	-0.040	(0)
CoF+	1.063e-12	9.693e-13	-11.974	-12.014	-0.040	(0)
CrF+2	4.468e-13	3.092e-13	-12.350	-12.510	-0.160	(0)
HF2-	3.050e-13	2.803e-13	-12.516	-12.552	-0.037	(0)
AlF2+	1.357e-13	1.251e-13	-12.868	-12.903	-0.035	(0)
AlF3	1.120e-13	1.120e-13	-12.951	-12.951	0.000	(0)
CdF+	7.002e-14	6.386e-14	-13.155	-13.195	-0.040	(0)
BF2 (OH) 2-	1.697e-14	1.557e-14	-13.770	-13.808	-0.038	(0)
PbF+	1.548e-14	1.412e-14	-13.810	-13.850	-0.040	(0)
AgF	7.345e-15	7.345e-15	-14.134	-14.134	0.000	(0)
AlF+2	6.106e-15	4.420e-15	-14.214	-14.355	-0.140	(0)
UO2F+	5.172e-15	4.717e-15	-14.286	-14.326	-0.040	(0)
AlF4-	4.335e-15	3.991e-15	-14.363	-14.399	-0.036	(0)
UO2F2	9.674e-16	9.674e-16	-15.014	-15.014	0.000	(0)
FeF2+	2.563e-16	2.363e-16	-15.591	-15.627	-0.035	(0)
FeF+2	1.720e-16	1.242e-16	-15.764	-15.906	-0.142	(0)
FeF3	2.370e-17	2.370e-17	-16.625	-16.625	0.000	(0)
PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
UO2F3-	1.894e-17	1.728e-17	-16.723	-16.763	-0.040	(0)
CdF2	9.060e-18	9.060e-18	-17.043	-17.043	0.000	(0)

H2F2	2.881e-18	2.881e-18	-17.540	-17.540	0.000	(0)
VO2F	2.835e-20	2.835e-20	-19.547	-19.547	0.000	(0)
UO2F4-2	1.410e-20	9.759e-21	-19.851	-20.011	-0.160	(0)
BF3OH-	4.630e-21	4.247e-21	-20.334	-20.372	-0.038	(0)
PbF3-	2.921e-21	2.664e-21	-20.535	-20.574	-0.040	(0)
VO2F2-	8.024e-22	7.319e-22	-21.096	-21.136	-0.040	(0)
VOF+	2.356e-23	2.149e-23	-22.628	-22.668	-0.040	(0)
VO2F3-2	9.379e-25	6.491e-25	-24.028	-24.188	-0.160	(0)
VOF2	5.730e-25	5.730e-25	-24.242	-24.242	0.000	(0)
PbF4-2	1.310e-25	9.066e-26	-24.883	-25.043	-0.160	(0)
BF4-	1.597e-26	1.465e-26	-25.797	-25.834	-0.038	(0)
HgF+	8.895e-27	8.113e-27	-26.051	-26.091	-0.040	(0)
VOF3-	1.585e-27	1.445e-27	-26.800	-26.840	-0.040	(0)
Sb(OH) 2F	5.405e-28	5.405e-28	-27.267	-27.267	0.000	(0)
SbOF	5.316e-28	5.316e-28	-27.274	-27.274	0.000	(0)
VO2F4-3	5.198e-29	2.271e-29	-28.284	-28.644	-0.360	(0)
SiF6-2	8.060e-31	5.817e-31	-30.094	-30.235	-0.142	(0)
VOF4-2	5.994e-31	4.149e-31	-30.222	-30.382	-0.160	(0)
UF3+	9.524e-39	8.687e-39	-38.021	-38.061	-0.040	(0)
UF2+2	1.114e-39	7.709e-40	-38.953	-39.113	-0.160	(0)
UF4	0.000e+00	0.000e+00	-40.169	-40.169	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.705	-42.065	-0.360	(0)
UF5-	0.000e+00	0.000e+00	-42.679	-42.719	-0.040	(0)
UF6-2	0.000e+00	0.000e+00	-44.228	-44.387	-0.160	(0)
Fe (2)	7.730e-10					
Fe+2	7.061e-10	4.887e-10	-9.151	-9.311	-0.160	(0)
FeSO4	3.182e-11	3.182e-11	-10.497	-10.497	0.000	(0)
FeOH+	2.155e-11	1.986e-11	-10.667	-10.702	-0.035	(0)
FeHCO3+	1.355e-11	1.251e-11	-10.868	-10.903	-0.035	(0)
Fe (OH) 2	1.611e-14	1.611e-14	-13.793	-13.793	0.000	(0)
Fe (OH) 3-	5.644e-15	5.202e-15	-14.248	-14.284	-0.035	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.025	-157.025	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.280	-233.320	-0.040	(0)
Fe (3)	9.568e-07					
Fe (OH) 3	4.574e-07	4.574e-07	-6.340	-6.340	0.000	(0)
Fe (OH) 2+	4.522e-07	4.171e-07	-6.345	-6.380	-0.035	(0)
Fe (OH) 4-	4.715e-08	4.349e-08	-7.327	-7.362	-0.035	(0)
FeOH+2	1.455e-12	1.050e-12	-11.837	-11.979	-0.142	(0)
FeF2+	2.563e-16	2.363e-16	-15.591	-15.627	-0.035	(0)
FeF+2	1.720e-16	1.242e-16	-15.764	-15.906	-0.142	(0)
FeF3	2.370e-17	2.370e-17	-16.625	-16.625	0.000	(0)
FeSO4+	5.143e-18	4.741e-18	-17.289	-17.324	-0.035	(0)
Fe+3	3.366e-18	1.593e-18	-17.473	-17.798	-0.325	(0)
FeCl+2	1.149e-19	8.292e-20	-18.940	-19.081	-0.142	(0)
Fe (SO4) 2-	2.948e-20	2.689e-20	-19.530	-19.570	-0.040	(0)
FeCl2+	6.928e-22	6.386e-22	-21.159	-21.195	-0.035	(0)
Fe2 (OH) 2+4	1.591e-22	3.651e-23	-21.798	-22.438	-0.639	(0)
FeHSeO3+2	6.642e-24	4.597e-24	-23.178	-23.338	-0.160	(0)
FeCl3	1.101e-25	1.101e-25	-24.958	-24.958	0.000	(0)
Fe3 (OH) 4+5	2.196e-27	2.201e-28	-26.658	-27.657	-0.999	(0)
FeNO3+2	4.173e-28	2.888e-28	-27.380	-27.539	-0.160	(0)
H (0)	1.117e-28					
H2	5.583e-29	5.591e-29	-28.253	-28.252	0.001	(0)
Hg (0)	2.308e-11					
Hg	2.308e-11	2.308e-11	-10.637	-10.637	0.000	(0)
Hg (1)	1.394e-25					
Hg2+2	6.970e-26	4.824e-26	-25.157	-25.317	-0.160	(0)
Hg (2)	3.076e-14					
Hg (OH) 2	2.022e-14	2.025e-14	-13.694	-13.694	0.001	(0)
HgClOH	9.570e-15	9.570e-15	-14.019	-14.019	0.000	(0)
HgCl2	9.150e-16	9.150e-16	-15.039	-15.039	0.000	(0)
HgCO3	3.563e-17	3.563e-17	-16.448	-16.448	0.000	(0)
HgCl3-	1.729e-17	1.577e-17	-16.762	-16.802	-0.040	(0)
Hg (CO3) 2-2	1.574e-18	1.090e-18	-17.803	-17.963	-0.160	(0)
HgCl4-2	1.564e-19	1.083e-19	-18.806	-18.966	-0.160	(0)
HgOH+	1.372e-19	1.251e-19	-18.863	-18.903	-0.040	(0)
HgCl+	1.161e-19	1.059e-19	-18.935	-18.975	-0.040	(0)
HgHCO3+	7.172e-21	6.541e-21	-20.144	-20.184	-0.040	(0)

	Hg (OH) 3-	2.854e-21	2.603e-21	-20.545	-20.585	-0.040	(0)
	Hg+2	4.448e-24	3.078e-24	-23.352	-23.512	-0.160	(0)
	HgNH3+2	1.330e-24	9.202e-25	-23.876	-24.036	-0.160	(0)
	Hg (NH3) 2+2	6.299e-25	4.360e-25	-24.201	-24.361	-0.160	(0)
	HgSO4	2.138e-25	2.138e-25	-24.670	-24.670	0.000	(0)
	HgF+	8.895e-27	8.113e-27	-26.051	-26.091	-0.040	(0)
	Hg (NH3) 3+2	1.188e-33	8.223e-34	-32.925	-33.085	-0.160	(0)
	HgNO3+	2.260e-35	2.061e-35	-34.646	-34.686	-0.040	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.350	-41.509	-0.160	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.809	-45.809	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-140.202	-140.242	-0.040	(0)
	HgS2-2	0.000e+00	0.000e+00	-140.784	-140.944	-0.160	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.854	-141.854	0.000	(0)
K	1.256e-04						
	K+	1.253e-04	1.153e-04	-3.902	-3.938	-0.036	(0)
	KSO4-	2.348e-07	2.166e-07	-6.629	-6.664	-0.035	(0)
	KCrO4-	7.073e-17	6.451e-17	-16.150	-16.190	-0.040	(0)
Mg	1.427e-04						
	Mg+2	1.342e-04	9.626e-05	-3.872	-4.017	-0.144	(0)
	MgSO4	4.647e-06	4.647e-06	-5.333	-5.333	0.000	(0)
	MgHCO3+	2.178e-06	2.003e-06	-5.662	-5.698	-0.036	(0)
	MgF+	8.339e-07	7.679e-07	-6.079	-6.115	-0.036	(0)
	MgCO3	7.743e-07	7.743e-07	-6.111	-6.111	0.000	(0)
	MgOH+	4.234e-08	3.913e-08	-7.373	-7.408	-0.034	(0)
	MgH2BO3+	1.569e-09	1.439e-09	-8.804	-8.842	-0.038	(0)
Mn (2)	7.069e-07						
	Mn+2	6.614e-07	4.577e-07	-6.180	-6.339	-0.160	(0)
	MnSO4	2.159e-08	2.159e-08	-7.666	-7.666	0.000	(0)
	MnHCO3+	2.015e-08	1.858e-08	-7.696	-7.731	-0.035	(0)
	MnF+	1.406e-09	1.296e-09	-8.852	-8.888	-0.035	(0)
	MnOH+	1.274e-09	1.174e-09	-8.895	-8.930	-0.035	(0)
	MnCl+	1.078e-09	9.934e-10	-8.967	-9.003	-0.035	(0)
	MnCl2	2.419e-12	2.419e-12	-11.616	-11.616	0.000	(0)
	MnCl3-	1.246e-15	1.149e-15	-14.904	-14.940	-0.035	(0)
	MnSeO4	8.502e-17	8.502e-17	-16.070	-16.070	0.000	(0)
	MnNO3+	1.442e-17	1.315e-17	-16.841	-16.881	-0.040	(0)
	Mn (OH) 3-	8.207e-18	7.565e-18	-17.086	-17.121	-0.035	(0)
	Mn (OH) 4-2	3.455e-23	2.494e-23	-22.462	-22.603	-0.142	(0)
	Mn (NO3) 2	5.992e-28	5.992e-28	-27.222	-27.222	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-43.127	-43.127	0.000	(0)
Mn (3)	1.516e-27						
	Mn+3	1.516e-27	7.173e-28	-26.819	-27.144	-0.325	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-42.391	-42.532	-0.142	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.322	-47.359	-0.037	(0)
Mo	1.768e-08						
	MoO4-2	1.767e-08	1.267e-08	-7.753	-7.897	-0.144	(0)
	HMoO4-	2.726e-12	2.486e-12	-11.565	-11.604	-0.040	(0)
	H2MoO4	1.796e-16	1.796e-16	-15.746	-15.746	0.000	(0)
	Ag2MoO4	8.114e-30	8.114e-30	-29.091	-29.091	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-57.274	-57.633	-0.360	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-64.900	-66.339	-1.439	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-66.959	-67.958	-0.999	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-70.543	-71.182	-0.639	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-75.583	-75.942	-0.360	(0)
N (-3)	9.432e-09						
	NH4+	8.933e-09	8.193e-09	-8.049	-8.087	-0.038	(0)
	NH3	4.738e-10	4.738e-10	-9.324	-9.324	0.000	(0)
	NH4SO4-	2.527e-11	2.329e-11	-10.597	-10.633	-0.035	(0)
	CaNH3+2	4.227e-13	2.926e-13	-12.374	-12.534	-0.160	(0)
	CuNH3+2	6.217e-15	4.303e-15	-14.206	-14.366	-0.160	(0)
	NiNH3+2	2.187e-16	1.514e-16	-15.660	-15.820	-0.160	(0)
	AgNH3+	4.362e-17	3.978e-17	-16.360	-16.400	-0.040	(0)
	Co (NH3) +2	3.548e-17	2.455e-17	-16.450	-16.610	-0.160	(0)
	BaNH3+2	2.117e-17	1.465e-17	-16.674	-16.834	-0.160	(0)
	Ag (NH3) 2+	1.680e-22	1.532e-22	-21.775	-21.815	-0.040	(0)
	Ca (NH3) 2+2	7.973e-23	5.518e-23	-22.098	-22.258	-0.160	(0)

Ni (NH3) 2+2	1.498e-23	1.037e-23	-22.825	-22.984	-0.160	(0)
HgNH3+2	1.330e-24	9.202e-25	-23.876	-24.036	-0.160	(0)
Co (NH3) 2+2	7.170e-25	4.963e-25	-24.144	-24.304	-0.160	(0)
Hg (NH3) 2+2	6.299e-25	4.360e-25	-24.201	-24.361	-0.160	(0)
Co (NH3) 3+2	4.277e-33	2.960e-33	-32.369	-32.529	-0.160	(0)
Hg (NH3) 3+2	1.188e-33	8.223e-34	-32.925	-33.085	-0.160	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.973	-41.133	-0.160	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.350	-41.509	-0.160	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.643	-45.802	-0.160	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.078	-50.238	-0.160	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.149	-56.508	-0.360	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.010	-58.170	-0.160	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.184	-58.344	-0.160	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.232	-70.272	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.252	-73.412	-0.160	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.224	-74.384	-0.160	(0)
N (3)	5.796e-08					
NO2-	5.796e-08	5.322e-08	-7.237	-7.274	-0.037	(0)
CuNO2+	5.422e-15	4.946e-15	-14.266	-14.306	-0.040	(0)
AgNO2	4.573e-16	4.573e-16	-15.340	-15.340	0.000	(0)
CoNO2+	1.772e-16	1.617e-16	-15.751	-15.791	-0.040	(0)
Cu (NO2) 2	2.693e-21	2.693e-21	-20.570	-20.570	0.000	(0)
Ag (NO2) 2-	4.132e-23	3.769e-23	-22.384	-22.424	-0.040	(0)
N (5)	1.974e-11					
NO3-	1.971e-11	1.813e-11	-10.705	-10.742	-0.036	(0)
CaNO3+	3.084e-14	2.813e-14	-13.511	-13.551	-0.040	(0)
MnNO3+	1.442e-17	1.315e-17	-16.841	-16.881	-0.040	(0)
ZnNO3+	9.452e-18	8.622e-18	-17.024	-17.064	-0.040	(0)
BaNO3+	4.884e-18	4.455e-18	-17.311	-17.351	-0.040	(0)
CuNO3+	5.580e-20	5.089e-20	-19.253	-19.293	-0.040	(0)
NiNO3+	2.971e-20	2.710e-20	-19.527	-19.567	-0.040	(0)
CoNO3+	1.358e-20	1.239e-20	-19.867	-19.907	-0.040	(0)
CdNO3+	3.563e-21	3.250e-21	-20.448	-20.488	-0.040	(0)
PbNO3+	8.285e-22	7.556e-22	-21.082	-21.122	-0.040	(0)
AgNO3	5.924e-22	5.924e-22	-21.227	-21.227	0.000	(0)
CrNO3+2	3.142e-26	2.175e-26	-25.503	-25.663	-0.160	(0)
UO2NO3+	1.907e-26	1.739e-26	-25.720	-25.760	-0.040	(0)
Mn (NO3) 2	5.992e-28	5.992e-28	-27.222	-27.222	0.000	(0)
FeNO3+2	4.173e-28	2.888e-28	-27.380	-27.539	-0.160	(0)
Zn (NO3) 2	3.119e-29	3.119e-29	-28.506	-28.506	0.000	(0)
VO2NO3	2.085e-30	2.085e-30	-29.681	-29.681	0.000	(0)
Co (NO3) 2	4.571e-31	4.571e-31	-30.340	-30.340	0.000	(0)
Cu (NO3) 2	1.162e-31	1.162e-31	-30.935	-30.935	0.000	(0)
Cd (NO3) 2	2.953e-32	2.953e-32	-31.530	-31.530	0.000	(0)
Pb (NO3) 2	2.327e-32	2.327e-32	-31.633	-31.633	0.000	(0)
HgNO3+	2.260e-35	2.061e-35	-34.646	-34.686	-0.040	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.809	-45.809	0.000	(0)
Na	3.155e-03					
Na+	3.147e-03	2.896e-03	-2.502	-2.538	-0.036	(0)
NaSO4-	4.473e-06	4.125e-06	-5.349	-5.385	-0.035	(0)
NaHCO3	3.312e-06	3.312e-06	-5.480	-5.480	0.000	(0)
NaCO3-	5.654e-07	5.215e-07	-6.248	-6.283	-0.035	(0)
NaF	1.299e-07	1.299e-07	-6.886	-6.886	0.000	(0)
NaH2BO3	1.979e-09	1.979e-09	-8.704	-8.704	0.000	(0)
NaCrO4-	2.375e-15	2.166e-15	-14.624	-14.664	-0.040	(0)
Ni	1.253e-09					
Ni+2	8.298e-10	5.950e-10	-9.081	-9.226	-0.144	(0)
NiCO3	2.147e-10	2.147e-10	-9.668	-9.668	0.000	(0)
NiHCO3+	1.636e-10	1.492e-10	-9.786	-9.826	-0.040	(0)
NiSO4	3.149e-11	3.149e-11	-10.502	-10.502	0.000	(0)
NiOH+	8.385e-12	7.648e-12	-11.076	-11.116	-0.040	(0)
NiCl+	2.877e-12	2.624e-12	-11.541	-11.581	-0.040	(0)
NiF+	1.165e-12	1.063e-12	-11.934	-11.974	-0.040	(0)
Ni (OH) 2	6.203e-13	6.203e-13	-12.207	-12.207	0.000	(0)
Ni (OH) 3-	6.944e-16	6.334e-16	-15.158	-15.198	-0.040	(0)
Ni (SO4) 2-2	3.997e-16	2.766e-16	-15.398	-15.558	-0.160	(0)
NiNH3+2	2.187e-16	1.514e-16	-15.660	-15.820	-0.160	(0)
NiCl2	2.278e-17	2.278e-17	-16.642	-16.642	0.000	(0)

NiSeO4	1.920e-19	1.920e-19	-18.717	-18.717	0.000	(0)
NiNO3+	2.971e-20	2.710e-20	-19.527	-19.567	-0.040	(0)
Ni (NH3) 2+2	1.498e-23	1.037e-23	-22.825	-22.984	-0.160	(0)
O (0)	3.237e-36					
O2	1.619e-36	1.621e-36	-35.791	-35.790	0.001	(0)
Pb	1.025e-10					
PbCO3	8.191e-11	8.191e-11	-10.087	-10.087	0.000	(0)
PbOH+	7.922e-12	7.226e-12	-11.101	-11.141	-0.040	(0)
PbHCO3+	4.668e-12	4.258e-12	-11.331	-11.371	-0.040	(0)
Pb+2	3.929e-12	2.817e-12	-11.406	-11.550	-0.144	(0)
Pb (CO3) 2-2	3.301e-12	2.285e-12	-11.481	-11.641	-0.160	(0)
PbSO4	3.661e-13	3.661e-13	-12.436	-12.436	0.000	(0)
Pb (OH) 2	2.333e-13	2.333e-13	-12.632	-12.632	0.000	(0)
PbCl+	1.889e-13	1.723e-13	-12.724	-12.764	-0.040	(0)
PbF+	1.548e-14	1.412e-14	-13.810	-13.850	-0.040	(0)
PbCl2	1.327e-15	1.327e-15	-14.877	-14.877	0.000	(0)
Pb (SO4) 2-2	8.455e-16	5.851e-16	-15.073	-15.233	-0.160	(0)
Pb (OH) 3-	2.612e-16	2.382e-16	-15.583	-15.623	-0.040	(0)
PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
PbCl3-	9.987e-19	9.109e-19	-18.001	-18.041	-0.040	(0)
Pb (OH) 4-2	8.608e-20	5.958e-20	-19.065	-19.225	-0.160	(0)
PbF3-	2.921e-21	2.664e-21	-20.535	-20.574	-0.040	(0)
PbCl4-2	1.037e-21	7.178e-22	-20.984	-21.144	-0.160	(0)
PbNO3+	8.285e-22	7.556e-22	-21.082	-21.122	-0.040	(0)
Pb2OH+3	7.385e-22	3.226e-22	-21.132	-21.491	-0.360	(0)
PbF4-2	1.310e-25	9.066e-26	-24.883	-25.043	-0.160	(0)
Pb3 (OH) 4+2	4.422e-27	3.060e-27	-26.354	-26.514	-0.160	(0)
Pb (NO3) 2	2.327e-32	2.327e-32	-31.633	-31.633	0.000	(0)
Pb4 (OH) 4+4	2.985e-34	6.848e-35	-33.525	-34.164	-0.639	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.944	-152.944	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.937	-229.977	-0.040	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.904	-74.904	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.292	-78.332	-0.040	(0)
H2S	0.000e+00	0.000e+00	-79.318	-79.318	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.531	-79.691	-0.160	(0)
S6-2	0.000e+00	0.000e+00	-80.047	-80.207	-0.160	(0)
S4-2	0.000e+00	0.000e+00	-80.127	-80.287	-0.160	(0)
CdHS+	0.000e+00	0.000e+00	-80.531	-80.571	-0.040	(0)
S3-2	0.000e+00	0.000e+00	-80.933	-81.093	-0.160	(0)
S2-2	0.000e+00	0.000e+00	-81.949	-82.109	-0.160	(0)
S-2	0.000e+00	0.000e+00	-87.484	-87.626	-0.142	(0)
HgHS2-	0.000e+00	0.000e+00	-140.202	-140.242	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.784	-140.944	-0.160	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.854	-141.854	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.943	-148.169	-0.226	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.498	-148.613	-0.115	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.531	-148.571	-0.040	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.680	-148.899	-0.219	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.096	-149.136	-0.040	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.817	-150.047	-0.230	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.136	-150.358	-0.222	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.567	-150.567	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.699	-151.699	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.944	-152.944	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.025	-157.025	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.109	-218.149	-0.040	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.579	-225.619	-0.040	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.433	-227.593	-0.160	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.091	-228.131	-0.040	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.937	-229.977	-0.040	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.280	-233.320	-0.040	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.107	-304.267	-0.160	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.252	-305.411	-0.160	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.405	-322.565	-0.160	(0)
S (6)	4.092e-04					
SO4-2	3.700e-04	2.653e-04	-3.432	-3.576	-0.144	(0)
CaSO4	2.981e-05	2.981e-05	-4.526	-4.526	0.000	(0)

MgSO4	4.647e-06	4.647e-06	-5.333	-5.333	0.000	(0)
NaSO4-	4.473e-06	4.125e-06	-5.349	-5.385	-0.035	(0)
KSO4-	2.348e-07	2.166e-07	-6.629	-6.664	-0.035	(0)
MnSO4	2.159e-08	2.159e-08	-7.666	-7.666	0.000	(0)
ZnSO4	1.099e-08	1.099e-08	-7.959	-7.959	0.000	(0)
HSO4-	2.776e-10	2.556e-10	-9.557	-9.592	-0.036	(0)
CuSO4	5.394e-11	5.394e-11	-10.268	-10.268	0.000	(0)
CrOHSO4	3.859e-11	3.859e-11	-10.414	-10.414	0.000	(0)
Zn(SO4) 2-2	3.667e-11	2.538e-11	-10.436	-10.595	-0.160	(0)
FeSO4	3.182e-11	3.182e-11	-10.497	-10.497	0.000	(0)
NiSO4	3.149e-11	3.149e-11	-10.502	-10.502	0.000	(0)
NH4SO4-	2.527e-11	2.329e-11	-10.597	-10.633	-0.035	(0)
CoSO4	2.282e-11	2.282e-11	-10.642	-10.642	0.000	(0)
CdSO4	3.524e-12	3.524e-12	-11.453	-11.453	0.000	(0)
PbSO4	3.661e-13	3.661e-13	-12.436	-12.436	0.000	(0)
AgSO4-	2.387e-13	2.177e-13	-12.622	-12.662	-0.040	(0)
CrSO4+	1.863e-14	1.700e-14	-13.730	-13.770	-0.040	(0)
Cd(SO4) 2-2	1.822e-14	1.261e-14	-13.739	-13.899	-0.160	(0)
Pb(SO4) 2-2	8.455e-16	5.851e-16	-15.073	-15.233	-0.160	(0)
Ni(SO4) 2-2	3.997e-16	2.766e-16	-15.398	-15.558	-0.160	(0)
UO2SO4	1.930e-16	1.930e-16	-15.714	-15.714	0.000	(0)
AlSO4+	1.390e-17	1.280e-17	-16.857	-16.893	-0.036	(0)
FeSO4+	5.143e-18	4.741e-18	-17.289	-17.324	-0.035	(0)
Cr2(OH) 2SO4+2	3.089e-18	2.138e-18	-17.510	-17.670	-0.160	(0)
UO2(SO4) 2-2	9.752e-19	6.749e-19	-18.011	-18.171	-0.160	(0)
Al(SO4) 2-	3.952e-20	3.639e-20	-19.403	-19.439	-0.036	(0)
Cr2(OH) 2(SO4) 2	3.369e-20	3.369e-20	-19.473	-19.473	0.000	(0)
Fe(SO4) 2-	2.948e-20	2.689e-20	-19.530	-19.570	-0.040	(0)
VO2SO4-	1.579e-21	1.440e-21	-20.802	-20.842	-0.040	(0)
CrO3SO4-2	5.530e-24	3.827e-24	-23.257	-23.417	-0.160	(0)
VOSO4	3.682e-24	3.682e-24	-23.434	-23.434	0.000	(0)
HgSO4	2.138e-25	2.138e-25	-24.670	-24.670	0.000	(0)
VSO4+	9.521e-39	8.684e-39	-38.021	-38.061	-0.040	(0)
U(SO4) 2	0.000e+00	0.000e+00	-43.869	-43.869	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.033	-44.193	-0.160	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-70.232	-70.272	-0.040	(0)
Sb(3)	9.754e-22					
Sb(OH) 3	4.935e-22	4.935e-22	-21.307	-21.307	0.000	(0)
HSbO2	4.818e-22	4.818e-22	-21.317	-21.317	0.000	(0)
SbO2-	8.677e-26	7.914e-26	-25.062	-25.102	-0.040	(0)
Sb(OH) 4-	4.971e-26	4.534e-26	-25.304	-25.344	-0.040	(0)
Sb(OH) 2F	5.405e-28	5.405e-28	-27.267	-27.267	0.000	(0)
SbOF	5.316e-28	5.316e-28	-27.274	-27.274	0.000	(0)
Sb(OH) 2+	1.296e-28	1.182e-28	-27.888	-27.927	-0.040	(0)
SbO+	4.467e-29	4.075e-29	-28.350	-28.390	-0.040	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.405	-322.565	-0.160	(0)
Sb(5)	2.913e-10					
SbO3-	2.909e-10	2.654e-10	-9.536	-9.576	-0.040	(0)
Sb(OH) 6-	3.372e-13	3.103e-13	-12.472	-12.508	-0.036	(0)
SbO2+	8.113e-27	7.400e-27	-26.091	-26.131	-0.040	(0)
Se(-2)	5.451e-18					
Ag2Se	5.451e-18	5.451e-18	-17.264	-17.264	0.000	(0)
HSe-	4.276e-40	3.900e-40	-39.369	-39.409	-0.040	(0)
MnSe	0.000e+00	0.000e+00	-43.127	-43.127	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.525	-43.525	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.243	-46.403	-0.160	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.055	-85.694	-0.639	(0)
Se(4)	1.835e-09					
HSeO3-	1.198e-09	1.092e-09	-8.922	-8.962	-0.040	(0)
SeO3-2	6.373e-10	4.410e-10	-9.196	-9.356	-0.160	(0)
H2SeO3	4.594e-15	4.594e-15	-14.338	-14.338	0.000	(0)
AgSeO3-	1.278e-17	1.166e-17	-16.893	-16.933	-0.040	(0)
Cd(SeO3) 2-2	1.313e-23	9.085e-24	-22.882	-23.042	-0.160	(0)
FeHSeO3+2	6.642e-24	4.597e-24	-23.178	-23.338	-0.160	(0)
Ag(SeO3) 2-3	1.054e-25	4.603e-26	-24.977	-25.337	-0.360	(0)
Se(6)	9.625e-13					
SeO4-2	9.624e-13	6.901e-13	-12.017	-12.161	-0.144	(0)
MnSeO4	8.502e-17	8.502e-17	-16.070	-16.070	0.000	(0)

	ZnSeO4	2.023e-17	2.023e-17	-16.694	-16.694	0.000	(0)
	HSeO4-	3.739e-19	3.410e-19	-18.427	-18.467	-0.040	(0)
	NiSeO4	1.920e-19	1.920e-19	-18.717	-18.717	0.000	(0)
	CoSeO4	1.491e-19	1.491e-19	-18.827	-18.827	0.000	(0)
	CdSeO4	7.282e-21	7.282e-21	-20.138	-20.138	0.000	(0)
	Zn (SeO4) 2-2	2.045e-29	1.416e-29	-28.689	-28.849	-0.160	(0)
Si	3.191e-04						
	H4SiO4	3.140e-04	3.145e-04	-3.503	-3.502	0.001	(0)
	H3SiO4-	5.011e-06	4.610e-06	-5.300	-5.336	-0.036	(0)
	H2SiO4-2	4.076e-11	2.950e-11	-10.390	-10.530	-0.140	(0)
	UO2H3SiO4+	2.063e-13	1.881e-13	-12.686	-12.726	-0.040	(0)
	SiF6-2	8.060e-31	5.817e-31	-30.094	-30.235	-0.142	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-60.198	-60.558	-0.360	(0)
U (4)	5.415e-21						
	U (OH) 5-	5.413e-21	4.937e-21	-20.267	-20.306	-0.040	(0)
	U (OH) 4	2.039e-24	2.039e-24	-23.691	-23.691	0.000	(0)
	U (OH) 3+	8.060e-29	7.352e-29	-28.094	-28.134	-0.040	(0)
	U (OH) 2+2	4.843e-34	3.352e-34	-33.315	-33.475	-0.160	(0)
	UF3+	9.524e-39	8.687e-39	-38.021	-38.061	-0.040	(0)
	UF2+2	1.114e-39	7.709e-40	-38.953	-39.113	-0.160	(0)
	UOH+3	3.564e-40	1.557e-40	-39.448	-39.808	-0.360	(0)
	UF4	0.000e+00	0.000e+00	-40.169	-40.169	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-41.705	-42.065	-0.360	(0)
	UF5-	0.000e+00	0.000e+00	-42.679	-42.719	-0.040	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-43.869	-43.869	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-44.033	-44.193	-0.160	(0)
	UF6-2	0.000e+00	0.000e+00	-44.228	-44.387	-0.160	(0)
	U+4	0.000e+00	0.000e+00	-46.577	-47.217	-0.639	(0)
	UCl+3	0.000e+00	0.000e+00	-47.921	-48.280	-0.360	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-177.128	-180.365	-3.237	(0)
U (5)	9.155e-18						
	UO2+	9.155e-18	8.350e-18	-17.038	-17.078	-0.040	(0)
U (6)	1.272e-08						
	UO2 (CO3) 3-4	7.544e-09	1.731e-09	-8.122	-8.762	-0.639	(0)
	UO2 (CO3) 2-2	5.160e-09	3.571e-09	-8.287	-8.447	-0.160	(0)
	UO2CO3	1.851e-11	1.851e-11	-10.733	-10.733	0.000	(0)
	UO2H3SiO4+	2.063e-13	1.881e-13	-12.686	-12.726	-0.040	(0)
	UO2OH+	6.774e-14	6.178e-14	-13.169	-13.209	-0.040	(0)
	UO2F+	5.172e-15	4.717e-15	-14.286	-14.326	-0.040	(0)
	UO2F2	9.674e-16	9.674e-16	-15.014	-15.014	0.000	(0)
	UO2+2	6.703e-16	4.806e-16	-15.174	-15.318	-0.144	(0)
	UO2SO4	1.930e-16	1.930e-16	-15.714	-15.714	0.000	(0)
	UO2F3-	1.894e-17	1.728e-17	-16.723	-16.763	-0.040	(0)
	UO2Cl+	1.473e-18	1.344e-18	-17.832	-17.872	-0.040	(0)
	UO2 (SO4) 2-2	9.752e-19	6.749e-19	-18.011	-18.171	-0.160	(0)
	UO2F4-2	1.410e-20	9.759e-21	-19.851	-20.011	-0.160	(0)
	(UO2) 2 (OH) 2+2	9.154e-21	6.335e-21	-20.038	-20.198	-0.160	(0)
	(UO2) 3 (OH) 5+	3.394e-22	3.096e-22	-21.469	-21.509	-0.040	(0)
	UO2NO3+	1.907e-26	1.739e-26	-25.720	-25.760	-0.040	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-44.455	-44.495	-0.040	(0)
	V+2	0.000e+00	0.000e+00	-45.854	-46.014	-0.160	(0)
V (3)	5.955e-17						
	V (OH) 3	5.955e-17	5.955e-17	-16.225	-16.225	0.000	(0)
	V (OH) 2+	4.160e-28	3.794e-28	-27.381	-27.421	-0.040	(0)
	VOH+2	5.128e-32	3.549e-32	-31.290	-31.450	-0.160	(0)
	V+3	1.587e-37	6.935e-38	-36.799	-37.159	-0.360	(0)
	VSO4+	9.521e-39	8.684e-39	-38.021	-38.061	-0.040	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-60.059	-60.419	-0.360	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-61.460	-62.100	-0.639	(0)
V (4)	1.135e-20						
	V (OH) 3+	1.125e-20	1.026e-20	-19.949	-19.989	-0.040	(0)
	VO+2	7.281e-23	5.039e-23	-22.138	-22.298	-0.160	(0)
	VOF+	2.356e-23	2.149e-23	-22.628	-22.668	-0.040	(0)
	VOSO4	3.682e-24	3.682e-24	-23.434	-23.434	0.000	(0)
	VOF2	5.730e-25	5.730e-25	-24.242	-24.242	0.000	(0)
	VOC1+	2.672e-25	2.437e-25	-24.573	-24.613	-0.040	(0)

VOF3-	1.585e-27	1.445e-27	-26.800	-26.840	-0.040	(0)
VOF4-2	5.994e-31	4.149e-31	-30.222	-30.382	-0.160	(0)
H2V2O4+2	7.632e-36	5.282e-36	-35.117	-35.277	-0.160	(0)
V (5)	1.716e-10					
H2VO4-	1.284e-10	1.172e-10	-9.891	-9.931	-0.040	(0)
HVO4-2	4.313e-11	2.985e-11	-10.365	-10.525	-0.160	(0)
H3VO4	1.155e-14	1.155e-14	-13.937	-13.937	0.000	(0)
VO4-3	3.473e-17	1.517e-17	-16.459	-16.819	-0.360	(0)
H3V2O7-	9.582e-18	8.739e-18	-17.019	-17.059	-0.040	(0)
HV2O7-3	2.712e-18	1.185e-18	-17.567	-17.926	-0.360	(0)
VO2+	2.470e-19	2.273e-19	-18.607	-18.643	-0.036	(0)
VO2F	2.835e-20	2.835e-20	-19.547	-19.547	0.000	(0)
V2O7-4	1.410e-20	3.235e-21	-19.851	-20.490	-0.639	(0)
VO2SO4-	1.579e-21	1.440e-21	-20.802	-20.842	-0.040	(0)
VO2F2-	8.024e-22	7.319e-22	-21.096	-21.136	-0.040	(0)
V3O9-3	3.856e-24	1.685e-24	-23.414	-23.773	-0.360	(0)
VO2F3-2	9.379e-25	6.491e-25	-24.028	-24.188	-0.160	(0)
VO2F4-3	5.198e-29	2.271e-29	-28.284	-28.644	-0.360	(0)
VO2NO3	2.085e-30	2.085e-30	-29.681	-29.681	0.000	(0)
V4O12-4	3.587e-31	8.229e-32	-30.445	-31.085	-0.639	(0)
V10O28-6	0.000e+00	0.000e+00	-80.992	-82.430	-1.439	(0)
HV10O28-5	0.000e+00	0.000e+00	-81.251	-82.250	-0.999	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.409	-85.048	-0.639	(0)
Zn	4.203e-07					
Zn+2	2.640e-07	1.893e-07	-6.578	-6.723	-0.144	(0)
ZnCO3	1.053e-07	1.053e-07	-6.977	-6.977	0.000	(0)
ZnOH+	2.119e-08	1.933e-08	-7.674	-7.714	-0.040	(0)
ZnHCO3+	1.335e-08	1.217e-08	-7.875	-7.915	-0.040	(0)
ZnSO4	1.099e-08	1.099e-08	-7.959	-7.959	0.000	(0)
Zn (OH) 2	3.128e-09	3.128e-09	-8.505	-8.505	0.000	(0)
ZnOHCl	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
ZnCl+	8.910e-10	8.197e-10	-9.050	-9.086	-0.036	(0)
ZnF+	2.944e-10	2.685e-10	-9.531	-9.571	-0.040	(0)
Zn (SO4) 2-2	3.667e-11	2.538e-11	-10.436	-10.595	-0.160	(0)
Zn (OH) 3-	1.755e-11	1.601e-11	-10.756	-10.796	-0.040	(0)
ZnCl2	2.240e-12	2.240e-12	-11.650	-11.650	0.000	(0)
ZnCl3-	3.334e-15	3.067e-15	-14.477	-14.513	-0.036	(0)
Zn (OH) 4-2	9.401e-16	6.506e-16	-15.027	-15.187	-0.160	(0)
ZnSeO4	2.023e-17	2.023e-17	-16.694	-16.694	0.000	(0)
ZnNO3+	9.452e-18	8.622e-18	-17.024	-17.064	-0.040	(0)
ZnCl4-2	3.663e-18	2.644e-18	-17.436	-17.578	-0.142	(0)
Zn (NO3) 2	3.119e-29	3.119e-29	-28.506	-28.506	0.000	(0)
Zn (SeO4) 2-2	2.045e-29	1.416e-29	-28.689	-28.849	-0.160	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.531	-148.571	-0.040	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.567	-150.567	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.579	-225.619	-0.040	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.433	-227.593	-0.160	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.252	-305.411	-0.160	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-68.16	-61.87	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-50.42	-45.91	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-57.65	-45.91	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-87.86	-69.93	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-66.02	-45.99	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.40	-29.00	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-28.78	-28.33	0.45	(NH4) 2SeO4
Acanthite	-54.88	-91.10	-36.22	Ag2S
Ag2CO3	-14.70	-25.79	-11.09	Ag2CO3
Ag2CrO4	-22.00	-33.59	-11.59	Ag2CrO4
Ag2HVO4	-16.88	-15.40	1.48	Ag2HVO4
Ag2MoO4	-17.12	-28.67	-11.55	Ag2MoO4
Ag2O	-17.33	-4.76	12.57	Ag2O
Ag2Se	-3.47	-52.17	-48.70	Ag2Se
Ag2SeO3	-14.58	-21.73	-7.15	Ag2SeO3

Ag2SeO4	-24.02	-32.93	-8.91	Ag2SeO4
Ag2SO4	-19.53	-24.35	-4.82	Ag2SO4
Ag3AsO3	-29.64	-27.48	2.16	Ag3AsO3
Ag3AsO4	-18.49	-21.28	-2.79	Ag3AsO4
Ag3H2VO5	-22.96	-17.78	5.18	Ag3H2VO5
AgF:4H2O	-15.58	-14.53	1.05	AgF:4H2O
Agmetal	-1.42	-14.93	-13.51	Ag
AgVO3	-13.79	-13.02	0.77	AgVO3
Al(OH)3(am)	-3.99	6.81	10.80	Al(OH)3
Al2(MoO4)3	-60.47	-58.10	2.37	Al2(MoO4)3
Al2O3	-6.03	13.62	19.65	Al2O3
Al4(OH)10SO4	-15.04	7.66	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.13	-7.33	4.80	AlAsO4:2H2O
AlOHSO4	-9.55	-12.78	-3.23	AlOHSO4
AlSb	-155.43	-89.80	65.62	AlSb
Alunite	-13.27	-14.67	-1.40	KAl3(SO4)2(OH)6
Anglesite	-7.34	-15.13	-7.79	PbSO4
Anhydrite	-2.53	-6.89	-4.36	CaSO4
Anilite	-57.07	-88.95	-31.88	Cu0.25Cu1.5S
Antlerite	-7.50	1.29	8.79	Cu3(OH)4SO4
Aragonite	-0.02	-8.32	-8.30	CaCO3
Arsenolite	-78.61	-81.37	-2.76	As4O6
Artinite	-6.64	2.96	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-34.98	-28.28	6.71	As2O5
Atacamite	-4.24	3.15	7.39	Cu2(OH)3Cl
Azurite	-4.27	-21.17	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.69	8.70	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-19.74	-3.87	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	6.74	-2.17	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-28.11	4.83	32.94	Ba3(VO4)2:4H2O
BaCrO4	-10.46	-20.13	-9.67	BaCrO4
BaF2	-9.79	-15.61	-5.82	BaF2
BaMoO4	-8.25	-15.21	-6.96	BaMoO4
Barite	-0.91	-10.89	-9.98	BaSO4
BaS	-93.82	-77.64	16.18	BaS
BaSeO3	-10.10	-8.27	1.83	BaSeO3
BaSeO4	-12.01	-19.47	-7.46	BaSeO4
Bianchite	-8.53	-10.30	-1.76	ZnSO4:6H2O
Birnessite	-8.67	9.43	18.09	MnO2
Bixbyite	-5.61	-6.25	-0.64	Mn2O3
BlaubleiI	-56.49	-80.65	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.20	-84.48	-27.28	Cu0.6Cu0.8S
Boehmite	-1.77	6.81	8.58	AlOOH
Breithauptite	-58.75	-77.28	-18.52	NiSb
Brochantite	-6.97	8.25	15.22	Cu4(OH)6SO4
Brucite	-4.85	12.00	16.84	Mg(OH)2
Bunsenite	-5.66	6.79	12.45	NiO
Ca(VO3)2	-14.23	-8.57	5.66	Ca(VO3)2
Ca2V2O7	-13.37	4.13	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.42	4.13	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-12.47	9.83	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-22.13	16.83	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-23.03	16.83	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.09	-155.12	142.97	Ca3Sb2
CaCrO4	-13.87	-16.13	-2.27	CaCrO4
Calcite	0.16	-8.32	-8.48	CaCO3
Calomel	-12.93	-30.84	-17.91	Hg2Cl2
CaMoO4	-3.26	-11.21	-7.95	CaMoO4
Carnotite	-6.11	-5.88	0.23	KUO2VO4
CaSeO3:2H2O	-7.08	-4.26	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.45	-15.47	-3.02	CaSeO4:2H2O
Cd(BO2)2	-14.35	-4.51	9.84	Cd(BO2)2
Cd(OH)2	-7.88	5.77	13.64	Cd(OH)2
Cd(OH)2(am)	-7.96	5.77	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.59	-21.88	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.85	-2.29	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.93	3.47	28.40	Cd4(OH)6SO4
CdCl2	-15.11	-15.77	-0.66	CdCl2

CdCl2:1H2O	-14.08	-15.77	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.86	-15.77	-1.91	CdCl2:2.5H2O
CdF2	-17.33	-18.54	-1.21	CdF2
Cdmetal (alpha)	-32.85	-19.34	13.51	Cd
Cdmetal (gamma)	-32.95	-19.34	13.62	Cd
CdMoO4	-3.99	-18.14	-14.15	CdMoO4
CdOHCl	-8.54	-5.00	3.54	CdOHCl
CdSb	-77.95	-78.30	-0.35	CdSb
CdSe	-21.45	-41.65	-20.20	CdSe
CdSeO4:2H2O	-20.56	-22.41	-1.85	CdSeO4:2H2O
CdSO4	-13.65	-13.82	-0.17	CdSO4
CdSO4:1H2O	-12.10	-13.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.95	-13.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.40	-13.15	-9.75	AgCl
Cerrusite	-3.43	-16.56	-13.13	PbCO3
CH4 (g)	-80.39	-121.44	-41.05	CH4
Chalcanthite	-9.99	-12.63	-2.64	CuSO4:5H2O
Chalcedony	0.05	-3.50	-3.55	SiO2
Chalcocite	-57.22	-92.14	-34.92	Cu2S
Chalcopyrite	-123.74	-159.01	-35.27	CuFeS2
Chrysotile	-3.22	28.98	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-54.34	-100.03	-45.69	HgS
Claudetite	-78.31	-81.37	-3.06	As4O6
Clausthalite	-15.85	-42.95	-27.10	PbSe
Co (BO2) 2	-30.69	-3.62	27.07	Co (BO2) 2
Co (OH) 2	-6.45	6.65	13.09	Co (OH) 2
Co (OH) 3	-10.89	-13.20	-2.31	Co (OH) 3
CO2 (g)	-2.88	-21.03	-18.15	CO2
Co3 (AsO4) 2	-21.37	-8.34	13.03	Co3 (AsO4) 2
Co3O4	-9.26	-19.76	-10.50	Co3O4
CoCl2	-23.16	-14.89	8.27	CoCl2
CoCl2:6H2O	-17.43	-14.89	2.54	CoCl2:6H2O
CoCO3	-4.40	-14.38	-9.98	CoCO3
CoF2	-16.06	-17.66	-1.60	CoF2
CoF3	-48.21	-49.66	-1.46	CoF3
CoFe2O4	22.62	19.09	-3.53	CoFe2O4
CoMoO4	-9.50	-17.26	-7.76	CoMoO4
CoO	-6.94	6.65	13.59	CoO
CoS (alpha)	-72.25	-79.69	-7.44	CoS
CoS (beta)	-68.62	-79.69	-11.07	CoS
CoSe	-24.57	-40.77	-16.20	CoSe
CoSeO3	-11.64	-10.32	1.32	CoSeO3
CoSeO4:6H2O	-20.00	-21.53	-1.53	CoSeO4:6H2O
CoSO4	-15.74	-12.94	2.80	CoSO4
CoSO4:6H2O	-10.47	-12.94	-2.47	CoSO4:6H2O
Cotunnite	-12.30	-17.08	-4.78	PbCl2
Covellite	-57.08	-79.38	-22.30	CuS
Cr (OH) 2	-19.54	-8.72	10.82	Cr (OH) 2
Cr (OH) 3	-0.45	0.89	1.34	Cr (OH) 3
Cr (OH) 3 (am)	1.64	0.89	-0.75	Cr (OH) 3
Cr2O3	4.13	1.78	-2.36	Cr2O3
CrCl2	-44.35	-30.26	14.09	CrCl2
CrCl3	-46.54	-31.42	15.11	CrCl3
CrF3	-24.24	-35.57	-11.34	CrF3
Cristobalite	-0.15	-3.50	-3.35	SiO2
Crmetal	-64.30	-33.82	30.48	Cr
CrO3	-25.62	-28.83	-3.21	CrO3
Cryolite	-15.87	-49.71	-33.84	Na3AlF6
Cu (OH) 2	-1.71	6.96	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.66	14.55	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-14.08	-4.83	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-57.67	-92.55	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-7.42	-53.22	-45.80	Cu2Se
Cu2SO4	-23.44	-25.39	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.50	-7.40	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.72	-105.32	-42.59	Cu3Sb
Cu3Se2	-30.18	-93.67	-63.49	Cu3Se2
CuCO3	-2.57	-14.07	-11.50	CuCO3

CuCrO4	-16.43	-21.87	-5.44	CuCrO4
CuF	-10.15	-15.06	-4.91	CuF
CuF2	-18.46	-17.35	1.12	CuF2
CuF2:2H2O	-12.80	-17.35	-4.55	CuF2:2H2O
Cumetal	-6.70	-15.45	-8.76	Cu
CuMoO4	-3.87	-16.95	-13.08	CuMoO4
CuOCuSO4	-15.97	-5.67	10.30	CuOCuSO4
Cupricferrite	13.41	19.40	5.99	CuFe2O4
Cuprite	-4.40	-5.80	-1.41	Cu2O
Cuprousferrite	12.24	3.32	-8.92	CuFeO2
CuSe	-7.35	-40.45	-33.10	CuSe
CuSe2	-29.40	-62.77	-33.37	CuSe2
CuSeO3:2H2O	-10.52	-10.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.77	-21.21	-2.44	CuSeO4:5H2O
CuSO4	-15.57	-12.63	2.94	CuSO4
Diaspore	-0.06	6.81	6.87	AlOOH
Djurleite	-57.38	-91.30	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.81	-17.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.26	-17.35	-17.09	CaMg(CO3)2
Epsomite	-5.47	-7.59	-2.13	MgSO4:7H2O
Fe(OH)2	-6.86	6.70	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.03	2.99	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.85	-14.57	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-6.08	-4.53	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.84	-38.46	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.59	-46.32	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.08	19.14	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.32	-7.92	0.40	FeAsO4:2H2O
FeCr2O4	1.28	8.48	7.20	FeCr2O4
FeMoO4	-7.12	-17.21	-10.09	FeMoO4
Ferrihydrite	3.03	6.22	3.19	Fe(OH)3
Ferroselite	-44.43	-63.03	-18.60	FeSe2
FeS(ppt)	-76.69	-79.64	-2.95	FeS
FeSe	-29.71	-40.71	-11.00	FeSe
Fix_pe	-4.55	-4.55	0.00	e-
Fluorite	-1.11	-11.61	-10.50	CaF2
Galena	-67.91	-81.88	-13.97	PbS
Gibbsite	-1.48	6.81	8.29	Al(OH)3
Goethite	5.73	6.22	0.49	FeOOH
Goslarite	-8.29	-10.30	-2.01	ZnSO4:7H2O
Greenalite	-7.71	13.10	20.81	Fe3Si2O5(OH)4
Greenockite	-66.21	-80.57	-14.36	CdS
Greigite	-281.18	-326.21	-45.03	Fe3S4
Gummite	-6.98	0.69	7.67	UO3
Gypsum	-2.28	-6.89	-4.61	CaSO4:2H2O
H-Jarosite	-8.42	-20.52	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.03	-23.91	-12.88	H2MoO4
H2S(g)	-78.33	-86.34	-8.01	H2S
H2Se(g)	-42.46	-47.42	-4.96	H2Se
Halite	-6.90	-5.30	1.60	NaCl
Halloysite	-2.96	6.62	9.57	Al2Si2O5(OH)4
Hausmannite	-6.91	54.12	61.03	Mn3O4
Hematite	13.86	12.44	-1.42	Fe2O3
Hercynite	-2.57	20.32	22.89	FeAl2O4
Hg(CH3)2(g)	-182.86	-256.57	-73.71	Hg(CH3)2
Hg(g)	-9.33	-17.20	-7.87	Hg
Hg(OH)2	-10.20	-13.69	-3.50	Hg(OH)2
Hg2(g)	-19.45	-34.41	-14.96	Hg2
Hg2(OH)2	-14.56	-9.30	5.26	Hg2(OH)2
Hg2CO3	-14.28	-30.33	-16.05	Hg2CO3
Hg2CrO4	-29.44	-38.14	-8.70	Hg2CrO4
Hg2F2	-23.25	-33.61	-10.36	Hg2F2
Hg2S	-83.97	-95.64	-11.68	Hg2S
Hg2SeO3	-21.62	-26.27	-4.66	Hg2SeO3
Hg2SO4	-22.76	-28.89	-6.13	Hg2SO4
Hg3O2CO3	-32.43	-62.11	-29.68	Hg3O2CO3
HgCl(g)	-34.92	-15.42	19.50	HgCl
HgCl2	-13.97	-35.23	-21.26	HgCl2

HgF(g)	-49.48	-16.81	32.68	HgF
HgF2(g)	-50.57	-38.00	12.57	HgF2
Hgmetal(l)	-3.75	-17.20	-13.45	Hg
HgSe	-5.41	-61.11	-55.69	HgSe
HgSeO3	-18.23	-30.66	-12.43	HgSeO3
HgSO4	-23.86	-33.28	-9.42	HgSO4
Huntite	-5.45	-35.42	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.90	-28.67	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-15.36	-24.13	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-23.13	-28.30	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-1.65	-16.45	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.29	-49.53	-17.24	K2Cr2O7
K2CrO4	-20.19	-20.70	-0.51	K2CrO4
K2MoO4	-19.04	-15.77	3.26	K2MoO4
K2SeO4	-19.31	-20.04	-0.73	K2SeO4
Kaolinite	-0.82	6.62	7.43	Al2Si2O5(OH)4
Langite	-9.24	8.25	17.49	Cu4(OH)6SO4·H2O
Larnakite	-10.23	-10.66	-0.43	PbO:PbSO4
Laurionite	-6.93	-6.31	0.62	PbOHCl
Lepidocrocite	4.85	6.22	1.37	FeOOH
Lime	-20.00	12.70	32.70	CaO
Litharge	-8.23	4.46	12.69	PbO
Mackinawite	-76.04	-79.64	-3.60	FeS
Maghemite	6.05	12.44	6.39	Fe2O3
Magnesioferrite	7.58	24.44	16.86	Fe2MgO4
Magnesite	-1.57	-9.03	-7.46	MgCO3
Magnetite	15.74	19.14	3.40	Fe3O4
Malachite	-1.80	-7.11	-5.31	Cu2(OH)2CO3
Manganite	-3.12	22.22	25.34	MnOOH
Massicot	-8.43	4.46	12.89	PbO
Matlockite	-9.49	-18.46	-8.97	PbClF
Melanothallite	-20.84	-14.58	6.26	CuCl2
Melanterite	-10.68	-12.89	-2.21	FeSO4·7H2O
Metacinnabar	-54.94	-100.03	-45.09	HgS
Mg(OH)2(active)	-6.80	12.00	18.79	Mg(OH)2
Mg(VO3)2	-20.56	-9.28	11.28	Mg(VO3)2
Mg2Sb3	-277.78	-203.09	74.68	Mg2Sb3
Mg2V2O7	-23.64	2.72	26.36	Mg2V2O7
MgCr2O4	-2.43	13.77	16.20	MgCr2O4
MgCrO4	-22.22	-16.84	5.38	MgCrO4
MgF2	-4.18	-12.31	-8.13	MgF2
MgMoO4	-10.06	-11.91	-1.85	MgMoO4
MgSeO3:6H2O	-8.03	-4.97	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-14.98	-16.18	-1.20	MgSeO4:6H2O
Minium	-35.03	38.49	73.52	Pb3O4
Mirabilite	-7.54	-8.65	-1.11	Na2SO4·10H2O
Mn(VO3)2	-16.50	-11.60	4.90	Mn(VO3)2
Mn2(SO4)3	-59.31	-65.02	-5.71	Mn2(SO4)3
Mn2Sb	-150.90	-89.82	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.76	0.74	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-14.58	-11.87	2.72	MnCl2·4H2O
MnS(grn)	-76.84	-76.67	0.17	MnS
MnS(pnk)	-80.01	-76.67	3.34	MnS
MnSb	-96.83	-99.74	-2.91	MnSb
MnSe	-41.24	-37.74	3.50	MnSe
MnSeO3	-8.42	-7.29	1.13	MnSeO3
MnSeO3:2H2O	-8.28	-7.30	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.45	-18.50	-2.05	MnSeO4:5H2O
MnSO4	-12.50	-9.92	2.58	MnSO4
Monteponite	-9.34	5.77	15.10	CdO
Montroydite	-10.05	-13.69	-3.64	HgO
MoO3	-15.91	-23.91	-8.00	MoO3
Morenosite	-10.66	-12.80	-2.14	NiSO4·7H2O
MoS2	-151.43	-221.69	-70.26	MoS2
Na-Jarosite	-3.85	-15.05	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-36.84	-46.73	-9.90	Na2Cr2O7
Na2CrO4	-20.83	-17.90	2.93	Na2CrO4
Na2Mo2O7	-20.29	-36.88	-16.60	Na2Mo2O7

Na2MoO4	-14.46	-12.97	1.49	Na2MoO4
Na2MoO4:2H2O	-14.20	-12.97	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.33	-6.03	10.30	Na2SeO3:5H2O
Na2SeO4	-18.52	-17.24	1.28	Na2SeO4
Na3Sb	-174.66	-80.21	94.45	Na3Sb
Na3VO4	-30.91	5.77	36.68	Na3VO4
Na4V2O7	-36.80	0.60	37.40	Na4V2O7
Nantokite	-6.94	-13.67	-6.73	CuCl
NaSb	-89.21	-66.04	23.17	NaSb
Natron	-8.78	-10.09	-1.31	Na2CO3:10H2O
NaVO3	-9.03	-5.17	3.86	NaVO3
Nesquehonite	-4.36	-9.03	-4.67	MgCO3:3H2O
Ni(OH)2	-6.01	6.79	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.62	-7.92	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-24.44	7.56	32.00	Ni4(OH)6SO4
NiCO3	-7.37	-14.24	-6.87	NiCO3
NiMoO4	-5.98	-17.12	-11.14	NiMoO4
NiS(alpha)	-73.95	-79.55	-5.60	NiS
NiS(beta)	-68.45	-79.55	-11.10	NiS
NiS(gamma)	-66.75	-79.55	-12.80	NiS
NiSe	-22.93	-40.63	-17.70	NiSe
NiSeO3:2H2O	-13.00	-10.18	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.87	-21.39	-1.52	NiSeO4:6H2O
Nsutite	-8.08	9.43	17.50	MnO2
O2(g)	-32.88	50.20	83.09	O2
Orpiment	-238.64	-299.70	-61.07	As2S3
Otavite	-3.26	-15.26	-12.00	CdCO3
Pb(BO2)2	-12.33	-5.81	6.52	Pb(BO2)2
Pb(OH)2	-3.69	4.46	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-72.78	-81.54	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-10.64	-1.85	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.26	8.92	26.19	Pb2O(OH)2
Pb2O3	-27.01	34.03	61.04	Pb2O3
Pb2OCO3	-11.54	-12.10	-0.56	Pb2OCO3
Pb2V2O7	-10.45	-12.35	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.69	-14.89	5.80	Pb3(AsO4)2
Pb3(VO4)2	-14.03	-7.89	6.14	Pb3(VO4)2
Pb3O2CO3	-18.66	-7.64	11.02	Pb3O2CO3
Pb3O2SO4	-16.89	-6.20	10.69	Pb3O2SO4
Pb4(OH)6SO4	-22.84	-1.74	21.10	Pb4(OH)6SO4
Pb4O3SO4	-23.62	-1.74	21.88	Pb4O3SO4
PbCrO4	-11.77	-24.37	-12.60	PbCrO4
PbF2	-12.41	-19.85	-7.44	PbF2
Pbmetal	-24.89	-20.64	4.25	Pb
PbMoO4	-3.83	-19.45	-15.62	PbMoO4
PbO:0.3H2O	-8.52	4.46	12.98	PbO:0.33H2O
PbSeO4	-16.87	-23.71	-6.84	PbSeO4
Periclase	-9.59	12.00	21.58	MgO
Phosgenite	-13.83	-33.64	-19.81	PbCl2:PbCO3
Plattnerite	-20.04	29.56	49.60	PbO2
Portlandite	-10.10	12.70	22.80	Ca(OH)2
Pyrite	-122.36	-140.87	-18.51	FeS2
Pyrochroite	-5.52	9.67	15.19	Mn(OH)2
Pyrolusite	-6.60	34.78	41.38	MnO2
Quartz	0.50	-3.50	-4.00	SiO2
Realgar	-99.49	-119.23	-19.75	AsS
Retgersite	-10.76	-12.80	-2.04	NiSO4:6H2O
Rhodochrosite	-0.77	-11.35	-10.58	MnCO3
Rutherfordine	-5.83	-20.33	-14.50	UO2CO3
Sb(OH)3	-14.20	-21.31	-7.11	Sb(OH)3
Sb2O4	-20.91	-17.51	3.40	Sb2O4
Sb2O5	-31.36	-41.03	-9.67	Sb2O5
Sb2Se3	-117.10	-184.86	-67.76	Sb2Se3
Sb4O6(cubic)	-66.97	-85.23	-18.26	Sb4O6
Sb4O6(orth)	-67.33	-85.23	-17.90	Sb4O6
SbCl3	-54.19	-53.62	0.57	SbCl3
SbF3	-47.54	-57.77	-10.23	SbF3
Sbmetal	-47.27	-58.96	-11.69	Sb

SbO2	-5.24	-33.07	-27.82	SbO2
Schoepite	-5.30	0.69	5.99	UO2 (OH) 2:H2O
Semetal (am)	-15.20	-22.31	-7.11	Se
Semetal (hex)	-14.60	-22.31	-7.71	Se
Senarmontite	-30.25	-42.61	-12.37	Sb2O3
SeO2	-17.09	-16.97	0.12	SeO2
SeO3	-49.22	-28.17	21.04	SeO3
Sepiolite	-2.28	13.48	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-5.30	13.48	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-4.09	-14.33	-10.24	FeCO3
SiO2 (am-gel)	-0.79	-3.50	-2.71	SiO2
SiO2 (am-ppt)	-0.76	-3.50	-2.74	SiO2
Smithsonite	-1.74	-11.74	-10.00	ZnCO3
Sphalerite	-65.60	-77.05	-11.45	ZnS
Spinel	-11.23	25.62	36.85	MgAl2O4
Stibnite	-251.17	-301.63	-50.46	Sb2S3
Sulfur	-59.09	-61.24	-2.14	S
Tenorite	-0.68	6.96	7.64	CuO
Thenardite	-8.97	-8.65	0.32	Na2SO4
Thermonatrite	-10.73	-10.09	0.64	Na2CO3:H2O
Tyuyamunite	-11.26	-7.18	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.46	4.63	21.08	U3O8
U3Sb4	-584.42	-432.03	152.38	U3Sb4
U4O9	-32.65	-35.67	-3.02	U4O9
UF4	-34.27	-63.81	-29.54	UF4
UF4:2.5H2O	-31.09	-63.81	-32.72	UF4:2.5H2O
UO2 (am)	-16.13	-15.19	0.93	UO2
UO2 (NO3) 2	-48.95	-36.80	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.65	-36.80	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-40.19	-36.80	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.85	-36.80	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.92	0.69	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.23	-27.48	-2.25	UO2SeO4:4H2O
UO3	-7.01	0.69	7.70	UO3
Uraninite	-10.52	-15.19	-4.67	UO2
USb2	-222.11	-192.53	29.58	USb2
V (OH) 3	-20.73	-13.14	7.59	V (OH) 3
V2O5	-19.91	-21.27	-1.36	V2O5
V3O5	-45.79	-43.96	1.84	V3O5
V4O7	-57.43	-50.24	7.19	V4O7
V6O13	-53.17	-114.03	-60.86	V6O13
Valentinite	-34.13	-42.61	-8.48	Sb2O3
VC12	-66.11	-47.23	18.87	VC12
VC13	-68.88	-45.45	23.43	VC13
VF4	-69.83	-54.90	14.93	VF4
Vmetal	-94.82	-50.79	44.03	V
VO	-40.45	-25.69	14.76	VO
VO (OH) 2	-11.44	-6.29	5.15	VO (OH) 2
VO2Cl	-24.25	-21.41	2.84	VO2Cl
VOC1	-35.06	-23.91	11.15	VOC1
VOC12	-40.58	-27.82	12.76	VOC12
VOSO4	-29.48	-25.87	3.61	VOSO4
Witherite	-3.75	-12.32	-8.57	BaCO3
Wurtzite	-68.10	-77.05	-8.95	ZnS
Zincite	-2.04	9.29	11.33	ZnO
Zincosite	-14.23	-10.30	3.93	ZnSO4
Zn (BO2) 2	-9.27	-0.98	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-31.52	-28.21	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.91	9.29	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.18	9.29	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.46	9.29	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.24	9.29	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.44	9.29	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.51	-1.01	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-7.38	7.81	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.06	-0.41	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-30.22	-11.31	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-10.83	17.57	28.40	Zn4 (OH) 6SO4

Zn5(OH)8Cl2	-13.59	24.91	38.50	Zn5(OH)8Cl2
ZnCl2	-19.30	-12.25	7.05	ZnCl2
ZnCO3:1H2O	-1.48	-11.74	-10.26	ZnCO3:1H2O
ZnF2	-14.48	-15.02	-0.53	ZnF2
Znmetal	-41.60	-15.81	25.79	Zn
ZnMoO4	-4.49	-14.62	-10.13	ZnMoO4
ZnO(active)	-1.90	9.29	11.19	ZnO
ZnS(am)	-68.00	-77.05	-9.05	ZnS
ZnSb	-85.79	-74.77	11.01	ZnSb
ZnSe	-23.73	-38.13	-14.40	ZnSe
ZnSeO4:6H2O	-17.36	-18.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.66	-10.30	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 32.

Title Return solution back to 1L
Mix 105
112 1.0205
save solution 113
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 105.

Mixture 105.

1.021e+00 Solution 112 Solution after simulation 31.

-----Solution composition-----

Elements	Molality	Moles
Ag	2.136e-10	2.136e-10
Al	1.475e-08	1.475e-08
As	7.273e-08	7.273e-08
B	7.796e-06	7.797e-06
Ba	6.964e-08	6.964e-08
C	2.298e-03	2.299e-03
Ca	7.420e-04	7.421e-04
Cd	1.068e-10	1.068e-10
Cl	1.874e-03	1.874e-03
Co	8.052e-10	8.053e-10
Cr	1.165e-07	1.165e-07
Cu	5.762e-08	5.763e-08
F	7.865e-05	7.866e-05
Fe	9.575e-07	9.577e-07
Hg	2.311e-11	2.312e-11
K	1.256e-04	1.256e-04
Mg	1.427e-04	1.427e-04

Mn	7.069e-07	7.069e-07
Mo	1.768e-08	1.768e-08
N	6.741e-08	6.742e-08
Na	3.155e-03	3.156e-03
Ni	1.253e-09	1.253e-09
Pb	1.025e-10	1.025e-10
S	4.092e-04	4.092e-04
Sb	2.913e-10	2.913e-10
Se	1.836e-09	1.836e-09
Si	3.191e-04	3.191e-04
U	1.272e-08	1.272e-08
V	1.716e-10	1.716e-10
Zn	4.203e-07	4.203e-07

-----Description of solution-----

	pH	=	8.006	Charge balance
	pe	=	4.545	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.138e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.283e-03	
	Total CO2 (mol/kg)	=	2.298e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.977e-09	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	0	
	Total H	=	1.110291e+02	
	Total O	=	5.552260e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.111e-06	1.021e-06	-5.954	-5.991	-0.037	(0)
H+	1.071e-08	9.860e-09	-7.970	-8.006	-0.036	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.136e-10					
AgCl	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
Ag+	4.469e-11	4.113e-11	-10.350	-10.386	-0.036	(0)
AgCl2-	2.383e-11	2.174e-11	-10.623	-10.663	-0.040	(0)
AgSO4-	2.387e-13	2.177e-13	-12.622	-12.662	-0.040	(0)
AgCl3-2	4.826e-14	3.340e-14	-13.316	-13.476	-0.160	(0)
AgF	7.345e-15	7.345e-15	-14.134	-14.134	0.000	(0)
AgOH	4.199e-15	4.199e-15	-14.377	-14.377	0.000	(0)
AgNO2	4.573e-16	4.573e-16	-15.340	-15.340	0.000	(0)
AgH2BO3	2.810e-16	2.810e-16	-15.551	-15.551	0.000	(0)
AgCl4-3	2.691e-16	1.176e-16	-15.570	-15.930	-0.360	(0)
AgNH3+	4.362e-17	3.978e-17	-16.360	-16.400	-0.040	(0)
AgSeO3-	1.278e-17	1.166e-17	-16.893	-16.933	-0.040	(0)
Ag2Se	5.451e-18	5.451e-18	-17.264	-17.264	0.000	(0)
Ag (OH) 2-	4.594e-19	4.190e-19	-18.338	-18.378	-0.040	(0)
AgNO3	5.924e-22	5.924e-22	-21.227	-21.227	0.000	(0)
Ag (NH3) 2+	1.680e-22	1.532e-22	-21.775	-21.815	-0.040	(0)
Ag (NO2) 2-	4.132e-23	3.769e-23	-22.384	-22.424	-0.040	(0)
Ag (SeO3) 2-3	1.054e-25	4.603e-26	-24.977	-25.337	-0.360	(0)
Ag2MoO4	8.114e-30	8.114e-30	-29.091	-29.091	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.904	-74.904	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.055	-85.694	-0.639	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.498	-148.613	-0.115	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.096	-149.136	-0.040	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.817	-150.047	-0.230	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.136	-150.358	-0.222	(0)
Al	1.475e-08					
Al (OH) 4-	1.464e-08	1.348e-08	-7.834	-7.870	-0.036	(0)
Al (OH) 3	1.049e-10	1.049e-10	-9.979	-9.979	0.000	(0)

Al (OH) 2+	5.582e-12	5.149e-12	-11.253	-11.288	-0.035	(0)
AlF2+	1.357e-13	1.251e-13	-12.868	-12.903	-0.035	(0)
AlF3	1.120e-13	1.120e-13	-12.951	-12.951	0.000	(0)
AlOH+2	8.769e-15	6.348e-15	-14.057	-14.197	-0.140	(0)
AlF+2	6.106e-15	4.420e-15	-14.214	-14.355	-0.140	(0)
AlF4-	4.335e-15	3.991e-15	-14.363	-14.399	-0.036	(0)
AlSO4+	1.390e-17	1.280e-17	-16.857	-16.893	-0.036	(0)
Al+3	1.314e-17	6.217e-18	-16.881	-17.206	-0.325	(0)
Al (SO4) 2-	3.952e-20	3.639e-20	-19.403	-19.439	-0.036	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.274	-57.633	-0.360	(0)
As (3)	4.791e-21					
H3AsO3	4.532e-21	4.532e-21	-20.344	-20.344	0.000	(0)
H2AsO3-	2.585e-22	2.357e-22	-21.588	-21.628	-0.040	(0)
HAsO3-2	3.151e-26	2.180e-26	-25.502	-25.661	-0.160	(0)
H4AsO3+	2.427e-29	2.214e-29	-28.615	-28.655	-0.040	(0)
AsO3-3	1.951e-31	8.525e-32	-30.710	-31.069	-0.360	(0)
As (5)	7.273e-08					
HAsO4-2	6.805e-08	4.710e-08	-7.167	-7.327	-0.160	(0)
H2AsO4-	4.643e-09	4.235e-09	-8.333	-8.373	-0.040	(0)
AsO4-3	3.457e-11	1.510e-11	-10.461	-10.821	-0.360	(0)
H3AsO4	7.246e-15	7.256e-15	-14.140	-14.139	0.001	(0)
B	7.796e-06					
H3BO3	7.309e-06	7.320e-06	-5.136	-5.136	0.001	(0)
H2BO3-	4.701e-07	4.311e-07	-6.328	-6.365	-0.038	(0)
CaH2BO3+	1.327e-08	1.217e-08	-7.877	-7.915	-0.038	(0)
NaH2BO3	1.979e-09	1.979e-09	-8.704	-8.704	0.000	(0)
MgH2BO3+	1.569e-09	1.439e-09	-8.804	-8.842	-0.038	(0)
BF (OH) 3-	2.264e-10	2.077e-10	-9.645	-9.683	-0.038	(0)
H5 (BO3) 2-	2.928e-12	2.686e-12	-11.533	-11.571	-0.038	(0)
BaH2BO3+	7.120e-13	6.531e-13	-12.147	-12.185	-0.038	(0)
BF2 (OH) 2-	1.697e-14	1.557e-14	-13.770	-13.808	-0.038	(0)
H8 (BO3) 3-	2.144e-15	1.966e-15	-14.669	-14.706	-0.038	(0)
AgH2BO3	2.810e-16	2.810e-16	-15.551	-15.551	0.000	(0)
BF3OH-	4.630e-21	4.247e-21	-20.334	-20.372	-0.038	(0)
BF4-	1.597e-26	1.465e-26	-25.797	-25.834	-0.038	(0)
Ba	6.964e-08					
Ba+2	6.836e-08	4.902e-08	-7.165	-7.310	-0.144	(0)
BaHCO3+	1.031e-09	9.521e-10	-8.987	-9.021	-0.035	(0)
BaCO3	2.431e-10	2.431e-10	-9.614	-9.614	0.000	(0)
BaH2BO3+	7.120e-13	6.531e-13	-12.147	-12.185	-0.038	(0)
BaOH+	2.370e-13	2.185e-13	-12.625	-12.661	-0.035	(0)
BaNH3+2	2.117e-17	1.465e-17	-16.674	-16.834	-0.160	(0)
BaNO3+	4.884e-18	4.455e-18	-17.311	-17.351	-0.040	(0)
C (4)	2.298e-03					
HCO3-	2.205e-03	2.034e-03	-2.657	-2.692	-0.035	(0)
H2CO3	4.511e-05	4.511e-05	-4.346	-4.346	0.000	(0)
CaHCO3+	2.012e-05	1.858e-05	-4.696	-4.731	-0.035	(0)
CO3-2	1.349e-05	9.671e-06	-4.870	-5.015	-0.144	(0)
CaCO3	7.519e-06	7.519e-06	-5.124	-5.124	0.000	(0)
NaHCO3	3.312e-06	3.312e-06	-5.480	-5.480	0.000	(0)
MgHCO3+	2.178e-06	2.003e-06	-5.662	-5.698	-0.036	(0)
MgCO3	7.743e-07	7.743e-07	-6.111	-6.111	0.000	(0)
NaCO3-	5.654e-07	5.215e-07	-6.248	-6.283	-0.035	(0)
ZnCO3	1.053e-07	1.053e-07	-6.977	-6.977	0.000	(0)
CuCO3	5.054e-08	5.054e-08	-7.296	-7.296	0.000	(0)
MnHCO3+	2.015e-08	1.858e-08	-7.696	-7.731	-0.035	(0)
ZnHCO3+	1.335e-08	1.217e-08	-7.875	-7.915	-0.040	(0)
UO2 (CO3) 3-4	7.544e-09	1.731e-09	-8.122	-8.762	-0.639	(0)
UO2 (CO3) 2-2	5.160e-09	3.571e-09	-8.287	-8.447	-0.160	(0)
Cu (CO3) 2-2	1.901e-09	1.316e-09	-8.721	-8.881	-0.160	(0)
BaHCO3+	1.031e-09	9.521e-10	-8.987	-9.021	-0.035	(0)
BaCO3	2.431e-10	2.431e-10	-9.614	-9.614	0.000	(0)
NiCO3	2.147e-10	2.147e-10	-9.668	-9.668	0.000	(0)
NiHCO3+	1.636e-10	1.492e-10	-9.786	-9.826	-0.040	(0)
CuHCO3+	1.249e-10	1.139e-10	-9.904	-9.943	-0.040	(0)
PbCO3	8.191e-11	8.191e-11	-10.087	-10.087	0.000	(0)
CoHCO3+	7.478e-11	6.821e-11	-10.126	-10.166	-0.040	(0)
CoCO3	7.048e-11	7.048e-11	-10.152	-10.152	0.000	(0)

	UO ₂ CO ₃	1.851e-11	1.851e-11	-10.733	-10.733	0.000	(0)
	FeHCO ₃ ⁺	1.355e-11	1.251e-11	-10.868	-10.903	-0.035	(0)
	CdCO ₃	1.249e-11	1.249e-11	-10.903	-10.903	0.000	(0)
	PbHCO ₃ ⁺	4.668e-12	4.258e-12	-11.331	-11.371	-0.040	(0)
	Pb(CO ₃) ₂₋₂	3.301e-12	2.285e-12	-11.481	-11.641	-0.160	(0)
	CdHCO ₃ ⁺	2.877e-13	2.624e-13	-12.541	-12.581	-0.040	(0)
	Cd(CO ₃) ₂₋₂	1.294e-13	8.956e-14	-12.888	-13.048	-0.160	(0)
	HgCO ₃	3.563e-17	3.563e-17	-16.448	-16.448	0.000	(0)
	Hg(CO ₃) ₂₋₂	1.574e-18	1.090e-18	-17.803	-17.963	-0.160	(0)
	HgHCO ₃ ⁺	7.172e-21	6.541e-21	-20.144	-20.184	-0.040	(0)
Ca		7.420e-04					
	Ca+2	6.841e-04	4.905e-04	-3.165	-3.309	-0.144	(0)
	CaSO ₄	2.981e-05	2.981e-05	-4.526	-4.526	0.000	(0)
	CaHCO ₃ ⁺	2.012e-05	1.858e-05	-4.696	-4.731	-0.035	(0)
	CaCO ₃	7.519e-06	7.519e-06	-5.124	-5.124	0.000	(0)
	CaF ⁺	4.130e-07	3.807e-07	-6.384	-6.419	-0.035	(0)
	CaH ₂ BO ₃ ⁺	1.327e-08	1.217e-08	-7.877	-7.915	-0.038	(0)
	CaOH ⁺	1.082e-08	9.994e-09	-7.966	-8.000	-0.035	(0)
	CaNH ₃ +2	4.227e-13	2.926e-13	-12.374	-12.534	-0.160	(0)
	CaNO ₃ ⁺	3.084e-14	2.813e-14	-13.511	-13.551	-0.040	(0)
	Ca(NH ₃) ₂₊₂	7.973e-23	5.518e-23	-22.098	-22.258	-0.160	(0)
Cd		1.068e-10					
	Cd+2	7.903e-11	5.667e-11	-10.102	-10.247	-0.144	(0)
	CdCO ₃	1.249e-11	1.249e-11	-10.903	-10.903	0.000	(0)
	CdCl ⁺	1.023e-11	9.330e-12	-10.990	-11.030	-0.040	(0)
	CdSO ₄	3.524e-12	3.524e-12	-11.453	-11.453	0.000	(0)
	CdOH ⁺	5.039e-13	4.596e-13	-12.298	-12.338	-0.040	(0)
	CdOHC1	3.908e-13	3.908e-13	-12.408	-12.408	0.000	(0)
	CdHCO ₃ ⁺	2.877e-13	2.624e-13	-12.541	-12.581	-0.040	(0)
	Cd(CO ₃) ₂₋₂	1.294e-13	8.956e-14	-12.888	-13.048	-0.160	(0)
	CdF ⁺	7.002e-14	6.386e-14	-13.155	-13.195	-0.040	(0)
	CdCl ₂	6.706e-14	6.706e-14	-13.174	-13.174	0.000	(0)
	Cd(SO ₄) ₂₋₂	1.822e-14	1.261e-14	-13.739	-13.899	-0.160	(0)
	Cd(OH) ₂	2.961e-15	2.961e-15	-14.529	-14.529	0.000	(0)
	CdCl ₃ -	7.997e-17	7.294e-17	-16.097	-16.137	-0.040	(0)
	CdF ₂	9.060e-18	9.060e-18	-17.043	-17.043	0.000	(0)
	Cd(OH) ₃₋	2.025e-19	1.847e-19	-18.694	-18.733	-0.040	(0)
	CdSeO ₄	7.282e-21	7.282e-21	-20.138	-20.138	0.000	(0)
	CdNO ₃ ⁺	3.563e-21	3.250e-21	-20.448	-20.488	-0.040	(0)
	Cd ₂ OH+3	2.988e-22	1.305e-22	-21.525	-21.884	-0.360	(0)
	Cd(SeO ₃) ₂₋₂	1.313e-23	9.085e-24	-22.882	-23.042	-0.160	(0)
	Cd(OH) ₄₋₂	4.461e-26	3.087e-26	-25.351	-25.510	-0.160	(0)
	Cd(NO ₃) ₂	2.953e-32	2.953e-32	-31.530	-31.530	0.000	(0)
	CdHS ⁺	0.000e+00	0.000e+00	-80.531	-80.571	-0.040	(0)
	Cd(HS) ₂	0.000e+00	0.000e+00	-151.699	-151.699	0.000	(0)
	Cd(HS) ₃₋	0.000e+00	0.000e+00	-228.091	-228.131	-0.040	(0)
	Cd(HS) ₄₋₂	0.000e+00	0.000e+00	-304.107	-304.267	-0.160	(0)
Cl		1.874e-03					
	Cl-	1.874e-03	1.724e-03	-2.727	-2.763	-0.036	(0)
	ZnOHC1	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
	MnCl ⁺	1.078e-09	9.934e-10	-8.967	-9.003	-0.035	(0)
	ZnCl ⁺	8.910e-10	8.197e-10	-9.050	-9.086	-0.036	(0)
	AgCl	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
	CuCl	2.689e-11	2.689e-11	-10.570	-10.570	0.000	(0)
	AgCl ₂ -	2.383e-11	2.174e-11	-10.623	-10.663	-0.040	(0)
	CuCl ₂ -	1.053e-11	9.686e-12	-10.978	-11.014	-0.036	(0)
	CdCl ⁺	1.023e-11	9.330e-12	-10.990	-11.030	-0.040	(0)
	NiCl ⁺	2.877e-12	2.624e-12	-11.541	-11.581	-0.040	(0)
	CoCl ⁺	2.819e-12	2.571e-12	-11.550	-11.590	-0.040	(0)
	CuCl ⁺	2.636e-12	2.425e-12	-11.579	-11.615	-0.036	(0)
	MnCl ₂	2.419e-12	2.419e-12	-11.616	-11.616	0.000	(0)
	ZnCl ₂	2.240e-12	2.240e-12	-11.650	-11.650	0.000	(0)
	CdOHC1	3.908e-13	3.908e-13	-12.408	-12.408	0.000	(0)
	PbCl ⁺	1.889e-13	1.723e-13	-12.724	-12.764	-0.040	(0)
	CdCl ₂	6.706e-14	6.706e-14	-13.174	-13.174	0.000	(0)
	AgCl ₃₋₂	4.826e-14	3.340e-14	-13.316	-13.476	-0.160	(0)
	HgClOH	9.570e-15	9.570e-15	-14.019	-14.019	0.000	(0)
	CuCl ₃₋₂	4.946e-15	3.570e-15	-14.306	-14.447	-0.142	(0)

ZnCl3-	3.334e-15	3.067e-15	-14.477	-14.513	-0.036	(0)
CuCl2	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
PbCl2	1.327e-15	1.327e-15	-14.877	-14.877	0.000	(0)
MnCl3-	1.246e-15	1.149e-15	-14.904	-14.940	-0.035	(0)
HgCl2	9.150e-16	9.150e-16	-15.039	-15.039	0.000	(0)
AgCl4-3	2.691e-16	1.176e-16	-15.570	-15.930	-0.360	(0)
CrCl+2	8.846e-17	6.122e-17	-16.053	-16.213	-0.160	(0)
CdCl3-	7.997e-17	7.294e-17	-16.097	-16.137	-0.040	(0)
NiCl2	2.278e-17	2.278e-17	-16.642	-16.642	0.000	(0)
HgCl3-	1.729e-17	1.577e-17	-16.762	-16.802	-0.040	(0)
ZnCl4-2	3.663e-18	2.644e-18	-17.436	-17.578	-0.142	(0)
CrOHC12	2.048e-18	2.048e-18	-17.689	-17.689	0.000	(0)
UO2Cl+	1.473e-18	1.344e-18	-17.832	-17.872	-0.040	(0)
PbCl3-	9.987e-19	9.109e-19	-18.001	-18.041	-0.040	(0)
HgCl4-2	1.564e-19	1.083e-19	-18.806	-18.966	-0.160	(0)
HgCl+	1.161e-19	1.059e-19	-18.935	-18.975	-0.040	(0)
FeCl+2	1.149e-19	8.292e-20	-18.940	-19.081	-0.142	(0)
CuCl3-	2.535e-20	2.332e-20	-19.596	-19.632	-0.036	(0)
CrCl2+	1.098e-20	1.001e-20	-19.959	-19.999	-0.040	(0)
PbCl4-2	1.037e-21	7.178e-22	-20.984	-21.144	-0.160	(0)
FeCl2+	6.928e-22	6.386e-22	-21.159	-21.195	-0.035	(0)
CrO3Cl-	5.631e-25	5.136e-25	-24.249	-24.289	-0.040	(0)
VuCl4-2	2.792e-25	2.015e-25	-24.554	-24.696	-0.142	(0)
VOCl+	2.672e-25	2.437e-25	-24.573	-24.613	-0.040	(0)
FeCl3	1.101e-25	1.101e-25	-24.958	-24.958	0.000	(0)
CoCl+2	3.052e-38	2.112e-38	-37.515	-37.675	-0.160	(0)
UCl+3	0.000e+00	0.000e+00	-47.921	-48.280	-0.360	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.010	-58.170	-0.160	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.184	-58.344	-0.160	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.224	-74.384	-0.160	(0)
Co (2)	8.052e-10					
Co+2	6.229e-10	4.311e-10	-9.206	-9.365	-0.160	(0)
CoHCO3+	7.478e-11	6.821e-11	-10.126	-10.166	-0.040	(0)
CoCO3	7.048e-11	7.048e-11	-10.152	-10.152	0.000	(0)
CoSO4	2.282e-11	2.282e-11	-10.642	-10.642	0.000	(0)
CoOH+	9.629e-12	8.783e-12	-11.016	-11.056	-0.040	(0)
CoCl+	2.819e-12	2.571e-12	-11.550	-11.590	-0.040	(0)
CoF+	1.063e-12	9.693e-13	-11.974	-12.014	-0.040	(0)
Co (OH) 2	7.123e-13	7.123e-13	-12.147	-12.147	0.000	(0)
CoNO2+	1.772e-16	1.617e-16	-15.751	-15.791	-0.040	(0)
Co (NH3) +2	3.548e-17	2.455e-17	-16.450	-16.610	-0.160	(0)
Co (OH) 3-	1.591e-17	1.451e-17	-16.798	-16.838	-0.040	(0)
CoOOH-	3.993e-18	3.642e-18	-17.399	-17.439	-0.040	(0)
CoSeO4	1.491e-19	1.491e-19	-18.827	-18.827	0.000	(0)
CoNO3+	1.358e-20	1.239e-20	-19.867	-19.907	-0.040	(0)
Co2OH+3	4.343e-22	1.898e-22	-21.362	-21.722	-0.360	(0)
Co (OH) 4-2	3.393e-24	2.349e-24	-23.469	-23.629	-0.160	(0)
Co (NH3) 2+2	7.170e-25	4.963e-25	-24.144	-24.304	-0.160	(0)
Co (NO3) 2	4.571e-31	4.571e-31	-30.340	-30.340	0.000	(0)
Co (NH3) 3+2	4.277e-33	2.960e-33	-32.369	-32.529	-0.160	(0)
Co4 (OH) 4+4	5.174e-36	1.187e-36	-35.286	-35.925	-0.639	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.973	-41.133	-0.160	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.078	-50.238	-0.160	(0)
Co (3)	4.514e-31					
CoOH+2	4.514e-31	3.124e-31	-30.345	-30.505	-0.160	(0)
Co+3	1.273e-37	6.021e-38	-36.895	-37.220	-0.325	(0)
CoCl+2	3.052e-38	2.112e-38	-37.515	-37.675	-0.160	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.184	-58.344	-0.160	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.232	-70.272	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.252	-73.412	-0.160	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.224	-74.384	-0.160	(0)
Cr (2)	2.699e-25					
Cr+2	2.699e-25	1.868e-25	-24.569	-24.729	-0.160	(0)
Cr (3)	1.165e-07					
Cr (OH) 2+	8.349e-08	7.615e-08	-7.078	-7.118	-0.040	(0)
Cr (OH) 3	2.921e-08	2.921e-08	-7.534	-7.534	0.000	(0)
CrO2-	1.543e-09	1.407e-09	-8.812	-8.852	-0.040	(0)
Cr (OH) 4-	1.302e-09	1.187e-09	-8.885	-8.925	-0.040	(0)

Cr(OH)+2	8.856e-10	6.129e-10	-9.053	-9.213	-0.160	(0)
CrOHSO4	3.859e-11	3.859e-11	-10.414	-10.414	0.000	(0)
CrF+2	4.468e-13	3.092e-13	-12.350	-12.510	-0.160	(0)
Cr+3	6.280e-14	2.744e-14	-13.202	-13.562	-0.360	(0)
CrSO4+	1.863e-14	1.700e-14	-13.730	-13.770	-0.040	(0)
CrCl+2	8.846e-17	6.122e-17	-16.053	-16.213	-0.160	(0)
Cr2(OH)2SO4+2	3.089e-18	2.138e-18	-17.510	-17.670	-0.160	(0)
CrOHC12	2.048e-18	2.048e-18	-17.689	-17.689	0.000	(0)
Cr2(OH)2(SO4)2	3.369e-20	3.369e-20	-19.473	-19.473	0.000	(0)
CrCl2+	1.098e-20	1.001e-20	-19.959	-19.999	-0.040	(0)
CrNO3+2	3.142e-26	2.175e-26	-25.503	-25.663	-0.160	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-45.643	-45.802	-0.160	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-56.149	-56.508	-0.360	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-58.010	-58.170	-0.160	(0)
Cr(6)	2.177e-13					
CrO4-2	2.100e-13	1.505e-13	-12.678	-12.822	-0.144	(0)
HCrO4-	5.266e-15	4.803e-15	-14.279	-14.318	-0.040	(0)
NaCrO4-	2.375e-15	2.166e-15	-14.624	-14.664	-0.040	(0)
KCrO4-	7.073e-17	6.451e-17	-16.150	-16.190	-0.040	(0)
H2CrO4	3.839e-23	3.839e-23	-22.416	-22.416	0.000	(0)
CrO3SO4-2	5.530e-24	3.827e-24	-23.257	-23.417	-0.160	(0)
CrO3Cl-	5.631e-25	5.136e-25	-24.249	-24.289	-0.040	(0)
Cr2O7-2	1.156e-27	8.001e-28	-26.937	-27.097	-0.160	(0)
Cu(1)	5.101e-11					
CuCl	2.689e-11	2.689e-11	-10.570	-10.570	0.000	(0)
Cu+	1.358e-11	1.239e-11	-10.867	-10.907	-0.040	(0)
CuCl2-	1.053e-11	9.686e-12	-10.978	-11.014	-0.036	(0)
CuCl3-2	4.946e-15	3.570e-15	-14.306	-14.447	-0.142	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-147.943	-148.169	-0.226	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.680	-148.899	-0.219	(0)
Cu(2)	5.757e-08					
CuCO3	5.054e-08	5.054e-08	-7.296	-7.296	0.000	(0)
CuOH+	3.115e-09	2.866e-09	-8.507	-8.543	-0.036	(0)
Cu(CO3)2-2	1.901e-09	1.316e-09	-8.721	-8.881	-0.160	(0)
Cu+2	1.238e-09	8.875e-10	-8.907	-9.052	-0.144	(0)
Cu(OH)2	5.838e-10	5.838e-10	-9.234	-9.234	0.000	(0)
CuHCO3+	1.249e-10	1.139e-10	-9.904	-9.943	-0.040	(0)
CuSO4	5.394e-11	5.394e-11	-10.268	-10.268	0.000	(0)
CuF+	4.365e-12	3.982e-12	-11.360	-11.400	-0.040	(0)
CuCl+	2.636e-12	2.425e-12	-11.579	-11.615	-0.036	(0)
Cu(OH)3-	1.341e-12	1.223e-12	-11.873	-11.913	-0.040	(0)
Cu2(OH)2+2	2.981e-13	2.063e-13	-12.526	-12.686	-0.160	(0)
CuNH3+2	6.217e-15	4.303e-15	-14.206	-14.366	-0.160	(0)
CuNO2+	5.422e-15	4.946e-15	-14.266	-14.306	-0.040	(0)
CuCl2	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
Cu(OH)4-2	1.420e-17	9.827e-18	-16.848	-17.008	-0.160	(0)
CuNO3+	5.580e-20	5.089e-20	-19.253	-19.293	-0.040	(0)
CuCl3-	2.535e-20	2.332e-20	-19.596	-19.632	-0.036	(0)
Cu(NO2)2	2.693e-21	2.693e-21	-20.570	-20.570	0.000	(0)
CuCl4-2	2.792e-25	2.015e-25	-24.554	-24.696	-0.142	(0)
Cu(NO3)2	1.162e-31	1.162e-31	-30.935	-30.935	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-218.109	-218.149	-0.040	(0)
F	7.865e-05					
F-	7.727e-05	7.110e-05	-4.112	-4.148	-0.036	(0)
MgF+	8.339e-07	7.679e-07	-6.079	-6.115	-0.036	(0)
CaF+	4.130e-07	3.807e-07	-6.384	-6.419	-0.035	(0)
NaF	1.299e-07	1.299e-07	-6.886	-6.886	0.000	(0)
MnF+	1.406e-09	1.296e-09	-8.852	-8.888	-0.035	(0)
HF	1.037e-09	1.037e-09	-8.984	-8.984	0.000	(0)
ZnF+	2.944e-10	2.685e-10	-9.531	-9.571	-0.040	(0)
BF(OH)3-	2.264e-10	2.077e-10	-9.645	-9.683	-0.038	(0)
CuF+	4.365e-12	3.982e-12	-11.360	-11.400	-0.040	(0)
NiF+	1.165e-12	1.063e-12	-11.934	-11.974	-0.040	(0)
CoF+	1.063e-12	9.693e-13	-11.974	-12.014	-0.040	(0)
CrF+2	4.468e-13	3.092e-13	-12.350	-12.510	-0.160	(0)
HF2-	3.050e-13	2.803e-13	-12.516	-12.552	-0.037	(0)
AlF2+	1.357e-13	1.251e-13	-12.868	-12.903	-0.035	(0)
AlF3	1.120e-13	1.120e-13	-12.951	-12.951	0.000	(0)

CdF+	7.002e-14	6.386e-14	-13.155	-13.195	-0.040	(0)
BF2 (OH) 2-	1.697e-14	1.557e-14	-13.770	-13.808	-0.038	(0)
PbF+	1.548e-14	1.412e-14	-13.810	-13.850	-0.040	(0)
AgF	7.345e-15	7.345e-15	-14.134	-14.134	0.000	(0)
AlF+2	6.106e-15	4.420e-15	-14.214	-14.355	-0.140	(0)
UO2F+	5.172e-15	4.717e-15	-14.286	-14.326	-0.040	(0)
AlF4-	4.335e-15	3.991e-15	-14.363	-14.399	-0.036	(0)
UO2F2	9.674e-16	9.674e-16	-15.014	-15.014	0.000	(0)
FeF2+	2.563e-16	2.363e-16	-15.591	-15.627	-0.035	(0)
FeF+2	1.720e-16	1.242e-16	-15.764	-15.906	-0.142	(0)
FeF3	2.370e-17	2.370e-17	-16.625	-16.625	0.000	(0)
PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
UO2F3-	1.894e-17	1.728e-17	-16.723	-16.763	-0.040	(0)
CdF2	9.060e-18	9.060e-18	-17.043	-17.043	0.000	(0)
H2F2	2.881e-18	2.881e-18	-17.540	-17.540	0.000	(0)
VO2F	2.835e-20	2.835e-20	-19.547	-19.547	0.000	(0)
UO2F4-2	1.410e-20	9.759e-21	-19.851	-20.011	-0.160	(0)
BF3OH-	4.630e-21	4.247e-21	-20.334	-20.372	-0.038	(0)
PbF3-	2.921e-21	2.664e-21	-20.535	-20.574	-0.040	(0)
VO2F2-	8.024e-22	7.319e-22	-21.096	-21.136	-0.040	(0)
VOF+	2.356e-23	2.149e-23	-22.628	-22.668	-0.040	(0)
VO2F3-2	9.379e-25	6.491e-25	-24.028	-24.188	-0.160	(0)
VOF2	5.730e-25	5.730e-25	-24.242	-24.242	0.000	(0)
PbF4-2	1.310e-25	9.066e-26	-24.883	-25.043	-0.160	(0)
BF4-	1.597e-26	1.465e-26	-25.797	-25.834	-0.038	(0)
HgF+	8.895e-27	8.113e-27	-26.051	-26.091	-0.040	(0)
VOF3-	1.585e-27	1.445e-27	-26.800	-26.840	-0.040	(0)
Sb (OH) 2F	5.405e-28	5.405e-28	-27.267	-27.267	0.000	(0)
SbOF	5.316e-28	5.316e-28	-27.274	-27.274	0.000	(0)
VO2F4-3	5.198e-29	2.271e-29	-28.284	-28.644	-0.360	(0)
SiF6-2	8.060e-31	5.817e-31	-30.094	-30.235	-0.142	(0)
VOF4-2	5.994e-31	4.149e-31	-30.222	-30.382	-0.160	(0)
UF3+	9.524e-39	8.687e-39	-38.021	-38.061	-0.040	(0)
UF2+2	1.114e-39	7.709e-40	-38.953	-39.113	-0.160	(0)
UF4	0.000e+00	0.000e+00	-40.169	-40.169	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.705	-42.065	-0.360	(0)
UF5-	0.000e+00	0.000e+00	-42.679	-42.719	-0.040	(0)
UF6-2	0.000e+00	0.000e+00	-44.228	-44.387	-0.160	(0)
Fe (2)	7.730e-10					
Fe+2	7.061e-10	4.887e-10	-9.151	-9.311	-0.160	(0)
FeSO4	3.182e-11	3.182e-11	-10.497	-10.497	0.000	(0)
FeOH+	2.155e-11	1.986e-11	-10.667	-10.702	-0.035	(0)
FeHCO3+	1.355e-11	1.251e-11	-10.868	-10.903	-0.035	(0)
Fe (OH) 2	1.611e-14	1.611e-14	-13.793	-13.793	0.000	(0)
Fe (OH) 3-	5.644e-15	5.202e-15	-14.248	-14.284	-0.035	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.025	-157.025	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.280	-233.320	-0.040	(0)
Fe (3)	9.568e-07					
Fe (OH) 3	4.574e-07	4.574e-07	-6.340	-6.340	0.000	(0)
Fe (OH) 2+	4.522e-07	4.171e-07	-6.345	-6.380	-0.035	(0)
Fe (OH) 4-	4.715e-08	4.349e-08	-7.327	-7.362	-0.035	(0)
FeOH+2	1.455e-12	1.050e-12	-11.837	-11.979	-0.142	(0)
FeF2+	2.563e-16	2.363e-16	-15.591	-15.627	-0.035	(0)
FeF+2	1.720e-16	1.242e-16	-15.764	-15.906	-0.142	(0)
FeF3	2.370e-17	2.370e-17	-16.625	-16.625	0.000	(0)
FeSO4+	5.143e-18	4.741e-18	-17.289	-17.324	-0.035	(0)
Fe+3	3.366e-18	1.593e-18	-17.473	-17.798	-0.325	(0)
FeCl+2	1.149e-19	8.292e-20	-18.940	-19.081	-0.142	(0)
Fe (SO4) 2-	2.948e-20	2.689e-20	-19.530	-19.570	-0.040	(0)
FeCl2+	6.928e-22	6.386e-22	-21.159	-21.195	-0.035	(0)
Fe2 (OH) 2+4	1.591e-22	3.651e-23	-21.798	-22.438	-0.639	(0)
FeHSeO3+2	6.642e-24	4.597e-24	-23.178	-23.338	-0.160	(0)
FeCl3	1.101e-25	1.101e-25	-24.958	-24.958	0.000	(0)
Fe3 (OH) 4+5	2.196e-27	2.201e-28	-26.658	-27.657	-0.999	(0)
FeNO3+2	4.173e-28	2.888e-28	-27.380	-27.539	-0.160	(0)
H (0)	1.117e-28					
H2	5.583e-29	5.591e-29	-28.253	-28.252	0.001	(0)
Hg (0)	2.308e-11					

Hg	2.308e-11	2.308e-11	-10.637	-10.637	0.000	(0)
Hg (1)	1.394e-25					
Hg2+2	6.970e-26	4.824e-26	-25.157	-25.317	-0.160	(0)
Hg (2)	3.076e-14					
Hg (OH) 2	2.022e-14	2.025e-14	-13.694	-13.694	0.001	(0)
HgClOH	9.570e-15	9.570e-15	-14.019	-14.019	0.000	(0)
HgCl2	9.150e-16	9.150e-16	-15.039	-15.039	0.000	(0)
HgCO3	3.563e-17	3.563e-17	-16.448	-16.448	0.000	(0)
HgCl3-	1.729e-17	1.577e-17	-16.762	-16.802	-0.040	(0)
Hg (CO3) 2-2	1.574e-18	1.090e-18	-17.803	-17.963	-0.160	(0)
HgCl4-2	1.564e-19	1.083e-19	-18.806	-18.966	-0.160	(0)
HgOH+	1.372e-19	1.251e-19	-18.863	-18.903	-0.040	(0)
HgCl+	1.161e-19	1.059e-19	-18.935	-18.975	-0.040	(0)
HgHCO3+	7.172e-21	6.541e-21	-20.144	-20.184	-0.040	(0)
Hg (OH) 3-	2.854e-21	2.603e-21	-20.545	-20.585	-0.040	(0)
Hg+2	4.448e-24	3.078e-24	-23.352	-23.512	-0.160	(0)
HgNH3+2	1.330e-24	9.202e-25	-23.876	-24.036	-0.160	(0)
Hg (NH3) 2+2	6.299e-25	4.360e-25	-24.201	-24.361	-0.160	(0)
HgSO4	2.138e-25	2.138e-25	-24.670	-24.670	0.000	(0)
HgF+	8.895e-27	8.113e-27	-26.051	-26.091	-0.040	(0)
Hg (NH3) 3+2	1.188e-33	8.223e-34	-32.925	-33.085	-0.160	(0)
HgNO3+	2.260e-35	2.061e-35	-34.646	-34.686	-0.040	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.350	-41.509	-0.160	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.809	-45.809	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-140.202	-140.242	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.784	-140.944	-0.160	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.854	-141.854	0.000	(0)
K	1.256e-04					
K+	1.253e-04	1.153e-04	-3.902	-3.938	-0.036	(0)
KSO4-	2.348e-07	2.166e-07	-6.629	-6.664	-0.035	(0)
KCrO4-	7.073e-17	6.451e-17	-16.150	-16.190	-0.040	(0)
Mg	1.427e-04					
Mg+2	1.342e-04	9.626e-05	-3.872	-4.017	-0.144	(0)
MgSO4	4.647e-06	4.647e-06	-5.333	-5.333	0.000	(0)
MgHCO3+	2.178e-06	2.003e-06	-5.662	-5.698	-0.036	(0)
MgF+	8.339e-07	7.679e-07	-6.079	-6.115	-0.036	(0)
MgCO3	7.743e-07	7.743e-07	-6.111	-6.111	0.000	(0)
MgOH+	4.234e-08	3.913e-08	-7.373	-7.408	-0.034	(0)
MgH2BO3+	1.569e-09	1.439e-09	-8.804	-8.842	-0.038	(0)
Mn (2)	7.069e-07					
Mn+2	6.614e-07	4.577e-07	-6.180	-6.339	-0.160	(0)
MnSO4	2.159e-08	2.159e-08	-7.666	-7.666	0.000	(0)
MnHCO3+	2.015e-08	1.858e-08	-7.696	-7.731	-0.035	(0)
MnF+	1.406e-09	1.296e-09	-8.852	-8.888	-0.035	(0)
MnOH+	1.274e-09	1.174e-09	-8.895	-8.930	-0.035	(0)
MnCl+	1.078e-09	9.934e-10	-8.967	-9.003	-0.035	(0)
MnCl2	2.419e-12	2.419e-12	-11.616	-11.616	0.000	(0)
MnCl3-	1.246e-15	1.149e-15	-14.904	-14.940	-0.035	(0)
MnSeO4	8.502e-17	8.502e-17	-16.070	-16.070	0.000	(0)
MnNO3+	1.442e-17	1.315e-17	-16.841	-16.881	-0.040	(0)
Mn (OH) 3-	8.207e-18	7.565e-18	-17.086	-17.121	-0.035	(0)
Mn (OH) 4-2	3.455e-23	2.494e-23	-22.462	-22.603	-0.142	(0)
Mn (NO3) 2	5.992e-28	5.992e-28	-27.222	-27.222	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.127	-43.127	0.000	(0)
Mn (3)	1.516e-27					
Mn+3	1.516e-27	7.173e-28	-26.819	-27.144	-0.325	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-42.391	-42.532	-0.142	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.322	-47.359	-0.037	(0)
Mo	1.768e-08					
MoO4-2	1.767e-08	1.267e-08	-7.753	-7.897	-0.144	(0)
HMoO4-	2.726e-12	2.486e-12	-11.565	-11.604	-0.040	(0)
H2MoO4	1.796e-16	1.796e-16	-15.746	-15.746	0.000	(0)
Ag2MoO4	8.114e-30	8.114e-30	-29.091	-29.091	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-57.274	-57.633	-0.360	(0)
Mo7O24-6	0.000e+00	0.000e+00	-64.900	-66.339	-1.439	(0)
HMo7O24-5	0.000e+00	0.000e+00	-66.959	-67.958	-0.999	(0)

H2Mo7O24-4	0.000e+00	0.000e+00	-70.543	-71.182	-0.639	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-75.583	-75.942	-0.360	(0)
N (-3)	9.432e-09					
NH4+	8.933e-09	8.193e-09	-8.049	-8.087	-0.038	(0)
NH3	4.738e-10	4.738e-10	-9.324	-9.324	0.000	(0)
NH4SO4-	2.527e-11	2.329e-11	-10.597	-10.633	-0.035	(0)
CaNH3+2	4.227e-13	2.926e-13	-12.374	-12.534	-0.160	(0)
CuNH3+2	6.217e-15	4.303e-15	-14.206	-14.366	-0.160	(0)
NiNH3+2	2.187e-16	1.514e-16	-15.660	-15.820	-0.160	(0)
AgNH3+	4.362e-17	3.978e-17	-16.360	-16.400	-0.040	(0)
Co (NH3) +2	3.548e-17	2.455e-17	-16.450	-16.610	-0.160	(0)
BaNH3+2	2.117e-17	1.465e-17	-16.674	-16.834	-0.160	(0)
Ag (NH3) 2+	1.680e-22	1.532e-22	-21.775	-21.815	-0.040	(0)
Ca (NH3) 2+2	7.973e-23	5.518e-23	-22.098	-22.258	-0.160	(0)
Ni (NH3) 2+2	1.498e-23	1.037e-23	-22.825	-22.984	-0.160	(0)
HgNH3+2	1.330e-24	9.202e-25	-23.876	-24.036	-0.160	(0)
Co (NH3) 2+2	7.170e-25	4.963e-25	-24.144	-24.304	-0.160	(0)
Hg (NH3) 2+2	6.299e-25	4.360e-25	-24.201	-24.361	-0.160	(0)
Co (NH3) 3+2	4.277e-33	2.960e-33	-32.369	-32.529	-0.160	(0)
Hg (NH3) 3+2	1.188e-33	8.223e-34	-32.925	-33.085	-0.160	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.973	-41.133	-0.160	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.350	-41.509	-0.160	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.643	-45.802	-0.160	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.078	-50.238	-0.160	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-56.149	-56.508	-0.360	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-58.010	-58.170	-0.160	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.184	-58.344	-0.160	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.232	-70.272	-0.040	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.252	-73.412	-0.160	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.224	-74.384	-0.160	(0)
N (3)	5.796e-08					
NO2-	5.796e-08	5.322e-08	-7.237	-7.274	-0.037	(0)
CuNO2+	5.422e-15	4.946e-15	-14.266	-14.306	-0.040	(0)
AgNO2	4.573e-16	4.573e-16	-15.340	-15.340	0.000	(0)
CoNO2+	1.772e-16	1.617e-16	-15.751	-15.791	-0.040	(0)
Cu (NO2) 2	2.693e-21	2.693e-21	-20.570	-20.570	0.000	(0)
Ag (NO2) 2-	4.132e-23	3.769e-23	-22.384	-22.424	-0.040	(0)
N (5)	1.974e-11					
NO3-	1.971e-11	1.813e-11	-10.705	-10.742	-0.036	(0)
CaNO3+	3.084e-14	2.813e-14	-13.511	-13.551	-0.040	(0)
MnNO3+	1.442e-17	1.315e-17	-16.841	-16.881	-0.040	(0)
ZnNO3+	9.452e-18	8.622e-18	-17.024	-17.064	-0.040	(0)
BaNO3+	4.884e-18	4.455e-18	-17.311	-17.351	-0.040	(0)
CuNO3+	5.580e-20	5.089e-20	-19.253	-19.293	-0.040	(0)
NiNO3+	2.971e-20	2.710e-20	-19.527	-19.567	-0.040	(0)
CoNO3+	1.358e-20	1.239e-20	-19.867	-19.907	-0.040	(0)
CdNO3+	3.563e-21	3.250e-21	-20.448	-20.488	-0.040	(0)
PbNO3+	8.285e-22	7.556e-22	-21.082	-21.122	-0.040	(0)
AgNO3	5.924e-22	5.924e-22	-21.227	-21.227	0.000	(0)
CrNO3+2	3.142e-26	2.175e-26	-25.503	-25.663	-0.160	(0)
UO2NO3+	1.907e-26	1.739e-26	-25.720	-25.760	-0.040	(0)
Mn (NO3) 2	5.992e-28	5.992e-28	-27.222	-27.222	0.000	(0)
FeNO3+2	4.173e-28	2.888e-28	-27.380	-27.539	-0.160	(0)
Zn (NO3) 2	3.119e-29	3.119e-29	-28.506	-28.506	0.000	(0)
VO2NO3	2.085e-30	2.085e-30	-29.681	-29.681	0.000	(0)
Co (NO3) 2	4.571e-31	4.571e-31	-30.340	-30.340	0.000	(0)
Cu (NO3) 2	1.162e-31	1.162e-31	-30.935	-30.935	0.000	(0)
Cd (NO3) 2	2.953e-32	2.953e-32	-31.530	-31.530	0.000	(0)
Pb (NO3) 2	2.327e-32	2.327e-32	-31.633	-31.633	0.000	(0)
HgNO3+	2.260e-35	2.061e-35	-34.646	-34.686	-0.040	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.809	-45.809	0.000	(0)
Na	3.155e-03					
Na+	3.147e-03	2.896e-03	-2.502	-2.538	-0.036	(0)
NaSO4-	4.473e-06	4.125e-06	-5.349	-5.385	-0.035	(0)
NaHCO3	3.312e-06	3.312e-06	-5.480	-5.480	0.000	(0)
NaCO3-	5.654e-07	5.215e-07	-6.248	-6.283	-0.035	(0)
NaF	1.299e-07	1.299e-07	-6.886	-6.886	0.000	(0)
NaH2BO3	1.979e-09	1.979e-09	-8.704	-8.704	0.000	(0)

NaCrO4-	2.375e-15	2.166e-15	-14.624	-14.664	-0.040	(0)
Ni	1.253e-09					
Ni+2	8.298e-10	5.950e-10	-9.081	-9.226	-0.144	(0)
NiCO3	2.147e-10	2.147e-10	-9.668	-9.668	0.000	(0)
NiHCO3+	1.636e-10	1.492e-10	-9.786	-9.826	-0.040	(0)
NiSO4	3.149e-11	3.149e-11	-10.502	-10.502	0.000	(0)
NiOH+	8.385e-12	7.648e-12	-11.076	-11.116	-0.040	(0)
NiCl+	2.877e-12	2.624e-12	-11.541	-11.581	-0.040	(0)
NiF+	1.165e-12	1.063e-12	-11.934	-11.974	-0.040	(0)
Ni (OH) 2	6.203e-13	6.203e-13	-12.207	-12.207	0.000	(0)
Ni (OH) 3-	6.944e-16	6.334e-16	-15.158	-15.198	-0.040	(0)
Ni (SO4) 2-2	3.997e-16	2.766e-16	-15.398	-15.558	-0.160	(0)
NiNH3+2	2.187e-16	1.514e-16	-15.660	-15.820	-0.160	(0)
NiCl2	2.278e-17	2.278e-17	-16.642	-16.642	0.000	(0)
NiSeO4	1.920e-19	1.920e-19	-18.717	-18.717	0.000	(0)
NiNO3+	2.971e-20	2.710e-20	-19.527	-19.567	-0.040	(0)
Ni (NH3) 2+2	1.498e-23	1.037e-23	-22.825	-22.984	-0.160	(0)
O (0)	3.237e-36					
O2	1.619e-36	1.621e-36	-35.791	-35.790	0.001	(0)
Pb	1.025e-10					
PbCO3	8.191e-11	8.191e-11	-10.087	-10.087	0.000	(0)
PbOH+	7.922e-12	7.226e-12	-11.101	-11.141	-0.040	(0)
PbHCO3+	4.668e-12	4.258e-12	-11.331	-11.371	-0.040	(0)
Pb+2	3.929e-12	2.817e-12	-11.406	-11.550	-0.144	(0)
Pb (CO3) 2-2	3.301e-12	2.285e-12	-11.481	-11.641	-0.160	(0)
PbSO4	3.661e-13	3.661e-13	-12.436	-12.436	0.000	(0)
Pb (OH) 2	2.333e-13	2.333e-13	-12.632	-12.632	0.000	(0)
PbCl+	1.889e-13	1.723e-13	-12.724	-12.764	-0.040	(0)
PbF+	1.548e-14	1.412e-14	-13.810	-13.850	-0.040	(0)
PbCl2	1.327e-15	1.327e-15	-14.877	-14.877	0.000	(0)
Pb (SO4) 2-2	8.455e-16	5.851e-16	-15.073	-15.233	-0.160	(0)
Pb (OH) 3-	2.612e-16	2.382e-16	-15.583	-15.623	-0.040	(0)
PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
PbCl3-	9.987e-19	9.109e-19	-18.001	-18.041	-0.040	(0)
Pb (OH) 4-2	8.608e-20	5.958e-20	-19.065	-19.225	-0.160	(0)
PbF3-	2.921e-21	2.664e-21	-20.535	-20.574	-0.040	(0)
PbCl4-2	1.037e-21	7.178e-22	-20.984	-21.144	-0.160	(0)
PbNO3+	8.285e-22	7.556e-22	-21.082	-21.122	-0.040	(0)
Pb2OH+3	7.385e-22	3.226e-22	-21.132	-21.491	-0.360	(0)
PbF4-2	1.310e-25	9.066e-26	-24.883	-25.043	-0.160	(0)
Pb3 (OH) 4+2	4.422e-27	3.060e-27	-26.354	-26.514	-0.160	(0)
Pb (NO3) 2	2.327e-32	2.327e-32	-31.633	-31.633	0.000	(0)
Pb4 (OH) 4+4	2.985e-34	6.848e-35	-33.525	-34.164	-0.639	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.944	-152.944	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.937	-229.977	-0.040	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.904	-74.904	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.292	-78.332	-0.040	(0)
H2S	0.000e+00	0.000e+00	-79.318	-79.318	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.531	-79.691	-0.160	(0)
S6-2	0.000e+00	0.000e+00	-80.047	-80.207	-0.160	(0)
S4-2	0.000e+00	0.000e+00	-80.127	-80.287	-0.160	(0)
CdHS+	0.000e+00	0.000e+00	-80.531	-80.571	-0.040	(0)
S3-2	0.000e+00	0.000e+00	-80.933	-81.093	-0.160	(0)
S2-2	0.000e+00	0.000e+00	-81.949	-82.109	-0.160	(0)
S-2	0.000e+00	0.000e+00	-87.484	-87.626	-0.142	(0)
HgHS2-	0.000e+00	0.000e+00	-140.202	-140.242	-0.040	(0)
HgS2-2	0.000e+00	0.000e+00	-140.784	-140.944	-0.160	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.854	-141.854	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.943	-148.169	-0.226	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.498	-148.613	-0.115	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.531	-148.571	-0.040	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.680	-148.899	-0.219	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.096	-149.136	-0.040	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.817	-150.047	-0.230	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.136	-150.358	-0.222	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.567	-150.567	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.699	-151.699	0.000	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-152.944	-152.944	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-157.025	-157.025	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.109	-218.149	-0.040	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.579	-225.619	-0.040	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.433	-227.593	-0.160	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.091	-228.131	-0.040	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.937	-229.977	-0.040	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.280	-233.320	-0.040	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.107	-304.267	-0.160	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.252	-305.411	-0.160	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.405	-322.565	-0.160	(0)
S (6)	4.092e-04					
SO4-2	3.700e-04	2.653e-04	-3.432	-3.576	-0.144	(0)
CaSO4	2.981e-05	2.981e-05	-4.526	-4.526	0.000	(0)
MgSO4	4.647e-06	4.647e-06	-5.333	-5.333	0.000	(0)
NaSO4-	4.473e-06	4.125e-06	-5.349	-5.385	-0.035	(0)
KSO4-	2.348e-07	2.166e-07	-6.629	-6.664	-0.035	(0)
MnSO4	2.159e-08	2.159e-08	-7.666	-7.666	0.000	(0)
ZnSO4	1.099e-08	1.099e-08	-7.959	-7.959	0.000	(0)
HSO4-	2.776e-10	2.556e-10	-9.557	-9.592	-0.036	(0)
CuSO4	5.394e-11	5.394e-11	-10.268	-10.268	0.000	(0)
CrOHSO4	3.859e-11	3.859e-11	-10.414	-10.414	0.000	(0)
Zn (SO4) 2-2	3.667e-11	2.538e-11	-10.436	-10.595	-0.160	(0)
FeSO4	3.182e-11	3.182e-11	-10.497	-10.497	0.000	(0)
NiSO4	3.149e-11	3.149e-11	-10.502	-10.502	0.000	(0)
NH4SO4-	2.527e-11	2.329e-11	-10.597	-10.633	-0.035	(0)
CoSO4	2.282e-11	2.282e-11	-10.642	-10.642	0.000	(0)
CdSO4	3.524e-12	3.524e-12	-11.453	-11.453	0.000	(0)
PbSO4	3.661e-13	3.661e-13	-12.436	-12.436	0.000	(0)
AgSO4-	2.387e-13	2.177e-13	-12.622	-12.662	-0.040	(0)
CrSO4+	1.863e-14	1.700e-14	-13.730	-13.770	-0.040	(0)
Cd (SO4) 2-2	1.822e-14	1.261e-14	-13.739	-13.899	-0.160	(0)
Pb (SO4) 2-2	8.455e-16	5.851e-16	-15.073	-15.233	-0.160	(0)
Ni (SO4) 2-2	3.997e-16	2.766e-16	-15.398	-15.558	-0.160	(0)
UO2SO4	1.930e-16	1.930e-16	-15.714	-15.714	0.000	(0)
AlSO4+	1.390e-17	1.280e-17	-16.857	-16.893	-0.036	(0)
FeSO4+	5.143e-18	4.741e-18	-17.289	-17.324	-0.035	(0)
Cr2 (OH) 2SO4+2	3.089e-18	2.138e-18	-17.510	-17.670	-0.160	(0)
UO2 (SO4) 2-2	9.752e-19	6.749e-19	-18.011	-18.171	-0.160	(0)
Al (SO4) 2-	3.952e-20	3.639e-20	-19.403	-19.439	-0.036	(0)
Cr2 (OH) 2 (SO4) 2	3.369e-20	3.369e-20	-19.473	-19.473	0.000	(0)
Fe (SO4) 2-	2.948e-20	2.689e-20	-19.530	-19.570	-0.040	(0)
VO2SO4-	1.579e-21	1.440e-21	-20.802	-20.842	-0.040	(0)
CrO3SO4-2	5.530e-24	3.827e-24	-23.257	-23.417	-0.160	(0)
VOSO4	3.682e-24	3.682e-24	-23.434	-23.434	0.000	(0)
HgSO4	2.138e-25	2.138e-25	-24.670	-24.670	0.000	(0)
VSO4+	9.521e-39	8.684e-39	-38.021	-38.061	-0.040	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.869	-43.869	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.033	-44.193	-0.160	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-70.232	-70.272	-0.040	(0)
Sb (3)	9.754e-22					
Sb (OH) 3	4.935e-22	4.935e-22	-21.307	-21.307	0.000	(0)
HSbO2	4.818e-22	4.818e-22	-21.317	-21.317	0.000	(0)
SbO2-	8.677e-26	7.914e-26	-25.062	-25.102	-0.040	(0)
Sb (OH) 4-	4.971e-26	4.534e-26	-25.304	-25.344	-0.040	(0)
Sb (OH) 2F	5.405e-28	5.405e-28	-27.267	-27.267	0.000	(0)
SbOF	5.316e-28	5.316e-28	-27.274	-27.274	0.000	(0)
Sb (OH) 2+	1.296e-28	1.182e-28	-27.888	-27.927	-0.040	(0)
SbO+	4.467e-29	4.075e-29	-28.350	-28.390	-0.040	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.405	-322.565	-0.160	(0)
Sb (5)	2.913e-10					
SbO3-	2.909e-10	2.654e-10	-9.536	-9.576	-0.040	(0)
Sb (OH) 6-	3.372e-13	3.103e-13	-12.472	-12.508	-0.036	(0)
SbO2+	8.113e-27	7.400e-27	-26.091	-26.131	-0.040	(0)
Se (-2)	5.451e-18					
Ag2Se	5.451e-18	5.451e-18	-17.264	-17.264	0.000	(0)
HSe-	4.276e-40	3.900e-40	-39.369	-39.409	-0.040	(0)
MnSe	0.000e+00	0.000e+00	-43.127	-43.127	0.000	(0)

H2Se	0.000e+00	0.000e+00	-43.525	-43.525	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.243	-46.403	-0.160	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.055	-85.694	-0.639	(0)
Se (4)	1.835e-09					
HSeO3-	1.198e-09	1.092e-09	-8.922	-8.962	-0.040	(0)
SeO3-2	6.373e-10	4.410e-10	-9.196	-9.356	-0.160	(0)
H2SeO3	4.594e-15	4.594e-15	-14.338	-14.338	0.000	(0)
AgSeO3-	1.278e-17	1.166e-17	-16.893	-16.933	-0.040	(0)
Cd (SeO3) 2-2	1.313e-23	9.085e-24	-22.882	-23.042	-0.160	(0)
FeHSeO3+2	6.642e-24	4.597e-24	-23.178	-23.338	-0.160	(0)
Ag (SeO3) 2-3	1.054e-25	4.603e-26	-24.977	-25.337	-0.360	(0)
Se (6)	9.625e-13					
SeO4-2	9.624e-13	6.901e-13	-12.017	-12.161	-0.144	(0)
MnSeO4	8.502e-17	8.502e-17	-16.070	-16.070	0.000	(0)
ZnSeO4	2.023e-17	2.023e-17	-16.694	-16.694	0.000	(0)
HSeO4-	3.739e-19	3.410e-19	-18.427	-18.467	-0.040	(0)
NiSeO4	1.920e-19	1.920e-19	-18.717	-18.717	0.000	(0)
CoSeO4	1.491e-19	1.491e-19	-18.827	-18.827	0.000	(0)
CdSeO4	7.282e-21	7.282e-21	-20.138	-20.138	0.000	(0)
Zn (SeO4) 2-2	2.045e-29	1.416e-29	-28.689	-28.849	-0.160	(0)
Si	3.191e-04					
H4SiO4	3.140e-04	3.145e-04	-3.503	-3.502	0.001	(0)
H3SiO4-	5.011e-06	4.610e-06	-5.300	-5.336	-0.036	(0)
H2SiO4-2	4.076e-11	2.950e-11	-10.390	-10.530	-0.140	(0)
UO2H3SiO4+	2.063e-13	1.881e-13	-12.686	-12.726	-0.040	(0)
SiF6-2	8.060e-31	5.817e-31	-30.094	-30.235	-0.142	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.198	-60.558	-0.360	(0)
U (4)	5.415e-21					
U (OH) 5-	5.413e-21	4.937e-21	-20.267	-20.306	-0.040	(0)
U (OH) 4	2.039e-24	2.039e-24	-23.691	-23.691	0.000	(0)
U (OH) 3+	8.060e-29	7.352e-29	-28.094	-28.134	-0.040	(0)
U (OH) 2+2	4.843e-34	3.352e-34	-33.315	-33.475	-0.160	(0)
UF3+	9.524e-39	8.687e-39	-38.021	-38.061	-0.040	(0)
UF2+2	1.114e-39	7.709e-40	-38.953	-39.113	-0.160	(0)
UOH+3	3.564e-40	1.557e-40	-39.448	-39.808	-0.360	(0)
UF4	0.000e+00	0.000e+00	-40.169	-40.169	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.705	-42.065	-0.360	(0)
UF5-	0.000e+00	0.000e+00	-42.679	-42.719	-0.040	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.869	-43.869	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.033	-44.193	-0.160	(0)
UF6-2	0.000e+00	0.000e+00	-44.228	-44.387	-0.160	(0)
U+4	0.000e+00	0.000e+00	-46.577	-47.217	-0.639	(0)
UCl+3	0.000e+00	0.000e+00	-47.921	-48.280	-0.360	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-177.128	-180.365	-3.237	(0)
U (5)	9.155e-18					
UO2+	9.155e-18	8.350e-18	-17.038	-17.078	-0.040	(0)
U (6)	1.272e-08					
UO2 (CO3) 3-4	7.544e-09	1.731e-09	-8.122	-8.762	-0.639	(0)
UO2 (CO3) 2-2	5.160e-09	3.571e-09	-8.287	-8.447	-0.160	(0)
UO2CO3	1.851e-11	1.851e-11	-10.733	-10.733	0.000	(0)
UO2H3SiO4+	2.063e-13	1.881e-13	-12.686	-12.726	-0.040	(0)
UO2OH+	6.774e-14	6.178e-14	-13.169	-13.209	-0.040	(0)
UO2F+	5.172e-15	4.717e-15	-14.286	-14.326	-0.040	(0)
UO2F2	9.674e-16	9.674e-16	-15.014	-15.014	0.000	(0)
UO2+2	6.703e-16	4.806e-16	-15.174	-15.318	-0.144	(0)
UO2SO4	1.930e-16	1.930e-16	-15.714	-15.714	0.000	(0)
UO2F3-	1.894e-17	1.728e-17	-16.723	-16.763	-0.040	(0)
UO2Cl+	1.473e-18	1.344e-18	-17.832	-17.872	-0.040	(0)
UO2 (SO4) 2-2	9.752e-19	6.749e-19	-18.011	-18.171	-0.160	(0)
UO2F4-2	1.410e-20	9.759e-21	-19.851	-20.011	-0.160	(0)
(UO2) 2 (OH) 2+2	9.154e-21	6.335e-21	-20.038	-20.198	-0.160	(0)
(UO2) 3 (OH) 5+	3.394e-22	3.096e-22	-21.469	-21.509	-0.040	(0)
UO2NO3+	1.907e-26	1.739e-26	-25.720	-25.760	-0.040	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.455	-44.495	-0.040	(0)
V+2	0.000e+00	0.000e+00	-45.854	-46.014	-0.160	(0)
V (3)	5.955e-17					

V(OH) 3	5.955e-17	5.955e-17	-16.225	-16.225	0.000	(0)
V(OH) 2+	4.160e-28	3.794e-28	-27.381	-27.421	-0.040	(0)
VOH+2	5.128e-32	3.549e-32	-31.290	-31.450	-0.160	(0)
V+3	1.587e-37	6.935e-38	-36.799	-37.159	-0.360	(0)
VSO4+	9.521e-39	8.684e-39	-38.021	-38.061	-0.040	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-60.059	-60.419	-0.360	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-61.460	-62.100	-0.639	(0)
V(4)	1.135e-20					
V(OH) 3+	1.125e-20	1.026e-20	-19.949	-19.989	-0.040	(0)
VO+2	7.281e-23	5.039e-23	-22.138	-22.298	-0.160	(0)
VOF+	2.356e-23	2.149e-23	-22.628	-22.668	-0.040	(0)
VOSO4	3.682e-24	3.682e-24	-23.434	-23.434	0.000	(0)
VOF2	5.730e-25	5.730e-25	-24.242	-24.242	0.000	(0)
VOC1+	2.672e-25	2.437e-25	-24.573	-24.613	-0.040	(0)
VOF3-	1.585e-27	1.445e-27	-26.800	-26.840	-0.040	(0)
VOF4-2	5.994e-31	4.149e-31	-30.222	-30.382	-0.160	(0)
H2V2O4+2	7.632e-36	5.282e-36	-35.117	-35.277	-0.160	(0)
V(5)	1.716e-10					
H2VO4-	1.284e-10	1.172e-10	-9.891	-9.931	-0.040	(0)
HVO4-2	4.313e-11	2.985e-11	-10.365	-10.525	-0.160	(0)
H3VO4	1.155e-14	1.155e-14	-13.937	-13.937	0.000	(0)
VO4-3	3.473e-17	1.517e-17	-16.459	-16.819	-0.360	(0)
H3V2O7-	9.582e-18	8.739e-18	-17.019	-17.059	-0.040	(0)
HV2O7-3	2.712e-18	1.185e-18	-17.567	-17.926	-0.360	(0)
VO2+	2.470e-19	2.273e-19	-18.607	-18.643	-0.036	(0)
VO2F	2.835e-20	2.835e-20	-19.547	-19.547	0.000	(0)
V2O7-4	1.410e-20	3.235e-21	-19.851	-20.490	-0.639	(0)
VO2SO4-	1.579e-21	1.440e-21	-20.802	-20.842	-0.040	(0)
VO2F2-	8.024e-22	7.319e-22	-21.096	-21.136	-0.040	(0)
V3O9-3	3.856e-24	1.685e-24	-23.414	-23.773	-0.360	(0)
VO2F3-2	9.379e-25	6.491e-25	-24.028	-24.188	-0.160	(0)
VO2F4-3	5.198e-29	2.271e-29	-28.284	-28.644	-0.360	(0)
VO2NO3	2.085e-30	2.085e-30	-29.681	-29.681	0.000	(0)
V4O12-4	3.587e-31	8.229e-32	-30.445	-31.085	-0.639	(0)
V10O28-6	0.000e+00	0.000e+00	-80.992	-82.430	-1.439	(0)
HV10O28-5	0.000e+00	0.000e+00	-81.251	-82.250	-0.999	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.409	-85.048	-0.639	(0)
Zn	4.203e-07					
Zn+2	2.640e-07	1.893e-07	-6.578	-6.723	-0.144	(0)
ZnCO3	1.053e-07	1.053e-07	-6.977	-6.977	0.000	(0)
ZnOH+	2.119e-08	1.933e-08	-7.674	-7.714	-0.040	(0)
ZnHCO3+	1.335e-08	1.217e-08	-7.875	-7.915	-0.040	(0)
ZnSO4	1.099e-08	1.099e-08	-7.959	-7.959	0.000	(0)
Zn(OH) 2	3.128e-09	3.128e-09	-8.505	-8.505	0.000	(0)
ZnOHCl	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
ZnCl+	8.910e-10	8.197e-10	-9.050	-9.086	-0.036	(0)
ZnF+	2.944e-10	2.685e-10	-9.531	-9.571	-0.040	(0)
Zn(SO4) 2-2	3.667e-11	2.538e-11	-10.436	-10.595	-0.160	(0)
Zn(OH) 3-	1.755e-11	1.601e-11	-10.756	-10.796	-0.040	(0)
ZnCl2	2.240e-12	2.240e-12	-11.650	-11.650	0.000	(0)
ZnCl3-	3.334e-15	3.067e-15	-14.477	-14.513	-0.036	(0)
Zn(OH) 4-2	9.401e-16	6.506e-16	-15.027	-15.187	-0.160	(0)
ZnSeO4	2.023e-17	2.023e-17	-16.694	-16.694	0.000	(0)
ZnNO3+	9.452e-18	8.622e-18	-17.024	-17.064	-0.040	(0)
ZnCl4-2	3.663e-18	2.644e-18	-17.436	-17.578	-0.142	(0)
Zn(NO3) 2	3.119e-29	3.119e-29	-28.506	-28.506	0.000	(0)
Zn(SeO4) 2-2	2.045e-29	1.416e-29	-28.689	-28.849	-0.160	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.531	-148.571	-0.040	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.567	-150.567	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.579	-225.619	-0.040	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.433	-227.593	-0.160	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.252	-305.411	-0.160	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-68.16	-61.87	6.29	(Co(NH3)5Cl)(NO3)2

(Co (NH3) 5Cl) Cl2	-50.42	-45.91	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-57.65	-45.91	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-87.86	-69.93	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-66.02	-45.99	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.40	-29.00	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-28.78	-28.33	0.45	(NH4) 2SeO4
Acanthite	-54.88	-91.10	-36.22	Ag2S
Ag2CO3	-14.70	-25.79	-11.09	Ag2CO3
Ag2CrO4	-22.00	-33.59	-11.59	Ag2CrO4
Ag2HVO4	-16.88	-15.40	1.48	Ag2HVO4
Ag2MoO4	-17.12	-28.67	-11.55	Ag2MoO4
Ag2O	-17.33	-4.76	12.57	Ag2O
Ag2Se	-3.47	-52.17	-48.70	Ag2Se
Ag2SeO3	-14.58	-21.73	-7.15	Ag2SeO3
Ag2SeO4	-24.02	-32.93	-8.91	Ag2SeO4
Ag2SO4	-19.53	-24.35	-4.82	Ag2SO4
Ag3AsO3	-29.64	-27.48	2.16	Ag3AsO3
Ag3AsO4	-18.49	-21.28	-2.79	Ag3AsO4
Ag3H2VO5	-22.96	-17.78	5.18	Ag3H2VO5
AgF:4H2O	-15.58	-14.53	1.05	AgF:4H2O
Agmetal	-1.42	-14.93	-13.51	Ag
AgVO3	-13.79	-13.02	0.77	AgVO3
Al (OH) 3 (am)	-3.99	6.81	10.80	Al (OH) 3
Al2 (MoO4) 3	-60.47	-58.10	2.37	Al2 (MoO4) 3
Al2O3	-6.03	13.62	19.65	Al2O3
Al4 (OH) 10SO4	-15.04	7.66	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.13	-7.33	4.80	AlAsO4:2H2O
AlOHSO4	-9.55	-12.78	-3.23	AlOHSO4
AlSb	-155.43	-89.80	65.62	AlSb
Alunite	-13.27	-14.67	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-7.34	-15.13	-7.79	PbSO4
Anhydrite	-2.53	-6.89	-4.36	CaSO4
Anilite	-57.07	-88.95	-31.88	Cu0.25Cu1.5S
Antlerite	-7.50	1.29	8.79	Cu3 (OH) 4SO4
Aragonite	-0.02	-8.32	-8.30	CaCO3
Arsenolite	-78.61	-81.37	-2.76	As4O6
Artinite	-6.64	2.96	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-34.98	-28.28	6.71	As2O5
Atacamite	-4.24	3.15	7.39	Cu2 (OH) 3Cl
Azurite	-4.27	-21.17	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.69	8.70	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.74	-3.87	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	6.74	-2.17	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.11	4.83	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-10.46	-20.13	-9.67	BaCrO4
BaF2	-9.79	-15.61	-5.82	BaF2
BaMoO4	-8.25	-15.21	-6.96	BaMoO4
Barite	-0.91	-10.89	-9.98	BaSO4
BaS	-93.82	-77.64	16.18	BaS
BaSeO3	-10.10	-8.27	1.83	BaSeO3
BaSeO4	-12.01	-19.47	-7.46	BaSeO4
Bianchite	-8.53	-10.30	-1.76	ZnSO4:6H2O
Birnessite	-8.67	9.43	18.09	MnO2
Bixbyite	-5.61	-6.25	-0.64	Mn2O3
BlaubleiI	-56.49	-80.65	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.20	-84.48	-27.28	Cu0.6Cu0.8S
Boehmite	-1.77	6.81	8.58	AlOOH
Breithauptite	-58.75	-77.28	-18.52	NiSb
Brochantite	-6.97	8.25	15.22	Cu4 (OH) 6SO4
Brucite	-4.85	12.00	16.84	Mg (OH) 2
Bunsenite	-5.66	6.79	12.45	NiO
Ca (VO3) 2	-14.23	-8.57	5.66	Ca (VO3) 2
Ca2V2O7	-13.37	4.13	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.42	4.13	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-12.47	9.83	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-22.13	16.83	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.03	16.83	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-298.09	-155.12	142.97	Ca3Sb2

CaCrO4	-13.87	-16.13	-2.27	CaCrO4
Calcite	0.16	-8.32	-8.48	CaCO3
Calomel	-12.93	-30.84	-17.91	Hg2Cl2
CaMoO4	-3.26	-11.21	-7.95	CaMoO4
Carnotite	-6.11	-5.88	0.23	KUO2VO4
CaSeO3:2H2O	-7.08	-4.26	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.45	-15.47	-3.02	CaSeO4:2H2O
Cd(BO2)2	-14.35	-4.51	9.84	Cd(BO2)2
Cd(OH)2	-7.88	5.77	13.64	Cd(OH)2
Cd(OH)2(am)	-7.96	5.77	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.59	-21.88	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.85	-2.29	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.93	3.47	28.40	Cd4(OH)6SO4
CdCl2	-15.11	-15.77	-0.66	CdCl2
CdCl2:1H2O	-14.08	-15.77	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.86	-15.77	-1.91	CdCl2:2.5H2O
CdF2	-17.33	-18.54	-1.21	CdF2
Cdmetal(alpha)	-32.85	-19.34	13.51	Cd
Cdmetal(gamma)	-32.95	-19.34	13.62	Cd
CdMoO4	-3.99	-18.14	-14.15	CdMoO4
CdOHCl	-8.54	-5.00	3.54	CdOHCl
CdSb	-77.95	-78.30	-0.35	CdSb
CdSe	-21.45	-41.65	-20.20	CdSe
CdSeO4:2H2O	-20.56	-22.41	-1.85	CdSeO4:2H2O
CdSO4	-13.65	-13.82	-0.17	CdSO4
CdSO4:1H2O	-12.10	-13.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.95	-13.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.40	-13.15	-9.75	AgCl
Cerrusite	-3.43	-16.56	-13.13	PbCO3
CH4(g)	-80.39	-121.44	-41.05	CH4
Chalcanthite	-9.99	-12.63	-2.64	CuSO4:5H2O
Chalcedony	0.05	-3.50	-3.55	SiO2
Chalcocite	-57.22	-92.14	-34.92	Cu2S
Chalcopyrite	-123.74	-159.01	-35.27	CuFeS2
Chrysotile	-3.22	28.98	32.20	Mg3Si2O5(OH)4
Cinnabar	-54.34	-100.03	-45.69	HgS
Claudetite	-78.31	-81.37	-3.06	As4O6
Clausthalite	-15.85	-42.95	-27.10	PbSe
Co(BO2)2	-30.69	-3.62	27.07	Co(BO2)2
Co(OH)2	-6.45	6.65	13.09	Co(OH)2
Co(OH)3	-10.89	-13.20	-2.31	Co(OH)3
CO2(g)	-2.88	-21.03	-18.15	CO2
Co3(AsO4)2	-21.37	-8.34	13.03	Co3(AsO4)2
Co3O4	-9.26	-19.76	-10.50	Co3O4
CoCl2	-23.16	-14.89	8.27	CoCl2
CoCl2:6H2O	-17.43	-14.89	2.54	CoCl2:6H2O
CoCO3	-4.40	-14.38	-9.98	CoCO3
CoF2	-16.06	-17.66	-1.60	CoF2
CoF3	-48.21	-49.66	-1.46	CoF3
CoFe2O4	22.62	19.09	-3.53	CoFe2O4
CoMoO4	-9.50	-17.26	-7.76	CoMoO4
CoO	-6.94	6.65	13.59	CoO
CoS(alpha)	-72.25	-79.69	-7.44	CoS
CoS(beta)	-68.62	-79.69	-11.07	CoS
CoSe	-24.57	-40.77	-16.20	CoSe
CoSeO3	-11.64	-10.32	1.32	CoSeO3
CoSeO4:6H2O	-20.00	-21.53	-1.53	CoSeO4:6H2O
CoSO4	-15.74	-12.94	2.80	CoSO4
CoSO4:6H2O	-10.47	-12.94	-2.47	CoSO4:6H2O
Cotunnite	-12.30	-17.08	-4.78	PbCl2
Covellite	-57.08	-79.38	-22.30	CuS
Cr(OH)2	-19.54	-8.72	10.82	Cr(OH)2
Cr(OH)3	-0.45	0.89	1.34	Cr(OH)3
Cr(OH)3(am)	1.64	0.89	-0.75	Cr(OH)3
Cr2O3	4.13	1.78	-2.36	Cr2O3
CrCl2	-44.35	-30.26	14.09	CrCl2
CrCl3	-46.54	-31.42	15.11	CrCl3
CrF3	-24.24	-35.57	-11.34	CrF3

Cristobalite	-0.15	-3.50	-3.35	SiO2
Crmetal	-64.30	-33.82	30.48	Cr
CrO3	-25.62	-28.83	-3.21	CrO3
Cryolite	-15.87	-49.71	-33.84	Na3AlF6
Cu(OH)2	-1.71	6.96	8.67	Cu(OH)2
Cu(SbO3)2	-30.66	14.55	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-14.08	-4.83	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.67	-92.55	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-7.42	-53.22	-45.80	Cu2Se
Cu2SO4	-23.44	-25.39	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.50	-7.40	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-62.72	-105.32	-42.59	Cu3Sb
Cu3Se2	-30.18	-93.67	-63.49	Cu3Se2
CuCO3	-2.57	-14.07	-11.50	CuCO3
CuCrO4	-16.43	-21.87	-5.44	CuCrO4
CuF	-10.15	-15.06	-4.91	CuF
CuF2	-18.46	-17.35	1.12	CuF2
CuF2:2H2O	-12.80	-17.35	-4.55	CuF2:2H2O
Cumetal	-6.70	-15.45	-8.76	Cu
CuMoO4	-3.87	-16.95	-13.08	CuMoO4
CuOCuSO4	-15.97	-5.67	10.30	CuOCuSO4
Cupricferrite	13.41	19.40	5.99	CuFe2O4
Cuprite	-4.40	-5.80	-1.41	Cu2O
Cuprousferrite	12.24	3.32	-8.92	CuFeO2
CuSe	-7.35	-40.45	-33.10	CuSe
CuSe2	-29.40	-62.77	-33.37	CuSe2
CuSeO3:2H2O	-10.52	-10.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.77	-21.21	-2.44	CuSeO4:5H2O
CuSO4	-15.57	-12.63	2.94	CuSO4
Diaspore	-0.06	6.81	6.87	AlOOH
Djurleite	-57.38	-91.30	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.81	-17.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.26	-17.35	-17.09	CaMg(CO3)2
Epsomite	-5.47	-7.59	-2.13	MgSO4:7H2O
Fe(OH)2	-6.86	6.70	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.03	2.99	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.85	-14.57	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-6.08	-4.53	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.84	-38.46	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.59	-46.32	-3.73	Fe2(SO4)3
Fe3(OH)8	-1.08	19.14	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.32	-7.92	0.40	FeAsO4:2H2O
FeCr2O4	1.28	8.48	7.20	FeCr2O4
FeMoO4	-7.12	-17.21	-10.09	FeMoO4
Ferrihydrite	3.03	6.22	3.19	Fe(OH)3
Ferroselite	-44.43	-63.03	-18.60	FeSe2
FeS(ppt)	-76.69	-79.64	-2.95	FeS
FeSe	-29.71	-40.71	-11.00	FeSe
Fix_pe	-4.55	-4.55	0.00	e-
Fluorite	-1.11	-11.61	-10.50	CaF2
Galena	-67.91	-81.88	-13.97	PbS
Gibbsite	-1.48	6.81	8.29	Al(OH)3
Goethite	5.73	6.22	0.49	FeOOH
Goslarite	-8.29	-10.30	-2.01	ZnSO4:7H2O
Greenalite	-7.71	13.10	20.81	Fe3Si2O5(OH)4
Greenockite	-66.21	-80.57	-14.36	CdS
Greigite	-281.18	-326.21	-45.03	Fe3S4
Gummite	-6.98	0.69	7.67	UO3
Gypsum	-2.28	-6.89	-4.61	CaSO4:2H2O
H-Jarosite	-8.42	-20.52	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.03	-23.91	-12.88	H2MoO4
H2S(g)	-78.33	-86.34	-8.01	H2S
H2Se(g)	-42.46	-47.42	-4.96	H2Se
Halite	-6.90	-5.30	1.60	NaCl
Halloysite	-2.96	6.62	9.57	Al2Si2O5(OH)4
Hausmannite	-6.91	54.12	61.03	Mn3O4
Hematite	13.86	12.44	-1.42	Fe2O3
Hercynite	-2.57	20.32	22.89	FeAl2O4

Hg (CH3) 2 (g)	-182.86	-256.57	-73.71	Hg (CH3) 2
Hg (g)	-9.33	-17.20	-7.87	Hg
Hg (OH) 2	-10.20	-13.69	-3.50	Hg (OH) 2
Hg2 (g)	-19.45	-34.41	-14.96	Hg2
Hg2 (OH) 2	-14.56	-9.30	5.26	Hg2 (OH) 2
Hg2CO3	-14.28	-30.33	-16.05	Hg2CO3
Hg2CrO4	-29.44	-38.14	-8.70	Hg2CrO4
Hg2F2	-23.25	-33.61	-10.36	Hg2F2
Hg2S	-83.97	-95.64	-11.68	Hg2S
Hg2SeO3	-21.62	-26.27	-4.66	Hg2SeO3
Hg2SO4	-22.76	-28.89	-6.13	Hg2SO4
Hg3O2CO3	-32.43	-62.11	-29.68	Hg3O2CO3
HgCl (g)	-34.92	-15.42	19.50	HgCl
HgCl2	-13.97	-35.23	-21.26	HgCl2
HgF (g)	-49.48	-16.81	32.68	HgF
HgF2 (g)	-50.57	-38.00	12.57	HgF2
Hgmetal (1)	-3.75	-17.20	-13.45	Hg
HgSe	-5.41	-61.11	-55.69	HgSe
HgSeO3	-18.23	-30.66	-12.43	HgSeO3
HgSO4	-23.86	-33.28	-9.42	HgSO4
Huntite	-5.45	-35.42	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-9.90	-28.67	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-15.36	-24.13	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-23.13	-28.30	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-1.65	-16.45	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.29	-49.53	-17.24	K2Cr2O7
K2CrO4	-20.19	-20.70	-0.51	K2CrO4
K2MoO4	-19.04	-15.77	3.26	K2MoO4
K2SeO4	-19.31	-20.04	-0.73	K2SeO4
Kaolinite	-0.82	6.62	7.43	Al2Si2O5 (OH) 4
Langite	-9.24	8.25	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-10.23	-10.66	-0.43	PbO : PbSO4
Laurionite	-6.93	-6.31	0.62	PbOHCl
Lepidocrocite	4.85	6.22	1.37	FeOOH
Lime	-20.00	12.70	32.70	CaO
Litharge	-8.23	4.46	12.69	PbO
Mackinawite	-76.04	-79.64	-3.60	FeS
Maghemite	6.05	12.44	6.39	Fe2O3
Magnesioferrite	7.58	24.44	16.86	Fe2MgO4
Magnesite	-1.57	-9.03	-7.46	MgCO3
Magnetite	15.74	19.14	3.40	Fe3O4
Malachite	-1.80	-7.11	-5.31	Cu2 (OH) 2CO3
Manganite	-3.12	22.22	25.34	MnOOH
Massicot	-8.43	4.46	12.89	PbO
Matlockite	-9.49	-18.46	-8.97	PbClF
Melanothallite	-20.84	-14.58	6.26	CuCl2
Melanterite	-10.68	-12.89	-2.21	FeSO4 : 7H2O
Metacinnabar	-54.94	-100.03	-45.09	HgS
Mg (OH) 2 (active)	-6.80	12.00	18.79	Mg (OH) 2
Mg (VO3) 2	-20.56	-9.28	11.28	Mg (VO3) 2
Mg2Sb3	-277.78	-203.09	74.68	Mg2Sb3
Mg2V2O7	-23.64	2.72	26.36	Mg2V2O7
MgCr2O4	-2.43	13.77	16.20	MgCr2O4
MgCrO4	-22.22	-16.84	5.38	MgCrO4
MgF2	-4.18	-12.31	-8.13	MgF2
MgMoO4	-10.06	-11.91	-1.85	MgMoO4
MgSeO3 : 6H2O	-8.03	-4.97	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-14.98	-16.18	-1.20	MgSeO4 : 6H2O
Minium	-35.03	38.49	73.52	Pb3O4
Mirabilite	-7.54	-8.65	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-16.50	-11.60	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-59.31	-65.02	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.90	-89.82	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.76	0.74	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-14.58	-11.87	2.72	MnCl2 : 4H2O
MnS (grn)	-76.84	-76.67	0.17	MnS
MnS (pnk)	-80.01	-76.67	3.34	MnS
MnSb	-96.83	-99.74	-2.91	MnSb

MnSe	-41.24	-37.74	3.50	MnSe
MnSeO3	-8.42	-7.29	1.13	MnSeO3
MnSeO3:2H2O	-8.28	-7.30	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.45	-18.50	-2.05	MnSeO4:5H2O
MnSO4	-12.50	-9.92	2.58	MnSO4
Monteponite	-9.34	5.77	15.10	CdO
Montroydite	-10.05	-13.69	-3.64	HgO
MoO3	-15.91	-23.91	-8.00	MoO3
Morenosite	-10.66	-12.80	-2.14	NiSO4:7H2O
MoS2	-151.43	-221.69	-70.26	MoS2
Na-Jarosite	-3.85	-15.05	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-36.84	-46.73	-9.90	Na2Cr2O7
Na2CrO4	-20.83	-17.90	2.93	Na2CrO4
Na2Mo2O7	-20.29	-36.88	-16.60	Na2Mo2O7
Na2MoO4	-14.46	-12.97	1.49	Na2MoO4
Na2MoO4:2H2O	-14.20	-12.97	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.33	-6.03	10.30	Na2SeO3:5H2O
Na2SeO4	-18.52	-17.24	1.28	Na2SeO4
Na3Sb	-174.66	-80.21	94.45	Na3Sb
Na3VO4	-30.91	5.77	36.68	Na3VO4
Na4V2O7	-36.80	0.60	37.40	Na4V2O7
Nantokite	-6.94	-13.67	-6.73	CuCl
NaSb	-89.21	-66.04	23.17	NaSb
Natron	-8.78	-10.09	-1.31	Na2CO3:10H2O
NaVO3	-9.03	-5.17	3.86	NaVO3
Nesquehonite	-4.36	-9.03	-4.67	MgCO3:3H2O
Ni(OH)2	-6.01	6.79	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.62	-7.92	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-24.44	7.56	32.00	Ni4(OH)6SO4
NiCO3	-7.37	-14.24	-6.87	NiCO3
NiMoO4	-5.98	-17.12	-11.14	NiMoO4
NiS(alpha)	-73.95	-79.55	-5.60	NiS
NiS(beta)	-68.45	-79.55	-11.10	NiS
NiS(gamma)	-66.75	-79.55	-12.80	NiS
NiSe	-22.93	-40.63	-17.70	NiSe
NiSeO3:2H2O	-13.00	-10.18	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.87	-21.39	-1.52	NiSeO4:6H2O
Nsutite	-8.08	9.43	17.50	MnO2
O2(g)	-32.88	50.20	83.09	O2
Orpiment	-238.64	-299.70	-61.07	As2S3
Otavite	-3.26	-15.26	-12.00	CdCO3
Pb(BO2)2	-12.33	-5.81	6.52	Pb(BO2)2
Pb(OH)2	-3.69	4.46	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-72.78	-81.54	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-10.64	-1.85	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.26	8.92	26.19	Pb2O(OH)2
Pb2O3	-27.01	34.03	61.04	Pb2O3
Pb2OCO3	-11.54	-12.10	-0.56	Pb2OCO3
Pb2V2O7	-10.45	-12.35	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.69	-14.89	5.80	Pb3(AsO4)2
Pb3(VO4)2	-14.03	-7.89	6.14	Pb3(VO4)2
Pb3O2CO3	-18.66	-7.64	11.02	Pb3O2CO3
Pb3O2SO4	-16.89	-6.20	10.69	Pb3O2SO4
Pb4(OH)6SO4	-22.84	-1.74	21.10	Pb4(OH)6SO4
Pb4O3SO4	-23.62	-1.74	21.88	Pb4O3SO4
PbCrO4	-11.77	-24.37	-12.60	PbCrO4
PbF2	-12.41	-19.85	-7.44	PbF2
Pbmetal	-24.89	-20.64	4.25	Pb
PbMoO4	-3.83	-19.45	-15.62	PbMoO4
PbO:0.3H2O	-8.52	4.46	12.98	PbO:0.33H2O
PbSeO4	-16.87	-23.71	-6.84	PbSeO4
Periclase	-9.59	12.00	21.58	MgO
Phosgenite	-13.83	-33.64	-19.81	PbCl2:PbCO3
Plattnerite	-20.04	29.56	49.60	PbO2
Portlandite	-10.10	12.70	22.80	Ca(OH)2
Pyrite	-122.36	-140.87	-18.51	FeS2
Pyrochroite	-5.52	9.67	15.19	Mn(OH)2
Pyrolusite	-6.60	34.78	41.38	MnO2

Quartz	0.50	-3.50	-4.00	SiO2
Realgar	-99.49	-119.23	-19.75	AsS
Retgersite	-10.76	-12.80	-2.04	NiSO4:6H2O
Rhodochrosite	-0.77	-11.35	-10.58	MnCO3
Rutherfordine	-5.83	-20.33	-14.50	UO2CO3
Sb(OH)3	-14.20	-21.31	-7.11	Sb(OH)3
Sb2O4	-20.91	-17.51	3.40	Sb2O4
Sb2O5	-31.36	-41.03	-9.67	Sb2O5
Sb2Se3	-117.10	-184.86	-67.76	Sb2Se3
Sb4O6(cubic)	-66.97	-85.23	-18.26	Sb4O6
Sb4O6(orth)	-67.33	-85.23	-17.90	Sb4O6
SbCl3	-54.19	-53.62	0.57	SbCl3
SbF3	-47.54	-57.77	-10.23	SbF3
Sbmetal	-47.27	-58.96	-11.69	Sb
SbO2	-5.24	-33.07	-27.82	SbO2
Schoepite	-5.30	0.69	5.99	UO2(OH)2:H2O
Semetal(am)	-15.20	-22.31	-7.11	Se
Semetal(hex)	-14.60	-22.31	-7.71	Se
Senarmontite	-30.25	-42.61	-12.37	Sb2O3
SeO2	-17.09	-16.97	0.12	SeO2
SeO3	-49.22	-28.17	21.04	SeO3
Sepiolite	-2.28	13.48	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-5.30	13.48	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-4.09	-14.33	-10.24	FeCO3
SiO2(am-gel)	-0.79	-3.50	-2.71	SiO2
SiO2(am-ppt)	-0.76	-3.50	-2.74	SiO2
Smithsonite	-1.74	-11.74	-10.00	ZnCO3
Sphalerite	-65.60	-77.05	-11.45	ZnS
Spinel	-11.23	25.62	36.85	MgAl2O4
Stibnite	-251.17	-301.63	-50.46	Sb2S3
Sulfur	-59.09	-61.24	-2.14	S
Tenorite	-0.68	6.96	7.64	CuO
Thenardite	-8.97	-8.65	0.32	Na2SO4
Thermonatrite	-10.73	-10.09	0.64	Na2CO3:H2O
Tyuyamunite	-11.26	-7.18	4.08	Ca(UO2)2(VO4)2
U3O8	-16.46	4.63	21.08	U3O8
U3Sb4	-584.42	-432.03	152.38	U3Sb4
U4O9	-32.65	-35.67	-3.02	U4O9
UF4	-34.27	-63.81	-29.54	UF4
UF4:2.5H2O	-31.09	-63.81	-32.72	UF4:2.5H2O
UO2(am)	-16.13	-15.19	0.93	UO2
UO2(NO3)2	-48.95	-36.80	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.65	-36.80	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.19	-36.80	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.85	-36.80	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.92	0.69	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.23	-27.48	-2.25	UO2SeO4:4H2O
UO3	-7.01	0.69	7.70	UO3
Uraninite	-10.52	-15.19	-4.67	UO2
USb2	-222.11	-192.53	29.58	USb2
V(OH)3	-20.73	-13.14	7.59	V(OH)3
V2O5	-19.91	-21.27	-1.36	V2O5
V3O5	-45.79	-43.96	1.84	V3O5
V4O7	-57.43	-50.24	7.19	V4O7
V6O13	-53.17	-114.03	-60.86	V6O13
Valentinite	-34.13	-42.61	-8.48	Sb2O3
VC12	-66.11	-47.23	18.87	VC12
VC13	-68.88	-45.45	23.43	VC13
VF4	-69.83	-54.90	14.93	VF4
Vmetal	-94.82	-50.79	44.03	V
VO	-40.45	-25.69	14.76	VO
VO(OH)2	-11.44	-6.29	5.15	VO(OH)2
VO2Cl	-24.25	-21.41	2.84	VO2Cl
VOC1	-35.06	-23.91	11.15	VOC1
VOC12	-40.58	-27.82	12.76	VOC12
VOSO4	-29.48	-25.87	3.61	VOSO4
Witherite	-3.75	-12.32	-8.57	BaCO3
Wurtzite	-68.10	-77.05	-8.95	ZnS

Zincite	-2.04	9.29	11.33	ZnO
Zincosite	-14.23	-10.30	3.93	ZnSO4
Zn(BO2)2	-9.27	-0.98	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-31.52	-28.21	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.91	9.29	12.20	Zn(OH)2
Zn(OH)2(am)	-3.18	9.29	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.46	9.29	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.24	9.29	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.44	9.29	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.51	-1.01	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.38	7.81	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.06	-0.41	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-30.22	-11.31	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-10.83	17.57	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.59	24.91	38.50	Zn5(OH)8Cl2
ZnCl2	-19.30	-12.25	7.05	ZnCl2
ZnCO3:1H2O	-1.48	-11.74	-10.26	ZnCO3:1H2O
ZnF2	-14.48	-15.02	-0.53	ZnF2
Znmetal	-41.60	-15.81	25.79	Zn
ZnMoO4	-4.49	-14.62	-10.13	ZnMoO4
ZnO(active)	-1.90	9.29	11.19	ZnO
ZnS(am)	-68.00	-77.05	-9.05	ZnS
ZnSb	-85.79	-74.77	11.01	ZnSb
ZnSe	-23.73	-38.13	-14.40	ZnSe
ZnSeO4:6H2O	-17.36	-18.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.66	-10.30	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 33.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 105

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

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HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 113
SAVE Solution 114 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 105
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 113. Solution after simulation 32.
Using pure phase assemblage 105.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-4.57	-53.27	-48.70	0.000e+00	0	0.000e+00
Alunite	-15.66	-17.06	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-2.85	-7.21	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.309e-08	2.309e-08
Barite	-3.13	-13.11	-9.98	0.000e+00	0	0.000e+00
Brochantite	-5.40	9.82	15.22	0.000e+00	0	0.000e+00
Brucite	-4.02	12.83	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	4.756e-04
CaMoO4	-3.60	-11.55	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-7.20	-4.39	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	4.250e-04	4.250e-04
Carnotite	-5.90	-5.67	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.63	-3.79	9.84	0.000e+00	0	0.000e+00
CdMoO4	-4.01	-18.16	-14.15	0.000e+00	0	0.000e+00
Chrysotile	-0.74	31.46	32.20	0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	5.795e-08	5.795e-08
Cu2Se(alpha)	-8.60	-54.40	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-4.09	-17.17	-13.08	0.000e+00	0	0.000e+00
Epsomite	-5.42	-7.55	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	9.569e-07	9.569e-07
Fluorite	-1.45	-11.95	-10.50	0.000e+00	0	0.000e+00

Gummite	-6.64	1.03	7.67	0.000e+00	0	0.000e+00
Gypsum	-2.60	-7.21	-4.61	0.000e+00	0	0.000e+00
HgSe	-6.89	-62.58	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-7.50	-8.62	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-8.18	-7.05	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.21	7.59	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.66	-7.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.19	-14.06	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-5.99	-17.13	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.424e-08
Otavite	-3.09	-15.09	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-4.03	-19.65	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-6.11	-20.61	-14.50	0.000e+00	0	0.000e+00
SbO2	-5.87	-33.69	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.96	1.03	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.64	15.12	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-0.77	-3.51	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-11.21	-7.13	4.08	0.000e+00	0	0.000e+00
U3O8	-15.88	5.20	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.58	1.03	5.61	0.000e+00	0	0.000e+00
UO3	-6.67	1.03	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-4.58	-14.70	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	2.136e-10	2.136e-10
Al	1.475e-08	1.475e-08
As	2.655e-08	2.656e-08
B	7.796e-06	7.797e-06
Ba	3.786e-10	3.787e-10
C	1.398e-03	1.398e-03
Ca	3.171e-04	3.171e-04
Cd	1.067e-10	1.068e-10
Cl	1.874e-03	1.874e-03
Co	8.052e-10	8.053e-10
Cr	5.898e-10	5.899e-10
Cu	5.762e-08	5.763e-08
F	7.865e-05	7.866e-05
Fe	7.033e-10	7.034e-10
Hg	2.311e-11	2.312e-11
K	1.256e-04	1.256e-04
Mg	1.427e-04	1.427e-04
Mn	7.069e-07	7.069e-07
Mo	1.768e-08	1.768e-08
N	6.741e-08	6.742e-08
Na	3.155e-03	3.156e-03
Ni	1.253e-09	1.253e-09
Pb	1.025e-10	1.025e-10
S	4.092e-04	4.092e-04
Sb	2.913e-10	2.913e-10
Se	1.836e-09	1.836e-09
Si	3.191e-04	3.191e-04
U	1.272e-08	1.272e-08
V	1.716e-10	1.716e-10
Zn	4.203e-07	4.203e-07

-----Description of solution-----

	pH	=	8.416	Charge balance
	pe	=	4.356	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	4.967e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.432e-03	

Total CO2 (mol/kg) = 1.398e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 7.977e-09
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 8
 Total H = 1.110291e+02
 Total O = 5.552037e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.835e-06	2.626e-06	-5.547	-5.581	-0.033	(0)
H+	4.135e-09	3.834e-09	-8.384	-8.416	-0.033	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	2.136e-10					
AgCl	1.452e-10	1.452e-10	-9.838	-9.838	0.000	(0)
Ag+	4.416e-11	4.095e-11	-10.355	-10.388	-0.033	(0)
AgCl2-	2.387e-11	2.197e-11	-10.622	-10.658	-0.036	(0)
AgSO4-	2.525e-13	2.324e-13	-12.598	-12.634	-0.036	(0)
AgCl3-2	4.737e-14	3.402e-14	-13.324	-13.468	-0.144	(0)
AgOH	1.075e-14	1.075e-14	-13.968	-13.968	0.000	(0)
AgF	7.389e-15	7.389e-15	-14.131	-14.131	0.000	(0)
AgH2BO3	6.574e-16	6.574e-16	-15.182	-15.182	0.000	(0)
AgNO2	5.326e-16	5.326e-16	-15.274	-15.274	0.000	(0)
AgCl4-3	2.542e-16	1.207e-16	-15.595	-15.918	-0.324	(0)
AgSeO3-	2.147e-17	1.977e-17	-16.668	-16.704	-0.036	(0)
Ag (OH) 2-	2.998e-18	2.760e-18	-17.523	-17.559	-0.036	(0)
AgNH3+	9.222e-19	8.490e-19	-18.035	-18.071	-0.036	(0)
Ag2Se	4.336e-19	4.336e-19	-18.363	-18.363	0.000	(0)
AgNO3	1.910e-21	1.910e-21	-20.719	-20.719	0.000	(0)
Ag (NO2) 2-	5.579e-23	5.136e-23	-22.253	-22.289	-0.036	(0)
Ag (SeO3) 2-3	2.799e-25	1.329e-25	-24.553	-24.876	-0.324	(0)
Ag (NH3) 2+	7.612e-26	7.007e-26	-25.119	-25.154	-0.036	(0)
Ag2MoO4	8.292e-30	8.292e-30	-29.081	-29.081	0.000	(0)
AgHS	0.000e+00	0.000e+00	-77.054	-77.054	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.902	-87.477	-0.575	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-152.396	-152.503	-0.107	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-153.312	-153.526	-0.214	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-153.400	-153.436	-0.036	(0)
AgS4S5-3	0.000e+00	0.000e+00	-153.629	-153.837	-0.208	(0)
Al	1.475e-08					
Al (OH) 4-	1.471e-08	1.365e-08	-7.832	-7.865	-0.033	(0)
Al (OH) 3	4.128e-11	4.128e-11	-10.384	-10.384	0.000	(0)
Al (OH) 2+	8.480e-13	7.878e-13	-12.072	-12.104	-0.032	(0)
AlF2+	3.180e-15	2.954e-15	-14.498	-14.530	-0.032	(0)
AlF3	2.671e-15	2.671e-15	-14.573	-14.573	0.000	(0)
AlOH+2	5.069e-16	3.777e-16	-15.295	-15.423	-0.128	(0)
AlF+2	1.386e-16	1.033e-16	-15.858	-15.986	-0.128	(0)
AlF4-	1.037e-16	9.617e-17	-15.984	-16.017	-0.033	(0)
AlSO4+	3.423e-19	3.176e-19	-18.466	-18.498	-0.033	(0)
Al+3	2.839e-19	1.438e-19	-18.547	-18.842	-0.295	(0)
Al (SO4) 2-	1.043e-21	9.680e-22	-20.982	-21.014	-0.033	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-61.328	-61.651	-0.324	(0)
As (3)	1.116e-22					
H3AsO3	9.742e-23	9.742e-23	-22.011	-22.011	0.000	(0)
H2AsO3-	1.416e-23	1.303e-23	-22.849	-22.885	-0.036	(0)
HAsO3-2	4.317e-27	3.100e-27	-26.365	-26.509	-0.144	(0)
H4AsO3+	2.010e-31	1.850e-31	-30.697	-30.733	-0.036	(0)
AsO3-3	6.567e-32	3.118e-32	-31.183	-31.506	-0.324	(0)
As (5)	2.655e-08					
HAsO4-2	2.582e-08	1.854e-08	-7.588	-7.732	-0.144	(0)
H2AsO4-	7.042e-10	6.482e-10	-9.152	-9.188	-0.036	(0)
AsO4-3	3.221e-11	1.529e-11	-10.492	-10.815	-0.324	(0)
H3AsO4	4.314e-16	4.319e-16	-15.365	-15.365	0.000	(0)
B	7.796e-06					
H3BO3	6.679e-06	6.686e-06	-5.175	-5.175	0.000	(0)

	H2BO3-	1.095e-06	1.013e-06	-5.960	-5.994	-0.034	(0)
	CaH2BO3+	1.361e-08	1.259e-08	-7.866	-7.900	-0.034	(0)
	NaH2BO3	4.685e-09	4.685e-09	-8.329	-8.329	0.000	(0)
	MgH2BO3+	3.761e-09	3.478e-09	-8.425	-8.459	-0.034	(0)
	BF(OH) 3-	2.072e-10	1.917e-10	-9.684	-9.717	-0.034	(0)
	H5 (BO3) 2-	6.234e-12	5.765e-12	-11.205	-11.239	-0.034	(0)
	BaH2BO3+	9.330e-15	8.628e-15	-14.030	-14.064	-0.034	(0)
	BF2 (OH) 2-	6.102e-15	5.643e-15	-14.215	-14.248	-0.034	(0)
	H8 (BO3) 3-	4.168e-15	3.854e-15	-14.380	-14.414	-0.034	(0)
	AgH2BO3	6.574e-16	6.574e-16	-15.182	-15.182	0.000	(0)
	BF3OH-	6.538e-22	6.046e-22	-21.185	-21.219	-0.034	(0)
	BF4-	8.861e-28	8.194e-28	-27.053	-27.087	-0.034	(0)
Ba		3.786e-10					
	Ba+2	3.729e-10	2.756e-10	-9.428	-9.560	-0.131	(0)
	BaHCO3+	3.550e-12	3.301e-12	-11.450	-11.481	-0.032	(0)
	BaCO3	2.168e-12	2.168e-12	-11.664	-11.664	0.000	(0)
	BaH2BO3+	9.330e-15	8.628e-15	-14.030	-14.064	-0.034	(0)
	BaOH+	3.403e-15	3.160e-15	-14.468	-14.500	-0.032	(0)
	BaNO3+	8.814e-20	8.114e-20	-19.055	-19.091	-0.036	(0)
	BaNH3+2	2.459e-21	1.766e-21	-20.609	-20.753	-0.144	(0)
C (4)		1.398e-03					
	HCO3-	1.350e-03	1.254e-03	-2.870	-2.902	-0.032	(0)
	CO3-2	2.075e-05	1.534e-05	-4.683	-4.814	-0.131	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CaHCO3+	5.422e-06	5.042e-06	-5.266	-5.297	-0.032	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	NaHCO3	2.058e-06	2.058e-06	-5.687	-5.687	0.000	(0)
	MgHCO3+	1.371e-06	1.271e-06	-5.863	-5.896	-0.033	(0)
	MgCO3	1.263e-06	1.263e-06	-5.899	-5.899	0.000	(0)
	NaCO3-	8.970e-07	8.334e-07	-6.047	-6.079	-0.032	(0)
	ZnCO3	1.345e-07	1.345e-07	-6.871	-6.871	0.000	(0)
	CuCO3	4.712e-08	4.712e-08	-7.327	-7.327	0.000	(0)
	MnHCO3+	1.285e-08	1.193e-08	-7.891	-7.923	-0.032	(0)
	UO2 (CO3) 3-4	8.579e-09	2.282e-09	-8.067	-8.642	-0.575	(0)
	ZnHCO3+	6.564e-09	6.043e-09	-8.183	-8.219	-0.036	(0)
	UO2 (CO3) 2-2	4.134e-09	2.969e-09	-8.384	-8.527	-0.144	(0)
	Cu (CO3) 2-2	2.708e-09	1.945e-09	-8.567	-8.711	-0.144	(0)
	NiCO3	3.258e-10	3.258e-10	-9.487	-9.487	0.000	(0)
	CoCO3	1.104e-10	1.104e-10	-9.957	-9.957	0.000	(0)
	NiHCO3+	9.564e-11	8.805e-11	-10.019	-10.055	-0.036	(0)
	PbCO3	7.980e-11	7.980e-11	-10.098	-10.098	0.000	(0)
	CoHCO3+	4.511e-11	4.153e-11	-10.346	-10.382	-0.036	(0)
	CuHCO3+	4.485e-11	4.128e-11	-10.348	-10.384	-0.036	(0)
	CdCO3	1.864e-11	1.864e-11	-10.730	-10.730	0.000	(0)
	UO2CO3	9.702e-12	9.702e-12	-11.013	-11.013	0.000	(0)
	Pb (CO3) 2-2	4.915e-12	3.530e-12	-11.308	-11.452	-0.144	(0)
	BaHCO3+	3.550e-12	3.301e-12	-11.450	-11.481	-0.032	(0)
	BaCO3	2.168e-12	2.168e-12	-11.664	-11.664	0.000	(0)
	PbHCO3+	1.752e-12	1.613e-12	-11.756	-11.792	-0.036	(0)
	Cd (CO3) 2-2	2.951e-13	2.119e-13	-12.530	-12.674	-0.144	(0)
	CdHCO3+	1.654e-13	1.523e-13	-12.781	-12.817	-0.036	(0)
	FeHCO3+	7.045e-16	6.552e-16	-15.152	-15.184	-0.032	(0)
	HgCO3	2.361e-17	2.361e-17	-16.627	-16.627	0.000	(0)
	Hg (CO3) 2-2	1.594e-18	1.145e-18	-17.797	-17.941	-0.144	(0)
	HgHCO3+	1.831e-21	1.685e-21	-20.737	-20.773	-0.036	(0)
Ca		3.171e-04					
	Ca+2	2.921e-04	2.159e-04	-3.534	-3.666	-0.131	(0)
	CaSO4	1.407e-05	1.407e-05	-4.852	-4.852	0.000	(0)
	CaHCO3+	5.422e-06	5.042e-06	-5.266	-5.297	-0.032	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.823e-07	1.693e-07	-6.739	-6.771	-0.032	(0)
	CaH2BO3+	1.361e-08	1.259e-08	-7.866	-7.900	-0.034	(0)
	CaOH+	1.217e-08	1.131e-08	-7.915	-7.946	-0.032	(0)
	CaNO3+	4.356e-14	4.010e-14	-13.361	-13.397	-0.036	(0)
	CaNH3+2	3.843e-15	2.760e-15	-14.415	-14.559	-0.144	(0)
	Ca (NH3) 2+2	1.554e-26	1.116e-26	-25.809	-25.952	-0.144	(0)
Cd		1.067e-10					
	Cd+2	7.215e-11	5.333e-11	-10.142	-10.273	-0.131	(0)

	CdCO3	1.864e-11	1.864e-11	-10.730	-10.730	0.000	(0)
	CdCl+	9.610e-12	8.847e-12	-11.017	-11.053	-0.036	(0)
	CdSO4	3.557e-12	3.557e-12	-11.449	-11.449	0.000	(0)
	CdOH+	1.208e-12	1.112e-12	-11.918	-11.954	-0.036	(0)
	CdOHC1	9.531e-13	9.531e-13	-12.021	-12.021	0.000	(0)
	Cd(CO3) 2-2	2.951e-13	2.119e-13	-12.530	-12.674	-0.144	(0)
	CdHCO3+	1.654e-13	1.523e-13	-12.781	-12.817	-0.036	(0)
	CdF+	6.595e-14	6.071e-14	-13.181	-13.217	-0.036	(0)
	CdCl2	6.407e-14	6.407e-14	-13.193	-13.193	0.000	(0)
	Cd(SO4) 2-2	1.901e-14	1.365e-14	-13.721	-13.865	-0.144	(0)
	Cd(OH) 2	1.843e-14	1.843e-14	-13.734	-13.734	0.000	(0)
	CdCl3-	7.628e-17	7.022e-17	-16.118	-16.154	-0.036	(0)
	CdF2	8.702e-18	8.702e-18	-17.060	-17.060	0.000	(0)
	Cd(OH) 3-	3.213e-18	2.958e-18	-17.493	-17.529	-0.036	(0)
	CdSeO4	3.231e-20	3.231e-20	-19.491	-19.491	0.000	(0)
	CdNO3+	1.076e-20	9.905e-21	-19.968	-20.004	-0.036	(0)
	Cd2OH+3	6.263e-22	2.973e-22	-21.203	-21.527	-0.324	(0)
	Cd(SeO3) 2-2	3.452e-23	2.479e-23	-22.462	-22.606	-0.144	(0)
	Cd(OH) 4-2	1.770e-24	1.271e-24	-23.752	-23.896	-0.144	(0)
	Cd(NO3) 2	2.916e-31	2.916e-31	-30.535	-30.535	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-82.710	-82.746	-0.036	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-156.023	-156.023	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-234.568	-234.604	-0.036	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-312.746	-312.890	-0.144	(0)
C1	1.874e-03						
	Cl-	1.874e-03	1.737e-03	-2.727	-2.760	-0.033	(0)
	ZnOHC1	2.286e-09	2.286e-09	-8.641	-8.641	0.000	(0)
	MnCl+	1.123e-09	1.043e-09	-8.950	-8.982	-0.032	(0)
	ZnCl+	7.172e-10	6.649e-10	-9.144	-9.177	-0.033	(0)
	AgCl	1.452e-10	1.452e-10	-9.838	-9.838	0.000	(0)
	CuCl	2.462e-11	2.462e-11	-10.609	-10.609	0.000	(0)
	AgCl2-	2.387e-11	2.197e-11	-10.622	-10.658	-0.036	(0)
	CuCl2-	9.639e-12	8.936e-12	-11.016	-11.049	-0.033	(0)
	CdCl+	9.610e-12	8.847e-12	-11.017	-11.053	-0.036	(0)
	CoCl+	2.779e-12	2.558e-12	-11.556	-11.592	-0.036	(0)
	NiCl+	2.750e-12	2.531e-12	-11.561	-11.597	-0.036	(0)
	MnCl2	2.559e-12	2.559e-12	-11.592	-11.592	0.000	(0)
	ZnCl2	1.830e-12	1.830e-12	-11.737	-11.737	0.000	(0)
	CuCl+	1.549e-12	1.436e-12	-11.810	-11.843	-0.033	(0)
	CdOHC1	9.531e-13	9.531e-13	-12.021	-12.021	0.000	(0)
	PbCl+	1.159e-13	1.067e-13	-12.936	-12.972	-0.036	(0)
	CdCl2	6.407e-14	6.407e-14	-13.193	-13.193	0.000	(0)
	AgCl3-2	4.737e-14	3.402e-14	-13.324	-13.468	-0.144	(0)
	HgClOH	1.036e-14	1.036e-14	-13.984	-13.984	0.000	(0)
	CuCl3-2	4.465e-15	3.319e-15	-14.350	-14.479	-0.129	(0)
	ZnCl3-	2.725e-15	2.526e-15	-14.565	-14.598	-0.033	(0)
	MnCl3-	1.318e-15	1.224e-15	-14.880	-14.912	-0.032	(0)
	CuCl2	8.652e-16	8.652e-16	-15.063	-15.063	0.000	(0)
	PbCl2	8.279e-16	8.279e-16	-15.082	-15.082	0.000	(0)
	HgCl2	3.882e-16	3.882e-16	-15.411	-15.411	0.000	(0)
	AgCl4-3	2.542e-16	1.207e-16	-15.595	-15.918	-0.324	(0)
	CdCl3-	7.628e-17	7.022e-17	-16.118	-16.154	-0.036	(0)
	NiCl2	2.214e-17	2.214e-17	-16.655	-16.655	0.000	(0)
	HgCl3-	7.325e-18	6.743e-18	-17.135	-17.171	-0.036	(0)
	ZnCl4-2	2.952e-18	2.194e-18	-17.530	-17.659	-0.129	(0)
	PbCl3-	6.219e-19	5.725e-19	-18.206	-18.242	-0.036	(0)
	UO2Cl+	4.863e-19	4.477e-19	-18.313	-18.349	-0.036	(0)
	HgCl4-2	6.494e-20	4.663e-20	-19.188	-19.331	-0.144	(0)
	HgCl+	4.843e-20	4.459e-20	-19.315	-19.351	-0.036	(0)
	CrCl+2	4.331e-20	3.110e-20	-19.363	-19.507	-0.144	(0)
	CuCl3-	1.513e-20	1.403e-20	-19.820	-19.853	-0.033	(0)
	CrOHC12	2.697e-21	2.697e-21	-20.569	-20.569	0.000	(0)
	PbCl4-2	6.330e-22	4.546e-22	-21.199	-21.342	-0.144	(0)
	FeCl+2	6.176e-24	4.590e-24	-23.209	-23.338	-0.129	(0)
	CrCl2+	5.568e-24	5.126e-24	-23.254	-23.290	-0.036	(0)
	CuCl4-2	1.643e-25	1.221e-25	-24.784	-24.913	-0.129	(0)
	FeCl2+	3.836e-26	3.562e-26	-25.416	-25.448	-0.032	(0)
	CrO3Cl-	2.221e-26	2.045e-26	-25.653	-25.689	-0.036	(0)

VOC1+	6.905e-27	6.356e-27	-26.161	-26.197	-0.036	(0)
FeCl3	6.187e-30	6.187e-30	-29.208	-29.208	0.000	(0)
CoCl+2	1.893e-38	1.360e-38	-37.723	-37.867	-0.144	(0)
UCl+3	0.000e+00	0.000e+00	-49.697	-50.020	-0.324	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.736	-66.880	-0.144	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.334	-71.477	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.445	-84.589	-0.144	(0)
Co (2)	8.052e-10					
Co+2	5.928e-10	4.257e-10	-9.227	-9.371	-0.144	(0)
CoCO3	1.104e-10	1.104e-10	-9.957	-9.957	0.000	(0)
CoHCO3+	4.511e-11	4.153e-11	-10.346	-10.382	-0.036	(0)
CoOH+	2.423e-11	2.231e-11	-10.616	-10.652	-0.036	(0)
CoSO4	2.417e-11	2.417e-11	-10.617	-10.617	0.000	(0)
Co (OH) 2	4.654e-12	4.654e-12	-11.332	-11.332	0.000	(0)
CoCl+	2.779e-12	2.558e-12	-11.556	-11.592	-0.036	(0)
CoF+	1.050e-12	9.670e-13	-11.979	-12.015	-0.036	(0)
Co (OH) 3-	2.649e-16	2.438e-16	-15.577	-15.613	-0.036	(0)
CoNO2+	2.029e-16	1.868e-16	-15.693	-15.729	-0.036	(0)
CoOOH-	6.647e-17	6.119e-17	-16.177	-16.213	-0.036	(0)
Co (NH3) +2	7.237e-19	5.197e-19	-18.140	-18.284	-0.144	(0)
CoSeO4	6.942e-19	6.942e-19	-18.159	-18.159	0.000	(0)
CoNO3+	4.305e-20	3.963e-20	-19.366	-19.402	-0.036	(0)
Co2OH+3	1.003e-21	4.760e-22	-20.999	-21.322	-0.324	(0)
Co (OH) 4-2	1.413e-22	1.015e-22	-21.850	-21.994	-0.144	(0)
Co (NH3) 2+2	3.135e-28	2.251e-28	-27.504	-27.648	-0.144	(0)
Co (NO3) 2	4.736e-30	4.736e-30	-29.325	-29.325	0.000	(0)
Co4 (OH) 4+4	1.858e-34	4.941e-35	-33.731	-34.306	-0.575	(0)
Co (NH3) 3+2	4.007e-38	2.878e-38	-37.397	-37.541	-0.144	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-47.671	-47.814	-0.144	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-58.444	-58.588	-0.144	(0)
Co (3)	7.149e-31					
CoOH+2	7.149e-31	5.134e-31	-30.146	-30.290	-0.144	(0)
Co+3	7.594e-38	3.847e-38	-37.120	-37.415	-0.295	(0)
CoCl+2	1.893e-38	1.360e-38	-37.723	-37.867	-0.144	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.736	-66.880	-0.144	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-80.414	-80.450	-0.036	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-83.066	-83.210	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.445	-84.589	-0.144	(0)
Cr (2)	2.027e-28					
Cr+2	2.027e-28	1.456e-28	-27.693	-27.837	-0.144	(0)
Cr (3)	5.898e-10					
Cr (OH) 2+	2.759e-10	2.540e-10	-9.559	-9.595	-0.036	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.372e-11	3.104e-11	-10.472	-10.508	-0.036	(0)
Cr (OH) 4-	2.846e-11	2.620e-11	-10.546	-10.582	-0.036	(0)
Cr (OH) +2	1.107e-12	7.948e-13	-11.956	-12.100	-0.144	(0)
CrOHSO4	5.366e-14	5.366e-14	-13.270	-13.270	0.000	(0)
CrF+2	2.193e-16	1.575e-16	-15.659	-15.803	-0.144	(0)
Cr+3	2.914e-17	1.383e-17	-16.536	-16.859	-0.324	(0)
CrSO4+	9.982e-18	9.189e-18	-17.001	-17.037	-0.036	(0)
CrCl+2	4.331e-20	3.110e-20	-19.363	-19.507	-0.144	(0)
CrOHC12	2.697e-21	2.697e-21	-20.569	-20.569	0.000	(0)
CrCl2+	5.568e-24	5.126e-24	-23.254	-23.290	-0.036	(0)
Cr2 (OH) 2SO4+2	5.367e-24	3.854e-24	-23.270	-23.414	-0.144	(0)
Cr2 (OH) 2 (SO4) 2	6.514e-26	6.514e-26	-25.186	-25.186	0.000	(0)
CrNO3+2	4.945e-29	3.551e-29	-28.306	-28.450	-0.144	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-56.890	-57.034	-0.144	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-69.496	-69.819	-0.324	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.334	-71.477	-0.144	(0)
Cr (6)	5.441e-14					
CrO4-2	5.324e-14	3.935e-14	-13.274	-13.405	-0.131	(0)
NaCrO4-	6.199e-16	5.707e-16	-15.208	-15.244	-0.036	(0)
HCrO4-	5.303e-16	4.882e-16	-15.275	-15.311	-0.036	(0)
KCrO4-	1.846e-17	1.699e-17	-16.734	-16.770	-0.036	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	2.258e-25	1.622e-25	-24.646	-24.790	-0.144	(0)
CrO3Cl-	2.221e-26	2.045e-26	-25.653	-25.689	-0.036	(0)
Cr2O7-2	1.151e-29	8.265e-30	-28.939	-29.083	-0.144	(0)

Cu (1)	4.649e-11					
CuCl	2.462e-11	2.462e-11	-10.609	-10.609	0.000	(0)
Cu+	1.223e-11	1.126e-11	-10.913	-10.949	-0.036	(0)
CuCl2-	9.639e-12	8.936e-12	-11.016	-11.049	-0.033	(0)
CuCl3-2	4.465e-15	3.319e-15	-14.350	-14.479	-0.129	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.477	-151.688	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.213	-152.418	-0.205	(0)
Cu (2)	5.757e-08					
CuCO3	4.712e-08	4.712e-08	-7.327	-7.327	0.000	(0)
CuOH+	4.674e-09	4.333e-09	-8.330	-8.363	-0.033	(0)
Cu (CO3) 2-2	2.708e-09	1.945e-09	-8.567	-8.711	-0.144	(0)
Cu (OH) 2	2.270e-09	2.270e-09	-8.644	-8.644	0.000	(0)
Cu+2	7.059e-10	5.217e-10	-9.151	-9.283	-0.131	(0)
CuHCO3+	4.485e-11	4.128e-11	-10.348	-10.384	-0.036	(0)
CuSO4	3.400e-11	3.400e-11	-10.468	-10.468	0.000	(0)
Cu (OH) 3-	1.329e-11	1.223e-11	-10.877	-10.913	-0.036	(0)
CuF+	2.569e-12	2.365e-12	-11.590	-11.626	-0.036	(0)
CuCl+	1.549e-12	1.436e-12	-11.810	-11.843	-0.033	(0)
Cu2 (OH) 2+2	6.567e-13	4.716e-13	-12.183	-12.326	-0.144	(0)
CuNO2+	3.695e-15	3.401e-15	-14.432	-14.468	-0.036	(0)
CuCl2	8.652e-16	8.652e-16	-15.063	-15.063	0.000	(0)
Cu (OH) 4-2	3.520e-16	2.528e-16	-15.453	-15.597	-0.144	(0)
CuNH3+2	7.549e-17	5.421e-17	-16.122	-16.266	-0.144	(0)
CuNO3+	1.053e-19	9.690e-20	-18.978	-19.014	-0.036	(0)
CuCl3-	1.513e-20	1.403e-20	-19.820	-19.853	-0.033	(0)
Cu (NO2) 2	2.167e-21	2.167e-21	-20.664	-20.664	0.000	(0)
CuCl4-2	1.643e-25	1.221e-25	-24.784	-24.913	-0.129	(0)
Cu (NO3) 2	7.165e-31	7.165e-31	-30.145	-30.145	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-224.791	-224.827	-0.036	(0)
F	7.865e-05					
F-	7.747e-05	7.183e-05	-4.111	-4.144	-0.033	(0)
MgF+	8.603e-07	7.982e-07	-6.065	-6.098	-0.033	(0)
CaF+	1.823e-07	1.693e-07	-6.739	-6.771	-0.032	(0)
NaF	1.323e-07	1.323e-07	-6.879	-6.879	0.000	(0)
MnF+	1.468e-09	1.363e-09	-8.833	-8.865	-0.032	(0)
HF	4.073e-10	4.073e-10	-9.390	-9.390	0.000	(0)
ZnF+	2.372e-10	2.184e-10	-9.625	-9.661	-0.036	(0)
BF (OH) 3-	2.072e-10	1.917e-10	-9.684	-9.717	-0.034	(0)
CuF+	2.569e-12	2.365e-12	-11.590	-11.626	-0.036	(0)
NiF+	1.116e-12	1.028e-12	-11.952	-11.988	-0.036	(0)
CoF+	1.050e-12	9.670e-13	-11.979	-12.015	-0.036	(0)
HF2-	1.201e-13	1.112e-13	-12.920	-12.954	-0.033	(0)
CdF+	6.595e-14	6.071e-14	-13.181	-13.217	-0.036	(0)
PbF+	9.518e-15	8.762e-15	-14.021	-14.057	-0.036	(0)
AgF	7.389e-15	7.389e-15	-14.131	-14.131	0.000	(0)
BF2 (OH) 2-	6.102e-15	5.643e-15	-14.215	-14.248	-0.034	(0)
AlF2+	3.180e-15	2.954e-15	-14.498	-14.530	-0.032	(0)
AlF3	2.671e-15	2.671e-15	-14.573	-14.573	0.000	(0)
UO2F+	1.712e-15	1.576e-15	-14.767	-14.803	-0.036	(0)
UO2F2	3.264e-16	3.264e-16	-15.486	-15.486	0.000	(0)
CrF+2	2.193e-16	1.575e-16	-15.659	-15.803	-0.144	(0)
AlF+2	1.386e-16	1.033e-16	-15.858	-15.986	-0.128	(0)
AlF4-	1.037e-16	9.617e-17	-15.984	-16.017	-0.033	(0)
PbF2	1.239e-17	1.239e-17	-16.907	-16.907	0.000	(0)
CdF2	8.702e-18	8.702e-18	-17.060	-17.060	0.000	(0)
UO2F3-	6.398e-18	5.890e-18	-17.194	-17.230	-0.036	(0)
H2F2	4.445e-19	4.445e-19	-18.352	-18.352	0.000	(0)
FeF2+	1.427e-20	1.325e-20	-19.846	-19.878	-0.032	(0)
FeF+2	9.273e-21	6.892e-21	-20.033	-20.162	-0.129	(0)
UO2F4-2	4.680e-21	3.361e-21	-20.330	-20.474	-0.144	(0)
VO2F	3.172e-21	3.172e-21	-20.499	-20.499	0.000	(0)
PbF3-	1.833e-21	1.688e-21	-20.737	-20.773	-0.036	(0)
FeF3	1.343e-21	1.343e-21	-20.872	-20.872	0.000	(0)
BF3OH-	6.538e-22	6.046e-22	-21.185	-21.219	-0.034	(0)
VO2F2-	8.988e-23	8.274e-23	-22.046	-22.082	-0.036	(0)
VOF+	6.104e-25	5.619e-25	-24.214	-24.250	-0.036	(0)
VO2F3-2	1.032e-25	7.414e-26	-24.986	-25.130	-0.144	(0)
PbF4-2	8.079e-26	5.802e-26	-25.093	-25.236	-0.144	(0)

VOF2	1.514e-26	1.514e-26	-25.820	-25.820	0.000	(0)
HgF+	3.721e-27	3.425e-27	-26.429	-26.465	-0.036	(0)
BF4-	8.861e-28	8.194e-28	-27.053	-27.087	-0.034	(0)
VOF3-	4.191e-29	3.858e-29	-28.378	-28.414	-0.036	(0)
Sb(OH) 2F	3.009e-29	3.009e-29	-28.522	-28.522	0.000	(0)
SbOF	2.960e-29	2.960e-29	-28.529	-28.529	0.000	(0)
VO2F4-3	5.519e-30	2.620e-30	-29.258	-29.582	-0.324	(0)
SiF6-2	1.856e-32	1.379e-32	-31.731	-31.860	-0.129	(0)
VOF4-2	1.558e-32	1.119e-32	-31.808	-31.951	-0.144	(0)
UF3+	1.756e-40	1.617e-40	-39.755	-39.791	-0.036	(0)
UF2+2	0.000e+00	0.000e+00	-40.704	-40.848	-0.144	(0)
UF4	0.000e+00	0.000e+00	-41.895	-41.895	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.480	-43.804	-0.324	(0)
UF5-	0.000e+00	0.000e+00	-44.405	-44.441	-0.036	(0)
UF6-2	0.000e+00	0.000e+00	-45.961	-46.104	-0.144	(0)
Fe (2)	6.608e-14					
Fe+2	5.778e-14	4.150e-14	-13.238	-13.382	-0.144	(0)
FeOH+	4.673e-15	4.339e-15	-14.330	-14.363	-0.032	(0)
FeSO4	2.898e-15	2.898e-15	-14.538	-14.538	0.000	(0)
FeHCO3+	7.045e-16	6.552e-16	-15.152	-15.184	-0.032	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	8.095e-18	7.516e-18	-17.092	-17.124	-0.032	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-165.394	-165.394	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.802	-243.838	-0.036	(0)
Fe (3)	7.033e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	1.632e-10	1.516e-10	-9.787	-9.819	-0.032	(0)
Fe (OH) 4-	1.125e-10	1.046e-10	-9.949	-9.981	-0.032	(0)
FeOH+2	1.996e-16	1.484e-16	-15.700	-15.829	-0.129	(0)
FeF2+	1.427e-20	1.325e-20	-19.846	-19.878	-0.032	(0)
FeF+2	9.273e-21	6.892e-21	-20.033	-20.162	-0.129	(0)
FeF3	1.343e-21	1.343e-21	-20.872	-20.872	0.000	(0)
FeSO4+	3.008e-22	2.793e-22	-21.522	-21.554	-0.032	(0)
Fe+3	1.727e-22	8.750e-23	-21.763	-22.058	-0.295	(0)
FeCl+2	6.176e-24	4.590e-24	-23.209	-23.338	-0.129	(0)
Fe (SO4) 2-	1.845e-24	1.699e-24	-23.734	-23.770	-0.036	(0)
FeCl2+	3.836e-26	3.562e-26	-25.416	-25.448	-0.032	(0)
FeHSeO3+2	2.328e-28	1.672e-28	-27.633	-27.777	-0.144	(0)
FeCl3	6.187e-30	6.187e-30	-29.208	-29.208	0.000	(0)
Fe2 (OH) 2+4	2.740e-30	7.289e-31	-29.562	-30.137	-0.575	(0)
FeNO3+2	7.156e-32	5.139e-32	-31.145	-31.289	-0.144	(0)
Fe3 (OH) 4+5	1.265e-38	1.597e-39	-37.898	-38.797	-0.899	(0)
H (0)	4.034e-29					
H2	2.017e-29	2.019e-29	-28.695	-28.695	0.000	(0)
Hg (0)	2.305e-11					
Hg	2.305e-11	2.305e-11	-10.637	-10.637	0.000	(0)
Hg (1)	5.605e-26					
Hg2+2	2.803e-26	2.013e-26	-25.552	-25.696	-0.144	(0)
Hg (2)	6.670e-14					
Hg (OH) 2	5.592e-14	5.598e-14	-13.252	-13.252	0.000	(0)
HgClOH	1.036e-14	1.036e-14	-13.984	-13.984	0.000	(0)
HgCl2	3.882e-16	3.882e-16	-15.411	-15.411	0.000	(0)
HgCO3	2.361e-17	2.361e-17	-16.627	-16.627	0.000	(0)
HgCl3-	7.325e-18	6.743e-18	-17.135	-17.171	-0.036	(0)
Hg (CO3) 2-2	1.594e-18	1.145e-18	-17.797	-17.941	-0.144	(0)
HgOH+	1.461e-19	1.345e-19	-18.835	-18.871	-0.036	(0)
HgCl4-2	6.494e-20	4.663e-20	-19.188	-19.331	-0.144	(0)
HgCl+	4.843e-20	4.459e-20	-19.315	-19.351	-0.036	(0)
Hg (OH) 3-	2.011e-20	1.851e-20	-19.697	-19.733	-0.036	(0)
HgHCO3+	1.831e-21	1.685e-21	-20.737	-20.773	-0.036	(0)
Hg+2	1.791e-24	1.286e-24	-23.747	-23.891	-0.144	(0)
HgSO4	9.582e-26	9.582e-26	-25.019	-25.019	0.000	(0)
HgNH3+2	1.148e-26	8.242e-27	-25.940	-26.084	-0.144	(0)
HgF+	3.721e-27	3.425e-27	-26.429	-26.465	-0.036	(0)
Hg (NH3) 2+2	1.165e-28	8.369e-29	-27.934	-28.077	-0.144	(0)
HgNO3+	3.030e-35	2.790e-35	-34.518	-34.554	-0.036	(0)
Hg (NH3) 3+2	4.711e-39	3.383e-39	-38.327	-38.471	-0.144	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.167	-45.167	0.000	(0)

	Hg (NH3) 4+2	0.000e+00	0.000e+00	-48.420	-48.564	-0.144	(0)
	HgHS2-	0.000e+00	0.000e+00	-144.473	-144.508	-0.036	(0)
	HgS2-2	0.000e+00	0.000e+00	-144.656	-144.800	-0.144	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-146.531	-146.531	0.000	(0)
K	1.256e-04						
	K+	1.253e-04	1.162e-04	-3.902	-3.935	-0.033	(0)
	KSO4-	2.519e-07	2.340e-07	-6.599	-6.631	-0.032	(0)
	KCrO4-	1.846e-17	1.699e-17	-16.734	-16.770	-0.036	(0)
Mg	1.427e-04						
	Mg+2	1.340e-04	9.903e-05	-3.873	-4.004	-0.131	(0)
	MgSO4	5.127e-06	5.127e-06	-5.290	-5.290	0.000	(0)
	MgHCO3+	1.371e-06	1.271e-06	-5.863	-5.896	-0.033	(0)
	MgCO3	1.263e-06	1.263e-06	-5.899	-5.899	0.000	(0)
	MgF+	8.603e-07	7.982e-07	-6.065	-6.098	-0.033	(0)
	MgOH+	1.113e-07	1.035e-07	-6.954	-6.985	-0.031	(0)
	MgH2BO3+	3.761e-09	3.478e-09	-8.425	-8.459	-0.034	(0)
Mn (2)	7.069e-07						
	Mn+2	6.639e-07	4.768e-07	-6.178	-6.322	-0.144	(0)
	MnSO4	2.412e-08	2.412e-08	-7.618	-7.618	0.000	(0)
	MnHCO3+	1.285e-08	1.193e-08	-7.891	-7.923	-0.032	(0)
	MnOH+	3.387e-09	3.145e-09	-8.470	-8.502	-0.032	(0)
	MnF+	1.468e-09	1.363e-09	-8.833	-8.865	-0.032	(0)
	MnCl+	1.123e-09	1.043e-09	-8.950	-8.982	-0.032	(0)
	MnCl2	2.559e-12	2.559e-12	-11.592	-11.592	0.000	(0)
	MnCl3-	1.318e-15	1.224e-15	-14.880	-14.912	-0.032	(0)
	MnSeO4	4.175e-16	4.175e-16	-15.379	-15.379	0.000	(0)
	Mn (OH) 3-	1.444e-16	1.341e-16	-15.840	-15.873	-0.032	(0)
	MnNO3+	4.821e-17	4.438e-17	-16.317	-16.353	-0.036	(0)
	Mn (OH) 4-2	1.529e-21	1.137e-21	-20.815	-20.944	-0.129	(0)
	Mn (NO3) 2	6.548e-27	6.548e-27	-26.184	-26.184	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-44.205	-44.205	0.000	(0)
Mn (3)	9.543e-28						
	Mn+3	9.543e-28	4.834e-28	-27.020	-27.316	-0.295	(0)
Mn (6)	1.380e-40						
	MnO4-2	1.380e-40	1.026e-40	-39.860	-39.989	-0.129	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.971	-45.005	-0.034	(0)
Mo	1.768e-08						
	MoO4-2	1.767e-08	1.306e-08	-7.753	-7.884	-0.131	(0)
	HMoO4-	1.083e-12	9.965e-13	-11.966	-12.002	-0.036	(0)
	H2MoO4	2.798e-17	2.798e-17	-16.553	-16.553	0.000	(0)
	Ag2MoO4	8.292e-30	8.292e-30	-29.081	-29.081	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-61.328	-61.651	-0.324	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-68.234	-69.528	-1.294	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-70.659	-71.558	-0.899	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-74.617	-75.192	-0.575	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-80.039	-80.363	-0.324	(0)
N (-3)	8.421e-11						
	NH4+	7.383e-11	6.827e-11	-10.132	-10.166	-0.034	(0)
	NH3	1.015e-11	1.015e-11	-10.993	-10.993	0.000	(0)
	NH4SO4-	2.241e-13	2.081e-13	-12.649	-12.682	-0.032	(0)
	CaNH3+2	3.843e-15	2.760e-15	-14.415	-14.559	-0.144	(0)
	CuNH3+2	7.549e-17	5.421e-17	-16.122	-16.266	-0.144	(0)
	NiNH3+2	4.324e-18	3.105e-18	-17.364	-17.508	-0.144	(0)
	AgNH3+	9.222e-19	8.490e-19	-18.035	-18.071	-0.036	(0)
	Co (NH3) +2	7.237e-19	5.197e-19	-18.140	-18.284	-0.144	(0)
	BaNH3+2	2.459e-21	1.766e-21	-20.609	-20.753	-0.144	(0)
	Ag (NH3) 2+	7.612e-26	7.007e-26	-25.119	-25.154	-0.036	(0)
	Ca (NH3) 2+2	1.554e-26	1.116e-26	-25.809	-25.952	-0.144	(0)
	HgNH3+2	1.148e-26	8.242e-27	-25.940	-26.084	-0.144	(0)
	Ni (NH3) 2+2	6.347e-27	4.558e-27	-26.197	-26.341	-0.144	(0)
	Co (NH3) 2+2	3.135e-28	2.251e-28	-27.504	-27.648	-0.144	(0)
	Hg (NH3) 2+2	1.165e-28	8.369e-29	-27.934	-28.077	-0.144	(0)
	Co (NH3) 3+2	4.007e-38	2.878e-38	-37.397	-37.541	-0.144	(0)
	Hg (NH3) 3+2	4.711e-39	3.383e-39	-38.327	-38.471	-0.144	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-47.671	-47.814	-0.144	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-48.420	-48.564	-0.144	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-56.890	-57.034	-0.144	(0)

Co (NH3) 5+2	0.000e+00	0.000e+00	-58.444	-58.588	-0.144	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.736	-66.880	-0.144	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-69.496	-69.819	-0.324	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.334	-71.477	-0.144	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-80.414	-80.450	-0.036	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-83.066	-83.210	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.445	-84.589	-0.144	(0)
N (3)	6.727e-08					
NO2-	6.727e-08	6.226e-08	-7.172	-7.206	-0.034	(0)
CuNO2+	3.695e-15	3.401e-15	-14.432	-14.468	-0.036	(0)
AgNO2	5.326e-16	5.326e-16	-15.274	-15.274	0.000	(0)
CoNO2+	2.029e-16	1.868e-16	-15.693	-15.729	-0.036	(0)
Cu (NO2) 2	2.167e-21	2.167e-21	-20.664	-20.664	0.000	(0)
Ag (NO2) 2-	5.579e-23	5.136e-23	-22.253	-22.289	-0.036	(0)
N (5)	6.339e-11					
NO3-	6.334e-11	5.873e-11	-10.198	-10.231	-0.033	(0)
CaNO3+	4.356e-14	4.010e-14	-13.361	-13.397	-0.036	(0)
MnNO3+	4.821e-17	4.438e-17	-16.317	-16.353	-0.036	(0)
ZnNO3+	2.442e-17	2.248e-17	-16.612	-16.648	-0.036	(0)
CuNO3+	1.053e-19	9.690e-20	-18.978	-19.014	-0.036	(0)
NiNO3+	9.127e-20	8.402e-20	-19.040	-19.076	-0.036	(0)
BaNO3+	8.814e-20	8.114e-20	-19.055	-19.091	-0.036	(0)
CoNO3+	4.305e-20	3.963e-20	-19.366	-19.402	-0.036	(0)
CdNO3+	1.076e-20	9.905e-21	-19.968	-20.004	-0.036	(0)
AgNO3	1.910e-21	1.910e-21	-20.719	-20.719	0.000	(0)
PbNO3+	1.634e-21	1.504e-21	-20.787	-20.823	-0.036	(0)
UO2NO3+	2.023e-26	1.862e-26	-25.694	-25.730	-0.036	(0)
Mn (NO3) 2	6.548e-27	6.548e-27	-26.184	-26.184	0.000	(0)
Zn (NO3) 2	2.634e-28	2.634e-28	-27.579	-27.579	0.000	(0)
CrNO3+2	4.945e-29	3.551e-29	-28.306	-28.450	-0.144	(0)
Co (NO3) 2	4.736e-30	4.736e-30	-29.325	-29.325	0.000	(0)
VO2NO3	7.481e-31	7.481e-31	-30.126	-30.126	0.000	(0)
Cu (NO3) 2	7.165e-31	7.165e-31	-30.145	-30.145	0.000	(0)
Cd (NO3) 2	2.916e-31	2.916e-31	-30.535	-30.535	0.000	(0)
Pb (NO3) 2	1.500e-31	1.500e-31	-30.824	-30.824	0.000	(0)
FeNO3+2	7.156e-32	5.139e-32	-31.145	-31.289	-0.144	(0)
HgNO3+	3.030e-35	2.790e-35	-34.518	-34.554	-0.036	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.167	-45.167	0.000	(0)
Na	3.155e-03					
Na+	3.147e-03	2.918e-03	-2.502	-2.535	-0.033	(0)
NaSO4-	4.799e-06	4.459e-06	-5.319	-5.351	-0.032	(0)
NaHCO3	2.058e-06	2.058e-06	-5.687	-5.687	0.000	(0)
NaCO3-	8.970e-07	8.334e-07	-6.047	-6.079	-0.032	(0)
NaF	1.323e-07	1.323e-07	-6.879	-6.879	0.000	(0)
NaH2BO3	4.685e-09	4.685e-09	-8.329	-8.329	0.000	(0)
NaCrO4-	6.199e-16	5.707e-16	-15.208	-15.244	-0.036	(0)
Ni	1.253e-09					
Ni+2	7.705e-10	5.695e-10	-9.113	-9.245	-0.131	(0)
NiCO3	3.258e-10	3.258e-10	-9.487	-9.487	0.000	(0)
NiHCO3+	9.564e-11	8.805e-11	-10.019	-10.055	-0.036	(0)
NiSO4	3.233e-11	3.233e-11	-10.490	-10.490	0.000	(0)
NiOH+	2.045e-11	1.883e-11	-10.689	-10.725	-0.036	(0)
Ni (OH) 2	3.928e-12	3.928e-12	-11.406	-11.406	0.000	(0)
NiCl+	2.750e-12	2.531e-12	-11.561	-11.597	-0.036	(0)
NiF+	1.116e-12	1.028e-12	-11.952	-11.988	-0.036	(0)
Ni (OH) 3-	1.121e-14	1.032e-14	-13.951	-13.987	-0.036	(0)
Ni (SO4) 2-2	4.240e-16	3.045e-16	-15.373	-15.516	-0.144	(0)
NiCl2	2.214e-17	2.214e-17	-16.655	-16.655	0.000	(0)
NiNH3+2	4.324e-18	3.105e-18	-17.364	-17.508	-0.144	(0)
NiSeO4	8.666e-19	8.666e-19	-18.062	-18.062	0.000	(0)
NiNO3+	9.127e-20	8.402e-20	-19.040	-19.076	-0.036	(0)
Ni (NH3) 2+2	6.347e-27	4.558e-27	-26.197	-26.341	-0.144	(0)
O (0)	2.482e-35					
O2	1.241e-35	1.243e-35	-34.906	-34.906	0.000	(0)
Pb	1.025e-10					
PbCO3	7.980e-11	7.980e-11	-10.098	-10.098	0.000	(0)
PbOH+	1.240e-11	1.142e-11	-10.906	-10.942	-0.036	(0)
Pb (CO3) 2-2	4.915e-12	3.530e-12	-11.308	-11.452	-0.144	(0)

Pb+2	2.342e-12	1.731e-12	-11.630	-11.762	-0.131	(0)
PbHCO3+	1.752e-12	1.613e-12	-11.756	-11.792	-0.036	(0)
Pb (OH) 2	9.483e-13	9.483e-13	-12.023	-12.023	0.000	(0)
PbSO4	2.412e-13	2.412e-13	-12.618	-12.618	0.000	(0)
PbCl+	1.159e-13	1.067e-13	-12.936	-12.972	-0.036	(0)
PbF+	9.518e-15	8.762e-15	-14.021	-14.057	-0.036	(0)
Pb (OH) 3-	2.705e-15	2.490e-15	-14.568	-14.604	-0.036	(0)
PbCl2	8.279e-16	8.279e-16	-15.082	-15.082	0.000	(0)
Pb (SO4) 2-2	5.757e-16	4.134e-16	-15.240	-15.384	-0.144	(0)
PbF2	1.239e-17	1.239e-17	-16.907	-16.907	0.000	(0)
Pb (OH) 4-2	2.230e-18	1.602e-18	-17.652	-17.795	-0.144	(0)
PbCl3-	6.219e-19	5.725e-19	-18.206	-18.242	-0.036	(0)
PbF3-	1.833e-21	1.688e-21	-20.737	-20.773	-0.036	(0)
PbNO3+	1.634e-21	1.504e-21	-20.787	-20.823	-0.036	(0)
Pb2OH+3	6.598e-22	3.133e-22	-21.181	-21.504	-0.324	(0)
PbCl4-2	6.330e-22	4.546e-22	-21.199	-21.342	-0.144	(0)
PbF4-2	8.079e-26	5.802e-26	-25.093	-25.236	-0.144	(0)
Pb3 (OH) 4+2	4.325e-26	3.106e-26	-25.364	-25.508	-0.144	(0)
Pb (NO3) 2	1.500e-31	1.500e-31	-30.824	-30.824	0.000	(0)
Pb4 (OH) 4+4	1.606e-33	4.270e-34	-32.794	-33.370	-0.575	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-157.454	-157.454	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-236.599	-236.635	-0.036	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-77.054	-77.054	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.445	-80.481	-0.036	(0)
S5-2	0.000e+00	0.000e+00	-81.286	-81.430	-0.144	(0)
S6-2	0.000e+00	0.000e+00	-81.802	-81.946	-0.144	(0)
H2S	0.000e+00	0.000e+00	-81.878	-81.878	0.000	(0)
S4-2	0.000e+00	0.000e+00	-81.882	-82.026	-0.144	(0)
S3-2	0.000e+00	0.000e+00	-82.688	-82.831	-0.144	(0)
CdHS+	0.000e+00	0.000e+00	-82.710	-82.746	-0.036	(0)
S2-2	0.000e+00	0.000e+00	-83.704	-83.848	-0.144	(0)
S-2	0.000e+00	0.000e+00	-89.236	-89.365	-0.129	(0)
HgHS2-	0.000e+00	0.000e+00	-144.473	-144.508	-0.036	(0)
HgS2-2	0.000e+00	0.000e+00	-144.656	-144.800	-0.144	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-146.531	-146.531	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.477	-151.688	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.213	-152.418	-0.205	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-152.396	-152.503	-0.107	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.517	-152.553	-0.036	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-153.312	-153.526	-0.214	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-153.400	-153.436	-0.036	(0)
AgS4S5-3	0.000e+00	0.000e+00	-153.629	-153.837	-0.208	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.959	-154.959	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-156.023	-156.023	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-157.454	-157.454	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-165.394	-165.394	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-224.791	-224.827	-0.036	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-232.125	-232.160	-0.036	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.580	-233.724	-0.144	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-234.568	-234.604	-0.036	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-236.599	-236.635	-0.036	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.802	-243.838	-0.036	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-312.746	-312.890	-0.144	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.958	-314.102	-0.144	(0)
Sb2S4-2	0.000e+00	0.000e+00	-333.535	-333.679	-0.144	(0)
S (6)	4.092e-04					
SO4-2	3.849e-04	2.845e-04	-3.415	-3.546	-0.131	(0)
CaSO4	1.407e-05	1.407e-05	-4.852	-4.852	0.000	(0)
MgSO4	5.127e-06	5.127e-06	-5.290	-5.290	0.000	(0)
NaSO4-	4.799e-06	4.459e-06	-5.319	-5.351	-0.032	(0)
KSO4-	2.519e-07	2.340e-07	-6.599	-6.631	-0.032	(0)
MnSO4	2.412e-08	2.412e-08	-7.618	-7.618	0.000	(0)
ZnSO4	9.483e-09	9.483e-09	-8.023	-8.023	0.000	(0)
HSO4-	1.149e-10	1.066e-10	-9.940	-9.972	-0.033	(0)
CuSO4	3.400e-11	3.400e-11	-10.468	-10.468	0.000	(0)
Zn (SO4) 2-2	3.272e-11	2.350e-11	-10.485	-10.629	-0.144	(0)
NiSO4	3.233e-11	3.233e-11	-10.490	-10.490	0.000	(0)

CoSO4	2.417e-11	2.417e-11	-10.617	-10.617	0.000	(0)
CdSO4	3.557e-12	3.557e-12	-11.449	-11.449	0.000	(0)
AgSO4-	2.525e-13	2.324e-13	-12.598	-12.634	-0.036	(0)
PbSO4	2.412e-13	2.412e-13	-12.618	-12.618	0.000	(0)
NH4SO4-	2.241e-13	2.081e-13	-12.649	-12.682	-0.032	(0)
CrOHSO4	5.366e-14	5.366e-14	-13.270	-13.270	0.000	(0)
Cd (SO4) 2-2	1.901e-14	1.365e-14	-13.721	-13.865	-0.144	(0)
FeSO4	2.898e-15	2.898e-15	-14.538	-14.538	0.000	(0)
Pb (SO4) 2-2	5.757e-16	4.134e-16	-15.240	-15.384	-0.144	(0)
Ni (SO4) 2-2	4.240e-16	3.045e-16	-15.373	-15.516	-0.144	(0)
UO2SO4	6.842e-17	6.842e-17	-16.165	-16.165	0.000	(0)
CrSO4+	9.982e-18	9.189e-18	-17.001	-17.037	-0.036	(0)
UO2 (SO4) 2-2	3.573e-19	2.566e-19	-18.447	-18.591	-0.144	(0)
AlSO4+	3.423e-19	3.176e-19	-18.466	-18.498	-0.033	(0)
Al (SO4) 2-	1.043e-21	9.680e-22	-20.982	-21.014	-0.033	(0)
FeSO4+	3.008e-22	2.793e-22	-21.522	-21.554	-0.032	(0)
VO2SO4-	1.858e-22	1.711e-22	-21.731	-21.767	-0.036	(0)
Cr2 (OH) 2SO4+2	5.367e-24	3.854e-24	-23.270	-23.414	-0.144	(0)
Fe (SO4) 2-	1.845e-24	1.699e-24	-23.734	-23.770	-0.036	(0)
CrO3SO4-2	2.258e-25	1.622e-25	-24.646	-24.790	-0.144	(0)
VOSO4	1.022e-25	1.022e-25	-24.991	-24.991	0.000	(0)
HgSO4	9.582e-26	9.582e-26	-25.019	-25.019	0.000	(0)
Cr2 (OH) 2 (SO4) 2	6.514e-26	6.514e-26	-25.186	-25.186	0.000	(0)
VSO4+	0.000e+00	0.000e+00	-40.213	-40.249	-0.036	(0)
U (SO4) 2	0.000e+00	0.000e+00	-45.552	-45.552	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.762	-45.906	-0.144	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-80.414	-80.450	-0.036	(0)
Sb (3)	1.383e-22					
Sb (OH) 3	6.995e-23	6.995e-23	-22.155	-22.155	0.000	(0)
HSbO2	6.829e-23	6.829e-23	-22.166	-22.166	0.000	(0)
SbO2-	3.134e-26	2.885e-26	-25.504	-25.540	-0.036	(0)
Sb (OH) 4-	1.795e-26	1.653e-26	-25.746	-25.782	-0.036	(0)
Sb (OH) 2F	3.009e-29	3.009e-29	-28.522	-28.522	0.000	(0)
SbOF	2.960e-29	2.960e-29	-28.529	-28.529	0.000	(0)
Sb (OH) 2+	7.075e-30	6.513e-30	-29.150	-29.186	-0.036	(0)
SbO+	2.439e-30	2.245e-30	-29.613	-29.649	-0.036	(0)
Sb2S4-2	0.000e+00	0.000e+00	-333.535	-333.679	-0.144	(0)
Sb (5)	2.913e-10					
SbO3-	2.909e-10	2.678e-10	-9.536	-9.572	-0.036	(0)
Sb (OH) 6-	3.377e-13	3.132e-13	-12.471	-12.504	-0.033	(0)
SbO2+	1.226e-27	1.129e-27	-26.911	-26.947	-0.036	(0)
Se (-2)	4.336e-19					
Ag2Se	4.336e-19	4.336e-19	-18.363	-18.363	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.879	-40.915	-0.036	(0)
MnSe	0.000e+00	0.000e+00	-44.205	-44.205	0.000	(0)
H2Se	0.000e+00	0.000e+00	-45.441	-45.441	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.355	-47.498	-0.144	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.902	-87.477	-0.575	(0)
Se (4)	1.831e-09					
SeO3-2	1.046e-09	7.510e-10	-8.981	-9.124	-0.144	(0)
HSeO3-	7.856e-10	7.232e-10	-9.105	-9.141	-0.036	(0)
H2SeO3	1.183e-15	1.183e-15	-14.927	-14.927	0.000	(0)
AgSeO3-	2.147e-17	1.977e-17	-16.668	-16.704	-0.036	(0)
Cd (SeO3) 2-2	3.452e-23	2.479e-23	-22.462	-22.606	-0.144	(0)
Ag (SeO3) 2-3	2.799e-25	1.329e-25	-24.553	-24.876	-0.324	(0)
FeHSeO3+2	2.328e-28	1.672e-28	-27.633	-27.777	-0.144	(0)
Se (6)	4.402e-12					
SeO4-2	4.402e-12	3.254e-12	-11.356	-11.488	-0.131	(0)
MnSeO4	4.175e-16	4.175e-16	-15.379	-15.379	0.000	(0)
ZnSeO4	7.678e-17	7.678e-17	-16.115	-16.115	0.000	(0)
NiSeO4	8.666e-19	8.666e-19	-18.062	-18.062	0.000	(0)
CoSeO4	6.942e-19	6.942e-19	-18.159	-18.159	0.000	(0)
HSeO4-	6.791e-19	6.251e-19	-18.168	-18.204	-0.036	(0)
CdSeO4	3.231e-20	3.231e-20	-19.491	-19.491	0.000	(0)
Zn (SeO4) 2-2	3.527e-28	2.533e-28	-27.453	-27.596	-0.144	(0)
Si	3.191e-04					
H4SiO4	3.066e-04	3.069e-04	-3.513	-3.513	0.000	(0)
H3SiO4-	1.248e-05	1.157e-05	-4.904	-4.937	-0.033	(0)

H2SiO4-2	2.556e-10	1.905e-10	-9.592	-9.720	-0.128	(0)
UO2H3SiO4+	1.696e-13	1.561e-13	-12.771	-12.807	-0.036	(0)
SiF6-2	1.856e-32	1.379e-32	-31.731	-31.860	-0.129	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.789	-62.112	-0.324	(0)
U (4)	1.090e-20					
U (OH) 5-	1.090e-20	1.003e-20	-19.963	-19.999	-0.036	(0)
U (OH) 4	1.611e-24	1.611e-24	-23.793	-23.793	0.000	(0)
U (OH) 3+	2.453e-29	2.258e-29	-28.610	-28.646	-0.036	(0)
U (OH) 2+2	5.574e-35	4.003e-35	-34.254	-34.398	-0.144	(0)
UF3+	1.756e-40	1.617e-40	-39.755	-39.791	-0.036	(0)
UF2+2	0.000e+00	0.000e+00	-40.704	-40.848	-0.144	(0)
UOH+3	0.000e+00	0.000e+00	-40.817	-41.141	-0.324	(0)
UF4	0.000e+00	0.000e+00	-41.895	-41.895	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.480	-43.804	-0.324	(0)
UF5-	0.000e+00	0.000e+00	-44.405	-44.441	-0.036	(0)
U (SO4) 2	0.000e+00	0.000e+00	-45.552	-45.552	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.762	-45.906	-0.144	(0)
UF6-2	0.000e+00	0.000e+00	-45.961	-46.104	-0.144	(0)
U+4	0.000e+00	0.000e+00	-48.385	-48.960	-0.575	(0)
UCl+3	0.000e+00	0.000e+00	-49.697	-50.020	-0.324	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-181.760	-184.672	-2.912	(0)
U (5)	4.635e-18					
UO2+	4.635e-18	4.267e-18	-17.334	-17.370	-0.036	(0)
U (6)	1.272e-08					
UO2 (CO3) 3-4	8.579e-09	2.282e-09	-8.067	-8.642	-0.575	(0)
UO2 (CO3) 2-2	4.134e-09	2.969e-09	-8.384	-8.527	-0.144	(0)
UO2CO3	9.702e-12	9.702e-12	-11.013	-11.013	0.000	(0)
UO2H3SiO4+	1.696e-13	1.561e-13	-12.771	-12.807	-0.036	(0)
UO2OH+	5.707e-14	5.254e-14	-13.244	-13.280	-0.036	(0)
UO2F+	1.712e-15	1.576e-15	-14.767	-14.803	-0.036	(0)
UO2F2	3.264e-16	3.264e-16	-15.486	-15.486	0.000	(0)
UO2+2	2.150e-16	1.589e-16	-15.668	-15.799	-0.131	(0)
UO2SO4	6.842e-17	6.842e-17	-16.165	-16.165	0.000	(0)
UO2F3-	6.398e-18	5.890e-18	-17.194	-17.230	-0.036	(0)
UO2Cl+	4.863e-19	4.477e-19	-18.313	-18.349	-0.036	(0)
UO2 (SO4) 2-2	3.573e-19	2.566e-19	-18.447	-18.591	-0.144	(0)
(UO2) 2 (OH) 2+2	6.378e-21	4.581e-21	-20.195	-20.339	-0.144	(0)
UO2F4-2	4.680e-21	3.361e-21	-20.330	-20.474	-0.144	(0)
(UO2) 3 (OH) 5+	1.368e-21	1.259e-21	-20.864	-20.900	-0.036	(0)
UO2NO3+	2.023e-26	1.862e-26	-25.694	-25.730	-0.036	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-46.078	-46.114	-0.036	(0)
V+2	0.000e+00	0.000e+00	-47.900	-48.043	-0.144	(0)
V (3)	6.128e-18					
V (OH) 3	6.128e-18	6.128e-18	-17.213	-17.213	0.000	(0)
V (OH) 2+	1.649e-29	1.518e-29	-28.783	-28.819	-0.036	(0)
VOH+2	7.687e-34	5.520e-34	-33.114	-33.258	-0.144	(0)
V+3	8.834e-40	4.194e-40	-39.054	-39.377	-0.324	(0)
VSO4+	0.000e+00	0.000e+00	-40.213	-40.249	-0.036	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-63.301	-63.625	-0.324	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-65.141	-65.716	-0.575	(0)
V (4)	7.448e-22					
V (OH) 3+	7.423e-22	6.833e-22	-21.129	-21.165	-0.036	(0)
VO+2	1.816e-24	1.304e-24	-23.741	-23.885	-0.144	(0)
VOF+	6.104e-25	5.619e-25	-24.214	-24.250	-0.036	(0)
VOSO4	1.022e-25	1.022e-25	-24.991	-24.991	0.000	(0)
VOF2	1.514e-26	1.514e-26	-25.820	-25.820	0.000	(0)
VOC1+	6.905e-27	6.356e-27	-26.161	-26.197	-0.036	(0)
VOF3-	4.191e-29	3.858e-29	-28.378	-28.414	-0.036	(0)
VOF4-2	1.558e-32	1.119e-32	-31.808	-31.951	-0.144	(0)
H2V2O4+2	3.260e-38	2.341e-38	-37.487	-37.631	-0.144	(0)
V (5)	1.716e-10					
H2VO4-	9.326e-11	8.585e-11	-10.030	-10.066	-0.036	(0)
HVO4-2	7.833e-11	5.625e-11	-10.106	-10.250	-0.144	(0)
H3VO4	3.291e-15	3.291e-15	-14.483	-14.483	0.000	(0)
VO4-3	1.549e-16	7.354e-17	-15.810	-16.133	-0.324	(0)
HV2O7-3	3.447e-18	1.636e-18	-17.463	-17.786	-0.324	(0)

H3V2O7-	1.982e-18	1.824e-18	-17.703	-17.739	-0.036	(0)
V2O7-4	4.319e-20	1.149e-20	-19.365	-19.940	-0.575	(0)
VO2+	2.716e-20	2.518e-20	-19.566	-19.599	-0.033	(0)
VO2F	3.172e-21	3.172e-21	-20.499	-20.499	0.000	(0)
VO2SO4-	1.858e-22	1.711e-22	-21.731	-21.767	-0.036	(0)
VO2F2-	8.988e-23	8.274e-23	-22.046	-22.082	-0.036	(0)
V3O9-3	1.396e-24	6.628e-25	-23.855	-24.179	-0.324	(0)
VO2F3-2	1.032e-25	7.414e-26	-24.986	-25.130	-0.144	(0)
VO2F4-3	5.519e-30	2.620e-30	-29.258	-29.582	-0.324	(0)
VO2NO3	7.481e-31	7.481e-31	-30.126	-30.126	0.000	(0)
V4O12-4	8.918e-32	2.372e-32	-31.050	-31.625	-0.575	(0)
V10O28-6	0.000e+00	0.000e+00	-84.128	-85.422	-1.294	(0)
HV10O28-5	0.000e+00	0.000e+00	-84.753	-85.652	-0.899	(0)
H2V10O28-4	0.000e+00	0.000e+00	-88.285	-88.860	-0.575	(0)
Zn	4.203e-07					
Zn+2	2.061e-07	1.524e-07	-6.686	-6.817	-0.131	(0)
ZnCO3	1.345e-07	1.345e-07	-6.871	-6.871	0.000	(0)
ZnOH+	4.347e-08	4.002e-08	-7.362	-7.398	-0.036	(0)
Zn (OH) 2	1.666e-08	1.666e-08	-7.778	-7.778	0.000	(0)
ZnSO4	9.483e-09	9.483e-09	-8.023	-8.023	0.000	(0)
ZnHCO3+	6.564e-09	6.043e-09	-8.183	-8.219	-0.036	(0)
ZnOHC1	2.286e-09	2.286e-09	-8.641	-8.641	0.000	(0)
ZnCl+	7.172e-10	6.649e-10	-9.144	-9.177	-0.033	(0)
Zn (OH) 3-	2.381e-10	2.192e-10	-9.623	-9.659	-0.036	(0)
ZnF+	2.372e-10	2.184e-10	-9.625	-9.661	-0.036	(0)
Zn (SO4) 2-2	3.272e-11	2.350e-11	-10.485	-10.629	-0.144	(0)
ZnCl2	1.830e-12	1.830e-12	-11.737	-11.737	0.000	(0)
Zn (OH) 4-2	3.192e-14	2.292e-14	-13.496	-13.640	-0.144	(0)
ZnCl3-	2.725e-15	2.526e-15	-14.565	-14.598	-0.033	(0)
ZnSeO4	7.678e-17	7.678e-17	-16.115	-16.115	0.000	(0)
ZnNO3+	2.442e-17	2.248e-17	-16.612	-16.648	-0.036	(0)
ZnCl4-2	2.952e-18	2.194e-18	-17.530	-17.659	-0.129	(0)
Zn (SeO4) 2-2	3.527e-28	2.533e-28	-27.453	-27.596	-0.144	(0)
Zn (NO3) 2	2.634e-28	2.634e-28	-27.579	-27.579	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.517	-152.553	-0.036	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.959	-154.959	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-232.125	-232.160	-0.036	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.580	-233.724	-0.144	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.958	-314.102	-0.144	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-75.67	-69.38	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-58.95	-54.44	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-66.18	-54.44	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-96.54	-78.60	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-76.22	-56.19	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-34.14	-33.74	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-32.27	-31.82	0.45	(NH4) 2SeO4
Acanthite	-56.62	-92.84	-36.22	Ag2S
Ag2CO3	-14.50	-25.59	-11.09	Ag2CO3
Ag2CrO4	-22.59	-34.18	-11.59	Ag2CrO4
Ag2HVO4	-16.61	-15.13	1.48	Ag2HVO4
Ag2MoO4	-17.11	-28.66	-11.55	Ag2MoO4
Ag2O	-16.52	-3.94	12.57	Ag2O
Ag2Se	-4.57	-53.27	-48.70	Ag2Se
Ag2SeO3	-14.35	-21.50	-7.15	Ag2SeO3
Ag2SeO4	-23.35	-32.26	-8.91	Ag2SeO4
Ag2SO4	-19.50	-24.32	-4.82	Ag2SO4
Ag3AsO3	-30.08	-27.93	2.16	Ag3AsO3
Ag3AsO4	-18.49	-21.28	-2.79	Ag3AsO4
Ag3H2VO5	-22.28	-17.10	5.18	Ag3H2VO5
AgF:4H2O	-15.58	-14.53	1.05	AgF:4H2O
Agmetal	-1.24	-14.74	-13.51	Ag
AgVO3	-13.92	-13.15	0.77	AgVO3
Al (OH) 3 (am)	-4.39	6.41	10.80	Al (OH) 3

Al ₂ (MoO ₄) ₃	-63.70	-61.34	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	-6.84	12.81	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	-17.45	5.25	22.70	Al ₄ (OH) ₁₀ SO ₄
AlAsO ₄ :2H ₂ O	-13.76	-8.96	4.80	AlAsO ₄ :2H ₂ O
AlOHSO ₄	-10.74	-13.97	-3.23	AlOHSO ₄
AlSb	-158.01	-92.38	65.62	AlSb
Alunite	-15.66	-17.06	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-7.52	-15.31	-7.79	PbSO ₄
Anhydrite	-2.85	-7.21	-4.36	CaSO ₄
Anilite	-58.93	-90.81	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-6.52	2.27	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-85.29	-88.05	-2.76	As ₄ O ₆
Artinite	-5.59	4.01	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-37.44	-30.73	6.71	As ₂ O ₅
Atacamite	-3.47	3.92	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-3.74	-20.64	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.12	7.27	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-23.69	-7.82	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-33.49	-0.55	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.29	-22.96	-9.67	BaCrO ₄
BaF ₂	-12.03	-17.85	-5.82	BaF ₂
BaMoO ₄	-10.48	-17.44	-6.96	BaMoO ₄
Barite	-3.13	-13.11	-9.98	BaSO ₄
BaS	-97.80	-81.62	16.18	BaS
BaSeO ₃	-12.11	-10.28	1.83	BaSeO ₃
BaSeO ₄	-13.59	-21.05	-7.46	BaSeO ₄
Bianchite	-8.60	-10.36	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.39	10.71	18.09	MnO ₂
Bixbyite	-3.49	-4.13	-0.64	Mn ₂ O ₃
BlaubleiI	-58.45	-82.61	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-59.11	-86.39	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-2.17	6.41	8.58	AlOOH
Breithauptite	-59.91	-78.43	-18.52	NiSb
Brochantite	-5.40	9.82	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.02	12.83	16.84	Mg(OH) ₂
Bunsenite	-4.86	7.59	12.45	NiO
Ca(VO ₃) ₂	-14.86	-9.20	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-13.53	3.97	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.58	3.97	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-13.53	8.77	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-21.82	17.14	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-22.72	17.14	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-301.05	-158.08	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-13.31	-31.22	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.60	-11.55	-7.95	CaMoO ₄
Carnotite	-5.90	-5.67	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.20	-4.39	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-12.13	-15.15	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.63	-3.79	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.08	6.56	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.17	6.56	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-27.79	-21.08	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-23.26	-0.70	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-22.54	5.86	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-15.13	-15.79	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-14.10	-15.79	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-13.88	-15.79	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-17.35	-18.56	-1.21	CdF ₂
Cdmetal(alpha)	-32.50	-18.99	13.51	Cd
Cdmetal(gamma)	-32.60	-18.99	13.62	Cd
CdMoO ₄	-4.01	-18.16	-14.15	CdMoO ₄
CdOHC1	-8.15	-4.62	3.54	CdOHC1
CdSb	-79.11	-79.46	-0.35	CdSb
CdSe	-22.57	-42.77	-20.20	CdSe

CdSeO4:2H2O	-19.91	-21.76	-1.85	CdSeO4:2H2O
CdSO4	-13.65	-13.82	-0.17	CdSO4
CdSO4:1H2O	-12.09	-13.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.95	-13.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.40	-13.15	-9.75	AgCl
Cerrusite	-3.45	-16.58	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-10.19	-12.83	-2.64	CuSO4:5H2O
Chalcedony	0.04	-3.51	-3.55	SiO2
Chalcocite	-59.04	-93.96	-34.92	Cu2S
Chalcopyrite	-131.52	-166.79	-35.27	CuFeS2
Chrysotile	-0.74	31.46	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-56.46	-102.15	-45.69	HgS
Claudetite	-84.98	-88.05	-3.06	As4O6
Clausthalite	-17.16	-44.26	-27.10	PbSe
Co (BO2) 2	-29.96	-2.89	27.07	Co (BO2) 2
Co (OH) 2	-5.63	7.46	13.09	Co (OH) 2
Co (OH) 3	-9.86	-12.17	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-21.38	-8.34	13.03	Co3 (AsO4) 2
Co3O4	-6.37	-16.87	-10.50	Co3O4
CoCl2	-23.16	-14.89	8.27	CoCl2
CoCl2:6H2O	-17.43	-14.89	2.54	CoCl2:6H2O
CoCO3	-4.21	-14.19	-9.98	CoCO3
CoF2	-16.06	-17.66	-1.60	CoF2
CoF3	-48.39	-49.85	-1.46	CoF3
CoFe2O4	17.37	13.84	-3.53	CoFe2O4
CoMoO4	-9.49	-17.25	-7.76	CoMoO4
CoO	-6.12	7.46	13.59	CoO
CoS (alpha)	-74.00	-81.44	-7.44	CoS
CoS (beta)	-70.37	-81.44	-11.07	CoS
CoSe	-25.67	-41.87	-16.20	CoSe
CoSeO3	-11.42	-10.10	1.32	CoSeO3
CoSeO4:6H2O	-19.33	-20.86	-1.53	CoSeO4:6H2O
CoSO4	-15.72	-12.92	2.80	CoSO4
CoSO4:6H2O	-10.44	-12.92	-2.47	CoSO4:6H2O
Cotunnite	-12.50	-17.28	-4.78	PbCl2
Covellite	-59.05	-81.35	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.45	-33.36	14.09	CrCl2
CrCl3	-49.82	-34.71	15.11	CrCl3
CrF3	-27.52	-38.86	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-17.47	-51.31	-33.84	Na3AlF6
Cu (OH) 2	-1.12	7.55	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.88	14.33	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.80	-3.55	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-58.89	-93.77	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.60	-54.40	-45.80	Cu2Se
Cu2SO4	-23.49	-25.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.18	-8.08	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-63.79	-106.39	-42.59	Cu3Sb
Cu3Se2	-32.69	-96.18	-63.49	Cu3Se2
CuCO3	-2.60	-14.10	-11.50	CuCO3
CuCrO4	-17.25	-22.69	-5.44	CuCrO4
CuF	-10.19	-15.09	-4.91	CuF
CuF2	-18.68	-17.57	1.12	CuF2
CuF2:2H2O	-13.02	-17.57	-4.55	CuF2:2H2O
Cumetal	-6.55	-15.30	-8.76	Cu
CuMoO4	-4.09	-17.17	-13.08	CuMoO4
CuOCuSO4	-15.58	-5.28	10.30	CuOCuSO4
Cupricferrite	7.94	13.93	5.99	CuFe2O4
Cuprite	-3.66	-5.06	-1.41	Cu2O

Cuprousferrite	9.58	0.66	-8.92	CuFeO2
CuSe	-8.68	-41.78	-33.10	CuSe
CuSe2	-32.20	-65.57	-33.37	CuSe2
CuSeO3:2H2O	-10.52	-10.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.33	-20.77	-2.44	CuSeO4:5H2O
CuSO4	-15.77	-12.83	2.94	CuSO4
Diaspore	-0.47	6.41	6.87	AlOOH
Djurleite	-59.21	-93.13	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.76	-17.30	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.21	-17.30	-17.09	CaMg(CO3)2
Epsomite	-5.42	-7.55	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.88	-0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-15.19	-18.91	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.73	-11.18	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-25.66	-46.29	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-51.02	-54.75	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.57	-12.17	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-11.17	-21.27	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-51.07	-69.67	-18.60	FeSe2
FeS(ppt)	-82.50	-85.45	-2.95	FeS
FeSe	-34.88	-45.88	-11.00	FeSe
Fix_pe	-4.36	-4.36	0.00	e-
Fluorite	-1.45	-11.95	-10.50	CaF2
Galena	-69.86	-83.83	-13.97	PbS
Gibbsite	-1.88	6.41	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-8.35	-10.36	-2.01	ZnSO4:7H2O
Greenalite	-17.48	3.33	20.81	Fe3Si2O5(OH)4
Greenockite	-67.98	-82.34	-14.36	CdS
Greigite	-300.72	-345.76	-45.03	Fe3S4
Gummite	-6.64	1.03	7.67	UO3
Gypsum	-2.60	-7.21	-4.61	CaSO4:2H2O
H-Jarosite	-19.08	-31.18	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.84	-24.72	-12.88	H2MoO4
H2S(g)	-80.89	-88.90	-8.01	H2S
H2Se(g)	-44.37	-49.33	-4.96	H2Se
Halite	-6.90	-5.30	1.60	NaCl
Halloysite	-3.79	5.79	9.57	Al2Si2O5(OH)4
Hausmannite	-3.95	57.08	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-6.63	16.26	22.89	FeAl2O4
Hg(CH3)2(g)	-187.20	-260.90	-73.71	Hg(CH3)2
Hg(g)	-9.33	-17.20	-7.87	Hg
Hg(OH)2	-9.76	-13.25	-3.50	Hg(OH)2
Hg2(g)	-19.45	-34.41	-14.96	Hg2
Hg2(OH)2	-14.12	-8.86	5.26	Hg2(OH)2
Hg2CO3	-14.46	-30.51	-16.05	Hg2CO3
Hg2CrO4	-30.40	-39.10	-8.70	Hg2CrO4
Hg2F2	-23.62	-33.98	-10.36	Hg2F2
Hg2S	-86.08	-97.76	-11.68	Hg2S
Hg2SeO3	-21.76	-26.42	-4.66	Hg2SeO3
Hg2SO4	-23.11	-29.24	-6.13	Hg2SO4
Hg3O2CO3	-31.72	-61.40	-29.68	Hg3O2CO3
HgCl(g)	-35.10	-15.61	19.50	HgCl
HgCl2	-14.34	-35.60	-21.26	HgCl2
HgF(g)	-49.67	-16.99	32.68	HgF
HgF2(g)	-50.94	-38.37	12.57	HgF2
Hgmetal(l)	-3.75	-17.20	-13.45	Hg
HgSe	-6.89	-62.58	-55.69	HgSe
HgSeO3	-18.38	-30.81	-12.43	HgSeO3
HgSO4	-24.21	-33.63	-9.42	HgSO4
Huntite	-4.97	-34.94	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.31	-28.08	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.68	-22.45	-8.77	Mg5(CO3)4(OH)2:4H2O

K-Alum	-24.70	-29.87	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-11.90	-26.70	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-34.27	-51.51	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-20.76	-21.27	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-19.02	-15.75	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-18.63	-19.36	-0.73	K ₂ SeO ₄
Kaolinite	-1.65	5.79	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-7.67	9.82	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-9.80	-10.24	-0.43	PbO:PbSO ₄
Laurionite	-6.73	-6.11	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-7.62	5.07	12.69	PbO
Mackinawite	-81.85	-85.45	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.35	19.21	16.86	Fe ₂ MgO ₄
Magnesite	-1.36	-8.82	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	-1.24	-6.55	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.06	23.28	25.34	MnOOH
Massicot	-7.82	5.07	12.89	PbO
Matlockite	-9.69	-18.67	-8.97	PbClF
Melanothallite	-21.06	-14.80	6.26	CuCl ₂
Melanterite	-14.72	-16.93	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-57.06	-102.15	-45.09	HgS
Mg(OH) ₂ (active)	-5.97	12.83	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-20.82	-9.54	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-281.53	-206.85	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.07	3.29	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.73	10.47	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.79	-17.41	5.38	MgCrO ₄
MgF ₂	-4.16	-12.29	-8.13	MgF ₂
MgMoO ₄	-10.04	-11.89	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-7.78	-4.73	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-14.29	-15.49	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.76	40.76	73.52	Pb ₃ O ₄
Mirabilite	-7.50	-8.62	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-16.75	-11.85	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-59.56	-65.27	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.62	-90.54	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-11.70	0.80	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-14.56	-11.84	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-78.56	-78.39	0.17	MnS
MnS (pnk)	-81.73	-78.39	3.34	MnS
MnSb	-97.95	-100.86	-2.91	MnSb
MnSe	-42.32	-38.82	3.50	MnSe
MnSeO ₃	-8.18	-7.05	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-8.03	-7.05	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-15.76	-17.81	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-12.45	-9.87	2.58	MnSO ₄
Monteponite	-8.54	6.56	15.10	CdO
Montroydite	-9.61	-13.25	-3.64	HgO
MoO ₃	-16.72	-24.72	-8.00	MoO ₃
Morenosite	-10.65	-12.79	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-157.80	-228.06	-70.26	MoS ₂
Na-Jarosite	-14.10	-25.30	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.82	-48.71	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-21.40	-18.47	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-21.07	-37.67	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-14.44	-12.95	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-14.18	-12.95	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-16.09	-5.79	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-17.84	-16.56	1.28	Na ₂ SeO ₄
Na ₃ Sb	-175.60	-81.14	94.45	Na ₃ Sb
Na ₃ VO ₄	-30.22	6.46	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-36.24	1.16	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.98	-13.71	-6.73	CuCl
NaSb	-90.53	-67.36	23.17	NaSb

Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-9.16	-5.30	3.86	NaVO3
Nesquehonite	-4.15	-8.82	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.21	7.59	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.66	-7.96	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-22.03	9.97	32.00	Ni4 (OH) 6SO4
NiCO3	-7.19	-14.06	-6.87	NiCO3
NiMoO4	-5.99	-17.13	-11.14	NiMoO4
NiS (alpha)	-75.71	-81.31	-5.60	NiS
NiS (beta)	-70.21	-81.31	-11.10	NiS
NiS (gamma)	-68.51	-81.31	-12.80	NiS
NiSe	-24.04	-41.74	-17.70	NiSe
NiSeO3:2H2O	-12.78	-9.97	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.21	-20.73	-1.52	NiSeO4:6H2O
Nsutite	-6.80	10.71	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-249.65	-310.71	-61.07	As2S3
Otavite	-3.09	-15.09	-12.00	CdCO3
Pb (BO2) 2	-11.80	-5.28	6.52	Pb (BO2) 2
Pb (OH) 2	-3.08	5.07	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-70.41	-79.17	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.83	-1.03	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-16.05	10.14	26.19	Pb2O (OH) 2
Pb2O3	-25.35	35.69	61.04	Pb2O3
Pb2OCO3	-10.95	-11.50	-0.56	Pb2OCO3
Pb2V2O7	-10.32	-12.22	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.32	-15.52	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-13.29	-7.15	6.14	Pb3 (VO4) 2
Pb3O2CO3	-17.45	-6.43	11.02	Pb3O2CO3
Pb3O2SO4	-15.85	-5.17	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-21.19	-0.09	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-21.97	-0.09	21.88	Pb4O3SO4
PbCrO4	-12.57	-25.17	-12.60	PbCrO4
PbF2	-12.61	-20.05	-7.44	PbF2
Pbmetal	-24.72	-20.47	4.25	Pb
PbMoO4	-4.03	-19.65	-15.62	PbMoO4
PbO:0.3H2O	-7.91	5.07	12.98	PbO:0.33H2O
PbSeO4	-16.41	-23.25	-6.84	PbSeO4
Periclase	-8.76	12.83	21.58	MgO
Phosgenite	-14.05	-33.86	-19.81	PbCl2:PbCO3
Plattnerite	-18.98	30.62	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-130.29	-148.80	-18.51	FeS2
Pyrochroite	-4.68	10.51	15.19	Mn (OH) 2
Pyrolusite	-5.32	36.06	41.38	MnO2
Quartz	0.49	-3.51	-4.00	SiO2
Realgar	-103.93	-123.68	-19.75	AsS
Retgersite	-10.75	-12.79	-2.04	NiSO4:6H2O
Rhodochrosite	-0.56	-11.14	-10.58	MnCO3
Rutherfordine	-6.11	-20.61	-14.50	UO2CO3
Sb (OH) 3	-15.05	-22.16	-7.11	Sb (OH) 3
Sb2O4	-22.17	-18.77	3.40	Sb2O4
Sb2O5	-32.17	-41.84	-9.67	Sb2O5
Sb2Se3	-124.55	-192.30	-67.76	Sb2Se3
Sb4O6 (cubic)	-70.36	-88.62	-18.26	Sb4O6
Sb4O6 (orth)	-70.72	-88.62	-17.90	Sb4O6
SbCl3	-56.26	-55.68	0.57	SbCl3
SbF3	-49.61	-59.84	-10.23	SbF3
Sbmetal	-48.78	-60.47	-11.69	Sb
SbO2	-5.87	-33.69	-27.82	SbO2
Schoepite	-4.96	1.03	5.99	UO2 (OH) 2:H2O
Semetal (am)	-16.68	-23.79	-7.11	Se
Semetal (hex)	-16.08	-23.79	-7.71	Se
Senarmontite	-31.94	-44.31	-12.37	Sb2O3
SeO2	-17.68	-17.56	0.12	SeO2
SeO3	-49.36	-28.32	21.04	SeO3
Sepiolite	-0.64	15.12	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.66	15.12	18.78	Mg2Si3O7.5OH:3H2O

Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2 (am-gel)	-0.80	-3.51	-2.71	SiO2
SiO2 (am-ppt)	-0.77	-3.51	-2.74	SiO2
Smithsonite	-1.63	-11.63	-10.00	ZnCO3
Sphalerite	-67.43	-78.88	-11.45	ZnS
Spinel	-11.21	25.64	36.85	MgAl2O4
Stibnite	-260.54	-311.00	-50.46	Sb2S3
Sulfur	-61.21	-63.35	-2.14	S
Tenorite	-0.09	7.55	7.64	CuO
Thenardite	-8.94	-8.62	0.32	Na2SO4
Thermonatrite	-10.52	-9.88	0.64	Na2CO3:H2O
Tyuyamunite	-11.21	-7.13	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.88	5.20	21.08	U3O8
U3Sb4	-593.42	-441.04	152.38	U3Sb4
U4O9	-32.61	-35.63	-3.02	U4O9
UF4	-36.00	-65.54	-29.54	UF4
UF4:2.5H2O	-32.82	-65.54	-32.72	UF4:2.5H2O
UO2 (am)	-16.23	-15.29	0.93	UO2
UO2 (NO3) 2	-48.41	-36.26	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.11	-36.26	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-39.65	-36.26	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.31	-36.26	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.58	1.03	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.04	-27.29	-2.25	UO2SeO4:4H2O
UO3	-6.67	1.03	7.70	UO3
Uraninite	-10.63	-15.29	-4.67	UO2
USb2	-226.12	-196.54	29.58	USb2
V (OH) 3	-21.72	-14.13	7.59	V (OH) 3
V2O5	-21.01	-22.37	-1.36	V2O5
V3O5	-48.54	-46.70	1.84	V3O5
V4O7	-60.94	-53.75	7.19	V4O7
V6O13	-57.32	-118.18	-60.86	V6O13
Valentinite	-35.83	-44.31	-8.48	Sb2O3
VC12	-68.13	-49.25	18.87	VC12
VC13	-71.09	-47.66	23.43	VC13
VF4	-72.22	-57.29	14.93	VF4
Vmetal	-96.47	-52.45	44.03	V
VO	-41.66	-26.90	14.76	VO
VO (OH) 2	-12.20	-7.05	5.15	VO (OH) 2
VO2Cl	-25.20	-22.36	2.84	VO2Cl
VOC1	-36.46	-25.30	11.15	VOC1
VOC12	-42.17	-29.40	12.76	VOC12
VOSO4	-31.04	-27.43	3.61	VOSO4
Witherite	-5.80	-14.37	-8.57	BaCO3
Wurtzite	-69.93	-78.88	-8.95	ZnS
Zincite	-1.32	10.02	11.33	ZnO
Zincosite	-14.29	-10.36	3.93	ZnSO4
Zn (BO2) 2	-8.62	-0.33	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-30.59	-27.28	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.18	10.02	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.46	10.02	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.74	10.02	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.52	10.02	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.72	10.02	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-7.85	-0.35	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-6.34	8.85	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.33	-0.68	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.62	-10.71	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-8.72	19.68	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-10.78	27.72	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.39	-12.34	7.05	ZnCl2
ZnCO3:1H2O	-1.37	-11.63	-10.26	ZnCO3:1H2O
ZnF2	-14.57	-15.10	-0.53	ZnF2
Znmetal	-41.32	-15.53	25.79	Zn
ZnMoO4	-4.58	-14.70	-10.13	ZnMoO4
ZnO (active)	-1.17	10.02	11.19	ZnO
ZnS (am)	-69.83	-78.88	-9.05	ZnS
ZnSb	-87.02	-76.00	11.01	ZnSb

ZnSe	-24.92	-39.32	-14.40	ZnSe
ZnSeO4:6H2O	-16.79	-18.31	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.73	-10.36	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 34.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 105
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 105
USE Surface 105
USE Solution 114
SAVE Solution 115  #Initial Stage 1 Pit Water After Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 105.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

5.384e-17  Surface + diffuse layer charge, eq
2.801e-09  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
6.144e-02  m² for 9.569e-07 moles of Ferrihydrite

```

Water in diffuse layer: 6.144e-07 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is +1).

Element	Moles
C	1.5694e-12
Ca	1.9451e-14
Cl	3.1428e-11
H	4.6298e-12
K	3.0857e-14
Mg	3.0136e-15
N	1.2723e-10
Na	1.3073e-13
O	5.6710e-09

S 1.3214e-09

Hfo_s

4.785e-09 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.198e-09	0.668	3.198e-09	-8.495
Hfo_sOH	1.569e-09	0.328	1.569e-09	-8.804
Hfo_sO-	1.762e-11	0.004	1.762e-11	-10.754
Hfo_sOHCa+2	5.839e-14	0.000	5.839e-14	-13.234

Hfo_w

1.914e-07 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	8.843e-08	0.462	8.843e-08	-7.053
Hfo_wOH	4.337e-08	0.227	4.337e-08	-7.363
Hfo_wSO4-	2.987e-08	0.156	2.987e-08	-7.525
Hfo_wOHSO4-2	2.923e-08	0.153	2.923e-08	-7.534
Hfo_wO-	4.873e-10	0.003	4.873e-10	-9.312
Hfo_wOMg+	6.887e-16	0.000	6.887e-16	-15.162
Hfo_wOCa+	2.337e-16	0.000	2.337e-16	-15.631

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.

Using solution 114. Solution after simulation 33.

Using surface 105.

Using pure phase assemblage 105. Pure-phase assemblage after simulation 33.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Initial	Moles in assemblage Final	Delta
Ag2Se	-4.58	-53.28	-48.70	0.000e+00	0	0.000e+00
Alunite	-15.66	-17.06	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-2.85	-7.21	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	2.309e-08	2.291e-08	-1.817e-10
Barite	-2.74	-12.72	-9.98	0.000e+00	0	0.000e+00
Brochantite	-6.10	9.12	15.22	0.000e+00	0	0.000e+00
Brucite	-4.02	12.83	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.605e-07
CaMoO4	-3.60	-11.55	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-7.21	-4.39	2.81	0.000e+00	0	0.000e+00
Calcite	-0.00	-8.48	-8.48	4.250e-04	4.249e-04	-4.619e-08
Carnotite	-6.39	-6.16	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.63	-3.79	9.84	0.000e+00	0	0.000e+00
CdMoO4	-4.01	-18.16	-14.15	0.000e+00	0	0.000e+00
Chrysotile	-0.74	31.46	32.20	0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	5.795e-08	5.752e-08	-4.285e-10
Cu2Se(alpha)	-8.95	-54.75	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-4.26	-17.34	-13.08	0.000e+00	0	0.000e+00
Epsomite	-5.42	-7.55	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	9.569e-07	9.569e-07	-5.871e-15
Fluorite	-1.45	-11.95	-10.50	0.000e+00	0	0.000e+00
Gummite	-6.64	1.03	7.67	0.000e+00	0	0.000e+00
Gypsum	-2.60	-7.21	-4.61	0.000e+00	0	0.000e+00
HgSe	-6.89	-62.59	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-7.50	-8.62	-1.11	0.000e+00	0	0.000e+00

MnSeO3	-8.18	-7.05	1.13	0.000e+00	0	0.000e+00
Ni (OH) 2	-5.22	7.58	12.79	0.000e+00	0	0.000e+00
Ni3 (AsO4) 2:8H2O	-24.85	-9.15	15.70	0.000e+00	0	0.000e+00
NiCO3	-7.20	-14.07	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-6.00	-17.14	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	5.921e-11
Otavite	-3.09	-15.09	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-4.50	-20.12	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-6.11	-20.61	-14.50	0.000e+00	0	0.000e+00
SbO2	-5.87	-33.69	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.96	1.03	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.64	15.12	15.76	0.000e+00	0	0.000e+00
SiO2 (am-ppt)	-0.77	-3.51	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-12.19	-8.11	4.08	0.000e+00	0	0.000e+00
U3O8	-15.88	5.21	21.08	0.000e+00	0	0.000e+00
UO2 (OH) 2 (beta)	-4.58	1.03	5.61	0.000e+00	0	0.000e+00
UO3	-6.67	1.03	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-4.60	-14.72	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.955e-22 Surface + diffuse layer charge, eq
6.186e-10 Surface charge, eq
9.716e-04 sigma, C/m²
6.024e-03 psi, V
-2.345e-01 -F*psi/RT
7.910e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.144e-02 m² for 9.569e-07 moles of Ferrihydrite

Water in diffuse layer: 6.144e-07 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 2.597e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.039e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	1.3019e-16
Al	1.0025e-14
As	5.2288e-15
B	4.8603e-12
Ba	4.6465e-16
C	9.4946e-10
Ca	1.6164e-10
Cd	5.6223e-17
Cl	1.2734e-09
Co	4.2063e-16
Cr	3.5003e-16
Cu	2.3685e-14
F	5.3319e-11
Fe	4.2981e-16
H	1.7305e-09
Hg	1.4199e-17
K	6.9762e-11
Mg	7.2461e-11
Mn	3.5729e-13
Mo	1.3292e-14
N	4.5898e-14
Na	1.7530e-09
Ni	6.6170e-16
O	4.8715e-09
Pb	2.1160e-17
S	3.0473e-10
Sb	1.9797e-16

Se	1.3147e-15
Si	1.9683e-10
U	1.1011e-14
V	3.9694e-17
Zn	2.1962e-13

Hfo_s

4.785e-09 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.817e-09	0.589	2.816e-09	-8.550
Hfo_sOCrOH+	8.571e-10	0.179	8.570e-10	-9.067
Hfo_sOCu+	5.414e-10	0.113	5.413e-10	-9.267
Hfo_sOMn+	3.781e-10	0.079	3.780e-10	-9.422
Hfo_sOHCa+2	1.221e-10	0.026	1.221e-10	-9.913
Hfo_sOPb+	5.227e-11	0.011	5.226e-11	-10.282
Hfo_sOH	9.687e-12	0.002	9.685e-12	-11.014
Hfo_sO-	3.753e-12	0.001	3.752e-12	-11.426
Hfo_sONi+	2.612e-12	0.001	2.612e-12	-11.583
Hfo_sOH2+	5.728e-13	0.000	5.727e-13	-12.242
Hfo_sOCd+	3.110e-13	0.000	3.110e-13	-12.507
Hfo_sOCu+	2.929e-13	0.000	2.929e-13	-12.533
Hfo_sOAg	1.971e-15	0.000	1.971e-15	-14.705
Hfo_sOHBa+2	1.175e-15	0.000	1.175e-15	-14.930
Hfo_sOFe+	4.157e-16	0.000	4.156e-16	-15.381
Hfo_sOHg+	1.466e-19	0.000	1.466e-19	-18.834

Hfo_w

1.914e-07 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH	6.469e-08	0.338	6.468e-08	-7.189
Hfo_wOMg+	3.319e-08	0.173	3.319e-08	-7.479
Hfo_wO-	2.506e-08	0.131	2.506e-08	-7.601
Hfo_wOHAsO4-3	1.995e-08	0.104	1.995e-08	-7.700
Hfo_wOZn+	1.970e-08	0.103	1.969e-08	-7.706
Hfo_wOCu+	1.854e-08	0.097	1.854e-08	-7.732
Hfo_wOCa+	4.071e-09	0.021	4.070e-09	-8.390
Hfo_wOH2+	3.825e-09	0.020	3.825e-09	-8.417
Hfo_wOMn+	2.005e-09	0.010	2.005e-09	-8.698
Hfo_wOHSO4-2	1.814e-10	0.001	1.814e-10	-9.741
Hfo_wOHVO4-3	1.159e-10	0.001	1.159e-10	-9.936
Hfo_wONi+	2.353e-11	0.000	2.353e-11	-10.628
Hfo_wOPb+	1.559e-11	0.000	1.559e-11	-10.807
Hfo_wOHSeO3-2	1.141e-11	0.000	1.140e-11	-10.943
Hfo_wOCO+	5.512e-12	0.000	5.512e-12	-11.259
Hfo_wSO4-	5.376e-12	0.000	5.375e-12	-11.270
Hfo_wH2BO3	1.803e-12	0.000	1.803e-12	-11.744
Hfo_wHAsO4-	1.562e-12	0.000	1.561e-12	-11.806
Hfo_wSeO3-	1.146e-12	0.000	1.145e-12	-11.941
Hfo_wOCd+	8.860e-13	0.000	8.859e-13	-12.053
Hfo_wOHMoO4-2	3.393e-13	0.000	3.392e-13	-12.470
Hfo_wMoO4-	1.295e-14	0.000	1.295e-14	-13.888
Hfo_wOAg	3.463e-15	0.000	3.462e-15	-14.461
Hfo_wH2AsO4	2.988e-15	0.000	2.988e-15	-14.525
Hfo_wOFe+	1.752e-15	0.000	1.751e-15	-14.757
Hfo_wOBa+	5.662e-16	0.000	5.661e-16	-15.247
Hfo_wOHg+	4.795e-17	0.000	4.794e-17	-16.319
Hfo_wOHCrO4-2	3.231e-17	0.000	3.231e-17	-16.491
Hfo_wOHSeO4-2	2.108e-18	0.000	2.108e-18	-17.676
Hfo_wCrO4-	8.735e-19	0.000	8.734e-19	-18.059
Hfo_wOHSbO(OH) 4-	5.110e-19	0.000	5.110e-19	-18.292
Hfo_wSeO4-	5.441e-20	0.000	5.441e-20	-19.264
Hfo_wSbO(OH) 4	1.951e-20	0.000	1.951e-20	-19.710
Hfo_wH2AsO3	4.253e-25	0.000	4.253e-25	-24.371

-----Solution composition-----

Elements	Molality	Moles
Ag	2.136e-10	2.136e-10
Al	1.475e-08	1.475e-08
As	6.970e-09	6.971e-09
B	7.796e-06	7.797e-06
Ba	9.236e-10	9.237e-10
C	1.398e-03	1.398e-03
Ca	3.171e-04	3.171e-04
Cd	1.056e-10	1.056e-10
Cl	1.874e-03	1.874e-03
Co	7.994e-10	7.995e-10
Cr	5.899e-10	5.899e-10
Cu	3.854e-08	3.854e-08
F	7.865e-05	7.866e-05
Fe	7.033e-10	7.034e-10
Hg	2.311e-11	2.312e-11
K	1.256e-04	1.256e-04
Mg	1.427e-04	1.427e-04
Mn	7.045e-07	7.045e-07
Mo	1.768e-08	1.768e-08
N	6.754e-08	6.755e-08
Na	3.155e-03	3.156e-03
Ni	1.226e-09	1.227e-09
Pb	3.468e-11	3.468e-11
S	4.092e-04	4.093e-04
Sb	2.913e-10	2.913e-10
Se	1.823e-09	1.823e-09
Si	3.191e-04	3.191e-04
U	1.272e-08	1.272e-08
V	5.570e-11	5.570e-11
Zn	3.978e-07	3.978e-07

-----Description of solution-----

	pH	=	8.416	Charge balance
	pe	=	4.356	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	4.967e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.432e-03	
	Total CO2 (mol/kg)	=	1.398e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.977e-09	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.110291e+02	
	Total O	=	5.552037e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.835e-06	2.626e-06	-5.547	-5.581	-0.033	(0)
H+	4.135e-09	3.834e-09	-8.384	-8.416	-0.033	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	2.136e-10					
AgCl	1.452e-10	1.452e-10	-9.838	-9.838	0.000	(0)
Ag+	4.416e-11	4.095e-11	-10.355	-10.388	-0.033	(0)
AgCl2-	2.387e-11	2.197e-11	-10.622	-10.658	-0.036	(0)
AgSO4-	2.525e-13	2.325e-13	-12.598	-12.634	-0.036	(0)
AgCl3-2	4.737e-14	3.402e-14	-13.324	-13.468	-0.144	(0)
AgOH	1.075e-14	1.075e-14	-13.968	-13.968	0.000	(0)
AgF	7.388e-15	7.388e-15	-14.131	-14.131	0.000	(0)

	AgH2BO3	6.573e-16	6.573e-16	-15.182	-15.182	0.000	(0)
	AgNO2	5.336e-16	5.336e-16	-15.273	-15.273	0.000	(0)
	AgCl4-3	2.541e-16	1.207e-16	-15.595	-15.918	-0.324	(0)
	AgSeO3-	2.132e-17	1.963e-17	-16.671	-16.707	-0.036	(0)
	Ag (OH) 2-	2.998e-18	2.760e-18	-17.523	-17.559	-0.036	(0)
	AgNH3+	9.240e-19	8.506e-19	-18.034	-18.070	-0.036	(0)
	Ag2Se	4.306e-19	4.306e-19	-18.366	-18.366	0.000	(0)
	AgNO3	1.914e-21	1.914e-21	-20.718	-20.718	0.000	(0)
	Ag (NO2) 2-	5.600e-23	5.155e-23	-22.252	-22.288	-0.036	(0)
	Ag (SeO3) 2-3	2.761e-25	1.311e-25	-24.559	-24.882	-0.324	(0)
	Ag (NH3) 2+	7.641e-26	7.034e-26	-25.117	-25.153	-0.036	(0)
	Ag2MoO4	8.291e-30	8.291e-30	-29.081	-29.081	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-77.054	-77.054	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-86.908	-87.483	-0.575	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-152.396	-152.502	-0.107	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-153.312	-153.526	-0.214	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-153.399	-153.435	-0.036	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-153.629	-153.837	-0.208	(0)
Al		1.475e-08					
	Al (OH) 4-	1.471e-08	1.365e-08	-7.832	-7.865	-0.033	(0)
	Al (OH) 3	4.128e-11	4.128e-11	-10.384	-10.384	0.000	(0)
	Al (OH) 2+	8.481e-13	7.879e-13	-12.072	-12.104	-0.032	(0)
	AlF2+	3.180e-15	2.955e-15	-14.498	-14.529	-0.032	(0)
	AlF3	2.672e-15	2.672e-15	-14.573	-14.573	0.000	(0)
	AlOH+2	5.070e-16	3.777e-16	-15.295	-15.423	-0.128	(0)
	AlF+2	1.387e-16	1.033e-16	-15.858	-15.986	-0.128	(0)
	AlF4-	1.037e-16	9.620e-17	-15.984	-16.017	-0.033	(0)
	AlSO4+	3.424e-19	3.177e-19	-18.465	-18.498	-0.033	(0)
	Al+3	2.840e-19	1.438e-19	-18.547	-18.842	-0.295	(0)
	Al (SO4) 2-	1.044e-21	9.686e-22	-20.981	-21.014	-0.033	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-61.328	-61.651	-0.324	(0)
As (3)		2.929e-23					
	H3AsO3	2.558e-23	2.558e-23	-22.592	-22.592	0.000	(0)
	H2AsO3-	3.716e-24	3.421e-24	-23.430	-23.466	-0.036	(0)
	HAsO3-2	1.133e-27	8.139e-28	-26.946	-27.089	-0.144	(0)
	H4AsO3+	5.277e-32	4.858e-32	-31.278	-31.314	-0.036	(0)
	AsO3-3	1.724e-32	8.183e-33	-31.764	-32.087	-0.324	(0)
As (5)		6.970e-09					
	HAsO4-2	6.777e-09	4.867e-09	-8.169	-8.313	-0.144	(0)
	H2AsO4-	1.849e-10	1.702e-10	-9.733	-9.769	-0.036	(0)
	AsO4-3	8.455e-12	4.014e-12	-11.073	-11.396	-0.324	(0)
	H3AsO4	1.132e-16	1.134e-16	-15.946	-15.945	0.000	(0)
B		7.796e-06					
	H3BO3	6.679e-06	6.686e-06	-5.175	-5.175	0.000	(0)
	H2BO3-	1.095e-06	1.013e-06	-5.960	-5.994	-0.034	(0)
	CaH2BO3+	1.361e-08	1.259e-08	-7.866	-7.900	-0.034	(0)
	NaH2BO3	4.685e-09	4.685e-09	-8.329	-8.329	0.000	(0)
	MgH2BO3+	3.760e-09	3.477e-09	-8.425	-8.459	-0.034	(0)
	BF (OH) 3-	2.072e-10	1.917e-10	-9.684	-9.717	-0.034	(0)
	H5 (BO3) 2-	6.233e-12	5.764e-12	-11.205	-11.239	-0.034	(0)
	BaH2BO3+	2.276e-14	2.104e-14	-13.643	-13.677	-0.034	(0)
	BF2 (OH) 2-	6.103e-15	5.643e-15	-14.214	-14.248	-0.034	(0)
	H8 (BO3) 3-	4.168e-15	3.854e-15	-14.380	-14.414	-0.034	(0)
	AgH2BO3	6.573e-16	6.573e-16	-15.182	-15.182	0.000	(0)
	BF3OH-	6.539e-22	6.047e-22	-21.184	-21.218	-0.034	(0)
	BF4-	8.862e-28	8.196e-28	-27.052	-27.086	-0.034	(0)
Ba		9.236e-10					
	Ba+2	9.096e-10	6.723e-10	-9.041	-9.172	-0.131	(0)
	BaHCO3+	8.659e-12	8.052e-12	-11.063	-11.094	-0.032	(0)
	BaCO3	5.288e-12	5.288e-12	-11.277	-11.277	0.000	(0)
	BaH2BO3+	2.276e-14	2.104e-14	-13.643	-13.677	-0.034	(0)
	BaOH+	8.301e-15	7.707e-15	-14.081	-14.113	-0.032	(0)
	BaNO3+	2.154e-19	1.983e-19	-18.667	-18.703	-0.036	(0)
	BaNH3+2	6.010e-21	4.316e-21	-20.221	-20.365	-0.144	(0)
C (4)		1.398e-03					
	HCO3-	1.350e-03	1.254e-03	-2.870	-2.902	-0.032	(0)
	CO3-2	2.075e-05	1.533e-05	-4.683	-4.814	-0.131	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)

		CaHCO3+	5.423e-06	5.042e-06	-5.266	-5.297	-0.032	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		NaHCO3	2.058e-06	2.058e-06	-5.687	-5.687	0.000	(0)
		MgHCO3+	1.370e-06	1.270e-06	-5.863	-5.896	-0.033	(0)
		MgCO3	1.263e-06	1.263e-06	-5.899	-5.899	0.000	(0)
		NaCO3-	8.969e-07	8.333e-07	-6.047	-6.079	-0.032	(0)
		ZnCO3	1.273e-07	1.273e-07	-6.895	-6.895	0.000	(0)
		CuCO3	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
		MnHCO3+	1.280e-08	1.189e-08	-7.893	-7.925	-0.032	(0)
		UO2 (CO3) 3-4	8.579e-09	2.282e-09	-8.067	-8.642	-0.575	(0)
		ZnHCO3+	6.212e-09	5.719e-09	-8.207	-8.243	-0.036	(0)
		UO2 (CO3) 2-2	4.134e-09	2.969e-09	-8.384	-8.527	-0.144	(0)
		Cu (CO3) 2-2	1.811e-09	1.301e-09	-8.742	-8.886	-0.144	(0)
		NiCO3	3.190e-10	3.190e-10	-9.496	-9.496	0.000	(0)
		CoCO3	1.096e-10	1.096e-10	-9.960	-9.960	0.000	(0)
		NiHCO3+	9.365e-11	8.621e-11	-10.029	-10.064	-0.036	(0)
		CoHCO3+	4.479e-11	4.123e-11	-10.349	-10.385	-0.036	(0)
		CuHCO3+	3.000e-11	2.761e-11	-10.523	-10.559	-0.036	(0)
		PbCO3	2.699e-11	2.699e-11	-10.569	-10.569	0.000	(0)
		CdCO3	1.843e-11	1.843e-11	-10.734	-10.734	0.000	(0)
		UO2CO3	9.704e-12	9.704e-12	-11.013	-11.013	0.000	(0)
		BaHCO3+	8.659e-12	8.052e-12	-11.063	-11.094	-0.032	(0)
		BaCO3	5.288e-12	5.288e-12	-11.277	-11.277	0.000	(0)
		Pb (CO3) 2-2	1.662e-12	1.194e-12	-11.779	-11.923	-0.144	(0)
		PbHCO3+	5.926e-13	5.456e-13	-12.227	-12.263	-0.036	(0)
		Cd (CO3) 2-2	2.917e-13	2.095e-13	-12.535	-12.679	-0.144	(0)
		CdHCO3+	1.635e-13	1.505e-13	-12.786	-12.822	-0.036	(0)
		FeHCO3+	7.046e-16	6.552e-16	-15.152	-15.184	-0.032	(0)
		HgCO3	2.361e-17	2.361e-17	-16.627	-16.627	0.000	(0)
		Hg (CO3) 2-2	1.594e-18	1.145e-18	-17.797	-17.941	-0.144	(0)
		HgHCO3+	1.831e-21	1.686e-21	-20.737	-20.773	-0.036	(0)
Ca	3.171e-04							
		Ca+2	2.922e-04	2.159e-04	-3.534	-3.666	-0.131	(0)
		CaSO4	1.408e-05	1.408e-05	-4.852	-4.852	0.000	(0)
		CaHCO3+	5.423e-06	5.042e-06	-5.266	-5.297	-0.032	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	1.823e-07	1.693e-07	-6.739	-6.771	-0.032	(0)
		CaH2BO3+	1.361e-08	1.259e-08	-7.866	-7.900	-0.034	(0)
		CaOH+	1.217e-08	1.131e-08	-7.915	-7.946	-0.032	(0)
		CaNO3+	4.365e-14	4.018e-14	-13.360	-13.396	-0.036	(0)
		CaNH3+2	3.851e-15	2.766e-15	-14.414	-14.558	-0.144	(0)
		Ca (NH3) 2+2	1.560e-26	1.120e-26	-25.807	-25.951	-0.144	(0)
Cd	1.056e-10							
		Cd+2	7.134e-11	5.273e-11	-10.147	-10.278	-0.131	(0)
		CdCO3	1.843e-11	1.843e-11	-10.734	-10.734	0.000	(0)
		CdCl+	9.503e-12	8.748e-12	-11.022	-11.058	-0.036	(0)
		CdSO4	3.517e-12	3.517e-12	-11.454	-11.454	0.000	(0)
		CdOH+	1.195e-12	1.100e-12	-11.923	-11.959	-0.036	(0)
		CdOHCl	9.424e-13	9.424e-13	-12.026	-12.026	0.000	(0)
		Cd (CO3) 2-2	2.917e-13	2.095e-13	-12.535	-12.679	-0.144	(0)
		CdHCO3+	1.635e-13	1.505e-13	-12.786	-12.822	-0.036	(0)
		CdF+	6.521e-14	6.003e-14	-13.186	-13.222	-0.036	(0)
		CdCl2	6.335e-14	6.335e-14	-13.198	-13.198	0.000	(0)
		Cd (SO4) 2-2	1.880e-14	1.350e-14	-13.726	-13.870	-0.144	(0)
		Cd (OH) 2	1.823e-14	1.823e-14	-13.739	-13.739	0.000	(0)
		CdCl3-	7.543e-17	6.944e-17	-16.122	-16.158	-0.036	(0)
		CdF2	8.604e-18	8.604e-18	-17.065	-17.065	0.000	(0)
		Cd (OH) 3-	3.176e-18	2.924e-18	-17.498	-17.534	-0.036	(0)
		CdSeO4	3.173e-20	3.173e-20	-19.499	-19.499	0.000	(0)
		CdNO3+	1.066e-20	9.813e-21	-19.972	-20.008	-0.036	(0)
		Cd2OH+3	6.123e-22	2.907e-22	-21.213	-21.537	-0.324	(0)
		Cd (SeO3) 2-2	3.367e-23	2.418e-23	-22.473	-22.617	-0.144	(0)
		Cd (OH) 4-2	1.750e-24	1.257e-24	-23.757	-23.901	-0.144	(0)
		Cd (NO3) 2	2.894e-31	2.894e-31	-30.539	-30.539	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-82.715	-82.751	-0.036	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-156.028	-156.028	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-234.573	-234.609	-0.036	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-312.750	-312.894	-0.144	(0)

C1	1.874e-03					
C1-	1.874e-03	1.737e-03	-2.727	-2.760	-0.033	(0)
ZnOHC1	2.163e-09	2.163e-09	-8.665	-8.665	0.000	(0)
MnCl+	1.119e-09	1.039e-09	-8.951	-8.983	-0.032	(0)
ZnCl+	6.788e-10	6.293e-10	-9.168	-9.201	-0.033	(0)
AgCl	1.452e-10	1.452e-10	-9.838	-9.838	0.000	(0)
AgCl2-	2.387e-11	2.197e-11	-10.622	-10.658	-0.036	(0)
CuCl	1.647e-11	1.647e-11	-10.783	-10.783	0.000	(0)
CdCl+	9.503e-12	8.748e-12	-11.022	-11.058	-0.036	(0)
CuCl2-	6.447e-12	5.977e-12	-11.191	-11.224	-0.033	(0)
CoCl+	2.759e-12	2.540e-12	-11.559	-11.595	-0.036	(0)
NiCl+	2.692e-12	2.478e-12	-11.570	-11.606	-0.036	(0)
MnCl2	2.550e-12	2.550e-12	-11.593	-11.593	0.000	(0)
ZnCl2	1.733e-12	1.733e-12	-11.761	-11.761	0.000	(0)
CuCl+	1.036e-12	9.608e-13	-11.984	-12.017	-0.033	(0)
CdOHC1	9.424e-13	9.424e-13	-12.026	-12.026	0.000	(0)
CdCl2	6.335e-14	6.335e-14	-13.198	-13.198	0.000	(0)
AgCl3-2	4.737e-14	3.402e-14	-13.324	-13.468	-0.144	(0)
PbCl+	3.920e-14	3.609e-14	-13.407	-13.443	-0.036	(0)
HgClOH	1.036e-14	1.036e-14	-13.984	-13.984	0.000	(0)
CuCl3-2	2.987e-15	2.220e-15	-14.525	-14.654	-0.129	(0)
ZnCl3-	2.579e-15	2.391e-15	-14.589	-14.621	-0.033	(0)
MnCl3-	1.314e-15	1.220e-15	-14.881	-14.914	-0.032	(0)
CuCl2	5.787e-16	5.787e-16	-15.238	-15.238	0.000	(0)
HgCl2	3.882e-16	3.882e-16	-15.411	-15.411	0.000	(0)
PbCl2	2.800e-16	2.800e-16	-15.553	-15.553	0.000	(0)
AgCl4-3	2.541e-16	1.207e-16	-15.595	-15.918	-0.324	(0)
CdCl3-	7.543e-17	6.944e-17	-16.122	-16.158	-0.036	(0)
NiCl2	2.168e-17	2.168e-17	-16.664	-16.664	0.000	(0)
HgCl3-	7.326e-18	6.744e-18	-17.135	-17.171	-0.036	(0)
ZnCl4-2	2.794e-18	2.077e-18	-17.554	-17.683	-0.129	(0)
UO2Cl+	4.865e-19	4.478e-19	-18.313	-18.349	-0.036	(0)
PbCl3-	2.104e-19	1.937e-19	-18.677	-18.713	-0.036	(0)
HgCl4-2	6.495e-20	4.664e-20	-19.187	-19.331	-0.144	(0)
HgCl+	4.844e-20	4.459e-20	-19.315	-19.351	-0.036	(0)
CrCl+2	4.331e-20	3.111e-20	-19.363	-19.507	-0.144	(0)
CuCl3-	1.012e-20	9.383e-21	-19.995	-20.028	-0.033	(0)
CrOHC12	2.697e-21	2.697e-21	-20.569	-20.569	0.000	(0)
PbCl4-2	2.141e-22	1.538e-22	-21.669	-21.813	-0.144	(0)
FeCl+2	6.177e-24	4.591e-24	-23.209	-23.338	-0.129	(0)
CrCl2+	5.570e-24	5.127e-24	-23.254	-23.290	-0.036	(0)
CuCl4-2	1.099e-25	8.169e-26	-24.959	-25.088	-0.129	(0)
FeCl2+	3.837e-26	3.563e-26	-25.416	-25.448	-0.032	(0)
CrO3Cl1-	2.221e-26	2.045e-26	-25.653	-25.689	-0.036	(0)
VOCl+	2.242e-27	2.064e-27	-26.649	-26.685	-0.036	(0)
FeCl3	6.189e-30	6.189e-30	-29.208	-29.208	0.000	(0)
CoCl+2	1.880e-38	1.350e-38	-37.726	-37.870	-0.144	(0)
UCl+3	0.000e+00	0.000e+00	-49.697	-50.020	-0.324	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.735	-66.879	-0.144	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.328	-71.472	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.443	-84.587	-0.144	(0)
Co (2)	7.994e-10					
Co+2	5.885e-10	4.227e-10	-9.230	-9.374	-0.144	(0)
CoCO3	1.096e-10	1.096e-10	-9.960	-9.960	0.000	(0)
CoHCO3+	4.479e-11	4.123e-11	-10.349	-10.385	-0.036	(0)
CoOH+	2.406e-11	2.215e-11	-10.619	-10.655	-0.036	(0)
CoSO4	2.399e-11	2.399e-11	-10.620	-10.620	0.000	(0)
Co (OH) 2	4.620e-12	4.620e-12	-11.335	-11.335	0.000	(0)
CoCl+	2.759e-12	2.540e-12	-11.559	-11.595	-0.036	(0)
CoF+	1.043e-12	9.601e-13	-11.982	-12.018	-0.036	(0)
Co (OH) 3-	2.629e-16	2.420e-16	-15.580	-15.616	-0.036	(0)
CoNO2+	2.018e-16	1.858e-16	-15.695	-15.731	-0.036	(0)
CoOOH-	6.598e-17	6.074e-17	-16.181	-16.217	-0.036	(0)
Co (NH3) +2	7.199e-19	5.170e-19	-18.143	-18.287	-0.144	(0)
CoSeO4	6.845e-19	6.845e-19	-18.165	-18.165	0.000	(0)
CoNO3+	4.282e-20	3.942e-20	-19.368	-19.404	-0.036	(0)
Co2OH+3	9.881e-22	4.691e-22	-21.005	-21.329	-0.324	(0)
Co (OH) 4-2	1.403e-22	1.007e-22	-21.853	-21.997	-0.144	(0)

Co (NH3) 2+2	3.124e-28	2.244e-28	-27.505	-27.649	-0.144	(0)
Co (NO3) 2	4.720e-30	4.720e-30	-29.326	-29.326	0.000	(0)
Co4 (OH) 4+4	1.804e-34	4.799e-35	-33.744	-34.319	-0.575	(0)
Co (NH3) 3+2	4.002e-38	2.874e-38	-37.398	-37.542	-0.144	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-47.670	-47.814	-0.144	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-58.443	-58.587	-0.144	(0)
Co (3)	7.097e-31					
CoOH+2	7.097e-31	5.097e-31	-30.149	-30.293	-0.144	(0)
Co+3	7.540e-38	3.820e-38	-37.123	-37.418	-0.295	(0)
CoCl+2	1.880e-38	1.350e-38	-37.726	-37.870	-0.144	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.735	-66.879	-0.144	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-80.412	-80.448	-0.036	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-83.064	-83.208	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.443	-84.587	-0.144	(0)
Cr (2)	2.028e-28					
Cr+2	2.028e-28	1.456e-28	-27.693	-27.837	-0.144	(0)
Cr (3)	5.898e-10					
Cr (OH) 2+	2.759e-10	2.540e-10	-9.559	-9.595	-0.036	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.372e-11	3.104e-11	-10.472	-10.508	-0.036	(0)
Cr (OH) 4-	2.846e-11	2.619e-11	-10.546	-10.582	-0.036	(0)
Cr (OH) +2	1.107e-12	7.949e-13	-11.956	-12.100	-0.144	(0)
CrOHSO4	5.367e-14	5.367e-14	-13.270	-13.270	0.000	(0)
CrF+2	2.193e-16	1.575e-16	-15.659	-15.803	-0.144	(0)
Cr+3	2.914e-17	1.384e-17	-16.535	-16.859	-0.324	(0)
CrSO4+	9.986e-18	9.192e-18	-17.001	-17.037	-0.036	(0)
CrCl+2	4.331e-20	3.111e-20	-19.363	-19.507	-0.144	(0)
CrOHC12	2.697e-21	2.697e-21	-20.569	-20.569	0.000	(0)
CrCl2+	5.570e-24	5.127e-24	-23.254	-23.290	-0.036	(0)
Cr2 (OH) 2SO4+2	5.369e-24	3.856e-24	-23.270	-23.414	-0.144	(0)
Cr2 (OH) 2 (SO4) 2	6.517e-26	6.517e-26	-25.186	-25.186	0.000	(0)
CrNO3+2	4.956e-29	3.559e-29	-28.305	-28.449	-0.144	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-56.886	-57.030	-0.144	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-69.491	-69.814	-0.324	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.328	-71.472	-0.144	(0)
Cr (6)	5.440e-14					
CrO4-2	5.323e-14	3.935e-14	-13.274	-13.405	-0.131	(0)
NaCrO4-	6.199e-16	5.706e-16	-15.208	-15.244	-0.036	(0)
HCrO4-	5.303e-16	4.882e-16	-15.275	-15.311	-0.036	(0)
KCrO4-	1.845e-17	1.699e-17	-16.734	-16.770	-0.036	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	2.259e-25	1.622e-25	-24.646	-24.790	-0.144	(0)
CrO3Cl-	2.221e-26	2.045e-26	-25.653	-25.689	-0.036	(0)
Cr2O7-2	1.151e-29	8.264e-30	-28.939	-29.083	-0.144	(0)
Cu (1)	3.110e-11					
CuCl	1.647e-11	1.647e-11	-10.783	-10.783	0.000	(0)
Cu+	8.180e-12	7.530e-12	-11.087	-11.123	-0.036	(0)
CuCl2-	6.447e-12	5.977e-12	-11.191	-11.224	-0.033	(0)
CuCl3-2	2.987e-15	2.220e-15	-14.525	-14.654	-0.129	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.651	-151.863	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.388	-152.593	-0.205	(0)
Cu (2)	3.851e-08					
CuCO3	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
CuOH+	3.126e-09	2.898e-09	-8.505	-8.538	-0.033	(0)
Cu (CO3) 2-2	1.811e-09	1.301e-09	-8.742	-8.886	-0.144	(0)
Cu (OH) 2	1.519e-09	1.519e-09	-8.819	-8.819	0.000	(0)
Cu+2	4.722e-10	3.490e-10	-9.326	-9.457	-0.131	(0)
CuHCO3+	3.000e-11	2.761e-11	-10.523	-10.559	-0.036	(0)
CuSO4	2.275e-11	2.275e-11	-10.643	-10.643	0.000	(0)
Cu (OH) 3-	8.885e-12	8.180e-12	-11.051	-11.087	-0.036	(0)
CuF+	1.718e-12	1.582e-12	-11.765	-11.801	-0.036	(0)
CuCl+	1.036e-12	9.608e-13	-11.984	-12.017	-0.033	(0)
Cu2 (OH) 2+2	2.938e-13	2.110e-13	-12.532	-12.676	-0.144	(0)
CuNO2+	2.476e-15	2.279e-15	-14.606	-14.642	-0.036	(0)
CuCl2	5.787e-16	5.787e-16	-15.238	-15.238	0.000	(0)
Cu (OH) 4-2	2.354e-16	1.691e-16	-15.628	-15.772	-0.144	(0)
CuNH3+2	5.059e-17	3.633e-17	-16.296	-16.440	-0.144	(0)
CuNO3+	7.055e-20	6.494e-20	-19.152	-19.187	-0.036	(0)

	CuCl3-	1.012e-20	9.383e-21	-19.995	-20.028	-0.033	(0)
	Cu(NO2)2	1.455e-21	1.455e-21	-20.837	-20.837	0.000	(0)
	CuCl4-2	1.099e-25	8.169e-26	-24.959	-25.088	-0.129	(0)
	Cu(NO3)2	4.811e-31	4.811e-31	-30.318	-30.318	0.000	(0)
	Cu(HS)3-	0.000e+00	0.000e+00	-224.965	-225.001	-0.036	(0)
F		7.865e-05					
	F-	7.747e-05	7.183e-05	-4.111	-4.144	-0.033	(0)
	MgF+	8.601e-07	7.980e-07	-6.065	-6.098	-0.033	(0)
	CaF+	1.823e-07	1.693e-07	-6.739	-6.771	-0.032	(0)
	NaF	1.323e-07	1.323e-07	-6.879	-6.879	0.000	(0)
	MnF+	1.463e-09	1.359e-09	-8.835	-8.867	-0.032	(0)
	HF	4.073e-10	4.073e-10	-9.390	-9.390	0.000	(0)
	ZnF+	2.245e-10	2.067e-10	-9.649	-9.685	-0.036	(0)
	BF(OH)3-	2.072e-10	1.917e-10	-9.684	-9.717	-0.034	(0)
	CuF+	1.718e-12	1.582e-12	-11.765	-11.801	-0.036	(0)
	NiF+	1.093e-12	1.006e-12	-11.961	-11.997	-0.036	(0)
	CoF+	1.043e-12	9.601e-13	-11.982	-12.018	-0.036	(0)
	HF2-	1.201e-13	1.112e-13	-12.920	-12.954	-0.033	(0)
	CdF+	6.521e-14	6.003e-14	-13.186	-13.222	-0.036	(0)
	AgF	7.388e-15	7.388e-15	-14.131	-14.131	0.000	(0)
	BF2(OH)2-	6.103e-15	5.643e-15	-14.214	-14.248	-0.034	(0)
	PbF+	3.220e-15	2.964e-15	-14.492	-14.528	-0.036	(0)
	AlF2+	3.180e-15	2.955e-15	-14.498	-14.529	-0.032	(0)
	AlF3	2.672e-15	2.672e-15	-14.573	-14.573	0.000	(0)
	UO2F+	1.712e-15	1.576e-15	-14.766	-14.802	-0.036	(0)
	UO2F2	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
	CrF+2	2.193e-16	1.575e-16	-15.659	-15.803	-0.144	(0)
	AlF+2	1.387e-16	1.033e-16	-15.858	-15.986	-0.128	(0)
	AlF4-	1.037e-16	9.620e-17	-15.984	-16.017	-0.033	(0)
	CdF2	8.604e-18	8.604e-18	-17.065	-17.065	0.000	(0)
	UO2F3-	6.400e-18	5.892e-18	-17.194	-17.230	-0.036	(0)
	PbF2	4.190e-18	4.190e-18	-17.378	-17.378	0.000	(0)
	H2F2	4.446e-19	4.446e-19	-18.352	-18.352	0.000	(0)
	FeF2+	1.427e-20	1.325e-20	-19.846	-19.878	-0.032	(0)
	FeF+2	9.274e-21	6.893e-21	-20.033	-20.162	-0.129	(0)
	UO2F4-2	4.681e-21	3.362e-21	-20.330	-20.473	-0.144	(0)
	FeF3	1.343e-21	1.343e-21	-20.872	-20.872	0.000	(0)
	VO2F	1.030e-21	1.030e-21	-20.987	-20.987	0.000	(0)
	BF3OH-	6.539e-22	6.047e-22	-21.184	-21.218	-0.034	(0)
	PbF3-	6.201e-22	5.708e-22	-21.208	-21.243	-0.036	(0)
	VO2F2-	2.918e-23	2.686e-23	-22.535	-22.571	-0.036	(0)
	VOF+	1.982e-25	1.824e-25	-24.703	-24.739	-0.036	(0)
	VO2F3-2	3.351e-26	2.407e-26	-25.475	-25.619	-0.144	(0)
	PbF4-2	2.733e-26	1.963e-26	-25.563	-25.707	-0.144	(0)
	VOF2	4.914e-27	4.914e-27	-26.309	-26.309	0.000	(0)
	HgF+	3.721e-27	3.426e-27	-26.429	-26.465	-0.036	(0)
	BF4-	8.862e-28	8.196e-28	-27.052	-27.086	-0.034	(0)
	Sb(OH)2F	3.010e-29	3.010e-29	-28.521	-28.521	0.000	(0)
	SbOF	2.960e-29	2.960e-29	-28.529	-28.529	0.000	(0)
	VOF3-	1.361e-29	1.252e-29	-28.866	-28.902	-0.036	(0)
	VO2F4-3	1.792e-30	8.507e-31	-29.747	-30.070	-0.324	(0)
	SiF6-2	1.856e-32	1.380e-32	-31.731	-31.860	-0.129	(0)
	VOF4-2	5.057e-33	3.632e-33	-32.296	-32.440	-0.144	(0)
	UF3+	1.757e-40	1.618e-40	-39.755	-39.791	-0.036	(0)
	UF2+2	0.000e+00	0.000e+00	-40.704	-40.847	-0.144	(0)
	UF4	0.000e+00	0.000e+00	-41.895	-41.895	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-43.480	-43.804	-0.324	(0)
	UF5-	0.000e+00	0.000e+00	-44.405	-44.440	-0.036	(0)
	UF6-2	0.000e+00	0.000e+00	-45.960	-46.104	-0.144	(0)
Fe(2)		6.608e-14					
	Fe+2	5.779e-14	4.150e-14	-13.238	-13.382	-0.144	(0)
	FeOH+	4.673e-15	4.339e-15	-14.330	-14.363	-0.032	(0)
	FeSO4	2.899e-15	2.899e-15	-14.538	-14.538	0.000	(0)
	FeHCO3+	7.046e-16	6.552e-16	-15.152	-15.184	-0.032	(0)
	Fe(OH)2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
	Fe(OH)3-	8.095e-18	7.516e-18	-17.092	-17.124	-0.032	(0)
	Fe(HS)2	0.000e+00	0.000e+00	-165.394	-165.394	0.000	(0)
	Fe(HS)3-	0.000e+00	0.000e+00	-243.802	-243.838	-0.036	(0)

Fe (3)	7.033e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	1.632e-10	1.516e-10	-9.787	-9.819	-0.032	(0)
Fe (OH) 4-	1.125e-10	1.045e-10	-9.949	-9.981	-0.032	(0)
FeOH+2	1.996e-16	1.484e-16	-15.700	-15.829	-0.129	(0)
FeF2+	1.427e-20	1.325e-20	-19.846	-19.878	-0.032	(0)
FeF+2	9.274e-21	6.893e-21	-20.033	-20.162	-0.129	(0)
FeF3	1.343e-21	1.343e-21	-20.872	-20.872	0.000	(0)
FeSO4+	3.009e-22	2.794e-22	-21.522	-21.554	-0.032	(0)
Fe+3	1.728e-22	8.752e-23	-21.763	-22.058	-0.295	(0)
FeCl+2	6.177e-24	4.591e-24	-23.209	-23.338	-0.129	(0)
Fe (SO4) 2-	1.846e-24	1.700e-24	-23.734	-23.770	-0.036	(0)
FeCl2+	3.837e-26	3.563e-26	-25.416	-25.448	-0.032	(0)
FeHSeO3+2	2.313e-28	1.661e-28	-27.636	-27.780	-0.144	(0)
FeCl3	6.189e-30	6.189e-30	-29.208	-29.208	0.000	(0)
Fe2 (OH) 2+4	2.741e-30	7.291e-31	-29.562	-30.137	-0.575	(0)
FeNO3+2	7.171e-32	5.150e-32	-31.144	-31.288	-0.144	(0)
Fe3 (OH) 4+5	1.265e-38	1.598e-39	-37.898	-38.797	-0.899	(0)
H (0)	4.034e-29					
H2	2.017e-29	2.019e-29	-28.695	-28.695	0.000	(0)
Hg (0)	2.305e-11					
Hg	2.305e-11	2.305e-11	-10.637	-10.637	0.000	(0)
Hg (1)	5.606e-26					
Hg2+2	2.803e-26	2.013e-26	-25.552	-25.696	-0.144	(0)
Hg (2)	6.670e-14					
Hg (OH) 2	5.592e-14	5.598e-14	-13.252	-13.252	0.000	(0)
HgClOH	1.036e-14	1.036e-14	-13.984	-13.984	0.000	(0)
HgCl2	3.882e-16	3.882e-16	-15.411	-15.411	0.000	(0)
HgCO3	2.361e-17	2.361e-17	-16.627	-16.627	0.000	(0)
HgCl3-	7.326e-18	6.744e-18	-17.135	-17.171	-0.036	(0)
Hg (CO3) 2-2	1.594e-18	1.145e-18	-17.797	-17.941	-0.144	(0)
HgOH+	1.461e-19	1.345e-19	-18.835	-18.871	-0.036	(0)
HgCl4-2	6.495e-20	4.664e-20	-19.187	-19.331	-0.144	(0)
HgCl+	4.844e-20	4.459e-20	-19.315	-19.351	-0.036	(0)
Hg (OH) 3-	2.010e-20	1.851e-20	-19.697	-19.733	-0.036	(0)
HgHCO3+	1.831e-21	1.686e-21	-20.737	-20.773	-0.036	(0)
Hg+2	1.791e-24	1.287e-24	-23.747	-23.891	-0.144	(0)
HgSO4	9.584e-26	9.584e-26	-25.018	-25.018	0.000	(0)
HgNH3+2	1.150e-26	8.259e-27	-25.939	-26.083	-0.144	(0)
HgF+	3.721e-27	3.426e-27	-26.429	-26.465	-0.036	(0)
Hg (NH3) 2+2	1.170e-28	8.402e-29	-27.932	-28.076	-0.144	(0)
HgNO3+	3.037e-35	2.795e-35	-34.518	-34.554	-0.036	(0)
Hg (NH3) 3+2	4.739e-39	3.403e-39	-38.324	-38.468	-0.144	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.165	-45.165	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-48.417	-48.561	-0.144	(0)
HgHS2-	0.000e+00	0.000e+00	-144.472	-144.508	-0.036	(0)
HgS2-2	0.000e+00	0.000e+00	-144.656	-144.800	-0.144	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-146.531	-146.531	0.000	(0)
K	1.256e-04					
K+	1.253e-04	1.162e-04	-3.902	-3.935	-0.033	(0)
KSO4-	2.519e-07	2.341e-07	-6.599	-6.631	-0.032	(0)
KCrO4-	1.845e-17	1.699e-17	-16.734	-16.770	-0.036	(0)
Mg	1.427e-04					
Mg+2	1.340e-04	9.901e-05	-3.873	-4.004	-0.131	(0)
MgSO4	5.126e-06	5.126e-06	-5.290	-5.290	0.000	(0)
MgHCO3+	1.370e-06	1.270e-06	-5.863	-5.896	-0.033	(0)
MgCO3	1.263e-06	1.263e-06	-5.899	-5.899	0.000	(0)
MgF+	8.601e-07	7.980e-07	-6.065	-6.098	-0.033	(0)
MgOH+	1.112e-07	1.035e-07	-6.954	-6.985	-0.031	(0)
MgH2BO3+	3.760e-09	3.477e-09	-8.425	-8.459	-0.034	(0)
Mn (2)	7.045e-07					
Mn+2	6.617e-07	4.752e-07	-6.179	-6.323	-0.144	(0)
MnSO4	2.404e-08	2.404e-08	-7.619	-7.619	0.000	(0)
MnHCO3+	1.280e-08	1.189e-08	-7.893	-7.925	-0.032	(0)
MnOH+	3.376e-09	3.134e-09	-8.472	-8.504	-0.032	(0)
MnF+	1.463e-09	1.359e-09	-8.835	-8.867	-0.032	(0)
MnCl+	1.119e-09	1.039e-09	-8.951	-8.983	-0.032	(0)
MnCl2	2.550e-12	2.550e-12	-11.593	-11.593	0.000	(0)

MnCl3-	1.314e-15	1.220e-15	-14.881	-14.914	-0.032	(0)
MnSeO4	4.132e-16	4.132e-16	-15.384	-15.384	0.000	(0)
Mn (OH) 3-	1.439e-16	1.336e-16	-15.842	-15.874	-0.032	(0)
MnNO3+	4.814e-17	4.432e-17	-16.317	-16.353	-0.036	(0)
Mn (OH) 4-2	1.524e-21	1.133e-21	-20.817	-20.946	-0.129	(0)
Mn (NO3) 2	6.550e-27	6.550e-27	-26.184	-26.184	0.000	(0)
MnSe	0.000e+00	0.000e+00	-44.210	-44.210	0.000	(0)
Mn (3)	9.511e-28					
Mn+3	9.511e-28	4.818e-28	-27.022	-27.317	-0.295	(0)
Mn (6)	1.375e-40					
MnO4-2	1.375e-40	1.022e-40	-39.862	-39.990	-0.129	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.973	-45.006	-0.034	(0)
Mo	1.768e-08					
MoO4-2	1.767e-08	1.306e-08	-7.753	-7.884	-0.131	(0)
HMoO4-	1.083e-12	9.966e-13	-11.966	-12.001	-0.036	(0)
H2MoO4	2.799e-17	2.799e-17	-16.553	-16.553	0.000	(0)
Ag2MoO4	8.291e-30	8.291e-30	-29.081	-29.081	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-61.328	-61.651	-0.324	(0)
Mo7O24-6	0.000e+00	0.000e+00	-68.234	-69.528	-1.294	(0)
HMo7O24-5	0.000e+00	0.000e+00	-70.659	-71.558	-0.899	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-74.617	-75.192	-0.575	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-80.039	-80.362	-0.324	(0)
N (-3)	8.438e-11					
NH4+	7.398e-11	6.841e-11	-10.131	-10.165	-0.034	(0)
NH3	1.017e-11	1.017e-11	-10.993	-10.993	0.000	(0)
NH4SO4-	2.246e-13	2.086e-13	-12.649	-12.681	-0.032	(0)
CaNH3+2	3.851e-15	2.766e-15	-14.414	-14.558	-0.144	(0)
CuNH3+2	5.059e-17	3.633e-17	-16.296	-16.440	-0.144	(0)
NiNH3+2	4.242e-18	3.047e-18	-17.372	-17.516	-0.144	(0)
AgNH3+	9.240e-19	8.506e-19	-18.034	-18.070	-0.036	(0)
Co (NH3) +2	7.199e-19	5.170e-19	-18.143	-18.287	-0.144	(0)
BaNH3+2	6.010e-21	4.316e-21	-20.221	-20.365	-0.144	(0)
Ag (NH3) 2+	7.641e-26	7.034e-26	-25.117	-25.153	-0.036	(0)
Ca (NH3) 2+2	1.560e-26	1.120e-26	-25.807	-25.951	-0.144	(0)
HgNH3+2	1.150e-26	8.259e-27	-25.939	-26.083	-0.144	(0)
Ni (NH3) 2+2	6.239e-27	4.480e-27	-26.205	-26.349	-0.144	(0)
Co (NH3) 2+2	3.124e-28	2.244e-28	-27.505	-27.649	-0.144	(0)
Hg (NH3) 2+2	1.170e-28	8.402e-29	-27.932	-28.076	-0.144	(0)
Co (NH3) 3+2	4.002e-38	2.874e-38	-37.398	-37.542	-0.144	(0)
Hg (NH3) 3+2	4.739e-39	3.403e-39	-38.324	-38.468	-0.144	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-47.670	-47.814	-0.144	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-48.417	-48.561	-0.144	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-56.886	-57.030	-0.144	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-58.443	-58.587	-0.144	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.735	-66.879	-0.144	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-69.491	-69.814	-0.324	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.328	-71.472	-0.144	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-80.412	-80.448	-0.036	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-83.064	-83.208	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.443	-84.587	-0.144	(0)
N (3)	6.739e-08					
NO2-	6.739e-08	6.237e-08	-7.171	-7.205	-0.034	(0)
CuNO2+	2.476e-15	2.279e-15	-14.606	-14.642	-0.036	(0)
AgNO2	5.336e-16	5.336e-16	-15.273	-15.273	0.000	(0)
CoNO2+	2.018e-16	1.858e-16	-15.695	-15.731	-0.036	(0)
Cu (NO2) 2	1.455e-21	1.455e-21	-20.837	-20.837	0.000	(0)
Ag (NO2) 2-	5.600e-23	5.155e-23	-22.252	-22.288	-0.036	(0)
N (5)	6.351e-11					
NO3-	6.346e-11	5.884e-11	-10.197	-10.230	-0.033	(0)
CaNO3+	4.365e-14	4.018e-14	-13.360	-13.396	-0.036	(0)
MnNO3+	4.814e-17	4.432e-17	-16.317	-16.353	-0.036	(0)
ZnNO3+	2.316e-17	2.132e-17	-16.635	-16.671	-0.036	(0)
BaNO3+	2.154e-19	1.983e-19	-18.667	-18.703	-0.036	(0)
NiNO3+	8.953e-20	8.242e-20	-19.048	-19.084	-0.036	(0)
CuNO3+	7.055e-20	6.494e-20	-19.152	-19.187	-0.036	(0)
CoNO3+	4.282e-20	3.942e-20	-19.368	-19.404	-0.036	(0)
CdNO3+	1.066e-20	9.813e-21	-19.972	-20.008	-0.036	(0)

AgNO3	1.914e-21	1.914e-21	-20.718	-20.718	0.000	(0)
PbNO3+	5.536e-22	5.096e-22	-21.257	-21.293	-0.036	(0)
UO2NO3+	2.027e-26	1.866e-26	-25.693	-25.729	-0.036	(0)
Mn (NO3) 2	6.550e-27	6.550e-27	-26.184	-26.184	0.000	(0)
Zn (NO3) 2	2.503e-28	2.503e-28	-27.602	-27.602	0.000	(0)
CrNO3+2	4.956e-29	3.559e-29	-28.305	-28.449	-0.144	(0)
Co (NO3) 2	4.720e-30	4.720e-30	-29.326	-29.326	0.000	(0)
Cu (NO3) 2	4.811e-31	4.811e-31	-30.318	-30.318	0.000	(0)
Cd (NO3) 2	2.894e-31	2.894e-31	-30.539	-30.539	0.000	(0)
VO2NO3	2.433e-31	2.433e-31	-30.614	-30.614	0.000	(0)
FeNO3+2	7.171e-32	5.150e-32	-31.144	-31.288	-0.144	(0)
Pb (NO3) 2	5.093e-32	5.093e-32	-31.293	-31.293	0.000	(0)
HgNO3+	3.037e-35	2.795e-35	-34.518	-34.554	-0.036	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.165	-45.165	0.000	(0)
Na	3.155e-03					
Na+	3.147e-03	2.918e-03	-2.502	-2.535	-0.033	(0)
NaSO4-	4.800e-06	4.459e-06	-5.319	-5.351	-0.032	(0)
NaHCO3	2.058e-06	2.058e-06	-5.687	-5.687	0.000	(0)
NaCO3-	8.969e-07	8.333e-07	-6.047	-6.079	-0.032	(0)
NaF	1.323e-07	1.323e-07	-6.879	-6.879	0.000	(0)
NaH2BO3	4.685e-09	4.685e-09	-8.329	-8.329	0.000	(0)
NaCrO4-	6.199e-16	5.706e-16	-15.208	-15.244	-0.036	(0)
Ni	1.226e-09					
Ni+2	7.544e-10	5.576e-10	-9.122	-9.254	-0.131	(0)
NiCO3	3.190e-10	3.190e-10	-9.496	-9.496	0.000	(0)
NiHCO3+	9.365e-11	8.621e-11	-10.029	-10.064	-0.036	(0)
NiSO4	3.166e-11	3.166e-11	-10.500	-10.500	0.000	(0)
NiOH+	2.003e-11	1.843e-11	-10.698	-10.734	-0.036	(0)
Ni (OH) 2	3.845e-12	3.845e-12	-11.415	-11.415	0.000	(0)
NiCl+	2.692e-12	2.478e-12	-11.570	-11.606	-0.036	(0)
NiF+	1.093e-12	1.006e-12	-11.961	-11.997	-0.036	(0)
Ni (OH) 3-	1.097e-14	1.010e-14	-13.960	-13.996	-0.036	(0)
Ni (SO4) 2-2	4.153e-16	2.983e-16	-15.382	-15.525	-0.144	(0)
NiCl2	2.168e-17	2.168e-17	-16.664	-16.664	0.000	(0)
NiNH3+2	4.242e-18	3.047e-18	-17.372	-17.516	-0.144	(0)
NiSeO4	8.428e-19	8.428e-19	-18.074	-18.074	0.000	(0)
NiNO3+	8.953e-20	8.242e-20	-19.048	-19.084	-0.036	(0)
Ni (NH3) 2+2	6.239e-27	4.480e-27	-26.205	-26.349	-0.144	(0)
O (0)	2.482e-35					
O2	1.241e-35	1.243e-35	-34.906	-34.906	0.000	(0)
Pb	3.468e-11					
PbCO3	2.699e-11	2.699e-11	-10.569	-10.569	0.000	(0)
PbOH+	4.196e-12	3.862e-12	-11.377	-11.413	-0.036	(0)
Pb (CO3) 2-2	1.662e-12	1.194e-12	-11.779	-11.923	-0.144	(0)
Pb+2	7.922e-13	5.855e-13	-12.101	-12.232	-0.131	(0)
PbHCO3+	5.926e-13	5.456e-13	-12.227	-12.263	-0.036	(0)
Pb (OH) 2	3.207e-13	3.207e-13	-12.494	-12.494	0.000	(0)
PbSO4	8.160e-14	8.160e-14	-13.088	-13.088	0.000	(0)
PbCl+	3.920e-14	3.609e-14	-13.407	-13.443	-0.036	(0)
PbF+	3.220e-15	2.964e-15	-14.492	-14.528	-0.036	(0)
Pb (OH) 3-	9.150e-16	8.423e-16	-15.039	-15.075	-0.036	(0)
PbCl2	2.800e-16	2.800e-16	-15.553	-15.553	0.000	(0)
Pb (SO4) 2-2	1.948e-16	1.399e-16	-15.710	-15.854	-0.144	(0)
PbF2	4.190e-18	4.190e-18	-17.378	-17.378	0.000	(0)
Pb (OH) 4-2	7.543e-19	5.417e-19	-18.122	-18.266	-0.144	(0)
PbCl3-	2.104e-19	1.937e-19	-18.677	-18.713	-0.036	(0)
PbF3-	6.201e-22	5.708e-22	-21.208	-21.243	-0.036	(0)
PbNO3+	5.536e-22	5.096e-22	-21.257	-21.293	-0.036	(0)
PbCl4-2	2.141e-22	1.538e-22	-21.669	-21.813	-0.144	(0)
Pb2OH+3	7.549e-23	3.584e-23	-22.122	-22.446	-0.324	(0)
PbF4-2	2.733e-26	1.963e-26	-25.563	-25.707	-0.144	(0)
Pb3 (OH) 4+2	1.674e-27	1.202e-27	-26.776	-26.920	-0.144	(0)
Pb (NO3) 2	5.093e-32	5.093e-32	-31.293	-31.293	0.000	(0)
Pb4 (OH) 4+4	2.102e-35	5.590e-36	-34.677	-35.253	-0.575	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-157.925	-157.925	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-237.070	-237.106	-0.036	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-77.054	-77.054	0.000	(0)

HS-	0.000e+00	0.000e+00	-80.445	-80.481	-0.036	(0)
S5-2	0.000e+00	0.000e+00	-81.286	-81.430	-0.144	(0)
S6-2	0.000e+00	0.000e+00	-81.802	-81.946	-0.144	(0)
H2S	0.000e+00	0.000e+00	-81.877	-81.877	0.000	(0)
S4-2	0.000e+00	0.000e+00	-81.882	-82.025	-0.144	(0)
S3-2	0.000e+00	0.000e+00	-82.688	-82.831	-0.144	(0)
CdHS+	0.000e+00	0.000e+00	-82.715	-82.751	-0.036	(0)
S2-2	0.000e+00	0.000e+00	-83.704	-83.847	-0.144	(0)
S-2	0.000e+00	0.000e+00	-89.236	-89.365	-0.129	(0)
HgHS2-	0.000e+00	0.000e+00	-144.472	-144.508	-0.036	(0)
HgS2-2	0.000e+00	0.000e+00	-144.656	-144.800	-0.144	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-146.531	-146.531	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.651	-151.863	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.388	-152.593	-0.205	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-152.396	-152.502	-0.107	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.541	-152.577	-0.036	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-153.312	-153.526	-0.214	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-153.399	-153.435	-0.036	(0)
AgS4S5-3	0.000e+00	0.000e+00	-153.629	-153.837	-0.208	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.983	-154.983	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-156.028	-156.028	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-157.925	-157.925	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-165.394	-165.394	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-224.965	-225.001	-0.036	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-232.148	-232.184	-0.036	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.604	-233.748	-0.144	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-234.573	-234.609	-0.036	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-237.070	-237.106	-0.036	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.802	-243.838	-0.036	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-312.750	-312.894	-0.144	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.981	-314.125	-0.144	(0)
Sb2S4-2	0.000e+00	0.000e+00	-333.535	-333.678	-0.144	(0)
S (6)	4.092e-04					
SO4-2	3.850e-04	2.845e-04	-3.415	-3.546	-0.131	(0)
CaSO4	1.408e-05	1.408e-05	-4.852	-4.852	0.000	(0)
MgSO4	5.126e-06	5.126e-06	-5.290	-5.290	0.000	(0)
NaSO4-	4.800e-06	4.459e-06	-5.319	-5.351	-0.032	(0)
KSO4-	2.519e-07	2.341e-07	-6.599	-6.631	-0.032	(0)
MnSO4	2.404e-08	2.404e-08	-7.619	-7.619	0.000	(0)
ZnSO4	8.977e-09	8.977e-09	-8.047	-8.047	0.000	(0)
HSO4-	1.149e-10	1.066e-10	-9.940	-9.972	-0.033	(0)
NiSO4	3.166e-11	3.166e-11	-10.500	-10.500	0.000	(0)
Zn (SO4) 2-2	3.098e-11	2.225e-11	-10.509	-10.653	-0.144	(0)
CoSO4	2.399e-11	2.399e-11	-10.620	-10.620	0.000	(0)
CuSO4	2.275e-11	2.275e-11	-10.643	-10.643	0.000	(0)
CdSO4	3.517e-12	3.517e-12	-11.454	-11.454	0.000	(0)
AgSO4-	2.525e-13	2.325e-13	-12.598	-12.634	-0.036	(0)
NH4SO4-	2.246e-13	2.086e-13	-12.649	-12.681	-0.032	(0)
PbSO4	8.160e-14	8.160e-14	-13.088	-13.088	0.000	(0)
CrOHSO4	5.367e-14	5.367e-14	-13.270	-13.270	0.000	(0)
Cd (SO4) 2-2	1.880e-14	1.350e-14	-13.726	-13.870	-0.144	(0)
FeSO4	2.899e-15	2.899e-15	-14.538	-14.538	0.000	(0)
Ni (SO4) 2-2	4.153e-16	2.983e-16	-15.382	-15.525	-0.144	(0)
Pb (SO4) 2-2	1.948e-16	1.399e-16	-15.710	-15.854	-0.144	(0)
UO2SO4	6.845e-17	6.845e-17	-16.165	-16.165	0.000	(0)
CrSO4+	9.986e-18	9.192e-18	-17.001	-17.037	-0.036	(0)
UO2 (SO4) 2-2	3.575e-19	2.568e-19	-18.447	-18.590	-0.144	(0)
AlSO4+	3.424e-19	3.177e-19	-18.465	-18.498	-0.033	(0)
Al (SO4) 2-	1.044e-21	9.686e-22	-20.981	-21.014	-0.033	(0)
FeSO4+	3.009e-22	2.794e-22	-21.522	-21.554	-0.032	(0)
VO2SO4-	6.033e-23	5.554e-23	-22.219	-22.255	-0.036	(0)
Cr2 (OH) 2SO4+2	5.369e-24	3.856e-24	-23.270	-23.414	-0.144	(0)
Fe (SO4) 2-	1.846e-24	1.700e-24	-23.734	-23.770	-0.036	(0)
CrO3SO4-2	2.259e-25	1.622e-25	-24.646	-24.790	-0.144	(0)
HgSO4	9.584e-26	9.584e-26	-25.018	-25.018	0.000	(0)
Cr2 (OH) 2 (SO4) 2	6.517e-26	6.517e-26	-25.186	-25.186	0.000	(0)
VOSO4	3.318e-26	3.318e-26	-25.479	-25.479	0.000	(0)
VSO4+	0.000e+00	0.000e+00	-40.702	-40.738	-0.036	(0)

U(SO4)2	0.000e+00	0.000e+00	-45.552	-45.552	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.762	-45.906	-0.144	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-80.412	-80.448	-0.036	(0)
Sb(3)	1.383e-22					
Sb(OH)3	6.995e-23	6.995e-23	-22.155	-22.155	0.000	(0)
HSbO2	6.829e-23	6.829e-23	-22.166	-22.166	0.000	(0)
SbO2-	3.134e-26	2.885e-26	-25.504	-25.540	-0.036	(0)
Sb(OH)4-	1.795e-26	1.653e-26	-25.746	-25.782	-0.036	(0)
Sb(OH)2F	3.010e-29	3.010e-29	-28.521	-28.521	0.000	(0)
SbOF	2.960e-29	2.960e-29	-28.529	-28.529	0.000	(0)
Sb(OH)2+	7.075e-30	6.513e-30	-29.150	-29.186	-0.036	(0)
SbO+	2.440e-30	2.246e-30	-29.613	-29.649	-0.036	(0)
Sb2S4-2	0.000e+00	0.000e+00	-333.535	-333.678	-0.144	(0)
Sb(5)	2.913e-10					
SbO3-	2.909e-10	2.678e-10	-9.536	-9.572	-0.036	(0)
Sb(OH)6-	3.377e-13	3.132e-13	-12.471	-12.504	-0.033	(0)
SbO2+	1.227e-27	1.129e-27	-26.911	-26.947	-0.036	(0)
Se(-2)	4.306e-19					
Ag2Se	4.306e-19	4.306e-19	-18.366	-18.366	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.882	-40.918	-0.036	(0)
MnSe	0.000e+00	0.000e+00	-44.210	-44.210	0.000	(0)
H2Se	0.000e+00	0.000e+00	-45.444	-45.444	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.358	-47.501	-0.144	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-86.908	-87.483	-0.575	(0)
Se(4)	1.819e-09					
SeO3-2	1.039e-09	7.459e-10	-8.984	-9.127	-0.144	(0)
HSeO3-	7.803e-10	7.183e-10	-9.108	-9.144	-0.036	(0)
H2SeO3	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
AgSeO3-	2.132e-17	1.963e-17	-16.671	-16.707	-0.036	(0)
Cd(SeO3)2-2	3.367e-23	2.418e-23	-22.473	-22.617	-0.144	(0)
Ag(SeO3)2-3	2.761e-25	1.311e-25	-24.559	-24.882	-0.324	(0)
FeHSeO3+2	2.313e-28	1.661e-28	-27.636	-27.780	-0.144	(0)
Se(6)	4.372e-12					
SeO4-2	4.372e-12	3.231e-12	-11.359	-11.491	-0.131	(0)
MnSeO4	4.132e-16	4.132e-16	-15.384	-15.384	0.000	(0)
ZnSeO4	7.217e-17	7.217e-17	-16.142	-16.142	0.000	(0)
NiSeO4	8.428e-19	8.428e-19	-18.074	-18.074	0.000	(0)
CoSeO4	6.845e-19	6.845e-19	-18.165	-18.165	0.000	(0)
HSeO4-	6.744e-19	6.209e-19	-18.171	-18.207	-0.036	(0)
CdSeO4	3.173e-20	3.173e-20	-19.499	-19.499	0.000	(0)
Zn(SeO4)2-2	3.293e-28	2.365e-28	-27.482	-27.626	-0.144	(0)
Si	3.191e-04					
H4SiO4	3.066e-04	3.069e-04	-3.513	-3.513	0.000	(0)
H3SiO4-	1.248e-05	1.157e-05	-4.904	-4.937	-0.033	(0)
H2SiO4-2	2.556e-10	1.904e-10	-9.592	-9.720	-0.128	(0)
UO2H3SiO4+	1.696e-13	1.562e-13	-12.770	-12.806	-0.036	(0)
SiF6-2	1.856e-32	1.380e-32	-31.731	-31.860	-0.129	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.789	-62.112	-0.324	(0)
U(4)	1.090e-20					
U(OH)5-	1.090e-20	1.003e-20	-19.963	-19.999	-0.036	(0)
U(OH)4	1.611e-24	1.611e-24	-23.793	-23.793	0.000	(0)
U(OH)3+	2.453e-29	2.259e-29	-28.610	-28.646	-0.036	(0)
U(OH)2+2	5.576e-35	4.004e-35	-34.254	-34.397	-0.144	(0)
UF3+	1.757e-40	1.618e-40	-39.755	-39.791	-0.036	(0)
UF2+2	0.000e+00	0.000e+00	-40.704	-40.847	-0.144	(0)
UOH+3	0.000e+00	0.000e+00	-40.817	-41.141	-0.324	(0)
UF4	0.000e+00	0.000e+00	-41.895	-41.895	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.480	-43.804	-0.324	(0)
UF5-	0.000e+00	0.000e+00	-44.405	-44.440	-0.036	(0)
U(SO4)2	0.000e+00	0.000e+00	-45.552	-45.552	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.762	-45.906	-0.144	(0)
UF6-2	0.000e+00	0.000e+00	-45.960	-46.104	-0.144	(0)
U+4	0.000e+00	0.000e+00	-48.385	-48.960	-0.575	(0)
UCl+3	0.000e+00	0.000e+00	-49.697	-50.020	-0.324	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-181.759	-184.671	-2.912	(0)
U(5)	4.637e-18					
UO2+	4.637e-18	4.268e-18	-17.334	-17.370	-0.036	(0)

U (6)	1.272e-08					
UO2 (CO3) 3-4	8.579e-09	2.282e-09	-8.067	-8.642	-0.575	(0)
UO2 (CO3) 2-2	4.134e-09	2.969e-09	-8.384	-8.527	-0.144	(0)
UO2CO3	9.704e-12	9.704e-12	-11.013	-11.013	0.000	(0)
UO2H3SiO4+	1.696e-13	1.562e-13	-12.770	-12.806	-0.036	(0)
UO2OH+	5.709e-14	5.255e-14	-13.243	-13.279	-0.036	(0)
UO2F+	1.712e-15	1.576e-15	-14.766	-14.802	-0.036	(0)
UO2F2	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
UO2+2	2.151e-16	1.590e-16	-15.667	-15.799	-0.131	(0)
UO2SO4	6.845e-17	6.845e-17	-16.165	-16.165	0.000	(0)
UO2F3-	6.400e-18	5.892e-18	-17.194	-17.230	-0.036	(0)
UO2Cl+	4.865e-19	4.478e-19	-18.313	-18.349	-0.036	(0)
UO2 (SO4) 2-2	3.575e-19	2.568e-19	-18.447	-18.590	-0.144	(0)
(UO2) 2 (OH) 2+2	6.382e-21	4.583e-21	-20.195	-20.339	-0.144	(0)
UO2F4-2	4.681e-21	3.362e-21	-20.330	-20.473	-0.144	(0)
(UO2) 3 (OH) 5+	1.369e-21	1.260e-21	-20.864	-20.900	-0.036	(0)
UO2NO3+	2.027e-26	1.866e-26	-25.693	-25.729	-0.036	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-46.567	-46.603	-0.036	(0)
V+2	0.000e+00	0.000e+00	-48.388	-48.532	-0.144	(0)
V (3)	1.989e-18					
V (OH) 3	1.989e-18	1.989e-18	-17.701	-17.701	0.000	(0)
V (OH) 2+	5.354e-30	4.929e-30	-29.271	-29.307	-0.036	(0)
VOH+2	2.496e-34	1.792e-34	-33.603	-33.747	-0.144	(0)
V+3	2.868e-40	1.362e-40	-39.542	-39.866	-0.324	(0)
VSO4+	0.000e+00	0.000e+00	-40.702	-40.738	-0.036	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-64.278	-64.602	-0.324	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-66.118	-66.693	-0.575	(0)
V (4)	2.418e-22					
V (OH) 3+	2.410e-22	2.218e-22	-21.618	-21.654	-0.036	(0)
VO+2	5.896e-25	4.234e-25	-24.229	-24.373	-0.144	(0)
VOF+	1.982e-25	1.824e-25	-24.703	-24.739	-0.036	(0)
VOSO4	3.318e-26	3.318e-26	-25.479	-25.479	0.000	(0)
VOF2	4.914e-27	4.914e-27	-26.309	-26.309	0.000	(0)
VOC1+	2.242e-27	2.064e-27	-26.649	-26.685	-0.036	(0)
VOF3-	1.361e-29	1.252e-29	-28.866	-28.902	-0.036	(0)
VOF4-2	5.057e-33	3.632e-33	-32.296	-32.440	-0.144	(0)
H2V2O4+2	3.435e-39	2.467e-39	-38.464	-38.608	-0.144	(0)
V (5)	5.570e-11					
H2VO4-	3.027e-11	2.787e-11	-10.519	-10.555	-0.036	(0)
HVO4-2	2.542e-11	1.826e-11	-10.595	-10.739	-0.144	(0)
H3VO4	1.068e-15	1.068e-15	-14.971	-14.971	0.000	(0)
VO4-3	5.027e-17	2.387e-17	-16.299	-16.622	-0.324	(0)
HV2O7-3	3.632e-19	1.724e-19	-18.440	-18.763	-0.324	(0)
H3V2O7-	2.088e-19	1.922e-19	-18.680	-18.716	-0.036	(0)
VO2+	8.816e-21	8.175e-21	-20.055	-20.088	-0.033	(0)
V2O7-4	4.551e-21	1.210e-21	-20.342	-20.917	-0.575	(0)
VO2F	1.030e-21	1.030e-21	-20.987	-20.987	0.000	(0)
VO2SO4-	6.033e-23	5.554e-23	-22.219	-22.255	-0.036	(0)
VO2F2-	2.918e-23	2.686e-23	-22.535	-22.571	-0.036	(0)
V3O9-3	4.775e-26	2.267e-26	-25.321	-25.645	-0.324	(0)
VO2F3-2	3.351e-26	2.407e-26	-25.475	-25.619	-0.144	(0)
VO2F4-3	1.792e-30	8.507e-31	-29.747	-30.070	-0.324	(0)
VO2NO3	2.433e-31	2.433e-31	-30.614	-30.614	0.000	(0)
V4O12-4	9.901e-34	2.634e-34	-33.004	-33.579	-0.575	(0)
V10O28-6	0.000e+00	0.000e+00	-89.014	-90.308	-1.294	(0)
HV10O28-5	0.000e+00	0.000e+00	-89.639	-90.538	-0.899	(0)
H2V10O28-4	0.000e+00	0.000e+00	-93.172	-93.747	-0.575	(0)
Zn	3.978e-07					
Zn+2	1.951e-07	1.442e-07	-6.710	-6.841	-0.131	(0)
ZnCO3	1.273e-07	1.273e-07	-6.895	-6.895	0.000	(0)
ZnOH+	4.114e-08	3.787e-08	-7.386	-7.422	-0.036	(0)
Zn (OH) 2	1.576e-08	1.576e-08	-7.802	-7.802	0.000	(0)
ZnSO4	8.977e-09	8.977e-09	-8.047	-8.047	0.000	(0)
ZnHCO3+	6.212e-09	5.719e-09	-8.207	-8.243	-0.036	(0)
ZnOHCl	2.163e-09	2.163e-09	-8.665	-8.665	0.000	(0)
ZnCl+	6.788e-10	6.293e-10	-9.168	-9.201	-0.033	(0)
Zn (OH) 3-	2.254e-10	2.075e-10	-9.647	-9.683	-0.036	(0)

ZnF+	2.245e-10	2.067e-10	-9.649	-9.685	-0.036	(0)
Zn(SO4) 2-2	3.098e-11	2.225e-11	-10.509	-10.653	-0.144	(0)
ZnCl2	1.733e-12	1.733e-12	-11.761	-11.761	0.000	(0)
Zn(OH) 4-2	3.020e-14	2.169e-14	-13.520	-13.664	-0.144	(0)
ZnCl3-	2.579e-15	2.391e-15	-14.589	-14.621	-0.033	(0)
ZnSeO4	7.217e-17	7.217e-17	-16.142	-16.142	0.000	(0)
ZnNO3+	2.316e-17	2.132e-17	-16.635	-16.671	-0.036	(0)
ZnCl4-2	2.794e-18	2.077e-18	-17.554	-17.683	-0.129	(0)
Zn(SeO4) 2-2	3.293e-28	2.365e-28	-27.482	-27.626	-0.144	(0)
Zn(NO3) 2	2.503e-28	2.503e-28	-27.602	-27.602	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-152.541	-152.577	-0.036	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.983	-154.983	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-232.148	-232.184	-0.036	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.604	-233.748	-0.144	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-313.981	-314.125	-0.144	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co(NH3)5Cl)(NO3) 2	-75.67	-69.38	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-58.95	-54.44	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-66.18	-54.44	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-96.53	-78.60	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-76.22	-56.19	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.14	-33.73	0.40	(NH4)2CrO4
(NH4)2SeO4	-32.27	-31.82	0.45	(NH4)2SeO4
Acanthite	-56.62	-92.84	-36.22	Ag2S
Ag2CO3	-14.50	-25.59	-11.09	Ag2CO3
Ag2CrO4	-22.59	-34.18	-11.59	Ag2CrO4
Ag2HVO4	-17.09	-15.61	1.48	Ag2HVO4
Ag2MoO4	-17.11	-28.66	-11.55	Ag2MoO4
Ag2O	-16.52	-3.94	12.57	Ag2O
Ag2Se	-4.58	-53.28	-48.70	Ag2Se
Ag2SeO3	-14.35	-21.50	-7.15	Ag2SeO3
Ag2SeO4	-23.36	-32.27	-8.91	Ag2SeO4
Ag2SO4	-19.50	-24.32	-4.82	Ag2SO4
Ag3AsO3	-30.66	-28.51	2.16	Ag3AsO3
Ag3AsO4	-19.07	-21.86	-2.79	Ag3AsO4
Ag3H2VO5	-22.77	-17.59	5.18	Ag3H2VO5
AgF:4H2O	-15.58	-14.53	1.05	AgF:4H2O
Agmetal	-1.24	-14.74	-13.51	Ag
AgVO3	-14.41	-13.64	0.77	AgVO3
Al(OH) 3(am)	-4.39	6.41	10.80	Al(OH) 3
Al2(MoO4) 3	-63.70	-61.34	2.37	Al2(MoO4) 3
Al2O3	-6.84	12.81	19.65	Al2O3
Al4(OH)10SO4	-17.45	5.25	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-14.34	-9.54	4.80	AlAsO4:2H2O
AlOHSO4	-10.74	-13.97	-3.23	AlOHSO4
AlSb	-158.01	-92.38	65.62	AlSb
Alunite	-15.66	-17.06	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-7.99	-15.78	-7.79	PbSO4
Anhydrite	-2.85	-7.21	-4.36	CaSO4
Anilite	-59.24	-91.11	-31.88	Cu0.25Cu1.5S
Antlerite	-7.04	1.75	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-87.61	-90.37	-2.76	As4O6
Artinite	-5.59	4.01	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-38.60	-31.89	6.71	As2O5
Atacamite	-3.82	3.57	7.39	Cu2(OH) 3Cl
Azurite	-4.26	-21.17	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-16.73	7.66	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-23.89	-8.02	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-0.00	-8.91	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-33.30	-0.36	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-11.64	-17.46	-5.82	BaF2
BaMoO4	-10.10	-17.06	-6.96	BaMoO4

Barite	-2.74	-12.72	-9.98	BaSO ₄
BaS	-97.42	-81.24	16.18	BaS
BaSeO ₃	-11.73	-9.90	1.83	BaSeO ₃
BaSeO ₄	-13.20	-20.66	-7.46	BaSeO ₄
Bianchite	-8.62	-10.39	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.39	10.70	18.09	MnO ₂
Bixbyite	-3.49	-4.14	-0.64	Mn ₂ O ₃
BlaubleiI	-58.64	-82.80	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-59.36	-86.64	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-2.17	6.41	8.58	AlOOH
Breithauptite	-59.92	-78.44	-18.52	NiSb
Brochantite	-6.10	9.12	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.02	12.83	16.84	Mg(OH) ₂
Bunsenite	-4.87	7.58	12.45	NiO
Ca(VO ₃) ₂	-15.84	-10.18	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-14.51	2.99	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-18.56	2.99	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-14.69	7.61	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-22.80	16.16	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-23.70	16.16	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-301.05	-158.08	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	-0.00	-8.48	-8.48	CaCO ₃
Calomel	-13.31	-31.22	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.60	-11.55	-7.95	CaMoO ₄
Carnotite	-6.39	-6.16	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.21	-4.39	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-12.14	-15.16	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.63	-3.79	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.09	6.55	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.18	6.55	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-27.80	-21.09	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-23.27	-0.71	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-22.56	5.84	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-15.14	-15.80	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-14.11	-15.80	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-13.89	-15.80	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-17.35	-18.57	-1.21	CdF ₂
Cdmetal(alpha)	-32.50	-18.99	13.51	Cd
Cdmetal(gamma)	-32.61	-18.99	13.62	Cd
CdMoO ₄	-4.01	-18.16	-14.15	CdMoO ₄
CdOHCl	-8.16	-4.62	3.54	CdOHCl
CdSb	-79.11	-79.46	-0.35	CdSb
CdSe	-22.58	-42.78	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-19.92	-21.77	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-13.65	-13.82	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-12.10	-13.82	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-11.95	-13.82	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-3.40	-13.15	-9.75	AgCl
Cerrusite	-3.92	-17.05	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-10.36	-13.00	-2.64	CuSO ₄ :5H ₂ O
Chalcedony	0.04	-3.51	-3.55	SiO ₂
Chalcocite	-59.39	-94.31	-34.92	Cu ₂ S
Chalcopyrite	-131.70	-166.97	-35.27	CuFeS ₂
Chrysotile	-0.74	31.46	32.20	Mg ₃ Si ₂ O ₅ (OH) ₄
Cinnabar	-56.46	-102.15	-45.69	HgS
Claudetite	-87.30	-90.37	-3.06	As ₄ O ₆
Clausthalite	-17.63	-44.73	-27.10	PbSe
Co(BO ₂) ₂	-29.96	-2.89	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.64	7.46	13.09	Co(OH) ₂
Co(OH) ₃	-9.86	-12.17	-2.31	Co(OH) ₃
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.55	-9.51	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-6.38	-16.88	-10.50	Co ₃ O ₄
CoCl ₂	-23.16	-14.89	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-17.43	-14.89	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-4.21	-14.19	-9.98	CoCO ₃

CoF2	-16.06	-17.66	-1.60	CoF2
CoF3	-48.39	-49.85	-1.46	CoF3
CoFe2O4	17.37	13.84	-3.53	CoFe2O4
CoMoO4	-9.50	-17.26	-7.76	CoMoO4
CoO	-6.13	7.46	13.59	CoO
CoS (alpha)	-74.00	-81.44	-7.44	CoS
CoS (beta)	-70.37	-81.44	-11.07	CoS
CoSe	-25.68	-41.88	-16.20	CoSe
CoSeO3	-11.42	-10.10	1.32	CoSeO3
CoSeO4:6H2O	-19.33	-20.86	-1.53	CoSeO4:6H2O
CoSO4	-15.72	-12.92	2.80	CoSO4
CoSO4:6H2O	-10.45	-12.92	-2.47	CoSO4:6H2O
Cotunnite	-12.97	-17.75	-4.78	PbCl2
Covellite	-59.22	-81.52	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.45	-33.36	14.09	CrCl2
CrCl3	-49.82	-34.71	15.11	CrCl3
CrF3	-27.52	-38.86	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-17.47	-51.31	-33.84	Na3AlF6
Cu (OH) 2	-1.30	7.38	8.67	Cu (OH) 2
Cu (SbO3) 2	-31.06	14.15	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-13.15	-3.90	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.24	-94.12	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.95	-54.75	-45.80	Cu2Se
Cu2SO4	-23.84	-25.79	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.86	-9.76	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-64.32	-106.91	-42.59	Cu3Sb
Cu3Se2	-33.22	-96.71	-63.49	Cu3Se2
CuCO3	-2.77	-14.27	-11.50	CuCO3
CuCrO4	-17.42	-22.86	-5.44	CuCrO4
CuF	-10.36	-15.27	-4.91	CuF
CuF2	-18.86	-17.74	1.12	CuF2
CuF2:2H2O	-13.19	-17.74	-4.55	CuF2:2H2O
Cumetal	-6.72	-15.48	-8.76	Cu
CuMoO4	-4.26	-17.34	-13.08	CuMoO4
CuOCuSO4	-15.93	-5.63	10.30	CuOCuSO4
Cupricferrite	7.77	13.76	5.99	CuFe2O4
Cuprite	-4.01	-5.41	-1.41	Cu2O
Cuprousferrite	9.40	0.48	-8.92	CuFeO2
CuSe	-8.86	-41.96	-33.10	CuSe
CuSe2	-32.38	-65.75	-33.37	CuSe2
CuSeO3:2H2O	-10.70	-10.18	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.51	-20.95	-2.44	CuSeO4:5H2O
CuSO4	-15.94	-13.00	2.94	CuSO4
Diaspore	-0.47	6.41	6.87	AlOOH
Djurleite	-59.55	-93.47	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.76	-17.30	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.21	-17.30	-17.09	CaMg (CO3) 2
Epsomite	-5.42	-7.55	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	2.88	-0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-16.17	-19.89	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-12.73	-11.18	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-25.67	-46.30	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-51.02	-54.75	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.15	-12.75	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-11.17	-21.27	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-51.08	-69.67	-18.60	FeSe2
FeS (ppt)	-82.50	-85.45	-2.95	FeS

FeSe	-34.88	-45.88	-11.00	FeSe
Fix_pe	-4.36	-4.36	0.00	e-
Fluorite	-1.45	-11.95	-10.50	CaF2
Galena	-70.33	-84.30	-13.97	PbS
Gibbsite	-1.88	6.41	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-8.38	-10.39	-2.01	ZnSO4:7H2O
Greenalite	-17.48	3.33	20.81	Fe3Si2O5(OH)4
Greenockite	-67.98	-82.34	-14.36	CdS
Greigite	-300.72	-345.76	-45.03	Fe3S4
Gummite	-6.64	1.03	7.67	UO3
Gypsum	-2.60	-7.21	-4.61	CaSO4:2H2O
H-Jarosite	-19.08	-31.18	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.84	-24.72	-12.88	H2MoO4
H2S(g)	-80.89	-88.90	-8.01	H2S
H2Se(g)	-44.37	-49.33	-4.96	H2Se
Halite	-6.90	-5.30	1.60	NaCl
Halloysite	-3.79	5.79	9.57	Al2Si2O5(OH)4
Hausmannite	-3.96	57.07	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-6.63	16.26	22.89	FeAl2O4
Hg(CH3)2(g)	-187.20	-260.90	-73.71	Hg(CH3)2
Hg(g)	-9.33	-17.20	-7.87	Hg
Hg(OH)2	-9.76	-13.25	-3.50	Hg(OH)2
Hg2(g)	-19.45	-34.41	-14.96	Hg2
Hg2(OH)2	-14.12	-8.86	5.26	Hg2(OH)2
Hg2CO3	-14.46	-30.51	-16.05	Hg2CO3
Hg2CrO4	-30.40	-39.10	-8.70	Hg2CrO4
Hg2F2	-23.62	-33.98	-10.36	Hg2F2
Hg2S	-86.08	-97.76	-11.68	Hg2S
Hg2SeO3	-21.77	-26.42	-4.66	Hg2SeO3
Hg2SO4	-23.11	-29.24	-6.13	Hg2SO4
Hg3O2CO3	-31.72	-61.40	-29.68	Hg3O2CO3
HgCl(g)	-35.10	-15.61	19.50	HgCl
HgCl2	-14.34	-35.60	-21.26	HgCl2
HgF(g)	-49.67	-16.99	32.68	HgF
HgF2(g)	-50.94	-38.37	12.57	HgF2
Hgmetal(l)	-3.75	-17.20	-13.45	Hg
HgSe	-6.89	-62.59	-55.69	HgSe
HgSeO3	-18.38	-30.81	-12.43	HgSeO3
HgSO4	-24.21	-33.63	-9.42	HgSO4
Huntite	-4.97	-34.94	-29.97	CaMg3(CO3)4
Hydrocerrusite	-10.72	-29.49	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.68	-22.45	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-24.70	-29.87	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-11.90	-26.70	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-34.27	-51.51	-17.24	K2Cr2O7
K2CrO4	-20.76	-21.27	-0.51	K2CrO4
K2MoO4	-19.02	-15.75	3.26	K2MoO4
K2SeO4	-18.63	-19.36	-0.73	K2SeO4
Kaolinite	-1.65	5.79	7.43	Al2Si2O5(OH)4
Langite	-8.37	9.12	17.49	Cu4(OH)6SO4:H2O
Larnakite	-10.74	-11.18	-0.43	PbO:PbSO4
Laurionite	-7.20	-6.58	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-8.09	4.60	12.69	PbO
Mackinawite	-81.85	-85.45	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.35	19.21	16.86	Fe2MgO4
Magnesite	-1.36	-8.82	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-1.59	-6.90	-5.31	Cu2(OH)2CO3
Manganite	-2.06	23.28	25.34	MnOOH
Massicot	-8.29	4.60	12.89	PbO
Matlockite	-10.16	-19.14	-8.97	PbClF
Melanothallite	-21.23	-14.98	6.26	CuCl2
Melanterite	-14.72	-16.93	-2.21	FeSO4:7H2O

Metacinnabar	-57.06	-102.15	-45.09	HgS
Mg(OH)2 (active)	-5.97	12.83	18.79	Mg(OH)2
Mg(VO3)2	-21.79	-10.51	11.28	Mg(VO3)2
Mg2Sb3	-281.53	-206.85	74.68	Mg2Sb3
Mg2V2O7	-24.05	2.31	26.36	Mg2V2O7
MgCr2O4	-5.73	10.47	16.20	MgCr2O4
MgCrO4	-22.79	-17.41	5.38	MgCrO4
MgF2	-4.16	-12.29	-8.13	MgF2
MgMoO4	-10.04	-11.89	-1.85	MgMoO4
MgSeO3:6H2O	-7.79	-4.73	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-14.30	-15.50	-1.20	MgSeO4:6H2O
Minium	-34.18	39.35	73.52	Pb3O4
Mirabilite	-7.50	-8.62	-1.11	Na2SO4:10H2O
Mn(VO3)2	-17.73	-12.83	4.90	Mn(VO3)2
Mn2(SO4)3	-59.56	-65.27	-5.71	Mn2(SO4)3
Mn2Sb	-151.62	-90.54	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.86	-0.36	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.56	-11.84	2.72	MnCl2:4H2O
MnS (grn)	-78.56	-78.39	0.17	MnS
MnS (pnk)	-81.73	-78.39	3.34	MnS
MnSb	-97.95	-100.86	-2.91	MnSb
MnSe	-42.32	-38.82	3.50	MnSe
MnSeO3	-8.18	-7.05	1.13	MnSeO3
MnSeO3:2H2O	-8.03	-7.05	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.76	-17.81	-2.05	MnSeO4:5H2O
MnSO4	-12.45	-9.87	2.58	MnSO4
Monteponite	-8.55	6.55	15.10	CdO
Montroydite	-9.61	-13.25	-3.64	HgO
MoO3	-16.72	-24.72	-8.00	MoO3
Morenosite	-10.66	-12.80	-2.14	NiSO4:7H2O
MoS2	-157.80	-228.06	-70.26	MoS2
Na-Jarosite	-14.10	-25.30	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.82	-48.71	-9.90	Na2Cr2O7
Na2CrO4	-21.41	-18.47	2.93	Na2CrO4
Na2Mo2O7	-21.07	-37.67	-16.60	Na2Mo2O7
Na2MoO4	-14.44	-12.95	1.49	Na2MoO4
Na2MoO4:2H2O	-14.18	-12.95	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-16.10	-5.80	10.30	Na2SeO3:5H2O
Na2SeO4	-17.84	-16.56	1.28	Na2SeO4
Na3Sb	-175.60	-81.14	94.45	Na3Sb
Na3VO4	-30.71	5.97	36.68	Na3VO4
Na4V2O7	-37.22	0.18	37.40	Na4V2O7
Nantokite	-7.15	-13.88	-6.73	CuCl
NaSb	-90.53	-67.36	23.17	NaSb
Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-9.65	-5.79	3.86	NaVO3
Nesquehonite	-4.15	-8.82	-4.67	MgCO3:3H2O
Ni(OH)2	-5.22	7.58	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.85	-9.15	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-22.06	9.94	32.00	Ni4(OH)6SO4
NiCO3	-7.20	-14.07	-6.87	NiCO3
NiMoO4	-6.00	-17.14	-11.14	NiMoO4
NiS (alpha)	-75.72	-81.32	-5.60	NiS
NiS (beta)	-70.22	-81.32	-11.10	NiS
NiS (gamma)	-68.52	-81.32	-12.80	NiS
NiSe	-24.06	-41.76	-17.70	NiSe
NiSeO3:2H2O	-12.80	-9.98	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.22	-20.74	-1.52	NiSeO4:6H2O
Nsutite	-6.80	10.70	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-250.81	-311.88	-61.07	As2S3
Otavite	-3.09	-15.09	-12.00	CdCO3
Pb(BO2)2	-12.27	-5.75	6.52	Pb(BO2)2
Pb(OH)2	-3.55	4.60	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-75.12	-83.88	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-10.77	-1.98	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-16.99	9.20	26.19	Pb2O(OH)2
Pb2O3	-26.29	34.75	61.04	Pb2O3

Pb2OCO3	-11.89	-12.45	-0.56	Pb2OCO3
Pb2V2O7	-12.24	-14.14	-1.90	Pb2V2O7
Pb3(AsO4)2	-23.89	-18.09	5.80	Pb3(AsO4)2
Pb3(VO4)2	-15.68	-9.54	6.14	Pb3(VO4)2
Pb3O2CO3	-18.87	-7.85	11.02	Pb3O2CO3
Pb3O2SO4	-17.26	-6.58	10.69	Pb3O2SO4
Pb4(OH)6SO4	-23.08	-1.98	21.10	Pb4(OH)6SO4
Pb4O3SO4	-23.85	-1.98	21.88	Pb4O3SO4
PbCrO4	-13.04	-25.64	-12.60	PbCrO4
PbF2	-13.08	-20.52	-7.44	PbF2
Pbmetal	-25.19	-20.94	4.25	Pb
PbMoO4	-4.50	-20.12	-15.62	PbMoO4
PbO:0.3H2O	-8.38	4.60	12.98	PbO:0.33H2O
PbSeO4	-16.88	-23.72	-6.84	PbSeO4
Periclase	-8.76	12.83	21.58	MgO
Phosgenite	-14.99	-34.80	-19.81	PbCl2:PbCO3
Plattnerite	-19.46	30.14	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-130.29	-148.80	-18.51	FeS2
Pyrochroite	-4.68	10.51	15.19	Mn(OH)2
Pyrolusite	-5.33	36.05	41.38	MnO2
Quartz	0.49	-3.51	-4.00	SiO2
Realgar	-104.51	-124.26	-19.75	AsS
Retgersite	-10.76	-12.80	-2.04	NiSO4:6H2O
Rhodochrosite	-0.56	-11.14	-10.58	MnCO3
Rutherfordine	-6.11	-20.61	-14.50	UO2CO3
Sb(OH)3	-15.05	-22.16	-7.11	Sb(OH)3
Sb2O4	-22.17	-18.77	3.40	Sb2O4
Sb2O5	-32.17	-41.84	-9.67	Sb2O5
Sb2Se3	-124.56	-192.31	-67.76	Sb2Se3
Sb4O6(cubic)	-70.36	-88.62	-18.26	Sb4O6
Sb4O6(orth)	-70.72	-88.62	-17.90	Sb4O6
SbCl3	-56.26	-55.68	0.57	SbCl3
SbF3	-49.61	-59.84	-10.23	SbF3
Sbmetal	-48.78	-60.47	-11.69	Sb
SbO2	-5.87	-33.69	-27.82	SbO2
Schoepite	-4.96	1.03	5.99	UO2(OH)2:H2O
Semetal(am)	-16.68	-23.79	-7.11	Se
Semetal(hex)	-16.08	-23.79	-7.71	Se
Senarmontite	-31.94	-44.31	-12.37	Sb2O3
SeO2	-17.68	-17.56	0.12	SeO2
SeO3	-49.37	-28.32	21.04	SeO3
Sepiolite	-0.64	15.12	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.66	15.12	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.80	-3.51	-2.71	SiO2
SiO2(am-ppt)	-0.77	-3.51	-2.74	SiO2
Smithsonite	-1.66	-11.66	-10.00	ZnCO3
Sphalerite	-67.46	-78.91	-11.45	ZnS
Spinel	-11.21	25.64	36.85	MgAl2O4
Stibnite	-260.54	-311.00	-50.46	Sb2S3
Sulfur	-61.21	-63.35	-2.14	S
Tenorite	-0.27	7.38	7.64	CuO
Thenardite	-8.94	-8.62	0.32	Na2SO4
Thermonatrite	-10.52	-9.88	0.64	Na2CO3:H2O
Tyuyamunite	-12.19	-8.11	4.08	Ca(UO2)2(VO4)2
U3O8	-15.88	5.21	21.08	U3O8
U3Sb4	-593.42	-441.04	152.38	U3Sb4
U4O9	-32.61	-35.63	-3.02	U4O9
UF4	-36.00	-65.53	-29.54	UF4
UF4:2.5H2O	-32.82	-65.53	-32.72	UF4:2.5H2O
UO2(am)	-16.23	-15.29	0.93	UO2
UO2(NO3)2	-48.41	-36.26	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.11	-36.26	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-39.65	-36.26	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.31	-36.26	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.58	1.03	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.04	-27.29	-2.25	UO2SeO4:4H2O

UO3	-6.67	1.03	7.70	UO3
Uraninite	-10.63	-15.29	-4.67	UO2
USb2	-226.12	-196.54	29.58	USb2
V(OH)3	-22.21	-14.62	7.59	V(OH)3
V2O5	-21.98	-23.34	-1.36	V2O5
V3O5	-50.00	-48.17	1.84	V3O5
V4O7	-62.89	-55.71	7.19	V4O7
V6O13	-60.26	-121.12	-60.86	V6O13
Valentinite	-35.83	-44.31	-8.48	Sb2O3
VC12	-68.62	-49.74	18.87	VC12
VC13	-71.58	-48.15	23.43	VC13
VF4	-72.71	-57.78	14.93	VF4
Vmetal	-96.96	-52.93	44.03	V
VO	-42.15	-27.39	14.76	VO
VO(OH)2	-12.69	-7.54	5.15	VO(OH)2
VO2Cl	-25.69	-22.85	2.84	VO2Cl
VOC1	-36.95	-25.79	11.15	VOC1
VOC12	-42.65	-29.89	12.76	VOC12
VOSO4	-31.53	-27.92	3.61	VOSO4
Witherite	-5.42	-13.99	-8.57	BaCO3
Wurtzite	-69.96	-78.91	-8.95	ZnS
Zincite	-1.34	9.99	11.33	ZnO
Zincosite	-14.32	-10.39	3.93	ZnSO4
Zn(BO2)2	-8.65	-0.36	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-30.62	-27.30	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.21	9.99	12.20	Zn(OH)2
Zn(OH)2(am)	-2.48	9.99	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.76	9.99	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.54	9.99	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.74	9.99	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.90	-0.40	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.38	8.81	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.57	-1.92	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.70	-10.78	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.81	19.59	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.89	27.61	38.50	Zn5(OH)8Cl2
ZnCl2	-19.41	-12.36	7.05	ZnCl2
ZnCO3:1H2O	-1.40	-11.66	-10.26	ZnCO3:1H2O
ZnF2	-14.59	-15.13	-0.53	ZnF2
Znmetal	-41.34	-15.55	25.79	Zn
ZnMoO4	-4.60	-14.72	-10.13	ZnMoO4
ZnO(active)	-1.20	9.99	11.19	ZnO
ZnS(am)	-69.85	-78.91	-9.05	ZnS
ZnSb	-87.04	-76.03	11.01	ZnSb
ZnSe	-24.94	-39.34	-14.40	ZnSe
ZnSeO4:6H2O	-16.81	-18.33	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.75	-10.39	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 35.

Title Use solution to allow model output
REACTION 106
H2O -0.0
0 moles
USE solution 115
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 115. Solution after simulation 34.

Using reaction 106.

Reaction 106.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.136e-10	2.136e-10
Al	1.475e-08	1.475e-08
As	6.970e-09	6.971e-09
B	7.796e-06	7.797e-06
Ba	9.236e-10	9.237e-10
C	1.398e-03	1.398e-03
Ca	3.171e-04	3.171e-04
Cd	1.056e-10	1.056e-10
Cl	1.874e-03	1.874e-03
Co	7.994e-10	7.995e-10
Cr	5.899e-10	5.899e-10
Cu	3.854e-08	3.854e-08
F	7.865e-05	7.866e-05
Fe	7.033e-10	7.034e-10
Hg	2.311e-11	2.312e-11
K	1.256e-04	1.256e-04
Mg	1.427e-04	1.427e-04
Mn	7.045e-07	7.045e-07
Mo	1.768e-08	1.768e-08
N	6.754e-08	6.755e-08
Na	3.155e-03	3.156e-03
Ni	1.226e-09	1.227e-09
Pb	3.468e-11	3.468e-11
S	4.092e-04	4.093e-04
Sb	2.913e-10	2.913e-10
Se	1.823e-09	1.823e-09
Si	3.191e-04	3.191e-04
U	1.272e-08	1.272e-08
V	5.570e-11	5.570e-11
Zn	3.978e-07	3.978e-07

-----Description of solution-----

	pH =	8.416	Charge balance
	pe =	4.356	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	4.967e-03	

Mass of water (kg) = 1.000e+00
 Total alkalinity (eq/kg) = 1.432e-03
 Total CO2 (mol/kg) = 1.398e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 7.977e-09
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 0
 Total H = 1.110291e+02
 Total O = 5.552037e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.835e-06	2.626e-06	-5.547	-5.581	-0.033	(0)
H+	4.135e-09	3.834e-09	-8.384	-8.416	-0.033	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	2.136e-10					
AgCl	1.452e-10	1.452e-10	-9.838	-9.838	0.000	(0)
Ag+	4.416e-11	4.095e-11	-10.355	-10.388	-0.033	(0)
AgCl2-	2.387e-11	2.197e-11	-10.622	-10.658	-0.036	(0)
AgSO4-	2.525e-13	2.325e-13	-12.598	-12.634	-0.036	(0)
AgCl3-2	4.737e-14	3.402e-14	-13.324	-13.468	-0.144	(0)
AgOH	1.075e-14	1.075e-14	-13.968	-13.968	0.000	(0)
AgF	7.388e-15	7.388e-15	-14.131	-14.131	0.000	(0)
AgH2BO3	6.573e-16	6.573e-16	-15.182	-15.182	0.000	(0)
AgNO2	5.336e-16	5.336e-16	-15.273	-15.273	0.000	(0)
AgCl4-3	2.541e-16	1.207e-16	-15.595	-15.918	-0.324	(0)
AgSeO3-	2.132e-17	1.963e-17	-16.671	-16.707	-0.036	(0)
Ag(OH) 2-	2.998e-18	2.760e-18	-17.523	-17.559	-0.036	(0)
AgNH3+	9.240e-19	8.506e-19	-18.034	-18.070	-0.036	(0)
Ag2Se	4.306e-19	4.306e-19	-18.366	-18.366	0.000	(0)
AgNO3	1.914e-21	1.914e-21	-20.718	-20.718	0.000	(0)
Ag(NO2) 2-	5.600e-23	5.155e-23	-22.252	-22.288	-0.036	(0)
Ag(SeO3) 2-3	2.761e-25	1.311e-25	-24.559	-24.882	-0.324	(0)
Ag(NH3) 2+	7.641e-26	7.034e-26	-25.117	-25.153	-0.036	(0)
Ag2MoO4	8.291e-30	8.291e-30	-29.081	-29.081	0.000	(0)
AgHS	0.000e+00	0.000e+00	-77.054	-77.054	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-86.908	-87.483	-0.575	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-152.396	-152.502	-0.107	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-153.312	-153.526	-0.214	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-153.399	-153.435	-0.036	(0)
AgS4S5-3	0.000e+00	0.000e+00	-153.629	-153.837	-0.208	(0)
Al	1.475e-08					
Al(OH) 4-	1.471e-08	1.365e-08	-7.832	-7.865	-0.033	(0)
Al(OH) 3	4.128e-11	4.128e-11	-10.384	-10.384	0.000	(0)
Al(OH) 2+	8.481e-13	7.879e-13	-12.072	-12.104	-0.032	(0)
AlF2+	3.180e-15	2.955e-15	-14.498	-14.529	-0.032	(0)
AlF3	2.672e-15	2.672e-15	-14.573	-14.573	0.000	(0)
AlOH+2	5.070e-16	3.777e-16	-15.295	-15.423	-0.128	(0)
AlF+2	1.387e-16	1.033e-16	-15.858	-15.986	-0.128	(0)
AlF4-	1.037e-16	9.620e-17	-15.984	-16.017	-0.033	(0)
AlSO4+	3.424e-19	3.177e-19	-18.465	-18.498	-0.033	(0)
Al+3	2.840e-19	1.438e-19	-18.547	-18.842	-0.295	(0)
Al(SO4) 2-	1.044e-21	9.686e-22	-20.981	-21.014	-0.033	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-61.328	-61.651	-0.324	(0)
As (3)	2.929e-23					
H3AsO3	2.558e-23	2.558e-23	-22.592	-22.592	0.000	(0)
H2AsO3-	3.716e-24	3.421e-24	-23.430	-23.466	-0.036	(0)
HAsO3-2	1.133e-27	8.139e-28	-26.946	-27.089	-0.144	(0)
H4AsO3+	5.277e-32	4.858e-32	-31.278	-31.314	-0.036	(0)
AsO3-3	1.724e-32	8.183e-33	-31.764	-32.087	-0.324	(0)
As (5)	6.970e-09					
HAsO4-2	6.777e-09	4.867e-09	-8.169	-8.313	-0.144	(0)
H2AsO4-	1.849e-10	1.702e-10	-9.733	-9.769	-0.036	(0)
AsO4-3	8.455e-12	4.014e-12	-11.073	-11.396	-0.324	(0)
H3AsO4	1.132e-16	1.134e-16	-15.946	-15.945	0.000	(0)

B	7.796e-06					
H3BO3	6.679e-06	6.686e-06	-5.175	-5.175	0.000	(0)
H2BO3-	1.095e-06	1.013e-06	-5.960	-5.994	-0.034	(0)
CaH2BO3+	1.361e-08	1.259e-08	-7.866	-7.900	-0.034	(0)
NaH2BO3	4.685e-09	4.685e-09	-8.329	-8.329	0.000	(0)
MgH2BO3+	3.760e-09	3.477e-09	-8.425	-8.459	-0.034	(0)
BF(OH) 3-	2.072e-10	1.917e-10	-9.684	-9.717	-0.034	(0)
H5(BO3) 2-	6.233e-12	5.764e-12	-11.205	-11.239	-0.034	(0)
BaH2BO3+	2.276e-14	2.104e-14	-13.643	-13.677	-0.034	(0)
BF2(OH) 2-	6.103e-15	5.643e-15	-14.214	-14.248	-0.034	(0)
H8(BO3) 3-	4.168e-15	3.854e-15	-14.380	-14.414	-0.034	(0)
AgH2BO3	6.573e-16	6.573e-16	-15.182	-15.182	0.000	(0)
BF3OH-	6.539e-22	6.047e-22	-21.184	-21.218	-0.034	(0)
BF4-	8.862e-28	8.196e-28	-27.052	-27.086	-0.034	(0)
Ba	9.236e-10					
Ba+2	9.096e-10	6.723e-10	-9.041	-9.172	-0.131	(0)
BaHCO3+	8.659e-12	8.052e-12	-11.063	-11.094	-0.032	(0)
BaCO3	5.288e-12	5.288e-12	-11.277	-11.277	0.000	(0)
BaH2BO3+	2.276e-14	2.104e-14	-13.643	-13.677	-0.034	(0)
BaOH+	8.301e-15	7.707e-15	-14.081	-14.113	-0.032	(0)
BaNO3+	2.154e-19	1.983e-19	-18.667	-18.703	-0.036	(0)
BaNH3+2	6.010e-21	4.316e-21	-20.221	-20.365	-0.144	(0)
C (4)	1.398e-03					
HCO3-	1.350e-03	1.254e-03	-2.870	-2.902	-0.032	(0)
CO3-2	2.075e-05	1.533e-05	-4.683	-4.814	-0.131	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	5.423e-06	5.042e-06	-5.266	-5.297	-0.032	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	2.058e-06	2.058e-06	-5.687	-5.687	0.000	(0)
MgHCO3+	1.370e-06	1.270e-06	-5.863	-5.896	-0.033	(0)
MgCO3	1.263e-06	1.263e-06	-5.899	-5.899	0.000	(0)
NaCO3-	8.969e-07	8.333e-07	-6.047	-6.079	-0.032	(0)
ZnCO3	1.273e-07	1.273e-07	-6.895	-6.895	0.000	(0)
CuCO3	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
MnHCO3+	1.280e-08	1.189e-08	-7.893	-7.925	-0.032	(0)
UO2(CO3) 3-4	8.579e-09	2.282e-09	-8.067	-8.642	-0.575	(0)
ZnHCO3+	6.212e-09	5.719e-09	-8.207	-8.243	-0.036	(0)
UO2(CO3) 2-2	4.134e-09	2.969e-09	-8.384	-8.527	-0.144	(0)
Cu(CO3) 2-2	1.811e-09	1.301e-09	-8.742	-8.886	-0.144	(0)
NiCO3	3.190e-10	3.190e-10	-9.496	-9.496	0.000	(0)
CoCO3	1.096e-10	1.096e-10	-9.960	-9.960	0.000	(0)
NiHCO3+	9.365e-11	8.621e-11	-10.029	-10.064	-0.036	(0)
CoHCO3+	4.479e-11	4.123e-11	-10.349	-10.385	-0.036	(0)
CuHCO3+	3.000e-11	2.761e-11	-10.523	-10.559	-0.036	(0)
PbCO3	2.699e-11	2.699e-11	-10.569	-10.569	0.000	(0)
CdCO3	1.843e-11	1.843e-11	-10.734	-10.734	0.000	(0)
UO2CO3	9.704e-12	9.704e-12	-11.013	-11.013	0.000	(0)
BaHCO3+	8.659e-12	8.052e-12	-11.063	-11.094	-0.032	(0)
BaCO3	5.288e-12	5.288e-12	-11.277	-11.277	0.000	(0)
Pb(CO3) 2-2	1.662e-12	1.194e-12	-11.779	-11.923	-0.144	(0)
PbHCO3+	5.926e-13	5.456e-13	-12.227	-12.263	-0.036	(0)
Cd(CO3) 2-2	2.917e-13	2.095e-13	-12.535	-12.679	-0.144	(0)
CdHCO3+	1.635e-13	1.505e-13	-12.786	-12.822	-0.036	(0)
FeHCO3+	7.046e-16	6.552e-16	-15.152	-15.184	-0.032	(0)
HgCO3	2.361e-17	2.361e-17	-16.627	-16.627	0.000	(0)
Hg(CO3) 2-2	1.594e-18	1.145e-18	-17.797	-17.941	-0.144	(0)
HgHCO3+	1.831e-21	1.686e-21	-20.737	-20.773	-0.036	(0)
Ca	3.171e-04					
Ca+2	2.922e-04	2.159e-04	-3.534	-3.666	-0.131	(0)
CaSO4	1.408e-05	1.408e-05	-4.852	-4.852	0.000	(0)
CaHCO3+	5.423e-06	5.042e-06	-5.266	-5.297	-0.032	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	1.823e-07	1.693e-07	-6.739	-6.771	-0.032	(0)
CaH2BO3+	1.361e-08	1.259e-08	-7.866	-7.900	-0.034	(0)
CaOH+	1.217e-08	1.131e-08	-7.915	-7.946	-0.032	(0)
CaNO3+	4.365e-14	4.018e-14	-13.360	-13.396	-0.036	(0)
CaNH3+2	3.851e-15	2.766e-15	-14.414	-14.558	-0.144	(0)
Ca(NH3) 2+2	1.560e-26	1.120e-26	-25.807	-25.951	-0.144	(0)

Cd	1.056e-10					
Cd+2	7.134e-11	5.273e-11	-10.147	-10.278	-0.131	(0)
CdCO3	1.843e-11	1.843e-11	-10.734	-10.734	0.000	(0)
CdCl+	9.503e-12	8.748e-12	-11.022	-11.058	-0.036	(0)
CdSO4	3.517e-12	3.517e-12	-11.454	-11.454	0.000	(0)
CdOH+	1.195e-12	1.100e-12	-11.923	-11.959	-0.036	(0)
CdOHC1	9.424e-13	9.424e-13	-12.026	-12.026	0.000	(0)
Cd (CO3) 2-2	2.917e-13	2.095e-13	-12.535	-12.679	-0.144	(0)
CdHCO3+	1.635e-13	1.505e-13	-12.786	-12.822	-0.036	(0)
CdF+	6.521e-14	6.003e-14	-13.186	-13.222	-0.036	(0)
CdCl2	6.335e-14	6.335e-14	-13.198	-13.198	0.000	(0)
Cd (SO4) 2-2	1.880e-14	1.350e-14	-13.726	-13.870	-0.144	(0)
Cd (OH) 2	1.823e-14	1.823e-14	-13.739	-13.739	0.000	(0)
CdCl3-	7.543e-17	6.944e-17	-16.122	-16.158	-0.036	(0)
CdF2	8.604e-18	8.604e-18	-17.065	-17.065	0.000	(0)
Cd (OH) 3-	3.176e-18	2.924e-18	-17.498	-17.534	-0.036	(0)
CdSeO4	3.173e-20	3.173e-20	-19.499	-19.499	0.000	(0)
CdNO3+	1.066e-20	9.813e-21	-19.972	-20.008	-0.036	(0)
Cd2OH+3	6.123e-22	2.907e-22	-21.213	-21.537	-0.324	(0)
Cd (SeO3) 2-2	3.367e-23	2.418e-23	-22.473	-22.617	-0.144	(0)
Cd (OH) 4-2	1.750e-24	1.257e-24	-23.757	-23.901	-0.144	(0)
Cd (NO3) 2	2.894e-31	2.894e-31	-30.539	-30.539	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-82.715	-82.751	-0.036	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-156.028	-156.028	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-234.573	-234.609	-0.036	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-312.750	-312.894	-0.144	(0)
Cl	1.874e-03					
Cl-	1.874e-03	1.737e-03	-2.727	-2.760	-0.033	(0)
ZnOHC1	2.163e-09	2.163e-09	-8.665	-8.665	0.000	(0)
MnCl+	1.119e-09	1.039e-09	-8.951	-8.983	-0.032	(0)
ZnCl+	6.788e-10	6.293e-10	-9.168	-9.201	-0.033	(0)
AgCl	1.452e-10	1.452e-10	-9.838	-9.838	0.000	(0)
AgCl2-	2.387e-11	2.197e-11	-10.622	-10.658	-0.036	(0)
CuCl	1.647e-11	1.647e-11	-10.783	-10.783	0.000	(0)
CdCl+	9.503e-12	8.748e-12	-11.022	-11.058	-0.036	(0)
CuCl2-	6.447e-12	5.977e-12	-11.191	-11.224	-0.033	(0)
CoCl+	2.759e-12	2.540e-12	-11.559	-11.595	-0.036	(0)
NiCl+	2.692e-12	2.478e-12	-11.570	-11.606	-0.036	(0)
MnCl2	2.550e-12	2.550e-12	-11.593	-11.593	0.000	(0)
ZnCl2	1.733e-12	1.733e-12	-11.761	-11.761	0.000	(0)
CuCl+	1.036e-12	9.608e-13	-11.984	-12.017	-0.033	(0)
CdOHC1	9.424e-13	9.424e-13	-12.026	-12.026	0.000	(0)
CdCl2	6.335e-14	6.335e-14	-13.198	-13.198	0.000	(0)
AgCl3-2	4.737e-14	3.402e-14	-13.324	-13.468	-0.144	(0)
PbCl+	3.920e-14	3.609e-14	-13.407	-13.443	-0.036	(0)
HgClOH	1.036e-14	1.036e-14	-13.984	-13.984	0.000	(0)
CuCl3-2	2.987e-15	2.220e-15	-14.525	-14.654	-0.129	(0)
ZnCl3-	2.579e-15	2.391e-15	-14.589	-14.621	-0.033	(0)
MnCl3-	1.314e-15	1.220e-15	-14.881	-14.914	-0.032	(0)
CuCl2	5.787e-16	5.787e-16	-15.238	-15.238	0.000	(0)
HgCl2	3.882e-16	3.882e-16	-15.411	-15.411	0.000	(0)
PbCl2	2.800e-16	2.800e-16	-15.553	-15.553	0.000	(0)
AgCl4-3	2.541e-16	1.207e-16	-15.595	-15.918	-0.324	(0)
CdCl3-	7.543e-17	6.944e-17	-16.122	-16.158	-0.036	(0)
NiCl2	2.168e-17	2.168e-17	-16.664	-16.664	0.000	(0)
HgCl3-	7.326e-18	6.744e-18	-17.135	-17.171	-0.036	(0)
ZnCl4-2	2.794e-18	2.077e-18	-17.554	-17.683	-0.129	(0)
UO2Cl+	4.865e-19	4.478e-19	-18.313	-18.349	-0.036	(0)
PbCl3-	2.104e-19	1.937e-19	-18.677	-18.713	-0.036	(0)
HgCl4-2	6.495e-20	4.664e-20	-19.187	-19.331	-0.144	(0)
HgCl+	4.844e-20	4.459e-20	-19.315	-19.351	-0.036	(0)
CrCl+2	4.331e-20	3.111e-20	-19.363	-19.507	-0.144	(0)
CuCl3-	1.012e-20	9.383e-21	-19.995	-20.028	-0.033	(0)
CrOHC12	2.697e-21	2.697e-21	-20.569	-20.569	0.000	(0)
PbCl4-2	2.141e-22	1.538e-22	-21.669	-21.813	-0.144	(0)
FeCl+2	6.177e-24	4.591e-24	-23.209	-23.338	-0.129	(0)
CrCl2+	5.570e-24	5.127e-24	-23.254	-23.290	-0.036	(0)
CuCl4-2	1.099e-25	8.169e-26	-24.959	-25.088	-0.129	(0)

FeCl2+	3.837e-26	3.563e-26	-25.416	-25.448	-0.032	(0)
CrO3Cl-	2.221e-26	2.045e-26	-25.653	-25.689	-0.036	(0)
VOCl+	2.242e-27	2.064e-27	-26.649	-26.685	-0.036	(0)
FeCl3	6.189e-30	6.189e-30	-29.208	-29.208	0.000	(0)
CoCl+2	1.880e-38	1.350e-38	-37.726	-37.870	-0.144	(0)
UCl+3	0.000e+00	0.000e+00	-49.697	-50.020	-0.324	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.735	-66.879	-0.144	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.328	-71.472	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.443	-84.587	-0.144	(0)
Co (2)	7.994e-10					
Co+2	5.885e-10	4.227e-10	-9.230	-9.374	-0.144	(0)
CoCO3	1.096e-10	1.096e-10	-9.960	-9.960	0.000	(0)
CoHCO3+	4.479e-11	4.123e-11	-10.349	-10.385	-0.036	(0)
CoOH+	2.406e-11	2.215e-11	-10.619	-10.655	-0.036	(0)
CoSO4	2.399e-11	2.399e-11	-10.620	-10.620	0.000	(0)
Co (OH) 2	4.620e-12	4.620e-12	-11.335	-11.335	0.000	(0)
CoCl+	2.759e-12	2.540e-12	-11.559	-11.595	-0.036	(0)
CoF+	1.043e-12	9.601e-13	-11.982	-12.018	-0.036	(0)
Co (OH) 3-	2.629e-16	2.420e-16	-15.580	-15.616	-0.036	(0)
CoNO2+	2.018e-16	1.858e-16	-15.695	-15.731	-0.036	(0)
CoOOH-	6.598e-17	6.074e-17	-16.181	-16.217	-0.036	(0)
Co (NH3) +2	7.199e-19	5.170e-19	-18.143	-18.287	-0.144	(0)
CoSeO4	6.845e-19	6.845e-19	-18.165	-18.165	0.000	(0)
CoNO3+	4.282e-20	3.942e-20	-19.368	-19.404	-0.036	(0)
Co2OH+3	9.881e-22	4.691e-22	-21.005	-21.329	-0.324	(0)
Co (OH) 4-2	1.403e-22	1.007e-22	-21.853	-21.997	-0.144	(0)
Co (NH3) 2+2	3.124e-28	2.244e-28	-27.505	-27.649	-0.144	(0)
Co (NO3) 2	4.720e-30	4.720e-30	-29.326	-29.326	0.000	(0)
Co4 (OH) 4+4	1.804e-34	4.799e-35	-33.744	-34.319	-0.575	(0)
Co (NH3) 3+2	4.002e-38	2.874e-38	-37.398	-37.542	-0.144	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-47.670	-47.814	-0.144	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-58.443	-58.587	-0.144	(0)
Co (3)	7.097e-31					
CoOH+2	7.097e-31	5.097e-31	-30.149	-30.293	-0.144	(0)
Co+3	7.540e-38	3.820e-38	-37.123	-37.418	-0.295	(0)
CoCl+2	1.880e-38	1.350e-38	-37.726	-37.870	-0.144	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.735	-66.879	-0.144	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-80.412	-80.448	-0.036	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-83.064	-83.208	-0.144	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.443	-84.587	-0.144	(0)
Cr (2)	2.028e-28					
Cr+2	2.028e-28	1.456e-28	-27.693	-27.837	-0.144	(0)
Cr (3)	5.898e-10					
Cr (OH) 2+	2.759e-10	2.540e-10	-9.559	-9.595	-0.036	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.372e-11	3.104e-11	-10.472	-10.508	-0.036	(0)
Cr (OH) 4-	2.846e-11	2.619e-11	-10.546	-10.582	-0.036	(0)
Cr (OH) +2	1.107e-12	7.949e-13	-11.956	-12.100	-0.144	(0)
CrOHSO4	5.367e-14	5.367e-14	-13.270	-13.270	0.000	(0)
CrF+2	2.193e-16	1.575e-16	-15.659	-15.803	-0.144	(0)
Cr+3	2.914e-17	1.384e-17	-16.535	-16.859	-0.324	(0)
CrSO4+	9.986e-18	9.192e-18	-17.001	-17.037	-0.036	(0)
CrCl+2	4.331e-20	3.111e-20	-19.363	-19.507	-0.144	(0)
CrOHC12	2.697e-21	2.697e-21	-20.569	-20.569	0.000	(0)
CrCl2+	5.570e-24	5.127e-24	-23.254	-23.290	-0.036	(0)
Cr2 (OH) 2SO4+2	5.369e-24	3.856e-24	-23.270	-23.414	-0.144	(0)
Cr2 (OH) 2 (SO4) 2	6.517e-26	6.517e-26	-25.186	-25.186	0.000	(0)
CrNO3+2	4.956e-29	3.559e-29	-28.305	-28.449	-0.144	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-56.886	-57.030	-0.144	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-69.491	-69.814	-0.324	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.328	-71.472	-0.144	(0)
Cr (6)	5.440e-14					
CrO4-2	5.323e-14	3.935e-14	-13.274	-13.405	-0.131	(0)
NaCrO4-	6.199e-16	5.706e-16	-15.208	-15.244	-0.036	(0)
HCrO4-	5.303e-16	4.882e-16	-15.275	-15.311	-0.036	(0)
KCrO4-	1.845e-17	1.699e-17	-16.734	-16.770	-0.036	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	2.259e-25	1.622e-25	-24.646	-24.790	-0.144	(0)

CrO3Cl-	2.221e-26	2.045e-26	-25.653	-25.689	-0.036	(0)
Cr2O7-2	1.151e-29	8.264e-30	-28.939	-29.083	-0.144	(0)
Cu (1)	3.110e-11					
CuCl	1.647e-11	1.647e-11	-10.783	-10.783	0.000	(0)
Cu+	8.180e-12	7.530e-12	-11.087	-11.123	-0.036	(0)
CuCl2-	6.447e-12	5.977e-12	-11.191	-11.224	-0.033	(0)
CuCl3-2	2.987e-15	2.220e-15	-14.525	-14.654	-0.129	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-151.651	-151.863	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.388	-152.593	-0.205	(0)
Cu (2)	3.851e-08					
CuCO3	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
CuOH+	3.126e-09	2.898e-09	-8.505	-8.538	-0.033	(0)
Cu (CO3) 2-2	1.811e-09	1.301e-09	-8.742	-8.886	-0.144	(0)
Cu (OH) 2	1.519e-09	1.519e-09	-8.819	-8.819	0.000	(0)
Cu+2	4.722e-10	3.490e-10	-9.326	-9.457	-0.131	(0)
CuHCO3+	3.000e-11	2.761e-11	-10.523	-10.559	-0.036	(0)
CuSO4	2.275e-11	2.275e-11	-10.643	-10.643	0.000	(0)
Cu (OH) 3-	8.885e-12	8.180e-12	-11.051	-11.087	-0.036	(0)
CuF+	1.718e-12	1.582e-12	-11.765	-11.801	-0.036	(0)
CuCl+	1.036e-12	9.608e-13	-11.984	-12.017	-0.033	(0)
Cu2 (OH) 2+2	2.938e-13	2.110e-13	-12.532	-12.676	-0.144	(0)
CuNO2+	2.476e-15	2.279e-15	-14.606	-14.642	-0.036	(0)
CuCl2	5.787e-16	5.787e-16	-15.238	-15.238	0.000	(0)
Cu (OH) 4-2	2.354e-16	1.691e-16	-15.628	-15.772	-0.144	(0)
CuNH3+2	5.059e-17	3.633e-17	-16.296	-16.440	-0.144	(0)
CuNO3+	7.055e-20	6.494e-20	-19.152	-19.187	-0.036	(0)
CuCl3-	1.012e-20	9.383e-21	-19.995	-20.028	-0.033	(0)
Cu (NO2) 2	1.455e-21	1.455e-21	-20.837	-20.837	0.000	(0)
CuCl4-2	1.099e-25	8.169e-26	-24.959	-25.088	-0.129	(0)
Cu (NO3) 2	4.811e-31	4.811e-31	-30.318	-30.318	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-224.965	-225.001	-0.036	(0)
F	7.865e-05					
F-	7.747e-05	7.183e-05	-4.111	-4.144	-0.033	(0)
MgF+	8.601e-07	7.980e-07	-6.065	-6.098	-0.033	(0)
CaF+	1.823e-07	1.693e-07	-6.739	-6.771	-0.032	(0)
NaF	1.323e-07	1.323e-07	-6.879	-6.879	0.000	(0)
MnF+	1.463e-09	1.359e-09	-8.835	-8.867	-0.032	(0)
HF	4.073e-10	4.073e-10	-9.390	-9.390	0.000	(0)
ZnF+	2.245e-10	2.067e-10	-9.649	-9.685	-0.036	(0)
BF (OH) 3-	2.072e-10	1.917e-10	-9.684	-9.717	-0.034	(0)
CuF+	1.718e-12	1.582e-12	-11.765	-11.801	-0.036	(0)
NiF+	1.093e-12	1.006e-12	-11.961	-11.997	-0.036	(0)
CoF+	1.043e-12	9.601e-13	-11.982	-12.018	-0.036	(0)
HF2-	1.201e-13	1.112e-13	-12.920	-12.954	-0.033	(0)
CdF+	6.521e-14	6.003e-14	-13.186	-13.222	-0.036	(0)
AgF	7.388e-15	7.388e-15	-14.131	-14.131	0.000	(0)
BF2 (OH) 2-	6.103e-15	5.643e-15	-14.214	-14.248	-0.034	(0)
PbF+	3.220e-15	2.964e-15	-14.492	-14.528	-0.036	(0)
AlF2+	3.180e-15	2.955e-15	-14.498	-14.529	-0.032	(0)
AlF3	2.672e-15	2.672e-15	-14.573	-14.573	0.000	(0)
UO2F+	1.712e-15	1.576e-15	-14.766	-14.802	-0.036	(0)
UO2F2	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
CrF+2	2.193e-16	1.575e-16	-15.659	-15.803	-0.144	(0)
AlF+2	1.387e-16	1.033e-16	-15.858	-15.986	-0.128	(0)
AlF4-	1.037e-16	9.620e-17	-15.984	-16.017	-0.033	(0)
CdF2	8.604e-18	8.604e-18	-17.065	-17.065	0.000	(0)
UO2F3-	6.400e-18	5.892e-18	-17.194	-17.230	-0.036	(0)
PbF2	4.190e-18	4.190e-18	-17.378	-17.378	0.000	(0)
H2F2	4.446e-19	4.446e-19	-18.352	-18.352	0.000	(0)
FeF2+	1.427e-20	1.325e-20	-19.846	-19.878	-0.032	(0)
FeF+2	9.274e-21	6.893e-21	-20.033	-20.162	-0.129	(0)
UO2F4-2	4.681e-21	3.362e-21	-20.330	-20.473	-0.144	(0)
FeF3	1.343e-21	1.343e-21	-20.872	-20.872	0.000	(0)
VO2F	1.030e-21	1.030e-21	-20.987	-20.987	0.000	(0)
BF3OH-	6.539e-22	6.047e-22	-21.184	-21.218	-0.034	(0)
PbF3-	6.201e-22	5.708e-22	-21.208	-21.243	-0.036	(0)
VO2F2-	2.918e-23	2.686e-23	-22.535	-22.571	-0.036	(0)
VOF+	1.982e-25	1.824e-25	-24.703	-24.739	-0.036	(0)

VO2F3-2	3.351e-26	2.407e-26	-25.475	-25.619	-0.144	(0)
PbF4-2	2.733e-26	1.963e-26	-25.563	-25.707	-0.144	(0)
VOF2	4.914e-27	4.914e-27	-26.309	-26.309	0.000	(0)
HgF+	3.721e-27	3.426e-27	-26.429	-26.465	-0.036	(0)
BF4-	8.862e-28	8.196e-28	-27.052	-27.086	-0.034	(0)
Sb(OH) 2F	3.010e-29	3.010e-29	-28.521	-28.521	0.000	(0)
SbOF	2.960e-29	2.960e-29	-28.529	-28.529	0.000	(0)
VOF3-	1.361e-29	1.252e-29	-28.866	-28.902	-0.036	(0)
VO2F4-3	1.792e-30	8.507e-31	-29.747	-30.070	-0.324	(0)
SiF6-2	1.856e-32	1.380e-32	-31.731	-31.860	-0.129	(0)
VOF4-2	5.057e-33	3.632e-33	-32.296	-32.440	-0.144	(0)
UF3+	1.757e-40	1.618e-40	-39.755	-39.791	-0.036	(0)
UF2+2	0.000e+00	0.000e+00	-40.704	-40.847	-0.144	(0)
UF4	0.000e+00	0.000e+00	-41.895	-41.895	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.480	-43.804	-0.324	(0)
UF5-	0.000e+00	0.000e+00	-44.405	-44.440	-0.036	(0)
UF6-2	0.000e+00	0.000e+00	-45.960	-46.104	-0.144	(0)
Fe (2)	6.608e-14					
Fe+2	5.779e-14	4.150e-14	-13.238	-13.382	-0.144	(0)
FeOH+	4.673e-15	4.339e-15	-14.330	-14.363	-0.032	(0)
FeSO4	2.899e-15	2.899e-15	-14.538	-14.538	0.000	(0)
FeHCO3+	7.046e-16	6.552e-16	-15.152	-15.184	-0.032	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	8.095e-18	7.516e-18	-17.092	-17.124	-0.032	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-165.394	-165.394	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.802	-243.838	-0.036	(0)
Fe (3)	7.033e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	1.632e-10	1.516e-10	-9.787	-9.819	-0.032	(0)
Fe (OH) 4-	1.125e-10	1.045e-10	-9.949	-9.981	-0.032	(0)
FeOH+2	1.996e-16	1.484e-16	-15.700	-15.829	-0.129	(0)
FeF2+	1.427e-20	1.325e-20	-19.846	-19.878	-0.032	(0)
FeF+2	9.274e-21	6.893e-21	-20.033	-20.162	-0.129	(0)
FeF3	1.343e-21	1.343e-21	-20.872	-20.872	0.000	(0)
FeSO4+	3.009e-22	2.794e-22	-21.522	-21.554	-0.032	(0)
Fe+3	1.728e-22	8.752e-23	-21.763	-22.058	-0.295	(0)
FeCl+2	6.177e-24	4.591e-24	-23.209	-23.338	-0.129	(0)
Fe (SO4) 2-	1.846e-24	1.700e-24	-23.734	-23.770	-0.036	(0)
FeCl2+	3.837e-26	3.563e-26	-25.416	-25.448	-0.032	(0)
FeHSeO3+2	2.313e-28	1.661e-28	-27.636	-27.780	-0.144	(0)
FeCl3	6.189e-30	6.189e-30	-29.208	-29.208	0.000	(0)
Fe2 (OH) 2+4	2.741e-30	7.291e-31	-29.562	-30.137	-0.575	(0)
FeNO3+2	7.171e-32	5.150e-32	-31.144	-31.288	-0.144	(0)
Fe3 (OH) 4+5	1.265e-38	1.598e-39	-37.898	-38.797	-0.899	(0)
H (0)	4.034e-29					
H2	2.017e-29	2.019e-29	-28.695	-28.695	0.000	(0)
Hg (0)	2.305e-11					
Hg	2.305e-11	2.305e-11	-10.637	-10.637	0.000	(0)
Hg (1)	5.606e-26					
Hg2+2	2.803e-26	2.013e-26	-25.552	-25.696	-0.144	(0)
Hg (2)	6.670e-14					
Hg (OH) 2	5.592e-14	5.598e-14	-13.252	-13.252	0.000	(0)
HgClOH	1.036e-14	1.036e-14	-13.984	-13.984	0.000	(0)
HgCl2	3.882e-16	3.882e-16	-15.411	-15.411	0.000	(0)
HgCO3	2.361e-17	2.361e-17	-16.627	-16.627	0.000	(0)
HgCl3-	7.326e-18	6.744e-18	-17.135	-17.171	-0.036	(0)
Hg (CO3) 2-2	1.594e-18	1.145e-18	-17.797	-17.941	-0.144	(0)
HgOH+	1.461e-19	1.345e-19	-18.835	-18.871	-0.036	(0)
HgCl4-2	6.495e-20	4.664e-20	-19.187	-19.331	-0.144	(0)
HgCl+	4.844e-20	4.459e-20	-19.315	-19.351	-0.036	(0)
Hg (OH) 3-	2.010e-20	1.851e-20	-19.697	-19.733	-0.036	(0)
HgHCO3+	1.831e-21	1.686e-21	-20.737	-20.773	-0.036	(0)
Hg+2	1.791e-24	1.287e-24	-23.747	-23.891	-0.144	(0)
HgSO4	9.584e-26	9.584e-26	-25.018	-25.018	0.000	(0)
HgNH3+2	1.150e-26	8.259e-27	-25.939	-26.083	-0.144	(0)
HgF+	3.721e-27	3.426e-27	-26.429	-26.465	-0.036	(0)
Hg (NH3) 2+2	1.170e-28	8.402e-29	-27.932	-28.076	-0.144	(0)
HgNO3+	3.037e-35	2.795e-35	-34.518	-34.554	-0.036	(0)

	Hg (NH3) 3+2	4.739e-39	3.403e-39	-38.324	-38.468	-0.144	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.165	-45.165	0.000	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-48.417	-48.561	-0.144	(0)
	HgHS2-	0.000e+00	0.000e+00	-144.472	-144.508	-0.036	(0)
	HgS2-2	0.000e+00	0.000e+00	-144.656	-144.800	-0.144	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-146.531	-146.531	0.000	(0)
K	1.256e-04						
	K+	1.253e-04	1.162e-04	-3.902	-3.935	-0.033	(0)
	KSO4-	2.519e-07	2.341e-07	-6.599	-6.631	-0.032	(0)
	KCrO4-	1.845e-17	1.699e-17	-16.734	-16.770	-0.036	(0)
Mg	1.427e-04						
	Mg+2	1.340e-04	9.901e-05	-3.873	-4.004	-0.131	(0)
	MgSO4	5.126e-06	5.126e-06	-5.290	-5.290	0.000	(0)
	MgHCO3+	1.370e-06	1.270e-06	-5.863	-5.896	-0.033	(0)
	MgCO3	1.263e-06	1.263e-06	-5.899	-5.899	0.000	(0)
	MgF+	8.601e-07	7.980e-07	-6.065	-6.098	-0.033	(0)
	MgOH+	1.112e-07	1.035e-07	-6.954	-6.985	-0.031	(0)
	MgH2BO3+	3.760e-09	3.477e-09	-8.425	-8.459	-0.034	(0)
Mn (2)	7.045e-07						
	Mn+2	6.617e-07	4.752e-07	-6.179	-6.323	-0.144	(0)
	MnSO4	2.404e-08	2.404e-08	-7.619	-7.619	0.000	(0)
	MnHCO3+	1.280e-08	1.189e-08	-7.893	-7.925	-0.032	(0)
	MnOH+	3.376e-09	3.134e-09	-8.472	-8.504	-0.032	(0)
	MnF+	1.463e-09	1.359e-09	-8.835	-8.867	-0.032	(0)
	MnCl+	1.119e-09	1.039e-09	-8.951	-8.983	-0.032	(0)
	MnCl2	2.550e-12	2.550e-12	-11.593	-11.593	0.000	(0)
	MnCl3-	1.314e-15	1.220e-15	-14.881	-14.914	-0.032	(0)
	MnSeO4	4.132e-16	4.132e-16	-15.384	-15.384	0.000	(0)
	Mn (OH) 3-	1.439e-16	1.336e-16	-15.842	-15.874	-0.032	(0)
	MnNO3+	4.814e-17	4.432e-17	-16.317	-16.353	-0.036	(0)
	Mn (OH) 4-2	1.524e-21	1.133e-21	-20.817	-20.946	-0.129	(0)
	Mn (NO3) 2	6.550e-27	6.550e-27	-26.184	-26.184	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-44.210	-44.210	0.000	(0)
Mn (3)	9.511e-28						
	Mn+3	9.511e-28	4.818e-28	-27.022	-27.317	-0.295	(0)
Mn (6)	1.375e-40						
	MnO4-2	1.375e-40	1.022e-40	-39.862	-39.990	-0.129	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.973	-45.006	-0.034	(0)
Mo	1.768e-08						
	MoO4-2	1.767e-08	1.306e-08	-7.753	-7.884	-0.131	(0)
	HMoO4-	1.083e-12	9.966e-13	-11.966	-12.001	-0.036	(0)
	H2MoO4	2.799e-17	2.799e-17	-16.553	-16.553	0.000	(0)
	Ag2MoO4	8.291e-30	8.291e-30	-29.081	-29.081	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-61.328	-61.651	-0.324	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-68.234	-69.528	-1.294	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-70.659	-71.558	-0.899	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-74.617	-75.192	-0.575	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-80.039	-80.362	-0.324	(0)
N (-3)	8.438e-11						
	NH4+	7.398e-11	6.841e-11	-10.131	-10.165	-0.034	(0)
	NH3	1.017e-11	1.017e-11	-10.993	-10.993	0.000	(0)
	NH4SO4-	2.246e-13	2.086e-13	-12.649	-12.681	-0.032	(0)
	CaNH3+2	3.851e-15	2.766e-15	-14.414	-14.558	-0.144	(0)
	CuNH3+2	5.059e-17	3.633e-17	-16.296	-16.440	-0.144	(0)
	NiNH3+2	4.242e-18	3.047e-18	-17.372	-17.516	-0.144	(0)
	AgNH3+	9.240e-19	8.506e-19	-18.034	-18.070	-0.036	(0)
	Co (NH3) +2	7.199e-19	5.170e-19	-18.143	-18.287	-0.144	(0)
	BaNH3+2	6.010e-21	4.316e-21	-20.221	-20.365	-0.144	(0)
	Ag (NH3) 2+	7.641e-26	7.034e-26	-25.117	-25.153	-0.036	(0)
	Ca (NH3) 2+2	1.560e-26	1.120e-26	-25.807	-25.951	-0.144	(0)
	HgNH3+2	1.150e-26	8.259e-27	-25.939	-26.083	-0.144	(0)
	Ni (NH3) 2+2	6.239e-27	4.480e-27	-26.205	-26.349	-0.144	(0)
	Co (NH3) 2+2	3.124e-28	2.244e-28	-27.505	-27.649	-0.144	(0)
	Hg (NH3) 2+2	1.170e-28	8.402e-29	-27.932	-28.076	-0.144	(0)
	Co (NH3) 3+2	4.002e-38	2.874e-38	-37.398	-37.542	-0.144	(0)
	Hg (NH3) 3+2	4.739e-39	3.403e-39	-38.324	-38.468	-0.144	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-47.670	-47.814	-0.144	(0)

	Hg (NH3) 4+2	0.000e+00	0.000e+00	-48.417	-48.561	-0.144	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-56.886	-57.030	-0.144	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-58.443	-58.587	-0.144	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-66.735	-66.879	-0.144	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-69.491	-69.814	-0.324	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.328	-71.472	-0.144	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-80.412	-80.448	-0.036	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-83.064	-83.208	-0.144	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-84.443	-84.587	-0.144	(0)
N (3)	6.739e-08						
	NO2-	6.739e-08	6.237e-08	-7.171	-7.205	-0.034	(0)
	CuNO2+	2.476e-15	2.279e-15	-14.606	-14.642	-0.036	(0)
	AgNO2	5.336e-16	5.336e-16	-15.273	-15.273	0.000	(0)
	CoNO2+	2.018e-16	1.858e-16	-15.695	-15.731	-0.036	(0)
	Cu (NO2) 2	1.455e-21	1.455e-21	-20.837	-20.837	0.000	(0)
	Ag (NO2) 2-	5.600e-23	5.155e-23	-22.252	-22.288	-0.036	(0)
N (5)	6.351e-11						
	NO3-	6.346e-11	5.884e-11	-10.197	-10.230	-0.033	(0)
	CaNO3+	4.365e-14	4.018e-14	-13.360	-13.396	-0.036	(0)
	MnNO3+	4.814e-17	4.432e-17	-16.317	-16.353	-0.036	(0)
	ZnNO3+	2.316e-17	2.132e-17	-16.635	-16.671	-0.036	(0)
	BaNO3+	2.154e-19	1.983e-19	-18.667	-18.703	-0.036	(0)
	NiNO3+	8.953e-20	8.242e-20	-19.048	-19.084	-0.036	(0)
	CuNO3+	7.055e-20	6.494e-20	-19.152	-19.187	-0.036	(0)
	CoNO3+	4.282e-20	3.942e-20	-19.368	-19.404	-0.036	(0)
	CdNO3+	1.066e-20	9.813e-21	-19.972	-20.008	-0.036	(0)
	AgNO3	1.914e-21	1.914e-21	-20.718	-20.718	0.000	(0)
	PbNO3+	5.536e-22	5.096e-22	-21.257	-21.293	-0.036	(0)
	UO2NO3+	2.027e-26	1.866e-26	-25.693	-25.729	-0.036	(0)
	Mn (NO3) 2	6.550e-27	6.550e-27	-26.184	-26.184	0.000	(0)
	Zn (NO3) 2	2.503e-28	2.503e-28	-27.602	-27.602	0.000	(0)
	CrNO3+2	4.956e-29	3.559e-29	-28.305	-28.449	-0.144	(0)
	Co (NO3) 2	4.720e-30	4.720e-30	-29.326	-29.326	0.000	(0)
	Cu (NO3) 2	4.811e-31	4.811e-31	-30.318	-30.318	0.000	(0)
	Cd (NO3) 2	2.894e-31	2.894e-31	-30.539	-30.539	0.000	(0)
	VO2NO3	2.433e-31	2.433e-31	-30.614	-30.614	0.000	(0)
	FeNO3+2	7.171e-32	5.150e-32	-31.144	-31.288	-0.144	(0)
	Pb (NO3) 2	5.093e-32	5.093e-32	-31.293	-31.293	0.000	(0)
	HgNO3+	3.037e-35	2.795e-35	-34.518	-34.554	-0.036	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.165	-45.165	0.000	(0)
Na	3.155e-03						
	Na+	3.147e-03	2.918e-03	-2.502	-2.535	-0.033	(0)
	NaSO4-	4.800e-06	4.459e-06	-5.319	-5.351	-0.032	(0)
	NaHCO3	2.058e-06	2.058e-06	-5.687	-5.687	0.000	(0)
	NaCO3-	8.969e-07	8.333e-07	-6.047	-6.079	-0.032	(0)
	NaF	1.323e-07	1.323e-07	-6.879	-6.879	0.000	(0)
	NaH2BO3	4.685e-09	4.685e-09	-8.329	-8.329	0.000	(0)
	NaCrO4-	6.199e-16	5.706e-16	-15.208	-15.244	-0.036	(0)
Ni	1.226e-09						
	Ni+2	7.544e-10	5.576e-10	-9.122	-9.254	-0.131	(0)
	NiCO3	3.190e-10	3.190e-10	-9.496	-9.496	0.000	(0)
	NiHCO3+	9.365e-11	8.621e-11	-10.029	-10.064	-0.036	(0)
	NiSO4	3.166e-11	3.166e-11	-10.500	-10.500	0.000	(0)
	NiOH+	2.003e-11	1.843e-11	-10.698	-10.734	-0.036	(0)
	Ni (OH) 2	3.845e-12	3.845e-12	-11.415	-11.415	0.000	(0)
	NiCl+	2.692e-12	2.478e-12	-11.570	-11.606	-0.036	(0)
	NiF+	1.093e-12	1.006e-12	-11.961	-11.997	-0.036	(0)
	Ni (OH) 3-	1.097e-14	1.010e-14	-13.960	-13.996	-0.036	(0)
	Ni (SO4) 2-2	4.153e-16	2.983e-16	-15.382	-15.525	-0.144	(0)
	NiCl2	2.168e-17	2.168e-17	-16.664	-16.664	0.000	(0)
	NiNH3+2	4.242e-18	3.047e-18	-17.372	-17.516	-0.144	(0)
	NiSeO4	8.428e-19	8.428e-19	-18.074	-18.074	0.000	(0)
	NiNO3+	8.953e-20	8.242e-20	-19.048	-19.084	-0.036	(0)
	Ni (NH3) 2+2	6.239e-27	4.480e-27	-26.205	-26.349	-0.144	(0)
O (0)	2.482e-35						
	O2	1.241e-35	1.243e-35	-34.906	-34.906	0.000	(0)
Pb	3.468e-11						
	PbCO3	2.699e-11	2.699e-11	-10.569	-10.569	0.000	(0)

PbOH+	4.196e-12	3.862e-12	-11.377	-11.413	-0.036	(0)
Pb(CO3) 2-2	1.662e-12	1.194e-12	-11.779	-11.923	-0.144	(0)
Pb+2	7.922e-13	5.855e-13	-12.101	-12.232	-0.131	(0)
PbHCO3+	5.926e-13	5.456e-13	-12.227	-12.263	-0.036	(0)
Pb(OH) 2	3.207e-13	3.207e-13	-12.494	-12.494	0.000	(0)
PbSO4	8.160e-14	8.160e-14	-13.088	-13.088	0.000	(0)
PbCl+	3.920e-14	3.609e-14	-13.407	-13.443	-0.036	(0)
PbF+	3.220e-15	2.964e-15	-14.492	-14.528	-0.036	(0)
Pb(OH) 3-	9.150e-16	8.423e-16	-15.039	-15.075	-0.036	(0)
PbCl2	2.800e-16	2.800e-16	-15.553	-15.553	0.000	(0)
Pb(SO4) 2-2	1.948e-16	1.399e-16	-15.710	-15.854	-0.144	(0)
PbF2	4.190e-18	4.190e-18	-17.378	-17.378	0.000	(0)
Pb(OH) 4-2	7.543e-19	5.417e-19	-18.122	-18.266	-0.144	(0)
PbCl3-	2.104e-19	1.937e-19	-18.677	-18.713	-0.036	(0)
PbF3-	6.201e-22	5.708e-22	-21.208	-21.243	-0.036	(0)
PbNO3+	5.536e-22	5.096e-22	-21.257	-21.293	-0.036	(0)
PbCl4-2	2.141e-22	1.538e-22	-21.669	-21.813	-0.144	(0)
Pb2OH+3	7.549e-23	3.584e-23	-22.122	-22.446	-0.324	(0)
PbF4-2	2.733e-26	1.963e-26	-25.563	-25.707	-0.144	(0)
Pb3(OH) 4+2	1.674e-27	1.202e-27	-26.776	-26.920	-0.144	(0)
Pb(NO3) 2	5.093e-32	5.093e-32	-31.293	-31.293	0.000	(0)
Pb4(OH) 4+4	2.102e-35	5.590e-36	-34.677	-35.253	-0.575	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-157.925	-157.925	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-237.070	-237.106	-0.036	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-77.054	-77.054	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.445	-80.481	-0.036	(0)
S5-2	0.000e+00	0.000e+00	-81.286	-81.430	-0.144	(0)
S6-2	0.000e+00	0.000e+00	-81.802	-81.946	-0.144	(0)
H2S	0.000e+00	0.000e+00	-81.877	-81.877	0.000	(0)
S4-2	0.000e+00	0.000e+00	-81.882	-82.025	-0.144	(0)
S3-2	0.000e+00	0.000e+00	-82.688	-82.831	-0.144	(0)
CdHS+	0.000e+00	0.000e+00	-82.715	-82.751	-0.036	(0)
S2-2	0.000e+00	0.000e+00	-83.704	-83.847	-0.144	(0)
S-2	0.000e+00	0.000e+00	-89.236	-89.365	-0.129	(0)
HgHS2-	0.000e+00	0.000e+00	-144.472	-144.508	-0.036	(0)
HgS2-2	0.000e+00	0.000e+00	-144.656	-144.800	-0.144	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-146.531	-146.531	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-151.651	-151.863	-0.211	(0)
CuS4S5-3	0.000e+00	0.000e+00	-152.388	-152.593	-0.205	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-152.396	-152.502	-0.107	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-152.541	-152.577	-0.036	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-153.312	-153.526	-0.214	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-153.399	-153.435	-0.036	(0)
AgS4S5-3	0.000e+00	0.000e+00	-153.629	-153.837	-0.208	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.983	-154.983	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-156.028	-156.028	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-157.925	-157.925	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-165.394	-165.394	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-224.965	-225.001	-0.036	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-232.148	-232.184	-0.036	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.604	-233.748	-0.144	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-234.573	-234.609	-0.036	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-237.070	-237.106	-0.036	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-243.802	-243.838	-0.036	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-312.750	-312.894	-0.144	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-313.981	-314.125	-0.144	(0)
Sb2S4-2	0.000e+00	0.000e+00	-333.535	-333.678	-0.144	(0)
S(6)	4.092e-04					
SO4-2	3.850e-04	2.845e-04	-3.415	-3.546	-0.131	(0)
CaSO4	1.408e-05	1.408e-05	-4.852	-4.852	0.000	(0)
MgSO4	5.126e-06	5.126e-06	-5.290	-5.290	0.000	(0)
NaSO4-	4.800e-06	4.459e-06	-5.319	-5.351	-0.032	(0)
KSO4-	2.519e-07	2.341e-07	-6.599	-6.631	-0.032	(0)
MnSO4	2.404e-08	2.404e-08	-7.619	-7.619	0.000	(0)
ZnSO4	8.977e-09	8.977e-09	-8.047	-8.047	0.000	(0)
HSO4-	1.149e-10	1.066e-10	-9.940	-9.972	-0.033	(0)
NiSO4	3.166e-11	3.166e-11	-10.500	-10.500	0.000	(0)

Zn(SO4) 2-2	3.098e-11	2.225e-11	-10.509	-10.653	-0.144	(0)
CoSO4	2.399e-11	2.399e-11	-10.620	-10.620	0.000	(0)
CuSO4	2.275e-11	2.275e-11	-10.643	-10.643	0.000	(0)
CdSO4	3.517e-12	3.517e-12	-11.454	-11.454	0.000	(0)
AgSO4-	2.525e-13	2.325e-13	-12.598	-12.634	-0.036	(0)
NH4SO4-	2.246e-13	2.086e-13	-12.649	-12.681	-0.032	(0)
PbSO4	8.160e-14	8.160e-14	-13.088	-13.088	0.000	(0)
CrOHSO4	5.367e-14	5.367e-14	-13.270	-13.270	0.000	(0)
Cd(SO4) 2-2	1.880e-14	1.350e-14	-13.726	-13.870	-0.144	(0)
FeSO4	2.899e-15	2.899e-15	-14.538	-14.538	0.000	(0)
Ni(SO4) 2-2	4.153e-16	2.983e-16	-15.382	-15.525	-0.144	(0)
Pb(SO4) 2-2	1.948e-16	1.399e-16	-15.710	-15.854	-0.144	(0)
UO2SO4	6.845e-17	6.845e-17	-16.165	-16.165	0.000	(0)
CrSO4+	9.986e-18	9.192e-18	-17.001	-17.037	-0.036	(0)
UO2(SO4) 2-2	3.575e-19	2.568e-19	-18.447	-18.590	-0.144	(0)
AlSO4+	3.424e-19	3.177e-19	-18.465	-18.498	-0.033	(0)
Al(SO4) 2-	1.044e-21	9.686e-22	-20.981	-21.014	-0.033	(0)
FeSO4+	3.009e-22	2.794e-22	-21.522	-21.554	-0.032	(0)
VO2SO4-	6.033e-23	5.554e-23	-22.219	-22.255	-0.036	(0)
Cr2(OH) 2SO4+2	5.369e-24	3.856e-24	-23.270	-23.414	-0.144	(0)
Fe(SO4) 2-	1.846e-24	1.700e-24	-23.734	-23.770	-0.036	(0)
CrO3SO4-2	2.259e-25	1.622e-25	-24.646	-24.790	-0.144	(0)
HgSO4	9.584e-26	9.584e-26	-25.018	-25.018	0.000	(0)
Cr2(OH) 2(SO4) 2	6.517e-26	6.517e-26	-25.186	-25.186	0.000	(0)
VOSO4	3.318e-26	3.318e-26	-25.479	-25.479	0.000	(0)
VSO4+	0.000e+00	0.000e+00	-40.702	-40.738	-0.036	(0)
U(SO4) 2	0.000e+00	0.000e+00	-45.552	-45.552	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.762	-45.906	-0.144	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-80.412	-80.448	-0.036	(0)
Sb(3)	1.383e-22					
Sb(OH) 3	6.995e-23	6.995e-23	-22.155	-22.155	0.000	(0)
HSbO2	6.829e-23	6.829e-23	-22.166	-22.166	0.000	(0)
SbO2-	3.134e-26	2.885e-26	-25.504	-25.540	-0.036	(0)
Sb(OH) 4-	1.795e-26	1.653e-26	-25.746	-25.782	-0.036	(0)
Sb(OH) 2F	3.010e-29	3.010e-29	-28.521	-28.521	0.000	(0)
SbOF	2.960e-29	2.960e-29	-28.529	-28.529	0.000	(0)
Sb(OH) 2+	7.075e-30	6.513e-30	-29.150	-29.186	-0.036	(0)
SbO+	2.440e-30	2.246e-30	-29.613	-29.649	-0.036	(0)
Sb2S4-2	0.000e+00	0.000e+00	-333.535	-333.678	-0.144	(0)
Sb(5)	2.913e-10					
SbO3-	2.909e-10	2.678e-10	-9.536	-9.572	-0.036	(0)
Sb(OH) 6-	3.377e-13	3.132e-13	-12.471	-12.504	-0.033	(0)
SbO2+	1.227e-27	1.129e-27	-26.911	-26.947	-0.036	(0)
Se(-2)	4.306e-19					
Ag2Se	4.306e-19	4.306e-19	-18.366	-18.366	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.882	-40.918	-0.036	(0)
MnSe	0.000e+00	0.000e+00	-44.210	-44.210	0.000	(0)
H2Se	0.000e+00	0.000e+00	-45.444	-45.444	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.358	-47.501	-0.144	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-86.908	-87.483	-0.575	(0)
Se(4)	1.819e-09					
SeO3-2	1.039e-09	7.459e-10	-8.984	-9.127	-0.144	(0)
HSeO3-	7.803e-10	7.183e-10	-9.108	-9.144	-0.036	(0)
H2SeO3	1.175e-15	1.175e-15	-14.930	-14.930	0.000	(0)
AgSeO3-	2.132e-17	1.963e-17	-16.671	-16.707	-0.036	(0)
Cd(SeO3) 2-2	3.367e-23	2.418e-23	-22.473	-22.617	-0.144	(0)
Ag(SeO3) 2-3	2.761e-25	1.311e-25	-24.559	-24.882	-0.324	(0)
FeHSeO3+2	2.313e-28	1.661e-28	-27.636	-27.780	-0.144	(0)
Se(6)	4.372e-12					
SeO4-2	4.372e-12	3.231e-12	-11.359	-11.491	-0.131	(0)
MnSeO4	4.132e-16	4.132e-16	-15.384	-15.384	0.000	(0)
ZnSeO4	7.217e-17	7.217e-17	-16.142	-16.142	0.000	(0)
NiSeO4	8.428e-19	8.428e-19	-18.074	-18.074	0.000	(0)
CoSeO4	6.845e-19	6.845e-19	-18.165	-18.165	0.000	(0)
HSeO4-	6.744e-19	6.209e-19	-18.171	-18.207	-0.036	(0)
CdSeO4	3.173e-20	3.173e-20	-19.499	-19.499	0.000	(0)
Zn(SeO4) 2-2	3.293e-28	2.365e-28	-27.482	-27.626	-0.144	(0)
Si	3.191e-04					

H4SiO4	3.066e-04	3.069e-04	-3.513	-3.513	0.000	(0)
H3SiO4-	1.248e-05	1.157e-05	-4.904	-4.937	-0.033	(0)
H2SiO4-2	2.556e-10	1.904e-10	-9.592	-9.720	-0.128	(0)
UO2H3SiO4+	1.696e-13	1.562e-13	-12.770	-12.806	-0.036	(0)
SiF6-2	1.856e-32	1.380e-32	-31.731	-31.860	-0.129	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.789	-62.112	-0.324	(0)
U (4)	1.090e-20					
U (OH) 5-	1.090e-20	1.003e-20	-19.963	-19.999	-0.036	(0)
U (OH) 4	1.611e-24	1.611e-24	-23.793	-23.793	0.000	(0)
U (OH) 3+	2.453e-29	2.259e-29	-28.610	-28.646	-0.036	(0)
U (OH) 2+2	5.576e-35	4.004e-35	-34.254	-34.397	-0.144	(0)
UF3+	1.757e-40	1.618e-40	-39.755	-39.791	-0.036	(0)
UF2+2	0.000e+00	0.000e+00	-40.704	-40.847	-0.144	(0)
UOH+3	0.000e+00	0.000e+00	-40.817	-41.141	-0.324	(0)
UF4	0.000e+00	0.000e+00	-41.895	-41.895	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.480	-43.804	-0.324	(0)
UF5-	0.000e+00	0.000e+00	-44.405	-44.440	-0.036	(0)
U (SO4) 2	0.000e+00	0.000e+00	-45.552	-45.552	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.762	-45.906	-0.144	(0)
UF6-2	0.000e+00	0.000e+00	-45.960	-46.104	-0.144	(0)
U+4	0.000e+00	0.000e+00	-48.385	-48.960	-0.575	(0)
UCl+3	0.000e+00	0.000e+00	-49.697	-50.020	-0.324	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-181.759	-184.671	-2.912	(0)
U (5)	4.637e-18					
UO2+	4.637e-18	4.268e-18	-17.334	-17.370	-0.036	(0)
U (6)	1.272e-08					
UO2 (CO3) 3-4	8.579e-09	2.282e-09	-8.067	-8.642	-0.575	(0)
UO2 (CO3) 2-2	4.134e-09	2.969e-09	-8.384	-8.527	-0.144	(0)
UO2CO3	9.704e-12	9.704e-12	-11.013	-11.013	0.000	(0)
UO2H3SiO4+	1.696e-13	1.562e-13	-12.770	-12.806	-0.036	(0)
UO2OH+	5.709e-14	5.255e-14	-13.243	-13.279	-0.036	(0)
UO2F+	1.712e-15	1.576e-15	-14.766	-14.802	-0.036	(0)
UO2F2	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
UO2+2	2.151e-16	1.590e-16	-15.667	-15.799	-0.131	(0)
UO2SO4	6.845e-17	6.845e-17	-16.165	-16.165	0.000	(0)
UO2F3-	6.400e-18	5.892e-18	-17.194	-17.230	-0.036	(0)
UO2Cl+	4.865e-19	4.478e-19	-18.313	-18.349	-0.036	(0)
UO2 (SO4) 2-2	3.575e-19	2.568e-19	-18.447	-18.590	-0.144	(0)
(UO2) 2 (OH) 2+2	6.382e-21	4.583e-21	-20.195	-20.339	-0.144	(0)
UO2F4-2	4.681e-21	3.362e-21	-20.330	-20.473	-0.144	(0)
(UO2) 3 (OH) 5+	1.369e-21	1.260e-21	-20.864	-20.900	-0.036	(0)
UO2NO3+	2.027e-26	1.866e-26	-25.693	-25.729	-0.036	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-46.567	-46.603	-0.036	(0)
V+2	0.000e+00	0.000e+00	-48.388	-48.532	-0.144	(0)
V (3)	1.989e-18					
V (OH) 3	1.989e-18	1.989e-18	-17.701	-17.701	0.000	(0)
V (OH) 2+	5.354e-30	4.929e-30	-29.271	-29.307	-0.036	(0)
VOH+2	2.496e-34	1.792e-34	-33.603	-33.747	-0.144	(0)
V+3	2.868e-40	1.362e-40	-39.542	-39.866	-0.324	(0)
VSO4+	0.000e+00	0.000e+00	-40.702	-40.738	-0.036	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-64.278	-64.602	-0.324	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-66.118	-66.693	-0.575	(0)
V (4)	2.418e-22					
V (OH) 3+	2.410e-22	2.218e-22	-21.618	-21.654	-0.036	(0)
VO+2	5.896e-25	4.234e-25	-24.229	-24.373	-0.144	(0)
VOF+	1.982e-25	1.824e-25	-24.703	-24.739	-0.036	(0)
VOSO4	3.318e-26	3.318e-26	-25.479	-25.479	0.000	(0)
VOF2	4.914e-27	4.914e-27	-26.309	-26.309	0.000	(0)
VOC1+	2.242e-27	2.064e-27	-26.649	-26.685	-0.036	(0)
VOF3-	1.361e-29	1.252e-29	-28.866	-28.902	-0.036	(0)
VOF4-2	5.057e-33	3.632e-33	-32.296	-32.440	-0.144	(0)
H2V2O4+2	3.435e-39	2.467e-39	-38.464	-38.608	-0.144	(0)
V (5)	5.570e-11					
H2VO4-	3.027e-11	2.787e-11	-10.519	-10.555	-0.036	(0)
HVO4-2	2.542e-11	1.826e-11	-10.595	-10.739	-0.144	(0)
H3VO4	1.068e-15	1.068e-15	-14.971	-14.971	0.000	(0)

VO4-3	5.027e-17	2.387e-17	-16.299	-16.622	-0.324	(0)
HV2O7-3	3.632e-19	1.724e-19	-18.440	-18.763	-0.324	(0)
H3V2O7-	2.088e-19	1.922e-19	-18.680	-18.716	-0.036	(0)
VO2+	8.816e-21	8.175e-21	-20.055	-20.088	-0.033	(0)
V2O7-4	4.551e-21	1.210e-21	-20.342	-20.917	-0.575	(0)
VO2F	1.030e-21	1.030e-21	-20.987	-20.987	0.000	(0)
VO2SO4-	6.033e-23	5.554e-23	-22.219	-22.255	-0.036	(0)
VO2F2-	2.918e-23	2.686e-23	-22.535	-22.571	-0.036	(0)
V3O9-3	4.775e-26	2.267e-26	-25.321	-25.645	-0.324	(0)
VO2F3-2	3.351e-26	2.407e-26	-25.475	-25.619	-0.144	(0)
VO2F4-3	1.792e-30	8.507e-31	-29.747	-30.070	-0.324	(0)
VO2NO3	2.433e-31	2.433e-31	-30.614	-30.614	0.000	(0)
V4O12-4	9.901e-34	2.634e-34	-33.004	-33.579	-0.575	(0)
V10O28-6	0.000e+00	0.000e+00	-89.014	-90.308	-1.294	(0)
HV10O28-5	0.000e+00	0.000e+00	-89.639	-90.538	-0.899	(0)
H2V10O28-4	0.000e+00	0.000e+00	-93.172	-93.747	-0.575	(0)
Zn	3.978e-07					
Zn+2	1.951e-07	1.442e-07	-6.710	-6.841	-0.131	(0)
ZnCO3	1.273e-07	1.273e-07	-6.895	-6.895	0.000	(0)
ZnOH+	4.114e-08	3.787e-08	-7.386	-7.422	-0.036	(0)
Zn(OH) 2	1.576e-08	1.576e-08	-7.802	-7.802	0.000	(0)
ZnSO4	8.977e-09	8.977e-09	-8.047	-8.047	0.000	(0)
ZnHCO3+	6.212e-09	5.719e-09	-8.207	-8.243	-0.036	(0)
ZnOHC1	2.163e-09	2.163e-09	-8.665	-8.665	0.000	(0)
ZnCl+	6.788e-10	6.293e-10	-9.168	-9.201	-0.033	(0)
Zn(OH) 3-	2.254e-10	2.075e-10	-9.647	-9.683	-0.036	(0)
ZnF+	2.245e-10	2.067e-10	-9.649	-9.685	-0.036	(0)
Zn(SO4) 2-2	3.098e-11	2.225e-11	-10.509	-10.653	-0.144	(0)
ZnCl2	1.733e-12	1.733e-12	-11.761	-11.761	0.000	(0)
Zn(OH) 4-2	3.020e-14	2.169e-14	-13.520	-13.664	-0.144	(0)
ZnCl3-	2.579e-15	2.391e-15	-14.589	-14.621	-0.033	(0)
ZnSeO4	7.217e-17	7.217e-17	-16.142	-16.142	0.000	(0)
ZnNO3+	2.316e-17	2.132e-17	-16.635	-16.671	-0.036	(0)
ZnCl4-2	2.794e-18	2.077e-18	-17.554	-17.683	-0.129	(0)
Zn(SeO4) 2-2	3.293e-28	2.365e-28	-27.482	-27.626	-0.144	(0)
Zn(NO3) 2	2.503e-28	2.503e-28	-27.602	-27.602	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-152.541	-152.577	-0.036	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.983	-154.983	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-232.148	-232.184	-0.036	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.604	-233.748	-0.144	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-313.981	-314.125	-0.144	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-75.67	-69.38	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-58.95	-54.44	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-66.18	-54.44	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-96.53	-78.60	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-76.22	-56.19	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.14	-33.73	0.40	(NH4)2CrO4
(NH4)2SeO4	-32.27	-31.82	0.45	(NH4)2SeO4
Acanthite	-56.62	-92.84	-36.22	Ag2S
Ag2CO3	-14.50	-25.59	-11.09	Ag2CO3
Ag2CrO4	-22.59	-34.18	-11.59	Ag2CrO4
Ag2HVO4	-17.09	-15.61	1.48	Ag2HVO4
Ag2MoO4	-17.11	-28.66	-11.55	Ag2MoO4
Ag2O	-16.52	-3.94	12.57	Ag2O
Ag2Se	-4.58	-53.28	-48.70	Ag2Se
Ag2SeO3	-14.35	-21.50	-7.15	Ag2SeO3
Ag2SeO4	-23.36	-32.27	-8.91	Ag2SeO4
Ag2SO4	-19.50	-24.32	-4.82	Ag2SO4
Ag3AsO3	-30.66	-28.51	2.16	Ag3AsO3
Ag3AsO4	-19.07	-21.86	-2.79	Ag3AsO4
Ag3H2VO5	-22.77	-17.59	5.18	Ag3H2VO5
AgF:4H2O	-15.58	-14.53	1.05	AgF:4H2O
Agmetal	-1.24	-14.74	-13.51	Ag

AgVO3	-14.41	-13.64	0.77	AgVO3
Al (OH) 3 (am)	-4.39	6.41	10.80	Al (OH) 3
Al2 (MoO4) 3	-63.70	-61.34	2.37	Al2 (MoO4) 3
Al2O3	-6.84	12.81	19.65	Al2O3
Al4 (OH) 10SO4	-17.45	5.25	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-14.34	-9.54	4.80	AlAsO4:2H2O
AlOHSO4	-10.74	-13.97	-3.23	AlOHSO4
AlSb	-158.01	-92.38	65.62	AlSb
Alunite	-15.66	-17.06	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-7.99	-15.78	-7.79	PbSO4
Anhydrite	-2.85	-7.21	-4.36	CaSO4
Anilite	-59.24	-91.11	-31.88	Cu0.25Cu1.5S
Antlerite	-7.04	1.75	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-87.61	-90.37	-2.76	As4O6
Artinite	-5.59	4.01	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.60	-31.89	6.71	As2O5
Atacamite	-3.82	3.57	7.39	Cu2 (OH) 3Cl
Azurite	-4.26	-21.17	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.73	7.66	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-23.89	-8.02	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-33.30	-0.36	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-11.64	-17.46	-5.82	BaF2
BaMoO4	-10.10	-17.06	-6.96	BaMoO4
Barite	-2.74	-12.72	-9.98	BaSO4
BaS	-97.42	-81.24	16.18	BaS
BaSeO3	-11.73	-9.90	1.83	BaSeO3
BaSeO4	-13.20	-20.66	-7.46	BaSeO4
Bianchite	-8.62	-10.39	-1.76	ZnSO4:6H2O
Birnessite	-7.39	10.70	18.09	MnO2
Bixbyite	-3.49	-4.14	-0.64	Mn2O3
BlaubleiI	-58.64	-82.80	-24.16	Cu0.9Cu0.2S
BlaubleiII	-59.36	-86.64	-27.28	Cu0.6Cu0.8S
Boehmite	-2.17	6.41	8.58	AlOOH
Breithauptite	-59.92	-78.44	-18.52	NiSb
Brochantite	-6.10	9.12	15.22	Cu4 (OH) 6SO4
Brucite	-4.02	12.83	16.84	Mg (OH) 2
Bunsenite	-4.87	7.58	12.45	NiO
Ca (VO3) 2	-15.84	-10.18	5.66	Ca (VO3) 2
Ca2V2O7	-14.51	2.99	17.50	Ca2V2O7
Ca2V2O7:2H2O	-18.56	2.99	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.69	7.61	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-22.80	16.16	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.70	16.16	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-301.05	-158.08	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	-0.00	-8.48	-8.48	CaCO3
Calomel	-13.31	-31.22	-17.91	Hg2Cl2
CaMoO4	-3.60	-11.55	-7.95	CaMoO4
Carnotite	-6.39	-6.16	0.23	KUO2VO4
CaSeO3:2H2O	-7.21	-4.39	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.14	-15.16	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.63	-3.79	9.84	Cd (BO2) 2
Cd (OH) 2	-7.09	6.55	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.18	6.55	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-27.80	-21.09	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-23.27	-0.71	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-22.56	5.84	28.40	Cd4 (OH) 6SO4
CdCl2	-15.14	-15.80	-0.66	CdCl2
CdCl2:1H2O	-14.11	-15.80	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.89	-15.80	-1.91	CdCl2:2.5H2O
CdF2	-17.35	-18.57	-1.21	CdF2
Cdmetal (alpha)	-32.50	-18.99	13.51	Cd
Cdmetal (gamma)	-32.61	-18.99	13.62	Cd
CdMoO4	-4.01	-18.16	-14.15	CdMoO4
CdOHCl	-8.16	-4.62	3.54	CdOHCl

CdSb	-79.11	-79.46	-0.35	CdSb
CdSe	-22.58	-42.78	-20.20	CdSe
CdSeO4:2H2O	-19.92	-21.77	-1.85	CdSeO4:2H2O
CdSO4	-13.65	-13.82	-0.17	CdSO4
CdSO4:1H2O	-12.10	-13.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.95	-13.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.40	-13.15	-9.75	AgCl
Cerrusite	-3.92	-17.05	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-10.36	-13.00	-2.64	CuSO4:5H2O
Chalcedony	0.04	-3.51	-3.55	SiO2
Chalcocite	-59.39	-94.31	-34.92	Cu2S
Chalcopyrite	-131.70	-166.97	-35.27	CuFeS2
Chrysotile	-0.74	31.46	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-56.46	-102.15	-45.69	HgS
Claudetite	-87.30	-90.37	-3.06	As4O6
Clausthalite	-17.63	-44.73	-27.10	PbSe
Co (BO2) 2	-29.96	-2.89	27.07	Co (BO2) 2
Co (OH) 2	-5.64	7.46	13.09	Co (OH) 2
Co (OH) 3	-9.86	-12.17	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-22.55	-9.51	13.03	Co3 (AsO4) 2
Co3O4	-6.38	-16.88	-10.50	Co3O4
CoCl2	-23.16	-14.89	8.27	CoCl2
CoCl2:6H2O	-17.43	-14.89	2.54	CoCl2:6H2O
CoCO3	-4.21	-14.19	-9.98	CoCO3
CoF2	-16.06	-17.66	-1.60	CoF2
CoF3	-48.39	-49.85	-1.46	CoF3
CoFe2O4	17.37	13.84	-3.53	CoFe2O4
CoMoO4	-9.50	-17.26	-7.76	CoMoO4
CoO	-6.13	7.46	13.59	CoO
CoS (alpha)	-74.00	-81.44	-7.44	CoS
CoS (beta)	-70.37	-81.44	-11.07	CoS
CoSe	-25.68	-41.88	-16.20	CoSe
CoSeO3	-11.42	-10.10	1.32	CoSeO3
CoSeO4:6H2O	-19.33	-20.86	-1.53	CoSeO4:6H2O
CoSO4	-15.72	-12.92	2.80	CoSO4
CoSO4:6H2O	-10.45	-12.92	-2.47	CoSO4:6H2O
Cotunnite	-12.97	-17.75	-4.78	PbCl2
Covellite	-59.22	-81.52	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.45	-33.36	14.09	CrCl2
CrCl3	-49.82	-34.71	15.11	CrCl3
CrF3	-27.52	-38.86	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-17.47	-51.31	-33.84	Na3AlF6
Cu (OH) 2	-1.30	7.38	8.67	Cu (OH) 2
Cu (SbO3) 2	-31.06	14.15	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-13.15	-3.90	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.24	-94.12	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.95	-54.75	-45.80	Cu2Se
Cu2SO4	-23.84	-25.79	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.86	-9.76	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-64.32	-106.91	-42.59	Cu3Sb
Cu3Se2	-33.22	-96.71	-63.49	Cu3Se2
CuCO3	-2.77	-14.27	-11.50	CuCO3
CuCrO4	-17.42	-22.86	-5.44	CuCrO4
CuF	-10.36	-15.27	-4.91	CuF
CuF2	-18.86	-17.74	1.12	CuF2
CuF2:2H2O	-13.19	-17.74	-4.55	CuF2:2H2O
Cumetal	-6.72	-15.48	-8.76	Cu
CuMoO4	-4.26	-17.34	-13.08	CuMoO4
CuOCuSO4	-15.93	-5.63	10.30	CuOCuSO4

Cupricferrite	7.77	13.76	5.99	CuFe2O4
Cuprite	-4.01	-5.41	-1.41	Cu2O
Cuprousferrite	9.40	0.48	-8.92	CuFeO2
CuSe	-8.86	-41.96	-33.10	CuSe
CuSe2	-32.38	-65.75	-33.37	CuSe2
CuSeO3:2H2O	-10.70	-10.18	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.51	-20.95	-2.44	CuSeO4:5H2O
CuSO4	-15.94	-13.00	2.94	CuSO4
Diaspore	-0.47	6.41	6.87	AlOOH
Djurleite	-59.55	-93.47	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.76	-17.30	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.21	-17.30	-17.09	CaMg(CO3)2
Epsomite	-5.42	-7.55	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.88	-0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-16.17	-19.89	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.73	-11.18	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-25.67	-46.30	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-51.02	-54.75	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.15	-12.75	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-11.17	-21.27	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-51.08	-69.67	-18.60	FeSe2
FeS(ppt)	-82.50	-85.45	-2.95	FeS
FeSe	-34.88	-45.88	-11.00	FeSe
Fix_pe	-4.36	-4.36	0.00	e-
Fluorite	-1.45	-11.95	-10.50	CaF2
Galena	-70.33	-84.30	-13.97	PbS
Gibbsite	-1.88	6.41	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-8.38	-10.39	-2.01	ZnSO4:7H2O
Greenalite	-17.48	3.33	20.81	Fe3Si2O5(OH)4
Greenockite	-67.98	-82.34	-14.36	CdS
Greigite	-300.72	-345.76	-45.03	Fe3S4
Gummite	-6.64	1.03	7.67	UO3
Gypsum	-2.60	-7.21	-4.61	CaSO4:2H2O
H-Jarosite	-19.08	-31.18	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.84	-24.72	-12.88	H2MoO4
H2S(g)	-80.89	-88.90	-8.01	H2S
H2Se(g)	-44.37	-49.33	-4.96	H2Se
Halite	-6.90	-5.30	1.60	NaCl
Halloysite	-3.79	5.79	9.57	Al2Si2O5(OH)4
Hausmannite	-3.96	57.07	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-6.63	16.26	22.89	FeAl2O4
Hg(CH3)2(g)	-187.20	-260.90	-73.71	Hg(CH3)2
Hg(g)	-9.33	-17.20	-7.87	Hg
Hg(OH)2	-9.76	-13.25	-3.50	Hg(OH)2
Hg2(g)	-19.45	-34.41	-14.96	Hg2
Hg2(OH)2	-14.12	-8.86	5.26	Hg2(OH)2
Hg2CO3	-14.46	-30.51	-16.05	Hg2CO3
Hg2CrO4	-30.40	-39.10	-8.70	Hg2CrO4
Hg2F2	-23.62	-33.98	-10.36	Hg2F2
Hg2S	-86.08	-97.76	-11.68	Hg2S
Hg2SeO3	-21.77	-26.42	-4.66	Hg2SeO3
Hg2SO4	-23.11	-29.24	-6.13	Hg2SO4
Hg3O2CO3	-31.72	-61.40	-29.68	Hg3O2CO3
HgCl(g)	-35.10	-15.61	19.50	HgCl
HgCl2	-14.34	-35.60	-21.26	HgCl2
HgF(g)	-49.67	-16.99	32.68	HgF
HgF2(g)	-50.94	-38.37	12.57	HgF2
Hgmetal(l)	-3.75	-17.20	-13.45	Hg
HgSe	-6.89	-62.59	-55.69	HgSe
HgSeO3	-18.38	-30.81	-12.43	HgSeO3
HgSO4	-24.21	-33.63	-9.42	HgSO4
Huntite	-4.97	-34.94	-29.97	CaMg3(CO3)4

Hydrocerrusite	-10.72	-29.49	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.68	-22.45	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-24.70	-29.87	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-11.90	-26.70	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.27	-51.51	-17.24	K2Cr2O7
K2CrO4	-20.76	-21.27	-0.51	K2CrO4
K2MoO4	-19.02	-15.75	3.26	K2MoO4
K2SeO4	-18.63	-19.36	-0.73	K2SeO4
Kaolinite	-1.65	5.79	7.43	Al2Si2O5 (OH) 4
Langite	-8.37	9.12	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-10.74	-11.18	-0.43	PbO : PbSO4
Laurionite	-7.20	-6.58	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-8.09	4.60	12.69	PbO
Mackinawite	-81.85	-85.45	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.35	19.21	16.86	Fe2MgO4
Magnesite	-1.36	-8.82	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-1.59	-6.90	-5.31	Cu2 (OH) 2CO3
Manganite	-2.06	23.28	25.34	MnOOH
Massicot	-8.29	4.60	12.89	PbO
Matlockite	-10.16	-19.14	-8.97	PbClF
Melanothallite	-21.23	-14.98	6.26	CuCl2
Melanterite	-14.72	-16.93	-2.21	FeSO4 : 7H2O
Metacinnabar	-57.06	-102.15	-45.09	HgS
Mg (OH) 2 (active)	-5.97	12.83	18.79	Mg (OH) 2
Mg (VO3) 2	-21.79	-10.51	11.28	Mg (VO3) 2
Mg2Sb3	-281.53	-206.85	74.68	Mg2Sb3
Mg2V2O7	-24.05	2.31	26.36	Mg2V2O7
MgCr2O4	-5.73	10.47	16.20	MgCr2O4
MgCrO4	-22.79	-17.41	5.38	MgCrO4
MgF2	-4.16	-12.29	-8.13	MgF2
MgMoO4	-10.04	-11.89	-1.85	MgMoO4
MgSeO3 : 6H2O	-7.79	-4.73	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-14.30	-15.50	-1.20	MgSeO4 : 6H2O
Minium	-34.18	39.35	73.52	Pb3O4
Mirabilite	-7.50	-8.62	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-17.73	-12.83	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-59.56	-65.27	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.62	-90.54	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.86	-0.36	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-14.56	-11.84	2.72	MnCl2 : 4H2O
MnS (grn)	-78.56	-78.39	0.17	MnS
MnS (pnk)	-81.73	-78.39	3.34	MnS
MnSb	-97.95	-100.86	-2.91	MnSb
MnSe	-42.32	-38.82	3.50	MnSe
MnSeO3	-8.18	-7.05	1.13	MnSeO3
MnSeO3 : 2H2O	-8.03	-7.05	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-15.76	-17.81	-2.05	MnSeO4 : 5H2O
MnSO4	-12.45	-9.87	2.58	MnSO4
Monteponite	-8.55	6.55	15.10	CdO
Montroydite	-9.61	-13.25	-3.64	HgO
MoO3	-16.72	-24.72	-8.00	MoO3
Morenosite	-10.66	-12.80	-2.14	NiSO4 : 7H2O
MoS2	-157.80	-228.06	-70.26	MoS2
Na-Jarosite	-14.10	-25.30	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.82	-48.71	-9.90	Na2Cr2O7
Na2CrO4	-21.41	-18.47	2.93	Na2CrO4
Na2Mo2O7	-21.07	-37.67	-16.60	Na2Mo2O7
Na2MoO4	-14.44	-12.95	1.49	Na2MoO4
Na2MoO4 : 2H2O	-14.18	-12.95	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-16.10	-5.80	10.30	Na2SeO3 : 5H2O
Na2SeO4	-17.84	-16.56	1.28	Na2SeO4
Na3Sb	-175.60	-81.14	94.45	Na3Sb
Na3VO4	-30.71	5.97	36.68	Na3VO4
Na4V2O7	-37.22	0.18	37.40	Na4V2O7

Nantokite	-7.15	-13.88	-6.73	CuCl
NaSb	-90.53	-67.36	23.17	NaSb
Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-9.65	-5.79	3.86	NaVO3
Nesquehonite	-4.15	-8.82	-4.67	MgCO3:3H2O
Ni(OH)2	-5.22	7.58	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.85	-9.15	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-22.06	9.94	32.00	Ni4(OH)6SO4
NiCO3	-7.20	-14.07	-6.87	NiCO3
NiMoO4	-6.00	-17.14	-11.14	NiMoO4
NiS(alpha)	-75.72	-81.32	-5.60	NiS
NiS(beta)	-70.22	-81.32	-11.10	NiS
NiS(gamma)	-68.52	-81.32	-12.80	NiS
NiSe	-24.06	-41.76	-17.70	NiSe
NiSeO3:2H2O	-12.80	-9.98	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.22	-20.74	-1.52	NiSeO4:6H2O
Nsutite	-6.80	10.70	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-250.81	-311.88	-61.07	As2S3
Otavite	-3.09	-15.09	-12.00	CdCO3
Pb(BO2)2	-12.27	-5.75	6.52	Pb(BO2)2
Pb(OH)2	-3.55	4.60	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-75.12	-83.88	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-10.77	-1.98	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-16.99	9.20	26.19	Pb2O(OH)2
Pb2O3	-26.29	34.75	61.04	Pb2O3
Pb2OCO3	-11.89	-12.45	-0.56	Pb2OCO3
Pb2V2O7	-12.24	-14.14	-1.90	Pb2V2O7
Pb3(AsO4)2	-23.89	-18.09	5.80	Pb3(AsO4)2
Pb3(VO4)2	-15.68	-9.54	6.14	Pb3(VO4)2
Pb3O2CO3	-18.87	-7.85	11.02	Pb3O2CO3
Pb3O2SO4	-17.26	-6.58	10.69	Pb3O2SO4
Pb4(OH)6SO4	-23.08	-1.98	21.10	Pb4(OH)6SO4
Pb4O3SO4	-23.85	-1.98	21.88	Pb4O3SO4
PbCrO4	-13.04	-25.64	-12.60	PbCrO4
PbF2	-13.08	-20.52	-7.44	PbF2
Pbmetal	-25.19	-20.94	4.25	Pb
PbMoO4	-4.50	-20.12	-15.62	PbMoO4
PbO:0.3H2O	-8.38	4.60	12.98	PbO:0.33H2O
PbSeO4	-16.88	-23.72	-6.84	PbSeO4
Periclase	-8.76	12.83	21.58	MgO
Phosgenite	-14.99	-34.80	-19.81	PbCl2:PbCO3
Plattnerite	-19.46	30.14	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-130.29	-148.80	-18.51	FeS2
Pyrochroite	-4.68	10.51	15.19	Mn(OH)2
Pyrolusite	-5.33	36.05	41.38	MnO2
Quartz	0.49	-3.51	-4.00	SiO2
Realgar	-104.51	-124.26	-19.75	AsS
Retgersite	-10.76	-12.80	-2.04	NiSO4:6H2O
Rhodochrosite	-0.56	-11.14	-10.58	MnCO3
Rutherfordine	-6.11	-20.61	-14.50	UO2CO3
Sb(OH)3	-15.05	-22.16	-7.11	Sb(OH)3
Sb2O4	-22.17	-18.77	3.40	Sb2O4
Sb2O5	-32.17	-41.84	-9.67	Sb2O5
Sb2Se3	-124.56	-192.31	-67.76	Sb2Se3
Sb4O6(cubic)	-70.36	-88.62	-18.26	Sb4O6
Sb4O6(orth)	-70.72	-88.62	-17.90	Sb4O6
SbCl3	-56.26	-55.68	0.57	SbCl3
SbF3	-49.61	-59.84	-10.23	SbF3
Sbmetal	-48.78	-60.47	-11.69	Sb
SbO2	-5.87	-33.69	-27.82	SbO2
Schoepite	-4.96	1.03	5.99	UO2(OH)2:H2O
Semetal(am)	-16.68	-23.79	-7.11	Se
Semetal(hex)	-16.08	-23.79	-7.71	Se
Senarmontite	-31.94	-44.31	-12.37	Sb2O3
SeO2	-17.68	-17.56	0.12	SeO2
SeO3	-49.37	-28.32	21.04	SeO3

Sepiolite	-0.64	15.12	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-3.66	15.12	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.96	-18.20	-10.24	FeCO ₃
SiO ₂ (am-gel)	-0.80	-3.51	-2.71	SiO ₂
SiO ₂ (am-ppt)	-0.77	-3.51	-2.74	SiO ₂
Smithsonite	-1.66	-11.66	-10.00	ZnCO ₃
Sphalerite	-67.46	-78.91	-11.45	ZnS
Spinel	-11.21	25.64	36.85	MgAl ₂ O ₄
Stibnite	-260.54	-311.00	-50.46	Sb ₂ S ₃
Sulfur	-61.21	-63.35	-2.14	S
Tenorite	-0.27	7.38	7.64	CuO
Thenardite	-8.94	-8.62	0.32	Na ₂ SO ₄
Thermonatrite	-10.52	-9.88	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-12.19	-8.11	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-15.88	5.21	21.08	U ₃ O ₈
U ₃ Sb ₄	-593.42	-441.04	152.38	U ₃ Sb ₄
U ₄ O ₉	-32.61	-35.63	-3.02	U ₄ O ₉
UF ₄	-36.00	-65.53	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-32.82	-65.53	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.23	-15.29	0.93	UO ₂
UO ₂ (NO ₃) ₂	-48.41	-36.26	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-41.11	-36.26	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-39.65	-36.26	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-38.31	-36.26	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.58	1.03	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-25.04	-27.29	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.67	1.03	7.70	UO ₃
Uraninite	-10.63	-15.29	-4.67	UO ₂
USb ₂	-226.12	-196.54	29.58	USb ₂
V(OH) ₃	-22.21	-14.62	7.59	V(OH) ₃
V ₂ O ₅	-21.98	-23.34	-1.36	V ₂ O ₅
V ₃ O ₅	-50.00	-48.17	1.84	V ₃ O ₅
V ₄ O ₇	-62.89	-55.71	7.19	V ₄ O ₇
V ₆ O ₁₃	-60.26	-121.12	-60.86	V ₆ O ₁₃
Valentinite	-35.83	-44.31	-8.48	Sb ₂ O ₃
VC ₁₂	-68.62	-49.74	18.87	VC ₁₂
VC ₁₃	-71.58	-48.15	23.43	VC ₁₃
VF ₄	-72.71	-57.78	14.93	VF ₄
Vmetal	-96.96	-52.93	44.03	V
VO	-42.15	-27.39	14.76	VO
VO(OH) ₂	-12.69	-7.54	5.15	VO(OH) ₂
VO ₂ Cl	-25.69	-22.85	2.84	VO ₂ Cl
VOC ₁	-36.95	-25.79	11.15	VOC ₁
VOC ₁₂	-42.65	-29.89	12.76	VOC ₁₂
VOSO ₄	-31.53	-27.92	3.61	VOSO ₄
Witherite	-5.42	-13.99	-8.57	BaCO ₃
Wurtzite	-69.96	-78.91	-8.95	ZnS
Zincite	-1.34	9.99	11.33	ZnO
Zincosite	-14.32	-10.39	3.93	ZnSO ₄
Zn(BO ₂) ₂	-8.65	-0.36	8.29	Zn(BO ₂) ₂
Zn(NO ₃) ₂ :6H ₂ O	-30.62	-27.30	3.32	Zn(NO ₃) ₂ :6H ₂ O
Zn(OH) ₂	-2.21	9.99	12.20	Zn(OH) ₂
Zn(OH) ₂ (am)	-2.48	9.99	12.47	Zn(OH) ₂
Zn(OH) ₂ (beta)	-1.76	9.99	11.75	Zn(OH) ₂
Zn(OH) ₂ (epsilon)	-1.54	9.99	11.53	Zn(OH) ₂
Zn(OH) ₂ (gamma)	-1.74	9.99	11.73	Zn(OH) ₂
Zn ₂ (OH) ₂ SO ₄	-7.90	-0.40	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-6.38	8.81	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-15.57	-1.92	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O(SO ₄) ₂	-29.70	-10.78	18.91	Zn ₃ O(SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-8.81	19.59	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-10.89	27.61	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-19.41	-12.36	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-1.40	-11.66	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-14.59	-15.13	-0.53	ZnF ₂
Znmetal	-41.34	-15.55	25.79	Zn
ZnMoO ₄	-4.60	-14.72	-10.13	ZnMoO ₄
ZnO(active)	-1.20	9.99	11.19	ZnO

ZnS(am)	-69.85	-78.91	-9.05	ZnS
ZnSb	-87.04	-76.03	11.01	ZnSb
ZnSe	-24.94	-39.34	-14.40	ZnSe
ZnSeO4:6H2O	-16.81	-18.33	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.75	-10.39	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 36.

```

Title Stage 2 pit lake GW inflow
Title Stage 2 Groundwater mix
MIX 201
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.256688
11     2.078061
12     1.534887
13     3.602556
14     0
15     0
Save solution 201
end

```

TITLE

Stage 2 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 201.

Mixture 201.

1.000e+00 Solution 2 JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)

0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)

0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.567e-01 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
2.078e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.535e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.603e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	9.856e-09	8.350e-08
Al	5.485e-07	4.647e-06
As	4.841e-09	4.101e-08
B	1.890e-06	1.601e-05
Ba	1.758e-07	1.490e-06
C	1.462e-03	1.238e-02
Ca	6.568e-04	5.565e-03
Cd	1.389e-09	1.176e-08
Cl	2.031e-04	1.720e-03
Co	1.604e-08	1.359e-07
Cr	1.499e-08	1.270e-07
Cu	1.145e-06	9.699e-06
F	5.127e-05	4.344e-04
Fe	3.153e-06	2.671e-05
Hg	2.623e-11	2.222e-10
K	8.620e-05	7.303e-04
Mg	2.074e-04	1.758e-03
Mn	2.830e-06	2.397e-05
Mo	6.637e-08	5.623e-07
Na	5.893e-04	4.992e-03
Ni	2.516e-08	2.131e-07
Pb	3.106e-09	2.631e-08
S	4.312e-04	3.654e-03
Sb	1.564e-09	1.325e-08
Se	5.639e-09	4.777e-08
U	1.010e-08	8.559e-08
V	1.385e-08	1.173e-07
Zn	1.373e-07	1.164e-06

-----Description of solution-----

	pH	=	7.210	Charge balance
	pe	=	4.777	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	3.516e-03	
	Mass of water (kg)	=	8.472e+00	
	Total alkalinity (eq/kg)	=	1.301e-03	
	Total CO2 (mol/kg)	=	1.462e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.781e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	13	
	Total H	=	9.405430e+02	
	Total O	=	4.703164e+02	

-----Distribution of species-----

Log	Log	Log	mole V
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	Species	Molality	Activity	Molality	Activity	Gamma	cm ³ /mol
	OH-	1.741e-07	1.631e-07	-6.759	-6.787	-0.028	(0)
	H+	6.584e-08	6.172e-08	-7.182	-7.210	-0.028	0.00
	H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag		9.856e-09					
	Ag+	6.834e-09	6.407e-09	-8.165	-8.193	-0.028	(0)
	AgCl	2.491e-09	2.491e-09	-8.604	-8.604	0.000	(0)
	Ag2Se	2.222e-10	2.222e-10	-9.653	-9.653	0.000	(0)
	AgCl2-	4.428e-11	4.130e-11	-10.354	-10.384	-0.030	(0)
	AgSO4-	4.121e-11	3.843e-11	-10.385	-10.415	-0.030	(0)
	AgF	7.563e-13	7.563e-13	-12.121	-12.121	0.000	(0)
	AgOH	1.045e-13	1.045e-13	-12.981	-12.981	0.000	(0)
	AgCl3-2	9.258e-15	7.007e-15	-14.033	-14.154	-0.121	(0)
	AgH2BO3	1.789e-15	1.789e-15	-14.747	-14.747	0.000	(0)
	AgSeO3-	1.333e-15	1.243e-15	-14.875	-14.906	-0.030	(0)
	AgCl4-3	5.098e-18	2.724e-18	-17.293	-17.565	-0.272	(0)
	Ag (OH) 2-	1.786e-18	1.666e-18	-17.748	-17.778	-0.030	(0)
	Ag (SeO3) 2-3	6.287e-24	3.359e-24	-23.202	-23.474	-0.272	(0)
	Ag2MoO4	7.961e-25	7.961e-25	-24.099	-24.099	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-67.340	-67.340	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.364	-77.848	-0.484	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-136.171	-136.202	-0.030	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-136.382	-136.476	-0.094	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-138.515	-138.706	-0.191	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-138.832	-139.017	-0.185	(0)
Al		5.485e-07					
	Al (OH) 4-	5.122e-07	4.804e-07	-6.291	-6.318	-0.028	(0)
	Al (OH) 3	2.339e-08	2.339e-08	-7.631	-7.631	0.000	(0)
	Al (OH) 2+	7.654e-09	7.187e-09	-8.116	-8.143	-0.027	(0)
	AlF2+	3.183e-09	2.989e-09	-8.497	-8.524	-0.027	(0)
	AlF3	1.768e-09	1.768e-09	-8.752	-8.752	0.000	(0)
	AlF+2	2.056e-10	1.598e-10	-9.687	-9.796	-0.109	(0)
	AlOH+2	7.136e-11	5.546e-11	-10.147	-10.256	-0.109	(0)
	AlF4-	4.440e-11	4.164e-11	-10.353	-10.380	-0.028	(0)
	AlSO4+	8.459e-13	7.934e-13	-12.073	-12.100	-0.028	(0)
	Al+3	6.076e-13	3.400e-13	-12.216	-12.469	-0.252	(0)
	Al (SO4) 2-	2.725e-15	2.556e-15	-14.565	-14.592	-0.028	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-44.204	-44.476	-0.272	(0)
As (3)		1.291e-19					
	H3AsO3	1.279e-19	1.279e-19	-18.893	-18.893	0.000	(0)
	H2AsO3-	1.140e-21	1.063e-21	-20.943	-20.974	-0.030	(0)
	HAsO3-2	2.075e-26	1.571e-26	-25.683	-25.804	-0.121	(0)
	H4AsO3+	4.194e-27	3.912e-27	-26.377	-26.408	-0.030	(0)
	AsO3-3	1.836e-32	9.808e-33	-31.736	-32.008	-0.272	(0)
As (5)		4.841e-09					
	HAsO4-2	3.323e-09	2.515e-09	-8.479	-8.599	-0.121	(0)
	H2AsO4-	1.518e-09	1.416e-09	-8.819	-8.849	-0.030	(0)
	AsO4-3	2.411e-13	1.288e-13	-12.618	-12.890	-0.272	(0)
	H3AsO4	1.517e-14	1.518e-14	-13.819	-13.819	0.000	(0)
B		1.890e-06					
	H3BO3	1.871e-06	1.872e-06	-5.728	-5.728	0.000	(0)
	H2BO3-	1.883e-08	1.762e-08	-7.725	-7.754	-0.029	(0)
	CaH2BO3+	5.123e-10	4.794e-10	-9.290	-9.319	-0.029	(0)
	MgH2BO3+	9.895e-11	9.259e-11	-10.005	-10.033	-0.029	(0)
	BF (OH) 3-	3.752e-11	3.511e-11	-10.426	-10.455	-0.029	(0)
	NaH2BO3	1.539e-11	1.539e-11	-10.813	-10.813	0.000	(0)
	BaH2BO3+	7.827e-14	7.324e-14	-13.106	-13.135	-0.029	(0)
	H5 (BO3) 2-	3.000e-14	2.807e-14	-13.523	-13.552	-0.029	(0)
	BF2 (OH) 2-	1.163e-14	1.089e-14	-13.934	-13.963	-0.029	(0)
	AgH2BO3	1.789e-15	1.789e-15	-14.747	-14.747	0.000	(0)
	H8 (BO3) 3-	5.617e-18	5.256e-18	-17.251	-17.279	-0.029	(0)
	BF3OH-	1.313e-20	1.228e-20	-19.882	-19.911	-0.029	(0)
	BF4-	1.874e-25	1.753e-25	-24.727	-24.756	-0.029	(0)
Ba		1.758e-07					
	Ba+2	1.741e-07	1.345e-07	-6.759	-6.871	-0.112	(0)
	BaHCO3+	1.641e-09	1.542e-09	-8.785	-8.812	-0.027	(0)
	BaCO3	6.291e-11	6.291e-11	-10.201	-10.201	0.000	(0)

BaOH+	1.021e-13	9.580e-14	-12.991	-13.019	-0.028	(0)
BaH2BO3+	7.827e-14	7.324e-14	-13.106	-13.135	-0.029	(0)
C (4)	1.462e-03					
HCO3-	1.278e-03	1.200e-03	-2.893	-2.921	-0.027	(0)
H2CO3	1.666e-04	1.666e-04	-3.778	-3.778	0.000	(0)
CaHCO3+	1.125e-05	1.057e-05	-4.949	-4.976	-0.027	(0)
MgHCO3+	1.986e-06	1.862e-06	-5.702	-5.730	-0.028	(0)
CO3-2	1.180e-06	9.117e-07	-5.928	-6.040	-0.112	(0)
CuCO3	8.289e-07	8.289e-07	-6.081	-6.081	0.000	(0)
CaCO3	6.833e-07	6.833e-07	-6.165	-6.165	0.000	(0)
NaHCO3	3.721e-07	3.721e-07	-6.429	-6.429	0.000	(0)
MgCO3	1.149e-07	1.149e-07	-6.939	-6.939	0.000	(0)
MnHCO3+	5.148e-08	4.831e-08	-7.288	-7.316	-0.028	(0)
CuHCO3+	1.254e-08	1.169e-08	-7.902	-7.932	-0.030	(0)
NaCO3-	9.966e-09	9.358e-09	-8.001	-8.029	-0.027	(0)
UO2 (CO3) 2-2	8.805e-09	6.664e-09	-8.055	-8.176	-0.121	(0)
ZnCO3	4.892e-09	4.892e-09	-8.311	-8.311	0.000	(0)
ZnHCO3+	3.794e-09	3.539e-09	-8.421	-8.451	-0.030	(0)
Cu (CO3) 2-2	2.688e-09	2.034e-09	-8.571	-8.692	-0.121	(0)
NiHCO3+	2.574e-09	2.400e-09	-8.589	-8.620	-0.030	(0)
BaHCO3+	1.641e-09	1.542e-09	-8.785	-8.812	-0.027	(0)
PbCO3	1.520e-09	1.520e-09	-8.818	-8.818	0.000	(0)
CoHCO3+	1.068e-09	9.964e-10	-8.971	-9.002	-0.030	(0)
FeHCO3+	1.066e-09	1.002e-09	-8.972	-8.999	-0.027	(0)
UO2 (CO3) 3-4	9.279e-10	3.045e-10	-9.032	-9.516	-0.484	(0)
NiCO3	5.517e-10	5.517e-10	-9.258	-9.258	0.000	(0)
PbHCO3+	5.302e-10	4.946e-10	-9.276	-9.306	-0.030	(0)
UO2CO3	3.664e-10	3.664e-10	-9.436	-9.436	0.000	(0)
CoCO3	1.645e-10	1.645e-10	-9.784	-9.784	0.000	(0)
BaCO3	6.291e-11	6.291e-11	-10.201	-10.201	0.000	(0)
CdCO3	2.046e-11	2.046e-11	-10.689	-10.689	0.000	(0)
Pb (CO3) 2-2	5.280e-12	3.996e-12	-11.277	-11.398	-0.121	(0)
CdHCO3+	2.884e-12	2.690e-12	-11.540	-11.570	-0.030	(0)
Cd (CO3) 2-2	1.827e-14	1.383e-14	-13.738	-13.859	-0.121	(0)
HgCO3	1.109e-17	1.109e-17	-16.955	-16.955	0.000	(0)
Hg (CO3) 2-2	4.223e-20	3.196e-20	-19.374	-19.495	-0.121	(0)
HgHCO3+	1.366e-20	1.274e-20	-19.865	-19.895	-0.030	(0)
Ca	6.568e-04					
Ca+2	6.121e-04	4.729e-04	-3.213	-3.325	-0.112	(0)
CaSO4	3.257e-05	3.257e-05	-4.487	-4.487	0.000	(0)
CaHCO3+	1.125e-05	1.057e-05	-4.949	-4.976	-0.027	(0)
CaCO3	6.833e-07	6.833e-07	-6.165	-6.165	0.000	(0)
CaF+	2.584e-07	2.425e-07	-6.588	-6.615	-0.028	(0)
CaOH+	1.638e-09	1.539e-09	-8.786	-8.813	-0.027	(0)
CaH2BO3+	5.123e-10	4.794e-10	-9.290	-9.319	-0.029	(0)
Cd	1.389e-09					
Cd+2	1.274e-09	9.843e-10	-8.895	-9.007	-0.112	(0)
CdSO4	6.937e-11	6.937e-11	-10.159	-10.159	0.000	(0)
CdCO3	2.046e-11	2.046e-11	-10.689	-10.689	0.000	(0)
CdCl+	1.919e-11	1.790e-11	-10.717	-10.747	-0.030	(0)
CdHCO3+	2.884e-12	2.690e-12	-11.540	-11.570	-0.030	(0)
CdOH+	1.367e-12	1.275e-12	-11.864	-11.894	-0.030	(0)
CdF+	7.860e-13	7.331e-13	-12.105	-12.135	-0.030	(0)
Cd (SO4) 2-2	3.717e-13	2.813e-13	-12.430	-12.551	-0.121	(0)
CdOHC1	1.198e-13	1.198e-13	-12.922	-12.922	0.000	(0)
Cd (CO3) 2-2	1.827e-14	1.383e-14	-13.738	-13.859	-0.121	(0)
CdCl2	1.420e-14	1.420e-14	-13.848	-13.848	0.000	(0)
Cd (OH) 2	1.313e-15	1.313e-15	-14.882	-14.882	0.000	(0)
CdF2	6.874e-17	6.874e-17	-16.163	-16.163	0.000	(0)
CdCl3-	1.829e-18	1.706e-18	-17.738	-17.768	-0.030	(0)
Cd (OH) 3-	1.403e-20	1.308e-20	-19.853	-19.883	-0.030	(0)
Cd2OH+3	1.178e-20	6.293e-21	-19.929	-20.201	-0.272	(0)
CdSeO4	6.418e-21	6.418e-21	-20.193	-20.193	0.000	(0)
Cd (SeO3) 2-2	9.765e-23	7.391e-23	-22.010	-22.131	-0.121	(0)
Cd (OH) 4-2	4.616e-28	3.494e-28	-27.336	-27.457	-0.121	(0)
CdHS+	0.000e+00	0.000e+00	-73.930	-73.960	-0.030	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.718	-139.718	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.749	-210.779	-0.030	(0)

Cd (HS) 4-2	0.000e+00	0.000e+00	-281.423	-281.544	-0.121	(0)
C1	2.031e-04					
Cl-	2.031e-04	1.904e-04	-3.692	-3.720	-0.028	(0)
AgCl	2.491e-09	2.491e-09	-8.604	-8.604	0.000	(0)
MnCl+	5.151e-10	4.835e-10	-9.288	-9.316	-0.028	(0)
CuCl	3.031e-10	3.031e-10	-9.518	-9.518	0.000	(0)
CuCl+	4.970e-11	4.659e-11	-10.304	-10.332	-0.028	(0)
ZnCl+	4.756e-11	4.459e-11	-10.323	-10.351	-0.028	(0)
AgCl2-	4.428e-11	4.130e-11	-10.354	-10.384	-0.030	(0)
CdCl+	1.919e-11	1.790e-11	-10.717	-10.747	-0.030	(0)
CuCl2-	1.286e-11	1.206e-11	-10.891	-10.919	-0.028	(0)
ZnOHC1	9.522e-12	9.522e-12	-11.021	-11.021	0.000	(0)
NiCl+	8.471e-12	7.901e-12	-11.072	-11.102	-0.030	(0)
CoCl+	7.535e-12	7.029e-12	-11.123	-11.153	-0.030	(0)
PbCl+	4.016e-12	3.746e-12	-11.396	-11.426	-0.030	(0)
MnCl2	1.300e-13	1.300e-13	-12.886	-12.886	0.000	(0)
CdOHC1	1.198e-13	1.198e-13	-12.922	-12.922	0.000	(0)
CdCl2	1.420e-14	1.420e-14	-13.848	-13.848	0.000	(0)
ZnCl2	1.345e-14	1.345e-14	-13.871	-13.871	0.000	(0)
AgCl3-2	9.258e-15	7.007e-15	-14.033	-14.154	-0.121	(0)
PbCl2	3.185e-15	3.185e-15	-14.497	-14.497	0.000	(0)
CuCl2	3.075e-15	3.075e-15	-14.512	-14.512	0.000	(0)
CuCl3-2	6.325e-16	4.907e-16	-15.199	-15.309	-0.110	(0)
HgClOH	5.573e-16	5.573e-16	-15.254	-15.254	0.000	(0)
CrCl+2	5.720e-17	4.329e-17	-16.243	-16.364	-0.121	(0)
HgCl2	3.683e-17	3.683e-17	-16.434	-16.434	0.000	(0)
UO2Cl+	3.341e-17	3.116e-17	-16.476	-16.506	-0.030	(0)
NiCl2	7.574e-18	7.574e-18	-17.121	-17.121	0.000	(0)
MnCl3-	7.264e-18	6.817e-18	-17.139	-17.166	-0.028	(0)
AgCl4-3	5.098e-18	2.724e-18	-17.293	-17.565	-0.272	(0)
FeCl+2	2.728e-18	2.117e-18	-17.564	-17.674	-0.110	(0)
ZnCl3-	2.170e-18	2.034e-18	-17.663	-17.692	-0.028	(0)
CdCl3-	1.829e-18	1.706e-18	-17.738	-17.768	-0.030	(0)
PbCl3-	2.588e-19	2.414e-19	-18.587	-18.617	-0.030	(0)
HgCl3-	7.517e-20	7.011e-20	-19.124	-19.154	-0.030	(0)
HgCl+	4.138e-20	3.860e-20	-19.383	-19.413	-0.030	(0)
CrOHC12	2.555e-20	2.555e-20	-19.593	-19.593	0.000	(0)
CuCl3-	5.829e-21	5.464e-21	-20.234	-20.262	-0.028	(0)
VOCl+	2.727e-21	2.544e-21	-20.564	-20.595	-0.030	(0)
FeCl2+	1.918e-21	1.800e-21	-20.717	-20.745	-0.028	(0)
CrCl2+	8.385e-22	7.821e-22	-21.077	-21.107	-0.030	(0)
ZnCl4-2	2.496e-22	1.937e-22	-21.603	-21.713	-0.110	(0)
HgCl4-2	7.021e-23	5.314e-23	-22.154	-22.275	-0.121	(0)
PbCl4-2	2.776e-23	2.101e-23	-22.557	-22.678	-0.121	(0)
FeCl3	3.427e-26	3.427e-26	-25.465	-25.465	0.000	(0)
CuCl4-2	6.720e-27	5.214e-27	-26.173	-26.283	-0.110	(0)
CrO3Cl-	3.205e-29	2.989e-29	-28.494	-28.524	-0.030	(0)
CoCl+2	1.300e-37	9.841e-38	-36.886	-37.007	-0.121	(0)
UCl+3	0.000e+00	0.000e+00	-43.920	-44.192	-0.272	(0)
Co (2)	1.604e-08					
Co+2	1.410e-08	1.067e-08	-7.851	-7.972	-0.121	(0)
CoHCO3+	1.068e-09	9.964e-10	-8.971	-9.002	-0.030	(0)
CoSO4	6.401e-10	6.401e-10	-9.194	-9.194	0.000	(0)
CoCO3	1.645e-10	1.645e-10	-9.784	-9.784	0.000	(0)
CoOH+	3.724e-11	3.474e-11	-10.429	-10.459	-0.030	(0)
CoF+	1.700e-11	1.586e-11	-10.769	-10.800	-0.030	(0)
CoCl+	7.535e-12	7.029e-12	-11.123	-11.153	-0.030	(0)
Co (OH) 2	4.501e-13	4.501e-13	-12.347	-12.347	0.000	(0)
Co (OH) 3-	1.571e-18	1.465e-18	-17.804	-17.834	-0.030	(0)
CoOOH-	3.941e-19	3.676e-19	-18.404	-18.435	-0.030	(0)
CoSeO4	1.873e-19	1.873e-19	-18.728	-18.728	0.000	(0)
Co2OH+3	3.477e-20	1.858e-20	-19.459	-19.731	-0.272	(0)
Co (OH) 4-2	5.004e-26	3.788e-26	-25.301	-25.422	-0.121	(0)
Co4 (OH) 4+4	8.851e-34	2.905e-34	-33.053	-33.537	-0.484	(0)
Co (3)	2.783e-30					
CoOH+2	2.783e-30	2.106e-30	-29.556	-29.677	-0.121	(0)
Co+3	4.540e-36	2.541e-36	-35.343	-35.595	-0.252	(0)
CoCl+2	1.300e-37	9.841e-38	-36.886	-37.007	-0.121	(0)

Cr (2)	9.274e-25					
Cr+2	9.274e-25	7.019e-25	-24.033	-24.154	-0.121	(0)
Cr (3)	1.499e-08					
Cr (OH) 2+	1.334e-08	1.245e-08	-7.875	-7.905	-0.030	(0)
Cr (OH) +2	8.285e-10	6.271e-10	-9.082	-9.203	-0.121	(0)
Cr (OH) 3	7.627e-10	7.627e-10	-9.118	-9.118	0.000	(0)
CrOHSO4	4.473e-11	4.473e-11	-10.349	-10.349	0.000	(0)
CrO2-	6.292e-12	5.869e-12	-11.201	-11.231	-0.030	(0)
Cr (OH) 4-	5.311e-12	4.953e-12	-11.275	-11.305	-0.030	(0)
CrF+2	1.729e-12	1.309e-12	-11.762	-11.883	-0.121	(0)
Cr+3	3.288e-13	1.757e-13	-12.483	-12.755	-0.272	(0)
CrSO4+	1.322e-13	1.233e-13	-12.879	-12.909	-0.030	(0)
CrCl+2	5.720e-17	4.329e-17	-16.243	-16.364	-0.121	(0)
Cr2 (OH) 2SO4+2	3.350e-18	2.536e-18	-17.475	-17.596	-0.121	(0)
Cr2 (OH) 2 (SO4) 2	4.528e-20	4.528e-20	-19.344	-19.344	0.000	(0)
CrOHC12	2.555e-20	2.555e-20	-19.593	-19.593	0.000	(0)
CrCl2+	8.385e-22	7.821e-22	-21.077	-21.107	-0.030	(0)
Cr (6)	3.061e-18					
CrO4-2	2.621e-18	2.025e-18	-17.582	-17.694	-0.112	(0)
HCrO4-	4.336e-19	4.044e-19	-18.363	-18.393	-0.030	(0)
NaCrO4-	5.946e-21	5.546e-21	-20.226	-20.256	-0.030	(0)
KCrO4-	6.504e-22	6.067e-22	-21.187	-21.217	-0.030	(0)
H2CrO4	2.023e-26	2.023e-26	-25.694	-25.694	0.000	(0)
CrO3SO4-2	3.020e-27	2.286e-27	-26.520	-26.641	-0.121	(0)
CrO3Cl-	3.205e-29	2.989e-29	-28.494	-28.524	-0.030	(0)
Cr2O7-2	7.494e-36	5.672e-36	-35.125	-35.246	-0.121	(0)
Cu (1)	1.672e-09					
Cu+	1.356e-09	1.265e-09	-8.868	-8.898	-0.030	(0)
CuCl	3.031e-10	3.031e-10	-9.518	-9.518	0.000	(0)
CuCl2-	1.286e-11	1.206e-11	-10.891	-10.919	-0.028	(0)
CuCl3-2	6.325e-16	4.907e-16	-15.199	-15.309	-0.110	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.824	-137.012	-0.188	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.559	-137.742	-0.183	(0)
Cu (2)	1.143e-06					
CuCO3	8.289e-07	8.289e-07	-6.081	-6.081	0.000	(0)
Cu+2	1.999e-07	1.544e-07	-6.699	-6.811	-0.112	(0)
CuOH+	8.497e-08	7.965e-08	-7.071	-7.099	-0.028	(0)
CuHCO3+	1.254e-08	1.169e-08	-7.902	-7.932	-0.030	(0)
CuSO4	1.063e-08	1.063e-08	-7.973	-7.973	0.000	(0)
Cu (CO3) 2-2	2.688e-09	2.034e-09	-8.571	-8.692	-0.121	(0)
Cu (OH) 2	2.592e-09	2.592e-09	-8.586	-8.586	0.000	(0)
CuF+	4.908e-10	4.578e-10	-9.309	-9.339	-0.030	(0)
Cu2 (OH) 2+2	2.105e-10	1.594e-10	-9.677	-9.798	-0.121	(0)
CuCl+	4.970e-11	4.659e-11	-10.304	-10.332	-0.028	(0)
Cu (OH) 3-	9.300e-13	8.674e-13	-12.032	-12.062	-0.030	(0)
CuCl2	3.075e-15	3.075e-15	-14.512	-14.512	0.000	(0)
Cu (OH) 4-2	1.471e-18	1.114e-18	-17.832	-17.953	-0.121	(0)
CuCl3-	5.829e-21	5.464e-21	-20.234	-20.262	-0.028	(0)
CuCl4-2	6.720e-27	5.214e-27	-26.173	-26.283	-0.110	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.766	-199.797	-0.030	(0)
F	5.127e-05					
F-	5.012e-05	4.699e-05	-4.300	-4.328	-0.028	(0)
MgF+	8.520e-07	7.992e-07	-6.070	-6.097	-0.028	(0)
CaF+	2.584e-07	2.425e-07	-6.588	-6.615	-0.028	(0)
NaF	1.634e-08	1.634e-08	-7.787	-7.787	0.000	(0)
HF	4.290e-09	4.290e-09	-8.368	-8.368	0.000	(0)
MnF+	4.021e-09	3.774e-09	-8.396	-8.423	-0.028	(0)
AlF2+	3.183e-09	2.989e-09	-8.497	-8.524	-0.027	(0)
AlF3	1.768e-09	1.768e-09	-8.752	-8.752	0.000	(0)
CuF+	4.908e-10	4.578e-10	-9.309	-9.339	-0.030	(0)
AlF+2	2.056e-10	1.598e-10	-9.687	-9.796	-0.109	(0)
ZnF+	9.372e-11	8.742e-11	-10.028	-10.058	-0.030	(0)
AlF4-	4.440e-11	4.164e-11	-10.353	-10.380	-0.028	(0)
BF (OH) 3-	3.752e-11	3.511e-11	-10.426	-10.455	-0.029	(0)
NiF+	2.053e-11	1.915e-11	-10.688	-10.718	-0.030	(0)
CoF+	1.700e-11	1.586e-11	-10.769	-10.800	-0.030	(0)
PbF+	1.969e-12	1.836e-12	-11.706	-11.736	-0.030	(0)
CrF+2	1.729e-12	1.309e-12	-11.762	-11.883	-0.121	(0)

HF2-	8.181e-13	7.664e-13	-12.087	-12.116	-0.028	(0)
CdF+	7.860e-13	7.331e-13	-12.105	-12.135	-0.030	(0)
AgF	7.563e-13	7.563e-13	-12.121	-12.121	0.000	(0)
UO2F+	7.019e-13	6.547e-13	-12.154	-12.184	-0.030	(0)
UO2F2	8.873e-14	8.873e-14	-13.052	-13.052	0.000	(0)
FeF2+	2.542e-14	2.386e-14	-13.595	-13.622	-0.028	(0)
FeF+2	2.445e-14	1.897e-14	-13.612	-13.722	-0.110	(0)
BF2 (OH) 2-	1.163e-14	1.089e-14	-13.934	-13.963	-0.029	(0)
PbF2	1.698e-15	1.698e-15	-14.770	-14.770	0.000	(0)
FeF3	1.582e-15	1.582e-15	-14.801	-14.801	0.000	(0)
UO2F3-	1.123e-15	1.047e-15	-14.950	-14.980	-0.030	(0)
VO2F	7.703e-17	7.703e-17	-16.113	-16.113	0.000	(0)
CdF2	6.874e-17	6.874e-17	-16.163	-16.163	0.000	(0)
H2F2	4.931e-17	4.931e-17	-16.307	-16.307	0.000	(0)
VOF+	1.439e-18	1.342e-18	-17.842	-17.872	-0.030	(0)
VO2F2-	1.409e-18	1.314e-18	-17.851	-17.881	-0.030	(0)
UO2F4-2	5.165e-19	3.909e-19	-18.287	-18.408	-0.121	(0)
PbF3-	1.623e-19	1.513e-19	-18.790	-18.820	-0.030	(0)
VOF2	2.365e-20	2.365e-20	-19.626	-19.626	0.000	(0)
BF3OH-	1.313e-20	1.228e-20	-19.882	-19.911	-0.029	(0)
VO2F3-2	1.018e-21	7.703e-22	-20.992	-21.113	-0.121	(0)
VOF3-	4.228e-23	3.944e-23	-22.374	-22.404	-0.030	(0)
PbF4-2	4.497e-24	3.404e-24	-23.347	-23.468	-0.121	(0)
Sb (OH) 2F	1.037e-24	1.037e-24	-23.984	-23.984	0.000	(0)
SbOF	1.020e-24	1.020e-24	-23.992	-23.992	0.000	(0)
BF4-	1.874e-25	1.753e-25	-24.727	-24.756	-0.029	(0)
VO2F4-3	3.333e-26	1.781e-26	-25.477	-25.749	-0.272	(0)
HgF+	1.898e-26	1.770e-26	-25.722	-25.752	-0.030	(0)
VOF4-2	9.883e-27	7.480e-27	-26.005	-26.126	-0.121	(0)
UF3+	2.984e-34	2.783e-34	-33.525	-33.555	-0.030	(0)
UF2+2	4.937e-35	3.737e-35	-34.307	-34.427	-0.121	(0)
UF4	1.434e-36	1.434e-36	-35.843	-35.843	0.000	(0)
UF+3	1.182e-37	6.317e-38	-36.927	-37.200	-0.272	(0)
UF5-	2.863e-39	2.670e-39	-38.543	-38.573	-0.030	(0)
UF6-2	0.000e+00	0.000e+00	-40.300	-40.421	-0.121	(0)
Fe (2)	9.398e-08					
Fe+2	8.757e-08	6.628e-08	-7.058	-7.179	-0.121	(0)
FeSO4	4.891e-09	4.891e-09	-8.311	-8.311	0.000	(0)
FeHCO3+	1.066e-09	1.002e-09	-8.972	-8.999	-0.027	(0)
FeOH+	4.586e-10	4.304e-10	-9.339	-9.366	-0.028	(0)
Fe (OH) 2	5.577e-14	5.577e-14	-13.254	-13.254	0.000	(0)
Fe (OH) 3-	3.066e-15	2.877e-15	-14.513	-14.541	-0.028	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.151	-144.151	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.046	-215.076	-0.030	(0)
Fe (3)	3.059e-06					
Fe (OH) 2+	2.621e-06	2.461e-06	-5.582	-5.609	-0.027	(0)
Fe (OH) 3	4.312e-07	4.312e-07	-6.365	-6.365	0.000	(0)
Fe (OH) 4-	6.975e-09	6.549e-09	-8.156	-8.184	-0.027	(0)
FeOH+2	4.998e-11	3.878e-11	-10.301	-10.411	-0.110	(0)
FeF2+	2.542e-14	2.386e-14	-13.595	-13.622	-0.028	(0)
FeF+2	2.445e-14	1.897e-14	-13.612	-13.722	-0.110	(0)
FeF3	1.582e-15	1.582e-15	-14.801	-14.801	0.000	(0)
FeSO4+	1.323e-15	1.242e-15	-14.878	-14.906	-0.028	(0)
Fe+3	6.579e-16	3.682e-16	-15.182	-15.434	-0.252	(0)
Fe (SO4) 2-	8.558e-18	7.982e-18	-17.068	-17.098	-0.030	(0)
FeCl+2	2.728e-18	2.117e-18	-17.564	-17.674	-0.110	(0)
Fe2 (OH) 2+4	1.517e-19	4.979e-20	-18.819	-19.303	-0.484	(0)
FeHSeO3+2	6.015e-21	4.553e-21	-20.221	-20.342	-0.121	(0)
FeCl2+	1.918e-21	1.800e-21	-20.717	-20.745	-0.028	(0)
Fe3 (OH) 4+5	1.010e-23	1.771e-24	-22.996	-23.752	-0.756	(0)
FeCl3	3.427e-26	3.427e-26	-25.465	-25.465	0.000	(0)
H (0)	1.507e-27					
H2	7.536e-28	7.542e-28	-27.123	-27.122	0.000	(0)
Hg (0)	2.623e-11					
Hg	2.623e-11	2.623e-11	-10.581	-10.581	0.000	(0)
Hg (1)	4.781e-25					
Hg2+2	2.390e-25	1.809e-25	-24.622	-24.743	-0.121	(0)
Hg (2)	2.310e-15					

	Hg (OH) 2	1.705e-15	1.706e-15	-14.768	-14.768	0.000	(0)
	HgClOH	5.573e-16	5.573e-16	-15.254	-15.254	0.000	(0)
	HgCl2	3.683e-17	3.683e-17	-16.434	-16.434	0.000	(0)
	HgCO3	1.109e-17	1.109e-17	-16.955	-16.955	0.000	(0)
	HgCl3-	7.517e-20	7.011e-20	-19.124	-19.154	-0.030	(0)
	HgOH+	7.075e-20	6.599e-20	-19.150	-19.181	-0.030	(0)
	Hg (CO3) 2-2	4.223e-20	3.196e-20	-19.374	-19.495	-0.121	(0)
	HgCl+	4.138e-20	3.860e-20	-19.383	-19.413	-0.030	(0)
	HgHCO3+	1.366e-20	1.274e-20	-19.865	-19.895	-0.030	(0)
	HgCl4-2	7.021e-23	5.314e-23	-22.154	-22.275	-0.121	(0)
	Hg (OH) 3-	3.756e-23	3.504e-23	-22.425	-22.455	-0.030	(0)
	Hg+2	1.342e-23	1.016e-23	-22.872	-22.993	-0.121	(0)
	HgSO4	7.998e-25	7.998e-25	-24.097	-24.097	0.000	(0)
	HgF+	1.898e-26	1.770e-26	-25.722	-25.752	-0.030	(0)
	HgHS2-	0.000e+00	0.000e+00	-129.748	-129.778	-0.030	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-130.594	-130.594	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-131.156	-131.277	-0.121	(0)
K	8.620e-05						
	K+	8.602e-05	8.064e-05	-4.065	-4.093	-0.028	(0)
	KSO4-	1.828e-07	1.716e-07	-6.738	-6.765	-0.027	(0)
	KCrO4-	6.504e-22	6.067e-22	-21.187	-21.217	-0.030	(0)
Mg	2.074e-04						
	Mg+2	1.962e-04	1.516e-04	-3.707	-3.819	-0.112	(0)
	MgSO4	8.292e-06	8.292e-06	-5.081	-5.081	0.000	(0)
	MgHCO3+	1.986e-06	1.862e-06	-5.702	-5.730	-0.028	(0)
	MgF+	8.520e-07	7.992e-07	-6.070	-6.097	-0.028	(0)
	MgCO3	1.149e-07	1.149e-07	-6.939	-6.939	0.000	(0)
	MgOH+	1.047e-08	9.844e-09	-7.980	-8.007	-0.027	(0)
	MgH2BO3+	9.895e-11	9.259e-11	-10.005	-10.033	-0.029	(0)
Mn (2)	2.830e-06						
	Mn+2	2.665e-06	2.017e-06	-5.574	-5.695	-0.121	(0)
	MnSO4	1.078e-07	1.078e-07	-6.967	-6.967	0.000	(0)
	MnHCO3+	5.148e-08	4.831e-08	-7.288	-7.316	-0.028	(0)
	MnF+	4.021e-09	3.774e-09	-8.396	-8.423	-0.028	(0)
	MnOH+	8.807e-10	8.266e-10	-9.055	-9.083	-0.028	(0)
	MnCl+	5.151e-10	4.835e-10	-9.288	-9.316	-0.028	(0)
	MnCl2	1.300e-13	1.300e-13	-12.886	-12.886	0.000	(0)
	MnSeO4	1.901e-17	1.901e-17	-16.721	-16.721	0.000	(0)
	MnCl3-	7.264e-18	6.817e-18	-17.139	-17.166	-0.028	(0)
	Mn (OH) 3-	1.448e-19	1.359e-19	-18.839	-18.867	-0.028	(0)
	Mn (OH) 4-2	9.228e-26	7.159e-26	-25.035	-25.145	-0.110	(0)
	MnSe	5.522e-40	5.522e-40	-39.258	-39.258	0.000	(0)
Mn (3)	9.628e-27						
	Mn+3	9.628e-27	5.388e-27	-26.016	-26.269	-0.252	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-47.224	-47.334	-0.110	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-51.901	-51.929	-0.029	(0)
Mo	6.637e-08						
	MoO4-2	6.631e-08	5.123e-08	-7.178	-7.290	-0.112	(0)
	HMoO4-	6.745e-11	6.291e-11	-10.171	-10.201	-0.030	(0)
	H2MoO4	2.844e-14	2.844e-14	-13.546	-13.546	0.000	(0)
	Ag2MoO4	7.961e-25	7.961e-25	-24.099	-24.099	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-44.204	-44.476	-0.272	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-54.631	-55.720	-1.089	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-55.786	-56.543	-0.756	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-58.486	-58.970	-0.484	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-62.661	-62.933	-0.272	(0)
Na	5.893e-04						
	Na+	5.879e-04	5.512e-04	-3.231	-3.259	-0.028	(0)
	NaSO4-	9.477e-07	8.899e-07	-6.023	-6.051	-0.027	(0)
	NaHCO3	3.721e-07	3.721e-07	-6.429	-6.429	0.000	(0)
	NaF	1.634e-08	1.634e-08	-7.787	-7.787	0.000	(0)
	NaCO3-	9.966e-09	9.358e-09	-8.001	-8.029	-0.027	(0)
	NaH2BO3	1.539e-11	1.539e-11	-10.813	-10.813	0.000	(0)
	NaCrO4-	5.946e-21	5.546e-21	-20.226	-20.256	-0.030	(0)
Ni	2.516e-08						
	Ni+2	2.100e-08	1.622e-08	-7.678	-7.790	-0.112	(0)

NiHCO3+	2.574e-09	2.400e-09	-8.589	-8.620	-0.030	(0)
NiSO4	9.730e-10	9.730e-10	-9.012	-9.012	0.000	(0)
NiCO3	5.517e-10	5.517e-10	-9.258	-9.258	0.000	(0)
NiOH+	3.571e-11	3.331e-11	-10.447	-10.477	-0.030	(0)
NiF+	2.053e-11	1.915e-11	-10.688	-10.718	-0.030	(0)
NiCl+	8.471e-12	7.901e-12	-11.072	-11.102	-0.030	(0)
Ni (OH) 2	4.316e-13	4.316e-13	-12.365	-12.365	0.000	(0)
Ni (SO4) 2-2	1.280e-14	9.686e-15	-13.893	-14.014	-0.121	(0)
Ni (OH) 3-	7.549e-17	7.041e-17	-16.122	-16.152	-0.030	(0)
NiCl2	7.574e-18	7.574e-18	-17.121	-17.121	0.000	(0)
NiSeO4	2.657e-19	2.657e-19	-18.576	-18.576	0.000	(0)
O (0)	1.780e-38					
O2	8.902e-39	8.910e-39	-38.050	-38.050	0.000	(0)
Pb	3.106e-09					
PbCO3	1.520e-09	1.520e-09	-8.818	-8.818	0.000	(0)
Pb+2	7.177e-10	5.545e-10	-9.144	-9.256	-0.112	(0)
PbHCO3+	5.302e-10	4.946e-10	-9.276	-9.306	-0.030	(0)
PbOH+	2.436e-10	2.272e-10	-9.613	-9.644	-0.030	(0)
PbSO4	8.165e-11	8.165e-11	-10.088	-10.088	0.000	(0)
Pb (CO3) 2-2	5.280e-12	3.996e-12	-11.277	-11.398	-0.121	(0)
PbCl+	4.016e-12	3.746e-12	-11.396	-11.426	-0.030	(0)
PbF+	1.969e-12	1.836e-12	-11.706	-11.736	-0.030	(0)
Pb (OH) 2	1.172e-12	1.172e-12	-11.931	-11.931	0.000	(0)
Pb (SO4) 2-2	1.954e-13	1.479e-13	-12.709	-12.830	-0.121	(0)
PbCl2	3.185e-15	3.185e-15	-14.497	-14.497	0.000	(0)
PbF2	1.698e-15	1.698e-15	-14.770	-14.770	0.000	(0)
Pb (OH) 3-	2.050e-16	1.912e-16	-15.688	-15.719	-0.030	(0)
Pb2OH+3	3.737e-18	1.997e-18	-17.427	-17.700	-0.272	(0)
PbCl3-	2.588e-19	2.414e-19	-18.587	-18.617	-0.030	(0)
PbF3-	1.623e-19	1.513e-19	-18.790	-18.820	-0.030	(0)
Pb (OH) 4-2	1.009e-20	7.639e-21	-19.996	-20.117	-0.121	(0)
PbCl4-2	2.776e-23	2.101e-23	-22.557	-22.678	-0.121	(0)
Pb3 (OH) 4+2	2.008e-23	1.520e-23	-22.697	-22.818	-0.121	(0)
PbF4-2	4.497e-24	3.404e-24	-23.347	-23.468	-0.121	(0)
Pb4 (OH) 4+4	2.040e-28	6.695e-29	-27.690	-28.174	-0.484	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.909	-139.909	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.540	-211.570	-0.030	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.340	-67.340	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.931	-72.961	-0.030	(0)
H2S	0.000e+00	0.000e+00	-73.151	-73.151	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.930	-73.960	-0.030	(0)
S5-2	0.000e+00	0.000e+00	-74.996	-75.117	-0.121	(0)
S6-2	0.000e+00	0.000e+00	-75.512	-75.633	-0.121	(0)
S4-2	0.000e+00	0.000e+00	-75.592	-75.713	-0.121	(0)
S3-2	0.000e+00	0.000e+00	-76.398	-76.519	-0.121	(0)
S2-2	0.000e+00	0.000e+00	-77.414	-77.535	-0.121	(0)
S-2	0.000e+00	0.000e+00	-82.942	-83.052	-0.110	(0)
HgHS2-	0.000e+00	0.000e+00	-129.748	-129.778	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.594	-130.594	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.156	-131.277	-0.121	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.171	-136.202	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.382	-136.476	-0.094	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.824	-137.012	-0.188	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.559	-137.742	-0.183	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.515	-138.706	-0.191	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.832	-139.017	-0.185	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.903	-138.934	-0.030	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.718	-139.718	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.909	-139.909	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.133	-140.133	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.151	-144.151	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.766	-199.797	-0.030	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.784	-209.815	-0.030	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.749	-210.779	-0.030	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.540	-211.570	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.464	-212.585	-0.121	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.046	-215.076	-0.030	(0)

Cd (HS) 4-2	0.000e+00	0.000e+00	-281.423	-281.544	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.115	-284.236	-0.121	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.036	-294.157	-0.121	(0)
S (6)	4.312e-04					
SO4-2	3.891e-04	3.006e-04	-3.410	-3.522	-0.112	(0)
CaSO4	3.257e-05	3.257e-05	-4.487	-4.487	0.000	(0)
MgSO4	8.292e-06	8.292e-06	-5.081	-5.081	0.000	(0)
NaSO4-	9.477e-07	8.899e-07	-6.023	-6.051	-0.027	(0)
KSO4-	1.828e-07	1.716e-07	-6.738	-6.765	-0.027	(0)
MnSO4	1.078e-07	1.078e-07	-6.967	-6.967	0.000	(0)
CuSO4	1.063e-08	1.063e-08	-7.973	-7.973	0.000	(0)
ZnSO4	6.132e-09	6.132e-09	-8.212	-8.212	0.000	(0)
FeSO4	4.891e-09	4.891e-09	-8.311	-8.311	0.000	(0)
HSO4-	1.933e-09	1.813e-09	-8.714	-8.742	-0.028	(0)
NiSO4	9.730e-10	9.730e-10	-9.012	-9.012	0.000	(0)
CoSO4	6.401e-10	6.401e-10	-9.194	-9.194	0.000	(0)
PbSO4	8.165e-11	8.165e-11	-10.088	-10.088	0.000	(0)
CdSO4	6.937e-11	6.937e-11	-10.159	-10.159	0.000	(0)
CrOHSO4	4.473e-11	4.473e-11	-10.349	-10.349	0.000	(0)
AgSO4-	4.121e-11	3.843e-11	-10.385	-10.415	-0.030	(0)
Zn (SO4) 2-2	2.121e-11	1.606e-11	-10.673	-10.794	-0.121	(0)
AlSO4+	8.459e-13	7.934e-13	-12.073	-12.100	-0.028	(0)
Cd (SO4) 2-2	3.717e-13	2.813e-13	-12.430	-12.551	-0.121	(0)
Pb (SO4) 2-2	1.954e-13	1.479e-13	-12.709	-12.830	-0.121	(0)
CrSO4+	1.322e-13	1.233e-13	-12.879	-12.909	-0.030	(0)
UO2SO4	4.593e-14	4.593e-14	-13.338	-13.338	0.000	(0)
Ni (SO4) 2-2	1.280e-14	9.686e-15	-13.893	-14.014	-0.121	(0)
Al (SO4) 2-	2.725e-15	2.556e-15	-14.565	-14.592	-0.028	(0)
FeSO4+	1.323e-15	1.242e-15	-14.878	-14.906	-0.028	(0)
UO2 (SO4) 2-2	2.405e-16	1.820e-16	-15.619	-15.740	-0.121	(0)
Fe (SO4) 2-	8.558e-18	7.982e-18	-17.068	-17.098	-0.030	(0)
VO2SO4-	7.193e-18	6.709e-18	-17.143	-17.173	-0.030	(0)
Cr2 (OH) 2SO4+2	3.350e-18	2.536e-18	-17.475	-17.596	-0.121	(0)
VOSO4	3.943e-19	3.943e-19	-18.404	-18.404	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.528e-20	4.528e-20	-19.344	-19.344	0.000	(0)
HgSO4	7.998e-25	7.998e-25	-24.097	-24.097	0.000	(0)
CrO3SO4-2	3.020e-27	2.286e-27	-26.520	-26.641	-0.121	(0)
VSO4+	2.293e-32	2.138e-32	-31.640	-31.670	-0.030	(0)
U (SO4) 2	1.925e-39	1.925e-39	-38.715	-38.715	0.000	(0)
USO4+2	1.065e-39	8.063e-40	-38.973	-39.093	-0.121	(0)
Sb (3)	4.522e-19					
Sb (OH) 3	2.288e-19	2.288e-19	-18.640	-18.640	0.000	(0)
HSbO2	2.234e-19	2.234e-19	-18.651	-18.651	0.000	(0)
SbO2-	6.284e-24	5.862e-24	-23.202	-23.232	-0.030	(0)
Sb (OH) 4-	3.601e-24	3.359e-24	-23.444	-23.474	-0.030	(0)
Sb (OH) 2F	1.037e-24	1.037e-24	-23.984	-23.984	0.000	(0)
SbOF	1.020e-24	1.020e-24	-23.992	-23.992	0.000	(0)
Sb (OH) 2+	3.678e-25	3.430e-25	-24.434	-24.465	-0.030	(0)
SbO+	1.268e-25	1.183e-25	-24.897	-24.927	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.036	-294.157	-0.121	(0)
Sb (5)	1.564e-09					
SbO3-	1.562e-09	1.457e-09	-8.806	-8.837	-0.030	(0)
Sb (OH) 6-	1.818e-12	1.704e-12	-11.740	-11.768	-0.028	(0)
SbO2+	1.707e-24	1.592e-24	-23.768	-23.798	-0.030	(0)
Se (-2)	2.222e-10					
Ag2Se	2.222e-10	2.222e-10	-9.653	-9.653	0.000	(0)
HSe-	4.396e-36	4.100e-36	-35.357	-35.387	-0.030	(0)
H2Se	1.965e-39	1.965e-39	-38.707	-38.707	0.000	(0)
MnSe	5.522e-40	5.522e-40	-39.258	-39.258	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.057	-43.178	-0.121	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.364	-77.848	-0.484	(0)
Se (4)	5.416e-09					
HSeO3-	5.017e-09	4.680e-09	-8.300	-8.330	-0.030	(0)
SeO3-2	3.988e-10	3.018e-10	-9.399	-9.520	-0.121	(0)
H2SeO3	1.232e-13	1.232e-13	-12.909	-12.909	0.000	(0)
AgSeO3-	1.333e-15	1.243e-15	-14.875	-14.906	-0.030	(0)
FeHSeO3+2	6.015e-21	4.553e-21	-20.221	-20.342	-0.121	(0)
Cd (SeO3) 2-2	9.765e-23	7.391e-23	-22.010	-22.131	-0.121	(0)

Ag (SeO3) 2-3	6.287e-24	3.359e-24	-23.202	-23.474	-0.272	(0)
Se (6)	4.534e-14					
SeO4-2	4.532e-14	3.502e-14	-13.344	-13.456	-0.112	(0)
MnSeO4	1.901e-17	1.901e-17	-16.721	-16.721	0.000	(0)
ZnSeO4	5.056e-19	5.056e-19	-18.296	-18.296	0.000	(0)
NiSeO4	2.657e-19	2.657e-19	-18.576	-18.576	0.000	(0)
CoSeO4	1.873e-19	1.873e-19	-18.728	-18.728	0.000	(0)
HSeO4-	1.161e-19	1.083e-19	-18.935	-18.965	-0.030	(0)
CdSeO4	6.418e-21	6.418e-21	-20.193	-20.193	0.000	(0)
Zn (SeO4) 2-2	2.372e-32	1.795e-32	-31.625	-31.746	-0.121	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.472	-55.744	-0.272	(0)
U (4)	6.129e-20					
U (OH) 5-	6.115e-20	5.703e-20	-19.214	-19.244	-0.030	(0)
U (OH) 4	1.474e-22	1.474e-22	-21.831	-21.831	0.000	(0)
U (OH) 3+	3.567e-26	3.327e-26	-25.448	-25.478	-0.030	(0)
U (OH) 2+2	1.255e-30	9.496e-31	-29.901	-30.022	-0.121	(0)
UF3+	2.984e-34	2.783e-34	-33.525	-33.555	-0.030	(0)
UF2+2	4.937e-35	3.737e-35	-34.307	-34.427	-0.121	(0)
UOH+3	5.167e-36	2.761e-36	-35.287	-35.559	-0.272	(0)
UF4	1.434e-36	1.434e-36	-35.843	-35.843	0.000	(0)
UF+3	1.182e-37	6.317e-38	-36.927	-37.200	-0.272	(0)
UF5-	2.863e-39	2.670e-39	-38.543	-38.573	-0.030	(0)
U (SO4) 2	1.925e-39	1.925e-39	-38.715	-38.715	0.000	(0)
USO4+2	1.065e-39	8.063e-40	-38.973	-39.093	-0.121	(0)
UF6-2	0.000e+00	0.000e+00	-40.300	-40.421	-0.121	(0)
U+4	0.000e+00	0.000e+00	-41.688	-42.172	-0.484	(0)
UC1+3	0.000e+00	0.000e+00	-43.920	-44.192	-0.272	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.591	-162.041	-2.450	(0)
U (5)	1.103e-15					
UO2+	1.103e-15	1.029e-15	-14.957	-14.988	-0.030	(0)
U (6)	1.010e-08					
UO2 (CO3) 2-2	8.805e-09	6.664e-09	-8.055	-8.176	-0.121	(0)
UO2 (CO3) 3-4	9.279e-10	3.045e-10	-9.032	-9.516	-0.484	(0)
UO2CO3	3.664e-10	3.664e-10	-9.436	-9.436	0.000	(0)
UO2OH+	2.222e-12	2.073e-12	-11.653	-11.683	-0.030	(0)
UO2F+	7.019e-13	6.547e-13	-12.154	-12.184	-0.030	(0)
UO2+2	1.306e-13	1.009e-13	-12.884	-12.996	-0.112	(0)
UO2F2	8.873e-14	8.873e-14	-13.052	-13.052	0.000	(0)
UO2SO4	4.593e-14	4.593e-14	-13.338	-13.338	0.000	(0)
UO2F3-	1.123e-15	1.047e-15	-14.950	-14.980	-0.030	(0)
UO2 (SO4) 2-2	2.405e-16	1.820e-16	-15.619	-15.740	-0.121	(0)
UO2C1+	3.341e-17	3.116e-17	-16.476	-16.506	-0.030	(0)
(UO2) 2 (OH) 2+2	9.421e-18	7.131e-18	-17.026	-17.147	-0.121	(0)
UO2F4-2	5.165e-19	3.909e-19	-18.287	-18.408	-0.121	(0)
(UO2) 3 (OH) 5+	3.199e-19	2.984e-19	-18.495	-18.525	-0.030	(0)
V (2)	8.615e-40					
VOH+	6.985e-40	6.515e-40	-39.156	-39.186	-0.030	(0)
V+2	1.631e-40	1.234e-40	-39.788	-39.909	-0.121	(0)
V (3)	5.277e-13					
V (OH) 3	5.277e-13	5.277e-13	-12.278	-12.278	0.000	(0)
V (OH) 2+	2.256e-23	2.104e-23	-22.647	-22.677	-0.030	(0)
VOH+2	1.628e-26	1.232e-26	-25.788	-25.909	-0.121	(0)
V+3	2.820e-31	1.507e-31	-30.550	-30.822	-0.272	(0)
VSO4+	2.293e-32	2.138e-32	-31.640	-31.670	-0.030	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.862	-50.134	-0.272	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.535	-51.019	-0.484	(0)
V (4)	1.743e-16					
V (OH) 3+	1.662e-16	1.550e-16	-15.779	-15.810	-0.030	(0)
VO+2	6.292e-18	4.763e-18	-17.201	-17.322	-0.121	(0)
VOF+	1.439e-18	1.342e-18	-17.842	-17.872	-0.030	(0)
VOSO4	3.943e-19	3.943e-19	-18.404	-18.404	0.000	(0)
VOF2	2.365e-20	2.365e-20	-19.626	-19.626	0.000	(0)
VOC1+	2.727e-21	2.544e-21	-20.564	-20.595	-0.030	(0)
VOF3-	4.228e-23	3.944e-23	-22.374	-22.404	-0.030	(0)
VOF4-2	9.883e-27	7.480e-27	-26.005	-26.126	-0.121	(0)
H2V2O4+2	1.591e-27	1.204e-27	-26.798	-26.919	-0.121	(0)
V (5)	1.385e-08					

H2VO4-	1.318e-08	1.229e-08	-7.880	-7.910	-0.030	(0)
HVO4-2	6.610e-10	5.003e-10	-9.180	-9.301	-0.121	(0)
H3VO4	7.588e-12	7.588e-12	-11.120	-11.120	0.000	(0)
H3V2O7-	6.458e-13	6.023e-13	-12.190	-12.220	-0.030	(0)
HV2O7-3	3.901e-15	2.084e-15	-14.409	-14.681	-0.272	(0)
VO2+	9.969e-16	9.346e-16	-15.001	-15.029	-0.028	(0)
VO2F	7.703e-17	7.703e-17	-16.113	-16.113	0.000	(0)
VO4-3	7.603e-17	4.062e-17	-16.119	-16.391	-0.272	(0)
VO2SO4-	7.193e-18	6.709e-18	-17.143	-17.173	-0.030	(0)
V3O9-3	3.642e-18	1.946e-18	-17.439	-17.711	-0.272	(0)
V2O7-4	2.769e-18	9.089e-19	-17.558	-18.042	-0.484	(0)
VO2F2-	1.409e-18	1.314e-18	-17.851	-17.881	-0.030	(0)
VO2F3-2	1.018e-21	7.703e-22	-20.992	-21.113	-0.121	(0)
V4O12-4	3.039e-23	9.973e-24	-22.517	-23.001	-0.484	(0)
VO2F4-3	3.333e-26	1.781e-26	-25.477	-25.749	-0.272	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.302	-58.058	-0.756	(0)
V10O28-6	0.000e+00	0.000e+00	-57.947	-59.035	-1.089	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.576	-60.060	-0.484	(0)
Zn	1.373e-07					
Zn+2	1.207e-07	9.324e-08	-6.918	-7.030	-0.112	(0)
ZnSO4	6.132e-09	6.132e-09	-8.212	-8.212	0.000	(0)
ZnCO3	4.892e-09	4.892e-09	-8.311	-8.311	0.000	(0)
ZnHCO3+	3.794e-09	3.539e-09	-8.421	-8.451	-0.030	(0)
ZnOH+	1.631e-09	1.521e-09	-8.788	-8.818	-0.030	(0)
ZnF+	9.372e-11	8.742e-11	-10.028	-10.058	-0.030	(0)
ZnCl+	4.756e-11	4.459e-11	-10.323	-10.351	-0.028	(0)
Zn (OH) 2	3.932e-11	3.932e-11	-10.405	-10.405	0.000	(0)
Zn (SO4) 2-2	2.121e-11	1.606e-11	-10.673	-10.794	-0.121	(0)
ZnOHCl	9.522e-12	9.522e-12	-11.021	-11.021	0.000	(0)
Zn (OH) 3-	3.447e-14	3.215e-14	-13.463	-13.493	-0.030	(0)
ZnCl2	1.345e-14	1.345e-14	-13.871	-13.871	0.000	(0)
ZnCl3-	2.170e-18	2.034e-18	-17.663	-17.692	-0.028	(0)
ZnSeO4	5.056e-19	5.056e-19	-18.296	-18.296	0.000	(0)
Zn (OH) 4-2	2.758e-19	2.088e-19	-18.559	-18.680	-0.121	(0)
ZnCl4-2	2.496e-22	1.937e-22	-21.603	-21.713	-0.110	(0)
Zn (SeO4) 2-2	2.372e-32	1.795e-32	-31.625	-31.746	-0.121	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.903	-138.934	-0.030	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.133	-140.133	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.784	-209.815	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.464	-212.585	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.115	-284.236	-0.121	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.92	-82.14	-36.22	Ag2S
Ag2CO3	-11.34	-22.43	-11.09	Ag2CO3
Ag2CrO4	-22.49	-34.08	-11.59	Ag2CrO4
Ag2HVO4	-11.27	-9.79	1.48	Ag2HVO4
Ag2MoO4	-12.13	-23.68	-11.55	Ag2MoO4
Ag2O	-14.54	-1.97	12.57	Ag2O
Ag2Se	4.14	-44.56	-48.70	Ag2Se
Ag2SeO3	-10.36	-17.51	-7.15	Ag2SeO3
Ag2SeO4	-20.93	-29.84	-8.91	Ag2SeO4
Ag2SO4	-15.09	-19.91	-4.82	Ag2SO4
Ag3AsO3	-24.00	-21.84	2.16	Ag3AsO3
Ag3AsO4	-13.98	-16.77	-2.79	Ag3AsO4
Ag3H2VO5	-15.95	-10.77	5.18	Ag3H2VO5
AgF:4H2O	-13.57	-12.52	1.05	AgF:4H2O
Agmetal	0.54	-12.97	-13.51	Ag
AgVO3	-9.57	-8.80	0.77	AgVO3
Al (OH) 3 (am)	-1.64	9.16	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.18	-46.81	2.37	Al2 (MoO4) 3
Al2O3	-1.33	18.32	19.65	Al2O3
Al4 (OH) 10SO4	-4.00	18.70	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.46	-4.66	4.80	AlAsO4:2H2O
AlOHSO4	-5.55	-8.78	-3.23	AlOHSO4

AlSb	-147.02	-81.40	65.62	AlSb
Alunite	-3.89	-5.29	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-4.99	-12.78	-7.79	PbSO ₄
Anhydrite	-2.49	-6.85	-4.36	CaSO ₄
Anilite	-48.92	-80.80	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-3.91	4.88	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-1.07	-9.37	-8.30	CaCO ₃
Arsenolite	-72.81	-75.57	-2.76	As ₄ O ₆
Artinite	-8.86	0.74	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-34.34	-27.64	6.71	As ₂ O ₅
Atacamite	-3.11	4.29	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.19	-18.10	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.85	7.55	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-16.42	-0.54	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	3.92	-4.99	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-25.94	7.00	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-14.89	-24.56	-9.67	BaCrO ₄
BaF ₂	-9.71	-15.53	-5.82	BaF ₂
BaMoO ₄	-7.20	-14.16	-6.96	BaMoO ₄
Barite	-0.41	-10.39	-9.98	BaSO ₄
BaS	-88.80	-72.62	16.18	BaS
BaSeO ₃	-9.82	-7.99	1.83	BaSeO ₃
BaSeO ₄	-12.87	-20.33	-7.46	BaSeO ₄
Bianchite	-8.79	-10.55	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-10.74	7.35	18.09	MnO ₂
Bixbyite	-8.64	-9.28	-0.64	Mn ₂ O ₃
BlaubleiI	-49.50	-73.66	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-49.68	-76.96	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.58	9.16	8.58	AlOOH
Breithauptite	-53.42	-71.94	-18.52	NiSb
Brochantite	-2.73	12.49	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.24	10.60	16.84	Mg(OH) ₂
Bunsenite	-5.82	6.63	12.45	NiO
Ca(VO ₃) ₂	-10.21	-4.55	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.95	6.55	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-15.00	6.55	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-16.66	5.64	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-21.32	17.64	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-22.22	17.64	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-290.81	-147.83	142.97	Ca ₃ Sb ₂
CaCrO ₄	-18.75	-21.02	-2.27	CaCrO ₄
Calcite	-0.89	-9.37	-8.48	CaCO ₃
Calomel	-14.27	-32.18	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.67	-10.62	-7.95	CaMoO ₄
Carnotite	-3.51	-3.28	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.26	-4.45	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-13.76	-16.78	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-15.88	-6.04	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.23	5.41	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.32	5.41	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-26.36	-19.65	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-24.26	-1.70	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-24.69	3.71	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-15.79	-16.45	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-14.75	-16.45	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-14.53	-16.45	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.45	-17.66	-1.21	CdF ₂
Cdmetal(alpha)	-32.07	-18.56	13.51	Cd
Cdmetal(gamma)	-32.18	-18.56	13.62	Cd
CdMoO ₄	-2.15	-16.30	-14.15	CdMoO ₄
CdOHCl	-9.06	-5.52	3.54	CdOHCl
CdSb	-72.81	-73.16	-0.35	CdSb
CdSe	-16.98	-37.18	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-20.61	-22.46	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-12.36	-12.53	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-10.80	-12.53	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-10.66	-12.53	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-2.16	-11.91	-9.75	AgCl

Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4 (g)	-75.30	-116.35	-41.05	CH4
Chalcanthite	-7.69	-10.33	-2.64	CuSO4:5H2O
Chalcocite	-48.63	-83.55	-34.92	Cu2S
Chalcopyrite	-110.22	-145.49	-35.27	CuFeS2
Cinnabar	-49.24	-94.94	-45.69	HgS
Claudetite	-72.51	-75.57	-3.06	As4O6
Clausthalite	-10.33	-37.43	-27.10	PbSe
Co (BO2) 2	-32.08	-5.01	27.07	Co (BO2) 2
Co (OH) 2	-6.65	6.45	13.09	Co (OH) 2
Co (OH) 3	-11.66	-13.97	-2.31	Co (OH) 3
CO2 (g)	-2.31	-20.46	-18.15	CO2
Co3 (AsO4) 2	-21.33	-8.30	13.03	Co3 (AsO4) 2
Co3O4	-10.99	-21.49	-10.50	Co3O4
CoCl2	-23.68	-15.41	8.27	CoCl2
CoCl2:6H2O	-17.95	-15.41	2.54	CoCl2:6H2O
CoCO3	-4.03	-14.01	-9.98	CoCO3
CoF2	-15.03	-16.63	-1.60	CoF2
CoF3	-47.12	-48.58	-1.46	CoF3
CoFe2O4	22.36	18.84	-3.53	CoFe2O4
CoMoO4	-7.50	-15.26	-7.76	CoMoO4
CoO	-7.14	6.45	13.59	CoO
CoS (alpha)	-66.28	-73.72	-7.44	CoS
CoS (beta)	-62.65	-73.72	-11.07	CoS
CoSe	-19.95	-36.15	-16.20	CoSe
CoSeO3	-10.41	-9.09	1.32	CoSeO3
CoSeO4:6H2O	-19.90	-21.43	-1.53	CoSeO4:6H2O
CoSO4	-14.30	-11.49	2.80	CoSO4
CoSO4:6H2O	-9.02	-11.49	-2.47	CoSO4:6H2O
Cotunnite	-11.92	-16.70	-4.78	PbCl2
Covellite	-50.26	-72.56	-22.30	CuS
Cr (OH) 2	-20.55	-9.73	10.82	Cr (OH) 2
Cr (OH) 3	-2.03	-0.70	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.05	-0.70	-0.75	Cr (OH) 3
Cr2O3	0.97	-1.39	-2.36	Cr2O3
CrCl2	-45.69	-31.59	14.09	CrCl2
CrCl3	-48.60	-33.49	15.11	CrCl3
CrF3	-23.97	-35.31	-11.34	CrF3
Crmetal	-64.19	-33.71	30.48	Cr
CrO3	-28.90	-32.11	-3.21	CrO3
Cryolite	-14.37	-48.21	-33.84	Na3AlF6
Cu (OH) 2	-1.07	7.61	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.94	18.27	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.76	-84.64	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.17	-45.97	-45.80	Cu2Se
Cu2SO4	-19.37	-21.32	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.91	-4.81	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.03	-95.62	-42.59	Cu3Sb
Cu3Se2	-17.47	-80.96	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-8.32	-13.23	-4.91	CuF
CuF2	-16.58	-15.47	1.12	CuF2
CuF2:2H2O	-10.92	-15.47	-4.55	CuF2:2H2O
Cumetal	-4.92	-13.67	-8.76	Cu
CuMoO4	-1.03	-14.10	-13.08	CuMoO4
CuOCuSO4	-13.03	-2.73	10.30	CuOCuSO4
Cupricferrite	14.01	20.00	5.99	CuFe2O4
Cuprite	-1.97	-3.38	-1.41	Cu2O
Cuprousferrite	13.42	4.51	-8.92	CuFeO2
CuSe	-1.89	-34.99	-33.10	CuSe
CuSe2	-20.25	-53.61	-33.37	CuSe2
CuSeO3:2H2O	-8.44	-7.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.83	-20.27	-2.44	CuSeO4:5H2O
CuSO4	-13.27	-10.33	2.94	CuSO4
Diaspore	2.29	9.16	6.87	AlOOH
Djurleite	-48.90	-82.82	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-2.68	-19.22	-16.54	CaMg (CO3) 2

Dolomite (ordered)	-2.13	-19.22	-17.09	CaMg (CO ₃) ₂
Epsomite	-5.22	-7.34	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-6.32	7.24	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl ₂ ·3	5.96	2.92	-3.04	Fe (OH) ₂ ·7Cl ₂ ·3
Fe (VO ₃) ₂	-4.68	-8.40	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-4.70	-3.15	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-13.60	-34.23	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-37.70	-41.43	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-0.59	19.63	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-8.02	-7.62	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-1.35	5.85	7.20	FeCr ₂ O ₄
FeMoO ₄	-4.38	-14.47	-10.09	FeMoO ₄
Ferrihydrite	3.00	6.19	3.19	Fe (OH) ₃
Ferroselite	-35.38	-53.98	-18.60	FeSe ₂
FeS (ppt)	-69.98	-72.93	-2.95	FeS
FeSe	-24.36	-35.36	-11.00	FeSe
Fix_pe	-4.78	-4.78	0.00	e-
Fluorite	-1.48	-11.98	-10.50	CaF ₂
Galena	-61.04	-75.01	-13.97	PbS
Gibbsite	0.87	9.16	8.29	Al (OH) ₃
Goethite	5.70	6.19	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-60.40	-74.76	-14.36	CdS
Greigite	-256.02	-301.05	-45.03	Fe ₃ S ₄
Gummite	-6.25	1.42	7.67	UO ₃
Gypsum	-2.24	-6.85	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-5.20	-17.30	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.83	-21.71	-12.88	H ₂ MoO ₄
H ₂ S (g)	-72.16	-80.17	-8.01	H ₂ S
H ₂ Se (g)	-37.64	-42.60	-4.96	H ₂ Se
Halite	-8.58	-6.98	1.60	NaCl
Hausmannite	-10.89	50.14	61.03	Mn ₃ O ₄
Hematite	13.81	12.39	-1.42	Fe ₂ O ₃
Hercynite	2.67	25.56	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-173.76	-247.47	-73.71	Hg (CH ₃) ₂
Hg (g)	-9.27	-17.15	-7.87	Hg
Hg (OH) ₂	-11.27	-14.77	-3.50	Hg (OH) ₂
Hg ₂ (g)	-19.34	-34.30	-14.96	Hg ₂
Hg ₂ (OH) ₂	-15.58	-10.32	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-14.73	-30.78	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-33.74	-42.44	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-23.04	-33.40	-10.36	Hg ₂ F ₂
Hg ₂ S	-78.82	-90.49	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-21.21	-25.86	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-22.13	-28.26	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-35.08	-64.76	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-35.59	-16.09	19.50	HgCl
HgCl ₂	-15.37	-36.63	-21.26	HgCl ₂
HgF (g)	-49.37	-16.70	32.68	HgF
HgF ₂ (g)	-50.41	-37.84	12.57	HgF ₂
Hgmetal (l)	-3.70	-17.15	-13.45	Hg
HgSe	-1.67	-57.36	-55.69	HgSe
HgSeO ₃	-17.88	-30.31	-12.43	HgSeO ₃
HgSO ₄	-23.29	-32.71	-9.42	HgSO ₄
Huntite	-8.98	-38.94	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerussite	-6.66	-25.43	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-20.07	-28.84	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-18.44	-23.61	-5.17	KAl (SO ₄) ₂ ·12H ₂ O
K-Jarosite	0.62	-14.18	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-40.75	-57.99	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-25.37	-25.88	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-18.74	-15.48	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-20.91	-21.64	-0.73	K ₂ SeO ₄
Langite	-5.00	12.49	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-7.18	-7.62	-0.43	PbO·PbSO ₄
Laurionite	-6.39	-5.77	0.62	PbOHCl
Lepidocrocite	4.82	6.19	1.37	FeOOH
Lime	-21.61	11.09	32.70	CaO

Litharge	-7.53	5.16	12.69	PbO
Mackinawite	-69.33	-72.93	-3.60	FeS
Maghemite	6.00	12.39	6.39	Fe2O3
Magnesioferrite	6.13	22.99	16.86	Fe2MgO4
Magnesite	-2.40	-9.86	-7.46	MgCO3
Magnetite	16.23	19.63	3.40	Fe3O4
Malachite	0.06	-5.24	-5.31	Cu2 (OH) 2CO3
Manganite	-4.63	20.71	25.34	MnOOH
Massicot	-7.73	5.16	12.89	PbO
Matlockite	-8.33	-17.30	-8.97	PbClF
Melanothallite	-20.51	-14.25	6.26	CuCl2
Melanterite	-8.49	-10.70	-2.21	FeSO4:7H2O
Metacinnabar	-49.84	-94.94	-45.09	HgS
Mg (OH) 2 (active)	-8.19	10.60	18.79	Mg (OH) 2
Mg (VO3) 2	-16.32	-5.04	11.28	Mg (VO3) 2
Mg2Sb3	-265.23	-190.54	74.68	Mg2Sb3
Mg2V2O7	-20.80	5.56	26.36	Mg2V2O7
MgCr2O4	-6.99	9.21	16.20	MgCr2O4
MgCrO4	-26.89	-21.51	5.38	MgCrO4
MgF2	-4.35	-12.48	-8.13	MgF2
MgMoO4	-9.26	-11.11	-1.85	MgMoO4
MgSeO3:6H2O	-8.00	-4.94	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.08	-17.28	-1.20	MgSeO4:6H2O
Minium	-34.06	39.46	73.52	Pb3O4
Mirabilite	-8.93	-10.04	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.82	-6.92	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.39	-63.10	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.18	-85.10	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.97	-1.47	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-15.85	-13.14	2.72	MnCl2:4H2O
MnS (grn)	-71.62	-71.45	0.17	MnS
MnS (pnk)	-74.79	-71.45	3.34	MnS
MnSb	-92.29	-95.20	-2.91	MnSb
MnSe	-37.37	-33.87	3.50	MnSe
MnSeO3	-7.95	-6.82	1.13	MnSeO3
MnSeO3:2H2O	-7.80	-6.82	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.10	-19.15	-2.05	MnSeO4:5H2O
MnSO4	-11.80	-9.22	2.58	MnSO4
Monteponite	-9.69	5.41	15.10	CdO
Montroydite	-11.13	-14.77	-3.64	HgO
MoO3	-13.71	-21.71	-8.00	MoO3
Morenosite	-9.17	-11.31	-2.14	NiSO4:7H2O
MoS2	-135.76	-206.02	-70.26	MoS2
Na-Jarosite	-2.15	-13.35	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-46.43	-56.32	-9.90	Na2Cr2O7
Na2CrO4	-27.14	-24.21	2.93	Na2CrO4
Na2Mo2O7	-18.92	-35.52	-16.60	Na2Mo2O7
Na2MoO4	-15.30	-13.81	1.49	Na2MoO4
Na2MoO4:2H2O	-15.03	-13.81	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-17.94	-7.64	10.30	Na2SeO3:5H2O
Na2SeO4	-21.25	-19.97	1.28	Na2SeO4
Na3Sb	-173.16	-78.71	94.45	Na3Sb
Na3VO4	-32.65	4.03	36.68	Na3VO4
Na4V2O7	-37.24	0.16	37.40	Na4V2O7
Nantokite	-5.89	-12.62	-6.73	CuCl
NaSb	-85.80	-62.63	23.17	NaSb
Natron	-11.25	-12.56	-1.31	Na2CO3:10H2O
NaVO3	-7.73	-3.87	3.86	NaVO3
Nesquehonite	-5.19	-9.86	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.16	6.63	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.45	-7.75	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-23.42	8.58	32.00	Ni4 (OH) 6SO4
NiCO3	-6.96	-13.83	-6.87	NiCO3
NiMoO4	-3.94	-15.08	-11.14	NiMoO4
NiS (alpha)	-67.94	-73.54	-5.60	NiS
NiS (beta)	-62.44	-73.54	-11.10	NiS
NiS (gamma)	-60.74	-73.54	-12.80	NiS
NiSe	-18.27	-35.97	-17.70	NiSe

NiSeO3:2H2O	-11.72	-8.91	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.73	-21.25	-1.52	NiSeO4:6H2O
Nsutite	-10.16	7.35	17.50	MnO2
O2 (g)	-35.14	47.94	83.09	O2
Orpiment	-217.23	-278.30	-61.07	As2S3
Otavite	-3.05	-15.05	-12.00	CdCO3
Pb(BO2)2	-12.81	-6.29	6.52	Pb(BO2)2
Pb(OH)2	-2.99	5.16	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.37	-71.13	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.40	-0.60	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.86	10.33	26.19	Pb2O(OH)2
Pb2O3	-26.74	34.30	61.04	Pb2O3
Pb2OCO3	-9.58	-10.13	-0.56	Pb2OCO3
Pb2V2O7	-3.41	-5.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.95	-12.15	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.29	-0.15	6.14	Pb3(VO4)2
Pb3O2CO3	-15.99	-4.97	11.02	Pb3O2CO3
Pb3O2SO4	-13.14	-2.45	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.39	2.71	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.17	2.71	21.88	Pb4O3SO4
PbCrO4	-14.35	-26.95	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.06	-18.81	4.25	Pb
PbMoO4	-0.93	-16.55	-15.62	PbMoO4
PbO:0.3H2O	-7.82	5.16	12.98	PbO:0.33H2O
PbSeO4	-15.87	-22.71	-6.84	PbSeO4
Periclase	-10.98	10.60	21.58	MgO
Phosgenite	-12.18	-31.99	-19.81	PbCl2:PbCO3
Plattnerite	-20.46	29.14	49.60	PbO2
Portlandite	-11.71	11.09	22.80	Ca(OH)2
Pyrite	-110.62	-129.13	-18.51	FeS2
Pyrochroite	-6.47	8.72	15.19	Mn(OH)2
Pyrolusite	-8.68	32.70	41.38	MnO2
Realgar	-91.30	-111.05	-19.75	AsS
Retgersite	-9.27	-11.31	-2.04	NiSO4:6H2O
Rhodochrosite	-1.16	-11.74	-10.58	MnCO3
Rutherfordine	-4.54	-19.04	-14.50	UO2CO3
Sb(OH)3	-11.53	-18.64	-7.11	Sb(OH)3
Sb2O4	-16.71	-13.31	3.40	Sb2O4
Sb2O5	-28.29	-37.96	-9.67	Sb2O5
Sb2Se3	-97.31	-165.07	-67.76	Sb2Se3
Sb4O6(cubic)	-56.30	-74.56	-18.26	Sb4O6
Sb4O6(orth)	-56.66	-74.56	-17.90	Sb4O6
SbCl3	-52.00	-51.43	0.57	SbCl3
SbF3	-43.03	-53.25	-10.23	SbF3
Sbmetal	-42.91	-54.60	-11.69	Sb
SbO2	-3.14	-30.96	-27.82	SbO2
Schoepite	-4.57	1.42	5.99	UO2(OH)2:H2O
Semetal(am)	-11.51	-18.62	-7.11	Se
Semetal(hex)	-10.92	-18.62	-7.71	Se
Senarmontite	-24.92	-37.28	-12.37	Sb2O3
SeO2	-15.66	-15.54	0.12	SeO2
SeO3	-48.92	-27.87	21.04	SeO3
Siderite	-2.98	-13.22	-10.24	FeCO3
Smithsonite	-3.07	-13.07	-10.00	ZnCO3
Sphalerite	-61.33	-72.78	-11.45	ZnS
Spinel	-7.93	28.92	36.85	MgAl2O4
Stibnite	-227.33	-277.79	-50.46	Sb2S3
Sulfur	-54.05	-56.20	-2.14	S
Tenorite	-0.04	7.61	7.64	CuO
Thenardite	-10.36	-10.04	0.32	Na2SO4
Thermonatrite	-13.19	-12.56	0.64	Na2CO3:H2O
Tyuyamunite	-5.78	-1.70	4.08	Ca(UO2)2(VO4)2
U3O8	-13.14	7.94	21.08	U3O8
U3Sb4	-554.61	-402.23	152.38	U3Sb4
U4O9	-26.34	-29.36	-3.02	U4O9
UF4	-29.95	-59.48	-29.54	UF4
UF4:2.5H2O	-26.77	-59.48	-32.72	UF4:2.5H2O

UO2(am)	-14.27	-13.33	0.93	UO2
UO2(OH)2(beta)	-4.19	1.42	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.20	-26.45	-2.25	UO2SeO4:4H2O
UO3	-6.28	1.42	7.70	UO3
Uraninite	-8.66	-13.33	-4.67	UO2
USb2	-209.27	-179.69	29.58	USb2
V(OH)3	-16.78	-9.19	7.59	V(OH)3
V2O5	-14.28	-15.64	-1.36	V2O5
V3O5	-34.52	-32.68	1.84	V3O5
V4O7	-42.77	-35.58	7.19	V4O7
V6O13	-34.00	-94.86	-60.86	V6O13
Valentinite	-28.80	-37.28	-8.48	Sb2O3
VC12	-61.91	-43.04	18.87	VC12
VC13	-65.42	-41.98	23.43	VC13
VF4	-63.98	-49.05	14.93	VF4
Vmetal	-89.18	-45.15	44.03	V
VO	-35.94	-21.18	14.76	VO
VO(OH)2	-8.05	-2.90	5.15	VO(OH)2
VO2Cl	-21.59	-18.75	2.84	VO2Cl
VOC1	-31.28	-20.12	11.15	VOC1
VOC12	-37.52	-24.76	12.76	VOC12
VOSO4	-24.45	-20.84	3.61	VOSO4
Witherite	-4.34	-12.91	-8.57	BaCO3
Wurtzite	-63.83	-72.78	-8.95	ZnS
Zincite	-3.95	7.39	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO4
Zn(BO2)2	-12.36	-4.07	8.29	Zn(BO2)2
Zn(OH)2	-4.81	7.39	12.20	Zn(OH)2
Zn(OH)2(am)	-5.09	7.39	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.37	7.39	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.15	7.39	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.35	7.39	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.66	-3.16	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.34	3.85	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.12	-5.47	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.63	-13.72	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-16.79	11.61	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-23.42	15.08	38.50	Zn5(OH)8Cl2
ZnCl2	-21.52	-14.47	7.05	ZnCl2
ZnCO3:1H2O	-2.81	-13.07	-10.26	ZnCO3:1H2O
ZnF2	-15.15	-15.69	-0.53	ZnF2
Znmetal	-42.37	-16.58	25.79	Zn
ZnMoO4	-4.20	-14.32	-10.13	ZnMoO4
ZnO(active)	-3.80	7.39	11.19	ZnO
ZnS(am)	-63.73	-72.78	-9.05	ZnS
ZnSb	-82.20	-71.18	11.01	ZnSb
ZnSe	-20.81	-35.21	-14.40	ZnSe
ZnSeO4:6H2O	-18.97	-20.49	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 37.

```

REACTION 201
  H2O      -1
  414.7700 moles ### Addition step. Removes HTC water but solute mass
remains
  USE solution 201
  SAVE Solution 202
End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 201. Solution after simulation 36.
Using reaction 201.

Reaction 201.

4.148e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.352e-08	8.350e-08
Al	4.648e-06	4.647e-06
As	4.102e-08	4.101e-08
B	1.602e-05	1.601e-05
Ba	1.490e-06	1.490e-06
C	1.239e-02	1.238e-02
Ca	5.566e-03	5.565e-03
Cd	1.177e-08	1.176e-08
Cl	1.721e-03	1.720e-03
Co	1.359e-07	1.359e-07
Cr	1.271e-07	1.270e-07
Cu	9.701e-06	9.699e-06
F	4.345e-04	4.344e-04
Fe	2.672e-05	2.671e-05
Hg	2.223e-10	2.222e-10
K	7.305e-04	7.303e-04
Mg	1.758e-03	1.758e-03
Mn	2.398e-05	2.397e-05
Mo	5.625e-07	5.623e-07
Na	4.993e-03	4.992e-03
Ni	2.132e-07	2.131e-07
Pb	2.632e-08	2.631e-08
S	3.654e-03	3.654e-03
Sb	1.325e-08	1.325e-08
Se	4.778e-08	4.777e-08
U	8.561e-08	8.559e-08
V	1.174e-07	1.173e-07
Zn	1.164e-06	1.164e-06

-----Description of solution-----

	pH	=	7.151	Charge balance
	pe	=	5.126	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	2.627e-02	
	Mass of water (kg)	=	9.998e-01	
	Total alkalinity (eq/kg)	=	1.102e-02	
	Total CO2 (mol/kg)	=	1.239e-02	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.467e-16	

Percent error, $100 \cdot (Cat - |An|) / (Cat + |An|)$ = 0.00
Iterations = 15
Total H = 1.110030e+02
Total O = 5.554644e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.673e-07	1.425e-07	-6.776	-6.846	-0.070	(0)
H+	8.241e-08	7.061e-08	-7.084	-7.151	-0.067	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.352e-08					
AgCl	5.344e-08	5.344e-08	-7.272	-7.272	0.000	(0)
Ag+	2.072e-08	1.775e-08	-7.684	-7.751	-0.067	(0)
AgCl2-	8.301e-09	6.862e-09	-8.081	-8.164	-0.083	(0)
AgSO4-	6.108e-10	5.049e-10	-9.214	-9.297	-0.083	(0)
Ag2Se	2.055e-10	2.055e-10	-9.687	-9.687	0.000	(0)
AgCl3-2	1.931e-11	9.017e-12	-10.714	-11.045	-0.331	(0)
AgF	1.456e-11	1.456e-11	-10.837	-10.837	0.000	(0)
AgOH	2.531e-13	2.531e-13	-12.597	-12.597	0.000	(0)
AgCl4-3	1.505e-13	2.714e-14	-12.822	-13.566	-0.744	(0)
AgH2BO3	3.687e-14	3.687e-14	-13.433	-13.433	0.000	(0)
AgSeO3-	2.783e-14	2.300e-14	-13.556	-13.638	-0.083	(0)
Ag (OH) 2-	4.264e-18	3.525e-18	-17.370	-17.453	-0.083	(0)
Ag (SeO3) 2-3	2.303e-21	4.153e-22	-20.638	-21.382	-0.744	(0)
Ag2MoO4	3.613e-23	3.613e-23	-22.442	-22.442	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.488	-68.488	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.980	-79.302	-1.323	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.858	-138.941	-0.083	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.089	-139.273	-0.184	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.219	-141.562	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.546	-141.873	-0.327	(0)
Al	4.648e-06					
AlF3	2.251e-06	2.251e-06	-5.648	-5.648	0.000	(0)
Al (OH) 4-	1.241e-06	1.064e-06	-5.906	-5.973	-0.067	(0)
AlF2+	6.352e-07	5.479e-07	-6.197	-6.261	-0.064	(0)
AlF4-	4.294e-07	3.683e-07	-6.367	-6.434	-0.067	(0)
Al (OH) 3	5.929e-08	5.929e-08	-7.227	-7.227	0.000	(0)
Al (OH) 2+	2.417e-08	2.085e-08	-7.617	-7.681	-0.064	(0)
AlF+2	7.617e-09	4.217e-09	-8.118	-8.375	-0.257	(0)
AlOH+2	3.326e-10	1.841e-10	-9.478	-9.735	-0.257	(0)
AlSO4+	1.667e-11	1.429e-11	-10.778	-10.845	-0.067	(0)
Al+3	5.191e-12	1.292e-12	-11.285	-11.889	-0.604	(0)
Al (SO4) 2-	2.546e-13	2.183e-13	-12.594	-12.661	-0.067	(0)
AlMo6O21-3	6.742e-39	1.216e-39	-38.171	-38.915	-0.744	(0)
As (3)	2.473e-19					
H3AsO3	2.452e-19	2.452e-19	-18.611	-18.611	0.000	(0)
H2AsO3-	2.154e-21	1.781e-21	-20.667	-20.749	-0.083	(0)
HAsO3-2	4.926e-26	2.300e-26	-25.308	-25.638	-0.331	(0)
H4AsO3+	1.038e-26	8.577e-27	-25.984	-26.067	-0.083	(0)
AsO3-3	6.965e-32	1.256e-32	-31.157	-31.901	-0.744	(0)
As (5)	4.102e-08					
HAsO4-2	3.008e-08	1.405e-08	-7.522	-7.852	-0.331	(0)
H2AsO4-	1.094e-08	9.045e-09	-7.961	-8.044	-0.083	(0)
AsO4-3	3.489e-12	6.291e-13	-11.457	-12.201	-0.744	(0)
H3AsO4	1.103e-13	1.110e-13	-12.957	-12.955	0.003	(0)
B	1.602e-05					
H3BO3	1.583e-05	1.593e-05	-4.800	-4.798	0.003	(0)
H2BO3-	1.550e-07	1.310e-07	-6.810	-6.883	-0.073	(0)
CaH2BO3+	2.079e-08	1.758e-08	-7.682	-7.755	-0.073	(0)
MgH2BO3+	4.163e-09	3.519e-09	-8.381	-8.454	-0.073	(0)
BF (OH) 3-	2.454e-09	2.075e-09	-8.610	-8.683	-0.073	(0)
NaH2BO3	8.778e-10	8.778e-10	-9.057	-9.057	0.000	(0)
BF2 (OH) 2-	6.050e-12	5.114e-12	-11.218	-11.291	-0.073	(0)
BaH2BO3+	3.647e-12	3.083e-12	-11.438	-11.511	-0.073	(0)
H5 (BO3) 2-	2.102e-12	1.777e-12	-11.677	-11.750	-0.073	(0)

	AgH2BO3	3.687e-14	3.687e-14	-13.433	-13.433	0.000	(0)
	H8 (BO3) 3-	3.348e-15	2.831e-15	-14.475	-14.548	-0.073	(0)
	BF3OH-	5.427e-17	4.588e-17	-16.265	-16.338	-0.073	(0)
	BF4-	6.157e-21	5.205e-21	-20.211	-20.284	-0.073	(0)
Ba	1.490e-06						
	Ba+2	1.413e-06	7.613e-07	-5.850	-6.118	-0.268	(0)
	BaHCO3+	7.508e-08	6.500e-08	-7.124	-7.187	-0.063	(0)
	BaCO3	2.318e-09	2.318e-09	-8.635	-8.635	0.000	(0)
	BaH2BO3+	3.647e-12	3.083e-12	-11.438	-11.511	-0.073	(0)
	BaOH+	5.505e-13	4.737e-13	-12.259	-12.325	-0.065	(0)
C (4)	1.239e-02						
	HCO3-	1.036e-02	8.940e-03	-1.984	-2.049	-0.064	(0)
	H2CO3	1.420e-03	1.420e-03	-2.848	-2.848	0.000	(0)
	CaHCO3+	4.482e-04	3.880e-04	-3.348	-3.411	-0.063	(0)
	MgHCO3+	8.290e-05	7.086e-05	-4.081	-4.150	-0.068	(0)
	CaCO3	2.193e-05	2.193e-05	-4.659	-4.659	0.000	(0)
	NaHCO3	2.125e-05	2.125e-05	-4.673	-4.673	0.000	(0)
	CO3-2	1.101e-05	5.936e-06	-4.958	-5.227	-0.268	(0)
	CuCO3	8.563e-06	8.563e-06	-5.067	-5.067	0.000	(0)
	MgCO3	3.824e-06	3.824e-06	-5.417	-5.417	0.000	(0)
	MnHCO3+	1.898e-06	1.633e-06	-5.722	-5.787	-0.065	(0)
	NaCO3-	5.416e-07	4.672e-07	-6.266	-6.330	-0.064	(0)
	Cu (CO3) 2-2	2.929e-07	1.368e-07	-6.533	-6.864	-0.331	(0)
	CuHCO3+	1.672e-07	1.382e-07	-6.777	-6.860	-0.083	(0)
	ZnHCO3+	1.377e-07	1.139e-07	-6.861	-6.944	-0.083	(0)
	ZnCO3	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
	NiHCO3+	7.659e-08	6.331e-08	-7.116	-7.199	-0.083	(0)
	BaHCO3+	7.508e-08	6.500e-08	-7.124	-7.187	-0.063	(0)
	UO2 (CO3) 3-4	6.371e-08	3.031e-09	-7.196	-8.518	-1.323	(0)
	FeHCO3+	4.044e-08	3.501e-08	-7.393	-7.456	-0.063	(0)
	CoHCO3+	3.373e-08	2.788e-08	-7.472	-7.555	-0.083	(0)
	UO2 (CO3) 2-2	2.181e-08	1.019e-08	-7.661	-7.992	-0.331	(0)
	PbCO3	1.585e-08	1.585e-08	-7.800	-7.800	0.000	(0)
	NiCO3	1.272e-08	1.272e-08	-7.895	-7.895	0.000	(0)
	PbHCO3+	7.138e-09	5.901e-09	-8.146	-8.229	-0.083	(0)
	CoCO3	4.023e-09	4.023e-09	-8.395	-8.395	0.000	(0)
	BaCO3	2.318e-09	2.318e-09	-8.635	-8.635	0.000	(0)
	CdCO3	6.258e-10	6.258e-10	-9.204	-9.204	0.000	(0)
	Pb (CO3) 2-2	5.810e-10	2.714e-10	-9.236	-9.566	-0.331	(0)
	CdHCO3+	1.139e-10	9.414e-11	-9.944	-10.026	-0.083	(0)
	UO2CO3	8.602e-11	8.602e-11	-10.065	-10.065	0.000	(0)
	Cd (CO3) 2-2	5.896e-12	2.754e-12	-11.229	-11.560	-0.331	(0)
	HgCO3	3.049e-15	3.049e-15	-14.516	-14.516	0.000	(0)
	Hg (CO3) 2-2	1.226e-16	5.724e-17	-15.912	-16.242	-0.331	(0)
	HgHCO3+	4.850e-18	4.009e-18	-17.314	-17.397	-0.083	(0)
Ca	5.566e-03						
	Ca+2	4.325e-03	2.331e-03	-2.364	-2.632	-0.268	(0)
	CaSO4	7.611e-04	7.611e-04	-3.119	-3.119	0.000	(0)
	CaHCO3+	4.482e-04	3.880e-04	-3.348	-3.411	-0.063	(0)
	CaCO3	2.193e-05	2.193e-05	-4.659	-4.659	0.000	(0)
	CaF+	9.650e-06	8.303e-06	-5.015	-5.081	-0.065	(0)
	CaH2BO3+	2.079e-08	1.758e-08	-7.682	-7.755	-0.073	(0)
	CaOH+	7.658e-09	6.629e-09	-8.116	-8.179	-0.063	(0)
Cd	1.177e-08						
	Cd+2	8.582e-09	4.625e-09	-8.066	-8.335	-0.268	(0)
	CdSO4	1.545e-09	1.545e-09	-8.811	-8.811	0.000	(0)
	CdCl+	7.877e-10	6.512e-10	-9.104	-9.186	-0.083	(0)
	CdCO3	6.258e-10	6.258e-10	-9.204	-9.204	0.000	(0)
	CdHCO3+	1.139e-10	9.414e-11	-9.944	-10.026	-0.083	(0)
	Cd (SO4) 2-2	6.363e-11	2.972e-11	-10.196	-10.527	-0.331	(0)
	CdF+	2.894e-11	2.393e-11	-10.538	-10.621	-0.083	(0)
	CdOH+	6.335e-12	5.237e-12	-11.198	-11.281	-0.083	(0)
	Cd (CO3) 2-2	5.896e-12	2.754e-12	-11.229	-11.560	-0.331	(0)
	CdCl2	4.002e-12	4.002e-12	-11.398	-11.398	0.000	(0)
	CdOHC1	3.808e-12	3.808e-12	-11.419	-11.419	0.000	(0)
	CdF2	1.558e-14	1.558e-14	-13.807	-13.807	0.000	(0)
	Cd (OH) 2	4.710e-15	4.710e-15	-14.327	-14.327	0.000	(0)
	CdCl3-	4.504e-15	3.723e-15	-14.346	-14.429	-0.083	(0)

	CdSeO4	7.681e-19	7.681e-19	-18.115	-18.115	0.000	(0)
	Cd2OH+3	6.732e-19	1.214e-19	-18.172	-18.916	-0.744	(0)
	Cd (OH) 3-	4.961e-20	4.101e-20	-19.304	-19.387	-0.083	(0)
	Cd (SeO3) 2-2	3.318e-20	1.550e-20	-19.479	-19.810	-0.331	(0)
	Cd (OH) 4-2	2.049e-27	9.569e-28	-26.688	-27.019	-0.331	(0)
	CdHS+	0.000e+00	0.000e+00	-74.796	-74.879	-0.083	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-142.227	-142.227	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-214.797	-214.879	-0.083	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-286.905	-287.236	-0.331	(0)
C1	1.721e-03						
	Cl-	1.721e-03	1.474e-03	-2.764	-2.831	-0.067	(0)
	AgCl	5.344e-08	5.344e-08	-7.272	-7.272	0.000	(0)
	MnCl+	1.975e-08	1.699e-08	-7.705	-7.770	-0.065	(0)
	AgCl2-	8.301e-09	6.862e-09	-8.081	-8.164	-0.083	(0)
	ZnCl+	1.745e-09	1.492e-09	-8.758	-8.826	-0.068	(0)
	CuCl	1.667e-09	1.667e-09	-8.778	-8.778	0.000	(0)
	CdCl+	7.877e-10	6.512e-10	-9.104	-9.186	-0.083	(0)
	CuCl+	6.697e-10	5.724e-10	-9.174	-9.242	-0.068	(0)
	CuCl2-	6.007e-10	5.135e-10	-9.221	-9.290	-0.068	(0)
	ZnOHCl	2.783e-10	2.783e-10	-9.555	-9.555	0.000	(0)
	NiCl+	2.621e-10	2.167e-10	-9.581	-9.664	-0.083	(0)
	CoCl+	2.474e-10	2.045e-10	-9.607	-9.689	-0.083	(0)
	PbCl+	5.621e-11	4.647e-11	-10.250	-10.333	-0.083	(0)
	MnCl2	3.538e-11	3.538e-11	-10.451	-10.451	0.000	(0)
	AgCl3-2	1.931e-11	9.017e-12	-10.714	-11.045	-0.331	(0)
	CdCl2	4.002e-12	4.002e-12	-11.398	-11.398	0.000	(0)
	CdOHCl	3.808e-12	3.808e-12	-11.419	-11.419	0.000	(0)
	ZnCl2	3.485e-12	3.485e-12	-11.458	-11.458	0.000	(0)
	PbCl2	3.060e-13	3.060e-13	-12.514	-12.514	0.000	(0)
	CuCl3-2	2.953e-13	1.618e-13	-12.530	-12.791	-0.261	(0)
	CuCl2	2.926e-13	2.926e-13	-12.534	-12.534	0.000	(0)
	HgClOH	1.593e-13	1.593e-13	-12.798	-12.798	0.000	(0)
	AgCl4-3	1.505e-13	2.714e-14	-12.822	-13.566	-0.744	(0)
	HgCl2	9.331e-14	9.331e-14	-13.030	-13.030	0.000	(0)
	MnCl3-	1.670e-14	1.437e-14	-13.777	-13.843	-0.065	(0)
	CrCl+2	6.811e-15	3.181e-15	-14.167	-14.497	-0.331	(0)
	ZnCl3-	4.775e-15	4.082e-15	-14.321	-14.389	-0.068	(0)
	CdCl3-	4.504e-15	3.723e-15	-14.346	-14.429	-0.083	(0)
	HgCl3-	1.664e-15	1.376e-15	-14.779	-14.861	-0.083	(0)
	NiCl2	1.609e-15	1.609e-15	-14.794	-14.794	0.000	(0)
	FeCl+2	3.136e-16	1.719e-16	-15.504	-15.765	-0.261	(0)
	PbCl3-	2.173e-16	1.796e-16	-15.663	-15.746	-0.083	(0)
	HgCl4-2	1.729e-17	8.075e-18	-16.762	-17.093	-0.331	(0)
	HgCl+	1.528e-17	1.263e-17	-16.816	-16.899	-0.083	(0)
	CrOHCl2	1.271e-17	1.271e-17	-16.896	-16.896	0.000	(0)
	UO2Cl+	1.053e-17	8.704e-18	-16.978	-17.060	-0.083	(0)
	ZnCl4-2	5.490e-18	3.009e-18	-17.260	-17.522	-0.261	(0)
	CuCl3-	4.711e-18	4.026e-18	-17.327	-17.395	-0.068	(0)
	FeCl2+	1.316e-18	1.132e-18	-17.881	-17.946	-0.065	(0)
	CrCl2+	5.383e-19	4.450e-19	-18.269	-18.352	-0.083	(0)
	PbCl4-2	2.592e-19	1.210e-19	-18.586	-18.917	-0.331	(0)
	VOCl+	1.356e-19	1.121e-19	-18.868	-18.950	-0.083	(0)
	FeCl3	1.669e-22	1.669e-22	-21.778	-21.778	0.000	(0)
	CuCl4-2	5.428e-23	2.975e-23	-22.265	-22.526	-0.261	(0)
	CrO3Cl-	1.321e-26	1.092e-26	-25.879	-25.962	-0.083	(0)
	CoCl+2	1.370e-35	6.397e-36	-34.863	-35.194	-0.331	(0)
	UCl+3	0.000e+00	0.000e+00	-44.466	-45.210	-0.744	(0)
Co (2)	1.359e-07						
	Co+2	8.584e-08	4.009e-08	-7.066	-7.397	-0.331	(0)
	CoHCO3+	3.373e-08	2.788e-08	-7.472	-7.555	-0.083	(0)
	CoSO4	1.140e-08	1.140e-08	-7.943	-7.943	0.000	(0)
	CoCO3	4.023e-09	4.023e-09	-8.395	-8.395	0.000	(0)
	CoF+	5.006e-10	4.138e-10	-9.301	-9.383	-0.083	(0)
	CoCl+	2.474e-10	2.045e-10	-9.607	-9.689	-0.083	(0)
	CoOH+	1.379e-10	1.140e-10	-9.860	-9.943	-0.083	(0)
	Co (OH) 2	1.291e-12	1.291e-12	-11.889	-11.889	0.000	(0)
	CoSeO4	1.792e-17	1.792e-17	-16.747	-16.747	0.000	(0)
	Co (OH) 3-	4.441e-18	3.672e-18	-17.352	-17.435	-0.083	(0)

	Co2OH+3	1.271e-18	2.291e-19	-17.896	-18.640	-0.744	(0)
	CoOOH-	1.115e-18	9.217e-19	-17.953	-18.035	-0.083	(0)
	Co (OH) 4-2	1.776e-25	8.294e-26	-24.751	-25.081	-0.331	(0)
	Co4 (OH) 4+4	7.089e-31	3.372e-32	-30.149	-31.472	-1.323	(0)
Co (3)	3.307e-29						
	CoOH+2	3.307e-29	1.545e-29	-28.481	-28.811	-0.331	(0)
	Co+3	8.569e-35	2.132e-35	-34.067	-34.671	-0.604	(0)
	CoCl+2	1.370e-35	6.397e-36	-34.863	-35.194	-0.331	(0)
Cr (2)	6.383e-24						
	Cr+2	6.383e-24	2.981e-24	-23.195	-23.526	-0.331	(0)
Cr (3)	1.271e-07						
	Cr (OH) 2+	1.091e-07	9.016e-08	-6.962	-7.045	-0.083	(0)
	Cr (OH) +2	1.113e-08	5.199e-09	-7.953	-8.284	-0.331	(0)
	Cr (OH) 3	4.828e-09	4.828e-09	-8.316	-8.316	0.000	(0)
	CrOHSO4	1.758e-09	1.758e-09	-8.755	-8.755	0.000	(0)
	CrF+2	1.847e-10	8.624e-11	-9.734	-10.064	-0.331	(0)
	CrO2-	3.930e-11	3.249e-11	-10.406	-10.488	-0.083	(0)
	Cr (OH) 4-	3.314e-11	2.740e-11	-10.480	-10.562	-0.083	(0)
	Cr+3	9.246e-12	1.667e-12	-11.034	-11.778	-0.744	(0)
	CrSO4+	6.712e-12	5.549e-12	-11.173	-11.256	-0.083	(0)
	CrCl+2	6.811e-15	3.181e-15	-14.167	-14.497	-0.331	(0)
	Cr2 (OH) 2SO4+2	1.769e-15	8.263e-16	-14.752	-15.083	-0.331	(0)
	Cr2 (OH) 2 (SO4) 2	6.997e-17	6.997e-17	-16.155	-16.155	0.000	(0)
	CrOHC12	1.271e-17	1.271e-17	-16.896	-16.896	0.000	(0)
	CrCl2+	5.383e-19	4.450e-19	-18.269	-18.352	-0.083	(0)
Cr (6)	1.576e-16						
	CrO4-2	1.354e-16	7.295e-17	-15.869	-16.137	-0.268	(0)
	HCrO4-	2.016e-17	1.667e-17	-16.695	-16.778	-0.083	(0)
	NaCrO4-	1.853e-18	1.532e-18	-17.732	-17.815	-0.083	(0)
	KCrO4-	2.031e-19	1.679e-19	-18.692	-18.775	-0.083	(0)
	CrO3SO4-2	1.094e-24	5.112e-25	-23.961	-24.291	-0.331	(0)
	H2CrO4	9.539e-25	9.539e-25	-24.021	-24.021	0.000	(0)
	CrO3Cl-	1.321e-26	1.092e-26	-25.879	-25.962	-0.083	(0)
	Cr2O7-2	2.063e-32	9.636e-33	-31.685	-32.016	-0.331	(0)
Cu (1)	3.354e-09						
	CuCl	1.667e-09	1.667e-09	-8.778	-8.778	0.000	(0)
	Cu+	1.086e-09	8.981e-10	-8.964	-9.047	-0.083	(0)
	CuCl2-	6.007e-10	5.135e-10	-9.221	-9.290	-0.068	(0)
	CuCl3-2	2.953e-13	1.618e-13	-12.530	-12.791	-0.261	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-140.124	-140.459	-0.334	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-140.870	-141.189	-0.319	(0)
Cu (2)	9.698e-06						
	CuCO3	8.563e-06	8.563e-06	-5.067	-5.067	0.000	(0)
	Cu+2	4.546e-07	2.450e-07	-6.342	-6.611	-0.268	(0)
	Cu (CO3) 2-2	2.929e-07	1.368e-07	-6.533	-6.864	-0.331	(0)
	CuHCO3+	1.672e-07	1.382e-07	-6.777	-6.860	-0.083	(0)
	CuOH+	1.292e-07	1.104e-07	-6.889	-6.957	-0.068	(0)
	CuSO4	8.000e-08	8.000e-08	-7.097	-7.097	0.000	(0)
	CuF+	6.103e-09	5.045e-09	-8.214	-8.297	-0.083	(0)
	Cu (OH) 2	3.141e-09	3.141e-09	-8.503	-8.503	0.000	(0)
	CuCl+	6.697e-10	5.724e-10	-9.174	-9.242	-0.068	(0)
	Cu2 (OH) 2+2	6.559e-10	3.063e-10	-9.183	-9.514	-0.331	(0)
	Cu (OH) 3-	1.111e-12	9.182e-13	-11.954	-12.037	-0.083	(0)
	CuCl2	2.926e-13	2.926e-13	-12.534	-12.534	0.000	(0)
	CuCl3-	4.711e-18	4.026e-18	-17.327	-17.395	-0.068	(0)
	Cu (OH) 4-2	2.206e-18	1.030e-18	-17.656	-17.987	-0.331	(0)
	CuCl4-2	5.428e-23	2.975e-23	-22.265	-22.526	-0.261	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-204.286	-204.368	-0.083	(0)
F	4.345e-04						
	F-	3.809e-04	3.264e-04	-3.419	-3.486	-0.067	(0)
	MgF+	3.307e-05	2.837e-05	-4.481	-4.547	-0.067	(0)
	CaF+	9.650e-06	8.303e-06	-5.015	-5.081	-0.065	(0)
	AlF3	2.251e-06	2.251e-06	-5.648	-5.648	0.000	(0)
	NaF	8.705e-07	8.705e-07	-6.060	-6.060	0.000	(0)
	AlF2+	6.352e-07	5.479e-07	-6.197	-6.261	-0.064	(0)
	AlF4-	4.294e-07	3.683e-07	-6.367	-6.434	-0.067	(0)
	MnF+	1.382e-07	1.189e-07	-6.859	-6.925	-0.065	(0)
	HF	3.409e-08	3.409e-08	-7.467	-7.467	0.000	(0)

AlF+2	7.617e-09	4.217e-09	-8.118	-8.375	-0.257	(0)
CuF+	6.103e-09	5.045e-09	-8.214	-8.297	-0.083	(0)
ZnF+	3.173e-09	2.623e-09	-8.499	-8.581	-0.083	(0)
BF(OH) 3-	2.454e-09	2.075e-09	-8.610	-8.683	-0.073	(0)
NiF+	5.697e-10	4.710e-10	-9.244	-9.327	-0.083	(0)
CoF+	5.006e-10	4.138e-10	-9.301	-9.383	-0.083	(0)
CrF+2	1.847e-10	8.624e-11	-9.734	-10.064	-0.331	(0)
HF2-	4.966e-11	4.230e-11	-10.304	-10.374	-0.070	(0)
CdF+	2.894e-11	2.393e-11	-10.538	-10.621	-0.083	(0)
PbF+	2.472e-11	2.043e-11	-10.607	-10.690	-0.083	(0)
AgF	1.456e-11	1.456e-11	-10.837	-10.837	0.000	(0)
FeF2+	1.402e-11	1.207e-11	-10.853	-10.918	-0.065	(0)
BF2(OH) 2-	6.050e-12	5.114e-12	-11.218	-11.291	-0.073	(0)
FeF3	5.557e-12	5.557e-12	-11.255	-11.255	0.000	(0)
FeF+2	2.521e-12	1.382e-12	-11.598	-11.860	-0.261	(0)
UO2F+	1.984e-13	1.640e-13	-12.702	-12.785	-0.083	(0)
UO2F2	1.544e-13	1.544e-13	-12.811	-12.811	0.000	(0)
PbF2	1.312e-13	1.312e-13	-12.882	-12.882	0.000	(0)
CdF2	1.558e-14	1.558e-14	-13.807	-13.807	0.000	(0)
UO2F3-	1.531e-14	1.266e-14	-13.815	-13.898	-0.083	(0)
VO2F	5.196e-15	5.196e-15	-14.284	-14.284	0.000	(0)
H2F2	3.113e-15	3.113e-15	-14.507	-14.507	0.000	(0)
VO2F2-	7.448e-16	6.157e-16	-15.128	-15.211	-0.083	(0)
PbF3-	9.827e-17	8.124e-17	-16.008	-16.090	-0.083	(0)
UO2F4-2	7.026e-17	3.281e-17	-16.153	-16.484	-0.331	(0)
VOF+	6.418e-17	5.306e-17	-16.193	-16.275	-0.083	(0)
BF3OH-	5.427e-17	4.588e-17	-16.265	-16.338	-0.073	(0)
VOF2	6.494e-18	6.494e-18	-17.188	-17.188	0.000	(0)
VO2F3-2	5.368e-18	2.507e-18	-17.270	-17.601	-0.331	(0)
VOF3-	9.097e-20	7.520e-20	-19.041	-19.124	-0.083	(0)
PbF4-2	2.718e-20	1.269e-20	-19.566	-19.896	-0.331	(0)
BF4-	6.157e-21	5.205e-21	-20.211	-20.284	-0.073	(0)
VO2F4-3	2.233e-21	4.026e-22	-20.651	-21.395	-0.744	(0)
VOF4-2	2.121e-22	9.908e-23	-21.673	-22.004	-0.331	(0)
Sb(OH) 2F	1.856e-23	1.856e-23	-22.731	-22.731	0.000	(0)
SbOF	1.826e-23	1.826e-23	-22.738	-22.738	0.000	(0)
HgF+	6.283e-24	5.194e-24	-23.202	-23.285	-0.083	(0)
UF3+	1.397e-33	1.155e-33	-32.855	-32.937	-0.083	(0)
UF2+2	4.780e-35	2.232e-35	-34.321	-34.651	-0.331	(0)
UF4	4.133e-35	4.133e-35	-34.384	-34.384	0.000	(0)
UF5-	6.466e-37	5.345e-37	-36.189	-36.272	-0.083	(0)
UF6-2	1.128e-37	5.269e-38	-36.948	-37.278	-0.331	(0)
UF+3	3.013e-38	5.433e-39	-37.521	-38.265	-0.744	(0)
Fe (2)	8.173e-07					
Fe+2	6.660e-07	3.110e-07	-6.177	-6.507	-0.331	(0)
FeSO4	1.088e-07	1.088e-07	-6.963	-6.963	0.000	(0)
FeHCO3+	4.044e-08	3.501e-08	-7.393	-7.456	-0.063	(0)
FeOH+	2.051e-09	1.765e-09	-8.688	-8.753	-0.065	(0)
Fe (OH) 2	1.998e-13	1.998e-13	-12.699	-12.699	0.000	(0)
Fe (OH) 3-	1.047e-14	9.007e-15	-13.980	-14.045	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.662	-146.662	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.094	-219.177	-0.083	(0)
Fe (3)	2.590e-05					
Fe (OH) 2+	2.284e-05	1.970e-05	-4.641	-4.705	-0.064	(0)
Fe (OH) 3	3.016e-06	3.016e-06	-5.521	-5.521	0.000	(0)
Fe (OH) 4-	4.641e-08	4.003e-08	-7.333	-7.398	-0.064	(0)
FeOH+2	6.482e-10	3.553e-10	-9.188	-9.449	-0.261	(0)
FeF2+	1.402e-11	1.207e-11	-10.853	-10.918	-0.065	(0)
FeF3	5.557e-12	5.557e-12	-11.255	-11.255	0.000	(0)
FeF+2	2.521e-12	1.382e-12	-11.598	-11.860	-0.261	(0)
FeSO4+	7.176e-14	6.174e-14	-13.144	-13.209	-0.065	(0)
Fe+3	1.551e-14	3.860e-15	-13.809	-14.413	-0.604	(0)
Fe (SO4) 2-	2.276e-15	1.882e-15	-14.643	-14.725	-0.083	(0)
FeCl+2	3.136e-16	1.719e-16	-15.504	-15.765	-0.261	(0)
Fe2 (OH) 2+4	8.786e-17	4.180e-18	-16.056	-17.379	-1.323	(0)
FeCl2+	1.316e-18	1.132e-18	-17.881	-17.946	-0.065	(0)
FeHSeO3+2	7.810e-19	3.648e-19	-18.107	-18.438	-0.331	(0)
Fe3 (OH) 4+5	1.388e-19	1.190e-21	-18.858	-20.924	-2.067	(0)

FeCl3	1.669e-22	1.669e-22	-21.778	-21.778	0.000	(0)
H (0)	3.930e-28					
H2	1.965e-28	1.977e-28	-27.707	-27.704	0.003	(0)
Hg (0)	2.220e-10					
Hg	2.220e-10	2.220e-10	-9.654	-9.654	0.000	(0)
Hg (1)	2.770e-22					
Hg2+2	1.385e-22	6.469e-23	-21.859	-22.189	-0.331	(0)
Hg (2)	3.122e-13					
HgClOH	1.593e-13	1.593e-13	-12.798	-12.798	0.000	(0)
HgCl2	9.331e-14	9.331e-14	-13.030	-13.030	0.000	(0)
Hg (OH) 2	5.470e-14	5.503e-14	-13.262	-13.259	0.003	(0)
HgCO3	3.049e-15	3.049e-15	-14.516	-14.516	0.000	(0)
HgCl3-	1.664e-15	1.376e-15	-14.779	-14.861	-0.083	(0)
Hg (CO3) 2-2	1.226e-16	5.724e-17	-15.912	-16.242	-0.331	(0)
HgCl4-2	1.729e-17	8.075e-18	-16.762	-17.093	-0.331	(0)
HgCl+	1.528e-17	1.263e-17	-16.816	-16.899	-0.083	(0)
HgHCO3+	4.850e-18	4.009e-18	-17.314	-17.397	-0.083	(0)
HgOH+	2.947e-18	2.436e-18	-17.531	-17.613	-0.083	(0)
Hg (OH) 3-	1.195e-21	9.875e-22	-20.923	-21.005	-0.083	(0)
Hg+2	9.192e-22	4.293e-22	-21.037	-21.367	-0.331	(0)
HgSO4	1.602e-22	1.602e-22	-21.795	-21.795	0.000	(0)
HgF+	6.283e-24	5.194e-24	-23.202	-23.285	-0.083	(0)
HgHS2-	0.000e+00	0.000e+00	-131.310	-131.393	-0.083	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.150	-132.150	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.619	-132.949	-0.331	(0)
K	7.305e-04					
K+	7.232e-04	6.196e-04	-3.141	-3.208	-0.067	(0)
KSO4-	7.249e-06	6.253e-06	-5.140	-5.204	-0.064	(0)
KCrO4-	2.031e-19	1.679e-19	-18.692	-18.775	-0.083	(0)
Mg	1.758e-03					
Mg+2	1.437e-03	7.745e-04	-2.842	-3.111	-0.268	(0)
MgSO4	2.009e-04	2.009e-04	-3.697	-3.697	0.000	(0)
MgHCO3+	8.290e-05	7.086e-05	-4.081	-4.150	-0.068	(0)
MgF+	3.307e-05	2.837e-05	-4.481	-4.547	-0.067	(0)
MgCO3	3.824e-06	3.824e-06	-5.417	-5.417	0.000	(0)
MgOH+	5.063e-08	4.395e-08	-7.296	-7.357	-0.061	(0)
MgH2BO3+	4.163e-09	3.519e-09	-8.381	-8.454	-0.073	(0)
Mn (2)	2.398e-05					
Mn+2	1.960e-05	9.154e-06	-4.708	-5.038	-0.331	(0)
MnSO4	2.320e-06	2.320e-06	-5.634	-5.634	0.000	(0)
MnHCO3+	1.898e-06	1.633e-06	-5.722	-5.787	-0.065	(0)
MnF+	1.382e-07	1.189e-07	-6.859	-6.925	-0.065	(0)
MnCl+	1.975e-08	1.699e-08	-7.705	-7.770	-0.065	(0)
MnOH+	3.809e-09	3.277e-09	-8.419	-8.484	-0.065	(0)
MnCl2	3.538e-11	3.538e-11	-10.451	-10.451	0.000	(0)
MnCl3-	1.670e-14	1.437e-14	-13.777	-13.843	-0.065	(0)
MnSeO4	2.197e-15	2.197e-15	-14.658	-14.658	0.000	(0)
Mn (OH) 3-	4.783e-19	4.115e-19	-18.320	-18.386	-0.065	(0)
Mn (OH) 4-2	3.455e-25	1.894e-25	-24.462	-24.723	-0.261	(0)
MnSe	3.019e-40	3.019e-40	-39.520	-39.520	0.000	(0)
Mn (3)	2.195e-25					
Mn+3	2.195e-25	5.463e-26	-24.659	-25.263	-0.604	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.488	-45.749	-0.261	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.924	-49.995	-0.071	(0)
Mo	5.625e-07					
MoO4-2	5.619e-07	3.028e-07	-6.250	-6.519	-0.268	(0)
HMoO4-	5.147e-10	4.255e-10	-9.288	-9.371	-0.083	(0)
H2MoO4	2.201e-13	2.201e-13	-12.657	-12.657	0.000	(0)
Ag2MoO4	3.613e-23	3.613e-23	-22.442	-22.442	0.000	(0)
AlMo6O21-3	6.742e-39	1.216e-39	-38.171	-38.915	-0.744	(0)
Mo7O24-6	0.000e+00	0.000e+00	-46.874	-49.850	-2.976	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.547	-50.614	-2.067	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.660	-52.983	-1.323	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.144	-56.888	-0.744	(0)
Na	4.993e-03					
Na+	4.933e-03	4.227e-03	-2.307	-2.374	-0.067	(0)

NaSO4-	3.751e-05	3.236e-05	-4.426	-4.490	-0.064	(0)
NaHCO3	2.125e-05	2.125e-05	-4.673	-4.673	0.000	(0)
NaF	8.705e-07	8.705e-07	-6.060	-6.060	0.000	(0)
NaCO3-	5.416e-07	4.672e-07	-6.266	-6.330	-0.064	(0)
NaH2BO3	8.778e-10	8.778e-10	-9.057	-9.057	0.000	(0)
NaCrO4-	1.853e-18	1.532e-18	-17.732	-17.815	-0.083	(0)
Ni	2.132e-07					
Ni+2	1.066e-07	5.745e-08	-6.972	-7.241	-0.268	(0)
NiHCO3+	7.659e-08	6.331e-08	-7.116	-7.199	-0.083	(0)
NiSO4	1.634e-08	1.634e-08	-7.787	-7.787	0.000	(0)
NiCO3	1.272e-08	1.272e-08	-7.895	-7.895	0.000	(0)
NiF+	5.697e-10	4.710e-10	-9.244	-9.327	-0.083	(0)
NiCl+	2.621e-10	2.167e-10	-9.581	-9.664	-0.083	(0)
NiOH+	1.247e-10	1.031e-10	-9.904	-9.987	-0.083	(0)
Ni(SO4)2-2	1.651e-12	7.711e-13	-11.782	-12.113	-0.331	(0)
Ni(OH)2	1.167e-12	1.167e-12	-11.933	-11.933	0.000	(0)
NiCl2	1.609e-15	1.609e-15	-14.794	-14.794	0.000	(0)
Ni(OH)3-	2.012e-16	1.664e-16	-15.696	-15.779	-0.083	(0)
NiSeO4	2.396e-17	2.396e-17	-16.620	-16.620	0.000	(0)
O(0)	2.575e-37					
O2	1.288e-37	1.295e-37	-36.890	-36.888	0.003	(0)
Pb	2.632e-08					
PbCO3	1.585e-08	1.585e-08	-7.800	-7.800	0.000	(0)
PbHCO3+	7.138e-09	5.901e-09	-8.146	-8.229	-0.083	(0)
Pb+2	1.648e-09	8.883e-10	-8.783	-9.051	-0.268	(0)
PbSO4	6.202e-10	6.202e-10	-9.208	-9.208	0.000	(0)
Pb(CO3)2-2	5.810e-10	2.714e-10	-9.236	-9.566	-0.331	(0)
PbOH+	3.847e-10	3.180e-10	-9.415	-9.498	-0.083	(0)
PbCl+	5.621e-11	4.647e-11	-10.250	-10.333	-0.083	(0)
PbF+	2.472e-11	2.043e-11	-10.607	-10.690	-0.083	(0)
Pb(SO4)2-2	1.141e-11	5.326e-12	-10.943	-11.274	-0.331	(0)
Pb(OH)2	1.434e-12	1.434e-12	-11.844	-11.844	0.000	(0)
PbCl2	3.060e-13	3.060e-13	-12.514	-12.514	0.000	(0)
PbF2	1.312e-13	1.312e-13	-12.882	-12.882	0.000	(0)
Pb(OH)3-	2.472e-16	2.043e-16	-15.607	-15.690	-0.083	(0)
PbCl3-	2.173e-16	1.796e-16	-15.663	-15.746	-0.083	(0)
PbF3-	9.827e-17	8.124e-17	-16.008	-16.090	-0.083	(0)
Pb2OH+3	2.483e-17	4.478e-18	-16.605	-17.349	-0.744	(0)
PbCl4-2	2.592e-19	1.210e-19	-18.586	-18.917	-0.331	(0)
PbF4-2	2.718e-20	1.269e-20	-19.566	-19.896	-0.331	(0)
Pb(OH)4-2	1.527e-20	7.133e-21	-19.816	-20.147	-0.331	(0)
Pb3(OH)4+2	7.799e-23	3.643e-23	-22.108	-22.439	-0.331	(0)
Pb4(OH)4+4	5.403e-27	2.570e-28	-26.267	-27.590	-1.323	(0)
Pb(HS)2	0.000e+00	0.000e+00	-142.886	-142.886	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-216.055	-216.138	-0.083	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-68.488	-68.488	0.000	(0)
HS-	0.000e+00	0.000e+00	-74.470	-74.552	-0.083	(0)
H2S	0.000e+00	0.000e+00	-74.683	-74.683	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.796	-74.879	-0.083	(0)
S5-2	0.000e+00	0.000e+00	-76.435	-76.766	-0.331	(0)
S6-2	0.000e+00	0.000e+00	-76.951	-77.282	-0.331	(0)
S4-2	0.000e+00	0.000e+00	-77.031	-77.362	-0.331	(0)
S3-2	0.000e+00	0.000e+00	-77.837	-78.168	-0.331	(0)
S2-2	0.000e+00	0.000e+00	-78.853	-79.184	-0.331	(0)
S-2	0.000e+00	0.000e+00	-84.440	-84.701	-0.261	(0)
HgHS2-	0.000e+00	0.000e+00	-131.310	-131.393	-0.083	(0)
Hg(HS)2	0.000e+00	0.000e+00	-132.150	-132.150	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.619	-132.949	-0.331	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-138.858	-138.941	-0.083	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-139.089	-139.273	-0.184	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-140.124	-140.459	-0.334	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.870	-141.189	-0.319	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-141.219	-141.562	-0.343	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-141.456	-141.538	-0.083	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.546	-141.873	-0.327	(0)
Cd(HS)2	0.000e+00	0.000e+00	-142.227	-142.227	0.000	(0)
Zn(HS)2	0.000e+00	0.000e+00	-142.679	-142.679	0.000	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-142.886	-142.886	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.662	-146.662	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.286	-204.368	-0.083	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.869	-213.952	-0.083	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.797	-214.879	-0.083	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.055	-216.138	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.450	-216.780	-0.331	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.094	-219.177	-0.083	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.905	-287.236	-0.331	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.633	-289.964	-0.331	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.366	-299.697	-0.331	(0)
S (6)	3.654e-03					
SO4-2	2.645e-03	1.425e-03	-2.578	-2.846	-0.268	(0)
CaSO4	7.611e-04	7.611e-04	-3.119	-3.119	0.000	(0)
MgSO4	2.009e-04	2.009e-04	-3.697	-3.697	0.000	(0)
NaSO4-	3.751e-05	3.236e-05	-4.426	-4.490	-0.064	(0)
KSO4-	7.249e-06	6.253e-06	-5.140	-5.204	-0.064	(0)
MnSO4	2.320e-06	2.320e-06	-5.634	-5.634	0.000	(0)
ZnSO4	1.256e-07	1.256e-07	-6.901	-6.901	0.000	(0)
FeSO4	1.088e-07	1.088e-07	-6.963	-6.963	0.000	(0)
CuSO4	8.000e-08	8.000e-08	-7.097	-7.097	0.000	(0)
NiSO4	1.634e-08	1.634e-08	-7.787	-7.787	0.000	(0)
HSO4-	1.147e-08	9.835e-09	-7.941	-8.007	-0.067	(0)
CoSO4	1.140e-08	1.140e-08	-7.943	-7.943	0.000	(0)
Zn (SO4) 2-2	3.339e-09	1.559e-09	-8.476	-8.807	-0.331	(0)
CrOHSO4	1.758e-09	1.758e-09	-8.755	-8.755	0.000	(0)
CdSO4	1.545e-09	1.545e-09	-8.811	-8.811	0.000	(0)
PbSO4	6.202e-10	6.202e-10	-9.208	-9.208	0.000	(0)
AgSO4-	6.108e-10	5.049e-10	-9.214	-9.297	-0.083	(0)
Cd (SO4) 2-2	6.363e-11	2.972e-11	-10.196	-10.527	-0.331	(0)
AlSO4+	1.667e-11	1.429e-11	-10.778	-10.845	-0.067	(0)
Pb (SO4) 2-2	1.141e-11	5.326e-12	-10.943	-11.274	-0.331	(0)
CrSO4+	6.712e-12	5.549e-12	-11.173	-11.256	-0.083	(0)
Ni (SO4) 2-2	1.651e-12	7.711e-13	-11.782	-12.113	-0.331	(0)
Al (SO4) 2-	2.546e-13	2.183e-13	-12.594	-12.661	-0.067	(0)
FeSO4+	7.176e-14	6.174e-14	-13.144	-13.209	-0.065	(0)
UO2SO4	7.853e-15	7.853e-15	-14.105	-14.105	0.000	(0)
Fe (SO4) 2-	2.276e-15	1.882e-15	-14.643	-14.725	-0.083	(0)
Cr2 (OH) 2SO4+2	1.769e-15	8.263e-16	-14.752	-15.083	-0.331	(0)
VO2SO4-	3.737e-16	3.089e-16	-15.427	-15.510	-0.083	(0)
UO2 (SO4) 2-2	3.160e-16	1.476e-16	-15.500	-15.831	-0.331	(0)
Cr2 (OH) 2 (SO4) 2	6.997e-17	6.997e-17	-16.155	-16.155	0.000	(0)
VOSO4	1.064e-17	1.064e-17	-16.973	-16.973	0.000	(0)
HgSO4	1.602e-22	1.602e-22	-21.795	-21.795	0.000	(0)
CrO3SO4-2	1.094e-24	5.112e-25	-23.961	-24.291	-0.331	(0)
VSO4+	4.090e-31	3.381e-31	-30.388	-30.471	-0.083	(0)
U (SO4) 2	5.360e-40	5.360e-40	-39.271	-39.271	0.000	(0)
USO4+2	1.014e-40	0.000e+00	-39.994	-40.325	-0.331	(0)
Sb (3)	1.019e-18					
Sb (OH) 3	5.154e-19	5.154e-19	-18.288	-18.288	0.000	(0)
HSbO2	5.034e-19	5.034e-19	-18.298	-18.298	0.000	(0)
Sb (OH) 2F	1.856e-23	1.856e-23	-22.731	-22.731	0.000	(0)
SbOF	1.826e-23	1.826e-23	-22.738	-22.738	0.000	(0)
SbO2-	1.397e-23	1.155e-23	-22.855	-22.938	-0.083	(0)
Sb (OH) 4-	7.996e-24	6.610e-24	-23.097	-23.180	-0.083	(0)
Sb (OH) 2+	1.070e-24	8.842e-25	-23.971	-24.053	-0.083	(0)
SbO+	3.689e-25	3.050e-25	-24.433	-24.516	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.366	-299.697	-0.331	(0)
Sb (5)	1.325e-08					
SbO3-	1.324e-08	1.094e-08	-7.878	-7.961	-0.083	(0)
Sb (OH) 6-	1.492e-11	1.278e-11	-10.826	-10.893	-0.067	(0)
SbO2+	1.894e-23	1.566e-23	-22.723	-22.805	-0.083	(0)
Se (-2)	2.055e-10					
Ag2Se	2.055e-10	2.055e-10	-9.687	-9.687	0.000	(0)
HSe-	6.836e-37	5.651e-37	-36.165	-36.248	-0.083	(0)
H2Se	3.097e-40	3.097e-40	-39.509	-39.509	0.000	(0)
MnSe	3.019e-40	3.019e-40	-39.520	-39.520	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.766	-44.097	-0.331	(0)

AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.980	-79.302	-1.323	(0)
Se (4)	4.757e-08					
HSeO3-	4.326e-08	3.576e-08	-7.364	-7.447	-0.083	(0)
SeO3-2	4.317e-09	2.016e-09	-8.365	-8.695	-0.331	(0)
H2SeO3	1.077e-12	1.077e-12	-11.968	-11.968	0.000	(0)
AgSeO3-	2.783e-14	2.300e-14	-13.556	-13.638	-0.083	(0)
FeHSeO3+2	7.810e-19	3.648e-19	-18.107	-18.438	-0.331	(0)
Cd (SeO3) 2-2	3.318e-20	1.550e-20	-19.479	-19.810	-0.331	(0)
Ag (SeO3) 2-3	2.303e-21	4.153e-22	-20.638	-21.382	-0.744	(0)
Se (6)	1.657e-12					
SeO4-2	1.655e-12	8.918e-13	-11.781	-12.050	-0.268	(0)
MnSeO4	2.197e-15	2.197e-15	-14.658	-14.658	0.000	(0)
ZnSeO4	5.563e-17	5.563e-17	-16.255	-16.255	0.000	(0)
NiSeO4	2.396e-17	2.396e-17	-16.620	-16.620	0.000	(0)
CoSeO4	1.792e-17	1.792e-17	-16.747	-16.747	0.000	(0)
HSeO4-	3.818e-18	3.156e-18	-17.418	-17.501	-0.083	(0)
CdSeO4	7.681e-19	7.681e-19	-18.115	-18.115	0.000	(0)
Zn (SeO4) 2-2	1.077e-28	5.030e-29	-27.968	-28.298	-0.331	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.257	-58.001	-0.744	(0)
U (4)	4.362e-22					
U (OH) 5-	4.351e-22	3.597e-22	-21.361	-21.444	-0.083	(0)
U (OH) 4	1.064e-24	1.064e-24	-23.973	-23.973	0.000	(0)
U (OH) 3+	3.325e-28	2.748e-28	-27.478	-27.561	-0.083	(0)
U (OH) 2+2	1.922e-32	8.977e-33	-31.716	-32.047	-0.331	(0)
UF3+	1.397e-33	1.155e-33	-32.855	-32.937	-0.083	(0)
UF2+2	4.780e-35	2.232e-35	-34.321	-34.651	-0.331	(0)
UF4	4.133e-35	4.133e-35	-34.384	-34.384	0.000	(0)
UF5-	6.466e-37	5.345e-37	-36.189	-36.272	-0.083	(0)
UOH+3	1.657e-37	2.987e-38	-36.781	-37.525	-0.744	(0)
UF6-2	1.128e-37	5.269e-38	-36.948	-37.278	-0.331	(0)
UF+3	3.013e-38	5.433e-39	-37.521	-38.265	-0.744	(0)
U (SO4) 2	5.360e-40	5.360e-40	-39.271	-39.271	0.000	(0)
USO4+2	1.014e-40	0.000e+00	-39.994	-40.325	-0.331	(0)
U+4	0.000e+00	0.000e+00	-42.756	-44.079	-1.323	(0)
UCl+3	0.000e+00	0.000e+00	-44.466	-45.210	-0.744	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.667	-174.363	-6.696	(0)
U (5)	2.009e-17					
UO2+	2.009e-17	1.661e-17	-16.697	-16.780	-0.083	(0)
U (6)	8.561e-08					
UO2 (CO3) 3-4	6.371e-08	3.031e-09	-7.196	-8.518	-1.323	(0)
UO2 (CO3) 2-2	2.181e-08	1.019e-08	-7.661	-7.992	-0.331	(0)
UO2CO3	8.602e-11	8.602e-11	-10.065	-10.065	0.000	(0)
UO2F+	1.984e-13	1.640e-13	-12.702	-12.785	-0.083	(0)
UO2F2	1.544e-13	1.544e-13	-12.811	-12.811	0.000	(0)
UO2OH+	7.902e-14	6.532e-14	-13.102	-13.185	-0.083	(0)
UO2F3-	1.531e-14	1.266e-14	-13.815	-13.898	-0.083	(0)
UO2SO4	7.853e-15	7.853e-15	-14.105	-14.105	0.000	(0)
UO2+2	6.754e-15	3.640e-15	-14.170	-14.439	-0.268	(0)
UO2 (SO4) 2-2	3.160e-16	1.476e-16	-15.500	-15.831	-0.331	(0)
UO2F4-2	7.026e-17	3.281e-17	-16.153	-16.484	-0.331	(0)
UO2Cl+	1.053e-17	8.704e-18	-16.978	-17.060	-0.083	(0)
(UO2) 2 (OH) 2+2	1.516e-20	7.081e-21	-19.819	-20.150	-0.331	(0)
(UO2) 3 (OH) 5+	8.623e-24	7.129e-24	-23.064	-23.147	-0.083	(0)
V (2)	1.422e-39					
VOH+	1.028e-39	8.496e-40	-38.988	-39.071	-0.083	(0)
V+2	3.944e-40	1.842e-40	-39.404	-39.735	-0.331	(0)
V (3)	1.174e-12					
V (OH) 3	1.174e-12	1.174e-12	-11.930	-11.930	0.000	(0)
V (OH) 2+	6.481e-23	5.357e-23	-22.188	-22.271	-0.083	(0)
VOH+2	7.686e-26	3.589e-26	-25.114	-25.445	-0.331	(0)
V+3	2.787e-30	5.025e-31	-29.555	-30.299	-0.744	(0)
VSO4+	4.090e-31	3.381e-31	-30.388	-30.471	-0.083	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.520	-49.264	-0.744	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.767	-50.090	-1.323	(0)
V (4)	1.072e-15					
V (OH) 3+	9.319e-16	7.704e-16	-15.031	-15.113	-0.083	(0)
VOF+	6.418e-17	5.306e-17	-16.193	-16.275	-0.083	(0)

VO+2	5.803e-17	2.710e-17	-16.236	-16.567	-0.331	(0)
VOSO4	1.064e-17	1.064e-17	-16.973	-16.973	0.000	(0)
VOF2	6.494e-18	6.494e-18	-17.188	-17.188	0.000	(0)
VOC1+	1.356e-19	1.121e-19	-18.868	-18.950	-0.083	(0)
VOF3-	9.097e-20	7.520e-20	-19.041	-19.124	-0.083	(0)
VOF4-2	2.121e-22	9.908e-23	-21.673	-22.004	-0.331	(0)
H2V2O4+2	6.376e-26	2.978e-26	-25.195	-25.526	-0.331	(0)
V(5)	1.174e-07					
H2VO4-	1.103e-07	9.116e-08	-6.958	-7.040	-0.083	(0)
HVO4-2	6.944e-09	3.243e-09	-8.158	-8.489	-0.331	(0)
H3VO4	6.436e-11	6.436e-11	-10.191	-10.191	0.000	(0)
H3V2O7-	4.585e-11	3.790e-11	-10.339	-10.421	-0.083	(0)
HV2O7-3	5.558e-13	1.002e-13	-12.255	-12.999	-0.744	(0)
VO2+	1.059e-14	9.077e-15	-13.975	-14.042	-0.067	(0)
VO2F	5.196e-15	5.196e-15	-14.284	-14.284	0.000	(0)
V3O9-3	4.406e-15	7.944e-16	-14.356	-15.100	-0.744	(0)
VO4-3	1.277e-15	2.302e-16	-14.894	-15.638	-0.744	(0)
V2O7-4	8.030e-16	3.820e-17	-15.095	-16.418	-1.323	(0)
VO2F2-	7.448e-16	6.157e-16	-15.128	-15.211	-0.083	(0)
VO2SO4-	3.737e-16	3.089e-16	-15.427	-15.510	-0.083	(0)
VO2F3-2	5.368e-18	2.507e-18	-17.270	-17.601	-0.331	(0)
V4O12-4	6.349e-19	3.020e-20	-18.197	-19.520	-1.323	(0)
VO2F4-3	2.233e-21	4.026e-22	-20.651	-21.395	-0.744	(0)
HV10O28-5	0.000e+00	0.000e+00	-46.996	-49.063	-2.067	(0)
V10O28-6	0.000e+00	0.000e+00	-47.122	-50.098	-2.976	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.684	-51.006	-1.323	(0)
Zn	1.164e-06					
Zn+2	7.473e-07	4.028e-07	-6.126	-6.395	-0.268	(0)
ZnHCO3+	1.377e-07	1.139e-07	-6.861	-6.944	-0.083	(0)
ZnCO3	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
ZnSO4	1.256e-07	1.256e-07	-6.901	-6.901	0.000	(0)
ZnOH+	6.944e-09	5.741e-09	-8.158	-8.241	-0.083	(0)
Zn(SO4) 2-2	3.339e-09	1.559e-09	-8.476	-8.807	-0.331	(0)
ZnF+	3.173e-09	2.623e-09	-8.499	-8.581	-0.083	(0)
ZnCl+	1.745e-09	1.492e-09	-8.758	-8.826	-0.068	(0)
ZnOHCl	2.783e-10	2.783e-10	-9.555	-9.555	0.000	(0)
Zn(OH) 2	1.297e-10	1.297e-10	-9.887	-9.887	0.000	(0)
ZnCl2	3.485e-12	3.485e-12	-11.458	-11.458	0.000	(0)
Zn(OH) 3-	1.121e-13	9.265e-14	-12.951	-13.033	-0.083	(0)
ZnCl3-	4.775e-15	4.082e-15	-14.321	-14.389	-0.068	(0)
ZnSeO4	5.563e-17	5.563e-17	-16.255	-16.255	0.000	(0)
ZnCl4-2	5.490e-18	3.009e-18	-17.260	-17.522	-0.261	(0)
Zn(OH) 4-2	1.126e-18	5.257e-19	-17.949	-18.279	-0.331	(0)
Zn(SeO4) 2-2	1.077e-28	5.030e-29	-27.968	-28.298	-0.331	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-141.456	-141.538	-0.083	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-142.679	-142.679	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-213.869	-213.952	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-216.450	-216.780	-0.331	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-289.633	-289.964	-0.331	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.68	-82.90	-36.22	Ag2S
Ag2CO3	-9.64	-20.73	-11.09	Ag2CO3
Ag2CrO4	-20.05	-31.64	-11.59	Ag2CrO4
Ag2HVO4	-9.57	-8.09	1.48	Ag2HVO4
Ag2MoO4	-10.47	-22.02	-11.55	Ag2MoO4
Ag2O	-13.77	-1.20	12.57	Ag2O
Ag2Se	4.10	-44.60	-48.70	Ag2Se
Ag2SeO3	-8.65	-15.80	-7.15	Ag2SeO3
Ag2SeO4	-18.64	-27.55	-8.91	Ag2SeO4
Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.57	-20.41	2.16	Ag3AsO3
Ag3AsO4	-11.97	-14.75	-2.79	Ag3AsO4
Ag3H2VO5	-13.87	-8.69	5.18	Ag3H2VO5
AgF:4H2O	-12.29	-11.24	1.05	AgF:4H2O

Agmetal	0.63	-12.88	-13.51	Ag
AgVO3	-8.26	-7.49	0.77	AgVO3
Al (OH) 3 (am)	-1.24	9.56	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.70	-43.33	2.37	Al2 (MoO4) 3
Al2O3	-0.52	19.13	19.65	Al2O3
Al4 (OH) 10SO4	-1.59	21.11	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-8.19	-3.39	4.80	AlAsO4:2H2O
AlOHSO4	-4.35	-7.58	-3.23	AlOHSO4
AlSb	-148.01	-82.38	65.62	AlSb
Alunite	-0.26	-1.66	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.11	-11.90	-7.79	PbSO4
Anhydrite	-1.12	-5.48	-4.36	CaSO4
Anilite	-50.75	-82.62	-31.88	Cu0.25Cu1.5S
Antlerite	-2.86	5.93	8.79	Cu3 (OH) 4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-71.68	-74.44	-2.76	As4O6
Artinite	-6.75	2.85	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-32.61	-25.91	6.71	As2O5
Atacamite	-1.99	5.40	7.39	Cu2 (OH) 3Cl
Azurite	0.92	-15.98	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.21	8.18	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-13.29	2.58	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.55	-1.36	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-22.17	10.77	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.59	-22.26	-9.67	BaCrO4
BaF2	-7.27	-13.09	-5.82	BaF2
BaMoO4	-5.68	-12.64	-6.96	BaMoO4
Barite	1.02	-8.96	-9.98	BaSO4
BaS	-89.70	-73.52	16.18	BaS
BaSeO3	-8.24	-6.41	1.83	BaSeO3
BaSeO4	-10.71	-18.17	-7.46	BaSeO4
Bianchite	-7.48	-9.24	-1.76	ZnSO4:6H2O
Birnessite	-9.62	8.47	18.09	MnO2
Bixbyite	-6.97	-7.62	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.33	-78.60	-27.28	Cu0.6Cu0.8S
Boehmite	0.99	9.56	8.58	AlOOH
Breithauptite	-54.09	-72.61	-18.52	NiSb
Brochantite	-1.61	13.62	15.22	Cu4 (OH) 6SO4
Brucite	-5.65	11.19	16.84	Mg (OH) 2
Bunsenite	-5.38	7.06	12.45	NiO
Ca (VO3) 2	-7.77	-2.11	5.66	Ca (VO3) 2
Ca2V2O7	-7.94	9.56	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.00	9.56	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-13.20	9.10	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.73	21.23	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.63	21.23	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-291.86	-148.89	142.97	Ca3Sb2
CaCrO4	-16.50	-18.77	-2.27	CaCrO4
Calcite	0.62	-7.86	-8.48	CaCO3
Calomel	-9.94	-27.85	-17.91	Hg2Cl2
CaMoO4	-1.20	-9.15	-7.95	CaMoO4
Carnotite	-3.31	-3.08	0.23	KUO2VO4
CaSeO3:2H2O	-5.74	-2.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.66	-14.68	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.47	-3.63	9.84	Cd (BO2) 2
Cd (OH) 2	-7.68	5.97	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.76	5.97	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.10	-16.39	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.81	0.75	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-21.68	6.72	28.40	Cd4 (OH) 6SO4
CdCl2	-13.34	-14.00	-0.66	CdCl2
CdCl2:1H2O	-12.30	-14.00	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.09	-14.00	-1.91	CdCl2:2.5H2O
CdF2	-14.09	-15.31	-1.21	CdF2
Cdmetal (alpha)	-32.10	-18.59	13.51	Cd
Cdmetal (gamma)	-32.20	-18.59	13.62	Cd
CdMoO4	-0.70	-14.85	-14.15	CdMoO4

CdOHCl	-7.55	-4.02	3.54	CdOHCl
CdSb	-73.35	-73.70	-0.35	CdSb
CdSe	-17.23	-37.43	-20.20	CdSe
CdSeO4:2H2O	-18.54	-20.39	-1.85	CdSeO4:2H2O
CdSO4	-11.01	-11.18	-0.17	CdSO4
CdSO4:1H2O	-9.46	-11.18	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.31	-11.18	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.15	-14.28	-13.13	PbCO3
CH4 (g)	-76.70	-117.74	-41.05	CH4
Chalcanthite	-6.82	-9.46	-2.64	CuSO4:5H2O
Chalcocite	-50.57	-85.49	-34.92	Cu2S
Chalcopyrite	-112.65	-147.92	-35.27	CuFeS2
Cinnabar	-49.27	-94.96	-45.69	HgS
Claudetite	-71.38	-74.44	-3.06	As4O6
Clausthalite	-11.05	-38.15	-27.10	PbSe
Co (BO2) 2	-29.76	-2.69	27.07	Co (BO2) 2
Co (OH) 2	-6.19	6.90	13.09	Co (OH) 2
Co (OH) 3	-10.91	-13.22	-2.31	Co (OH) 3
CO2 (g)	-1.38	-19.53	-18.15	CO2
Co3 (AsO4) 2	-18.23	-5.19	13.03	Co3 (AsO4) 2
Co3O4	-9.04	-19.53	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-2.64	-12.62	-9.98	CoCO3
CoF2	-12.77	-14.37	-1.60	CoF2
CoF3	-43.67	-45.13	-1.46	CoF3
CoFe2O4	24.51	20.98	-3.53	CoFe2O4
CoMoO4	-6.15	-13.92	-7.76	CoMoO4
CoO	-6.68	6.91	13.59	CoO
CoS (alpha)	-67.36	-74.80	-7.44	CoS
CoS (beta)	-63.73	-74.80	-11.07	CoS
CoSe	-20.29	-36.49	-16.20	CoSe
CoSeO3	-9.01	-7.69	1.32	CoSeO3
CoSeO4:6H2O	-17.92	-19.45	-1.53	CoSeO4:6H2O
CoSO4	-13.05	-10.24	2.80	CoSO4
CoSO4:6H2O	-7.77	-10.24	-2.47	CoSO4:6H2O
Cotunnite	-9.93	-14.71	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr (OH) 2	-20.04	-9.22	10.82	Cr (OH) 2
Cr (OH) 3	-1.23	0.11	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.86	0.11	-0.75	Cr (OH) 3
Cr2O3	2.57	0.21	-2.36	Cr2O3
CrCl2	-43.28	-29.19	14.09	CrCl2
CrCl3	-44.96	-29.84	15.11	CrCl3
CrF3	-20.47	-31.81	-11.34	CrF3
Crmetal	-64.26	-33.78	30.48	Cr
CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.09	-39.93	-33.84	Na3AlF6
Cu (OH) 2	-0.98	7.69	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.99	20.22	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-51.27	-86.15	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.39	-47.19	-45.80	Cu2Se
Cu2SO4	-18.99	-20.94	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-8.94	-2.84	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-55.04	-97.64	-42.59	Cu3Sb
Cu3Se2	-19.41	-82.90	-63.49	Cu3Se2
CuCO3	-0.34	-11.84	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.63	-12.53	-4.91	CuF
CuF2	-14.70	-13.58	1.12	CuF2
CuF2:2H2O	-9.03	-13.58	-4.55	CuF2:2H2O
Cumetal	-5.42	-14.17	-8.76	Cu
CuMoO4	-0.05	-13.13	-13.08	CuMoO4
CuOCuSO4	-12.07	-1.77	10.30	CuOCuSO4
Cupricferrite	15.78	21.77	5.99	CuFe2O4
Cuprite	-2.39	-3.79	-1.41	Cu2O
Cuprousferrite	14.06	5.14	-8.92	CuFeO2

CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.55	-33.37	CuSe2
CuSeO3:2H2O	-7.42	-6.91	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.22	-18.66	-2.44	CuSeO4:5H2O
CuSO4	-12.40	-9.46	2.94	CuSO4
Diaspore	2.69	9.56	6.87	AlOOH
Djurleite	-50.82	-84.74	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.34	-16.20	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.89	-16.20	-17.09	CaMg(CO3)2
Epsomite	-3.83	-5.96	-2.13	MgSO4:7H2O
Fe(OH)2	-5.77	7.79	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.08	4.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-2.27	-5.99	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.07	-0.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-9.09	-29.71	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.63	-37.36	-3.73	Fe2(SO4)3
Fe3(OH)8	1.65	21.87	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.32	-5.92	0.40	FeAsO4:2H2O
FeCr2O4	0.81	8.01	7.20	FeCr2O4
FeMoO4	-2.93	-13.03	-10.09	FeMoO4
Ferrihydrite	3.85	7.04	3.19	Fe(OH)3
Ferroselite	-35.85	-54.45	-18.60	FeSe2
FeS(ppt)	-70.96	-73.91	-2.95	FeS
FeSe	-24.60	-35.60	-11.00	FeSe
Fix_pe	-5.13	-5.13	0.00	e-
Fluorite	0.89	-9.61	-10.50	CaF2
Galena	-62.48	-76.45	-13.97	PbS
Gibbsite	1.27	9.56	8.29	Al(OH)3
Goethite	6.55	7.04	0.49	FeOOH
Goslarite	-7.23	-9.24	-2.01	ZnSO4:7H2O
Greenockite	-61.38	-75.74	-14.36	CdS
Greigite	-259.90	-304.94	-45.03	Fe3S4
Gummite	-7.81	-0.14	7.67	UO3
Gypsum	-0.87	-5.48	-4.61	CaSO4:2H2O
H-Jarosite	-1.08	-13.18	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.94	-20.82	-12.88	H2MoO4
H2S(g)	-73.69	-81.70	-8.01	H2S
H2Se(g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.81	-5.21	1.60	NaCl
Hausmannite	-8.69	52.34	61.03	Mn3O4
Hematite	15.50	14.08	-1.42	Fe2O3
Hercynite	4.03	26.92	22.89	FeAl2O4
Hg(CH3)2(g)	-175.04	-248.75	-73.71	Hg(CH3)2
Hg(g)	-8.35	-16.22	-7.87	Hg
Hg(OH)2	-9.76	-13.26	-3.50	Hg(OH)2
Hg2(g)	-17.49	-32.44	-14.96	Hg2
Hg2(OH)2	-13.15	-7.89	5.26	Hg2(OH)2
Hg2CO3	-11.37	-27.42	-16.05	Hg2CO3
Hg2CrO4	-29.63	-38.33	-8.70	Hg2CrO4
Hg2F2	-18.80	-29.16	-10.36	Hg2F2
Hg2S	-77.91	-89.59	-11.68	Hg2S
Hg2SeO3	-17.83	-22.48	-4.66	Hg2SeO3
Hg2SO4	-18.91	-25.04	-6.13	Hg2SO4
Hg3O2CO3	-29.62	-59.31	-29.68	Hg3O2CO3
HgCl(g)	-33.42	-13.93	19.50	HgCl
HgCl2	-11.96	-33.22	-21.26	HgCl2
HgF(g)	-47.26	-14.58	32.68	HgF
HgF2(g)	-47.10	-34.53	12.57	HgF2
Hgmetal(l)	-2.77	-16.22	-13.45	Hg
HgSe	-0.96	-56.66	-55.69	HgSe
HgSeO3	-15.43	-27.86	-12.43	HgSeO3
HgSO4	-20.99	-30.41	-9.42	HgSO4
Huntite	-2.90	-32.87	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.53	-23.31	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.39	-22.16	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.62	-20.79	-5.17	KAl(SO4)2:12H2O
K-Jarosite	5.57	-9.23	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.75	-52.99	-17.24	K2Cr2O7

K2CrO4	-22.04	-22.55	-0.51	K2CrO4
K2MoO4	-16.20	-12.93	3.26	K2MoO4
K2SeO4	-17.74	-18.47	-0.73	K2SeO4
Langite	-3.87	13.62	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.21	-6.65	-0.43	PbO:PbSO4
Laurionite	-5.35	-4.73	0.62	PbOHCl
Lepidocrocite	5.67	7.04	1.37	FeOOH
Lime	-21.03	11.67	32.70	CaO
Litharge	-7.44	5.25	12.69	PbO
Mackinawite	-70.31	-73.91	-3.60	FeS
Maghemite	7.69	14.08	6.39	Fe2O3
Magnesianoferrite	8.41	25.27	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	18.47	21.87	3.40	Fe3O4
Malachite	1.16	-4.15	-5.31	Cu2 (OH) 2CO3
Manganite	-3.80	21.54	25.34	MnOOH
Massicot	-7.64	5.25	12.89	PbO
Matlockite	-6.40	-15.37	-8.97	PbClF
Melanothallite	-18.53	-12.27	6.26	CuCl2
Melanterite	-7.15	-9.35	-2.21	FeSO4:7H2O
Metacinnabar	-49.87	-94.96	-45.09	HgS
Mg (OH) 2 (active)	-7.60	11.19	18.79	Mg (OH) 2
Mg (VO3) 2	-13.87	-2.59	11.28	Mg (VO3) 2
Mg2Sb3	-266.76	-192.08	74.68	Mg2Sb3
Mg2V2O7	-17.76	8.60	26.36	Mg2V2O7
MgCr2O4	-4.80	11.40	16.20	MgCr2O4
MgCrO4	-24.63	-19.25	5.38	MgCrO4
MgF2	-1.95	-10.08	-8.13	MgF2
MgMoO4	-7.78	-9.63	-1.85	MgMoO4
MgSeO3:6H2O	-6.46	-3.41	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.96	-15.16	-1.20	MgSeO4:6H2O
Minium	-33.22	40.31	73.52	Pb3O4
Mirabilite	-6.48	-7.60	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-9.42	-4.52	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-53.35	-59.06	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.78	-85.70	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.62	1.88	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.42	-10.70	2.72	MnCl2:4H2O
MnS (grn)	-72.61	-72.44	0.17	MnS
MnS (pnk)	-75.78	-72.44	3.34	MnS
MnSb	-92.85	-95.76	-2.91	MnSb
MnSe	-37.64	-34.14	3.50	MnSe
MnSeO3	-6.46	-5.33	1.13	MnSeO3
MnSeO3:2H2O	-6.32	-5.33	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.04	-17.09	-2.05	MnSeO4:5H2O
MnSO4	-10.47	-7.88	2.58	MnSO4
Monteponite	-9.14	5.97	15.10	CdO
Montroydite	-9.62	-13.26	-3.64	HgO
MoO3	-12.82	-20.82	-8.00	MoO3
Morenosite	-7.94	-10.09	-2.14	NiSO4:7H2O
MoS2	-138.52	-208.78	-70.26	MoS2
Na-Jarosite	2.80	-8.40	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.43	-51.32	-9.90	Na2Cr2O7
Na2CrO4	-23.82	-20.88	2.93	Na2CrO4
Na2Mo2O7	-15.49	-32.09	-16.60	Na2Mo2O7
Na2MoO4	-12.76	-11.27	1.49	Na2MoO4
Na2MoO4:2H2O	-12.49	-11.27	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.34	-5.04	10.30	Na2SeO3:5H2O
Na2SeO4	-18.08	-16.80	1.28	Na2SeO4
Na3Sb	-172.07	-77.62	94.45	Na3Sb
Na3VO4	-29.24	7.44	36.68	Na3VO4
Na4V2O7	-32.07	5.33	37.40	Na4V2O7
Nantokite	-5.15	-11.88	-6.73	CuCl
NaSb	-85.78	-62.62	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-5.97	-2.11	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.73	7.06	12.79	Ni (OH) 2

Ni3(AsO4)2·8H2O	-20.43	-4.73	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-20.90	11.10	32.00	Ni4(OH)6SO4
NiCO3	-5.60	-12.47	-6.87	NiCO3
NiMoO4	-2.62	-13.76	-11.14	NiMoO4
NiS(alpha)	-69.04	-74.64	-5.60	NiS
NiS(beta)	-63.54	-74.64	-11.10	NiS
NiS(gamma)	-61.84	-74.64	-12.80	NiS
NiSe	-18.64	-36.34	-17.70	NiSe
NiSeO3·2H2O	-10.35	-7.54	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-17.77	-19.29	-1.52	NiSeO4·6H2O
Nsutite	-9.04	8.47	17.50	MnO2
O2(g)	-33.98	49.11	83.09	O2
Orpiment	-221.26	-282.33	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.86	-4.34	6.52	Pb(BO2)2
Pb(OH)2	-2.90	5.25	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.91	-64.67	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.27	0.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.69	10.50	26.19	Pb2O(OH)2
Pb2O3	-25.98	35.06	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	-1.38	-3.28	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.96	-10.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.17	1.97	6.14	Pb3(VO4)2
Pb3O2CO3	-14.80	-3.78	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.25	3.85	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.02	3.85	21.88	Pb4O3SO4
PbCrO4	-12.59	-25.19	-12.60	PbCrO4
PbF2	-8.58	-16.02	-7.44	PbF2
Pbmetal	-23.55	-19.30	4.25	Pb
PbMoO4	0.05	-15.57	-15.62	PbMoO4
PbO·0.3H2O	-7.73	5.25	12.98	PbO·0.33H2O
PbSeO4	-14.26	-21.10	-6.84	PbSeO4
Periclase	-10.39	11.19	21.58	MgO
Phosgenite	-9.18	-28.99	-19.81	PbCl2:PbCO3
Plattnerite	-19.80	29.80	49.60	PbO2
Portlandite	-11.13	11.67	22.80	Ca(OH)2
Pyrite	-112.55	-131.06	-18.51	FeS2
Pyrochroite	-5.93	9.26	15.19	Mn(OH)2
Pyrolusite	-7.56	33.82	41.38	MnO2
Realgar	-92.84	-112.59	-19.75	AsS
Retgersite	-8.05	-10.09	-2.04	NiSO4·6H2O
Rhodochrosite	0.32	-10.26	-10.58	MnCO3
Rutherfordine	-5.17	-19.67	-14.50	UO2CO3
Sb(OH)3	-11.18	-18.29	-7.11	Sb(OH)3
Sb2O4	-15.42	-12.02	3.40	Sb2O4
Sb2O5	-26.42	-36.09	-9.67	Sb2O5
Sb2Se3	-99.01	-166.77	-67.76	Sb2Se3
Sb4O6(cubic)	-54.89	-73.15	-18.26	Sb4O6
Sb4O6(orth)	-55.25	-73.15	-17.90	Sb4O6
SbCl3	-48.81	-48.23	0.57	SbCl3
SbF3	-39.97	-50.20	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.50	-30.32	-27.82	SbO2
Schoepite	-6.13	-0.14	5.99	UO2(OH)2·H2O
Semetal(am)	-11.74	-18.85	-7.11	Se
Semetal(hex)	-11.14	-18.85	-7.71	Se
Senarmontite	-24.21	-36.58	-12.37	Sb2O3
SeO2	-14.72	-14.60	0.12	SeO2
SeO3	-47.40	-26.35	21.04	SeO3
Siderite	-1.49	-11.73	-10.24	FeCO3
Smithsonite	-1.62	-11.62	-10.00	ZnCO3
Sphalerite	-62.35	-73.80	-11.45	ZnS
Spinel	-6.53	30.32	36.85	MgAl2O4
Stibnite	-231.22	-281.68	-50.46	Sb2S3
Sulfur	-55.00	-57.15	-2.14	S
Tenorite	0.05	7.69	7.64	CuO

Thenardite	-7.92	-7.59	0.32	Na2SO4
Thermonatrite	-10.61	-9.97	0.64	Na2CO3:H2O
Tyuyamunite	-6.47	-2.39	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-18.40	2.68	21.08	U3O8
U3Sb4	-566.60	-414.22	152.38	U3Sb4
U4O9	-34.32	-37.34	-3.02	U4O9
UF4	-28.49	-58.02	-29.54	UF4
UF4:2.5H2O	-25.31	-58.02	-32.72	UF4:2.5H2O
UO2 (am)	-16.41	-15.47	0.93	UO2
UO2 (OH) 2 (beta)	-5.75	-0.14	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.24	-26.49	-2.25	UO2SeO4:4H2O
UO3	-7.84	-0.14	7.70	UO3
Uraninite	-10.81	-15.47	-4.67	UO2
USb2	-213.61	-184.03	29.58	USb2
V (OH) 3	-16.44	-8.85	7.59	V (OH) 3
V2O5	-12.42	-13.78	-1.36	V2O5
V3O5	-33.18	-31.35	1.84	V3O5
V4O7	-40.80	-33.61	7.19	V4O7
V6O13	-29.59	-90.45	-60.86	V6O13
Valentinite	-28.09	-36.58	-8.48	Sb2O3
VC12	-59.96	-41.09	18.87	VC12
VC13	-62.23	-38.79	23.43	VC13
VF4	-59.74	-44.81	14.93	VF4
Vmetal	-89.70	-45.68	44.03	V
VO	-35.88	-21.12	14.76	VO
VO (OH) 2	-7.42	-2.27	5.15	VO (OH) 2
VO2Cl	-19.71	-16.87	2.84	VO2Cl
VOC1	-29.98	-18.83	11.15	VOC1
VOC12	-34.99	-22.23	12.76	VOC12
VOSO4	-23.02	-19.41	3.61	VOSO4
Witherite	-2.77	-11.34	-8.57	BaCO3
Wurtzite	-64.85	-73.80	-8.95	ZnS
Zincite	-3.43	7.91	11.33	ZnO
Zincosite	-13.17	-9.24	3.93	ZnSO4
Zn (BO2) 2	-9.98	-1.69	8.29	Zn (BO2) 2
Zn (OH) 2	-4.29	7.91	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.57	7.91	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.85	7.91	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.63	7.91	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.83	7.91	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.83	-1.33	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.36	5.83	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.84	-2.19	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.49	-10.57	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.92	14.48	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.93	19.57	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.11	-12.06	7.05	ZnCl2
ZnCO3:1H2O	-1.36	-11.62	-10.26	ZnCO3:1H2O
ZnF2	-12.83	-13.37	-0.53	ZnF2
Znmetal	-42.44	-16.65	25.79	Zn
ZnMoO4	-2.79	-12.91	-10.13	ZnMoO4
ZnO (active)	-3.28	7.91	11.19	ZnO
ZnS (am)	-64.74	-73.80	-9.05	ZnS
ZnSb	-82.78	-71.76	11.01	ZnSb
ZnSe	-21.09	-35.49	-14.40	ZnSe
ZnSeO4:6H2O	-16.93	-18.45	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.60	-9.24	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 38.

Title Precipitate oversaturated phases in groundwater
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 201

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -1.69 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 202

SAVE Solution 203 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 201

END

TITLE

Precipitate oversaturated phases in groundwater

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 202. Solution after simulation 37.
Using pure phase assemblage 201.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.533e-08	2.533e-08
Alunite	-0.00	-1.40	-1.40	0.000e+00	9.056e-07	9.056e-07
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.037e-08	2.037e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.318e-06	1.318e-06
Brochantite	-0.43	14.80	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.633e-03
CaMoO4	-1.74	-9.69	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.36	-3.55	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.907e-03	2.907e-03
Carnotite	-2.33	-2.10	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.91	-15.05	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.029e-08	6.029e-08
Cu2Se(alpha)	-5.11	-50.91	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.493e-07	2.493e-07
Epsomite	-3.73	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	2.671e-05	2.671e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.113e-04	1.113e-04
Gummite	-6.85	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.26	-58.95	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.51	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.73	-5.60	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.17	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-24.35	-8.65	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.73	-13.87	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.669e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	5.334e-09	5.334e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.82	-0.74	4.08	0.000e+00	0	0.000e+00
U3O8	-16.50	4.58	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.79	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.95	-13.07	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.284e-08	3.284e-08
Al	1.930e-06	1.930e-06
As	2.715e-10	2.715e-10
B	1.602e-05	1.601e-05
Ba	1.103e-07	1.102e-07
C	5.843e-03	5.842e-03
Ca	2.547e-03	2.546e-03
Cd	1.177e-08	1.176e-08
Cl	1.721e-03	1.720e-03
Co	1.359e-07	1.359e-07
Cr	6.443e-09	6.442e-09
Cu	9.452e-06	9.450e-06
F	2.117e-04	2.117e-04
Fe	3.678e-09	3.677e-09
Hg	2.223e-10	2.222e-10
K	7.295e-04	7.294e-04
Mg	1.758e-03	1.758e-03
Mn	2.398e-05	2.397e-05
Mo	3.078e-07	3.077e-07
Na	4.993e-03	4.992e-03
Ni	2.132e-07	2.131e-07
Pb	2.098e-08	2.098e-08
S	3.651e-03	3.650e-03
Sb	1.325e-08	1.325e-08
Se	2.244e-08	2.244e-08
U	8.561e-08	8.559e-08
V	1.174e-07	1.173e-07
Zn	1.164e-06	1.164e-06

-----Description of solution-----

	pH	=	7.147	Charge balance
	pe	=	5.625	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.908e-02	
	Mass of water (kg)	=	9.998e-01	
	Total alkalinity (eq/kg)	=	5.172e-03	
	Total CO2 (mol/kg)	=	5.843e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.379e-16	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	10	
	Total H	=	1.110029e+02	
	Total O	=	5.553035e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.625e-07	1.413e-07	-6.789	-6.850	-0.061	(0)
H+	8.159e-08	7.123e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.284e-08					
AgCl	2.132e-08	2.132e-08	-7.671	-7.671	0.000	(0)
Ag+	7.962e-09	6.951e-09	-8.099	-8.158	-0.059	(0)
AgCl2-	3.280e-09	2.789e-09	-8.484	-8.555	-0.070	(0)
AgSO4-	2.742e-10	2.331e-10	-9.562	-9.632	-0.070	(0)
AgCl3-2	7.144e-12	3.734e-12	-11.146	-11.428	-0.282	(0)
AgF	2.889e-12	2.889e-12	-11.539	-11.539	0.000	(0)
AgOH	9.822e-14	9.822e-14	-13.008	-13.008	0.000	(0)
AgCl4-3	4.930e-14	1.145e-14	-13.307	-13.941	-0.634	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgH2BO3	1.430e-14	1.430e-14	-13.845	-13.845	0.000	(0)

	AgSeO3-	5.135e-15	4.366e-15	-14.289	-14.360	-0.070	(0)
	Ag (OH) 2-	1.595e-18	1.356e-18	-17.797	-17.868	-0.070	(0)
	Ag (SeO3) 2-3	1.645e-22	3.821e-23	-21.784	-22.418	-0.634	(0)
	Ag2MoO4	3.266e-24	3.266e-24	-23.486	-23.486	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.784	-72.784	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.161	-86.288	-1.127	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.054	-147.125	-0.070	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.293	-147.461	-0.168	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.436	-149.753	-0.317	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.761	-150.064	-0.304	(0)
Al	1.930e-06						
	Al (OH) 4-	1.303e-06	1.139e-06	-5.885	-5.944	-0.058	(0)
	AlF3	3.250e-07	3.250e-07	-6.488	-6.488	0.000	(0)
	AlF2+	1.777e-07	1.560e-07	-6.750	-6.807	-0.057	(0)
	Al (OH) 3	6.399e-08	6.399e-08	-7.194	-7.194	0.000	(0)
	AlF4-	3.084e-08	2.696e-08	-7.511	-7.569	-0.058	(0)
	Al (OH) 2+	2.585e-08	2.270e-08	-7.587	-7.644	-0.057	(0)
	AlF+2	3.987e-09	2.368e-09	-8.399	-8.626	-0.226	(0)
	AlOH+2	3.405e-10	2.022e-10	-9.468	-9.694	-0.226	(0)
	AlSO4+	2.136e-11	1.867e-11	-10.670	-10.729	-0.058	(0)
	Al+3	4.857e-12	1.431e-12	-11.314	-11.844	-0.531	(0)
	Al (SO4) 2-	3.848e-13	3.363e-13	-12.415	-12.473	-0.058	(0)
	AlMo6O21-3	2.570e-40	0.000e+00	-39.590	-40.224	-0.634	(0)
As (3)	1.855e-22						
	H3AsO3	1.839e-22	1.839e-22	-21.735	-21.735	0.000	(0)
	H2AsO3-	1.558e-24	1.324e-24	-23.808	-23.878	-0.070	(0)
	HAsO3-2	3.244e-29	1.696e-29	-28.489	-28.771	-0.282	(0)
	H4AsO3+	7.634e-30	6.491e-30	-29.117	-29.188	-0.070	(0)
	AsO3-3	3.951e-35	9.177e-36	-34.403	-35.037	-0.634	(0)
As (5)	2.715e-10						
	HAsO4-2	1.940e-10	1.014e-10	-9.712	-9.994	-0.282	(0)
	H2AsO4-	7.748e-11	6.588e-11	-10.111	-10.181	-0.070	(0)
	AsO4-3	1.938e-14	4.502e-15	-13.713	-14.347	-0.634	(0)
	H3AsO4	8.118e-16	8.154e-16	-15.091	-15.089	0.002	(0)
B	1.602e-05						
	H3BO3	1.585e-05	1.592e-05	-4.800	-4.798	0.002	(0)
	H2BO3-	1.502e-07	1.298e-07	-6.823	-6.887	-0.063	(0)
	CaH2BO3+	9.977e-09	8.625e-09	-8.001	-8.064	-0.063	(0)
	MgH2BO3+	4.354e-09	3.763e-09	-8.361	-8.424	-0.063	(0)
	BF (OH) 3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
	NaH2BO3	8.868e-10	8.868e-10	-9.052	-9.052	0.000	(0)
	H5 (BO3) 2-	2.035e-12	1.759e-12	-11.691	-11.755	-0.063	(0)
	BF2 (OH) 2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
	BaH2BO3+	2.890e-13	2.499e-13	-12.539	-12.602	-0.063	(0)
	AgH2BO3	1.430e-14	1.430e-14	-13.845	-13.845	0.000	(0)
	H8 (BO3) 3-	3.239e-15	2.800e-15	-14.490	-14.553	-0.063	(0)
	BF3OH-	7.033e-18	6.080e-18	-17.153	-17.216	-0.063	(0)
	BF4-	4.080e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
Ba	1.103e-07						
	Ba+2	1.072e-07	6.229e-08	-6.970	-7.206	-0.236	(0)
	BaHCO3+	2.944e-09	2.592e-09	-8.531	-8.586	-0.055	(0)
	BaCO3	9.161e-11	9.161e-11	-10.038	-10.038	0.000	(0)
	BaH2BO3+	2.890e-13	2.499e-13	-12.539	-12.602	-0.063	(0)
	BaOH+	4.385e-14	3.842e-14	-13.358	-13.415	-0.057	(0)
C (4)	5.843e-03						
	HCO3-	4.963e-03	4.357e-03	-2.304	-2.361	-0.057	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.064e-04	9.368e-05	-3.973	-4.028	-0.055	(0)
	MgHCO3+	4.277e-05	3.728e-05	-4.369	-4.429	-0.060	(0)
	NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)
	CuCO3	7.933e-06	7.933e-06	-5.101	-5.101	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.937e-06	2.868e-06	-5.307	-5.542	-0.236	(0)
	MgCO3	1.994e-06	1.994e-06	-5.700	-5.700	0.000	(0)
	MnHCO3+	1.025e-06	8.979e-07	-5.989	-6.047	-0.057	(0)
	NaCO3-	2.622e-07	2.302e-07	-6.581	-6.638	-0.057	(0)
	CuHCO3+	1.519e-07	1.291e-07	-6.818	-6.889	-0.070	(0)
	Cu (CO3) 2-2	1.171e-07	6.123e-08	-6.931	-7.213	-0.282	(0)

	ZnCO3	7.830e-08	7.830e-08	-7.106	-7.106	0.000	(0)
	ZnHCO3+	7.689e-08	6.538e-08	-7.114	-7.185	-0.070	(0)
	NiHCO3+	4.797e-08	4.079e-08	-7.319	-7.389	-0.070	(0)
	UO2 (CO3) 3-4	4.275e-08	3.190e-09	-7.369	-8.496	-1.127	(0)
	UO2 (CO3) 2-2	4.247e-08	2.220e-08	-7.372	-7.654	-0.282	(0)
	CoHCO3+	1.997e-08	1.698e-08	-7.700	-7.770	-0.070	(0)
	PbCO3	1.158e-08	1.158e-08	-7.936	-7.936	0.000	(0)
	NiCO3	8.125e-09	8.125e-09	-8.090	-8.090	0.000	(0)
	PbHCO3+	5.114e-09	4.348e-09	-8.291	-8.362	-0.070	(0)
	BaHCO3+	2.944e-09	2.592e-09	-8.531	-8.586	-0.055	(0)
	CoCO3	2.429e-09	2.429e-09	-8.615	-8.615	0.000	(0)
	UO2CO3	3.879e-10	3.879e-10	-9.411	-9.411	0.000	(0)
	CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
	Pb (CO3) 2-2	1.832e-10	9.576e-11	-9.737	-10.019	-0.282	(0)
	BaCO3	9.161e-11	9.161e-11	-10.038	-10.038	0.000	(0)
	CdHCO3+	5.756e-11	4.894e-11	-10.240	-10.310	-0.070	(0)
	Cd (CO3) 2-2	1.312e-12	6.856e-13	-11.882	-12.164	-0.282	(0)
	FeHCO3+	8.931e-13	7.862e-13	-12.049	-12.104	-0.055	(0)
	HgCO3	1.450e-14	1.450e-14	-13.839	-13.839	0.000	(0)
	Hg (CO3) 2-2	2.515e-16	1.315e-16	-15.599	-15.881	-0.282	(0)
	HgHCO3+	2.261e-17	1.923e-17	-16.646	-16.716	-0.070	(0)
Ca		2.547e-03					
	Ca+2	1.988e-03	1.155e-03	-2.702	-2.938	-0.236	(0)
	CaSO4	4.447e-04	4.447e-04	-3.352	-3.352	0.000	(0)
	CaHCO3+	1.064e-04	9.368e-05	-3.973	-4.028	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.380e-06	2.086e-06	-5.623	-5.681	-0.057	(0)
	CaH2BO3+	9.977e-09	8.625e-09	-8.001	-8.064	-0.063	(0)
	CaOH+	3.698e-09	3.256e-09	-8.432	-8.487	-0.055	(0)
Cd		1.177e-08					
	Cd+2	8.494e-09	4.934e-09	-8.071	-8.307	-0.236	(0)
	CdSO4	1.945e-09	1.945e-09	-8.711	-8.711	0.000	(0)
	CdCl+	8.325e-10	7.078e-10	-9.080	-9.150	-0.070	(0)
	CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
	Cd (SO4) 2-2	8.437e-11	4.410e-11	-10.074	-10.356	-0.282	(0)
	CdHCO3+	5.756e-11	4.894e-11	-10.240	-10.310	-0.070	(0)
	CdF+	1.522e-11	1.294e-11	-10.818	-10.888	-0.070	(0)
	CdOH+	6.514e-12	5.539e-12	-11.186	-11.257	-0.070	(0)
	CdCl2	4.432e-12	4.432e-12	-11.353	-11.353	0.000	(0)
	CdOHC1	4.103e-12	4.103e-12	-11.387	-11.387	0.000	(0)
	Cd (CO3) 2-2	1.312e-12	6.856e-13	-11.882	-12.164	-0.282	(0)
	CdCl3-	4.941e-15	4.201e-15	-14.306	-14.377	-0.070	(0)
	Cd (OH) 2	4.938e-15	4.938e-15	-14.306	-14.306	0.000	(0)
	CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
	CdSeO4	3.890e-18	3.890e-18	-17.410	-17.410	0.000	(0)
	Cd2OH+3	5.896e-19	1.370e-19	-18.229	-18.863	-0.634	(0)
	Cd (OH) 3-	5.014e-20	4.264e-20	-19.300	-19.370	-0.070	(0)
	Cd (SeO3) 2-2	7.431e-21	3.884e-21	-20.129	-20.411	-0.282	(0)
	Cd (OH) 4-2	1.887e-27	9.862e-28	-26.724	-27.006	-0.282	(0)
	CdHS+	0.000e+00	0.000e+00	-78.669	-78.739	-0.070	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.976	-149.976	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.516	-0.070	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.479	-302.761	-0.282	(0)
Cl		1.721e-03					
	Cl-	1.721e-03	1.502e-03	-2.764	-2.823	-0.059	(0)
	MnCl+	2.229e-08	1.953e-08	-7.652	-7.709	-0.057	(0)
	AgCl	2.132e-08	2.132e-08	-7.671	-7.671	0.000	(0)
	AgCl2-	3.280e-09	2.789e-09	-8.484	-8.555	-0.070	(0)
	ZnCl+	2.054e-09	1.790e-09	-8.687	-8.747	-0.060	(0)
	CuCl+	1.283e-09	1.118e-09	-8.892	-8.951	-0.060	(0)
	CuCl	1.032e-09	1.032e-09	-8.986	-8.986	0.000	(0)
	CdCl+	8.325e-10	7.078e-10	-9.080	-9.150	-0.070	(0)
	CuCl2-	3.714e-10	3.238e-10	-9.430	-9.490	-0.060	(0)
	NiCl+	3.433e-10	2.919e-10	-9.464	-9.535	-0.070	(0)
	ZnOHC1	3.313e-10	3.313e-10	-9.480	-9.480	0.000	(0)
	CoCl+	3.063e-10	2.604e-10	-9.514	-9.584	-0.070	(0)
	PbCl+	8.419e-11	7.158e-11	-10.075	-10.145	-0.070	(0)
	MnCl2	4.145e-11	4.145e-11	-10.383	-10.383	0.000	(0)

AgCl3-2	7.144e-12	3.734e-12	-11.146	-11.428	-0.282	(0)
CdCl2	4.432e-12	4.432e-12	-11.353	-11.353	0.000	(0)
ZnCl2	4.263e-12	4.263e-12	-11.370	-11.370	0.000	(0)
CdOHC1	4.103e-12	4.103e-12	-11.387	-11.387	0.000	(0)
HgClOH	1.584e-12	1.584e-12	-11.800	-11.800	0.000	(0)
HgCl2	9.531e-13	9.531e-13	-12.021	-12.021	0.000	(0)
CuCl2	5.825e-13	5.825e-13	-12.235	-12.235	0.000	(0)
PbCl2	4.803e-13	4.803e-13	-12.318	-12.318	0.000	(0)
CuCl3-2	1.765e-13	1.040e-13	-12.753	-12.983	-0.230	(0)
AgCl4-3	4.930e-14	1.145e-14	-13.307	-13.941	-0.634	(0)
MnCl3-	1.957e-14	1.715e-14	-13.708	-13.766	-0.057	(0)
HgCl3-	1.684e-14	1.432e-14	-13.774	-13.844	-0.070	(0)
ZnCl3-	5.835e-15	5.086e-15	-14.234	-14.294	-0.060	(0)
CdCl3-	4.941e-15	4.201e-15	-14.306	-14.377	-0.070	(0)
NiCl2	2.208e-15	2.208e-15	-14.656	-14.656	0.000	(0)
PbCl3-	3.378e-16	2.872e-16	-15.471	-15.542	-0.070	(0)
CrCl+2	3.301e-16	1.725e-16	-15.481	-15.763	-0.282	(0)
HgCl4-2	1.638e-16	8.562e-17	-15.786	-16.067	-0.282	(0)
HgCl+	1.489e-16	1.266e-16	-15.827	-15.898	-0.070	(0)
UO2Cl+	9.736e-17	8.278e-17	-16.012	-16.082	-0.070	(0)
CuCl3-	9.368e-18	8.166e-18	-17.028	-17.088	-0.060	(0)
ZnCl4-2	6.483e-18	3.820e-18	-17.188	-17.418	-0.230	(0)
CrOHC12	6.962e-19	6.962e-19	-18.157	-18.157	0.000	(0)
PbCl4-2	3.773e-19	1.972e-19	-18.423	-18.705	-0.282	(0)
VOC1+	4.554e-20	3.872e-20	-19.342	-19.412	-0.070	(0)
FeCl+2	4.323e-20	2.548e-20	-19.364	-19.594	-0.230	(0)
CrCl2+	2.892e-20	2.459e-20	-19.539	-19.609	-0.070	(0)
FeCl2+	1.951e-22	1.709e-22	-21.710	-21.767	-0.057	(0)
CuCl4-2	1.043e-22	6.148e-23	-21.982	-22.211	-0.230	(0)
FeCl3	2.568e-26	2.568e-26	-25.590	-25.590	0.000	(0)
CrO3Cl-	2.080e-26	1.768e-26	-25.682	-25.752	-0.070	(0)
CoCl+2	4.921e-35	2.572e-35	-34.308	-34.590	-0.282	(0)
UCl+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
Co (2)	1.359e-07					
Co+2	9.588e-08	5.011e-08	-7.018	-7.300	-0.282	(0)
CoHCO3+	1.997e-08	1.698e-08	-7.700	-7.770	-0.070	(0)
CoSO4	1.681e-08	1.681e-08	-7.774	-7.774	0.000	(0)
CoCO3	2.429e-09	2.429e-09	-8.615	-8.615	0.000	(0)
CoF+	3.084e-10	2.622e-10	-9.511	-9.581	-0.070	(0)
CoCl+	3.063e-10	2.604e-10	-9.514	-9.584	-0.070	(0)
CoOH+	1.662e-10	1.413e-10	-9.779	-9.850	-0.070	(0)
Co (OH) 2	1.586e-12	1.586e-12	-11.800	-11.800	0.000	(0)
CoSeO4	1.063e-16	1.063e-16	-15.973	-15.973	0.000	(0)
Co (OH) 3-	5.260e-18	4.472e-18	-17.279	-17.349	-0.070	(0)
Co2OH+3	1.528e-18	3.549e-19	-17.816	-18.450	-0.634	(0)
CoOOH-	1.320e-18	1.122e-18	-17.879	-17.950	-0.070	(0)
Co (OH) 4-2	1.916e-25	1.002e-25	-24.718	-24.999	-0.282	(0)
Co4 (OH) 4+4	1.066e-30	7.953e-32	-29.972	-31.099	-1.127	(0)
Co (3)	1.156e-28					
CoOH+2	1.156e-28	6.043e-29	-27.937	-28.219	-0.282	(0)
Co+3	2.856e-34	8.414e-35	-33.544	-34.075	-0.531	(0)
CoCl+2	4.921e-35	2.572e-35	-34.308	-34.590	-0.282	(0)
Cr (2)	9.618e-26					
Cr+2	9.618e-26	5.027e-26	-25.017	-25.299	-0.282	(0)
Cr (3)	6.443e-09					
Cr (OH) 2+	5.549e-09	4.718e-09	-8.256	-8.326	-0.070	(0)
Cr (OH) +2	5.250e-10	2.744e-10	-9.280	-9.562	-0.282	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
CrF+2	4.454e-12	2.328e-12	-11.351	-11.633	-0.282	(0)
CrO2-	1.965e-12	1.671e-12	-11.707	-11.777	-0.070	(0)
Cr (OH) 4-	1.657e-12	1.409e-12	-11.781	-11.851	-0.070	(0)
CrSO4+	4.098e-13	3.484e-13	-12.387	-12.458	-0.070	(0)
Cr+3	3.821e-13	8.875e-14	-12.418	-13.052	-0.634	(0)
CrCl+2	3.301e-16	1.725e-16	-15.481	-15.763	-0.282	(0)
Cr2 (OH) 2SO4+2	5.195e-18	2.715e-18	-17.284	-17.566	-0.282	(0)
CrOHC12	6.962e-19	6.962e-19	-18.157	-18.157	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.711e-19	2.711e-19	-18.567	-18.567	0.000	(0)

CrCl2+	2.892e-20	2.459e-20	-19.539	-19.609	-0.070	(0)
Cr (6)	2.303e-16					
CrO4-2	1.962e-16	1.140e-16	-15.707	-15.943	-0.236	(0)
HCrO4-	3.089e-17	2.627e-17	-16.510	-16.581	-0.070	(0)
NaCrO4-	2.871e-18	2.441e-18	-17.542	-17.612	-0.070	(0)
KCrO4-	3.135e-19	2.665e-19	-18.504	-18.574	-0.070	(0)
CrO3SO4-2	1.834e-24	9.584e-25	-23.737	-24.018	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.080e-26	1.768e-26	-25.682	-25.752	-0.070	(0)
Cr2O7-2	4.579e-32	2.394e-32	-31.339	-31.621	-0.282	(0)
Cu (1)	2.045e-09					
CuCl	1.032e-09	1.032e-09	-8.986	-8.986	0.000	(0)
Cu+	6.416e-10	5.455e-10	-9.193	-9.263	-0.070	(0)
CuCl2-	3.714e-10	3.238e-10	-9.430	-9.490	-0.060	(0)
CuCl3-2	1.765e-13	1.040e-13	-12.753	-12.983	-0.230	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.149	-148.460	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.893	-149.190	-0.297	(0)
Cu (2)	9.450e-06					
CuCO3	7.933e-06	7.933e-06	-5.101	-5.101	0.000	(0)
Cu+2	8.087e-07	4.698e-07	-6.092	-6.328	-0.236	(0)
CuOH+	2.408e-07	2.099e-07	-6.618	-6.678	-0.060	(0)
CuSO4	1.809e-07	1.809e-07	-6.743	-6.743	0.000	(0)
CuHCO3+	1.519e-07	1.291e-07	-6.818	-6.889	-0.070	(0)
Cu (CO3) 2-2	1.171e-07	6.123e-08	-6.931	-7.213	-0.282	(0)
Cu (OH) 2	5.919e-09	5.919e-09	-8.228	-8.228	0.000	(0)
CuF+	5.769e-09	4.905e-09	-8.239	-8.309	-0.070	(0)
Cu2 (OH) 2+2	2.118e-09	1.107e-09	-8.674	-8.956	-0.282	(0)
CuCl+	1.283e-09	1.118e-09	-8.892	-8.951	-0.060	(0)
Cu (OH) 3-	2.018e-12	1.716e-12	-11.695	-11.766	-0.070	(0)
CuCl2	5.825e-13	5.825e-13	-12.235	-12.235	0.000	(0)
CuCl3-	9.368e-18	8.166e-18	-17.028	-17.088	-0.060	(0)
Cu (OH) 4-2	3.651e-18	1.908e-18	-17.438	-17.719	-0.282	(0)
CuCl4-2	1.043e-22	6.148e-23	-21.982	-22.211	-0.230	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.680	-215.751	-0.070	(0)
F	2.117e-04					
F-	1.896e-04	1.655e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.776e-05	1.553e-05	-4.750	-4.809	-0.058	(0)
CaF+	2.380e-06	2.086e-06	-5.623	-5.681	-0.057	(0)
NaF	4.501e-07	4.501e-07	-6.347	-6.347	0.000	(0)
AlF3	3.250e-07	3.250e-07	-6.488	-6.488	0.000	(0)
AlF2+	1.777e-07	1.560e-07	-6.750	-6.807	-0.057	(0)
MnF+	7.767e-08	6.805e-08	-7.110	-7.167	-0.057	(0)
AlF4-	3.084e-08	2.696e-08	-7.511	-7.569	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	5.769e-09	4.905e-09	-8.239	-8.309	-0.070	(0)
AlF+2	3.987e-09	2.368e-09	-8.399	-8.626	-0.226	(0)
ZnF+	1.843e-09	1.567e-09	-8.735	-8.805	-0.070	(0)
BF (OH) 3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
NiF+	3.713e-10	3.157e-10	-9.430	-9.501	-0.070	(0)
CoF+	3.084e-10	2.622e-10	-9.511	-9.581	-0.070	(0)
PbF+	1.842e-11	1.566e-11	-10.735	-10.805	-0.070	(0)
CdF+	1.522e-11	1.294e-11	-10.818	-10.888	-0.070	(0)
HF2-	1.262e-11	1.097e-11	-10.899	-10.960	-0.061	(0)
CrF+2	4.454e-12	2.328e-12	-11.351	-11.633	-0.282	(0)
AgF	2.889e-12	2.889e-12	-11.539	-11.539	0.000	(0)
BF2 (OH) 2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
UO2F+	9.129e-13	7.762e-13	-12.040	-12.110	-0.070	(0)
UO2F2	3.705e-13	3.705e-13	-12.431	-12.431	0.000	(0)
PbF2	5.101e-14	5.101e-14	-13.292	-13.292	0.000	(0)
UO2F3-	1.811e-14	1.540e-14	-13.742	-13.812	-0.070	(0)
CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
VO2F	2.771e-15	2.771e-15	-14.557	-14.557	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.151e-16	4.513e-16	-15.288	-15.346	-0.057	(0)
VO2F2-	1.958e-16	1.665e-16	-15.708	-15.779	-0.070	(0)
FeF+2	1.729e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	3.873e-17	2.024e-17	-16.412	-16.694	-0.282	(0)

PbF3-	1.883e-17	1.601e-17	-16.725	-16.796	-0.070	(0)
VOF+	1.073e-17	9.120e-18	-16.970	-17.040	-0.070	(0)
BF3OH-	7.033e-18	6.080e-18	-17.153	-17.216	-0.063	(0)
VO2F3-2	6.576e-19	3.437e-19	-18.182	-18.464	-0.282	(0)
VOF2	5.660e-19	5.660e-19	-18.247	-18.247	0.000	(0)
VOF3-	3.908e-21	3.323e-21	-20.408	-20.478	-0.070	(0)
PbF4-2	2.426e-21	1.268e-21	-20.615	-20.897	-0.282	(0)
BF4-	4.080e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
VO2F4-3	1.205e-22	2.799e-23	-21.919	-22.553	-0.634	(0)
HgF+	3.047e-23	2.591e-23	-22.516	-22.587	-0.070	(0)
VOF4-2	4.247e-24	2.220e-24	-23.372	-23.654	-0.282	(0)
Sb(OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.895e-25	9.895e-25	-24.005	-24.005	0.000	(0)
UF3+	1.717e-34	1.460e-34	-33.765	-33.836	-0.070	(0)
UF2+2	1.065e-35	5.565e-36	-34.973	-35.254	-0.282	(0)
UF4	2.649e-36	2.649e-36	-35.577	-35.577	0.000	(0)
UF5-	2.043e-38	1.737e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.150e-38	2.671e-39	-37.939	-38.573	-0.634	(0)
UF6-2	1.661e-39	8.681e-40	-38.780	-39.061	-0.282	(0)
Fe (2)	3.432e-11					
Fe+2	2.742e-11	1.433e-11	-10.562	-10.844	-0.282	(0)
FeSO4	5.915e-12	5.915e-12	-11.228	-11.228	0.000	(0)
FeHCO3+	8.931e-13	7.862e-13	-12.049	-12.104	-0.055	(0)
FeOH+	9.203e-14	8.064e-14	-13.036	-13.093	-0.057	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.617e-19	4.045e-19	-18.336	-18.393	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.775	-158.775	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.108	-235.178	-0.070	(0)
Fe (3)	3.643e-09					
Fe (OH) 2+	3.209e-09	2.817e-09	-8.494	-8.550	-0.057	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.409e-12	5.626e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.695e-14	5.124e-14	-13.061	-13.290	-0.230	(0)
FeF2+	5.151e-16	4.513e-16	-15.288	-15.346	-0.057	(0)
FeF+2	1.729e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.209e-17	1.059e-17	-16.918	-16.975	-0.057	(0)
Fe+3	1.906e-18	5.616e-19	-17.720	-18.251	-0.531	(0)
Fe (SO4) 2-	4.478e-19	3.807e-19	-18.349	-18.419	-0.070	(0)
FeCl+2	4.323e-20	2.548e-20	-19.364	-19.594	-0.230	(0)
FeCl2+	1.951e-22	1.709e-22	-21.710	-21.767	-0.057	(0)
FeHSeO3+2	4.965e-23	2.595e-23	-22.304	-22.586	-0.282	(0)
Fe2 (OH) 2+4	1.165e-24	8.694e-26	-23.934	-25.061	-1.127	(0)
FeCl3	2.568e-26	2.568e-26	-25.590	-25.590	0.000	(0)
Fe3 (OH) 4+5	2.042e-31	3.540e-33	-30.690	-32.451	-1.761	(0)
H (0)	4.020e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.192e-10					
Hg	2.192e-10	2.192e-10	-9.659	-9.659	0.000	(0)
Hg (1)	2.405e-21					
Hg2+2	1.202e-21	6.285e-22	-20.920	-21.202	-0.282	(0)
Hg (2)	3.099e-12					
HgClOH	1.584e-12	1.584e-12	-11.800	-11.800	0.000	(0)
HgCl2	9.531e-13	9.531e-13	-12.021	-12.021	0.000	(0)
Hg (OH) 2	5.299e-13	5.322e-13	-12.276	-12.274	0.002	(0)
HgCl3-	1.684e-14	1.432e-14	-13.774	-13.844	-0.070	(0)
HgCO3	1.450e-14	1.450e-14	-13.839	-13.839	0.000	(0)
Hg (CO3) 2-2	2.515e-16	1.315e-16	-15.599	-15.881	-0.282	(0)
HgCl4-2	1.638e-16	8.562e-17	-15.786	-16.067	-0.282	(0)
HgCl+	1.489e-16	1.266e-16	-15.827	-15.898	-0.070	(0)
HgOH+	2.795e-17	2.376e-17	-16.554	-16.624	-0.070	(0)
HgHCO3+	2.261e-17	1.923e-17	-16.646	-16.716	-0.070	(0)
Hg (OH) 3-	1.114e-20	9.469e-21	-19.953	-20.024	-0.070	(0)
Hg+2	8.081e-21	4.224e-21	-20.093	-20.374	-0.282	(0)
HgSO4	1.859e-21	1.859e-21	-20.731	-20.731	0.000	(0)
HgF+	3.047e-23	2.591e-23	-22.516	-22.587	-0.070	(0)
HgHS2-	0.000e+00	0.000e+00	-138.110	-138.180	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.933	-138.933	0.000	(0)

	HgS2-2	0.000e+00	0.000e+00	-139.459	-139.741	-0.282	(0)
K	7.295e-04						
	K+	7.210e-04	6.294e-04	-3.142	-3.201	-0.059	(0)
	KSO4-	8.534e-06	7.491e-06	-5.069	-5.125	-0.057	(0)
	KCrO4-	3.135e-19	2.665e-19	-18.504	-18.574	-0.070	(0)
Mg	1.758e-03						
	Mg+2	1.439e-03	8.362e-04	-2.842	-3.078	-0.236	(0)
	MgSO4	2.558e-04	2.558e-04	-3.592	-3.592	0.000	(0)
	MgHCO3+	4.277e-05	3.728e-05	-4.369	-4.429	-0.060	(0)
	MgF+	1.776e-05	1.553e-05	-4.750	-4.809	-0.058	(0)
	MgCO3	1.994e-06	1.994e-06	-5.700	-5.700	0.000	(0)
	MgOH+	5.332e-08	4.704e-08	-7.273	-7.328	-0.054	(0)
	MgH2BO3+	4.354e-09	3.763e-09	-8.361	-8.424	-0.063	(0)
Mn (2)	2.398e-05						
	Mn+2	1.976e-05	1.033e-05	-4.704	-4.986	-0.282	(0)
	MnSO4	3.088e-06	3.088e-06	-5.510	-5.510	0.000	(0)
	MnHCO3+	1.025e-06	8.979e-07	-5.989	-6.047	-0.057	(0)
	MnF+	7.767e-08	6.805e-08	-7.110	-7.167	-0.057	(0)
	MnCl+	2.229e-08	1.953e-08	-7.652	-7.709	-0.057	(0)
	MnOH+	4.185e-09	3.666e-09	-8.378	-8.436	-0.057	(0)
	MnCl2	4.145e-11	4.145e-11	-10.383	-10.383	0.000	(0)
	MnCl3-	1.957e-14	1.715e-14	-13.708	-13.766	-0.057	(0)
	MnSeO4	1.177e-14	1.177e-14	-13.929	-13.929	0.000	(0)
	Mn (OH) 3-	5.165e-19	4.525e-19	-18.287	-18.344	-0.057	(0)
	Mn (OH) 4-2	3.503e-25	2.065e-25	-24.455	-24.685	-0.230	(0)
	MnSe	0.000e+00	0.000e+00	-42.755	-42.755	0.000	(0)
Mn (3)	6.606e-25						
	Mn+3	6.606e-25	1.946e-25	-24.180	-24.711	-0.531	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-43.500	-43.729	-0.230	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.414	-47.476	-0.062	(0)
Mo	3.078e-07						
	MoO4-2	3.075e-07	1.786e-07	-6.512	-6.748	-0.236	(0)
	HMoO4-	2.977e-10	2.531e-10	-9.526	-9.597	-0.070	(0)
	H2MoO4	1.321e-13	1.321e-13	-12.879	-12.879	0.000	(0)
	Ag2MoO4	3.266e-24	3.266e-24	-23.486	-23.486	0.000	(0)
	AlMo6O21-3	2.570e-40	0.000e+00	-39.590	-40.224	-0.634	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-48.889	-51.425	-2.536	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.424	-52.185	-1.761	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.423	-54.550	-1.127	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-57.818	-58.452	-0.634	(0)
Na	4.993e-03						
	Na+	4.937e-03	4.311e-03	-2.306	-2.365	-0.059	(0)
	NaSO4-	4.433e-05	3.892e-05	-4.353	-4.410	-0.057	(0)
	NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)
	NaF	4.501e-07	4.501e-07	-6.347	-6.347	0.000	(0)
	NaCO3-	2.622e-07	2.302e-07	-6.581	-6.638	-0.057	(0)
	NaH2BO3	8.868e-10	8.868e-10	-9.052	-9.052	0.000	(0)
	NaCrO4-	2.871e-18	2.441e-18	-17.542	-17.612	-0.070	(0)
Ni	2.132e-07						
	Ni+2	1.307e-07	7.594e-08	-6.884	-7.120	-0.236	(0)
	NiHCO3+	4.797e-08	4.079e-08	-7.319	-7.389	-0.070	(0)
	NiSO4	2.547e-08	2.547e-08	-7.594	-7.594	0.000	(0)
	NiCO3	8.125e-09	8.125e-09	-8.090	-8.090	0.000	(0)
	NiF+	3.713e-10	3.157e-10	-9.430	-9.501	-0.070	(0)
	NiCl+	3.433e-10	2.919e-10	-9.464	-9.535	-0.070	(0)
	NiOH+	1.589e-10	1.351e-10	-9.799	-9.869	-0.070	(0)
	Ni (SO4) 2-2	2.713e-12	1.418e-12	-11.567	-11.848	-0.282	(0)
	Ni (OH) 2	1.517e-12	1.517e-12	-11.819	-11.819	0.000	(0)
	NiCl2	2.208e-15	2.208e-15	-14.656	-14.656	0.000	(0)
	Ni (OH) 3-	2.521e-16	2.143e-16	-15.598	-15.669	-0.070	(0)
	NiSeO4	1.504e-16	1.504e-16	-15.823	-15.823	0.000	(0)
O (0)	2.474e-35						
	O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.098e-08						
	PbCO3	1.158e-08	1.158e-08	-7.936	-7.936	0.000	(0)
	PbHCO3+	5.114e-09	4.348e-09	-8.291	-8.362	-0.070	(0)

Pb+2	2.312e-09	1.343e-09	-8.636	-8.872	-0.236	(0)
PbSO4	1.106e-09	1.106e-09	-8.956	-8.956	0.000	(0)
PbOH+	5.607e-10	4.767e-10	-9.251	-9.322	-0.070	(0)
Pb (CO3) 2-2	1.832e-10	9.576e-11	-9.737	-10.019	-0.282	(0)
PbCl+	8.419e-11	7.158e-11	-10.075	-10.145	-0.070	(0)
Pb (SO4) 2-2	2.143e-11	1.120e-11	-10.669	-10.951	-0.282	(0)
PbF+	1.842e-11	1.566e-11	-10.735	-10.805	-0.070	(0)
Pb (OH) 2	2.130e-12	2.130e-12	-11.672	-11.672	0.000	(0)
PbCl2	4.803e-13	4.803e-13	-12.318	-12.318	0.000	(0)
PbF2	5.101e-14	5.101e-14	-13.292	-13.292	0.000	(0)
Pb (OH) 3-	3.541e-16	3.011e-16	-15.451	-15.521	-0.070	(0)
PbCl3-	3.378e-16	2.872e-16	-15.471	-15.542	-0.070	(0)
Pb2OH+3	4.369e-17	1.015e-17	-16.360	-16.994	-0.634	(0)
PbF3-	1.883e-17	1.601e-17	-16.725	-16.796	-0.070	(0)
PbCl4-2	3.773e-19	1.972e-19	-18.423	-18.705	-0.282	(0)
Pb (OH) 4-2	1.994e-20	1.042e-20	-19.700	-19.982	-0.282	(0)
PbF4-2	2.426e-21	1.268e-21	-20.615	-20.897	-0.282	(0)
Pb3 (OH) 4+2	2.327e-22	1.216e-22	-21.633	-21.915	-0.282	(0)
Pb4 (OH) 4+4	1.739e-26	1.298e-27	-25.760	-26.887	-1.127	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.483	-150.483	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.553	-227.624	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.784	-72.784	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.370	-78.441	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.568	-78.568	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.669	-78.739	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.377	-80.658	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.892	-81.174	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.972	-81.254	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.778	-82.060	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.794	-83.076	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.364	-88.593	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.110	-138.180	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.933	-138.933	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.459	-139.741	-0.282	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.054	-147.125	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.293	-147.461	-0.168	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.149	-148.460	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.893	-149.190	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.177	-149.247	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.436	-149.753	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.761	-150.064	-0.304	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.976	-149.976	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.385	-150.385	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.483	-150.483	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.775	-158.775	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.680	-215.751	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.475	-225.545	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.516	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.553	-227.624	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.096	-228.378	-0.282	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.108	-235.178	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.479	-302.761	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.164	-305.446	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.911	-317.193	-0.282	(0)
S (6)	3.651e-03					
SO4-2	2.894e-03	1.681e-03	-2.538	-2.774	-0.236	(0)
CaSO4	4.447e-04	4.447e-04	-3.352	-3.352	0.000	(0)
MgSO4	2.558e-04	2.558e-04	-3.592	-3.592	0.000	(0)
NaSO4-	4.433e-05	3.892e-05	-4.353	-4.410	-0.057	(0)
KSO4-	8.534e-06	7.491e-06	-5.069	-5.125	-0.057	(0)
MnSO4	3.088e-06	3.088e-06	-5.510	-5.510	0.000	(0)
CuSO4	1.809e-07	1.809e-07	-6.743	-6.743	0.000	(0)
ZnSO4	1.745e-07	1.745e-07	-6.758	-6.758	0.000	(0)
NiSO4	2.547e-08	2.547e-08	-7.594	-7.594	0.000	(0)
CoSO4	1.681e-08	1.681e-08	-7.774	-7.774	0.000	(0)
HSO4-	1.339e-08	1.170e-08	-7.873	-7.932	-0.058	(0)
Zn (SO4) 2-2	4.889e-09	2.555e-09	-8.311	-8.593	-0.282	(0)

CdSO4	1.945e-09	1.945e-09	-8.711	-8.711	0.000	(0)
PbSO4	1.106e-09	1.106e-09	-8.956	-8.956	0.000	(0)
AgSO4-	2.742e-10	2.331e-10	-9.562	-9.632	-0.070	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
Cd (SO4) 2-2	8.437e-11	4.410e-11	-10.074	-10.356	-0.282	(0)
Pb (SO4) 2-2	2.143e-11	1.120e-11	-10.669	-10.951	-0.282	(0)
AlSO4+	2.136e-11	1.867e-11	-10.670	-10.729	-0.058	(0)
FeSO4	5.915e-12	5.915e-12	-11.228	-11.228	0.000	(0)
Ni (SO4) 2-2	2.713e-12	1.418e-12	-11.567	-11.848	-0.282	(0)
CrSO4+	4.098e-13	3.484e-13	-12.387	-12.458	-0.070	(0)
Al (SO4) 2-	3.848e-13	3.363e-13	-12.415	-12.473	-0.058	(0)
UO2SO4	8.646e-14	8.646e-14	-13.063	-13.063	0.000	(0)
UO2 (SO4) 2-2	3.666e-15	1.916e-15	-14.436	-14.718	-0.282	(0)
VO2SO4-	4.507e-16	3.832e-16	-15.346	-15.417	-0.070	(0)
FeSO4+	1.209e-17	1.059e-17	-16.918	-16.975	-0.057	(0)
Cr2 (OH) 2SO4+2	5.195e-18	2.715e-18	-17.284	-17.566	-0.282	(0)
VOSO4	4.255e-18	4.255e-18	-17.371	-17.371	0.000	(0)
Fe (SO4) 2-	4.478e-19	3.807e-19	-18.349	-18.419	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.711e-19	2.711e-19	-18.567	-18.567	0.000	(0)
HgSO4	1.859e-21	1.859e-21	-20.731	-20.731	0.000	(0)
CrO3SO4-2	1.834e-24	9.584e-25	-23.737	-24.018	-0.282	(0)
VS04+	5.125e-32	4.357e-32	-31.290	-31.361	-0.070	(0)
U (SO4) 2	7.231e-40	7.231e-40	-39.141	-39.141	0.000	(0)
USO4+2	1.036e-40	0.000e+00	-39.985	-40.266	-0.282	(0)
Sb (3)	1.079e-19					
Sb (OH) 3	5.461e-20	5.461e-20	-19.263	-19.263	0.000	(0)
HSbO2	5.332e-20	5.332e-20	-19.273	-19.273	0.000	(0)
SbO2-	1.426e-24	1.212e-24	-23.846	-23.916	-0.070	(0)
Sb (OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.895e-25	9.895e-25	-24.005	-24.005	0.000	(0)
Sb (OH) 4-	8.166e-25	6.943e-25	-24.088	-24.158	-0.070	(0)
Sb (OH) 2+	1.111e-25	9.449e-26	-24.954	-25.025	-0.070	(0)
SbO+	3.832e-26	3.259e-26	-25.417	-25.487	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.911	-317.193	-0.282	(0)
Sb (5)	1.325e-08					
SbO3-	1.324e-08	1.126e-08	-7.878	-7.949	-0.070	(0)
Sb (OH) 6-	1.507e-11	1.315e-11	-10.822	-10.881	-0.059	(0)
SbO2+	1.927e-23	1.638e-23	-22.715	-22.786	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.460e-40	2.942e-40	-39.461	-39.531	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.755	-42.755	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.789	-42.789	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.102	-47.384	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.161	-86.288	-1.127	(0)
Se (4)	2.244e-08					
HSeO3-	2.057e-08	1.749e-08	-7.687	-7.757	-0.070	(0)
SeO3-2	1.870e-09	9.774e-10	-8.728	-9.010	-0.282	(0)
H2SeO3	5.313e-13	5.313e-13	-12.275	-12.275	0.000	(0)
AgSeO3-	5.135e-15	4.366e-15	-14.289	-14.360	-0.070	(0)
Cd (SeO3) 2-2	7.431e-21	3.884e-21	-20.129	-20.411	-0.282	(0)
Ag (SeO3) 2-3	1.645e-22	3.821e-23	-21.784	-22.418	-0.634	(0)
FeHSeO3+2	4.965e-23	2.595e-23	-22.304	-22.586	-0.282	(0)
Se (6)	7.301e-12					
SeO4-2	7.289e-12	4.234e-12	-11.137	-11.373	-0.236	(0)
MnSeO4	1.177e-14	1.177e-14	-13.929	-13.929	0.000	(0)
ZnSeO4	3.112e-16	3.112e-16	-15.507	-15.507	0.000	(0)
NiSeO4	1.504e-16	1.504e-16	-15.823	-15.823	0.000	(0)
CoSeO4	1.063e-16	1.063e-16	-15.973	-15.973	0.000	(0)
HSeO4-	1.778e-17	1.511e-17	-16.750	-16.821	-0.070	(0)
CdSeO4	3.890e-18	3.890e-18	-17.410	-17.410	0.000	(0)
Zn (SeO4) 2-2	2.556e-27	1.336e-27	-26.592	-26.874	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.879	-58.513	-0.634	(0)
U (4)	3.940e-22					
U (OH) 5-	3.930e-22	3.341e-22	-21.406	-21.476	-0.070	(0)
U (OH) 4	9.971e-25	9.971e-25	-24.001	-24.001	0.000	(0)
U (OH) 3+	3.055e-28	2.597e-28	-27.515	-27.585	-0.070	(0)

U (OH) 2+2	1.637e-32	8.558e-33	-31.786	-32.068	-0.282	(0)
UF3+	1.717e-34	1.460e-34	-33.765	-33.836	-0.070	(0)
UF2+2	1.065e-35	5.565e-36	-34.973	-35.254	-0.282	(0)
UF4	2.649e-36	2.649e-36	-35.577	-35.577	0.000	(0)
UOH+3	1.236e-37	2.872e-38	-36.908	-37.542	-0.634	(0)
UF5-	2.043e-38	1.737e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.150e-38	2.671e-39	-37.939	-38.573	-0.634	(0)
UF6-2	1.661e-39	8.681e-40	-38.780	-39.061	-0.282	(0)
U (SO4) 2	7.231e-40	7.231e-40	-39.141	-39.141	0.000	(0)
USO4+2	1.036e-40	0.000e+00	-39.985	-40.266	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.965	-44.092	-1.127	(0)
UC1+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.793	-174.499	-5.706	(0)
U (5)	5.775e-17					
UO2+	5.775e-17	4.910e-17	-16.238	-16.309	-0.070	(0)
U (6)	8.561e-08					
UO2 (CO3) 3-4	4.275e-08	3.190e-09	-7.369	-8.496	-1.127	(0)
UO2 (CO3) 2-2	4.247e-08	2.220e-08	-7.372	-7.654	-0.282	(0)
UO2CO3	3.879e-10	3.879e-10	-9.411	-9.411	0.000	(0)
UO2F+	9.129e-13	7.762e-13	-12.040	-12.110	-0.070	(0)
UO2OH+	7.109e-13	6.045e-13	-12.148	-12.219	-0.070	(0)
UO2F2	3.705e-13	3.705e-13	-12.431	-12.431	0.000	(0)
UO2SO4	8.646e-14	8.646e-14	-13.063	-13.063	0.000	(0)
UO2+2	5.849e-14	3.398e-14	-13.233	-13.469	-0.236	(0)
UO2F3-	1.811e-14	1.540e-14	-13.742	-13.812	-0.070	(0)
UO2 (SO4) 2-2	3.666e-15	1.916e-15	-14.436	-14.718	-0.282	(0)
UO2Cl+	9.736e-17	8.278e-17	-16.012	-16.082	-0.070	(0)
UO2F4-2	3.873e-17	2.024e-17	-16.412	-16.694	-0.282	(0)
(UO2) 2 (OH) 2+2	1.160e-18	6.064e-19	-17.935	-18.217	-0.282	(0)
(UO2) 3 (OH) 5+	6.532e-21	5.554e-21	-20.185	-20.255	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.465	-40.535	-0.070	(0)
V+2	0.000e+00	0.000e+00	-40.914	-41.195	-0.282	(0)
V (3)	1.250e-13					
V (OH) 3	1.250e-13	1.250e-13	-12.903	-12.903	0.000	(0)
V (OH) 2+	6.768e-24	5.755e-24	-23.170	-23.240	-0.070	(0)
VOH+2	7.440e-27	3.889e-27	-26.128	-26.410	-0.282	(0)
V+3	2.364e-31	5.491e-32	-30.626	-31.260	-0.634	(0)
VSO4+	5.125e-32	4.357e-32	-31.290	-31.361	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.564	-51.198	-0.634	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.893	-52.020	-1.127	(0)
V (4)	3.378e-16					
V (OH) 3+	3.046e-16	2.590e-16	-15.516	-15.587	-0.070	(0)
VO+2	1.758e-17	9.189e-18	-16.755	-17.037	-0.282	(0)
VOF+	1.073e-17	9.120e-18	-16.970	-17.040	-0.070	(0)
VOSO4	4.255e-18	4.255e-18	-17.371	-17.371	0.000	(0)
VOF2	5.660e-19	5.660e-19	-18.247	-18.247	0.000	(0)
VOC1+	4.554e-20	3.872e-20	-19.342	-19.412	-0.070	(0)
VOF3-	3.908e-21	3.323e-21	-20.408	-20.478	-0.070	(0)
VOF4-2	4.247e-24	2.220e-24	-23.372	-23.654	-0.282	(0)
H2V2O4+2	6.437e-27	3.364e-27	-26.191	-26.473	-0.282	(0)
V (5)	1.174e-07					
H2VO4-	1.108e-07	9.424e-08	-6.955	-7.026	-0.070	(0)
HVO4-2	6.359e-09	3.324e-09	-8.197	-8.478	-0.282	(0)
H3VO4	6.713e-11	6.713e-11	-10.173	-10.173	0.000	(0)
H3V2O7-	4.806e-11	4.086e-11	-10.318	-10.389	-0.070	(0)
HV2O7-3	4.571e-13	1.062e-13	-12.340	-12.974	-0.634	(0)
VO2+	1.094e-14	9.547e-15	-13.961	-14.020	-0.059	(0)
V3O9-3	3.778e-15	8.775e-16	-14.423	-15.057	-0.634	(0)
VO2F	2.771e-15	2.771e-15	-14.557	-14.557	0.000	(0)
VO4-3	1.007e-15	2.339e-16	-14.997	-15.631	-0.634	(0)
V2O7-4	5.376e-16	4.012e-17	-15.270	-16.397	-1.127	(0)
VO2SO4-	4.507e-16	3.832e-16	-15.346	-15.417	-0.070	(0)
VO2F2-	1.958e-16	1.665e-16	-15.708	-15.779	-0.070	(0)
VO2F3-2	6.576e-19	3.437e-19	-18.182	-18.464	-0.282	(0)
V4O12-4	4.621e-19	3.449e-20	-18.335	-19.462	-1.127	(0)
VO2F4-3	1.205e-22	2.799e-23	-21.919	-22.553	-0.634	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.139	-48.900	-1.761	(0)

V10O28-6	0.000e+00	0.000e+00	-47.403	-49.939	-2.536	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.713	-50.840	-1.127	(0)
Zn	1.164e-06					
Zn+2	8.169e-07	4.745e-07	-6.088	-6.324	-0.236	(0)
ZnSO4	1.745e-07	1.745e-07	-6.758	-6.758	0.000	(0)
ZnCO3	7.830e-08	7.830e-08	-7.106	-7.106	0.000	(0)
ZnHCO3+	7.689e-08	6.538e-08	-7.114	-7.185	-0.070	(0)
ZnOH+	7.887e-09	6.706e-09	-8.103	-8.174	-0.070	(0)
Zn(SO4)2-2	4.889e-09	2.555e-09	-8.311	-8.593	-0.282	(0)
ZnCl+	2.054e-09	1.790e-09	-8.687	-8.747	-0.060	(0)
ZnF+	1.843e-09	1.567e-09	-8.735	-8.805	-0.070	(0)
ZnOHCl	3.313e-10	3.313e-10	-9.480	-9.480	0.000	(0)
Zn(OH)2	1.502e-10	1.502e-10	-9.823	-9.823	0.000	(0)
ZnCl2	4.263e-12	4.263e-12	-11.370	-11.370	0.000	(0)
Zn(OH)3-	1.251e-13	1.064e-13	-12.903	-12.973	-0.070	(0)
ZnCl3-	5.835e-15	5.086e-15	-14.234	-14.294	-0.060	(0)
ZnSeO4	3.112e-16	3.112e-16	-15.507	-15.507	0.000	(0)
ZnCl4-2	6.483e-18	3.820e-18	-17.188	-17.418	-0.230	(0)
Zn(OH)4-2	1.145e-18	5.984e-19	-17.941	-18.223	-0.282	(0)
Zn(SeO4)2-2	2.556e-27	1.336e-27	-26.592	-26.874	-0.282	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.177	-149.247	-0.070	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.385	-150.385	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.475	-225.545	-0.070	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-228.096	-228.378	-0.282	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-305.164	-305.446	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.39	-87.61	-36.22	Ag2S
Ag2CO3	-10.77	-21.86	-11.09	Ag2CO3
Ag2CrO4	-20.67	-32.26	-11.59	Ag2CrO4
Ag2HVO4	-10.37	-8.89	1.48	Ag2HVO4
Ag2MoO4	-11.51	-23.06	-11.55	Ag2MoO4
Ag2O	-14.60	-2.02	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-26.92	-24.77	2.16	Ag3AsO3
Ag3AsO4	-15.33	-18.12	-2.79	Ag3AsO4
Ag3H2VO5	-15.09	-9.91	5.18	Ag3H2VO5
AgF:4H2O	-12.99	-11.94	1.05	AgF:4H2O
Agmetal	-0.28	-13.78	-13.51	Ag
AgVO3	-8.65	-7.88	0.77	AgVO3
Al(OH)3(am)	-1.20	9.60	10.80	Al(OH)3
Al2(MoO4)3	-46.30	-43.93	2.37	Al2(MoO4)3
Al2O3	-0.46	19.19	19.65	Al2O3
Al4(OH)10SO4	-1.38	21.32	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.29	-5.49	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.86	-11.65	-7.79	PbSO4
Anhydrite	-1.35	-5.71	-4.36	CaSO4
Anilite	-54.89	-86.77	-31.88	Cu0.25Cu1.5S
Antlerite	-1.96	6.83	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-84.18	-86.94	-2.76	As4O6
Artinite	-7.00	2.60	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-36.88	-30.18	6.71	As2O5
Atacamite	-1.43	5.96	7.39	Cu2(OH)3Cl
Azurite	1.13	-15.77	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.31	7.09	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.44	0.43	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.42	7.52	32.94	Ba3(VO4)2:4H2O

BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-8.95	-14.77	-5.82	BaF2
BaMoO4	-6.99	-13.95	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.65	-7.82	1.83	BaSeO3
BaSeO4	-11.12	-18.58	-7.46	BaSeO4
Bianchite	-7.33	-9.10	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.89	-6.54	-0.64	Mn2O3
BlaubleiI	-54.68	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.22	-82.50	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.43	14.80	15.22	Cu4(OH)6SO4
Brucite	-5.63	11.22	16.84	Mg(OH)2
Bunsenite	-5.27	7.18	12.45	NiO
Ca(VO3)2	-8.05	-2.39	5.66	Ca(VO3)2
Ca2V2O7	-8.53	8.97	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.58	8.97	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-18.41	3.89	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.63	20.33	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-19.54	20.32	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.70	-157.72	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.94	-26.85	-17.91	Hg2Cl2
CaMoO4	-1.74	-9.69	-7.95	CaMoO4
Carnotite	-2.33	-2.10	0.23	KUO2VO4
CaSeO3:2H2O	-6.36	-3.55	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.29	-14.31	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.45	-3.61	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.88	-16.17	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.67	0.89	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.52	6.88	28.40	Cd4(OH)6SO4
CdCl2	-13.29	-13.95	-0.66	CdCl2
CdCl2:1H2O	-12.26	-13.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.04	-13.95	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.17	-19.56	13.62	Cd
CdMoO4	-0.91	-15.05	-14.15	CdMoO4
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.79	-77.14	-0.35	CdSb
CdSe	-20.49	-40.69	-20.20	CdSe
CdSeO4:2H2O	-17.83	-19.68	-1.85	CdSeO4:2H2O
CdSO4	-10.91	-11.08	-0.17	CdSO4
CdSO4:1H2O	-9.36	-11.08	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.21	-11.08	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.23	-10.98	-9.75	AgCl
Cerrusite	-1.28	-14.41	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.46	-9.10	-2.64	CuSO4:5H2O
Chalcocite	-54.90	-89.82	-34.92	Cu2S
Chalcopyrite	-124.49	-159.76	-35.27	CuFeS2
Cinnabar	-52.17	-97.86	-45.69	HgS
Claudetite	-83.88	-86.94	-3.06	As4O6
Clausthalite	-14.16	-41.26	-27.10	PbSe
Co(BO2)2	-29.67	-2.60	27.07	Co(BO2)2
Co(OH)2	-6.10	6.99	13.09	Co(OH)2
Co(OH)3	-10.32	-12.63	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-22.23	-9.19	13.03	Co3(AsO4)2
Co3O4	-7.78	-18.27	-10.50	Co3O4
CoCl2	-21.21	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.48	-12.95	2.54	CoCl2:6H2O

CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.27	-14.86	-1.60	CoF2
CoF3	-43.96	-45.42	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.29	-14.05	-7.76	CoMoO4
CoO	-6.59	6.99	13.59	CoO
CoS (alpha)	-71.15	-78.59	-7.44	CoS
CoS (beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.48	-39.68	-16.20	CoSe
CoSeO3	-9.23	-7.91	1.32	CoSeO3
CoSeO4:6H2O	-17.14	-18.67	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.07	2.80	CoSO4
CoSO4:6H2O	-7.60	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.74	-14.52	-4.78	PbCl2
Covellite	-55.32	-77.62	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.04	-30.95	14.09	CrCl2
CrCl3	-46.20	-31.09	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu (OH) 2	-0.71	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.68	20.53	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-55.16	-90.05	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.11	-50.91	-45.80	Cu2Se
Cu2SO4	-19.35	-21.30	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.38	-6.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.65	-102.24	-42.59	Cu3Sb
Cu3Se2	-26.13	-89.62	-63.49	Cu3Se2
CuCO3	-0.37	-11.87	-11.50	CuCO3
CuCrO4	-16.83	-22.27	-5.44	CuCrO4
CuF	-8.14	-13.04	-4.91	CuF
CuF2	-15.01	-13.89	1.12	CuF2
CuF2:2H2O	-9.34	-13.89	-4.55	CuF2:2H2O
Cumetal	-6.13	-14.89	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.44	-1.14	10.30	CuOCuSO4
Cupricferrite	8.36	14.35	5.99	CuFe2O4
Cuprite	-2.83	-4.23	-1.41	Cu2O
Cuprousferrite	9.99	1.08	-8.92	CuFeO2
CuSe	-5.61	-38.71	-33.10	CuSe
CuSe2	-26.48	-59.85	-33.37	CuSe2
CuSeO3:2H2O	-7.45	-6.94	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.26	-17.70	-2.44	CuSeO4:5H2O
CuSO4	-12.04	-9.10	2.94	CuSO4
Diaspore	2.72	9.60	6.87	AlOOH
Djurleite	-55.09	-89.01	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.56	-17.10	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.01	-17.10	-17.09	CaMg (CO3) 2
Epsomite	-3.73	-5.85	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.24	0.20	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-6.57	-10.29	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.08	-8.52	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.71	-38.33	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.09	-44.82	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.30	-11.90	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.50	-17.59	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.77	-64.36	-18.60	FeSe2
FeS (ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.23	-43.23	-11.00	FeSe

Fix_pe	-5.63	-5.63	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.20	-80.17	-13.97	PbS
Gibbsite	1.31	9.60	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.09	-9.10	-2.01	ZnSO4:7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.48	-332.52	-45.03	Fe3S4
Gummite	-6.85	0.83	7.67	UO3
Gypsum	-1.10	-5.71	-4.61	CaSO4:2H2O
H-Jarosite	-12.46	-24.56	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.17	-21.04	-12.88	H2MoO4
H2S (g)	-77.58	-85.59	-8.01	H2S
H2Se (g)	-41.72	-46.68	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.25	22.65	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.60	-256.31	-73.71	Hg (CH3) 2
Hg (g)	-8.35	-16.23	-7.87	Hg
Hg (OH) 2	-8.78	-12.27	-3.50	Hg (OH) 2
Hg2 (g)	-17.50	-32.45	-14.96	Hg2
Hg2 (OH) 2	-12.17	-6.91	5.26	Hg2 (OH) 2
Hg2CO3	-10.69	-26.74	-16.05	Hg2CO3
Hg2CrO4	-28.44	-37.14	-8.70	Hg2CrO4
Hg2F2	-18.40	-28.76	-10.36	Hg2F2
Hg2S	-80.82	-92.49	-11.68	Hg2S
Hg2SeO3	-17.15	-21.81	-4.66	Hg2SeO3
Hg2SO4	-17.85	-23.98	-6.13	Hg2SO4
Hg3O2CO3	-26.98	-56.66	-29.68	Hg3O2CO3
HgCl (g)	-32.92	-13.42	19.50	HgCl
HgCl2	-10.95	-32.21	-21.26	HgCl2
HgF (g)	-47.06	-14.38	32.68	HgF
HgF2 (g)	-46.70	-34.13	12.57	HgF2
Hgmetal (l)	-2.77	-16.23	-13.45	Hg
HgSe	-3.26	-58.95	-55.69	HgSe
HgSeO3	-14.75	-27.18	-12.43	HgSeO3
HgSO4	-19.92	-29.34	-9.42	HgSO4
Huntite	-4.37	-34.34	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.64	-23.41	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.50	-23.26	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.43	-20.60	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.82	-20.62	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.34	-52.58	-17.24	K2Cr2O7
K2CrO4	-21.83	-22.35	-0.51	K2CrO4
K2MoO4	-16.41	-13.15	3.26	K2MoO4
K2SeO4	-17.05	-17.78	-0.73	K2SeO4
Langite	-2.69	14.80	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.79	-6.22	-0.43	PbO:PbSO4
Laurionite	-5.17	-4.55	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.27	5.42	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.40	-3.90	-5.31	Cu2 (OH) 2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.47	5.42	12.89	PbO
Matlockite	-6.50	-15.48	-8.97	PbClF
Melanothallite	-18.23	-11.97	6.26	CuCl2
Melanterite	-11.41	-13.62	-2.21	FeSO4:7H2O
Metacinnabar	-52.77	-97.86	-45.09	HgS
Mg (OH) 2 (active)	-7.58	11.22	18.79	Mg (OH) 2
Mg (VO3) 2	-13.81	-2.53	11.28	Mg (VO3) 2
Mg2Sb3	-276.08	-201.39	74.68	Mg2Sb3

Mg ₂ V ₂ O ₇	-17.67	8.69	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.34	8.86	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.40	-19.02	5.38	MgCrO ₄
MgF ₂	-2.51	-10.64	-8.13	MgF ₂
MgMoO ₄	-7.98	-9.83	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-6.74	-3.69	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-13.25	-14.45	-1.20	MgSeO ₄ :6H ₂ O
Minium	-31.71	41.81	73.52	Pb ₃ O ₄
Mirabilite	-6.39	-7.51	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn(VO ₃) ₂	-9.34	-4.44	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.03	-57.74	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.13	-90.05	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ :8H ₂ O	-14.75	-2.25	12.50	Mn ₃ (AsO ₄) ₂ :8H ₂ O
MnCl ₂ :4H ₂ O	-13.35	-10.63	2.72	MnCl ₂ :4H ₂ O
MnS (grn)	-76.45	-76.28	0.17	MnS
MnS (pnk)	-79.62	-76.28	3.34	MnS
MnSb	-96.26	-99.17	-2.91	MnSb
MnSe	-40.87	-37.37	3.50	MnSe
MnSeO ₃	-6.73	-5.60	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-6.58	-5.60	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-14.31	-16.36	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-10.34	-7.76	2.58	MnSO ₄
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO ₃	-13.04	-21.04	-8.00	MoO ₃
Morenosite	-7.75	-9.89	-2.14	NiSO ₄ :7H ₂ O
MoS ₂	-147.50	-217.76	-70.26	MoS ₂
Na-Jarosite	-8.58	-19.78	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.02	-50.91	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.60	-20.67	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.93	-32.52	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.97	-11.48	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-12.70	-11.48	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-15.64	-5.34	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-17.38	-16.10	1.28	Na ₂ SeO ₄
Na ₃ Sb	-176.00	-81.55	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.21	7.47	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.02	5.38	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.36	-12.09	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.27	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-5.95	-2.09	3.86	NaVO ₃
Nesquehonite	-3.95	-8.62	-4.67	MgCO ₃ :3H ₂ O
Ni(OH) ₂	-5.62	7.17	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ :8H ₂ O	-24.35	-8.65	15.70	Ni ₃ (AsO ₄) ₂ :8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.37	11.63	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.79	-12.66	-6.87	NiCO ₃
NiMoO ₄	-2.73	-13.87	-11.14	NiMoO ₄
NiS (alpha)	-72.81	-78.41	-5.60	NiS
NiS (beta)	-67.31	-78.41	-11.10	NiS
NiS (gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.80	-39.50	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-10.54	-7.73	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-16.97	-18.49	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-8.00	9.50	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-239.17	-300.23	-61.07	As ₂ S ₃
Otavite	-1.85	-13.85	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.69	-4.17	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.73	5.42	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-56.04	-64.80	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-7.92	0.87	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-15.34	10.85	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-24.65	36.39	61.04	Pb ₂ O ₃
Pb ₂ O ₂ CO ₃	-8.43	-8.99	-0.56	Pb ₂ O ₂ CO ₃
Pb ₂ V ₂ O ₇	-1.00	-2.90	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-19.71	-13.91	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-3.62	2.52	6.14	Pb ₃ (VO ₄) ₂

Pb3O2CO3	-14.59	-3.57	11.02	Pb3O2CO3
Pb3O2SO4	-11.49	-0.80	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.48	4.62	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.26	4.62	21.88	Pb4O3SO4
PbCrO4	-12.22	-24.82	-12.60	PbCrO4
PbF2	-8.99	-16.43	-7.44	PbF2
Pbmetal	-24.37	-20.12	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.56	5.42	12.98	PbO:0.33H2O
PbSeO4	-13.41	-20.25	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.12	-28.93	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca (OH) 2
Pyrite	-123.67	-142.18	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn (OH) 2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.35	-120.10	-19.75	AsS
Retgersite	-7.85	-9.89	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.51	-19.01	-14.50	UO2CO3
Sb (OH) 3	-12.15	-19.26	-7.11	Sb (OH) 3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-26.39	-36.06	-9.67	Sb2O5
Sb2Se3	-110.80	-178.56	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.79	-77.05	-18.26	Sb4O6
Sb4O6 (orth)	-59.15	-77.05	-17.90	Sb4O6
SbCl3	-49.75	-49.17	0.57	SbCl3
SbF3	-41.82	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-5.17	0.83	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.02	-21.13	-7.11	Se
Semetal (hex)	-13.43	-21.13	-7.71	Se
Senarmontite	-26.16	-38.53	-12.37	Sb2O3
SeO2	-15.03	-14.90	0.12	SeO2
SeO3	-46.71	-25.67	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.17	-77.62	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.83	-295.29	-50.46	Sb2S3
Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.32	7.97	7.64	CuO
Thenardite	-7.83	-7.51	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-4.82	-0.74	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.50	4.58	21.08	U3O8
U3Sb4	-582.48	-430.10	152.38	U3Sb4
U4O9	-33.45	-36.47	-3.02	U4O9
UF4	-29.68	-59.22	-29.54	UF4
UF4:2.5H2O	-26.50	-59.22	-32.72	UF4:2.5H2O
UO2 (am)	-16.44	-15.50	0.93	UO2
UO2 (OH) 2 (beta)	-4.79	0.83	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.59	-24.84	-2.25	UO2SeO4:4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.97	29.58	USb2
V (OH) 3	-17.41	-9.82	7.59	V (OH) 3
V2O5	-12.39	-13.75	-1.36	V2O5
V3O5	-35.61	-33.77	1.84	V3O5
V4O7	-43.70	-36.51	7.19	V4O7
V6O13	-31.47	-92.33	-60.86	V6O13
Valentinite	-30.04	-38.53	-8.48	Sb2O3
VC12	-61.41	-42.53	18.87	VC12
VC13	-63.16	-39.73	23.43	VC13
VF4	-61.39	-46.46	14.93	VF4
Vmetal	-92.16	-48.14	44.03	V

VO	-37.35	-22.59	14.76	VO
VO(OH)2	-7.89	-2.74	5.15	VO(OH)2
VO2Cl	-19.68	-16.84	2.84	VO2Cl
VOC1	-30.94	-19.79	11.15	VOC1
VOC12	-35.44	-22.68	12.76	VOC12
VOSO4	-23.42	-19.81	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.67	-77.62	-8.95	ZnS
Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.03	-9.10	3.93	ZnSO4
Zn(BO2)2	-9.91	-1.62	8.29	Zn(BO2)2
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.50	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.78	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.56	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.76	7.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.63	-1.13	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.22	5.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.91	-6.26	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.14	-10.23	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.59	14.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.59	19.91	38.50	Zn5(OH)8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.35	-13.89	-0.53	ZnF2
Znmetal	-43.36	-17.57	25.79	Zn
ZnMoO4	-2.95	-13.07	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO
ZnS(am)	-68.56	-77.62	-9.05	ZnS
ZnSb	-86.17	-75.15	11.01	ZnSb
ZnSe	-24.31	-38.71	-14.40	ZnSe
ZnSeO4:6H2O	-16.18	-17.70	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.46	-9.10	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 39.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 201
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 201
USE Surface 201
USE Solution 203
SAVE Solution 204  #Initial Stage 2 groundwater after Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 201.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.137e-15 Surface + diffuse layer charge, eq
 7.817e-08 Surface charge, eq
 4.399e-03 sigma, C/m²
 1.213e-01 psi, V
 -4.722e+00 -F*psi/RT
 8.900e-03 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is

+1).

Element	Moles
C	4.3808e-11
Ca	5.4293e-13
Cl	8.7726e-10
H	1.2923e-10
K	8.6130e-13
Mg	8.4117e-14
N	3.5515e-09
Na	3.6492e-12
O	1.5829e-07
S	3.6885e-08

Hfo_s

1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.928e-08	0.668	8.928e-08	-7.049
Hfo_sOH	4.379e-08	0.328	4.379e-08	-7.359
Hfo_sO-	4.919e-10	0.004	4.919e-10	-9.308
Hfo_sOHCa+2	1.630e-12	0.000	1.630e-12	-11.788

Hfo_w

5.342e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.468e-06	0.462	2.468e-06	-5.608
Hfo_wOH	1.211e-06	0.227	1.211e-06	-5.917
Hfo_wSO4-	8.337e-07	0.156	8.337e-07	-6.079
Hfo_wOHSO4-2	8.159e-07	0.153	8.159e-07	-6.088
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.866
Hfo_wOMg+	1.922e-14	0.000	1.922e-14	-13.716
Hfo_wOCa+	6.522e-15	0.000	6.522e-15	-14.186

 Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
 but is not in solution or other phases.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
 but is not in solution or other phases.

WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
 but is not in solution or other phases.

WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),

but is not in solution or other phases.

WARNING: Element in phase, Chrysotile, is not in model.

WARNING: Element in phase, Sepiolite, is not in model.

WARNING: Element in phase, SiO2(am-ppt), is not in model.

WARNING: Element in phase, Chrysotile, is not in model.

WARNING: Element in phase, Sepiolite, is not in model.

WARNING: Element in phase, SiO2(am-ppt), is not in model.

Using solution 203. Solution after simulation 38.

Using surface 201.

Using pure phase assemblage 201. Pure-phase assemblage after simulation 38.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.533e-08	2.171e-08	-3.617e-09
Alunite	-0.00	-1.40	-1.40	9.056e-07	9.057e-07	1.404e-10
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.02	-9.93	-8.91	2.037e-08	0	-2.037e-08
Barite	0.00	-9.98	-9.98	1.318e-06	1.379e-06	6.112e-08
Brochantite	-0.97	14.25	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.268e-06
CaMoO4	-1.60	-9.55	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.53	-3.72	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.907e-03	2.907e-03	-6.460e-07
Carnotite	-4.10	-3.87	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.77	-14.92	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	6.029e-08	3.887e-08	-2.142e-08
Cu2Se(alpha)	-5.56	-51.36	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.493e-07	1.352e-07	-1.140e-07
Epsomite	-3.73	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.671e-05	2.671e-05	-5.122e-13
Fluorite	0.00	-10.50	-10.50	1.113e-04	1.114e-04	9.527e-09
Gummite	-6.85	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.43	-59.13	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.51	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.90	-5.77	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.17	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.38	-9.68	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.59	-13.73	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.317e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.334e-09	0	-5.334e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.35	-4.27	4.08	0.000e+00	0	0.000e+00
U3O8	-16.50	4.58	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.79	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.81	-12.94	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.368e-19 Surface + diffuse layer charge, eq
3.763e-07 Surface charge, eq

2.117e-02 sigma, C/m²
 5.562e-02 psi, V
 -2.165e+00 -F*psi/RT
 1.148e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.325e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.970e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	6.7060e-13
Al	4.7074e-11
As	3.5622e-15
B	2.7632e-10
Ba	6.8696e-13
C	1.5675e-07
Ca	2.0984e-08
Cd	1.0425e-13
Cl	4.9425e-08
Co	1.1276e-12
Cr	6.6335e-14
Cu	1.1251e-10
F	5.6836e-09
Fe	4.0653e-14
H	1.6921e-07
Hg	3.8112e-15
K	7.6260e-09
Mg	1.3838e-08
Mn	1.8523e-10
Mo	2.0255e-11
N	8.4014e-14
Na	5.2017e-08
Ni	1.8709e-12
O	1.0828e-06
Pb	1.8227e-13
S	1.5287e-07
Sb	3.8067e-13
Se	4.5745e-13
U	7.8203e-12
V	5.9750e-14
Zn	1.0386e-11

Hfo_s

1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.712e-08	0.577	7.713e-08	-7.113
Hfo_sOCrOH+	4.285e-08	0.321	4.285e-08	-7.368
Hfo_sOPb+	1.052e-08	0.079	1.053e-08	-7.978
Hfo_sOZn+	1.330e-09	0.010	1.330e-09	-8.876
Hfo_sOMn+	1.189e-09	0.009	1.190e-09	-8.925
Hfo_sOHCa+2	2.550e-10	0.002	2.550e-10	-9.593
Hfo_sOH	1.796e-10	0.001	1.796e-10	-9.746
Hfo_sONi+	5.139e-11	0.000	5.140e-11	-10.289
Hfo_sOH2+	2.863e-11	0.000	2.864e-11	-10.543
Hfo_sO-	2.581e-11	0.000	2.582e-11	-10.588
Hfo_sOCu+	5.024e-12	0.000	5.025e-12	-11.299
Hfo_sOCd+	4.208e-12	0.000	4.208e-12	-11.376
Hfo_sOAg	4.075e-13	0.000	4.075e-13	-12.390
Hfo_sOHBa+2	4.249e-14	0.000	4.250e-14	-13.372
Hfo_sOFe+	2.079e-14	0.000	2.079e-14	-13.682
Hfo_sOHg+	6.969e-17	0.000	6.970e-17	-16.157

Hfo_w

5.342e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.582e-06	0.483	2.583e-06	-5.588
Hfo_wOH	1.173e-06	0.220	1.173e-06	-5.931
Hfo_wOHSO4-2	9.230e-07	0.173	9.232e-07	-6.035
Hfo_wOH2+	1.869e-07	0.035	1.870e-07	-6.728
Hfo_wO-	1.685e-07	0.032	1.686e-07	-6.773
Hfo_wOHVO4-3	1.153e-07	0.022	1.154e-07	-6.938
Hfo_wSO4-	7.377e-08	0.014	7.378e-08	-7.132
Hfo_wOHAsO4-3	4.090e-08	0.008	4.091e-08	-7.388
Hfo_wOMg+	3.968e-08	0.007	3.968e-08	-7.401
Hfo_wOZn+	9.091e-09	0.002	9.093e-09	-8.041
Hfo_wOHSeO3-2	8.644e-09	0.002	8.645e-09	-8.063
Hfo_wOMn+	6.169e-09	0.001	6.170e-09	-8.210
Hfo_wOHMoO4-2	5.466e-09	0.001	5.466e-09	-8.262
Hfo_wOCa+	3.082e-09	0.001	3.083e-09	-8.511
Hfo_wOPb+	3.070e-09	0.001	3.070e-09	-8.513
Hfo_wSeO3-	2.341e-09	0.000	2.341e-09	-8.631
Hfo_wMoO4-	5.627e-10	0.000	5.628e-10	-9.250
Hfo_wONi+	4.526e-10	0.000	4.527e-10	-9.344
Hfo_wOCO+	9.245e-11	0.000	9.247e-11	-10.034
Hfo_wH2BO3	7.785e-11	0.000	7.786e-11	-10.109
Hfo_wHAsO4-	2.328e-11	0.000	2.328e-11	-10.633
Hfo_wOCd+	1.172e-11	0.000	1.172e-11	-10.931
Hfo_wOAg	6.998e-13	0.000	6.999e-13	-12.155
Hfo_wH2AsO4	1.201e-13	0.000	1.201e-13	-12.920
Hfo_wOFe+	8.565e-14	0.000	8.566e-14	-13.067
Hfo_wOHg+	2.229e-14	0.000	2.229e-14	-13.652
Hfo_wOBa+	7.424e-15	0.000	7.425e-15	-14.129
Hfo_wOHSbO(OH) 4-	2.682e-15	0.000	2.683e-15	-14.571
Hfo_wOHSeO4-2	1.597e-15	0.000	1.598e-15	-14.797
Hfo_wSbO(OH) 4	2.762e-16	0.000	2.762e-16	-15.559
Hfo_wSeO4-	1.112e-16	0.000	1.112e-16	-15.954
Hfo_wOHCrO4-2	8.058e-17	0.000	8.060e-17	-16.094
Hfo_wCrO4-	5.874e-18	0.000	5.875e-18	-17.231
Hfo_wH2AsO3	1.709e-23	0.000	1.709e-23	-22.767

-----Solution composition-----

Elements	Molality	Moles
Ag	4.008e-08	4.007e-08
Al	1.930e-06	1.930e-06
As	8.365e-11	8.364e-11
B	1.602e-05	1.601e-05
Ba	1.102e-07	1.102e-07
C	5.841e-03	5.840e-03
Ca	2.547e-03	2.547e-03
Cd	1.175e-08	1.175e-08
Cl	1.721e-03	1.720e-03
Co	1.358e-07	1.358e-07
Cr	6.444e-09	6.443e-09
Cu	6.906e-06	6.905e-06
F	2.117e-04	2.117e-04
Fe	3.678e-09	3.677e-09
Hg	2.222e-10	2.222e-10
K	7.295e-04	7.294e-04
Mg	1.758e-03	1.757e-03
Mn	2.397e-05	2.397e-05
Mo	4.211e-07	4.211e-07
N	3.552e-09	3.551e-09
Na	4.993e-03	4.992e-03
Ni	2.127e-07	2.126e-07
Pb	1.272e-08	1.272e-08

S	3.651e-03	3.651e-03
Sb	1.325e-08	1.325e-08
Se	1.507e-08	1.507e-08
U	8.560e-08	8.558e-08
V	2.007e-09	2.007e-09
Zn	1.153e-06	1.153e-06

-----Description of solution-----

	pH =	7.147	Charge balance
	pe =	5.625	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.908e-02	
	Mass of water (kg) =	9.998e-01	
	Total alkalinity (eq/kg) =	5.167e-03	
	Total CO2 (mol/kg) =	5.841e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.876e-15	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.00	
	Iterations =	1	
	Total H =	1.110029e+02	
	Total O =	5.553035e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.625e-07	1.413e-07	-6.789	-6.850	-0.061	(0)
H+	8.160e-08	7.124e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.008e-08					
AgCl	2.601e-08	2.601e-08	-7.585	-7.585	0.000	(0)
Ag+	9.715e-09	8.482e-09	-8.013	-8.072	-0.059	(0)
AgCl2-	4.002e-09	3.403e-09	-8.398	-8.468	-0.070	(0)
AgSO4-	3.346e-10	2.845e-10	-9.475	-9.546	-0.070	(0)
AgCl3-2	8.717e-12	4.556e-12	-11.060	-11.341	-0.282	(0)
AgF	3.525e-12	3.525e-12	-11.453	-11.453	0.000	(0)
AgOH	1.198e-13	1.198e-13	-12.921	-12.921	0.000	(0)
AgCl4-3	6.016e-14	1.397e-14	-13.221	-13.855	-0.634	(0)
AgH2BO3	1.745e-14	1.745e-14	-13.758	-13.758	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	4.208e-15	3.578e-15	-14.376	-14.446	-0.070	(0)
AgNO2	3.926e-15	3.926e-15	-14.406	-14.406	0.000	(0)
AgNH3+	1.367e-16	1.162e-16	-15.864	-15.935	-0.070	(0)
Ag (OH) 2-	1.946e-18	1.655e-18	-17.711	-17.781	-0.070	(0)
AgNO3	1.408e-20	1.408e-20	-19.851	-19.851	0.000	(0)
Ag (SeO3) 2-3	9.053e-23	2.103e-23	-22.043	-22.677	-0.634	(0)
Ag (NO2) 2-	1.584e-23	1.347e-23	-22.800	-22.871	-0.070	(0)
Ag (NH3) 2+	7.459e-24	6.342e-24	-23.127	-23.198	-0.070	(0)
Ag2MoO4	6.655e-24	6.655e-24	-23.177	-23.177	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.697	-72.697	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.420	-86.547	-1.127	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.967	-147.038	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.206	-147.374	-0.168	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.350	-149.667	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.674	-149.978	-0.304	(0)
Al	1.930e-06					
Al (OH) 4-	1.302e-06	1.138e-06	-5.885	-5.944	-0.059	(0)
AlF3	3.249e-07	3.249e-07	-6.488	-6.488	0.000	(0)
AlF2+	1.777e-07	1.560e-07	-6.750	-6.807	-0.057	(0)
Al (OH) 3	6.398e-08	6.398e-08	-7.194	-7.194	0.000	(0)
AlF4-	3.083e-08	2.695e-08	-7.511	-7.569	-0.059	(0)
Al (OH) 2+	2.585e-08	2.269e-08	-7.588	-7.644	-0.057	(0)
AlF+2	3.987e-09	2.368e-09	-8.399	-8.626	-0.226	(0)
AlOH+2	3.405e-10	2.022e-10	-9.468	-9.694	-0.226	(0)
AlSO4+	2.137e-11	1.868e-11	-10.670	-10.729	-0.059	(0)

Al+3	4.857e-12	1.431e-12	-11.314	-11.844	-0.531	(0)
Al(SO4)2-	3.850e-13	3.365e-13	-12.415	-12.473	-0.059	(0)
AlMo6O21-3	1.688e-39	3.920e-40	-38.773	-39.407	-0.634	(0)
As (3)	5.716e-23					
H3AsO3	5.668e-23	5.668e-23	-22.247	-22.247	0.000	(0)
H2AsO3-	4.799e-25	4.081e-25	-24.319	-24.389	-0.070	(0)
HAsO3-2	9.995e-30	5.224e-30	-29.000	-29.282	-0.282	(0)
H4AsO3+	2.353e-30	2.000e-30	-29.628	-29.699	-0.070	(0)
AsO3-3	1.217e-35	2.827e-36	-34.915	-35.549	-0.634	(0)
As (5)	8.365e-11					
HAsO4-2	5.977e-11	3.124e-11	-10.224	-10.505	-0.282	(0)
H2AsO4-	2.387e-11	2.030e-11	-10.622	-10.693	-0.070	(0)
AsO4-3	5.971e-15	1.387e-15	-14.224	-14.858	-0.634	(0)
H3AsO4	2.502e-16	2.513e-16	-15.602	-15.600	0.002	(0)
B	1.602e-05					
H3BO3	1.585e-05	1.592e-05	-4.800	-4.798	0.002	(0)
H2BO3-	1.501e-07	1.298e-07	-6.823	-6.887	-0.063	(0)
CaH2BO3+	9.978e-09	8.626e-09	-8.001	-8.064	-0.063	(0)
MgH2BO3+	4.353e-09	3.763e-09	-8.361	-8.424	-0.063	(0)
BF(OH)3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
NaH2BO3	8.867e-10	8.867e-10	-9.052	-9.052	0.000	(0)
H5(BO3)2-	2.034e-12	1.759e-12	-11.692	-11.755	-0.063	(0)
BF2(OH)2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
BaH2BO3+	2.890e-13	2.498e-13	-12.539	-12.602	-0.063	(0)
AgH2BO3	1.745e-14	1.745e-14	-13.758	-13.758	0.000	(0)
H8(BO3)3-	3.239e-15	2.800e-15	-14.490	-14.553	-0.063	(0)
BF3OH-	7.032e-18	6.079e-18	-17.153	-17.216	-0.063	(0)
BF4-	4.080e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
Ba	1.102e-07					
Ba+2	1.072e-07	6.228e-08	-6.970	-7.206	-0.236	(0)
BaHCO3+	2.943e-09	2.591e-09	-8.531	-8.587	-0.055	(0)
BaCO3	9.158e-11	9.158e-11	-10.038	-10.038	0.000	(0)
BaH2BO3+	2.890e-13	2.498e-13	-12.539	-12.602	-0.063	(0)
BaOH+	4.384e-14	3.841e-14	-13.358	-13.416	-0.057	(0)
BaNO3+	7.672e-19	6.523e-19	-18.115	-18.186	-0.070	(0)
BaNH3+2	5.047e-19	2.638e-19	-18.297	-18.579	-0.282	(0)
C (4)	5.841e-03					
HCO3-	4.963e-03	4.357e-03	-2.304	-2.361	-0.057	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	1.064e-04	9.369e-05	-3.973	-4.028	-0.055	(0)
MgHCO3+	4.276e-05	3.727e-05	-4.369	-4.429	-0.060	(0)
NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)
CuCO3	5.797e-06	5.797e-06	-5.237	-5.237	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	4.936e-06	2.867e-06	-5.307	-5.543	-0.236	(0)
MgCO3	1.994e-06	1.994e-06	-5.700	-5.700	0.000	(0)
MnHCO3+	1.024e-06	8.975e-07	-5.990	-6.047	-0.057	(0)
NaCO3-	2.622e-07	2.301e-07	-6.581	-6.638	-0.057	(0)
CuHCO3+	1.110e-07	9.438e-08	-6.955	-7.025	-0.070	(0)
Cu(CO3)2-2	8.558e-08	4.473e-08	-7.068	-7.349	-0.282	(0)
ZnCO3	7.759e-08	7.759e-08	-7.110	-7.110	0.000	(0)
ZnHCO3+	7.620e-08	6.479e-08	-7.118	-7.189	-0.070	(0)
NiHCO3+	4.786e-08	4.069e-08	-7.320	-7.391	-0.070	(0)
UO2(CO3)3-4	4.274e-08	3.190e-09	-7.369	-8.496	-1.127	(0)
UO2(CO3)2-2	4.247e-08	2.220e-08	-7.372	-7.654	-0.282	(0)
CoHCO3+	1.996e-08	1.697e-08	-7.700	-7.770	-0.070	(0)
NiCO3	8.104e-09	8.104e-09	-8.091	-8.091	0.000	(0)
PbCO3	7.018e-09	7.018e-09	-8.154	-8.154	0.000	(0)
PbHCO3+	3.100e-09	2.636e-09	-8.509	-8.579	-0.070	(0)
BaHCO3+	2.943e-09	2.591e-09	-8.531	-8.587	-0.055	(0)
CoCO3	2.427e-09	2.427e-09	-8.615	-8.615	0.000	(0)
UO2CO3	3.880e-10	3.880e-10	-9.411	-9.411	0.000	(0)
CdCO3	3.220e-10	3.220e-10	-9.492	-9.492	0.000	(0)
Pb(CO3)2-2	1.110e-10	5.803e-11	-9.955	-10.236	-0.282	(0)
BaCO3	9.158e-11	9.158e-11	-10.038	-10.038	0.000	(0)
CdHCO3+	5.748e-11	4.887e-11	-10.241	-10.311	-0.070	(0)
Cd(CO3)2-2	1.309e-12	6.844e-13	-11.883	-12.165	-0.282	(0)
FeHCO3+	8.932e-13	7.863e-13	-12.049	-12.104	-0.055	(0)

		HgCO3	1.449e-14	1.449e-14	-13.839	-13.839	0.000	(0)
		Hg (CO3) 2-2	2.514e-16	1.314e-16	-15.600	-15.881	-0.282	(0)
		HgHCO3+	2.261e-17	1.923e-17	-16.646	-16.716	-0.070	(0)
Ca	2.547e-03							
		Ca+2	1.988e-03	1.155e-03	-2.702	-2.937	-0.236	(0)
		CaSO4	4.448e-04	4.448e-04	-3.352	-3.352	0.000	(0)
		CaHCO3+	1.064e-04	9.369e-05	-3.973	-4.028	-0.055	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.381e-06	2.086e-06	-5.623	-5.681	-0.057	(0)
		CaH2BO3+	9.978e-09	8.626e-09	-8.001	-8.064	-0.063	(0)
		CaOH+	3.699e-09	3.256e-09	-8.432	-8.487	-0.055	(0)
		CaNH3+2	1.867e-14	9.760e-15	-13.729	-14.011	-0.282	(0)
		CaNO3+	8.977e-15	7.633e-15	-14.047	-14.117	-0.070	(0)
		Ca (NH3) 2+2	4.990e-26	2.608e-26	-25.302	-25.584	-0.282	(0)
Cd	1.175e-08							
		Cd+2	8.482e-09	4.927e-09	-8.071	-8.307	-0.236	(0)
		CdSO4	1.942e-09	1.942e-09	-8.712	-8.712	0.000	(0)
		CdCl+	8.313e-10	7.068e-10	-9.080	-9.151	-0.070	(0)
		CdCO3	3.220e-10	3.220e-10	-9.492	-9.492	0.000	(0)
		Cd (SO4) 2-2	8.427e-11	4.405e-11	-10.074	-10.356	-0.282	(0)
		CdHCO3+	5.748e-11	4.887e-11	-10.241	-10.311	-0.070	(0)
		CdF+	1.520e-11	1.292e-11	-10.818	-10.889	-0.070	(0)
		CdOH+	6.504e-12	5.530e-12	-11.187	-11.257	-0.070	(0)
		CdCl2	4.426e-12	4.426e-12	-11.354	-11.354	0.000	(0)
		CdOHC1	4.097e-12	4.097e-12	-11.388	-11.388	0.000	(0)
		Cd (CO3) 2-2	1.309e-12	6.844e-13	-11.883	-12.165	-0.282	(0)
		CdCl3-	4.933e-15	4.195e-15	-14.307	-14.377	-0.070	(0)
		Cd (OH) 2	4.931e-15	4.931e-15	-14.307	-14.307	0.000	(0)
		CdF2	4.266e-15	4.266e-15	-14.370	-14.370	0.000	(0)
		CdSeO4	2.609e-18	2.609e-18	-17.584	-17.584	0.000	(0)
		Cd2OH+3	5.880e-19	1.366e-19	-18.231	-18.865	-0.634	(0)
		Cd (OH) 3-	5.006e-20	4.256e-20	-19.301	-19.371	-0.070	(0)
		CdNO3+	3.830e-20	3.256e-20	-19.417	-19.487	-0.070	(0)
		Cd (SeO3) 2-2	3.347e-21	1.749e-21	-20.475	-20.757	-0.282	(0)
		Cd (OH) 4-2	1.884e-27	9.844e-28	-26.725	-27.007	-0.282	(0)
		Cd (NO3) 2	3.411e-32	3.411e-32	-31.467	-31.467	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.669	-78.740	-0.070	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-149.976	-149.976	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.517	-0.070	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.479	-302.761	-0.282	(0)
Cl	1.721e-03							
		Cl-	1.721e-03	1.502e-03	-2.764	-2.823	-0.059	(0)
		AgCl	2.601e-08	2.601e-08	-7.585	-7.585	0.000	(0)
		MnCl+	2.229e-08	1.953e-08	-7.652	-7.709	-0.057	(0)
		AgCl2-	4.002e-09	3.403e-09	-8.398	-8.468	-0.070	(0)
		ZnCl+	2.035e-09	1.774e-09	-8.691	-8.751	-0.060	(0)
		CuCl+	9.377e-10	8.174e-10	-9.028	-9.088	-0.060	(0)
		CdCl+	8.313e-10	7.068e-10	-9.080	-9.151	-0.070	(0)
		CuCl	7.539e-10	7.539e-10	-9.123	-9.123	0.000	(0)
		NiCl+	3.424e-10	2.912e-10	-9.465	-9.536	-0.070	(0)
		ZnOHC1	3.282e-10	3.282e-10	-9.484	-9.484	0.000	(0)
		CoCl+	3.060e-10	2.602e-10	-9.514	-9.585	-0.070	(0)
		CuCl2-	2.714e-10	2.366e-10	-9.566	-9.626	-0.060	(0)
		PbCl+	5.104e-11	4.340e-11	-10.292	-10.363	-0.070	(0)
		MnCl2	4.143e-11	4.143e-11	-10.383	-10.383	0.000	(0)
		AgCl3-2	8.717e-12	4.556e-12	-11.060	-11.341	-0.282	(0)
		CdCl2	4.426e-12	4.426e-12	-11.354	-11.354	0.000	(0)
		ZnCl2	4.224e-12	4.224e-12	-11.374	-11.374	0.000	(0)
		CdOHC1	4.097e-12	4.097e-12	-11.388	-11.388	0.000	(0)
		HgClOH	1.583e-12	1.583e-12	-11.800	-11.800	0.000	(0)
		HgCl2	9.532e-13	9.532e-13	-12.021	-12.021	0.000	(0)
		CuCl2	4.257e-13	4.257e-13	-12.371	-12.371	0.000	(0)
		PbCl2	2.912e-13	2.912e-13	-12.536	-12.536	0.000	(0)
		CuCl3-2	1.289e-13	7.598e-14	-12.890	-13.119	-0.230	(0)
		AgCl4-3	6.016e-14	1.397e-14	-13.221	-13.855	-0.634	(0)
		MnCl3-	1.956e-14	1.714e-14	-13.709	-13.766	-0.057	(0)
		HgCl3-	1.684e-14	1.432e-14	-13.774	-13.844	-0.070	(0)
		ZnCl3-	5.782e-15	5.040e-15	-14.238	-14.298	-0.060	(0)

CdCl3-	4.933e-15	4.195e-15	-14.307	-14.377	-0.070	(0)
NiCl2	2.202e-15	2.202e-15	-14.657	-14.657	0.000	(0)
CrCl+2	3.302e-16	1.726e-16	-15.481	-15.763	-0.282	(0)
PbCl3-	2.048e-16	1.741e-16	-15.689	-15.759	-0.070	(0)
HgCl4-2	1.638e-16	8.562e-17	-15.786	-16.067	-0.282	(0)
HgCl+	1.489e-16	1.266e-16	-15.827	-15.898	-0.070	(0)
UO2Cl+	9.739e-17	8.281e-17	-16.011	-16.082	-0.070	(0)
CuCl3-	6.846e-18	5.968e-18	-17.165	-17.224	-0.060	(0)
ZnCl4-2	6.424e-18	3.786e-18	-17.192	-17.422	-0.230	(0)
CrOHC12	6.963e-19	6.963e-19	-18.157	-18.157	0.000	(0)
PbCl4-2	2.288e-19	1.196e-19	-18.641	-18.922	-0.282	(0)
FeCl+2	4.324e-20	2.548e-20	-19.364	-19.594	-0.230	(0)
CrCl2+	2.893e-20	2.460e-20	-19.539	-19.609	-0.070	(0)
VOCl+	7.797e-22	6.629e-22	-21.108	-21.179	-0.070	(0)
FeCl2+	1.952e-22	1.710e-22	-21.710	-21.767	-0.057	(0)
CuCl4-2	7.624e-23	4.493e-23	-22.118	-22.347	-0.230	(0)
FeCl3	2.568e-26	2.568e-26	-25.590	-25.590	0.000	(0)
CrO3Cl-	2.080e-26	1.768e-26	-25.682	-25.752	-0.070	(0)
CoCl+2	4.917e-35	2.570e-35	-34.308	-34.590	-0.282	(0)
UCl+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.221	-64.503	-0.282	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.530	-68.812	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.109	-82.391	-0.282	(0)
Co (2)	1.358e-07					
Co+2	9.581e-08	5.008e-08	-7.019	-7.300	-0.282	(0)
CoHCO3+	1.996e-08	1.697e-08	-7.700	-7.770	-0.070	(0)
CoSO4	1.680e-08	1.680e-08	-7.775	-7.775	0.000	(0)
CoCO3	2.427e-09	2.427e-09	-8.615	-8.615	0.000	(0)
CoF+	3.082e-10	2.620e-10	-9.511	-9.582	-0.070	(0)
CoCl+	3.060e-10	2.602e-10	-9.514	-9.585	-0.070	(0)
CoOH+	1.660e-10	1.412e-10	-9.780	-9.850	-0.070	(0)
Co (OH) 2	1.585e-12	1.585e-12	-11.800	-11.800	0.000	(0)
CoNO2+	9.194e-16	7.817e-16	-15.036	-15.107	-0.070	(0)
Co (NH3) +2	7.732e-17	4.041e-17	-16.112	-16.393	-0.282	(0)
CoSeO4	7.136e-17	7.136e-17	-16.147	-16.147	0.000	(0)
Co (OH) 3-	5.254e-18	4.468e-18	-17.279	-17.350	-0.070	(0)
Co2OH+3	1.525e-18	3.543e-19	-17.817	-18.451	-0.634	(0)
CoOOH-	1.319e-18	1.121e-18	-17.880	-17.950	-0.070	(0)
CoNO3+	1.951e-19	1.659e-19	-18.710	-18.780	-0.070	(0)
Co (OH) 4-2	1.914e-25	1.000e-25	-24.718	-25.000	-0.282	(0)
Co (NH3) 2+2	2.214e-26	1.157e-26	-25.655	-25.937	-0.282	(0)
Co4 (OH) 4+4	1.062e-30	7.927e-32	-29.974	-31.101	-1.127	(0)
Co (NO3) 2	7.053e-31	7.053e-31	-30.152	-30.152	0.000	(0)
Co (NH3) 3+2	1.871e-36	9.779e-37	-35.728	-36.010	-0.282	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.181	-46.463	-0.282	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.134	-57.416	-0.282	(0)
Co (3)	1.155e-28					
CoOH+2	1.155e-28	6.038e-29	-27.937	-28.219	-0.282	(0)
Co+3	2.855e-34	8.409e-35	-33.544	-34.075	-0.531	(0)
CoCl+2	4.917e-35	2.570e-35	-34.308	-34.590	-0.282	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.221	-64.503	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.346	-77.417	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.936	-82.218	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.109	-82.391	-0.282	(0)
Cr (2)	9.620e-26					
Cr+2	9.620e-26	5.028e-26	-25.017	-25.299	-0.282	(0)
Cr (3)	6.444e-09					
Cr (OH) 2+	5.550e-09	4.719e-09	-8.256	-8.326	-0.070	(0)
Cr (OH) +2	5.251e-10	2.745e-10	-9.280	-9.562	-0.282	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
CrF+2	4.455e-12	2.328e-12	-11.351	-11.633	-0.282	(0)
CrO2-	1.965e-12	1.670e-12	-11.707	-11.777	-0.070	(0)
Cr (OH) 4-	1.657e-12	1.409e-12	-11.781	-11.851	-0.070	(0)
CrSO4+	4.100e-13	3.486e-13	-12.387	-12.458	-0.070	(0)
Cr+3	3.822e-13	8.878e-14	-12.418	-13.052	-0.634	(0)
CrCl+2	3.302e-16	1.726e-16	-15.481	-15.763	-0.282	(0)
Cr2 (OH) 2SO4+2	5.197e-18	2.717e-18	-17.284	-17.566	-0.282	(0)

CrOHC12	6.963e-19	6.963e-19	-18.157	-18.157	0.000	(0)
Cr2(OH)2(SO4)2	2.713e-19	2.713e-19	-18.567	-18.567	0.000	(0)
CrCl2+	2.893e-20	2.460e-20	-19.539	-19.609	-0.070	(0)
CrNO3+2	1.552e-26	8.111e-27	-25.809	-26.091	-0.282	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-55.113	-55.395	-0.282	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-66.456	-67.090	-0.634	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-68.530	-68.812	-0.282	(0)
Cr(6)	2.302e-16					
CrO4-2	1.962e-16	1.139e-16	-15.707	-15.943	-0.236	(0)
HCrO4-	3.089e-17	2.627e-17	-16.510	-16.581	-0.070	(0)
NaCrO4-	2.871e-18	2.441e-18	-17.542	-17.612	-0.070	(0)
KCrO4-	3.134e-19	2.665e-19	-18.504	-18.574	-0.070	(0)
CrO3SO4-2	1.834e-24	9.585e-25	-23.737	-24.018	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.080e-26	1.768e-26	-25.682	-25.752	-0.070	(0)
Cr2O7-2	4.579e-32	2.393e-32	-31.339	-31.621	-0.282	(0)
Cu(1)	1.494e-09					
CuCl	7.539e-10	7.539e-10	-9.123	-9.123	0.000	(0)
Cu+	4.689e-10	3.987e-10	-9.329	-9.399	-0.070	(0)
CuCl2-	2.714e-10	2.366e-10	-9.566	-9.626	-0.060	(0)
CuCl3-2	1.289e-13	7.598e-14	-12.890	-13.119	-0.230	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-148.285	-148.596	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.029	-149.326	-0.297	(0)
Cu(2)	6.904e-06					
CuCO3	5.797e-06	5.797e-06	-5.237	-5.237	0.000	(0)
Cu+2	5.911e-07	3.433e-07	-6.228	-6.464	-0.236	(0)
CuOH+	1.760e-07	1.534e-07	-6.755	-6.814	-0.060	(0)
CuSO4	1.322e-07	1.322e-07	-6.879	-6.879	0.000	(0)
CuHCO3+	1.110e-07	9.438e-08	-6.955	-7.025	-0.070	(0)
Cu(CO3)2-2	8.558e-08	4.473e-08	-7.068	-7.349	-0.282	(0)
Cu(OH)2	4.325e-09	4.325e-09	-8.364	-8.364	0.000	(0)
CuF+	4.216e-09	3.585e-09	-8.375	-8.446	-0.070	(0)
Cu2(OH)2+2	1.131e-09	5.912e-10	-8.946	-9.228	-0.282	(0)
CuCl+	9.377e-10	8.174e-10	-9.028	-9.088	-0.060	(0)
Cu(OH)3-	1.474e-12	1.254e-12	-11.831	-11.902	-0.070	(0)
CuCl2	4.257e-13	4.257e-13	-12.371	-12.371	0.000	(0)
CuNO2+	9.367e-14	7.964e-14	-13.028	-13.099	-0.070	(0)
CuNH3+2	4.512e-14	2.358e-14	-13.346	-13.627	-0.282	(0)
CuCl3-	6.846e-18	5.968e-18	-17.165	-17.224	-0.060	(0)
CuNO3+	2.669e-18	2.269e-18	-17.574	-17.644	-0.070	(0)
Cu(OH)4-2	2.667e-18	1.394e-18	-17.574	-17.856	-0.282	(0)
Cu(NO2)2	1.805e-21	1.805e-21	-20.743	-20.743	0.000	(0)
CuCl4-2	7.624e-23	4.493e-23	-22.118	-22.347	-0.230	(0)
Cu(NO3)2	5.970e-31	5.970e-31	-30.224	-30.224	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-215.816	-215.887	-0.070	(0)
F	2.117e-04					
F-	1.895e-04	1.655e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.776e-05	1.552e-05	-4.751	-4.809	-0.059	(0)
CaF+	2.381e-06	2.086e-06	-5.623	-5.681	-0.057	(0)
NaF	4.500e-07	4.500e-07	-6.347	-6.347	0.000	(0)
AlF3	3.249e-07	3.249e-07	-6.488	-6.488	0.000	(0)
AlF2+	1.777e-07	1.560e-07	-6.750	-6.807	-0.057	(0)
MnF+	7.763e-08	6.802e-08	-7.110	-7.167	-0.057	(0)
AlF4-	3.083e-08	2.695e-08	-7.511	-7.569	-0.059	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	4.216e-09	3.585e-09	-8.375	-8.446	-0.070	(0)
AlF+2	3.987e-09	2.368e-09	-8.399	-8.626	-0.226	(0)
ZnF+	1.826e-09	1.553e-09	-8.738	-8.809	-0.070	(0)
BF(OH)3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
NiF+	3.704e-10	3.149e-10	-9.431	-9.502	-0.070	(0)
CoF+	3.082e-10	2.620e-10	-9.511	-9.582	-0.070	(0)
CdF+	1.520e-11	1.292e-11	-10.818	-10.889	-0.070	(0)
HF2-	1.262e-11	1.097e-11	-10.899	-10.960	-0.061	(0)
PbF+	1.117e-11	9.495e-12	-10.952	-11.022	-0.070	(0)
CrF+2	4.455e-12	2.328e-12	-11.351	-11.633	-0.282	(0)
AgF	3.525e-12	3.525e-12	-11.453	-11.453	0.000	(0)
BF2(OH)2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
UO2F+	9.132e-13	7.764e-13	-12.039	-12.110	-0.070	(0)

UO2F2	3.705e-13	3.705e-13	-12.431	-12.431	0.000	(0)
PbF2	3.092e-14	3.092e-14	-13.510	-13.510	0.000	(0)
UO2F3-	1.811e-14	1.540e-14	-13.742	-13.812	-0.070	(0)
CdF2	4.266e-15	4.266e-15	-14.370	-14.370	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.151e-16	4.513e-16	-15.288	-15.345	-0.057	(0)
FeF+2	1.730e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
VO2F	4.743e-17	4.743e-17	-16.324	-16.324	0.000	(0)
UO2F4-2	3.873e-17	2.024e-17	-16.412	-16.694	-0.282	(0)
PbF3-	1.141e-17	9.704e-18	-16.943	-17.013	-0.070	(0)
BF3OH-	7.032e-18	6.079e-18	-17.153	-17.216	-0.063	(0)
VO2F2-	3.351e-18	2.850e-18	-17.475	-17.545	-0.070	(0)
VOF+	1.836e-19	1.561e-19	-18.736	-18.807	-0.070	(0)
VO2F3-2	1.125e-20	5.882e-21	-19.949	-20.230	-0.282	(0)
VOF2	9.687e-21	9.687e-21	-20.014	-20.014	0.000	(0)
PbF4-2	1.470e-21	7.686e-22	-20.833	-21.114	-0.282	(0)
BF4-	4.080e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
VOF3-	6.689e-23	5.688e-23	-22.175	-22.245	-0.070	(0)
HgF+	3.047e-23	2.591e-23	-22.516	-22.587	-0.070	(0)
VO2F4-3	2.062e-24	4.789e-25	-23.686	-24.320	-0.634	(0)
Sb(OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.895e-25	9.895e-25	-24.005	-24.005	0.000	(0)
VOF4-2	7.268e-26	3.799e-26	-25.139	-25.420	-0.282	(0)
UF3+	1.717e-34	1.460e-34	-33.765	-33.836	-0.070	(0)
UF2+2	1.065e-35	5.568e-36	-34.973	-35.254	-0.282	(0)
UF4	2.649e-36	2.649e-36	-35.577	-35.577	0.000	(0)
UF5-	2.043e-38	1.737e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.151e-38	2.673e-39	-37.939	-38.573	-0.634	(0)
UF6-2	1.661e-39	8.681e-40	-38.780	-39.061	-0.282	(0)
Fe (2)	3.433e-11					
Fe+2	2.743e-11	1.434e-11	-10.562	-10.844	-0.282	(0)
FeSO4	5.917e-12	5.917e-12	-11.228	-11.228	0.000	(0)
FeHCO3+	8.932e-13	7.863e-13	-12.049	-12.104	-0.055	(0)
FeOH+	9.204e-14	8.065e-14	-13.036	-13.093	-0.057	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.616e-19	4.045e-19	-18.336	-18.393	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.774	-158.774	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.107	-235.178	-0.070	(0)
Fe (3)	3.644e-09					
Fe (OH) 2+	3.209e-09	2.817e-09	-8.494	-8.550	-0.057	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.408e-12	5.625e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.697e-14	5.125e-14	-13.061	-13.290	-0.230	(0)
FeF2+	5.151e-16	4.513e-16	-15.288	-15.345	-0.057	(0)
FeF+2	1.730e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.210e-17	1.060e-17	-16.917	-16.975	-0.057	(0)
Fe+3	1.907e-18	5.618e-19	-17.720	-18.250	-0.531	(0)
Fe (SO4) 2-	4.480e-19	3.810e-19	-18.349	-18.419	-0.070	(0)
FeCl+2	4.324e-20	2.548e-20	-19.364	-19.594	-0.230	(0)
FeCl2+	1.952e-22	1.710e-22	-21.710	-21.767	-0.057	(0)
FeHSeO3+2	3.336e-23	1.743e-23	-22.477	-22.759	-0.282	(0)
Fe2 (OH) 2+4	1.166e-24	8.698e-26	-23.933	-25.061	-1.127	(0)
FeCl3	2.568e-26	2.568e-26	-25.590	-25.590	0.000	(0)
FeNO3+2	2.246e-29	1.174e-29	-28.649	-28.930	-0.282	(0)
Fe3 (OH) 4+5	2.044e-31	3.542e-33	-30.690	-32.451	-1.761	(0)
H (0)	4.020e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.191e-10					
Hg	2.191e-10	2.191e-10	-9.659	-9.659	0.000	(0)
Hg (1)	2.405e-21					
Hg2+2	1.202e-21	6.284e-22	-20.920	-21.202	-0.282	(0)
Hg (2)	3.098e-12					
HgClOH	1.583e-12	1.583e-12	-11.800	-11.800	0.000	(0)
HgCl2	9.532e-13	9.532e-13	-12.021	-12.021	0.000	(0)
Hg (OH) 2	5.298e-13	5.322e-13	-12.276	-12.274	0.002	(0)
HgCl3-	1.684e-14	1.432e-14	-13.774	-13.844	-0.070	(0)

	HgCO3	1.449e-14	1.449e-14	-13.839	-13.839	0.000	(0)
	Hg (CO3) 2-2	2.514e-16	1.314e-16	-15.600	-15.881	-0.282	(0)
	HgCl4-2	1.638e-16	8.562e-17	-15.786	-16.067	-0.282	(0)
	HgCl+	1.489e-16	1.266e-16	-15.827	-15.898	-0.070	(0)
	HgOH+	2.795e-17	2.376e-17	-16.554	-16.624	-0.070	(0)
	HgHCO3+	2.261e-17	1.923e-17	-16.646	-16.716	-0.070	(0)
	Hg (OH) 3-	1.113e-20	9.467e-21	-19.953	-20.024	-0.070	(0)
	Hg+2	8.082e-21	4.224e-21	-20.092	-20.374	-0.282	(0)
	HgSO4	1.860e-21	1.860e-21	-20.731	-20.731	0.000	(0)
	HgNH3+2	3.423e-23	1.789e-23	-22.466	-22.747	-0.282	(0)
	HgF+	3.047e-23	2.591e-23	-22.516	-22.587	-0.070	(0)
	Hg (NH3) 2+2	2.298e-25	1.201e-25	-24.639	-24.920	-0.282	(0)
	HgNO3+	3.834e-33	3.260e-33	-32.416	-32.487	-0.070	(0)
	Hg (NH3) 3+2	6.140e-36	3.209e-36	-35.212	-35.494	-0.282	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-44.548	-44.548	0.000	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.485	-45.767	-0.282	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.109	-138.180	-0.070	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.933	-138.933	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.459	-139.741	-0.282	(0)
K		7.295e-04					
	K+	7.210e-04	6.294e-04	-3.142	-3.201	-0.059	(0)
	KSO4-	8.534e-06	7.492e-06	-5.069	-5.125	-0.057	(0)
	KCrO4-	3.134e-19	2.665e-19	-18.504	-18.574	-0.070	(0)
Mg		1.758e-03					
	Mg+2	1.439e-03	8.361e-04	-2.842	-3.078	-0.236	(0)
	MgSO4	2.558e-04	2.558e-04	-3.592	-3.592	0.000	(0)
	MgHCO3+	4.276e-05	3.727e-05	-4.369	-4.429	-0.060	(0)
	MgF+	1.776e-05	1.552e-05	-4.751	-4.809	-0.059	(0)
	MgCO3	1.994e-06	1.994e-06	-5.700	-5.700	0.000	(0)
	MgOH+	5.331e-08	4.703e-08	-7.273	-7.328	-0.054	(0)
	MgH2BO3+	4.353e-09	3.763e-09	-8.361	-8.424	-0.063	(0)
Mn (2)		2.397e-05					
	Mn+2	1.976e-05	1.033e-05	-4.704	-4.986	-0.282	(0)
	MnSO4	3.087e-06	3.087e-06	-5.510	-5.510	0.000	(0)
	MnHCO3+	1.024e-06	8.975e-07	-5.990	-6.047	-0.057	(0)
	MnF+	7.763e-08	6.802e-08	-7.110	-7.167	-0.057	(0)
	MnCl+	2.229e-08	1.953e-08	-7.652	-7.709	-0.057	(0)
	MnOH+	4.183e-09	3.665e-09	-8.379	-8.436	-0.057	(0)
	MnCl2	4.143e-11	4.143e-11	-10.383	-10.383	0.000	(0)
	MnCl3-	1.956e-14	1.714e-14	-13.709	-13.766	-0.057	(0)
	MnSeO4	7.902e-15	7.902e-15	-14.102	-14.102	0.000	(0)
	MnNO3+	4.022e-17	3.420e-17	-16.396	-16.466	-0.070	(0)
	Mn (OH) 3-	5.161e-19	4.522e-19	-18.287	-18.345	-0.057	(0)
	Mn (OH) 4-2	3.501e-25	2.063e-25	-24.456	-24.686	-0.230	(0)
	Mn (NO3) 2	1.795e-28	1.795e-28	-27.746	-27.746	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-42.928	-42.928	0.000	(0)
Mn (3)		6.604e-25					
	Mn+3	6.604e-25	1.946e-25	-24.180	-24.711	-0.531	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-43.500	-43.730	-0.230	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-47.415	-47.477	-0.062	(0)
Mo		4.211e-07					
	MoO4-2	4.207e-07	2.444e-07	-6.376	-6.612	-0.236	(0)
	HMoO4-	4.074e-10	3.464e-10	-9.390	-9.460	-0.070	(0)
	H2MoO4	1.808e-13	1.808e-13	-12.743	-12.743	0.000	(0)
	Ag2MoO4	6.655e-24	6.655e-24	-23.177	-23.177	0.000	(0)
	AlMo6O21-3	1.688e-39	3.920e-40	-38.773	-39.407	-0.634	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-47.935	-50.471	-2.536	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-49.471	-51.232	-1.761	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.470	-53.597	-1.127	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.864	-57.498	-0.634	(0)
N (-3)		9.942e-10					
	NH4+	9.702e-10	8.387e-10	-9.013	-9.076	-0.063	(0)
	NH4SO4-	1.724e-11	1.511e-11	-10.763	-10.821	-0.057	(0)
	NH3	6.712e-12	6.712e-12	-11.173	-11.173	0.000	(0)
	CuNH3+2	4.512e-14	2.358e-14	-13.346	-13.627	-0.282	(0)
	CaNH3+2	1.867e-14	9.760e-15	-13.729	-14.011	-0.282	(0)

NiNH3+2	5.225e-16	2.731e-16	-15.282	-15.564	-0.282	(0)
AgNH3+	1.367e-16	1.162e-16	-15.864	-15.935	-0.070	(0)
Co (NH3) 2+	7.732e-17	4.041e-17	-16.112	-16.393	-0.282	(0)
BaNH3+2	5.047e-19	2.638e-19	-18.297	-18.579	-0.282	(0)
HgNH3+2	3.423e-23	1.789e-23	-22.466	-22.747	-0.282	(0)
Ag (NH3) 2+	7.459e-24	6.342e-24	-23.127	-23.198	-0.070	(0)
Ni (NH3) 2+2	5.070e-25	2.650e-25	-24.295	-24.577	-0.282	(0)
Hg (NH3) 2+2	2.298e-25	1.201e-25	-24.639	-24.920	-0.282	(0)
Ca (NH3) 2+2	4.990e-26	2.608e-26	-25.302	-25.584	-0.282	(0)
Co (NH3) 2+2	2.214e-26	1.157e-26	-25.655	-25.937	-0.282	(0)
Hg (NH3) 3+2	6.140e-36	3.209e-36	-35.212	-35.494	-0.282	(0)
Co (NH3) 3+2	1.871e-36	9.779e-37	-35.728	-36.010	-0.282	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.485	-45.767	-0.282	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.181	-46.463	-0.282	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.113	-55.395	-0.282	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.134	-57.416	-0.282	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.221	-64.503	-0.282	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.456	-67.090	-0.634	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.530	-68.812	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.346	-77.417	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.936	-82.218	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.109	-82.391	-0.282	(0)
N (3)	2.555e-09					
NO2-	2.555e-09	2.215e-09	-8.593	-8.655	-0.062	(0)
CuNO2+	9.367e-14	7.964e-14	-13.028	-13.099	-0.070	(0)
AgNO2	3.926e-15	3.926e-15	-14.406	-14.406	0.000	(0)
CoNO2+	9.194e-16	7.817e-16	-15.036	-15.107	-0.070	(0)
Cu (NO2) 2	1.805e-21	1.805e-21	-20.743	-20.743	0.000	(0)
Ag (NO2) 2-	1.584e-23	1.347e-23	-22.800	-22.871	-0.070	(0)
N (5)	2.403e-12					
NO3-	2.394e-12	2.090e-12	-11.621	-11.680	-0.059	(0)
CaNO3+	8.977e-15	7.633e-15	-14.047	-14.117	-0.070	(0)
MnNO3+	4.022e-17	3.420e-17	-16.396	-16.466	-0.070	(0)
ZnNO3+	2.903e-18	2.469e-18	-17.537	-17.608	-0.070	(0)
CuNO3+	2.669e-18	2.269e-18	-17.574	-17.644	-0.070	(0)
BaNO3+	7.672e-19	6.523e-19	-18.115	-18.186	-0.070	(0)
NiNO3+	4.678e-19	3.977e-19	-18.330	-18.400	-0.070	(0)
CoNO3+	1.951e-19	1.659e-19	-18.710	-18.780	-0.070	(0)
CdNO3+	3.830e-20	3.256e-20	-19.417	-19.487	-0.070	(0)
PbNO3+	2.960e-20	2.517e-20	-19.529	-19.599	-0.070	(0)
AgNO3	1.408e-20	1.408e-20	-19.851	-19.851	0.000	(0)
UO2NO3+	1.667e-25	1.417e-25	-24.778	-24.848	-0.070	(0)
CrNO3+2	1.552e-26	8.111e-27	-25.809	-26.091	-0.282	(0)
Mn (NO3) 2	1.795e-28	1.795e-28	-27.746	-27.746	0.000	(0)
VO2NO3	1.728e-28	1.728e-28	-27.763	-27.763	0.000	(0)
FeNO3+2	2.246e-29	1.174e-29	-28.649	-28.930	-0.282	(0)
Zn (NO3) 2	1.029e-30	1.029e-30	-29.987	-29.987	0.000	(0)
Co (NO3) 2	7.053e-31	7.053e-31	-30.152	-30.152	0.000	(0)
Cu (NO3) 2	5.970e-31	5.970e-31	-30.224	-30.224	0.000	(0)
Pb (NO3) 2	8.934e-32	8.934e-32	-31.049	-31.049	0.000	(0)
Cd (NO3) 2	3.411e-32	3.411e-32	-31.467	-31.467	0.000	(0)
HgNO3+	3.834e-33	3.260e-33	-32.416	-32.487	-0.070	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.548	-44.548	0.000	(0)
Na	4.993e-03					
Na+	4.937e-03	4.310e-03	-2.306	-2.365	-0.059	(0)
NaSO4-	4.434e-05	3.892e-05	-4.353	-4.410	-0.057	(0)
NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)
NaF	4.500e-07	4.500e-07	-6.347	-6.347	0.000	(0)
NaCO3-	2.622e-07	2.301e-07	-6.581	-6.638	-0.057	(0)
NaH2BO3	8.867e-10	8.867e-10	-9.052	-9.052	0.000	(0)
NaCrO4-	2.871e-18	2.441e-18	-17.542	-17.612	-0.070	(0)
Ni	2.127e-07					
Ni+2	1.304e-07	7.576e-08	-6.885	-7.121	-0.236	(0)
NiHCO3+	4.786e-08	4.069e-08	-7.320	-7.391	-0.070	(0)
NiSO4	2.542e-08	2.542e-08	-7.595	-7.595	0.000	(0)
NiCO3	8.104e-09	8.104e-09	-8.091	-8.091	0.000	(0)
NiF+	3.704e-10	3.149e-10	-9.431	-9.502	-0.070	(0)
NiCl+	3.424e-10	2.912e-10	-9.465	-9.536	-0.070	(0)

NiOH+	1.585e-10	1.348e-10	-9.800	-9.870	-0.070	(0)
Ni(SO4)2-2	2.707e-12	1.415e-12	-11.567	-11.849	-0.282	(0)
Ni(OH)2	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
NiCl2	2.202e-15	2.202e-15	-14.657	-14.657	0.000	(0)
NiNH3+2	5.225e-16	2.731e-16	-15.282	-15.564	-0.282	(0)
Ni(OH)3-	2.514e-16	2.137e-16	-15.600	-15.670	-0.070	(0)
NiSeO4	1.008e-16	1.008e-16	-15.997	-15.997	0.000	(0)
NiNO3+	4.678e-19	3.977e-19	-18.330	-18.400	-0.070	(0)
Ni(NH3)2+2	5.070e-25	2.650e-25	-24.295	-24.577	-0.282	(0)
O(0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	1.272e-08					
PbCO3	7.018e-09	7.018e-09	-8.154	-8.154	0.000	(0)
PbHCO3+	3.100e-09	2.636e-09	-8.509	-8.579	-0.070	(0)
Pb+2	1.402e-09	8.143e-10	-8.853	-9.089	-0.236	(0)
PbSO4	6.706e-10	6.706e-10	-9.174	-9.174	0.000	(0)
PbOH+	3.399e-10	2.890e-10	-9.469	-9.539	-0.070	(0)
Pb(CO3)2-2	1.110e-10	5.803e-11	-9.955	-10.236	-0.282	(0)
PbCl+	5.104e-11	4.340e-11	-10.292	-10.363	-0.070	(0)
Pb(SO4)2-2	1.300e-11	6.794e-12	-10.886	-11.168	-0.282	(0)
PbF+	1.117e-11	9.495e-12	-10.952	-11.022	-0.070	(0)
Pb(OH)2	1.291e-12	1.291e-12	-11.889	-11.889	0.000	(0)
PbCl2	2.912e-13	2.912e-13	-12.536	-12.536	0.000	(0)
PbF2	3.092e-14	3.092e-14	-13.510	-13.510	0.000	(0)
Pb(OH)3-	2.146e-16	1.825e-16	-15.668	-15.739	-0.070	(0)
PbCl3-	2.048e-16	1.741e-16	-15.689	-15.759	-0.070	(0)
Pb2OH+3	1.606e-17	3.730e-18	-16.794	-17.428	-0.634	(0)
PbF3-	1.141e-17	9.704e-18	-16.943	-17.013	-0.070	(0)
PbCl4-2	2.288e-19	1.196e-19	-18.641	-18.922	-0.282	(0)
PbNO3+	2.960e-20	2.517e-20	-19.529	-19.599	-0.070	(0)
Pb(OH)4-2	1.208e-20	6.315e-21	-19.918	-20.200	-0.282	(0)
PbF4-2	1.470e-21	7.686e-22	-20.833	-21.114	-0.282	(0)
Pb3(OH)4+2	5.185e-23	2.710e-23	-22.285	-22.567	-0.282	(0)
Pb4(OH)4+4	2.349e-27	1.753e-28	-26.629	-27.756	-1.127	(0)
Pb(NO3)2	8.934e-32	8.934e-32	-31.049	-31.049	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-150.700	-150.700	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-227.770	-227.841	-0.070	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.697	-72.697	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.370	-78.440	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.568	-78.568	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.669	-78.740	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.376	-80.658	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.892	-81.174	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.972	-81.254	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.778	-82.060	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.794	-83.076	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.363	-88.593	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.109	-138.180	-0.070	(0)
Hg(HS)2	0.000e+00	0.000e+00	-138.933	-138.933	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.459	-139.741	-0.282	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-146.967	-147.038	-0.070	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-147.206	-147.374	-0.168	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-148.285	-148.596	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.029	-149.326	-0.297	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.181	-149.251	-0.070	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-149.350	-149.667	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.674	-149.978	-0.304	(0)
Cd(HS)2	0.000e+00	0.000e+00	-149.976	-149.976	0.000	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.389	-150.389	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-150.700	-150.700	0.000	(0)
Fe(HS)2	0.000e+00	0.000e+00	-158.774	-158.774	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-215.816	-215.887	-0.070	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.479	-225.549	-0.070	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-226.446	-226.517	-0.070	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-227.770	-227.841	-0.070	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-228.100	-228.382	-0.282	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-235.107	-235.178	-0.070	(0)

Cd (HS) 4-2	0.000e+00	0.000e+00	-302.479	-302.761	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.168	-305.449	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.910	-317.192	-0.282	(0)
S (6)	3.651e-03					
SO4-2	2.894e-03	1.681e-03	-2.538	-2.774	-0.236	(0)
CaSO4	4.448e-04	4.448e-04	-3.352	-3.352	0.000	(0)
MgSO4	2.558e-04	2.558e-04	-3.592	-3.592	0.000	(0)
NaSO4-	4.434e-05	3.892e-05	-4.353	-4.410	-0.057	(0)
KSO4-	8.534e-06	7.492e-06	-5.069	-5.125	-0.057	(0)
MnSO4	3.087e-06	3.087e-06	-5.510	-5.510	0.000	(0)
ZnSO4	1.730e-07	1.730e-07	-6.762	-6.762	0.000	(0)
CuSO4	1.322e-07	1.322e-07	-6.879	-6.879	0.000	(0)
NiSO4	2.542e-08	2.542e-08	-7.595	-7.595	0.000	(0)
CoSO4	1.680e-08	1.680e-08	-7.775	-7.775	0.000	(0)
HSO4-	1.339e-08	1.170e-08	-7.873	-7.932	-0.059	(0)
Zn (SO4) 2-2	4.847e-09	2.533e-09	-8.315	-8.596	-0.282	(0)
CdSO4	1.942e-09	1.942e-09	-8.712	-8.712	0.000	(0)
PbSO4	6.706e-10	6.706e-10	-9.174	-9.174	0.000	(0)
AgSO4-	3.346e-10	2.845e-10	-9.475	-9.546	-0.070	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
Cd (SO4) 2-2	8.427e-11	4.405e-11	-10.074	-10.356	-0.282	(0)
AlSO4+	2.137e-11	1.868e-11	-10.670	-10.729	-0.059	(0)
NH4SO4-	1.724e-11	1.511e-11	-10.763	-10.821	-0.057	(0)
Pb (SO4) 2-2	1.300e-11	6.794e-12	-10.886	-11.168	-0.282	(0)
FeSO4	5.917e-12	5.917e-12	-11.228	-11.228	0.000	(0)
Ni (SO4) 2-2	2.707e-12	1.415e-12	-11.567	-11.849	-0.282	(0)
CrSO4+	4.100e-13	3.486e-13	-12.387	-12.458	-0.070	(0)
Al (SO4) 2-	3.850e-13	3.365e-13	-12.415	-12.473	-0.059	(0)
UO2SO4	8.651e-14	8.651e-14	-13.063	-13.063	0.000	(0)
UO2 (SO4) 2-2	3.668e-15	1.917e-15	-14.436	-14.717	-0.282	(0)
FeSO4+	1.210e-17	1.060e-17	-16.917	-16.975	-0.057	(0)
VO2SO4-	7.717e-18	6.561e-18	-17.113	-17.183	-0.070	(0)
Cr2 (OH) 2SO4+2	5.197e-18	2.717e-18	-17.284	-17.566	-0.282	(0)
Fe (SO4) 2-	4.480e-19	3.810e-19	-18.349	-18.419	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.713e-19	2.713e-19	-18.567	-18.567	0.000	(0)
VOSO4	7.285e-20	7.285e-20	-19.138	-19.138	0.000	(0)
HgSO4	1.860e-21	1.860e-21	-20.731	-20.731	0.000	(0)
CrO3SO4-2	1.834e-24	9.585e-25	-23.737	-24.018	-0.282	(0)
VSO4+	8.776e-34	7.462e-34	-33.057	-33.127	-0.070	(0)
U (SO4) 2	7.237e-40	7.237e-40	-39.140	-39.140	0.000	(0)
USO4+2	1.037e-40	0.000e+00	-39.984	-40.266	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.346	-77.417	-0.070	(0)
Sb (3)	1.079e-19					
Sb (OH) 3	5.461e-20	5.461e-20	-19.263	-19.263	0.000	(0)
HSbO2	5.333e-20	5.333e-20	-19.273	-19.273	0.000	(0)
SbO2-	1.426e-24	1.212e-24	-23.846	-23.916	-0.070	(0)
Sb (OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.895e-25	9.895e-25	-24.005	-24.005	0.000	(0)
Sb (OH) 4-	8.166e-25	6.943e-25	-24.088	-24.158	-0.070	(0)
Sb (OH) 2+	1.111e-25	9.450e-26	-24.954	-25.025	-0.070	(0)
SbO+	3.833e-26	3.259e-26	-25.416	-25.487	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.910	-317.192	-0.282	(0)
Sb (5)	1.325e-08					
SbO3-	1.324e-08	1.126e-08	-7.878	-7.949	-0.070	(0)
Sb (OH) 6-	1.507e-11	1.315e-11	-10.822	-10.881	-0.059	(0)
SbO2+	1.927e-23	1.639e-23	-22.715	-22.785	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.324e-40	1.976e-40	-39.634	-39.704	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.928	-42.928	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.962	-42.962	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.275	-47.557	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.420	-86.547	-1.127	(0)
Se (4)	1.507e-08					
HSeO3-	1.381e-08	1.174e-08	-7.860	-7.930	-0.070	(0)
SeO3-2	1.256e-09	6.564e-10	-8.901	-9.183	-0.282	(0)
H2SeO3	3.569e-13	3.569e-13	-12.447	-12.447	0.000	(0)
AgSeO3-	4.208e-15	3.578e-15	-14.376	-14.446	-0.070	(0)

Cd(SeO3) 2-2	3.347e-21	1.749e-21	-20.475	-20.757	-0.282	(0)
Ag(SeO3) 2-3	9.053e-23	2.103e-23	-22.043	-22.677	-0.634	(0)
FeHSeO3+2	3.336e-23	1.743e-23	-22.477	-22.759	-0.282	(0)
Se (6)	4.903e-12					
SeO4-2	4.895e-12	2.843e-12	-11.310	-11.546	-0.236	(0)
MnSeO4	7.902e-15	7.902e-15	-14.102	-14.102	0.000	(0)
ZnSeO4	2.071e-16	2.071e-16	-15.684	-15.684	0.000	(0)
NiSeO4	1.008e-16	1.008e-16	-15.997	-15.997	0.000	(0)
CoSeO4	7.136e-17	7.136e-17	-16.147	-16.147	0.000	(0)
HSeO4-	1.194e-17	1.015e-17	-16.923	-16.993	-0.070	(0)
CdSeO4	2.609e-18	2.609e-18	-17.584	-17.584	0.000	(0)
Zn(SeO4) 2-2	1.142e-27	5.971e-28	-26.942	-27.224	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.879	-58.513	-0.634	(0)
U (4)	3.940e-22					
U(OH) 5-	3.930e-22	3.342e-22	-21.406	-21.476	-0.070	(0)
U(OH) 4	9.973e-25	9.973e-25	-24.001	-24.001	0.000	(0)
U(OH) 3+	3.056e-28	2.598e-28	-27.515	-27.585	-0.070	(0)
U(OH) 2+2	1.638e-32	8.561e-33	-31.786	-32.067	-0.282	(0)
UF3+	1.717e-34	1.460e-34	-33.765	-33.836	-0.070	(0)
UF2+2	1.065e-35	5.568e-36	-34.973	-35.254	-0.282	(0)
UF4	2.649e-36	2.649e-36	-35.577	-35.577	0.000	(0)
UOH+3	1.237e-37	2.873e-38	-36.908	-37.542	-0.634	(0)
UF5-	2.043e-38	1.737e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.151e-38	2.673e-39	-37.939	-38.573	-0.634	(0)
UF6-2	1.661e-39	8.681e-40	-38.780	-39.061	-0.282	(0)
U(SO4) 2	7.237e-40	7.237e-40	-39.140	-39.140	0.000	(0)
USO4+2	1.037e-40	0.000e+00	-39.984	-40.266	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.965	-44.092	-1.127	(0)
UC1+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-168.792	-174.498	-5.706	(0)
U (5)	5.777e-17					
UO2+	5.777e-17	4.912e-17	-16.238	-16.309	-0.070	(0)
U (6)	8.560e-08					
UO2(CO3) 3-4	4.274e-08	3.190e-09	-7.369	-8.496	-1.127	(0)
UO2(CO3) 2-2	4.247e-08	2.220e-08	-7.372	-7.654	-0.282	(0)
UO2CO3	3.880e-10	3.880e-10	-9.411	-9.411	0.000	(0)
UO2F+	9.132e-13	7.764e-13	-12.039	-12.110	-0.070	(0)
UO2OH+	7.112e-13	6.047e-13	-12.148	-12.218	-0.070	(0)
UO2F2	3.705e-13	3.705e-13	-12.431	-12.431	0.000	(0)
UO2SO4	8.651e-14	8.651e-14	-13.063	-13.063	0.000	(0)
UO2+2	5.852e-14	3.399e-14	-13.233	-13.469	-0.236	(0)
UO2F3-	1.811e-14	1.540e-14	-13.742	-13.812	-0.070	(0)
UO2(SO4) 2-2	3.668e-15	1.917e-15	-14.436	-14.717	-0.282	(0)
UO2Cl+	9.739e-17	8.281e-17	-16.011	-16.082	-0.070	(0)
UO2F4-2	3.873e-17	2.024e-17	-16.412	-16.694	-0.282	(0)
(UO2) 2(OH) 2+2	1.161e-18	6.068e-19	-17.935	-18.217	-0.282	(0)
(UO2) 3(OH) 5+	6.536e-21	5.558e-21	-20.185	-20.255	-0.070	(0)
UO2NO3+	1.667e-25	1.417e-25	-24.778	-24.848	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.231	-42.302	-0.070	(0)
V+2	0.000e+00	0.000e+00	-42.680	-42.962	-0.282	(0)
V (3)	2.140e-15					
V(OH) 3	2.140e-15	2.140e-15	-14.670	-14.670	0.000	(0)
V(OH) 2+	1.159e-25	9.851e-26	-24.936	-25.007	-0.070	(0)
VOH+2	1.274e-28	6.658e-29	-27.895	-28.177	-0.282	(0)
V+3	4.048e-33	9.401e-34	-32.393	-33.027	-0.634	(0)
VSO4+	8.776e-34	7.462e-34	-33.057	-33.127	-0.070	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.097	-54.731	-0.634	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-54.426	-55.553	-1.127	(0)
V (4)	5.782e-18					
V(OH) 3+	5.214e-18	4.434e-18	-17.283	-17.353	-0.070	(0)
VO+2	3.010e-19	1.573e-19	-18.521	-18.803	-0.282	(0)
VOF+	1.836e-19	1.561e-19	-18.736	-18.807	-0.070	(0)
VOSO4	7.285e-20	7.285e-20	-19.138	-19.138	0.000	(0)
VOF2	9.687e-21	9.687e-21	-20.014	-20.014	0.000	(0)
VOCl+	7.797e-22	6.629e-22	-21.108	-21.179	-0.070	(0)
VOF3-	6.689e-23	5.688e-23	-22.175	-22.245	-0.070	(0)

VOF4-2	7.268e-26	3.799e-26	-25.139	-25.420	-0.282	(0)
H2V2O4+2	1.886e-30	9.859e-31	-29.724	-30.006	-0.282	(0)
V (5)	2.007e-09					
H2VO4-	1.897e-09	1.613e-09	-8.722	-8.792	-0.070	(0)
HVO4-2	1.088e-10	5.688e-11	-9.963	-10.245	-0.282	(0)
H3VO4	1.149e-12	1.149e-12	-11.940	-11.940	0.000	(0)
H3V2O7-	1.408e-14	1.197e-14	-13.851	-13.922	-0.070	(0)
VO2+	1.872e-16	1.634e-16	-15.728	-15.787	-0.059	(0)
HV2O7-3	1.339e-16	3.110e-17	-15.873	-16.507	-0.634	(0)
VO2F	4.743e-17	4.743e-17	-16.324	-16.324	0.000	(0)
VO4-3	1.723e-17	4.002e-18	-16.764	-17.398	-0.634	(0)
VO2SO4-	7.717e-18	6.561e-18	-17.113	-17.183	-0.070	(0)
VO2F2-	3.351e-18	2.850e-18	-17.475	-17.545	-0.070	(0)
V2O7-4	1.574e-19	1.175e-20	-18.803	-19.930	-1.127	(0)
V3O9-3	1.894e-20	4.399e-21	-19.723	-20.357	-0.634	(0)
VO2F3-2	1.125e-20	5.882e-21	-19.949	-20.230	-0.282	(0)
VO2F4-3	2.062e-24	4.789e-25	-23.686	-24.320	-0.634	(0)
V4O12-4	3.965e-26	2.959e-27	-25.402	-26.529	-1.127	(0)
VO2NO3	1.728e-28	1.728e-28	-27.763	-27.763	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-64.805	-66.566	-1.761	(0)
V10O28-6	0.000e+00	0.000e+00	-65.069	-67.605	-2.536	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.379	-68.506	-1.127	(0)
Zn	1.153e-06					
Zn+2	8.095e-07	4.703e-07	-6.092	-6.328	-0.236	(0)
ZnSO4	1.730e-07	1.730e-07	-6.762	-6.762	0.000	(0)
ZnCO3	7.759e-08	7.759e-08	-7.110	-7.110	0.000	(0)
ZnHCO3+	7.620e-08	6.479e-08	-7.118	-7.189	-0.070	(0)
ZnOH+	7.815e-09	6.645e-09	-8.107	-8.178	-0.070	(0)
Zn (SO4) 2-2	4.847e-09	2.533e-09	-8.315	-8.596	-0.282	(0)
ZnCl+	2.035e-09	1.774e-09	-8.691	-8.751	-0.060	(0)
ZnF+	1.826e-09	1.553e-09	-8.738	-8.809	-0.070	(0)
ZnOHCl	3.282e-10	3.282e-10	-9.484	-9.484	0.000	(0)
Zn (OH) 2	1.488e-10	1.488e-10	-9.827	-9.827	0.000	(0)
ZnCl2	4.224e-12	4.224e-12	-11.374	-11.374	0.000	(0)
Zn (OH) 3-	1.239e-13	1.054e-13	-12.907	-12.977	-0.070	(0)
ZnCl3-	5.782e-15	5.040e-15	-14.238	-14.298	-0.060	(0)
ZnSeO4	2.071e-16	2.071e-16	-15.684	-15.684	0.000	(0)
ZnCl4-2	6.424e-18	3.786e-18	-17.192	-17.422	-0.230	(0)
ZnNO3+	2.903e-18	2.469e-18	-17.537	-17.608	-0.070	(0)
Zn (OH) 4-2	1.134e-18	5.928e-19	-17.945	-18.227	-0.282	(0)
Zn (SeO4) 2-2	1.142e-27	5.971e-28	-26.942	-27.224	-0.282	(0)
Zn (NO3) 2	1.029e-30	1.029e-30	-29.987	-29.987	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.181	-149.251	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.389	-150.389	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.479	-225.549	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.100	-228.382	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.168	-305.449	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-76.19	-69.90	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-56.70	-52.19	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-63.93	-52.19	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-98.62	-80.69	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-74.15	-54.12	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-34.50	-34.10	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-30.15	-29.70	0.45	(NH4) 2SeO4
Acanthite	-51.22	-87.44	-36.22	Ag2S
Ag2CO3	-10.60	-21.69	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4
Ag2MoO4	-11.20	-22.75	-11.55	Ag2MoO4
Ag2O	-14.42	-1.85	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4

Ag2SO4	-14.10	-18.92	-4.82	Ag2SO4
Ag3AsO3	-27.18	-25.02	2.16	Ag3AsO3
Ag3AsO4	-15.59	-18.37	-2.79	Ag3AsO4
Ag3H2VO5	-16.59	-11.41	5.18	Ag3H2VO5
AgF·4H2O	-12.90	-11.85	1.05	AgF·4H2O
Agmetal	-0.19	-13.70	-13.51	Ag
AgVO3	-10.33	-9.56	0.77	AgVO3
Al (OH) 3 (am)	-1.20	9.60	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.89	-43.52	2.37	Al2 (MoO4) 3
Al2O3	-0.46	19.19	19.65	Al2O3
Al4 (OH) 10SO4	-1.38	21.32	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.80	-6.00	4.80	AlAsO4·2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.07	-11.86	-7.79	PbSO4
Anhydrite	-1.35	-5.71	-4.36	CaSO4
Anilite	-55.13	-87.01	-31.88	Cu0.25Cu1.5S
Antlerite	-2.37	6.42	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-86.23	-88.99	-2.76	As4O6
Artinite	-7.00	2.60	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.91	-31.20	6.71	As2O5
Atacamite	-1.70	5.69	7.39	Cu2 (OH) 3Cl
Azurite	0.72	-16.18	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.31	7.09	24.39	Ba (OH) 2:8H2O
Ba2V2O7·2H2O	-18.97	-3.10	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-1.02	-9.93	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.95	3.99	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-8.95	-14.77	-5.82	BaF2
BaMoO4	-6.86	-13.82	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-11.29	-18.75	-7.46	BaSeO4
Bianchite	-7.34	-9.10	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.89	-6.54	-0.64	Mn2O3
BlaubleiI	-54.83	-78.99	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.41	-82.69	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.97	14.25	15.22	Cu4 (OH) 6SO4
Brucite	-5.63	11.22	16.84	Mg (OH) 2
Bunsenite	-5.27	7.17	12.45	NiO
Ca (VO3) 2	-11.58	-5.92	5.66	Ca (VO3) 2
Ca2V2O7	-12.06	5.44	17.50	Ca2V2O7
Ca2V2O7·2H2O	-16.12	5.43	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2:4H2O	-19.43	2.87	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-22.17	16.79	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.07	16.79	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.70	-157.72	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.94	-26.85	-17.91	Hg2Cl2
CaMoO4	-1.60	-9.55	-7.95	CaMoO4
Carnotite	-4.10	-3.87	0.23	KUO2VO4
CaSeO3·2H2O	-6.53	-3.72	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.46	-14.48	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-13.45	-3.61	9.84	Cd (BO2) 2
Cd (OH) 2	-7.66	5.99	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.74	5.99	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-22.89	-16.18	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.67	0.89	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-21.52	6.88	28.40	Cd4 (OH) 6SO4
CdCl2	-13.30	-13.95	-0.66	CdCl2
CdCl2·1H2O	-12.26	-13.95	-1.69	CdCl2·1H2O

CdCl2:2.5H2O	-12.04	-13.95	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal (alpha)	-33.07	-19.56	13.51	Cd
Cdmetal (gamma)	-33.18	-19.56	13.62	Cd
CdMoO4	-0.77	-14.92	-14.15	CdMoO4
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.79	-77.14	-0.35	CdSb
CdSe	-20.66	-40.86	-20.20	CdSe
CdSeO4:2H2O	-18.00	-19.85	-1.85	CdSeO4:2H2O
CdSO4	-10.91	-11.08	-0.17	CdSO4
CdSO4:1H2O	-9.36	-11.08	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.21	-11.08	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-1.50	-14.63	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.60	-9.24	-2.64	CuSO4:5H2O
Chalcocite	-55.17	-90.09	-34.92	Cu2S
Chalcopyrite	-124.62	-159.89	-35.27	CuFeS2
Cinnabar	-52.17	-97.86	-45.69	HgS
Claudetite	-85.92	-88.99	-3.06	As4O6
Clausthalite	-14.55	-41.65	-27.10	PbSe
Co (BO2) 2	-29.67	-2.60	27.07	Co (BO2) 2
Co (OH) 2	-6.10	6.99	13.09	Co (OH) 2
Co (OH) 3	-10.32	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-23.25	-10.22	13.03	Co3 (AsO4) 2
Co3O4	-7.78	-18.27	-10.50	Co3O4
CoCl2	-21.21	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.48	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.27	-14.86	-1.60	CoF2
CoF3	-43.96	-45.42	-1.46	CoF3
CoFe2O4	16.90	13.38	-3.53	CoFe2O4
CoMoO4	-6.15	-13.91	-7.76	CoMoO4
CoO	-6.59	6.99	13.59	CoO
CoS (alpha)	-71.15	-78.59	-7.44	CoS
CoS (beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.66	-39.86	-16.20	CoSe
CoSeO3	-9.40	-8.08	1.32	CoSeO3
CoSeO4:6H2O	-17.32	-18.85	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.07	2.80	CoSO4
CoSO4:6H2O	-7.60	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.96	-14.74	-4.78	PbCl2
Covellite	-55.46	-77.76	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.04	-30.95	14.09	CrCl2
CrCl3	-46.20	-31.09	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu (OH) 2	-0.84	7.83	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.82	20.39	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.42	-3.17	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.44	-90.32	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.56	-51.36	-45.80	Cu2Se
Cu2SO4	-19.62	-21.57	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.81	-7.71	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.06	-102.65	-42.59	Cu3Sb
Cu3Se2	-26.89	-90.38	-63.49	Cu3Se2
CuCO3	-0.51	-12.01	-11.50	CuCO3
CuCrO4	-16.97	-22.41	-5.44	CuCrO4
CuF	-8.28	-13.18	-4.91	CuF
CuF2	-15.14	-14.03	1.12	CuF2
CuF2:2H2O	-9.48	-14.03	-4.55	CuF2:2H2O

Cumetal	-6.27	-15.02	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.71	-1.41	10.30	CuOCuSO4
Cupricferrite	8.22	14.21	5.99	CuFe2O4
Cuprite	-3.10	-4.50	-1.41	Cu2O
Cuprousferrite	9.86	0.94	-8.92	CuFeO2
CuSe	-5.92	-39.02	-33.10	CuSe
CuSe2	-26.96	-60.33	-33.37	CuSe2
CuSeO3:2H2O	-7.76	-7.25	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.57	-18.01	-2.44	CuSeO4:5H2O
CuSO4	-12.18	-9.24	2.94	CuSO4
Diaspore	2.72	9.60	6.87	AlOOH
Djurleite	-55.36	-89.28	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.73	-5.85	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.11	-13.83	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.25	-8.70	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.22	-38.85	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.09	-44.82	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.81	-12.41	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.36	-17.46	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.11	-64.71	-18.60	FeSe2
FeS(ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.40	-43.40	-11.00	FeSe
Fix_pe	-5.63	-5.63	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.41	-80.38	-13.97	PbS
Gibbsite	1.31	9.60	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.09	-9.10	-2.01	ZnSO4:7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.48	-332.52	-45.03	Fe3S4
Gummite	-6.85	0.83	7.67	UO3
Gypsum	-1.10	-5.71	-4.61	CaSO4:2H2O
H-Jarosite	-12.46	-24.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.03	-20.91	-12.88	H2MoO4
H2S(g)	-77.58	-85.59	-8.01	H2S
H2Se(g)	-41.89	-46.85	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.25	22.65	22.89	FeAl2O4
Hg(CH3)2(g)	-182.60	-256.31	-73.71	Hg(CH3)2
Hg(g)	-8.35	-16.23	-7.87	Hg
Hg(OH)2	-8.78	-12.27	-3.50	Hg(OH)2
Hg2(g)	-17.50	-32.45	-14.96	Hg2
Hg2(OH)2	-12.17	-6.91	5.26	Hg2(OH)2
Hg2CO3	-10.69	-26.74	-16.05	Hg2CO3
Hg2CrO4	-28.45	-37.15	-8.70	Hg2CrO4
Hg2F2	-18.40	-28.76	-10.36	Hg2F2
Hg2S	-80.82	-92.49	-11.68	Hg2S
Hg2SeO3	-17.33	-21.98	-4.66	Hg2SeO3
Hg2SO4	-17.85	-23.98	-6.13	Hg2SO4
Hg3O2CO3	-26.98	-56.66	-29.68	Hg3O2CO3
HgCl(g)	-32.92	-13.42	19.50	HgCl
HgCl2	-10.95	-32.21	-21.26	HgCl2
HgF(g)	-47.06	-14.38	32.68	HgF
HgF2(g)	-46.70	-34.13	12.57	HgF2
Hgmetal(l)	-2.77	-16.23	-13.45	Hg
HgSe	-3.43	-59.13	-55.69	HgSe
HgSeO3	-14.92	-27.35	-12.43	HgSeO3
HgSO4	-19.92	-29.34	-9.42	HgSO4

Huntite	-4.37	-34.34	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-5.29	-24.06	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-14.50	-23.27	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.43	-20.60	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.82	-20.62	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-35.34	-52.58	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-21.83	-22.35	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.28	-13.01	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-17.22	-17.95	-0.73	K ₂ SeO ₄
Langite	-3.24	14.25	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-6.22	-6.66	-0.43	PbO:PbSO ₄
Laurionite	-5.39	-4.77	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.49	5.21	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesianoferrite	0.74	17.60	16.86	Fe ₂ MgO ₄
Magnesite	-1.16	-8.62	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	1.13	-4.18	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.69	5.21	12.89	PbO
Matlockite	-6.72	-15.69	-8.97	PbClF
Melanothallite	-18.37	-12.11	6.26	CuCl ₂
Melanterite	-11.41	-13.62	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.77	-97.86	-45.09	HgS
Mg(OH) ₂ (active)	-7.58	11.22	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.34	-6.06	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.08	-201.39	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-21.21	5.15	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.34	8.86	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.40	-19.02	5.38	MgCrO ₄
MgF ₂	-2.51	-10.64	-8.13	MgF ₂
MgMoO ₄	-7.84	-9.69	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.92	-3.86	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-13.42	-14.62	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.36	41.16	73.52	Pb ₃ O ₄
Mirabilite	-6.39	-7.51	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.87	-7.97	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.03	-57.74	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.13	-90.05	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-15.78	-3.28	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.35	-10.63	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.45	-76.28	0.17	MnS
MnS (pnk)	-79.62	-76.28	3.34	MnS
MnSb	-96.26	-99.17	-2.91	MnSb
MnSe	-41.04	-37.54	3.50	MnSe
MnSeO ₃	-6.90	-5.77	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.75	-5.77	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-14.48	-16.53	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.34	-7.76	2.58	MnSO ₄
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO ₃	-12.91	-20.91	-8.00	MoO ₃
Morenosite	-7.75	-9.90	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-147.37	-217.63	-70.26	MoS ₂
Na-Jarosite	-8.58	-19.78	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.02	-50.91	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.60	-20.67	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.65	-32.25	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.83	-11.34	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.57	-11.34	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.81	-5.51	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-17.56	-16.28	1.28	Na ₂ SeO ₄
Na ₃ Sb	-176.00	-81.55	94.45	Na ₃ Sb
Na ₃ VO ₄	-30.98	5.71	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-35.55	1.85	37.40	Na ₄ V ₂ O ₇

Nantokite	-5.49	-12.22	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.28	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.72	-3.86	3.86	NaVO ₃
Nesquehonite	-3.95	-8.62	-4.67	MgCO ₃ ·3H ₂ O
Ni (OH) 2	-5.62	7.17	12.79	Ni (OH) 2
Ni ₃ (AsO ₄) 2·8H ₂ O	-25.38	-9.68	15.70	Ni ₃ (AsO ₄) 2·8H ₂ O
Ni ₄ (OH) 6SO ₄	-20.37	11.63	32.00	Ni ₄ (OH) 6SO ₄
NiCO ₃	-5.79	-12.66	-6.87	NiCO ₃
NiMoO ₄	-2.59	-13.73	-11.14	NiMoO ₄
NiS (alpha)	-72.81	-78.41	-5.60	NiS
NiS (beta)	-67.31	-78.41	-11.10	NiS
NiS (gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.98	-39.68	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.72	-7.90	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.15	-18.67	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-8.00	9.50	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-240.19	-301.26	-61.07	As ₂ S ₃
Otavite	-1.85	-13.85	-12.00	CdCO ₃
Pb (BO ₂) 2	-10.91	-4.39	6.52	Pb (BO ₂) 2
Pb (OH) 2	-2.94	5.21	8.15	Pb (OH) 2
Pb ₁₀ (OH) 6O (CO ₃) 6	-58.21	-66.97	-8.76	Pb ₁₀ (OH) 6O (CO ₃) 6
Pb ₂ (OH) 3Cl	-8.35	0.44	8.79	Pb ₂ (OH) 3Cl
Pb ₂ O (OH) 2	-15.78	10.41	26.19	Pb ₂ O (OH) 2
Pb ₂ O ₃	-25.08	35.96	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-8.87	-9.43	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-4.97	-6.87	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) 2	-21.38	-15.58	5.80	Pb ₃ (AsO ₄) 2
Pb ₃ (VO ₄) 2	-7.80	-1.66	6.14	Pb ₃ (VO ₄) 2
Pb ₃ O ₂ CO ₃	-15.24	-4.22	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-12.14	-1.45	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) 6SO ₄	-17.35	3.75	21.10	Pb ₄ (OH) 6SO ₄
Pb ₄ O ₃ SO ₄	-18.13	3.75	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-12.43	-25.03	-12.60	PbCrO ₄
PbF ₂	-9.21	-16.65	-7.44	PbF ₂
Pbmetal	-24.59	-20.34	4.25	Pb
PbMoO ₄	-0.08	-15.70	-15.62	PbMoO ₄
PbO·0.3H ₂ O	-7.77	5.21	12.98	PbO·0.33H ₂ O
PbSeO ₄	-13.80	-20.64	-6.84	PbSeO ₄
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.56	-29.37	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-18.85	30.75	49.60	PbO ₂
Portlandite	-11.45	11.36	22.80	Ca (OH) 2
Pyrite	-123.67	-142.18	-18.51	FeS ₂
Pyrochroite	-5.89	9.31	15.19	Mn (OH) 2
Pyrolusite	-6.53	34.85	41.38	MnO ₂
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO ₄ ·6H ₂ O
Rhodochrosite	0.05	-10.53	-10.58	MnCO ₃
Rutherfordine	-4.51	-19.01	-14.50	UO ₂ CO ₃
Sb (OH) 3	-12.15	-19.26	-7.11	Sb (OH) 3
Sb ₂ O ₄	-16.38	-12.98	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-26.39	-36.06	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-111.32	-179.08	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-58.79	-77.05	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-59.15	-77.05	-17.90	Sb ₄ O ₆
SbCl ₃	-49.75	-49.17	0.57	SbCl ₃
SbF ₃	-41.82	-52.05	-10.23	SbF ₃
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO ₂	-2.98	-30.80	-27.82	SbO ₂
Schoepite	-5.17	0.83	5.99	UO ₂ (OH) 2·H ₂ O
Semetal (am)	-14.20	-21.31	-7.11	Se
Semetal (hex)	-13.60	-21.31	-7.71	Se
Senarmontite	-26.16	-38.52	-12.37	Sb ₂ O ₃
SeO ₂	-15.20	-15.08	0.12	SeO ₂
SeO ₃	-46.88	-25.84	21.04	SeO ₃
Siderite	-6.15	-16.39	-10.24	FeCO ₃

Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.17	-77.62	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.83	-295.29	-50.46	Sb2S3
Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.19	7.83	7.64	CuO
Thenardite	-7.83	-7.51	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-8.35	-4.27	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.50	4.58	21.08	U3O8
U3Sb4	-582.48	-430.09	152.38	U3Sb4
U4O9	-33.45	-36.47	-3.02	U4O9
UF4	-29.68	-59.22	-29.54	UF4
UF4:2.5H2O	-26.50	-59.22	-32.72	UF4:2.5H2O
UO2 (am)	-16.44	-15.50	0.93	UO2
UO2 (NO3) 2	-48.98	-36.83	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.68	-36.83	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-40.22	-36.83	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.88	-36.83	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.79	0.83	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.77	-25.02	-2.25	UO2SeO4:4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.97	29.58	USb2
V (OH) 3	-19.18	-11.59	7.59	V (OH) 3
V2O5	-15.92	-17.28	-1.36	V2O5
V3O5	-40.91	-39.07	1.84	V3O5
V4O7	-50.77	-43.58	7.19	V4O7
V6O13	-42.07	-102.93	-60.86	V6O13
Valentinite	-30.04	-38.52	-8.48	Sb2O3
VC12	-63.17	-44.30	18.87	VC12
VC13	-64.93	-41.50	23.43	VC13
VF4	-63.15	-48.22	14.93	VF4
Vmetal	-93.93	-49.90	44.03	V
VO	-39.11	-24.36	14.76	VO
VO (OH) 2	-9.66	-4.51	5.15	VO (OH) 2
VO2Cl	-21.45	-18.61	2.84	VO2Cl
VOC1	-32.71	-21.56	11.15	VOC1
VOC12	-37.21	-24.45	12.76	VOC12
VOSO4	-25.19	-21.58	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.67	-77.62	-8.95	ZnS
Zincite	-3.37	7.97	11.33	ZnO
Zincosite	-13.03	-9.10	3.93	ZnSO4
Zn (BO2) 2	-9.92	-1.63	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-33.00	-29.69	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-4.23	7.97	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.51	7.97	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.79	7.97	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.57	7.97	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.77	7.97	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.64	-1.14	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.23	5.96	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-20.95	-7.30	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.15	-10.24	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.60	14.80	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.61	19.89	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.36	-13.89	-0.53	ZnF2
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO4	-2.81	-12.94	-10.13	ZnMoO4
ZnO (active)	-3.22	7.97	11.19	ZnO
ZnS (am)	-68.57	-77.62	-9.05	ZnS
ZnSb	-86.17	-75.16	11.01	ZnSb
ZnSe	-24.48	-38.88	-14.40	ZnSe
ZnSeO4:6H2O	-16.35	-17.87	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.46	-9.10	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 40.

Title Stage 2 Run-off mix
Mix 202
1 1
3 0.001240
4 0.013022
5 0.007066
6 0.000000
7 0.023691
8 0.000000
9 3.566961
10 5.583891
11 10.793291
12 57.862766
13 44.640567
14 17.900146
15 9.061957
Save solution 205
end

TITLE

Stage 2 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 202.

Mixture 202.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.

1.240e-03 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)

1.302e-02 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)

7.066e-03 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

2.369e-02 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

3.567e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)

5.584e+00 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)

1.079e+01 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

5.786e+01 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
4.464e+01 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
1.790e+01 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
9.062e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	9.806e-07	1.475e-04
As	4.508e-10	6.783e-08
B	4.436e-07	6.674e-05
Ba	1.330e-07	2.002e-05
C	7.209e-04	1.085e-01
Ca	3.119e-04	4.692e-02
Cd	1.164e-09	1.752e-07
Cl	3.738e-05	5.624e-03
Co	1.310e-11	1.971e-09
Cr	5.041e-12	7.584e-10
Cu	2.369e-06	3.565e-04
F	3.353e-05	5.044e-03
Fe	4.725e-08	7.109e-06
Hg	4.255e-11	6.402e-09
K	6.669e-05	1.003e-02
Mg	8.156e-05	1.227e-02
Mn	9.854e-07	1.483e-04
Mo	3.805e-08	5.725e-06
N	1.501e-07	2.258e-05
Na	1.196e-04	1.799e-02
Ni	2.134e-12	3.210e-10
Pb	3.321e-09	4.997e-07
S	2.503e-04	3.765e-02
Sb	4.001e-10	6.019e-08
Se	3.481e-09	5.238e-07
U	1.210e-08	1.820e-06
V	9.398e-09	1.414e-06
Zn	1.150e-07	1.731e-05

-----Description of solution-----

pH = 6.452 Charge balance
pe = 6.523 Adjusted to redox
equilibrium
Activity of water = 1.000
Ionic strength (mol/kgw) = 1.566e-03
Mass of water (kg) = 1.505e+02
Total alkalinity (eq/kg) = 4.118e-04
Total CO2 (mol/kg) = 7.209e-04
Temperature (°C) = 25.00
Electrical balance (eq) = 2.673e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 13
Total H = 1.670267e+04
Total O = 8.351735e+03

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.696e-07	3.536e-07	-6.432	-6.452	-0.019	0.00
OH-	2.977e-08	2.848e-08	-7.526	-7.546	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.806e-07					

AlF2+	4.657e-07	4.459e-07	-6.332	-6.351	-0.019	(0)
AlF3	1.702e-07	1.702e-07	-6.769	-6.769	0.000	(0)
Al (OH) 4-	1.670e-07	1.599e-07	-6.777	-6.796	-0.019	(0)
Al (OH) 2+	8.197e-08	7.848e-08	-7.086	-7.105	-0.019	(0)
Al (OH) 3	4.459e-08	4.459e-08	-7.351	-7.351	0.000	(0)
AlF+2	4.395e-08	3.694e-08	-7.357	-7.432	-0.075	(0)
AlOH+2	4.128e-09	3.470e-09	-8.384	-8.460	-0.075	(0)
AlF4-	2.702e-09	2.586e-09	-8.568	-8.587	-0.019	(0)
AlSO4+	1.956e-10	1.872e-10	-9.709	-9.728	-0.019	(0)
Al+3	1.813e-10	1.218e-10	-9.742	-9.914	-0.173	(0)
Al (SO4) 2-	4.150e-13	3.972e-13	-12.382	-12.401	-0.019	(0)
AlMo6O21-3	3.605e-39	2.372e-39	-38.443	-38.625	-0.182	(0)
As (3)	1.733e-21					
H3AsO3	1.730e-21	1.730e-21	-20.762	-20.762	0.000	(0)
H2AsO3-	2.629e-24	2.510e-24	-23.580	-23.600	-0.020	(0)
H4AsO3+	3.175e-28	3.031e-28	-27.498	-27.518	-0.020	(0)
HAsO3-2	7.796e-30	6.473e-30	-29.108	-29.189	-0.081	(0)
AsO3-3	1.072e-36	7.057e-37	-35.970	-36.151	-0.182	(0)
As (5)	4.508e-10					
H2AsO4-	3.323e-10	3.172e-10	-9.478	-9.499	-0.020	(0)
HAsO4-2	1.185e-10	9.838e-11	-9.926	-10.007	-0.081	(0)
H3AsO4	1.949e-14	1.949e-14	-13.710	-13.710	0.000	(0)
AsO4-3	1.337e-15	8.798e-16	-14.874	-15.056	-0.182	(0)
B	4.436e-07					
H3BO3	4.428e-07	4.430e-07	-6.354	-6.354	0.000	(0)
H2BO3-	7.611e-10	7.276e-10	-9.119	-9.138	-0.020	(0)
CaH2BO3+	1.096e-11	1.048e-11	-10.960	-10.980	-0.020	(0)
BF (OH) 3-	5.606e-12	5.359e-12	-11.251	-11.271	-0.020	(0)
MgH2BO3+	1.740e-12	1.663e-12	-11.759	-11.779	-0.020	(0)
NaH2BO3	1.317e-13	1.317e-13	-12.880	-12.880	0.000	(0)
BF2 (OH) 2-	6.425e-15	6.142e-15	-14.192	-14.212	-0.020	(0)
BaH2BO3+	2.614e-15	2.499e-15	-14.583	-14.602	-0.020	(0)
H5 (BO3) 2-	2.869e-16	2.743e-16	-15.542	-15.562	-0.020	(0)
BF3OH-	2.680e-20	2.562e-20	-19.572	-19.591	-0.020	(0)
H8 (BO3) 3-	1.271e-20	1.215e-20	-19.896	-19.915	-0.020	(0)
BF4-	1.414e-24	1.351e-24	-23.850	-23.869	-0.020	(0)
Ba	1.330e-07					
Ba+2	1.326e-07	1.111e-07	-6.877	-6.954	-0.077	(0)
BaHCO3+	4.326e-10	4.144e-10	-9.364	-9.383	-0.019	(0)
BaCO3	2.950e-12	2.950e-12	-11.530	-11.530	0.000	(0)
BaOH+	1.443e-14	1.382e-14	-13.841	-13.860	-0.019	(0)
BaH2BO3+	2.614e-15	2.499e-15	-14.583	-14.602	-0.020	(0)
BaNO3+	1.276e-16	1.218e-16	-15.894	-15.914	-0.020	(0)
BaNH3+2	7.061e-18	5.863e-18	-17.151	-17.232	-0.081	(0)
C (4)	7.209e-04					
HCO3-	4.077e-04	3.904e-04	-3.390	-3.409	-0.019	(0)
H2CO3	3.104e-04	3.104e-04	-3.508	-3.508	0.000	(0)
CaHCO3+	1.899e-06	1.819e-06	-5.722	-5.740	-0.019	(0)
CuCO3	4.333e-07	4.333e-07	-6.363	-6.363	0.000	(0)
MgHCO3+	2.753e-07	2.634e-07	-6.560	-6.579	-0.019	(0)
CO3-2	6.176e-08	5.176e-08	-7.209	-7.286	-0.077	(0)
CuHCO3+	3.668e-08	3.501e-08	-7.436	-7.456	-0.020	(0)
NaHCO3	2.508e-08	2.508e-08	-7.601	-7.601	0.000	(0)
CaCO3	2.052e-08	2.052e-08	-7.688	-7.688	0.000	(0)
UO2 (CO3) 2-2	6.548e-09	5.437e-09	-8.184	-8.265	-0.081	(0)
MnHCO3+	6.419e-09	6.145e-09	-8.193	-8.211	-0.019	(0)
UO2CO3	5.264e-09	5.264e-09	-8.279	-8.279	0.000	(0)
MgCO3	2.839e-09	2.839e-09	-8.547	-8.547	0.000	(0)
ZnHCO3+	1.184e-09	1.130e-09	-8.927	-8.947	-0.020	(0)
PbHCO3+	5.520e-10	5.269e-10	-9.258	-9.278	-0.020	(0)
BaHCO3+	4.326e-10	4.144e-10	-9.364	-9.383	-0.019	(0)
PbCO3	2.826e-10	2.826e-10	-9.549	-9.549	0.000	(0)
ZnCO3	2.727e-10	2.727e-10	-9.564	-9.564	0.000	(0)
NaCO3-	1.150e-10	1.101e-10	-9.939	-9.958	-0.019	(0)
Cu (CO3) 2-2	7.269e-11	6.036e-11	-10.139	-10.219	-0.081	(0)
UO2 (CO3) 3-4	2.967e-11	1.410e-11	-10.528	-10.851	-0.323	(0)
FeHCO3+	3.506e-12	3.358e-12	-11.455	-11.474	-0.019	(0)
BaCO3	2.950e-12	2.950e-12	-11.530	-11.530	0.000	(0)

		CdCO3	1.102e-12	1.102e-12	-11.958	-11.958	0.000	(0)
		CdHCO3+	8.699e-13	8.304e-13	-12.061	-12.081	-0.020	(0)
		CoHCO3+	3.261e-13	3.113e-13	-12.487	-12.507	-0.020	(0)
		NiHCO3+	8.363e-14	7.983e-14	-13.078	-13.098	-0.020	(0)
		Pb (CO3) 2-2	5.081e-14	4.219e-14	-13.294	-13.375	-0.081	(0)
		CoCO3	8.969e-15	8.969e-15	-14.047	-14.047	0.000	(0)
		NiCO3	3.203e-15	3.203e-15	-14.494	-14.494	0.000	(0)
		HgCO3	3.153e-15	3.153e-15	-14.501	-14.501	0.000	(0)
		Cd (CO3) 2-2	5.094e-17	4.230e-17	-16.293	-16.374	-0.081	(0)
		HgHCO3+	2.175e-17	2.076e-17	-16.663	-16.683	-0.020	(0)
		Hg (CO3) 2-2	6.216e-19	5.161e-19	-18.206	-18.287	-0.081	(0)
Ca	3.119e-04							
		Ca+2	2.985e-04	2.502e-04	-3.525	-3.602	-0.077	(0)
		CaSO4	1.135e-05	1.135e-05	-4.945	-4.945	0.000	(0)
		CaHCO3+	1.899e-06	1.819e-06	-5.722	-5.740	-0.019	(0)
		CaF+	8.649e-08	8.279e-08	-7.063	-7.082	-0.019	(0)
		CaCO3	2.052e-08	2.052e-08	-7.688	-7.688	0.000	(0)
		CaOH+	1.484e-10	1.422e-10	-9.829	-9.847	-0.019	(0)
		CaH2BO3+	1.096e-11	1.048e-11	-10.960	-10.980	-0.020	(0)
		CaNO3+	1.813e-13	1.730e-13	-12.742	-12.762	-0.020	(0)
		CaNH3+2	3.171e-14	2.633e-14	-13.499	-13.579	-0.081	(0)
		Ca (NH3) 2+2	1.056e-24	8.765e-25	-23.977	-24.057	-0.081	(0)
Cd	1.164e-09							
		Cd+2	1.115e-09	9.344e-10	-8.953	-9.029	-0.077	(0)
		CdSO4	4.336e-11	4.336e-11	-10.363	-10.363	0.000	(0)
		CdCl+	3.343e-12	3.191e-12	-11.476	-11.496	-0.020	(0)
		CdCO3	1.102e-12	1.102e-12	-11.958	-11.958	0.000	(0)
		CdHCO3+	8.699e-13	8.304e-13	-12.061	-12.081	-0.020	(0)
		CdF+	4.703e-13	4.490e-13	-12.328	-12.348	-0.020	(0)
		CdOH+	2.214e-13	2.114e-13	-12.655	-12.675	-0.020	(0)
		Cd (SO4) 2-2	1.395e-13	1.158e-13	-12.856	-12.936	-0.081	(0)
		CdOHC1	3.728e-15	3.728e-15	-14.429	-14.429	0.000	(0)
		CdCl2	4.758e-16	4.758e-16	-15.323	-15.323	0.000	(0)
		Cd (CO3) 2-2	5.094e-17	4.230e-17	-16.293	-16.374	-0.081	(0)
		Cd (OH) 2	3.797e-17	3.797e-17	-16.421	-16.421	0.000	(0)
		CdF2	2.716e-17	2.716e-17	-16.566	-16.566	0.000	(0)
		CdNO3+	6.770e-19	6.462e-19	-18.169	-18.190	-0.020	(0)
		CdSeO4	7.074e-20	7.074e-20	-19.150	-19.150	0.000	(0)
		CdCl3-	1.125e-20	1.074e-20	-19.949	-19.969	-0.020	(0)
		Cd2OH+3	1.504e-21	9.897e-22	-20.823	-21.004	-0.182	(0)
		Cd (OH) 3-	6.921e-23	6.607e-23	-22.160	-22.180	-0.020	(0)
		Cd (SeO3) 2-2	1.265e-24	1.050e-24	-23.898	-23.979	-0.081	(0)
		Cd (NO3) 2	7.084e-29	7.084e-29	-28.150	-28.150	0.000	(0)
		Cd (OH) 4-2	3.709e-31	3.080e-31	-30.431	-30.512	-0.081	(0)
		CdHS+	0.000e+00	0.000e+00	-81.295	-81.316	-0.020	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-154.406	-154.406	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-232.779	-232.800	-0.020	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-310.817	-310.898	-0.081	(0)
Cl	3.738e-05							
		Cl-	3.738e-05	3.576e-05	-4.427	-4.447	-0.019	(0)
		CuCl+	8.421e-11	8.057e-11	-10.075	-10.094	-0.019	(0)
		MnCl+	3.710e-11	3.552e-11	-10.431	-10.450	-0.019	(0)
		CuCl	9.393e-12	9.393e-12	-11.027	-11.027	0.000	(0)
		ZnCl+	8.598e-12	8.226e-12	-11.066	-11.085	-0.019	(0)
		CdCl+	3.343e-12	3.191e-12	-11.476	-11.496	-0.020	(0)
		PbCl+	2.415e-12	2.305e-12	-11.617	-11.637	-0.020	(0)
		ZnOHC1	3.067e-13	3.067e-13	-12.513	-12.513	0.000	(0)
		HgClOH	9.156e-14	9.156e-14	-13.038	-13.038	0.000	(0)
		CuCl2-	7.335e-14	7.018e-14	-13.135	-13.154	-0.019	(0)
		HgCl2	6.511e-15	6.511e-15	-14.186	-14.186	0.000	(0)
		CdOHC1	3.728e-15	3.728e-15	-14.429	-14.429	0.000	(0)
		MnCl2	1.794e-15	1.794e-15	-14.746	-14.746	0.000	(0)
		UO2Cl+	1.552e-15	1.482e-15	-14.809	-14.829	-0.020	(0)
		CoCl+	1.329e-15	1.268e-15	-14.877	-14.897	-0.020	(0)
		CuCl2	9.991e-16	9.991e-16	-15.000	-15.000	0.000	(0)
		CdCl2	4.758e-16	4.758e-16	-15.323	-15.323	0.000	(0)
		ZnCl2	4.663e-16	4.663e-16	-15.331	-15.331	0.000	(0)
		PbCl2	3.682e-16	3.682e-16	-15.434	-15.434	0.000	(0)

NiCl+	1.590e-16	1.518e-16	-15.799	-15.819	-0.020	(0)
HgCl+	3.805e-17	3.633e-17	-16.420	-16.440	-0.020	(0)
HgCl3-	2.439e-18	2.329e-18	-17.613	-17.633	-0.020	(0)
CuCl3-2	6.390e-19	5.366e-19	-18.195	-18.270	-0.076	(0)
FeCl+2	2.724e-19	2.288e-19	-18.565	-18.641	-0.076	(0)
CrCl+2	9.147e-20	7.595e-20	-19.039	-19.119	-0.081	(0)
MnCl3-	1.846e-20	1.767e-20	-19.734	-19.753	-0.019	(0)
ZnCl3-	1.384e-20	1.325e-20	-19.859	-19.878	-0.019	(0)
CdCl3-	1.125e-20	1.074e-20	-19.949	-19.969	-0.020	(0)
VOCl+	6.965e-21	6.649e-21	-20.157	-20.177	-0.020	(0)
PbCl3-	5.492e-21	5.243e-21	-20.260	-20.280	-0.020	(0)
HgCl4-2	3.993e-22	3.315e-22	-21.399	-21.479	-0.081	(0)
CuCl3-	3.485e-22	3.335e-22	-21.458	-21.477	-0.019	(0)
FeCl2+	3.817e-23	3.654e-23	-22.418	-22.437	-0.019	(0)
NiCl2	2.733e-23	2.733e-23	-22.563	-22.563	0.000	(0)
CrOHC12	1.470e-24	1.470e-24	-23.833	-23.833	0.000	(0)
ZnCl4-2	2.820e-25	2.369e-25	-24.550	-24.625	-0.076	(0)
CrCl2+	2.700e-25	2.577e-25	-24.569	-24.589	-0.020	(0)
PbCl4-2	1.032e-25	8.570e-26	-24.986	-25.067	-0.081	(0)
FeCl3	1.307e-28	1.307e-28	-27.884	-27.884	0.000	(0)
CuCl4-2	7.117e-29	5.977e-29	-28.148	-28.223	-0.076	(0)
CrO3Cl-	2.702e-31	2.579e-31	-30.568	-30.589	-0.020	(0)
CoCl+2	1.194e-39	9.910e-40	-38.923	-39.004	-0.081	(0)
UCl+3	0.000e+00	0.000e+00	-42.794	-42.976	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.359	-63.440	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.515	-65.596	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.152	-80.233	-0.081	(0)
Co (2)	1.310e-11					
Co+2	1.235e-11	1.025e-11	-10.909	-10.989	-0.081	(0)
CoSO4	4.049e-13	4.049e-13	-12.393	-12.393	0.000	(0)
CoHCO3+	3.261e-13	3.113e-13	-12.487	-12.507	-0.020	(0)
CoF+	1.030e-14	9.828e-15	-13.987	-14.008	-0.020	(0)
CoCO3	8.969e-15	8.969e-15	-14.047	-14.047	0.000	(0)
CoOH+	6.101e-15	5.824e-15	-14.215	-14.235	-0.020	(0)
CoCl+	1.329e-15	1.268e-15	-14.877	-14.897	-0.020	(0)
Co (OH) 2	1.317e-17	1.317e-17	-16.880	-16.880	0.000	(0)
CoNO2+	6.903e-18	6.589e-18	-17.161	-17.181	-0.020	(0)
Co (NH3) +2	1.241e-19	1.030e-19	-18.906	-18.987	-0.081	(0)
CoNO3+	3.722e-21	3.553e-21	-20.429	-20.449	-0.020	(0)
CoSeO4	2.089e-21	2.089e-21	-20.680	-20.680	0.000	(0)
Co (OH) 3-	7.842e-24	7.486e-24	-23.106	-23.126	-0.020	(0)
CoOOH-	1.968e-24	1.878e-24	-23.706	-23.726	-0.020	(0)
Co2OH+3	4.546e-27	2.992e-27	-26.342	-26.524	-0.182	(0)
Co (NH3) 2+2	4.425e-28	3.675e-28	-27.354	-27.435	-0.081	(0)
Co (NO3) 2	1.581e-30	1.581e-30	-29.801	-29.801	0.000	(0)
Co (OH) 4-2	4.069e-32	3.378e-32	-31.391	-31.471	-0.081	(0)
Co (NH3) 3+2	4.658e-37	3.868e-37	-36.332	-36.413	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-45.690	-45.770	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.316	-48.639	-0.323	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-55.547	-55.628	-0.081	(0)
Co (3)	2.373e-32					
CoOH+2	2.373e-32	1.971e-32	-31.625	-31.705	-0.081	(0)
Co+3	2.026e-37	1.362e-37	-36.693	-36.866	-0.173	(0)
CoCl+2	1.194e-39	9.910e-40	-38.923	-39.004	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.359	-63.440	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-74.544	-74.564	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.051	-79.132	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.152	-80.233	-0.081	(0)
Cr (2)	1.415e-28					
Cr+2	1.415e-28	1.175e-28	-27.849	-27.930	-0.081	(0)
Cr (3)	5.041e-12					
Cr (OH) 2+	3.711e-12	3.542e-12	-11.431	-11.451	-0.020	(0)
Cr (OH) +2	1.231e-12	1.022e-12	-11.910	-11.990	-0.081	(0)
CrOHSO4	4.803e-14	4.803e-14	-13.319	-13.319	0.000	(0)
Cr (OH) 3	3.789e-14	3.789e-14	-13.421	-13.421	0.000	(0)
CrF+2	9.496e-15	7.885e-15	-14.022	-14.103	-0.081	(0)
Cr+3	2.493e-15	1.641e-15	-14.603	-14.785	-0.182	(0)
CrSO4+	7.947e-16	7.586e-16	-15.100	-15.120	-0.020	(0)

CrO2-	5.332e-17	5.089e-17	-16.273	-16.293	-0.020	(0)
Cr (OH) 4-	4.500e-17	4.296e-17	-16.347	-16.367	-0.020	(0)
CrCl+2	9.147e-20	7.595e-20	-19.039	-19.119	-0.081	(0)
Cr2 (OH) 2SO4+2	5.344e-24	4.438e-24	-23.272	-23.353	-0.081	(0)
CrOHC12	1.470e-24	1.470e-24	-23.833	-23.833	0.000	(0)
CrCl2+	2.700e-25	2.577e-25	-24.569	-24.589	-0.020	(0)
Cr2 (OH) 2 (SO4) 2	5.219e-26	5.219e-26	-25.282	-25.282	0.000	(0)
CrNO3+2	1.889e-26	1.569e-26	-25.724	-25.804	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.266	-52.347	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.070	-62.252	-0.182	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.515	-65.596	-0.081	(0)
Cr (6)	6.782e-21					
HCrO4-	3.397e-21	3.243e-21	-20.469	-20.489	-0.020	(0)
CrO4-2	3.382e-21	2.834e-21	-20.471	-20.548	-0.077	(0)
NaCrO4-	1.686e-24	1.609e-24	-23.773	-23.793	-0.020	(0)
KCrO4-	7.029e-25	6.710e-25	-24.153	-24.173	-0.020	(0)
H2CrO4	9.295e-28	9.295e-28	-27.032	-27.032	0.000	(0)
CrO3SO4-2	8.327e-29	6.914e-29	-28.079	-28.160	-0.081	(0)
CrO3Cl-	2.702e-31	2.579e-31	-30.568	-30.589	-0.020	(0)
Cr2O7-2	4.392e-40	3.647e-40	-39.357	-39.438	-0.081	(0)
Cu (1)	2.280e-10					
Cu+	2.185e-10	2.086e-10	-9.660	-9.681	-0.020	(0)
CuCl	9.393e-12	9.393e-12	-11.027	-11.027	0.000	(0)
CuCl2-	7.335e-14	7.018e-14	-13.135	-13.154	-0.019	(0)
CuCl3-2	6.390e-19	5.366e-19	-18.195	-18.270	-0.076	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.836	-153.976	-0.140	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.569	-154.706	-0.137	(0)
Cu (2)	2.369e-06					
Cu+2	1.696e-06	1.421e-06	-5.771	-5.847	-0.077	(0)
CuCO3	4.333e-07	4.333e-07	-6.363	-6.363	0.000	(0)
CuOH+	1.338e-07	1.280e-07	-6.874	-6.893	-0.019	(0)
CuSO4	6.447e-08	6.447e-08	-7.191	-7.191	0.000	(0)
CuHCO3+	3.668e-08	3.501e-08	-7.436	-7.456	-0.020	(0)
CuF+	2.849e-09	2.719e-09	-8.545	-8.566	-0.020	(0)
Cu (OH) 2	7.273e-10	7.273e-10	-9.138	-9.138	0.000	(0)
Cu2 (OH) 2+2	4.957e-10	4.116e-10	-9.305	-9.386	-0.081	(0)
CuCl+	8.421e-11	8.057e-11	-10.075	-10.094	-0.019	(0)
Cu (CO3) 2-2	7.269e-11	6.036e-11	-10.139	-10.219	-0.081	(0)
CuNO2+	1.422e-11	1.358e-11	-10.847	-10.867	-0.020	(0)
CuNH3+2	1.465e-12	1.216e-12	-11.834	-11.915	-0.081	(0)
Cu (OH) 3-	4.450e-14	4.248e-14	-13.352	-13.372	-0.020	(0)
CuNO3+	1.030e-15	9.832e-16	-14.987	-15.007	-0.020	(0)
CuCl2	9.991e-16	9.991e-16	-15.000	-15.000	0.000	(0)
Cu (NO2) 2	1.267e-17	1.267e-17	-16.897	-16.897	0.000	(0)
Cu (OH) 4-2	1.147e-20	9.522e-21	-19.941	-20.021	-0.081	(0)
CuCl3-	3.485e-22	3.335e-22	-21.458	-21.477	-0.019	(0)
Cu (NO3) 2	2.707e-26	2.707e-26	-25.567	-25.567	0.000	(0)
CuCl4-2	7.117e-29	5.977e-29	-28.148	-28.223	-0.076	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.810	-220.830	-0.020	(0)
F	3.353e-05					
F-	3.169e-05	3.032e-05	-4.499	-4.518	-0.019	(0)
AlF2+	4.657e-07	4.459e-07	-6.332	-6.351	-0.019	(0)
MgF+	2.344e-07	2.243e-07	-6.630	-6.649	-0.019	(0)
AlF3	1.702e-07	1.702e-07	-6.769	-6.769	0.000	(0)
CaF+	8.649e-08	8.279e-08	-7.063	-7.082	-0.019	(0)
AlF+2	4.395e-08	3.694e-08	-7.357	-7.432	-0.075	(0)
HF	1.586e-08	1.586e-08	-7.800	-7.800	0.000	(0)
CuF+	2.849e-09	2.719e-09	-8.545	-8.566	-0.020	(0)
AlF4-	2.702e-09	2.586e-09	-8.568	-8.587	-0.019	(0)
NaF	2.186e-09	2.186e-09	-8.660	-8.660	0.000	(0)
MnF+	9.947e-10	9.522e-10	-9.002	-9.021	-0.019	(0)
UO2F+	1.120e-10	1.069e-10	-9.951	-9.971	-0.020	(0)
ZnF+	5.803e-11	5.539e-11	-10.236	-10.257	-0.020	(0)
UO2F2	9.349e-12	9.349e-12	-11.029	-11.029	0.000	(0)
BF (OH) 3-	5.606e-12	5.359e-12	-11.251	-11.271	-0.020	(0)
PbF+	4.066e-12	3.881e-12	-11.391	-11.411	-0.020	(0)
HF2-	1.911e-12	1.828e-12	-11.719	-11.738	-0.019	(0)
CdF+	4.703e-13	4.490e-13	-12.328	-12.348	-0.020	(0)

UO2F3-	7.459e-14	7.120e-14	-13.127	-13.148	-0.020	(0)
CoF+	1.030e-14	9.828e-15	-13.987	-14.008	-0.020	(0)
CrF+2	9.496e-15	7.885e-15	-14.022	-14.103	-0.081	(0)
FeF+2	8.384e-15	7.041e-15	-14.077	-14.152	-0.076	(0)
BF2 (OH) 2-	6.425e-15	6.142e-15	-14.192	-14.212	-0.020	(0)
FeF2+	5.968e-15	5.713e-15	-14.224	-14.243	-0.019	(0)
PbF2	2.316e-15	2.316e-15	-14.635	-14.635	0.000	(0)
NiF+	1.323e-15	1.263e-15	-14.878	-14.898	-0.020	(0)
VO2F	1.176e-15	1.176e-15	-14.930	-14.930	0.000	(0)
H2F2	6.736e-16	6.736e-16	-15.172	-15.172	0.000	(0)
FeF3	2.444e-16	2.444e-16	-15.612	-15.612	0.000	(0)
CdF2	2.716e-17	2.716e-17	-16.566	-16.566	0.000	(0)
UO2F4-2	2.065e-17	1.715e-17	-16.685	-16.766	-0.081	(0)
VO2F2-	1.356e-17	1.295e-17	-16.868	-16.888	-0.020	(0)
VOF+	1.262e-17	1.205e-17	-16.899	-16.919	-0.020	(0)
PbF3-	1.395e-19	1.332e-19	-18.855	-18.876	-0.020	(0)
VOF2	1.370e-19	1.370e-19	-18.863	-18.863	0.000	(0)
BF3OH-	2.680e-20	2.562e-20	-19.572	-19.591	-0.020	(0)
VO2F3-2	5.896e-21	4.896e-21	-20.229	-20.310	-0.081	(0)
VOF3-	1.544e-22	1.474e-22	-21.811	-21.832	-0.020	(0)
HgF+	5.993e-23	5.721e-23	-22.222	-22.243	-0.020	(0)
PbF4-2	2.327e-24	1.932e-24	-23.633	-23.714	-0.081	(0)
BF4-	1.414e-24	1.351e-24	-23.850	-23.869	-0.020	(0)
VO2F4-3	1.110e-25	7.304e-26	-24.955	-25.136	-0.182	(0)
Sb (OH) 2F	6.056e-26	6.056e-26	-25.218	-25.218	0.000	(0)
SbOF	5.955e-26	5.955e-26	-25.225	-25.225	0.000	(0)
VOF4-2	2.172e-26	1.804e-26	-25.663	-25.744	-0.081	(0)
UF3+	6.853e-33	6.542e-33	-32.164	-32.184	-0.020	(0)
UF2+2	1.640e-33	1.361e-33	-32.785	-32.866	-0.081	(0)
UF4	2.175e-35	2.175e-35	-34.663	-34.663	0.000	(0)
UF+3	5.419e-36	3.567e-36	-35.266	-35.448	-0.182	(0)
UF5-	2.737e-38	2.613e-38	-37.563	-37.583	-0.020	(0)
UF6-2	2.881e-40	2.392e-40	-39.540	-39.621	-0.081	(0)
Fe (2)	8.603e-10					
Fe+2	8.228e-10	6.832e-10	-9.085	-9.165	-0.081	(0)
FeSO4	3.320e-11	3.320e-11	-10.479	-10.479	0.000	(0)
FeHCO3+	3.506e-12	3.358e-12	-11.455	-11.474	-0.019	(0)
FeOH+	8.091e-13	7.745e-13	-12.092	-12.111	-0.019	(0)
Fe (OH) 2	1.752e-17	1.752e-17	-16.756	-16.756	0.000	(0)
Fe (OH) 3-	1.648e-19	1.578e-19	-18.783	-18.802	-0.019	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.804	-160.804	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-239.040	-239.061	-0.020	(0)
Fe (3)	4.639e-08					
Fe (OH) 2+	4.506e-08	4.314e-08	-7.346	-7.365	-0.019	(0)
Fe (OH) 3	1.320e-09	1.320e-09	-8.880	-8.880	0.000	(0)
FeOH+2	4.637e-12	3.894e-12	-11.334	-11.410	-0.076	(0)
Fe (OH) 4-	3.654e-12	3.499e-12	-11.437	-11.456	-0.019	(0)
FeF+2	8.384e-15	7.041e-15	-14.077	-14.152	-0.076	(0)
FeF2+	5.968e-15	5.713e-15	-14.224	-14.243	-0.019	(0)
FeSO4+	4.915e-16	4.705e-16	-15.308	-15.327	-0.019	(0)
Fe+3	3.152e-16	2.118e-16	-15.501	-15.674	-0.173	(0)
FeF3	2.444e-16	2.444e-16	-15.612	-15.612	0.000	(0)
Fe (SO4) 2-	2.086e-18	1.991e-18	-17.681	-17.701	-0.020	(0)
FeCl+2	2.724e-19	2.288e-19	-18.565	-18.641	-0.076	(0)
FeHSeO3+2	2.211e-21	1.836e-21	-20.655	-20.736	-0.081	(0)
Fe2 (OH) 2+4	1.056e-21	5.022e-22	-20.976	-21.299	-0.323	(0)
FeCl2+	3.817e-23	3.654e-23	-22.418	-22.437	-0.019	(0)
FeNO3+2	5.579e-25	4.633e-25	-24.253	-24.334	-0.081	(0)
Fe3 (OH) 4+5	1.001e-27	3.132e-28	-27.000	-27.504	-0.505	(0)
FeCl3	1.307e-28	1.307e-28	-27.884	-27.884	0.000	(0)
H (0)	1.589e-29					
H2	7.944e-30	7.947e-30	-29.100	-29.100	0.000	(0)
Hg (0)	4.219e-11					
Hg	4.219e-11	4.219e-11	-10.375	-10.375	0.000	(0)
Hg (1)	3.512e-21					
Hg2+2	1.756e-21	1.458e-21	-20.756	-20.836	-0.081	(0)
Hg (2)	3.617e-13					
Hg (OH) 2	2.604e-13	2.605e-13	-12.584	-12.584	0.000	(0)

	HgClOH	9.156e-14	9.156e-14	-13.038	-13.038	0.000	(0)
	HgCl2	6.511e-15	6.511e-15	-14.186	-14.186	0.000	(0)
	HgCO3	3.153e-15	3.153e-15	-14.501	-14.501	0.000	(0)
	HgOH+	6.046e-17	5.771e-17	-16.219	-16.239	-0.020	(0)
	HgCl+	3.805e-17	3.633e-17	-16.420	-16.440	-0.020	(0)
	HgHCO3+	2.175e-17	2.076e-17	-16.663	-16.683	-0.020	(0)
	HgCl3-	2.439e-18	2.329e-18	-17.613	-17.633	-0.020	(0)
	Hg (CO3) 2-2	6.216e-19	5.161e-19	-18.206	-18.287	-0.081	(0)
	Hg+2	6.131e-20	5.091e-20	-19.212	-19.293	-0.081	(0)
	HgNH3+2	3.234e-21	2.685e-21	-20.490	-20.571	-0.081	(0)
	HgSO4	2.639e-21	2.639e-21	-20.579	-20.579	0.000	(0)
	Hg (OH) 3-	9.782e-22	9.338e-22	-21.010	-21.030	-0.020	(0)
	HgCl4-2	3.993e-22	3.315e-22	-21.399	-21.479	-0.081	(0)
	Hg (NH3) 2+2	2.704e-22	2.245e-22	-21.568	-21.649	-0.081	(0)
	HgF+	5.993e-23	5.721e-23	-22.222	-22.243	-0.020	(0)
	HgNO3+	4.307e-30	4.111e-30	-29.366	-29.386	-0.020	(0)
	Hg (NH3) 3+2	8.999e-32	7.473e-32	-31.046	-31.127	-0.081	(0)
	Hg (NO3) 2	3.737e-40	3.737e-40	-39.427	-39.427	0.000	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.224	-40.304	-0.081	(0)
	HgHS2-	0.000e+00	0.000e+00	-141.482	-141.502	-0.020	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.559	-141.559	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-143.678	-143.758	-0.081	(0)
K		6.669e-05					
	K+	6.659e-05	6.372e-05	-4.177	-4.196	-0.019	(0)
	KSO4-	9.327e-08	8.930e-08	-7.030	-7.049	-0.019	(0)
	KCrO4-	7.029e-25	6.710e-25	-24.153	-24.173	-0.020	(0)
Mg		8.156e-05					
	Mg+2	7.867e-05	6.593e-05	-4.104	-4.181	-0.077	(0)
	MgSO4	2.375e-06	2.375e-06	-5.624	-5.624	0.000	(0)
	MgHCO3+	2.753e-07	2.634e-07	-6.560	-6.579	-0.019	(0)
	MgF+	2.344e-07	2.243e-07	-6.630	-6.649	-0.019	(0)
	MgCO3	2.839e-09	2.839e-09	-8.547	-8.547	0.000	(0)
	MgOH+	7.802e-10	7.475e-10	-9.108	-9.126	-0.019	(0)
	MgH2BO3+	1.740e-12	1.663e-12	-11.759	-11.779	-0.020	(0)
Mn (2)		9.854e-07					
	Mn+2	9.501e-07	7.889e-07	-6.022	-6.103	-0.081	(0)
	MnSO4	2.777e-08	2.777e-08	-7.556	-7.556	0.000	(0)
	MnHCO3+	6.419e-09	6.145e-09	-8.193	-8.211	-0.019	(0)
	MnF+	9.947e-10	9.522e-10	-9.002	-9.021	-0.019	(0)
	MnOH+	5.895e-11	5.643e-11	-10.230	-10.248	-0.019	(0)
	MnCl+	3.710e-11	3.552e-11	-10.431	-10.450	-0.019	(0)
	MnCl2	1.794e-15	1.794e-15	-14.746	-14.746	0.000	(0)
	MnNO3+	2.865e-16	2.735e-16	-15.543	-15.563	-0.020	(0)
	MnSeO4	8.632e-17	8.632e-17	-16.064	-16.064	0.000	(0)
	MnCl3-	1.846e-20	1.767e-20	-19.734	-19.753	-0.019	(0)
	Mn (OH) 3-	2.954e-22	2.828e-22	-21.530	-21.549	-0.019	(0)
	Mn (NO3) 2	1.502e-25	1.502e-25	-24.823	-24.823	0.000	(0)
	Mn (OH) 4-2	3.096e-29	2.600e-29	-28.509	-28.585	-0.076	(0)
	MnSe	0.000e+00	0.000e+00	-46.510	-46.510	0.000	(0)
Mn (3)		1.750e-25					
	Mn+3	1.750e-25	1.176e-25	-24.757	-24.930	-0.173	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-46.744	-46.819	-0.076	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-49.649	-49.668	-0.019	(0)
Mo		3.805e-08					
	MoO4-2	3.782e-08	3.169e-08	-7.422	-7.499	-0.077	(0)
	HMoO4-	2.336e-10	2.230e-10	-9.632	-9.652	-0.020	(0)
	H2MoO4	5.775e-13	5.775e-13	-12.238	-12.238	0.000	(0)
	AlMo6O21-3	3.605e-39	2.372e-39	-38.443	-38.625	-0.182	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.388	-51.115	-0.727	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.675	-51.180	-0.505	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.526	-52.849	-0.323	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-55.873	-56.055	-0.182	(0)
N (-3)		5.444e-08					
	NH4+	5.424e-08	5.185e-08	-7.266	-7.285	-0.020	(0)
	NH4SO4-	1.149e-10	1.100e-10	-9.940	-9.959	-0.019	(0)
	NH3	8.361e-11	8.361e-11	-10.078	-10.078	0.000	(0)

	CuNH3+2	1.465e-12	1.216e-12	-11.834	-11.915	-0.081	(0)
	CaNH3+2	3.171e-14	2.633e-14	-13.499	-13.579	-0.081	(0)
	BaNH3+2	7.061e-18	5.863e-18	-17.151	-17.232	-0.081	(0)
	Co (NH3) +2	1.241e-19	1.030e-19	-18.906	-18.987	-0.081	(0)
	NiNH3+2	8.970e-20	7.448e-20	-19.047	-19.128	-0.081	(0)
	HgNH3+2	3.234e-21	2.685e-21	-20.490	-20.571	-0.081	(0)
	Hg (NH3) 2+2	2.704e-22	2.245e-22	-21.568	-21.649	-0.081	(0)
	Ca (NH3) 2+2	1.056e-24	8.765e-25	-23.977	-24.057	-0.081	(0)
	Ni (NH3) 2+2	1.084e-27	9.000e-28	-26.965	-27.046	-0.081	(0)
	Co (NH3) 2+2	4.425e-28	3.675e-28	-27.354	-27.435	-0.081	(0)
	Hg (NH3) 3+2	8.999e-32	7.473e-32	-31.046	-31.127	-0.081	(0)
	Co (NH3) 3+2	4.658e-37	3.868e-37	-36.332	-36.413	-0.081	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.224	-40.304	-0.081	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-45.690	-45.770	-0.081	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.266	-52.347	-0.081	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-55.547	-55.628	-0.081	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.070	-62.252	-0.182	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.359	-63.440	-0.081	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.515	-65.596	-0.081	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-74.544	-74.564	-0.020	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.051	-79.132	-0.081	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.152	-80.233	-0.081	(0)
N (3)	9.541e-08						
	NO2-	9.540e-08	9.122e-08	-7.020	-7.040	-0.019	(0)
	CuNO2+	1.422e-11	1.358e-11	-10.847	-10.867	-0.020	(0)
	Cu (NO2) 2	1.267e-17	1.267e-17	-16.897	-16.897	0.000	(0)
	CoNO2+	6.903e-18	6.589e-18	-17.161	-17.181	-0.020	(0)
N (5)	2.288e-10						
	NO3-	2.286e-10	2.187e-10	-9.641	-9.660	-0.019	(0)
	CaNO3+	1.813e-13	1.730e-13	-12.742	-12.762	-0.020	(0)
	CuNO3+	1.030e-15	9.832e-16	-14.987	-15.007	-0.020	(0)
	MnNO3+	2.865e-16	2.735e-16	-15.543	-15.563	-0.020	(0)
	BaNO3+	1.276e-16	1.218e-16	-15.894	-15.914	-0.020	(0)
	ZnNO3+	5.270e-17	5.031e-17	-16.278	-16.298	-0.020	(0)
	PbNO3+	6.156e-18	5.876e-18	-17.211	-17.231	-0.020	(0)
	CdNO3+	6.770e-19	6.462e-19	-18.169	-18.190	-0.020	(0)
	UO2NO3+	1.168e-20	1.115e-20	-19.933	-19.953	-0.020	(0)
	CoNO3+	3.722e-21	3.553e-21	-20.429	-20.449	-0.020	(0)
	NiNO3+	9.547e-22	9.113e-22	-21.020	-21.040	-0.020	(0)
	VO2NO3	2.447e-24	2.447e-24	-23.611	-23.611	0.000	(0)
	FeNO3+2	5.579e-25	4.633e-25	-24.253	-24.334	-0.081	(0)
	Mn (NO3) 2	1.502e-25	1.502e-25	-24.823	-24.823	0.000	(0)
	Cu (NO3) 2	2.707e-26	2.707e-26	-25.567	-25.567	0.000	(0)
	CrNO3+2	1.889e-26	1.569e-26	-25.724	-25.804	-0.081	(0)
	Zn (NO3) 2	2.195e-27	2.195e-27	-26.658	-26.658	0.000	(0)
	Pb (NO3) 2	2.183e-27	2.183e-27	-26.661	-26.661	0.000	(0)
	Cd (NO3) 2	7.084e-29	7.084e-29	-28.150	-28.150	0.000	(0)
	HgNO3+	4.307e-30	4.111e-30	-29.366	-29.386	-0.020	(0)
	Co (NO3) 2	1.581e-30	1.581e-30	-29.801	-29.801	0.000	(0)
	Hg (NO3) 2	3.737e-40	3.737e-40	-39.427	-39.427	0.000	(0)
Na	1.196e-04						
	Na+	1.194e-04	1.143e-04	-3.923	-3.942	-0.019	(0)
	NaSO4-	1.269e-07	1.215e-07	-6.897	-6.916	-0.019	(0)
	NaHCO3	2.508e-08	2.508e-08	-7.601	-7.601	0.000	(0)
	NaF	2.186e-09	2.186e-09	-8.660	-8.660	0.000	(0)
	NaCO3-	1.150e-10	1.101e-10	-9.939	-9.958	-0.019	(0)
	NaH2BO3	1.317e-13	1.317e-13	-12.880	-12.880	0.000	(0)
	NaCrO4-	1.686e-24	1.609e-24	-23.773	-23.793	-0.020	(0)
Ni	2.134e-12						
	Ni+2	1.979e-12	1.659e-12	-11.703	-11.780	-0.077	(0)
	NiHCO3+	8.363e-14	7.983e-14	-13.078	-13.098	-0.020	(0)
	NiSO4	6.552e-14	6.552e-14	-13.184	-13.184	0.000	(0)
	NiCO3	3.203e-15	3.203e-15	-14.494	-14.494	0.000	(0)
	NiF+	1.323e-15	1.263e-15	-14.878	-14.898	-0.020	(0)
	NiOH+	6.230e-16	5.947e-16	-15.206	-15.226	-0.020	(0)
	NiCl+	1.590e-16	1.518e-16	-15.799	-15.819	-0.020	(0)
	Ni (OH) 2	1.345e-18	1.345e-18	-17.871	-17.871	0.000	(0)
	Ni (SO4) 2-2	5.173e-19	4.295e-19	-18.286	-18.367	-0.081	(0)

NiNH3+2	8.970e-20	7.448e-20	-19.047	-19.128	-0.081	(0)
NiNO3+	9.547e-22	9.113e-22	-21.020	-21.040	-0.020	(0)
NiSeO4	3.154e-22	3.154e-22	-21.501	-21.501	0.000	(0)
Ni (OH) 3-	4.013e-23	3.831e-23	-22.397	-22.417	-0.020	(0)
NiCl2	2.733e-23	2.733e-23	-22.563	-22.563	0.000	(0)
Ni (NH3) 2+2	1.084e-27	9.000e-28	-26.965	-27.046	-0.081	(0)
O (0)	1.605e-34					
O2	8.023e-35	8.026e-35	-34.096	-34.096	0.000	(0)
Pb	3.321e-09					
Pb+2	2.167e-09	1.816e-09	-8.664	-8.741	-0.077	(0)
PbHCO3+	5.520e-10	5.269e-10	-9.258	-9.278	-0.020	(0)
PbCO3	2.826e-10	2.826e-10	-9.549	-9.549	0.000	(0)
PbSO4	1.761e-10	1.761e-10	-9.754	-9.754	0.000	(0)
PbOH+	1.361e-10	1.299e-10	-9.866	-9.886	-0.020	(0)
PbF+	4.066e-12	3.881e-12	-11.391	-11.411	-0.020	(0)
PbCl+	2.415e-12	2.305e-12	-11.617	-11.637	-0.020	(0)
Pb (SO4) 2-2	2.530e-13	2.101e-13	-12.597	-12.678	-0.081	(0)
Pb (OH) 2	1.170e-13	1.170e-13	-12.932	-12.932	0.000	(0)
Pb (CO3) 2-2	5.081e-14	4.219e-14	-13.294	-13.375	-0.081	(0)
PbF2	2.316e-15	2.316e-15	-14.635	-14.635	0.000	(0)
PbCl2	3.682e-16	3.682e-16	-15.434	-15.434	0.000	(0)
PbNO3+	6.156e-18	5.876e-18	-17.211	-17.231	-0.020	(0)
Pb2OH+3	5.684e-18	3.741e-18	-17.245	-17.427	-0.182	(0)
Pb (OH) 3-	3.491e-18	3.332e-18	-17.457	-17.477	-0.020	(0)
PbF3-	1.395e-19	1.332e-19	-18.855	-18.876	-0.020	(0)
PbCl3-	5.492e-21	5.243e-21	-20.260	-20.280	-0.020	(0)
Pb (OH) 4-2	2.799e-23	2.324e-23	-22.553	-22.634	-0.081	(0)
PbF4-2	2.327e-24	1.932e-24	-23.633	-23.714	-0.081	(0)
Pb3 (OH) 4+2	5.976e-25	4.962e-25	-24.224	-24.304	-0.081	(0)
PbCl4-2	1.032e-25	8.570e-26	-24.986	-25.067	-0.081	(0)
Pb (NO3) 2	2.183e-27	2.183e-27	-26.661	-26.661	0.000	(0)
Pb4 (OH) 4+4	1.506e-29	7.160e-30	-28.822	-29.145	-0.323	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.059	-154.059	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-233.033	-233.053	-0.020	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.726	-79.726	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.274	-80.294	-0.020	(0)
CdHS+	0.000e+00	0.000e+00	-81.295	-81.316	-0.020	(0)
S5-2	0.000e+00	0.000e+00	-83.127	-83.208	-0.081	(0)
S6-2	0.000e+00	0.000e+00	-83.643	-83.724	-0.081	(0)
S4-2	0.000e+00	0.000e+00	-83.723	-83.803	-0.081	(0)
S3-2	0.000e+00	0.000e+00	-84.528	-84.609	-0.081	(0)
S2-2	0.000e+00	0.000e+00	-85.545	-85.625	-0.081	(0)
S-2	0.000e+00	0.000e+00	-91.067	-91.143	-0.076	(0)
HgHS2-	0.000e+00	0.000e+00	-141.482	-141.502	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.559	-141.559	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.678	-143.758	-0.081	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.836	-153.976	-0.140	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.059	-154.059	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-154.345	-154.365	-0.020	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-154.406	-154.406	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.569	-154.706	-0.137	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.806	-154.806	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.804	-160.804	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.810	-220.830	-0.020	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.800	-231.820	-0.020	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.779	-232.800	-0.020	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-233.033	-233.053	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-235.268	-235.349	-0.081	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-239.040	-239.061	-0.020	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-310.817	-310.898	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.494	-313.574	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-325.493	-325.574	-0.081	(0)
S (6)	2.503e-04					
SO4-2	2.362e-04	1.980e-04	-3.627	-3.703	-0.077	(0)
CaSO4	1.135e-05	1.135e-05	-4.945	-4.945	0.000	(0)
MgSO4	2.375e-06	2.375e-06	-5.624	-5.624	0.000	(0)
NaSO4-	1.269e-07	1.215e-07	-6.897	-6.916	-0.019	(0)

KSO4-	9.327e-08	8.930e-08	-7.030	-7.049	-0.019	(0)
CuSO4	6.447e-08	6.447e-08	-7.191	-7.191	0.000	(0)
MnSO4	2.777e-08	2.777e-08	-7.556	-7.556	0.000	(0)
HSO4-	7.148e-09	6.841e-09	-8.146	-8.165	-0.019	(0)
ZnSO4	3.966e-09	3.966e-09	-8.402	-8.402	0.000	(0)
AlSO4+	1.956e-10	1.872e-10	-9.709	-9.728	-0.019	(0)
PbSO4	1.761e-10	1.761e-10	-9.754	-9.754	0.000	(0)
NH4SO4-	1.149e-10	1.100e-10	-9.940	-9.959	-0.019	(0)
CdSO4	4.336e-11	4.336e-11	-10.363	-10.363	0.000	(0)
FeSO4	3.320e-11	3.320e-11	-10.479	-10.479	0.000	(0)
Zn(SO4) 2-2	8.236e-12	6.839e-12	-11.084	-11.165	-0.081	(0)
UO2SO4	7.655e-12	7.655e-12	-11.116	-11.116	0.000	(0)
Al(SO4) 2-	4.150e-13	3.972e-13	-12.382	-12.401	-0.019	(0)
CoSO4	4.049e-13	4.049e-13	-12.393	-12.393	0.000	(0)
Pb(SO4) 2-2	2.530e-13	2.101e-13	-12.597	-12.678	-0.081	(0)
Cd(SO4) 2-2	1.395e-13	1.158e-13	-12.856	-12.936	-0.081	(0)
NiSO4	6.552e-14	6.552e-14	-13.184	-13.184	0.000	(0)
CrOHSO4	4.803e-14	4.803e-14	-13.319	-13.319	0.000	(0)
UO2(SO4) 2-2	2.406e-14	1.998e-14	-13.619	-13.699	-0.081	(0)
CrSO4+	7.947e-16	7.586e-16	-15.100	-15.120	-0.020	(0)
FeSO4+	4.915e-16	4.705e-16	-15.308	-15.327	-0.019	(0)
VO2SO4-	1.095e-16	1.045e-16	-15.960	-15.981	-0.020	(0)
VOSO4	3.614e-18	3.614e-18	-17.442	-17.442	0.000	(0)
Fe(SO4) 2-	2.086e-18	1.991e-18	-17.681	-17.701	-0.020	(0)
Ni(SO4) 2-2	5.173e-19	4.295e-19	-18.286	-18.367	-0.081	(0)
HgSO4	2.639e-21	2.639e-21	-20.579	-20.579	0.000	(0)
Cr2(OH) 2SO4+2	5.344e-24	4.438e-24	-23.272	-23.353	-0.081	(0)
Cr2(OH) 2(SO4) 2	5.219e-26	5.219e-26	-25.282	-25.282	0.000	(0)
CrO3SO4-2	8.327e-29	6.914e-29	-28.079	-28.160	-0.081	(0)
VSO4+	1.207e-31	1.152e-31	-30.918	-30.938	-0.020	(0)
U(SO4) 2	7.308e-38	7.308e-38	-37.136	-37.136	0.000	(0)
USO4+2	5.596e-38	4.647e-38	-37.252	-37.333	-0.081	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-74.544	-74.564	-0.020	(0)
Sb(3)	7.146e-21					
Sb(OH) 3	3.616e-21	3.616e-21	-20.442	-20.442	0.000	(0)
HSbO2	3.530e-21	3.530e-21	-20.452	-20.452	0.000	(0)
Sb(OH) 2F	6.056e-26	6.056e-26	-25.218	-25.218	0.000	(0)
SbOF	5.955e-26	5.955e-26	-25.225	-25.225	0.000	(0)
Sb(OH) 2+	3.253e-26	3.105e-26	-25.488	-25.508	-0.020	(0)
SbO2-	1.694e-26	1.617e-26	-25.771	-25.791	-0.020	(0)
SbO+	1.121e-26	1.070e-26	-25.950	-25.970	-0.020	(0)
Sb(OH) 4-	9.705e-27	9.265e-27	-26.013	-26.033	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-325.493	-325.574	-0.081	(0)
Sb(5)	4.001e-10					
SbO3-	3.996e-10	3.814e-10	-9.398	-9.419	-0.020	(0)
Sb(OH) 6-	4.663e-13	4.462e-13	-12.331	-12.351	-0.019	(0)
SbO2+	1.433e-23	1.368e-23	-22.844	-22.864	-0.020	(0)
Se(-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.453	-41.474	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-44.035	-44.035	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.510	-46.510	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.941	-50.022	-0.081	(0)
Se(4)	3.481e-09					
HSeO3-	3.436e-09	3.280e-09	-8.464	-8.484	-0.020	(0)
SeO3-2	4.447e-11	3.693e-11	-10.352	-10.433	-0.081	(0)
H2SeO3	4.947e-13	4.947e-13	-12.306	-12.306	0.000	(0)
FeHSeO3+2	2.211e-21	1.836e-21	-20.655	-20.736	-0.081	(0)
Cd(SeO3) 2-2	1.265e-24	1.050e-24	-23.898	-23.979	-0.081	(0)
Se(6)	4.852e-13					
SeO4-2	4.851e-13	4.066e-13	-12.314	-12.391	-0.077	(0)
MnSeO4	8.632e-17	8.632e-17	-16.064	-16.064	0.000	(0)
HSeO4-	7.548e-18	7.205e-18	-17.122	-17.142	-0.020	(0)
ZnSeO4	5.766e-18	5.766e-18	-17.239	-17.239	0.000	(0)
CdSeO4	7.074e-20	7.074e-20	-19.150	-19.150	0.000	(0)
CoSeO4	2.089e-21	2.089e-21	-20.680	-20.680	0.000	(0)
NiSeO4	3.154e-22	3.154e-22	-21.501	-21.501	0.000	(0)
Zn(SeO4) 2-2	2.862e-30	2.377e-30	-29.543	-29.624	-0.081	(0)
U(3)	0.000e+00					

U+3	0.000e+00	0.000e+00	-55.367	-55.549	-0.182	(0)
U(4)	8.596e-22					
U(OH) 5-	8.476e-22	8.091e-22	-21.072	-21.092	-0.020	(0)
U(OH) 4	1.198e-23	1.198e-23	-22.921	-22.921	0.000	(0)
U(OH) 3+	1.623e-26	1.549e-26	-25.790	-25.810	-0.020	(0)
U(OH) 2+2	3.050e-30	2.532e-30	-29.516	-29.596	-0.081	(0)
UF3+	6.853e-33	6.542e-33	-32.164	-32.184	-0.020	(0)
UF2+2	1.640e-33	1.361e-33	-32.785	-32.866	-0.081	(0)
UOH+3	6.408e-35	4.218e-35	-34.193	-34.375	-0.182	(0)
UF4	2.175e-35	2.175e-35	-34.663	-34.663	0.000	(0)
UF+3	5.419e-36	3.567e-36	-35.266	-35.448	-0.182	(0)
U(SO4) 2	7.308e-38	7.308e-38	-37.136	-37.136	0.000	(0)
USO4+2	5.596e-38	4.647e-38	-37.252	-37.333	-0.081	(0)
UF5-	2.737e-38	2.613e-38	-37.563	-37.583	-0.020	(0)
UF6-2	2.881e-40	2.392e-40	-39.540	-39.621	-0.081	(0)
U+4	1.240e-40	0.000e+00	-39.906	-40.229	-0.323	(0)
UC1+3	0.000e+00	0.000e+00	-42.794	-42.976	-0.182	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-160.124	-161.759	-1.635	(0)
U(5)	4.888e-15					
UO2+	4.888e-15	4.666e-15	-14.311	-14.331	-0.020	(0)
U(6)	1.210e-08					
UO2(CO3) 2-2	6.548e-09	5.437e-09	-8.184	-8.265	-0.081	(0)
UO2CO3	5.264e-09	5.264e-09	-8.279	-8.279	0.000	(0)
UO2F+	1.120e-10	1.069e-10	-9.951	-9.971	-0.020	(0)
UO2OH+	9.594e-11	9.159e-11	-10.018	-10.038	-0.020	(0)
UO2+2	3.048e-11	2.555e-11	-10.516	-10.593	-0.077	(0)
UO2(CO3) 3-4	2.967e-11	1.410e-11	-10.528	-10.851	-0.323	(0)
UO2F2	9.349e-12	9.349e-12	-11.029	-11.029	0.000	(0)
UO2SO4	7.655e-12	7.655e-12	-11.116	-11.116	0.000	(0)
UO2F3-	7.459e-14	7.120e-14	-13.127	-13.148	-0.020	(0)
UO2(SO4) 2-2	2.406e-14	1.998e-14	-13.619	-13.699	-0.081	(0)
(UO2) 2(OH) 2+2	1.677e-14	1.392e-14	-13.776	-13.856	-0.081	(0)
UO2C1+	1.552e-15	1.482e-15	-14.809	-14.829	-0.020	(0)
(UO2) 3(OH) 5+	8.216e-16	7.843e-16	-15.085	-15.106	-0.020	(0)
UO2F4-2	2.065e-17	1.715e-17	-16.685	-16.766	-0.081	(0)
UO2NO3+	1.168e-20	1.115e-20	-19.933	-19.953	-0.020	(0)
V(2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.662	-40.742	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.758	-40.778	-0.020	(0)
V(3)	2.297e-14					
V(OH) 3	2.297e-14	2.297e-14	-13.639	-13.639	0.000	(0)
V(OH) 2+	5.497e-24	5.247e-24	-23.260	-23.280	-0.020	(0)
VOH+2	2.119e-26	1.760e-26	-25.674	-25.755	-0.081	(0)
V+3	1.873e-30	1.233e-30	-29.727	-29.909	-0.182	(0)
VSO4+	1.207e-31	1.152e-31	-30.918	-30.938	-0.020	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-50.386	-50.709	-0.323	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-50.401	-50.583	-0.182	(0)
V(4)	4.906e-16					
V(OH) 3+	3.944e-16	3.765e-16	-15.404	-15.424	-0.020	(0)
VO+2	7.981e-17	6.627e-17	-16.098	-16.179	-0.081	(0)
VOF+	1.262e-17	1.205e-17	-16.899	-16.919	-0.020	(0)
VOSO4	3.614e-18	3.614e-18	-17.442	-17.442	0.000	(0)
VOF2	1.370e-19	1.370e-19	-18.863	-18.863	0.000	(0)
VOC1+	6.965e-21	6.649e-21	-20.157	-20.177	-0.020	(0)
VOF3-	1.544e-22	1.474e-22	-21.811	-21.832	-0.020	(0)
VOF4-2	2.172e-26	1.804e-26	-25.663	-25.744	-0.081	(0)
H2V2O4+2	8.558e-27	7.106e-27	-26.068	-26.148	-0.081	(0)
V(5)	9.398e-09					
H2VO4-	9.287e-09	8.865e-09	-8.032	-8.052	-0.020	(0)
HVO4-2	7.585e-11	6.298e-11	-10.120	-10.201	-0.081	(0)
H3VO4	3.135e-11	3.135e-11	-10.504	-10.504	0.000	(0)
H3V2O7-	1.880e-12	1.794e-12	-11.726	-11.746	-0.020	(0)
VO2+	2.311e-14	2.212e-14	-13.636	-13.655	-0.019	(0)
VO2F	1.176e-15	1.176e-15	-14.930	-14.930	0.000	(0)
HV2O7-3	2.875e-16	1.892e-16	-15.541	-15.723	-0.182	(0)
VO2SO4-	1.095e-16	1.045e-16	-15.960	-15.981	-0.020	(0)
VO2F2-	1.356e-17	1.295e-17	-16.868	-16.888	-0.020	(0)
VO4-3	1.356e-18	8.927e-19	-17.868	-18.049	-0.182	(0)

V309-3	1.109e-18	7.297e-19	-17.955	-18.137	-0.182	(0)
V207-4	3.030e-20	1.440e-20	-19.519	-19.842	-0.323	(0)
VO2F3-2	5.896e-21	4.896e-21	-20.229	-20.310	-0.081	(0)
V4012-4	5.673e-24	2.697e-24	-23.246	-23.569	-0.323	(0)
VO2NO3	2.447e-24	2.447e-24	-23.611	-23.611	0.000	(0)
VO2F4-3	1.110e-25	7.304e-26	-24.955	-25.136	-0.182	(0)
HV10028-5	0.000e+00	0.000e+00	-55.183	-55.688	-0.505	(0)
H2V10028-4	0.000e+00	0.000e+00	-56.609	-56.932	-0.323	(0)
V10028-6	0.000e+00	0.000e+00	-56.697	-57.423	-0.727	(0)
Zn	1.150e-07					
Zn+2	1.093e-07	9.157e-08	-6.962	-7.038	-0.077	(0)
ZnSO4	3.966e-09	3.966e-09	-8.402	-8.402	0.000	(0)
ZnHCO3+	1.184e-09	1.130e-09	-8.927	-8.947	-0.020	(0)
ZnOH+	2.732e-10	2.608e-10	-9.564	-9.584	-0.020	(0)
ZnCO3	2.727e-10	2.727e-10	-9.564	-9.564	0.000	(0)
ZnF+	5.803e-11	5.539e-11	-10.236	-10.257	-0.020	(0)
ZnCl+	8.598e-12	8.226e-12	-11.066	-11.085	-0.019	(0)
Zn(SO4) 2-2	8.236e-12	6.839e-12	-11.084	-11.165	-0.081	(0)
Zn(OH) 2	1.177e-12	1.177e-12	-11.929	-11.929	0.000	(0)
ZnOHCl	3.067e-13	3.067e-13	-12.513	-12.513	0.000	(0)
ZnCl2	4.663e-16	4.663e-16	-15.331	-15.331	0.000	(0)
Zn(OH) 3-	1.760e-16	1.680e-16	-15.755	-15.775	-0.020	(0)
ZnNO3+	5.270e-17	5.031e-17	-16.278	-16.298	-0.020	(0)
ZnSeO4	5.766e-18	5.766e-18	-17.239	-17.239	0.000	(0)
ZnCl3-	1.384e-20	1.325e-20	-19.859	-19.878	-0.019	(0)
Zn(OH) 4-2	2.293e-22	1.904e-22	-21.640	-21.720	-0.081	(0)
ZnCl4-2	2.820e-25	2.369e-25	-24.550	-24.625	-0.076	(0)
Zn(NO3) 2	2.195e-27	2.195e-27	-26.658	-26.658	0.000	(0)
Zn(SeO4) 2-2	2.862e-30	2.377e-30	-29.543	-29.624	-0.081	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-154.345	-154.365	-0.020	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.806	-154.806	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.800	-231.820	-0.020	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-235.268	-235.349	-0.081	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-313.494	-313.574	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-71.09	-64.80	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-58.88	-54.37	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-66.11	-54.37	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-88.78	-70.85	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-75.24	-55.21	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-35.52	-35.12	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.41	-26.96	0.45	(NH4)2SeO4
Al(OH) 3(am)	-1.36	9.44	10.80	Al(OH) 3
Al2(MoO4) 3	-44.69	-42.33	2.37	Al2(MoO4) 3
Al2O3	-0.77	18.88	19.65	Al2O3
Al4(OH)10SO4	-1.55	21.15	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-9.07	-4.27	4.80	AlAsO4:2H2O
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4
AlSb	-154.47	-88.85	65.62	AlSb
Alunite	-1.24	-2.64	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.65	-12.44	-7.79	PbSO4
Anhydrite	-2.95	-7.31	-4.36	CaSO4
Anilite	-57.95	-89.83	-31.88	Cu0.25Cu1.5S
Antlerite	-4.23	4.56	8.79	Cu3(OH) 4SO4
Aragonite	-2.59	-10.89	-8.30	CaCO3
Arsenolite	-80.29	-83.05	-2.76	As4O6
Artinite	-12.34	-2.74	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-34.13	-27.42	6.71	As2O5
Atacamite	-4.18	3.21	7.39	Cu2(OH) 3Cl
Azurite	-2.30	-19.21	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-18.45	5.95	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-18.38	-2.51	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-0.66	-9.57	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-29.50	3.44	32.94	Ba3(VO4) 2:4H2O

BaCrO4	-17.83	-27.50	-9.67	BaCrO4
BaF2	-10.17	-15.99	-5.82	BaF2
BaMoO4	-7.49	-14.45	-6.96	BaMoO4
Barite	-0.68	-10.66	-9.98	BaSO4
BaS	-96.98	-80.80	16.18	BaS
BaSeO3	-10.82	-8.99	1.83	BaSeO3
BaSeO4	-11.89	-19.35	-7.46	BaSeO4
Bianchite	-8.98	-10.74	-1.76	ZnSO4:6H2O
Birnessite	-10.69	7.40	18.09	MnO2
Bixbyite	-10.51	-11.15	-0.64	Mn2O3
BlaubleiI	-56.88	-81.04	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.82	-85.10	-27.28	Cu0.6Cu0.8S
Boehmite	0.86	9.44	8.58	AlOOH
Breithauptite	-65.67	-84.19	-18.52	NiSb
Brochantite	-3.61	11.62	15.22	Cu4(OH)6SO4
Brucite	-8.12	8.72	16.84	Mg(OH)2
Bunsenite	-11.32	1.12	12.45	NiO
Ca(VO3)2	-10.77	-5.11	5.66	Ca(VO3)2
Ca2V2O7	-13.31	4.19	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.36	4.19	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-21.82	0.48	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-25.46	13.50	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-26.36	13.50	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-311.65	-168.68	142.97	Ca3Sb2
CaCrO4	-21.88	-24.15	-2.27	CaCrO4
Calcite	-2.41	-10.89	-8.48	CaCO3
Calomel	-11.82	-29.73	-17.91	Hg2Cl2
CaMoO4	-3.15	-11.10	-7.95	CaMoO4
Carnotite	-2.87	-2.64	0.23	KUO2VO4
CaSeO3:2H2O	-8.45	-5.63	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.97	-15.99	-3.02	CaSeO4:2H2O
Cd(BO2)2	-18.67	-8.83	9.84	Cd(BO2)2
Cd(OH)2	-9.77	3.87	13.64	Cd(OH)2
Cd(OH)2(am)	-9.86	3.87	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.30	-21.59	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.55	-4.99	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.51	-1.11	28.40	Cd4(OH)6SO4
CdCl2	-17.26	-17.92	-0.66	CdCl2
CdCl2:1H2O	-16.23	-17.92	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.01	-17.92	-1.91	CdCl2:2.5H2O
CdF2	-16.85	-18.07	-1.21	CdF2
Cdmetal(alpha)	-35.59	-22.08	13.51	Cd
Cdmetal(gamma)	-35.69	-22.08	13.62	Cd
CdMoO4	-2.38	-16.53	-14.15	CdMoO4
CdOHCl	-10.56	-7.02	3.54	CdOHCl
CdSb	-81.09	-81.44	-0.35	CdSb
CdSe	-23.85	-44.05	-20.20	CdSe
CdSeO4:2H2O	-19.57	-21.42	-1.85	CdSeO4:2H2O
CdSO4	-12.56	-12.73	-0.17	CdSO4
CdSO4:1H2O	-11.01	-12.73	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.86	-12.73	-1.87	CdSO4:2.67H2O
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4(g)	-82.94	-123.99	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-58.28	-93.20	-34.92	Cu2S
Chalcopyrite	-127.43	-162.70	-35.27	CuFeS2
Cinnabar	-53.64	-99.33	-45.69	HgS
Claudetite	-79.98	-83.05	-3.06	As4O6
Clausthalite	-16.66	-43.76	-27.10	PbSe
Co(BO2)2	-37.86	-10.79	27.07	Co(BO2)2
Co(OH)2	-11.18	1.91	13.09	Co(OH)2
Co(OH)3	-15.20	-17.51	-2.31	Co(OH)3
CO2(g)	-2.04	-20.19	-18.15	CO2
Co3(AsO4)2	-34.71	-21.68	13.03	Co3(AsO4)2
Co3O4	-22.61	-33.11	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.30	-18.28	-9.98	CoCO3

CoF2	-18.43	-20.03	-1.60	CoF2
CoF3	-48.96	-50.42	-1.46	CoF3
CoFe2O4	12.80	9.27	-3.53	CoFe2O4
CoMoO4	-10.73	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS (alpha)	-77.39	-84.83	-7.44	CoS
CoS (beta)	-73.76	-84.83	-11.07	CoS
CoSe	-29.81	-46.01	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.85	-23.38	-1.53	CoSeO4:6H2O
CoSO4	-17.50	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.39	-79.69	-22.30	CuS
Cr (OH) 2	-25.85	-15.03	10.82	Cr (OH) 2
Cr (OH) 3	-6.33	-5.00	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-4.25	-5.00	-0.75	Cr (OH) 3
Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.91	-36.82	14.09	CrCl2
CrCl3	-52.81	-37.69	15.11	CrCl3
CrF3	-26.57	-37.91	-11.34	CrF3
Crmetal	-71.46	-40.98	30.48	Cr
CrO3	-30.24	-33.45	-3.21	CrO3
Cryolite	-15.01	-48.85	-33.84	Na3AlF6
Cu (OH) 2	-1.62	7.06	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.14	18.07	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.25	-2.00	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.58	-94.46	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.58	-54.38	-45.80	Cu2Se
Cu2SO4	-21.11	-23.06	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.38	-107.98	-42.59	Cu3Sb
Cu3Se2	-31.76	-95.25	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-20.95	-26.39	-5.44	CuCrO4
CuF	-9.29	-14.20	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.45	-16.20	-8.76	Cu
CuMoO4	-0.27	-13.35	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-5.05	-6.46	-1.41	Cu2O
Cuprousferrite	9.37	0.45	-8.92	CuFeO2
CuSe	-7.77	-40.87	-33.10	CuSe
CuSe2	-29.48	-62.84	-33.37	CuSe2
CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.80	-18.24	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.39	-92.31	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-5.81	-22.35	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-5.26	-22.35	-17.09	CaMg (CO3) 2
Epsomite	-5.76	-7.88	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.83	3.74	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.45	0.41	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-6.95	-10.67	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.13	-7.57	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.82	-37.45	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-38.72	-42.46	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.12	11.10	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.46	-6.26	7.20	FeCr2O4
FeMoO4	-6.57	-16.66	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe (OH) 3
Ferroselite	-47.57	-66.16	-18.60	FeSe2
FeS (ppt)	-80.06	-83.01	-2.95	FeS
FeSe	-33.19	-44.19	-11.00	FeSe

Fix_pe	-6.52	-6.52	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF2
Galena	-68.61	-82.58	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al (OH) 3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4:7H2O
Greenockite	-68.51	-82.87	-14.36	CdS
Greigite	-290.85	-335.88	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.70	-7.31	-4.61	CaSO4:2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-7.53	-20.40	-12.88	H2MoO4
H2S (g)	-78.74	-86.75	-8.01	H2S
H2Se (g)	-42.97	-47.93	-4.96	H2Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.68	46.35	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3
Hercynite	-0.27	22.62	22.89	FeAl2O4
Hg (CH3) 2 (g)	-186.85	-260.56	-73.71	Hg (CH3) 2
Hg (g)	-9.07	-16.94	-7.87	Hg
Hg (OH) 2	-9.09	-12.58	-3.50	Hg (OH) 2
Hg2 (g)	-18.93	-33.88	-14.96	Hg2
Hg2 (OH) 2	-13.19	-7.93	5.26	Hg2 (OH) 2
Hg2CO3	-12.07	-28.12	-16.05	Hg2CO3
Hg2CrO4	-32.68	-41.38	-8.70	Hg2CrO4
Hg2F2	-19.51	-29.87	-10.36	Hg2F2
Hg2S	-83.00	-94.68	-11.68	Hg2S
Hg2SeO3	-18.21	-22.87	-4.66	Hg2SeO3
Hg2SO4	-18.41	-24.54	-6.13	Hg2SO4
Hg3O2CO3	-28.26	-57.94	-29.68	Hg3O2CO3
HgCl (g)	-34.36	-14.86	19.50	HgCl
HgCl2	-13.12	-34.38	-21.26	HgCl2
HgF (g)	-47.61	-14.94	32.68	HgF
HgF2 (g)	-47.09	-34.52	12.57	HgF2
Hgmetal (l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.82	-60.51	-55.69	HgSe
HgSeO3	-15.09	-27.52	-12.43	HgSeO3
HgSO4	-19.77	-29.19	-9.42	HgSO4
Huntite	-15.32	-45.29	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-9.12	-27.89	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-28.38	-37.15	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.35	-21.52	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.12	-19.92	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-45.15	-62.39	-17.24	K2Cr2O7
K2CrO4	-28.43	-28.94	-0.51	K2CrO4
K2MoO4	-19.15	-15.89	3.26	K2MoO4
K2SeO4	-20.05	-20.78	-0.73	K2SeO4
Langite	-5.87	11.62	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.85	-8.28	-0.43	PbO:PbSO4
Laurionite	-7.36	-6.74	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.41	-83.01	-3.60	FeS
Maghemite	0.97	7.36	6.39	Fe2O3
Magnesioferrite	-0.78	16.08	16.86	Fe2MgO4
Magnesite	-4.01	-11.47	-7.46	MgCO3
Magnetite	7.70	11.10	3.40	Fe3O4
Malachite	-0.77	-6.08	-5.31	Cu2 (OH) 2CO3
Manganite	-5.57	19.77	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.71	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl2
Melanterite	-10.66	-12.87	-2.21	FeSO4:7H2O
Metacinnabar	-54.24	-99.33	-45.09	HgS
Mg (OH) 2 (active)	-10.07	8.72	18.79	Mg (OH) 2
Mg (VO3) 2	-16.97	-5.69	11.28	Mg (VO3) 2
Mg2Sb3	-287.24	-212.55	74.68	Mg2Sb3

Mg ₂ V ₂ O ₇	-23.32	3.04	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-17.48	-1.28	16.20	MgCr ₂ O ₄
MgCrO ₄	-30.11	-24.73	5.38	MgCrO ₄
MgF ₂	-5.09	-13.22	-8.13	MgF ₂
MgMoO ₄	-9.83	-11.68	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-9.27	-6.21	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-15.37	-16.57	-1.20	MgSeO ₄ :6H ₂ O
Minium	-35.09	38.44	73.52	Pb ₃ O ₄
Mirabilite	-10.47	-11.59	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn(VO ₃) ₂	-12.51	-7.61	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.26	-60.97	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-158.75	-97.67	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ :8H ₂ O	-19.52	-7.02	12.50	Mn ₃ (AsO ₄) ₂ :8H ₂ O
MnCl ₂ :4H ₂ O	-17.71	-15.00	2.72	MnCl ₂ :4H ₂ O
MnS (grn)	-80.12	-79.95	0.17	MnS
MnS (pnk)	-83.29	-79.95	3.34	MnS
MnSb	-100.96	-103.87	-2.91	MnSb
MnSe	-44.63	-41.13	3.50	MnSe
MnSeO ₃	-9.27	-8.14	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-9.12	-8.14	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-16.44	-18.49	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-12.39	-9.81	2.58	MnSO ₄
Monteponite	-11.23	3.87	15.10	CdO
Montroydite	-8.94	-12.58	-3.64	HgO
MoO ₃	-12.40	-20.40	-8.00	MoO ₃
Morenosite	-13.34	-15.48	-2.14	NiSO ₄ :7H ₂ O
MoS ₂	-149.58	-219.84	-70.26	MoS ₂
Na-Jarosite	-8.46	-19.66	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-51.99	-61.88	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-31.36	-28.43	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-19.19	-35.79	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.87	-15.38	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-16.61	-15.38	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-20.22	-9.92	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-21.56	-20.28	1.28	Na ₂ SeO ₄
Na ₃ Sb	-185.21	-90.76	94.45	Na ₃ Sb
Na ₃ VO ₄	-36.36	0.32	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-41.77	-4.37	37.40	Na ₄ V ₂ O ₇
Nantokite	-7.40	-14.13	-6.73	CuCl
NaSb	-93.00	-69.83	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-8.55	-4.69	3.86	NaVO ₃
Nesquehonite	-6.80	-11.47	-4.67	MgCO ₃ :3H ₂ O
Ni(OH) ₂	-11.67	1.12	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ :8H ₂ O	-39.75	-24.05	15.70	Ni ₃ (AsO ₄) ₂ :8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-44.12	-12.12	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-12.20	-19.07	-6.87	NiCO ₃
NiMoO ₄	-8.14	-19.28	-11.14	NiMoO ₄
NiS (alpha)	-80.02	-85.62	-5.60	NiS
NiS (beta)	-74.52	-85.62	-11.10	NiS
NiS (gamma)	-72.82	-85.62	-12.80	NiS
NiSe	-29.10	-46.80	-17.70	NiSe
NiSeO ₃ :2H ₂ O	-16.63	-13.81	2.81	NiSeO ₃ :2H ₂ O
NiSeO ₄ :6H ₂ O	-22.65	-24.17	-1.52	NiSeO ₄ :6H ₂ O
Nsutite	-10.10	7.40	17.50	MnO ₂
O ₂ (g)	-31.19	51.90	83.09	O ₂
Orpiment	-240.69	-301.76	-61.07	As ₂ S ₃
Otavite	-4.32	-16.32	-12.00	CdCO ₃
Pb(BO ₂) ₂	-15.06	-8.54	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.99	4.16	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-70.75	-79.51	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-11.37	-2.57	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-17.86	8.32	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-26.77	34.27	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-11.31	-11.86	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-4.18	-6.08	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-20.73	-14.93	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-8.06	-1.92	6.14	Pb ₃ (VO ₄) ₂

Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.81	-4.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.06	0.04	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.04	21.88	Pb4O3SO4
PbCrO4	-16.69	-29.29	-12.60	PbCrO4
PbF2	-10.34	-17.78	-7.44	PbF2
Pbmetal	-26.03	-21.79	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.29	-21.13	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.49	30.11	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-125.30	-143.80	-18.51	FeS2
Pyrochroite	-8.39	6.80	15.19	Mn(OH)2
Pyrolusite	-8.63	32.75	41.38	MnO2
Realgar	-100.74	-120.48	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb(OH)3	-13.33	-20.44	-7.11	Sb(OH)3
Sb2O4	-18.34	-14.93	3.40	Sb2O4
Sb2O5	-27.94	-37.60	-9.67	Sb2O5
Sb2Se3	-116.90	-184.66	-67.76	Sb2Se3
Sb4O6(cubic)	-63.51	-81.77	-18.26	Sb4O6
Sb4O6(orth)	-63.87	-81.77	-17.90	Sb4O6
SbCl3	-53.71	-53.14	0.57	SbCl3
SbF3	-43.13	-53.35	-10.23	SbF3
Sbmetal	-47.68	-59.37	-11.69	Sb
SbO2	-3.95	-31.78	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2(OH)2:H2O
Semetal(am)	-14.87	-21.98	-7.11	Se
Semetal(hex)	-14.27	-21.98	-7.71	Se
Senarmontite	-28.52	-40.88	-12.37	Sb2O3
SeO2	-15.06	-14.94	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-6.21	-16.45	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3
Sphalerite	-69.43	-80.88	-11.45	ZnS
Spinel	-9.24	27.60	36.85	MgAl2O4
Stibnite	-250.66	-301.12	-50.46	Sb2S3
Sulfur	-58.65	-60.80	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na2SO4
Thermonatrite	-15.81	-15.17	0.64	Na2CO3:H2O
Tyuyamunite	-4.57	-0.49	4.08	Ca(UO2)2(VO4)2
U3O8	-12.45	8.63	21.08	U3O8
U3Sb4	-588.82	-436.43	152.38	U3Sb4
U4O9	-28.72	-31.74	-3.02	U4O9
UF4	-28.77	-58.30	-29.54	UF4
UF4:2.5H2O	-25.58	-58.30	-32.72	UF4:2.5H2O
UO2(am)	-15.36	-14.42	0.93	UO2
UO2(NO3)2	-42.06	-29.91	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.76	-29.91	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.30	-29.91	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.96	-29.91	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.30	2.31	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.73	-22.98	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3
Uraninite	-9.75	-14.42	-4.67	UO2
USb2	-223.85	-194.27	29.58	USb2
V(OH)3	-18.15	-10.55	7.59	V(OH)3
V2O5	-13.05	-14.41	-1.36	V2O5
V3O5	-37.61	-35.78	1.84	V3O5
V4O7	-46.24	-39.05	7.19	V4O7
V6O13	-34.26	-95.12	-60.86	V6O13
Valentinite	-32.40	-40.88	-8.48	Sb2O3

VC12	-64.20	-45.33	18.87	VC12
VC13	-66.68	-43.25	23.43	VC13
VF4	-62.08	-47.15	14.93	VF4
Vmetal	-93.50	-49.48	44.03	V
VO	-38.29	-23.53	14.76	VO
VO(OH)2	-8.43	-3.28	5.15	VO(OH)2
VO2Cl	-20.94	-18.10	2.84	VO2Cl
VOC1	-32.61	-21.45	11.15	VOC1
VOC12	-37.83	-25.07	12.76	VOC12
VOSO4	-23.49	-19.88	3.61	VOSO4
Witherite	-5.67	-14.24	-8.57	BaCO3
Wurtzite	-71.93	-80.88	-8.95	ZnS
Zincite	-5.47	5.86	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO4
Zn(BO2)2	-15.13	-6.84	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-29.67	-26.36	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-6.34	5.86	12.20	Zn(OH)2
Zn(OH)2(am)	-6.61	5.86	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.89	5.86	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.67	5.86	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.87	5.86	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.38	-4.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.36	0.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.48	-9.83	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.53	-15.62	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.55	6.85	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.97	7.53	38.50	Zn5(OH)8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.87	-20.09	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO(active)	-5.32	5.86	11.19	ZnO
ZnS(am)	-71.83	-80.88	-9.05	ZnS
ZnSb	-90.47	-79.45	11.01	ZnSb
ZnSe	-27.66	-42.06	-14.40	ZnSe
ZnSeO4:6H2O	-17.91	-19.43	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 41.

```

      REACTION 202
      H2O      -1
      8295.75 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 205
      SAVE Solution 206
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 205. Solution after simulation 40.
Using reaction 202.

Reaction 202.

8.296e+03 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	1.475e-04	1.475e-04
As	6.783e-08	6.783e-08
B	6.674e-05	6.674e-05
Ba	2.002e-05	2.002e-05
C	1.085e-01	1.085e-01
Ca	4.692e-02	4.692e-02
Cd	1.752e-07	1.752e-07
Cl	5.624e-03	5.624e-03
Co	1.971e-09	1.971e-09
Cr	7.584e-10	7.584e-10
Cu	3.565e-04	3.565e-04
F	5.044e-03	5.044e-03
Fe	7.108e-06	7.109e-06
Hg	6.402e-09	6.402e-09
K	1.003e-02	1.003e-02
Mg	1.227e-02	1.227e-02
Mn	1.482e-04	1.483e-04
Mo	5.725e-06	5.725e-06
N	2.258e-05	2.258e-05
Na	1.799e-02	1.799e-02
Ni	3.210e-10	3.210e-10
Pb	4.997e-07	4.997e-07
S	3.765e-02	3.765e-02
Sb	6.019e-08	6.019e-08
Se	5.237e-07	5.238e-07
U	1.820e-06	1.820e-06
V	1.414e-06	1.414e-06
Zn	1.731e-05	1.731e-05

-----Description of solution-----

	pH =	6.276	Charge balance
	pe =	6.765	Adjusted to redox
equilibrium	Activity of water =	0.996	
	Ionic strength (mol/kgw) =	1.565e-01	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	6.195e-02	
	Total CO2 (mol/kg) =	1.085e-01	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	31	
	Total H =	1.111724e+02	
	Total O =	5.598488e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	6.996e-07	5.300e-07	-6.155	-6.276	-0.121	0.00

	OH-	2.605e-08	1.893e-08	-7.584	-7.723	-0.139	(0)
	H2O	5.551e+01	9.963e-01	1.744	-0.002	0.000	18.07
Al		1.475e-04					
	AlF4-	9.099e-05	6.787e-05	-4.041	-4.168	-0.127	(0)
	AlF3	5.427e-05	5.427e-05	-4.265	-4.265	0.000	(0)
	AlF2+	2.269e-06	1.727e-06	-5.644	-5.763	-0.119	(0)
	AlF+2	5.181e-09	1.738e-09	-8.286	-8.760	-0.474	(0)
	Al (OH) 2+	2.605e-11	1.983e-11	-10.584	-10.703	-0.119	(0)
	Al (OH) 4-	2.393e-11	1.785e-11	-10.621	-10.748	-0.127	(0)
	Al (OH) 3	7.489e-12	7.489e-12	-11.126	-11.126	0.000	(0)
	AlSO4+	4.910e-12	3.663e-12	-11.309	-11.436	-0.127	(0)
	AlOH+2	3.930e-12	1.319e-12	-11.406	-11.880	-0.474	(0)
	Al+3	8.483e-13	6.966e-14	-12.071	-13.157	-1.086	(0)
	Al (SO4) 2-	3.564e-13	2.658e-13	-12.448	-12.575	-0.127	(0)
	AlMo6O21-3	4.353e-29	6.654e-31	-28.361	-30.177	-1.816	(0)
As (3)		1.408e-19					
	H3AsO3	1.406e-19	1.406e-19	-18.852	-18.852	0.000	(0)
	H2AsO3-	2.165e-22	1.361e-22	-21.665	-21.866	-0.202	(0)
	H4AsO3+	5.874e-26	3.692e-26	-25.231	-25.433	-0.202	(0)
	HAsO3-2	1.501e-27	2.341e-28	-26.824	-27.631	-0.807	(0)
	AsO3-3	1.114e-33	1.703e-35	-32.953	-34.769	-1.816	(0)
As (5)		6.783e-08					
	H2AsO4-	3.699e-08	2.325e-08	-7.432	-7.634	-0.202	(0)
	HAsO4-2	3.084e-08	4.809e-09	-7.511	-8.318	-0.807	(0)
	H3AsO4	2.065e-12	2.141e-12	-11.685	-11.669	0.016	(0)
	AsO4-3	1.877e-12	2.870e-14	-11.726	-13.542	-1.816	(0)
B		6.674e-05					
	H3BO3	6.646e-05	6.889e-05	-4.177	-4.162	0.016	(0)
	H2BO3-	1.072e-07	7.550e-08	-6.970	-7.122	-0.152	(0)
	BF (OH) 3-	9.742e-08	6.861e-08	-7.011	-7.164	-0.152	(0)
	CaH2BO3+	5.187e-08	3.653e-08	-7.285	-7.437	-0.152	(0)
	BF2 (OH) 2-	1.383e-08	9.736e-09	-7.859	-8.012	-0.152	(0)
	MgH2BO3+	8.781e-09	6.184e-09	-8.056	-8.209	-0.152	(0)
	NaH2BO3	1.547e-09	1.547e-09	-8.811	-8.811	0.000	(0)
	BaH2BO3+	1.881e-11	1.324e-11	-10.726	-10.878	-0.152	(0)
	BF3OH-	7.140e-12	5.028e-12	-11.146	-11.299	-0.152	(0)
	H5 (BO3) 2-	6.286e-12	4.427e-12	-11.202	-11.354	-0.152	(0)
	BF4-	4.664e-14	3.284e-14	-13.331	-13.484	-0.152	(0)
	H8 (BO3) 3-	4.331e-14	3.050e-14	-13.363	-13.516	-0.152	(0)
Ba		2.002e-05					
	Ba+2	1.724e-05	5.676e-06	-4.763	-5.246	-0.482	(0)
	BaHCO3+	2.766e-06	2.131e-06	-5.558	-5.671	-0.113	(0)
	BaCO3	1.012e-08	1.012e-08	-7.995	-7.995	0.000	(0)
	BaH2BO3+	1.881e-11	1.324e-11	-10.726	-10.878	-0.152	(0)
	BaNO3+	1.516e-12	9.525e-13	-11.819	-12.021	-0.202	(0)
	BaOH+	6.216e-13	4.691e-13	-12.206	-12.329	-0.122	(0)
	BaNH3+2	1.315e-13	2.051e-14	-12.881	-13.688	-0.807	(0)
C (4)		1.085e-01					
	HCO3-	5.164e-02	3.931e-02	-1.287	-1.406	-0.119	(0)
	H2CO3	4.685e-02	4.685e-02	-1.329	-1.329	0.000	(0)
	CaHCO3+	7.989e-03	6.154e-03	-2.097	-2.211	-0.113	(0)
	MgHCO3+	1.290e-03	9.502e-04	-2.889	-3.022	-0.133	(0)
	NaHCO3	2.857e-04	2.857e-04	-3.544	-3.544	0.000	(0)
	CuCO3	2.385e-04	2.385e-04	-3.622	-3.622	0.000	(0)
	CaCO3	4.633e-05	4.633e-05	-4.334	-4.334	0.000	(0)
	CuHCO3+	4.598e-05	2.889e-05	-4.337	-4.539	-0.202	(0)
	MnHCO3+	1.752e-05	1.322e-05	-4.756	-4.879	-0.122	(0)
	Cu (CO3) 2-2	1.431e-05	2.232e-06	-4.844	-5.651	-0.807	(0)
	CO3-2	1.056e-05	3.477e-06	-4.976	-5.459	-0.482	(0)
	MgCO3	6.832e-06	6.832e-06	-5.165	-5.165	0.000	(0)
	ZnHCO3+	4.654e-06	2.925e-06	-5.332	-5.534	-0.202	(0)
	BaHCO3+	2.766e-06	2.131e-06	-5.558	-5.671	-0.113	(0)
	UO2 (CO3) 3-4	1.781e-06	1.054e-09	-5.749	-8.977	-3.228	(0)
	NaCO3-	1.100e-06	8.368e-07	-5.959	-6.077	-0.119	(0)
	ZnCO3	4.708e-07	4.708e-07	-6.327	-6.327	0.000	(0)
	PbHCO3+	3.549e-07	2.230e-07	-6.450	-6.652	-0.202	(0)
	PbCO3	7.982e-08	7.982e-08	-7.098	-7.098	0.000	(0)
	FeHCO3+	6.153e-08	4.739e-08	-7.211	-7.324	-0.113	(0)

	UO2 (CO3) 2-2	3.878e-08	6.048e-09	-7.411	-8.218	-0.807	(0)
	BaCO3	1.012e-08	1.012e-08	-7.995	-7.995	0.000	(0)
	Pb (CO3) 2-2	5.132e-09	8.004e-10	-8.290	-9.097	-0.807	(0)
	CdHCO3+	3.840e-09	2.413e-09	-8.416	-8.617	-0.202	(0)
	CdCO3	2.137e-09	2.137e-09	-8.670	-8.670	0.000	(0)
	CoHCO3+	7.471e-10	4.695e-10	-9.127	-9.328	-0.202	(0)
	NiHCO3+	2.005e-10	1.260e-10	-9.698	-9.900	-0.202	(0)
	UO2CO3	8.718e-11	8.718e-11	-10.060	-10.060	0.000	(0)
	Cd (CO3) 2-2	3.532e-11	5.508e-12	-10.452	-11.259	-0.807	(0)
	HgCO3	1.125e-11	1.125e-11	-10.949	-10.949	0.000	(0)
	CoCO3	9.026e-12	9.026e-12	-11.044	-11.044	0.000	(0)
	NiCO3	3.372e-12	3.372e-12	-11.472	-11.472	0.000	(0)
	Hg (CO3) 2-2	7.933e-13	1.237e-13	-12.101	-12.908	-0.807	(0)
	HgHCO3+	1.767e-13	1.111e-13	-12.753	-12.954	-0.202	(0)
Ca	4.692e-02						
	Ca+2	2.554e-02	8.408e-03	-1.593	-2.075	-0.482	(0)
	CaSO4	1.305e-02	1.305e-02	-1.884	-1.884	0.000	(0)
	CaHCO3+	7.989e-03	6.154e-03	-2.097	-2.211	-0.113	(0)
	CaF+	3.035e-04	2.290e-04	-3.518	-3.640	-0.122	(0)
	CaCO3	4.633e-05	4.633e-05	-4.334	-4.334	0.000	(0)
	CaH2BO3+	5.187e-08	3.653e-08	-7.285	-7.437	-0.152	(0)
	CaOH+	4.123e-09	3.176e-09	-8.385	-8.498	-0.113	(0)
	CaNO3+	1.416e-09	8.902e-10	-8.849	-9.051	-0.202	(0)
	CaNH3+2	3.887e-10	6.062e-11	-9.410	-10.217	-0.807	(0)
	Ca (NH3) 2+2	8.861e-19	1.382e-19	-18.052	-18.859	-0.807	(0)
Cd	1.752e-07						
	Cd+2	8.190e-08	2.697e-08	-7.087	-7.569	-0.482	(0)
	CdSO4	4.282e-08	4.282e-08	-7.368	-7.368	0.000	(0)
	Cd (SO4) 2-2	2.508e-08	3.912e-09	-7.601	-8.408	-0.807	(0)
	CdCl+	1.745e-08	1.097e-08	-7.758	-7.960	-0.202	(0)
	CdHCO3+	3.840e-09	2.413e-09	-8.416	-8.617	-0.202	(0)
	CdCO3	2.137e-09	2.137e-09	-8.670	-8.670	0.000	(0)
	CdF+	1.697e-09	1.067e-09	-8.770	-8.972	-0.202	(0)
	CdCl2	1.948e-10	1.948e-10	-9.710	-9.710	0.000	(0)
	Cd (CO3) 2-2	3.532e-11	5.508e-12	-10.452	-11.259	-0.807	(0)
	CdOHCl	8.518e-12	8.518e-12	-11.070	-11.070	0.000	(0)
	CdOH+	6.452e-12	4.055e-12	-11.190	-11.392	-0.202	(0)
	CdF2	5.311e-12	5.311e-12	-11.275	-11.275	0.000	(0)
	CdCl3-	8.330e-13	5.235e-13	-12.079	-12.281	-0.202	(0)
	CdNO3+	4.543e-15	2.855e-15	-14.343	-14.544	-0.202	(0)
	Cd (OH) 2	4.843e-16	4.843e-16	-15.315	-15.315	0.000	(0)
	CdSeO4	1.792e-16	1.792e-16	-15.747	-15.747	0.000	(0)
	Cd2OH+3	3.584e-17	5.480e-19	-16.446	-18.261	-1.816	(0)
	Cd (SeO3) 2-2	8.200e-19	1.279e-19	-18.086	-18.893	-0.807	(0)
	Cd (OH) 3-	8.912e-22	5.601e-22	-21.050	-21.252	-0.202	(0)
	Cd (NO3) 2	4.790e-23	4.790e-23	-22.320	-22.320	0.000	(0)
	Cd (OH) 4-2	1.113e-29	1.735e-30	-28.954	-29.761	-0.807	(0)
	CdHS+	0.000e+00	0.000e+00	-78.467	-78.669	-0.202	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.572	-150.572	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-227.578	-227.780	-0.202	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-303.884	-304.691	-0.807	(0)
Cl	5.624e-03						
	Cl-	5.623e-03	4.260e-03	-2.250	-2.371	-0.121	(0)
	MnCl+	1.198e-07	9.040e-08	-6.922	-7.044	-0.122	(0)
	CuCl+	1.068e-07	7.865e-08	-6.972	-7.104	-0.133	(0)
	ZnCl+	3.418e-08	2.518e-08	-7.466	-7.599	-0.133	(0)
	CdCl+	1.745e-08	1.097e-08	-7.758	-7.960	-0.202	(0)
	CuCl2-	6.345e-09	4.674e-09	-8.198	-8.330	-0.133	(0)
	CuCl	5.252e-09	5.252e-09	-8.280	-8.280	0.000	(0)
	HgCl2	4.907e-09	4.907e-09	-8.309	-8.309	0.000	(0)
	PbCl+	1.837e-09	1.154e-09	-8.736	-8.938	-0.202	(0)
	ZnOHCl	6.240e-10	6.240e-10	-9.205	-9.205	0.000	(0)
	MnCl2	5.439e-10	5.439e-10	-9.264	-9.264	0.000	(0)
	HgClOH	3.851e-10	3.851e-10	-9.414	-9.414	0.000	(0)
	HgCl3-	3.326e-10	2.090e-10	-9.478	-9.680	-0.202	(0)
	CdCl2	1.948e-10	1.948e-10	-9.710	-9.710	0.000	(0)
	ZnCl2	1.700e-10	1.700e-10	-9.770	-9.770	0.000	(0)
	CuCl2	1.162e-10	1.162e-10	-9.935	-9.935	0.000	(0)

HgCl4-2	2.273e-11	3.545e-12	-10.643	-11.450	-0.807	(0)
PbCl2	2.196e-11	2.196e-11	-10.658	-10.658	0.000	(0)
CuCl3-2	1.313e-11	4.257e-12	-10.882	-11.371	-0.489	(0)
CdOHC1	8.518e-12	8.518e-12	-11.070	-11.070	0.000	(0)
CoCl+	3.601e-12	2.263e-12	-11.444	-11.645	-0.202	(0)
MnCl3-	8.456e-13	6.381e-13	-12.073	-12.195	-0.122	(0)
CdCl3-	8.330e-13	5.235e-13	-12.079	-12.281	-0.202	(0)
ZnCl3-	7.807e-13	5.751e-13	-12.108	-12.240	-0.133	(0)
NiCl+	4.508e-13	2.833e-13	-12.346	-12.548	-0.202	(0)
HgCl+	3.658e-13	2.299e-13	-12.437	-12.639	-0.202	(0)
PbCl3-	5.926e-14	3.724e-14	-13.227	-13.429	-0.202	(0)
FeCl+2	2.057e-14	6.668e-15	-13.687	-14.176	-0.489	(0)
CuCl3-	6.269e-15	4.618e-15	-14.203	-14.336	-0.133	(0)
ZnCl4-2	3.778e-15	1.225e-15	-14.423	-14.912	-0.489	(0)
CrCl+2	3.587e-15	5.595e-16	-14.445	-15.252	-0.807	(0)
PbCl4-2	4.649e-16	7.251e-17	-15.333	-16.140	-0.807	(0)
VOCl+	3.421e-16	2.150e-16	-15.466	-15.668	-0.202	(0)
FeCl2+	1.681e-16	1.269e-16	-15.774	-15.897	-0.122	(0)
UO2Cl+	6.924e-17	4.351e-17	-16.160	-16.361	-0.202	(0)
NiCl2	6.076e-18	6.076e-18	-17.216	-17.216	0.000	(0)
CrOHC12	8.574e-19	8.574e-19	-18.067	-18.067	0.000	(0)
CrCl2+	3.598e-19	2.261e-19	-18.444	-18.646	-0.202	(0)
CuCl4-2	3.041e-19	9.859e-20	-18.517	-19.006	-0.489	(0)
FeCl3	5.404e-20	5.404e-20	-19.267	-19.267	0.000	(0)
CrO3Cl-	1.403e-27	8.818e-28	-26.853	-27.055	-0.202	(0)
CoCl+2	1.979e-35	3.087e-36	-34.704	-35.510	-0.807	(0)
UCl+3	0.000e+00	0.000e+00	-42.470	-44.286	-1.816	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.908	-50.715	-0.807	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.961	-50.768	-0.807	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.918	-65.725	-0.807	(0)
Co (2)	1.971e-09					
Co+2	9.846e-10	1.536e-10	-9.007	-9.814	-0.807	(0)
CoHCO3+	7.471e-10	4.695e-10	-9.127	-9.328	-0.202	(0)
CoSO4	2.076e-10	2.076e-10	-9.683	-9.683	0.000	(0)
CoF+	1.929e-11	1.212e-11	-10.715	-10.917	-0.202	(0)
CoCO3	9.026e-12	9.026e-12	-11.044	-11.044	0.000	(0)
CoCl+	3.601e-12	2.263e-12	-11.444	-11.645	-0.202	(0)
CoOH+	9.230e-14	5.800e-14	-13.035	-13.237	-0.202	(0)
CoNO2+	1.779e-14	1.118e-14	-13.750	-13.952	-0.202	(0)
Co (NH3) +2	6.779e-16	1.057e-16	-15.169	-15.976	-0.807	(0)
Co (OH) 2	8.722e-17	8.722e-17	-16.059	-16.059	0.000	(0)
CoNO3+	1.297e-17	8.149e-18	-16.887	-17.089	-0.202	(0)
CoSeO4	2.748e-18	2.748e-18	-17.561	-17.561	0.000	(0)
Co (NH3) 2+2	1.656e-22	2.583e-23	-21.781	-22.588	-0.807	(0)
Co (OH) 3-	5.242e-23	3.294e-23	-22.281	-22.482	-0.202	(0)
Co2OH+3	2.920e-23	4.464e-25	-22.535	-24.350	-1.816	(0)
CoOOH-	1.320e-23	8.296e-24	-22.879	-23.081	-0.202	(0)
Co (NO3) 2	5.551e-25	5.551e-25	-24.256	-24.256	0.000	(0)
Co (NH3) 3+2	1.194e-29	1.862e-30	-28.923	-29.730	-0.807	(0)
Co (OH) 4-2	6.337e-31	9.883e-32	-30.198	-31.005	-0.807	(0)
Co (NH3) 4+2	3.589e-37	5.598e-38	-36.445	-37.252	-0.807	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-41.418	-44.646	-3.228	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.467	-45.274	-0.807	(0)
Co (3)	2.197e-30					
CoOH+2	2.197e-30	3.426e-31	-29.658	-30.465	-0.807	(0)
Co+3	4.338e-35	3.562e-36	-34.363	-35.448	-1.086	(0)
CoCl+2	1.979e-35	3.087e-36	-34.704	-35.510	-0.807	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.961	-50.768	-0.807	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.397	-60.599	-0.202	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.918	-65.725	-0.807	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.070	-66.877	-0.807	(0)
Cr (2)	2.668e-26					
Cr+2	2.668e-26	4.162e-27	-25.574	-26.381	-0.807	(0)
Cr (3)	7.584e-10					
Cr (OH) +2	2.695e-10	4.203e-11	-9.569	-10.376	-0.807	(0)
CrF+2	2.574e-10	4.014e-11	-9.589	-10.396	-0.807	(0)
Cr (OH) 2+	1.541e-10	9.681e-11	-9.812	-10.014	-0.202	(0)
CrOHSO4	6.756e-11	6.756e-11	-10.170	-10.170	0.000	(0)

Cr+3	6.639e-12	1.015e-13	-11.178	-12.994	-1.816	(0)
CrSO4+	2.554e-12	1.605e-12	-11.593	-11.794	-0.202	(0)
Cr (OH) 3	6.885e-13	6.885e-13	-12.162	-12.162	0.000	(0)
CrCl+2	3.587e-15	5.595e-16	-14.445	-15.252	-0.807	(0)
CrO2-	9.853e-16	6.192e-16	-15.006	-15.208	-0.202	(0)
Cr (OH) 4-	8.256e-16	5.188e-16	-15.083	-15.285	-0.202	(0)
Cr2 (OH) 2SO4+2	1.646e-18	2.567e-19	-17.784	-18.591	-0.807	(0)
CrOHC12	8.574e-19	8.574e-19	-18.067	-18.067	0.000	(0)
CrCl2+	3.598e-19	2.261e-19	-18.444	-18.646	-0.202	(0)
Cr2 (OH) 2 (SO4) 2	1.033e-19	1.033e-19	-18.986	-18.986	0.000	(0)
CrNO3+2	9.523e-22	1.485e-22	-21.021	-21.828	-0.807	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.748	-41.555	-0.807	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.630	-49.446	-1.816	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.908	-50.715	-0.807	(0)
Cr (6)	2.133e-19					
CrO4-2	1.096e-19	3.608e-20	-18.960	-19.443	-0.482	(0)
HCrO4-	9.847e-20	6.188e-20	-19.007	-19.208	-0.202	(0)
NaCrO4-	3.688e-21	2.318e-21	-20.433	-20.635	-0.202	(0)
KCrO4-	1.547e-21	9.725e-22	-20.810	-21.012	-0.202	(0)
CrO3SO4-2	4.354e-25	6.791e-26	-24.361	-25.168	-0.807	(0)
H2CrO4	2.658e-26	2.658e-26	-25.575	-25.575	0.000	(0)
CrO3Cl-	1.403e-27	8.818e-28	-26.853	-27.055	-0.202	(0)
Cr2O7-2	8.545e-37	1.333e-37	-36.068	-36.875	-0.807	(0)
Cu (1)	1.317e-08					
CuCl2-	6.345e-09	4.674e-09	-8.198	-8.330	-0.133	(0)
CuCl	5.252e-09	5.252e-09	-8.280	-8.280	0.000	(0)
Cu+	1.559e-09	9.795e-10	-8.807	-9.009	-0.202	(0)
CuCl3-2	1.313e-11	4.257e-12	-10.882	-11.371	-0.489	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.827	-151.282	-0.455	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.585	-152.012	-0.427	(0)
Cu (2)	3.564e-04					
CuCO3	2.385e-04	2.385e-04	-3.622	-3.622	0.000	(0)
CuHCO3+	4.598e-05	2.889e-05	-4.337	-4.539	-0.202	(0)
Cu+2	3.539e-05	1.165e-05	-4.451	-4.934	-0.482	(0)
CuSO4	1.808e-05	1.808e-05	-4.743	-4.743	0.000	(0)
Cu (CO3) 2-2	1.431e-05	2.232e-06	-4.844	-5.651	-0.807	(0)
CuF+	2.919e-06	1.835e-06	-5.535	-5.736	-0.202	(0)
CuOH+	9.468e-07	6.974e-07	-6.024	-6.157	-0.133	(0)
CuCl+	1.068e-07	7.865e-08	-6.972	-7.104	-0.133	(0)
Cu2 (OH) 2+2	7.834e-08	1.222e-08	-7.106	-7.913	-0.807	(0)
CuNO2+	2.006e-08	1.260e-08	-7.698	-7.899	-0.202	(0)
CuNH3+2	4.378e-09	6.828e-10	-8.359	-9.166	-0.807	(0)
Cu (OH) 2	2.634e-09	2.634e-09	-8.579	-8.579	0.000	(0)
CuCl2	1.162e-10	1.162e-10	-9.935	-9.935	0.000	(0)
CuNO3+	1.963e-12	1.233e-12	-11.707	-11.909	-0.202	(0)
Cu (NO2) 2	1.332e-12	1.332e-12	-11.875	-11.875	0.000	(0)
Cu (OH) 3-	1.628e-13	1.023e-13	-12.788	-12.990	-0.202	(0)
CuCl3-	6.269e-15	4.618e-15	-14.203	-14.336	-0.133	(0)
CuCl4-2	3.041e-19	9.859e-20	-18.517	-19.006	-0.489	(0)
Cu (OH) 4-2	9.770e-20	1.524e-20	-19.010	-19.817	-0.807	(0)
Cu (NO3) 2	5.199e-21	5.199e-21	-20.284	-20.284	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.155	-216.357	-0.202	(0)
F	5.044e-03					
F-	3.295e-03	2.496e-03	-2.482	-2.603	-0.121	(0)
MgF+	8.868e-04	6.615e-04	-3.052	-3.179	-0.127	(0)
CaF+	3.035e-04	2.290e-04	-3.518	-3.640	-0.122	(0)
AlF4-	9.099e-05	6.787e-05	-4.041	-4.168	-0.127	(0)
AlF3	5.427e-05	5.427e-05	-4.265	-4.265	0.000	(0)
NaF	2.035e-05	2.035e-05	-4.691	-4.691	0.000	(0)
CuF+	2.919e-06	1.835e-06	-5.535	-5.736	-0.202	(0)
AlF2+	2.269e-06	1.727e-06	-5.644	-5.763	-0.119	(0)
MnF+	2.220e-06	1.675e-06	-5.654	-5.776	-0.122	(0)
HF	1.956e-06	1.956e-06	-5.709	-5.709	0.000	(0)
ZnF+	1.865e-07	1.172e-07	-6.729	-6.931	-0.202	(0)
BF (OH) 3-	9.742e-08	6.861e-08	-7.011	-7.164	-0.152	(0)
FeF3	3.335e-08	3.335e-08	-7.477	-7.477	0.000	(0)
HF2-	2.554e-08	1.856e-08	-7.593	-7.731	-0.139	(0)
BF2 (OH) 2-	1.383e-08	9.736e-09	-7.859	-8.012	-0.152	(0)

FeF2+	1.255e-08	9.473e-09	-7.901	-8.024	-0.122	(0)
AlF+2	5.181e-09	1.738e-09	-8.286	-8.760	-0.474	(0)
PbF+	2.137e-09	1.343e-09	-8.670	-8.872	-0.202	(0)
CdF+	1.697e-09	1.067e-09	-8.770	-8.972	-0.202	(0)
FeF+2	4.375e-10	1.418e-10	-9.359	-9.848	-0.489	(0)
CrF+2	2.574e-10	4.014e-11	-9.589	-10.396	-0.807	(0)
PbF2	6.596e-11	6.596e-11	-10.181	-10.181	0.000	(0)
VO2F2-	2.933e-11	1.843e-11	-10.533	-10.734	-0.202	(0)
VO2F	2.034e-11	2.034e-11	-10.692	-10.692	0.000	(0)
CoF+	1.929e-11	1.212e-11	-10.715	-10.917	-0.202	(0)
UO2F2	1.562e-11	1.562e-11	-10.806	-10.806	0.000	(0)
UO2F3-	1.558e-11	9.790e-12	-10.807	-11.009	-0.202	(0)
H2F2	1.025e-11	1.025e-11	-10.989	-10.989	0.000	(0)
BF3OH-	7.140e-12	5.028e-12	-11.146	-11.299	-0.152	(0)
CdF2	5.311e-12	5.311e-12	-11.275	-11.275	0.000	(0)
VO2F3-2	3.679e-12	5.739e-13	-11.434	-12.241	-0.807	(0)
UO2F+	3.453e-12	2.170e-12	-11.462	-11.664	-0.202	(0)
NiF+	2.593e-12	1.630e-12	-11.586	-11.788	-0.202	(0)
UO2F4-2	1.244e-12	1.941e-13	-11.905	-12.712	-0.807	(0)
PbF3-	4.968e-13	3.122e-13	-12.304	-12.506	-0.202	(0)
VOF+	4.285e-13	2.693e-13	-12.368	-12.570	-0.202	(0)
VOF2	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
BF4-	4.664e-14	3.284e-14	-13.331	-13.484	-0.152	(0)
VO2F4-3	4.610e-14	7.047e-16	-13.336	-15.152	-1.816	(0)
VOF3-	3.551e-14	2.231e-14	-13.450	-13.651	-0.202	(0)
PbF4-2	2.391e-15	3.730e-16	-14.621	-15.428	-0.807	(0)
VOF4-2	1.441e-15	2.248e-16	-14.841	-15.648	-0.807	(0)
HgF+	3.981e-19	2.502e-19	-18.400	-18.602	-0.202	(0)
Sb(OH) 2F	8.208e-22	8.208e-22	-21.086	-21.086	0.000	(0)
SbOF	8.100e-22	8.100e-22	-21.091	-21.091	0.000	(0)
UF3+	2.388e-30	1.501e-30	-29.622	-29.824	-0.202	(0)
UF4	4.106e-31	4.106e-31	-30.387	-30.387	0.000	(0)
UF6-2	1.962e-31	3.061e-32	-30.707	-31.514	-0.807	(0)
UF5-	6.462e-32	4.061e-32	-31.190	-31.391	-0.202	(0)
UF2+2	2.432e-32	3.794e-33	-31.614	-32.421	-0.807	(0)
UF+3	7.899e-36	1.208e-37	-35.102	-36.918	-1.816	(0)
Fe (2)	8.349e-07					
Fe+2	6.141e-07	9.577e-08	-6.212	-7.019	-0.807	(0)
FeSO4	1.592e-07	1.592e-07	-6.798	-6.798	0.000	(0)
FeHCO3+	6.153e-08	4.739e-08	-7.211	-7.324	-0.113	(0)
FeOH+	9.565e-11	7.218e-11	-10.019	-10.142	-0.122	(0)
Fe(OH) 2	1.085e-15	1.085e-15	-14.964	-14.964	0.000	(0)
Fe(OH) 3-	8.610e-18	6.497e-18	-17.065	-17.187	-0.122	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-156.284	-156.284	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-233.152	-233.354	-0.202	(0)
Fe (3)	6.273e-06					
Fe(OH) 2+	6.130e-06	4.666e-06	-5.213	-5.331	-0.119	(0)
Fe(OH) 3	9.486e-08	9.486e-08	-7.023	-7.023	0.000	(0)
FeF3	3.335e-08	3.335e-08	-7.477	-7.477	0.000	(0)
FeF2+	1.255e-08	9.473e-09	-7.901	-8.024	-0.122	(0)
FeOH+2	1.954e-09	6.335e-10	-8.709	-9.198	-0.489	(0)
FeF+2	4.375e-10	1.418e-10	-9.359	-9.848	-0.489	(0)
Fe(OH) 4-	2.197e-10	1.672e-10	-9.658	-9.777	-0.119	(0)
FeSO4+	5.221e-12	3.939e-12	-11.282	-11.405	-0.122	(0)
Fe(SO4) 2-	9.078e-13	5.705e-13	-12.042	-12.244	-0.202	(0)
Fe+3	6.312e-13	5.183e-14	-12.200	-13.285	-1.086	(0)
Fe2(OH) 2+4	2.246e-14	1.329e-17	-13.649	-16.876	-3.228	(0)
FeCl+2	2.057e-14	6.668e-15	-13.687	-14.176	-0.489	(0)
FeHSeO3+2	2.804e-16	4.374e-17	-15.552	-16.359	-0.807	(0)
FeCl2+	1.681e-16	1.269e-16	-15.774	-15.897	-0.122	(0)
Fe3(OH) 4+5	9.907e-17	8.963e-22	-16.004	-21.048	-5.044	(0)
FeNO3+2	1.113e-19	1.735e-20	-18.954	-19.761	-0.807	(0)
FeCl3	5.404e-20	5.404e-20	-19.267	-19.267	0.000	(0)
H (0)	1.130e-29					
H2	5.651e-30	5.858e-30	-29.248	-29.232	0.016	(0)
Hg (0)	7.355e-10					
Hg	7.355e-10	7.355e-10	-9.133	-9.133	0.000	(0)
Hg (1)	1.732e-17					

Hg2+2	8.658e-18	1.350e-18	-17.063	-17.870	-0.807	(0)
Hg (2)	5.666e-09					
HgCl2	4.907e-09	4.907e-09	-8.309	-8.309	0.000	(0)
HgClOH	3.851e-10	3.851e-10	-9.414	-9.414	0.000	(0)
HgCl3-	3.326e-10	2.090e-10	-9.478	-9.680	-0.202	(0)
HgCl4-2	2.273e-11	3.545e-12	-10.643	-11.450	-0.807	(0)
HgCO3	1.125e-11	1.125e-11	-10.949	-10.949	0.000	(0)
Hg (OH) 2	5.899e-12	6.115e-12	-11.229	-11.214	0.016	(0)
Hg (CO3) 2-2	7.933e-13	1.237e-13	-12.101	-12.908	-0.807	(0)
HgCl+	3.658e-13	2.299e-13	-12.437	-12.639	-0.202	(0)
HgHCO3+	1.767e-13	1.111e-13	-12.753	-12.954	-0.202	(0)
HgOH+	3.243e-15	2.038e-15	-14.489	-14.691	-0.202	(0)
Hg (NH3) 2+2	3.588e-16	5.597e-17	-15.445	-16.252	-0.807	(0)
HgNH3+2	6.266e-17	9.773e-18	-16.203	-17.010	-0.807	(0)
Hg+2	1.734e-17	2.705e-18	-16.761	-17.568	-0.807	(0)
HgSO4	4.796e-18	4.796e-18	-17.319	-17.319	0.000	(0)
HgF+	3.981e-19	2.502e-19	-18.400	-18.602	-0.202	(0)
Hg (OH) 3-	2.319e-20	1.457e-20	-19.635	-19.836	-0.202	(0)
Hg (NH3) 3+2	8.181e-24	1.276e-24	-23.087	-23.894	-0.807	(0)
HgNO3+	5.320e-26	3.343e-26	-25.274	-25.476	-0.202	(0)
Hg (NH3) 4+2	3.722e-31	5.805e-32	-30.429	-31.236	-0.807	(0)
Hg (NO3) 2	4.652e-34	4.652e-34	-33.332	-33.332	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.377	-137.579	-0.202	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.461	-137.461	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.204	-140.011	-0.807	(0)
K	1.003e-02					
K+	9.576e-03	7.254e-03	-2.019	-2.139	-0.121	(0)
KSO4-	4.570e-04	3.478e-04	-3.340	-3.459	-0.119	(0)
KCrO4-	1.547e-21	9.725e-22	-20.810	-21.012	-0.202	(0)
Mg	1.227e-02					
Mg+2	7.175e-03	2.362e-03	-2.144	-2.627	-0.482	(0)
MgSO4	2.912e-03	2.912e-03	-2.536	-2.536	0.000	(0)
MgHCO3+	1.290e-03	9.502e-04	-2.889	-3.022	-0.133	(0)
MgF+	8.868e-04	6.615e-04	-3.052	-3.179	-0.127	(0)
MgCO3	6.832e-06	6.832e-06	-5.165	-5.165	0.000	(0)
MgOH+	2.290e-08	1.780e-08	-7.640	-7.749	-0.109	(0)
MgH2BO3+	8.781e-09	6.184e-09	-8.056	-8.209	-0.152	(0)
Mn (2)	1.482e-04					
Mn+2	1.081e-04	1.686e-05	-3.966	-4.773	-0.807	(0)
MnSO4	2.031e-05	2.031e-05	-4.692	-4.692	0.000	(0)
MnHCO3+	1.752e-05	1.322e-05	-4.756	-4.879	-0.122	(0)
MnF+	2.220e-06	1.675e-06	-5.654	-5.776	-0.122	(0)
MnCl+	1.198e-07	9.040e-08	-6.922	-7.044	-0.122	(0)
MnOH+	1.062e-09	8.016e-10	-8.974	-9.096	-0.122	(0)
MnCl2	5.439e-10	5.439e-10	-9.264	-9.264	0.000	(0)
MnNO3+	1.423e-12	8.945e-13	-11.847	-12.048	-0.202	(0)
MnCl3-	8.456e-13	6.381e-13	-12.073	-12.195	-0.122	(0)
MnSeO4	1.620e-13	1.620e-13	-12.791	-12.791	0.000	(0)
Mn (NO3) 2	7.522e-20	7.522e-20	-19.124	-19.124	0.000	(0)
Mn (OH) 3-	2.352e-21	1.775e-21	-20.628	-20.751	-0.122	(0)
Mn (OH) 4-2	3.346e-28	1.085e-28	-27.475	-27.965	-0.489	(0)
MnSe	0.000e+00	0.000e+00	-43.760	-43.760	0.000	(0)
Mn (3)	5.342e-23					
Mn+3	5.342e-23	4.387e-24	-22.272	-23.358	-1.086	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.445	-45.934	-0.489	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.396	-48.541	-0.145	(0)
Mo	5.725e-06					
MoO4-2	5.693e-06	1.874e-06	-5.245	-5.727	-0.482	(0)
HMoO4-	3.145e-08	1.977e-08	-7.502	-7.704	-0.202	(0)
H2MoO4	7.673e-11	7.673e-11	-10.115	-10.115	0.000	(0)
AlMo6O21-3	4.353e-29	6.654e-31	-28.361	-30.177	-1.816	(0)
Mo7O24-6	9.189e-31	5.019e-38	-30.037	-37.299	-7.263	(0)
HMo7O24-5	7.164e-33	6.481e-38	-32.145	-37.188	-5.044	(0)
H2Mo7O24-4	3.515e-36	2.080e-39	-35.454	-38.682	-3.228	(0)
H3Mo7O24-3	1.271e-40	0.000e+00	-39.896	-41.712	-1.816	(0)
N (-3)	8.081e-06					

NH4+	7.559e-06	5.323e-06	-5.122	-5.274	-0.152	(0)
NH4SO4-	5.120e-07	3.864e-07	-6.291	-6.413	-0.122	(0)
NH3	5.727e-09	5.727e-09	-8.242	-8.242	0.000	(0)
CuNH3+2	4.378e-09	6.828e-10	-8.359	-9.166	-0.807	(0)
CaNH3+2	3.887e-10	6.062e-11	-9.410	-10.217	-0.807	(0)
BaNH3+2	1.315e-13	2.051e-14	-12.881	-13.688	-0.807	(0)
Co (NH3) +2	6.779e-16	1.057e-16	-15.169	-15.976	-0.807	(0)
NiNH3+2	5.126e-16	7.995e-17	-15.290	-16.097	-0.807	(0)
Hg (NH3) 2+2	3.588e-16	5.597e-17	-15.445	-16.252	-0.807	(0)
HgNH3+2	6.266e-17	9.773e-18	-16.203	-17.010	-0.807	(0)
Ca (NH3) 2+2	8.861e-19	1.382e-19	-18.052	-18.859	-0.807	(0)
Ni (NH3) 2+2	4.244e-22	6.619e-23	-21.372	-22.179	-0.807	(0)
Co (NH3) 2+2	1.656e-22	2.583e-23	-21.781	-22.588	-0.807	(0)
Hg (NH3) 3+2	8.181e-24	1.276e-24	-23.087	-23.894	-0.807	(0)
Co (NH3) 3+2	1.194e-29	1.862e-30	-28.923	-29.730	-0.807	(0)
Hg (NH3) 4+2	3.722e-31	5.805e-32	-30.429	-31.236	-0.807	(0)
Co (NH3) 4+2	3.589e-37	5.598e-38	-36.445	-37.252	-0.807	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.748	-41.555	-0.807	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.467	-45.274	-0.807	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.630	-49.446	-1.816	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.908	-50.715	-0.807	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.961	-50.768	-0.807	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.397	-60.599	-0.202	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.918	-65.725	-0.807	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.070	-66.877	-0.807	(0)
N (3)	1.445e-05					
NO2-	1.443e-05	1.033e-05	-4.841	-4.986	-0.145	(0)
CuNO2+	2.006e-08	1.260e-08	-7.698	-7.899	-0.202	(0)
Cu (NO2) 2	1.332e-12	1.332e-12	-11.875	-11.875	0.000	(0)
CoNO2+	1.779e-14	1.118e-14	-13.750	-13.952	-0.202	(0)
N (5)	4.562e-08					
NO3-	4.420e-08	3.348e-08	-7.355	-7.475	-0.121	(0)
CaNO3+	1.416e-09	8.902e-10	-8.849	-9.051	-0.202	(0)
CuNO3+	1.963e-12	1.233e-12	-11.707	-11.909	-0.202	(0)
BaNO3+	1.516e-12	9.525e-13	-11.819	-12.021	-0.202	(0)
MnNO3+	1.423e-12	8.945e-13	-11.847	-12.048	-0.202	(0)
ZnNO3+	3.149e-13	1.979e-13	-12.502	-12.704	-0.202	(0)
PbNO3+	6.018e-15	3.782e-15	-14.221	-14.422	-0.202	(0)
CdNO3+	4.543e-15	2.855e-15	-14.343	-14.544	-0.202	(0)
CoNO3+	1.297e-17	8.149e-18	-16.887	-17.089	-0.202	(0)
NiNO3+	3.479e-18	2.186e-18	-17.459	-17.660	-0.202	(0)
FeNO3+2	1.113e-19	1.735e-20	-18.954	-19.761	-0.807	(0)
VO2NO3	7.872e-20	7.872e-20	-19.104	-19.104	0.000	(0)
Mn (NO3) 2	7.522e-20	7.522e-20	-19.124	-19.124	0.000	(0)
Cu (NO3) 2	5.199e-21	5.199e-21	-20.284	-20.284	0.000	(0)
Zn (NO3) 2	1.322e-21	1.322e-21	-20.879	-20.879	0.000	(0)
CrNO3+2	9.523e-22	1.485e-22	-21.021	-21.828	-0.807	(0)
UO2NO3+	6.695e-22	4.207e-22	-21.174	-21.376	-0.202	(0)
Pb (NO3) 2	2.150e-22	2.150e-22	-21.668	-21.668	0.000	(0)
Cd (NO3) 2	4.790e-23	4.790e-23	-22.320	-22.320	0.000	(0)
Co (NO3) 2	5.551e-25	5.551e-25	-24.256	-24.256	0.000	(0)
HgNO3+	5.320e-26	3.343e-26	-25.274	-25.476	-0.202	(0)
Hg (NO3) 2	4.652e-34	4.652e-34	-33.332	-33.332	0.000	(0)
Na	1.799e-02					
Na+	1.706e-02	1.293e-02	-1.768	-1.889	-0.121	(0)
NaSO4-	6.178e-04	4.702e-04	-3.209	-3.328	-0.119	(0)
NaHCO3	2.857e-04	2.857e-04	-3.544	-3.544	0.000	(0)
NaF	2.035e-05	2.035e-05	-4.691	-4.691	0.000	(0)
NaCO3-	1.100e-06	8.368e-07	-5.959	-6.077	-0.119	(0)
NaH2BO3	1.547e-09	1.547e-09	-8.811	-8.811	0.000	(0)
NaCrO4-	3.688e-21	2.318e-21	-20.433	-20.635	-0.202	(0)
Ni	3.210e-10					
NiHCO3+	2.005e-10	1.260e-10	-9.698	-9.900	-0.202	(0)
Ni+2	7.896e-11	2.600e-11	-10.103	-10.585	-0.482	(0)
NiSO4	3.514e-11	3.514e-11	-10.454	-10.454	0.000	(0)
NiCO3	3.372e-12	3.372e-12	-11.472	-11.472	0.000	(0)
NiF+	2.593e-12	1.630e-12	-11.586	-11.788	-0.202	(0)
NiCl+	4.508e-13	2.833e-13	-12.346	-12.548	-0.202	(0)

Ni (SO4) 2-2	5.053e-14	7.881e-15	-13.296	-14.103	-0.807	(0)
NiOH+	9.858e-15	6.195e-15	-14.006	-14.208	-0.202	(0)
NiNH3+2	5.126e-16	7.995e-17	-15.290	-16.097	-0.807	(0)
Ni (OH) 2	9.316e-18	9.316e-18	-17.031	-17.031	0.000	(0)
NiCl2	6.076e-18	6.076e-18	-17.216	-17.216	0.000	(0)
NiNO3+	3.479e-18	2.186e-18	-17.459	-17.660	-0.202	(0)
NiSeO4	4.341e-19	4.341e-19	-18.362	-18.362	0.000	(0)
Ni (NH3) 2+2	4.244e-22	6.619e-23	-21.372	-22.179	-0.807	(0)
Ni (OH) 3-	2.806e-22	1.763e-22	-21.552	-21.754	-0.202	(0)
O (0)	2.829e-34					
O2	1.414e-34	1.466e-34	-33.849	-33.834	0.016	(0)
Pb	4.997e-07					
PbHCO3+	3.549e-07	2.230e-07	-6.450	-6.652	-0.202	(0)
PbCO3	7.982e-08	7.982e-08	-7.098	-7.098	0.000	(0)
PbSO4	2.534e-08	2.534e-08	-7.596	-7.596	0.000	(0)
Pb+2	2.320e-08	7.637e-09	-7.635	-8.117	-0.482	(0)
Pb (SO4) 2-2	6.630e-09	1.034e-09	-8.178	-8.985	-0.807	(0)
Pb (CO3) 2-2	5.132e-09	8.004e-10	-8.290	-9.097	-0.807	(0)
PbF+	2.137e-09	1.343e-09	-8.670	-8.872	-0.202	(0)
PbCl+	1.837e-09	1.154e-09	-8.736	-8.938	-0.202	(0)
PbOH+	5.779e-10	3.631e-10	-9.238	-9.440	-0.202	(0)
PbF2	6.596e-11	6.596e-11	-10.181	-10.181	0.000	(0)
PbCl2	2.196e-11	2.196e-11	-10.658	-10.658	0.000	(0)
PbF3-	4.968e-13	3.122e-13	-12.304	-12.506	-0.202	(0)
Pb (OH) 2	2.174e-13	2.174e-13	-12.663	-12.663	0.000	(0)
PbCl3-	5.926e-14	3.724e-14	-13.227	-13.429	-0.202	(0)
PbNO3+	6.018e-15	3.782e-15	-14.221	-14.422	-0.202	(0)
Pb2OH+3	2.875e-15	4.395e-17	-14.541	-16.357	-1.816	(0)
PbF4-2	2.391e-15	3.730e-16	-14.621	-15.428	-0.807	(0)
PbCl4-2	4.649e-16	7.251e-17	-15.333	-16.140	-0.807	(0)
Pb (OH) 3-	6.548e-18	4.115e-18	-17.184	-17.386	-0.202	(0)
Pb (NO3) 2	2.150e-22	2.150e-22	-21.668	-21.668	0.000	(0)
Pb (OH) 4-2	1.223e-22	1.908e-23	-21.913	-22.719	-0.807	(0)
Pb3 (OH) 4+2	4.617e-23	7.201e-24	-22.336	-23.143	-0.807	(0)
Pb4 (OH) 4+4	7.382e-25	4.368e-28	-24.132	-27.360	-3.228	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.062	-151.062	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.668	-228.869	-0.202	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.363	-78.363	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.467	-78.669	-0.202	(0)
HS-	0.000e+00	0.000e+00	-78.906	-79.107	-0.202	(0)
S5-2	0.000e+00	0.000e+00	-81.390	-82.197	-0.807	(0)
S6-2	0.000e+00	0.000e+00	-81.906	-82.713	-0.807	(0)
S4-2	0.000e+00	0.000e+00	-81.986	-82.792	-0.807	(0)
S3-2	0.000e+00	0.000e+00	-82.791	-83.598	-0.807	(0)
S2-2	0.000e+00	0.000e+00	-83.808	-84.614	-0.807	(0)
S-2	0.000e+00	0.000e+00	-89.643	-90.132	-0.489	(0)
HgHS2-	0.000e+00	0.000e+00	-137.377	-137.579	-0.202	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.461	-137.461	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.204	-140.011	-0.807	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.556	-150.757	-0.202	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.572	-150.572	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.827	-151.282	-0.455	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.023	-151.023	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.062	-151.062	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.585	-152.012	-0.427	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-156.284	-156.284	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.155	-216.357	-0.202	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.649	-226.851	-0.202	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.578	-227.780	-0.202	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.668	-228.869	-0.202	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.748	-230.555	-0.807	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-233.152	-233.354	-0.202	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.884	-304.691	-0.807	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.611	-307.418	-0.807	(0)
Sb2S4-2	0.000e+00	0.000e+00	-315.581	-316.388	-0.807	(0)
S (6)	3.765e-02					
SO4-2	2.057e-02	6.774e-03	-1.687	-2.169	-0.482	(0)

CaSO4	1.305e-02	1.305e-02	-1.884	-1.884	0.000	(0)
MgSO4	2.912e-03	2.912e-03	-2.536	-2.536	0.000	(0)
NaSO4-	6.178e-04	4.702e-04	-3.209	-3.328	-0.119	(0)
KSO4-	4.570e-04	3.478e-04	-3.340	-3.459	-0.119	(0)
MnSO4	2.031e-05	2.031e-05	-4.692	-4.692	0.000	(0)
CuSO4	1.808e-05	1.808e-05	-4.743	-4.743	0.000	(0)
ZnSO4	3.487e-06	3.487e-06	-5.458	-5.458	0.000	(0)
Zn (SO4) 2-2	1.319e-06	2.057e-07	-5.880	-6.687	-0.807	(0)
NH4SO4-	5.120e-07	3.864e-07	-6.291	-6.413	-0.122	(0)
HSO4-	4.703e-07	3.508e-07	-6.328	-6.455	-0.127	(0)
FeSO4	1.592e-07	1.592e-07	-6.798	-6.798	0.000	(0)
CdSO4	4.282e-08	4.282e-08	-7.368	-7.368	0.000	(0)
PbSO4	2.534e-08	2.534e-08	-7.596	-7.596	0.000	(0)
Cd (SO4) 2-2	2.508e-08	3.912e-09	-7.601	-8.408	-0.807	(0)
Pb (SO4) 2-2	6.630e-09	1.034e-09	-8.178	-8.985	-0.807	(0)
CoSO4	2.076e-10	2.076e-10	-9.683	-9.683	0.000	(0)
CrOHSO4	6.756e-11	6.756e-11	-10.170	-10.170	0.000	(0)
NiSO4	3.514e-11	3.514e-11	-10.454	-10.454	0.000	(0)
FeSO4+	5.221e-12	3.939e-12	-11.282	-11.405	-0.122	(0)
AlSO4+	4.910e-12	3.663e-12	-11.309	-11.436	-0.127	(0)
CrSO4+	2.554e-12	1.605e-12	-11.593	-11.794	-0.202	(0)
VO2SO4-	1.196e-12	7.518e-13	-11.922	-12.124	-0.202	(0)
Fe (SO4) 2-	9.078e-13	5.705e-13	-12.042	-12.244	-0.202	(0)
Al (SO4) 2-	3.564e-13	2.658e-13	-12.448	-12.575	-0.127	(0)
UO2SO4	6.457e-14	6.457e-14	-13.190	-13.190	0.000	(0)
Ni (SO4) 2-2	5.053e-14	7.881e-15	-13.296	-14.103	-0.807	(0)
UO2 (SO4) 2-2	3.697e-14	5.766e-15	-13.432	-14.239	-0.807	(0)
VOSO4	3.356e-14	3.356e-14	-13.474	-13.474	0.000	(0)
HgSO4	4.796e-18	4.796e-18	-17.319	-17.319	0.000	(0)
Cr2 (OH) 2SO4+2	1.646e-18	2.567e-19	-17.784	-18.591	-0.807	(0)
Cr2 (OH) 2 (SO4) 2	1.033e-19	1.033e-19	-18.986	-18.986	0.000	(0)
CrO3SO4-2	4.354e-25	6.791e-26	-24.361	-25.168	-0.807	(0)
VSO4+	2.199e-27	1.382e-27	-26.658	-26.859	-0.202	(0)
U (SO4) 2	3.518e-38	3.518e-38	-37.454	-37.454	0.000	(0)
USO4+2	4.193e-39	6.539e-40	-38.378	-39.184	-0.807	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.397	-60.599	-0.202	(0)
Sb (3)	7.852e-19					
Sb (OH) 3	3.958e-19	3.958e-19	-18.403	-18.403	0.000	(0)
HSbO2	3.878e-19	3.878e-19	-18.411	-18.411	0.000	(0)
Sb (OH) 2F	8.208e-22	8.208e-22	-21.086	-21.086	0.000	(0)
SbOF	8.100e-22	8.100e-22	-21.091	-21.091	0.000	(0)
Sb (OH) 2+	8.135e-24	5.112e-24	-23.090	-23.291	-0.202	(0)
SbO+	2.815e-24	1.769e-24	-23.551	-23.752	-0.202	(0)
SbO2-	1.886e-24	1.185e-24	-23.725	-23.926	-0.202	(0)
Sb (OH) 4-	1.073e-24	6.741e-25	-23.970	-24.171	-0.202	(0)
Sb2S4-2	0.000e+00	0.000e+00	-315.581	-316.388	-0.807	(0)
Sb (5)	6.019e-08					
SbO3-	6.013e-08	3.779e-08	-7.221	-7.423	-0.202	(0)
Sb (OH) 6-	5.771e-11	4.372e-11	-10.239	-10.359	-0.121	(0)
SbO2+	4.862e-21	3.055e-21	-20.313	-20.515	-0.202	(0)
Se (-2)	2.109e-40					
HSe-	2.109e-40	1.326e-40	-39.676	-39.878	-0.202	(0)
H2Se	0.000e+00	0.000e+00	-42.263	-42.263	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.760	-43.760	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.795	-48.602	-0.807	(0)
Se (4)	5.236e-07					
HSeO3-	5.082e-07	3.194e-07	-6.294	-6.496	-0.202	(0)
SeO3-2	1.538e-08	2.399e-09	-7.813	-8.620	-0.807	(0)
H2SeO3	7.220e-11	7.220e-11	-10.141	-10.141	0.000	(0)
FeHSeO3+2	2.804e-16	4.374e-17	-15.552	-16.359	-0.807	(0)
Cd (SeO3) 2-2	8.200e-19	1.279e-19	-18.086	-18.893	-0.807	(0)
Se (6)	1.086e-10					
SeO4-2	1.084e-10	3.570e-11	-9.965	-10.447	-0.482	(0)
MnSeO4	1.620e-13	1.620e-13	-12.791	-12.791	0.000	(0)
ZnSeO4	1.301e-14	1.301e-14	-13.886	-13.886	0.000	(0)
HSeO4-	1.509e-15	9.482e-16	-14.821	-15.023	-0.202	(0)
CdSeO4	1.792e-16	1.792e-16	-15.747	-15.747	0.000	(0)
CoSeO4	2.748e-18	2.748e-18	-17.561	-17.561	0.000	(0)

NiSeO4	4.341e-19	4.341e-19	-18.362	-18.362	0.000	(0)
Zn (SeO4) 2-2	3.019e-24	4.709e-25	-23.520	-24.327	-0.807	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.361	-59.177	-1.816	(0)
U (4)	6.971e-26					
U (OH) 5-	6.874e-26	4.320e-26	-25.163	-25.365	-0.202	(0)
U (OH) 4	9.623e-28	9.623e-28	-27.017	-27.017	0.000	(0)
U (OH) 3+	2.978e-30	1.871e-30	-29.526	-29.728	-0.202	(0)
UF3+	2.388e-30	1.501e-30	-29.622	-29.824	-0.202	(0)
UF4	4.106e-31	4.106e-31	-30.387	-30.387	0.000	(0)
UF6-2	1.962e-31	3.061e-32	-30.707	-31.514	-0.807	(0)
UF5-	6.462e-32	4.061e-32	-31.190	-31.391	-0.202	(0)
UF2+2	2.432e-32	3.794e-33	-31.614	-32.421	-0.807	(0)
U (OH) 2+2	2.951e-33	4.603e-34	-32.530	-33.337	-0.807	(0)
UF+3	7.899e-36	1.208e-37	-35.102	-36.918	-1.816	(0)
UOH+3	7.543e-37	1.153e-38	-36.122	-37.938	-1.816	(0)
U (SO4) 2	3.518e-38	3.518e-38	-37.454	-37.454	0.000	(0)
USO4+2	4.193e-39	6.539e-40	-38.378	-39.184	-0.807	(0)
U+4	0.000e+00	0.000e+00	-40.387	-43.615	-3.228	(0)
UCl+3	0.000e+00	0.000e+00	-42.470	-44.286	-1.816	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.393	-184.734	-16.341	(0)
U (5)	1.049e-18					
UO2+	1.049e-18	6.590e-19	-17.979	-18.181	-0.202	(0)
U (6)	1.820e-06					
UO2 (CO3) 3-4	1.781e-06	1.054e-09	-5.749	-8.977	-3.228	(0)
UO2 (CO3) 2-2	3.878e-08	6.048e-09	-7.411	-8.218	-0.807	(0)
UO2CO3	8.718e-11	8.718e-11	-10.060	-10.060	0.000	(0)
UO2F2	1.562e-11	1.562e-11	-10.806	-10.806	0.000	(0)
UO2F3-	1.558e-11	9.790e-12	-10.807	-11.009	-0.202	(0)
UO2F+	3.453e-12	2.170e-12	-11.462	-11.664	-0.202	(0)
UO2F4-2	1.244e-12	1.941e-13	-11.905	-12.712	-0.807	(0)
UO2SO4	6.457e-14	6.457e-14	-13.190	-13.190	0.000	(0)
UO2 (SO4) 2-2	3.697e-14	5.766e-15	-13.432	-14.239	-0.807	(0)
UO2OH+	2.389e-14	1.501e-14	-13.622	-13.824	-0.202	(0)
UO2+2	1.913e-14	6.298e-15	-13.718	-14.201	-0.482	(0)
UO2Cl+	6.924e-17	4.351e-17	-16.160	-16.361	-0.202	(0)
(UO2) 2 (OH) 2+2	2.397e-21	3.739e-22	-20.620	-21.427	-0.807	(0)
UO2NO3+	6.695e-22	4.207e-22	-21.174	-21.376	-0.202	(0)
(UO2) 3 (OH) 5+	2.428e-27	1.526e-27	-26.615	-26.817	-0.202	(0)
V (2)	2.684e-38					
V+2	2.330e-38	3.634e-39	-37.633	-38.440	-0.807	(0)
VOH+	3.542e-39	2.226e-39	-38.451	-38.652	-0.202	(0)
V (3)	2.365e-12					
V (OH) 3	2.365e-12	2.365e-12	-11.626	-11.626	0.000	(0)
V (OH) 2+	1.294e-21	8.129e-22	-20.888	-21.090	-0.202	(0)
VOH+2	2.629e-23	4.101e-24	-22.580	-23.387	-0.807	(0)
V+3	2.828e-26	4.323e-28	-25.549	-27.364	-1.816	(0)
VSO4+	2.199e-27	1.382e-27	-26.658	-26.859	-0.202	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-42.746	-45.974	-3.228	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-44.209	-46.025	-1.816	(0)
V (4)	9.744e-13					
VOF+	4.285e-13	2.693e-13	-12.368	-12.570	-0.202	(0)
VOF2	2.520e-13	2.520e-13	-12.599	-12.599	0.000	(0)
VO+2	1.153e-13	1.799e-14	-12.938	-13.745	-0.807	(0)
V (OH) 3+	1.077e-13	6.770e-14	-12.968	-13.169	-0.202	(0)
VOF3-	3.551e-14	2.231e-14	-13.450	-13.651	-0.202	(0)
VOSO4	3.356e-14	3.356e-14	-13.474	-13.474	0.000	(0)
VOF4-2	1.441e-15	2.248e-16	-14.841	-15.648	-0.807	(0)
VOC1+	3.421e-16	2.150e-16	-15.466	-15.668	-0.202	(0)
H2V2O4+2	1.484e-21	2.314e-22	-20.829	-21.636	-0.807	(0)
V (5)	1.414e-06					
H2VO4-	1.310e-06	8.233e-07	-5.883	-6.084	-0.202	(0)
H3V2O7-	3.705e-08	2.328e-08	-7.431	-7.633	-0.202	(0)
HVO4-2	2.502e-08	3.902e-09	-7.602	-8.409	-0.807	(0)
H3VO4	4.363e-09	4.363e-09	-8.360	-8.360	0.000	(0)
HV2O7-3	7.148e-11	1.093e-12	-10.146	-11.962	-1.816	(0)
V3O9-3	3.865e-11	5.909e-13	-10.413	-12.228	-1.816	(0)
VO2F2-	2.933e-11	1.843e-11	-10.533	-10.734	-0.202	(0)

VO2F	2.034e-11	2.034e-11	-10.692	-10.692	0.000	(0)
VO2+	6.136e-12	4.648e-12	-11.212	-11.333	-0.121	(0)
VO2F3-2	3.679e-12	5.739e-13	-11.434	-12.241	-0.807	(0)
VO2SO4-	1.196e-12	7.518e-13	-11.922	-12.124	-0.202	(0)
V4O12-4	3.440e-13	2.036e-16	-12.463	-15.691	-3.228	(0)
V2O7-4	9.378e-14	5.549e-17	-13.028	-16.256	-3.228	(0)
VO2F4-3	4.610e-14	7.047e-16	-13.336	-15.152	-1.816	(0)
VO4-3	2.414e-15	3.690e-17	-14.617	-16.433	-1.816	(0)
VO2NO3	7.872e-20	7.872e-20	-19.104	-19.104	0.000	(0)
V10O28-6	1.739e-30	9.498e-38	-29.760	-37.022	-7.263	(0)
HV10O28-5	8.553e-31	7.737e-36	-30.068	-35.111	-5.044	(0)
H2V10O28-4	1.118e-33	6.614e-37	-32.952	-36.180	-3.228	(0)
Zn	1.731e-05					
Zn+2	7.147e-06	2.353e-06	-5.146	-5.628	-0.482	(0)
ZnHCO3+	4.654e-06	2.925e-06	-5.332	-5.534	-0.202	(0)
ZnSO4	3.487e-06	3.487e-06	-5.458	-5.458	0.000	(0)
Zn (SO4) 2-2	1.319e-06	2.057e-07	-5.880	-6.687	-0.807	(0)
ZnCO3	4.708e-07	4.708e-07	-6.327	-6.327	0.000	(0)
ZnF+	1.865e-07	1.172e-07	-6.729	-6.931	-0.202	(0)
ZnCl+	3.418e-08	2.518e-08	-7.466	-7.599	-0.133	(0)
ZnOH+	7.088e-09	4.454e-09	-8.149	-8.351	-0.202	(0)
ZnOHCl	6.240e-10	6.240e-10	-9.205	-9.205	0.000	(0)
ZnCl2	1.700e-10	1.700e-10	-9.770	-9.770	0.000	(0)
Zn (OH) 2	1.336e-11	1.336e-11	-10.874	-10.874	0.000	(0)
ZnCl3-	7.807e-13	5.751e-13	-12.108	-12.240	-0.133	(0)
ZnNO3+	3.149e-13	1.979e-13	-12.502	-12.704	-0.202	(0)
ZnSeO4	1.301e-14	1.301e-14	-13.886	-13.886	0.000	(0)
ZnCl4-2	3.778e-15	1.225e-15	-14.423	-14.912	-0.489	(0)
Zn (OH) 3-	2.018e-15	1.268e-15	-14.695	-14.897	-0.202	(0)
Zn (OH) 4-2	6.126e-21	9.555e-22	-20.213	-21.020	-0.807	(0)
Zn (NO3) 2	1.322e-21	1.322e-21	-20.879	-20.879	0.000	(0)
Zn (SeO4) 2-2	3.019e-24	4.709e-25	-23.520	-24.327	-0.807	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.556	-150.757	-0.202	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.023	-151.023	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.649	-226.851	-0.202	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-229.748	-230.555	-0.807	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.611	-307.418	-0.807	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-54.05	-47.76	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-42.06	-37.55	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-49.29	-37.55	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-69.80	-51.86	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-56.58	-36.55	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-30.39	-29.99	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-21.44	-20.99	0.45	(NH4) 2SeO4	
Al (OH) 3 (am)	-5.13	5.67	10.80	Al (OH) 3	
Al2 (MoO4) 3	-45.86	-43.50	2.37	Al2 (MoO4) 3	
Al2O3	-8.32	11.34	19.65	Al2O3	
Al4 (OH) 10SO4	-14.76	7.94	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-10.80	-6.00	4.80	AlAsO4:2H2O	
AlOHSO4	-5.82	-9.05	-3.23	AlOHSO4	
AlSb	-156.60	-90.97	65.62	AlSb	
Alunite	-6.90	-8.30	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-2.50	-10.29	-7.79	PbSO4	
Anhydrite	0.12	-4.24	-4.36	CaSO4	
Anilite	-55.70	-87.58	-31.88	Cu0.25Cu1.5S	
Antlerite	-0.66	8.13	8.79	Cu3 (OH) 4SO4	
Aragonite	0.77	-7.53	-8.30	CaCO3	
Arsenolite	-72.64	-75.40	-2.76	As4O6	
Artinite	-7.77	1.83	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-30.04	-23.33	6.71	As2O5	
Atacamite	-0.81	6.58	7.39	Cu2 (OH) 3Cl	
Azurite	3.74	-13.17	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-17.10	7.29	24.39	Ba (OH) 2:8H2O	

Ba2V2O7:2H2O	-11.38	4.49	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	7.49	-1.42	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-21.15	11.79	32.94	Ba3(VO4)2:4H2O
BaCrO4	-15.02	-24.69	-9.67	BaCrO4
BaF2	-4.63	-10.45	-5.82	BaF2
BaMoO4	-4.01	-10.97	-6.96	BaMoO4
Barite	2.56	-7.42	-9.98	BaSO4
BaS	-94.26	-78.08	16.18	BaS
BaSeO3	-7.30	-5.47	1.83	BaSeO3
BaSeO4	-8.23	-15.69	-7.46	BaSeO4
Bianchite	-6.04	-7.81	-1.76	ZnSO4:6H2O
Birnessite	-9.58	8.51	18.09	MnO2
Bixbyite	-8.42	-9.07	-0.64	Mn2O3
BlaubleiI	-54.91	-79.07	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.72	-83.00	-27.28	Cu0.6Cu0.8S
Boehmite	-2.91	5.67	8.58	AlOOH
Breithauptite	-63.11	-81.64	-18.52	NiSb
Brochantite	0.52	15.74	15.22	Cu4(OH)6SO4
Brucite	-6.92	9.92	16.84	Mg(OH)2
Bunsenite	-10.48	1.96	12.45	NiO
Ca(VO3)2	-5.30	0.36	5.66	Ca(VO3)2
Ca2V2O7	-6.67	10.83	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.72	10.83	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.22	8.08	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.65	21.31	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.56	21.30	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-304.83	-161.86	142.97	Ca3Sb2
CaCrO4	-19.25	-21.52	-2.27	CaCrO4
Calcite	0.95	-7.53	-8.48	CaCO3
Calomel	-4.70	-22.61	-17.91	Hg2Cl2
CaMoO4	0.15	-7.80	-7.95	CaMoO4
Carnotite	-2.80	-2.57	0.23	KUO2VO4
CaSeO3:2H2O	-5.11	-2.30	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.51	-12.53	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.18	-3.34	9.84	Cd(BO2)2
Cd(OH)2	-8.66	4.98	13.64	Cd(OH)2
Cd(OH)2(am)	-8.75	4.98	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.21	-14.50	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.34	0.22	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.20	5.20	28.40	Cd4(OH)6SO4
CdCl2	-11.65	-12.31	-0.66	CdCl2
CdCl2:1H2O	-10.62	-12.31	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.40	-12.31	-1.91	CdCl2:2.5H2O
CdF2	-11.56	-12.77	-1.21	CdF2
Cdmetal(alpha)	-34.61	-21.10	13.51	Cd
Cdmetal(gamma)	-34.72	-21.10	13.62	Cd
CdMoO4	0.85	-13.30	-14.15	CdMoO4
CdOHCl	-7.20	-3.67	3.54	CdOHCl
CdSb	-78.27	-78.62	-0.35	CdSb
CdSe	-20.97	-41.17	-20.20	CdSe
CdSeO4:2H2O	-16.17	-18.02	-1.85	CdSeO4:2H2O
CdSO4	-9.57	-9.74	-0.17	CdSO4
CdSO4:1H2O	-8.01	-9.74	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.87	-9.74	-1.87	CdSO4:2.67H2O
Cerrusite	-0.45	-13.58	-13.13	PbCO3
CH4(g)	-81.29	-122.33	-41.05	CH4
Chalcanthite	-4.47	-7.11	-2.64	CuSO4:5H2O
Chalcocite	-55.93	-90.85	-34.92	Cu2S
Chalcopyrite	-122.35	-157.62	-35.27	CuFeS2
Cinnabar	-50.90	-96.59	-45.69	HgS
Claudetite	-72.33	-75.40	-3.06	As4O6
Clausthalite	-14.62	-41.72	-27.10	PbSe
Co(BO2)2	-32.65	-5.58	27.07	Co(BO2)2
Co(OH)2	-10.36	2.73	13.09	Co(OH)2
Co(OH)3	-14.32	-16.63	-2.31	Co(OH)3
CO2(g)	0.14	-18.01	-18.15	CO2
Co3(AsO4)2	-28.16	-15.13	13.03	Co3(AsO4)2
Co3O4	-20.02	-30.51	-10.50	Co3O4

CoCl2	-22.82	-14.55	8.27	CoCl2
CoCl2:6H2O	-17.10	-14.56	2.54	CoCl2:6H2O
CoCO3	-5.29	-15.27	-9.98	CoCO3
CoF2	-13.42	-15.02	-1.60	CoF2
CoF3	-41.80	-43.26	-1.46	CoF3
CoFe2O4	17.34	13.82	-3.53	CoFe2O4
CoMoO4	-7.78	-15.54	-7.76	CoMoO4
CoO	-10.85	2.74	13.59	CoO
CoS (alpha)	-75.21	-82.65	-7.44	CoS
CoS (beta)	-71.58	-82.65	-11.07	CoS
CoSe	-27.22	-43.42	-16.20	CoSe
CoSeO3	-11.35	-10.03	1.32	CoSeO3
CoSeO4:6H2O	-18.74	-20.27	-1.53	CoSeO4:6H2O
CoSO4	-14.79	-11.98	2.80	CoSO4
CoSO4:6H2O	-9.52	-11.99	-2.47	CoSO4:6H2O
Cotunnite	-8.08	-12.86	-4.78	PbCl2
Covellite	-55.47	-77.77	-22.30	CuS
Cr (OH) 2	-24.65	-13.83	10.82	Cr (OH) 2
Cr (OH) 3	-5.08	-3.74	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-2.99	-3.74	-0.75	Cr (OH) 3
Cr2O3	-5.12	-7.48	-2.36	Cr2O3
CrCl2	-45.21	-31.12	14.09	CrCl2
CrCl3	-44.79	-29.67	15.11	CrCl3
CrF3	-19.03	-30.37	-11.34	CrF3
Crmetal	-70.39	-39.91	30.48	Cr
CrO3	-28.78	-31.99	-3.21	CrO3
Cryolite	-0.60	-34.44	-33.84	Na3AlF6
Cu (OH) 2	-1.06	7.61	8.67	Cu (OH) 2
Cu (SbO3) 2	-22.23	22.98	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.77	1.48	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.88	-91.76	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.82	-51.62	-45.80	Cu2Se
Cu2SO4	-18.24	-20.19	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.59	-0.49	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.25	-104.84	-42.59	Cu3Sb
Cu3Se2	-26.66	-90.16	-63.49	Cu3Se2
CuCO3	1.11	-10.39	-11.50	CuCO3
CuCrO4	-18.94	-24.38	-5.44	CuCrO4
CuF	-6.71	-11.61	-4.91	CuF
CuF2	-11.25	-10.14	1.12	CuF2
CuF2:2H2O	-5.59	-10.14	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.42	-10.66	-13.08	CuMoO4
CuOCuSO4	-9.79	0.51	10.30	CuOCuSO4
Cupricferrite	12.71	18.70	5.99	CuFe2O4
Cuprite	-4.06	-5.47	-1.41	Cu2O
Cuprousferrite	11.72	2.81	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe
CuSe2	-25.24	-58.61	-33.37	CuSe2
CuSeO3:2H2O	-5.67	-5.16	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.95	-15.39	-2.44	CuSeO4:5H2O
CuSO4	-10.04	-7.10	2.94	CuSO4
Diaspore	-1.21	5.67	6.87	AlOOH
Djurleite	-56.07	-89.99	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.92	-15.62	-16.54	CaMg (CO3) 2
Dolomite (ordered)	1.47	-15.62	-17.09	CaMg (CO3) 2
Epsomite	-2.68	-4.81	-2.13	MgSO4:7H2O
Fe (OH) 2	-8.03	5.53	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	5.98	2.94	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-0.86	-4.58	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-3.25	-1.69	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-6.61	-27.23	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-29.34	-33.08	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-3.62	16.60	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.53	-6.13	0.40	FeAsO4:2H2O
FeCr2O4	-9.14	-1.94	7.20	FeCr2O4
FeMoO4	-2.65	-12.75	-10.09	FeMoO4
Ferrihydrite	2.35	5.54	3.19	Fe (OH) 3

Ferroselite	-42.10	-60.69	-18.60	FeSe2
FeS (ppt)	-76.90	-79.85	-2.95	FeS
FeSe	-29.62	-40.62	-11.00	FeSe
Fix_pe	-6.77	-6.77	0.00	e-
Fluorite	3.22	-7.28	-10.50	CaF2
Galena	-66.98	-80.95	-13.97	PbS
Gibbsite	-2.63	5.67	8.29	Al (OH) 3
Goethite	5.05	5.54	0.49	FeOOH
Goslarite	-5.80	-7.81	-2.01	ZnSO4:7H2O
Greenockite	-66.04	-80.40	-14.36	CdS
Greigite	-279.88	-324.92	-45.03	Fe3S4
Gummite	-9.32	-1.65	7.67	UO3
Gypsum	0.36	-4.25	-4.61	CaSO4:2H2O
H-Jarosite	-0.73	-12.83	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-5.40	-18.28	-12.88	H2MoO4
H2S (g)	-77.37	-85.38	-8.01	H2S
H2Se (g)	-41.19	-46.15	-4.96	H2Se
Halite	-5.86	-4.26	1.60	NaCl
Hausmannite	-11.62	49.41	61.03	Mn3O4
Hematite	12.50	11.08	-1.42	Fe2O3
Hercynite	-6.03	16.87	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.17	-255.88	-73.71	Hg (CH3) 2
Hg (g)	-7.83	-15.70	-7.87	Hg
Hg (OH) 2	-7.72	-11.21	-3.50	Hg (OH) 2
Hg2 (g)	-16.44	-31.40	-14.96	Hg2
Hg2 (OH) 2	-10.58	-5.32	5.26	Hg2 (OH) 2
Hg2CO3	-7.28	-23.33	-16.05	Hg2CO3
Hg2CrO4	-28.61	-37.31	-8.70	Hg2CrO4
Hg2F2	-12.71	-23.08	-10.36	Hg2F2
Hg2S	-79.02	-90.70	-11.68	Hg2S
Hg2SeO3	-13.43	-18.09	-4.66	Hg2SeO3
Hg2SO4	-13.91	-20.04	-6.13	Hg2SO4
Hg3O2CO3	-21.96	-51.64	-29.68	Hg3O2CO3
HgCl (g)	-30.80	-11.31	19.50	HgCl
HgCl2	-7.24	-28.50	-21.26	HgCl2
HgF (g)	-44.21	-11.54	32.68	HgF
HgF2 (g)	-41.53	-28.97	12.57	HgF2
Hgmetal (l)	-2.25	-15.70	-13.45	Hg
HgSe	-1.67	-57.36	-55.69	HgSe
HgSeO3	-11.55	-23.98	-12.43	HgSeO3
HgSO4	-16.51	-25.93	-9.42	HgSO4
Huntite	-1.82	-31.79	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-3.95	-22.72	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.66	-22.43	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-14.48	-19.65	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	6.11	-8.69	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-38.47	-55.71	-17.24	K2Cr2O7
K2CrO4	-23.21	-23.72	-0.51	K2CrO4
K2MoO4	-13.27	-10.01	3.26	K2MoO4
K2SeO4	-14.00	-14.73	-0.73	K2SeO4
Langite	-1.75	15.74	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.42	-5.85	-0.43	PbO:PbSO4
Laurionite	-4.84	-4.21	0.62	PbOHCl
Lepidocrocite	4.17	5.54	1.37	FeOOH
Lime	-22.22	10.47	32.70	CaO
Litharge	-8.26	4.43	12.69	PbO
Mackinawite	-76.25	-79.85	-3.60	FeS
Maghemite	4.69	11.08	6.39	Fe2O3
Magnesioferrite	4.14	21.00	16.86	Fe2MgO4
Magnesite	-0.63	-8.09	-7.46	MgCO3
Magnetite	13.21	16.61	3.40	Fe3O4
Malachite	2.53	-2.78	-5.31	Cu2 (OH) 2CO3
Manganite	-4.52	20.82	25.34	MnOOH
Massicot	-8.46	4.43	12.89	PbO
Matlockite	-4.12	-13.09	-8.97	PbClF
Melanothallite	-15.93	-9.67	6.26	CuCl2
Melanterite	-6.99	-9.20	-2.21	FeSO4:7H2O
Metacinnabar	-51.50	-96.59	-45.09	HgS

Mg (OH) 2 (active)	-8.87	9.92	18.79	Mg (OH) 2
Mg (VO3) 2	-11.47	-0.19	11.28	Mg (VO3) 2
Mg2Sb3	-279.56	-204.88	74.68	Mg2Sb3
Mg2V2O7	-16.63	9.73	26.36	Mg2V2O7
MgCr2O4	-13.75	2.45	16.20	MgCr2O4
MgCrO4	-27.45	-22.07	5.38	MgCrO4
MgF2	0.30	-7.83	-8.13	MgF2
MgMoO4	-6.50	-8.35	-1.85	MgMoO4
MgSeO3:6H2O	-5.91	-2.86	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.88	-13.08	-1.20	MgSeO4:6H2O
Minium	-34.14	39.38	73.52	Pb3O4
Mirabilite	-4.85	-5.96	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-7.24	-2.34	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-47.51	-53.22	-5.71	Mn2 (SO4) 3
Mn2Sb	-155.21	-94.13	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-12.52	-0.02	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.24	-9.52	2.72	MnCl2:4H2O
MnS (grn)	-77.77	-77.60	0.17	MnS
MnS (pnk)	-80.94	-77.60	3.34	MnS
MnSb	-98.27	-101.18	-2.91	MnSb
MnSe	-41.88	-38.38	3.50	MnSe
MnSeO3	-6.12	-4.99	1.13	MnSeO3
MnSeO3:2H2O	-5.98	-5.00	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.18	-15.23	-2.05	MnSeO4:5H2O
MnSO4	-9.53	-6.94	2.58	MnSO4
Monteponite	-10.12	4.98	15.10	CdO
Montroydite	-7.57	-11.21	-3.64	HgO
MoO3	-10.28	-18.28	-8.00	MoO3
Morenosite	-10.62	-12.77	-2.14	NiSO4:7H2O
MoS2	-144.86	-215.12	-70.26	MoS2
Na-Jarosite	2.76	-8.44	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-45.32	-55.21	-9.90	Na2Cr2O7
Na2CrO4	-26.15	-23.22	2.93	Na2CrO4
Na2Mo2O7	-11.18	-27.78	-16.60	Na2Mo2O7
Na2MoO4	-10.99	-9.50	1.49	Na2MoO4
Na2MoO4:2H2O	-10.73	-9.51	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.31	-4.01	10.30	Na2SeO3:5H2O
Na2SeO4	-15.50	-14.22	1.28	Na2SeO4
Na3Sb	-177.93	-83.48	94.45	Na3Sb
Na3VO4	-28.58	8.10	36.68	Na3VO4
Na4V2O7	-29.97	7.43	37.40	Na4V2O7
Nantokite	-4.65	-11.38	-6.73	CuCl
NaSb	-89.34	-66.17	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-4.53	-0.67	3.86	NaVO3
Nesquehonite	-3.42	-8.09	-4.67	MgCO3:3H2O
Ni (OH) 2	-10.83	1.96	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-33.15	-17.45	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-38.86	-6.86	32.00	Ni4 (OH) 6SO4
NiCO3	-9.17	-16.04	-6.87	NiCO3
NiMoO4	-5.17	-16.31	-11.14	NiMoO4
NiS (alpha)	-77.82	-83.42	-5.60	NiS
NiS (beta)	-72.32	-83.42	-11.10	NiS
NiS (gamma)	-70.62	-83.42	-12.80	NiS
NiSe	-26.49	-44.19	-17.70	NiSe
NiSeO3:2H2O	-13.62	-10.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.52	-21.04	-1.52	NiSeO4:6H2O
Nsutite	-9.00	8.51	17.50	MnO2
O2 (g)	-30.93	52.16	83.09	O2
Orpiment	-232.78	-293.84	-61.07	As2S3
Otavite	-1.03	-13.03	-12.00	CdCO3
Pb (BO2) 2	-10.41	-3.89	6.52	Pb (BO2) 2
Pb (OH) 2	-3.72	4.43	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-54.97	-63.73	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.58	0.22	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.32	8.86	26.19	Pb2O (OH) 2
Pb2O3	-26.09	34.95	61.04	Pb2O3
Pb2OCO3	-8.59	-9.14	-0.56	Pb2OCO3

Pb2V2O7	0.65	-1.25	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-15.84	-10.04	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-2.96	3.18	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.73	-4.71	11.02	Pb3O2CO3
Pb3O2SO4	-12.11	-1.42	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-18.09	3.01	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.86	3.01	21.88	Pb4O3SO4
PbCrO4	-14.96	-27.56	-12.60	PbCrO4
PbF2	-5.88	-13.32	-7.44	PbF2
Pbmetal	-25.89	-21.65	4.25	Pb
PbMoO4	1.78	-13.84	-15.62	PbMoO4
PbO:0.3H2O	-8.55	4.43	12.98	PbO:0.33H2O
PbSeO4	-11.72	-18.56	-6.84	PbSeO4
Periclase	-11.66	9.92	21.58	MgO
Phosgenite	-6.62	-26.43	-19.81	PbCl2:PbCO3
Plattnerite	-19.09	30.51	49.60	PbO2
Portlandite	-12.33	10.47	22.80	Ca (OH) 2
Pyrite	-120.64	-139.15	-18.51	FeS2
Pyrochroite	-7.42	7.78	15.19	Mn (OH) 2
Pyrolusite	-7.52	33.86	41.38	MnO2
Realgar	-97.52	-117.27	-19.75	AsS
Retgersite	-10.72	-12.76	-2.04	NiSO4:6H2O
Rhodochrosite	0.35	-10.23	-10.58	MnCO3
Rutherfordine	-5.16	-19.66	-14.50	UO2CO3
Sb (OH) 3	-11.29	-18.40	-7.11	Sb (OH) 3
Sb2O4	-14.12	-10.72	3.40	Sb2O4
Sb2O5	-23.59	-33.26	-9.67	Sb2O5
Sb2Se3	-107.50	-175.26	-67.76	Sb2Se3
Sb4O6 (cubic)	-55.34	-73.60	-18.26	Sb4O6
Sb4O6 (orth)	-55.70	-73.60	-17.90	Sb4O6
SbCl3	-44.91	-44.34	0.57	SbCl3
SbF3	-34.81	-45.03	-10.23	SbF3
Sbmetal	-45.83	-57.52	-11.69	Sb
SbO2	-1.85	-29.67	-27.82	SbO2
Schoepite	-7.65	-1.65	5.99	UO2 (OH) 2:H2O
Semetal (am)	-12.96	-20.07	-7.11	Se
Semetal (hex)	-12.36	-20.07	-7.71	Se
Senarmontite	-24.43	-36.80	-12.37	Sb2O3
SeO2	-12.89	-12.77	0.12	SeO2
SeO3	-44.04	-23.00	21.04	SeO3
Siderite	-2.24	-12.48	-10.24	FeCO3
Smithsonite	-1.09	-11.09	-10.00	ZnCO3
Sphalerite	-67.01	-78.46	-11.45	ZnS
Spinel	-15.59	21.26	36.85	MgAl2O4
Stibnite	-242.49	-292.95	-50.46	Sb2S3
Sulfur	-57.16	-59.30	-2.14	S
Tenorite	-0.03	7.62	7.64	CuO
Thenardite	-6.27	-5.95	0.32	Na2SO4
Thermonatrite	-9.87	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-7.02	-2.94	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-24.47	-3.39	21.08	U3O8
U3Sb4	-594.50	-442.11	152.38	U3Sb4
U4O9	-44.96	-47.98	-3.02	U4O9
UF4	-24.49	-54.03	-29.54	UF4
UF4:2.5H2O	-21.31	-54.03	-32.72	UF4:2.5H2O
UO2 (am)	-19.45	-18.52	0.93	UO2
UO2 (NO3) 2	-41.30	-29.15	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.01	-29.15	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.55	-29.16	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.21	-29.16	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-7.26	-1.65	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.40	-24.65	-2.25	UO2SeO4:4H2O
UO3	-9.35	-1.65	7.70	UO3
Uraninite	-13.85	-18.52	-4.67	UO2
USb2	-224.51	-194.93	29.58	USb2
V (OH) 3	-16.13	-8.54	7.59	V (OH) 3
V2O5	-8.76	-10.12	-1.36	V2O5
V3O5	-31.50	-29.67	1.84	V3O5

V4O7	-38.05	-30.86	7.19	V4O7
V6O13	-21.65	-82.51	-60.86	V6O13
Valentinite	-28.32	-36.80	-8.48	Sb2O3
VC12	-57.75	-38.87	18.87	VC12
VC13	-57.91	-34.48	23.43	VC13
VF4	-51.64	-36.71	14.93	VF4
Vmetal	-91.69	-47.66	44.03	V
VO	-36.34	-21.58	14.76	VO
VO(OH)2	-6.35	-1.20	5.15	VO(OH)2
VO2Cl	-16.54	-13.70	2.84	VO2Cl
VOC1	-28.34	-17.18	11.15	VOC1
VOC12	-31.25	-18.49	12.76	VOC12
VOSO4	-19.52	-15.91	3.61	VOSO4
Witherite	-2.13	-10.70	-8.57	BaCO3
Wurtzite	-69.51	-78.46	-8.95	ZnS
Zincite	-4.41	6.92	11.33	ZnO
Zincosite	-11.73	-7.80	3.93	ZnSO4
Zn(BO2)2	-9.69	-1.40	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-23.90	-20.59	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.28	6.92	12.20	Zn(OH)2
Zn(OH)2(am)	-5.55	6.92	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.83	6.92	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.61	6.92	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.81	6.92	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.38	-0.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-10.00	5.20	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.22	-2.57	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.59	-8.67	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.44	12.96	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-21.19	17.31	38.50	Zn5(OH)8Cl2
ZnCl2	-17.42	-10.37	7.05	ZnCl2
ZnCO3:1H2O	-0.83	-11.09	-10.26	ZnCO3:1H2O
ZnF2	-10.30	-10.83	-0.53	ZnF2
Znmetal	-44.95	-19.16	25.79	Zn
ZnMoO4	-1.23	-11.36	-10.13	ZnMoO4
ZnO(active)	-4.27	6.92	11.19	ZnO
ZnS(am)	-69.41	-78.46	-9.05	ZnS
ZnSb	-87.69	-76.68	11.01	ZnSb
ZnSe	-24.83	-39.23	-14.40	ZnSe
ZnSeO4:6H2O	-14.57	-16.09	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.16	-7.80	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 42.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
e==e-
log_k      0
EQUILIBRIUM_PHASES 202
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0

```

```

CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 206
SAVE Solution 207 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 202
END

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TITLE
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Precipitate oversaturated phases

```

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Beginning of batch-reaction calculations.
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```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.

```

WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 206. Solution after simulation 41.
 Using pure phase assemblage 202.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not	present.	0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	4.724e-05	4.724e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	3.337e-08	3.337e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.989e-05	1.989e-05
Brochantite	0.00	15.22	15.22	0.000e+00	8.899e-05	8.899e-05
Brucite	-3.66	13.19	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.008e+01	7.767e-02
CaMoO4	-0.34	-8.29	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.23	-1.41	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	3.028e-02	3.028e-02
Carnotite	-0.00	0.23	0.23	0.000e+00	1.382e-06	1.382e-06
Cd(BO2)2	-10.93	-1.09	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	1.508e-07	1.508e-07
Chrysotile		Element not	present.	0.000e+00	0	0.000e+00
Cr2O3	-0.66	-3.02	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.22	-50.02	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.13	-13.20	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.47	-4.59	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	7.108e-06	7.108e-06
Fluorite	0.00	-10.50	-10.50	0.000e+00	2.428e-03	2.428e-03
Gummite	-4.76	2.91	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	1.399e-03	1.399e-03
HgSe	-1.47	-57.17	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not	present.	0.000e+00	0	0.000e+00
Mirabilite	-4.68	-5.79	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.57	-3.44	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.22	5.58	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-31.27	-15.57	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.20	-16.07	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.73	-15.88	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.180e-05
Otavite	-2.34	-14.34	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	4.978e-07	4.978e-07
Rutherfordine	-4.24	-18.74	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.13	-30.95	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.09	2.91	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not	present.	0.000e+00	0	0.000e+00
SiO2(am-ppt)		Element not	present.	0.000e+00	0	0.000e+00
Tyuyamunite	-1.92	2.16	4.08	0.000e+00	0	0.000e+00
U3O8	-10.25	10.83	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.70	2.91	5.61	0.000e+00	0	0.000e+00
UO3	-4.79	2.91	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.10	-11.22	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.808e-06	5.816e-06
As	1.083e-09	1.084e-09
B	6.665e-05	6.674e-05
Ba	3.037e-08	3.041e-08
C	5.112e-04	5.119e-04
Ca	1.280e-02	1.281e-02
Cd	2.431e-08	2.434e-08
Cl	5.616e-03	5.624e-03
Co	1.969e-09	1.971e-09

Cr	7.574e-10	7.584e-10
Cu	5.100e-07	5.107e-07
F	1.874e-04	1.877e-04
Fe	1.145e-09	1.147e-09
Hg	6.393e-09	6.402e-09
K	9.971e-03	9.985e-03
Mg	1.225e-02	1.227e-02
Mn	1.480e-04	1.483e-04
Mo	5.069e-06	5.076e-06
N	2.255e-05	2.258e-05
Na	1.796e-02	1.799e-02
Ni	3.206e-10	3.210e-10
Pb	1.910e-09	1.913e-09
S	3.600e-02	3.605e-02
Sb	6.011e-08	6.019e-08
Se	5.230e-07	5.238e-07
U	4.372e-07	4.378e-07
V	3.167e-08	3.172e-08
Zn	1.728e-05	1.731e-05

-----Description of solution-----

	pH	=	7.869	Charge balance
	pe	=	4.904	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	9.495e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	5.445e-04	
	Total CO2 (mol/kg)	=	5.112e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	9	
	Total H	=	1.111660e+02	
	Total O	=	5.572865e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.706e-07	7.430e-07	-6.013	-6.129	-0.116	(0)
H+	1.726e-08	1.353e-08	-7.763	-7.869	-0.106	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Al	5.808e-06					
Al(OH) 4-	5.755e-06	4.488e-06	-5.240	-5.348	-0.108	(0)
Al(OH) 3	4.798e-08	4.798e-08	-7.319	-7.319	0.000	(0)
Al(OH) 2+	4.089e-09	3.236e-09	-8.388	-8.490	-0.102	(0)
AlF3	4.704e-10	4.704e-10	-9.328	-9.328	0.000	(0)
AlF2+	4.358e-10	3.449e-10	-9.361	-9.462	-0.102	(0)
AlF4-	3.275e-11	2.554e-11	-10.485	-10.593	-0.108	(0)
AlF+2	2.038e-11	7.995e-12	-10.691	-11.097	-0.406	(0)
AlOH+2	1.398e-11	5.483e-12	-10.855	-11.261	-0.406	(0)
AlSO4+	6.712e-13	5.235e-13	-12.173	-12.281	-0.108	(0)
Al+3	6.584e-14	7.379e-15	-13.181	-14.132	-0.950	(0)
Al(SO4) 2-	6.573e-14	5.126e-14	-13.182	-13.290	-0.108	(0)
AlMo6O21-3	5.752e-40	0.000e+00	-39.240	-40.655	-1.414	(0)
As (3)	1.686e-23					
H3AsO3	1.599e-23	1.599e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	8.700e-25	6.058e-25	-24.060	-24.218	-0.157	(0)
HAsO3-2	1.736e-28	4.083e-29	-27.760	-28.389	-0.629	(0)
H4AsO3+	1.539e-31	1.072e-31	-30.813	-30.970	-0.157	(0)
AsO3-3	3.020e-33	1.163e-34	-32.520	-33.934	-1.414	(0)
As (5)	1.083e-09					
HAsO4-2	1.038e-09	2.442e-10	-8.984	-9.612	-0.629	(0)
H2AsO4-	4.327e-11	3.013e-11	-10.364	-10.521	-0.157	(0)
AsO4-3	1.482e-12	5.706e-14	-11.829	-13.244	-1.414	(0)

	H3AsO4	6.933e-17	7.086e-17	-16.159	-16.150	0.009	(0)
B		6.665e-05					
	H3BO3	6.204e-05	6.341e-05	-4.207	-4.198	0.009	(0)
	H2BO3-	3.632e-06	2.721e-06	-5.440	-5.565	-0.125	(0)
	CaH2BO3+	5.630e-07	4.218e-07	-6.249	-6.375	-0.125	(0)
	MgH2BO3+	3.564e-07	2.670e-07	-6.448	-6.573	-0.125	(0)
	NaH2BO3	5.792e-08	5.792e-08	-7.237	-7.237	0.000	(0)
	BF(OH) 3-	3.659e-09	2.741e-09	-8.437	-8.562	-0.125	(0)
	H5(BO3) 2-	1.960e-10	1.469e-10	-9.708	-9.833	-0.125	(0)
	BaH2BO3+	1.286e-12	9.636e-13	-11.891	-12.016	-0.125	(0)
	H8(BO3) 3-	1.243e-12	9.312e-13	-11.906	-12.031	-0.125	(0)
	BF2(OH) 2-	5.743e-13	4.303e-13	-12.241	-12.366	-0.125	(0)
	BF3OH-	3.281e-19	2.458e-19	-18.484	-18.609	-0.125	(0)
	BF4-	2.370e-24	1.776e-24	-23.625	-23.751	-0.125	(0)
Ba		3.037e-08					
	Ba+2	3.031e-08	1.146e-08	-7.518	-7.941	-0.422	(0)
	BaHCO3+	4.863e-11	3.883e-11	-10.313	-10.411	-0.098	(0)
	BaCO3	7.224e-12	7.224e-12	-11.141	-11.141	0.000	(0)
	BaH2BO3+	1.286e-12	9.636e-13	-11.891	-12.016	-0.125	(0)
	BaOH+	4.726e-14	3.717e-14	-13.326	-13.430	-0.104	(0)
	BaNO3+	1.308e-15	9.106e-16	-14.884	-15.041	-0.157	(0)
	BaNH3+2	2.971e-16	6.987e-17	-15.527	-16.156	-0.629	(0)
C(4)		5.112e-04					
	HCO3-	4.484e-04	3.548e-04	-3.348	-3.450	-0.102	(0)
	CaHCO3+	2.229e-05	1.780e-05	-4.652	-4.750	-0.098	(0)
	MgHCO3+	1.330e-05	1.028e-05	-4.876	-4.988	-0.112	(0)
	H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	3.251e-06	1.229e-06	-5.488	-5.910	-0.422	(0)
	MgCO3	2.894e-06	2.894e-06	-5.539	-5.539	0.000	(0)
	NaHCO3	2.680e-06	2.680e-06	-5.572	-5.572	0.000	(0)
	NaCO3-	3.884e-07	3.074e-07	-6.411	-6.512	-0.102	(0)
	UO2(CO3) 3-4	3.604e-07	1.102e-09	-6.443	-8.958	-2.515	(0)
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	MnHCO3+	2.258e-07	1.776e-07	-6.646	-6.751	-0.104	(0)
	ZnCO3	2.202e-07	2.202e-07	-6.657	-6.657	0.000	(0)
	UO2(CO3) 2-2	7.607e-08	1.789e-08	-7.119	-7.747	-0.629	(0)
	ZnHCO3+	5.016e-08	3.493e-08	-7.300	-7.457	-0.157	(0)
	Cu(CO3) 2-2	3.320e-09	7.808e-10	-8.479	-9.107	-0.629	(0)
	CuHCO3+	1.048e-09	7.299e-10	-8.980	-9.137	-0.157	(0)
	UO2CO3	7.294e-10	7.294e-10	-9.137	-9.137	0.000	(0)
	PbCO3	4.626e-10	4.626e-10	-9.335	-9.335	0.000	(0)
	CdCO3	1.036e-10	1.036e-10	-9.985	-9.985	0.000	(0)
	BaHCO3+	4.863e-11	3.883e-11	-10.313	-10.411	-0.098	(0)
	PbHCO3+	4.739e-11	3.300e-11	-10.324	-10.481	-0.157	(0)
	CoHCO3+	1.261e-11	8.785e-12	-10.899	-11.056	-0.157	(0)
	BaCO3	7.224e-12	7.224e-12	-11.141	-11.141	0.000	(0)
	Pb(CO3) 2-2	6.973e-12	1.640e-12	-11.157	-11.785	-0.629	(0)
	CoCO3	6.614e-12	6.614e-12	-11.180	-11.180	0.000	(0)
	NiHCO3+	4.365e-12	3.040e-12	-11.360	-11.517	-0.157	(0)
	CdHCO3+	4.289e-12	2.986e-12	-11.368	-11.525	-0.157	(0)
	NiCO3	3.187e-12	3.187e-12	-11.497	-11.497	0.000	(0)
	Cd(CO3) 2-2	4.014e-13	9.439e-14	-12.396	-13.025	-0.629	(0)
	HgCO3	6.498e-15	6.498e-15	-14.187	-14.187	0.000	(0)
	FeHCO3+	2.902e-15	2.317e-15	-14.537	-14.635	-0.098	(0)
	Hg(CO3) 2-2	1.074e-16	2.526e-17	-15.969	-16.598	-0.629	(0)
	HgHCO3+	2.352e-18	1.638e-18	-17.629	-17.786	-0.157	(0)
Ca		1.280e-02					
	Ca+2	7.125e-03	2.694e-03	-2.147	-2.570	-0.422	(0)
	CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
	CaHCO3+	2.229e-05	1.780e-05	-4.652	-4.750	-0.098	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	4.051e-06	3.186e-06	-5.392	-5.497	-0.104	(0)
	CaH2BO3+	5.630e-07	4.218e-07	-6.249	-6.375	-0.125	(0)
	CaOH+	5.002e-08	3.994e-08	-7.301	-7.399	-0.098	(0)
	CaNO3+	1.940e-10	1.351e-10	-9.712	-9.869	-0.157	(0)
	CaNH3+2	1.394e-10	3.277e-11	-9.856	-10.484	-0.629	(0)
	Ca(NH3) 2+2	5.361e-19	1.261e-19	-18.271	-18.899	-0.629	(0)

Cd	2.431e-08					
Cd+2	9.779e-09	3.697e-09	-8.010	-8.432	-0.422	(0)
CdSO4	7.920e-09	7.920e-09	-8.101	-8.101	0.000	(0)
Cd(SO4) 2-2	4.152e-09	9.763e-10	-8.382	-9.010	-0.629	(0)
CdCl+	2.233e-09	1.555e-09	-8.651	-8.808	-0.157	(0)
CdCO3	1.036e-10	1.036e-10	-9.985	-9.985	0.000	(0)
CdOHC1	4.739e-11	4.739e-11	-10.324	-10.324	0.000	(0)
CdOH+	3.133e-11	2.182e-11	-10.504	-10.661	-0.157	(0)
CdCl2	2.854e-11	2.854e-11	-10.545	-10.545	0.000	(0)
CdF+	9.116e-12	6.348e-12	-11.040	-11.197	-0.157	(0)
CdHCO3+	4.289e-12	2.986e-12	-11.368	-11.525	-0.157	(0)
Cd(CO3) 2-2	4.014e-13	9.439e-14	-12.396	-13.025	-0.629	(0)
CdCl3-	1.139e-13	7.930e-14	-12.944	-13.101	-0.157	(0)
Cd(OH) 2	1.023e-13	1.023e-13	-12.990	-12.990	0.000	(0)
CdF2	1.372e-15	1.372e-15	-14.863	-14.863	0.000	(0)
CdNO3+	2.662e-16	1.854e-16	-15.575	-15.732	-0.157	(0)
CdSeO4	1.706e-16	1.706e-16	-15.768	-15.768	0.000	(0)
Cd(SeO3) 2-2	4.238e-17	9.966e-18	-16.373	-17.001	-0.629	(0)
Cd2OH+3	1.050e-17	4.043e-19	-16.979	-18.393	-1.414	(0)
Cd(OH) 3-	6.668e-18	4.644e-18	-17.176	-17.333	-0.157	(0)
Cd(OH) 4-2	2.402e-24	5.648e-25	-23.620	-24.248	-0.629	(0)
Cd(NO3) 2	1.473e-24	1.473e-24	-23.832	-23.832	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.694	-78.851	-0.157	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.073	-150.073	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.443	-226.600	-0.157	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.202	-302.830	-0.629	(0)
Cl	5.616e-03					
Cl-	5.616e-03	4.404e-03	-2.251	-2.356	-0.106	(0)
MnCl+	1.768e-07	1.391e-07	-6.752	-6.857	-0.104	(0)
ZnCl+	4.455e-08	3.444e-08	-7.351	-7.463	-0.112	(0)
ZnOHC1	3.350e-08	3.350e-08	-7.475	-7.475	0.000	(0)
CdCl+	2.233e-09	1.555e-09	-8.651	-8.808	-0.157	(0)
CuCl2-	1.314e-09	1.016e-09	-8.881	-8.993	-0.112	(0)
CuCl	1.104e-09	1.104e-09	-8.957	-8.957	0.000	(0)
MnCl2	8.651e-10	8.651e-10	-9.063	-9.063	0.000	(0)
CuCl+	2.944e-10	2.275e-10	-9.531	-9.643	-0.112	(0)
ZnCl2	2.403e-10	2.403e-10	-9.619	-9.619	0.000	(0)
CdOHC1	4.739e-11	4.739e-11	-10.324	-10.324	0.000	(0)
CdCl2	2.854e-11	2.854e-11	-10.545	-10.545	0.000	(0)
PbCl+	2.809e-11	1.956e-11	-10.551	-10.709	-0.157	(0)
HgClOH	2.553e-11	2.553e-11	-10.593	-10.593	0.000	(0)
HgCl2	8.566e-12	8.566e-12	-11.067	-11.067	0.000	(0)
CoCl+	6.963e-12	4.849e-12	-11.157	-11.314	-0.157	(0)
CuCl3-2	2.501e-12	9.564e-13	-11.602	-12.019	-0.417	(0)
MnCl3-	1.334e-12	1.049e-12	-11.875	-11.979	-0.104	(0)
NiCl+	1.124e-12	7.829e-13	-11.949	-12.106	-0.157	(0)
ZnCl3-	1.088e-12	8.407e-13	-11.964	-12.075	-0.112	(0)
HgCl3-	5.417e-13	3.772e-13	-12.266	-12.423	-0.157	(0)
PbCl2	3.847e-13	3.847e-13	-12.415	-12.415	0.000	(0)
CuCl2	3.474e-13	3.474e-13	-12.459	-12.459	0.000	(0)
CdCl3-	1.139e-13	7.930e-14	-12.944	-13.101	-0.157	(0)
HgCl4-2	2.812e-14	6.613e-15	-13.551	-14.180	-0.629	(0)
ZnCl4-2	4.840e-15	1.851e-15	-14.315	-14.733	-0.417	(0)
UO2Cl+	1.529e-15	1.064e-15	-14.816	-14.973	-0.157	(0)
PbCl3-	9.685e-16	6.744e-16	-15.014	-15.171	-0.157	(0)
HgCl+	5.574e-16	3.881e-16	-15.254	-15.411	-0.157	(0)
CuCl3-	1.847e-17	1.428e-17	-16.733	-16.845	-0.112	(0)
NiCl2	1.736e-17	1.736e-17	-16.760	-16.760	0.000	(0)
CrCl+2	6.891e-18	1.621e-18	-17.162	-17.790	-0.629	(0)
PbCl4-2	5.773e-18	1.358e-18	-17.239	-17.867	-0.629	(0)
CrOHC12	1.008e-19	1.008e-19	-18.997	-18.997	0.000	(0)
FeCl+2	1.343e-21	5.138e-22	-20.872	-21.289	-0.417	(0)
CrCl2+	9.724e-22	6.771e-22	-21.012	-21.169	-0.157	(0)
CuCl4-2	8.239e-22	3.151e-22	-21.084	-21.502	-0.417	(0)
VOCl+	1.693e-22	1.179e-22	-21.771	-21.929	-0.157	(0)
FeCl2+	1.285e-23	1.011e-23	-22.891	-22.995	-0.104	(0)
CrO3Cl-	3.472e-26	2.418e-26	-25.459	-25.617	-0.157	(0)
FeCl3	4.450e-27	4.450e-27	-26.352	-26.352	0.000	(0)

CoCl+2	3.871e-37	9.102e-38	-36.412	-37.041	-0.629	(0)
UCl+3	0.000e+00	0.000e+00	-44.134	-45.548	-1.414	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.533	-51.162	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.261	-51.890	-0.629	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.892	-0.629	(0)
Co (2)	1.969e-09					
Co+2	1.353e-09	3.183e-10	-8.869	-9.497	-0.629	(0)
CoSO4	5.803e-10	5.803e-10	-9.236	-9.236	0.000	(0)
CoHCO3+	1.261e-11	8.785e-12	-10.899	-11.056	-0.157	(0)
CoCl+	6.963e-12	4.849e-12	-11.157	-11.314	-0.157	(0)
CoOH+	6.776e-12	4.719e-12	-11.169	-11.326	-0.157	(0)
CoCO3	6.614e-12	6.614e-12	-11.180	-11.180	0.000	(0)
CoF+	1.566e-12	1.091e-12	-11.805	-11.962	-0.157	(0)
Co (OH) 2	2.785e-13	2.785e-13	-12.555	-12.555	0.000	(0)
CoNO2+	5.413e-14	3.770e-14	-13.267	-13.424	-0.157	(0)
Co (NH3) +2	1.572e-15	3.698e-16	-14.803	-15.432	-0.629	(0)
CoSeO4	3.952e-17	3.952e-17	-16.403	-16.403	0.000	(0)
CoNO3+	1.149e-17	7.998e-18	-16.940	-17.097	-0.157	(0)
Co (OH) 3-	5.929e-18	4.129e-18	-17.227	-17.384	-0.157	(0)
CoOOH-	1.490e-18	1.037e-18	-17.827	-17.984	-0.157	(0)
Co2OH+3	1.955e-21	7.527e-23	-20.709	-22.123	-1.414	(0)
Co (NH3) 2+2	6.482e-22	1.524e-22	-21.188	-21.817	-0.629	(0)
Co (OH) 4-2	2.068e-24	4.862e-25	-23.685	-24.313	-0.629	(0)
Co (NO3) 2	2.580e-25	2.580e-25	-24.588	-24.588	0.000	(0)
Co (NH3) 3+2	7.886e-29	1.855e-29	-28.103	-28.732	-0.629	(0)
Co4 (OH) 4+4	3.235e-35	9.892e-38	-34.490	-37.005	-2.515	(0)
Co (NH3) 4+2	3.999e-36	9.405e-37	-35.398	-36.027	-0.629	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.193	-43.822	-0.629	(0)
Co (3)	1.631e-30					
CoOH+2	1.631e-30	3.836e-31	-29.788	-30.416	-0.629	(0)
Co+3	9.065e-37	1.016e-37	-36.043	-36.993	-0.950	(0)
CoCl+2	3.871e-37	9.102e-38	-36.412	-37.041	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.533	-51.162	-0.629	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.493	-60.650	-0.157	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.836	-65.465	-0.629	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.892	-0.629	(0)
Cr (2)	3.603e-27					
Cr+2	3.603e-27	8.473e-28	-26.443	-27.072	-0.629	(0)
Cr (3)	7.573e-10					
Cr (OH) 2+	6.001e-10	4.179e-10	-9.222	-9.379	-0.157	(0)
Cr (OH) 3	1.167e-10	1.167e-10	-9.933	-9.933	0.000	(0)
Cr (OH) +2	1.966e-11	4.623e-12	-10.706	-11.335	-0.629	(0)
CrOHSO4	1.002e-11	1.002e-11	-10.999	-10.999	0.000	(0)
CrO2-	5.887e-12	4.100e-12	-11.230	-11.387	-0.157	(0)
Cr (OH) 4-	4.955e-12	3.451e-12	-11.305	-11.462	-0.157	(0)
CrF+2	2.076e-14	4.883e-15	-13.683	-14.311	-0.629	(0)
CrSO4+	8.714e-15	6.068e-15	-14.060	-14.217	-0.157	(0)
Cr+3	7.384e-15	2.844e-16	-14.132	-15.546	-1.414	(0)
CrCl+2	6.891e-18	1.621e-18	-17.162	-17.790	-0.629	(0)
CrOHC12	1.008e-19	1.008e-19	-18.997	-18.997	0.000	(0)
Cr2 (OH) 2SO4+2	1.781e-20	4.188e-21	-19.749	-20.378	-0.629	(0)
Cr2 (OH) 2 (SO4) 2	2.274e-21	2.274e-21	-20.643	-20.643	0.000	(0)
CrCl2+	9.724e-22	6.771e-22	-21.012	-21.169	-0.157	(0)
CrNO3+2	8.381e-25	1.971e-25	-24.077	-24.705	-0.629	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.749	-41.377	-0.629	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.221	-50.635	-1.414	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.261	-51.890	-0.629	(0)
Cr (6)	4.183e-15					
CrO4-2	3.892e-15	1.471e-15	-14.410	-14.832	-0.422	(0)
NaCrO4-	1.410e-16	9.819e-17	-15.851	-16.008	-0.157	(0)
HCrO4-	9.252e-17	6.443e-17	-16.034	-16.191	-0.157	(0)
KCrO4-	5.768e-17	4.017e-17	-16.239	-16.396	-0.157	(0)
CrO3SO4-2	1.033e-23	2.430e-24	-22.986	-23.614	-0.629	(0)
H2CrO4	7.067e-25	7.067e-25	-24.151	-24.151	0.000	(0)
CrO3Cl-	3.472e-26	2.418e-26	-25.459	-25.617	-0.157	(0)
Cr2O7-2	6.129e-31	1.441e-31	-30.213	-30.841	-0.629	(0)
Cu (1)	2.707e-09					
CuCl2-	1.314e-09	1.016e-09	-8.881	-8.993	-0.112	(0)

CuCl	1.104e-09	1.104e-09	-8.957	-8.957	0.000	(0)
Cu+	2.860e-10	1.992e-10	-9.544	-9.701	-0.157	(0)
CuCl3-2	2.501e-12	9.564e-13	-11.602	-12.019	-0.417	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.002	-147.427	-0.425	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.756	-148.157	-0.401	(0)
Cu (2)	5.073e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.912e-08	7.661e-08	-7.004	-7.116	-0.112	(0)
Cu+2	8.624e-08	3.260e-08	-7.064	-7.487	-0.422	(0)
CuSO4	6.826e-08	6.826e-08	-7.166	-7.166	0.000	(0)
Cu (OH) 2	1.136e-08	1.136e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	3.320e-09	7.808e-10	-8.479	-9.107	-0.629	(0)
CuHCO3+	1.048e-09	7.299e-10	-8.980	-9.137	-0.157	(0)
Cu2 (OH) 2+2	6.269e-10	1.474e-10	-9.203	-9.831	-0.629	(0)
CuF+	3.201e-10	2.229e-10	-9.495	-9.652	-0.157	(0)
CuCl+	2.944e-10	2.275e-10	-9.531	-9.643	-0.112	(0)
CuNO2+	8.240e-11	5.738e-11	-10.084	-10.241	-0.157	(0)
Cu (OH) 3-	2.486e-11	1.731e-11	-10.605	-10.762	-0.157	(0)
CuNH3+2	1.371e-11	3.224e-12	-10.863	-11.492	-0.629	(0)
CuCl2	3.474e-13	3.474e-13	-12.459	-12.459	0.000	(0)
Cu (NO2) 2	9.868e-15	9.868e-15	-14.006	-14.006	0.000	(0)
CuNO3+	2.348e-15	1.635e-15	-14.629	-14.787	-0.157	(0)
Cu (OH) 4-2	4.305e-16	1.012e-16	-15.366	-15.995	-0.629	(0)
CuCl3-	1.847e-17	1.428e-17	-16.733	-16.845	-0.112	(0)
CuCl4-2	8.239e-22	3.151e-22	-21.084	-21.502	-0.417	(0)
Cu (NO3) 2	3.263e-24	3.263e-24	-23.486	-23.486	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.710	-216.867	-0.157	(0)
F	1.874e-04					
F-	1.382e-04	1.083e-04	-3.860	-3.965	-0.106	(0)
MgF+	4.412e-05	3.441e-05	-4.355	-4.463	-0.108	(0)
CaF+	4.051e-06	3.186e-06	-5.392	-5.497	-0.104	(0)
NaF	9.181e-07	9.181e-07	-6.037	-6.037	0.000	(0)
MnF+	1.376e-07	1.082e-07	-6.861	-6.966	-0.104	(0)
ZnF+	9.665e-09	6.730e-09	-8.015	-8.172	-0.157	(0)
BF (OH) 3-	3.659e-09	2.741e-09	-8.437	-8.562	-0.125	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
AlF3	4.704e-10	4.704e-10	-9.328	-9.328	0.000	(0)
AlF2+	4.358e-10	3.449e-10	-9.361	-9.462	-0.102	(0)
CuF+	3.201e-10	2.229e-10	-9.495	-9.652	-0.157	(0)
AlF4-	3.275e-11	2.554e-11	-10.485	-10.593	-0.108	(0)
AlF+2	2.038e-11	7.995e-12	-10.691	-11.097	-0.406	(0)
CdF+	9.116e-12	6.348e-12	-11.040	-11.197	-0.157	(0)
UO2F+	3.201e-12	2.229e-12	-11.495	-11.652	-0.157	(0)
CoF+	1.566e-12	1.091e-12	-11.805	-11.962	-0.157	(0)
PbF+	1.373e-12	9.558e-13	-11.862	-12.020	-0.157	(0)
HF2-	1.167e-12	8.933e-13	-11.933	-12.049	-0.116	(0)
UO2F2	6.966e-13	6.966e-13	-12.157	-12.157	0.000	(0)
BF2 (OH) 2-	5.743e-13	4.303e-13	-12.241	-12.366	-0.125	(0)
NiF+	2.716e-13	1.891e-13	-12.566	-12.723	-0.157	(0)
UO2F3-	2.722e-14	1.896e-14	-13.565	-13.722	-0.157	(0)
CrF+2	2.076e-14	4.883e-15	-13.683	-14.311	-0.629	(0)
PbF2	2.038e-15	2.038e-15	-14.691	-14.691	0.000	(0)
CdF2	1.372e-15	1.372e-15	-14.863	-14.863	0.000	(0)
UO2F4-2	6.938e-17	1.632e-17	-16.159	-16.787	-0.629	(0)
H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
VO2F	9.910e-18	9.910e-18	-17.004	-17.004	0.000	(0)
FeF2+	1.692e-18	1.331e-18	-17.772	-17.876	-0.104	(0)
FeF+2	1.200e-18	4.590e-19	-17.921	-18.338	-0.417	(0)
PbF3-	6.014e-19	4.188e-19	-18.221	-18.378	-0.157	(0)
VO2F2-	5.598e-19	3.898e-19	-18.252	-18.409	-0.157	(0)
BF3OH-	3.281e-19	2.458e-19	-18.484	-18.609	-0.125	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
VOF+	8.904e-21	6.200e-21	-20.050	-20.208	-0.157	(0)
VO2F3-2	2.240e-21	5.269e-22	-20.650	-21.278	-0.629	(0)
VOF2	2.519e-22	2.519e-22	-21.599	-21.599	0.000	(0)
PbF4-2	9.235e-23	2.172e-23	-22.035	-22.663	-0.629	(0)
HgF+	2.548e-23	1.774e-23	-22.594	-22.751	-0.157	(0)
BF4-	2.370e-24	1.776e-24	-23.625	-23.751	-0.125	(0)

VOF3-	1.391e-24	9.684e-25	-23.857	-24.014	-0.157	(0)
VO2F4-3	7.294e-25	2.809e-26	-24.137	-25.551	-1.414	(0)
Sb(OH) 2F	8.831e-26	8.831e-26	-25.054	-25.054	0.000	(0)
SbOF	8.696e-26	8.696e-26	-25.061	-25.061	0.000	(0)
VOF4-2	1.801e-27	4.235e-28	-26.745	-27.373	-0.629	(0)
UF3+	9.324e-36	6.493e-36	-35.030	-35.188	-0.157	(0)
UF2+2	1.608e-36	3.781e-37	-35.794	-36.422	-0.629	(0)
UF4	7.714e-38	7.714e-38	-37.113	-37.113	0.000	(0)
UF+3	7.198e-39	2.772e-40	-38.143	-39.557	-1.414	(0)
UF5-	4.756e-40	3.312e-40	-39.323	-39.480	-0.157	(0)
UF6-2	0.000e+00	0.000e+00	-40.336	-40.965	-0.629	(0)
Fe (2)	3.392e-12					
Fe+2	2.206e-12	5.187e-13	-11.656	-12.285	-0.629	(0)
FeSO4	1.164e-12	1.164e-12	-11.934	-11.934	0.000	(0)
FeOH+	1.951e-14	1.534e-14	-13.710	-13.814	-0.104	(0)
FeHCO3+	2.902e-15	2.317e-15	-14.537	-14.635	-0.098	(0)
Fe (OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	2.706e-18	2.128e-18	-17.568	-17.672	-0.104	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.421	-236.578	-0.157	(0)
Fe (3)	1.142e-09					
Fe (OH) 2+	6.770e-10	5.358e-10	-9.169	-9.271	-0.102	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	3.738e-11	2.958e-11	-10.427	-10.529	-0.102	(0)
FeOH+2	4.846e-15	1.853e-15	-14.315	-14.732	-0.417	(0)
FeF2+	1.692e-18	1.331e-18	-17.772	-17.876	-0.104	(0)
FeF+2	1.200e-18	4.590e-19	-17.921	-18.338	-0.417	(0)
FeSO4+	5.037e-19	3.961e-19	-18.298	-18.402	-0.104	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
Fe (SO4) 2-	1.111e-19	7.740e-20	-18.954	-19.111	-0.157	(0)
Fe+3	3.447e-20	3.863e-21	-19.463	-20.413	-0.950	(0)
FeCl+2	1.343e-21	5.138e-22	-20.872	-21.289	-0.417	(0)
FeCl2+	1.285e-23	1.011e-23	-22.891	-22.995	-0.104	(0)
FeHSeO3+2	8.440e-24	1.985e-24	-23.074	-23.702	-0.629	(0)
Fe2 (OH) 2+4	3.720e-26	1.138e-28	-25.430	-27.944	-2.515	(0)
FeCl3	4.450e-27	4.450e-27	-26.352	-26.352	0.000	(0)
FeNO3+2	2.605e-27	6.126e-28	-26.584	-27.213	-0.629	(0)
Fe3 (OH) 4+5	7.480e-33	8.810e-37	-32.126	-36.055	-3.929	(0)
H (0)	3.947e-29					
H2	1.973e-29	2.017e-29	-28.705	-28.695	0.009	(0)
Hg (0)	6.343e-09					
Hg	6.343e-09	6.343e-09	-8.198	-8.198	0.000	(0)
Hg (1)	1.618e-19					
Hg2+2	8.090e-20	1.902e-20	-19.092	-19.721	-0.629	(0)
Hg (2)	4.973e-11					
HgClOH	2.553e-11	2.553e-11	-10.593	-10.593	0.000	(0)
Hg (OH) 2	1.506e-11	1.539e-11	-10.822	-10.813	0.009	(0)
HgCl2	8.566e-12	8.566e-12	-11.067	-11.067	0.000	(0)
HgCl3-	5.417e-13	3.772e-13	-12.266	-12.423	-0.157	(0)
HgCl4-2	2.812e-14	6.613e-15	-13.551	-14.180	-0.629	(0)
HgCO3	6.498e-15	6.498e-15	-14.187	-14.187	0.000	(0)
HgCl+	5.574e-16	3.881e-16	-15.254	-15.411	-0.157	(0)
HgOH+	1.876e-16	1.307e-16	-15.727	-15.884	-0.157	(0)
Hg (CO3) 2-2	1.074e-16	2.526e-17	-15.969	-16.598	-0.629	(0)
HgHCO3+	2.352e-18	1.638e-18	-17.629	-17.786	-0.157	(0)
Hg (OH) 3-	2.067e-18	1.439e-18	-17.685	-17.842	-0.157	(0)
Hg (NH3) 2+2	1.107e-18	2.603e-19	-17.956	-18.585	-0.629	(0)
HgNH3+2	1.145e-19	2.694e-20	-18.941	-19.570	-0.629	(0)
Hg+2	1.879e-20	4.418e-21	-19.726	-20.355	-0.629	(0)
HgSO4	1.057e-20	1.057e-20	-19.976	-19.976	0.000	(0)
HgF+	2.548e-23	1.774e-23	-22.594	-22.751	-0.157	(0)
Hg (NH3) 3+2	4.258e-26	1.001e-26	-25.371	-25.999	-0.629	(0)
HgNO3+	3.714e-29	2.586e-29	-28.430	-28.587	-0.157	(0)
Hg (NH3) 4+2	3.269e-33	7.686e-34	-32.486	-33.114	-0.629	(0)
Hg (NO3) 2	1.704e-37	1.704e-37	-36.768	-36.768	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.254	-137.411	-0.157	(0)
HgS2-2	0.000e+00	0.000e+00	-137.622	-138.251	-0.629	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.886	-138.886	0.000	(0)

K	9.971e-03					
K+	9.370e-03	7.348e-03	-2.028	-2.134	-0.106	(0)
KSO4-	6.007e-04	4.754e-04	-3.221	-3.323	-0.102	(0)
KCrO4-	5.768e-17	4.017e-17	-16.239	-16.396	-0.157	(0)
Mg	1.225e-02					
Mg+2	7.486e-03	2.830e-03	-2.126	-2.548	-0.422	(0)
MgSO4	4.706e-03	4.706e-03	-2.327	-2.327	0.000	(0)
MgF+	4.412e-05	3.441e-05	-4.355	-4.463	-0.108	(0)
MgHCO3+	1.330e-05	1.028e-05	-4.876	-4.988	-0.112	(0)
MgCO3	2.894e-06	2.894e-06	-5.539	-5.539	0.000	(0)
MgOH+	1.041e-06	8.372e-07	-5.982	-6.077	-0.095	(0)
MgH2BO3+	3.564e-07	2.670e-07	-6.448	-6.573	-0.125	(0)
Mn (2)	1.480e-04					
Mn+2	1.067e-04	2.509e-05	-3.972	-4.601	-0.629	(0)
MnSO4	4.077e-05	4.077e-05	-4.390	-4.390	0.000	(0)
MnHCO3+	2.258e-07	1.776e-07	-6.646	-6.751	-0.104	(0)
MnCl+	1.768e-07	1.391e-07	-6.752	-6.857	-0.104	(0)
MnF+	1.376e-07	1.082e-07	-6.861	-6.966	-0.104	(0)
MnOH+	5.954e-08	4.682e-08	-7.225	-7.330	-0.104	(0)
MnCl2	8.651e-10	8.651e-10	-9.063	-9.063	0.000	(0)
MnSeO4	1.673e-12	1.673e-12	-11.776	-11.776	0.000	(0)
MnCl3-	1.334e-12	1.049e-12	-11.875	-11.979	-0.104	(0)
MnNO3+	9.053e-13	6.304e-13	-12.043	-12.200	-0.157	(0)
Mn (OH) 3-	2.032e-16	1.598e-16	-15.692	-15.797	-0.104	(0)
Mn (NO3) 2	2.511e-20	2.511e-20	-19.600	-19.600	0.000	(0)
Mn (OH) 4-2	1.002e-21	3.832e-22	-20.999	-21.417	-0.417	(0)
MnSe	0.000e+00	0.000e+00	-40.602	-40.602	0.000	(0)
Mn (3)	8.016e-25					
Mn+3	8.016e-25	8.984e-26	-24.096	-25.047	-0.950	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-40.042	-40.460	-0.417	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.807	-44.928	-0.121	(0)
Mo	5.069e-06					
MoO4-2	5.069e-06	1.916e-06	-5.295	-5.718	-0.422	(0)
HMoO4-	7.410e-10	5.160e-10	-9.130	-9.287	-0.157	(0)
H2MoO4	5.115e-14	5.115e-14	-13.291	-13.291	0.000	(0)
AlMo6O21-3	5.752e-40	0.000e+00	-39.240	-40.655	-1.414	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.322	-49.979	-5.658	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.532	-51.461	-3.929	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.033	-54.548	-2.515	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.756	-59.170	-1.414	(0)
N (-3)	3.445e-07					
NH4+	3.061e-07	2.294e-07	-6.514	-6.639	-0.125	(0)
NH4SO4-	2.856e-08	2.246e-08	-7.544	-7.649	-0.104	(0)
NH3	9.664e-09	9.664e-09	-8.015	-8.015	0.000	(0)
CaNH3+2	1.394e-10	3.277e-11	-9.856	-10.484	-0.629	(0)
CuNH3+2	1.371e-11	3.224e-12	-10.863	-11.492	-0.629	(0)
Co (NH3) +2	1.572e-15	3.698e-16	-14.803	-15.432	-0.629	(0)
NiNH3+2	1.534e-15	3.606e-16	-14.814	-15.443	-0.629	(0)
BaNH3+2	2.971e-16	6.987e-17	-15.527	-16.156	-0.629	(0)
Hg (NH3) 2+2	1.107e-18	2.603e-19	-17.956	-18.585	-0.629	(0)
Ca (NH3) 2+2	5.361e-19	1.261e-19	-18.271	-18.899	-0.629	(0)
HgNH3+2	1.145e-19	2.694e-20	-18.941	-19.570	-0.629	(0)
Ni (NH3) 2+2	2.142e-21	5.037e-22	-20.669	-21.298	-0.629	(0)
Co (NH3) 2+2	6.482e-22	1.524e-22	-21.188	-21.817	-0.629	(0)
Hg (NH3) 3+2	4.258e-26	1.001e-26	-25.371	-25.999	-0.629	(0)
Co (NH3) 3+2	7.886e-29	1.855e-29	-28.103	-28.732	-0.629	(0)
Hg (NH3) 4+2	3.269e-33	7.686e-34	-32.486	-33.114	-0.629	(0)
Co (NH3) 4+2	3.999e-36	9.405e-37	-35.398	-36.027	-0.629	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.749	-41.377	-0.629	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.193	-43.822	-0.629	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.221	-50.635	-1.414	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.533	-51.162	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.261	-51.890	-0.629	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.493	-60.650	-0.157	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.836	-65.465	-0.629	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.892	-0.629	(0)

N (3)	2.218e-05					
NO2-	2.218e-05	1.681e-05	-4.654	-4.775	-0.121	(0)
CuNO2+	8.240e-11	5.738e-11	-10.084	-10.241	-0.157	(0)
CoNO2+	5.413e-14	3.770e-14	-13.267	-13.424	-0.157	(0)
Cu (NO2) 2	9.868e-15	9.868e-15	-14.006	-14.006	0.000	(0)
N (5)	2.042e-08					
NO3-	2.022e-08	1.586e-08	-7.694	-7.800	-0.106	(0)
CaNO3+	1.940e-10	1.351e-10	-9.712	-9.869	-0.157	(0)
MnNO3+	9.053e-13	6.304e-13	-12.043	-12.200	-0.157	(0)
ZnNO3+	1.781e-13	1.240e-13	-12.749	-12.907	-0.157	(0)
CuNO3+	2.348e-15	1.635e-15	-14.629	-14.787	-0.157	(0)
BaNO3+	1.308e-15	9.106e-16	-14.884	-15.041	-0.157	(0)
CdNO3+	2.662e-16	1.854e-16	-15.575	-15.732	-0.157	(0)
PbNO3+	4.216e-17	2.936e-17	-16.375	-16.532	-0.157	(0)
CoNO3+	1.149e-17	7.998e-18	-16.940	-17.097	-0.157	(0)
NiNO3+	3.974e-18	2.768e-18	-17.401	-17.558	-0.157	(0)
Mn (NO3) 2	2.511e-20	2.511e-20	-19.600	-19.600	0.000	(0)
UO2NO3+	6.771e-21	4.715e-21	-20.169	-20.326	-0.157	(0)
Zn (NO3) 2	3.923e-22	3.923e-22	-21.406	-21.406	0.000	(0)
Cu (NO3) 2	3.263e-24	3.263e-24	-23.486	-23.486	0.000	(0)
Cd (NO3) 2	1.473e-24	1.473e-24	-23.832	-23.832	0.000	(0)
CrNO3+2	8.381e-25	1.971e-25	-24.077	-24.705	-0.629	(0)
Pb (NO3) 2	7.905e-25	7.905e-25	-24.102	-24.102	0.000	(0)
VO2NO3	4.182e-25	4.182e-25	-24.379	-24.379	0.000	(0)
Co (NO3) 2	2.580e-25	2.580e-25	-24.588	-24.588	0.000	(0)
FeNO3+2	2.605e-27	6.126e-28	-26.584	-27.213	-0.629	(0)
HgNO3+	3.714e-29	2.586e-29	-28.430	-28.587	-0.157	(0)
Hg (NO3) 2	1.704e-37	1.704e-37	-36.768	-36.768	0.000	(0)
Na	1.796e-02					
Na+	1.713e-02	1.343e-02	-1.766	-1.872	-0.106	(0)
NaSO4-	8.328e-04	6.591e-04	-3.079	-3.181	-0.102	(0)
NaHCO3	2.680e-06	2.680e-06	-5.572	-5.572	0.000	(0)
NaF	9.181e-07	9.181e-07	-6.037	-6.037	0.000	(0)
NaCO3-	3.884e-07	3.074e-07	-6.411	-6.512	-0.102	(0)
NaH2BO3	5.792e-08	5.792e-08	-7.237	-7.237	0.000	(0)
NaCrO4-	1.410e-16	9.819e-17	-15.851	-16.008	-0.157	(0)
Ni	3.206e-10					
Ni+2	1.838e-10	6.949e-11	-9.736	-10.158	-0.422	(0)
NiSO4	1.267e-10	1.267e-10	-9.897	-9.897	0.000	(0)
NiHCO3+	4.365e-12	3.040e-12	-11.360	-11.517	-0.157	(0)
NiCO3	3.187e-12	3.187e-12	-11.497	-11.497	0.000	(0)
NiCl+	1.124e-12	7.829e-13	-11.949	-12.106	-0.157	(0)
NiOH+	9.334e-13	6.500e-13	-12.030	-12.187	-0.157	(0)
NiF+	2.716e-13	1.891e-13	-12.566	-12.723	-0.157	(0)
Ni (SO4) 2-2	1.630e-13	3.834e-14	-12.788	-13.416	-0.629	(0)
Ni (OH) 2	3.836e-14	3.836e-14	-13.416	-13.416	0.000	(0)
NiNH3+2	1.534e-15	3.606e-16	-14.814	-15.443	-0.629	(0)
Ni (OH) 3-	4.094e-17	2.851e-17	-16.388	-16.545	-0.157	(0)
NiCl2	1.736e-17	1.736e-17	-16.760	-16.760	0.000	(0)
NiSeO4	8.053e-18	8.053e-18	-17.094	-17.094	0.000	(0)
NiNO3+	3.974e-18	2.768e-18	-17.401	-17.558	-0.157	(0)
Ni (NH3) 2+2	2.142e-21	5.037e-22	-20.669	-21.298	-0.629	(0)
O (0)	2.431e-35					
O2	1.216e-35	1.243e-35	-34.915	-34.906	0.009	(0)
Pb	1.910e-09					
PbSO4	5.603e-10	5.603e-10	-9.252	-9.252	0.000	(0)
PbCO3	4.626e-10	4.626e-10	-9.335	-9.335	0.000	(0)
PbOH+	3.355e-10	2.336e-10	-9.474	-9.631	-0.157	(0)
Pb+2	3.311e-10	1.252e-10	-9.480	-9.902	-0.422	(0)
Pb (SO4) 2-2	1.312e-10	3.085e-11	-9.882	-10.511	-0.629	(0)
PbHCO3+	4.739e-11	3.300e-11	-10.324	-10.481	-0.157	(0)
PbCl+	2.809e-11	1.956e-11	-10.551	-10.709	-0.157	(0)
Pb (CO3) 2-2	6.973e-12	1.640e-12	-11.157	-11.785	-0.629	(0)
Pb (OH) 2	5.490e-12	5.490e-12	-11.260	-11.260	0.000	(0)
PbF+	1.373e-12	9.558e-13	-11.862	-12.020	-0.157	(0)
PbCl2	3.847e-13	3.847e-13	-12.415	-12.415	0.000	(0)
Pb (OH) 3-	5.858e-15	4.079e-15	-14.232	-14.389	-0.157	(0)
PbF2	2.038e-15	2.038e-15	-14.691	-14.691	0.000	(0)

PbCl3-	9.685e-16	6.744e-16	-15.014	-15.171	-0.157	(0)
PbNO3+	4.216e-17	2.936e-17	-16.375	-16.532	-0.157	(0)
Pb2OH+3	1.204e-17	4.635e-19	-16.919	-18.334	-1.414	(0)
PbCl4-2	5.773e-18	1.358e-18	-17.239	-17.867	-0.629	(0)
Pb(OH) 4-2	3.156e-18	7.423e-19	-17.501	-18.129	-0.629	(0)
PbF3-	6.014e-19	4.188e-19	-18.221	-18.378	-0.157	(0)
Pb3(OH) 4+2	3.201e-22	7.528e-23	-21.495	-22.123	-0.629	(0)
PbF4-2	9.235e-23	2.172e-23	-22.035	-22.663	-0.629	(0)
Pb(NO3) 2	7.905e-25	7.905e-25	-24.102	-24.102	0.000	(0)
Pb4(OH) 4+4	2.447e-26	7.485e-29	-25.611	-28.126	-2.515	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.486	-151.486	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.455	-228.612	-0.157	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.269	-78.427	-0.157	(0)
CdHS+	0.000e+00	0.000e+00	-78.694	-78.851	-0.157	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.294	-79.923	-0.629	(0)
S6-2	0.000e+00	0.000e+00	-79.810	-80.439	-0.629	(0)
S4-2	0.000e+00	0.000e+00	-79.890	-80.519	-0.629	(0)
S3-2	0.000e+00	0.000e+00	-80.696	-81.325	-0.629	(0)
S2-2	0.000e+00	0.000e+00	-81.712	-82.341	-0.629	(0)
S-2	0.000e+00	0.000e+00	-87.441	-87.858	-0.417	(0)
HgHS2-	0.000e+00	0.000e+00	-137.254	-137.411	-0.157	(0)
HgS2-2	0.000e+00	0.000e+00	-137.622	-138.251	-0.629	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.886	-138.886	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-147.002	-147.427	-0.425	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.524	-147.681	-0.157	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.756	-148.157	-0.401	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.540	-149.540	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.073	-150.073	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.486	-151.486	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.710	-216.867	-0.157	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.529	-224.686	-0.157	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.169	-226.798	-0.629	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.443	-226.600	-0.157	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.455	-228.612	-0.157	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.421	-236.578	-0.157	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.202	-302.830	-0.629	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.944	-304.573	-0.629	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.252	-318.880	-0.629	(0)
S(6)	3.600e-02					
SO4-2	2.417e-02	9.138e-03	-1.617	-2.039	-0.422	(0)
CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
MgSO4	4.706e-03	4.706e-03	-2.327	-2.327	0.000	(0)
NaSO4-	8.328e-04	6.591e-04	-3.079	-3.181	-0.102	(0)
KSO4-	6.007e-04	4.754e-04	-3.221	-3.323	-0.102	(0)
MnSO4	4.077e-05	4.077e-05	-4.390	-4.390	0.000	(0)
ZnSO4	6.224e-06	6.224e-06	-5.206	-5.206	0.000	(0)
Zn(SO4) 2-2	2.107e-06	4.954e-07	-5.676	-6.305	-0.629	(0)
CuSO4	6.826e-08	6.826e-08	-7.166	-7.166	0.000	(0)
NH4SO4-	2.856e-08	2.246e-08	-7.544	-7.649	-0.104	(0)
HSO4-	1.550e-08	1.208e-08	-7.810	-7.918	-0.108	(0)
CdSO4	7.920e-09	7.920e-09	-8.101	-8.101	0.000	(0)
Cd(SO4) 2-2	4.152e-09	9.763e-10	-8.382	-9.010	-0.629	(0)
CoSO4	5.803e-10	5.803e-10	-9.236	-9.236	0.000	(0)
PbSO4	5.603e-10	5.603e-10	-9.252	-9.252	0.000	(0)
Pb(SO4) 2-2	1.312e-10	3.085e-11	-9.882	-10.511	-0.629	(0)
NiSO4	1.267e-10	1.267e-10	-9.897	-9.897	0.000	(0)
CrOHSO4	1.002e-11	1.002e-11	-10.999	-10.999	0.000	(0)
UO2SO4	2.062e-12	2.062e-12	-11.686	-11.686	0.000	(0)
FeSO4	1.164e-12	1.164e-12	-11.934	-11.934	0.000	(0)
UO2(SO4) 2-2	1.056e-12	2.484e-13	-11.976	-12.605	-0.629	(0)
AlSO4+	6.712e-13	5.235e-13	-12.173	-12.281	-0.108	(0)
Ni(SO4) 2-2	1.630e-13	3.834e-14	-12.788	-13.416	-0.629	(0)
Al(SO4) 2-	6.573e-14	5.126e-14	-13.182	-13.290	-0.108	(0)
CrSO4+	8.714e-15	6.068e-15	-14.060	-14.217	-0.157	(0)
VO2SO4-	1.634e-17	1.138e-17	-16.787	-16.944	-0.157	(0)

FeSO4+	5.037e-19	3.961e-19	-18.298	-18.402	-0.104	(0)
Fe (SO4) 2-	1.111e-19	7.740e-20	-18.954	-19.111	-0.157	(0)
VO SO4	2.401e-20	2.401e-20	-19.620	-19.620	0.000	(0)
Cr2 (OH) 2SO4+2	1.781e-20	4.188e-21	-19.749	-20.378	-0.629	(0)
HgSO4	1.057e-20	1.057e-20	-19.976	-19.976	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.274e-21	2.274e-21	-20.643	-20.643	0.000	(0)
CrO3SO4-2	1.033e-23	2.430e-24	-22.986	-23.614	-0.629	(0)
VS O4+	6.714e-35	4.675e-35	-34.173	-34.330	-0.157	(0)
U (SO4) 2	3.386e-39	3.386e-39	-38.470	-38.470	0.000	(0)
USO4+2	1.984e-40	0.000e+00	-39.703	-40.331	-0.629	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.493	-60.650	-0.157	(0)
Sb (3)	7.615e-20					
Sb (OH) 3	3.850e-20	3.850e-20	-19.415	-19.415	0.000	(0)
HSbO2	3.764e-20	3.764e-20	-19.424	-19.424	0.000	(0)
SbO2-	6.468e-24	4.504e-24	-23.189	-23.346	-0.157	(0)
Sb (OH) 4-	3.696e-24	2.574e-24	-23.432	-23.589	-0.157	(0)
Sb (OH) 2F	8.831e-26	8.831e-26	-25.054	-25.054	0.000	(0)
SbOF	8.696e-26	8.696e-26	-25.061	-25.061	0.000	(0)
Sb (OH) 2+	1.819e-26	1.267e-26	-25.740	-25.897	-0.157	(0)
SbO+	6.281e-27	4.374e-27	-26.202	-26.359	-0.157	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.252	-318.880	-0.629	(0)
Sb (5)	6.011e-08					
SbO3-	6.005e-08	4.181e-08	-7.222	-7.379	-0.157	(0)
Sb (OH) 6-	6.211e-11	4.871e-11	-10.207	-10.312	-0.106	(0)
SbO2+	3.158e-24	2.199e-24	-23.501	-23.658	-0.157	(0)
Se (-2)	4.697e-39					
HSe-	4.697e-39	3.271e-39	-38.328	-38.485	-0.157	(0)
MnSe	0.000e+00	0.000e+00	-40.602	-40.602	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.464	-42.464	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.988	-45.617	-0.629	(0)
Se (4)	5.224e-07					
HSeO3-	2.792e-07	1.944e-07	-6.554	-6.711	-0.157	(0)
SeO3-2	2.432e-07	5.719e-08	-6.614	-7.243	-0.629	(0)
H2SeO3	1.122e-12	1.122e-12	-11.950	-11.950	0.000	(0)
Cd (SeO3) 2-2	4.238e-17	9.966e-18	-16.373	-17.001	-0.629	(0)
FeHSeO3+2	8.440e-24	1.985e-24	-23.074	-23.702	-0.629	(0)
Se (6)	6.572e-10					
SeO4-2	6.554e-10	2.478e-10	-9.184	-9.606	-0.422	(0)
MnSeO4	1.673e-12	1.673e-12	-11.776	-11.776	0.000	(0)
ZnSeO4	1.195e-13	1.195e-13	-12.923	-12.923	0.000	(0)
HSeO4-	2.413e-16	1.680e-16	-15.617	-15.775	-0.157	(0)
CdSeO4	1.706e-16	1.706e-16	-15.768	-15.768	0.000	(0)
CoSeO4	3.952e-17	3.952e-17	-16.403	-16.403	0.000	(0)
NiSeO4	8.053e-18	8.053e-18	-17.094	-17.094	0.000	(0)
Zn (SeO4) 2-2	1.276e-22	3.001e-23	-21.894	-22.523	-0.629	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.178	-58.592	-1.414	(0)
U (4)	3.057e-19					
U (OH) 5-	3.056e-19	2.128e-19	-18.515	-18.672	-0.157	(0)
U (OH) 4	1.208e-22	1.208e-22	-21.918	-21.918	0.000	(0)
U (OH) 3+	8.594e-27	5.984e-27	-26.066	-26.223	-0.157	(0)
U (OH) 2+2	1.595e-31	3.750e-32	-30.797	-31.426	-0.629	(0)
UF3+	9.324e-36	6.493e-36	-35.030	-35.188	-0.157	(0)
UF2+2	1.608e-36	3.781e-37	-35.794	-36.422	-0.629	(0)
UOH+3	6.215e-37	2.393e-38	-36.207	-37.621	-1.414	(0)
UF4	7.714e-38	7.714e-38	-37.113	-37.113	0.000	(0)
UF+3	7.198e-39	2.772e-40	-38.143	-39.557	-1.414	(0)
U (SO4) 2	3.386e-39	3.386e-39	-38.470	-38.470	0.000	(0)
UF5-	4.756e-40	3.312e-40	-39.323	-39.480	-0.157	(0)
USO4+2	1.984e-40	0.000e+00	-39.703	-40.331	-0.629	(0)
UF6-2	0.000e+00	0.000e+00	-40.336	-40.965	-0.629	(0)
U+4	0.000e+00	0.000e+00	-42.377	-44.892	-2.515	(0)
UC1+3	0.000e+00	0.000e+00	-44.134	-45.548	-1.414	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.757	-168.487	-12.730	(0)
U (5)	1.627e-15					
UO2+	1.627e-15	1.133e-15	-14.789	-14.946	-0.157	(0)
U (6)	4.372e-07					
UO2 (CO3) 3-4	3.604e-07	1.102e-09	-6.443	-8.958	-2.515	(0)

UO2 (CO3) 2-2	7.607e-08	1.789e-08	-7.119	-7.747	-0.629	(0)
UO2CO3	7.294e-10	7.294e-10	-9.137	-9.137	0.000	(0)
UO2OH+	2.002e-11	1.394e-11	-10.699	-10.856	-0.157	(0)
UO2F+	3.201e-12	2.229e-12	-11.495	-11.652	-0.157	(0)
UO2SO4	2.062e-12	2.062e-12	-11.686	-11.686	0.000	(0)
UO2 (SO4) 2-2	1.056e-12	2.484e-13	-11.976	-12.605	-0.629	(0)
UO2F2	6.966e-13	6.966e-13	-12.157	-12.157	0.000	(0)
UO2+2	3.943e-13	1.491e-13	-12.404	-12.827	-0.422	(0)
UO2F3-	2.722e-14	1.896e-14	-13.565	-13.722	-0.157	(0)
(UO2) 3 (OH) 5+	2.705e-15	1.884e-15	-14.568	-14.725	-0.157	(0)
UO2Cl+	1.529e-15	1.064e-15	-14.816	-14.973	-0.157	(0)
(UO2) 2 (OH) 2+2	1.372e-15	3.226e-16	-14.863	-15.491	-0.629	(0)
UO2F4-2	6.938e-17	1.632e-17	-16.159	-16.787	-0.629	(0)
UO2NO3+	6.771e-21	4.715e-21	-20.169	-20.326	-0.157	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.641	-42.798	-0.157	(0)
V+2	0.000e+00	0.000e+00	-43.550	-44.179	-0.629	(0)
V (3)	3.586e-15					
V (OH) 3	3.586e-15	3.586e-15	-14.445	-14.445	0.000	(0)
V (OH) 2+	4.509e-26	3.140e-26	-25.346	-25.503	-0.157	(0)
VOH+2	1.716e-29	4.036e-30	-28.765	-29.394	-0.629	(0)
V+3	2.814e-34	1.084e-35	-33.551	-34.965	-1.414	(0)
VSO4+	6.714e-35	4.675e-35	-34.173	-34.330	-0.157	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.031	-56.445	-1.414	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.474	-57.988	-2.515	(0)
V (4)	2.102e-18					
V (OH) 3+	2.028e-18	1.412e-18	-17.693	-17.850	-0.157	(0)
VO+2	4.057e-20	9.541e-21	-19.392	-20.020	-0.629	(0)
VOSO4	2.401e-20	2.401e-20	-19.620	-19.620	0.000	(0)
VOF+	8.904e-21	6.200e-21	-20.050	-20.208	-0.157	(0)
VOF2	2.519e-22	2.519e-22	-21.599	-21.599	0.000	(0)
VOC1+	1.693e-22	1.179e-22	-21.771	-21.929	-0.157	(0)
VOF3-	1.391e-24	9.684e-25	-23.857	-24.014	-0.157	(0)
VOF4-2	1.801e-27	4.235e-28	-26.745	-27.373	-0.629	(0)
H2V2O4+2	4.264e-31	1.003e-31	-30.370	-30.999	-0.629	(0)
V (5)	3.167e-08					
H2VO4-	2.044e-08	1.423e-08	-7.690	-7.847	-0.157	(0)
HVO4-2	1.123e-08	2.642e-09	-7.949	-8.578	-0.629	(0)
H3VO4	1.926e-12	1.926e-12	-11.715	-11.715	0.000	(0)
HV2O7-3	3.313e-13	1.276e-14	-12.480	-13.894	-1.414	(0)
H3V2O7-	2.545e-13	1.772e-13	-12.594	-12.751	-0.157	(0)
VO4-3	2.541e-14	9.784e-16	-13.595	-15.009	-1.414	(0)
V2O7-4	8.297e-15	2.538e-17	-14.081	-16.596	-2.515	(0)
V3O9-3	7.872e-17	3.032e-18	-16.104	-17.518	-1.414	(0)
VO2+	6.651e-17	5.215e-17	-16.177	-16.283	-0.106	(0)
VO2SO4-	1.634e-17	1.138e-17	-16.787	-16.944	-0.157	(0)
VO2F	9.910e-18	9.910e-18	-17.004	-17.004	0.000	(0)
VO2F2-	5.598e-19	3.898e-19	-18.252	-18.409	-0.157	(0)
V4O12-4	5.889e-21	1.801e-23	-20.230	-22.744	-2.515	(0)
VO2F3-2	2.240e-21	5.269e-22	-20.650	-21.278	-0.629	(0)
VO2F4-3	7.294e-25	2.809e-26	-24.137	-25.551	-1.414	(0)
VO2NO3	4.182e-25	4.182e-25	-24.379	-24.379	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.371	-61.029	-5.658	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.782	-60.711	-3.929	(0)
H2V10O28-4	0.000e+00	0.000e+00	-60.857	-63.372	-2.515	(0)
Zn	1.728e-05					
Zn+2	8.235e-06	3.113e-06	-5.084	-5.507	-0.422	(0)
ZnSO4	6.224e-06	6.224e-06	-5.206	-5.206	0.000	(0)
Zn (SO4) 2-2	2.107e-06	4.954e-07	-5.676	-6.305	-0.629	(0)
ZnOH+	3.322e-07	2.313e-07	-6.479	-6.636	-0.157	(0)
ZnCO3	2.202e-07	2.202e-07	-6.657	-6.657	0.000	(0)
ZnHCO3+	5.016e-08	3.493e-08	-7.300	-7.457	-0.157	(0)
ZnCl+	4.455e-08	3.444e-08	-7.351	-7.463	-0.112	(0)
ZnOHC1	3.350e-08	3.350e-08	-7.475	-7.475	0.000	(0)
Zn (OH) 2	2.724e-08	2.724e-08	-7.565	-7.565	0.000	(0)
ZnF+	9.665e-09	6.730e-09	-8.015	-8.172	-0.157	(0)
ZnCl2	2.403e-10	2.403e-10	-9.619	-9.619	0.000	(0)
Zn (OH) 3-	1.457e-10	1.014e-10	-9.837	-9.994	-0.157	(0)

ZnCl3-	1.088e-12	8.407e-13	-11.964	-12.075	-0.112	(0)
ZnNO3+	1.781e-13	1.240e-13	-12.749	-12.907	-0.157	(0)
ZnSeO4	1.195e-13	1.195e-13	-12.923	-12.923	0.000	(0)
Zn(OH) 4-2	1.276e-14	3.001e-15	-13.894	-14.523	-0.629	(0)
ZnCl4-2	4.840e-15	1.851e-15	-14.315	-14.733	-0.417	(0)
Zn(NO3) 2	3.923e-22	3.923e-22	-21.406	-21.406	0.000	(0)
Zn(SeO4) 2-2	1.276e-22	3.001e-23	-21.894	-22.523	-0.629	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.524	-147.681	-0.157	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.540	-149.540	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.529	-224.686	-0.157	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.169	-226.798	-0.629	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.944	-304.573	-0.629	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-55.09	-48.80	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-42.43	-37.92	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.65	-37.92	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-70.95	-53.02	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-56.72	-36.69	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.52	-28.11	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.33	-22.88	0.45	(NH4)2SeO4
Al(OH) 3(am)	-1.33	9.47	10.80	Al(OH) 3
Al2(MoO4) 3	-47.78	-45.42	2.37	Al2(MoO4) 3
Al2O3	-0.71	18.95	19.65	Al2O3
Al4(OH)10SO4	-2.59	20.11	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.48	-6.68	4.80	AlAsO4:2H2O
AlOHSO4	-5.07	-8.30	-3.23	AlOHSO4
AlSb	-152.20	-86.57	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.15	-11.94	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.87	4.73	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-1.12	6.27	7.39	Cu2(OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-16.60	7.79	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-17.11	-1.24	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	0.00	-8.91	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-26.38	6.56	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-13.10	-22.77	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.70	-13.66	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.61	-6.78	1.83	BaSeO3
BaSeO4	-10.09	-17.55	-7.46	BaSeO4
Bianchite	-5.78	-7.55	-1.76	ZnSO4:6H2O
Birnessite	-6.76	11.33	18.09	MnO2
Bixbyite	-2.24	-2.88	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.89	9.47	8.58	AlOOH
Breithauptite	-59.17	-77.70	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH) 6SO4
Brucite	-3.66	13.19	16.84	Mg(OH) 2
Bunsenite	-6.87	5.58	12.45	NiO
Ca(VO3) 2	-9.32	-3.66	5.66	Ca(VO3) 2
Ca2V2O7	-7.99	9.51	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.05	9.50	21.55	Ca2V2O7:2H2O
Ca3(AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3(AsO4) 2:4H2O
Ca3(VO4) 2	-16.29	22.67	38.96	Ca3(VO4) 2

Ca ₃ (VO ₄) ₂ ·4H ₂ O	-17.19	22.67	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-295.57	-152.59	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.14	-17.40	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-6.52	-24.43	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.34	-8.29	-7.95	CaMoO ₄
Carnotite	-0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-4.23	-1.41	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-9.16	-12.18	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-10.93	-1.09	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.34	7.30	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.43	7.30	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.35	-13.64	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.42	4.14	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-16.96	11.44	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.49	-13.14	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-11.45	-13.15	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.23	-13.15	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.15	-16.36	-1.21	CdF ₂
Cdmetal(alpha)	-31.75	-18.24	13.51	Cd
Cdmetal(gamma)	-31.86	-18.24	13.62	Cd
CdMoO ₄	0.00	-14.15	-14.15	CdMoO ₄
CdOHCl	-6.46	-2.92	3.54	CdOHCl
CdSb	-75.62	-75.97	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.19	-18.04	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.30	-10.47	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-8.75	-10.47	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-8.60	-10.47	-1.87	CdSO ₄ ·2.67H ₂ O
Cerrusite	-2.68	-15.81	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-6.89	-9.53	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-55.04	-89.96	-34.92	Cu ₂ S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS ₂
Cinnabar	-51.41	-97.11	-45.69	HgS
Claudetite	-88.12	-91.18	-3.06	As ₄ O ₆
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co(BO ₂) ₂	-29.22	-2.15	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.86	6.24	13.09	Co(OH) ₂
Co(OH) ₃	-11.08	-13.39	-2.31	Co(OH) ₃
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-26.61	-13.58	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-10.04	-20.54	-10.50	Co ₃ O ₄
CoCl ₂	-22.48	-14.21	8.27	CoCl ₂
CoCl ₂ ·6H ₂ O	-16.75	-14.21	2.54	CoCl ₂ ·6H ₂ O
CoCO ₃	-5.43	-15.41	-9.98	CoCO ₃
CoF ₂	-15.83	-17.43	-1.60	CoF ₂
CoF ₃	-47.43	-48.89	-1.46	CoF ₃
CoFe ₂ O ₄	16.15	12.62	-3.53	CoFe ₂ O ₄
CoMoO ₄	-7.45	-15.21	-7.76	CoMoO ₄
CoO	-7.35	6.24	13.59	CoO
CoS(alpha)	-72.62	-80.06	-7.44	CoS
CoS(beta)	-68.99	-80.06	-11.07	CoS
CoSe	-23.91	-40.11	-16.20	CoSe
CoSeO ₃	-9.66	-8.34	1.32	CoSeO ₃
CoSeO ₄ ·6H ₂ O	-17.58	-19.11	-1.53	CoSeO ₄ ·6H ₂ O
CoSO ₄	-14.34	-11.54	2.80	CoSO ₄
CoSO ₄ ·6H ₂ O	-9.07	-11.54	-2.47	CoSO ₄ ·6H ₂ O
Cotunnite	-9.83	-14.61	-4.78	PbCl ₂
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH) ₂	-22.15	-11.34	10.82	Cr(OH) ₂
Cr(OH) ₃	-2.85	-1.51	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	-0.76	-1.51	-0.75	Cr(OH) ₃
Cr ₂ O ₃	-0.66	-3.02	-2.36	Cr ₂ O ₃
CrCl ₂	-45.88	-31.78	14.09	CrCl ₂
CrCl ₃	-47.30	-32.18	15.11	CrCl ₃
CrF ₃	-25.67	-37.01	-11.34	CrF ₃
Crmetal	-67.36	-36.88	30.48	Cr

CrO3	-27.36	-30.57	-3.21	CrO3
Cryolite	-9.70	-43.54	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.70	20.51	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.42	0.83	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.75	-89.63	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.22	-50.02	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.95	-101.55	-42.59	Cu3Sb
Cu3Se2	-24.63	-88.12	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.88	-22.32	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.13	-13.20	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.00	-38.10	-33.10	CuSe
CuSe2	-25.55	-58.91	-33.37	CuSe2
CuSeO3:2H2O	-6.84	-6.33	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.66	-17.10	-2.44	CuSeO4:5H2O
CuSO4	-12.47	-9.53	2.94	CuSO4
Diaspore	2.60	9.47	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.40	-16.94	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.15	-16.94	-17.09	CaMg (CO3) 2
Epsomite	-2.47	-4.59	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.16	0.12	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.66	-13.38	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.75	-8.20	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.73	-37.36	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.77	0.43	7.20	FeCr2O4
FeMoO4	-7.91	-18.00	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.11	-63.71	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.90	-42.90	-11.00	FeSe
Fix_pe	-4.90	-4.90	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.49	-80.46	-13.97	PbS
Gibbsite	1.18	9.47	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.54	-7.55	-2.01	ZnSO4:7H2O
Greenockite	-64.63	-78.99	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummit	-4.76	2.91	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.58	-21.45	-12.88	H2MoO4
H2S (g)	-78.29	-86.30	-8.01	H2S
H2Se (g)	-41.39	-46.35	-4.96	H2Se
Halite	-5.83	-4.23	1.60	NaCl
Hausmannite	-2.08	58.95	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.50	22.40	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.76	-258.47	-73.71	Hg (CH3) 2
Hg (g)	-6.89	-14.76	-7.87	Hg
Hg (OH) 2	-7.32	-10.81	-3.50	Hg (OH) 2
Hg2 (g)	-14.57	-29.53	-14.96	Hg2

Hg2 (OH) 2	-9.24	-3.98	5.26	Hg2 (OH) 2
Hg2CO3	-9.58	-25.63	-16.05	Hg2CO3
Hg2CrO4	-25.85	-34.55	-8.70	Hg2CrO4
Hg2F2	-17.29	-27.65	-10.36	Hg2F2
Hg2S	-78.60	-90.28	-11.68	Hg2S
Hg2SeO3	-13.91	-18.56	-4.66	Hg2SeO3
Hg2SO4	-15.63	-21.76	-6.13	Hg2SO4
Hg3O2CO3	-24.40	-54.08	-29.68	Hg3O2CO3
HgCl (g)	-31.71	-12.22	19.50	HgCl
HgCl2	-10.00	-31.26	-21.26	HgCl2
HgF (g)	-46.50	-13.83	32.68	HgF
HgF2 (g)	-47.04	-34.48	12.57	HgF2
Hgmetal (l)	-1.31	-14.76	-13.45	Hg
HgSe	-1.47	-57.17	-55.69	HgSe
HgSeO3	-12.96	-25.39	-12.43	HgSeO3
HgSO4	-19.17	-28.59	-9.42	HgSO4
Huntite	-3.89	-33.86	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.02	-25.79	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.88	-20.65	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.18	-20.35	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.44	-20.24	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.43	-49.67	-17.24	K2Cr2O7
K2CrO4	-18.59	-19.10	-0.51	K2CrO4
K2MoO4	-13.25	-9.99	3.26	K2MoO4
K2SeO4	-13.14	-13.87	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.67	-6.11	-0.43	PbO : PbSO4
Laurionite	-5.01	-4.39	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.86	5.83	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.71	19.57	16.86	Fe2MgO4
Magnesite	-1.00	-8.46	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.43	23.91	25.34	MnOOH
Massicot	-7.06	5.83	12.89	PbO
Matlockite	-7.25	-16.22	-8.97	PbClF
Melanothallite	-18.46	-12.20	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.01	-97.11	-45.09	HgS
Mg (OH) 2 (active)	-5.61	13.19	18.79	Mg (OH) 2
Mg (VO3) 2	-14.92	-3.64	11.28	Mg (VO3) 2
Mg2Sb3	-272.59	-197.90	74.68	Mg2Sb3
Mg2V2O7	-16.81	9.55	26.36	Mg2V2O7
MgCr2O4	-6.03	10.17	16.20	MgCr2O4
MgCrO4	-22.76	-17.38	5.38	MgCrO4
MgF2	-2.35	-10.48	-8.13	MgF2
MgMoO4	-6.42	-8.27	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.45	-1.39	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.96	-12.16	-1.20	MgSeO4 : 6H2O
Minium	-30.47	43.05	73.52	Pb3O4
Mirabilite	-4.68	-5.79	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.59	-5.69	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.50	-56.21	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.63	-86.55	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.39	1.11	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.03	-9.32	2.72	MnCl2 : 4H2O
MnS (grn)	-75.33	-75.16	0.17	MnS
MnS (pnk)	-78.50	-75.16	3.34	MnS
MnSb	-94.58	-97.49	-2.91	MnSb
MnSe	-38.72	-35.22	3.50	MnSe
MnSeO3	-4.57	-3.44	1.13	MnSeO3
MnSeO3 : 2H2O	-4.43	-3.44	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.16	-14.21	-2.05	MnSeO4 : 5H2O
MnSO4	-9.22	-6.64	2.58	MnSO4

Monteponite	-7.80	7.30	15.10	CdO
Montroydite	-7.17	-10.81	-3.64	HgO
MoO3	-13.45	-21.45	-8.00	MoO3
Morenosite	-10.06	-12.20	-2.14	NiSO4:7H2O
MoS2	-149.33	-219.59	-70.26	MoS2
Na-Jarosite	-8.78	-19.98	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.25	-49.15	-9.90	Na2Cr2O7
Na2CrO4	-21.51	-18.58	2.93	Na2CrO4
Na2Mo2O7	-14.32	-30.92	-16.60	Na2Mo2O7
Na2MoO4	-10.95	-9.46	1.49	Na2MoO4
Na2MoO4:2H2O	-10.69	-9.46	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.89	-2.59	10.30	Na2SeO3:5H2O
Na2SeO4	-14.63	-13.35	1.28	Na2SeO4
Na3Sb	-172.51	-78.06	94.45	Na3Sb
Na3VO4	-27.11	9.57	36.68	Na3VO4
Na4V2O7	-30.24	7.16	37.40	Na4V2O7
Nantokite	-5.33	-12.06	-6.73	CuCl
NaSb	-87.67	-64.51	23.17	NaSb
Natron	-8.35	-9.66	-1.31	Na2CO3:10H2O
NaVO3	-6.28	-2.42	3.86	NaVO3
Nesquehonite	-3.79	-8.46	-4.67	MgCO3:3H2O
Ni(OH)2	-7.22	5.58	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-31.27	-15.57	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-27.46	4.54	32.00	Ni4(OH)6SO4
NiCO3	-9.20	-16.07	-6.87	NiCO3
NiMoO4	-4.73	-15.88	-11.14	NiMoO4
NiS(alpha)	-75.12	-80.72	-5.60	NiS
NiS(beta)	-69.62	-80.72	-11.10	NiS
NiS(gamma)	-67.92	-80.72	-12.80	NiS
NiSe	-23.07	-40.77	-17.70	NiSe
NiSeO3:2H2O	-11.82	-9.00	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.25	-19.77	-1.52	NiSeO4:6H2O
Nsutite	-6.17	11.33	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.34	-14.34	-12.00	CdCO3
Pb(BO2)2	-9.08	-2.56	6.52	Pb(BO2)2
Pb(OH)2	-2.32	5.83	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.78	-71.54	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.52	11.67	26.19	Pb2O(OH)2
Pb2O3	-23.83	37.21	61.04	Pb2O3
Pb2OCO3	-9.42	-9.98	-0.56	Pb2OCO3
Pb2V2O7	-3.26	-5.16	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.59	-14.79	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.47	0.67	6.14	Pb3(VO4)2
Pb3O2CO3	-15.16	-4.14	11.02	Pb3O2CO3
Pb3O2SO4	-10.96	-0.27	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.54	5.56	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.32	5.56	21.88	Pb4O3SO4
PbCrO4	-12.13	-24.73	-12.60	PbCrO4
PbF2	-10.39	-17.83	-7.44	PbF2
Pbmetal	-23.96	-19.71	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.15	5.83	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.40	13.19	21.58	MgO
Phosgenite	-10.62	-30.43	-19.81	PbCl2:PbCO3
Plattnerite	-18.22	31.38	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-4.06	11.14	15.19	Mn(OH)2
Pyrolusite	-4.70	36.68	41.38	MnO2
Realgar	-102.12	-121.86	-19.75	AsS
Retgersite	-10.16	-12.20	-2.04	NiSO4:6H2O
Rhodochrosite	0.07	-10.51	-10.58	MnCO3
Rutherfordine	-4.24	-18.74	-14.50	UO2CO3
Sb(OH)3	-12.30	-19.41	-7.11	Sb(OH)3

Sb2O4	-16.68	-13.28	3.40	Sb2O4
Sb2O5	-26.69	-36.36	-9.67	Sb2O5
Sb2Se3	-110.13	-177.89	-67.76	Sb2Se3
Sb4O6(cubic)	-59.39	-77.65	-18.26	Sb4O6
Sb4O6(orth)	-59.75	-77.65	-17.90	Sb4O6
SbCl3	-50.66	-50.09	0.57	SbCl3
SbF3	-44.69	-54.91	-10.23	SbF3
Sbmetal	-46.04	-57.73	-11.69	Sb
SbO2	-3.13	-30.95	-27.82	SbO2
Schoepite	-3.09	2.91	5.99	UO2(OH)2·H2O
Semetal(am)	-13.70	-20.81	-7.11	Se
Semetal(hex)	-13.10	-20.81	-7.71	Se
Senarmontite	-26.46	-38.83	-12.37	Sb2O3
SeO2	-14.70	-14.58	0.12	SeO2
SeO3	-46.39	-25.34	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.42	-11.42	-10.00	ZnCO3
Sphalerite	-64.61	-76.06	-11.45	ZnS
Spinel	-4.71	32.13	36.85	MgAl2O4
Stibnite	-247.25	-297.71	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.10	-5.78	0.32	Na2SO4
Thermonatrite	-10.29	-9.65	0.64	Na2CO3·H2O
Tyuyamunite	-1.92	2.16	4.08	Ca(UO2)2(VO4)2
U3O8	-10.25	10.83	21.08	U3O8
U3Sb4	-576.83	-424.45	152.38	U3Sb4
U4O9	-25.11	-28.13	-3.02	U4O9
UF4	-31.22	-60.75	-29.54	UF4
UF4·2.5H2O	-28.04	-60.75	-32.72	UF4·2.5H2O
UO2(am)	-14.35	-13.42	0.93	UO2
UO2(NO3)2	-40.57	-28.43	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-33.28	-28.43	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-31.82	-28.43	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-30.48	-28.43	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-2.70	2.91	5.61	UO2(OH)2
UO2SeO4·4H2O	-20.19	-22.44	-2.25	UO2SeO4·4H2O
UO3	-4.79	2.91	7.70	UO3
Uraninite	-8.75	-13.42	-4.67	UO2
USb2	-218.76	-189.19	29.58	USb2
V(OH)3	-18.95	-11.36	7.59	V(OH)3
V2O5	-15.47	-16.83	-1.36	V2O5
V3O5	-40.23	-38.40	1.84	V3O5
V4O7	-49.87	-42.68	7.19	V4O7
V6O13	-40.72	-101.58	-60.86	V6O13
Valentinite	-30.35	-38.83	-8.48	Sb2O3
VC12	-63.46	-44.58	18.87	VC12
VC13	-65.47	-42.03	23.43	VC13
VF4	-66.55	-51.62	14.93	VF4
Vmetal	-93.70	-49.68	44.03	V
VO	-38.89	-24.13	14.76	VO
VO(OH)2	-9.43	-4.28	5.15	VO(OH)2
VO2Cl	-21.48	-18.64	2.84	VO2Cl
VOC1	-32.74	-21.58	11.15	VOC1
VOC12	-37.49	-24.73	12.76	VOC12
VOSO4	-25.67	-22.06	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.11	-76.06	-8.95	ZnS
Zincite	-1.10	10.23	11.33	ZnO
Zincosite	-11.48	-7.55	3.93	ZnSO4
Zn(BO2)2	-6.45	1.84	8.29	Zn(BO2)2
Zn(NO3)2·6H2O	-24.43	-21.11	3.32	Zn(NO3)2·6H2O
Zn(OH)2	-1.97	10.23	12.20	Zn(OH)2
Zn(OH)2(am)	-2.24	10.23	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.52	10.23	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.30	10.23	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.50	10.23	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.82	2.68	7.50	Zn2(OH)2SO4

Zn2(OH)3Cl	-4.96	10.23	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-15.26	-1.61	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-23.78	-4.86	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.26	23.14	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-7.80	30.70	38.50	Zn5(OH)8Cl2
ZnCl2	-17.27	-10.22	7.05	ZnCl2
ZnCO3·1H2O	-1.16	-11.42	-10.26	ZnCO3·1H2O
ZnF2	-12.90	-13.44	-0.53	ZnF2
Znmetal	-41.10	-15.31	25.79	Zn
ZnMoO4	-1.10	-11.22	-10.13	ZnMoO4
ZnO(active)	-0.96	10.23	11.19	ZnO
ZnS(am)	-67.01	-76.06	-9.05	ZnS
ZnSb	-84.06	-73.05	11.01	ZnSb
ZnSe	-21.72	-36.12	-14.40	ZnSe
ZnSeO4·6H2O	-13.60	-15.12	-1.52	ZnSeO4·6H2O
ZnSO4·1H2O	-6.91	-7.55	-0.64	ZnSO4·1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 43.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 202
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 202
USE Surface 202
USE Solution 207
SAVE Solution 208  #Initial Stage 2 Run-off Water After Mineral
Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 202.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

3.243e-22  Surface + diffuse layer charge, eq
2.080e-08  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
4.563e-01  m² for 7.108e-06 moles of Ferrihydrite

```

Water in diffuse layer: 4.563e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.
Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451\text{e-}02$ (= c_DL / c_free if z is +1).

Element	Moles
C	1.1657e-11
Ca	1.4447e-13
Cl	2.3343e-10
H	3.4387e-11
K	2.2918e-13
Mg	2.2382e-14
N	9.4501e-10
Na	9.7100e-13
O	4.2120e-08
S	9.8146e-09

Hfo_s
3.554e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	2.376e-08	0.668	2.376e-08	-7.624
Hfo_sOH	1.165e-08	0.328	1.165e-08	-7.934
Hfo_sO-	1.309e-10	0.004	1.309e-10	-9.883
Hfo_sOHCa+2	4.336e-13	0.000	4.336e-13	-12.363

Hfo_w
1.422e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	6.568e-07	0.462	6.568e-07	-6.183
Hfo_wOH	3.221e-07	0.227	3.221e-07	-6.492
Hfo_wSO4-	2.218e-07	0.156	2.218e-07	-6.654
Hfo_wOHSO4-2	2.171e-07	0.153	2.171e-07	-6.663
Hfo_wO-	3.619e-09	0.003	3.619e-09	-8.441
Hfo_wOMg+	5.115e-15	0.000	5.115e-15	-14.291
Hfo_wOCa+	1.735e-15	0.000	1.735e-15	-14.761

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 207. Solution after simulation 42.
Using surface 202.
Using pure phase assemblage 202. Pure-phase assemblage after simulation 42.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	4.724e-05	4.724e-05	6.782e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	3.337e-08	2.667e-08	-6.699e-09
Barite	0.00	-9.98	-9.98	1.989e-05	1.991e-05	2.010e-08
Brochantite	0.00	15.22	15.22	8.899e-05	8.887e-05	-1.213e-07
Brucite	-3.66	13.19	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.008e+01	1.008e+01	5.728e-07
CaMoO4	-0.34	-8.29	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-4.24	-1.43	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	3.028e-02	3.028e-02	-1.013e-06
Carnotite	0.00	0.23	0.23	1.382e-06	1.225e-06	-1.569e-07
Cd(BO2)2	-10.93	-1.09	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	1.508e-07	1.508e-07	-9.329e-12
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-1.49	-3.85	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.23	-50.03	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.13	-13.20	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.47	-4.59	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	7.108e-06	7.108e-06	-1.672e-14
Fluorite	0.00	-10.50	-10.50	2.428e-03	2.428e-03	6.591e-10
Gummite	-4.63	3.04	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	1.399e-03	1.400e-03	8.435e-07
HgSe	-1.49	-57.18	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.68	-5.79	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.59	-3.46	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.22	5.58	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-31.27	-15.57	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.20	-16.07	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.73	-15.88	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	5.049e-10
Otavite	-2.34	-14.34	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	4.978e-07	4.941e-07	-3.624e-09
Rutherfordine	-4.10	-18.60	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.13	-30.95	-27.82	0.000e+00	0	0.000e+00
Schoepite	-2.95	3.04	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2(am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-1.92	2.16	4.08	0.000e+00	0	0.000e+00
U3O8	-9.85	11.23	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.57	3.04	5.61	0.000e+00	0	0.000e+00
UO3	-4.66	3.04	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.10	-11.23	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

6.898e-21 Surface + diffuse layer charge, eq
1.096e-07 Surface charge, eq
2.318e-02 sigma, C/m²
3.103e-02 psi, V
-1.208e+00 -F*psi/RT
2.989e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
4.563e-01 m² for 7.108e-06 moles of Ferrihydrite

Water in diffuse layer: 4.563e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 3.164e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.841e-01 (= c_DL / c_free if z is +1).

Element	Moles
Al	2.9940e-11
As	6.2938e-15
B	3.0581e-10
Ba	1.0834e-13
C	2.5926e-09
Ca	5.1281e-08
Cd	1.0520e-13
Cl	2.8984e-08
Co	7.6155e-15
Cr	1.2030e-15
Cu	2.1917e-12
F	9.1226e-10
Fe	4.8885e-15
H	3.6029e-09
Hg	2.9171e-14
K	4.0904e-08
Mg	4.8427e-08
Mn	5.6883e-10
Mo	2.9608e-11
N	1.1603e-10
Na	7.3414e-08
Ni	1.2730e-15
O	7.9297e-07
Pb	8.3408e-15
S	1.9594e-07
Sb	3.1022e-13
Se	2.7707e-12
U	4.2634e-12
V	1.2593e-13
Zn	7.2566e-11

Hfo_s

3.554e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	1.467e-08	0.413	1.465e-08	-7.834
Hfo_sOCu+	1.230e-08	0.346	1.228e-08	-7.911
Hfo_sOMn+	4.852e-09	0.137	4.846e-09	-8.315
Hfo_sOPb+	2.716e-09	0.076	2.712e-09	-8.567
Hfo_sOHCa+2	4.942e-10	0.014	4.935e-10	-9.307
Hfo_sOCrOH+	4.665e-10	0.013	4.658e-10	-9.332
Hfo_sOH	2.200e-11	0.001	2.197e-11	-10.658
Hfo_sO-	6.391e-12	0.000	6.382e-12	-11.195
Hfo_sOCd+	5.299e-12	0.000	5.292e-12	-11.276
Hfo_sOH2+	1.735e-12	0.000	1.733e-12	-11.761
Hfo_sONi+	7.895e-14	0.000	7.884e-14	-13.103
Hfo_sOCu+	5.360e-14	0.000	5.353e-14	-13.271
Hfo_sOHBa+2	6.496e-15	0.000	6.487e-15	-14.188
Hfo_sOFe+	1.263e-15	0.000	1.262e-15	-14.899
Hfo_sOHg+	1.224e-16	0.000	1.222e-16	-15.913

Hfo_w

1.422e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	4.729e-07	0.333	4.722e-07	-6.326
Hfo_wOMg+	2.590e-07	0.182	2.586e-07	-6.587
Hfo_wOHVO4-3	1.653e-07	0.116	1.650e-07	-6.782
Hfo_wOH	1.649e-07	0.116	1.647e-07	-6.783
Hfo_wOZn+	1.152e-07	0.081	1.150e-07	-6.939
Hfo_wOHSO4-2	1.040e-07	0.073	1.039e-07	-6.983
Hfo_wO-	4.791e-08	0.034	4.784e-08	-7.320
Hfo_wOMn+	2.889e-08	0.020	2.886e-08	-7.540
Hfo_wOHSeO3-2	1.511e-08	0.011	1.509e-08	-7.821

Hfo_wOCa+	1.386e-08	0.010	1.384e-08	-7.859
Hfo_wOHAsO4-3	1.340e-08	0.009	1.338e-08	-7.874
Hfo_wOH2+	1.301e-08	0.009	1.299e-08	-7.886
Hfo_wSO4-	4.118e-09	0.003	4.112e-09	-8.386
Hfo_wSeO3-	2.026e-09	0.001	2.023e-09	-8.694
Hfo_wOPb+	9.095e-10	0.001	9.082e-10	-9.042
Hfo_wOHMoO4-2	8.891e-10	0.001	8.879e-10	-9.052
Hfo_wMoO4-	4.534e-11	0.000	4.528e-11	-10.344
Hfo_wH2BO3	4.366e-11	0.000	4.360e-11	-10.361
Hfo_wOCd+	1.695e-11	0.000	1.692e-11	-10.772
Hfo_wHAsO4-	1.868e-12	0.000	1.866e-12	-11.729
Hfo_wOCa+	1.132e-12	0.000	1.131e-12	-11.947
Hfo_wONi+	7.984e-13	0.000	7.973e-13	-12.098
Hfo_wOHg+	4.494e-14	0.000	4.488e-14	-13.348
Hfo_wOFe+	5.976e-15	0.000	5.968e-15	-14.224
Hfo_wH2AsO4	4.768e-15	0.000	4.762e-15	-14.322
Hfo_wOHSeO4-2	2.792e-15	0.000	2.788e-15	-14.555
Hfo_wOBa+	2.634e-15	0.000	2.630e-15	-14.580
Hfo_wOHSbO(OH) 4-	5.370e-16	0.000	5.363e-16	-15.271
Hfo_wSeO4-	9.625e-17	0.000	9.611e-17	-16.017
Hfo_wSbO(OH) 4	2.738e-17	0.000	2.735e-17	-16.563
Hfo_wOHCrO4-2	8.304e-18	0.000	8.293e-18	-17.081
Hfo_wCrO4-	2.998e-19	0.000	2.994e-19	-18.524
Hfo_wH2AsO3	6.787e-25	0.000	6.777e-25	-24.169

-----Solution composition-----

Elements	Molality	Moles
Al	5.808e-06	5.816e-06
As	1.083e-09	1.084e-09
B	6.665e-05	6.674e-05
Ba	3.037e-08	3.041e-08
C	5.116e-04	5.123e-04
Ca	1.280e-02	1.281e-02
Cd	2.429e-08	2.433e-08
Cl	5.616e-03	5.624e-03
Co	1.967e-09	1.970e-09
Cr	2.915e-10	2.919e-10
Cu	5.100e-07	5.107e-07
F	1.874e-04	1.877e-04
Fe	1.145e-09	1.147e-09
Hg	6.393e-09	6.402e-09
K	9.971e-03	9.985e-03
Mg	1.225e-02	1.227e-02
Mn	1.480e-04	1.482e-04
Mo	5.072e-06	5.079e-06
N	2.255e-05	2.258e-05
Na	1.796e-02	1.799e-02
Ni	3.197e-10	3.202e-10
Pb	1.909e-09	1.912e-09
S	3.600e-02	3.605e-02
Sb	6.011e-08	6.019e-08
Se	5.059e-07	5.066e-07
U	5.939e-07	5.947e-07
V	2.332e-08	2.335e-08
Zn	1.715e-05	1.718e-05

-----Description of solution-----

	pH	=	7.869	Charge balance
	pe	=	4.904	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	9.495e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	5.454e-04	
	Total CO2 (mol/kg)	=	5.116e-04	

Temperature (°C) = 25.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 1
 Total H = 1.111660e+02
 Total O = 5.572865e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.706e-07	7.430e-07	-6.013	-6.129	-0.116	(0)
H+	1.726e-08	1.353e-08	-7.763	-7.869	-0.106	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Al	5.808e-06					
Al (OH) 4-	5.755e-06	4.488e-06	-5.240	-5.348	-0.108	(0)
Al (OH) 3	4.798e-08	4.798e-08	-7.319	-7.319	0.000	(0)
Al (OH) 2+	4.089e-09	3.236e-09	-8.388	-8.490	-0.102	(0)
AlF3	4.704e-10	4.704e-10	-9.328	-9.328	0.000	(0)
AlF2+	4.358e-10	3.449e-10	-9.361	-9.462	-0.102	(0)
AlF4-	3.275e-11	2.554e-11	-10.485	-10.593	-0.108	(0)
AlF+2	2.038e-11	7.996e-12	-10.691	-11.097	-0.406	(0)
AlOH+2	1.398e-11	5.483e-12	-10.854	-11.261	-0.406	(0)
AlSO4+	6.712e-13	5.235e-13	-12.173	-12.281	-0.108	(0)
Al+3	6.585e-14	7.380e-15	-13.181	-14.132	-0.950	(0)
Al (SO4) 2-	6.573e-14	5.126e-14	-13.182	-13.290	-0.108	(0)
AlMo6O21-3	5.770e-40	0.000e+00	-39.239	-40.653	-1.414	(0)
As (3)	1.686e-23					
H3AsO3	1.599e-23	1.599e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	8.700e-25	6.058e-25	-24.060	-24.218	-0.157	(0)
HAsO3-2	1.736e-28	4.083e-29	-27.760	-28.389	-0.629	(0)
H4AsO3+	1.539e-31	1.072e-31	-30.813	-30.970	-0.157	(0)
AsO3-3	3.020e-33	1.163e-34	-32.520	-33.934	-1.414	(0)
As (5)	1.083e-09					
HAsO4-2	1.038e-09	2.442e-10	-8.984	-9.612	-0.629	(0)
H2AsO4-	4.327e-11	3.013e-11	-10.364	-10.521	-0.157	(0)
AsO4-3	1.482e-12	5.705e-14	-11.829	-13.244	-1.414	(0)
H3AsO4	6.933e-17	7.086e-17	-16.159	-16.150	0.009	(0)
B	6.665e-05					
H3BO3	6.203e-05	6.341e-05	-4.207	-4.198	0.009	(0)
H2BO3-	3.632e-06	2.721e-06	-5.440	-5.565	-0.125	(0)
CaH2BO3+	5.630e-07	4.218e-07	-6.249	-6.375	-0.125	(0)
MgH2BO3+	3.564e-07	2.670e-07	-6.448	-6.573	-0.125	(0)
NaH2BO3	5.792e-08	5.792e-08	-7.237	-7.237	0.000	(0)
BF (OH) 3-	3.659e-09	2.741e-09	-8.437	-8.562	-0.125	(0)
H5 (BO3) 2-	1.960e-10	1.469e-10	-9.708	-9.833	-0.125	(0)
BaH2BO3+	1.286e-12	9.636e-13	-11.891	-12.016	-0.125	(0)
H8 (BO3) 3-	1.243e-12	9.311e-13	-11.906	-12.031	-0.125	(0)
BF2 (OH) 2-	5.743e-13	4.303e-13	-12.241	-12.366	-0.125	(0)
BF3OH-	3.281e-19	2.458e-19	-18.484	-18.609	-0.125	(0)
BF4-	2.370e-24	1.776e-24	-23.625	-23.751	-0.125	(0)
Ba	3.037e-08					
Ba+2	3.031e-08	1.146e-08	-7.518	-7.941	-0.422	(0)
BaHCO3+	4.863e-11	3.883e-11	-10.313	-10.411	-0.098	(0)
BaCO3	7.224e-12	7.224e-12	-11.141	-11.141	0.000	(0)
BaH2BO3+	1.286e-12	9.636e-13	-11.891	-12.016	-0.125	(0)
BaOH+	4.726e-14	3.717e-14	-13.326	-13.430	-0.104	(0)
BaNO3+	1.308e-15	9.106e-16	-14.884	-15.041	-0.157	(0)
BaNH3+2	2.971e-16	6.987e-17	-15.527	-16.156	-0.629	(0)
C (4)	5.116e-04					
HCO3-	4.484e-04	3.548e-04	-3.348	-3.450	-0.102	(0)
CaHCO3+	2.229e-05	1.780e-05	-4.652	-4.750	-0.098	(0)
MgHCO3+	1.329e-05	1.028e-05	-4.876	-4.988	-0.112	(0)
H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	3.251e-06	1.229e-06	-5.488	-5.910	-0.422	(0)
MgCO3	2.894e-06	2.894e-06	-5.539	-5.539	0.000	(0)

	NaHCO3	2.680e-06	2.680e-06	-5.572	-5.572	0.000	(0)
	UO2 (CO3) 3-4	4.895e-07	1.497e-09	-6.310	-8.825	-2.515	(0)
	NaCO3-	3.884e-07	3.074e-07	-6.411	-6.512	-0.102	(0)
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	MnHCO3+	2.258e-07	1.776e-07	-6.646	-6.751	-0.104	(0)
	ZnCO3	2.186e-07	2.186e-07	-6.660	-6.660	0.000	(0)
	UO2 (CO3) 2-2	1.033e-07	2.430e-08	-6.986	-7.614	-0.629	(0)
	ZnHCO3+	4.979e-08	3.467e-08	-7.303	-7.460	-0.157	(0)
	Cu (CO3) 2-2	3.320e-09	7.808e-10	-8.479	-9.107	-0.629	(0)
	CuHCO3+	1.048e-09	7.299e-10	-8.980	-9.137	-0.157	(0)
	UO2CO3	9.908e-10	9.908e-10	-9.004	-9.004	0.000	(0)
	PbCO3	4.623e-10	4.623e-10	-9.335	-9.335	0.000	(0)
	CdCO3	1.035e-10	1.035e-10	-9.985	-9.985	0.000	(0)
	BaHCO3+	4.863e-11	3.883e-11	-10.313	-10.411	-0.098	(0)
	PbHCO3+	4.737e-11	3.299e-11	-10.325	-10.482	-0.157	(0)
	CoHCO3+	1.261e-11	8.779e-12	-10.899	-11.057	-0.157	(0)
	BaCO3	7.224e-12	7.224e-12	-11.141	-11.141	0.000	(0)
	Pb (CO3) 2-2	6.969e-12	1.639e-12	-11.157	-11.785	-0.629	(0)
	CoCO3	6.610e-12	6.610e-12	-11.180	-11.180	0.000	(0)
	NiHCO3+	4.353e-12	3.031e-12	-11.361	-11.518	-0.157	(0)
	CdHCO3+	4.286e-12	2.985e-12	-11.368	-11.525	-0.157	(0)
	NiCO3	3.178e-12	3.178e-12	-11.498	-11.498	0.000	(0)
	Cd (CO3) 2-2	4.011e-13	9.433e-14	-12.397	-13.025	-0.629	(0)
	HgCO3	6.498e-15	6.498e-15	-14.187	-14.187	0.000	(0)
	FeHCO3+	2.902e-15	2.317e-15	-14.537	-14.635	-0.098	(0)
	Hg (CO3) 2-2	1.074e-16	2.526e-17	-15.969	-16.598	-0.629	(0)
	HgHCO3+	2.351e-18	1.638e-18	-17.629	-17.786	-0.157	(0)
Ca	1.280e-02						
	Ca+2	7.126e-03	2.694e-03	-2.147	-2.570	-0.422	(0)
	CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
	CaHCO3+	2.229e-05	1.780e-05	-4.652	-4.750	-0.098	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	4.051e-06	3.186e-06	-5.392	-5.497	-0.104	(0)
	CaH2BO3+	5.630e-07	4.218e-07	-6.249	-6.375	-0.125	(0)
	CaOH+	5.002e-08	3.994e-08	-7.301	-7.399	-0.098	(0)
	CaNO3+	1.940e-10	1.351e-10	-9.712	-9.869	-0.157	(0)
	CaNH3+2	1.394e-10	3.277e-11	-9.856	-10.484	-0.629	(0)
	Ca (NH3) 2+2	5.362e-19	1.261e-19	-18.271	-18.899	-0.629	(0)
Cd	2.429e-08						
	Cd+2	9.774e-09	3.695e-09	-8.010	-8.432	-0.422	(0)
	CdSO4	7.915e-09	7.915e-09	-8.102	-8.102	0.000	(0)
	Cd (SO4) 2-2	4.149e-09	9.757e-10	-8.382	-9.011	-0.629	(0)
	CdCl+	2.231e-09	1.554e-09	-8.651	-8.809	-0.157	(0)
	CdCO3	1.035e-10	1.035e-10	-9.985	-9.985	0.000	(0)
	CdOHC1	4.736e-11	4.736e-11	-10.325	-10.325	0.000	(0)
	CdOH+	3.132e-11	2.181e-11	-10.504	-10.661	-0.157	(0)
	CdCl2	2.852e-11	2.852e-11	-10.545	-10.545	0.000	(0)
	CdF+	9.111e-12	6.345e-12	-11.040	-11.198	-0.157	(0)
	CdHCO3+	4.286e-12	2.985e-12	-11.368	-11.525	-0.157	(0)
	Cd (CO3) 2-2	4.011e-13	9.433e-14	-12.397	-13.025	-0.629	(0)
	CdCl3-	1.138e-13	7.925e-14	-12.944	-13.101	-0.157	(0)
	Cd (OH) 2	1.022e-13	1.022e-13	-12.990	-12.990	0.000	(0)
	CdF2	1.372e-15	1.372e-15	-14.863	-14.863	0.000	(0)
	CdNO3+	2.661e-16	1.853e-16	-15.575	-15.732	-0.157	(0)
	CdSeO4	1.649e-16	1.649e-16	-15.783	-15.783	0.000	(0)
	Cd (SeO3) 2-2	3.963e-17	9.320e-18	-16.402	-17.031	-0.629	(0)
	Cd2OH+3	1.049e-17	4.039e-19	-16.979	-18.394	-1.414	(0)
	Cd (OH) 3-	6.665e-18	4.641e-18	-17.176	-17.333	-0.157	(0)
	Cd (OH) 4-2	2.400e-24	5.645e-25	-23.620	-24.248	-0.629	(0)
	Cd (NO3) 2	1.472e-24	1.472e-24	-23.832	-23.832	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.694	-78.851	-0.157	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.074	-150.074	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.443	-226.600	-0.157	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.202	-302.831	-0.629	(0)
Cl	5.616e-03						
	Cl-	5.616e-03	4.404e-03	-2.251	-2.356	-0.106	(0)
	MnCl+	1.768e-07	1.390e-07	-6.752	-6.857	-0.104	(0)
	ZnCl+	4.422e-08	3.418e-08	-7.354	-7.466	-0.112	(0)

ZnOHCl	3.325e-08	3.325e-08	-7.478	-7.478	0.000	(0)
CdCl+	2.231e-09	1.554e-09	-8.651	-8.809	-0.157	(0)
CuCl2-	1.314e-09	1.016e-09	-8.881	-8.993	-0.112	(0)
CuCl	1.104e-09	1.104e-09	-8.957	-8.957	0.000	(0)
MnCl2	8.649e-10	8.649e-10	-9.063	-9.063	0.000	(0)
CuCl+	2.944e-10	2.276e-10	-9.531	-9.643	-0.112	(0)
ZnCl2	2.385e-10	2.385e-10	-9.622	-9.622	0.000	(0)
CdOHCl	4.736e-11	4.736e-11	-10.325	-10.325	0.000	(0)
CdCl2	2.852e-11	2.852e-11	-10.545	-10.545	0.000	(0)
PbCl+	2.807e-11	1.955e-11	-10.552	-10.709	-0.157	(0)
HgClOH	2.553e-11	2.553e-11	-10.593	-10.593	0.000	(0)
HgCl2	8.566e-12	8.566e-12	-11.067	-11.067	0.000	(0)
CoCl+	6.958e-12	4.846e-12	-11.157	-11.315	-0.157	(0)
CuCl3-2	2.501e-12	9.564e-13	-11.602	-12.019	-0.417	(0)
MnCl3-	1.334e-12	1.049e-12	-11.875	-11.979	-0.104	(0)
NiCl+	1.121e-12	7.808e-13	-11.950	-12.107	-0.157	(0)
ZnCl3-	1.079e-12	8.343e-13	-11.967	-12.079	-0.112	(0)
HgCl3-	5.417e-13	3.772e-13	-12.266	-12.423	-0.157	(0)
PbCl2	3.845e-13	3.845e-13	-12.415	-12.415	0.000	(0)
CuCl2	3.474e-13	3.474e-13	-12.459	-12.459	0.000	(0)
CdCl3-	1.138e-13	7.925e-14	-12.944	-13.101	-0.157	(0)
HgCl4-2	2.812e-14	6.613e-15	-13.551	-14.180	-0.629	(0)
ZnCl4-2	4.803e-15	1.837e-15	-14.318	-14.736	-0.417	(0)
UO2Cl+	2.076e-15	1.446e-15	-14.683	-14.840	-0.157	(0)
PbCl3-	9.680e-16	6.741e-16	-15.014	-15.171	-0.157	(0)
HgCl+	5.574e-16	3.881e-16	-15.254	-15.411	-0.157	(0)
CuCl3-	1.847e-17	1.428e-17	-16.733	-16.845	-0.112	(0)
NiCl2	1.731e-17	1.731e-17	-16.762	-16.762	0.000	(0)
PbCl4-2	5.770e-18	1.357e-18	-17.239	-17.867	-0.629	(0)
CrCl+2	2.653e-18	6.238e-19	-17.576	-18.205	-0.629	(0)
CrOHCl2	3.879e-20	3.879e-20	-19.411	-19.411	0.000	(0)
FeCl+2	1.343e-21	5.138e-22	-20.872	-21.289	-0.417	(0)
CuCl4-2	8.239e-22	3.151e-22	-21.084	-21.502	-0.417	(0)
CrCl2+	3.743e-22	2.606e-22	-21.427	-21.584	-0.157	(0)
VOCl+	1.246e-22	8.677e-23	-21.904	-22.062	-0.157	(0)
FeCl2+	1.285e-23	1.011e-23	-22.891	-22.995	-0.104	(0)
CrO3Cl-	1.337e-26	9.307e-27	-25.874	-26.031	-0.157	(0)
FeCl3	4.450e-27	4.450e-27	-26.352	-26.352	0.000	(0)
CoCl+2	3.868e-37	9.097e-38	-36.412	-37.041	-0.629	(0)
UCl+3	0.000e+00	0.000e+00	-44.001	-45.415	-1.414	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.534	-51.162	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.675	-52.304	-0.629	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.893	-0.629	(0)
Co (2)	1.967e-09					
Co+2	1.353e-09	3.181e-10	-8.869	-9.497	-0.629	(0)
CoSO4	5.800e-10	5.800e-10	-9.237	-9.237	0.000	(0)
CoHCO3+	1.261e-11	8.779e-12	-10.899	-11.057	-0.157	(0)
CoCl+	6.958e-12	4.846e-12	-11.157	-11.315	-0.157	(0)
CoOH+	6.772e-12	4.716e-12	-11.169	-11.326	-0.157	(0)
CoCO3	6.610e-12	6.610e-12	-11.180	-11.180	0.000	(0)
CoF+	1.565e-12	1.090e-12	-11.805	-11.963	-0.157	(0)
Co (OH) 2	2.783e-13	2.783e-13	-12.555	-12.555	0.000	(0)
CoNO2+	5.410e-14	3.767e-14	-13.267	-13.424	-0.157	(0)
Co (NH3) +2	1.572e-15	3.696e-16	-14.804	-15.432	-0.629	(0)
CoSeO4	3.821e-17	3.821e-17	-16.418	-16.418	0.000	(0)
CoNO3+	1.148e-17	7.994e-18	-16.940	-17.097	-0.157	(0)
Co (OH) 3-	5.926e-18	4.126e-18	-17.227	-17.384	-0.157	(0)
CoOOH-	1.489e-18	1.037e-18	-17.827	-17.984	-0.157	(0)
Co2OH+3	1.952e-21	7.518e-23	-20.709	-22.124	-1.414	(0)
Co (NH3) 2+2	6.479e-22	1.524e-22	-21.189	-21.817	-0.629	(0)
Co (OH) 4-2	2.066e-24	4.859e-25	-23.685	-24.313	-0.629	(0)
Co (NO3) 2	2.579e-25	2.579e-25	-24.589	-24.589	0.000	(0)
Co (NH3) 3+2	7.882e-29	1.854e-29	-28.103	-28.732	-0.629	(0)
Co4 (OH) 4+4	3.227e-35	9.868e-38	-34.491	-37.006	-2.515	(0)
Co (NH3) 4+2	3.998e-36	9.401e-37	-35.398	-36.027	-0.629	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.193	-43.822	-0.629	(0)
Co (3)	1.630e-30					
CoOH+2	1.630e-30	3.834e-31	-29.788	-30.416	-0.629	(0)

Co+3	9.059e-37	1.015e-37	-36.043	-36.993	-0.950	(0)
CoCl+2	3.868e-37	9.097e-38	-36.412	-37.041	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.534	-51.162	-0.629	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.493	-60.650	-0.157	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.837	-65.465	-0.629	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.893	-0.629	(0)
Cr (2)	1.387e-27					
Cr+2	1.387e-27	3.261e-28	-26.858	-27.487	-0.629	(0)
Cr (3)	2.915e-10					
Cr (OH) 2+	2.310e-10	1.609e-10	-9.636	-9.794	-0.157	(0)
Cr (OH) 3	4.490e-11	4.490e-11	-10.348	-10.348	0.000	(0)
Cr (OH) +2	7.566e-12	1.779e-12	-11.121	-11.750	-0.629	(0)
CrOHSO4	3.858e-12	3.858e-12	-11.414	-11.414	0.000	(0)
CrO2-	2.266e-12	1.578e-12	-11.645	-11.802	-0.157	(0)
Cr (OH) 4-	1.907e-12	1.328e-12	-11.720	-11.877	-0.157	(0)
CrF+2	7.992e-15	1.880e-15	-14.097	-14.726	-0.629	(0)
CrSO4+	3.354e-15	2.336e-15	-14.474	-14.632	-0.157	(0)
Cr+3	2.842e-15	1.095e-16	-14.546	-15.961	-1.414	(0)
CrCl+2	2.653e-18	6.238e-19	-17.576	-18.205	-0.629	(0)
CrOHC12	3.879e-20	3.879e-20	-19.411	-19.411	0.000	(0)
Cr2 (OH) 2SO4+2	2.639e-21	6.205e-22	-20.579	-21.207	-0.629	(0)
CrCl2+	3.743e-22	2.606e-22	-21.427	-21.584	-0.157	(0)
Cr2 (OH) 2 (SO4) 2	3.368e-22	3.368e-22	-21.473	-21.473	0.000	(0)
CrNO3+2	3.226e-25	7.586e-26	-24.491	-25.120	-0.629	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.163	-41.792	-0.629	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.635	-51.050	-1.414	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.675	-52.304	-0.629	(0)
Cr (6)	1.610e-15					
CrO4-2	1.498e-15	5.663e-16	-14.825	-15.247	-0.422	(0)
NaCrO4-	5.427e-17	3.779e-17	-16.265	-16.423	-0.157	(0)
HCrO4-	3.561e-17	2.480e-17	-16.448	-16.606	-0.157	(0)
KCrO4-	2.220e-17	1.546e-17	-16.654	-16.811	-0.157	(0)
CrO3SO4-2	3.978e-24	9.354e-25	-23.400	-24.029	-0.629	(0)
H2CrO4	2.720e-25	2.720e-25	-24.565	-24.565	0.000	(0)
CrO3Cl-	1.337e-26	9.307e-27	-25.874	-26.031	-0.157	(0)
Cr2O7-2	9.080e-32	2.135e-32	-31.042	-31.671	-0.629	(0)
Cu (1)	2.707e-09					
CuCl2-	1.314e-09	1.016e-09	-8.881	-8.993	-0.112	(0)
CuCl	1.104e-09	1.104e-09	-8.957	-8.957	0.000	(0)
Cu+	2.860e-10	1.992e-10	-9.544	-9.701	-0.157	(0)
CuCl3-2	2.501e-12	9.564e-13	-11.602	-12.019	-0.417	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.002	-147.427	-0.425	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.756	-148.157	-0.401	(0)
Cu (2)	5.073e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.912e-08	7.661e-08	-7.004	-7.116	-0.112	(0)
Cu+2	8.624e-08	3.260e-08	-7.064	-7.487	-0.422	(0)
CuSO4	6.826e-08	6.826e-08	-7.166	-7.166	0.000	(0)
Cu (OH) 2	1.136e-08	1.136e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	3.320e-09	7.808e-10	-8.479	-9.107	-0.629	(0)
CuHCO3+	1.048e-09	7.299e-10	-8.980	-9.137	-0.157	(0)
Cu2 (OH) 2+2	6.269e-10	1.474e-10	-9.203	-9.831	-0.629	(0)
CuF+	3.201e-10	2.229e-10	-9.495	-9.652	-0.157	(0)
CuCl+	2.944e-10	2.276e-10	-9.531	-9.643	-0.112	(0)
CuNO2+	8.240e-11	5.738e-11	-10.084	-10.241	-0.157	(0)
Cu (OH) 3-	2.486e-11	1.731e-11	-10.605	-10.762	-0.157	(0)
CuNH3+2	1.371e-11	3.224e-12	-10.863	-11.492	-0.629	(0)
CuCl2	3.474e-13	3.474e-13	-12.459	-12.459	0.000	(0)
Cu (NO2) 2	9.869e-15	9.869e-15	-14.006	-14.006	0.000	(0)
CuNO3+	2.348e-15	1.635e-15	-14.629	-14.787	-0.157	(0)
Cu (OH) 4-2	4.305e-16	1.012e-16	-15.366	-15.995	-0.629	(0)
CuCl3-	1.847e-17	1.428e-17	-16.733	-16.845	-0.112	(0)
CuCl4-2	8.239e-22	3.151e-22	-21.084	-21.502	-0.417	(0)
Cu (NO3) 2	3.263e-24	3.263e-24	-23.486	-23.486	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.710	-216.867	-0.157	(0)
F	1.874e-04					
F-	1.382e-04	1.083e-04	-3.860	-3.965	-0.106	(0)
MgF+	4.412e-05	3.441e-05	-4.355	-4.463	-0.108	(0)

CaF+	4.051e-06	3.186e-06	-5.392	-5.497	-0.104	(0)
NaF	9.181e-07	9.181e-07	-6.037	-6.037	0.000	(0)
MnF+	1.376e-07	1.082e-07	-6.861	-6.966	-0.104	(0)
ZnF+	9.592e-09	6.680e-09	-8.018	-8.175	-0.157	(0)
BF(OH) 3-	3.659e-09	2.741e-09	-8.437	-8.562	-0.125	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
AlF3	4.704e-10	4.704e-10	-9.328	-9.328	0.000	(0)
AlF2+	4.358e-10	3.449e-10	-9.361	-9.462	-0.102	(0)
CuF+	3.201e-10	2.229e-10	-9.495	-9.652	-0.157	(0)
AlF4-	3.275e-11	2.554e-11	-10.485	-10.593	-0.108	(0)
AlF+2	2.038e-11	7.996e-12	-10.691	-11.097	-0.406	(0)
CdF+	9.111e-12	6.345e-12	-11.040	-11.198	-0.157	(0)
UO2F+	4.349e-12	3.028e-12	-11.362	-11.519	-0.157	(0)
CoF+	1.565e-12	1.090e-12	-11.805	-11.963	-0.157	(0)
PbF+	1.372e-12	9.553e-13	-11.863	-12.020	-0.157	(0)
HF2-	1.167e-12	8.933e-13	-11.933	-12.049	-0.116	(0)
UO2F2	9.462e-13	9.462e-13	-12.024	-12.024	0.000	(0)
BF2(OH) 2-	5.743e-13	4.303e-13	-12.241	-12.366	-0.125	(0)
NiF+	2.708e-13	1.886e-13	-12.567	-12.724	-0.157	(0)
UO2F3-	3.698e-14	2.575e-14	-13.432	-13.589	-0.157	(0)
CrF+2	7.992e-15	1.880e-15	-14.097	-14.726	-0.629	(0)
PbF2	2.037e-15	2.037e-15	-14.691	-14.691	0.000	(0)
CdF2	1.372e-15	1.372e-15	-14.863	-14.863	0.000	(0)
UO2F4-2	9.424e-17	2.216e-17	-16.026	-16.654	-0.629	(0)
H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
VO2F	7.295e-18	7.295e-18	-17.137	-17.137	0.000	(0)
FeF2+	1.692e-18	1.331e-18	-17.772	-17.876	-0.104	(0)
FeF+2	1.200e-18	4.590e-19	-17.921	-18.338	-0.417	(0)
PbF3-	6.010e-19	4.186e-19	-18.221	-18.378	-0.157	(0)
VO2F2-	4.121e-19	2.870e-19	-18.385	-18.542	-0.157	(0)
BF3OH-	3.281e-19	2.458e-19	-18.484	-18.609	-0.125	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
VOF+	6.554e-21	4.564e-21	-20.183	-20.341	-0.157	(0)
VO2F3-2	1.649e-21	3.878e-22	-20.783	-21.411	-0.629	(0)
VOF2	1.854e-22	1.854e-22	-21.732	-21.732	0.000	(0)
PbF4-2	9.230e-23	2.171e-23	-22.035	-22.663	-0.629	(0)
HgF+	2.548e-23	1.774e-23	-22.594	-22.751	-0.157	(0)
BF4-	2.370e-24	1.776e-24	-23.625	-23.751	-0.125	(0)
VOF3-	1.024e-24	7.129e-25	-23.990	-24.147	-0.157	(0)
VO2F4-3	5.369e-25	2.068e-26	-24.270	-25.685	-1.414	(0)
Sb(OH) 2F	8.831e-26	8.831e-26	-25.054	-25.054	0.000	(0)
SbOF	8.696e-26	8.696e-26	-25.061	-25.061	0.000	(0)
VOF4-2	1.326e-27	3.118e-28	-26.878	-27.506	-0.629	(0)
UF3+	1.267e-35	8.820e-36	-34.897	-35.055	-0.157	(0)
UF2+2	2.184e-36	5.137e-37	-35.661	-36.289	-0.629	(0)
UF4	1.048e-37	1.048e-37	-36.980	-36.980	0.000	(0)
UF+3	9.779e-39	3.766e-40	-38.010	-39.424	-1.414	(0)
UF5-	6.460e-40	4.499e-40	-39.190	-39.347	-0.157	(0)
UF6-2	0.000e+00	0.000e+00	-40.203	-40.832	-0.629	(0)
Fe (2)	3.392e-12					
Fe+2	2.206e-12	5.187e-13	-11.656	-12.285	-0.629	(0)
FeSO4	1.164e-12	1.164e-12	-11.934	-11.934	0.000	(0)
FeOH+	1.951e-14	1.534e-14	-13.710	-13.814	-0.104	(0)
FeHCO3+	2.902e-15	2.317e-15	-14.537	-14.635	-0.098	(0)
Fe(OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	2.706e-18	2.128e-18	-17.568	-17.672	-0.104	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.421	-236.578	-0.157	(0)
Fe (3)	1.142e-09					
Fe(OH) 2+	6.770e-10	5.358e-10	-9.169	-9.271	-0.102	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	3.738e-11	2.958e-11	-10.427	-10.529	-0.102	(0)
FeOH+2	4.846e-15	1.854e-15	-14.315	-14.732	-0.417	(0)
FeF2+	1.692e-18	1.331e-18	-17.772	-17.876	-0.104	(0)
FeF+2	1.200e-18	4.590e-19	-17.921	-18.338	-0.417	(0)
FeSO4+	5.037e-19	3.961e-19	-18.298	-18.402	-0.104	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
Fe(SO4) 2-	1.111e-19	7.739e-20	-18.954	-19.111	-0.157	(0)

Fe+3	3.447e-20	3.864e-21	-19.463	-20.413	-0.950	(0)
FeCl+2	1.343e-21	5.138e-22	-20.872	-21.289	-0.417	(0)
FeCl2+	1.285e-23	1.011e-23	-22.891	-22.995	-0.104	(0)
FeHSeO3+2	8.164e-24	1.920e-24	-23.088	-23.717	-0.629	(0)
Fe2 (OH) 2+4	3.720e-26	1.138e-28	-25.429	-27.944	-2.515	(0)
FeCl3	4.450e-27	4.450e-27	-26.352	-26.352	0.000	(0)
FeNO3+2	2.605e-27	6.126e-28	-26.584	-27.213	-0.629	(0)
Fe3 (OH) 4+5	7.480e-33	8.810e-37	-32.126	-36.055	-3.929	(0)
H (0)	3.947e-29					
H2	1.973e-29	2.017e-29	-28.705	-28.695	0.009	(0)
Hg (0)	6.343e-09					
Hg	6.343e-09	6.343e-09	-8.198	-8.198	0.000	(0)
Hg (1)	1.618e-19					
Hg2+2	8.090e-20	1.902e-20	-19.092	-19.721	-0.629	(0)
Hg (2)	4.972e-11					
HgClOH	2.553e-11	2.553e-11	-10.593	-10.593	0.000	(0)
Hg (OH) 2	1.506e-11	1.539e-11	-10.822	-10.813	0.009	(0)
HgCl2	8.566e-12	8.566e-12	-11.067	-11.067	0.000	(0)
HgCl3-	5.417e-13	3.772e-13	-12.266	-12.423	-0.157	(0)
HgCl4-2	2.812e-14	6.613e-15	-13.551	-14.180	-0.629	(0)
HgCO3	6.498e-15	6.498e-15	-14.187	-14.187	0.000	(0)
HgCl+	5.574e-16	3.881e-16	-15.254	-15.411	-0.157	(0)
HgOH+	1.876e-16	1.307e-16	-15.727	-15.884	-0.157	(0)
Hg (CO3) 2-2	1.074e-16	2.526e-17	-15.969	-16.598	-0.629	(0)
HgHCO3+	2.351e-18	1.638e-18	-17.629	-17.786	-0.157	(0)
Hg (OH) 3-	2.067e-18	1.439e-18	-17.685	-17.842	-0.157	(0)
Hg (NH3) 2+2	1.107e-18	2.603e-19	-17.956	-18.585	-0.629	(0)
HgNH3+2	1.145e-19	2.694e-20	-18.941	-19.570	-0.629	(0)
Hg+2	1.879e-20	4.418e-21	-19.726	-20.355	-0.629	(0)
HgSO4	1.057e-20	1.057e-20	-19.976	-19.976	0.000	(0)
HgF+	2.548e-23	1.774e-23	-22.594	-22.751	-0.157	(0)
Hg (NH3) 3+2	4.259e-26	1.001e-26	-25.371	-25.999	-0.629	(0)
HgNO3+	3.714e-29	2.586e-29	-28.430	-28.587	-0.157	(0)
Hg (NH3) 4+2	3.269e-33	7.688e-34	-32.486	-33.114	-0.629	(0)
Hg (NO3) 2	1.704e-37	1.704e-37	-36.768	-36.768	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.254	-137.411	-0.157	(0)
HgS2-2	0.000e+00	0.000e+00	-137.622	-138.251	-0.629	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.886	-138.886	0.000	(0)
K	9.971e-03					
K+	9.371e-03	7.348e-03	-2.028	-2.134	-0.106	(0)
KSO4-	6.007e-04	4.754e-04	-3.221	-3.323	-0.102	(0)
KCrO4-	2.220e-17	1.546e-17	-16.654	-16.811	-0.157	(0)
Mg	1.225e-02					
Mg+2	7.486e-03	2.830e-03	-2.126	-2.548	-0.422	(0)
MgSO4	4.706e-03	4.706e-03	-2.327	-2.327	0.000	(0)
MgF+	4.412e-05	3.441e-05	-4.355	-4.463	-0.108	(0)
MgHCO3+	1.329e-05	1.028e-05	-4.876	-4.988	-0.112	(0)
MgCO3	2.894e-06	2.894e-06	-5.539	-5.539	0.000	(0)
MgOH+	1.041e-06	8.372e-07	-5.982	-6.077	-0.095	(0)
MgH2BO3+	3.564e-07	2.670e-07	-6.448	-6.573	-0.125	(0)
Mn (2)	1.480e-04					
Mn+2	1.067e-04	2.508e-05	-3.972	-4.601	-0.629	(0)
MnSO4	4.076e-05	4.076e-05	-4.390	-4.390	0.000	(0)
MnHCO3+	2.258e-07	1.776e-07	-6.646	-6.751	-0.104	(0)
MnCl+	1.768e-07	1.390e-07	-6.752	-6.857	-0.104	(0)
MnF+	1.376e-07	1.082e-07	-6.861	-6.966	-0.104	(0)
MnOH+	5.953e-08	4.681e-08	-7.225	-7.330	-0.104	(0)
MnCl2	8.649e-10	8.649e-10	-9.063	-9.063	0.000	(0)
MnSeO4	1.618e-12	1.618e-12	-11.791	-11.791	0.000	(0)
MnCl3-	1.334e-12	1.049e-12	-11.875	-11.979	-0.104	(0)
MnNO3+	9.051e-13	6.303e-13	-12.043	-12.200	-0.157	(0)
Mn (OH) 3-	2.031e-16	1.597e-16	-15.692	-15.797	-0.104	(0)
Mn (NO3) 2	2.510e-20	2.510e-20	-19.600	-19.600	0.000	(0)
Mn (OH) 4-2	1.002e-21	3.831e-22	-20.999	-21.417	-0.417	(0)
MnSe	0.000e+00	0.000e+00	-40.617	-40.617	0.000	(0)
Mn (3)	8.015e-25					
Mn+3	8.015e-25	8.982e-26	-24.096	-25.047	-0.950	(0)
Mn (6)	0.000e+00					

MnO4-2	0.000e+00	0.000e+00	-40.043	-40.460	-0.417	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.807	-44.928	-0.121	(0)
Mo	5.072e-06					
MoO4-2	5.071e-06	1.917e-06	-5.295	-5.717	-0.422	(0)
HMoO4-	7.413e-10	5.163e-10	-9.130	-9.287	-0.157	(0)
H2MoO4	5.117e-14	5.117e-14	-13.291	-13.291	0.000	(0)
AlMo6O21-3	5.770e-40	0.000e+00	-39.239	-40.653	-1.414	(0)
Mo7O24-6	0.000e+00	0.000e+00	-44.320	-49.978	-5.658	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.531	-51.460	-3.929	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.031	-54.546	-2.515	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.754	-59.169	-1.414	(0)
N (-3)	3.445e-07					
NH4+	3.062e-07	2.294e-07	-6.514	-6.639	-0.125	(0)
NH4SO4-	2.856e-08	2.246e-08	-7.544	-7.649	-0.104	(0)
NH3	9.664e-09	9.664e-09	-8.015	-8.015	0.000	(0)
CaNH3+2	1.394e-10	3.277e-11	-9.856	-10.484	-0.629	(0)
CuNH3+2	1.371e-11	3.224e-12	-10.863	-11.492	-0.629	(0)
Co (NH3) +2	1.572e-15	3.696e-16	-14.804	-15.432	-0.629	(0)
NiNH3+2	1.529e-15	3.597e-16	-14.815	-15.444	-0.629	(0)
BaNH3+2	2.971e-16	6.987e-17	-15.527	-16.156	-0.629	(0)
Hg (NH3) 2+2	1.107e-18	2.603e-19	-17.956	-18.585	-0.629	(0)
Ca (NH3) 2+2	5.362e-19	1.261e-19	-18.271	-18.899	-0.629	(0)
HgNH3+2	1.145e-19	2.694e-20	-18.941	-19.570	-0.629	(0)
Ni (NH3) 2+2	2.136e-21	5.024e-22	-20.670	-21.299	-0.629	(0)
Co (NH3) 2+2	6.479e-22	1.524e-22	-21.189	-21.817	-0.629	(0)
Hg (NH3) 3+2	4.259e-26	1.001e-26	-25.371	-25.999	-0.629	(0)
Co (NH3) 3+2	7.882e-29	1.854e-29	-28.103	-28.732	-0.629	(0)
Hg (NH3) 4+2	3.269e-33	7.688e-34	-32.486	-33.114	-0.629	(0)
Co (NH3) 4+2	3.998e-36	9.401e-37	-35.398	-36.027	-0.629	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.163	-41.792	-0.629	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.193	-43.822	-0.629	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.635	-51.050	-1.414	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.534	-51.162	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.675	-52.304	-0.629	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.493	-60.650	-0.157	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.837	-65.465	-0.629	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.893	-0.629	(0)
N (3)	2.218e-05					
NO2-	2.218e-05	1.681e-05	-4.654	-4.775	-0.121	(0)
CuNO2+	8.240e-11	5.738e-11	-10.084	-10.241	-0.157	(0)
CoNO2+	5.410e-14	3.767e-14	-13.267	-13.424	-0.157	(0)
Cu (NO2) 2	9.869e-15	9.869e-15	-14.006	-14.006	0.000	(0)
N (5)	2.042e-08					
NO3-	2.022e-08	1.586e-08	-7.694	-7.800	-0.106	(0)
CaNO3+	1.940e-10	1.351e-10	-9.712	-9.869	-0.157	(0)
MnNO3+	9.051e-13	6.303e-13	-12.043	-12.200	-0.157	(0)
ZnNO3+	1.767e-13	1.231e-13	-12.753	-12.910	-0.157	(0)
CuNO3+	2.348e-15	1.635e-15	-14.629	-14.787	-0.157	(0)
BaNO3+	1.308e-15	9.106e-16	-14.884	-15.041	-0.157	(0)
CdNO3+	2.661e-16	1.853e-16	-15.575	-15.732	-0.157	(0)
PbNO3+	4.214e-17	2.934e-17	-16.375	-16.532	-0.157	(0)
CoNO3+	1.148e-17	7.994e-18	-16.940	-17.097	-0.157	(0)
NiNO3+	3.964e-18	2.760e-18	-17.402	-17.559	-0.157	(0)
Mn (NO3) 2	2.510e-20	2.510e-20	-19.600	-19.600	0.000	(0)
UO2NO3+	9.199e-21	6.406e-21	-20.036	-20.193	-0.157	(0)
Zn (NO3) 2	3.893e-22	3.893e-22	-21.410	-21.410	0.000	(0)
Cu (NO3) 2	3.263e-24	3.263e-24	-23.486	-23.486	0.000	(0)
Cd (NO3) 2	1.472e-24	1.472e-24	-23.832	-23.832	0.000	(0)
Pb (NO3) 2	7.901e-25	7.901e-25	-24.102	-24.102	0.000	(0)
CrNO3+2	3.226e-25	7.586e-26	-24.491	-25.120	-0.629	(0)
VO2NO3	3.079e-25	3.079e-25	-24.512	-24.512	0.000	(0)
Co (NO3) 2	2.579e-25	2.579e-25	-24.589	-24.589	0.000	(0)
FeNO3+2	2.605e-27	6.126e-28	-26.584	-27.213	-0.629	(0)
HgNO3+	3.714e-29	2.586e-29	-28.430	-28.587	-0.157	(0)
Hg (NO3) 2	1.704e-37	1.704e-37	-36.768	-36.768	0.000	(0)
Na	1.796e-02					
Na+	1.713e-02	1.343e-02	-1.766	-1.872	-0.106	(0)

NaSO4-	8.328e-04	6.591e-04	-3.079	-3.181	-0.102	(0)
NaHCO3	2.680e-06	2.680e-06	-5.572	-5.572	0.000	(0)
NaF	9.181e-07	9.181e-07	-6.037	-6.037	0.000	(0)
NaCO3-	3.884e-07	3.074e-07	-6.411	-6.512	-0.102	(0)
NaH2BO3	5.792e-08	5.792e-08	-7.237	-7.237	0.000	(0)
NaCrO4-	5.427e-17	3.779e-17	-16.265	-16.423	-0.157	(0)
Ni	3.197e-10					
Ni+2	1.833e-10	6.930e-11	-9.737	-10.159	-0.422	(0)
NiSO4	1.264e-10	1.264e-10	-9.898	-9.898	0.000	(0)
NiHCO3+	4.353e-12	3.031e-12	-11.361	-11.518	-0.157	(0)
NiCO3	3.178e-12	3.178e-12	-11.498	-11.498	0.000	(0)
NiCl+	1.121e-12	7.808e-13	-11.950	-12.107	-0.157	(0)
NiOH+	9.309e-13	6.482e-13	-12.031	-12.188	-0.157	(0)
NiF+	2.708e-13	1.886e-13	-12.567	-12.724	-0.157	(0)
Ni(SO4)2-2	1.626e-13	3.823e-14	-12.789	-13.418	-0.629	(0)
Ni(OH)2	3.826e-14	3.826e-14	-13.417	-13.417	0.000	(0)
NiNH3+2	1.529e-15	3.597e-16	-14.815	-15.444	-0.629	(0)
Ni(OH)3-	4.082e-17	2.843e-17	-16.389	-16.546	-0.157	(0)
NiCl2	1.731e-17	1.731e-17	-16.762	-16.762	0.000	(0)
NiSeO4	7.768e-18	7.768e-18	-17.110	-17.110	0.000	(0)
NiNO3+	3.964e-18	2.760e-18	-17.402	-17.559	-0.157	(0)
Ni(NH3)2+2	2.136e-21	5.024e-22	-20.670	-21.299	-0.629	(0)
O(0)	2.431e-35					
O2	1.216e-35	1.243e-35	-34.915	-34.906	0.009	(0)
Pb	1.909e-09					
PbSO4	5.600e-10	5.600e-10	-9.252	-9.252	0.000	(0)
PbCO3	4.623e-10	4.623e-10	-9.335	-9.335	0.000	(0)
PbOH+	3.353e-10	2.335e-10	-9.475	-9.632	-0.157	(0)
Pb+2	3.309e-10	1.251e-10	-9.480	-9.903	-0.422	(0)
Pb(SO4)2-2	1.311e-10	3.083e-11	-9.882	-10.511	-0.629	(0)
PbHCO3+	4.737e-11	3.299e-11	-10.325	-10.482	-0.157	(0)
PbCl+	2.807e-11	1.955e-11	-10.552	-10.709	-0.157	(0)
Pb(CO3)2-2	6.969e-12	1.639e-12	-11.157	-11.785	-0.629	(0)
Pb(OH)2	5.487e-12	5.487e-12	-11.261	-11.261	0.000	(0)
PbF+	1.372e-12	9.553e-13	-11.863	-12.020	-0.157	(0)
PbCl2	3.845e-13	3.845e-13	-12.415	-12.415	0.000	(0)
Pb(OH)3-	5.854e-15	4.077e-15	-14.233	-14.390	-0.157	(0)
PbF2	2.037e-15	2.037e-15	-14.691	-14.691	0.000	(0)
PbCl3-	9.680e-16	6.741e-16	-15.014	-15.171	-0.157	(0)
PbNO3+	4.214e-17	2.934e-17	-16.375	-16.532	-0.157	(0)
Pb2OH+3	1.202e-17	4.631e-19	-16.920	-18.334	-1.414	(0)
PbCl4-2	5.770e-18	1.357e-18	-17.239	-17.867	-0.629	(0)
Pb(OH)4-2	3.155e-18	7.419e-19	-17.501	-18.130	-0.629	(0)
PbF3-	6.010e-19	4.186e-19	-18.221	-18.378	-0.157	(0)
Pb3(OH)4+2	3.196e-22	7.516e-23	-21.495	-22.124	-0.629	(0)
PbF4-2	9.230e-23	2.171e-23	-22.035	-22.663	-0.629	(0)
Pb(NO3)2	7.901e-25	7.901e-25	-24.102	-24.102	0.000	(0)
Pb4(OH)4+4	2.442e-26	7.469e-29	-25.612	-28.127	-2.515	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.486	-151.486	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.455	-228.612	-0.157	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.269	-78.427	-0.157	(0)
CdHS+	0.000e+00	0.000e+00	-78.694	-78.851	-0.157	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.294	-79.923	-0.629	(0)
S6-2	0.000e+00	0.000e+00	-79.810	-80.439	-0.629	(0)
S4-2	0.000e+00	0.000e+00	-79.890	-80.519	-0.629	(0)
S3-2	0.000e+00	0.000e+00	-80.696	-81.325	-0.629	(0)
S2-2	0.000e+00	0.000e+00	-81.712	-82.341	-0.629	(0)
S-2	0.000e+00	0.000e+00	-87.441	-87.858	-0.417	(0)
HgHS2-	0.000e+00	0.000e+00	-137.254	-137.411	-0.157	(0)
HgS2-2	0.000e+00	0.000e+00	-137.622	-138.251	-0.629	(0)
Hg(HS)2	0.000e+00	0.000e+00	-138.886	-138.886	0.000	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-147.002	-147.427	-0.425	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.527	-147.685	-0.157	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.756	-148.157	-0.401	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.543	-149.543	0.000	(0)
Cd(HS)2	0.000e+00	0.000e+00	-150.074	-150.074	0.000	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-151.486	-151.486	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.188	-160.188	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.710	-216.867	-0.157	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.533	-224.690	-0.157	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.172	-226.801	-0.629	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.443	-226.600	-0.157	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.455	-228.612	-0.157	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.421	-236.578	-0.157	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.202	-302.831	-0.629	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.948	-304.576	-0.629	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.252	-318.880	-0.629	(0)
S (6)	3.600e-02					
SO4-2	2.417e-02	9.138e-03	-1.617	-2.039	-0.422	(0)
CaSO4	5.639e-03	5.639e-03	-2.249	-2.249	0.000	(0)
MgSO4	4.706e-03	4.706e-03	-2.327	-2.327	0.000	(0)
NaSO4-	8.328e-04	6.591e-04	-3.079	-3.181	-0.102	(0)
KSO4-	6.007e-04	4.754e-04	-3.221	-3.323	-0.102	(0)
MnSO4	4.076e-05	4.076e-05	-4.390	-4.390	0.000	(0)
ZnSO4	6.177e-06	6.177e-06	-5.209	-5.209	0.000	(0)
Zn (SO4) 2-2	2.091e-06	4.917e-07	-5.680	-6.308	-0.629	(0)
CuSO4	6.826e-08	6.826e-08	-7.166	-7.166	0.000	(0)
NH4SO4-	2.856e-08	2.246e-08	-7.544	-7.649	-0.104	(0)
HSO4-	1.550e-08	1.208e-08	-7.810	-7.918	-0.108	(0)
CdSO4	7.915e-09	7.915e-09	-8.102	-8.102	0.000	(0)
Cd (SO4) 2-2	4.149e-09	9.757e-10	-8.382	-9.011	-0.629	(0)
CoSO4	5.800e-10	5.800e-10	-9.237	-9.237	0.000	(0)
PbSO4	5.600e-10	5.600e-10	-9.252	-9.252	0.000	(0)
Pb (SO4) 2-2	1.311e-10	3.083e-11	-9.882	-10.511	-0.629	(0)
NiSO4	1.264e-10	1.264e-10	-9.898	-9.898	0.000	(0)
CrOHSO4	3.858e-12	3.858e-12	-11.414	-11.414	0.000	(0)
UO2SO4	2.800e-12	2.800e-12	-11.553	-11.553	0.000	(0)
UO2 (SO4) 2-2	1.435e-12	3.374e-13	-11.843	-12.472	-0.629	(0)
FeSO4	1.164e-12	1.164e-12	-11.934	-11.934	0.000	(0)
AlSO4+	6.712e-13	5.235e-13	-12.173	-12.281	-0.108	(0)
Ni (SO4) 2-2	1.626e-13	3.823e-14	-12.789	-13.418	-0.629	(0)
Al (SO4) 2-	6.573e-14	5.126e-14	-13.182	-13.290	-0.108	(0)
CrSO4+	3.354e-15	2.336e-15	-14.474	-14.632	-0.157	(0)
VO2SO4-	1.203e-17	8.377e-18	-16.920	-17.077	-0.157	(0)
FeSO4+	5.037e-19	3.961e-19	-18.298	-18.402	-0.104	(0)
Fe (SO4) 2-	1.111e-19	7.739e-20	-18.954	-19.111	-0.157	(0)
VOSO4	1.768e-20	1.768e-20	-19.753	-19.753	0.000	(0)
HgSO4	1.057e-20	1.057e-20	-19.976	-19.976	0.000	(0)
Cr2 (OH) 2SO4+2	2.639e-21	6.205e-22	-20.579	-21.207	-0.629	(0)
Cr2 (OH) 2 (SO4) 2	3.368e-22	3.368e-22	-21.473	-21.473	0.000	(0)
CrO3SO4-2	3.978e-24	9.354e-25	-23.400	-24.029	-0.629	(0)
VSO4+	4.942e-35	3.442e-35	-34.306	-34.463	-0.157	(0)
U (SO4) 2	4.600e-39	4.600e-39	-38.337	-38.337	0.000	(0)
USO4+2	2.695e-40	0.000e+00	-39.569	-40.198	-0.629	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.493	-60.650	-0.157	(0)
Sb (3)	7.615e-20					
Sb (OH) 3	3.850e-20	3.850e-20	-19.415	-19.415	0.000	(0)
HSbO2	3.764e-20	3.764e-20	-19.424	-19.424	0.000	(0)
SbO2-	6.468e-24	4.504e-24	-23.189	-23.346	-0.157	(0)
Sb (OH) 4-	3.696e-24	2.574e-24	-23.432	-23.589	-0.157	(0)
Sb (OH) 2F	8.831e-26	8.831e-26	-25.054	-25.054	0.000	(0)
SbOF	8.696e-26	8.696e-26	-25.061	-25.061	0.000	(0)
Sb (OH) 2+	1.819e-26	1.267e-26	-25.740	-25.897	-0.157	(0)
SbO+	6.281e-27	4.374e-27	-26.202	-26.359	-0.157	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.252	-318.880	-0.629	(0)
Sb (5)	6.011e-08					
SbO3-	6.005e-08	4.181e-08	-7.222	-7.379	-0.157	(0)
Sb (OH) 6-	6.211e-11	4.870e-11	-10.207	-10.312	-0.106	(0)
SbO2+	3.158e-24	2.199e-24	-23.501	-23.658	-0.157	(0)
Se (-2)	4.543e-39					
HSe-	4.543e-39	3.164e-39	-38.343	-38.500	-0.157	(0)
MnSe	0.000e+00	0.000e+00	-40.617	-40.617	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.003	-45.631	-0.629	(0)

Se (4)	5.053e-07					
HSeO3-	2.700e-07	1.881e-07	-6.569	-6.726	-0.157	(0)
SeO3-2	2.353e-07	5.532e-08	-6.628	-7.257	-0.629	(0)
H2SeO3	1.086e-12	1.086e-12	-11.964	-11.964	0.000	(0)
Cd (SeO3) 2-2	3.963e-17	9.320e-18	-16.402	-17.031	-0.629	(0)
FeHSeO3+2	8.164e-24	1.920e-24	-23.088	-23.717	-0.629	(0)
Se (6)	6.357e-10					
SeO4-2	6.339e-10	2.397e-10	-9.198	-9.620	-0.422	(0)
MnSeO4	1.618e-12	1.618e-12	-11.791	-11.791	0.000	(0)
ZnSeO4	1.147e-13	1.147e-13	-12.940	-12.940	0.000	(0)
HSeO4-	2.334e-16	1.625e-16	-15.632	-15.789	-0.157	(0)
CdSeO4	1.649e-16	1.649e-16	-15.783	-15.783	0.000	(0)
CoSeO4	3.821e-17	3.821e-17	-16.418	-16.418	0.000	(0)
NiSeO4	7.768e-18	7.768e-18	-17.110	-17.110	0.000	(0)
Zn (SeO4) 2-2	1.185e-22	2.787e-23	-21.926	-22.555	-0.629	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.045	-58.459	-1.414	(0)
U (4)	4.153e-19					
U (OH) 5-	4.152e-19	2.891e-19	-18.382	-18.539	-0.157	(0)
U (OH) 4	1.641e-22	1.641e-22	-21.785	-21.785	0.000	(0)
U (OH) 3+	1.167e-26	8.129e-27	-25.933	-26.090	-0.157	(0)
U (OH) 2+2	2.166e-31	5.094e-32	-30.664	-31.293	-0.629	(0)
UF3+	1.267e-35	8.820e-36	-34.897	-35.055	-0.157	(0)
UF2+2	2.184e-36	5.137e-37	-35.661	-36.289	-0.629	(0)
UOH+3	8.442e-37	3.251e-38	-36.074	-37.488	-1.414	(0)
UF4	1.048e-37	1.048e-37	-36.980	-36.980	0.000	(0)
UF+3	9.779e-39	3.766e-40	-38.010	-39.424	-1.414	(0)
U (SO4) 2	4.600e-39	4.600e-39	-38.337	-38.337	0.000	(0)
UF5-	6.460e-40	4.499e-40	-39.190	-39.347	-0.157	(0)
USO4+2	2.695e-40	0.000e+00	-39.569	-40.198	-0.629	(0)
UF6-2	0.000e+00	0.000e+00	-40.203	-40.832	-0.629	(0)
U+4	0.000e+00	0.000e+00	-42.244	-44.759	-2.515	(0)
UCl+3	0.000e+00	0.000e+00	-44.001	-45.415	-1.414	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-154.959	-167.689	-12.730	(0)
U (5)	2.210e-15					
UO2+	2.210e-15	1.539e-15	-14.656	-14.813	-0.157	(0)
U (6)	5.939e-07					
UO2 (CO3) 3-4	4.895e-07	1.497e-09	-6.310	-8.825	-2.515	(0)
UO2 (CO3) 2-2	1.033e-07	2.430e-08	-6.986	-7.614	-0.629	(0)
UO2CO3	9.908e-10	9.908e-10	-9.004	-9.004	0.000	(0)
UO2OH+	2.720e-11	1.894e-11	-10.565	-10.723	-0.157	(0)
UO2F+	4.349e-12	3.028e-12	-11.362	-11.519	-0.157	(0)
UO2SO4	2.800e-12	2.800e-12	-11.553	-11.553	0.000	(0)
UO2 (SO4) 2-2	1.435e-12	3.374e-13	-11.843	-12.472	-0.629	(0)
UO2F2	9.462e-13	9.462e-13	-12.024	-12.024	0.000	(0)
UO2+2	5.356e-13	2.025e-13	-12.271	-12.694	-0.422	(0)
UO2F3-	3.698e-14	2.575e-14	-13.432	-13.589	-0.157	(0)
(UO2) 3 (OH) 5+	6.781e-15	4.722e-15	-14.169	-14.326	-0.157	(0)
(UO2) 2 (OH) 2+2	2.532e-15	5.953e-16	-14.597	-15.225	-0.629	(0)
UO2Cl+	2.076e-15	1.446e-15	-14.683	-14.840	-0.157	(0)
UO2F4-2	9.424e-17	2.216e-17	-16.026	-16.654	-0.629	(0)
UO2NO3+	9.199e-21	6.406e-21	-20.036	-20.193	-0.157	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.774	-42.931	-0.157	(0)
V+2	0.000e+00	0.000e+00	-43.684	-44.312	-0.629	(0)
V (3)	2.640e-15					
V (OH) 3	2.640e-15	2.640e-15	-14.578	-14.578	0.000	(0)
V (OH) 2+	3.319e-26	2.312e-26	-25.479	-25.636	-0.157	(0)
VOH+2	1.263e-29	2.971e-30	-28.898	-29.527	-0.629	(0)
V+3	2.072e-34	7.978e-36	-33.684	-35.098	-1.414	(0)
VSO4+	4.942e-35	3.442e-35	-34.306	-34.463	-0.157	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.297	-56.711	-1.414	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.740	-58.254	-2.515	(0)
V (4)	1.548e-18					
V (OH) 3+	1.493e-18	1.040e-18	-17.826	-17.983	-0.157	(0)
VO+2	2.987e-20	7.024e-21	-19.525	-20.153	-0.629	(0)
VOSO4	1.768e-20	1.768e-20	-19.753	-19.753	0.000	(0)
VOF+	6.554e-21	4.564e-21	-20.183	-20.341	-0.157	(0)

VOF2	1.854e-22	1.854e-22	-21.732	-21.732	0.000	(0)
VOC1+	1.246e-22	8.677e-23	-21.904	-22.062	-0.157	(0)
VOF3-	1.024e-24	7.129e-25	-23.990	-24.147	-0.157	(0)
VOF4-2	1.326e-27	3.118e-28	-26.878	-27.506	-0.629	(0)
H2V2O4+2	2.311e-31	5.434e-32	-30.636	-31.265	-0.629	(0)
V (5)	2.332e-08					
H2VO4-	1.504e-08	1.048e-08	-7.823	-7.980	-0.157	(0)
HVO4-2	8.270e-09	1.945e-09	-8.083	-8.711	-0.629	(0)
H3VO4	1.418e-12	1.418e-12	-11.848	-11.848	0.000	(0)
HV2O7-3	1.795e-13	6.914e-15	-12.746	-14.160	-1.414	(0)
H3V2O7-	1.379e-13	9.604e-14	-12.860	-13.018	-0.157	(0)
VO4-3	1.870e-14	7.202e-16	-13.728	-15.143	-1.414	(0)
V2O7-4	4.496e-15	1.375e-17	-14.347	-16.862	-2.515	(0)
VO2+	4.896e-17	3.839e-17	-16.310	-16.416	-0.106	(0)
V3O9-3	3.140e-17	1.209e-18	-16.503	-17.917	-1.414	(0)
VO2SO4-	1.203e-17	8.377e-18	-16.920	-17.077	-0.157	(0)
VO2F	7.295e-18	7.295e-18	-17.137	-17.137	0.000	(0)
VO2F2-	4.121e-19	2.870e-19	-18.385	-18.542	-0.157	(0)
V4O12-4	1.730e-21	5.289e-24	-20.762	-23.277	-2.515	(0)
VO2F3-2	1.649e-21	3.878e-22	-20.783	-21.411	-0.629	(0)
VO2F4-3	5.369e-25	2.068e-26	-24.270	-25.685	-1.414	(0)
VO2NO3	3.079e-25	3.079e-25	-24.512	-24.512	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-56.701	-62.359	-5.658	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.112	-62.041	-3.929	(0)
H2V10O28-4	0.000e+00	0.000e+00	-62.187	-64.702	-2.515	(0)
Zn	1.715e-05					
Zn+2	8.173e-06	3.090e-06	-5.088	-5.510	-0.422	(0)
ZnSO4	6.177e-06	6.177e-06	-5.209	-5.209	0.000	(0)
Zn (SO4) 2-2	2.091e-06	4.917e-07	-5.680	-6.308	-0.629	(0)
ZnOH+	3.297e-07	2.296e-07	-6.482	-6.639	-0.157	(0)
ZnCO3	2.186e-07	2.186e-07	-6.660	-6.660	0.000	(0)
ZnHCO3+	4.979e-08	3.467e-08	-7.303	-7.460	-0.157	(0)
ZnCl+	4.422e-08	3.418e-08	-7.354	-7.466	-0.112	(0)
ZnOHCl	3.325e-08	3.325e-08	-7.478	-7.478	0.000	(0)
Zn (OH) 2	2.704e-08	2.704e-08	-7.568	-7.568	0.000	(0)
ZnF+	9.592e-09	6.680e-09	-8.018	-8.175	-0.157	(0)
ZnCl2	2.385e-10	2.385e-10	-9.622	-9.622	0.000	(0)
Zn (OH) 3-	1.446e-10	1.007e-10	-9.840	-9.997	-0.157	(0)
ZnCl3-	1.079e-12	8.343e-13	-11.967	-12.079	-0.112	(0)
ZnNO3+	1.767e-13	1.231e-13	-12.753	-12.910	-0.157	(0)
ZnSeO4	1.147e-13	1.147e-13	-12.940	-12.940	0.000	(0)
Zn (OH) 4-2	1.266e-14	2.978e-15	-13.897	-14.526	-0.629	(0)
ZnCl4-2	4.803e-15	1.837e-15	-14.318	-14.736	-0.417	(0)
Zn (NO3) 2	3.893e-22	3.893e-22	-21.410	-21.410	0.000	(0)
Zn (SeO4) 2-2	1.185e-22	2.787e-23	-21.926	-22.555	-0.629	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.527	-147.685	-0.157	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.543	-149.543	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.533	-224.690	-0.157	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.172	-226.801	-0.629	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.948	-304.576	-0.629	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-55.09	-48.80	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.43	-37.92	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.65	-37.92	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-70.95	-53.02	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-56.72	-36.69	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.93	-28.53	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.35	-22.90	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.33	9.47	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.78	-45.42	2.37	Al2 (MoO4) 3
Al2O3	-0.71	18.95	19.65	Al2O3
Al4 (OH) 10SO4	-2.59	20.11	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.48	-6.68	4.80	AlAsO4:2H2O
AlOHSO4	-5.07	-8.30	-3.23	AlOHSO4

AlSb	-152.20	-86.57	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-4.15	-11.94	-7.79	PbSO ₄
Anhydrite	-0.25	-4.61	-4.36	CaSO ₄
Anilite	-55.10	-86.98	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-1.82	6.97	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-88.42	-91.18	-2.76	As ₄ O ₆
Artinite	-4.87	4.73	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-39.00	-32.30	6.71	As ₂ O ₅
Atacamite	-1.12	6.27	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.64	-18.54	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.60	7.79	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-17.38	-1.50	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-26.65	6.29	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.52	-23.19	-9.67	BaCrO ₄
BaF ₂	-10.05	-15.87	-5.82	BaF ₂
BaMoO ₄	-6.70	-13.66	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-8.63	-6.80	1.83	BaSeO ₃
BaSeO ₄	-10.10	-17.56	-7.46	BaSeO ₄
Bianchite	-5.79	-7.55	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-6.76	11.33	18.09	MnO ₂
Bixbyite	-2.24	-2.88	-0.64	Mn ₂ O ₃
BlaubleiI	-55.07	-79.24	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.53	-82.81	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.89	9.47	8.58	AlOOH
Breithauptite	-59.18	-77.70	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.66	13.19	16.84	Mg(OH) ₂
Bunsenite	-6.87	5.58	12.45	NiO
Ca(VO ₃) ₂	-9.59	-3.93	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.26	9.24	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.31	9.24	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-15.10	7.20	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-16.55	22.41	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-17.46	22.40	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-295.57	-152.59	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.55	-17.82	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-6.52	-24.43	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.34	-8.29	-7.95	CaMoO ₄
Carnotite	0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.24	-1.43	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.17	-12.19	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-10.93	-1.09	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.34	7.30	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.43	7.30	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.35	-13.64	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.42	4.14	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-16.96	11.44	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.49	-13.14	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-11.45	-13.15	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.23	-13.15	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.15	-16.36	-1.21	CdF ₂
Cdmetal(alpha)	-31.76	-18.24	13.51	Cd
Cdmetal(gamma)	-31.86	-18.24	13.62	Cd
CdMoO ₄	0.00	-14.15	-14.15	CdMoO ₄
CdOHCl	-6.46	-2.92	3.54	CdOHCl
CdSb	-75.62	-75.97	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.20	-18.05	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.30	-10.47	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.75	-10.47	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.60	-10.47	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-2.68	-15.81	-13.13	PbCO ₃

CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.41	-97.11	-45.69	HgS
Claudetite	-88.12	-91.18	-3.06	As4O6
Clausthalite	-13.43	-40.53	-27.10	PbSe
Co(BO2)2	-29.23	-2.15	27.07	Co(BO2)2
Co(OH)2	-6.86	6.24	13.09	Co(OH)2
Co(OH)3	-11.08	-13.39	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-26.61	-13.58	13.03	Co3(AsO4)2
Co3O4	-10.04	-20.54	-10.50	Co3O4
CoCl2	-22.48	-14.21	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.21	2.54	CoCl2:6H2O
CoCO3	-5.43	-15.41	-9.98	CoCO3
CoF2	-15.83	-17.43	-1.60	CoF2
CoF3	-47.43	-48.89	-1.46	CoF3
CoFe2O4	16.15	12.62	-3.53	CoFe2O4
CoMoO4	-7.45	-15.21	-7.76	CoMoO4
CoO	-7.35	6.24	13.59	CoO
CoS(alpha)	-72.62	-80.06	-7.44	CoS
CoS(beta)	-68.99	-80.06	-11.07	CoS
CoSe	-23.93	-40.13	-16.20	CoSe
CoSeO3	-9.67	-8.35	1.32	CoSeO3
CoSeO4:6H2O	-17.59	-19.12	-1.53	CoSeO4:6H2O
CoSO4	-14.34	-11.54	2.80	CoSO4
CoSO4:6H2O	-9.07	-11.54	-2.47	CoSO4:6H2O
Cotunnite	-9.84	-14.62	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-22.57	-11.75	10.82	Cr(OH)2
Cr(OH)3	-3.26	-1.93	1.34	Cr(OH)3
Cr(OH)3(am)	-1.18	-1.93	-0.75	Cr(OH)3
Cr2O3	-1.49	-3.85	-2.36	Cr2O3
CrCl2	-46.29	-32.20	14.09	CrCl2
CrCl3	-47.71	-32.60	15.11	CrCl3
CrF3	-26.09	-37.43	-11.34	CrF3
Crmetal	-67.78	-37.29	30.48	Cr
CrO3	-27.77	-30.98	-3.21	CrO3
Cryolite	-9.70	-43.54	-33.84	Na3AlF6
Cu(OH)2	-0.42	8.25	8.67	Cu(OH)2
Cu(SbO3)2	-24.70	20.51	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.42	0.83	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.75	-89.63	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.23	-50.03	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.65	-7.55	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.95	-101.55	-42.59	Cu3Sb
Cu3Se2	-24.66	-88.15	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-17.29	-22.73	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.13	-13.20	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-5.02	-38.12	-33.10	CuSe
CuSe2	-25.58	-58.94	-33.37	CuSe2
CuSeO3:2H2O	-6.86	-6.35	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.67	-17.11	-2.44	CuSeO4:5H2O
CuSO4	-12.47	-9.53	2.94	CuSO4
Diaspore	2.60	9.47	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.40	-16.94	-16.54	CaMg(CO3)2

Dolomite (ordered)	0.15	-16.94	-17.09	CaMg (CO ₃) ₂
Epsomite	-2.47	-4.59	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-10.11	3.45	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl ₂ ·3	3.16	0.12	-3.04	Fe (OH) ₂ ·7Cl ₂ ·3
Fe (VO ₃) ₂	-9.92	-13.64	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.77	-8.21	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-16.77	-37.40	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-43.21	-46.94	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-13.36	-12.96	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-7.60	-0.40	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.91	-18.00	-10.09	FeMoO ₄
Ferrihydrite	0.00	3.19	3.19	Fe (OH) ₃
Ferroselite	-45.14	-63.74	-18.60	FeSe ₂
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.92	-42.92	-11.00	FeSe
Fix_pe	-4.90	-4.90	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF ₂
Galena	-66.49	-80.46	-13.97	PbS
Gibbsite	1.18	9.47	8.29	Al (OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.54	-7.55	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-64.63	-78.99	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe ₃ S ₄
Gummite	-4.63	3.04	7.67	UO ₃
Gypsum	0.00	-4.61	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-13.88	-25.98	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.58	-21.45	-12.88	H ₂ MoO ₄
H ₂ S (g)	-78.29	-86.30	-8.01	H ₂ S
H ₂ Se (g)	-41.41	-46.37	-4.96	H ₂ Se
Halite	-5.83	-4.23	1.60	NaCl
Hausmannite	-2.08	58.95	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-0.50	22.40	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-184.76	-258.47	-73.71	Hg (CH ₃) ₂
Hg (g)	-6.89	-14.76	-7.87	Hg
Hg (OH) ₂	-7.32	-10.81	-3.50	Hg (OH) ₂
Hg ₂ (g)	-14.57	-29.53	-14.96	Hg ₂
Hg ₂ (OH) ₂	-9.25	-3.98	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-9.58	-25.63	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-26.27	-34.97	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-17.29	-27.65	-10.36	Hg ₂ F ₂
Hg ₂ S	-78.60	-90.28	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-13.92	-18.58	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-15.63	-21.76	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-24.40	-54.08	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-31.71	-12.22	19.50	HgCl
HgCl ₂	-10.00	-31.26	-21.26	HgCl ₂
HgF (g)	-46.50	-13.83	32.68	HgF
HgF ₂ (g)	-47.04	-34.48	12.57	HgF ₂
Hgmetal (l)	-1.31	-14.76	-13.45	Hg
HgSe	-1.49	-57.18	-55.69	HgSe
HgSeO ₃	-12.98	-25.41	-12.43	HgSeO ₃
HgSO ₄	-19.17	-28.59	-9.42	HgSO ₄
Huntite	-3.89	-33.86	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerussite	-7.02	-25.79	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-11.88	-20.65	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.18	-20.35	-5.17	KAl (SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.44	-20.24	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-33.26	-50.50	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-19.00	-19.51	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-13.25	-9.99	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-13.16	-13.89	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.67	-6.11	-0.43	PbO·PbSO ₄
Laurionite	-5.01	-4.39	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO

Litharge	-6.86	5.83	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.71	19.57	16.86	Fe2MgO4
Magnesite	-1.00	-8.46	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.43	23.91	25.34	MnOOH
Massicot	-7.06	5.83	12.89	PbO
Matlockite	-7.25	-16.22	-8.97	PbClF
Melanothallite	-18.46	-12.20	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-52.01	-97.11	-45.09	HgS
Mg (OH) 2 (active)	-5.61	13.19	18.79	Mg (OH) 2
Mg (VO3) 2	-15.19	-3.91	11.28	Mg (VO3) 2
Mg2Sb3	-272.59	-197.90	74.68	Mg2Sb3
Mg2V2O7	-17.08	9.28	26.36	Mg2V2O7
MgCr2O4	-6.86	9.34	16.20	MgCr2O4
MgCrO4	-23.18	-17.80	5.38	MgCrO4
MgF2	-2.35	-10.48	-8.13	MgF2
MgMoO4	-6.42	-8.27	-1.85	MgMoO4
MgSeO3:6H2O	-4.46	-1.41	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.97	-12.17	-1.20	MgSeO4:6H2O
Minium	-30.48	43.05	73.52	Pb3O4
Mirabilite	-4.68	-5.79	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-10.86	-5.96	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.50	-56.21	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.63	-86.55	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-11.39	1.11	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.03	-9.32	2.72	MnCl2:4H2O
MnS (grn)	-75.33	-75.16	0.17	MnS
MnS (pnk)	-78.50	-75.16	3.34	MnS
MnSb	-94.58	-97.49	-2.91	MnSb
MnSe	-38.73	-35.23	3.50	MnSe
MnSeO3	-4.59	-3.46	1.13	MnSeO3
MnSeO3:2H2O	-4.44	-3.46	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.17	-14.22	-2.05	MnSeO4:5H2O
MnSO4	-9.22	-6.64	2.58	MnSO4
Monteponite	-7.80	7.30	15.10	CdO
Montroydite	-7.17	-10.81	-3.64	HgO
MoO3	-13.45	-21.45	-8.00	MoO3
Morenosite	-10.06	-12.20	-2.14	NiSO4:7H2O
MoS2	-149.33	-219.59	-70.26	MoS2
Na-Jarosite	-8.78	-19.98	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.08	-49.97	-9.90	Na2Cr2O7
Na2CrO4	-21.92	-18.99	2.93	Na2CrO4
Na2Mo2O7	-14.32	-30.92	-16.60	Na2Mo2O7
Na2MoO4	-10.95	-9.46	1.49	Na2MoO4
Na2MoO4:2H2O	-10.69	-9.46	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.90	-2.60	10.30	Na2SeO3:5H2O
Na2SeO4	-14.64	-13.36	1.28	Na2SeO4
Na3Sb	-172.51	-78.06	94.45	Na3Sb
Na3VO4	-27.24	9.44	36.68	Na3VO4
Na4V2O7	-30.51	6.89	37.40	Na4V2O7
Nantokite	-5.33	-12.06	-6.73	CuCl
NaSb	-87.67	-64.51	23.17	NaSb
Natron	-8.35	-9.66	-1.31	Na2CO3:10H2O
NaVO3	-6.41	-2.55	3.86	NaVO3
Nesquehonite	-3.79	-8.46	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.22	5.58	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-31.27	-15.57	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-27.47	4.53	32.00	Ni4 (OH) 6SO4
NiCO3	-9.20	-16.07	-6.87	NiCO3
NiMoO4	-4.73	-15.88	-11.14	NiMoO4
NiS (alpha)	-75.12	-80.72	-5.60	NiS
NiS (beta)	-69.62	-80.72	-11.10	NiS
NiS (gamma)	-67.92	-80.72	-12.80	NiS
NiSe	-23.09	-40.79	-17.70	NiSe

NiSeO3:2H2O	-11.83	-9.02	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.26	-19.78	-1.52	NiSeO4:6H2O
Nsutite	-6.17	11.33	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.34	-14.34	-12.00	CdCO3
Pb(BO2)2	-9.08	-2.56	6.52	Pb(BO2)2
Pb(OH)2	-2.32	5.83	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.78	-71.54	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.52	11.67	26.19	Pb2O(OH)2
Pb2O3	-23.83	37.21	61.04	Pb2O3
Pb2OCO3	-9.42	-9.98	-0.56	Pb2OCO3
Pb2V2O7	-3.53	-5.43	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.60	-14.80	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.73	0.41	6.14	Pb3(VO4)2
Pb3O2CO3	-15.17	-4.15	11.02	Pb3O2CO3
Pb3O2SO4	-10.96	-0.27	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.54	5.56	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.32	5.56	21.88	Pb4O3SO4
PbCrO4	-12.55	-25.15	-12.60	PbCrO4
PbF2	-10.39	-17.83	-7.44	PbF2
Pbmetal	-23.96	-19.71	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.15	5.83	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.40	13.19	21.58	MgO
Phosgenite	-10.62	-30.43	-19.81	PbCl2:PbCO3
Plattnerite	-18.22	31.38	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-4.06	11.14	15.19	Mn(OH)2
Pyrolusite	-4.70	36.68	41.38	MnO2
Realgar	-102.12	-121.86	-19.75	AsS
Retgersite	-10.16	-12.20	-2.04	NiSO4:6H2O
Rhodochrosite	0.07	-10.51	-10.58	MnCO3
Rutherfordine	-4.10	-18.60	-14.50	UO2CO3
Sb(OH)3	-12.30	-19.41	-7.11	Sb(OH)3
Sb2O4	-16.68	-13.28	3.40	Sb2O4
Sb2O5	-26.69	-36.36	-9.67	Sb2O5
Sb2Se3	-110.17	-177.93	-67.76	Sb2Se3
Sb4O6(cubic)	-59.39	-77.65	-18.26	Sb4O6
Sb4O6(orth)	-59.75	-77.65	-17.90	Sb4O6
SbCl3	-50.66	-50.09	0.57	SbCl3
SbF3	-44.69	-54.91	-10.23	SbF3
Sbmetal	-46.04	-57.73	-11.69	Sb
SbO2	-3.13	-30.95	-27.82	SbO2
Schoepite	-2.95	3.04	5.99	UO2(OH)2:H2O
Semetal(am)	-13.71	-20.82	-7.11	Se
Semetal(hex)	-13.11	-20.82	-7.71	Se
Senarmontite	-26.46	-38.83	-12.37	Sb2O3
SeO2	-14.72	-14.59	0.12	SeO2
SeO3	-46.40	-25.36	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.42	-11.42	-10.00	ZnCO3
Sphalerite	-64.62	-76.07	-11.45	ZnS
Spinel	-4.71	32.13	36.85	MgAl2O4
Stibnite	-247.25	-297.71	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-6.10	-5.78	0.32	Na2SO4
Thermonatrite	-10.29	-9.65	0.64	Na2CO3:H2O
Tyuyamunite	-1.92	2.16	4.08	Ca(UO2)2(VO4)2
U3O8	-9.85	11.23	21.08	U3O8
U3Sb4	-576.43	-424.05	152.38	U3Sb4
U4O9	-24.58	-27.60	-3.02	U4O9
UF4	-31.08	-60.62	-29.54	UF4
UF4:2.5H2O	-27.90	-60.62	-32.72	UF4:2.5H2O

UO2 (am)	-14.22	-13.29	0.93	UO2
UO2 (NO3) 2	-40.44	-28.29	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.15	-28.29	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-31.69	-28.30	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.34	-28.30	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.57	3.04	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.07	-22.32	-2.25	UO2SeO4:4H2O
UO3	-4.66	3.04	7.70	UO3
Uraninite	-8.62	-13.29	-4.67	UO2
USb2	-218.63	-189.05	29.58	USb2
V (OH) 3	-19.09	-11.49	7.59	V (OH) 3
V2O5	-15.73	-17.09	-1.36	V2O5
V3O5	-40.63	-38.80	1.84	V3O5
V4O7	-50.40	-43.21	7.19	V4O7
V6O13	-41.51	-102.37	-60.86	V6O13
Valentinite	-30.35	-38.83	-8.48	Sb2O3
VC12	-63.59	-44.71	18.87	VC12
VC13	-65.60	-42.17	23.43	VC13
VF4	-66.68	-51.75	14.93	VF4
Vmetal	-93.84	-49.81	44.03	V
VO	-39.02	-24.27	14.76	VO
VO (OH) 2	-9.57	-4.42	5.15	VO (OH) 2
VO2Cl	-21.61	-18.77	2.84	VO2Cl
VOC1	-32.87	-21.72	11.15	VOC1
VOC12	-37.63	-24.87	12.76	VOC12
VOSO4	-25.80	-22.19	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-67.12	-76.07	-8.95	ZnS
Zincite	-1.11	10.23	11.33	ZnO
Zincosite	-11.48	-7.55	3.93	ZnSO4
Zn (BO2) 2	-6.46	1.83	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.43	-21.11	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.97	10.23	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.25	10.23	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.53	10.23	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.31	10.23	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.51	10.23	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.82	2.68	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.96	10.23	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.27	-1.62	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.79	-4.87	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-5.27	23.13	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-7.82	30.68	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.27	-10.22	7.05	ZnCl2
ZnCO3:1H2O	-1.16	-11.42	-10.26	ZnCO3:1H2O
ZnF2	-12.91	-13.44	-0.53	ZnF2
Znmetal	-41.11	-15.32	25.79	Zn
ZnMoO4	-1.10	-11.23	-10.13	ZnMoO4
ZnO (active)	-0.96	10.23	11.19	ZnO
ZnS (am)	-67.02	-76.07	-9.05	ZnS
ZnSb	-84.06	-73.05	11.01	ZnSb
ZnSe	-21.74	-36.14	-14.40	ZnSe
ZnSeO4:6H2O	-13.61	-15.13	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.91	-7.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 44.

Title Stage 2 Pit lake Mix
Mix 203

```

204      0.007822
208      0.003247
1        0.007582
17       0.008224
16       0.000000
115      0.973125
Save solution 209
end

```

```

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TITLE
-----

```

Stage 2 Pit lake Mix

```

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Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

Using mix 203.

Mixture 203.

```

7.582e-03 Solution 1      Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
0.000e+00 Solution 16     Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)
8.224e-03 Solution 17     Average water quality for Background Surface Water
SWQ-1 (representative of haul road and watershed run-off)
9.731e-01 Solution 115    Solution after simulation 34.
7.822e-03 Solution 204    Solution after simulation 39.
3.247e-03 Solution 208    Solution after simulation 43.

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-----Solution composition-----

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Elements	Molality	Moles
Ag	5.212e-10	5.213e-10
Al	4.833e-08	4.834e-08
As	6.787e-09	6.788e-09
B	7.944e-06	7.945e-06
Ba	1.860e-09	1.860e-09
C	1.464e-03	1.464e-03
Ca	3.925e-04	3.926e-04
Cd	2.736e-10	2.736e-10
Cl	1.860e-03	1.860e-03
Co	1.846e-09	1.846e-09
Cr	6.253e-10	6.254e-10
Cu	9.316e-08	9.317e-08
F	7.893e-05	7.894e-05
Fe	7.169e-10	7.170e-10
Hg	4.501e-11	4.502e-11
K	1.607e-04	1.607e-04
Mg	2.046e-04	2.047e-04
Mn	1.354e-06	1.354e-06
Mo	3.698e-08	3.699e-08
N	3.102e-07	3.103e-07
Na	3.206e-03	3.207e-03
Ni	2.858e-09	2.858e-09
Pb	1.394e-10	1.394e-10
S	5.663e-04	5.663e-04
Sb	5.825e-10	5.825e-10
Se	3.537e-09	3.537e-09
Si	3.105e-04	3.105e-04
U	1.498e-08	1.498e-08
V	1.457e-10	1.457e-10

Zn 4.519e-07 4.519e-07

-----Description of solution-----

equilibrium

pH	=	8.358	Charge balance
pe	=	4.093	Adjusted to redox
Activity of water	=	1.000	
Ionic strength (mol/kgw)	=	5.559e-03	
Mass of water (kg)	=	1.000e+00	
Total alkalinity (eq/kg)	=	1.494e-03	
Total CO2 (mol/kg)	=	1.464e-03	
Temperature (°C)	=	25.00	
Electrical balance (eq)	=	3.670e-08	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
Iterations	=	8	
Total H	=	1.110292e+02	
Total O	=	5.552117e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.487e-06	2.294e-06	-5.604	-5.639	-0.035	(0)
H+	4.752e-09	4.389e-09	-8.323	-8.358	-0.035	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.212e-10					
AgCl	3.534e-10	3.534e-10	-9.452	-9.452	0.000	(0)
Ag+	1.091e-10	1.008e-10	-9.962	-9.997	-0.035	(0)
AgCl2-	5.771e-11	5.287e-11	-10.239	-10.277	-0.038	(0)
AgSO4-	8.410e-13	7.705e-13	-12.075	-12.113	-0.038	(0)
AgCl3-2	1.149e-13	8.094e-14	-12.940	-13.092	-0.152	(0)
AgOH	2.312e-14	2.312e-14	-13.636	-13.636	0.000	(0)
AgF	1.809e-14	1.809e-14	-13.743	-13.743	0.000	(0)
AgNO2	5.288e-15	5.288e-15	-14.277	-14.277	0.000	(0)
AgH2BO3	1.465e-15	1.465e-15	-14.834	-14.834	0.000	(0)
AgNH3+	9.010e-16	8.255e-16	-15.045	-15.083	-0.038	(0)
AgCl4-3	6.242e-16	2.839e-16	-15.205	-15.547	-0.342	(0)
Ag2Se	4.032e-16	4.032e-16	-15.395	-15.395	0.000	(0)
AgSeO3-	9.528e-17	8.729e-17	-16.021	-16.059	-0.038	(0)
Ag (OH) 2-	5.656e-18	5.182e-18	-17.247	-17.286	-0.038	(0)
Ag (NH3) 2+	2.938e-20	2.692e-20	-19.532	-19.570	-0.038	(0)
AgNO3	4.304e-21	4.304e-21	-20.366	-20.366	0.000	(0)
Ag (NO2) 2-	2.245e-21	2.057e-21	-20.649	-20.687	-0.038	(0)
Ag (SeO3) 2-3	2.317e-24	1.054e-24	-23.635	-23.977	-0.342	(0)
Ag2MoO4	1.034e-28	1.034e-28	-27.985	-27.985	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.899	-73.899	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.164	-82.772	-0.608	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.530	-146.641	-0.111	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.477	-147.515	-0.038	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.501	-147.724	-0.222	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.819	-148.035	-0.216	(0)
Al	4.833e-08					
Al (OH) 4-	4.817e-08	4.452e-08	-7.317	-7.351	-0.034	(0)
Al (OH) 3	1.542e-10	1.542e-10	-9.812	-9.812	0.000	(0)
Al (OH) 2+	3.639e-12	3.368e-12	-11.439	-11.473	-0.034	(0)
AlF2+	1.770e-14	1.638e-14	-13.752	-13.786	-0.034	(0)
AlF3	1.474e-14	1.474e-14	-13.832	-13.832	0.000	(0)
AlOH+2	2.519e-15	1.848e-15	-14.599	-14.733	-0.134	(0)
AlF+2	7.846e-16	5.758e-16	-15.105	-15.240	-0.134	(0)
AlF4-	5.711e-16	5.278e-16	-15.243	-15.278	-0.034	(0)
AlSO4+	2.594e-18	2.397e-18	-17.586	-17.620	-0.034	(0)
Al+3	1.648e-18	8.058e-19	-17.783	-18.094	-0.311	(0)
Al (SO4) 2-	1.065e-20	9.844e-21	-19.973	-20.007	-0.034	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-58.326	-58.668	-0.342	(0)
As (3)	1.586e-22					
H3AsO3	1.406e-22	1.406e-22	-21.852	-21.852	0.000	(0)

	H2AsO3-	1.794e-23	1.643e-23	-22.746	-22.784	-0.038	(0)
	HAsO3-2	4.847e-27	3.415e-27	-26.315	-26.467	-0.152	(0)
	H4AsO3+	3.338e-31	3.058e-31	-30.477	-30.515	-0.038	(0)
	AsO3-3	6.595e-32	2.999e-32	-31.181	-31.523	-0.342	(0)
As (5)	6.787e-09						
	HAsO4-2	6.577e-09	4.634e-09	-8.182	-8.334	-0.152	(0)
	H2AsO4-	2.025e-10	1.855e-10	-9.694	-9.732	-0.038	(0)
	AsO4-3	7.342e-12	3.339e-12	-11.134	-11.476	-0.342	(0)
	H3AsO4	1.413e-16	1.415e-16	-15.850	-15.849	0.001	(0)
B	7.944e-06						
	H3BO3	6.924e-06	6.932e-06	-5.160	-5.159	0.001	(0)
	H2BO3-	9.962e-07	9.173e-07	-6.002	-6.037	-0.036	(0)
	CaH2BO3+	1.489e-08	1.371e-08	-7.827	-7.863	-0.036	(0)
	MgH2BO3+	4.776e-09	4.398e-09	-8.321	-8.357	-0.036	(0)
	NaH2BO3	4.292e-09	4.292e-09	-8.367	-8.367	0.000	(0)
	BF(OH) 3-	2.147e-10	1.977e-10	-9.668	-9.704	-0.036	(0)
	H5(BO3) 2-	5.878e-12	5.413e-12	-11.231	-11.267	-0.036	(0)
	BaH2BO3+	4.103e-14	3.778e-14	-13.387	-13.423	-0.036	(0)
	BF2(OH) 2-	7.199e-15	6.629e-15	-14.143	-14.179	-0.036	(0)
	H8(BO3) 3-	4.075e-15	3.752e-15	-14.390	-14.426	-0.036	(0)
	AgH2BO3	1.465e-15	1.465e-15	-14.834	-14.834	0.000	(0)
	BF3OH-	8.785e-22	8.089e-22	-21.056	-21.092	-0.036	(0)
	BF4-	1.356e-27	1.249e-27	-26.868	-26.904	-0.036	(0)
Ba	1.860e-09						
	Ba+2	1.832e-09	1.333e-09	-8.737	-8.875	-0.138	(0)
	BaHCO3+	1.796e-11	1.664e-11	-10.746	-10.779	-0.033	(0)
	BaCO3	9.547e-12	9.547e-12	-11.020	-11.020	0.000	(0)
	BaH2BO3+	4.103e-14	3.778e-14	-13.387	-13.423	-0.036	(0)
	BaOH+	1.443e-14	1.335e-14	-13.841	-13.875	-0.034	(0)
	BaNH3+2	4.789e-18	3.374e-18	-17.320	-17.472	-0.152	(0)
	BaNO3+	3.921e-19	3.592e-19	-18.407	-18.445	-0.038	(0)
C (4)	1.464e-03						
	HCO3-	1.413e-03	1.307e-03	-2.850	-2.884	-0.034	(0)
	CO3-2	1.920e-05	1.397e-05	-4.717	-4.855	-0.138	(0)
	H2CO3	1.291e-05	1.291e-05	-4.889	-4.889	0.000	(0)
	CaHCO3+	6.824e-06	6.322e-06	-5.166	-5.199	-0.033	(0)
	CaCO3	5.748e-06	5.748e-06	-5.241	-5.241	0.000	(0)
	NaHCO3	2.171e-06	2.171e-06	-5.663	-5.663	0.000	(0)
	MgHCO3+	2.003e-06	1.850e-06	-5.698	-5.733	-0.035	(0)
	MgCO3	1.606e-06	1.606e-06	-5.794	-5.794	0.000	(0)
	NaCO3-	8.295e-07	7.677e-07	-6.081	-6.115	-0.034	(0)
	ZnCO3	1.364e-07	1.364e-07	-6.865	-6.865	0.000	(0)
	CuCO3	7.696e-08	7.696e-08	-7.114	-7.114	0.000	(0)
	MnHCO3+	2.501e-08	2.313e-08	-7.602	-7.636	-0.034	(0)
	UO2(CO3) 3-4	9.981e-09	2.459e-09	-8.001	-8.609	-0.608	(0)
	ZnHCO3+	7.662e-09	7.020e-09	-8.116	-8.154	-0.038	(0)
	UO2(CO3) 2-2	4.987e-09	3.513e-09	-8.302	-8.454	-0.152	(0)
	Cu(CO3) 2-2	4.106e-09	2.893e-09	-8.387	-8.539	-0.152	(0)
	NiCO3	6.794e-10	6.794e-10	-9.168	-9.168	0.000	(0)
	NiHCO3+	2.294e-10	2.102e-10	-9.639	-9.677	-0.038	(0)
	CoCO3	2.282e-10	2.282e-10	-9.642	-9.642	0.000	(0)
	PbCO3	1.088e-10	1.088e-10	-9.963	-9.963	0.000	(0)
	CoHCO3+	1.073e-10	9.829e-11	-9.969	-10.008	-0.038	(0)
	CuHCO3+	8.427e-11	7.721e-11	-10.074	-10.112	-0.038	(0)
	CdCO3	4.337e-11	4.337e-11	-10.363	-10.363	0.000	(0)
	BaHCO3+	1.796e-11	1.664e-11	-10.746	-10.779	-0.033	(0)
	UO2CO3	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
	BaCO3	9.547e-12	9.547e-12	-11.020	-11.020	0.000	(0)
	Pb(CO3) 2-2	6.221e-12	4.383e-12	-11.206	-11.358	-0.152	(0)
	PbHCO3+	2.748e-12	2.518e-12	-11.561	-11.599	-0.038	(0)
	Cd(CO3) 2-2	6.373e-13	4.490e-13	-12.196	-12.348	-0.152	(0)
	CdHCO3+	4.426e-13	4.055e-13	-12.354	-12.392	-0.038	(0)
	FeHCO3+	2.037e-15	1.887e-15	-14.691	-14.724	-0.033	(0)
	HgCO3	1.248e-17	1.248e-17	-16.904	-16.904	0.000	(0)
	Hg(CO3) 2-2	7.825e-19	5.513e-19	-18.107	-18.259	-0.152	(0)
	HgHCO3+	1.114e-21	1.020e-21	-20.953	-20.991	-0.038	(0)
Ca	3.925e-04						
	Ca+2	3.569e-04	2.597e-04	-3.447	-3.586	-0.138	(0)

	CaSO4	2.280e-05	2.280e-05	-4.642	-4.642	0.000	(0)
	CaHCO3+	6.824e-06	6.322e-06	-5.166	-5.199	-0.033	(0)
	CaCO3	5.748e-06	5.748e-06	-5.241	-5.241	0.000	(0)
	CaF+	2.190e-07	2.025e-07	-6.660	-6.694	-0.034	(0)
	CaH2BO3+	1.489e-08	1.371e-08	-7.827	-7.863	-0.036	(0)
	CaOH+	1.283e-08	1.189e-08	-7.892	-7.925	-0.033	(0)
	CaNH3+2	1.862e-12	1.312e-12	-11.730	-11.882	-0.152	(0)
	CaNO3+	4.819e-14	4.415e-14	-13.317	-13.355	-0.038	(0)
	Ca (NH3) 2+2	2.974e-21	2.095e-21	-20.527	-20.679	-0.152	(0)
Cd		2.736e-10					
	Cd+2	1.872e-10	1.362e-10	-9.728	-9.866	-0.138	(0)
	CdCO3	4.337e-11	4.337e-11	-10.363	-10.363	0.000	(0)
	CdCl+	2.439e-11	2.235e-11	-10.613	-10.651	-0.038	(0)
	CdSO4	1.224e-11	1.224e-11	-10.912	-10.912	0.000	(0)
	CdOH+	2.709e-12	2.482e-12	-11.567	-11.605	-0.038	(0)
	CdOHC1	2.103e-12	2.103e-12	-11.677	-11.677	0.000	(0)
	Cd (CO3) 2-2	6.373e-13	4.490e-13	-12.196	-12.348	-0.152	(0)
	CdHCO3+	4.426e-13	4.055e-13	-12.354	-12.392	-0.038	(0)
	CdF+	1.684e-13	1.543e-13	-12.774	-12.812	-0.038	(0)
	CdCl2	1.600e-13	1.600e-13	-12.796	-12.796	0.000	(0)
	Cd (SO4) 2-2	8.980e-14	6.327e-14	-13.047	-13.199	-0.152	(0)
	Cd (OH) 2	3.593e-14	3.593e-14	-13.445	-13.445	0.000	(0)
	CdCl3-	1.893e-16	1.734e-16	-15.723	-15.761	-0.038	(0)
	CdF2	2.200e-17	2.200e-17	-16.658	-16.658	0.000	(0)
	Cd (OH) 3-	5.496e-18	5.035e-18	-17.260	-17.298	-0.038	(0)
	CdSeO4	3.361e-20	3.361e-20	-19.473	-19.473	0.000	(0)
	CdNO3+	2.528e-20	2.316e-20	-19.597	-19.635	-0.038	(0)
	Cd2OH+3	3.727e-21	1.695e-21	-20.429	-20.771	-0.342	(0)
	Cd (SeO3) 2-2	2.895e-22	2.040e-22	-21.538	-21.690	-0.152	(0)
	Cd (OH) 4-2	2.683e-24	1.890e-24	-23.571	-23.723	-0.152	(0)
	Cd (NO3) 2	6.242e-31	6.242e-31	-30.205	-30.205	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.536	-79.574	-0.038	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.087	-150.087	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.866	-225.904	-0.038	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.272	-301.424	-0.152	(0)
Cl		1.860e-03					
	Cl-	1.860e-03	1.718e-03	-2.731	-2.765	-0.035	(0)
	ZnOHC1	2.200e-09	2.200e-09	-8.658	-8.658	0.000	(0)
	MnCl+	2.073e-09	1.917e-09	-8.683	-8.717	-0.034	(0)
	ZnCl+	7.934e-10	7.325e-10	-9.101	-9.135	-0.035	(0)
	AgCl	3.534e-10	3.534e-10	-9.452	-9.452	0.000	(0)
	CuCl	8.007e-11	8.007e-11	-10.097	-10.097	0.000	(0)
	AgCl2-	5.771e-11	5.287e-11	-10.239	-10.277	-0.038	(0)
	CuCl2-	3.112e-11	2.873e-11	-10.507	-10.542	-0.035	(0)
	CdCl+	2.439e-11	2.235e-11	-10.613	-10.651	-0.038	(0)
	CoCl+	6.268e-12	5.742e-12	-11.203	-11.241	-0.038	(0)
	NiCl+	6.255e-12	5.731e-12	-11.204	-11.242	-0.038	(0)
	MnCl2	4.652e-12	4.652e-12	-11.332	-11.332	0.000	(0)
	CuCl+	2.759e-12	2.548e-12	-11.559	-11.594	-0.035	(0)
	CdOHC1	2.103e-12	2.103e-12	-11.677	-11.677	0.000	(0)
	ZnCl2	1.994e-12	1.994e-12	-11.700	-11.700	0.000	(0)
	PbCl+	1.724e-13	1.580e-13	-12.763	-12.801	-0.038	(0)
	CdCl2	1.600e-13	1.600e-13	-12.796	-12.796	0.000	(0)
	AgCl3-2	1.149e-13	8.094e-14	-12.940	-13.092	-0.152	(0)
	CuCl3-2	1.442e-14	1.055e-14	-13.841	-13.977	-0.136	(0)
	HgClOH	5.197e-15	5.197e-15	-14.284	-14.284	0.000	(0)
	ZnCl3-	2.947e-15	2.721e-15	-14.531	-14.565	-0.035	(0)
	MnCl3-	2.379e-15	2.201e-15	-14.624	-14.657	-0.034	(0)
	CuCl2	1.517e-15	1.517e-15	-14.819	-14.819	0.000	(0)
	PbCl2	1.212e-15	1.212e-15	-14.916	-14.916	0.000	(0)
	AgCl4-3	6.242e-16	2.839e-16	-15.205	-15.547	-0.342	(0)
	HgCl2	2.204e-16	2.204e-16	-15.657	-15.657	0.000	(0)
	CdCl3-	1.893e-16	1.734e-16	-15.723	-15.761	-0.038	(0)
	NiCl2	4.956e-17	4.956e-17	-16.305	-16.305	0.000	(0)
	HgCl3-	4.132e-18	3.785e-18	-17.384	-17.422	-0.038	(0)
	ZnCl4-2	3.193e-18	2.337e-18	-17.496	-17.631	-0.136	(0)
	PbCl3-	9.047e-19	8.288e-19	-18.044	-18.082	-0.038	(0)
	UO2Cl+	6.895e-19	6.317e-19	-18.161	-18.200	-0.038	(0)

CrCl+2	6.563e-20	4.624e-20	-19.183	-19.335	-0.152	(0)
HgCl4-2	3.674e-20	2.588e-20	-19.435	-19.587	-0.152	(0)
HgCl+	2.794e-20	2.560e-20	-19.554	-19.592	-0.038	(0)
CuCl3-	2.634e-20	2.432e-20	-19.579	-19.614	-0.035	(0)
CrOHC12	3.463e-21	3.463e-21	-20.461	-20.461	0.000	(0)
PbCl4-2	9.236e-22	6.507e-22	-21.034	-21.187	-0.152	(0)
FeCl+2	9.344e-24	6.840e-24	-23.029	-23.165	-0.136	(0)
CrCl2+	8.226e-24	7.536e-24	-23.085	-23.123	-0.038	(0)
CuCl4-2	2.861e-25	2.094e-25	-24.543	-24.679	-0.136	(0)
FeCl2+	5.674e-26	5.248e-26	-25.246	-25.280	-0.034	(0)
VOC1+	1.926e-26	1.765e-26	-25.715	-25.753	-0.038	(0)
CrO3Cl1-	2.391e-27	2.191e-27	-26.621	-26.659	-0.038	(0)
FeCl3	9.014e-30	9.014e-30	-29.045	-29.045	0.000	(0)
CoCl+2	2.363e-38	1.665e-38	-37.627	-37.779	-0.152	(0)
UCl+3	0.000e+00	0.000e+00	-48.767	-49.109	-0.342	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.657	-53.809	-0.152	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.573	-55.725	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.769	-68.921	-0.152	(0)
Co (2)	1.846e-09					
Co+2	1.372e-09	9.664e-10	-8.863	-9.015	-0.152	(0)
CoCO3	2.282e-10	2.282e-10	-9.642	-9.642	0.000	(0)
CoHCO3+	1.073e-10	9.829e-11	-9.969	-10.008	-0.038	(0)
CoSO4	7.389e-11	7.389e-11	-10.131	-10.131	0.000	(0)
CoOH+	4.828e-11	4.423e-11	-10.316	-10.354	-0.038	(0)
Co (OH) 2	8.059e-12	8.059e-12	-11.094	-11.094	0.000	(0)
CoCl+	6.268e-12	5.742e-12	-11.203	-11.241	-0.038	(0)
CoF+	2.384e-12	2.184e-12	-11.623	-11.661	-0.038	(0)
CoNO2+	1.867e-15	1.710e-15	-14.729	-14.767	-0.038	(0)
Co (NH3) +2	6.617e-16	4.662e-16	-15.179	-15.331	-0.152	(0)
Co (OH) 3-	4.026e-16	3.689e-16	-15.395	-15.433	-0.038	(0)
CoOOH-	1.010e-16	9.256e-17	-15.996	-16.034	-0.038	(0)
CoSeO4	6.418e-19	6.418e-19	-18.193	-18.193	0.000	(0)
CoNO3+	8.989e-20	8.236e-20	-19.046	-19.084	-0.038	(0)
Co2OH+3	4.711e-21	2.142e-21	-20.327	-20.669	-0.342	(0)
Co (OH) 4-2	1.904e-22	1.341e-22	-21.720	-21.873	-0.152	(0)
Co (NH3) 2+2	1.132e-22	7.978e-23	-21.946	-22.098	-0.152	(0)
Co (NO3) 2	9.010e-30	9.010e-30	-29.045	-29.045	0.000	(0)
Co (NH3) 3+2	5.720e-30	4.030e-30	-29.243	-29.395	-0.152	(0)
Co4 (OH) 4+4	3.100e-33	7.637e-34	-32.509	-33.117	-0.608	(0)
Co (NH3) 4+2	1.204e-37	8.485e-38	-36.919	-37.071	-0.152	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.096	-45.248	-0.152	(0)
Co (3)	7.880e-31					
CoOH+2	7.880e-31	5.552e-31	-30.103	-30.256	-0.152	(0)
Co+3	9.743e-38	4.763e-38	-37.011	-37.322	-0.311	(0)
CoCl+2	2.363e-38	1.665e-38	-37.627	-37.779	-0.152	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.657	-53.809	-0.152	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.609	-64.647	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.443	-67.595	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.769	-68.921	-0.152	(0)
Cr (2)	5.697e-28					
Cr+2	5.697e-28	4.014e-28	-27.244	-27.396	-0.152	(0)
Cr (3)	6.253e-10					
Cr (OH) 2+	3.180e-10	2.913e-10	-9.498	-9.536	-0.038	(0)
Cr (OH) 3	2.511e-10	2.511e-10	-9.600	-9.600	0.000	(0)
CrO2-	2.966e-11	2.717e-11	-10.528	-10.566	-0.038	(0)
Cr (OH) 4-	2.503e-11	2.293e-11	-10.602	-10.640	-0.038	(0)
Cr (OH) +2	1.482e-12	1.044e-12	-11.829	-11.981	-0.152	(0)
CrOHSO4	9.493e-14	9.493e-14	-13.023	-13.023	0.000	(0)
CrF+2	3.344e-16	2.356e-16	-15.476	-15.628	-0.152	(0)
Cr+3	4.574e-17	2.080e-17	-16.340	-16.682	-0.342	(0)
CrSO4+	2.032e-17	1.861e-17	-16.692	-16.730	-0.038	(0)
CrCl+2	6.563e-20	4.624e-20	-19.183	-19.335	-0.152	(0)
CrOHC12	3.463e-21	3.463e-21	-20.461	-20.461	0.000	(0)
Cr2 (OH) 2SO4+2	1.271e-23	8.956e-24	-22.896	-23.048	-0.152	(0)
CrCl2+	8.226e-24	7.536e-24	-23.085	-23.123	-0.038	(0)
Cr2 (OH) 2 (SO4) 2	2.039e-25	2.039e-25	-24.691	-24.691	0.000	(0)
CrNO3+2	6.939e-29	4.889e-29	-28.159	-28.311	-0.152	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.780	-43.932	-0.152	(0)

Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.719	-54.062	-0.342	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.573	-55.725	-0.152	(0)
Cr (6)	4.575e-15					
CrO4-2	4.471e-15	3.253e-15	-14.350	-14.488	-0.138	(0)
NaCrO4-	5.208e-17	4.772e-17	-16.283	-16.321	-0.038	(0)
HCrO4-	5.042e-17	4.619e-17	-16.297	-16.335	-0.038	(0)
KCrO4-	1.952e-18	1.789e-18	-17.709	-17.747	-0.038	(0)
H2CrO4	1.643e-25	1.643e-25	-24.784	-24.784	0.000	(0)
CrO3SO4-2	3.359e-26	2.367e-26	-25.474	-25.626	-0.152	(0)
CrO3Cl-	2.391e-27	2.191e-27	-26.621	-26.659	-0.038	(0)
Cr2O7-2	1.050e-31	7.400e-32	-30.979	-31.131	-0.152	(0)
Cu (1)	1.516e-10					
CuCl	8.007e-11	8.007e-11	-10.097	-10.097	0.000	(0)
Cu+	4.041e-11	3.703e-11	-10.393	-10.431	-0.038	(0)
CuCl2-	3.112e-11	2.873e-11	-10.507	-10.542	-0.035	(0)
CuCl3-2	1.442e-14	1.055e-14	-13.841	-13.977	-0.136	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.541	-145.760	-0.219	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.277	-146.490	-0.212	(0)
Cu (2)	9.301e-08					
CuCO3	7.696e-08	7.696e-08	-7.114	-7.114	0.000	(0)
CuOH+	7.352e-09	6.789e-09	-8.134	-8.168	-0.035	(0)
Cu (CO3) 2-2	4.106e-09	2.893e-09	-8.387	-8.539	-0.152	(0)
Cu (OH) 2	3.107e-09	3.107e-09	-8.508	-8.508	0.000	(0)
Cu+2	1.286e-09	9.359e-10	-8.891	-9.029	-0.138	(0)
CuHCO3+	8.427e-11	7.721e-11	-10.074	-10.112	-0.038	(0)
CuSO4	8.216e-11	8.216e-11	-10.085	-10.085	0.000	(0)
Cu (OH) 3-	1.596e-11	1.462e-11	-10.797	-10.835	-0.038	(0)
CuF+	4.606e-12	4.220e-12	-11.337	-11.375	-0.038	(0)
CuCl+	2.759e-12	2.548e-12	-11.559	-11.594	-0.035	(0)
Cu2 (OH) 2+2	1.643e-12	1.158e-12	-11.784	-11.936	-0.152	(0)
CuNH3+2	5.454e-14	3.842e-14	-13.263	-13.415	-0.152	(0)
CuNO2+	2.686e-14	2.461e-14	-13.571	-13.609	-0.038	(0)
CuCl2	1.517e-15	1.517e-15	-14.819	-14.819	0.000	(0)
Cu (OH) 4-2	3.746e-16	2.639e-16	-15.426	-15.578	-0.152	(0)
CuNO3+	1.737e-19	1.591e-19	-18.760	-18.798	-0.038	(0)
Cu (NO2) 2	6.325e-20	6.325e-20	-19.199	-19.199	0.000	(0)
CuCl3-	2.634e-20	2.432e-20	-19.579	-19.614	-0.035	(0)
CuCl4-2	2.861e-25	2.094e-25	-24.543	-24.679	-0.136	(0)
Cu (NO3) 2	1.077e-30	1.077e-30	-29.968	-29.968	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.242	-216.280	-0.038	(0)
F	7.893e-05					
F-	7.737e-05	7.146e-05	-4.111	-4.146	-0.035	(0)
MgF+	1.200e-06	1.109e-06	-5.921	-5.955	-0.034	(0)
CaF+	2.190e-07	2.025e-07	-6.660	-6.694	-0.034	(0)
NaF	1.331e-07	1.331e-07	-6.876	-6.876	0.000	(0)
MnF+	2.727e-09	2.522e-09	-8.564	-8.598	-0.034	(0)
HF	4.639e-10	4.639e-10	-9.334	-9.334	0.000	(0)
ZnF+	2.642e-10	2.421e-10	-9.578	-9.616	-0.038	(0)
BF (OH) 3-	2.147e-10	1.977e-10	-9.668	-9.704	-0.036	(0)
CuF+	4.606e-12	4.220e-12	-11.337	-11.375	-0.038	(0)
NiF+	2.555e-12	2.341e-12	-11.593	-11.631	-0.038	(0)
CoF+	2.384e-12	2.184e-12	-11.623	-11.661	-0.038	(0)
CdF+	1.684e-13	1.543e-13	-12.774	-12.812	-0.038	(0)
HF2-	1.366e-13	1.260e-13	-12.864	-12.900	-0.035	(0)
AgF	1.809e-14	1.809e-14	-13.743	-13.743	0.000	(0)
AlF2+	1.770e-14	1.638e-14	-13.752	-13.786	-0.034	(0)
AlF3	1.474e-14	1.474e-14	-13.832	-13.832	0.000	(0)
PbF+	1.425e-14	1.305e-14	-13.846	-13.884	-0.038	(0)
BF2 (OH) 2-	7.199e-15	6.629e-15	-14.143	-14.179	-0.036	(0)
UO2F+	2.441e-15	2.237e-15	-14.612	-14.650	-0.038	(0)
AlF+2	7.846e-16	5.758e-16	-15.105	-15.240	-0.134	(0)
AlF4-	5.711e-16	5.278e-16	-15.243	-15.278	-0.034	(0)
UO2F2	4.610e-16	4.610e-16	-15.336	-15.336	0.000	(0)
CrF+2	3.344e-16	2.356e-16	-15.476	-15.628	-0.152	(0)
CdF2	2.200e-17	2.200e-17	-16.658	-16.658	0.000	(0)
PbF2	1.835e-17	1.835e-17	-16.736	-16.736	0.000	(0)
UO2F3-	9.031e-18	8.274e-18	-17.044	-17.082	-0.038	(0)
H2F2	5.766e-19	5.766e-19	-18.239	-18.239	0.000	(0)

FeF2+	2.136e-20	1.976e-20	-19.670	-19.704	-0.034	(0)
FeF+2	1.411e-20	1.033e-20	-19.850	-19.986	-0.136	(0)
UO2F4-2	6.667e-21	4.697e-21	-20.176	-20.328	-0.152	(0)
VO2F	3.687e-21	3.687e-21	-20.433	-20.433	0.000	(0)
PbF3-	2.715e-21	2.488e-21	-20.566	-20.604	-0.038	(0)
FeF3	1.992e-21	1.992e-21	-20.701	-20.701	0.000	(0)
BF3OH-	8.785e-22	8.089e-22	-21.056	-21.092	-0.036	(0)
VO2F2-	1.044e-22	9.567e-23	-21.981	-22.019	-0.038	(0)
VOF+	1.713e-24	1.570e-24	-23.766	-23.804	-0.038	(0)
VO2F3-2	1.210e-25	8.528e-26	-24.917	-25.069	-0.152	(0)
PbF4-2	1.208e-25	8.509e-26	-24.918	-25.070	-0.152	(0)
VOF2	4.206e-26	4.206e-26	-25.376	-25.376	0.000	(0)
HgF+	2.159e-27	1.978e-27	-26.666	-26.704	-0.038	(0)
BF4-	1.356e-27	1.249e-27	-26.868	-26.904	-0.036	(0)
Sb(OH) 2F	3.441e-28	3.441e-28	-27.463	-27.463	0.000	(0)
SbOF	3.384e-28	3.384e-28	-27.471	-27.471	0.000	(0)
VOF3-	1.164e-28	1.066e-28	-27.934	-27.972	-0.038	(0)
VO2F4-3	6.594e-30	2.998e-30	-29.181	-29.523	-0.342	(0)
VOF4-2	4.366e-32	3.076e-32	-31.360	-31.512	-0.152	(0)
SiF6-2	3.068e-32	2.246e-32	-31.513	-31.649	-0.136	(0)
UF3+	1.432e-39	1.312e-39	-38.844	-38.882	-0.038	(0)
UF2+2	1.644e-40	1.158e-40	-39.784	-39.936	-0.152	(0)
UF4	0.000e+00	0.000e+00	-40.988	-40.988	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.548	-42.890	-0.342	(0)
UF5-	0.000e+00	0.000e+00	-43.498	-43.536	-0.038	(0)
UF6-2	0.000e+00	0.000e+00	-45.050	-45.202	-0.152	(0)
Fe (2)	1.869e-13					
Fe+2	1.627e-13	1.147e-13	-12.789	-12.941	-0.152	(0)
FeOH+	1.132e-14	1.047e-14	-13.946	-13.980	-0.034	(0)
FeSO4	1.079e-14	1.079e-14	-13.967	-13.967	0.000	(0)
FeHCO3+	2.037e-15	1.887e-15	-14.691	-14.724	-0.033	(0)
Fe(OH) 2	1.908e-17	1.908e-17	-16.719	-16.719	0.000	(0)
Fe(OH) 3-	1.496e-17	1.384e-17	-16.825	-16.859	-0.034	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.424	-159.424	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.066	-235.104	-0.038	(0)
Fe (3)	7.167e-10					
Fe(OH) 3	4.294e-10	4.294e-10	-9.367	-9.367	0.000	(0)
Fe(OH) 2+	1.883e-10	1.743e-10	-9.725	-9.759	-0.034	(0)
Fe(OH) 4-	9.908e-11	9.171e-11	-10.004	-10.038	-0.034	(0)
FeOH+2	2.668e-16	1.953e-16	-15.574	-15.709	-0.136	(0)
FeF2+	2.136e-20	1.976e-20	-19.670	-19.704	-0.034	(0)
FeF+2	1.411e-20	1.033e-20	-19.850	-19.986	-0.136	(0)
FeF3	1.992e-21	1.992e-21	-20.701	-20.701	0.000	(0)
FeSO4+	6.129e-22	5.670e-22	-21.213	-21.246	-0.034	(0)
Fe+3	2.697e-22	1.319e-22	-21.569	-21.880	-0.311	(0)
FeCl+2	9.344e-24	6.840e-24	-23.029	-23.165	-0.136	(0)
Fe(SO4) 2-	5.070e-24	4.645e-24	-23.295	-23.333	-0.038	(0)
FeCl2+	5.674e-26	5.248e-26	-25.246	-25.280	-0.034	(0)
FeHSeO3+2	7.349e-28	5.177e-28	-27.134	-27.286	-0.152	(0)
FeCl3	9.014e-30	9.014e-30	-29.045	-29.045	0.000	(0)
Fe2(OH) 2+4	5.126e-30	1.263e-30	-29.290	-29.899	-0.608	(0)
FeNO3+2	1.006e-31	7.090e-32	-30.997	-31.149	-0.152	(0)
Fe3(OH) 4+5	2.839e-38	3.181e-39	-37.547	-38.497	-0.951	(0)
H (0)	1.777e-28					
H2	8.887e-29	8.899e-29	-28.051	-28.051	0.001	(0)
Hg (0)	4.498e-11					
Hg	4.498e-11	4.498e-11	-10.347	-10.347	0.000	(0)
Hg (1)	6.475e-26					
Hg2+2	3.237e-26	2.281e-26	-25.490	-25.642	-0.152	(0)
Hg (2)	3.020e-14					
Hg(OH) 2	2.477e-14	2.480e-14	-13.606	-13.606	0.001	(0)
HgClOH	5.197e-15	5.197e-15	-14.284	-14.284	0.000	(0)
HgCl2	2.204e-16	2.204e-16	-15.657	-15.657	0.000	(0)
HgCO3	1.248e-17	1.248e-17	-16.904	-16.904	0.000	(0)
HgCl3-	4.132e-18	3.785e-18	-17.384	-17.422	-0.038	(0)
Hg(CO3) 2-2	7.825e-19	5.513e-19	-18.107	-18.259	-0.152	(0)
HgOH+	7.445e-20	6.821e-20	-19.128	-19.166	-0.038	(0)
HgCl4-2	3.674e-20	2.588e-20	-19.435	-19.587	-0.152	(0)

	HgCl+	2.794e-20	2.560e-20	-19.554	-19.592	-0.038	(0)
	Hg (OH) 3-	7.816e-21	7.161e-21	-20.107	-20.145	-0.038	(0)
	HgHCO3+	1.114e-21	1.020e-21	-20.953	-20.991	-0.038	(0)
	Hg (NH3) 2+2	1.077e-23	7.586e-24	-22.968	-23.120	-0.152	(0)
	HgNH3+2	2.684e-24	1.891e-24	-23.571	-23.723	-0.152	(0)
	Hg+2	1.060e-24	7.469e-25	-23.975	-24.127	-0.152	(0)
	HgSO4	7.494e-26	7.494e-26	-25.125	-25.125	0.000	(0)
	HgF+	2.159e-27	1.978e-27	-26.666	-26.704	-0.038	(0)
	Hg (NH3) 3+2	1.720e-31	1.212e-31	-30.765	-30.917	-0.152	(0)
	HgNO3+	1.619e-35	1.483e-35	-34.791	-34.829	-0.038	(0)
	Hg (NH3) 4+2	5.481e-39	3.862e-39	-38.261	-38.413	-0.152	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.480	-45.480	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.236	-139.274	-0.038	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.473	-139.625	-0.152	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)
K		1.607e-04					
	K+	1.603e-04	1.480e-04	-3.795	-3.830	-0.035	(0)
	KSO4-	4.339e-07	4.016e-07	-6.363	-6.396	-0.034	(0)
	KCrO4-	1.952e-18	1.789e-18	-17.709	-17.747	-0.038	(0)
Mg		2.046e-04					
	Mg+2	1.900e-04	1.383e-04	-3.721	-3.859	-0.138	(0)
	MgSO4	9.642e-06	9.642e-06	-5.016	-5.016	0.000	(0)
	MgHCO3+	2.003e-06	1.850e-06	-5.698	-5.733	-0.035	(0)
	MgCO3	1.606e-06	1.606e-06	-5.794	-5.794	0.000	(0)
	MgF+	1.200e-06	1.109e-06	-5.921	-5.955	-0.034	(0)
	MgOH+	1.362e-07	1.263e-07	-6.866	-6.899	-0.033	(0)
	MgH2BO3+	4.776e-09	4.398e-09	-8.321	-8.357	-0.036	(0)
Mn (2)		1.354e-06					
	Mn+2	1.258e-06	8.866e-07	-5.900	-6.052	-0.152	(0)
	MnSO4	6.042e-08	6.042e-08	-7.219	-7.219	0.000	(0)
	MnHCO3+	2.501e-08	2.313e-08	-7.602	-7.636	-0.034	(0)
	MnOH+	5.523e-09	5.109e-09	-8.258	-8.292	-0.034	(0)
	MnF+	2.727e-09	2.522e-09	-8.564	-8.598	-0.034	(0)
	MnCl+	2.073e-09	1.917e-09	-8.683	-8.717	-0.034	(0)
	MnCl2	4.652e-12	4.652e-12	-11.332	-11.332	0.000	(0)
	MnCl3-	2.379e-15	2.201e-15	-14.624	-14.657	-0.034	(0)
	MnSeO4	3.162e-16	3.162e-16	-15.500	-15.500	0.000	(0)
	Mn (OH) 3-	1.796e-16	1.661e-16	-15.746	-15.780	-0.034	(0)
	MnNO3+	8.247e-17	7.556e-17	-16.084	-16.122	-0.038	(0)
	Mn (OH) 4-2	1.681e-21	1.230e-21	-20.774	-20.910	-0.136	(0)
	Mn (NO3) 2	1.020e-26	1.020e-26	-25.991	-25.991	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.749	-41.749	0.000	(0)
Mn (3)		1.003e-27					
	Mn+3	1.003e-27	4.903e-28	-26.999	-27.310	-0.311	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.107	-41.243	-0.136	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-46.486	-46.522	-0.035	(0)
Mo		3.698e-08					
	MoO4-2	3.698e-08	2.690e-08	-7.432	-7.570	-0.138	(0)
	HMoO4-	2.565e-12	2.350e-12	-11.591	-11.629	-0.038	(0)
	H2MoO4	7.554e-17	7.554e-17	-16.122	-16.122	0.000	(0)
	Ag2MoO4	1.034e-28	1.034e-28	-27.985	-27.985	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.326	-58.668	-0.342	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-65.493	-66.862	-1.369	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-67.882	-68.833	-0.951	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-71.800	-72.408	-0.608	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-77.178	-77.520	-0.342	(0)
N (-3)		3.769e-08					
	NH4+	3.354e-08	3.088e-08	-7.474	-7.510	-0.036	(0)
	NH3	4.012e-09	4.012e-09	-8.397	-8.397	0.000	(0)
	NH4SO4-	1.371e-10	1.268e-10	-9.863	-9.897	-0.034	(0)
	CaNH3+2	1.862e-12	1.312e-12	-11.730	-11.882	-0.152	(0)
	CuNH3+2	5.454e-14	3.842e-14	-13.263	-13.415	-0.152	(0)
	NiNH3+2	3.988e-15	2.810e-15	-14.399	-14.551	-0.152	(0)
	AgNH3+	9.010e-16	8.255e-16	-15.045	-15.083	-0.038	(0)
	Co (NH3) +2	6.617e-16	4.662e-16	-15.179	-15.331	-0.152	(0)
	BaNH3+2	4.789e-18	3.374e-18	-17.320	-17.472	-0.152	(0)

Ag (NH3) 2+	2.938e-20	2.692e-20	-19.532	-19.570	-0.038	(0)
Ca (NH3) 2+2	2.974e-21	2.095e-21	-20.527	-20.679	-0.152	(0)
Ni (NH3) 2+2	2.313e-21	1.629e-21	-20.636	-20.788	-0.152	(0)
Co (NH3) 2+2	1.132e-22	7.978e-23	-21.946	-22.098	-0.152	(0)
Hg (NH3) 2+2	1.077e-23	7.586e-24	-22.968	-23.120	-0.152	(0)
HgNH3+2	2.684e-24	1.891e-24	-23.571	-23.723	-0.152	(0)
Co (NH3) 3+2	5.720e-30	4.030e-30	-29.243	-29.395	-0.152	(0)
Hg (NH3) 3+2	1.720e-31	1.212e-31	-30.765	-30.917	-0.152	(0)
Co (NH3) 4+2	1.204e-37	8.485e-38	-36.919	-37.071	-0.152	(0)
Hg (NH3) 4+2	5.481e-39	3.862e-39	-38.261	-38.413	-0.152	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.780	-43.932	-0.152	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.096	-45.248	-0.152	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.657	-53.809	-0.152	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.719	-54.062	-0.342	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.573	-55.725	-0.152	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.609	-64.647	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.443	-67.595	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.769	-68.921	-0.152	(0)
N (3)	2.725e-07					
NO2-	2.725e-07	2.511e-07	-6.565	-6.600	-0.035	(0)
CuNO2+	2.686e-14	2.461e-14	-13.571	-13.609	-0.038	(0)
AgNO2	5.288e-15	5.288e-15	-14.277	-14.277	0.000	(0)
CoNO2+	1.867e-15	1.710e-15	-14.729	-14.767	-0.038	(0)
Cu (NO2) 2	6.325e-20	6.325e-20	-19.199	-19.199	0.000	(0)
Ag (NO2) 2-	2.245e-21	2.057e-21	-20.649	-20.687	-0.038	(0)
N (5)	5.827e-11					
NO3-	5.822e-11	5.377e-11	-10.235	-10.269	-0.035	(0)
CaNO3+	4.819e-14	4.415e-14	-13.317	-13.355	-0.038	(0)
MnNO3+	8.247e-17	7.556e-17	-16.084	-16.122	-0.038	(0)
ZnNO3+	2.503e-17	2.293e-17	-16.602	-16.640	-0.038	(0)
BaNO3+	3.921e-19	3.592e-19	-18.407	-18.445	-0.038	(0)
NiNO3+	1.922e-19	1.761e-19	-18.716	-18.754	-0.038	(0)
CuNO3+	1.737e-19	1.591e-19	-18.760	-18.798	-0.038	(0)
CoNO3+	8.989e-20	8.236e-20	-19.046	-19.084	-0.038	(0)
CdNO3+	2.528e-20	2.316e-20	-19.597	-19.635	-0.038	(0)
AgNO3	4.304e-21	4.304e-21	-20.366	-20.366	0.000	(0)
PbNO3+	2.250e-21	2.061e-21	-20.648	-20.686	-0.038	(0)
UO2NO3+	2.655e-26	2.433e-26	-25.576	-25.614	-0.038	(0)
Mn (NO3) 2	1.020e-26	1.020e-26	-25.991	-25.991	0.000	(0)
Zn (NO3) 2	2.460e-28	2.460e-28	-27.609	-27.609	0.000	(0)
CrNO3+2	6.939e-29	4.889e-29	-28.159	-28.311	-0.152	(0)
Co (NO3) 2	9.010e-30	9.010e-30	-29.045	-29.045	0.000	(0)
Cu (NO3) 2	1.077e-30	1.077e-30	-29.968	-29.968	0.000	(0)
VO2NO3	8.002e-31	8.002e-31	-30.097	-30.097	0.000	(0)
Cd (NO3) 2	6.242e-31	6.242e-31	-30.205	-30.205	0.000	(0)
Pb (NO3) 2	1.882e-31	1.882e-31	-30.725	-30.725	0.000	(0)
FeNO3+2	1.006e-31	7.090e-32	-30.997	-31.149	-0.152	(0)
HgNO3+	1.619e-35	1.483e-35	-34.791	-34.829	-0.038	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.480	-45.480	0.000	(0)
Na	3.206e-03					
Na+	3.197e-03	2.952e-03	-2.495	-2.530	-0.035	(0)
NaSO4-	6.564e-06	6.076e-06	-5.183	-5.216	-0.034	(0)
NaHCO3	2.171e-06	2.171e-06	-5.663	-5.663	0.000	(0)
NaCO3-	8.295e-07	7.677e-07	-6.081	-6.115	-0.034	(0)
NaF	1.331e-07	1.331e-07	-6.876	-6.876	0.000	(0)
NaH2BO3	4.292e-09	4.292e-09	-8.367	-8.367	0.000	(0)
NaCrO4-	5.208e-17	4.772e-17	-16.283	-16.321	-0.038	(0)
Ni	2.858e-09					
Ni+2	1.792e-09	1.304e-09	-8.747	-8.885	-0.138	(0)
NiCO3	6.794e-10	6.794e-10	-9.168	-9.168	0.000	(0)
NiHCO3+	2.294e-10	2.102e-10	-9.639	-9.677	-0.038	(0)
NiSO4	9.970e-11	9.970e-11	-10.001	-10.001	0.000	(0)
NiOH+	4.110e-11	3.766e-11	-10.386	-10.424	-0.038	(0)
Ni (OH) 2	6.861e-12	6.861e-12	-11.164	-11.164	0.000	(0)
NiCl+	6.255e-12	5.731e-12	-11.204	-11.242	-0.038	(0)
NiF+	2.555e-12	2.341e-12	-11.593	-11.631	-0.038	(0)
Ni (OH) 3-	1.718e-14	1.574e-14	-13.765	-13.803	-0.038	(0)
NiNH3+2	3.988e-15	2.810e-15	-14.399	-14.551	-0.152	(0)

	Ni (SO4) 2-2	1.796e-15	1.265e-15	-14.746	-14.898	-0.152	(0)
	NiCl2	4.956e-17	4.956e-17	-16.305	-16.305	0.000	(0)
	NiSeO4	8.082e-19	8.082e-19	-18.092	-18.092	0.000	(0)
	NiNO3+	1.922e-19	1.761e-19	-18.716	-18.754	-0.038	(0)
	Ni (NH3) 2+2	2.313e-21	1.629e-21	-20.636	-20.788	-0.152	(0)
O (0)	1.278e-36						
	O2	6.391e-37	6.400e-37	-36.194	-36.194	0.001	(0)
Pb	1.394e-10						
	PbCO3	1.088e-10	1.088e-10	-9.963	-9.963	0.000	(0)
	PbOH+	1.630e-11	1.493e-11	-10.788	-10.826	-0.038	(0)
	Pb (CO3) 2-2	6.221e-12	4.383e-12	-11.206	-11.358	-0.152	(0)
	Pb+2	3.563e-12	2.592e-12	-11.448	-11.586	-0.138	(0)
	PbHCO3+	2.748e-12	2.518e-12	-11.561	-11.599	-0.038	(0)
	Pb (OH) 2	1.083e-12	1.083e-12	-11.965	-11.965	0.000	(0)
	PbSO4	4.865e-13	4.865e-13	-12.313	-12.313	0.000	(0)
	PbCl+	1.724e-13	1.580e-13	-12.763	-12.801	-0.038	(0)
	PbF+	1.425e-14	1.305e-14	-13.846	-13.884	-0.038	(0)
	Pb (OH) 3-	2.713e-15	2.485e-15	-14.567	-14.605	-0.038	(0)
	Pb (SO4) 2-2	1.595e-15	1.123e-15	-14.797	-14.949	-0.152	(0)
	PbCl2	1.212e-15	1.212e-15	-14.916	-14.916	0.000	(0)
	PbF2	1.835e-17	1.835e-17	-16.736	-16.736	0.000	(0)
	Pb (OH) 4-2	1.982e-18	1.396e-18	-17.703	-17.855	-0.152	(0)
	PbCl3-	9.047e-19	8.288e-19	-18.044	-18.082	-0.038	(0)
	PbF3-	2.715e-21	2.488e-21	-20.566	-20.604	-0.038	(0)
	PbNO3+	2.250e-21	2.061e-21	-20.648	-20.686	-0.038	(0)
	Pb2OH+3	1.349e-21	6.135e-22	-20.870	-21.212	-0.342	(0)
	PbCl4-2	9.236e-22	6.507e-22	-21.034	-21.187	-0.152	(0)
	PbF4-2	1.208e-25	8.509e-26	-24.918	-25.070	-0.152	(0)
	Pb3 (OH) 4+2	8.615e-26	6.070e-26	-25.065	-25.217	-0.152	(0)
	Pb (NO3) 2	1.882e-31	1.882e-31	-30.725	-30.725	0.000	(0)
	Pb4 (OH) 4+4	5.072e-33	1.250e-33	-32.295	-32.903	-0.608	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.750	-151.750	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.128	-228.166	-0.038	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.899	-73.899	0.000	(0)
	HS-	0.000e+00	0.000e+00	-77.679	-77.717	-0.038	(0)
	S5-2	0.000e+00	0.000e+00	-78.572	-78.724	-0.152	(0)
	H2S	0.000e+00	0.000e+00	-79.054	-79.054	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-79.088	-79.240	-0.152	(0)
	S4-2	0.000e+00	0.000e+00	-79.168	-79.320	-0.152	(0)
	CdHS+	0.000e+00	0.000e+00	-79.536	-79.574	-0.038	(0)
	S3-2	0.000e+00	0.000e+00	-79.974	-80.126	-0.152	(0)
	S2-2	0.000e+00	0.000e+00	-80.990	-81.142	-0.152	(0)
	S-2	0.000e+00	0.000e+00	-86.523	-86.659	-0.136	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.236	-139.274	-0.038	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.473	-139.625	-0.152	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-145.541	-145.760	-0.219	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-146.277	-146.490	-0.212	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.530	-146.641	-0.111	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-146.998	-147.036	-0.038	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.477	-147.515	-0.038	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-147.501	-147.724	-0.222	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-147.819	-148.035	-0.216	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-149.383	-149.383	0.000	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.087	-150.087	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.750	-151.750	0.000	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-159.424	-159.424	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.242	-216.280	-0.038	(0)
	Zn (HS) 3-	0.000e+00	0.000e+00	-223.782	-223.820	-0.038	(0)
	ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.290	-225.442	-0.152	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.866	-225.904	-0.038	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.128	-228.166	-0.038	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-235.066	-235.104	-0.038	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.272	-301.424	-0.152	(0)
	Zn (HS) 4-2	0.000e+00	0.000e+00	-302.845	-302.997	-0.152	(0)
	Sb2S4-2	0.000e+00	0.000e+00	-320.348	-320.500	-0.152	(0)
S (6)	5.663e-04						

SO4-2	5.268e-04	3.832e-04	-3.278	-3.417	-0.138	(0)
CaSO4	2.280e-05	2.280e-05	-4.642	-4.642	0.000	(0)
MgSO4	9.642e-06	9.642e-06	-5.016	-5.016	0.000	(0)
NaSO4-	6.564e-06	6.076e-06	-5.183	-5.216	-0.034	(0)
KSO4-	4.339e-07	4.016e-07	-6.363	-6.396	-0.034	(0)
MnSO4	6.042e-08	6.042e-08	-7.219	-7.219	0.000	(0)
ZnSO4	1.423e-08	1.423e-08	-7.847	-7.847	0.000	(0)
HSO4-	1.779e-10	1.644e-10	-9.750	-9.784	-0.034	(0)
NH4SO4-	1.371e-10	1.268e-10	-9.863	-9.897	-0.034	(0)
NiSO4	9.970e-11	9.970e-11	-10.001	-10.001	0.000	(0)
CuSO4	8.216e-11	8.216e-11	-10.085	-10.085	0.000	(0)
CoSO4	7.389e-11	7.389e-11	-10.131	-10.131	0.000	(0)
Zn (SO4) 2-2	6.744e-11	4.751e-11	-10.171	-10.323	-0.152	(0)
CdSO4	1.224e-11	1.224e-11	-10.912	-10.912	0.000	(0)
AgSO4-	8.410e-13	7.705e-13	-12.075	-12.113	-0.038	(0)
PbSO4	4.865e-13	4.865e-13	-12.313	-12.313	0.000	(0)
CrOHSO4	9.493e-14	9.493e-14	-13.023	-13.023	0.000	(0)
Cd (SO4) 2-2	8.980e-14	6.327e-14	-13.047	-13.199	-0.152	(0)
FeSO4	1.079e-14	1.079e-14	-13.967	-13.967	0.000	(0)
Ni (SO4) 2-2	1.796e-15	1.265e-15	-14.746	-14.898	-0.152	(0)
Pb (SO4) 2-2	1.595e-15	1.123e-15	-14.797	-14.949	-0.152	(0)
UO2SO4	1.315e-16	1.315e-16	-15.881	-15.881	0.000	(0)
CrSO4+	2.032e-17	1.861e-17	-16.692	-16.730	-0.038	(0)
AlSO4+	2.594e-18	2.397e-18	-17.586	-17.620	-0.034	(0)
UO2 (SO4) 2-2	9.431e-19	6.645e-19	-18.025	-18.178	-0.152	(0)
Al (SO4) 2-	1.065e-20	9.844e-21	-19.973	-20.007	-0.034	(0)
FeSO4+	6.129e-22	5.670e-22	-21.213	-21.246	-0.034	(0)
VO2SO4-	2.939e-22	2.692e-22	-21.532	-21.570	-0.038	(0)
Cr2 (OH) 2SO4+2	1.271e-23	8.956e-24	-22.896	-23.048	-0.152	(0)
Fe (SO4) 2-	5.070e-24	4.645e-24	-23.295	-23.333	-0.038	(0)
VOSO4	3.865e-25	3.865e-25	-24.413	-24.413	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.039e-25	2.039e-25	-24.691	-24.691	0.000	(0)
HgSO4	7.494e-26	7.494e-26	-25.125	-25.125	0.000	(0)
CrO3SO4-2	3.359e-26	2.367e-26	-25.474	-25.626	-0.152	(0)
VSO4+	5.589e-40	5.120e-40	-39.253	-39.291	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.377	-44.377	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.709	-44.861	-0.152	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.609	-64.647	-0.038	(0)
Sb (3)	1.388e-21					
Sb (OH) 3	7.023e-22	7.023e-22	-21.153	-21.153	0.000	(0)
HSbO2	6.856e-22	6.856e-22	-21.164	-21.164	0.000	(0)
SbO2-	2.762e-25	2.530e-25	-24.559	-24.597	-0.038	(0)
Sb (OH) 4-	1.582e-25	1.449e-25	-24.801	-24.839	-0.038	(0)
Sb (OH) 2F	3.441e-28	3.441e-28	-27.463	-27.463	0.000	(0)
SbOF	3.384e-28	3.384e-28	-27.471	-27.471	0.000	(0)
Sb (OH) 2+	8.171e-29	7.486e-29	-28.088	-28.126	-0.038	(0)
SbO+	2.817e-29	2.581e-29	-28.550	-28.588	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.348	-320.500	-0.152	(0)
Sb (5)	5.825e-10					
SbO3-	5.818e-10	5.330e-10	-9.235	-9.273	-0.038	(0)
Sb (OH) 6-	6.748e-13	6.233e-13	-12.171	-12.205	-0.035	(0)
SbO2+	3.215e-27	2.945e-27	-26.493	-26.531	-0.038	(0)
Se (-2)	4.032e-16					
Ag2Se	4.032e-16	4.032e-16	-15.395	-15.395	0.000	(0)
HSe-	2.334e-39	2.139e-39	-38.632	-38.670	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-41.749	-41.749	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.137	-43.137	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.160	-45.312	-0.152	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.164	-82.772	-0.608	(0)
Se (4)	3.535e-09					
SeO3-2	1.913e-09	1.348e-09	-8.718	-8.870	-0.152	(0)
HSeO3-	1.622e-09	1.486e-09	-8.790	-8.828	-0.038	(0)
H2SeO3	2.782e-15	2.782e-15	-14.556	-14.556	0.000	(0)
AgSeO3-	9.528e-17	8.729e-17	-16.021	-16.059	-0.038	(0)
Cd (SeO3) 2-2	2.895e-22	2.040e-22	-21.538	-21.690	-0.152	(0)
Ag (SeO3) 2-3	2.317e-24	1.054e-24	-23.635	-23.977	-0.342	(0)
FeHSeO3+2	7.349e-28	5.177e-28	-27.134	-27.286	-0.152	(0)
Se (6)	1.822e-12					

	SeO4-2	1.821e-12	1.325e-12	-11.740	-11.878	-0.138	(0)
	MnSeO4	3.162e-16	3.162e-16	-15.500	-15.500	0.000	(0)
	ZnSeO4	3.485e-17	3.485e-17	-16.458	-16.458	0.000	(0)
	NiSeO4	8.082e-19	8.082e-19	-18.092	-18.092	0.000	(0)
	CoSeO4	6.418e-19	6.418e-19	-18.193	-18.193	0.000	(0)
	HSeO4-	3.182e-19	2.915e-19	-18.497	-18.535	-0.038	(0)
	CdSeO4	3.361e-20	3.361e-20	-19.473	-19.473	0.000	(0)
	Zn(SeO4) 2-2	6.646e-29	4.682e-29	-28.177	-28.330	-0.152	(0)
Si	3.105e-04						
	H4SiO4	2.998e-04	3.002e-04	-3.523	-3.523	0.001	(0)
	H3SiO4-	1.071e-05	9.885e-06	-4.970	-5.005	-0.035	(0)
	H2SiO4-2	1.936e-10	1.421e-10	-9.713	-9.847	-0.134	(0)
	UO2H3SiO4+	2.077e-13	1.903e-13	-12.683	-12.721	-0.038	(0)
	SiF6-2	3.068e-32	2.246e-32	-31.513	-31.649	-0.136	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-60.591	-60.933	-0.342	(0)
U (4)	4.589e-20						
	U (OH) 5-	4.588e-20	4.203e-20	-19.338	-19.376	-0.038	(0)
	U (OH) 4	7.727e-24	7.727e-24	-23.112	-23.112	0.000	(0)
	U (OH) 3+	1.354e-28	1.240e-28	-27.869	-27.907	-0.038	(0)
	U (OH) 2+2	3.573e-34	2.517e-34	-33.447	-33.599	-0.152	(0)
	UF3+	1.432e-39	1.312e-39	-38.844	-38.882	-0.038	(0)
	UF2+2	1.644e-40	1.158e-40	-39.784	-39.936	-0.152	(0)
	UOH+3	1.144e-40	0.000e+00	-39.941	-40.284	-0.342	(0)
	UF4	0.000e+00	0.000e+00	-40.988	-40.988	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-42.548	-42.890	-0.342	(0)
	UF5-	0.000e+00	0.000e+00	-43.498	-43.536	-0.038	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-44.377	-44.377	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-44.709	-44.861	-0.152	(0)
	UF6-2	0.000e+00	0.000e+00	-45.050	-45.202	-0.152	(0)
	U+4	0.000e+00	0.000e+00	-47.436	-48.044	-0.608	(0)
	UCl+3	0.000e+00	0.000e+00	-48.767	-49.109	-0.342	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-176.977	-180.057	-3.080	(0)
U (5)	1.219e-17						
	UO2+	1.219e-17	1.116e-17	-16.914	-16.952	-0.038	(0)
U (6)	1.498e-08						
	UO2 (CO3) 3-4	9.981e-09	2.459e-09	-8.001	-8.609	-0.608	(0)
	UO2 (CO3) 2-2	4.987e-09	3.513e-09	-8.302	-8.454	-0.152	(0)
	UO2CO3	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
	UO2H3SiO4+	2.077e-13	1.903e-13	-12.683	-12.721	-0.038	(0)
	UO2OH+	7.147e-14	6.548e-14	-13.146	-13.184	-0.038	(0)
	UO2F+	2.441e-15	2.237e-15	-14.612	-14.650	-0.038	(0)
	UO2F2	4.610e-16	4.610e-16	-15.336	-15.336	0.000	(0)
	UO2+2	3.117e-16	2.268e-16	-15.506	-15.644	-0.138	(0)
	UO2SO4	1.315e-16	1.315e-16	-15.881	-15.881	0.000	(0)
	UO2F3-	9.031e-18	8.274e-18	-17.044	-17.082	-0.038	(0)
	UO2 (SO4) 2-2	9.431e-19	6.645e-19	-18.025	-18.178	-0.152	(0)
	UO2Cl+	6.895e-19	6.317e-19	-18.161	-18.200	-0.038	(0)
	(UO2) 2 (OH) 2+2	1.010e-20	7.116e-21	-19.996	-20.148	-0.152	(0)
	UO2F4-2	6.667e-21	4.697e-21	-20.176	-20.328	-0.152	(0)
	(UO2) 3 (OH) 5+	2.030e-21	1.860e-21	-20.692	-20.730	-0.038	(0)
	UO2NO3+	2.655e-26	2.433e-26	-25.576	-25.614	-0.038	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-45.042	-45.080	-0.038	(0)
	V+2	0.000e+00	0.000e+00	-46.799	-46.951	-0.152	(0)
V (3)	2.756e-17						
	V (OH) 3	2.756e-17	2.756e-17	-16.560	-16.560	0.000	(0)
	V (OH) 2+	8.531e-29	7.816e-29	-28.069	-28.107	-0.038	(0)
	VOH+2	4.619e-33	3.254e-33	-32.335	-32.488	-0.152	(0)
	V+3	6.224e-39	2.830e-39	-38.206	-38.548	-0.342	(0)
	VSO4+	5.589e-40	5.120e-40	-39.253	-39.291	-0.038	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-61.800	-62.143	-0.342	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-63.567	-64.175	-0.608	(0)
V (4)	1.837e-21						
	V (OH) 3+	1.829e-21	1.676e-21	-20.738	-20.776	-0.038	(0)
	VO+2	5.198e-24	3.662e-24	-23.284	-23.436	-0.152	(0)
	VOF+	1.713e-24	1.570e-24	-23.766	-23.804	-0.038	(0)
	VOSO4	3.865e-25	3.865e-25	-24.413	-24.413	0.000	(0)

VOF2	4.206e-26	4.206e-26	-25.376	-25.376	0.000	(0)
VOC1+	1.926e-26	1.765e-26	-25.715	-25.753	-0.038	(0)
VOF3-	1.164e-28	1.066e-28	-27.934	-27.972	-0.038	(0)
VOF4-2	4.366e-32	3.076e-32	-31.360	-31.512	-0.152	(0)
H2V2O4+2	1.999e-37	1.408e-37	-36.699	-36.851	-0.152	(0)
V (5)	1.457e-10					
H2VO4-	8.353e-11	7.653e-11	-10.078	-10.116	-0.038	(0)
HVO4-2	6.217e-11	4.380e-11	-10.206	-10.359	-0.152	(0)
H3VO4	3.359e-15	3.359e-15	-14.474	-14.474	0.000	(0)
VO4-3	1.100e-16	5.001e-17	-15.959	-16.301	-0.342	(0)
HV2O7-3	2.498e-18	1.136e-18	-17.602	-17.945	-0.342	(0)
H3V2O7-	1.812e-18	1.660e-18	-17.742	-17.780	-0.038	(0)
VO2+	3.186e-20	2.942e-20	-19.497	-19.531	-0.035	(0)
V2O7-4	2.827e-20	6.965e-21	-19.549	-20.157	-0.608	(0)
VO2F	3.687e-21	3.687e-21	-20.433	-20.433	0.000	(0)
VO2SO4-	2.939e-22	2.692e-22	-21.532	-21.570	-0.038	(0)
VO2F2-	1.044e-22	9.567e-23	-21.981	-22.019	-0.038	(0)
V3O9-3	1.032e-24	4.695e-25	-23.986	-24.328	-0.342	(0)
VO2F3-2	1.210e-25	8.528e-26	-24.917	-25.069	-0.152	(0)
VO2F4-3	6.594e-30	2.998e-30	-29.181	-29.523	-0.342	(0)
VO2NO3	8.002e-31	8.002e-31	-30.097	-30.097	0.000	(0)
V4O12-4	6.080e-32	1.498e-32	-31.216	-31.825	-0.608	(0)
V10O28-6	0.000e+00	0.000e+00	-84.317	-85.686	-1.369	(0)
HV10O28-5	0.000e+00	0.000e+00	-84.906	-85.857	-0.951	(0)
H2V10O28-4	0.000e+00	0.000e+00	-88.399	-89.007	-0.608	(0)
Zn	4.519e-07					
Zn+2	2.334e-07	1.698e-07	-6.632	-6.770	-0.138	(0)
ZnCO3	1.364e-07	1.364e-07	-6.865	-6.865	0.000	(0)
ZnOH+	4.251e-08	3.895e-08	-7.372	-7.410	-0.038	(0)
ZnSO4	1.423e-08	1.423e-08	-7.847	-7.847	0.000	(0)
Zn (OH) 2	1.416e-08	1.416e-08	-7.849	-7.849	0.000	(0)
ZnHCO3+	7.662e-09	7.020e-09	-8.116	-8.154	-0.038	(0)
ZnOHCl	2.200e-09	2.200e-09	-8.658	-8.658	0.000	(0)
ZnCl+	7.934e-10	7.325e-10	-9.101	-9.135	-0.035	(0)
ZnF+	2.642e-10	2.421e-10	-9.578	-9.616	-0.038	(0)
Zn (OH) 3-	1.777e-10	1.628e-10	-9.750	-9.788	-0.038	(0)
Zn (SO4) 2-2	6.744e-11	4.751e-11	-10.171	-10.323	-0.152	(0)
ZnCl2	1.994e-12	1.994e-12	-11.700	-11.700	0.000	(0)
Zn (OH) 4-2	2.110e-14	1.487e-14	-13.676	-13.828	-0.152	(0)
ZnCl3-	2.947e-15	2.721e-15	-14.531	-14.565	-0.035	(0)
ZnSeO4	3.485e-17	3.485e-17	-16.458	-16.458	0.000	(0)
ZnNO3+	2.503e-17	2.293e-17	-16.602	-16.640	-0.038	(0)
ZnCl4-2	3.193e-18	2.337e-18	-17.496	-17.631	-0.136	(0)
Zn (NO3) 2	2.460e-28	2.460e-28	-27.609	-27.609	0.000	(0)
Zn (SeO4) 2-2	6.646e-29	4.682e-29	-28.177	-28.330	-0.152	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-146.998	-147.036	-0.038	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.383	-149.383	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.782	-223.820	-0.038	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.290	-225.442	-0.152	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-302.845	-302.997	-0.152	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-62.68	-56.39	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-45.89	-41.38	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-53.12	-41.38	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-80.98	-63.05	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-60.56	-40.53	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.91	-29.51	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-27.35	-26.90	0.45	(NH4) 2SeO4
Acanthite	-53.13	-89.35	-36.22	Ag2S
Ag2CO3	-13.76	-24.85	-11.09	Ag2CO3
Ag2CrO4	-22.89	-34.48	-11.59	Ag2CrO4
Ag2HVO4	-15.93	-14.45	1.48	Ag2HVO4
Ag2MoO4	-16.01	-27.56	-11.55	Ag2MoO4
Ag2O	-15.85	-3.28	12.57	Ag2O

Ag2Se	-1.61	-50.31	-48.70	Ag2Se
Ag2SeO3	-13.31	-20.46	-7.15	Ag2SeO3
Ag2SeO4	-22.96	-31.87	-8.91	Ag2SeO4
Ag2SO4	-18.59	-23.41	-4.82	Ag2SO4
Ag3AsO3	-28.93	-26.77	2.16	Ag3AsO3
Ag3AsO4	-17.98	-20.77	-2.79	Ag3AsO4
Ag3H2VO5	-21.27	-16.09	5.18	Ag3H2VO5
AgF·4H2O	-15.19	-14.14	1.05	AgF·4H2O
Agmetal	-0.58	-14.09	-13.51	Ag
AgVO3	-13.58	-12.81	0.77	AgVO3
Al(OH)3(am)	-3.82	6.98	10.80	Al(OH)3
Al2(MoO4)3	-61.27	-58.90	2.37	Al2(MoO4)3
Al2O3	-5.69	13.96	19.65	Al2O3
Al4(OH)10SO4	-14.92	7.78	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-13.67	-8.87	4.80	AlAsO4·2H2O
AlOHSO4	-9.92	-13.15	-3.23	AlOHSO4
AlSb	-154.50	-88.88	65.62	AlSb
Alunite	-13.40	-14.80	-1.40	KAl3(SO4)2(OH)6
Anglesite	-7.21	-15.00	-7.79	PbSO4
Anhydrite	-2.64	-7.00	-4.36	CaSO4
Anilite	-55.39	-87.26	-31.88	Cu0.25Cu1.5S
Antlerite	-5.86	2.93	8.79	Cu3(OH)4SO4
Aragonite	-0.14	-8.44	-8.30	CaCO3
Arsenolite	-84.65	-87.41	-2.76	As4O6
Artinite	-5.46	4.14	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-38.40	-31.70	6.71	As2O5
Atacamite	-3.14	4.25	7.39	Cu2(OH)3Cl
Azurite	-3.18	-20.08	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-16.55	7.84	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-22.54	-6.67	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	0.73	-8.18	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-31.77	1.17	32.94	Ba3(VO4)2·4H2O
BaCrO4	-13.69	-23.36	-9.67	BaCrO4
BaF2	-11.35	-17.17	-5.82	BaF2
BaMoO4	-9.49	-16.45	-6.96	BaMoO4
Barite	-2.31	-12.29	-9.98	BaSO4
BaS	-94.41	-78.23	16.18	BaS
BaSeO3	-11.18	-9.35	1.83	BaSeO3
BaSeO4	-13.29	-20.75	-7.46	BaSeO4
Bianchite	-8.42	-10.19	-1.76	ZnSO4·6H2O
Birnessite	-7.88	10.21	18.09	MnO2
Bixbyite	-3.83	-4.47	-0.64	Mn2O3
BlaubleiI	-55.41	-79.57	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.84	-83.12	-27.28	Cu0.6Cu0.8S
Boehmite	-1.60	6.98	8.58	AlOOH
Breithauptite	-57.05	-75.57	-18.52	NiSb
Brochantite	-4.61	10.61	15.22	Cu4(OH)6SO4
Brucite	-3.99	12.86	16.84	Mg(OH)2
Bunsenite	-4.62	7.83	12.45	NiO
Ca(VO3)2	-14.88	-9.22	5.66	Ca(VO3)2
Ca2V2O7	-13.59	3.91	17.50	Ca2V2O7
Ca2V2O7·2H2O	-17.64	3.91	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-14.61	7.69	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-21.92	17.04	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-22.82	17.04	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-295.30	-152.32	142.97	Ca3Sb2
CaCrO4	-15.81	-18.07	-2.27	CaCrO4
Calcite	0.04	-8.44	-8.48	CaCO3
Calomel	-13.26	-31.17	-17.91	Hg2Cl2
CaMoO4	-3.21	-11.16	-7.95	CaMoO4
Carnotite	-5.81	-5.58	0.23	KUO2VO4
CaSeO3·2H2O	-6.87	-4.06	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-12.44	-15.46	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.31	-3.47	9.84	Cd(BO2)2
Cd(OH)2	-6.79	6.85	13.64	Cd(OH)2
Cd(OH)2(am)	-6.88	6.85	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.43	-19.72	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.14	0.42	22.56	Cd3(OH)4SO4

Cd4 (OH) 6SO4	-21.13	7.27	28.40	Cd4 (OH) 6SO4
CdCl2	-14.74	-15.40	-0.66	CdCl2
CdCl2:1H2O	-13.70	-15.40	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.48	-15.40	-1.91	CdCl2:2.5H2O
CdF2	-16.95	-18.16	-1.21	CdF2
Cdmetal (alpha)	-31.57	-18.05	13.51	Cd
Cdmetal (gamma)	-31.67	-18.05	13.62	Cd
CdMoO4	-3.29	-17.44	-14.15	CdMoO4
CdOHCl	-7.81	-4.27	3.54	CdOHCl
CdSb	-76.21	-76.56	-0.35	CdSb
CdSe	-19.98	-40.18	-20.20	CdSe
CdSeO4:2H2O	-19.89	-21.74	-1.85	CdSeO4:2H2O
CdSO4	-13.11	-13.28	-0.17	CdSO4
CdSO4:1H2O	-11.56	-13.28	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.41	-13.28	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.01	-12.76	-9.75	AgCl
Cerrusite	-3.31	-16.44	-13.13	PbCO3
CH4 (g)	-80.13	-121.17	-41.05	CH4
Chalcanthite	-9.81	-12.45	-2.64	CuSO4:5H2O
Chalcedony	0.03	-3.52	-3.55	SiO2
Chalcocite	-55.30	-90.22	-34.92	Cu2S
Chalcopyrite	-125.42	-160.69	-35.27	CuFeS2
Chrysotile	-0.68	31.52	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-53.99	-99.68	-45.69	HgS
Claudetite	-84.34	-87.41	-3.06	As4O6
Clausthalite	-14.80	-41.90	-27.10	PbSe
Co (BO2) 2	-29.69	-2.62	27.07	Co (BO2) 2
Co (OH) 2	-5.39	7.70	13.09	Co (OH) 2
Co (OH) 3	-9.94	-12.25	-2.31	Co (OH) 3
CO2 (g)	-3.42	-21.57	-18.15	CO2
Co3 (AsO4) 2	-21.63	-8.60	13.03	Co3 (AsO4) 2
Co3O4	-6.30	-16.80	-10.50	Co3O4
CoCl2	-22.81	-14.54	8.27	CoCl2
CoCl2:6H2O	-17.08	-14.55	2.54	CoCl2:6H2O
CoCO3	-3.89	-13.87	-9.98	CoCO3
CoF2	-15.71	-17.31	-1.60	CoF2
CoF3	-48.30	-49.76	-1.46	CoF3
CoFe2O4	17.61	14.09	-3.53	CoFe2O4
CoMoO4	-8.82	-16.59	-7.76	CoMoO4
CoO	-5.89	7.70	13.59	CoO
CoS (alpha)	-70.93	-78.37	-7.44	CoS
CoS (beta)	-67.30	-78.37	-11.07	CoS
CoSe	-23.13	-39.33	-16.20	CoSe
CoSeO3	-10.81	-9.49	1.32	CoSeO3
CoSeO4:6H2O	-19.36	-20.89	-1.53	CoSeO4:6H2O
CoSO4	-15.23	-12.43	2.80	CoSO4
CoSO4:6H2O	-9.96	-12.43	-2.47	CoSO4:6H2O
Cotunnite	-12.34	-17.12	-4.78	PbCl2
Covellite	-56.09	-78.39	-22.30	CuS
Cr (OH) 2	-21.50	-10.68	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.02	-32.93	14.09	CrCl2
CrCl3	-49.66	-34.55	15.11	CrCl3
CrF3	-27.35	-38.69	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-66.06	-35.58	30.48	Cr
CrO3	-27.99	-31.20	-3.21	CrO3
Cryolite	-16.72	-50.56	-33.84	Na3AlF6
Cu (OH) 2	-0.99	7.69	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.03	15.18	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.51	-3.25	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.36	-90.24	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.38	-51.18	-45.80	Cu2Se
Cu2SO4	-22.33	-24.28	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.74	-8.64	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.48	-102.08	-42.59	Cu3Sb

Cu3Se2	-27.03	-90.52	-63.49	Cu3Se2
CuCO3	-2.38	-13.88	-11.50	CuCO3
CuCrO4	-18.08	-23.52	-5.44	CuCrO4
CuF	-9.67	-14.58	-4.91	CuF
CuF2	-18.44	-17.32	1.12	CuF2
CuF2:2H2O	-12.77	-17.32	-4.55	CuF2:2H2O
Cumetal	-5.77	-14.52	-8.76	Cu
CuMoO4	-3.52	-16.60	-13.08	CuMoO4
CuOCuSO4	-15.06	-4.76	10.30	CuOCuSO4
Cupricferrite	8.08	14.07	5.99	CuFe2O4
Cuprite	-2.74	-4.15	-1.41	Cu2O
Cuprousferrite	10.04	1.12	-8.92	CuFeO2
CuSe	-6.24	-39.34	-33.10	CuSe
CuSe2	-28.10	-61.47	-33.37	CuSe2
CuSeO3:2H2O	-10.01	-9.50	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.47	-20.91	-2.44	CuSeO4:5H2O
CuSO4	-15.38	-12.45	2.94	CuSO4
Diaspore	0.11	6.98	6.87	AlOOH
Djurleite	-55.52	-89.44	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.61	-17.15	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.06	-17.15	-17.09	CaMg(CO3)2
Epsomite	-5.15	-7.28	-2.13	MgSO4:7H2O
Fe(OH)2	-9.79	3.77	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.90	-0.14	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-14.85	-18.57	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.35	-10.80	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-24.54	-45.17	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-50.28	-54.01	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.06	10.16	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.06	-12.66	0.40	FeAsO4:2H2O
FeCr2O4	-5.78	1.42	7.20	FeCr2O4
FeMoO4	-10.42	-20.51	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.78	-65.38	-18.60	FeSe2
FeS(ppt)	-79.35	-82.30	-2.95	FeS
FeSe	-32.25	-43.25	-11.00	FeSe
Fix_pe	-4.09	-4.09	0.00	e-
Fluorite	-1.38	-11.88	-10.50	CaF2
Galena	-66.98	-80.95	-13.97	PbS
Gibbsite	-1.31	6.98	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-8.18	-10.19	-2.01	ZnSO4:7H2O
Greenalite	-16.53	4.28	20.81	Fe3Si2O5(OH)4
Greenockite	-64.86	-79.22	-14.36	CdS
Greigite	-289.10	-334.14	-45.03	Fe3S4
Gummite	-6.60	1.07	7.67	UO3
Gypsum	-2.39	-7.00	-4.61	CaSO4:2H2O
H-Jarosite	-18.59	-30.69	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.41	-24.29	-12.88	H2MoO4
H2S(g)	-78.06	-86.07	-8.01	H2S
H2Se(g)	-42.07	-47.03	-4.96	H2Se
Halite	-6.90	-5.29	1.60	NaCl
Halloysite	-2.66	6.91	9.57	Al2Si2O5(OH)4
Hausmannite	-4.14	56.89	61.03	Mn3O4
Hematite	7.80	6.39	-1.42	Fe2O3
Hercynite	-5.16	17.73	22.89	FeAl2O4
Hg(CH3)2(g)	-182.24	-255.95	-73.71	Hg(CH3)2
Hg(g)	-9.04	-16.91	-7.87	Hg
Hg(OH)2	-10.11	-13.61	-3.50	Hg(OH)2
Hg2(g)	-18.87	-33.83	-14.96	Hg2
Hg2(OH)2	-14.19	-8.93	5.26	Hg2(OH)2
Hg2CO3	-14.45	-30.50	-16.05	Hg2CO3
Hg2CrO4	-31.43	-40.13	-8.70	Hg2CrO4
Hg2F2	-23.57	-33.93	-10.36	Hg2F2
Hg2S	-83.32	-95.00	-11.68	Hg2S
Hg2SeO3	-21.46	-26.11	-4.66	Hg2SeO3
Hg2SO4	-22.93	-29.06	-6.13	Hg2SO4
Hg3O2CO3	-32.70	-62.39	-29.68	Hg3O2CO3

HgCl(g)	-35.08	-15.59	19.50	HgCl
HgCl2	-14.59	-35.85	-21.26	HgCl2
HgF(g)	-49.64	-16.97	32.68	HgF
HgF2(g)	-51.18	-38.61	12.57	HgF2
Hgmetal(l)	-3.46	-16.91	-13.45	Hg
HgSe	-4.94	-60.63	-55.69	HgSe
HgSeO3	-18.36	-30.79	-12.43	HgSeO3
HgSO4	-24.32	-33.74	-9.42	HgSO4
Huntite	-4.62	-34.58	-29.97	CaMg3(CO3)4
Hydrocerrusite	-8.98	-27.75	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.24	-22.00	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-23.59	-28.76	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-11.36	-26.16	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-36.11	-53.35	-17.24	K2Cr2O7
K2CrO4	-21.63	-22.15	-0.51	K2CrO4
K2MoO4	-18.49	-15.23	3.26	K2MoO4
K2SeO4	-18.81	-19.54	-0.73	K2SeO4
Kaolinite	-0.52	6.91	7.43	Al2Si2O5(OH)4
Langite	-6.87	10.61	17.49	Cu4(OH)6SO4·H2O
Larnakite	-9.44	-9.87	-0.43	PbO·PbSO4
Laurionite	-6.62	-5.99	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.57	13.13	32.70	CaO
Litharge	-7.57	5.13	12.69	PbO
Mackinawite	-78.70	-82.30	-3.60	FeS
Maghemite	-0.00	6.39	6.39	Fe2O3
Magnesioferrite	2.38	19.24	16.86	Fe2MgO4
Magnesite	-1.25	-8.71	-7.46	MgCO3
Magnetite	6.76	10.16	3.40	Fe3O4
Malachite	-0.89	-6.20	-5.31	Cu2(OH)2CO3
Manganite	-2.23	23.11	25.34	MnOOH
Massicot	-7.77	5.13	12.89	PbO
Matlockite	-9.52	-18.50	-8.97	PbClF
Melanothallite	-20.82	-14.56	6.26	CuCl2
Melanterite	-14.15	-16.36	-2.21	FeSO4·7H2O
Metacinnabar	-54.59	-99.68	-45.09	HgS
Mg(OH)2(active)	-5.94	12.86	18.79	Mg(OH)2
Mg(VO3)2	-20.77	-9.49	11.28	Mg(VO3)2
Mg2Sb3	-274.29	-199.60	74.68	Mg2Sb3
Mg2V2O7	-23.00	3.36	26.36	Mg2V2O7
MgCr2O4	-5.70	10.50	16.20	MgCr2O4
MgCrO4	-23.73	-18.35	5.38	MgCrO4
MgF2	-4.02	-12.15	-8.13	MgF2
MgMoO4	-9.58	-11.43	-1.85	MgMoO4
MgSeO3·6H2O	-7.39	-4.33	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-14.54	-15.74	-1.20	MgSeO4·6H2O
Minium	-33.23	40.29	73.52	Pb3O4
Mirabilite	-7.36	-8.48	-1.11	Na2SO4·10H2O
Mn(VO3)2	-16.58	-11.68	4.90	Mn(VO3)2
Mn2(SO4)3	-59.16	-64.87	-5.71	Mn2(SO4)3
Mn2Sb	-148.06	-86.98	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-12.21	0.29	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-14.30	-11.58	2.72	MnCl2·4H2O
MnS(grn)	-75.58	-75.41	0.17	MnS
MnS(pnk)	-78.75	-75.41	3.34	MnS
MnSb	-95.18	-98.09	-2.91	MnSb
MnSe	-39.86	-36.36	3.50	MnSe
MnSeO3	-7.65	-6.52	1.13	MnSeO3
MnSeO3·2H2O	-7.50	-6.52	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-15.88	-17.93	-2.05	MnSeO4·5H2O
MnSO4	-12.05	-9.47	2.58	MnSO4
Monteponite	-8.25	6.85	15.10	CdO
Montroydite	-9.97	-13.61	-3.64	HgO
MoO3	-16.29	-24.29	-8.00	MoO3
Morenosite	-10.16	-12.30	-2.14	NiSO4·7H2O
MoS2	-151.07	-221.33	-70.26	MoS2
Na-Jarosite	-13.66	-24.86	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.86	-50.75	-9.90	Na2Cr2O7

Na2CrO4	-22.48	-19.55	2.93	Na2CrO4
Na2Mo2O7	-20.32	-36.92	-16.60	Na2Mo2O7
Na2MoO4	-14.12	-12.63	1.49	Na2MoO4
Na2MoO4:2H2O	-13.85	-12.63	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.83	-5.53	10.30	Na2SeO3:5H2O
Na2SeO4	-18.22	-16.94	1.28	Na2SeO4
Na3Sb	-172.82	-78.37	94.45	Na3Sb
Na3VO4	-30.37	6.31	36.68	Na3VO4
Na4V2O7	-36.44	0.96	37.40	Na4V2O7
Nantokite	-6.47	-13.20	-6.73	CuCl
NaSb	-88.29	-65.13	23.17	NaSb
Natron	-8.60	-9.92	-1.31	Na2CO3:10H2O
NaVO3	-9.20	-5.35	3.86	NaVO3
Nesquehonite	-4.04	-8.71	-4.67	MgCO3:3H2O
Ni(OH)2	-4.96	7.83	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.91	-8.21	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.81	11.19	32.00	Ni4(OH)6SO4
NiCO3	-6.87	-13.74	-6.87	NiCO3
NiMoO4	-5.31	-16.45	-11.14	NiMoO4
NiS(alpha)	-72.64	-78.24	-5.60	NiS
NiS(beta)	-67.14	-78.24	-11.10	NiS
NiS(gamma)	-65.44	-78.24	-12.80	NiS
NiSe	-21.50	-39.20	-17.70	NiSe
NiSeO3:2H2O	-12.17	-9.36	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.24	-20.76	-1.52	NiSeO4:6H2O
Nsutite	-7.29	10.21	17.50	MnO2
O2(g)	-33.29	49.80	83.09	O2
Orpiment	-240.86	-301.93	-61.07	As2S3
Otavite	-2.72	-14.72	-12.00	CdCO3
Pb(BO2)2	-11.71	-5.19	6.52	Pb(BO2)2
Pb(OH)2	-3.02	5.13	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-69.37	-78.13	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.66	-0.87	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.93	10.26	26.19	Pb2O(OH)2
Pb2O3	-25.88	35.16	61.04	Pb2O3
Pb2OCO3	-10.75	-11.31	-0.56	Pb2OCO3
Pb2V2O7	-10.19	-12.09	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.11	-16.31	5.80	Pb3(AsO4)2
Pb3(VO4)2	-13.10	-6.96	6.14	Pb3(VO4)2
Pb3O2CO3	-17.20	-6.18	11.02	Pb3O2CO3
Pb3O2SO4	-15.43	-4.75	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.72	0.38	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.49	0.38	21.88	Pb4O3SO4
PbCrO4	-13.47	-26.07	-12.60	PbCrO4
PbF2	-12.44	-19.88	-7.44	PbF2
Pbmetal	-24.02	-19.77	4.25	Pb
PbMoO4	-3.54	-19.16	-15.62	PbMoO4
PbO:0.3H2O	-7.85	5.13	12.98	PbO:0.33H2O
PbSeO4	-16.62	-23.46	-6.84	PbSeO4
Periclase	-8.73	12.86	21.58	MgO
Phosgenite	-13.75	-33.56	-19.81	PbCl2:PbCO3
Plattnerite	-19.57	30.03	49.60	PbO2
Portlandite	-9.67	13.13	22.80	Ca(OH)2
Pyrite	-124.97	-143.47	-18.51	FeS2
Pyrochroite	-4.53	10.66	15.19	Mn(OH)2
Pyrolusite	-5.82	35.56	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-100.63	-120.38	-19.75	AsS
Retgersite	-10.26	-12.30	-2.04	NiSO4:6H2O
Rhodochrosite	-0.33	-10.91	-10.58	MnCO3
Rutherfordine	-6.00	-20.50	-14.50	UO2CO3
Sb(OH)3	-14.04	-21.15	-7.11	Sb(OH)3
Sb2O4	-20.81	-17.41	3.40	Sb2O4
Sb2O5	-31.46	-41.13	-9.67	Sb2O5
Sb2Se3	-115.63	-183.39	-67.76	Sb2Se3
Sb4O6(cubic)	-66.35	-84.61	-18.26	Sb4O6
Sb4O6(orth)	-66.71	-84.61	-17.90	Sb4O6
SbCl3	-55.09	-54.52	0.57	SbCl3

SbF3	-48.44	-58.66	-10.23	SbF3
Sbmetal	-46.82	-58.50	-11.69	Sb
SbO2	-5.19	-33.01	-27.82	SbO2
Schoepite	-4.92	1.07	5.99	UO2 (OH) 2:H2O
Semetal (am)	-15.02	-22.13	-7.11	Se
Semetal (hex)	-14.42	-22.13	-7.71	Se
Senarmontite	-29.94	-42.31	-12.37	Sb2O3
SeO2	-17.31	-17.19	0.12	SeO2
SeO3	-49.64	-28.59	21.04	SeO3
Sepiolite	-0.62	15.14	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.64	15.14	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.56	-17.80	-10.24	FeCO3
SiO2 (am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2 (am-ppt)	-0.78	-3.52	-2.74	SiO2
Smithsonite	-1.63	-11.63	-10.00	ZnCO3
Sphalerite	-64.68	-76.13	-11.45	ZnS
Spinel	-10.03	26.81	36.85	MgAl2O4
Stibnite	-250.07	-300.53	-50.46	Sb2S3
Sulfur	-59.03	-61.17	-2.14	S
Tenorite	0.04	7.69	7.64	CuO
Thenardite	-8.80	-8.48	0.32	Na2SO4
Thermonatrite	-10.55	-9.91	0.64	Na2CO3:H2O
Tyuyamunite	-11.16	-7.08	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.12	5.96	21.08	U3O8
U3Sb4	-579.65	-427.26	152.38	U3Sb4
U4O9	-30.53	-33.55	-3.02	U4O9
UF4	-35.09	-64.63	-29.54	UF4
UF4:2.5H2O	-31.91	-64.63	-32.72	UF4:2.5H2O
UO2 (am)	-15.55	-14.61	0.93	UO2
UO2 (NO3) 2	-48.33	-36.18	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.03	-36.18	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-39.57	-36.18	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.23	-36.18	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.54	1.07	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.27	-27.52	-2.25	UO2SeO4:4H2O
UO3	-6.63	1.07	7.70	UO3
Uraninite	-9.94	-14.61	-4.67	UO2
USb2	-220.22	-190.64	29.58	USb2
V (OH) 3	-21.07	-13.48	7.59	V (OH) 3
V2O5	-20.99	-22.35	-1.36	V2O5
V3O5	-46.90	-45.06	1.84	V3O5
V4O7	-58.97	-51.78	7.19	V4O7
V6O13	-55.98	-116.84	-60.86	V6O13
Valentinite	-33.83	-42.31	-8.48	Sb2O3
VC12	-67.05	-48.17	18.87	VC12
VC13	-70.28	-46.84	23.43	VC13
VF4	-71.67	-56.74	14.93	VF4
Vmetal	-94.85	-50.83	44.03	V
VO	-40.68	-25.93	14.76	VO
VO (OH) 2	-11.87	-6.72	5.15	VO (OH) 2
VO2Cl	-25.14	-22.30	2.84	VO2Cl
VOC1	-35.75	-24.60	11.15	VOC1
VOC12	-41.73	-28.97	12.76	VOC12
VOSO4	-30.46	-26.85	3.61	VOSO4
Witherite	-5.16	-13.73	-8.57	BaCO3
Wurtzite	-67.18	-76.13	-8.95	ZnS
Zincite	-1.39	9.95	11.33	ZnO
Zincosite	-14.12	-10.19	3.93	ZnSO4
Zn (BO2) 2	-8.66	-0.37	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-30.62	-27.31	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.25	9.95	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.53	9.95	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.81	9.95	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.59	9.95	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.79	9.95	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-7.74	-0.24	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-6.42	8.77	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.51	-1.86	13.65	Zn3 (AsO4) 2:2.5H2O

Zn3O(SO4)2	-29.34	-10.43	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.75	19.65	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.02	27.48	38.50	Zn5(OH)8Cl2
ZnCl2	-19.35	-12.30	7.05	ZnCl2
ZnCO3:1H2O	-1.37	-11.63	-10.26	ZnCO3:1H2O
ZnF2	-14.53	-15.06	-0.53	ZnF2
Znmetal	-40.74	-14.96	25.79	Zn
ZnMoO4	-4.21	-14.34	-10.13	ZnMoO4
ZnO(active)	-1.24	9.95	11.19	ZnO
ZnS(am)	-67.08	-76.13	-9.05	ZnS
ZnSb	-84.47	-73.46	11.01	ZnSb
ZnSe	-22.68	-37.08	-14.40	ZnSe
ZnSeO4:6H2O	-17.13	-18.65	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.55	-10.19	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 45.

```

Title Stage 2 Pit wall interaction mix calculator
MIX 204
209 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000078
11 0.000635
12 0.000469
13 0.001101
14 0
15 0
Save solution 210
end

```

TITLE

Stage 2 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 204.

Mixture 204.

```

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

```

0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
7.800e-05 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
6.350e-04 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
4.690e-04 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
1.101e-03 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 209 Solution after simulation 44.

-----Solution composition-----

Elements	Molality	Moles
Ag	5.201e-10	5.213e-10
Al	4.931e-08	4.943e-08
As	6.775e-09	6.791e-09
B	7.927e-06	7.946e-06
Ba	2.112e-09	2.117e-09
C	1.463e-03	1.466e-03
Ca	3.927e-04	3.936e-04
Cd	2.744e-10	2.750e-10
Cl	1.856e-03	1.860e-03
Co	1.842e-09	1.846e-09
Cr	6.239e-10	6.254e-10
Cu	9.588e-08	9.611e-08
F	7.885e-05	7.904e-05
Fe	7.743e-10	7.761e-10
Hg	4.498e-11	4.508e-11
K	1.605e-04	1.609e-04
Mg	2.045e-04	2.050e-04
Mn	1.355e-06	1.358e-06
Mo	3.703e-08	3.712e-08
N	3.095e-07	3.103e-07
Na	3.199e-03	3.207e-03
Ni	2.851e-09	2.858e-09
Pb	1.434e-10	1.438e-10
S	5.658e-04	5.672e-04
Sb	5.829e-10	5.843e-10
Se	3.538e-09	3.546e-09
Si	3.098e-04	3.105e-04
U	1.497e-08	1.501e-08
V	1.757e-10	1.762e-10
Zn	4.511e-07	4.522e-07

-----Description of solution-----

	pH	=	8.354	Charge balance
	pe	=	4.097	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	5.551e-03	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	1.491e-03	
	Total CO2 (mol/kg)	=	1.463e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.670e-08	

Percent error, $100 * (Cat - |An|) / (Cat + |An|)$ = 0.00
Iterations = 3
Total H = 1.112826e+02
Total O = 5.564790e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.467e-06	2.276e-06	-5.608	-5.643	-0.035	(0)
H+	4.789e-09	4.423e-09	-8.320	-8.354	-0.035	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.201e-10					
AgCl	3.525e-10	3.525e-10	-9.453	-9.453	0.000	(0)
Ag+	1.091e-10	1.007e-10	-9.962	-9.997	-0.035	(0)
AgCl2-	5.744e-11	5.263e-11	-10.241	-10.279	-0.038	(0)
AgSO4-	8.402e-13	7.698e-13	-12.076	-12.114	-0.038	(0)
AgCl3-2	1.141e-13	8.039e-14	-12.943	-13.095	-0.152	(0)
AgOH	2.293e-14	2.293e-14	-13.640	-13.640	0.000	(0)
AgF	1.807e-14	1.807e-14	-13.743	-13.743	0.000	(0)
AgNO2	5.274e-15	5.274e-15	-14.278	-14.278	0.000	(0)
AgH2BO3	1.452e-15	1.452e-15	-14.838	-14.838	0.000	(0)
AgNH3+	8.931e-16	8.183e-16	-15.049	-15.087	-0.038	(0)
AgCl4-3	6.183e-16	2.813e-16	-15.209	-15.551	-0.342	(0)
Ag2Se	3.961e-16	3.961e-16	-15.402	-15.402	0.000	(0)
AgSeO3-	9.494e-17	8.699e-17	-16.023	-16.061	-0.038	(0)
Ag (OH) 2-	5.567e-18	5.101e-18	-17.254	-17.292	-0.038	(0)
Ag (NH3) 2+	2.888e-20	2.646e-20	-19.539	-19.577	-0.038	(0)
AgNO3	4.313e-21	4.313e-21	-20.365	-20.365	0.000	(0)
Ag (NO2) 2-	2.234e-21	2.047e-21	-20.651	-20.689	-0.038	(0)
Ag (SeO3) 2-3	2.300e-24	1.046e-24	-23.638	-23.980	-0.342	(0)
Ag2MoO4	1.035e-28	1.035e-28	-27.985	-27.985	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.904	-73.904	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.183	-82.791	-0.608	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.543	-146.655	-0.111	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.487	-147.525	-0.038	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.518	-147.740	-0.222	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.836	-148.051	-0.215	(0)
Al	4.931e-08					
Al (OH) 4-	4.915e-08	4.542e-08	-7.309	-7.343	-0.034	(0)
Al (OH) 3	1.585e-10	1.585e-10	-9.800	-9.800	0.000	(0)
Al (OH) 2+	3.770e-12	3.490e-12	-11.424	-11.457	-0.034	(0)
AlF2+	1.859e-14	1.720e-14	-13.731	-13.764	-0.034	(0)
AlF3	1.546e-14	1.546e-14	-13.811	-13.811	0.000	(0)
AlOH+2	2.629e-15	1.930e-15	-14.580	-14.714	-0.134	(0)
AlF+2	8.246e-16	6.053e-16	-15.084	-15.218	-0.134	(0)
AlF4-	5.986e-16	5.533e-16	-15.223	-15.257	-0.034	(0)
AlSO4+	2.728e-18	2.521e-18	-17.564	-17.598	-0.034	(0)
Al+3	1.734e-18	8.479e-19	-17.761	-18.072	-0.311	(0)
Al (SO4) 2-	1.119e-20	1.035e-20	-19.951	-19.985	-0.034	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-58.280	-58.622	-0.342	(0)
As (3)	1.599e-22					
H3AsO3	1.419e-22	1.419e-22	-21.848	-21.848	0.000	(0)
H2AsO3-	1.796e-23	1.645e-23	-22.746	-22.784	-0.038	(0)
HAsO3-2	4.814e-27	3.393e-27	-26.317	-26.469	-0.152	(0)
H4AsO3+	3.394e-31	3.109e-31	-30.469	-30.507	-0.038	(0)
AsO3-3	6.499e-32	2.957e-32	-31.187	-31.529	-0.342	(0)
As (5)	6.775e-09					
HAsO4-2	6.564e-09	4.625e-09	-8.183	-8.335	-0.152	(0)
H2AsO4-	2.036e-10	1.866e-10	-9.691	-9.729	-0.038	(0)
AsO4-3	7.268e-12	3.307e-12	-11.139	-11.481	-0.342	(0)
H3AsO4	1.432e-16	1.434e-16	-15.844	-15.843	0.001	(0)
B	7.927e-06					
H3BO3	6.916e-06	6.924e-06	-5.160	-5.160	0.001	(0)
H2BO3-	9.874e-07	9.092e-07	-6.006	-6.041	-0.036	(0)
CaH2BO3+	1.476e-08	1.360e-08	-7.831	-7.867	-0.036	(0)
MgH2BO3+	4.731e-09	4.356e-09	-8.325	-8.361	-0.036	(0)

	NaH2BO3	4.245e-09	4.245e-09	-8.372	-8.372	0.000	(0)
	BF(OH) 3-	2.142e-10	1.973e-10	-9.669	-9.705	-0.036	(0)
	H5(BO3) 2-	5.819e-12	5.359e-12	-11.235	-11.271	-0.036	(0)
	BaH2BO3+	4.620e-14	4.254e-14	-13.335	-13.371	-0.036	(0)
	BF2(OH) 2-	7.232e-15	6.659e-15	-14.141	-14.177	-0.036	(0)
	H8(BO3) 3-	4.029e-15	3.710e-15	-14.395	-14.431	-0.036	(0)
	AgH2BO3	1.452e-15	1.452e-15	-14.838	-14.838	0.000	(0)
	BF3OH-	8.885e-22	8.182e-22	-21.051	-21.087	-0.036	(0)
	BF4-	1.381e-27	1.271e-27	-26.860	-26.896	-0.036	(0)
Ba		2.112e-09					
	Ba+2	2.081e-09	1.514e-09	-8.682	-8.820	-0.138	(0)
	BaHCO3+	2.038e-11	1.889e-11	-10.691	-10.724	-0.033	(0)
	BaCO3	1.075e-11	1.075e-11	-10.969	-10.969	0.000	(0)
	BaH2BO3+	4.620e-14	4.254e-14	-13.335	-13.371	-0.036	(0)
	BaOH+	1.626e-14	1.504e-14	-13.789	-13.823	-0.034	(0)
	BaNH3+2	5.393e-18	3.800e-18	-17.268	-17.420	-0.152	(0)
	BaNO3+	4.463e-19	4.089e-19	-18.350	-18.388	-0.038	(0)
C(4)		1.463e-03					
	HCO3-	1.411e-03	1.306e-03	-2.850	-2.884	-0.034	(0)
	CO3-2	1.903e-05	1.384e-05	-4.721	-4.859	-0.138	(0)
	H2CO3	1.299e-05	1.299e-05	-4.886	-4.886	0.000	(0)
	CaHCO3+	6.822e-06	6.320e-06	-5.166	-5.199	-0.033	(0)
	CaCO3	5.702e-06	5.702e-06	-5.244	-5.244	0.000	(0)
	NaHCO3	2.164e-06	2.164e-06	-5.665	-5.665	0.000	(0)
	MgHCO3+	2.000e-06	1.847e-06	-5.699	-5.734	-0.035	(0)
	MgCO3	1.591e-06	1.591e-06	-5.798	-5.798	0.000	(0)
	NaCO3-	8.205e-07	7.595e-07	-6.086	-6.119	-0.034	(0)
	ZnCO3	1.356e-07	1.356e-07	-6.868	-6.868	0.000	(0)
	CuCO3	7.924e-08	7.924e-08	-7.101	-7.101	0.000	(0)
	MnHCO3+	2.500e-08	2.312e-08	-7.602	-7.636	-0.034	(0)
	UO2(CO3) 3-4	9.943e-09	2.452e-09	-8.002	-8.610	-0.608	(0)
	ZnHCO3+	7.671e-09	7.029e-09	-8.115	-8.153	-0.038	(0)
	UO2(CO3) 2-2	5.015e-09	3.534e-09	-8.300	-8.452	-0.152	(0)
	Cu(CO3) 2-2	4.190e-09	2.953e-09	-8.378	-8.530	-0.152	(0)
	NiCO3	6.736e-10	6.736e-10	-9.172	-9.172	0.000	(0)
	NiHCO3+	2.292e-10	2.100e-10	-9.640	-9.678	-0.038	(0)
	CoCO3	2.260e-10	2.260e-10	-9.646	-9.646	0.000	(0)
	PbCO3	1.119e-10	1.119e-10	-9.951	-9.951	0.000	(0)
	CoHCO3+	1.071e-10	9.812e-11	-9.970	-10.008	-0.038	(0)
	CuHCO3+	8.743e-11	8.010e-11	-10.058	-10.096	-0.038	(0)
	CdCO3	4.320e-11	4.320e-11	-10.365	-10.365	0.000	(0)
	BaHCO3+	2.038e-11	1.889e-11	-10.691	-10.724	-0.033	(0)
	UO2CO3	1.279e-11	1.279e-11	-10.893	-10.893	0.000	(0)
	BaCO3	1.075e-11	1.075e-11	-10.969	-10.969	0.000	(0)
	Pb(CO3) 2-2	6.343e-12	4.470e-12	-11.198	-11.350	-0.152	(0)
	PbHCO3+	2.849e-12	2.611e-12	-11.545	-11.583	-0.038	(0)
	Cd(CO3) 2-2	6.291e-13	4.433e-13	-12.201	-12.353	-0.152	(0)
	CdHCO3+	4.443e-13	4.071e-13	-12.352	-12.390	-0.038	(0)
	FeHCO3+	2.225e-15	2.061e-15	-14.653	-14.686	-0.033	(0)
	HgCO3	1.261e-17	1.261e-17	-16.899	-16.899	0.000	(0)
	Hg(CO3) 2-2	7.837e-19	5.523e-19	-18.106	-18.258	-0.152	(0)
	HgHCO3+	1.134e-21	1.039e-21	-20.945	-20.983	-0.038	(0)
Ca		3.927e-04					
	Ca+2	3.571e-04	2.599e-04	-3.447	-3.585	-0.138	(0)
	CaSO4	2.280e-05	2.280e-05	-4.642	-4.642	0.000	(0)
	CaHCO3+	6.822e-06	6.320e-06	-5.166	-5.199	-0.033	(0)
	CaCO3	5.702e-06	5.702e-06	-5.244	-5.244	0.000	(0)
	CaF+	2.189e-07	2.025e-07	-6.660	-6.694	-0.034	(0)
	CaH2BO3+	1.476e-08	1.360e-08	-7.831	-7.867	-0.036	(0)
	CaOH+	1.274e-08	1.180e-08	-7.895	-7.928	-0.033	(0)
	CaNH3+2	1.847e-12	1.302e-12	-11.734	-11.886	-0.152	(0)
	CaNO3+	4.834e-14	4.429e-14	-13.316	-13.354	-0.038	(0)
	Ca(NH3) 2+2	2.925e-21	2.061e-21	-20.534	-20.686	-0.152	(0)
Cd		2.744e-10					
	Cd+2	1.881e-10	1.369e-10	-9.726	-9.864	-0.138	(0)
	CdCO3	4.320e-11	4.320e-11	-10.365	-10.365	0.000	(0)
	CdCl+	2.445e-11	2.241e-11	-10.612	-10.650	-0.038	(0)
	CdSO4	1.229e-11	1.229e-11	-10.910	-10.910	0.000	(0)

CdOH+	2.701e-12	2.475e-12	-11.568	-11.606	-0.038	(0)
CdOHC1	2.092e-12	2.092e-12	-11.679	-11.679	0.000	(0)
Cd(CO3) 2-2	6.291e-13	4.433e-13	-12.201	-12.353	-0.152	(0)
CdHCO3+	4.443e-13	4.071e-13	-12.352	-12.390	-0.038	(0)
CdF+	1.690e-13	1.549e-13	-12.772	-12.810	-0.038	(0)
CdCl2	1.601e-13	1.601e-13	-12.796	-12.796	0.000	(0)
Cd(SO4) 2-2	9.011e-14	6.350e-14	-13.045	-13.197	-0.152	(0)
Cd(OH) 2	3.555e-14	3.555e-14	-13.449	-13.449	0.000	(0)
CdCl3-	1.890e-16	1.731e-16	-15.724	-15.762	-0.038	(0)
CdF2	2.206e-17	2.206e-17	-16.656	-16.656	0.000	(0)
Cd(OH) 3-	5.396e-18	4.943e-18	-17.268	-17.306	-0.038	(0)
CdSeO4	3.383e-20	3.383e-20	-19.471	-19.471	0.000	(0)
CdNO3+	2.546e-20	2.333e-20	-19.594	-19.632	-0.038	(0)
Cd2OH+3	3.732e-21	1.698e-21	-20.428	-20.770	-0.342	(0)
Cd(SeO3) 2-2	2.890e-22	2.037e-22	-21.539	-21.691	-0.152	(0)
Cd(OH) 4-2	2.614e-24	1.842e-24	-23.583	-23.735	-0.152	(0)
Cd(NO3) 2	6.301e-31	6.301e-31	-30.201	-30.201	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.539	-79.577	-0.038	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.095	-150.095	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.878	-225.916	-0.038	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.290	-301.442	-0.152	(0)
C1	1.856e-03					
Cl-	1.856e-03	1.714e-03	-2.731	-2.766	-0.035	(0)
ZnOHC1	2.183e-09	2.183e-09	-8.661	-8.661	0.000	(0)
MnCl+	2.070e-09	1.914e-09	-8.684	-8.718	-0.034	(0)
ZnCl+	7.934e-10	7.326e-10	-9.101	-9.135	-0.035	(0)
AgCl	3.525e-10	3.525e-10	-9.453	-9.453	0.000	(0)
CuCl	8.215e-11	8.215e-11	-10.085	-10.085	0.000	(0)
AgCl2-	5.744e-11	5.263e-11	-10.241	-10.279	-0.038	(0)
CuCl2-	3.186e-11	2.942e-11	-10.497	-10.531	-0.035	(0)
CdCl+	2.445e-11	2.241e-11	-10.612	-10.650	-0.038	(0)
CoCl+	6.250e-12	5.726e-12	-11.204	-11.242	-0.038	(0)
NiCl+	6.242e-12	5.719e-12	-11.205	-11.243	-0.038	(0)
MnCl2	4.635e-12	4.635e-12	-11.334	-11.334	0.000	(0)
CuCl+	2.859e-12	2.640e-12	-11.544	-11.578	-0.035	(0)
CdOHC1	2.092e-12	2.092e-12	-11.679	-11.679	0.000	(0)
ZnCl2	1.990e-12	1.990e-12	-11.701	-11.701	0.000	(0)
PbCl+	1.785e-13	1.636e-13	-12.748	-12.786	-0.038	(0)
CdCl2	1.601e-13	1.601e-13	-12.796	-12.796	0.000	(0)
AgCl3-2	1.141e-13	8.039e-14	-12.943	-13.095	-0.152	(0)
CuCl3-2	1.472e-14	1.078e-14	-13.832	-13.967	-0.135	(0)
HgClOH	5.246e-15	5.246e-15	-14.280	-14.280	0.000	(0)
ZnCl3-	2.934e-15	2.709e-15	-14.533	-14.567	-0.035	(0)
MnCl3-	2.365e-15	2.188e-15	-14.626	-14.660	-0.034	(0)
CuCl2	1.569e-15	1.569e-15	-14.804	-14.804	0.000	(0)
PbCl2	1.252e-15	1.252e-15	-14.902	-14.902	0.000	(0)
AgCl4-3	6.183e-16	2.813e-16	-15.209	-15.551	-0.342	(0)
HgCl2	2.237e-16	2.237e-16	-15.650	-15.650	0.000	(0)
CdCl3-	1.890e-16	1.731e-16	-15.724	-15.762	-0.038	(0)
NiCl2	4.935e-17	4.935e-17	-16.307	-16.307	0.000	(0)
HgCl3-	4.184e-18	3.834e-18	-17.378	-17.416	-0.038	(0)
ZnCl4-2	3.172e-18	2.322e-18	-17.499	-17.634	-0.135	(0)
PbCl3-	9.327e-19	8.545e-19	-18.030	-18.068	-0.038	(0)
UO2Cl+	7.041e-19	6.451e-19	-18.152	-18.190	-0.038	(0)
CrCl+2	6.664e-20	4.696e-20	-19.176	-19.328	-0.152	(0)
HgCl4-2	3.712e-20	2.616e-20	-19.430	-19.582	-0.152	(0)
HgCl+	2.842e-20	2.604e-20	-19.546	-19.584	-0.038	(0)
CuCl3-	2.718e-20	2.510e-20	-19.566	-19.600	-0.035	(0)
CrOHC12	3.482e-21	3.482e-21	-20.458	-20.458	0.000	(0)
PbCl4-2	9.500e-22	6.695e-22	-21.022	-21.174	-0.152	(0)
FeCl+2	1.029e-23	7.536e-24	-22.987	-23.123	-0.135	(0)
CrCl2+	8.335e-24	7.637e-24	-23.079	-23.117	-0.038	(0)
CuCl4-2	2.945e-25	2.156e-25	-24.531	-24.666	-0.135	(0)
FeCl2+	6.238e-26	5.770e-26	-25.205	-25.239	-0.034	(0)
VOCl+	2.375e-26	2.176e-26	-25.624	-25.662	-0.038	(0)
CrO3Cl-	2.389e-27	2.189e-27	-26.622	-26.660	-0.038	(0)
FeCl3	9.889e-30	9.889e-30	-29.005	-29.005	0.000	(0)
CoCl+2	2.379e-38	1.677e-38	-37.624	-37.776	-0.152	(0)

UCl+3	0.000e+00	0.000e+00	-48.753	-49.095	-0.342	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.672	-53.824	-0.152	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.588	-55.740	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.788	-68.940	-0.152	(0)
Co (2)	1.842e-09					
Co+2	1.370e-09	9.657e-10	-8.863	-9.015	-0.152	(0)
CoCO3	2.260e-10	2.260e-10	-9.646	-9.646	0.000	(0)
CoHCO3+	1.071e-10	9.812e-11	-9.970	-10.008	-0.038	(0)
CoSO4	7.380e-11	7.380e-11	-10.132	-10.132	0.000	(0)
CoOH+	4.787e-11	4.386e-11	-10.320	-10.358	-0.038	(0)
Co (OH) 2	7.931e-12	7.931e-12	-11.101	-11.101	0.000	(0)
CoCl+	6.250e-12	5.726e-12	-11.204	-11.242	-0.038	(0)
CoF+	2.380e-12	2.180e-12	-11.623	-11.661	-0.038	(0)
CoNO2+	1.861e-15	1.705e-15	-14.730	-14.768	-0.038	(0)
Co (NH3) +2	6.555e-16	4.619e-16	-15.183	-15.335	-0.152	(0)
Co (OH) 3-	3.931e-16	3.602e-16	-15.405	-15.443	-0.038	(0)
CoOOH-	9.865e-17	9.038e-17	-16.006	-16.044	-0.038	(0)
CoSeO4	6.423e-19	6.423e-19	-18.192	-18.192	0.000	(0)
CoNO3+	9.003e-20	8.249e-20	-19.046	-19.084	-0.038	(0)
Co2OH+3	4.666e-21	2.123e-21	-20.331	-20.673	-0.342	(0)
Co (OH) 4-2	1.844e-22	1.299e-22	-21.734	-21.886	-0.152	(0)
Co (NH3) 2+2	1.112e-22	7.839e-23	-21.954	-22.106	-0.152	(0)
Co (NO3) 2	9.046e-30	9.046e-30	-29.044	-29.044	0.000	(0)
Co (NH3) 3+2	5.572e-30	3.926e-30	-29.254	-29.406	-0.152	(0)
Co4 (OH) 4+4	2.995e-33	7.385e-34	-32.524	-33.132	-0.608	(0)
Co (NH3) 4+2	1.163e-37	8.198e-38	-36.934	-37.086	-0.152	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.115	-45.267	-0.152	(0)
Co (3)	7.891e-31					
CoOH+2	7.891e-31	5.561e-31	-30.103	-30.255	-0.152	(0)
Co+3	9.830e-38	4.808e-38	-37.007	-37.318	-0.311	(0)
CoCl+2	2.379e-38	1.677e-38	-37.624	-37.776	-0.152	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.672	-53.824	-0.152	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.627	-64.665	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.464	-67.616	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.788	-68.940	-0.152	(0)
Cr (2)	5.739e-28					
Cr+2	5.739e-28	4.044e-28	-27.241	-27.393	-0.152	(0)
Cr (3)	6.239e-10					
Cr (OH) 2+	3.187e-10	2.920e-10	-9.497	-9.535	-0.038	(0)
Cr (OH) 3	2.497e-10	2.497e-10	-9.603	-9.603	0.000	(0)
CrO2-	2.926e-11	2.681e-11	-10.534	-10.572	-0.038	(0)
Cr (OH) 4-	2.469e-11	2.263e-11	-10.607	-10.645	-0.038	(0)
Cr (OH) +2	1.496e-12	1.054e-12	-11.825	-11.977	-0.152	(0)
CrOHSO4	9.582e-14	9.582e-14	-13.019	-13.019	0.000	(0)
CrF+2	3.399e-16	2.395e-16	-15.469	-15.621	-0.152	(0)
Cr+3	4.653e-17	2.117e-17	-16.332	-16.674	-0.342	(0)
CrSO4+	2.066e-17	1.893e-17	-16.685	-16.723	-0.038	(0)
CrCl+2	6.664e-20	4.696e-20	-19.176	-19.328	-0.152	(0)
CrOHC12	3.482e-21	3.482e-21	-20.458	-20.458	0.000	(0)
Cr2 (OH) 2SO4+2	1.296e-23	9.130e-24	-22.888	-23.040	-0.152	(0)
CrCl2+	8.335e-24	7.637e-24	-23.079	-23.117	-0.038	(0)
Cr2 (OH) 2 (SO4) 2	2.077e-25	2.077e-25	-24.683	-24.683	0.000	(0)
CrNO3+2	7.077e-29	4.987e-29	-28.150	-28.302	-0.152	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.794	-43.946	-0.152	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.734	-54.076	-0.342	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.588	-55.740	-0.152	(0)
Cr (6)	4.511e-15					
CrO4-2	4.407e-15	3.207e-15	-14.356	-14.494	-0.138	(0)
NaCrO4-	5.124e-17	4.695e-17	-16.290	-16.328	-0.038	(0)
HCrO4-	5.010e-17	4.590e-17	-16.300	-16.338	-0.038	(0)
KCrO4-	1.923e-18	1.762e-18	-17.716	-17.754	-0.038	(0)
H2CrO4	1.646e-25	1.646e-25	-24.784	-24.784	0.000	(0)
CrO3SO4-2	3.361e-26	2.369e-26	-25.473	-25.625	-0.152	(0)
CrO3Cl-	2.389e-27	2.189e-27	-26.622	-26.660	-0.038	(0)
Cr2O7-2	1.037e-31	7.307e-32	-30.984	-31.136	-0.152	(0)
Cu (1)	1.556e-10					
CuCl	8.215e-11	8.215e-11	-10.085	-10.085	0.000	(0)
Cu+	4.155e-11	3.807e-11	-10.381	-10.419	-0.038	(0)

CuCl2-	3.186e-11	2.942e-11	-10.497	-10.531	-0.035	(0)
CuCl3-2	1.472e-14	1.078e-14	-13.832	-13.967	-0.135	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.545	-145.764	-0.219	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.282	-146.494	-0.212	(0)
Cu (2)	9.572e-08					
CuCO3	7.924e-08	7.924e-08	-7.101	-7.101	0.000	(0)
CuOH+	7.577e-09	6.996e-09	-8.121	-8.155	-0.035	(0)
Cu (CO3) 2-2	4.190e-09	2.953e-09	-8.378	-8.530	-0.152	(0)
Cu (OH) 2	3.178e-09	3.178e-09	-8.498	-8.498	0.000	(0)
Cu+2	1.336e-09	9.720e-10	-8.874	-9.012	-0.138	(0)
CuHCO3+	8.743e-11	8.010e-11	-10.058	-10.096	-0.038	(0)
CuSO4	8.528e-11	8.528e-11	-10.069	-10.069	0.000	(0)
Cu (OH) 3-	1.619e-11	1.484e-11	-10.791	-10.829	-0.038	(0)
CuF+	4.779e-12	4.378e-12	-11.321	-11.359	-0.038	(0)
CuCl+	2.859e-12	2.640e-12	-11.544	-11.578	-0.035	(0)
Cu2 (OH) 2+2	1.745e-12	1.230e-12	-11.758	-11.910	-0.152	(0)
CuNH3+2	5.615e-14	3.957e-14	-13.251	-13.403	-0.152	(0)
CuNO2+	2.783e-14	2.550e-14	-13.555	-13.593	-0.038	(0)
CuCl2	1.569e-15	1.569e-15	-14.804	-14.804	0.000	(0)
Cu (OH) 4-2	3.772e-16	2.658e-16	-15.423	-15.575	-0.152	(0)
CuNO3+	1.808e-19	1.657e-19	-18.743	-18.781	-0.038	(0)
Cu (NO2) 2	6.539e-20	6.539e-20	-19.185	-19.185	0.000	(0)
CuCl3-	2.718e-20	2.510e-20	-19.566	-19.600	-0.035	(0)
CuCl4-2	2.945e-25	2.156e-25	-24.531	-24.666	-0.135	(0)
Cu (NO3) 2	1.124e-30	1.124e-30	-29.949	-29.949	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.240	-216.278	-0.038	(0)
F	7.885e-05					
F-	7.730e-05	7.139e-05	-4.112	-4.146	-0.035	(0)
MgF+	1.198e-06	1.107e-06	-5.922	-5.956	-0.034	(0)
CaF+	2.189e-07	2.025e-07	-6.660	-6.694	-0.034	(0)
NaF	1.327e-07	1.327e-07	-6.877	-6.877	0.000	(0)
MnF+	2.726e-09	2.522e-09	-8.564	-8.598	-0.034	(0)
HF	4.670e-10	4.670e-10	-9.331	-9.331	0.000	(0)
ZnF+	2.645e-10	2.424e-10	-9.577	-9.615	-0.038	(0)
BF (OH) 3-	2.142e-10	1.973e-10	-9.669	-9.705	-0.036	(0)
CuF+	4.779e-12	4.378e-12	-11.321	-11.359	-0.038	(0)
NiF+	2.553e-12	2.339e-12	-11.593	-11.631	-0.038	(0)
CoF+	2.380e-12	2.180e-12	-11.623	-11.661	-0.038	(0)
CdF+	1.690e-13	1.549e-13	-12.772	-12.810	-0.038	(0)
HF2-	1.374e-13	1.268e-13	-12.862	-12.897	-0.035	(0)
AlF2+	1.859e-14	1.720e-14	-13.731	-13.764	-0.034	(0)
AgF	1.807e-14	1.807e-14	-13.743	-13.743	0.000	(0)
AlF3	1.546e-14	1.546e-14	-13.811	-13.811	0.000	(0)
PbF+	1.477e-14	1.353e-14	-13.831	-13.869	-0.038	(0)
BF2 (OH) 2-	7.232e-15	6.659e-15	-14.141	-14.177	-0.036	(0)
UO2F+	2.496e-15	2.287e-15	-14.603	-14.641	-0.038	(0)
AlF+2	8.246e-16	6.053e-16	-15.084	-15.218	-0.134	(0)
AlF4-	5.986e-16	5.533e-16	-15.223	-15.257	-0.034	(0)
UO2F2	4.709e-16	4.709e-16	-15.327	-15.327	0.000	(0)
CrF+2	3.399e-16	2.395e-16	-15.469	-15.621	-0.152	(0)
CdF2	2.206e-17	2.206e-17	-16.656	-16.656	0.000	(0)
PbF2	1.901e-17	1.901e-17	-16.721	-16.721	0.000	(0)
UO2F3-	9.217e-18	8.444e-18	-17.035	-17.073	-0.038	(0)
H2F2	5.844e-19	5.844e-19	-18.233	-18.233	0.000	(0)
FeF2+	2.354e-20	2.177e-20	-19.628	-19.662	-0.034	(0)
FeF+2	1.557e-20	1.140e-20	-19.808	-19.943	-0.135	(0)
UO2F4-2	6.795e-21	4.789e-21	-20.168	-20.320	-0.152	(0)
VO2F	4.528e-21	4.528e-21	-20.344	-20.344	0.000	(0)
PbF3-	2.810e-21	2.574e-21	-20.551	-20.589	-0.038	(0)
FeF3	2.193e-21	2.193e-21	-20.659	-20.659	0.000	(0)
BF3OH-	8.885e-22	8.182e-22	-21.051	-21.087	-0.036	(0)
VO2F2-	1.281e-22	1.174e-22	-21.892	-21.930	-0.038	(0)
VOF+	2.115e-24	1.938e-24	-23.675	-23.713	-0.038	(0)
VO2F3-2	1.483e-25	1.045e-25	-24.829	-24.981	-0.152	(0)
PbF4-2	1.248e-25	8.796e-26	-24.904	-25.056	-0.152	(0)
VOF2	5.188e-26	5.188e-26	-25.285	-25.285	0.000	(0)
HgF+	2.199e-27	2.015e-27	-26.658	-26.696	-0.038	(0)
BF4-	1.381e-27	1.271e-27	-26.860	-26.896	-0.036	(0)

Sb(OH) 2F	3.478e-28	3.478e-28	-27.459	-27.459	0.000	(0)
SbOF	3.421e-28	3.421e-28	-27.466	-27.466	0.000	(0)
VOF3-	1.434e-28	1.314e-28	-27.843	-27.881	-0.038	(0)
VO2F4-3	8.069e-30	3.671e-30	-29.093	-29.435	-0.342	(0)
VOF4-2	5.373e-32	3.787e-32	-31.270	-31.422	-0.152	(0)
SiF6-2	3.139e-32	2.298e-32	-31.503	-31.639	-0.135	(0)
UF3+	1.477e-39	1.353e-39	-38.831	-38.869	-0.038	(0)
UF2+2	1.697e-40	1.196e-40	-39.770	-39.922	-0.152	(0)
UF4	0.000e+00	0.000e+00	-40.975	-40.975	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.534	-42.876	-0.342	(0)
UF5-	0.000e+00	0.000e+00	-43.485	-43.523	-0.038	(0)
UF6-2	0.000e+00	0.000e+00	-45.038	-45.190	-0.152	(0)
Fe (2)	2.042e-13					
Fe+2	1.779e-13	1.253e-13	-12.750	-12.902	-0.152	(0)
FeOH+	1.228e-14	1.136e-14	-13.911	-13.945	-0.034	(0)
FeSO4	1.178e-14	1.178e-14	-13.929	-13.929	0.000	(0)
FeHCO3+	2.225e-15	2.061e-15	-14.653	-14.686	-0.033	(0)
Fe (OH) 2	2.054e-17	2.054e-17	-16.687	-16.687	0.000	(0)
Fe (OH) 3-	1.598e-17	1.478e-17	-16.796	-16.830	-0.034	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.395	-159.395	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.042	-235.080	-0.038	(0)
Fe (3)	7.741e-10					
Fe (OH) 3	4.633e-10	4.633e-10	-9.334	-9.334	0.000	(0)
Fe (OH) 2+	2.047e-10	1.895e-10	-9.689	-9.722	-0.034	(0)
Fe (OH) 4-	1.061e-10	9.819e-11	-9.974	-10.008	-0.034	(0)
FeOH+2	2.923e-16	2.140e-16	-15.534	-15.670	-0.135	(0)
FeF2+	2.354e-20	2.177e-20	-19.628	-19.662	-0.034	(0)
FeF+2	1.557e-20	1.140e-20	-19.808	-19.943	-0.135	(0)
FeF3	2.193e-21	2.193e-21	-20.659	-20.659	0.000	(0)
FeSO4+	6.764e-22	6.257e-22	-21.170	-21.204	-0.034	(0)
Fe+3	2.977e-22	1.456e-22	-21.526	-21.837	-0.311	(0)
FeCl+2	1.029e-23	7.536e-24	-22.987	-23.123	-0.135	(0)
Fe (SO4) 2-	5.592e-24	5.123e-24	-23.252	-23.290	-0.038	(0)
FeCl2+	6.238e-26	5.770e-26	-25.205	-25.239	-0.034	(0)
FeHSeO3+2	8.150e-28	5.743e-28	-27.089	-27.241	-0.152	(0)
FeCl3	9.889e-30	9.889e-30	-29.005	-29.005	0.000	(0)
Fe2 (OH) 2+4	6.148e-30	1.516e-30	-29.211	-29.819	-0.608	(0)
FeNO3+2	1.114e-31	7.847e-32	-30.953	-31.105	-0.152	(0)
Fe3 (OH) 4+5	3.701e-38	4.153e-39	-37.432	-38.382	-0.950	(0)
H (0)	1.769e-28					
H2	8.846e-29	8.858e-29	-28.053	-28.053	0.001	(0)
Hg (0)	4.494e-11					
Hg	4.494e-11	4.494e-11	-10.347	-10.347	0.000	(0)
Hg (1)	6.593e-26					
Hg2+2	3.297e-26	2.323e-26	-25.482	-25.634	-0.152	(0)
Hg (2)	3.035e-14					
Hg (OH) 2	2.486e-14	2.489e-14	-13.605	-13.604	0.001	(0)
HgClOH	5.246e-15	5.246e-15	-14.280	-14.280	0.000	(0)
HgCl2	2.237e-16	2.237e-16	-15.650	-15.650	0.000	(0)
HgCO3	1.261e-17	1.261e-17	-16.899	-16.899	0.000	(0)
HgCl3-	4.184e-18	3.834e-18	-17.378	-17.416	-0.038	(0)
Hg (CO3) 2-2	7.837e-19	5.523e-19	-18.106	-18.258	-0.152	(0)
HgOH+	7.530e-20	6.900e-20	-19.123	-19.161	-0.038	(0)
HgCl4-2	3.712e-20	2.616e-20	-19.430	-19.582	-0.152	(0)
HgCl+	2.842e-20	2.604e-20	-19.546	-19.584	-0.038	(0)
Hg (OH) 3-	7.785e-21	7.133e-21	-20.109	-20.147	-0.038	(0)
HgHCO3+	1.134e-21	1.039e-21	-20.945	-20.983	-0.038	(0)
Hg (NH3) 2+2	1.079e-23	7.603e-24	-22.967	-23.119	-0.152	(0)
HgNH3+2	2.712e-24	1.911e-24	-23.567	-23.719	-0.152	(0)
Hg+2	1.080e-24	7.614e-25	-23.966	-24.118	-0.152	(0)
HgSO4	7.635e-26	7.635e-26	-25.117	-25.117	0.000	(0)
HgF+	2.199e-27	2.015e-27	-26.658	-26.696	-0.038	(0)
Hg (NH3) 3+2	1.709e-31	1.204e-31	-30.767	-30.919	-0.152	(0)
HgNO3+	1.654e-35	1.515e-35	-34.782	-34.820	-0.038	(0)
Hg (NH3) 4+2	5.400e-39	3.806e-39	-38.268	-38.420	-0.152	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.469	-45.469	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.241	-139.279	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-139.481	-139.633	-0.152	(0)

	Hg (HS) 2	0.000e+00	0.000e+00	-141.240	-141.240	0.000	(0)
K	1.605e-04						
	K+	1.601e-04	1.479e-04	-3.796	-3.830	-0.035	(0)
	KSO4-	4.332e-07	4.009e-07	-6.363	-6.397	-0.034	(0)
	KCrO4-	1.923e-18	1.762e-18	-17.716	-17.754	-0.038	(0)
Mg	2.045e-04						
	Mg+2	1.899e-04	1.382e-04	-3.721	-3.860	-0.138	(0)
	MgSO4	9.631e-06	9.631e-06	-5.016	-5.016	0.000	(0)
	MgHCO3+	2.000e-06	1.847e-06	-5.699	-5.734	-0.035	(0)
	MgCO3	1.591e-06	1.591e-06	-5.798	-5.798	0.000	(0)
	MgF+	1.198e-06	1.107e-06	-5.922	-5.956	-0.034	(0)
	MgOH+	1.350e-07	1.252e-07	-6.870	-6.902	-0.033	(0)
	MgH2BO3+	4.731e-09	4.356e-09	-8.325	-8.361	-0.036	(0)
Mn (2)	1.355e-06						
	Mn+2	1.259e-06	8.872e-07	-5.900	-6.052	-0.152	(0)
	MnSO4	6.043e-08	6.043e-08	-7.219	-7.219	0.000	(0)
	MnHCO3+	2.500e-08	2.312e-08	-7.602	-7.636	-0.034	(0)
	MnOH+	5.484e-09	5.073e-09	-8.261	-8.295	-0.034	(0)
	MnF+	2.726e-09	2.522e-09	-8.564	-8.598	-0.034	(0)
	MnCl+	2.070e-09	1.914e-09	-8.684	-8.718	-0.034	(0)
	MnCl2	4.635e-12	4.635e-12	-11.334	-11.334	0.000	(0)
	MnCl3-	2.365e-15	2.188e-15	-14.626	-14.660	-0.034	(0)
	MnSeO4	3.169e-16	3.169e-16	-15.499	-15.499	0.000	(0)
	Mn (OH) 3-	1.756e-16	1.624e-16	-15.755	-15.789	-0.034	(0)
	MnNO3+	8.271e-17	7.578e-17	-16.082	-16.120	-0.038	(0)
	Mn (OH) 4-2	1.631e-21	1.194e-21	-20.788	-20.923	-0.135	(0)
	Mn (NO3) 2	1.026e-26	1.026e-26	-25.989	-25.989	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.757	-41.757	0.000	(0)
Mn (3)	1.013e-27						
	Mn+3	1.013e-27	4.956e-28	-26.994	-27.305	-0.311	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.116	-41.252	-0.135	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-46.491	-46.527	-0.035	(0)
Mo	3.703e-08						
	MoO4-2	3.703e-08	2.695e-08	-7.431	-7.570	-0.138	(0)
	HMoO4-	2.588e-12	2.371e-12	-11.587	-11.625	-0.038	(0)
	H2MoO4	7.683e-17	7.683e-17	-16.114	-16.114	0.000	(0)
	Ag2MoO4	1.035e-28	1.035e-28	-27.985	-27.985	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.280	-58.622	-0.342	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-65.463	-66.831	-1.368	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-67.848	-68.798	-0.950	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-71.762	-72.370	-0.608	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-77.136	-77.478	-0.342	(0)
N (-3)	3.763e-08						
	NH4+	3.351e-08	3.086e-08	-7.475	-7.511	-0.036	(0)
	NH3	3.978e-09	3.978e-09	-8.400	-8.400	0.000	(0)
	NH4SO4-	1.369e-10	1.267e-10	-9.864	-9.897	-0.034	(0)
	CaNH3+2	1.847e-12	1.302e-12	-11.734	-11.886	-0.152	(0)
	CuNH3+2	5.615e-14	3.957e-14	-13.251	-13.403	-0.152	(0)
	NiNH3+2	3.954e-15	2.786e-15	-14.403	-14.555	-0.152	(0)
	AgNH3+	8.931e-16	8.183e-16	-15.049	-15.087	-0.038	(0)
	Co (NH3) +2	6.555e-16	4.619e-16	-15.183	-15.335	-0.152	(0)
	BaNH3+2	5.393e-18	3.800e-18	-17.268	-17.420	-0.152	(0)
	Ag (NH3) 2+	2.888e-20	2.646e-20	-19.539	-19.577	-0.038	(0)
	Ca (NH3) 2+2	2.925e-21	2.061e-21	-20.534	-20.686	-0.152	(0)
	Ni (NH3) 2+2	2.274e-21	1.602e-21	-20.643	-20.795	-0.152	(0)
	Co (NH3) 2+2	1.112e-22	7.839e-23	-21.954	-22.106	-0.152	(0)
	Hg (NH3) 2+2	1.079e-23	7.603e-24	-22.967	-23.119	-0.152	(0)
	HgNH3+2	2.712e-24	1.911e-24	-23.567	-23.719	-0.152	(0)
	Co (NH3) 3+2	5.572e-30	3.926e-30	-29.254	-29.406	-0.152	(0)
	Hg (NH3) 3+2	1.709e-31	1.204e-31	-30.767	-30.919	-0.152	(0)
	Co (NH3) 4+2	1.163e-37	8.198e-38	-36.934	-37.086	-0.152	(0)
	Hg (NH3) 4+2	5.400e-39	3.806e-39	-38.268	-38.420	-0.152	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.794	-43.946	-0.152	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-45.115	-45.267	-0.152	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.672	-53.824	-0.152	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.734	-54.076	-0.342	(0)

	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.588	-55.740	-0.152	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.627	-64.665	-0.038	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.464	-67.616	-0.152	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.788	-68.940	-0.152	(0)
N (3)	2.718e-07						
	NO2-	2.718e-07	2.506e-07	-6.566	-6.601	-0.035	(0)
	CuNO2+	2.783e-14	2.550e-14	-13.555	-13.593	-0.038	(0)
	AgNO2	5.274e-15	5.274e-15	-14.278	-14.278	0.000	(0)
	CoNO2+	1.861e-15	1.705e-15	-14.730	-14.768	-0.038	(0)
	Cu (NO2) 2	6.539e-20	6.539e-20	-19.185	-19.185	0.000	(0)
	Ag (NO2) 2-	2.234e-21	2.047e-21	-20.651	-20.689	-0.038	(0)
N (5)	5.840e-11						
	NO3-	5.835e-11	5.389e-11	-10.234	-10.268	-0.035	(0)
	CaNO3+	4.834e-14	4.429e-14	-13.316	-13.354	-0.038	(0)
	MnNO3+	8.271e-17	7.578e-17	-16.082	-16.120	-0.038	(0)
	ZnNO3+	2.514e-17	2.304e-17	-16.600	-16.638	-0.038	(0)
	BaNO3+	4.463e-19	4.089e-19	-18.350	-18.388	-0.038	(0)
	NiNO3+	1.927e-19	1.765e-19	-18.715	-18.753	-0.038	(0)
	CuNO3+	1.808e-19	1.657e-19	-18.743	-18.781	-0.038	(0)
	CoNO3+	9.003e-20	8.249e-20	-19.046	-19.084	-0.038	(0)
	CdNO3+	2.546e-20	2.333e-20	-19.594	-19.632	-0.038	(0)
	AgNO3	4.313e-21	4.313e-21	-20.365	-20.365	0.000	(0)
	PbNO3+	2.340e-21	2.144e-21	-20.631	-20.669	-0.038	(0)
	UO2NO3+	2.724e-26	2.496e-26	-25.565	-25.603	-0.038	(0)
	Mn (NO3) 2	1.026e-26	1.026e-26	-25.989	-25.989	0.000	(0)
	Zn (NO3) 2	2.477e-28	2.477e-28	-27.606	-27.606	0.000	(0)
	CrNO3+2	7.077e-29	4.987e-29	-28.150	-28.302	-0.152	(0)
	Co (NO3) 2	9.046e-30	9.046e-30	-29.044	-29.044	0.000	(0)
	Cu (NO3) 2	1.124e-30	1.124e-30	-29.949	-29.949	0.000	(0)
	VO2NO3	9.858e-31	9.858e-31	-30.006	-30.006	0.000	(0)
	Cd (NO3) 2	6.301e-31	6.301e-31	-30.201	-30.201	0.000	(0)
	Pb (NO3) 2	1.962e-31	1.962e-31	-30.707	-30.707	0.000	(0)
	FeNO3+2	1.114e-31	7.847e-32	-30.953	-31.105	-0.152	(0)
	HgNO3+	1.654e-35	1.515e-35	-34.782	-34.820	-0.038	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.469	-45.469	0.000	(0)
Na	3.199e-03						
	Na+	3.190e-03	2.946e-03	-2.496	-2.531	-0.035	(0)
	NaSO4-	6.546e-06	6.059e-06	-5.184	-5.218	-0.034	(0)
	NaHCO3	2.164e-06	2.164e-06	-5.665	-5.665	0.000	(0)
	NaCO3-	8.205e-07	7.595e-07	-6.086	-6.119	-0.034	(0)
	NaF	1.327e-07	1.327e-07	-6.877	-6.877	0.000	(0)
	NaH2BO3	4.245e-09	4.245e-09	-8.372	-8.372	0.000	(0)
	NaCrO4-	5.124e-17	4.695e-17	-16.290	-16.328	-0.038	(0)
Ni	2.851e-09						
	Ni+2	1.792e-09	1.304e-09	-8.747	-8.885	-0.138	(0)
	NiCO3	6.736e-10	6.736e-10	-9.172	-9.172	0.000	(0)
	NiHCO3+	2.292e-10	2.100e-10	-9.640	-9.678	-0.038	(0)
	NiSO4	9.966e-11	9.966e-11	-10.001	-10.001	0.000	(0)
	NiOH+	4.079e-11	3.737e-11	-10.389	-10.427	-0.038	(0)
	Ni (OH) 2	6.757e-12	6.757e-12	-11.170	-11.170	0.000	(0)
	NiCl+	6.242e-12	5.719e-12	-11.205	-11.243	-0.038	(0)
	NiF+	2.553e-12	2.339e-12	-11.593	-11.631	-0.038	(0)
	Ni (OH) 3-	1.679e-14	1.538e-14	-13.775	-13.813	-0.038	(0)
	NiNH3+2	3.954e-15	2.786e-15	-14.403	-14.555	-0.152	(0)
	Ni (SO4) 2-2	1.794e-15	1.264e-15	-14.746	-14.898	-0.152	(0)
	NiCl2	4.935e-17	4.935e-17	-16.307	-16.307	0.000	(0)
	NiSeO4	8.095e-19	8.095e-19	-18.092	-18.092	0.000	(0)
	NiNO3+	1.927e-19	1.765e-19	-18.715	-18.753	-0.038	(0)
	Ni (NH3) 2+2	2.274e-21	1.602e-21	-20.643	-20.795	-0.152	(0)
O (0)	1.290e-36						
	O2	6.451e-37	6.459e-37	-36.190	-36.190	0.001	(0)
Pb	1.434e-10						
	PbCO3	1.119e-10	1.119e-10	-9.951	-9.951	0.000	(0)
	PbOH+	1.679e-11	1.538e-11	-10.775	-10.813	-0.038	(0)
	Pb (CO3) 2-2	6.343e-12	4.470e-12	-11.198	-11.350	-0.152	(0)
	Pb+2	3.696e-12	2.690e-12	-11.432	-11.570	-0.138	(0)
	PbHCO3+	2.849e-12	2.611e-12	-11.545	-11.583	-0.038	(0)
	Pb (OH) 2	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)

PbSO4	5.046e-13	5.046e-13	-12.297	-12.297	0.000	(0)
PbCl+	1.785e-13	1.636e-13	-12.748	-12.786	-0.038	(0)
PbF+	1.477e-14	1.353e-14	-13.831	-13.869	-0.038	(0)
Pb(OH) 3-	2.750e-15	2.520e-15	-14.561	-14.599	-0.038	(0)
Pb(SO4) 2-2	1.652e-15	1.164e-15	-14.782	-14.934	-0.152	(0)
PbCl2	1.252e-15	1.252e-15	-14.902	-14.902	0.000	(0)
PbF2	1.901e-17	1.901e-17	-16.721	-16.721	0.000	(0)
Pb(OH) 4-2	1.994e-18	1.405e-18	-17.700	-17.852	-0.152	(0)
PbCl3-	9.327e-19	8.545e-19	-18.030	-18.068	-0.038	(0)
PbF3-	2.810e-21	2.574e-21	-20.551	-20.589	-0.038	(0)
PbNO3+	2.340e-21	2.144e-21	-20.631	-20.669	-0.038	(0)
Pb2OH+3	1.441e-21	6.557e-22	-20.841	-21.183	-0.342	(0)
PbCl4-2	9.500e-22	6.695e-22	-21.022	-21.174	-0.152	(0)
PbF4-2	1.248e-25	8.796e-26	-24.904	-25.056	-0.152	(0)
Pb3(OH) 4+2	9.334e-26	6.578e-26	-25.030	-25.182	-0.152	(0)
Pb(NO3) 2	1.962e-31	1.962e-31	-30.707	-30.707	0.000	(0)
Pb4(OH) 4+4	5.699e-33	1.405e-33	-32.244	-32.852	-0.608	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.743	-151.743	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.127	-228.165	-0.038	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.904	-73.904	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.684	-77.722	-0.038	(0)
S5-2	0.000e+00	0.000e+00	-78.580	-78.732	-0.152	(0)
H2S	0.000e+00	0.000e+00	-79.056	-79.056	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.096	-79.248	-0.152	(0)
S4-2	0.000e+00	0.000e+00	-79.176	-79.328	-0.152	(0)
CdHS+	0.000e+00	0.000e+00	-79.539	-79.577	-0.038	(0)
S3-2	0.000e+00	0.000e+00	-79.982	-80.134	-0.152	(0)
S2-2	0.000e+00	0.000e+00	-80.998	-81.150	-0.152	(0)
S-2	0.000e+00	0.000e+00	-86.532	-86.667	-0.135	(0)
HgHS2-	0.000e+00	0.000e+00	-139.241	-139.279	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-139.481	-139.633	-0.152	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-141.240	-141.240	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-145.545	-145.764	-0.219	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.282	-146.494	-0.212	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-146.543	-146.655	-0.111	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.010	-147.048	-0.038	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.487	-147.525	-0.038	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-147.518	-147.740	-0.222	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.836	-148.051	-0.215	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.392	-149.392	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.095	-150.095	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.743	-151.743	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.395	-159.395	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.240	-216.278	-0.038	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-223.796	-223.834	-0.038	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.308	-225.460	-0.152	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.878	-225.916	-0.038	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.127	-228.165	-0.038	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.042	-235.080	-0.038	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.290	-301.442	-0.152	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-302.863	-303.015	-0.152	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.357	-320.509	-0.152	(0)
S(6)	5.658e-04					
SO4-2	5.263e-04	3.830e-04	-3.279	-3.417	-0.138	(0)
CaSO4	2.280e-05	2.280e-05	-4.642	-4.642	0.000	(0)
MgSO4	9.631e-06	9.631e-06	-5.016	-5.016	0.000	(0)
NaSO4-	6.546e-06	6.059e-06	-5.184	-5.218	-0.034	(0)
KSO4-	4.332e-07	4.009e-07	-6.363	-6.397	-0.034	(0)
MnSO4	6.043e-08	6.043e-08	-7.219	-7.219	0.000	(0)
ZnSO4	1.426e-08	1.426e-08	-7.846	-7.846	0.000	(0)
HSO4-	1.791e-10	1.655e-10	-9.747	-9.781	-0.034	(0)
NH4SO4-	1.369e-10	1.267e-10	-9.864	-9.897	-0.034	(0)
NiSO4	9.966e-11	9.966e-11	-10.001	-10.001	0.000	(0)
CuSO4	8.528e-11	8.528e-11	-10.069	-10.069	0.000	(0)
CoSO4	7.380e-11	7.380e-11	-10.132	-10.132	0.000	(0)
Zn(SO4) 2-2	6.749e-11	4.756e-11	-10.171	-10.323	-0.152	(0)
CdSO4	1.229e-11	1.229e-11	-10.910	-10.910	0.000	(0)

AgSO4-	8.402e-13	7.698e-13	-12.076	-12.114	-0.038	(0)
PbSO4	5.046e-13	5.046e-13	-12.297	-12.297	0.000	(0)
CrOHSO4	9.582e-14	9.582e-14	-13.019	-13.019	0.000	(0)
Cd(SO4) 2-2	9.011e-14	6.350e-14	-13.045	-13.197	-0.152	(0)
FeSO4	1.178e-14	1.178e-14	-13.929	-13.929	0.000	(0)
Ni(SO4) 2-2	1.794e-15	1.264e-15	-14.746	-14.898	-0.152	(0)
Pb(SO4) 2-2	1.652e-15	1.164e-15	-14.782	-14.934	-0.152	(0)
UO2SO4	1.345e-16	1.345e-16	-15.871	-15.871	0.000	(0)
CrSO4+	2.066e-17	1.893e-17	-16.685	-16.723	-0.038	(0)
AlSO4+	2.728e-18	2.521e-18	-17.564	-17.598	-0.034	(0)
UO2(SO4) 2-2	9.640e-19	6.793e-19	-18.016	-18.168	-0.152	(0)
Al(SO4) 2-	1.119e-20	1.035e-20	-19.951	-19.985	-0.034	(0)
FeSO4+	6.764e-22	6.257e-22	-21.170	-21.204	-0.034	(0)
VO2SO4-	3.610e-22	3.307e-22	-21.443	-21.481	-0.038	(0)
Cr2(OH) 2SO4+2	1.296e-23	9.130e-24	-22.888	-23.040	-0.152	(0)
Fe(SO4) 2-	5.592e-24	5.123e-24	-23.252	-23.290	-0.038	(0)
VOSO4	4.774e-25	4.774e-25	-24.321	-24.321	0.000	(0)
Cr2(OH) 2(SO4) 2	2.077e-25	2.077e-25	-24.683	-24.683	0.000	(0)
HgSO4	7.635e-26	7.635e-26	-25.117	-25.117	0.000	(0)
CrO3SO4-2	3.361e-26	2.369e-26	-25.473	-25.625	-0.152	(0)
VSO4+	6.939e-40	6.358e-40	-39.159	-39.197	-0.038	(0)
U(SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.694	-44.846	-0.152	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-64.627	-64.665	-0.038	(0)
Sb(3)	1.394e-21					
Sb(OH) 3	7.051e-22	7.051e-22	-21.152	-21.152	0.000	(0)
HSbO2	6.883e-22	6.883e-22	-21.162	-21.162	0.000	(0)
SbO2-	2.751e-25	2.521e-25	-24.561	-24.599	-0.038	(0)
Sb(OH) 4-	1.576e-25	1.444e-25	-24.802	-24.840	-0.038	(0)
Sb(OH) 2F	3.478e-28	3.478e-28	-27.459	-27.459	0.000	(0)
SbOF	3.421e-28	3.421e-28	-27.466	-27.466	0.000	(0)
Sb(OH) 2+	8.267e-29	7.574e-29	-28.083	-28.121	-0.038	(0)
SbO+	2.850e-29	2.611e-29	-28.545	-28.583	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.357	-320.509	-0.152	(0)
Sb(5)	5.829e-10					
SbO3-	5.823e-10	5.335e-10	-9.235	-9.273	-0.038	(0)
Sb(OH) 6-	6.754e-13	6.238e-13	-12.170	-12.205	-0.035	(0)
SbO2+	3.267e-27	2.994e-27	-26.486	-26.524	-0.038	(0)
Se(-2)	3.961e-16					
Ag2Se	3.961e-16	3.961e-16	-15.402	-15.402	0.000	(0)
HSe-	2.313e-39	2.119e-39	-38.636	-38.674	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-41.757	-41.757	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.138	-43.138	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.168	-45.320	-0.152	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.183	-82.791	-0.608	(0)
Se(4)	3.536e-09					
SeO3-2	1.907e-09	1.344e-09	-8.720	-8.872	-0.152	(0)
HSeO3-	1.629e-09	1.493e-09	-8.788	-8.826	-0.038	(0)
H2SeO3	2.816e-15	2.816e-15	-14.550	-14.550	0.000	(0)
AgSeO3-	9.494e-17	8.699e-17	-16.023	-16.061	-0.038	(0)
Cd(SeO3) 2-2	2.890e-22	2.037e-22	-21.539	-21.691	-0.152	(0)
Ag(SeO3) 2-3	2.300e-24	1.046e-24	-23.638	-23.980	-0.342	(0)
FeHSeO3+2	8.150e-28	5.743e-28	-27.089	-27.241	-0.152	(0)
Se(6)	1.824e-12					
SeO4-2	1.824e-12	1.327e-12	-11.739	-11.877	-0.138	(0)
MnSeO4	3.169e-16	3.169e-16	-15.499	-15.499	0.000	(0)
ZnSeO4	3.497e-17	3.497e-17	-16.456	-16.456	0.000	(0)
NiSeO4	8.095e-19	8.095e-19	-18.092	-18.092	0.000	(0)
CoSeO4	6.423e-19	6.423e-19	-18.192	-18.192	0.000	(0)
HSeO4-	3.211e-19	2.942e-19	-18.493	-18.531	-0.038	(0)
CdSeO4	3.383e-20	3.383e-20	-19.471	-19.471	0.000	(0)
Zn(SeO4) 2-2	6.678e-29	4.706e-29	-28.175	-28.327	-0.152	(0)
Si	3.098e-04					
H4SiO4	2.992e-04	2.996e-04	-3.524	-3.524	0.001	(0)
H3SiO4-	1.060e-05	9.789e-06	-4.975	-5.009	-0.035	(0)
H2SiO4-2	1.902e-10	1.396e-10	-9.721	-9.855	-0.134	(0)
UO2H3SiO4+	2.105e-13	1.929e-13	-12.677	-12.715	-0.038	(0)
SiF6-2	3.139e-32	2.298e-32	-31.503	-31.639	-0.135	(0)

U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.581	-60.923	-0.342	(0)
U (4)	4.568e-20					
U (OH) 5-	4.567e-20	4.184e-20	-19.340	-19.378	-0.038	(0)
U (OH) 4	7.752e-24	7.752e-24	-23.111	-23.111	0.000	(0)
U (OH) 3+	1.368e-28	1.254e-28	-27.864	-27.902	-0.038	(0)
U (OH) 2+2	3.639e-34	2.564e-34	-33.439	-33.591	-0.152	(0)
UF3+	1.477e-39	1.353e-39	-38.831	-38.869	-0.038	(0)
UF2+2	1.697e-40	1.196e-40	-39.770	-39.922	-0.152	(0)
UOH+3	1.174e-40	0.000e+00	-39.930	-40.272	-0.342	(0)
UF4	0.000e+00	0.000e+00	-40.975	-40.975	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.534	-42.876	-0.342	(0)
UF5-	0.000e+00	0.000e+00	-43.485	-43.523	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.694	-44.846	-0.152	(0)
UF6-2	0.000e+00	0.000e+00	-45.038	-45.190	-0.152	(0)
U+4	0.000e+00	0.000e+00	-47.421	-48.029	-0.608	(0)
UC1+3	0.000e+00	0.000e+00	-48.753	-49.095	-0.342	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-176.940	-180.019	-3.078	(0)
U (5)	1.235e-17					
UO2+	1.235e-17	1.131e-17	-16.908	-16.946	-0.038	(0)
U (6)	1.497e-08					
UO2 (CO3) 3-4	9.943e-09	2.452e-09	-8.002	-8.610	-0.608	(0)
UO2 (CO3) 2-2	5.015e-09	3.534e-09	-8.300	-8.452	-0.152	(0)
UO2CO3	1.279e-11	1.279e-11	-10.893	-10.893	0.000	(0)
UO2H3SiO4+	2.105e-13	1.929e-13	-12.677	-12.715	-0.038	(0)
UO2OH+	7.259e-14	6.651e-14	-13.139	-13.177	-0.038	(0)
UO2F+	2.496e-15	2.287e-15	-14.603	-14.641	-0.038	(0)
UO2F2	4.709e-16	4.709e-16	-15.327	-15.327	0.000	(0)
UO2+2	3.189e-16	2.321e-16	-15.496	-15.634	-0.138	(0)
UO2SO4	1.345e-16	1.345e-16	-15.871	-15.871	0.000	(0)
UO2F3-	9.217e-18	8.444e-18	-17.035	-17.073	-0.038	(0)
UO2 (SO4) 2-2	9.640e-19	6.793e-19	-18.016	-18.168	-0.152	(0)
UO2C1+	7.041e-19	6.451e-19	-18.152	-18.190	-0.038	(0)
(UO2) 2 (OH) 2+2	1.042e-20	7.341e-21	-19.982	-20.134	-0.152	(0)
UO2F4-2	6.795e-21	4.789e-21	-20.168	-20.320	-0.152	(0)
(UO2) 3 (OH) 5+	2.094e-21	1.919e-21	-20.679	-20.717	-0.038	(0)
UO2NO3+	2.724e-26	2.496e-26	-25.565	-25.603	-0.038	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.956	-44.994	-0.038	(0)
V+2	0.000e+00	0.000e+00	-46.709	-46.861	-0.152	(0)
V (3)	3.346e-17					
V (OH) 3	3.346e-17	3.346e-17	-16.476	-16.476	0.000	(0)
V (OH) 2+	1.044e-28	9.563e-29	-27.981	-28.019	-0.038	(0)
VOH+2	5.693e-33	4.012e-33	-32.245	-32.397	-0.152	(0)
V+3	7.729e-39	3.517e-39	-38.112	-38.454	-0.342	(0)
VSO4+	6.939e-40	6.358e-40	-39.159	-39.197	-0.038	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-61.622	-61.964	-0.342	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-63.385	-63.993	-0.608	(0)
V (4)	2.252e-21					
V (OH) 3+	2.243e-21	2.055e-21	-20.649	-20.687	-0.038	(0)
VO+2	6.422e-24	4.526e-24	-23.192	-23.344	-0.152	(0)
VOF+	2.115e-24	1.938e-24	-23.675	-23.713	-0.038	(0)
VOSO4	4.774e-25	4.774e-25	-24.321	-24.321	0.000	(0)
VOF2	5.188e-26	5.188e-26	-25.285	-25.285	0.000	(0)
VOC1+	2.375e-26	2.176e-26	-25.624	-25.662	-0.038	(0)
VOF3-	1.434e-28	1.314e-28	-27.843	-27.881	-0.038	(0)
VOF4-2	5.373e-32	3.787e-32	-31.270	-31.422	-0.152	(0)
H2V2O4+2	3.005e-37	2.118e-37	-36.522	-36.674	-0.152	(0)
V (5)	1.757e-10					
H2VO4-	1.011e-10	9.262e-11	-9.995	-10.033	-0.038	(0)
HVO4-2	7.464e-11	5.260e-11	-10.127	-10.279	-0.152	(0)
H3VO4	4.097e-15	4.097e-15	-14.388	-14.388	0.000	(0)
VO4-3	1.310e-16	5.960e-17	-15.883	-16.225	-0.342	(0)
HV2O7-3	3.629e-18	1.651e-18	-17.440	-17.782	-0.342	(0)
H3V2O7-	2.674e-18	2.450e-18	-17.573	-17.611	-0.038	(0)
V2O7-4	4.074e-20	1.005e-20	-19.390	-19.998	-0.608	(0)
VO2+	3.915e-20	3.616e-20	-19.407	-19.442	-0.035	(0)

VO2F	4.528e-21	4.528e-21	-20.344	-20.344	0.000	(0)
VO2SO4-	3.610e-22	3.307e-22	-21.443	-21.481	-0.038	(0)
VO2F2-	1.281e-22	1.174e-22	-21.892	-21.930	-0.038	(0)
V3O9-3	1.829e-24	8.323e-25	-23.738	-24.080	-0.342	(0)
VO2F3-2	1.483e-25	1.045e-25	-24.829	-24.981	-0.152	(0)
VO2F4-3	8.069e-30	3.671e-30	-29.093	-29.435	-0.342	(0)
VO2NO3	9.858e-31	9.858e-31	-30.006	-30.006	0.000	(0)
V4O12-4	1.303e-31	3.214e-32	-30.885	-31.493	-0.608	(0)
V10O28-6	0.000e+00	0.000e+00	-83.476	-84.844	-1.368	(0)
HV10O28-5	0.000e+00	0.000e+00	-84.061	-85.011	-0.950	(0)
H2V10O28-4	0.000e+00	0.000e+00	-87.550	-88.158	-0.608	(0)
Zn	4.511e-07					
Zn+2	2.338e-07	1.702e-07	-6.631	-6.769	-0.138	(0)
ZnCO3	1.356e-07	1.356e-07	-6.868	-6.868	0.000	(0)
ZnOH+	4.228e-08	3.873e-08	-7.374	-7.412	-0.038	(0)
ZnSO4	1.426e-08	1.426e-08	-7.846	-7.846	0.000	(0)
Zn (OH) 2	1.397e-08	1.397e-08	-7.855	-7.855	0.000	(0)
ZnHCO3+	7.671e-09	7.029e-09	-8.115	-8.153	-0.038	(0)
ZnOHCl	2.183e-09	2.183e-09	-8.661	-8.661	0.000	(0)
ZnCl+	7.934e-10	7.326e-10	-9.101	-9.135	-0.035	(0)
ZnF+	2.645e-10	2.424e-10	-9.577	-9.615	-0.038	(0)
Zn (OH) 3-	1.740e-10	1.594e-10	-9.759	-9.797	-0.038	(0)
Zn (SO4) 2-2	6.749e-11	4.756e-11	-10.171	-10.323	-0.152	(0)
ZnCl2	1.990e-12	1.990e-12	-11.701	-11.701	0.000	(0)
Zn (OH) 4-2	2.050e-14	1.445e-14	-13.688	-13.840	-0.152	(0)
ZnCl3-	2.934e-15	2.709e-15	-14.533	-14.567	-0.035	(0)
ZnSeO4	3.497e-17	3.497e-17	-16.456	-16.456	0.000	(0)
ZnNO3+	2.514e-17	2.304e-17	-16.600	-16.638	-0.038	(0)
ZnCl4-2	3.172e-18	2.322e-18	-17.499	-17.634	-0.135	(0)
Zn (NO3) 2	2.477e-28	2.477e-28	-27.606	-27.606	0.000	(0)
Zn (SeO4) 2-2	6.678e-29	4.706e-29	-28.175	-28.327	-0.152	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.010	-147.048	-0.038	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.392	-149.392	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.796	-223.834	-0.038	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.308	-225.460	-0.152	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-302.863	-303.015	-0.152	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-62.69	-56.40	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-45.91	-41.40	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-53.13	-41.40	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-81.00	-63.06	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-60.59	-40.55	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.92	-29.52	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-27.35	-26.90	0.45	(NH4) 2SeO4
Acanthite	-53.14	-89.36	-36.22	Ag2S
Ag2CO3	-13.76	-24.85	-11.09	Ag2CO3
Ag2CrO4	-22.90	-34.49	-11.59	Ag2CrO4
Ag2HVO4	-15.85	-14.37	1.48	Ag2HVO4
Ag2MoO4	-16.01	-27.56	-11.55	Ag2MoO4
Ag2O	-15.86	-3.29	12.57	Ag2O
Ag2Se	-1.61	-50.31	-48.70	Ag2Se
Ag2SeO3	-13.32	-20.47	-7.15	Ag2SeO3
Ag2SeO4	-22.96	-31.87	-8.91	Ag2SeO4
Ag2SO4	-18.59	-23.41	-4.82	Ag2SO4
Ag3AsO3	-28.93	-26.78	2.16	Ag3AsO3
Ag3AsO4	-17.98	-20.77	-2.79	Ag3AsO4
Ag3H2VO5	-21.20	-16.02	5.18	Ag3H2VO5
AgF:4H2O	-15.19	-14.14	1.05	AgF:4H2O
Agmetal	-0.59	-14.09	-13.51	Ag
AgVO3	-13.50	-12.73	0.77	AgVO3
Al (OH) 3 (am)	-3.81	6.99	10.80	Al (OH) 3
Al2 (MoO4) 3	-61.22	-58.85	2.37	Al2 (MoO4) 3
Al2O3	-5.67	13.98	19.65	Al2O3
Al4 (OH) 10SO4	-14.86	7.84	22.70	Al4 (OH) 10SO4

AlAsO4:2H2O	-13.65	-8.85	4.80	AlAsO4:2H2O
AlOHSO4	-9.90	-13.13	-3.23	AlOHSO4
AlSb	-154.49	-88.87	65.62	AlSb
Alunite	-13.35	-14.75	-1.40	KAl3(SO4)2(OH)6
Anglesite	-7.20	-14.99	-7.79	PbSO4
Anhydrite	-2.64	-7.00	-4.36	CaSO4
Anilite	-55.37	-87.25	-31.88	Cu0.25Cu1.5S
Antlerite	-5.82	2.96	8.79	Cu3(OH)4SO4
Aragonite	-0.14	-8.44	-8.30	CaCO3
Arsenolite	-84.63	-87.39	-2.76	As4O6
Artinite	-5.47	4.13	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.39	-31.69	6.71	As2O5
Atacamite	-3.12	4.27	7.39	Cu2(OH)3Cl
Azurite	-3.14	-20.05	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.51	7.89	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-22.27	-6.40	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.89	-8.02	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-31.45	1.49	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.64	-23.31	-9.67	BaCrO4
BaF2	-11.29	-17.11	-5.82	BaF2
BaMoO4	-9.43	-16.39	-6.96	BaMoO4
Barite	-2.26	-12.24	-9.98	BaSO4
BaS	-94.37	-78.19	16.18	BaS
BaSeO3	-11.12	-9.29	1.83	BaSeO3
BaSeO4	-13.24	-20.70	-7.46	BaSeO4
Bianchite	-8.42	-10.19	-1.76	ZnSO4:6H2O
Birnessite	-7.88	10.21	18.09	MnO2
Bixbyite	-3.84	-4.48	-0.64	Mn2O3
BlaubleiI	-55.40	-79.56	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.83	-83.11	-27.28	Cu0.6Cu0.8S
Boehmite	-1.59	6.99	8.58	AlOOH
Breithauptite	-57.06	-75.58	-18.52	NiSb
Brochantite	-4.56	10.66	15.22	Cu4(OH)6SO4
Brucite	-4.00	12.85	16.84	Mg(OH)2
Bunsenite	-4.62	7.82	12.45	NiO
Ca(VO3)2	-14.71	-9.05	5.66	Ca(VO3)2
Ca2V2O7	-13.43	4.07	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.48	4.07	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.62	7.68	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.77	17.19	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.67	17.19	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.32	-152.35	142.97	Ca3Sb2
CaCrO4	-15.81	-18.08	-2.27	CaCrO4
Calcite	0.04	-8.44	-8.48	CaCO3
Calomel	-13.26	-31.17	-17.91	Hg2Cl2
CaMoO4	-3.20	-11.15	-7.95	CaMoO4
Carnotite	-5.72	-5.49	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.06	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.44	-15.46	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.31	-3.47	9.84	Cd(BO2)2
Cd(OH)2	-6.80	6.84	13.64	Cd(OH)2
Cd(OH)2(am)	-6.89	6.84	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.43	-19.72	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.15	0.41	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.15	7.25	28.40	Cd4(OH)6SO4
CdCl2	-14.74	-15.40	-0.66	CdCl2
CdCl2:1H2O	-13.70	-15.40	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.48	-15.40	-1.91	CdCl2:2.5H2O
CdF2	-16.94	-18.16	-1.21	CdF2
Cdmetal(alpha)	-31.57	-18.06	13.51	Cd
Cdmetal(gamma)	-31.68	-18.06	13.62	Cd
CdMoO4	-3.28	-17.43	-14.15	CdMoO4
CdOHC1	-7.81	-4.28	3.54	CdOHC1
CdSb	-76.21	-76.56	-0.35	CdSb
CdSe	-19.98	-40.18	-20.20	CdSe
CdSeO4:2H2O	-19.89	-21.74	-1.85	CdSeO4:2H2O
CdSO4	-13.11	-13.28	-0.17	CdSO4
CdSO4:1H2O	-11.55	-13.28	-1.73	CdSO4:1H2O

CdSO4:2.67H2O	-11.41	-13.28	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.01	-12.76	-9.75	AgCl
Cerrusite	-3.30	-16.43	-13.13	PbCO3
CH4 (g)	-80.13	-121.18	-41.05	CH4
Chalcanthite	-9.79	-12.43	-2.64	CuSO4:5H2O
Chalcedony	0.03	-3.52	-3.55	SiO2
Chalcocite	-55.29	-90.21	-34.92	Cu2S
Chalcopyrite	-125.38	-160.65	-35.27	CuFeS2
Chrysotile	-0.70	31.50	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-53.99	-99.68	-45.69	HgS
Claudetite	-84.33	-87.39	-3.06	As4O6
Clausthalite	-14.79	-41.89	-27.10	PbSe
Co (BO2) 2	-29.70	-2.63	27.07	Co (BO2) 2
Co (OH) 2	-5.40	7.69	13.09	Co (OH) 2
Co (OH) 3	-9.95	-12.26	-2.31	Co (OH) 3
CO2 (g)	-3.42	-21.57	-18.15	CO2
Co3 (AsO4) 2	-21.64	-8.61	13.03	Co3 (AsO4) 2
Co3O4	-6.32	-16.82	-10.50	Co3O4
CoCl2	-22.81	-14.55	8.27	CoCl2
CoCl2:6H2O	-17.08	-14.55	2.54	CoCl2:6H2O
CoCO3	-3.89	-13.87	-9.98	CoCO3
CoF2	-15.71	-17.31	-1.60	CoF2
CoF3	-48.30	-49.76	-1.46	CoF3
CoFe2O4	17.67	14.15	-3.53	CoFe2O4
CoMoO4	-8.82	-16.58	-7.76	CoMoO4
CoO	-5.89	7.69	13.59	CoO
CoS (alpha)	-70.94	-78.38	-7.44	CoS
CoS (beta)	-67.31	-78.38	-11.07	CoS
CoSe	-23.13	-39.33	-16.20	CoSe
CoSeO3	-10.81	-9.49	1.32	CoSeO3
CoSeO4:6H2O	-19.36	-20.89	-1.53	CoSeO4:6H2O
CoSO4	-15.23	-12.43	2.80	CoSO4
CoSO4:6H2O	-9.96	-12.43	-2.47	CoSO4:6H2O
Cotunnite	-12.32	-17.10	-4.78	PbCl2
Covellite	-56.08	-78.38	-22.30	CuS
Cr (OH) 2	-21.50	-10.68	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.02	-32.93	14.09	CrCl2
CrCl3	-49.66	-34.54	15.11	CrCl3
CrF3	-27.35	-38.68	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-66.07	-35.59	30.48	Cr
CrO3	-27.99	-31.20	-3.21	CrO3
Cryolite	-16.70	-50.54	-33.84	Na3AlF6
Cu (OH) 2	-0.98	7.70	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.01	15.20	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.48	-3.23	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.35	-90.23	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.36	-51.16	-45.80	Cu2Se
Cu2SO4	-22.31	-24.26	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.70	-8.60	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.46	-102.05	-42.59	Cu3Sb
Cu3Se2	-27.00	-90.49	-63.49	Cu3Se2
CuCO3	-2.37	-13.87	-11.50	CuCO3
CuCrO4	-18.07	-23.51	-5.44	CuCrO4
CuF	-9.66	-14.57	-4.91	CuF
CuF2	-18.42	-17.31	1.12	CuF2
CuF2:2H2O	-12.76	-17.31	-4.55	CuF2:2H2O
Cumetal	-5.76	-14.52	-8.76	Cu
CuMoO4	-3.51	-16.58	-13.08	CuMoO4
CuOCuSO4	-15.04	-4.73	10.30	CuOCuSO4
Cupricferrite	8.16	14.15	5.99	CuFe2O4
Cuprite	-2.72	-4.13	-1.41	Cu2O
Cuprousferrite	10.08	1.16	-8.92	CuFeO2
CuSe	-6.23	-39.33	-33.10	CuSe
CuSe2	-28.09	-61.46	-33.37	CuSe2

CuSeO3:2H2O	-10.00	-9.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.45	-20.89	-2.44	CuSeO4:5H2O
CuSO4	-15.37	-12.43	2.94	CuSO4
Diaspore	0.12	6.99	6.87	AlOOH
Djurleite	-55.51	-89.43	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.62	-17.16	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.07	-17.16	-17.09	CaMg(CO3)2
Epsomite	-5.15	-7.28	-2.13	MgSO4:7H2O
Fe(OH)2	-9.76	3.81	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.93	-0.11	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-14.65	-18.37	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.28	-10.73	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-24.46	-45.09	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-50.19	-53.92	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.96	10.26	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.02	-12.62	0.40	FeAsO4:2H2O
FeCr2O4	-5.75	1.45	7.20	FeCr2O4
FeMoO4	-10.38	-20.47	-10.09	FeMoO4
Ferrihydrite	0.03	3.23	3.19	Fe(OH)3
Ferroselite	-46.75	-65.35	-18.60	FeSe2
FeS(ppt)	-79.32	-82.27	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-4.10	-4.10	0.00	e-
Fluorite	-1.38	-11.88	-10.50	CaF2
Galena	-66.97	-80.94	-13.97	PbS
Gibbsite	-1.30	6.99	8.29	Al(OH)3
Goethite	2.73	3.23	0.49	FeOOH
Goslarite	-8.18	-10.19	-2.01	ZnSO4:7H2O
Greenalite	-16.44	4.37	20.81	Fe3Si2O5(OH)4
Greenockite	-64.87	-79.23	-14.36	CdS
Greigite	-289.01	-334.04	-45.03	Fe3S4
Gummite	-6.60	1.07	7.67	UO3
Gypsum	-2.39	-7.00	-4.61	CaSO4:2H2O
H-Jarosite	-18.47	-30.57	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.40	-24.28	-12.88	H2MoO4
H2S(g)	-78.07	-86.08	-8.01	H2S
H2Se(g)	-42.07	-47.03	-4.96	H2Se
Halite	-6.90	-5.30	1.60	NaCl
Halloysite	-2.64	6.94	9.57	Al2Si2O5(OH)4
Hausmannite	-4.16	56.87	61.03	Mn3O4
Hematite	7.87	6.45	-1.42	Fe2O3
Hercynite	-5.10	17.79	22.89	FeAl2O4
Hg(CH3)2(g)	-182.25	-255.96	-73.71	Hg(CH3)2
Hg(g)	-9.04	-16.91	-7.87	Hg
Hg(OH)2	-10.11	-13.60	-3.50	Hg(OH)2
Hg2(g)	-18.87	-33.83	-14.96	Hg2
Hg2(OH)2	-14.19	-8.93	5.26	Hg2(OH)2
Hg2CO3	-14.44	-30.49	-16.05	Hg2CO3
Hg2CrO4	-31.43	-40.13	-8.70	Hg2CrO4
Hg2F2	-23.56	-33.93	-10.36	Hg2F2
Hg2S	-83.32	-95.00	-11.68	Hg2S
Hg2SeO3	-21.45	-26.11	-4.66	Hg2SeO3
Hg2SO4	-22.92	-29.05	-6.13	Hg2SO4
Hg3O2CO3	-32.70	-62.38	-29.68	Hg3O2CO3
HgCl(g)	-35.08	-15.58	19.50	HgCl
HgCl2	-14.58	-35.84	-21.26	HgCl2
HgF(g)	-49.64	-16.96	32.68	HgF
HgF2(g)	-51.17	-38.61	12.57	HgF2
Hgmetal(l)	-3.46	-16.91	-13.45	Hg
HgSe	-4.94	-60.63	-55.69	HgSe
HgSeO3	-18.35	-30.78	-12.43	HgSeO3
HgSO4	-24.31	-33.73	-9.42	HgSO4
Huntite	-4.63	-34.60	-29.97	CaMg3(CO3)4
Hydrocerrusite	-8.95	-27.72	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.26	-22.02	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-23.57	-28.74	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-11.25	-26.05	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-36.11	-53.36	-17.24	K2Cr2O7

K2CrO4	-21.64	-22.15	-0.51	K2CrO4
K2MoO4	-18.49	-15.23	3.26	K2MoO4
K2SeO4	-18.81	-19.54	-0.73	K2SeO4
Kaolinite	-0.50	6.94	7.43	Al2Si2O5(OH)4
Langite	-6.83	10.66	17.49	Cu4(OH)6SO4·H2O
Larnakite	-9.41	-9.85	-0.43	PbO:PbSO4
Laurionite	-6.61	-5.98	0.62	PbOHCl
Lepidocrocite	1.85	3.23	1.37	FeOOH
Lime	-19.58	13.12	32.70	CaO
Litharge	-7.56	5.14	12.69	PbO
Mackinawite	-78.67	-82.27	-3.60	FeS
Maghemite	0.07	6.45	6.39	Fe2O3
Magnesioferrite	2.44	19.30	16.86	Fe2MgO4
Magnesite	-1.26	-8.72	-7.46	MgCO3
Magnetite	6.86	10.26	3.40	Fe3O4
Malachite	-0.87	-6.17	-5.31	Cu2(OH)2CO3
Manganite	-2.23	23.11	25.34	MnOOH
Massicot	-7.76	5.14	12.89	PbO
Matlockite	-9.51	-18.48	-8.97	PbClF
Melanothallite	-20.80	-14.54	6.26	CuCl2
Melanterite	-14.11	-16.32	-2.21	FeSO4·7H2O
Metacinnabar	-54.59	-99.68	-45.09	HgS
Mg(OH)2 (active)	-5.95	12.85	18.79	Mg(OH)2
Mg(VO3)2	-20.61	-9.33	11.28	Mg(VO3)2
Mg2Sb3	-274.31	-199.62	74.68	Mg2Sb3
Mg2V2O7	-22.84	3.52	26.36	Mg2V2O7
MgCr2O4	-5.71	10.49	16.20	MgCr2O4
MgCrO4	-23.73	-18.35	5.38	MgCrO4
MgF2	-4.02	-12.15	-8.13	MgF2
MgMoO4	-9.58	-11.43	-1.85	MgMoO4
MgSeO3·6H2O	-7.39	-4.33	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-14.54	-15.74	-1.20	MgSeO4·6H2O
Minium	-33.20	40.32	73.52	Pb3O4
Mirabilite	-7.36	-8.48	-1.11	Na2SO4·10H2O
Mn(VO3)2	-16.42	-11.52	4.90	Mn(VO3)2
Mn2(SO4)3	-59.15	-64.86	-5.71	Mn2(SO4)3
Mn2Sb	-148.08	-87.00	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-12.22	0.28	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-14.30	-11.58	2.72	MnCl2·4H2O
MnS (grn)	-75.59	-75.42	0.17	MnS
MnS (pnk)	-78.76	-75.42	3.34	MnS
MnSb	-95.19	-98.10	-2.91	MnSb
MnSe	-39.87	-36.37	3.50	MnSe
MnSeO3	-7.65	-6.52	1.13	MnSeO3
MnSeO3·2H2O	-7.51	-6.52	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-15.88	-17.93	-2.05	MnSeO4·5H2O
MnSO4	-12.05	-9.47	2.58	MnSO4
Monteponite	-8.26	6.84	15.10	CdO
Montroydite	-9.96	-13.60	-3.64	HgO
MoO3	-16.28	-24.28	-8.00	MoO3
Morenosite	-10.16	-12.30	-2.14	NiSO4·7H2O
MoS2	-151.07	-221.33	-70.26	MoS2
Na-Jarosite	-13.55	-24.75	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.86	-50.76	-9.90	Na2Cr2O7
Na2CrO4	-22.49	-19.56	2.93	Na2CrO4
Na2Mo2O7	-20.31	-36.91	-16.60	Na2Mo2O7
Na2MoO4	-14.12	-12.63	1.49	Na2MoO4
Na2MoO4·2H2O	-13.86	-12.63	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.83	-5.53	10.30	Na2SeO3·5H2O
Na2SeO4	-18.22	-16.94	1.28	Na2SeO4
Na3Sb	-172.84	-78.39	94.45	Na3Sb
Na3VO4	-30.30	6.38	36.68	Na3VO4
Na4V2O7	-36.28	1.12	37.40	Na4V2O7
Nantokite	-6.46	-13.19	-6.73	CuCl
NaSb	-88.30	-65.13	23.17	NaSb
Natron	-8.61	-9.92	-1.31	Na2CO3·10H2O
NaVO3	-9.12	-5.26	3.86	NaVO3
Nesquehonite	-4.05	-8.72	-4.67	MgCO3·3H2O

Ni(OH)2	-4.97	7.82	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-23.92	-8.22	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-20.83	11.17	32.00	Ni4(OH)6SO4
NiCO3	-6.87	-13.74	-6.87	NiCO3
NiMoO4	-5.31	-16.45	-11.14	NiMoO4
NiS(alpha)	-72.65	-78.25	-5.60	NiS
NiS(beta)	-67.15	-78.25	-11.10	NiS
NiS(gamma)	-65.45	-78.25	-12.80	NiS
NiSe	-21.50	-39.20	-17.70	NiSe
NiSeO3·2H2O	-12.17	-9.36	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-19.24	-20.76	-1.52	NiSeO4·6H2O
Nsutite	-7.29	10.21	17.50	MnO2
O2(g)	-33.28	49.81	83.09	O2
Orpiment	-240.86	-301.92	-61.07	As2S3
Otavite	-2.72	-14.72	-12.00	CdCO3
Pb(BO2)2	-11.70	-5.18	6.52	Pb(BO2)2
Pb(OH)2	-3.01	5.14	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-69.26	-78.02	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.64	-0.84	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.91	10.28	26.19	Pb2O(OH)2
Pb2O3	-25.86	35.18	61.04	Pb2O3
Pb2OCO3	-10.73	-11.29	-0.56	Pb2OCO3
Pb2V2O7	-10.00	-11.90	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.07	-16.27	5.80	Pb3(AsO4)2
Pb3(VO4)2	-12.90	-6.76	6.14	Pb3(VO4)2
Pb3O2CO3	-17.17	-6.15	11.02	Pb3O2CO3
Pb3O2SO4	-15.40	-4.71	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.67	0.43	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.45	0.43	21.88	Pb4O3SO4
PbCrO4	-13.46	-26.06	-12.60	PbCrO4
PbF2	-12.42	-19.86	-7.44	PbF2
Pbmetal	-24.01	-19.76	4.25	Pb
PbMoO4	-3.52	-19.14	-15.62	PbMoO4
PbO:0.3H2O	-7.84	5.14	12.98	PbO:0.33H2O
PbSeO4	-16.61	-23.45	-6.84	PbSeO4
Periclase	-8.74	12.85	21.58	MgO
Phosgenite	-13.72	-33.53	-19.81	PbCl2:PbCO3
Plattnerite	-19.56	30.04	49.60	PbO2
Portlandite	-9.68	13.12	22.80	Ca(OH)2
Pyrite	-124.93	-143.44	-18.51	FeS2
Pyrochroite	-4.54	10.66	15.19	Mn(OH)2
Pyrolusite	-5.82	35.56	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-100.63	-120.38	-19.75	AsS
Retgersite	-10.26	-12.30	-2.04	NiSO4·6H2O
Rhodochrosite	-0.33	-10.91	-10.58	MnCO3
Rutherfordine	-5.99	-20.49	-14.50	UO2CO3
Sb(OH)3	-14.04	-21.15	-7.11	Sb(OH)3
Sb2O4	-20.80	-17.40	3.40	Sb2O4
Sb2O5	-31.45	-41.12	-9.67	Sb2O5
Sb2Se3	-115.63	-183.39	-67.76	Sb2Se3
Sb4O6(cubic)	-66.35	-84.61	-18.26	Sb4O6
Sb4O6(orth)	-66.71	-84.61	-17.90	Sb4O6
SbCl3	-55.08	-54.51	0.57	SbCl3
SbF3	-48.43	-58.65	-10.23	SbF3
Sbmetal	-46.82	-58.51	-11.69	Sb
SbO2	-5.19	-33.01	-27.82	SbO2
Schoepite	-4.92	1.07	5.99	UO2(OH)2·H2O
Semetal(am)	-15.02	-22.13	-7.11	Se
Semetal(hex)	-14.42	-22.13	-7.71	Se
Senarmontite	-29.94	-42.30	-12.37	Sb2O3
SeO2	-17.30	-17.18	0.12	SeO2
SeO3	-49.63	-28.59	21.04	SeO3
Sepiolite	-0.63	15.13	15.76	Mg2Si3O7·5OH:3H2O
Sepiolite(A)	-3.65	15.13	18.78	Mg2Si3O7·5OH:3H2O
Siderite	-7.52	-17.76	-10.24	FeCO3
SiO2(am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2(am-ppt)	-0.78	-3.52	-2.74	SiO2

Smithsonite	-1.63	-11.63	-10.00	ZnCO3
Sphalerite	-64.69	-76.14	-11.45	ZnS
Spinel	-10.02	26.83	36.85	MgAl2O4
Stibnite	-250.07	-300.53	-50.46	Sb2S3
Sulfur	-59.03	-61.17	-2.14	S
Tenorite	0.05	7.70	7.64	CuO
Thenardite	-8.80	-8.48	0.32	Na2SO4
Thermonatrite	-10.56	-9.92	0.64	Na2CO3:H2O
Tyuyamunite	-10.98	-6.90	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.12	5.97	21.08	U3O8
U3Sb4	-579.66	-427.28	152.38	U3Sb4
U4O9	-30.53	-33.55	-3.02	U4O9
UF4	-35.08	-64.61	-29.54	UF4
UF4:2.5H2O	-31.90	-64.62	-32.72	UF4:2.5H2O
UO2 (am)	-15.55	-14.61	0.93	UO2
UO2 (NO3) 2	-48.32	-36.17	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.02	-36.17	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-39.56	-36.17	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.22	-36.17	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.54	1.07	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.26	-27.51	-2.25	UO2SeO4:4H2O
UO3	-6.63	1.07	7.70	UO3
Uraninite	-9.94	-14.61	-4.67	UO2
USb2	-220.22	-190.64	29.58	USb2
V (OH) 3	-20.98	-13.39	7.59	V (OH) 3
V2O5	-20.81	-22.17	-1.36	V2O5
V3O5	-46.65	-44.81	1.84	V3O5
V4O7	-58.63	-51.45	7.19	V4O7
V6O13	-55.47	-116.33	-60.86	V6O13
Valentinite	-33.82	-42.30	-8.48	Sb2O3
VCl2	-66.96	-48.08	18.87	VCl2
VCl3	-70.18	-46.75	23.43	VCl3
VF4	-71.57	-56.64	14.93	VF4
Vmetal	-94.77	-50.75	44.03	V
VO	-40.60	-25.84	14.76	VO
VO (OH) 2	-11.79	-6.64	5.15	VO (OH) 2
VO2Cl	-25.05	-22.21	2.84	VO2Cl
VOC1	-35.66	-24.51	11.15	VOC1
VOC12	-41.64	-28.88	12.76	VOC12
VOSO4	-30.37	-26.76	3.61	VOSO4
Witherite	-5.11	-13.68	-8.57	BaCO3
Wurtzite	-67.19	-76.14	-8.95	ZnS
Zincite	-1.39	9.94	11.33	ZnO
Zincosite	-14.12	-10.19	3.93	ZnSO4
Zn (BO2) 2	-8.67	-0.38	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-30.62	-27.31	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.26	9.94	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.53	9.94	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.81	9.94	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.59	9.94	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.79	9.94	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-7.75	-0.25	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-6.43	8.76	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.52	-1.87	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.35	-10.43	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-8.77	19.63	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-11.04	27.46	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.35	-12.30	7.05	ZnCl2
ZnCO3:1H2O	-1.37	-11.63	-10.26	ZnCO3:1H2O
ZnF2	-14.53	-15.06	-0.53	ZnF2
Znmetal	-40.75	-14.96	25.79	Zn
ZnMoO4	-4.21	-14.34	-10.13	ZnMoO4
ZnO (active)	-1.25	9.94	11.19	ZnO
ZnS (am)	-67.08	-76.14	-9.05	ZnS
ZnSb	-84.48	-73.47	11.01	ZnSb
ZnSe	-22.69	-37.09	-14.40	ZnSe
ZnSeO4:6H2O	-17.13	-18.65	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.55	-10.19	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 46.

REACTION 204
H2O -1
0.126837 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 210
SAVE Solution 211
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 210. Solution after simulation 45.
Using reaction 204.

Reaction 204.

1.268e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000
Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	5.212e-10	5.213e-10
Al	4.942e-08	4.943e-08
As	6.790e-09	6.791e-09
B	7.945e-06	7.946e-06
Ba	2.117e-09	2.117e-09
C	1.466e-03	1.466e-03
Ca	3.936e-04	3.936e-04
Cd	2.750e-10	2.750e-10
Cl	1.860e-03	1.860e-03
Co	1.846e-09	1.846e-09
Cr	6.253e-10	6.254e-10
Cu	9.609e-08	9.611e-08
F	7.903e-05	7.904e-05
Fe	7.760e-10	7.761e-10
Hg	4.508e-11	4.508e-11
K	1.609e-04	1.609e-04
Mg	2.049e-04	2.050e-04
Mn	1.358e-06	1.358e-06
Mo	3.712e-08	3.712e-08
N	3.102e-07	3.103e-07
Na	3.207e-03	3.207e-03
Ni	2.858e-09	2.858e-09

Pb	1.438e-10	1.438e-10
S	5.671e-04	5.672e-04
Sb	5.843e-10	5.843e-10
Se	3.546e-09	3.546e-09
Si	3.105e-04	3.105e-04
U	1.501e-08	1.501e-08
V	1.761e-10	1.762e-10
Zn	4.521e-07	4.522e-07

-----Description of solution-----

	pH	=	8.354	Charge balance
	pe	=	4.097	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	5.564e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.495e-03	
	Total CO2 (mol/kg)	=	1.466e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.670e-08	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	3	
	Total H	=	1.110290e+02	
	Total O	=	5.552106e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.467e-06	2.276e-06	-5.608	-5.643	-0.035	(0)
H+	4.791e-09	4.424e-09	-8.320	-8.354	-0.035	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.212e-10					
AgCl	3.534e-10	3.534e-10	-9.452	-9.452	0.000	(0)
Ag+	1.091e-10	1.008e-10	-9.962	-9.997	-0.035	(0)
AgCl2-	5.771e-11	5.287e-11	-10.239	-10.277	-0.038	(0)
AgSO4-	8.421e-13	7.715e-13	-12.075	-12.113	-0.038	(0)
AgCl3-2	1.149e-13	8.095e-14	-12.940	-13.092	-0.152	(0)
AgOH	2.293e-14	2.293e-14	-13.640	-13.640	0.000	(0)
AgF	1.811e-14	1.811e-14	-13.742	-13.742	0.000	(0)
AgNO2	5.287e-15	5.287e-15	-14.277	-14.277	0.000	(0)
AgH2BO3	1.455e-15	1.455e-15	-14.837	-14.837	0.000	(0)
AgNH3+	8.952e-16	8.201e-16	-15.048	-15.086	-0.038	(0)
AgCl4-3	6.245e-16	2.839e-16	-15.204	-15.547	-0.342	(0)
Ag2Se	3.968e-16	3.968e-16	-15.401	-15.401	0.000	(0)
AgSeO3-	9.516e-17	8.718e-17	-16.022	-16.060	-0.038	(0)
Ag (OH) 2-	5.566e-18	5.099e-18	-17.254	-17.292	-0.038	(0)
Ag (NH3) 2+	2.900e-20	2.657e-20	-19.538	-19.576	-0.038	(0)
AgNO3	4.324e-21	4.324e-21	-20.364	-20.364	0.000	(0)
Ag (NO2) 2-	2.244e-21	2.056e-21	-20.649	-20.687	-0.038	(0)
Ag (SeO3) 2-3	2.311e-24	1.051e-24	-23.636	-23.979	-0.342	(0)
Ag2MoO4	1.038e-28	1.038e-28	-27.984	-27.984	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.903	-73.903	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.181	-82.790	-0.609	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.542	-146.653	-0.111	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.486	-147.524	-0.038	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.517	-147.739	-0.222	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.835	-148.050	-0.216	(0)
Al	4.942e-08					
Al (OH) 4-	4.926e-08	4.552e-08	-7.308	-7.342	-0.034	(0)
Al (OH) 3	1.589e-10	1.589e-10	-9.799	-9.799	0.000	(0)
Al (OH) 2+	3.781e-12	3.500e-12	-11.422	-11.456	-0.034	(0)
AlF2+	1.873e-14	1.734e-14	-13.727	-13.761	-0.034	(0)
AlF3	1.562e-14	1.562e-14	-13.806	-13.806	0.000	(0)
AlOH+2	2.638e-15	1.936e-15	-14.579	-14.713	-0.134	(0)

AlF+2	8.294e-16	6.087e-16	-15.081	-15.216	-0.134	(0)
AlF4-	6.059e-16	5.599e-16	-15.218	-15.252	-0.034	(0)
AlSO4+	2.742e-18	2.534e-18	-17.562	-17.596	-0.034	(0)
Al+3	1.741e-18	8.508e-19	-17.759	-18.070	-0.311	(0)
Al (SO4) 2-	1.127e-20	1.042e-20	-19.948	-19.982	-0.034	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-58.272	-58.614	-0.342	(0)
As (3)	1.602e-22					
H3AsO3	1.422e-22	1.422e-22	-21.847	-21.847	0.000	(0)
H2AsO3-	1.800e-23	1.649e-23	-22.745	-22.783	-0.038	(0)
HAsO3-2	4.824e-27	3.398e-27	-26.317	-26.469	-0.152	(0)
H4AsO3+	3.403e-31	3.117e-31	-30.468	-30.506	-0.038	(0)
AsO3-3	6.514e-32	2.961e-32	-31.186	-31.529	-0.342	(0)
As (5)	6.790e-09					
HAsO4-2	6.579e-09	4.634e-09	-8.182	-8.334	-0.152	(0)
H2AsO4-	2.041e-10	1.870e-10	-9.690	-9.728	-0.038	(0)
AsO4-3	7.287e-12	3.312e-12	-11.137	-11.480	-0.342	(0)
H3AsO4	1.436e-16	1.438e-16	-15.843	-15.842	0.001	(0)
B	7.945e-06					
H3BO3	6.931e-06	6.940e-06	-5.159	-5.159	0.001	(0)
H2BO3-	9.894e-07	9.110e-07	-6.005	-6.040	-0.036	(0)
CaH2BO3+	1.482e-08	1.365e-08	-7.829	-7.865	-0.036	(0)
MgH2BO3+	4.750e-09	4.373e-09	-8.323	-8.359	-0.036	(0)
NaH2BO3	4.263e-09	4.263e-09	-8.370	-8.370	0.000	(0)
BF (OH) 3-	2.152e-10	1.981e-10	-9.667	-9.703	-0.036	(0)
H5 (BO3) 2-	5.845e-12	5.382e-12	-11.233	-11.269	-0.036	(0)
BaH2BO3+	4.638e-14	4.271e-14	-13.334	-13.369	-0.036	(0)
BF2 (OH) 2-	7.283e-15	6.706e-15	-14.138	-14.174	-0.036	(0)
H8 (BO3) 3-	4.057e-15	3.735e-15	-14.392	-14.428	-0.036	(0)
AgH2BO3	1.455e-15	1.455e-15	-14.837	-14.837	0.000	(0)
BF3OH-	8.970e-22	8.259e-22	-21.047	-21.083	-0.036	(0)
BF4-	1.397e-27	1.286e-27	-26.855	-26.891	-0.036	(0)
Ba	2.117e-09					
Ba+2	2.085e-09	1.517e-09	-8.681	-8.819	-0.138	(0)
BaHCO3+	2.047e-11	1.896e-11	-10.689	-10.722	-0.033	(0)
BaCO3	1.079e-11	1.079e-11	-10.967	-10.967	0.000	(0)
BaH2BO3+	4.638e-14	4.271e-14	-13.334	-13.369	-0.036	(0)
BaOH+	1.629e-14	1.507e-14	-13.788	-13.822	-0.034	(0)
BaNH3+2	5.416e-18	3.815e-18	-17.266	-17.418	-0.152	(0)
BaNO3+	4.483e-19	4.107e-19	-18.348	-18.386	-0.038	(0)
C (4)	1.466e-03					
HCO3-	1.414e-03	1.309e-03	-2.849	-2.883	-0.034	(0)
CO3-2	1.907e-05	1.387e-05	-4.720	-4.858	-0.138	(0)
H2CO3	1.303e-05	1.303e-05	-4.885	-4.885	0.000	(0)
CaHCO3+	6.849e-06	6.346e-06	-5.164	-5.198	-0.033	(0)
CaCO3	5.723e-06	5.723e-06	-5.242	-5.242	0.000	(0)
NaHCO3	2.173e-06	2.173e-06	-5.663	-5.663	0.000	(0)
MgHCO3+	2.008e-06	1.854e-06	-5.697	-5.732	-0.035	(0)
MgCO3	1.597e-06	1.597e-06	-5.797	-5.797	0.000	(0)
NaCO3-	8.239e-07	7.626e-07	-6.084	-6.118	-0.034	(0)
ZnCO3	1.360e-07	1.360e-07	-6.866	-6.866	0.000	(0)
CuCO3	7.943e-08	7.943e-08	-7.100	-7.100	0.000	(0)
MnHCO3+	2.510e-08	2.321e-08	-7.600	-7.634	-0.034	(0)
UO2 (CO3) 3-4	9.976e-09	2.456e-09	-8.001	-8.610	-0.609	(0)
ZnHCO3+	7.700e-09	7.054e-09	-8.114	-8.152	-0.038	(0)
UO2 (CO3) 2-2	5.016e-09	3.533e-09	-8.300	-8.452	-0.152	(0)
Cu (CO3) 2-2	4.210e-09	2.966e-09	-8.376	-8.528	-0.152	(0)
NiCO3	6.758e-10	6.758e-10	-9.170	-9.170	0.000	(0)
NiHCO3+	2.301e-10	2.108e-10	-9.638	-9.676	-0.038	(0)
CoCO3	2.268e-10	2.268e-10	-9.644	-9.644	0.000	(0)
PbCO3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
CoHCO3+	1.075e-10	9.849e-11	-9.969	-10.007	-0.038	(0)
CuHCO3+	8.768e-11	8.032e-11	-10.057	-10.095	-0.038	(0)
CdCO3	4.334e-11	4.334e-11	-10.363	-10.363	0.000	(0)
BaHCO3+	2.047e-11	1.896e-11	-10.689	-10.722	-0.033	(0)
UO2CO3	1.277e-11	1.277e-11	-10.894	-10.894	0.000	(0)
BaCO3	1.079e-11	1.079e-11	-10.967	-10.967	0.000	(0)
Pb (CO3) 2-2	6.373e-12	4.490e-12	-11.196	-11.348	-0.152	(0)
PbHCO3+	2.857e-12	2.618e-12	-11.544	-11.582	-0.038	(0)

	Cd(CO3) 2-2	6.327e-13	4.457e-13	-12.199	-12.351	-0.152	(0)
	CdHCO3+	4.460e-13	4.085e-13	-12.351	-12.389	-0.038	(0)
	FeHCO3+	2.236e-15	2.071e-15	-14.651	-14.684	-0.033	(0)
	HgCO3	1.268e-17	1.268e-17	-16.897	-16.897	0.000	(0)
	Hg(CO3) 2-2	7.894e-19	5.561e-19	-18.103	-18.255	-0.152	(0)
	HgHCO3+	1.140e-21	1.044e-21	-20.943	-20.981	-0.038	(0)
Ca	3.936e-04						
	Ca+2	3.579e-04	2.603e-04	-3.446	-3.584	-0.138	(0)
	CaSO4	2.288e-05	2.288e-05	-4.640	-4.640	0.000	(0)
	CaHCO3+	6.849e-06	6.346e-06	-5.164	-5.198	-0.033	(0)
	CaCO3	5.723e-06	5.723e-06	-5.242	-5.242	0.000	(0)
	CaF+	2.198e-07	2.033e-07	-6.658	-6.692	-0.034	(0)
	CaH2BO3+	1.482e-08	1.365e-08	-7.829	-7.865	-0.036	(0)
	CaOH+	1.276e-08	1.182e-08	-7.894	-7.927	-0.033	(0)
	CaNH3+2	1.855e-12	1.306e-12	-11.732	-11.884	-0.152	(0)
	CaNO3+	4.855e-14	4.447e-14	-13.314	-13.352	-0.038	(0)
	Ca(NH3) 2+2	2.943e-21	2.073e-21	-20.531	-20.683	-0.152	(0)
Cd	2.750e-10						
	Cd+2	1.884e-10	1.371e-10	-9.725	-9.863	-0.138	(0)
	CdCO3	4.334e-11	4.334e-11	-10.363	-10.363	0.000	(0)
	CdCl+	2.455e-11	2.249e-11	-10.610	-10.648	-0.038	(0)
	CdSO4	1.233e-11	1.233e-11	-10.909	-10.909	0.000	(0)
	CdOH+	2.705e-12	2.478e-12	-11.568	-11.606	-0.038	(0)
	CdOHC1	2.099e-12	2.099e-12	-11.678	-11.678	0.000	(0)
	Cd(CO3) 2-2	6.327e-13	4.457e-13	-12.199	-12.351	-0.152	(0)
	CdHCO3+	4.460e-13	4.085e-13	-12.351	-12.389	-0.038	(0)
	CdF+	1.697e-13	1.554e-13	-12.770	-12.808	-0.038	(0)
	CdCl2	1.610e-13	1.610e-13	-12.793	-12.793	0.000	(0)
	Cd(SO4) 2-2	9.061e-14	6.383e-14	-13.043	-13.195	-0.152	(0)
	Cd(OH) 2	3.558e-14	3.558e-14	-13.449	-13.449	0.000	(0)
	CdCl3-	1.905e-16	1.745e-16	-15.720	-15.758	-0.038	(0)
	CdF2	2.219e-17	2.219e-17	-16.654	-16.654	0.000	(0)
	Cd(OH) 3-	5.399e-18	4.946e-18	-17.268	-17.306	-0.038	(0)
	CdSeO4	3.395e-20	3.395e-20	-19.469	-19.469	0.000	(0)
	CdNO3+	2.556e-20	2.342e-20	-19.592	-19.630	-0.038	(0)
	Cd2OH+3	3.745e-21	1.702e-21	-20.427	-20.769	-0.342	(0)
	Cd(SeO3) 2-2	2.906e-22	2.047e-22	-21.537	-21.689	-0.152	(0)
	Cd(OH) 4-2	2.616e-24	1.842e-24	-23.582	-23.735	-0.152	(0)
	Cd(NO3) 2	6.341e-31	6.341e-31	-30.198	-30.198	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.538	-79.576	-0.038	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.093	-150.093	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-225.876	-225.914	-0.038	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-301.287	-301.439	-0.152	(0)
Cl	1.860e-03						
	Cl-	1.860e-03	1.718e-03	-2.730	-2.765	-0.035	(0)
	ZnOHC1	2.191e-09	2.191e-09	-8.659	-8.659	0.000	(0)
	MnCl+	2.078e-09	1.922e-09	-8.682	-8.716	-0.034	(0)
	ZnCl+	7.963e-10	7.353e-10	-9.099	-9.134	-0.035	(0)
	AgCl	3.534e-10	3.534e-10	-9.452	-9.452	0.000	(0)
	CuCl	8.234e-11	8.234e-11	-10.084	-10.084	0.000	(0)
	AgCl2-	5.771e-11	5.287e-11	-10.239	-10.277	-0.038	(0)
	CuCl2-	3.201e-11	2.955e-11	-10.495	-10.529	-0.035	(0)
	CdCl+	2.455e-11	2.249e-11	-10.610	-10.648	-0.038	(0)
	CoCl+	6.274e-12	5.748e-12	-11.202	-11.241	-0.038	(0)
	NiCl+	6.265e-12	5.740e-12	-11.203	-11.241	-0.038	(0)
	MnCl2	4.664e-12	4.664e-12	-11.331	-11.331	0.000	(0)
	CuCl+	2.867e-12	2.648e-12	-11.543	-11.577	-0.035	(0)
	CdOHC1	2.099e-12	2.099e-12	-11.678	-11.678	0.000	(0)
	ZnCl2	2.002e-12	2.002e-12	-11.699	-11.699	0.000	(0)
	PbCl+	1.791e-13	1.640e-13	-12.747	-12.785	-0.038	(0)
	CdCl2	1.610e-13	1.610e-13	-12.793	-12.793	0.000	(0)
	AgCl3-2	1.149e-13	8.095e-14	-12.940	-13.092	-0.152	(0)
	CuCl3-2	1.483e-14	1.085e-14	-13.829	-13.964	-0.136	(0)
	HgClOH	5.272e-15	5.272e-15	-14.278	-14.278	0.000	(0)
	ZnCl3-	2.958e-15	2.731e-15	-14.529	-14.564	-0.035	(0)
	MnCl3-	2.385e-15	2.206e-15	-14.622	-14.656	-0.034	(0)
	CuCl2	1.577e-15	1.577e-15	-14.802	-14.802	0.000	(0)
	PbCl2	1.259e-15	1.259e-15	-14.900	-14.900	0.000	(0)

AgCl4-3	6.245e-16	2.839e-16	-15.204	-15.547	-0.342	(0)
HgCl2	2.253e-16	2.253e-16	-15.647	-15.647	0.000	(0)
CdCl3-	1.905e-16	1.745e-16	-15.720	-15.758	-0.038	(0)
NiCl2	4.964e-17	4.964e-17	-16.304	-16.304	0.000	(0)
HgCl3-	4.225e-18	3.871e-18	-17.374	-17.412	-0.038	(0)
ZnCl4-2	3.205e-18	2.346e-18	-17.494	-17.630	-0.136	(0)
PbCl3-	9.395e-19	8.607e-19	-18.027	-18.065	-0.038	(0)
UO2Cl+	7.030e-19	6.440e-19	-18.153	-18.191	-0.038	(0)
CrCl+2	6.701e-20	4.720e-20	-19.174	-19.326	-0.152	(0)
HgCl4-2	3.758e-20	2.647e-20	-19.425	-19.577	-0.152	(0)
HgCl+	2.857e-20	2.617e-20	-19.544	-19.582	-0.038	(0)
CuCl3-	2.738e-20	2.528e-20	-19.563	-19.597	-0.035	(0)
CrOHC12	3.507e-21	3.507e-21	-20.455	-20.455	0.000	(0)
PbCl4-2	9.593e-22	6.758e-22	-21.018	-21.170	-0.152	(0)
FeCl+2	1.035e-23	7.576e-24	-22.985	-23.121	-0.136	(0)
CrCl2+	8.398e-24	7.693e-24	-23.076	-23.114	-0.038	(0)
CuCl4-2	2.974e-25	2.176e-25	-24.527	-24.662	-0.136	(0)
FeCl2+	6.285e-26	5.813e-26	-25.202	-25.236	-0.034	(0)
VOCl+	2.388e-26	2.187e-26	-25.622	-25.660	-0.038	(0)
CrO3Cl-	2.400e-27	2.199e-27	-26.620	-26.658	-0.038	(0)
FeCl3	9.985e-30	9.985e-30	-29.001	-29.001	0.000	(0)
CoCl+2	2.390e-38	1.684e-38	-37.622	-37.774	-0.152	(0)
UCl+3	0.000e+00	0.000e+00	-48.754	-49.096	-0.342	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.666	-53.818	-0.152	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.581	-55.733	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.781	-68.933	-0.152	(0)
Co (2)	1.846e-09					
Co+2	1.373e-09	9.672e-10	-8.862	-9.014	-0.152	(0)
CoCO3	2.268e-10	2.268e-10	-9.644	-9.644	0.000	(0)
CoHCO3+	1.075e-10	9.849e-11	-9.969	-10.007	-0.038	(0)
CoSO4	7.405e-11	7.405e-11	-10.130	-10.130	0.000	(0)
CoOH+	4.794e-11	4.392e-11	-10.319	-10.357	-0.038	(0)
Co (OH) 2	7.938e-12	7.938e-12	-11.100	-11.100	0.000	(0)
CoCl+	6.274e-12	5.748e-12	-11.202	-11.241	-0.038	(0)
CoF+	2.389e-12	2.188e-12	-11.622	-11.660	-0.038	(0)
CoNO2+	1.868e-15	1.712e-15	-14.729	-14.767	-0.038	(0)
Co (NH3) +2	6.580e-16	4.635e-16	-15.182	-15.334	-0.152	(0)
Co (OH) 3-	3.934e-16	3.604e-16	-15.405	-15.443	-0.038	(0)
CoOOH-	9.873e-17	9.045e-17	-16.006	-16.044	-0.038	(0)
CoSeO4	6.446e-19	6.446e-19	-18.191	-18.191	0.000	(0)
CoNO3+	9.040e-20	8.281e-20	-19.044	-19.082	-0.038	(0)
Co2OH+3	4.683e-21	2.129e-21	-20.329	-20.672	-0.342	(0)
Co (OH) 4-2	1.845e-22	1.300e-22	-21.734	-21.886	-0.152	(0)
Co (NH3) 2+2	1.119e-22	7.882e-23	-21.951	-22.103	-0.152	(0)
Co (NO3) 2	9.103e-30	9.103e-30	-29.041	-29.041	0.000	(0)
Co (NH3) 3+2	5.615e-30	3.955e-30	-29.251	-29.403	-0.152	(0)
Co4 (OH) 4+4	3.015e-33	7.422e-34	-32.521	-33.129	-0.609	(0)
Co (NH3) 4+2	1.175e-37	8.274e-38	-36.930	-37.082	-0.152	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.110	-45.262	-0.152	(0)
Co (3)	7.907e-31					
CoOH+2	7.907e-31	5.570e-31	-30.102	-30.254	-0.152	(0)
Co+3	9.856e-38	4.817e-38	-37.006	-37.317	-0.311	(0)
CoCl+2	2.390e-38	1.684e-38	-37.622	-37.774	-0.152	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.666	-53.818	-0.152	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.621	-64.659	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.458	-67.611	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.781	-68.933	-0.152	(0)
Cr (2)	5.756e-28					
Cr+2	5.756e-28	4.055e-28	-27.240	-27.392	-0.152	(0)
Cr (3)	6.253e-10					
Cr (OH) 2+	3.195e-10	2.927e-10	-9.496	-9.534	-0.038	(0)
Cr (OH) 3	2.502e-10	2.502e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.932e-11	2.686e-11	-10.533	-10.571	-0.038	(0)
Cr (OH) 4-	2.474e-11	2.267e-11	-10.607	-10.645	-0.038	(0)
Cr (OH) +2	1.501e-12	1.057e-12	-11.824	-11.976	-0.152	(0)
CrOHSO4	9.625e-14	9.625e-14	-13.017	-13.017	0.000	(0)
CrF+2	3.418e-16	2.408e-16	-15.466	-15.618	-0.152	(0)
Cr+3	4.671e-17	2.123e-17	-16.331	-16.673	-0.342	(0)

CrSO4+	2.077e-17	1.902e-17	-16.683	-16.721	-0.038	(0)
CrCl+2	6.701e-20	4.720e-20	-19.174	-19.326	-0.152	(0)
CrOHC12	3.507e-21	3.507e-21	-20.455	-20.455	0.000	(0)
Cr2(OH)2SO4+2	1.305e-23	9.196e-24	-22.884	-23.036	-0.152	(0)
CrCl2+	8.398e-24	7.693e-24	-23.076	-23.114	-0.038	(0)
Cr2(OH)2(SO4)2	2.096e-25	2.096e-25	-24.679	-24.679	0.000	(0)
CrNO3+2	7.118e-29	5.014e-29	-28.148	-28.300	-0.152	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-43.789	-43.941	-0.152	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-53.727	-54.070	-0.342	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-55.581	-55.733	-0.152	(0)
Cr(6)	4.520e-15					
CrO4-2	4.417e-15	3.213e-15	-14.355	-14.493	-0.138	(0)
NaCrO4-	5.145e-17	4.714e-17	-16.289	-16.327	-0.038	(0)
HCrO4-	5.021e-17	4.600e-17	-16.299	-16.337	-0.038	(0)
KCrO4-	1.931e-18	1.769e-18	-17.714	-17.752	-0.038	(0)
H2CrO4	1.650e-25	1.650e-25	-24.783	-24.783	0.000	(0)
CrO3SO4-2	3.377e-26	2.379e-26	-25.471	-25.624	-0.152	(0)
CrO3Cl-	2.400e-27	2.199e-27	-26.620	-26.658	-0.038	(0)
Cr2O7-2	1.042e-31	7.337e-32	-30.982	-31.134	-0.152	(0)
Cu(1)	1.559e-10					
CuCl	8.234e-11	8.234e-11	-10.084	-10.084	0.000	(0)
Cu+	4.156e-11	3.808e-11	-10.381	-10.419	-0.038	(0)
CuCl2-	3.201e-11	2.955e-11	-10.495	-10.529	-0.035	(0)
CuCl3-2	1.483e-14	1.085e-14	-13.829	-13.964	-0.136	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-145.544	-145.763	-0.219	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.281	-146.493	-0.212	(0)
Cu(2)	9.594e-08					
CuCO3	7.943e-08	7.943e-08	-7.100	-7.100	0.000	(0)
CuOH+	7.579e-09	6.998e-09	-8.120	-8.155	-0.035	(0)
Cu(CO3)2-2	4.210e-09	2.966e-09	-8.376	-8.528	-0.152	(0)
Cu(OH)2	3.178e-09	3.178e-09	-8.498	-8.498	0.000	(0)
Cu+2	1.337e-09	9.725e-10	-8.874	-9.012	-0.138	(0)
CuHCO3+	8.768e-11	8.032e-11	-10.057	-10.095	-0.038	(0)
CuSO4	8.549e-11	8.549e-11	-10.068	-10.068	0.000	(0)
Cu(OH)3-	1.619e-11	1.483e-11	-10.791	-10.829	-0.038	(0)
CuF+	4.792e-12	4.390e-12	-11.319	-11.358	-0.038	(0)
CuCl+	2.867e-12	2.648e-12	-11.543	-11.577	-0.035	(0)
Cu2(OH)2+2	1.746e-12	1.230e-12	-11.758	-11.910	-0.152	(0)
CuNH3+2	5.631e-14	3.967e-14	-13.249	-13.402	-0.152	(0)
CuNO2+	2.791e-14	2.557e-14	-13.554	-13.592	-0.038	(0)
CuCl2	1.577e-15	1.577e-15	-14.802	-14.802	0.000	(0)
Cu(OH)4-2	3.771e-16	2.656e-16	-15.424	-15.576	-0.152	(0)
CuNO3+	1.813e-19	1.661e-19	-18.741	-18.780	-0.038	(0)
Cu(NO2)2	6.571e-20	6.571e-20	-19.182	-19.182	0.000	(0)
CuCl3-	2.738e-20	2.528e-20	-19.563	-19.597	-0.035	(0)
CuCl4-2	2.974e-25	2.176e-25	-24.527	-24.662	-0.136	(0)
Cu(NO3)2	1.130e-30	1.130e-30	-29.947	-29.947	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-216.238	-216.276	-0.038	(0)
F	7.903e-05					
F-	7.747e-05	7.155e-05	-4.111	-4.145	-0.035	(0)
MgF+	1.203e-06	1.111e-06	-5.920	-5.954	-0.034	(0)
CaF+	2.198e-07	2.033e-07	-6.658	-6.692	-0.034	(0)
NaF	1.333e-07	1.333e-07	-6.875	-6.875	0.000	(0)
MnF+	2.737e-09	2.532e-09	-8.563	-8.597	-0.034	(0)
HF	4.682e-10	4.682e-10	-9.330	-9.330	0.000	(0)
ZnF+	2.655e-10	2.433e-10	-9.576	-9.614	-0.038	(0)
BF(OH)3-	2.152e-10	1.981e-10	-9.667	-9.703	-0.036	(0)
CuF+	4.792e-12	4.390e-12	-11.319	-11.358	-0.038	(0)
NiF+	2.562e-12	2.347e-12	-11.591	-11.629	-0.038	(0)
CoF+	2.389e-12	2.188e-12	-11.622	-11.660	-0.038	(0)
CdF+	1.697e-13	1.554e-13	-12.770	-12.808	-0.038	(0)
HF2-	1.381e-13	1.274e-13	-12.860	-12.895	-0.035	(0)
AlF2+	1.873e-14	1.734e-14	-13.727	-13.761	-0.034	(0)
AgF	1.811e-14	1.811e-14	-13.742	-13.742	0.000	(0)
AlF3	1.562e-14	1.562e-14	-13.806	-13.806	0.000	(0)
PbF+	1.481e-14	1.357e-14	-13.829	-13.867	-0.038	(0)
BF2(OH)2-	7.283e-15	6.706e-15	-14.138	-14.174	-0.036	(0)
UO2F+	2.492e-15	2.283e-15	-14.603	-14.641	-0.038	(0)

AlF+2	8.294e-16	6.087e-16	-15.081	-15.216	-0.134	(0)
AlF4-	6.059e-16	5.599e-16	-15.218	-15.252	-0.034	(0)
UO2F2	4.711e-16	4.711e-16	-15.327	-15.327	0.000	(0)
CrF+2	3.418e-16	2.408e-16	-15.466	-15.618	-0.152	(0)
CdF2	2.219e-17	2.219e-17	-16.654	-16.654	0.000	(0)
PbF2	1.910e-17	1.910e-17	-16.719	-16.719	0.000	(0)
UO2F3-	9.241e-18	8.466e-18	-17.034	-17.072	-0.038	(0)
H2F2	5.873e-19	5.873e-19	-18.231	-18.231	0.000	(0)
FeF2+	2.372e-20	2.194e-20	-19.625	-19.659	-0.034	(0)
FeF+2	1.565e-20	1.146e-20	-19.805	-19.941	-0.136	(0)
UO2F4-2	6.830e-21	4.811e-21	-20.166	-20.318	-0.152	(0)
VO2F	4.550e-21	4.550e-21	-20.342	-20.342	0.000	(0)
PbF3-	2.830e-21	2.592e-21	-20.548	-20.586	-0.038	(0)
FeF3	2.214e-21	2.214e-21	-20.655	-20.655	0.000	(0)
BF3OH-	8.970e-22	8.259e-22	-21.047	-21.083	-0.036	(0)
VO2F2-	1.290e-22	1.182e-22	-21.889	-21.927	-0.038	(0)
VOF+	2.126e-24	1.948e-24	-23.672	-23.710	-0.038	(0)
VO2F3-2	1.497e-25	1.055e-25	-24.825	-24.977	-0.152	(0)
PbF4-2	1.260e-25	8.878e-26	-24.900	-25.052	-0.152	(0)
VOF2	5.226e-26	5.226e-26	-25.282	-25.282	0.000	(0)
HgF+	2.211e-27	2.025e-27	-26.655	-26.694	-0.038	(0)
BF4-	1.397e-27	1.286e-27	-26.855	-26.891	-0.036	(0)
Sb(OH)2F	3.495e-28	3.495e-28	-27.457	-27.457	0.000	(0)
SbOF	3.437e-28	3.437e-28	-27.464	-27.464	0.000	(0)
VOF3-	1.448e-28	1.327e-28	-27.839	-27.877	-0.038	(0)
VO2F4-3	8.169e-30	3.713e-30	-29.088	-29.430	-0.342	(0)
VOF4-2	5.438e-32	3.831e-32	-31.265	-31.417	-0.152	(0)
SiF6-2	3.192e-32	2.336e-32	-31.496	-31.631	-0.136	(0)
UF3+	1.482e-39	1.357e-39	-38.829	-38.867	-0.038	(0)
UF2+2	1.699e-40	1.197e-40	-39.770	-39.922	-0.152	(0)
UF4	0.000e+00	0.000e+00	-40.973	-40.973	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.534	-42.876	-0.342	(0)
UF5-	0.000e+00	0.000e+00	-43.482	-43.520	-0.038	(0)
UF6-2	0.000e+00	0.000e+00	-45.033	-45.186	-0.152	(0)
Fe(2)	2.048e-13					
Fe+2	1.784e-13	1.257e-13	-12.749	-12.901	-0.152	(0)
FeOH+	1.231e-14	1.139e-14	-13.910	-13.944	-0.034	(0)
FeSO4	1.184e-14	1.184e-14	-13.927	-13.927	0.000	(0)
FeHCO3+	2.236e-15	2.071e-15	-14.651	-14.684	-0.033	(0)
Fe(OH)2	2.058e-17	2.058e-17	-16.687	-16.687	0.000	(0)
Fe(OH)3-	1.601e-17	1.481e-17	-16.796	-16.829	-0.034	(0)
Fe(HS)2	0.000e+00	0.000e+00	-159.393	-159.393	0.000	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-235.039	-235.077	-0.038	(0)
Fe(3)	7.758e-10					
Fe(OH)3	4.643e-10	4.643e-10	-9.333	-9.333	0.000	(0)
Fe(OH)2+	2.053e-10	1.900e-10	-9.688	-9.721	-0.034	(0)
Fe(OH)4-	1.063e-10	9.837e-11	-9.974	-10.007	-0.034	(0)
FeOH+2	2.932e-16	2.146e-16	-15.533	-15.668	-0.136	(0)
FeF2+	2.372e-20	2.194e-20	-19.625	-19.659	-0.034	(0)
FeF+2	1.565e-20	1.146e-20	-19.805	-19.941	-0.136	(0)
FeF3	2.214e-21	2.214e-21	-20.655	-20.655	0.000	(0)
FeSO4+	6.798e-22	6.288e-22	-21.168	-21.202	-0.034	(0)
Fe+3	2.988e-22	1.460e-22	-21.525	-21.836	-0.311	(0)
FeCl+2	1.035e-23	7.576e-24	-22.985	-23.121	-0.136	(0)
Fe(SO4)2-	5.630e-24	5.158e-24	-23.249	-23.288	-0.038	(0)
FeCl2+	6.285e-26	5.813e-26	-25.202	-25.236	-0.034	(0)
FeHSeO3+2	8.196e-28	5.773e-28	-27.086	-27.239	-0.152	(0)
FeCl3	9.985e-30	9.985e-30	-29.001	-29.001	0.000	(0)
Fe2(OH)2+4	6.192e-30	1.525e-30	-29.208	-29.817	-0.609	(0)
FeNO3+2	1.120e-31	7.890e-32	-30.951	-31.103	-0.152	(0)
Fe3(OH)4+5	3.740e-38	4.187e-39	-37.427	-38.378	-0.951	(0)
H(0)	1.769e-28					
H2	8.845e-29	8.856e-29	-28.053	-28.053	0.001	(0)
Hg(0)	4.505e-11					
Hg	4.505e-11	4.505e-11	-10.346	-10.346	0.000	(0)
Hg(1)	6.631e-26					
Hg2+2	3.316e-26	2.336e-26	-25.479	-25.632	-0.152	(0)
Hg(2)	3.044e-14					

	Hg (OH) 2	2.492e-14	2.495e-14	-13.603	-13.603	0.001	(0)
	HgClOH	5.272e-15	5.272e-15	-14.278	-14.278	0.000	(0)
	HgCl2	2.253e-16	2.253e-16	-15.647	-15.647	0.000	(0)
	HgCO3	1.268e-17	1.268e-17	-16.897	-16.897	0.000	(0)
	HgCl3-	4.225e-18	3.871e-18	-17.374	-17.412	-0.038	(0)
	Hg (CO3) 2-2	7.894e-19	5.561e-19	-18.103	-18.255	-0.152	(0)
	HgOH+	7.552e-20	6.919e-20	-19.122	-19.160	-0.038	(0)
	HgCl4-2	3.758e-20	2.647e-20	-19.425	-19.577	-0.152	(0)
	HgCl+	2.857e-20	2.617e-20	-19.544	-19.582	-0.038	(0)
	Hg (OH) 3-	7.803e-21	7.148e-21	-20.108	-20.146	-0.038	(0)
	HgHCO3+	1.140e-21	1.044e-21	-20.943	-20.981	-0.038	(0)
	Hg (NH3) 2+2	1.087e-23	7.656e-24	-22.964	-23.116	-0.152	(0)
	HgNH3+2	2.727e-24	1.921e-24	-23.564	-23.717	-0.152	(0)
	Hg+2	1.084e-24	7.637e-25	-23.965	-24.117	-0.152	(0)
	HgSO4	7.672e-26	7.672e-26	-25.115	-25.115	0.000	(0)
	HgF+	2.211e-27	2.025e-27	-26.655	-26.694	-0.038	(0)
	Hg (NH3) 3+2	1.725e-31	1.215e-31	-30.763	-30.915	-0.152	(0)
	HgNO3+	1.663e-35	1.523e-35	-34.779	-34.817	-0.038	(0)
	Hg (NH3) 4+2	5.461e-39	3.847e-39	-38.263	-38.415	-0.152	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-45.466	-45.466	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.239	-139.277	-0.038	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.479	-139.631	-0.152	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
K		1.609e-04					
	K+	1.605e-04	1.482e-04	-3.795	-3.829	-0.035	(0)
	KSO4-	4.350e-07	4.026e-07	-6.362	-6.395	-0.034	(0)
	KCrO4-	1.931e-18	1.769e-18	-17.714	-17.752	-0.038	(0)
Mg		2.049e-04					
	Mg+2	1.903e-04	1.384e-04	-3.721	-3.859	-0.138	(0)
	MgSO4	9.667e-06	9.667e-06	-5.015	-5.015	0.000	(0)
	MgHCO3+	2.008e-06	1.854e-06	-5.697	-5.732	-0.035	(0)
	MgCO3	1.597e-06	1.597e-06	-5.797	-5.797	0.000	(0)
	MgF+	1.203e-06	1.111e-06	-5.920	-5.954	-0.034	(0)
	MgOH+	1.353e-07	1.254e-07	-6.869	-6.902	-0.033	(0)
	MgH2BO3+	4.750e-09	4.373e-09	-8.323	-8.359	-0.036	(0)
Mn (2)		1.358e-06					
	Mn+2	1.262e-06	8.888e-07	-5.899	-6.051	-0.152	(0)
	MnSO4	6.065e-08	6.065e-08	-7.217	-7.217	0.000	(0)
	MnHCO3+	2.510e-08	2.321e-08	-7.600	-7.634	-0.034	(0)
	MnOH+	5.493e-09	5.081e-09	-8.260	-8.294	-0.034	(0)
	MnF+	2.737e-09	2.532e-09	-8.563	-8.597	-0.034	(0)
	MnCl+	2.078e-09	1.922e-09	-8.682	-8.716	-0.034	(0)
	MnCl2	4.664e-12	4.664e-12	-11.331	-11.331	0.000	(0)
	MnCl3-	2.385e-15	2.206e-15	-14.622	-14.656	-0.034	(0)
	MnSeO4	3.181e-16	3.181e-16	-15.497	-15.497	0.000	(0)
	Mn (OH) 3-	1.758e-16	1.626e-16	-15.755	-15.789	-0.034	(0)
	MnNO3+	8.307e-17	7.610e-17	-16.081	-16.119	-0.038	(0)
	Mn (OH) 4-2	1.632e-21	1.195e-21	-20.787	-20.923	-0.136	(0)
	Mn (NO3) 2	1.033e-26	1.033e-26	-25.986	-25.986	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.755	-41.755	0.000	(0)
Mn (3)		1.016e-27					
	Mn+3	1.016e-27	4.966e-28	-26.993	-27.304	-0.311	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.116	-41.251	-0.136	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-46.491	-46.526	-0.035	(0)
Mo		3.712e-08					
	MoO4-2	3.711e-08	2.700e-08	-7.430	-7.569	-0.138	(0)
	HMoO4-	2.594e-12	2.377e-12	-11.586	-11.624	-0.038	(0)
	H2MoO4	7.702e-17	7.702e-17	-16.113	-16.113	0.000	(0)
	Ag2MoO4	1.038e-28	1.038e-28	-27.984	-27.984	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.272	-58.614	-0.342	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-65.454	-66.824	-1.370	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-67.840	-68.791	-0.951	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-71.754	-72.363	-0.609	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-77.129	-77.471	-0.342	(0)
N (-3)		3.772e-08					
	NH4+	3.359e-08	3.093e-08	-7.474	-7.510	-0.036	(0)

NH3	3.986e-09	3.986e-09	-8.399	-8.399	0.000	(0)
NH4SO4-	1.375e-10	1.272e-10	-9.862	-9.896	-0.034	(0)
CaNH3+2	1.855e-12	1.306e-12	-11.732	-11.884	-0.152	(0)
CuNH3+2	5.631e-14	3.967e-14	-13.249	-13.402	-0.152	(0)
NiNH3+2	3.969e-15	2.796e-15	-14.401	-14.554	-0.152	(0)
AgNH3+	8.952e-16	8.201e-16	-15.048	-15.086	-0.038	(0)
Co (NH3) +2	6.580e-16	4.635e-16	-15.182	-15.334	-0.152	(0)
BaNH3+2	5.416e-18	3.815e-18	-17.266	-17.418	-0.152	(0)
Ag (NH3) 2+	2.900e-20	2.657e-20	-19.538	-19.576	-0.038	(0)
Ca (NH3) 2+2	2.943e-21	2.073e-21	-20.531	-20.683	-0.152	(0)
Ni (NH3) 2+2	2.287e-21	1.611e-21	-20.641	-20.793	-0.152	(0)
Co (NH3) 2+2	1.119e-22	7.882e-23	-21.951	-22.103	-0.152	(0)
Hg (NH3) 2+2	1.087e-23	7.656e-24	-22.964	-23.116	-0.152	(0)
HgNH3+2	2.727e-24	1.921e-24	-23.564	-23.717	-0.152	(0)
Co (NH3) 3+2	5.615e-30	3.955e-30	-29.251	-29.403	-0.152	(0)
Hg (NH3) 3+2	1.725e-31	1.215e-31	-30.763	-30.915	-0.152	(0)
Co (NH3) 4+2	1.175e-37	8.274e-38	-36.930	-37.082	-0.152	(0)
Hg (NH3) 4+2	5.461e-39	3.847e-39	-38.263	-38.415	-0.152	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.789	-43.941	-0.152	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.110	-45.262	-0.152	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.666	-53.818	-0.152	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.727	-54.070	-0.342	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.581	-55.733	-0.152	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.621	-64.659	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.458	-67.611	-0.152	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.781	-68.933	-0.152	(0)
N (3)	2.725e-07					
NO2-	2.725e-07	2.511e-07	-6.565	-6.600	-0.035	(0)
CuNO2+	2.791e-14	2.557e-14	-13.554	-13.592	-0.038	(0)
AgNO2	5.287e-15	5.287e-15	-14.277	-14.277	0.000	(0)
CoNO2+	1.868e-15	1.712e-15	-14.729	-14.767	-0.038	(0)
Cu (NO2) 2	6.571e-20	6.571e-20	-19.182	-19.182	0.000	(0)
Ag (NO2) 2-	2.244e-21	2.056e-21	-20.649	-20.687	-0.038	(0)
N (5)	5.854e-11					
NO3-	5.850e-11	5.402e-11	-10.233	-10.267	-0.035	(0)
CaNO3+	4.855e-14	4.447e-14	-13.314	-13.352	-0.038	(0)
MnNO3+	8.307e-17	7.610e-17	-16.081	-16.119	-0.038	(0)
ZnNO3+	2.524e-17	2.312e-17	-16.598	-16.636	-0.038	(0)
BaNO3+	4.483e-19	4.107e-19	-18.348	-18.386	-0.038	(0)
NiNO3+	1.934e-19	1.772e-19	-18.713	-18.752	-0.038	(0)
CuNO3+	1.813e-19	1.661e-19	-18.741	-18.780	-0.038	(0)
CoNO3+	9.040e-20	8.281e-20	-19.044	-19.082	-0.038	(0)
CdNO3+	2.556e-20	2.342e-20	-19.592	-19.630	-0.038	(0)
AgNO3	4.324e-21	4.324e-21	-20.364	-20.364	0.000	(0)
PbNO3+	2.347e-21	2.151e-21	-20.629	-20.667	-0.038	(0)
UO2NO3+	2.720e-26	2.492e-26	-25.565	-25.603	-0.038	(0)
Mn (NO3) 2	1.033e-26	1.033e-26	-25.986	-25.986	0.000	(0)
Zn (NO3) 2	2.493e-28	2.493e-28	-27.603	-27.603	0.000	(0)
CrNO3+2	7.118e-29	5.014e-29	-28.148	-28.300	-0.152	(0)
Co (NO3) 2	9.103e-30	9.103e-30	-29.041	-29.041	0.000	(0)
Cu (NO3) 2	1.130e-30	1.130e-30	-29.947	-29.947	0.000	(0)
VO2NO3	9.909e-31	9.909e-31	-30.004	-30.004	0.000	(0)
Cd (NO3) 2	6.341e-31	6.341e-31	-30.198	-30.198	0.000	(0)
Pb (NO3) 2	1.973e-31	1.973e-31	-30.705	-30.705	0.000	(0)
FeNO3+2	1.120e-31	7.890e-32	-30.951	-31.103	-0.152	(0)
HgNO3+	1.663e-35	1.523e-35	-34.779	-34.817	-0.038	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.466	-45.466	0.000	(0)
Na	3.207e-03					
Na+	3.197e-03	2.952e-03	-2.495	-2.530	-0.035	(0)
NaSO4-	6.573e-06	6.084e-06	-5.182	-5.216	-0.034	(0)
NaHCO3	2.173e-06	2.173e-06	-5.663	-5.663	0.000	(0)
NaCO3-	8.239e-07	7.626e-07	-6.084	-6.118	-0.034	(0)
NaF	1.333e-07	1.333e-07	-6.875	-6.875	0.000	(0)
NaH2BO3	4.263e-09	4.263e-09	-8.370	-8.370	0.000	(0)
NaCrO4-	5.145e-17	4.714e-17	-16.289	-16.327	-0.038	(0)
Ni	2.858e-09					
Ni+2	1.795e-09	1.306e-09	-8.746	-8.884	-0.138	(0)
NiCO3	6.758e-10	6.758e-10	-9.170	-9.170	0.000	(0)

NiHCO3+	2.301e-10	2.108e-10	-9.638	-9.676	-0.038	(0)
NiSO4	9.998e-11	9.998e-11	-10.000	-10.000	0.000	(0)
NiOH+	4.084e-11	3.741e-11	-10.389	-10.427	-0.038	(0)
Ni(OH) 2	6.763e-12	6.763e-12	-11.170	-11.170	0.000	(0)
NiCl+	6.265e-12	5.740e-12	-11.203	-11.241	-0.038	(0)
NiF+	2.562e-12	2.347e-12	-11.591	-11.629	-0.038	(0)
Ni(OH) 3-	1.680e-14	1.539e-14	-13.775	-13.813	-0.038	(0)
NiNH3+2	3.969e-15	2.796e-15	-14.401	-14.554	-0.152	(0)
Ni(SO4) 2-2	1.803e-15	1.270e-15	-14.744	-14.896	-0.152	(0)
NiCl2	4.964e-17	4.964e-17	-16.304	-16.304	0.000	(0)
NiSeO4	8.123e-19	8.123e-19	-18.090	-18.090	0.000	(0)
NiNO3+	1.934e-19	1.772e-19	-18.713	-18.752	-0.038	(0)
Ni(NH3) 2+2	2.287e-21	1.611e-21	-20.641	-20.793	-0.152	(0)
O(0)	1.291e-36					
O2	6.453e-37	6.461e-37	-36.190	-36.190	0.001	(0)
Pb	1.438e-10					
PbCO3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
PbOH+	1.679e-11	1.538e-11	-10.775	-10.813	-0.038	(0)
Pb(CO3) 2-2	6.373e-12	4.490e-12	-11.196	-11.348	-0.152	(0)
Pb+2	3.700e-12	2.691e-12	-11.432	-11.570	-0.138	(0)
PbHCO3+	2.857e-12	2.618e-12	-11.544	-11.582	-0.038	(0)
Pb(OH) 2	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
PbSO4	5.058e-13	5.058e-13	-12.296	-12.296	0.000	(0)
PbCl+	1.791e-13	1.640e-13	-12.747	-12.785	-0.038	(0)
PbF+	1.481e-14	1.357e-14	-13.829	-13.867	-0.038	(0)
Pb(OH) 3-	2.750e-15	2.519e-15	-14.561	-14.599	-0.038	(0)
Pb(SO4) 2-2	1.660e-15	1.169e-15	-14.780	-14.932	-0.152	(0)
PbCl2	1.259e-15	1.259e-15	-14.900	-14.900	0.000	(0)
PbF2	1.910e-17	1.910e-17	-16.719	-16.719	0.000	(0)
Pb(OH) 4-2	1.993e-18	1.404e-18	-17.700	-17.853	-0.152	(0)
PbCl3-	9.395e-19	8.607e-19	-18.027	-18.065	-0.038	(0)
PbF3-	2.830e-21	2.592e-21	-20.548	-20.586	-0.038	(0)
PbNO3+	2.347e-21	2.151e-21	-20.629	-20.667	-0.038	(0)
Pb2OH+3	1.444e-21	6.562e-22	-20.841	-21.183	-0.342	(0)
PbCl4-2	9.593e-22	6.758e-22	-21.018	-21.170	-0.152	(0)
PbF4-2	1.260e-25	8.878e-26	-24.900	-25.052	-0.152	(0)
Pb3(OH) 4+2	9.343e-26	6.582e-26	-25.030	-25.182	-0.152	(0)
Pb(NO3) 2	1.973e-31	1.973e-31	-30.705	-30.705	0.000	(0)
Pb4(OH) 4+4	5.715e-33	1.407e-33	-32.243	-32.852	-0.609	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.742	-151.742	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.125	-228.163	-0.038	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.903	-73.903	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.683	-77.721	-0.038	(0)
S5-2	0.000e+00	0.000e+00	-78.580	-78.732	-0.152	(0)
H2S	0.000e+00	0.000e+00	-79.055	-79.055	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.096	-79.248	-0.152	(0)
S4-2	0.000e+00	0.000e+00	-79.175	-79.328	-0.152	(0)
CdHS+	0.000e+00	0.000e+00	-79.538	-79.576	-0.038	(0)
S3-2	0.000e+00	0.000e+00	-79.981	-80.133	-0.152	(0)
S2-2	0.000e+00	0.000e+00	-80.997	-81.150	-0.152	(0)
S-2	0.000e+00	0.000e+00	-86.531	-86.667	-0.136	(0)
HgHS2-	0.000e+00	0.000e+00	-139.239	-139.277	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-139.479	-139.631	-0.152	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-145.544	-145.763	-0.219	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.281	-146.493	-0.212	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-146.542	-146.653	-0.111	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.008	-147.046	-0.038	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.486	-147.524	-0.038	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-147.517	-147.739	-0.222	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.835	-148.050	-0.216	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.390	-149.390	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.093	-150.093	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.742	-151.742	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.393	-159.393	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.238	-216.276	-0.038	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-223.793	-223.831	-0.038	(0)

ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.305	-225.457	-0.152	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.876	-225.914	-0.038	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.125	-228.163	-0.038	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.039	-235.077	-0.038	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.287	-301.439	-0.152	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-302.860	-303.012	-0.152	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.353	-320.505	-0.152	(0)
S (6)	5.671e-04					
SO4-2	5.275e-04	3.837e-04	-3.278	-3.416	-0.138	(0)
CaSO4	2.288e-05	2.288e-05	-4.640	-4.640	0.000	(0)
MgSO4	9.667e-06	9.667e-06	-5.015	-5.015	0.000	(0)
NaSO4-	6.573e-06	6.084e-06	-5.182	-5.216	-0.034	(0)
KSO4-	4.350e-07	4.026e-07	-6.362	-6.395	-0.034	(0)
MnSO4	6.065e-08	6.065e-08	-7.217	-7.217	0.000	(0)
ZnSO4	1.431e-08	1.431e-08	-7.844	-7.844	0.000	(0)
HSO4-	1.795e-10	1.659e-10	-9.746	-9.780	-0.034	(0)
NH4SO4-	1.375e-10	1.272e-10	-9.862	-9.896	-0.034	(0)
NiSO4	9.998e-11	9.998e-11	-10.000	-10.000	0.000	(0)
CuSO4	8.549e-11	8.549e-11	-10.068	-10.068	0.000	(0)
CoSO4	7.405e-11	7.405e-11	-10.130	-10.130	0.000	(0)
Zn (SO4) 2-2	6.787e-11	4.781e-11	-10.168	-10.320	-0.152	(0)
CdSO4	1.233e-11	1.233e-11	-10.909	-10.909	0.000	(0)
AgSO4-	8.421e-13	7.715e-13	-12.075	-12.113	-0.038	(0)
PbSO4	5.058e-13	5.058e-13	-12.296	-12.296	0.000	(0)
CrOHSO4	9.625e-14	9.625e-14	-13.017	-13.017	0.000	(0)
Cd (SO4) 2-2	9.061e-14	6.383e-14	-13.043	-13.195	-0.152	(0)
FeSO4	1.184e-14	1.184e-14	-13.927	-13.927	0.000	(0)
Ni (SO4) 2-2	1.803e-15	1.270e-15	-14.744	-14.896	-0.152	(0)
Pb (SO4) 2-2	1.660e-15	1.169e-15	-14.780	-14.932	-0.152	(0)
UO2SO4	1.343e-16	1.343e-16	-15.872	-15.872	0.000	(0)
CrSO4+	2.077e-17	1.902e-17	-16.683	-16.721	-0.038	(0)
AlSO4+	2.742e-18	2.534e-18	-17.562	-17.596	-0.034	(0)
UO2 (SO4) 2-2	9.641e-19	6.791e-19	-18.016	-18.168	-0.152	(0)
Al (SO4) 2-	1.127e-20	1.042e-20	-19.948	-19.982	-0.034	(0)
FeSO4+	6.798e-22	6.288e-22	-21.168	-21.202	-0.034	(0)
VO2SO4-	3.627e-22	3.322e-22	-21.440	-21.479	-0.038	(0)
Cr2 (OH) 2SO4+2	1.305e-23	9.196e-24	-22.884	-23.036	-0.152	(0)
Fe (SO4) 2-	5.630e-24	5.158e-24	-23.249	-23.288	-0.038	(0)
VOSO4	4.797e-25	4.797e-25	-24.319	-24.319	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.096e-25	2.096e-25	-24.679	-24.679	0.000	(0)
HgSO4	7.672e-26	7.672e-26	-25.115	-25.115	0.000	(0)
CrO3SO4-2	3.377e-26	2.379e-26	-25.471	-25.624	-0.152	(0)
VSO4+	6.975e-40	6.390e-40	-39.156	-39.195	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.695	-44.847	-0.152	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.621	-64.659	-0.038	(0)
Sb (3)	1.397e-21					
Sb (OH) 3	7.067e-22	7.067e-22	-21.151	-21.151	0.000	(0)
HSbO2	6.899e-22	6.899e-22	-21.161	-21.161	0.000	(0)
SbO2-	2.757e-25	2.526e-25	-24.560	-24.598	-0.038	(0)
Sb (OH) 4-	1.579e-25	1.447e-25	-24.802	-24.840	-0.038	(0)
Sb (OH) 2F	3.495e-28	3.495e-28	-27.457	-27.457	0.000	(0)
SbOF	3.437e-28	3.437e-28	-27.464	-27.464	0.000	(0)
Sb (OH) 2+	8.289e-29	7.594e-29	-28.082	-28.120	-0.038	(0)
SbO+	2.858e-29	2.618e-29	-28.544	-28.582	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.353	-320.505	-0.152	(0)
Sb (5)	5.843e-10					
SbO3-	5.836e-10	5.346e-10	-9.234	-9.272	-0.038	(0)
Sb (OH) 6-	6.769e-13	6.251e-13	-12.169	-12.204	-0.035	(0)
SbO2+	3.277e-27	3.002e-27	-26.485	-26.523	-0.038	(0)
Se (-2)	3.968e-16					
Ag2Se	3.968e-16	3.968e-16	-15.401	-15.401	0.000	(0)
HSe-	2.317e-39	2.122e-39	-38.635	-38.673	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-41.755	-41.755	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.137	-43.137	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.167	-45.319	-0.152	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.181	-82.790	-0.609	(0)
Se (4)	3.544e-09					

SeO3-2	1.911e-09	1.346e-09	-8.719	-8.871	-0.152	(0)
HSeO3-	1.633e-09	1.496e-09	-8.787	-8.825	-0.038	(0)
H2SeO3	2.823e-15	2.823e-15	-14.549	-14.549	0.000	(0)
AgSeO3-	9.516e-17	8.718e-17	-16.022	-16.060	-0.038	(0)
Cd (SeO3) 2-2	2.906e-22	2.047e-22	-21.537	-21.689	-0.152	(0)
Ag (SeO3) 2-3	2.311e-24	1.051e-24	-23.636	-23.979	-0.342	(0)
FeHSeO3+2	8.196e-28	5.773e-28	-27.086	-27.239	-0.152	(0)
Se (6)	1.828e-12					
SeO4-2	1.828e-12	1.330e-12	-11.738	-11.876	-0.138	(0)
MnSeO4	3.181e-16	3.181e-16	-15.497	-15.497	0.000	(0)
ZnSeO4	3.510e-17	3.510e-17	-16.455	-16.455	0.000	(0)
NiSeO4	8.123e-19	8.123e-19	-18.090	-18.090	0.000	(0)
CoSeO4	6.446e-19	6.446e-19	-18.191	-18.191	0.000	(0)
HSeO4-	3.219e-19	2.949e-19	-18.492	-18.530	-0.038	(0)
CdSeO4	3.395e-20	3.395e-20	-19.469	-19.469	0.000	(0)
Zn (SeO4) 2-2	6.718e-29	4.732e-29	-28.173	-28.325	-0.152	(0)
Si	3.105e-04					
H4SiO4	2.999e-04	3.002e-04	-3.523	-3.523	0.001	(0)
H3SiO4-	1.062e-05	9.809e-06	-4.974	-5.008	-0.035	(0)
H2SiO4-2	1.906e-10	1.399e-10	-9.720	-9.854	-0.134	(0)
UO2H3SiO4+	2.101e-13	1.925e-13	-12.677	-12.716	-0.038	(0)
SiF6-2	3.192e-32	2.336e-32	-31.496	-31.631	-0.136	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.582	-60.924	-0.342	(0)
U (4)	4.546e-20					
U (OH) 5-	4.545e-20	4.164e-20	-19.342	-19.381	-0.038	(0)
U (OH) 4	7.716e-24	7.716e-24	-23.113	-23.113	0.000	(0)
U (OH) 3+	1.362e-28	1.248e-28	-27.866	-27.904	-0.038	(0)
U (OH) 2+2	3.625e-34	2.554e-34	-33.441	-33.593	-0.152	(0)
UF3+	1.482e-39	1.357e-39	-38.829	-38.867	-0.038	(0)
UF2+2	1.699e-40	1.197e-40	-39.770	-39.922	-0.152	(0)
UOH+3	1.171e-40	0.000e+00	-39.932	-40.274	-0.342	(0)
UF4	0.000e+00	0.000e+00	-40.973	-40.973	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.534	-42.876	-0.342	(0)
UF5-	0.000e+00	0.000e+00	-43.482	-43.520	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.695	-44.847	-0.152	(0)
UF6-2	0.000e+00	0.000e+00	-45.033	-45.186	-0.152	(0)
U+4	0.000e+00	0.000e+00	-47.422	-48.031	-0.609	(0)
UC1+3	0.000e+00	0.000e+00	-48.754	-49.096	-0.342	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-176.948	-180.030	-3.081	(0)
U (5)	1.230e-17					
UO2+	1.230e-17	1.126e-17	-16.910	-16.948	-0.038	(0)
U (6)	1.501e-08					
UO2 (CO3) 3-4	9.976e-09	2.456e-09	-8.001	-8.610	-0.609	(0)
UO2 (CO3) 2-2	5.016e-09	3.533e-09	-8.300	-8.452	-0.152	(0)
UO2CO3	1.277e-11	1.277e-11	-10.894	-10.894	0.000	(0)
UO2H3SiO4+	2.101e-13	1.925e-13	-12.677	-12.716	-0.038	(0)
UO2OH+	7.229e-14	6.623e-14	-13.141	-13.179	-0.038	(0)
UO2F+	2.492e-15	2.283e-15	-14.603	-14.641	-0.038	(0)
UO2F2	4.711e-16	4.711e-16	-15.327	-15.327	0.000	(0)
UO2+2	3.178e-16	2.312e-16	-15.498	-15.636	-0.138	(0)
UO2SO4	1.343e-16	1.343e-16	-15.872	-15.872	0.000	(0)
UO2F3-	9.241e-18	8.466e-18	-17.034	-17.072	-0.038	(0)
UO2 (SO4) 2-2	9.641e-19	6.791e-19	-18.016	-18.168	-0.152	(0)
UO2Cl+	7.030e-19	6.440e-19	-18.153	-18.191	-0.038	(0)
(UO2) 2 (OH) 2+2	1.033e-20	7.279e-21	-19.986	-20.138	-0.152	(0)
UO2F4-2	6.830e-21	4.811e-21	-20.166	-20.318	-0.152	(0)
(UO2) 3 (OH) 5+	2.067e-21	1.894e-21	-20.685	-20.723	-0.038	(0)
UO2NO3+	2.720e-26	2.492e-26	-25.565	-25.603	-0.038	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.955	-44.993	-0.038	(0)
V+2	0.000e+00	0.000e+00	-46.708	-46.860	-0.152	(0)
V (3)	3.353e-17					
V (OH) 3	3.353e-17	3.353e-17	-16.475	-16.475	0.000	(0)
V (OH) 2+	1.046e-28	9.587e-29	-27.980	-28.018	-0.038	(0)
VOH+2	5.712e-33	4.023e-33	-32.243	-32.395	-0.152	(0)
V+3	7.760e-39	3.528e-39	-38.110	-38.453	-0.342	(0)

VSO4+	6.975e-40	6.390e-40	-39.156	-39.195	-0.038	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-61.619	-61.962	-0.342	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-63.382	-63.991	-0.609	(0)
V (4)	2.258e-21					
V (OH) 3+	2.249e-21	2.061e-21	-20.648	-20.686	-0.038	(0)
VO+2	6.444e-24	4.539e-24	-23.191	-23.343	-0.152	(0)
VOF+	2.126e-24	1.948e-24	-23.672	-23.710	-0.038	(0)
VOSO4	4.797e-25	4.797e-25	-24.319	-24.319	0.000	(0)
VOF2	5.226e-26	5.226e-26	-25.282	-25.282	0.000	(0)
VOC1+	2.388e-26	2.187e-26	-25.622	-25.660	-0.038	(0)
VOF3-	1.448e-28	1.327e-28	-27.839	-27.877	-0.038	(0)
VOF4-2	5.438e-32	3.831e-32	-31.265	-31.417	-0.152	(0)
H2V2O4+2	3.022e-37	2.129e-37	-36.520	-36.672	-0.152	(0)
V (5)	1.761e-10					
H2VO4-	1.013e-10	9.282e-11	-9.994	-10.032	-0.038	(0)
HVO4-2	7.481e-11	5.270e-11	-10.126	-10.278	-0.152	(0)
H3VO4	4.107e-15	4.107e-15	-14.387	-14.387	0.000	(0)
VO4-3	1.313e-16	5.970e-17	-15.882	-16.224	-0.342	(0)
HV2O7-3	3.647e-18	1.658e-18	-17.438	-17.780	-0.342	(0)
H3V2O7-	2.687e-18	2.462e-18	-17.571	-17.609	-0.038	(0)
V2O7-4	4.096e-20	1.009e-20	-19.388	-19.996	-0.609	(0)
VO2+	3.926e-20	3.626e-20	-19.406	-19.441	-0.035	(0)
VO2F	4.550e-21	4.550e-21	-20.342	-20.342	0.000	(0)
VO2SO4-	3.627e-22	3.322e-22	-21.440	-21.479	-0.038	(0)
VO2F2-	1.290e-22	1.182e-22	-21.889	-21.927	-0.038	(0)
V3O9-3	1.843e-24	8.378e-25	-23.734	-24.077	-0.342	(0)
VO2F3-2	1.497e-25	1.055e-25	-24.825	-24.977	-0.152	(0)
VO2F4-3	8.169e-30	3.713e-30	-29.088	-29.430	-0.342	(0)
VO2NO3	9.909e-31	9.909e-31	-30.004	-30.004	0.000	(0)
V4O12-4	1.317e-31	3.242e-32	-30.880	-31.489	-0.609	(0)
V10O28-6	0.000e+00	0.000e+00	-83.464	-84.834	-1.370	(0)
HV10O28-5	0.000e+00	0.000e+00	-84.050	-85.001	-0.951	(0)
H2V10O28-4	0.000e+00	0.000e+00	-87.539	-88.148	-0.609	(0)
Zn	4.521e-07					
Zn+2	2.343e-07	1.704e-07	-6.630	-6.769	-0.138	(0)
ZnCO3	1.360e-07	1.360e-07	-6.866	-6.866	0.000	(0)
ZnOH+	4.233e-08	3.878e-08	-7.373	-7.411	-0.038	(0)
ZnSO4	1.431e-08	1.431e-08	-7.844	-7.844	0.000	(0)
Zn (OH) 2	1.399e-08	1.399e-08	-7.854	-7.854	0.000	(0)
ZnHCO3+	7.700e-09	7.054e-09	-8.114	-8.152	-0.038	(0)
ZnOHCl	2.191e-09	2.191e-09	-8.659	-8.659	0.000	(0)
ZnCl+	7.963e-10	7.353e-10	-9.099	-9.134	-0.035	(0)
ZnF+	2.655e-10	2.433e-10	-9.576	-9.614	-0.038	(0)
Zn (OH) 3-	1.741e-10	1.595e-10	-9.759	-9.797	-0.038	(0)
Zn (SO4) 2-2	6.787e-11	4.781e-11	-10.168	-10.320	-0.152	(0)
ZnCl2	2.002e-12	2.002e-12	-11.699	-11.699	0.000	(0)
Zn (OH) 4-2	2.051e-14	1.445e-14	-13.688	-13.840	-0.152	(0)
ZnCl3-	2.958e-15	2.731e-15	-14.529	-14.564	-0.035	(0)
ZnSeO4	3.510e-17	3.510e-17	-16.455	-16.455	0.000	(0)
ZnNO3+	2.524e-17	2.312e-17	-16.598	-16.636	-0.038	(0)
ZnCl4-2	3.205e-18	2.346e-18	-17.494	-17.630	-0.136	(0)
Zn (NO3) 2	2.493e-28	2.493e-28	-27.603	-27.603	0.000	(0)
Zn (SeO4) 2-2	6.718e-29	4.732e-29	-28.173	-28.325	-0.152	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.008	-147.046	-0.038	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.390	-149.390	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.793	-223.831	-0.038	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.305	-225.457	-0.152	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-302.860	-303.012	-0.152	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-62.68	-56.39	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-45.90	-41.39	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-53.12	-41.39	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-80.99	-63.05	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-60.58	-40.55	20.03	(Co (NH3) 6) Cl3	

(NH4)2CrO4	-29.92	-29.51	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.35	-26.90	0.45	(NH4)2SeO4
Acanthite	-53.14	-89.36	-36.22	Ag2S
Ag2CO3	-13.76	-24.85	-11.09	Ag2CO3
Ag2CrO4	-22.90	-34.49	-11.59	Ag2CrO4
Ag2HVO4	-15.85	-14.37	1.48	Ag2HVO4
Ag2MoO4	-16.01	-27.56	-11.55	Ag2MoO4
Ag2O	-15.86	-3.29	12.57	Ag2O
Ag2Se	-1.61	-50.31	-48.70	Ag2Se
Ag2SeO3	-13.31	-20.46	-7.15	Ag2SeO3
Ag2SeO4	-22.96	-31.87	-8.91	Ag2SeO4
Ag2SO4	-18.59	-23.41	-4.82	Ag2SO4
Ag3AsO3	-28.93	-26.77	2.16	Ag3AsO3
Ag3AsO4	-17.98	-20.77	-2.79	Ag3AsO4
Ag3H2VO5	-21.19	-16.01	5.18	Ag3H2VO5
AgF·4H2O	-15.19	-14.14	1.05	AgF·4H2O
Agmetal	-0.59	-14.09	-13.51	Ag
AgVO3	-13.50	-12.73	0.77	AgVO3
Al (OH) 3 (am)	-3.81	6.99	10.80	Al (OH) 3
Al2 (MoO4) 3	-61.21	-58.85	2.37	Al2 (MoO4) 3
Al2O3	-5.67	13.98	19.65	Al2O3
Al4 (OH) 10SO4	-14.86	7.84	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-13.65	-8.85	4.80	AlAsO4·2H2O
AlOHSO4	-9.90	-13.13	-3.23	AlOHSO4
AlSb	-154.49	-88.87	65.62	AlSb
Alunite	-13.35	-14.75	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-7.20	-14.99	-7.79	PbSO4
Anhydrite	-2.64	-7.00	-4.36	CaSO4
Anilite	-55.37	-87.25	-31.88	Cu0.25Cu1.5S
Antlerite	-5.82	2.96	8.79	Cu3 (OH) 4SO4
Aragonite	-0.14	-8.44	-8.30	CaCO3
Arsenolite	-84.63	-87.39	-2.76	As4O6
Artinite	-5.47	4.13	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.39	-31.68	6.71	As2O5
Atacamite	-3.12	4.27	7.39	Cu2 (OH) 3Cl
Azurite	-3.14	-20.04	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-16.51	7.89	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-22.27	-6.39	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	0.89	-8.02	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-31.45	1.49	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-13.64	-23.31	-9.67	BaCrO4
BaF2	-11.29	-17.11	-5.82	BaF2
BaMoO4	-9.43	-16.39	-6.96	BaMoO4
Barite	-2.26	-12.24	-9.98	BaSO4
BaS	-94.37	-78.19	16.18	BaS
BaSeO3	-11.12	-9.29	1.83	BaSeO3
BaSeO4	-13.24	-20.70	-7.46	BaSeO4
Bianchite	-8.42	-10.18	-1.76	ZnSO4·6H2O
Birnessite	-7.88	10.21	18.09	MnO2
Bixbyite	-3.84	-4.48	-0.64	Mn2O3
BlaubleiI	-55.40	-79.56	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.83	-83.11	-27.28	Cu0.6Cu0.8S
Boehmite	-1.59	6.99	8.58	AlOOH
Breithauptite	-57.06	-75.58	-18.52	NiSb
Brochantite	-4.56	10.66	15.22	Cu4 (OH) 6SO4
Brucite	-3.99	12.85	16.84	Mg (OH) 2
Bunsenite	-4.62	7.82	12.45	NiO
Ca (VO3) 2	-14.71	-9.05	5.66	Ca (VO3) 2
Ca2V2O7	-13.43	4.07	17.50	Ca2V2O7
Ca2V2O7·2H2O	-17.48	4.07	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-14.61	7.69	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-21.76	17.20	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-22.66	17.20	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-295.32	-152.35	142.97	Ca3Sb2
CaCrO4	-15.81	-18.08	-2.27	CaCrO4
Calcite	0.04	-8.44	-8.48	CaCO3
Calomel	-13.25	-31.16	-17.91	Hg2Cl2
CaMoO4	-3.20	-11.15	-7.95	CaMoO4

Carnotite	-5.72	-5.49	0.23	KUO2VO4
CaSeO3:2H2O	-6.87	-4.06	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.44	-15.46	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.31	-3.47	9.84	Cd(BO2)2
Cd(OH)2	-6.80	6.85	13.64	Cd(OH)2
Cd(OH)2(am)	-6.88	6.85	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.42	-19.71	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.15	0.41	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.14	7.26	28.40	Cd4(OH)6SO4
CdCl2	-14.73	-15.39	-0.66	CdCl2
CdCl2:1H2O	-13.70	-15.39	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.48	-15.39	-1.91	CdCl2:2.5H2O
CdF2	-16.94	-18.15	-1.21	CdF2
Cdmetal(alpha)	-31.57	-18.06	13.51	Cd
Cdmetal(gamma)	-31.68	-18.06	13.62	Cd
CdMoO4	-3.28	-17.43	-14.15	CdMoO4
CdOHC1	-7.81	-4.27	3.54	CdOHC1
CdSb	-76.21	-76.56	-0.35	CdSb
CdSe	-19.98	-40.18	-20.20	CdSe
CdSeO4:2H2O	-19.89	-21.74	-1.85	CdSeO4:2H2O
CdSO4	-13.11	-13.28	-0.17	CdSO4
CdSO4:1H2O	-11.55	-13.28	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.41	-13.28	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.01	-12.76	-9.75	AgCl
Cerrusite	-3.30	-16.43	-13.13	PbCO3
CH4(g)	-80.13	-121.18	-41.05	CH4
Chalcanthite	-9.79	-12.43	-2.64	CuSO4:5H2O
Chalcedony	0.03	-3.52	-3.55	SiO2
Chalcocite	-55.29	-90.21	-34.92	Cu2S
Chalcocopyrite	-125.38	-160.65	-35.27	CuFeS2
Chrysotile	-0.70	31.50	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.98	-99.68	-45.69	HgS
Claudetite	-84.32	-87.39	-3.06	As4O6
Clausthalite	-14.79	-41.89	-27.10	PbSe
Co(BO2)2	-29.69	-2.62	27.07	Co(BO2)2
Co(OH)2	-5.40	7.69	13.09	Co(OH)2
Co(OH)3	-9.95	-12.25	-2.31	Co(OH)3
CO2(g)	-3.42	-21.57	-18.15	CO2
Co3(AsO4)2	-21.64	-8.60	13.03	Co3(AsO4)2
Co3O4	-6.32	-16.82	-10.50	Co3O4
CoCl2	-22.81	-14.54	8.27	CoCl2
CoCl2:6H2O	-17.08	-14.54	2.54	CoCl2:6H2O
CoCO3	-3.89	-13.87	-9.98	CoCO3
CoF2	-15.71	-17.31	-1.60	CoF2
CoF3	-48.30	-49.75	-1.46	CoF3
CoFe2O4	17.68	14.15	-3.53	CoFe2O4
CoMoO4	-8.82	-16.58	-7.76	CoMoO4
CoO	-5.89	7.69	13.59	CoO
CoS(alpha)	-70.94	-78.38	-7.44	CoS
CoS(beta)	-67.31	-78.38	-11.07	CoS
CoSe	-23.13	-39.33	-16.20	CoSe
CoSeO3	-10.81	-9.49	1.32	CoSeO3
CoSeO4:6H2O	-19.36	-20.89	-1.53	CoSeO4:6H2O
CoSO4	-15.23	-12.43	2.80	CoSO4
CoSO4:6H2O	-9.96	-12.43	-2.47	CoSO4:6H2O
Cotunnite	-12.32	-17.10	-4.78	PbCl2
Covellite	-56.08	-78.38	-22.30	CuS
Cr(OH)2	-21.50	-10.68	10.82	Cr(OH)2
Cr(OH)3	-2.52	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.01	-32.92	14.09	CrCl2
CrCl3	-49.65	-34.54	15.11	CrCl3
CrF3	-27.34	-38.68	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-66.07	-35.59	30.48	Cr
CrO3	-27.99	-31.20	-3.21	CrO3
Cryolite	-16.69	-50.53	-33.84	Na3AlF6

Cu(OH)2	-0.98	7.70	8.67	Cu(OH)2
Cu(SbO3)2	-30.01	15.20	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-12.48	-3.23	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.35	-90.23	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.36	-51.16	-45.80	Cu2Se
Cu2SO4	-22.30	-24.25	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.70	-8.60	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.46	-102.05	-42.59	Cu3Sb
Cu3Se2	-27.00	-90.49	-63.49	Cu3Se2
CuCO3	-2.37	-13.87	-11.50	CuCO3
CuCrO4	-18.07	-23.51	-5.44	CuCrO4
CuF	-9.66	-14.56	-4.91	CuF
CuF2	-18.42	-17.30	1.12	CuF2
CuF2:2H2O	-12.75	-17.30	-4.55	CuF2:2H2O
Cumetal	-5.76	-14.52	-8.76	Cu
CuMoO4	-3.50	-16.58	-13.08	CuMoO4
CuOCuSO4	-15.04	-4.73	10.30	CuOCuSO4
Cupricferrite	8.16	14.15	5.99	CuFe2O4
Cuprite	-2.72	-4.13	-1.41	Cu2O
Cuprousferrite	10.08	1.16	-8.92	CuFeO2
CuSe	-6.23	-39.33	-33.10	CuSe
CuSe2	-28.09	-61.46	-33.37	CuSe2
CuSeO3:2H2O	-9.99	-9.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.45	-20.89	-2.44	CuSeO4:5H2O
CuSO4	-15.37	-12.43	2.94	CuSO4
Diaspore	0.12	6.99	6.87	AlOOH
Djurleite	-55.50	-89.42	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.62	-17.16	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.07	-17.16	-17.09	CaMg(CO3)2
Epsomite	-5.15	-7.28	-2.13	MgSO4:7H2O
Fe(OH)2	-9.76	3.81	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.93	-0.11	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-14.65	-18.37	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.28	-10.73	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-24.46	-45.08	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-50.18	-53.92	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.96	10.26	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.02	-12.62	0.40	FeAsO4:2H2O
FeCr2O4	-5.75	1.45	7.20	FeCr2O4
FeMoO4	-10.38	-20.47	-10.09	FeMoO4
Ferrihydrite	0.04	3.23	3.19	Fe(OH)3
Ferroselite	-46.75	-65.34	-18.60	FeSe2
FeS(ppt)	-79.32	-82.27	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-4.10	-4.10	0.00	e-
Fluorite	-1.38	-11.88	-10.50	CaF2
Galena	-66.97	-80.94	-13.97	PbS
Gibbsite	-1.30	6.99	8.29	Al(OH)3
Goethite	2.74	3.23	0.49	FeOOH
Goslarite	-8.17	-10.18	-2.01	ZnSO4:7H2O
Greenalite	-16.43	4.38	20.81	Fe3Si2O5(OH)4
Greenockite	-64.87	-79.23	-14.36	CdS
Greigite	-289.00	-334.04	-45.03	Fe3S4
Gummite	-6.60	1.07	7.67	UO3
Gypsum	-2.39	-7.00	-4.61	CaSO4:2H2O
H-Jarosite	-18.47	-30.57	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.40	-24.28	-12.88	H2MoO4
H2S(g)	-78.07	-86.08	-8.01	H2S
H2Se(g)	-42.07	-47.03	-4.96	H2Se
Halite	-6.90	-5.29	1.60	NaCl
Halloysite	-2.64	6.94	9.57	Al2Si2O5(OH)4
Hausmannite	-4.16	56.87	61.03	Mn3O4
Hematite	7.87	6.45	-1.42	Fe2O3
Hercynite	-5.10	17.79	22.89	FeAl2O4
Hg(CH3)2(g)	-182.25	-255.96	-73.71	Hg(CH3)2
Hg(g)	-9.04	-16.91	-7.87	Hg
Hg(OH)2	-10.11	-13.60	-3.50	Hg(OH)2
Hg2(g)	-18.87	-33.83	-14.96	Hg2

Hg2 (OH) 2	-14.18	-8.92	5.26	Hg2 (OH) 2
Hg2CO3	-14.44	-30.49	-16.05	Hg2CO3
Hg2CrO4	-31.42	-40.12	-8.70	Hg2CrO4
Hg2F2	-23.56	-33.92	-10.36	Hg2F2
Hg2S	-83.32	-95.00	-11.68	Hg2S
Hg2SeO3	-21.45	-26.10	-4.66	Hg2SeO3
Hg2SO4	-22.92	-29.05	-6.13	Hg2SO4
Hg3O2CO3	-32.69	-62.37	-29.68	Hg3O2CO3
HgCl (g)	-35.08	-15.58	19.50	HgCl
HgCl2	-14.58	-35.84	-21.26	HgCl2
HgF (g)	-49.64	-16.96	32.68	HgF
HgF2 (g)	-51.17	-38.60	12.57	HgF2
Hgmetal (l)	-3.46	-16.91	-13.45	Hg
HgSe	-4.94	-60.63	-55.69	HgSe
HgSeO3	-18.35	-30.78	-12.43	HgSeO3
HgSO4	-24.31	-33.73	-9.42	HgSO4
Huntite	-4.62	-34.59	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-8.95	-27.72	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.25	-22.02	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-23.56	-28.73	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-11.24	-26.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.11	-53.35	-17.24	K2Cr2O7
K2CrO4	-21.64	-22.15	-0.51	K2CrO4
K2MoO4	-18.49	-15.23	3.26	K2MoO4
K2SeO4	-18.80	-19.53	-0.73	K2SeO4
Kaolinite	-0.50	6.94	7.43	Al2Si2O5 (OH) 4
Langite	-6.83	10.66	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-9.41	-9.85	-0.43	PbO:PbSO4
Laurionite	-6.60	-5.98	0.62	PbOHCl
Lepidocrocite	1.86	3.23	1.37	FeOOH
Lime	-19.58	13.12	32.70	CaO
Litharge	-7.56	5.14	12.69	PbO
Mackinawite	-78.67	-82.27	-3.60	FeS
Maghemite	0.07	6.45	6.39	Fe2O3
Magnesioferrite	2.44	19.30	16.86	Fe2MgO4
Magnesite	-1.26	-8.72	-7.46	MgCO3
Magnetite	6.86	10.26	3.40	Fe3O4
Malachite	-0.87	-6.17	-5.31	Cu2 (OH) 2CO3
Manganite	-2.23	23.11	25.34	MnOOH
Massicot	-7.76	5.14	12.89	PbO
Matlockite	-9.51	-18.48	-8.97	PbClF
Melanothallite	-20.80	-14.54	6.26	CuCl2
Melanterite	-14.11	-16.32	-2.21	FeSO4:7H2O
Metacinnabar	-54.58	-99.68	-45.09	HgS
Mg (OH) 2 (active)	-5.94	12.85	18.79	Mg (OH) 2
Mg (VO3) 2	-20.60	-9.32	11.28	Mg (VO3) 2
Mg2Sb3	-274.30	-199.62	74.68	Mg2Sb3
Mg2V2O7	-22.83	3.53	26.36	Mg2V2O7
MgCr2O4	-5.71	10.49	16.20	MgCr2O4
MgCrO4	-23.73	-18.35	5.38	MgCrO4
MgF2	-4.02	-12.15	-8.13	MgF2
MgMoO4	-9.58	-11.43	-1.85	MgMoO4
MgSeO3:6H2O	-7.39	-4.33	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-14.54	-15.74	-1.20	MgSeO4:6H2O
Minium	-33.20	40.32	73.52	Pb3O4
Mirabilite	-7.36	-8.48	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-16.42	-11.52	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-59.14	-64.86	-5.71	Mn2 (SO4) 3
Mn2Sb	-148.08	-87.00	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-12.21	0.29	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-14.30	-11.58	2.72	MnCl2:4H2O
MnS (grn)	-75.59	-75.42	0.17	MnS
MnS (pnk)	-78.76	-75.42	3.34	MnS
MnSb	-95.19	-98.10	-2.91	MnSb
MnSe	-39.87	-36.37	3.50	MnSe
MnSeO3	-7.65	-6.52	1.13	MnSeO3
MnSeO3:2H2O	-7.50	-6.52	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.88	-17.93	-2.05	MnSeO4:5H2O

MnSO4	-12.05	-9.47	2.58	MnSO4
Monteponite	-8.26	6.85	15.10	CdO
Montroydite	-9.96	-13.60	-3.64	HgO
MoO3	-16.28	-24.28	-8.00	MoO3
Morenosite	-10.16	-12.30	-2.14	NiSO4:7H2O
MoS2	-151.07	-221.33	-70.26	MoS2
Na-Jarosite	-13.54	-24.74	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.86	-50.75	-9.90	Na2Cr2O7
Na2CrO4	-22.48	-19.55	2.93	Na2CrO4
Na2Mo2O7	-20.31	-36.91	-16.60	Na2Mo2O7
Na2MoO4	-14.12	-12.63	1.49	Na2MoO4
Na2MoO4:2H2O	-13.85	-12.63	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.83	-5.53	10.30	Na2SeO3:5H2O
Na2SeO4	-18.22	-16.94	1.28	Na2SeO4
Na3Sb	-172.84	-78.39	94.45	Na3Sb
Na3VO4	-30.29	6.39	36.68	Na3VO4
Na4V2O7	-36.28	1.12	37.40	Na4V2O7
Nantokite	-6.45	-13.18	-6.73	CuCl
NaSb	-88.30	-65.13	23.17	NaSb
Natron	-8.61	-9.92	-1.31	Na2CO3:10H2O
NaVO3	-9.12	-5.26	3.86	NaVO3
Nesquehonite	-4.05	-8.72	-4.67	MgCO3:3H2O
Ni(OH)2	-4.97	7.82	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.91	-8.21	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.83	11.17	32.00	Ni4(OH)6SO4
NiCO3	-6.87	-13.74	-6.87	NiCO3
NiMoO4	-5.31	-16.45	-11.14	NiMoO4
NiS(alpha)	-72.65	-78.25	-5.60	NiS
NiS(beta)	-67.15	-78.25	-11.10	NiS
NiS(gamma)	-65.45	-78.25	-12.80	NiS
NiSe	-21.50	-39.20	-17.70	NiSe
NiSeO3:2H2O	-12.17	-9.36	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.24	-20.76	-1.52	NiSeO4:6H2O
Nsutite	-7.29	10.21	17.50	MnO2
O2(g)	-33.28	49.81	83.09	O2
Orpiment	-240.85	-301.92	-61.07	As2S3
Otavite	-2.72	-14.72	-12.00	CdCO3
Pb(BO2)2	-11.70	-5.18	6.52	Pb(BO2)2
Pb(OH)2	-3.01	5.14	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-69.25	-78.01	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.64	-0.84	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.91	10.28	26.19	Pb2O(OH)2
Pb2O3	-25.86	35.18	61.04	Pb2O3
Pb2OCO3	-10.73	-11.29	-0.56	Pb2OCO3
Pb2V2O7	-10.00	-11.90	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.07	-16.27	5.80	Pb3(AsO4)2
Pb3(VO4)2	-12.90	-6.76	6.14	Pb3(VO4)2
Pb3O2CO3	-17.17	-6.15	11.02	Pb3O2CO3
Pb3O2SO4	-15.40	-4.71	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.67	0.43	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.45	0.43	21.88	Pb4O3SO4
PbCrO4	-13.46	-26.06	-12.60	PbCrO4
PbF2	-12.42	-19.86	-7.44	PbF2
Pbmetal	-24.01	-19.76	4.25	Pb
PbMoO4	-3.52	-19.14	-15.62	PbMoO4
PbO:0.3H2O	-7.84	5.14	12.98	PbO:0.33H2O
PbSeO4	-16.61	-23.45	-6.84	PbSeO4
Periclase	-8.73	12.85	21.58	MgO
Phosgenite	-13.72	-33.53	-19.81	PbCl2:PbCO3
Plattnerite	-19.56	30.04	49.60	PbO2
Portlandite	-9.68	13.12	22.80	Ca(OH)2
Pyrite	-124.93	-143.44	-18.51	FeS2
Pyrochroite	-4.54	10.66	15.19	Mn(OH)2
Pyrolusite	-5.82	35.56	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-100.63	-120.37	-19.75	AsS
Retgersite	-10.26	-12.30	-2.04	NiSO4:6H2O
Rhodochrosite	-0.33	-10.91	-10.58	MnCO3

Rutherfordine	-5.99	-20.49	-14.50	UO2CO3
Sb(OH)3	-14.04	-21.15	-7.11	Sb(OH)3
Sb2O4	-20.80	-17.40	3.40	Sb2O4
Sb2O5	-31.45	-41.12	-9.67	Sb2O5
Sb2Se3	-115.63	-183.38	-67.76	Sb2Se3
Sb4O6(cubic)	-66.34	-84.60	-18.26	Sb4O6
Sb4O6(orth)	-66.70	-84.60	-17.90	Sb4O6
SbCl3	-55.08	-54.51	0.57	SbCl3
SbF3	-48.42	-58.65	-10.23	SbF3
Sbmetal	-46.82	-58.50	-11.69	Sb
SbO2	-5.19	-33.01	-27.82	SbO2
Schoepite	-4.92	1.07	5.99	UO2(OH)2·H2O
Semetal(am)	-15.01	-22.12	-7.11	Se
Semetal(hex)	-14.42	-22.12	-7.71	Se
Senarmontite	-29.94	-42.30	-12.37	Sb2O3
SeO2	-17.30	-17.18	0.12	SeO2
SeO3	-49.63	-28.58	21.04	SeO3
Sepiolite	-0.63	15.13	15.76	Mg2Si3O7·5OH·3H2O
Sepiolite(A)	-3.65	15.13	18.78	Mg2Si3O7·5OH·3H2O
Siderite	-7.52	-17.76	-10.24	FeCO3
SiO2(am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2(am-ppt)	-0.78	-3.52	-2.74	SiO2
Smithsonite	-1.63	-11.63	-10.00	ZnCO3
Sphalerite	-64.69	-76.14	-11.45	ZnS
Spinel	-10.01	26.83	36.85	MgAl2O4
Stibnite	-250.07	-300.53	-50.46	Sb2S3
Sulfur	-59.03	-61.17	-2.14	S
Tenorite	0.05	7.70	7.64	CuO
Thenardite	-8.80	-8.48	0.32	Na2SO4
Thermonatrite	-10.55	-9.92	0.64	Na2CO3·H2O
Tyuyamunite	-10.98	-6.90	4.08	Ca(UO2)2(VO4)2
U3O8	-15.12	5.96	21.08	U3O8
U3Sb4	-579.66	-427.28	152.38	U3Sb4
U4O9	-30.54	-33.56	-3.02	U4O9
UF4	-35.08	-64.61	-29.54	UF4
UF4·2.5H2O	-31.89	-64.61	-32.72	UF4·2.5H2O
UO2(am)	-15.55	-14.61	0.93	UO2
UO2(NO3)2	-48.32	-36.17	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-41.02	-36.17	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-39.56	-36.17	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-38.22	-36.17	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-4.54	1.07	5.61	UO2(OH)2
UO2SeO4·4H2O	-25.26	-27.51	-2.25	UO2SeO4·4H2O
UO3	-6.63	1.07	7.70	UO3
Uraninite	-9.95	-14.61	-4.67	UO2
USb2	-220.22	-190.65	29.58	USb2
V(OH)3	-20.98	-13.39	7.59	V(OH)3
V2O5	-20.81	-22.17	-1.36	V2O5
V3O5	-46.64	-44.81	1.84	V3O5
V4O7	-58.63	-51.44	7.19	V4O7
V6O13	-55.46	-116.32	-60.86	V6O13
Valentinite	-33.82	-42.30	-8.48	Sb2O3
VC12	-66.95	-48.08	18.87	VC12
VC13	-70.18	-46.75	23.43	VC13
VF4	-71.56	-56.63	14.93	VF4
Vmetal	-94.77	-50.74	44.03	V
VO	-40.60	-25.84	14.76	VO
VO(OH)2	-11.79	-6.63	5.15	VO(OH)2
VO2Cl	-25.05	-22.21	2.84	VO2Cl
VOC1	-35.66	-24.51	11.15	VOC1
VOC12	-41.63	-28.87	12.76	VOC12
VOSO4	-30.37	-26.76	3.61	VOSO4
Witherite	-5.11	-13.68	-8.57	BaCO3
Wurtzite	-67.19	-76.14	-8.95	ZnS
Zincite	-1.39	9.94	11.33	ZnO
Zincosite	-14.11	-10.18	3.93	ZnSO4
Zn(BO2)2	-8.67	-0.38	8.29	Zn(BO2)2
Zn(NO3)2·6H2O	-30.62	-27.30	3.32	Zn(NO3)2·6H2O

Zn(OH) 2	-2.26	9.94	12.20	Zn(OH) 2
Zn(OH) 2 (am)	-2.53	9.94	12.47	Zn(OH) 2
Zn(OH) 2 (beta)	-1.81	9.94	11.75	Zn(OH) 2
Zn(OH) 2 (epsilon)	-1.59	9.94	11.53	Zn(OH) 2
Zn(OH) 2 (gamma)	-1.79	9.94	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-7.74	-0.24	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-6.43	8.76	15.19	Zn2(OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-15.52	-1.87	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-29.34	-10.43	18.91	Zn3O(SO4) 2
Zn4(OH) 6SO4	-8.77	19.63	28.40	Zn4(OH) 6SO4
Zn5(OH) 8Cl2	-11.04	27.46	38.50	Zn5(OH) 8Cl2
ZnCl2	-19.35	-12.30	7.05	ZnCl2
ZnCO3:1H2O	-1.37	-11.63	-10.26	ZnCO3:1H2O
ZnF2	-14.53	-15.06	-0.53	ZnF2
Znmetal	-40.75	-14.96	25.79	Zn
ZnMoO4	-4.21	-14.34	-10.13	ZnMoO4
ZnO(active)	-1.25	9.94	11.19	ZnO
ZnS(am)	-67.08	-76.14	-9.05	ZnS
ZnSb	-84.48	-73.47	11.01	ZnSb
ZnSe	-22.69	-37.09	-14.40	ZnSe
ZnSeO4:6H2O	-17.13	-18.65	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.55	-10.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 47.

```

Title Evaporate Stage 2 lake water to produce initial Stage 2 Lake water
REACTION 205
      H2O      -1
      0.85 moles    ## Removes x m3 water, but solute mass remains the same
USE solution 211
Save Solution 212
END

```

TITLE

Evaporate Stage 2 lake water to produce initial Stage 2 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 211. Solution after simulation 46.
Using reaction 205.

Reaction 205.

8.500e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000

O -1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	5.293e-10	5.213e-10
Al	5.019e-08	4.943e-08
As	6.896e-09	6.791e-09
B	8.069e-06	7.946e-06
Ba	2.150e-09	2.117e-09
C	1.489e-03	1.466e-03
Ca	3.997e-04	3.936e-04
Cd	2.793e-10	2.750e-10
Cl	1.889e-03	1.860e-03
Co	1.875e-09	1.846e-09
Cr	6.351e-10	6.254e-10
Cu	9.759e-08	9.611e-08
F	8.026e-05	7.904e-05
Fe	7.881e-10	7.761e-10
Hg	4.578e-11	4.508e-11
K	1.634e-04	1.609e-04
Mg	2.081e-04	2.050e-04
Mn	1.379e-06	1.358e-06
Mo	3.769e-08	3.712e-08
N	3.151e-07	3.103e-07
Na	3.256e-03	3.207e-03
Ni	2.902e-09	2.858e-09
Pb	1.460e-10	1.438e-10
S	5.759e-04	5.672e-04
Sb	5.934e-10	5.843e-10
Se	3.601e-09	3.546e-09
Si	3.153e-04	3.105e-04
U	1.524e-08	1.501e-08
V	1.789e-10	1.762e-10
Zn	4.591e-07	4.522e-07

-----Description of solution-----

	pH =	8.353	Charge balance
	pe =	4.098	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	5.648e-03	
	Mass of water (kg) =	9.848e-01	
	Total alkalinity (eq/kg) =	1.518e-03	
	Total CO2 (mol/kg) =	1.489e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	3.670e-08	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	3	
	Total H =	1.093290e+02	
	Total O =	5.467106e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.463e-06	2.271e-06	-5.608	-5.644	-0.035	(0)
H+	4.803e-09	4.433e-09	-8.319	-8.353	-0.035	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.293e-10					
AgCl	3.594e-10	3.594e-10	-9.444	-9.444	0.000	(0)
Ag+	1.094e-10	1.009e-10	-9.961	-9.996	-0.035	(0)
AgCl2-	5.960e-11	5.457e-11	-10.225	-10.263	-0.038	(0)
AgSO4-	8.548e-13	7.826e-13	-12.068	-12.106	-0.038	(0)

	AgCl3-2	1.207e-13	8.479e-14	-12.918	-13.072	-0.153	(0)
	AgOH	2.293e-14	2.293e-14	-13.640	-13.640	0.000	(0)
	AgF	1.841e-14	1.841e-14	-13.735	-13.735	0.000	(0)
	AgNO2	5.376e-15	5.376e-15	-14.270	-14.270	0.000	(0)
	AgH2BO3	1.478e-15	1.478e-15	-14.830	-14.830	0.000	(0)
	AgNH3+	9.092e-16	8.324e-16	-15.041	-15.080	-0.038	(0)
	AgCl4-3	6.680e-16	3.018e-16	-15.175	-15.520	-0.345	(0)
	Ag2Se	4.019e-16	4.019e-16	-15.396	-15.396	0.000	(0)
	AgSeO3-	9.662e-17	8.846e-17	-16.015	-16.053	-0.038	(0)
	Ag (OH) 2-	5.558e-18	5.089e-18	-17.255	-17.293	-0.038	(0)
	Ag (NH3) 2+	2.985e-20	2.733e-20	-19.525	-19.563	-0.038	(0)
	AgNO3	4.402e-21	4.402e-21	-20.356	-20.356	0.000	(0)
	Ag (NO2) 2-	2.318e-21	2.122e-21	-20.635	-20.673	-0.038	(0)
	Ag (SeO3) 2-3	2.390e-24	1.080e-24	-23.622	-23.967	-0.345	(0)
	Ag2MoO4	1.055e-28	1.055e-28	-27.977	-27.977	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.898	-73.898	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.168	-82.782	-0.613	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.533	-146.645	-0.112	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.477	-147.515	-0.038	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-147.508	-147.732	-0.224	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-147.826	-148.043	-0.217	(0)
Al	5.019e-08						
	Al (OH) 4-	5.002e-08	4.620e-08	-7.301	-7.335	-0.034	(0)
	Al (OH) 3	1.616e-10	1.616e-10	-9.792	-9.792	0.000	(0)
	Al (OH) 2+	3.855e-12	3.566e-12	-11.414	-11.448	-0.034	(0)
	AlF2+	1.974e-14	1.826e-14	-13.705	-13.738	-0.034	(0)
	AlF3	1.669e-14	1.669e-14	-13.778	-13.778	0.000	(0)
	AlOH+2	2.699e-15	1.977e-15	-14.569	-14.704	-0.135	(0)
	AlF+2	8.628e-16	6.319e-16	-15.064	-15.199	-0.135	(0)
	AlF4-	6.576e-16	6.073e-16	-15.182	-15.217	-0.034	(0)
	AlSO4+	2.842e-18	2.625e-18	-17.546	-17.581	-0.034	(0)
	Al+3	1.790e-18	8.703e-19	-17.747	-18.060	-0.313	(0)
	Al (SO4) 2-	1.183e-20	1.093e-20	-19.927	-19.961	-0.034	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.220	-58.565	-0.345	(0)
As (3)	1.627e-22						
	H3AsO3	1.444e-22	1.444e-22	-21.840	-21.840	0.000	(0)
	H2AsO3-	1.825e-23	1.671e-23	-22.739	-22.777	-0.038	(0)
	HAsO3-2	4.893e-27	3.438e-27	-26.310	-26.464	-0.153	(0)
	H4AsO3+	3.465e-31	3.172e-31	-30.460	-30.499	-0.038	(0)
	AsO3-3	6.616e-32	2.990e-32	-31.179	-31.524	-0.345	(0)
As (5)	6.896e-09						
	HAsO4-2	6.681e-09	4.694e-09	-8.175	-8.328	-0.153	(0)
	H2AsO4-	2.073e-10	1.898e-10	-9.683	-9.722	-0.038	(0)
	AsO4-3	7.410e-12	3.348e-12	-11.130	-11.475	-0.345	(0)
	H3AsO4	1.460e-16	1.462e-16	-15.836	-15.835	0.001	(0)
B	8.069e-06						
	H3BO3	7.040e-06	7.049e-06	-5.152	-5.152	0.001	(0)
	H2BO3-	1.004e-06	9.235e-07	-5.998	-6.035	-0.036	(0)
	CaH2BO3+	1.522e-08	1.401e-08	-7.818	-7.854	-0.036	(0)
	MgH2BO3+	4.878e-09	4.489e-09	-8.312	-8.348	-0.036	(0)
	NaH2BO3	4.386e-09	4.386e-09	-8.358	-8.358	0.000	(0)
	BF (OH) 3-	2.219e-10	2.042e-10	-9.654	-9.690	-0.036	(0)
	H5 (BO3) 2-	6.022e-12	5.541e-12	-11.220	-11.256	-0.036	(0)
	BaH2BO3+	4.767e-14	4.386e-14	-13.322	-13.358	-0.036	(0)
	BF2 (OH) 2-	7.636e-15	7.027e-15	-14.117	-14.153	-0.036	(0)
	H8 (BO3) 3-	4.245e-15	3.906e-15	-14.372	-14.408	-0.036	(0)
	AgH2BO3	1.478e-15	1.478e-15	-14.830	-14.830	0.000	(0)
	BF3OH-	9.562e-22	8.800e-22	-21.019	-21.056	-0.036	(0)
	BF4-	1.514e-27	1.394e-27	-26.820	-26.856	-0.036	(0)
Ba	2.150e-09						
	Ba+2	2.117e-09	1.537e-09	-8.674	-8.813	-0.139	(0)
	BaHCO3+	2.106e-11	1.950e-11	-10.677	-10.710	-0.033	(0)
	BaCO3	1.107e-11	1.107e-11	-10.956	-10.956	0.000	(0)
	BaH2BO3+	4.767e-14	4.386e-14	-13.322	-13.358	-0.036	(0)
	BaOH+	1.648e-14	1.524e-14	-13.783	-13.817	-0.034	(0)
	BaNH3+2	5.575e-18	3.916e-18	-17.254	-17.407	-0.153	(0)
	BaNO3+	4.619e-19	4.229e-19	-18.335	-18.374	-0.038	(0)
C (4)	1.489e-03						

HCO3-	1.436e-03	1.328e-03	-2.843	-2.877	-0.034	(0)
CO3-2	1.936e-05	1.405e-05	-4.713	-4.852	-0.139	(0)
H2CO3	1.324e-05	1.324e-05	-4.878	-4.878	0.000	(0)
CaHCO3+	7.040e-06	6.520e-06	-5.152	-5.186	-0.033	(0)
CaCO3	5.868e-06	5.868e-06	-5.231	-5.231	0.000	(0)
NaHCO3	2.239e-06	2.239e-06	-5.650	-5.650	0.000	(0)
MgHCO3+	2.065e-06	1.906e-06	-5.685	-5.720	-0.035	(0)
MgCO3	1.638e-06	1.638e-06	-5.786	-5.786	0.000	(0)
NaCO3-	8.474e-07	7.840e-07	-6.072	-6.106	-0.034	(0)
ZnCO3	1.391e-07	1.391e-07	-6.857	-6.857	0.000	(0)
CuCO3	8.076e-08	8.076e-08	-7.093	-7.093	0.000	(0)
MnHCO3+	2.580e-08	2.385e-08	-7.588	-7.623	-0.034	(0)
UO2 (CO3) 3-4	1.020e-08	2.485e-09	-7.991	-8.605	-0.613	(0)
ZnHCO3+	7.898e-09	7.230e-09	-8.103	-8.141	-0.038	(0)
UO2 (CO3) 2-2	5.024e-09	3.529e-09	-8.299	-8.452	-0.153	(0)
Cu (CO3) 2-2	4.347e-09	3.054e-09	-8.362	-8.515	-0.153	(0)
NiCO3	6.909e-10	6.909e-10	-9.161	-9.161	0.000	(0)
NiHCO3+	2.358e-10	2.159e-10	-9.627	-9.666	-0.038	(0)
CoCO3	2.321e-10	2.321e-10	-9.634	-9.634	0.000	(0)
PbCO3	1.141e-10	1.141e-10	-9.943	-9.943	0.000	(0)
CoHCO3+	1.103e-10	1.010e-10	-9.957	-9.996	-0.038	(0)
CuHCO3+	8.938e-11	8.183e-11	-10.049	-10.087	-0.038	(0)
CdCO3	4.433e-11	4.433e-11	-10.353	-10.353	0.000	(0)
BaHCO3+	2.106e-11	1.950e-11	-10.677	-10.710	-0.033	(0)
UO2CO3	1.259e-11	1.259e-11	-10.900	-10.900	0.000	(0)
BaCO3	1.107e-11	1.107e-11	-10.956	-10.956	0.000	(0)
Pb (CO3) 2-2	6.582e-12	4.624e-12	-11.182	-11.335	-0.153	(0)
PbHCO3+	2.913e-12	2.667e-12	-11.536	-11.574	-0.038	(0)
Cd (CO3) 2-2	6.572e-13	4.617e-13	-12.182	-12.336	-0.153	(0)
CdHCO3+	4.573e-13	4.187e-13	-12.340	-12.378	-0.038	(0)
FeHCO3+	2.312e-15	2.141e-15	-14.636	-14.669	-0.033	(0)
HgCO3	1.311e-17	1.311e-17	-16.882	-16.882	0.000	(0)
Hg (CO3) 2-2	8.289e-19	5.824e-19	-18.081	-18.235	-0.153	(0)
HgHCO3+	1.182e-21	1.082e-21	-20.927	-20.966	-0.038	(0)
Ca	3.997e-04					
Ca+2	3.631e-04	2.635e-04	-3.440	-3.579	-0.139	(0)
CaSO4	2.346e-05	2.346e-05	-4.630	-4.630	0.000	(0)
CaHCO3+	7.040e-06	6.520e-06	-5.152	-5.186	-0.033	(0)
CaCO3	5.868e-06	5.868e-06	-5.231	-5.231	0.000	(0)
CaF+	2.259e-07	2.088e-07	-6.646	-6.680	-0.034	(0)
CaH2BO3+	1.522e-08	1.401e-08	-7.818	-7.854	-0.036	(0)
CaOH+	1.290e-08	1.194e-08	-7.890	-7.923	-0.033	(0)
CaNH3+2	1.907e-12	1.340e-12	-11.720	-11.873	-0.153	(0)
CaNO3+	4.997e-14	4.575e-14	-13.301	-13.340	-0.038	(0)
Ca (NH3) 2+2	3.067e-21	2.154e-21	-20.513	-20.667	-0.153	(0)
Cd	2.793e-10					
Cd+2	1.907e-10	1.384e-10	-9.720	-9.859	-0.139	(0)
CdCO3	4.433e-11	4.433e-11	-10.353	-10.353	0.000	(0)
CdCl+	2.518e-11	2.305e-11	-10.599	-10.637	-0.038	(0)
CdSO4	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
CdOH+	2.728e-12	2.497e-12	-11.564	-11.603	-0.038	(0)
CdOHC1	2.147e-12	2.147e-12	-11.668	-11.668	0.000	(0)
Cd (CO3) 2-2	6.572e-13	4.617e-13	-12.182	-12.336	-0.153	(0)
CdHCO3+	4.573e-13	4.187e-13	-12.340	-12.378	-0.038	(0)
CdF+	1.740e-13	1.593e-13	-12.760	-12.798	-0.038	(0)
CdCl2	1.675e-13	1.675e-13	-12.776	-12.776	0.000	(0)
Cd (SO4) 2-2	9.406e-14	6.608e-14	-13.027	-13.180	-0.153	(0)
Cd (OH) 2	3.579e-14	3.579e-14	-13.446	-13.446	0.000	(0)
CdCl3-	2.013e-16	1.843e-16	-15.696	-15.735	-0.038	(0)
CdF2	2.307e-17	2.307e-17	-16.637	-16.637	0.000	(0)
Cd (OH) 3-	5.424e-18	4.966e-18	-17.266	-17.304	-0.038	(0)
CdSeO4	3.476e-20	3.476e-20	-19.459	-19.459	0.000	(0)
CdNO3+	2.625e-20	2.403e-20	-19.581	-19.619	-0.038	(0)
Cd2OH+3	3.834e-21	1.733e-21	-20.416	-20.761	-0.345	(0)
Cd (SeO3) 2-2	3.019e-22	2.121e-22	-21.520	-21.673	-0.153	(0)
Cd (OH) 4-2	2.627e-24	1.846e-24	-23.580	-23.734	-0.153	(0)
Cd (NO3) 2	6.612e-31	6.612e-31	-30.180	-30.180	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.529	-79.568	-0.038	(0)

	Cd (HS) 2	0.000e+00	0.000e+00	-150.080	-150.080	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.859	-225.897	-0.038	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.265	-301.418	-0.153	(0)
Cl	1.889e-03						
	Cl-	1.889e-03	1.744e-03	-2.724	-2.759	-0.035	(0)
	ZnOHCl	2.241e-09	2.241e-09	-8.650	-8.650	0.000	(0)
	MnCl+	2.136e-09	1.975e-09	-8.670	-8.705	-0.034	(0)
	ZnCl+	8.168e-10	7.538e-10	-9.088	-9.123	-0.035	(0)
	AgCl	3.594e-10	3.594e-10	-9.444	-9.444	0.000	(0)
	CuCl	8.368e-11	8.368e-11	-10.077	-10.077	0.000	(0)
	AgCl2-	5.960e-11	5.457e-11	-10.225	-10.263	-0.038	(0)
	CuCl2-	3.303e-11	3.048e-11	-10.481	-10.516	-0.035	(0)
	CdCl+	2.518e-11	2.305e-11	-10.599	-10.637	-0.038	(0)
	CoCl+	6.439e-12	5.895e-12	-11.191	-11.230	-0.038	(0)
	NiCl+	6.423e-12	5.880e-12	-11.192	-11.231	-0.038	(0)
	MnCl2	4.863e-12	4.863e-12	-11.313	-11.313	0.000	(0)
	CuCl+	2.923e-12	2.697e-12	-11.534	-11.569	-0.035	(0)
	CdOHCl	2.147e-12	2.147e-12	-11.668	-11.668	0.000	(0)
	ZnCl2	2.083e-12	2.083e-12	-11.681	-11.681	0.000	(0)
	PbCl+	1.826e-13	1.671e-13	-12.739	-12.777	-0.038	(0)
	CdCl2	1.675e-13	1.675e-13	-12.776	-12.776	0.000	(0)
	AgCl3-2	1.207e-13	8.479e-14	-12.918	-13.072	-0.153	(0)
	CuCl3-2	1.556e-14	1.136e-14	-13.808	-13.945	-0.136	(0)
	HgClOH	5.452e-15	5.452e-15	-14.263	-14.263	0.000	(0)
	ZnCl3-	3.126e-15	2.885e-15	-14.505	-14.540	-0.035	(0)
	MnCl3-	2.526e-15	2.335e-15	-14.598	-14.632	-0.034	(0)
	CuCl2	1.631e-15	1.631e-15	-14.788	-14.788	0.000	(0)
	PbCl2	1.302e-15	1.302e-15	-14.885	-14.885	0.000	(0)
	AgCl4-3	6.680e-16	3.018e-16	-15.175	-15.520	-0.345	(0)
	HgCl2	2.370e-16	2.370e-16	-15.625	-15.625	0.000	(0)
	CdCl3-	2.013e-16	1.843e-16	-15.696	-15.735	-0.038	(0)
	NiCl2	5.162e-17	5.162e-17	-16.287	-16.287	0.000	(0)
	HgCl3-	4.513e-18	4.132e-18	-17.346	-17.384	-0.038	(0)
	ZnCl4-2	3.443e-18	2.515e-18	-17.463	-17.600	-0.136	(0)
	PbCl3-	9.869e-19	9.035e-19	-18.006	-18.044	-0.038	(0)
	UO2Cl+	6.952e-19	6.365e-19	-18.158	-18.196	-0.038	(0)
	CrCl+2	6.957e-20	4.888e-20	-19.158	-19.311	-0.153	(0)
	HgCl4-2	4.082e-20	2.868e-20	-19.389	-19.542	-0.153	(0)
	HgCl+	2.962e-20	2.712e-20	-19.528	-19.567	-0.038	(0)
	CuCl3-	2.875e-20	2.653e-20	-19.541	-19.576	-0.035	(0)
	CrOHCl2	3.679e-21	3.679e-21	-20.434	-20.434	0.000	(0)
	PbCl4-2	1.025e-21	7.201e-22	-20.989	-21.143	-0.153	(0)
	FeCl+2	1.075e-23	7.852e-24	-22.969	-23.105	-0.136	(0)
	CrCl2+	8.832e-24	8.086e-24	-23.054	-23.092	-0.038	(0)
	CuCl4-2	3.175e-25	2.319e-25	-24.498	-24.635	-0.136	(0)
	FeCl2+	6.615e-26	6.115e-26	-25.179	-25.214	-0.034	(0)
	VOCl+	2.474e-26	2.265e-26	-25.607	-25.645	-0.038	(0)
	CrO3Cl-	2.477e-27	2.268e-27	-26.606	-26.644	-0.038	(0)
	FeCl3	1.066e-29	1.066e-29	-28.972	-28.972	0.000	(0)
	CoCl+2	2.464e-38	1.731e-38	-37.608	-37.762	-0.153	(0)
	UCl+3	0.000e+00	0.000e+00	-48.755	-49.100	-0.345	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.624	-53.777	-0.153	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.530	-55.683	-0.153	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.733	-68.887	-0.153	(0)
Co (2)	1.875e-09						
	Co+2	1.391e-09	9.774e-10	-8.857	-9.010	-0.153	(0)
	CoCO3	2.321e-10	2.321e-10	-9.634	-9.634	0.000	(0)
	CoHCO3+	1.103e-10	1.010e-10	-9.957	-9.996	-0.038	(0)
	CoSO4	7.577e-11	7.577e-11	-10.120	-10.120	0.000	(0)
	CoOH+	4.838e-11	4.429e-11	-10.315	-10.354	-0.038	(0)
	Co (OH) 2	7.990e-12	7.990e-12	-11.097	-11.097	0.000	(0)
	CoCl+	6.439e-12	5.895e-12	-11.191	-11.230	-0.038	(0)
	CoF+	2.451e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
	CoNO2+	1.917e-15	1.755e-15	-14.717	-14.756	-0.038	(0)
	Co (NH3) +2	6.755e-16	4.746e-16	-15.170	-15.324	-0.153	(0)
	Co (OH) 3-	3.955e-16	3.621e-16	-15.403	-15.441	-0.038	(0)
	CoOOH-	9.925e-17	9.086e-17	-16.003	-16.042	-0.038	(0)
	CoSeO4	6.606e-19	6.606e-19	-18.180	-18.180	0.000	(0)

CoNO3+	9.289e-20	8.504e-20	-19.032	-19.070	-0.038	(0)
Co2OH+3	4.801e-21	2.170e-21	-20.319	-20.664	-0.345	(0)
Co (OH) 4-2	1.855e-22	1.303e-22	-21.732	-21.885	-0.153	(0)
Co (NH3) 2+2	1.164e-22	8.176e-23	-21.934	-22.087	-0.153	(0)
Co (NO3) 2	9.499e-30	9.499e-30	-29.022	-29.022	0.000	(0)
Co (NH3) 3+2	5.917e-30	4.157e-30	-29.228	-29.381	-0.153	(0)
Co4 (OH) 4+4	3.152e-33	7.679e-34	-32.501	-33.115	-0.613	(0)
Co (NH3) 4+2	1.254e-37	8.811e-38	-36.902	-37.055	-0.153	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.075	-45.229	-0.153	(0)
Co (3)	8.017e-31					
CoOH+2	8.017e-31	5.632e-31	-30.096	-30.249	-0.153	(0)
Co+3	1.003e-37	4.880e-38	-36.999	-37.312	-0.313	(0)
CoCl+2	2.464e-38	1.731e-38	-37.608	-37.762	-0.153	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.624	-53.777	-0.153	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.575	-64.613	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.418	-67.572	-0.153	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.733	-68.887	-0.153	(0)
Cr (2)	5.873e-28					
Cr+2	5.873e-28	4.126e-28	-27.231	-27.384	-0.153	(0)
Cr (3)	6.351e-10					
Cr (OH) 2+	3.249e-10	2.974e-10	-9.488	-9.527	-0.038	(0)
Cr (OH) 3	2.538e-10	2.538e-10	-9.596	-9.596	0.000	(0)
CrO2-	2.970e-11	2.719e-11	-10.527	-10.566	-0.038	(0)
Cr (OH) 4-	2.506e-11	2.295e-11	-10.601	-10.639	-0.038	(0)
Cr (OH) +2	1.532e-12	1.076e-12	-11.815	-11.968	-0.153	(0)
CrOHSO4	9.924e-14	9.924e-14	-13.003	-13.003	0.000	(0)
CrF+2	3.548e-16	2.493e-16	-15.450	-15.603	-0.153	(0)
Cr+3	4.794e-17	2.166e-17	-16.319	-16.664	-0.345	(0)
CrSO4+	2.147e-17	1.965e-17	-16.668	-16.707	-0.038	(0)
CrCl+2	6.957e-20	4.888e-20	-19.158	-19.311	-0.153	(0)
CrOHC12	3.679e-21	3.679e-21	-20.434	-20.434	0.000	(0)
Cr2 (OH) 2SO4+2	1.374e-23	9.655e-24	-22.862	-23.015	-0.153	(0)
CrCl2+	8.832e-24	8.086e-24	-23.054	-23.092	-0.038	(0)
Cr2 (OH) 2 (SO4) 2	2.228e-25	2.228e-25	-24.652	-24.652	0.000	(0)
CrNO3+2	7.399e-29	5.198e-29	-28.131	-28.284	-0.153	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.751	-43.905	-0.153	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.682	-54.027	-0.345	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.530	-55.683	-0.153	(0)
Cr (6)	4.586e-15					
CrO4-2	4.480e-15	3.252e-15	-14.349	-14.488	-0.139	(0)
NaCrO4-	5.289e-17	4.843e-17	-16.277	-16.315	-0.038	(0)
HCrO4-	5.095e-17	4.665e-17	-16.293	-16.331	-0.038	(0)
KCrO4-	1.985e-18	1.817e-18	-17.702	-17.741	-0.038	(0)
H2CrO4	1.676e-25	1.676e-25	-24.776	-24.776	0.000	(0)
CrO3SO4-2	3.484e-26	2.448e-26	-25.458	-25.611	-0.153	(0)
CrO3Cl-	2.477e-27	2.268e-27	-26.606	-26.644	-0.038	(0)
Cr2O7-2	1.074e-31	7.547e-32	-30.969	-31.122	-0.153	(0)
Cu (1)	1.584e-10					
CuCl	8.368e-11	8.368e-11	-10.077	-10.077	0.000	(0)
Cu+	4.164e-11	3.812e-11	-10.380	-10.419	-0.038	(0)
CuCl2-	3.303e-11	3.048e-11	-10.481	-10.516	-0.035	(0)
CuCl3-2	1.556e-14	1.136e-14	-13.808	-13.945	-0.136	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.536	-145.756	-0.220	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.273	-146.486	-0.213	(0)
Cu (2)	9.743e-08					
CuCO3	8.076e-08	8.076e-08	-7.093	-7.093	0.000	(0)
CuOH+	7.597e-09	7.011e-09	-8.119	-8.154	-0.035	(0)
Cu (CO3) 2-2	4.347e-09	3.054e-09	-8.362	-8.515	-0.153	(0)
Cu (OH) 2	3.177e-09	3.177e-09	-8.498	-8.498	0.000	(0)
Cu+2	1.345e-09	9.762e-10	-8.871	-9.010	-0.139	(0)
CuHCO3+	8.938e-11	8.183e-11	-10.049	-10.087	-0.038	(0)
CuSO4	8.689e-11	8.689e-11	-10.061	-10.061	0.000	(0)
Cu (OH) 3-	1.617e-11	1.480e-11	-10.791	-10.830	-0.038	(0)
CuF+	4.884e-12	4.472e-12	-11.311	-11.350	-0.038	(0)
CuCl+	2.923e-12	2.697e-12	-11.534	-11.569	-0.035	(0)
Cu2 (OH) 2+2	1.757e-12	1.235e-12	-11.755	-11.908	-0.153	(0)
CuNH3+2	5.742e-14	4.034e-14	-13.241	-13.394	-0.153	(0)
CuNO2+	2.846e-14	2.605e-14	-13.546	-13.584	-0.038	(0)

	CuCl2	1.631e-15	1.631e-15	-14.788	-14.788	0.000	(0)
	Cu (OH) 4-2	3.766e-16	2.646e-16	-15.424	-15.577	-0.153	(0)
	CuNO3+	1.851e-19	1.695e-19	-18.733	-18.771	-0.038	(0)
	Cu (NO2) 2	6.795e-20	6.795e-20	-19.168	-19.168	0.000	(0)
	CuCl3-	2.875e-20	2.653e-20	-19.541	-19.576	-0.035	(0)
	CuCl4-2	3.175e-25	2.319e-25	-24.498	-24.635	-0.136	(0)
	Cu (NO3) 2	1.171e-30	1.171e-30	-29.931	-29.931	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.224	-216.262	-0.038	(0)
F		8.026e-05					
	F-	7.865e-05	7.260e-05	-4.104	-4.139	-0.035	(0)
	MgF+	1.236e-06	1.142e-06	-5.908	-5.942	-0.034	(0)
	CaF+	2.259e-07	2.088e-07	-6.646	-6.680	-0.034	(0)
	NaF	1.373e-07	1.373e-07	-6.862	-6.862	0.000	(0)
	MnF+	2.813e-09	2.600e-09	-8.551	-8.585	-0.034	(0)
	HF	4.760e-10	4.760e-10	-9.322	-9.322	0.000	(0)
	ZnF+	2.723e-10	2.493e-10	-9.565	-9.603	-0.038	(0)
	BF (OH) 3-	2.219e-10	2.042e-10	-9.654	-9.690	-0.036	(0)
	CuF+	4.884e-12	4.472e-12	-11.311	-11.350	-0.038	(0)
	NiF+	2.626e-12	2.404e-12	-11.581	-11.619	-0.038	(0)
	CoF+	2.451e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
	CdF+	1.740e-13	1.593e-13	-12.760	-12.798	-0.038	(0)
	HF2-	1.425e-13	1.314e-13	-12.846	-12.881	-0.035	(0)
	AlF2+	1.974e-14	1.826e-14	-13.705	-13.738	-0.034	(0)
	AgF	1.841e-14	1.841e-14	-13.735	-13.735	0.000	(0)
	AlF3	1.669e-14	1.669e-14	-13.778	-13.778	0.000	(0)
	PbF+	1.510e-14	1.382e-14	-13.821	-13.859	-0.038	(0)
	BF2 (OH) 2-	7.636e-15	7.027e-15	-14.117	-14.153	-0.036	(0)
	UO2F+	2.464e-15	2.256e-15	-14.608	-14.647	-0.038	(0)
	AlF+2	8.628e-16	6.319e-16	-15.064	-15.199	-0.135	(0)
	AlF4-	6.576e-16	6.073e-16	-15.182	-15.217	-0.034	(0)
	UO2F2	4.723e-16	4.723e-16	-15.326	-15.326	0.000	(0)
	CrF+2	3.548e-16	2.493e-16	-15.450	-15.603	-0.153	(0)
	CdF2	2.307e-17	2.307e-17	-16.637	-16.637	0.000	(0)
	PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
	UO2F3-	9.408e-18	8.614e-18	-17.026	-17.065	-0.038	(0)
	H2F2	6.071e-19	6.071e-19	-18.217	-18.217	0.000	(0)
	FeF2+	2.495e-20	2.306e-20	-19.603	-19.637	-0.034	(0)
	FeF+2	1.625e-20	1.187e-20	-19.789	-19.926	-0.136	(0)
	UO2F4-2	7.070e-21	4.967e-21	-20.151	-20.304	-0.153	(0)
	VO2F	4.704e-21	4.704e-21	-20.328	-20.328	0.000	(0)
	PbF3-	2.970e-21	2.720e-21	-20.527	-20.566	-0.038	(0)
	FeF3	2.362e-21	2.362e-21	-20.627	-20.627	0.000	(0)
	BF3OH-	9.562e-22	8.800e-22	-21.019	-21.056	-0.036	(0)
	VO2F2-	1.354e-22	1.240e-22	-21.868	-21.907	-0.038	(0)
	VOF+	2.203e-24	2.016e-24	-23.657	-23.695	-0.038	(0)
	VO2F3-2	1.598e-25	1.123e-25	-24.796	-24.950	-0.153	(0)
	PbF4-2	1.345e-25	9.450e-26	-24.871	-25.025	-0.153	(0)
	VOF2	5.490e-26	5.490e-26	-25.260	-25.260	0.000	(0)
	HgF+	2.291e-27	2.098e-27	-26.640	-26.678	-0.038	(0)
	BF4-	1.514e-27	1.394e-27	-26.820	-26.856	-0.036	(0)
	Sb (OH) 2F	3.609e-28	3.609e-28	-27.443	-27.443	0.000	(0)
	SbOF	3.549e-28	3.549e-28	-27.450	-27.450	0.000	(0)
	VOF3-	1.545e-28	1.414e-28	-27.811	-27.850	-0.038	(0)
	VO2F4-3	8.877e-30	4.011e-30	-29.052	-29.397	-0.345	(0)
	VOF4-2	5.898e-32	4.144e-32	-31.229	-31.383	-0.153	(0)
	SiF6-2	3.575e-32	2.611e-32	-31.447	-31.583	-0.136	(0)
	UF3+	1.513e-39	1.385e-39	-38.820	-38.859	-0.038	(0)
	UF2+2	1.713e-40	1.204e-40	-39.766	-39.920	-0.153	(0)
	UF4	0.000e+00	0.000e+00	-40.958	-40.958	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-42.536	-42.880	-0.345	(0)
	UF5-	0.000e+00	0.000e+00	-43.460	-43.499	-0.038	(0)
	UF6-2	0.000e+00	0.000e+00	-45.004	-45.158	-0.153	(0)
Fe (2)		2.093e-13					
	Fe+2	1.822e-13	1.280e-13	-12.739	-12.893	-0.153	(0)
	FeOH+	1.252e-14	1.157e-14	-13.902	-13.937	-0.034	(0)
	FeSO4	1.221e-14	1.221e-14	-13.913	-13.913	0.000	(0)
	FeHCO3+	2.312e-15	2.141e-15	-14.636	-14.669	-0.033	(0)
	Fe (OH) 2	2.088e-17	2.088e-17	-16.680	-16.680	0.000	(0)

Fe (OH) 3-	1.622e-17	1.500e-17	-16.790	-16.824	-0.034	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.376	-159.376	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.018	-235.056	-0.038	(0)
Fe (3)	7.879e-10					
Fe (OH) 3	4.713e-10	4.713e-10	-9.327	-9.327	0.000	(0)
Fe (OH) 2+	2.089e-10	1.932e-10	-9.680	-9.714	-0.034	(0)
Fe (OH) 4-	1.077e-10	9.966e-11	-9.968	-10.001	-0.034	(0)
FeOH+2	2.994e-16	2.187e-16	-15.524	-15.660	-0.136	(0)
FeF2+	2.495e-20	2.306e-20	-19.603	-19.637	-0.034	(0)
FeF+2	1.625e-20	1.187e-20	-19.789	-19.926	-0.136	(0)
FeF3	2.362e-21	2.362e-21	-20.627	-20.627	0.000	(0)
FeSO4+	7.032e-22	6.501e-22	-21.153	-21.187	-0.034	(0)
Fe+3	3.066e-22	1.491e-22	-21.513	-21.826	-0.313	(0)
FeCl+2	1.075e-23	7.852e-24	-22.969	-23.105	-0.136	(0)
Fe (SO4) 2-	5.898e-24	5.400e-24	-23.229	-23.268	-0.038	(0)
FeCl2+	6.615e-26	6.115e-26	-25.179	-25.214	-0.034	(0)
FeHSeO3+2	8.515e-28	5.982e-28	-27.070	-27.223	-0.153	(0)
FeCl3	1.066e-29	1.066e-29	-28.972	-28.972	0.000	(0)
Fe2 (OH) 2+4	6.499e-30	1.583e-30	-29.187	-29.800	-0.613	(0)
FeNO3+2	1.165e-31	8.187e-32	-30.934	-31.087	-0.153	(0)
Fe3 (OH) 4+5	4.017e-38	4.422e-39	-37.396	-38.354	-0.958	(0)
H (0)	1.767e-28					
H2	8.834e-29	8.845e-29	-28.054	-28.053	0.001	(0)
Hg (0)	4.575e-11					
Hg	4.575e-11	4.575e-11	-10.340	-10.340	0.000	(0)
Hg (1)	6.892e-26					
Hg2+2	3.446e-26	2.421e-26	-25.463	-25.616	-0.153	(0)
Hg (2)	3.105e-14					
Hg (OH) 2	2.534e-14	2.537e-14	-13.596	-13.596	0.001	(0)
HgClOH	5.452e-15	5.452e-15	-14.263	-14.263	0.000	(0)
HgCl2	2.370e-16	2.370e-16	-15.625	-15.625	0.000	(0)
HgCO3	1.311e-17	1.311e-17	-16.882	-16.882	0.000	(0)
HgCl3-	4.513e-18	4.132e-18	-17.346	-17.384	-0.038	(0)
Hg (CO3) 2-2	8.289e-19	5.824e-19	-18.081	-18.235	-0.153	(0)
HgOH+	7.699e-20	7.048e-20	-19.114	-19.152	-0.038	(0)
HgCl4-2	4.082e-20	2.868e-20	-19.389	-19.542	-0.153	(0)
HgCl+	2.962e-20	2.712e-20	-19.528	-19.567	-0.038	(0)
Hg (OH) 3-	7.924e-21	7.254e-21	-20.101	-20.139	-0.038	(0)
HgHCO3+	1.182e-21	1.082e-21	-20.927	-20.966	-0.038	(0)
Hg (NH3) 2+2	1.142e-23	8.023e-24	-22.942	-23.096	-0.153	(0)
HgNH3+2	2.828e-24	1.987e-24	-23.549	-23.702	-0.153	(0)
Hg+2	1.110e-24	7.796e-25	-23.955	-24.108	-0.153	(0)
HgSO4	7.930e-26	7.930e-26	-25.101	-25.101	0.000	(0)
HgF+	2.291e-27	2.098e-27	-26.640	-26.678	-0.038	(0)
Hg (NH3) 3+2	1.836e-31	1.290e-31	-30.736	-30.889	-0.153	(0)
HgNO3+	1.726e-35	1.580e-35	-34.763	-34.801	-0.038	(0)
Hg (NH3) 4+2	5.890e-39	4.138e-39	-38.230	-38.383	-0.153	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.443	-45.443	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.222	-139.260	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-139.462	-139.615	-0.153	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.220	-141.220	0.000	(0)
K	1.634e-04					
K+	1.630e-04	1.504e-04	-3.788	-3.823	-0.035	(0)
KSO4-	4.472e-07	4.137e-07	-6.349	-6.383	-0.034	(0)
KCrO4-	1.985e-18	1.817e-18	-17.702	-17.741	-0.038	(0)
Mg	2.081e-04					
Mg+2	1.931e-04	1.402e-04	-3.714	-3.853	-0.139	(0)
MgSO4	9.911e-06	9.911e-06	-5.004	-5.004	0.000	(0)
MgHCO3+	2.065e-06	1.906e-06	-5.685	-5.720	-0.035	(0)
MgCO3	1.638e-06	1.638e-06	-5.786	-5.786	0.000	(0)
MgF+	1.236e-06	1.142e-06	-5.908	-5.942	-0.034	(0)
MgOH+	1.368e-07	1.267e-07	-6.864	-6.897	-0.033	(0)
MgH2BO3+	4.878e-09	4.489e-09	-8.312	-8.348	-0.036	(0)
Mn (2)	1.379e-06					
Mn+2	1.281e-06	8.996e-07	-5.893	-6.046	-0.153	(0)
MnSO4	6.216e-08	6.216e-08	-7.207	-7.207	0.000	(0)
MnHCO3+	2.580e-08	2.385e-08	-7.588	-7.623	-0.034	(0)
MnOH+	5.552e-09	5.132e-09	-8.256	-8.290	-0.034	(0)

MnF+	2.813e-09	2.600e-09	-8.551	-8.585	-0.034	(0)
MnCl+	2.136e-09	1.975e-09	-8.670	-8.705	-0.034	(0)
MnCl2	4.863e-12	4.863e-12	-11.313	-11.313	0.000	(0)
MnCl3-	2.526e-15	2.335e-15	-14.598	-14.632	-0.034	(0)
MnSeO4	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
Mn (OH) 3-	1.770e-16	1.636e-16	-15.752	-15.786	-0.034	(0)
MnNO3+	8.550e-17	7.827e-17	-16.068	-16.106	-0.038	(0)
Mn (OH) 4-2	1.643e-21	1.200e-21	-20.784	-20.921	-0.136	(0)
Mn (NO3) 2	1.079e-26	1.079e-26	-25.967	-25.967	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.746	-41.746	0.000	(0)
Mn (3)	1.036e-27					
Mn+3	1.036e-27	5.040e-28	-26.985	-27.298	-0.313	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.112	-41.248	-0.136	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.486	-46.522	-0.036	(0)
Mo	3.769e-08					
MoO4-2	3.769e-08	2.736e-08	-7.424	-7.563	-0.139	(0)
HMoO4-	2.636e-12	2.413e-12	-11.579	-11.617	-0.038	(0)
H2MoO4	7.836e-17	7.836e-17	-16.106	-16.106	0.000	(0)
Ag2MoO4	1.055e-28	1.055e-28	-27.977	-27.977	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-58.220	-58.565	-0.345	(0)
Mo7O24-6	0.000e+00	0.000e+00	-65.397	-66.777	-1.380	(0)
HMo7O24-5	0.000e+00	0.000e+00	-67.785	-68.743	-0.958	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-71.701	-72.314	-0.613	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-77.077	-77.421	-0.345	(0)
N (-3)	3.830e-08					
NH4+	3.412e-08	3.140e-08	-7.467	-7.503	-0.036	(0)
NH3	4.039e-09	4.039e-09	-8.394	-8.394	0.000	(0)
NH4SO4-	1.414e-10	1.307e-10	-9.850	-9.884	-0.034	(0)
CaNH3+2	1.907e-12	1.340e-12	-11.720	-11.873	-0.153	(0)
CuNH3+2	5.742e-14	4.034e-14	-13.241	-13.394	-0.153	(0)
NiNH3+2	4.069e-15	2.859e-15	-14.390	-14.544	-0.153	(0)
AgNH3+	9.092e-16	8.324e-16	-15.041	-15.080	-0.038	(0)
Co (NH3) +2	6.755e-16	4.746e-16	-15.170	-15.324	-0.153	(0)
BaNH3+2	5.575e-18	3.916e-18	-17.254	-17.407	-0.153	(0)
Ag (NH3) 2+	2.985e-20	2.733e-20	-19.525	-19.563	-0.038	(0)
Ca (NH3) 2+2	3.067e-21	2.154e-21	-20.513	-20.667	-0.153	(0)
Ni (NH3) 2+2	2.376e-21	1.669e-21	-20.624	-20.778	-0.153	(0)
Co (NH3) 2+2	1.164e-22	8.176e-23	-21.934	-22.087	-0.153	(0)
Hg (NH3) 2+2	1.142e-23	8.023e-24	-22.942	-23.096	-0.153	(0)
HgNH3+2	2.828e-24	1.987e-24	-23.549	-23.702	-0.153	(0)
Co (NH3) 3+2	5.917e-30	4.157e-30	-29.228	-29.381	-0.153	(0)
Hg (NH3) 3+2	1.836e-31	1.290e-31	-30.736	-30.889	-0.153	(0)
Co (NH3) 4+2	1.254e-37	8.811e-38	-36.902	-37.055	-0.153	(0)
Hg (NH3) 4+2	5.890e-39	4.138e-39	-38.230	-38.383	-0.153	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.751	-43.905	-0.153	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.075	-45.229	-0.153	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.624	-53.777	-0.153	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.682	-54.027	-0.345	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.530	-55.683	-0.153	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.575	-64.613	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.418	-67.572	-0.153	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.733	-68.887	-0.153	(0)
N (3)	2.767e-07					
NO2-	2.767e-07	2.549e-07	-6.558	-6.594	-0.036	(0)
CuNO2+	2.846e-14	2.605e-14	-13.546	-13.584	-0.038	(0)
AgNO2	5.376e-15	5.376e-15	-14.270	-14.270	0.000	(0)
CoNO2+	1.917e-15	1.755e-15	-14.717	-14.756	-0.038	(0)
Cu (NO2) 2	6.795e-20	6.795e-20	-19.168	-19.168	0.000	(0)
Ag (NO2) 2-	2.318e-21	2.122e-21	-20.635	-20.673	-0.038	(0)
N (5)	5.953e-11					
NO3-	5.948e-11	5.490e-11	-10.226	-10.260	-0.035	(0)
CaNO3+	4.997e-14	4.575e-14	-13.301	-13.340	-0.038	(0)
MnNO3+	8.550e-17	7.827e-17	-16.068	-16.106	-0.038	(0)
ZnNO3+	2.592e-17	2.373e-17	-16.586	-16.625	-0.038	(0)
BaNO3+	4.619e-19	4.229e-19	-18.335	-18.374	-0.038	(0)
NiNO3+	1.985e-19	1.818e-19	-18.702	-18.740	-0.038	(0)

CuNO3+	1.851e-19	1.695e-19	-18.733	-18.771	-0.038	(0)
CoNO3+	9.289e-20	8.504e-20	-19.032	-19.070	-0.038	(0)
CdNO3+	2.625e-20	2.403e-20	-19.581	-19.619	-0.038	(0)
AgNO3	4.402e-21	4.402e-21	-20.356	-20.356	0.000	(0)
PbNO3+	2.396e-21	2.194e-21	-20.620	-20.659	-0.038	(0)
UO2NO3+	2.693e-26	2.466e-26	-25.570	-25.608	-0.038	(0)
Mn (NO3) 2	1.079e-26	1.079e-26	-25.967	-25.967	0.000	(0)
Zn (NO3) 2	2.600e-28	2.600e-28	-27.585	-27.585	0.000	(0)
CrNO3+2	7.399e-29	5.198e-29	-28.131	-28.284	-0.153	(0)
Co (NO3) 2	9.499e-30	9.499e-30	-29.022	-29.022	0.000	(0)
Cu (NO3) 2	1.171e-30	1.171e-30	-29.931	-29.931	0.000	(0)
VO2NO3	1.026e-30	1.026e-30	-29.989	-29.989	0.000	(0)
Cd (NO3) 2	6.612e-31	6.612e-31	-30.180	-30.180	0.000	(0)
Pb (NO3) 2	2.046e-31	2.046e-31	-30.689	-30.689	0.000	(0)
FeNO3+2	1.165e-31	8.187e-32	-30.934	-31.087	-0.153	(0)
HgNO3+	1.726e-35	1.580e-35	-34.763	-34.801	-0.038	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.443	-45.443	0.000	(0)
Na	3.256e-03					
Na+	3.246e-03	2.997e-03	-2.489	-2.523	-0.035	(0)
NaSO4-	6.759e-06	6.253e-06	-5.170	-5.204	-0.034	(0)
NaHCO3	2.239e-06	2.239e-06	-5.650	-5.650	0.000	(0)
NaCO3-	8.474e-07	7.840e-07	-6.072	-6.106	-0.034	(0)
NaF	1.373e-07	1.373e-07	-6.862	-6.862	0.000	(0)
NaH2BO3	4.386e-09	4.386e-09	-8.358	-8.358	0.000	(0)
NaCrO4-	5.289e-17	4.843e-17	-16.277	-16.315	-0.038	(0)
Ni	2.902e-09					
Ni+2	1.816e-09	1.318e-09	-8.741	-8.880	-0.139	(0)
NiCO3	6.909e-10	6.909e-10	-9.161	-9.161	0.000	(0)
NiHCO3+	2.358e-10	2.159e-10	-9.627	-9.666	-0.038	(0)
NiSO4	1.022e-10	1.022e-10	-9.991	-9.991	0.000	(0)
NiOH+	4.117e-11	3.769e-11	-10.385	-10.424	-0.038	(0)
Ni (OH) 2	6.799e-12	6.799e-12	-11.168	-11.168	0.000	(0)
NiCl+	6.423e-12	5.880e-12	-11.192	-11.231	-0.038	(0)
NiF+	2.626e-12	2.404e-12	-11.581	-11.619	-0.038	(0)
Ni (OH) 3-	1.687e-14	1.544e-14	-13.773	-13.811	-0.038	(0)
NiNH3+2	4.069e-15	2.859e-15	-14.390	-14.544	-0.153	(0)
Ni (SO4) 2-2	1.871e-15	1.315e-15	-14.728	-14.881	-0.153	(0)
NiCl2	5.162e-17	5.162e-17	-16.287	-16.287	0.000	(0)
NiSeO4	8.315e-19	8.315e-19	-18.080	-18.080	0.000	(0)
NiNO3+	1.985e-19	1.818e-19	-18.702	-18.740	-0.038	(0)
Ni (NH3) 2+2	2.376e-21	1.669e-21	-20.624	-20.778	-0.153	(0)
O (0)	1.294e-36					
O2	6.469e-37	6.477e-37	-36.189	-36.189	0.001	(0)
Pb	1.460e-10					
PbCO3	1.141e-10	1.141e-10	-9.943	-9.943	0.000	(0)
PbOH+	1.684e-11	1.541e-11	-10.774	-10.812	-0.038	(0)
Pb (CO3) 2-2	6.582e-12	4.624e-12	-11.182	-11.335	-0.153	(0)
Pb+2	3.722e-12	2.702e-12	-11.429	-11.568	-0.139	(0)
PbHCO3+	2.913e-12	2.667e-12	-11.536	-11.574	-0.038	(0)
Pb (OH) 2	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
PbSO4	5.142e-13	5.142e-13	-12.289	-12.289	0.000	(0)
PbCl+	1.826e-13	1.671e-13	-12.739	-12.777	-0.038	(0)
PbF+	1.510e-14	1.382e-14	-13.821	-13.859	-0.038	(0)
Pb (OH) 3-	2.746e-15	2.514e-15	-14.561	-14.600	-0.038	(0)
Pb (SO4) 2-2	1.713e-15	1.204e-15	-14.766	-14.919	-0.153	(0)
PbCl2	1.302e-15	1.302e-15	-14.885	-14.885	0.000	(0)
PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
Pb (OH) 4-2	1.991e-18	1.399e-18	-17.701	-17.854	-0.153	(0)
PbCl3-	9.869e-19	9.035e-19	-18.006	-18.044	-0.038	(0)
PbF3-	2.970e-21	2.720e-21	-20.527	-20.566	-0.038	(0)
PbNO3+	2.396e-21	2.194e-21	-20.620	-20.659	-0.038	(0)
Pb2OH+3	1.461e-21	6.601e-22	-20.835	-21.180	-0.345	(0)
PbCl4-2	1.025e-21	7.201e-22	-20.989	-21.143	-0.153	(0)
PbF4-2	1.345e-25	9.450e-26	-24.871	-25.025	-0.153	(0)
Pb3 (OH) 4+2	9.405e-26	6.608e-26	-25.027	-25.180	-0.153	(0)
Pb (NO3) 2	2.046e-31	2.046e-31	-30.689	-30.689	0.000	(0)
Pb4 (OH) 4+4	5.821e-33	1.418e-33	-32.235	-32.848	-0.613	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.732	-151.732	0.000	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-228.110	-228.149	-0.038	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.898	-73.898	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.678	-77.717	-0.038	(0)
S5-2	0.000e+00	0.000e+00	-78.575	-78.729	-0.153	(0)
H2S	0.000e+00	0.000e+00	-79.050	-79.050	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.091	-79.245	-0.153	(0)
S4-2	0.000e+00	0.000e+00	-79.171	-79.324	-0.153	(0)
CdHS+	0.000e+00	0.000e+00	-79.529	-79.568	-0.038	(0)
S3-2	0.000e+00	0.000e+00	-79.977	-80.130	-0.153	(0)
S2-2	0.000e+00	0.000e+00	-80.993	-81.146	-0.153	(0)
S-2	0.000e+00	0.000e+00	-86.527	-86.664	-0.136	(0)
HgHS2-	0.000e+00	0.000e+00	-139.222	-139.260	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-139.462	-139.615	-0.153	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.220	-141.220	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.536	-145.756	-0.220	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.273	-146.486	-0.213	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.533	-146.645	-0.112	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-146.996	-147.035	-0.038	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.477	-147.515	-0.038	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.508	-147.732	-0.224	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.826	-148.043	-0.217	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.378	-149.378	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.080	-150.080	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.732	-151.732	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.376	-159.376	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.224	-216.262	-0.038	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.776	-223.815	-0.038	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.288	-225.441	-0.153	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.859	-225.897	-0.038	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.110	-228.149	-0.038	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.018	-235.056	-0.038	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.265	-301.418	-0.153	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-302.838	-302.991	-0.153	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.320	-320.473	-0.153	(0)
S (6)	5.759e-04					
SO4-2	5.353e-04	3.885e-04	-3.271	-3.411	-0.139	(0)
CaSO4	2.346e-05	2.346e-05	-4.630	-4.630	0.000	(0)
MgSO4	9.911e-06	9.911e-06	-5.004	-5.004	0.000	(0)
NaSO4-	6.759e-06	6.253e-06	-5.170	-5.204	-0.034	(0)
KSO4-	4.472e-07	4.137e-07	-6.349	-6.383	-0.034	(0)
MnSO4	6.216e-08	6.216e-08	-7.207	-7.207	0.000	(0)
ZnSO4	1.463e-08	1.463e-08	-7.835	-7.835	0.000	(0)
HSO4-	1.822e-10	1.683e-10	-9.739	-9.774	-0.034	(0)
NH4SO4-	1.414e-10	1.307e-10	-9.850	-9.884	-0.034	(0)
NiSO4	1.022e-10	1.022e-10	-9.991	-9.991	0.000	(0)
CuSO4	8.689e-11	8.689e-11	-10.061	-10.061	0.000	(0)
CoSO4	7.577e-11	7.577e-11	-10.120	-10.120	0.000	(0)
Zn (SO4) 2-2	7.047e-11	4.951e-11	-10.152	-10.305	-0.153	(0)
CdSO4	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
AgSO4-	8.548e-13	7.826e-13	-12.068	-12.106	-0.038	(0)
PbSO4	5.142e-13	5.142e-13	-12.289	-12.289	0.000	(0)
CrOHSO4	9.924e-14	9.924e-14	-13.003	-13.003	0.000	(0)
Cd (SO4) 2-2	9.406e-14	6.608e-14	-13.027	-13.180	-0.153	(0)
FeSO4	1.221e-14	1.221e-14	-13.913	-13.913	0.000	(0)
Ni (SO4) 2-2	1.871e-15	1.315e-15	-14.728	-14.881	-0.153	(0)
Pb (SO4) 2-2	1.713e-15	1.204e-15	-14.766	-14.919	-0.153	(0)
UO2SO4	1.324e-16	1.324e-16	-15.878	-15.878	0.000	(0)
CrSO4+	2.147e-17	1.965e-17	-16.668	-16.707	-0.038	(0)
AlSO4+	2.842e-18	2.625e-18	-17.546	-17.581	-0.034	(0)
UO2 (SO4) 2-2	9.651e-19	6.780e-19	-18.015	-18.169	-0.153	(0)
Al (SO4) 2-	1.183e-20	1.093e-20	-19.927	-19.961	-0.034	(0)
FeSO4+	7.032e-22	6.501e-22	-21.153	-21.187	-0.034	(0)
VO2SO4-	3.744e-22	3.428e-22	-21.427	-21.465	-0.038	(0)
Cr2 (OH) 2SO4+2	1.374e-23	9.655e-24	-22.862	-23.015	-0.153	(0)
Fe (SO4) 2-	5.898e-24	5.400e-24	-23.229	-23.268	-0.038	(0)
VOSO4	4.956e-25	4.956e-25	-24.305	-24.305	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.228e-25	2.228e-25	-24.652	-24.652	0.000	(0)

HgSO4	7.930e-26	7.930e-26	-25.101	-25.101	0.000	(0)
CrO3SO4-2	3.484e-26	2.448e-26	-25.458	-25.611	-0.153	(0)
VSO4+	7.220e-40	6.610e-40	-39.141	-39.180	-0.038	(0)
U(SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.699	-44.852	-0.153	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-64.575	-64.613	-0.038	(0)
Sb (3)	1.419e-21					
Sb(OH) 3	7.177e-22	7.177e-22	-21.144	-21.144	0.000	(0)
HSbO2	7.007e-22	7.007e-22	-21.154	-21.154	0.000	(0)
SbO2-	2.796e-25	2.560e-25	-24.553	-24.592	-0.038	(0)
Sb(OH) 4-	1.602e-25	1.467e-25	-24.795	-24.834	-0.038	(0)
Sb(OH) 2F	3.609e-28	3.609e-28	-27.443	-27.443	0.000	(0)
SbOF	3.549e-28	3.549e-28	-27.450	-27.450	0.000	(0)
Sb(OH) 2+	8.440e-29	7.727e-29	-28.074	-28.112	-0.038	(0)
SbO+	2.910e-29	2.664e-29	-28.536	-28.574	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.320	-320.473	-0.153	(0)
Sb (5)	5.934e-10					
SbO3-	5.927e-10	5.426e-10	-9.227	-9.266	-0.038	(0)
Sb(OH) 6-	6.874e-13	6.344e-13	-12.163	-12.198	-0.035	(0)
SbO2+	3.341e-27	3.059e-27	-26.476	-26.514	-0.038	(0)
Se (-2)	4.019e-16					
Ag2Se	4.019e-16	4.019e-16	-15.396	-15.396	0.000	(0)
HSe-	2.344e-39	2.146e-39	-38.630	-38.668	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-41.746	-41.746	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.132	-43.132	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.162	-45.315	-0.153	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.168	-82.782	-0.613	(0)
Se (4)	3.599e-09					
SeO3-2	1.941e-09	1.363e-09	-8.712	-8.865	-0.153	(0)
HSeO3-	1.658e-09	1.518e-09	-8.780	-8.819	-0.038	(0)
H2SeO3	2.871e-15	2.871e-15	-14.542	-14.542	0.000	(0)
AgSeO3-	9.662e-17	8.846e-17	-16.015	-16.053	-0.038	(0)
Cd(SeO3) 2-2	3.019e-22	2.121e-22	-21.520	-21.673	-0.153	(0)
Ag(SeO3) 2-3	2.390e-24	1.080e-24	-23.622	-23.967	-0.345	(0)
FeHSeO3+2	8.515e-28	5.982e-28	-27.070	-27.223	-0.153	(0)
Se (6)	1.858e-12					
SeO4-2	1.858e-12	1.349e-12	-11.731	-11.870	-0.139	(0)
MnSeO4	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
ZnSeO4	3.595e-17	3.595e-17	-16.444	-16.444	0.000	(0)
NiSeO4	8.315e-19	8.315e-19	-18.080	-18.080	0.000	(0)
CoSeO4	6.606e-19	6.606e-19	-18.180	-18.180	0.000	(0)
HSeO4-	3.273e-19	2.996e-19	-18.485	-18.523	-0.038	(0)
CdSeO4	3.476e-20	3.476e-20	-19.459	-19.459	0.000	(0)
Zn(SeO4) 2-2	6.997e-29	4.915e-29	-28.155	-28.308	-0.153	(0)
Si	3.153e-04					
H4SiO4	3.045e-04	3.049e-04	-3.516	-3.516	0.001	(0)
H3SiO4-	1.077e-05	9.943e-06	-4.968	-5.002	-0.035	(0)
H2SiO4-2	1.932e-10	1.415e-10	-9.714	-9.849	-0.135	(0)
UO2H3SiO4+	2.075e-13	1.900e-13	-12.683	-12.721	-0.038	(0)
SiF6-2	3.575e-32	2.611e-32	-31.447	-31.583	-0.136	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.591	-60.936	-0.345	(0)
U (4)	4.398e-20					
U(OH) 5-	4.397e-20	4.026e-20	-19.357	-19.395	-0.038	(0)
U(OH) 4	7.474e-24	7.474e-24	-23.126	-23.126	0.000	(0)
U(OH) 3+	1.323e-28	1.211e-28	-27.878	-27.917	-0.038	(0)
U(OH) 2+2	3.535e-34	2.484e-34	-33.452	-33.605	-0.153	(0)
UF3+	1.513e-39	1.385e-39	-38.820	-38.859	-0.038	(0)
UF2+2	1.713e-40	1.204e-40	-39.766	-39.920	-0.153	(0)
UOH+3	1.148e-40	0.000e+00	-39.940	-40.285	-0.345	(0)
UF4	0.000e+00	0.000e+00	-40.958	-40.958	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.536	-42.880	-0.345	(0)
UF5-	0.000e+00	0.000e+00	-43.460	-43.499	-0.038	(0)
U(SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.699	-44.852	-0.153	(0)
UF6-2	0.000e+00	0.000e+00	-45.004	-45.158	-0.153	(0)
U+4	0.000e+00	0.000e+00	-47.428	-48.041	-0.613	(0)
UC1+3	0.000e+00	0.000e+00	-48.755	-49.100	-0.345	(0)

U6(OH) 15+9	0.000e+00	0.000e+00	-177.000	-180.105	-3.105	(0)
U(5)	1.195e-17					
UO2+	1.195e-17	1.094e-17	-16.923	-16.961	-0.038	(0)
U(6)	1.524e-08					
UO2(CO3) 3-4	1.020e-08	2.485e-09	-7.991	-8.605	-0.613	(0)
UO2(CO3) 2-2	5.024e-09	3.529e-09	-8.299	-8.452	-0.153	(0)
UO2CO3	1.259e-11	1.259e-11	-10.900	-10.900	0.000	(0)
UO2H3SiO4+	2.075e-13	1.900e-13	-12.683	-12.721	-0.038	(0)
UO2OH+	7.030e-14	6.436e-14	-13.153	-13.191	-0.038	(0)
UO2F+	2.464e-15	2.256e-15	-14.608	-14.647	-0.038	(0)
UO2F2	4.723e-16	4.723e-16	-15.326	-15.326	0.000	(0)
UO2+2	3.101e-16	2.251e-16	-15.508	-15.648	-0.139	(0)
UO2SO4	1.324e-16	1.324e-16	-15.878	-15.878	0.000	(0)
UO2F3-	9.408e-18	8.614e-18	-17.026	-17.065	-0.038	(0)
UO2(SO4) 2-2	9.651e-19	6.780e-19	-18.015	-18.169	-0.153	(0)
UO2Cl+	6.952e-19	6.365e-19	-18.158	-18.196	-0.038	(0)
(UO2) 2 (OH) 2+2	9.785e-21	6.874e-21	-20.009	-20.163	-0.153	(0)
UO2F4-2	7.070e-21	4.967e-21	-20.151	-20.304	-0.153	(0)
(UO2) 3 (OH) 5+	1.891e-21	1.731e-21	-20.723	-20.762	-0.038	(0)
UO2NO3+	2.693e-26	2.466e-26	-25.570	-25.608	-0.038	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.947	-44.985	-0.038	(0)
V+2	0.000e+00	0.000e+00	-46.698	-46.852	-0.153	(0)
V(3)	3.406e-17					
V(OH) 3	3.406e-17	3.406e-17	-16.468	-16.468	0.000	(0)
V(OH) 2+	1.066e-28	9.756e-29	-27.972	-28.011	-0.038	(0)
VOH+2	5.839e-33	4.102e-33	-32.234	-32.387	-0.153	(0)
V+3	7.975e-39	3.604e-39	-38.098	-38.443	-0.345	(0)
VSO4+	7.220e-40	6.610e-40	-39.141	-39.180	-0.038	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-61.601	-61.946	-0.345	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-63.361	-63.974	-0.613	(0)
V(4)	2.301e-21					
V(OH) 3+	2.292e-21	2.098e-21	-20.640	-20.678	-0.038	(0)
VO+2	6.591e-24	4.631e-24	-23.181	-23.334	-0.153	(0)
VOF+	2.203e-24	2.016e-24	-23.657	-23.695	-0.038	(0)
VOSO4	4.956e-25	4.956e-25	-24.305	-24.305	0.000	(0)
VOF2	5.490e-26	5.490e-26	-25.260	-25.260	0.000	(0)
VOC1+	2.474e-26	2.265e-26	-25.607	-25.645	-0.038	(0)
VOF3-	1.545e-28	1.414e-28	-27.811	-27.850	-0.038	(0)
VOF4-2	5.898e-32	4.144e-32	-31.229	-31.383	-0.153	(0)
H2V2O4+2	3.142e-37	2.207e-37	-36.503	-36.656	-0.153	(0)
V(5)	1.789e-10					
H2VO4-	1.029e-10	9.420e-11	-9.988	-10.026	-0.038	(0)
HVO4-2	7.598e-11	5.338e-11	-10.119	-10.273	-0.153	(0)
H3VO4	4.176e-15	4.176e-15	-14.379	-14.379	0.000	(0)
VO4-3	1.336e-16	6.035e-17	-15.874	-16.219	-0.345	(0)
HV2O7-3	3.771e-18	1.704e-18	-17.424	-17.769	-0.345	(0)
H3V2O7-	2.775e-18	2.540e-18	-17.557	-17.595	-0.038	(0)
V2O7-4	4.247e-20	1.035e-20	-19.372	-19.985	-0.613	(0)
VO2+	4.003e-20	3.695e-20	-19.398	-19.432	-0.035	(0)
VO2F	4.704e-21	4.704e-21	-20.328	-20.328	0.000	(0)
VO2SO4-	3.744e-22	3.428e-22	-21.427	-21.465	-0.038	(0)
VO2F2-	1.354e-22	1.240e-22	-21.868	-21.907	-0.038	(0)
V3O9-3	1.938e-24	8.757e-25	-23.713	-24.058	-0.345	(0)
VO2F3-2	1.598e-25	1.123e-25	-24.796	-24.950	-0.153	(0)
VO2F4-3	8.877e-30	4.011e-30	-29.052	-29.397	-0.345	(0)
VO2NO3	1.026e-30	1.026e-30	-29.989	-29.989	0.000	(0)
V4O12-4	1.412e-31	3.439e-32	-30.850	-31.464	-0.613	(0)
V10O28-6	0.000e+00	0.000e+00	-83.386	-84.766	-1.380	(0)
HV10O28-5	0.000e+00	0.000e+00	-83.975	-84.933	-0.958	(0)
H2V10O28-4	0.000e+00	0.000e+00	-87.465	-88.079	-0.613	(0)
Zn	4.591e-07					
Zn+2	2.371e-07	1.721e-07	-6.625	-6.764	-0.139	(0)
ZnCO3	1.391e-07	1.391e-07	-6.857	-6.857	0.000	(0)
ZnOH+	4.270e-08	3.909e-08	-7.370	-7.408	-0.038	(0)
ZnSO4	1.463e-08	1.463e-08	-7.835	-7.835	0.000	(0)
Zn(OH) 2	1.407e-08	1.407e-08	-7.852	-7.852	0.000	(0)
ZnHCO3+	7.898e-09	7.230e-09	-8.103	-8.141	-0.038	(0)

ZnOHCl	2.241e-09	2.241e-09	-8.650	-8.650	0.000	(0)
ZnCl+	8.168e-10	7.538e-10	-9.088	-9.123	-0.035	(0)
ZnF+	2.723e-10	2.493e-10	-9.565	-9.603	-0.038	(0)
Zn(OH) 3-	1.749e-10	1.602e-10	-9.757	-9.795	-0.038	(0)
Zn(SO4) 2-2	7.047e-11	4.951e-11	-10.152	-10.305	-0.153	(0)
ZnCl2	2.083e-12	2.083e-12	-11.681	-11.681	0.000	(0)
Zn(OH) 4-2	2.061e-14	1.448e-14	-13.686	-13.839	-0.153	(0)
ZnCl3-	3.126e-15	2.885e-15	-14.505	-14.540	-0.035	(0)
ZnSeO4	3.595e-17	3.595e-17	-16.444	-16.444	0.000	(0)
ZnNO3+	2.592e-17	2.373e-17	-16.586	-16.625	-0.038	(0)
ZnCl4-2	3.443e-18	2.515e-18	-17.463	-17.600	-0.136	(0)
Zn(NO3) 2	2.600e-28	2.600e-28	-27.585	-27.585	0.000	(0)
Zn(SeO4) 2-2	6.997e-29	4.915e-29	-28.155	-28.308	-0.153	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-146.996	-147.035	-0.038	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.378	-149.378	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-223.776	-223.815	-0.038	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.288	-225.441	-0.153	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-302.838	-302.991	-0.153	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-62.63	-56.34	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-45.85	-41.34	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-53.07	-41.34	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-80.93	-62.99	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-60.52	-40.49	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-29.90	-29.49	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-27.33	-26.88	0.45	(NH4) 2SeO4
Acanthite	-53.14	-89.36	-36.22	Ag2S
Ag2CO3	-13.75	-24.84	-11.09	Ag2CO3
Ag2CrO4	-22.89	-34.48	-11.59	Ag2CrO4
Ag2HVO4	-15.84	-14.36	1.48	Ag2HVO4
Ag2MoO4	-16.00	-27.55	-11.55	Ag2MoO4
Ag2O	-15.86	-3.29	12.57	Ag2O
Ag2Se	-1.61	-50.31	-48.70	Ag2Se
Ag2SeO3	-13.31	-20.46	-7.15	Ag2SeO3
Ag2SeO4	-22.95	-31.86	-8.91	Ag2SeO4
Ag2SO4	-18.58	-23.40	-4.82	Ag2SO4
Ag3AsO3	-28.93	-26.77	2.16	Ag3AsO3
Ag3AsO4	-17.98	-20.76	-2.79	Ag3AsO4
Ag3H2VO5	-21.19	-16.01	5.18	Ag3H2VO5
AgF:4H2O	-15.18	-14.14	1.05	AgF:4H2O
Agmetal	-0.59	-14.09	-13.51	Ag
AgVO3	-13.49	-12.72	0.77	AgVO3
Al(OH) 3 (am)	-3.80	7.00	10.80	Al(OH) 3
Al2(MoO4) 3	-61.18	-58.81	2.37	Al2(MoO4) 3
Al2O3	-5.65	14.00	19.65	Al2O3
Al4(OH) 10SO4	-14.82	7.88	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-13.64	-8.84	4.80	AlAsO4:2H2O
AlOHSO4	-9.89	-13.12	-3.23	AlOHSO4
AlSb	-154.48	-88.85	65.62	AlSb
Alunite	-13.31	-14.71	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-7.19	-14.98	-7.79	PbSO4
Anhydrite	-2.63	-6.99	-4.36	CaSO4
Anilite	-55.37	-87.24	-31.88	Cu0.25Cu1.5S
Antlerite	-5.82	2.97	8.79	Cu3(OH) 4SO4
Aragonite	-0.13	-8.43	-8.30	CaCO3
Arsenolite	-84.60	-87.36	-2.76	As4O6
Artinite	-5.45	4.15	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-38.38	-31.67	6.71	As2O5
Atacamite	-3.11	4.28	7.39	Cu2(OH) 3Cl
Azurite	-3.12	-20.03	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-16.50	7.89	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-22.24	-6.37	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	0.92	-7.99	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-31.42	1.52	32.94	Ba3(VO4) 2:4H2O

BaCrO4	-13.63	-23.30	-9.67	BaCrO4
BaF2	-11.27	-17.09	-5.82	BaF2
BaMoO4	-9.42	-16.38	-6.96	BaMoO4
Barite	-2.24	-12.22	-9.98	BaSO4
BaS	-94.36	-78.18	16.18	BaS
BaSeO3	-11.11	-9.28	1.83	BaSeO3
BaSeO4	-13.22	-20.68	-7.46	BaSeO4
Bianchite	-8.41	-10.18	-1.76	ZnSO4:6H2O
Birnessite	-7.88	10.21	18.09	MnO2
Bixbyite	-3.83	-4.48	-0.64	Mn2O3
BlaubleiI	-55.39	-79.56	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.83	-83.10	-27.28	Cu0.6Cu0.8S
Boehmite	-1.58	7.00	8.58	AlOOH
Breithauptite	-57.05	-75.58	-18.52	NiSb
Brochantite	-4.55	10.67	15.22	Cu4(OH)6SO4
Brucite	-3.99	12.85	16.84	Mg(OH)2
Bunsenite	-4.62	7.83	12.45	NiO
Ca(VO3)2	-14.69	-9.03	5.66	Ca(VO3)2
Ca2V2O7	-13.40	4.10	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.46	4.10	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.59	7.71	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.74	17.22	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.64	17.22	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.30	-152.33	142.97	Ca3Sb2
CaCrO4	-15.80	-18.07	-2.27	CaCrO4
Calcite	0.05	-8.43	-8.48	CaCO3
Calomel	-13.22	-31.13	-17.91	Hg2Cl2
CaMoO4	-3.19	-11.14	-7.95	CaMoO4
Carnotite	-5.72	-5.49	0.23	KUO2VO4
CaSeO3:2H2O	-6.86	-4.04	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.43	-15.45	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.30	-3.46	9.84	Cd(BO2)2
Cd(OH)2	-6.80	6.85	13.64	Cd(OH)2
Cd(OH)2(am)	-6.88	6.85	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.40	-19.69	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.13	0.43	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.13	7.27	28.40	Cd4(OH)6SO4
CdCl2	-14.72	-15.38	-0.66	CdCl2
CdCl2:1H2O	-13.68	-15.38	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.46	-15.38	-1.91	CdCl2:2.5H2O
CdF2	-16.92	-18.14	-1.21	CdF2
Cdmetal(alpha)	-31.57	-18.06	13.51	Cd
Cdmetal(gamma)	-31.67	-18.06	13.62	Cd
CdMoO4	-3.27	-17.42	-14.15	CdMoO4
CdOHCl	-7.80	-4.26	3.54	CdOHCl
CdSb	-76.20	-76.55	-0.35	CdSb
CdSe	-19.97	-40.17	-20.20	CdSe
CdSeO4:2H2O	-19.88	-21.73	-1.85	CdSeO4:2H2O
CdSO4	-13.10	-13.27	-0.17	CdSO4
CdSO4:1H2O	-11.54	-13.27	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.40	-13.27	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.00	-12.75	-9.75	AgCl
Cerrusite	-3.29	-16.42	-13.13	PbCO3
CH4(g)	-80.13	-121.17	-41.05	CH4
Chalcanthite	-9.78	-12.42	-2.64	CuSO4:5H2O
Chalcedony	0.03	-3.52	-3.55	SiO2
Chalcocite	-55.28	-90.20	-34.92	Cu2S
Chalcopyrite	-125.36	-160.63	-35.27	CuFeS2
Chrysotile	-0.67	31.53	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.97	-99.67	-45.69	HgS
Claudetite	-84.30	-87.36	-3.06	As4O6
Clausthalite	-14.78	-41.88	-27.10	PbSe
Co(BO2)2	-29.68	-2.61	27.07	Co(BO2)2
Co(OH)2	-5.40	7.70	13.09	Co(OH)2
Co(OH)3	-9.94	-12.25	-2.31	Co(OH)3
CO2(g)	-3.41	-21.56	-18.15	CO2
Co3(AsO4)2	-21.61	-8.58	13.03	Co3(AsO4)2
Co3O4	-6.31	-16.81	-10.50	Co3O4

CoCl2	-22.79	-14.53	8.27	CoCl2
CoCl2:6H2O	-17.06	-14.53	2.54	CoCl2:6H2O
CoCO3	-3.88	-13.86	-9.98	CoCO3
CoF2	-15.69	-17.29	-1.60	CoF2
CoF3	-48.27	-49.73	-1.46	CoF3
CoFe2O4	17.69	14.16	-3.53	CoFe2O4
CoMoO4	-8.81	-16.57	-7.76	CoMoO4
CoO	-5.89	7.70	13.59	CoO
CoS (alpha)	-70.93	-78.37	-7.44	CoS
CoS (beta)	-67.30	-78.37	-11.07	CoS
CoSe	-23.12	-39.32	-16.20	CoSe
CoSeO3	-10.80	-9.48	1.32	CoSeO3
CoSeO4:6H2O	-19.35	-20.88	-1.53	CoSeO4:6H2O
CoSO4	-15.22	-12.42	2.80	CoSO4
CoSO4:6H2O	-9.95	-12.42	-2.47	CoSO4:6H2O
Cotunnite	-12.31	-17.09	-4.78	PbCl2
Covellite	-56.07	-78.37	-22.30	CuS
Cr (OH) 2	-21.50	-10.68	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.17	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.42	-1.17	-0.75	Cr (OH) 3
Cr2O3	0.01	-2.35	-2.36	Cr2O3
CrCl2	-46.99	-32.90	14.09	CrCl2
CrCl3	-49.62	-34.51	15.11	CrCl3
CrF3	-27.31	-38.65	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-66.06	-35.58	30.48	Cr
CrO3	-27.98	-31.19	-3.21	CrO3
Cryolite	-16.62	-50.46	-33.84	Na3AlF6
Cu (OH) 2	-0.98	7.70	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.00	15.21	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.47	-3.22	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.34	-90.22	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.35	-51.15	-45.80	Cu2Se
Cu2SO4	-22.30	-24.25	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.68	-8.58	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.46	-102.05	-42.59	Cu3Sb
Cu3Se2	-26.99	-90.48	-63.49	Cu3Se2
CuCO3	-2.36	-13.86	-11.50	CuCO3
CuCrO4	-18.06	-23.50	-5.44	CuCrO4
CuF	-9.65	-14.56	-4.91	CuF
CuF2	-18.40	-17.29	1.12	CuF2
CuF2:2H2O	-12.74	-17.29	-4.55	CuF2:2H2O
Cumetal	-5.76	-14.52	-8.76	Cu
CuMoO4	-3.50	-16.57	-13.08	CuMoO4
CuOCuSO4	-15.03	-4.72	10.30	CuOCuSO4
Cupricferrite	8.17	14.16	5.99	CuFe2O4
Cuprite	-2.73	-4.13	-1.41	Cu2O
Cuprousferrite	10.08	1.17	-8.92	CuFeO2
CuSe	-6.23	-39.33	-33.10	CuSe
CuSe2	-28.08	-61.44	-33.37	CuSe2
CuSeO3:2H2O	-9.99	-9.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.44	-20.88	-2.44	CuSeO4:5H2O
CuSO4	-15.36	-12.42	2.94	CuSO4
Diaspore	0.13	7.00	6.87	AlOOH
Djurleite	-55.50	-89.42	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.60	-17.14	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.05	-17.14	-17.09	CaMg (CO3) 2
Epsomite	-5.14	-7.26	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.75	3.81	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	2.94	-0.10	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-14.62	-18.34	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-12.26	-10.71	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-24.42	-45.05	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-50.15	-53.88	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.94	10.28	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.00	-12.60	0.40	FeAsO4:2H2O
FeCr2O4	-5.73	1.47	7.20	FeCr2O4
FeMoO4	-10.36	-20.46	-10.09	FeMoO4

Ferrihydrite	0.04	3.23	3.19	Fe (OH) 3
Ferroselite	-46.73	-65.33	-18.60	FeSe2
FeS (ppt)	-79.31	-82.26	-2.95	FeS
FeSe	-32.21	-43.21	-11.00	FeSe
Fix_pe	-4.10	-4.10	0.00	e-
Fluorite	-1.36	-11.86	-10.50	CaF2
Galena	-66.96	-80.93	-13.97	PbS
Gibbsite	-1.29	7.00	8.29	Al (OH) 3
Goethite	2.74	3.23	0.49	FeOOH
Goslarite	-8.16	-10.18	-2.01	ZnSO4:7H2O
Greenalite	-16.40	4.41	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.86	-79.22	-14.36	CdS
Greigite	-288.96	-334.00	-45.03	Fe3S4
Gummite	-6.61	1.06	7.67	UO3
Gypsum	-2.38	-6.99	-4.61	CaSO4:2H2O
H-Jarosite	-18.43	-30.53	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-11.39	-24.27	-12.88	H2MoO4
H2S (g)	-78.06	-86.07	-8.01	H2S
H2Se (g)	-42.06	-47.02	-4.96	H2Se
Halite	-6.88	-5.28	1.60	NaCl
Halloysite	-2.61	6.97	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.14	56.89	61.03	Mn3O4
Hematite	7.88	6.47	-1.42	Fe2O3
Hercynite	-5.08	17.81	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.23	-255.94	-73.71	Hg (CH3) 2
Hg (g)	-9.03	-16.91	-7.87	Hg
Hg (OH) 2	-10.10	-13.60	-3.50	Hg (OH) 2
Hg2 (g)	-18.86	-33.81	-14.96	Hg2
Hg2 (OH) 2	-14.17	-8.91	5.26	Hg2 (OH) 2
Hg2CO3	-14.42	-30.47	-16.05	Hg2CO3
Hg2CrO4	-31.40	-40.10	-8.70	Hg2CrO4
Hg2F2	-23.53	-33.89	-10.36	Hg2F2
Hg2S	-83.30	-94.98	-11.68	Hg2S
Hg2SeO3	-21.42	-26.08	-4.66	Hg2SeO3
Hg2SO4	-22.90	-29.03	-6.13	Hg2SO4
Hg3O2CO3	-32.66	-62.35	-29.68	Hg3O2CO3
HgCl (g)	-35.06	-15.57	19.50	HgCl
HgCl2	-14.56	-35.82	-21.26	HgCl2
HgF (g)	-49.62	-16.95	32.68	HgF
HgF2 (g)	-51.15	-38.58	12.57	HgF2
Hgmetal (l)	-3.45	-16.91	-13.45	Hg
HgSe	-4.92	-60.62	-55.69	HgSe
HgSeO3	-18.34	-30.77	-12.43	HgSeO3
HgSO4	-24.29	-33.71	-9.42	HgSO4
Huntite	-4.58	-34.55	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-8.93	-27.70	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.20	-21.97	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-23.53	-28.70	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-11.20	-26.00	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-36.09	-53.33	-17.24	K2Cr2O7
K2CrO4	-21.62	-22.13	-0.51	K2CrO4
K2MoO4	-18.47	-15.21	3.26	K2MoO4
K2SeO4	-18.79	-19.52	-0.73	K2SeO4
Kaolinite	-0.47	6.97	7.43	Al2Si2O5 (OH) 4
Langite	-6.82	10.67	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-9.41	-9.84	-0.43	PbO:PbSO4
Laurionite	-6.60	-5.97	0.62	PbOHCl
Lepidocrocite	1.86	3.23	1.37	FeOOH
Lime	-19.57	13.13	32.70	CaO
Litharge	-7.56	5.14	12.69	PbO
Mackinawite	-78.66	-82.26	-3.60	FeS
Maghemite	0.08	6.47	6.39	Fe2O3
Magnesioferrite	2.46	19.32	16.86	Fe2MgO4
Magnesite	-1.25	-8.71	-7.46	MgCO3
Magnetite	6.88	10.28	3.40	Fe3O4
Malachite	-0.86	-6.17	-5.31	Cu2 (OH) 2CO3
Manganite	-2.23	23.11	25.34	MnOOH
Massicot	-7.76	5.14	12.89	PbO

Matlockite	-9.49	-18.47	-8.97	PbClF
Melanothallite	-20.78	-14.53	6.26	CuCl2
Melanterite	-14.09	-16.30	-2.21	FeSO4:7H2O
Metacinnabar	-54.57	-99.67	-45.09	HgS
Mg(OH)2 (active)	-5.94	12.85	18.79	Mg(OH)2
Mg(VO3)2	-20.59	-9.31	11.28	Mg(VO3)2
Mg2Sb3	-274.28	-199.60	74.68	Mg2Sb3
Mg2V2O7	-22.81	3.55	26.36	Mg2V2O7
MgCr2O4	-5.69	10.51	16.20	MgCr2O4
MgCrO4	-23.72	-18.34	5.38	MgCrO4
MgF2	-4.00	-12.13	-8.13	MgF2
MgMoO4	-9.57	-11.42	-1.85	MgMoO4
MgSeO3:6H2O	-7.37	-4.32	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-14.52	-15.72	-1.20	MgSeO4:6H2O
Minium	-33.20	40.32	73.52	Pb3O4
Mirabilite	-7.34	-8.46	-1.11	Na2SO4:10H2O
Mn(VO3)2	-16.40	-11.50	4.90	Mn(VO3)2
Mn2(SO4)3	-59.12	-64.83	-5.71	Mn2(SO4)3
Mn2Sb	-148.06	-86.98	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.19	0.31	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.28	-11.56	2.72	MnCl2:4H2O
MnS (grn)	-75.58	-75.41	0.17	MnS
MnS (pnk)	-78.75	-75.41	3.34	MnS
MnSb	-95.18	-98.09	-2.91	MnSb
MnSe	-39.86	-36.36	3.50	MnSe
MnSeO3	-7.64	-6.51	1.13	MnSeO3
MnSeO3:2H2O	-7.49	-6.51	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.87	-17.92	-2.05	MnSeO4:5H2O
MnSO4	-12.04	-9.46	2.58	MnSO4
Monteponite	-8.26	6.85	15.10	CdO
Montroydite	-9.96	-13.60	-3.64	HgO
MoO3	-16.27	-24.27	-8.00	MoO3
Morenosite	-10.15	-12.29	-2.14	NiSO4:7H2O
MoS2	-151.05	-221.31	-70.26	MoS2
Na-Jarosite	-13.50	-24.70	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.83	-50.73	-9.90	Na2Cr2O7
Na2CrO4	-22.46	-19.53	2.93	Na2CrO4
Na2Mo2O7	-20.28	-36.88	-16.60	Na2Mo2O7
Na2MoO4	-14.10	-12.61	1.49	Na2MoO4
Na2MoO4:2H2O	-13.83	-12.61	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.81	-5.51	10.30	Na2SeO3:5H2O
Na2SeO4	-18.20	-16.92	1.28	Na2SeO4
Na3Sb	-172.82	-78.36	94.45	Na3Sb
Na3VO4	-30.27	6.41	36.68	Na3VO4
Na4V2O7	-36.24	1.16	37.40	Na4V2O7
Nantokite	-6.45	-13.18	-6.73	CuCl
NaSb	-88.29	-65.12	23.17	NaSb
Natron	-8.59	-9.90	-1.31	Na2CO3:10H2O
NaVO3	-9.11	-5.25	3.86	NaVO3
Nesquehonite	-4.04	-8.71	-4.67	MgCO3:3H2O
Ni(OH)2	-4.97	7.83	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.89	-8.19	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.81	11.19	32.00	Ni4(OH)6SO4
NiCO3	-6.86	-13.73	-6.87	NiCO3
NiMoO4	-5.30	-16.44	-11.14	NiMoO4
NiS (alpha)	-72.64	-78.24	-5.60	NiS
NiS (beta)	-67.14	-78.24	-11.10	NiS
NiS (gamma)	-65.44	-78.24	-12.80	NiS
NiSe	-21.50	-39.20	-17.70	NiSe
NiSeO3:2H2O	-12.16	-9.35	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.23	-20.75	-1.52	NiSeO4:6H2O
Nsutite	-7.29	10.21	17.50	MnO2
O2 (g)	-33.28	49.81	83.09	O2
Orpiment	-240.82	-301.89	-61.07	As2S3
Otavite	-2.71	-14.71	-12.00	CdCO3
Pb(BO2)2	-11.68	-5.17	6.52	Pb(BO2)2
Pb(OH)2	-3.01	5.14	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-69.21	-77.97	-8.76	Pb10(OH)60(CO3)6

Pb2 (OH) 3Cl	-9.63	-0.84	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.91	10.28	26.19	Pb2O (OH) 2
Pb2O3	-25.86	35.18	61.04	Pb2O3
Pb2OCO3	-10.72	-11.28	-0.56	Pb2OCO3
Pb2V2O7	-9.98	-11.88	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-22.06	-16.26	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-12.88	-6.74	6.14	Pb3 (VO4) 2
Pb3O2CO3	-17.16	-6.14	11.02	Pb3O2CO3
Pb3O2SO4	-15.39	-4.70	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-20.66	0.44	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-21.44	0.44	21.88	Pb4O3SO4
PbCrO4	-13.46	-26.06	-12.60	PbCrO4
PbF2	-12.41	-19.85	-7.44	PbF2
Pbmetal	-24.01	-19.76	4.25	Pb
PbMoO4	-3.51	-19.13	-15.62	PbMoO4
PbO:0.3H2O	-7.84	5.14	12.98	PbO:0.3H2O
PbSeO4	-16.60	-23.44	-6.84	PbSeO4
Periclase	-8.73	12.85	21.58	MgO
Phosgenite	-13.70	-33.51	-19.81	PbCl2:PbCO3
Plattnerite	-19.56	30.04	49.60	PbO2
Portlandite	-9.68	13.13	22.80	Ca (OH) 2
Pyrite	-124.91	-143.42	-18.51	FeS2
Pyrochroite	-4.53	10.66	15.19	Mn (OH) 2
Pyrolusite	-5.82	35.56	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-100.61	-120.36	-19.75	AsS
Retgersite	-10.25	-12.29	-2.04	NiSO4:6H2O
Rhodochrosite	-0.32	-10.90	-10.58	MnCO3
Rutherfordine	-6.00	-20.50	-14.50	UO2CO3
Sb (OH) 3	-14.03	-21.14	-7.11	Sb (OH) 3
Sb2O4	-20.79	-17.38	3.40	Sb2O4
Sb2O5	-31.43	-41.10	-9.67	Sb2O5
Sb2Se3	-115.60	-183.35	-67.76	Sb2Se3
Sb4O6(cubic)	-66.31	-84.58	-18.26	Sb4O6
Sb4O6(orth)	-66.67	-84.58	-17.90	Sb4O6
SbCl3	-55.05	-54.48	0.57	SbCl3
SbF3	-48.40	-58.62	-10.23	SbF3
Sbmetal	-46.81	-58.50	-11.69	Sb
SbO2	-5.18	-33.00	-27.82	SbO2
Schoepite	-4.94	1.06	5.99	UO2 (OH) 2:H2O
Semetal (am)	-15.01	-22.12	-7.11	Se
Semetal (hex)	-14.41	-22.12	-7.71	Se
Senarmontite	-29.92	-42.29	-12.37	Sb2O3
SeO2	-17.30	-17.17	0.12	SeO2
SeO3	-49.62	-28.58	21.04	SeO3
Sepiolite	-0.60	15.16	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.62	15.16	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.51	-17.75	-10.24	FeCO3
SiO2 (am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2 (am-ppt)	-0.78	-3.52	-2.74	SiO2
Smithsonite	-1.62	-11.62	-10.00	ZnCO3
Sphalerite	-64.68	-76.13	-11.45	ZnS
Spinel	-10.00	26.85	36.85	MgAl2O4
Stibnite	-250.04	-300.50	-50.46	Sb2S3
Sulfur	-59.02	-61.17	-2.14	S
Tenorite	0.05	7.70	7.64	CuO
Thenardite	-8.78	-8.46	0.32	Na2SO4
Thermonatrite	-10.54	-9.90	0.64	Na2CO3:H2O
Tyuyamunite	-10.99	-6.91	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.16	5.92	21.08	U3O8
U3Sb4	-579.68	-427.30	152.38	U3Sb4
U4O9	-30.59	-33.61	-3.02	U4O9
UF4	-35.06	-64.60	-29.54	UF4
UF4:2.5H2O	-31.88	-64.60	-32.72	UF4:2.5H2O
UO2 (am)	-15.56	-14.63	0.93	UO2
UO2 (NO3) 2	-48.32	-36.17	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.02	-36.17	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-39.56	-36.17	3.39	UO2 (NO3) 2:3H2O

UO2(NO3)2:6H2O	-38.22	-36.17	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.55	1.06	5.61	UO2(OH)2
UO2SeO4:4H2O	-25.27	-27.52	-2.25	UO2SeO4:4H2O
UO3	-6.64	1.06	7.70	UO3
Uraninite	-9.96	-14.63	-4.67	UO2
USb2	-220.23	-190.65	29.58	USb2
V(OH)3	-20.97	-13.38	7.59	V(OH)3
V2O5	-20.80	-22.16	-1.36	V2O5
V3O5	-46.62	-44.79	1.84	V3O5
V4O7	-58.60	-51.41	7.19	V4O7
V6O13	-55.42	-116.28	-60.86	V6O13
Valentinite	-33.81	-42.29	-8.48	Sb2O3
VC12	-66.93	-48.06	18.87	VC12
VC13	-70.15	-46.72	23.43	VC13
VF4	-71.53	-56.60	14.93	VF4
Vmetal	-94.76	-50.74	44.03	V
VO	-40.59	-25.84	14.76	VO
VO(OH)2	-11.78	-6.63	5.15	VO(OH)2
VO2Cl	-25.03	-22.19	2.84	VO2Cl
VOC1	-35.65	-24.50	11.15	VOC1
VOC12	-41.61	-28.85	12.76	VOC12
VOSO4	-30.35	-26.74	3.61	VOSO4
Witherite	-5.10	-13.67	-8.57	BaCO3
Wurtzite	-67.18	-76.13	-8.95	ZnS
Zincite	-1.39	9.94	11.33	ZnO
Zincosite	-14.10	-10.17	3.93	ZnSO4
Zn(BO2)2	-8.65	-0.36	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-30.60	-27.29	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.26	9.94	12.20	Zn(OH)2
Zn(OH)2(am)	-2.53	9.94	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.81	9.94	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.59	9.94	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.79	9.94	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.73	-0.23	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.42	8.77	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.49	-1.84	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.32	-10.41	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.75	19.65	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.01	27.49	38.50	Zn5(OH)8Cl2
ZnCl2	-19.33	-12.28	7.05	ZnCl2
ZnCO3:1H2O	-1.36	-11.62	-10.26	ZnCO3:1H2O
ZnF2	-14.51	-15.04	-0.53	ZnF2
Znmetal	-40.75	-14.96	25.79	Zn
ZnMoO4	-4.20	-14.33	-10.13	ZnMoO4
ZnO(active)	-1.25	9.94	11.19	ZnO
ZnS(am)	-67.08	-76.13	-9.05	ZnS
ZnSb	-84.47	-73.46	11.01	ZnSb
ZnSe	-22.68	-37.08	-14.40	ZnSe
ZnSeO4:6H2O	-17.11	-18.63	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.54	-10.17	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 48.

Title Return solution back to 1L
Mix 205
212 1.0155
save solution 213
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 205.

Mixture 205.

1.016e+00 Solution 212 Solution after simulation 47.

-----Solution composition-----

Elements	Molality	Moles
Ag	5.293e-10	5.294e-10
Al	5.019e-08	5.019e-08
As	6.896e-09	6.896e-09
B	8.069e-06	8.069e-06
Ba	2.150e-09	2.150e-09
C	1.489e-03	1.489e-03
Ca	3.997e-04	3.997e-04
Cd	2.793e-10	2.793e-10
Cl	1.889e-03	1.889e-03
Co	1.875e-09	1.875e-09
Cr	6.351e-10	6.351e-10
Cu	9.759e-08	9.760e-08
F	8.026e-05	8.026e-05
Fe	7.881e-10	7.881e-10
Hg	4.578e-11	4.578e-11
K	1.634e-04	1.634e-04
Mg	2.081e-04	2.081e-04
Mn	1.379e-06	1.379e-06
Mo	3.769e-08	3.770e-08
N	3.151e-07	3.151e-07
Na	3.256e-03	3.257e-03
Ni	2.902e-09	2.902e-09
Pb	1.460e-10	1.460e-10
S	5.759e-04	5.760e-04
Sb	5.934e-10	5.934e-10
Se	3.601e-09	3.601e-09
Si	3.153e-04	3.153e-04
U	1.524e-08	1.524e-08
V	1.789e-10	1.789e-10
Zn	4.591e-07	4.592e-07

-----Description of solution-----

	pH	=	8.353	Charge balance
	pe	=	4.098	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	5.648e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.518e-03	
	Total CO2 (mol/kg)	=	1.489e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.727e-08	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	0	
	Total H	=	1.110236e+02	

Total O = 5.551846e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.463e-06	2.271e-06	-5.608	-5.644	-0.035	(0)
H+	4.803e-09	4.433e-09	-8.319	-8.353	-0.035	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.293e-10					
AgCl	3.594e-10	3.594e-10	-9.444	-9.444	0.000	(0)
Ag+	1.094e-10	1.009e-10	-9.961	-9.996	-0.035	(0)
AgCl2-	5.960e-11	5.457e-11	-10.225	-10.263	-0.038	(0)
AgSO4-	8.548e-13	7.826e-13	-12.068	-12.106	-0.038	(0)
AgCl3-2	1.207e-13	8.479e-14	-12.918	-13.072	-0.153	(0)
AgOH	2.293e-14	2.293e-14	-13.640	-13.640	0.000	(0)
AgF	1.841e-14	1.841e-14	-13.735	-13.735	0.000	(0)
AgNO2	5.376e-15	5.376e-15	-14.270	-14.270	0.000	(0)
AgH2BO3	1.478e-15	1.478e-15	-14.830	-14.830	0.000	(0)
AgNH3+	9.092e-16	8.324e-16	-15.041	-15.080	-0.038	(0)
AgCl4-3	6.680e-16	3.018e-16	-15.175	-15.520	-0.345	(0)
Ag2Se	4.019e-16	4.019e-16	-15.396	-15.396	0.000	(0)
AgSeO3-	9.662e-17	8.846e-17	-16.015	-16.053	-0.038	(0)
Ag (OH) 2-	5.558e-18	5.089e-18	-17.255	-17.293	-0.038	(0)
Ag (NH3) 2+	2.985e-20	2.733e-20	-19.525	-19.563	-0.038	(0)
AgNO3	4.402e-21	4.402e-21	-20.356	-20.356	0.000	(0)
Ag (NO2) 2-	2.318e-21	2.122e-21	-20.635	-20.673	-0.038	(0)
Ag (SeO3) 2-3	2.390e-24	1.080e-24	-23.622	-23.967	-0.345	(0)
Ag2MoO4	1.055e-28	1.055e-28	-27.977	-27.977	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.898	-73.898	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.168	-82.782	-0.613	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.533	-146.645	-0.112	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.477	-147.515	-0.038	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.508	-147.732	-0.224	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.826	-148.043	-0.217	(0)
Al	5.019e-08					
Al (OH) 4-	5.002e-08	4.620e-08	-7.301	-7.335	-0.034	(0)
Al (OH) 3	1.616e-10	1.616e-10	-9.792	-9.792	0.000	(0)
Al (OH) 2+	3.855e-12	3.566e-12	-11.414	-11.448	-0.034	(0)
AlF2+	1.974e-14	1.826e-14	-13.705	-13.738	-0.034	(0)
AlF3	1.669e-14	1.669e-14	-13.778	-13.778	0.000	(0)
AlOH+2	2.699e-15	1.977e-15	-14.569	-14.704	-0.135	(0)
AlF+2	8.628e-16	6.319e-16	-15.064	-15.199	-0.135	(0)
AlF4-	6.576e-16	6.073e-16	-15.182	-15.217	-0.034	(0)
AlSO4+	2.842e-18	2.625e-18	-17.546	-17.581	-0.034	(0)
Al+3	1.790e-18	8.703e-19	-17.747	-18.060	-0.313	(0)
Al (SO4) 2-	1.183e-20	1.093e-20	-19.927	-19.961	-0.034	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-58.220	-58.565	-0.345	(0)
As (3)	1.627e-22					
H3AsO3	1.444e-22	1.444e-22	-21.840	-21.840	0.000	(0)
H2AsO3-	1.825e-23	1.671e-23	-22.739	-22.777	-0.038	(0)
HAsO3-2	4.893e-27	3.438e-27	-26.310	-26.464	-0.153	(0)
H4AsO3+	3.465e-31	3.172e-31	-30.460	-30.499	-0.038	(0)
AsO3-3	6.616e-32	2.990e-32	-31.179	-31.524	-0.345	(0)
As (5)	6.896e-09					
HAsO4-2	6.681e-09	4.694e-09	-8.175	-8.328	-0.153	(0)
H2AsO4-	2.073e-10	1.898e-10	-9.683	-9.722	-0.038	(0)
AsO4-3	7.410e-12	3.348e-12	-11.130	-11.475	-0.345	(0)
H3AsO4	1.460e-16	1.462e-16	-15.836	-15.835	0.001	(0)
B	8.069e-06					
H3BO3	7.040e-06	7.049e-06	-5.152	-5.152	0.001	(0)
H2BO3-	1.004e-06	9.235e-07	-5.998	-6.035	-0.036	(0)
CaH2BO3+	1.522e-08	1.401e-08	-7.818	-7.854	-0.036	(0)
MgH2BO3+	4.878e-09	4.489e-09	-8.312	-8.348	-0.036	(0)
NaH2BO3	4.386e-09	4.386e-09	-8.358	-8.358	0.000	(0)
BF (OH) 3-	2.219e-10	2.042e-10	-9.654	-9.690	-0.036	(0)
H5 (BO3) 2-	6.022e-12	5.541e-12	-11.220	-11.256	-0.036	(0)

		BaH2BO3+	4.767e-14	4.386e-14	-13.322	-13.358	-0.036	(0)
		BF2 (OH) 2-	7.636e-15	7.027e-15	-14.117	-14.153	-0.036	(0)
		H8 (BO3) 3-	4.245e-15	3.906e-15	-14.372	-14.408	-0.036	(0)
		AgH2BO3	1.478e-15	1.478e-15	-14.830	-14.830	0.000	(0)
		BF3OH-	9.562e-22	8.800e-22	-21.019	-21.056	-0.036	(0)
		BF4-	1.514e-27	1.394e-27	-26.820	-26.856	-0.036	(0)
Ba	2.150e-09							
		Ba+2	2.117e-09	1.537e-09	-8.674	-8.813	-0.139	(0)
		BaHCO3+	2.106e-11	1.950e-11	-10.677	-10.710	-0.033	(0)
		BaCO3	1.107e-11	1.107e-11	-10.956	-10.956	0.000	(0)
		BaH2BO3+	4.767e-14	4.386e-14	-13.322	-13.358	-0.036	(0)
		BaOH+	1.648e-14	1.524e-14	-13.783	-13.817	-0.034	(0)
		BaNH3+2	5.575e-18	3.916e-18	-17.254	-17.407	-0.153	(0)
		BaNO3+	4.619e-19	4.229e-19	-18.335	-18.374	-0.038	(0)
C (4)	1.489e-03							
		HCO3-	1.436e-03	1.328e-03	-2.843	-2.877	-0.034	(0)
		CO3-2	1.936e-05	1.405e-05	-4.713	-4.852	-0.139	(0)
		H2CO3	1.324e-05	1.324e-05	-4.878	-4.878	0.000	(0)
		CaHCO3+	7.040e-06	6.520e-06	-5.152	-5.186	-0.033	(0)
		CaCO3	5.868e-06	5.868e-06	-5.231	-5.231	0.000	(0)
		NaHCO3	2.239e-06	2.239e-06	-5.650	-5.650	0.000	(0)
		MgHCO3+	2.065e-06	1.906e-06	-5.685	-5.720	-0.035	(0)
		MgCO3	1.638e-06	1.638e-06	-5.786	-5.786	0.000	(0)
		NaCO3-	8.474e-07	7.840e-07	-6.072	-6.106	-0.034	(0)
		ZnCO3	1.391e-07	1.391e-07	-6.857	-6.857	0.000	(0)
		CuCO3	8.076e-08	8.076e-08	-7.093	-7.093	0.000	(0)
		MnHCO3+	2.580e-08	2.385e-08	-7.588	-7.623	-0.034	(0)
		UO2 (CO3) 3-4	1.020e-08	2.485e-09	-7.991	-8.605	-0.613	(0)
		ZnHCO3+	7.898e-09	7.230e-09	-8.103	-8.141	-0.038	(0)
		UO2 (CO3) 2-2	5.024e-09	3.529e-09	-8.299	-8.452	-0.153	(0)
		Cu (CO3) 2-2	4.347e-09	3.054e-09	-8.362	-8.515	-0.153	(0)
		NiCO3	6.909e-10	6.909e-10	-9.161	-9.161	0.000	(0)
		NiHCO3+	2.358e-10	2.159e-10	-9.627	-9.666	-0.038	(0)
		CoCO3	2.321e-10	2.321e-10	-9.634	-9.634	0.000	(0)
		PbCO3	1.141e-10	1.141e-10	-9.943	-9.943	0.000	(0)
		CoHCO3+	1.103e-10	1.010e-10	-9.957	-9.996	-0.038	(0)
		CuHCO3+	8.938e-11	8.183e-11	-10.049	-10.087	-0.038	(0)
		CdCO3	4.433e-11	4.433e-11	-10.353	-10.353	0.000	(0)
		BaHCO3+	2.106e-11	1.950e-11	-10.677	-10.710	-0.033	(0)
		UO2CO3	1.259e-11	1.259e-11	-10.900	-10.900	0.000	(0)
		BaCO3	1.107e-11	1.107e-11	-10.956	-10.956	0.000	(0)
		Pb (CO3) 2-2	6.582e-12	4.624e-12	-11.182	-11.335	-0.153	(0)
		PbHCO3+	2.913e-12	2.667e-12	-11.536	-11.574	-0.038	(0)
		Cd (CO3) 2-2	6.572e-13	4.617e-13	-12.182	-12.336	-0.153	(0)
		CdHCO3+	4.573e-13	4.187e-13	-12.340	-12.378	-0.038	(0)
		FeHCO3+	2.312e-15	2.141e-15	-14.636	-14.669	-0.033	(0)
		HgCO3	1.311e-17	1.311e-17	-16.882	-16.882	0.000	(0)
		Hg (CO3) 2-2	8.289e-19	5.824e-19	-18.081	-18.235	-0.153	(0)
		HgHCO3+	1.182e-21	1.082e-21	-20.927	-20.966	-0.038	(0)
Ca	3.997e-04							
		Ca+2	3.631e-04	2.635e-04	-3.440	-3.579	-0.139	(0)
		CaSO4	2.346e-05	2.346e-05	-4.630	-4.630	0.000	(0)
		CaHCO3+	7.040e-06	6.520e-06	-5.152	-5.186	-0.033	(0)
		CaCO3	5.868e-06	5.868e-06	-5.231	-5.231	0.000	(0)
		CaF+	2.259e-07	2.088e-07	-6.646	-6.680	-0.034	(0)
		CaH2BO3+	1.522e-08	1.401e-08	-7.818	-7.854	-0.036	(0)
		CaOH+	1.290e-08	1.194e-08	-7.890	-7.923	-0.033	(0)
		CaNH3+2	1.907e-12	1.340e-12	-11.720	-11.873	-0.153	(0)
		CaNO3+	4.997e-14	4.575e-14	-13.301	-13.340	-0.038	(0)
		Ca (NH3) 2+2	3.067e-21	2.154e-21	-20.513	-20.667	-0.153	(0)
Cd	2.793e-10							
		Cd+2	1.907e-10	1.384e-10	-9.720	-9.859	-0.139	(0)
		CdCO3	4.433e-11	4.433e-11	-10.353	-10.353	0.000	(0)
		CdCl+	2.518e-11	2.305e-11	-10.599	-10.637	-0.038	(0)
		CdSO4	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
		CdOH+	2.728e-12	2.497e-12	-11.564	-11.603	-0.038	(0)
		CdOHC1	2.147e-12	2.147e-12	-11.668	-11.668	0.000	(0)
		Cd (CO3) 2-2	6.572e-13	4.617e-13	-12.182	-12.336	-0.153	(0)

CdHCO3+	4.573e-13	4.187e-13	-12.340	-12.378	-0.038	(0)
CdF+	1.740e-13	1.593e-13	-12.760	-12.798	-0.038	(0)
CdCl2	1.675e-13	1.675e-13	-12.776	-12.776	0.000	(0)
Cd(SO4) 2-2	9.406e-14	6.608e-14	-13.027	-13.180	-0.153	(0)
Cd(OH) 2	3.579e-14	3.579e-14	-13.446	-13.446	0.000	(0)
CdCl3-	2.013e-16	1.843e-16	-15.696	-15.735	-0.038	(0)
CdF2	2.307e-17	2.307e-17	-16.637	-16.637	0.000	(0)
Cd(OH) 3-	5.424e-18	4.966e-18	-17.266	-17.304	-0.038	(0)
CdSeO4	3.476e-20	3.476e-20	-19.459	-19.459	0.000	(0)
CdNO3+	2.625e-20	2.403e-20	-19.581	-19.619	-0.038	(0)
Cd2OH+3	3.834e-21	1.733e-21	-20.416	-20.761	-0.345	(0)
Cd(SeO3) 2-2	3.019e-22	2.121e-22	-21.520	-21.673	-0.153	(0)
Cd(OH) 4-2	2.627e-24	1.846e-24	-23.580	-23.734	-0.153	(0)
Cd(NO3) 2	6.612e-31	6.612e-31	-30.180	-30.180	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.529	-79.568	-0.038	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.080	-150.080	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.859	-225.897	-0.038	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.265	-301.418	-0.153	(0)
C1	1.889e-03					
Cl-	1.889e-03	1.744e-03	-2.724	-2.759	-0.035	(0)
ZnOHCl	2.241e-09	2.241e-09	-8.650	-8.650	0.000	(0)
MnCl+	2.136e-09	1.975e-09	-8.670	-8.705	-0.034	(0)
ZnCl+	8.168e-10	7.538e-10	-9.088	-9.123	-0.035	(0)
AgCl	3.594e-10	3.594e-10	-9.444	-9.444	0.000	(0)
CuCl	8.368e-11	8.368e-11	-10.077	-10.077	0.000	(0)
AgCl2-	5.960e-11	5.457e-11	-10.225	-10.263	-0.038	(0)
CuCl2-	3.303e-11	3.048e-11	-10.481	-10.516	-0.035	(0)
CdCl+	2.518e-11	2.305e-11	-10.599	-10.637	-0.038	(0)
CoCl+	6.439e-12	5.895e-12	-11.191	-11.230	-0.038	(0)
NiCl+	6.423e-12	5.880e-12	-11.192	-11.231	-0.038	(0)
MnCl2	4.863e-12	4.863e-12	-11.313	-11.313	0.000	(0)
CuCl+	2.923e-12	2.697e-12	-11.534	-11.569	-0.035	(0)
CdOHCl	2.147e-12	2.147e-12	-11.668	-11.668	0.000	(0)
ZnCl2	2.083e-12	2.083e-12	-11.681	-11.681	0.000	(0)
PbCl+	1.826e-13	1.671e-13	-12.739	-12.777	-0.038	(0)
CdCl2	1.675e-13	1.675e-13	-12.776	-12.776	0.000	(0)
AgCl3-2	1.207e-13	8.479e-14	-12.918	-13.072	-0.153	(0)
CuCl3-2	1.556e-14	1.136e-14	-13.808	-13.945	-0.136	(0)
HgClOH	5.452e-15	5.452e-15	-14.263	-14.263	0.000	(0)
ZnCl3-	3.126e-15	2.885e-15	-14.505	-14.540	-0.035	(0)
MnCl3-	2.526e-15	2.335e-15	-14.598	-14.632	-0.034	(0)
CuCl2	1.631e-15	1.631e-15	-14.788	-14.788	0.000	(0)
PbCl2	1.302e-15	1.302e-15	-14.885	-14.885	0.000	(0)
AgCl4-3	6.680e-16	3.018e-16	-15.175	-15.520	-0.345	(0)
HgCl2	2.370e-16	2.370e-16	-15.625	-15.625	0.000	(0)
CdCl3-	2.013e-16	1.843e-16	-15.696	-15.735	-0.038	(0)
NiCl2	5.162e-17	5.162e-17	-16.287	-16.287	0.000	(0)
HgCl3-	4.513e-18	4.132e-18	-17.346	-17.384	-0.038	(0)
ZnCl4-2	3.443e-18	2.515e-18	-17.463	-17.600	-0.136	(0)
PbCl3-	9.869e-19	9.035e-19	-18.006	-18.044	-0.038	(0)
UO2Cl+	6.952e-19	6.365e-19	-18.158	-18.196	-0.038	(0)
CrCl+2	6.957e-20	4.888e-20	-19.158	-19.311	-0.153	(0)
HgCl4-2	4.082e-20	2.868e-20	-19.389	-19.542	-0.153	(0)
HgCl+	2.962e-20	2.712e-20	-19.528	-19.567	-0.038	(0)
CuCl3-	2.875e-20	2.653e-20	-19.541	-19.576	-0.035	(0)
CrOHCl2	3.679e-21	3.679e-21	-20.434	-20.434	0.000	(0)
PbCl4-2	1.025e-21	7.201e-22	-20.989	-21.143	-0.153	(0)
FeCl+2	1.075e-23	7.852e-24	-22.969	-23.105	-0.136	(0)
CrCl2+	8.832e-24	8.086e-24	-23.054	-23.092	-0.038	(0)
CuCl4-2	3.175e-25	2.319e-25	-24.498	-24.635	-0.136	(0)
FeCl2+	6.615e-26	6.115e-26	-25.179	-25.214	-0.034	(0)
VOCl+	2.474e-26	2.265e-26	-25.607	-25.645	-0.038	(0)
CrO3Cl-	2.477e-27	2.268e-27	-26.606	-26.644	-0.038	(0)
FeCl3	1.066e-29	1.066e-29	-28.972	-28.972	0.000	(0)
CoCl+2	2.464e-38	1.731e-38	-37.608	-37.762	-0.153	(0)
UCl+3	0.000e+00	0.000e+00	-48.755	-49.100	-0.345	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-53.624	-53.777	-0.153	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-55.530	-55.683	-0.153	(0)

Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.733	-68.887	-0.153	(0)
Co (2)	1.875e-09					
Co+2	1.391e-09	9.774e-10	-8.857	-9.010	-0.153	(0)
CoCO3	2.321e-10	2.321e-10	-9.634	-9.634	0.000	(0)
CoHCO3+	1.103e-10	1.010e-10	-9.957	-9.996	-0.038	(0)
CoSO4	7.577e-11	7.577e-11	-10.120	-10.120	0.000	(0)
CoOH+	4.838e-11	4.429e-11	-10.315	-10.354	-0.038	(0)
Co (OH) 2	7.990e-12	7.990e-12	-11.097	-11.097	0.000	(0)
CoCl+	6.439e-12	5.895e-12	-11.191	-11.230	-0.038	(0)
CoF+	2.451e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
CoNO2+	1.917e-15	1.755e-15	-14.717	-14.756	-0.038	(0)
Co (NH3) +2	6.755e-16	4.746e-16	-15.170	-15.324	-0.153	(0)
Co (OH) 3-	3.955e-16	3.621e-16	-15.403	-15.441	-0.038	(0)
CoOOH-	9.925e-17	9.086e-17	-16.003	-16.042	-0.038	(0)
CoSeO4	6.606e-19	6.606e-19	-18.180	-18.180	0.000	(0)
CoNO3+	9.289e-20	8.504e-20	-19.032	-19.070	-0.038	(0)
Co2OH+3	4.801e-21	2.170e-21	-20.319	-20.664	-0.345	(0)
Co (OH) 4-2	1.855e-22	1.303e-22	-21.732	-21.885	-0.153	(0)
Co (NH3) 2+2	1.164e-22	8.176e-23	-21.934	-22.087	-0.153	(0)
Co (NO3) 2	9.499e-30	9.499e-30	-29.022	-29.022	0.000	(0)
Co (NH3) 3+2	5.917e-30	4.157e-30	-29.228	-29.381	-0.153	(0)
Co4 (OH) 4+4	3.152e-33	7.679e-34	-32.501	-33.115	-0.613	(0)
Co (NH3) 4+2	1.254e-37	8.811e-38	-36.902	-37.055	-0.153	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.075	-45.229	-0.153	(0)
Co (3)	8.017e-31					
CoOH+2	8.017e-31	5.632e-31	-30.096	-30.249	-0.153	(0)
Co+3	1.003e-37	4.880e-38	-36.999	-37.312	-0.313	(0)
CoCl+2	2.464e-38	1.731e-38	-37.608	-37.762	-0.153	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.624	-53.777	-0.153	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.575	-64.613	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.418	-67.572	-0.153	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.733	-68.887	-0.153	(0)
Cr (2)	5.873e-28					
Cr+2	5.873e-28	4.126e-28	-27.231	-27.384	-0.153	(0)
Cr (3)	6.351e-10					
Cr (OH) 2+	3.249e-10	2.974e-10	-9.488	-9.527	-0.038	(0)
Cr (OH) 3	2.538e-10	2.538e-10	-9.596	-9.596	0.000	(0)
CrO2-	2.970e-11	2.719e-11	-10.527	-10.566	-0.038	(0)
Cr (OH) 4-	2.506e-11	2.295e-11	-10.601	-10.639	-0.038	(0)
Cr (OH) +2	1.532e-12	1.076e-12	-11.815	-11.968	-0.153	(0)
CrOHSO4	9.924e-14	9.924e-14	-13.003	-13.003	0.000	(0)
CrF+2	3.548e-16	2.493e-16	-15.450	-15.603	-0.153	(0)
Cr+3	4.794e-17	2.166e-17	-16.319	-16.664	-0.345	(0)
CrSO4+	2.147e-17	1.965e-17	-16.668	-16.707	-0.038	(0)
CrCl+2	6.957e-20	4.888e-20	-19.158	-19.311	-0.153	(0)
CrOHC12	3.679e-21	3.679e-21	-20.434	-20.434	0.000	(0)
Cr2 (OH) 2SO4+2	1.374e-23	9.655e-24	-22.862	-23.015	-0.153	(0)
CrCl2+	8.832e-24	8.086e-24	-23.054	-23.092	-0.038	(0)
Cr2 (OH) 2 (SO4) 2	2.228e-25	2.228e-25	-24.652	-24.652	0.000	(0)
CrNO3+2	7.399e-29	5.198e-29	-28.131	-28.284	-0.153	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.751	-43.905	-0.153	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.682	-54.027	-0.345	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.530	-55.683	-0.153	(0)
Cr (6)	4.586e-15					
CrO4-2	4.480e-15	3.252e-15	-14.349	-14.488	-0.139	(0)
NaCrO4-	5.289e-17	4.843e-17	-16.277	-16.315	-0.038	(0)
HCrO4-	5.095e-17	4.665e-17	-16.293	-16.331	-0.038	(0)
KCrO4-	1.985e-18	1.817e-18	-17.702	-17.741	-0.038	(0)
H2CrO4	1.676e-25	1.676e-25	-24.776	-24.776	0.000	(0)
CrO3SO4-2	3.484e-26	2.448e-26	-25.458	-25.611	-0.153	(0)
CrO3Cl-	2.477e-27	2.268e-27	-26.606	-26.644	-0.038	(0)
Cr2O7-2	1.074e-31	7.547e-32	-30.969	-31.122	-0.153	(0)
Cu (1)	1.584e-10					
CuCl	8.368e-11	8.368e-11	-10.077	-10.077	0.000	(0)
Cu+	4.164e-11	3.812e-11	-10.380	-10.419	-0.038	(0)
CuCl2-	3.303e-11	3.048e-11	-10.481	-10.516	-0.035	(0)
CuCl3-2	1.556e-14	1.136e-14	-13.808	-13.945	-0.136	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.536	-145.756	-0.220	(0)

CuS4S5-3	0.000e+00	0.000e+00	-146.273	-146.486	-0.213	(0)
Cu (2)	9.743e-08					
CuCO3	8.076e-08	8.076e-08	-7.093	-7.093	0.000	(0)
CuOH+	7.597e-09	7.011e-09	-8.119	-8.154	-0.035	(0)
Cu (CO3) 2-2	4.347e-09	3.054e-09	-8.362	-8.515	-0.153	(0)
Cu (OH) 2	3.177e-09	3.177e-09	-8.498	-8.498	0.000	(0)
Cu+2	1.345e-09	9.762e-10	-8.871	-9.010	-0.139	(0)
CuHCO3+	8.938e-11	8.183e-11	-10.049	-10.087	-0.038	(0)
CuSO4	8.689e-11	8.689e-11	-10.061	-10.061	0.000	(0)
Cu (OH) 3-	1.617e-11	1.480e-11	-10.791	-10.830	-0.038	(0)
CuF+	4.884e-12	4.472e-12	-11.311	-11.350	-0.038	(0)
CuCl+	2.923e-12	2.697e-12	-11.534	-11.569	-0.035	(0)
Cu2 (OH) 2+2	1.757e-12	1.235e-12	-11.755	-11.908	-0.153	(0)
CuNH3+2	5.742e-14	4.034e-14	-13.241	-13.394	-0.153	(0)
CuNO2+	2.846e-14	2.605e-14	-13.546	-13.584	-0.038	(0)
CuCl2	1.631e-15	1.631e-15	-14.788	-14.788	0.000	(0)
Cu (OH) 4-2	3.766e-16	2.646e-16	-15.424	-15.577	-0.153	(0)
CuNO3+	1.851e-19	1.695e-19	-18.733	-18.771	-0.038	(0)
Cu (NO2) 2	6.795e-20	6.795e-20	-19.168	-19.168	0.000	(0)
CuCl3-	2.875e-20	2.653e-20	-19.541	-19.576	-0.035	(0)
CuCl4-2	3.175e-25	2.319e-25	-24.498	-24.635	-0.136	(0)
Cu (NO3) 2	1.171e-30	1.171e-30	-29.931	-29.931	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.224	-216.262	-0.038	(0)
F	8.026e-05					
F-	7.865e-05	7.260e-05	-4.104	-4.139	-0.035	(0)
MgF+	1.236e-06	1.142e-06	-5.908	-5.942	-0.034	(0)
CaF+	2.259e-07	2.088e-07	-6.646	-6.680	-0.034	(0)
NaF	1.373e-07	1.373e-07	-6.862	-6.862	0.000	(0)
MnF+	2.813e-09	2.600e-09	-8.551	-8.585	-0.034	(0)
HF	4.760e-10	4.760e-10	-9.322	-9.322	0.000	(0)
ZnF+	2.723e-10	2.493e-10	-9.565	-9.603	-0.038	(0)
BF (OH) 3-	2.219e-10	2.042e-10	-9.654	-9.690	-0.036	(0)
CuF+	4.884e-12	4.472e-12	-11.311	-11.350	-0.038	(0)
NiF+	2.626e-12	2.404e-12	-11.581	-11.619	-0.038	(0)
CoF+	2.451e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
CdF+	1.740e-13	1.593e-13	-12.760	-12.798	-0.038	(0)
HF2-	1.425e-13	1.314e-13	-12.846	-12.881	-0.035	(0)
AlF2+	1.974e-14	1.826e-14	-13.705	-13.738	-0.034	(0)
AgF	1.841e-14	1.841e-14	-13.735	-13.735	0.000	(0)
AlF3	1.669e-14	1.669e-14	-13.778	-13.778	0.000	(0)
PbF+	1.510e-14	1.382e-14	-13.821	-13.859	-0.038	(0)
BF2 (OH) 2-	7.636e-15	7.027e-15	-14.117	-14.153	-0.036	(0)
UO2F+	2.464e-15	2.256e-15	-14.608	-14.647	-0.038	(0)
AlF+2	8.628e-16	6.319e-16	-15.064	-15.199	-0.135	(0)
AlF4-	6.576e-16	6.073e-16	-15.182	-15.217	-0.034	(0)
UO2F2	4.723e-16	4.723e-16	-15.326	-15.326	0.000	(0)
CrF+2	3.548e-16	2.493e-16	-15.450	-15.603	-0.153	(0)
CdF2	2.307e-17	2.307e-17	-16.637	-16.637	0.000	(0)
PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
UO2F3-	9.408e-18	8.614e-18	-17.026	-17.065	-0.038	(0)
H2F2	6.071e-19	6.071e-19	-18.217	-18.217	0.000	(0)
FeF2+	2.495e-20	2.306e-20	-19.603	-19.637	-0.034	(0)
FeF+2	1.625e-20	1.187e-20	-19.789	-19.926	-0.136	(0)
UO2F4-2	7.070e-21	4.967e-21	-20.151	-20.304	-0.153	(0)
VO2F	4.704e-21	4.704e-21	-20.328	-20.328	0.000	(0)
PbF3-	2.970e-21	2.720e-21	-20.527	-20.566	-0.038	(0)
FeF3	2.362e-21	2.362e-21	-20.627	-20.627	0.000	(0)
BF3OH-	9.562e-22	8.800e-22	-21.019	-21.056	-0.036	(0)
VO2F2-	1.354e-22	1.240e-22	-21.868	-21.907	-0.038	(0)
VOF+	2.203e-24	2.016e-24	-23.657	-23.695	-0.038	(0)
VO2F3-2	1.598e-25	1.123e-25	-24.796	-24.950	-0.153	(0)
PbF4-2	1.345e-25	9.450e-26	-24.871	-25.025	-0.153	(0)
VOF2	5.490e-26	5.490e-26	-25.260	-25.260	0.000	(0)
HgF+	2.291e-27	2.098e-27	-26.640	-26.678	-0.038	(0)
BF4-	1.514e-27	1.394e-27	-26.820	-26.856	-0.036	(0)
Sb (OH) 2F	3.609e-28	3.609e-28	-27.443	-27.443	0.000	(0)
SbOF	3.549e-28	3.549e-28	-27.450	-27.450	0.000	(0)
VOF3-	1.545e-28	1.414e-28	-27.811	-27.850	-0.038	(0)

VO2F4-3	8.877e-30	4.011e-30	-29.052	-29.397	-0.345	(0)
VOF4-2	5.898e-32	4.144e-32	-31.229	-31.383	-0.153	(0)
SiF6-2	3.575e-32	2.611e-32	-31.447	-31.583	-0.136	(0)
UF3+	1.513e-39	1.385e-39	-38.820	-38.859	-0.038	(0)
UF2+2	1.713e-40	1.204e-40	-39.766	-39.920	-0.153	(0)
UF4	0.000e+00	0.000e+00	-40.958	-40.958	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.536	-42.880	-0.345	(0)
UF5-	0.000e+00	0.000e+00	-43.460	-43.499	-0.038	(0)
UF6-2	0.000e+00	0.000e+00	-45.004	-45.158	-0.153	(0)
Fe (2)	2.093e-13					
Fe+2	1.822e-13	1.280e-13	-12.739	-12.893	-0.153	(0)
FeOH+	1.252e-14	1.157e-14	-13.902	-13.937	-0.034	(0)
FeSO4	1.221e-14	1.221e-14	-13.913	-13.913	0.000	(0)
FeHCO3+	2.312e-15	2.141e-15	-14.636	-14.669	-0.033	(0)
Fe (OH) 2	2.088e-17	2.088e-17	-16.680	-16.680	0.000	(0)
Fe (OH) 3-	1.622e-17	1.500e-17	-16.790	-16.824	-0.034	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.376	-159.376	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.018	-235.056	-0.038	(0)
Fe (3)	7.879e-10					
Fe (OH) 3	4.713e-10	4.713e-10	-9.327	-9.327	0.000	(0)
Fe (OH) 2+	2.089e-10	1.932e-10	-9.680	-9.714	-0.034	(0)
Fe (OH) 4-	1.077e-10	9.966e-11	-9.968	-10.001	-0.034	(0)
FeOH+2	2.994e-16	2.187e-16	-15.524	-15.660	-0.136	(0)
FeF2+	2.495e-20	2.306e-20	-19.603	-19.637	-0.034	(0)
FeF+2	1.625e-20	1.187e-20	-19.789	-19.926	-0.136	(0)
FeF3	2.362e-21	2.362e-21	-20.627	-20.627	0.000	(0)
FeSO4+	7.032e-22	6.501e-22	-21.153	-21.187	-0.034	(0)
Fe+3	3.066e-22	1.491e-22	-21.513	-21.826	-0.313	(0)
FeCl+2	1.075e-23	7.852e-24	-22.969	-23.105	-0.136	(0)
Fe (SO4) 2-	5.898e-24	5.400e-24	-23.229	-23.268	-0.038	(0)
FeCl2+	6.615e-26	6.115e-26	-25.179	-25.214	-0.034	(0)
FeHSeO3+2	8.515e-28	5.982e-28	-27.070	-27.223	-0.153	(0)
FeCl3	1.066e-29	1.066e-29	-28.972	-28.972	0.000	(0)
Fe2 (OH) 2+4	6.499e-30	1.583e-30	-29.187	-29.800	-0.613	(0)
FeNO3+2	1.165e-31	8.187e-32	-30.934	-31.087	-0.153	(0)
Fe3 (OH) 4+5	4.017e-38	4.422e-39	-37.396	-38.354	-0.958	(0)
H (0)	1.767e-28					
H2	8.834e-29	8.845e-29	-28.054	-28.053	0.001	(0)
Hg (0)	4.575e-11					
Hg	4.575e-11	4.575e-11	-10.340	-10.340	0.000	(0)
Hg (1)	6.892e-26					
Hg2+2	3.446e-26	2.421e-26	-25.463	-25.616	-0.153	(0)
Hg (2)	3.105e-14					
Hg (OH) 2	2.534e-14	2.537e-14	-13.596	-13.596	0.001	(0)
HgClOH	5.452e-15	5.452e-15	-14.263	-14.263	0.000	(0)
HgCl2	2.370e-16	2.370e-16	-15.625	-15.625	0.000	(0)
HgCO3	1.311e-17	1.311e-17	-16.882	-16.882	0.000	(0)
HgCl3-	4.513e-18	4.132e-18	-17.346	-17.384	-0.038	(0)
Hg (CO3) 2-2	8.289e-19	5.824e-19	-18.081	-18.235	-0.153	(0)
HgOH+	7.699e-20	7.048e-20	-19.114	-19.152	-0.038	(0)
HgCl4-2	4.082e-20	2.868e-20	-19.389	-19.542	-0.153	(0)
HgCl+	2.962e-20	2.712e-20	-19.528	-19.567	-0.038	(0)
Hg (OH) 3-	7.924e-21	7.254e-21	-20.101	-20.139	-0.038	(0)
HgHCO3+	1.182e-21	1.082e-21	-20.927	-20.966	-0.038	(0)
Hg (NH3) 2+2	1.142e-23	8.023e-24	-22.942	-23.096	-0.153	(0)
HgNH3+2	2.828e-24	1.987e-24	-23.549	-23.702	-0.153	(0)
Hg+2	1.110e-24	7.796e-25	-23.955	-24.108	-0.153	(0)
HgSO4	7.930e-26	7.930e-26	-25.101	-25.101	0.000	(0)
HgF+	2.291e-27	2.098e-27	-26.640	-26.678	-0.038	(0)
Hg (NH3) 3+2	1.836e-31	1.290e-31	-30.736	-30.889	-0.153	(0)
HgNO3+	1.726e-35	1.580e-35	-34.763	-34.801	-0.038	(0)
Hg (NH3) 4+2	5.890e-39	4.138e-39	-38.230	-38.383	-0.153	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-45.443	-45.443	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.222	-139.260	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-139.462	-139.615	-0.153	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.220	-141.220	0.000	(0)
K	1.634e-04					
K+	1.630e-04	1.504e-04	-3.788	-3.823	-0.035	(0)

	KSO4-	4.472e-07	4.137e-07	-6.349	-6.383	-0.034	(0)
	KCrO4-	1.985e-18	1.817e-18	-17.702	-17.741	-0.038	(0)
Mg		2.081e-04					
	Mg+2	1.931e-04	1.402e-04	-3.714	-3.853	-0.139	(0)
	MgSO4	9.911e-06	9.911e-06	-5.004	-5.004	0.000	(0)
	MgHCO3+	2.065e-06	1.906e-06	-5.685	-5.720	-0.035	(0)
	MgCO3	1.638e-06	1.638e-06	-5.786	-5.786	0.000	(0)
	MgF+	1.236e-06	1.142e-06	-5.908	-5.942	-0.034	(0)
	MgOH+	1.368e-07	1.267e-07	-6.864	-6.897	-0.033	(0)
	MgH2BO3+	4.878e-09	4.489e-09	-8.312	-8.348	-0.036	(0)
Mn (2)		1.379e-06					
	Mn+2	1.281e-06	8.996e-07	-5.893	-6.046	-0.153	(0)
	MnSO4	6.216e-08	6.216e-08	-7.207	-7.207	0.000	(0)
	MnHCO3+	2.580e-08	2.385e-08	-7.588	-7.623	-0.034	(0)
	MnOH+	5.552e-09	5.132e-09	-8.256	-8.290	-0.034	(0)
	MnF+	2.813e-09	2.600e-09	-8.551	-8.585	-0.034	(0)
	MnCl+	2.136e-09	1.975e-09	-8.670	-8.705	-0.034	(0)
	MnCl2	4.863e-12	4.863e-12	-11.313	-11.313	0.000	(0)
	MnCl3-	2.526e-15	2.335e-15	-14.598	-14.632	-0.034	(0)
	MnSeO4	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
	Mn (OH) 3-	1.770e-16	1.636e-16	-15.752	-15.786	-0.034	(0)
	MnNO3+	8.550e-17	7.827e-17	-16.068	-16.106	-0.038	(0)
	Mn (OH) 4-2	1.643e-21	1.200e-21	-20.784	-20.921	-0.136	(0)
	Mn (NO3) 2	1.079e-26	1.079e-26	-25.967	-25.967	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.746	-41.746	0.000	(0)
Mn (3)		1.036e-27					
	Mn+3	1.036e-27	5.040e-28	-26.985	-27.298	-0.313	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.112	-41.248	-0.136	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-46.486	-46.522	-0.036	(0)
Mo		3.769e-08					
	MoO4-2	3.769e-08	2.736e-08	-7.424	-7.563	-0.139	(0)
	HMoO4-	2.636e-12	2.413e-12	-11.579	-11.617	-0.038	(0)
	H2MoO4	7.836e-17	7.836e-17	-16.106	-16.106	0.000	(0)
	Ag2MoO4	1.055e-28	1.055e-28	-27.977	-27.977	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.220	-58.565	-0.345	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-65.397	-66.777	-1.380	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-67.785	-68.743	-0.958	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-71.701	-72.314	-0.613	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-77.077	-77.421	-0.345	(0)
N (-3)		3.830e-08					
	NH4+	3.412e-08	3.140e-08	-7.467	-7.503	-0.036	(0)
	NH3	4.039e-09	4.039e-09	-8.394	-8.394	0.000	(0)
	NH4SO4-	1.414e-10	1.307e-10	-9.850	-9.884	-0.034	(0)
	CaNH3+2	1.907e-12	1.340e-12	-11.720	-11.873	-0.153	(0)
	CuNH3+2	5.742e-14	4.034e-14	-13.241	-13.394	-0.153	(0)
	NiNH3+2	4.069e-15	2.859e-15	-14.390	-14.544	-0.153	(0)
	AgNH3+	9.092e-16	8.324e-16	-15.041	-15.080	-0.038	(0)
	Co (NH3) +2	6.755e-16	4.746e-16	-15.170	-15.324	-0.153	(0)
	BaNH3+2	5.575e-18	3.916e-18	-17.254	-17.407	-0.153	(0)
	Ag (NH3) 2+	2.985e-20	2.733e-20	-19.525	-19.563	-0.038	(0)
	Ca (NH3) 2+2	3.067e-21	2.154e-21	-20.513	-20.667	-0.153	(0)
	Ni (NH3) 2+2	2.376e-21	1.669e-21	-20.624	-20.778	-0.153	(0)
	Co (NH3) 2+2	1.164e-22	8.176e-23	-21.934	-22.087	-0.153	(0)
	Hg (NH3) 2+2	1.142e-23	8.023e-24	-22.942	-23.096	-0.153	(0)
	HgNH3+2	2.828e-24	1.987e-24	-23.549	-23.702	-0.153	(0)
	Co (NH3) 3+2	5.917e-30	4.157e-30	-29.228	-29.381	-0.153	(0)
	Hg (NH3) 3+2	1.836e-31	1.290e-31	-30.736	-30.889	-0.153	(0)
	Co (NH3) 4+2	1.254e-37	8.811e-38	-36.902	-37.055	-0.153	(0)
	Hg (NH3) 4+2	5.890e-39	4.138e-39	-38.230	-38.383	-0.153	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.751	-43.905	-0.153	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-45.075	-45.229	-0.153	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.624	-53.777	-0.153	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.682	-54.027	-0.345	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.530	-55.683	-0.153	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-64.575	-64.613	-0.038	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.418	-67.572	-0.153	(0)

Co(NH3)6Cl+2	0.000e+00	0.000e+00	-68.733	-68.887	-0.153	(0)
N(3)	2.767e-07					
NO2-	2.767e-07	2.549e-07	-6.558	-6.594	-0.036	(0)
CuNO2+	2.846e-14	2.605e-14	-13.546	-13.584	-0.038	(0)
AgNO2	5.376e-15	5.376e-15	-14.270	-14.270	0.000	(0)
CoNO2+	1.917e-15	1.755e-15	-14.717	-14.756	-0.038	(0)
Cu(NO2)2	6.795e-20	6.795e-20	-19.168	-19.168	0.000	(0)
Ag(NO2)2-	2.318e-21	2.122e-21	-20.635	-20.673	-0.038	(0)
N(5)	5.953e-11					
NO3-	5.948e-11	5.490e-11	-10.226	-10.260	-0.035	(0)
CaNO3+	4.997e-14	4.575e-14	-13.301	-13.340	-0.038	(0)
MnNO3+	8.550e-17	7.827e-17	-16.068	-16.106	-0.038	(0)
ZnNO3+	2.592e-17	2.373e-17	-16.586	-16.625	-0.038	(0)
BaNO3+	4.619e-19	4.229e-19	-18.335	-18.374	-0.038	(0)
NiNO3+	1.985e-19	1.818e-19	-18.702	-18.740	-0.038	(0)
CuNO3+	1.851e-19	1.695e-19	-18.733	-18.771	-0.038	(0)
CoNO3+	9.289e-20	8.504e-20	-19.032	-19.070	-0.038	(0)
CdNO3+	2.625e-20	2.403e-20	-19.581	-19.619	-0.038	(0)
AgNO3	4.402e-21	4.402e-21	-20.356	-20.356	0.000	(0)
PbNO3+	2.396e-21	2.194e-21	-20.620	-20.659	-0.038	(0)
UO2NO3+	2.693e-26	2.466e-26	-25.570	-25.608	-0.038	(0)
Mn(NO3)2	1.079e-26	1.079e-26	-25.967	-25.967	0.000	(0)
Zn(NO3)2	2.600e-28	2.600e-28	-27.585	-27.585	0.000	(0)
CrNO3+2	7.399e-29	5.198e-29	-28.131	-28.284	-0.153	(0)
Co(NO3)2	9.499e-30	9.499e-30	-29.022	-29.022	0.000	(0)
Cu(NO3)2	1.171e-30	1.171e-30	-29.931	-29.931	0.000	(0)
VO2NO3	1.026e-30	1.026e-30	-29.989	-29.989	0.000	(0)
Cd(NO3)2	6.612e-31	6.612e-31	-30.180	-30.180	0.000	(0)
Pb(NO3)2	2.046e-31	2.046e-31	-30.689	-30.689	0.000	(0)
FeNO3+2	1.165e-31	8.187e-32	-30.934	-31.087	-0.153	(0)
HgNO3+	1.726e-35	1.580e-35	-34.763	-34.801	-0.038	(0)
Hg(NO3)2	0.000e+00	0.000e+00	-45.443	-45.443	0.000	(0)
Na	3.256e-03					
Na+	3.246e-03	2.997e-03	-2.489	-2.523	-0.035	(0)
NaSO4-	6.759e-06	6.253e-06	-5.170	-5.204	-0.034	(0)
NaHCO3	2.239e-06	2.239e-06	-5.650	-5.650	0.000	(0)
NaCO3-	8.474e-07	7.840e-07	-6.072	-6.106	-0.034	(0)
NaF	1.373e-07	1.373e-07	-6.862	-6.862	0.000	(0)
NaH2BO3	4.386e-09	4.386e-09	-8.358	-8.358	0.000	(0)
NaCrO4-	5.289e-17	4.843e-17	-16.277	-16.315	-0.038	(0)
Ni	2.902e-09					
Ni+2	1.816e-09	1.318e-09	-8.741	-8.880	-0.139	(0)
NiCO3	6.909e-10	6.909e-10	-9.161	-9.161	0.000	(0)
NiHCO3+	2.358e-10	2.159e-10	-9.627	-9.666	-0.038	(0)
NiSO4	1.022e-10	1.022e-10	-9.991	-9.991	0.000	(0)
NiOH+	4.117e-11	3.769e-11	-10.385	-10.424	-0.038	(0)
Ni(OH)2	6.799e-12	6.799e-12	-11.168	-11.168	0.000	(0)
NiCl+	6.423e-12	5.880e-12	-11.192	-11.231	-0.038	(0)
NiF+	2.626e-12	2.404e-12	-11.581	-11.619	-0.038	(0)
Ni(OH)3-	1.687e-14	1.544e-14	-13.773	-13.811	-0.038	(0)
NiNH3+2	4.069e-15	2.859e-15	-14.390	-14.544	-0.153	(0)
Ni(SO4)2-2	1.871e-15	1.315e-15	-14.728	-14.881	-0.153	(0)
NiCl2	5.162e-17	5.162e-17	-16.287	-16.287	0.000	(0)
NiSeO4	8.315e-19	8.315e-19	-18.080	-18.080	0.000	(0)
NiNO3+	1.985e-19	1.818e-19	-18.702	-18.740	-0.038	(0)
Ni(NH3)2+2	2.376e-21	1.669e-21	-20.624	-20.778	-0.153	(0)
O(0)	1.294e-36					
O2	6.469e-37	6.477e-37	-36.189	-36.189	0.001	(0)
Pb	1.460e-10					
PbCO3	1.141e-10	1.141e-10	-9.943	-9.943	0.000	(0)
PbOH+	1.684e-11	1.541e-11	-10.774	-10.812	-0.038	(0)
Pb(CO3)2-2	6.582e-12	4.624e-12	-11.182	-11.335	-0.153	(0)
Pb+2	3.722e-12	2.702e-12	-11.429	-11.568	-0.139	(0)
PbHCO3+	2.913e-12	2.667e-12	-11.536	-11.574	-0.038	(0)
Pb(OH)2	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
PbSO4	5.142e-13	5.142e-13	-12.289	-12.289	0.000	(0)
PbCl+	1.826e-13	1.671e-13	-12.739	-12.777	-0.038	(0)
PbF+	1.510e-14	1.382e-14	-13.821	-13.859	-0.038	(0)

Pb(OH) 3-	2.746e-15	2.514e-15	-14.561	-14.600	-0.038	(0)
Pb(SO4) 2-2	1.713e-15	1.204e-15	-14.766	-14.919	-0.153	(0)
PbCl2	1.302e-15	1.302e-15	-14.885	-14.885	0.000	(0)
PbF2	1.975e-17	1.975e-17	-16.704	-16.704	0.000	(0)
Pb(OH) 4-2	1.991e-18	1.399e-18	-17.701	-17.854	-0.153	(0)
PbCl3-	9.869e-19	9.035e-19	-18.006	-18.044	-0.038	(0)
PbF3-	2.970e-21	2.720e-21	-20.527	-20.566	-0.038	(0)
PbNO3+	2.396e-21	2.194e-21	-20.620	-20.659	-0.038	(0)
Pb2OH+3	1.461e-21	6.601e-22	-20.835	-21.180	-0.345	(0)
PbCl4-2	1.025e-21	7.201e-22	-20.989	-21.143	-0.153	(0)
PbF4-2	1.345e-25	9.450e-26	-24.871	-25.025	-0.153	(0)
Pb3(OH) 4+2	9.405e-26	6.608e-26	-25.027	-25.180	-0.153	(0)
Pb(NO3) 2	2.046e-31	2.046e-31	-30.689	-30.689	0.000	(0)
Pb4(OH) 4+4	5.821e-33	1.418e-33	-32.235	-32.848	-0.613	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.732	-151.732	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.110	-228.149	-0.038	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.898	-73.898	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.678	-77.717	-0.038	(0)
S5-2	0.000e+00	0.000e+00	-78.575	-78.729	-0.153	(0)
H2S	0.000e+00	0.000e+00	-79.050	-79.050	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.091	-79.245	-0.153	(0)
S4-2	0.000e+00	0.000e+00	-79.171	-79.324	-0.153	(0)
CdHS+	0.000e+00	0.000e+00	-79.529	-79.568	-0.038	(0)
S3-2	0.000e+00	0.000e+00	-79.977	-80.130	-0.153	(0)
S2-2	0.000e+00	0.000e+00	-80.993	-81.146	-0.153	(0)
S-2	0.000e+00	0.000e+00	-86.527	-86.664	-0.136	(0)
HgHS2-	0.000e+00	0.000e+00	-139.222	-139.260	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-139.462	-139.615	-0.153	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-141.220	-141.220	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-145.536	-145.756	-0.220	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.273	-146.486	-0.213	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-146.533	-146.645	-0.112	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-146.996	-147.035	-0.038	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.477	-147.515	-0.038	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-147.508	-147.732	-0.224	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.826	-148.043	-0.217	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.378	-149.378	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.080	-150.080	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.732	-151.732	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.376	-159.376	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.224	-216.262	-0.038	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-223.776	-223.815	-0.038	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.288	-225.441	-0.153	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.859	-225.897	-0.038	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.110	-228.149	-0.038	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.018	-235.056	-0.038	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.265	-301.418	-0.153	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-302.838	-302.991	-0.153	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.320	-320.473	-0.153	(0)
S(6)	5.759e-04					
SO4-2	5.353e-04	3.885e-04	-3.271	-3.411	-0.139	(0)
CaSO4	2.346e-05	2.346e-05	-4.630	-4.630	0.000	(0)
MgSO4	9.911e-06	9.911e-06	-5.004	-5.004	0.000	(0)
NaSO4-	6.759e-06	6.253e-06	-5.170	-5.204	-0.034	(0)
KSO4-	4.472e-07	4.137e-07	-6.349	-6.383	-0.034	(0)
MnSO4	6.216e-08	6.216e-08	-7.207	-7.207	0.000	(0)
ZnSO4	1.463e-08	1.463e-08	-7.835	-7.835	0.000	(0)
HSO4-	1.822e-10	1.683e-10	-9.739	-9.774	-0.034	(0)
NH4SO4-	1.414e-10	1.307e-10	-9.850	-9.884	-0.034	(0)
NiSO4	1.022e-10	1.022e-10	-9.991	-9.991	0.000	(0)
CuSO4	8.689e-11	8.689e-11	-10.061	-10.061	0.000	(0)
CoSO4	7.577e-11	7.577e-11	-10.120	-10.120	0.000	(0)
Zn(SO4) 2-2	7.047e-11	4.951e-11	-10.152	-10.305	-0.153	(0)
CdSO4	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
AgSO4-	8.548e-13	7.826e-13	-12.068	-12.106	-0.038	(0)
PbSO4	5.142e-13	5.142e-13	-12.289	-12.289	0.000	(0)
CrOHSO4	9.924e-14	9.924e-14	-13.003	-13.003	0.000	(0)

Cd(SO4) 2-2	9.406e-14	6.608e-14	-13.027	-13.180	-0.153	(0)
FeSO4	1.221e-14	1.221e-14	-13.913	-13.913	0.000	(0)
Ni(SO4) 2-2	1.871e-15	1.315e-15	-14.728	-14.881	-0.153	(0)
Pb(SO4) 2-2	1.713e-15	1.204e-15	-14.766	-14.919	-0.153	(0)
UO2SO4	1.324e-16	1.324e-16	-15.878	-15.878	0.000	(0)
CrSO4+	2.147e-17	1.965e-17	-16.668	-16.707	-0.038	(0)
AlSO4+	2.842e-18	2.625e-18	-17.546	-17.581	-0.034	(0)
UO2(SO4) 2-2	9.651e-19	6.780e-19	-18.015	-18.169	-0.153	(0)
Al(SO4) 2-	1.183e-20	1.093e-20	-19.927	-19.961	-0.034	(0)
FeSO4+	7.032e-22	6.501e-22	-21.153	-21.187	-0.034	(0)
VO2SO4-	3.744e-22	3.428e-22	-21.427	-21.465	-0.038	(0)
Cr2(OH) 2SO4+2	1.374e-23	9.655e-24	-22.862	-23.015	-0.153	(0)
Fe(SO4) 2-	5.898e-24	5.400e-24	-23.229	-23.268	-0.038	(0)
VOSO4	4.956e-25	4.956e-25	-24.305	-24.305	0.000	(0)
Cr2(OH) 2(SO4) 2	2.228e-25	2.228e-25	-24.652	-24.652	0.000	(0)
HgSO4	7.930e-26	7.930e-26	-25.101	-25.101	0.000	(0)
CrO3SO4-2	3.484e-26	2.448e-26	-25.458	-25.611	-0.153	(0)
VSO4+	7.220e-40	6.610e-40	-39.141	-39.180	-0.038	(0)
U(SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.699	-44.852	-0.153	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-64.575	-64.613	-0.038	(0)
Sb(3)	1.419e-21					
Sb(OH) 3	7.177e-22	7.177e-22	-21.144	-21.144	0.000	(0)
HSbO2	7.007e-22	7.007e-22	-21.154	-21.154	0.000	(0)
SbO2-	2.796e-25	2.560e-25	-24.553	-24.592	-0.038	(0)
Sb(OH) 4-	1.602e-25	1.467e-25	-24.795	-24.834	-0.038	(0)
Sb(OH) 2F	3.609e-28	3.609e-28	-27.443	-27.443	0.000	(0)
SbOF	3.549e-28	3.549e-28	-27.450	-27.450	0.000	(0)
Sb(OH) 2+	8.440e-29	7.727e-29	-28.074	-28.112	-0.038	(0)
SbO+	2.910e-29	2.664e-29	-28.536	-28.574	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.320	-320.473	-0.153	(0)
Sb(5)	5.934e-10					
SbO3-	5.927e-10	5.426e-10	-9.227	-9.266	-0.038	(0)
Sb(OH) 6-	6.874e-13	6.344e-13	-12.163	-12.198	-0.035	(0)
SbO2+	3.341e-27	3.059e-27	-26.476	-26.514	-0.038	(0)
Se(-2)	4.019e-16					
Ag2Se	4.019e-16	4.019e-16	-15.396	-15.396	0.000	(0)
HSe-	2.344e-39	2.146e-39	-38.630	-38.668	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-41.746	-41.746	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.132	-43.132	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.162	-45.315	-0.153	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.168	-82.782	-0.613	(0)
Se(4)	3.599e-09					
SeO3-2	1.941e-09	1.363e-09	-8.712	-8.865	-0.153	(0)
HSeO3-	1.658e-09	1.518e-09	-8.780	-8.819	-0.038	(0)
H2SeO3	2.871e-15	2.871e-15	-14.542	-14.542	0.000	(0)
AgSeO3-	9.662e-17	8.846e-17	-16.015	-16.053	-0.038	(0)
Cd(SeO3) 2-2	3.019e-22	2.121e-22	-21.520	-21.673	-0.153	(0)
Ag(SeO3) 2-3	2.390e-24	1.080e-24	-23.622	-23.967	-0.345	(0)
FeHSeO3+2	8.515e-28	5.982e-28	-27.070	-27.223	-0.153	(0)
Se(6)	1.858e-12					
SeO4-2	1.858e-12	1.349e-12	-11.731	-11.870	-0.139	(0)
MnSeO4	3.265e-16	3.265e-16	-15.486	-15.486	0.000	(0)
ZnSeO4	3.595e-17	3.595e-17	-16.444	-16.444	0.000	(0)
NiSeO4	8.315e-19	8.315e-19	-18.080	-18.080	0.000	(0)
CoSeO4	6.606e-19	6.606e-19	-18.180	-18.180	0.000	(0)
HSeO4-	3.273e-19	2.996e-19	-18.485	-18.523	-0.038	(0)
CdSeO4	3.476e-20	3.476e-20	-19.459	-19.459	0.000	(0)
Zn(SeO4) 2-2	6.997e-29	4.915e-29	-28.155	-28.308	-0.153	(0)
Si	3.153e-04					
H4SiO4	3.045e-04	3.049e-04	-3.516	-3.516	0.001	(0)
H3SiO4-	1.077e-05	9.943e-06	-4.968	-5.002	-0.035	(0)
H2SiO4-2	1.932e-10	1.415e-10	-9.714	-9.849	-0.135	(0)
UO2H3SiO4+	2.075e-13	1.900e-13	-12.683	-12.721	-0.038	(0)
SiF6-2	3.575e-32	2.611e-32	-31.447	-31.583	-0.136	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.591	-60.936	-0.345	(0)
U(4)	4.398e-20					

U (OH) 5-	4.397e-20	4.026e-20	-19.357	-19.395	-0.038	(0)
U (OH) 4	7.474e-24	7.474e-24	-23.126	-23.126	0.000	(0)
U (OH) 3+	1.323e-28	1.211e-28	-27.878	-27.917	-0.038	(0)
U (OH) 2+2	3.535e-34	2.484e-34	-33.452	-33.605	-0.153	(0)
UF3+	1.513e-39	1.385e-39	-38.820	-38.859	-0.038	(0)
UF2+2	1.713e-40	1.204e-40	-39.766	-39.920	-0.153	(0)
UOH+3	1.148e-40	0.000e+00	-39.940	-40.285	-0.345	(0)
UF4	0.000e+00	0.000e+00	-40.958	-40.958	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.536	-42.880	-0.345	(0)
UF5-	0.000e+00	0.000e+00	-43.460	-43.499	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.363	-44.363	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.699	-44.852	-0.153	(0)
UF6-2	0.000e+00	0.000e+00	-45.004	-45.158	-0.153	(0)
U+4	0.000e+00	0.000e+00	-47.428	-48.041	-0.613	(0)
UC1+3	0.000e+00	0.000e+00	-48.755	-49.100	-0.345	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-177.000	-180.105	-3.105	(0)
U (5)	1.195e-17					
UO2+	1.195e-17	1.094e-17	-16.923	-16.961	-0.038	(0)
U (6)	1.524e-08					
UO2 (CO3) 3-4	1.020e-08	2.485e-09	-7.991	-8.605	-0.613	(0)
UO2 (CO3) 2-2	5.024e-09	3.529e-09	-8.299	-8.452	-0.153	(0)
UO2CO3	1.259e-11	1.259e-11	-10.900	-10.900	0.000	(0)
UO2H3SiO4+	2.075e-13	1.900e-13	-12.683	-12.721	-0.038	(0)
UO2OH+	7.030e-14	6.436e-14	-13.153	-13.191	-0.038	(0)
UO2F+	2.464e-15	2.256e-15	-14.608	-14.647	-0.038	(0)
UO2F2	4.723e-16	4.723e-16	-15.326	-15.326	0.000	(0)
UO2+2	3.101e-16	2.251e-16	-15.508	-15.648	-0.139	(0)
UO2SO4	1.324e-16	1.324e-16	-15.878	-15.878	0.000	(0)
UO2F3-	9.408e-18	8.614e-18	-17.026	-17.065	-0.038	(0)
UO2 (SO4) 2-2	9.651e-19	6.780e-19	-18.015	-18.169	-0.153	(0)
UO2Cl+	6.952e-19	6.365e-19	-18.158	-18.196	-0.038	(0)
(UO2) 2 (OH) 2+2	9.785e-21	6.874e-21	-20.009	-20.163	-0.153	(0)
UO2F4-2	7.070e-21	4.967e-21	-20.151	-20.304	-0.153	(0)
(UO2) 3 (OH) 5+	1.891e-21	1.731e-21	-20.723	-20.762	-0.038	(0)
UO2NO3+	2.693e-26	2.466e-26	-25.570	-25.608	-0.038	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.947	-44.985	-0.038	(0)
V+2	0.000e+00	0.000e+00	-46.698	-46.852	-0.153	(0)
V (3)	3.406e-17					
V (OH) 3	3.406e-17	3.406e-17	-16.468	-16.468	0.000	(0)
V (OH) 2+	1.066e-28	9.756e-29	-27.972	-28.011	-0.038	(0)
VOH+2	5.839e-33	4.102e-33	-32.234	-32.387	-0.153	(0)
V+3	7.975e-39	3.604e-39	-38.098	-38.443	-0.345	(0)
VSO4+	7.220e-40	6.610e-40	-39.141	-39.180	-0.038	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-61.601	-61.946	-0.345	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-63.361	-63.974	-0.613	(0)
V (4)	2.301e-21					
V (OH) 3+	2.292e-21	2.098e-21	-20.640	-20.678	-0.038	(0)
VO+2	6.591e-24	4.631e-24	-23.181	-23.334	-0.153	(0)
VOF+	2.203e-24	2.016e-24	-23.657	-23.695	-0.038	(0)
VOSO4	4.956e-25	4.956e-25	-24.305	-24.305	0.000	(0)
VOF2	5.490e-26	5.490e-26	-25.260	-25.260	0.000	(0)
VOC1+	2.474e-26	2.265e-26	-25.607	-25.645	-0.038	(0)
VOF3-	1.545e-28	1.414e-28	-27.811	-27.850	-0.038	(0)
VOF4-2	5.898e-32	4.144e-32	-31.229	-31.383	-0.153	(0)
H2V2O4+2	3.142e-37	2.207e-37	-36.503	-36.656	-0.153	(0)
V (5)	1.789e-10					
H2VO4-	1.029e-10	9.420e-11	-9.988	-10.026	-0.038	(0)
HVO4-2	7.598e-11	5.338e-11	-10.119	-10.273	-0.153	(0)
H3VO4	4.176e-15	4.176e-15	-14.379	-14.379	0.000	(0)
VO4-3	1.336e-16	6.035e-17	-15.874	-16.219	-0.345	(0)
HV2O7-3	3.771e-18	1.704e-18	-17.424	-17.769	-0.345	(0)
H3V2O7-	2.775e-18	2.540e-18	-17.557	-17.595	-0.038	(0)
V2O7-4	4.247e-20	1.035e-20	-19.372	-19.985	-0.613	(0)
VO2+	4.003e-20	3.695e-20	-19.398	-19.432	-0.035	(0)
VO2F	4.704e-21	4.704e-21	-20.328	-20.328	0.000	(0)
VO2SO4-	3.744e-22	3.428e-22	-21.427	-21.465	-0.038	(0)
VO2F2-	1.354e-22	1.240e-22	-21.868	-21.907	-0.038	(0)

V3O9-3	1.938e-24	8.757e-25	-23.713	-24.058	-0.345	(0)
VO2F3-2	1.598e-25	1.123e-25	-24.796	-24.950	-0.153	(0)
VO2F4-3	8.877e-30	4.011e-30	-29.052	-29.397	-0.345	(0)
VO2NO3	1.026e-30	1.026e-30	-29.989	-29.989	0.000	(0)
V4O12-4	1.412e-31	3.439e-32	-30.850	-31.464	-0.613	(0)
V10O28-6	0.000e+00	0.000e+00	-83.386	-84.766	-1.380	(0)
HV10O28-5	0.000e+00	0.000e+00	-83.975	-84.933	-0.958	(0)
H2V10O28-4	0.000e+00	0.000e+00	-87.465	-88.079	-0.613	(0)
Zn	4.591e-07					
Zn+2	2.371e-07	1.721e-07	-6.625	-6.764	-0.139	(0)
ZnCO3	1.391e-07	1.391e-07	-6.857	-6.857	0.000	(0)
ZnOH+	4.270e-08	3.909e-08	-7.370	-7.408	-0.038	(0)
ZnSO4	1.463e-08	1.463e-08	-7.835	-7.835	0.000	(0)
Zn(OH)2	1.407e-08	1.407e-08	-7.852	-7.852	0.000	(0)
ZnHCO3+	7.898e-09	7.230e-09	-8.103	-8.141	-0.038	(0)
ZnOHCl	2.241e-09	2.241e-09	-8.650	-8.650	0.000	(0)
ZnCl+	8.168e-10	7.538e-10	-9.088	-9.123	-0.035	(0)
ZnF+	2.723e-10	2.493e-10	-9.565	-9.603	-0.038	(0)
Zn(OH)3-	1.749e-10	1.602e-10	-9.757	-9.795	-0.038	(0)
Zn(SO4)2-2	7.047e-11	4.951e-11	-10.152	-10.305	-0.153	(0)
ZnCl2	2.083e-12	2.083e-12	-11.681	-11.681	0.000	(0)
Zn(OH)4-2	2.061e-14	1.448e-14	-13.686	-13.839	-0.153	(0)
ZnCl3-	3.126e-15	2.885e-15	-14.505	-14.540	-0.035	(0)
ZnSeO4	3.595e-17	3.595e-17	-16.444	-16.444	0.000	(0)
ZnNO3+	2.592e-17	2.373e-17	-16.586	-16.625	-0.038	(0)
ZnCl4-2	3.443e-18	2.515e-18	-17.463	-17.600	-0.136	(0)
Zn(NO3)2	2.600e-28	2.600e-28	-27.585	-27.585	0.000	(0)
Zn(SeO4)2-2	6.997e-29	4.915e-29	-28.155	-28.308	-0.153	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-146.996	-147.035	-0.038	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.378	-149.378	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-223.776	-223.815	-0.038	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.288	-225.441	-0.153	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-302.838	-302.991	-0.153	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-62.63	-56.34	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-45.85	-41.34	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-53.07	-41.34	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-80.93	-62.99	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-60.52	-40.49	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.90	-29.49	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.33	-26.88	0.45	(NH4)2SeO4
Acanthite	-53.14	-89.36	-36.22	Ag2S
Ag2CO3	-13.75	-24.84	-11.09	Ag2CO3
Ag2CrO4	-22.89	-34.48	-11.59	Ag2CrO4
Ag2HVO4	-15.84	-14.36	1.48	Ag2HVO4
Ag2MoO4	-16.00	-27.55	-11.55	Ag2MoO4
Ag2O	-15.86	-3.29	12.57	Ag2O
Ag2Se	-1.61	-50.31	-48.70	Ag2Se
Ag2SeO3	-13.31	-20.46	-7.15	Ag2SeO3
Ag2SeO4	-22.95	-31.86	-8.91	Ag2SeO4
Ag2SO4	-18.58	-23.40	-4.82	Ag2SO4
Ag3AsO3	-28.93	-26.77	2.16	Ag3AsO3
Ag3AsO4	-17.98	-20.76	-2.79	Ag3AsO4
Ag3H2VO5	-21.19	-16.01	5.18	Ag3H2VO5
AgF·4H2O	-15.18	-14.14	1.05	AgF·4H2O
Agmetal	-0.59	-14.09	-13.51	Ag
AgVO3	-13.49	-12.72	0.77	AgVO3
Al(OH)3(am)	-3.80	7.00	10.80	Al(OH)3
Al2(MoO4)3	-61.18	-58.81	2.37	Al2(MoO4)3
Al2O3	-5.65	14.00	19.65	Al2O3
Al4(OH)10SO4	-14.82	7.88	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-13.64	-8.84	4.80	AlAsO4·2H2O
AlOHSO4	-9.89	-13.12	-3.23	AlOHSO4
AlSb	-154.48	-88.85	65.62	AlSb

Alunite	-13.31	-14.71	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-7.19	-14.98	-7.79	PbSO ₄
Anhydrite	-2.63	-6.99	-4.36	CaSO ₄
Anilite	-55.37	-87.24	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-5.82	2.97	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.13	-8.43	-8.30	CaCO ₃
Arsenolite	-84.60	-87.36	-2.76	As ₄ O ₆
Artinite	-5.45	4.15	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-38.38	-31.67	6.71	As ₂ O ₅
Atacamite	-3.11	4.28	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-3.12	-20.03	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.50	7.89	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-22.24	-6.37	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	0.92	-7.99	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-31.42	1.52	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.63	-23.30	-9.67	BaCrO ₄
BaF ₂	-11.27	-17.09	-5.82	BaF ₂
BaMoO ₄	-9.42	-16.38	-6.96	BaMoO ₄
Barite	-2.24	-12.22	-9.98	BaSO ₄
BaS	-94.36	-78.18	16.18	BaS
BaSeO ₃	-11.11	-9.28	1.83	BaSeO ₃
BaSeO ₄	-13.22	-20.68	-7.46	BaSeO ₄
Bianchite	-8.41	-10.18	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.88	10.21	18.09	MnO ₂
Bixbyite	-3.83	-4.48	-0.64	Mn ₂ O ₃
BlaubleiI	-55.39	-79.56	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.83	-83.10	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-1.58	7.00	8.58	AlOOH
Breithauptite	-57.05	-75.58	-18.52	NiSb
Brochantite	-4.55	10.67	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.99	12.85	16.84	Mg(OH) ₂
Bunsenite	-4.62	7.83	12.45	NiO
Ca(VO ₃) ₂	-14.69	-9.03	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-13.40	4.10	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.46	4.10	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-14.59	7.71	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-21.74	17.22	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-22.64	17.22	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-295.30	-152.33	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.80	-18.07	-2.27	CaCrO ₄
Calcite	0.05	-8.43	-8.48	CaCO ₃
Calomel	-13.22	-31.13	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.19	-11.14	-7.95	CaMoO ₄
Carnotite	-5.72	-5.49	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.86	-4.04	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-12.43	-15.45	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.30	-3.46	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.80	6.85	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.88	6.85	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-26.40	-19.69	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.13	0.43	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.13	7.27	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-14.72	-15.38	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-13.68	-15.38	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-13.46	-15.38	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.92	-18.14	-1.21	CdF ₂
Cdmetal(alpha)	-31.57	-18.06	13.51	Cd
Cdmetal(gamma)	-31.67	-18.06	13.62	Cd
CdMoO ₄	-3.27	-17.42	-14.15	CdMoO ₄
CdOHCl	-7.80	-4.26	3.54	CdOHCl
CdSb	-76.20	-76.55	-0.35	CdSb
CdSe	-19.97	-40.17	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-19.88	-21.73	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-13.10	-13.27	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.54	-13.27	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-11.40	-13.27	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-3.00	-12.75	-9.75	AgCl
Cerrusite	-3.29	-16.42	-13.13	PbCO ₃

CH4(g)	-80.13	-121.17	-41.05	CH4
Chalcanthite	-9.78	-12.42	-2.64	CuSO4:5H2O
Chalcedony	0.03	-3.52	-3.55	SiO2
Chalcocite	-55.28	-90.20	-34.92	Cu2S
Chalcopyrite	-125.36	-160.63	-35.27	CuFeS2
Chrysotile	-0.67	31.53	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.97	-99.67	-45.69	HgS
Claudetite	-84.30	-87.36	-3.06	As4O6
Clausthalite	-14.78	-41.88	-27.10	PbSe
Co(BO2)2	-29.68	-2.61	27.07	Co(BO2)2
Co(OH)2	-5.40	7.70	13.09	Co(OH)2
Co(OH)3	-9.94	-12.25	-2.31	Co(OH)3
CO2(g)	-3.41	-21.56	-18.15	CO2
Co3(AsO4)2	-21.61	-8.58	13.03	Co3(AsO4)2
Co3O4	-6.31	-16.81	-10.50	Co3O4
CoCl2	-22.79	-14.53	8.27	CoCl2
CoCl2:6H2O	-17.06	-14.53	2.54	CoCl2:6H2O
CoCO3	-3.88	-13.86	-9.98	CoCO3
CoF2	-15.69	-17.29	-1.60	CoF2
CoF3	-48.27	-49.73	-1.46	CoF3
CoFe2O4	17.69	14.16	-3.53	CoFe2O4
CoMoO4	-8.81	-16.57	-7.76	CoMoO4
CoO	-5.89	7.70	13.59	CoO
CoS(alpha)	-70.93	-78.37	-7.44	CoS
CoS(beta)	-67.30	-78.37	-11.07	CoS
CoSe	-23.12	-39.32	-16.20	CoSe
CoSeO3	-10.80	-9.48	1.32	CoSeO3
CoSeO4:6H2O	-19.35	-20.88	-1.53	CoSeO4:6H2O
CoSO4	-15.22	-12.42	2.80	CoSO4
CoSO4:6H2O	-9.95	-12.42	-2.47	CoSO4:6H2O
Cotunnite	-12.31	-17.09	-4.78	PbCl2
Covellite	-56.07	-78.37	-22.30	CuS
Cr(OH)2	-21.50	-10.68	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.17	1.34	Cr(OH)3
Cr(OH)3(am)	-0.42	-1.17	-0.75	Cr(OH)3
Cr2O3	0.01	-2.35	-2.36	Cr2O3
CrCl2	-46.99	-32.90	14.09	CrCl2
CrCl3	-49.62	-34.51	15.11	CrCl3
CrF3	-27.31	-38.65	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-66.06	-35.58	30.48	Cr
CrO3	-27.98	-31.19	-3.21	CrO3
Cryolite	-16.62	-50.46	-33.84	Na3AlF6
Cu(OH)2	-0.98	7.70	8.67	Cu(OH)2
Cu(SbO3)2	-30.00	15.21	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-12.47	-3.22	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.34	-90.22	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.35	-51.15	-45.80	Cu2Se
Cu2SO4	-22.30	-24.25	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.68	-8.58	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.46	-102.05	-42.59	Cu3Sb
Cu3Se2	-26.99	-90.48	-63.49	Cu3Se2
CuCO3	-2.36	-13.86	-11.50	CuCO3
CuCrO4	-18.06	-23.50	-5.44	CuCrO4
CuF	-9.65	-14.56	-4.91	CuF
CuF2	-18.40	-17.29	1.12	CuF2
CuF2:2H2O	-12.74	-17.29	-4.55	CuF2:2H2O
Cumetal	-5.76	-14.52	-8.76	Cu
CuMoO4	-3.50	-16.57	-13.08	CuMoO4
CuOCuSO4	-15.03	-4.72	10.30	CuOCuSO4
Cupricferrite	8.17	14.16	5.99	CuFe2O4
Cuprite	-2.73	-4.13	-1.41	Cu2O
Cuprousferrite	10.08	1.17	-8.92	CuFeO2
CuSe	-6.23	-39.33	-33.10	CuSe
CuSe2	-28.08	-61.44	-33.37	CuSe2
CuSeO3:2H2O	-9.99	-9.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-18.44	-20.88	-2.44	CuSeO4:5H2O
CuSO4	-15.36	-12.42	2.94	CuSO4

Diaspore	0.13	7.00	6.87	AlOOH
Djurleite	-55.50	-89.42	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite (disordered)	-0.60	-17.14	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	-0.05	-17.14	-17.09	CaMg (CO ₃) ₂
Epsomite	-5.14	-7.26	-2.13	MgSO ₄ ·7H ₂ O
Fe (OH) ₂	-9.75	3.81	13.56	Fe (OH) ₂
Fe (OH) ₂ ·7Cl _{1.3}	2.94	-0.10	-3.04	Fe (OH) ₂ ·7Cl _{1.3}
Fe (VO ₃) ₂	-14.62	-18.34	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-12.26	-10.71	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-24.42	-45.05	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-50.15	-53.88	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-9.94	10.28	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-13.00	-12.60	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-5.73	1.47	7.20	FeCr ₂ O ₄
FeMoO ₄	-10.36	-20.46	-10.09	FeMoO ₄
Ferrihydrite	0.04	3.23	3.19	Fe (OH) ₃
Ferroselite	-46.73	-65.33	-18.60	FeSe ₂
FeS (ppt)	-79.31	-82.26	-2.95	FeS
FeSe	-32.21	-43.21	-11.00	FeSe
Fix_pe	-4.10	-4.10	0.00	e-
Fluorite	-1.36	-11.86	-10.50	CaF ₂
Galena	-66.96	-80.93	-13.97	PbS
Gibbsite	-1.29	7.00	8.29	Al (OH) ₃
Goethite	2.74	3.23	0.49	FeOOH
Goslarite	-8.16	-10.18	-2.01	ZnSO ₄ ·7H ₂ O
Greenalite	-16.40	4.41	20.81	Fe ₃ Si ₂ O ₅ (OH) ₄
Greenockite	-64.86	-79.22	-14.36	CdS
Greigite	-288.96	-334.00	-45.03	Fe ₃ S ₄
Gummite	-6.61	1.06	7.67	UO ₃
Gypsum	-2.38	-6.99	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-18.43	-30.53	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-11.39	-24.27	-12.88	H ₂ MoO ₄
H ₂ S (g)	-78.06	-86.07	-8.01	H ₂ S
H ₂ Se (g)	-42.06	-47.02	-4.96	H ₂ Se
Halite	-6.88	-5.28	1.60	NaCl
Halloysite	-2.61	6.97	9.57	Al ₂ Si ₂ O ₅ (OH) ₄
Hausmannite	-4.14	56.89	61.03	Mn ₃ O ₄
Hematite	7.88	6.47	-1.42	Fe ₂ O ₃
Hercynite	-5.08	17.81	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-182.23	-255.94	-73.71	Hg (CH ₃) ₂
Hg (g)	-9.03	-16.91	-7.87	Hg
Hg (OH) ₂	-10.10	-13.60	-3.50	Hg (OH) ₂
Hg ₂ (g)	-18.86	-33.81	-14.96	Hg ₂
Hg ₂ (OH) ₂	-14.17	-8.91	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-14.42	-30.47	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-31.40	-40.10	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-23.53	-33.89	-10.36	Hg ₂ F ₂
Hg ₂ S	-83.30	-94.98	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-21.42	-26.08	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-22.90	-29.03	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-32.66	-62.35	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-35.06	-15.57	19.50	HgCl
HgCl ₂	-14.56	-35.82	-21.26	HgCl ₂
HgF (g)	-49.62	-16.95	32.68	HgF
HgF ₂ (g)	-51.15	-38.58	12.57	HgF ₂
Hgmetal (1)	-3.45	-16.91	-13.45	Hg
HgSe	-4.92	-60.62	-55.69	HgSe
HgSeO ₃	-18.34	-30.77	-12.43	HgSeO ₃
HgSO ₄	-24.29	-33.71	-9.42	HgSO ₄
Huntite	-4.58	-34.55	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-8.93	-27.70	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-13.20	-21.97	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-23.53	-28.70	-5.17	KAl (SO ₄) ₂ ·12H ₂ O
K-Jarosite	-11.20	-26.00	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-36.09	-53.33	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-21.62	-22.13	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-18.47	-15.21	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-18.79	-19.52	-0.73	K ₂ SeO ₄

Kaolinite	-0.47	6.97	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-6.82	10.67	17.49	Cu ₄ (OH) ₆ SO ₄ :H ₂ O
Larnakite	-9.41	-9.84	-0.43	PbO:PbSO ₄
Laurionite	-6.60	-5.97	0.62	PbOHCl
Lepidocrocite	1.86	3.23	1.37	FeOOH
Lime	-19.57	13.13	32.70	CaO
Litharge	-7.56	5.14	12.69	PbO
Mackinawite	-78.66	-82.26	-3.60	FeS
Maghemite	0.08	6.47	6.39	Fe ₂ O ₃
Magnesioferrite	2.46	19.32	16.86	Fe ₂ MgO ₄
Magnesite	-1.25	-8.71	-7.46	MgCO ₃
Magnetite	6.88	10.28	3.40	Fe ₃ O ₄
Malachite	-0.86	-6.17	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.23	23.11	25.34	MnOOH
Massicot	-7.76	5.14	12.89	PbO
Matlockite	-9.49	-18.47	-8.97	PbClF
Melanothallite	-20.78	-14.53	6.26	CuCl ₂
Melanterite	-14.09	-16.30	-2.21	FeSO ₄ :7H ₂ O
Metacinnabar	-54.57	-99.67	-45.09	HgS
Mg(OH) ₂ (active)	-5.94	12.85	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-20.59	-9.31	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-274.28	-199.60	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-22.81	3.55	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.69	10.51	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.72	-18.34	5.38	MgCrO ₄
MgF ₂	-4.00	-12.13	-8.13	MgF ₂
MgMoO ₄	-9.57	-11.42	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-7.37	-4.32	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-14.52	-15.72	-1.20	MgSeO ₄ :6H ₂ O
Minium	-33.20	40.32	73.52	Pb ₃ O ₄
Mirabilite	-7.34	-8.46	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn(VO ₃) ₂	-16.40	-11.50	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-59.12	-64.83	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-148.06	-86.98	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ :8H ₂ O	-12.19	0.31	12.50	Mn ₃ (AsO ₄) ₂ :8H ₂ O
MnCl ₂ :4H ₂ O	-14.28	-11.56	2.72	MnCl ₂ :4H ₂ O
MnS(grn)	-75.58	-75.41	0.17	MnS
MnS(pnk)	-78.75	-75.41	3.34	MnS
MnSb	-95.18	-98.09	-2.91	MnSb
MnSe	-39.86	-36.36	3.50	MnSe
MnSeO ₃	-7.64	-6.51	1.13	MnSeO ₃
MnSeO ₃ :2H ₂ O	-7.49	-6.51	0.98	MnSeO ₃ :2H ₂ O
MnSeO ₄ :5H ₂ O	-15.87	-17.92	-2.05	MnSeO ₄ :5H ₂ O
MnSO ₄	-12.04	-9.46	2.58	MnSO ₄
Monteponite	-8.26	6.85	15.10	CdO
Montroydite	-9.96	-13.60	-3.64	HgO
MoO ₃	-16.27	-24.27	-8.00	MoO ₃
Morenosite	-10.15	-12.29	-2.14	NiSO ₄ :7H ₂ O
MoS ₂	-151.05	-221.31	-70.26	MoS ₂
Na-Jarosite	-13.50	-24.70	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-40.83	-50.73	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.46	-19.53	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-20.28	-36.88	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-14.10	-12.61	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ :2H ₂ O	-13.83	-12.61	1.22	Na ₂ MoO ₄ :2H ₂ O
Na ₂ SeO ₃ :5H ₂ O	-15.81	-5.51	10.30	Na ₂ SeO ₃ :5H ₂ O
Na ₂ SeO ₄	-18.20	-16.92	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.82	-78.36	94.45	Na ₃ Sb
Na ₃ VO ₄	-30.27	6.41	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-36.24	1.16	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.45	-13.18	-6.73	CuCl
NaSb	-88.29	-65.12	23.17	NaSb
Natron	-8.59	-9.90	-1.31	Na ₂ CO ₃ :10H ₂ O
NaVO ₃	-9.11	-5.25	3.86	NaVO ₃
Nesquehonite	-4.04	-8.71	-4.67	MgCO ₃ :3H ₂ O
Ni(OH) ₂	-4.97	7.83	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ :8H ₂ O	-23.89	-8.19	15.70	Ni ₃ (AsO ₄) ₂ :8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.81	11.19	32.00	Ni ₄ (OH) ₆ SO ₄

NiCO3	-6.86	-13.73	-6.87	NiCO3
NiMoO4	-5.30	-16.44	-11.14	NiMoO4
NiS (alpha)	-72.64	-78.24	-5.60	NiS
NiS (beta)	-67.14	-78.24	-11.10	NiS
NiS (gamma)	-65.44	-78.24	-12.80	NiS
NiSe	-21.50	-39.20	-17.70	NiSe
NiSeO3:2H2O	-12.16	-9.35	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.23	-20.75	-1.52	NiSeO4:6H2O
Nsutite	-7.29	10.21	17.50	MnO2
O2 (g)	-33.28	49.81	83.09	O2
Orpiment	-240.82	-301.89	-61.07	As2S3
Otavite	-2.71	-14.71	-12.00	CdCO3
Pb (BO2) 2	-11.68	-5.17	6.52	Pb (BO2) 2
Pb (OH) 2	-3.01	5.14	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-69.21	-77.97	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-9.63	-0.84	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.91	10.28	26.19	Pb2O (OH) 2
Pb2O3	-25.86	35.18	61.04	Pb2O3
Pb2OCO3	-10.72	-11.28	-0.56	Pb2OCO3
Pb2V2O7	-9.98	-11.88	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-22.06	-16.26	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-12.88	-6.74	6.14	Pb3 (VO4) 2
Pb3O2CO3	-17.16	-6.14	11.02	Pb3O2CO3
Pb3O2SO4	-15.39	-4.70	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-20.66	0.44	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-21.44	0.44	21.88	Pb4O3SO4
PbCrO4	-13.46	-26.06	-12.60	PbCrO4
PbF2	-12.41	-19.85	-7.44	PbF2
Pbmetal	-24.01	-19.76	4.25	Pb
PbMoO4	-3.51	-19.13	-15.62	PbMoO4
PbO:0.3H2O	-7.84	5.14	12.98	PbO:0.33H2O
PbSeO4	-16.60	-23.44	-6.84	PbSeO4
Periclase	-8.73	12.85	21.58	MgO
Phosgenite	-13.70	-33.51	-19.81	PbCl2:PbCO3
Plattnerite	-19.56	30.04	49.60	PbO2
Portlandite	-9.68	13.13	22.80	Ca (OH) 2
Pyrite	-124.91	-143.42	-18.51	FeS2
Pyrochroite	-4.53	10.66	15.19	Mn (OH) 2
Pyrolusite	-5.82	35.56	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-100.61	-120.36	-19.75	AsS
Retgersite	-10.25	-12.29	-2.04	NiSO4:6H2O
Rhodochrosite	-0.32	-10.90	-10.58	MnCO3
Rutherfordine	-6.00	-20.50	-14.50	UO2CO3
Sb (OH) 3	-14.03	-21.14	-7.11	Sb (OH) 3
Sb2O4	-20.79	-17.38	3.40	Sb2O4
Sb2O5	-31.43	-41.10	-9.67	Sb2O5
Sb2Se3	-115.60	-183.35	-67.76	Sb2Se3
Sb4O6 (cubic)	-66.31	-84.58	-18.26	Sb4O6
Sb4O6 (orth)	-66.67	-84.58	-17.90	Sb4O6
SbCl3	-55.05	-54.48	0.57	SbCl3
SbF3	-48.40	-58.62	-10.23	SbF3
Sbmetal	-46.81	-58.50	-11.69	Sb
SbO2	-5.18	-33.00	-27.82	SbO2
Schoepite	-4.94	1.06	5.99	UO2 (OH) 2:H2O
Semetal (am)	-15.01	-22.12	-7.11	Se
Semetal (hex)	-14.41	-22.12	-7.71	Se
Senarmontite	-29.92	-42.29	-12.37	Sb2O3
SeO2	-17.30	-17.17	0.12	SeO2
SeO3	-49.62	-28.58	21.04	SeO3
Sepiolite	-0.60	15.16	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.62	15.16	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.51	-17.75	-10.24	FeCO3
SiO2 (am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2 (am-ppt)	-0.78	-3.52	-2.74	SiO2
Smithsonite	-1.62	-11.62	-10.00	ZnCO3
Sphalerite	-64.68	-76.13	-11.45	ZnS
Spinel	-10.00	26.85	36.85	MgAl2O4

Stibnite	-250.04	-300.50	-50.46	Sb2S3
Sulfur	-59.02	-61.17	-2.14	S
Tenorite	0.05	7.70	7.64	CuO
Thenardite	-8.78	-8.46	0.32	Na2SO4
Thermonatrite	-10.54	-9.90	0.64	Na2CO3:H2O
Tyuyamunite	-10.99	-6.91	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.16	5.92	21.08	U3O8
U3Sb4	-579.68	-427.30	152.38	U3Sb4
U4O9	-30.59	-33.61	-3.02	U4O9
UF4	-35.06	-64.60	-29.54	UF4
UF4:2.5H2O	-31.88	-64.60	-32.72	UF4:2.5H2O
UO2 (am)	-15.56	-14.63	0.93	UO2
UO2 (NO3) 2	-48.32	-36.17	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.02	-36.17	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-39.56	-36.17	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.22	-36.17	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.55	1.06	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-25.27	-27.52	-2.25	UO2SeO4:4H2O
UO3	-6.64	1.06	7.70	UO3
Uraninite	-9.96	-14.63	-4.67	UO2
USb2	-220.23	-190.65	29.58	USb2
V (OH) 3	-20.97	-13.38	7.59	V (OH) 3
V2O5	-20.80	-22.16	-1.36	V2O5
V3O5	-46.62	-44.79	1.84	V3O5
V4O7	-58.60	-51.41	7.19	V4O7
V6O13	-55.42	-116.28	-60.86	V6O13
Valentinite	-33.81	-42.29	-8.48	Sb2O3
VC12	-66.93	-48.06	18.87	VC12
VC13	-70.15	-46.72	23.43	VC13
VF4	-71.53	-56.60	14.93	VF4
Vmetal	-94.76	-50.74	44.03	V
VO	-40.59	-25.84	14.76	VO
VO (OH) 2	-11.78	-6.63	5.15	VO (OH) 2
VO2Cl	-25.03	-22.19	2.84	VO2Cl
VOC1	-35.65	-24.50	11.15	VOC1
VOC12	-41.61	-28.85	12.76	VOC12
VOSO4	-30.35	-26.74	3.61	VOSO4
Witherite	-5.10	-13.67	-8.57	BaCO3
Wurtzite	-67.18	-76.13	-8.95	ZnS
Zincite	-1.39	9.94	11.33	ZnO
Zincosite	-14.10	-10.17	3.93	ZnSO4
Zn (BO2) 2	-8.65	-0.36	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-30.60	-27.29	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.26	9.94	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.53	9.94	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.81	9.94	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.59	9.94	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.79	9.94	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-7.73	-0.23	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-6.42	8.77	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.49	-1.84	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.32	-10.41	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-8.75	19.65	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-11.01	27.49	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.33	-12.28	7.05	ZnCl2
ZnCO3:1H2O	-1.36	-11.62	-10.26	ZnCO3:1H2O
ZnF2	-14.51	-15.04	-0.53	ZnF2
Znmetal	-40.75	-14.96	25.79	Zn
ZnMoO4	-4.20	-14.33	-10.13	ZnMoO4
ZnO (active)	-1.25	9.94	11.19	ZnO
ZnS (am)	-67.08	-76.13	-9.05	ZnS
ZnSb	-84.47	-73.46	11.01	ZnSb
ZnSe	-22.68	-37.08	-14.40	ZnSe
ZnSeO4:6H2O	-17.11	-18.63	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.54	-10.17	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 49.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 205

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3·2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2·8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 213

SAVE Solution 214 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 205

END

TITLE

Precipitate oversaturated phases

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 213. Solution after simulation 48.
Using pure phase assemblage 205.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-3.51	-52.21	-48.70	0.000e+00	0	0.000e+00
Alunite	-13.61	-15.01	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-2.69	-7.05	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	3.681e-10	3.681e-10
Barite	-2.55	-12.53	-9.98	0.000e+00	0	0.000e+00
Brochantite	-4.33	10.89	15.22	0.000e+00	0	0.000e+00
Brucite	-3.88	12.96	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	6.154e-05
CaMoO4	-3.26	-11.21	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.90	-4.09	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	5.709e-05	5.709e-05
Carnotite	-5.67	-5.44	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.21	-3.37	9.84	0.000e+00	0	0.000e+00
CdMoO4	-3.27	-17.42	-14.15	0.000e+00	0	0.000e+00
Chrysotile	-0.36	31.84	32.20	0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	1.915e-11	1.915e-11
Cu2Se (alpha)	-7.84	-53.64	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-3.52	-16.59	-13.08	0.000e+00	0	0.000e+00
Epsomite	-5.13	-7.26	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	8.251e-11	8.251e-11
Fluorite	-1.42	-11.92	-10.50	0.000e+00	0	0.000e+00
Gummite	-6.55	1.13	7.67	0.000e+00	0	0.000e+00
Gypsum	-2.44	-7.05	-4.61	0.000e+00	0	0.000e+00
HgSe	-6.29	-61.98	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-7.34	-8.45	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.62	-6.49	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.86	7.93	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-23.88	-8.18	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.85	-13.72	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-5.30	-16.44	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-5.698e-08
Otavite	-2.70	-14.70	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-3.53	-19.15	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-6.02	-20.52	-14.50	0.000e+00	0	0.000e+00
SbO2	-5.55	-33.37	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.87	1.13	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.39	15.37	15.76	0.000e+00	0	0.000e+00
SiO2 (am-ppt)	-0.78	-3.52	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-10.97	-6.89	4.08	0.000e+00	0	0.000e+00
U3O8	-15.60	5.48	21.08	0.000e+00	0	0.000e+00
UO2(OH)2 (beta)	-4.49	1.13	5.61	0.000e+00	0	0.000e+00
UO3	-6.57	1.13	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-4.21	-14.34	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	5.293e-10	5.294e-10

Al	5.019e-08	5.019e-08
As	6.160e-09	6.160e-09
B	8.069e-06	8.069e-06
Ba	1.045e-09	1.045e-09
C	1.370e-03	1.370e-03
Ca	3.426e-04	3.426e-04
Cd	2.793e-10	2.793e-10
Cl	1.889e-03	1.889e-03
Co	1.875e-09	1.875e-09
Cr	5.968e-10	5.968e-10
Cu	9.759e-08	9.760e-08
F	8.026e-05	8.026e-05
Fe	7.056e-10	7.056e-10
Hg	4.578e-11	4.578e-11
K	1.634e-04	1.634e-04
Mg	2.081e-04	2.081e-04
Mn	1.379e-06	1.379e-06
Mo	3.769e-08	3.770e-08
N	3.151e-07	3.151e-07
Na	3.256e-03	3.257e-03
Ni	2.902e-09	2.902e-09
Pb	1.460e-10	1.460e-10
S	5.759e-04	5.760e-04
Sb	5.933e-10	5.934e-10
Se	3.601e-09	3.601e-09
Si	3.153e-04	3.153e-04
U	1.524e-08	1.524e-08
V	1.789e-10	1.789e-10
Zn	4.591e-07	4.592e-07

-----Description of solution-----

	pH	=	8.406	Charge balance
	pe	=	4.367	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	5.494e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.404e-03	
	Total CO2 (mol/kg)	=	1.370e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.727e-08	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	19	
	Total H	=	1.110236e+02	
	Total O	=	5.551817e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.777e-06	2.563e-06	-5.556	-5.591	-0.035	(0)
H+	4.252e-09	3.929e-09	-8.371	-8.406	-0.034	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.293e-10					
AgCl	3.595e-10	3.595e-10	-9.444	-9.444	0.000	(0)
Ag+	1.092e-10	1.009e-10	-9.962	-9.996	-0.034	(0)
AgCl2-	5.962e-11	5.465e-11	-10.225	-10.262	-0.038	(0)
AgSO4-	8.613e-13	7.895e-13	-12.065	-12.103	-0.038	(0)
AgCl3-2	1.204e-13	8.500e-14	-12.919	-13.071	-0.151	(0)
AgOH	2.585e-14	2.585e-14	-13.587	-13.587	0.000	(0)
AgF	1.842e-14	1.842e-14	-13.735	-13.735	0.000	(0)
AgNO2	6.110e-15	6.110e-15	-14.214	-14.214	0.000	(0)
AgH2BO3	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
AgCl4-3	6.630e-16	3.029e-16	-15.178	-15.519	-0.340	(0)
AgSeO3-	1.019e-16	9.343e-17	-15.992	-16.030	-0.038	(0)

	AgNH3+	1.089e-17	9.980e-18	-16.963	-17.001	-0.038	(0)
	Ag (OH) 2-	7.063e-18	6.474e-18	-17.151	-17.189	-0.038	(0)
	Ag2Se	5.049e-18	5.049e-18	-17.297	-17.297	0.000	(0)
	AgNO3	2.191e-20	2.191e-20	-19.659	-19.659	0.000	(0)
	Ag (NO2) 2-	2.992e-21	2.743e-21	-20.524	-20.562	-0.038	(0)
	Ag (NH3) 2+	4.288e-24	3.931e-24	-23.368	-23.406	-0.038	(0)
	Ag (SeO3) 2-3	2.638e-24	1.205e-24	-23.579	-23.919	-0.340	(0)
	Ag2MoO4	1.058e-28	1.058e-28	-27.975	-27.975	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-76.513	-76.513	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.926	-86.530	-0.605	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-151.711	-151.821	-0.111	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-152.634	-152.856	-0.222	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-152.706	-152.744	-0.038	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-152.952	-153.167	-0.215	(0)
Al		5.019e-08					
	Al (OH) 4-	5.004e-08	4.627e-08	-7.301	-7.335	-0.034	(0)
	Al (OH) 3	1.434e-10	1.434e-10	-9.843	-9.843	0.000	(0)
	Al (OH) 2+	3.029e-12	2.805e-12	-11.519	-11.552	-0.033	(0)
	AlF2+	1.222e-14	1.131e-14	-13.913	-13.946	-0.033	(0)
	AlF3	1.035e-14	1.035e-14	-13.985	-13.985	0.000	(0)
	AlOH+2	1.875e-15	1.378e-15	-14.727	-14.861	-0.134	(0)
	AlF+2	5.318e-16	3.909e-16	-15.274	-15.408	-0.134	(0)
	AlF4-	4.081e-16	3.773e-16	-15.389	-15.423	-0.034	(0)
	AlSO4+	1.771e-18	1.637e-18	-17.752	-17.786	-0.034	(0)
	Al+3	1.096e-18	5.378e-19	-17.960	-18.269	-0.309	(0)
	Al (SO4) 2-	7.442e-21	6.880e-21	-20.128	-20.162	-0.034	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.738	-59.078	-0.340	(0)
As (3)		2.665e-23					
	H3AsO3	2.333e-23	2.333e-23	-22.632	-22.632	0.000	(0)
	H2AsO3-	3.322e-24	3.045e-24	-23.479	-23.516	-0.038	(0)
	HAsO3-2	1.001e-27	7.068e-28	-26.999	-27.151	-0.151	(0)
	H4AsO3+	4.954e-32	4.541e-32	-31.305	-31.343	-0.038	(0)
	AsO3-3	1.518e-32	6.935e-33	-31.819	-32.159	-0.340	(0)
As (5)		6.160e-09					
	HAsO4-2	5.987e-09	4.227e-09	-8.223	-8.374	-0.151	(0)
	H2AsO4-	1.652e-10	1.514e-10	-9.782	-9.820	-0.038	(0)
	AsO4-3	7.447e-12	3.402e-12	-11.128	-11.468	-0.340	(0)
	H3AsO4	1.033e-16	1.034e-16	-15.986	-15.985	0.001	(0)
B		8.069e-06					
	H3BO3	6.930e-06	6.939e-06	-5.159	-5.159	0.001	(0)
	H2BO3-	1.113e-06	1.026e-06	-5.953	-5.989	-0.036	(0)
	CaH2BO3+	1.453e-08	1.339e-08	-7.838	-7.873	-0.036	(0)
	MgH2BO3+	5.431e-09	5.004e-09	-8.265	-8.301	-0.036	(0)
	NaH2BO3	4.876e-09	4.876e-09	-8.312	-8.312	0.000	(0)
	BF (OH) 3-	2.185e-10	2.013e-10	-9.661	-9.696	-0.036	(0)
	H5 (BO3) 2-	6.576e-12	6.058e-12	-11.182	-11.218	-0.036	(0)
	BaH2BO3+	2.583e-14	2.380e-14	-13.588	-13.623	-0.036	(0)
	BF2 (OH) 2-	6.672e-15	6.147e-15	-14.176	-14.211	-0.036	(0)
	H8 (BO3) 3-	4.563e-15	4.203e-15	-14.341	-14.376	-0.036	(0)
	AgH2BO3	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
	BF3OH-	7.415e-22	6.831e-22	-21.130	-21.166	-0.036	(0)
	BF4-	1.042e-27	9.601e-28	-26.982	-27.018	-0.036	(0)
Ba		1.045e-09					
	Ba+2	1.030e-09	7.508e-10	-8.987	-9.124	-0.137	(0)
	BaHCO3+	9.466e-12	8.774e-12	-11.024	-11.057	-0.033	(0)
	BaCO3	5.622e-12	5.622e-12	-11.250	-11.250	0.000	(0)
	BaH2BO3+	2.583e-14	2.380e-14	-13.588	-13.623	-0.036	(0)
	BaOH+	9.076e-15	8.398e-15	-14.042	-14.076	-0.034	(0)
	BaNO3+	1.123e-18	1.029e-18	-17.950	-17.988	-0.038	(0)
	BaNH3+2	3.251e-20	2.295e-20	-19.488	-19.639	-0.151	(0)
C (4)		1.370e-03					
	HCO3-	1.322e-03	1.224e-03	-2.879	-2.912	-0.033	(0)
	CO3-2	2.004e-05	1.460e-05	-4.698	-4.836	-0.137	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CaHCO3+	5.575e-06	5.167e-06	-5.254	-5.287	-0.033	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	NaHCO3	2.064e-06	2.064e-06	-5.685	-5.685	0.000	(0)
	MgHCO3+	1.907e-06	1.762e-06	-5.720	-5.754	-0.034	(0)

	MgCO3	1.709e-06	1.709e-06	-5.767	-5.767	0.000	(0)
	NaCO3-	8.808e-07	8.156e-07	-6.055	-6.089	-0.033	(0)
	ZnCO3	1.404e-07	1.404e-07	-6.853	-6.853	0.000	(0)
	CuCO3	7.964e-08	7.964e-08	-7.099	-7.099	0.000	(0)
	MnHCO3+	2.386e-08	2.208e-08	-7.622	-7.656	-0.034	(0)
	UO2 (CO3) 3-4	1.028e-08	2.554e-09	-7.988	-8.593	-0.605	(0)
	ZnHCO3+	7.056e-09	6.468e-09	-8.151	-8.189	-0.038	(0)
	UO2 (CO3) 2-2	4.944e-09	3.490e-09	-8.306	-8.457	-0.151	(0)
	Cu (CO3) 2-2	4.434e-09	3.130e-09	-8.353	-8.504	-0.151	(0)
	NiCO3	7.158e-10	7.158e-10	-9.145	-9.145	0.000	(0)
	CoCO3	2.409e-10	2.409e-10	-9.618	-9.618	0.000	(0)
	NiHCO3+	2.163e-10	1.982e-10	-9.665	-9.703	-0.038	(0)
	PbCO3	1.130e-10	1.130e-10	-9.947	-9.947	0.000	(0)
	CoHCO3+	1.014e-10	9.291e-11	-9.994	-10.032	-0.038	(0)
	CuHCO3+	7.802e-11	7.152e-11	-10.108	-10.146	-0.038	(0)
	CdCO3	4.578e-11	4.578e-11	-10.339	-10.339	0.000	(0)
	UO2CO3	1.198e-11	1.198e-11	-10.922	-10.922	0.000	(0)
	BaHCO3+	9.466e-12	8.774e-12	-11.024	-11.057	-0.033	(0)
	Pb (CO3) 2-2	6.743e-12	4.760e-12	-11.171	-11.322	-0.151	(0)
	BaCO3	5.622e-12	5.622e-12	-11.250	-11.250	0.000	(0)
	PbHCO3+	2.555e-12	2.342e-12	-11.593	-11.630	-0.038	(0)
	Cd (CO3) 2-2	7.020e-13	4.956e-13	-12.154	-12.305	-0.151	(0)
	CdHCO3+	4.181e-13	3.833e-13	-12.379	-12.417	-0.038	(0)
	FeHCO3+	7.244e-16	6.714e-16	-15.140	-15.173	-0.033	(0)
	HgCO3	4.676e-17	4.676e-17	-16.330	-16.330	0.000	(0)
	Hg (CO3) 2-2	3.059e-18	2.159e-18	-17.514	-17.666	-0.151	(0)
	HgHCO3+	3.732e-21	3.421e-21	-20.428	-20.466	-0.038	(0)
Ca		3.426e-04					
	Ca+2	3.112e-04	2.268e-04	-3.507	-3.644	-0.137	(0)
	CaSO4	2.038e-05	2.038e-05	-4.691	-4.691	0.000	(0)
	CaHCO3+	5.575e-06	5.167e-06	-5.254	-5.287	-0.033	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.945e-07	1.799e-07	-6.711	-6.745	-0.034	(0)
	CaH2BO3+	1.453e-08	1.339e-08	-7.838	-7.873	-0.036	(0)
	CaOH+	1.251e-08	1.160e-08	-7.903	-7.936	-0.033	(0)
	CaNO3+	2.139e-13	1.961e-13	-12.670	-12.708	-0.038	(0)
	CaNH3+2	1.959e-14	1.383e-14	-13.708	-13.859	-0.151	(0)
	Ca (NH3) 2+2	3.779e-25	2.668e-25	-24.423	-24.574	-0.151	(0)
Cd		2.793e-10					
	Cd+2	1.888e-10	1.376e-10	-9.724	-9.861	-0.137	(0)
	CdCO3	4.578e-11	4.578e-11	-10.339	-10.339	0.000	(0)
	CdCl+	2.501e-11	2.293e-11	-10.602	-10.640	-0.038	(0)
	CdSO4	1.265e-11	1.265e-11	-10.898	-10.898	0.000	(0)
	CdOH+	3.055e-12	2.800e-12	-11.515	-11.553	-0.038	(0)
	CdOHC1	2.410e-12	2.410e-12	-11.618	-11.618	0.000	(0)
	Cd (CO3) 2-2	7.020e-13	4.956e-13	-12.154	-12.305	-0.151	(0)
	CdHCO3+	4.181e-13	3.833e-13	-12.379	-12.417	-0.038	(0)
	CdF+	1.729e-13	1.585e-13	-12.762	-12.800	-0.038	(0)
	CdCl2	1.668e-13	1.668e-13	-12.778	-12.778	0.000	(0)
	Cd (SO4) 2-2	9.478e-14	6.691e-14	-13.023	-13.174	-0.151	(0)
	Cd (OH) 2	4.527e-14	4.527e-14	-13.344	-13.344	0.000	(0)
	CdCl3-	2.004e-16	1.837e-16	-15.698	-15.736	-0.038	(0)
	CdF2	2.299e-17	2.299e-17	-16.638	-16.638	0.000	(0)
	Cd (OH) 3-	7.733e-18	7.088e-18	-17.112	-17.149	-0.038	(0)
	CdSeO4	1.599e-19	1.599e-19	-18.796	-18.796	0.000	(0)
	CdNO3+	1.298e-19	1.190e-19	-18.887	-18.925	-0.038	(0)
	Cd2OH+3	4.226e-21	1.931e-21	-20.374	-20.714	-0.340	(0)
	Cd (SeO3) 2-2	3.334e-22	2.354e-22	-21.477	-21.628	-0.151	(0)
	Cd (OH) 4-2	4.211e-24	2.973e-24	-23.376	-23.527	-0.151	(0)
	Cd (NO3) 2	1.630e-29	1.630e-29	-28.788	-28.788	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-82.147	-82.185	-0.038	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-155.312	-155.312	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-233.705	-233.743	-0.038	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-311.726	-311.878	-0.151	(0)
Cl		1.889e-03					
	Cl-	1.889e-03	1.745e-03	-2.724	-2.758	-0.034	(0)
	ZnOHC1	2.458e-09	2.458e-09	-8.609	-8.609	0.000	(0)
	MnCl+	2.147e-09	1.987e-09	-8.668	-8.702	-0.034	(0)

ZnCl+	7.932e-10	7.327e-10	-9.101	-9.135	-0.034	(0)
AgCl	3.595e-10	3.595e-10	-9.444	-9.444	0.000	(0)
AgCl2-	5.962e-11	5.465e-11	-10.225	-10.262	-0.038	(0)
CuCl	4.285e-11	4.285e-11	-10.368	-10.368	0.000	(0)
CdCl+	2.501e-11	2.293e-11	-10.602	-10.640	-0.038	(0)
CuCl2-	1.691e-11	1.562e-11	-10.772	-10.806	-0.034	(0)
CoCl+	6.429e-12	5.893e-12	-11.192	-11.230	-0.038	(0)
NiCl+	6.401e-12	5.868e-12	-11.194	-11.232	-0.038	(0)
MnCl2	4.897e-12	4.897e-12	-11.310	-11.310	0.000	(0)
CuCl+	2.774e-12	2.562e-12	-11.557	-11.591	-0.034	(0)
CdOHC1	2.410e-12	2.410e-12	-11.618	-11.618	0.000	(0)
ZnCl2	2.027e-12	2.027e-12	-11.693	-11.693	0.000	(0)
PbCl+	1.740e-13	1.595e-13	-12.759	-12.797	-0.038	(0)
CdCl2	1.668e-13	1.668e-13	-12.778	-12.778	0.000	(0)
AgCl3-2	1.204e-13	8.500e-14	-12.919	-13.071	-0.151	(0)
HgClOH	2.114e-14	2.114e-14	-13.675	-13.675	0.000	(0)
CuCl3-2	7.952e-15	5.830e-15	-14.100	-14.234	-0.135	(0)
ZnCl3-	3.042e-15	2.810e-15	-14.517	-14.551	-0.034	(0)
MnCl3-	2.544e-15	2.354e-15	-14.594	-14.628	-0.034	(0)
CuCl2	1.550e-15	1.550e-15	-14.810	-14.810	0.000	(0)
PbCl2	1.243e-15	1.243e-15	-14.905	-14.905	0.000	(0)
HgCl2	8.151e-16	8.151e-16	-15.089	-15.089	0.000	(0)
AgCl4-3	6.630e-16	3.029e-16	-15.178	-15.519	-0.340	(0)
CdCl3-	2.004e-16	1.837e-16	-15.698	-15.736	-0.038	(0)
NiCl2	5.156e-17	5.156e-17	-16.288	-16.288	0.000	(0)
HgCl3-	1.552e-17	1.423e-17	-16.809	-16.847	-0.038	(0)
ZnCl4-2	3.344e-18	2.452e-18	-17.476	-17.611	-0.135	(0)
PbCl3-	9.424e-19	8.638e-19	-18.026	-18.064	-0.038	(0)
UO2Cl+	6.364e-19	5.833e-19	-18.196	-18.234	-0.038	(0)
HgCl4-2	1.400e-19	9.884e-20	-18.854	-19.005	-0.151	(0)
HgCl+	1.017e-19	9.319e-20	-18.993	-19.031	-0.038	(0)
CrCl+2	4.764e-20	3.363e-20	-19.322	-19.473	-0.151	(0)
CuCl3-	2.734e-20	2.525e-20	-19.563	-19.598	-0.034	(0)
CrOHC12	2.859e-21	2.859e-21	-20.544	-20.544	0.000	(0)
PbCl4-2	9.761e-22	6.891e-22	-21.011	-21.162	-0.151	(0)
FeCl+2	6.771e-24	4.964e-24	-23.169	-23.304	-0.135	(0)
CrCl2+	6.076e-24	5.569e-24	-23.216	-23.254	-0.038	(0)
CuCl4-2	3.013e-25	2.209e-25	-24.521	-24.656	-0.135	(0)
FeCl2+	4.182e-26	3.870e-26	-25.379	-25.412	-0.034	(0)
CrO3Cl-	2.241e-26	2.054e-26	-25.649	-25.687	-0.038	(0)
VOCl+	7.826e-27	7.173e-27	-26.106	-26.144	-0.038	(0)
FeCl3	6.754e-30	6.754e-30	-29.170	-29.170	0.000	(0)
CoCl+2	4.547e-38	3.210e-38	-37.342	-37.494	-0.151	(0)
UCl+3	0.000e+00	0.000e+00	-49.544	-49.884	-0.340	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
Co (2)	1.875e-09					
Co+2	1.383e-09	9.761e-10	-8.859	-9.011	-0.151	(0)
CoCO3	2.409e-10	2.409e-10	-9.618	-9.618	0.000	(0)
CoHCO3+	1.014e-10	9.291e-11	-9.994	-10.032	-0.038	(0)
CoSO4	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
CoOH+	5.444e-11	4.990e-11	-10.264	-10.302	-0.038	(0)
Co (OH) 2	1.016e-11	1.016e-11	-10.993	-10.993	0.000	(0)
CoCl+	6.429e-12	5.893e-12	-11.192	-11.230	-0.038	(0)
CoF+	2.448e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
CoNO2+	2.175e-15	1.994e-15	-14.663	-14.700	-0.038	(0)
Co (OH) 3-	5.666e-16	5.194e-16	-15.247	-15.285	-0.038	(0)
CoOOH-	1.422e-16	1.303e-16	-15.847	-15.885	-0.038	(0)
Co (NH3) +2	8.054e-18	5.686e-18	-17.094	-17.245	-0.151	(0)
CoSeO4	3.053e-18	3.053e-18	-17.515	-17.515	0.000	(0)
CoNO3+	4.615e-19	4.230e-19	-18.336	-18.374	-0.038	(0)
Co2OH+3	5.344e-21	2.441e-21	-20.272	-20.612	-0.340	(0)
Co (OH) 4-2	2.988e-22	2.109e-22	-21.525	-21.676	-0.151	(0)
Co (NH3) 2+2	1.665e-26	1.175e-26	-25.779	-25.930	-0.151	(0)
Co (NO3) 2	2.354e-28	2.354e-28	-27.628	-27.628	0.000	(0)
Co4 (OH) 4+4	4.982e-33	1.238e-33	-32.303	-32.907	-0.605	(0)
Co (NH3) 3+2	1.015e-35	7.168e-36	-34.993	-35.145	-0.151	(0)

Co (NH3) 4+2	0.000e+00	0.000e+00	-44.588	-44.739	-0.151	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-54.683	-54.834	-0.151	(0)
Co (3)	1.667e-30					
CoOH+2	1.667e-30	1.177e-30	-29.778	-29.929	-0.151	(0)
Co+3	1.842e-37	9.039e-38	-36.735	-37.044	-0.309	(0)
CoCl+2	4.547e-38	3.210e-38	-37.342	-37.494	-0.151	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-78.626	-78.777	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
Cr (2)	2.166e-28					
Cr+2	2.166e-28	1.529e-28	-27.664	-27.816	-0.151	(0)
Cr (3)	5.967e-10					
Cr (OH) 2+	2.840e-10	2.603e-10	-9.547	-9.585	-0.038	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.304e-11	3.029e-11	-10.481	-10.519	-0.038	(0)
Cr (OH) 4-	2.789e-11	2.556e-11	-10.555	-10.592	-0.038	(0)
Cr (OH) +2	1.182e-12	8.348e-13	-11.927	-12.078	-0.151	(0)
CrOHSO4	7.769e-14	7.769e-14	-13.110	-13.110	0.000	(0)
CrF+2	2.430e-16	1.716e-16	-15.614	-15.766	-0.151	(0)
Cr+3	3.260e-17	1.489e-17	-16.487	-16.827	-0.340	(0)
CrSO4+	1.488e-17	1.364e-17	-16.827	-16.865	-0.038	(0)
CrCl+2	4.764e-20	3.363e-20	-19.322	-19.473	-0.151	(0)
CrOHC12	2.859e-21	2.859e-21	-20.544	-20.544	0.000	(0)
Cr2 (OH) 2SO4+2	8.304e-24	5.862e-24	-23.081	-23.232	-0.151	(0)
CrCl2+	6.076e-24	5.569e-24	-23.216	-23.254	-0.038	(0)
Cr2 (OH) 2 (SO4) 2	1.366e-25	1.366e-25	-24.865	-24.865	0.000	(0)
CrNO3+2	2.521e-28	1.780e-28	-27.598	-27.750	-0.151	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.468	-53.620	-0.151	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-65.375	-65.715	-0.340	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Cr (6)	5.256e-14					
CrO4-2	5.141e-14	3.747e-14	-13.289	-13.426	-0.137	(0)
NaCrO4-	6.093e-16	5.585e-16	-15.215	-15.253	-0.038	(0)
HCrO4-	5.197e-16	4.763e-16	-15.284	-15.322	-0.038	(0)
KCrO4-	2.286e-17	2.096e-17	-16.641	-16.679	-0.038	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	3.167e-25	2.236e-25	-24.499	-24.651	-0.151	(0)
CrO3Cl-	2.241e-26	2.054e-26	-25.649	-25.687	-0.038	(0)
Cr2O7-2	1.115e-29	7.869e-30	-28.953	-29.104	-0.151	(0)
Cu (1)	8.105e-11					
CuCl	4.285e-11	4.285e-11	-10.368	-10.368	0.000	(0)
Cu+	2.128e-11	1.950e-11	-10.672	-10.710	-0.038	(0)
CuCl2-	1.691e-11	1.562e-11	-10.772	-10.806	-0.034	(0)
CuCl3-2	7.952e-15	5.830e-15	-14.100	-14.234	-0.135	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.952	-151.171	-0.218	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.689	-151.901	-0.211	(0)
Cu (2)	9.751e-08					
CuCO3	7.964e-08	7.964e-08	-7.099	-7.099	0.000	(0)
CuOH+	8.126e-09	7.506e-09	-8.090	-8.125	-0.034	(0)
Cu (CO3) 2-2	4.434e-09	3.130e-09	-8.353	-8.504	-0.151	(0)
Cu (OH) 2	3.838e-09	3.838e-09	-8.416	-8.416	0.000	(0)
Cu+2	1.271e-09	9.263e-10	-8.896	-9.033	-0.137	(0)
CuSO4	8.323e-11	8.323e-11	-10.080	-10.080	0.000	(0)
CuHCO3+	7.802e-11	7.152e-11	-10.108	-10.146	-0.038	(0)
Cu (OH) 3-	2.201e-11	2.017e-11	-10.657	-10.695	-0.038	(0)
CuF+	4.635e-12	4.249e-12	-11.334	-11.372	-0.038	(0)
CuCl+	2.774e-12	2.562e-12	-11.557	-11.591	-0.034	(0)
Cu2 (OH) 2+2	2.005e-12	1.415e-12	-11.698	-11.849	-0.151	(0)
CuNO2+	3.067e-14	2.812e-14	-13.513	-13.551	-0.038	(0)
CuCl2	1.550e-15	1.550e-15	-14.810	-14.810	0.000	(0)
CuNH3+2	6.506e-16	4.593e-16	-15.187	-15.338	-0.151	(0)
Cu (OH) 4-2	5.763e-16	4.068e-16	-15.239	-15.391	-0.151	(0)
CuNO3+	8.739e-19	8.010e-19	-18.059	-18.096	-0.038	(0)
Cu (NO2) 2	8.339e-20	8.339e-20	-19.079	-19.079	0.000	(0)
CuCl3-	2.734e-20	2.525e-20	-19.563	-19.598	-0.034	(0)
CuCl4-2	3.013e-25	2.209e-25	-24.521	-24.656	-0.135	(0)
Cu (NO3) 2	2.758e-29	2.758e-29	-28.559	-28.559	0.000	(0)

F	Cu (HS) 3-	0.000e+00	0.000e+00	-224.090	-224.127	-0.038	(0)
	8.026e-05						
	F-	7.868e-05	7.270e-05	-4.104	-4.138	-0.034	(0)
	MgF+	1.241e-06	1.148e-06	-5.906	-5.940	-0.034	(0)
	CaF+	1.945e-07	1.799e-07	-6.711	-6.745	-0.034	(0)
	NaF	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
	MnF+	2.828e-09	2.617e-09	-8.549	-8.582	-0.034	(0)
	HF	4.225e-10	4.225e-10	-9.374	-9.374	0.000	(0)
	ZnF+	2.645e-10	2.424e-10	-9.578	-9.615	-0.038	(0)
	BF (OH) 3-	2.185e-10	2.013e-10	-9.661	-9.696	-0.036	(0)
	CuF+	4.635e-12	4.249e-12	-11.334	-11.372	-0.038	(0)
	NiF+	2.618e-12	2.400e-12	-11.582	-11.620	-0.038	(0)
	CoF+	2.448e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
	CdF+	1.729e-13	1.585e-13	-12.762	-12.800	-0.038	(0)
	HF2-	1.265e-13	1.168e-13	-12.898	-12.933	-0.035	(0)
	AgF	1.842e-14	1.842e-14	-13.735	-13.735	0.000	(0)
	PbF+	1.439e-14	1.319e-14	-13.842	-13.880	-0.038	(0)
	AlF2+	1.222e-14	1.131e-14	-13.913	-13.946	-0.033	(0)
	AlF3	1.035e-14	1.035e-14	-13.985	-13.985	0.000	(0)
	BF2 (OH) 2-	6.672e-15	6.147e-15	-14.176	-14.211	-0.036	(0)
	UO2F+	2.256e-15	2.068e-15	-14.647	-14.684	-0.038	(0)
	AlF+2	5.318e-16	3.909e-16	-15.274	-15.408	-0.134	(0)
	UO2F2	4.336e-16	4.336e-16	-15.363	-15.363	0.000	(0)
	AlF4-	4.081e-16	3.773e-16	-15.389	-15.423	-0.034	(0)
	CrF+2	2.430e-16	1.716e-16	-15.614	-15.766	-0.151	(0)
	CdF2	2.299e-17	2.299e-17	-16.638	-16.638	0.000	(0)
	PbF2	1.887e-17	1.887e-17	-16.724	-16.724	0.000	(0)
	UO2F3-	8.637e-18	7.917e-18	-17.064	-17.101	-0.038	(0)
	H2F2	4.782e-19	4.782e-19	-18.320	-18.320	0.000	(0)
	FeF2+	1.578e-20	1.461e-20	-19.802	-19.835	-0.034	(0)
	FeF+2	1.024e-20	7.508e-21	-19.990	-20.124	-0.135	(0)
	UO2F4-2	6.476e-21	4.572e-21	-20.189	-20.340	-0.151	(0)
	VO2F	3.519e-21	3.519e-21	-20.454	-20.454	0.000	(0)
	PbF3-	2.839e-21	2.603e-21	-20.547	-20.585	-0.038	(0)
	FeF3	1.498e-21	1.498e-21	-20.824	-20.824	0.000	(0)
	BF3OH-	7.415e-22	6.831e-22	-21.130	-21.166	-0.036	(0)
	VO2F2-	1.013e-22	9.289e-23	-21.994	-22.032	-0.038	(0)
	VOF+	6.969e-25	6.388e-25	-24.157	-24.195	-0.038	(0)
	PbF4-2	1.283e-25	9.055e-26	-24.892	-25.043	-0.151	(0)
	VO2F3-2	1.193e-25	8.423e-26	-24.923	-25.075	-0.151	(0)
	VOF2	1.741e-26	1.741e-26	-25.759	-25.759	0.000	(0)
	HgF+	7.867e-27	7.211e-27	-26.104	-26.142	-0.038	(0)
	BF4-	1.042e-27	9.601e-28	-26.982	-27.018	-0.036	(0)
	Sb (OH) 2F	6.489e-29	6.489e-29	-28.188	-28.188	0.000	(0)
	SbOF	6.381e-29	6.381e-29	-28.195	-28.195	0.000	(0)
	VOF3-	4.900e-29	4.492e-29	-28.310	-28.348	-0.038	(0)
	VO2F4-3	6.595e-30	3.013e-30	-29.181	-29.521	-0.340	(0)
	SiF6-2	2.206e-32	1.617e-32	-31.656	-31.791	-0.135	(0)
	VOF4-2	1.867e-32	1.318e-32	-31.729	-31.880	-0.151	(0)
	UF3+	2.491e-40	2.283e-40	-39.604	-39.642	-0.038	(0)
	UF2+2	0.000e+00	0.000e+00	-40.552	-40.703	-0.151	(0)
	UF4	0.000e+00	0.000e+00	-41.740	-41.740	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-43.324	-43.665	-0.340	(0)
	UF5-	0.000e+00	0.000e+00	-44.243	-44.280	-0.038	(0)
	UF6-2	0.000e+00	0.000e+00	-45.788	-45.939	-0.151	(0)
Fe (2)	7.148e-14						
	Fe+2	6.174e-14	4.359e-14	-13.209	-13.361	-0.151	(0)
	FeOH+	4.805e-15	4.446e-15	-14.318	-14.352	-0.034	(0)
	FeSO4	4.196e-15	4.196e-15	-14.377	-14.377	0.000	(0)
	FeHCO3+	7.244e-16	6.714e-16	-15.140	-15.173	-0.033	(0)
	Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	7.926e-18	7.334e-18	-17.101	-17.135	-0.034	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-165.073	-165.073	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-243.329	-243.367	-0.038	(0)
Fe (3)	7.055e-10						
	Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
	Fe (OH) 2+	1.678e-10	1.554e-10	-9.775	-9.809	-0.033	(0)
	Fe (OH) 4-	1.102e-10	1.020e-10	-9.958	-9.991	-0.033	(0)

	FeOH+2	2.126e-16	1.558e-16	-15.673	-15.807	-0.135	(0)
	FeF2+	1.578e-20	1.461e-20	-19.802	-19.835	-0.034	(0)
	FeF+2	1.024e-20	7.508e-21	-19.990	-20.124	-0.135	(0)
	FeF3	1.498e-21	1.498e-21	-20.824	-20.824	0.000	(0)
	FeSO4+	4.479e-22	4.145e-22	-21.349	-21.383	-0.034	(0)
	Fe+3	1.920e-22	9.419e-23	-21.717	-22.026	-0.309	(0)
	FeCl+2	6.771e-24	4.964e-24	-23.169	-23.304	-0.135	(0)
	Fe (SO4) 2-	3.791e-24	3.475e-24	-23.421	-23.459	-0.038	(0)
	FeCl2+	4.182e-26	3.870e-26	-25.379	-25.412	-0.034	(0)
	FeHSeO3+2	5.013e-28	3.539e-28	-27.300	-27.451	-0.151	(0)
	FeCl3	6.754e-30	6.754e-30	-29.170	-29.170	0.000	(0)
	Fe2 (OH) 2+4	3.237e-30	8.041e-31	-29.490	-30.095	-0.605	(0)
	FeNO3+2	3.648e-31	2.576e-31	-30.438	-30.589	-0.151	(0)
	Fe3 (OH) 4+5	1.591e-38	1.806e-39	-37.798	-38.743	-0.945	(0)
H (0)	4.034e-29						
	H2	2.017e-29	2.019e-29	-28.695	-28.695	0.001	(0)
Hg (0)	4.565e-11						
	Hg	4.565e-11	4.565e-11	-10.341	-10.341	0.000	(0)
Hg (1)	2.349e-25						
	Hg2+2	1.175e-25	8.293e-26	-24.930	-25.081	-0.151	(0)
Hg (2)	1.328e-13						
	Hg (OH) 2	1.107e-13	1.109e-13	-12.956	-12.955	0.001	(0)
	HgClOH	2.114e-14	2.114e-14	-13.675	-13.675	0.000	(0)
	HgCl2	8.151e-16	8.151e-16	-15.089	-15.089	0.000	(0)
	HgCO3	4.676e-17	4.676e-17	-16.330	-16.330	0.000	(0)
	HgCl3-	1.552e-17	1.423e-17	-16.809	-16.847	-0.038	(0)
	Hg (CO3) 2-2	3.059e-18	2.159e-18	-17.514	-17.666	-0.151	(0)
	HgOH+	2.978e-19	2.730e-19	-18.526	-18.564	-0.038	(0)
	HgCl4-2	1.400e-19	9.884e-20	-18.854	-19.005	-0.151	(0)
	HgCl+	1.017e-19	9.319e-20	-18.993	-19.031	-0.038	(0)
	Hg (OH) 3-	3.902e-20	3.577e-20	-19.409	-19.446	-0.038	(0)
	HgHCO3+	3.732e-21	3.421e-21	-20.428	-20.466	-0.038	(0)
	Hg+2	3.791e-24	2.676e-24	-23.421	-23.572	-0.151	(0)
	HgSO4	2.748e-25	2.748e-25	-24.561	-24.561	0.000	(0)
	HgNH3+2	1.159e-25	8.181e-26	-24.936	-25.087	-0.151	(0)
	HgF+	7.867e-27	7.211e-27	-26.104	-26.142	-0.038	(0)
	Hg (NH3) 2+2	5.615e-27	3.964e-27	-26.251	-26.402	-0.151	(0)
	HgNO3+	2.948e-34	2.702e-34	-33.530	-33.568	-0.038	(0)
	Hg (NH3) 3+2	1.083e-36	7.646e-37	-35.965	-36.117	-0.151	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-43.513	-43.513	0.000	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.380	-45.531	-0.151	(0)
	HgHS2-	0.000e+00	0.000e+00	-143.863	-143.901	-0.038	(0)
	HgS2-2	0.000e+00	0.000e+00	-144.052	-144.203	-0.151	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-145.913	-145.913	0.000	(0)
K	1.634e-04						
	K+	1.630e-04	1.506e-04	-3.788	-3.822	-0.034	(0)
	KSO4-	4.515e-07	4.180e-07	-6.345	-6.379	-0.033	(0)
	KCrO4-	2.286e-17	2.096e-17	-16.641	-16.679	-0.038	(0)
Mg	2.081e-04						
	Mg+2	1.931e-04	1.407e-04	-3.714	-3.852	-0.137	(0)
	MgSO4	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
	MgHCO3+	1.907e-06	1.762e-06	-5.720	-5.754	-0.034	(0)
	MgCO3	1.709e-06	1.709e-06	-5.767	-5.767	0.000	(0)
	MgF+	1.241e-06	1.148e-06	-5.906	-5.940	-0.034	(0)
	MgOH+	1.547e-07	1.435e-07	-6.810	-6.843	-0.033	(0)
	MgH2BO3+	5.431e-09	5.004e-09	-8.265	-8.301	-0.036	(0)
Mn (2)	1.379e-06						
	Mn+2	1.281e-06	9.042e-07	-5.893	-6.044	-0.151	(0)
	MnSO4	6.306e-08	6.306e-08	-7.200	-7.200	0.000	(0)
	MnHCO3+	2.386e-08	2.208e-08	-7.622	-7.656	-0.034	(0)
	MnOH+	6.290e-09	5.820e-09	-8.201	-8.235	-0.034	(0)
	MnF+	2.828e-09	2.617e-09	-8.549	-8.582	-0.034	(0)
	MnCl+	2.147e-09	1.987e-09	-8.668	-8.702	-0.034	(0)
	MnCl2	4.897e-12	4.897e-12	-11.310	-11.310	0.000	(0)
	MnCl3-	2.544e-15	2.354e-15	-14.594	-14.628	-0.034	(0)
	MnSeO4	1.519e-15	1.519e-15	-14.818	-14.818	0.000	(0)
	MnNO3+	4.275e-16	3.919e-16	-15.369	-15.407	-0.038	(0)
	Mn (OH) 3-	2.552e-16	2.362e-16	-15.593	-15.627	-0.034	(0)

Mn (OH) 4-2	2.665e-21	1.954e-21	-20.574	-20.709	-0.135	(0)
Mn (NO3) 2	2.692e-25	2.692e-25	-24.570	-24.570	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.644	-43.644	0.000	(0)
Mn (3)	1.915e-27					
Mn+3	1.915e-27	9.395e-28	-26.718	-27.027	-0.309	(0)
Mn (6)	2.406e-40					
MnO4-2	2.406e-40	1.764e-40	-39.619	-39.754	-0.135	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.724	-44.759	-0.035	(0)
Mo	3.769e-08					
MoO4-2	3.769e-08	2.747e-08	-7.424	-7.561	-0.137	(0)
HMoO4-	2.343e-12	2.147e-12	-11.630	-11.668	-0.038	(0)
H2MoO4	6.180e-17	6.180e-17	-16.209	-16.209	0.000	(0)
Ag2MoO4	1.058e-28	1.058e-28	-27.975	-27.975	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-58.738	-59.078	-0.340	(0)
Mo7O24-6	0.000e+00	0.000e+00	-65.823	-67.184	-1.361	(0)
HMo7O24-5	0.000e+00	0.000e+00	-68.258	-69.203	-0.945	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-72.221	-72.826	-0.605	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-77.646	-77.986	-0.340	(0)
N (-3)	4.124e-10					
NH4+	3.624e-10	3.339e-10	-9.441	-9.476	-0.036	(0)
NH3	4.845e-11	4.845e-11	-10.315	-10.315	0.000	(0)
NH4SO4-	1.516e-12	1.403e-12	-11.819	-11.853	-0.034	(0)
CaNH3+2	1.959e-14	1.383e-14	-13.708	-13.859	-0.151	(0)
CuNH3+2	6.506e-16	4.593e-16	-15.187	-15.338	-0.151	(0)
NiNH3+2	4.843e-17	3.419e-17	-16.315	-16.466	-0.151	(0)
AgNH3+	1.089e-17	9.980e-18	-16.963	-17.001	-0.038	(0)
Co (NH3) +2	8.054e-18	5.686e-18	-17.094	-17.245	-0.151	(0)
BaNH3+2	3.251e-20	2.295e-20	-19.488	-19.639	-0.151	(0)
Ag (NH3) 2+	4.288e-24	3.931e-24	-23.368	-23.406	-0.038	(0)
Ca (NH3) 2+2	3.779e-25	2.668e-25	-24.423	-24.574	-0.151	(0)
Ni (NH3) 2+2	3.392e-25	2.395e-25	-24.470	-24.621	-0.151	(0)
HgNH3+2	1.159e-25	8.181e-26	-24.936	-25.087	-0.151	(0)
Co (NH3) 2+2	1.665e-26	1.175e-26	-25.779	-25.930	-0.151	(0)
Hg (NH3) 2+2	5.615e-27	3.964e-27	-26.251	-26.402	-0.151	(0)
Co (NH3) 3+2	1.015e-35	7.168e-36	-34.993	-35.145	-0.151	(0)
Hg (NH3) 3+2	1.083e-36	7.646e-37	-35.965	-36.117	-0.151	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-44.588	-44.739	-0.151	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.380	-45.531	-0.151	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.468	-53.620	-0.151	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-54.683	-54.834	-0.151	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-65.375	-65.715	-0.340	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-78.626	-78.777	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
N (3)	3.144e-07					
NO2-	3.144e-07	2.899e-07	-6.503	-6.538	-0.035	(0)
CuNO2+	3.067e-14	2.812e-14	-13.513	-13.551	-0.038	(0)
AgNO2	6.110e-15	6.110e-15	-14.214	-14.214	0.000	(0)
CoNO2+	2.175e-15	1.994e-15	-14.663	-14.700	-0.038	(0)
Cu (NO2) 2	8.339e-20	8.339e-20	-19.079	-19.079	0.000	(0)
Ag (NO2) 2-	2.992e-21	2.743e-21	-20.524	-20.562	-0.038	(0)
N (5)	2.962e-10					
NO3-	2.960e-10	2.735e-10	-9.529	-9.563	-0.034	(0)
CaNO3+	2.139e-13	1.961e-13	-12.670	-12.708	-0.038	(0)
MnNO3+	4.275e-16	3.919e-16	-15.369	-15.407	-0.038	(0)
ZnNO3+	1.252e-16	1.148e-16	-15.902	-15.940	-0.038	(0)
BaNO3+	1.123e-18	1.029e-18	-17.950	-17.988	-0.038	(0)
NiNO3+	9.847e-19	9.026e-19	-18.007	-18.044	-0.038	(0)
CuNO3+	8.739e-19	8.010e-19	-18.059	-18.096	-0.038	(0)
CoNO3+	4.615e-19	4.230e-19	-18.336	-18.374	-0.038	(0)
CdNO3+	1.298e-19	1.190e-19	-18.887	-18.925	-0.038	(0)
AgNO3	2.191e-20	2.191e-20	-19.659	-19.659	0.000	(0)
PbNO3+	1.136e-20	1.042e-20	-19.944	-19.982	-0.038	(0)
Mn (NO3) 2	2.692e-25	2.692e-25	-24.570	-24.570	0.000	(0)
UO2NO3+	1.227e-25	1.124e-25	-24.911	-24.949	-0.038	(0)

	Zn(NO3)2	6.264e-27	6.264e-27	-26.203	-26.203	0.000	(0)
	CrNO3+2	2.521e-28	1.780e-28	-27.598	-27.750	-0.151	(0)
	Co(NO3)2	2.354e-28	2.354e-28	-27.628	-27.628	0.000	(0)
	Cu(NO3)2	2.758e-29	2.758e-29	-28.559	-28.559	0.000	(0)
	Cd(NO3)2	1.630e-29	1.630e-29	-28.788	-28.788	0.000	(0)
	Pb(NO3)2	4.838e-30	4.838e-30	-29.315	-29.315	0.000	(0)
	VO2NO3	3.818e-30	3.818e-30	-29.418	-29.418	0.000	(0)
	FeNO3+2	3.648e-31	2.576e-31	-30.438	-30.589	-0.151	(0)
	HgNO3+	2.948e-34	2.702e-34	-33.530	-33.568	-0.038	(0)
	Hg(NO3)2	0.000e+00	0.000e+00	-43.513	-43.513	0.000	(0)
Na		3.256e-03					
	Na+	3.247e-03	3.000e-03	-2.489	-2.523	-0.034	(0)
	NaSO4-	6.823e-06	6.318e-06	-5.166	-5.199	-0.033	(0)
	NaHCO3	2.064e-06	2.064e-06	-5.685	-5.685	0.000	(0)
	NaCO3-	8.808e-07	8.156e-07	-6.055	-6.089	-0.033	(0)
	NaF	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
	NaH2BO3	4.876e-09	4.876e-09	-8.312	-8.312	0.000	(0)
	NaCrO4-	6.093e-16	5.585e-16	-15.215	-15.253	-0.038	(0)
Ni		2.902e-09					
	Ni+2	1.803e-09	1.314e-09	-8.744	-8.881	-0.137	(0)
	NiCO3	7.158e-10	7.158e-10	-9.145	-9.145	0.000	(0)
	NiHCO3+	2.163e-10	1.982e-10	-9.665	-9.703	-0.038	(0)
	NiSO4	1.028e-10	1.028e-10	-9.988	-9.988	0.000	(0)
	NiOH+	4.625e-11	4.239e-11	-10.335	-10.373	-0.038	(0)
	Ni(OH)2	8.629e-12	8.629e-12	-11.064	-11.064	0.000	(0)
	NiCl+	6.401e-12	5.868e-12	-11.194	-11.232	-0.038	(0)
	NiF+	2.618e-12	2.400e-12	-11.582	-11.620	-0.038	(0)
	Ni(OH)3-	2.412e-14	2.211e-14	-13.618	-13.655	-0.038	(0)
	Ni(SO4)2-2	1.892e-15	1.335e-15	-14.723	-14.874	-0.151	(0)
	NiCl2	5.156e-17	5.156e-17	-16.288	-16.288	0.000	(0)
	NiNH3+2	4.843e-17	3.419e-17	-16.315	-16.466	-0.151	(0)
	NiSeO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
	NiNO3+	9.847e-19	9.026e-19	-18.007	-18.044	-0.038	(0)
	Ni(NH3)2+2	3.392e-25	2.395e-25	-24.470	-24.621	-0.151	(0)
O(0)		2.482e-35					
	O2	1.241e-35	1.243e-35	-34.906	-34.906	0.001	(0)
Pb		1.460e-10					
	PbCO3	1.130e-10	1.130e-10	-9.947	-9.947	0.000	(0)
	PbOH+	1.809e-11	1.658e-11	-10.743	-10.780	-0.038	(0)
	Pb(CO3)2-2	6.743e-12	4.760e-12	-11.171	-11.322	-0.151	(0)
	Pb+2	3.534e-12	2.575e-12	-11.452	-11.589	-0.137	(0)
	PbHCO3+	2.555e-12	2.342e-12	-11.593	-11.630	-0.038	(0)
	Pb(OH)2	1.343e-12	1.343e-12	-11.872	-11.872	0.000	(0)
	PbSO4	4.947e-13	4.947e-13	-12.306	-12.306	0.000	(0)
	PbCl+	1.740e-13	1.595e-13	-12.759	-12.797	-0.038	(0)
	PbF+	1.439e-14	1.319e-14	-13.842	-13.880	-0.038	(0)
	Pb(OH)3-	3.755e-15	3.442e-15	-14.425	-14.463	-0.038	(0)
	Pb(SO4)2-2	1.656e-15	1.169e-15	-14.781	-14.932	-0.151	(0)
	PbCl2	1.243e-15	1.243e-15	-14.905	-14.905	0.000	(0)
	PbF2	1.887e-17	1.887e-17	-16.724	-16.724	0.000	(0)
	Pb(OH)4-2	3.060e-18	2.160e-18	-17.514	-17.665	-0.151	(0)
	PbCl3-	9.424e-19	8.638e-19	-18.026	-18.064	-0.038	(0)
	PbNO3+	1.136e-20	1.042e-20	-19.944	-19.982	-0.038	(0)
	PbF3-	2.839e-21	2.603e-21	-20.547	-20.585	-0.038	(0)
	Pb2OH+3	1.481e-21	6.767e-22	-20.829	-21.170	-0.340	(0)
	PbCl4-2	9.761e-22	6.891e-22	-21.011	-21.162	-0.151	(0)
	Pb3(OH)4+2	1.314e-25	9.274e-26	-24.882	-25.033	-0.151	(0)
	PbF4-2	1.283e-25	9.055e-26	-24.892	-25.043	-0.151	(0)
	Pb(NO3)2	4.838e-30	4.838e-30	-29.315	-29.315	0.000	(0)
	Pb4(OH)4+4	7.638e-33	1.897e-33	-32.117	-32.722	-0.605	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-156.981	-156.981	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-235.974	-236.012	-0.038	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-76.513	-76.513	0.000	(0)
	HS-	0.000e+00	0.000e+00	-80.293	-80.331	-0.038	(0)
	S5-2	0.000e+00	0.000e+00	-81.139	-81.290	-0.151	(0)
	S6-2	0.000e+00	0.000e+00	-81.655	-81.806	-0.151	(0)
	H2S	0.000e+00	0.000e+00	-81.717	-81.717	0.000	(0)

S4-2	0.000e+00	0.000e+00	-81.735	-81.886	-0.151	(0)
CdHS+	0.000e+00	0.000e+00	-82.147	-82.185	-0.038	(0)
S3-2	0.000e+00	0.000e+00	-82.541	-82.692	-0.151	(0)
S2-2	0.000e+00	0.000e+00	-83.557	-83.708	-0.151	(0)
S-2	0.000e+00	0.000e+00	-89.090	-89.225	-0.135	(0)
HgHS2-	0.000e+00	0.000e+00	-143.863	-143.901	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-144.052	-144.203	-0.151	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-145.913	-145.913	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.952	-151.171	-0.218	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.689	-151.901	-0.211	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-151.711	-151.821	-0.111	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.185	-152.223	-0.038	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-152.634	-152.856	-0.222	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-152.706	-152.744	-0.038	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.952	-153.167	-0.215	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.619	-154.619	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-155.312	-155.312	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-156.981	-156.981	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-165.073	-165.073	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-224.090	-224.127	-0.038	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.632	-231.670	-0.038	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.093	-233.244	-0.151	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-233.705	-233.743	-0.038	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-235.974	-236.012	-0.038	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.329	-243.367	-0.038	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-311.726	-311.878	-0.151	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.310	-313.461	-0.151	(0)
Sb2S4-2	0.000e+00	0.000e+00	-332.270	-332.421	-0.151	(0)
S (6)	5.759e-04					
SO4-2	5.382e-04	3.922e-04	-3.269	-3.407	-0.137	(0)
CaSO4	2.038e-05	2.038e-05	-4.691	-4.691	0.000	(0)
MgSO4	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
NaSO4-	6.823e-06	6.318e-06	-5.166	-5.199	-0.033	(0)
KSO4-	4.515e-07	4.180e-07	-6.345	-6.379	-0.033	(0)
MnSO4	6.306e-08	6.306e-08	-7.200	-7.200	0.000	(0)
ZnSO4	1.434e-08	1.434e-08	-7.843	-7.843	0.000	(0)
HSO4-	1.629e-10	1.506e-10	-9.788	-9.822	-0.034	(0)
NiSO4	1.028e-10	1.028e-10	-9.988	-9.988	0.000	(0)
CuSO4	8.323e-11	8.323e-11	-10.080	-10.080	0.000	(0)
CoSO4	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
Zn (SO4) 2-2	6.939e-11	4.899e-11	-10.159	-10.310	-0.151	(0)
CdSO4	1.265e-11	1.265e-11	-10.898	-10.898	0.000	(0)
NH4SO4-	1.516e-12	1.403e-12	-11.819	-11.853	-0.034	(0)
AgSO4-	8.613e-13	7.895e-13	-12.065	-12.103	-0.038	(0)
PbSO4	4.947e-13	4.947e-13	-12.306	-12.306	0.000	(0)
Cd (SO4) 2-2	9.478e-14	6.691e-14	-13.023	-13.174	-0.151	(0)
CrOHSO4	7.769e-14	7.769e-14	-13.110	-13.110	0.000	(0)
FeSO4	4.196e-15	4.196e-15	-14.377	-14.377	0.000	(0)
Ni (SO4) 2-2	1.892e-15	1.335e-15	-14.723	-14.874	-0.151	(0)
Pb (SO4) 2-2	1.656e-15	1.169e-15	-14.781	-14.932	-0.151	(0)
UO2SO4	1.223e-16	1.223e-16	-15.912	-15.912	0.000	(0)
CrSO4+	1.488e-17	1.364e-17	-16.827	-16.865	-0.038	(0)
AlSO4+	1.771e-18	1.637e-18	-17.752	-17.786	-0.034	(0)
UO2 (SO4) 2-2	8.959e-19	6.325e-19	-18.048	-18.199	-0.151	(0)
Al (SO4) 2-	7.442e-21	6.880e-21	-20.128	-20.162	-0.034	(0)
FeSO4+	4.479e-22	4.145e-22	-21.349	-21.383	-0.034	(0)
VO2SO4-	2.820e-22	2.585e-22	-21.550	-21.588	-0.038	(0)
Cr2 (OH) 2SO4+2	8.304e-24	5.862e-24	-23.081	-23.232	-0.151	(0)
Fe (SO4) 2-	3.791e-24	3.475e-24	-23.421	-23.459	-0.038	(0)
CrO3SO4-2	3.167e-25	2.236e-25	-24.499	-24.651	-0.151	(0)
HgSO4	2.748e-25	2.748e-25	-24.561	-24.561	0.000	(0)
VOSO4	1.583e-25	1.583e-25	-24.801	-24.801	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.366e-25	1.366e-25	-24.865	-24.865	0.000	(0)
VS04+	0.000e+00	0.000e+00	-40.011	-40.049	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-45.139	-45.139	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.481	-45.633	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Sb (3)	2.875e-22					

Sb(OH) 3	1.454e-22	1.454e-22	-21.837	-21.837	0.000	(0)
HSbO2	1.420e-22	1.420e-22	-21.848	-21.848	0.000	(0)
SbO2-	6.384e-26	5.852e-26	-25.195	-25.233	-0.038	(0)
Sb(OH) 4-	3.658e-26	3.353e-26	-25.437	-25.475	-0.038	(0)
Sb(OH) 2F	6.489e-29	6.489e-29	-28.188	-28.188	0.000	(0)
SbOF	6.381e-29	6.381e-29	-28.195	-28.195	0.000	(0)
Sb(OH) 2+	1.514e-29	1.388e-29	-28.820	-28.858	-0.038	(0)
SbO+	5.219e-30	4.784e-30	-29.282	-29.320	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-332.270	-332.421	-0.151	(0)
Sb(5)	5.933e-10					
SbO3-	5.927e-10	5.433e-10	-9.227	-9.265	-0.038	(0)
Sb(OH) 6-	6.875e-13	6.352e-13	-12.163	-12.197	-0.034	(0)
SbO2+	2.624e-27	2.406e-27	-26.581	-26.619	-0.038	(0)
Se(-2)	5.049e-18					
Ag2Se	5.049e-18	5.049e-18	-17.297	-17.297	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.583	-40.621	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-43.644	-43.644	0.000	(0)
H2Se	0.000e+00	0.000e+00	-45.137	-45.137	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.064	-47.215	-0.151	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.926	-86.530	-0.605	(0)
Se(4)	3.592e-09					
SeO3-2	2.041e-09	1.441e-09	-8.690	-8.841	-0.151	(0)
HSeO3-	1.551e-09	1.422e-09	-8.809	-8.847	-0.038	(0)
H2SeO3	2.383e-15	2.383e-15	-14.623	-14.623	0.000	(0)
AgSeO3-	1.019e-16	9.343e-17	-15.992	-16.030	-0.038	(0)
Cd(SeO3) 2-2	3.334e-22	2.354e-22	-21.477	-21.628	-0.151	(0)
Ag(SeO3) 2-3	2.638e-24	1.205e-24	-23.579	-23.919	-0.340	(0)
FeHSeO3+2	5.013e-28	3.539e-28	-27.300	-27.451	-0.151	(0)
Se(6)	8.567e-12					
SeO4-2	8.565e-12	6.242e-12	-11.067	-11.205	-0.137	(0)
MnSeO4	1.519e-15	1.519e-15	-14.818	-14.818	0.000	(0)
ZnSeO4	1.616e-16	1.616e-16	-15.792	-15.792	0.000	(0)
NiSeO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
CoSeO4	3.053e-18	3.053e-18	-17.515	-17.515	0.000	(0)
HSeO4-	1.341e-18	1.229e-18	-17.873	-17.910	-0.038	(0)
CdSeO4	1.599e-19	1.599e-19	-18.796	-18.796	0.000	(0)
Zn(SeO4) 2-2	1.449e-27	1.023e-27	-26.839	-26.990	-0.151	(0)
Si	3.153e-04					
H4SiO4	3.032e-04	3.036e-04	-3.518	-3.518	0.001	(0)
H3SiO4-	1.209e-05	1.117e-05	-4.918	-4.952	-0.034	(0)
H2SiO4-2	2.440e-10	1.794e-10	-9.613	-9.746	-0.134	(0)
UO2H3SiO4+	2.132e-13	1.954e-13	-12.671	-12.709	-0.038	(0)
SiF6-2	2.206e-32	1.617e-32	-31.656	-31.791	-0.135	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.648	-61.989	-0.340	(0)
U(4)	1.319e-20					
U(OH) 5-	1.319e-20	1.209e-20	-19.880	-19.918	-0.038	(0)
U(OH) 4	1.989e-24	1.989e-24	-23.701	-23.701	0.000	(0)
U(OH) 3+	3.117e-29	2.857e-29	-28.506	-28.544	-0.038	(0)
U(OH) 2+2	7.354e-35	5.191e-35	-34.134	-34.285	-0.151	(0)
UF3+	2.491e-40	2.283e-40	-39.604	-39.642	-0.038	(0)
UF2+2	0.000e+00	0.000e+00	-40.552	-40.703	-0.151	(0)
UOH+3	0.000e+00	0.000e+00	-40.677	-41.017	-0.340	(0)
UF4	0.000e+00	0.000e+00	-41.740	-41.740	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.324	-43.665	-0.340	(0)
UF5-	0.000e+00	0.000e+00	-44.243	-44.280	-0.038	(0)
U(SO4) 2	0.000e+00	0.000e+00	-45.139	-45.139	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.481	-45.633	-0.151	(0)
UF6-2	0.000e+00	0.000e+00	-45.788	-45.939	-0.151	(0)
U+4	0.000e+00	0.000e+00	-48.221	-48.826	-0.605	(0)
UCl+3	0.000e+00	0.000e+00	-49.544	-49.884	-0.340	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-180.964	-184.026	-3.062	(0)
U(5)	5.891e-18					
UO2+	5.891e-18	5.400e-18	-17.230	-17.268	-0.038	(0)
U(6)	1.524e-08					
UO2(CO3) 3-4	1.028e-08	2.554e-09	-7.988	-8.593	-0.605	(0)
UO2(CO3) 2-2	4.944e-09	3.490e-09	-8.306	-8.457	-0.151	(0)
UO2CO3	1.198e-11	1.198e-11	-10.922	-10.922	0.000	(0)

UO2H3SiO4+	2.132e-13	1.954e-13	-12.671	-12.709	-0.038	(0)
UO2OH+	7.253e-14	6.648e-14	-13.139	-13.177	-0.038	(0)
UO2F+	2.256e-15	2.068e-15	-14.647	-14.684	-0.038	(0)
UO2F2	4.336e-16	4.336e-16	-15.363	-15.363	0.000	(0)
UO2+2	2.828e-16	2.061e-16	-15.549	-15.686	-0.137	(0)
UO2SO4	1.223e-16	1.223e-16	-15.912	-15.912	0.000	(0)
UO2F3-	8.637e-18	7.917e-18	-17.064	-17.101	-0.038	(0)
UO2 (SO4) 2-2	8.959e-19	6.325e-19	-18.048	-18.199	-0.151	(0)
UO2Cl+	6.364e-19	5.833e-19	-18.196	-18.234	-0.038	(0)
(UO2) 2 (OH) 2+2	1.039e-20	7.335e-21	-19.983	-20.135	-0.151	(0)
UO2F4-2	6.476e-21	4.572e-21	-20.189	-20.340	-0.151	(0)
(UO2) 3 (OH) 5+	2.650e-21	2.429e-21	-20.577	-20.615	-0.038	(0)
UO2NO3+	1.227e-25	1.124e-25	-24.911	-24.949	-0.038	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-46.036	-46.074	-0.038	(0)
V+2	0.000e+00	0.000e+00	-47.842	-47.993	-0.151	(0)
V (3)	6.554e-18					
V (OH) 3	6.554e-18	6.554e-18	-17.183	-17.183	0.000	(0)
V (OH) 2+	1.815e-29	1.664e-29	-28.741	-28.779	-0.038	(0)
VOH+2	8.784e-34	6.202e-34	-33.056	-33.208	-0.151	(0)
V+3	1.057e-39	4.829e-40	-38.976	-39.316	-0.340	(0)
VSO4+	0.000e+00	0.000e+00	-40.011	-40.049	-0.038	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-63.194	-63.534	-0.340	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-65.010	-65.615	-0.605	(0)
V (4)	8.201e-22					
V (OH) 3+	8.171e-22	7.490e-22	-21.088	-21.126	-0.038	(0)
VO+2	2.075e-24	1.465e-24	-23.683	-23.834	-0.151	(0)
VOF+	6.969e-25	6.388e-25	-24.157	-24.195	-0.038	(0)
VOSO4	1.583e-25	1.583e-25	-24.801	-24.801	0.000	(0)
VOF2	1.741e-26	1.741e-26	-25.759	-25.759	0.000	(0)
VOCl+	7.826e-27	7.173e-27	-26.106	-26.144	-0.038	(0)
VOF3-	4.900e-29	4.492e-29	-28.310	-28.348	-0.038	(0)
VOF4-2	1.867e-32	1.318e-32	-31.729	-31.880	-0.151	(0)
H2V2O4+2	3.984e-38	2.812e-38	-37.400	-37.551	-0.151	(0)
V (5)	1.789e-10					
H2VO4-	9.774e-11	8.959e-11	-10.010	-10.048	-0.038	(0)
HVO4-2	8.113e-11	5.728e-11	-10.091	-10.242	-0.151	(0)
H3VO4	3.520e-15	3.520e-15	-14.453	-14.453	0.000	(0)
VO4-3	1.599e-16	7.307e-17	-15.796	-16.136	-0.340	(0)
HV2O7-3	3.807e-18	1.739e-18	-17.419	-17.760	-0.340	(0)
H3V2O7-	2.222e-18	2.036e-18	-17.653	-17.691	-0.038	(0)
V2O7-4	4.796e-20	1.191e-20	-19.319	-19.924	-0.605	(0)
VO2+	2.987e-20	2.760e-20	-19.525	-19.559	-0.034	(0)
VO2F	3.519e-21	3.519e-21	-20.454	-20.454	0.000	(0)
VO2SO4-	2.820e-22	2.585e-22	-21.550	-21.588	-0.038	(0)
VO2F2-	1.013e-22	9.289e-23	-21.994	-22.032	-0.038	(0)
V3O9-3	1.649e-24	7.533e-25	-23.783	-24.123	-0.340	(0)
VO2F3-2	1.193e-25	8.423e-26	-24.923	-25.075	-0.151	(0)
VO2F4-3	6.595e-30	3.013e-30	-29.181	-29.521	-0.340	(0)
VO2NO3	3.818e-30	3.818e-30	-29.418	-29.418	0.000	(0)
V4O12-4	1.133e-31	2.814e-32	-30.946	-31.551	-0.605	(0)
V10O28-6	0.000e+00	0.000e+00	-83.833	-85.194	-1.361	(0)
HV10O28-5	0.000e+00	0.000e+00	-84.468	-85.413	-0.945	(0)
H2V10O28-4	0.000e+00	0.000e+00	-88.006	-88.611	-0.605	(0)
Zn	4.591e-07					
Zn+2	2.294e-07	1.671e-07	-6.640	-6.777	-0.137	(0)
ZnCO3	1.404e-07	1.404e-07	-6.853	-6.853	0.000	(0)
ZnOH+	4.673e-08	4.283e-08	-7.330	-7.368	-0.038	(0)
Zn (OH) 2	1.739e-08	1.739e-08	-7.760	-7.760	0.000	(0)
ZnSO4	1.434e-08	1.434e-08	-7.843	-7.843	0.000	(0)
ZnHCO3+	7.056e-09	6.468e-09	-8.151	-8.189	-0.038	(0)
ZnOHCl	2.458e-09	2.458e-09	-8.609	-8.609	0.000	(0)
ZnCl+	7.932e-10	7.327e-10	-9.101	-9.135	-0.034	(0)
ZnF+	2.645e-10	2.424e-10	-9.578	-9.615	-0.038	(0)
Zn (OH) 3-	2.437e-10	2.234e-10	-9.613	-9.651	-0.038	(0)
Zn (SO4) 2-2	6.939e-11	4.899e-11	-10.159	-10.310	-0.151	(0)
ZnCl2	2.027e-12	2.027e-12	-11.693	-11.693	0.000	(0)
Zn (OH) 4-2	3.228e-14	2.279e-14	-13.491	-13.642	-0.151	(0)

ZnCl3-	3.042e-15	2.810e-15	-14.517	-14.551	-0.034	(0)
ZnSeO4	1.616e-16	1.616e-16	-15.792	-15.792	0.000	(0)
ZnNO3+	1.252e-16	1.148e-16	-15.902	-15.940	-0.038	(0)
ZnCl4-2	3.344e-18	2.452e-18	-17.476	-17.611	-0.135	(0)
Zn(NO3)2	6.264e-27	6.264e-27	-26.203	-26.203	0.000	(0)
Zn(SeO4)2-2	1.449e-27	1.023e-27	-26.839	-26.990	-0.151	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-152.185	-152.223	-0.038	(0)
Zn(HS)2	0.000e+00	0.000e+00	-154.619	-154.619	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-231.632	-231.670	-0.038	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-233.093	-233.244	-0.151	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-313.310	-313.461	-0.151	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-70.57	-64.28	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-55.18	-50.67	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-62.41	-50.67	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-90.09	-72.16	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-71.77	-51.74	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-32.78	-32.38	0.40	(NH4)2CrO4	
(NH4)2SeO4	-30.61	-30.16	0.45	(NH4)2SeO4	
Acanthite	-55.70	-91.92	-36.22	Ag2S	
Ag2CO3	-13.74	-24.83	-11.09	Ag2CO3	
Ag2CrO4	-21.83	-33.42	-11.59	Ag2CrO4	
Ag2HVO4	-15.81	-14.33	1.48	Ag2HVO4	
Ag2MoO4	-16.00	-27.55	-11.55	Ag2MoO4	
Ag2O	-15.75	-3.18	12.57	Ag2O	
Ag2Se	-3.51	-52.21	-48.70	Ag2Se	
Ag2SeO3	-13.28	-20.43	-7.15	Ag2SeO3	
Ag2SeO4	-22.29	-31.20	-8.91	Ag2SeO4	
Ag2SO4	-18.58	-23.40	-4.82	Ag2SO4	
Ag3AsO3	-29.56	-27.40	2.16	Ag3AsO3	
Ag3AsO4	-17.97	-20.76	-2.79	Ag3AsO4	
Ag3H2VO5	-21.10	-15.92	5.18	Ag3H2VO5	
AgF·4H2O	-15.18	-14.13	1.05	AgF·4H2O	
Agmetal	-0.86	-14.36	-13.51	Ag	
AgVO3	-13.51	-12.74	0.77	AgVO3	
Al(OH)3(am)	-3.85	6.95	10.80	Al(OH)3	
Al2(MoO4)3	-61.59	-59.22	2.37	Al2(MoO4)3	
Al2O3	-5.76	13.90	19.65	Al2O3	
Al4(OH)10SO4	-15.13	7.57	22.70	Al4(OH)10SO4	
AlAsO4·2H2O	-13.84	-9.04	4.80	AlAsO4·2H2O	
AlOHSO4	-10.04	-13.27	-3.23	AlOHSO4	
AlSb	-157.15	-91.52	65.62	AlSb	
Alunite	-13.61	-15.01	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-7.21	-15.00	-7.79	PbSO4	
Anhydrite	-2.69	-7.05	-4.36	CaSO4	
Anilite	-58.37	-90.25	-31.88	Cu0.25Cu1.5S	
Antlerite	-5.67	3.12	8.79	Cu3(OH)4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-87.77	-90.53	-2.76	As4O6	
Artinite	-5.33	4.27	9.60	MgCO3:Mg(OH)2·3H2O	
As2O5	-38.68	-31.97	6.71	As2O5	
Atacamite	-3.00	4.39	7.39	Cu2(OH)3Cl	
Azurite	-3.05	-19.96	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2·8H2O	-16.71	7.69	24.39	Ba(OH)2·8H2O	
Ba2V2O7·2H2O	-22.81	-6.93	15.87	Ba2V2O7·2H2O	
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2	
Ba3(VO4)2·4H2O	-32.19	0.75	32.94	Ba3(VO4)2·4H2O	
BaCrO4	-12.88	-22.55	-9.67	BaCrO4	
BaF2	-11.58	-17.40	-5.82	BaF2	
BaMoO4	-9.73	-16.69	-6.96	BaMoO4	
Barite	-2.55	-12.53	-9.98	BaSO4	
BaS	-97.23	-81.05	16.18	BaS	
BaSeO3	-11.40	-9.57	1.83	BaSeO3	
BaSeO4	-12.87	-20.33	-7.46	BaSeO4	

Bianchite	-8.42	-10.18	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.13	10.96	18.09	MnO ₂
Bixbyite	-2.98	-3.62	-0.64	Mn ₂ O ₃
BlaubleiI	-58.04	-82.20	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-58.63	-85.91	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-1.63	6.95	8.58	AlOOH
Breithauptite	-59.25	-77.77	-18.52	NiSb
Brochantite	-4.33	10.89	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.88	12.96	16.84	Mg(OH) ₂
Bunsenite	-4.52	7.93	12.45	NiO
Ca(VO ₃) ₂	-14.80	-9.14	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-13.47	4.03	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.52	4.03	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-14.77	7.53	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-21.77	17.19	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-22.67	17.19	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-300.42	-157.44	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-12.69	-30.60	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.26	-11.21	-7.95	CaMoO ₄
Carnotite	-5.67	-5.44	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.90	-4.09	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.83	-14.85	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.21	-3.37	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.69	6.95	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.78	6.95	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-26.30	-19.59	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.93	0.63	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.82	7.58	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-14.72	-15.38	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-13.68	-15.38	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-13.46	-15.38	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.93	-18.14	-1.21	CdF ₂
Cdmetal(alpha)	-32.11	-18.59	13.51	Cd
Cdmetal(gamma)	-32.21	-18.59	13.62	Cd
CdMoO ₄	-3.27	-17.42	-14.15	CdMoO ₄
CdOHCl	-7.75	-4.21	3.54	CdOHCl
CdSb	-78.40	-78.75	-0.35	CdSb
CdSe	-21.88	-42.08	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-19.22	-21.07	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-13.10	-13.27	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.54	-13.27	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-11.40	-13.27	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-3.00	-12.75	-9.75	AgCl
Cerrusite	-3.29	-16.42	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-9.80	-12.44	-2.64	CuSO ₄ :5H ₂ O
Chalcedony	0.03	-3.52	-3.55	SiO ₂
Chalcocite	-58.43	-93.35	-34.92	Cu ₂ S
Chalcopyrite	-130.97	-166.24	-35.27	CuFeS ₂
Chrysotile	-0.36	31.84	32.20	Mg ₃ Si ₂ O ₅ (OH) ₄
Cinnabar	-56.00	-101.69	-45.69	HgS
Claudetite	-87.46	-90.53	-3.06	As ₄ O ₆
Clausthalite	-16.70	-43.80	-27.10	PbSe
Co(BO ₂) ₂	-29.59	-2.52	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.29	7.80	13.09	Co(OH) ₂
Co(OH) ₃	-9.52	-11.83	-2.31	Co(OH) ₃
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-21.60	-8.57	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-5.36	-15.85	-10.50	Co ₃ O ₄
CoCl ₂	-22.79	-14.53	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-17.06	-14.53	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.87	-13.85	-9.98	CoCO ₃
CoF ₂	-15.69	-17.29	-1.60	CoF ₂
CoF ₃	-48.00	-49.46	-1.46	CoF ₃
CoFe ₂ O ₄	17.71	14.18	-3.53	CoFe ₂ O ₄
CoMoO ₄	-8.81	-16.57	-7.76	CoMoO ₄

CoO	-5.79	7.80	13.59	CoO
CoS (alpha)	-73.50	-80.94	-7.44	CoS
CoS (beta)	-69.87	-80.94	-11.07	CoS
CoSe	-25.03	-41.23	-16.20	CoSe
CoSeO3	-10.77	-9.45	1.32	CoSeO3
CoSeO4:6H2O	-18.69	-20.22	-1.53	CoSeO4:6H2O
CoSO4	-15.22	-12.42	2.80	CoSO4
CoSO4:6H2O	-9.94	-12.42	-2.47	CoSO4:6H2O
Cotunnite	-12.33	-17.11	-4.78	PbCl2
Covellite	-58.66	-80.96	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.42	-33.33	14.09	CrCl2
CrCl3	-49.78	-34.67	15.11	CrCl3
CrF3	-27.47	-38.81	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-16.83	-50.67	-33.84	Na3AlF6
Cu (OH) 2	-0.90	7.78	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.02	15.19	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.66	-2.41	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-58.11	-93.00	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-7.84	-53.64	-45.80	Cu2Se
Cu2SO4	-22.88	-24.83	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.74	-8.64	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.79	-105.38	-42.59	Cu3Sb
Cu3Se2	-31.39	-94.88	-63.49	Cu3Se2
CuCO3	-2.37	-13.87	-11.50	CuCO3
CuCrO4	-17.02	-22.46	-5.44	CuCrO4
CuF	-9.94	-14.85	-4.91	CuF
CuF2	-18.43	-17.31	1.12	CuF2
CuF2:2H2O	-12.76	-17.31	-4.55	CuF2:2H2O
Cumetal	-6.32	-15.08	-8.76	Cu
CuMoO4	-3.52	-16.59	-13.08	CuMoO4
CuOCuSO4	-14.96	-4.66	10.30	CuOCuSO4
Cupricferrite	8.17	14.16	5.99	CuFe2O4
Cuprite	-3.20	-4.61	-1.41	Cu2O
Cuprousferrite	9.80	0.89	-8.92	CuFeO2
CuSe	-8.15	-41.25	-33.10	CuSe
CuSe2	-31.37	-64.73	-33.37	CuSe2
CuSeO3:2H2O	-9.99	-9.47	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.80	-20.24	-2.44	CuSeO4:5H2O
CuSO4	-15.38	-12.44	2.94	CuSO4
Diaspore	0.07	6.95	6.87	AlOOH
Djurleite	-58.61	-92.53	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.63	-17.17	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.08	-17.17	-17.09	CaMg (CO3) 2
Epsomite	-5.13	-7.26	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	2.88	-0.16	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-15.14	-18.86	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-12.42	-10.87	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-24.75	-45.38	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-50.54	-54.27	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.19	-12.79	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.83	-20.92	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-50.46	-69.06	-18.60	FeSe2
FeS (ppt)	-82.34	-85.29	-2.95	FeS
FeSe	-34.58	-45.58	-11.00	FeSe
Fix_pe	-4.37	-4.37	0.00	e-
Fluorite	-1.42	-11.92	-10.50	CaF2
Galena	-69.54	-83.51	-13.97	PbS

Gibbsite	-1.34	6.95	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-8.17	-10.18	-2.01	ZnSO4:7H2O
Greenalite	-17.49	3.32	20.81	Fe3Si2O5 (OH) 4
Greenockite	-67.43	-81.79	-14.36	CdS
Greigite	-300.08	-345.11	-45.03	Fe3S4
Gummite	-6.55	1.13	7.67	UO3
Gypsum	-2.44	-7.05	-4.61	CaSO4:2H2O
H-Jarosite	-18.76	-30.86	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-11.50	-24.37	-12.88	H2MoO4
H2S (g)	-80.73	-88.74	-8.01	H2S
H2Se (g)	-44.07	-49.03	-4.96	H2Se
Halite	-6.88	-5.28	1.60	NaCl
Halloysite	-2.71	6.86	9.57	Al2Si2O5 (OH) 4
Hausmannite	-3.18	57.85	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-5.55	17.35	22.89	FeAl2O4
Hg (CH3) 2 (g)	-186.90	-260.61	-73.71	Hg (CH3) 2
Hg (g)	-9.03	-16.91	-7.87	Hg
Hg (OH) 2	-9.46	-12.96	-3.50	Hg (OH) 2
Hg2 (g)	-18.86	-33.81	-14.96	Hg2
Hg2 (OH) 2	-13.53	-8.27	5.26	Hg2 (OH) 2
Hg2CO3	-13.87	-29.92	-16.05	Hg2CO3
Hg2CrO4	-29.81	-38.51	-8.70	Hg2CrO4
Hg2F2	-23.00	-33.36	-10.36	Hg2F2
Hg2S	-85.33	-97.01	-11.68	Hg2S
Hg2SeO3	-20.87	-25.52	-4.66	Hg2SeO3
Hg2SO4	-22.36	-28.49	-6.13	Hg2SO4
Hg3O2CO3	-30.83	-60.51	-29.68	Hg3O2CO3
HgCl (g)	-34.80	-15.30	19.50	HgCl
HgCl2	-14.02	-35.28	-21.26	HgCl2
HgF (g)	-49.35	-16.68	32.68	HgF
HgF2 (g)	-50.61	-38.04	12.57	HgF2
Hgmetal (l)	-3.46	-16.91	-13.45	Hg
HgSe	-6.29	-61.98	-55.69	HgSe
HgSeO3	-17.78	-30.21	-12.43	HgSeO3
HgSO4	-23.75	-33.17	-9.42	HgSO4
Huntite	-4.57	-34.54	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-8.86	-27.63	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.02	-21.79	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-23.74	-28.91	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-11.48	-26.28	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.07	-51.31	-17.24	K2Cr2O7
K2CrO4	-20.56	-21.07	-0.51	K2CrO4
K2MoO4	-18.47	-15.21	3.26	K2MoO4
K2SeO4	-18.12	-18.85	-0.73	K2SeO4
Kaolinite	-0.57	6.86	7.43	Al2Si2O5 (OH) 4
Langite	-6.59	10.89	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-9.34	-9.77	-0.43	PbO:PbSO4
Laurionite	-6.56	-5.94	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-7.47	5.22	12.69	PbO
Mackinawite	-81.69	-85.29	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.48	19.34	16.86	Fe2MgO4
Magnesite	-1.23	-8.69	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-0.78	-6.09	-5.31	Cu2 (OH) 2CO3
Manganite	-1.80	23.54	25.34	MnOOH
Massicot	-7.67	5.22	12.89	PbO
Matlockite	-9.51	-18.49	-8.97	PbClF
Melanothallite	-20.81	-14.55	6.26	CuCl2
Melanterite	-14.56	-16.77	-2.21	FeSO4:7H2O
Metacinnabar	-56.60	-101.69	-45.09	HgS
Mg (OH) 2 (active)	-5.83	12.96	18.79	Mg (OH) 2
Mg (VO3) 2	-20.63	-9.35	11.28	Mg (VO3) 2
Mg2Sb3	-280.32	-205.63	74.68	Mg2Sb3

Mg2V2O7	-22.75	3.61	26.36	Mg2V2O7
MgCr2O4	-5.60	10.60	16.20	MgCr2O4
MgCrO4	-22.66	-17.28	5.38	MgCrO4
MgF2	-4.00	-12.13	-8.13	MgF2
MgMoO4	-9.56	-11.41	-1.85	MgMoO4
MgSeO3:6H2O	-7.35	-4.29	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.86	-15.06	-1.20	MgSeO4:6H2O
Minium	-32.31	41.21	73.52	Pb3O4
Mirabilite	-7.34	-8.45	-1.11	Na2SO4:10H2O
Mn(VO3)2	-16.44	-11.54	4.90	Mn(VO3)2
Mn2(SO4)3	-58.56	-64.27	-5.71	Mn2(SO4)3
Mn2Sb	-150.79	-89.71	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.17	0.33	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.28	-11.56	2.72	MnCl2:4H2O
MnS(grn)	-78.14	-77.97	0.17	MnS
MnS(pnk)	-81.31	-77.97	3.34	MnS
MnSb	-97.37	-100.28	-2.91	MnSb
MnSe	-41.76	-38.26	3.50	MnSe
MnSeO3	-7.62	-6.49	1.13	MnSeO3
MnSeO3:2H2O	-7.47	-6.49	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.20	-17.25	-2.05	MnSeO4:5H2O
MnSO4	-12.03	-9.45	2.58	MnSO4
Monteponite	-8.15	6.95	15.10	CdO
Montroydite	-9.32	-12.96	-3.64	HgO
MoO3	-16.37	-24.37	-8.00	MoO3
Morenosite	-10.14	-12.29	-2.14	NiSO4:7H2O
MoS2	-157.13	-227.39	-70.26	MoS2
Na-Jarosite	-13.78	-24.98	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.81	-48.71	-9.90	Na2Cr2O7
Na2CrO4	-21.40	-18.47	2.93	Na2CrO4
Na2Mo2O7	-20.38	-36.98	-16.60	Na2Mo2O7
Na2MoO4	-14.10	-12.61	1.49	Na2MoO4
Na2MoO4:2H2O	-13.83	-12.61	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.79	-5.49	10.30	Na2SeO3:5H2O
Na2SeO4	-17.53	-16.25	1.28	Na2SeO4
Na3Sb	-175.27	-80.82	94.45	Na3Sb
Na3VO4	-30.19	6.49	36.68	Na3VO4
Na4V2O7	-36.18	1.22	37.40	Na4V2O7
Nantokite	-6.74	-13.47	-6.73	CuCl
NaSb	-90.21	-67.04	23.17	NaSb
Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-9.13	-5.27	3.86	NaVO3
Nesquehonite	-4.02	-8.69	-4.67	MgCO3:3H2O
Ni(OH)2	-4.86	7.93	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.88	-8.18	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.50	11.50	32.00	Ni4(OH)6SO4
NiCO3	-6.85	-13.72	-6.87	NiCO3
NiMoO4	-5.30	-16.44	-11.14	NiMoO4
NiS(alpha)	-75.21	-80.81	-5.60	NiS
NiS(beta)	-69.71	-80.81	-11.10	NiS
NiS(gamma)	-68.01	-80.81	-12.80	NiS
NiSe	-23.40	-41.10	-17.70	NiSe
NiSeO3:2H2O	-12.14	-9.32	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.57	-20.09	-1.52	NiSeO4:6H2O
Nsutite	-6.54	10.96	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-250.41	-311.47	-61.07	As2S3
Otavite	-2.70	-14.70	-12.00	CdCO3
Pb(BO2)2	-11.61	-5.09	6.52	Pb(BO2)2
Pb(OH)2	-2.93	5.22	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-68.90	-77.66	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.51	-0.72	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.74	10.44	26.19	Pb2O(OH)2
Pb2O3	-25.05	35.99	61.04	Pb2O3
Pb2OCO3	-10.64	-11.20	-0.56	Pb2OCO3
Pb2V2O7	-9.96	-11.86	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.10	-16.30	5.80	Pb3(AsO4)2
Pb3(VO4)2	-12.78	-6.64	6.14	Pb3(VO4)2

Pb3O2CO3	-17.00	-5.98	11.02	Pb3O2CO3
Pb3O2SO4	-15.24	-4.55	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-20.43	0.67	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-21.21	0.67	21.88	Pb4O3SO4
PbCrO4	-12.42	-25.02	-12.60	PbCrO4
PbF2	-12.43	-19.87	-7.44	PbF2
Pbmetal	-24.57	-20.32	4.25	Pb
PbMoO4	-3.53	-19.15	-15.62	PbMoO4
PbO:0.3H2O	-7.76	5.22	12.98	PbO:0.33H2O
PbSeO4	-15.95	-22.79	-6.84	PbSeO4
Periclase	-8.62	12.96	21.58	MgO
Phosgenite	-13.72	-33.53	-19.81	PbCl2:PbCO3
Plattnerite	-18.83	30.77	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-129.97	-148.48	-18.51	FeS2
Pyrochroite	-4.43	10.77	15.19	Mn (OH) 2
Pyrolusite	-5.07	36.31	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-104.39	-124.14	-19.75	AsS
Retgersite	-10.25	-12.29	-2.04	NiSO4:6H2O
Rhodochrosite	-0.30	-10.88	-10.58	MnCO3
Rutherfordine	-6.02	-20.52	-14.50	UO2CO3
Sb (OH) 3	-14.73	-21.84	-7.11	Sb (OH) 3
Sb2O4	-21.53	-18.13	3.40	Sb2O4
Sb2O5	-31.54	-41.21	-9.67	Sb2O5
Sb2Se3	-123.00	-190.76	-67.76	Sb2Se3
Sb4O6(cubic)	-69.09	-87.35	-18.26	Sb4O6
Sb4O6(orth)	-69.45	-87.35	-17.90	Sb4O6
SbCl3	-55.90	-55.33	0.57	SbCl3
SbF3	-49.24	-59.47	-10.23	SbF3
Sbmetal	-48.47	-60.15	-11.69	Sb
SbO2	-5.55	-33.37	-27.82	SbO2
Schoepite	-4.87	1.13	5.99	UO2 (OH) 2:H2O
Semetal (am)	-16.37	-23.48	-7.11	Se
Semetal (hex)	-15.77	-23.48	-7.71	Se
Senarmontite	-31.31	-43.67	-12.37	Sb2O3
SeO2	-17.38	-17.25	0.12	SeO2
SeO3	-49.06	-28.02	21.04	SeO3
Sepiolite	-0.39	15.37	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.41	15.37	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2 (am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2 (am-ppt)	-0.78	-3.52	-2.74	SiO2
Smithsonite	-1.61	-11.61	-10.00	ZnCO3
Sphalerite	-67.25	-78.70	-11.45	ZnS
Spinel	-9.99	26.86	36.85	MgAl2O4
Stibnite	-259.42	-309.88	-50.46	Sb2S3
Sulfur	-61.05	-63.19	-2.14	S
Tenorite	0.13	7.78	7.64	CuO
Thenardite	-8.77	-8.45	0.32	Na2SO4
Thermonatrite	-10.52	-9.88	0.64	Na2CO3:H2O
Tyuyamunite	-10.97	-6.89	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-15.60	5.48	21.08	U3O8
U3Sb4	-591.88	-439.50	152.38	U3Sb4
U4O9	-32.25	-35.27	-3.02	U4O9
UF4	-35.84	-65.38	-29.54	UF4
UF4:2.5H2O	-32.66	-65.38	-32.72	UF4:2.5H2O
UO2 (am)	-16.14	-15.20	0.93	UO2
UO2 (NO3) 2	-46.96	-34.81	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-39.66	-34.81	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-38.20	-34.81	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-36.86	-34.81	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.49	1.13	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.64	-26.89	-2.25	UO2SeO4:4H2O
UO3	-6.57	1.13	7.70	UO3
Uraninite	-10.53	-15.20	-4.67	UO2
USb2	-225.39	-195.82	29.58	USb2
V (OH) 3	-21.69	-14.10	7.59	V (OH) 3

V2O5	-20.95	-22.31	-1.36	V2O5
V3O5	-48.45	-46.61	1.84	V3O5
V4O7	-60.82	-53.64	7.19	V4O7
V6O13	-57.15	-118.01	-60.86	V6O13
Valentinite	-35.19	-43.67	-8.48	Sb2O3
VC12	-68.07	-49.20	18.87	VC12
VC13	-71.02	-47.59	23.43	VC13
VF4	-72.13	-57.20	14.93	VF4
Vmetal	-96.44	-52.42	44.03	V
VO	-41.63	-26.87	14.76	VO
VO(OH)2	-12.17	-7.02	5.15	VO(OH)2
VO2Cl	-25.16	-22.32	2.84	VO2Cl
VOC1	-36.42	-25.26	11.15	VOC1
VOC12	-42.11	-29.35	12.76	VOC12
VOSO4	-30.85	-27.24	3.61	VOSO4
Witherite	-5.39	-13.96	-8.57	BaCO3
Wurtzite	-69.75	-78.70	-8.95	ZnS
Zincite	-1.30	10.03	11.33	ZnO
Zincosite	-14.11	-10.18	3.93	ZnSO4
Zn(BO2)2	-8.57	-0.28	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-29.22	-25.90	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.17	10.03	12.20	Zn(OH)2
Zn(OH)2(am)	-2.44	10.03	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.72	10.03	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.50	10.03	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.70	10.03	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.65	-0.15	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.29	8.91	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.52	-1.87	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.25	-10.33	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.48	19.92	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.66	27.84	38.50	Zn5(OH)8Cl2
ZnCl2	-19.34	-12.29	7.05	ZnCl2
ZnCO3:1H2O	-1.35	-11.61	-10.26	ZnCO3:1H2O
ZnF2	-14.52	-15.05	-0.53	ZnF2
Znmetal	-41.30	-15.51	25.79	Zn
ZnMoO4	-4.21	-14.34	-10.13	ZnMoO4
ZnO(active)	-1.15	10.03	11.19	ZnO
ZnS(am)	-69.65	-78.70	-9.05	ZnS
ZnSb	-86.68	-75.66	11.01	ZnSb
ZnSe	-24.59	-38.99	-14.40	ZnSe
ZnSeO4:6H2O	-16.46	-17.98	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.55	-10.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 50.

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Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 205
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 205
USE Surface 205
USE Solution 214
SAVE Solution 215  #Initial Stage 2 Pit Water After Mineral Precipitation
and Sorption Loss
END
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TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 205.

Diffuse Double Layer Surface-Complexation Model

Hfo

5.021e-21 Surface + diffuse layer charge, eq
2.415e-13 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
5.297e-06 m² for 8.251e-11 moles of Ferrihydrite

Water in diffuse layer: 5.297e-11 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is +1).

Element	Moles
C	1.3532e-16
Ca	1.6771e-18
Cl	2.7098e-15
H	3.9919e-16
K	2.6605e-18
Mg	2.5984e-19
N	1.0970e-14
Na	1.1272e-17
O	4.8897e-13
S	1.1394e-13

Hfo_s

Species	Moles	Mole Fraction	Molality	Log Molality
4.126e-13 moles [0.005 mol/(mol Ferrihydrite)]				
Hfo_sOH2+	2.758e-13	0.668	2.758e-13	-12.559
Hfo_sOH	1.353e-13	0.328	1.353e-13	-12.869
Hfo_sO-	1.520e-15	0.004	1.520e-15	-14.818
Hfo_sOHCa+2	5.034e-18	0.000	5.034e-18	-17.298

Hfo_w

Species	Moles	Mole Fraction	Molality	Log Molality
1.650e-11 moles [0.2 mol/(mol Ferrihydrite)]				
Hfo_wOH2+	7.625e-12	0.462	7.625e-12	-11.118
Hfo_wOH	3.740e-12	0.227	3.740e-12	-11.427
Hfo_wSO4-	2.575e-12	0.156	2.575e-12	-11.589
Hfo_wOHSO4-2	2.520e-12	0.153	2.520e-12	-11.599
Hfo_wO-	4.202e-14	0.003	4.202e-14	-13.377
Hfo_wOMg+	5.938e-20	0.000	5.938e-20	-19.226
Hfo_wOCa+	2.015e-20	0.000	2.015e-20	-19.696

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.

Using solution 214. Solution after simulation 49.

Using surface 205.

Using pure phase assemblage 205. Pure-phase assemblage after simulation 49.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-3.51	-52.21	-48.70	0.000e+00	0	0.000e+00
Alunite	-13.61	-15.01	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-2.69	-7.05	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	3.681e-10	3.680e-10	-6.882e-14
Barite	-2.55	-12.53	-9.98	0.000e+00	0	0.000e+00
Brochantite	-4.33	10.89	15.22	0.000e+00	0	0.000e+00
Brucite	-3.88	12.96	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.388e-11
CaMoO4	-3.26	-11.21	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.90	-4.09	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	5.709e-05	5.709e-05	-3.821e-12
Carnotite	-5.67	-5.44	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.21	-3.37	9.84	0.000e+00	0	0.000e+00
CdMoO4	-3.27	-17.42	-14.15	0.000e+00	0	0.000e+00
Chrysotile	-0.36	31.84	32.20	0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	1.915e-11	1.913e-11	-2.776e-14
Cu2Se(alpha)	-7.84	-53.64	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-3.52	-16.59	-13.08	0.000e+00	0	0.000e+00
Epsomite	-5.13	-7.26	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	8.251e-11	8.251e-11	-4.646e-19
Fluorite	-1.42	-11.92	-10.50	0.000e+00	0	0.000e+00
Gummite	-6.55	1.13	7.67	0.000e+00	0	0.000e+00
Gypsum	-2.44	-7.05	-4.61	0.000e+00	0	0.000e+00
HgSe	-6.29	-61.98	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-7.34	-8.45	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.62	-6.49	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.86	7.93	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.88	-8.18	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.85	-13.72	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-5.30	-16.44	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	3.553e-15
Otavite	-2.70	-14.70	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-3.53	-19.15	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-6.02	-20.52	-14.50	0.000e+00	0	0.000e+00
SbO2	-5.55	-33.37	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.87	1.13	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.39	15.37	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-0.78	-3.52	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-10.97	-6.89	4.08	0.000e+00	0	0.000e+00
U3O8	-15.60	5.48	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.49	1.13	5.61	0.000e+00	0	0.000e+00
UO3	-6.57	1.13	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-4.21	-14.34	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-2.566e-26 Surface + diffuse layer charge, eq
9.521e-14 Surface charge, eq
1.734e-03 sigma, C/m²
1.018e-02 psi, V

-3.963e-01 -F*psi/RT
6.728e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
5.297e-06 m² for 8.251e-11 moles of Ferrihydrite

Water in diffuse layer: 5.297e-11 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 4.153e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.507e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	2.7741e-20
Al	3.1237e-18
As	4.4899e-19
B	4.3759e-16
Ba	4.0231e-20
C	8.5213e-14
Ca	1.3549e-14
Cd	1.1821e-20
Cl	1.1761e-13
Co	7.7772e-20
Cr	2.9916e-20
Cu	5.1755e-18
F	4.9713e-15
Fe	3.7073e-20
H	1.5183e-13
Hg	2.4250e-21
K	7.3715e-15
Mg	8.1728e-15
Mn	5.4025e-17
Mo	2.7589e-18
N	1.9611e-17
Na	1.4690e-13
Ni	1.2519e-19
O	4.9029e-13
Pb	7.6527e-21
S	4.1457e-14
Sb	3.6946e-20
Se	2.4660e-19
Si	1.6815e-14
U	1.4023e-18
V	1.2021e-20
Zn	2.0535e-17

Hfo_s

4.126e-13 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.014e-13	0.488	2.014e-13	-12.696
Hfo_sOCu+	8.865e-14	0.215	8.864e-14	-13.052
Hfo_sOCrOH+	5.553e-14	0.135	5.552e-14	-13.256
Hfo_sOMn+	4.438e-14	0.108	4.438e-14	-13.353
Hfo_sOPb+	1.418e-14	0.034	1.418e-14	-13.848
Hfo_sOHCa+2	6.898e-15	0.017	6.897e-15	-14.161
Hfo_sOH	7.199e-16	0.002	7.199e-16	-15.143
Hfo_sONi+	3.798e-16	0.001	3.798e-16	-15.420
Hfo_sO-	3.200e-16	0.001	3.200e-16	-15.495
Hfo_sOCd+	5.005e-17	0.000	5.005e-17	-16.301
Hfo_sOCu+	4.172e-17	0.000	4.172e-17	-16.380
Hfo_sOH2+	3.711e-17	0.000	3.711e-17	-16.431
Hfo_sOAg	3.523e-19	0.000	3.522e-19	-18.453
Hfo_sOHBa+2	7.058e-20	0.000	7.058e-20	-19.151
Hfo_sOFe+	2.693e-20	0.000	2.693e-20	-19.570
Hfo_sOHg+	1.881e-23	0.000	1.881e-23	-22.726

Hfo_w

1.650e-11 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH	4.622e-12	0.280	4.621e-12	-11.335
Hfo_wOCu+	2.919e-12	0.177	2.918e-12	-11.535
Hfo_wOMg+	2.797e-12	0.169	2.797e-12	-11.553
Hfo_wO-	2.054e-12	0.124	2.054e-12	-11.687
Hfo_wOHAsO4-3	1.962e-12	0.119	1.962e-12	-11.707
Hfo_wOZn+	1.354e-12	0.082	1.354e-12	-11.869
Hfo_wOCa+	2.535e-13	0.015	2.535e-13	-12.596
Hfo_wOH2+	2.382e-13	0.014	2.382e-13	-12.623
Hfo_wOMn+	2.263e-13	0.014	2.263e-13	-12.645
Hfo_wOHVO4-3	4.118e-14	0.002	4.118e-14	-13.385
Hfo_wOHSO4-2	2.469e-14	0.001	2.469e-14	-13.608
Hfo_wOPb+	4.066e-15	0.000	4.066e-15	-14.391
Hfo_wONi+	3.289e-15	0.000	3.289e-15	-14.483
Hfo_wOHSeO3-2	2.176e-15	0.000	2.176e-15	-14.662
Hfo_wOCu+	7.549e-16	0.000	7.548e-16	-15.122
Hfo_wSO4-	6.378e-16	0.000	6.378e-16	-15.195
Hfo_wSeO3-	1.905e-16	0.000	1.905e-16	-15.720
Hfo_wOCd+	1.371e-16	0.000	1.371e-16	-15.863
Hfo_wH2BO3	1.337e-16	0.000	1.337e-16	-15.874
Hfo_wHAsO4-	1.167e-16	0.000	1.167e-16	-15.933
Hfo_wOHMoO4-2	7.044e-17	0.000	7.043e-17	-16.152
Hfo_wMoO4-	2.344e-18	0.000	2.344e-18	-17.630
Hfo_wOAg	5.948e-19	0.000	5.947e-19	-18.226
Hfo_wH2AsO4	1.947e-19	0.000	1.946e-19	-18.711
Hfo_wOFe+	1.091e-19	0.000	1.091e-19	-18.962
Hfo_wOBa+	3.750e-20	0.000	3.750e-20	-19.426
Hfo_wOHg+	5.915e-21	0.000	5.914e-21	-20.228
Hfo_wOHCrO4-2	3.038e-21	0.000	3.038e-21	-20.517
Hfo_wOHSeO4-2	4.021e-22	0.000	4.021e-22	-21.396
Hfo_wOHSbO(OH) 4-	8.707e-23	0.000	8.706e-23	-22.060
Hfo_wCrO4-	7.159e-23	0.000	7.159e-23	-22.145
Hfo_wSeO4-	9.048e-24	0.000	9.047e-24	-23.043
Hfo_wSbO(OH) 4	2.898e-24	0.000	2.898e-24	-23.538
Hfo_wH2AsO3	2.771e-29	0.000	2.770e-29	-28.557

-----Solution composition-----

Elements	Molality	Moles
Ag	5.293e-10	5.294e-10
Al	5.019e-08	5.019e-08
As	6.158e-09	6.158e-09
B	8.069e-06	8.069e-06
Ba	1.046e-09	1.046e-09
C	1.370e-03	1.370e-03
Ca	3.426e-04	3.426e-04
Cd	2.793e-10	2.793e-10
Cl	1.889e-03	1.889e-03
Co	1.875e-09	1.875e-09
Cr	5.968e-10	5.968e-10
Cu	9.759e-08	9.759e-08
F	8.026e-05	8.026e-05
Fe	7.056e-10	7.056e-10
Hg	4.578e-11	4.578e-11
K	1.634e-04	1.634e-04
Mg	2.081e-04	2.081e-04
Mn	1.379e-06	1.379e-06
Mo	3.769e-08	3.770e-08
N	3.151e-07	3.151e-07
Na	3.256e-03	3.257e-03
Ni	2.902e-09	2.902e-09
Pb	1.460e-10	1.460e-10
S	5.759e-04	5.760e-04

Sb	5.933e-10	5.934e-10
Se	3.601e-09	3.601e-09
Si	3.153e-04	3.153e-04
U	1.524e-08	1.524e-08
V	1.788e-10	1.788e-10
Zn	4.591e-07	4.592e-07

-----Description of solution-----

	pH	=	8.406	Charge balance
	pe	=	4.367	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	5.494e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.404e-03	
	Total CO2 (mol/kg)	=	1.370e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.727e-08	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	1	
	Total H	=	1.110236e+02	
	Total O	=	5.551817e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.777e-06	2.563e-06	-5.556	-5.591	-0.035	(0)
H+	4.252e-09	3.929e-09	-8.371	-8.406	-0.034	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.293e-10					
AgCl	3.595e-10	3.595e-10	-9.444	-9.444	0.000	(0)
Ag+	1.092e-10	1.009e-10	-9.962	-9.996	-0.034	(0)
AgCl2-	5.962e-11	5.465e-11	-10.225	-10.262	-0.038	(0)
AgSO4-	8.613e-13	7.895e-13	-12.065	-12.103	-0.038	(0)
AgCl3-2	1.204e-13	8.500e-14	-12.919	-13.071	-0.151	(0)
AgOH	2.585e-14	2.585e-14	-13.587	-13.587	0.000	(0)
AgF	1.842e-14	1.842e-14	-13.735	-13.735	0.000	(0)
AgNO2	6.110e-15	6.110e-15	-14.214	-14.214	0.000	(0)
AgH2BO3	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
AgCl4-3	6.630e-16	3.029e-16	-15.178	-15.519	-0.340	(0)
AgSeO3-	1.019e-16	9.343e-17	-15.992	-16.030	-0.038	(0)
AgNH3+	1.089e-17	9.980e-18	-16.963	-17.001	-0.038	(0)
Ag (OH) 2-	7.063e-18	6.474e-18	-17.151	-17.189	-0.038	(0)
Ag2Se	5.049e-18	5.049e-18	-17.297	-17.297	0.000	(0)
AgNO3	2.191e-20	2.191e-20	-19.659	-19.659	0.000	(0)
Ag (NO2) 2-	2.992e-21	2.743e-21	-20.524	-20.562	-0.038	(0)
Ag (NH3) 2+	4.288e-24	3.931e-24	-23.368	-23.406	-0.038	(0)
Ag (SeO3) 2-3	2.638e-24	1.205e-24	-23.579	-23.919	-0.340	(0)
Ag2MoO4	1.058e-28	1.058e-28	-27.975	-27.975	0.000	(0)
AgHS	0.000e+00	0.000e+00	-76.513	-76.513	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.926	-86.530	-0.605	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-151.711	-151.821	-0.111	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-152.634	-152.856	-0.222	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-152.706	-152.744	-0.038	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.952	-153.167	-0.215	(0)
Al	5.019e-08					
Al (OH) 4-	5.004e-08	4.627e-08	-7.301	-7.335	-0.034	(0)
Al (OH) 3	1.434e-10	1.434e-10	-9.843	-9.843	0.000	(0)
Al (OH) 2+	3.029e-12	2.805e-12	-11.519	-11.552	-0.033	(0)
AlF2+	1.222e-14	1.131e-14	-13.913	-13.946	-0.033	(0)
AlF3	1.035e-14	1.035e-14	-13.985	-13.985	0.000	(0)
AlOH+2	1.875e-15	1.378e-15	-14.727	-14.861	-0.134	(0)
AlF+2	5.318e-16	3.909e-16	-15.274	-15.408	-0.134	(0)
AlF4-	4.081e-16	3.773e-16	-15.389	-15.423	-0.034	(0)

	AlSO4+	1.771e-18	1.637e-18	-17.752	-17.786	-0.034	(0)
	Al+3	1.096e-18	5.378e-19	-17.960	-18.269	-0.309	(0)
	Al (SO4) 2-	7.442e-21	6.880e-21	-20.128	-20.162	-0.034	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.738	-59.078	-0.340	(0)
As (3)	2.664e-23						
	H3AsO3	2.332e-23	2.332e-23	-22.632	-22.632	0.000	(0)
	H2AsO3-	3.321e-24	3.044e-24	-23.479	-23.517	-0.038	(0)
	HAsO3-2	1.001e-27	7.066e-28	-27.000	-27.151	-0.151	(0)
	H4AsO3+	4.952e-32	4.539e-32	-31.305	-31.343	-0.038	(0)
	AsO3-3	1.518e-32	6.933e-33	-31.819	-32.159	-0.340	(0)
As (5)	6.158e-09						
	HAsO4-2	5.985e-09	4.225e-09	-8.223	-8.374	-0.151	(0)
	H2AsO4-	1.652e-10	1.514e-10	-9.782	-9.820	-0.038	(0)
	AsO4-3	7.444e-12	3.401e-12	-11.128	-11.468	-0.340	(0)
	H3AsO4	1.032e-16	1.034e-16	-15.986	-15.986	0.001	(0)
B	8.069e-06						
	H3BO3	6.930e-06	6.939e-06	-5.159	-5.159	0.001	(0)
	H2BO3-	1.113e-06	1.026e-06	-5.953	-5.989	-0.036	(0)
	CaH2BO3+	1.453e-08	1.339e-08	-7.838	-7.873	-0.036	(0)
	MgH2BO3+	5.431e-09	5.004e-09	-8.265	-8.301	-0.036	(0)
	NaH2BO3	4.876e-09	4.876e-09	-8.312	-8.312	0.000	(0)
	BF (OH) 3-	2.185e-10	2.013e-10	-9.661	-9.696	-0.036	(0)
	H5 (BO3) 2-	6.576e-12	6.058e-12	-11.182	-11.218	-0.036	(0)
	BaH2BO3+	2.584e-14	2.380e-14	-13.588	-13.623	-0.036	(0)
	BF2 (OH) 2-	6.672e-15	6.147e-15	-14.176	-14.211	-0.036	(0)
	H8 (BO3) 3-	4.563e-15	4.203e-15	-14.341	-14.376	-0.036	(0)
	AgH2BO3	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
	BF3OH-	7.415e-22	6.831e-22	-21.130	-21.166	-0.036	(0)
	BF4-	1.042e-27	9.601e-28	-26.982	-27.018	-0.036	(0)
Ba	1.046e-09						
	Ba+2	1.030e-09	7.509e-10	-8.987	-9.124	-0.137	(0)
	BaHCO3+	9.468e-12	8.776e-12	-11.024	-11.057	-0.033	(0)
	BaCO3	5.623e-12	5.623e-12	-11.250	-11.250	0.000	(0)
	BaH2BO3+	2.584e-14	2.380e-14	-13.588	-13.623	-0.036	(0)
	BaOH+	9.078e-15	8.400e-15	-14.042	-14.076	-0.034	(0)
	BaNO3+	1.123e-18	1.029e-18	-17.950	-17.988	-0.038	(0)
	BaNH3+2	3.252e-20	2.296e-20	-19.488	-19.639	-0.151	(0)
C (4)	1.370e-03						
	HCO3-	1.322e-03	1.224e-03	-2.879	-2.912	-0.033	(0)
	CO3-2	2.004e-05	1.460e-05	-4.698	-4.836	-0.137	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CaHCO3+	5.575e-06	5.167e-06	-5.254	-5.287	-0.033	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	NaHCO3	2.064e-06	2.064e-06	-5.685	-5.685	0.000	(0)
	MgHCO3+	1.907e-06	1.762e-06	-5.720	-5.754	-0.034	(0)
	MgCO3	1.709e-06	1.709e-06	-5.767	-5.767	0.000	(0)
	NaCO3-	8.808e-07	8.156e-07	-6.055	-6.089	-0.033	(0)
	ZnCO3	1.404e-07	1.404e-07	-6.853	-6.853	0.000	(0)
	CuCO3	7.964e-08	7.964e-08	-7.099	-7.099	0.000	(0)
	MnHCO3+	2.386e-08	2.208e-08	-7.622	-7.656	-0.034	(0)
	UO2 (CO3) 3-4	1.028e-08	2.554e-09	-7.988	-8.593	-0.605	(0)
	ZnHCO3+	7.056e-09	6.468e-09	-8.151	-8.189	-0.038	(0)
	UO2 (CO3) 2-2	4.944e-09	3.490e-09	-8.306	-8.457	-0.151	(0)
	Cu (CO3) 2-2	4.434e-09	3.130e-09	-8.353	-8.504	-0.151	(0)
	NiCO3	7.158e-10	7.158e-10	-9.145	-9.145	0.000	(0)
	CoCO3	2.409e-10	2.409e-10	-9.618	-9.618	0.000	(0)
	NiHCO3+	2.163e-10	1.982e-10	-9.665	-9.703	-0.038	(0)
	PbCO3	1.130e-10	1.130e-10	-9.947	-9.947	0.000	(0)
	CoHCO3+	1.014e-10	9.291e-11	-9.994	-10.032	-0.038	(0)
	CuHCO3+	7.802e-11	7.152e-11	-10.108	-10.146	-0.038	(0)
	CdCO3	4.578e-11	4.578e-11	-10.339	-10.339	0.000	(0)
	UO2CO3	1.198e-11	1.198e-11	-10.922	-10.922	0.000	(0)
	BaHCO3+	9.468e-12	8.776e-12	-11.024	-11.057	-0.033	(0)
	Pb (CO3) 2-2	6.742e-12	4.760e-12	-11.171	-11.322	-0.151	(0)
	BaCO3	5.623e-12	5.623e-12	-11.250	-11.250	0.000	(0)
	PbHCO3+	2.554e-12	2.341e-12	-11.593	-11.631	-0.038	(0)
	Cd (CO3) 2-2	7.020e-13	4.956e-13	-12.154	-12.305	-0.151	(0)
	CdHCO3+	4.181e-13	3.833e-13	-12.379	-12.417	-0.038	(0)

		FeHCO3+	7.244e-16	6.714e-16	-15.140	-15.173	-0.033	(0)
		HgCO3	4.676e-17	4.676e-17	-16.330	-16.330	0.000	(0)
		Hg (CO3) 2-2	3.059e-18	2.159e-18	-17.514	-17.666	-0.151	(0)
		HgHCO3+	3.732e-21	3.421e-21	-20.428	-20.466	-0.038	(0)
Ca	3.426e-04							
		Ca+2	3.112e-04	2.268e-04	-3.507	-3.644	-0.137	(0)
		CaSO4	2.038e-05	2.038e-05	-4.691	-4.691	0.000	(0)
		CaHCO3+	5.575e-06	5.167e-06	-5.254	-5.287	-0.033	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	1.945e-07	1.799e-07	-6.711	-6.745	-0.034	(0)
		CaH2BO3+	1.453e-08	1.339e-08	-7.838	-7.873	-0.036	(0)
		CaOH+	1.251e-08	1.160e-08	-7.903	-7.936	-0.033	(0)
		CaNO3+	2.139e-13	1.961e-13	-12.670	-12.708	-0.038	(0)
		CaNH3+2	1.959e-14	1.383e-14	-13.708	-13.859	-0.151	(0)
		Ca (NH3) 2+2	3.779e-25	2.668e-25	-24.423	-24.574	-0.151	(0)
Cd	2.793e-10							
		Cd+2	1.888e-10	1.376e-10	-9.724	-9.861	-0.137	(0)
		CdCO3	4.578e-11	4.578e-11	-10.339	-10.339	0.000	(0)
		CdCl+	2.501e-11	2.293e-11	-10.602	-10.640	-0.038	(0)
		CdSO4	1.265e-11	1.265e-11	-10.898	-10.898	0.000	(0)
		CdOH+	3.055e-12	2.800e-12	-11.515	-11.553	-0.038	(0)
		CdOHC1	2.410e-12	2.410e-12	-11.618	-11.618	0.000	(0)
		Cd (CO3) 2-2	7.020e-13	4.956e-13	-12.154	-12.305	-0.151	(0)
		CdHCO3+	4.181e-13	3.833e-13	-12.379	-12.417	-0.038	(0)
		CdF+	1.729e-13	1.585e-13	-12.762	-12.800	-0.038	(0)
		CdCl2	1.668e-13	1.668e-13	-12.778	-12.778	0.000	(0)
		Cd (SO4) 2-2	9.478e-14	6.691e-14	-13.023	-13.174	-0.151	(0)
		Cd (OH) 2	4.527e-14	4.527e-14	-13.344	-13.344	0.000	(0)
		CdCl3-	2.004e-16	1.837e-16	-15.698	-15.736	-0.038	(0)
		CdF2	2.299e-17	2.299e-17	-16.638	-16.638	0.000	(0)
		Cd (OH) 3-	7.733e-18	7.088e-18	-17.112	-17.149	-0.038	(0)
		CdSeO4	1.599e-19	1.599e-19	-18.796	-18.796	0.000	(0)
		CdNO3+	1.298e-19	1.190e-19	-18.887	-18.925	-0.038	(0)
		Cd2OH+3	4.226e-21	1.931e-21	-20.374	-20.714	-0.340	(0)
		Cd (SeO3) 2-2	3.334e-22	2.354e-22	-21.477	-21.628	-0.151	(0)
		Cd (OH) 4-2	4.211e-24	2.973e-24	-23.376	-23.527	-0.151	(0)
		Cd (NO3) 2	1.630e-29	1.630e-29	-28.788	-28.788	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-82.147	-82.185	-0.038	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-155.312	-155.312	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-233.705	-233.743	-0.038	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-311.726	-311.878	-0.151	(0)
Cl	1.889e-03							
		Cl-	1.889e-03	1.745e-03	-2.724	-2.758	-0.034	(0)
		ZnOHC1	2.458e-09	2.458e-09	-8.609	-8.609	0.000	(0)
		MnCl+	2.147e-09	1.987e-09	-8.668	-8.702	-0.034	(0)
		ZnCl+	7.932e-10	7.327e-10	-9.101	-9.135	-0.034	(0)
		AgCl	3.595e-10	3.595e-10	-9.444	-9.444	0.000	(0)
		AgCl2-	5.962e-11	5.465e-11	-10.225	-10.262	-0.038	(0)
		CuCl	4.285e-11	4.285e-11	-10.368	-10.368	0.000	(0)
		CdCl+	2.501e-11	2.293e-11	-10.602	-10.640	-0.038	(0)
		CuCl2-	1.691e-11	1.562e-11	-10.772	-10.806	-0.034	(0)
		CoCl+	6.429e-12	5.893e-12	-11.192	-11.230	-0.038	(0)
		NiCl+	6.401e-12	5.868e-12	-11.194	-11.232	-0.038	(0)
		MnCl2	4.897e-12	4.897e-12	-11.310	-11.310	0.000	(0)
		CuCl+	2.774e-12	2.562e-12	-11.557	-11.591	-0.034	(0)
		CdOHC1	2.410e-12	2.410e-12	-11.618	-11.618	0.000	(0)
		ZnCl2	2.027e-12	2.027e-12	-11.693	-11.693	0.000	(0)
		PbCl+	1.740e-13	1.595e-13	-12.760	-12.797	-0.038	(0)
		CdCl2	1.668e-13	1.668e-13	-12.778	-12.778	0.000	(0)
		AgCl3-2	1.204e-13	8.500e-14	-12.919	-13.071	-0.151	(0)
		HgClOH	2.114e-14	2.114e-14	-13.675	-13.675	0.000	(0)
		CuCl3-2	7.952e-15	5.830e-15	-14.100	-14.234	-0.135	(0)
		ZnCl3-	3.041e-15	2.810e-15	-14.517	-14.551	-0.034	(0)
		MnCl3-	2.544e-15	2.354e-15	-14.594	-14.628	-0.034	(0)
		CuCl2	1.550e-15	1.550e-15	-14.810	-14.810	0.000	(0)
		PbCl2	1.243e-15	1.243e-15	-14.905	-14.905	0.000	(0)
		HgCl2	8.151e-16	8.151e-16	-15.089	-15.089	0.000	(0)
		AgCl4-3	6.630e-16	3.029e-16	-15.178	-15.519	-0.340	(0)

CdCl3-	2.004e-16	1.837e-16	-15.698	-15.736	-0.038	(0)
NiCl2	5.156e-17	5.156e-17	-16.288	-16.288	0.000	(0)
HgCl3-	1.552e-17	1.423e-17	-16.809	-16.847	-0.038	(0)
ZnCl4-2	3.344e-18	2.452e-18	-17.476	-17.611	-0.135	(0)
PbCl3-	9.423e-19	8.637e-19	-18.026	-18.064	-0.038	(0)
UO2Cl+	6.364e-19	5.833e-19	-18.196	-18.234	-0.038	(0)
HgCl4-2	1.400e-19	9.884e-20	-18.854	-19.005	-0.151	(0)
HgCl+	1.017e-19	9.319e-20	-18.993	-19.031	-0.038	(0)
CrCl+2	4.764e-20	3.363e-20	-19.322	-19.473	-0.151	(0)
CuCl3-	2.734e-20	2.525e-20	-19.563	-19.598	-0.034	(0)
CrOHC12	2.859e-21	2.859e-21	-20.544	-20.544	0.000	(0)
PbCl4-2	9.760e-22	6.890e-22	-21.011	-21.162	-0.151	(0)
FeCl+2	6.771e-24	4.964e-24	-23.169	-23.304	-0.135	(0)
CrCl2+	6.076e-24	5.569e-24	-23.216	-23.254	-0.038	(0)
CuCl4-2	3.013e-25	2.209e-25	-24.521	-24.656	-0.135	(0)
FeCl2+	4.182e-26	3.870e-26	-25.379	-25.412	-0.034	(0)
CrO3Cl-	2.241e-26	2.054e-26	-25.649	-25.687	-0.038	(0)
VOCl+	7.824e-27	7.172e-27	-26.107	-26.144	-0.038	(0)
FeCl3	6.754e-30	6.754e-30	-29.170	-29.170	0.000	(0)
CoCl+2	4.547e-38	3.210e-38	-37.342	-37.494	-0.151	(0)
UCl+3	0.000e+00	0.000e+00	-49.544	-49.884	-0.340	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
Co (2)	1.875e-09					
Co+2	1.383e-09	9.761e-10	-8.859	-9.011	-0.151	(0)
CoCO3	2.409e-10	2.409e-10	-9.618	-9.618	0.000	(0)
CoHCO3+	1.014e-10	9.291e-11	-9.994	-10.032	-0.038	(0)
CoSO4	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
CoOH+	5.444e-11	4.990e-11	-10.264	-10.302	-0.038	(0)
Co (OH) 2	1.016e-11	1.016e-11	-10.993	-10.993	0.000	(0)
CoCl+	6.429e-12	5.893e-12	-11.192	-11.230	-0.038	(0)
CoF+	2.448e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
CoNO2+	2.175e-15	1.994e-15	-14.663	-14.700	-0.038	(0)
Co (OH) 3-	5.666e-16	5.194e-16	-15.247	-15.285	-0.038	(0)
CoOOH-	1.422e-16	1.303e-16	-15.847	-15.885	-0.038	(0)
Co (NH3) +2	8.054e-18	5.686e-18	-17.094	-17.245	-0.151	(0)
CoSeO4	3.053e-18	3.053e-18	-17.515	-17.515	0.000	(0)
CoNO3+	4.615e-19	4.230e-19	-18.336	-18.374	-0.038	(0)
Co2OH+3	5.344e-21	2.441e-21	-20.272	-20.612	-0.340	(0)
Co (OH) 4-2	2.988e-22	2.109e-22	-21.525	-21.676	-0.151	(0)
Co (NH3) 2+2	1.665e-26	1.175e-26	-25.779	-25.930	-0.151	(0)
Co (NO3) 2	2.354e-28	2.354e-28	-27.628	-27.628	0.000	(0)
Co4 (OH) 4+4	4.982e-33	1.238e-33	-32.303	-32.907	-0.605	(0)
Co (NH3) 3+2	1.015e-35	7.168e-36	-34.993	-35.145	-0.151	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-44.588	-44.739	-0.151	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-54.683	-54.834	-0.151	(0)
Co (3)	1.667e-30					
CoOH+2	1.667e-30	1.177e-30	-29.778	-29.929	-0.151	(0)
Co+3	1.842e-37	9.039e-38	-36.735	-37.044	-0.309	(0)
CoCl+2	4.547e-38	3.210e-38	-37.342	-37.494	-0.151	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-78.626	-78.777	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
Cr (2)	2.166e-28					
Cr+2	2.166e-28	1.529e-28	-27.664	-27.816	-0.151	(0)
Cr (3)	5.967e-10					
Cr (OH) 2+	2.840e-10	2.603e-10	-9.547	-9.585	-0.038	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.304e-11	3.029e-11	-10.481	-10.519	-0.038	(0)
Cr (OH) 4-	2.789e-11	2.556e-11	-10.555	-10.592	-0.038	(0)
Cr (OH) +2	1.182e-12	8.348e-13	-11.927	-12.078	-0.151	(0)
CrOHSO4	7.769e-14	7.769e-14	-13.110	-13.110	0.000	(0)
CrF+2	2.430e-16	1.716e-16	-15.614	-15.766	-0.151	(0)
Cr+3	3.260e-17	1.489e-17	-16.487	-16.827	-0.340	(0)
CrSO4+	1.488e-17	1.364e-17	-16.827	-16.865	-0.038	(0)
CrCl+2	4.764e-20	3.363e-20	-19.322	-19.473	-0.151	(0)

	CrOHC12	2.859e-21	2.859e-21	-20.544	-20.544	0.000	(0)
	Cr2 (OH) 2SO4+2	8.304e-24	5.862e-24	-23.081	-23.232	-0.151	(0)
	CrCl2+	6.076e-24	5.569e-24	-23.216	-23.254	-0.038	(0)
	Cr2 (OH) 2 (SO4) 2	1.366e-25	1.366e-25	-24.865	-24.865	0.000	(0)
	CrNO3+2	2.521e-28	1.780e-28	-27.598	-27.750	-0.151	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.468	-53.620	-0.151	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-65.375	-65.715	-0.340	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Cr (6)	5.256e-14						
	CrO4-2	5.141e-14	3.747e-14	-13.289	-13.426	-0.137	(0)
	NaCrO4-	6.093e-16	5.585e-16	-15.215	-15.253	-0.038	(0)
	HCrO4-	5.197e-16	4.763e-16	-15.284	-15.322	-0.038	(0)
	KCrO4-	2.286e-17	2.096e-17	-16.641	-16.679	-0.038	(0)
	H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
	CrO3SO4-2	3.167e-25	2.236e-25	-24.499	-24.651	-0.151	(0)
	CrO3Cl-	2.241e-26	2.054e-26	-25.649	-25.687	-0.038	(0)
	Cr2O7-2	1.115e-29	7.869e-30	-28.953	-29.104	-0.151	(0)
Cu (1)	8.105e-11						
	CuCl	4.285e-11	4.285e-11	-10.368	-10.368	0.000	(0)
	Cu+	2.128e-11	1.950e-11	-10.672	-10.710	-0.038	(0)
	CuCl2-	1.691e-11	1.562e-11	-10.772	-10.806	-0.034	(0)
	CuCl3-2	7.952e-15	5.830e-15	-14.100	-14.234	-0.135	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-150.952	-151.171	-0.218	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-151.689	-151.901	-0.211	(0)
Cu (2)	9.750e-08						
	CuCO3	7.964e-08	7.964e-08	-7.099	-7.099	0.000	(0)
	CuOH+	8.126e-09	7.506e-09	-8.090	-8.125	-0.034	(0)
	Cu (CO3) 2-2	4.434e-09	3.130e-09	-8.353	-8.504	-0.151	(0)
	Cu (OH) 2	3.838e-09	3.838e-09	-8.416	-8.416	0.000	(0)
	Cu+2	1.271e-09	9.263e-10	-8.896	-9.033	-0.137	(0)
	CuSO4	8.322e-11	8.322e-11	-10.080	-10.080	0.000	(0)
	CuHCO3+	7.802e-11	7.152e-11	-10.108	-10.146	-0.038	(0)
	Cu (OH) 3-	2.201e-11	2.017e-11	-10.657	-10.695	-0.038	(0)
	CuF+	4.635e-12	4.249e-12	-11.334	-11.372	-0.038	(0)
	CuCl+	2.774e-12	2.562e-12	-11.557	-11.591	-0.034	(0)
	Cu2 (OH) 2+2	2.005e-12	1.415e-12	-11.698	-11.849	-0.151	(0)
	CuNO2+	3.067e-14	2.811e-14	-13.513	-13.551	-0.038	(0)
	CuCl2	1.550e-15	1.550e-15	-14.810	-14.810	0.000	(0)
	CuNH3+2	6.505e-16	4.593e-16	-15.187	-15.338	-0.151	(0)
	Cu (OH) 4-2	5.763e-16	4.068e-16	-15.239	-15.391	-0.151	(0)
	CuNO3+	8.739e-19	8.010e-19	-18.059	-18.096	-0.038	(0)
	Cu (NO2) 2	8.339e-20	8.339e-20	-19.079	-19.079	0.000	(0)
	CuCl3-	2.734e-20	2.525e-20	-19.563	-19.598	-0.034	(0)
	CuCl4-2	3.013e-25	2.209e-25	-24.521	-24.656	-0.135	(0)
	Cu (NO3) 2	2.758e-29	2.758e-29	-28.559	-28.559	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-224.090	-224.127	-0.038	(0)
F	8.026e-05						
	F-	7.868e-05	7.270e-05	-4.104	-4.138	-0.034	(0)
	MgF+	1.241e-06	1.148e-06	-5.906	-5.940	-0.034	(0)
	CaF+	1.945e-07	1.799e-07	-6.711	-6.745	-0.034	(0)
	NaF	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
	MnF+	2.828e-09	2.617e-09	-8.549	-8.582	-0.034	(0)
	HF	4.225e-10	4.225e-10	-9.374	-9.374	0.000	(0)
	ZnF+	2.645e-10	2.424e-10	-9.578	-9.615	-0.038	(0)
	BF (OH) 3-	2.185e-10	2.013e-10	-9.661	-9.696	-0.036	(0)
	CuF+	4.635e-12	4.249e-12	-11.334	-11.372	-0.038	(0)
	NiF+	2.618e-12	2.400e-12	-11.582	-11.620	-0.038	(0)
	CoF+	2.448e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
	CdF+	1.729e-13	1.585e-13	-12.762	-12.800	-0.038	(0)
	HF2-	1.265e-13	1.168e-13	-12.898	-12.933	-0.035	(0)
	AgF	1.842e-14	1.842e-14	-13.735	-13.735	0.000	(0)
	PbF+	1.439e-14	1.319e-14	-13.842	-13.880	-0.038	(0)
	AlF2+	1.222e-14	1.131e-14	-13.913	-13.946	-0.033	(0)
	AlF3	1.035e-14	1.035e-14	-13.985	-13.985	0.000	(0)
	BF2 (OH) 2-	6.672e-15	6.147e-15	-14.176	-14.211	-0.036	(0)
	UO2F+	2.256e-15	2.068e-15	-14.647	-14.684	-0.038	(0)
	AlF+2	5.318e-16	3.909e-16	-15.274	-15.408	-0.134	(0)
	UO2F2	4.336e-16	4.336e-16	-15.363	-15.363	0.000	(0)

AlF4-	4.081e-16	3.773e-16	-15.389	-15.423	-0.034	(0)
CrF+2	2.430e-16	1.716e-16	-15.614	-15.766	-0.151	(0)
CdF2	2.299e-17	2.299e-17	-16.638	-16.638	0.000	(0)
PbF2	1.887e-17	1.887e-17	-16.724	-16.724	0.000	(0)
UO2F3-	8.637e-18	7.917e-18	-17.064	-17.101	-0.038	(0)
H2F2	4.782e-19	4.782e-19	-18.320	-18.320	0.000	(0)
FeF2+	1.578e-20	1.461e-20	-19.802	-19.835	-0.034	(0)
FeF+2	1.024e-20	7.508e-21	-19.990	-20.124	-0.135	(0)
UO2F4-2	6.476e-21	4.572e-21	-20.189	-20.340	-0.151	(0)
VO2F	3.518e-21	3.518e-21	-20.454	-20.454	0.000	(0)
PbF3-	2.839e-21	2.602e-21	-20.547	-20.585	-0.038	(0)
FeF3	1.498e-21	1.498e-21	-20.824	-20.824	0.000	(0)
BF3OH-	7.415e-22	6.831e-22	-21.130	-21.166	-0.036	(0)
VO2F2-	1.013e-22	9.286e-23	-21.994	-22.032	-0.038	(0)
VOF+	6.968e-25	6.387e-25	-24.157	-24.195	-0.038	(0)
PbF4-2	1.283e-25	9.054e-26	-24.892	-25.043	-0.151	(0)
VO2F3-2	1.193e-25	8.421e-26	-24.923	-25.075	-0.151	(0)
VOF2	1.741e-26	1.741e-26	-25.759	-25.759	0.000	(0)
HgF+	7.867e-27	7.211e-27	-26.104	-26.142	-0.038	(0)
BF4-	1.042e-27	9.601e-28	-26.982	-27.018	-0.036	(0)
Sb(OH) 2F	6.489e-29	6.489e-29	-28.188	-28.188	0.000	(0)
SbOF	6.381e-29	6.381e-29	-28.195	-28.195	0.000	(0)
VOF3-	4.899e-29	4.491e-29	-28.310	-28.348	-0.038	(0)
VO2F4-3	6.594e-30	3.012e-30	-29.181	-29.521	-0.340	(0)
SiF6-2	2.206e-32	1.617e-32	-31.656	-31.791	-0.135	(0)
VOF4-2	1.867e-32	1.318e-32	-31.729	-31.880	-0.151	(0)
UF3+	2.491e-40	2.283e-40	-39.604	-39.642	-0.038	(0)
UF2+2	0.000e+00	0.000e+00	-40.552	-40.703	-0.151	(0)
UF4	0.000e+00	0.000e+00	-41.740	-41.740	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.324	-43.665	-0.340	(0)
UF5-	0.000e+00	0.000e+00	-44.243	-44.280	-0.038	(0)
UF6-2	0.000e+00	0.000e+00	-45.788	-45.939	-0.151	(0)
Fe (2)	7.148e-14					
Fe+2	6.174e-14	4.359e-14	-13.209	-13.361	-0.151	(0)
FeOH+	4.805e-15	4.446e-15	-14.318	-14.352	-0.034	(0)
FeSO4	4.196e-15	4.196e-15	-14.377	-14.377	0.000	(0)
FeHCO3+	7.244e-16	6.714e-16	-15.140	-15.173	-0.033	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	7.926e-18	7.334e-18	-17.101	-17.135	-0.034	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-165.073	-165.073	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.329	-243.367	-0.038	(0)
Fe (3)	7.055e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	1.678e-10	1.554e-10	-9.775	-9.809	-0.033	(0)
Fe (OH) 4-	1.102e-10	1.020e-10	-9.958	-9.991	-0.033	(0)
FeOH+2	2.126e-16	1.558e-16	-15.673	-15.807	-0.135	(0)
FeF2+	1.578e-20	1.461e-20	-19.802	-19.835	-0.034	(0)
FeF+2	1.024e-20	7.508e-21	-19.990	-20.124	-0.135	(0)
FeF3	1.498e-21	1.498e-21	-20.824	-20.824	0.000	(0)
FeSO4+	4.479e-22	4.145e-22	-21.349	-21.383	-0.034	(0)
Fe+3	1.920e-22	9.419e-23	-21.717	-22.026	-0.309	(0)
FeCl+2	6.771e-24	4.964e-24	-23.169	-23.304	-0.135	(0)
Fe (SO4) 2-	3.791e-24	3.475e-24	-23.421	-23.459	-0.038	(0)
FeCl2+	4.182e-26	3.870e-26	-25.379	-25.412	-0.034	(0)
FeHSeO3+2	5.013e-28	3.539e-28	-27.300	-27.451	-0.151	(0)
FeCl3	6.754e-30	6.754e-30	-29.170	-29.170	0.000	(0)
Fe2 (OH) 2+4	3.237e-30	8.041e-31	-29.490	-30.095	-0.605	(0)
FeNO3+2	3.648e-31	2.576e-31	-30.438	-30.589	-0.151	(0)
Fe3 (OH) 4+5	1.591e-38	1.806e-39	-37.798	-38.743	-0.945	(0)
H (0)	4.034e-29					
H2	2.017e-29	2.019e-29	-28.695	-28.695	0.001	(0)
Hg (0)	4.565e-11					
Hg	4.565e-11	4.565e-11	-10.341	-10.341	0.000	(0)
Hg (1)	2.349e-25					
Hg2+2	1.175e-25	8.293e-26	-24.930	-25.081	-0.151	(0)
Hg (2)	1.328e-13					
Hg (OH) 2	1.107e-13	1.109e-13	-12.956	-12.955	0.001	(0)
HgClOH	2.114e-14	2.114e-14	-13.675	-13.675	0.000	(0)

	HgCl ₂	8.151e-16	8.151e-16	-15.089	-15.089	0.000	(0)
	HgCO ₃	4.676e-17	4.676e-17	-16.330	-16.330	0.000	(0)
	HgCl ₃ -	1.552e-17	1.423e-17	-16.809	-16.847	-0.038	(0)
	Hg (CO ₃) 2-2	3.059e-18	2.159e-18	-17.514	-17.666	-0.151	(0)
	HgOH+	2.978e-19	2.730e-19	-18.526	-18.564	-0.038	(0)
	HgCl ₄ -2	1.400e-19	9.884e-20	-18.854	-19.005	-0.151	(0)
	HgCl+	1.017e-19	9.319e-20	-18.993	-19.031	-0.038	(0)
	Hg (OH) 3-	3.902e-20	3.577e-20	-19.409	-19.446	-0.038	(0)
	HgHCO ₃ +	3.732e-21	3.421e-21	-20.428	-20.466	-0.038	(0)
	Hg+2	3.791e-24	2.676e-24	-23.421	-23.572	-0.151	(0)
	HgSO ₄	2.748e-25	2.748e-25	-24.561	-24.561	0.000	(0)
	HgNH ₃ +2	1.159e-25	8.181e-26	-24.936	-25.087	-0.151	(0)
	HgF+	7.867e-27	7.211e-27	-26.104	-26.142	-0.038	(0)
	Hg (NH ₃) 2+2	5.615e-27	3.964e-27	-26.251	-26.402	-0.151	(0)
	HgNO ₃ +	2.948e-34	2.702e-34	-33.530	-33.568	-0.038	(0)
	Hg (NH ₃) 3+2	1.083e-36	7.646e-37	-35.965	-36.117	-0.151	(0)
	Hg (NO ₃) 2	0.000e+00	0.000e+00	-43.513	-43.513	0.000	(0)
	Hg (NH ₃) 4+2	0.000e+00	0.000e+00	-45.380	-45.531	-0.151	(0)
	HgHS ₂ -	0.000e+00	0.000e+00	-143.863	-143.901	-0.038	(0)
	HgS ₂ -2	0.000e+00	0.000e+00	-144.052	-144.203	-0.151	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-145.913	-145.913	0.000	(0)
K		1.634e-04					
	K+	1.630e-04	1.506e-04	-3.788	-3.822	-0.034	(0)
	KSO ₄ -	4.515e-07	4.180e-07	-6.345	-6.379	-0.033	(0)
	KCrO ₄ -	2.286e-17	2.096e-17	-16.641	-16.679	-0.038	(0)
Mg		2.081e-04					
	Mg+2	1.931e-04	1.407e-04	-3.714	-3.852	-0.137	(0)
	MgSO ₄	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
	MgHCO ₃ +	1.907e-06	1.762e-06	-5.720	-5.754	-0.034	(0)
	MgCO ₃	1.709e-06	1.709e-06	-5.767	-5.767	0.000	(0)
	MgF+	1.241e-06	1.148e-06	-5.906	-5.940	-0.034	(0)
	MgOH+	1.547e-07	1.435e-07	-6.810	-6.843	-0.033	(0)
	MgH ₂ BO ₃ +	5.431e-09	5.004e-09	-8.265	-8.301	-0.036	(0)
Mn (2)		1.379e-06					
	Mn+2	1.281e-06	9.042e-07	-5.893	-6.044	-0.151	(0)
	MnSO ₄	6.306e-08	6.306e-08	-7.200	-7.200	0.000	(0)
	MnHCO ₃ +	2.386e-08	2.208e-08	-7.622	-7.656	-0.034	(0)
	MnOH+	6.290e-09	5.820e-09	-8.201	-8.235	-0.034	(0)
	MnF+	2.828e-09	2.617e-09	-8.549	-8.582	-0.034	(0)
	MnCl+	2.147e-09	1.987e-09	-8.668	-8.702	-0.034	(0)
	MnCl ₂	4.897e-12	4.897e-12	-11.310	-11.310	0.000	(0)
	MnCl ₃ -	2.544e-15	2.354e-15	-14.594	-14.628	-0.034	(0)
	MnSeO ₄	1.519e-15	1.519e-15	-14.818	-14.818	0.000	(0)
	MnNO ₃ +	4.275e-16	3.919e-16	-15.369	-15.407	-0.038	(0)
	Mn (OH) 3-	2.552e-16	2.362e-16	-15.593	-15.627	-0.034	(0)
	Mn (OH) 4-2	2.665e-21	1.954e-21	-20.574	-20.709	-0.135	(0)
	Mn (NO ₃) 2	2.692e-25	2.692e-25	-24.570	-24.570	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-43.644	-43.644	0.000	(0)
Mn (3)		1.915e-27					
	Mn+3	1.915e-27	9.395e-28	-26.718	-27.027	-0.309	(0)
Mn (6)		2.406e-40					
	MnO ₄ -2	2.406e-40	1.764e-40	-39.619	-39.754	-0.135	(0)
Mn (7)		0.000e+00					
	MnO ₄ -	0.000e+00	0.000e+00	-44.724	-44.759	-0.035	(0)
Mo		3.769e-08					
	MoO ₄ -2	3.769e-08	2.747e-08	-7.424	-7.561	-0.137	(0)
	HMoO ₄ -	2.343e-12	2.147e-12	-11.630	-11.668	-0.038	(0)
	H ₂ MoO ₄	6.180e-17	6.180e-17	-16.209	-16.209	0.000	(0)
	Ag ₂ MoO ₄	1.058e-28	1.058e-28	-27.975	-27.975	0.000	(0)
	AlMo ₆ O ₂₁ -3	0.000e+00	0.000e+00	-58.738	-59.078	-0.340	(0)
	Mo ₇ O ₂₄ -6	0.000e+00	0.000e+00	-65.823	-67.184	-1.361	(0)
	HMo ₇ O ₂₄ -5	0.000e+00	0.000e+00	-68.258	-69.203	-0.945	(0)
	H ₂ Mo ₇ O ₂₄ -4	0.000e+00	0.000e+00	-72.221	-72.826	-0.605	(0)
	H ₃ Mo ₇ O ₂₄ -3	0.000e+00	0.000e+00	-77.646	-77.986	-0.340	(0)
N (-3)		4.124e-10					
	NH ₄ +	3.624e-10	3.339e-10	-9.441	-9.476	-0.036	(0)
	NH ₃	4.845e-11	4.845e-11	-10.315	-10.315	0.000	(0)
	NH ₄ SO ₄ -	1.516e-12	1.403e-12	-11.819	-11.853	-0.034	(0)

CaNH3+2	1.959e-14	1.383e-14	-13.708	-13.859	-0.151	(0)
CuNH3+2	6.505e-16	4.593e-16	-15.187	-15.338	-0.151	(0)
NiNH3+2	4.843e-17	3.419e-17	-16.315	-16.466	-0.151	(0)
AgNH3+	1.089e-17	9.980e-18	-16.963	-17.001	-0.038	(0)
Co (NH3) +2	8.054e-18	5.686e-18	-17.094	-17.245	-0.151	(0)
BaNH3+2	3.252e-20	2.296e-20	-19.488	-19.639	-0.151	(0)
Ag (NH3) 2+	4.288e-24	3.931e-24	-23.368	-23.406	-0.038	(0)
Ca (NH3) 2+2	3.779e-25	2.668e-25	-24.423	-24.574	-0.151	(0)
Ni (NH3) 2+2	3.392e-25	2.395e-25	-24.470	-24.621	-0.151	(0)
HgNH3+2	1.159e-25	8.181e-26	-24.936	-25.087	-0.151	(0)
Co (NH3) 2+2	1.665e-26	1.175e-26	-25.779	-25.930	-0.151	(0)
Hg (NH3) 2+2	5.615e-27	3.964e-27	-26.251	-26.402	-0.151	(0)
Co (NH3) 3+2	1.015e-35	7.168e-36	-34.993	-35.145	-0.151	(0)
Hg (NH3) 3+2	1.083e-36	7.646e-37	-35.965	-36.117	-0.151	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-44.588	-44.739	-0.151	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.380	-45.531	-0.151	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.468	-53.620	-0.151	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-54.683	-54.834	-0.151	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-65.375	-65.715	-0.340	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-78.626	-78.777	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
N (3)	3.144e-07					
NO2-	3.144e-07	2.899e-07	-6.503	-6.538	-0.035	(0)
CuNO2+	3.067e-14	2.811e-14	-13.513	-13.551	-0.038	(0)
AgNO2	6.110e-15	6.110e-15	-14.214	-14.214	0.000	(0)
CoNO2+	2.175e-15	1.994e-15	-14.663	-14.700	-0.038	(0)
Cu (NO2) 2	8.339e-20	8.339e-20	-19.079	-19.079	0.000	(0)
Ag (NO2) 2-	2.992e-21	2.743e-21	-20.524	-20.562	-0.038	(0)
N (5)	2.962e-10					
NO3-	2.960e-10	2.735e-10	-9.529	-9.563	-0.034	(0)
CaNO3+	2.139e-13	1.961e-13	-12.670	-12.708	-0.038	(0)
MnNO3+	4.275e-16	3.919e-16	-15.369	-15.407	-0.038	(0)
ZnNO3+	1.252e-16	1.148e-16	-15.902	-15.940	-0.038	(0)
BaNO3+	1.123e-18	1.029e-18	-17.950	-17.988	-0.038	(0)
NiNO3+	9.847e-19	9.026e-19	-18.007	-18.044	-0.038	(0)
CuNO3+	8.739e-19	8.010e-19	-18.059	-18.096	-0.038	(0)
CoNO3+	4.615e-19	4.230e-19	-18.336	-18.374	-0.038	(0)
CdNO3+	1.298e-19	1.190e-19	-18.887	-18.925	-0.038	(0)
AgNO3	2.191e-20	2.191e-20	-19.659	-19.659	0.000	(0)
PbNO3+	1.136e-20	1.042e-20	-19.945	-19.982	-0.038	(0)
Mn (NO3) 2	2.692e-25	2.692e-25	-24.570	-24.570	0.000	(0)
UO2NO3+	1.227e-25	1.124e-25	-24.911	-24.949	-0.038	(0)
Zn (NO3) 2	6.264e-27	6.264e-27	-26.203	-26.203	0.000	(0)
CrNO3+2	2.521e-28	1.780e-28	-27.598	-27.750	-0.151	(0)
Co (NO3) 2	2.354e-28	2.354e-28	-27.628	-27.628	0.000	(0)
Cu (NO3) 2	2.758e-29	2.758e-29	-28.559	-28.559	0.000	(0)
Cd (NO3) 2	1.630e-29	1.630e-29	-28.788	-28.788	0.000	(0)
Pb (NO3) 2	4.837e-30	4.837e-30	-29.315	-29.315	0.000	(0)
VO2NO3	3.817e-30	3.817e-30	-29.418	-29.418	0.000	(0)
FeNO3+2	3.648e-31	2.576e-31	-30.438	-30.589	-0.151	(0)
HgNO3+	2.948e-34	2.702e-34	-33.530	-33.568	-0.038	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-43.513	-43.513	0.000	(0)
Na	3.256e-03					
Na+	3.247e-03	3.000e-03	-2.489	-2.523	-0.034	(0)
NaSO4-	6.823e-06	6.318e-06	-5.166	-5.199	-0.033	(0)
NaHCO3	2.064e-06	2.064e-06	-5.685	-5.685	0.000	(0)
NaCO3-	8.808e-07	8.156e-07	-6.055	-6.089	-0.033	(0)
NaF	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
NaH2BO3	4.876e-09	4.876e-09	-8.312	-8.312	0.000	(0)
NaCrO4-	6.093e-16	5.585e-16	-15.215	-15.253	-0.038	(0)
Ni	2.902e-09					
Ni+2	1.803e-09	1.314e-09	-8.744	-8.881	-0.137	(0)
NiCO3	7.158e-10	7.158e-10	-9.145	-9.145	0.000	(0)
NiHCO3+	2.163e-10	1.982e-10	-9.665	-9.703	-0.038	(0)
NiSO4	1.028e-10	1.028e-10	-9.988	-9.988	0.000	(0)

NiOH+	4.625e-11	4.239e-11	-10.335	-10.373	-0.038	(0)
Ni(OH) 2	8.629e-12	8.629e-12	-11.064	-11.064	0.000	(0)
NiCl+	6.401e-12	5.868e-12	-11.194	-11.232	-0.038	(0)
NiF+	2.618e-12	2.400e-12	-11.582	-11.620	-0.038	(0)
Ni(OH) 3-	2.412e-14	2.211e-14	-13.618	-13.655	-0.038	(0)
Ni(SO4) 2-2	1.892e-15	1.335e-15	-14.723	-14.874	-0.151	(0)
NiCl2	5.156e-17	5.156e-17	-16.288	-16.288	0.000	(0)
NiNH3+2	4.843e-17	3.419e-17	-16.315	-16.466	-0.151	(0)
NiSeO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
NiNO3+	9.847e-19	9.026e-19	-18.007	-18.044	-0.038	(0)
Ni(NH3) 2+2	3.392e-25	2.395e-25	-24.470	-24.621	-0.151	(0)
O(0)	2.482e-35					
O2	1.241e-35	1.243e-35	-34.906	-34.906	0.001	(0)
Pb	1.460e-10					
PbCO3	1.130e-10	1.130e-10	-9.947	-9.947	0.000	(0)
PbOH+	1.808e-11	1.658e-11	-10.743	-10.781	-0.038	(0)
Pb(CO3) 2-2	6.742e-12	4.760e-12	-11.171	-11.322	-0.151	(0)
Pb+2	3.534e-12	2.575e-12	-11.452	-11.589	-0.137	(0)
PbHCO3+	2.554e-12	2.341e-12	-11.593	-11.631	-0.038	(0)
Pb(OH) 2	1.343e-12	1.343e-12	-11.872	-11.872	0.000	(0)
PbSO4	4.947e-13	4.947e-13	-12.306	-12.306	0.000	(0)
PbCl+	1.740e-13	1.595e-13	-12.760	-12.797	-0.038	(0)
PbF+	1.439e-14	1.319e-14	-13.842	-13.880	-0.038	(0)
Pb(OH) 3-	3.755e-15	3.442e-15	-14.425	-14.463	-0.038	(0)
Pb(SO4) 2-2	1.656e-15	1.169e-15	-14.781	-14.932	-0.151	(0)
PbCl2	1.243e-15	1.243e-15	-14.905	-14.905	0.000	(0)
PbF2	1.887e-17	1.887e-17	-16.724	-16.724	0.000	(0)
Pb(OH) 4-2	3.060e-18	2.160e-18	-17.514	-17.666	-0.151	(0)
PbCl3-	9.423e-19	8.637e-19	-18.026	-18.064	-0.038	(0)
PbNO3+	1.136e-20	1.042e-20	-19.945	-19.982	-0.038	(0)
PbF3-	2.839e-21	2.602e-21	-20.547	-20.585	-0.038	(0)
Pb2OH+3	1.481e-21	6.765e-22	-20.829	-21.170	-0.340	(0)
PbCl4-2	9.760e-22	6.890e-22	-21.011	-21.162	-0.151	(0)
Pb3(OH) 4+2	1.313e-25	9.270e-26	-24.882	-25.033	-0.151	(0)
PbF4-2	1.283e-25	9.054e-26	-24.892	-25.043	-0.151	(0)
Pb(NO3) 2	4.837e-30	4.837e-30	-29.315	-29.315	0.000	(0)
Pb4(OH) 4+4	7.634e-33	1.896e-33	-32.117	-32.722	-0.605	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-156.981	-156.981	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-235.974	-236.012	-0.038	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-76.513	-76.513	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.293	-80.331	-0.038	(0)
S5-2	0.000e+00	0.000e+00	-81.139	-81.290	-0.151	(0)
S6-2	0.000e+00	0.000e+00	-81.655	-81.806	-0.151	(0)
H2S	0.000e+00	0.000e+00	-81.717	-81.717	0.000	(0)
S4-2	0.000e+00	0.000e+00	-81.735	-81.886	-0.151	(0)
CdHS+	0.000e+00	0.000e+00	-82.147	-82.185	-0.038	(0)
S3-2	0.000e+00	0.000e+00	-82.541	-82.692	-0.151	(0)
S2-2	0.000e+00	0.000e+00	-83.557	-83.708	-0.151	(0)
S-2	0.000e+00	0.000e+00	-89.090	-89.225	-0.135	(0)
HgHS2-	0.000e+00	0.000e+00	-143.863	-143.901	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-144.052	-144.203	-0.151	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-145.913	-145.913	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-150.952	-151.171	-0.218	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.689	-151.901	-0.211	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-151.711	-151.821	-0.111	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-152.185	-152.223	-0.038	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-152.634	-152.856	-0.222	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-152.706	-152.744	-0.038	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.952	-153.167	-0.215	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.619	-154.619	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-155.312	-155.312	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-156.981	-156.981	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-165.073	-165.073	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-224.090	-224.127	-0.038	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.632	-231.670	-0.038	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.093	-233.244	-0.151	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-233.705	-233.743	-0.038	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-235.974	-236.012	-0.038	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.329	-243.367	-0.038	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-311.726	-311.878	-0.151	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.310	-313.461	-0.151	(0)
Sb2S4-2	0.000e+00	0.000e+00	-332.270	-332.421	-0.151	(0)
S (6)	5.759e-04					
SO4-2	5.382e-04	3.922e-04	-3.269	-3.407	-0.137	(0)
CaSO4	2.038e-05	2.038e-05	-4.691	-4.691	0.000	(0)
MgSO4	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
NaSO4-	6.823e-06	6.318e-06	-5.166	-5.199	-0.033	(0)
KSO4-	4.515e-07	4.180e-07	-6.345	-6.379	-0.033	(0)
MnSO4	6.306e-08	6.306e-08	-7.200	-7.200	0.000	(0)
ZnSO4	1.434e-08	1.434e-08	-7.843	-7.843	0.000	(0)
HSO4-	1.629e-10	1.506e-10	-9.788	-9.822	-0.034	(0)
NiSO4	1.028e-10	1.028e-10	-9.988	-9.988	0.000	(0)
CuSO4	8.322e-11	8.322e-11	-10.080	-10.080	0.000	(0)
CoSO4	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
Zn (SO4) 2-2	6.939e-11	4.899e-11	-10.159	-10.310	-0.151	(0)
CdSO4	1.265e-11	1.265e-11	-10.898	-10.898	0.000	(0)
NH4SO4-	1.516e-12	1.403e-12	-11.819	-11.853	-0.034	(0)
AgSO4-	8.613e-13	7.895e-13	-12.065	-12.103	-0.038	(0)
PbSO4	4.947e-13	4.947e-13	-12.306	-12.306	0.000	(0)
Cd (SO4) 2-2	9.478e-14	6.691e-14	-13.023	-13.174	-0.151	(0)
CrOHSO4	7.769e-14	7.769e-14	-13.110	-13.110	0.000	(0)
FeSO4	4.196e-15	4.196e-15	-14.377	-14.377	0.000	(0)
Ni (SO4) 2-2	1.892e-15	1.335e-15	-14.723	-14.874	-0.151	(0)
Pb (SO4) 2-2	1.656e-15	1.169e-15	-14.781	-14.932	-0.151	(0)
UO2SO4	1.223e-16	1.223e-16	-15.912	-15.912	0.000	(0)
CrSO4+	1.488e-17	1.364e-17	-16.827	-16.865	-0.038	(0)
AlSO4+	1.771e-18	1.637e-18	-17.752	-17.786	-0.034	(0)
UO2 (SO4) 2-2	8.959e-19	6.325e-19	-18.048	-18.199	-0.151	(0)
Al (SO4) 2-	7.442e-21	6.880e-21	-20.128	-20.162	-0.034	(0)
FeSO4+	4.479e-22	4.145e-22	-21.349	-21.383	-0.034	(0)
VO2SO4-	2.819e-22	2.584e-22	-21.550	-21.588	-0.038	(0)
Cr2 (OH) 2SO4+2	8.304e-24	5.862e-24	-23.081	-23.232	-0.151	(0)
Fe (SO4) 2-	3.791e-24	3.475e-24	-23.421	-23.459	-0.038	(0)
CrO3SO4-2	3.167e-25	2.236e-25	-24.499	-24.651	-0.151	(0)
HgSO4	2.748e-25	2.748e-25	-24.561	-24.561	0.000	(0)
VOSO4	1.582e-25	1.582e-25	-24.801	-24.801	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.366e-25	1.366e-25	-24.865	-24.865	0.000	(0)
VSO4+	0.000e+00	0.000e+00	-40.011	-40.049	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-45.139	-45.139	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.481	-45.633	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Sb (3)	2.875e-22					
Sb (OH) 3	1.454e-22	1.454e-22	-21.837	-21.837	0.000	(0)
HSbO2	1.420e-22	1.420e-22	-21.848	-21.848	0.000	(0)
SbO2-	6.384e-26	5.852e-26	-25.195	-25.233	-0.038	(0)
Sb (OH) 4-	3.658e-26	3.353e-26	-25.437	-25.475	-0.038	(0)
Sb (OH) 2F	6.489e-29	6.489e-29	-28.188	-28.188	0.000	(0)
SbOF	6.381e-29	6.381e-29	-28.195	-28.195	0.000	(0)
Sb (OH) 2+	1.514e-29	1.388e-29	-28.820	-28.858	-0.038	(0)
SbO+	5.219e-30	4.784e-30	-29.282	-29.320	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-332.270	-332.421	-0.151	(0)
Sb (5)	5.933e-10					
SbO3-	5.927e-10	5.433e-10	-9.227	-9.265	-0.038	(0)
Sb (OH) 6-	6.875e-13	6.352e-13	-12.163	-12.197	-0.034	(0)
SbO2+	2.624e-27	2.406e-27	-26.581	-26.619	-0.038	(0)
Se (-2)	5.049e-18					
Ag2Se	5.049e-18	5.049e-18	-17.297	-17.297	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.583	-40.621	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-43.644	-43.644	0.000	(0)
H2Se	0.000e+00	0.000e+00	-45.137	-45.137	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.064	-47.215	-0.151	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.926	-86.530	-0.605	(0)
Se (4)	3.592e-09					
SeO3-2	2.041e-09	1.441e-09	-8.690	-8.841	-0.151	(0)
HSeO3-	1.551e-09	1.422e-09	-8.809	-8.847	-0.038	(0)

H2SeO3	2.383e-15	2.383e-15	-14.623	-14.623	0.000	(0)
AgSeO3-	1.019e-16	9.343e-17	-15.992	-16.030	-0.038	(0)
Cd (SeO3) 2-2	3.334e-22	2.354e-22	-21.477	-21.628	-0.151	(0)
Ag (SeO3) 2-3	2.638e-24	1.205e-24	-23.579	-23.919	-0.340	(0)
FeHSeO3+2	5.013e-28	3.539e-28	-27.300	-27.451	-0.151	(0)
Se (6)	8.567e-12					
SeO4-2	8.565e-12	6.242e-12	-11.067	-11.205	-0.137	(0)
MnSeO4	1.519e-15	1.519e-15	-14.818	-14.818	0.000	(0)
ZnSeO4	1.616e-16	1.616e-16	-15.792	-15.792	0.000	(0)
NiSeO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
CoSeO4	3.053e-18	3.053e-18	-17.515	-17.515	0.000	(0)
HSeO4-	1.341e-18	1.229e-18	-17.873	-17.910	-0.038	(0)
CdSeO4	1.599e-19	1.599e-19	-18.796	-18.796	0.000	(0)
Zn (SeO4) 2-2	1.449e-27	1.023e-27	-26.839	-26.990	-0.151	(0)
Si	3.153e-04					
H4SiO4	3.032e-04	3.036e-04	-3.518	-3.518	0.001	(0)
H3SiO4-	1.209e-05	1.117e-05	-4.918	-4.952	-0.034	(0)
H2SiO4-2	2.440e-10	1.794e-10	-9.613	-9.746	-0.134	(0)
UO2H3SiO4+	2.132e-13	1.954e-13	-12.671	-12.709	-0.038	(0)
SiF6-2	2.206e-32	1.617e-32	-31.656	-31.791	-0.135	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.648	-61.989	-0.340	(0)
U (4)	1.319e-20					
U (OH) 5-	1.319e-20	1.209e-20	-19.880	-19.918	-0.038	(0)
U (OH) 4	1.989e-24	1.989e-24	-23.701	-23.701	0.000	(0)
U (OH) 3+	3.117e-29	2.857e-29	-28.506	-28.544	-0.038	(0)
U (OH) 2+2	7.354e-35	5.191e-35	-34.134	-34.285	-0.151	(0)
UF3+	2.491e-40	2.283e-40	-39.604	-39.642	-0.038	(0)
UF2+2	0.000e+00	0.000e+00	-40.552	-40.703	-0.151	(0)
UOH+3	0.000e+00	0.000e+00	-40.677	-41.017	-0.340	(0)
UF4	0.000e+00	0.000e+00	-41.740	-41.740	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.324	-43.665	-0.340	(0)
UF5-	0.000e+00	0.000e+00	-44.243	-44.280	-0.038	(0)
U (SO4) 2	0.000e+00	0.000e+00	-45.139	-45.139	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.481	-45.633	-0.151	(0)
UF6-2	0.000e+00	0.000e+00	-45.788	-45.939	-0.151	(0)
U+4	0.000e+00	0.000e+00	-48.221	-48.826	-0.605	(0)
UCl+3	0.000e+00	0.000e+00	-49.544	-49.884	-0.340	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-180.964	-184.026	-3.062	(0)
U (5)	5.891e-18					
UO2+	5.891e-18	5.400e-18	-17.230	-17.268	-0.038	(0)
U (6)	1.524e-08					
UO2 (CO3) 3-4	1.028e-08	2.554e-09	-7.988	-8.593	-0.605	(0)
UO2 (CO3) 2-2	4.944e-09	3.490e-09	-8.306	-8.457	-0.151	(0)
UO2CO3	1.198e-11	1.198e-11	-10.922	-10.922	0.000	(0)
UO2H3SiO4+	2.132e-13	1.954e-13	-12.671	-12.709	-0.038	(0)
UO2OH+	7.253e-14	6.648e-14	-13.139	-13.177	-0.038	(0)
UO2F+	2.256e-15	2.068e-15	-14.647	-14.684	-0.038	(0)
UO2F2	4.336e-16	4.336e-16	-15.363	-15.363	0.000	(0)
UO2+2	2.828e-16	2.061e-16	-15.549	-15.686	-0.137	(0)
UO2SO4	1.223e-16	1.223e-16	-15.912	-15.912	0.000	(0)
UO2F3-	8.637e-18	7.917e-18	-17.064	-17.101	-0.038	(0)
UO2 (SO4) 2-2	8.959e-19	6.325e-19	-18.048	-18.199	-0.151	(0)
UO2Cl+	6.364e-19	5.833e-19	-18.196	-18.234	-0.038	(0)
(UO2) 2 (OH) 2+2	1.039e-20	7.335e-21	-19.983	-20.135	-0.151	(0)
UO2F4-2	6.476e-21	4.572e-21	-20.189	-20.340	-0.151	(0)
(UO2) 3 (OH) 5+	2.650e-21	2.429e-21	-20.577	-20.615	-0.038	(0)
UO2NO3+	1.227e-25	1.124e-25	-24.911	-24.949	-0.038	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-46.036	-46.074	-0.038	(0)
V+2	0.000e+00	0.000e+00	-47.842	-47.993	-0.151	(0)
V (3)	6.553e-18					
V (OH) 3	6.553e-18	6.553e-18	-17.184	-17.184	0.000	(0)
V (OH) 2+	1.815e-29	1.664e-29	-28.741	-28.779	-0.038	(0)
VOH+2	8.782e-34	6.200e-34	-33.056	-33.208	-0.151	(0)
V+3	1.057e-39	4.828e-40	-38.976	-39.316	-0.340	(0)
VSO4+	0.000e+00	0.000e+00	-40.011	-40.049	-0.038	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-63.194	-63.535	-0.340	(0)

V2 (OH) 2+4	0.000e+00	0.000e+00	-65.010	-65.615	-0.605	(0)
V (4)	8.199e-22					
V (OH) 3+	8.169e-22	7.488e-22	-21.088	-21.126	-0.038	(0)
VO+2	2.075e-24	1.465e-24	-23.683	-23.834	-0.151	(0)
VOF+	6.968e-25	6.387e-25	-24.157	-24.195	-0.038	(0)
VOSO4	1.582e-25	1.582e-25	-24.801	-24.801	0.000	(0)
VOF2	1.741e-26	1.741e-26	-25.759	-25.759	0.000	(0)
VOC1+	7.824e-27	7.172e-27	-26.107	-26.144	-0.038	(0)
VOF3-	4.899e-29	4.491e-29	-28.310	-28.348	-0.038	(0)
VOF4-2	1.867e-32	1.318e-32	-31.729	-31.880	-0.151	(0)
H2V2O4+2	3.982e-38	2.811e-38	-37.400	-37.551	-0.151	(0)
V (5)	1.788e-10					
H2VO4-	9.772e-11	8.957e-11	-10.010	-10.048	-0.038	(0)
HVO4-2	8.112e-11	5.726e-11	-10.091	-10.242	-0.151	(0)
H3VO4	3.519e-15	3.519e-15	-14.454	-14.454	0.000	(0)
VO4-3	1.599e-16	7.305e-17	-15.796	-16.136	-0.340	(0)
HV2O7-3	3.805e-18	1.738e-18	-17.420	-17.760	-0.340	(0)
H3V2O7-	2.221e-18	2.035e-18	-17.654	-17.691	-0.038	(0)
V2O7-4	4.794e-20	1.191e-20	-19.319	-19.924	-0.605	(0)
VO2+	2.987e-20	2.759e-20	-19.525	-19.559	-0.034	(0)
VO2F	3.518e-21	3.518e-21	-20.454	-20.454	0.000	(0)
VO2SO4-	2.819e-22	2.584e-22	-21.550	-21.588	-0.038	(0)
VO2F2-	1.013e-22	9.286e-23	-21.994	-22.032	-0.038	(0)
V3O9-3	1.648e-24	7.528e-25	-23.783	-24.123	-0.340	(0)
VO2F3-2	1.193e-25	8.421e-26	-24.923	-25.075	-0.151	(0)
VO2F4-3	6.594e-30	3.012e-30	-29.181	-29.521	-0.340	(0)
VO2NO3	3.817e-30	3.817e-30	-29.418	-29.418	0.000	(0)
V4O12-4	1.132e-31	2.811e-32	-30.946	-31.551	-0.605	(0)
V10O28-6	0.000e+00	0.000e+00	-83.834	-85.195	-1.361	(0)
HV10O28-5	0.000e+00	0.000e+00	-84.469	-85.414	-0.945	(0)
H2V10O28-4	0.000e+00	0.000e+00	-88.007	-88.612	-0.605	(0)
Zn	4.591e-07					
Zn+2	2.293e-07	1.671e-07	-6.640	-6.777	-0.137	(0)
ZnCO3	1.404e-07	1.404e-07	-6.853	-6.853	0.000	(0)
ZnOH+	4.672e-08	4.283e-08	-7.330	-7.368	-0.038	(0)
Zn (OH) 2	1.739e-08	1.739e-08	-7.760	-7.760	0.000	(0)
ZnSO4	1.434e-08	1.434e-08	-7.843	-7.843	0.000	(0)
ZnHCO3+	7.056e-09	6.468e-09	-8.151	-8.189	-0.038	(0)
ZnOHCl	2.458e-09	2.458e-09	-8.609	-8.609	0.000	(0)
ZnCl+	7.932e-10	7.327e-10	-9.101	-9.135	-0.034	(0)
ZnF+	2.645e-10	2.424e-10	-9.578	-9.615	-0.038	(0)
Zn (OH) 3-	2.437e-10	2.234e-10	-9.613	-9.651	-0.038	(0)
Zn (SO4) 2-2	6.939e-11	4.899e-11	-10.159	-10.310	-0.151	(0)
ZnCl2	2.027e-12	2.027e-12	-11.693	-11.693	0.000	(0)
Zn (OH) 4-2	3.228e-14	2.279e-14	-13.491	-13.642	-0.151	(0)
ZnCl3-	3.041e-15	2.810e-15	-14.517	-14.551	-0.034	(0)
ZnSeO4	1.616e-16	1.616e-16	-15.792	-15.792	0.000	(0)
ZnNO3+	1.252e-16	1.148e-16	-15.902	-15.940	-0.038	(0)
ZnCl4-2	3.344e-18	2.452e-18	-17.476	-17.611	-0.135	(0)
Zn (NO3) 2	6.264e-27	6.264e-27	-26.203	-26.203	0.000	(0)
Zn (SeO4) 2-2	1.449e-27	1.023e-27	-26.839	-26.990	-0.151	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.185	-152.223	-0.038	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.619	-154.619	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.632	-231.670	-0.038	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.093	-233.244	-0.151	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.310	-313.461	-0.151	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-70.57	-64.28	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-55.18	-50.67	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-62.41	-50.67	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-90.09	-72.16	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-71.77	-51.74	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-32.78	-32.38	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-30.61	-30.16	0.45	(NH4) 2SeO4

Acanthite	-55.70	-91.92	-36.22	Ag ₂ S
Ag ₂ CO ₃	-13.74	-24.83	-11.09	Ag ₂ CO ₃
Ag ₂ CrO ₄	-21.83	-33.42	-11.59	Ag ₂ CrO ₄
Ag ₂ HVO ₄	-15.81	-14.33	1.48	Ag ₂ HVO ₄
Ag ₂ MoO ₄	-16.00	-27.55	-11.55	Ag ₂ MoO ₄
Ag ₂ O	-15.75	-3.18	12.57	Ag ₂ O
Ag ₂ Se	-3.51	-52.21	-48.70	Ag ₂ Se
Ag ₂ SeO ₃	-13.28	-20.43	-7.15	Ag ₂ SeO ₃
Ag ₂ SeO ₄	-22.29	-31.20	-8.91	Ag ₂ SeO ₄
Ag ₂ SO ₄	-18.58	-23.40	-4.82	Ag ₂ SO ₄
Ag ₃ AsO ₃	-29.56	-27.40	2.16	Ag ₃ AsO ₃
Ag ₃ AsO ₄	-17.97	-20.76	-2.79	Ag ₃ AsO ₄
Ag ₃ H ₂ VO ₅	-21.10	-15.92	5.18	Ag ₃ H ₂ VO ₅
AgF·4H ₂ O	-15.18	-14.13	1.05	AgF·4H ₂ O
Agmetal	-0.86	-14.36	-13.51	Ag
AgVO ₃	-13.51	-12.74	0.77	AgVO ₃
Al (OH) 3 (am)	-3.85	6.95	10.80	Al (OH) 3
Al ₂ (MoO ₄) 3	-61.59	-59.22	2.37	Al ₂ (MoO ₄) 3
Al ₂ O ₃	-5.76	13.90	19.65	Al ₂ O ₃
Al ₄ (OH) 10SO ₄	-15.13	7.57	22.70	Al ₄ (OH) 10SO ₄
AlAsO ₄ :2H ₂ O	-13.84	-9.04	4.80	AlAsO ₄ :2H ₂ O
AlOHSO ₄	-10.04	-13.27	-3.23	AlOHSO ₄
AlSb	-157.15	-91.52	65.62	AlSb
Alunite	-13.61	-15.01	-1.40	KAl ₃ (SO ₄) 2 (OH) 6
Anglesite	-7.21	-15.00	-7.79	PbSO ₄
Anhydrite	-2.69	-7.05	-4.36	CaSO ₄
Anilite	-58.37	-90.25	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-5.67	3.12	8.79	Cu ₃ (OH) 4SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-87.77	-90.53	-2.76	As ₄ O ₆
Artinite	-5.33	4.27	9.60	MgCO ₃ :Mg (OH) 2:3H ₂ O
As ₂ O ₅	-38.68	-31.97	6.71	As ₂ O ₅
Atacamite	-3.00	4.39	7.39	Cu ₂ (OH) 3Cl
Azurite	-3.05	-19.96	-16.91	Cu ₃ (OH) 2 (CO ₃) 2
Ba (OH) 2:8H ₂ O	-16.71	7.69	24.39	Ba (OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-22.81	-6.93	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	0.00	-8.91	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-32.19	0.75	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-12.88	-22.55	-9.67	BaCrO ₄
BaF ₂	-11.58	-17.40	-5.82	BaF ₂
BaMoO ₄	-9.73	-16.69	-6.96	BaMoO ₄
Barite	-2.55	-12.53	-9.98	BaSO ₄
BaS	-97.23	-81.05	16.18	BaS
BaSeO ₃	-11.40	-9.57	1.83	BaSeO ₃
BaSeO ₄	-12.87	-20.33	-7.46	BaSeO ₄
Bianchite	-8.42	-10.18	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.13	10.96	18.09	MnO ₂
Bixbyite	-2.98	-3.62	-0.64	Mn ₂ O ₃
BlaubleiI	-58.04	-82.20	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-58.63	-85.91	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-1.63	6.95	8.58	AlOOH
Breithauptite	-59.25	-77.77	-18.52	NiSb
Brochantite	-4.33	10.89	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-3.88	12.96	16.84	Mg (OH) 2
Bunsenite	-4.52	7.93	12.45	NiO
Ca (VO ₃) 2	-14.80	-9.14	5.66	Ca (VO ₃) 2
Ca ₂ V ₂ O ₇	-13.47	4.03	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.53	4.03	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-14.77	7.53	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-21.77	17.19	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-22.67	17.19	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-300.42	-157.44	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-12.69	-30.60	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.26	-11.21	-7.95	CaMoO ₄
Carnotite	-5.67	-5.44	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.90	-4.09	2.81	CaSeO ₃ :2H ₂ O

CaSeO4:2H2O	-11.83	-14.85	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.21	-3.37	9.84	Cd(BO2)2
Cd(OH)2	-6.69	6.95	13.64	Cd(OH)2
Cd(OH)2(am)	-6.78	6.95	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.30	-19.59	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.93	0.63	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.82	7.58	28.40	Cd4(OH)6SO4
CdCl2	-14.72	-15.38	-0.66	CdCl2
CdCl2:1H2O	-13.68	-15.38	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.46	-15.38	-1.91	CdCl2:2.5H2O
CdF2	-16.93	-18.14	-1.21	CdF2
Cdmetal(alpha)	-32.11	-18.59	13.51	Cd
Cdmetal(gamma)	-32.21	-18.59	13.62	Cd
CdMoO4	-3.27	-17.42	-14.15	CdMoO4
CdOHC1	-7.75	-4.21	3.54	CdOHC1
CdSb	-78.40	-78.75	-0.35	CdSb
CdSe	-21.88	-42.08	-20.20	CdSe
CdSeO4:2H2O	-19.22	-21.07	-1.85	CdSeO4:2H2O
CdSO4	-13.10	-13.27	-0.17	CdSO4
CdSO4:1H2O	-11.54	-13.27	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-11.40	-13.27	-1.87	CdSO4:2.67H2O
Cerargyrite	-3.00	-12.75	-9.75	AgCl
Cerrusite	-3.29	-16.42	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-9.80	-12.44	-2.64	CuSO4:5H2O
Chalcedony	0.03	-3.52	-3.55	SiO2
Chalcocite	-58.43	-93.35	-34.92	Cu2S
Chalcopyrite	-130.97	-166.24	-35.27	CuFeS2
Chrysotile	-0.36	31.84	32.20	Mg3Si2O5(OH)4
Cinnabar	-56.00	-101.69	-45.69	HgS
Claudetite	-87.46	-90.53	-3.06	As4O6
Clausthalite	-16.70	-43.80	-27.10	PbSe
Co(BO2)2	-29.59	-2.52	27.07	Co(BO2)2
Co(OH)2	-5.29	7.80	13.09	Co(OH)2
Co(OH)3	-9.52	-11.83	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.60	-8.57	13.03	Co3(AsO4)2
Co3O4	-5.36	-15.85	-10.50	Co3O4
CoCl2	-22.79	-14.53	8.27	CoCl2
CoCl2:6H2O	-17.06	-14.53	2.54	CoCl2:6H2O
CoCO3	-3.87	-13.85	-9.98	CoCO3
CoF2	-15.69	-17.29	-1.60	CoF2
CoF3	-48.00	-49.46	-1.46	CoF3
CoFe2O4	17.71	14.18	-3.53	CoFe2O4
CoMoO4	-8.81	-16.57	-7.76	CoMoO4
CoO	-5.79	7.80	13.59	CoO
CoS(alpha)	-73.50	-80.94	-7.44	CoS
CoS(beta)	-69.87	-80.94	-11.07	CoS
CoSe	-25.03	-41.23	-16.20	CoSe
CoSeO3	-10.77	-9.45	1.32	CoSeO3
CoSeO4:6H2O	-18.69	-20.22	-1.53	CoSeO4:6H2O
CoSO4	-15.22	-12.42	2.80	CoSO4
CoSO4:6H2O	-9.94	-12.42	-2.47	CoSO4:6H2O
Cotunnite	-12.33	-17.11	-4.78	PbCl2
Covellite	-58.66	-80.96	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.42	-33.33	14.09	CrCl2
CrCl3	-49.78	-34.67	15.11	CrCl3
CrF3	-27.47	-38.81	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-16.83	-50.67	-33.84	Na3AlF6
Cu(OH)2	-0.90	7.78	8.67	Cu(OH)2
Cu(SbO3)2	-30.02	15.19	45.21	Cu(SbO3)2

Cu ₂ (OH) 3NO ₃	-11.66	-2.41	9.25	Cu ₂ (OH) 3NO ₃
Cu ₂ Sb:3H ₂ O	-58.11	-93.00	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se (alpha)	-7.84	-53.64	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-22.88	-24.83	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) 2:2H ₂ O	-14.74	-8.64	6.10	Cu ₃ (AsO ₄) 2:2H ₂ O
Cu ₃ Sb	-62.79	-105.38	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-31.39	-94.88	-63.49	Cu ₃ Se ₂
CuCO ₃	-2.37	-13.87	-11.50	CuCO ₃
CuCrO ₄	-17.02	-22.46	-5.44	CuCrO ₄
CuF	-9.94	-14.85	-4.91	CuF
CuF ₂	-18.43	-17.31	1.12	CuF ₂
CuF ₂ :2H ₂ O	-12.76	-17.31	-4.55	CuF ₂ :2H ₂ O
Cumetal	-6.32	-15.08	-8.76	Cu
CuMoO ₄	-3.52	-16.59	-13.08	CuMoO ₄
CuOCuSO ₄	-14.96	-4.66	10.30	CuOCuSO ₄
Cupricferrite	8.17	14.16	5.99	CuFe ₂ O ₄
Cuprite	-3.20	-4.61	-1.41	Cu ₂ O
Cuprousferrite	9.80	0.89	-8.92	CuFeO ₂
CuSe	-8.15	-41.25	-33.10	CuSe
CuSe ₂	-31.37	-64.73	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-9.99	-9.47	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-17.80	-20.24	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-15.38	-12.44	2.94	CuSO ₄
Diaspore	0.07	6.95	6.87	AlOOH
Djurleite	-58.61	-92.53	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.63	-17.17	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	-0.08	-17.17	-17.09	CaMg(CO ₃) ₂
Epsomite	-5.13	-7.26	-2.13	MgSO ₄ :7H ₂ O
Fe(OH) 2	-10.11	3.45	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	2.88	-0.16	-3.04	Fe(OH) 2.7Cl.3
Fe(VO ₃) 2	-15.14	-18.86	-3.72	Fe(VO ₃) 2
Fe ₂ (OH) 4SeO ₃	-12.42	-10.87	1.55	Fe ₂ (OH) 4SeO ₃
Fe ₂ (SeO ₃) 3:2H ₂ O	-24.75	-45.38	-20.63	Fe ₂ (SeO ₃) 3:2H ₂ O
Fe ₂ (SO ₄) 3	-50.54	-54.27	-3.73	Fe ₂ (SO ₄) 3
Fe ₃ (OH) 8	-10.39	9.83	20.22	Fe ₃ (OH) 8
FeAsO ₄ :2H ₂ O	-13.19	-12.79	0.40	FeAsO ₄ :2H ₂ O
FeCr ₂ O ₄	-6.11	1.09	7.20	FeCr ₂ O ₄
FeMoO ₄	-10.83	-20.92	-10.09	FeMoO ₄
Ferrihydrite	0.00	3.19	3.19	Fe(OH) 3
Ferroselite	-50.46	-69.06	-18.60	FeSe ₂
FeS (ppt)	-82.34	-85.29	-2.95	FeS
FeSe	-34.58	-45.58	-11.00	FeSe
Fix_pe	-4.37	-4.37	0.00	e-
Fluorite	-1.42	-11.92	-10.50	CaF ₂
Galena	-69.54	-83.51	-13.97	PbS
Gibbsite	-1.34	6.95	8.29	Al(OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-8.17	-10.18	-2.01	ZnSO ₄ :7H ₂ O
Greenalite	-17.49	3.32	20.81	Fe ₃ Si ₂ O ₅ (OH) 4
Greenockite	-67.43	-81.79	-14.36	CdS
Greigite	-300.08	-345.11	-45.03	Fe ₃ S ₄
Gummite	-6.55	1.13	7.67	UO ₃
Gypsum	-2.44	-7.05	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-18.76	-30.86	-12.10	(H ₃ O) Fe ₃ (SO ₄) 2(OH) 6
H ₂ MoO ₄	-11.50	-24.37	-12.88	H ₂ MoO ₄
H ₂ S(g)	-80.73	-88.74	-8.01	H ₂ S
H ₂ Se(g)	-44.07	-49.03	-4.96	H ₂ Se
Halite	-6.88	-5.28	1.60	NaCl
Halloysite	-2.71	6.86	9.57	Al ₂ Si ₂ O ₅ (OH) 4
Hausmannite	-3.18	57.85	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-5.55	17.35	22.89	FeAl ₂ O ₄
Hg(CH ₃) 2(g)	-186.90	-260.61	-73.71	Hg(CH ₃) 2
Hg(g)	-9.03	-16.91	-7.87	Hg
Hg(OH) 2	-9.46	-12.96	-3.50	Hg(OH) 2
Hg ₂ (g)	-18.86	-33.81	-14.96	Hg ₂
Hg ₂ (OH) 2	-13.53	-8.27	5.26	Hg ₂ (OH) 2
Hg ₂ CO ₃	-13.87	-29.92	-16.05	Hg ₂ CO ₃

Hg2CrO4	-29.81	-38.51	-8.70	Hg2CrO4
Hg2F2	-23.00	-33.36	-10.36	Hg2F2
Hg2S	-85.33	-97.01	-11.68	Hg2S
Hg2SeO3	-20.87	-25.52	-4.66	Hg2SeO3
Hg2SO4	-22.36	-28.49	-6.13	Hg2SO4
Hg3O2CO3	-30.83	-60.51	-29.68	Hg3O2CO3
HgCl (g)	-34.80	-15.30	19.50	HgCl
HgCl2	-14.02	-35.28	-21.26	HgCl2
HgF (g)	-49.35	-16.68	32.68	HgF
HgF2 (g)	-50.61	-38.04	12.57	HgF2
Hgmetal (l)	-3.46	-16.91	-13.45	Hg
HgSe	-6.29	-61.98	-55.69	HgSe
HgSeO3	-17.78	-30.21	-12.43	HgSeO3
HgSO4	-23.75	-33.17	-9.42	HgSO4
Huntite	-4.57	-34.54	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-8.86	-27.63	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.02	-21.79	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-23.74	-28.91	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-11.48	-26.28	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.07	-51.31	-17.24	K2Cr2O7
K2CrO4	-20.56	-21.07	-0.51	K2CrO4
K2MoO4	-18.47	-15.21	3.26	K2MoO4
K2SeO4	-18.12	-18.85	-0.73	K2SeO4
Kaolinite	-0.57	6.86	7.43	Al2Si2O5 (OH) 4
Langite	-6.59	10.89	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-9.34	-9.77	-0.43	PbO : PbSO4
Laurionite	-6.56	-5.94	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-7.47	5.22	12.69	PbO
Mackinawite	-81.69	-85.29	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.48	19.34	16.86	Fe2MgO4
Magnesite	-1.23	-8.69	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-0.78	-6.09	-5.31	Cu2 (OH) 2CO3
Manganite	-1.80	23.54	25.34	MnOOH
Massicot	-7.67	5.22	12.89	PbO
Matlockite	-9.51	-18.49	-8.97	PbClF
Melanothallite	-20.81	-14.55	6.26	CuCl2
Melanterite	-14.56	-16.77	-2.21	FeSO4 : 7H2O
Metacinnabar	-56.60	-101.69	-45.09	HgS
Mg (OH) 2 (active)	-5.83	12.96	18.79	Mg (OH) 2
Mg (VO3) 2	-20.63	-9.35	11.28	Mg (VO3) 2
Mg2Sb3	-280.32	-205.63	74.68	Mg2Sb3
Mg2V2O7	-22.75	3.61	26.36	Mg2V2O7
MgCr2O4	-5.60	10.60	16.20	MgCr2O4
MgCrO4	-22.66	-17.28	5.38	MgCrO4
MgF2	-4.00	-12.13	-8.13	MgF2
MgMoO4	-9.56	-11.41	-1.85	MgMoO4
MgSeO3 : 6H2O	-7.35	-4.29	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.86	-15.06	-1.20	MgSeO4 : 6H2O
Minium	-32.31	41.21	73.52	Pb3O4
Mirabilite	-7.34	-8.45	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-16.44	-11.54	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-58.56	-64.27	-5.71	Mn2 (SO4) 3
Mn2Sb	-150.79	-89.71	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.17	0.33	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-14.28	-11.56	2.72	MnCl2 : 4H2O
MnS (grn)	-78.14	-77.97	0.17	MnS
MnS (pnk)	-81.31	-77.97	3.34	MnS
MnSb	-97.37	-100.28	-2.91	MnSb
MnSe	-41.76	-38.26	3.50	MnSe
MnSeO3	-7.62	-6.49	1.13	MnSeO3
MnSeO3 : 2H2O	-7.47	-6.49	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-15.20	-17.25	-2.05	MnSeO4 : 5H2O
MnSO4	-12.03	-9.45	2.58	MnSO4
Monteponite	-8.15	6.95	15.10	CdO

Montroydite	-9.32	-12.96	-3.64	HgO
MoO3	-16.37	-24.37	-8.00	MoO3
Morenosite	-10.14	-12.29	-2.14	NiSO4:7H2O
MoS2	-157.13	-227.39	-70.26	MoS2
Na-Jarosite	-13.78	-24.98	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.81	-48.71	-9.90	Na2Cr2O7
Na2CrO4	-21.40	-18.47	2.93	Na2CrO4
Na2Mo2O7	-20.38	-36.98	-16.60	Na2Mo2O7
Na2MoO4	-14.10	-12.61	1.49	Na2MoO4
Na2MoO4:2H2O	-13.83	-12.61	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.79	-5.49	10.30	Na2SeO3:5H2O
Na2SeO4	-17.53	-16.25	1.28	Na2SeO4
Na3Sb	-175.27	-80.82	94.45	Na3Sb
Na3VO4	-30.19	6.49	36.68	Na3VO4
Na4V2O7	-36.18	1.22	37.40	Na4V2O7
Nantokite	-6.74	-13.47	-6.73	CuCl
NaSb	-90.21	-67.04	23.17	NaSb
Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-9.13	-5.27	3.86	NaVO3
Nesquehonite	-4.02	-8.69	-4.67	MgCO3:3H2O
Ni(OH)2	-4.86	7.93	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.88	-8.18	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.50	11.50	32.00	Ni4(OH)6SO4
NiCO3	-6.85	-13.72	-6.87	NiCO3
NiMoO4	-5.30	-16.44	-11.14	NiMoO4
NiS(alpha)	-75.21	-80.81	-5.60	NiS
NiS(beta)	-69.71	-80.81	-11.10	NiS
NiS(gamma)	-68.01	-80.81	-12.80	NiS
NiSe	-23.40	-41.10	-17.70	NiSe
NiSeO3:2H2O	-12.14	-9.32	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.57	-20.09	-1.52	NiSeO4:6H2O
Nsutite	-6.54	10.96	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-250.41	-311.47	-61.07	As2S3
Otavite	-2.70	-14.70	-12.00	CdCO3
Pb(BO2)2	-11.61	-5.10	6.52	Pb(BO2)2
Pb(OH)2	-2.93	5.22	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-68.90	-77.66	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.51	-0.72	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.74	10.44	26.19	Pb2O(OH)2
Pb2O3	-25.05	35.99	61.04	Pb2O3
Pb2OCO3	-10.64	-11.20	-0.56	Pb2OCO3
Pb2V2O7	-9.96	-11.86	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.10	-16.30	5.80	Pb3(AsO4)2
Pb3(VO4)2	-12.78	-6.64	6.14	Pb3(VO4)2
Pb3O2CO3	-17.00	-5.98	11.02	Pb3O2CO3
Pb3O2SO4	-15.24	-4.55	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.43	0.67	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.21	0.67	21.88	Pb4O3SO4
PbCrO4	-12.42	-25.02	-12.60	PbCrO4
PbF2	-12.43	-19.87	-7.44	PbF2
Pbmetal	-24.57	-20.32	4.25	Pb
PbMoO4	-3.53	-19.15	-15.62	PbMoO4
PbO:0.3H2O	-7.76	5.22	12.98	PbO:0.33H2O
PbSeO4	-15.95	-22.79	-6.84	PbSeO4
Periclase	-8.62	12.96	21.58	MgO
Phosgenite	-13.72	-33.53	-19.81	PbCl2:PbCO3
Plattnerite	-18.83	30.77	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-129.97	-148.48	-18.51	FeS2
Pyrochroite	-4.43	10.77	15.19	Mn(OH)2
Pyrolusite	-5.07	36.31	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-104.39	-124.14	-19.75	AsS
Retgersite	-10.25	-12.29	-2.04	NiSO4:6H2O
Rhodochrosite	-0.30	-10.88	-10.58	MnCO3
Rutherfordine	-6.02	-20.52	-14.50	UO2CO3
Sb(OH)3	-14.73	-21.84	-7.11	Sb(OH)3

Sb2O4	-21.53	-18.13	3.40	Sb2O4
Sb2O5	-31.54	-41.21	-9.67	Sb2O5
Sb2Se3	-123.00	-190.76	-67.76	Sb2Se3
Sb4O6(cubic)	-69.09	-87.35	-18.26	Sb4O6
Sb4O6(orth)	-69.45	-87.35	-17.90	Sb4O6
SbCl3	-55.90	-55.33	0.57	SbCl3
SbF3	-49.24	-59.47	-10.23	SbF3
Sbmetal	-48.47	-60.15	-11.69	Sb
SbO2	-5.55	-33.37	-27.82	SbO2
Schoepite	-4.87	1.13	5.99	UO2(OH)2·H2O
Semetal(am)	-16.37	-23.48	-7.11	Se
Semetal(hex)	-15.77	-23.48	-7.71	Se
Senarmontite	-31.31	-43.67	-12.37	Sb2O3
SeO2	-17.38	-17.25	0.12	SeO2
SeO3	-49.06	-28.02	21.04	SeO3
Sepiolite	-0.39	15.37	15.76	Mg2Si3O7·5OH·3H2O
Sepiolite(A)	-3.41	15.37	18.78	Mg2Si3O7·5OH·3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2(am-ppt)	-0.78	-3.52	-2.74	SiO2
Smithsonite	-1.61	-11.61	-10.00	ZnCO3
Sphalerite	-67.25	-78.70	-11.45	ZnS
Spinel	-9.99	26.86	36.85	MgAl2O4
Stibnite	-259.42	-309.88	-50.46	Sb2S3
Sulfur	-61.05	-63.19	-2.14	S
Tenorite	0.13	7.78	7.64	CuO
Thenardite	-8.77	-8.45	0.32	Na2SO4
Thermonatrite	-10.52	-9.88	0.64	Na2CO3·H2O
Tyuyamunite	-10.97	-6.89	4.08	Ca(UO2)2(VO4)2
U3O8	-15.60	5.48	21.08	U3O8
U3Sb4	-591.88	-439.50	152.38	U3Sb4
U4O9	-32.25	-35.27	-3.02	U4O9
UF4	-35.84	-65.38	-29.54	UF4
UF4:2.5H2O	-32.66	-65.38	-32.72	UF4:2.5H2O
UO2(am)	-16.14	-15.20	0.93	UO2
UO2(NO3)2	-46.96	-34.81	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-39.66	-34.81	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-38.20	-34.81	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-36.86	-34.81	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-4.49	1.13	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.64	-26.89	-2.25	UO2SeO4:4H2O
UO3	-6.57	1.13	7.70	UO3
Uraninite	-10.53	-15.20	-4.67	UO2
USb2	-225.39	-195.82	29.58	USb2
V(OH)3	-21.69	-14.10	7.59	V(OH)3
V2O5	-20.95	-22.31	-1.36	V2O5
V3O5	-48.45	-46.61	1.84	V3O5
V4O7	-60.82	-53.64	7.19	V4O7
V6O13	-57.15	-118.01	-60.86	V6O13
Valentinite	-35.19	-43.67	-8.48	Sb2O3
VC12	-68.07	-49.20	18.87	VC12
VC13	-71.02	-47.59	23.43	VC13
VF4	-72.13	-57.20	14.93	VF4
Vmetal	-96.44	-52.42	44.03	V
VO	-41.63	-26.87	14.76	VO
VO(OH)2	-12.17	-7.02	5.15	VO(OH)2
VO2Cl	-25.16	-22.32	2.84	VO2Cl
VOC1	-36.42	-25.26	11.15	VOC1
VOC12	-42.11	-29.35	12.76	VOC12
VOSO4	-30.85	-27.24	3.61	VOSO4
Witherite	-5.39	-13.96	-8.57	BaCO3
Wurtzite	-69.75	-78.70	-8.95	ZnS
Zincite	-1.30	10.03	11.33	ZnO
Zincosite	-14.11	-10.18	3.93	ZnSO4
Zn(BO2)2	-8.57	-0.28	8.29	Zn(BO2)2
Zn(NO3)2·6H2O	-29.22	-25.90	3.32	Zn(NO3)2·6H2O
Zn(OH)2	-2.17	10.03	12.20	Zn(OH)2
Zn(OH)2(am)	-2.44	10.03	12.47	Zn(OH)2

Zn(OH)2(beta)	-1.72	10.03	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.50	10.03	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.70	10.03	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.65	-0.15	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.29	8.91	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.52	-1.87	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.25	-10.33	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.48	19.92	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.66	27.84	38.50	Zn5(OH)8Cl2
ZnCl2	-19.34	-12.29	7.05	ZnCl2
ZnCO3:1H2O	-1.35	-11.61	-10.26	ZnCO3:1H2O
ZnF2	-14.52	-15.05	-0.53	ZnF2
Znmetal	-41.30	-15.51	25.79	Zn
ZnMoO4	-4.21	-14.34	-10.13	ZnMoO4
ZnO(active)	-1.15	10.03	11.19	ZnO
ZnS(am)	-69.65	-78.70	-9.05	ZnS
ZnSb	-86.68	-75.66	11.01	ZnSb
ZnSe	-24.59	-38.99	-14.40	ZnSe
ZnSeO4:6H2O	-16.46	-17.98	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.55	-10.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 51.

Title Use solution to allow model output
REACTION 206
H2O -0.0
0 moles
USE solution 215
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 215. Solution after simulation 50.
Using reaction 206.

Reaction 206.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	5.293e-10	5.294e-10
Al	5.019e-08	5.019e-08
As	6.158e-09	6.158e-09
B	8.069e-06	8.069e-06
Ba	1.046e-09	1.046e-09
C	1.370e-03	1.370e-03
Ca	3.426e-04	3.426e-04
Cd	2.793e-10	2.793e-10
Cl	1.889e-03	1.889e-03
Co	1.875e-09	1.875e-09
Cr	5.968e-10	5.968e-10
Cu	9.759e-08	9.759e-08
F	8.026e-05	8.026e-05
Fe	7.056e-10	7.056e-10
Hg	4.578e-11	4.578e-11
K	1.634e-04	1.634e-04
Mg	2.081e-04	2.081e-04
Mn	1.379e-06	1.379e-06
Mo	3.769e-08	3.770e-08
N	3.151e-07	3.151e-07
Na	3.256e-03	3.257e-03
Ni	2.902e-09	2.902e-09
Pb	1.460e-10	1.460e-10
S	5.759e-04	5.760e-04
Sb	5.933e-10	5.934e-10
Se	3.601e-09	3.601e-09
Si	3.153e-04	3.153e-04
U	1.524e-08	1.524e-08
V	1.788e-10	1.788e-10
Zn	4.591e-07	4.592e-07

-----Description of solution-----

	pH	=	8.406	Charge balance
	pe	=	4.367	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	5.494e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.404e-03	
	Total CO2 (mol/kg)	=	1.370e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.727e-08	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110236e+02	
	Total O	=	5.551817e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.777e-06	2.563e-06	-5.556	-5.591	-0.035	(0)
H+	4.252e-09	3.929e-09	-8.371	-8.406	-0.034	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	5.293e-10					
AgCl	3.595e-10	3.595e-10	-9.444	-9.444	0.000	(0)
Ag+	1.092e-10	1.009e-10	-9.962	-9.996	-0.034	(0)
AgCl2-	5.962e-11	5.465e-11	-10.225	-10.262	-0.038	(0)
AgSO4-	8.613e-13	7.895e-13	-12.065	-12.103	-0.038	(0)
AgCl3-2	1.204e-13	8.500e-14	-12.919	-13.071	-0.151	(0)
AgOH	2.585e-14	2.585e-14	-13.587	-13.587	0.000	(0)
AgF	1.842e-14	1.842e-14	-13.735	-13.735	0.000	(0)

	AgNO2	6.110e-15	6.110e-15	-14.214	-14.214	0.000	(0)
	AgH2BO3	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
	AgCl4-3	6.630e-16	3.029e-16	-15.178	-15.519	-0.340	(0)
	AgSeO3-	1.019e-16	9.343e-17	-15.992	-16.030	-0.038	(0)
	AgNH3+	1.089e-17	9.980e-18	-16.963	-17.001	-0.038	(0)
	Ag (OH) 2-	7.063e-18	6.474e-18	-17.151	-17.189	-0.038	(0)
	Ag2Se	5.049e-18	5.049e-18	-17.297	-17.297	0.000	(0)
	AgNO3	2.191e-20	2.191e-20	-19.659	-19.659	0.000	(0)
	Ag (NO2) 2-	2.992e-21	2.743e-21	-20.524	-20.562	-0.038	(0)
	Ag (NH3) 2+	4.288e-24	3.931e-24	-23.368	-23.406	-0.038	(0)
	Ag (SeO3) 2-3	2.638e-24	1.205e-24	-23.579	-23.919	-0.340	(0)
	Ag2MoO4	1.058e-28	1.058e-28	-27.975	-27.975	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-76.513	-76.513	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.926	-86.530	-0.605	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-151.711	-151.821	-0.111	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-152.634	-152.856	-0.222	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-152.706	-152.744	-0.038	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-152.952	-153.167	-0.215	(0)
Al		5.019e-08					
	Al (OH) 4-	5.004e-08	4.627e-08	-7.301	-7.335	-0.034	(0)
	Al (OH) 3	1.434e-10	1.434e-10	-9.843	-9.843	0.000	(0)
	Al (OH) 2+	3.029e-12	2.805e-12	-11.519	-11.552	-0.033	(0)
	AlF2+	1.222e-14	1.131e-14	-13.913	-13.946	-0.033	(0)
	AlF3	1.035e-14	1.035e-14	-13.985	-13.985	0.000	(0)
	AlOH+2	1.875e-15	1.378e-15	-14.727	-14.861	-0.134	(0)
	AlF+2	5.318e-16	3.909e-16	-15.274	-15.408	-0.134	(0)
	AlF4-	4.081e-16	3.773e-16	-15.389	-15.423	-0.034	(0)
	AlSO4+	1.771e-18	1.637e-18	-17.752	-17.786	-0.034	(0)
	Al+3	1.096e-18	5.378e-19	-17.960	-18.269	-0.309	(0)
	Al (SO4) 2-	7.442e-21	6.880e-21	-20.128	-20.162	-0.034	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-58.738	-59.078	-0.340	(0)
As (3)		2.664e-23					
	H3AsO3	2.332e-23	2.332e-23	-22.632	-22.632	0.000	(0)
	H2AsO3-	3.321e-24	3.044e-24	-23.479	-23.517	-0.038	(0)
	HAsO3-2	1.001e-27	7.066e-28	-27.000	-27.151	-0.151	(0)
	H4AsO3+	4.952e-32	4.539e-32	-31.305	-31.343	-0.038	(0)
	AsO3-3	1.518e-32	6.933e-33	-31.819	-32.159	-0.340	(0)
As (5)		6.158e-09					
	HAsO4-2	5.985e-09	4.225e-09	-8.223	-8.374	-0.151	(0)
	H2AsO4-	1.652e-10	1.514e-10	-9.782	-9.820	-0.038	(0)
	AsO4-3	7.444e-12	3.401e-12	-11.128	-11.468	-0.340	(0)
	H3AsO4	1.032e-16	1.034e-16	-15.986	-15.986	0.001	(0)
B		8.069e-06					
	H3BO3	6.930e-06	6.939e-06	-5.159	-5.159	0.001	(0)
	H2BO3-	1.113e-06	1.026e-06	-5.953	-5.989	-0.036	(0)
	CaH2BO3+	1.453e-08	1.339e-08	-7.838	-7.873	-0.036	(0)
	MgH2BO3+	5.431e-09	5.004e-09	-8.265	-8.301	-0.036	(0)
	NaH2BO3	4.876e-09	4.876e-09	-8.312	-8.312	0.000	(0)
	BF (OH) 3-	2.185e-10	2.013e-10	-9.661	-9.696	-0.036	(0)
	H5 (BO3) 2-	6.576e-12	6.058e-12	-11.182	-11.218	-0.036	(0)
	BaH2BO3+	2.584e-14	2.380e-14	-13.588	-13.623	-0.036	(0)
	BF2 (OH) 2-	6.672e-15	6.147e-15	-14.176	-14.211	-0.036	(0)
	H8 (BO3) 3-	4.563e-15	4.203e-15	-14.341	-14.376	-0.036	(0)
	AgH2BO3	1.640e-15	1.640e-15	-14.785	-14.785	0.000	(0)
	BF3OH-	7.415e-22	6.831e-22	-21.130	-21.166	-0.036	(0)
	BF4-	1.042e-27	9.601e-28	-26.982	-27.018	-0.036	(0)
Ba		1.046e-09					
	Ba+2	1.030e-09	7.509e-10	-8.987	-9.124	-0.137	(0)
	BaHCO3+	9.468e-12	8.776e-12	-11.024	-11.057	-0.033	(0)
	BaCO3	5.623e-12	5.623e-12	-11.250	-11.250	0.000	(0)
	BaH2BO3+	2.584e-14	2.380e-14	-13.588	-13.623	-0.036	(0)
	BaOH+	9.078e-15	8.400e-15	-14.042	-14.076	-0.034	(0)
	BaNO3+	1.123e-18	1.029e-18	-17.950	-17.988	-0.038	(0)
	BaNH3+2	3.252e-20	2.296e-20	-19.488	-19.639	-0.151	(0)
C (4)		1.370e-03					
	HCO3-	1.322e-03	1.224e-03	-2.879	-2.912	-0.033	(0)
	CO3-2	2.004e-05	1.460e-05	-4.698	-4.836	-0.137	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)

		CaHCO3+	5.575e-06	5.167e-06	-5.254	-5.287	-0.033	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		NaHCO3	2.064e-06	2.064e-06	-5.685	-5.685	0.000	(0)
		MgHCO3+	1.907e-06	1.762e-06	-5.720	-5.754	-0.034	(0)
		MgCO3	1.709e-06	1.709e-06	-5.767	-5.767	0.000	(0)
		NaCO3-	8.808e-07	8.156e-07	-6.055	-6.089	-0.033	(0)
		ZnCO3	1.404e-07	1.404e-07	-6.853	-6.853	0.000	(0)
		CuCO3	7.964e-08	7.964e-08	-7.099	-7.099	0.000	(0)
		MnHCO3+	2.386e-08	2.208e-08	-7.622	-7.656	-0.034	(0)
		UO2 (CO3) 3-4	1.028e-08	2.554e-09	-7.988	-8.593	-0.605	(0)
		ZnHCO3+	7.056e-09	6.468e-09	-8.151	-8.189	-0.038	(0)
		UO2 (CO3) 2-2	4.944e-09	3.490e-09	-8.306	-8.457	-0.151	(0)
		Cu (CO3) 2-2	4.434e-09	3.130e-09	-8.353	-8.504	-0.151	(0)
		NiCO3	7.158e-10	7.158e-10	-9.145	-9.145	0.000	(0)
		CoCO3	2.409e-10	2.409e-10	-9.618	-9.618	0.000	(0)
		NiHCO3+	2.163e-10	1.982e-10	-9.665	-9.703	-0.038	(0)
		PbCO3	1.130e-10	1.130e-10	-9.947	-9.947	0.000	(0)
		CoHCO3+	1.014e-10	9.291e-11	-9.994	-10.032	-0.038	(0)
		CuHCO3+	7.802e-11	7.152e-11	-10.108	-10.146	-0.038	(0)
		CdCO3	4.578e-11	4.578e-11	-10.339	-10.339	0.000	(0)
		UO2CO3	1.198e-11	1.198e-11	-10.922	-10.922	0.000	(0)
		BaHCO3+	9.468e-12	8.776e-12	-11.024	-11.057	-0.033	(0)
		Pb (CO3) 2-2	6.742e-12	4.760e-12	-11.171	-11.322	-0.151	(0)
		BaCO3	5.623e-12	5.623e-12	-11.250	-11.250	0.000	(0)
		PbHCO3+	2.554e-12	2.341e-12	-11.593	-11.631	-0.038	(0)
		Cd (CO3) 2-2	7.020e-13	4.956e-13	-12.154	-12.305	-0.151	(0)
		CdHCO3+	4.181e-13	3.833e-13	-12.379	-12.417	-0.038	(0)
		FeHCO3+	7.244e-16	6.714e-16	-15.140	-15.173	-0.033	(0)
		HgCO3	4.676e-17	4.676e-17	-16.330	-16.330	0.000	(0)
		Hg (CO3) 2-2	3.059e-18	2.159e-18	-17.514	-17.666	-0.151	(0)
		HgHCO3+	3.732e-21	3.421e-21	-20.428	-20.466	-0.038	(0)
Ca	3.426e-04							
		Ca+2	3.112e-04	2.268e-04	-3.507	-3.644	-0.137	(0)
		CaSO4	2.038e-05	2.038e-05	-4.691	-4.691	0.000	(0)
		CaHCO3+	5.575e-06	5.167e-06	-5.254	-5.287	-0.033	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	1.945e-07	1.799e-07	-6.711	-6.745	-0.034	(0)
		CaH2BO3+	1.453e-08	1.339e-08	-7.838	-7.873	-0.036	(0)
		CaOH+	1.251e-08	1.160e-08	-7.903	-7.936	-0.033	(0)
		CaNO3+	2.139e-13	1.961e-13	-12.670	-12.708	-0.038	(0)
		CaNH3+2	1.959e-14	1.383e-14	-13.708	-13.859	-0.151	(0)
		Ca (NH3) 2+2	3.779e-25	2.668e-25	-24.423	-24.574	-0.151	(0)
Cd	2.793e-10							
		Cd+2	1.888e-10	1.376e-10	-9.724	-9.861	-0.137	(0)
		CdCO3	4.578e-11	4.578e-11	-10.339	-10.339	0.000	(0)
		CdCl+	2.501e-11	2.293e-11	-10.602	-10.640	-0.038	(0)
		CdSO4	1.265e-11	1.265e-11	-10.898	-10.898	0.000	(0)
		CdOH+	3.055e-12	2.800e-12	-11.515	-11.553	-0.038	(0)
		CdOHC1	2.410e-12	2.410e-12	-11.618	-11.618	0.000	(0)
		Cd (CO3) 2-2	7.020e-13	4.956e-13	-12.154	-12.305	-0.151	(0)
		CdHCO3+	4.181e-13	3.833e-13	-12.379	-12.417	-0.038	(0)
		CdF+	1.729e-13	1.585e-13	-12.762	-12.800	-0.038	(0)
		CdCl2	1.668e-13	1.668e-13	-12.778	-12.778	0.000	(0)
		Cd (SO4) 2-2	9.478e-14	6.691e-14	-13.023	-13.174	-0.151	(0)
		Cd (OH) 2	4.527e-14	4.527e-14	-13.344	-13.344	0.000	(0)
		CdCl3-	2.004e-16	1.837e-16	-15.698	-15.736	-0.038	(0)
		CdF2	2.299e-17	2.299e-17	-16.638	-16.638	0.000	(0)
		Cd (OH) 3-	7.733e-18	7.088e-18	-17.112	-17.149	-0.038	(0)
		CdSeO4	1.599e-19	1.599e-19	-18.796	-18.796	0.000	(0)
		CdNO3+	1.298e-19	1.190e-19	-18.887	-18.925	-0.038	(0)
		Cd2OH+3	4.226e-21	1.931e-21	-20.374	-20.714	-0.340	(0)
		Cd (SeO3) 2-2	3.334e-22	2.354e-22	-21.477	-21.628	-0.151	(0)
		Cd (OH) 4-2	4.211e-24	2.973e-24	-23.376	-23.527	-0.151	(0)
		Cd (NO3) 2	1.630e-29	1.630e-29	-28.788	-28.788	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-82.147	-82.185	-0.038	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-155.312	-155.312	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-233.705	-233.743	-0.038	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-311.726	-311.878	-0.151	(0)

C1	1.889e-03					
C1-	1.889e-03	1.745e-03	-2.724	-2.758	-0.034	(0)
ZnOHC1	2.458e-09	2.458e-09	-8.609	-8.609	0.000	(0)
MnCl+	2.147e-09	1.987e-09	-8.668	-8.702	-0.034	(0)
ZnCl+	7.932e-10	7.327e-10	-9.101	-9.135	-0.034	(0)
AgCl	3.595e-10	3.595e-10	-9.444	-9.444	0.000	(0)
AgCl2-	5.962e-11	5.465e-11	-10.225	-10.262	-0.038	(0)
CuCl	4.285e-11	4.285e-11	-10.368	-10.368	0.000	(0)
CdCl+	2.501e-11	2.293e-11	-10.602	-10.640	-0.038	(0)
CuCl2-	1.691e-11	1.562e-11	-10.772	-10.806	-0.034	(0)
CoCl+	6.429e-12	5.893e-12	-11.192	-11.230	-0.038	(0)
NiCl+	6.401e-12	5.868e-12	-11.194	-11.232	-0.038	(0)
MnCl2	4.897e-12	4.897e-12	-11.310	-11.310	0.000	(0)
CuCl+	2.774e-12	2.562e-12	-11.557	-11.591	-0.034	(0)
CdOHC1	2.410e-12	2.410e-12	-11.618	-11.618	0.000	(0)
ZnCl2	2.027e-12	2.027e-12	-11.693	-11.693	0.000	(0)
PbCl+	1.740e-13	1.595e-13	-12.760	-12.797	-0.038	(0)
CdCl2	1.668e-13	1.668e-13	-12.778	-12.778	0.000	(0)
AgCl3-2	1.204e-13	8.500e-14	-12.919	-13.071	-0.151	(0)
HgClOH	2.114e-14	2.114e-14	-13.675	-13.675	0.000	(0)
CuCl3-2	7.952e-15	5.830e-15	-14.100	-14.234	-0.135	(0)
ZnCl3-	3.041e-15	2.810e-15	-14.517	-14.551	-0.034	(0)
MnCl3-	2.544e-15	2.354e-15	-14.594	-14.628	-0.034	(0)
CuCl2	1.550e-15	1.550e-15	-14.810	-14.810	0.000	(0)
PbCl2	1.243e-15	1.243e-15	-14.905	-14.905	0.000	(0)
HgCl2	8.151e-16	8.151e-16	-15.089	-15.089	0.000	(0)
AgCl4-3	6.630e-16	3.029e-16	-15.178	-15.519	-0.340	(0)
CdCl3-	2.004e-16	1.837e-16	-15.698	-15.736	-0.038	(0)
NiCl2	5.156e-17	5.156e-17	-16.288	-16.288	0.000	(0)
HgCl3-	1.552e-17	1.423e-17	-16.809	-16.847	-0.038	(0)
ZnCl4-2	3.344e-18	2.452e-18	-17.476	-17.611	-0.135	(0)
PbCl3-	9.423e-19	8.637e-19	-18.026	-18.064	-0.038	(0)
UO2Cl+	6.364e-19	5.833e-19	-18.196	-18.234	-0.038	(0)
HgCl4-2	1.400e-19	9.884e-20	-18.854	-19.005	-0.151	(0)
HgCl+	1.017e-19	9.319e-20	-18.993	-19.031	-0.038	(0)
CrCl+2	4.764e-20	3.363e-20	-19.322	-19.473	-0.151	(0)
CuCl3-	2.734e-20	2.525e-20	-19.563	-19.598	-0.034	(0)
CrOHC12	2.859e-21	2.859e-21	-20.544	-20.544	0.000	(0)
PbCl4-2	9.760e-22	6.890e-22	-21.011	-21.162	-0.151	(0)
FeCl+2	6.771e-24	4.964e-24	-23.169	-23.304	-0.135	(0)
CrCl2+	6.076e-24	5.569e-24	-23.216	-23.254	-0.038	(0)
CuCl4-2	3.013e-25	2.209e-25	-24.521	-24.656	-0.135	(0)
FeCl2+	4.182e-26	3.870e-26	-25.379	-25.412	-0.034	(0)
CrO3Cl-	2.241e-26	2.054e-26	-25.649	-25.687	-0.038	(0)
VOCl+	7.824e-27	7.172e-27	-26.107	-26.144	-0.038	(0)
FeCl3	6.754e-30	6.754e-30	-29.170	-29.170	0.000	(0)
CoCl+2	4.547e-38	3.210e-38	-37.342	-37.494	-0.151	(0)
UCl+3	0.000e+00	0.000e+00	-49.544	-49.884	-0.340	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
Co (2)	1.875e-09					
Co+2	1.383e-09	9.761e-10	-8.859	-9.011	-0.151	(0)
CoCO3	2.409e-10	2.409e-10	-9.618	-9.618	0.000	(0)
CoHCO3+	1.014e-10	9.291e-11	-9.994	-10.032	-0.038	(0)
CoSO4	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
CoOH+	5.444e-11	4.990e-11	-10.264	-10.302	-0.038	(0)
Co (OH) 2	1.016e-11	1.016e-11	-10.993	-10.993	0.000	(0)
CoCl+	6.429e-12	5.893e-12	-11.192	-11.230	-0.038	(0)
CoF+	2.448e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
CoNO2+	2.175e-15	1.994e-15	-14.663	-14.700	-0.038	(0)
Co (OH) 3-	5.666e-16	5.194e-16	-15.247	-15.285	-0.038	(0)
CoOOH-	1.422e-16	1.303e-16	-15.847	-15.885	-0.038	(0)
Co (NH3) +2	8.054e-18	5.686e-18	-17.094	-17.245	-0.151	(0)
CoSeO4	3.053e-18	3.053e-18	-17.515	-17.515	0.000	(0)
CoNO3+	4.615e-19	4.230e-19	-18.336	-18.374	-0.038	(0)
Co2OH+3	5.344e-21	2.441e-21	-20.272	-20.612	-0.340	(0)
Co (OH) 4-2	2.988e-22	2.109e-22	-21.525	-21.676	-0.151	(0)

Co (NH3) 2+2	1.665e-26	1.175e-26	-25.779	-25.930	-0.151	(0)
Co (NO3) 2	2.354e-28	2.354e-28	-27.628	-27.628	0.000	(0)
Co4 (OH) 4+4	4.982e-33	1.238e-33	-32.303	-32.907	-0.605	(0)
Co (NH3) 3+2	1.015e-35	7.168e-36	-34.993	-35.145	-0.151	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-44.588	-44.739	-0.151	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-54.683	-54.834	-0.151	(0)
Co (3)	1.667e-30					
CoOH+2	1.667e-30	1.177e-30	-29.778	-29.929	-0.151	(0)
Co+3	1.842e-37	9.039e-38	-36.735	-37.044	-0.309	(0)
CoCl+2	4.547e-38	3.210e-38	-37.342	-37.494	-0.151	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-78.626	-78.777	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
Cr (2)	2.166e-28					
Cr+2	2.166e-28	1.529e-28	-27.664	-27.816	-0.151	(0)
Cr (3)	5.967e-10					
Cr (OH) 2+	2.840e-10	2.603e-10	-9.547	-9.585	-0.038	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.304e-11	3.029e-11	-10.481	-10.519	-0.038	(0)
Cr (OH) 4-	2.789e-11	2.556e-11	-10.555	-10.592	-0.038	(0)
Cr (OH) +2	1.182e-12	8.348e-13	-11.927	-12.078	-0.151	(0)
CrOHSO4	7.769e-14	7.769e-14	-13.110	-13.110	0.000	(0)
CrF+2	2.430e-16	1.716e-16	-15.614	-15.766	-0.151	(0)
Cr+3	3.260e-17	1.489e-17	-16.487	-16.827	-0.340	(0)
CrSO4+	1.488e-17	1.364e-17	-16.827	-16.865	-0.038	(0)
CrCl+2	4.764e-20	3.363e-20	-19.322	-19.473	-0.151	(0)
CrOHC12	2.859e-21	2.859e-21	-20.544	-20.544	0.000	(0)
Cr2 (OH) 2SO4+2	8.304e-24	5.862e-24	-23.081	-23.232	-0.151	(0)
CrCl2+	6.076e-24	5.569e-24	-23.216	-23.254	-0.038	(0)
Cr2 (OH) 2 (SO4) 2	1.366e-25	1.366e-25	-24.865	-24.865	0.000	(0)
CrNO3+2	2.521e-28	1.780e-28	-27.598	-27.750	-0.151	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.468	-53.620	-0.151	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-65.375	-65.715	-0.340	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Cr (6)	5.256e-14					
CrO4-2	5.141e-14	3.747e-14	-13.289	-13.426	-0.137	(0)
NaCrO4-	6.093e-16	5.585e-16	-15.215	-15.253	-0.038	(0)
HCrO4-	5.197e-16	4.763e-16	-15.284	-15.322	-0.038	(0)
KCrO4-	2.286e-17	2.096e-17	-16.641	-16.679	-0.038	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	3.167e-25	2.236e-25	-24.499	-24.651	-0.151	(0)
CrO3Cl-	2.241e-26	2.054e-26	-25.649	-25.687	-0.038	(0)
Cr2O7-2	1.115e-29	7.869e-30	-28.953	-29.104	-0.151	(0)
Cu (1)	8.105e-11					
CuCl	4.285e-11	4.285e-11	-10.368	-10.368	0.000	(0)
Cu+	2.128e-11	1.950e-11	-10.672	-10.710	-0.038	(0)
CuCl2-	1.691e-11	1.562e-11	-10.772	-10.806	-0.034	(0)
CuCl3-2	7.952e-15	5.830e-15	-14.100	-14.234	-0.135	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.952	-151.171	-0.218	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.689	-151.901	-0.211	(0)
Cu (2)	9.750e-08					
CuCO3	7.964e-08	7.964e-08	-7.099	-7.099	0.000	(0)
CuOH+	8.126e-09	7.506e-09	-8.090	-8.125	-0.034	(0)
Cu (CO3) 2-2	4.434e-09	3.130e-09	-8.353	-8.504	-0.151	(0)
Cu (OH) 2	3.838e-09	3.838e-09	-8.416	-8.416	0.000	(0)
Cu+2	1.271e-09	9.263e-10	-8.896	-9.033	-0.137	(0)
CuSO4	8.322e-11	8.322e-11	-10.080	-10.080	0.000	(0)
CuHCO3+	7.802e-11	7.152e-11	-10.108	-10.146	-0.038	(0)
Cu (OH) 3-	2.201e-11	2.017e-11	-10.657	-10.695	-0.038	(0)
CuF+	4.635e-12	4.249e-12	-11.334	-11.372	-0.038	(0)
CuCl+	2.774e-12	2.562e-12	-11.557	-11.591	-0.034	(0)
Cu2 (OH) 2+2	2.005e-12	1.415e-12	-11.698	-11.849	-0.151	(0)
CuNO2+	3.067e-14	2.811e-14	-13.513	-13.551	-0.038	(0)
CuCl2	1.550e-15	1.550e-15	-14.810	-14.810	0.000	(0)
CuNH3+2	6.505e-16	4.593e-16	-15.187	-15.338	-0.151	(0)
Cu (OH) 4-2	5.763e-16	4.068e-16	-15.239	-15.391	-0.151	(0)
CuNO3+	8.739e-19	8.010e-19	-18.059	-18.096	-0.038	(0)

	Cu (NO ₂) ₂	8.339e-20	8.339e-20	-19.079	-19.079	0.000	(0)
	CuCl ₃ -	2.734e-20	2.525e-20	-19.563	-19.598	-0.034	(0)
	CuCl ₄ -2	3.013e-25	2.209e-25	-24.521	-24.656	-0.135	(0)
	Cu (NO ₃) ₂	2.758e-29	2.758e-29	-28.559	-28.559	0.000	(0)
	Cu (HS) ₃ -	0.000e+00	0.000e+00	-224.090	-224.127	-0.038	(0)
F		8.026e-05					
	F-	7.868e-05	7.270e-05	-4.104	-4.138	-0.034	(0)
	MgF+	1.241e-06	1.148e-06	-5.906	-5.940	-0.034	(0)
	CaF+	1.945e-07	1.799e-07	-6.711	-6.745	-0.034	(0)
	NaF	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
	MnF+	2.828e-09	2.617e-09	-8.549	-8.582	-0.034	(0)
	HF	4.225e-10	4.225e-10	-9.374	-9.374	0.000	(0)
	ZnF+	2.645e-10	2.424e-10	-9.578	-9.615	-0.038	(0)
	BF (OH) ₃ -	2.185e-10	2.013e-10	-9.661	-9.696	-0.036	(0)
	CuF+	4.635e-12	4.249e-12	-11.334	-11.372	-0.038	(0)
	NiF+	2.618e-12	2.400e-12	-11.582	-11.620	-0.038	(0)
	CoF+	2.448e-12	2.244e-12	-11.611	-11.649	-0.038	(0)
	CdF+	1.729e-13	1.585e-13	-12.762	-12.800	-0.038	(0)
	HF ₂ -	1.265e-13	1.168e-13	-12.898	-12.933	-0.035	(0)
	AgF	1.842e-14	1.842e-14	-13.735	-13.735	0.000	(0)
	PbF+	1.439e-14	1.319e-14	-13.842	-13.880	-0.038	(0)
	AlF ₂ +	1.222e-14	1.131e-14	-13.913	-13.946	-0.033	(0)
	AlF ₃	1.035e-14	1.035e-14	-13.985	-13.985	0.000	(0)
	BF ₂ (OH) ₂ -	6.672e-15	6.147e-15	-14.176	-14.211	-0.036	(0)
	UO ₂ F+	2.256e-15	2.068e-15	-14.647	-14.684	-0.038	(0)
	AlF+ ₂	5.318e-16	3.909e-16	-15.274	-15.408	-0.134	(0)
	UO ₂ F ₂	4.336e-16	4.336e-16	-15.363	-15.363	0.000	(0)
	AlF ₄ -	4.081e-16	3.773e-16	-15.389	-15.423	-0.034	(0)
	CrF+ ₂	2.430e-16	1.716e-16	-15.614	-15.766	-0.151	(0)
	CdF ₂	2.299e-17	2.299e-17	-16.638	-16.638	0.000	(0)
	PbF ₂	1.887e-17	1.887e-17	-16.724	-16.724	0.000	(0)
	UO ₂ F ₃ -	8.637e-18	7.917e-18	-17.064	-17.101	-0.038	(0)
	H ₂ F ₂	4.782e-19	4.782e-19	-18.320	-18.320	0.000	(0)
	FeF ₂ +	1.578e-20	1.461e-20	-19.802	-19.835	-0.034	(0)
	FeF+ ₂	1.024e-20	7.508e-21	-19.990	-20.124	-0.135	(0)
	UO ₂ F ₄ -2	6.476e-21	4.572e-21	-20.189	-20.340	-0.151	(0)
	VO ₂ F	3.518e-21	3.518e-21	-20.454	-20.454	0.000	(0)
	PbF ₃ -	2.839e-21	2.602e-21	-20.547	-20.585	-0.038	(0)
	FeF ₃	1.498e-21	1.498e-21	-20.824	-20.824	0.000	(0)
	BF ₃ OH-	7.415e-22	6.831e-22	-21.130	-21.166	-0.036	(0)
	VO ₂ F ₂ -	1.013e-22	9.286e-23	-21.994	-22.032	-0.038	(0)
	VOF+	6.968e-25	6.387e-25	-24.157	-24.195	-0.038	(0)
	PbF ₄ -2	1.283e-25	9.054e-26	-24.892	-25.043	-0.151	(0)
	VO ₂ F ₃ -2	1.193e-25	8.421e-26	-24.923	-25.075	-0.151	(0)
	VOF ₂	1.741e-26	1.741e-26	-25.759	-25.759	0.000	(0)
	HgF+	7.867e-27	7.211e-27	-26.104	-26.142	-0.038	(0)
	BF ₄ -	1.042e-27	9.601e-28	-26.982	-27.018	-0.036	(0)
	Sb (OH) ₂ F	6.489e-29	6.489e-29	-28.188	-28.188	0.000	(0)
	SbOF	6.381e-29	6.381e-29	-28.195	-28.195	0.000	(0)
	VOF ₃ -	4.899e-29	4.491e-29	-28.310	-28.348	-0.038	(0)
	VO ₂ F ₄ -3	6.594e-30	3.012e-30	-29.181	-29.521	-0.340	(0)
	SiF ₆ -2	2.206e-32	1.617e-32	-31.656	-31.791	-0.135	(0)
	VOF ₄ -2	1.867e-32	1.318e-32	-31.729	-31.880	-0.151	(0)
	UF ₃ +	2.491e-40	2.283e-40	-39.604	-39.642	-0.038	(0)
	UF ₂ + ₂	0.000e+00	0.000e+00	-40.552	-40.703	-0.151	(0)
	UF ₄	0.000e+00	0.000e+00	-41.740	-41.740	0.000	(0)
	UF+ ₃	0.000e+00	0.000e+00	-43.324	-43.665	-0.340	(0)
	UF ₅ -	0.000e+00	0.000e+00	-44.243	-44.280	-0.038	(0)
	UF ₆ -2	0.000e+00	0.000e+00	-45.788	-45.939	-0.151	(0)
Fe (2)		7.148e-14					
	Fe+ ₂	6.174e-14	4.359e-14	-13.209	-13.361	-0.151	(0)
	FeOH+	4.805e-15	4.446e-15	-14.318	-14.352	-0.034	(0)
	FeSO ₄	4.196e-15	4.196e-15	-14.377	-14.377	0.000	(0)
	FeHCO ₃ +	7.244e-16	6.714e-16	-15.140	-15.173	-0.033	(0)
	Fe (OH) ₂	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) ₃ -	7.926e-18	7.334e-18	-17.101	-17.135	-0.034	(0)
	Fe (HS) ₂	0.000e+00	0.000e+00	-165.073	-165.073	0.000	(0)
	Fe (HS) ₃ -	0.000e+00	0.000e+00	-243.329	-243.367	-0.038	(0)

Fe (3)	7.055e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	1.678e-10	1.554e-10	-9.775	-9.809	-0.033	(0)
Fe (OH) 4-	1.102e-10	1.020e-10	-9.958	-9.991	-0.033	(0)
FeOH+2	2.126e-16	1.558e-16	-15.673	-15.807	-0.135	(0)
FeF2+	1.578e-20	1.461e-20	-19.802	-19.835	-0.034	(0)
FeF+2	1.024e-20	7.508e-21	-19.990	-20.124	-0.135	(0)
FeF3	1.498e-21	1.498e-21	-20.824	-20.824	0.000	(0)
FeSO4+	4.479e-22	4.145e-22	-21.349	-21.383	-0.034	(0)
Fe+3	1.920e-22	9.419e-23	-21.717	-22.026	-0.309	(0)
FeCl+2	6.771e-24	4.964e-24	-23.169	-23.304	-0.135	(0)
Fe (SO4) 2-	3.791e-24	3.475e-24	-23.421	-23.459	-0.038	(0)
FeCl2+	4.182e-26	3.870e-26	-25.379	-25.412	-0.034	(0)
FeHSeO3+2	5.013e-28	3.539e-28	-27.300	-27.451	-0.151	(0)
FeCl3	6.754e-30	6.754e-30	-29.170	-29.170	0.000	(0)
Fe2 (OH) 2+4	3.237e-30	8.041e-31	-29.490	-30.095	-0.605	(0)
FeNO3+2	3.648e-31	2.576e-31	-30.438	-30.589	-0.151	(0)
Fe3 (OH) 4+5	1.591e-38	1.806e-39	-37.798	-38.743	-0.945	(0)
H (0)	4.034e-29					
H2	2.017e-29	2.019e-29	-28.695	-28.695	0.001	(0)
Hg (0)	4.565e-11					
Hg	4.565e-11	4.565e-11	-10.341	-10.341	0.000	(0)
Hg (1)	2.349e-25					
Hg2+2	1.175e-25	8.293e-26	-24.930	-25.081	-0.151	(0)
Hg (2)	1.328e-13					
Hg (OH) 2	1.107e-13	1.109e-13	-12.956	-12.955	0.001	(0)
HgClOH	2.114e-14	2.114e-14	-13.675	-13.675	0.000	(0)
HgCl2	8.151e-16	8.151e-16	-15.089	-15.089	0.000	(0)
HgCO3	4.676e-17	4.676e-17	-16.330	-16.330	0.000	(0)
HgCl3-	1.552e-17	1.423e-17	-16.809	-16.847	-0.038	(0)
Hg (CO3) 2-2	3.059e-18	2.159e-18	-17.514	-17.666	-0.151	(0)
HgOH+	2.978e-19	2.730e-19	-18.526	-18.564	-0.038	(0)
HgCl4-2	1.400e-19	9.884e-20	-18.854	-19.005	-0.151	(0)
HgCl+	1.017e-19	9.319e-20	-18.993	-19.031	-0.038	(0)
Hg (OH) 3-	3.902e-20	3.577e-20	-19.409	-19.446	-0.038	(0)
HgHCO3+	3.732e-21	3.421e-21	-20.428	-20.466	-0.038	(0)
Hg+2	3.791e-24	2.676e-24	-23.421	-23.572	-0.151	(0)
HgSO4	2.748e-25	2.748e-25	-24.561	-24.561	0.000	(0)
HgNH3+2	1.159e-25	8.181e-26	-24.936	-25.087	-0.151	(0)
HgF+	7.867e-27	7.211e-27	-26.104	-26.142	-0.038	(0)
Hg (NH3) 2+2	5.615e-27	3.964e-27	-26.251	-26.402	-0.151	(0)
HgNO3+	2.948e-34	2.702e-34	-33.530	-33.568	-0.038	(0)
Hg (NH3) 3+2	1.083e-36	7.646e-37	-35.965	-36.117	-0.151	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-43.513	-43.513	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.380	-45.531	-0.151	(0)
HgHS2-	0.000e+00	0.000e+00	-143.863	-143.901	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-144.052	-144.203	-0.151	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-145.913	-145.913	0.000	(0)
K	1.634e-04					
K+	1.630e-04	1.506e-04	-3.788	-3.822	-0.034	(0)
KSO4-	4.515e-07	4.180e-07	-6.345	-6.379	-0.033	(0)
KCrO4-	2.286e-17	2.096e-17	-16.641	-16.679	-0.038	(0)
Mg	2.081e-04					
Mg+2	1.931e-04	1.407e-04	-3.714	-3.852	-0.137	(0)
MgSO4	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
MgHCO3+	1.907e-06	1.762e-06	-5.720	-5.754	-0.034	(0)
MgCO3	1.709e-06	1.709e-06	-5.767	-5.767	0.000	(0)
MgF+	1.241e-06	1.148e-06	-5.906	-5.940	-0.034	(0)
MgOH+	1.547e-07	1.435e-07	-6.810	-6.843	-0.033	(0)
MgH2BO3+	5.431e-09	5.004e-09	-8.265	-8.301	-0.036	(0)
Mn (2)	1.379e-06					
Mn+2	1.281e-06	9.042e-07	-5.893	-6.044	-0.151	(0)
MnSO4	6.306e-08	6.306e-08	-7.200	-7.200	0.000	(0)
MnHCO3+	2.386e-08	2.208e-08	-7.622	-7.656	-0.034	(0)
MnOH+	6.290e-09	5.820e-09	-8.201	-8.235	-0.034	(0)
MnF+	2.828e-09	2.617e-09	-8.549	-8.582	-0.034	(0)
MnCl+	2.147e-09	1.987e-09	-8.668	-8.702	-0.034	(0)
MnCl2	4.897e-12	4.897e-12	-11.310	-11.310	0.000	(0)

MnCl3-	2.544e-15	2.354e-15	-14.594	-14.628	-0.034	(0)
MnSeO4	1.519e-15	1.519e-15	-14.818	-14.818	0.000	(0)
MnNO3+	4.275e-16	3.919e-16	-15.369	-15.407	-0.038	(0)
Mn (OH) 3-	2.552e-16	2.362e-16	-15.593	-15.627	-0.034	(0)
Mn (OH) 4-2	2.665e-21	1.954e-21	-20.574	-20.709	-0.135	(0)
Mn (NO3) 2	2.692e-25	2.692e-25	-24.570	-24.570	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.644	-43.644	0.000	(0)
Mn (3)	1.915e-27					
Mn+3	1.915e-27	9.395e-28	-26.718	-27.027	-0.309	(0)
Mn (6)	2.406e-40					
MnO4-2	2.406e-40	1.764e-40	-39.619	-39.754	-0.135	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.724	-44.759	-0.035	(0)
Mo	3.769e-08					
MoO4-2	3.769e-08	2.747e-08	-7.424	-7.561	-0.137	(0)
HMoO4-	2.343e-12	2.147e-12	-11.630	-11.668	-0.038	(0)
H2MoO4	6.180e-17	6.180e-17	-16.209	-16.209	0.000	(0)
Ag2MoO4	1.058e-28	1.058e-28	-27.975	-27.975	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-58.738	-59.078	-0.340	(0)
Mo7O24-6	0.000e+00	0.000e+00	-65.823	-67.184	-1.361	(0)
HMo7O24-5	0.000e+00	0.000e+00	-68.258	-69.203	-0.945	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-72.221	-72.826	-0.605	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-77.646	-77.986	-0.340	(0)
N (-3)	4.124e-10					
NH4+	3.624e-10	3.339e-10	-9.441	-9.476	-0.036	(0)
NH3	4.845e-11	4.845e-11	-10.315	-10.315	0.000	(0)
NH4SO4-	1.516e-12	1.403e-12	-11.819	-11.853	-0.034	(0)
CaNH3+2	1.959e-14	1.383e-14	-13.708	-13.859	-0.151	(0)
CuNH3+2	6.505e-16	4.593e-16	-15.187	-15.338	-0.151	(0)
NiNH3+2	4.843e-17	3.419e-17	-16.315	-16.466	-0.151	(0)
AgNH3+	1.089e-17	9.980e-18	-16.963	-17.001	-0.038	(0)
Co (NH3) +2	8.054e-18	5.686e-18	-17.094	-17.245	-0.151	(0)
BaNH3+2	3.252e-20	2.296e-20	-19.488	-19.639	-0.151	(0)
Ag (NH3) 2+	4.288e-24	3.931e-24	-23.368	-23.406	-0.038	(0)
Ca (NH3) 2+2	3.779e-25	2.668e-25	-24.423	-24.574	-0.151	(0)
Ni (NH3) 2+2	3.392e-25	2.395e-25	-24.470	-24.621	-0.151	(0)
HgNH3+2	1.159e-25	8.181e-26	-24.936	-25.087	-0.151	(0)
Co (NH3) 2+2	1.665e-26	1.175e-26	-25.779	-25.930	-0.151	(0)
Hg (NH3) 2+2	5.615e-27	3.964e-27	-26.251	-26.402	-0.151	(0)
Co (NH3) 3+2	1.015e-35	7.168e-36	-34.993	-35.145	-0.151	(0)
Hg (NH3) 3+2	1.083e-36	7.646e-37	-35.965	-36.117	-0.151	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-44.588	-44.739	-0.151	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.380	-45.531	-0.151	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-53.468	-53.620	-0.151	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-54.683	-54.834	-0.151	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-62.963	-63.114	-0.151	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-65.375	-65.715	-0.340	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.220	-67.371	-0.151	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-78.626	-78.777	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-79.993	-80.144	-0.151	(0)
N (3)	3.144e-07					
NO2-	3.144e-07	2.899e-07	-6.503	-6.538	-0.035	(0)
CuNO2+	3.067e-14	2.811e-14	-13.513	-13.551	-0.038	(0)
AgNO2	6.110e-15	6.110e-15	-14.214	-14.214	0.000	(0)
CoNO2+	2.175e-15	1.994e-15	-14.663	-14.700	-0.038	(0)
Cu (NO2) 2	8.339e-20	8.339e-20	-19.079	-19.079	0.000	(0)
Ag (NO2) 2-	2.992e-21	2.743e-21	-20.524	-20.562	-0.038	(0)
N (5)	2.962e-10					
NO3-	2.960e-10	2.735e-10	-9.529	-9.563	-0.034	(0)
CaNO3+	2.139e-13	1.961e-13	-12.670	-12.708	-0.038	(0)
MnNO3+	4.275e-16	3.919e-16	-15.369	-15.407	-0.038	(0)
ZnNO3+	1.252e-16	1.148e-16	-15.902	-15.940	-0.038	(0)
BaNO3+	1.123e-18	1.029e-18	-17.950	-17.988	-0.038	(0)
NiNO3+	9.847e-19	9.026e-19	-18.007	-18.044	-0.038	(0)
CuNO3+	8.739e-19	8.010e-19	-18.059	-18.096	-0.038	(0)
CoNO3+	4.615e-19	4.230e-19	-18.336	-18.374	-0.038	(0)
CdNO3+	1.298e-19	1.190e-19	-18.887	-18.925	-0.038	(0)

AgNO3	2.191e-20	2.191e-20	-19.659	-19.659	0.000	(0)
PbNO3+	1.136e-20	1.042e-20	-19.945	-19.982	-0.038	(0)
Mn (NO3) 2	2.692e-25	2.692e-25	-24.570	-24.570	0.000	(0)
UO2NO3+	1.227e-25	1.124e-25	-24.911	-24.949	-0.038	(0)
Zn (NO3) 2	6.264e-27	6.264e-27	-26.203	-26.203	0.000	(0)
CrNO3+2	2.521e-28	1.780e-28	-27.598	-27.750	-0.151	(0)
Co (NO3) 2	2.354e-28	2.354e-28	-27.628	-27.628	0.000	(0)
Cu (NO3) 2	2.758e-29	2.758e-29	-28.559	-28.559	0.000	(0)
Cd (NO3) 2	1.630e-29	1.630e-29	-28.788	-28.788	0.000	(0)
Pb (NO3) 2	4.837e-30	4.837e-30	-29.315	-29.315	0.000	(0)
VO2NO3	3.817e-30	3.817e-30	-29.418	-29.418	0.000	(0)
FeNO3+2	3.648e-31	2.576e-31	-30.438	-30.589	-0.151	(0)
HgNO3+	2.948e-34	2.702e-34	-33.530	-33.568	-0.038	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-43.513	-43.513	0.000	(0)
Na	3.256e-03					
Na+	3.247e-03	3.000e-03	-2.489	-2.523	-0.034	(0)
NaSO4-	6.823e-06	6.318e-06	-5.166	-5.199	-0.033	(0)
NaHCO3	2.064e-06	2.064e-06	-5.685	-5.685	0.000	(0)
NaCO3-	8.808e-07	8.156e-07	-6.055	-6.089	-0.033	(0)
NaF	1.376e-07	1.376e-07	-6.861	-6.861	0.000	(0)
NaH2BO3	4.876e-09	4.876e-09	-8.312	-8.312	0.000	(0)
NaCrO4-	6.093e-16	5.585e-16	-15.215	-15.253	-0.038	(0)
Ni	2.902e-09					
Ni+2	1.803e-09	1.314e-09	-8.744	-8.881	-0.137	(0)
NiCO3	7.158e-10	7.158e-10	-9.145	-9.145	0.000	(0)
NiHCO3+	2.163e-10	1.982e-10	-9.665	-9.703	-0.038	(0)
NiSO4	1.028e-10	1.028e-10	-9.988	-9.988	0.000	(0)
NiOH+	4.625e-11	4.239e-11	-10.335	-10.373	-0.038	(0)
Ni (OH) 2	8.629e-12	8.629e-12	-11.064	-11.064	0.000	(0)
NiCl+	6.401e-12	5.868e-12	-11.194	-11.232	-0.038	(0)
NiF+	2.618e-12	2.400e-12	-11.582	-11.620	-0.038	(0)
Ni (OH) 3-	2.412e-14	2.211e-14	-13.618	-13.655	-0.038	(0)
Ni (SO4) 2-2	1.892e-15	1.335e-15	-14.723	-14.874	-0.151	(0)
NiCl2	5.156e-17	5.156e-17	-16.288	-16.288	0.000	(0)
NiNH3+2	4.843e-17	3.419e-17	-16.315	-16.466	-0.151	(0)
NiSeO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
NiNO3+	9.847e-19	9.026e-19	-18.007	-18.044	-0.038	(0)
Ni (NH3) 2+2	3.392e-25	2.395e-25	-24.470	-24.621	-0.151	(0)
O (0)	2.482e-35					
O2	1.241e-35	1.243e-35	-34.906	-34.906	0.001	(0)
Pb	1.460e-10					
PbCO3	1.130e-10	1.130e-10	-9.947	-9.947	0.000	(0)
PbOH+	1.808e-11	1.658e-11	-10.743	-10.781	-0.038	(0)
Pb (CO3) 2-2	6.742e-12	4.760e-12	-11.171	-11.322	-0.151	(0)
Pb+2	3.534e-12	2.575e-12	-11.452	-11.589	-0.137	(0)
PbHCO3+	2.554e-12	2.341e-12	-11.593	-11.631	-0.038	(0)
Pb (OH) 2	1.343e-12	1.343e-12	-11.872	-11.872	0.000	(0)
PbSO4	4.947e-13	4.947e-13	-12.306	-12.306	0.000	(0)
PbCl+	1.740e-13	1.595e-13	-12.760	-12.797	-0.038	(0)
PbF+	1.439e-14	1.319e-14	-13.842	-13.880	-0.038	(0)
Pb (OH) 3-	3.755e-15	3.442e-15	-14.425	-14.463	-0.038	(0)
Pb (SO4) 2-2	1.656e-15	1.169e-15	-14.781	-14.932	-0.151	(0)
PbCl2	1.243e-15	1.243e-15	-14.905	-14.905	0.000	(0)
PbF2	1.887e-17	1.887e-17	-16.724	-16.724	0.000	(0)
Pb (OH) 4-2	3.060e-18	2.160e-18	-17.514	-17.666	-0.151	(0)
PbCl3-	9.423e-19	8.637e-19	-18.026	-18.064	-0.038	(0)
PbNO3+	1.136e-20	1.042e-20	-19.945	-19.982	-0.038	(0)
PbF3-	2.839e-21	2.602e-21	-20.547	-20.585	-0.038	(0)
Pb2OH+3	1.481e-21	6.765e-22	-20.829	-21.170	-0.340	(0)
PbCl4-2	9.760e-22	6.890e-22	-21.011	-21.162	-0.151	(0)
Pb3 (OH) 4+2	1.313e-25	9.270e-26	-24.882	-25.033	-0.151	(0)
PbF4-2	1.283e-25	9.054e-26	-24.892	-25.043	-0.151	(0)
Pb (NO3) 2	4.837e-30	4.837e-30	-29.315	-29.315	0.000	(0)
Pb4 (OH) 4+4	7.634e-33	1.896e-33	-32.117	-32.722	-0.605	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-156.981	-156.981	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-235.974	-236.012	-0.038	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-76.513	-76.513	0.000	(0)

HS-	0.000e+00	0.000e+00	-80.293	-80.331	-0.038	(0)
S5-2	0.000e+00	0.000e+00	-81.139	-81.290	-0.151	(0)
S6-2	0.000e+00	0.000e+00	-81.655	-81.806	-0.151	(0)
H2S	0.000e+00	0.000e+00	-81.717	-81.717	0.000	(0)
S4-2	0.000e+00	0.000e+00	-81.735	-81.886	-0.151	(0)
CdHS+	0.000e+00	0.000e+00	-82.147	-82.185	-0.038	(0)
S3-2	0.000e+00	0.000e+00	-82.541	-82.692	-0.151	(0)
S2-2	0.000e+00	0.000e+00	-83.557	-83.708	-0.151	(0)
S-2	0.000e+00	0.000e+00	-89.090	-89.225	-0.135	(0)
HgHS2-	0.000e+00	0.000e+00	-143.863	-143.901	-0.038	(0)
HgS2-2	0.000e+00	0.000e+00	-144.052	-144.203	-0.151	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-145.913	-145.913	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.952	-151.171	-0.218	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.689	-151.901	-0.211	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-151.711	-151.821	-0.111	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-152.185	-152.223	-0.038	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-152.634	-152.856	-0.222	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-152.706	-152.744	-0.038	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.952	-153.167	-0.215	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.619	-154.619	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-155.312	-155.312	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-156.981	-156.981	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-165.073	-165.073	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-224.090	-224.127	-0.038	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.632	-231.670	-0.038	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-233.093	-233.244	-0.151	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-233.705	-233.743	-0.038	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-235.974	-236.012	-0.038	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-243.329	-243.367	-0.038	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-311.726	-311.878	-0.151	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-313.310	-313.461	-0.151	(0)
Sb2S4-2	0.000e+00	0.000e+00	-332.270	-332.421	-0.151	(0)
S (6)	5.759e-04					
SO4-2	5.382e-04	3.922e-04	-3.269	-3.407	-0.137	(0)
CaSO4	2.038e-05	2.038e-05	-4.691	-4.691	0.000	(0)
MgSO4	1.004e-05	1.004e-05	-4.998	-4.998	0.000	(0)
NaSO4-	6.823e-06	6.318e-06	-5.166	-5.199	-0.033	(0)
KSO4-	4.515e-07	4.180e-07	-6.345	-6.379	-0.033	(0)
MnSO4	6.306e-08	6.306e-08	-7.200	-7.200	0.000	(0)
ZnSO4	1.434e-08	1.434e-08	-7.843	-7.843	0.000	(0)
HSO4-	1.629e-10	1.506e-10	-9.788	-9.822	-0.034	(0)
NiSO4	1.028e-10	1.028e-10	-9.988	-9.988	0.000	(0)
CuSO4	8.322e-11	8.322e-11	-10.080	-10.080	0.000	(0)
CoSO4	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
Zn (SO4) 2-2	6.939e-11	4.899e-11	-10.159	-10.310	-0.151	(0)
CdSO4	1.265e-11	1.265e-11	-10.898	-10.898	0.000	(0)
NH4SO4-	1.516e-12	1.403e-12	-11.819	-11.853	-0.034	(0)
AgSO4-	8.613e-13	7.895e-13	-12.065	-12.103	-0.038	(0)
PbSO4	4.947e-13	4.947e-13	-12.306	-12.306	0.000	(0)
Cd (SO4) 2-2	9.478e-14	6.691e-14	-13.023	-13.174	-0.151	(0)
CrOHSO4	7.769e-14	7.769e-14	-13.110	-13.110	0.000	(0)
FeSO4	4.196e-15	4.196e-15	-14.377	-14.377	0.000	(0)
Ni (SO4) 2-2	1.892e-15	1.335e-15	-14.723	-14.874	-0.151	(0)
Pb (SO4) 2-2	1.656e-15	1.169e-15	-14.781	-14.932	-0.151	(0)
UO2SO4	1.223e-16	1.223e-16	-15.912	-15.912	0.000	(0)
CrSO4+	1.488e-17	1.364e-17	-16.827	-16.865	-0.038	(0)
AlSO4+	1.771e-18	1.637e-18	-17.752	-17.786	-0.034	(0)
UO2 (SO4) 2-2	8.959e-19	6.325e-19	-18.048	-18.199	-0.151	(0)
Al (SO4) 2-	7.442e-21	6.880e-21	-20.128	-20.162	-0.034	(0)
FeSO4+	4.479e-22	4.145e-22	-21.349	-21.383	-0.034	(0)
VO2SO4-	2.819e-22	2.584e-22	-21.550	-21.588	-0.038	(0)
Cr2 (OH) 2SO4+2	8.304e-24	5.862e-24	-23.081	-23.232	-0.151	(0)
Fe (SO4) 2-	3.791e-24	3.475e-24	-23.421	-23.459	-0.038	(0)
CrO3SO4-2	3.167e-25	2.236e-25	-24.499	-24.651	-0.151	(0)
HgSO4	2.748e-25	2.748e-25	-24.561	-24.561	0.000	(0)
VOSO4	1.582e-25	1.582e-25	-24.801	-24.801	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.366e-25	1.366e-25	-24.865	-24.865	0.000	(0)
VS04+	0.000e+00	0.000e+00	-40.011	-40.049	-0.038	(0)

U(SO4)2	0.000e+00	0.000e+00	-45.139	-45.139	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.481	-45.633	-0.151	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-75.829	-75.867	-0.038	(0)
Sb(3)	2.875e-22					
Sb(OH)3	1.454e-22	1.454e-22	-21.837	-21.837	0.000	(0)
HSbO2	1.420e-22	1.420e-22	-21.848	-21.848	0.000	(0)
SbO2-	6.384e-26	5.852e-26	-25.195	-25.233	-0.038	(0)
Sb(OH)4-	3.658e-26	3.353e-26	-25.437	-25.475	-0.038	(0)
Sb(OH)2F	6.489e-29	6.489e-29	-28.188	-28.188	0.000	(0)
SbOF	6.381e-29	6.381e-29	-28.195	-28.195	0.000	(0)
Sb(OH)2+	1.514e-29	1.388e-29	-28.820	-28.858	-0.038	(0)
SbO+	5.219e-30	4.784e-30	-29.282	-29.320	-0.038	(0)
Sb2S4-2	0.000e+00	0.000e+00	-332.270	-332.421	-0.151	(0)
Sb(5)	5.933e-10					
SbO3-	5.927e-10	5.433e-10	-9.227	-9.265	-0.038	(0)
Sb(OH)6-	6.875e-13	6.352e-13	-12.163	-12.197	-0.034	(0)
SbO2+	2.624e-27	2.406e-27	-26.581	-26.619	-0.038	(0)
Se(-2)	5.049e-18					
Ag2Se	5.049e-18	5.049e-18	-17.297	-17.297	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.583	-40.621	-0.038	(0)
MnSe	0.000e+00	0.000e+00	-43.644	-43.644	0.000	(0)
H2Se	0.000e+00	0.000e+00	-45.137	-45.137	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.064	-47.215	-0.151	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-85.926	-86.530	-0.605	(0)
Se(4)	3.592e-09					
SeO3-2	2.041e-09	1.441e-09	-8.690	-8.841	-0.151	(0)
HSeO3-	1.551e-09	1.422e-09	-8.809	-8.847	-0.038	(0)
H2SeO3	2.383e-15	2.383e-15	-14.623	-14.623	0.000	(0)
AgSeO3-	1.019e-16	9.343e-17	-15.992	-16.030	-0.038	(0)
Cd(SeO3)2-2	3.334e-22	2.354e-22	-21.477	-21.628	-0.151	(0)
Ag(SeO3)2-3	2.638e-24	1.205e-24	-23.579	-23.919	-0.340	(0)
FeHSeO3+2	5.013e-28	3.539e-28	-27.300	-27.451	-0.151	(0)
Se(6)	8.567e-12					
SeO4-2	8.565e-12	6.242e-12	-11.067	-11.205	-0.137	(0)
MnSeO4	1.519e-15	1.519e-15	-14.818	-14.818	0.000	(0)
ZnSeO4	1.616e-16	1.616e-16	-15.792	-15.792	0.000	(0)
NiSeO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
CoSeO4	3.053e-18	3.053e-18	-17.515	-17.515	0.000	(0)
HSeO4-	1.341e-18	1.229e-18	-17.873	-17.910	-0.038	(0)
CdSeO4	1.599e-19	1.599e-19	-18.796	-18.796	0.000	(0)
Zn(SeO4)2-2	1.449e-27	1.023e-27	-26.839	-26.990	-0.151	(0)
Si	3.153e-04					
H4SiO4	3.032e-04	3.036e-04	-3.518	-3.518	0.001	(0)
H3SiO4-	1.209e-05	1.117e-05	-4.918	-4.952	-0.034	(0)
H2SiO4-2	2.440e-10	1.794e-10	-9.613	-9.746	-0.134	(0)
UO2H3SiO4+	2.132e-13	1.954e-13	-12.671	-12.709	-0.038	(0)
SiF6-2	2.206e-32	1.617e-32	-31.656	-31.791	-0.135	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.648	-61.989	-0.340	(0)
U(4)	1.319e-20					
U(OH)5-	1.319e-20	1.209e-20	-19.880	-19.918	-0.038	(0)
U(OH)4	1.989e-24	1.989e-24	-23.701	-23.701	0.000	(0)
U(OH)3+	3.117e-29	2.857e-29	-28.506	-28.544	-0.038	(0)
U(OH)2+2	7.354e-35	5.191e-35	-34.134	-34.285	-0.151	(0)
UF3+	2.491e-40	2.283e-40	-39.604	-39.642	-0.038	(0)
UF2+2	0.000e+00	0.000e+00	-40.552	-40.703	-0.151	(0)
UOH+3	0.000e+00	0.000e+00	-40.677	-41.017	-0.340	(0)
UF4	0.000e+00	0.000e+00	-41.740	-41.740	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.324	-43.665	-0.340	(0)
UF5-	0.000e+00	0.000e+00	-44.243	-44.280	-0.038	(0)
U(SO4)2	0.000e+00	0.000e+00	-45.139	-45.139	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.481	-45.633	-0.151	(0)
UF6-2	0.000e+00	0.000e+00	-45.788	-45.939	-0.151	(0)
U+4	0.000e+00	0.000e+00	-48.221	-48.826	-0.605	(0)
UCl+3	0.000e+00	0.000e+00	-49.544	-49.884	-0.340	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-180.964	-184.026	-3.062	(0)
U(5)	5.891e-18					
UO2+	5.891e-18	5.400e-18	-17.230	-17.268	-0.038	(0)

U (6)	1.524e-08					
UO2 (CO3) 3-4	1.028e-08	2.554e-09	-7.988	-8.593	-0.605	(0)
UO2 (CO3) 2-2	4.944e-09	3.490e-09	-8.306	-8.457	-0.151	(0)
UO2CO3	1.198e-11	1.198e-11	-10.922	-10.922	0.000	(0)
UO2H3SiO4+	2.132e-13	1.954e-13	-12.671	-12.709	-0.038	(0)
UO2OH+	7.253e-14	6.648e-14	-13.139	-13.177	-0.038	(0)
UO2F+	2.256e-15	2.068e-15	-14.647	-14.684	-0.038	(0)
UO2F2	4.336e-16	4.336e-16	-15.363	-15.363	0.000	(0)
UO2+2	2.828e-16	2.061e-16	-15.549	-15.686	-0.137	(0)
UO2SO4	1.223e-16	1.223e-16	-15.912	-15.912	0.000	(0)
UO2F3-	8.637e-18	7.917e-18	-17.064	-17.101	-0.038	(0)
UO2 (SO4) 2-2	8.959e-19	6.325e-19	-18.048	-18.199	-0.151	(0)
UO2Cl+	6.364e-19	5.833e-19	-18.196	-18.234	-0.038	(0)
(UO2) 2 (OH) 2+2	1.039e-20	7.335e-21	-19.983	-20.135	-0.151	(0)
UO2F4-2	6.476e-21	4.572e-21	-20.189	-20.340	-0.151	(0)
(UO2) 3 (OH) 5+	2.650e-21	2.429e-21	-20.577	-20.615	-0.038	(0)
UO2NO3+	1.227e-25	1.124e-25	-24.911	-24.949	-0.038	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-46.036	-46.074	-0.038	(0)
V+2	0.000e+00	0.000e+00	-47.842	-47.993	-0.151	(0)
V (3)	6.553e-18					
V (OH) 3	6.553e-18	6.553e-18	-17.184	-17.184	0.000	(0)
V (OH) 2+	1.815e-29	1.664e-29	-28.741	-28.779	-0.038	(0)
VOH+2	8.782e-34	6.200e-34	-33.056	-33.208	-0.151	(0)
V+3	1.057e-39	4.828e-40	-38.976	-39.316	-0.340	(0)
VSO4+	0.000e+00	0.000e+00	-40.011	-40.049	-0.038	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-63.194	-63.535	-0.340	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-65.010	-65.615	-0.605	(0)
V (4)	8.199e-22					
V (OH) 3+	8.169e-22	7.488e-22	-21.088	-21.126	-0.038	(0)
VO+2	2.075e-24	1.465e-24	-23.683	-23.834	-0.151	(0)
VOF+	6.968e-25	6.387e-25	-24.157	-24.195	-0.038	(0)
VOSO4	1.582e-25	1.582e-25	-24.801	-24.801	0.000	(0)
VOF2	1.741e-26	1.741e-26	-25.759	-25.759	0.000	(0)
VOC1+	7.824e-27	7.172e-27	-26.107	-26.144	-0.038	(0)
VOF3-	4.899e-29	4.491e-29	-28.310	-28.348	-0.038	(0)
VOF4-2	1.867e-32	1.318e-32	-31.729	-31.880	-0.151	(0)
H2V2O4+2	3.982e-38	2.811e-38	-37.400	-37.551	-0.151	(0)
V (5)	1.788e-10					
H2VO4-	9.772e-11	8.957e-11	-10.010	-10.048	-0.038	(0)
HVO4-2	8.112e-11	5.726e-11	-10.091	-10.242	-0.151	(0)
H3VO4	3.519e-15	3.519e-15	-14.454	-14.454	0.000	(0)
VO4-3	1.599e-16	7.305e-17	-15.796	-16.136	-0.340	(0)
HV2O7-3	3.805e-18	1.738e-18	-17.420	-17.760	-0.340	(0)
H3V2O7-	2.221e-18	2.035e-18	-17.654	-17.691	-0.038	(0)
V2O7-4	4.794e-20	1.191e-20	-19.319	-19.924	-0.605	(0)
VO2+	2.987e-20	2.759e-20	-19.525	-19.559	-0.034	(0)
VO2F	3.518e-21	3.518e-21	-20.454	-20.454	0.000	(0)
VO2SO4-	2.819e-22	2.584e-22	-21.550	-21.588	-0.038	(0)
VO2F2-	1.013e-22	9.286e-23	-21.994	-22.032	-0.038	(0)
V3O9-3	1.648e-24	7.528e-25	-23.783	-24.123	-0.340	(0)
VO2F3-2	1.193e-25	8.421e-26	-24.923	-25.075	-0.151	(0)
VO2F4-3	6.594e-30	3.012e-30	-29.181	-29.521	-0.340	(0)
VO2NO3	3.817e-30	3.817e-30	-29.418	-29.418	0.000	(0)
V4O12-4	1.132e-31	2.811e-32	-30.946	-31.551	-0.605	(0)
V10O28-6	0.000e+00	0.000e+00	-83.834	-85.195	-1.361	(0)
HV10O28-5	0.000e+00	0.000e+00	-84.469	-85.414	-0.945	(0)
H2V10O28-4	0.000e+00	0.000e+00	-88.007	-88.612	-0.605	(0)
Zn	4.591e-07					
Zn+2	2.293e-07	1.671e-07	-6.640	-6.777	-0.137	(0)
ZnCO3	1.404e-07	1.404e-07	-6.853	-6.853	0.000	(0)
ZnOH+	4.672e-08	4.283e-08	-7.330	-7.368	-0.038	(0)
Zn (OH) 2	1.739e-08	1.739e-08	-7.760	-7.760	0.000	(0)
ZnSO4	1.434e-08	1.434e-08	-7.843	-7.843	0.000	(0)
ZnHCO3+	7.056e-09	6.468e-09	-8.151	-8.189	-0.038	(0)
ZnOHC1	2.458e-09	2.458e-09	-8.609	-8.609	0.000	(0)
ZnCl+	7.932e-10	7.327e-10	-9.101	-9.135	-0.034	(0)
ZnF+	2.645e-10	2.424e-10	-9.578	-9.615	-0.038	(0)

Zn(OH) 3-	2.437e-10	2.234e-10	-9.613	-9.651	-0.038	(0)
Zn(SO4) 2-2	6.939e-11	4.899e-11	-10.159	-10.310	-0.151	(0)
ZnCl2	2.027e-12	2.027e-12	-11.693	-11.693	0.000	(0)
Zn(OH) 4-2	3.228e-14	2.279e-14	-13.491	-13.642	-0.151	(0)
ZnCl3-	3.041e-15	2.810e-15	-14.517	-14.551	-0.034	(0)
ZnSeO4	1.616e-16	1.616e-16	-15.792	-15.792	0.000	(0)
ZnNO3+	1.252e-16	1.148e-16	-15.902	-15.940	-0.038	(0)
ZnCl4-2	3.344e-18	2.452e-18	-17.476	-17.611	-0.135	(0)
Zn(NO3) 2	6.264e-27	6.264e-27	-26.203	-26.203	0.000	(0)
Zn(SeO4) 2-2	1.449e-27	1.023e-27	-26.839	-26.990	-0.151	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-152.185	-152.223	-0.038	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.619	-154.619	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.632	-231.670	-0.038	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-233.093	-233.244	-0.151	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-313.310	-313.461	-0.151	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co(NH3)5Cl)(NO3) 2	-70.57	-64.28	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-55.18	-50.67	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-62.41	-50.67	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-90.09	-72.16	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-71.77	-51.74	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-32.78	-32.38	0.40	(NH4)2CrO4
(NH4)2SeO4	-30.61	-30.16	0.45	(NH4)2SeO4
Acanthite	-55.70	-91.92	-36.22	Ag2S
Ag2CO3	-13.74	-24.83	-11.09	Ag2CO3
Ag2CrO4	-21.83	-33.42	-11.59	Ag2CrO4
Ag2HVO4	-15.81	-14.33	1.48	Ag2HVO4
Ag2MoO4	-16.00	-27.55	-11.55	Ag2MoO4
Ag2O	-15.75	-3.18	12.57	Ag2O
Ag2Se	-3.51	-52.21	-48.70	Ag2Se
Ag2SeO3	-13.28	-20.43	-7.15	Ag2SeO3
Ag2SeO4	-22.29	-31.20	-8.91	Ag2SeO4
Ag2SO4	-18.58	-23.40	-4.82	Ag2SO4
Ag3AsO3	-29.56	-27.40	2.16	Ag3AsO3
Ag3AsO4	-17.97	-20.76	-2.79	Ag3AsO4
Ag3H2VO5	-21.10	-15.92	5.18	Ag3H2VO5
AgF:4H2O	-15.18	-14.13	1.05	AgF:4H2O
Agmetal	-0.86	-14.36	-13.51	Ag
AgVO3	-13.51	-12.74	0.77	AgVO3
Al(OH) 3(am)	-3.85	6.95	10.80	Al(OH) 3
Al2(MoO4) 3	-61.59	-59.22	2.37	Al2(MoO4) 3
Al2O3	-5.76	13.90	19.65	Al2O3
Al4(OH)10SO4	-15.13	7.57	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-13.84	-9.04	4.80	AlAsO4:2H2O
AlOHSO4	-10.04	-13.27	-3.23	AlOHSO4
AlSb	-157.15	-91.52	65.62	AlSb
Alunite	-13.61	-15.01	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-7.21	-15.00	-7.79	PbSO4
Anhydrite	-2.69	-7.05	-4.36	CaSO4
Anilite	-58.37	-90.25	-31.88	Cu0.25Cu1.5S
Antlerite	-5.67	3.12	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-87.77	-90.53	-2.76	As4O6
Artinite	-5.33	4.27	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-38.68	-31.97	6.71	As2O5
Atacamite	-3.00	4.39	7.39	Cu2(OH) 3Cl
Azurite	-3.05	-19.96	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-16.71	7.69	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-22.81	-6.93	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	0.00	-8.91	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-32.19	0.75	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-12.88	-22.55	-9.67	BaCrO4
BaF2	-11.58	-17.40	-5.82	BaF2
BaMoO4	-9.73	-16.69	-6.96	BaMoO4

Barite	-2.55	-12.53	-9.98	BaSO ₄
BaS	-97.23	-81.05	16.18	BaS
BaSeO ₃	-11.40	-9.57	1.83	BaSeO ₃
BaSeO ₄	-12.87	-20.33	-7.46	BaSeO ₄
Bianchite	-8.42	-10.18	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.13	10.96	18.09	MnO ₂
Bixbyite	-2.98	-3.62	-0.64	Mn ₂ O ₃
BlaubleiI	-58.04	-82.20	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-58.63	-85.91	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-1.63	6.95	8.58	AlOOH
Breithauptite	-59.25	-77.77	-18.52	NiSb
Brochantite	-4.33	10.89	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.88	12.96	16.84	Mg(OH) ₂
Bunsenite	-4.52	7.93	12.45	NiO
Ca(VO ₃) ₂	-14.80	-9.14	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-13.47	4.03	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.53	4.03	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-14.77	7.53	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-21.77	17.19	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-22.67	17.19	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-300.42	-157.44	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-12.69	-30.60	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.26	-11.21	-7.95	CaMoO ₄
Carnotite	-5.67	-5.44	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.90	-4.09	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.83	-14.85	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.21	-3.37	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.69	6.95	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.78	6.95	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-26.30	-19.59	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.93	0.63	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-20.82	7.58	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-14.72	-15.38	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-13.68	-15.38	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-13.46	-15.38	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.93	-18.14	-1.21	CdF ₂
Cdmetal(alpha)	-32.11	-18.59	13.51	Cd
Cdmetal(gamma)	-32.21	-18.59	13.62	Cd
CdMoO ₄	-3.27	-17.42	-14.15	CdMoO ₄
CdOHCl	-7.75	-4.21	3.54	CdOHCl
CdSb	-78.40	-78.75	-0.35	CdSb
CdSe	-21.88	-42.08	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-19.22	-21.07	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-13.10	-13.27	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.54	-13.27	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-11.40	-13.27	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-3.00	-12.75	-9.75	AgCl
Cerrusite	-3.29	-16.42	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-9.80	-12.44	-2.64	CuSO ₄ :5H ₂ O
Chalcedony	0.03	-3.52	-3.55	SiO ₂
Chalcocite	-58.43	-93.35	-34.92	Cu ₂ S
Chalcopyrite	-130.97	-166.24	-35.27	CuFeS ₂
Chrysotile	-0.36	31.84	32.20	Mg ₃ Si ₂ O ₅ (OH) ₄
Cinnabar	-56.00	-101.69	-45.69	HgS
Claudetite	-87.46	-90.53	-3.06	As ₄ O ₆
Clausthalite	-16.70	-43.80	-27.10	PbSe
Co(BO ₂) ₂	-29.59	-2.52	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.29	7.80	13.09	Co(OH) ₂
Co(OH) ₃	-9.52	-11.83	-2.31	Co(OH) ₃
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-21.60	-8.57	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-5.36	-15.85	-10.50	Co ₃ O ₄
CoCl ₂	-22.79	-14.53	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-17.06	-14.53	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.87	-13.85	-9.98	CoCO ₃

CoF2	-15.69	-17.29	-1.60	CoF2
CoF3	-48.00	-49.46	-1.46	CoF3
CoFe2O4	17.71	14.18	-3.53	CoFe2O4
CoMoO4	-8.81	-16.57	-7.76	CoMoO4
CoO	-5.79	7.80	13.59	CoO
CoS (alpha)	-73.50	-80.94	-7.44	CoS
CoS (beta)	-69.87	-80.94	-11.07	CoS
CoSe	-25.03	-41.23	-16.20	CoSe
CoSeO3	-10.77	-9.45	1.32	CoSeO3
CoSeO4:6H2O	-18.69	-20.22	-1.53	CoSeO4:6H2O
CoSO4	-15.22	-12.42	2.80	CoSO4
CoSO4:6H2O	-9.94	-12.42	-2.47	CoSO4:6H2O
Cotunnite	-12.33	-17.11	-4.78	PbCl2
Covellite	-58.66	-80.96	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.42	-33.33	14.09	CrCl2
CrCl3	-49.78	-34.67	15.11	CrCl3
CrF3	-27.47	-38.81	-11.34	CrF3
Cristobalite	-0.17	-3.52	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-16.83	-50.67	-33.84	Na3AlF6
Cu (OH) 2	-0.90	7.78	8.67	Cu (OH) 2
Cu (SbO3) 2	-30.02	15.19	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.66	-2.41	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-58.11	-93.00	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-7.84	-53.64	-45.80	Cu2Se
Cu2SO4	-22.88	-24.83	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.74	-8.64	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.79	-105.38	-42.59	Cu3Sb
Cu3Se2	-31.39	-94.88	-63.49	Cu3Se2
CuCO3	-2.37	-13.87	-11.50	CuCO3
CuCrO4	-17.02	-22.46	-5.44	CuCrO4
CuF	-9.94	-14.85	-4.91	CuF
CuF2	-18.43	-17.31	1.12	CuF2
CuF2:2H2O	-12.76	-17.31	-4.55	CuF2:2H2O
Cumetal	-6.32	-15.08	-8.76	Cu
CuMoO4	-3.52	-16.59	-13.08	CuMoO4
CuOCuSO4	-14.96	-4.66	10.30	CuOCuSO4
Cupricferrite	8.17	14.16	5.99	CuFe2O4
Cuprite	-3.20	-4.61	-1.41	Cu2O
Cuprousferrite	9.80	0.89	-8.92	CuFeO2
CuSe	-8.15	-41.25	-33.10	CuSe
CuSe2	-31.37	-64.73	-33.37	CuSe2
CuSeO3:2H2O	-9.99	-9.47	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.80	-20.24	-2.44	CuSeO4:5H2O
CuSO4	-15.38	-12.44	2.94	CuSO4
Diaspore	0.07	6.95	6.87	AlOOH
Djurleite	-58.61	-92.53	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.63	-17.17	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.08	-17.17	-17.09	CaMg (CO3) 2
Epsomite	-5.13	-7.26	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	2.88	-0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-15.14	-18.86	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-12.42	-10.87	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-24.75	-45.38	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-50.54	-54.27	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.19	-12.79	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.83	-20.92	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-50.46	-69.06	-18.60	FeSe2
FeS (ppt)	-82.34	-85.29	-2.95	FeS

FeSe	-34.58	-45.58	-11.00	FeSe
Fix_pe	-4.37	-4.37	0.00	e-
Fluorite	-1.42	-11.92	-10.50	CaF2
Galena	-69.54	-83.51	-13.97	PbS
Gibbsite	-1.34	6.95	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-8.17	-10.18	-2.01	ZnSO4:7H2O
Greenalite	-17.49	3.32	20.81	Fe3Si2O5(OH)4
Greenockite	-67.43	-81.79	-14.36	CdS
Greigite	-300.08	-345.11	-45.03	Fe3S4
Gummite	-6.55	1.13	7.67	UO3
Gypsum	-2.44	-7.05	-4.61	CaSO4:2H2O
H-Jarosite	-18.76	-30.86	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.50	-24.37	-12.88	H2MoO4
H2S(g)	-80.73	-88.74	-8.01	H2S
H2Se(g)	-44.07	-49.03	-4.96	H2Se
Halite	-6.88	-5.28	1.60	NaCl
Halloysite	-2.71	6.86	9.57	Al2Si2O5(OH)4
Hausmannite	-3.18	57.85	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-5.55	17.35	22.89	FeAl2O4
Hg(CH3)2(g)	-186.90	-260.61	-73.71	Hg(CH3)2
Hg(g)	-9.03	-16.91	-7.87	Hg
Hg(OH)2	-9.46	-12.96	-3.50	Hg(OH)2
Hg2(g)	-18.86	-33.81	-14.96	Hg2
Hg2(OH)2	-13.53	-8.27	5.26	Hg2(OH)2
Hg2CO3	-13.87	-29.92	-16.05	Hg2CO3
Hg2CrO4	-29.81	-38.51	-8.70	Hg2CrO4
Hg2F2	-23.00	-33.36	-10.36	Hg2F2
Hg2S	-85.33	-97.01	-11.68	Hg2S
Hg2SeO3	-20.87	-25.52	-4.66	Hg2SeO3
Hg2SO4	-22.36	-28.49	-6.13	Hg2SO4
Hg3O2CO3	-30.83	-60.51	-29.68	Hg3O2CO3
HgCl(g)	-34.80	-15.30	19.50	HgCl
HgCl2	-14.02	-35.28	-21.26	HgCl2
HgF(g)	-49.35	-16.68	32.68	HgF
HgF2(g)	-50.61	-38.04	12.57	HgF2
Hgmetal(l)	-3.46	-16.91	-13.45	Hg
HgSe	-6.29	-61.98	-55.69	HgSe
HgSeO3	-17.78	-30.21	-12.43	HgSeO3
HgSO4	-23.75	-33.17	-9.42	HgSO4
Huntite	-4.57	-34.54	-29.97	CaMg3(CO3)4
Hydrocerrusite	-8.86	-27.63	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.02	-21.79	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-23.74	-28.91	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-11.48	-26.28	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-34.07	-51.31	-17.24	K2Cr2O7
K2CrO4	-20.56	-21.07	-0.51	K2CrO4
K2MoO4	-18.47	-15.21	3.26	K2MoO4
K2SeO4	-18.12	-18.85	-0.73	K2SeO4
Kaolinite	-0.57	6.86	7.43	Al2Si2O5(OH)4
Langite	-6.59	10.89	17.49	Cu4(OH)6SO4:H2O
Larnakite	-9.34	-9.77	-0.43	PbO:PbSO4
Laurionite	-6.56	-5.94	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-7.47	5.22	12.69	PbO
Mackinawite	-81.69	-85.29	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.48	19.34	16.86	Fe2MgO4
Magnesite	-1.23	-8.69	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-0.78	-6.09	-5.31	Cu2(OH)2CO3
Manganite	-1.80	23.54	25.34	MnOOH
Massicot	-7.67	5.22	12.89	PbO
Matlockite	-9.51	-18.49	-8.97	PbClF
Melanothallite	-20.81	-14.55	6.26	CuCl2
Melanterite	-14.56	-16.77	-2.21	FeSO4:7H2O

Metacinnabar	-56.60	-101.69	-45.09	HgS
Mg(OH)2 (active)	-5.83	12.96	18.79	Mg(OH)2
Mg(VO3)2	-20.63	-9.35	11.28	Mg(VO3)2
Mg2Sb3	-280.32	-205.63	74.68	Mg2Sb3
Mg2V2O7	-22.75	3.61	26.36	Mg2V2O7
MgCr2O4	-5.60	10.60	16.20	MgCr2O4
MgCrO4	-22.66	-17.28	5.38	MgCrO4
MgF2	-4.00	-12.13	-8.13	MgF2
MgMoO4	-9.56	-11.41	-1.85	MgMoO4
MgSeO3:6H2O	-7.35	-4.29	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.86	-15.06	-1.20	MgSeO4:6H2O
Minium	-32.31	41.21	73.52	Pb3O4
Mirabilite	-7.34	-8.45	-1.11	Na2SO4:10H2O
Mn(VO3)2	-16.44	-11.54	4.90	Mn(VO3)2
Mn2(SO4)3	-58.56	-64.27	-5.71	Mn2(SO4)3
Mn2Sb	-150.79	-89.71	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.17	0.33	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-14.28	-11.56	2.72	MnCl2:4H2O
MnS (grn)	-78.14	-77.97	0.17	MnS
MnS (pnk)	-81.31	-77.97	3.34	MnS
MnSb	-97.37	-100.28	-2.91	MnSb
MnSe	-41.76	-38.26	3.50	MnSe
MnSeO3	-7.62	-6.49	1.13	MnSeO3
MnSeO3:2H2O	-7.47	-6.49	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.20	-17.25	-2.05	MnSeO4:5H2O
MnSO4	-12.03	-9.45	2.58	MnSO4
Monteponite	-8.15	6.95	15.10	CdO
Montroydite	-9.32	-12.96	-3.64	HgO
MoO3	-16.37	-24.37	-8.00	MoO3
Morenosite	-10.14	-12.29	-2.14	NiSO4:7H2O
MoS2	-157.13	-227.39	-70.26	MoS2
Na-Jarosite	-13.78	-24.98	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.81	-48.71	-9.90	Na2Cr2O7
Na2CrO4	-21.40	-18.47	2.93	Na2CrO4
Na2Mo2O7	-20.38	-36.98	-16.60	Na2Mo2O7
Na2MoO4	-14.10	-12.61	1.49	Na2MoO4
Na2MoO4:2H2O	-13.83	-12.61	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.79	-5.49	10.30	Na2SeO3:5H2O
Na2SeO4	-17.53	-16.25	1.28	Na2SeO4
Na3Sb	-175.27	-80.82	94.45	Na3Sb
Na3VO4	-30.19	6.49	36.68	Na3VO4
Na4V2O7	-36.18	1.22	37.40	Na4V2O7
Nantokite	-6.74	-13.47	-6.73	CuCl
NaSb	-90.21	-67.04	23.17	NaSb
Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-9.13	-5.27	3.86	NaVO3
Nesquehonite	-4.02	-8.69	-4.67	MgCO3:3H2O
Ni(OH)2	-4.86	7.93	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.88	-8.18	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.50	11.50	32.00	Ni4(OH)6SO4
NiCO3	-6.85	-13.72	-6.87	NiCO3
NiMoO4	-5.30	-16.44	-11.14	NiMoO4
NiS (alpha)	-75.21	-80.81	-5.60	NiS
NiS (beta)	-69.71	-80.81	-11.10	NiS
NiS (gamma)	-68.01	-80.81	-12.80	NiS
NiSe	-23.40	-41.10	-17.70	NiSe
NiSeO3:2H2O	-12.14	-9.32	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.57	-20.09	-1.52	NiSeO4:6H2O
Nsutite	-6.54	10.96	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-250.41	-311.47	-61.07	As2S3
Otavite	-2.70	-14.70	-12.00	CdCO3
Pb(BO2)2	-11.61	-5.10	6.52	Pb(BO2)2
Pb(OH)2	-2.93	5.22	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-68.90	-77.66	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.51	-0.72	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.74	10.44	26.19	Pb2O(OH)2
Pb2O3	-25.05	35.99	61.04	Pb2O3

Pb2OCO3	-10.64	-11.20	-0.56	Pb2OCO3
Pb2V2O7	-9.96	-11.86	-1.90	Pb2V2O7
Pb3(AsO4)2	-22.10	-16.30	5.80	Pb3(AsO4)2
Pb3(VO4)2	-12.78	-6.64	6.14	Pb3(VO4)2
Pb3O2CO3	-17.00	-5.98	11.02	Pb3O2CO3
Pb3O2SO4	-15.24	-4.55	10.69	Pb3O2SO4
Pb4(OH)6SO4	-20.43	0.67	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.21	0.67	21.88	Pb4O3SO4
PbCrO4	-12.42	-25.02	-12.60	PbCrO4
PbF2	-12.43	-19.87	-7.44	PbF2
Pbmetal	-24.57	-20.32	4.25	Pb
PbMoO4	-3.53	-19.15	-15.62	PbMoO4
PbO:0.3H2O	-7.76	5.22	12.98	PbO:0.33H2O
PbSeO4	-15.95	-22.79	-6.84	PbSeO4
Periclase	-8.62	12.96	21.58	MgO
Phosgenite	-13.72	-33.53	-19.81	PbCl2:PbCO3
Plattnerite	-18.83	30.77	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-129.97	-148.48	-18.51	FeS2
Pyrochroite	-4.43	10.77	15.19	Mn(OH)2
Pyrolusite	-5.07	36.31	41.38	MnO2
Quartz	0.48	-3.52	-4.00	SiO2
Realgar	-104.39	-124.14	-19.75	AsS
Retgersite	-10.25	-12.29	-2.04	NiSO4:6H2O
Rhodochrosite	-0.30	-10.88	-10.58	MnCO3
Rutherfordine	-6.02	-20.52	-14.50	UO2CO3
Sb(OH)3	-14.73	-21.84	-7.11	Sb(OH)3
Sb2O4	-21.53	-18.13	3.40	Sb2O4
Sb2O5	-31.54	-41.21	-9.67	Sb2O5
Sb2Se3	-123.00	-190.76	-67.76	Sb2Se3
Sb4O6(cubic)	-69.09	-87.35	-18.26	Sb4O6
Sb4O6(orth)	-69.45	-87.35	-17.90	Sb4O6
SbCl3	-55.90	-55.33	0.57	SbCl3
SbF3	-49.24	-59.47	-10.23	SbF3
Sbmetal	-48.47	-60.15	-11.69	Sb
SbO2	-5.55	-33.37	-27.82	SbO2
Schoepite	-4.87	1.13	5.99	UO2(OH)2:H2O
Semetal(am)	-16.37	-23.48	-7.11	Se
Semetal(hex)	-15.77	-23.48	-7.71	Se
Senarmontite	-31.31	-43.67	-12.37	Sb2O3
SeO2	-17.38	-17.25	0.12	SeO2
SeO3	-49.06	-28.02	21.04	SeO3
Sepiolite	-0.39	15.37	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.41	15.37	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.81	-3.52	-2.71	SiO2
SiO2(am-ppt)	-0.78	-3.52	-2.74	SiO2
Smithsonite	-1.61	-11.61	-10.00	ZnCO3
Sphalerite	-67.25	-78.70	-11.45	ZnS
Spinel	-9.99	26.86	36.85	MgAl2O4
Stibnite	-259.42	-309.88	-50.46	Sb2S3
Sulfur	-61.05	-63.19	-2.14	S
Tenorite	0.13	7.78	7.64	CuO
Thenardite	-8.77	-8.45	0.32	Na2SO4
Thermonatrite	-10.52	-9.88	0.64	Na2CO3:H2O
Tyuyamunite	-10.97	-6.89	4.08	Ca(UO2)2(VO4)2
U3O8	-15.60	5.48	21.08	U3O8
U3Sb4	-591.88	-439.50	152.38	U3Sb4
U4O9	-32.25	-35.27	-3.02	U4O9
UF4	-35.84	-65.38	-29.54	UF4
UF4:2.5H2O	-32.66	-65.38	-32.72	UF4:2.5H2O
UO2(am)	-16.14	-15.20	0.93	UO2
UO2(NO3)2	-46.96	-34.81	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-39.66	-34.81	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-38.20	-34.81	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-36.86	-34.81	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.49	1.13	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.64	-26.89	-2.25	UO2SeO4:4H2O

UO3	-6.57	1.13	7.70	UO3
Uraninite	-10.53	-15.20	-4.67	UO2
USb2	-225.39	-195.82	29.58	USb2
V(OH)3	-21.69	-14.10	7.59	V(OH)3
V2O5	-20.95	-22.31	-1.36	V2O5
V3O5	-48.45	-46.61	1.84	V3O5
V4O7	-60.82	-53.64	7.19	V4O7
V6O13	-57.15	-118.01	-60.86	V6O13
Valentinite	-35.19	-43.67	-8.48	Sb2O3
VC12	-68.07	-49.20	18.87	VC12
VC13	-71.02	-47.59	23.43	VC13
VF4	-72.13	-57.20	14.93	VF4
Vmetal	-96.44	-52.42	44.03	V
VO	-41.63	-26.87	14.76	VO
VO(OH)2	-12.17	-7.02	5.15	VO(OH)2
VO2Cl	-25.16	-22.32	2.84	VO2Cl
VOC1	-36.42	-25.26	11.15	VOC1
VOC12	-42.11	-29.35	12.76	VOC12
VOSO4	-30.85	-27.24	3.61	VOSO4
Witherite	-5.39	-13.96	-8.57	BaCO3
Wurtzite	-69.75	-78.70	-8.95	ZnS
Zincite	-1.30	10.03	11.33	ZnO
Zincosite	-14.11	-10.18	3.93	ZnSO4
Zn(BO2)2	-8.57	-0.28	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-29.22	-25.90	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.17	10.03	12.20	Zn(OH)2
Zn(OH)2(am)	-2.44	10.03	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.72	10.03	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.50	10.03	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.70	10.03	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.65	-0.15	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.29	8.91	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.52	-1.87	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.25	-10.33	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.48	19.92	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.66	27.84	38.50	Zn5(OH)8Cl2
ZnCl2	-19.34	-12.29	7.05	ZnCl2
ZnCO3:1H2O	-1.35	-11.61	-10.26	ZnCO3:1H2O
ZnF2	-14.52	-15.05	-0.53	ZnF2
Znmetal	-41.30	-15.51	25.79	Zn
ZnMoO4	-4.21	-14.34	-10.13	ZnMoO4
ZnO(active)	-1.15	10.03	11.19	ZnO
ZnS(am)	-69.65	-78.70	-9.05	ZnS
ZnSb	-86.68	-75.66	11.01	ZnSb
ZnSe	-24.59	-38.99	-14.40	ZnSe
ZnSeO4:6H2O	-16.46	-17.98	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.55	-10.18	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 52.

Title Stage 3 pit lake GW inflow
Title Stage 3 Groundwater mix
MIX 301
2 1
3 0
4 0
5 0
6 0
7 0

```

8      0
9      0
10     0.246706
11     1.997676
12     1.477751
13     3.468753
14     0
15     0
Save solution 301
end

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TITLE
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Stage 3 Groundwater mix

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Beginning of batch-reaction calculations.
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Reaction step 1.

Using mix 301.

Mixture 301.

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1.000e+00 Solution 2      JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.467e-01 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.998e+00 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.478e+00 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.469e+00 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

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-----Solution composition-----

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Elements	Molality	Moles
Ag	1.019e-08	8.350e-08
Al	5.510e-07	4.513e-06
As	4.958e-09	4.061e-08
B	1.939e-06	1.589e-05
Ba	1.780e-07	1.458e-06
C	1.486e-03	1.217e-02
Ca	6.636e-04	5.435e-03
Cd	1.415e-09	1.159e-08

Cl	2.085e-04	1.708e-03
Co	1.659e-08	1.359e-07
Cr	1.551e-08	1.270e-07
Cu	1.140e-06	9.341e-06
F	5.154e-05	4.221e-04
Fe	3.261e-06	2.671e-05
Hg	2.617e-11	2.143e-10
K	8.615e-05	7.056e-04
Mg	2.101e-04	1.721e-03
Mn	2.872e-06	2.353e-05
Mo	6.665e-08	5.459e-07
Na	6.046e-04	4.952e-03
Ni	2.602e-08	2.131e-07
Pb	3.148e-09	2.578e-08
S	4.332e-04	3.549e-03
Sb	1.591e-09	1.303e-08
Se	5.700e-09	4.669e-08
U	1.008e-08	8.260e-08
V	1.386e-08	1.136e-07
Zn	1.388e-07	1.137e-06

-----Description of solution-----

	pH	=	7.218	Charge balance
	pe	=	4.770	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	3.559e-03	
	Mass of water (kg)	=	8.191e+00	
	Total alkalinity (eq/kg)	=	1.325e-03	
	Total CO2 (mol/kg)	=	1.486e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	5.573e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	13	
	Total H	=	9.093139e+02	
	Total O	=	4.547010e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.776e-07	1.663e-07	-6.751	-6.779	-0.028	(0)
H+	6.461e-08	6.055e-08	-7.190	-7.218	-0.028	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	1.019e-08					
Ag+	7.012e-09	6.572e-09	-8.154	-8.182	-0.028	(0)
AgCl	2.622e-09	2.622e-09	-8.581	-8.581	0.000	(0)
Ag2Se	2.345e-10	2.345e-10	-9.630	-9.630	0.000	(0)
AgCl2-	4.786e-11	4.462e-11	-10.320	-10.350	-0.030	(0)
AgSO4-	4.238e-11	3.952e-11	-10.373	-10.403	-0.030	(0)
AgF	7.793e-13	7.793e-13	-12.108	-12.108	0.000	(0)
AgOH	1.093e-13	1.093e-13	-12.961	-12.961	0.000	(0)
AgCl3-2	1.028e-14	7.771e-15	-13.988	-14.110	-0.122	(0)
AgH2BO3	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
AgSeO3-	1.404e-15	1.309e-15	-14.853	-14.883	-0.030	(0)
AgCl4-3	5.824e-18	3.100e-18	-17.235	-17.509	-0.274	(0)
Ag (OH) 2-	1.905e-18	1.776e-18	-17.720	-17.751	-0.030	(0)
Ag (SeO3) 2-3	6.822e-24	3.631e-24	-23.166	-23.440	-0.274	(0)
Ag2MoO4	8.397e-25	8.397e-25	-24.076	-24.076	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.350	-67.350	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.339	-77.826	-0.487	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.202	-136.232	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.404	-136.498	-0.094	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.529	-138.720	-0.191	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.845	-139.031	-0.186	(0)

Al	5.510e-07					
Al (OH) 4-	5.155e-07	4.834e-07	-6.288	-6.316	-0.028	(0)
Al (OH) 3	2.309e-08	2.309e-08	-7.637	-7.637	0.000	(0)
Al (OH) 2+	7.415e-09	6.960e-09	-8.130	-8.157	-0.028	(0)
AlF2+	2.995e-09	2.811e-09	-8.524	-8.551	-0.028	(0)
AlF3	1.671e-09	1.671e-09	-8.777	-8.777	0.000	(0)
AlF+2	1.927e-10	1.496e-10	-9.715	-9.825	-0.110	(0)
AlOH+2	6.789e-11	5.269e-11	-10.168	-10.278	-0.110	(0)
AlF4-	4.216e-11	3.953e-11	-10.375	-10.403	-0.028	(0)
AlSO4+	7.905e-13	7.412e-13	-12.102	-12.130	-0.028	(0)
Al+3	5.681e-13	3.169e-13	-12.246	-12.499	-0.254	(0)
Al (SO4) 2-	2.553e-15	2.394e-15	-14.593	-14.621	-0.028	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.276	-44.550	-0.274	(0)
As (3)	1.269e-19					
H3AsO3	1.257e-19	1.257e-19	-18.901	-18.901	0.000	(0)
H2AsO3-	1.142e-21	1.065e-21	-20.942	-20.973	-0.030	(0)
HAsO3-2	2.122e-26	1.604e-26	-25.673	-25.795	-0.122	(0)
H4AsO3+	4.045e-27	3.771e-27	-26.393	-26.424	-0.030	(0)
AsO3-3	1.918e-32	1.021e-32	-31.717	-31.991	-0.274	(0)
As (5)	4.958e-09					
HAsO4-2	3.425e-09	2.588e-09	-8.465	-8.587	-0.122	(0)
H2AsO4-	1.533e-09	1.429e-09	-8.814	-8.845	-0.030	(0)
AsO4-3	2.539e-13	1.352e-13	-12.595	-12.869	-0.274	(0)
H3AsO4	1.503e-14	1.504e-14	-13.823	-13.823	0.000	(0)
B	1.939e-06					
H3BO3	1.919e-06	1.921e-06	-5.717	-5.717	0.000	(0)
H2BO3-	1.969e-08	1.842e-08	-7.706	-7.735	-0.029	(0)
CaH2BO3+	5.404e-10	5.055e-10	-9.267	-9.296	-0.029	(0)
MgH2BO3+	1.047e-10	9.790e-11	-9.980	-10.009	-0.029	(0)
BF (OH) 3-	3.868e-11	3.618e-11	-10.413	-10.442	-0.029	(0)
NaH2BO3	1.651e-11	1.651e-11	-10.782	-10.782	0.000	(0)
BaH2BO3+	8.276e-14	7.741e-14	-13.082	-13.111	-0.029	(0)
H5 (BO3) 2-	3.219e-14	3.011e-14	-13.492	-13.521	-0.029	(0)
BF2 (OH) 2-	1.182e-14	1.106e-14	-13.927	-13.956	-0.029	(0)
AgH2BO3	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
H8 (BO3) 3-	6.183e-18	5.784e-18	-17.209	-17.238	-0.029	(0)
BF3OH-	1.315e-20	1.230e-20	-19.881	-19.910	-0.029	(0)
BF4-	1.849e-25	1.730e-25	-24.733	-24.762	-0.029	(0)
Ba	1.780e-07					
Ba+2	1.763e-07	1.360e-07	-6.754	-6.866	-0.113	(0)
BaHCO3+	1.690e-09	1.588e-09	-8.772	-8.799	-0.027	(0)
BaCO3	6.602e-11	6.602e-11	-10.180	-10.180	0.000	(0)
BaOH+	1.052e-13	9.871e-14	-12.978	-13.006	-0.028	(0)
BaH2BO3+	8.276e-14	7.741e-14	-13.082	-13.111	-0.029	(0)
C (4)	1.486e-03					
HCO3-	1.303e-03	1.223e-03	-2.885	-2.913	-0.028	(0)
H2CO3	1.665e-04	1.665e-04	-3.779	-3.779	0.000	(0)
CaHCO3+	1.156e-05	1.086e-05	-4.937	-4.964	-0.027	(0)
MgHCO3+	2.046e-06	1.918e-06	-5.689	-5.717	-0.028	(0)
CO3-2	1.227e-06	9.466e-07	-5.911	-6.024	-0.113	(0)
CuCO3	8.324e-07	8.324e-07	-6.080	-6.080	0.000	(0)
CaCO3	7.154e-07	7.154e-07	-6.145	-6.145	0.000	(0)
NaHCO3	3.887e-07	3.887e-07	-6.410	-6.410	0.000	(0)
MgCO3	1.207e-07	1.207e-07	-6.918	-6.918	0.000	(0)
MnHCO3+	5.312e-08	4.984e-08	-7.275	-7.302	-0.028	(0)
CuHCO3+	1.236e-08	1.152e-08	-7.908	-7.939	-0.030	(0)
NaCO3-	1.062e-08	9.965e-09	-7.974	-8.002	-0.028	(0)
UO2 (CO3) 2-2	8.766e-09	6.624e-09	-8.057	-8.179	-0.122	(0)
ZnCO3	5.116e-09	5.116e-09	-8.291	-8.291	0.000	(0)
ZnHCO3+	3.895e-09	3.631e-09	-8.410	-8.440	-0.030	(0)
Cu (CO3) 2-2	2.807e-09	2.121e-09	-8.552	-8.674	-0.122	(0)
NiHCO3+	2.701e-09	2.518e-09	-8.568	-8.599	-0.030	(0)
BaHCO3+	1.690e-09	1.588e-09	-8.772	-8.799	-0.027	(0)
PbCO3	1.562e-09	1.562e-09	-8.806	-8.806	0.000	(0)
CoHCO3+	1.122e-09	1.046e-09	-8.950	-8.980	-0.030	(0)
FeHCO3+	1.095e-09	1.028e-09	-8.961	-8.988	-0.027	(0)
UO2 (CO3) 3-4	9.641e-10	3.142e-10	-9.016	-9.503	-0.487	(0)
NiCO3	5.901e-10	5.901e-10	-9.229	-9.229	0.000	(0)

	PbHCO3+	5.347e-10	4.985e-10	-9.272	-9.302	-0.030	(0)
	UO2CO3	3.507e-10	3.507e-10	-9.455	-9.455	0.000	(0)
	CoCO3	1.760e-10	1.760e-10	-9.754	-9.754	0.000	(0)
	BaCO3	6.602e-11	6.602e-11	-10.180	-10.180	0.000	(0)
	CdCO3	2.159e-11	2.159e-11	-10.666	-10.666	0.000	(0)
	Pb (CO3) 2-2	5.642e-12	4.263e-12	-11.249	-11.370	-0.122	(0)
	CdHCO3+	2.988e-12	2.785e-12	-11.525	-11.555	-0.030	(0)
	Cd (CO3) 2-2	2.005e-14	1.515e-14	-13.698	-13.820	-0.122	(0)
	HgCO3	1.114e-17	1.114e-17	-16.953	-16.953	0.000	(0)
	Hg (CO3) 2-2	4.412e-20	3.334e-20	-19.355	-19.477	-0.122	(0)
	HgHCO3+	1.347e-20	1.256e-20	-19.871	-19.901	-0.030	(0)
Ca	6.636e-04						
	Ca+2	6.181e-04	4.769e-04	-3.209	-3.322	-0.113	(0)
	CaSO4	3.292e-05	3.292e-05	-4.483	-4.483	0.000	(0)
	CaHCO3+	1.156e-05	1.086e-05	-4.937	-4.964	-0.027	(0)
	CaCO3	7.154e-07	7.154e-07	-6.145	-6.145	0.000	(0)
	CaF+	2.619e-07	2.457e-07	-6.582	-6.610	-0.028	(0)
	CaOH+	1.685e-09	1.582e-09	-8.774	-8.801	-0.027	(0)
	CaH2BO3+	5.404e-10	5.055e-10	-9.267	-9.296	-0.029	(0)
Cd	1.415e-09						
	Cd+2	1.297e-09	1.001e-09	-8.887	-9.000	-0.113	(0)
	CdSO4	7.070e-11	7.070e-11	-10.151	-10.151	0.000	(0)
	CdCO3	2.159e-11	2.159e-11	-10.666	-10.666	0.000	(0)
	CdCl+	2.003e-11	1.867e-11	-10.698	-10.729	-0.030	(0)
	CdHCO3+	2.988e-12	2.785e-12	-11.525	-11.555	-0.030	(0)
	CdOH+	1.418e-12	1.322e-12	-11.848	-11.879	-0.030	(0)
	CdF+	8.031e-13	7.487e-13	-12.095	-12.126	-0.030	(0)
	Cd (SO4) 2-2	3.803e-13	2.874e-13	-12.420	-12.542	-0.122	(0)
	CdOHC1	1.274e-13	1.274e-13	-12.895	-12.895	0.000	(0)
	Cd (CO3) 2-2	2.005e-14	1.515e-14	-13.698	-13.820	-0.122	(0)
	CdCl2	1.521e-14	1.521e-14	-13.818	-13.818	0.000	(0)
	Cd (OH) 2	1.387e-15	1.387e-15	-14.858	-14.858	0.000	(0)
	CdF2	7.053e-17	7.053e-17	-16.152	-16.152	0.000	(0)
	CdCl3-	2.011e-18	1.875e-18	-17.696	-17.727	-0.030	(0)
	Cd (OH) 3-	1.511e-20	1.409e-20	-19.821	-19.851	-0.030	(0)
	Cd2OH+3	1.246e-20	6.630e-21	-19.905	-20.179	-0.274	(0)
	CdSeO4	6.751e-21	6.751e-21	-20.171	-20.171	0.000	(0)
	Cd (SeO3) 2-2	1.048e-22	7.920e-23	-21.980	-22.101	-0.122	(0)
	Cd (OH) 4-2	5.075e-28	3.835e-28	-27.295	-27.416	-0.122	(0)
	CdHS+	0.000e+00	0.000e+00	-73.943	-73.974	-0.030	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-139.752	-139.752	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-210.804	-210.834	-0.030	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-281.499	-281.620	-0.122	(0)
Cl	2.085e-04						
	Cl-	2.085e-04	1.954e-04	-3.681	-3.709	-0.028	(0)
	AgCl	2.622e-09	2.622e-09	-8.581	-8.581	0.000	(0)
	MnCl+	5.357e-10	5.026e-10	-9.271	-9.299	-0.028	(0)
	CuCl	3.055e-10	3.055e-10	-9.515	-9.515	0.000	(0)
	CuCl+	4.935e-11	4.625e-11	-10.307	-10.335	-0.028	(0)
	ZnCl+	4.919e-11	4.610e-11	-10.308	-10.336	-0.028	(0)
	AgCl2-	4.786e-11	4.462e-11	-10.320	-10.350	-0.030	(0)
	CdCl+	2.003e-11	1.867e-11	-10.698	-10.729	-0.030	(0)
	CuCl2-	1.331e-11	1.247e-11	-10.876	-10.904	-0.028	(0)
	ZnOHC1	1.004e-11	1.004e-11	-10.998	-10.998	0.000	(0)
	NiCl+	8.960e-12	8.354e-12	-11.048	-11.078	-0.030	(0)
	CoCl+	7.977e-12	7.437e-12	-11.098	-11.129	-0.030	(0)
	PbCl+	4.081e-12	3.805e-12	-11.389	-11.420	-0.030	(0)
	MnCl2	1.387e-13	1.387e-13	-12.858	-12.858	0.000	(0)
	CdOHC1	1.274e-13	1.274e-13	-12.895	-12.895	0.000	(0)
	CdCl2	1.521e-14	1.521e-14	-13.818	-13.818	0.000	(0)
	ZnCl2	1.428e-14	1.428e-14	-13.845	-13.845	0.000	(0)
	AgCl3-2	1.028e-14	7.771e-15	-13.988	-14.110	-0.122	(0)
	PbCl2	3.321e-15	3.321e-15	-14.479	-14.479	0.000	(0)
	CuCl2	3.133e-15	3.133e-15	-14.504	-14.504	0.000	(0)
	CuCl3-2	6.726e-16	5.211e-16	-15.172	-15.283	-0.111	(0)
	HgClOH	5.641e-16	5.641e-16	-15.249	-15.249	0.000	(0)
	CrCl+2	5.852e-17	4.421e-17	-16.233	-16.354	-0.122	(0)
	HgCl2	3.754e-17	3.754e-17	-16.426	-16.426	0.000	(0)

UO2Cl+	3.163e-17	2.949e-17	-16.500	-16.530	-0.030	(0)
NiCl2	8.218e-18	8.218e-18	-17.085	-17.085	0.000	(0)
MnCl3-	7.958e-18	7.466e-18	-17.099	-17.127	-0.028	(0)
AgCl4-3	5.824e-18	3.100e-18	-17.235	-17.509	-0.274	(0)
FeCl+2	2.784e-18	2.157e-18	-17.555	-17.666	-0.111	(0)
ZnCl3-	2.365e-18	2.216e-18	-17.626	-17.654	-0.028	(0)
CdCl3-	2.011e-18	1.875e-18	-17.696	-17.727	-0.030	(0)
PbCl3-	2.771e-19	2.583e-19	-18.557	-18.588	-0.030	(0)
HgCl3-	7.867e-20	7.335e-20	-19.104	-19.135	-0.030	(0)
HgCl+	4.111e-20	3.833e-20	-19.386	-19.416	-0.030	(0)
CrOHC12	2.730e-20	2.730e-20	-19.564	-19.564	0.000	(0)
CuCl3-	6.098e-21	5.714e-21	-20.215	-20.243	-0.028	(0)
VOCl+	2.633e-21	2.454e-21	-20.580	-20.610	-0.030	(0)
FeCl2+	2.007e-21	1.883e-21	-20.698	-20.725	-0.028	(0)
CrCl2+	8.792e-22	8.197e-22	-21.056	-21.086	-0.030	(0)
ZnCl4-2	2.795e-22	2.165e-22	-21.554	-21.665	-0.111	(0)
HgCl4-2	7.551e-23	5.706e-23	-22.122	-22.244	-0.122	(0)
PbCl4-2	3.054e-23	2.307e-23	-22.515	-22.637	-0.122	(0)
FeCl3	3.679e-26	3.679e-26	-25.434	-25.434	0.000	(0)
CuCl4-2	7.223e-27	5.596e-27	-26.141	-26.252	-0.111	(0)
CrO3Cl-	3.509e-29	3.271e-29	-28.455	-28.485	-0.030	(0)
CoCl+2	1.357e-37	1.026e-37	-36.867	-36.989	-0.122	(0)
UCl+3	0.000e+00	0.000e+00	-43.962	-44.236	-0.274	(0)
Co (2)	1.659e-08					
Co+2	1.456e-08	1.100e-08	-7.837	-7.959	-0.122	(0)
CoHCO3+	1.122e-09	1.046e-09	-8.950	-8.980	-0.030	(0)
CoSO4	6.615e-10	6.615e-10	-9.179	-9.179	0.000	(0)
CoCO3	1.760e-10	1.760e-10	-9.754	-9.754	0.000	(0)
CoOH+	3.915e-11	3.650e-11	-10.407	-10.438	-0.030	(0)
CoF+	1.762e-11	1.642e-11	-10.754	-10.785	-0.030	(0)
CoCl+	7.977e-12	7.437e-12	-11.098	-11.129	-0.030	(0)
Co (OH) 2	4.821e-13	4.821e-13	-12.317	-12.317	0.000	(0)
Co (OH) 3-	1.716e-18	1.600e-18	-17.766	-17.796	-0.030	(0)
CoOOH-	4.305e-19	4.014e-19	-18.366	-18.396	-0.030	(0)
CoSeO4	1.998e-19	1.998e-19	-18.699	-18.699	0.000	(0)
Co2OH+3	3.781e-20	2.013e-20	-19.422	-19.696	-0.274	(0)
Co (OH) 4-2	5.580e-26	4.216e-26	-25.253	-25.375	-0.122	(0)
Co4 (OH) 4+4	1.087e-33	3.542e-34	-32.964	-33.451	-0.487	(0)
Co (3)	2.885e-30					
CoOH+2	2.885e-30	2.180e-30	-29.540	-29.662	-0.122	(0)
Co+3	4.624e-36	2.579e-36	-35.335	-35.588	-0.254	(0)
CoCl+2	1.357e-37	1.026e-37	-36.867	-36.989	-0.122	(0)
Cr (2)	9.386e-25					
Cr+2	9.386e-25	7.092e-25	-24.028	-24.149	-0.122	(0)
Cr (3)	1.551e-08					
Cr (OH) 2+	1.380e-08	1.287e-08	-7.860	-7.890	-0.030	(0)
Cr (OH) +2	8.418e-10	6.361e-10	-9.075	-9.197	-0.122	(0)
Cr (OH) 3	8.039e-10	8.039e-10	-9.095	-9.095	0.000	(0)
CrOHSO4	4.548e-11	4.548e-11	-10.342	-10.342	0.000	(0)
CrO2-	6.763e-12	6.305e-12	-11.170	-11.200	-0.030	(0)
Cr (OH) 4-	5.708e-12	5.322e-12	-11.244	-11.274	-0.030	(0)
CrF+2	1.731e-12	1.308e-12	-11.762	-11.883	-0.122	(0)
Cr+3	3.285e-13	1.748e-13	-12.484	-12.757	-0.274	(0)
CrSO4+	1.320e-13	1.230e-13	-12.880	-12.910	-0.030	(0)
CrCl+2	5.852e-17	4.421e-17	-16.233	-16.354	-0.122	(0)
Cr2 (OH) 2SO4+2	3.461e-18	2.615e-18	-17.461	-17.583	-0.122	(0)
Cr2 (OH) 2 (SO4) 2	4.681e-20	4.681e-20	-19.330	-19.330	0.000	(0)
CrOHC12	2.730e-20	2.730e-20	-19.564	-19.564	0.000	(0)
CrCl2+	8.792e-22	8.197e-22	-21.056	-21.086	-0.030	(0)
Cr (6)	3.387e-18					
CrO4-2	2.908e-18	2.244e-18	-17.536	-17.649	-0.113	(0)
HCrO4-	4.715e-19	4.396e-19	-18.327	-18.357	-0.030	(0)
NaCrO4-	6.760e-21	6.303e-21	-20.170	-20.200	-0.030	(0)
KCrO4-	7.203e-22	6.715e-22	-21.142	-21.173	-0.030	(0)
H2CrO4	2.158e-26	2.158e-26	-25.666	-25.666	0.000	(0)
CrO3SO4-2	3.234e-27	2.443e-27	-26.490	-26.612	-0.122	(0)
CrO3Cl-	3.509e-29	3.271e-29	-28.455	-28.485	-0.030	(0)
Cr2O7-2	8.868e-36	6.701e-36	-35.052	-35.174	-0.122	(0)

Cu (1)	1.651e-09					
Cu+	1.332e-09	1.242e-09	-8.875	-8.906	-0.030	(0)
CuCl	3.055e-10	3.055e-10	-9.515	-9.515	0.000	(0)
CuCl2-	1.331e-11	1.247e-11	-10.876	-10.904	-0.028	(0)
CuCl3-2	6.726e-16	5.211e-16	-15.172	-15.283	-0.111	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.856	-137.044	-0.189	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.591	-137.774	-0.184	(0)
Cu (2)	1.139e-06					
CuCO3	8.324e-07	8.324e-07	-6.080	-6.080	0.000	(0)
Cu+2	1.936e-07	1.493e-07	-6.713	-6.826	-0.113	(0)
CuOH+	8.380e-08	7.853e-08	-7.077	-7.105	-0.028	(0)
CuHCO3+	1.236e-08	1.152e-08	-7.908	-7.939	-0.030	(0)
CuSO4	1.031e-08	1.031e-08	-7.987	-7.987	0.000	(0)
Cu (CO3) 2-2	2.807e-09	2.121e-09	-8.552	-8.674	-0.122	(0)
Cu (OH) 2	2.606e-09	2.606e-09	-8.584	-8.584	0.000	(0)
CuF+	4.771e-10	4.448e-10	-9.321	-9.352	-0.030	(0)
Cu2 (OH) 2+2	2.050e-10	1.549e-10	-9.688	-9.810	-0.122	(0)
CuCl+	4.935e-11	4.625e-11	-10.307	-10.335	-0.028	(0)
Cu (OH) 3-	9.532e-13	8.887e-13	-12.021	-12.051	-0.030	(0)
CuCl2	3.133e-15	3.133e-15	-14.504	-14.504	0.000	(0)
Cu (OH) 4-2	1.539e-18	1.163e-18	-17.813	-17.934	-0.122	(0)
CuCl3-	6.098e-21	5.714e-21	-20.215	-20.243	-0.028	(0)
CuCl4-2	7.223e-27	5.596e-27	-26.141	-26.252	-0.111	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.843	-199.873	-0.030	(0)
F	5.154e-05					
F-	5.037e-05	4.721e-05	-4.298	-4.326	-0.028	(0)
MgF+	8.659e-07	8.119e-07	-6.063	-6.091	-0.028	(0)
CaF+	2.619e-07	2.457e-07	-6.582	-6.610	-0.028	(0)
NaF	1.684e-08	1.684e-08	-7.774	-7.774	0.000	(0)
HF	4.228e-09	4.228e-09	-8.374	-8.374	0.000	(0)
MnF+	4.093e-09	3.840e-09	-8.388	-8.416	-0.028	(0)
AlF2+	2.995e-09	2.811e-09	-8.524	-8.551	-0.028	(0)
AlF3	1.671e-09	1.671e-09	-8.777	-8.777	0.000	(0)
CuF+	4.771e-10	4.448e-10	-9.321	-9.352	-0.030	(0)
AlF+2	1.927e-10	1.496e-10	-9.715	-9.825	-0.110	(0)
ZnF+	9.489e-11	8.847e-11	-10.023	-10.053	-0.030	(0)
AlF4-	4.216e-11	3.953e-11	-10.375	-10.403	-0.028	(0)
BF (OH) 3-	3.868e-11	3.618e-11	-10.413	-10.442	-0.029	(0)
NiF+	2.125e-11	1.981e-11	-10.673	-10.703	-0.030	(0)
CoF+	1.762e-11	1.642e-11	-10.754	-10.785	-0.030	(0)
PbF+	1.958e-12	1.826e-12	-11.708	-11.739	-0.030	(0)
CrF+2	1.731e-12	1.308e-12	-11.762	-11.883	-0.122	(0)
HF2-	8.103e-13	7.588e-13	-12.091	-12.120	-0.028	(0)
CdF+	8.031e-13	7.487e-13	-12.095	-12.126	-0.030	(0)
AgF	7.793e-13	7.793e-13	-12.108	-12.108	0.000	(0)
UO2F+	6.505e-13	6.065e-13	-12.187	-12.217	-0.030	(0)
UO2F2	8.257e-14	8.257e-14	-13.083	-13.083	0.000	(0)
FeF2+	2.548e-14	2.390e-14	-13.594	-13.622	-0.028	(0)
FeF+2	2.442e-14	1.892e-14	-13.612	-13.723	-0.111	(0)
BF2 (OH) 2-	1.182e-14	1.106e-14	-13.927	-13.956	-0.029	(0)
PbF2	1.696e-15	1.696e-15	-14.771	-14.771	0.000	(0)
FeF3	1.592e-15	1.592e-15	-14.798	-14.798	0.000	(0)
UO2F3-	1.050e-15	9.791e-16	-14.979	-15.009	-0.030	(0)
VO2F	7.444e-17	7.444e-17	-16.128	-16.128	0.000	(0)
CdF2	7.053e-17	7.053e-17	-16.152	-16.152	0.000	(0)
H2F2	4.789e-17	4.789e-17	-16.320	-16.320	0.000	(0)
VO2F2-	1.369e-18	1.276e-18	-17.864	-17.894	-0.030	(0)
VOF+	1.360e-18	1.268e-18	-17.867	-17.897	-0.030	(0)
UO2F4-2	4.859e-19	3.672e-19	-18.313	-18.435	-0.122	(0)
PbF3-	1.629e-19	1.519e-19	-18.788	-18.819	-0.030	(0)
VOF2	2.244e-20	2.244e-20	-19.649	-19.649	0.000	(0)
BF3OH-	1.315e-20	1.230e-20	-19.881	-19.910	-0.029	(0)
VO2F3-2	9.944e-22	7.514e-22	-21.002	-21.124	-0.122	(0)
VOF3-	4.032e-23	3.759e-23	-22.395	-22.425	-0.030	(0)
PbF4-2	4.541e-24	3.431e-24	-23.343	-23.465	-0.122	(0)
Sb (OH) 2F	1.011e-24	1.011e-24	-23.995	-23.995	0.000	(0)
SbOF	9.945e-25	9.945e-25	-24.002	-24.002	0.000	(0)
BF4-	1.849e-25	1.730e-25	-24.733	-24.762	-0.029	(0)

VO2F4-3	3.279e-26	1.745e-26	-25.484	-25.758	-0.274	(0)
HgF+	1.845e-26	1.720e-26	-25.734	-25.764	-0.030	(0)
VOF4-2	9.480e-27	7.163e-27	-26.023	-26.145	-0.122	(0)
UF3+	2.665e-34	2.485e-34	-33.574	-33.605	-0.030	(0)
UF2+2	4.395e-35	3.321e-35	-34.357	-34.479	-0.122	(0)
UF4	1.286e-36	1.286e-36	-35.891	-35.891	0.000	(0)
UF+3	1.050e-37	5.588e-38	-36.979	-37.253	-0.274	(0)
UF5-	2.581e-39	2.406e-39	-38.588	-38.619	-0.030	(0)
UF6-2	0.000e+00	0.000e+00	-40.343	-40.465	-0.122	(0)
Fe (2)	9.493e-08					
Fe+2	8.842e-08	6.681e-08	-7.053	-7.175	-0.122	(0)
FeSO4	4.942e-09	4.942e-09	-8.306	-8.306	0.000	(0)
FeHCO3+	1.095e-09	1.028e-09	-8.961	-8.988	-0.027	(0)
FeOH+	4.714e-10	4.423e-10	-9.327	-9.354	-0.028	(0)
Fe (OH) 2	5.842e-14	5.842e-14	-13.233	-13.233	0.000	(0)
Fe (OH) 3-	3.274e-15	3.072e-15	-14.485	-14.513	-0.028	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.189	-144.189	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.104	-215.135	-0.030	(0)
Fe (3)	3.166e-06					
Fe (OH) 2+	2.705e-06	2.539e-06	-5.568	-5.595	-0.028	(0)
Fe (OH) 3	4.534e-07	4.534e-07	-6.344	-6.344	0.000	(0)
Fe (OH) 4-	7.479e-09	7.020e-09	-8.126	-8.154	-0.028	(0)
FeOH+2	5.065e-11	3.924e-11	-10.295	-10.406	-0.111	(0)
FeF2+	2.548e-14	2.390e-14	-13.594	-13.622	-0.028	(0)
FeF+2	2.442e-14	1.892e-14	-13.612	-13.723	-0.111	(0)
FeF3	1.592e-15	1.592e-15	-14.798	-14.798	0.000	(0)
FeSO4+	1.317e-15	1.236e-15	-14.880	-14.908	-0.028	(0)
Fe+3	6.553e-16	3.655e-16	-15.184	-15.437	-0.254	(0)
Fe (SO4) 2-	8.541e-18	7.963e-18	-17.069	-17.099	-0.030	(0)
FeCl+2	2.784e-18	2.157e-18	-17.555	-17.666	-0.111	(0)
Fe2 (OH) 2+4	1.565e-19	5.100e-20	-18.806	-19.292	-0.487	(0)
FeHSeO3+2	6.025e-21	4.552e-21	-20.220	-20.342	-0.122	(0)
FeCl2+	2.007e-21	1.883e-21	-20.698	-20.725	-0.028	(0)
Fe3 (OH) 4+5	1.079e-23	1.871e-24	-22.967	-23.728	-0.761	(0)
FeCl3	3.679e-26	3.679e-26	-25.434	-25.434	0.000	(0)
H (0)	1.496e-27					
H2	7.478e-28	7.484e-28	-27.126	-27.126	0.000	(0)
Hg (0)	2.616e-11					
Hg	2.616e-11	2.616e-11	-10.582	-10.582	0.000	(0)
Hg (1)	4.622e-25					
Hg2+2	2.311e-25	1.746e-25	-24.636	-24.758	-0.122	(0)
Hg (2)	2.327e-15					
Hg (OH) 2	1.714e-15	1.715e-15	-14.766	-14.766	0.000	(0)
HgClOH	5.641e-16	5.641e-16	-15.249	-15.249	0.000	(0)
HgCl2	3.754e-17	3.754e-17	-16.426	-16.426	0.000	(0)
HgCO3	1.114e-17	1.114e-17	-16.953	-16.953	0.000	(0)
HgCl3-	7.867e-20	7.335e-20	-19.104	-19.135	-0.030	(0)
HgOH+	6.981e-20	6.508e-20	-19.156	-19.187	-0.030	(0)
Hg (CO3) 2-2	4.412e-20	3.334e-20	-19.355	-19.477	-0.122	(0)
HgCl+	4.111e-20	3.833e-20	-19.386	-19.416	-0.030	(0)
HgHCO3+	1.347e-20	1.256e-20	-19.871	-19.901	-0.030	(0)
HgCl4-2	7.551e-23	5.706e-23	-22.122	-22.244	-0.122	(0)
Hg (OH) 3-	3.851e-23	3.591e-23	-22.414	-22.445	-0.030	(0)
Hg+2	1.301e-23	9.831e-24	-22.886	-23.007	-0.122	(0)
HgSO4	7.757e-25	7.757e-25	-24.110	-24.110	0.000	(0)
HgF+	1.845e-26	1.720e-26	-25.734	-25.764	-0.030	(0)
HgHS2-	0.000e+00	0.000e+00	-129.795	-129.826	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.650	-130.650	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.194	-131.316	-0.122	(0)
K	8.615e-05					
K+	8.596e-05	8.056e-05	-4.066	-4.094	-0.028	(0)
KSO4-	1.831e-07	1.719e-07	-6.737	-6.765	-0.028	(0)
KCrO4-	7.203e-22	6.715e-22	-21.142	-21.173	-0.030	(0)
Mg	2.101e-04					
Mg+2	1.987e-04	1.533e-04	-3.702	-3.815	-0.113	(0)
MgSO4	8.405e-06	8.405e-06	-5.075	-5.075	0.000	(0)
MgHCO3+	2.046e-06	1.918e-06	-5.689	-5.717	-0.028	(0)
MgF+	8.659e-07	8.119e-07	-6.063	-6.091	-0.028	(0)

MgCO3	1.207e-07	1.207e-07	-6.918	-6.918	0.000	(0)
MgOH+	1.080e-08	1.015e-08	-7.967	-7.994	-0.027	(0)
MgH2BO3+	1.047e-10	9.790e-11	-9.980	-10.009	-0.029	(0)
Mn (2)	2.872e-06					
Mn+2	2.704e-06	2.043e-06	-5.568	-5.690	-0.122	(0)
MnSO4	1.095e-07	1.095e-07	-6.961	-6.961	0.000	(0)
MnHCO3+	5.312e-08	4.984e-08	-7.275	-7.302	-0.028	(0)
MnF+	4.093e-09	3.840e-09	-8.388	-8.416	-0.028	(0)
MnOH+	9.097e-10	8.534e-10	-9.041	-9.069	-0.028	(0)
MnCl+	5.357e-10	5.026e-10	-9.271	-9.299	-0.028	(0)
MnCl2	1.387e-13	1.387e-13	-12.858	-12.858	0.000	(0)
MnSeO4	1.992e-17	1.992e-17	-16.701	-16.701	0.000	(0)
MnCl3-	7.958e-18	7.466e-18	-17.099	-17.127	-0.028	(0)
Mn (OH) 3-	1.554e-19	1.458e-19	-18.808	-18.836	-0.028	(0)
Mn (OH) 4-2	1.011e-25	7.829e-26	-24.995	-25.106	-0.111	(0)
MnSe	5.610e-40	5.610e-40	-39.251	-39.251	0.000	(0)
Mn (3)	9.636e-27					
Mn+3	9.636e-27	5.375e-27	-26.016	-26.270	-0.254	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.178	-47.289	-0.111	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-51.862	-51.890	-0.029	(0)
Mo	6.665e-08					
MoO4-2	6.658e-08	5.136e-08	-7.177	-7.289	-0.113	(0)
HMoO4-	6.638e-11	6.188e-11	-10.178	-10.208	-0.030	(0)
H2MoO4	2.745e-14	2.745e-14	-13.562	-13.562	0.000	(0)
Ag2MoO4	8.397e-25	8.397e-25	-24.076	-24.076	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.276	-44.550	-0.274	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.683	-55.778	-1.095	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.849	-56.609	-0.761	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.558	-59.045	-0.487	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.743	-63.017	-0.274	(0)
Na	6.046e-04					
Na+	6.032e-04	5.653e-04	-3.220	-3.248	-0.028	(0)
NaSO4-	9.748e-07	9.149e-07	-6.011	-6.039	-0.028	(0)
NaHCO3	3.887e-07	3.887e-07	-6.410	-6.410	0.000	(0)
NaF	1.684e-08	1.684e-08	-7.774	-7.774	0.000	(0)
NaCO3-	1.062e-08	9.965e-09	-7.974	-8.002	-0.028	(0)
NaH2BO3	1.651e-11	1.651e-11	-10.782	-10.782	0.000	(0)
NaCrO4-	6.760e-21	6.303e-21	-20.170	-20.200	-0.030	(0)
Ni	2.602e-08					
Ni+2	2.166e-08	1.671e-08	-7.664	-7.777	-0.113	(0)
NiHCO3+	2.701e-09	2.518e-09	-8.568	-8.599	-0.030	(0)
NiSO4	1.005e-09	1.005e-09	-8.998	-8.998	0.000	(0)
NiCO3	5.901e-10	5.901e-10	-9.229	-9.229	0.000	(0)
NiOH+	3.752e-11	3.498e-11	-10.426	-10.456	-0.030	(0)
NiF+	2.125e-11	1.981e-11	-10.673	-10.703	-0.030	(0)
NiCl+	8.960e-12	8.354e-12	-11.048	-11.078	-0.030	(0)
Ni (OH) 2	4.620e-13	4.620e-13	-12.335	-12.335	0.000	(0)
Ni (SO4) 2-2	1.327e-14	1.003e-14	-13.877	-13.999	-0.122	(0)
Ni (OH) 3-	8.240e-17	7.683e-17	-16.084	-16.114	-0.030	(0)
NiCl2	8.218e-18	8.218e-18	-17.085	-17.085	0.000	(0)
NiSeO4	2.831e-19	2.831e-19	-18.548	-18.548	0.000	(0)
O (0)	1.808e-38					
O2	9.042e-39	9.049e-39	-38.044	-38.043	0.000	(0)
Pb	3.148e-09					
PbCO3	1.562e-09	1.562e-09	-8.806	-8.806	0.000	(0)
Pb+2	7.113e-10	5.488e-10	-9.148	-9.261	-0.113	(0)
PbHCO3+	5.347e-10	4.985e-10	-9.272	-9.302	-0.030	(0)
PbOH+	2.459e-10	2.292e-10	-9.609	-9.640	-0.030	(0)
PbSO4	8.100e-11	8.100e-11	-10.092	-10.092	0.000	(0)
Pb (CO3) 2-2	5.642e-12	4.263e-12	-11.249	-11.370	-0.122	(0)
PbCl+	4.081e-12	3.805e-12	-11.389	-11.420	-0.030	(0)
PbF+	1.958e-12	1.826e-12	-11.708	-11.739	-0.030	(0)
Pb (OH) 2	1.205e-12	1.205e-12	-11.919	-11.919	0.000	(0)
Pb (SO4) 2-2	1.947e-13	1.471e-13	-12.711	-12.832	-0.122	(0)
PbCl2	3.321e-15	3.321e-15	-14.479	-14.479	0.000	(0)
PbF2	1.696e-15	1.696e-15	-14.771	-14.771	0.000	(0)

Pb(OH) 3-	2.150e-16	2.004e-16	-15.668	-15.698	-0.030	(0)
Pb2OH+3	3.745e-18	1.994e-18	-17.426	-17.700	-0.274	(0)
PbCl3-	2.771e-19	2.583e-19	-18.557	-18.588	-0.030	(0)
PbF3-	1.629e-19	1.519e-19	-18.788	-18.819	-0.030	(0)
Pb(OH) 4-2	1.080e-20	8.162e-21	-19.966	-20.088	-0.122	(0)
PbCl4-2	3.054e-23	2.307e-23	-22.515	-22.637	-0.122	(0)
Pb3(OH) 4+2	2.105e-23	1.591e-23	-22.677	-22.798	-0.122	(0)
PbF4-2	4.541e-24	3.431e-24	-23.343	-23.465	-0.122	(0)
Pb4(OH) 4+4	2.128e-28	6.935e-29	-27.672	-28.159	-0.487	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-139.955	-139.955	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-211.607	-211.637	-0.030	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.350	-67.350	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.952	-72.982	-0.030	(0)
H2S	0.000e+00	0.000e+00	-73.180	-73.180	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.943	-73.974	-0.030	(0)
S5-2	0.000e+00	0.000e+00	-75.008	-75.129	-0.122	(0)
S6-2	0.000e+00	0.000e+00	-75.524	-75.645	-0.122	(0)
S4-2	0.000e+00	0.000e+00	-75.603	-75.725	-0.122	(0)
S3-2	0.000e+00	0.000e+00	-76.409	-76.531	-0.122	(0)
S2-2	0.000e+00	0.000e+00	-77.425	-77.547	-0.122	(0)
S-2	0.000e+00	0.000e+00	-82.953	-83.064	-0.111	(0)
HgHS2-	0.000e+00	0.000e+00	-129.795	-129.826	-0.030	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-130.650	-130.650	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.194	-131.316	-0.122	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-136.202	-136.232	-0.030	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-136.404	-136.498	-0.094	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-136.856	-137.044	-0.189	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.591	-137.774	-0.184	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-138.529	-138.720	-0.191	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.845	-139.031	-0.186	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-138.933	-138.964	-0.030	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-139.752	-139.752	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-139.955	-139.955	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-140.172	-140.172	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-144.189	-144.189	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-199.843	-199.873	-0.030	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-209.843	-209.874	-0.030	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-210.804	-210.834	-0.030	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-211.607	-211.637	-0.030	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-212.514	-212.636	-0.122	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-215.104	-215.135	-0.030	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-281.499	-281.620	-0.122	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-284.194	-284.316	-0.122	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.144	-294.266	-0.122	(0)
S(6)	4.332e-04					
SO4-2	3.906e-04	3.014e-04	-3.408	-3.521	-0.113	(0)
CaSO4	3.292e-05	3.292e-05	-4.483	-4.483	0.000	(0)
MgSO4	8.405e-06	8.405e-06	-5.075	-5.075	0.000	(0)
NaSO4-	9.748e-07	9.149e-07	-6.011	-6.039	-0.028	(0)
KSO4-	1.831e-07	1.719e-07	-6.737	-6.765	-0.028	(0)
MnSO4	1.095e-07	1.095e-07	-6.961	-6.961	0.000	(0)
CuSO4	1.031e-08	1.031e-08	-7.987	-7.987	0.000	(0)
ZnSO4	6.192e-09	6.192e-09	-8.208	-8.208	0.000	(0)
FeSO4	4.942e-09	4.942e-09	-8.306	-8.306	0.000	(0)
HSO4-	1.902e-09	1.783e-09	-8.721	-8.749	-0.028	(0)
NiSO4	1.005e-09	1.005e-09	-8.998	-8.998	0.000	(0)
CoSO4	6.615e-10	6.615e-10	-9.179	-9.179	0.000	(0)
PbSO4	8.100e-11	8.100e-11	-10.092	-10.092	0.000	(0)
CdSO4	7.070e-11	7.070e-11	-10.151	-10.151	0.000	(0)
CrOHSO4	4.548e-11	4.548e-11	-10.342	-10.342	0.000	(0)
AgSO4-	4.238e-11	3.952e-11	-10.373	-10.403	-0.030	(0)
Zn(SO4) 2-2	2.151e-11	1.625e-11	-10.667	-10.789	-0.122	(0)
AlSO4+	7.905e-13	7.412e-13	-12.102	-12.130	-0.028	(0)
Cd(SO4) 2-2	3.803e-13	2.874e-13	-12.420	-12.542	-0.122	(0)
Pb(SO4) 2-2	1.947e-13	1.471e-13	-12.711	-12.832	-0.122	(0)
CrSO4+	1.320e-13	1.230e-13	-12.880	-12.910	-0.030	(0)
UO2SO4	4.245e-14	4.245e-14	-13.372	-13.372	0.000	(0)

Ni (SO4) 2-2	1.327e-14	1.003e-14	-13.877	-13.999	-0.122	(0)
Al (SO4) 2-	2.553e-15	2.394e-15	-14.593	-14.621	-0.028	(0)
FeSO4+	1.317e-15	1.236e-15	-14.880	-14.908	-0.028	(0)
UO2 (SO4) 2-2	2.232e-16	1.686e-16	-15.651	-15.773	-0.122	(0)
Fe (SO4) 2-	8.541e-18	7.963e-18	-17.069	-17.099	-0.030	(0)
VO2SO4-	6.939e-18	6.470e-18	-17.159	-17.189	-0.030	(0)
Cr2 (OH) 2SO4+2	3.461e-18	2.615e-18	-17.461	-17.583	-0.122	(0)
VOSO4	3.716e-19	3.716e-19	-18.430	-18.430	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.681e-20	4.681e-20	-19.330	-19.330	0.000	(0)
HgSO4	7.757e-25	7.757e-25	-24.110	-24.110	0.000	(0)
CrO3SO4-2	3.234e-27	2.443e-27	-26.490	-26.612	-0.122	(0)
VSO4+	2.112e-32	1.969e-32	-31.675	-31.706	-0.030	(0)
U (SO4) 2	1.704e-39	1.704e-39	-38.769	-38.769	0.000	(0)
USO4+2	9.419e-40	7.117e-40	-39.026	-39.148	-0.122	(0)
Sb (3)	4.476e-19					
Sb (OH) 3	2.265e-19	2.265e-19	-18.645	-18.645	0.000	(0)
HSbO2	2.211e-19	2.211e-19	-18.655	-18.655	0.000	(0)
SbO2-	6.342e-24	5.913e-24	-23.198	-23.228	-0.030	(0)
Sb (OH) 4-	3.634e-24	3.388e-24	-23.440	-23.470	-0.030	(0)
Sb (OH) 2F	1.011e-24	1.011e-24	-23.995	-23.995	0.000	(0)
SbOF	9.945e-25	9.945e-25	-24.002	-24.002	0.000	(0)
Sb (OH) 2+	3.572e-25	3.330e-25	-24.447	-24.478	-0.030	(0)
SbO+	1.231e-25	1.148e-25	-24.910	-24.940	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.144	-294.266	-0.122	(0)
Sb (5)	1.591e-09					
SbO3-	1.589e-09	1.481e-09	-8.799	-8.829	-0.030	(0)
Sb (OH) 6-	1.849e-12	1.733e-12	-11.733	-11.761	-0.028	(0)
SbO2+	1.671e-24	1.558e-24	-23.777	-23.807	-0.030	(0)
Se (-2)	2.345e-10					
Ag2Se	2.345e-10	2.345e-10	-9.630	-9.630	0.000	(0)
HSe-	4.327e-36	4.035e-36	-35.364	-35.394	-0.030	(0)
H2Se	1.896e-39	1.896e-39	-38.722	-38.722	0.000	(0)
MnSe	5.610e-40	5.610e-40	-39.251	-39.251	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.055	-43.176	-0.122	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.339	-77.826	-0.487	(0)
Se (4)	5.465e-09					
HSeO3-	5.055e-09	4.713e-09	-8.296	-8.327	-0.030	(0)
SeO3-2	4.101e-10	3.099e-10	-9.387	-9.509	-0.122	(0)
H2SeO3	1.217e-13	1.217e-13	-12.915	-12.915	0.000	(0)
AgSeO3-	1.404e-15	1.309e-15	-14.853	-14.883	-0.030	(0)
FeHSeO3+2	6.025e-21	4.552e-21	-20.220	-20.342	-0.122	(0)
Cd (SeO3) 2-2	1.048e-22	7.920e-23	-21.980	-22.101	-0.122	(0)
Ag (SeO3) 2-3	6.822e-24	3.631e-24	-23.166	-23.440	-0.274	(0)
Se (6)	4.698e-14					
SeO4-2	4.696e-14	3.623e-14	-13.328	-13.441	-0.113	(0)
MnSeO4	1.992e-17	1.992e-17	-16.701	-16.701	0.000	(0)
ZnSeO4	5.270e-19	5.270e-19	-18.278	-18.278	0.000	(0)
NiSeO4	2.831e-19	2.831e-19	-18.548	-18.548	0.000	(0)
CoSeO4	1.998e-19	1.998e-19	-18.699	-18.699	0.000	(0)
HSeO4-	1.179e-19	1.099e-19	-18.928	-18.959	-0.030	(0)
CdSeO4	6.751e-21	6.751e-21	-20.171	-20.171	0.000	(0)
Zn (SeO4) 2-2	2.562e-32	1.936e-32	-31.591	-31.713	-0.122	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.519	-55.793	-0.274	(0)
U (4)	5.942e-20					
U (OH) 5-	5.928e-20	5.527e-20	-19.227	-19.258	-0.030	(0)
U (OH) 4	1.402e-22	1.402e-22	-21.853	-21.853	0.000	(0)
U (OH) 3+	3.328e-26	3.103e-26	-25.478	-25.508	-0.030	(0)
U (OH) 2+2	1.150e-30	8.688e-31	-29.939	-30.061	-0.122	(0)
UF3+	2.665e-34	2.485e-34	-33.574	-33.605	-0.030	(0)
UF2+2	4.395e-35	3.321e-35	-34.357	-34.479	-0.122	(0)
UOH+3	4.655e-36	2.478e-36	-35.332	-35.606	-0.274	(0)
UF4	1.286e-36	1.286e-36	-35.891	-35.891	0.000	(0)
UF+3	1.050e-37	5.588e-38	-36.979	-37.253	-0.274	(0)
UF5-	2.581e-39	2.406e-39	-38.588	-38.619	-0.030	(0)
U (SO4) 2	1.704e-39	1.704e-39	-38.769	-38.769	0.000	(0)
USO4+2	9.419e-40	7.117e-40	-39.026	-39.148	-0.122	(0)
UF6-2	0.000e+00	0.000e+00	-40.343	-40.465	-0.122	(0)

U+4	0.000e+00	0.000e+00	-41.740	-42.227	-0.487	(0)
UC1+3	0.000e+00	0.000e+00	-43.962	-44.236	-0.274	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.783	-162.248	-2.465	(0)
U (5)	1.033e-15					
UO2+	1.033e-15	9.633e-16	-14.986	-15.016	-0.030	(0)
U (6)	1.008e-08					
UO2 (CO3) 2-2	8.766e-09	6.624e-09	-8.057	-8.179	-0.122	(0)
UO2 (CO3) 3-4	9.641e-10	3.142e-10	-9.016	-9.503	-0.487	(0)
UO2CO3	3.507e-10	3.507e-10	-9.455	-9.455	0.000	(0)
UO2OH+	2.090e-12	1.948e-12	-11.680	-11.710	-0.030	(0)
UO2F+	6.505e-13	6.065e-13	-12.187	-12.217	-0.030	(0)
UO2+2	1.206e-13	9.307e-14	-12.919	-13.031	-0.113	(0)
UO2F2	8.257e-14	8.257e-14	-13.083	-13.083	0.000	(0)
UO2SO4	4.245e-14	4.245e-14	-13.372	-13.372	0.000	(0)
UO2F3-	1.050e-15	9.791e-16	-14.979	-15.009	-0.030	(0)
UO2 (SO4) 2-2	2.232e-16	1.686e-16	-15.651	-15.773	-0.122	(0)
UO2Cl+	3.163e-17	2.949e-17	-16.500	-16.530	-0.030	(0)
(UO2) 2 (OH) 2+2	8.337e-18	6.299e-18	-17.079	-17.201	-0.122	(0)
UO2F4-2	4.859e-19	3.672e-19	-18.313	-18.435	-0.122	(0)
(UO2) 3 (OH) 5+	2.761e-19	2.574e-19	-18.559	-18.589	-0.030	(0)
V (2)	8.168e-40					
VOH+	6.645e-40	6.195e-40	-39.178	-39.208	-0.030	(0)
V+2	1.524e-40	1.151e-40	-39.817	-39.939	-0.122	(0)
V (3)	5.134e-13					
V (OH) 3	5.134e-13	5.134e-13	-12.290	-12.290	0.000	(0)
V (OH) 2+	2.155e-23	2.009e-23	-22.667	-22.697	-0.030	(0)
VOH+2	1.527e-26	1.154e-26	-25.816	-25.938	-0.122	(0)
V+3	2.601e-31	1.384e-31	-30.585	-30.859	-0.274	(0)
VSO4+	2.112e-32	1.969e-32	-31.675	-31.706	-0.030	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.909	-50.183	-0.274	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.589	-51.076	-0.487	(0)
V (4)	1.670e-16					
V (OH) 3+	1.593e-16	1.485e-16	-15.798	-15.828	-0.030	(0)
VO+2	5.926e-18	4.477e-18	-17.227	-17.349	-0.122	(0)
VOF+	1.360e-18	1.268e-18	-17.867	-17.897	-0.030	(0)
VOSO4	3.716e-19	3.716e-19	-18.430	-18.430	0.000	(0)
VOF2	2.244e-20	2.244e-20	-19.649	-19.649	0.000	(0)
VOC1+	2.633e-21	2.454e-21	-20.580	-20.610	-0.030	(0)
VOF3-	4.032e-23	3.759e-23	-22.395	-22.425	-0.030	(0)
VOF4-2	9.480e-27	7.163e-27	-26.023	-26.145	-0.122	(0)
H2V2O4+2	1.464e-27	1.106e-27	-26.835	-26.956	-0.122	(0)
V (5)	1.386e-08					
H2VO4-	1.318e-08	1.229e-08	-7.880	-7.910	-0.030	(0)
HVO4-2	6.747e-10	5.098e-10	-9.171	-9.293	-0.122	(0)
H3VO4	7.441e-12	7.441e-12	-11.128	-11.128	0.000	(0)
H3V2O7-	6.333e-13	5.904e-13	-12.198	-12.229	-0.030	(0)
HV2O7-3	3.988e-15	2.123e-15	-14.399	-14.673	-0.274	(0)
VO2+	9.593e-16	8.991e-16	-15.018	-15.046	-0.028	(0)
VO4-3	7.927e-17	4.220e-17	-16.101	-16.375	-0.274	(0)
VO2F	7.444e-17	7.444e-17	-16.128	-16.128	0.000	(0)
VO2SO4-	6.939e-18	6.470e-18	-17.159	-17.189	-0.030	(0)
V3O9-3	3.652e-18	1.944e-18	-17.438	-17.711	-0.274	(0)
V2O7-4	2.895e-18	9.437e-19	-17.538	-18.025	-0.487	(0)
VO2F2-	1.369e-18	1.276e-18	-17.864	-17.894	-0.030	(0)
VO2F3-2	9.944e-22	7.514e-22	-21.002	-21.124	-0.122	(0)
V4O12-4	3.055e-23	9.958e-24	-22.515	-23.002	-0.487	(0)
VO2F4-3	3.279e-26	1.745e-26	-25.484	-25.758	-0.274	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.341	-58.102	-0.761	(0)
V10O28-6	0.000e+00	0.000e+00	-57.975	-59.070	-1.095	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.625	-60.112	-0.487	(0)
Zn	1.388e-07					
Zn+2	1.217e-07	9.392e-08	-6.915	-7.027	-0.113	(0)
ZnSO4	6.192e-09	6.192e-09	-8.208	-8.208	0.000	(0)
ZnCO3	5.116e-09	5.116e-09	-8.291	-8.291	0.000	(0)
ZnHCO3+	3.895e-09	3.631e-09	-8.410	-8.440	-0.030	(0)
ZnOH+	1.675e-09	1.562e-09	-8.776	-8.806	-0.030	(0)
ZnF+	9.489e-11	8.847e-11	-10.023	-10.053	-0.030	(0)
ZnCl+	4.919e-11	4.610e-11	-10.308	-10.336	-0.028	(0)

Zn(OH) 2	4.116e-11	4.116e-11	-10.386	-10.386	0.000	(0)
Zn(SO4) 2-2	2.151e-11	1.625e-11	-10.667	-10.789	-0.122	(0)
ZnOHCl	1.004e-11	1.004e-11	-10.998	-10.998	0.000	(0)
Zn(OH) 3-	3.679e-14	3.430e-14	-13.434	-13.465	-0.030	(0)
ZnCl2	1.428e-14	1.428e-14	-13.845	-13.845	0.000	(0)
ZnCl3-	2.365e-18	2.216e-18	-17.626	-17.654	-0.028	(0)
ZnSeO4	5.270e-19	5.270e-19	-18.278	-18.278	0.000	(0)
Zn(OH) 4-2	3.005e-19	2.271e-19	-18.522	-18.644	-0.122	(0)
ZnCl4-2	2.795e-22	2.165e-22	-21.554	-21.665	-0.111	(0)
Zn(SeO4) 2-2	2.562e-32	1.936e-32	-31.591	-31.713	-0.122	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-138.933	-138.964	-0.030	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-140.172	-140.172	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-209.843	-209.874	-0.030	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-212.514	-212.636	-0.122	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-284.194	-284.316	-0.122	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.91	-82.13	-36.22	Ag2S
Ag2CO3	-11.30	-22.39	-11.09	Ag2CO3
Ag2CrO4	-22.42	-34.01	-11.59	Ag2CrO4
Ag2HVO4	-11.24	-9.76	1.48	Ag2HVO4
Ag2MoO4	-12.10	-23.65	-11.55	Ag2MoO4
Ag2O	-14.50	-1.93	12.57	Ag2O
Ag2Se	4.16	-44.54	-48.70	Ag2Se
Ag2SeO3	-10.32	-17.47	-7.15	Ag2SeO3
Ag2SeO4	-20.90	-29.81	-8.91	Ag2SeO4
Ag2SO4	-15.07	-19.89	-4.82	Ag2SO4
Ag3AsO3	-23.95	-21.79	2.16	Ag3AsO3
Ag3AsO4	-13.93	-16.72	-2.79	Ag3AsO4
Ag3H2VO5	-15.90	-10.72	5.18	Ag3H2VO5
AgF·4H2O	-13.56	-12.51	1.05	AgF·4H2O
Agmetal	0.55	-12.95	-13.51	Ag
AgVO3	-9.56	-8.79	0.77	AgVO3
Al(OH) 3(am)	-1.65	9.15	10.80	Al(OH) 3
Al2(MoO4) 3	-49.23	-46.87	2.37	Al2(MoO4) 3
Al2O3	-1.34	18.31	19.65	Al2O3
Al4(OH) 10SO4	-4.04	18.66	22.70	Al4(OH) 10SO4
AlAsO4·2H2O	-9.47	-4.67	4.80	AlAsO4·2H2O
AlOHSO4	-5.57	-8.80	-3.23	AlOHSO4
AlSb	-147.04	-81.42	65.62	AlSb
Alunite	-3.93	-5.33	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.99	-12.78	-7.79	PbSO4
Anhydrite	-2.48	-6.84	-4.36	CaSO4
Anilite	-48.95	-80.83	-31.88	Cu0.25Cu1.5S
Antlerite	-3.91	4.87	8.79	Cu3(OH) 4SO4
Aragonite	-1.05	-9.35	-8.30	CaCO3
Arsenolite	-72.84	-75.60	-2.76	As4O6
Artinite	-8.82	0.78	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-34.35	-27.65	6.71	As2O5
Atacamite	-3.10	4.29	7.39	Cu2(OH) 3Cl
Azurite	-1.18	-18.09	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-16.83	7.57	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-16.39	-0.52	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	3.97	-4.94	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-25.89	7.05	32.94	Ba3(VO4) 2:4H2O
BaCrO4	-14.85	-24.52	-9.67	BaCrO4
BaF2	-9.70	-15.52	-5.82	BaF2
BaMoO4	-7.20	-14.16	-6.96	BaMoO4
Barite	-0.41	-10.39	-9.98	BaSO4
BaS	-88.81	-72.63	16.18	BaS
BaSeO3	-9.81	-7.98	1.83	BaSeO3
BaSeO4	-12.85	-20.31	-7.46	BaSeO4
Bianchite	-8.78	-10.55	-1.76	ZnSO4:6H2O
Birnessite	-10.72	7.37	18.09	MnO2
Bixbyite	-8.59	-9.23	-0.64	Mn2O3

BlaubleiI	-49.53	-73.69	-24.16	Cu0.9Cu0.2S
BlaubleiII	-49.71	-76.98	-27.28	Cu0.6Cu0.8S
Boehmite	0.58	9.15	8.58	AlOOH
Breithauptite	-53.40	-71.93	-18.52	NiSb
Brochantite	-2.74	12.48	15.22	Cu4(OH)6SO4
Brucite	-6.22	10.62	16.84	Mg(OH)2
Bunsenite	-5.79	6.66	12.45	NiO
Ca(VO3)2	-10.20	-4.54	5.66	Ca(VO3)2
Ca2V2O7	-10.93	6.57	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.98	6.57	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.60	5.70	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.27	17.69	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.17	17.69	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-290.78	-147.80	142.97	Ca3Sb2
CaCrO4	-18.70	-20.97	-2.27	CaCrO4
Calcite	-0.87	-9.35	-8.48	CaCO3
Calomel	-14.27	-32.18	-17.91	Hg2Cl2
CaMoO4	-2.66	-10.61	-7.95	CaMoO4
Carnotite	-3.53	-3.30	0.23	KUO2VO4
CaSeO3:2H2O	-7.24	-4.43	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.74	-16.76	-3.02	CaSeO4:2H2O
Cd(BO2)2	-15.84	-6.00	9.84	Cd(BO2)2
Cd(OH)2	-8.21	5.44	13.64	Cd(OH)2
Cd(OH)2(am)	-8.29	5.44	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.32	-19.61	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.21	-1.65	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.61	3.79	28.40	Cd4(OH)6SO4
CdCl2	-15.76	-16.42	-0.66	CdCl2
CdCl2:1H2O	-14.72	-16.42	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-14.50	-16.42	-1.91	CdCl2:2.5H2O
CdF2	-16.44	-17.65	-1.21	CdF2
Cdmetal(alpha)	-32.05	-18.54	13.51	Cd
Cdmetal(gamma)	-32.16	-18.54	13.62	Cd
CdMoO4	-2.14	-16.29	-14.15	CdMoO4
CdOHCl	-9.03	-5.49	3.54	CdOHCl
CdSb	-72.80	-73.15	-0.35	CdSb
CdSe	-16.98	-37.18	-20.20	CdSe
CdSeO4:2H2O	-20.59	-22.44	-1.85	CdSeO4:2H2O
CdSO4	-12.35	-12.52	-0.17	CdSO4
CdSO4:1H2O	-10.79	-12.52	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.65	-12.52	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.14	-11.89	-9.75	AgCl
Cerrusite	-2.15	-15.28	-13.13	PbCO3
CH4(g)	-75.32	-116.36	-41.05	CH4
Chalcanthite	-7.71	-10.35	-2.64	CuSO4:5H2O
Chalcocite	-48.66	-83.58	-34.92	Cu2S
Chalcopyrite	-110.26	-145.53	-35.27	CuFeS2
Cinnabar	-49.27	-94.97	-45.69	HgS
Claudetite	-72.54	-75.60	-3.06	As4O6
Clausthalite	-10.34	-37.44	-27.10	PbSe
Co(BO2)2	-32.03	-4.96	27.07	Co(BO2)2
Co(OH)2	-6.62	6.48	13.09	Co(OH)2
Co(OH)3	-11.63	-13.93	-2.31	Co(OH)3
CO2(g)	-2.31	-20.46	-18.15	CO2
Co3(AsO4)2	-21.25	-8.21	13.03	Co3(AsO4)2
Co3O4	-10.90	-21.39	-10.50	Co3O4
CoCl2	-23.64	-15.38	8.27	CoCl2
CoCl2:6H2O	-17.91	-15.38	2.54	CoCl2:6H2O
CoCO3	-4.00	-13.98	-9.98	CoCO3
CoF2	-15.01	-16.61	-1.60	CoF2
CoF3	-47.11	-48.57	-1.46	CoF3
CoFe2O4	22.44	18.91	-3.53	CoFe2O4
CoMoO4	-7.49	-15.25	-7.76	CoMoO4
CoO	-7.11	6.48	13.59	CoO
CoS(alpha)	-66.28	-73.72	-7.44	CoS
CoS(beta)	-62.65	-73.72	-11.07	CoS
CoSe	-19.93	-36.13	-16.20	CoSe
CoSeO3	-10.39	-9.07	1.32	CoSeO3

CoSeO4:6H2O	-19.87	-21.40	-1.53	CoSeO4:6H2O
CoSO4	-14.28	-11.48	2.80	CoSO4
CoSO4:6H2O	-9.01	-11.48	-2.47	CoSO4:6H2O
Cotunnite	-11.90	-16.68	-4.78	PbCl2
Covellite	-50.29	-72.59	-22.30	CuS
Cr (OH) 2	-20.53	-9.71	10.82	Cr (OH) 2
Cr (OH) 3	-2.01	-0.67	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.08	-0.67	-0.75	Cr (OH) 3
Cr2O3	1.01	-1.35	-2.36	Cr2O3
CrCl2	-45.66	-31.57	14.09	CrCl2
CrCl3	-48.57	-33.45	15.11	CrCl3
CrF3	-23.97	-35.30	-11.34	CrF3
Crmetal	-64.17	-33.69	30.48	Cr
CrO3	-28.87	-32.08	-3.21	CrO3
Cryolite	-14.36	-48.20	-33.84	Na3AlF6
Cu (OH) 2	-1.06	7.61	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.94	18.27	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.77	-84.65	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.19	-45.99	-45.80	Cu2Se
Cu2SO4	-19.38	-21.33	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.92	-4.82	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.04	-95.64	-42.59	Cu3Sb
Cu3Se2	-17.50	-80.99	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.03	-24.47	-5.44	CuCrO4
CuF	-8.33	-13.23	-4.91	CuF
CuF2	-16.59	-15.48	1.12	CuF2
CuF2:2H2O	-10.93	-15.48	-4.55	CuF2:2H2O
Cumetal	-4.92	-13.68	-8.76	Cu
CuMoO4	-1.04	-14.12	-13.08	CuMoO4
CuOCuSO4	-13.04	-2.74	10.30	CuOCuSO4
Cupricferrite	14.05	20.04	5.99	CuFe2O4
Cuprite	-1.97	-3.38	-1.41	Cu2O
Cuprousferrite	13.45	4.53	-8.92	CuFeO2
CuSe	-1.90	-35.00	-33.10	CuSe
CuSe2	-20.27	-53.64	-33.37	CuSe2
CuSeO3:2H2O	-8.45	-7.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.83	-20.27	-2.44	CuSeO4:5H2O
CuSO4	-13.29	-10.35	2.94	CuSO4
Diaspore	2.28	9.15	6.87	AlOOH
Djurleite	-48.93	-82.85	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-2.64	-19.18	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-2.09	-19.18	-17.09	CaMg (CO3) 2
Epsomite	-5.21	-7.34	-2.13	MgSO4:7H2O
Fe (OH) 2	-6.30	7.26	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	5.98	2.94	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-4.68	-8.40	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-4.67	-3.11	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-13.57	-34.20	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-37.70	-41.44	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-0.53	19.69	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-8.01	-7.61	0.40	FeAsO4:2H2O
FeCr2O4	-1.28	5.92	7.20	FeCr2O4
FeMoO4	-4.37	-14.46	-10.09	FeMoO4
Ferrihydrite	3.03	6.22	3.19	Fe (OH) 3
Ferroselite	-35.39	-53.99	-18.60	FeSe2
FeS (ppt)	-69.99	-72.94	-2.95	FeS
FeSe	-24.35	-35.35	-11.00	FeSe
Fix_pe	-4.77	-4.77	0.00	e-
Fluorite	-1.47	-11.97	-10.50	CaF2
Galena	-61.05	-75.02	-13.97	PbS
Gibbsite	0.86	9.15	8.29	Al (OH) 3
Goethite	5.73	6.22	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO4:7H2O
Greenockite	-60.40	-74.76	-14.36	CdS
Greigite	-256.07	-301.11	-45.03	Fe3S4
Gummite	-6.27	1.40	7.67	UO3
Gypsum	-2.23	-6.84	-4.61	CaSO4:2H2O

H-Jarosite	-5.16	-17.26	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.85	-21.73	-12.88	H2MoO4
H2S (g)	-72.19	-80.20	-8.01	H2S
H2Se (g)	-37.65	-42.61	-4.96	H2Se
Halite	-8.56	-6.96	1.60	NaCl
Hausmannite	-10.82	50.21	61.03	Mn3O4
Hematite	13.85	12.43	-1.42	Fe2O3
Hercynite	2.68	25.57	22.89	FeAl2O4
Hg (CH3) 2 (g)	-173.78	-247.49	-73.71	Hg (CH3) 2
Hg (g)	-9.28	-17.15	-7.87	Hg
Hg (OH) 2	-11.27	-14.77	-3.50	Hg (OH) 2
Hg2 (g)	-19.34	-34.30	-14.96	Hg2
Hg2 (OH) 2	-15.58	-10.32	5.26	Hg2 (OH) 2
Hg2CO3	-14.73	-30.78	-16.05	Hg2CO3
Hg2CrO4	-33.71	-42.41	-8.70	Hg2CrO4
Hg2F2	-23.05	-33.41	-10.36	Hg2F2
Hg2S	-78.85	-90.52	-11.68	Hg2S
Hg2SeO3	-21.21	-25.87	-4.66	Hg2SeO3
Hg2SO4	-22.15	-28.28	-6.13	Hg2SO4
Hg3O2CO3	-35.07	-64.76	-29.68	Hg3O2CO3
HgCl (g)	-35.58	-16.09	19.50	HgCl
HgCl2	-15.36	-36.62	-21.26	HgCl2
HgF (g)	-49.38	-16.70	32.68	HgF
HgF2 (g)	-50.42	-37.85	12.57	HgF2
Hgmetal (l)	-3.70	-17.15	-13.45	Hg
HgSe	-1.68	-57.38	-55.69	HgSe
HgSeO3	-17.88	-30.31	-12.43	HgSeO3
HgSO4	-23.30	-32.72	-9.42	HgSO4
Huntite	-8.89	-38.86	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-6.62	-25.39	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-19.97	-28.73	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-18.47	-23.64	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	0.66	-14.14	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-40.68	-57.92	-17.24	K2Cr2O7
K2CrO4	-25.32	-25.84	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.90	-21.63	-0.73	K2SeO4
Langite	-5.01	12.48	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.17	-7.61	-0.43	PbO : PbSO4
Laurionite	-6.37	-5.75	0.62	PbOHCl
Lepidocrocite	4.85	6.22	1.37	FeOOH
Lime	-21.59	11.11	32.70	CaO
Litharge	-7.52	5.18	12.69	PbO
Mackinawite	-69.34	-72.94	-3.60	FeS
Maghemite	6.05	12.43	6.39	Fe2O3
Magnesioferrite	6.19	23.05	16.86	Fe2MgO4
Magnesite	-2.38	-9.84	-7.46	MgCO3
Magnetite	16.29	19.69	3.40	Fe3O4
Malachite	0.07	-5.24	-5.31	Cu2 (OH) 2CO3
Manganite	-4.61	20.73	25.34	MnOOH
Massicot	-7.72	5.18	12.89	PbO
Matlockite	-8.32	-17.30	-8.97	PbClF
Melanothallite	-20.50	-14.24	6.26	CuCl2
Melanterite	-8.49	-10.70	-2.21	FeSO4 : 7H2O
Metacinnabar	-49.87	-94.97	-45.09	HgS
Mg (OH) 2 (active)	-8.17	10.62	18.79	Mg (OH) 2
Mg (VO3) 2	-16.32	-5.04	11.28	Mg (VO3) 2
Mg2Sb3	-265.22	-190.54	74.68	Mg2Sb3
Mg2V2O7	-20.77	5.59	26.36	Mg2V2O7
MgCr2O4	-6.92	9.28	16.20	MgCr2O4
MgCrO4	-26.84	-21.46	5.38	MgCrO4
MgF2	-4.34	-12.47	-8.13	MgF2
MgMoO4	-9.25	-11.10	-1.85	MgMoO4
MgSeO3 : 6H2O	-7.98	-4.92	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-16.06	-17.26	-1.20	MgSeO4 : 6H2O
Minium	-34.02	39.50	73.52	Pb3O4
Mirabilite	-8.90	-10.02	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.81	-6.91	4.90	Mn (VO3) 2

Mn2 (SO4) 3	-57.39	-63.10	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.15	-85.07	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.91	-1.41	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-15.82	-13.11	2.72	MnCl2 : 4H2O
MnS (grn)	-71.62	-71.45	0.17	MnS
MnS (pnk)	-74.79	-71.45	3.34	MnS
MnSb	-92.28	-95.19	-2.91	MnSb
MnSe	-37.37	-33.87	3.50	MnSe
MnSeO3	-7.93	-6.80	1.13	MnSeO3
MnSeO3 : 2H2O	-7.78	-6.80	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-17.08	-19.13	-2.05	MnSeO4 : 5H2O
MnSO4	-11.79	-9.21	2.58	MnSO4
Monteponite	-9.67	5.44	15.10	CdO
Montroydite	-11.13	-14.77	-3.64	HgO
MoO3	-13.73	-21.73	-8.00	MoO3
Morenosite	-9.15	-11.30	-2.14	NiSO4 : 7H2O
MoS2	-135.84	-206.10	-70.26	MoS2
Na-Jarosite	-2.09	-13.29	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-46.33	-56.23	-9.90	Na2Cr2O7
Na2CrO4	-27.07	-24.14	2.93	Na2CrO4
Na2Mo2O7	-18.91	-35.51	-16.60	Na2Mo2O7
Na2MoO4	-15.27	-13.78	1.49	Na2MoO4
Na2MoO4 : 2H2O	-15.01	-13.78	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-17.90	-7.60	10.30	Na2SeO3 : 5H2O
Na2SeO4	-21.22	-19.94	1.28	Na2SeO4
Na3Sb	-173.11	-78.66	94.45	Na3Sb
Na3VO4	-32.60	4.08	36.68	Na3VO4
Na4V2O7	-37.18	0.22	37.40	Na4V2O7
Nantokite	-5.88	-12.61	-6.73	CuCl
NaSb	-85.79	-62.63	23.17	NaSb
Natron	-11.21	-12.52	-1.31	Na2CO3 : 10H2O
NaVO3	-7.72	-3.86	3.86	NaVO3
Nesquehonite	-5.17	-9.84	-4.67	MgCO3 : 3H2O
Ni (OH) 2	-6.14	6.66	12.79	Ni (OH) 2
Ni3 (AsO4) 2 : 8H2O	-23.37	-7.67	15.70	Ni3 (AsO4) 2 : 8H2O
Ni4 (OH) 6SO4	-23.32	8.68	32.00	Ni4 (OH) 6SO4
NiCO3	-6.93	-13.80	-6.87	NiCO3
NiMoO4	-3.92	-15.07	-11.14	NiMoO4
NiS (alpha)	-67.94	-73.54	-5.60	NiS
NiS (beta)	-62.44	-73.54	-11.10	NiS
NiS (gamma)	-60.74	-73.54	-12.80	NiS
NiSe	-18.25	-35.95	-17.70	NiSe
NiSeO3 : 2H2O	-11.70	-8.89	2.81	NiSeO3 : 2H2O
NiSeO4 : 6H2O	-19.70	-21.22	-1.52	NiSeO4 : 6H2O
Nsutite	-10.13	7.37	17.50	MnO2
O2 (g)	-35.14	47.95	83.09	O2
Orpiment	-217.33	-278.40	-61.07	As2S3
Otavite	-3.02	-15.02	-12.00	CdCO3
Pb (BO2) 2	-12.78	-6.26	6.52	Pb (BO2) 2
Pb (OH) 2	-2.97	5.18	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-62.25	-71.01	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-9.37	-0.58	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.84	10.35	26.19	Pb2O (OH) 2
Pb2O3	-26.71	34.33	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.41	-5.31	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-17.92	-12.12	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-6.27	-0.13	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.95	-4.93	11.02	Pb3O2CO3
Pb3O2SO4	-13.12	-2.43	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-18.36	2.74	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-19.13	2.74	21.88	Pb4O3SO4
PbCrO4	-14.31	-26.91	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.05	-18.80	4.25	Pb
PbMoO4	-0.93	-16.55	-15.62	PbMoO4
PbO : 0.3H2O	-7.80	5.18	12.98	PbO : 0.33H2O
PbSeO4	-15.86	-22.70	-6.84	PbSeO4

Periclase	-10.96	10.62	21.58	MgO
Phosgenite	-12.15	-31.96	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-20.45	29.15	49.60	PbO ₂
Portlandite	-11.69	11.11	22.80	Ca(OH) ₂
Pyrite	-110.66	-129.16	-18.51	FeS ₂
Pyrochroite	-6.45	8.75	15.19	Mn(OH) ₂
Pyrolusite	-8.66	32.72	41.38	MnO ₂
Realgar	-91.34	-111.09	-19.75	AsS
Retgersite	-9.26	-11.30	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	-1.13	-11.71	-10.58	MnCO ₃
Rutherfordine	-4.56	-19.06	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-11.54	-18.64	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-16.72	-13.31	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-28.29	-37.96	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-97.37	-165.13	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-56.32	-74.58	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-56.68	-74.58	-17.90	Sb ₄ O ₆
SbCl ₃	-52.00	-51.43	0.57	SbCl ₃
SbF ₃	-43.05	-53.28	-10.23	SbF ₃
Sbmetal	-42.92	-54.61	-11.69	Sb
SbO ₂	-3.14	-30.97	-27.82	SbO ₂
Schoepite	-4.59	1.40	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-11.53	-18.64	-7.11	Se
Semetal(hex)	-10.93	-18.64	-7.71	Se
Senarmontite	-24.92	-37.29	-12.37	Sb ₂ O ₃
SeO ₂	-15.67	-15.54	0.12	SeO ₂
SeO ₃	-48.92	-27.88	21.04	SeO ₃
Siderite	-2.96	-13.20	-10.24	FeCO ₃
Smithsonite	-3.05	-13.05	-10.00	ZnCO ₃
Sphalerite	-61.34	-72.79	-11.45	ZnS
Spinel	-7.92	28.93	36.85	MgAl ₂ O ₄
Stibnite	-227.43	-277.89	-50.46	Sb ₂ S ₃
Sulfur	-54.08	-56.22	-2.14	S
Tenorite	-0.03	7.61	7.64	CuO
Thenardite	-10.34	-10.02	0.32	Na ₂ SO ₄
Thermonatrite	-13.16	-12.52	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-5.81	-1.73	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-13.20	7.89	21.08	U ₃ O ₈
U ₃ Sb ₄	-554.74	-402.36	152.38	U ₃ Sb ₄
U ₄ O ₉	-26.43	-29.45	-3.02	U ₄ O ₉
UF ₄	-29.99	-59.53	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-26.81	-59.53	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.29	-13.36	0.93	UO ₂
UO ₂ (OH) ₂ (beta)	-4.21	1.40	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-24.22	-26.47	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.30	1.40	7.70	UO ₃
Uraninite	-8.69	-13.36	-4.67	UO ₂
USb ₂	-209.32	-179.74	29.58	USb ₂
V(OH) ₃	-16.80	-9.21	7.59	V(OH) ₃
V ₂ O ₅	-14.30	-15.66	-1.36	V ₂ O ₅
V ₃ O ₅	-34.55	-32.72	1.84	V ₃ O ₅
V ₄ O ₇	-42.82	-35.63	7.19	V ₄ O ₇
V ₆ O ₁₃	-34.06	-94.92	-60.86	V ₆ O ₁₃
Valentinite	-28.81	-37.29	-8.48	Sb ₂ O ₃
VC ₁₂	-61.92	-43.05	18.87	VC ₁₂
VC ₁₃	-65.42	-41.99	23.43	VC ₁₃
VF ₄	-64.02	-49.09	14.93	VF ₄
Vmetal	-89.19	-45.17	44.03	V
VO	-35.95	-21.19	14.76	VO
VO(OH) ₂	-8.06	-2.91	5.15	VO(OH) ₂
VO ₂ Cl	-21.60	-18.76	2.84	VO ₂ Cl
VOC ₁	-31.28	-20.13	11.15	VOC ₁
VOC ₁₂	-37.53	-24.77	12.76	VOC ₁₂
VOSO ₄	-24.48	-20.87	3.61	VOSO ₄
Witherite	-4.32	-12.89	-8.57	BaCO ₃
Wurtzite	-63.84	-72.79	-8.95	ZnS
Zincite	-3.93	7.41	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO ₄

Zn(BO2)2	-12.31	-4.02	8.29	Zn(BO2)2
Zn(OH)2	-4.79	7.41	12.20	Zn(OH)2
Zn(OH)2(am)	-5.07	7.41	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.35	7.41	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.13	7.41	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.33	7.41	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.64	-3.14	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.30	3.89	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.07	-5.42	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.60	-13.69	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-16.72	11.68	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-23.31	15.19	38.50	Zn5(OH)8Cl2
ZnCl2	-21.50	-14.45	7.05	ZnCl2
ZnCO3:1H2O	-2.79	-13.05	-10.26	ZnCO3:1H2O
ZnF2	-15.14	-15.68	-0.53	ZnF2
Znmetal	-42.36	-16.57	25.79	Zn
ZnMoO4	-4.19	-14.32	-10.13	ZnMoO4
ZnO(active)	-3.78	7.41	11.19	ZnO
ZnS(am)	-63.74	-72.79	-9.05	ZnS
ZnSb	-82.19	-71.18	11.01	ZnSb
ZnSe	-20.80	-35.20	-14.40	ZnSe
ZnSeO4:6H2O	-18.95	-20.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 53.

```

      REACTION 301
        H2O      -1
      399.1717 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 301
      SAVE Solution 302
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 301. Solution after simulation 52.
Using reaction 301.

Reaction 301.

3.992e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
----------	----------	-------

Ag	8.354e-08	8.350e-08
Al	4.516e-06	4.513e-06
As	4.063e-08	4.061e-08
B	1.589e-05	1.589e-05
Ba	1.459e-06	1.458e-06
C	1.218e-02	1.217e-02
Ca	5.438e-03	5.435e-03
Cd	1.160e-08	1.159e-08
Cl	1.709e-03	1.708e-03
Co	1.359e-07	1.359e-07
Cr	1.271e-07	1.270e-07
Cu	9.346e-06	9.341e-06
F	4.223e-04	4.221e-04
Fe	2.672e-05	2.671e-05
Hg	2.144e-10	2.143e-10
K	7.060e-04	7.056e-04
Mg	1.722e-03	1.721e-03
Mn	2.354e-05	2.353e-05
Mo	5.462e-07	5.459e-07
Na	4.955e-03	4.952e-03
Ni	2.133e-07	2.131e-07
Pb	2.579e-08	2.578e-08
S	3.550e-03	3.549e-03
Sb	1.304e-08	1.303e-08
Se	4.671e-08	4.669e-08
U	8.264e-08	8.260e-08
V	1.136e-07	1.136e-07
Zn	1.138e-06	1.137e-06

-----Description of solution-----

	pH	=	7.160	Charge balance
	pe	=	5.114	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	2.579e-02	
	Mass of water (kg)	=	9.995e-01	
	Total alkalinity (eq/kg)	=	1.086e-02	
	Total CO2 (mol/kg)	=	1.218e-02	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	8.921e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	15	
	Total H	=	1.109705e+02	
	Total O	=	5.552928e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.707e-07	1.455e-07	-6.768	-6.837	-0.069	(0)
H+	8.062e-08	6.915e-08	-7.094	-7.160	-0.067	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.354e-08					
AgCl	5.343e-08	5.343e-08	-7.272	-7.272	0.000	(0)
Ag+	2.081e-08	1.785e-08	-7.682	-7.748	-0.067	(0)
AgCl2-	8.235e-09	6.819e-09	-8.084	-8.166	-0.082	(0)
AgSO4-	6.002e-10	4.970e-10	-9.222	-9.304	-0.082	(0)
Ag2Se	2.171e-10	2.171e-10	-9.663	-9.663	0.000	(0)
AgCl3-2	1.894e-11	8.907e-12	-10.723	-11.050	-0.328	(0)
AgF	1.428e-11	1.428e-11	-10.845	-10.845	0.000	(0)
AgOH	2.598e-13	2.598e-13	-12.585	-12.585	0.000	(0)
AgCl4-3	1.455e-13	2.665e-14	-12.837	-13.574	-0.737	(0)
AgH2BO3	3.755e-14	3.755e-14	-13.425	-13.425	0.000	(0)
AgSeO3-	2.789e-14	2.309e-14	-13.555	-13.637	-0.082	(0)

	Ag (OH) 2-	4.463e-18	3.696e-18	-17.350	-17.432	-0.082	(0)
	Ag (SeO3) 2-3	2.272e-21	4.161e-22	-20.644	-21.381	-0.737	(0)
	Ag2MoO4	3.565e-23	3.565e-23	-22.448	-22.448	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-68.478	-68.478	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.942	-79.253	-1.310	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-138.840	-138.922	-0.082	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-139.063	-139.246	-0.183	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-141.184	-141.525	-0.341	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-141.511	-141.836	-0.325	(0)
Al		4.516e-06					
	AlF3	2.086e-06	2.086e-06	-5.681	-5.681	0.000	(0)
	Al (OH) 4-	1.344e-06	1.154e-06	-5.872	-5.938	-0.066	(0)
	AlF2+	6.026e-07	5.203e-07	-6.220	-6.284	-0.064	(0)
	AlF4-	3.877e-07	3.329e-07	-6.411	-6.478	-0.066	(0)
	Al (OH) 3	6.297e-08	6.297e-08	-7.201	-7.201	0.000	(0)
	Al (OH) 2+	2.511e-08	2.168e-08	-7.600	-7.664	-0.064	(0)
	AlF+2	7.383e-09	4.104e-09	-8.132	-8.387	-0.255	(0)
	AlOH+2	3.374e-10	1.876e-10	-9.472	-9.727	-0.255	(0)
	AlSO4+	1.626e-11	1.396e-11	-10.789	-10.855	-0.066	(0)
	Al+3	5.126e-12	1.289e-12	-11.290	-11.890	-0.600	(0)
	Al (SO4) 2-	2.430e-13	2.087e-13	-12.614	-12.681	-0.066	(0)
	AlMo6O21-3	5.035e-39	9.223e-40	-38.298	-39.035	-0.737	(0)
As (3)		2.413e-19					
	H3AsO3	2.392e-19	2.392e-19	-18.621	-18.621	0.000	(0)
	H2AsO3-	2.142e-21	1.774e-21	-20.669	-20.751	-0.082	(0)
	HAsO3-2	4.974e-26	2.339e-26	-25.303	-25.631	-0.328	(0)
	H4AsO3+	9.895e-27	8.195e-27	-26.005	-26.086	-0.082	(0)
	AsO3-3	7.119e-32	1.304e-32	-31.148	-31.885	-0.737	(0)
As (5)		4.063e-08					
	HAsO4-2	2.991e-08	1.407e-08	-7.524	-7.852	-0.328	(0)
	H2AsO4-	1.072e-08	8.873e-09	-7.970	-8.052	-0.082	(0)
	AsO4-3	3.512e-12	6.434e-13	-11.454	-12.192	-0.737	(0)
	H3AsO4	1.060e-13	1.066e-13	-12.975	-12.972	0.003	(0)
B		1.589e-05					
	H3BO3	1.571e-05	1.580e-05	-4.804	-4.801	0.003	(0)
	H2BO3-	1.568e-07	1.327e-07	-6.805	-6.877	-0.072	(0)
	CaH2BO3+	2.070e-08	1.752e-08	-7.684	-7.756	-0.072	(0)
	MgH2BO3+	4.155e-09	3.517e-09	-8.381	-8.454	-0.072	(0)
	BF (OH) 3-	2.372e-09	2.008e-09	-8.625	-8.697	-0.072	(0)
	NaH2BO3	8.834e-10	8.834e-10	-9.054	-9.054	0.000	(0)
	BF2 (OH) 2-	5.587e-12	4.729e-12	-11.253	-11.325	-0.072	(0)
	BaH2BO3+	3.629e-12	3.072e-12	-11.440	-11.513	-0.072	(0)
	H5 (BO3) 2-	2.109e-12	1.785e-12	-11.676	-11.748	-0.072	(0)
	AgH2BO3	3.755e-14	3.755e-14	-13.425	-13.425	0.000	(0)
	H8 (BO3) 3-	3.332e-15	2.821e-15	-14.477	-14.550	-0.072	(0)
	BF3OH-	4.789e-17	4.054e-17	-16.320	-16.392	-0.072	(0)
	BF4-	5.191e-21	4.395e-21	-20.285	-20.357	-0.072	(0)
Ba		1.459e-06					
	Ba+2	1.384e-06	7.492e-07	-5.859	-6.125	-0.266	(0)
	BaHCO3+	7.286e-08	6.314e-08	-7.137	-7.200	-0.062	(0)
	BaCO3	2.299e-09	2.299e-09	-8.639	-8.639	0.000	(0)
	BaH2BO3+	3.629e-12	3.072e-12	-11.440	-11.513	-0.072	(0)
	BaOH+	5.525e-13	4.759e-13	-12.258	-12.322	-0.065	(0)
C (4)		1.218e-02					
	HCO3-	1.022e-02	8.825e-03	-1.991	-2.054	-0.064	(0)
	H2CO3	1.373e-03	1.373e-03	-2.862	-2.862	0.000	(0)
	CaHCO3+	4.352e-04	3.771e-04	-3.361	-3.424	-0.062	(0)
	MgHCO3+	8.065e-05	6.902e-05	-4.093	-4.161	-0.068	(0)
	CaCO3	2.176e-05	2.176e-05	-4.662	-4.662	0.000	(0)
	NaHCO3	2.084e-05	2.084e-05	-4.681	-4.681	0.000	(0)
	CO3-2	1.105e-05	5.983e-06	-4.957	-5.223	-0.266	(0)
	CuCO3	8.258e-06	8.258e-06	-5.083	-5.083	0.000	(0)
	MgCO3	3.803e-06	3.803e-06	-5.420	-5.420	0.000	(0)
	MnHCO3+	1.854e-06	1.597e-06	-5.732	-5.797	-0.065	(0)
	NaCO3-	5.419e-07	4.679e-07	-6.266	-6.330	-0.064	(0)
	Cu (CO3) 2-2	2.827e-07	1.330e-07	-6.549	-6.876	-0.328	(0)
	CuHCO3+	1.576e-07	1.305e-07	-6.802	-6.884	-0.082	(0)
	ZnCO3	1.364e-07	1.364e-07	-6.865	-6.865	0.000	(0)

	ZnHCO3+	1.335e-07	1.106e-07	-6.875	-6.956	-0.082	(0)
	NiHCO3+	7.616e-08	6.307e-08	-7.118	-7.200	-0.082	(0)
	BaHCO3+	7.286e-08	6.314e-08	-7.137	-7.200	-0.062	(0)
	UO2 (CO3) 3-4	6.129e-08	2.999e-09	-7.213	-8.523	-1.310	(0)
	FeHCO3+	3.932e-08	3.407e-08	-7.405	-7.468	-0.062	(0)
	CoHCO3+	3.357e-08	2.780e-08	-7.474	-7.556	-0.082	(0)
	UO2 (CO3) 2-2	2.127e-08	1.000e-08	-7.672	-8.000	-0.328	(0)
	PbCO3	1.565e-08	1.565e-08	-7.805	-7.805	0.000	(0)
	NiCO3	1.294e-08	1.294e-08	-7.888	-7.888	0.000	(0)
	PbHCO3+	6.891e-09	5.707e-09	-8.162	-8.244	-0.082	(0)
	CoCO3	4.096e-09	4.096e-09	-8.388	-8.388	0.000	(0)
	BaCO3	2.299e-09	2.299e-09	-8.639	-8.639	0.000	(0)
	CdCO3	6.258e-10	6.258e-10	-9.204	-9.204	0.000	(0)
	Pb (CO3) 2-2	5.742e-10	2.701e-10	-9.241	-9.569	-0.328	(0)
	CdHCO3+	1.113e-10	9.220e-11	-9.953	-10.035	-0.082	(0)
	UO2CO3	8.378e-11	8.378e-11	-10.077	-10.077	0.000	(0)
	Cd (CO3) 2-2	5.901e-12	2.775e-12	-11.229	-11.557	-0.328	(0)
	HgCO3	2.802e-15	2.802e-15	-14.553	-14.553	0.000	(0)
	Hg (CO3) 2-2	1.127e-16	5.301e-17	-15.948	-16.276	-0.328	(0)
	HgHCO3+	4.357e-18	3.608e-18	-17.361	-17.443	-0.082	(0)
Ca	5.438e-03						
	Ca+2	4.239e-03	2.295e-03	-2.373	-2.639	-0.266	(0)
	CaSO4	7.334e-04	7.334e-04	-3.135	-3.135	0.000	(0)
	CaHCO3+	4.352e-04	3.771e-04	-3.361	-3.424	-0.062	(0)
	CaCO3	2.176e-05	2.176e-05	-4.662	-4.662	0.000	(0)
	CaF+	9.259e-06	7.975e-06	-5.033	-5.098	-0.065	(0)
	CaH2BO3+	2.070e-08	1.752e-08	-7.684	-7.756	-0.072	(0)
	CaOH+	7.690e-09	6.663e-09	-8.114	-8.176	-0.062	(0)
Cd	1.160e-08						
	Cd+2	8.476e-09	4.589e-09	-8.072	-8.338	-0.266	(0)
	CdSO4	1.501e-09	1.501e-09	-8.824	-8.824	0.000	(0)
	CdCl+	7.756e-10	6.423e-10	-9.110	-9.192	-0.082	(0)
	CdCO3	6.258e-10	6.258e-10	-9.204	-9.204	0.000	(0)
	CdHCO3+	1.113e-10	9.220e-11	-9.953	-10.035	-0.082	(0)
	Cd (SO4) 2-2	6.006e-11	2.825e-11	-10.221	-10.549	-0.328	(0)
	CdF+	2.797e-11	2.316e-11	-10.553	-10.635	-0.082	(0)
	CdOH+	6.406e-12	5.305e-12	-11.193	-11.275	-0.082	(0)
	Cd (CO3) 2-2	5.901e-12	2.775e-12	-11.229	-11.557	-0.328	(0)
	CdCl2	3.924e-12	3.924e-12	-11.406	-11.406	0.000	(0)
	CdOHC1	3.834e-12	3.834e-12	-11.416	-11.416	0.000	(0)
	CdF2	1.472e-14	1.472e-14	-13.832	-13.832	0.000	(0)
	Cd (OH) 2	4.872e-15	4.872e-15	-14.312	-14.312	0.000	(0)
	CdCl3-	4.382e-15	3.629e-15	-14.358	-14.440	-0.082	(0)
	CdSeO4	7.492e-19	7.492e-19	-18.125	-18.125	0.000	(0)
	Cd2OH+3	6.661e-19	1.220e-19	-18.176	-18.914	-0.737	(0)
	Cd (OH) 3-	5.230e-20	4.332e-20	-19.281	-19.363	-0.082	(0)
	Cd (SeO3) 2-2	3.257e-20	1.532e-20	-19.487	-19.815	-0.328	(0)
	Cd (OH) 4-2	2.194e-27	1.032e-27	-26.659	-26.986	-0.328	(0)
	CdHS+	0.000e+00	0.000e+00	-74.793	-74.875	-0.082	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-142.215	-142.215	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-214.777	-214.859	-0.082	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-286.880	-287.207	-0.328	(0)
Cl	1.709e-03						
	Cl-	1.709e-03	1.466e-03	-2.767	-2.834	-0.067	(0)
	AgCl	5.343e-08	5.343e-08	-7.272	-7.272	0.000	(0)
	MnCl+	1.942e-08	1.673e-08	-7.712	-7.777	-0.065	(0)
	AgCl2-	8.235e-09	6.819e-09	-8.084	-8.166	-0.082	(0)
	ZnCl+	1.704e-09	1.458e-09	-8.768	-8.836	-0.068	(0)
	CuCl	1.631e-09	1.631e-09	-8.788	-8.788	0.000	(0)
	CdCl+	7.756e-10	6.423e-10	-9.110	-9.192	-0.082	(0)
	CuCl+	6.362e-10	5.445e-10	-9.196	-9.264	-0.068	(0)
	CuCl2-	5.836e-10	4.994e-10	-9.234	-9.302	-0.068	(0)
	ZnOHC1	2.779e-10	2.779e-10	-9.556	-9.556	0.000	(0)
	NiCl+	2.625e-10	2.174e-10	-9.581	-9.663	-0.082	(0)
	CoCl+	2.479e-10	2.053e-10	-9.606	-9.688	-0.082	(0)
	PbCl+	5.465e-11	4.526e-11	-10.262	-10.344	-0.082	(0)
	MnCl2	3.463e-11	3.463e-11	-10.461	-10.461	0.000	(0)
	AgCl3-2	1.894e-11	8.907e-12	-10.723	-11.050	-0.328	(0)

CdCl2	3.924e-12	3.924e-12	-11.406	-11.406	0.000	(0)
CdOHCl	3.834e-12	3.834e-12	-11.416	-11.416	0.000	(0)
ZnCl2	3.388e-12	3.388e-12	-11.470	-11.470	0.000	(0)
PbCl2	2.963e-13	2.963e-13	-12.528	-12.528	0.000	(0)
CuCl3-2	2.843e-13	1.565e-13	-12.546	-12.806	-0.259	(0)
CuCl2	2.767e-13	2.767e-13	-12.558	-12.558	0.000	(0)
HgClOH	1.474e-13	1.474e-13	-12.831	-12.831	0.000	(0)
AgCl4-3	1.455e-13	2.665e-14	-12.837	-13.574	-0.737	(0)
HgCl2	8.405e-14	8.405e-14	-13.075	-13.075	0.000	(0)
MnCl3-	1.623e-14	1.398e-14	-13.790	-13.855	-0.065	(0)
CrCl+2	6.475e-15	3.045e-15	-14.189	-14.516	-0.328	(0)
ZnCl3-	4.608e-15	3.944e-15	-14.336	-14.404	-0.068	(0)
CdCl3-	4.382e-15	3.629e-15	-14.358	-14.440	-0.082	(0)
NiCl2	1.604e-15	1.604e-15	-14.795	-14.795	0.000	(0)
HgCl3-	1.487e-15	1.232e-15	-14.828	-14.909	-0.082	(0)
FeCl+2	2.975e-16	1.638e-16	-15.527	-15.786	-0.259	(0)
PbCl3-	2.087e-16	1.729e-16	-15.680	-15.762	-0.082	(0)
HgCl4-2	1.528e-17	7.187e-18	-16.816	-17.143	-0.328	(0)
HgCl+	1.382e-17	1.144e-17	-16.860	-16.941	-0.082	(0)
CrOHCl2	1.235e-17	1.235e-17	-16.908	-16.908	0.000	(0)
UO2Cl+	1.010e-17	8.361e-18	-16.996	-17.078	-0.082	(0)
ZnCl4-2	5.250e-18	2.890e-18	-17.280	-17.539	-0.259	(0)
CuCl3-	4.422e-18	3.784e-18	-17.354	-17.422	-0.068	(0)
FeCl2+	1.245e-18	1.072e-18	-17.905	-17.970	-0.065	(0)
CrCl2+	5.114e-19	4.235e-19	-18.291	-18.373	-0.082	(0)
PbCl4-2	2.462e-19	1.158e-19	-18.609	-18.936	-0.328	(0)
VOCl+	1.234e-19	1.022e-19	-18.909	-18.991	-0.082	(0)
FeCl3	1.571e-22	1.571e-22	-21.804	-21.804	0.000	(0)
CuCl4-2	5.049e-23	2.780e-23	-22.297	-22.556	-0.259	(0)
CrO3Cl-	1.313e-26	1.088e-26	-25.882	-25.964	-0.082	(0)
CoCl+2	1.327e-35	6.243e-36	-34.877	-35.205	-0.328	(0)
UCl+3	0.000e+00	0.000e+00	-44.502	-45.239	-0.737	(0)
Co (2)	1.359e-07					
Co+2	8.610e-08	4.050e-08	-7.065	-7.393	-0.328	(0)
CoHCO3+	3.357e-08	2.780e-08	-7.474	-7.556	-0.082	(0)
CoSO4	1.127e-08	1.127e-08	-7.948	-7.948	0.000	(0)
CoCO3	4.096e-09	4.096e-09	-8.388	-8.388	0.000	(0)
CoF+	4.924e-10	4.078e-10	-9.308	-9.390	-0.082	(0)
CoCl+	2.479e-10	2.053e-10	-9.606	-9.688	-0.082	(0)
CoOH+	1.420e-10	1.176e-10	-9.848	-9.930	-0.082	(0)
Co (OH) 2	1.359e-12	1.359e-12	-11.867	-11.867	0.000	(0)
CoSeO4	1.780e-17	1.780e-17	-16.750	-16.750	0.000	(0)
Co (OH) 3-	4.767e-18	3.948e-18	-17.322	-17.404	-0.082	(0)
Co2OH+3	1.303e-18	2.387e-19	-17.885	-18.622	-0.737	(0)
CoOOH-	1.197e-18	9.909e-19	-17.922	-18.004	-0.082	(0)
Co (OH) 4-2	1.936e-25	9.105e-26	-24.713	-25.041	-0.328	(0)
Co4 (OH) 4+4	7.797e-31	3.815e-32	-30.108	-31.418	-1.310	(0)
Co (3)	3.292e-29					
CoOH+2	3.292e-29	1.548e-29	-28.483	-28.810	-0.328	(0)
Co+3	8.328e-35	2.094e-35	-34.079	-34.679	-0.600	(0)
CoCl+2	1.327e-35	6.243e-36	-34.877	-35.205	-0.328	(0)
Cr (2)	6.280e-24					
Cr+2	6.280e-24	2.954e-24	-23.202	-23.530	-0.328	(0)
Cr (3)	1.271e-07					
Cr (OH) 2+	1.093e-07	9.053e-08	-6.961	-7.043	-0.082	(0)
Cr (OH) +2	1.087e-08	5.112e-09	-7.964	-8.291	-0.328	(0)
Cr (OH) 3	4.950e-09	4.950e-09	-8.305	-8.305	0.000	(0)
CrOHSO4	1.693e-09	1.693e-09	-8.771	-8.771	0.000	(0)
CrF+2	1.723e-10	8.104e-11	-9.764	-10.091	-0.328	(0)
CrO2-	4.107e-11	3.401e-11	-10.387	-10.468	-0.082	(0)
Cr (OH) 4-	3.463e-11	2.868e-11	-10.461	-10.542	-0.082	(0)
Cr+3	8.765e-12	1.606e-12	-11.057	-11.794	-0.737	(0)
CrSO4+	6.317e-12	5.231e-12	-11.200	-11.281	-0.082	(0)
CrCl+2	6.475e-15	3.045e-15	-14.189	-14.516	-0.328	(0)
Cr2 (OH) 2SO4+2	1.663e-15	7.821e-16	-14.779	-15.107	-0.328	(0)
Cr2 (OH) 2 (SO4) 2	6.482e-17	6.482e-17	-16.188	-16.188	0.000	(0)
CrOHCl2	1.235e-17	1.235e-17	-16.908	-16.908	0.000	(0)
CrCl2+	5.114e-19	4.235e-19	-18.291	-18.373	-0.082	(0)

Cr (6)	1.635e-16					
CrO4-2	1.408e-16	7.621e-17	-15.851	-16.118	-0.266	(0)
HCrO4-	2.059e-17	1.705e-17	-16.686	-16.768	-0.082	(0)
NaCrO4-	1.921e-18	1.591e-18	-17.717	-17.798	-0.082	(0)
KCrO4-	2.050e-19	1.698e-19	-18.688	-18.770	-0.082	(0)
CrO3SO4-2	1.066e-24	5.014e-25	-23.972	-24.300	-0.328	(0)
H2CrO4	9.560e-25	9.560e-25	-24.020	-24.020	0.000	(0)
CrO3Cl-	1.313e-26	1.088e-26	-25.882	-25.964	-0.082	(0)
Cr2O7-2	2.145e-32	1.009e-32	-31.669	-31.996	-0.328	(0)
Cu (1)	3.282e-09					
CuCl	1.631e-09	1.631e-09	-8.788	-8.788	0.000	(0)
Cu+	1.067e-09	8.840e-10	-8.972	-9.054	-0.082	(0)
CuCl2-	5.836e-10	4.994e-10	-9.234	-9.302	-0.068	(0)
CuCl3-2	2.843e-13	1.565e-13	-12.546	-12.806	-0.259	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.099	-140.432	-0.333	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.844	-141.162	-0.318	(0)
Cu (2)	9.343e-06					
CuCO3	8.258e-06	8.258e-06	-5.083	-5.083	0.000	(0)
Cu+2	4.330e-07	2.344e-07	-6.364	-6.630	-0.266	(0)
Cu (CO3) 2-2	2.827e-07	1.330e-07	-6.549	-6.876	-0.328	(0)
CuHCO3+	1.576e-07	1.305e-07	-6.802	-6.884	-0.082	(0)
CuOH+	1.261e-07	1.079e-07	-6.899	-6.967	-0.068	(0)
CuSO4	7.492e-08	7.492e-08	-7.125	-7.125	0.000	(0)
CuF+	5.687e-09	4.710e-09	-8.245	-8.327	-0.082	(0)
Cu (OH) 2	3.133e-09	3.133e-09	-8.504	-8.504	0.000	(0)
CuCl+	6.362e-10	5.445e-10	-9.196	-9.264	-0.068	(0)
Cu2 (OH) 2+2	6.216e-10	2.923e-10	-9.207	-9.534	-0.328	(0)
Cu (OH) 3-	1.129e-12	9.352e-13	-11.947	-12.029	-0.082	(0)
CuCl2	2.767e-13	2.767e-13	-12.558	-12.558	0.000	(0)
CuCl3-	4.422e-18	3.784e-18	-17.354	-17.422	-0.068	(0)
Cu (OH) 4-2	2.278e-18	1.071e-18	-17.643	-17.970	-0.328	(0)
CuCl4-2	5.049e-23	2.780e-23	-22.297	-22.556	-0.259	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.282	-204.364	-0.082	(0)
F	4.223e-04					
F-	3.712e-04	3.184e-04	-3.430	-3.497	-0.067	(0)
MgF+	3.180e-05	2.731e-05	-4.498	-4.564	-0.066	(0)
CaF+	9.259e-06	7.975e-06	-5.033	-5.098	-0.065	(0)
AlF3	2.086e-06	2.086e-06	-5.681	-5.681	0.000	(0)
NaF	8.438e-07	8.438e-07	-6.074	-6.074	0.000	(0)
AlF2+	6.026e-07	5.203e-07	-6.220	-6.284	-0.064	(0)
AlF4-	3.877e-07	3.329e-07	-6.411	-6.478	-0.066	(0)
MnF+	1.334e-07	1.149e-07	-6.875	-6.939	-0.065	(0)
HF	3.257e-08	3.257e-08	-7.487	-7.487	0.000	(0)
AlF+2	7.383e-09	4.104e-09	-8.132	-8.387	-0.255	(0)
CuF+	5.687e-09	4.710e-09	-8.245	-8.327	-0.082	(0)
ZnF+	3.040e-09	2.517e-09	-8.517	-8.599	-0.082	(0)
BF (OH) 3-	2.372e-09	2.008e-09	-8.625	-8.697	-0.072	(0)
NiF+	5.599e-10	4.637e-10	-9.252	-9.334	-0.082	(0)
CoF+	4.924e-10	4.078e-10	-9.308	-9.390	-0.082	(0)
CrF+2	1.723e-10	8.104e-11	-9.764	-10.091	-0.328	(0)
HF2-	4.624e-11	3.943e-11	-10.335	-10.404	-0.069	(0)
CdF+	2.797e-11	2.316e-11	-10.553	-10.635	-0.082	(0)
PbF+	2.358e-11	1.953e-11	-10.627	-10.709	-0.082	(0)
AgF	1.428e-11	1.428e-11	-10.845	-10.845	0.000	(0)
FeF2+	1.278e-11	1.101e-11	-10.893	-10.958	-0.065	(0)
BF2 (OH) 2-	5.587e-12	4.729e-12	-11.253	-11.325	-0.072	(0)
FeF3	4.946e-12	4.946e-12	-11.306	-11.306	0.000	(0)
FeF+2	2.347e-12	1.292e-12	-11.630	-11.889	-0.259	(0)
UO2F+	1.867e-13	1.546e-13	-12.729	-12.811	-0.082	(0)
UO2F2	1.420e-13	1.420e-13	-12.848	-12.848	0.000	(0)
PbF2	1.224e-13	1.224e-13	-12.912	-12.912	0.000	(0)
CdF2	1.472e-14	1.472e-14	-13.832	-13.832	0.000	(0)
UO2F3-	1.372e-14	1.136e-14	-13.863	-13.945	-0.082	(0)
VO2F	4.711e-15	4.711e-15	-14.327	-14.327	0.000	(0)
H2F2	2.842e-15	2.842e-15	-14.546	-14.546	0.000	(0)
VO2F2-	6.578e-16	5.447e-16	-15.182	-15.264	-0.082	(0)
PbF3-	8.926e-17	7.392e-17	-16.049	-16.131	-0.082	(0)
UO2F4-2	6.109e-17	2.873e-17	-16.214	-16.542	-0.328	(0)

VOF+	5.733e-17	4.748e-17	-16.242	-16.324	-0.082	(0)
BF3OH-	4.789e-17	4.054e-17	-16.320	-16.392	-0.072	(0)
VOF2	5.669e-18	5.669e-18	-17.246	-17.246	0.000	(0)
VO2F3-2	4.601e-18	2.164e-18	-17.337	-17.665	-0.328	(0)
VOF3-	7.735e-20	6.405e-20	-19.112	-19.193	-0.082	(0)
PbF4-2	2.395e-20	1.127e-20	-19.621	-19.948	-0.328	(0)
BF4-	5.191e-21	4.395e-21	-20.285	-20.357	-0.072	(0)
VO2F4-3	1.851e-21	3.390e-22	-20.733	-21.470	-0.737	(0)
VOF4-2	1.751e-22	8.233e-23	-21.757	-22.084	-0.328	(0)
Sb(OH) 2F	1.738e-23	1.738e-23	-22.760	-22.760	0.000	(0)
SbOF	1.710e-23	1.710e-23	-22.767	-22.767	0.000	(0)
HgF+	5.578e-24	4.619e-24	-23.254	-23.335	-0.082	(0)
UF3+	1.219e-33	1.009e-33	-32.914	-32.996	-0.082	(0)
UF2+2	4.252e-35	2.000e-35	-34.371	-34.699	-0.328	(0)
UF4	3.524e-35	3.524e-35	-34.453	-34.453	0.000	(0)
UF5-	5.370e-37	4.447e-37	-36.270	-36.352	-0.082	(0)
UF6-2	9.093e-38	4.277e-38	-37.041	-37.369	-0.328	(0)
UF+3	2.723e-38	4.988e-39	-37.565	-38.302	-0.737	(0)
Fe (2)	7.985e-07					
Fe+2	6.521e-07	3.067e-07	-6.186	-6.513	-0.328	(0)
FeSO4	1.050e-07	1.050e-07	-6.979	-6.979	0.000	(0)
FeHCO3+	3.932e-08	3.407e-08	-7.405	-7.468	-0.062	(0)
FeOH+	2.063e-09	1.777e-09	-8.686	-8.750	-0.065	(0)
Fe (OH) 2	2.054e-13	2.054e-13	-12.687	-12.687	0.000	(0)
Fe (OH) 3-	1.098e-14	9.454e-15	-13.960	-14.024	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.652	-146.652	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.077	-219.159	-0.082	(0)
Fe (3)	2.592e-05					
Fe (OH) 2+	2.280e-05	1.969e-05	-4.642	-4.706	-0.064	(0)
Fe (OH) 3	3.077e-06	3.077e-06	-5.512	-5.512	0.000	(0)
Fe (OH) 4-	4.829e-08	4.170e-08	-7.316	-7.380	-0.064	(0)
FeOH+2	6.315e-10	3.477e-10	-9.200	-9.459	-0.259	(0)
FeF2+	1.278e-11	1.101e-11	-10.893	-10.958	-0.065	(0)
FeF3	4.946e-12	4.946e-12	-11.306	-11.306	0.000	(0)
FeF+2	2.347e-12	1.292e-12	-11.630	-11.889	-0.259	(0)
FeSO4+	6.724e-14	5.792e-14	-13.172	-13.237	-0.065	(0)
Fe+3	1.472e-14	3.700e-15	-13.832	-14.432	-0.600	(0)
Fe (SO4) 2-	2.086e-15	1.728e-15	-14.681	-14.763	-0.082	(0)
FeCl+2	2.975e-16	1.638e-16	-15.527	-15.786	-0.259	(0)
Fe2 (OH) 2+4	8.180e-17	4.002e-18	-16.087	-17.398	-1.310	(0)
FeCl2+	1.245e-18	1.072e-18	-17.905	-17.970	-0.065	(0)
FeHSeO3+2	7.267e-19	3.418e-19	-18.139	-18.466	-0.328	(0)
Fe3 (OH) 4+5	1.271e-19	1.139e-21	-18.896	-20.944	-2.048	(0)
FeCl3	1.571e-22	1.571e-22	-21.804	-21.804	0.000	(0)
H (0)	3.991e-28					
H2	1.995e-28	2.007e-28	-27.700	-27.697	0.003	(0)
Hg (0)	2.142e-10					
Hg	2.142e-10	2.142e-10	-9.669	-9.669	0.000	(0)
Hg (1)	2.419e-22					
Hg2+2	1.210e-22	5.689e-23	-21.917	-22.245	-0.328	(0)
Hg (2)	2.879e-13					
HgClOH	1.474e-13	1.474e-13	-12.831	-12.831	0.000	(0)
HgCl2	8.405e-14	8.405e-14	-13.075	-13.075	0.000	(0)
Hg (OH) 2	5.199e-14	5.230e-14	-13.284	-13.282	0.003	(0)
HgCO3	2.802e-15	2.802e-15	-14.553	-14.553	0.000	(0)
HgCl3-	1.487e-15	1.232e-15	-14.828	-14.909	-0.082	(0)
Hg (CO3) 2-2	1.127e-16	5.301e-17	-15.948	-16.276	-0.328	(0)
HgCl4-2	1.528e-17	7.187e-18	-16.816	-17.143	-0.328	(0)
HgCl+	1.382e-17	1.144e-17	-16.860	-16.941	-0.082	(0)
HgHCO3+	4.357e-18	3.608e-18	-17.361	-17.443	-0.082	(0)
HgOH+	2.738e-18	2.267e-18	-17.563	-17.644	-0.082	(0)
Hg (OH) 3-	1.157e-21	9.582e-22	-20.937	-21.019	-0.082	(0)
Hg+2	8.320e-22	3.913e-22	-21.080	-21.407	-0.328	(0)
HgSO4	1.429e-22	1.429e-22	-21.845	-21.845	0.000	(0)
HgF+	5.578e-24	4.619e-24	-23.254	-23.335	-0.082	(0)
HgHS2-	0.000e+00	0.000e+00	-131.326	-131.408	-0.082	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.174	-132.174	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.628	-132.956	-0.328	(0)

K	7.060e-04					
K+	6.991e-04	5.997e-04	-3.155	-3.222	-0.067	(0)
KSO4-	6.860e-06	5.923e-06	-5.164	-5.227	-0.064	(0)
KCrO4-	2.050e-19	1.698e-19	-18.688	-18.770	-0.082	(0)
Mg	1.722e-03					
Mg+2	1.412e-03	7.643e-04	-2.850	-3.117	-0.266	(0)
MgSO4	1.940e-04	1.940e-04	-3.712	-3.712	0.000	(0)
MgHCO3+	8.065e-05	6.902e-05	-4.093	-4.161	-0.068	(0)
MgF+	3.180e-05	2.731e-05	-4.498	-4.564	-0.066	(0)
MgCO3	3.803e-06	3.803e-06	-5.420	-5.420	0.000	(0)
MgOH+	5.096e-08	4.428e-08	-7.293	-7.354	-0.061	(0)
MgH2BO3+	4.155e-09	3.517e-09	-8.381	-8.454	-0.072	(0)
Mn (2)	2.354e-05					
Mn+2	1.928e-05	9.067e-06	-4.715	-5.043	-0.328	(0)
MnSO4	2.250e-06	2.250e-06	-5.648	-5.648	0.000	(0)
MnHCO3+	1.854e-06	1.597e-06	-5.732	-5.797	-0.065	(0)
MnF+	1.334e-07	1.149e-07	-6.875	-6.939	-0.065	(0)
MnCl+	1.942e-08	1.673e-08	-7.712	-7.777	-0.065	(0)
MnOH+	3.848e-09	3.315e-09	-8.415	-8.480	-0.065	(0)
MnCl2	3.463e-11	3.463e-11	-10.461	-10.461	0.000	(0)
MnCl3-	1.623e-14	1.398e-14	-13.790	-13.855	-0.065	(0)
MnSeO4	2.140e-15	2.140e-15	-14.670	-14.670	0.000	(0)
Mn (OH) 3-	5.037e-19	4.339e-19	-18.298	-18.363	-0.065	(0)
Mn (OH) 4-2	3.703e-25	2.039e-25	-24.431	-24.691	-0.259	(0)
MnSe	3.124e-40	3.124e-40	-39.505	-39.505	0.000	(0)
Mn (3)	2.092e-25					
Mn+3	2.092e-25	5.260e-26	-24.679	-25.279	-0.600	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.471	-45.730	-0.259	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.918	-49.988	-0.071	(0)
Mo	5.462e-07					
MoO4-2	5.457e-07	2.954e-07	-6.263	-6.530	-0.266	(0)
HMoO4-	4.909e-10	4.065e-10	-9.309	-9.391	-0.082	(0)
H2MoO4	2.059e-13	2.059e-13	-12.686	-12.686	0.000	(0)
Ag2MoO4	3.565e-23	3.565e-23	-22.448	-22.448	0.000	(0)
AlMo6O21-3	5.035e-39	9.223e-40	-38.298	-39.035	-0.737	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.049	-49.998	-2.948	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.723	-50.771	-2.048	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.839	-53.149	-1.310	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.326	-57.063	-0.737	(0)
Na	4.955e-03					
Na+	4.896e-03	4.200e-03	-2.310	-2.377	-0.067	(0)
NaSO4-	3.644e-05	3.147e-05	-4.438	-4.502	-0.064	(0)
NaHCO3	2.084e-05	2.084e-05	-4.681	-4.681	0.000	(0)
NaF	8.438e-07	8.438e-07	-6.074	-6.074	0.000	(0)
NaCO3-	5.419e-07	4.679e-07	-6.266	-6.330	-0.064	(0)
NaH2BO3	8.834e-10	8.834e-10	-9.054	-9.054	0.000	(0)
NaCrO4-	1.921e-18	1.591e-18	-17.717	-17.798	-0.082	(0)
Ni	2.133e-07					
Ni+2	1.071e-07	5.797e-08	-6.970	-7.237	-0.266	(0)
NiHCO3+	7.616e-08	6.307e-08	-7.118	-7.200	-0.082	(0)
NiSO4	1.614e-08	1.614e-08	-7.792	-7.792	0.000	(0)
NiCO3	1.294e-08	1.294e-08	-7.888	-7.888	0.000	(0)
NiF+	5.599e-10	4.637e-10	-9.252	-9.334	-0.082	(0)
NiCl+	2.625e-10	2.174e-10	-9.581	-9.663	-0.082	(0)
NiOH+	1.283e-10	1.062e-10	-9.892	-9.974	-0.082	(0)
Ni (SO4) 2-2	1.585e-12	7.455e-13	-11.800	-12.128	-0.328	(0)
Ni (OH) 2	1.228e-12	1.228e-12	-11.911	-11.911	0.000	(0)
NiCl2	1.604e-15	1.604e-15	-14.795	-14.795	0.000	(0)
Ni (OH) 3-	2.158e-16	1.787e-16	-15.666	-15.748	-0.082	(0)
NiSeO4	2.377e-17	2.377e-17	-16.624	-16.624	0.000	(0)
O (0)	2.499e-37					
O2	1.249e-37	1.257e-37	-36.903	-36.901	0.003	(0)
Pb	2.579e-08					
PbCO3	1.565e-08	1.565e-08	-7.805	-7.805	0.000	(0)
PbHCO3+	6.891e-09	5.707e-09	-8.162	-8.244	-0.082	(0)
Pb+2	1.608e-09	8.703e-10	-8.794	-9.060	-0.266	(0)

PbSO4	5.947e-10	5.947e-10	-9.226	-9.226	0.000	(0)
Pb (CO3) 2-2	5.742e-10	2.701e-10	-9.241	-9.569	-0.328	(0)
PbOH+	3.842e-10	3.182e-10	-9.415	-9.497	-0.082	(0)
PbCl+	5.465e-11	4.526e-11	-10.262	-10.344	-0.082	(0)
PbF+	2.358e-11	1.953e-11	-10.627	-10.709	-0.082	(0)
Pb (SO4) 2-2	1.063e-11	5.000e-12	-10.973	-11.301	-0.328	(0)
Pb (OH) 2	1.464e-12	1.464e-12	-11.834	-11.834	0.000	(0)
PbCl2	2.963e-13	2.963e-13	-12.528	-12.528	0.000	(0)
PbF2	1.224e-13	1.224e-13	-12.912	-12.912	0.000	(0)
Pb (OH) 3-	2.573e-16	2.131e-16	-15.590	-15.671	-0.082	(0)
PbCl3-	2.087e-16	1.729e-16	-15.680	-15.762	-0.082	(0)
PbF3-	8.926e-17	7.392e-17	-16.049	-16.131	-0.082	(0)
Pb2OH+3	2.396e-17	4.388e-18	-16.621	-17.358	-0.737	(0)
PbCl4-2	2.462e-19	1.158e-19	-18.609	-18.936	-0.328	(0)
PbF4-2	2.395e-20	1.127e-20	-19.621	-19.948	-0.328	(0)
Pb (OH) 4-2	1.615e-20	7.596e-21	-19.792	-20.119	-0.328	(0)
Pb3 (OH) 4+2	7.916e-23	3.723e-23	-22.102	-22.429	-0.328	(0)
Pb4 (OH) 4+4	5.260e-27	2.574e-28	-26.279	-27.589	-1.310	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.879	-142.879	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.041	-216.123	-0.082	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-68.478	-68.478	0.000	(0)
HS-	0.000e+00	0.000e+00	-74.462	-74.544	-0.082	(0)
H2S	0.000e+00	0.000e+00	-74.684	-74.684	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.793	-74.875	-0.082	(0)
S5-2	0.000e+00	0.000e+00	-76.422	-76.749	-0.328	(0)
S6-2	0.000e+00	0.000e+00	-76.937	-77.265	-0.328	(0)
S4-2	0.000e+00	0.000e+00	-77.017	-77.345	-0.328	(0)
S3-2	0.000e+00	0.000e+00	-77.823	-78.151	-0.328	(0)
S2-2	0.000e+00	0.000e+00	-78.839	-79.167	-0.328	(0)
S-2	0.000e+00	0.000e+00	-84.425	-84.684	-0.259	(0)
HgHS2-	0.000e+00	0.000e+00	-131.326	-131.408	-0.082	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.174	-132.174	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.628	-132.956	-0.328	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.840	-138.922	-0.082	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.063	-139.246	-0.183	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.099	-140.432	-0.333	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.844	-141.162	-0.318	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.184	-141.525	-0.341	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.439	-141.520	-0.082	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.511	-141.836	-0.325	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.215	-142.215	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.671	-142.671	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.879	-142.879	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.652	-146.652	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.282	-204.364	-0.082	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.853	-213.935	-0.082	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.777	-214.859	-0.082	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.041	-216.123	-0.082	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.427	-216.755	-0.328	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.077	-219.159	-0.082	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.880	-287.207	-0.328	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.612	-289.939	-0.328	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.373	-299.701	-0.328	(0)
S (6)	3.550e-03					
SO4-2	2.577e-03	1.395e-03	-2.589	-2.855	-0.266	(0)
CaSO4	7.334e-04	7.334e-04	-3.135	-3.135	0.000	(0)
MgSO4	1.940e-04	1.940e-04	-3.712	-3.712	0.000	(0)
NaSO4-	3.644e-05	3.147e-05	-4.438	-4.502	-0.064	(0)
KSO4-	6.860e-06	5.923e-06	-5.164	-5.227	-0.064	(0)
MnSO4	2.250e-06	2.250e-06	-5.648	-5.648	0.000	(0)
ZnSO4	1.209e-07	1.209e-07	-6.917	-6.917	0.000	(0)
FeSO4	1.050e-07	1.050e-07	-6.979	-6.979	0.000	(0)
CuSO4	7.492e-08	7.492e-08	-7.125	-7.125	0.000	(0)
NiSO4	1.614e-08	1.614e-08	-7.792	-7.792	0.000	(0)
CoSO4	1.127e-08	1.127e-08	-7.948	-7.948	0.000	(0)
HSO4-	1.098e-08	9.429e-09	-7.959	-8.026	-0.066	(0)
Zn (SO4) 2-2	3.124e-09	1.469e-09	-8.505	-8.833	-0.328	(0)

CrOHSO4	1.693e-09	1.693e-09	-8.771	-8.771	0.000	(0)
CdSO4	1.501e-09	1.501e-09	-8.824	-8.824	0.000	(0)
AgSO4-	6.002e-10	4.970e-10	-9.222	-9.304	-0.082	(0)
PbSO4	5.947e-10	5.947e-10	-9.226	-9.226	0.000	(0)
Cd(SO4) 2-2	6.006e-11	2.825e-11	-10.221	-10.549	-0.328	(0)
AlSO4+	1.626e-11	1.396e-11	-10.789	-10.855	-0.066	(0)
Pb(SO4) 2-2	1.063e-11	5.000e-12	-10.973	-11.301	-0.328	(0)
CrSO4+	6.317e-12	5.231e-12	-11.200	-11.281	-0.082	(0)
Ni(SO4) 2-2	1.585e-12	7.455e-13	-11.800	-12.128	-0.328	(0)
Al(SO4) 2-	2.430e-13	2.087e-13	-12.614	-12.681	-0.066	(0)
FeSO4+	6.724e-14	5.792e-14	-13.172	-13.237	-0.065	(0)
UO2SO4	7.428e-15	7.428e-15	-14.129	-14.129	0.000	(0)
Fe(SO4) 2-	2.086e-15	1.728e-15	-14.681	-14.763	-0.082	(0)
Cr2(OH) 2SO4+2	1.663e-15	7.821e-16	-14.779	-15.107	-0.328	(0)
VO2SO4-	3.394e-16	2.810e-16	-15.469	-15.551	-0.082	(0)
UO2(SO4) 2-2	2.905e-16	1.366e-16	-15.537	-15.864	-0.328	(0)
Cr2(OH) 2(SO4) 2	6.482e-17	6.482e-17	-16.188	-16.188	0.000	(0)
VOSO4	9.552e-18	9.552e-18	-17.020	-17.020	0.000	(0)
HgSO4	1.429e-22	1.429e-22	-21.845	-21.845	0.000	(0)
CrO3SO4-2	1.066e-24	5.014e-25	-23.972	-24.300	-0.328	(0)
VSO4+	3.617e-31	2.995e-31	-30.442	-30.524	-0.082	(0)
U(SO4) 2	4.833e-40	4.833e-40	-39.316	-39.316	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.033	-40.360	-0.328	(0)
Sb(3)	9.982e-19					
Sb(OH) 3	5.050e-19	5.050e-19	-18.297	-18.297	0.000	(0)
HSbO2	4.932e-19	4.932e-19	-18.307	-18.307	0.000	(0)
Sb(OH) 2F	1.738e-23	1.738e-23	-22.760	-22.760	0.000	(0)
SbOF	1.710e-23	1.710e-23	-22.767	-22.767	0.000	(0)
SbO2-	1.395e-23	1.155e-23	-22.856	-22.937	-0.082	(0)
Sb(OH) 4-	7.985e-24	6.612e-24	-23.098	-23.180	-0.082	(0)
Sb(OH) 2+	1.024e-24	8.484e-25	-23.989	-24.071	-0.082	(0)
SbO+	3.534e-25	2.926e-25	-24.452	-24.534	-0.082	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.373	-299.701	-0.328	(0)
Sb(5)	1.304e-08					
SbO3-	1.302e-08	1.078e-08	-7.885	-7.967	-0.082	(0)
Sb(OH) 6-	1.468e-11	1.260e-11	-10.833	-10.900	-0.067	(0)
SbO2+	1.787e-23	1.480e-23	-22.748	-22.830	-0.082	(0)
Se(-2)	2.171e-10					
Ag2Se	2.171e-10	2.171e-10	-9.663	-9.663	0.000	(0)
HSe-	6.981e-37	5.781e-37	-36.156	-36.238	-0.082	(0)
MnSe	3.124e-40	3.124e-40	-39.505	-39.505	0.000	(0)
H2Se	3.103e-40	3.103e-40	-39.508	-39.508	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.750	-44.078	-0.328	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.942	-79.253	-1.310	(0)
Se(4)	4.649e-08					
HSeO3-	4.221e-08	3.496e-08	-7.375	-7.456	-0.082	(0)
SeO3-2	4.279e-09	2.012e-09	-8.369	-8.696	-0.328	(0)
H2SeO3	1.031e-12	1.031e-12	-11.987	-11.987	0.000	(0)
AgSeO3-	2.789e-14	2.309e-14	-13.555	-13.637	-0.082	(0)
FeHSeO3+2	7.267e-19	3.418e-19	-18.139	-18.466	-0.328	(0)
Cd(SeO3) 2-2	3.257e-20	1.532e-20	-19.487	-19.815	-0.328	(0)
Ag(SeO3) 2-3	2.272e-21	4.161e-22	-20.644	-21.381	-0.737	(0)
Se(6)	1.622e-12					
SeO4-2	1.620e-12	8.768e-13	-11.791	-12.057	-0.266	(0)
MnSeO4	2.140e-15	2.140e-15	-14.670	-14.670	0.000	(0)
ZnSeO4	5.380e-17	5.380e-17	-16.269	-16.269	0.000	(0)
NiSeO4	2.377e-17	2.377e-17	-16.624	-16.624	0.000	(0)
CoSeO4	1.780e-17	1.780e-17	-16.750	-16.750	0.000	(0)
HSeO4-	3.670e-18	3.039e-18	-17.435	-17.517	-0.082	(0)
CdSeO4	7.492e-19	7.492e-19	-18.125	-18.125	0.000	(0)
Zn(SeO4) 2-2	1.017e-28	4.783e-29	-27.993	-28.320	-0.328	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.277	-58.015	-0.737	(0)
U(4)	4.547e-22					
U(OH) 5-	4.536e-22	3.757e-22	-21.343	-21.425	-0.082	(0)
U(OH) 4	1.088e-24	1.088e-24	-23.963	-23.963	0.000	(0)
U(OH) 3+	3.325e-28	2.753e-28	-27.478	-27.560	-0.082	(0)
U(OH) 2+2	1.873e-32	8.808e-33	-31.728	-32.055	-0.328	(0)

UF3+	1.219e-33	1.009e-33	-32.914	-32.996	-0.082	(0)
UF2+2	4.252e-35	2.000e-35	-34.371	-34.699	-0.328	(0)
UF4	3.524e-35	3.524e-35	-34.453	-34.453	0.000	(0)
UF5-	5.370e-37	4.447e-37	-36.270	-36.352	-0.082	(0)
UOH+3	1.567e-37	2.870e-38	-36.805	-37.542	-0.737	(0)
UF6-2	9.093e-38	4.277e-38	-37.041	-37.369	-0.328	(0)
UF+3	2.723e-38	4.988e-39	-37.565	-38.302	-0.737	(0)
U(SO4) 2	4.833e-40	4.833e-40	-39.316	-39.316	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.033	-40.360	-0.328	(0)
U+4	0.000e+00	0.000e+00	-42.795	-44.105	-1.310	(0)
UC1+3	0.000e+00	0.000e+00	-44.502	-45.239	-0.737	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-167.752	-174.386	-6.634	(0)
U(5)	1.994e-17					
UO2+	1.994e-17	1.651e-17	-16.700	-16.782	-0.082	(0)
U(6)	8.264e-08					
UO2(CO3) 3-4	6.129e-08	2.999e-09	-7.213	-8.523	-1.310	(0)
UO2(CO3) 2-2	2.127e-08	1.000e-08	-7.672	-8.000	-0.328	(0)
UO2CO3	8.378e-11	8.378e-11	-10.077	-10.077	0.000	(0)
UO2F+	1.867e-13	1.546e-13	-12.729	-12.811	-0.082	(0)
UO2F2	1.420e-13	1.420e-13	-12.848	-12.848	0.000	(0)
UO2OH+	7.783e-14	6.445e-14	-13.109	-13.191	-0.082	(0)
UO2F3-	1.372e-14	1.136e-14	-13.863	-13.945	-0.082	(0)
UO2SO4	7.428e-15	7.428e-15	-14.129	-14.129	0.000	(0)
UO2+2	6.498e-15	3.518e-15	-14.187	-14.454	-0.266	(0)
UO2(SO4) 2-2	2.905e-16	1.366e-16	-15.537	-15.864	-0.328	(0)
UO2F4-2	6.109e-17	2.873e-17	-16.214	-16.542	-0.328	(0)
UO2Cl+	1.010e-17	8.361e-18	-16.996	-17.078	-0.082	(0)
(UO2) 2(OH) 2+2	1.466e-20	6.894e-21	-19.834	-20.162	-0.328	(0)
(UO2) 3(OH) 5+	8.621e-24	7.139e-24	-23.064	-23.146	-0.082	(0)
V(2)	1.340e-39					
VOH+	9.753e-40	8.077e-40	-39.011	-39.093	-0.082	(0)
V+2	3.647e-40	1.715e-40	-39.438	-39.766	-0.328	(0)
V(3)	1.131e-12					
V(OH) 3	1.131e-12	1.131e-12	-11.947	-11.947	0.000	(0)
V(OH) 2+	6.104e-23	5.055e-23	-22.214	-22.296	-0.082	(0)
VOH+2	7.053e-26	3.317e-26	-25.152	-25.479	-0.328	(0)
V+3	2.483e-30	4.548e-31	-29.605	-30.342	-0.737	(0)
VSO4+	3.617e-31	2.995e-31	-30.442	-30.524	-0.082	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-48.586	-49.324	-0.737	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-48.848	-50.158	-1.310	(0)
V(4)	9.968e-16					
V(OH) 3+	8.712e-16	7.215e-16	-15.060	-15.142	-0.082	(0)
VOF+	5.733e-17	4.748e-17	-16.242	-16.324	-0.082	(0)
VO+2	5.285e-17	2.486e-17	-16.277	-16.605	-0.328	(0)
VOSO4	9.552e-18	9.552e-18	-17.020	-17.020	0.000	(0)
VOF2	5.669e-18	5.669e-18	-17.246	-17.246	0.000	(0)
VOC1+	1.234e-19	1.022e-19	-18.909	-18.991	-0.082	(0)
VOF3-	7.735e-20	6.405e-20	-19.112	-19.193	-0.082	(0)
VOF4-2	1.751e-22	8.233e-23	-21.757	-22.084	-0.328	(0)
H2V2O4+2	5.552e-26	2.611e-26	-25.256	-25.583	-0.328	(0)
V(5)	1.136e-07					
H2VO4-	1.067e-07	8.832e-08	-6.972	-7.054	-0.082	(0)
HVO4-2	6.821e-09	3.208e-09	-8.166	-8.494	-0.328	(0)
H3VO4	6.108e-11	6.108e-11	-10.214	-10.214	0.000	(0)
H3V2O7-	4.208e-11	3.485e-11	-10.376	-10.458	-0.082	(0)
HV2O7-3	5.244e-13	9.606e-14	-12.280	-13.017	-0.737	(0)
VO2+	9.834e-15	8.436e-15	-14.007	-14.074	-0.067	(0)
VO2F	4.711e-15	4.711e-15	-14.327	-14.327	0.000	(0)
V3O9-3	3.944e-15	7.226e-16	-14.404	-15.141	-0.737	(0)
VO4-3	1.269e-15	2.325e-16	-14.896	-15.634	-0.737	(0)
V2O7-4	7.641e-16	3.739e-17	-15.117	-16.427	-1.310	(0)
VO2F2-	6.578e-16	5.447e-16	-15.182	-15.264	-0.082	(0)
VO2SO4-	3.394e-16	2.810e-16	-15.469	-15.551	-0.082	(0)
VO2F3-2	4.601e-18	2.164e-18	-17.337	-17.665	-0.328	(0)
V4O12-4	5.440e-19	2.662e-20	-18.264	-19.575	-1.310	(0)
VO2F4-3	1.851e-21	3.390e-22	-20.733	-21.470	-0.737	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.198	-49.245	-2.048	(0)
V10O28-6	0.000e+00	0.000e+00	-47.323	-50.272	-2.948	(0)

H2V10O28-4	0.000e+00	0.000e+00	-49.887	-51.198	-1.310	(0)
Zn	1.138e-06					
Zn+2	7.318e-07	3.962e-07	-6.136	-6.402	-0.266	(0)
ZnCO3	1.364e-07	1.364e-07	-6.865	-6.865	0.000	(0)
ZnHCO3+	1.335e-07	1.106e-07	-6.875	-6.956	-0.082	(0)
ZnSO4	1.209e-07	1.209e-07	-6.917	-6.917	0.000	(0)
ZnOH+	6.962e-09	5.766e-09	-8.157	-8.239	-0.082	(0)
Zn (SO4) 2-2	3.124e-09	1.469e-09	-8.505	-8.833	-0.328	(0)
ZnF+	3.040e-09	2.517e-09	-8.517	-8.599	-0.082	(0)
ZnCl+	1.704e-09	1.458e-09	-8.768	-8.836	-0.068	(0)
ZnOHCl	2.779e-10	2.779e-10	-9.556	-9.556	0.000	(0)
Zn (OH) 2	1.330e-10	1.330e-10	-9.876	-9.876	0.000	(0)
ZnCl2	3.388e-12	3.388e-12	-11.470	-11.470	0.000	(0)
Zn (OH) 3-	1.171e-13	9.701e-14	-12.931	-13.013	-0.082	(0)
ZnCl3-	4.608e-15	3.944e-15	-14.336	-14.404	-0.068	(0)
ZnSeO4	5.380e-17	5.380e-17	-16.269	-16.269	0.000	(0)
ZnCl4-2	5.250e-18	2.890e-18	-17.280	-17.539	-0.259	(0)
Zn (OH) 4-2	1.195e-18	5.620e-19	-17.923	-18.250	-0.328	(0)
Zn (SeO4) 2-2	1.017e-28	4.783e-29	-27.993	-28.320	-0.328	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.439	-141.520	-0.082	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.671	-142.671	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.853	-213.935	-0.082	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.427	-216.755	-0.328	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.612	-289.939	-0.328	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.66	-82.88	-36.22	Ag2S
Ag2CO3	-9.63	-20.72	-11.09	Ag2CO3
Ag2CrO4	-20.02	-31.61	-11.59	Ag2CrO4
Ag2HVO4	-9.57	-8.09	1.48	Ag2HVO4
Ag2MoO4	-10.48	-22.03	-11.55	Ag2MoO4
Ag2O	-13.75	-1.18	12.57	Ag2O
Ag2Se	4.13	-44.57	-48.70	Ag2Se
Ag2SeO3	-8.64	-15.79	-7.15	Ag2SeO3
Ag2SeO4	-18.64	-27.55	-8.91	Ag2SeO4
Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.54	-20.39	2.16	Ag3AsO3
Ag3AsO4	-11.95	-14.74	-2.79	Ag3AsO4
Ag3H2VO5	-13.86	-8.68	5.18	Ag3H2VO5
AgF:4H2O	-12.30	-11.25	1.05	AgF:4H2O
Agmetal	0.64	-12.86	-13.51	Ag
AgVO3	-8.27	-7.50	0.77	AgVO3
Al (OH) 3 (am)	-1.21	9.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.74	-43.37	2.37	Al2 (MoO4) 3
Al2O3	-0.47	19.18	19.65	Al2O3
Al4 (OH) 10SO4	-1.51	21.19	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-8.18	-3.38	4.80	AlAsO4:2H2O
AlOHSO4	-4.36	-7.59	-3.23	AlOHSO4
AlSb	-147.97	-82.35	65.62	AlSb
Alunite	-0.24	-1.64	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.13	-11.92	-7.79	PbSO4
Anhydrite	-1.13	-5.49	-4.36	CaSO4
Anilite	-50.74	-82.62	-31.88	Cu0.25Cu1.5S
Antlerite	-2.89	5.89	8.79	Cu3 (OH) 4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-71.72	-74.48	-2.76	As4O6
Artinite	-6.74	2.86	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-32.65	-25.94	6.71	As2O5
Atacamite	-2.01	5.39	7.39	Cu2 (OH) 3Cl
Azurite	0.89	-16.02	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.20	8.19	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-13.31	2.56	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.55	-1.36	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-22.18	10.76	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.57	-22.24	-9.67	BaCrO4

BaF2	-7.30	-13.12	-5.82	BaF2
BaMoO4	-5.69	-12.65	-6.96	BaMoO4
Barite	1.00	-8.98	-9.98	BaSO4
BaS	-89.69	-73.51	16.18	BaS
BaSeO3	-8.25	-6.42	1.83	BaSeO3
BaSeO4	-10.72	-18.18	-7.46	BaSeO4
Bianchite	-7.49	-9.26	-1.76	ZnSO4:6H2O
Birnessite	-9.62	8.47	18.09	MnO2
Bixbyite	-6.95	-7.60	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-51.33	-78.60	-27.28	Cu0.6Cu0.8S
Boehmite	1.01	9.59	8.58	AlOOH
Breithauptite	-54.06	-72.58	-18.52	NiSb
Brochantite	-1.64	13.58	15.22	Cu4(OH)6SO4
Brucite	-5.64	11.20	16.84	Mg(OH)2
Bunsenite	-5.36	7.08	12.45	NiO
Ca(VO3)2	-7.81	-2.15	5.66	Ca(VO3)2
Ca2V2O7	-7.97	9.53	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.02	9.53	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.20	9.10	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.74	21.22	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.65	21.21	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-291.81	-148.83	142.97	Ca3Sb2
CaCrO4	-16.49	-18.76	-2.27	CaCrO4
Calcite	0.62	-7.86	-8.48	CaCO3
Calomel	-10.00	-27.91	-17.91	Hg2Cl2
CaMoO4	-1.22	-9.17	-7.95	CaMoO4
Carnotite	-3.34	-3.11	0.23	KUO2VO4
CaSeO3:2H2O	-5.75	-2.94	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.68	-14.70	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.46	-3.62	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.98	13.64	Cd(OH)2
Cd(OH)2(am)	-7.75	5.98	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.12	-16.41	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.79	0.77	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.65	6.75	28.40	Cd4(OH)6SO4
CdCl2	-13.35	-14.01	-0.66	CdCl2
CdCl2:1H2O	-12.31	-14.01	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.09	-14.01	-1.91	CdCl2:2.5H2O
CdF2	-14.12	-15.33	-1.21	CdF2
Cdmetal(alpha)	-32.08	-18.57	13.51	Cd
Cdmetal(gamma)	-32.18	-18.57	13.62	Cd
CdMoO4	-0.72	-14.87	-14.15	CdMoO4
CdOHCl	-7.55	-4.01	3.54	CdOHCl
CdSb	-73.33	-73.68	-0.35	CdSb
CdSe	-17.22	-37.42	-20.20	CdSe
CdSeO4:2H2O	-18.55	-20.40	-1.85	CdSeO4:2H2O
CdSO4	-11.02	-11.19	-0.17	CdSO4
CdSO4:1H2O	-9.47	-11.19	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.32	-11.19	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.15	-14.28	-13.13	PbCO3
CH4(g)	-76.69	-117.73	-41.05	CH4
Chalcanthite	-6.85	-9.49	-2.64	CuSO4:5H2O
Chalcocite	-50.57	-85.49	-34.92	Cu2S
Chalcopyrite	-112.64	-147.91	-35.27	CuFeS2
Cinnabar	-49.29	-94.99	-45.69	HgS
Claudetite	-71.42	-74.48	-3.06	As4O6
Clausthalite	-11.04	-38.14	-27.10	PbSe
Co(BO2)2	-29.74	-2.67	27.07	Co(BO2)2
Co(OH)2	-6.17	6.93	13.09	Co(OH)2
Co(OH)3	-10.89	-13.20	-2.31	Co(OH)3
CO2(g)	-1.40	-19.54	-18.15	CO2
Co3(AsO4)2	-18.19	-5.16	13.03	Co3(AsO4)2
Co3O4	-8.97	-19.47	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-2.64	-12.62	-9.98	CoCO3

CoF2	-12.79	-14.39	-1.60	CoF2
CoF3	-43.71	-45.17	-1.46	CoF3
CoFe2O4	24.55	21.02	-3.53	CoFe2O4
CoMoO4	-6.16	-13.92	-7.76	CoMoO4
CoO	-6.66	6.93	13.59	CoO
CoS (alpha)	-67.34	-74.78	-7.44	CoS
CoS (beta)	-63.71	-74.78	-11.07	CoS
CoSe	-20.27	-36.47	-16.20	CoSe
CoSeO3	-9.01	-7.69	1.32	CoSeO3
CoSeO4:6H2O	-17.92	-19.45	-1.53	CoSeO4:6H2O
CoSO4	-13.05	-10.25	2.80	CoSO4
CoSO4:6H2O	-7.78	-10.25	-2.47	CoSO4:6H2O
Cotunnite	-9.95	-14.73	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr (OH) 2	-20.03	-9.21	10.82	Cr (OH) 2
Cr (OH) 3	-1.22	0.12	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.87	0.12	-0.75	Cr (OH) 3
Cr2O3	2.59	0.23	-2.36	Cr2O3
CrCl2	-43.29	-29.20	14.09	CrCl2
CrCl3	-44.98	-29.87	15.11	CrCl3
CrF3	-20.52	-31.85	-11.34	CrF3
Crmetal	-64.24	-33.76	30.48	Cr
CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.16	-40.00	-33.84	Na3AlF6
Cu (OH) 2	-0.98	7.69	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.02	20.19	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-51.26	-86.14	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.38	-47.18	-45.80	Cu2Se
Cu2SO4	-19.01	-20.96	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-8.97	-2.87	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-55.02	-97.62	-42.59	Cu3Sb
Cu3Se2	-19.40	-82.89	-63.49	Cu3Se2
CuCO3	-0.35	-11.85	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.64	-12.55	-4.91	CuF
CuF2	-14.74	-13.62	1.12	CuF2
CuF2:2H2O	-9.07	-13.62	-4.55	CuF2:2H2O
Cumetal	-5.41	-14.17	-8.76	Cu
CuMoO4	-0.08	-13.16	-13.08	CuMoO4
CuOCuSO4	-12.10	-1.80	10.30	CuOCuSO4
Cupricferrite	15.80	21.79	5.99	CuFe2O4
Cuprite	-2.38	-3.79	-1.41	Cu2O
Cuprousferrite	14.07	5.15	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.56	-33.37	CuSe2
CuSeO3:2H2O	-7.44	-6.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.25	-18.69	-2.44	CuSeO4:5H2O
CuSO4	-12.42	-9.49	2.94	CuSO4
Diaspore	2.72	9.59	6.87	AlOOH
Djurleite	-50.81	-84.73	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.34	-16.20	-16.54	CaMg (CO3) 2
Dolomite(ordered)	0.89	-16.20	-17.09	CaMg (CO3) 2
Epsomite	-3.85	-5.97	-2.13	MgSO4:7H2O
Fe (OH) 2	-5.76	7.81	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	7.09	4.05	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-2.30	-6.02	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-2.07	-0.52	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-9.13	-29.75	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-33.70	-37.43	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	1.68	21.90	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.32	-5.92	0.40	FeAsO4:2H2O
FeCr2O4	0.84	8.04	7.20	FeCr2O4
FeMoO4	-2.95	-13.04	-10.09	FeMoO4
Ferrihydrite	3.86	7.05	3.19	Fe (OH) 3
Ferroselite	-35.85	-54.44	-18.60	FeSe2
FeS (ppt)	-70.95	-73.90	-2.95	FeS
FeSe	-24.59	-35.59	-11.00	FeSe
Fix_pe	-5.11	-5.11	0.00	e-

Fluorite	0.87	-9.63	-10.50	CaF2
Galena	-62.47	-76.44	-13.97	PbS
Gibbsite	1.30	9.59	8.29	Al (OH) 3
Goethite	6.56	7.05	0.49	FeOOH
Goslarite	-7.25	-9.26	-2.01	ZnSO4:7H2O
Greenockite	-61.36	-75.72	-14.36	CdS
Greigite	-259.88	-304.91	-45.03	Fe3S4
Gummite	-7.81	-0.13	7.67	UO3
Gypsum	-0.89	-5.50	-4.61	CaSO4:2H2O
H-Jarosite	-1.11	-13.21	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-7.97	-20.85	-12.88	H2MoO4
H2S (g)	-73.69	-81.70	-8.01	H2S
H2Se (g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.81	-5.21	1.60	NaCl
Hausmannite	-8.65	52.38	61.03	Mn3O4
Hematite	15.51	14.10	-1.42	Fe2O3
Hercynite	4.09	26.99	22.89	FeAl2O4
Hg (CH3) 2 (g)	-175.04	-248.75	-73.71	Hg (CH3) 2
Hg (g)	-8.36	-16.24	-7.87	Hg
Hg (OH) 2	-9.79	-13.28	-3.50	Hg (OH) 2
Hg2 (g)	-17.52	-32.47	-14.96	Hg2
Hg2 (OH) 2	-13.19	-7.93	5.26	Hg2 (OH) 2
Hg2CO3	-11.42	-27.47	-16.05	Hg2CO3
Hg2CrO4	-29.66	-38.36	-8.70	Hg2CrO4
Hg2F2	-18.88	-29.24	-10.36	Hg2F2
Hg2S	-77.95	-89.63	-11.68	Hg2S
Hg2SeO3	-17.88	-22.54	-4.66	Hg2SeO3
Hg2SO4	-18.97	-25.10	-6.13	Hg2SO4
Hg3O2CO3	-29.71	-59.39	-29.68	Hg3O2CO3
HgCl (g)	-33.45	-13.96	19.50	HgCl
HgCl2	-12.01	-33.27	-21.26	HgCl2
HgF (g)	-47.30	-14.62	32.68	HgF
HgF2 (g)	-47.16	-34.60	12.57	HgF2
Hgmetal (l)	-2.78	-16.24	-13.45	Hg
HgSe	-0.99	-56.68	-55.69	HgSe
HgSeO3	-15.47	-27.90	-12.43	HgSeO3
HgSO4	-21.04	-30.46	-9.42	HgSO4
Huntite	-2.91	-32.88	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.54	-23.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.39	-22.16	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.66	-20.83	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	5.53	-9.27	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.76	-53.00	-17.24	K2Cr2O7
K2CrO4	-22.05	-22.56	-0.51	K2CrO4
K2MoO4	-16.24	-12.97	3.26	K2MoO4
K2SeO4	-17.77	-18.50	-0.73	K2SeO4
Langite	-3.90	13.58	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.22	-6.66	-0.43	PbO:PbSO4
Laurionite	-5.36	-4.73	0.62	PbOHCl
Lepidocrocite	5.68	7.05	1.37	FeOOH
Lime	-21.02	11.68	32.70	CaO
Litharge	-7.43	5.26	12.69	PbO
Mackinawite	-70.30	-73.90	-3.60	FeS
Maghemite	7.71	14.10	6.39	Fe2O3
Magnesioferrite	8.44	25.30	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	18.50	21.90	3.40	Fe3O4
Malachite	1.14	-4.16	-5.31	Cu2 (OH) 2CO3
Manganite	-3.79	21.55	25.34	MnOOH
Massicot	-7.63	5.26	12.89	PbO
Matlockite	-6.42	-15.39	-8.97	PbClF
Melanothallite	-18.56	-12.30	6.26	CuCl2
Melanterite	-7.16	-9.37	-2.21	FeSO4:7H2O
Metacinnabar	-49.89	-94.99	-45.09	HgS
Mg (OH) 2 (active)	-7.59	11.20	18.79	Mg (OH) 2
Mg (VO3) 2	-13.90	-2.62	11.28	Mg (VO3) 2
Mg2Sb3	-266.72	-192.04	74.68	Mg2Sb3
Mg2V2O7	-17.78	8.58	26.36	Mg2V2O7

MgCr2O4	-4.76	11.44	16.20	MgCr2O4
MgCrO4	-24.61	-19.23	5.38	MgCrO4
MgF2	-1.98	-10.11	-8.13	MgF2
MgMoO4	-7.80	-9.65	-1.85	MgMoO4
MgSeO3:6H2O	-6.47	-3.41	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.98	-15.18	-1.20	MgSeO4:6H2O
Minium	-33.20	40.33	73.52	Pb3O4
Mirabilite	-6.50	-7.61	-1.11	Na2SO4:10H2O
Mn(VO3)2	-9.45	-4.55	4.90	Mn(VO3)2
Mn2(SO4)3	-53.41	-59.12	-5.71	Mn2(SO4)3
Mn2Sb	-146.74	-85.66	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-10.61	1.89	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.43	-10.71	2.72	MnCl2:4H2O
MnS(grn)	-72.60	-72.43	0.17	MnS
MnS(pnk)	-75.77	-72.43	3.34	MnS
MnSb	-92.83	-95.74	-2.91	MnSb
MnSe	-37.62	-34.12	3.50	MnSe
MnSeO3	-6.47	-5.34	1.13	MnSeO3
MnSeO3:2H2O	-6.32	-5.34	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.05	-17.10	-2.05	MnSeO4:5H2O
MnSO4	-10.48	-7.90	2.58	MnSO4
Monteponite	-9.12	5.98	15.10	CdO
Montroydite	-9.64	-13.28	-3.64	HgO
MoO3	-12.85	-20.85	-8.00	MoO3
Morenosite	-7.95	-10.09	-2.14	NiSO4:7H2O
MoS2	-138.55	-208.81	-70.26	MoS2
Na-Jarosite	2.78	-8.42	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.41	-51.31	-9.90	Na2Cr2O7
Na2CrO4	-23.80	-20.87	2.93	Na2CrO4
Na2Mo2O7	-15.54	-32.13	-16.60	Na2Mo2O7
Na2MoO4	-12.77	-11.28	1.49	Na2MoO4
Na2MoO4:2H2O	-12.51	-11.28	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.35	-5.05	10.30	Na2SeO3:5H2O
Na2SeO4	-18.09	-16.81	1.28	Na2SeO4
Na3Sb	-172.04	-77.59	94.45	Na3Sb
Na3VO4	-29.25	7.44	36.68	Na3VO4
Na4V2O7	-32.09	5.31	37.40	Na4V2O7
Nantokite	-5.16	-11.89	-6.73	CuCl
NaSb	-85.77	-62.61	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-5.99	-2.13	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-5.71	7.08	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.40	-4.70	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.84	11.16	32.00	Ni4(OH)6SO4
NiCO3	-5.59	-12.46	-6.87	NiCO3
NiMoO4	-2.62	-13.77	-11.14	NiMoO4
NiS(alpha)	-69.02	-74.62	-5.60	NiS
NiS(beta)	-63.52	-74.62	-11.10	NiS
NiS(gamma)	-61.82	-74.62	-12.80	NiS
NiSe	-18.61	-36.31	-17.70	NiSe
NiSeO3:2H2O	-10.35	-7.53	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.78	-19.30	-1.52	NiSeO4:6H2O
Nsutite	-9.03	8.47	17.50	MnO2
O2(g)	-34.00	49.09	83.09	O2
Orpiment	-221.29	-282.35	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.86	-4.34	6.52	Pb(BO2)2
Pb(OH)2	-2.89	5.26	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-55.90	-64.66	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.27	0.53	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.67	10.52	26.19	Pb2O(OH)2
Pb2O3	-25.97	35.07	61.04	Pb2O3
Pb2OCO3	-8.47	-9.02	-0.56	Pb2OCO3
Pb2V2O7	-1.41	-3.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.96	-10.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.19	1.95	6.14	Pb3(VO4)2
Pb3O2CO3	-14.78	-3.76	11.02	Pb3O2CO3

Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.24	3.86	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.01	3.86	21.88	Pb4O3SO4
PbCrO4	-12.58	-25.18	-12.60	PbCrO4
PbF2	-8.61	-16.05	-7.44	PbF2
Pbmetal	-23.53	-19.29	4.25	Pb
PbMoO4	0.03	-15.59	-15.62	PbMoO4
PbO:0.3H2O	-7.72	5.26	12.98	PbO:0.33H2O
PbSeO4	-14.28	-21.12	-6.84	PbSeO4
Periclase	-10.38	11.20	21.58	MgO
Phosgenite	-9.20	-29.01	-19.81	PbCl2:PbCO3
Plattnerite	-19.79	29.81	49.60	PbO2
Portlandite	-11.12	11.68	22.80	Ca (OH) 2
Pyrite	-112.55	-131.05	-18.51	FeS2
Pyrochroite	-5.92	9.28	15.19	Mn (OH) 2
Pyrolusite	-7.56	33.82	41.38	MnO2
Realgar	-92.85	-112.60	-19.75	AsS
Retgersite	-8.05	-10.09	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.18	-19.68	-14.50	UO2CO3
Sb (OH) 3	-11.19	-18.30	-7.11	Sb (OH) 3
Sb2O4	-15.45	-12.05	3.40	Sb2O4
Sb2O5	-26.45	-36.12	-9.67	Sb2O5
Sb2Se3	-99.03	-166.79	-67.76	Sb2Se3
Sb4O6(cubic)	-54.92	-73.19	-18.26	Sb4O6
Sb4O6(orth)	-55.28	-73.19	-17.90	Sb4O6
SbCl3	-48.85	-48.28	0.57	SbCl3
SbF3	-40.04	-50.27	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.51	-30.33	-27.82	SbO2
Schoepite	-6.13	-0.13	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.74	-18.85	-7.11	Se
Semetal (hex)	-11.14	-18.85	-7.71	Se
Senarmontite	-24.23	-36.59	-12.37	Sb2O3
SeO2	-14.74	-14.62	0.12	SeO2
SeO3	-47.42	-26.38	21.04	SeO3
Siderite	-1.50	-11.74	-10.24	FeCO3
Smithsonite	-1.63	-11.63	-10.00	ZnCO3
Sphalerite	-62.34	-73.79	-11.45	ZnS
Spinel	-6.46	30.38	36.85	MgAl2O4
Stibnite	-231.25	-281.71	-50.46	Sb2S3
Sulfur	-55.01	-57.16	-2.14	S
Tenorite	0.05	7.69	7.64	CuO
Thenardite	-7.93	-7.61	0.32	Na2SO4
Thermonatrite	-10.61	-9.98	0.64	Na2CO3:H2O
Tyuyamunite	-6.49	-2.41	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-18.38	2.70	21.08	U3O8
U3Sb4	-566.53	-414.15	152.38	U3Sb4
U4O9	-34.29	-37.31	-3.02	U4O9
UF4	-28.56	-58.09	-29.54	UF4
UF4:2.5H2O	-25.38	-58.09	-32.72	UF4:2.5H2O
UO2 (am)	-16.40	-15.46	0.93	UO2
UO2 (OH) 2 (beta)	-5.75	-0.13	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.26	-26.51	-2.25	UO2SeO4:4H2O
UO3	-7.83	-0.13	7.70	UO3
Uraninite	-10.80	-15.46	-4.67	UO2
USb2	-213.59	-184.01	29.58	USb2
V (OH) 3	-16.45	-8.86	7.59	V (OH) 3
V2O5	-12.47	-13.83	-1.36	V2O5
V3O5	-33.24	-31.40	1.84	V3O5
V4O7	-40.87	-33.68	7.19	V4O7
V6O13	-29.72	-90.58	-60.86	V6O13
Valentinite	-28.11	-36.59	-8.48	Sb2O3
VC12	-60.00	-41.12	18.87	VC12
VC13	-62.28	-38.84	23.43	VC13
VF4	-59.84	-44.91	14.93	VF4
Vmetal	-89.71	-45.68	44.03	V
VO	-35.89	-21.14	14.76	VO

VO(OH)2	-7.44	-2.28	5.15	VO(OH)2
VO2Cl	-19.75	-16.91	2.84	VO2Cl
VOC1	-30.01	-18.86	11.15	VOC1
VOC12	-35.03	-22.27	12.76	VOC12
VOSO4	-23.07	-19.46	3.61	VOSO4
Witherite	-2.78	-11.35	-8.57	BaCO3
Wurtzite	-64.84	-73.79	-8.95	ZnS
Zincite	-3.42	7.92	11.33	ZnO
Zincosite	-13.19	-9.26	3.93	ZnSO4
Zn(BO2)2	-9.97	-1.68	8.29	Zn(BO2)2
Zn(OH)2	-4.28	7.92	12.20	Zn(OH)2
Zn(OH)2(am)	-4.56	7.92	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.84	7.92	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.62	7.92	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.82	7.92	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.84	-1.34	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.35	5.84	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.84	-2.19	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.51	-10.60	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.90	14.50	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.90	19.60	38.50	Zn5(OH)8Cl2
ZnCl2	-19.12	-12.07	7.05	ZnCl2
ZnCO3:1H2O	-1.37	-11.63	-10.26	ZnCO3:1H2O
ZnF2	-12.86	-13.40	-0.53	ZnF2
Znmetal	-42.42	-16.63	25.79	Zn
ZnMoO4	-2.81	-12.93	-10.13	ZnMoO4
ZnO(active)	-3.27	7.92	11.19	ZnO
ZnS(am)	-64.73	-73.79	-9.05	ZnS
ZnSb	-82.76	-71.75	11.01	ZnSb
ZnSe	-21.08	-35.48	-14.40	ZnSe
ZnSeO4:6H2O	-16.94	-18.46	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.62	-9.26	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 54.

```

Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
  e-=e-
  log_k      0
EQUILIBRIUM_PHASES 301
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -1.69 10
  Cr2O3 0 0
  CuMoO4 0 0

```

```

Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 302
SAVE Solution 303 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 301
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases in groundwater

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 302. Solution after simulation 53.
Using pure phase assemblage 301.

```

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.514e-08	2.514e-08
Alunite	0.00	-1.40	-1.40	0.000e+00	8.403e-07	8.403e-07
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00

Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.018e-08	2.018e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.285e-06	1.285e-06
Brochantite	-0.50	14.72	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.21	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.498e-03
CaMoO4	-1.72	-9.67	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.38	-3.57	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.820e-03	2.820e-03
Carnotite	-2.37	-2.14	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.89	-15.04	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.031e-08	6.031e-08
Cu2Se(alpha)	-5.16	-50.96	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.209e-07	2.209e-07
Epsomite	-3.74	-5.87	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.670e-05	2.670e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.051e-04	1.051e-04
Gummite	-6.86	0.81	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.29	-58.99	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.41	-7.52	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.75	-5.62	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.61	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-24.38	-8.68	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.71	-13.85	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.625e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	5.587e-09	5.587e-09
Rutherfordine	-4.53	-19.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.81	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.18	0.81	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.88	-0.80	4.08	0.000e+00	0	0.000e+00
U3O8	-16.55	4.54	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.80	0.81	5.61	0.000e+00	0	0.000e+00
UO3	-6.89	0.81	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.94	-13.06	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.324e-08	3.322e-08
Al	1.993e-06	1.993e-06
As	2.597e-10	2.595e-10
B	1.589e-05	1.589e-05
Ba	1.126e-07	1.125e-07
C	5.856e-03	5.854e-03
Ca	2.511e-03	2.510e-03
Cd	1.160e-08	1.159e-08
Cl	1.709e-03	1.708e-03
Co	1.359e-07	1.359e-07
Cr	6.406e-09	6.404e-09
Cu	9.125e-06	9.120e-06
F	2.121e-04	2.120e-04
Fe	3.663e-09	3.661e-09
Hg	2.144e-10	2.143e-10
K	7.051e-04	7.048e-04
Mg	1.722e-03	1.721e-03
Mn	2.354e-05	2.353e-05
Mo	3.195e-07	3.194e-07
Na	4.955e-03	4.952e-03
Ni	2.132e-07	2.131e-07
Pb	2.020e-08	2.019e-08

S	3.547e-03	3.546e-03
Sb	1.304e-08	1.303e-08
Se	2.156e-08	2.155e-08
U	8.263e-08	8.260e-08
V	1.136e-07	1.136e-07
Zn	1.138e-06	1.137e-06

-----Description of solution-----

	pH	=	7.149	Charge balance
	pe	=	5.623	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.880e-02	
	Mass of water (kg)	=	9.996e-01	
	Total alkalinity (eq/kg)	=	5.185e-03	
	Total CO2 (mol/kg)	=	5.856e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	9.699e-17	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	10	
	Total H	=	1.109704e+02	
	Total O	=	5.551373e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.630e-07	1.418e-07	-6.788	-6.848	-0.060	(0)
H+	8.123e-08	7.097e-08	-7.090	-7.149	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.324e-08					
AgCl	2.156e-08	2.156e-08	-7.666	-7.666	0.000	(0)
Ag+	8.097e-09	7.075e-09	-8.092	-8.150	-0.059	(0)
AgCl2-	3.293e-09	2.804e-09	-8.482	-8.552	-0.070	(0)
AgSO4-	2.721e-10	2.317e-10	-9.565	-9.635	-0.070	(0)
AgCl3-2	7.102e-12	3.730e-12	-11.149	-11.428	-0.280	(0)
AgF	2.952e-12	2.952e-12	-11.530	-11.530	0.000	(0)
AgOH	1.003e-13	1.003e-13	-12.999	-12.999	0.000	(0)
AgCl4-3	4.842e-14	1.137e-14	-13.315	-13.944	-0.629	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgH2BO3	1.449e-14	1.449e-14	-13.839	-13.839	0.000	(0)
AgSeO3-	5.039e-15	4.289e-15	-14.298	-14.368	-0.070	(0)
Ag (OH) 2-	1.634e-18	1.391e-18	-17.787	-17.857	-0.070	(0)
Ag (SeO3) 2-3	1.543e-22	3.623e-23	-21.812	-22.441	-0.629	(0)
Ag2MoO4	3.525e-24	3.525e-24	-23.453	-23.453	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.788	-72.788	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.191	-86.309	-1.119	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.071	-147.141	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.309	-147.476	-0.167	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.451	-149.767	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.775	-150.078	-0.302	(0)
Al	1.993e-06					
Al (OH) 4-	1.347e-06	1.178e-06	-5.871	-5.929	-0.058	(0)
AlF3	3.351e-07	3.351e-07	-6.475	-6.475	0.000	(0)
AlF2+	1.824e-07	1.603e-07	-6.739	-6.795	-0.056	(0)
Al (OH) 3	6.599e-08	6.599e-08	-7.181	-7.181	0.000	(0)
AlF4-	3.189e-08	2.790e-08	-7.496	-7.554	-0.058	(0)
Al (OH) 2+	2.654e-08	2.332e-08	-7.576	-7.632	-0.056	(0)
AlF+2	4.069e-09	2.424e-09	-8.391	-8.616	-0.225	(0)
AlOH+2	3.475e-10	2.070e-10	-9.459	-9.684	-0.225	(0)
AlSO4+	2.125e-11	1.859e-11	-10.673	-10.731	-0.058	(0)
Al+3	4.917e-12	1.459e-12	-11.308	-11.836	-0.528	(0)
Al (SO4) 2-	3.737e-13	3.269e-13	-12.427	-12.486	-0.058	(0)
AlMo6O21-3	3.241e-40	0.000e+00	-39.489	-40.119	-0.629	(0)
As (3)	1.770e-22					

	H3AsO3	1.755e-22	1.755e-22	-21.756	-21.756	0.000	(0)
	H2AsO3-	1.490e-24	1.268e-24	-23.827	-23.897	-0.070	(0)
	HAsO3-2	3.103e-29	1.630e-29	-28.508	-28.788	-0.280	(0)
	H4AsO3+	7.248e-30	6.170e-30	-29.140	-29.210	-0.070	(0)
	AsO3-3	3.770e-35	8.851e-36	-34.424	-35.053	-0.629	(0)
As (5)	2.597e-10						
	HAsO4-2	1.856e-10	9.745e-11	-9.732	-10.011	-0.280	(0)
	H2AsO4-	7.409e-11	6.307e-11	-10.130	-10.200	-0.070	(0)
	AsO4-3	1.849e-14	4.342e-15	-13.733	-14.362	-0.629	(0)
	H3AsO4	7.745e-16	7.779e-16	-15.111	-15.109	0.002	(0)
B	1.589e-05						
	H3BO3	1.573e-05	1.580e-05	-4.803	-4.801	0.002	(0)
	H2BO3-	1.494e-07	1.293e-07	-6.826	-6.889	-0.063	(0)
	CaH2BO3+	9.854e-09	8.526e-09	-8.006	-8.069	-0.063	(0)
	MgH2BO3+	4.269e-09	3.693e-09	-8.370	-8.433	-0.063	(0)
	BF (OH) 3-	1.210e-09	1.047e-09	-8.917	-8.980	-0.063	(0)
	NaH2BO3	8.771e-10	8.771e-10	-9.057	-9.057	0.000	(0)
	H5 (BO3) 2-	2.008e-12	1.738e-12	-11.697	-11.760	-0.063	(0)
	BF2 (OH) 2-	1.525e-12	1.320e-12	-11.817	-11.880	-0.063	(0)
	BaH2BO3+	2.946e-13	2.549e-13	-12.531	-12.594	-0.063	(0)
	AgH2BO3	1.449e-14	1.449e-14	-13.839	-13.839	0.000	(0)
	H8 (BO3) 3-	3.172e-15	2.745e-15	-14.499	-14.561	-0.063	(0)
	BF3OH-	6.996e-18	6.054e-18	-17.155	-17.218	-0.063	(0)
	BF4-	4.059e-22	3.512e-22	-21.392	-21.454	-0.063	(0)
Ba	1.126e-07						
	Ba+2	1.095e-07	6.381e-08	-6.961	-7.195	-0.234	(0)
	BaHCO3+	3.025e-09	2.665e-09	-8.519	-8.574	-0.055	(0)
	BaCO3	9.453e-11	9.453e-11	-10.024	-10.024	0.000	(0)
	BaH2BO3+	2.946e-13	2.549e-13	-12.531	-12.594	-0.063	(0)
	BaOH+	4.505e-14	3.950e-14	-13.346	-13.403	-0.057	(0)
C (4)	5.856e-03						
	HCO3-	4.978e-03	4.373e-03	-2.303	-2.359	-0.056	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.060e-04	9.334e-05	-3.975	-4.030	-0.055	(0)
	MgHCO3+	4.227e-05	3.688e-05	-4.374	-4.433	-0.059	(0)
	NaHCO3	1.053e-05	1.053e-05	-4.978	-4.978	0.000	(0)
	CuCO3	7.671e-06	7.671e-06	-5.115	-5.115	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.956e-06	2.889e-06	-5.305	-5.539	-0.234	(0)
	MgCO3	1.980e-06	1.980e-06	-5.703	-5.703	0.000	(0)
	MnHCO3+	1.016e-06	8.907e-07	-5.993	-6.050	-0.057	(0)
	NaCO3-	2.622e-07	2.303e-07	-6.581	-6.638	-0.056	(0)
	CuHCO3+	1.462e-07	1.244e-07	-6.835	-6.905	-0.070	(0)
	Cu (CO3) 2-2	1.136e-07	5.964e-08	-6.945	-7.224	-0.280	(0)
	ZnCO3	7.754e-08	7.754e-08	-7.110	-7.110	0.000	(0)
	ZnHCO3+	7.577e-08	6.450e-08	-7.120	-7.190	-0.070	(0)
	NiHCO3+	4.830e-08	4.112e-08	-7.316	-7.386	-0.070	(0)
	UO2 (CO3) 2-2	4.114e-08	2.161e-08	-7.386	-7.665	-0.280	(0)
	UO2 (CO3) 3-4	4.112e-08	3.128e-09	-7.386	-8.505	-1.119	(0)
	CoHCO3+	2.015e-08	1.715e-08	-7.696	-7.766	-0.070	(0)
	PbCO3	1.120e-08	1.120e-08	-7.951	-7.951	0.000	(0)
	NiCO3	8.220e-09	8.220e-09	-8.085	-8.085	0.000	(0)
	PbHCO3+	4.921e-09	4.189e-09	-8.308	-8.378	-0.070	(0)
	BaHCO3+	3.025e-09	2.665e-09	-8.519	-8.574	-0.055	(0)
	CoCO3	2.462e-09	2.462e-09	-8.609	-8.609	0.000	(0)
	UO2CO3	3.749e-10	3.749e-10	-9.426	-9.426	0.000	(0)
	CdCO3	3.224e-10	3.224e-10	-9.492	-9.492	0.000	(0)
	Pb (CO3) 2-2	1.776e-10	9.328e-11	-9.751	-10.030	-0.280	(0)
	BaCO3	9.453e-11	9.453e-11	-10.024	-10.024	0.000	(0)
	CdHCO3+	5.727e-11	4.876e-11	-10.242	-10.312	-0.070	(0)
	Cd (CO3) 2-2	1.315e-12	6.905e-13	-11.881	-12.161	-0.280	(0)
	FeHCO3+	8.892e-13	7.833e-13	-12.051	-12.106	-0.055	(0)
	HgCO3	1.399e-14	1.399e-14	-13.854	-13.854	0.000	(0)
	Hg (CO3) 2-2	2.433e-16	1.278e-16	-15.614	-15.894	-0.280	(0)
	HgHCO3+	2.171e-17	1.849e-17	-16.663	-16.733	-0.070	(0)
Ca	2.511e-03						
	Ca+2	1.967e-03	1.146e-03	-2.706	-2.941	-0.234	(0)
	CaSO4	4.310e-04	4.310e-04	-3.366	-3.366	0.000	(0)

		CaHCO3+	1.060e-04	9.334e-05	-3.975	-4.030	-0.055	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
		CaH2BO3+	9.854e-09	8.526e-09	-8.006	-8.069	-0.063	(0)
		CaOH+	3.682e-09	3.244e-09	-8.434	-8.489	-0.055	(0)
Cd	1.160e-08							
		Cd+2	8.403e-09	4.897e-09	-8.076	-8.310	-0.234	(0)
		CdSO4	1.884e-09	1.884e-09	-8.725	-8.725	0.000	(0)
		CdCl+	8.201e-10	6.981e-10	-9.086	-9.156	-0.070	(0)
		CdCO3	3.224e-10	3.224e-10	-9.492	-9.492	0.000	(0)
		Cd(SO4) 2-2	7.942e-11	4.171e-11	-10.100	-10.380	-0.280	(0)
		CdHCO3+	5.727e-11	4.876e-11	-10.242	-10.312	-0.070	(0)
		CdF+	1.514e-11	1.289e-11	-10.820	-10.890	-0.070	(0)
		CdOH+	6.481e-12	5.517e-12	-11.188	-11.258	-0.070	(0)
		CdCl2	4.345e-12	4.345e-12	-11.362	-11.362	0.000	(0)
		CdOHC1	4.062e-12	4.062e-12	-11.391	-11.391	0.000	(0)
		Cd(CO3) 2-2	1.315e-12	6.905e-13	-11.881	-12.161	-0.280	(0)
		Cd(OH) 2	4.937e-15	4.937e-15	-14.306	-14.306	0.000	(0)
		CdCl3-	4.807e-15	4.092e-15	-14.318	-14.388	-0.070	(0)
		CdF2	4.272e-15	4.272e-15	-14.369	-14.369	0.000	(0)
		CdSeO4	3.727e-18	3.727e-18	-17.429	-17.429	0.000	(0)
		Cd2OH+3	5.768e-19	1.354e-19	-18.239	-18.868	-0.629	(0)
		Cd(OH) 3-	5.026e-20	4.278e-20	-19.299	-19.369	-0.070	(0)
		Cd(SeO3) 2-2	6.839e-21	3.592e-21	-20.165	-20.445	-0.280	(0)
		Cd(OH) 4-2	1.891e-27	9.932e-28	-26.723	-27.003	-0.280	(0)
		CdHS+	0.000e+00	0.000e+00	-78.685	-78.755	-0.070	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-150.003	-150.003	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-226.486	-226.556	-0.070	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-302.533	-302.812	-0.280	(0)
Cl	1.709e-03							
		Cl-	1.708e-03	1.493e-03	-2.767	-2.826	-0.059	(0)
		MnCl+	2.188e-08	1.919e-08	-7.660	-7.717	-0.057	(0)
		AgCl	2.156e-08	2.156e-08	-7.666	-7.666	0.000	(0)
		AgCl2-	3.293e-09	2.804e-09	-8.482	-8.552	-0.070	(0)
		ZnCl+	2.005e-09	1.749e-09	-8.698	-8.757	-0.059	(0)
		CuCl+	1.223e-09	1.067e-09	-8.913	-8.972	-0.059	(0)
		CuCl	9.878e-10	9.878e-10	-9.005	-9.005	0.000	(0)
		CdCl+	8.201e-10	6.981e-10	-9.086	-9.156	-0.070	(0)
		CuCl2-	3.531e-10	3.081e-10	-9.452	-9.511	-0.059	(0)
		NiCl+	3.422e-10	2.913e-10	-9.466	-9.536	-0.070	(0)
		ZnOHC1	3.248e-10	3.248e-10	-9.488	-9.488	0.000	(0)
		CoCl+	3.059e-10	2.604e-10	-9.514	-9.584	-0.070	(0)
		PbCl+	8.022e-11	6.829e-11	-10.096	-10.166	-0.070	(0)
		MnCl2	4.045e-11	4.045e-11	-10.393	-10.393	0.000	(0)
		AgCl3-2	7.102e-12	3.730e-12	-11.149	-11.428	-0.280	(0)
		CdCl2	4.345e-12	4.345e-12	-11.362	-11.362	0.000	(0)
		ZnCl2	4.138e-12	4.138e-12	-11.383	-11.383	0.000	(0)
		CdOHC1	4.062e-12	4.062e-12	-11.391	-11.391	0.000	(0)
		HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
		HgCl2	9.016e-13	9.016e-13	-12.045	-12.045	0.000	(0)
		CuCl2	5.523e-13	5.523e-13	-12.258	-12.258	0.000	(0)
		PbCl2	4.554e-13	4.554e-13	-12.342	-12.342	0.000	(0)
		CuCl3-2	1.663e-13	9.832e-14	-12.779	-13.007	-0.228	(0)
		AgCl4-3	4.842e-14	1.137e-14	-13.315	-13.944	-0.629	(0)
		MnCl3-	1.897e-14	1.663e-14	-13.722	-13.779	-0.057	(0)
		HgCl3-	1.581e-14	1.346e-14	-13.801	-13.871	-0.070	(0)
		ZnCl3-	5.624e-15	4.907e-15	-14.250	-14.309	-0.059	(0)
		CdCl3-	4.807e-15	4.092e-15	-14.318	-14.388	-0.070	(0)
		NiCl2	2.190e-15	2.190e-15	-14.660	-14.660	0.000	(0)
		CrCl+2	3.229e-16	1.696e-16	-15.491	-15.771	-0.280	(0)
		PbCl3-	3.179e-16	2.706e-16	-15.498	-15.568	-0.070	(0)
		HgCl4-2	1.523e-16	7.999e-17	-15.817	-16.097	-0.280	(0)
		HgCl+	1.416e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
		UO2Cl+	9.270e-17	7.891e-17	-16.033	-16.103	-0.070	(0)
		CuCl3-	8.819e-18	7.694e-18	-17.055	-17.114	-0.059	(0)
		ZnCl4-2	6.195e-18	3.663e-18	-17.208	-17.436	-0.228	(0)
		CrOHC12	6.825e-19	6.825e-19	-18.166	-18.166	0.000	(0)
		PbCl4-2	3.516e-19	1.846e-19	-18.454	-18.734	-0.280	(0)

VOC1+	4.334e-20	3.689e-20	-19.363	-19.433	-0.070	(0)
FeCl+2	4.236e-20	2.504e-20	-19.373	-19.601	-0.228	(0)
CrCl2+	2.822e-20	2.402e-20	-19.549	-19.619	-0.070	(0)
FeCl2+	1.904e-22	1.670e-22	-21.720	-21.777	-0.057	(0)
CuCl4-2	9.737e-23	5.756e-23	-22.012	-22.240	-0.228	(0)
FeCl3	2.493e-26	2.493e-26	-25.603	-25.603	0.000	(0)
CrO3Cl-	2.064e-26	1.757e-26	-25.685	-25.755	-0.070	(0)
CoCl+2	4.879e-35	2.562e-35	-34.312	-34.591	-0.280	(0)
UCl+3	0.000e+00	0.000e+00	-44.610	-45.239	-0.629	(0)
Co (2)	1.359e-07					
Co+2	9.601e-08	5.042e-08	-7.018	-7.297	-0.280	(0)
CoHCO3+	2.015e-08	1.715e-08	-7.696	-7.766	-0.070	(0)
CoSO4	1.651e-08	1.651e-08	-7.782	-7.782	0.000	(0)
CoCO3	2.462e-09	2.462e-09	-8.609	-8.609	0.000	(0)
CoF+	3.111e-10	2.648e-10	-9.507	-9.577	-0.070	(0)
CoCl+	3.059e-10	2.604e-10	-9.514	-9.584	-0.070	(0)
CoOH+	1.676e-10	1.427e-10	-9.776	-9.846	-0.070	(0)
Co (OH) 2	1.608e-12	1.608e-12	-11.794	-11.794	0.000	(0)
CoSeO4	1.033e-16	1.033e-16	-15.986	-15.986	0.000	(0)
Co (OH) 3-	5.344e-18	4.549e-18	-17.272	-17.342	-0.070	(0)
Co2OH+3	1.536e-18	3.606e-19	-17.814	-18.443	-0.629	(0)
CoOOH-	1.341e-18	1.142e-18	-17.872	-17.942	-0.070	(0)
Co (OH) 4-2	1.947e-25	1.023e-25	-24.711	-24.990	-0.280	(0)
Co4 (OH) 4+4	1.087e-30	8.271e-32	-29.964	-31.082	-1.119	(0)
Co (3)	1.158e-28					
CoOH+2	1.158e-28	6.080e-29	-27.936	-28.216	-0.280	(0)
Co+3	2.842e-34	8.436e-35	-33.546	-34.074	-0.528	(0)
CoCl+2	4.879e-35	2.562e-35	-34.312	-34.591	-0.280	(0)
Cr (2)	9.503e-26					
Cr+2	9.503e-26	4.991e-26	-25.022	-25.302	-0.280	(0)
Cr (3)	6.406e-09					
Cr (OH) 2+	5.522e-09	4.701e-09	-8.258	-8.328	-0.070	(0)
Cr (OH) +2	5.187e-10	2.724e-10	-9.285	-9.565	-0.280	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.061e-10	1.061e-10	-9.974	-9.974	0.000	(0)
CrF+2	4.400e-12	2.311e-12	-11.357	-11.636	-0.280	(0)
CrO2-	1.970e-12	1.677e-12	-11.706	-11.776	-0.070	(0)
Cr (OH) 4-	1.661e-12	1.414e-12	-11.780	-11.849	-0.070	(0)
CrSO4+	3.952e-13	3.364e-13	-12.403	-12.473	-0.070	(0)
Cr+3	3.739e-13	8.779e-14	-12.427	-13.057	-0.629	(0)
CrCl+2	3.229e-16	1.696e-16	-15.491	-15.771	-0.280	(0)
Cr2 (OH) 2SO4+2	4.974e-18	2.612e-18	-17.303	-17.583	-0.280	(0)
CrOHC12	6.825e-19	6.825e-19	-18.166	-18.166	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.546e-19	2.546e-19	-18.594	-18.594	0.000	(0)
CrCl2+	2.822e-20	2.402e-20	-19.549	-19.619	-0.070	(0)
Cr (6)	2.311e-16					
CrO4-2	1.970e-16	1.148e-16	-15.706	-15.940	-0.234	(0)
HCrO4-	3.097e-17	2.636e-17	-16.509	-16.579	-0.070	(0)
NaCrO4-	2.869e-18	2.443e-18	-17.542	-17.612	-0.070	(0)
KCrO4-	3.052e-19	2.598e-19	-18.515	-18.585	-0.070	(0)
CrO3SO4-2	1.781e-24	9.356e-25	-23.749	-24.029	-0.280	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.064e-26	1.757e-26	-25.685	-25.755	-0.070	(0)
Cr2O7-2	4.591e-32	2.411e-32	-31.338	-31.618	-0.280	(0)
Cu (1)	1.958e-09					
CuCl	9.878e-10	9.878e-10	-9.005	-9.005	0.000	(0)
Cu+	6.174e-10	5.256e-10	-9.209	-9.279	-0.070	(0)
CuCl2-	3.531e-10	3.081e-10	-9.452	-9.511	-0.059	(0)
CuCl3-2	1.663e-13	9.832e-14	-12.779	-13.007	-0.228	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.188	-148.497	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.931	-149.227	-0.296	(0)
Cu (2)	9.123e-06					
CuCO3	7.671e-06	7.671e-06	-5.115	-5.115	0.000	(0)
Cu+2	7.738e-07	4.510e-07	-6.111	-6.346	-0.234	(0)
CuOH+	2.318e-07	2.023e-07	-6.635	-6.694	-0.059	(0)
CuSO4	1.696e-07	1.696e-07	-6.771	-6.771	0.000	(0)
CuHCO3+	1.462e-07	1.244e-07	-6.835	-6.905	-0.070	(0)
Cu (CO3) 2-2	1.136e-07	5.964e-08	-6.945	-7.224	-0.280	(0)

	Cu (OH) 2	5.724e-09	5.724e-09	-8.242	-8.242	0.000	(0)
	CuF+	5.552e-09	4.726e-09	-8.256	-8.325	-0.070	(0)
	Cu2 (OH) 2+2	1.957e-09	1.028e-09	-8.708	-8.988	-0.280	(0)
	CuCl+	1.223e-09	1.067e-09	-8.913	-8.972	-0.059	(0)
	Cu (OH) 3-	1.956e-12	1.665e-12	-11.709	-11.779	-0.070	(0)
	CuCl2	5.523e-13	5.523e-13	-12.258	-12.258	0.000	(0)
	CuCl3-	8.819e-18	7.694e-18	-17.055	-17.114	-0.059	(0)
	Cu (OH) 4-2	3.540e-18	1.859e-18	-17.451	-17.731	-0.280	(0)
	CuCl4-2	9.737e-23	5.756e-23	-22.012	-22.240	-0.228	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.735	-215.805	-0.070	(0)
F	2.121e-04						
	F-	1.901e-04	1.661e-04	-3.721	-3.780	-0.059	(0)
	MgF+	1.756e-05	1.536e-05	-4.756	-4.814	-0.058	(0)
	CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
	NaF	4.487e-07	4.487e-07	-6.348	-6.348	0.000	(0)
	AlF3	3.351e-07	3.351e-07	-6.475	-6.475	0.000	(0)
	AlF2+	1.824e-07	1.603e-07	-6.739	-6.795	-0.056	(0)
	MnF+	7.698e-08	6.750e-08	-7.114	-7.171	-0.057	(0)
	AlF4-	3.189e-08	2.790e-08	-7.496	-7.554	-0.058	(0)
	HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
	CuF+	5.552e-09	4.726e-09	-8.256	-8.325	-0.070	(0)
	AlF+2	4.069e-09	2.424e-09	-8.391	-8.616	-0.225	(0)
	ZnF+	1.816e-09	1.546e-09	-8.741	-8.811	-0.070	(0)
	BF (OH) 3-	1.210e-09	1.047e-09	-8.917	-8.980	-0.063	(0)
	NiF+	3.738e-10	3.182e-10	-9.427	-9.497	-0.070	(0)
	CoF+	3.111e-10	2.648e-10	-9.507	-9.577	-0.070	(0)
	PbF+	1.773e-11	1.509e-11	-10.751	-10.821	-0.070	(0)
	CdF+	1.514e-11	1.289e-11	-10.820	-10.890	-0.070	(0)
	HF2-	1.265e-11	1.101e-11	-10.898	-10.958	-0.060	(0)
	CrF+2	4.400e-12	2.311e-12	-11.357	-11.636	-0.280	(0)
	AgF	2.952e-12	2.952e-12	-11.530	-11.530	0.000	(0)
	BF2 (OH) 2-	1.525e-12	1.320e-12	-11.817	-11.880	-0.063	(0)
	UO2F+	8.779e-13	7.473e-13	-12.057	-12.126	-0.070	(0)
	UO2F2	3.580e-13	3.580e-13	-12.446	-12.446	0.000	(0)
	PbF2	4.932e-14	4.932e-14	-13.307	-13.307	0.000	(0)
	UO2F3-	1.754e-14	1.494e-14	-13.756	-13.826	-0.070	(0)
	CdF2	4.272e-15	4.272e-15	-14.369	-14.369	0.000	(0)
	VO2F	2.676e-15	2.676e-15	-14.573	-14.573	0.000	(0)
	H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
	FeF2+	5.128e-16	4.497e-16	-15.290	-15.347	-0.057	(0)
	VO2F2-	1.896e-16	1.614e-16	-15.722	-15.792	-0.070	(0)
	FeF+2	1.711e-16	1.012e-16	-15.767	-15.995	-0.228	(0)
	FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
	UO2F4-2	3.752e-17	1.970e-17	-16.426	-16.705	-0.280	(0)
	PbF3-	1.825e-17	1.554e-17	-16.739	-16.809	-0.070	(0)
	VOF+	1.031e-17	8.776e-18	-16.987	-17.057	-0.070	(0)
	BF3OH-	6.996e-18	6.054e-18	-17.155	-17.218	-0.063	(0)
	VO2F3-2	6.366e-19	3.343e-19	-18.196	-18.476	-0.280	(0)
	VOF2	5.466e-19	5.466e-19	-18.262	-18.262	0.000	(0)
	VOF3-	3.784e-21	3.221e-21	-20.422	-20.492	-0.070	(0)
	PbF4-2	2.352e-21	1.235e-21	-20.629	-20.908	-0.280	(0)
	BF4-	4.059e-22	3.512e-22	-21.392	-21.454	-0.063	(0)
	VO2F4-3	1.164e-22	2.732e-23	-21.934	-22.563	-0.629	(0)
	HgF+	2.926e-23	2.491e-23	-22.534	-22.604	-0.070	(0)
	VOF4-2	4.112e-24	2.159e-24	-23.386	-23.666	-0.280	(0)
	Sb (OH) 2F	9.870e-25	9.870e-25	-24.006	-24.006	0.000	(0)
	SbOF	9.709e-25	9.709e-25	-24.013	-24.013	0.000	(0)
	UF3+	1.651e-34	1.405e-34	-33.782	-33.852	-0.070	(0)
	UF2+2	1.017e-35	5.339e-36	-34.993	-35.273	-0.280	(0)
	UF4	2.560e-36	2.560e-36	-35.592	-35.592	0.000	(0)
	UF5-	1.979e-38	1.685e-38	-37.704	-37.773	-0.070	(0)
	UF+3	1.087e-38	2.553e-39	-37.964	-38.593	-0.629	(0)
	UF6-2	1.609e-39	8.450e-40	-38.793	-39.073	-0.280	(0)
Fe (2)	3.381e-11						
	Fe+2	2.709e-11	1.423e-11	-10.567	-10.847	-0.280	(0)
	FeSO4	5.732e-12	5.732e-12	-11.242	-11.242	0.000	(0)
	FeHCO3+	8.892e-13	7.833e-13	-12.051	-12.106	-0.055	(0)
	FeOH+	9.163e-14	8.034e-14	-13.038	-13.095	-0.057	(0)

Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.630e-19	4.060e-19	-18.334	-18.391	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.802	-158.802	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.148	-235.218	-0.070	(0)
Fe (3)	3.629e-09					
Fe (OH) 2+	3.195e-09	2.807e-09	-8.496	-8.552	-0.056	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.427e-12	5.646e-12	-11.192	-11.248	-0.056	(0)
FeOH+2	8.605e-14	5.087e-14	-13.065	-13.294	-0.228	(0)
FeF2+	5.128e-16	4.497e-16	-15.290	-15.347	-0.057	(0)
FeF+2	1.711e-16	1.012e-16	-15.767	-15.995	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.166e-17	1.023e-17	-16.933	-16.990	-0.057	(0)
Fe+3	1.872e-18	5.555e-19	-17.728	-18.255	-0.528	(0)
Fe (SO4) 2-	4.216e-19	3.589e-19	-18.375	-18.445	-0.070	(0)
FeCl+2	4.236e-20	2.504e-20	-19.373	-19.601	-0.228	(0)
FeCl2+	1.904e-22	1.670e-22	-21.720	-21.777	-0.057	(0)
FeHSeO3+2	4.700e-23	2.468e-23	-22.328	-22.608	-0.280	(0)
Fe2 (OH) 2+4	1.126e-24	8.568e-26	-23.948	-25.067	-1.119	(0)
FeCl3	2.493e-26	2.493e-26	-25.603	-25.603	0.000	(0)
Fe3 (OH) 4+5	1.946e-31	3.476e-33	-30.711	-32.459	-1.748	(0)
H (0)	4.021e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.115e-10					
Hg	2.115e-10	2.115e-10	-9.675	-9.675	0.000	(0)
Hg (1)	2.212e-21					
Hg2+2	1.106e-21	5.809e-22	-20.956	-21.236	-0.280	(0)
Hg (2)	2.956e-12					
HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
HgCl2	9.016e-13	9.016e-13	-12.045	-12.045	0.000	(0)
Hg (OH) 2	5.113e-13	5.136e-13	-12.291	-12.289	0.002	(0)
HgCl3-	1.581e-14	1.346e-14	-13.801	-13.871	-0.070	(0)
HgCO3	1.399e-14	1.399e-14	-13.854	-13.854	0.000	(0)
Hg (CO3) 2-2	2.433e-16	1.278e-16	-15.614	-15.894	-0.280	(0)
HgCl4-2	1.523e-16	7.999e-17	-15.817	-16.097	-0.280	(0)
HgCl+	1.416e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
HgOH+	2.684e-17	2.285e-17	-16.571	-16.641	-0.070	(0)
HgHCO3+	2.171e-17	1.849e-17	-16.663	-16.733	-0.070	(0)
Hg (OH) 3-	1.077e-20	9.170e-21	-19.968	-20.038	-0.070	(0)
Hg+2	7.704e-21	4.046e-21	-20.113	-20.393	-0.280	(0)
HgSO4	1.739e-21	1.739e-21	-20.760	-20.760	0.000	(0)
HgF+	2.926e-23	2.491e-23	-22.534	-22.604	-0.070	(0)
HgHS2-	0.000e+00	0.000e+00	-138.151	-138.221	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.976	-138.976	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.501	-139.780	-0.280	(0)
K	7.051e-04					
K+	6.970e-04	6.090e-04	-3.157	-3.215	-0.059	(0)
KSO4-	8.054e-06	7.076e-06	-5.094	-5.150	-0.056	(0)
KCrO4-	3.052e-19	2.598e-19	-18.515	-18.585	-0.070	(0)
Mg	1.722e-03					
Mg+2	1.414e-03	8.241e-04	-2.850	-3.084	-0.234	(0)
MgSO4	2.461e-04	2.461e-04	-3.609	-3.609	0.000	(0)
MgHCO3+	4.227e-05	3.688e-05	-4.374	-4.433	-0.059	(0)
MgF+	1.756e-05	1.536e-05	-4.756	-4.814	-0.058	(0)
MgCO3	1.980e-06	1.980e-06	-5.703	-5.703	0.000	(0)
MgOH+	5.270e-08	4.653e-08	-7.278	-7.332	-0.054	(0)
MgH2BO3+	4.269e-09	3.693e-09	-8.370	-8.433	-0.063	(0)
Mn (2)	2.354e-05					
Mn+2	1.944e-05	1.021e-05	-4.711	-4.991	-0.280	(0)
MnSO4	2.979e-06	2.979e-06	-5.526	-5.526	0.000	(0)
MnHCO3+	1.016e-06	8.907e-07	-5.993	-6.050	-0.057	(0)
MnF+	7.698e-08	6.750e-08	-7.114	-7.171	-0.057	(0)
MnCl+	2.188e-08	1.919e-08	-7.660	-7.717	-0.057	(0)
MnOH+	4.148e-09	3.637e-09	-8.382	-8.439	-0.057	(0)
MnCl2	4.045e-11	4.045e-11	-10.393	-10.393	0.000	(0)
MnCl3-	1.897e-14	1.663e-14	-13.722	-13.779	-0.057	(0)
MnSeO4	1.123e-14	1.123e-14	-13.950	-13.950	0.000	(0)
Mn (OH) 3-	5.157e-19	4.522e-19	-18.288	-18.345	-0.057	(0)

Mn (OH) 4-2	3.502e-25	2.071e-25	-24.456	-24.684	-0.228	(0)
MnSe	0.000e+00	0.000e+00	-42.775	-42.775	0.000	(0)
Mn (3)	6.457e-25					
Mn+3	6.457e-25	1.916e-25	-24.190	-24.718	-0.528	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.500	-43.728	-0.228	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.415	-47.477	-0.062	(0)
Mo	3.195e-07					
MoO4-2	3.192e-07	1.861e-07	-6.496	-6.730	-0.234	(0)
HMoO4-	3.086e-10	2.627e-10	-9.511	-9.580	-0.070	(0)
H2MoO4	1.366e-13	1.366e-13	-12.865	-12.865	0.000	(0)
Ag2MoO4	3.525e-24	3.525e-24	-23.453	-23.453	0.000	(0)
AlMo6O21-3	3.241e-40	0.000e+00	-39.489	-40.119	-0.629	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.796	-51.313	-2.517	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.327	-52.075	-1.748	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-53.323	-54.442	-1.119	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.716	-58.345	-0.629	(0)
Na	4.955e-03					
Na+	4.900e-03	4.282e-03	-2.310	-2.368	-0.059	(0)
NaSO4-	4.295e-05	3.773e-05	-4.367	-4.423	-0.056	(0)
NaHCO3	1.053e-05	1.053e-05	-4.978	-4.978	0.000	(0)
NaF	4.487e-07	4.487e-07	-6.348	-6.348	0.000	(0)
NaCO3-	2.622e-07	2.303e-07	-6.581	-6.638	-0.056	(0)
NaH2BO3	8.771e-10	8.771e-10	-9.057	-9.057	0.000	(0)
NaCrO4-	2.869e-18	2.443e-18	-17.542	-17.612	-0.070	(0)
Ni	2.132e-07					
Ni+2	1.309e-07	7.627e-08	-6.883	-7.118	-0.234	(0)
NiHCO3+	4.830e-08	4.112e-08	-7.316	-7.386	-0.070	(0)
NiSO4	2.497e-08	2.497e-08	-7.603	-7.603	0.000	(0)
NiCO3	8.220e-09	8.220e-09	-8.085	-8.085	0.000	(0)
NiF+	3.738e-10	3.182e-10	-9.427	-9.497	-0.070	(0)
NiCl+	3.422e-10	2.913e-10	-9.466	-9.536	-0.070	(0)
NiOH+	1.600e-10	1.362e-10	-9.796	-9.866	-0.070	(0)
Ni (SO4) 2-2	2.584e-12	1.357e-12	-11.588	-11.867	-0.280	(0)
Ni (OH) 2	1.534e-12	1.534e-12	-11.814	-11.814	0.000	(0)
NiCl2	2.190e-15	2.190e-15	-14.660	-14.660	0.000	(0)
Ni (OH) 3-	2.556e-16	2.176e-16	-15.592	-15.662	-0.070	(0)
NiSeO4	1.458e-16	1.458e-16	-15.836	-15.836	0.000	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.020e-08					
PbCO3	1.120e-08	1.120e-08	-7.951	-7.951	0.000	(0)
PbHCO3+	4.921e-09	4.189e-09	-8.308	-8.378	-0.070	(0)
Pb+2	2.212e-09	1.289e-09	-8.655	-8.890	-0.234	(0)
PbSO4	1.036e-09	1.036e-09	-8.985	-8.985	0.000	(0)
PbOH+	5.396e-10	4.593e-10	-9.268	-9.338	-0.070	(0)
Pb (CO3) 2-2	1.776e-10	9.328e-11	-9.751	-10.030	-0.280	(0)
PbCl+	8.022e-11	6.829e-11	-10.096	-10.166	-0.070	(0)
Pb (SO4) 2-2	1.951e-11	1.025e-11	-10.710	-10.989	-0.280	(0)
PbF+	1.773e-11	1.509e-11	-10.751	-10.821	-0.070	(0)
Pb (OH) 2	2.060e-12	2.060e-12	-11.686	-11.686	0.000	(0)
PbCl2	4.554e-13	4.554e-13	-12.342	-12.342	0.000	(0)
PbF2	4.932e-14	4.932e-14	-13.307	-13.307	0.000	(0)
Pb (OH) 3-	3.433e-16	2.922e-16	-15.464	-15.534	-0.070	(0)
PbCl3-	3.179e-16	2.706e-16	-15.498	-15.568	-0.070	(0)
Pb2OH+3	3.998e-17	9.387e-18	-16.398	-17.027	-0.629	(0)
PbF3-	1.825e-17	1.554e-17	-16.739	-16.809	-0.070	(0)
PbCl4-2	3.516e-19	1.846e-19	-18.454	-18.734	-0.280	(0)
Pb (OH) 4-2	1.933e-20	1.015e-20	-19.714	-19.994	-0.280	(0)
PbF4-2	2.352e-21	1.235e-21	-20.629	-20.908	-0.280	(0)
Pb3 (OH) 4+2	2.079e-22	1.092e-22	-21.682	-21.962	-0.280	(0)
Pb4 (OH) 4+4	1.470e-26	1.118e-27	-25.833	-26.951	-1.119	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.525	-150.525	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.607	-227.677	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.788	-72.788	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.383	-78.453	-0.070	(0)

H2S	0.000e+00	0.000e+00	-78.582	-78.582	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.685	-78.755	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.389	-80.669	-0.280	(0)
S6-2	0.000e+00	0.000e+00	-80.905	-81.185	-0.280	(0)
S4-2	0.000e+00	0.000e+00	-80.985	-81.264	-0.280	(0)
S3-2	0.000e+00	0.000e+00	-81.791	-82.070	-0.280	(0)
S2-2	0.000e+00	0.000e+00	-82.807	-83.086	-0.280	(0)
S-2	0.000e+00	0.000e+00	-88.375	-88.604	-0.228	(0)
HgHS2-	0.000e+00	0.000e+00	-138.151	-138.221	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.976	-138.976	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.501	-139.780	-0.280	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.071	-147.141	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.309	-147.476	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.188	-148.497	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.931	-149.227	-0.296	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.208	-149.277	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.451	-149.767	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.775	-150.078	-0.302	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.003	-150.003	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.416	-150.416	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.525	-150.525	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.802	-158.802	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.735	-215.805	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.519	-225.589	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.486	-226.556	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.607	-227.677	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.140	-228.420	-0.280	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.148	-235.218	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.533	-302.812	-0.280	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.222	-305.502	-0.280	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.981	-317.261	-0.280	(0)
S (6)	3.547e-03					
SO4-2	2.816e-03	1.641e-03	-2.550	-2.785	-0.234	(0)
CaSO4	4.310e-04	4.310e-04	-3.366	-3.366	0.000	(0)
MgSO4	2.461e-04	2.461e-04	-3.609	-3.609	0.000	(0)
NaSO4-	4.295e-05	3.773e-05	-4.367	-4.423	-0.056	(0)
KSO4-	8.054e-06	7.076e-06	-5.094	-5.150	-0.056	(0)
MnSO4	2.979e-06	2.979e-06	-5.526	-5.526	0.000	(0)
CuSO4	1.696e-07	1.696e-07	-6.771	-6.771	0.000	(0)
ZnSO4	1.675e-07	1.675e-07	-6.776	-6.776	0.000	(0)
NiSO4	2.497e-08	2.497e-08	-7.603	-7.603	0.000	(0)
CoSO4	1.651e-08	1.651e-08	-7.782	-7.782	0.000	(0)
HSO4-	1.301e-08	1.138e-08	-7.886	-7.944	-0.058	(0)
Zn (SO4) 2-2	4.558e-09	2.394e-09	-8.341	-8.621	-0.280	(0)
CdSO4	1.884e-09	1.884e-09	-8.725	-8.725	0.000	(0)
PbSO4	1.036e-09	1.036e-09	-8.985	-8.985	0.000	(0)
AgSO4-	2.721e-10	2.317e-10	-9.565	-9.635	-0.070	(0)
CrOHSO4	1.061e-10	1.061e-10	-9.974	-9.974	0.000	(0)
Cd (SO4) 2-2	7.942e-11	4.171e-11	-10.100	-10.380	-0.280	(0)
AlSO4+	2.125e-11	1.859e-11	-10.673	-10.731	-0.058	(0)
Pb (SO4) 2-2	1.951e-11	1.025e-11	-10.710	-10.989	-0.280	(0)
FeSO4	5.732e-12	5.732e-12	-11.242	-11.242	0.000	(0)
Ni (SO4) 2-2	2.584e-12	1.357e-12	-11.588	-11.867	-0.280	(0)
CrSO4+	3.952e-13	3.364e-13	-12.403	-12.473	-0.070	(0)
Al (SO4) 2-	3.737e-13	3.269e-13	-12.427	-12.486	-0.058	(0)
UO2SO4	8.096e-14	8.096e-14	-13.092	-13.092	0.000	(0)
UO2 (SO4) 2-2	3.335e-15	1.752e-15	-14.477	-14.757	-0.280	(0)
VO2SO4-	4.229e-16	3.600e-16	-15.374	-15.444	-0.070	(0)
FeSO4+	1.166e-17	1.023e-17	-16.933	-16.990	-0.057	(0)
Cr2 (OH) 2SO4+2	4.974e-18	2.612e-18	-17.303	-17.583	-0.280	(0)
VOSO4	3.982e-18	3.982e-18	-17.400	-17.400	0.000	(0)
Fe (SO4) 2-	4.216e-19	3.589e-19	-18.375	-18.445	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.546e-19	2.546e-19	-18.594	-18.594	0.000	(0)
HgSO4	1.739e-21	1.739e-21	-20.760	-20.760	0.000	(0)
CrO3SO4-2	1.781e-24	9.356e-25	-23.749	-24.029	-0.280	(0)
VSO4+	4.773e-32	4.063e-32	-31.321	-31.391	-0.070	(0)
U (SO4) 2	6.562e-40	6.562e-40	-39.183	-39.183	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.018	-40.298	-0.280	(0)

Sb (3)	1.059e-19					
Sb (OH) 3	5.358e-20	5.358e-20	-19.271	-19.271	0.000	(0)
HSbO2	5.232e-20	5.232e-20	-19.281	-19.281	0.000	(0)
SbO2-	1.403e-24	1.194e-24	-23.853	-23.923	-0.070	(0)
Sb (OH) 2F	9.870e-25	9.870e-25	-24.006	-24.006	0.000	(0)
SbOF	9.709e-25	9.709e-25	-24.013	-24.013	0.000	(0)
Sb (OH) 4-	8.032e-25	6.838e-25	-24.095	-24.165	-0.070	(0)
Sb (OH) 2+	1.085e-25	9.238e-26	-24.965	-25.034	-0.070	(0)
SbO+	3.742e-26	3.186e-26	-25.427	-25.497	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.981	-317.261	-0.280	(0)
Sb (5)	1.304e-08					
SbO3-	1.302e-08	1.108e-08	-7.885	-7.955	-0.070	(0)
Sb (OH) 6-	1.482e-11	1.295e-11	-10.829	-10.888	-0.059	(0)
SbO2+	1.882e-23	1.602e-23	-22.725	-22.795	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.323e-40	2.829e-40	-39.478	-39.548	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.775	-42.775	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.807	-42.807	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.120	-47.399	-0.280	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.191	-86.309	-1.119	(0)
Se (4)	2.155e-08					
HSeO3-	1.975e-08	1.682e-08	-7.704	-7.774	-0.070	(0)
SeO3-2	1.796e-09	9.433e-10	-8.746	-9.025	-0.280	(0)
H2SeO3	5.091e-13	5.091e-13	-12.293	-12.293	0.000	(0)
AgSeO3-	5.039e-15	4.289e-15	-14.298	-14.368	-0.070	(0)
Cd (SeO3) 2-2	6.839e-21	3.592e-21	-20.165	-20.445	-0.280	(0)
Ag (SeO3) 2-3	1.543e-22	3.623e-23	-21.812	-22.441	-0.629	(0)
FeHSeO3+2	4.700e-23	2.468e-23	-22.328	-22.608	-0.280	(0)
Se (6)	7.024e-12					
SeO4-2	7.012e-12	4.087e-12	-11.154	-11.389	-0.234	(0)
MnSeO4	1.123e-14	1.123e-14	-13.950	-13.950	0.000	(0)
ZnSeO4	2.952e-16	2.952e-16	-15.530	-15.530	0.000	(0)
NiSeO4	1.458e-16	1.458e-16	-15.836	-15.836	0.000	(0)
CoSeO4	1.033e-16	1.033e-16	-15.986	-15.986	0.000	(0)
HSeO4-	1.707e-17	1.454e-17	-16.768	-16.838	-0.070	(0)
CdSeO4	3.727e-18	3.727e-18	-17.429	-17.429	0.000	(0)
Zn (SeO4) 2-2	2.329e-27	1.223e-27	-26.633	-26.912	-0.280	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.903	-58.533	-0.629	(0)
U (4)	3.816e-22					
U (OH) 5-	3.807e-22	3.241e-22	-21.419	-21.489	-0.070	(0)
U (OH) 4	9.635e-25	9.635e-25	-24.016	-24.016	0.000	(0)
U (OH) 3+	2.938e-28	2.501e-28	-27.532	-27.602	-0.070	(0)
U (OH) 2+2	1.563e-32	8.209e-33	-31.806	-32.086	-0.280	(0)
UF3+	1.651e-34	1.405e-34	-33.782	-33.852	-0.070	(0)
UF2+2	1.017e-35	5.339e-36	-34.993	-35.273	-0.280	(0)
UF4	2.560e-36	2.560e-36	-35.592	-35.592	0.000	(0)
UOH+3	1.169e-37	2.745e-38	-36.932	-37.561	-0.629	(0)
UF5-	1.979e-38	1.685e-38	-37.704	-37.773	-0.070	(0)
UF+3	1.087e-38	2.553e-39	-37.964	-38.593	-0.629	(0)
UF6-2	1.609e-39	8.450e-40	-38.793	-39.073	-0.280	(0)
U (SO4) 2	6.562e-40	6.562e-40	-39.183	-39.183	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.018	-40.298	-0.280	(0)
U+4	0.000e+00	0.000e+00	-42.994	-44.113	-1.119	(0)
UCl+3	0.000e+00	0.000e+00	-44.610	-45.239	-0.629	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.939	-174.603	-5.664	(0)
U (5)	5.554e-17					
UO2+	5.554e-17	4.728e-17	-16.255	-16.325	-0.070	(0)
U (6)	8.263e-08					
UO2 (CO3) 2-2	4.114e-08	2.161e-08	-7.386	-7.665	-0.280	(0)
UO2 (CO3) 3-4	4.112e-08	3.128e-09	-7.386	-8.505	-1.119	(0)
UO2CO3	3.749e-10	3.749e-10	-9.426	-9.426	0.000	(0)
UO2F+	8.779e-13	7.473e-13	-12.057	-12.126	-0.070	(0)
UO2OH+	6.837e-13	5.820e-13	-12.165	-12.235	-0.070	(0)
UO2F2	3.580e-13	3.580e-13	-12.446	-12.446	0.000	(0)
UO2SO4	8.096e-14	8.096e-14	-13.092	-13.092	0.000	(0)
UO2+2	5.593e-14	3.260e-14	-13.252	-13.487	-0.234	(0)

UO2F3-	1.754e-14	1.494e-14	-13.756	-13.826	-0.070	(0)
UO2 (SO4) 2-2	3.335e-15	1.752e-15	-14.477	-14.757	-0.280	(0)
UO2Cl+	9.270e-17	7.891e-17	-16.033	-16.103	-0.070	(0)
UO2F4-2	3.752e-17	1.970e-17	-16.426	-16.705	-0.280	(0)
(UO2) 2 (OH) 2+2	1.070e-18	5.622e-19	-17.970	-18.250	-0.280	(0)
(UO2) 3 (OH) 5+	5.865e-21	4.993e-21	-20.232	-20.302	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.482	-40.552	-0.070	(0)
V+2	0.000e+00	0.000e+00	-40.934	-41.214	-0.280	(0)
V (3)	1.207e-13					
V (OH) 3	1.207e-13	1.207e-13	-12.918	-12.918	0.000	(0)
V (OH) 2+	6.504e-24	5.537e-24	-23.187	-23.257	-0.070	(0)
VOH+2	7.099e-27	3.728e-27	-26.149	-26.428	-0.280	(0)
V+3	2.234e-31	5.245e-32	-30.651	-31.280	-0.629	(0)
VSO4+	4.773e-32	4.063e-32	-31.321	-31.391	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.604	-51.233	-0.629	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.938	-52.057	-1.119	(0)
V (4)	3.244e-16					
V (OH) 3+	2.927e-16	2.492e-16	-15.534	-15.603	-0.070	(0)
VO+2	1.677e-17	8.809e-18	-16.775	-17.055	-0.280	(0)
VOF+	1.031e-17	8.776e-18	-16.987	-17.057	-0.070	(0)
VOSO4	3.982e-18	3.982e-18	-17.400	-17.400	0.000	(0)
VOF2	5.466e-19	5.466e-19	-18.262	-18.262	0.000	(0)
VOC1+	4.334e-20	3.689e-20	-19.363	-19.433	-0.070	(0)
VOF3-	3.784e-21	3.221e-21	-20.422	-20.492	-0.070	(0)
VOF4-2	4.112e-24	2.159e-24	-23.386	-23.666	-0.280	(0)
H2V2O4+2	5.931e-27	3.115e-27	-26.227	-26.507	-0.280	(0)
V (5)	1.136e-07					
H2VO4-	1.073e-07	9.135e-08	-6.969	-7.039	-0.070	(0)
HVO4-2	6.156e-09	3.233e-09	-8.211	-8.490	-0.280	(0)
H3VO4	6.483e-11	6.483e-11	-10.188	-10.188	0.000	(0)
H3V2O7-	4.493e-11	3.825e-11	-10.347	-10.417	-0.070	(0)
HV2O7-3	4.263e-13	1.001e-13	-12.370	-13.000	-0.629	(0)
VO2+	1.051e-14	9.186e-15	-13.978	-14.037	-0.059	(0)
V3O9-3	3.403e-15	7.990e-16	-14.468	-15.097	-0.629	(0)
VO2F	2.676e-15	2.676e-15	-14.573	-14.573	0.000	(0)
VO4-3	9.724e-16	2.283e-16	-15.012	-15.641	-0.629	(0)
V2O7-4	4.991e-16	3.797e-17	-15.302	-16.421	-1.119	(0)
VO2SO4-	4.229e-16	3.600e-16	-15.374	-15.444	-0.070	(0)
VO2F2-	1.896e-16	1.614e-16	-15.722	-15.792	-0.070	(0)
VO2F3-2	6.366e-19	3.343e-19	-18.196	-18.476	-0.280	(0)
V4O12-4	4.001e-19	3.043e-20	-18.398	-19.517	-1.119	(0)
VO2F4-3	1.164e-22	2.732e-23	-21.934	-22.563	-0.629	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.295	-49.044	-1.748	(0)
V10O28-6	0.000e+00	0.000e+00	-47.564	-50.081	-2.517	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.866	-50.985	-1.119	(0)
Zn	1.138e-06					
Zn+2	8.003e-07	4.664e-07	-6.097	-6.331	-0.234	(0)
ZnSO4	1.675e-07	1.675e-07	-6.776	-6.776	0.000	(0)
ZnCO3	7.754e-08	7.754e-08	-7.110	-7.110	0.000	(0)
ZnHCO3+	7.577e-08	6.450e-08	-7.120	-7.190	-0.070	(0)
ZnOH+	7.771e-09	6.616e-09	-8.109	-8.179	-0.070	(0)
Zn (SO4) 2-2	4.558e-09	2.394e-09	-8.341	-8.621	-0.280	(0)
ZnCl+	2.005e-09	1.749e-09	-8.698	-8.757	-0.059	(0)
ZnF+	1.816e-09	1.546e-09	-8.741	-8.811	-0.070	(0)
ZnOHC1	3.248e-10	3.248e-10	-9.488	-9.488	0.000	(0)
Zn (OH) 2	1.487e-10	1.487e-10	-9.828	-9.828	0.000	(0)
ZnCl2	4.138e-12	4.138e-12	-11.383	-11.383	0.000	(0)
Zn (OH) 3-	1.242e-13	1.057e-13	-12.906	-12.976	-0.070	(0)
ZnCl3-	5.624e-15	4.907e-15	-14.250	-14.309	-0.059	(0)
ZnSeO4	2.952e-16	2.952e-16	-15.530	-15.530	0.000	(0)
ZnCl4-2	6.195e-18	3.663e-18	-17.208	-17.436	-0.228	(0)
Zn (OH) 4-2	1.137e-18	5.969e-19	-17.944	-18.224	-0.280	(0)
Zn (SeO4) 2-2	2.329e-27	1.223e-27	-26.633	-26.912	-0.280	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.208	-149.277	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.416	-150.416	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.519	-225.589	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.140	-228.420	-0.280	(0)

Zn(HS) 4-2 0.000e+00 0.000e+00 -305.222 -305.502 -0.280 (0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Acanthite	-51.38	-87.60	-36.22	Ag ₂ S
Ag ₂ CO ₃	-10.75	-21.84	-11.09	Ag ₂ CO ₃
Ag ₂ CrO ₄	-20.65	-32.24	-11.59	Ag ₂ CrO ₄
Ag ₂ HVO ₄	-10.37	-8.89	1.48	Ag ₂ HVO ₄
Ag ₂ MoO ₄	-11.48	-23.03	-11.55	Ag ₂ MoO ₄
Ag ₂ O	-14.58	-2.00	12.57	Ag ₂ O
Ag ₂ Se	0.00	-48.70	-48.70	Ag ₂ Se
Ag ₂ SeO ₃	-9.78	-16.93	-7.15	Ag ₂ SeO ₃
Ag ₂ SeO ₄	-18.78	-27.69	-8.91	Ag ₂ SeO ₄
Ag ₂ SO ₄	-14.27	-19.09	-4.82	Ag ₂ SO ₄
Ag ₃ AsO ₃	-26.92	-24.76	2.16	Ag ₃ AsO ₃
Ag ₃ AsO ₄	-15.33	-18.11	-2.79	Ag ₃ AsO ₄
Ag ₃ H ₂ VO ₅	-15.07	-9.89	5.18	Ag ₃ H ₂ VO ₅
AgF·4H ₂ O	-12.98	-11.93	1.05	AgF·4H ₂ O
Agmetal	-0.27	-13.77	-13.51	Ag
AgVO ₃	-8.66	-7.89	0.77	AgVO ₃
Al(OH) 3 (am)	-1.19	9.61	10.80	Al(OH) 3
Al ₂ (MoO ₄) 3	-46.23	-43.86	2.37	Al ₂ (MoO ₄) 3
Al ₂ O ₃	-0.43	19.22	19.65	Al ₂ O ₃
Al ₄ (OH) 10SO ₄	-1.34	21.36	22.70	Al ₄ (OH) 10SO ₄
AlAsO ₄ ·2H ₂ O	-10.30	-5.50	4.80	AlAsO ₄ ·2H ₂ O
AlOHSO ₄	-4.24	-7.47	-3.23	AlOHSO ₄
AlSb	-151.92	-86.29	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl ₃ (SO ₄) 2 (OH) 6
Anglesite	-3.88	-11.67	-7.79	PbSO ₄
Anhydrite	-1.37	-5.73	-4.36	CaSO ₄
Anilite	-54.93	-86.81	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-2.02	6.77	8.79	Cu ₃ (OH) 4SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-84.26	-87.02	-2.76	As ₄ O ₆
Artinite	-7.01	2.59	9.60	MgCO ₃ :Mg (OH) 2:3H ₂ O
As ₂ O ₅	-36.92	-30.22	6.71	As ₂ O ₅
Atacamite	-1.46	5.93	7.39	Cu ₂ (OH) 3Cl
Azurite	1.09	-15.82	-16.91	Cu ₃ (OH) 2 (CO ₃) 2
Ba(OH) 2:8H ₂ O	-17.29	7.10	24.39	Ba(OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-15.44	0.43	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	0.00	-8.91	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-25.41	7.53	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-13.47	-23.14	-9.67	BaCrO ₄
BaF ₂	-8.93	-14.75	-5.82	BaF ₂
BaMoO ₄	-6.97	-13.93	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.65	-7.82	1.83	BaSeO ₃
BaSeO ₄	-11.12	-18.58	-7.46	BaSeO ₄
Bianchite	-7.35	-9.12	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-8.59	9.50	18.09	MnO ₂
Bixbyite	-5.90	-6.54	-0.64	Mn ₂ O ₃
BlaubleiI	-54.71	-78.87	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.26	-82.53	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.03	9.61	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.50	14.72	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-5.63	11.21	16.84	Mg(OH) 2
Bunsenite	-5.27	7.18	12.45	NiO
Ca(VO ₃) 2	-8.08	-2.42	5.66	Ca(VO ₃) 2
Ca ₂ V ₂ O ₇	-8.56	8.94	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.61	8.94	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-18.45	3.85	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-18.67	20.29	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-19.57	20.29	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-300.71	-157.74	142.97	Ca ₃ Sb ₂

CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.98	-26.89	-17.91	Hg2Cl2
CaMoO4	-1.72	-9.67	-7.95	CaMoO4
Carnotite	-2.37	-2.14	0.23	KUO2VO4
CaSeO3:2H2O	-6.38	-3.57	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.31	-14.33	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.45	-3.61	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.91	-16.20	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.68	0.88	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.53	6.87	28.40	Cd4(OH)6SO4
CdCl2	-13.30	-13.96	-0.66	CdCl2
CdCl2:1H2O	-12.27	-13.96	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.05	-13.96	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO4	-0.89	-15.04	-14.15	CdMoO4
CdOHCl	-7.52	-3.99	3.54	CdOHCl
CdSb	-76.79	-77.14	-0.35	CdSb
CdSe	-20.51	-40.71	-20.20	CdSe
CdSeO4:2H2O	-17.85	-19.70	-1.85	CdSeO4:2H2O
CdSO4	-10.92	-11.09	-0.17	CdSO4
CdSO4:1H2O	-9.37	-11.10	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.22	-11.10	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.23	-10.98	-9.75	AgCl
Cerrusite	-1.30	-14.43	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.49	-9.13	-2.64	CuSO4:5H2O
Chalcocite	-54.94	-89.86	-34.92	Cu2S
Chalcopyrite	-124.53	-159.80	-35.27	CuFeS2
Cinnabar	-52.20	-97.89	-45.69	HgS
Claudetite	-83.96	-87.02	-3.06	As4O6
Clausthalite	-14.19	-41.29	-27.10	PbSe
Co(BO2)2	-29.67	-2.60	27.07	Co(BO2)2
Co(OH)2	-6.09	7.00	13.09	Co(OH)2
Co(OH)3	-10.32	-12.63	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-22.25	-9.22	13.03	Co3(AsO4)2
Co3O4	-7.76	-18.25	-10.50	Co3O4
CoCl2	-21.22	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.95	-45.41	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.27	-14.03	-7.76	CoMoO4
CoO	-6.59	7.00	13.59	CoO
CoS(alpha)	-71.16	-78.60	-7.44	CoS
CoS(beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.50	-39.70	-16.20	CoSe
CoSeO3	-9.24	-7.92	1.32	CoSeO3
CoSeO4:6H2O	-17.16	-18.69	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.08	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.76	-14.54	-4.78	PbCl2
Covellite	-55.35	-77.65	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.05	-30.95	14.09	CrCl2
CrCl3	-46.22	-31.10	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3

Cryolite	-7.78	-41.62	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.72	7.95	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-24.71	20.50	45.21	Cu(SbO ₃) ₂
Cu ₂ Sb·3H ₂ O	-55.20	-90.08	-34.88	Cu ₂ Sb·3H ₂ O
Cu ₂ Se(alpha)	-5.16	-50.96	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.39	-21.34	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-12.46	-6.36	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-59.70	-102.30	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-26.21	-89.70	-63.49	Cu ₃ Se ₂
CuCO ₃	-0.39	-11.89	-11.50	CuCO ₃
CuCrO ₄	-16.85	-22.29	-5.44	CuCrO ₄
CuF	-8.15	-13.06	-4.91	CuF
CuF ₂	-15.02	-13.91	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-9.36	-13.91	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-6.15	-14.90	-8.76	Cu
CuMoO ₄	0.00	-13.08	-13.08	CuMoO ₄
CuOCuSO ₄	-11.48	-1.18	10.30	CuOCuSO ₄
Cupricferrite	8.35	14.33	5.99	CuFe ₂ O ₄
Cuprite	-2.85	-4.26	-1.41	Cu ₂ O
Cuprousferrite	9.98	1.06	-8.92	CuFeO ₂
CuSe	-5.65	-38.75	-33.10	CuSe
CuSe ₂	-26.53	-59.90	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-7.48	-6.97	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-15.30	-17.74	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.07	-9.13	2.94	CuSO ₄
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-55.14	-89.06	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO ₃) ₂
Epsomite	-3.74	-5.87	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.11	3.45	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.24	0.20	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-6.61	-10.33	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-10.09	-8.54	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-17.76	-38.39	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-41.13	-44.87	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-12.32	-11.92	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.11	1.09	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.49	-17.58	-10.09	FeMoO ₄
Ferrihydrite	-0.00	3.19	3.19	Fe(OH) ₃
Ferroselite	-45.80	-64.40	-18.60	FeSe ₂
FeS(ppt)	-79.20	-82.15	-2.95	FeS
FeSe	-32.25	-43.25	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF ₂
Galena	-66.22	-80.19	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al(OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.11	-9.12	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-65.25	-79.61	-14.36	CdS
Greigite	-287.54	-332.57	-45.03	Fe ₃ S ₄
Gummite	-6.86	0.81	7.67	UO ₃
Gypsum	-1.12	-5.73	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-12.49	-24.59	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.15	-21.03	-12.88	H ₂ MoO ₄
H ₂ S(g)	-77.59	-85.60	-8.01	H ₂ S
H ₂ Se(g)	-41.74	-46.70	-4.96	H ₂ Se
Halite	-6.80	-5.19	1.60	NaCl
Hausmannite	-7.57	53.46	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-0.22	22.67	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-182.61	-256.32	-73.71	Hg(CH ₃) ₂
Hg(g)	-8.37	-16.24	-7.87	Hg
Hg(OH) ₂	-8.79	-12.29	-3.50	Hg(OH) ₂
Hg ₂ (g)	-17.53	-32.48	-14.96	Hg ₂
Hg ₂ (OH) ₂	-12.20	-6.94	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-10.73	-26.78	-16.05	Hg ₂ CO ₃

Hg2CrO4	-28.48	-37.18	-8.70	Hg2CrO4
Hg2F2	-18.43	-28.80	-10.36	Hg2F2
Hg2S	-80.86	-92.54	-11.68	Hg2S
Hg2SeO3	-17.20	-21.86	-4.66	Hg2SeO3
Hg2SO4	-17.89	-24.02	-6.13	Hg2SO4
Hg3O2CO3	-27.02	-56.70	-29.68	Hg3O2CO3
HgCl (g)	-32.94	-13.44	19.50	HgCl
HgCl2	-10.98	-32.24	-21.26	HgCl2
HgF (g)	-47.07	-14.40	32.68	HgF
HgF2 (g)	-46.71	-34.15	12.57	HgF2
Hgmetal (l)	-2.79	-16.24	-13.45	Hg
HgSe	-3.29	-58.99	-55.69	HgSe
HgSeO3	-14.78	-27.21	-12.43	HgSeO3
HgSO4	-19.95	-29.37	-9.42	HgSO4
Huntite	-4.38	-34.35	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.68	-23.45	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.51	-23.28	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.45	-20.62	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.86	-20.66	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.37	-52.61	-17.24	K2Cr2O7
K2CrO4	-21.86	-22.37	-0.51	K2CrO4
K2MoO4	-16.42	-13.16	3.26	K2MoO4
K2SeO4	-17.09	-17.82	-0.73	K2SeO4
Langite	-2.76	14.72	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.83	-6.27	-0.43	PbO : PbSO4
Laurionite	-5.19	-4.57	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.29	5.41	12.69	PbO
Mackinawite	-78.55	-82.15	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.37	-3.93	-5.31	Cu2 (OH) 2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.49	5.41	12.89	PbO
Matlockite	-6.52	-15.50	-8.97	PbClF
Melanothallite	-18.26	-12.00	6.26	CuCl2
Melanterite	-11.42	-13.63	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.80	-97.89	-45.09	HgS
Mg (OH) 2 (active)	-7.58	11.21	18.79	Mg (OH) 2
Mg (VO3) 2	-13.84	-2.56	11.28	Mg (VO3) 2
Mg2Sb3	-276.11	-201.43	74.68	Mg2Sb3
Mg2V2O7	-17.71	8.65	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.96	-9.81	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.77	-3.71	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.27	-14.47	-1.20	MgSeO4 : 6H2O
Minium	-31.75	41.77	73.52	Pb3O4
Mirabilite	-6.41	-7.52	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.37	-4.47	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.08	-57.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.14	-90.06	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-14.80	-2.30	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.36	-10.64	2.72	MnCl2 : 4H2O
MnS (grn)	-76.46	-76.29	0.17	MnS
MnS (pnk)	-79.63	-76.29	3.34	MnS
MnSb	-96.27	-99.18	-2.91	MnSb
MnSe	-40.89	-37.39	3.50	MnSe
MnSeO3	-6.75	-5.62	1.13	MnSeO3
MnSeO3 : 2H2O	-6.60	-5.62	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-14.33	-16.38	-2.05	MnSeO4 : 5H2O
MnSO4	-10.36	-7.78	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.65	-12.29	-3.64	HgO

MoO3	-13.03	-21.03	-8.00	MoO3
Morenosite	-7.76	-9.90	-2.14	NiSO4:7H2O
MoS2	-147.52	-217.78	-70.26	MoS2
Na-Jarosite	-8.61	-19.81	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.68	2.93	Na2CrO4
Na2Mo2O7	-15.90	-32.50	-16.60	Na2Mo2O7
Na2MoO4	-12.96	-11.47	1.49	Na2MoO4
Na2MoO4:2H2O	-12.69	-11.47	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.66	-5.36	10.30	Na2SeO3:5H2O
Na2SeO4	-17.41	-16.13	1.28	Na2SeO4
Na3Sb	-176.02	-81.56	94.45	Na3Sb
Na3VO4	-29.23	7.45	36.68	Na3VO4
Na4V2O7	-32.05	5.35	37.40	Na4V2O7
Nantokite	-5.38	-12.11	-6.73	CuCl
NaSb	-88.75	-65.58	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-5.97	-2.11	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.61	7.18	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.38	-8.68	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.36	11.64	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.71	-13.85	-11.14	NiMoO4
NiS(alpha)	-72.82	-78.42	-5.60	NiS
NiS(beta)	-67.32	-78.42	-11.10	NiS
NiS(gamma)	-65.62	-78.42	-12.80	NiS
NiSe	-21.82	-39.52	-17.70	NiSe
NiSeO3:2H2O	-10.56	-7.74	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.99	-18.51	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-239.25	-300.32	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.71	-4.19	6.52	Pb(BO2)2
Pb(OH)2	-2.74	5.41	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-56.18	-64.94	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.95	0.84	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.37	10.82	26.19	Pb2O(OH)2
Pb2O3	-24.68	36.36	61.04	Pb2O3
Pb2OCO3	-8.46	-9.02	-0.56	Pb2OCO3
Pb2V2O7	-1.06	-2.96	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.79	-13.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.69	2.45	6.14	Pb3(VO4)2
Pb3O2CO3	-14.63	-3.61	11.02	Pb3O2CO3
Pb3O2SO4	-11.54	-0.86	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.55	4.55	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.33	4.55	21.88	Pb4O3SO4
PbCrO4	-12.23	-24.83	-12.60	PbCrO4
PbF2	-9.01	-16.45	-7.44	PbF2
Pbmetal	-24.38	-20.14	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.57	5.41	12.98	PbO:0.33H2O
PbSeO4	-13.44	-20.28	-6.84	PbSeO4
Periclase	-10.37	11.21	21.58	MgO
Phosgenite	-9.16	-28.97	-19.81	PbCl2:PbCO3
Plattnerite	-18.65	30.95	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.70	-142.21	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.38	-120.13	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-12.16	-19.27	-7.11	Sb(OH)3
Sb2O4	-16.40	-13.00	3.40	Sb2O4
Sb2O5	-26.40	-36.07	-9.67	Sb2O5

Sb2Se3	-110.88	-178.63	-67.76	Sb2Se3
Sb4O6(cubic)	-58.82	-77.08	-18.26	Sb4O6
Sb4O6(orth)	-59.18	-77.08	-17.90	Sb4O6
SbCl3	-49.77	-49.20	0.57	SbCl3
SbF3	-41.83	-52.06	-10.23	SbF3
Sbmetal	-45.90	-57.59	-11.69	Sb
SbO2	-2.98	-30.81	-27.82	SbO2
Schoepite	-5.18	0.81	5.99	UO2(OH)2·H2O
Semetal(am)	-14.04	-21.15	-7.11	Se
Semetal(hex)	-13.44	-21.15	-7.71	Se
Senarmontite	-26.18	-38.54	-12.37	Sb2O3
SeO2	-15.05	-14.92	0.12	SeO2
SeO3	-46.73	-25.69	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.18	-77.63	-11.45	ZnS
Spinel	-6.41	30.44	36.85	MgAl2O4
Stibnite	-244.89	-295.35	-50.46	Sb2S3
Sulfur	-57.91	-60.06	-2.14	S
Tenorite	0.31	7.95	7.64	CuO
Thenardite	-7.84	-7.52	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3·H2O
Tyuyamunite	-4.88	-0.80	4.08	Ca(UO2)2(VO4)2
U3O8	-16.55	4.54	21.08	U3O8
U3Sb4	-582.56	-430.17	152.38	U3Sb4
U4O9	-33.51	-36.53	-3.02	U4O9
UF4	-29.69	-59.23	-29.54	UF4
UF4·2.5H2O	-26.51	-59.23	-32.72	UF4·2.5H2O
UO2(am)	-16.45	-15.52	0.93	UO2
UO2(OH)2(beta)	-4.80	0.81	5.61	UO2(OH)2
UO2SeO4·4H2O	-22.63	-24.88	-2.25	UO2SeO4·4H2O
UO3	-6.89	0.81	7.70	UO3
Uraninite	-10.85	-15.52	-4.67	UO2
USb2	-220.58	-191.00	29.58	USb2
V(OH)3	-17.42	-9.83	7.59	V(OH)3
V2O5	-12.42	-13.78	-1.36	V2O5
V3O5	-35.65	-33.82	1.84	V3O5
V4O7	-43.76	-36.57	7.19	V4O7
V6O13	-31.56	-92.42	-60.86	V6O13
Valentinite	-30.06	-38.54	-8.48	Sb2O3
VC12	-61.43	-42.56	18.87	VC12
VC13	-63.19	-39.76	23.43	VC13
VF4	-61.40	-46.47	14.93	VF4
Vmetal	-92.18	-48.15	44.03	V
VO	-37.36	-22.61	14.76	VO
VO(OH)2	-7.91	-2.76	5.15	VO(OH)2
VO2Cl	-19.70	-16.86	2.84	VO2Cl
VOC1	-30.96	-19.81	11.15	VOC1
VOC12	-35.47	-22.71	12.76	VOC12
VOSO4	-23.45	-19.84	3.61	VOSO4
Witherite	-4.16	-12.73	-8.57	BaCO3
Wurtzite	-68.68	-77.63	-8.95	ZnS
Zincite	-3.37	7.97	11.33	ZnO
Zincosite	-13.05	-9.12	3.93	ZnSO4
Zn(BO2)2	-9.93	-1.64	8.29	Zn(BO2)2
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.51	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.79	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.57	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.77	7.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.65	-1.15	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.23	5.96	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-19.97	-6.32	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-29.18	-10.27	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.62	14.78	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.62	19.88	38.50	Zn5(OH)8Cl2
ZnCl2	-19.03	-11.98	7.05	ZnCl2
ZnCO3·1H2O	-1.61	-11.87	-10.26	ZnCO3·1H2O

ZnF2	-13.36	-13.89	-0.53	ZnF2
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO4	-2.94	-13.06	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO
ZnS(am)	-68.58	-77.63	-9.05	ZnS
ZnSb	-86.18	-75.17	11.01	ZnSb
ZnSe	-24.33	-38.73	-14.40	ZnSe
ZnSeO4:6H2O	-16.20	-17.72	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.48	-9.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 55.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 301
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 301
USE Surface 301
USE Solution 303
SAVE Solution 304  #Initial Stage 3 groundwater after Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 301.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

1.142e-15  Surface + diffuse layer charge, eq
7.815e-08  Surface charge, eq
4.399e-03  sigma, C/m^2
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m^2/mol Ferrihydrite
1.714e+00  m^2 for 2.670e-05 moles of Ferrihydrite

```

Water in diffuse layer: 1.714e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451\text{e-}02$ (= c_DL / c_free if z is +1).

Element	Moles
C	4.3796e-11
Ca	5.4278e-13
Cl	8.7702e-10

H	1.2920e-10
K	8.6106e-13
Mg	8.4095e-14
N	3.5505e-09
Na	3.6482e-12
O	1.5825e-07
S	3.6875e-08

Hfo_s

1.335e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.925e-08	0.668	8.925e-08	-7.049
Hfo_sOH	4.377e-08	0.328	4.377e-08	-7.359
Hfo_sO-	4.918e-10	0.004	4.918e-10	-9.308
Hfo_sOHCa+2	1.629e-12	0.000	1.629e-12	-11.788

Hfo_w

5.341e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.468e-06	0.462	2.468e-06	-5.608
Hfo_wOH	1.210e-06	0.227	1.210e-06	-5.917
Hfo_wSO4-	8.335e-07	0.156	8.335e-07	-6.079
Hfo_wOHSO4-2	8.156e-07	0.153	8.156e-07	-6.089
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.867
Hfo_wOMg+	1.922e-14	0.000	1.922e-14	-13.716
Hfo_wOCa+	6.520e-15	0.000	6.520e-15	-14.186

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 303. Solution after simulation 54.
 Using surface 301.
 Using pure phase assemblage 301. Pure-phase assemblage after simulation 54.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.514e-08	2.147e-08	-3.673e-09
Alunite	-0.00	-1.40	-1.40	8.403e-07	8.404e-07	1.500e-10
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.01	-9.92	-8.91	2.018e-08	0	-2.018e-08
Barite	0.00	-9.98	-9.98	1.285e-06	1.346e-06	6.054e-08
Brochantite	-1.05	14.17	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.21	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.253e-06

CaMoO4	-1.58	-9.53	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.55	-3.74	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.820e-03	2.819e-03	-6.520e-07
Carnotite	-4.15	-3.92	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.46	-3.62	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.75	-14.90	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.031e-08	3.833e-08	-2.198e-08
Cu2Se(alpha)	-5.61	-51.41	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.209e-07	9.929e-08	-1.216e-07
Epsomite	-3.74	-5.87	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.670e-05	2.670e-05	-5.215e-13
Fluorite	0.00	-10.50	-10.50	1.051e-04	1.051e-04	9.762e-09
Gummite	-6.86	0.81	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.47	-59.16	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.41	-7.52	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.92	-5.79	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.39	-9.69	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.57	-13.71	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.407e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.587e-09	0	-5.587e-09
Rutherfordine	-4.53	-19.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.81	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.18	0.81	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.43	-4.35	4.08	0.000e+00	0	0.000e+00
U3O8	-16.55	4.54	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.80	0.81	5.61	0.000e+00	0	0.000e+00
UO3	-6.89	0.81	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.80	-12.93	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-6.176e-20 Surface + diffuse layer charge, eq
3.722e-07 Surface charge, eq
2.095e-02 sigma, C/m²
5.549e-02 psi, V
-2.160e+00 -F*psi/RT
1.153e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.714e+00 m² for 2.670e-05 moles of Ferrihydrite

Water in diffuse layer: 1.714e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.332e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.954e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	6.7816e-13
Al	4.8728e-11
As	3.4738e-15
B	2.7412e-10
Ba	6.9782e-13
C	1.5748e-07
Ca	2.0544e-08
Cd	1.0198e-13
Cl	4.9192e-08

Co	1.1216e-12
Cr	6.5781e-14
Cu	1.0788e-10
F	5.7097e-09
Fe	4.0406e-14
H	1.6993e-07
Hg	3.6759e-15
K	7.3471e-09
Mg	1.3458e-08
Mn	1.8059e-10
Mo	2.1286e-11
N	8.4255e-14
Na	5.1454e-08
Ni	1.8620e-12
O	1.0708e-06
Pb	1.7578e-13
S	1.4932e-07
Sb	3.7532e-13
Se	4.4000e-13
U	7.6035e-12
V	5.6850e-14
Zn	1.0090e-11

Hfo_s

1.335e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.597e-08	0.569	7.600e-08	-7.119
Hfo_sOCrOH+	4.396e-08	0.329	4.398e-08	-7.357
Hfo_sOPb+	1.046e-08	0.078	1.046e-08	-7.980
Hfo_sOZn+	1.350e-09	0.010	1.351e-09	-8.869
Hfo_sOMn+	1.215e-09	0.009	1.216e-09	-8.915
Hfo_sOHCa+2	2.620e-10	0.002	2.621e-10	-9.582
Hfo_sOH	1.840e-10	0.001	1.841e-10	-9.735
Hfo_sONi+	5.334e-11	0.000	5.336e-11	-10.273
Hfo_sOH2+	2.938e-11	0.000	2.939e-11	-10.532
Hfo_sO-	2.641e-11	0.000	2.642e-11	-10.578
Hfo_sOCu+	5.224e-12	0.000	5.227e-12	-11.282
Hfo_sOCd+	4.316e-12	0.000	4.318e-12	-11.365
Hfo_sOAg	4.268e-13	0.000	4.270e-13	-12.370
Hfo_sOHBa+2	4.505e-14	0.000	4.507e-14	-13.346
Hfo_sOFe+	2.133e-14	0.000	2.134e-14	-13.671
Hfo_sOHg+	6.900e-17	0.000	6.903e-17	-16.161

Hfo_w

5.341e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.550e-06	0.477	2.551e-06	-5.593
Hfo_wOH	1.204e-06	0.225	1.205e-06	-5.919
Hfo_wOHSO4-2	9.160e-07	0.172	9.164e-07	-6.038
Hfo_wOH2+	1.922e-07	0.036	1.923e-07	-6.716
Hfo_wO-	1.728e-07	0.032	1.729e-07	-6.762
Hfo_wOHVO4-3	1.117e-07	0.021	1.117e-07	-6.952
Hfo_wSO4-	7.331e-08	0.014	7.335e-08	-7.135
Hfo_wOMg+	4.051e-08	0.008	4.053e-08	-7.392
Hfo_wOHAsO4-3	4.051e-08	0.008	4.053e-08	-7.392
Hfo_wOZn+	9.254e-09	0.002	9.258e-09	-8.033
Hfo_wOHSeO3-2	8.470e-09	0.002	8.474e-09	-8.072
Hfo_wOMn+	6.316e-09	0.001	6.319e-09	-8.199
Hfo_wOHMoO4-2	5.830e-09	0.001	5.832e-09	-8.234
Hfo_wOCa+	3.170e-09	0.001	3.171e-09	-8.499
Hfo_wOPb+	3.058e-09	0.001	3.059e-09	-8.514
Hfo_wSeO3-	2.297e-09	0.000	2.298e-09	-8.639
Hfo_wMoO4-	6.010e-10	0.000	6.013e-10	-9.221
Hfo_wONi+	4.709e-10	0.000	4.711e-10	-9.327

Hfo_wOCO+	9.636e-11	0.000	9.640e-11	-10.016
Hfo_wH2BO3	7.932e-11	0.000	7.936e-11	-10.100
Hfo_wHAsO4-	2.312e-11	0.000	2.313e-11	-10.636
Hfo_wOCd+	1.205e-11	0.000	1.205e-11	-10.919
Hfo_wOAg	7.346e-13	0.000	7.350e-13	-12.134
Hfo_wH2AsO4	1.194e-13	0.000	1.195e-13	-12.923
Hfo_wOFe+	8.808e-14	0.000	8.812e-14	-13.055
Hfo_wOHg+	2.212e-14	0.000	2.213e-14	-13.655
Hfo_wOBa+	7.878e-15	0.000	7.882e-15	-14.103
Hfo_wOHSbO(OH) 4-	2.699e-15	0.000	2.700e-15	-14.569
Hfo_wOHSeO4-2	1.565e-15	0.000	1.566e-15	-14.805
Hfo_wSbO(OH) 4	2.783e-16	0.000	2.784e-16	-15.555
Hfo_wSeO4-	1.091e-16	0.000	1.092e-16	-15.962
Hfo_wOHCrO4-2	8.252e-17	0.000	8.256e-17	-16.083
Hfo_wCrO4-	6.024e-18	0.000	6.026e-18	-17.220
Hfo_wH2AsO3	1.700e-23	0.000	1.700e-23	-22.769

-----Solution composition-----

Elements	Molality	Moles
Ag	4.058e-08	4.056e-08
Al	1.993e-06	1.992e-06
As	8.121e-11	8.117e-11
B	1.589e-05	1.589e-05
Ba	1.126e-07	1.125e-07
C	5.854e-03	5.851e-03
Ca	2.512e-03	2.511e-03
Cd	1.158e-08	1.158e-08
Cl	1.708e-03	1.708e-03
Co	1.358e-07	1.357e-07
Cr	6.407e-09	6.404e-09
Cu	6.619e-06	6.616e-06
F	2.121e-04	2.120e-04
Fe	3.663e-09	3.662e-09
Hg	2.144e-10	2.143e-10
K	7.051e-04	7.048e-04
Mg	1.722e-03	1.721e-03
Mn	2.353e-05	2.352e-05
Mo	4.403e-07	4.401e-07
N	3.552e-09	3.550e-09
Na	4.954e-03	4.952e-03
Ni	2.127e-07	2.126e-07
Pb	1.227e-08	1.226e-08
S	3.548e-03	3.546e-03
Sb	1.304e-08	1.303e-08
Se	1.446e-08	1.445e-08
U	8.263e-08	8.259e-08
V	1.905e-09	1.904e-09
Zn	1.127e-06	1.127e-06

-----Description of solution-----

	pH	=	7.149	Charge balance
	pe	=	5.624	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.880e-02	
	Mass of water (kg)	=	9.996e-01	
	Total alkalinity (eq/kg)	=	5.180e-03	
	Total CO2 (mol/kg)	=	5.854e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.234e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.109704e+02	
	Total O	=	5.551372e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.630e-07	1.418e-07	-6.788	-6.848	-0.060	(0)
H+	8.123e-08	7.098e-08	-7.090	-7.149	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.058e-08					
AgCl	2.633e-08	2.633e-08	-7.580	-7.580	0.000	(0)
Ag+	9.887e-09	8.639e-09	-8.005	-8.064	-0.059	(0)
AgCl2-	4.021e-09	3.423e-09	-8.396	-8.466	-0.070	(0)
AgSO4-	3.323e-10	2.829e-10	-9.478	-9.548	-0.070	(0)
AgCl3-2	8.672e-12	4.554e-12	-11.062	-11.342	-0.280	(0)
AgF	3.604e-12	3.604e-12	-11.443	-11.443	0.000	(0)
AgOH	1.225e-13	1.225e-13	-12.912	-12.912	0.000	(0)
AgCl4-3	5.912e-14	1.388e-14	-13.228	-13.858	-0.629	(0)
AgH2BO3	1.770e-14	1.770e-14	-13.752	-13.752	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	4.126e-15	3.513e-15	-14.384	-14.454	-0.070	(0)
AgNO2	4.011e-15	4.011e-15	-14.397	-14.397	0.000	(0)
AgNH3+	1.390e-16	1.183e-16	-15.857	-15.927	-0.070	(0)
Ag (OH) 2-	1.995e-18	1.698e-18	-17.700	-17.770	-0.070	(0)
AgNO3	1.439e-20	1.439e-20	-19.842	-19.842	0.000	(0)
Ag (SeO3) 2-3	8.475e-23	1.990e-23	-22.072	-22.701	-0.629	(0)
Ag (NO2) 2-	1.622e-23	1.380e-23	-22.790	-22.860	-0.070	(0)
Ag (NH3) 2+	7.580e-24	6.453e-24	-23.120	-23.190	-0.070	(0)
Ag2MoO4	7.243e-24	7.243e-24	-23.140	-23.140	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.702	-72.702	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.451	-86.570	-1.119	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.984	-147.054	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.222	-147.389	-0.167	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.364	-149.680	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.688	-149.991	-0.302	(0)
Al	1.993e-06					
Al (OH) 4-	1.347e-06	1.178e-06	-5.871	-5.929	-0.058	(0)
AlF3	3.351e-07	3.351e-07	-6.475	-6.475	0.000	(0)
AlF2+	1.824e-07	1.603e-07	-6.739	-6.795	-0.056	(0)
Al (OH) 3	6.598e-08	6.598e-08	-7.181	-7.181	0.000	(0)
AlF4-	3.188e-08	2.789e-08	-7.496	-7.555	-0.058	(0)
Al (OH) 2+	2.654e-08	2.332e-08	-7.576	-7.632	-0.056	(0)
AlF+2	4.069e-09	2.424e-09	-8.391	-8.615	-0.225	(0)
AlOH+2	3.475e-10	2.070e-10	-9.459	-9.684	-0.225	(0)
AlSO4+	2.126e-11	1.860e-11	-10.672	-10.731	-0.058	(0)
Al+3	4.918e-12	1.460e-12	-11.308	-11.836	-0.528	(0)
Al (SO4) 2-	3.739e-13	3.270e-13	-12.427	-12.485	-0.058	(0)
AlMo6O21-3	2.221e-39	5.216e-40	-38.653	-39.283	-0.629	(0)
As (3)	5.535e-23					
H3AsO3	5.489e-23	5.489e-23	-22.261	-22.261	0.000	(0)
H2AsO3-	4.659e-25	3.966e-25	-24.332	-24.402	-0.070	(0)
HAsO3-2	9.704e-30	5.096e-30	-29.013	-29.293	-0.280	(0)
H4AsO3+	2.267e-30	1.930e-30	-29.644	-29.714	-0.070	(0)
AsO3-3	1.179e-35	2.768e-36	-34.929	-35.558	-0.629	(0)
As (5)	8.121e-11					
HAsO4-2	5.803e-11	3.047e-11	-10.236	-10.516	-0.280	(0)
H2AsO4-	2.317e-11	1.973e-11	-10.635	-10.705	-0.070	(0)
AsO4-3	5.783e-15	1.358e-15	-14.238	-14.867	-0.629	(0)
H3AsO4	2.423e-16	2.433e-16	-15.616	-15.614	0.002	(0)
B	1.589e-05					
H3BO3	1.573e-05	1.580e-05	-4.803	-4.801	0.002	(0)
H2BO3-	1.494e-07	1.292e-07	-6.826	-6.889	-0.063	(0)
CaH2BO3+	9.855e-09	8.527e-09	-8.006	-8.069	-0.063	(0)
MgH2BO3+	4.268e-09	3.693e-09	-8.370	-8.433	-0.063	(0)
BF (OH) 3-	1.210e-09	1.047e-09	-8.917	-8.980	-0.063	(0)
NaH2BO3	8.770e-10	8.770e-10	-9.057	-9.057	0.000	(0)
H5 (BO3) 2-	2.008e-12	1.737e-12	-11.697	-11.760	-0.063	(0)
BF2 (OH) 2-	1.525e-12	1.319e-12	-11.817	-11.880	-0.063	(0)

		BaH ₂ BO ₃ +	2.945e-13	2.548e-13	-12.531	-12.594	-0.063	(0)
		AgH ₂ BO ₃	1.770e-14	1.770e-14	-13.752	-13.752	0.000	(0)
		H ₈ (BO ₃) ³⁻	3.172e-15	2.744e-15	-14.499	-14.562	-0.063	(0)
		BF ₃ OH-	6.996e-18	6.053e-18	-17.155	-17.218	-0.063	(0)
		BF ₄ -	4.059e-22	3.512e-22	-21.392	-21.454	-0.063	(0)
Ba	1.126e-07							
		Ba+2	1.095e-07	6.380e-08	-6.961	-7.195	-0.234	(0)
		BaHCO ₃ +	3.024e-09	2.664e-09	-8.519	-8.574	-0.055	(0)
		BaCO ₃	9.450e-11	9.450e-11	-10.025	-10.025	0.000	(0)
		BaH ₂ BO ₃ +	2.945e-13	2.548e-13	-12.531	-12.594	-0.063	(0)
		BaOH+	4.504e-14	3.949e-14	-13.346	-13.403	-0.057	(0)
		BaNO ₃ +	7.874e-19	6.703e-19	-18.104	-18.174	-0.070	(0)
		BaNH ₃ +2	5.142e-19	2.701e-19	-18.289	-18.569	-0.280	(0)
C (4)	5.854e-03							
		HCO ₃ -	4.977e-03	4.372e-03	-2.303	-2.359	-0.056	(0)
		H ₂ CO ₃	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
		CaHCO ₃ +	1.060e-04	9.335e-05	-3.975	-4.030	-0.055	(0)
		MgHCO ₃ +	4.226e-05	3.687e-05	-4.374	-4.433	-0.059	(0)
		NaHCO ₃	1.053e-05	1.053e-05	-4.978	-4.978	0.000	(0)
		CuCO ₃	5.565e-06	5.565e-06	-5.255	-5.255	0.000	(0)
		CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CO ₃ -2	4.955e-06	2.888e-06	-5.305	-5.539	-0.234	(0)
		MgCO ₃	1.980e-06	1.980e-06	-5.703	-5.703	0.000	(0)
		MnHCO ₃ +	1.015e-06	8.903e-07	-5.993	-6.050	-0.057	(0)
		NaCO ₃ -	2.621e-07	2.303e-07	-6.582	-6.638	-0.056	(0)
		CuHCO ₃ +	1.061e-07	9.029e-08	-6.974	-7.044	-0.070	(0)
		Cu (CO ₃) ²⁻²	8.238e-08	4.326e-08	-7.084	-7.364	-0.280	(0)
		ZnCO ₃	7.680e-08	7.680e-08	-7.115	-7.115	0.000	(0)
		ZnHCO ₃ +	7.506e-08	6.389e-08	-7.125	-7.195	-0.070	(0)
		NiHCO ₃ +	4.818e-08	4.101e-08	-7.317	-7.387	-0.070	(0)
		UO ₂ (CO ₃) ²⁻²	4.114e-08	2.161e-08	-7.386	-7.665	-0.280	(0)
		UO ₂ (CO ₃) ³⁻⁴	4.111e-08	3.127e-09	-7.386	-8.505	-1.119	(0)
		CoHCO ₃ +	2.013e-08	1.714e-08	-7.696	-7.766	-0.070	(0)
		NiCO ₃	8.198e-09	8.198e-09	-8.086	-8.086	0.000	(0)
		PbCO ₃	6.798e-09	6.798e-09	-8.168	-8.168	0.000	(0)
		BaHCO ₃ +	3.024e-09	2.664e-09	-8.519	-8.574	-0.055	(0)
		PbHCO ₃ +	2.988e-09	2.544e-09	-8.525	-8.594	-0.070	(0)
		CoCO ₃	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
		UO ₂ CO ₃	3.749e-10	3.749e-10	-9.426	-9.426	0.000	(0)
		CdCO ₃	3.219e-10	3.219e-10	-9.492	-9.492	0.000	(0)
		Pb (CO ₃) ²⁻²	1.078e-10	5.663e-11	-9.967	-10.247	-0.280	(0)
		BaCO ₃	9.450e-11	9.450e-11	-10.025	-10.025	0.000	(0)
		CdHCO ₃ +	5.718e-11	4.868e-11	-10.243	-10.313	-0.070	(0)
		Cd (CO ₃) ²⁻²	1.312e-12	6.892e-13	-11.882	-12.162	-0.280	(0)
		FeHCO ₃ +	8.893e-13	7.834e-13	-12.051	-12.106	-0.055	(0)
		HgCO ₃	1.399e-14	1.399e-14	-13.854	-13.854	0.000	(0)
		Hg (CO ₃) ²⁻²	2.432e-16	1.277e-16	-15.614	-15.894	-0.280	(0)
		HgHCO ₃ +	2.171e-17	1.848e-17	-16.663	-16.733	-0.070	(0)
Ca	2.512e-03							
		Ca+2	1.967e-03	1.147e-03	-2.706	-2.941	-0.234	(0)
		CaSO ₄	4.311e-04	4.311e-04	-3.365	-3.365	0.000	(0)
		CaHCO ₃ +	1.060e-04	9.335e-05	-3.975	-4.030	-0.055	(0)
		CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
		CaH ₂ BO ₃ +	9.855e-09	8.527e-09	-8.006	-8.069	-0.063	(0)
		CaOH+	3.683e-09	3.244e-09	-8.434	-8.489	-0.055	(0)
		CaNH ₃ +2	1.844e-14	9.684e-15	-13.734	-14.014	-0.280	(0)
		CaNO ₃ +	8.929e-15	7.601e-15	-14.049	-14.119	-0.070	(0)
		Ca (NH ₃) ²⁺²	4.925e-26	2.586e-26	-25.308	-25.587	-0.280	(0)
Cd	1.158e-08							
		Cd+2	8.391e-09	4.890e-09	-8.076	-8.311	-0.234	(0)
		CdSO ₄	1.882e-09	1.882e-09	-8.725	-8.725	0.000	(0)
		CdCl+	8.189e-10	6.971e-10	-9.087	-9.157	-0.070	(0)
		CdCO ₃	3.219e-10	3.219e-10	-9.492	-9.492	0.000	(0)
		Cd (SO ₄) ²⁻²	7.932e-11	4.166e-11	-10.101	-10.380	-0.280	(0)
		CdHCO ₃ +	5.718e-11	4.868e-11	-10.243	-10.313	-0.070	(0)
		CdF+	1.512e-11	1.287e-11	-10.820	-10.890	-0.070	(0)
		CdOH+	6.471e-12	5.509e-12	-11.189	-11.259	-0.070	(0)

	CdCl ₂	4.338e-12	4.338e-12	-11.363	-11.363	0.000	(0)
	CdOHC1	4.055e-12	4.055e-12	-11.392	-11.392	0.000	(0)
	Cd (CO ₃) 2-2	1.312e-12	6.892e-13	-11.882	-12.162	-0.280	(0)
	Cd (OH) 2	4.929e-15	4.929e-15	-14.307	-14.307	0.000	(0)
	CdCl ₃ -	4.799e-15	4.086e-15	-14.319	-14.389	-0.070	(0)
	CdF ₂	4.265e-15	4.265e-15	-14.370	-14.370	0.000	(0)
	CdSeO ₄	2.496e-18	2.496e-18	-17.603	-17.603	0.000	(0)
	Cd ₂ OH+3	5.750e-19	1.350e-19	-18.240	-18.870	-0.629	(0)
	Cd (OH) 3-	5.017e-20	4.271e-20	-19.300	-19.369	-0.070	(0)
	CdNO ₃ +	3.808e-20	3.242e-20	-19.419	-19.489	-0.070	(0)
	Cd (SeO ₃) 2-2	3.072e-21	1.613e-21	-20.513	-20.792	-0.280	(0)
	Cd (OH) 4-2	1.888e-27	9.914e-28	-26.724	-27.004	-0.280	(0)
	Cd (NO ₃) 2	3.406e-32	3.406e-32	-31.468	-31.468	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.685	-78.755	-0.070	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.004	-150.004	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.486	-226.556	-0.070	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.533	-302.813	-0.280	(0)
C1	1.708e-03						
	Cl-	1.708e-03	1.493e-03	-2.767	-2.826	-0.059	(0)
	AgCl	2.633e-08	2.633e-08	-7.580	-7.580	0.000	(0)
	MnCl+	2.187e-08	1.918e-08	-7.660	-7.717	-0.057	(0)
	AgCl ₂ -	4.021e-09	3.423e-09	-8.396	-8.466	-0.070	(0)
	ZnCl+	1.986e-09	1.733e-09	-8.702	-8.761	-0.059	(0)
	CuCl+	8.874e-10	7.742e-10	-9.052	-9.111	-0.059	(0)
	CdCl+	8.189e-10	6.971e-10	-9.087	-9.157	-0.070	(0)
	CuCl	7.167e-10	7.167e-10	-9.145	-9.145	0.000	(0)
	NiCl+	3.414e-10	2.906e-10	-9.467	-9.537	-0.070	(0)
	ZnOHC1	3.217e-10	3.217e-10	-9.493	-9.493	0.000	(0)
	CoCl+	3.056e-10	2.602e-10	-9.515	-9.585	-0.070	(0)
	CuCl ₂ -	2.562e-10	2.235e-10	-9.591	-9.651	-0.059	(0)
	PbCl+	4.872e-11	4.147e-11	-10.312	-10.382	-0.070	(0)
	MnCl ₂	4.044e-11	4.044e-11	-10.393	-10.393	0.000	(0)
	AgCl ₃ -2	8.672e-12	4.554e-12	-11.062	-11.342	-0.280	(0)
	CdCl ₂	4.338e-12	4.338e-12	-11.363	-11.363	0.000	(0)
	ZnCl ₂	4.099e-12	4.099e-12	-11.387	-11.387	0.000	(0)
	CdOHC1	4.055e-12	4.055e-12	-11.392	-11.392	0.000	(0)
	HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
	HgCl ₂	9.017e-13	9.017e-13	-12.045	-12.045	0.000	(0)
	CuCl ₂	4.007e-13	4.007e-13	-12.397	-12.397	0.000	(0)
	PbCl ₂	2.765e-13	2.765e-13	-12.558	-12.558	0.000	(0)
	CuCl ₃ -2	1.207e-13	7.133e-14	-12.918	-13.147	-0.228	(0)
	AgCl ₄ -3	5.912e-14	1.388e-14	-13.228	-13.858	-0.629	(0)
	MnCl ₃ -	1.896e-14	1.663e-14	-13.722	-13.779	-0.057	(0)
	HgCl ₃ -	1.581e-14	1.346e-14	-13.801	-13.871	-0.070	(0)
	ZnCl ₃ -	5.571e-15	4.860e-15	-14.254	-14.313	-0.059	(0)
	CdCl ₃ -	4.799e-15	4.086e-15	-14.319	-14.389	-0.070	(0)
	NiCl ₂	2.184e-15	2.184e-15	-14.661	-14.661	0.000	(0)
	CrCl+2	3.231e-16	1.697e-16	-15.491	-15.770	-0.280	(0)
	PbCl ₃ -	1.930e-16	1.643e-16	-15.714	-15.784	-0.070	(0)
	HgCl ₄ -2	1.523e-16	7.998e-17	-15.817	-16.097	-0.280	(0)
	HgCl+	1.416e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
	UO ₂ Cl+	9.274e-17	7.895e-17	-16.033	-16.103	-0.070	(0)
	CuCl ₃ -	6.399e-18	5.583e-18	-17.194	-17.253	-0.059	(0)
	ZnCl ₄ -2	6.137e-18	3.628e-18	-17.212	-17.440	-0.228	(0)
	CrOHC1 ₂	6.826e-19	6.826e-19	-18.166	-18.166	0.000	(0)
	PbCl ₄ -2	2.135e-19	1.121e-19	-18.671	-18.950	-0.280	(0)
	FeCl+2	4.237e-20	2.505e-20	-19.373	-19.601	-0.228	(0)
	CrCl ₂ +	2.823e-20	2.403e-20	-19.549	-19.619	-0.070	(0)
	VOCl+	7.273e-22	6.191e-22	-21.138	-21.208	-0.070	(0)
	FeCl ₂ +	1.905e-22	1.670e-22	-21.720	-21.777	-0.057	(0)
	CuCl ₄ -2	7.065e-23	4.176e-23	-22.151	-22.379	-0.228	(0)
	FeCl ₃	2.493e-26	2.493e-26	-25.603	-25.603	0.000	(0)
	CrO ₃ Cl-	2.064e-26	1.757e-26	-25.685	-25.755	-0.070	(0)
	CoCl+2	4.875e-35	2.560e-35	-34.312	-34.592	-0.280	(0)
	UCl+3	0.000e+00	0.000e+00	-44.610	-45.239	-0.629	(0)
	Co (NH ₃) 5Cl+2	0.000e+00	0.000e+00	-64.226	-64.505	-0.280	(0)
	Cr (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-68.541	-68.821	-0.280	(0)
	Co (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-82.114	-82.394	-0.280	(0)

Co (2)	1.358e-07					
Co+2	9.594e-08	5.038e-08	-7.018	-7.298	-0.280	(0)
CoHCO3+	2.013e-08	1.714e-08	-7.696	-7.766	-0.070	(0)
CoSO4	1.650e-08	1.650e-08	-7.783	-7.783	0.000	(0)
CoCO3	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
CoF+	3.108e-10	2.646e-10	-9.507	-9.577	-0.070	(0)
CoCl+	3.056e-10	2.602e-10	-9.515	-9.585	-0.070	(0)
CoOH+	1.675e-10	1.426e-10	-9.776	-9.846	-0.070	(0)
Co (OH) 2	1.606e-12	1.606e-12	-11.794	-11.794	0.000	(0)
CoNO2+	9.268e-16	7.890e-16	-15.033	-15.103	-0.070	(0)
Co (NH3) +2	7.738e-17	4.064e-17	-16.111	-16.391	-0.280	(0)
CoSeO4	6.921e-17	6.921e-17	-16.160	-16.160	0.000	(0)
Co (OH) 3-	5.338e-18	4.544e-18	-17.273	-17.343	-0.070	(0)
Co2OH+3	1.533e-18	3.600e-19	-17.814	-18.444	-0.629	(0)
CoOH-	1.340e-18	1.141e-18	-17.873	-17.943	-0.070	(0)
CoNO3+	1.966e-19	1.674e-19	-18.706	-18.776	-0.070	(0)
Co (OH) 4-2	1.945e-25	1.021e-25	-24.711	-24.991	-0.280	(0)
Co (NH3) 2+2	2.215e-26	1.163e-26	-25.655	-25.934	-0.280	(0)
Co4 (OH) 4+4	1.084e-30	8.242e-32	-29.965	-31.084	-1.119	(0)
Co (NO3) 2	7.141e-31	7.141e-31	-30.146	-30.146	0.000	(0)
Co (NH3) 3+2	1.870e-36	9.823e-37	-35.728	-36.008	-0.280	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.181	-46.461	-0.280	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.135	-57.414	-0.280	(0)
Co (3)	1.157e-28					
CoOH+2	1.157e-28	6.075e-29	-27.937	-28.216	-0.280	(0)
Co+3	2.840e-34	8.430e-35	-33.547	-34.074	-0.528	(0)
CoCl+2	4.875e-35	2.560e-35	-34.312	-34.592	-0.280	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.226	-64.505	-0.280	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.358	-77.428	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.937	-82.216	-0.280	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.114	-82.394	-0.280	(0)
Cr (2)	9.505e-26					
Cr+2	9.505e-26	4.992e-26	-25.022	-25.302	-0.280	(0)
Cr (3)	6.407e-09					
Cr (OH) 2+	5.523e-09	4.702e-09	-8.258	-8.328	-0.070	(0)
Cr (OH) +2	5.188e-10	2.725e-10	-9.285	-9.565	-0.280	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.061e-10	1.061e-10	-9.974	-9.974	0.000	(0)
CrF+2	4.401e-12	2.312e-12	-11.356	-11.636	-0.280	(0)
CrO2-	1.969e-12	1.676e-12	-11.706	-11.776	-0.070	(0)
Cr (OH) 4-	1.661e-12	1.414e-12	-11.780	-11.849	-0.070	(0)
CrSO4+	3.954e-13	3.366e-13	-12.403	-12.473	-0.070	(0)
Cr+3	3.740e-13	8.782e-14	-12.427	-13.056	-0.629	(0)
CrCl+2	3.231e-16	1.697e-16	-15.491	-15.770	-0.280	(0)
Cr2 (OH) 2SO4+2	4.977e-18	2.614e-18	-17.303	-17.583	-0.280	(0)
CrOHC12	6.826e-19	6.826e-19	-18.166	-18.166	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.548e-19	2.548e-19	-18.594	-18.594	0.000	(0)
CrCl2+	2.823e-20	2.403e-20	-19.549	-19.619	-0.070	(0)
CrNO3+2	1.532e-26	8.048e-27	-25.815	-26.094	-0.280	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.119	-55.399	-0.280	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.467	-67.097	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.541	-68.821	-0.280	(0)
Cr (6)	2.311e-16					
CrO4-2	1.969e-16	1.148e-16	-15.706	-15.940	-0.234	(0)
HCrO4-	3.097e-17	2.636e-17	-16.509	-16.579	-0.070	(0)
NaCrO4-	2.869e-18	2.442e-18	-17.542	-17.612	-0.070	(0)
KCrO4-	3.051e-19	2.597e-19	-18.516	-18.586	-0.070	(0)
CrO3SO4-2	1.782e-24	9.357e-25	-23.749	-24.029	-0.280	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.064e-26	1.757e-26	-25.685	-25.755	-0.070	(0)
Cr2O7-2	4.590e-32	2.410e-32	-31.338	-31.618	-0.280	(0)
Cu (1)	1.421e-09					
CuCl	7.167e-10	7.167e-10	-9.145	-9.145	0.000	(0)
Cu+	4.480e-10	3.814e-10	-9.349	-9.419	-0.070	(0)
CuCl2-	2.562e-10	2.235e-10	-9.591	-9.651	-0.059	(0)
CuCl3-2	1.207e-13	7.133e-14	-12.918	-13.147	-0.228	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.327	-148.636	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.070	-149.366	-0.296	(0)

Cu (2)	6.618e-06					
CuCO3	5.565e-06	5.565e-06	-5.255	-5.255	0.000	(0)
Cu+2	5.615e-07	3.273e-07	-6.251	-6.485	-0.234	(0)
CuOH+	1.682e-07	1.468e-07	-6.774	-6.833	-0.059	(0)
CuSO4	1.231e-07	1.231e-07	-6.910	-6.910	0.000	(0)
CuHCO3+	1.061e-07	9.029e-08	-6.974	-7.044	-0.070	(0)
Cu (CO3) 2-2	8.238e-08	4.326e-08	-7.084	-7.364	-0.280	(0)
Cu (OH) 2	4.153e-09	4.153e-09	-8.382	-8.382	0.000	(0)
CuF+	4.028e-09	3.429e-09	-8.395	-8.465	-0.070	(0)
Cu2 (OH) 2+2	1.030e-09	5.411e-10	-8.987	-9.267	-0.280	(0)
CuCl+	8.874e-10	7.742e-10	-9.052	-9.111	-0.059	(0)
Cu (OH) 3-	1.419e-12	1.208e-12	-11.848	-11.918	-0.070	(0)
CuCl2	4.007e-13	4.007e-13	-12.397	-12.397	0.000	(0)
CuNO2+	8.945e-14	7.615e-14	-13.048	-13.118	-0.070	(0)
CuNH3+2	4.278e-14	2.247e-14	-13.369	-13.648	-0.280	(0)
CuCl3-	6.399e-18	5.583e-18	-17.194	-17.253	-0.059	(0)
Cu (OH) 4-2	2.567e-18	1.348e-18	-17.590	-17.870	-0.280	(0)
CuNO3+	2.549e-18	2.170e-18	-17.594	-17.664	-0.070	(0)
Cu (NO2) 2	1.732e-21	1.732e-21	-20.762	-20.762	0.000	(0)
CuCl4-2	7.065e-23	4.176e-23	-22.151	-22.379	-0.228	(0)
Cu (NO3) 2	5.726e-31	5.726e-31	-30.242	-30.242	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.874	-215.944	-0.070	(0)
F	2.121e-04					
F-	1.901e-04	1.661e-04	-3.721	-3.780	-0.059	(0)
MgF+	1.755e-05	1.536e-05	-4.756	-4.814	-0.058	(0)
CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
NaF	4.486e-07	4.486e-07	-6.348	-6.348	0.000	(0)
AlF3	3.351e-07	3.351e-07	-6.475	-6.475	0.000	(0)
AlF2+	1.824e-07	1.603e-07	-6.739	-6.795	-0.056	(0)
MnF+	7.695e-08	6.747e-08	-7.114	-7.171	-0.057	(0)
AlF4-	3.188e-08	2.789e-08	-7.496	-7.555	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
AlF+2	4.069e-09	2.424e-09	-8.391	-8.615	-0.225	(0)
CuF+	4.028e-09	3.429e-09	-8.395	-8.465	-0.070	(0)
ZnF+	1.799e-09	1.531e-09	-8.745	-8.815	-0.070	(0)
BF (OH) 3-	1.210e-09	1.047e-09	-8.917	-8.980	-0.063	(0)
NiF+	3.728e-10	3.174e-10	-9.428	-9.498	-0.070	(0)
CoF+	3.108e-10	2.646e-10	-9.507	-9.577	-0.070	(0)
CdF+	1.512e-11	1.287e-11	-10.820	-10.890	-0.070	(0)
HF2-	1.265e-11	1.101e-11	-10.898	-10.958	-0.060	(0)
PbF+	1.077e-11	9.164e-12	-10.968	-11.038	-0.070	(0)
CrF+2	4.401e-12	2.312e-12	-11.356	-11.636	-0.280	(0)
AgF	3.604e-12	3.604e-12	-11.443	-11.443	0.000	(0)
BF2 (OH) 2-	1.525e-12	1.319e-12	-11.817	-11.880	-0.063	(0)
UO2F+	8.782e-13	7.476e-13	-12.056	-12.126	-0.070	(0)
UO2F2	3.581e-13	3.581e-13	-12.446	-12.446	0.000	(0)
PbF2	2.995e-14	2.995e-14	-13.524	-13.524	0.000	(0)
UO2F3-	1.755e-14	1.494e-14	-13.756	-13.826	-0.070	(0)
CdF2	4.265e-15	4.265e-15	-14.370	-14.370	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.129e-16	4.497e-16	-15.290	-15.347	-0.057	(0)
FeF+2	1.712e-16	1.012e-16	-15.767	-15.995	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
VO2F	4.490e-17	4.490e-17	-16.348	-16.348	0.000	(0)
UO2F4-2	3.752e-17	1.970e-17	-16.426	-16.705	-0.280	(0)
PbF3-	1.108e-17	9.434e-18	-16.955	-17.025	-0.070	(0)
BF3OH-	6.996e-18	6.053e-18	-17.155	-17.218	-0.063	(0)
VO2F2-	3.180e-18	2.707e-18	-17.498	-17.567	-0.070	(0)
VOF+	1.730e-19	1.473e-19	-18.762	-18.832	-0.070	(0)
VO2F3-2	1.068e-20	5.609e-21	-19.971	-20.251	-0.280	(0)
VOF2	9.171e-21	9.171e-21	-20.038	-20.038	0.000	(0)
PbF4-2	1.428e-21	7.499e-22	-20.845	-21.125	-0.280	(0)
BF4-	4.059e-22	3.512e-22	-21.392	-21.454	-0.063	(0)
VOF3-	6.348e-23	5.404e-23	-22.197	-22.267	-0.070	(0)
HgF+	2.926e-23	2.491e-23	-22.534	-22.604	-0.070	(0)
VO2F4-3	1.952e-24	4.583e-25	-23.710	-24.339	-0.629	(0)
Sb (OH) 2F	9.871e-25	9.871e-25	-24.006	-24.006	0.000	(0)
SbOF	9.709e-25	9.709e-25	-24.013	-24.013	0.000	(0)

VOF4-2	6.898e-26	3.623e-26	-25.161	-25.441	-0.280	(0)
UF3+	1.651e-34	1.406e-34	-33.782	-33.852	-0.070	(0)
UF2+2	1.017e-35	5.341e-36	-34.993	-35.272	-0.280	(0)
UF4	2.560e-36	2.560e-36	-35.592	-35.592	0.000	(0)
UF5-	1.979e-38	1.685e-38	-37.704	-37.773	-0.070	(0)
UF+3	1.088e-38	2.555e-39	-37.963	-38.593	-0.629	(0)
UF6-2	1.609e-39	8.450e-40	-38.793	-39.073	-0.280	(0)
Fe (2)	3.381e-11					
Fe+2	2.710e-11	1.423e-11	-10.567	-10.847	-0.280	(0)
FeSO4	5.734e-12	5.734e-12	-11.242	-11.242	0.000	(0)
FeHCO3+	8.893e-13	7.834e-13	-12.051	-12.106	-0.055	(0)
FeOH+	9.164e-14	8.035e-14	-13.038	-13.095	-0.057	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.629e-19	4.059e-19	-18.334	-18.392	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.802	-158.802	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.147	-235.217	-0.070	(0)
Fe (3)	3.629e-09					
Fe (OH) 2+	3.195e-09	2.807e-09	-8.495	-8.552	-0.056	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.426e-12	5.646e-12	-11.192	-11.248	-0.056	(0)
FeOH+2	8.607e-14	5.088e-14	-13.065	-13.293	-0.228	(0)
FeF2+	5.129e-16	4.497e-16	-15.290	-15.347	-0.057	(0)
FeF+2	1.712e-16	1.012e-16	-15.767	-15.995	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.167e-17	1.023e-17	-16.933	-16.990	-0.057	(0)
Fe+3	1.872e-18	5.557e-19	-17.728	-18.255	-0.528	(0)
Fe (SO4) 2-	4.218e-19	3.591e-19	-18.375	-18.445	-0.070	(0)
FeCl+2	4.237e-20	2.505e-20	-19.373	-19.601	-0.228	(0)
FeCl2+	1.905e-22	1.670e-22	-21.720	-21.777	-0.057	(0)
FeHSeO3+2	3.154e-23	1.656e-23	-22.501	-22.781	-0.280	(0)
Fe2 (OH) 2+4	1.127e-24	8.572e-26	-23.948	-25.067	-1.119	(0)
FeCl3	2.493e-26	2.493e-26	-25.603	-25.603	0.000	(0)
FeNO3+2	2.218e-29	1.165e-29	-28.654	-28.934	-0.280	(0)
Fe3 (OH) 4+5	1.947e-31	3.478e-33	-30.711	-32.459	-1.748	(0)
H (0)	4.021e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.114e-10					
Hg	2.114e-10	2.114e-10	-9.675	-9.675	0.000	(0)
Hg (1)	2.212e-21					
Hg2+2	1.106e-21	5.809e-22	-20.956	-21.236	-0.280	(0)
Hg (2)	2.956e-12					
HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
HgCl2	9.017e-13	9.017e-13	-12.045	-12.045	0.000	(0)
Hg (OH) 2	5.113e-13	5.135e-13	-12.291	-12.289	0.002	(0)
HgCl3-	1.581e-14	1.346e-14	-13.801	-13.871	-0.070	(0)
HgCO3	1.399e-14	1.399e-14	-13.854	-13.854	0.000	(0)
Hg (CO3) 2-2	2.432e-16	1.277e-16	-15.614	-15.894	-0.280	(0)
HgCl4-2	1.523e-16	7.998e-17	-15.817	-16.097	-0.280	(0)
HgCl+	1.416e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
HgOH+	2.684e-17	2.285e-17	-16.571	-16.641	-0.070	(0)
HgHCO3+	2.171e-17	1.848e-17	-16.663	-16.733	-0.070	(0)
Hg (OH) 3-	1.077e-20	9.168e-21	-19.968	-20.038	-0.070	(0)
Hg+2	7.705e-21	4.047e-21	-20.113	-20.393	-0.280	(0)
HgSO4	1.739e-21	1.739e-21	-20.760	-20.760	0.000	(0)
HgNH3+2	3.262e-23	1.713e-23	-22.487	-22.766	-0.280	(0)
HgF+	2.926e-23	2.491e-23	-22.534	-22.604	-0.070	(0)
Hg (NH3) 2+2	2.188e-25	1.149e-25	-24.660	-24.940	-0.280	(0)
HgNO3+	3.680e-33	3.132e-33	-32.434	-32.504	-0.070	(0)
Hg (NH3) 3+2	5.844e-36	3.069e-36	-35.233	-35.513	-0.280	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.564	-44.564	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.507	-45.786	-0.280	(0)
HgHS2-	0.000e+00	0.000e+00	-138.151	-138.221	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.976	-138.976	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.500	-139.780	-0.280	(0)
K	7.051e-04					
K+	6.970e-04	6.090e-04	-3.157	-3.215	-0.059	(0)
KSO4-	8.055e-06	7.077e-06	-5.094	-5.150	-0.056	(0)
KCrO4-	3.051e-19	2.597e-19	-18.516	-18.586	-0.070	(0)

Mg	1.722e-03						
Mg+2	1.414e-03	8.241e-04	-2.850	-3.084	-0.234	(0)	
MgSO4	2.461e-04	2.461e-04	-3.609	-3.609	0.000	(0)	
MgHCO3+	4.226e-05	3.687e-05	-4.374	-4.433	-0.059	(0)	
MgF+	1.755e-05	1.536e-05	-4.756	-4.814	-0.058	(0)	
MgCO3	1.980e-06	1.980e-06	-5.703	-5.703	0.000	(0)	
MgOH+	5.270e-08	4.652e-08	-7.278	-7.332	-0.054	(0)	
MgH2BO3+	4.268e-09	3.693e-09	-8.370	-8.433	-0.063	(0)	
Mn (2)	2.353e-05						
Mn+2	1.943e-05	1.021e-05	-4.711	-4.991	-0.280	(0)	
MnSO4	2.979e-06	2.979e-06	-5.526	-5.526	0.000	(0)	
MnHCO3+	1.015e-06	8.903e-07	-5.993	-6.050	-0.057	(0)	
MnF+	7.695e-08	6.747e-08	-7.114	-7.171	-0.057	(0)	
MnCl+	2.187e-08	1.918e-08	-7.660	-7.717	-0.057	(0)	
MnOH+	4.146e-09	3.635e-09	-8.382	-8.439	-0.057	(0)	
MnCl2	4.044e-11	4.044e-11	-10.393	-10.393	0.000	(0)	
MnCl3-	1.896e-14	1.663e-14	-13.722	-13.779	-0.057	(0)	
MnSeO4	7.528e-15	7.528e-15	-14.123	-14.123	0.000	(0)	
MnNO3+	3.983e-17	3.391e-17	-16.400	-16.470	-0.070	(0)	
Mn (OH) 3-	5.153e-19	4.519e-19	-18.288	-18.345	-0.057	(0)	
Mn (OH) 4-2	3.500e-25	2.069e-25	-24.456	-24.684	-0.228	(0)	
Mn (NO3) 2	1.786e-28	1.786e-28	-27.748	-27.748	0.000	(0)	
MnSe	0.000e+00	0.000e+00	-42.949	-42.949	0.000	(0)	
Mn (3)	6.456e-25						
Mn+3	6.456e-25	1.916e-25	-24.190	-24.718	-0.528	(0)	
Mn (6)	0.000e+00						
MnO4-2	0.000e+00	0.000e+00	-43.500	-43.729	-0.228	(0)	
Mn (7)	0.000e+00						
MnO4-	0.000e+00	0.000e+00	-47.415	-47.477	-0.062	(0)	
Mo	4.403e-07						
MoO4-2	4.399e-07	2.564e-07	-6.357	-6.591	-0.234	(0)	
HMoO4-	4.254e-10	3.621e-10	-9.371	-9.441	-0.070	(0)	
H2MoO4	1.883e-13	1.883e-13	-12.725	-12.725	0.000	(0)	
Ag2MoO4	7.243e-24	7.243e-24	-23.140	-23.140	0.000	(0)	
AlMo6O21-3	2.221e-39	5.216e-40	-38.653	-39.283	-0.629	(0)	
Mo7O24-6	0.000e+00	0.000e+00	-47.821	-50.338	-2.517	(0)	
HMo7O24-5	0.000e+00	0.000e+00	-49.352	-51.100	-1.748	(0)	
H2Mo7O24-4	0.000e+00	0.000e+00	-52.348	-53.467	-1.119	(0)	
H3Mo7O24-3	0.000e+00	0.000e+00	-56.740	-57.370	-0.629	(0)	
N (-3)	9.887e-10						
NH4+	9.652e-10	8.352e-10	-9.015	-9.078	-0.063	(0)	
NH4SO4-	1.675e-11	1.469e-11	-10.776	-10.833	-0.057	(0)	
NH3	6.709e-12	6.709e-12	-11.173	-11.173	0.000	(0)	
CuNH3+2	4.278e-14	2.247e-14	-13.369	-13.648	-0.280	(0)	
CaNH3+2	1.844e-14	9.684e-15	-13.734	-14.014	-0.280	(0)	
NiNH3+2	5.220e-16	2.741e-16	-15.282	-15.562	-0.280	(0)	
AgNH3+	1.390e-16	1.183e-16	-15.857	-15.927	-0.070	(0)	
Co (NH3) +2	7.738e-17	4.064e-17	-16.111	-16.391	-0.280	(0)	
BaNH3+2	5.142e-19	2.701e-19	-18.289	-18.569	-0.280	(0)	
HgNH3+2	3.262e-23	1.713e-23	-22.487	-22.766	-0.280	(0)	
Ag (NH3) 2+	7.580e-24	6.453e-24	-23.120	-23.190	-0.070	(0)	
Ni (NH3) 2+2	5.062e-25	2.658e-25	-24.296	-24.575	-0.280	(0)	
Hg (NH3) 2+2	2.188e-25	1.149e-25	-24.660	-24.940	-0.280	(0)	
Ca (NH3) 2+2	4.925e-26	2.586e-26	-25.308	-25.587	-0.280	(0)	
Co (NH3) 2+2	2.215e-26	1.163e-26	-25.655	-25.934	-0.280	(0)	
Hg (NH3) 3+2	5.844e-36	3.069e-36	-35.233	-35.513	-0.280	(0)	
Co (NH3) 3+2	1.870e-36	9.823e-37	-35.728	-36.008	-0.280	(0)	
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.507	-45.786	-0.280	(0)	
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.181	-46.461	-0.280	(0)	
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.119	-55.399	-0.280	(0)	
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.135	-57.414	-0.280	(0)	
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.226	-64.505	-0.280	(0)	
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.467	-67.097	-0.629	(0)	
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.541	-68.821	-0.280	(0)	
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.358	-77.428	-0.070	(0)	
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.937	-82.216	-0.280	(0)	
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.114	-82.394	-0.280	(0)	
N (3)	2.561e-09						

NO2-	2.561e-09	2.222e-09	-8.592	-8.653	-0.062	(0)
CuNO2+	8.945e-14	7.615e-14	-13.048	-13.118	-0.070	(0)
AgNO2	4.011e-15	4.011e-15	-14.397	-14.397	0.000	(0)
CoNO2+	9.268e-16	7.890e-16	-15.033	-15.103	-0.070	(0)
Cu (NO2) 2	1.732e-21	1.732e-21	-20.762	-20.762	0.000	(0)
Ag (NO2) 2-	1.622e-23	1.380e-23	-22.790	-22.860	-0.070	(0)
N (5)	2.408e-12					
NO3-	2.399e-12	2.096e-12	-11.620	-11.679	-0.059	(0)
CaNO3+	8.929e-15	7.601e-15	-14.049	-14.119	-0.070	(0)
MnNO3+	3.983e-17	3.391e-17	-16.400	-16.470	-0.070	(0)
ZnNO3+	2.858e-18	2.433e-18	-17.544	-17.614	-0.070	(0)
CuNO3+	2.549e-18	2.170e-18	-17.594	-17.664	-0.070	(0)
BaNO3+	7.874e-19	6.703e-19	-18.104	-18.174	-0.070	(0)
NiNO3+	4.707e-19	4.007e-19	-18.327	-18.397	-0.070	(0)
CoNO3+	1.966e-19	1.674e-19	-18.706	-18.776	-0.070	(0)
CdNO3+	3.808e-20	3.242e-20	-19.419	-19.489	-0.070	(0)
PbNO3+	2.852e-20	2.428e-20	-19.545	-19.615	-0.070	(0)
AgNO3	1.439e-20	1.439e-20	-19.842	-19.842	0.000	(0)
UO2NO3+	1.602e-25	1.364e-25	-24.795	-24.865	-0.070	(0)
CrNO3+2	1.532e-26	8.048e-27	-25.815	-26.094	-0.280	(0)
Mn (NO3) 2	1.786e-28	1.786e-28	-27.748	-27.748	0.000	(0)
VO2NO3	1.635e-28	1.635e-28	-27.787	-27.787	0.000	(0)
FeNO3+2	2.218e-29	1.165e-29	-28.654	-28.934	-0.280	(0)
Zn (NO3) 2	1.018e-30	1.018e-30	-29.992	-29.992	0.000	(0)
Co (NO3) 2	7.141e-31	7.141e-31	-30.146	-30.146	0.000	(0)
Cu (NO3) 2	5.726e-31	5.726e-31	-30.242	-30.242	0.000	(0)
Pb (NO3) 2	8.645e-32	8.645e-32	-31.063	-31.063	0.000	(0)
Cd (NO3) 2	3.406e-32	3.406e-32	-31.468	-31.468	0.000	(0)
HgNO3+	3.680e-33	3.132e-33	-32.434	-32.504	-0.070	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.564	-44.564	0.000	(0)
Na	4.954e-03					
Na+	4.900e-03	4.282e-03	-2.310	-2.368	-0.059	(0)
NaSO4-	4.296e-05	3.774e-05	-4.367	-4.423	-0.056	(0)
NaHCO3	1.053e-05	1.053e-05	-4.978	-4.978	0.000	(0)
NaF	4.486e-07	4.486e-07	-6.348	-6.348	0.000	(0)
NaCO3-	2.621e-07	2.303e-07	-6.582	-6.638	-0.056	(0)
NaH2BO3	8.770e-10	8.770e-10	-9.057	-9.057	0.000	(0)
NaCrO4-	2.869e-18	2.442e-18	-17.542	-17.612	-0.070	(0)
Ni	2.127e-07					
Ni+2	1.305e-07	7.608e-08	-6.884	-7.119	-0.234	(0)
NiHCO3+	4.818e-08	4.101e-08	-7.317	-7.387	-0.070	(0)
NiSO4	2.492e-08	2.492e-08	-7.604	-7.604	0.000	(0)
NiCO3	8.198e-09	8.198e-09	-8.086	-8.086	0.000	(0)
NiF+	3.728e-10	3.174e-10	-9.428	-9.498	-0.070	(0)
NiCl+	3.414e-10	2.906e-10	-9.467	-9.537	-0.070	(0)
NiOH+	1.596e-10	1.358e-10	-9.797	-9.867	-0.070	(0)
Ni (SO4) 2-2	2.578e-12	1.354e-12	-11.589	-11.868	-0.280	(0)
Ni (OH) 2	1.530e-12	1.530e-12	-11.815	-11.815	0.000	(0)
NiCl2	2.184e-15	2.184e-15	-14.661	-14.661	0.000	(0)
NiNH3+2	5.220e-16	2.741e-16	-15.282	-15.562	-0.280	(0)
Ni (OH) 3-	2.549e-16	2.170e-16	-15.594	-15.664	-0.070	(0)
NiSeO4	9.754e-17	9.754e-17	-16.011	-16.011	0.000	(0)
NiNO3+	4.707e-19	4.007e-19	-18.327	-18.397	-0.070	(0)
Ni (NH3) 2+2	5.062e-25	2.658e-25	-24.296	-24.575	-0.280	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	1.227e-08					
PbCO3	6.798e-09	6.798e-09	-8.168	-8.168	0.000	(0)
PbHCO3+	2.988e-09	2.544e-09	-8.525	-8.594	-0.070	(0)
Pb+2	1.344e-09	7.831e-10	-8.872	-9.106	-0.234	(0)
PbSO4	6.295e-10	6.295e-10	-9.201	-9.201	0.000	(0)
PbOH+	3.277e-10	2.790e-10	-9.485	-9.554	-0.070	(0)
Pb (CO3) 2-2	1.078e-10	5.663e-11	-9.967	-10.247	-0.280	(0)
PbCl+	4.872e-11	4.147e-11	-10.312	-10.382	-0.070	(0)
Pb (SO4) 2-2	1.185e-11	6.225e-12	-10.926	-11.206	-0.280	(0)
PbF+	1.077e-11	9.164e-12	-10.968	-11.038	-0.070	(0)
Pb (OH) 2	1.251e-12	1.251e-12	-11.903	-11.903	0.000	(0)
PbCl2	2.765e-13	2.765e-13	-12.558	-12.558	0.000	(0)

PbF2	2.995e-14	2.995e-14	-13.524	-13.524	0.000	(0)
Pb(OH) 3-	2.084e-16	1.774e-16	-15.681	-15.751	-0.070	(0)
PbCl3-	1.930e-16	1.643e-16	-15.714	-15.784	-0.070	(0)
Pb2OH+3	1.475e-17	3.462e-18	-16.831	-17.461	-0.629	(0)
PbF3-	1.108e-17	9.434e-18	-16.955	-17.025	-0.070	(0)
PbCl4-2	2.135e-19	1.121e-19	-18.671	-18.950	-0.280	(0)
PbNO3+	2.852e-20	2.428e-20	-19.545	-19.615	-0.070	(0)
Pb(OH) 4-2	1.173e-20	6.162e-21	-19.931	-20.210	-0.280	(0)
PbF4-2	1.428e-21	7.499e-22	-20.845	-21.125	-0.280	(0)
Pb3(OH) 4+2	4.656e-23	2.445e-23	-22.332	-22.612	-0.280	(0)
Pb4(OH) 4+4	1.999e-27	1.521e-28	-26.699	-27.818	-1.119	(0)
Pb(NO3) 2	8.645e-32	8.645e-32	-31.063	-31.063	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.741	-150.741	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.824	-227.894	-0.070	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.702	-72.702	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.383	-78.452	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.581	-78.581	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.685	-78.755	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.389	-80.669	-0.280	(0)
S6-2	0.000e+00	0.000e+00	-80.905	-81.185	-0.280	(0)
S4-2	0.000e+00	0.000e+00	-80.985	-81.264	-0.280	(0)
S3-2	0.000e+00	0.000e+00	-81.791	-82.070	-0.280	(0)
S2-2	0.000e+00	0.000e+00	-82.807	-83.086	-0.280	(0)
S-2	0.000e+00	0.000e+00	-88.375	-88.604	-0.228	(0)
HgHS2-	0.000e+00	0.000e+00	-138.151	-138.221	-0.070	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.976	-138.976	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.500	-139.780	-0.280	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-146.984	-147.054	-0.070	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.222	-147.389	-0.167	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-148.327	-148.636	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.070	-149.366	-0.296	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.211	-149.281	-0.070	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.364	-149.680	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.688	-149.991	-0.302	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.004	-150.004	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.420	-150.420	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.741	-150.741	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.802	-158.802	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.874	-215.944	-0.070	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.523	-225.593	-0.070	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.486	-226.556	-0.070	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.824	-227.894	-0.070	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.144	-228.424	-0.280	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.147	-235.217	-0.070	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.533	-302.813	-0.280	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.226	-305.505	-0.280	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.980	-317.260	-0.280	(0)
S(6)	3.548e-03					
SO4-2	2.816e-03	1.641e-03	-2.550	-2.785	-0.234	(0)
CaSO4	4.311e-04	4.311e-04	-3.365	-3.365	0.000	(0)
MgSO4	2.461e-04	2.461e-04	-3.609	-3.609	0.000	(0)
NaSO4-	4.296e-05	3.774e-05	-4.367	-4.423	-0.056	(0)
KSO4-	8.055e-06	7.077e-06	-5.094	-5.150	-0.056	(0)
MnSO4	2.979e-06	2.979e-06	-5.526	-5.526	0.000	(0)
ZnSO4	1.659e-07	1.659e-07	-6.780	-6.780	0.000	(0)
CuSO4	1.231e-07	1.231e-07	-6.910	-6.910	0.000	(0)
NiSO4	2.492e-08	2.492e-08	-7.604	-7.604	0.000	(0)
CoSO4	1.650e-08	1.650e-08	-7.783	-7.783	0.000	(0)
HSO4-	1.302e-08	1.138e-08	-7.886	-7.944	-0.058	(0)
Zn(SO4) 2-2	4.516e-09	2.372e-09	-8.345	-8.625	-0.280	(0)
CdSO4	1.882e-09	1.882e-09	-8.725	-8.725	0.000	(0)
PbSO4	6.295e-10	6.295e-10	-9.201	-9.201	0.000	(0)
AgSO4-	3.323e-10	2.829e-10	-9.478	-9.548	-0.070	(0)
CrOHSO4	1.061e-10	1.061e-10	-9.974	-9.974	0.000	(0)
Cd(SO4) 2-2	7.932e-11	4.166e-11	-10.101	-10.380	-0.280	(0)
AlSO4+	2.126e-11	1.860e-11	-10.672	-10.731	-0.058	(0)
NH4SO4-	1.675e-11	1.469e-11	-10.776	-10.833	-0.057	(0)

Pb(SO4) 2-2	1.185e-11	6.225e-12	-10.926	-11.206	-0.280	(0)
FeSO4	5.734e-12	5.734e-12	-11.242	-11.242	0.000	(0)
Ni(SO4) 2-2	2.578e-12	1.354e-12	-11.589	-11.868	-0.280	(0)
CrSO4+	3.954e-13	3.366e-13	-12.403	-12.473	-0.070	(0)
Al(SO4) 2-	3.739e-13	3.270e-13	-12.427	-12.485	-0.058	(0)
UO2SO4	8.101e-14	8.101e-14	-13.091	-13.091	0.000	(0)
UO2(SO4) 2-2	3.337e-15	1.753e-15	-14.477	-14.756	-0.280	(0)
FeSO4+	1.167e-17	1.023e-17	-16.933	-16.990	-0.057	(0)
VO2SO4-	7.097e-18	6.042e-18	-17.149	-17.219	-0.070	(0)
Cr2(OH) 2SO4+2	4.977e-18	2.614e-18	-17.303	-17.583	-0.280	(0)
Fe(SO4) 2-	4.218e-19	3.591e-19	-18.375	-18.445	-0.070	(0)
Cr2(OH) 2(SO4) 2	2.548e-19	2.548e-19	-18.594	-18.594	0.000	(0)
VOSO4	6.683e-20	6.683e-20	-19.175	-19.175	0.000	(0)
HgSO4	1.739e-21	1.739e-21	-20.760	-20.760	0.000	(0)
CrO3SO4-2	1.782e-24	9.357e-25	-23.749	-24.029	-0.280	(0)
VSO4+	8.013e-34	6.821e-34	-33.096	-33.166	-0.070	(0)
U(SO4) 2	6.568e-40	6.568e-40	-39.183	-39.183	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.018	-40.298	-0.280	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-77.358	-77.428	-0.070	(0)
Sb(3)	1.059e-19					
Sb(OH) 3	5.359e-20	5.359e-20	-19.271	-19.271	0.000	(0)
HSbo2	5.233e-20	5.233e-20	-19.281	-19.281	0.000	(0)
Sbo2-	1.403e-24	1.194e-24	-23.853	-23.923	-0.070	(0)
Sb(OH) 2F	9.871e-25	9.871e-25	-24.006	-24.006	0.000	(0)
SboF	9.709e-25	9.709e-25	-24.013	-24.013	0.000	(0)
Sb(OH) 4-	8.032e-25	6.837e-25	-24.095	-24.165	-0.070	(0)
Sb(OH) 2+	1.085e-25	9.239e-26	-24.964	-25.034	-0.070	(0)
Sbo+	3.743e-26	3.186e-26	-25.427	-25.497	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.980	-317.260	-0.280	(0)
Sb(5)	1.304e-08					
Sbo3-	1.302e-08	1.108e-08	-7.885	-7.955	-0.070	(0)
Sb(OH) 6-	1.482e-11	1.295e-11	-10.829	-10.888	-0.059	(0)
Sbo2+	1.882e-23	1.602e-23	-22.725	-22.795	-0.070	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.229e-40	1.898e-40	-39.652	-39.722	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.949	-42.949	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.981	-42.981	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.293	-47.573	-0.280	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.451	-86.570	-1.119	(0)
Se(4)	1.446e-08					
HSeO3-	1.325e-08	1.128e-08	-7.878	-7.948	-0.070	(0)
SeO3-2	1.205e-09	6.327e-10	-8.919	-9.199	-0.280	(0)
H2SeO3	3.415e-13	3.415e-13	-12.467	-12.467	0.000	(0)
AgSeO3-	4.126e-15	3.513e-15	-14.384	-14.454	-0.070	(0)
Cd(SeO3) 2-2	3.072e-21	1.613e-21	-20.513	-20.792	-0.280	(0)
Ag(SeO3) 2-3	8.475e-23	1.990e-23	-22.072	-22.701	-0.629	(0)
FeHSeO3+2	3.154e-23	1.656e-23	-22.501	-22.781	-0.280	(0)
Se(6)	4.711e-12					
SeO4-2	4.703e-12	2.741e-12	-11.328	-11.562	-0.234	(0)
MnSeO4	7.528e-15	7.528e-15	-14.123	-14.123	0.000	(0)
ZnSeO4	1.962e-16	1.962e-16	-15.707	-15.707	0.000	(0)
NiSeO4	9.754e-17	9.754e-17	-16.011	-16.011	0.000	(0)
CoSeO4	6.921e-17	6.921e-17	-16.160	-16.160	0.000	(0)
HSeO4-	1.145e-17	9.750e-18	-16.941	-17.011	-0.070	(0)
CdSeO4	2.496e-18	2.496e-18	-17.603	-17.603	0.000	(0)
Zn(SeO4) 2-2	1.038e-27	5.451e-28	-26.984	-27.264	-0.280	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.903	-58.533	-0.629	(0)
U(4)	3.817e-22					
U(OH) 5-	3.807e-22	3.241e-22	-21.419	-21.489	-0.070	(0)
U(OH) 4	9.637e-25	9.637e-25	-24.016	-24.016	0.000	(0)
U(OH) 3+	2.939e-28	2.502e-28	-27.532	-27.602	-0.070	(0)
U(OH) 2+2	1.564e-32	8.213e-33	-31.806	-32.086	-0.280	(0)
UF3+	1.651e-34	1.406e-34	-33.782	-33.852	-0.070	(0)
UF2+2	1.017e-35	5.341e-36	-34.993	-35.272	-0.280	(0)
UF4	2.560e-36	2.560e-36	-35.592	-35.592	0.000	(0)
UOH+3	1.170e-37	2.746e-38	-36.932	-37.561	-0.629	(0)

UF5-	1.979e-38	1.685e-38	-37.704	-37.773	-0.070	(0)
UF+3	1.088e-38	2.555e-39	-37.963	-38.593	-0.629	(0)
UF6-2	1.609e-39	8.450e-40	-38.793	-39.073	-0.280	(0)
U(SO4) 2	6.568e-40	6.568e-40	-39.183	-39.183	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.018	-40.298	-0.280	(0)
U+4	0.000e+00	0.000e+00	-42.994	-44.113	-1.119	(0)
UC1+3	0.000e+00	0.000e+00	-44.610	-45.239	-0.629	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-168.938	-174.602	-5.664	(0)
U (5)	5.556e-17					
UO2+	5.556e-17	4.729e-17	-16.255	-16.325	-0.070	(0)
U (6)	8.263e-08					
UO2 (CO3) 2-2	4.114e-08	2.161e-08	-7.386	-7.665	-0.280	(0)
UO2 (CO3) 3-4	4.111e-08	3.127e-09	-7.386	-8.505	-1.119	(0)
UO2CO3	3.749e-10	3.749e-10	-9.426	-9.426	0.000	(0)
UO2F+	8.782e-13	7.476e-13	-12.056	-12.126	-0.070	(0)
UO2OH+	6.839e-13	5.822e-13	-12.165	-12.235	-0.070	(0)
UO2F2	3.581e-13	3.581e-13	-12.446	-12.446	0.000	(0)
UO2SO4	8.101e-14	8.101e-14	-13.091	-13.091	0.000	(0)
UO2+2	5.595e-14	3.261e-14	-13.252	-13.487	-0.234	(0)
UO2F3-	1.755e-14	1.494e-14	-13.756	-13.826	-0.070	(0)
UO2 (SO4) 2-2	3.337e-15	1.753e-15	-14.477	-14.756	-0.280	(0)
UO2Cl+	9.274e-17	7.895e-17	-16.033	-16.103	-0.070	(0)
UO2F4-2	3.752e-17	1.970e-17	-16.426	-16.705	-0.280	(0)
(UO2) 2 (OH) 2+2	1.071e-18	5.625e-19	-17.970	-18.250	-0.280	(0)
(UO2) 3 (OH) 5+	5.870e-21	4.997e-21	-20.231	-20.301	-0.070	(0)
UO2NO3+	1.602e-25	1.364e-25	-24.795	-24.865	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.257	-42.327	-0.070	(0)
V+2	0.000e+00	0.000e+00	-42.709	-42.989	-0.280	(0)
V (3)	2.026e-15					
V (OH) 3	2.026e-15	2.026e-15	-14.693	-14.693	0.000	(0)
V (OH) 2+	1.092e-25	9.292e-26	-24.962	-25.032	-0.070	(0)
VOH+2	1.191e-28	6.257e-29	-27.924	-28.204	-0.280	(0)
V+3	3.750e-33	8.804e-34	-32.426	-33.055	-0.629	(0)
VSO4+	8.013e-34	6.821e-34	-33.096	-33.166	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.154	-54.784	-0.629	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.488	-55.607	-1.119	(0)
V (4)	5.444e-18					
V (OH) 3+	4.913e-18	4.182e-18	-17.309	-17.379	-0.070	(0)
VO+2	2.815e-19	1.478e-19	-18.550	-18.830	-0.280	(0)
VOF+	1.730e-19	1.473e-19	-18.762	-18.832	-0.070	(0)
VOSO4	6.683e-20	6.683e-20	-19.175	-19.175	0.000	(0)
VOF2	9.171e-21	9.171e-21	-20.038	-20.038	0.000	(0)
VOCl+	7.273e-22	6.191e-22	-21.138	-21.208	-0.070	(0)
VOF3-	6.348e-23	5.404e-23	-22.197	-22.267	-0.070	(0)
VOF4-2	6.898e-26	3.623e-26	-25.161	-25.441	-0.280	(0)
H2V2O4+2	1.670e-30	8.772e-31	-29.777	-30.057	-0.280	(0)
V (5)	1.905e-09					
H2VO4-	1.800e-09	1.533e-09	-8.745	-8.815	-0.070	(0)
HVO4-2	1.033e-10	5.424e-11	-9.986	-10.266	-0.280	(0)
H3VO4	1.088e-12	1.088e-12	-11.963	-11.963	0.000	(0)
H3V2O7-	1.265e-14	1.077e-14	-13.898	-13.968	-0.070	(0)
VO2+	1.764e-16	1.542e-16	-15.753	-15.812	-0.059	(0)
HV2O7-3	1.200e-16	2.817e-17	-15.921	-16.550	-0.629	(0)
VO2F	4.490e-17	4.490e-17	-16.348	-16.348	0.000	(0)
VO4-3	1.631e-17	3.830e-18	-16.788	-17.417	-0.629	(0)
VO2SO4-	7.097e-18	6.042e-18	-17.149	-17.219	-0.070	(0)
VO2F2-	3.180e-18	2.707e-18	-17.498	-17.567	-0.070	(0)
V2O7-4	1.405e-19	1.068e-20	-18.852	-19.971	-1.119	(0)
V3O9-3	1.607e-20	3.773e-21	-19.794	-20.423	-0.629	(0)
VO2F3-2	1.068e-20	5.609e-21	-19.971	-20.251	-0.280	(0)
VO2F4-3	1.952e-24	4.583e-25	-23.710	-24.339	-0.629	(0)
V4O12-4	3.170e-26	2.411e-27	-25.499	-26.618	-1.119	(0)
VO2NO3	1.635e-28	1.635e-28	-27.787	-27.787	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.048	-66.796	-1.748	(0)
V10O28-6	0.000e+00	0.000e+00	-65.317	-67.834	-2.517	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.619	-68.737	-1.119	(0)
Zn	1.127e-06					

Zn+2	7.929e-07	4.621e-07	-6.101	-6.335	-0.234	(0)
ZnSO4	1.659e-07	1.659e-07	-6.780	-6.780	0.000	(0)
ZnCO3	7.680e-08	7.680e-08	-7.115	-7.115	0.000	(0)
ZnHCO3+	7.506e-08	6.389e-08	-7.125	-7.195	-0.070	(0)
ZnOH+	7.698e-09	6.553e-09	-8.114	-8.184	-0.070	(0)
Zn(SO4) 2-2	4.516e-09	2.372e-09	-8.345	-8.625	-0.280	(0)
ZnCl+	1.986e-09	1.733e-09	-8.702	-8.761	-0.059	(0)
ZnF+	1.799e-09	1.531e-09	-8.745	-8.815	-0.070	(0)
ZnOHCl	3.217e-10	3.217e-10	-9.493	-9.493	0.000	(0)
Zn(OH) 2	1.473e-10	1.473e-10	-9.832	-9.832	0.000	(0)
ZnCl2	4.099e-12	4.099e-12	-11.387	-11.387	0.000	(0)
Zn(OH) 3-	1.230e-13	1.047e-13	-12.910	-12.980	-0.070	(0)
ZnCl3-	5.571e-15	4.860e-15	-14.254	-14.313	-0.059	(0)
ZnSeO4	1.962e-16	1.962e-16	-15.707	-15.707	0.000	(0)
ZnCl4-2	6.137e-18	3.628e-18	-17.212	-17.440	-0.228	(0)
ZnNO3+	2.858e-18	2.433e-18	-17.544	-17.614	-0.070	(0)
Zn(OH) 4-2	1.125e-18	5.911e-19	-17.949	-18.228	-0.280	(0)
Zn(SeO4) 2-2	1.038e-27	5.451e-28	-26.984	-27.264	-0.280	(0)
Zn(NO3) 2	1.018e-30	1.018e-30	-29.992	-29.992	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.211	-149.281	-0.070	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.420	-150.420	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.523	-225.593	-0.070	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.144	-228.424	-0.280	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.226	-305.505	-0.280	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3) 2	-76.19	-69.90	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2	-56.71	-52.20	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-63.93	-52.20	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3	-98.62	-80.69	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3	-74.16	-54.13	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-34.50	-34.10	0.40	(NH4)2CrO4	
(NH4)2SeO4	-30.17	-29.72	0.45	(NH4)2SeO4	
Acanthite	-51.21	-87.43	-36.22	Ag2S	
Ag2CO3	-10.58	-21.67	-11.09	Ag2CO3	
Ag2CrO4	-20.48	-32.07	-11.59	Ag2CrO4	
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4	
Ag2MoO4	-11.17	-22.72	-11.55	Ag2MoO4	
Ag2O	-14.40	-1.83	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-14.09	-18.91	-4.82	Ag2SO4	
Ag3AsO3	-27.16	-25.00	2.16	Ag3AsO3	
Ag3AsO4	-15.57	-18.36	-2.79	Ag3AsO4	
Ag3H2VO5	-16.59	-11.41	5.18	Ag3H2VO5	
AgF:4H2O	-12.89	-11.84	1.05	AgF:4H2O	
Agmetal	-0.18	-13.69	-13.51	Ag	
AgVO3	-10.35	-9.58	0.77	AgVO3	
Al(OH) 3 (am)	-1.19	9.61	10.80	Al(OH) 3	
Al2(MoO4) 3	-45.81	-43.44	2.37	Al2(MoO4) 3	
Al2O3	-0.43	19.22	19.65	Al2O3	
Al4(OH)10SO4	-1.34	21.36	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-10.80	-6.00	4.80	AlAsO4:2H2O	
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4	
AlSb	-151.92	-86.29	65.62	AlSb	
Alunite	-0.00	-1.40	-1.40	KAl3(SO4) 2 (OH) 6	
Anglesite	-4.10	-11.89	-7.79	PbSO4	
Anhydrite	-1.37	-5.73	-4.36	CaSO4	
Anilite	-55.17	-87.05	-31.88	Cu0.25Cu1.5S	
Antlerite	-2.43	6.35	8.79	Cu3(OH) 4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-86.28	-89.04	-2.76	As4O6	
Artinite	-7.01	2.59	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5	-37.93	-31.23	6.71	As2O5	

Atacamite	-1.74	5.65	7.39	Cu ₂ (OH) ₃ Cl
Azurite	0.67	-16.24	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-17.29	7.10	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-18.99	-3.12	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	-1.01	-9.92	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-28.96	3.98	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-13.47	-23.14	-9.67	BaCrO ₄
BaF ₂	-8.93	-14.75	-5.82	BaF ₂
BaMoO ₄	-6.83	-13.79	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.82	-7.99	1.83	BaSeO ₃
BaSeO ₄	-11.30	-18.76	-7.46	BaSeO ₄
Bianchite	-7.36	-9.12	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-8.59	9.50	18.09	MnO ₂
Bixbyite	-5.90	-6.54	-0.64	Mn ₂ O ₃
BlaubleiI	-54.86	-79.02	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.45	-82.73	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.03	9.61	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-1.05	14.17	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.63	11.21	16.84	Mg(OH) ₂
Bunsenite	-5.27	7.18	12.45	NiO
Ca(VO ₃) ₂	-11.63	-5.97	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-12.11	5.39	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-16.16	5.39	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-19.46	2.84	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-22.22	16.74	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-23.12	16.74	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-300.71	-157.74	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-8.98	-26.89	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.58	-9.53	-7.95	CaMoO ₄
Carnotite	-4.15	-3.92	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-6.55	-3.74	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-11.48	-14.50	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-13.46	-3.62	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.66	5.99	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.74	5.99	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.91	-16.20	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.68	0.88	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.54	6.86	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.30	-13.96	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.27	-13.96	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-12.05	-13.96	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-14.66	-15.87	-1.21	CdF ₂
Cdmetal(α)	-33.07	-19.56	13.51	Cd
Cdmetal(γ)	-33.18	-19.56	13.62	Cd
CdMoO ₄	-0.75	-14.90	-14.15	CdMoO ₄
CdOHC1	-7.53	-3.99	3.54	CdOHC1
CdSb	-76.80	-77.15	-0.35	CdSb
CdSe	-20.68	-40.88	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-18.02	-19.87	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.92	-11.10	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.37	-11.10	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-9.22	-11.10	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-1.52	-14.65	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-6.63	-9.27	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-55.22	-90.14	-34.92	Cu ₂ S
Chalcopyrite	-124.67	-159.94	-35.27	CuFeS ₂
Cinnabar	-52.20	-97.89	-45.69	HgS
Claudetite	-85.98	-89.04	-3.06	As ₄ O ₆
Clausthalite	-14.58	-41.68	-27.10	PbSe
Co(BO ₂) ₂	-29.67	-2.60	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.09	7.00	13.09	Co(OH) ₂

Co(OH) 3	-10.32	-12.63	-2.31	Co(OH) 3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4) 2	-23.26	-10.23	13.03	Co3(AsO4) 2
Co3O4	-7.76	-18.26	-10.50	Co3O4
CoCl2	-21.22	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.96	-45.41	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.13	-13.89	-7.76	CoMoO4
CoO	-6.59	7.00	13.59	CoO
CoS(alpha)	-71.16	-78.60	-7.44	CoS
CoS(beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.08	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.98	-14.76	-4.78	PbCl2
Covellite	-55.49	-77.79	-22.30	CuS
Cr(OH) 2	-21.82	-11.00	10.82	Cr(OH) 2
Cr(OH) 3	-2.51	-1.18	1.34	Cr(OH) 3
Cr(OH) 3(am)	-0.43	-1.18	-0.75	Cr(OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.05	-30.95	14.09	CrCl2
CrCl3	-46.22	-31.10	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.78	-41.62	-33.84	Na3AlF6
Cu(OH) 2	-0.86	7.81	8.67	Cu(OH) 2
Cu(SbO3) 2	-24.85	20.36	45.21	Cu(SbO3) 2
Cu2(OH) 3NO3	-12.45	-3.20	9.25	Cu2(OH) 3NO3
Cu2Sb:3H2O	-55.48	-90.36	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-19.67	-21.62	-1.95	Cu2SO4
Cu3(AsO4) 2:2H2O	-13.89	-7.79	6.10	Cu3(AsO4) 2:2H2O
Cu3Sb	-60.12	-102.71	-42.59	Cu3Sb
Cu3Se2	-26.98	-90.47	-63.49	Cu3Se2
CuCO3	-0.52	-12.02	-11.50	CuCO3
CuCrO4	-16.99	-22.43	-5.44	CuCrO4
CuF	-8.29	-13.20	-4.91	CuF
CuF2	-15.16	-14.04	1.12	CuF2
CuF2:2H2O	-9.49	-14.04	-4.55	CuF2:2H2O
Cumetal	-6.29	-15.04	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.76	-1.46	10.30	CuOCuSO4
Cupricferrite	8.21	14.19	5.99	CuFe2O4
Cuprite	-3.13	-4.54	-1.41	Cu2O
Cuprousferrite	9.84	0.92	-8.92	CuFeO2
CuSe	-5.96	-39.06	-33.10	CuSe
CuSe2	-27.02	-60.38	-33.37	CuSe2
CuSeO3:2H2O	-7.80	-7.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.61	-18.05	-2.44	CuSeO4:5H2O
CuSO4	-12.21	-9.27	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-55.41	-89.33	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3) 2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3) 2
Epsomite	-3.74	-5.87	-2.13	MgSO4:7H2O
Fe(OH) 2	-10.11	3.45	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	3.24	0.20	-3.04	Fe(OH) 2.7Cl.3
Fe(VO3) 2	-10.16	-13.88	-3.72	Fe(VO3) 2
Fe2(OH) 4SeO3	-10.27	-8.71	1.55	Fe2(OH) 4SeO3
Fe2(SeO3) 3:2H2O	-18.28	-38.91	-20.63	Fe2(SeO3) 3:2H2O
Fe2(SO4) 3	-41.13	-44.86	-3.73	Fe2(SO4) 3
Fe3(OH) 8	-10.39	9.83	20.22	Fe3(OH) 8

FeAsO4:2H2O	-12.82	-12.42	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.35	-17.44	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.15	-64.75	-18.60	FeSe2
FeS (ppt)	-79.20	-82.15	-2.95	FeS
FeSe	-32.42	-43.42	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.44	-80.41	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.11	-9.12	-2.01	ZnSO4:7H2O
Greenockite	-65.25	-79.61	-14.36	CdS
Greigite	-287.54	-332.57	-45.03	Fe3S4
Gummite	-6.86	0.81	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-12.49	-24.59	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.01	-20.89	-12.88	H2MoO4
H2S (g)	-77.59	-85.60	-8.01	H2S
H2Se (g)	-41.91	-46.87	-4.96	H2Se
Halite	-6.80	-5.19	1.60	NaCl
Hausmannite	-7.57	53.46	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.22	22.67	22.89	FeAl2O4
Hg(CH3)2 (g)	-182.61	-256.32	-73.71	Hg(CH3)2
Hg (g)	-8.37	-16.24	-7.87	Hg
Hg(OH)2	-8.79	-12.29	-3.50	Hg(OH)2
Hg2 (g)	-17.53	-32.48	-14.96	Hg2
Hg2(OH)2	-12.20	-6.94	5.26	Hg2(OH)2
Hg2CO3	-10.73	-26.78	-16.05	Hg2CO3
Hg2CrO4	-28.48	-37.18	-8.70	Hg2CrO4
Hg2F2	-18.43	-28.80	-10.36	Hg2F2
Hg2S	-80.86	-92.54	-11.68	Hg2S
Hg2SeO3	-17.38	-22.03	-4.66	Hg2SeO3
Hg2SO4	-17.89	-24.02	-6.13	Hg2SO4
Hg3O2CO3	-27.02	-56.70	-29.68	Hg3O2CO3
HgCl (g)	-32.94	-13.44	19.50	HgCl
HgCl2	-10.98	-32.24	-21.26	HgCl2
HgF (g)	-47.07	-14.40	32.68	HgF
HgF2 (g)	-46.71	-34.15	12.57	HgF2
Hgmetal (l)	-2.79	-16.24	-13.45	Hg
HgSe	-3.47	-59.16	-55.69	HgSe
HgSeO3	-14.96	-27.39	-12.43	HgSeO3
HgSO4	-19.95	-29.37	-9.42	HgSO4
Huntite	-4.38	-34.35	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.33	-24.10	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.51	-23.28	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.45	-20.62	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.86	-20.66	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.37	-52.61	-17.24	K2Cr2O7
K2CrO4	-21.86	-22.37	-0.51	K2CrO4
K2MoO4	-16.28	-13.02	3.26	K2MoO4
K2SeO4	-17.26	-17.99	-0.73	K2SeO4
Langite	-3.32	14.17	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.27	-6.70	-0.43	PbO:PbSO4
Laurionite	-5.41	-4.78	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.50	5.19	12.69	PbO
Mackinawite	-78.55	-82.15	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnetite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.09	-4.21	-5.31	Cu2(OH)2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.70	5.19	12.89	PbO

Matlockite	-6.74	-15.71	-8.97	PbClF
Melanothallite	-18.39	-12.14	6.26	CuCl2
Melanterite	-11.42	-13.63	-2.21	FeSO4:7H2O
Metacinnabar	-52.80	-97.89	-45.09	HgS
Mg(OH)2 (active)	-7.58	11.21	18.79	Mg(OH)2
Mg(VO3)2	-17.39	-6.11	11.28	Mg(VO3)2
Mg2Sb3	-276.11	-201.43	74.68	Mg2Sb3
Mg2V2O7	-21.26	5.10	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.83	-9.68	-1.85	MgMoO4
MgSeO3:6H2O	-6.94	-3.88	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.45	-14.65	-1.20	MgSeO4:6H2O
Minium	-32.40	41.12	73.52	Pb3O4
Mirabilite	-6.41	-7.52	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.92	-8.02	4.90	Mn(VO3)2
Mn2(SO4)3	-52.08	-57.79	-5.71	Mn2(SO4)3
Mn2Sb	-151.14	-90.06	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-15.81	-3.31	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.36	-10.64	2.72	MnCl2:4H2O
MnS (grn)	-76.46	-76.29	0.17	MnS
MnS (pnk)	-79.63	-76.29	3.34	MnS
MnSb	-96.27	-99.18	-2.91	MnSb
MnSe	-41.06	-37.56	3.50	MnSe
MnSeO3	-6.92	-5.79	1.13	MnSeO3
MnSeO3:2H2O	-6.77	-5.79	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.50	-16.55	-2.05	MnSeO4:5H2O
MnSO4	-10.36	-7.78	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.65	-12.29	-3.64	HgO
MoO3	-12.89	-20.89	-8.00	MoO3
Morenosite	-7.76	-9.90	-2.14	NiSO4:7H2O
MoS2	-147.38	-217.64	-70.26	MoS2
Na-Jarosite	-8.61	-19.81	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.68	2.93	Na2CrO4
Na2Mo2O7	-15.62	-32.22	-16.60	Na2Mo2O7
Na2MoO4	-12.82	-11.33	1.49	Na2MoO4
Na2MoO4:2H2O	-12.55	-11.33	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.84	-5.54	10.30	Na2SeO3:5H2O
Na2SeO4	-17.58	-16.30	1.28	Na2SeO4
Na3Sb	-176.02	-81.56	94.45	Na3Sb
Na3VO4	-31.00	5.68	36.68	Na3VO4
Na4V2O7	-35.60	1.80	37.40	Na4V2O7
Nantokite	-5.51	-12.24	-6.73	CuCl
NaSb	-88.75	-65.58	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-7.74	-3.88	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.62	7.18	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.39	-9.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.57	-13.71	-11.14	NiMoO4
NiS (alpha)	-72.82	-78.42	-5.60	NiS
NiS (beta)	-67.32	-78.42	-11.10	NiS
NiS (gamma)	-65.62	-78.42	-12.80	NiS
NiSe	-21.99	-39.69	-17.70	NiSe
NiSeO3:2H2O	-10.73	-7.92	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.16	-18.68	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-240.26	-301.32	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.93	-4.41	6.52	Pb(BO2)2
Pb(OH)2	-2.96	5.19	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.35	-67.11	-8.76	Pb10(OH)60(CO3)6

Pb2 (OH) 3Cl	-8.39	0.41	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.81	10.38	26.19	Pb2O (OH) 2
Pb2O3	-25.11	35.93	61.04	Pb2O3
Pb2OCO3	-8.90	-9.45	-0.56	Pb2OCO3
Pb2V2O7	-5.04	-6.94	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.45	-15.65	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.89	-1.75	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.28	-4.26	11.02	Pb3O2CO3
Pb3O2SO4	-12.19	-1.51	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.42	3.68	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.19	3.68	21.88	Pb4O3SO4
PbCrO4	-12.45	-25.05	-12.60	PbCrO4
PbF2	-9.23	-16.67	-7.44	PbF2
Pbmetal	-24.60	-20.35	4.25	Pb
PbMoO4	-0.08	-15.70	-15.62	PbMoO4
PbO:0.3H2O	-7.79	5.19	12.98	PbO:0.33H2O
PbSeO4	-13.83	-20.67	-6.84	PbSeO4
Periclase	-10.37	11.21	21.58	MgO
Phosgenite	-9.59	-29.40	-19.81	PbCl2:PbCO3
Plattnerite	-18.86	30.74	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca (OH) 2
Pyrite	-123.70	-142.21	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn (OH) 2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.89	-120.63	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb (OH) 3	-12.16	-19.27	-7.11	Sb (OH) 3
Sb2O4	-16.40	-13.00	3.40	Sb2O4
Sb2O5	-26.40	-36.07	-9.67	Sb2O5
Sb2Se3	-111.40	-179.15	-67.76	Sb2Se3
Sb4O6(cubic)	-58.82	-77.08	-18.26	Sb4O6
Sb4O6(orth)	-59.18	-77.08	-17.90	Sb4O6
SbCl3	-49.77	-49.20	0.57	SbCl3
SbF3	-41.83	-52.06	-10.23	SbF3
Sbmetal	-45.90	-57.59	-11.69	Sb
SbO2	-2.98	-30.81	-27.82	SbO2
Schoepite	-5.18	0.81	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.22	-21.33	-7.11	Se
Semetal (hex)	-13.62	-21.33	-7.71	Se
Senarmontite	-26.18	-38.54	-12.37	Sb2O3
SeO2	-15.22	-15.10	0.12	SeO2
SeO3	-46.90	-25.86	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.19	-77.64	-11.45	ZnS
Spinel	-6.41	30.43	36.85	MgAl2O4
Stibnite	-244.89	-295.35	-50.46	Sb2S3
Sulfur	-57.91	-60.06	-2.14	S
Tenorite	0.17	7.81	7.64	CuO
Thenardite	-7.84	-7.52	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3:H2O
Tyuyamunite	-8.43	-4.35	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.55	4.54	21.08	U3O8
U3Sb4	-582.56	-430.17	152.38	U3Sb4
U4O9	-33.51	-36.53	-3.02	U4O9
UF4	-29.69	-59.23	-29.54	UF4
UF4:2.5H2O	-26.51	-59.23	-32.72	UF4:2.5H2O
UO2 (am)	-16.45	-15.52	0.93	UO2
UO2 (NO3) 2	-48.99	-36.84	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.69	-36.84	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-40.23	-36.84	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.89	-36.84	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.80	0.81	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.80	-25.05	-2.25	UO2SeO4:4H2O
UO3	-6.89	0.81	7.70	UO3
Uraninite	-10.85	-15.52	-4.67	UO2

USb2	-220.58	-191.00	29.58	USb2
V(OH)3	-19.20	-11.61	7.59	V(OH)3
V2O5	-15.97	-17.33	-1.36	V2O5
V3O5	-40.98	-39.14	1.84	V3O5
V4O7	-50.86	-43.68	7.19	V4O7
V6O13	-42.21	-103.07	-60.86	V6O13
Valentinite	-30.06	-38.54	-8.48	Sb2O3
VC12	-63.21	-44.33	18.87	VC12
VC13	-64.97	-41.53	23.43	VC13
VF4	-63.18	-48.25	14.93	VF4
Vmetal	-93.95	-49.93	44.03	V
VO	-39.14	-24.38	14.76	VO
VO(OH)2	-9.68	-4.53	5.15	VO(OH)2
VO2Cl	-21.48	-18.64	2.84	VO2Cl
VOC1	-32.74	-21.58	11.15	VOC1
VOC12	-37.24	-24.48	12.76	VOC12
VOSO4	-25.22	-21.62	3.61	VOSO4
Witherite	-4.16	-12.73	-8.57	BaCO3
Wurtzite	-68.69	-77.64	-8.95	ZnS
Zincite	-3.37	7.96	11.33	ZnO
Zincosite	-13.05	-9.12	3.93	ZnSO4
Zn(BO2)2	-9.93	-1.64	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.01	-29.69	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.24	7.96	12.20	Zn(OH)2
Zn(OH)2(am)	-4.51	7.96	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.79	7.96	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.57	7.96	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.77	7.96	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.66	-1.16	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.24	5.95	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-20.99	-7.34	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.19	-10.28	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.63	14.77	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.64	19.86	38.50	Zn5(OH)8Cl2
ZnCl2	-19.04	-11.99	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.36	-13.89	-0.53	ZnF2
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO4	-2.80	-12.93	-10.13	ZnMoO4
ZnO(active)	-3.23	7.96	11.19	ZnO
ZnS(am)	-68.59	-77.64	-9.05	ZnS
ZnSb	-86.18	-75.17	11.01	ZnSb
ZnSe	-24.51	-38.91	-14.40	ZnSe
ZnSeO4:6H2O	-16.38	-17.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.48	-9.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 56.

```

Title Stage 3 Run-off mix
Mix 302
1      1
3      0.001868
4      0.019618
5      0.010646
6      0.000000
7      0.035693
8      0.000000
9      5.373865
10     8.412506

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11      16.259210
12      87.164501
13      67.230252
14      26.967769
15      13.652446
Save solution 305
end
-----
TITLE
-----

Stage 3 Run-off mix

-----
Beginning of batch-reaction calculations.
-----

Reaction step 1.

Using mix 302.

Mixture 302.

1.000e+00 Solution 1      Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
1.868e-03 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
1.962e-02 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
1.065e-02 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
3.569e-02 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
5.374e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
8.413e+00 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.626e+01 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
8.716e+01 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
6.723e+01 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
2.697e+01 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
1.365e+01 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements          Molality          Moles
Al                9.829e-07         2.223e-04
As                4.519e-10         1.022e-07
B                 4.446e-07         1.005e-04
Ba                1.333e-07         3.015e-05
C                 7.226e-04         1.634e-01
Ca                3.126e-04         7.068e-02
Cd                1.167e-09         2.639e-07
Cl                3.745e-05         8.469e-03
Co                1.313e-11         2.970e-09
Cr                5.053e-12         1.143e-09
Cu                2.375e-06         5.370e-04

```


F	3.360e-05	7.598e-03
Fe	4.736e-08	1.071e-05
Hg	4.265e-11	9.643e-09
K	6.683e-05	1.511e-02
Mg	8.173e-05	1.848e-02
Mn	9.874e-07	2.233e-04
Mo	3.813e-08	8.623e-06
N	9.985e-08	2.258e-05
Na	1.198e-04	2.709e-02
Ni	2.139e-12	4.837e-10
Pb	3.329e-09	7.527e-07
S	2.508e-04	5.671e-02
Sb	4.009e-10	9.066e-08
Se	3.489e-09	7.889e-07
U	1.212e-08	2.742e-06
V	9.419e-09	2.130e-06
Zn	1.153e-07	2.607e-05

-----Description of solution-----

```

                                pH = 6.452      Charge balance
                                pe = 6.501      Adjusted to redox
equilibrium
                                Activity of water = 1.000
                                Ionic strength (mol/kgw) = 1.570e-03
                                Mass of water (kg) = 2.261e+02
                                Total alkalinity (eq/kg) = 4.127e-04
                                Total CO2 (mol/kg) = 7.226e-04
                                Temperature (°C) = 25.00
                                Electrical balance (eq) = 2.673e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
                                Iterations = 13
                                Total H = 2.510357e+04
                                Total O = 1.255239e+04

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.695e-07	3.535e-07	-6.432	-6.452	-0.019	0.00
OH-	2.978e-08	2.848e-08	-7.526	-7.545	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.829e-07					
AlF2+	4.671e-07	4.473e-07	-6.331	-6.349	-0.019	(0)
AlF3	1.711e-07	1.711e-07	-6.767	-6.767	0.000	(0)
Al(OH) 4-	1.670e-07	1.598e-07	-6.777	-6.796	-0.019	(0)
Al(OH) 2+	8.191e-08	7.842e-08	-7.087	-7.106	-0.019	(0)
Al(OH) 3	4.456e-08	4.456e-08	-7.351	-7.351	0.000	(0)
AlF+2	4.400e-08	3.698e-08	-7.357	-7.432	-0.076	(0)
AlOH+2	4.125e-09	3.466e-09	-8.385	-8.460	-0.076	(0)
AlF4-	2.722e-09	2.605e-09	-8.565	-8.584	-0.019	(0)
AlSO4+	1.958e-10	1.874e-10	-9.708	-9.727	-0.019	(0)
Al+3	1.812e-10	1.217e-10	-9.742	-9.915	-0.173	(0)
Al(SO4) 2-	4.161e-13	3.982e-13	-12.381	-12.400	-0.019	(0)
AlMo6O21-3	3.642e-39	2.396e-39	-38.439	-38.621	-0.182	(0)
As (3)	1.928e-21					
H3AsO3	1.925e-21	1.925e-21	-20.716	-20.716	0.000	(0)
H2AsO3-	2.926e-24	2.793e-24	-23.534	-23.554	-0.020	(0)
H4AsO3+	3.533e-28	3.372e-28	-27.452	-27.472	-0.020	(0)
HAsO3-2	8.678e-30	7.204e-30	-29.062	-29.142	-0.081	(0)
AsO3-3	1.194e-36	7.855e-37	-35.923	-36.105	-0.182	(0)
As (5)	4.519e-10					
H2AsO4-	3.331e-10	3.179e-10	-9.477	-9.498	-0.020	(0)
HAsO4-2	1.188e-10	9.861e-11	-9.925	-10.006	-0.081	(0)
H3AsO4	1.953e-14	1.953e-14	-13.709	-13.709	0.000	(0)
AsO4-3	1.341e-15	8.820e-16	-14.873	-15.055	-0.182	(0)
B	4.446e-07					

	H3BO3	4.438e-07	4.440e-07	-6.353	-6.353	0.000	(0)
	H2BO3-	7.629e-10	7.293e-10	-9.118	-9.137	-0.020	(0)
	CaH2BO3+	1.100e-11	1.052e-11	-10.958	-10.978	-0.020	(0)
	BF(OH) 3-	5.630e-12	5.382e-12	-11.249	-11.269	-0.020	(0)
	MgH2BO3+	1.747e-12	1.670e-12	-11.758	-11.777	-0.020	(0)
	NaH2BO3	1.323e-13	1.323e-13	-12.878	-12.878	0.000	(0)
	BF2(OH) 2-	6.465e-15	6.180e-15	-14.189	-14.209	-0.020	(0)
	BaH2BO3+	2.626e-15	2.510e-15	-14.581	-14.600	-0.020	(0)
	H5(BO3) 2-	2.883e-16	2.756e-16	-15.540	-15.560	-0.020	(0)
	BF3OH-	2.702e-20	2.583e-20	-19.568	-19.588	-0.020	(0)
	H8(BO3) 3-	1.280e-20	1.223e-20	-19.893	-19.912	-0.020	(0)
	BF4-	1.428e-24	1.365e-24	-23.845	-23.865	-0.020	(0)
Ba		1.333e-07					
	Ba+2	1.329e-07	1.114e-07	-6.876	-6.953	-0.077	(0)
	BaHCO3+	4.345e-10	4.161e-10	-9.362	-9.381	-0.019	(0)
	BaCO3	2.964e-12	2.964e-12	-11.528	-11.528	0.000	(0)
	BaOH+	1.446e-14	1.385e-14	-13.840	-13.859	-0.019	(0)
	BaH2BO3+	2.626e-15	2.510e-15	-14.581	-14.600	-0.020	(0)
	BaNO3+	6.761e-17	6.454e-17	-16.170	-16.190	-0.020	(0)
	BaNH3+2	5.685e-18	4.720e-18	-17.245	-17.326	-0.081	(0)
C(4)		7.226e-04					
	HCO3-	4.087e-04	3.913e-04	-3.389	-3.408	-0.019	(0)
	H2CO3	3.111e-04	3.111e-04	-3.507	-3.507	0.000	(0)
	CaHCO3+	1.907e-06	1.826e-06	-5.720	-5.738	-0.019	(0)
	CuCO3	4.350e-07	4.350e-07	-6.362	-6.362	0.000	(0)
	MgHCO3+	2.764e-07	2.645e-07	-6.558	-6.578	-0.019	(0)
	CO3-2	6.192e-08	5.188e-08	-7.208	-7.285	-0.077	(0)
	CuHCO3+	3.682e-08	3.515e-08	-7.434	-7.454	-0.020	(0)
	NaHCO3	2.519e-08	2.519e-08	-7.599	-7.599	0.000	(0)
	CaCO3	2.061e-08	2.061e-08	-7.686	-7.686	0.000	(0)
	UO2(CO3) 2-2	6.570e-09	5.455e-09	-8.182	-8.263	-0.081	(0)
	MnHCO3+	6.446e-09	6.170e-09	-8.191	-8.210	-0.019	(0)
	UO2CO3	5.269e-09	5.269e-09	-8.278	-8.278	0.000	(0)
	MgCO3	2.851e-09	2.851e-09	-8.545	-8.545	0.000	(0)
	ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
	PbHCO3+	5.540e-10	5.289e-10	-9.256	-9.277	-0.020	(0)
	BaHCO3+	4.345e-10	4.161e-10	-9.362	-9.381	-0.019	(0)
	PbCO3	2.837e-10	2.837e-10	-9.547	-9.547	0.000	(0)
	ZnCO3	2.739e-10	2.739e-10	-9.562	-9.562	0.000	(0)
	NaCO3-	1.155e-10	1.106e-10	-9.937	-9.956	-0.019	(0)
	Cu(CO3) 2-2	7.317e-11	6.075e-11	-10.136	-10.216	-0.081	(0)
	UO2(CO3) 3-4	2.986e-11	1.418e-11	-10.525	-10.848	-0.323	(0)
	FeHCO3+	3.707e-12	3.550e-12	-11.431	-11.450	-0.019	(0)
	BaCO3	2.964e-12	2.964e-12	-11.528	-11.528	0.000	(0)
	CdCO3	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
	CdHCO3+	8.737e-13	8.340e-13	-12.059	-12.079	-0.020	(0)
	CoHCO3+	3.275e-13	3.126e-13	-12.485	-12.505	-0.020	(0)
	NiHCO3+	8.400e-14	8.018e-14	-13.076	-13.096	-0.020	(0)
	Pb(CO3) 2-2	5.114e-14	4.246e-14	-13.291	-13.372	-0.081	(0)
	CoCO3	9.010e-15	9.010e-15	-14.045	-14.045	0.000	(0)
	NiCO3	3.218e-15	3.218e-15	-14.492	-14.492	0.000	(0)
	HgCO3	2.855e-15	2.855e-15	-14.544	-14.544	0.000	(0)
	Cd(CO3) 2-2	5.130e-17	4.259e-17	-16.290	-16.371	-0.081	(0)
	HgHCO3+	1.969e-17	1.879e-17	-16.706	-16.726	-0.020	(0)
	Hg(CO3) 2-2	5.642e-19	4.684e-19	-18.249	-18.329	-0.081	(0)
Ca		3.126e-04					
	Ca+2	2.992e-04	2.507e-04	-3.524	-3.601	-0.077	(0)
	CaSO4	1.139e-05	1.139e-05	-4.943	-4.943	0.000	(0)
	CaHCO3+	1.907e-06	1.826e-06	-5.720	-5.738	-0.019	(0)
	CaF+	8.684e-08	8.312e-08	-7.061	-7.080	-0.019	(0)
	CaCO3	2.061e-08	2.061e-08	-7.686	-7.686	0.000	(0)
	CaOH+	1.487e-10	1.425e-10	-9.828	-9.846	-0.019	(0)
	CaH2BO3+	1.100e-11	1.052e-11	-10.958	-10.978	-0.020	(0)
	CaNO3+	9.602e-14	9.166e-14	-13.018	-13.038	-0.020	(0)
	CaNH3+2	2.553e-14	2.119e-14	-13.593	-13.674	-0.081	(0)
	Ca(NH3) 2+2	6.826e-25	5.667e-25	-24.166	-24.247	-0.081	(0)
Cd		1.167e-09					
	Cd+2	1.117e-09	9.363e-10	-8.952	-9.029	-0.077	(0)

	CdSO4	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	CdCO3	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
	CdHCO3+	8.737e-13	8.340e-13	-12.059	-12.079	-0.020	(0)
	CdF+	4.723e-13	4.508e-13	-12.326	-12.346	-0.020	(0)
	CdOH+	2.219e-13	2.118e-13	-12.654	-12.674	-0.020	(0)
	Cd(SO4) 2-2	1.403e-13	1.165e-13	-12.853	-12.934	-0.081	(0)
	CdOHC1	3.743e-15	3.743e-15	-14.427	-14.427	0.000	(0)
	CdCl2	4.786e-16	4.786e-16	-15.320	-15.320	0.000	(0)
	Cd(CO3) 2-2	5.130e-17	4.259e-17	-16.290	-16.371	-0.081	(0)
	Cd(OH) 2	3.806e-17	3.806e-17	-16.419	-16.419	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	CdNO3+	3.586e-19	3.423e-19	-18.445	-18.466	-0.020	(0)
	CdSeO4	6.399e-20	6.399e-20	-19.194	-19.194	0.000	(0)
	CdCl3-	1.134e-20	1.082e-20	-19.946	-19.966	-0.020	(0)
	Cd2OH+3	1.511e-21	9.939e-22	-20.821	-21.003	-0.182	(0)
	Cd(OH) 3-	6.939e-23	6.623e-23	-22.159	-22.179	-0.020	(0)
	Cd(SeO3) 2-2	1.273e-24	1.057e-24	-23.895	-23.976	-0.081	(0)
	Cd(NO3) 2	1.984e-29	1.984e-29	-28.702	-28.702	0.000	(0)
	Cd(OH) 4-2	3.719e-31	3.088e-31	-30.430	-30.510	-0.081	(0)
	CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-232.231	-232.251	-0.020	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-310.086	-310.167	-0.081	(0)
C1		3.745e-05					
	Cl-	3.745e-05	3.583e-05	-4.427	-4.446	-0.019	(0)
	CuCl+	8.452e-11	8.086e-11	-10.073	-10.092	-0.019	(0)
	MnCl+	3.725e-11	3.565e-11	-10.429	-10.448	-0.019	(0)
	CuCl	9.934e-12	9.934e-12	-11.003	-11.003	0.000	(0)
	ZnCl+	8.632e-12	8.258e-12	-11.064	-11.083	-0.019	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	PbCl+	2.423e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
	ZnOHC1	3.079e-13	3.079e-13	-12.512	-12.512	0.000	(0)
	HgClOH	8.287e-14	8.287e-14	-13.082	-13.082	0.000	(0)
	CuCl2-	7.773e-14	7.437e-14	-13.109	-13.129	-0.019	(0)
	HgCl2	5.904e-15	5.904e-15	-14.229	-14.229	0.000	(0)
	CdOHC1	3.743e-15	3.743e-15	-14.427	-14.427	0.000	(0)
	MnCl2	1.805e-15	1.805e-15	-14.744	-14.744	0.000	(0)
	UO2Cl+	1.553e-15	1.482e-15	-14.809	-14.829	-0.020	(0)
	CoCl+	1.334e-15	1.273e-15	-14.875	-14.895	-0.020	(0)
	CuCl2	1.005e-15	1.005e-15	-14.998	-14.998	0.000	(0)
	CdCl2	4.786e-16	4.786e-16	-15.320	-15.320	0.000	(0)
	ZnCl2	4.690e-16	4.690e-16	-15.329	-15.329	0.000	(0)
	PbCl2	3.702e-16	3.702e-16	-15.432	-15.432	0.000	(0)
	NiCl+	1.597e-16	1.524e-16	-15.797	-15.817	-0.020	(0)
	HgCl+	3.444e-17	3.287e-17	-16.463	-16.483	-0.020	(0)
	HgCl3-	2.216e-18	2.115e-18	-17.654	-17.675	-0.020	(0)
	CuCl3-2	6.786e-19	5.698e-19	-18.168	-18.244	-0.076	(0)
	FeCl+2	2.732e-19	2.294e-19	-18.563	-18.639	-0.076	(0)
	CrCl+2	9.186e-20	7.626e-20	-19.037	-19.118	-0.081	(0)
	MnCl3-	1.861e-20	1.781e-20	-19.730	-19.749	-0.019	(0)
	ZnCl3-	1.395e-20	1.335e-20	-19.855	-19.875	-0.019	(0)
	CdCl3-	1.134e-20	1.082e-20	-19.946	-19.966	-0.020	(0)
	VOCl+	7.367e-21	7.032e-21	-20.133	-20.153	-0.020	(0)
	PbCl3-	5.533e-21	5.281e-21	-20.257	-20.277	-0.020	(0)
	HgCl4-2	3.635e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
	CuCl3-	3.512e-22	3.360e-22	-21.454	-21.474	-0.019	(0)
	FeCl2+	3.836e-23	3.672e-23	-22.416	-22.435	-0.019	(0)
	NiCl2	2.750e-23	2.750e-23	-22.561	-22.561	0.000	(0)
	CrOHC12	1.479e-24	1.479e-24	-23.830	-23.830	0.000	(0)
	ZnCl4-2	2.849e-25	2.392e-25	-24.545	-24.621	-0.076	(0)
	CrCl2+	2.716e-25	2.593e-25	-24.566	-24.586	-0.020	(0)
	PbCl4-2	1.042e-25	8.650e-26	-24.982	-25.063	-0.081	(0)
	FeCl3	1.316e-28	1.316e-28	-27.881	-27.881	0.000	(0)
	CuCl4-2	7.186e-29	6.034e-29	-28.144	-28.219	-0.076	(0)
	CrO3Cl-	2.320e-31	2.214e-31	-30.635	-30.655	-0.020	(0)
	CoCl+2	1.137e-39	9.442e-40	-38.944	-39.025	-0.081	(0)
	UCl+3	0.000e+00	0.000e+00	-42.749	-42.930	-0.182	(0)

Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.855	-63.936	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.084	-66.165	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.744	-80.825	-0.081	(0)
Co (2)	1.313e-11					
Co+2	1.237e-11	1.027e-11	-10.907	-10.988	-0.081	(0)
CoSO4	4.065e-13	4.065e-13	-12.391	-12.391	0.000	(0)
CoHCO3+	3.275e-13	3.126e-13	-12.485	-12.505	-0.020	(0)
CoF+	1.034e-14	9.870e-15	-13.985	-14.006	-0.020	(0)
CoCO3	9.010e-15	9.010e-15	-14.045	-14.045	0.000	(0)
CoOH+	6.116e-15	5.838e-15	-14.214	-14.234	-0.020	(0)
CoCl+	1.334e-15	1.273e-15	-14.875	-14.895	-0.020	(0)
Co (OH) 2	1.321e-17	1.321e-17	-16.879	-16.879	0.000	(0)
CoNO2+	4.061e-18	3.876e-18	-17.391	-17.412	-0.020	(0)
Co (NH3) +2	9.992e-20	8.295e-20	-19.000	-19.081	-0.081	(0)
CoNO3+	1.972e-21	1.883e-21	-20.705	-20.725	-0.020	(0)
CoSeO4	1.890e-21	1.890e-21	-20.724	-20.724	0.000	(0)
Co (OH) 3-	7.862e-24	7.505e-24	-23.104	-23.125	-0.020	(0)
CoOH-	1.973e-24	1.883e-24	-23.705	-23.725	-0.020	(0)
Co2OH+3	4.569e-27	3.005e-27	-26.340	-26.522	-0.182	(0)
Co (NH3) 2+2	2.863e-28	2.376e-28	-27.543	-27.624	-0.081	(0)
Co (NO3) 2	4.429e-31	4.429e-31	-30.354	-30.354	0.000	(0)
Co (OH) 4-2	4.081e-32	3.388e-32	-31.389	-31.470	-0.081	(0)
Co (NH3) 3+2	2.420e-37	2.009e-37	-36.616	-36.697	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.069	-46.150	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.312	-48.635	-0.323	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.022	-56.103	-0.081	(0)
Co (3)	2.258e-32					
CoOH+2	2.258e-32	1.874e-32	-31.646	-31.727	-0.081	(0)
Co+3	1.928e-37	1.295e-37	-36.715	-36.888	-0.173	(0)
CoCl+2	1.137e-39	9.442e-40	-38.944	-39.025	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.855	-63.936	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.136	-75.156	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.643	-79.724	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.744	-80.825	-0.081	(0)
Cr (2)	1.494e-28					
Cr+2	1.494e-28	1.240e-28	-27.826	-27.906	-0.081	(0)
Cr (3)	5.053e-12					
Cr (OH) 2+	3.720e-12	3.551e-12	-11.429	-11.450	-0.020	(0)
Cr (OH) +2	1.234e-12	1.025e-12	-11.909	-11.989	-0.081	(0)
CrOHSO4	4.822e-14	4.822e-14	-13.317	-13.317	0.000	(0)
Cr (OH) 3	3.799e-14	3.799e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.538e-15	7.918e-15	-14.021	-14.101	-0.081	(0)
Cr+3	2.500e-15	1.644e-15	-14.602	-14.784	-0.182	(0)
CrSO4+	7.978e-16	7.615e-16	-15.098	-15.118	-0.020	(0)
CrO2-	5.346e-17	5.103e-17	-16.272	-16.292	-0.020	(0)
Cr (OH) 4-	4.512e-17	4.307e-17	-16.346	-16.366	-0.020	(0)
CrCl+2	9.186e-20	7.626e-20	-19.037	-19.118	-0.081	(0)
Cr2 (OH) 2SO4+2	5.379e-24	4.466e-24	-23.269	-23.350	-0.081	(0)
CrOHC12	1.479e-24	1.479e-24	-23.830	-23.830	0.000	(0)
CrCl2+	2.716e-25	2.593e-25	-24.566	-24.586	-0.020	(0)
Cr2 (OH) 2 (SO4) 2	5.261e-26	5.261e-26	-25.279	-25.279	0.000	(0)
CrNO3+2	1.001e-26	8.311e-27	-26.000	-26.080	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.741	-52.822	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.639	-62.821	-0.182	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.084	-66.165	-0.081	(0)
Cr (6)	5.813e-21					
HCrO4-	2.912e-21	2.779e-21	-20.536	-20.556	-0.020	(0)
CrO4-2	2.899e-21	2.429e-21	-20.538	-20.615	-0.077	(0)
NaCrO4-	1.448e-24	1.382e-24	-23.839	-23.859	-0.020	(0)
KCrO4-	6.038e-25	5.763e-25	-24.219	-24.239	-0.020	(0)
H2CrO4	7.965e-28	7.965e-28	-27.099	-27.099	0.000	(0)
CrO3SO4-2	7.150e-29	5.936e-29	-28.146	-28.227	-0.081	(0)
CrO3Cl-	2.320e-31	2.214e-31	-30.635	-30.655	-0.020	(0)
Cr2O7-2	3.226e-40	2.678e-40	-39.491	-39.572	-0.081	(0)
Cu (1)	2.407e-10					
Cu+	2.307e-10	2.202e-10	-9.637	-9.657	-0.020	(0)
CuCl	9.934e-12	9.934e-12	-11.003	-11.003	0.000	(0)
CuCl2-	7.773e-14	7.437e-14	-13.109	-13.129	-0.019	(0)

		CuCl3-2	6.786e-19	5.698e-19	-18.168	-18.244	-0.076	(0)
		Cu (S4) 2-3	0.000e+00	0.000e+00	-153.447	-153.587	-0.140	(0)
		CuS4S5-3	0.000e+00	0.000e+00	-154.180	-154.317	-0.137	(0)
	Cu (2)	2.374e-06						
		Cu+2	1.699e-06	1.424e-06	-5.770	-5.847	-0.077	(0)
		CuCO3	4.350e-07	4.350e-07	-6.362	-6.362	0.000	(0)
		CuOH+	1.340e-07	1.282e-07	-6.873	-6.892	-0.019	(0)
		CuSO4	6.469e-08	6.469e-08	-7.189	-7.189	0.000	(0)
		CuHCO3+	3.682e-08	3.515e-08	-7.434	-7.454	-0.020	(0)
		CuF+	2.859e-09	2.729e-09	-8.544	-8.564	-0.020	(0)
		Cu (OH) 2	7.287e-10	7.287e-10	-9.137	-9.137	0.000	(0)
		Cu2 (OH) 2+2	4.975e-10	4.130e-10	-9.303	-9.384	-0.081	(0)
		CuCl+	8.452e-11	8.086e-11	-10.073	-10.092	-0.019	(0)
		Cu (CO3) 2-2	7.317e-11	6.075e-11	-10.136	-10.216	-0.081	(0)
		CuNO2+	8.363e-12	7.983e-12	-11.078	-11.098	-0.020	(0)
		CuNH3+2	1.179e-12	9.785e-13	-11.929	-12.009	-0.081	(0)
		Cu (OH) 3-	4.460e-14	4.257e-14	-13.351	-13.371	-0.020	(0)
		CuCl2	1.005e-15	1.005e-15	-14.998	-14.998	0.000	(0)
		CuNO3+	5.454e-16	5.206e-16	-15.263	-15.283	-0.020	(0)
		Cu (NO2) 2	4.374e-18	4.374e-18	-17.359	-17.359	0.000	(0)
		Cu (OH) 4-2	1.149e-20	9.542e-21	-19.940	-20.020	-0.081	(0)
		CuCl3-	3.512e-22	3.360e-22	-21.454	-21.474	-0.019	(0)
		Cu (NO3) 2	7.578e-27	7.578e-27	-26.120	-26.120	0.000	(0)
		CuCl4-2	7.186e-29	6.034e-29	-28.144	-28.219	-0.076	(0)
		Cu (HS) 3-	0.000e+00	0.000e+00	-220.262	-220.282	-0.020	(0)
	F	3.360e-05						
		F-	3.176e-05	3.038e-05	-4.498	-4.517	-0.019	(0)
		AlF2+	4.671e-07	4.473e-07	-6.331	-6.349	-0.019	(0)
		MgF+	2.353e-07	2.252e-07	-6.628	-6.647	-0.019	(0)
		AlF3	1.711e-07	1.711e-07	-6.767	-6.767	0.000	(0)
		CaF+	8.684e-08	8.312e-08	-7.061	-7.080	-0.019	(0)
		AlF+2	4.400e-08	3.698e-08	-7.357	-7.432	-0.076	(0)
		HF	1.589e-08	1.589e-08	-7.799	-7.799	0.000	(0)
		CuF+	2.859e-09	2.729e-09	-8.544	-8.564	-0.020	(0)
		AlF4-	2.722e-09	2.605e-09	-8.565	-8.584	-0.019	(0)
		NaF	2.195e-09	2.195e-09	-8.659	-8.659	0.000	(0)
		MnF+	9.986e-10	9.560e-10	-9.001	-9.020	-0.019	(0)
		UO2F+	1.121e-10	1.070e-10	-9.950	-9.971	-0.020	(0)
		ZnF+	5.827e-11	5.562e-11	-10.235	-10.255	-0.020	(0)
		UO2F2	9.374e-12	9.374e-12	-11.028	-11.028	0.000	(0)
		BF (OH) 3-	5.630e-12	5.382e-12	-11.249	-11.269	-0.020	(0)
		PbF+	4.080e-12	3.895e-12	-11.389	-11.410	-0.020	(0)
		HF2-	1.919e-12	1.835e-12	-11.717	-11.736	-0.019	(0)
		CdF+	4.723e-13	4.508e-13	-12.326	-12.346	-0.020	(0)
		UO2F3-	7.494e-14	7.154e-14	-13.125	-13.145	-0.020	(0)
		CoF+	1.034e-14	9.870e-15	-13.985	-14.006	-0.020	(0)
		CrF+2	9.538e-15	7.918e-15	-14.021	-14.101	-0.081	(0)
		FeF+2	8.412e-15	7.063e-15	-14.075	-14.151	-0.076	(0)
		BF2 (OH) 2-	6.465e-15	6.180e-15	-14.189	-14.209	-0.020	(0)
		FeF2+	5.999e-15	5.743e-15	-14.222	-14.241	-0.019	(0)
		PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
		NiF+	1.329e-15	1.269e-15	-14.876	-14.897	-0.020	(0)
		VO2F	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
		H2F2	6.762e-16	6.762e-16	-15.170	-15.170	0.000	(0)
		FeF3	2.462e-16	2.462e-16	-15.609	-15.609	0.000	(0)
		CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
		UO2F4-2	2.080e-17	1.726e-17	-16.682	-16.763	-0.081	(0)
		VO2F2-	1.364e-17	1.302e-17	-16.865	-16.885	-0.020	(0)
		VOF+	1.335e-17	1.275e-17	-16.874	-16.895	-0.020	(0)
		VOF2	1.452e-19	1.452e-19	-18.838	-18.838	0.000	(0)
		PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
		BF3OH-	2.702e-20	2.583e-20	-19.568	-19.588	-0.020	(0)
		VO2F3-2	5.946e-21	4.936e-21	-20.226	-20.307	-0.081	(0)
		VOF3-	1.640e-22	1.565e-22	-21.785	-21.805	-0.020	(0)
		HgF+	5.425e-23	5.178e-23	-22.266	-22.286	-0.020	(0)
		PbF4-2	2.351e-24	1.951e-24	-23.629	-23.710	-0.081	(0)
		BF4-	1.428e-24	1.365e-24	-23.845	-23.865	-0.020	(0)
		VO2F4-3	1.122e-25	7.379e-26	-24.950	-25.132	-0.182	(0)

Sb(OH) 2F	6.750e-26	6.750e-26	-25.171	-25.171	0.000	(0)
SbOF	6.637e-26	6.637e-26	-25.178	-25.178	0.000	(0)
VOF4-2	2.313e-26	1.920e-26	-25.636	-25.717	-0.081	(0)
UF3+	7.643e-33	7.296e-33	-32.117	-32.137	-0.020	(0)
UF2+2	1.825e-33	1.515e-33	-32.739	-32.820	-0.081	(0)
UF4	2.430e-35	2.430e-35	-34.614	-34.614	0.000	(0)
UF+3	6.021e-36	3.961e-36	-35.220	-35.402	-0.182	(0)
UF5-	3.066e-38	2.926e-38	-37.513	-37.534	-0.020	(0)
UF6-2	3.234e-40	2.685e-40	-39.490	-39.571	-0.081	(0)
Fe (2)	9.078e-10					
Fe+2	8.681e-10	7.207e-10	-9.061	-9.142	-0.081	(0)
FeSO4	3.509e-11	3.509e-11	-10.455	-10.455	0.000	(0)
FeHCO3+	3.707e-12	3.550e-12	-11.431	-11.450	-0.019	(0)
FeOH+	8.537e-13	8.172e-13	-12.069	-12.088	-0.019	(0)
Fe (OH) 2	1.849e-17	1.849e-17	-16.733	-16.733	0.000	(0)
Fe (OH) 3-	1.739e-19	1.665e-19	-18.760	-18.779	-0.019	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.470	-238.490	-0.020	(0)
Fe (3)	4.645e-08					
Fe (OH) 2+	4.512e-08	4.320e-08	-7.346	-7.365	-0.019	(0)
Fe (OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
FeOH+2	4.643e-12	3.899e-12	-11.333	-11.409	-0.076	(0)
Fe (OH) 4-	3.660e-12	3.504e-12	-11.437	-11.455	-0.019	(0)
FeF+2	8.412e-15	7.063e-15	-14.075	-14.151	-0.076	(0)
FeF2+	5.999e-15	5.743e-15	-14.222	-14.241	-0.019	(0)
FeSO4+	4.929e-16	4.718e-16	-15.307	-15.326	-0.019	(0)
Fe+3	3.156e-16	2.120e-16	-15.501	-15.674	-0.173	(0)
FeF3	2.462e-16	2.462e-16	-15.609	-15.609	0.000	(0)
Fe (SO4) 2-	2.096e-18	2.001e-18	-17.679	-17.699	-0.020	(0)
FeCl+2	2.732e-19	2.294e-19	-18.563	-18.639	-0.076	(0)
FeHSeO3+2	2.218e-21	1.841e-21	-20.654	-20.735	-0.081	(0)
Fe2 (OH) 2+4	1.060e-21	5.033e-22	-20.975	-21.298	-0.323	(0)
FeCl2+	3.836e-23	3.672e-23	-22.416	-22.435	-0.019	(0)
FeNO3+2	2.953e-25	2.451e-25	-24.530	-24.611	-0.081	(0)
Fe3 (OH) 4+5	1.006e-27	3.143e-28	-26.997	-27.503	-0.505	(0)
FeCl3	1.316e-28	1.316e-28	-27.881	-27.881	0.000	(0)
H (0)	1.764e-29					
H2	8.820e-30	8.824e-30	-29.055	-29.054	0.000	(0)
Hg (0)	4.232e-11					
Hg	4.232e-11	4.232e-11	-10.373	-10.373	0.000	(0)
Hg (1)	3.182e-21					
Hg2+2	1.591e-21	1.321e-21	-20.798	-20.879	-0.081	(0)
Hg (2)	3.270e-13					
Hg (OH) 2	2.352e-13	2.353e-13	-12.629	-12.628	0.000	(0)
HgClOH	8.287e-14	8.287e-14	-13.082	-13.082	0.000	(0)
HgCl2	5.904e-15	5.904e-15	-14.229	-14.229	0.000	(0)
HgCO3	2.855e-15	2.855e-15	-14.544	-14.544	0.000	(0)
HgOH+	5.461e-17	5.213e-17	-16.263	-16.283	-0.020	(0)
HgCl+	3.444e-17	3.287e-17	-16.463	-16.483	-0.020	(0)
HgHCO3+	1.969e-17	1.879e-17	-16.706	-16.726	-0.020	(0)
HgCl3-	2.216e-18	2.115e-18	-17.654	-17.675	-0.020	(0)
Hg (CO3) 2-2	5.642e-19	4.684e-19	-18.249	-18.329	-0.081	(0)
Hg+2	5.538e-20	4.598e-20	-19.257	-19.337	-0.081	(0)
HgSO4	2.388e-21	2.388e-21	-20.622	-20.622	0.000	(0)
HgNH3+2	2.347e-21	1.948e-21	-20.630	-20.710	-0.081	(0)
Hg (OH) 3-	8.839e-22	8.437e-22	-21.054	-21.074	-0.020	(0)
HgCl4-2	3.635e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
Hg (NH3) 2+2	1.576e-22	1.309e-22	-21.802	-21.883	-0.081	(0)
HgF+	5.425e-23	5.178e-23	-22.266	-22.286	-0.020	(0)
HgNO3+	2.056e-30	1.963e-30	-29.687	-29.707	-0.020	(0)
Hg (NH3) 3+2	4.214e-32	3.499e-32	-31.375	-31.456	-0.081	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.025	-40.025	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.648	-40.729	-0.081	(0)
HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.357	-143.437	-0.081	(0)
K	6.683e-05					
K+	6.674e-05	6.385e-05	-4.176	-4.195	-0.019	(0)

	KSO4-	9.364e-08	8.966e-08	-7.029	-7.047	-0.019	(0)
	KCrO4-	6.038e-25	5.763e-25	-24.219	-24.239	-0.020	(0)
Mg		8.173e-05					
	Mg+2	7.884e-05	6.606e-05	-4.103	-4.180	-0.077	(0)
	MgSO4	2.384e-06	2.384e-06	-5.623	-5.623	0.000	(0)
	MgHCO3+	2.764e-07	2.645e-07	-6.558	-6.578	-0.019	(0)
	MgF+	2.353e-07	2.252e-07	-6.628	-6.647	-0.019	(0)
	MgCO3	2.851e-09	2.851e-09	-8.545	-8.545	0.000	(0)
	MgOH+	7.818e-10	7.490e-10	-9.107	-9.126	-0.019	(0)
	MgH2BO3+	1.747e-12	1.670e-12	-11.758	-11.777	-0.020	(0)
Mn (2)		9.874e-07					
	Mn+2	9.520e-07	7.904e-07	-6.021	-6.102	-0.081	(0)
	MnSO4	2.788e-08	2.788e-08	-7.555	-7.555	0.000	(0)
	MnHCO3+	6.446e-09	6.170e-09	-8.191	-8.210	-0.019	(0)
	MnF+	9.986e-10	9.560e-10	-9.001	-9.020	-0.019	(0)
	MnOH+	5.907e-11	5.654e-11	-10.229	-10.248	-0.019	(0)
	MnCl+	3.725e-11	3.565e-11	-10.429	-10.448	-0.019	(0)
	MnCl2	1.805e-15	1.805e-15	-14.744	-14.744	0.000	(0)
	MnNO3+	1.517e-16	1.448e-16	-15.819	-15.839	-0.020	(0)
	MnSeO4	7.807e-17	7.807e-17	-16.107	-16.107	0.000	(0)
	MnCl3-	1.861e-20	1.781e-20	-19.730	-19.749	-0.019	(0)
	Mn (OH) 3-	2.961e-22	2.835e-22	-21.529	-21.548	-0.019	(0)
	Mn (NO3) 2	4.207e-26	4.207e-26	-25.376	-25.376	0.000	(0)
	Mn (OH) 4-2	3.104e-29	2.606e-29	-28.508	-28.584	-0.076	(0)
	MnSe	0.000e+00	0.000e+00	-46.372	-46.372	0.000	(0)
Mn (3)		1.664e-25					
	Mn+3	1.664e-25	1.118e-25	-24.779	-24.952	-0.173	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-46.833	-46.909	-0.076	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-49.761	-49.781	-0.019	(0)
Mo		3.813e-08					
	MoO4-2	3.790e-08	3.176e-08	-7.421	-7.498	-0.077	(0)
	HMoO4-	2.340e-10	2.234e-10	-9.631	-9.651	-0.020	(0)
	H2MoO4	5.785e-13	5.785e-13	-12.238	-12.238	0.000	(0)
	AlMo6O21-3	3.642e-39	2.396e-39	-38.439	-38.621	-0.182	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.382	-51.110	-0.727	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.669	-51.174	-0.505	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.520	-52.844	-0.323	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-55.867	-56.049	-0.182	(0)
N (-3)		4.372e-08					
	NH4+	4.356e-08	4.164e-08	-7.361	-7.380	-0.020	(0)
	NH4SO4-	9.246e-11	8.850e-11	-10.034	-10.053	-0.019	(0)
	NH3	6.716e-11	6.716e-11	-10.173	-10.173	0.000	(0)
	CuNH3+2	1.179e-12	9.785e-13	-11.929	-12.009	-0.081	(0)
	CaNH3+2	2.553e-14	2.119e-14	-13.593	-13.674	-0.081	(0)
	BaNH3+2	5.685e-18	4.720e-18	-17.245	-17.326	-0.081	(0)
	Co (NH3) +2	9.992e-20	8.295e-20	-19.000	-19.081	-0.081	(0)
	NiNH3+2	7.222e-20	5.996e-20	-19.141	-19.222	-0.081	(0)
	HgNH3+2	2.347e-21	1.948e-21	-20.630	-20.710	-0.081	(0)
	Hg (NH3) 2+2	1.576e-22	1.309e-22	-21.802	-21.883	-0.081	(0)
	Ca (NH3) 2+2	6.826e-25	5.667e-25	-24.166	-24.247	-0.081	(0)
	Ni (NH3) 2+2	7.011e-28	5.820e-28	-27.154	-27.235	-0.081	(0)
	Co (NH3) 2+2	2.863e-28	2.376e-28	-27.543	-27.624	-0.081	(0)
	Hg (NH3) 3+2	4.214e-32	3.499e-32	-31.375	-31.456	-0.081	(0)
	Co (NH3) 3+2	2.420e-37	2.009e-37	-36.616	-36.697	-0.081	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.648	-40.729	-0.081	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-46.069	-46.150	-0.081	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.741	-52.822	-0.081	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-56.022	-56.103	-0.081	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.639	-62.821	-0.182	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.855	-63.936	-0.081	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.084	-66.165	-0.081	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.136	-75.156	-0.020	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.643	-79.724	-0.081	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.744	-80.825	-0.081	(0)
N (3)		5.601e-08					
	NO2-	5.600e-08	5.355e-08	-7.252	-7.271	-0.019	(0)

CuNO ₂ +	8.363e-12	7.983e-12	-11.078	-11.098	-0.020	(0)
Cu (NO ₂) ₂	4.374e-18	4.374e-18	-17.359	-17.359	0.000	(0)
CoNO ₂ +	4.061e-18	3.876e-18	-17.391	-17.412	-0.020	(0)
N (5)	1.209e-10					
NO ₃ -	1.209e-10	1.156e-10	-9.918	-9.937	-0.019	(0)
CaNO ₃ +	9.602e-14	9.166e-14	-13.018	-13.038	-0.020	(0)
CuNO ₃ +	5.454e-16	5.206e-16	-15.263	-15.283	-0.020	(0)
MnNO ₃ +	1.517e-16	1.448e-16	-15.819	-15.839	-0.020	(0)
BaNO ₃ +	6.761e-17	6.454e-17	-16.170	-16.190	-0.020	(0)
ZnNO ₃ +	2.792e-17	2.665e-17	-16.554	-16.574	-0.020	(0)
PbNO ₃ +	3.259e-18	3.111e-18	-17.487	-17.507	-0.020	(0)
CdNO ₃ +	3.586e-19	3.423e-19	-18.445	-18.466	-0.020	(0)
UO ₂ NO ₃ +	6.165e-21	5.885e-21	-20.210	-20.230	-0.020	(0)
CoNO ₃ +	1.972e-21	1.883e-21	-20.705	-20.725	-0.020	(0)
NiNO ₃ +	5.058e-22	4.828e-22	-21.296	-21.316	-0.020	(0)
VO ₂ NO ₃	1.296e-24	1.296e-24	-23.887	-23.887	0.000	(0)
FeNO ₃ +2	2.953e-25	2.451e-25	-24.530	-24.611	-0.081	(0)
Mn (NO ₃) ₂	4.207e-26	4.207e-26	-25.376	-25.376	0.000	(0)
CrNO ₃ +2	1.001e-26	8.311e-27	-26.000	-26.080	-0.081	(0)
Cu (NO ₃) ₂	7.578e-27	7.578e-27	-26.120	-26.120	0.000	(0)
Zn (NO ₃) ₂	6.148e-28	6.148e-28	-27.211	-27.211	0.000	(0)
Pb (NO ₃) ₂	6.109e-28	6.109e-28	-27.214	-27.214	0.000	(0)
Cd (NO ₃) ₂	1.984e-29	1.984e-29	-28.702	-28.702	0.000	(0)
HgNO ₃ +	2.056e-30	1.963e-30	-29.687	-29.707	-0.020	(0)
Co (NO ₃) ₂	4.429e-31	4.429e-31	-30.354	-30.354	0.000	(0)
Hg (NO ₃) ₂	0.000e+00	0.000e+00	-40.025	-40.025	0.000	(0)
Na	1.198e-04					
Na+	1.197e-04	1.145e-04	-3.922	-3.941	-0.019	(0)
NaSO ₄ -	1.274e-07	1.219e-07	-6.895	-6.914	-0.019	(0)
NaHCO ₃	2.519e-08	2.519e-08	-7.599	-7.599	0.000	(0)
NaF	2.195e-09	2.195e-09	-8.659	-8.659	0.000	(0)
NaCO ₃ -	1.155e-10	1.106e-10	-9.937	-9.956	-0.019	(0)
NaH ₂ BO ₃	1.323e-13	1.323e-13	-12.878	-12.878	0.000	(0)
NaCrO ₄ -	1.448e-24	1.382e-24	-23.839	-23.859	-0.020	(0)
Ni	2.139e-12					
Ni+2	1.984e-12	1.662e-12	-11.703	-11.779	-0.077	(0)
NiHCO ₃ +	8.400e-14	8.018e-14	-13.076	-13.096	-0.020	(0)
NiSO ₄	6.578e-14	6.578e-14	-13.182	-13.182	0.000	(0)
NiCO ₃	3.218e-15	3.218e-15	-14.492	-14.492	0.000	(0)
NiF+	1.329e-15	1.269e-15	-14.876	-14.897	-0.020	(0)
NiOH+	6.244e-16	5.960e-16	-15.205	-15.225	-0.020	(0)
NiCl+	1.597e-16	1.524e-16	-15.797	-15.817	-0.020	(0)
Ni (OH) ₂	1.348e-18	1.348e-18	-17.870	-17.870	0.000	(0)
Ni (SO ₄) ₂ -2	5.204e-19	4.320e-19	-18.284	-18.364	-0.081	(0)
NiNH ₃ +2	7.222e-20	5.996e-20	-19.141	-19.222	-0.081	(0)
NiNO ₃ +	5.058e-22	4.828e-22	-21.296	-21.316	-0.020	(0)
NiSeO ₄	2.854e-22	2.854e-22	-21.545	-21.545	0.000	(0)
Ni (OH) ₃ -	4.023e-23	3.840e-23	-22.395	-22.416	-0.020	(0)
NiCl ₂	2.750e-23	2.750e-23	-22.561	-22.561	0.000	(0)
Ni (NH ₃) ₂ +2	7.011e-28	5.820e-28	-27.154	-27.235	-0.081	(0)
O (0)	1.302e-34					
O ₂	6.508e-35	6.510e-35	-34.187	-34.186	0.000	(0)
Pb	3.329e-09					
Pb+2	2.171e-09	1.819e-09	-8.663	-8.740	-0.077	(0)
PbHCO ₃ +	5.540e-10	5.289e-10	-9.256	-9.277	-0.020	(0)
PbCO ₃	2.837e-10	2.837e-10	-9.547	-9.547	0.000	(0)
PbSO ₄	1.767e-10	1.767e-10	-9.753	-9.753	0.000	(0)
PbOH+	1.363e-10	1.301e-10	-9.865	-9.886	-0.020	(0)
PbF+	4.080e-12	3.895e-12	-11.389	-11.410	-0.020	(0)
PbCl+	2.423e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
Pb (SO ₄) ₂ -2	2.544e-13	2.112e-13	-12.594	-12.675	-0.081	(0)
Pb (OH) ₂	1.172e-13	1.172e-13	-12.931	-12.931	0.000	(0)
Pb (CO ₃) ₂ -2	5.114e-14	4.246e-14	-13.291	-13.372	-0.081	(0)
PbF ₂	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
PbCl ₂	3.702e-16	3.702e-16	-15.432	-15.432	0.000	(0)
Pb ₂ OH+3	5.704e-18	3.752e-18	-17.244	-17.426	-0.182	(0)
Pb (OH) ₃ -	3.497e-18	3.338e-18	-17.456	-17.476	-0.020	(0)
PbNO ₃ +	3.259e-18	3.111e-18	-17.487	-17.507	-0.020	(0)

PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
PbCl3-	5.533e-21	5.281e-21	-20.257	-20.277	-0.020	(0)
Pb (OH) 4-2	2.805e-23	2.329e-23	-22.552	-22.633	-0.081	(0)
PbF4-2	2.351e-24	1.951e-24	-23.629	-23.710	-0.081	(0)
Pb3 (OH) 4+2	6.007e-25	4.987e-25	-24.221	-24.302	-0.081	(0)
PbCl4-2	1.042e-25	8.650e-26	-24.982	-25.063	-0.081	(0)
Pb (NO3) 2	6.109e-28	6.109e-28	-27.214	-27.214	0.000	(0)
Pb4 (OH) 4+4	1.517e-29	7.206e-30	-28.819	-29.142	-0.323	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.693	-153.693	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.484	-232.505	-0.020	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.543	-79.543	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.091	-80.112	-0.020	(0)
CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
S5-2	0.000e+00	0.000e+00	-82.944	-83.025	-0.081	(0)
S6-2	0.000e+00	0.000e+00	-83.460	-83.541	-0.081	(0)
S4-2	0.000e+00	0.000e+00	-83.540	-83.621	-0.081	(0)
S3-2	0.000e+00	0.000e+00	-84.346	-84.427	-0.081	(0)
S2-2	0.000e+00	0.000e+00	-85.362	-85.443	-0.081	(0)
S-2	0.000e+00	0.000e+00	-90.884	-90.960	-0.076	(0)
HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.357	-143.437	-0.081	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.447	-153.587	-0.140	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.693	-153.693	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.979	-153.999	-0.020	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.180	-154.317	-0.137	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.440	-154.440	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.262	-220.282	-0.020	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.252	-231.272	-0.020	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.231	-232.251	-0.020	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.484	-232.505	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.720	-234.800	-0.081	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.470	-238.490	-0.020	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-310.086	-310.167	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.763	-312.843	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.671	-324.752	-0.081	(0)
S (6)	2.508e-04					
SO4-2	2.367e-04	1.983e-04	-3.626	-3.703	-0.077	(0)
CaSO4	1.139e-05	1.139e-05	-4.943	-4.943	0.000	(0)
MgSO4	2.384e-06	2.384e-06	-5.623	-5.623	0.000	(0)
NaSO4-	1.274e-07	1.219e-07	-6.895	-6.914	-0.019	(0)
KSO4-	9.364e-08	8.966e-08	-7.029	-7.047	-0.019	(0)
CuSO4	6.469e-08	6.469e-08	-7.189	-7.189	0.000	(0)
MnSO4	2.788e-08	2.788e-08	-7.555	-7.555	0.000	(0)
HSO4-	7.160e-09	6.852e-09	-8.145	-8.164	-0.019	(0)
ZnSO4	3.981e-09	3.981e-09	-8.400	-8.400	0.000	(0)
AlSO4+	1.958e-10	1.874e-10	-9.708	-9.727	-0.019	(0)
PbSO4	1.767e-10	1.767e-10	-9.753	-9.753	0.000	(0)
NH4SO4-	9.246e-11	8.850e-11	-10.034	-10.053	-0.019	(0)
CdSO4	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
FeSO4	3.509e-11	3.509e-11	-10.455	-10.455	0.000	(0)
Zn (SO4) 2-2	8.284e-12	6.877e-12	-11.082	-11.163	-0.081	(0)
UO2SO4	7.657e-12	7.657e-12	-11.116	-11.116	0.000	(0)
Al (SO4) 2-	4.161e-13	3.982e-13	-12.381	-12.400	-0.019	(0)
CoSO4	4.065e-13	4.065e-13	-12.391	-12.391	0.000	(0)
Pb (SO4) 2-2	2.544e-13	2.112e-13	-12.594	-12.675	-0.081	(0)
Cd (SO4) 2-2	1.403e-13	1.165e-13	-12.853	-12.934	-0.081	(0)
NiSO4	6.578e-14	6.578e-14	-13.182	-13.182	0.000	(0)
CrOHSO4	4.822e-14	4.822e-14	-13.317	-13.317	0.000	(0)
UO2 (SO4) 2-2	2.412e-14	2.002e-14	-13.618	-13.699	-0.081	(0)
CrSO4+	7.978e-16	7.615e-16	-15.098	-15.118	-0.020	(0)
FeSO4+	4.929e-16	4.718e-16	-15.307	-15.326	-0.019	(0)
VO2SO4-	1.099e-16	1.049e-16	-15.959	-15.979	-0.020	(0)
VOSO4	3.821e-18	3.821e-18	-17.418	-17.418	0.000	(0)
Fe (SO4) 2-	2.096e-18	2.001e-18	-17.679	-17.699	-0.020	(0)

Ni (SO4) 2-2	5.204e-19	4.320e-19	-18.284	-18.364	-0.081	(0)
HgSO4	2.388e-21	2.388e-21	-20.622	-20.622	0.000	(0)
Cr2 (OH) 2SO4+2	5.379e-24	4.466e-24	-23.269	-23.350	-0.081	(0)
Cr2 (OH) 2 (SO4) 2	5.261e-26	5.261e-26	-25.279	-25.279	0.000	(0)
CrO3SO4-2	7.150e-29	5.936e-29	-28.146	-28.227	-0.081	(0)
VSO4+	1.345e-31	1.284e-31	-30.871	-30.892	-0.020	(0)
U (SO4) 2	8.129e-38	8.129e-38	-37.090	-37.090	0.000	(0)
USO4+2	6.215e-38	5.160e-38	-37.207	-37.287	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.136	-75.156	-0.020	(0)
Sb (3)	7.949e-21					
Sb (OH) 3	4.023e-21	4.023e-21	-20.395	-20.395	0.000	(0)
HSbO2	3.927e-21	3.927e-21	-20.406	-20.406	0.000	(0)
Sb (OH) 2F	6.750e-26	6.750e-26	-25.171	-25.171	0.000	(0)
SbOF	6.637e-26	6.637e-26	-25.178	-25.178	0.000	(0)
Sb (OH) 2+	3.618e-26	3.453e-26	-25.442	-25.462	-0.020	(0)
SbO2-	1.884e-26	1.799e-26	-25.725	-25.745	-0.020	(0)
SbO+	1.247e-26	1.191e-26	-25.904	-25.924	-0.020	(0)
Sb (OH) 4-	1.080e-26	1.031e-26	-25.967	-25.987	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.671	-324.752	-0.081	(0)
Sb (5)	4.009e-10					
SbO3-	4.004e-10	3.822e-10	-9.397	-9.418	-0.020	(0)
Sb (OH) 6-	4.673e-13	4.471e-13	-12.330	-12.350	-0.019	(0)
SbO2+	1.436e-23	1.370e-23	-22.843	-22.863	-0.020	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.316	-41.336	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.898	-43.898	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.372	-46.372	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.804	-49.885	-0.081	(0)
Se (4)	3.488e-09					
HSeO3-	3.443e-09	3.287e-09	-8.463	-8.483	-0.020	(0)
SeO3-2	4.458e-11	3.701e-11	-10.351	-10.432	-0.081	(0)
H2SeO3	4.957e-13	4.957e-13	-12.305	-12.305	0.000	(0)
FeHSeO3+2	2.218e-21	1.841e-21	-20.654	-20.735	-0.081	(0)
Cd (SeO3) 2-2	1.273e-24	1.057e-24	-23.895	-23.976	-0.081	(0)
Se (6)	4.381e-13					
SeO4-2	4.380e-13	3.670e-13	-12.359	-12.435	-0.077	(0)
MnSeO4	7.807e-17	7.807e-17	-16.107	-16.107	0.000	(0)
HSeO4-	6.813e-18	6.503e-18	-17.167	-17.187	-0.020	(0)
ZnSeO4	5.215e-18	5.215e-18	-17.283	-17.283	0.000	(0)
CdSeO4	6.399e-20	6.399e-20	-19.194	-19.194	0.000	(0)
CoSeO4	1.890e-21	1.890e-21	-20.724	-20.724	0.000	(0)
NiSeO4	2.854e-22	2.854e-22	-21.545	-21.545	0.000	(0)
Zn (SeO4) 2-2	2.338e-30	1.941e-30	-29.631	-29.712	-0.081	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.300	-55.481	-0.182	(0)
U (4)	9.535e-22					
U (OH) 5-	9.401e-22	8.974e-22	-21.027	-21.047	-0.020	(0)
U (OH) 4	1.329e-23	1.329e-23	-22.877	-22.877	0.000	(0)
U (OH) 3+	1.799e-26	1.717e-26	-25.745	-25.765	-0.020	(0)
U (OH) 2+2	3.382e-30	2.808e-30	-29.471	-29.552	-0.081	(0)
UF3+	7.643e-33	7.296e-33	-32.117	-32.137	-0.020	(0)
UF2+2	1.825e-33	1.515e-33	-32.739	-32.820	-0.081	(0)
UOH+3	7.106e-35	4.675e-35	-34.148	-34.330	-0.182	(0)
UF4	2.430e-35	2.430e-35	-34.614	-34.614	0.000	(0)
UF+3	6.021e-36	3.961e-36	-35.220	-35.402	-0.182	(0)
U (SO4) 2	8.129e-38	8.129e-38	-37.090	-37.090	0.000	(0)
USO4+2	6.215e-38	5.160e-38	-37.207	-37.287	-0.081	(0)
UF5-	3.066e-38	2.926e-38	-37.513	-37.534	-0.020	(0)
UF6-2	3.234e-40	2.685e-40	-39.490	-39.571	-0.081	(0)
U+4	1.376e-40	0.000e+00	-39.861	-40.185	-0.323	(0)
UCl+3	0.000e+00	0.000e+00	-42.749	-42.930	-0.182	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.854	-161.490	-1.637	(0)
U (5)	5.144e-15					
UO2+	5.144e-15	4.910e-15	-14.289	-14.309	-0.020	(0)
U (6)	1.212e-08					
UO2 (CO3) 2-2	6.570e-09	5.455e-09	-8.182	-8.263	-0.081	(0)
UO2CO3	5.269e-09	5.269e-09	-8.278	-8.278	0.000	(0)
UO2F+	1.121e-10	1.070e-10	-9.950	-9.971	-0.020	(0)

UO2OH+	9.582e-11	9.146e-11	-10.019	-10.039	-0.020	(0)
UO2+2	3.044e-11	2.551e-11	-10.517	-10.593	-0.077	(0)
UO2 (CO3) 3-4	2.986e-11	1.418e-11	-10.525	-10.848	-0.323	(0)
UO2F2	9.374e-12	9.374e-12	-11.028	-11.028	0.000	(0)
UO2SO4	7.657e-12	7.657e-12	-11.116	-11.116	0.000	(0)
UO2F3-	7.494e-14	7.154e-14	-13.125	-13.145	-0.020	(0)
UO2 (SO4) 2-2	2.412e-14	2.002e-14	-13.618	-13.699	-0.081	(0)
(UO2) 2 (OH) 2+2	1.672e-14	1.388e-14	-13.777	-13.858	-0.081	(0)
UO2Cl+	1.553e-15	1.482e-15	-14.809	-14.829	-0.020	(0)
(UO2) 3 (OH) 5+	8.185e-16	7.813e-16	-15.087	-15.107	-0.020	(0)
UO2F4-2	2.080e-17	1.726e-17	-16.682	-16.763	-0.081	(0)
UO2NO3+	6.165e-21	5.885e-21	-20.210	-20.230	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.593	-40.674	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.689	-40.709	-0.020	(0)
V (3)	2.555e-14					
V (OH) 3	2.555e-14	2.555e-14	-13.593	-13.593	0.000	(0)
V (OH) 2+	6.115e-24	5.837e-24	-23.214	-23.234	-0.020	(0)
VOH+2	2.357e-26	1.957e-26	-25.628	-25.708	-0.081	(0)
V+3	2.084e-30	1.371e-30	-29.681	-29.863	-0.182	(0)
VSO4+	1.345e-31	1.284e-31	-30.871	-30.892	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.293	-50.617	-0.323	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.308	-50.490	-0.182	(0)
V (4)	5.180e-16					
V (OH) 3+	4.164e-16	3.975e-16	-15.380	-15.401	-0.020	(0)
VO+2	8.426e-17	6.995e-17	-16.074	-16.155	-0.081	(0)
VOF+	1.335e-17	1.275e-17	-16.874	-16.895	-0.020	(0)
VOSO4	3.821e-18	3.821e-18	-17.418	-17.418	0.000	(0)
VOF2	1.452e-19	1.452e-19	-18.838	-18.838	0.000	(0)
VOC1+	7.367e-21	7.032e-21	-20.133	-20.153	-0.020	(0)
VOF3-	1.640e-22	1.565e-22	-21.785	-21.805	-0.020	(0)
VOF4-2	2.313e-26	1.920e-26	-25.636	-25.717	-0.081	(0)
H2V2O4+2	9.540e-27	7.920e-27	-26.020	-26.101	-0.081	(0)
V (5)	9.419e-09					
H2VO4-	9.308e-09	8.885e-09	-8.031	-8.051	-0.020	(0)
HVO4-2	7.604e-11	6.313e-11	-10.119	-10.200	-0.081	(0)
H3VO4	3.141e-11	3.141e-11	-10.503	-10.503	0.000	(0)
H3V2O7-	1.888e-12	1.802e-12	-11.724	-11.744	-0.020	(0)
VO2+	2.316e-14	2.216e-14	-13.635	-13.654	-0.019	(0)
VO2F	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
HV2O7-3	2.889e-16	1.900e-16	-15.539	-15.721	-0.182	(0)
VO2SO4-	1.099e-16	1.049e-16	-15.959	-15.979	-0.020	(0)
VO2F2-	1.364e-17	1.302e-17	-16.865	-16.885	-0.020	(0)
VO4-3	1.360e-18	8.949e-19	-17.866	-18.048	-0.182	(0)
V3O9-3	1.116e-18	7.344e-19	-17.952	-18.134	-0.182	(0)
V2O7-4	3.046e-20	1.447e-20	-19.516	-19.840	-0.323	(0)
VO2F3-2	5.946e-21	4.936e-21	-20.226	-20.307	-0.081	(0)
V4O12-4	5.727e-24	2.720e-24	-23.242	-23.565	-0.323	(0)
VO2NO3	1.296e-24	1.296e-24	-23.887	-23.887	0.000	(0)
VO2F4-3	1.122e-25	7.379e-26	-24.950	-25.132	-0.182	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.174	-55.679	-0.505	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.600	-56.923	-0.323	(0)
V10O28-6	0.000e+00	0.000e+00	-56.687	-57.414	-0.727	(0)
Zn	1.153e-07					
Zn+2	1.095e-07	9.175e-08	-6.961	-7.037	-0.077	(0)
ZnSO4	3.981e-09	3.981e-09	-8.400	-8.400	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
ZnCO3	2.739e-10	2.739e-10	-9.562	-9.562	0.000	(0)
ZnOH+	2.738e-10	2.613e-10	-9.563	-9.583	-0.020	(0)
ZnF+	5.827e-11	5.562e-11	-10.235	-10.255	-0.020	(0)
ZnCl+	8.632e-12	8.258e-12	-11.064	-11.083	-0.019	(0)
Zn (SO4) 2-2	8.284e-12	6.877e-12	-11.082	-11.163	-0.081	(0)
Zn (OH) 2	1.180e-12	1.180e-12	-11.928	-11.928	0.000	(0)
ZnOHCl	3.079e-13	3.079e-13	-12.512	-12.512	0.000	(0)
ZnCl2	4.690e-16	4.690e-16	-15.329	-15.329	0.000	(0)
Zn (OH) 3-	1.764e-16	1.684e-16	-15.754	-15.774	-0.020	(0)
ZnNO3+	2.792e-17	2.665e-17	-16.554	-16.574	-0.020	(0)
ZnSeO4	5.215e-18	5.215e-18	-17.283	-17.283	0.000	(0)

ZnCl3-	1.395e-20	1.335e-20	-19.855	-19.875	-0.019	(0)
Zn(OH) 4-2	2.300e-22	1.909e-22	-21.638	-21.719	-0.081	(0)
ZnCl4-2	2.849e-25	2.392e-25	-24.545	-24.621	-0.076	(0)
Zn(NO3) 2	6.148e-28	6.148e-28	-27.211	-27.211	0.000	(0)
Zn(SeO4) 2-2	2.338e-30	1.941e-30	-29.631	-29.712	-0.081	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.979	-153.999	-0.020	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.440	-154.440	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.252	-231.272	-0.020	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-234.720	-234.800	-0.081	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.763	-312.843	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3) 2	-72.14	-65.85	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2	-59.38	-54.87	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-66.60	-54.87	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3	-90.21	-72.27	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3	-75.83	-55.80	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-35.78	-35.38	0.40	(NH4)2CrO4	
(NH4)2SeO4	-27.65	-27.20	0.45	(NH4)2SeO4	
Al(OH) 3(am)	-1.36	9.44	10.80	Al(OH) 3	
Al2(MoO4) 3	-44.69	-42.32	2.37	Al2(MoO4) 3	
Al2O3	-0.77	18.88	19.65	Al2O3	
Al4(OH)10SO4	-1.55	21.15	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-9.07	-4.27	4.80	AlAsO4:2H2O	
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4	
AlSb	-154.29	-88.67	65.62	AlSb	
Alunite	-1.23	-2.63	-1.40	KAl3(SO4) 2(OH) 6	
Anglesite	-4.65	-12.44	-7.79	PbSO4	
Anhydrite	-2.94	-7.30	-4.36	CaSO4	
Anilite	-57.73	-89.61	-31.88	Cu0.25Cu1.5S	
Antlerite	-4.22	4.56	8.79	Cu3(OH) 4SO4	
Aragonite	-2.59	-10.89	-8.30	CaCO3	
Arsenolite	-80.10	-82.86	-2.76	As4O6	
Artinite	-12.34	-2.74	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5	-34.12	-27.42	6.71	As2O5	
Atacamite	-4.18	3.22	7.39	Cu2(OH) 3Cl	
Azurite	-2.30	-19.21	-16.91	Cu3(OH) 2(CO3) 2	
Ba(OH) 2:8H2O	-18.44	5.95	24.39	Ba(OH) 2:8H2O	
Ba2V2O7:2H2O	-18.38	-2.51	15.87	Ba2V2O7:2H2O	
Ba3(AsO4) 2	-0.66	-9.57	-8.91	Ba3(AsO4) 2	
Ba3(VO4) 2:4H2O	-29.50	3.44	32.94	Ba3(VO4) 2:4H2O	
BaCrO4	-17.90	-27.57	-9.67	BaCrO4	
BaF2	-10.17	-15.99	-5.82	BaF2	
BaMoO4	-7.49	-14.45	-6.96	BaMoO4	
Barite	-0.68	-10.66	-9.98	BaSO4	
BaS	-96.79	-80.61	16.18	BaS	
BaSeO3	-10.81	-8.98	1.83	BaSeO3	
BaSeO4	-11.93	-19.39	-7.46	BaSeO4	
Bianchite	-8.98	-10.74	-1.76	ZnSO4:6H2O	
Birnessite	-10.74	7.36	18.09	MnO2	
Bixbyite	-10.55	-11.19	-0.64	Mn2O3	
BlaubleiI	-56.69	-80.85	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-57.61	-84.89	-27.28	Cu0.6Cu0.8S	
Boehmite	0.86	9.44	8.58	AlOOH	
Breithauptite	-65.51	-84.03	-18.52	NiSb	
Brochantite	-3.60	11.62	15.22	Cu4(OH) 6SO4	
Brucite	-8.12	8.72	16.84	Mg(OH) 2	
Bunsenite	-11.32	1.12	12.45	NiO	
Ca(VO3) 2	-10.76	-5.10	5.66	Ca(VO3) 2	
Ca2V2O7	-13.30	4.20	17.50	Ca2V2O7	
Ca2V2O7:2H2O	-17.35	4.20	21.55	Ca2V2O7:2H2O	
Ca3(AsO4) 2:4H2O	-21.81	0.49	22.30	Ca3(AsO4) 2:4H2O	
Ca3(VO4) 2	-25.46	13.50	38.96	Ca3(VO4) 2	
Ca3(VO4) 2:4H2O	-26.36	13.50	39.86	Ca3(VO4) 2:4H2O	
Ca3Sb2	-311.28	-168.31	142.97	Ca3Sb2	

CaCrO4	-21.95	-24.22	-2.27	CaCrO4
Calcite	-2.41	-10.89	-8.48	CaCO3
Calomel	-11.86	-29.77	-17.91	Hg2Cl2
CaMoO4	-3.15	-11.10	-7.95	CaMoO4
Carnotite	-2.87	-2.64	0.23	KUO2VO4
CaSeO3:2H2O	-8.45	-5.63	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.02	-16.04	-3.02	CaSeO4:2H2O
Cd(BO2)2	-18.67	-8.83	9.84	Cd(BO2)2
Cd(OH)2	-9.77	3.87	13.64	Cd(OH)2
Cd(OH)2(am)	-9.86	3.87	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.30	-21.59	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.54	-4.98	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.51	-1.11	28.40	Cd4(OH)6SO4
CdCl2	-17.26	-17.92	-0.66	CdCl2
CdCl2:1H2O	-16.23	-17.92	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.01	-17.92	-1.91	CdCl2:2.5H2O
CdF2	-16.85	-18.06	-1.21	CdF2
Cdmetal(alpha)	-35.54	-22.03	13.51	Cd
Cdmetal(gamma)	-35.65	-22.03	13.62	Cd
CdMoO4	-2.38	-16.53	-14.15	CdMoO4
CdOHCl	-10.56	-7.02	3.54	CdOHCl
CdSb	-80.93	-81.28	-0.35	CdSb
CdSe	-23.71	-43.91	-20.20	CdSe
CdSeO4:2H2O	-19.61	-21.46	-1.85	CdSeO4:2H2O
CdSO4	-12.56	-12.73	-0.17	CdSO4
CdSO4:1H2O	-11.01	-12.73	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.86	-12.73	-1.87	CdSO4:2.67H2O
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4(g)	-82.76	-123.81	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-58.05	-92.97	-34.92	Cu2S
Chalcopyrite	-127.04	-162.31	-35.27	CuFeS2
Cinnabar	-53.50	-99.19	-45.69	HgS
Claudetite	-79.80	-82.86	-3.06	As4O6
Clausthalite	-16.52	-43.62	-27.10	PbSe
Co(BO2)2	-37.86	-10.79	27.07	Co(BO2)2
Co(OH)2	-11.18	1.91	13.09	Co(OH)2
Co(OH)3	-15.22	-17.53	-2.31	Co(OH)3
CO2(g)	-2.04	-20.19	-18.15	CO2
Co3(AsO4)2	-34.71	-21.67	13.03	Co3(AsO4)2
Co3O4	-22.66	-33.15	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.43	-20.02	-1.60	CoF2
CoF3	-48.98	-50.44	-1.46	CoF3
CoFe2O4	12.81	9.28	-3.53	CoFe2O4
CoMoO4	-10.73	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS(alpha)	-77.21	-84.65	-7.44	CoS
CoS(beta)	-73.58	-84.65	-11.07	CoS
CoSe	-29.67	-45.87	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.89	-23.42	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.21	-79.51	-22.30	CuS
Cr(OH)2	-25.82	-15.00	10.82	Cr(OH)2
Cr(OH)3	-6.33	-5.00	1.34	Cr(OH)3
Cr(OH)3(am)	-4.25	-5.00	-0.75	Cr(OH)3
Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.89	-36.80	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.39	-40.91	30.48	Cr
CrO3	-30.31	-33.52	-3.21	CrO3
Cryolite	-15.00	-48.84	-33.84	Na3AlF6

Cu(OH) 2	-1.62	7.06	8.67	Cu(OH) 2
Cu(SbO3) 2	-27.14	18.07	45.21	Cu(SbO3) 2
Cu2(OH) 3NO3	-11.53	-2.28	9.25	Cu2(OH) 3NO3
Cu2Sb:3H2O	-59.37	-94.26	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-8.40	-54.20	-45.80	Cu2Se
Cu2SO4	-21.07	-23.02	-1.95	Cu2SO4
Cu3(AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3(AsO4) 2:2H2O
Cu3Sb	-65.13	-107.73	-42.59	Cu3Sb
Cu3Se2	-31.44	-94.93	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.02	-26.46	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.40	-16.16	-8.76	Cu
CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-5.01	-6.41	-1.41	Cu2O
Cuprousferrite	9.39	0.48	-8.92	CuFeO2
CuSe	-7.63	-40.73	-33.10	CuSe
CuSe2	-29.25	-62.61	-33.37	CuSe2
CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.84	-18.28	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.17	-92.09	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.81	-22.35	-16.54	CaMg(CO3) 2
Dolomite(ordered)	-5.26	-22.35	-17.09	CaMg(CO3) 2
Epsomite	-5.76	-7.88	-2.13	MgSO4:7H2O
Fe(OH) 2	-9.80	3.76	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	3.45	0.41	-3.04	Fe(OH) 2.7Cl.3
Fe(VO3) 2	-6.92	-10.64	-3.72	Fe(VO3) 2
Fe2(OH) 4SeO3	-9.13	-7.57	1.55	Fe2(OH) 4SeO3
Fe2(SeO3) 3:2H2O	-16.82	-37.44	-20.63	Fe2(SeO3) 3:2H2O
Fe2(SO4) 3	-38.72	-42.46	-3.73	Fe2(SO4) 3
Fe3(OH) 8	-9.10	11.12	20.22	Fe3(OH) 8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.44	-6.24	7.20	FeCr2O4
FeMoO4	-6.55	-16.64	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe(OH) 3
Ferroselite	-47.31	-65.91	-18.60	FeSe2
FeS(ppt)	-79.85	-82.80	-2.95	FeS
FeSe	-33.03	-44.03	-11.00	FeSe
Fix_pe	-6.50	-6.50	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF2
Galena	-68.43	-82.40	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al(OH) 3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4:7H2O
Greenockite	-68.33	-82.69	-14.36	CdS
Greigite	-290.09	-335.13	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.69	-7.30	-4.61	CaSO4:2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O) Fe3(SO4) 2(OH) 6
H2MoO4	-7.52	-20.40	-12.88	H2MoO4
H2S(g)	-78.55	-86.56	-8.01	H2S
H2Se(g)	-42.83	-47.79	-4.96	H2Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.72	46.31	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3) 2(g)	-186.53	-260.24	-73.71	Hg(CH3) 2
Hg(g)	-9.07	-16.94	-7.87	Hg
Hg(OH) 2	-9.13	-12.63	-3.50	Hg(OH) 2
Hg2(g)	-18.92	-33.88	-14.96	Hg2
Hg2(OH) 2	-13.24	-7.98	5.26	Hg2(OH) 2
Hg2CO3	-12.11	-28.16	-16.05	Hg2CO3

Hg2CrO4	-32.79	-41.49	-8.70	Hg2CrO4
Hg2F2	-19.55	-29.91	-10.36	Hg2F2
Hg2S	-82.86	-94.54	-11.68	Hg2S
Hg2SeO3	-18.25	-22.91	-4.66	Hg2SeO3
Hg2SO4	-18.45	-24.58	-6.13	Hg2SO4
Hg3O2CO3	-28.39	-58.07	-29.68	Hg3O2CO3
HgCl (g)	-34.38	-14.89	19.50	HgCl
HgCl2	-13.16	-34.42	-21.26	HgCl2
HgF (g)	-47.63	-14.96	32.68	HgF
HgF2 (g)	-47.13	-34.57	12.57	HgF2
Hgmetal (l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.72	-60.42	-55.69	HgSe
HgSeO3	-15.13	-27.56	-12.43	HgSeO3
HgSO4	-19.82	-29.23	-9.42	HgSO4
Huntite	-15.31	-45.28	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-9.12	-27.89	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-28.37	-37.14	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.34	-21.51	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.11	-19.91	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-45.28	-62.52	-17.24	K2Cr2O7
K2CrO4	-28.49	-29.00	-0.51	K2CrO4
K2MoO4	-19.15	-15.89	3.26	K2MoO4
K2SeO4	-20.09	-20.82	-0.73	K2SeO4
Langite	-5.87	11.62	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.85	-8.28	-0.43	PbO : PbSO4
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.20	-82.80	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe2O3
Magnesioferrite	-0.77	16.09	16.86	Fe2MgO4
Magnesite	-4.01	-11.47	-7.46	MgCO3
Magnetite	7.72	11.12	3.40	Fe3O4
Malachite	-0.77	-6.07	-5.31	Cu2 (OH) 2CO3
Manganite	-5.59	19.75	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl2
Melanterite	-10.64	-12.84	-2.21	FeSO4 : 7H2O
Metacinnabar	-54.10	-99.19	-45.09	HgS
Mg (OH) 2 (active)	-10.07	8.72	18.79	Mg (OH) 2
Mg (VO3) 2	-16.96	-5.68	11.28	Mg (VO3) 2
Mg2Sb3	-286.80	-212.12	74.68	Mg2Sb3
Mg2V2O7	-23.32	3.04	26.36	Mg2V2O7
MgCr2O4	-17.47	-1.27	16.20	MgCr2O4
MgCrO4	-30.17	-24.79	5.38	MgCrO4
MgF2	-5.08	-13.21	-8.13	MgF2
MgMoO4	-9.83	-11.68	-1.85	MgMoO4
MgSeO3 : 6H2O	-9.27	-6.21	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-15.42	-16.62	-1.20	MgSeO4 : 6H2O
Minium	-35.13	38.39	73.52	Pb3O4
Mirabilite	-10.47	-11.59	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-12.50	-7.60	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-55.30	-61.01	-5.71	Mn2 (SO4) 3
Mn2Sb	-158.54	-97.46	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-19.52	-7.02	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-17.71	-14.99	2.72	MnCl2 : 4H2O
MnS (grn)	-79.93	-79.76	0.17	MnS
MnS (pnk)	-83.10	-79.76	3.34	MnS
MnSb	-100.80	-103.71	-2.91	MnSb
MnSe	-44.49	-40.99	3.50	MnSe
MnSeO3	-9.26	-8.13	1.13	MnSeO3
MnSeO3 : 2H2O	-9.12	-8.13	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-16.49	-18.54	-2.05	MnSeO4 : 5H2O
MnSO4	-12.39	-9.80	2.58	MnSO4
Monteponite	-11.23	3.87	15.10	CdO
Montroydite	-8.99	-12.63	-3.64	HgO

MoO3	-12.40	-20.40	-8.00	MoO3
Morenosite	-13.34	-15.48	-2.14	NiSO4:7H2O
MoS2	-149.17	-219.43	-70.26	MoS2
Na-Jarosite	-8.46	-19.66	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-52.12	-62.01	-9.90	Na2Cr2O7
Na2CrO4	-31.43	-28.50	2.93	Na2CrO4
Na2Mo2O7	-19.19	-35.78	-16.60	Na2Mo2O7
Na2MoO4	-16.87	-15.38	1.49	Na2MoO4
Na2MoO4:2H2O	-16.60	-15.38	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.21	-9.91	10.30	Na2SeO3:5H2O
Na2SeO4	-21.60	-20.32	1.28	Na2SeO4
Na3Sb	-185.03	-90.58	94.45	Na3Sb
Na3VO4	-36.35	0.33	36.68	Na3VO4
Na4V2O7	-41.76	-4.36	37.40	Na4V2O7
Nantokite	-7.37	-14.10	-6.73	CuCl
NaSb	-92.86	-69.69	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na2CO3:10H2O
NaVO3	-8.55	-4.69	3.86	NaVO3
Nesquehonite	-6.80	-11.47	-4.67	MgCO3:3H2O
Ni(OH)2	-11.67	1.12	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-39.75	-24.05	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-44.11	-12.11	32.00	Ni4(OH)6SO4
NiCO3	-12.19	-19.06	-6.87	NiCO3
NiMoO4	-8.14	-19.28	-11.14	NiMoO4
NiS(alpha)	-79.84	-85.44	-5.60	NiS
NiS(beta)	-74.34	-85.44	-11.10	NiS
NiS(gamma)	-72.64	-85.44	-12.80	NiS
NiSe	-28.96	-46.66	-17.70	NiSe
NiSeO3:2H2O	-16.63	-13.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-22.69	-24.21	-1.52	NiSeO4:6H2O
Nsutite	-10.15	7.36	17.50	MnO2
O2(g)	-31.28	51.81	83.09	O2
Orpiment	-240.05	-301.12	-61.07	As2S3
Otavite	-4.31	-16.31	-12.00	CdCO3
Pb(BO2)2	-15.06	-8.54	6.52	Pb(BO2)2
Pb(OH)2	-3.99	4.16	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-70.74	-79.50	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-11.36	-2.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.86	8.33	26.19	Pb2O(OH)2
Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.30	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.73	-14.93	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.06	-1.92	6.14	Pb3(VO4)2
Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.05	0.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.05	21.88	Pb4O3SO4
PbCrO4	-16.75	-29.35	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.34	-21.18	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.53	30.07	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-124.95	-143.46	-18.51	FeS2
Pyrochroite	-8.39	6.80	15.19	Mn(OH)2
Pyrolusite	-8.67	32.71	41.38	MnO2
Realgar	-100.48	-120.23	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb(OH)3	-13.29	-20.40	-7.11	Sb(OH)3
Sb2O4	-18.29	-14.89	3.40	Sb2O4
Sb2O5	-27.93	-37.60	-9.67	Sb2O5

Sb2Se3	-116.40	-184.15	-67.76	Sb2Se3
Sb4O6 (cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6 (orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.66	-53.09	0.57	SbCl3
SbF3	-43.08	-53.30	-10.23	SbF3
Sbmetal	-47.56	-59.25	-11.69	Sb
SbO2	-3.93	-31.75	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.77	-21.88	-7.11	Se
Semetal (hex)	-14.18	-21.88	-7.71	Se
Senarmontite	-28.43	-40.79	-12.37	Sb2O3
SeO2	-15.06	-14.93	0.12	SeO2
SeO3	-46.38	-25.34	21.04	SeO3
Siderite	-6.19	-16.43	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3
Sphalerite	-69.25	-80.70	-11.45	ZnS
Spinel	-9.24	27.60	36.85	MgAl2O4
Stibnite	-250.02	-300.48	-50.46	Sb2S3
Sulfur	-58.51	-60.66	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na2SO4
Thermonatrite	-15.80	-15.17	0.64	Na2CO3:H2O
Tyuyamunite	-4.56	-0.48	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-587.95	-435.57	152.38	U3Sb4
U4O9	-28.59	-31.61	-3.02	U4O9
UF4	-28.72	-58.25	-29.54	UF4
UF4:2.5H2O	-25.54	-58.25	-32.72	UF4:2.5H2O
UO2 (am)	-15.31	-14.38	0.93	UO2
UO2 (NO3) 2	-42.61	-30.47	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.32	-30.47	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.86	-30.47	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.51	-30.47	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.30	2.31	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.78	-23.03	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3
Uraninite	-9.71	-14.38	-4.67	UO2
USb2	-223.48	-193.91	29.58	USb2
V (OH) 3	-18.10	-10.51	7.59	V (OH) 3
V2O5	-13.05	-14.41	-1.36	V2O5
V3O5	-37.50	-35.66	1.84	V3O5
V4O7	-46.10	-38.91	7.19	V4O7
V6O13	-34.17	-95.03	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VC12	-64.13	-45.25	18.87	VC12
VC13	-66.63	-43.20	23.43	VC13
VF4	-62.06	-47.13	14.93	VF4
Vmetal	-93.39	-49.36	44.03	V
VO	-38.22	-23.46	14.76	VO
VO (OH) 2	-8.40	-3.25	5.15	VO (OH) 2
VO2Cl	-20.94	-18.10	2.84	VO2Cl
VOC1	-32.56	-21.41	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO4	-23.47	-19.86	3.61	VOSO4
Witherite	-5.67	-14.24	-8.57	BaCO3
Wurtzite	-71.75	-80.70	-8.95	ZnS
Zincite	-5.47	5.87	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO4
Zn (BO2) 2	-15.13	-6.84	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-30.23	-26.91	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-6.33	5.87	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-6.61	5.87	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-5.89	5.87	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-5.67	5.87	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-5.87	5.87	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-12.37	-4.87	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-14.36	0.83	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-23.47	-9.82	13.65	Zn3 (AsO4) 2:2.5H2O

Zn3O(SO4)2	-34.53	-15.61	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.54	6.86	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.97	7.53	38.50	Zn5(OH)8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.83	-20.04	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO(active)	-5.32	5.87	11.19	ZnO
ZnS(am)	-71.65	-80.70	-9.05	ZnS
ZnSb	-90.30	-79.29	11.01	ZnSb
ZnSe	-27.52	-41.92	-14.40	ZnSe
ZnSeO4:6H2O	-17.95	-19.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 57.

REACTION 302
H2O -1
12496.15 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 305
SAVE Solution 306
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 305. Solution after simulation 56.
Using reaction 302.

Reaction 302.

1.250e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.222e-04	2.223e-04
As	1.022e-07	1.022e-07
B	1.005e-04	1.005e-04
Ba	3.015e-05	3.015e-05
C	1.633e-01	1.634e-01
Ca	7.066e-02	7.068e-02
Cd	2.638e-07	2.639e-07
Cl	8.467e-03	8.469e-03

Co	2.969e-09	2.970e-09
Cr	1.142e-09	1.143e-09
Cu	5.369e-04	5.370e-04
F	7.596e-03	7.598e-03
Fe	1.071e-05	1.071e-05
Hg	9.641e-09	9.643e-09
K	1.511e-02	1.511e-02
Mg	1.848e-02	1.848e-02
Mn	2.232e-04	2.233e-04
Mo	8.621e-06	8.623e-06
N	2.257e-05	2.258e-05
Na	2.709e-02	2.709e-02
Ni	4.836e-10	4.837e-10
Pb	7.525e-07	7.527e-07
S	5.670e-02	5.671e-02
Sb	9.063e-08	9.066e-08
Se	7.888e-07	7.889e-07
U	2.741e-06	2.742e-06
V	2.129e-06	2.130e-06
Zn	2.606e-05	2.607e-05

-----Description of solution-----

	pH	=	6.246	Charge balance
	pe	=	6.786	Adjusted to redox
equilibrium				
	Activity of water	=	0.995	
	Ionic strength (mol/kgw)	=	2.212e-01	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	9.331e-02	
	Total CO2 (mol/kg)	=	1.633e-01	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	33	
	Total H	=	1.112746e+02	
	Total O	=	5.623781e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	7.640e-07	5.673e-07	-6.117	-6.246	-0.129	0.00
OH-	2.526e-08	1.765e-08	-7.597	-7.753	-0.156	(0)
H2O	5.551e+01	9.946e-01	1.744	-0.002	0.000	18.07
Al	2.222e-04					
AlF4-	1.549e-04	1.118e-04	-3.810	-3.951	-0.142	(0)
AlF3	6.523e-05	6.523e-05	-4.186	-4.186	0.000	(0)
AlF2+	2.047e-06	1.515e-06	-5.689	-5.820	-0.131	(0)
AlF+2	3.709e-09	1.112e-09	-8.431	-8.954	-0.523	(0)
Al(OH)2+	1.088e-11	8.048e-12	-10.964	-11.094	-0.131	(0)
Al(OH)4-	8.726e-12	6.300e-12	-11.059	-11.201	-0.142	(0)
AlSO4+	3.057e-12	2.207e-12	-11.515	-11.656	-0.142	(0)
Al(OH)3	2.835e-12	2.835e-12	-11.548	-11.548	0.000	(0)
AlOH+2	1.914e-12	5.740e-13	-11.718	-12.241	-0.523	(0)
Al+3	4.740e-13	3.251e-14	-12.324	-13.488	-1.164	(0)
Al(SO4)2-	2.864e-13	2.068e-13	-12.543	-12.684	-0.142	(0)
AlMo6O21-3	4.876e-28	3.382e-30	-27.312	-29.471	-2.159	(0)
As(3)	1.980e-19					
H3AsO3	1.977e-19	1.977e-19	-18.704	-18.704	0.000	(0)
H2AsO3-	3.105e-22	1.787e-22	-21.508	-21.748	-0.240	(0)
H4AsO3+	9.654e-26	5.557e-26	-25.015	-25.255	-0.240	(0)
HAsO3-2	2.618e-27	2.873e-28	-26.582	-27.542	-0.960	(0)
AsO3-3	2.815e-33	1.952e-35	-32.551	-34.709	-2.159	(0)
As(5)	1.022e-07					
HAsO4-2	5.142e-08	5.644e-09	-7.289	-8.248	-0.960	(0)
H2AsO4-	5.073e-08	2.920e-08	-7.295	-7.535	-0.240	(0)

	AsO4-3	4.536e-12	3.146e-14	-11.343	-13.502	-2.159	(0)
	H3AsO4	2.736e-12	2.879e-12	-11.563	-11.541	0.022	(0)
B	1.005e-04						
	H3BO3	9.997e-05	1.052e-04	-4.000	-3.978	0.022	(0)
	BF(OH) 3-	2.139e-07	1.436e-07	-6.670	-6.843	-0.173	(0)
	H2BO3-	1.604e-07	1.077e-07	-6.795	-6.968	-0.173	(0)
	CaH2BO3+	9.701e-08	6.513e-08	-7.013	-7.186	-0.173	(0)
	BF2(OH) 2-	4.462e-08	2.995e-08	-7.351	-7.524	-0.173	(0)
	MgH2BO3+	1.654e-08	1.111e-08	-7.781	-7.954	-0.173	(0)
	NaH2BO3	3.203e-09	3.203e-09	-8.495	-8.495	0.000	(0)
	BaH2BO3+	3.740e-11	2.511e-11	-10.427	-10.600	-0.173	(0)
	BF3OH-	3.387e-11	2.274e-11	-10.470	-10.643	-0.173	(0)
	H5(BO3) 2-	1.436e-11	9.642e-12	-10.843	-11.016	-0.173	(0)
	BF4-	3.252e-13	2.183e-13	-12.488	-12.661	-0.173	(0)
	H8(BO3) 3-	1.511e-13	1.014e-13	-12.821	-12.994	-0.173	(0)
Ba	3.015e-05						
	Ba+2	2.482e-05	7.544e-06	-4.605	-5.122	-0.517	(0)
	BaHCO3+	5.308e-06	3.985e-06	-5.275	-5.400	-0.124	(0)
	BaCO3	1.769e-08	1.769e-08	-7.752	-7.752	0.000	(0)
	BaH2BO3+	3.740e-11	2.511e-11	-10.427	-10.600	-0.173	(0)
	BaNO3+	1.797e-12	1.034e-12	-11.745	-11.985	-0.240	(0)
	BaOH+	7.939e-13	5.813e-13	-12.100	-12.236	-0.135	(0)
	BaNH3+2	2.593e-13	2.847e-14	-12.586	-13.546	-0.960	(0)
C(4)	1.633e-01						
	HCO3-	7.475e-02	5.531e-02	-1.126	-1.257	-0.131	(0)
	H2CO3	7.057e-02	7.057e-02	-1.151	-1.151	0.000	(0)
	CaHCO3+	1.442e-02	1.082e-02	-1.841	-1.966	-0.124	(0)
	MgHCO3+	2.368e-03	1.683e-03	-2.626	-2.774	-0.148	(0)
	NaHCO3	5.836e-04	5.836e-04	-3.234	-3.234	0.000	(0)
	CuCO3	3.459e-04	3.459e-04	-3.461	-3.461	0.000	(0)
	CuHCO3+	7.791e-05	4.485e-05	-4.108	-4.348	-0.240	(0)
	CaCO3	7.614e-05	7.614e-05	-4.118	-4.118	0.000	(0)
	Cu(CO3) 2-2	3.876e-05	4.255e-06	-4.412	-5.371	-0.960	(0)
	MnHCO3+	2.720e-05	1.992e-05	-4.565	-4.701	-0.135	(0)
	CO3-2	1.504e-05	4.571e-06	-4.823	-5.340	-0.517	(0)
	MgCO3	1.131e-05	1.131e-05	-4.947	-4.947	0.000	(0)
	ZnHCO3+	7.939e-06	4.570e-06	-5.100	-5.340	-0.240	(0)
	BaHCO3+	5.308e-06	3.985e-06	-5.275	-5.400	-0.124	(0)
	UO2(CO3) 3-4	2.725e-06	3.957e-10	-5.565	-9.403	-3.838	(0)
	NaCO3-	2.158e-06	1.597e-06	-5.666	-5.797	-0.131	(0)
	ZnCO3	6.872e-07	6.872e-07	-6.163	-6.163	0.000	(0)
	PbHCO3+	5.521e-07	3.178e-07	-6.258	-6.498	-0.240	(0)
	FeHCO3+	1.337e-07	1.004e-07	-6.874	-6.998	-0.124	(0)
	PbCO3	1.062e-07	1.062e-07	-6.974	-6.974	0.000	(0)
	BaCO3	1.769e-08	1.769e-08	-7.752	-7.752	0.000	(0)
	UO2(CO3) 2-2	1.573e-08	1.727e-09	-7.803	-8.763	-0.960	(0)
	Pb(CO3) 2-2	1.276e-08	1.401e-09	-7.894	-8.854	-0.960	(0)
	CdHCO3+	6.397e-09	3.682e-09	-8.194	-8.434	-0.240	(0)
	CdCO3	3.046e-09	3.046e-09	-8.516	-8.516	0.000	(0)
	CoHCO3+	1.191e-09	6.857e-10	-8.924	-9.164	-0.240	(0)
	NiHCO3+	3.324e-10	1.913e-10	-9.478	-9.718	-0.240	(0)
	Cd(CO3) 2-2	9.404e-11	1.032e-11	-10.027	-10.986	-0.960	(0)
	UO2CO3	1.894e-11	1.894e-11	-10.723	-10.723	0.000	(0)
	CoCO3	1.231e-11	1.231e-11	-10.910	-10.910	0.000	(0)
	HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
	NiCO3	4.785e-12	4.785e-12	-11.320	-11.320	0.000	(0)
	Hg(CO3) 2-2	1.420e-12	1.558e-13	-11.848	-12.807	-0.960	(0)
	HgHCO3+	1.978e-13	1.139e-13	-12.704	-12.944	-0.240	(0)
Ca	7.066e-02						
	Ca+2	3.458e-02	1.051e-02	-1.461	-1.978	-0.517	(0)
	CaSO4	2.105e-02	2.105e-02	-1.677	-1.677	0.000	(0)
	CaHCO3+	1.442e-02	1.082e-02	-1.841	-1.966	-0.124	(0)
	CaF+	5.359e-04	3.924e-04	-3.271	-3.406	-0.135	(0)
	CaCO3	7.614e-05	7.614e-05	-4.118	-4.118	0.000	(0)
	CaH2BO3+	9.701e-08	6.513e-08	-7.013	-7.186	-0.173	(0)
	CaOH+	4.930e-09	3.702e-09	-8.307	-8.432	-0.124	(0)
	CaNO3+	1.580e-09	9.093e-10	-8.801	-9.041	-0.240	(0)
	CaNH3+2	7.208e-10	7.912e-11	-9.142	-10.102	-0.960	(0)

Ca (NH3) 2+2	1.716e-18	1.884e-19	-17.765	-18.725	-0.960	(0)
Cd	2.638e-07					
Cd+2	9.620e-08	2.924e-08	-7.017	-7.534	-0.517	(0)
Cd (SO4) 2-2	6.441e-08	7.071e-09	-7.191	-8.151	-0.960	(0)
CdSO4	5.994e-08	5.994e-08	-7.222	-7.222	0.000	(0)
CdCl+	3.050e-08	1.755e-08	-7.516	-7.756	-0.240	(0)
CdHCO3+	6.397e-09	3.682e-09	-8.194	-8.434	-0.240	(0)
CdCO3	3.046e-09	3.046e-09	-8.516	-8.516	0.000	(0)
CdF+	2.754e-09	1.585e-09	-8.560	-8.800	-0.240	(0)
CdCl2	4.600e-10	4.600e-10	-9.337	-9.337	0.000	(0)
Cd (CO3) 2-2	9.404e-11	1.032e-11	-10.027	-10.986	-0.960	(0)
CdOHC1	1.271e-11	1.271e-11	-10.896	-10.896	0.000	(0)
CdF2	1.082e-11	1.082e-11	-10.966	-10.966	0.000	(0)
CdOH+	7.123e-12	4.100e-12	-11.147	-11.387	-0.240	(0)
CdCl3-	3.170e-12	1.825e-12	-11.499	-11.739	-0.240	(0)
CdNO3+	4.395e-15	2.530e-15	-14.357	-14.597	-0.240	(0)
Cd (OH) 2	4.567e-16	4.567e-16	-15.340	-15.340	0.000	(0)
CdSeO4	2.380e-16	2.380e-16	-15.623	-15.623	0.000	(0)
Cd2OH+3	8.664e-17	6.009e-19	-16.062	-18.221	-2.159	(0)
Cd (SeO3) 2-2	2.072e-18	2.274e-19	-17.684	-18.643	-0.960	(0)
Cd (OH) 3-	8.557e-22	4.925e-22	-21.068	-21.308	-0.240	(0)
Cd (NO3) 2	3.469e-23	3.469e-23	-22.460	-22.460	0.000	(0)
Cd (OH) 4-2	1.296e-29	1.423e-30	-28.887	-29.847	-0.960	(0)
CdHS+	0.000e+00	0.000e+00	-78.175	-78.415	-0.240	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.101	-150.101	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.850	-227.090	-0.240	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.824	-303.783	-0.960	(0)
Cl	8.467e-03					
Cl-	8.467e-03	6.286e-03	-2.072	-2.202	-0.129	(0)
MnCl+	1.951e-07	1.428e-07	-6.710	-6.845	-0.135	(0)
CuCl+	1.801e-07	1.280e-07	-6.744	-6.893	-0.148	(0)
ZnCl+	5.804e-08	4.125e-08	-7.236	-7.385	-0.148	(0)
CdCl+	3.050e-08	1.755e-08	-7.516	-7.756	-0.240	(0)
CuCl2-	1.508e-08	1.072e-08	-7.822	-7.970	-0.148	(0)
CuCl	8.160e-09	8.160e-09	-8.088	-8.088	0.000	(0)
HgCl2	7.788e-09	7.788e-09	-8.109	-8.109	0.000	(0)
PbCl+	2.996e-09	1.725e-09	-8.523	-8.763	-0.240	(0)
MnCl2	1.268e-09	1.268e-09	-8.897	-8.897	0.000	(0)
ZnOHC1	9.534e-10	9.534e-10	-9.021	-9.021	0.000	(0)
HgCl3-	8.506e-10	4.896e-10	-9.070	-9.310	-0.240	(0)
CdCl2	4.600e-10	4.600e-10	-9.337	-9.337	0.000	(0)
ZnCl2	4.110e-10	4.110e-10	-9.386	-9.386	0.000	(0)
HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
CuCl2	2.791e-10	2.791e-10	-9.554	-9.554	0.000	(0)
HgCl4-2	1.116e-10	1.225e-11	-9.952	-10.912	-0.960	(0)
CuCl3-2	5.010e-11	1.440e-11	-10.300	-10.841	-0.541	(0)
PbCl2	4.843e-11	4.843e-11	-10.315	-10.315	0.000	(0)
CdOHC1	1.271e-11	1.271e-11	-10.896	-10.896	0.000	(0)
CoCl+	6.021e-12	3.466e-12	-11.220	-11.460	-0.240	(0)
CdCl3-	3.170e-12	1.825e-12	-11.499	-11.739	-0.240	(0)
MnCl3-	2.999e-12	2.196e-12	-11.523	-11.658	-0.135	(0)
ZnCl3-	2.888e-12	2.052e-12	-11.539	-11.688	-0.148	(0)
NiCl+	7.840e-13	4.513e-13	-12.106	-12.346	-0.240	(0)
HgCl+	4.294e-13	2.472e-13	-12.367	-12.607	-0.240	(0)
PbCl3-	2.106e-13	1.212e-13	-12.677	-12.916	-0.240	(0)
FeCl+2	5.399e-14	1.552e-14	-13.268	-13.809	-0.541	(0)
CuCl3-	2.303e-14	1.637e-14	-13.638	-13.786	-0.148	(0)
ZnCl4-2	2.244e-14	6.452e-15	-13.649	-14.190	-0.541	(0)
CrCl+2	7.778e-15	8.538e-16	-14.109	-15.069	-0.960	(0)
PbCl4-2	3.173e-15	3.483e-16	-14.499	-15.458	-0.960	(0)
VOCl+	9.325e-16	5.367e-16	-15.030	-15.270	-0.240	(0)
FeCl2+	5.953e-16	4.359e-16	-15.225	-15.361	-0.135	(0)
UO2Cl+	1.843e-17	1.061e-17	-16.734	-16.974	-0.240	(0)
NiCl2	1.428e-17	1.428e-17	-16.845	-16.845	0.000	(0)
CrOHC12	1.801e-18	1.801e-18	-17.745	-17.745	0.000	(0)
CuCl4-2	1.794e-18	5.158e-19	-17.746	-18.287	-0.541	(0)
CrCl2+	8.848e-19	5.093e-19	-18.053	-18.293	-0.240	(0)
FeCl3	2.740e-19	2.740e-19	-18.562	-18.562	0.000	(0)

CrO3Cl-	1.778e-27	1.023e-27	-26.750	-26.990	-0.240	(0)
CoCl+2	4.513e-35	4.953e-36	-34.346	-35.305	-0.960	(0)
UCl+3	0.000e+00	0.000e+00	-42.661	-44.820	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.509	-50.468	-0.960	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.448	-65.407	-0.960	(0)
Co (2)	2.969e-09					
Co+2	1.452e-09	1.594e-10	-8.838	-9.798	-0.960	(0)
CoHCO3+	1.191e-09	6.857e-10	-8.924	-9.164	-0.240	(0)
CoSO4	2.780e-10	2.780e-10	-9.556	-9.556	0.000	(0)
CoF+	2.995e-11	1.724e-11	-10.524	-10.763	-0.240	(0)
CoCO3	1.231e-11	1.231e-11	-10.910	-10.910	0.000	(0)
CoCl+	6.021e-12	3.466e-12	-11.220	-11.460	-0.240	(0)
CoOH+	9.751e-14	5.613e-14	-13.011	-13.251	-0.240	(0)
CoNO2+	1.722e-14	9.915e-15	-13.764	-14.004	-0.240	(0)
Co (NH3) +2	1.044e-15	1.146e-16	-14.981	-15.941	-0.960	(0)
Co (OH) 2	7.871e-17	7.871e-17	-16.104	-16.104	0.000	(0)
CoNO3+	1.201e-17	6.910e-18	-16.921	-17.161	-0.240	(0)
CoSeO4	3.491e-18	3.491e-18	-17.457	-17.457	0.000	(0)
Co (NH3) 2+2	2.663e-22	2.923e-23	-21.575	-22.534	-0.960	(0)
Co2OH+3	6.464e-23	4.483e-25	-22.190	-24.348	-2.159	(0)
Co (OH) 3-	4.816e-23	2.772e-23	-22.317	-22.557	-0.240	(0)
CoOOH-	1.215e-23	6.993e-24	-22.915	-23.155	-0.240	(0)
Co (NO3) 2	3.847e-25	3.847e-25	-24.415	-24.415	0.000	(0)
Co (NH3) 3+2	2.005e-29	2.200e-30	-28.698	-29.658	-0.960	(0)
Co (OH) 4-2	7.066e-31	7.756e-32	-30.151	-31.110	-0.960	(0)
Co (NH3) 4+2	6.291e-37	6.906e-38	-36.201	-37.161	-0.960	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.865	-44.703	-3.838	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.205	-45.164	-0.960	(0)
Co (3)	3.165e-30					
CoOH+2	3.165e-30	3.474e-31	-29.500	-30.459	-0.960	(0)
Co+3	5.645e-35	3.872e-36	-34.248	-35.412	-1.164	(0)
CoCl+2	4.513e-35	4.953e-36	-34.346	-35.305	-0.960	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.509	-50.468	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.099	-60.339	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.448	-65.407	-0.960	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.799	-66.759	-0.960	(0)
Cr (2)	3.742e-26					
Cr+2	3.742e-26	4.107e-27	-25.427	-26.386	-0.960	(0)
Cr (3)	1.142e-09					
CrF+2	5.183e-10	5.690e-11	-9.285	-10.245	-0.960	(0)
Cr (OH) +2	3.692e-10	4.053e-11	-9.433	-10.392	-0.960	(0)
Cr (OH) 2+	1.512e-10	8.705e-11	-9.820	-10.060	-0.240	(0)
CrOHSO4	8.410e-11	8.410e-11	-10.075	-10.075	0.000	(0)
Cr+3	1.513e-11	1.049e-13	-10.820	-12.979	-2.159	(0)
CrSO4+	3.723e-12	2.143e-12	-11.429	-11.669	-0.240	(0)
Cr (OH) 3	5.773e-13	5.773e-13	-12.239	-12.239	0.000	(0)
CrCl+2	7.778e-15	8.538e-16	-14.109	-15.069	-0.960	(0)
CrO2-	8.442e-16	4.859e-16	-15.074	-15.313	-0.240	(0)
Cr (OH) 4-	7.048e-16	4.057e-16	-15.152	-15.392	-0.240	(0)
Cr2 (OH) 2SO4+2	2.807e-18	3.081e-19	-17.552	-18.511	-0.960	(0)
CrOHC12	1.801e-18	1.801e-18	-17.745	-17.745	0.000	(0)
CrCl2+	8.848e-19	5.093e-19	-18.053	-18.293	-0.240	(0)
Cr2 (OH) 2 (SO4) 2	1.600e-19	1.600e-19	-18.796	-18.796	0.000	(0)
CrNO3+2	1.143e-21	1.255e-22	-20.942	-21.901	-0.960	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.517	-41.476	-0.960	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.160	-49.319	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
Cr (6)	1.658e-19					
CrO4-2	8.131e-20	2.471e-20	-19.090	-19.607	-0.517	(0)
HCrO4-	7.882e-20	4.537e-20	-19.103	-19.343	-0.240	(0)
NaCrO4-	4.004e-21	2.305e-21	-20.398	-20.637	-0.240	(0)
KCrO4-	1.685e-21	9.699e-22	-20.773	-21.013	-0.240	(0)
CrO3SO4-2	6.279e-25	6.893e-26	-24.202	-25.162	-0.960	(0)
H2CrO4	2.086e-26	2.086e-26	-25.681	-25.681	0.000	(0)
CrO3Cl-	1.778e-27	1.023e-27	-26.750	-26.990	-0.240	(0)
Cr2O7-2	6.538e-37	7.177e-38	-36.185	-37.144	-0.960	(0)
Cu (1)	2.508e-08					

CuCl2-	1.508e-08	1.072e-08	-7.822	-7.970	-0.148	(0)
CuCl	8.160e-09	8.160e-09	-8.088	-8.088	0.000	(0)
Cu+	1.791e-09	1.031e-09	-8.747	-8.987	-0.240	(0)
CuCl3-2	5.010e-11	1.440e-11	-10.300	-10.841	-0.541	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.409	-150.883	-0.474	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.169	-151.613	-0.444	(0)
Cu (2)	5.368e-04					
CuCO3	3.459e-04	3.459e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.791e-05	4.485e-05	-4.108	-4.348	-0.240	(0)
Cu+2	4.228e-05	1.285e-05	-4.374	-4.891	-0.517	(0)
Cu (CO3) 2-2	3.876e-05	4.255e-06	-4.412	-5.371	-0.960	(0)
CuSO4	2.574e-05	2.574e-05	-4.589	-4.589	0.000	(0)
CuF+	4.818e-06	2.773e-06	-5.317	-5.557	-0.240	(0)
CuOH+	1.009e-06	7.173e-07	-5.996	-6.144	-0.148	(0)
CuCl+	1.801e-07	1.280e-07	-6.744	-6.893	-0.148	(0)
Cu2 (OH) 2+2	1.177e-07	1.292e-08	-6.929	-7.889	-0.960	(0)
CuNO2+	2.064e-08	1.188e-08	-7.685	-7.925	-0.240	(0)
CuNH3+2	7.163e-09	7.863e-10	-8.145	-9.104	-0.960	(0)
Cu (OH) 2	2.526e-09	2.526e-09	-8.597	-8.597	0.000	(0)
CuCl2	2.791e-10	2.791e-10	-9.554	-9.554	0.000	(0)
CuNO3+	1.931e-12	1.112e-12	-11.714	-11.954	-0.240	(0)
Cu (NO2) 2	1.073e-12	1.073e-12	-11.969	-11.969	0.000	(0)
Cu (OH) 3-	1.589e-13	9.148e-14	-12.799	-13.039	-0.240	(0)
CuCl3-	2.303e-14	1.637e-14	-13.638	-13.786	-0.148	(0)
CuCl4-2	1.794e-18	5.158e-19	-17.746	-18.287	-0.541	(0)
Cu (OH) 4-2	1.158e-19	1.271e-20	-18.936	-19.896	-0.960	(0)
Cu (NO3) 2	3.829e-21	3.829e-21	-20.417	-20.417	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.420	-215.660	-0.240	(0)
F	7.596e-03					
F-	4.607e-03	3.421e-03	-2.337	-2.466	-0.129	(0)
MgF+	1.581e-03	1.142e-03	-2.801	-2.943	-0.142	(0)
CaF+	5.359e-04	3.924e-04	-3.271	-3.406	-0.135	(0)
AlF4-	1.549e-04	1.118e-04	-3.810	-3.951	-0.142	(0)
AlF3	6.523e-05	6.523e-05	-4.186	-4.186	0.000	(0)
NaF	4.050e-05	4.050e-05	-4.393	-4.393	0.000	(0)
CuF+	4.818e-06	2.773e-06	-5.317	-5.557	-0.240	(0)
MnF+	3.357e-06	2.458e-06	-5.474	-5.609	-0.135	(0)
HF	2.870e-06	2.870e-06	-5.542	-5.542	0.000	(0)
AlF2+	2.047e-06	1.515e-06	-5.689	-5.820	-0.131	(0)
ZnF+	3.098e-07	1.783e-07	-6.509	-6.749	-0.240	(0)
BF (OH) 3-	2.139e-07	1.436e-07	-6.670	-6.843	-0.173	(0)
FeF3	1.355e-07	1.355e-07	-6.868	-6.868	0.000	(0)
HF2-	5.343e-08	3.733e-08	-7.272	-7.428	-0.156	(0)
BF2 (OH) 2-	4.462e-08	2.995e-08	-7.351	-7.524	-0.173	(0)
FeF2+	3.834e-08	2.808e-08	-7.416	-7.552	-0.135	(0)
AlF+2	3.709e-09	1.112e-09	-8.431	-8.954	-0.523	(0)
PbF+	3.238e-09	1.864e-09	-8.490	-8.730	-0.240	(0)
CdF+	2.754e-09	1.585e-09	-8.560	-8.800	-0.240	(0)
FeF+2	1.067e-09	3.067e-10	-8.972	-9.513	-0.541	(0)
CrF+2	5.183e-10	5.690e-11	-9.285	-10.245	-0.960	(0)
PbF2	1.255e-10	1.255e-10	-9.901	-9.901	0.000	(0)
VO2F2-	9.292e-11	5.349e-11	-10.032	-10.272	-0.240	(0)
VO2F	4.306e-11	4.306e-11	-10.366	-10.366	0.000	(0)
BF3OH-	3.387e-11	2.274e-11	-10.470	-10.643	-0.173	(0)
CoF+	2.995e-11	1.724e-11	-10.524	-10.763	-0.240	(0)
H2F2	2.208e-11	2.208e-11	-10.656	-10.656	0.000	(0)
VO2F3-2	2.079e-11	2.282e-12	-10.682	-11.642	-0.960	(0)
CdF2	1.082e-11	1.082e-11	-10.966	-10.966	0.000	(0)
UO2F3-	7.237e-12	4.166e-12	-11.140	-11.380	-0.240	(0)
UO2F2	4.848e-12	4.848e-12	-11.314	-11.314	0.000	(0)
NiF+	4.189e-12	2.411e-12	-11.378	-11.618	-0.240	(0)
PbF3-	1.414e-12	8.141e-13	-11.849	-12.089	-0.240	(0)
VOF+	1.085e-12	6.244e-13	-11.965	-12.205	-0.240	(0)
UO2F4-2	1.031e-12	1.132e-13	-11.987	-12.946	-0.960	(0)
UO2F+	8.537e-13	4.914e-13	-12.069	-12.309	-0.240	(0)
VOF2	8.010e-13	8.010e-13	-12.096	-12.096	0.000	(0)
VO2F4-3	5.539e-13	3.842e-15	-12.257	-14.415	-2.159	(0)
BF4-	3.252e-13	2.183e-13	-12.488	-12.661	-0.173	(0)

VOF3-	1.689e-13	9.722e-14	-12.772	-13.012	-0.240	(0)
VOF4-2	1.223e-14	1.342e-15	-13.913	-14.872	-0.960	(0)
PbF4-2	1.214e-14	1.333e-15	-13.916	-14.875	-0.960	(0)
HgF+	4.341e-19	2.499e-19	-18.362	-18.602	-0.240	(0)
Sb(OH) 2F	1.859e-21	1.859e-21	-20.731	-20.731	0.000	(0)
SbOF	1.838e-21	1.838e-21	-20.736	-20.736	0.000	(0)
UF3+	1.332e-30	7.665e-31	-29.876	-30.116	-0.240	(0)
UF6-2	3.668e-31	4.026e-32	-30.436	-31.395	-0.960	(0)
UF4	2.875e-31	2.875e-31	-30.541	-30.541	0.000	(0)
UF5-	6.771e-32	3.897e-32	-31.169	-31.409	-0.240	(0)
UF2+2	1.288e-32	1.414e-33	-31.890	-32.850	-0.960	(0)
UF+3	4.733e-36	3.283e-38	-35.325	-37.484	-2.159	(0)
Fe (2)	1.757e-06					
Fe+2	1.314e-06	1.442e-07	-5.882	-6.841	-0.960	(0)
FeSO4	3.095e-07	3.095e-07	-6.509	-6.509	0.000	(0)
FeHCO3+	1.337e-07	1.004e-07	-6.874	-6.998	-0.124	(0)
FeOH+	1.384e-10	1.013e-10	-9.859	-9.994	-0.135	(0)
Fe (OH) 2	1.421e-15	1.421e-15	-14.847	-14.847	0.000	(0)
Fe (OH) 3-	1.083e-17	7.932e-18	-16.965	-17.101	-0.135	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.670	-155.670	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.282	-232.522	-0.240	(0)
Fe (3)	8.949e-06					
Fe (OH) 2+	8.649e-06	6.400e-06	-5.063	-5.194	-0.131	(0)
FeF3	1.355e-07	1.355e-07	-6.868	-6.868	0.000	(0)
Fe (OH) 3	1.213e-07	1.213e-07	-6.916	-6.916	0.000	(0)
FeF2+	3.834e-08	2.808e-08	-7.416	-7.552	-0.135	(0)
FeOH+2	3.241e-09	9.319e-10	-8.489	-9.031	-0.541	(0)
FeF+2	1.067e-09	3.067e-10	-8.972	-9.513	-0.541	(0)
Fe (OH) 4-	2.695e-10	1.994e-10	-9.569	-9.700	-0.131	(0)
FeSO4+	1.096e-11	8.022e-12	-10.960	-11.096	-0.135	(0)
Fe (SO4) 2-	2.606e-12	1.500e-12	-11.584	-11.824	-0.240	(0)
Fe+3	1.192e-12	8.177e-14	-11.924	-13.087	-1.164	(0)
Fe2 (OH) 2+4	1.981e-13	2.876e-17	-12.703	-16.541	-3.838	(0)
FeCl+2	5.399e-14	1.552e-14	-13.268	-13.809	-0.541	(0)
Fe3 (OH) 4+5	2.642e-15	2.661e-21	-14.578	-20.575	-5.997	(0)
FeHSeO3+2	8.616e-16	9.458e-17	-15.065	-16.024	-0.960	(0)
FeCl2+	5.953e-16	4.359e-16	-15.225	-15.361	-0.135	(0)
FeCl3	2.740e-19	2.740e-19	-18.562	-18.562	0.000	(0)
FeNO3+2	2.038e-19	2.237e-20	-18.691	-19.650	-0.960	(0)
H (0)	1.162e-29					
H2	5.812e-30	6.115e-30	-29.236	-29.214	0.022	(0)
Hg (0)	4.882e-10					
Hg	4.882e-10	4.882e-10	-9.311	-9.311	0.000	(0)
Hg (1)	1.190e-17					
Hg2+2	5.950e-18	6.531e-19	-17.225	-18.185	-0.960	(0)
Hg (2)	9.153e-09					
HgCl2	7.788e-09	7.788e-09	-8.109	-8.109	0.000	(0)
HgCl3-	8.506e-10	4.896e-10	-9.070	-9.310	-0.240	(0)
HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
HgCl4-2	1.116e-10	1.225e-11	-9.952	-10.912	-0.960	(0)
HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
Hg (OH) 2	3.682e-12	3.875e-12	-11.434	-11.412	0.022	(0)
Hg (CO3) 2-2	1.420e-12	1.558e-13	-11.848	-12.807	-0.960	(0)
HgCl+	4.294e-13	2.472e-13	-12.367	-12.607	-0.240	(0)
HgHCO3+	1.978e-13	1.139e-13	-12.704	-12.944	-0.240	(0)
HgOH+	2.406e-15	1.385e-15	-14.619	-14.859	-0.240	(0)
Hg (NH3) 2+2	4.051e-16	4.446e-17	-15.392	-16.352	-0.960	(0)
HgNH3+2	6.774e-17	7.435e-18	-16.169	-17.129	-0.960	(0)
Hg+2	1.795e-17	1.971e-18	-16.746	-17.705	-0.960	(0)
HgSO4	4.512e-18	4.512e-18	-17.346	-17.346	0.000	(0)
HgF+	4.341e-19	2.499e-19	-18.362	-18.602	-0.240	(0)
Hg (OH) 3-	1.496e-20	8.611e-21	-19.825	-20.065	-0.240	(0)
Hg (NH3) 3+2	9.644e-24	1.059e-24	-23.016	-23.975	-0.960	(0)
HgNO3+	3.459e-26	1.991e-26	-25.461	-25.701	-0.240	(0)
Hg (NH3) 4+2	4.581e-31	5.028e-32	-30.339	-31.299	-0.960	(0)
Hg (NO3) 2	2.264e-34	2.264e-34	-33.645	-33.645	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)

	HgS2-2	0.000e+00	0.000e+00	-138.812	-139.772	-0.960	(0)
K		1.511e-02					
	K+	1.423e-02	1.056e-02	-1.847	-1.976	-0.129	(0)
	KSO4-	8.836e-04	6.539e-04	-3.054	-3.185	-0.131	(0)
	KCrO4-	1.685e-21	9.699e-22	-20.773	-21.013	-0.240	(0)
Mg		1.848e-02					
	Mg+2	9.785e-03	2.974e-03	-2.009	-2.527	-0.517	(0)
	MgSO4	4.732e-03	4.732e-03	-2.325	-2.325	0.000	(0)
	MgHCO3+	2.368e-03	1.683e-03	-2.626	-2.774	-0.148	(0)
	MgF+	1.581e-03	1.142e-03	-2.801	-2.943	-0.142	(0)
	MgCO3	1.131e-05	1.131e-05	-4.947	-4.947	0.000	(0)
	MgOH+	2.753e-08	2.090e-08	-7.560	-7.680	-0.120	(0)
	MgH2BO3+	1.654e-08	1.111e-08	-7.781	-7.954	-0.173	(0)
Mn (2)		2.232e-04					
	Mn+2	1.644e-04	1.805e-05	-3.784	-4.744	-0.960	(0)
	MnSO4	2.806e-05	2.806e-05	-4.552	-4.552	0.000	(0)
	MnHCO3+	2.720e-05	1.992e-05	-4.565	-4.701	-0.135	(0)
	MnF+	3.357e-06	2.458e-06	-5.474	-5.609	-0.135	(0)
	MnCl+	1.951e-07	1.428e-07	-6.710	-6.845	-0.135	(0)
	MnCl2	1.268e-09	1.268e-09	-8.897	-8.897	0.000	(0)
	MnOH+	1.093e-09	8.003e-10	-8.961	-9.097	-0.135	(0)
	MnCl3-	2.999e-12	2.196e-12	-11.523	-11.658	-0.135	(0)
	MnNO3+	1.360e-12	7.826e-13	-11.867	-12.106	-0.240	(0)
	MnSeO4	2.123e-13	2.123e-13	-12.673	-12.673	0.000	(0)
	Mn (NO3) 2	5.378e-20	5.378e-20	-19.269	-19.269	0.000	(0)
	Mn (OH) 3-	2.105e-21	1.541e-21	-20.677	-20.812	-0.135	(0)
	Mn (OH) 4-2	3.055e-28	8.784e-29	-27.515	-28.056	-0.541	(0)
	MnSe	0.000e+00	0.000e+00	-43.565	-43.565	0.000	(0)
Mn (3)		7.174e-23					
	Mn+3	7.174e-23	4.921e-24	-22.144	-23.308	-1.164	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-45.522	-46.063	-0.541	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-48.486	-48.650	-0.164	(0)
Mo		8.621e-06					
	MoO4-2	8.570e-06	2.605e-06	-5.067	-5.584	-0.517	(0)
	HMoO4-	5.108e-08	2.940e-08	-7.292	-7.532	-0.240	(0)
	H2MoO4	1.222e-10	1.222e-10	-9.913	-9.913	0.000	(0)
	AlMo6O21-3	4.876e-28	3.382e-30	-27.312	-29.471	-2.159	(0)
	Mo7O24-6	3.768e-28	8.717e-37	-27.424	-36.060	-8.636	(0)
	HMo7O24-5	1.197e-30	1.205e-36	-29.922	-35.919	-5.997	(0)
	H2Mo7O24-4	2.852e-34	4.140e-38	-33.545	-37.383	-3.838	(0)
	H3Mo7O24-3	5.967e-39	0.000e+00	-38.224	-40.383	-2.159	(0)
N (-3)		9.638e-06					
	NH4+	8.863e-06	5.950e-06	-5.052	-5.225	-0.173	(0)
	NH4SO4-	7.614e-07	5.575e-07	-6.118	-6.254	-0.135	(0)
	CuNH3+2	7.163e-09	7.863e-10	-8.145	-9.104	-0.960	(0)
	NH3	5.980e-09	5.980e-09	-8.223	-8.223	0.000	(0)
	CaNH3+2	7.208e-10	7.912e-11	-9.142	-10.102	-0.960	(0)
	BaNH3+2	2.593e-13	2.847e-14	-12.586	-13.546	-0.960	(0)
	Co (NH3) +2	1.044e-15	1.146e-16	-14.981	-15.941	-0.960	(0)
	NiNH3+2	8.209e-16	9.011e-17	-15.086	-16.045	-0.960	(0)
	Hg (NH3) 2+2	4.051e-16	4.446e-17	-15.392	-16.352	-0.960	(0)
	HgNH3+2	6.774e-17	7.435e-18	-16.169	-17.129	-0.960	(0)
	Ca (NH3) 2+2	1.716e-18	1.884e-19	-17.765	-18.725	-0.960	(0)
	Ni (NH3) 2+2	7.095e-22	7.789e-23	-21.149	-22.109	-0.960	(0)
	Co (NH3) 2+2	2.663e-22	2.923e-23	-21.575	-22.534	-0.960	(0)
	Hg (NH3) 3+2	9.644e-24	1.059e-24	-23.016	-23.975	-0.960	(0)
	Co (NH3) 3+2	2.005e-29	2.200e-30	-28.698	-29.658	-0.960	(0)
	Hg (NH3) 4+2	4.581e-31	5.028e-32	-30.339	-31.299	-0.960	(0)
	Co (NH3) 4+2	6.291e-37	6.906e-38	-36.201	-37.161	-0.960	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.517	-41.476	-0.960	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-44.205	-45.164	-0.960	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.160	-49.319	-2.159	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.509	-50.468	-0.960	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.099	-60.339	-0.240	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.448	-65.407	-0.960	(0)

Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.799	-66.759	-0.960	(0)
N (3)	1.290e-05					
NO2-	1.288e-05	8.829e-06	-4.890	-5.054	-0.164	(0)
CuNO2+	2.064e-08	1.188e-08	-7.685	-7.925	-0.240	(0)
Cu (NO2) 2	1.073e-12	1.073e-12	-11.969	-11.969	0.000	(0)
CoNO2+	1.722e-14	9.915e-15	-13.764	-14.004	-0.240	(0)
N (5)	3.843e-08					
NO3-	3.685e-08	2.736e-08	-7.434	-7.563	-0.129	(0)
CaNO3+	1.580e-09	9.093e-10	-8.801	-9.041	-0.240	(0)
CuNO3+	1.931e-12	1.112e-12	-11.714	-11.954	-0.240	(0)
BaNO3+	1.797e-12	1.034e-12	-11.745	-11.985	-0.240	(0)
MnNO3+	1.360e-12	7.826e-13	-11.867	-12.106	-0.240	(0)
ZnNO3+	3.119e-13	1.795e-13	-12.506	-12.746	-0.240	(0)
PbNO3+	5.436e-15	3.129e-15	-14.265	-14.505	-0.240	(0)
CdNO3+	4.395e-15	2.530e-15	-14.357	-14.597	-0.240	(0)
CoNO3+	1.201e-17	6.910e-18	-16.921	-17.161	-0.240	(0)
NiNO3+	3.350e-18	1.928e-18	-17.475	-17.715	-0.240	(0)
FeNO3+2	2.038e-19	2.237e-20	-18.691	-19.650	-0.960	(0)
VO2NO3	9.933e-20	9.933e-20	-19.003	-19.003	0.000	(0)
Mn (NO3) 2	5.378e-20	5.378e-20	-19.269	-19.269	0.000	(0)
Cu (NO3) 2	3.829e-21	3.829e-21	-20.417	-20.417	0.000	(0)
CrNO3+2	1.143e-21	1.255e-22	-20.942	-21.901	-0.960	(0)
Zn (NO3) 2	9.801e-22	9.801e-22	-21.009	-21.009	0.000	(0)
Pb (NO3) 2	1.454e-22	1.454e-22	-21.837	-21.837	0.000	(0)
UO2NO3+	9.869e-23	5.681e-23	-22.006	-22.246	-0.240	(0)
Cd (NO3) 2	3.469e-23	3.469e-23	-22.460	-22.460	0.000	(0)
Co (NO3) 2	3.847e-25	3.847e-25	-24.415	-24.415	0.000	(0)
HgNO3+	3.459e-26	1.991e-26	-25.461	-25.701	-0.240	(0)
Hg (NO3) 2	2.264e-34	2.264e-34	-33.645	-33.645	0.000	(0)
Na	2.709e-02					
Na+	2.527e-02	1.876e-02	-1.597	-1.727	-0.129	(0)
NaSO4-	1.191e-03	8.812e-04	-2.924	-3.055	-0.131	(0)
NaHCO3	5.836e-04	5.836e-04	-3.234	-3.234	0.000	(0)
NaF	4.050e-05	4.050e-05	-4.393	-4.393	0.000	(0)
NaCO3-	2.158e-06	1.597e-06	-5.666	-5.797	-0.131	(0)
NaH2BO3	3.203e-09	3.203e-09	-8.495	-8.495	0.000	(0)
NaCrO4-	4.004e-21	2.305e-21	-20.398	-20.637	-0.240	(0)
Ni	4.836e-10					
NiHCO3+	3.324e-10	1.913e-10	-9.478	-9.718	-0.240	(0)
Ni+2	9.231e-11	2.806e-11	-10.035	-10.552	-0.517	(0)
NiSO4	4.895e-11	4.895e-11	-10.310	-10.310	0.000	(0)
NiCO3	4.785e-12	4.785e-12	-11.320	-11.320	0.000	(0)
NiF+	4.189e-12	2.411e-12	-11.378	-11.618	-0.240	(0)
NiCl+	7.840e-13	4.513e-13	-12.106	-12.346	-0.240	(0)
Ni (SO4) 2-2	1.291e-13	1.417e-14	-12.889	-13.848	-0.960	(0)
NiOH+	1.083e-14	6.235e-15	-13.965	-14.205	-0.240	(0)
NiNH3+2	8.209e-16	9.011e-17	-15.086	-16.045	-0.960	(0)
NiCl2	1.428e-17	1.428e-17	-16.845	-16.845	0.000	(0)
Ni (OH) 2	8.743e-18	8.743e-18	-17.058	-17.058	0.000	(0)
NiNO3+	3.350e-18	1.928e-18	-17.475	-17.715	-0.240	(0)
NiSeO4	5.737e-19	5.737e-19	-18.241	-18.241	0.000	(0)
Ni (NH3) 2+2	7.095e-22	7.789e-23	-21.149	-22.109	-0.960	(0)
Ni (OH) 3-	2.681e-22	1.543e-22	-21.572	-21.812	-0.240	(0)
O (0)	2.548e-34					
O2	1.274e-34	1.341e-34	-33.895	-33.873	0.022	(0)
Pb	7.525e-07					
PbHCO3+	5.521e-07	3.178e-07	-6.258	-6.498	-0.240	(0)
PbCO3	1.062e-07	1.062e-07	-6.974	-6.974	0.000	(0)
PbSO4	3.312e-08	3.312e-08	-7.480	-7.480	0.000	(0)
Pb+2	2.544e-08	7.732e-09	-7.595	-8.112	-0.517	(0)
Pb (SO4) 2-2	1.590e-08	1.745e-09	-7.799	-8.758	-0.960	(0)
Pb (CO3) 2-2	1.276e-08	1.401e-09	-7.894	-8.854	-0.960	(0)
PbF+	3.238e-09	1.864e-09	-8.490	-8.730	-0.240	(0)
PbCl+	2.996e-09	1.725e-09	-8.523	-8.763	-0.240	(0)
PbOH+	5.956e-10	3.428e-10	-9.225	-9.465	-0.240	(0)
PbF2	1.255e-10	1.255e-10	-9.901	-9.901	0.000	(0)
PbCl2	4.843e-11	4.843e-11	-10.315	-10.315	0.000	(0)
PbF3-	1.414e-12	8.141e-13	-11.849	-12.089	-0.240	(0)

PbCl3-	2.106e-13	1.212e-13	-12.677	-12.916	-0.240	(0)
Pb(OH) 2	1.914e-13	1.914e-13	-12.718	-12.718	0.000	(0)
PbF4-2	1.214e-14	1.333e-15	-13.916	-14.875	-0.960	(0)
Pb2OH+3	6.058e-15	4.201e-17	-14.218	-16.377	-2.159	(0)
PbNO3+	5.436e-15	3.129e-15	-14.265	-14.505	-0.240	(0)
PbCl4-2	3.173e-15	3.483e-16	-14.499	-15.458	-0.960	(0)
Pb(OH) 3-	5.870e-18	3.379e-18	-17.231	-17.471	-0.240	(0)
Pb(NO3) 2	1.454e-22	1.454e-22	-21.837	-21.837	0.000	(0)
Pb(OH) 4-2	1.331e-22	1.461e-23	-21.876	-22.835	-0.960	(0)
Pb3(OH) 4+2	5.148e-23	5.651e-24	-22.288	-23.248	-0.960	(0)
Pb4(OH) 4+4	2.391e-24	3.471e-28	-23.621	-27.460	-3.838	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.620	-150.620	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.970	-228.210	-0.240	(0)
S(-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.115	-78.115	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.175	-78.415	-0.240	(0)
HS-	0.000e+00	0.000e+00	-78.649	-78.889	-0.240	(0)
S5-2	0.000e+00	0.000e+00	-81.049	-82.008	-0.960	(0)
S6-2	0.000e+00	0.000e+00	-81.565	-82.524	-0.960	(0)
S4-2	0.000e+00	0.000e+00	-81.644	-82.604	-0.960	(0)
S3-2	0.000e+00	0.000e+00	-82.450	-83.410	-0.960	(0)
S2-2	0.000e+00	0.000e+00	-83.466	-84.426	-0.960	(0)
S-2	0.000e+00	0.000e+00	-89.402	-89.943	-0.541	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.812	-139.772	-0.960	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.065	-150.305	-0.240	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.101	-150.101	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-150.409	-150.883	-0.474	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.542	-150.542	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.620	-150.620	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.169	-151.613	-0.444	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-155.670	-155.670	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.420	-215.660	-0.240	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.911	-226.151	-0.240	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.850	-227.090	-0.240	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.970	-228.210	-0.240	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.925	-229.885	-0.960	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-232.282	-232.522	-0.240	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.824	-303.783	-0.960	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.541	-306.500	-0.960	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.117	-315.076	-0.960	(0)
S(6)	5.670e-02					
SO4-2	2.877e-02	8.745e-03	-1.541	-2.058	-0.517	(0)
CaSO4	2.105e-02	2.105e-02	-1.677	-1.677	0.000	(0)
MgSO4	4.732e-03	4.732e-03	-2.325	-2.325	0.000	(0)
NaSO4-	1.191e-03	8.812e-04	-2.924	-3.055	-0.131	(0)
KSO4-	8.836e-04	6.539e-04	-3.054	-3.185	-0.131	(0)
MnSO4	2.806e-05	2.806e-05	-4.552	-4.552	0.000	(0)
CuSO4	2.574e-05	2.574e-05	-4.589	-4.589	0.000	(0)
ZnSO4	4.998e-06	4.998e-06	-5.301	-5.301	0.000	(0)
Zn(SO4) 2-2	3.468e-06	3.806e-07	-5.460	-6.419	-0.960	(0)
NH4SO4-	7.614e-07	5.575e-07	-6.118	-6.254	-0.135	(0)
HSO4-	6.715e-07	4.848e-07	-6.173	-6.314	-0.142	(0)
FeSO4	3.095e-07	3.095e-07	-6.509	-6.509	0.000	(0)
Cd(SO4) 2-2	6.441e-08	7.071e-09	-7.191	-8.151	-0.960	(0)
CdSO4	5.994e-08	5.994e-08	-7.222	-7.222	0.000	(0)
PbSO4	3.312e-08	3.312e-08	-7.480	-7.480	0.000	(0)
Pb(SO4) 2-2	1.590e-08	1.745e-09	-7.799	-8.758	-0.960	(0)
CoSO4	2.780e-10	2.780e-10	-9.556	-9.556	0.000	(0)
CrOHSO4	8.410e-11	8.410e-11	-10.075	-10.075	0.000	(0)
NiSO4	4.895e-11	4.895e-11	-10.310	-10.310	0.000	(0)
FeSO4+	1.096e-11	8.022e-12	-10.960	-11.096	-0.135	(0)
CrSO4+	3.723e-12	2.143e-12	-11.429	-11.669	-0.240	(0)
AlSO4+	3.057e-12	2.207e-12	-11.515	-11.656	-0.142	(0)
Fe(SO4) 2-	2.606e-12	1.500e-12	-11.584	-11.824	-0.240	(0)
VO2SO4-	2.604e-12	1.499e-12	-11.584	-11.824	-0.240	(0)
Al(SO4) 2-	2.864e-13	2.068e-13	-12.543	-12.684	-0.142	(0)

Ni (SO4) 2-2	1.291e-13	1.417e-14	-12.889	-13.848	-0.960	(0)
VOSO4	7.330e-14	7.330e-14	-13.135	-13.135	0.000	(0)
UO2 (SO4) 2-2	1.446e-14	1.588e-15	-13.840	-14.799	-0.960	(0)
UO2SO4	1.377e-14	1.377e-14	-13.861	-13.861	0.000	(0)
HgSO4	4.512e-18	4.512e-18	-17.346	-17.346	0.000	(0)
Cr2 (OH) 2SO4+2	2.807e-18	3.081e-19	-17.552	-18.511	-0.960	(0)
Cr2 (OH) 2 (SO4) 2	1.600e-19	1.600e-19	-18.796	-18.796	0.000	(0)
CrO3SO4-2	6.279e-25	6.893e-26	-24.202	-25.162	-0.960	(0)
VSO4+	5.746e-27	3.307e-27	-26.241	-26.481	-0.240	(0)
U (SO4) 2	1.163e-38	1.163e-38	-37.934	-37.934	0.000	(0)
USO4+2	1.525e-39	1.674e-40	-38.817	-39.776	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.099	-60.339	-0.240	(0)
Sb (3)	1.212e-18					
Sb (OH) 3	6.100e-19	6.100e-19	-18.215	-18.215	0.000	(0)
HSbO2	5.987e-19	5.987e-19	-18.223	-18.223	0.000	(0)
Sb (OH) 2F	1.859e-21	1.859e-21	-20.731	-20.731	0.000	(0)
SbOF	1.838e-21	1.838e-21	-20.736	-20.736	0.000	(0)
Sb (OH) 2+	1.468e-23	8.450e-24	-22.833	-23.073	-0.240	(0)
SbO+	5.089e-24	2.929e-24	-23.293	-23.533	-0.240	(0)
SbO2-	2.970e-24	1.709e-24	-23.527	-23.767	-0.240	(0)
Sb (OH) 4-	1.683e-24	9.689e-25	-23.774	-24.014	-0.240	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.117	-315.076	-0.960	(0)
Sb (5)	9.063e-08					
SbO3-	9.055e-08	5.212e-08	-7.043	-7.283	-0.240	(0)
Sb (OH) 6-	8.078e-11	5.998e-11	-10.093	-10.222	-0.129	(0)
SbO2+	8.404e-21	4.838e-21	-20.075	-20.315	-0.240	(0)
Se (-2)	3.610e-40					
HSe-	3.610e-40	2.078e-40	-39.443	-39.682	-0.240	(0)
H2Se	0.000e+00	0.000e+00	-42.039	-42.039	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.565	-43.565	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.477	-48.436	-0.960	(0)
Se (4)	7.886e-07					
HSeO3-	7.605e-07	4.378e-07	-6.119	-6.359	-0.240	(0)
SeO3-2	2.799e-08	3.072e-09	-7.553	-8.513	-0.960	(0)
H2SeO3	1.059e-10	1.059e-10	-9.975	-9.975	0.000	(0)
FeHSeO3+2	8.616e-16	9.458e-17	-15.065	-16.024	-0.960	(0)
Cd (SeO3) 2-2	2.072e-18	2.274e-19	-17.684	-18.643	-0.960	(0)
Se (6)	1.441e-10					
SeO4-2	1.438e-10	4.371e-11	-9.842	-10.359	-0.517	(0)
MnSeO4	2.123e-13	2.123e-13	-12.673	-12.673	0.000	(0)
ZnSeO4	1.769e-14	1.769e-14	-13.752	-13.752	0.000	(0)
HSeO4-	2.159e-15	1.243e-15	-14.666	-14.906	-0.240	(0)
CdSeO4	2.380e-16	2.380e-16	-15.623	-15.623	0.000	(0)
CoSeO4	3.491e-18	3.491e-18	-17.457	-17.457	0.000	(0)
NiSeO4	5.737e-19	5.737e-19	-18.241	-18.241	0.000	(0)
Zn (SeO4) 2-2	7.142e-24	7.840e-25	-23.146	-24.106	-0.960	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.741	-59.900	-2.159	(0)
U (4)	1.064e-26					
U (OH) 5-	1.050e-26	6.042e-27	-25.979	-26.219	-0.240	(0)
U (OH) 4	1.443e-28	1.443e-28	-27.841	-27.841	0.000	(0)
UF3+	1.332e-30	7.665e-31	-29.876	-30.116	-0.240	(0)
U (OH) 3+	5.229e-31	3.010e-31	-30.282	-30.521	-0.240	(0)
UF6-2	3.668e-31	4.026e-32	-30.436	-31.395	-0.960	(0)
UF4	2.875e-31	2.875e-31	-30.541	-30.541	0.000	(0)
UF5-	6.771e-32	3.897e-32	-31.169	-31.409	-0.240	(0)
UF2+2	1.288e-32	1.414e-33	-31.890	-32.850	-0.960	(0)
U (OH) 2+2	7.232e-34	7.938e-35	-33.141	-34.100	-0.960	(0)
UF+3	4.733e-36	3.283e-38	-35.325	-37.484	-2.159	(0)
UOH+3	3.075e-37	2.133e-39	-36.512	-38.671	-2.159	(0)
U (SO4) 2	1.163e-38	1.163e-38	-37.934	-37.934	0.000	(0)
USO4+2	1.525e-39	1.674e-40	-38.817	-39.776	-0.960	(0)
U+4	0.000e+00	0.000e+00	-40.480	-44.318	-3.838	(0)
UCl+3	0.000e+00	0.000e+00	-42.661	-44.820	-2.159	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-169.975	-189.405	-19.430	(0)
U (5)	1.805e-19					
UO2+	1.805e-19	1.039e-19	-18.743	-18.983	-0.240	(0)
U (6)	2.741e-06					

UO2 (CO3) 3-4	2.725e-06	3.957e-10	-5.565	-9.403	-3.838	(0)
UO2 (CO3) 2-2	1.573e-08	1.727e-09	-7.803	-8.763	-0.960	(0)
UO2CO3	1.894e-11	1.894e-11	-10.723	-10.723	0.000	(0)
UO2F3-	7.237e-12	4.166e-12	-11.140	-11.380	-0.240	(0)
UO2F2	4.848e-12	4.848e-12	-11.314	-11.314	0.000	(0)
UO2F4-2	1.031e-12	1.132e-13	-11.987	-12.946	-0.960	(0)
UO2F+	8.537e-13	4.914e-13	-12.069	-12.309	-0.240	(0)
UO2 (SO4) 2-2	1.446e-14	1.588e-15	-13.840	-14.799	-0.960	(0)
UO2SO4	1.377e-14	1.377e-14	-13.861	-13.861	0.000	(0)
UO2OH+	4.018e-15	2.313e-15	-14.396	-14.636	-0.240	(0)
UO2+2	3.424e-15	1.041e-15	-14.466	-14.983	-0.517	(0)
UO2Cl+	1.843e-17	1.061e-17	-16.734	-16.974	-0.240	(0)
UO2NO3+	9.869e-23	5.681e-23	-22.006	-22.246	-0.240	(0)
(UO2) 2 (OH) 2+2	8.086e-23	8.876e-24	-22.092	-23.052	-0.960	(0)
(UO2) 3 (OH) 5+	8.430e-30	4.852e-30	-29.074	-29.314	-0.240	(0)
V (2)	6.495e-38					
V+2	5.857e-38	6.429e-39	-37.232	-38.192	-0.960	(0)
VOH+	6.380e-39	3.672e-39	-38.195	-38.435	-0.240	(0)
V (3)	3.555e-12					
V (OH) 3	3.555e-12	3.555e-12	-11.449	-11.449	0.000	(0)
V (OH) 2+	2.276e-21	1.310e-21	-20.643	-20.883	-0.240	(0)
VOH+2	6.458e-23	7.089e-24	-22.190	-23.149	-0.960	(0)
V+3	1.155e-25	8.012e-28	-24.937	-27.096	-2.159	(0)
VSO4+	5.746e-27	3.307e-27	-26.241	-26.481	-0.240	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-41.661	-45.499	-3.838	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-43.421	-45.580	-2.159	(0)
V (4)	2.604e-12					
VOF+	1.085e-12	6.244e-13	-11.965	-12.205	-0.240	(0)
VOF2	8.010e-13	8.010e-13	-12.096	-12.096	0.000	(0)
VO+2	2.773e-13	3.043e-14	-12.557	-13.517	-0.960	(0)
V (OH) 3+	1.852e-13	1.066e-13	-12.732	-12.972	-0.240	(0)
VOF3-	1.689e-13	9.722e-14	-12.772	-13.012	-0.240	(0)
VOSO4	7.330e-14	7.330e-14	-13.135	-13.135	0.000	(0)
VOF4-2	1.223e-14	1.342e-15	-13.913	-14.872	-0.960	(0)
VOC1+	9.325e-16	5.367e-16	-15.030	-15.270	-0.240	(0)
H2V2O4+2	5.247e-21	5.759e-22	-20.280	-21.240	-0.960	(0)
V (5)	2.129e-06					
H2VO4-	1.921e-06	1.106e-06	-5.717	-5.956	-0.240	(0)
H3V2O7-	7.821e-08	4.502e-08	-7.107	-7.347	-0.240	(0)
HVO4-2	4.460e-08	4.895e-09	-7.351	-8.310	-0.960	(0)
H3VO4	6.272e-09	6.272e-09	-8.203	-8.203	0.000	(0)
HV2O7-3	2.659e-10	1.844e-12	-9.575	-11.734	-2.159	(0)
V3O9-3	2.074e-10	1.438e-12	-9.683	-11.842	-2.159	(0)
VO2F2-	9.292e-11	5.349e-11	-10.032	-10.272	-0.240	(0)
VO2F	4.306e-11	4.306e-11	-10.366	-10.366	0.000	(0)
VO2F3-2	2.079e-11	2.282e-12	-10.682	-11.642	-0.960	(0)
VO2+	9.666e-12	7.177e-12	-11.015	-11.144	-0.129	(0)
V4O12-4	4.591e-12	6.665e-16	-11.338	-15.176	-3.838	(0)
VO2SO4-	2.604e-12	1.499e-12	-11.584	-11.824	-0.240	(0)
V2O7-4	6.026e-13	8.748e-17	-12.220	-16.058	-3.838	(0)
VO2F4-3	5.539e-13	3.842e-15	-12.257	-14.415	-2.159	(0)
VO4-3	6.236e-15	4.325e-17	-14.205	-16.364	-2.159	(0)
VO2NO3	9.933e-20	9.933e-20	-19.003	-19.003	0.000	(0)
V10O28-6	1.050e-27	2.428e-36	-26.979	-35.615	-8.636	(0)
HV10O28-5	2.103e-28	2.117e-34	-27.677	-33.674	-5.997	(0)
H2V10O28-4	1.335e-31	1.937e-35	-30.875	-34.713	-3.838	(0)
Zn	2.606e-05					
Zn+2	8.595e-06	2.612e-06	-5.066	-5.583	-0.517	(0)
ZnHCO3+	7.939e-06	4.570e-06	-5.100	-5.340	-0.240	(0)
ZnSO4	4.998e-06	4.998e-06	-5.301	-5.301	0.000	(0)
Zn (SO4) 2-2	3.468e-06	3.806e-07	-5.460	-6.419	-0.960	(0)
ZnCO3	6.872e-07	6.872e-07	-6.163	-6.163	0.000	(0)
ZnF+	3.098e-07	1.783e-07	-6.509	-6.749	-0.240	(0)
ZnCl+	5.804e-08	4.125e-08	-7.236	-7.385	-0.148	(0)
ZnOH+	8.012e-09	4.612e-09	-8.096	-8.336	-0.240	(0)
ZnOHC1	9.534e-10	9.534e-10	-9.021	-9.021	0.000	(0)
ZnCl2	4.110e-10	4.110e-10	-9.386	-9.386	0.000	(0)
Zn (OH) 2	1.290e-11	1.290e-11	-10.889	-10.889	0.000	(0)

ZnCl3-	2.888e-12	2.052e-12	-11.539	-11.688	-0.148	(0)
ZnNO3+	3.119e-13	1.795e-13	-12.506	-12.746	-0.240	(0)
ZnCl4-2	2.244e-14	6.452e-15	-13.649	-14.190	-0.541	(0)
ZnSeO4	1.769e-14	1.769e-14	-13.752	-13.752	0.000	(0)
Zn(OH) 3-	1.983e-15	1.142e-15	-14.703	-14.943	-0.240	(0)
Zn(OH) 4-2	7.308e-21	8.022e-22	-20.136	-21.096	-0.960	(0)
Zn(NO3) 2	9.801e-22	9.801e-22	-21.009	-21.009	0.000	(0)
Zn(SeO4) 2-2	7.142e-24	7.840e-25	-23.146	-24.106	-0.960	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.065	-150.305	-0.240	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.542	-150.542	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.911	-226.151	-0.240	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.925	-229.885	-0.960	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.541	-306.500	-0.960	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.92	-47.64	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.42	-36.91	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.65	-36.92	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.91	-51.98	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.92	-35.89	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.46	-30.06	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.26	-20.81	0.45	(NH4)2SeO4
Al(OH)3(am)	-5.56	5.24	10.80	Al(OH)3
Al2(MoO4)3	-46.10	-43.73	2.37	Al2(MoO4)3
Al2O3	-9.16	10.49	19.65	Al2O3
Al4(OH)10SO4	-16.27	6.43	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.09	-6.29	4.80	AlAsO4:2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-156.77	-91.15	65.62	AlSb
Alunite	-7.69	-9.09	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.38	-10.17	-7.79	PbSO4
Anhydrite	0.32	-4.04	-4.36	CaSO4
Anilite	-55.47	-87.35	-31.88	Cu0.25Cu1.5S
Antlerite	-0.54	8.24	8.79	Cu3(OH)4SO4
Aragonite	0.98	-7.32	-8.30	CaCO3
Arsenolite	-72.04	-74.80	-2.76	As4O6
Artinite	-7.51	2.09	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-29.78	-23.07	6.71	As2O5
Atacamite	-0.64	6.75	7.39	Cu2(OH)3Cl
Azurite	4.04	-12.87	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.05	7.35	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-10.94	4.93	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	7.94	-0.97	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-20.64	12.30	32.94	Ba3(VO4)2:4H2O
BaCrO4	-15.06	-24.73	-9.67	BaCrO4
BaF2	-4.23	-10.05	-5.82	BaF2
BaMoO4	-3.75	-10.71	-6.96	BaMoO4
Barite	2.80	-7.18	-9.98	BaSO4
BaS	-93.95	-77.77	16.18	BaS
BaSeO3	-7.06	-5.23	1.83	BaSeO3
BaSeO4	-8.02	-15.48	-7.46	BaSeO4
Bianchite	-5.89	-7.66	-1.76	ZnSO4:6H2O
Birnessite	-9.63	8.46	18.09	MnO2
Bixbyite	-8.50	-9.15	-0.64	Mn2O3
BlaubleiI	-54.68	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.49	-82.77	-27.28	Cu0.6Cu0.8S
Boehmite	-3.33	5.25	8.58	AlOOH
Breithauptite	-62.90	-81.43	-18.52	NiSb
Brochantite	0.62	15.84	15.22	Cu4(OH)6SO4
Brucite	-6.88	9.96	16.84	Mg(OH)2
Bunsenite	-10.51	1.94	12.45	NiO
Ca(VO3)2	-4.95	0.71	5.66	Ca(VO3)2
Ca2V2O7	-6.27	11.23	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.33	11.22	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.85	8.45	22.30	Ca3(AsO4)2:4H2O

Ca3(VO4)2	-17.22	21.74	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.13	21.73	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-304.23	-161.25	142.97	Ca3Sb2
CaCrO4	-19.32	-21.59	-2.27	CaCrO4
Calcite	1.16	-7.32	-8.48	CaCO3
Calomel	-4.68	-22.59	-17.91	Hg2Cl2
CaMoO4	0.39	-7.56	-7.95	CaMoO4
Carnotite	-3.35	-3.12	0.23	KUO2VO4
CaSeO3:2H2O	-4.91	-2.10	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.32	-12.34	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.83	-2.99	9.84	Cd(BO2)2
Cd(OH)2	-8.69	4.95	13.64	Cd(OH)2
Cd(OH)2(am)	-8.78	4.95	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.94	-14.23	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.25	0.31	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.13	5.27	28.40	Cd4(OH)6SO4
CdCl2	-11.28	-11.94	-0.66	CdCl2
CdCl2:1H2O	-10.25	-11.94	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.03	-11.94	-1.91	CdCl2:2.5H2O
CdF2	-11.25	-12.47	-1.21	CdF2
Cdmetal(alpha)	-34.62	-21.11	13.51	Cd
Cdmetal(gamma)	-34.72	-21.11	13.62	Cd
CdMoO4	1.03	-13.12	-14.15	CdMoO4
CdOHCl	-7.03	-3.49	3.54	CdOHCl
CdSb	-78.06	-78.41	-0.35	CdSb
CdSe	-20.77	-40.97	-20.20	CdSe
CdSeO4:2H2O	-16.05	-17.90	-1.85	CdSeO4:2H2O
CdSO4	-9.42	-9.59	-0.17	CdSO4
CdSO4:1H2O	-7.87	-9.59	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.73	-9.60	-1.87	CdSO4:2.67H2O
Cerrusite	-0.32	-13.45	-13.13	PbCO3
CH4(g)	-81.03	-122.08	-41.05	CH4
Chalcanthite	-4.32	-6.96	-2.64	CuSO4:5H2O
Chalcocite	-55.70	-90.62	-34.92	Cu2S
Chalcopyrite	-121.75	-157.02	-35.27	CuFeS2
Cinnabar	-50.85	-96.54	-45.69	HgS
Claudetite	-71.74	-74.80	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co(BO2)2	-32.33	-5.26	27.07	Co(BO2)2
Co(OH)2	-10.40	2.69	13.09	Co(OH)2
Co(OH)3	-14.37	-16.68	-2.31	Co(OH)3
CO2(g)	0.32	-17.83	-18.15	CO2
Co3(AsO4)2	-28.03	-15.00	13.03	Co3(AsO4)2
Co3O4	-20.17	-30.66	-10.50	Co3O4
CoCl2	-22.47	-14.20	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.22	2.54	CoCl2:6H2O
CoCO3	-5.16	-15.14	-9.98	CoCO3
CoF2	-13.13	-14.73	-1.60	CoF2
CoF3	-41.35	-42.81	-1.46	CoF3
CoFe2O4	17.52	13.99	-3.53	CoFe2O4
CoMoO4	-7.62	-15.38	-7.76	CoMoO4
CoO	-10.89	2.69	13.59	CoO
CoS(alpha)	-75.00	-82.44	-7.44	CoS
CoS(beta)	-71.37	-82.44	-11.07	CoS
CoSe	-27.03	-43.23	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-18.64	-20.17	-1.53	CoSeO4:6H2O
CoSO4	-14.66	-11.86	2.80	CoSO4
CoSO4:6H2O	-9.40	-11.87	-2.47	CoSO4:6H2O
Cotunnite	-7.73	-12.51	-4.78	PbCl2
Covellite	-55.23	-77.53	-22.30	CuS
Cr(OH)2	-24.72	-13.90	10.82	Cr(OH)2
Cr(OH)3	-5.15	-3.82	1.34	Cr(OH)3
Cr(OH)3(am)	-3.07	-3.82	-0.75	Cr(OH)3
Cr2O3	-5.27	-7.63	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-44.27	-29.15	15.11	CrCl3
CrF3	-18.61	-29.95	-11.34	CrF3

Crmetal	-70.44	-39.96	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	0.38	-33.46	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.60	8.67	Cu (OH) 2
Cu (SbO3) 2	-21.91	23.30	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.86	1.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.66	-91.54	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.38	-0.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.03	-104.62	-42.59	Cu3Sb
Cu3Se2	-26.25	-89.74	-63.49	Cu3Se2
CuCO3	1.27	-10.23	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-6.55	-11.45	-4.91	CuF
CuF2	-10.94	-9.82	1.12	CuF2
CuF2:2H2O	-5.28	-9.83	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.60	-10.48	-13.08	CuMoO4
CuOCuSO4	-9.65	0.65	10.30	CuOCuSO4
Cupricferrite	12.91	18.89	5.99	CuFe2O4
Cuprite	-4.08	-5.48	-1.41	Cu2O
Cuprousferrite	11.82	2.91	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-24.83	-58.19	-33.37	CuSe2
CuSeO3:2H2O	-5.52	-5.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.82	-15.26	-2.44	CuSeO4:5H2O
CuSO4	-9.89	-6.95	2.94	CuSO4
Diaspore	-1.63	5.25	6.87	AlOOH
Djurleite	-55.83	-89.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	1.35	-15.19	-16.54	CaMg (CO3) 2
Dolomite(ordered)	1.90	-15.19	-17.09	CaMg (CO3) 2
Epsomite	-2.47	-4.60	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.92	5.65	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.15	3.11	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-0.43	-4.15	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-2.87	-1.31	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-5.89	-26.52	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-28.62	-32.35	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-3.29	16.93	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.29	-5.89	0.40	FeAsO4:2H2O
FeCr2O4	-9.18	-1.98	7.20	FeCr2O4
FeMoO4	-2.33	-12.43	-10.09	FeMoO4
Ferrihydrite	2.45	5.64	3.19	Fe (OH) 3
Ferroselite	-41.55	-60.14	-18.60	FeSe2
FeS (ppt)	-76.53	-79.48	-2.95	FeS
FeSe	-29.28	-40.28	-11.00	FeSe
Fix_pe	-6.79	-6.79	0.00	e-
Fluorite	3.59	-6.91	-10.50	CaF2
Galena	-66.78	-80.75	-13.97	PbS
Gibbsite	-3.05	5.24	8.29	Al (OH) 3
Goethite	5.16	5.65	0.49	FeOOH
Goslarite	-5.65	-7.66	-2.01	ZnSO4:7H2O
Greenockite	-65.82	-80.18	-14.36	CdS
Greigite	-278.55	-323.59	-45.03	Fe3S4
Gummite	-10.16	-2.49	7.67	UO3
Gypsum	0.57	-4.04	-4.61	CaSO4:2H2O
H-Jarosite	-0.06	-12.16	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-5.20	-18.08	-12.88	H2MoO4
H2S (g)	-77.13	-85.14	-8.01	H2S
H2Se (g)	-40.97	-45.93	-4.96	H2Se
Halite	-5.53	-3.93	1.60	NaCl
Hausmannite	-11.73	49.30	61.03	Mn3O4
Hematite	12.71	11.30	-1.42	Fe2O3
Hercynite	-6.75	16.14	22.89	FeAl2O4
Hg (CH3) 2 (g)	-181.86	-255.57	-73.71	Hg (CH3) 2
Hg (g)	-8.00	-15.88	-7.87	Hg
Hg (OH) 2	-7.92	-11.41	-3.50	Hg (OH) 2

Hg2 (g)	-16.80	-31.76	-14.96	Hg2
Hg2 (OH) 2	-10.96	-5.70	5.26	Hg2 (OH) 2
Hg2CO3	-7.48	-23.53	-16.05	Hg2CO3
Hg2CrO4	-29.09	-37.79	-8.70	Hg2CrO4
Hg2F2	-12.75	-23.12	-10.36	Hg2F2
Hg2S	-79.15	-90.83	-11.68	Hg2S
Hg2SeO3	-13.64	-18.30	-4.66	Hg2SeO3
Hg2SO4	-14.11	-20.24	-6.13	Hg2SO4
Hg3O2CO3	-22.38	-52.06	-29.68	Hg3O2CO3
HgCl (g)	-30.79	-11.29	19.50	HgCl
HgCl2	-7.04	-28.30	-21.26	HgCl2
HgF (g)	-44.23	-11.56	32.68	HgF
HgF2 (g)	-41.40	-28.83	12.57	HgF2
Hgmetal (l)	-2.43	-15.88	-13.45	Hg
HgSe	-1.64	-57.34	-55.69	HgSe
HgSeO3	-11.58	-24.01	-12.43	HgSeO3
HgSO4	-16.54	-25.96	-9.42	HgSO4
Huntite	-0.95	-30.92	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-3.76	-22.53	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.75	-21.52	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.44	-19.61	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	6.91	-7.89	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-38.41	-55.66	-17.24	K2Cr2O7
K2CrO4	-23.05	-23.56	-0.51	K2CrO4
K2MoO4	-12.80	-9.54	3.26	K2MoO4
K2SeO4	-13.58	-14.31	-0.73	K2SeO4
Langite	-1.65	15.84	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.36	-5.79	-0.43	PbO : PbSO4
Laurionite	-4.69	-4.07	0.62	PbOHCl
Lepidocrocite	4.28	5.65	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.32	4.38	12.69	PbO
Mackinawite	-75.88	-79.48	-3.60	FeS
Maghemite	4.91	11.30	6.39	Fe2O3
Magnesioferrite	4.40	21.26	16.86	Fe2MgO4
Magnesite	-0.41	-7.87	-7.46	MgCO3
Magnetite	13.54	16.94	3.40	Fe3O4
Malachite	2.67	-2.63	-5.31	Cu2 (OH) 2CO3
Manganite	-4.56	20.78	25.34	MnOOH
Massicot	-8.52	4.38	12.89	PbO
Matlockite	-3.81	-12.78	-8.97	PbClF
Melanothallite	-15.55	-9.29	6.26	CuCl2
Melanterite	-6.71	-8.92	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.45	-96.54	-45.09	HgS
Mg (OH) 2 (active)	-8.83	9.96	18.79	Mg (OH) 2
Mg (VO3) 2	-11.11	0.17	11.28	Mg (VO3) 2
Mg2Sb3	-278.79	-204.10	74.68	Mg2Sb3
Mg2V2O7	-16.23	10.13	26.36	Mg2V2O7
MgCr2O4	-13.86	2.34	16.20	MgCr2O4
MgCrO4	-27.51	-22.13	5.38	MgCrO4
MgF2	0.67	-7.46	-8.13	MgF2
MgMoO4	-6.26	-8.11	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.71	-2.65	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.70	-12.90	-1.20	MgSeO4 : 6H2O
Minium	-34.33	39.20	73.52	Pb3O4
Mirabilite	-4.42	-5.54	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-6.95	-2.05	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-47.08	-52.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-155.01	-93.93	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.35	0.15	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.87	-9.16	2.72	MnCl2 : 4H2O
MnS (grn)	-77.56	-77.39	0.17	MnS
MnS (pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.06	-100.97	-2.91	MnSb
MnSe	-41.68	-38.18	3.50	MnSe
MnSeO3	-5.99	-4.86	1.13	MnSeO3
MnSeO3 : 2H2O	-5.84	-4.86	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.06	-15.11	-2.05	MnSeO4 : 5H2O

MnSO4	-9.38	-6.80	2.58	MnSO4
Monteponite	-10.15	4.96	15.10	CdO
Montroydite	-7.77	-11.41	-3.64	HgO
MoO3	-10.07	-18.07	-8.00	MoO3
Morenosite	-10.48	-12.63	-2.14	NiSO4:7H2O
MoS2	-144.14	-214.40	-70.26	MoS2
Na-Jarosite	3.56	-7.64	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-45.26	-55.16	-9.90	Na2Cr2O7
Na2CrO4	-25.99	-23.06	2.93	Na2CrO4
Na2Mo2O7	-10.52	-27.11	-16.60	Na2Mo2O7
Na2MoO4	-10.53	-9.04	1.49	Na2MoO4
Na2MoO4:2H2O	-10.27	-9.04	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.88	-3.58	10.30	Na2SeO3:5H2O
Na2SeO4	-15.09	-13.81	1.28	Na2SeO4
Na3Sb	-177.29	-82.84	94.45	Na3Sb
Na3VO4	-28.03	8.66	36.68	Na3VO4
Na4V2O7	-29.12	8.28	37.40	Na4V2O7
Nantokite	-4.46	-11.19	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-4.24	-0.38	3.86	NaVO3
Nesquehonite	-3.20	-7.87	-4.67	MgCO3:3H2O
Ni(OH)2	-10.86	1.94	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-32.98	-17.28	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-38.80	-6.80	32.00	Ni4(OH)6SO4
NiCO3	-9.02	-15.89	-6.87	NiCO3
NiMoO4	-4.99	-16.14	-11.14	NiMoO4
NiS(alpha)	-77.60	-83.20	-5.60	NiS
NiS(beta)	-72.10	-83.20	-11.10	NiS
NiS(gamma)	-70.40	-83.20	-12.80	NiS
NiSe	-26.29	-43.99	-17.70	NiSe
NiSeO3:2H2O	-13.48	-10.67	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.41	-20.93	-1.52	NiSeO4:6H2O
Nsutite	-9.05	8.46	17.50	MnO2
O2(g)	-30.97	52.12	83.09	O2
Orpiment	-231.73	-292.80	-61.07	As2S3
Otavite	-0.87	-12.87	-12.00	CdCO3
Pb(BO2)2	-10.09	-3.57	6.52	Pb(BO2)2
Pb(OH)2	-3.77	4.38	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-54.44	-63.20	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.49	0.31	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.43	8.75	26.19	Pb2O(OH)2
Pb2O3	-26.22	34.82	61.04	Pb2O3
Pb2OCO3	-8.52	-9.07	-0.56	Pb2OCO3
Pb2V2O7	0.86	-1.04	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.74	-9.94	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.80	3.34	6.14	Pb3(VO4)2
Pb3O2CO3	-15.72	-4.70	11.02	Pb3O2CO3
Pb3O2SO4	-12.10	-1.41	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.14	2.96	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.96	21.88	Pb4O3SO4
PbCrO4	-15.12	-27.72	-12.60	PbCrO4
PbF2	-5.60	-13.04	-7.44	PbF2
Pbmetal	-25.93	-21.68	4.25	Pb
PbMoO4	1.92	-13.70	-15.62	PbMoO4
PbO:0.3H2O	-8.60	4.38	12.98	PbO:0.33H2O
PbSeO4	-11.63	-18.47	-6.84	PbSeO4
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-6.16	-25.97	-19.81	PbCl2:PbCO3
Plattnerite	-19.16	30.44	49.60	PbO2
Portlandite	-12.29	10.51	22.80	Ca(OH)2
Pyrite	-120.05	-138.56	-18.51	FeS2
Pyrochroite	-7.45	7.74	15.19	Mn(OH)2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-97.12	-116.86	-19.75	AsS
Retgersite	-10.58	-12.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-5.82	-20.32	-14.50	UO2CO3

Sb(OH) 3	-11.10	-18.21	-7.11	Sb(OH) 3
Sb2O4	-13.76	-10.36	3.40	Sb2O4
Sb2O5	-23.25	-32.92	-9.67	Sb2O5
Sb2Se3	-106.44	-174.20	-67.76	Sb2Se3
Sb4O6(cubic)	-54.58	-72.84	-18.26	Sb4O6
Sb4O6(orth)	-54.94	-72.84	-17.90	Sb4O6
SbCl3	-44.12	-43.55	0.57	SbCl3
SbF3	-34.12	-44.34	-10.23	SbF3
Sbmetal	-45.61	-57.30	-11.69	Sb
SbO2	-1.67	-29.49	-27.82	SbO2
Schoepite	-8.49	-2.50	5.99	UO2(OH) 2:H2O
Semetal(am)	-12.76	-19.87	-7.11	Se
Semetal(hex)	-12.16	-19.87	-7.71	Se
Senarmontite	-24.06	-36.42	-12.37	Sb2O3
SeO2	-12.73	-12.60	0.12	SeO2
SeO3	-43.89	-22.85	21.04	SeO3
Siderite	-1.94	-12.18	-10.24	FeCO3
Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-66.78	-78.23	-11.45	ZnS
Spinel	-16.39	20.46	36.85	MgAl2O4
Stibnite	-241.36	-291.82	-50.46	Sb2S3
Sulfur	-56.93	-59.07	-2.14	S
Tenorite	-0.05	7.60	7.64	CuO
Thenardite	-5.83	-5.51	0.32	Na2SO4
Thermonatrite	-9.43	-8.80	0.64	Na2CO3:H2O
Tyuyamunite	-8.35	-4.27	4.08	Ca(UO2) 2(VO4) 2
U3O8	-26.97	-5.89	21.08	U3O8
U3Sb4	-595.98	-443.59	152.38	U3Sb4
U4O9	-48.27	-51.29	-3.02	U4O9
UF4	-24.64	-54.18	-29.54	UF4
UF4:2.5H2O	-21.47	-54.19	-32.72	UF4:2.5H2O
UO2(am)	-20.27	-19.34	0.93	UO2
UO2(NO3) 2	-42.26	-30.11	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-34.96	-30.11	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-33.51	-30.12	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-32.17	-30.12	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-8.11	-2.50	5.61	UO2(OH) 2
UO2SeO4:4H2O	-23.10	-25.35	-2.25	UO2SeO4:4H2O
UO3	-10.19	-2.49	7.70	UO3
Uraninite	-14.67	-19.34	-4.67	UO2
USb2	-224.86	-195.28	29.58	USb2
V(OH) 3	-15.96	-8.36	7.59	V(OH) 3
V2O5	-8.44	-9.80	-1.36	V2O5
V3O5	-30.98	-29.14	1.84	V3O5
V4O7	-37.35	-30.17	7.19	V4O7
V6O13	-20.66	-81.52	-60.86	V6O13
Valentinite	-27.94	-36.42	-8.48	Sb2O3
VC12	-57.16	-38.29	18.87	VC12
VC13	-57.13	-33.70	23.43	VC13
VF4	-50.80	-35.87	14.93	VF4
Vmetal	-91.48	-47.45	44.03	V
VO	-36.15	-21.39	14.76	VO
VO(OH) 2	-6.18	-1.03	5.15	VO(OH) 2
VO2Cl	-16.19	-13.35	2.84	VO2Cl
VOC1	-27.96	-16.81	11.15	VOC1
VOC12	-30.68	-17.92	12.76	VOC12
VOSO4	-19.18	-15.57	3.61	VOSO4
Witherite	-1.89	-10.46	-8.57	BaCO3
Wurtzite	-69.28	-78.23	-8.95	ZnS
Zincite	-4.43	6.91	11.33	ZnO
Zincosite	-11.57	-7.64	3.93	ZnSO4
Zn(BO2) 2	-9.33	-1.04	8.29	Zn(BO2) 2
Zn(NO3) 2:6H2O	-24.04	-20.72	3.32	Zn(NO3) 2:6H2O
Zn(OH) 2	-5.30	6.90	12.20	Zn(OH) 2
Zn(OH) 2(am)	-5.57	6.90	12.47	Zn(OH) 2
Zn(OH) 2(beta)	-4.85	6.90	11.75	Zn(OH) 2
Zn(OH) 2(epsilon)	-4.63	6.90	11.53	Zn(OH) 2
Zn(OH) 2(gamma)	-4.83	6.90	11.73	Zn(OH) 2

Zn2(OH)2SO4	-8.24	-0.74	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.83	5.36	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-16.01	-2.36	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-27.29	-8.38	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.33	13.07	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.87	17.63	38.50	Zn5(OH)8Cl2
ZnCl2	-17.04	-9.99	7.05	ZnCl2
ZnCO3·1H2O	-0.67	-10.93	-10.26	ZnCO3·1H2O
ZnF2	-9.98	-10.51	-0.53	ZnF2
Znmetal	-44.94	-19.15	25.79	Zn
ZnMoO4	-1.04	-11.17	-10.13	ZnMoO4
ZnO(active)	-4.28	6.91	11.19	ZnO
ZnS(am)	-69.17	-78.23	-9.05	ZnS
ZnSb	-87.47	-76.46	11.01	ZnSb
ZnSe	-24.62	-39.02	-14.40	ZnSe
ZnSeO4·6H2O	-14.44	-15.96	-1.52	ZnSeO4·6H2O
ZnSO4·1H2O	-7.01	-7.64	-0.64	ZnSO4·1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 58.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e==e-

log_k 0

EQUILIBRIUM_PHASES 302

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3·2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

```

Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 306
SAVE Solution 307 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 302
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 306. Solution after simulation 57.
Using pure phase assemblage 302.

```

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	0.000e+00	7.223e-05	7.223e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	5.030e-08	5.030e-08
Barite	0.00	-9.98	-9.98	0.000e+00	2.998e-05	2.998e-05
Brochantite	-0.00	15.22	15.22	0.000e+00	1.341e-04	1.341e-04

Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.012e+01	1.171e-01
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	4.572e-02	4.572e-02
Carnotite	-0.00	0.23	0.23	0.000e+00	2.082e-06	2.082e-06
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	2.415e-07	2.415e-07
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.28	-2.64	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.071e-05	1.071e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	3.686e-03	3.686e-03
Gummite	-5.05	2.63	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	9.184e-03	9.184e-03
HgSe	-1.23	-56.92	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.34	-3.21	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.99	-15.86	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.46	-15.61	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.445e-05
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	7.511e-07	7.511e-07
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.83	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.37	2.62	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2 (am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-11.10	9.98	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.99	2.63	5.61	0.000e+00	0	0.000e+00
UO3	-5.07	2.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.98	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.553e-06	5.564e-06
As	1.576e-09	1.579e-09
B	1.003e-04	1.005e-04
Ba	2.720e-08	2.725e-08
C	5.744e-04	5.756e-04
Ca	1.206e-02	1.209e-02
Cd	2.231e-08	2.236e-08
Cl	8.452e-03	8.469e-03
Co	2.964e-09	2.970e-09
Cr	1.140e-09	1.142e-09
Cu	4.981e-07	4.991e-07
F	2.258e-04	2.263e-04
Fe	1.103e-09	1.105e-09
Hg	9.624e-09	9.643e-09
K	1.501e-02	1.504e-02
Mg	1.845e-02	1.848e-02
Mn	2.228e-04	2.233e-04
Mo	7.615e-06	7.630e-06
N	2.253e-05	2.258e-05
Na	2.704e-02	2.709e-02
Ni	4.827e-10	4.837e-10
Pb	1.664e-09	1.667e-09
S	4.712e-02	4.722e-02
Sb	9.048e-08	9.066e-08
Se	7.874e-07	7.889e-07

U	6.586e-07	6.599e-07
V	4.801e-08	4.811e-08
Zn	2.602e-05	2.607e-05

-----Description of solution-----

	pH =	7.908	Charge balance
	pe =	4.864	Adjusted to redox
equilibrium	Activity of water =	0.998	
	Ionic strength (mol/kgw) =	1.229e-01	
	Mass of water (kg) =	1.002e+00	
	Total alkalinity (eq/kg) =	6.149e-04	
	Total CO2 (mol/kg) =	5.744e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.00	
	Iterations =	53	
	Total H =	1.112366e+02	
	Total O =	5.580886e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.091e-06	8.139e-07	-5.962	-6.089	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.553e-06					
Al(OH) 4-	5.508e-06	4.200e-06	-5.259	-5.377	-0.118	(0)
Al(OH) 3	4.099e-08	4.099e-08	-7.387	-7.387	0.000	(0)
Al(OH) 2+	3.253e-09	2.524e-09	-8.488	-8.598	-0.110	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
AlOH+2	1.078e-11	3.904e-12	-10.968	-11.409	-0.441	(0)
AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
Al(SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.048e-14	4.796e-15	-13.297	-14.319	-1.022	(0)
AlMo6O21-3	2.502e-39	0.000e+00	-38.602	-40.211	-1.609	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.003e-24	6.645e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.547e-28	4.908e-29	-27.594	-28.309	-0.715	(0)
H4AsO3+	1.477e-31	9.787e-32	-30.831	-31.009	-0.179	(0)
AsO3-3	6.230e-33	1.532e-34	-32.206	-33.815	-1.609	(0)
As (5)	1.576e-09					
HAsO4-2	1.523e-09	2.935e-10	-8.817	-9.532	-0.715	(0)
H2AsO4-	4.989e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.056e-12	7.516e-14	-11.515	-13.124	-1.609	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.003e-04					
H3BO3	9.242e-05	9.508e-05	-4.034	-4.022	0.012	(0)
H2BO3-	6.156e-06	4.472e-06	-5.211	-5.350	-0.139	(0)
MgH2BO3+	8.086e-07	5.874e-07	-6.092	-6.231	-0.139	(0)
CaH2BO3+	7.949e-07	5.774e-07	-6.100	-6.239	-0.139	(0)
NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
BF(OH) 3-	6.200e-09	4.504e-09	-8.208	-8.346	-0.139	(0)
H5(BO3) 2-	4.982e-10	3.619e-10	-9.303	-9.441	-0.139	(0)
H8(BO3) 3-	4.737e-12	3.441e-12	-11.325	-11.463	-0.139	(0)
BaH2BO3+	1.814e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
BF2(OH) 2-	9.735e-13	7.071e-13	-12.012	-12.151	-0.139	(0)
BF3OH-	5.562e-19	4.040e-19	-18.255	-18.394	-0.139	(0)
BF4-	4.019e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
Ba	2.720e-08					
Ba+2	2.714e-08	9.535e-09	-7.566	-8.021	-0.454	(0)

BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.814e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
BaOH+	4.399e-14	3.388e-14	-13.357	-13.470	-0.113	(0)
BaNO3+	1.114e-15	7.377e-16	-14.953	-15.132	-0.179	(0)
BaNH3+2	2.679e-16	5.162e-17	-15.572	-16.287	-0.715	(0)
C (4)	5.744e-04					
HCO3-	5.010e-04	3.887e-04	-3.300	-3.410	-0.110	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
MgHCO3+	1.997e-05	1.507e-05	-4.700	-4.822	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
CO3-2	4.201e-06	1.476e-06	-5.377	-5.831	-0.454	(0)
NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
UO2 (CO3) 3-4	6.002e-07	8.270e-10	-6.222	-9.082	-2.861	(0)
ZnCO3	3.287e-07	3.287e-07	-6.483	-6.483	0.000	(0)
MnHCO3+	3.129e-07	2.409e-07	-6.505	-6.618	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
ZnHCO3+	7.181e-08	4.758e-08	-7.144	-7.323	-0.179	(0)
UO2 (CO3) 2-2	5.804e-08	1.118e-08	-7.236	-7.951	-0.715	(0)
Cu (CO3) 2-2	4.866e-09	9.375e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
PbCO3	3.978e-10	3.978e-10	-9.400	-9.400	0.000	(0)
UO2CO3	3.798e-10	3.798e-10	-9.420	-9.420	0.000	(0)
CdCO3	8.909e-11	8.909e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.909e-11	2.590e-11	-10.408	-10.587	-0.179	(0)
CoHCO3+	1.799e-11	1.192e-11	-10.745	-10.924	-0.179	(0)
CoCO3	9.837e-12	9.837e-12	-11.007	-11.007	0.000	(0)
Pb (CO3) 2-2	8.788e-12	1.693e-12	-11.056	-11.771	-0.715	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
NiHCO3+	6.694e-12	4.435e-12	-11.174	-11.353	-0.179	(0)
NiCO3	5.096e-12	5.096e-12	-11.293	-11.293	0.000	(0)
CdHCO3+	3.537e-12	2.344e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.058e-13	9.745e-14	-12.296	-13.011	-0.715	(0)
HgCO3	9.757e-15	9.757e-15	-14.011	-14.011	0.000	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
Hg (CO3) 2-2	2.363e-16	4.553e-17	-15.626	-16.342	-0.715	(0)
HgHCO3+	3.386e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
Ca	1.206e-02					
Ca+2	6.388e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	3.775e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
CaH2BO3+	7.949e-07	5.774e-07	-6.100	-6.239	-0.139	(0)
CaOH+	4.649e-08	3.644e-08	-7.333	-7.438	-0.106	(0)
CaNO3+	1.653e-10	1.095e-10	-9.782	-9.960	-0.179	(0)
CaNH3+2	1.258e-10	2.424e-11	-9.900	-10.615	-0.715	(0)
Ca (NH3) 2+2	4.298e-19	8.280e-20	-18.367	-19.082	-0.715	(0)
Cd	2.231e-08					
Cd+2	7.539e-09	2.649e-09	-8.123	-8.577	-0.454	(0)
CdSO4	6.818e-09	6.818e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.243e-09	1.010e-09	-8.280	-8.996	-0.715	(0)
CdCl+	2.484e-09	1.646e-09	-8.605	-8.784	-0.179	(0)
CdCO3	8.909e-11	8.909e-11	-10.050	-10.050	0.000	(0)
CdOHCl	5.495e-11	5.495e-11	-10.260	-10.260	0.000	(0)
CdCl2	4.464e-11	4.464e-11	-10.350	-10.350	0.000	(0)
CdOH+	2.585e-11	1.712e-11	-10.588	-10.766	-0.179	(0)
CdF+	7.522e-12	4.983e-12	-11.124	-11.302	-0.179	(0)
CdHCO3+	3.537e-12	2.344e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.058e-13	9.745e-14	-12.296	-13.011	-0.715	(0)
CdCl3-	2.766e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
Cd (OH) 2	8.794e-14	8.794e-14	-13.056	-13.056	0.000	(0)
CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
CdNO3+	1.952e-16	1.293e-16	-15.710	-15.888	-0.179	(0)

	CdSeO4	1.702e-16	1.702e-16	-15.769	-15.769	0.000	(0)
	Cd (SeO3) 2-2	7.189e-17	1.385e-17	-16.143	-16.859	-0.715	(0)
	Cd2OH+3	9.242e-18	2.273e-19	-17.034	-18.643	-1.609	(0)
	Cd (OH) 3-	6.600e-18	4.373e-18	-17.180	-17.359	-0.179	(0)
	Cd (OH) 4-2	3.024e-24	5.825e-25	-23.519	-24.235	-0.715	(0)
	Cd (NO3) 2	1.000e-24	1.000e-24	-24.000	-24.000	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.777	-78.956	-0.179	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Cl	8.452e-03						
	Cl-	8.452e-03	6.507e-03	-2.073	-2.187	-0.114	(0)
	MnCl+	3.305e-07	2.545e-07	-6.481	-6.594	-0.113	(0)
	ZnCl+	8.386e-08	6.327e-08	-7.076	-7.199	-0.122	(0)
	ZnOHCl	6.741e-08	6.741e-08	-7.171	-7.171	0.000	(0)
	CuCl2-	2.684e-09	2.025e-09	-8.571	-8.694	-0.122	(0)
	CdCl+	2.484e-09	1.646e-09	-8.605	-8.784	-0.179	(0)
	MnCl2	2.339e-09	2.339e-09	-8.631	-8.631	0.000	(0)
	CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
	ZnCl2	6.524e-10	6.524e-10	-9.185	-9.185	0.000	(0)
	CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
	CdOHCl	5.495e-11	5.495e-11	-10.260	-10.260	0.000	(0)
	HgClOH	5.167e-11	5.167e-11	-10.287	-10.287	0.000	(0)
	CdCl2	4.464e-11	4.464e-11	-10.350	-10.350	0.000	(0)
	PbCl+	3.125e-11	2.070e-11	-10.505	-10.684	-0.179	(0)
	HgCl2	2.339e-11	2.339e-11	-10.631	-10.631	0.000	(0)
	CoCl+	1.340e-11	8.876e-12	-10.873	-11.052	-0.179	(0)
	CuCl3-2	8.009e-12	2.816e-12	-11.096	-11.550	-0.454	(0)
	MnCl3-	5.443e-12	4.192e-12	-11.264	-11.378	-0.113	(0)
	ZnCl3-	4.470e-12	3.372e-12	-11.350	-11.472	-0.122	(0)
	NiCl+	2.326e-12	1.541e-12	-11.633	-11.812	-0.179	(0)
	HgCl3-	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
	CuCl2	6.320e-13	6.320e-13	-12.199	-12.199	0.000	(0)
	PbCl2	6.018e-13	6.018e-13	-12.221	-12.221	0.000	(0)
	CdCl3-	2.766e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
	HgCl4-2	2.046e-13	3.943e-14	-12.689	-13.404	-0.715	(0)
	ZnCl4-2	3.120e-14	1.097e-14	-13.506	-13.960	-0.454	(0)
	PbCl3-	2.353e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
	HgCl+	1.083e-15	7.173e-16	-14.966	-15.144	-0.179	(0)
	UO2Cl+	1.030e-15	6.821e-16	-14.987	-15.166	-0.179	(0)
	CuCl3-	5.087e-17	3.838e-17	-16.294	-16.416	-0.122	(0)
	NiCl2	5.048e-17	5.048e-17	-16.297	-16.297	0.000	(0)
	PbCl4-2	2.406e-17	4.636e-18	-16.619	-17.334	-0.715	(0)
	CrCl+2	1.467e-17	2.826e-18	-16.834	-17.549	-0.715	(0)
	CrOHCl2	2.844e-19	2.844e-19	-18.546	-18.546	0.000	(0)
	CuCl4-2	3.559e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
	CrCl2+	2.633e-21	1.745e-21	-20.580	-20.758	-0.179	(0)
	FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
	VOCl+	2.629e-22	1.742e-22	-21.580	-21.759	-0.179	(0)
	FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
	CrO3Cl-	8.371e-26	5.546e-26	-25.077	-25.256	-0.179	(0)
	FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
	CoCl+2	7.893e-37	1.521e-37	-36.103	-36.818	-0.715	(0)
	UCl+3	0.000e+00	0.000e+00	-44.212	-45.821	-1.609	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.482	-51.197	-0.715	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.243	-51.958	-0.715	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.979	-0.715	(0)
Co (2)	2.964e-09						
	Co+2	2.047e-09	3.943e-10	-8.689	-9.404	-0.715	(0)
	CoSO4	8.640e-10	8.640e-10	-9.063	-9.063	0.000	(0)
	CoHCO3+	1.799e-11	1.192e-11	-10.745	-10.924	-0.179	(0)
	CoCl+	1.340e-11	8.876e-12	-10.873	-11.052	-0.179	(0)
	CoCO3	9.837e-12	9.837e-12	-11.007	-11.007	0.000	(0)
	CoOH+	9.665e-12	6.404e-12	-11.015	-11.194	-0.179	(0)
	CoF+	2.234e-12	1.480e-12	-11.651	-11.830	-0.179	(0)
	Co (OH) 2	4.140e-13	4.140e-13	-12.383	-12.383	0.000	(0)
	CoNO2+	6.863e-14	4.547e-14	-13.163	-13.342	-0.179	(0)
	Co (NH3) +2	2.111e-15	4.068e-16	-14.675	-15.391	-0.715	(0)

CoSeO4	6.820e-17	6.820e-17	-16.166	-16.166	0.000	(0)
CoNO3+	1.456e-17	9.648e-18	-16.837	-17.016	-0.179	(0)
Co (OH) 3-	1.015e-17	6.723e-18	-16.994	-17.172	-0.179	(0)
CoOOH-	2.551e-18	1.690e-18	-17.593	-17.772	-0.179	(0)
Co2OH+3	5.146e-21	1.266e-22	-20.289	-21.898	-1.609	(0)
Co (NH3) 2+2	7.728e-22	1.489e-22	-21.112	-21.827	-0.715	(0)
Co (OH) 4-2	4.501e-24	8.673e-25	-23.347	-24.062	-0.715	(0)
Co (NO3) 2	3.030e-25	3.030e-25	-24.519	-24.519	0.000	(0)
Co (NH3) 3+2	8.348e-29	1.608e-29	-28.078	-28.794	-0.715	(0)
Co4 (OH) 4+4	2.435e-34	3.355e-37	-33.614	-36.474	-2.861	(0)
Co (NH3) 4+2	3.759e-36	7.243e-37	-35.425	-36.140	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.271	-43.987	-0.715	(0)
Co (3)	2.466e-30					
CoOH+2	2.466e-30	4.751e-31	-29.608	-30.323	-0.715	(0)
Co+3	1.209e-36	1.149e-37	-35.918	-36.940	-1.022	(0)
CoCl+2	7.893e-37	1.521e-37	-36.103	-36.818	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.482	-51.197	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.648	-60.827	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.967	-65.682	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.979	-0.715	(0)
Cr (2)	5.686e-27					
Cr+2	5.686e-27	1.095e-27	-26.245	-26.960	-0.715	(0)
Cr (3)	1.140e-09					
Cr (OH) 2+	8.931e-10	5.917e-10	-9.049	-9.228	-0.179	(0)
Cr (OH) 3	1.809e-10	1.809e-10	-9.743	-9.743	0.000	(0)
Cr (OH) +2	3.101e-11	5.975e-12	-10.508	-11.224	-0.715	(0)
CrOHSO4	1.557e-11	1.557e-11	-10.808	-10.808	0.000	(0)
CrO2-	1.052e-11	6.972e-12	-10.978	-11.157	-0.179	(0)
Cr (OH) 4-	8.848e-12	5.862e-12	-11.053	-11.232	-0.179	(0)
CrF+2	3.277e-14	6.313e-15	-13.485	-14.200	-0.715	(0)
Cr+3	1.364e-14	3.355e-16	-13.865	-15.474	-1.609	(0)
CrSO4+	1.299e-14	8.604e-15	-13.886	-14.065	-0.179	(0)
CrCl+2	1.467e-17	2.826e-18	-16.834	-17.549	-0.715	(0)
CrOHCl2	2.844e-19	2.844e-19	-18.546	-18.546	0.000	(0)
Cr2 (OH) 2SO4+2	4.364e-20	8.409e-21	-19.360	-20.075	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	5.485e-21	5.485e-21	-20.261	-20.261	0.000	(0)
CrCl2+	2.633e-21	1.745e-21	-20.580	-20.758	-0.179	(0)
CrNO3+2	1.175e-24	2.264e-25	-23.930	-24.645	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.809	-41.524	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.264	-50.873	-1.609	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.243	-51.958	-0.715	(0)
Cr (6)	8.539e-15					
CrO4-2	7.804e-15	2.742e-15	-14.108	-14.562	-0.454	(0)
NaCrO4-	4.043e-16	2.679e-16	-15.393	-15.572	-0.179	(0)
HCrO4-	1.653e-16	1.095e-16	-15.782	-15.960	-0.179	(0)
KCrO4-	1.649e-16	1.093e-16	-15.783	-15.962	-0.179	(0)
CrO3SO4-2	2.353e-23	4.533e-24	-22.628	-23.344	-0.715	(0)
H2CrO4	1.096e-24	1.096e-24	-23.960	-23.960	0.000	(0)
CrO3Cl-	8.371e-26	5.546e-26	-25.077	-25.256	-0.179	(0)
Cr2O7-2	2.164e-30	4.168e-31	-29.665	-30.380	-0.715	(0)
Cu (1)	4.455e-09					
CuCl2-	2.684e-09	2.025e-09	-8.571	-8.694	-0.122	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	8.009e-12	2.816e-12	-11.096	-11.550	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu (2)	4.936e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.267e-08	6.991e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.732e-08	2.716e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.866e-09	9.375e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)

	CuNO2+	7.025e-11	4.654e-11	-10.153	-10.332	-0.179	(0)
	Cu (OH) 3-	2.861e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
	CuNH3+2	1.238e-11	2.385e-12	-10.907	-11.623	-0.715	(0)
	CuCl2	6.320e-13	6.320e-13	-12.199	-12.199	0.000	(0)
	Cu (NO2) 2	7.793e-15	7.793e-15	-14.108	-14.108	0.000	(0)
	CuNO3+	2.001e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
	Cu (OH) 4-2	6.302e-16	1.214e-16	-15.201	-15.916	-0.715	(0)
	CuCl3-	5.087e-17	3.838e-17	-16.294	-16.416	-0.122	(0)
	CuCl4-2	3.559e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
	Cu (NO3) 2	2.577e-24	2.577e-24	-23.589	-23.589	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F		2.258e-04					
	F-	1.542e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
	MgF+	6.617e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
	CaF+	3.775e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
	NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
	MnF+	1.907e-07	1.468e-07	-6.720	-6.833	-0.113	(0)
	ZnF+	1.384e-08	9.169e-09	-7.859	-8.038	-0.179	(0)
	BF (OH) 3-	6.200e-09	4.504e-09	-8.208	-8.346	-0.139	(0)
	HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
	AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
	AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
	CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)
	AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
	CdF+	7.522e-12	4.983e-12	-11.124	-11.302	-0.179	(0)
	CoF+	2.234e-12	1.480e-12	-11.651	-11.830	-0.179	(0)
	UO2F+	1.599e-12	1.059e-12	-11.796	-11.975	-0.179	(0)
	HF2-	1.312e-12	9.785e-13	-11.882	-12.009	-0.127	(0)
	PbF+	1.132e-12	7.503e-13	-11.946	-12.125	-0.179	(0)
	BF2 (OH) 2-	9.735e-13	7.071e-13	-12.012	-12.151	-0.139	(0)
	NiF+	4.166e-13	2.760e-13	-12.380	-12.559	-0.179	(0)
	UO2F2	3.627e-13	3.627e-13	-12.440	-12.440	0.000	(0)
	CrF+2	3.277e-14	6.313e-15	-13.485	-14.200	-0.715	(0)
	UO2F3-	1.632e-14	1.081e-14	-13.787	-13.966	-0.179	(0)
	PbF2	1.753e-15	1.753e-15	-14.756	-14.756	0.000	(0)
	CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
	UO2F4-2	5.293e-17	1.020e-17	-16.276	-16.991	-0.715	(0)
	H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
	VO2F	1.190e-17	1.190e-17	-16.924	-16.924	0.000	(0)
	FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
	FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
	VO2F2-	7.741e-19	5.129e-19	-18.111	-18.290	-0.179	(0)
	PbF3-	5.957e-19	3.946e-19	-18.225	-18.404	-0.179	(0)
	BF3OH-	5.562e-19	4.040e-19	-18.255	-18.394	-0.139	(0)
	FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
	VOF+	1.026e-20	6.795e-21	-19.989	-20.168	-0.179	(0)
	VO2F3-2	3.942e-21	7.595e-22	-20.404	-21.119	-0.715	(0)
	VOF2	3.025e-22	3.025e-22	-21.519	-21.519	0.000	(0)
	PbF4-2	1.164e-22	2.242e-23	-21.934	-22.649	-0.715	(0)
	HgF+	3.670e-23	2.431e-23	-22.435	-22.614	-0.179	(0)
	BF4-	4.019e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
	VOF3-	1.923e-24	1.274e-24	-23.716	-23.895	-0.179	(0)
	VO2F4-3	1.804e-24	4.436e-26	-23.744	-25.353	-1.609	(0)
	Sb (OH) 2F	1.154e-25	1.154e-25	-24.938	-24.938	0.000	(0)
	SbOF	1.137e-25	1.137e-25	-24.944	-24.944	0.000	(0)
	VOF4-2	3.169e-27	6.105e-28	-26.499	-27.214	-0.715	(0)
	UF3+	4.657e-36	3.085e-36	-35.332	-35.511	-0.179	(0)
	UF2+2	8.512e-37	1.640e-37	-36.070	-36.785	-0.715	(0)
	UF4	4.016e-38	4.016e-38	-37.396	-37.396	0.000	(0)
	UF+3	4.462e-39	1.097e-40	-38.351	-39.960	-1.609	(0)
	UF5-	2.852e-40	1.889e-40	-39.545	-39.724	-0.179	(0)
	UF6-2	0.000e+00	0.000e+00	-40.454	-41.169	-0.715	(0)
Fe (2)		3.431e-12					
	Fe+2	2.244e-12	4.324e-13	-11.649	-12.364	-0.715	(0)
	FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
	FeOH+	1.820e-14	1.401e-14	-13.740	-13.854	-0.113	(0)
	FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)

	Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	3.028e-18	2.332e-18	-17.519	-17.632	-0.113	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09						
	Fe (OH) 2+	6.305e-10	4.891e-10	-9.200	-9.311	-0.110	(0)
	Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
	Fe (OH) 4-	4.177e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
	FeOH+2	4.392e-15	1.545e-15	-14.357	-14.811	-0.454	(0)
	FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
	FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
	FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
	FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
	Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
	Fe+3	3.094e-20	2.939e-21	-19.509	-20.532	-1.022	(0)
	FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
	FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
	FeHSeO3+2	9.960e-24	1.919e-24	-23.002	-23.717	-0.715	(0)
	Fe2 (OH) 2+4	5.734e-26	7.901e-29	-25.242	-28.102	-2.861	(0)
	FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
	FeNO3+2	2.355e-27	4.538e-28	-26.628	-27.343	-0.715	(0)
	Fe3 (OH) 4+5	1.648e-32	5.586e-37	-31.783	-36.253	-4.470	(0)
H (0)	3.919e-29						
	H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.524e-09						
	Hg	9.524e-09	9.524e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.708e-19						
	Hg2+2	1.854e-19	3.572e-20	-18.732	-19.447	-0.715	(0)
Hg (2)	1.000e-10						
	HgClOH	5.167e-11	5.167e-11	-10.287	-10.287	0.000	(0)
	HgCl2	2.339e-11	2.339e-11	-10.631	-10.631	0.000	(0)
	Hg (OH) 2	2.245e-11	2.309e-11	-10.649	-10.637	0.012	(0)
	HgCl3-	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
	HgCl4-2	2.046e-13	3.943e-14	-12.689	-13.404	-0.715	(0)
	HgCO3	9.757e-15	9.757e-15	-14.011	-14.011	0.000	(0)
	HgCl+	1.083e-15	7.173e-16	-14.966	-15.144	-0.179	(0)
	HgOH+	2.702e-16	1.790e-16	-15.568	-15.747	-0.179	(0)
	Hg (CO3) 2-2	2.363e-16	4.553e-17	-15.626	-16.342	-0.715	(0)
	Hg (OH) 3-	3.572e-18	2.366e-18	-17.447	-17.626	-0.179	(0)
	HgHCO3+	3.386e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
	Hg (NH3) 2+2	1.332e-18	2.567e-19	-17.875	-18.591	-0.715	(0)
	HgNH3+2	1.553e-19	2.991e-20	-18.809	-19.524	-0.715	(0)
	Hg+2	2.868e-20	5.525e-21	-19.542	-20.258	-0.715	(0)
	HgSO4	1.589e-20	1.589e-20	-19.799	-19.799	0.000	(0)
	HgF+	3.670e-23	2.431e-23	-22.435	-22.614	-0.179	(0)
	Hg (NH3) 3+2	4.551e-26	8.768e-27	-25.342	-26.057	-0.715	(0)
	HgNO3+	4.753e-29	3.149e-29	-28.323	-28.502	-0.179	(0)
	Hg (NH3) 4+2	3.102e-33	5.976e-34	-32.508	-33.224	-0.715	(0)
	Hg (NO3) 2	2.021e-37	2.021e-37	-36.695	-36.695	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.016	-137.194	-0.179	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K	1.501e-02						
	K+	1.393e-02	1.073e-02	-1.856	-1.970	-0.114	(0)
	KSO4-	1.075e-03	8.340e-04	-2.969	-3.079	-0.110	(0)
	KCrO4-	1.649e-16	1.093e-16	-15.783	-15.962	-0.179	(0)
Mg	1.845e-02						
	Mg+2	1.078e-02	3.788e-03	-1.967	-2.422	-0.454	(0)
	MgSO4	7.570e-03	7.570e-03	-2.121	-2.121	0.000	(0)
	MgF+	6.617e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
	MgHCO3+	1.997e-05	1.507e-05	-4.700	-4.822	-0.122	(0)
	MgCO3	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
	MgOH+	1.553e-06	1.227e-06	-5.809	-5.911	-0.102	(0)
	MgH2BO3+	8.086e-07	5.874e-07	-6.092	-6.231	-0.139	(0)
Mn (2)	2.228e-04						
	Mn+2	1.613e-04	3.107e-05	-3.792	-4.508	-0.715	(0)
	MnSO4	6.067e-05	6.067e-05	-4.217	-4.217	0.000	(0)
	MnCl+	3.305e-07	2.545e-07	-6.481	-6.594	-0.113	(0)

MnHCO3+	3.129e-07	2.409e-07	-6.505	-6.618	-0.113	(0)
MnF+	1.907e-07	1.468e-07	-6.720	-6.833	-0.113	(0)
MnOH+	8.248e-08	6.352e-08	-7.084	-7.197	-0.113	(0)
MnCl2	2.339e-09	2.339e-09	-8.631	-8.631	0.000	(0)
MnCl3-	5.443e-12	4.192e-12	-11.264	-11.378	-0.113	(0)
MnSeO4	2.886e-12	2.886e-12	-11.540	-11.540	0.000	(0)
MnNO3+	1.147e-12	7.601e-13	-11.940	-12.119	-0.179	(0)
Mn (OH) 3-	3.377e-16	2.600e-16	-15.471	-15.585	-0.113	(0)
Mn (NO3) 2	2.948e-20	2.948e-20	-19.531	-19.531	0.000	(0)
Mn (OH) 4-2	1.943e-21	6.833e-22	-20.712	-21.165	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
Mn (3)	1.069e-24					
Mn+3	1.069e-24	1.015e-25	-23.971	-24.993	-1.022	(0)
Mn (6)	1.760e-40					
MnO4-2	1.760e-40	0.000e+00	-39.754	-40.208	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.583	-44.716	-0.133	(0)
Mo	7.615e-06					
MoO4-2	7.614e-06	2.675e-06	-5.118	-5.573	-0.454	(0)
HMoO4-	9.919e-10	6.572e-10	-9.004	-9.182	-0.179	(0)
H2MoO4	5.944e-14	5.944e-14	-13.226	-13.226	0.000	(0)
AlMo6O21-3	2.502e-39	0.000e+00	-38.602	-40.211	-1.609	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.846	-49.283	-6.437	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.335	-50.805	-4.470	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.070	-53.931	-2.861	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.984	-58.593	-1.609	(0)
N (-3)	2.929e-07					
NH4+	2.558e-07	1.858e-07	-6.592	-6.731	-0.139	(0)
NH4SO4-	2.839e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
NH3	8.581e-09	8.581e-09	-8.066	-8.066	0.000	(0)
CaNH3+2	1.258e-10	2.424e-11	-9.900	-10.615	-0.715	(0)
CuNH3+2	1.238e-11	2.385e-12	-10.907	-11.623	-0.715	(0)
NiNH3+2	2.214e-15	4.265e-16	-14.655	-15.370	-0.715	(0)
Co (NH3) +2	2.111e-15	4.068e-16	-14.675	-15.391	-0.715	(0)
BaNH3+2	2.679e-16	5.162e-17	-15.572	-16.287	-0.715	(0)
Hg (NH3) 2+2	1.332e-18	2.567e-19	-17.875	-18.591	-0.715	(0)
Ca (NH3) 2+2	4.298e-19	8.280e-20	-18.367	-19.082	-0.715	(0)
HgNH3+2	1.553e-19	2.991e-20	-18.809	-19.524	-0.715	(0)
Ni (NH3) 2+2	2.746e-21	5.290e-22	-20.561	-21.277	-0.715	(0)
Co (NH3) 2+2	7.728e-22	1.489e-22	-21.112	-21.827	-0.715	(0)
Hg (NH3) 3+2	4.551e-26	8.768e-27	-25.342	-26.057	-0.715	(0)
Co (NH3) 3+2	8.348e-29	1.608e-29	-28.078	-28.794	-0.715	(0)
Hg (NH3) 4+2	3.102e-33	5.976e-34	-32.508	-33.224	-0.715	(0)
Co (NH3) 4+2	3.759e-36	7.243e-37	-35.425	-36.140	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.809	-41.524	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.271	-43.987	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.264	-50.873	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.482	-51.197	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.243	-51.958	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.648	-60.827	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.967	-65.682	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.979	-0.715	(0)
N (3)	2.222e-05					
NO2-	2.222e-05	1.636e-05	-4.653	-4.786	-0.133	(0)
CuNO2+	7.025e-11	4.654e-11	-10.153	-10.332	-0.179	(0)
CoNO2+	6.863e-14	4.547e-14	-13.163	-13.342	-0.179	(0)
Cu (NO2) 2	7.793e-15	7.793e-15	-14.108	-14.108	0.000	(0)
N (5)	2.022e-08					
NO3-	2.005e-08	1.544e-08	-7.698	-7.811	-0.114	(0)
CaNO3+	1.653e-10	1.095e-10	-9.782	-9.960	-0.179	(0)
MnNO3+	1.147e-12	7.601e-13	-11.940	-12.119	-0.179	(0)
ZnNO3+	2.266e-13	1.501e-13	-12.645	-12.824	-0.179	(0)
CuNO3+	2.001e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
BaNO3+	1.114e-15	7.377e-16	-14.953	-15.132	-0.179	(0)
CdNO3+	1.952e-16	1.293e-16	-15.710	-15.888	-0.179	(0)
PbNO3+	3.091e-17	2.048e-17	-16.510	-16.689	-0.179	(0)
CoNO3+	1.456e-17	9.648e-18	-16.837	-17.016	-0.179	(0)
NiNO3+	5.417e-18	3.589e-18	-17.266	-17.445	-0.179	(0)

Mn (NO3) 2	2.948e-20	2.948e-20	-19.531	-19.531	0.000	(0)
UO2NO3+	3.005e-21	1.991e-21	-20.522	-20.701	-0.179	(0)
Zn (NO3) 2	4.623e-22	4.623e-22	-21.335	-21.335	0.000	(0)
Cu (NO3) 2	2.577e-24	2.577e-24	-23.589	-23.589	0.000	(0)
CrNO3+2	1.175e-24	2.264e-25	-23.930	-24.645	-0.715	(0)
Cd (NO3) 2	1.000e-24	1.000e-24	-24.000	-24.000	0.000	(0)
Pb (NO3) 2	5.369e-25	5.369e-25	-24.270	-24.270	0.000	(0)
VO2NO3	4.463e-25	4.463e-25	-24.350	-24.350	0.000	(0)
Co (NO3) 2	3.030e-25	3.030e-25	-24.519	-24.519	0.000	(0)
FeNO3+2	2.355e-27	4.538e-28	-26.628	-27.343	-0.715	(0)
HgNO3+	4.753e-29	3.149e-29	-28.323	-28.502	-0.179	(0)
Hg (NO3) 2	2.021e-37	2.021e-37	-36.695	-36.695	0.000	(0)
Na	2.704e-02					
Na+	2.554e-02	1.966e-02	-1.593	-1.706	-0.114	(0)
NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)
NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
NaCrO4-	4.043e-16	2.679e-16	-15.393	-15.572	-0.179	(0)
Ni	4.827e-10					
Ni+2	2.635e-10	9.256e-11	-9.579	-10.034	-0.454	(0)
NiSO4	2.028e-10	2.028e-10	-9.693	-9.693	0.000	(0)
NiHCO3+	6.694e-12	4.435e-12	-11.174	-11.353	-0.179	(0)
NiCO3	5.096e-12	5.096e-12	-11.293	-11.293	0.000	(0)
NiCl+	2.326e-12	1.541e-12	-11.633	-11.812	-0.179	(0)
NiOH+	1.432e-12	9.484e-13	-11.844	-12.023	-0.179	(0)
NiF+	4.166e-13	2.760e-13	-12.380	-12.559	-0.179	(0)
Ni (SO4) 2-2	3.828e-13	7.375e-14	-12.417	-13.132	-0.715	(0)
Ni (OH) 2	6.132e-14	6.132e-14	-13.212	-13.212	0.000	(0)
NiNH3+2	2.214e-15	4.265e-16	-14.655	-15.370	-0.715	(0)
Ni (OH) 3-	7.533e-17	4.991e-17	-16.123	-16.302	-0.179	(0)
NiCl2	5.048e-17	5.048e-17	-16.297	-16.297	0.000	(0)
NiSeO4	1.494e-17	1.494e-17	-16.826	-16.826	0.000	(0)
NiNO3+	5.417e-18	3.589e-18	-17.266	-17.445	-0.179	(0)
Ni (NH3) 2+2	2.746e-21	5.290e-22	-20.561	-21.277	-0.715	(0)
O (0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.664e-09					
PbSO4	4.824e-10	4.824e-10	-9.317	-9.317	0.000	(0)
PbCO3	3.978e-10	3.978e-10	-9.400	-9.400	0.000	(0)
PbOH+	2.767e-10	1.834e-10	-9.558	-9.737	-0.179	(0)
Pb+2	2.553e-10	8.968e-11	-9.593	-10.047	-0.454	(0)
Pb (SO4) 2-2	1.657e-10	3.192e-11	-9.781	-10.496	-0.715	(0)
PbHCO3+	3.909e-11	2.590e-11	-10.408	-10.587	-0.179	(0)
PbCl+	3.125e-11	2.070e-11	-10.505	-10.684	-0.179	(0)
Pb (CO3) 2-2	8.788e-12	1.693e-12	-11.056	-11.771	-0.715	(0)
Pb (OH) 2	4.719e-12	4.719e-12	-11.326	-11.326	0.000	(0)
PbF+	1.132e-12	7.503e-13	-11.946	-12.125	-0.179	(0)
PbCl2	6.018e-13	6.018e-13	-12.221	-12.221	0.000	(0)
Pb (OH) 3-	5.798e-15	3.841e-15	-14.237	-14.416	-0.179	(0)
PbCl3-	2.353e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
PbF2	1.753e-15	1.753e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.091e-17	2.048e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.406e-17	4.636e-18	-16.619	-17.334	-0.715	(0)
Pb2OH+3	1.060e-17	2.606e-19	-16.975	-18.584	-1.609	(0)
Pb (OH) 4-2	3.974e-18	7.656e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.957e-19	3.946e-19	-18.225	-18.404	-0.179	(0)
Pb3 (OH) 4+2	2.068e-22	3.985e-23	-21.684	-22.400	-0.715	(0)
PbF4-2	1.164e-22	2.242e-23	-21.934	-22.649	-0.715	(0)
Pb (NO3) 2	5.369e-25	5.369e-25	-24.270	-24.270	0.000	(0)
Pb4 (OH) 4+4	2.060e-26	2.839e-29	-25.686	-28.547	-2.861	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.777	-78.956	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)

H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.016	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.288	-147.467	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.293	-224.472	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.603	-304.318	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.851	-318.567	-0.715	(0)
S (6)	4.712e-02					
SO4-2	3.126e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.570e-03	7.570e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)
KSO4-	1.075e-03	8.340e-04	-2.969	-3.079	-0.110	(0)
MnSO4	6.067e-05	6.067e-05	-4.217	-4.217	0.000	(0)
ZnSO4	9.300e-06	9.300e-06	-5.032	-5.032	0.000	(0)
Zn (SO4) 2-2	4.617e-06	8.895e-07	-5.336	-6.051	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.839e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.818e-09	6.818e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.243e-09	1.010e-09	-8.280	-8.996	-0.715	(0)
CoSO4	8.640e-10	8.640e-10	-9.063	-9.063	0.000	(0)
PbSO4	4.824e-10	4.824e-10	-9.317	-9.317	0.000	(0)
NiSO4	2.028e-10	2.028e-10	-9.693	-9.693	0.000	(0)
Pb (SO4) 2-2	1.657e-10	3.192e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	1.557e-11	1.557e-11	-10.808	-10.808	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2SO4	1.074e-12	1.074e-12	-11.969	-11.969	0.000	(0)
UO2 (SO4) 2-2	8.073e-13	1.555e-13	-12.093	-12.808	-0.715	(0)
AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.828e-13	7.375e-14	-12.417	-13.132	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	1.299e-14	8.604e-15	-13.886	-14.065	-0.179	(0)
VO2SO4-	2.262e-17	1.499e-17	-16.646	-16.824	-0.179	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
Cr2 (OH) 2SO4+2	4.364e-20	8.409e-21	-19.360	-20.075	-0.715	(0)
VOSO4	2.886e-20	2.886e-20	-19.540	-19.540	0.000	(0)
HgSO4	1.589e-20	1.589e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.485e-21	5.485e-21	-20.261	-20.261	0.000	(0)
CrO3SO4-2	2.353e-23	4.533e-24	-22.628	-23.344	-0.715	(0)
VSO4+	7.741e-35	5.129e-35	-34.111	-34.290	-0.179	(0)
U (SO4) 2	1.767e-39	1.767e-39	-38.753	-38.753	0.000	(0)
USO4+2	1.051e-40	0.000e+00	-39.978	-40.694	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.648	-60.827	-0.179	(0)
Sb (3)	9.948e-20					
Sb (OH) 3	5.029e-20	5.029e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.918e-20	4.918e-20	-19.308	-19.308	0.000	(0)
SbO2-	9.736e-24	6.451e-24	-23.012	-23.190	-0.179	(0)
Sb (OH) 4-	5.558e-24	3.682e-24	-23.255	-23.434	-0.179	(0)

Sb(OH) 2F	1.154e-25	1.154e-25	-24.938	-24.938	0.000	(0)
SbOF	1.137e-25	1.137e-25	-24.944	-24.944	0.000	(0)
Sb(OH) 2+	2.280e-26	1.511e-26	-25.642	-25.821	-0.179	(0)
SbO+	7.876e-27	5.218e-27	-26.104	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.851	-318.567	-0.715	(0)
Sb (5)	9.048e-08					
SbO3-	9.038e-08	5.988e-08	-7.044	-7.223	-0.179	(0)
Sb(OH) 6-	9.046e-11	6.964e-11	-10.044	-10.157	-0.114	(0)
SbO2+	3.960e-24	2.624e-24	-23.402	-23.581	-0.179	(0)
Se (-2)	6.274e-39					
HSe-	6.274e-39	4.156e-39	-38.202	-38.381	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.400	-42.400	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.758	-45.473	-0.715	(0)
Se (4)	7.864e-07					
SeO3-2	4.135e-07	7.966e-08	-6.384	-7.099	-0.715	(0)
HSeO3-	3.729e-07	2.471e-07	-6.428	-6.607	-0.179	(0)
H2SeO3	1.301e-12	1.301e-12	-11.886	-11.886	0.000	(0)
Cd(SeO3) 2-2	7.189e-17	1.385e-17	-16.143	-16.859	-0.715	(0)
FeHSeO3+2	9.960e-24	1.919e-24	-23.002	-23.717	-0.715	(0)
Se (6)	9.855e-10					
SeO4-2	9.824e-10	3.451e-10	-9.008	-9.462	-0.454	(0)
MnSeO4	2.886e-12	2.886e-12	-11.540	-11.540	0.000	(0)
ZnSeO4	2.069e-13	2.069e-13	-12.684	-12.684	0.000	(0)
HSeO4-	3.223e-16	2.136e-16	-15.492	-15.670	-0.179	(0)
CdSeO4	1.702e-16	1.702e-16	-15.769	-15.769	0.000	(0)
CoSeO4	6.820e-17	6.820e-17	-16.166	-16.166	0.000	(0)
NiSeO4	1.494e-17	1.494e-17	-16.826	-16.826	0.000	(0)
Zn(SeO4) 2-2	3.757e-22	7.239e-23	-21.425	-22.140	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.385	-58.995	-1.609	(0)
U (4)	1.831e-19					
U(OH) 5-	1.830e-19	1.213e-19	-18.737	-18.916	-0.179	(0)
U(OH) 4	6.283e-23	6.283e-23	-22.202	-22.202	0.000	(0)
U(OH) 3+	4.289e-27	2.842e-27	-26.368	-26.546	-0.179	(0)
U(OH) 2+2	8.437e-32	1.625e-32	-31.074	-31.789	-0.715	(0)
UF3+	4.657e-36	3.085e-36	-35.332	-35.511	-0.179	(0)
UF2+2	8.512e-37	1.640e-37	-36.070	-36.785	-0.715	(0)
UOH+3	3.851e-37	9.471e-39	-36.414	-38.024	-1.609	(0)
UF4	4.016e-38	4.016e-38	-37.396	-37.396	0.000	(0)
UF+3	4.462e-39	1.097e-40	-38.351	-39.960	-1.609	(0)
U(SO4) 2	1.767e-39	1.767e-39	-38.753	-38.753	0.000	(0)
UF5-	2.852e-40	1.889e-40	-39.545	-39.724	-0.179	(0)
USO4+2	1.051e-40	0.000e+00	-39.978	-40.694	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.454	-41.169	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.473	-45.334	-2.861	(0)
UCl+3	0.000e+00	0.000e+00	-44.212	-45.821	-1.609	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-156.064	-170.546	-14.483	(0)
U (5)	8.128e-16					
UO2+	8.128e-16	5.385e-16	-15.090	-15.269	-0.179	(0)
U (6)	6.586e-07					
UO2(CO3) 3-4	6.002e-07	8.270e-10	-6.222	-9.082	-2.861	(0)
UO2(CO3) 2-2	5.804e-08	1.118e-08	-7.236	-7.951	-0.715	(0)
UO2CO3	3.798e-10	3.798e-10	-9.420	-9.420	0.000	(0)
UO2OH+	9.998e-12	6.624e-12	-11.000	-11.179	-0.179	(0)
UO2F+	1.599e-12	1.059e-12	-11.796	-11.975	-0.179	(0)
UO2SO4	1.074e-12	1.074e-12	-11.969	-11.969	0.000	(0)
UO2(SO4) 2-2	8.073e-13	1.555e-13	-12.093	-12.808	-0.715	(0)
UO2F2	3.627e-13	3.627e-13	-12.440	-12.440	0.000	(0)
UO2+2	1.840e-13	6.464e-14	-12.735	-13.189	-0.454	(0)
UO2F3-	1.632e-14	1.081e-14	-13.787	-13.966	-0.179	(0)
UO2Cl+	1.030e-15	6.821e-16	-14.987	-15.166	-0.179	(0)
(UO2) 2(OH) 2+2	3.779e-16	7.281e-17	-15.423	-16.138	-0.715	(0)
(UO2) 3(OH) 5+	3.658e-16	2.424e-16	-15.437	-15.616	-0.179	(0)
UO2F4-2	5.293e-17	1.020e-17	-16.276	-16.991	-0.715	(0)
UO2NO3+	3.005e-21	1.991e-21	-20.522	-20.701	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.580	-42.758	-0.179	(0)

V+2	0.000e+00	0.000e+00	-43.464	-44.179	-0.715	(0)
V(3)	4.303e-15					
V(OH) 3	4.303e-15	4.303e-15	-14.366	-14.366	0.000	(0)
V(OH) 2+	5.191e-26	3.439e-26	-25.285	-25.464	-0.179	(0)
VOH+2	2.095e-29	4.036e-30	-28.679	-29.394	-0.715	(0)
V+3	4.023e-34	9.893e-36	-33.395	-35.005	-1.609	(0)
VSO4+	7.741e-35	5.129e-35	-34.111	-34.290	-0.179	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.797	-56.406	-1.609	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-55.127	-57.988	-2.861	(0)
V(4)	2.424e-18					
V(OH) 3+	2.335e-18	1.547e-18	-17.632	-17.811	-0.179	(0)
VO+2	4.953e-20	9.543e-21	-19.305	-20.020	-0.715	(0)
VOSO4	2.886e-20	2.886e-20	-19.540	-19.540	0.000	(0)
VOF+	1.026e-20	6.795e-21	-19.989	-20.168	-0.179	(0)
VOF2	3.025e-22	3.025e-22	-21.519	-21.519	0.000	(0)
VOC1+	2.629e-22	1.742e-22	-21.580	-21.759	-0.179	(0)
VOF3-	1.923e-24	1.274e-24	-23.716	-23.895	-0.179	(0)
VOF4-2	3.169e-27	6.105e-28	-26.499	-27.214	-0.715	(0)
H2V2O4+2	6.247e-31	1.204e-31	-30.204	-30.919	-0.715	(0)
V(5)	4.801e-08					
H2VO4-	2.825e-08	1.871e-08	-7.549	-7.728	-0.179	(0)
HVO4-2	1.976e-08	3.807e-09	-7.704	-8.419	-0.715	(0)
H3VO4	2.311e-12	2.311e-12	-11.636	-11.636	0.000	(0)
HV2O7-3	9.835e-13	2.419e-14	-12.007	-13.616	-1.609	(0)
H3V2O7-	4.223e-13	2.798e-13	-12.374	-12.553	-0.179	(0)
VO4-3	6.283e-14	1.545e-15	-13.202	-14.811	-1.609	(0)
V2O7-4	3.826e-14	5.273e-17	-13.417	-16.278	-2.861	(0)
V3O9-3	2.807e-16	6.903e-18	-15.552	-17.161	-1.609	(0)
VO2+	7.423e-17	5.715e-17	-16.129	-16.243	-0.114	(0)
VO2SO4-	2.262e-17	1.499e-17	-16.646	-16.824	-0.179	(0)
VO2F	1.190e-17	1.190e-17	-16.924	-16.924	0.000	(0)
VO2F2-	7.741e-19	5.129e-19	-18.111	-18.290	-0.179	(0)
V4O12-4	3.916e-20	5.396e-23	-19.407	-22.268	-2.861	(0)
VO2F3-2	3.942e-21	7.595e-22	-20.404	-21.119	-0.715	(0)
VO2F4-3	1.804e-24	4.436e-26	-23.744	-25.353	-1.609	(0)
VO2NO3	4.463e-25	4.463e-25	-24.350	-24.350	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.559	-59.996	-6.437	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.248	-59.718	-4.470	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.558	-62.419	-2.861	(0)
Zn	2.602e-05					
Zn+2	1.102e-05	3.871e-06	-4.958	-5.412	-0.454	(0)
ZnSO4	9.300e-06	9.300e-06	-5.032	-5.032	0.000	(0)
Zn(SO4) 2-2	4.617e-06	8.895e-07	-5.336	-6.051	-0.715	(0)
ZnOH+	4.755e-07	3.151e-07	-6.323	-6.502	-0.179	(0)
ZnCO3	3.287e-07	3.287e-07	-6.483	-6.483	0.000	(0)
ZnCl+	8.386e-08	6.327e-08	-7.076	-7.199	-0.122	(0)
ZnHCO3+	7.181e-08	4.758e-08	-7.144	-7.323	-0.179	(0)
ZnOHCl	6.741e-08	6.741e-08	-7.171	-7.171	0.000	(0)
Zn(OH) 2	4.064e-08	4.064e-08	-7.391	-7.391	0.000	(0)
ZnF+	1.384e-08	9.169e-09	-7.859	-8.038	-0.179	(0)
ZnCl2	6.524e-10	6.524e-10	-9.185	-9.185	0.000	(0)
Zn(OH) 3-	2.502e-10	1.658e-10	-9.602	-9.780	-0.179	(0)
ZnCl3-	4.470e-12	3.372e-12	-11.350	-11.472	-0.122	(0)
ZnNO3+	2.266e-13	1.501e-13	-12.645	-12.824	-0.179	(0)
ZnSeO4	2.069e-13	2.069e-13	-12.684	-12.684	0.000	(0)
ZnCl4-2	3.120e-14	1.097e-14	-13.506	-13.960	-0.454	(0)
Zn(OH) 4-2	2.788e-14	5.372e-15	-13.555	-14.270	-0.715	(0)
Zn(NO3) 2	4.623e-22	4.623e-22	-21.335	-21.335	0.000	(0)
Zn(SeO4) 2-2	3.757e-22	7.239e-23	-21.425	-22.140	-0.715	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.288	-147.467	-0.179	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.293	-224.472	-0.179	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.603	-304.318	-0.715	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-55.15	-48.86	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.12	-37.61	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.35	-37.61	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.24	-53.31	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-56.47	-36.43	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.43	-28.02	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.37	-22.92	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.40	9.40	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.72	-45.36	2.37	Al2 (MoO4) 3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4 (OH) 10SO4	-2.86	19.84	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.95	-1.08	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.23	6.71	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.55	-6.72	1.83	BaSeO3
BaSeO4	-10.02	-17.48	-7.46	BaSeO4
Bianchite	-5.61	-7.38	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.89	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.85	-77.38	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.45	13.39	16.84	Mg (OH) 2
Bunsenite	-6.66	5.78	12.45	NiO
Ca (VO3) 2	-9.16	-3.50	5.66	Ca (VO3) 2
Ca2V2O7	-7.84	9.66	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.89	9.66	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-16.13	22.83	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-17.03	22.83	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-14.95	-17.21	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	-0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.16	-1.35	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.09	-12.11	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.64	-0.80	9.84	Cd (BO2) 2
Cd (OH) 2	-6.41	7.24	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.49	7.24	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.54	-13.83	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-18.62	3.94	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-17.22	11.18	28.40	Cd4 (OH) 6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2

CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal (alpha)	-31.82	-18.31	13.51	Cd
Cdmetal (gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHC1	-6.39	-2.86	3.54	CdOHC1
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4:2H2O	-16.19	-18.04	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co (BO2) 2	-28.70	-1.63	27.07	Co (BO2) 2
Co (OH) 2	-6.68	6.41	13.09	Co (OH) 2
Co (OH) 3	-10.91	-13.22	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-26.09	-13.06	13.03	Co3 (AsO4) 2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.26	-15.24	-9.98	CoCO3
CoF2	-15.66	-17.26	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.32	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.68	-39.88	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.34	-18.87	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.96	-11.15	10.82	Cr (OH) 2
Cr (OH) 3	-2.66	-1.32	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.57	-1.32	-0.75	Cr (OH) 3
Cr2O3	-0.28	-2.64	-2.36	Cr2O3
CrCl2	-45.43	-31.33	14.09	CrCl2
CrCl3	-46.72	-31.60	15.11	CrCl3
CrF3	-25.48	-36.82	-11.34	CrF3
Crmetal	-67.17	-36.69	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.83	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.50	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.69	-22.13	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O

Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.42	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.78	-6.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg(CO3)2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.20	0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.50	-13.22	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.69	-8.13	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.54	-37.16	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.39	0.81	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.99	-63.58	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.84	-42.84	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.70	-79.06	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-5.05	2.63	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg(CH3)2(g)	-184.58	-258.29	-73.71	Hg(CH3)2
Hg(g)	-6.71	-14.59	-7.87	Hg
Hg(OH)2	-7.14	-10.64	-3.50	Hg(OH)2
Hg2(g)	-14.22	-29.18	-14.96	Hg2
Hg2(OH)2	-8.89	-3.63	5.26	Hg2(OH)2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.31	-34.01	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.49	-18.15	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl(g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF(g)	-46.32	-13.65	32.68	HgF
HgF2(g)	-46.87	-34.30	12.57	HgF2
Hgmetal(l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.23	-56.92	-55.69	HgSe
HgSeO3	-12.72	-25.15	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4

Huntite	-3.27	-33.24	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-7.22	-25.99	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-10.85	-19.62	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.05	-20.22	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.24	-20.04	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-31.64	-48.88	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-17.99	-18.50	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-12.77	-9.51	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-12.67	-13.40	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO ₄
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.93	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.92	19.78	16.86	Fe ₂ MgO ₄
Magnesite	-0.79	-8.25	-7.46	MgCO ₃
Magnetite	6.43	9.84	3.40	Fe ₃ O ₄
Malachite	0.16	-5.15	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.13	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl ₂
Melanterite	-12.12	-14.33	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg(OH) ₂ (active)	-5.40	13.39	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.56	-3.28	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-271.83	-197.14	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.24	10.12	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.44	10.76	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.36	-16.98	5.38	MgCrO ₄
MgF ₂	-2.14	-10.27	-8.13	MgF ₂
MgMoO ₄	-6.14	-7.99	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.18	-1.13	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-10.69	-11.89	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-30.67	42.85	73.52	Pb ₃ O ₄
Mirabilite	-4.27	-5.38	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-10.26	-5.36	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.15	-55.86	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.17	-86.09	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.88	1.62	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.60	-8.88	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.48	-34.98	3.50	MnSe
MnSeO ₃	-4.34	-3.21	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.19	-3.21	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-11.92	-13.97	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.05	-6.47	2.58	MnSO ₄
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO ₃	-13.39	-21.39	-8.00	MoO ₃
Morenosite	-9.85	-12.00	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.26	-219.52	-70.26	MoS ₂
Na-Jarosite	-8.57	-19.77	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.46	-48.35	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.90	-17.97	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-13.78	-30.37	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.48	-8.99	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.21	-8.99	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-12.42	-2.12	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-14.15	-12.87	1.28	Na ₂ SeO ₄
Na ₃ Sb	-171.78	-77.33	94.45	Na ₃ Sb
Na ₃ VO ₄	-26.41	10.27	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.26	8.14	37.40	Na ₄ V ₂ O ₇

Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-5.99	-2.13	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.01	5.78	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-30.66	-14.96	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-26.65	5.35	32.00	Ni4 (OH) 6SO4
NiCO3	-8.99	-15.86	-6.87	NiCO3
NiMoO4	-4.46	-15.61	-11.14	NiMoO4
NiS (alpha)	-74.91	-80.51	-5.60	NiS
NiS (beta)	-69.41	-80.51	-11.10	NiS
NiS (gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.81	-40.51	-17.70	NiSe
NiSeO3:2H2O	-11.55	-8.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.98	-19.50	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb (BO2) 2	-8.79	-2.27	6.52	Pb (BO2) 2
Pb (OH) 2	-2.38	5.77	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-63.44	-72.20	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-7.35	1.44	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.65	11.54	26.19	Pb2O (OH) 2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.23	-5.13	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.79	-14.99	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.50	0.64	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.16	-0.47	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.80	5.30	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn (OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb (OH) 3	-12.19	-19.30	-7.11	Sb (OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.70	-177.46	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6 (orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.61	-11.69	Sb
SbO2	-3.01	-30.83	-27.82	SbO2
Schoepite	-3.37	2.62	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.63	-20.74	-7.11	Se
Semetal (hex)	-13.04	-20.74	-7.71	Se
Senarmontite	-26.23	-38.59	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.28	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3

Smithsonite	-1.24	-11.24	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.10	9.98	21.08	U3O8
U3Sb4	-577.22	-424.83	152.38	U3Sb4
U4O9	-26.24	-29.26	-3.02	U4O9
UF4	-31.50	-61.04	-29.54	UF4
UF4:2.5H2O	-28.32	-61.04	-32.72	UF4:2.5H2O
UO2 (am)	-14.64	-13.70	0.93	UO2
UO2 (NO3) 2	-40.96	-28.81	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.67	-28.81	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.20	-28.81	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.86	-28.82	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.99	2.63	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.40	-22.65	-2.25	UO2SeO4:4H2O
UO3	-5.07	2.63	7.70	UO3
Uraninite	-9.03	-13.70	-4.67	UO2
USb2	-218.81	-189.24	29.58	USb2
V (OH) 3	-18.87	-11.28	7.59	V (OH) 3
V2O5	-15.31	-16.67	-1.36	V2O5
V3O5	-39.99	-38.16	1.84	V3O5
V4O7	-49.55	-42.36	7.19	V4O7
V6O13	-40.24	-101.10	-60.86	V6O13
Valentinite	-30.11	-38.59	-8.48	Sb2O3
VCl2	-63.12	-44.24	18.87	VCl2
VCl3	-65.00	-41.56	23.43	VCl3
VF4	-66.47	-51.54	14.93	VF4
Vmetal	-93.62	-49.60	44.03	V
VO	-38.81	-24.05	14.76	VO
VO (OH) 2	-9.36	-4.21	5.15	VO (OH) 2
VO2Cl	-21.27	-18.43	2.84	VO2Cl
VOC1	-32.53	-21.38	11.15	VOC1
VOC12	-37.15	-24.39	12.76	VOC12
VOSO4	-25.59	-21.98	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO4
Zn (BO2) 2	-5.93	2.36	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.36	-21.04	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.80	10.40	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.07	10.40	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.35	10.40	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.13	10.40	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.33	10.40	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.47	3.03	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.48	10.71	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.74	-1.09	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.25	-4.34	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.56	23.84	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.67	31.83	38.50	Zn5 (OH) 8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.98	-11.24	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.26	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.98	-10.13	ZnMoO4
ZnO (active)	-0.78	10.40	11.19	ZnO
ZnS (am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.49	-35.89	-14.40	ZnSe
ZnSeO4:6H2O	-13.36	-14.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.73	-7.37	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 59.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 302
 equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 donnan 1e-008
USE EQUILIBRIUM_PHASES 302
USE Surface 302
USE Solution 307
SAVE Solution 308 #Initial Stage 3 Run-off Water After Mineral
Precipitation and Sorption Loss
END

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 302.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.906e-19 Surface + diffuse layer charge, eq
3.134e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.874e-01 m² for 1.071e-05 moles of Ferrihydrite

Water in diffuse layer: 6.874e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is
+1).

Element	Moles
C	1.7561e-11
Ca	2.1764e-13
Cl	3.5166e-10
H	5.1804e-11
K	3.4526e-13
Mg	3.3719e-14
N	1.4237e-09
Na	1.4628e-12
O	6.3454e-08
S	1.4786e-08

Hfo_s

5.354e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.579e-08	0.668	3.579e-08	-7.446
Hfo_sOH	1.755e-08	0.328	1.755e-08	-7.756
Hfo_sO-	1.972e-10	0.004	1.972e-10	-9.705
Hfo_sOHCa+2	6.533e-13	0.000	6.533e-13	-12.185

Hfo_w 2.142e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	9.895e-07	0.462	9.895e-07	-6.005
Hfo_wOH	4.853e-07	0.227	4.853e-07	-6.314
Hfo_wSO4-	3.342e-07	0.156	3.342e-07	-6.476
Hfo_wOHSO4-2	3.270e-07	0.153	3.270e-07	-6.485
Hfo_wO-	5.452e-09	0.003	5.452e-09	-8.263
Hfo_wOMg+	7.706e-15	0.000	7.706e-15	-14.113
Hfo_wOCa+	2.614e-15	0.000	2.614e-15	-14.583

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 307. Solution after simulation 58.
Using surface 302.
Using pure phase assemblage 302. Pure-phase assemblage after simulation 58.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Initial	Moles in assemblage Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	7.223e-05	7.223e-05	6.094e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	5.030e-08	4.088e-08	-9.419e-09
Barite	0.00	-9.98	-9.98	2.998e-05	3.000e-05	2.826e-08
Brochantite	-0.00	15.22	15.22	1.341e-04	1.340e-04	-1.501e-07
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.012e+01	1.012e+01	9.797e-07
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.18	-1.36	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	4.572e-02	4.572e-02	-1.726e-06
Carnotite	0.00	0.23	0.23	2.082e-06	1.823e-06	-2.584e-07
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00

CdMoO4	0.00	-14.15	-14.15	2.415e-07	2.415e-07	-1.672e-11
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-1.22	-3.58	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.17	-49.97	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.071e-05	1.071e-05	-2.204e-14
Fluorite	0.00	-10.50	-10.50	3.686e-03	3.686e-03	1.246e-09
Gummite	-4.90	2.77	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	9.184e-03	9.186e-03	1.505e-06
HgSe	-1.25	-56.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.35	-3.22	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.00	-15.87	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.47	-15.61	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	7.547e-10
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	7.511e-07	7.473e-07	-3.756e-09
Rutherfordine	-4.38	-18.88	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.83	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.23	2.77	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-10.67	10.41	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.84	2.77	5.61	0.000e+00	0	0.000e+00
UO3	-4.93	2.77	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

1.180e-20 Surface + diffuse layer charge, eq
1.775e-07 Surface charge, eq
2.492e-02 sigma, C/m²
2.948e-02 psi, V
-1.148e+00 -F*psi/RT
3.174e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.874e-01 m² for 1.071e-05 moles of Ferrihydrite

Water in diffuse layer: 6.874e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 2.637e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.024e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Al	4.2263e-11
As	1.3266e-14
B	6.9320e-10
Ba	1.5230e-13
C	4.3148e-09
Ca	7.4760e-08
Cd	1.5023e-13
Cl	6.4383e-08
Co	1.7723e-14
Cr	2.4331e-15
Cu	3.2699e-12
F	1.6200e-09
Fe	7.1893e-15
H	6.4737e-09

Hg	6.6159e-14
K	9.4625e-08
Mg	1.1298e-07
Mn	1.3251e-09
Mo	6.4297e-11
N	1.7129e-10
Na	1.6987e-07
Ni	2.9647e-15
O	1.5152e-06
Pb	1.1146e-14
S	3.7484e-07
Sb	6.8918e-13
Se	6.1228e-12
U	9.3416e-12
V	2.7450e-13
Zn	1.7002e-10

Hfo_s

5.354e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.609e-08	0.487	2.604e-08	-7.584
Hfo_sOCu+	1.468e-08	0.274	1.465e-08	-7.834
Hfo_sOMn+	8.608e-09	0.161	8.591e-09	-8.066
Hfo_sOPb+	2.788e-09	0.052	2.782e-09	-8.556
Hfo_sOCrOH+	7.570e-10	0.014	7.555e-10	-9.122
Hfo_sOHCa+2	5.713e-10	0.011	5.702e-10	-9.244
Hfo_sOH	2.708e-11	0.001	2.703e-11	-10.568
Hfo_sO-	8.119e-12	0.000	8.103e-12	-11.091
Hfo_sOCd+	5.440e-12	0.000	5.429e-12	-11.265
Hfo_sOH2+	2.070e-12	0.000	2.065e-12	-11.685
Hfo_sONi+	1.505e-13	0.000	1.502e-13	-12.823
Hfo_sOCu+	9.511e-14	0.000	9.492e-14	-13.023
Hfo_sOHBa+2	7.503e-15	0.000	7.488e-15	-14.126
Hfo_sOFe+	1.509e-15	0.000	1.506e-15	-14.822
Hfo_sOHg+	2.193e-16	0.000	2.189e-16	-15.660

Hfo_w

2.142e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	5.858e-07	0.274	5.846e-07	-6.233
Hfo_wOMg+	5.154e-07	0.241	5.144e-07	-6.289
Hfo_wOHVO4-3	2.719e-07	0.127	2.714e-07	-6.566
Hfo_wOZn+	2.126e-07	0.099	2.122e-07	-6.673
Hfo_wOH	2.107e-07	0.098	2.103e-07	-6.677
Hfo_wOHSeO4-2	1.417e-07	0.066	1.414e-07	-6.850
Hfo_wO-	6.318e-08	0.030	6.305e-08	-7.200
Hfo_wOMn+	5.321e-08	0.025	5.310e-08	-7.275
Hfo_wOHSeO3-2	2.381e-08	0.011	2.376e-08	-7.624
Hfo_wOHAsO4-3	1.884e-08	0.009	1.880e-08	-7.726
Hfo_wOCa+	1.717e-08	0.008	1.714e-08	-7.766
Hfo_wOH2+	1.610e-08	0.008	1.607e-08	-7.794
Hfo_wSO4-	5.436e-09	0.003	5.425e-09	-8.266
Hfo_wSeO3-	3.096e-09	0.001	3.089e-09	-8.510
Hfo_wOHMoO4-2	1.406e-09	0.001	1.403e-09	-8.853
Hfo_wOPb+	9.690e-10	0.000	9.671e-10	-9.015
Hfo_wH2BO3	8.369e-11	0.000	8.352e-11	-10.078
Hfo_wMoO4-	6.950e-11	0.000	6.936e-11	-10.159
Hfo_wOCd+	1.806e-11	0.000	1.802e-11	-10.744
Hfo_wHAsO4-	2.467e-12	0.000	2.462e-12	-11.609
Hfo_wOCu+	2.086e-12	0.000	2.082e-12	-11.682
Hfo_wONi+	1.580e-12	0.000	1.577e-12	-11.802
Hfo_wOHg+	8.358e-14	0.000	8.341e-14	-13.079
Hfo_wOFe+	7.408e-15	0.000	7.393e-15	-14.131
Hfo_wH2AsO4	6.100e-15	0.000	6.088e-15	-14.216

Hfo_wOHSeO4-2	4.400e-15	0.000	4.391e-15	-14.357
Hfo_wOBa+	3.259e-15	0.000	3.253e-15	-14.488
Hfo_wOHSbO(OH) 4-	9.244e-16	0.000	9.226e-16	-15.035
Hfo_wSeO4-	1.470e-16	0.000	1.468e-16	-15.833
Hfo_wSbO(OH) 4	4.570e-17	0.000	4.561e-17	-16.341
Hfo_wOHCrO4-2	1.537e-17	0.000	1.534e-17	-16.814
Hfo_wCrO4-	5.378e-19	0.000	5.367e-19	-18.270
Hfo_wH2AsO3	8.683e-25	0.000	8.665e-25	-24.062

-----Solution composition-----

Elements	Molality	Moles
Al	5.553e-06	5.564e-06
As	1.576e-09	1.579e-09
B	1.003e-04	1.005e-04
Ba	2.720e-08	2.725e-08
C	5.752e-04	5.763e-04
Ca	1.206e-02	1.209e-02
Cd	2.230e-08	2.235e-08
Cl	8.452e-03	8.469e-03
Co	2.962e-09	2.968e-09
Cr	3.846e-10	3.853e-10
Cu	4.981e-07	4.991e-07
F	2.258e-04	2.263e-04
Fe	1.103e-09	1.105e-09
Hg	9.624e-09	9.643e-09
K	1.501e-02	1.504e-02
Mg	1.845e-02	1.848e-02
Mn	2.228e-04	2.232e-04
Mo	7.617e-06	7.633e-06
N	2.254e-05	2.258e-05
Na	2.704e-02	2.709e-02
Ni	4.810e-10	4.819e-10
Pb	1.663e-09	1.666e-09
S	4.712e-02	4.722e-02
Sb	9.047e-08	9.066e-08
Se	7.605e-07	7.620e-07
U	9.165e-07	9.183e-07
V	3.450e-08	3.457e-08
Zn	2.578e-05	2.583e-05

-----Description of solution-----

	pH	=	7.908	Charge balance
	pe	=	4.864	Adjusted to redox
equilibrium	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.229e-01	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	6.164e-04	
	Total CO2 (mol/kg)	=	5.752e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.112366e+02	
	Total O	=	5.580886e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.091e-06	8.139e-07	-5.962	-6.089	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.553e-06					

Al (OH) 4-	5.508e-06	4.200e-06	-5.259	-5.377	-0.118	(0)
Al (OH) 3	4.099e-08	4.099e-08	-7.387	-7.387	0.000	(0)
Al (OH) 2+	3.253e-09	2.524e-09	-8.488	-8.598	-0.110	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
AlOH+2	1.078e-11	3.904e-12	-10.968	-11.409	-0.441	(0)
AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
Al (SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.048e-14	4.796e-15	-13.297	-14.319	-1.022	(0)
AlMo6O21-3	2.507e-39	0.000e+00	-38.601	-40.210	-1.609	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.003e-24	6.645e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.547e-28	4.908e-29	-27.594	-28.309	-0.715	(0)
H4AsO3+	1.477e-31	9.787e-32	-30.831	-31.009	-0.179	(0)
AsO3-3	6.230e-33	1.532e-34	-32.206	-33.815	-1.609	(0)
As (5)	1.576e-09					
HAsO4-2	1.523e-09	2.935e-10	-8.817	-9.532	-0.715	(0)
H2AsO4-	4.988e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.056e-12	7.516e-14	-11.515	-13.124	-1.609	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.003e-04					
H3BO3	9.242e-05	9.508e-05	-4.034	-4.022	0.012	(0)
H2BO3-	6.156e-06	4.472e-06	-5.211	-5.350	-0.139	(0)
MgH2BO3+	8.086e-07	5.873e-07	-6.092	-6.231	-0.139	(0)
CaH2BO3+	7.949e-07	5.774e-07	-6.100	-6.239	-0.139	(0)
NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
BF (OH) 3-	6.200e-09	4.504e-09	-8.208	-8.346	-0.139	(0)
H5 (BO3) 2-	4.982e-10	3.619e-10	-9.303	-9.441	-0.139	(0)
H8 (BO3) 3-	4.737e-12	3.441e-12	-11.325	-11.463	-0.139	(0)
BaH2BO3+	1.814e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
BF2 (OH) 2-	9.735e-13	7.071e-13	-12.012	-12.151	-0.139	(0)
BF3OH-	5.562e-19	4.040e-19	-18.255	-18.394	-0.139	(0)
BF4-	4.019e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
Ba	2.720e-08					
Ba+2	2.714e-08	9.535e-09	-7.566	-8.021	-0.454	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.814e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
BaOH+	4.399e-14	3.388e-14	-13.357	-13.470	-0.113	(0)
BaNO3+	1.114e-15	7.378e-16	-14.953	-15.132	-0.179	(0)
BaNH3+2	2.680e-16	5.163e-17	-15.572	-16.287	-0.715	(0)
C (4)	5.752e-04					
HCO3-	5.010e-04	3.887e-04	-3.300	-3.410	-0.110	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
CO3-2	4.201e-06	1.476e-06	-5.377	-5.831	-0.454	(0)
UO2 (CO3) 3-4	8.352e-07	1.151e-09	-6.078	-8.939	-2.861	(0)
NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
ZnCO3	3.257e-07	3.257e-07	-6.487	-6.487	0.000	(0)
MnHCO3+	3.128e-07	2.409e-07	-6.505	-6.618	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
UO2 (CO3) 2-2	8.076e-08	1.556e-08	-7.093	-7.808	-0.715	(0)
ZnHCO3+	7.115e-08	4.714e-08	-7.148	-7.327	-0.179	(0)
Cu (CO3) 2-2	4.866e-09	9.374e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
UO2CO3	5.285e-10	5.285e-10	-9.277	-9.277	0.000	(0)
PbCO3	3.977e-10	3.977e-10	-9.400	-9.400	0.000	(0)
CdCO3	8.906e-11	8.906e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.908e-11	2.589e-11	-10.408	-10.587	-0.179	(0)
CoHCO3+	1.798e-11	1.191e-11	-10.745	-10.924	-0.179	(0)

		CoCO3	9.829e-12	9.829e-12	-11.007	-11.007	0.000	(0)
		Pb(CO3) 2-2	8.785e-12	1.693e-12	-11.056	-11.771	-0.715	(0)
		BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
		NiHCO3+	6.670e-12	4.419e-12	-11.176	-11.355	-0.179	(0)
		NiCO3	5.078e-12	5.078e-12	-11.294	-11.294	0.000	(0)
		CdHCO3+	3.536e-12	2.343e-12	-11.451	-11.630	-0.179	(0)
		Cd(CO3) 2-2	5.056e-13	9.742e-14	-12.296	-13.011	-0.715	(0)
		HgCO3	9.757e-15	9.757e-15	-14.011	-14.011	0.000	(0)
		FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
		Hg(CO3) 2-2	2.363e-16	4.553e-17	-15.627	-16.342	-0.715	(0)
		HgHCO3+	3.386e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
Ca	1.206e-02							
		Ca+2	6.388e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
		CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
		CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.775e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
		CaH2BO3+	7.949e-07	5.774e-07	-6.100	-6.239	-0.139	(0)
		CaOH+	4.649e-08	3.644e-08	-7.333	-7.438	-0.106	(0)
		CaNO3+	1.654e-10	1.095e-10	-9.782	-9.960	-0.179	(0)
		CaNH3+2	1.258e-10	2.424e-11	-9.900	-10.615	-0.715	(0)
		Ca(NH3) 2+2	4.298e-19	8.281e-20	-18.367	-19.082	-0.715	(0)
Cd	2.230e-08							
		Cd+2	7.537e-09	2.648e-09	-8.123	-8.577	-0.454	(0)
		CdSO4	6.816e-09	6.816e-09	-8.166	-8.166	0.000	(0)
		Cd(SO4) 2-2	5.241e-09	1.010e-09	-8.281	-8.996	-0.715	(0)
		CdCl+	2.483e-09	1.645e-09	-8.605	-8.784	-0.179	(0)
		CdCO3	8.906e-11	8.906e-11	-10.050	-10.050	0.000	(0)
		CdOHC1	5.493e-11	5.493e-11	-10.260	-10.260	0.000	(0)
		CdCl2	4.463e-11	4.463e-11	-10.350	-10.350	0.000	(0)
		CdOH+	2.584e-11	1.712e-11	-10.588	-10.767	-0.179	(0)
		CdF+	7.519e-12	4.982e-12	-11.124	-11.303	-0.179	(0)
		CdHCO3+	3.536e-12	2.343e-12	-11.451	-11.630	-0.179	(0)
		Cd(CO3) 2-2	5.056e-13	9.742e-14	-12.296	-13.011	-0.715	(0)
		CdCl3-	2.765e-13	1.832e-13	-12.558	-12.737	-0.179	(0)
		Cd(OH) 2	8.791e-14	8.791e-14	-13.056	-13.056	0.000	(0)
		CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
		CdNO3+	1.951e-16	1.293e-16	-15.710	-15.889	-0.179	(0)
		CdSeO4	1.643e-16	1.643e-16	-15.784	-15.784	0.000	(0)
		Cd(SeO3) 2-2	6.705e-17	1.292e-17	-16.174	-16.889	-0.715	(0)
		Cd2OH+3	9.237e-18	2.272e-19	-17.034	-18.644	-1.609	(0)
		Cd(OH) 3-	6.598e-18	4.371e-18	-17.181	-17.359	-0.179	(0)
		Cd(OH) 4-2	3.023e-24	5.824e-25	-23.520	-24.235	-0.715	(0)
		Cd(NO3) 2	1.000e-24	1.000e-24	-24.000	-24.000	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.777	-78.956	-0.179	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Cl	8.452e-03							
		Cl-	8.452e-03	6.507e-03	-2.073	-2.187	-0.114	(0)
		MnCl+	3.304e-07	2.544e-07	-6.481	-6.594	-0.113	(0)
		ZnCl+	8.310e-08	6.269e-08	-7.080	-7.203	-0.122	(0)
		ZnOHC1	6.680e-08	6.680e-08	-7.175	-7.175	0.000	(0)
		CuCl2-	2.684e-09	2.025e-09	-8.571	-8.694	-0.122	(0)
		CdCl+	2.483e-09	1.645e-09	-8.605	-8.784	-0.179	(0)
		MnCl2	2.338e-09	2.338e-09	-8.631	-8.631	0.000	(0)
		CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
		ZnCl2	6.464e-10	6.464e-10	-9.189	-9.189	0.000	(0)
		CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
		CdOHC1	5.493e-11	5.493e-11	-10.260	-10.260	0.000	(0)
		HgClOH	5.167e-11	5.167e-11	-10.287	-10.287	0.000	(0)
		CdCl2	4.463e-11	4.463e-11	-10.350	-10.350	0.000	(0)
		PbCl+	3.124e-11	2.070e-11	-10.505	-10.684	-0.179	(0)
		HgCl2	2.339e-11	2.339e-11	-10.631	-10.631	0.000	(0)
		CoCl+	1.339e-11	8.869e-12	-10.873	-11.052	-0.179	(0)
		CuCl3-2	8.009e-12	2.816e-12	-11.096	-11.550	-0.454	(0)
		MnCl3-	5.442e-12	4.191e-12	-11.264	-11.378	-0.113	(0)
		ZnCl3-	4.429e-12	3.341e-12	-11.354	-11.476	-0.122	(0)

NiCl+	2.318e-12	1.535e-12	-11.635	-11.814	-0.179	(0)
HgCl3-	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
CuCl2	6.320e-13	6.320e-13	-12.199	-12.199	0.000	(0)
PbCl2	6.016e-13	6.016e-13	-12.221	-12.221	0.000	(0)
CdCl3-	2.765e-13	1.832e-13	-12.558	-12.737	-0.179	(0)
HgCl4-2	2.046e-13	3.942e-14	-12.689	-13.404	-0.715	(0)
ZnCl4-2	3.091e-14	1.087e-14	-13.510	-13.964	-0.454	(0)
PbCl3-	2.352e-15	1.558e-15	-14.629	-14.807	-0.179	(0)
UO2Cl+	1.433e-15	9.493e-16	-14.844	-15.023	-0.179	(0)
HgCl+	1.083e-15	7.173e-16	-14.966	-15.144	-0.179	(0)
CuCl3-	5.087e-17	3.838e-17	-16.294	-16.416	-0.122	(0)
NiCl2	5.030e-17	5.030e-17	-16.298	-16.298	0.000	(0)
PbCl4-2	2.406e-17	4.635e-18	-16.619	-17.334	-0.715	(0)
CrCl+2	4.947e-18	9.532e-19	-17.306	-18.021	-0.715	(0)
CrOHC12	9.594e-20	9.594e-20	-19.018	-19.018	0.000	(0)
CuCl4-2	3.559e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
CrCl2+	8.882e-22	5.885e-22	-21.051	-21.230	-0.179	(0)
VOCl+	1.889e-22	1.252e-22	-21.724	-21.902	-0.179	(0)
FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
CrO3Cl-	2.824e-26	1.871e-26	-25.549	-25.728	-0.179	(0)
FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
CoCl+2	7.887e-37	1.520e-37	-36.103	-36.818	-0.715	(0)
UCl+3	0.000e+00	0.000e+00	-44.068	-45.677	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.482	-51.197	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.714	-52.430	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.979	-0.715	(0)
Co (2)	2.962e-09					
Co+2	2.045e-09	3.940e-10	-8.689	-9.404	-0.715	(0)
CoSO4	8.634e-10	8.634e-10	-9.064	-9.064	0.000	(0)
CoHCO3+	1.798e-11	1.191e-11	-10.745	-10.924	-0.179	(0)
CoCl+	1.339e-11	8.869e-12	-10.873	-11.052	-0.179	(0)
CoCO3	9.829e-12	9.829e-12	-11.007	-11.007	0.000	(0)
CoOH+	9.658e-12	6.399e-12	-11.015	-11.194	-0.179	(0)
CoF+	2.233e-12	1.479e-12	-11.651	-11.830	-0.179	(0)
Co (OH) 2	4.137e-13	4.137e-13	-12.383	-12.383	0.000	(0)
CoNO2+	6.858e-14	4.544e-14	-13.164	-13.343	-0.179	(0)
Co (NH3) +2	2.110e-15	4.065e-16	-14.676	-15.391	-0.715	(0)
CoSeO4	6.583e-17	6.583e-17	-16.182	-16.182	0.000	(0)
CoNO3+	1.455e-17	9.641e-18	-16.837	-17.016	-0.179	(0)
Co (OH) 3-	1.014e-17	6.718e-18	-16.994	-17.173	-0.179	(0)
CoOOH-	2.549e-18	1.689e-18	-17.594	-17.772	-0.179	(0)
Co2OH+3	5.138e-21	1.264e-22	-20.289	-21.898	-1.609	(0)
Co (NH3) 2+2	7.723e-22	1.488e-22	-21.112	-21.827	-0.715	(0)
Co (OH) 4-2	4.498e-24	8.666e-25	-23.347	-24.062	-0.715	(0)
Co (NO3) 2	3.028e-25	3.028e-25	-24.519	-24.519	0.000	(0)
Co (NH3) 3+2	8.344e-29	1.608e-29	-28.079	-28.794	-0.715	(0)
Co4 (OH) 4+4	2.428e-34	3.345e-37	-33.615	-36.476	-2.861	(0)
Co (NH3) 4+2	3.758e-36	7.240e-37	-35.425	-36.140	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.272	-43.987	-0.715	(0)
Co (3)	2.464e-30					
CoOH+2	2.464e-30	4.747e-31	-29.608	-30.324	-0.715	(0)
Co+3	1.208e-36	1.148e-37	-35.918	-36.940	-1.022	(0)
CoCl+2	7.887e-37	1.520e-37	-36.103	-36.818	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.482	-51.197	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.648	-60.827	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.967	-65.682	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.979	-0.715	(0)
Cr (2)	1.918e-27					
Cr+2	1.918e-27	3.695e-28	-26.717	-27.432	-0.715	(0)
Cr (3)	3.846e-10					
Cr (OH) 2+	3.013e-10	1.996e-10	-9.521	-9.700	-0.179	(0)
Cr (OH) 3	6.103e-11	6.103e-11	-10.214	-10.214	0.000	(0)
Cr (OH) +2	1.046e-11	2.016e-12	-10.980	-11.696	-0.715	(0)
CrOHSO4	5.252e-12	5.252e-12	-11.280	-11.280	0.000	(0)
CrO2-	3.550e-12	2.352e-12	-11.450	-11.629	-0.179	(0)
Cr (OH) 4-	2.985e-12	1.977e-12	-11.525	-11.704	-0.179	(0)
CrF+2	1.105e-14	2.130e-15	-13.957	-14.672	-0.715	(0)

Cr+3	4.602e-15	1.132e-16	-14.337	-15.946	-1.609	(0)
CrSO4+	4.381e-15	2.903e-15	-14.358	-14.537	-0.179	(0)
CrCl+2	4.947e-18	9.532e-19	-17.306	-18.021	-0.715	(0)
CrOHC12	9.594e-20	9.594e-20	-19.018	-19.018	0.000	(0)
Cr2 (OH) 2SO4+2	4.966e-21	9.568e-22	-20.304	-21.019	-0.715	(0)
CrCl2+	8.882e-22	5.885e-22	-21.051	-21.230	-0.179	(0)
Cr2 (OH) 2 (SO4) 2	6.242e-22	6.242e-22	-21.205	-21.205	0.000	(0)
CrNO3+2	3.965e-25	7.638e-26	-24.402	-25.117	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.280	-41.996	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.736	-51.345	-1.609	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.714	-52.430	-0.715	(0)
Cr (6)	2.880e-15					
CrO4-2	2.632e-15	9.248e-16	-14.580	-15.034	-0.454	(0)
NaCrO4-	1.364e-16	9.036e-17	-15.865	-16.044	-0.179	(0)
HCrO4-	5.577e-17	3.695e-17	-16.254	-16.432	-0.179	(0)
KCrO4-	5.563e-17	3.686e-17	-16.255	-16.433	-0.179	(0)
CrO3SO4-2	7.936e-24	1.529e-24	-23.100	-23.816	-0.715	(0)
H2CrO4	3.698e-25	3.698e-25	-24.432	-24.432	0.000	(0)
CrO3Cl-	2.824e-26	1.871e-26	-25.549	-25.728	-0.179	(0)
Cr2O7-2	2.462e-31	4.743e-32	-30.609	-31.324	-0.715	(0)
Cu (1)	4.455e-09					
CuCl2-	2.684e-09	2.025e-09	-8.571	-8.694	-0.122	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	8.009e-12	2.816e-12	-11.096	-11.550	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu (2)	4.936e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.267e-08	6.991e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.732e-08	2.716e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.866e-09	9.374e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)
CuNO2+	7.025e-11	4.654e-11	-10.153	-10.332	-0.179	(0)
Cu (OH) 3-	2.861e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
CuNH3+2	1.238e-11	2.385e-12	-10.907	-11.622	-0.715	(0)
CuCl2	6.320e-13	6.320e-13	-12.199	-12.199	0.000	(0)
Cu (NO2) 2	7.794e-15	7.794e-15	-14.108	-14.108	0.000	(0)
CuNO3+	2.002e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
Cu (OH) 4-2	6.302e-16	1.214e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.087e-17	3.838e-17	-16.294	-16.416	-0.122	(0)
CuCl4-2	3.559e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
Cu (NO3) 2	2.577e-24	2.577e-24	-23.589	-23.589	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.258e-04					
F-	1.542e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.617e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
CaF+	3.775e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
MnF+	1.906e-07	1.468e-07	-6.720	-6.833	-0.113	(0)
ZnF+	1.371e-08	9.085e-09	-7.863	-8.042	-0.179	(0)
BF (OH) 3-	6.200e-09	4.504e-09	-8.208	-8.346	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
CdF+	7.519e-12	4.982e-12	-11.124	-11.303	-0.179	(0)
CoF+	2.233e-12	1.479e-12	-11.651	-11.830	-0.179	(0)
UO2F+	2.225e-12	1.474e-12	-11.653	-11.831	-0.179	(0)
HF2-	1.312e-12	9.785e-13	-11.882	-12.009	-0.127	(0)
PbF+	1.132e-12	7.500e-13	-11.946	-12.125	-0.179	(0)

BF2 (OH) 2-	9.735e-13	7.071e-13	-12.012	-12.151	-0.139	(0)
UO2F2	5.047e-13	5.047e-13	-12.297	-12.297	0.000	(0)
NiF+	4.151e-13	2.750e-13	-12.382	-12.561	-0.179	(0)
UO2F3-	2.272e-14	1.505e-14	-13.644	-13.822	-0.179	(0)
CrF+2	1.105e-14	2.130e-15	-13.957	-14.672	-0.715	(0)
PbF2	1.752e-15	1.752e-15	-14.756	-14.756	0.000	(0)
CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
UO2F4-2	7.366e-17	1.419e-17	-16.133	-16.848	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	8.551e-18	8.551e-18	-17.068	-17.068	0.000	(0)
FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
PbF3-	5.955e-19	3.945e-19	-18.225	-18.404	-0.179	(0)
VO2F2-	5.563e-19	3.686e-19	-18.255	-18.434	-0.179	(0)
BF3OH-	5.562e-19	4.040e-19	-18.255	-18.394	-0.139	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	7.370e-21	4.883e-21	-20.133	-20.311	-0.179	(0)
VO2F3-2	2.833e-21	5.457e-22	-20.548	-21.263	-0.715	(0)
VOF2	2.173e-22	2.173e-22	-21.663	-21.663	0.000	(0)
PbF4-2	1.163e-22	2.242e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.670e-23	2.431e-23	-22.435	-22.614	-0.179	(0)
BF4-	4.019e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
VOF3-	1.382e-24	9.155e-25	-23.860	-24.038	-0.179	(0)
VO2F4-3	1.296e-24	3.188e-26	-23.887	-25.497	-1.609	(0)
Sb (OH) 2F	1.154e-25	1.154e-25	-24.938	-24.938	0.000	(0)
SbOF	1.137e-25	1.137e-25	-24.944	-24.944	0.000	(0)
VOF4-2	2.277e-27	4.387e-28	-26.643	-27.358	-0.715	(0)
UF3+	6.481e-36	4.294e-36	-35.188	-35.367	-0.179	(0)
UF2+2	1.184e-36	2.282e-37	-35.926	-36.642	-0.715	(0)
UF4	5.589e-38	5.589e-38	-37.253	-37.253	0.000	(0)
UF+3	6.209e-39	1.527e-40	-38.207	-39.816	-1.609	(0)
UF5-	3.968e-40	2.629e-40	-39.401	-39.580	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.310	-41.026	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.324e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.401e-14	-13.740	-13.854	-0.113	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.028e-18	2.332e-18	-17.519	-17.632	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.305e-10	4.891e-10	-9.200	-9.311	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.177e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
FeOH+2	4.392e-15	1.545e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
Fe+3	3.094e-20	2.939e-21	-19.509	-20.532	-1.022	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
FeHSeO3+2	9.621e-24	1.854e-24	-23.017	-23.732	-0.715	(0)
Fe2 (OH) 2+4	5.734e-26	7.901e-29	-25.242	-28.102	-2.861	(0)
FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
FeNO3+2	2.355e-27	4.538e-28	-26.628	-27.343	-0.715	(0)
Fe3 (OH) 4+5	1.648e-32	5.586e-37	-31.783	-36.253	-4.470	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.524e-09					
Hg	9.524e-09	9.524e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.708e-19					
Hg2+2	1.854e-19	3.572e-20	-18.732	-19.447	-0.715	(0)
Hg (2)	1.000e-10					
HgClOH	5.167e-11	5.167e-11	-10.287	-10.287	0.000	(0)

	HgCl ₂	2.339e-11	2.339e-11	-10.631	-10.631	0.000	(0)
	Hg (OH) 2	2.245e-11	2.309e-11	-10.649	-10.637	0.012	(0)
	HgCl ₃ -	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
	HgCl ₄ -2	2.046e-13	3.942e-14	-12.689	-13.404	-0.715	(0)
	HgCO ₃	9.757e-15	9.757e-15	-14.011	-14.011	0.000	(0)
	HgCl+	1.083e-15	7.173e-16	-14.966	-15.144	-0.179	(0)
	HgOH+	2.702e-16	1.790e-16	-15.568	-15.747	-0.179	(0)
	Hg (CO ₃) 2-2	2.363e-16	4.553e-17	-15.627	-16.342	-0.715	(0)
	Hg (OH) 3-	3.571e-18	2.366e-18	-17.447	-17.626	-0.179	(0)
	HgHCO ₃ +	3.386e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
	Hg (NH ₃) 2+2	1.332e-18	2.567e-19	-17.875	-18.591	-0.715	(0)
	HgNH ₃ +2	1.553e-19	2.991e-20	-18.809	-19.524	-0.715	(0)
	Hg+2	2.868e-20	5.525e-21	-19.542	-20.258	-0.715	(0)
	HgSO ₄	1.588e-20	1.588e-20	-19.799	-19.799	0.000	(0)
	HgF+	3.670e-23	2.431e-23	-22.435	-22.614	-0.179	(0)
	Hg (NH ₃) 3+2	4.552e-26	8.769e-27	-25.342	-26.057	-0.715	(0)
	HgNO ₃ +	4.754e-29	3.149e-29	-28.323	-28.502	-0.179	(0)
	Hg (NH ₃) 4+2	3.102e-33	5.977e-34	-32.508	-33.223	-0.715	(0)
	Hg (NO ₃) 2	2.021e-37	2.021e-37	-36.694	-36.694	0.000	(0)
	HgHS ₂ -	0.000e+00	0.000e+00	-137.016	-137.194	-0.179	(0)
	HgS ₂ -2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K		1.501e-02					
	K+	1.393e-02	1.073e-02	-1.856	-1.970	-0.114	(0)
	KSO ₄ -	1.075e-03	8.339e-04	-2.969	-3.079	-0.110	(0)
	KCrO ₄ -	5.563e-17	3.686e-17	-16.255	-16.433	-0.179	(0)
Mg		1.845e-02					
	Mg+2	1.078e-02	3.788e-03	-1.967	-2.422	-0.454	(0)
	MgSO ₄	7.569e-03	7.569e-03	-2.121	-2.121	0.000	(0)
	MgF+	6.617e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
	MgHCO ₃ +	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
	MgCO ₃	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
	MgOH+	1.553e-06	1.227e-06	-5.809	-5.911	-0.102	(0)
	MgH ₂ BO ₃ +	8.086e-07	5.873e-07	-6.092	-6.231	-0.139	(0)
Mn (2)		2.228e-04					
	Mn+2	1.612e-04	3.106e-05	-3.793	-4.508	-0.715	(0)
	MnSO ₄	6.065e-05	6.065e-05	-4.217	-4.217	0.000	(0)
	MnCl+	3.304e-07	2.544e-07	-6.481	-6.594	-0.113	(0)
	MnHCO ₃ +	3.128e-07	2.409e-07	-6.505	-6.618	-0.113	(0)
	MnF+	1.906e-07	1.468e-07	-6.720	-6.833	-0.113	(0)
	MnOH+	8.246e-08	6.350e-08	-7.084	-7.197	-0.113	(0)
	MnCl ₂	2.338e-09	2.338e-09	-8.631	-8.631	0.000	(0)
	MnCl ₃ -	5.442e-12	4.191e-12	-11.264	-11.378	-0.113	(0)
	MnSeO ₄	2.787e-12	2.787e-12	-11.555	-11.555	0.000	(0)
	MnNO ₃ +	1.147e-12	7.600e-13	-11.940	-12.119	-0.179	(0)
	Mn (OH) 3-	3.376e-16	2.600e-16	-15.472	-15.585	-0.113	(0)
	Mn (NO ₃) 2	2.947e-20	2.947e-20	-19.531	-19.531	0.000	(0)
	Mn (OH) 4-2	1.942e-21	6.831e-22	-20.712	-21.166	-0.454	(0)
	MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
Mn (3)		1.069e-24					
	Mn+3	1.069e-24	1.015e-25	-23.971	-24.993	-1.022	(0)
Mn (6)		1.760e-40					
	MnO ₄ -2	1.760e-40	0.000e+00	-39.755	-40.208	-0.454	(0)
Mn (7)		0.000e+00					
	MnO ₄ -	0.000e+00	0.000e+00	-44.583	-44.716	-0.133	(0)
Mo		7.617e-06					
	MoO ₄ -2	7.616e-06	2.676e-06	-5.118	-5.573	-0.454	(0)
	HMoO ₄ -	9.922e-10	6.574e-10	-9.003	-9.182	-0.179	(0)
	H ₂ MoO ₄	5.946e-14	5.946e-14	-13.226	-13.226	0.000	(0)
	AlMo ₆ O ₂₁ -3	2.507e-39	0.000e+00	-38.601	-40.210	-1.609	(0)
	Mo ₇ O ₂₄ -6	0.000e+00	0.000e+00	-42.845	-49.282	-6.437	(0)
	HMo ₇ O ₂₄ -5	0.000e+00	0.000e+00	-46.334	-50.804	-4.470	(0)
	H ₂ Mo ₇ O ₂₄ -4	0.000e+00	0.000e+00	-51.069	-53.930	-2.861	(0)
	H ₃ Mo ₇ O ₂₄ -3	0.000e+00	0.000e+00	-56.983	-58.592	-1.609	(0)
N (-3)		2.930e-07					
	NH ₄ +	2.558e-07	1.858e-07	-6.592	-6.731	-0.139	(0)
	NH ₄ SO ₄ -	2.840e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
	NH ₃	8.581e-09	8.581e-09	-8.066	-8.066	0.000	(0)

CaNH3+2	1.258e-10	2.424e-11	-9.900	-10.615	-0.715	(0)
CuNH3+2	1.238e-11	2.385e-12	-10.907	-11.622	-0.715	(0)
NiNH3+2	2.206e-15	4.250e-16	-14.656	-15.372	-0.715	(0)
Co (NH3) +2	2.110e-15	4.065e-16	-14.676	-15.391	-0.715	(0)
BaNH3+2	2.680e-16	5.163e-17	-15.572	-16.287	-0.715	(0)
Hg (NH3) 2+2	1.332e-18	2.567e-19	-17.875	-18.591	-0.715	(0)
Ca (NH3) 2+2	4.298e-19	8.281e-20	-18.367	-19.082	-0.715	(0)
HgNH3+2	1.553e-19	2.991e-20	-18.809	-19.524	-0.715	(0)
Ni (NH3) 2+2	2.736e-21	5.272e-22	-20.563	-21.278	-0.715	(0)
Co (NH3) 2+2	7.723e-22	1.488e-22	-21.112	-21.827	-0.715	(0)
Hg (NH3) 3+2	4.552e-26	8.769e-27	-25.342	-26.057	-0.715	(0)
Co (NH3) 3+2	8.344e-29	1.608e-29	-28.079	-28.794	-0.715	(0)
Hg (NH3) 4+2	3.102e-33	5.977e-34	-32.508	-33.223	-0.715	(0)
Co (NH3) 4+2	3.758e-36	7.240e-37	-35.425	-36.140	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.280	-41.996	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.272	-43.987	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.736	-51.345	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.482	-51.197	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.714	-52.430	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.648	-60.827	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.967	-65.682	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.264	-65.979	-0.715	(0)
N (3)	2.222e-05					
NO2-	2.222e-05	1.636e-05	-4.653	-4.786	-0.133	(0)
CuNO2+	7.025e-11	4.654e-11	-10.153	-10.332	-0.179	(0)
CoNO2+	6.858e-14	4.544e-14	-13.164	-13.343	-0.179	(0)
Cu (NO2) 2	7.794e-15	7.794e-15	-14.108	-14.108	0.000	(0)
N (5)	2.022e-08					
NO3-	2.005e-08	1.544e-08	-7.698	-7.811	-0.114	(0)
CaNO3+	1.654e-10	1.095e-10	-9.782	-9.960	-0.179	(0)
MnNO3+	1.147e-12	7.600e-13	-11.940	-12.119	-0.179	(0)
ZnNO3+	2.245e-13	1.487e-13	-12.649	-12.828	-0.179	(0)
CuNO3+	2.002e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
BaNO3+	1.114e-15	7.378e-16	-14.953	-15.132	-0.179	(0)
CdNO3+	1.951e-16	1.293e-16	-15.710	-15.889	-0.179	(0)
PbNO3+	3.090e-17	2.047e-17	-16.510	-16.689	-0.179	(0)
CoNO3+	1.455e-17	9.641e-18	-16.837	-17.016	-0.179	(0)
NiNO3+	5.398e-18	3.577e-18	-17.268	-17.447	-0.179	(0)
Mn (NO3) 2	2.947e-20	2.947e-20	-19.531	-19.531	0.000	(0)
UO2NO3+	4.182e-21	2.771e-21	-20.379	-20.557	-0.179	(0)
Zn (NO3) 2	4.582e-22	4.582e-22	-21.339	-21.339	0.000	(0)
Cu (NO3) 2	2.577e-24	2.577e-24	-23.589	-23.589	0.000	(0)
Cd (NO3) 2	1.000e-24	1.000e-24	-24.000	-24.000	0.000	(0)
Pb (NO3) 2	5.368e-25	5.368e-25	-24.270	-24.270	0.000	(0)
CrNO3+2	3.965e-25	7.638e-26	-24.402	-25.117	-0.715	(0)
VO2NO3	3.207e-25	3.207e-25	-24.494	-24.494	0.000	(0)
Co (NO3) 2	3.028e-25	3.028e-25	-24.519	-24.519	0.000	(0)
FeNO3+2	2.355e-27	4.538e-28	-26.628	-27.343	-0.715	(0)
HgNO3+	4.754e-29	3.149e-29	-28.323	-28.502	-0.179	(0)
Hg (NO3) 2	2.021e-37	2.021e-37	-36.694	-36.694	0.000	(0)
Na	2.704e-02					
Na+	2.554e-02	1.966e-02	-1.593	-1.706	-0.114	(0)
NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)
NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
NaCrO4-	1.364e-16	9.036e-17	-15.865	-16.044	-0.179	(0)
Ni	4.810e-10					
Ni+2	2.625e-10	9.223e-11	-9.581	-10.035	-0.454	(0)
NiSO4	2.021e-10	2.021e-10	-9.694	-9.694	0.000	(0)
NiHCO3+	6.670e-12	4.419e-12	-11.176	-11.355	-0.179	(0)
NiCO3	5.078e-12	5.078e-12	-11.294	-11.294	0.000	(0)
NiCl+	2.318e-12	1.535e-12	-11.635	-11.814	-0.179	(0)
NiOH+	1.426e-12	9.450e-13	-11.846	-12.025	-0.179	(0)
NiF+	4.151e-13	2.750e-13	-12.382	-12.561	-0.179	(0)
Ni (SO4) 2-2	3.814e-13	7.348e-14	-12.419	-13.134	-0.715	(0)
Ni (OH) 2	6.110e-14	6.110e-14	-13.214	-13.214	0.000	(0)

NiNH3+2	2.206e-15	4.250e-16	-14.656	-15.372	-0.715	(0)
Ni(OH) 3-	7.506e-17	4.973e-17	-16.125	-16.303	-0.179	(0)
NiCl2	5.030e-17	5.030e-17	-16.298	-16.298	0.000	(0)
NiSeO4	1.438e-17	1.438e-17	-16.842	-16.842	0.000	(0)
NiNO3+	5.398e-18	3.577e-18	-17.268	-17.447	-0.179	(0)
Ni(NH3) 2+2	2.736e-21	5.272e-22	-20.563	-21.278	-0.715	(0)
O(0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.663e-09					
PbSO4	4.822e-10	4.822e-10	-9.317	-9.317	0.000	(0)
PbCO3	3.977e-10	3.977e-10	-9.400	-9.400	0.000	(0)
PbOH+	2.767e-10	1.833e-10	-9.558	-9.737	-0.179	(0)
Pb+2	2.552e-10	8.966e-11	-9.593	-10.047	-0.454	(0)
Pb(SO4) 2-2	1.656e-10	3.191e-11	-9.781	-10.496	-0.715	(0)
PbHCO3+	3.908e-11	2.589e-11	-10.408	-10.587	-0.179	(0)
PbCl+	3.124e-11	2.070e-11	-10.505	-10.684	-0.179	(0)
Pb(CO3) 2-2	8.785e-12	1.693e-12	-11.056	-11.771	-0.715	(0)
Pb(OH) 2	4.718e-12	4.718e-12	-11.326	-11.326	0.000	(0)
PbF+	1.132e-12	7.500e-13	-11.946	-12.125	-0.179	(0)
PbCl2	6.016e-13	6.016e-13	-12.221	-12.221	0.000	(0)
Pb(OH) 3-	5.796e-15	3.840e-15	-14.237	-14.416	-0.179	(0)
PbCl3-	2.352e-15	1.558e-15	-14.629	-14.807	-0.179	(0)
PbF2	1.752e-15	1.752e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.090e-17	2.047e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.406e-17	4.635e-18	-16.619	-17.334	-0.715	(0)
Pb2OH+3	1.059e-17	2.605e-19	-16.975	-18.584	-1.609	(0)
Pb(OH) 4-2	3.973e-18	7.654e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.955e-19	3.945e-19	-18.225	-18.404	-0.179	(0)
Pb3(OH) 4+2	2.067e-22	3.982e-23	-21.685	-22.400	-0.715	(0)
PbF4-2	1.163e-22	2.242e-23	-21.934	-22.649	-0.715	(0)
Pb(NO3) 2	5.368e-25	5.368e-25	-24.270	-24.270	0.000	(0)
Pb4(OH) 4+4	2.058e-26	2.836e-29	-25.687	-28.547	-2.861	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.551	-151.551	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.777	-78.956	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.016	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.292	-147.471	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.551	-151.551	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.297	-224.476	-0.179	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.851	-318.567	-0.715	(0)
S(6)	4.712e-02					
SO4-2	3.126e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.569e-03	7.569e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)

KSO4-	1.075e-03	8.339e-04	-2.969	-3.079	-0.110	(0)
MnSO4	6.065e-05	6.065e-05	-4.217	-4.217	0.000	(0)
ZnSO4	9.215e-06	9.215e-06	-5.036	-5.036	0.000	(0)
Zn (SO4) 2-2	4.574e-06	8.813e-07	-5.340	-6.055	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.840e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.816e-09	6.816e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.241e-09	1.010e-09	-8.281	-8.996	-0.715	(0)
CoSO4	8.634e-10	8.634e-10	-9.064	-9.064	0.000	(0)
PbSO4	4.822e-10	4.822e-10	-9.317	-9.317	0.000	(0)
NiSO4	2.021e-10	2.021e-10	-9.694	-9.694	0.000	(0)
Pb (SO4) 2-2	1.656e-10	3.191e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	5.252e-12	5.252e-12	-11.280	-11.280	0.000	(0)
UO2SO4	1.495e-12	1.495e-12	-11.825	-11.825	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2 (SO4) 2-2	1.123e-12	2.165e-13	-11.949	-12.665	-0.715	(0)
AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.814e-13	7.348e-14	-12.419	-13.134	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	4.381e-15	2.903e-15	-14.358	-14.537	-0.179	(0)
VO2SO4-	1.625e-17	1.077e-17	-16.789	-16.968	-0.179	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
VOSO4	2.074e-20	2.074e-20	-19.683	-19.683	0.000	(0)
HgSO4	1.588e-20	1.588e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2SO4+2	4.966e-21	9.568e-22	-20.304	-21.019	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	6.242e-22	6.242e-22	-21.205	-21.205	0.000	(0)
CrO3SO4-2	7.936e-24	1.529e-24	-23.100	-23.816	-0.715	(0)
VSO4+	5.563e-35	3.685e-35	-34.255	-34.434	-0.179	(0)
U (SO4) 2	2.459e-39	2.459e-39	-38.609	-38.609	0.000	(0)
USO4+2	1.463e-40	0.000e+00	-39.835	-40.550	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.648	-60.827	-0.179	(0)
Sb (3)	9.948e-20					
Sb (OH) 3	5.029e-20	5.029e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.918e-20	4.918e-20	-19.308	-19.308	0.000	(0)
SbO2-	9.736e-24	6.450e-24	-23.012	-23.190	-0.179	(0)
Sb (OH) 4-	5.558e-24	3.682e-24	-23.255	-23.434	-0.179	(0)
Sb (OH) 2F	1.154e-25	1.154e-25	-24.938	-24.938	0.000	(0)
SbOF	1.137e-25	1.137e-25	-24.944	-24.944	0.000	(0)
Sb (OH) 2+	2.280e-26	1.511e-26	-25.642	-25.821	-0.179	(0)
SbO+	7.876e-27	5.218e-27	-26.104	-26.282	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.851	-318.567	-0.715	(0)
Sb (5)	9.047e-08					
SbO3-	9.038e-08	5.988e-08	-7.044	-7.223	-0.179	(0)
Sb (OH) 6-	9.046e-11	6.964e-11	-10.044	-10.157	-0.114	(0)
SbO2+	3.960e-24	2.624e-24	-23.402	-23.581	-0.179	(0)
Se (-2)	6.060e-39					
HSe-	6.060e-39	4.015e-39	-38.218	-38.396	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.415	-42.415	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.773	-45.488	-0.715	(0)
Se (4)	7.596e-07					
SeO3-2	3.994e-07	7.694e-08	-6.399	-7.114	-0.715	(0)
HSeO3-	3.602e-07	2.386e-07	-6.443	-6.622	-0.179	(0)
H2SeO3	1.257e-12	1.257e-12	-11.901	-11.901	0.000	(0)
Cd (SeO3) 2-2	6.705e-17	1.292e-17	-16.174	-16.889	-0.715	(0)
FeHSeO3+2	9.621e-24	1.854e-24	-23.017	-23.732	-0.715	(0)
Se (6)	9.518e-10					
SeO4-2	9.489e-10	3.333e-10	-9.023	-9.477	-0.454	(0)
MnSeO4	2.787e-12	2.787e-12	-11.555	-11.555	0.000	(0)
ZnSeO4	1.980e-13	1.980e-13	-12.703	-12.703	0.000	(0)
HSeO4-	3.114e-16	2.063e-16	-15.507	-15.686	-0.179	(0)
CdSeO4	1.643e-16	1.643e-16	-15.784	-15.784	0.000	(0)
CoSeO4	6.583e-17	6.583e-17	-16.182	-16.182	0.000	(0)
NiSeO4	1.438e-17	1.438e-17	-16.842	-16.842	0.000	(0)
Zn (SeO4) 2-2	3.473e-22	6.692e-23	-21.459	-22.174	-0.715	(0)
U (3)	0.000e+00					

U+3	0.000e+00	0.000e+00	-57.242	-58.851	-1.609	(0)
U (4)	2.548e-19					
U (OH) 5-	2.547e-19	1.687e-19	-18.594	-18.773	-0.179	(0)
U (OH) 4	8.743e-23	8.743e-23	-22.058	-22.058	0.000	(0)
U (OH) 3+	5.969e-27	3.954e-27	-26.224	-26.403	-0.179	(0)
U (OH) 2+2	1.174e-31	2.262e-32	-30.930	-31.645	-0.715	(0)
UF3+	6.481e-36	4.294e-36	-35.188	-35.367	-0.179	(0)
UF2+2	1.184e-36	2.282e-37	-35.926	-36.642	-0.715	(0)
UOH+3	5.359e-37	1.318e-38	-36.271	-37.880	-1.609	(0)
UF4	5.589e-38	5.589e-38	-37.253	-37.253	0.000	(0)
UF+3	6.209e-39	1.527e-40	-38.207	-39.816	-1.609	(0)
U (SO4) 2	2.459e-39	2.459e-39	-38.609	-38.609	0.000	(0)
UF5-	3.968e-40	2.629e-40	-39.401	-39.580	-0.179	(0)
USO4+2	1.463e-40	0.000e+00	-39.835	-40.550	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.310	-41.026	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.330	-45.191	-2.861	(0)
UC1+3	0.000e+00	0.000e+00	-44.068	-45.677	-1.609	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.203	-169.685	-14.483	(0)
U (5)	1.131e-15					
UO2+	1.131e-15	7.493e-16	-14.947	-15.125	-0.179	(0)
U (6)	9.165e-07					
UO2 (CO3) 3-4	8.352e-07	1.151e-09	-6.078	-8.939	-2.861	(0)
UO2 (CO3) 2-2	8.076e-08	1.556e-08	-7.093	-7.808	-0.715	(0)
UO2CO3	5.285e-10	5.285e-10	-9.277	-9.277	0.000	(0)
UO2OH+	1.391e-11	9.218e-12	-10.857	-11.035	-0.179	(0)
UO2F+	2.225e-12	1.474e-12	-11.653	-11.831	-0.179	(0)
UO2SO4	1.495e-12	1.495e-12	-11.825	-11.825	0.000	(0)
UO2 (SO4) 2-2	1.123e-12	2.165e-13	-11.949	-12.665	-0.715	(0)
UO2F2	5.047e-13	5.047e-13	-12.297	-12.297	0.000	(0)
UO2+2	2.561e-13	8.996e-14	-12.592	-13.046	-0.454	(0)
UO2F3-	2.272e-14	1.505e-14	-13.644	-13.822	-0.179	(0)
UO2Cl+	1.433e-15	9.493e-16	-14.844	-15.023	-0.179	(0)
(UO2) 3 (OH) 5+	9.858e-16	6.531e-16	-15.006	-15.185	-0.179	(0)
(UO2) 2 (OH) 2+2	7.318e-16	1.410e-16	-15.136	-15.851	-0.715	(0)
UO2F4-2	7.366e-17	1.419e-17	-16.133	-16.848	-0.715	(0)
UO2NO3+	4.182e-21	2.771e-21	-20.379	-20.557	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.723	-42.902	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.607	-44.323	-0.715	(0)
V (3)	3.092e-15					
V (OH) 3	3.092e-15	3.092e-15	-14.510	-14.510	0.000	(0)
V (OH) 2+	3.731e-26	2.472e-26	-25.428	-25.607	-0.179	(0)
VOH+2	1.505e-29	2.900e-30	-28.822	-29.538	-0.715	(0)
V+3	2.891e-34	7.109e-36	-33.539	-35.148	-1.609	(0)
VSO4+	5.563e-35	3.685e-35	-34.255	-34.434	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.084	-56.693	-1.609	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.414	-58.275	-2.861	(0)
V (4)	1.742e-18					
V (OH) 3+	1.678e-18	1.111e-18	-17.775	-17.954	-0.179	(0)
VO+2	3.559e-20	6.857e-21	-19.449	-20.164	-0.715	(0)
VOSO4	2.074e-20	2.074e-20	-19.683	-19.683	0.000	(0)
VOF+	7.370e-21	4.883e-21	-20.133	-20.311	-0.179	(0)
VOF2	2.173e-22	2.173e-22	-21.663	-21.663	0.000	(0)
VOC1+	1.889e-22	1.252e-22	-21.724	-21.902	-0.179	(0)
VOF3-	1.382e-24	9.155e-25	-23.860	-24.038	-0.179	(0)
VOF4-2	2.277e-27	4.387e-28	-26.643	-27.358	-0.715	(0)
H2V2O4+2	3.226e-31	6.216e-32	-30.491	-31.207	-0.715	(0)
V (5)	3.450e-08					
H2VO4-	2.030e-08	1.345e-08	-7.693	-7.871	-0.179	(0)
HVO4-2	1.420e-08	2.736e-09	-7.848	-8.563	-0.715	(0)
H3VO4	1.661e-12	1.661e-12	-11.780	-11.780	0.000	(0)
HV2O7-3	5.079e-13	1.249e-14	-12.294	-13.903	-1.609	(0)
H3V2O7-	2.180e-13	1.445e-13	-12.661	-12.840	-0.179	(0)
VO4-3	4.515e-14	1.110e-15	-13.345	-14.955	-1.609	(0)
V2O7-4	1.976e-14	2.723e-17	-13.704	-16.565	-2.861	(0)
V3O9-3	1.042e-16	2.561e-18	-15.982	-17.592	-1.609	(0)
VO2+	5.334e-17	4.107e-17	-16.273	-16.386	-0.114	(0)
VO2SO4-	1.625e-17	1.077e-17	-16.789	-16.968	-0.179	(0)

VO2F	8.551e-18	8.551e-18	-17.068	-17.068	0.000	(0)
VO2F2-	5.563e-19	3.686e-19	-18.255	-18.434	-0.179	(0)
V4O12-4	1.044e-20	1.439e-23	-19.981	-22.842	-2.861	(0)
VO2F3-2	2.833e-21	5.457e-22	-20.548	-21.263	-0.715	(0)
VO2F4-3	1.296e-24	3.188e-26	-23.887	-25.497	-1.609	(0)
VO2NO3	3.207e-25	3.207e-25	-24.494	-24.494	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-54.995	-61.431	-6.437	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.683	-61.153	-4.470	(0)
H2V10O28-4	0.000e+00	0.000e+00	-60.993	-63.854	-2.861	(0)
Zn	2.578e-05					
Zn+2	1.092e-05	3.835e-06	-4.962	-5.416	-0.454	(0)
ZnSO4	9.215e-06	9.215e-06	-5.036	-5.036	0.000	(0)
Zn(SO4) 2-2	4.574e-06	8.813e-07	-5.340	-6.055	-0.715	(0)
ZnOH+	4.712e-07	3.122e-07	-6.327	-6.506	-0.179	(0)
ZnCO3	3.257e-07	3.257e-07	-6.487	-6.487	0.000	(0)
ZnCl+	8.310e-08	6.269e-08	-7.080	-7.203	-0.122	(0)
ZnHCO3+	7.115e-08	4.714e-08	-7.148	-7.327	-0.179	(0)
ZnOHCl	6.680e-08	6.680e-08	-7.175	-7.175	0.000	(0)
Zn(OH) 2	4.027e-08	4.027e-08	-7.395	-7.395	0.000	(0)
ZnF+	1.371e-08	9.085e-09	-7.863	-8.042	-0.179	(0)
ZnCl2	6.464e-10	6.464e-10	-9.189	-9.189	0.000	(0)
Zn(OH) 3-	2.479e-10	1.643e-10	-9.606	-9.784	-0.179	(0)
ZnCl3-	4.429e-12	3.341e-12	-11.354	-11.476	-0.122	(0)
ZnNO3+	2.245e-13	1.487e-13	-12.649	-12.828	-0.179	(0)
ZnSeO4	1.980e-13	1.980e-13	-12.703	-12.703	0.000	(0)
ZnCl4-2	3.091e-14	1.087e-14	-13.510	-13.964	-0.454	(0)
Zn(OH) 4-2	2.763e-14	5.322e-15	-13.559	-14.274	-0.715	(0)
Zn(NO3) 2	4.582e-22	4.582e-22	-21.339	-21.339	0.000	(0)
Zn(SeO4) 2-2	3.473e-22	6.692e-23	-21.459	-22.174	-0.715	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.292	-147.471	-0.179	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.297	-224.476	-0.179	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-55.15	-48.86	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-42.12	-37.61	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.35	-37.61	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-71.24	-53.31	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-56.47	-36.43	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.90	-28.50	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.39	-22.94	0.45	(NH4)2SeO4
Al(OH) 3(am)	-1.40	9.40	10.80	Al(OH) 3
Al2(MoO4) 3	-47.72	-45.36	2.37	Al2(MoO4) 3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4) 2(OH) 6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2(OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH) 2(CO3) 2
Ba(OH) 2:8H2O	-16.61	7.79	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-17.24	-1.37	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	-0.00	-8.91	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-26.51	6.43	32.94	Ba3(VO4) 2:4H2O

BaCrO4	-13.38	-23.05	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.56	-6.73	1.83	BaSeO3
BaSeO4	-10.04	-17.50	-7.46	BaSeO4
Bianchite	-5.62	-7.38	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.89	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.86	-77.38	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.45	13.39	16.84	Mg(OH)2
Bunsenite	-6.66	5.78	12.45	NiO
Ca(VO3)2	-9.45	-3.79	5.66	Ca(VO3)2
Ca2V2O7	-8.12	9.38	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.18	9.38	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.42	22.54	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.32	22.54	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-15.42	-17.68	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.18	-1.36	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.11	-12.13	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.41	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal(alpha)	-31.82	-18.31	13.51	Cd
Cdmetal(gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.87	-39.07	-20.20	CdSe
CdSeO4:2H2O	-16.21	-18.06	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.44	-40.54	-27.10	PbSe
Co(BO2)2	-28.70	-1.63	27.07	Co(BO2)2
Co(OH)2	-6.68	6.41	13.09	Co(OH)2
Co(OH)3	-10.91	-13.22	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-26.10	-13.06	13.03	Co3(AsO4)2
Co3O4	-9.53	-20.02	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.26	-15.24	-9.98	CoCO3

CoF2	-15.66	-17.26	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.32	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.69	-39.89	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.36	-18.89	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-22.44	-11.62	10.82	Cr (OH) 2
Cr (OH) 3	-3.13	-1.79	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-1.04	-1.79	-0.75	Cr (OH) 3
Cr2O3	-1.22	-3.58	-2.36	Cr2O3
CrCl2	-45.90	-31.81	14.09	CrCl2
CrCl3	-47.19	-32.07	15.11	CrCl3
CrF3	-25.95	-37.29	-11.34	CrF3
Crmetal	-67.64	-37.16	30.48	Cr
CrO3	-27.64	-30.85	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.17	-49.97	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.83	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.53	-88.02	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-17.16	-22.60	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.95	-38.05	-33.10	CuSe
CuSe2	-25.45	-58.81	-33.37	CuSe2
CuSeO3:2H2O	-6.79	-6.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.61	-17.05	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.79	-13.51	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.70	-8.15	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.58	-37.21	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-7.33	-0.13	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.02	-63.61	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.85	-42.85	-11.00	FeSe

Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.70	-79.06	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.90	2.77	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.34	-46.30	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.58	-258.29	-73.71	Hg (CH3) 2
Hg (g)	-6.71	-14.59	-7.87	Hg
Hg (OH) 2	-7.14	-10.64	-3.50	Hg (OH) 2
Hg2 (g)	-14.22	-29.18	-14.96	Hg2
Hg2 (OH) 2	-8.89	-3.63	5.26	Hg2 (OH) 2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.78	-34.48	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.50	-18.16	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF (g)	-46.32	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.25	-56.94	-55.69	HgSe
HgSeO3	-12.74	-25.17	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.85	-19.62	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.58	-49.82	-17.24	K2Cr2O7
K2CrO4	-18.46	-18.97	-0.51	K2CrO4
K2MoO4	-12.77	-9.51	3.26	K2MoO4
K2SeO4	-12.69	-13.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.93	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.13	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.84	-3.56	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.14	74.68	Mg2Sb3

Mg2V2O7	-16.53	9.83	26.36	Mg2V2O7
MgCr2O4	-6.39	9.81	16.20	MgCr2O4
MgCrO4	-22.84	-17.46	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.14	-7.99	-1.85	MgMoO4
MgSeO3:6H2O	-4.20	-1.14	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.70	-11.90	-1.20	MgSeO4:6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4:10H2O
Mn(VO3)2	-10.55	-5.65	4.90	Mn(VO3)2
Mn2(SO4)3	-50.15	-55.86	-5.71	Mn2(SO4)3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-10.88	1.62	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.60	-8.88	2.72	MnCl2:4H2O
MnS(grn)	-75.16	-74.99	0.17	MnS
MnS(pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.50	-35.00	3.50	MnSe
MnSeO3	-4.35	-3.22	1.13	MnSeO3
MnSeO3:2H2O	-4.21	-3.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.94	-13.99	-2.05	MnSeO4:5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.86	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.57	-19.77	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.40	-49.30	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.45	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.37	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.43	-2.13	10.30	Na2SeO3:5H2O
Na2SeO4	-14.17	-12.89	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.55	10.13	36.68	Na3VO4
Na4V2O7	-29.55	7.85	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-6.14	-2.28	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni(OH)2	-7.01	5.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-26.65	5.35	32.00	Ni4(OH)6SO4
NiCO3	-9.00	-15.87	-6.87	NiCO3
NiMoO4	-4.47	-15.61	-11.14	NiMoO4
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.82	-40.52	-17.70	NiSe
NiSeO3:2H2O	-11.57	-8.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.00	-19.52	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb(BO2)2	-8.79	-2.27	6.52	Pb(BO2)2
Pb(OH)2	-2.38	5.77	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-63.44	-72.20	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.65	11.54	26.19	Pb2O(OH)2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.52	-5.42	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.79	0.35	6.14	Pb3(VO4)2

Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.16	-0.47	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.80	5.30	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.48	-25.08	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn (OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.38	-18.88	-14.50	UO2CO3
Sb (OH) 3	-12.19	-19.30	-7.11	Sb (OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.75	-177.51	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6 (orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.61	-11.69	Sb
SbO2	-3.01	-30.83	-27.82	SbO2
Schoepite	-3.23	2.77	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.65	-20.76	-7.11	Se
Semetal (hex)	-13.05	-20.76	-7.71	Se
Senarmontite	-26.23	-38.59	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.25	-11.25	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.67	10.41	21.08	U3O8
U3Sb4	-576.78	-424.40	152.38	U3Sb4
U4O9	-25.67	-28.69	-3.02	U4O9
UF4	-31.36	-60.89	-29.54	UF4
UF4:2.5H2O	-28.18	-60.89	-32.72	UF4:2.5H2O
UO2 (am)	-14.49	-13.56	0.93	UO2
UO2 (NO3) 2	-40.82	-28.67	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.52	-28.67	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.06	-28.67	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.72	-28.67	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.84	2.77	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.28	-22.53	-2.25	UO2SeO4:4H2O
UO3	-4.93	2.77	7.70	UO3
Uraninite	-8.89	-13.56	-4.67	UO2
USb2	-218.67	-189.09	29.58	USb2
V (OH) 3	-19.02	-11.43	7.59	V (OH) 3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-40.42	-38.59	1.84	V3O5
V4O7	-50.12	-42.94	7.19	V4O7
V6O13	-41.10	-101.96	-60.86	V6O13
Valentinite	-30.11	-38.59	-8.48	Sb2O3

VC12	-63.26	-44.39	18.87	VC12
VC13	-65.14	-41.71	23.43	VC13
VF4	-66.61	-51.68	14.93	VF4
Vmetal	-93.77	-49.74	44.03	V
VO	-38.95	-24.20	14.76	VO
VO(OH)2	-9.50	-4.35	5.15	VO(OH)2
VO2Cl	-21.41	-18.57	2.84	VO2Cl
VOC1	-32.67	-21.52	11.15	VOC1
VOC12	-37.30	-24.54	12.76	VOC12
VOSO4	-25.73	-22.12	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.31	-7.38	3.93	ZnSO4
Zn(BO2)2	-5.93	2.36	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.36	-21.04	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.80	10.40	12.20	Zn(OH)2
Zn(OH)2(am)	-2.08	10.40	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.36	10.40	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.14	10.40	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.34	10.40	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.48	3.02	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.49	10.70	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.75	-1.10	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.26	-4.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.69	31.81	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.27	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.79	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.50	-35.90	-14.40	ZnSe
ZnSeO4:6H2O	-13.38	-14.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 60.

```

Title Stage 3 Pit lake Mix
Mix 303
304    0.015860
308    0.004200
1      0.009823
17     0.010640
16     0.000000
215    0.959477
Save solution 309
end

```

TITLE

Stage 3 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 303.

Mixture 303.

9.823e-03 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1 and PW-3 (representative of water used to rapidly re-fill pit)

1.064e-02 Solution 17 Average water quality for Background Surface Water SWQ-1 (representative of haul road and watershed run-off)

9.595e-01 Solution 215 Solution after simulation 50.

1.586e-02 Solution 304 Solution after simulation 55.

4.200e-03 Solution 308 Solution after simulation 59.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.151e-09	1.151e-09
Al	1.031e-07	1.031e-07
As	5.916e-09	5.917e-09
B	8.435e-06	8.436e-06
Ba	2.902e-09	2.903e-09
C	1.483e-03	1.483e-03
Ca	4.483e-04	4.484e-04
Cd	5.454e-10	5.454e-10
Cl	1.881e-03	1.882e-03
Co	3.964e-09	3.964e-09
Cr	6.758e-10	6.758e-10
Cu	2.007e-07	2.007e-07
F	8.149e-05	8.149e-05
Fe	7.397e-10	7.398e-10
Hg	8.782e-11	8.783e-11
K	2.316e-04	2.316e-04
Mg	3.204e-04	3.204e-04
Mn	2.634e-06	2.634e-06
Mo	7.520e-08	7.521e-08
N	6.190e-07	6.190e-07
Na	3.366e-03	3.367e-03
Ni	6.158e-09	6.159e-09
Pb	3.415e-10	3.416e-10
S	8.362e-04	8.362e-04
Sb	1.157e-09	1.157e-09
Se	6.885e-09	6.885e-09
Si	3.025e-04	3.025e-04
U	1.979e-08	1.979e-08
V	3.470e-10	3.470e-10
Zn	5.669e-07	5.669e-07

-----Description of solution-----

	pH	=	8.293	Charge balance
	pe	=	4.213	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.467e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.507e-03	
	Total CO2 (mol/kg)	=	1.483e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	7.324e-08	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	

Iterations = 9
Total H = 1.110235e+02
Total O = 5.551942e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.153e-06	1.975e-06	-5.667	-5.704	-0.038	(0)
H+	5.551e-09	5.098e-09	-8.256	-8.293	-0.037	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.151e-09					
AgCl	7.789e-10	7.789e-10	-9.108	-9.108	0.000	(0)
Ag+	2.404e-10	2.208e-10	-9.619	-9.656	-0.037	(0)
AgCl2-	1.288e-10	1.172e-10	-9.890	-9.931	-0.041	(0)
AgSO4-	2.648e-12	2.410e-12	-11.577	-11.618	-0.041	(0)
AgCl3-2	2.634e-13	1.805e-13	-12.579	-12.743	-0.164	(0)
AgOH	4.361e-14	4.361e-14	-13.360	-13.360	0.000	(0)
AgF	4.036e-14	4.036e-14	-13.394	-13.394	0.000	(0)
AgNO2	2.409e-14	2.409e-14	-13.618	-13.618	0.000	(0)
AgH2BO3	2.985e-15	2.985e-15	-14.525	-14.525	0.000	(0)
AgNH3+	2.236e-15	2.035e-15	-14.651	-14.692	-0.041	(0)
Ag2Se	1.605e-15	1.605e-15	-14.794	-14.794	0.000	(0)
AgCl4-3	1.490e-15	6.369e-16	-14.827	-15.196	-0.369	(0)
AgSeO3-	3.743e-16	3.406e-16	-15.427	-15.468	-0.041	(0)
Ag (OH) 2-	9.250e-18	8.416e-18	-17.034	-17.075	-0.041	(0)
Ag (NH3) 2+	8.203e-20	7.464e-20	-19.086	-19.127	-0.041	(0)
AgNO3	2.529e-20	2.529e-20	-19.597	-19.597	0.000	(0)
Ag (NO2) 2-	2.141e-20	1.948e-20	-19.669	-19.710	-0.041	(0)
Ag (SeO3) 2-3	1.713e-23	7.320e-24	-22.766	-23.135	-0.369	(0)
Ag2MoO4	9.871e-28	9.871e-28	-27.006	-27.006	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.781	-73.781	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.003	-82.659	-0.656	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.694	-146.811	-0.118	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.579	-147.620	-0.041	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.725	-147.959	-0.233	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.044	-148.270	-0.226	(0)
Al	1.031e-07					
Al (OH) 4-	1.027e-07	9.441e-08	-6.988	-7.025	-0.037	(0)
Al (OH) 3	3.797e-10	3.797e-10	-9.421	-9.421	0.000	(0)
Al (OH) 2+	1.047e-11	9.636e-12	-10.980	-11.016	-0.036	(0)
AlF2+	7.122e-14	6.557e-14	-13.147	-13.183	-0.036	(0)
AlF3	6.008e-14	6.008e-14	-13.221	-13.221	0.000	(0)
AlOH+2	8.549e-15	6.142e-15	-14.068	-14.212	-0.144	(0)
AlF+2	3.150e-15	2.263e-15	-14.502	-14.645	-0.144	(0)
AlF4-	2.384e-15	2.191e-15	-14.623	-14.659	-0.037	(0)
AlSO4+	1.437e-17	1.321e-17	-16.843	-16.879	-0.037	(0)
Al+3	6.691e-18	3.110e-18	-17.174	-17.507	-0.333	(0)
Al (SO4) 2-	8.422e-20	7.740e-20	-19.075	-19.111	-0.037	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.531	-55.901	-0.369	(0)
As (3)	1.379e-22					
H3AsO3	1.242e-22	1.242e-22	-21.906	-21.906	0.000	(0)
H2AsO3-	1.373e-23	1.250e-23	-22.862	-22.903	-0.041	(0)
HAsO3-2	3.262e-27	2.236e-27	-26.487	-26.651	-0.164	(0)
H4AsO3+	3.448e-31	3.137e-31	-30.462	-30.503	-0.041	(0)
AsO3-3	3.955e-32	1.691e-32	-31.403	-31.772	-0.369	(0)
As (5)	5.916e-09					
HAsO4-2	5.711e-09	3.914e-09	-8.243	-8.407	-0.164	(0)
H2AsO4-	2.000e-10	1.820e-10	-9.699	-9.740	-0.041	(0)
AsO4-3	5.681e-12	2.428e-12	-11.246	-11.615	-0.369	(0)
H3AsO4	1.610e-16	1.612e-16	-15.793	-15.793	0.001	(0)
B	8.435e-06					
H3BO3	7.477e-06	7.488e-06	-5.126	-5.126	0.001	(0)
H2BO3-	9.321e-07	8.531e-07	-6.031	-6.069	-0.038	(0)
CaH2BO3+	1.524e-08	1.395e-08	-7.817	-7.855	-0.038	(0)
MgH2BO3+	6.725e-09	6.155e-09	-8.172	-8.211	-0.038	(0)
NaH2BO3	4.164e-09	4.164e-09	-8.380	-8.380	0.000	(0)

	BF(OH) 3-	2.376e-10	2.174e-10	-9.624	-9.663	-0.038	(0)
	H5(BO3) 2-	5.941e-12	5.437e-12	-11.226	-11.265	-0.038	(0)
	BaH2BO3+	5.865e-14	5.367e-14	-13.232	-13.270	-0.038	(0)
	BF2(OH) 2-	9.424e-15	8.625e-15	-14.026	-14.064	-0.038	(0)
	H8(BO3) 3-	4.448e-15	4.071e-15	-14.352	-14.390	-0.038	(0)
	AgH2BO3	2.985e-15	2.985e-15	-14.525	-14.525	0.000	(0)
	BF3OH-	1.360e-21	1.245e-21	-20.866	-20.905	-0.038	(0)
	BF4-	2.484e-27	2.273e-27	-26.605	-26.643	-0.038	(0)
Ba		2.902e-09					
	Ba+2	2.862e-09	2.036e-09	-8.543	-8.691	-0.148	(0)
	BaHCO3+	2.776e-11	2.558e-11	-10.557	-10.592	-0.035	(0)
	BaCO3	1.264e-11	1.264e-11	-10.898	-10.898	0.000	(0)
	BaH2BO3+	5.865e-14	5.367e-14	-13.232	-13.270	-0.038	(0)
	BaOH+	1.908e-14	1.755e-14	-13.719	-13.756	-0.036	(0)
	BaNH3+2	8.459e-18	5.798e-18	-17.073	-17.237	-0.164	(0)
	BaNO3+	1.617e-18	1.472e-18	-17.791	-17.832	-0.041	(0)
C (4)		1.483e-03					
	HCO3-	1.429e-03	1.316e-03	-2.845	-2.881	-0.036	(0)
	CO3-2	1.701e-05	1.210e-05	-4.769	-4.917	-0.148	(0)
	H2CO3	1.509e-05	1.509e-05	-4.821	-4.821	0.000	(0)
	CaHCO3+	7.554e-06	6.963e-06	-5.122	-5.157	-0.035	(0)
	CaCO3	5.450e-06	5.450e-06	-5.264	-5.264	0.000	(0)
	MgHCO3+	3.052e-06	2.802e-06	-5.515	-5.553	-0.037	(0)
	NaHCO3	2.279e-06	2.279e-06	-5.642	-5.642	0.000	(0)
	MgCO3	2.094e-06	2.094e-06	-5.679	-5.679	0.000	(0)
	NaCO3-	7.538e-07	6.940e-07	-6.123	-6.159	-0.036	(0)
	CuCO3	1.669e-07	1.669e-07	-6.778	-6.778	0.000	(0)
	ZnCO3	1.539e-07	1.539e-07	-6.813	-6.813	0.000	(0)
	MnHCO3+	4.710e-08	4.333e-08	-7.327	-7.363	-0.036	(0)
	UO2(CO3) 3-4	1.291e-08	2.850e-09	-7.889	-8.545	-0.656	(0)
	ZnHCO3+	1.011e-08	9.195e-09	-7.995	-8.036	-0.041	(0)
	Cu(CO3) 2-2	7.931e-09	5.436e-09	-8.101	-8.265	-0.164	(0)
	UO2(CO3) 2-2	6.854e-09	4.698e-09	-8.164	-8.328	-0.164	(0)
	NiCO3	1.274e-09	1.274e-09	-8.895	-8.895	0.000	(0)
	NiHCO3+	5.030e-10	4.577e-10	-9.298	-9.339	-0.041	(0)
	CoCO3	4.172e-10	4.172e-10	-9.380	-9.380	0.000	(0)
	PbCO3	2.654e-10	2.654e-10	-9.576	-9.576	0.000	(0)
	CoHCO3+	2.294e-10	2.087e-10	-9.639	-9.680	-0.041	(0)
	CuHCO3+	2.137e-10	1.944e-10	-9.670	-9.711	-0.041	(0)
	CdCO3	7.401e-11	7.401e-11	-10.131	-10.131	0.000	(0)
	BaHCO3+	2.776e-11	2.558e-11	-10.557	-10.592	-0.035	(0)
	UO2CO3	1.946e-11	1.946e-11	-10.711	-10.711	0.000	(0)
	Pb(CO3) 2-2	1.351e-11	9.263e-12	-10.869	-11.033	-0.164	(0)
	BaCO3	1.264e-11	1.264e-11	-10.898	-10.898	0.000	(0)
	PbHCO3+	7.839e-12	7.133e-12	-11.106	-11.147	-0.041	(0)
	Cd(CO3) 2-2	9.688e-13	6.640e-13	-12.014	-12.178	-0.164	(0)
	CdHCO3+	8.835e-13	8.038e-13	-12.054	-12.095	-0.041	(0)
	FeHCO3+	2.463e-15	2.270e-15	-14.609	-14.644	-0.035	(0)
	HgCO3	3.672e-17	3.672e-17	-16.435	-16.435	0.000	(0)
	Hg(CO3) 2-2	2.050e-18	1.405e-18	-17.688	-17.852	-0.164	(0)
	HgHCO3+	3.831e-21	3.485e-21	-20.417	-20.458	-0.041	(0)
Ca		4.483e-04					
	Ca+2	3.994e-04	2.842e-04	-3.399	-3.546	-0.148	(0)
	CaSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
	CaHCO3+	7.554e-06	6.963e-06	-5.122	-5.157	-0.035	(0)
	CaCO3	5.450e-06	5.450e-06	-5.264	-5.264	0.000	(0)
	CaF+	2.453e-07	2.257e-07	-6.610	-6.646	-0.036	(0)
	CaH2BO3+	1.524e-08	1.395e-08	-7.817	-7.855	-0.038	(0)
	CaOH+	1.215e-08	1.120e-08	-7.915	-7.951	-0.035	(0)
	CaNH3+2	2.356e-12	1.615e-12	-11.628	-11.792	-0.164	(0)
	CaNO3+	1.424e-13	1.296e-13	-12.846	-12.887	-0.041	(0)
	Ca(NH3) 2+2	4.233e-21	2.901e-21	-20.373	-20.537	-0.164	(0)
Cd		5.454e-10					
	Cd+2	3.772e-10	2.683e-10	-9.423	-9.571	-0.148	(0)
	CdCO3	7.401e-11	7.401e-11	-10.131	-10.131	0.000	(0)
	CdCl+	4.866e-11	4.428e-11	-10.313	-10.354	-0.041	(0)
	CdSO4	3.441e-11	3.441e-11	-10.463	-10.463	0.000	(0)
	CdOH+	4.626e-12	4.209e-12	-11.335	-11.376	-0.041	(0)

	CdOHC1	3.587e-12	3.587e-12	-11.445	-11.445	0.000	(0)
	Cd(CO3) 2-2	9.688e-13	6.640e-13	-12.014	-12.178	-0.164	(0)
	CdHCO3+	8.835e-13	8.038e-13	-12.054	-12.095	-0.041	(0)
	Cd(SO4) 2-2	3.704e-13	2.539e-13	-12.431	-12.595	-0.164	(0)
	CdF+	3.401e-13	3.095e-13	-12.468	-12.509	-0.041	(0)
	CdCl2	3.189e-13	3.189e-13	-12.496	-12.496	0.000	(0)
	Cd(OH) 2	5.245e-14	5.245e-14	-13.280	-13.280	0.000	(0)
	CdCl3-	3.822e-16	3.477e-16	-15.418	-15.459	-0.041	(0)
	CdF2	4.494e-17	4.494e-17	-16.347	-16.347	0.000	(0)
	Cd(OH) 3-	6.956e-18	6.329e-18	-17.158	-17.199	-0.041	(0)
	CdSeO4	1.521e-19	1.521e-19	-18.818	-18.818	0.000	(0)
	CdNO3+	1.345e-19	1.224e-19	-18.871	-18.912	-0.041	(0)
	Cd2OH+3	1.324e-20	5.661e-21	-19.878	-20.247	-0.369	(0)
	Cd(SeO3) 2-2	1.859e-21	1.274e-21	-20.731	-20.895	-0.164	(0)
	Cd(OH) 4-2	2.985e-24	2.046e-24	-23.525	-23.689	-0.164	(0)
	Cd(NO3) 2	8.846e-30	8.846e-30	-29.053	-29.053	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.462	-79.503	-0.041	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.238	-150.238	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.237	-226.278	-0.041	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-301.857	-302.021	-0.164	(0)
C1	1.881e-03						
	Cl-	1.881e-03	1.728e-03	-2.725	-2.762	-0.037	(0)
	MnCl+	3.902e-09	3.590e-09	-8.409	-8.445	-0.036	(0)
	ZnOHC1	2.480e-09	2.480e-09	-8.606	-8.606	0.000	(0)
	ZnCl+	1.045e-09	9.591e-10	-8.981	-9.018	-0.037	(0)
	AgCl	7.789e-10	7.789e-10	-9.108	-9.108	0.000	(0)
	CuCl	1.528e-10	1.528e-10	-9.816	-9.816	0.000	(0)
	AgCl2-	1.288e-10	1.172e-10	-9.890	-9.931	-0.041	(0)
	CuCl2-	6.007e-11	5.516e-11	-10.221	-10.258	-0.037	(0)
	CdCl+	4.866e-11	4.428e-11	-10.313	-10.354	-0.041	(0)
	NiCl+	1.371e-11	1.247e-11	-10.863	-10.904	-0.041	(0)
	CoCl+	1.340e-11	1.219e-11	-10.873	-10.914	-0.041	(0)
	MnCl2	8.763e-12	8.763e-12	-11.057	-11.057	0.000	(0)
	CuCl+	6.985e-12	6.413e-12	-11.156	-11.193	-0.037	(0)
	CdOHC1	3.587e-12	3.587e-12	-11.445	-11.445	0.000	(0)
	ZnCl2	2.627e-12	2.627e-12	-11.581	-11.581	0.000	(0)
	PbCl+	4.915e-13	4.473e-13	-12.308	-12.349	-0.041	(0)
	CdCl2	3.189e-13	3.189e-13	-12.496	-12.496	0.000	(0)
	AgCl3-2	2.634e-13	1.805e-13	-12.579	-12.743	-0.164	(0)
	CuCl3-2	2.845e-14	2.038e-14	-13.546	-13.691	-0.145	(0)
	HgClOH	1.528e-14	1.528e-14	-13.816	-13.816	0.000	(0)
	MnCl3-	4.533e-15	4.170e-15	-14.344	-14.380	-0.036	(0)
	ZnCl3-	3.926e-15	3.605e-15	-14.406	-14.443	-0.037	(0)
	CuCl2	3.842e-15	3.842e-15	-14.415	-14.415	0.000	(0)
	PbCl2	3.452e-15	3.452e-15	-14.462	-14.462	0.000	(0)
	AgCl4-3	1.490e-15	6.369e-16	-14.827	-15.196	-0.369	(0)
	HgCl2	7.570e-16	7.570e-16	-15.121	-15.121	0.000	(0)
	CdCl3-	3.822e-16	3.477e-16	-15.418	-15.459	-0.041	(0)
	NiCl2	1.085e-16	1.085e-16	-15.964	-15.964	0.000	(0)
	HgCl3-	1.438e-17	1.308e-17	-16.842	-16.883	-0.041	(0)
	ZnCl4-2	4.349e-18	3.115e-18	-17.362	-17.507	-0.145	(0)
	PbCl3-	2.610e-18	2.375e-18	-17.583	-17.624	-0.041	(0)
	UO2Cl+	1.244e-18	1.132e-18	-17.905	-17.946	-0.041	(0)
	HgCl4-2	1.313e-19	8.998e-20	-18.882	-19.046	-0.164	(0)
	CrCl+2	1.068e-19	7.322e-20	-18.971	-19.135	-0.164	(0)
	HgCl+	9.606e-20	8.741e-20	-19.017	-19.058	-0.041	(0)
	CuCl3-	6.749e-20	6.196e-20	-19.171	-19.208	-0.037	(0)
	CrOHC12	4.749e-21	4.749e-21	-20.323	-20.323	0.000	(0)
	PbCl4-2	2.737e-21	1.876e-21	-20.563	-20.727	-0.164	(0)
	FeCl+2	1.514e-23	1.085e-23	-22.820	-22.965	-0.145	(0)
	CrCl2+	1.319e-23	1.200e-23	-22.880	-22.921	-0.041	(0)
	CuCl4-2	7.492e-25	5.366e-25	-24.125	-24.270	-0.145	(0)
	FeCl2+	9.100e-26	8.372e-26	-25.041	-25.077	-0.036	(0)
	VOCl+	6.712e-26	6.108e-26	-25.173	-25.214	-0.041	(0)
	CrO3Cl-	3.565e-27	3.244e-27	-26.448	-26.489	-0.041	(0)
	FeCl3	1.447e-29	1.447e-29	-28.840	-28.840	0.000	(0)
	CoCl+2	6.801e-38	4.661e-38	-37.167	-37.331	-0.164	(0)
	UCl+3	0.000e+00	0.000e+00	-48.468	-48.837	-0.369	(0)

Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.942	-53.106	-0.164	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.054	-55.218	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.003	-68.167	-0.164	(0)
Co (2)	3.964e-09					
Co+2	2.975e-09	2.039e-09	-8.526	-8.691	-0.164	(0)
CoCO3	4.172e-10	4.172e-10	-9.380	-9.380	0.000	(0)
CoHCO3+	2.294e-10	2.087e-10	-9.639	-9.680	-0.041	(0)
CoSO4	2.226e-10	2.226e-10	-9.653	-9.653	0.000	(0)
CoOH+	8.832e-11	8.036e-11	-10.054	-10.095	-0.041	(0)
CoCl+	1.340e-11	1.219e-11	-10.873	-10.914	-0.041	(0)
Co (OH) 2	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
CoF+	5.158e-12	4.693e-12	-11.288	-11.329	-0.041	(0)
CoNO2+	8.248e-15	7.504e-15	-14.084	-14.125	-0.041	(0)
Co (NH3) +2	1.615e-15	1.107e-15	-14.792	-14.956	-0.164	(0)
Co (OH) 3-	5.460e-16	4.968e-16	-15.263	-15.304	-0.041	(0)
CoOOH-	1.370e-16	1.247e-16	-15.863	-15.904	-0.041	(0)
CoSeO4	3.111e-18	3.111e-18	-17.507	-17.507	0.000	(0)
CoNO3+	5.123e-19	4.661e-19	-18.290	-18.331	-0.041	(0)
Co2OH+3	1.922e-20	8.213e-21	-19.716	-20.085	-0.369	(0)
Co (NH3) 2+2	3.108e-22	2.131e-22	-21.507	-21.672	-0.164	(0)
Co (OH) 4-2	2.269e-22	1.555e-22	-21.644	-21.808	-0.164	(0)
Co (NO3) 2	1.368e-28	1.368e-28	-27.864	-27.864	0.000	(0)
Co (NH3) 3+2	1.766e-29	1.211e-29	-28.753	-28.917	-0.164	(0)
Co4 (OH) 4+4	3.771e-32	8.321e-33	-31.424	-32.080	-0.656	(0)
Co (NH3) 4+2	4.184e-37	2.867e-37	-36.378	-36.543	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.504	-44.668	-0.164	(0)
Co (3)	1.941e-30					
CoOH+2	1.941e-30	1.331e-30	-29.712	-29.876	-0.164	(0)
Co+3	2.853e-37	1.326e-37	-36.545	-36.878	-0.333	(0)
CoCl+2	6.801e-38	4.661e-38	-37.167	-37.331	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.942	-53.106	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.700	-63.741	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.745	-66.909	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.003	-68.167	-0.164	(0)
Cr (2)	6.988e-28					
Cr+2	6.988e-28	4.790e-28	-27.156	-27.320	-0.164	(0)
Cr (3)	6.758e-10					
Cr (OH) 2+	3.736e-10	3.400e-10	-9.428	-9.469	-0.041	(0)
Cr (OH) 3	2.522e-10	2.522e-10	-9.598	-9.598	0.000	(0)
CrO2-	2.583e-11	2.350e-11	-10.588	-10.629	-0.041	(0)
Cr (OH) 4-	2.180e-11	1.983e-11	-10.662	-10.703	-0.041	(0)
Cr (OH) +2	2.064e-12	1.415e-12	-11.685	-11.849	-0.164	(0)
CrOHSO4	1.836e-13	1.836e-13	-12.736	-12.736	0.000	(0)
CrF+2	5.510e-16	3.777e-16	-15.259	-15.423	-0.164	(0)
Cr+3	7.660e-17	3.274e-17	-16.116	-16.485	-0.369	(0)
CrSO4+	4.596e-17	4.182e-17	-16.338	-16.379	-0.041	(0)
CrCl+2	1.068e-19	7.322e-20	-18.971	-19.135	-0.164	(0)
CrOHCl2	4.749e-21	4.749e-21	-20.323	-20.323	0.000	(0)
Cr2 (OH) 2SO4+2	3.426e-23	2.348e-23	-22.465	-22.629	-0.164	(0)
CrCl2+	1.319e-23	1.200e-23	-22.880	-22.921	-0.041	(0)
Cr2 (OH) 2 (SO4) 2	7.630e-25	7.630e-25	-24.117	-24.117	0.000	(0)
CrNO3+2	3.012e-28	2.064e-28	-27.521	-27.685	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.380	-43.545	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.189	-53.558	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.054	-55.218	-0.164	(0)
Cr (6)	5.116e-15					
CrO4-2	4.989e-15	3.549e-15	-14.302	-14.450	-0.148	(0)
HCrO4-	6.434e-17	5.854e-17	-16.191	-16.233	-0.041	(0)
NaCrO4-	5.970e-17	5.432e-17	-16.224	-16.265	-0.041	(0)
KCrO4-	3.071e-18	2.794e-18	-17.513	-17.554	-0.041	(0)
H2CrO4	2.419e-25	2.419e-25	-24.616	-24.616	0.000	(0)
CrO3SO4-2	7.256e-26	4.973e-26	-25.139	-25.303	-0.164	(0)
CrO3Cl-	3.565e-27	3.244e-27	-26.448	-26.489	-0.041	(0)
Cr2O7-2	1.734e-31	1.189e-31	-30.761	-30.925	-0.164	(0)
Cu (1)	2.901e-10					
CuCl	1.528e-10	1.528e-10	-9.816	-9.816	0.000	(0)
Cu+	7.719e-11	7.023e-11	-10.112	-10.153	-0.041	(0)
CuCl2-	6.007e-11	5.516e-11	-10.221	-10.258	-0.037	(0)

		CuCl3-2	2.845e-14	2.038e-14	-13.546	-13.691	-0.145	(0)
		Cu (S4) 2-3	0.000e+00	0.000e+00	-145.828	-146.057	-0.230	(0)
		CuS4S5-3	0.000e+00	0.000e+00	-146.565	-146.787	-0.222	(0)
Cu (2)	2.004e-07							
		CuCO3	1.669e-07	1.669e-07	-6.778	-6.778	0.000	(0)
		CuOH+	1.593e-08	1.463e-08	-7.798	-7.835	-0.037	(0)
		Cu (CO3) 2-2	7.931e-09	5.436e-09	-8.101	-8.265	-0.164	(0)
		Cu (OH) 2	5.763e-09	5.763e-09	-8.239	-8.239	0.000	(0)
		Cu+2	3.292e-09	2.342e-09	-8.483	-8.630	-0.148	(0)
		CuSO4	2.935e-10	2.935e-10	-9.532	-9.532	0.000	(0)
		CuHCO3+	2.137e-10	1.944e-10	-9.670	-9.711	-0.041	(0)
		Cu (OH) 3-	2.566e-11	2.335e-11	-10.591	-10.632	-0.041	(0)
		CuF+	1.182e-11	1.075e-11	-10.927	-10.968	-0.041	(0)
		Cu2 (OH) 2+2	7.840e-12	5.373e-12	-11.106	-11.270	-0.164	(0)
		CuCl+	6.985e-12	6.413e-12	-11.156	-11.193	-0.037	(0)
		CuNH3+2	1.578e-13	1.082e-13	-12.802	-12.966	-0.164	(0)
		CuNO2+	1.407e-13	1.280e-13	-12.852	-12.893	-0.041	(0)
		CuCl2	3.842e-15	3.842e-15	-14.415	-14.415	0.000	(0)
		Cu (OH) 4-2	5.295e-16	3.629e-16	-15.276	-15.440	-0.164	(0)
		CuNO3+	1.174e-18	1.068e-18	-17.930	-17.971	-0.041	(0)
		Cu (NO2) 2	6.842e-19	6.842e-19	-18.165	-18.165	0.000	(0)
		CuCl3-	6.749e-20	6.196e-20	-19.171	-19.208	-0.037	(0)
		CuCl4-2	7.492e-25	5.366e-25	-24.125	-24.270	-0.145	(0)
		Cu (NO3) 2	1.939e-29	1.939e-29	-28.712	-28.712	0.000	(0)
		Cu (HS) 3-	0.000e+00	0.000e+00	-216.509	-216.550	-0.041	(0)
F	8.149e-05							
		F-	7.924e-05	7.278e-05	-4.101	-4.138	-0.037	(0)
		MgF+	1.849e-06	1.699e-06	-5.733	-5.770	-0.037	(0)
		CaF+	2.453e-07	2.257e-07	-6.610	-6.646	-0.036	(0)
		NaF	1.414e-07	1.414e-07	-6.849	-6.849	0.000	(0)
		MnF+	5.198e-09	4.782e-09	-8.284	-8.320	-0.036	(0)
		HF	5.487e-10	5.487e-10	-9.261	-9.261	0.000	(0)
		ZnF+	3.526e-10	3.209e-10	-9.453	-9.494	-0.041	(0)
		BF (OH) 3-	2.376e-10	2.174e-10	-9.624	-9.663	-0.038	(0)
		CuF+	1.182e-11	1.075e-11	-10.927	-10.968	-0.041	(0)
		NiF+	5.669e-12	5.158e-12	-11.247	-11.288	-0.041	(0)
		CoF+	5.158e-12	4.693e-12	-11.288	-11.329	-0.041	(0)
		CdF+	3.401e-13	3.095e-13	-12.468	-12.509	-0.041	(0)
		HF2-	1.655e-13	1.518e-13	-12.781	-12.819	-0.038	(0)
		AlF2+	7.122e-14	6.557e-14	-13.147	-13.183	-0.036	(0)
		AlF3	6.008e-14	6.008e-14	-13.221	-13.221	0.000	(0)
		PbF+	4.112e-14	3.741e-14	-13.386	-13.427	-0.041	(0)
		AgF	4.036e-14	4.036e-14	-13.394	-13.394	0.000	(0)
		BF2 (OH) 2-	9.424e-15	8.625e-15	-14.026	-14.064	-0.038	(0)
		UO2F+	4.459e-15	4.057e-15	-14.351	-14.392	-0.041	(0)
		AlF+2	3.150e-15	2.263e-15	-14.502	-14.645	-0.144	(0)
		AlF4-	2.384e-15	2.191e-15	-14.623	-14.659	-0.037	(0)
		UO2F2	8.515e-16	8.515e-16	-15.070	-15.070	0.000	(0)
		CrF+2	5.510e-16	3.777e-16	-15.259	-15.423	-0.164	(0)
		PbF2	5.358e-17	5.358e-17	-16.271	-16.271	0.000	(0)
		CdF2	4.494e-17	4.494e-17	-16.347	-16.347	0.000	(0)
		UO2F3-	1.711e-17	1.557e-17	-16.767	-16.808	-0.041	(0)
		H2F2	8.067e-19	8.067e-19	-18.093	-18.093	0.000	(0)
		FeF2+	3.511e-20	3.230e-20	-19.455	-19.491	-0.036	(0)
		FeF+2	2.316e-20	1.659e-20	-19.635	-19.780	-0.145	(0)
		UO2F4-2	1.313e-20	8.998e-21	-19.882	-20.046	-0.164	(0)
		VO2F	1.263e-20	1.263e-20	-19.898	-19.898	0.000	(0)
		PbF3-	8.129e-21	7.396e-21	-20.090	-20.131	-0.041	(0)
		FeF3	3.317e-21	3.317e-21	-20.479	-20.479	0.000	(0)
		BF3OH-	1.360e-21	1.245e-21	-20.866	-20.905	-0.038	(0)
		VO2F2-	3.669e-22	3.338e-22	-21.435	-21.476	-0.041	(0)
		VOF+	6.044e-24	5.500e-24	-23.219	-23.260	-0.041	(0)
		VO2F3-2	4.422e-25	3.031e-25	-24.354	-24.518	-0.164	(0)
		PbF4-2	3.759e-25	2.576e-25	-24.425	-24.589	-0.164	(0)
		VOF2	1.501e-25	1.501e-25	-24.824	-24.824	0.000	(0)
		HgF+	7.517e-27	6.839e-27	-26.124	-26.165	-0.041	(0)
		BF4-	2.484e-27	2.273e-27	-26.605	-26.643	-0.038	(0)
		Sb (OH) 2F	7.228e-28	7.228e-28	-27.141	-27.141	0.000	(0)

SbOF	7.108e-28	7.108e-28	-27.148	-27.148	0.000	(0)
VOF3-	4.259e-28	3.875e-28	-27.371	-27.412	-0.041	(0)
VO2F4-3	2.539e-29	1.085e-29	-28.595	-28.964	-0.369	(0)
VOF4-2	1.661e-31	1.138e-31	-30.780	-30.944	-0.164	(0)
SiF6-2	6.234e-32	4.465e-32	-31.205	-31.350	-0.145	(0)
UF3+	2.836e-39	2.581e-39	-38.547	-38.588	-0.041	(0)
UF2+2	3.265e-40	2.237e-40	-39.486	-39.650	-0.164	(0)
UF4	0.000e+00	0.000e+00	-40.686	-40.686	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.243	-42.612	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.185	-43.226	-0.041	(0)
UF6-2	0.000e+00	0.000e+00	-44.720	-44.884	-0.164	(0)
Fe (2)	2.325e-13					
Fe+2	1.999e-13	1.370e-13	-12.699	-12.863	-0.164	(0)
FeSO4	1.840e-14	1.840e-14	-13.735	-13.735	0.000	(0)
FeOH+	1.171e-14	1.077e-14	-13.931	-13.968	-0.036	(0)
FeHCO3+	2.463e-15	2.270e-15	-14.609	-14.644	-0.035	(0)
Fe (OH) 2	1.690e-17	1.690e-17	-16.772	-16.772	0.000	(0)
Fe (OH) 3-	1.147e-17	1.056e-17	-16.940	-16.977	-0.036	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.792	-159.792	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.654	-235.695	-0.041	(0)
Fe (3)	7.395e-10					
Fe (OH) 3	4.320e-10	4.320e-10	-9.365	-9.365	0.000	(0)
Fe (OH) 2+	2.212e-10	2.037e-10	-9.655	-9.691	-0.036	(0)
Fe (OH) 4-	8.628e-11	7.944e-11	-10.064	-10.100	-0.036	(0)
FeOH+2	3.700e-16	2.651e-16	-15.432	-15.577	-0.145	(0)
FeF2+	3.511e-20	3.230e-20	-19.455	-19.491	-0.036	(0)
FeF+2	2.316e-20	1.659e-20	-19.635	-19.780	-0.145	(0)
FeF3	3.317e-21	3.317e-21	-20.479	-20.479	0.000	(0)
FeSO4+	1.387e-21	1.276e-21	-20.858	-20.894	-0.036	(0)
Fe+3	4.472e-22	2.079e-22	-21.349	-21.682	-0.333	(0)
Fe (SO4) 2-	1.640e-23	1.492e-23	-22.785	-22.826	-0.041	(0)
FeCl+2	1.514e-23	1.085e-23	-22.820	-22.965	-0.145	(0)
FeCl2+	9.100e-26	8.372e-26	-25.041	-25.077	-0.036	(0)
FeHSeO3+2	2.463e-27	1.688e-27	-26.609	-26.773	-0.164	(0)
FeCl3	1.447e-29	1.447e-29	-28.840	-28.840	0.000	(0)
Fe2 (OH) 2+4	1.054e-29	2.326e-30	-28.977	-29.633	-0.656	(0)
FeNO3+2	4.374e-31	2.998e-31	-30.359	-30.523	-0.164	(0)
Fe3 (OH) 4+5	7.261e-38	6.848e-39	-37.139	-38.164	-1.025	(0)
H (0)	1.378e-28					
H2	6.888e-29	6.898e-29	-28.162	-28.161	0.001	(0)
Hg (0)	8.774e-11					
Hg	8.774e-11	8.774e-11	-10.057	-10.057	0.000	(0)
Hg (1)	4.407e-25					
Hg2+2	2.203e-25	1.510e-25	-24.657	-24.821	-0.164	(0)
Hg (2)	7.839e-14					
Hg (OH) 2	6.230e-14	6.240e-14	-13.205	-13.205	0.001	(0)
HgClOH	1.528e-14	1.528e-14	-13.816	-13.816	0.000	(0)
HgCl2	7.570e-16	7.570e-16	-15.121	-15.121	0.000	(0)
HgCO3	3.672e-17	3.672e-17	-16.435	-16.435	0.000	(0)
HgCl3-	1.438e-17	1.308e-17	-16.842	-16.883	-0.041	(0)
Hg (CO3) 2-2	2.050e-18	1.405e-18	-17.688	-17.852	-0.164	(0)
HgOH+	2.191e-19	1.993e-19	-18.659	-18.700	-0.041	(0)
HgCl4-2	1.313e-19	8.998e-20	-18.882	-19.046	-0.164	(0)
HgCl+	9.606e-20	8.741e-20	-19.017	-19.058	-0.041	(0)
Hg (OH) 3-	1.705e-20	1.551e-20	-19.768	-19.809	-0.041	(0)
HgHCO3+	3.831e-21	3.485e-21	-20.417	-20.458	-0.041	(0)
Hg (NH3) 2+2	4.754e-23	3.259e-23	-22.323	-22.487	-0.164	(0)
HgNH3+2	1.053e-23	7.220e-24	-22.977	-23.141	-0.164	(0)
Hg+2	3.699e-24	2.535e-24	-23.432	-23.596	-0.164	(0)
HgSO4	3.631e-25	3.631e-25	-24.440	-24.440	0.000	(0)
HgF+	7.517e-27	6.839e-27	-26.124	-26.165	-0.041	(0)
Hg (NH3) 3+2	8.543e-31	5.855e-31	-30.068	-30.232	-0.164	(0)
HgNO3+	1.484e-34	1.350e-34	-33.829	-33.870	-0.041	(0)
Hg (NH3) 4+2	3.063e-38	2.099e-38	-37.514	-37.678	-0.164	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.092	-44.092	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.213	-139.254	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-139.506	-139.670	-0.164	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.153	-141.153	0.000	(0)

K	2.316e-04					
K+	2.307e-04	2.119e-04	-3.637	-3.674	-0.037	(0)
KSO4-	8.913e-07	8.206e-07	-6.050	-6.086	-0.036	(0)
KCrO4-	3.071e-18	2.794e-18	-17.513	-17.554	-0.041	(0)
Mg	3.204e-04					
Mg+2	2.925e-04	2.081e-04	-3.534	-3.682	-0.148	(0)
MgSO4	2.071e-05	2.071e-05	-4.684	-4.684	0.000	(0)
MgHCO3+	3.052e-06	2.802e-06	-5.515	-5.553	-0.037	(0)
MgCO3	2.094e-06	2.094e-06	-5.679	-5.679	0.000	(0)
MgF+	1.849e-06	1.699e-06	-5.733	-5.770	-0.037	(0)
MgOH+	1.773e-07	1.636e-07	-6.751	-6.786	-0.035	(0)
MgH2BO3+	6.725e-09	6.155e-09	-8.172	-8.211	-0.038	(0)
Mn (2)	2.634e-06					
Mn+2	2.408e-06	1.650e-06	-5.618	-5.782	-0.164	(0)
MnSO4	1.605e-07	1.605e-07	-6.794	-6.794	0.000	(0)
MnHCO3+	4.710e-08	4.333e-08	-7.327	-7.363	-0.036	(0)
MnOH+	8.900e-09	8.187e-09	-8.051	-8.087	-0.036	(0)
MnF+	5.198e-09	4.782e-09	-8.284	-8.320	-0.036	(0)
MnCl+	3.902e-09	3.590e-09	-8.409	-8.445	-0.036	(0)
MnCl2	8.763e-12	8.763e-12	-11.057	-11.057	0.000	(0)
MnCl3-	4.533e-15	4.170e-15	-14.344	-14.380	-0.036	(0)
MnSeO4	1.352e-15	1.352e-15	-14.869	-14.869	0.000	(0)
MnNO3+	4.146e-16	3.772e-16	-15.382	-15.423	-0.041	(0)
Mn (OH) 3-	2.145e-16	1.974e-16	-15.668	-15.705	-0.036	(0)
Mn (OH) 4-2	1.757e-21	1.258e-21	-20.755	-20.900	-0.145	(0)
Mn (NO3) 2	1.367e-25	1.367e-25	-24.864	-24.864	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.561	-41.561	0.000	(0)
Mn (3)	2.590e-27					
Mn+3	2.590e-27	1.204e-27	-26.587	-26.919	-0.333	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-40.867	-41.012	-0.145	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.133	-46.171	-0.038	(0)
Mo	7.520e-08					
MoO4-2	7.520e-08	5.349e-08	-7.124	-7.272	-0.148	(0)
HMoO4-	5.963e-12	5.426e-12	-11.225	-11.266	-0.041	(0)
H2MoO4	2.026e-16	2.026e-16	-15.693	-15.693	0.000	(0)
Ag2MoO4	9.871e-28	9.871e-28	-27.006	-27.006	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.531	-55.901	-0.369	(0)
Mo7O24-6	0.000e+00	0.000e+00	-62.776	-64.253	-1.477	(0)
HMo7O24-5	0.000e+00	0.000e+00	-65.133	-66.159	-1.025	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-69.013	-69.669	-0.656	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-74.346	-74.716	-0.369	(0)
N (-3)	4.886e-08					
NH4+	4.409e-08	4.035e-08	-7.356	-7.394	-0.038	(0)
NH3	4.513e-09	4.513e-09	-8.345	-8.345	0.000	(0)
NH4SO4-	2.571e-10	2.365e-10	-9.590	-9.626	-0.036	(0)
CaNH3+2	2.356e-12	1.615e-12	-11.628	-11.792	-0.164	(0)
CuNH3+2	1.578e-13	1.082e-13	-12.802	-12.966	-0.164	(0)
NiNH3+2	9.978e-15	6.839e-15	-14.001	-14.165	-0.164	(0)
AgNH3+	2.236e-15	2.035e-15	-14.651	-14.692	-0.041	(0)
Co (NH3) +2	1.615e-15	1.107e-15	-14.792	-14.956	-0.164	(0)
BaNH3+2	8.459e-18	5.798e-18	-17.073	-17.237	-0.164	(0)
Ag (NH3) 2+	8.203e-20	7.464e-20	-19.086	-19.127	-0.041	(0)
Ni (NH3) 2+2	6.509e-21	4.461e-21	-20.186	-20.351	-0.164	(0)
Ca (NH3) 2+2	4.233e-21	2.901e-21	-20.373	-20.537	-0.164	(0)
Co (NH3) 2+2	3.108e-22	2.131e-22	-21.507	-21.672	-0.164	(0)
Hg (NH3) 2+2	4.754e-23	3.259e-23	-22.323	-22.487	-0.164	(0)
HgNH3+2	1.053e-23	7.220e-24	-22.977	-23.141	-0.164	(0)
Co (NH3) 3+2	1.766e-29	1.211e-29	-28.753	-28.917	-0.164	(0)
Hg (NH3) 3+2	8.543e-31	5.855e-31	-30.068	-30.232	-0.164	(0)
Co (NH3) 4+2	4.184e-37	2.867e-37	-36.378	-36.543	-0.164	(0)
Hg (NH3) 4+2	3.063e-38	2.099e-38	-37.514	-37.678	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.380	-43.545	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.504	-44.668	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.942	-53.106	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.189	-53.558	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.054	-55.218	-0.164	(0)

	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.700	-63.741	-0.041	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.745	-66.909	-0.164	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.003	-68.167	-0.164	(0)
N (3)	5.699e-07						
	NO2-	5.699e-07	5.222e-07	-6.244	-6.282	-0.038	(0)
	CuNO2+	1.407e-13	1.280e-13	-12.852	-12.893	-0.041	(0)
	AgNO2	2.409e-14	2.409e-14	-13.618	-13.618	0.000	(0)
	CoNO2+	8.248e-15	7.504e-15	-14.084	-14.125	-0.041	(0)
	Cu (NO2) 2	6.842e-19	6.842e-19	-18.165	-18.165	0.000	(0)
	Ag (NO2) 2-	2.141e-20	1.948e-20	-19.669	-19.710	-0.041	(0)
N (5)	1.572e-10						
	NO3-	1.570e-10	1.442e-10	-9.804	-9.841	-0.037	(0)
	CaNO3+	1.424e-13	1.296e-13	-12.846	-12.887	-0.041	(0)
	MnNO3+	4.146e-16	3.772e-16	-15.382	-15.423	-0.041	(0)
	ZnNO3+	8.798e-17	8.005e-17	-16.056	-16.097	-0.041	(0)
	BaNO3+	1.617e-18	1.472e-18	-17.791	-17.832	-0.041	(0)
	CuNO3+	1.174e-18	1.068e-18	-17.930	-17.971	-0.041	(0)
	NiNO3+	1.123e-18	1.022e-18	-17.949	-17.990	-0.041	(0)
	CoNO3+	5.123e-19	4.661e-19	-18.290	-18.331	-0.041	(0)
	CdNO3+	1.345e-19	1.224e-19	-18.871	-18.912	-0.041	(0)
	AgNO3	2.529e-20	2.529e-20	-19.597	-19.597	0.000	(0)
	PbNO3+	1.710e-20	1.556e-20	-19.767	-19.808	-0.041	(0)
	Mn (NO3) 2	1.367e-25	1.367e-25	-24.864	-24.864	0.000	(0)
	UO2NO3+	1.277e-25	1.162e-25	-24.894	-24.935	-0.041	(0)
	Zn (NO3) 2	2.304e-27	2.304e-27	-26.638	-26.638	0.000	(0)
	CrNO3+2	3.012e-28	2.064e-28	-27.521	-27.685	-0.164	(0)
	Co (NO3) 2	1.368e-28	1.368e-28	-27.864	-27.864	0.000	(0)
	Cu (NO3) 2	1.939e-29	1.939e-29	-28.712	-28.712	0.000	(0)
	Cd (NO3) 2	8.846e-30	8.846e-30	-29.053	-29.053	0.000	(0)
	VO2NO3	7.221e-30	7.221e-30	-29.141	-29.141	0.000	(0)
	Pb (NO3) 2	3.812e-30	3.812e-30	-29.419	-29.419	0.000	(0)
	FeNO3+2	4.374e-31	2.998e-31	-30.359	-30.523	-0.164	(0)
	HgNO3+	1.484e-34	1.350e-34	-33.829	-33.870	-0.041	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-44.092	-44.092	0.000	(0)
Na	3.366e-03						
	Na+	3.353e-03	3.080e-03	-2.475	-2.511	-0.037	(0)
	NaSO4-	9.827e-06	9.047e-06	-5.008	-5.043	-0.036	(0)
	NaHCO3	2.279e-06	2.279e-06	-5.642	-5.642	0.000	(0)
	NaCO3-	7.538e-07	6.940e-07	-6.123	-6.159	-0.036	(0)
	NaF	1.414e-07	1.414e-07	-6.849	-6.849	0.000	(0)
	NaH2BO3	4.164e-09	4.164e-09	-8.380	-8.380	0.000	(0)
	NaCrO4-	5.970e-17	5.432e-17	-16.224	-16.265	-0.041	(0)
Ni	6.158e-09						
	Ni+2	3.966e-09	2.821e-09	-8.402	-8.550	-0.148	(0)
	NiCO3	1.274e-09	1.274e-09	-8.895	-8.895	0.000	(0)
	NiHCO3+	5.030e-10	4.577e-10	-9.298	-9.339	-0.041	(0)
	NiSO4	3.079e-10	3.079e-10	-9.512	-9.512	0.000	(0)
	NiOH+	7.710e-11	7.015e-11	-10.113	-10.154	-0.041	(0)
	NiCl+	1.371e-11	1.247e-11	-10.863	-10.904	-0.041	(0)
	Ni (OH) 2	1.101e-11	1.101e-11	-10.958	-10.958	0.000	(0)
	NiF+	5.669e-12	5.158e-12	-11.247	-11.288	-0.041	(0)
	Ni (OH) 3-	2.389e-14	2.174e-14	-13.622	-13.663	-0.041	(0)
	NiNH3+2	9.978e-15	6.839e-15	-14.001	-14.165	-0.164	(0)
	Ni (SO4) 2-2	8.138e-15	5.578e-15	-14.089	-14.254	-0.164	(0)
	NiCl2	1.085e-16	1.085e-16	-15.964	-15.964	0.000	(0)
	NiSeO4	4.017e-18	4.017e-18	-17.396	-17.396	0.000	(0)
	NiNO3+	1.123e-18	1.022e-18	-17.949	-17.990	-0.041	(0)
	Ni (NH3) 2+2	6.509e-21	4.461e-21	-20.186	-20.351	-0.164	(0)
O (0)	2.127e-36						
	O2	1.063e-36	1.065e-36	-35.973	-35.973	0.001	(0)
Pb	3.415e-10						
	PbCO3	2.654e-10	2.654e-10	-9.576	-9.576	0.000	(0)
	PbOH+	3.977e-11	3.619e-11	-10.400	-10.441	-0.041	(0)
	Pb (CO3) 2-2	1.351e-11	9.263e-12	-10.869	-11.033	-0.164	(0)
	Pb+2	1.025e-11	7.295e-12	-10.989	-11.137	-0.148	(0)
	PbHCO3+	7.839e-12	7.133e-12	-11.106	-11.147	-0.041	(0)
	Pb (OH) 2	2.260e-12	2.260e-12	-11.646	-11.646	0.000	(0)
	PbSO4	1.954e-12	1.954e-12	-11.709	-11.709	0.000	(0)

PbCl+	4.915e-13	4.473e-13	-12.308	-12.349	-0.041	(0)
PbF+	4.112e-14	3.741e-14	-13.386	-13.427	-0.041	(0)
Pb (SO4) 2-2	9.399e-15	6.442e-15	-14.027	-14.191	-0.164	(0)
Pb (OH) 3-	4.906e-15	4.464e-15	-14.309	-14.350	-0.041	(0)
PbCl2	3.452e-15	3.452e-15	-14.462	-14.462	0.000	(0)
PbF2	5.358e-17	5.358e-17	-16.271	-16.271	0.000	(0)
Pb (OH) 4-2	3.150e-18	2.159e-18	-17.502	-17.666	-0.164	(0)
PbCl3-	2.610e-18	2.375e-18	-17.583	-17.624	-0.041	(0)
PbNO3+	1.710e-20	1.556e-20	-19.767	-19.808	-0.041	(0)
Pb2OH+3	9.789e-21	4.184e-21	-20.009	-20.378	-0.369	(0)
PbF3-	8.129e-21	7.396e-21	-20.090	-20.131	-0.041	(0)
PbCl4-2	2.737e-21	1.876e-21	-20.563	-20.727	-0.164	(0)
Pb3 (OH) 4+2	1.085e-24	7.436e-25	-23.965	-24.129	-0.164	(0)
PbF4-2	3.759e-25	2.576e-25	-24.425	-24.589	-0.164	(0)
Pb (NO3) 2	3.812e-30	3.812e-30	-29.419	-29.419	0.000	(0)
Pb4 (OH) 4+4	1.953e-31	4.309e-32	-30.709	-31.366	-0.656	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.746	-151.746	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.344	-228.385	-0.041	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.781	-73.781	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.898	-77.939	-0.041	(0)
S5-2	0.000e+00	0.000e+00	-78.848	-79.012	-0.164	(0)
H2S	0.000e+00	0.000e+00	-79.212	-79.212	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.364	-79.528	-0.164	(0)
S4-2	0.000e+00	0.000e+00	-79.444	-79.608	-0.164	(0)
CdHS+	0.000e+00	0.000e+00	-79.462	-79.503	-0.041	(0)
S3-2	0.000e+00	0.000e+00	-80.249	-80.414	-0.164	(0)
S2-2	0.000e+00	0.000e+00	-81.266	-81.430	-0.164	(0)
S-2	0.000e+00	0.000e+00	-86.802	-86.947	-0.145	(0)
HgHS2-	0.000e+00	0.000e+00	-139.213	-139.254	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-139.506	-139.670	-0.164	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.153	-141.153	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.828	-146.057	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.565	-146.787	-0.222	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.694	-146.811	-0.118	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.391	-147.432	-0.041	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.579	-147.620	-0.041	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.725	-147.959	-0.233	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.044	-148.270	-0.226	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.715	-149.715	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.238	-150.238	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.746	-151.746	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.792	-159.792	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.509	-216.550	-0.041	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.333	-224.374	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.897	-226.061	-0.164	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.237	-226.278	-0.041	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.344	-228.385	-0.041	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.654	-235.695	-0.041	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.857	-302.021	-0.164	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.610	-303.774	-0.164	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.598	-320.762	-0.164	(0)
S (6)	8.362e-04					
SO4-2	7.689e-04	5.470e-04	-3.114	-3.262	-0.148	(0)
CaSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
MgSO4	2.071e-05	2.071e-05	-4.684	-4.684	0.000	(0)
NaSO4-	9.827e-06	9.047e-06	-5.008	-5.043	-0.036	(0)
KSO4-	8.913e-07	8.206e-07	-6.050	-6.086	-0.036	(0)
MnSO4	1.605e-07	1.605e-07	-6.794	-6.794	0.000	(0)
ZnSO4	2.644e-08	2.644e-08	-7.578	-7.578	0.000	(0)
NiSO4	3.079e-10	3.079e-10	-9.512	-9.512	0.000	(0)
HSO4-	2.965e-10	2.725e-10	-9.528	-9.565	-0.037	(0)
CuSO4	2.935e-10	2.935e-10	-9.532	-9.532	0.000	(0)
NH4SO4-	2.571e-10	2.365e-10	-9.590	-9.626	-0.036	(0)
CoSO4	2.226e-10	2.226e-10	-9.653	-9.653	0.000	(0)
Zn (SO4) 2-2	1.838e-10	1.260e-10	-9.736	-9.900	-0.164	(0)
CdSO4	3.441e-11	3.441e-11	-10.463	-10.463	0.000	(0)
AgSO4-	2.648e-12	2.410e-12	-11.577	-11.618	-0.041	(0)

PbSO4	1.954e-12	1.954e-12	-11.709	-11.709	0.000	(0)
Cd(SO4) 2-2	3.704e-13	2.539e-13	-12.431	-12.595	-0.164	(0)
CrOHSO4	1.836e-13	1.836e-13	-12.736	-12.736	0.000	(0)
FeSO4	1.840e-14	1.840e-14	-13.735	-13.735	0.000	(0)
Pb(SO4) 2-2	9.399e-15	6.442e-15	-14.027	-14.191	-0.164	(0)
Ni(SO4) 2-2	8.138e-15	5.578e-15	-14.089	-14.254	-0.164	(0)
UO2SO4	3.343e-16	3.343e-16	-15.476	-15.476	0.000	(0)
CrSO4+	4.596e-17	4.182e-17	-16.338	-16.379	-0.041	(0)
AlSO4+	1.437e-17	1.321e-17	-16.843	-16.879	-0.037	(0)
UO2(SO4) 2-2	3.518e-18	2.411e-18	-17.454	-17.618	-0.164	(0)
Al(SO4) 2-	8.422e-20	7.740e-20	-19.075	-19.111	-0.037	(0)
VO2SO4-	1.421e-21	1.293e-21	-20.847	-20.888	-0.041	(0)
FeSO4+	1.387e-21	1.276e-21	-20.858	-20.894	-0.036	(0)
Cr2(OH) 2SO4+2	3.426e-23	2.348e-23	-22.465	-22.629	-0.164	(0)
Fe(SO4) 2-	1.640e-23	1.492e-23	-22.785	-22.826	-0.041	(0)
VOSO4	1.898e-24	1.898e-24	-23.722	-23.722	0.000	(0)
Cr2(OH) 2(SO4) 2	7.630e-25	7.630e-25	-24.117	-24.117	0.000	(0)
HgSO4	3.631e-25	3.631e-25	-24.440	-24.440	0.000	(0)
CrO3SO4-2	7.256e-26	4.973e-26	-25.139	-25.303	-0.164	(0)
VSO4+	2.826e-39	2.571e-39	-38.549	-38.590	-0.041	(0)
U(SO4) 2	0.000e+00	0.000e+00	-43.798	-43.798	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.272	-44.436	-0.164	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-63.700	-63.741	-0.041	(0)
Sb(3)	2.465e-21					
Sb(OH) 3	1.247e-21	1.247e-21	-20.904	-20.904	0.000	(0)
HSbO2	1.217e-21	1.217e-21	-20.915	-20.915	0.000	(0)
SbO2-	4.251e-25	3.868e-25	-24.372	-24.413	-0.041	(0)
Sb(OH) 4-	2.435e-25	2.216e-25	-24.613	-24.654	-0.041	(0)
Sb(OH) 2F	7.228e-28	7.228e-28	-27.141	-27.141	0.000	(0)
SbOF	7.108e-28	7.108e-28	-27.148	-27.148	0.000	(0)
Sb(OH) 2+	1.697e-28	1.544e-28	-27.770	-27.811	-0.041	(0)
SbO+	5.851e-29	5.323e-29	-28.233	-28.274	-0.041	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.598	-320.762	-0.164	(0)
Sb(5)	1.157e-09					
SbO3-	1.155e-09	1.051e-09	-8.937	-8.978	-0.041	(0)
Sb(OH) 6-	1.338e-12	1.229e-12	-11.873	-11.910	-0.037	(0)
SbO2+	8.612e-27	7.836e-27	-26.065	-26.106	-0.041	(0)
Se(-2)	1.605e-15					
Ag2Se	1.605e-15	1.605e-15	-14.794	-14.794	0.000	(0)
HSe-	2.265e-39	2.061e-39	-38.645	-38.686	-0.041	(0)
MnSe	0.000e+00	0.000e+00	-41.561	-41.561	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.089	-43.089	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.229	-45.393	-0.164	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.003	-82.659	-0.656	(0)
Se(4)	6.880e-09					
SeO3-2	3.502e-09	2.400e-09	-8.456	-8.620	-0.164	(0)
HSeO3-	3.378e-09	3.074e-09	-8.471	-8.512	-0.041	(0)
H2SeO3	6.684e-15	6.684e-15	-14.175	-14.175	0.000	(0)
AgSeO3-	3.743e-16	3.406e-16	-15.427	-15.468	-0.041	(0)
Cd(SeO3) 2-2	1.859e-21	1.274e-21	-20.731	-20.895	-0.164	(0)
Ag(SeO3) 2-3	1.713e-23	7.320e-24	-22.766	-23.135	-0.369	(0)
FeHSeO3+2	2.463e-27	1.688e-27	-26.609	-26.773	-0.164	(0)
Se(6)	4.281e-12					
SeO4-2	4.279e-12	3.044e-12	-11.369	-11.517	-0.148	(0)
MnSeO4	1.352e-15	1.352e-15	-14.869	-14.869	0.000	(0)
ZnSeO4	1.042e-16	1.042e-16	-15.982	-15.982	0.000	(0)
NiSeO4	4.017e-18	4.017e-18	-17.396	-17.396	0.000	(0)
CoSeO4	3.111e-18	3.111e-18	-17.507	-17.507	0.000	(0)
HSeO4-	8.548e-19	7.778e-19	-18.068	-18.109	-0.041	(0)
CdSeO4	1.521e-19	1.521e-19	-18.818	-18.818	0.000	(0)
Zn(SeO4) 2-2	4.692e-28	3.216e-28	-27.329	-27.493	-0.164	(0)
Si	3.025e-04					
H4SiO4	2.935e-04	2.939e-04	-3.532	-3.532	0.001	(0)
H3SiO4-	9.076e-06	8.333e-06	-5.042	-5.079	-0.037	(0)
H2SiO4-2	1.436e-10	1.031e-10	-9.843	-9.987	-0.144	(0)
UO2H3SiO4+	3.140e-13	2.857e-13	-12.503	-12.544	-0.041	(0)
SiF6-2	6.234e-32	4.465e-32	-31.205	-31.350	-0.145	(0)
U(3)	0.000e+00					

U+3	0.000e+00	0.000e+00	-60.414	-60.783	-0.369	(0)
U(4)	4.071e-20					
U(OH) 5-	4.070e-20	3.704e-20	-19.390	-19.431	-0.041	(0)
U(OH) 4	7.908e-24	7.908e-24	-23.102	-23.102	0.000	(0)
U(OH) 3+	1.620e-28	1.474e-28	-27.790	-27.832	-0.041	(0)
U(OH) 2+2	5.070e-34	3.475e-34	-33.295	-33.459	-0.164	(0)
UF3+	2.836e-39	2.581e-39	-38.547	-38.588	-0.041	(0)
UF2+2	3.265e-40	2.237e-40	-39.486	-39.650	-0.164	(0)
UOH+3	1.952e-40	0.000e+00	-39.710	-40.079	-0.369	(0)
UF4	0.000e+00	0.000e+00	-40.686	-40.686	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.243	-42.612	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.185	-43.226	-0.041	(0)
U(SO4) 2	0.000e+00	0.000e+00	-43.798	-43.798	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.272	-44.436	-0.164	(0)
UF6-2	0.000e+00	0.000e+00	-44.720	-44.884	-0.164	(0)
U+4	0.000e+00	0.000e+00	-47.118	-47.774	-0.656	(0)
UC1+3	0.000e+00	0.000e+00	-48.468	-48.837	-0.369	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-176.090	-179.412	-3.322	(0)
U(5)	1.657e-17					
UO2+	1.657e-17	1.507e-17	-16.781	-16.822	-0.041	(0)
U(6)	1.979e-08					
UO2(CO3) 3-4	1.291e-08	2.850e-09	-7.889	-8.545	-0.656	(0)
UO2(CO3) 2-2	6.854e-09	4.698e-09	-8.164	-8.328	-0.164	(0)
UO2CO3	1.946e-11	1.946e-11	-10.711	-10.711	0.000	(0)
UO2H3SiO4+	3.140e-13	2.857e-13	-12.503	-12.544	-0.041	(0)
UO2OH+	1.104e-13	1.004e-13	-12.957	-12.998	-0.041	(0)
UO2F+	4.459e-15	4.057e-15	-14.351	-14.392	-0.041	(0)
UO2F2	8.515e-16	8.515e-16	-15.070	-15.070	0.000	(0)
UO2+2	5.677e-16	4.038e-16	-15.246	-15.394	-0.148	(0)
UO2SO4	3.343e-16	3.343e-16	-15.476	-15.476	0.000	(0)
UO2F3-	1.711e-17	1.557e-17	-16.767	-16.808	-0.041	(0)
UO2(SO4) 2-2	3.518e-18	2.411e-18	-17.454	-17.618	-0.164	(0)
UO2Cl+	1.244e-18	1.132e-18	-17.905	-17.946	-0.041	(0)
(UO2) 2(OH) 2+2	2.441e-20	1.673e-20	-19.612	-19.776	-0.164	(0)
UO2F4-2	1.313e-20	8.998e-21	-19.882	-20.046	-0.164	(0)
(UO2) 3(OH) 5+	5.463e-21	4.971e-21	-20.263	-20.304	-0.041	(0)
UO2NO3+	1.277e-25	1.162e-25	-24.894	-24.935	-0.041	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.678	-44.719	-0.041	(0)
V+2	0.000e+00	0.000e+00	-46.361	-46.525	-0.164	(0)
V(3)	6.188e-17					
V(OH) 3	6.188e-17	6.188e-17	-16.208	-16.208	0.000	(0)
V(OH) 2+	2.240e-28	2.038e-28	-27.650	-27.691	-0.041	(0)
VOH+2	1.438e-32	9.856e-33	-31.842	-32.006	-0.164	(0)
V+3	2.330e-38	9.957e-39	-37.633	-38.002	-0.369	(0)
VSO4+	2.826e-39	2.571e-39	-38.549	-38.590	-0.041	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-60.876	-61.245	-0.369	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-62.556	-63.213	-0.656	(0)
V(4)	5.482e-21					
V(OH) 3+	5.456e-21	4.964e-21	-20.263	-20.304	-0.041	(0)
VO+2	1.838e-23	1.260e-23	-22.736	-22.900	-0.164	(0)
VOF+	6.044e-24	5.500e-24	-23.219	-23.260	-0.041	(0)
VOSO4	1.898e-24	1.898e-24	-23.722	-23.722	0.000	(0)
VOF2	1.501e-25	1.501e-25	-24.824	-24.824	0.000	(0)
VOC1+	6.712e-26	6.108e-26	-25.173	-25.214	-0.041	(0)
VOF3-	4.259e-28	3.875e-28	-27.371	-27.412	-0.041	(0)
VOF4-2	1.661e-31	1.138e-31	-30.780	-30.944	-0.164	(0)
H2V2O4+2	1.803e-36	1.235e-36	-35.744	-35.908	-0.164	(0)
V(5)	3.470e-10					
H2VO4-	2.097e-10	1.908e-10	-9.678	-9.719	-0.041	(0)
HVO4-2	1.372e-10	9.404e-11	-9.863	-10.027	-0.164	(0)
H3VO4	9.728e-15	9.728e-15	-14.012	-14.012	0.000	(0)
VO4-3	2.163e-16	9.246e-17	-15.665	-16.034	-0.369	(0)
HV2O7-3	1.423e-17	6.082e-18	-16.847	-17.216	-0.369	(0)
H3V2O7-	1.318e-17	1.199e-17	-16.880	-16.921	-0.041	(0)
V2O7-4	1.455e-19	3.211e-20	-18.837	-19.493	-0.656	(0)
VO2+	1.078e-19	9.898e-20	-18.967	-19.004	-0.037	(0)
VO2F	1.263e-20	1.263e-20	-19.898	-19.898	0.000	(0)

VO2SO4-	1.421e-21	1.293e-21	-20.847	-20.888	-0.041	(0)
VO2F2-	3.669e-22	3.338e-22	-21.435	-21.476	-0.041	(0)
V3O9-3	1.704e-23	7.282e-24	-22.769	-23.138	-0.369	(0)
VO2F3-2	4.422e-25	3.031e-25	-24.354	-24.518	-0.164	(0)
VO2F4-3	2.539e-29	1.085e-29	-28.595	-28.964	-0.369	(0)
VO2NO3	7.221e-30	7.221e-30	-29.141	-29.141	0.000	(0)
V4O12-4	2.626e-30	5.794e-31	-29.581	-30.237	-0.656	(0)
V10O28-6	0.000e+00	0.000e+00	-79.981	-81.457	-1.477	(0)
HV10O28-5	0.000e+00	0.000e+00	-80.538	-81.563	-1.025	(0)
H2V10O28-4	0.000e+00	0.000e+00	-83.992	-84.648	-0.656	(0)
Zn	5.669e-07					
Zn+2	3.106e-07	2.210e-07	-6.508	-6.656	-0.148	(0)
ZnCO3	1.539e-07	1.539e-07	-6.813	-6.813	0.000	(0)
ZnOH+	4.796e-08	4.364e-08	-7.319	-7.360	-0.041	(0)
ZnSO4	2.644e-08	2.644e-08	-7.578	-7.578	0.000	(0)
Zn (OH) 2	1.366e-08	1.366e-08	-7.865	-7.865	0.000	(0)
ZnHCO3+	1.011e-08	9.195e-09	-7.995	-8.036	-0.041	(0)
ZnOHCl	2.480e-09	2.480e-09	-8.606	-8.606	0.000	(0)
ZnCl+	1.045e-09	9.591e-10	-8.981	-9.018	-0.037	(0)
ZnF+	3.526e-10	3.209e-10	-9.453	-9.494	-0.041	(0)
Zn (SO4) 2-2	1.838e-10	1.260e-10	-9.736	-9.900	-0.164	(0)
Zn (OH) 3-	1.486e-10	1.352e-10	-9.828	-9.869	-0.041	(0)
ZnCl2	2.627e-12	2.627e-12	-11.581	-11.581	0.000	(0)
Zn (OH) 4-2	1.551e-14	1.063e-14	-13.809	-13.973	-0.164	(0)
ZnCl3-	3.926e-15	3.605e-15	-14.406	-14.443	-0.037	(0)
ZnSeO4	1.042e-16	1.042e-16	-15.982	-15.982	0.000	(0)
ZnNO3+	8.798e-17	8.005e-17	-16.056	-16.097	-0.041	(0)
ZnCl4-2	4.349e-18	3.115e-18	-17.362	-17.507	-0.145	(0)
Zn (NO3) 2	2.304e-27	2.304e-27	-26.638	-26.638	0.000	(0)
Zn (SeO4) 2-2	4.692e-28	3.216e-28	-27.329	-27.493	-0.164	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.391	-147.432	-0.041	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.715	-149.715	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.333	-224.374	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.897	-226.061	-0.164	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.610	-303.774	-0.164	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-61.12	-54.83	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-45.18	-40.67	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-52.41	-40.67	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-78.94	-61.01	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-59.81	-39.77	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.64	-29.24	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-26.75	-26.30	0.45	(NH4) 2SeO4
Acanthite	-52.74	-88.96	-36.22	Ag2S
Ag2CO3	-13.14	-24.23	-11.09	Ag2CO3
Ag2CrO4	-22.17	-33.76	-11.59	Ag2CrO4
Ag2HVO4	-14.92	-13.44	1.48	Ag2HVO4
Ag2MoO4	-15.03	-26.58	-11.55	Ag2MoO4
Ag2O	-15.30	-2.73	12.57	Ag2O
Ag2Se	-1.01	-49.71	-48.70	Ag2Se
Ag2SeO3	-12.38	-19.53	-7.15	Ag2SeO3
Ag2SeO4	-21.92	-30.83	-8.91	Ag2SeO4
Ag2SO4	-17.75	-22.57	-4.82	Ag2SO4
Ag3AsO3	-28.15	-26.00	2.16	Ag3AsO3
Ag3AsO4	-17.10	-19.88	-2.79	Ag3AsO4
Ag3H2VO5	-19.98	-14.80	5.18	Ag3H2VO5
AgF:4H2O	-14.84	-13.79	1.05	AgF:4H2O
Agmetal	-0.36	-13.87	-13.51	Ag
AgVO3	-12.85	-12.08	0.77	AgVO3
Al (OH) 3 (am)	-3.43	7.37	10.80	Al (OH) 3
Al2 (MoO4) 3	-59.20	-56.83	2.37	Al2 (MoO4) 3
Al2O3	-4.91	14.74	19.65	Al2O3
Al4 (OH) 10SO4	-13.07	9.63	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.22	-8.42	4.80	AlAsO4:2H2O

AlOHSO4	-9.25	-12.48	-3.23	AlOHSO4
AlSb	-154.19	-88.57	65.62	AlSb
Alunite	-11.56	-12.96	-1.40	KAl3(SO4)2(OH)6
Anglesite	-6.61	-14.40	-7.79	PbSO4
Anhydrite	-2.45	-6.81	-4.36	CaSO4
Anilite	-55.16	-87.03	-31.88	Cu0.25Cu1.5S
Antlerite	-4.77	4.02	8.79	Cu3(OH)4SO4
Aragonite	-0.16	-8.46	-8.30	CaCO3
Arsenolite	-84.86	-87.62	-2.76	As4O6
Artinite	-5.30	4.30	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.29	-31.59	6.71	As2O5
Atacamite	-2.54	4.85	7.39	Cu2(OH)3Cl
Azurite	-2.23	-19.14	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.50	7.89	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-21.51	-5.64	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	1.01	-7.90	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-30.68	2.26	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.47	-23.14	-9.67	BaCrO4
BaF2	-11.15	-16.97	-5.82	BaF2
BaMoO4	-9.00	-15.96	-6.96	BaMoO4
Barite	-1.97	-11.95	-9.98	BaSO4
BaS	-94.52	-78.34	16.18	BaS
BaSeO3	-10.74	-8.91	1.83	BaSeO3
BaSeO4	-12.75	-20.21	-7.46	BaSeO4
Bianchite	-8.15	-9.92	-1.76	ZnSO4:6H2O
Birnessite	-7.63	10.46	18.09	MnO2
Bixbyite	-3.44	-4.08	-0.64	Mn2O3
BlaubleiI	-55.28	-79.44	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.67	-82.95	-27.28	Cu0.6Cu0.8S
Boehmite	-1.21	7.37	8.58	AlOOH
Breithauptite	-56.87	-75.40	-18.52	NiSb
Brochantite	-3.25	11.97	15.22	Cu4(OH)6SO4
Brucite	-3.94	12.90	16.84	Mg(OH)2
Bunsenite	-4.41	8.04	12.45	NiO
Ca(VO3)2	-14.04	-8.38	5.66	Ca(VO3)2
Ca2V2O7	-12.85	4.65	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.90	4.65	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.77	7.53	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.27	17.69	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.17	17.69	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.73	-152.76	142.97	Ca3Sb2
CaCrO4	-15.73	-18.00	-2.27	CaCrO4
Calcite	0.02	-8.46	-8.48	CaCO3
Calomel	-12.44	-30.35	-17.91	Hg2Cl2
CaMoO4	-2.87	-10.82	-7.95	CaMoO4
Carnotite	-5.13	-4.90	0.23	KUO2VO4
CaSeO3:2H2O	-6.58	-3.77	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.04	-15.06	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.08	-3.24	9.84	Cd(BO2)2
Cd(OH)2	-6.63	7.01	13.64	Cd(OH)2
Cd(OH)2(am)	-6.72	7.01	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-25.36	-18.65	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.37	1.19	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.19	8.21	28.40	Cd4(OH)6SO4
CdCl2	-14.44	-15.10	-0.66	CdCl2
CdCl2:1H2O	-13.40	-15.10	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.18	-15.10	-1.91	CdCl2:2.5H2O
CdF2	-16.63	-17.85	-1.21	CdF2
Cdmetal(alpha)	-31.51	-18.00	13.51	Cd
Cdmetal(gamma)	-31.62	-18.00	13.62	Cd
CdMoO4	-2.69	-16.84	-14.15	CdMoO4
CdOHCl	-7.58	-4.04	3.54	CdOHCl
CdSb	-76.07	-76.42	-0.35	CdSb
CdSe	-19.76	-39.96	-20.20	CdSe
CdSeO4:2H2O	-19.24	-21.09	-1.85	CdSeO4:2H2O
CdSO4	-12.66	-12.83	-0.17	CdSO4
CdSO4:1H2O	-11.11	-12.83	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.96	-12.83	-1.87	CdSO4:2.67H2O

Cerargyrite	-2.67	-12.42	-9.75	AgCl
Cerrusite	-2.92	-16.05	-13.13	PbCO3
CH4 (g)	-80.50	-121.55	-41.05	CH4
Chalcanthite	-9.25	-11.89	-2.64	CuSO4:5H2O
Chalcedony	0.02	-3.53	-3.55	SiO2
Chalcocite	-55.03	-89.95	-34.92	Cu2S
Chalcopyrite	-125.52	-160.79	-35.27	CuFeS2
Chrysotile	-0.55	31.65	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-53.74	-99.44	-45.69	HgS
Claudetite	-84.56	-87.62	-3.06	As4O6
Clausthalite	-14.43	-41.53	-27.10	PbSe
Co(BO2)2	-29.43	-2.36	27.07	Co(BO2)2
Co(OH)2	-5.20	7.89	13.09	Co(OH)2
Co(OH)3	-9.69	-12.00	-2.31	Co(OH)3
CO2 (g)	-3.36	-21.50	-18.15	CO2
Co3(AsO4)2	-20.94	-7.90	13.03	Co3(AsO4)2
Co3O4	-5.61	-16.10	-10.50	Co3O4
CoCl2	-22.48	-14.22	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.22	2.54	CoCl2:6H2O
CoCO3	-3.63	-13.61	-9.98	CoCO3
CoF2	-15.37	-16.97	-1.60	CoF2
CoF3	-47.83	-49.29	-1.46	CoF3
CoFe2O4	17.81	14.29	-3.53	CoFe2O4
CoMoO4	-8.20	-15.96	-7.76	CoMoO4
CoO	-5.69	7.89	13.59	CoO
CoS (alpha)	-70.90	-78.34	-7.44	CoS
CoS (beta)	-67.27	-78.34	-11.07	CoS
CoSe	-22.88	-39.08	-16.20	CoSe
CoSeO3	-10.23	-8.91	1.32	CoSeO3
CoSeO4:6H2O	-18.68	-20.21	-1.53	CoSeO4:6H2O
CoSO4	-14.75	-11.95	2.80	CoSO4
CoSO4:6H2O	-9.48	-11.95	-2.47	CoSO4:6H2O
Cotunnite	-11.88	-16.66	-4.78	PbCl2
Covellite	-55.98	-78.28	-22.30	CuS
Cr(OH)2	-21.55	-10.73	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3 (am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.01	-2.35	-2.36	Cr2O3
CrCl2	-46.94	-32.84	14.09	CrCl2
CrCl3	-49.46	-34.34	15.11	CrCl3
CrF3	-27.13	-38.47	-11.34	CrF3
Cristobalite	-0.18	-3.53	-3.35	SiO2
Crmetal	-66.23	-35.75	30.48	Cr
CrO3	-27.82	-31.04	-3.21	CrO3
Cryolite	-16.03	-49.87	-33.84	Na3AlF6
Cu(OH)2	-0.72	7.95	8.67	Cu(OH)2
Cu(SbO3)2	-29.04	16.17	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-11.48	-2.22	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.96	-89.84	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.90	-50.70	-45.80	Cu2Se
Cu2SO4	-21.62	-23.57	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.82	-7.72	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-26.23	-89.72	-63.49	Cu3Se2
CuCO3	-2.05	-13.55	-11.50	CuCO3
CuCrO4	-17.64	-23.08	-5.44	CuCrO4
CuF	-9.39	-14.29	-4.91	CuF
CuF2	-18.02	-16.91	1.12	CuF2
CuF2:2H2O	-12.36	-16.91	-4.55	CuF2:2H2O
Cumetal	-5.61	-14.37	-8.76	Cu
CuMoO4	-2.83	-15.90	-13.08	CuMoO4
CuOCuSO4	-14.24	-3.94	10.30	CuOCuSO4
Cupricferrite	8.36	14.35	5.99	CuFe2O4
Cuprite	-2.32	-3.72	-1.41	Cu2O
Cuprousferrite	10.25	1.33	-8.92	CuFeO2
CuSe	-5.92	-39.02	-33.10	CuSe
CuSe2	-27.63	-60.99	-33.37	CuSe2
CuSeO3:2H2O	-9.36	-8.85	0.51	CuSeO3:2H2O

CuSeO4:5H2O	-17.71	-20.15	-2.44	CuSeO4:5H2O
CuSO4	-14.83	-11.89	2.94	CuSO4
Diaspore	0.50	7.37	6.87	AlOOH
Djurleite	-55.26	-89.18	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.52	-17.06	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.03	-17.06	-17.09	CaMg(CO3)2
Epsomite	-4.82	-6.94	-2.13	MgSO4:7H2O
Fe(OH)2	-9.84	3.72	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.92	-0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-13.98	-17.70	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.97	-10.41	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-23.40	-44.02	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-49.42	-53.15	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.11	10.11	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.00	-12.60	0.40	FeAsO4:2H2O
FeCr2O4	-5.83	1.37	7.20	FeCr2O4
FeMoO4	-10.04	-20.13	-10.09	FeMoO4
Ferrihydrite	0.00	3.20	3.19	Fe(OH)3
Ferroselite	-46.63	-65.22	-18.60	FeSe2
FeS(ppt)	-79.56	-82.51	-2.95	FeS
FeSe	-32.26	-43.26	-11.00	FeSe
Fix_pe	-4.21	-4.21	0.00	e-
Fluorite	-1.32	-11.82	-10.50	CaF2
Galena	-66.81	-80.78	-13.97	PbS
Gibbsite	-0.92	7.37	8.29	Al(OH)3
Goethite	2.70	3.20	0.49	FeOOH
Goslarite	-7.91	-9.92	-2.01	ZnSO4:7H2O
Greenalite	-16.71	4.10	20.81	Fe3Si2O5(OH)4
Greenockite	-64.86	-79.22	-14.36	CdS
Greigite	-289.78	-334.82	-45.03	Fe3S4
Gummite	-6.48	1.19	7.67	UO3
Gypsum	-2.20	-6.81	-4.61	CaSO4:2H2O
H-Jarosite	-18.01	-30.11	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.98	-23.86	-12.88	H2MoO4
H2S(g)	-78.22	-86.23	-8.01	H2S
H2Se(g)	-42.02	-46.98	-4.96	H2Se
Halite	-6.88	-5.27	1.60	NaCl
Halloysite	-1.90	7.68	9.57	Al2Si2O5(OH)4
Hausmannite	-3.61	57.42	61.03	Mn3O4
Hematite	7.81	6.39	-1.42	Fe2O3
Hercynite	-4.43	18.46	22.89	FeAl2O4
Hg(CH3)2(g)	-182.59	-256.30	-73.71	Hg(CH3)2
Hg(g)	-8.75	-16.62	-7.87	Hg
Hg(OH)2	-9.71	-13.20	-3.50	Hg(OH)2
Hg2(g)	-18.29	-33.25	-14.96	Hg2
Hg2(OH)2	-13.50	-8.24	5.26	Hg2(OH)2
Hg2CO3	-13.69	-29.74	-16.05	Hg2CO3
Hg2CrO4	-30.57	-39.27	-8.70	Hg2CrO4
Hg2F2	-22.73	-33.10	-10.36	Hg2F2
Hg2S	-82.79	-94.47	-11.68	Hg2S
Hg2SeO3	-20.38	-25.04	-4.66	Hg2SeO3
Hg2SO4	-21.95	-28.08	-6.13	Hg2SO4
Hg3O2CO3	-31.43	-61.12	-29.68	Hg3O2CO3
HgCl(g)	-34.67	-15.17	19.50	HgCl
HgCl2	-14.05	-35.31	-21.26	HgCl2
HgF(g)	-49.22	-16.55	32.68	HgF
HgF2(g)	-50.63	-38.07	12.57	HgF2
Hgmetal(l)	-3.17	-16.62	-13.45	Hg
HgSe	-4.49	-60.18	-55.69	HgSe
HgSeO3	-17.58	-30.01	-12.43	HgSeO3
HgSO4	-23.63	-33.05	-9.42	HgSO4
Huntite	-4.29	-34.26	-29.97	CaMg3(CO3)4
Hydrocerussite	-7.89	-26.66	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.73	-21.49	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-22.54	-27.71	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-10.69	-25.49	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.59	-52.83	-17.24	K2Cr2O7
K2CrO4	-21.28	-21.80	-0.51	K2CrO4

K2MoO4	-17.88	-14.62	3.26	K2MoO4
K2SeO4	-18.13	-18.86	-0.73	K2SeO4
Kaolinite	0.24	7.68	7.43	Al2Si2O5(OH)4
Langite	-5.52	11.97	17.49	Cu4(OH)6SO4·H2O
Larnakite	-8.52	-8.95	-0.43	PbO:PbSO4
Laurionite	-6.23	-5.61	0.62	PbOHCl
Lepidocrocite	1.82	3.20	1.37	FeOOH
Lime	-19.66	13.04	32.70	CaO
Litharge	-7.25	5.45	12.69	PbO
Mackinawite	-78.91	-82.51	-3.60	FeS
Maghemite	0.01	6.39	6.39	Fe2O3
Magnesioferrite	2.43	19.29	16.86	Fe2MgO4
Magnesite	-1.14	-8.60	-7.46	MgCO3
Magnetite	6.71	10.11	3.40	Fe3O4
Malachite	-0.29	-5.59	-5.31	Cu2(OH)2CO3
Manganite	-2.03	23.31	25.34	MnOOH
Massicot	-7.45	5.45	12.89	PbO
Matlockite	-9.06	-18.04	-8.97	PbClF
Melanothallite	-20.41	-14.16	6.26	CuCl2
Melanterite	-13.92	-16.13	-2.21	FeSO4·7H2O
Metacinnabar	-54.34	-99.44	-45.09	HgS
Mg(OH)2(active)	-5.89	12.90	18.79	Mg(OH)2
Mg(VO3)2	-19.80	-8.52	11.28	Mg(VO3)2
Mg2Sb3	-274.16	-199.48	74.68	Mg2Sb3
Mg2V2O7	-21.98	4.38	26.36	Mg2V2O7
MgCr2O4	-5.65	10.55	16.20	MgCr2O4
MgCrO4	-23.51	-18.13	5.38	MgCrO4
MgF2	-3.83	-11.96	-8.13	MgF2
MgMoO4	-9.10	-10.95	-1.85	MgMoO4
MgSeO3·6H2O	-6.96	-3.90	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-14.00	-15.20	-1.20	MgSeO4·6H2O
Minium	-32.17	41.36	73.52	Pb3O4
Mirabilite	-7.17	-8.29	-1.11	Na2SO4·10H2O
Mn(VO3)2	-15.52	-10.62	4.90	Mn(VO3)2
Mn2(SO4)3	-57.91	-63.62	-5.71	Mn2(SO4)3
Mn2Sb	-147.92	-86.84	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.68	0.82	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-14.02	-11.31	2.72	MnCl2·4H2O
MnS(grn)	-75.60	-75.43	0.17	MnS
MnS(pnk)	-78.77	-75.43	3.34	MnS
MnSb	-95.07	-97.98	-2.91	MnSb
MnSe	-39.68	-36.18	3.50	MnSe
MnSeO3	-7.13	-6.00	1.13	MnSeO3
MnSeO3·2H2O	-6.98	-6.00	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-15.25	-17.30	-2.05	MnSeO4·5H2O
MnSO4	-11.63	-9.04	2.58	MnSO4
Monteponite	-8.09	7.01	15.10	CdO
Montroydite	-9.56	-13.20	-3.64	HgO
MoO3	-15.86	-23.86	-8.00	MoO3
Morenosite	-9.67	-11.81	-2.14	NiSO4·7H2O
MoS2	-151.07	-221.33	-70.26	MoS2
Na-Jarosite	-13.13	-24.33	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.61	-50.51	-9.90	Na2Cr2O7
Na2CrO4	-22.40	-19.47	2.93	Na2CrO4
Na2Mo2O7	-19.55	-36.15	-16.60	Na2Mo2O7
Na2MoO4	-13.78	-12.29	1.49	Na2MoO4
Na2MoO4·2H2O	-13.52	-12.29	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.54	-5.24	10.30	Na2SeO3·5H2O
Na2SeO4	-17.82	-16.54	1.28	Na2SeO4
Na3Sb	-173.05	-78.59	94.45	Na3Sb
Na3VO4	-30.05	6.63	36.68	Na3VO4
Na4V2O7	-35.70	1.70	37.40	Na4V2O7
Nantokite	-6.19	-12.92	-6.73	CuCl
NaSb	-88.31	-65.15	23.17	NaSb
Natron	-8.63	-9.94	-1.31	Na2CO3·10H2O
NaVO3	-8.79	-4.93	3.86	NaVO3
Nesquehonite	-3.93	-8.60	-4.67	MgCO3·3H2O
Ni(OH)2	-4.76	8.04	12.79	Ni(OH)2

Ni3(AsO4)2·8H2O	-23.18	-7.48	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-19.70	12.30	32.00	Ni4(OH)6SO4
NiCO3	-6.60	-13.47	-6.87	NiCO3
NiMoO4	-4.68	-15.82	-11.14	NiMoO4
NiS(alpha)	-72.60	-78.20	-5.60	NiS
NiS(beta)	-67.10	-78.20	-11.10	NiS
NiS(gamma)	-65.40	-78.20	-12.80	NiS
NiSe	-21.24	-38.94	-17.70	NiSe
NiSeO3·2H2O	-11.58	-8.77	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-18.55	-20.07	-1.52	NiSeO4·6H2O
Nsutite	-7.04	10.46	17.50	MnO2
O2(g)	-33.07	50.02	83.09	O2
Orpiment	-241.44	-302.51	-61.07	As2S3
Otavite	-2.49	-14.49	-12.00	CdCO3
Pb(BO2)2	-11.32	-4.80	6.52	Pb(BO2)2
Pb(OH)2	-2.70	5.45	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-65.77	-74.53	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.95	-0.16	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.29	10.90	26.19	Pb2O(OH)2
Pb2O3	-25.13	35.91	61.04	Pb2O3
Pb2OCO3	-10.05	-10.61	-0.56	Pb2OCO3
Pb2V2O7	-8.63	-10.53	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.04	-15.24	5.80	Pb3(AsO4)2
Pb3(VO4)2	-11.22	-5.08	6.14	Pb3(VO4)2
Pb3O2CO3	-16.18	-5.16	11.02	Pb3O2CO3
Pb3O2SO4	-14.19	-3.50	10.69	Pb3O2SO4
Pb4(OH)6SO4	-19.15	1.95	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.93	1.95	21.88	Pb4O3SO4
PbCrO4	-12.99	-25.59	-12.60	PbCrO4
PbF2	-11.97	-19.41	-7.44	PbF2
Pbmetal	-23.81	-19.56	4.25	Pb
PbMoO4	-2.79	-18.41	-15.62	PbMoO4
PbO·0.3H2O	-7.53	5.45	12.98	PbO·0.33H2O
PbSeO4	-15.81	-22.65	-6.84	PbSeO4
Periclase	-8.68	12.90	21.58	MgO
Phosgenite	-12.91	-32.72	-19.81	PbCl2:PbCO3
Plattnerite	-19.14	30.46	49.60	PbO2
Portlandite	-9.77	13.04	22.80	Ca(OH)2
Pyrite	-125.22	-143.73	-18.51	FeS2
Pyrochroite	-4.39	10.80	15.19	Mn(OH)2
Pyrolusite	-5.57	35.81	41.38	MnO2
Quartz	0.47	-3.53	-4.00	SiO2
Realgar	-100.90	-120.64	-19.75	AsS
Retgersite	-9.77	-11.81	-2.04	NiSO4·6H2O
Rhodochrosite	-0.12	-10.70	-10.58	MnCO3
Rutherfordine	-5.81	-20.31	-14.50	UO2CO3
Sb(OH)3	-13.79	-20.90	-7.11	Sb(OH)3
Sb2O4	-20.20	-16.80	3.40	Sb2O4
Sb2O5	-30.74	-40.41	-9.67	Sb2O5
Sb2Se3	-114.99	-182.74	-67.76	Sb2Se3
Sb4O6(cubic)	-65.35	-83.62	-18.26	Sb4O6
Sb4O6(orth)	-65.71	-83.62	-17.90	Sb4O6
SbCl3	-54.64	-54.07	0.57	SbCl3
SbF3	-47.97	-58.20	-10.23	SbF3
Sbmetal	-46.73	-58.42	-11.69	Sb
SbO2	-4.88	-32.71	-27.82	SbO2
Schoepite	-4.80	1.19	5.99	UO2(OH)2·H2O
Semetal(am)	-14.86	-21.97	-7.11	Se
Semetal(hex)	-14.26	-21.97	-7.71	Se
Senarmontite	-29.44	-41.81	-12.37	Sb2O3
SeO2	-16.93	-16.80	0.12	SeO2
SeO3	-49.15	-28.10	21.04	SeO3
Sepiolite	-0.55	15.21	15.76	Mg2Si3O7·5OH·3H2O
Sepiolite(A)	-3.57	15.21	18.78	Mg2Si3O7·5OH·3H2O
Siderite	-7.54	-17.78	-10.24	FeCO3
SiO2(am-gel)	-0.82	-3.53	-2.71	SiO2
SiO2(am-ppt)	-0.79	-3.53	-2.74	SiO2
Smithsonite	-1.57	-11.57	-10.00	ZnCO3

Sphalerite	-64.85	-76.30	-11.45	ZnS
Spinel	-9.20	27.64	36.85	MgAl ₂ O ₄
Stibnite	-250.04	-300.50	-50.46	Sb ₂ S ₃
Sulfur	-59.08	-61.22	-2.14	S
Tenorite	0.31	7.95	7.64	CuO
Thenardite	-8.61	-8.28	0.32	Na ₂ SO ₄
Thermonatrite	-10.58	-9.94	0.64	Na ₂ CO ₃ ·H ₂ O
Tyuyamunite	-10.08	-6.00	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-14.87	6.21	21.08	U ₃ O ₈
U ₃ Sb ₄	-579.95	-427.56	152.38	U ₃ Sb ₄
U ₄ O ₉	-30.38	-33.40	-3.02	U ₄ O ₉
UF ₄	-34.79	-64.33	-29.54	UF ₄
UF ₄ ·2.5H ₂ O	-31.61	-64.33	-32.72	UF ₄ ·2.5H ₂ O
UO ₂ (am)	-15.54	-14.60	0.93	UO ₂
UO ₂ (NO ₃) ₂	-47.22	-35.08	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ ·2H ₂ O	-39.93	-35.08	4.85	UO ₂ (NO ₃) ₂ ·2H ₂ O
UO ₂ (NO ₃) ₂ ·3H ₂ O	-38.47	-35.08	3.39	UO ₂ (NO ₃) ₂ ·3H ₂ O
UO ₂ (NO ₃) ₂ ·6H ₂ O	-37.12	-35.08	2.05	UO ₂ (NO ₃) ₂ ·6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.42	1.19	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ ·4H ₂ O	-24.66	-26.91	-2.25	UO ₂ SeO ₄ ·4H ₂ O
UO ₃	-6.51	1.19	7.70	UO ₃
Uraninite	-9.93	-14.60	-4.67	UO ₂
USb ₂	-220.26	-190.68	29.58	USb ₂
V (OH) ₃	-20.72	-13.12	7.59	V (OH) ₃
V ₂ O ₅	-20.06	-21.42	-1.36	V ₂ O ₅
V ₃ O ₅	-45.79	-43.95	1.84	V ₃ O ₅
V ₄ O ₇	-57.46	-50.27	7.19	V ₄ O ₇
V ₆ O ₁₃	-53.43	-114.29	-60.86	V ₆ O ₁₃
Valentinite	-33.33	-41.81	-8.48	Sb ₂ O ₃
VC ₁₂	-66.61	-47.74	18.87	VC ₁₂
VC ₁₃	-69.72	-46.29	23.43	VC ₁₃
VF ₄	-70.97	-56.04	14.93	VF ₄
Vmetal	-94.67	-50.64	44.03	V
VO	-40.39	-25.63	14.76	VO
VO (OH) ₂	-11.47	-6.31	5.15	VO (OH) ₂
VO ₂ Cl	-24.61	-21.77	2.84	VO ₂ Cl
VOC ₁	-35.33	-24.18	11.15	VOC ₁
VOC ₁₂	-41.18	-28.42	12.76	VOC ₁₂
VOSO ₄	-29.77	-26.16	3.61	VOSO ₄
Witherite	-5.04	-13.61	-8.57	BaCO ₃
Wurtzite	-67.35	-76.30	-8.95	ZnS
Zincite	-1.40	9.93	11.33	ZnO
Zincosite	-13.85	-9.92	3.93	ZnSO ₄
Zn (BO ₂) ₂	-8.61	-0.32	8.29	Zn (BO ₂) ₂
Zn (NO ₃) ₂ ·6H ₂ O	-29.65	-26.34	3.32	Zn (NO ₃) ₂ ·6H ₂ O
Zn (OH) ₂	-2.27	9.93	12.20	Zn (OH) ₂
Zn (OH) ₂ (am)	-2.54	9.93	12.47	Zn (OH) ₂
Zn (OH) ₂ (beta)	-1.82	9.93	11.75	Zn (OH) ₂
Zn (OH) ₂ (epsilon)	-1.60	9.93	11.53	Zn (OH) ₂
Zn (OH) ₂ (gamma)	-1.80	9.93	11.73	Zn (OH) ₂
Zn ₂ (OH) ₂ SO ₄	-7.49	0.01	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-6.39	8.80	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O	-15.45	-1.80	13.65	Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O
Zn ₃ O (SO ₄) ₂	-28.82	-9.91	18.91	Zn ₃ O (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-8.53	19.87	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-10.96	27.54	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-19.23	-12.18	7.05	ZnCl ₂
ZnCO ₃ ·1H ₂ O	-1.31	-11.57	-10.26	ZnCO ₃ ·1H ₂ O
ZnF ₂	-14.40	-14.93	-0.53	ZnF ₂
Znmetal	-40.87	-15.08	25.79	Zn
ZnMoO ₄	-3.80	-13.93	-10.13	ZnMoO ₄
ZnO (active)	-1.26	9.93	11.19	ZnO
ZnS (am)	-67.25	-76.30	-9.05	ZnS
ZnSb	-84.52	-73.50	11.01	ZnSb
ZnSe	-22.65	-37.05	-14.40	ZnSe
ZnSeO ₄ ·6H ₂ O	-16.65	-18.17	-1.52	ZnSeO ₄ ·6H ₂ O
ZnSO ₄ ·1H ₂ O	-9.28	-9.92	-0.64	ZnSO ₄ ·1H ₂ O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 61.

Title Stage 3 Pit wall interaction mix calculator
MIX 304
309 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000078
11 0.000634
12 0.000469
13 0.001101
14 0
15 0
Save solution 310
end

TITLE

Stage 3 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 304.

Mixture 304.

0.000e+00	Solution 3	Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)		
0.000e+00	Solution 4	Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)		
0.000e+00	Solution 5	Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)		
0.000e+00	Solution 6	Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)		
0.000e+00	Solution 7	Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)		
0.000e+00	Solution 8	Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)		
0.000e+00	Solution 9	Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)		
7.800e-05	Solution 10	Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)		
6.340e-04	Solution 11	Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)		
4.690e-04	Solution 12	Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)		
1.101e-03	Solution 13	Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)		

0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 309 Solution after simulation 60.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.149e-09	1.151e-09
Al	1.040e-07	1.042e-07
As	5.906e-09	5.920e-09
B	8.417e-06	8.437e-06
Ba	3.152e-09	3.159e-09
C	1.481e-03	1.485e-03
Ca	4.483e-04	4.494e-04
Cd	5.456e-10	5.469e-10
Cl	1.877e-03	1.882e-03
Co	3.955e-09	3.964e-09
Cr	6.742e-10	6.758e-10
Cu	2.031e-07	2.036e-07
F	8.140e-05	8.159e-05
Fe	7.970e-10	7.989e-10
Hg	8.769e-11	8.789e-11
K	2.313e-04	2.318e-04
Mg	3.199e-04	3.207e-04
Mn	2.631e-06	2.637e-06
Mo	7.516e-08	7.534e-08
N	6.176e-07	6.190e-07
Na	3.359e-03	3.367e-03
Ni	6.144e-09	6.159e-09
Pb	3.451e-10	3.459e-10
S	8.351e-04	8.371e-04
Sb	1.156e-09	1.159e-09
Se	6.878e-09	6.894e-09
Si	3.018e-04	3.025e-04
U	1.977e-08	1.981e-08
V	3.765e-10	3.774e-10
Zn	5.658e-07	5.671e-07

-----Description of solution-----

equilibrium

pH	=	8.289	Charge balance
pe	=	4.217	Adjusted to redox
Activity of water	=	1.000	
Ionic strength (mol/kgw)	=	6.458e-03	
Mass of water (kg)	=	1.002e+00	
Total alkalinity (eq/kg)	=	1.504e-03	
Total CO2 (mol/kg)	=	1.481e-03	
Temperature (°C)	=	25.00	
Electrical balance (eq)	=	7.324e-08	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
Iterations	=	4	
Total H	=	1.112768e+02	
Total O	=	5.564610e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.137e-06	1.960e-06	-5.670	-5.708	-0.038	(0)
H+	5.594e-09	5.137e-09	-8.252	-8.289	-0.037	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.149e-09					
AgCl	7.770e-10	7.770e-10	-9.110	-9.110	0.000	(0)

	Ag+	2.403e-10	2.207e-10	-9.619	-9.656	-0.037	(0)
	AgCl2-	1.282e-10	1.167e-10	-9.892	-9.933	-0.041	(0)
	AgSO4-	2.645e-12	2.407e-12	-11.578	-11.619	-0.041	(0)
	AgCl3-2	2.615e-13	1.793e-13	-12.582	-12.746	-0.164	(0)
	AgOH	4.325e-14	4.325e-14	-13.364	-13.364	0.000	(0)
	AgF	4.031e-14	4.031e-14	-13.395	-13.395	0.000	(0)
	AgNO2	2.403e-14	2.403e-14	-13.619	-13.619	0.000	(0)
	AgH2BO3	2.957e-15	2.957e-15	-14.529	-14.529	0.000	(0)
	AgNH3+	2.216e-15	2.016e-15	-14.654	-14.695	-0.041	(0)
	Ag2Se	1.574e-15	1.574e-15	-14.803	-14.803	0.000	(0)
	AgCl4-3	1.476e-15	6.312e-16	-14.831	-15.200	-0.369	(0)
	AgSeO3-	3.725e-16	3.389e-16	-15.429	-15.470	-0.041	(0)
	Ag (OH) 2-	9.103e-18	8.283e-18	-17.041	-17.082	-0.041	(0)
	Ag (NH3) 2+	8.058e-20	7.332e-20	-19.094	-19.135	-0.041	(0)
	AgNO3	2.535e-20	2.535e-20	-19.596	-19.596	0.000	(0)
	Ag (NO2) 2-	2.131e-20	1.939e-20	-19.671	-19.712	-0.041	(0)
	Ag (SeO3) 2-3	1.695e-23	7.250e-24	-22.771	-23.140	-0.369	(0)
	Ag2MoO4	9.862e-28	9.862e-28	-27.006	-27.006	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.786	-73.786	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.023	-82.679	-0.656	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.708	-146.826	-0.117	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.590	-147.631	-0.041	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-147.743	-147.976	-0.233	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.061	-148.287	-0.226	(0)
Al		1.040e-07					
	Al (OH) 4-	1.036e-07	9.519e-08	-6.985	-7.021	-0.037	(0)
	Al (OH) 3	3.859e-10	3.859e-10	-9.414	-9.414	0.000	(0)
	Al (OH) 2+	1.072e-11	9.868e-12	-10.970	-11.006	-0.036	(0)
	AlF2+	7.394e-14	6.808e-14	-13.131	-13.167	-0.036	(0)
	AlF3	6.231e-14	6.231e-14	-13.205	-13.205	0.000	(0)
	AlOH+2	8.822e-15	6.340e-15	-14.054	-14.198	-0.143	(0)
	AlF+2	3.273e-15	2.352e-15	-14.485	-14.629	-0.143	(0)
	AlF4-	2.470e-15	2.271e-15	-14.607	-14.644	-0.037	(0)
	AlSO4+	1.493e-17	1.372e-17	-16.826	-16.863	-0.037	(0)
	Al+3	6.957e-18	3.235e-18	-17.158	-17.490	-0.333	(0)
	Al (SO4) 2-	8.742e-20	8.035e-20	-19.058	-19.095	-0.037	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-55.495	-55.864	-0.369	(0)
As (3)		1.391e-22					
	H3AsO3	1.253e-22	1.253e-22	-21.902	-21.902	0.000	(0)
	H2AsO3-	1.375e-23	1.251e-23	-22.862	-22.903	-0.041	(0)
	HAsO3-2	3.240e-27	2.221e-27	-26.489	-26.653	-0.164	(0)
	H4AsO3+	3.506e-31	3.190e-31	-30.455	-30.496	-0.041	(0)
	AsO3-3	3.897e-32	1.667e-32	-31.409	-31.778	-0.369	(0)
As (5)		5.906e-09					
	HAsO4-2	5.699e-09	3.907e-09	-8.244	-8.408	-0.164	(0)
	H2AsO4-	2.012e-10	1.831e-10	-9.696	-9.737	-0.041	(0)
	AsO4-3	5.623e-12	2.405e-12	-11.250	-11.619	-0.369	(0)
	H3AsO4	1.632e-16	1.634e-16	-15.787	-15.787	0.001	(0)
B		8.417e-06					
	H3BO3	7.467e-06	7.479e-06	-5.127	-5.126	0.001	(0)
	H2BO3-	9.237e-07	8.454e-07	-6.034	-6.073	-0.038	(0)
	CaH2BO3+	1.511e-08	1.383e-08	-7.821	-7.859	-0.038	(0)
	MgH2BO3+	6.657e-09	6.093e-09	-8.177	-8.215	-0.038	(0)
	NaH2BO3	4.118e-09	4.118e-09	-8.385	-8.385	0.000	(0)
	BF (OH) 3-	2.370e-10	2.170e-10	-9.625	-9.664	-0.038	(0)
	H5 (BO3) 2-	5.879e-12	5.381e-12	-11.231	-11.269	-0.038	(0)
	BaH2BO3+	6.313e-14	5.778e-14	-13.200	-13.238	-0.038	(0)
	BF2 (OH) 2-	9.467e-15	8.665e-15	-14.024	-14.062	-0.038	(0)
	H8 (BO3) 3-	4.397e-15	4.024e-15	-14.357	-14.395	-0.038	(0)
	AgH2BO3	2.957e-15	2.957e-15	-14.529	-14.529	0.000	(0)
	BF3OH-	1.376e-21	1.259e-21	-20.861	-20.900	-0.038	(0)
	BF4-	2.529e-27	2.315e-27	-26.597	-26.635	-0.038	(0)
Ba		3.152e-09					
	Ba+2	3.108e-09	2.212e-09	-8.507	-8.655	-0.148	(0)
	BaHCO3+	3.012e-11	2.777e-11	-10.521	-10.556	-0.035	(0)
	BaCO3	1.361e-11	1.361e-11	-10.866	-10.866	0.000	(0)
	BaH2BO3+	6.313e-14	5.778e-14	-13.200	-13.238	-0.038	(0)
	BaOH+	2.056e-14	1.892e-14	-13.687	-13.723	-0.036	(0)

BaNH3+2	9.107e-18	6.243e-18	-17.041	-17.205	-0.164	(0)
BaNO3+	1.761e-18	1.603e-18	-17.754	-17.795	-0.041	(0)
C (4)	1.481e-03					
HCO3-	1.428e-03	1.315e-03	-2.845	-2.881	-0.036	(0)
CO3-2	1.686e-05	1.200e-05	-4.773	-4.921	-0.148	(0)
H2CO3	1.519e-05	1.519e-05	-4.818	-4.818	0.000	(0)
CaHCO3+	7.550e-06	6.959e-06	-5.122	-5.157	-0.035	(0)
CaCO3	5.405e-06	5.405e-06	-5.267	-5.267	0.000	(0)
MgHCO3+	3.045e-06	2.796e-06	-5.516	-5.553	-0.037	(0)
NaHCO3	2.272e-06	2.272e-06	-5.644	-5.644	0.000	(0)
MgCO3	2.074e-06	2.074e-06	-5.683	-5.683	0.000	(0)
NaCO3-	7.456e-07	6.865e-07	-6.128	-6.163	-0.036	(0)
CuCO3	1.690e-07	1.690e-07	-6.772	-6.772	0.000	(0)
ZnCO3	1.528e-07	1.528e-07	-6.816	-6.816	0.000	(0)
MnHCO3+	4.703e-08	4.326e-08	-7.328	-7.364	-0.036	(0)
UO2 (CO3) 3-4	1.286e-08	2.840e-09	-7.891	-8.547	-0.656	(0)
ZnHCO3+	1.011e-08	9.202e-09	-7.995	-8.036	-0.041	(0)
Cu (CO3) 2-2	7.959e-09	5.456e-09	-8.099	-8.263	-0.164	(0)
UO2 (CO3) 2-2	6.890e-09	4.724e-09	-8.162	-8.326	-0.164	(0)
NiCO3	1.263e-09	1.263e-09	-8.899	-8.899	0.000	(0)
NiHCO3+	5.025e-10	4.572e-10	-9.299	-9.340	-0.041	(0)
CoCO3	4.132e-10	4.132e-10	-9.384	-9.384	0.000	(0)
PbCO3	2.681e-10	2.681e-10	-9.572	-9.572	0.000	(0)
CoHCO3+	2.290e-10	2.084e-10	-9.640	-9.681	-0.041	(0)
CuHCO3+	2.181e-10	1.984e-10	-9.661	-9.702	-0.041	(0)
CdCO3	7.352e-11	7.352e-11	-10.134	-10.134	0.000	(0)
BaHCO3+	3.012e-11	2.777e-11	-10.521	-10.556	-0.035	(0)
UO2CO3	1.974e-11	1.974e-11	-10.705	-10.705	0.000	(0)
BaCO3	1.361e-11	1.361e-11	-10.866	-10.866	0.000	(0)
Pb (CO3) 2-2	1.353e-11	9.276e-12	-10.869	-11.033	-0.164	(0)
PbHCO3+	7.981e-12	7.262e-12	-11.098	-11.139	-0.041	(0)
Cd (CO3) 2-2	9.536e-13	6.538e-13	-12.021	-12.185	-0.164	(0)
CdHCO3+	8.844e-13	8.047e-13	-12.053	-12.094	-0.041	(0)
FeHCO3+	2.682e-15	2.472e-15	-14.572	-14.607	-0.035	(0)
HgCO3	3.709e-17	3.709e-17	-16.431	-16.431	0.000	(0)
Hg (CO3) 2-2	2.052e-18	1.407e-18	-17.688	-17.852	-0.164	(0)
HgHCO3+	3.899e-21	3.548e-21	-20.409	-20.450	-0.041	(0)
Ca	4.483e-04					
Ca+2	3.995e-04	2.843e-04	-3.398	-3.546	-0.148	(0)
CaSO4	3.559e-05	3.559e-05	-4.449	-4.449	0.000	(0)
CaHCO3+	7.550e-06	6.959e-06	-5.122	-5.157	-0.035	(0)
CaCO3	5.405e-06	5.405e-06	-5.267	-5.267	0.000	(0)
CaF+	2.452e-07	2.256e-07	-6.610	-6.647	-0.036	(0)
CaH2BO3+	1.511e-08	1.383e-08	-7.821	-7.859	-0.038	(0)
CaOH+	1.206e-08	1.112e-08	-7.919	-7.954	-0.035	(0)
CaNH3+2	2.336e-12	1.601e-12	-11.632	-11.796	-0.164	(0)
CaNO3+	1.428e-13	1.300e-13	-12.845	-12.886	-0.041	(0)
Ca (NH3) 2+2	4.160e-21	2.852e-21	-20.381	-20.545	-0.164	(0)
Cd	5.456e-10					
Cd+2	3.779e-10	2.689e-10	-9.423	-9.570	-0.148	(0)
CdCO3	7.352e-11	7.352e-11	-10.134	-10.134	0.000	(0)
CdCl+	4.866e-11	4.427e-11	-10.313	-10.354	-0.041	(0)
CdSO4	3.444e-11	3.444e-11	-10.463	-10.463	0.000	(0)
CdOH+	4.600e-12	4.185e-12	-11.337	-11.378	-0.041	(0)
CdOHC1	3.559e-12	3.559e-12	-11.449	-11.449	0.000	(0)
Cd (CO3) 2-2	9.536e-13	6.538e-13	-12.021	-12.185	-0.164	(0)
CdHCO3+	8.844e-13	8.047e-13	-12.053	-12.094	-0.041	(0)
Cd (SO4) 2-2	3.703e-13	2.539e-13	-12.431	-12.595	-0.164	(0)
CdF+	3.405e-13	3.098e-13	-12.468	-12.509	-0.041	(0)
CdCl2	3.182e-13	3.182e-13	-12.497	-12.497	0.000	(0)
Cd (OH) 2	5.175e-14	5.175e-14	-13.286	-13.286	0.000	(0)
CdCl3-	3.805e-16	3.462e-16	-15.420	-15.461	-0.041	(0)
CdF2	4.495e-17	4.495e-17	-16.347	-16.347	0.000	(0)
Cd (OH) 3-	6.809e-18	6.196e-18	-17.167	-17.208	-0.041	(0)
CdSeO4	1.524e-19	1.524e-19	-18.817	-18.817	0.000	(0)
CdNO3+	1.351e-19	1.229e-19	-18.869	-18.910	-0.041	(0)
Cd2OH+3	1.319e-20	5.640e-21	-19.880	-20.249	-0.369	(0)
Cd (SeO3) 2-2	1.845e-21	1.265e-21	-20.734	-20.898	-0.164	(0)

	Cd(OH) 4-2	2.899e-24	1.987e-24	-23.538	-23.702	-0.164	(0)
	Cd(NO3) 2	8.909e-30	8.909e-30	-29.050	-29.050	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.466	-79.507	-0.041	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.248	-150.248	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.252	-226.293	-0.041	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-301.878	-302.042	-0.164	(0)
Cl		1.877e-03					
	Cl-	1.877e-03	1.724e-03	-2.726	-2.763	-0.037	(0)
	MnCl+	3.892e-09	3.580e-09	-8.410	-8.446	-0.036	(0)
	ZnOHCl	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
	ZnCl+	1.044e-09	9.587e-10	-8.981	-9.018	-0.037	(0)
	AgCl	7.770e-10	7.770e-10	-9.110	-9.110	0.000	(0)
	CuCl	1.542e-10	1.542e-10	-9.812	-9.812	0.000	(0)
	AgCl2-	1.282e-10	1.167e-10	-9.892	-9.933	-0.041	(0)
	CuCl2-	6.048e-11	5.554e-11	-10.218	-10.255	-0.037	(0)
	CdCl+	4.866e-11	4.427e-11	-10.313	-10.354	-0.041	(0)
	NiCl+	1.368e-11	1.245e-11	-10.864	-10.905	-0.041	(0)
	CoCl+	1.336e-11	1.215e-11	-10.874	-10.915	-0.041	(0)
	MnCl2	8.720e-12	8.720e-12	-11.059	-11.059	0.000	(0)
	CuCl+	7.120e-12	6.537e-12	-11.148	-11.185	-0.037	(0)
	CdOHCl	3.559e-12	3.559e-12	-11.449	-11.449	0.000	(0)
	ZnCl2	2.620e-12	2.620e-12	-11.582	-11.582	0.000	(0)
	PbCl+	4.998e-13	4.548e-13	-12.301	-12.342	-0.041	(0)
	CdCl2	3.182e-13	3.182e-13	-12.497	-12.497	0.000	(0)
	AgCl3-2	2.615e-13	1.793e-13	-12.582	-12.746	-0.164	(0)
	CuCl3-2	2.858e-14	2.047e-14	-13.544	-13.689	-0.145	(0)
	HgClOH	1.542e-14	1.542e-14	-13.812	-13.812	0.000	(0)
	MnCl3-	4.501e-15	4.141e-15	-14.347	-14.383	-0.036	(0)
	CuCl2	3.908e-15	3.908e-15	-14.408	-14.408	0.000	(0)
	ZnCl3-	3.908e-15	3.588e-15	-14.408	-14.445	-0.037	(0)
	PbCl2	3.503e-15	3.503e-15	-14.456	-14.456	0.000	(0)
	AgCl4-3	1.476e-15	6.312e-16	-14.831	-15.200	-0.369	(0)
	HgCl2	7.680e-16	7.680e-16	-15.115	-15.115	0.000	(0)
	CdCl3-	3.805e-16	3.462e-16	-15.420	-15.461	-0.041	(0)
	NiCl2	1.080e-16	1.080e-16	-15.966	-15.966	0.000	(0)
	HgCl3-	1.455e-17	1.324e-17	-16.837	-16.878	-0.041	(0)
	ZnCl4-2	4.318e-18	3.093e-18	-17.365	-17.510	-0.145	(0)
	PbCl3-	2.642e-18	2.405e-18	-17.578	-17.619	-0.041	(0)
	UO2Cl+	1.270e-18	1.156e-18	-17.896	-17.937	-0.041	(0)
	HgCl4-2	1.326e-19	9.089e-20	-18.878	-19.041	-0.164	(0)
	CrCl+2	1.084e-19	7.434e-20	-18.965	-19.129	-0.164	(0)
	HgCl+	9.767e-20	8.887e-20	-19.010	-19.051	-0.041	(0)
	CuCl3-	6.849e-20	6.289e-20	-19.164	-19.201	-0.037	(0)
	CrOHCl2	4.774e-21	4.774e-21	-20.321	-20.321	0.000	(0)
	PbCl4-2	2.764e-21	1.895e-21	-20.558	-20.722	-0.164	(0)
	FeCl+2	1.664e-23	1.192e-23	-22.779	-22.924	-0.145	(0)
	CrCl2+	1.337e-23	1.216e-23	-22.874	-22.915	-0.041	(0)
	CuCl4-2	7.586e-25	5.435e-25	-24.120	-24.265	-0.145	(0)
	FeCl2+	9.979e-26	9.181e-26	-25.001	-25.037	-0.036	(0)
	VOCl+	7.446e-26	6.776e-26	-25.128	-25.169	-0.041	(0)
	CrO3Cl-	3.561e-27	3.240e-27	-26.448	-26.489	-0.041	(0)
	FeCl3	1.583e-29	1.583e-29	-28.801	-28.801	0.000	(0)
	CoCl+2	6.848e-38	4.695e-38	-37.164	-37.328	-0.164	(0)
	UCl+3	0.000e+00	0.000e+00	-48.454	-48.823	-0.369	(0)
	Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-52.958	-53.122	-0.164	(0)
	Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-55.071	-55.235	-0.164	(0)
	Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-68.023	-68.187	-0.164	(0)
Co(2)		3.955e-09					
	Co+2	2.972e-09	2.038e-09	-8.527	-8.691	-0.164	(0)
	CoCO3	4.132e-10	4.132e-10	-9.384	-9.384	0.000	(0)
	CoHCO3+	2.290e-10	2.084e-10	-9.640	-9.681	-0.041	(0)
	CoSO4	2.222e-10	2.222e-10	-9.653	-9.653	0.000	(0)
	CoOH+	8.756e-11	7.967e-11	-10.058	-10.099	-0.041	(0)
	CoCl+	1.336e-11	1.215e-11	-10.874	-10.915	-0.041	(0)
	Co(OH) 2	1.240e-11	1.240e-11	-10.906	-10.906	0.000	(0)
	CoF+	5.149e-12	4.685e-12	-11.288	-11.329	-0.041	(0)
	CoNO2+	8.222e-15	7.481e-15	-14.085	-14.126	-0.041	(0)
	Co(NH3) +2	1.599e-15	1.096e-15	-14.796	-14.960	-0.164	(0)

Co (OH) 3-	5.329e-16	4.849e-16	-15.273	-15.314	-0.041	(0)
CoOH-	1.337e-16	1.217e-16	-15.874	-15.915	-0.041	(0)
CoSeO4	3.109e-18	3.109e-18	-17.507	-17.507	0.000	(0)
CoNO3+	5.132e-19	4.669e-19	-18.290	-18.331	-0.041	(0)
Co2OH+3	1.903e-20	8.137e-21	-19.721	-20.090	-0.369	(0)
Co (NH3) 2+2	3.051e-22	2.092e-22	-21.516	-21.679	-0.164	(0)
Co (OH) 4-2	2.197e-22	1.506e-22	-21.658	-21.822	-0.164	(0)
Co (NO3) 2	1.374e-28	1.374e-28	-27.862	-27.862	0.000	(0)
Co (NH3) 3+2	1.719e-29	1.178e-29	-28.765	-28.929	-0.164	(0)
Co4 (OH) 4+4	3.640e-32	8.040e-33	-31.439	-32.095	-0.656	(0)
Co (NH3) 4+2	4.035e-37	2.766e-37	-36.394	-36.558	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.523	-44.687	-0.164	(0)
Co (3)	1.944e-30					
CoOH+2	1.944e-30	1.333e-30	-29.711	-29.875	-0.164	(0)
Co+3	2.878e-37	1.338e-37	-36.541	-36.873	-0.333	(0)
CoCl+2	6.848e-38	4.695e-38	-37.164	-37.328	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.958	-53.122	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.719	-63.760	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.767	-66.931	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.023	-68.187	-0.164	(0)
Cr (2)	7.036e-28					
Cr+2	7.036e-28	4.824e-28	-27.153	-27.317	-0.164	(0)
Cr (3)	6.742e-10					
Cr (OH) 2+	3.743e-10	3.406e-10	-9.427	-9.468	-0.041	(0)
Cr (OH) 3	2.507e-10	2.507e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.547e-11	2.318e-11	-10.594	-10.635	-0.041	(0)
Cr (OH) 4-	2.150e-11	1.956e-11	-10.668	-10.709	-0.041	(0)
Cr (OH) +2	2.083e-12	1.428e-12	-11.681	-11.845	-0.164	(0)
CrOHSO4	1.852e-13	1.852e-13	-12.732	-12.732	0.000	(0)
CrF+2	5.599e-16	3.839e-16	-15.252	-15.416	-0.164	(0)
Cr+3	7.789e-17	3.331e-17	-16.109	-16.477	-0.369	(0)
CrSO4+	4.672e-17	4.251e-17	-16.331	-16.372	-0.041	(0)
CrCl+2	1.084e-19	7.434e-20	-18.965	-19.129	-0.164	(0)
CrOHCl2	4.774e-21	4.774e-21	-20.321	-20.321	0.000	(0)
Cr2 (OH) 2SO4+2	3.487e-23	2.391e-23	-22.457	-22.621	-0.164	(0)
CrCl2+	1.337e-23	1.216e-23	-22.874	-22.915	-0.041	(0)
Cr2 (OH) 2 (SO4) 2	7.761e-25	7.761e-25	-24.110	-24.110	0.000	(0)
CrNO3+2	3.071e-28	2.105e-28	-27.513	-27.677	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.395	-43.559	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.204	-53.573	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.071	-55.235	-0.164	(0)
Cr (6)	5.042e-15					
CrO4-2	4.916e-15	3.498e-15	-14.308	-14.456	-0.148	(0)
HCrO4-	6.391e-17	5.815e-17	-16.194	-16.235	-0.041	(0)
NaCrO4-	5.871e-17	5.342e-17	-16.231	-16.272	-0.041	(0)
KCrO4-	3.022e-18	2.750e-18	-17.520	-17.561	-0.041	(0)
H2CrO4	2.422e-25	2.422e-25	-24.616	-24.616	0.000	(0)
CrO3SO4-2	7.254e-26	4.973e-26	-25.139	-25.303	-0.164	(0)
CrO3Cl-	3.561e-27	3.240e-27	-26.448	-26.489	-0.041	(0)
Cr2O7-2	1.711e-31	1.173e-31	-30.767	-30.931	-0.164	(0)
Cu (1)	2.927e-10					
CuCl	1.542e-10	1.542e-10	-9.812	-9.812	0.000	(0)
Cu+	7.805e-11	7.102e-11	-10.108	-10.149	-0.041	(0)
CuCl2-	6.048e-11	5.554e-11	-10.218	-10.255	-0.037	(0)
CuCl3-2	2.858e-14	2.047e-14	-13.544	-13.689	-0.145	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.840	-146.070	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.578	-146.800	-0.222	(0)
Cu (2)	2.028e-07					
CuCO3	1.690e-07	1.690e-07	-6.772	-6.772	0.000	(0)
CuOH+	1.615e-08	1.483e-08	-7.792	-7.829	-0.037	(0)
Cu (CO3) 2-2	7.959e-09	5.456e-09	-8.099	-8.263	-0.164	(0)
Cu (OH) 2	5.797e-09	5.797e-09	-8.237	-8.237	0.000	(0)
Cu+2	3.362e-09	2.392e-09	-8.473	-8.621	-0.148	(0)
CuSO4	2.995e-10	2.995e-10	-9.524	-9.524	0.000	(0)
CuHCO3+	2.181e-10	1.984e-10	-9.661	-9.702	-0.041	(0)
Cu (OH) 3-	2.561e-11	2.330e-11	-10.592	-10.633	-0.041	(0)
CuF+	1.206e-11	1.097e-11	-10.919	-10.960	-0.041	(0)
Cu2 (OH) 2+2	8.053e-12	5.521e-12	-11.094	-11.258	-0.164	(0)

	CuCl+	7.120e-12	6.537e-12	-11.148	-11.185	-0.037	(0)
	CuNH3+2	1.598e-13	1.095e-13	-12.797	-12.960	-0.164	(0)
	CuNO2+	1.434e-13	1.305e-13	-12.843	-12.884	-0.041	(0)
	CuCl2	3.908e-15	3.908e-15	-14.408	-14.408	0.000	(0)
	Cu(OH) 4-2	5.242e-16	3.594e-16	-15.280	-15.444	-0.164	(0)
	CuNO3+	1.202e-18	1.094e-18	-17.920	-17.961	-0.041	(0)
	Cu(NO2) 2	6.959e-19	6.959e-19	-18.157	-18.157	0.000	(0)
	CuCl3-	6.849e-20	6.289e-20	-19.164	-19.201	-0.037	(0)
	CuCl4-2	7.586e-25	5.435e-25	-24.120	-24.265	-0.145	(0)
	Cu(NO3) 2	1.991e-29	1.991e-29	-28.701	-28.701	0.000	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-216.516	-216.557	-0.041	(0)
F		8.140e-05					
	F-	7.916e-05	7.270e-05	-4.101	-4.138	-0.037	(0)
	MgF+	1.845e-06	1.696e-06	-5.734	-5.771	-0.037	(0)
	CaF+	2.452e-07	2.256e-07	-6.610	-6.647	-0.036	(0)
	NaF	1.410e-07	1.410e-07	-6.851	-6.851	0.000	(0)
	MnF+	5.189e-09	4.774e-09	-8.285	-8.321	-0.036	(0)
	HF	5.525e-10	5.525e-10	-9.258	-9.258	0.000	(0)
	ZnF+	3.529e-10	3.211e-10	-9.452	-9.493	-0.041	(0)
	BF(OH) 3-	2.370e-10	2.170e-10	-9.625	-9.664	-0.038	(0)
	CuF+	1.206e-11	1.097e-11	-10.919	-10.960	-0.041	(0)
	NiF+	5.662e-12	5.152e-12	-11.247	-11.288	-0.041	(0)
	CoF+	5.149e-12	4.685e-12	-11.288	-11.329	-0.041	(0)
	CdF+	3.405e-13	3.098e-13	-12.468	-12.509	-0.041	(0)
	HF2-	1.665e-13	1.527e-13	-12.779	-12.816	-0.038	(0)
	AlF2+	7.394e-14	6.808e-14	-13.131	-13.167	-0.036	(0)
	AlF3	6.231e-14	6.231e-14	-13.205	-13.205	0.000	(0)
	PbF+	4.186e-14	3.809e-14	-13.378	-13.419	-0.041	(0)
	AgF	4.031e-14	4.031e-14	-13.395	-13.395	0.000	(0)
	BF2(OH) 2-	9.467e-15	8.665e-15	-14.024	-14.062	-0.038	(0)
	UO2F+	4.558e-15	4.148e-15	-14.341	-14.382	-0.041	(0)
	AlF+2	3.273e-15	2.352e-15	-14.485	-14.629	-0.143	(0)
	AlF4-	2.470e-15	2.271e-15	-14.607	-14.644	-0.037	(0)
	UO2F2	8.697e-16	8.697e-16	-15.061	-15.061	0.000	(0)
	CrF+2	5.599e-16	3.839e-16	-15.252	-15.416	-0.164	(0)
	PbF2	5.450e-17	5.450e-17	-16.264	-16.264	0.000	(0)
	CdF2	4.495e-17	4.495e-17	-16.347	-16.347	0.000	(0)
	UO2F3-	1.745e-17	1.588e-17	-16.758	-16.799	-0.041	(0)
	H2F2	8.178e-19	8.178e-19	-18.087	-18.087	0.000	(0)
	FeF2+	3.859e-20	3.551e-20	-19.413	-19.450	-0.036	(0)
	FeF+2	2.547e-20	1.825e-20	-19.594	-19.739	-0.145	(0)
	VO2F	1.396e-20	1.396e-20	-19.855	-19.855	0.000	(0)
	UO2F4-2	1.338e-20	9.172e-21	-19.874	-20.038	-0.164	(0)
	PbF3-	8.259e-21	7.515e-21	-20.083	-20.124	-0.041	(0)
	FeF3	3.642e-21	3.642e-21	-20.439	-20.439	0.000	(0)
	BF3OH-	1.376e-21	1.259e-21	-20.861	-20.900	-0.038	(0)
	VO2F2-	4.049e-22	3.684e-22	-21.393	-21.434	-0.041	(0)
	VOF+	6.713e-24	6.108e-24	-23.173	-23.214	-0.041	(0)
	VO2F3-2	4.874e-25	3.341e-25	-24.312	-24.476	-0.164	(0)
	PbF4-2	3.815e-25	2.615e-25	-24.419	-24.582	-0.164	(0)
	VOF2	1.665e-25	1.665e-25	-24.779	-24.779	0.000	(0)
	HgF+	7.651e-27	6.962e-27	-26.116	-26.157	-0.041	(0)
	BF4-	2.529e-27	2.315e-27	-26.597	-26.635	-0.038	(0)
	Sb(OH) 2F	7.294e-28	7.294e-28	-27.137	-27.137	0.000	(0)
	SbOF	7.174e-28	7.174e-28	-27.144	-27.144	0.000	(0)
	VOF3-	4.721e-28	4.296e-28	-27.326	-27.367	-0.041	(0)
	VO2F4-3	2.795e-29	1.195e-29	-28.554	-28.923	-0.369	(0)
	VOF4-2	1.839e-31	1.261e-31	-30.735	-30.899	-0.164	(0)
	SiF6-2	6.379e-32	4.570e-32	-31.195	-31.340	-0.145	(0)
	UF3+	2.925e-39	2.662e-39	-38.534	-38.575	-0.041	(0)
	UF2+2	3.370e-40	2.310e-40	-39.472	-39.636	-0.164	(0)
	UF4	0.000e+00	0.000e+00	-40.673	-40.673	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-42.229	-42.598	-0.369	(0)
	UF5-	0.000e+00	0.000e+00	-43.173	-43.214	-0.041	(0)
	UF6-2	0.000e+00	0.000e+00	-44.708	-44.872	-0.164	(0)
Fe(2)		2.533e-13					
	Fe+2	2.179e-13	1.494e-13	-12.662	-12.826	-0.164	(0)
	FeSO4	2.004e-14	2.004e-14	-13.698	-13.698	0.000	(0)

FeOH+	1.267e-14	1.165e-14	-13.897	-13.934	-0.036	(0)
FeHCO3+	2.682e-15	2.472e-15	-14.572	-14.607	-0.035	(0)
Fe (OH) 2	1.814e-17	1.814e-17	-16.741	-16.741	0.000	(0)
Fe (OH) 3-	1.222e-17	1.124e-17	-16.913	-16.949	-0.036	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.765	-159.765	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.632	-235.673	-0.041	(0)
Fe (3)	7.967e-10					
Fe (OH) 3	4.648e-10	4.648e-10	-9.333	-9.333	0.000	(0)
Fe (OH) 2+	2.398e-10	2.208e-10	-9.620	-9.656	-0.036	(0)
Fe (OH) 4-	9.211e-11	8.481e-11	-10.036	-10.072	-0.036	(0)
FeOH+2	4.043e-16	2.897e-16	-15.393	-15.538	-0.145	(0)
FeF2+	3.859e-20	3.551e-20	-19.413	-19.450	-0.036	(0)
FeF+2	2.547e-20	1.825e-20	-19.594	-19.739	-0.145	(0)
FeF3	3.642e-21	3.642e-21	-20.439	-20.439	0.000	(0)
FeSO4+	1.526e-21	1.404e-21	-20.817	-20.853	-0.036	(0)
Fe+3	4.923e-22	2.289e-22	-21.308	-21.640	-0.333	(0)
Fe (SO4) 2-	1.802e-23	1.640e-23	-22.744	-22.785	-0.041	(0)
FeCl+2	1.664e-23	1.192e-23	-22.779	-22.924	-0.145	(0)
FeCl2+	9.979e-26	9.181e-26	-25.001	-25.037	-0.036	(0)
FeHSeO3+2	2.720e-27	1.865e-27	-26.565	-26.729	-0.164	(0)
FeCl3	1.583e-29	1.583e-29	-28.801	-28.801	0.000	(0)
Fe2 (OH) 2+4	1.258e-29	2.778e-30	-28.900	-29.556	-0.656	(0)
FeNO3+2	4.828e-31	3.310e-31	-30.316	-30.480	-0.164	(0)
Fe3 (OH) 4+5	9.386e-38	8.868e-39	-37.028	-38.052	-1.025	(0)
H (0)	1.371e-28					
H2	6.855e-29	6.865e-29	-28.164	-28.163	0.001	(0)
Hg (0)	8.761e-11					
Hg	8.761e-11	8.761e-11	-10.057	-10.057	0.000	(0)
Hg (1)	4.482e-25					
Hg2+2	2.241e-25	1.536e-25	-24.650	-24.813	-0.164	(0)
Hg (2)	7.874e-14					
Hg (OH) 2	6.250e-14	6.260e-14	-13.204	-13.203	0.001	(0)
HgClOH	1.542e-14	1.542e-14	-13.812	-13.812	0.000	(0)
HgCl2	7.680e-16	7.680e-16	-15.115	-15.115	0.000	(0)
HgCO3	3.709e-17	3.709e-17	-16.431	-16.431	0.000	(0)
HgCl3-	1.455e-17	1.324e-17	-16.837	-16.878	-0.041	(0)
Hg (CO3) 2-2	2.052e-18	1.407e-18	-17.688	-17.852	-0.164	(0)
HgOH+	2.215e-19	2.015e-19	-18.655	-18.696	-0.041	(0)
HgCl4-2	1.326e-19	9.089e-20	-18.878	-19.041	-0.164	(0)
HgCl+	9.767e-20	8.887e-20	-19.010	-19.051	-0.041	(0)
Hg (OH) 3-	1.697e-20	1.544e-20	-19.770	-19.811	-0.041	(0)
HgHCO3+	3.899e-21	3.548e-21	-20.409	-20.450	-0.041	(0)
Hg (NH3) 2+2	4.759e-23	3.263e-23	-22.322	-22.486	-0.164	(0)
HgNH3+2	1.064e-23	7.293e-24	-22.973	-23.137	-0.164	(0)
Hg+2	3.768e-24	2.583e-24	-23.424	-23.588	-0.164	(0)
HgSO4	3.696e-25	3.696e-25	-24.432	-24.432	0.000	(0)
HgF+	7.651e-27	6.962e-27	-26.116	-26.157	-0.041	(0)
Hg (NH3) 3+2	8.476e-31	5.811e-31	-30.072	-30.236	-0.164	(0)
HgNO3+	1.516e-34	1.379e-34	-33.819	-33.860	-0.041	(0)
Hg (NH3) 4+2	3.012e-38	2.065e-38	-37.521	-37.685	-0.164	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.082	-44.082	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.219	-139.260	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-139.515	-139.679	-0.164	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.155	-141.155	0.000	(0)
K	2.313e-04					
K+	2.304e-04	2.116e-04	-3.638	-3.674	-0.037	(0)
KSO4-	8.891e-07	8.186e-07	-6.051	-6.087	-0.036	(0)
KCrO4-	3.022e-18	2.750e-18	-17.520	-17.561	-0.041	(0)
Mg	3.199e-04					
Mg+2	2.921e-04	2.079e-04	-3.534	-3.682	-0.148	(0)
MgSO4	2.067e-05	2.067e-05	-4.685	-4.685	0.000	(0)
MgHCO3+	3.045e-06	2.796e-06	-5.516	-5.553	-0.037	(0)
MgCO3	2.074e-06	2.074e-06	-5.683	-5.683	0.000	(0)
MgF+	1.845e-06	1.696e-06	-5.734	-5.771	-0.037	(0)
MgOH+	1.758e-07	1.622e-07	-6.755	-6.790	-0.035	(0)
MgH2BO3+	6.657e-09	6.093e-09	-8.177	-8.215	-0.038	(0)
Mn (2)	2.631e-06					
Mn+2	2.406e-06	1.649e-06	-5.619	-5.783	-0.164	(0)

MnSO4	1.603e-07	1.603e-07	-6.795	-6.795	0.000	(0)
MnHCO3+	4.703e-08	4.326e-08	-7.328	-7.364	-0.036	(0)
MnOH+	8.826e-09	8.120e-09	-8.054	-8.090	-0.036	(0)
MnF+	5.189e-09	4.774e-09	-8.285	-8.321	-0.036	(0)
MnCl+	3.892e-09	3.580e-09	-8.410	-8.446	-0.036	(0)
MnCl2	8.720e-12	8.720e-12	-11.059	-11.059	0.000	(0)
MnCl3-	4.501e-15	4.141e-15	-14.347	-14.383	-0.036	(0)
MnSeO4	1.352e-15	1.352e-15	-14.869	-14.869	0.000	(0)
MnNO3+	4.154e-16	3.780e-16	-15.382	-15.423	-0.041	(0)
Mn (OH) 3-	2.095e-16	1.927e-16	-15.679	-15.715	-0.036	(0)
Mn (OH) 4-2	1.702e-21	1.219e-21	-20.769	-20.914	-0.145	(0)
Mn (NO3) 2	1.373e-25	1.373e-25	-24.862	-24.862	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.569	-41.569	0.000	(0)
Mn (3)	2.614e-27					
Mn+3	2.614e-27	1.216e-27	-26.583	-26.915	-0.333	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-40.876	-41.021	-0.145	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.138	-46.176	-0.038	(0)
Mo	7.516e-08					
MoO4-2	7.516e-08	5.348e-08	-7.124	-7.272	-0.148	(0)
HMoO4-	6.008e-12	5.467e-12	-11.221	-11.262	-0.041	(0)
H2MoO4	2.057e-16	2.057e-16	-15.687	-15.687	0.000	(0)
Ag2MoO4	9.862e-28	9.862e-28	-27.006	-27.006	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.495	-55.864	-0.369	(0)
Mo7O24-6	0.000e+00	0.000e+00	-62.751	-64.226	-1.475	(0)
HMo7O24-5	0.000e+00	0.000e+00	-65.104	-66.129	-1.025	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-68.980	-69.636	-0.656	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-74.310	-74.679	-0.369	(0)
N (-3)	4.878e-08					
NH4+	4.404e-08	4.031e-08	-7.356	-7.395	-0.038	(0)
NH3	4.474e-09	4.474e-09	-8.349	-8.349	0.000	(0)
NH4SO4-	2.566e-10	2.360e-10	-9.591	-9.627	-0.036	(0)
CaNH3+2	2.336e-12	1.601e-12	-11.632	-11.796	-0.164	(0)
CuNH3+2	1.598e-13	1.095e-13	-12.797	-12.960	-0.164	(0)
NiNH3+2	9.887e-15	6.779e-15	-14.005	-14.169	-0.164	(0)
AgNH3+	2.216e-15	2.016e-15	-14.654	-14.695	-0.041	(0)
Co (NH3) +2	1.599e-15	1.096e-15	-14.796	-14.960	-0.164	(0)
BaNH3+2	9.107e-18	6.243e-18	-17.041	-17.205	-0.164	(0)
Ag (NH3) 2+	8.058e-20	7.332e-20	-19.094	-19.135	-0.041	(0)
Ni (NH3) 2+2	6.394e-21	4.384e-21	-20.194	-20.358	-0.164	(0)
Ca (NH3) 2+2	4.160e-21	2.852e-21	-20.381	-20.545	-0.164	(0)
Co (NH3) 2+2	3.051e-22	2.092e-22	-21.516	-21.679	-0.164	(0)
Hg (NH3) 2+2	4.759e-23	3.263e-23	-22.322	-22.486	-0.164	(0)
HgNH3+2	1.064e-23	7.293e-24	-22.973	-23.137	-0.164	(0)
Co (NH3) 3+2	1.719e-29	1.178e-29	-28.765	-28.929	-0.164	(0)
Hg (NH3) 3+2	8.476e-31	5.811e-31	-30.072	-30.236	-0.164	(0)
Co (NH3) 4+2	4.035e-37	2.766e-37	-36.394	-36.558	-0.164	(0)
Hg (NH3) 4+2	3.012e-38	2.065e-38	-37.521	-37.685	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.395	-43.559	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.523	-44.687	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.958	-53.122	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.204	-53.573	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.071	-55.235	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.719	-63.760	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.767	-66.931	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.023	-68.187	-0.164	(0)
N (3)	5.686e-07					
NO2-	5.686e-07	5.210e-07	-6.245	-6.283	-0.038	(0)
CuNO2+	1.434e-13	1.305e-13	-12.843	-12.884	-0.041	(0)
AgNO2	2.403e-14	2.403e-14	-13.619	-13.619	0.000	(0)
CoNO2+	8.222e-15	7.481e-15	-14.085	-14.126	-0.041	(0)
Cu (NO2) 2	6.959e-19	6.959e-19	-18.157	-18.157	0.000	(0)
Ag (NO2) 2-	2.131e-20	1.939e-20	-19.671	-19.712	-0.041	(0)
N (5)	1.576e-10					
NO3-	1.574e-10	1.446e-10	-9.803	-9.840	-0.037	(0)
CaNO3+	1.428e-13	1.300e-13	-12.845	-12.886	-0.041	(0)
MnNO3+	4.154e-16	3.780e-16	-15.382	-15.423	-0.041	(0)

ZnNO3+	8.835e-17	8.039e-17	-16.054	-16.095	-0.041	(0)
BaNO3+	1.761e-18	1.603e-18	-17.754	-17.795	-0.041	(0)
CuNO3+	1.202e-18	1.094e-18	-17.920	-17.961	-0.041	(0)
NiNO3+	1.126e-18	1.025e-18	-17.948	-17.989	-0.041	(0)
CoNO3+	5.132e-19	4.669e-19	-18.290	-18.331	-0.041	(0)
CdNO3+	1.351e-19	1.229e-19	-18.869	-18.910	-0.041	(0)
AgNO3	2.535e-20	2.535e-20	-19.596	-19.596	0.000	(0)
PbNO3+	1.747e-20	1.590e-20	-19.758	-19.799	-0.041	(0)
Mn (NO3) 2	1.373e-25	1.373e-25	-24.862	-24.862	0.000	(0)
UO2NO3+	1.310e-25	1.192e-25	-24.883	-24.924	-0.041	(0)
Zn (NO3) 2	2.319e-27	2.319e-27	-26.635	-26.635	0.000	(0)
CrNO3+2	3.071e-28	2.105e-28	-27.513	-27.677	-0.164	(0)
Co (NO3) 2	1.374e-28	1.374e-28	-27.862	-27.862	0.000	(0)
Cu (NO3) 2	1.991e-29	1.991e-29	-28.701	-28.701	0.000	(0)
Cd (NO3) 2	8.909e-30	8.909e-30	-29.050	-29.050	0.000	(0)
VO2NO3	8.005e-30	8.005e-30	-29.097	-29.097	0.000	(0)
Pb (NO3) 2	3.904e-30	3.904e-30	-29.408	-29.408	0.000	(0)
FeNO3+2	4.828e-31	3.310e-31	-30.316	-30.480	-0.164	(0)
HgNO3+	1.516e-34	1.379e-34	-33.819	-33.860	-0.041	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.082	-44.082	0.000	(0)
Na	3.359e-03					
Na+	3.346e-03	3.073e-03	-2.475	-2.512	-0.037	(0)
NaSO4-	9.795e-06	9.019e-06	-5.009	-5.045	-0.036	(0)
NaHCO3	2.272e-06	2.272e-06	-5.644	-5.644	0.000	(0)
NaCO3-	7.456e-07	6.865e-07	-6.128	-6.163	-0.036	(0)
NaF	1.410e-07	1.410e-07	-6.851	-6.851	0.000	(0)
NaH2BO3	4.118e-09	4.118e-09	-8.385	-8.385	0.000	(0)
NaCrO4-	5.871e-17	5.342e-17	-16.231	-16.272	-0.041	(0)
Ni	6.144e-09					
Ni+2	3.965e-09	2.821e-09	-8.402	-8.550	-0.148	(0)
NiCO3	1.263e-09	1.263e-09	-8.899	-8.899	0.000	(0)
NiHCO3+	5.025e-10	4.572e-10	-9.299	-9.340	-0.041	(0)
NiSO4	3.076e-10	3.076e-10	-9.512	-9.512	0.000	(0)
NiOH+	7.649e-11	6.960e-11	-10.116	-10.157	-0.041	(0)
NiCl+	1.368e-11	1.245e-11	-10.864	-10.905	-0.041	(0)
Ni (OH) 2	1.083e-11	1.083e-11	-10.965	-10.965	0.000	(0)
NiF+	5.662e-12	5.152e-12	-11.247	-11.288	-0.041	(0)
Ni (OH) 3-	2.333e-14	2.123e-14	-13.632	-13.673	-0.041	(0)
NiNH3+2	9.887e-15	6.779e-15	-14.005	-14.169	-0.164	(0)
Ni (SO4) 2-2	8.119e-15	5.566e-15	-14.091	-14.254	-0.164	(0)
NiCl2	1.080e-16	1.080e-16	-15.966	-15.966	0.000	(0)
NiSeO4	4.018e-18	4.018e-18	-17.396	-17.396	0.000	(0)
NiNO3+	1.126e-18	1.025e-18	-17.948	-17.989	-0.041	(0)
Ni (NH3) 2+2	6.394e-21	4.384e-21	-20.194	-20.358	-0.164	(0)
O (0)	2.147e-36					
O2	1.074e-36	1.075e-36	-35.969	-35.969	0.001	(0)
Pb	3.451e-10					
PbCO3	2.681e-10	2.681e-10	-9.572	-9.572	0.000	(0)
PbOH+	4.022e-11	3.660e-11	-10.396	-10.437	-0.041	(0)
Pb (CO3) 2-2	1.353e-11	9.276e-12	-10.869	-11.033	-0.164	(0)
Pb+2	1.045e-11	7.435e-12	-10.981	-11.129	-0.148	(0)
PbHCO3+	7.981e-12	7.262e-12	-11.098	-11.139	-0.041	(0)
Pb (OH) 2	2.268e-12	2.268e-12	-11.644	-11.644	0.000	(0)
PbSO4	1.990e-12	1.990e-12	-11.701	-11.701	0.000	(0)
PbCl+	4.998e-13	4.548e-13	-12.301	-12.342	-0.041	(0)
PbF+	4.186e-14	3.809e-14	-13.378	-13.419	-0.041	(0)
Pb (SO4) 2-2	9.557e-15	6.552e-15	-14.020	-14.184	-0.164	(0)
Pb (OH) 3-	4.884e-15	4.444e-15	-14.311	-14.352	-0.041	(0)
PbCl2	3.503e-15	3.503e-15	-14.456	-14.456	0.000	(0)
PbF2	5.450e-17	5.450e-17	-16.264	-16.264	0.000	(0)
Pb (OH) 4-2	3.111e-18	2.133e-18	-17.507	-17.671	-0.164	(0)
PbCl3-	2.642e-18	2.405e-18	-17.578	-17.619	-0.041	(0)
PbNO3+	1.747e-20	1.590e-20	-19.758	-19.799	-0.041	(0)
Pb2OH+3	1.008e-20	4.312e-21	-19.996	-20.365	-0.369	(0)
PbF3-	8.259e-21	7.515e-21	-20.083	-20.124	-0.041	(0)
PbCl4-2	2.764e-21	1.895e-21	-20.558	-20.722	-0.164	(0)
Pb3 (OH) 4+2	1.113e-24	7.630e-25	-23.954	-24.117	-0.164	(0)
PbF4-2	3.815e-25	2.615e-25	-24.419	-24.582	-0.164	(0)

Pb(NO3)2	3.904e-30	3.904e-30	-29.408	-29.408	0.000	(0)
Pb4(OH)4+4	2.040e-31	4.506e-32	-30.690	-31.346	-0.656	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.748	-151.748	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.352	-228.393	-0.041	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.786	-73.786	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.904	-77.945	-0.041	(0)
S5-2	0.000e+00	0.000e+00	-78.857	-79.021	-0.164	(0)
H2S	0.000e+00	0.000e+00	-79.214	-79.214	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.373	-79.537	-0.164	(0)
S4-2	0.000e+00	0.000e+00	-79.452	-79.616	-0.164	(0)
CdHS+	0.000e+00	0.000e+00	-79.466	-79.507	-0.041	(0)
S3-2	0.000e+00	0.000e+00	-80.258	-80.422	-0.164	(0)
S2-2	0.000e+00	0.000e+00	-81.274	-81.438	-0.164	(0)
S-2	0.000e+00	0.000e+00	-86.811	-86.956	-0.145	(0)
HgHS2-	0.000e+00	0.000e+00	-139.219	-139.260	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-139.515	-139.679	-0.164	(0)
Hg(HS)2	0.000e+00	0.000e+00	-141.155	-141.155	0.000	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-145.840	-146.070	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.578	-146.800	-0.222	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-146.708	-146.826	-0.117	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.404	-147.445	-0.041	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-147.590	-147.631	-0.041	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-147.743	-147.976	-0.233	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.061	-148.287	-0.226	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.725	-149.725	0.000	(0)
Cd(HS)2	0.000e+00	0.000e+00	-150.248	-150.248	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.748	-151.748	0.000	(0)
Fe(HS)2	0.000e+00	0.000e+00	-159.765	-159.765	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-216.516	-216.557	-0.041	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.348	-224.389	-0.041	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.916	-226.080	-0.164	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-226.252	-226.293	-0.041	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.352	-228.393	-0.041	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-235.632	-235.673	-0.041	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-301.878	-302.042	-0.164	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.630	-303.794	-0.164	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.611	-320.775	-0.164	(0)
S(6)	8.351e-04					
SO4-2	7.680e-04	5.464e-04	-3.115	-3.262	-0.148	(0)
CaSO4	3.559e-05	3.559e-05	-4.449	-4.449	0.000	(0)
MgSO4	2.067e-05	2.067e-05	-4.685	-4.685	0.000	(0)
NaSO4-	9.795e-06	9.019e-06	-5.009	-5.045	-0.036	(0)
KSO4-	8.891e-07	8.186e-07	-6.051	-6.087	-0.036	(0)
MnSO4	1.603e-07	1.603e-07	-6.795	-6.795	0.000	(0)
ZnSO4	2.646e-08	2.646e-08	-7.577	-7.577	0.000	(0)
NiSO4	3.076e-10	3.076e-10	-9.512	-9.512	0.000	(0)
CuSO4	2.995e-10	2.995e-10	-9.524	-9.524	0.000	(0)
HSO4-	2.985e-10	2.743e-10	-9.525	-9.562	-0.037	(0)
NH4SO4-	2.566e-10	2.360e-10	-9.591	-9.627	-0.036	(0)
CoSO4	2.222e-10	2.222e-10	-9.653	-9.653	0.000	(0)
Zn(SO4)2-2	1.837e-10	1.259e-10	-9.736	-9.900	-0.164	(0)
CdSO4	3.444e-11	3.444e-11	-10.463	-10.463	0.000	(0)
AgSO4-	2.645e-12	2.407e-12	-11.578	-11.619	-0.041	(0)
PbSO4	1.990e-12	1.990e-12	-11.701	-11.701	0.000	(0)
Cd(SO4)2-2	3.703e-13	2.539e-13	-12.431	-12.595	-0.164	(0)
CrOHSO4	1.852e-13	1.852e-13	-12.732	-12.732	0.000	(0)
FeSO4	2.004e-14	2.004e-14	-13.698	-13.698	0.000	(0)
Pb(SO4)2-2	9.557e-15	6.552e-15	-14.020	-14.184	-0.164	(0)
Ni(SO4)2-2	8.119e-15	5.566e-15	-14.091	-14.254	-0.164	(0)
UO2SO4	3.418e-16	3.418e-16	-15.466	-15.466	0.000	(0)
CrSO4+	4.672e-17	4.251e-17	-16.331	-16.372	-0.041	(0)
AlSO4+	1.493e-17	1.372e-17	-16.826	-16.863	-0.037	(0)
UO2(SO4)2-2	3.591e-18	2.462e-18	-17.445	-17.609	-0.164	(0)
Al(SO4)2-	8.742e-20	8.035e-20	-19.058	-19.095	-0.037	(0)
VO2SO4-	1.569e-21	1.428e-21	-20.804	-20.845	-0.041	(0)
FeSO4+	1.526e-21	1.404e-21	-20.817	-20.853	-0.036	(0)
Cr2(OH)2SO4+2	3.487e-23	2.391e-23	-22.457	-22.621	-0.164	(0)

Fe (SO4) 2-	1.802e-23	1.640e-23	-22.744	-22.785	-0.041	(0)
VOSO4	2.108e-24	2.108e-24	-23.676	-23.676	0.000	(0)
Cr2 (OH) 2 (SO4) 2	7.761e-25	7.761e-25	-24.110	-24.110	0.000	(0)
HgSO4	3.696e-25	3.696e-25	-24.432	-24.432	0.000	(0)
CrO3SO4-2	7.254e-26	4.973e-26	-25.139	-25.303	-0.164	(0)
VSO4+	3.155e-39	2.871e-39	-38.501	-38.542	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.784	-43.784	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.258	-44.422	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.719	-63.760	-0.041	(0)
Sb (3)	2.471e-21					
Sb (OH) 3	1.250e-21	1.250e-21	-20.903	-20.903	0.000	(0)
HSbO2	1.220e-21	1.220e-21	-20.914	-20.914	0.000	(0)
SbO2-	4.228e-25	3.847e-25	-24.374	-24.415	-0.041	(0)
Sb (OH) 4-	2.422e-25	2.204e-25	-24.616	-24.657	-0.041	(0)
Sb (OH) 2F	7.294e-28	7.294e-28	-27.137	-27.137	0.000	(0)
SbOF	7.174e-28	7.174e-28	-27.144	-27.144	0.000	(0)
Sb (OH) 2+	1.714e-28	1.560e-28	-27.766	-27.807	-0.041	(0)
SbO+	5.910e-29	5.378e-29	-28.228	-28.269	-0.041	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.611	-320.775	-0.164	(0)
Sb (5)	1.156e-09					
SbO3-	1.154e-09	1.051e-09	-8.938	-8.979	-0.041	(0)
Sb (OH) 6-	1.337e-12	1.228e-12	-11.874	-11.911	-0.037	(0)
SbO2+	8.741e-27	7.954e-27	-26.058	-26.099	-0.041	(0)
Se (-2)	1.574e-15					
Ag2Se	1.574e-15	1.574e-15	-14.803	-14.803	0.000	(0)
HSe-	2.240e-39	2.038e-39	-38.650	-38.691	-0.041	(0)
MnSe	0.000e+00	0.000e+00	-41.569	-41.569	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.090	-43.090	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.238	-45.402	-0.164	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.023	-82.679	-0.656	(0)
Se (4)	6.873e-09					
SeO3-2	3.485e-09	2.389e-09	-8.458	-8.622	-0.164	(0)
HSeO3-	3.388e-09	3.083e-09	-8.470	-8.511	-0.041	(0)
H2SeO3	6.757e-15	6.757e-15	-14.170	-14.170	0.000	(0)
AgSeO3-	3.725e-16	3.389e-16	-15.429	-15.470	-0.041	(0)
Cd (SeO3) 2-2	1.845e-21	1.265e-21	-20.734	-20.898	-0.164	(0)
Ag (SeO3) 2-3	1.695e-23	7.250e-24	-22.771	-23.140	-0.369	(0)
FeHSeO3+2	2.720e-27	1.865e-27	-26.565	-26.729	-0.164	(0)
Se (6)	4.280e-12					
SeO4-2	4.279e-12	3.045e-12	-11.369	-11.516	-0.148	(0)
MnSeO4	1.352e-15	1.352e-15	-14.869	-14.869	0.000	(0)
ZnSeO4	1.044e-16	1.044e-16	-15.981	-15.981	0.000	(0)
NiSeO4	4.018e-18	4.018e-18	-17.396	-17.396	0.000	(0)
CoSeO4	3.109e-18	3.109e-18	-17.507	-17.507	0.000	(0)
HSeO4-	8.615e-19	7.839e-19	-18.065	-18.106	-0.041	(0)
CdSeO4	1.524e-19	1.524e-19	-18.817	-18.817	0.000	(0)
Zn (SeO4) 2-2	4.700e-28	3.222e-28	-27.328	-27.492	-0.164	(0)
Si	3.018e-04					
H4SiO4	2.929e-04	2.933e-04	-3.533	-3.533	0.001	(0)
H3SiO4-	8.987e-06	8.252e-06	-5.046	-5.083	-0.037	(0)
H2SiO4-2	1.410e-10	1.013e-10	-9.851	-9.994	-0.143	(0)
UO2H3SiO4+	3.182e-13	2.895e-13	-12.497	-12.538	-0.041	(0)
SiF6-2	6.379e-32	4.570e-32	-31.195	-31.340	-0.145	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.404	-60.773	-0.369	(0)
U (4)	4.051e-20					
U (OH) 5-	4.050e-20	3.685e-20	-19.393	-19.434	-0.041	(0)
U (OH) 4	7.930e-24	7.930e-24	-23.101	-23.101	0.000	(0)
U (OH) 3+	1.637e-28	1.490e-28	-27.786	-27.827	-0.041	(0)
U (OH) 2+2	5.162e-34	3.539e-34	-33.287	-33.451	-0.164	(0)
UF3+	2.925e-39	2.662e-39	-38.534	-38.575	-0.041	(0)
UF2+2	3.370e-40	2.310e-40	-39.472	-39.636	-0.164	(0)
UOH+3	2.002e-40	0.000e+00	-39.698	-40.067	-0.369	(0)
UF4	0.000e+00	0.000e+00	-40.673	-40.673	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.229	-42.598	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.173	-43.214	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.784	-43.784	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.258	-44.422	-0.164	(0)

UF6-2	0.000e+00	0.000e+00	-44.708	-44.872	-0.164	(0)
U+4	0.000e+00	0.000e+00	-47.104	-47.759	-0.656	(0)
UCl+3	0.000e+00	0.000e+00	-48.454	-48.823	-0.369	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-176.054	-179.374	-3.320	(0)
U(5)	1.678e-17					
UO2+	1.678e-17	1.527e-17	-16.775	-16.816	-0.041	(0)
U(6)	1.977e-08					
UO2(CO3) 3-4	1.286e-08	2.840e-09	-7.891	-8.547	-0.656	(0)
UO2(CO3) 2-2	6.890e-09	4.724e-09	-8.162	-8.326	-0.164	(0)
UO2CO3	1.974e-11	1.974e-11	-10.705	-10.705	0.000	(0)
UO2H3SiO4+	3.182e-13	2.895e-13	-12.497	-12.538	-0.041	(0)
UO2OH+	1.120e-13	1.020e-13	-12.951	-12.992	-0.041	(0)
UO2F+	4.558e-15	4.148e-15	-14.341	-14.382	-0.041	(0)
UO2F2	8.697e-16	8.697e-16	-15.061	-15.061	0.000	(0)
UO2+2	5.808e-16	4.133e-16	-15.236	-15.384	-0.148	(0)
UO2SO4	3.418e-16	3.418e-16	-15.466	-15.466	0.000	(0)
UO2F3-	1.745e-17	1.588e-17	-16.758	-16.799	-0.041	(0)
UO2(SO4) 2-2	3.591e-18	2.462e-18	-17.445	-17.609	-0.164	(0)
UO2Cl+	1.270e-18	1.156e-18	-17.896	-17.937	-0.041	(0)
(UO2) 2(OH) 2+2	2.516e-20	1.725e-20	-19.599	-19.763	-0.164	(0)
UO2F4-2	1.338e-20	9.172e-21	-19.874	-20.038	-0.164	(0)
(UO2) 3(OH) 5+	5.631e-21	5.124e-21	-20.249	-20.290	-0.041	(0)
UO2NO3+	1.310e-25	1.192e-25	-24.883	-24.924	-0.041	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.638	-44.679	-0.041	(0)
V+2	0.000e+00	0.000e+00	-46.317	-46.481	-0.164	(0)
V(3)	6.757e-17					
V(OH) 3	6.757e-17	6.757e-17	-16.170	-16.170	0.000	(0)
V(OH) 2+	2.465e-28	2.243e-28	-27.608	-27.649	-0.041	(0)
VOH+2	1.595e-32	1.093e-32	-31.797	-31.961	-0.164	(0)
V+3	2.602e-38	1.113e-38	-37.585	-37.953	-0.369	(0)
VSO4+	3.155e-39	2.871e-39	-38.501	-38.542	-0.041	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-60.790	-61.159	-0.369	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-62.467	-63.123	-0.656	(0)
V(4)	6.048e-21					
V(OH) 3+	6.018e-21	5.476e-21	-20.221	-20.262	-0.041	(0)
VO+2	2.043e-23	1.401e-23	-22.690	-22.854	-0.164	(0)
VOF+	6.713e-24	6.108e-24	-23.173	-23.214	-0.041	(0)
VOSO4	2.108e-24	2.108e-24	-23.676	-23.676	0.000	(0)
VOF2	1.665e-25	1.665e-25	-24.779	-24.779	0.000	(0)
VOC1+	7.446e-26	6.776e-26	-25.128	-25.169	-0.041	(0)
VOF3-	4.721e-28	4.296e-28	-27.326	-27.367	-0.041	(0)
VOF4-2	1.839e-31	1.261e-31	-30.735	-30.899	-0.164	(0)
H2V2O4+2	2.193e-36	1.503e-36	-35.659	-35.823	-0.164	(0)
V(5)	3.765e-10					
H2VO4-	2.283e-10	2.078e-10	-9.641	-9.682	-0.041	(0)
HVO4-2	1.482e-10	1.016e-10	-9.829	-9.993	-0.164	(0)
H3VO4	1.067e-14	1.067e-14	-13.972	-13.972	0.000	(0)
VO4-3	2.317e-16	9.910e-17	-15.635	-16.004	-0.369	(0)
HV2O7-3	1.673e-17	7.153e-18	-16.777	-17.146	-0.369	(0)
H3V2O7-	1.574e-17	1.432e-17	-16.803	-16.844	-0.041	(0)
V2O7-4	1.696e-19	3.748e-20	-18.770	-19.426	-0.656	(0)
VO2+	1.192e-19	1.095e-19	-18.924	-18.961	-0.037	(0)
VO2F	1.396e-20	1.396e-20	-19.855	-19.855	0.000	(0)
VO2SO4-	1.569e-21	1.428e-21	-20.804	-20.845	-0.041	(0)
VO2F2-	4.049e-22	3.684e-22	-21.393	-21.434	-0.041	(0)
V3O9-3	2.197e-23	9.397e-24	-22.658	-23.027	-0.369	(0)
VO2F3-2	4.874e-25	3.341e-25	-24.312	-24.476	-0.164	(0)
VO2F4-3	2.795e-29	1.195e-29	-28.554	-28.923	-0.369	(0)
VO2NO3	8.005e-30	8.005e-30	-29.097	-29.097	0.000	(0)
V4O12-4	3.685e-30	8.140e-31	-29.434	-30.089	-0.656	(0)
V10O28-6	0.000e+00	0.000e+00	-79.599	-81.075	-1.475	(0)
HV10O28-5	0.000e+00	0.000e+00	-80.153	-81.177	-1.025	(0)
H2V10O28-4	0.000e+00	0.000e+00	-83.603	-84.259	-0.656	(0)
Zn	5.658e-07					
Zn+2	3.111e-07	2.214e-07	-6.507	-6.655	-0.148	(0)
ZnCO3	1.528e-07	1.528e-07	-6.816	-6.816	0.000	(0)
ZnOH+	4.767e-08	4.338e-08	-7.322	-7.363	-0.041	(0)

ZnSO4	2.646e-08	2.646e-08	-7.577	-7.577	0.000	(0)
Zn(OH) 2	1.347e-08	1.347e-08	-7.871	-7.871	0.000	(0)
ZnHCO3+	1.011e-08	9.202e-09	-7.995	-8.036	-0.041	(0)
ZnOHC1	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
ZnCl+	1.044e-09	9.587e-10	-8.981	-9.018	-0.037	(0)
ZnF+	3.529e-10	3.211e-10	-9.452	-9.493	-0.041	(0)
Zn(SO4) 2-2	1.837e-10	1.259e-10	-9.736	-9.900	-0.164	(0)
Zn(OH) 3-	1.454e-10	1.323e-10	-9.837	-9.878	-0.041	(0)
ZnCl2	2.620e-12	2.620e-12	-11.582	-11.582	0.000	(0)
Zn(OH) 4-2	1.506e-14	1.032e-14	-13.822	-13.986	-0.164	(0)
ZnCl3-	3.908e-15	3.588e-15	-14.408	-14.445	-0.037	(0)
ZnSeO4	1.044e-16	1.044e-16	-15.981	-15.981	0.000	(0)
ZnNO3+	8.835e-17	8.039e-17	-16.054	-16.095	-0.041	(0)
ZnCl4-2	4.318e-18	3.093e-18	-17.365	-17.510	-0.145	(0)
Zn(NO3) 2	2.319e-27	2.319e-27	-26.635	-26.635	0.000	(0)
Zn(SeO4) 2-2	4.700e-28	3.222e-28	-27.328	-27.492	-0.164	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.404	-147.445	-0.041	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.725	-149.725	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.348	-224.389	-0.041	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.916	-226.080	-0.164	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.630	-303.794	-0.164	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-61.13	-54.84	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-45.20	-40.69	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-52.43	-40.69	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-78.96	-61.02	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-59.83	-39.80	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-29.65	-29.25	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-26.76	-26.31	0.45	(NH4) 2SeO4
Acanthite	-52.75	-88.97	-36.22	Ag2S
Ag2CO3	-13.14	-24.23	-11.09	Ag2CO3
Ag2CrO4	-22.18	-33.77	-11.59	Ag2CrO4
Ag2HVO4	-14.89	-13.41	1.48	Ag2HVO4
Ag2MoO4	-15.03	-26.58	-11.55	Ag2MoO4
Ag2O	-15.31	-2.73	12.57	Ag2O
Ag2Se	-1.01	-49.71	-48.70	Ag2Se
Ag2SeO3	-12.38	-19.53	-7.15	Ag2SeO3
Ag2SeO4	-21.92	-30.83	-8.91	Ag2SeO4
Ag2SO4	-17.75	-22.57	-4.82	Ag2SO4
Ag3AsO3	-28.16	-26.00	2.16	Ag3AsO3
Ag3AsO4	-17.10	-19.89	-2.79	Ag3AsO4
Ag3H2VO5	-19.95	-14.77	5.18	Ag3H2VO5
AgF:4H2O	-14.84	-13.79	1.05	AgF:4H2O
Agmetal	-0.37	-13.87	-13.51	Ag
AgVO3	-12.81	-12.04	0.77	AgVO3
Al(OH) 3 (am)	-3.42	7.38	10.80	Al(OH) 3
Al2(MoO4) 3	-59.16	-56.80	2.37	Al2(MoO4) 3
Al2O3	-4.90	14.76	19.65	Al2O3
Al4(OH) 10SO4	-13.03	9.67	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-13.21	-8.41	4.80	AlAsO4:2H2O
AlOHSO4	-9.23	-12.46	-3.23	AlOHSO4
AlSb	-154.19	-88.57	65.62	AlSb
Alunite	-11.53	-12.93	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-6.60	-14.39	-7.79	PbSO4
Anhydrite	-2.45	-6.81	-4.36	CaSO4
Anilite	-55.16	-87.03	-31.88	Cu0.25Cu1.5S
Antlerite	-4.76	4.03	8.79	Cu3(OH) 4SO4
Aragonite	-0.17	-8.47	-8.30	CaCO3
Arsenolite	-84.85	-87.61	-2.76	As4O6
Artinite	-5.31	4.29	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-38.28	-31.57	6.71	As2O5
Atacamite	-2.53	4.86	7.39	Cu2(OH) 3Cl
Azurite	-2.22	-19.13	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-16.47	7.92	24.39	Ba(OH) 2:8H2O

Ba2V2O7:2H2O	-21.37	-5.50	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	1.11	-7.80	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-30.51	2.43	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.44	-23.11	-9.67	BaCrO4
BaF2	-11.11	-16.93	-5.82	BaF2
BaMoO4	-8.97	-15.93	-6.96	BaMoO4
Barite	-1.94	-11.92	-9.98	BaSO4
BaS	-94.49	-78.31	16.18	BaS
BaSeO3	-10.71	-8.88	1.83	BaSeO3
BaSeO4	-12.71	-20.17	-7.46	BaSeO4
Bianchite	-8.15	-9.92	-1.76	ZnSO4:6H2O
Birnessite	-7.63	10.46	18.09	MnO2
Bixbyite	-3.45	-4.10	-0.64	Mn2O3
BlaubleiI	-55.28	-79.44	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.67	-82.95	-27.28	Cu0.6Cu0.8S
Boehmite	-1.20	7.38	8.58	AlOOH
Breithauptite	-56.88	-75.41	-18.52	NiSb
Brochantite	-3.23	11.99	15.22	Cu4(OH)6SO4
Brucite	-3.95	12.90	16.84	Mg(OH)2
Bunsenite	-4.42	8.03	12.45	NiO
Ca(VO3)2	-13.97	-8.31	5.66	Ca(VO3)2
Ca2V2O7	-12.78	4.72	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.83	4.72	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.78	7.52	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.21	17.75	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.11	17.75	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.76	-152.79	142.97	Ca3Sb2
CaCrO4	-15.74	-18.00	-2.27	CaCrO4
Calcite	0.01	-8.47	-8.48	CaCO3
Calomel	-12.43	-30.34	-17.91	Hg2Cl2
CaMoO4	-2.87	-10.82	-7.95	CaMoO4
Carnotite	-5.09	-4.86	0.23	KUO2VO4
CaSeO3:2H2O	-6.58	-3.77	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.04	-15.06	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.08	-3.24	9.84	Cd(BO2)2
Cd(OH)2	-6.64	7.01	13.64	Cd(OH)2
Cd(OH)2(am)	-6.72	7.01	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-25.37	-18.66	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.38	1.18	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.21	8.19	28.40	Cd4(OH)6SO4
CdCl2	-14.44	-15.10	-0.66	CdCl2
CdCl2:1H2O	-13.40	-15.10	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.18	-15.10	-1.91	CdCl2:2.5H2O
CdF2	-16.63	-17.85	-1.21	CdF2
Cdmetal(alpha)	-31.52	-18.01	13.51	Cd
Cdmetal(gamma)	-31.62	-18.01	13.62	Cd
CdMoO4	-2.69	-16.84	-14.15	CdMoO4
CdOHCl	-7.58	-4.04	3.54	CdOHCl
CdSb	-76.08	-76.43	-0.35	CdSb
CdSe	-19.77	-39.97	-20.20	CdSe
CdSeO4:2H2O	-19.24	-21.09	-1.85	CdSeO4:2H2O
CdSO4	-12.66	-12.83	-0.17	CdSO4
CdSO4:1H2O	-11.11	-12.83	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.96	-12.83	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.67	-12.42	-9.75	AgCl
Cerrusite	-2.92	-16.05	-13.13	PbCO3
CH4(g)	-80.51	-121.55	-41.05	CH4
Chalcanthite	-9.24	-11.88	-2.64	CuSO4:5H2O
Chalcedony	0.02	-3.53	-3.55	SiO2
Chalcocite	-55.03	-89.95	-34.92	Cu2S
Chalcopyrite	-125.49	-160.76	-35.27	CuFeS2
Chrysotile	-0.58	31.62	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.74	-99.44	-45.69	HgS
Claudetite	-84.54	-87.61	-3.06	As4O6
Clausthalite	-14.43	-41.53	-27.10	PbSe
Co(BO2)2	-29.43	-2.36	27.07	Co(BO2)2
Co(OH)2	-5.21	7.89	13.09	Co(OH)2
Co(OH)3	-9.70	-12.01	-2.31	Co(OH)3

CO2(g)	-3.35	-21.50	-18.15	CO2
Co3(AsO4)2	-20.94	-7.91	13.03	Co3(AsO4)2
Co3O4	-5.63	-16.12	-10.50	Co3O4
CoCl2	-22.48	-14.22	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.22	2.54	CoCl2:6H2O
CoCO3	-3.63	-13.61	-9.98	CoCO3
CoF2	-15.37	-16.97	-1.60	CoF2
CoF3	-47.83	-49.29	-1.46	CoF3
CoFe2O4	17.87	14.34	-3.53	CoFe2O4
CoMoO4	-8.20	-15.96	-7.76	CoMoO4
CoO	-5.70	7.89	13.59	CoO
CoS(alpha)	-70.91	-78.35	-7.44	CoS
CoS(beta)	-67.28	-78.35	-11.07	CoS
CoSe	-22.89	-39.09	-16.20	CoSe
CoSeO3	-10.23	-8.91	1.32	CoSeO3
CoSeO4:6H2O	-18.68	-20.21	-1.53	CoSeO4:6H2O
CoSO4	-14.76	-11.95	2.80	CoSO4
CoSO4:6H2O	-9.48	-11.95	-2.47	CoSO4:6H2O
Cotunnite	-11.88	-16.66	-4.78	PbCl2
Covellite	-55.98	-78.28	-22.30	CuS
Cr(OH)2	-21.56	-10.74	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.94	-32.84	14.09	CrCl2
CrCl3	-49.45	-34.34	15.11	CrCl3
CrF3	-27.12	-38.46	-11.34	CrF3
Cristobalite	-0.18	-3.53	-3.35	SiO2
Crmetal	-66.23	-35.75	30.48	Cr
CrO3	-27.82	-31.03	-3.21	CrO3
Cryolite	-16.02	-49.86	-33.84	Na3AlF6
Cu(OH)2	-0.72	7.96	8.67	Cu(OH)2
Cu(SbO3)2	-29.03	16.18	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-11.47	-2.21	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.96	-89.85	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.90	-50.70	-45.80	Cu2Se
Cu2SO4	-21.61	-23.56	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.80	-7.70	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-26.23	-89.72	-63.49	Cu3Se2
CuCO3	-2.04	-13.54	-11.50	CuCO3
CuCrO4	-17.64	-23.08	-5.44	CuCrO4
CuF	-9.38	-14.29	-4.91	CuF
CuF2	-18.01	-16.90	1.12	CuF2
CuF2:2H2O	-12.35	-16.90	-4.55	CuF2:2H2O
Cumetal	-5.61	-14.37	-8.76	Cu
CuMoO4	-2.82	-15.89	-13.08	CuMoO4
CuOCuSO4	-14.23	-3.93	10.30	CuOCuSO4
Cupricferrite	8.42	14.41	5.99	CuFe2O4
Cuprite	-2.31	-3.72	-1.41	Cu2O
Cuprousferrite	10.29	1.37	-8.92	CuFeO2
CuSe	-5.92	-39.02	-33.10	CuSe
CuSe2	-27.62	-60.99	-33.37	CuSe2
CuSeO3:2H2O	-9.35	-8.84	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.70	-20.14	-2.44	CuSeO4:5H2O
CuSO4	-14.82	-11.88	2.94	CuSO4
Diaspore	0.50	7.38	6.87	AlOOH
Djurleite	-55.26	-89.18	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.53	-17.07	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.02	-17.07	-17.09	CaMg(CO3)2
Epsomite	-4.82	-6.95	-2.13	MgSO4:7H2O
Fe(OH)2	-9.81	3.75	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.95	-0.09	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-13.87	-17.59	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.90	-10.35	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-23.32	-43.95	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-49.33	-53.07	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.01	10.21	20.22	Fe3(OH)8

FeAsO4:2H2O	-12.96	-12.56	0.40	FeAsO4:2H2O
FeCr2O4	-5.80	1.40	7.20	FeCr2O4
FeMoO4	-10.01	-20.10	-10.09	FeMoO4
Ferrihydrite	0.04	3.23	3.19	Fe(OH)3
Ferroselite	-46.60	-65.19	-18.60	FeSe2
FeS(ppt)	-79.53	-82.48	-2.95	FeS
FeSe	-32.23	-43.23	-11.00	FeSe
Fix_pe	-4.22	-4.22	0.00	e-
Fluorite	-1.32	-11.82	-10.50	CaF2
Galena	-66.81	-80.78	-13.97	PbS
Gibbsite	-0.91	7.38	8.29	Al(OH)3
Goethite	2.74	3.23	0.49	FeOOH
Goslarite	-7.91	-9.92	-2.01	ZnSO4:7H2O
Greenalite	-16.62	4.19	20.81	Fe3Si2O5(OH)4
Greenockite	-64.87	-79.23	-14.36	CdS
Greigite	-289.69	-334.73	-45.03	Fe3S4
Gummite	-6.48	1.19	7.67	UO3
Gypsum	-2.20	-6.81	-4.61	CaSO4:2H2O
H-Jarosite	-17.90	-30.00	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.97	-23.85	-12.88	H2MoO4
H2S(g)	-78.22	-86.23	-8.01	H2S
H2Se(g)	-42.02	-46.98	-4.96	H2Se
Halite	-6.88	-5.28	1.60	NaCl
Halloysite	-1.89	7.69	9.57	Al2Si2O5(OH)4
Hausmannite	-3.63	57.40	61.03	Mn3O4
Hematite	7.87	6.45	-1.42	Fe2O3
Hercynite	-4.39	18.51	22.89	FeAl2O4
Hg(CH3)2(g)	-182.60	-256.31	-73.71	Hg(CH3)2
Hg(g)	-8.75	-16.62	-7.87	Hg
Hg(OH)2	-9.71	-13.20	-3.50	Hg(OH)2
Hg2(g)	-18.29	-33.25	-14.96	Hg2
Hg2(OH)2	-13.50	-8.24	5.26	Hg2(OH)2
Hg2CO3	-13.68	-29.73	-16.05	Hg2CO3
Hg2CrO4	-30.57	-39.27	-8.70	Hg2CrO4
Hg2F2	-22.73	-33.09	-10.36	Hg2F2
Hg2S	-82.79	-94.47	-11.68	Hg2S
Hg2SeO3	-20.38	-25.04	-4.66	Hg2SeO3
Hg2SO4	-21.95	-28.08	-6.13	Hg2SO4
Hg3O2CO3	-31.43	-61.11	-29.68	Hg3O2CO3
HgCl(g)	-34.67	-15.17	19.50	HgCl
HgCl2	-14.05	-35.31	-21.26	HgCl2
HgF(g)	-49.22	-16.55	32.68	HgF
HgF2(g)	-50.62	-38.06	12.57	HgF2
Hgmetal(l)	-3.17	-16.62	-13.45	Hg
HgSe	-4.49	-60.18	-55.69	HgSe
HgSeO3	-17.57	-30.00	-12.43	HgSeO3
HgSO4	-23.63	-33.04	-9.42	HgSO4
Huntite	-4.31	-34.28	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.88	-26.65	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.75	-21.52	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-22.52	-27.69	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-10.59	-25.39	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.60	-52.84	-17.24	K2Cr2O7
K2CrO4	-21.29	-21.81	-0.51	K2CrO4
K2MoO4	-17.88	-14.62	3.26	K2MoO4
K2SeO4	-18.14	-18.87	-0.73	K2SeO4
Kaolinite	0.25	7.69	7.43	Al2Si2O5(OH)4
Langite	-5.50	11.99	17.49	Cu4(OH)6SO4:H2O
Larnakite	-8.51	-8.94	-0.43	PbO:PbSO4
Laurionite	-6.23	-5.60	0.62	PbOHCl
Lepidocrocite	1.86	3.23	1.37	FeOOH
Lime	-19.67	13.03	32.70	CaO
Litharge	-7.24	5.45	12.69	PbO
Mackinawite	-78.88	-82.48	-3.60	FeS
Maghemite	0.07	6.45	6.39	Fe2O3
Magnesioferrite	2.49	19.35	16.86	Fe2MgO4
Magnesite	-1.14	-8.60	-7.46	MgCO3
Magnetite	6.80	10.21	3.40	Fe3O4

Malachite	-0.28	-5.58	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.04	23.30	25.34	MnOOH
Massicot	-7.44	5.45	12.89	PbO
Matlockite	-9.06	-18.03	-8.97	PbClF
Melanothallite	-20.41	-14.15	6.26	CuCl ₂
Melanterite	-13.88	-16.09	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-54.34	-99.44	-45.09	HgS
Mg(OH) ₂ (active)	-5.90	12.90	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-19.73	-8.45	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-274.19	-199.50	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-21.91	4.45	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.66	10.54	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.52	-18.14	5.38	MgCrO ₄
MgF ₂	-3.83	-11.96	-8.13	MgF ₂
MgMoO ₄	-9.10	-10.95	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.96	-3.90	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-14.00	-15.20	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.16	41.36	73.52	Pb ₃ O ₄
Mirabilite	-7.17	-8.29	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-15.45	-10.55	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.91	-63.62	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.94	-86.86	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-11.69	0.81	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-14.02	-11.31	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.61	-75.44	0.17	MnS
MnS (pnk)	-78.78	-75.44	3.34	MnS
MnSb	-95.08	-97.99	-2.91	MnSb
MnSe	-39.68	-36.18	3.50	MnSe
MnSeO ₃	-7.13	-6.00	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.99	-6.00	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-15.25	-17.30	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.63	-9.05	2.58	MnSO ₄
Monteponite	-8.10	7.01	15.10	CdO
Montroydite	-9.56	-13.20	-3.64	HgO
MoO ₃	-15.85	-23.85	-8.00	MoO ₃
Morenosite	-9.67	-11.81	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-151.07	-221.33	-70.26	MoS ₂
Na-Jarosite	-13.02	-24.22	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-40.62	-50.52	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.41	-19.48	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-19.55	-36.15	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-13.79	-12.30	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-13.52	-12.30	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.55	-5.25	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-17.82	-16.54	1.28	Na ₂ SeO ₄
Na ₃ Sb	-173.06	-78.61	94.45	Na ₃ Sb
Na ₃ VO ₄	-30.02	6.66	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-35.64	1.76	37.40	Na ₄ V ₂ O ₇
Nantokite	-6.18	-12.91	-6.73	CuCl
NaSb	-88.32	-65.15	23.17	NaSb
Natron	-8.64	-9.95	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.75	-4.89	3.86	NaVO ₃
Nesquehonite	-3.93	-8.60	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-4.77	8.03	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-23.19	-7.49	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-19.73	12.27	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.60	-13.47	-6.87	NiCO ₃
NiMoO ₄	-4.68	-15.82	-11.14	NiMoO ₄
NiS (alpha)	-72.61	-78.21	-5.60	NiS
NiS (beta)	-67.11	-78.21	-11.10	NiS
NiS (gamma)	-65.41	-78.21	-12.80	NiS
NiSe	-21.25	-38.95	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-11.59	-8.77	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-18.55	-20.07	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-7.04	10.46	17.50	MnO ₂
O ₂ (g)	-33.06	50.03	83.09	O ₂
Orpiment	-241.44	-302.51	-61.07	As ₂ S ₃
Otavite	-2.49	-14.49	-12.00	CdCO ₃

Pb(BO ₂) ₂	-11.32	-4.80	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.70	5.45	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-65.74	-74.50	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.95	-0.15	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-15.29	10.90	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-25.13	35.91	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-10.04	-10.60	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-8.54	-10.44	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-21.02	-15.22	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-11.13	-4.99	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-16.17	-5.15	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-14.18	-3.49	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-19.14	1.96	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-19.92	1.96	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-12.98	-25.58	-12.60	PbCrO ₄
PbF ₂	-11.97	-19.41	-7.44	PbF ₂
Pbmetal	-23.81	-19.56	4.25	Pb
PbMoO ₄	-2.78	-18.40	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-7.53	5.45	12.98	PbO:0.33H ₂ O
PbSeO ₄	-15.81	-22.65	-6.84	PbSeO ₄
Periclase	-8.69	12.90	21.58	MgO
Phosgenite	-12.90	-32.71	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-19.14	30.46	49.60	PbO ₂
Portlandite	-9.77	13.03	22.80	Ca(OH) ₂
Pyrite	-125.19	-143.70	-18.51	FeS ₂
Pyrochroite	-4.40	10.80	15.19	Mn(OH) ₂
Pyrolusite	-5.57	35.81	41.38	MnO ₂
Quartz	0.47	-3.53	-4.00	SiO ₂
Realgar	-100.90	-120.64	-19.75	AsS
Retgersite	-9.77	-11.81	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	-0.12	-10.70	-10.58	MnCO ₃
Rutherfordine	-5.80	-20.30	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-13.79	-20.90	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-20.19	-16.79	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-30.73	-40.40	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-114.99	-182.75	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-65.35	-83.61	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-65.71	-83.61	-17.90	Sb ₄ O ₆
SbCl ₃	-54.63	-54.06	0.57	SbCl ₃
SbF ₃	-47.96	-58.19	-10.23	SbF ₃
Sbmetal	-46.73	-58.42	-11.69	Sb
SbO ₂	-4.88	-32.71	-27.82	SbO ₂
Schoepite	-4.80	1.19	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-14.86	-21.97	-7.11	Se
Semetal(hex)	-14.26	-21.97	-7.71	Se
Senarmontite	-29.44	-41.81	-12.37	Sb ₂ O ₃
SeO ₂	-16.92	-16.80	0.12	SeO ₂
SeO ₃	-49.14	-28.09	21.04	SeO ₃
Sepiolite	-0.57	15.19	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-3.59	15.19	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.51	-17.75	-10.24	FeCO ₃
SiO ₂ (am-gel)	-0.82	-3.53	-2.71	SiO ₂
SiO ₂ (am-ppt)	-0.79	-3.53	-2.74	SiO ₂
Smithsonite	-1.58	-11.58	-10.00	ZnCO ₃
Sphalerite	-64.86	-76.31	-11.45	ZnS
Spinel	-9.20	27.65	36.85	MgAl ₂ O ₄
Stibnite	-250.05	-300.51	-50.46	Sb ₂ S ₃
Sulfur	-59.08	-61.22	-2.14	S
Tenorite	0.31	7.96	7.64	CuO
Thenardite	-8.61	-8.29	0.32	Na ₂ SO ₄
Thermonatrite	-10.58	-9.95	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-10.00	-5.92	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-14.86	6.22	21.08	U ₃ O ₈
U ₃ Sb ₄	-579.96	-427.58	152.38	U ₃ Sb ₄
U ₄ O ₉	-30.38	-33.40	-3.02	U ₄ O ₉
UF ₄	-34.78	-64.31	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-31.60	-64.31	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-15.54	-14.60	0.93	UO ₂

UO2(NO3)2	-47.21	-35.06	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-39.91	-35.06	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-38.45	-35.06	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-37.11	-35.06	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.42	1.19	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.65	-26.90	-2.25	UO2SeO4:4H2O
UO3	-6.51	1.19	7.70	UO3
Uraninite	-9.93	-14.60	-4.67	UO2
USb2	-220.27	-190.69	29.58	USb2
V(OH)3	-20.68	-13.09	7.59	V(OH)3
V2O5	-19.98	-21.34	-1.36	V2O5
V3O5	-45.67	-43.84	1.84	V3O5
V4O7	-57.30	-50.11	7.19	V4O7
V6O13	-53.20	-114.06	-60.86	V6O13
Valentinite	-33.33	-41.81	-8.48	Sb2O3
VC12	-66.57	-47.70	18.87	VC12
VC13	-69.68	-46.24	23.43	VC13
VF4	-70.92	-55.99	14.93	VF4
Vmetal	-94.63	-50.61	44.03	V
VO	-40.35	-25.59	14.76	VO
VO(OH)2	-11.43	-6.28	5.15	VO(OH)2
VO2Cl	-24.57	-21.72	2.84	VO2Cl
VOC1	-35.29	-24.14	11.15	VOC1
VOC12	-41.14	-28.38	12.76	VOC12
VOSO4	-29.73	-26.12	3.61	VOSO4
Witherite	-5.01	-13.58	-8.57	BaCO3
Wurtzite	-67.36	-76.31	-8.95	ZnS
Zincite	-1.41	9.92	11.33	ZnO
Zincosite	-13.85	-9.92	3.93	ZnSO4
Zn(BO2)2	-8.62	-0.33	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-29.65	-26.34	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.28	9.92	12.20	Zn(OH)2
Zn(OH)2(am)	-2.55	9.92	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.83	9.92	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.61	9.92	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.81	9.92	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.49	0.01	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.40	8.79	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.45	-1.80	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.82	-9.91	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.55	19.85	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.99	27.51	38.50	Zn5(OH)8Cl2
ZnCl2	-19.23	-12.18	7.05	ZnCl2
ZnCO3:1H2O	-1.32	-11.58	-10.26	ZnCO3:1H2O
ZnF2	-14.40	-14.93	-0.53	ZnF2
Znmetal	-40.88	-15.09	25.79	Zn
ZnMoO4	-3.80	-13.93	-10.13	ZnMoO4
ZnO(active)	-1.26	9.92	11.19	ZnO
ZnS(am)	-67.26	-76.31	-9.05	ZnS
ZnSb	-84.53	-73.51	11.01	ZnSb
ZnSe	-22.66	-37.06	-14.40	ZnSe
ZnSeO4:6H2O	-16.65	-18.17	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.28	-9.92	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 62.

REACTION 304
H2O -1

0.126817 moles ### Addition step. Removes HTC water but solute mass remains
 USE solution 310
 SAVE Solution 311
 End

 Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 310. Solution after simulation 61.
 Using reaction 304.

Reaction 304.

1.268e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.151e-09	1.151e-09
Al	1.042e-07	1.042e-07
As	5.919e-09	5.920e-09
B	8.436e-06	8.437e-06
Ba	3.159e-09	3.159e-09
C	1.485e-03	1.485e-03
Ca	4.494e-04	4.494e-04
Cd	5.468e-10	5.469e-10
Cl	1.882e-03	1.882e-03
Co	3.964e-09	3.964e-09
Cr	6.758e-10	6.758e-10
Cu	2.036e-07	2.036e-07
F	8.158e-05	8.159e-05
Fe	7.988e-10	7.989e-10
Hg	8.789e-11	8.789e-11
K	2.318e-04	2.318e-04
Mg	3.207e-04	3.207e-04
Mn	2.637e-06	2.637e-06
Mo	7.534e-08	7.534e-08
N	6.190e-07	6.190e-07
Na	3.367e-03	3.367e-03
Ni	6.158e-09	6.159e-09
Pb	3.459e-10	3.459e-10
S	8.370e-04	8.371e-04
Sb	1.158e-09	1.159e-09
Se	6.893e-09	6.894e-09
Si	3.025e-04	3.025e-04
U	1.981e-08	1.981e-08
V	3.774e-10	3.774e-10
Zn	5.671e-07	5.671e-07

-----Description of solution-----

	pH = 8.289	Charge balance
	pe = 4.218	Adjusted to redox
equilibrium		

Activity of water = 1.000
 Ionic strength (mol/kgw) = 6.472e-03
 Mass of water (kg) = 1.000e+00
 Total alkalinity (eq/kg) = 1.508e-03
 Total CO2 (mol/kg) = 1.485e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 7.324e-08
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 3
 Total H = 1.110232e+02
 Total O = 5.551928e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.136e-06	1.959e-06	-5.670	-5.708	-0.038	(0)
H+	5.596e-09	5.139e-09	-8.252	-8.289	-0.037	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.151e-09					
AgCl	7.789e-10	7.789e-10	-9.109	-9.109	0.000	(0)
Ag+	2.404e-10	2.208e-10	-9.619	-9.656	-0.037	(0)
AgCl2-	1.288e-10	1.172e-10	-9.890	-9.931	-0.041	(0)
AgSO4-	2.651e-12	2.412e-12	-11.577	-11.618	-0.041	(0)
AgCl3-2	2.635e-13	1.805e-13	-12.579	-12.743	-0.164	(0)
AgOH	4.325e-14	4.325e-14	-13.364	-13.364	0.000	(0)
AgF	4.041e-14	4.041e-14	-13.394	-13.394	0.000	(0)
AgNO2	2.409e-14	2.409e-14	-13.618	-13.618	0.000	(0)
AgH2BO3	2.964e-15	2.964e-15	-14.528	-14.528	0.000	(0)
AgNH3+	2.221e-15	2.021e-15	-14.653	-14.695	-0.041	(0)
Ag2Se	1.577e-15	1.577e-15	-14.802	-14.802	0.000	(0)
AgCl4-3	1.491e-15	6.370e-16	-14.827	-15.196	-0.369	(0)
AgSeO3-	3.733e-16	3.396e-16	-15.428	-15.469	-0.041	(0)
Ag (OH) 2-	9.101e-18	8.281e-18	-17.041	-17.082	-0.041	(0)
Ag (NH3) 2+	8.092e-20	7.362e-20	-19.092	-19.133	-0.041	(0)
AgNO3	2.542e-20	2.542e-20	-19.595	-19.595	0.000	(0)
Ag (NO2) 2-	2.141e-20	1.948e-20	-19.669	-19.710	-0.041	(0)
Ag (SeO3) 2-3	1.704e-23	7.279e-24	-22.769	-23.138	-0.369	(0)
Ag2MoO4	9.887e-28	9.887e-28	-27.005	-27.005	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.786	-73.786	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.022	-82.678	-0.656	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.707	-146.824	-0.118	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.589	-147.630	-0.041	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.742	-147.975	-0.234	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.060	-148.286	-0.226	(0)
Al	1.042e-07					
Al (OH) 4-	1.038e-07	9.540e-08	-6.984	-7.020	-0.037	(0)
Al (OH) 3	3.868e-10	3.868e-10	-9.412	-9.412	0.000	(0)
Al (OH) 2+	1.075e-11	9.896e-12	-10.969	-11.005	-0.036	(0)
AlF2+	7.452e-14	6.860e-14	-13.128	-13.164	-0.036	(0)
AlF3	6.293e-14	6.293e-14	-13.201	-13.201	0.000	(0)
AlOH+2	8.852e-15	6.359e-15	-14.053	-14.197	-0.144	(0)
AlF+2	3.292e-15	2.365e-15	-14.483	-14.626	-0.144	(0)
AlF4-	2.500e-15	2.298e-15	-14.602	-14.639	-0.037	(0)
AlSO4+	1.501e-17	1.379e-17	-16.824	-16.860	-0.037	(0)
Al+3	6.986e-18	3.246e-18	-17.156	-17.489	-0.333	(0)
Al (SO4) 2-	8.805e-20	8.092e-20	-19.055	-19.092	-0.037	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.487	-55.857	-0.369	(0)
As (3)	1.394e-22					
H3AsO3	1.256e-22	1.256e-22	-21.901	-21.901	0.000	(0)
H2AsO3-	1.378e-23	1.254e-23	-22.861	-22.902	-0.041	(0)
HAsO3-2	3.247e-27	2.225e-27	-26.489	-26.653	-0.164	(0)
H4AsO3+	3.516e-31	3.199e-31	-30.454	-30.495	-0.041	(0)
AsO3-3	3.906e-32	1.669e-32	-31.408	-31.778	-0.369	(0)
As (5)	5.919e-09					
HAsO4-2	5.712e-09	3.914e-09	-8.243	-8.407	-0.164	(0)
H2AsO4-	2.016e-10	1.835e-10	-9.695	-9.736	-0.041	(0)

	AsO4-3	5.637e-12	2.409e-12	-11.249	-11.618	-0.369	(0)
	H3AsO4	1.636e-16	1.638e-16	-15.786	-15.786	0.001	(0)
B	8.436e-06						
	H3BO3	7.485e-06	7.496e-06	-5.126	-5.125	0.001	(0)
	H2BO3-	9.256e-07	8.471e-07	-6.034	-6.072	-0.038	(0)
	CaH2BO3+	1.517e-08	1.388e-08	-7.819	-7.858	-0.038	(0)
	MgH2BO3+	6.683e-09	6.116e-09	-8.175	-8.214	-0.038	(0)
	NaH2BO3	4.135e-09	4.135e-09	-8.384	-8.384	0.000	(0)
	BF(OH) 3-	2.381e-10	2.179e-10	-9.623	-9.662	-0.038	(0)
	H5(BO3) 2-	5.905e-12	5.404e-12	-11.229	-11.267	-0.038	(0)
	BaH2BO3+	6.338e-14	5.801e-14	-13.198	-13.237	-0.038	(0)
	BF2(OH) 2-	9.533e-15	8.725e-15	-14.021	-14.059	-0.038	(0)
	H8(BO3) 3-	4.426e-15	4.051e-15	-14.354	-14.392	-0.038	(0)
	AgH2BO3	2.964e-15	2.964e-15	-14.528	-14.528	0.000	(0)
	BF3OH-	1.389e-21	1.271e-21	-20.857	-20.896	-0.038	(0)
	BF4-	2.559e-27	2.342e-27	-26.592	-26.630	-0.038	(0)
Ba	3.159e-09						
	Ba+2	3.115e-09	2.216e-09	-8.506	-8.654	-0.148	(0)
	BaHCO3+	3.025e-11	2.788e-11	-10.519	-10.555	-0.035	(0)
	BaCO3	1.366e-11	1.366e-11	-10.865	-10.865	0.000	(0)
	BaH2BO3+	6.338e-14	5.801e-14	-13.198	-13.237	-0.038	(0)
	BaOH+	2.060e-14	1.895e-14	-13.686	-13.722	-0.036	(0)
	BaNH3+2	9.146e-18	6.267e-18	-17.039	-17.203	-0.164	(0)
	BaNO3+	1.769e-18	1.610e-18	-17.752	-17.793	-0.041	(0)
C(4)	1.485e-03						
	HCO3-	1.431e-03	1.317e-03	-2.844	-2.880	-0.036	(0)
	CO3-2	1.690e-05	1.202e-05	-4.772	-4.920	-0.148	(0)
	H2CO3	1.523e-05	1.523e-05	-4.817	-4.817	0.000	(0)
	CaHCO3+	7.580e-06	6.986e-06	-5.120	-5.156	-0.035	(0)
	CaCO3	5.425e-06	5.425e-06	-5.266	-5.266	0.000	(0)
	MgHCO3+	3.058e-06	2.807e-06	-5.515	-5.552	-0.037	(0)
	NaHCO3	2.282e-06	2.282e-06	-5.642	-5.642	0.000	(0)
	MgCO3	2.082e-06	2.082e-06	-5.682	-5.682	0.000	(0)
	NaCO3-	7.487e-07	6.893e-07	-6.126	-6.162	-0.036	(0)
	CuCO3	1.694e-07	1.694e-07	-6.771	-6.771	0.000	(0)
	ZnCO3	1.533e-07	1.533e-07	-6.814	-6.814	0.000	(0)
	MnHCO3+	4.721e-08	4.343e-08	-7.326	-7.362	-0.036	(0)
	UO2(CO3) 3-4	1.290e-08	2.845e-09	-7.889	-8.546	-0.656	(0)
	ZnHCO3+	1.015e-08	9.236e-09	-7.994	-8.035	-0.041	(0)
	Cu(CO3) 2-2	7.996e-09	5.480e-09	-8.097	-8.261	-0.164	(0)
	UO2(CO3) 2-2	6.892e-09	4.723e-09	-8.162	-8.326	-0.164	(0)
	NiCO3	1.267e-09	1.267e-09	-8.897	-8.897	0.000	(0)
	NiHCO3+	5.043e-10	4.589e-10	-9.297	-9.338	-0.041	(0)
	CoCO3	4.146e-10	4.146e-10	-9.382	-9.382	0.000	(0)
	PbCO3	2.688e-10	2.688e-10	-9.571	-9.571	0.000	(0)
	CoHCO3+	2.299e-10	2.091e-10	-9.639	-9.680	-0.041	(0)
	CuHCO3+	2.187e-10	1.990e-10	-9.660	-9.701	-0.041	(0)
	CdCO3	7.376e-11	7.376e-11	-10.132	-10.132	0.000	(0)
	BaHCO3+	3.025e-11	2.788e-11	-10.519	-10.555	-0.035	(0)
	UO2CO3	1.970e-11	1.970e-11	-10.706	-10.706	0.000	(0)
	BaCO3	1.366e-11	1.366e-11	-10.865	-10.865	0.000	(0)
	Pb(CO3) 2-2	1.359e-11	9.316e-12	-10.867	-11.031	-0.164	(0)
	PbHCO3+	8.004e-12	7.282e-12	-11.097	-11.138	-0.041	(0)
	Cd(CO3) 2-2	9.590e-13	6.572e-13	-12.018	-12.182	-0.164	(0)
	CdHCO3+	8.877e-13	8.076e-13	-12.052	-12.093	-0.041	(0)
	FeHCO3+	2.695e-15	2.484e-15	-14.569	-14.605	-0.035	(0)
	HgCO3	3.727e-17	3.727e-17	-16.429	-16.429	0.000	(0)
	Hg(CO3) 2-2	2.067e-18	1.416e-18	-17.685	-17.849	-0.164	(0)
	HgHCO3+	3.920e-21	3.567e-21	-20.407	-20.448	-0.041	(0)
Ca	4.494e-04						
	Ca+2	4.004e-04	2.848e-04	-3.398	-3.545	-0.148	(0)
	CaSO4	3.572e-05	3.572e-05	-4.447	-4.447	0.000	(0)
	CaHCO3+	7.580e-06	6.986e-06	-5.120	-5.156	-0.035	(0)
	CaCO3	5.425e-06	5.425e-06	-5.266	-5.266	0.000	(0)
	CaF+	2.462e-07	2.265e-07	-6.609	-6.645	-0.036	(0)
	CaH2BO3+	1.517e-08	1.388e-08	-7.819	-7.858	-0.038	(0)
	CaOH+	1.208e-08	1.113e-08	-7.918	-7.953	-0.035	(0)
	CaNH3+2	2.345e-12	1.607e-12	-11.630	-11.794	-0.164	(0)

	CaNO3+	1.435e-13	1.305e-13	-12.843	-12.884	-0.041	(0)
	Ca (NH3) 2+2	4.185e-21	2.868e-21	-20.378	-20.542	-0.164	(0)
Cd	5.468e-10						
	Cd+2	3.786e-10	2.693e-10	-9.422	-9.570	-0.148	(0)
	CdCO3	7.376e-11	7.376e-11	-10.132	-10.132	0.000	(0)
	CdCl+	4.884e-11	4.444e-11	-10.311	-10.352	-0.041	(0)
	CdSO4	3.456e-11	3.456e-11	-10.461	-10.461	0.000	(0)
	CdOH+	4.605e-12	4.190e-12	-11.337	-11.378	-0.041	(0)
	CdOHC1	3.571e-12	3.571e-12	-11.447	-11.447	0.000	(0)
	Cd (CO3) 2-2	9.590e-13	6.572e-13	-12.018	-12.182	-0.164	(0)
	CdHCO3+	8.877e-13	8.076e-13	-12.052	-12.093	-0.041	(0)
	Cd (SO4) 2-2	3.724e-13	2.552e-13	-12.429	-12.593	-0.164	(0)
	CdF+	3.418e-13	3.109e-13	-12.466	-12.507	-0.041	(0)
	CdCl2	3.201e-13	3.201e-13	-12.495	-12.495	0.000	(0)
	Cd (OH) 2	5.180e-14	5.180e-14	-13.286	-13.286	0.000	(0)
	CdCl3-	3.836e-16	3.490e-16	-15.416	-15.457	-0.041	(0)
	CdF2	4.520e-17	4.520e-17	-16.345	-16.345	0.000	(0)
	Cd (OH) 3-	6.814e-18	6.199e-18	-17.167	-17.208	-0.041	(0)
	CdSeO4	1.530e-19	1.530e-19	-18.815	-18.815	0.000	(0)
	CdNO3+	1.356e-19	1.234e-19	-18.868	-18.909	-0.041	(0)
	Cd2OH+3	1.323e-20	5.655e-21	-19.878	-20.248	-0.369	(0)
	Cd (SeO3) 2-2	1.855e-21	1.272e-21	-20.732	-20.896	-0.164	(0)
	Cd (OH) 4-2	2.901e-24	1.988e-24	-23.537	-23.702	-0.164	(0)
	Cd (NO3) 2	8.964e-30	8.964e-30	-29.047	-29.047	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.465	-79.506	-0.041	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.246	-150.246	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.249	-226.290	-0.041	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.875	-302.039	-0.164	(0)
Cl	1.882e-03						
	Cl-	1.882e-03	1.728e-03	-2.725	-2.762	-0.037	(0)
	MnCl+	3.907e-09	3.595e-09	-8.408	-8.444	-0.036	(0)
	ZnOHC1	2.468e-09	2.468e-09	-8.608	-8.608	0.000	(0)
	ZnCl+	1.048e-09	9.622e-10	-8.980	-9.017	-0.037	(0)
	AgCl	7.789e-10	7.789e-10	-9.109	-9.109	0.000	(0)
	CuCl	1.545e-10	1.545e-10	-9.811	-9.811	0.000	(0)
	AgCl2-	1.288e-10	1.172e-10	-9.890	-9.931	-0.041	(0)
	CuCl2-	6.077e-11	5.579e-11	-10.216	-10.253	-0.037	(0)
	CdCl+	4.884e-11	4.444e-11	-10.311	-10.352	-0.041	(0)
	NiCl+	1.373e-11	1.249e-11	-10.862	-10.903	-0.041	(0)
	CoCl+	1.341e-11	1.220e-11	-10.873	-10.914	-0.041	(0)
	MnCl2	8.774e-12	8.774e-12	-11.057	-11.057	0.000	(0)
	CuCl+	7.140e-12	6.556e-12	-11.146	-11.183	-0.037	(0)
	CdOHC1	3.571e-12	3.571e-12	-11.447	-11.447	0.000	(0)
	ZnCl2	2.635e-12	2.635e-12	-11.579	-11.579	0.000	(0)
	PbCl+	5.013e-13	4.561e-13	-12.300	-12.341	-0.041	(0)
	CdCl2	3.201e-13	3.201e-13	-12.495	-12.495	0.000	(0)
	AgCl3-2	2.635e-13	1.805e-13	-12.579	-12.743	-0.164	(0)
	CuCl3-2	2.878e-14	2.061e-14	-13.541	-13.686	-0.145	(0)
	HgClOH	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
	MnCl3-	4.539e-15	4.176e-15	-14.343	-14.379	-0.036	(0)
	ZnCl3-	3.940e-15	3.617e-15	-14.405	-14.442	-0.037	(0)
	CuCl2	3.928e-15	3.928e-15	-14.406	-14.406	0.000	(0)
	PbCl2	3.521e-15	3.521e-15	-14.453	-14.453	0.000	(0)
	AgCl4-3	1.491e-15	6.370e-16	-14.827	-15.196	-0.369	(0)
	HgCl2	7.738e-16	7.738e-16	-15.111	-15.111	0.000	(0)
	CdCl3-	3.836e-16	3.490e-16	-15.416	-15.457	-0.041	(0)
	NiCl2	1.087e-16	1.087e-16	-15.964	-15.964	0.000	(0)
	HgCl3-	1.470e-17	1.337e-17	-16.833	-16.874	-0.041	(0)
	ZnCl4-2	4.364e-18	3.125e-18	-17.360	-17.505	-0.145	(0)
	PbCl3-	2.662e-18	2.422e-18	-17.575	-17.616	-0.041	(0)
	UO2Cl+	1.268e-18	1.154e-18	-17.897	-17.938	-0.041	(0)
	HgCl4-2	1.342e-19	9.198e-20	-18.872	-19.036	-0.164	(0)
	CrCl+2	1.090e-19	7.472e-20	-18.962	-19.127	-0.164	(0)
	HgCl+	9.820e-20	8.934e-20	-19.008	-19.049	-0.041	(0)
	CuCl3-	6.899e-20	6.334e-20	-19.161	-19.198	-0.037	(0)
	CrOHC12	4.808e-21	4.808e-21	-20.318	-20.318	0.000	(0)
	PbCl4-2	2.791e-21	1.913e-21	-20.554	-20.718	-0.164	(0)
	FeCl+2	1.673e-23	1.198e-23	-22.776	-22.921	-0.145	(0)

CrCl2+	1.347e-23	1.225e-23	-22.871	-22.912	-0.041	(0)
CuCl4-2	7.660e-25	5.486e-25	-24.116	-24.261	-0.145	(0)
FeCl2+	1.005e-25	9.250e-26	-24.998	-25.034	-0.036	(0)
VOC1+	7.486e-26	6.811e-26	-25.126	-25.167	-0.041	(0)
CrO3Cl-	3.578e-27	3.255e-27	-26.446	-26.487	-0.041	(0)
FeCl3	1.598e-29	1.598e-29	-28.796	-28.796	0.000	(0)
CoCl+2	6.880e-38	4.715e-38	-37.162	-37.327	-0.164	(0)
UCl+3	0.000e+00	0.000e+00	-48.454	-48.823	-0.369	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.952	-53.116	-0.164	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.063	-55.227	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.016	-68.180	-0.164	(0)
Co (2)	3.964e-09					
Co+2	2.978e-09	2.041e-09	-8.526	-8.690	-0.164	(0)
CoCO3	4.146e-10	4.146e-10	-9.382	-9.382	0.000	(0)
CoHCO3+	2.299e-10	2.091e-10	-9.639	-9.680	-0.041	(0)
CoSO4	2.229e-10	2.229e-10	-9.652	-9.652	0.000	(0)
CoOH+	8.768e-11	7.977e-11	-10.057	-10.098	-0.041	(0)
CoCl+	1.341e-11	1.220e-11	-10.873	-10.914	-0.041	(0)
Co (OH) 2	1.241e-11	1.241e-11	-10.906	-10.906	0.000	(0)
CoF+	5.168e-12	4.702e-12	-11.287	-11.328	-0.041	(0)
CoNO2+	8.253e-15	7.509e-15	-14.083	-14.124	-0.041	(0)
Co (NH3) +2	1.605e-15	1.100e-15	-14.795	-14.959	-0.164	(0)
Co (OH) 3-	5.333e-16	4.852e-16	-15.273	-15.314	-0.041	(0)
CoOOH-	1.338e-16	1.218e-16	-15.873	-15.914	-0.041	(0)
CoSeO4	3.121e-18	3.121e-18	-17.506	-17.506	0.000	(0)
CoNO3+	5.152e-19	4.688e-19	-18.288	-18.329	-0.041	(0)
Co2OH+3	1.910e-20	8.159e-21	-19.719	-20.088	-0.369	(0)
Co (NH3) 2+2	3.069e-22	2.103e-22	-21.513	-21.677	-0.164	(0)
Co (OH) 4-2	2.199e-22	1.507e-22	-21.658	-21.822	-0.164	(0)
Co (NO3) 2	1.382e-28	1.382e-28	-27.859	-27.859	0.000	(0)
Co (NH3) 3+2	1.732e-29	1.187e-29	-28.761	-28.926	-0.164	(0)
Co4 (OH) 4+4	3.664e-32	8.080e-33	-31.436	-32.093	-0.656	(0)
Co (NH3) 4+2	4.074e-37	2.792e-37	-36.390	-36.554	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.518	-44.683	-0.164	(0)
Co (3)	1.948e-30					
CoOH+2	1.948e-30	1.335e-30	-29.710	-29.875	-0.164	(0)
Co+3	2.886e-37	1.341e-37	-36.540	-36.873	-0.333	(0)
CoCl+2	6.880e-38	4.715e-38	-37.162	-37.327	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.952	-53.116	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.713	-63.754	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.761	-66.925	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.016	-68.180	-0.164	(0)
Cr (2)	7.057e-28					
Cr+2	7.057e-28	4.836e-28	-27.151	-27.315	-0.164	(0)
Cr (3)	6.758e-10					
Cr (OH) 2+	3.752e-10	3.414e-10	-9.426	-9.467	-0.041	(0)
Cr (OH) 3	2.512e-10	2.512e-10	-9.600	-9.600	0.000	(0)
CrO2-	2.552e-11	2.322e-11	-10.593	-10.634	-0.041	(0)
Cr (OH) 4-	2.154e-11	1.959e-11	-10.667	-10.708	-0.041	(0)
Cr (OH) +2	2.090e-12	1.432e-12	-11.680	-11.844	-0.164	(0)
CrOHSO4	1.860e-13	1.860e-13	-12.730	-12.730	0.000	(0)
CrF+2	5.630e-16	3.858e-16	-15.249	-15.414	-0.164	(0)
Cr+3	7.820e-17	3.341e-17	-16.107	-16.476	-0.369	(0)
CrSO4+	4.695e-17	4.271e-17	-16.328	-16.369	-0.041	(0)
CrCl+2	1.090e-19	7.472e-20	-18.962	-19.127	-0.164	(0)
CrOHC12	4.808e-21	4.808e-21	-20.318	-20.318	0.000	(0)
Cr2 (OH) 2SO4+2	3.514e-23	2.408e-23	-22.454	-22.618	-0.164	(0)
CrCl2+	1.347e-23	1.225e-23	-22.871	-22.912	-0.041	(0)
Cr2 (OH) 2 (SO4) 2	7.831e-25	7.831e-25	-24.106	-24.106	0.000	(0)
CrNO3+2	3.089e-28	2.117e-28	-27.510	-27.674	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.390	-43.554	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.198	-53.567	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.063	-55.227	-0.164	(0)
Cr (6)	5.052e-15					
CrO4-2	4.926e-15	3.504e-15	-14.307	-14.455	-0.148	(0)
HCrO4-	6.405e-17	5.827e-17	-16.194	-16.235	-0.041	(0)
NaCrO4-	5.895e-17	5.363e-17	-16.230	-16.271	-0.041	(0)
KCrO4-	3.035e-18	2.761e-18	-17.518	-17.559	-0.041	(0)

	H2CrO4	2.427e-25	2.427e-25	-24.615	-24.615	0.000	(0)
	CrO3SO4-2	7.288e-26	4.994e-26	-25.137	-25.302	-0.164	(0)
	CrO3Cl-	3.578e-27	3.255e-27	-26.446	-26.487	-0.041	(0)
	Cr2O7-2	1.718e-31	1.178e-31	-30.765	-30.929	-0.164	(0)
Cu (1)	2.934e-10						
	CuCl	1.545e-10	1.545e-10	-9.811	-9.811	0.000	(0)
	Cu+	7.808e-11	7.104e-11	-10.107	-10.149	-0.041	(0)
	CuCl2-	6.077e-11	5.579e-11	-10.216	-10.253	-0.037	(0)
	CuCl3-2	2.878e-14	2.061e-14	-13.541	-13.686	-0.145	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-145.839	-146.069	-0.230	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-146.576	-146.799	-0.222	(0)
Cu (2)	2.033e-07						
	CuCO3	1.694e-07	1.694e-07	-6.771	-6.771	0.000	(0)
	CuOH+	1.615e-08	1.483e-08	-7.792	-7.829	-0.037	(0)
	Cu (CO3) 2-2	7.996e-09	5.480e-09	-8.097	-8.261	-0.164	(0)
	Cu (OH) 2	5.797e-09	5.797e-09	-8.237	-8.237	0.000	(0)
	Cu+2	3.365e-09	2.394e-09	-8.473	-8.621	-0.148	(0)
	CuSO4	3.002e-10	3.002e-10	-9.523	-9.523	0.000	(0)
	CuHCO3+	2.187e-10	1.990e-10	-9.660	-9.701	-0.041	(0)
	Cu (OH) 3-	2.560e-11	2.329e-11	-10.592	-10.633	-0.041	(0)
	CuF+	1.209e-11	1.100e-11	-10.917	-10.958	-0.041	(0)
	Cu2 (OH) 2+2	8.061e-12	5.524e-12	-11.094	-11.258	-0.164	(0)
	CuCl+	7.140e-12	6.556e-12	-11.146	-11.183	-0.037	(0)
	CuNH3+2	1.602e-13	1.098e-13	-12.795	-12.959	-0.164	(0)
	CuNO2+	1.438e-13	1.309e-13	-12.842	-12.883	-0.041	(0)
	CuCl2	3.928e-15	3.928e-15	-14.406	-14.406	0.000	(0)
	Cu (OH) 4-2	5.241e-16	3.592e-16	-15.281	-15.445	-0.164	(0)
	CuNO3+	1.206e-18	1.097e-18	-17.919	-17.960	-0.041	(0)
	Cu (NO2) 2	6.993e-19	6.993e-19	-18.155	-18.155	0.000	(0)
	CuCl3-	6.899e-20	6.334e-20	-19.161	-19.198	-0.037	(0)
	CuCl4-2	7.660e-25	5.486e-25	-24.116	-24.261	-0.145	(0)
	Cu (NO3) 2	2.002e-29	2.002e-29	-28.699	-28.699	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.514	-216.555	-0.041	(0)
F	8.158e-05						
	F-	7.934e-05	7.286e-05	-4.101	-4.138	-0.037	(0)
	MgF+	1.852e-06	1.702e-06	-5.732	-5.769	-0.037	(0)
	CaF+	2.462e-07	2.265e-07	-6.609	-6.645	-0.036	(0)
	NaF	1.416e-07	1.416e-07	-6.849	-6.849	0.000	(0)
	MnF+	5.210e-09	4.793e-09	-8.283	-8.319	-0.036	(0)
	HF	5.538e-10	5.538e-10	-9.257	-9.257	0.000	(0)
	ZnF+	3.542e-10	3.223e-10	-9.451	-9.492	-0.041	(0)
	BF (OH) 3-	2.381e-10	2.179e-10	-9.623	-9.662	-0.038	(0)
	CuF+	1.209e-11	1.100e-11	-10.917	-10.958	-0.041	(0)
	NiF+	5.683e-12	5.171e-12	-11.245	-11.286	-0.041	(0)
	CoF+	5.168e-12	4.702e-12	-11.287	-11.328	-0.041	(0)
	CdF+	3.418e-13	3.109e-13	-12.466	-12.507	-0.041	(0)
	HF2-	1.673e-13	1.534e-13	-12.777	-12.814	-0.038	(0)
	AlF2+	7.452e-14	6.860e-14	-13.128	-13.164	-0.036	(0)
	AlF3	6.293e-14	6.293e-14	-13.201	-13.201	0.000	(0)
	PbF+	4.198e-14	3.820e-14	-13.377	-13.418	-0.041	(0)
	AgF	4.041e-14	4.041e-14	-13.394	-13.394	0.000	(0)
	BF2 (OH) 2-	9.533e-15	8.725e-15	-14.021	-14.059	-0.038	(0)
	UO2F+	4.550e-15	4.140e-15	-14.342	-14.383	-0.041	(0)
	AlF+2	3.292e-15	2.365e-15	-14.483	-14.626	-0.144	(0)
	AlF4-	2.500e-15	2.298e-15	-14.602	-14.639	-0.037	(0)
	UO2F2	8.700e-16	8.700e-16	-15.060	-15.060	0.000	(0)
	CrF+2	5.630e-16	3.858e-16	-15.249	-15.414	-0.164	(0)
	PbF2	5.477e-17	5.477e-17	-16.261	-16.261	0.000	(0)
	CdF2	4.520e-17	4.520e-17	-16.345	-16.345	0.000	(0)
	UO2F3-	1.750e-17	1.592e-17	-16.757	-16.798	-0.041	(0)
	H2F2	8.218e-19	8.218e-19	-18.085	-18.085	0.000	(0)
	FeF2+	3.888e-20	3.577e-20	-19.410	-19.446	-0.036	(0)
	FeF+2	2.562e-20	1.835e-20	-19.591	-19.736	-0.145	(0)
	VO2F	1.403e-20	1.403e-20	-19.853	-19.853	0.000	(0)
	UO2F4-2	1.345e-20	9.215e-21	-19.871	-20.035	-0.164	(0)
	PbF3-	8.319e-21	7.569e-21	-20.080	-20.121	-0.041	(0)
	FeF3	3.677e-21	3.677e-21	-20.434	-20.434	0.000	(0)
	BF3OH-	1.389e-21	1.271e-21	-20.857	-20.896	-0.038	(0)

VO2F2-	4.078e-22	3.710e-22	-21.390	-21.431	-0.041	(0)
VOF+	6.748e-24	6.140e-24	-23.171	-23.212	-0.041	(0)
VO2F3-2	4.921e-25	3.372e-25	-24.308	-24.472	-0.164	(0)
PbF4-2	3.852e-25	2.639e-25	-24.414	-24.578	-0.164	(0)
VOF2	1.677e-25	1.677e-25	-24.775	-24.775	0.000	(0)
HgF+	7.692e-27	6.999e-27	-26.114	-26.155	-0.041	(0)
BF4-	2.559e-27	2.342e-27	-26.592	-26.630	-0.038	(0)
Sb(OH) 2F	7.329e-28	7.329e-28	-27.135	-27.135	0.000	(0)
SbOF	7.208e-28	7.208e-28	-27.142	-27.142	0.000	(0)
VOF3-	4.766e-28	4.337e-28	-27.322	-27.363	-0.041	(0)
VO2F4-3	2.829e-29	1.209e-29	-28.548	-28.918	-0.369	(0)
VOF4-2	1.861e-31	1.275e-31	-30.730	-30.894	-0.164	(0)
SiF6-2	6.487e-32	4.646e-32	-31.188	-31.333	-0.145	(0)
UF3+	2.934e-39	2.670e-39	-38.532	-38.574	-0.041	(0)
UF2+2	3.374e-40	2.312e-40	-39.472	-39.636	-0.164	(0)
UF4	0.000e+00	0.000e+00	-40.671	-40.671	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.229	-42.599	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.169	-43.211	-0.041	(0)
UF6-2	0.000e+00	0.000e+00	-44.704	-44.868	-0.164	(0)
Fe (2)	2.541e-13					
Fe+2	2.186e-13	1.498e-13	-12.660	-12.825	-0.164	(0)
FeSO4	2.013e-14	2.013e-14	-13.696	-13.696	0.000	(0)
FeOH+	1.270e-14	1.168e-14	-13.896	-13.932	-0.036	(0)
FeHCO3+	2.695e-15	2.484e-15	-14.569	-14.605	-0.035	(0)
Fe (OH) 2	1.818e-17	1.818e-17	-16.740	-16.740	0.000	(0)
Fe (OH) 3-	1.224e-17	1.126e-17	-16.912	-16.948	-0.036	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.763	-159.763	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.629	-235.670	-0.041	(0)
Fe (3)	7.986e-10					
Fe (OH) 3	4.658e-10	4.658e-10	-9.332	-9.332	0.000	(0)
Fe (OH) 2+	2.405e-10	2.214e-10	-9.619	-9.655	-0.036	(0)
Fe (OH) 4-	9.229e-11	8.497e-11	-10.035	-10.071	-0.036	(0)
FeOH+2	4.056e-16	2.905e-16	-15.392	-15.537	-0.145	(0)
FeF2+	3.888e-20	3.577e-20	-19.410	-19.446	-0.036	(0)
FeF+2	2.562e-20	1.835e-20	-19.591	-19.736	-0.145	(0)
FeF3	3.677e-21	3.677e-21	-20.434	-20.434	0.000	(0)
FeSO4+	1.533e-21	1.411e-21	-20.814	-20.851	-0.036	(0)
Fe+3	4.942e-22	2.296e-22	-21.306	-21.639	-0.333	(0)
Fe (SO4) 2-	1.815e-23	1.651e-23	-22.741	-22.782	-0.041	(0)
FeCl+2	1.673e-23	1.198e-23	-22.776	-22.921	-0.145	(0)
FeCl2+	1.005e-25	9.250e-26	-24.998	-25.034	-0.036	(0)
FeHSeO3+2	2.736e-27	1.875e-27	-26.563	-26.727	-0.164	(0)
FeCl3	1.598e-29	1.598e-29	-28.796	-28.796	0.000	(0)
Fe2 (OH) 2+4	1.267e-29	2.794e-30	-28.897	-29.554	-0.656	(0)
FeNO3+2	4.857e-31	3.328e-31	-30.314	-30.478	-0.164	(0)
Fe3 (OH) 4+5	9.487e-38	8.940e-39	-37.023	-38.049	-1.026	(0)
H (0)	1.371e-28					
H2	6.854e-29	6.864e-29	-28.164	-28.163	0.001	(0)
Hg (0)	8.781e-11					
Hg	8.781e-11	8.781e-11	-10.056	-10.056	0.000	(0)
Hg (1)	4.508e-25					
Hg2+2	2.254e-25	1.545e-25	-24.647	-24.811	-0.164	(0)
Hg (2)	7.898e-14					
Hg (OH) 2	6.266e-14	6.275e-14	-13.203	-13.202	0.001	(0)
HgClOH	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
HgCl2	7.738e-16	7.738e-16	-15.111	-15.111	0.000	(0)
HgCO3	3.727e-17	3.727e-17	-16.429	-16.429	0.000	(0)
HgCl3-	1.470e-17	1.337e-17	-16.833	-16.874	-0.041	(0)
Hg (CO3) 2-2	2.067e-18	1.416e-18	-17.685	-17.849	-0.164	(0)
HgOH+	2.221e-19	2.021e-19	-18.653	-18.694	-0.041	(0)
HgCl4-2	1.342e-19	9.198e-20	-18.872	-19.036	-0.164	(0)
HgCl+	9.820e-20	8.934e-20	-19.008	-19.049	-0.041	(0)
Hg (OH) 3-	1.701e-20	1.548e-20	-19.769	-19.810	-0.041	(0)
HgHCO3+	3.920e-21	3.567e-21	-20.407	-20.448	-0.041	(0)
Hg (NH3) 2+2	4.794e-23	3.285e-23	-22.319	-22.483	-0.164	(0)
HgNH3+2	1.069e-23	7.329e-24	-22.971	-23.135	-0.164	(0)
Hg+2	3.781e-24	2.591e-24	-23.422	-23.586	-0.164	(0)
HgSO4	3.714e-25	3.714e-25	-24.430	-24.430	0.000	(0)

	HgF+	7.692e-27	6.999e-27	-26.114	-26.155	-0.041	(0)
	Hg (NH3) 3+2	8.555e-31	5.863e-31	-30.068	-30.232	-0.164	(0)
	HgNO3+	1.524e-34	1.387e-34	-33.817	-33.858	-0.041	(0)
	Hg (NH3) 4+2	3.046e-38	2.088e-38	-37.516	-37.680	-0.164	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-44.078	-44.078	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.217	-139.258	-0.041	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.513	-139.677	-0.164	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.153	-141.153	0.000	(0)
K		2.318e-04					
	K+	2.309e-04	2.121e-04	-3.637	-3.674	-0.037	(0)
	KSO4-	8.927e-07	8.219e-07	-6.049	-6.085	-0.036	(0)
	KCrO4-	3.035e-18	2.761e-18	-17.518	-17.559	-0.041	(0)
Mg		3.207e-04					
	Mg+2	2.928e-04	2.082e-04	-3.533	-3.681	-0.148	(0)
	MgSO4	2.074e-05	2.074e-05	-4.683	-4.683	0.000	(0)
	MgHCO3+	3.058e-06	2.807e-06	-5.515	-5.552	-0.037	(0)
	MgCO3	2.082e-06	2.082e-06	-5.682	-5.682	0.000	(0)
	MgF+	1.852e-06	1.702e-06	-5.732	-5.769	-0.037	(0)
	MgOH+	1.760e-07	1.624e-07	-6.754	-6.789	-0.035	(0)
	MgH2BO3+	6.683e-09	6.116e-09	-8.175	-8.214	-0.038	(0)
Mn (2)		2.637e-06					
	Mn+2	2.411e-06	1.652e-06	-5.618	-5.782	-0.164	(0)
	MnSO4	1.609e-07	1.609e-07	-6.794	-6.794	0.000	(0)
	MnHCO3+	4.721e-08	4.343e-08	-7.326	-7.362	-0.036	(0)
	MnOH+	8.839e-09	8.131e-09	-8.054	-8.090	-0.036	(0)
	MnF+	5.210e-09	4.793e-09	-8.283	-8.319	-0.036	(0)
	MnCl+	3.907e-09	3.595e-09	-8.408	-8.444	-0.036	(0)
	MnCl2	8.774e-12	8.774e-12	-11.057	-11.057	0.000	(0)
	MnCl3-	4.539e-15	4.176e-15	-14.343	-14.379	-0.036	(0)
	MnSeO4	1.357e-15	1.357e-15	-14.867	-14.867	0.000	(0)
	MnNO3+	4.172e-16	3.795e-16	-15.380	-15.421	-0.041	(0)
	Mn (OH) 3-	2.097e-16	1.929e-16	-15.678	-15.715	-0.036	(0)
	Mn (OH) 4-2	1.703e-21	1.220e-21	-20.769	-20.914	-0.145	(0)
	Mn (NO3) 2	1.382e-25	1.382e-25	-24.860	-24.860	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.568	-41.568	0.000	(0)
Mn (3)		2.622e-27					
	Mn+3	2.622e-27	1.218e-27	-26.581	-26.914	-0.333	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-40.876	-41.021	-0.145	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-46.137	-46.175	-0.038	(0)
Mo		7.534e-08					
	MoO4-2	7.533e-08	5.358e-08	-7.123	-7.271	-0.148	(0)
	HMoO4-	6.022e-12	5.479e-12	-11.220	-11.261	-0.041	(0)
	H2MoO4	2.062e-16	2.062e-16	-15.686	-15.686	0.000	(0)
	Ag2MoO4	9.887e-28	9.887e-28	-27.005	-27.005	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-55.487	-55.857	-0.369	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-62.742	-64.220	-1.477	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-65.096	-66.122	-1.026	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-68.972	-69.629	-0.656	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-74.303	-74.672	-0.369	(0)
N (-3)		4.889e-08					
	NH4+	4.415e-08	4.040e-08	-7.355	-7.394	-0.038	(0)
	NH3	4.483e-09	4.483e-09	-8.348	-8.348	0.000	(0)
	NH4SO4-	2.576e-10	2.370e-10	-9.589	-9.625	-0.036	(0)
	CaNH3+2	2.345e-12	1.607e-12	-11.630	-11.794	-0.164	(0)
	CuNH3+2	1.602e-13	1.098e-13	-12.795	-12.959	-0.164	(0)
	NiNH3+2	9.924e-15	6.801e-15	-14.003	-14.167	-0.164	(0)
	AgNH3+	2.221e-15	2.021e-15	-14.653	-14.695	-0.041	(0)
	Co (NH3) +2	1.605e-15	1.100e-15	-14.795	-14.959	-0.164	(0)
	BaNH3+2	9.146e-18	6.267e-18	-17.039	-17.203	-0.164	(0)
	Ag (NH3) 2+	8.092e-20	7.362e-20	-19.092	-19.133	-0.041	(0)
	Ni (NH3) 2+2	6.430e-21	4.407e-21	-20.192	-20.356	-0.164	(0)
	Ca (NH3) 2+2	4.185e-21	2.868e-21	-20.378	-20.542	-0.164	(0)
	Co (NH3) 2+2	3.069e-22	2.103e-22	-21.513	-21.677	-0.164	(0)
	Hg (NH3) 2+2	4.794e-23	3.285e-23	-22.319	-22.483	-0.164	(0)
	HgNH3+2	1.069e-23	7.329e-24	-22.971	-23.135	-0.164	(0)
	Co (NH3) 3+2	1.732e-29	1.187e-29	-28.761	-28.926	-0.164	(0)

	Hg (NH3) 3+2	8.555e-31	5.863e-31	-30.068	-30.232	-0.164	(0)
	Co (NH3) 4+2	4.074e-37	2.792e-37	-36.390	-36.554	-0.164	(0)
	Hg (NH3) 4+2	3.046e-38	2.088e-38	-37.516	-37.680	-0.164	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.390	-43.554	-0.164	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-44.518	-44.683	-0.164	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.952	-53.116	-0.164	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.198	-53.567	-0.369	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-55.063	-55.227	-0.164	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.713	-63.754	-0.041	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.761	-66.925	-0.164	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.016	-68.180	-0.164	(0)
N (3)	5.699e-07						
	NO2-	5.699e-07	5.222e-07	-6.244	-6.282	-0.038	(0)
	CuNO2+	1.438e-13	1.309e-13	-12.842	-12.883	-0.041	(0)
	AgNO2	2.409e-14	2.409e-14	-13.618	-13.618	0.000	(0)
	CoNO2+	8.253e-15	7.509e-15	-14.083	-14.124	-0.041	(0)
	Cu (NO2) 2	6.993e-19	6.993e-19	-18.155	-18.155	0.000	(0)
	Ag (NO2) 2-	2.141e-20	1.948e-20	-19.669	-19.710	-0.041	(0)
N (5)	1.580e-10						
	NO3-	1.578e-10	1.449e-10	-9.802	-9.839	-0.037	(0)
	CaNO3+	1.435e-13	1.305e-13	-12.843	-12.884	-0.041	(0)
	MnNO3+	4.172e-16	3.795e-16	-15.380	-15.421	-0.041	(0)
	ZnNO3+	8.870e-17	8.070e-17	-16.052	-16.093	-0.041	(0)
	BaNO3+	1.769e-18	1.610e-18	-17.752	-17.793	-0.041	(0)
	CuNO3+	1.206e-18	1.097e-18	-17.919	-17.960	-0.041	(0)
	NiNO3+	1.130e-18	1.029e-18	-17.947	-17.988	-0.041	(0)
	CoNO3+	5.152e-19	4.688e-19	-18.288	-18.329	-0.041	(0)
	CdNO3+	1.356e-19	1.234e-19	-18.868	-18.909	-0.041	(0)
	AgNO3	2.542e-20	2.542e-20	-19.595	-19.595	0.000	(0)
	PbNO3+	1.753e-20	1.595e-20	-19.756	-19.797	-0.041	(0)
	Mn (NO3) 2	1.382e-25	1.382e-25	-24.860	-24.860	0.000	(0)
	UO2NO3+	1.308e-25	1.190e-25	-24.883	-24.924	-0.041	(0)
	Zn (NO3) 2	2.334e-27	2.334e-27	-26.632	-26.632	0.000	(0)
	CrNO3+2	3.089e-28	2.117e-28	-27.510	-27.674	-0.164	(0)
	Co (NO3) 2	1.382e-28	1.382e-28	-27.859	-27.859	0.000	(0)
	Cu (NO3) 2	2.002e-29	2.002e-29	-28.699	-28.699	0.000	(0)
	Cd (NO3) 2	8.964e-30	8.964e-30	-29.047	-29.047	0.000	(0)
	VO2NO3	8.046e-30	8.046e-30	-29.094	-29.094	0.000	(0)
	Pb (NO3) 2	3.925e-30	3.925e-30	-29.406	-29.406	0.000	(0)
	FeNO3+2	4.857e-31	3.328e-31	-30.314	-30.478	-0.164	(0)
	HgNO3+	1.524e-34	1.387e-34	-33.817	-33.858	-0.041	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-44.078	-44.078	0.000	(0)
Na	3.367e-03						
	Na+	3.354e-03	3.080e-03	-2.474	-2.511	-0.037	(0)
	NaSO4-	9.835e-06	9.055e-06	-5.007	-5.043	-0.036	(0)
	NaHCO3	2.282e-06	2.282e-06	-5.642	-5.642	0.000	(0)
	NaCO3-	7.487e-07	6.893e-07	-6.126	-6.162	-0.036	(0)
	NaF	1.416e-07	1.416e-07	-6.849	-6.849	0.000	(0)
	NaH2BO3	4.135e-09	4.135e-09	-8.384	-8.384	0.000	(0)
	NaCrO4-	5.895e-17	5.363e-17	-16.230	-16.271	-0.041	(0)
Ni	6.158e-09						
	Ni+2	3.972e-09	2.825e-09	-8.401	-8.549	-0.148	(0)
	NiCO3	1.267e-09	1.267e-09	-8.897	-8.897	0.000	(0)
	NiHCO3+	5.043e-10	4.589e-10	-9.297	-9.338	-0.041	(0)
	NiSO4	3.086e-10	3.086e-10	-9.511	-9.511	0.000	(0)
	NiOH+	7.658e-11	6.968e-11	-10.116	-10.157	-0.041	(0)
	NiCl+	1.373e-11	1.249e-11	-10.862	-10.903	-0.041	(0)
	Ni (OH) 2	1.084e-11	1.084e-11	-10.965	-10.965	0.000	(0)
	NiF+	5.683e-12	5.171e-12	-11.245	-11.286	-0.041	(0)
	Ni (OH) 3-	2.335e-14	2.124e-14	-13.632	-13.673	-0.041	(0)
	NiNH3+2	9.924e-15	6.801e-15	-14.003	-14.167	-0.164	(0)
	Ni (SO4) 2-2	8.163e-15	5.594e-15	-14.088	-14.252	-0.164	(0)
	NiCl2	1.087e-16	1.087e-16	-15.964	-15.964	0.000	(0)
	NiSeO4	4.032e-18	4.032e-18	-17.395	-17.395	0.000	(0)
	NiNO3+	1.130e-18	1.029e-18	-17.947	-17.988	-0.041	(0)
	Ni (NH3) 2+2	6.430e-21	4.407e-21	-20.192	-20.356	-0.164	(0)
O (0)	2.148e-36						
	O2	1.074e-36	1.076e-36	-35.969	-35.968	0.001	(0)

Pb	3.459e-10					
PbCO3	2.688e-10	2.688e-10	-9.571	-9.571	0.000	(0)
PbOH+	4.024e-11	3.661e-11	-10.395	-10.436	-0.041	(0)
Pb (CO3) 2-2	1.359e-11	9.316e-12	-10.867	-11.031	-0.164	(0)
Pb+2	1.046e-11	7.439e-12	-10.981	-11.128	-0.148	(0)
PbHCO3+	8.004e-12	7.282e-12	-11.097	-11.138	-0.041	(0)
Pb (OH) 2	2.268e-12	2.268e-12	-11.644	-11.644	0.000	(0)
PbSO4	1.995e-12	1.995e-12	-11.700	-11.700	0.000	(0)
PbCl+	5.013e-13	4.561e-13	-12.300	-12.341	-0.041	(0)
PbF+	4.198e-14	3.820e-14	-13.377	-13.418	-0.041	(0)
Pb (SO4) 2-2	9.602e-15	6.580e-15	-14.018	-14.182	-0.164	(0)
Pb (OH) 3-	4.883e-15	4.443e-15	-14.311	-14.352	-0.041	(0)
PbCl2	3.521e-15	3.521e-15	-14.453	-14.453	0.000	(0)
PbF2	5.477e-17	5.477e-17	-16.261	-16.261	0.000	(0)
Pb (OH) 4-2	3.111e-18	2.132e-18	-17.507	-17.671	-0.164	(0)
PbCl3-	2.662e-18	2.422e-18	-17.575	-17.616	-0.041	(0)
PbNO3+	1.753e-20	1.595e-20	-19.756	-19.797	-0.041	(0)
Pb2OH+3	1.010e-20	4.316e-21	-19.996	-20.365	-0.369	(0)
PbF3-	8.319e-21	7.569e-21	-20.080	-20.121	-0.041	(0)
PbCl4-2	2.791e-21	1.913e-21	-20.554	-20.718	-0.164	(0)
Pb3 (OH) 4+2	1.114e-24	7.635e-25	-23.953	-24.117	-0.164	(0)
PbF4-2	3.852e-25	2.639e-25	-24.414	-24.578	-0.164	(0)
Pb (NO3) 2	3.925e-30	3.925e-30	-29.406	-29.406	0.000	(0)
Pb4 (OH) 4+4	2.046e-31	4.512e-32	-30.689	-31.346	-0.656	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.747	-151.747	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.350	-228.391	-0.041	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.786	-73.786	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.903	-77.944	-0.041	(0)
S5-2	0.000e+00	0.000e+00	-78.856	-79.020	-0.164	(0)
H2S	0.000e+00	0.000e+00	-79.213	-79.213	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.372	-79.536	-0.164	(0)
S4-2	0.000e+00	0.000e+00	-79.452	-79.616	-0.164	(0)
CdHS+	0.000e+00	0.000e+00	-79.465	-79.506	-0.041	(0)
S3-2	0.000e+00	0.000e+00	-80.258	-80.422	-0.164	(0)
S2-2	0.000e+00	0.000e+00	-81.274	-81.438	-0.164	(0)
S-2	0.000e+00	0.000e+00	-86.810	-86.955	-0.145	(0)
HgHS2-	0.000e+00	0.000e+00	-139.217	-139.258	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-139.513	-139.677	-0.164	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.153	-141.153	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.839	-146.069	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.576	-146.799	-0.222	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.707	-146.824	-0.118	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.403	-147.444	-0.041	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.589	-147.630	-0.041	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.742	-147.975	-0.234	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.060	-148.286	-0.226	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.723	-149.723	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.246	-150.246	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.747	-151.747	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.763	-159.763	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.514	-216.555	-0.041	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.346	-224.387	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.914	-226.078	-0.164	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.249	-226.290	-0.041	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.350	-228.391	-0.041	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.629	-235.670	-0.041	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.875	-302.039	-0.164	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.627	-303.791	-0.164	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.606	-320.770	-0.164	(0)
S (6)	8.370e-04					
SO4-2	7.696e-04	5.474e-04	-3.114	-3.262	-0.148	(0)
CaSO4	3.572e-05	3.572e-05	-4.447	-4.447	0.000	(0)
MgSO4	2.074e-05	2.074e-05	-4.683	-4.683	0.000	(0)
NaSO4-	9.835e-06	9.055e-06	-5.007	-5.043	-0.036	(0)
KSO4-	8.927e-07	8.219e-07	-6.049	-6.085	-0.036	(0)
MnSO4	1.609e-07	1.609e-07	-6.794	-6.794	0.000	(0)
ZnSO4	2.655e-08	2.655e-08	-7.576	-7.576	0.000	(0)

NiSO4	3.086e-10	3.086e-10	-9.511	-9.511	0.000	(0)
CuSO4	3.002e-10	3.002e-10	-9.523	-9.523	0.000	(0)
HSO4-	2.992e-10	2.749e-10	-9.524	-9.561	-0.037	(0)
NH4SO4-	2.576e-10	2.370e-10	-9.589	-9.625	-0.036	(0)
CoSO4	2.229e-10	2.229e-10	-9.652	-9.652	0.000	(0)
Zn(SO4) 2-2	1.847e-10	1.266e-10	-9.733	-9.898	-0.164	(0)
CdSO4	3.456e-11	3.456e-11	-10.461	-10.461	0.000	(0)
AgSO4-	2.651e-12	2.412e-12	-11.577	-11.618	-0.041	(0)
PbSO4	1.995e-12	1.995e-12	-11.700	-11.700	0.000	(0)
Cd(SO4) 2-2	3.724e-13	2.552e-13	-12.429	-12.593	-0.164	(0)
CrOHSO4	1.860e-13	1.860e-13	-12.730	-12.730	0.000	(0)
FeSO4	2.013e-14	2.013e-14	-13.696	-13.696	0.000	(0)
Pb(SO4) 2-2	9.602e-15	6.580e-15	-14.018	-14.182	-0.164	(0)
Ni(SO4) 2-2	8.163e-15	5.594e-15	-14.088	-14.252	-0.164	(0)
UO2SO4	3.411e-16	3.411e-16	-15.467	-15.467	0.000	(0)
CrSO4+	4.695e-17	4.271e-17	-16.328	-16.369	-0.041	(0)
AlSO4+	1.501e-17	1.379e-17	-16.824	-16.860	-0.037	(0)
UO2(SO4) 2-2	3.592e-18	2.462e-18	-17.445	-17.609	-0.164	(0)
Al(SO4) 2-	8.805e-20	8.092e-20	-19.055	-19.092	-0.037	(0)
VO2SO4-	1.577e-21	1.435e-21	-20.802	-20.843	-0.041	(0)
FeSO4+	1.533e-21	1.411e-21	-20.814	-20.851	-0.036	(0)
Cr2(OH) 2SO4+2	3.514e-23	2.408e-23	-22.454	-22.618	-0.164	(0)
Fe(SO4) 2-	1.815e-23	1.651e-23	-22.741	-22.782	-0.041	(0)
VOSO4	2.118e-24	2.118e-24	-23.674	-23.674	0.000	(0)
Cr2(OH) 2(SO4) 2	7.831e-25	7.831e-25	-24.106	-24.106	0.000	(0)
HgSO4	3.714e-25	3.714e-25	-24.430	-24.430	0.000	(0)
CrO3SO4-2	7.288e-26	4.994e-26	-25.137	-25.302	-0.164	(0)
VSO4+	3.172e-39	2.886e-39	-38.499	-38.540	-0.041	(0)
U(SO4) 2	0.000e+00	0.000e+00	-43.784	-43.784	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.259	-44.423	-0.164	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-63.713	-63.754	-0.041	(0)
Sb(3)	2.477e-21					
Sb(OH) 3	1.253e-21	1.253e-21	-20.902	-20.902	0.000	(0)
HSbO2	1.223e-21	1.223e-21	-20.913	-20.913	0.000	(0)
SbO2-	4.237e-25	3.855e-25	-24.373	-24.414	-0.041	(0)
Sb(OH) 4-	2.427e-25	2.208e-25	-24.615	-24.656	-0.041	(0)
Sb(OH) 2F	7.329e-28	7.329e-28	-27.135	-27.135	0.000	(0)
SbOF	7.208e-28	7.208e-28	-27.142	-27.142	0.000	(0)
Sb(OH) 2+	1.719e-28	1.564e-28	-27.765	-27.806	-0.041	(0)
SbO+	5.926e-29	5.392e-29	-28.227	-28.268	-0.041	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.606	-320.770	-0.164	(0)
Sb(5)	1.158e-09					
SbO3-	1.157e-09	1.053e-09	-8.937	-8.978	-0.041	(0)
Sb(OH) 6-	1.340e-12	1.231e-12	-11.873	-11.910	-0.037	(0)
SbO2+	8.766e-27	7.976e-27	-26.057	-26.098	-0.041	(0)
Se(-2)	1.577e-15					
Ag2Se	1.577e-15	1.577e-15	-14.802	-14.802	0.000	(0)
HSe-	2.243e-39	2.041e-39	-38.649	-38.690	-0.041	(0)
MnSe	0.000e+00	0.000e+00	-41.568	-41.568	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.089	-43.089	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.237	-45.401	-0.164	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.022	-82.678	-0.656	(0)
Se(4)	6.889e-09					
SeO3-2	3.493e-09	2.394e-09	-8.457	-8.621	-0.164	(0)
HSeO3-	3.396e-09	3.090e-09	-8.469	-8.510	-0.041	(0)
H2SeO3	6.774e-15	6.774e-15	-14.169	-14.169	0.000	(0)
AgSeO3-	3.733e-16	3.396e-16	-15.428	-15.469	-0.041	(0)
Cd(SeO3) 2-2	1.855e-21	1.272e-21	-20.732	-20.896	-0.164	(0)
Ag(SeO3) 2-3	1.704e-23	7.279e-24	-22.769	-23.138	-0.369	(0)
FeHSeO3+2	2.736e-27	1.875e-27	-26.563	-26.727	-0.164	(0)
Se(6)	4.291e-12					
SeO4-2	4.289e-12	3.051e-12	-11.368	-11.516	-0.148	(0)
MnSeO4	1.357e-15	1.357e-15	-14.867	-14.867	0.000	(0)
ZnSeO4	1.048e-16	1.048e-16	-15.980	-15.980	0.000	(0)
NiSeO4	4.032e-18	4.032e-18	-17.395	-17.395	0.000	(0)
CoSeO4	3.121e-18	3.121e-18	-17.506	-17.506	0.000	(0)
HSeO4-	8.637e-19	7.858e-19	-18.064	-18.105	-0.041	(0)
CdSeO4	1.530e-19	1.530e-19	-18.815	-18.815	0.000	(0)

	Zn(SeO4) 2-2	4.728e-28	3.240e-28	-27.325	-27.489	-0.164	(0)
Si	3.025e-04						
	H4SiO4	2.935e-04	2.940e-04	-3.532	-3.532	0.001	(0)
	H3SiO4-	9.006e-06	8.268e-06	-5.045	-5.083	-0.037	(0)
	H2SiO4-2	1.413e-10	1.015e-10	-9.850	-9.993	-0.144	(0)
	UO2H3SiO4+	3.176e-13	2.890e-13	-12.498	-12.539	-0.041	(0)
	SiF6-2	6.487e-32	4.646e-32	-31.188	-31.333	-0.145	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-60.405	-60.775	-0.369	(0)
U (4)	4.031e-20						
	U (OH) 5-	4.030e-20	3.667e-20	-19.395	-19.436	-0.041	(0)
	U (OH) 4	7.892e-24	7.892e-24	-23.103	-23.103	0.000	(0)
	U (OH) 3+	1.630e-28	1.483e-28	-27.788	-27.829	-0.041	(0)
	U (OH) 2+2	5.143e-34	3.525e-34	-33.289	-33.453	-0.164	(0)
	UF3+	2.934e-39	2.670e-39	-38.532	-38.574	-0.041	(0)
	UF2+2	3.374e-40	2.312e-40	-39.472	-39.636	-0.164	(0)
	UOH+3	1.997e-40	0.000e+00	-39.700	-40.069	-0.369	(0)
	UF4	0.000e+00	0.000e+00	-40.671	-40.671	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-42.229	-42.599	-0.369	(0)
	UF5-	0.000e+00	0.000e+00	-43.169	-43.211	-0.041	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-43.784	-43.784	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-44.259	-44.423	-0.164	(0)
	UF6-2	0.000e+00	0.000e+00	-44.704	-44.868	-0.164	(0)
	U+4	0.000e+00	0.000e+00	-47.105	-47.761	-0.656	(0)
	UC1+3	0.000e+00	0.000e+00	-48.454	-48.823	-0.369	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-176.062	-179.385	-3.324	(0)
U (5)	1.671e-17						
	UO2+	1.671e-17	1.520e-17	-16.777	-16.818	-0.041	(0)
U (6)	1.981e-08						
	UO2 (CO3) 3-4	1.290e-08	2.845e-09	-7.889	-8.546	-0.656	(0)
	UO2 (CO3) 2-2	6.892e-09	4.723e-09	-8.162	-8.326	-0.164	(0)
	UO2CO3	1.970e-11	1.970e-11	-10.706	-10.706	0.000	(0)
	UO2H3SiO4+	3.176e-13	2.890e-13	-12.498	-12.539	-0.041	(0)
	UO2OH+	1.116e-13	1.015e-13	-12.952	-12.993	-0.041	(0)
	UO2F+	4.550e-15	4.140e-15	-14.342	-14.383	-0.041	(0)
	UO2F2	8.700e-16	8.700e-16	-15.060	-15.060	0.000	(0)
	UO2+2	5.787e-16	4.117e-16	-15.238	-15.385	-0.148	(0)
	UO2SO4	3.411e-16	3.411e-16	-15.467	-15.467	0.000	(0)
	UO2F3-	1.750e-17	1.592e-17	-16.757	-16.798	-0.041	(0)
	UO2 (SO4) 2-2	3.592e-18	2.462e-18	-17.445	-17.609	-0.164	(0)
	UO2Cl+	1.268e-18	1.154e-18	-17.897	-17.938	-0.041	(0)
	(UO2) 2 (OH) 2+2	2.496e-20	1.711e-20	-19.603	-19.767	-0.164	(0)
	UO2F4-2	1.345e-20	9.215e-21	-19.871	-20.035	-0.164	(0)
	(UO2) 3 (OH) 5+	5.558e-21	5.056e-21	-20.255	-20.296	-0.041	(0)
	UO2NO3+	1.308e-25	1.190e-25	-24.883	-24.924	-0.041	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-44.637	-44.678	-0.041	(0)
	V+2	0.000e+00	0.000e+00	-46.316	-46.480	-0.164	(0)
V (3)	6.773e-17						
	V (OH) 3	6.773e-17	6.773e-17	-16.169	-16.169	0.000	(0)
	V (OH) 2+	2.472e-28	2.249e-28	-27.607	-27.648	-0.041	(0)
	VOH+2	1.600e-32	1.096e-32	-31.796	-31.960	-0.164	(0)
	V+3	2.613e-38	1.117e-38	-37.583	-37.952	-0.369	(0)
	VSO4+	3.172e-39	2.886e-39	-38.499	-38.540	-0.041	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-60.787	-61.156	-0.369	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-62.464	-63.120	-0.656	(0)
V (4)	6.065e-21						
	V (OH) 3+	6.035e-21	5.491e-21	-20.219	-20.260	-0.041	(0)
	VO+2	2.050e-23	1.405e-23	-22.688	-22.852	-0.164	(0)
	VOF+	6.748e-24	6.140e-24	-23.171	-23.212	-0.041	(0)
	VOSO4	2.118e-24	2.118e-24	-23.674	-23.674	0.000	(0)
	VOF2	1.677e-25	1.677e-25	-24.775	-24.775	0.000	(0)
	VOC1+	7.486e-26	6.811e-26	-25.126	-25.167	-0.041	(0)
	VOF3-	4.766e-28	4.337e-28	-27.322	-27.363	-0.041	(0)
	VOF4-2	1.861e-31	1.275e-31	-30.730	-30.894	-0.164	(0)
	H2V2O4+2	2.206e-36	1.512e-36	-35.656	-35.821	-0.164	(0)
V (5)	3.774e-10						
	H2VO4-	2.289e-10	2.082e-10	-9.640	-9.681	-0.041	(0)

HVO4-2	1.485e-10	1.018e-10	-9.828	-9.992	-0.164	(0)
H3VO4	1.070e-14	1.070e-14	-13.971	-13.971	0.000	(0)
VO4-3	2.323e-16	9.926e-17	-15.634	-16.003	-0.369	(0)
HV2O7-3	1.681e-17	7.182e-18	-16.774	-17.144	-0.369	(0)
H3V2O7-	1.581e-17	1.439e-17	-16.801	-16.842	-0.041	(0)
V2O7-4	1.706e-19	3.762e-20	-18.768	-19.425	-0.656	(0)
VO2+	1.195e-19	1.098e-19	-18.923	-18.960	-0.037	(0)
VO2F	1.403e-20	1.403e-20	-19.853	-19.853	0.000	(0)
VO2SO4-	1.577e-21	1.435e-21	-20.802	-20.843	-0.041	(0)
VO2F2-	4.078e-22	3.710e-22	-21.390	-21.431	-0.041	(0)
V3O9-3	2.213e-23	9.458e-24	-22.655	-23.024	-0.369	(0)
VO2F3-2	4.921e-25	3.372e-25	-24.308	-24.472	-0.164	(0)
VO2F4-3	2.829e-29	1.209e-29	-28.548	-28.918	-0.369	(0)
VO2NO3	8.046e-30	8.046e-30	-29.094	-29.094	0.000	(0)
V4O12-4	3.723e-30	8.211e-31	-29.429	-30.086	-0.656	(0)
V10O28-6	0.000e+00	0.000e+00	-79.588	-81.065	-1.477	(0)
HV10O28-5	0.000e+00	0.000e+00	-80.141	-81.167	-1.026	(0)
H2V10O28-4	0.000e+00	0.000e+00	-83.592	-84.249	-0.656	(0)
Zn	5.671e-07					
Zn+2	3.117e-07	2.217e-07	-6.506	-6.654	-0.148	(0)
ZnCO3	1.533e-07	1.533e-07	-6.814	-6.814	0.000	(0)
ZnOH+	4.773e-08	4.343e-08	-7.321	-7.362	-0.041	(0)
ZnSO4	2.655e-08	2.655e-08	-7.576	-7.576	0.000	(0)
Zn(OH)2	1.348e-08	1.348e-08	-7.870	-7.870	0.000	(0)
ZnHCO3+	1.015e-08	9.236e-09	-7.994	-8.035	-0.041	(0)
ZnOHCl	2.468e-09	2.468e-09	-8.608	-8.608	0.000	(0)
ZnCl+	1.048e-09	9.622e-10	-8.980	-9.017	-0.037	(0)
ZnF+	3.542e-10	3.223e-10	-9.451	-9.492	-0.041	(0)
Zn(SO4)2-2	1.847e-10	1.266e-10	-9.733	-9.898	-0.164	(0)
Zn(OH)3-	1.455e-10	1.324e-10	-9.837	-9.878	-0.041	(0)
ZnCl2	2.635e-12	2.635e-12	-11.579	-11.579	0.000	(0)
Zn(OH)4-2	1.507e-14	1.033e-14	-13.822	-13.986	-0.164	(0)
ZnCl3-	3.940e-15	3.617e-15	-14.405	-14.442	-0.037	(0)
ZnSeO4	1.048e-16	1.048e-16	-15.980	-15.980	0.000	(0)
ZnNO3+	8.870e-17	8.070e-17	-16.052	-16.093	-0.041	(0)
ZnCl4-2	4.364e-18	3.125e-18	-17.360	-17.505	-0.145	(0)
Zn(NO3)2	2.334e-27	2.334e-27	-26.632	-26.632	0.000	(0)
Zn(SeO4)2-2	4.728e-28	3.240e-28	-27.325	-27.489	-0.164	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.403	-147.444	-0.041	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.723	-149.723	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.346	-224.387	-0.041	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.914	-226.078	-0.164	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.627	-303.791	-0.164	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-61.12	-54.84	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-45.19	-40.68	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-52.42	-40.68	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-78.95	-61.02	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-59.82	-39.79	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.65	-29.24	0.40	(NH4)2CrO4
(NH4)2SeO4	-26.75	-26.30	0.45	(NH4)2SeO4
Acanthite	-52.75	-88.97	-36.22	Ag2S
Ag2CO3	-13.14	-24.23	-11.09	Ag2CO3
Ag2CrO4	-22.18	-33.77	-11.59	Ag2CrO4
Ag2HVO4	-14.88	-13.40	1.48	Ag2HVO4
Ag2MoO4	-15.03	-26.58	-11.55	Ag2MoO4
Ag2O	-15.31	-2.73	12.57	Ag2O
Ag2Se	-1.01	-49.71	-48.70	Ag2Se
Ag2SeO3	-12.38	-19.53	-7.15	Ag2SeO3
Ag2SeO4	-21.92	-30.83	-8.91	Ag2SeO4
Ag2SO4	-17.75	-22.57	-4.82	Ag2SO4
Ag3AsO3	-28.16	-26.00	2.16	Ag3AsO3
Ag3AsO4	-17.10	-19.89	-2.79	Ag3AsO4
Ag3H2VO5	-19.95	-14.77	5.18	Ag3H2VO5

AgF:4H2O	-14.84	-13.79	1.05	AgF:4H2O
Agmetal	-0.37	-13.87	-13.51	Ag
AgVO3	-12.81	-12.04	0.77	AgVO3
Al (OH) 3 (am)	-3.42	7.38	10.80	Al (OH) 3
Al2 (MoO4) 3	-59.16	-56.79	2.37	Al2 (MoO4) 3
Al2O3	-4.90	14.76	19.65	Al2O3
Al4 (OH) 10SO4	-13.03	9.67	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.21	-8.41	4.80	AlAsO4:2H2O
AlOHSO4	-9.23	-12.46	-3.23	AlOHSO4
AlSb	-154.19	-88.56	65.62	AlSb
Alunite	-11.53	-12.93	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-6.60	-14.39	-7.79	PbSO4
Anhydrite	-2.45	-6.81	-4.36	CaSO4
Anilite	-55.16	-87.03	-31.88	Cu0.25Cu1.5S
Antlerite	-4.76	4.03	8.79	Cu3 (OH) 4SO4
Aragonite	-0.17	-8.47	-8.30	CaCO3
Arsenolite	-84.84	-87.60	-2.76	As4O6
Artinite	-5.31	4.29	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.28	-31.57	6.71	As2O5
Atacamite	-2.53	4.86	7.39	Cu2 (OH) 3Cl
Azurite	-2.22	-19.12	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.47	7.92	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-21.37	-5.49	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	1.11	-7.80	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-30.51	2.43	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.44	-23.11	-9.67	BaCrO4
BaF2	-11.11	-16.93	-5.82	BaF2
BaMoO4	-8.97	-15.93	-6.96	BaMoO4
Barite	-1.94	-11.92	-9.98	BaSO4
BaS	-94.49	-78.31	16.18	BaS
BaSeO3	-10.71	-8.88	1.83	BaSeO3
BaSeO4	-12.71	-20.17	-7.46	BaSeO4
Bianchite	-8.15	-9.92	-1.76	ZnSO4:6H2O
Birnessite	-7.63	10.46	18.09	MnO2
Bixbyite	-3.45	-4.09	-0.64	Mn2O3
BlaubleiI	-55.28	-79.44	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.67	-82.95	-27.28	Cu0.6Cu0.8S
Boehmite	-1.20	7.38	8.58	AlOOH
Breithauptite	-56.88	-75.41	-18.52	NiSb
Brochantite	-3.23	11.99	15.22	Cu4 (OH) 6SO4
Brucite	-3.95	12.90	16.84	Mg (OH) 2
Bunsenite	-4.42	8.03	12.45	NiO
Ca (VO3) 2	-13.97	-8.31	5.66	Ca (VO3) 2
Ca2V2O7	-12.78	4.72	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.83	4.72	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.77	7.53	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-21.20	17.76	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-22.10	17.76	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-295.76	-152.79	142.97	Ca3Sb2
CaCrO4	-15.74	-18.00	-2.27	CaCrO4
Calcite	0.01	-8.47	-8.48	CaCO3
Calomel	-12.43	-30.34	-17.91	Hg2Cl2
CaMoO4	-2.87	-10.82	-7.95	CaMoO4
Carnotite	-5.09	-4.86	0.23	KUO2VO4
CaSeO3:2H2O	-6.58	-3.77	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.04	-15.06	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.08	-3.24	9.84	Cd (BO2) 2
Cd (OH) 2	-6.64	7.01	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.72	7.01	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-25.36	-18.65	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.37	1.19	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-20.21	8.19	28.40	Cd4 (OH) 6SO4
CdCl2	-14.44	-15.09	-0.66	CdCl2
CdCl2:1H2O	-13.40	-15.09	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.18	-15.09	-1.91	CdCl2:2.5H2O
CdF2	-16.63	-17.84	-1.21	CdF2
Cdmetal (alpha)	-31.52	-18.01	13.51	Cd
Cdmetal (gamma)	-31.62	-18.01	13.62	Cd

CdMoO4	-2.69	-16.84	-14.15	CdMoO4
CdOHCl	-7.58	-4.04	3.54	CdOHCl
CdSb	-76.08	-76.43	-0.35	CdSb
CdSe	-19.77	-39.97	-20.20	CdSe
CdSeO4:2H2O	-19.24	-21.09	-1.85	CdSeO4:2H2O
CdSO4	-12.66	-12.83	-0.17	CdSO4
CdSO4:1H2O	-11.11	-12.83	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.96	-12.83	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.67	-12.42	-9.75	AgCl
Cerrusite	-2.92	-16.05	-13.13	PbCO3
CH4(g)	-80.51	-121.55	-41.05	CH4
Chalcanthite	-9.24	-11.88	-2.64	CuSO4:5H2O
Chalcedony	0.02	-3.53	-3.55	SiO2
Chalcocite	-55.03	-89.95	-34.92	Cu2S
Chalcopyrite	-125.49	-160.76	-35.27	CuFeS2
Chrysotile	-0.57	31.63	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.74	-99.44	-45.69	HgS
Claudetite	-84.54	-87.60	-3.06	As4O6
Clausthalite	-14.43	-41.53	-27.10	PbSe
Co(BO2)2	-29.43	-2.36	27.07	Co(BO2)2
Co(OH)2	-5.21	7.89	13.09	Co(OH)2
Co(OH)3	-9.70	-12.01	-2.31	Co(OH)3
CO2(g)	-3.35	-21.50	-18.15	CO2
Co3(AsO4)2	-20.94	-7.91	13.03	Co3(AsO4)2
Co3O4	-5.63	-16.12	-10.50	Co3O4
CoCl2	-22.48	-14.22	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.22	2.54	CoCl2:6H2O
CoCO3	-3.63	-13.61	-9.98	CoCO3
CoF2	-15.37	-16.97	-1.60	CoF2
CoF3	-47.83	-49.29	-1.46	CoF3
CoFe2O4	17.87	14.34	-3.53	CoFe2O4
CoMoO4	-8.20	-15.96	-7.76	CoMoO4
CoO	-5.70	7.89	13.59	CoO
CoS(alpha)	-70.91	-78.35	-7.44	CoS
CoS(beta)	-67.28	-78.35	-11.07	CoS
CoSe	-22.89	-39.09	-16.20	CoSe
CoSeO3	-10.23	-8.91	1.32	CoSeO3
CoSeO4:6H2O	-18.68	-20.21	-1.53	CoSeO4:6H2O
CoSO4	-14.75	-11.95	2.80	CoSO4
CoSO4:6H2O	-9.48	-11.95	-2.47	CoSO4:6H2O
Cotunnite	-11.87	-16.65	-4.78	PbCl2
Covellite	-55.98	-78.28	-22.30	CuS
Cr(OH)2	-21.56	-10.74	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.93	-32.84	14.09	CrCl2
CrCl3	-49.45	-34.33	15.11	CrCl3
CrF3	-27.12	-38.46	-11.34	CrF3
Cristobalite	-0.18	-3.53	-3.35	SiO2
Crmetal	-66.23	-35.75	30.48	Cr
CrO3	-27.82	-31.03	-3.21	CrO3
Cryolite	-16.01	-49.85	-33.84	Na3AlF6
Cu(OH)2	-0.72	7.96	8.67	Cu(OH)2
Cu(SbO3)2	-29.03	16.18	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-11.46	-2.21	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.96	-89.84	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.90	-50.70	-45.80	Cu2Se
Cu2SO4	-21.61	-23.56	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.80	-7.70	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.93	-101.52	-42.59	Cu3Sb
Cu3Se2	-26.23	-89.72	-63.49	Cu3Se2
CuCO3	-2.04	-13.54	-11.50	CuCO3
CuCrO4	-17.64	-23.08	-5.44	CuCrO4
CuF	-9.38	-14.29	-4.91	CuF
CuF2	-18.01	-16.90	1.12	CuF2
CuF2:2H2O	-12.35	-16.90	-4.55	CuF2:2H2O
Cumetal	-5.61	-14.37	-8.76	Cu

CuMoO4	-2.82	-15.89	-13.08	CuMoO4
CuOCuSO4	-14.23	-3.93	10.30	CuOCuSO4
Cupricferrite	8.43	14.41	5.99	CuFe2O4
Cuprite	-2.31	-3.72	-1.41	Cu2O
Cuprousferrite	10.29	1.37	-8.92	CuFeO2
CuSe	-5.92	-39.02	-33.10	CuSe
CuSe2	-27.62	-60.99	-33.37	CuSe2
CuSeO3:2H2O	-9.35	-8.84	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.70	-20.14	-2.44	CuSeO4:5H2O
CuSO4	-14.82	-11.88	2.94	CuSO4
Diaspore	0.51	7.38	6.87	AlOOH
Djurleite	-55.26	-89.18	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.53	-17.07	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.02	-17.07	-17.09	CaMg(CO3)2
Epsomite	-4.82	-6.94	-2.13	MgSO4:7H2O
Fe(OH)2	-9.81	3.75	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.95	-0.09	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-13.87	-17.59	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.90	-10.34	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-23.31	-43.94	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-49.33	-53.06	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.01	10.21	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.96	-12.56	0.40	FeAsO4:2H2O
FeCr2O4	-5.80	1.40	7.20	FeCr2O4
FeMoO4	-10.00	-20.10	-10.09	FeMoO4
Ferrihydrite	0.04	3.23	3.19	Fe(OH)3
Ferroselite	-46.60	-65.19	-18.60	FeSe2
FeS(ppt)	-79.53	-82.48	-2.95	FeS
FeSe	-32.23	-43.23	-11.00	FeSe
Fix_pe	-4.22	-4.22	0.00	e-
Fluorite	-1.32	-11.82	-10.50	CaF2
Galena	-66.81	-80.78	-13.97	PbS
Gibbsite	-0.91	7.38	8.29	Al(OH)3
Goethite	2.74	3.23	0.49	FeOOH
Goslarite	-7.91	-9.92	-2.01	ZnSO4:7H2O
Greenalite	-16.61	4.20	20.81	Fe3Si2O5(OH)4
Greenockite	-64.86	-79.22	-14.36	CdS
Greigite	-289.69	-334.72	-45.03	Fe3S4
Gummite	-6.48	1.19	7.67	UO3
Gypsum	-2.20	-6.81	-4.61	CaSO4:2H2O
H-Jarosite	-17.90	-30.00	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.97	-23.85	-12.88	H2MoO4
H2S(g)	-78.22	-86.23	-8.01	H2S
H2Se(g)	-42.02	-46.98	-4.96	H2Se
Halite	-6.88	-5.27	1.60	NaCl
Halloysite	-1.88	7.69	9.57	Al2Si2O5(OH)4
Hausmannite	-3.63	57.40	61.03	Mn3O4
Hematite	7.87	6.46	-1.42	Fe2O3
Hercynite	-4.38	18.51	22.89	FeAl2O4
Hg(CH3)2(g)	-182.60	-256.31	-73.71	Hg(CH3)2
Hg(g)	-8.75	-16.62	-7.87	Hg
Hg(OH)2	-9.71	-13.20	-3.50	Hg(OH)2
Hg2(g)	-18.29	-33.25	-14.96	Hg2
Hg2(OH)2	-13.49	-8.23	5.26	Hg2(OH)2
Hg2CO3	-13.68	-29.73	-16.05	Hg2CO3
Hg2CrO4	-30.57	-39.27	-8.70	Hg2CrO4
Hg2F2	-22.72	-33.09	-10.36	Hg2F2
Hg2S	-82.79	-94.47	-11.68	Hg2S
Hg2SeO3	-20.38	-25.03	-4.66	Hg2SeO3
Hg2SO4	-21.94	-28.07	-6.13	Hg2SO4
Hg3O2CO3	-31.42	-61.11	-29.68	Hg3O2CO3
HgCl(g)	-34.66	-15.17	19.50	HgCl
HgCl2	-14.04	-35.31	-21.26	HgCl2
HgF(g)	-49.22	-16.54	32.68	HgF
HgF2(g)	-50.62	-38.06	12.57	HgF2
Hgmetal(1)	-3.17	-16.62	-13.45	Hg
HgSe	-4.49	-60.18	-55.69	HgSe
HgSeO3	-17.57	-30.00	-12.43	HgSeO3

HgSO4	-23.62	-33.04	-9.42	HgSO4
Huntite	-4.30	-34.27	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.88	-26.65	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.74	-21.51	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-22.52	-27.69	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-10.58	-25.38	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.59	-52.84	-17.24	K2Cr2O7
K2CrO4	-21.29	-21.80	-0.51	K2CrO4
K2MoO4	-17.88	-14.62	3.26	K2MoO4
K2SeO4	-18.13	-18.86	-0.73	K2SeO4
Kaolinite	0.26	7.69	7.43	Al2Si2O5 (OH) 4
Langite	-5.50	11.99	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-8.51	-8.94	-0.43	PbO : PbSO4
Laurionite	-6.22	-5.60	0.62	PbOHCl
Lepidocrocite	1.86	3.23	1.37	FeOOH
Lime	-19.67	13.03	32.70	CaO
Litharge	-7.24	5.45	12.69	PbO
Mackinawite	-78.88	-82.48	-3.60	FeS
Maghemite	0.07	6.46	6.39	Fe2O3
Magnesioferrite	2.49	19.35	16.86	Fe2MgO4
Magnesite	-1.14	-8.60	-7.46	MgCO3
Magnetite	6.81	10.21	3.40	Fe3O4
Malachite	-0.28	-5.58	-5.31	Cu2 (OH) 2CO3
Manganite	-2.04	23.30	25.34	MnOOH
Massicot	-7.44	5.45	12.89	PbO
Matlockite	-9.06	-18.03	-8.97	PbClF
Melanothallite	-20.40	-14.15	6.26	CuCl2
Melanterite	-13.88	-16.09	-2.21	FeSO4 : 7H2O
Metacinnabar	-54.34	-99.44	-45.09	HgS
Mg (OH) 2 (active)	-5.90	12.90	18.79	Mg (OH) 2
Mg (VO3) 2	-19.72	-8.44	11.28	Mg (VO3) 2
Mg2Sb3	-274.18	-199.50	74.68	Mg2Sb3
Mg2V2O7	-21.91	4.45	26.36	Mg2V2O7
MgCr2O4	-5.66	10.54	16.20	MgCr2O4
MgCrO4	-23.52	-18.14	5.38	MgCrO4
MgF2	-3.83	-11.96	-8.13	MgF2
MgMoO4	-9.10	-10.95	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.96	-3.90	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-14.00	-15.20	-1.20	MgSeO4 : 6H2O
Minium	-32.16	41.36	73.52	Pb3O4
Mirabilite	-7.17	-8.29	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-15.44	-10.54	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.90	-63.61	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.94	-86.86	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.68	0.82	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-14.02	-11.31	2.72	MnCl2 : 4H2O
MnS (grn)	-75.61	-75.44	0.17	MnS
MnS (pnk)	-78.78	-75.44	3.34	MnS
MnSb	-95.08	-97.99	-2.91	MnSb
MnSe	-39.68	-36.18	3.50	MnSe
MnSeO3	-7.13	-6.00	1.13	MnSeO3
MnSeO3 : 2H2O	-6.99	-6.00	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-15.25	-17.30	-2.05	MnSeO4 : 5H2O
MnSO4	-11.63	-9.04	2.58	MnSO4
Monteponite	-8.10	7.01	15.10	CdO
Montroydite	-9.56	-13.20	-3.64	HgO
MoO3	-15.85	-23.85	-8.00	MoO3
Morenosite	-9.67	-11.81	-2.14	NiSO4 : 7H2O
MoS2	-151.07	-221.33	-70.26	MoS2
Na-Jarosite	-13.02	-24.22	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.62	-50.51	-9.90	Na2Cr2O7
Na2CrO4	-22.41	-19.48	2.93	Na2CrO4
Na2Mo2O7	-19.55	-36.14	-16.60	Na2Mo2O7
Na2MoO4	-13.78	-12.29	1.49	Na2MoO4
Na2MoO4 : 2H2O	-13.52	-12.29	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-15.54	-5.24	10.30	Na2SeO3 : 5H2O
Na2SeO4	-17.82	-16.54	1.28	Na2SeO4
Na3Sb	-173.06	-78.61	94.45	Na3Sb

Na3VO4	-30.02	6.66	36.68	Na3VO4
Na4V2O7	-35.63	1.77	37.40	Na4V2O7
Nantokite	-6.18	-12.91	-6.73	CuCl
NaSb	-88.32	-65.15	23.17	NaSb
Natron	-8.63	-9.94	-1.31	Na2CO3:10H2O
NaVO3	-8.75	-4.89	3.86	NaVO3
Nesquehonite	-3.93	-8.60	-4.67	MgCO3:3H2O
Ni(OH)2	-4.76	8.03	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.18	-7.48	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.72	12.28	32.00	Ni4(OH)6SO4
NiCO3	-6.60	-13.47	-6.87	NiCO3
NiMoO4	-4.68	-15.82	-11.14	NiMoO4
NiS(alpha)	-72.60	-78.20	-5.60	NiS
NiS(beta)	-67.10	-78.20	-11.10	NiS
NiS(gamma)	-65.40	-78.20	-12.80	NiS
NiSe	-21.25	-38.95	-17.70	NiSe
NiSeO3:2H2O	-11.58	-8.77	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.54	-20.06	-1.52	NiSeO4:6H2O
Nsutite	-7.04	10.46	17.50	MnO2
O2(g)	-33.06	50.03	83.09	O2
Orpiment	-241.44	-302.50	-61.07	As2S3
Otavite	-2.49	-14.49	-12.00	CdCO3
Pb(BO2)2	-11.32	-4.80	6.52	Pb(BO2)2
Pb(OH)2	-2.70	5.45	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-65.73	-74.49	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.95	-0.15	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.29	10.90	26.19	Pb2O(OH)2
Pb2O3	-25.13	35.91	61.04	Pb2O3
Pb2OCO3	-10.04	-10.60	-0.56	Pb2OCO3
Pb2V2O7	-8.54	-10.44	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.02	-15.22	5.80	Pb3(AsO4)2
Pb3(VO4)2	-11.13	-4.99	6.14	Pb3(VO4)2
Pb3O2CO3	-16.17	-5.15	11.02	Pb3O2CO3
Pb3O2SO4	-14.18	-3.49	10.69	Pb3O2SO4
Pb4(OH)6SO4	-19.14	1.96	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.92	1.96	21.88	Pb4O3SO4
PbCrO4	-12.98	-25.58	-12.60	PbCrO4
PbF2	-11.96	-19.40	-7.44	PbF2
Pbmetal	-23.81	-19.56	4.25	Pb
PbMoO4	-2.78	-18.40	-15.62	PbMoO4
PbO:0.3H2O	-7.53	5.45	12.98	PbO:0.33H2O
PbSeO4	-15.80	-22.64	-6.84	PbSeO4
Periclase	-8.69	12.90	21.58	MgO
Phosgenite	-12.89	-32.70	-19.81	PbCl2:PbCO3
Plattnerite	-19.14	30.46	49.60	PbO2
Portlandite	-9.77	13.03	22.80	Ca(OH)2
Pyrite	-125.19	-143.70	-18.51	FeS2
Pyrochroite	-4.40	10.80	15.19	Mn(OH)2
Pyrolusite	-5.57	35.81	41.38	MnO2
Quartz	0.47	-3.53	-4.00	SiO2
Realgar	-100.89	-120.64	-19.75	AsS
Retgersite	-9.77	-11.81	-2.04	NiSO4:6H2O
Rhodochrosite	-0.12	-10.70	-10.58	MnCO3
Rutherfordine	-5.81	-20.31	-14.50	UO2CO3
Sb(OH)3	-13.79	-20.90	-7.11	Sb(OH)3
Sb2O4	-20.19	-16.79	3.40	Sb2O4
Sb2O5	-30.73	-40.40	-9.67	Sb2O5
Sb2Se3	-114.98	-182.74	-67.76	Sb2Se3
Sb4O6(cubic)	-65.35	-83.61	-18.26	Sb4O6
Sb4O6(orth)	-65.71	-83.61	-17.90	Sb4O6
SbCl3	-54.63	-54.06	0.57	SbCl3
SbF3	-47.96	-58.18	-10.23	SbF3
Sbmetal	-46.73	-58.42	-11.69	Sb
SbO2	-4.88	-32.71	-27.82	SbO2
Schoepite	-4.80	1.19	5.99	UO2(OH)2:H2O
Semetal(am)	-14.86	-21.97	-7.11	Se
Semetal(hex)	-14.26	-21.97	-7.71	Se
Senarmontite	-29.44	-41.80	-12.37	Sb2O3

SeO2	-16.92	-16.80	0.12	SeO2
SeO3	-49.14	-28.09	21.04	SeO3
Sepiolite	-0.56	15.20	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.58	15.20	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.50	-17.74	-10.24	FeCO3
SiO2 (am-gel)	-0.82	-3.53	-2.71	SiO2
SiO2 (am-ppt)	-0.79	-3.53	-2.74	SiO2
Smithsonite	-1.57	-11.57	-10.00	ZnCO3
Sphalerite	-64.86	-76.31	-11.45	ZnS
Spinel	-9.19	27.65	36.85	MgAl2O4
Stibnite	-250.04	-300.50	-50.46	Sb2S3
Sulfur	-59.08	-61.22	-2.14	S
Tenorite	0.31	7.96	7.64	CuO
Thenardite	-8.61	-8.28	0.32	Na2SO4
Thermonatrite	-10.58	-9.94	0.64	Na2CO3:H2O
Tyuyamunite	-10.00	-5.92	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.87	6.21	21.08	U3O8
U3Sb4	-579.97	-427.58	152.38	U3Sb4
U4O9	-30.39	-33.41	-3.02	U4O9
UF4	-34.77	-64.31	-29.54	UF4
UF4:2.5H2O	-31.59	-64.31	-32.72	UF4:2.5H2O
UO2 (am)	-15.54	-14.60	0.93	UO2
UO2 (NO3) 2	-47.21	-35.06	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-39.91	-35.06	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-38.45	-35.06	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-37.11	-35.06	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.42	1.19	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.65	-26.90	-2.25	UO2SeO4:4H2O
UO3	-6.51	1.19	7.70	UO3
Uraninite	-9.94	-14.60	-4.67	UO2
USb2	-220.27	-190.69	29.58	USb2
V (OH) 3	-20.68	-13.08	7.59	V (OH) 3
V2O5	-19.98	-21.34	-1.36	V2O5
V3O5	-45.67	-43.84	1.84	V3O5
V4O7	-57.30	-50.11	7.19	V4O7
V6O13	-53.19	-114.05	-60.86	V6O13
Valentinite	-33.32	-41.80	-8.48	Sb2O3
VC12	-66.57	-47.69	18.87	VC12
VC13	-69.67	-46.24	23.43	VC13
VF4	-70.91	-55.98	14.93	VF4
Vmetal	-94.63	-50.60	44.03	V
VO	-40.35	-25.59	14.76	VO
VO (OH) 2	-11.42	-6.27	5.15	VO (OH) 2
VO2Cl	-24.56	-21.72	2.84	VO2Cl
VOC1	-35.29	-24.14	11.15	VOC1
VOC12	-41.14	-28.38	12.76	VOC12
VOSO4	-29.72	-26.11	3.61	VOSO4
Witherite	-5.00	-13.57	-8.57	BaCO3
Wurtzite	-67.36	-76.31	-8.95	ZnS
Zincite	-1.41	9.92	11.33	ZnO
Zincosite	-13.85	-9.92	3.93	ZnSO4
Zn (BO2) 2	-8.62	-0.33	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-29.65	-26.33	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.28	9.92	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.55	9.92	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.83	9.92	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.61	9.92	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.81	9.92	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-7.49	0.01	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-6.39	8.80	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.45	-1.80	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-28.82	-9.91	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-8.54	19.86	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-10.98	27.52	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.23	-12.18	7.05	ZnCl2
ZnCO3:1H2O	-1.31	-11.57	-10.26	ZnCO3:1H2O
ZnF2	-14.39	-14.93	-0.53	ZnF2
Znmetal	-40.88	-15.09	25.79	Zn

ZnMoO4	-3.80	-13.93	-10.13	ZnMoO4
ZnO(active)	-1.26	9.92	11.19	ZnO
ZnS(am)	-67.26	-76.31	-9.05	ZnS
ZnSb	-84.53	-73.51	11.01	ZnSb
ZnSe	-22.66	-37.06	-14.40	ZnSe
ZnSeO4:6H2O	-16.65	-18.17	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.28	-9.92	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 63.

Title Evaporate Stage 3 lake water to produce initial Stage 2 Lake water
REACTION 305
H2O -1
2.17 moles ## Removes x m3 water, but solute mass remains the same
USE solution 311
Save Solution 312
END

TITLE

Evaporate Stage 3 lake water to produce initial Stage 2 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 311. Solution after simulation 62.
Using reaction 305.

Reaction 305.

2.170e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.198e-09	1.151e-09
Al	1.084e-07	1.042e-07
As	6.160e-09	5.920e-09
B	8.780e-06	8.437e-06
Ba	3.288e-09	3.159e-09
C	1.545e-03	1.485e-03
Ca	4.677e-04	4.494e-04
Cd	5.691e-10	5.469e-10
Cl	1.958e-03	1.882e-03

Co	4.125e-09	3.964e-09
Cr	7.033e-10	6.758e-10
Cu	2.119e-07	2.036e-07
F	8.490e-05	8.159e-05
Fe	8.313e-10	7.989e-10
Hg	9.146e-11	8.789e-11
K	2.412e-04	2.318e-04
Mg	3.337e-04	3.207e-04
Mn	2.744e-06	2.637e-06
Mo	7.840e-08	7.534e-08
N	6.442e-07	6.190e-07
Na	3.504e-03	3.367e-03
Ni	6.409e-09	6.159e-09
Pb	3.600e-10	3.459e-10
S	8.711e-04	8.371e-04
Sb	1.206e-09	1.159e-09
Se	7.174e-09	6.894e-09
Si	3.148e-04	3.025e-04
U	2.062e-08	1.981e-08
V	3.927e-10	3.774e-10
Zn	5.902e-07	5.671e-07

-----Description of solution-----

equilibrium	pH	=	8.287	Charge balance
	pe	=	4.221	Adjusted to redox
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.728e-03	
	Mass of water (kg)	=	9.610e-01	
	Total alkalinity (eq/kg)	=	1.569e-03	
	Total CO2 (mol/kg)	=	1.545e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.324e-08	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	4	
	Total H	=	1.066832e+02	
	Total O	=	5.334928e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.128e-06	1.948e-06	-5.672	-5.710	-0.038	(0)
H+	5.635e-09	5.167e-09	-8.249	-8.287	-0.038	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.198e-09					
AgCl	8.130e-10	8.130e-10	-9.090	-9.090	0.000	(0)
Ag+	2.418e-10	2.218e-10	-9.616	-9.654	-0.038	(0)
AgCl2-	1.400e-10	1.272e-10	-9.854	-9.896	-0.042	(0)
AgSO4-	2.753e-12	2.500e-12	-11.560	-11.602	-0.042	(0)
AgCl3-2	2.991e-13	2.035e-13	-12.524	-12.691	-0.167	(0)
AgOH	4.321e-14	4.321e-14	-13.364	-13.364	0.000	(0)
AgF	4.214e-14	4.214e-14	-13.375	-13.375	0.000	(0)
AgNO2	2.514e-14	2.514e-14	-13.600	-13.600	0.000	(0)
AgH2BO3	3.083e-15	3.083e-15	-14.511	-14.511	0.000	(0)
AgNH3+	2.311e-15	2.098e-15	-14.636	-14.678	-0.042	(0)
AgCl4-3	1.775e-15	7.460e-16	-14.751	-15.127	-0.376	(0)
Ag2Se	1.627e-15	1.627e-15	-14.789	-14.789	0.000	(0)
AgSeO3-	3.881e-16	3.524e-16	-15.411	-15.453	-0.042	(0)
Ag (OH) 2-	9.059e-18	8.228e-18	-17.043	-17.085	-0.042	(0)
Ag (NH3) 2+	8.704e-20	7.904e-20	-19.060	-19.102	-0.042	(0)
AgNO3	2.662e-20	2.662e-20	-19.575	-19.575	0.000	(0)
Ag (NO2) 2-	2.326e-20	2.112e-20	-19.633	-19.675	-0.042	(0)
Ag (SeO3) 2-3	1.857e-23	7.803e-24	-22.731	-23.108	-0.376	(0)
Ag2MoO4	1.032e-27	1.032e-27	-26.986	-26.986	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.774	-73.774	0.000	(0)

	AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.990	-82.659	-0.669	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.685	-146.805	-0.119	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.566	-147.608	-0.042	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-147.721	-147.958	-0.236	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.040	-148.269	-0.229	(0)
Al	1.084e-07						
	Al (OH) 4-	1.080e-07	9.914e-08	-6.966	-7.004	-0.037	(0)
	Al (OH) 3	4.042e-10	4.042e-10	-9.393	-9.393	0.000	(0)
	Al (OH) 2+	1.131e-11	1.040e-11	-10.947	-10.983	-0.037	(0)
	AlF2+	8.542e-14	7.853e-14	-13.068	-13.105	-0.037	(0)
	AlF3	7.479e-14	7.479e-14	-13.126	-13.126	0.000	(0)
	AlOH+2	9.403e-15	6.717e-15	-14.027	-14.173	-0.146	(0)
	AlF+2	3.650e-15	2.608e-15	-14.438	-14.584	-0.146	(0)
	AlF4-	3.090e-15	2.835e-15	-14.510	-14.547	-0.037	(0)
	AlSO4+	1.648e-17	1.512e-17	-16.783	-16.820	-0.037	(0)
	Al+3	7.519e-18	3.447e-18	-17.124	-17.463	-0.339	(0)
	Al (SO4) 2-	9.978e-20	9.157e-20	-19.001	-19.038	-0.037	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-55.351	-55.728	-0.376	(0)
As (3)	1.450e-22						
	H3AsO3	1.307e-22	1.307e-22	-21.884	-21.884	0.000	(0)
	H2AsO3-	1.429e-23	1.298e-23	-22.845	-22.887	-0.042	(0)
	HAsO3-2	3.367e-27	2.290e-27	-26.473	-26.640	-0.167	(0)
	H4AsO3+	3.685e-31	3.347e-31	-30.434	-30.475	-0.042	(0)
	AsO3-3	4.066e-32	1.709e-32	-31.391	-31.767	-0.376	(0)
As (5)	6.160e-09						
	HAsO4-2	5.945e-09	4.044e-09	-8.226	-8.393	-0.167	(0)
	H2AsO4-	2.098e-10	1.906e-10	-9.678	-9.720	-0.042	(0)
	AsO4-3	5.889e-12	2.475e-12	-11.230	-11.606	-0.376	(0)
	H3AsO4	1.708e-16	1.711e-16	-15.767	-15.767	0.001	(0)
B	8.780e-06						
	H3BO3	7.792e-06	7.804e-06	-5.108	-5.108	0.001	(0)
	H2BO3-	9.600e-07	8.771e-07	-6.018	-6.057	-0.039	(0)
	CaH2BO3+	1.623e-08	1.483e-08	-7.790	-7.829	-0.039	(0)
	MgH2BO3+	7.153e-09	6.536e-09	-8.145	-8.185	-0.039	(0)
	NaH2BO3	4.449e-09	4.449e-09	-8.352	-8.352	0.000	(0)
	BF (OH) 3-	2.578e-10	2.355e-10	-9.589	-9.628	-0.039	(0)
	H5 (BO3) 2-	6.376e-12	5.826e-12	-11.195	-11.235	-0.039	(0)
	BaH2BO3+	6.797e-14	6.211e-14	-13.168	-13.207	-0.039	(0)
	BF2 (OH) 2-	1.077e-14	9.844e-15	-13.968	-14.007	-0.039	(0)
	H8 (BO3) 3-	4.976e-15	4.546e-15	-14.303	-14.342	-0.039	(0)
	AgH2BO3	3.083e-15	3.083e-15	-14.511	-14.511	0.000	(0)
	BF3OH-	1.639e-21	1.497e-21	-20.786	-20.825	-0.039	(0)
	BF4-	3.152e-27	2.880e-27	-26.501	-26.541	-0.039	(0)
Ba	3.288e-09						
	Ba+2	3.241e-09	2.291e-09	-8.489	-8.640	-0.151	(0)
	BaHCO3+	3.253e-11	2.995e-11	-10.488	-10.524	-0.036	(0)
	BaCO3	1.459e-11	1.459e-11	-10.836	-10.836	0.000	(0)
	BaH2BO3+	6.797e-14	6.211e-14	-13.168	-13.207	-0.039	(0)
	BaOH+	2.122e-14	1.949e-14	-13.673	-13.710	-0.037	(0)
	BaNH3+2	9.850e-18	6.700e-18	-17.007	-17.174	-0.167	(0)
	BaNO3+	1.911e-18	1.735e-18	-17.719	-17.761	-0.042	(0)
C (4)	1.545e-03						
	HCO3-	1.489e-03	1.368e-03	-2.827	-2.864	-0.037	(0)
	CO3-2	1.756e-05	1.242e-05	-4.755	-4.906	-0.151	(0)
	H2CO3	1.590e-05	1.590e-05	-4.799	-4.799	0.000	(0)
	CaHCO3+	8.132e-06	7.485e-06	-5.090	-5.126	-0.036	(0)
	CaCO3	5.780e-06	5.780e-06	-5.238	-5.238	0.000	(0)
	MgHCO3+	3.283e-06	3.009e-06	-5.484	-5.522	-0.038	(0)
	NaHCO3	2.463e-06	2.463e-06	-5.609	-5.609	0.000	(0)
	MgCO3	2.219e-06	2.219e-06	-5.654	-5.654	0.000	(0)
	NaCO3-	8.048e-07	7.399e-07	-6.094	-6.131	-0.037	(0)
	CuCO3	1.768e-07	1.768e-07	-6.752	-6.752	0.000	(0)
	ZnCO3	1.625e-07	1.625e-07	-6.789	-6.789	0.000	(0)
	MnHCO3+	5.063e-08	4.651e-08	-7.296	-7.332	-0.037	(0)
	UO2 (CO3) 3-4	1.368e-08	2.929e-09	-7.864	-8.533	-0.669	(0)
	ZnHCO3+	1.084e-08	9.844e-09	-7.965	-8.007	-0.042	(0)
	Cu (CO3) 2-2	8.686e-09	5.909e-09	-8.061	-8.229	-0.167	(0)
	UO2 (CO3) 2-2	6.919e-09	4.707e-09	-8.160	-8.327	-0.167	(0)

	NiCO3	1.341e-09	1.341e-09	-8.873	-8.873	0.000	(0)
	NiHCO3+	5.378e-10	4.884e-10	-9.269	-9.311	-0.042	(0)
	CoCO3	4.399e-10	4.399e-10	-9.357	-9.357	0.000	(0)
	PbCO3	2.807e-10	2.807e-10	-9.552	-9.552	0.000	(0)
	CoHCO3+	2.457e-10	2.231e-10	-9.610	-9.651	-0.042	(0)
	CuHCO3+	2.299e-10	2.088e-10	-9.638	-9.680	-0.042	(0)
	CdCO3	7.815e-11	7.815e-11	-10.107	-10.107	0.000	(0)
	BaHCO3+	3.253e-11	2.995e-11	-10.488	-10.524	-0.036	(0)
	UO2CO3	1.900e-11	1.900e-11	-10.721	-10.721	0.000	(0)
	Pb (CO3) 2-2	1.477e-11	1.005e-11	-10.830	-10.998	-0.167	(0)
	BaCO3	1.459e-11	1.459e-11	-10.836	-10.836	0.000	(0)
	PbHCO3+	8.419e-12	7.646e-12	-11.075	-11.117	-0.042	(0)
	Cd (CO3) 2-2	1.057e-12	7.193e-13	-11.976	-12.143	-0.167	(0)
	CdHCO3+	9.473e-13	8.603e-13	-12.024	-12.065	-0.042	(0)
	FeHCO3+	2.940e-15	2.706e-15	-14.532	-14.568	-0.036	(0)
	HgCO3	4.065e-17	4.065e-17	-16.391	-16.391	0.000	(0)
	Hg (CO3) 2-2	2.346e-18	1.596e-18	-17.630	-17.797	-0.167	(0)
	HgHCO3+	4.307e-21	3.911e-21	-20.366	-20.408	-0.042	(0)
Ca	4.677e-04						
	Ca+2	4.154e-04	2.937e-04	-3.382	-3.532	-0.151	(0)
	CaSO4	3.803e-05	3.803e-05	-4.420	-4.420	0.000	(0)
	CaHCO3+	8.132e-06	7.485e-06	-5.090	-5.126	-0.036	(0)
	CaCO3	5.780e-06	5.780e-06	-5.238	-5.238	0.000	(0)
	CaF+	2.640e-07	2.425e-07	-6.578	-6.615	-0.037	(0)
	CaH2BO3+	1.623e-08	1.483e-08	-7.790	-7.829	-0.039	(0)
	CaOH+	1.241e-08	1.142e-08	-7.906	-7.942	-0.036	(0)
	CaNH3+2	2.519e-12	1.714e-12	-11.599	-11.766	-0.167	(0)
	CaNO3+	1.546e-13	1.404e-13	-12.811	-12.853	-0.042	(0)
	Ca (NH3) 2+2	4.648e-21	3.162e-21	-20.333	-20.500	-0.167	(0)
Cd	5.691e-10						
	Cd+2	3.905e-10	2.761e-10	-9.408	-9.559	-0.151	(0)
	CdCO3	7.815e-11	7.815e-11	-10.107	-10.107	0.000	(0)
	CdCl+	5.214e-11	4.735e-11	-10.283	-10.325	-0.042	(0)
	CdSO4	3.658e-11	3.658e-11	-10.437	-10.437	0.000	(0)
	CdOH+	4.706e-12	4.274e-12	-11.327	-11.369	-0.042	(0)
	CdOHC1	3.785e-12	3.785e-12	-11.422	-11.422	0.000	(0)
	Cd (CO3) 2-2	1.057e-12	7.193e-13	-11.976	-12.143	-0.167	(0)
	CdHCO3+	9.473e-13	8.603e-13	-12.024	-12.065	-0.042	(0)
	Cd (SO4) 2-2	4.099e-13	2.789e-13	-12.387	-12.555	-0.167	(0)
	CdF+	3.645e-13	3.311e-13	-12.438	-12.480	-0.042	(0)
	CdCl2	3.544e-13	3.544e-13	-12.450	-12.450	0.000	(0)
	Cd (OH) 2	5.254e-14	5.254e-14	-13.280	-13.280	0.000	(0)
	CdCl3-	4.422e-16	4.016e-16	-15.354	-15.396	-0.042	(0)
	CdF2	4.997e-17	4.997e-17	-16.301	-16.301	0.000	(0)
	Cd (OH) 3-	6.887e-18	6.254e-18	-17.162	-17.204	-0.042	(0)
	CdSeO4	1.626e-19	1.626e-19	-18.789	-18.789	0.000	(0)
	CdNO3+	1.453e-19	1.320e-19	-18.838	-18.880	-0.042	(0)
	Cd2OH+3	1.407e-20	5.915e-21	-19.852	-20.228	-0.376	(0)
	Cd (SeO3) 2-2	2.046e-21	1.392e-21	-20.689	-20.856	-0.167	(0)
	Cd (OH) 4-2	2.932e-24	1.995e-24	-23.533	-23.700	-0.167	(0)
	Cd (NO3) 2	9.994e-30	9.994e-30	-29.000	-29.000	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.443	-79.485	-0.042	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.215	-150.215	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.207	-226.249	-0.042	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.820	-301.987	-0.167	(0)
Cl	1.958e-03						
	Cl-	1.958e-03	1.796e-03	-2.708	-2.746	-0.038	(0)
	MnCl+	4.191e-09	3.850e-09	-8.378	-8.415	-0.037	(0)
	ZnOHC1	2.617e-09	2.617e-09	-8.582	-8.582	0.000	(0)
	ZnCl+	1.119e-09	1.026e-09	-8.951	-8.989	-0.038	(0)
	AgCl	8.130e-10	8.130e-10	-9.090	-9.090	0.000	(0)
	CuCl	1.611e-10	1.611e-10	-9.793	-9.793	0.000	(0)
	AgCl2-	1.400e-10	1.272e-10	-9.854	-9.896	-0.042	(0)
	CuCl2-	6.591e-11	6.043e-11	-10.181	-10.219	-0.038	(0)
	CdCl+	5.214e-11	4.735e-11	-10.283	-10.325	-0.042	(0)
	NiCl+	1.464e-11	1.330e-11	-10.834	-10.876	-0.042	(0)
	CoCl+	1.434e-11	1.302e-11	-10.844	-10.885	-0.042	(0)
	MnCl2	9.766e-12	9.766e-12	-11.010	-11.010	0.000	(0)

CuCl+	7.507e-12	6.882e-12	-11.125	-11.162	-0.038	(0)
CdOHC1	3.785e-12	3.785e-12	-11.422	-11.422	0.000	(0)
ZnCl2	2.920e-12	2.920e-12	-11.535	-11.535	0.000	(0)
PbCl+	5.275e-13	4.791e-13	-12.278	-12.320	-0.042	(0)
CdCl2	3.544e-13	3.544e-13	-12.450	-12.450	0.000	(0)
AgCl3-2	2.991e-13	2.035e-13	-12.524	-12.691	-0.167	(0)
CuCl3-2	3.258e-14	2.320e-14	-13.487	-13.635	-0.147	(0)
HgClOH	1.690e-14	1.690e-14	-13.772	-13.772	0.000	(0)
MnCl3-	5.257e-15	4.830e-15	-14.279	-14.316	-0.037	(0)
ZnCl3-	4.543e-15	4.165e-15	-14.343	-14.380	-0.038	(0)
CuCl2	4.285e-15	4.285e-15	-14.368	-14.368	0.000	(0)
PbCl2	3.843e-15	3.843e-15	-14.415	-14.415	0.000	(0)
AgCl4-3	1.775e-15	7.460e-16	-14.751	-15.127	-0.376	(0)
HgCl2	8.821e-16	8.821e-16	-15.055	-15.055	0.000	(0)
CdCl3-	4.422e-16	4.016e-16	-15.354	-15.396	-0.042	(0)
NiCl2	1.202e-16	1.202e-16	-15.920	-15.920	0.000	(0)
HgCl3-	1.744e-17	1.584e-17	-16.758	-16.800	-0.042	(0)
ZnCl4-2	5.251e-18	3.739e-18	-17.280	-17.427	-0.147	(0)
PbCl3-	3.025e-18	2.747e-18	-17.519	-17.561	-0.042	(0)
UO2Cl+	1.233e-18	1.119e-18	-17.909	-17.951	-0.042	(0)
HgCl4-2	1.664e-19	1.132e-19	-18.779	-18.946	-0.167	(0)
CrCl+2	1.203e-19	8.182e-20	-18.920	-19.087	-0.167	(0)
HgCl+	1.079e-19	9.801e-20	-18.967	-19.009	-0.042	(0)
CuCl3-	7.833e-20	7.180e-20	-19.106	-19.144	-0.038	(0)
CrOHC12	5.441e-21	5.441e-21	-20.264	-20.264	0.000	(0)
PbCl4-2	3.314e-21	2.254e-21	-20.480	-20.647	-0.167	(0)
FeCl+2	1.847e-23	1.315e-23	-22.734	-22.881	-0.147	(0)
CrCl2+	1.535e-23	1.394e-23	-22.814	-22.856	-0.042	(0)
CuCl4-2	9.074e-25	6.462e-25	-24.042	-24.190	-0.147	(0)
FeCl2+	1.148e-25	1.055e-25	-24.940	-24.977	-0.037	(0)
VOCl+	8.214e-26	7.460e-26	-25.085	-25.127	-0.042	(0)
CrO3Cl-	3.881e-27	3.525e-27	-26.411	-26.453	-0.042	(0)
FeCl3	1.894e-29	1.894e-29	-28.723	-28.723	0.000	(0)
CoCl+2	7.450e-38	5.068e-38	-37.128	-37.295	-0.167	(0)
UCl+3	0.000e+00	0.000e+00	-48.457	-48.833	-0.376	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.845	-53.012	-0.167	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.934	-55.101	-0.167	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.894	-68.062	-0.167	(0)
Co (2)	4.125e-09					
Co+2	3.081e-09	2.096e-09	-8.511	-8.679	-0.167	(0)
CoCO3	4.399e-10	4.399e-10	-9.357	-9.357	0.000	(0)
CoHCO3+	2.457e-10	2.231e-10	-9.610	-9.651	-0.042	(0)
CoSO4	2.363e-10	2.363e-10	-9.626	-9.626	0.000	(0)
CoOH+	8.972e-11	8.148e-11	-10.047	-10.089	-0.042	(0)
CoCl+	1.434e-11	1.302e-11	-10.844	-10.885	-0.042	(0)
Co (OH) 2	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
CoF+	5.521e-12	5.014e-12	-11.258	-11.300	-0.042	(0)
CoNO2+	8.824e-15	8.013e-15	-14.054	-14.096	-0.042	(0)
Co (NH3) +2	1.717e-15	1.168e-15	-14.765	-14.933	-0.167	(0)
Co (OH) 3-	5.399e-16	4.903e-16	-15.268	-15.310	-0.042	(0)
CoOOH-	1.355e-16	1.230e-16	-15.868	-15.910	-0.042	(0)
CoSeO4	3.322e-18	3.322e-18	-17.479	-17.479	0.000	(0)
CoNO3+	5.527e-19	5.020e-19	-18.257	-18.299	-0.042	(0)
Co2OH+3	2.037e-20	8.560e-21	-19.691	-20.068	-0.376	(0)
Co (NH3) 2+2	3.394e-22	2.309e-22	-21.469	-21.637	-0.167	(0)
Co (OH) 4-2	2.226e-22	1.514e-22	-21.653	-21.820	-0.167	(0)
Co (NO3) 2	1.543e-28	1.543e-28	-27.812	-27.812	0.000	(0)
Co (NH3) 3+2	1.980e-29	1.347e-29	-28.703	-28.871	-0.167	(0)
Co4 (OH) 4+4	4.108e-32	8.796e-33	-31.386	-32.056	-0.669	(0)
Co (NH3) 4+2	4.816e-37	3.276e-37	-36.317	-36.485	-0.167	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.431	-44.599	-0.167	(0)
Co (3)	2.019e-30					
CoOH+2	2.019e-30	1.373e-30	-29.695	-29.862	-0.167	(0)
Co+3	3.026e-37	1.387e-37	-36.519	-36.858	-0.339	(0)
CoCl+2	7.450e-38	5.068e-38	-37.128	-37.295	-0.167	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.845	-53.012	-0.167	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.597	-63.638	-0.042	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.659	-66.826	-0.167	(0)

Co(NH3)6Cl+2	0.000e+00	0.000e+00	-67.894	-68.062	-0.167	(0)
Cr(2)	7.438e-28					
Cr+2	7.438e-28	5.060e-28	-27.129	-27.296	-0.167	(0)
Cr(3)	7.032e-10					
Cr(OH)2+	3.918e-10	3.558e-10	-9.407	-9.449	-0.042	(0)
Cr(OH)3	2.604e-10	2.604e-10	-9.584	-9.584	0.000	(0)
CrO2-	2.636e-11	2.394e-11	-10.579	-10.621	-0.042	(0)
Cr(OH)4-	2.224e-11	2.020e-11	-10.653	-10.695	-0.042	(0)
Cr(OH)+2	2.206e-12	1.501e-12	-11.656	-11.824	-0.167	(0)
CrOHSO4	2.013e-13	2.013e-13	-12.696	-12.696	0.000	(0)
CrF+2	6.205e-16	4.221e-16	-15.207	-15.375	-0.167	(0)
Cr+3	8.378e-17	3.521e-17	-16.077	-16.453	-0.376	(0)
CrSO4+	5.116e-17	4.646e-17	-16.291	-16.333	-0.042	(0)
CrCl+2	1.203e-19	8.182e-20	-18.920	-19.087	-0.167	(0)
CrOHC12	5.441e-21	5.441e-21	-20.264	-20.264	0.000	(0)
Cr2(OH)2SO4+2	4.014e-23	2.730e-23	-22.396	-22.564	-0.167	(0)
CrCl2+	1.535e-23	1.394e-23	-22.814	-22.856	-0.042	(0)
Cr2(OH)2(SO4)2	9.165e-25	9.165e-25	-24.038	-24.038	0.000	(0)
CrNO3+2	3.419e-28	2.326e-28	-27.466	-27.633	-0.167	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-43.294	-43.461	-0.167	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-53.081	-53.457	-0.376	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-54.934	-55.101	-0.167	(0)
Cr(6)	5.242e-15					
CrO4-2	5.109e-15	3.612e-15	-14.292	-14.442	-0.151	(0)
HCrO4-	6.650e-17	6.040e-17	-16.177	-16.219	-0.042	(0)
NaCrO4-	6.325e-17	5.744e-17	-16.199	-16.241	-0.042	(0)
KCrO4-	3.256e-18	2.957e-18	-17.487	-17.529	-0.042	(0)
H2CrO4	2.530e-25	2.530e-25	-24.597	-24.597	0.000	(0)
CrO3SO4-2	7.897e-26	5.372e-26	-25.103	-25.270	-0.167	(0)
CrO3Cl-	3.881e-27	3.525e-27	-26.411	-26.453	-0.042	(0)
Cr2O7-2	1.860e-31	1.265e-31	-30.731	-30.898	-0.167	(0)
Cu(1)	3.055e-10					
CuCl	1.611e-10	1.611e-10	-9.793	-9.793	0.000	(0)
Cu+	7.846e-11	7.125e-11	-10.105	-10.147	-0.042	(0)
CuCl2-	6.591e-11	6.043e-11	-10.181	-10.219	-0.038	(0)
CuCl3-2	3.258e-14	2.320e-14	-13.487	-13.635	-0.147	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-145.819	-146.052	-0.232	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.557	-146.782	-0.225	(0)
Cu(2)	2.116e-07					
CuCO3	1.768e-07	1.768e-07	-6.752	-6.752	0.000	(0)
CuOH+	1.625e-08	1.490e-08	-7.789	-7.827	-0.038	(0)
Cu(CO3)2-2	8.686e-09	5.909e-09	-8.061	-8.229	-0.167	(0)
Cu(OH)2	5.793e-09	5.793e-09	-8.237	-8.237	0.000	(0)
Cu+2	3.420e-09	2.418e-09	-8.466	-8.616	-0.151	(0)
CuSO4	3.131e-10	3.131e-10	-9.504	-9.504	0.000	(0)
CuHCO3+	2.299e-10	2.088e-10	-9.638	-9.680	-0.042	(0)
Cu(OH)3-	2.549e-11	2.315e-11	-10.594	-10.635	-0.042	(0)
CuF+	1.271e-11	1.154e-11	-10.896	-10.938	-0.042	(0)
Cu2(OH)2+2	8.198e-12	5.577e-12	-11.086	-11.254	-0.167	(0)
CuCl+	7.507e-12	6.882e-12	-11.125	-11.162	-0.038	(0)
CuNH3+2	1.686e-13	1.147e-13	-12.773	-12.941	-0.167	(0)
CuNO2+	1.513e-13	1.374e-13	-12.820	-12.862	-0.042	(0)
CuCl2	4.285e-15	4.285e-15	-14.368	-14.368	0.000	(0)
Cu(OH)4-2	5.219e-16	3.550e-16	-15.282	-15.450	-0.167	(0)
CuNO3+	1.272e-18	1.156e-18	-17.895	-17.937	-0.042	(0)
Cu(NO2)2	7.627e-19	7.627e-19	-18.118	-18.118	0.000	(0)
CuCl3-	7.833e-20	7.180e-20	-19.106	-19.144	-0.038	(0)
CuCl4-2	9.074e-25	6.462e-25	-24.042	-24.190	-0.147	(0)
Cu(NO3)2	2.198e-29	2.198e-29	-28.658	-28.658	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-216.478	-216.520	-0.042	(0)
F	8.490e-05					
F-	8.249e-05	7.565e-05	-4.084	-4.121	-0.038	(0)
MgF+	1.988e-06	1.824e-06	-5.702	-5.739	-0.037	(0)
CaF+	2.640e-07	2.425e-07	-6.578	-6.615	-0.037	(0)
NaF	1.527e-07	1.527e-07	-6.816	-6.816	0.000	(0)
MnF+	5.584e-09	5.129e-09	-8.253	-8.290	-0.037	(0)
HF	5.781e-10	5.781e-10	-9.238	-9.238	0.000	(0)
ZnF+	3.781e-10	3.433e-10	-9.422	-9.464	-0.042	(0)

BF(OH) 3-	2.578e-10	2.355e-10	-9.589	-9.628	-0.039	(0)
CuF+	1.271e-11	1.154e-11	-10.896	-10.938	-0.042	(0)
NiF+	6.057e-12	5.500e-12	-11.218	-11.260	-0.042	(0)
CoF+	5.521e-12	5.014e-12	-11.258	-11.300	-0.042	(0)
CdF+	3.645e-13	3.311e-13	-12.438	-12.480	-0.042	(0)
HF2-	1.816e-13	1.663e-13	-12.741	-12.779	-0.038	(0)
AlF2+	8.542e-14	7.853e-14	-13.068	-13.105	-0.037	(0)
AlF3	7.479e-14	7.479e-14	-13.126	-13.126	0.000	(0)
PbF+	4.414e-14	4.008e-14	-13.355	-13.397	-0.042	(0)
AgF	4.214e-14	4.214e-14	-13.375	-13.375	0.000	(0)
BF2(OH) 2-	1.077e-14	9.844e-15	-13.968	-14.007	-0.039	(0)
UO2F+	4.419e-15	4.014e-15	-14.355	-14.396	-0.042	(0)
AlF+2	3.650e-15	2.608e-15	-14.438	-14.584	-0.146	(0)
AlF4-	3.090e-15	2.835e-15	-14.510	-14.547	-0.037	(0)
UO2F2	8.756e-16	8.756e-16	-15.058	-15.058	0.000	(0)
CrF+2	6.205e-16	4.221e-16	-15.207	-15.375	-0.167	(0)
PbF2	5.967e-17	5.967e-17	-16.224	-16.224	0.000	(0)
CdF2	4.997e-17	4.997e-17	-16.301	-16.301	0.000	(0)
UO2F3-	1.832e-17	1.664e-17	-16.737	-16.779	-0.042	(0)
H2F2	8.955e-19	8.955e-19	-18.048	-18.048	0.000	(0)
FeF2+	4.433e-20	4.072e-20	-19.353	-19.390	-0.037	(0)
FeF+2	2.825e-20	2.012e-20	-19.549	-19.696	-0.147	(0)
VO2F	1.529e-20	1.529e-20	-19.816	-19.816	0.000	(0)
UO2F4-2	1.470e-20	9.997e-21	-19.833	-20.000	-0.167	(0)
PbF3-	9.427e-21	8.561e-21	-20.026	-20.067	-0.042	(0)
FeF3	4.346e-21	4.346e-21	-20.362	-20.362	0.000	(0)
BF3OH-	1.639e-21	1.497e-21	-20.786	-20.825	-0.039	(0)
VO2F2-	4.624e-22	4.200e-22	-21.335	-21.377	-0.042	(0)
VOF+	7.398e-24	6.719e-24	-23.131	-23.173	-0.042	(0)
VO2F3-2	5.825e-25	3.963e-25	-24.235	-24.402	-0.167	(0)
PbF4-2	4.557e-25	3.100e-25	-24.341	-24.509	-0.167	(0)
VOF2	1.906e-25	1.906e-25	-24.720	-24.720	0.000	(0)
HgF+	8.447e-27	7.671e-27	-26.073	-26.115	-0.042	(0)
BF4-	3.152e-27	2.880e-27	-26.501	-26.541	-0.039	(0)
Sb(OH) 2F	7.963e-28	7.963e-28	-27.099	-27.099	0.000	(0)
SbOF	7.831e-28	7.831e-28	-27.106	-27.106	0.000	(0)
VOF3-	5.632e-28	5.115e-28	-27.249	-27.291	-0.042	(0)
VO2F4-3	3.510e-29	1.475e-29	-28.455	-28.831	-0.376	(0)
VOF4-2	2.296e-31	1.562e-31	-30.639	-30.806	-0.167	(0)
SiF6-2	8.691e-32	6.189e-32	-31.061	-31.208	-0.147	(0)
UF3+	3.095e-39	2.810e-39	-38.509	-38.551	-0.042	(0)
UF2+2	3.446e-40	2.344e-40	-39.463	-39.630	-0.167	(0)
UF4	0.000e+00	0.000e+00	-40.632	-40.632	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.232	-42.609	-0.376	(0)
UF5-	0.000e+00	0.000e+00	-43.114	-43.156	-0.042	(0)
UF6-2	0.000e+00	0.000e+00	-44.630	-44.797	-0.167	(0)
Fe (2)	2.689e-13					
Fe+2	2.309e-13	1.571e-13	-12.637	-12.804	-0.167	(0)
FeSO4	2.179e-14	2.179e-14	-13.662	-13.662	0.000	(0)
FeOH+	1.326e-14	1.218e-14	-13.877	-13.914	-0.037	(0)
FeHCO3+	2.940e-15	2.706e-15	-14.532	-14.568	-0.036	(0)
Fe(OH) 2	1.885e-17	1.885e-17	-16.725	-16.725	0.000	(0)
Fe(OH) 3-	1.265e-17	1.162e-17	-16.898	-16.935	-0.037	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.722	-159.722	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.577	-235.619	-0.042	(0)
Fe (3)	8.310e-10					
Fe(OH) 3	4.840e-10	4.840e-10	-9.315	-9.315	0.000	(0)
Fe(OH) 2+	2.516e-10	2.313e-10	-9.599	-9.636	-0.037	(0)
Fe(OH) 4-	9.551e-11	8.780e-11	-10.020	-10.056	-0.037	(0)
FeOH+2	4.285e-16	3.051e-16	-15.368	-15.516	-0.147	(0)
FeF2+	4.433e-20	4.072e-20	-19.353	-19.390	-0.037	(0)
FeF+2	2.825e-20	2.012e-20	-19.549	-19.696	-0.147	(0)
FeF3	4.346e-21	4.346e-21	-20.362	-20.362	0.000	(0)
FeSO4+	1.674e-21	1.538e-21	-20.776	-20.813	-0.037	(0)
Fe+3	5.290e-22	2.425e-22	-21.277	-21.615	-0.339	(0)
Fe(SO4) 2-	2.046e-23	1.858e-23	-22.689	-22.731	-0.042	(0)
FeCl+2	1.847e-23	1.315e-23	-22.734	-22.881	-0.147	(0)
FeCl2+	1.148e-25	1.055e-25	-24.940	-24.977	-0.037	(0)

	FeHSeO3+2	3.024e-27	2.057e-27	-26.519	-26.687	-0.167	(0)
	FeCl3	1.894e-29	1.894e-29	-28.723	-28.723	0.000	(0)
	Fe2 (OH) 2+4	1.440e-29	3.082e-30	-28.842	-29.511	-0.669	(0)
	FeNO3+2	5.388e-31	3.665e-31	-30.269	-30.436	-0.167	(0)
	Fe3 (OH) 4+5	1.145e-37	1.030e-38	-36.941	-37.987	-1.046	(0)
H (0)	1.366e-28						
	H2	6.829e-29	6.840e-29	-28.166	-28.165	0.001	(0)
Hg (0)	9.138e-11						
	Hg	9.138e-11	9.138e-11	-10.039	-10.039	0.000	(0)
Hg (1)	4.990e-25						
	Hg2+2	2.495e-25	1.697e-25	-24.603	-24.770	-0.167	(0)
Hg (2)	8.328e-14						
	Hg (OH) 2	6.543e-14	6.553e-14	-13.184	-13.184	0.001	(0)
	HgClOH	1.690e-14	1.690e-14	-13.772	-13.772	0.000	(0)
	HgCl2	8.821e-16	8.821e-16	-15.055	-15.055	0.000	(0)
	HgCO3	4.065e-17	4.065e-17	-16.391	-16.391	0.000	(0)
	HgCl3-	1.744e-17	1.584e-17	-16.758	-16.800	-0.042	(0)
	Hg (CO3) 2-2	2.346e-18	1.596e-18	-17.630	-17.797	-0.167	(0)
	HgOH+	2.337e-19	2.122e-19	-18.631	-18.673	-0.042	(0)
	HgCl4-2	1.664e-19	1.132e-19	-18.779	-18.946	-0.167	(0)
	HgCl+	1.079e-19	9.801e-20	-18.967	-19.009	-0.042	(0)
	Hg (OH) 3-	1.770e-20	1.607e-20	-19.752	-19.794	-0.042	(0)
	HgHCO3+	4.307e-21	3.911e-21	-20.366	-20.408	-0.042	(0)
	Hg (NH3) 2+2	5.450e-23	3.707e-23	-22.264	-22.431	-0.167	(0)
	HgNH3+2	1.176e-23	7.999e-24	-22.930	-23.097	-0.167	(0)
	Hg+2	4.022e-24	2.736e-24	-23.396	-23.563	-0.167	(0)
	HgSO4	4.048e-25	4.048e-25	-24.393	-24.393	0.000	(0)
	HgF+	8.447e-27	7.671e-27	-26.073	-26.115	-0.042	(0)
	Hg (NH3) 3+2	1.005e-30	6.840e-31	-29.998	-30.165	-0.167	(0)
	HgNO3+	1.681e-34	1.526e-34	-33.774	-33.816	-0.042	(0)
	Hg (NH3) 4+2	3.701e-38	2.518e-38	-37.432	-37.599	-0.167	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-44.018	-44.018	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.175	-139.216	-0.042	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.470	-139.638	-0.167	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.109	-141.109	0.000	(0)
K	2.412e-04						
	K+	2.403e-04	2.203e-04	-3.619	-3.657	-0.038	(0)
	KSO4-	9.588e-07	8.815e-07	-6.018	-6.055	-0.037	(0)
	KCrO4-	3.256e-18	2.957e-18	-17.487	-17.529	-0.042	(0)
Mg	3.337e-04						
	Mg+2	3.039e-04	2.149e-04	-3.517	-3.668	-0.151	(0)
	MgSO4	2.210e-05	2.210e-05	-4.656	-4.656	0.000	(0)
	MgHCO3+	3.283e-06	3.009e-06	-5.484	-5.522	-0.038	(0)
	MgCO3	2.219e-06	2.219e-06	-5.654	-5.654	0.000	(0)
	MgF+	1.988e-06	1.824e-06	-5.702	-5.739	-0.037	(0)
	MgOH+	1.809e-07	1.667e-07	-6.742	-6.778	-0.036	(0)
	MgH2BO3+	7.153e-09	6.536e-09	-8.145	-8.185	-0.039	(0)
Mn (2)	2.744e-06						
	Mn+2	2.504e-06	1.703e-06	-5.601	-5.769	-0.167	(0)
	MnSO4	1.712e-07	1.712e-07	-6.767	-6.767	0.000	(0)
	MnHCO3+	5.063e-08	4.651e-08	-7.296	-7.332	-0.037	(0)
	MnOH+	9.075e-09	8.336e-09	-8.042	-8.079	-0.037	(0)
	MnF+	5.584e-09	5.129e-09	-8.253	-8.290	-0.037	(0)
	MnCl+	4.191e-09	3.850e-09	-8.378	-8.415	-0.037	(0)
	MnCl2	9.766e-12	9.766e-12	-11.010	-11.010	0.000	(0)
	MnCl3-	5.257e-15	4.830e-15	-14.279	-14.316	-0.037	(0)
	MnSeO4	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
	MnNO3+	4.492e-16	4.079e-16	-15.348	-15.389	-0.042	(0)
	Mn (OH) 3-	2.129e-16	1.956e-16	-15.672	-15.709	-0.037	(0)
	Mn (OH) 4-2	1.728e-21	1.230e-21	-20.763	-20.910	-0.147	(0)
	Mn (NO3) 2	1.548e-25	1.548e-25	-24.810	-24.810	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.545	-41.545	0.000	(0)
Mn (3)	2.759e-27						
	Mn+3	2.759e-27	1.265e-27	-26.559	-26.898	-0.339	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-40.867	-41.014	-0.147	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-46.127	-46.165	-0.039	(0)

Mo	7.840e-08					
MoO4-2	7.839e-08	5.543e-08	-7.106	-7.256	-0.151	(0)
HMoO4-	6.275e-12	5.699e-12	-11.202	-11.244	-0.042	(0)
H2MoO4	2.157e-16	2.157e-16	-15.666	-15.666	0.000	(0)
Ag2MoO4	1.032e-27	1.032e-27	-26.986	-26.986	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.351	-55.728	-0.376	(0)
Mo7O24-6	0.000e+00	0.000e+00	-62.591	-64.097	-1.506	(0)
HMo7O24-5	0.000e+00	0.000e+00	-64.952	-65.997	-1.046	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-68.833	-69.502	-0.669	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-74.166	-74.543	-0.376	(0)
N (-3)	5.088e-08					
NH4+	4.596e-08	4.200e-08	-7.338	-7.377	-0.039	(0)
NH3	4.634e-09	4.634e-09	-8.334	-8.334	0.000	(0)
NH4SO4-	2.768e-10	2.543e-10	-9.558	-9.595	-0.037	(0)
CaNH3+2	2.519e-12	1.714e-12	-11.599	-11.766	-0.167	(0)
CuNH3+2	1.686e-13	1.147e-13	-12.773	-12.941	-0.167	(0)
NiNH3+2	1.059e-14	7.204e-15	-13.975	-14.142	-0.167	(0)
AgNH3+	2.311e-15	2.098e-15	-14.636	-14.678	-0.042	(0)
Co (NH3) +2	1.717e-15	1.168e-15	-14.765	-14.933	-0.167	(0)
BaNH3+2	9.850e-18	6.700e-18	-17.007	-17.174	-0.167	(0)
Ag (NH3) 2+	8.704e-20	7.904e-20	-19.060	-19.102	-0.042	(0)
Ni (NH3) 2+2	7.094e-21	4.826e-21	-20.149	-20.316	-0.167	(0)
Ca (NH3) 2+2	4.648e-21	3.162e-21	-20.333	-20.500	-0.167	(0)
Co (NH3) 2+2	3.394e-22	2.309e-22	-21.469	-21.637	-0.167	(0)
Hg (NH3) 2+2	5.450e-23	3.707e-23	-22.264	-22.431	-0.167	(0)
HgNH3+2	1.176e-23	7.999e-24	-22.930	-23.097	-0.167	(0)
Co (NH3) 3+2	1.980e-29	1.347e-29	-28.703	-28.871	-0.167	(0)
Hg (NH3) 3+2	1.005e-30	6.840e-31	-29.998	-30.165	-0.167	(0)
Co (NH3) 4+2	4.816e-37	3.276e-37	-36.317	-36.485	-0.167	(0)
Hg (NH3) 4+2	3.701e-38	2.518e-38	-37.432	-37.599	-0.167	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.294	-43.461	-0.167	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.431	-44.599	-0.167	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.845	-53.012	-0.167	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.081	-53.457	-0.376	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.934	-55.101	-0.167	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.597	-63.638	-0.042	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.659	-66.826	-0.167	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.894	-68.062	-0.167	(0)
N (3)	5.931e-07					
NO2-	5.931e-07	5.425e-07	-6.227	-6.266	-0.039	(0)
CuNO2+	1.513e-13	1.374e-13	-12.820	-12.862	-0.042	(0)
AgNO2	2.514e-14	2.514e-14	-13.600	-13.600	0.000	(0)
CoNO2+	8.824e-15	8.013e-15	-14.054	-14.096	-0.042	(0)
Cu (NO2) 2	7.627e-19	7.627e-19	-18.118	-18.118	0.000	(0)
Ag (NO2) 2-	2.326e-20	2.112e-20	-19.633	-19.675	-0.042	(0)
N (5)	1.649e-10					
NO3-	1.648e-10	1.511e-10	-9.783	-9.821	-0.038	(0)
CaNO3+	1.546e-13	1.404e-13	-12.811	-12.853	-0.042	(0)
MnNO3+	4.492e-16	4.079e-16	-15.348	-15.389	-0.042	(0)
ZnNO3+	9.508e-17	8.635e-17	-16.022	-16.064	-0.042	(0)
BaNO3+	1.911e-18	1.735e-18	-17.719	-17.761	-0.042	(0)
CuNO3+	1.272e-18	1.156e-18	-17.895	-17.937	-0.042	(0)
NiNO3+	1.210e-18	1.099e-18	-17.917	-17.959	-0.042	(0)
CoNO3+	5.527e-19	5.020e-19	-18.257	-18.299	-0.042	(0)
CdNO3+	1.453e-19	1.320e-19	-18.838	-18.880	-0.042	(0)
AgNO3	2.662e-20	2.662e-20	-19.575	-19.575	0.000	(0)
PbNO3+	1.851e-20	1.681e-20	-19.733	-19.774	-0.042	(0)
Mn (NO3) 2	1.548e-25	1.548e-25	-24.810	-24.810	0.000	(0)
UO2NO3+	1.276e-25	1.159e-25	-24.894	-24.936	-0.042	(0)
Zn (NO3) 2	2.603e-27	2.603e-27	-26.584	-26.584	0.000	(0)
CrNO3+2	3.419e-28	2.326e-28	-27.466	-27.633	-0.167	(0)
Co (NO3) 2	1.543e-28	1.543e-28	-27.812	-27.812	0.000	(0)
Cu (NO3) 2	2.198e-29	2.198e-29	-28.658	-28.658	0.000	(0)
Cd (NO3) 2	9.994e-30	9.994e-30	-29.000	-29.000	0.000	(0)
VO2NO3	8.810e-30	8.810e-30	-29.055	-29.055	0.000	(0)
Pb (NO3) 2	4.313e-30	4.313e-30	-29.365	-29.365	0.000	(0)
FeNO3+2	5.388e-31	3.665e-31	-30.269	-30.436	-0.167	(0)
HgNO3+	1.681e-34	1.526e-34	-33.774	-33.816	-0.042	(0)

Hg (NO3) 2	0.000e+00	0.000e+00	-44.018	-44.018	0.000	(0)
Na	3.504e-03					
Na+	3.490e-03	3.200e-03	-2.457	-2.495	-0.038	(0)
NaSO4-	1.056e-05	9.712e-06	-4.976	-5.013	-0.037	(0)
NaHCO3	2.463e-06	2.463e-06	-5.609	-5.609	0.000	(0)
NaCO3-	8.048e-07	7.399e-07	-6.094	-6.131	-0.037	(0)
NaF	1.527e-07	1.527e-07	-6.816	-6.816	0.000	(0)
NaH2BO3	4.449e-09	4.449e-09	-8.352	-8.352	0.000	(0)
NaCrO4-	6.325e-17	5.744e-17	-16.199	-16.241	-0.042	(0)
Ni	6.409e-09					
Ni+2	4.094e-09	2.895e-09	-8.388	-8.538	-0.151	(0)
NiCO3	1.341e-09	1.341e-09	-8.873	-8.873	0.000	(0)
NiHCO3+	5.378e-10	4.884e-10	-9.269	-9.311	-0.042	(0)
NiSO4	3.264e-10	3.264e-10	-9.486	-9.486	0.000	(0)
NiOH+	7.819e-11	7.101e-11	-10.107	-10.149	-0.042	(0)
NiCl+	1.464e-11	1.330e-11	-10.834	-10.876	-0.042	(0)
Ni (OH) 2	1.099e-11	1.099e-11	-10.959	-10.959	0.000	(0)
NiF+	6.057e-12	5.500e-12	-11.218	-11.260	-0.042	(0)
Ni (OH) 3-	2.358e-14	2.141e-14	-13.627	-13.669	-0.042	(0)
NiNH3+2	1.059e-14	7.204e-15	-13.975	-14.142	-0.167	(0)
Ni (SO4) 2-2	8.979e-15	6.108e-15	-14.047	-14.214	-0.167	(0)
NiCl2	1.202e-16	1.202e-16	-15.920	-15.920	0.000	(0)
NiSeO4	4.282e-18	4.282e-18	-17.368	-17.368	0.000	(0)
NiNO3+	1.210e-18	1.099e-18	-17.917	-17.959	-0.042	(0)
Ni (NH3) 2+2	7.094e-21	4.826e-21	-20.149	-20.316	-0.167	(0)
O (0)	2.163e-36					
O2	1.081e-36	1.083e-36	-35.966	-35.965	0.001	(0)
Pb	3.600e-10					
PbCO3	2.807e-10	2.807e-10	-9.552	-9.552	0.000	(0)
PbOH+	4.052e-11	3.680e-11	-10.392	-10.434	-0.042	(0)
Pb (CO3) 2-2	1.477e-11	1.005e-11	-10.830	-10.998	-0.167	(0)
Pb+2	1.063e-11	7.520e-12	-10.973	-11.124	-0.151	(0)
PbHCO3+	8.419e-12	7.646e-12	-11.075	-11.117	-0.042	(0)
Pb (OH) 2	2.268e-12	2.268e-12	-11.644	-11.644	0.000	(0)
PbSO4	2.081e-12	2.081e-12	-11.682	-11.682	0.000	(0)
PbCl+	5.275e-13	4.791e-13	-12.278	-12.320	-0.042	(0)
PbF+	4.414e-14	4.008e-14	-13.355	-13.397	-0.042	(0)
Pb (SO4) 2-2	1.042e-14	7.087e-15	-13.982	-14.150	-0.167	(0)
Pb (OH) 3-	4.865e-15	4.418e-15	-14.313	-14.355	-0.042	(0)
PbCl2	3.843e-15	3.843e-15	-14.415	-14.415	0.000	(0)
PbF2	5.967e-17	5.967e-17	-16.224	-16.224	0.000	(0)
Pb (OH) 4-2	3.099e-18	2.108e-18	-17.509	-17.676	-0.167	(0)
PbCl3-	3.025e-18	2.747e-18	-17.519	-17.561	-0.042	(0)
PbNO3+	1.851e-20	1.681e-20	-19.733	-19.774	-0.042	(0)
Pb2OH+3	1.044e-20	4.386e-21	-19.981	-20.358	-0.376	(0)
PbF3-	9.427e-21	8.561e-21	-20.026	-20.067	-0.042	(0)
PbCl4-2	3.314e-21	2.254e-21	-20.480	-20.647	-0.167	(0)
Pb3 (OH) 4+2	1.134e-24	7.715e-25	-23.945	-24.113	-0.167	(0)
PbF4-2	4.557e-25	3.100e-25	-24.341	-24.509	-0.167	(0)
Pb (NO3) 2	4.313e-30	4.313e-30	-29.365	-29.365	0.000	(0)
Pb4 (OH) 4+4	2.152e-31	4.608e-32	-30.667	-31.336	-0.669	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.722	-151.722	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.314	-228.356	-0.042	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.774	-73.774	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.892	-77.934	-0.042	(0)
S5-2	0.000e+00	0.000e+00	-78.845	-79.012	-0.167	(0)
H2S	0.000e+00	0.000e+00	-79.201	-79.201	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.361	-79.528	-0.167	(0)
S4-2	0.000e+00	0.000e+00	-79.441	-79.608	-0.167	(0)
CdHS+	0.000e+00	0.000e+00	-79.443	-79.485	-0.042	(0)
S3-2	0.000e+00	0.000e+00	-80.247	-80.414	-0.167	(0)
S2-2	0.000e+00	0.000e+00	-81.263	-81.430	-0.167	(0)
S-2	0.000e+00	0.000e+00	-86.800	-86.947	-0.147	(0)
HgHS2-	0.000e+00	0.000e+00	-139.175	-139.216	-0.042	(0)
HgS2-2	0.000e+00	0.000e+00	-139.470	-139.638	-0.167	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.109	-141.109	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.819	-146.052	-0.232	(0)

CuS4S5-3	0.000e+00	0.000e+00	-146.557	-146.782	-0.225	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.685	-146.805	-0.119	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.373	-147.415	-0.042	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.566	-147.608	-0.042	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.721	-147.958	-0.236	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.040	-148.269	-0.229	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.691	-149.691	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.215	-150.215	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.722	-151.722	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.722	-159.722	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.478	-216.520	-0.042	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.304	-224.345	-0.042	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.871	-226.039	-0.167	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.207	-226.249	-0.042	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.314	-228.356	-0.042	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.577	-235.619	-0.042	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.820	-301.987	-0.167	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.572	-303.740	-0.167	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.523	-320.690	-0.167	(0)
S (6)	8.711e-04					
SO4-2	7.992e-04	5.651e-04	-3.097	-3.248	-0.151	(0)
CaSO4	3.803e-05	3.803e-05	-4.420	-4.420	0.000	(0)
MgSO4	2.210e-05	2.210e-05	-4.656	-4.656	0.000	(0)
NaSO4-	1.056e-05	9.712e-06	-4.976	-5.013	-0.037	(0)
KSO4-	9.588e-07	8.815e-07	-6.018	-6.055	-0.037	(0)
MnSO4	1.712e-07	1.712e-07	-6.767	-6.767	0.000	(0)
ZnSO4	2.812e-08	2.812e-08	-7.551	-7.551	0.000	(0)
NiSO4	3.264e-10	3.264e-10	-9.486	-9.486	0.000	(0)
CuSO4	3.131e-10	3.131e-10	-9.504	-9.504	0.000	(0)
HSO4-	3.109e-10	2.853e-10	-9.507	-9.545	-0.037	(0)
NH4SO4-	2.768e-10	2.543e-10	-9.558	-9.595	-0.037	(0)
CoSO4	2.363e-10	2.363e-10	-9.626	-9.626	0.000	(0)
Zn (SO4) 2-2	2.035e-10	1.384e-10	-9.691	-9.859	-0.167	(0)
CdSO4	3.658e-11	3.658e-11	-10.437	-10.437	0.000	(0)
AgSO4-	2.753e-12	2.500e-12	-11.560	-11.602	-0.042	(0)
PbSO4	2.081e-12	2.081e-12	-11.682	-11.682	0.000	(0)
Cd (SO4) 2-2	4.099e-13	2.789e-13	-12.387	-12.555	-0.167	(0)
CrOHSO4	2.013e-13	2.013e-13	-12.696	-12.696	0.000	(0)
FeSO4	2.179e-14	2.179e-14	-13.662	-13.662	0.000	(0)
Pb (SO4) 2-2	1.042e-14	7.087e-15	-13.982	-14.150	-0.167	(0)
Ni (SO4) 2-2	8.979e-15	6.108e-15	-14.047	-14.214	-0.167	(0)
UO2SO4	3.288e-16	3.288e-16	-15.483	-15.483	0.000	(0)
CrSO4+	5.116e-17	4.646e-17	-16.291	-16.333	-0.042	(0)
AlSO4+	1.648e-17	1.512e-17	-16.783	-16.820	-0.037	(0)
UO2 (SO4) 2-2	3.600e-18	2.449e-18	-17.444	-17.611	-0.167	(0)
Al (SO4) 2-	9.978e-20	9.157e-20	-19.001	-19.038	-0.037	(0)
VO2SO4-	1.712e-21	1.555e-21	-20.766	-20.808	-0.042	(0)
FeSO4+	1.674e-21	1.538e-21	-20.776	-20.813	-0.037	(0)
Cr2 (OH) 2SO4+2	4.014e-23	2.730e-23	-22.396	-22.564	-0.167	(0)
Fe (SO4) 2-	2.046e-23	1.858e-23	-22.689	-22.731	-0.042	(0)
VOSO4	2.305e-24	2.305e-24	-23.637	-23.637	0.000	(0)
Cr2 (OH) 2 (SO4) 2	9.165e-25	9.165e-25	-24.038	-24.038	0.000	(0)
HgSO4	4.048e-25	4.048e-25	-24.393	-24.393	0.000	(0)
CrO3SO4-2	7.897e-26	5.372e-26	-25.103	-25.270	-0.167	(0)
VSO4+	3.470e-39	3.151e-39	-38.460	-38.502	-0.042	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.783	-43.783	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.268	-44.435	-0.167	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.597	-63.638	-0.042	(0)
Sb (3)	2.578e-21					
Sb (OH) 3	1.304e-21	1.304e-21	-20.885	-20.885	0.000	(0)
HSbO2	1.273e-21	1.273e-21	-20.895	-20.895	0.000	(0)
SbO2-	4.394e-25	3.990e-25	-24.357	-24.399	-0.042	(0)
Sb (OH) 4-	2.517e-25	2.286e-25	-24.599	-24.641	-0.042	(0)
Sb (OH) 2F	7.963e-28	7.963e-28	-27.099	-27.099	0.000	(0)
SbOF	7.831e-28	7.831e-28	-27.106	-27.106	0.000	(0)
Sb (OH) 2+	1.802e-28	1.636e-28	-27.744	-27.786	-0.042	(0)
SbO+	6.213e-29	5.642e-29	-28.207	-28.249	-0.042	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.523	-320.690	-0.167	(0)

Sb (5)	1.206e-09					
SbO3-	1.204e-09	1.094e-09	-8.919	-8.961	-0.042	(0)
Sb (OH) 6-	1.394e-12	1.279e-12	-11.856	-11.893	-0.038	(0)
SbO2+	9.223e-27	8.376e-27	-26.035	-26.077	-0.042	(0)
Se (-2)	1.627e-15					
Ag2Se	1.627e-15	1.627e-15	-14.789	-14.789	0.000	(0)
HSe-	2.310e-39	2.098e-39	-38.636	-38.678	-0.042	(0)
MnSe	0.000e+00	0.000e+00	-41.545	-41.545	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.075	-43.075	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.224	-45.391	-0.167	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.990	-82.659	-0.669	(0)
Se (4)	7.169e-09					
SeO3-2	3.635e-09	2.473e-09	-8.439	-8.607	-0.167	(0)
HSeO3-	3.534e-09	3.210e-09	-8.452	-8.494	-0.042	(0)
H2SeO3	7.074e-15	7.074e-15	-14.150	-14.150	0.000	(0)
AgSeO3-	3.881e-16	3.524e-16	-15.411	-15.453	-0.042	(0)
Cd (SeO3) 2-2	2.046e-21	1.392e-21	-20.689	-20.856	-0.167	(0)
Ag (SeO3) 2-3	1.857e-23	7.803e-24	-22.731	-23.108	-0.376	(0)
FeHSeO3+2	3.024e-27	2.057e-27	-26.519	-26.687	-0.167	(0)
Se (6)	4.475e-12					
SeO4-2	4.473e-12	3.163e-12	-11.349	-11.500	-0.151	(0)
MnSeO4	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
ZnSeO4	1.114e-16	1.114e-16	-15.953	-15.953	0.000	(0)
NiSeO4	4.282e-18	4.282e-18	-17.368	-17.368	0.000	(0)
CoSeO4	3.322e-18	3.322e-18	-17.479	-17.479	0.000	(0)
HSeO4-	9.019e-19	8.191e-19	-18.045	-18.087	-0.042	(0)
CdSeO4	1.626e-19	1.626e-19	-18.789	-18.789	0.000	(0)
Zn (SeO4) 2-2	5.253e-28	3.573e-28	-27.280	-27.447	-0.167	(0)
Si	3.148e-04					
H4SiO4	3.055e-04	3.060e-04	-3.515	-3.514	0.001	(0)
H3SiO4-	9.337e-06	8.559e-06	-5.030	-5.068	-0.038	(0)
H2SiO4-2	1.463e-10	1.045e-10	-9.835	-9.981	-0.146	(0)
UO2H3SiO4+	3.076e-13	2.793e-13	-12.512	-12.554	-0.042	(0)
SiF6-2	8.691e-32	6.189e-32	-31.061	-31.208	-0.147	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.428	-60.804	-0.376	(0)
U (4)	3.696e-20					
U (OH) 5-	3.696e-20	3.356e-20	-19.432	-19.474	-0.042	(0)
U (OH) 4	7.264e-24	7.264e-24	-23.139	-23.139	0.000	(0)
U (OH) 3+	1.511e-28	1.372e-28	-27.821	-27.863	-0.042	(0)
U (OH) 2+2	4.821e-34	3.279e-34	-33.317	-33.484	-0.167	(0)
UF3+	3.095e-39	2.810e-39	-38.509	-38.551	-0.042	(0)
UF2+2	3.446e-40	2.344e-40	-39.463	-39.630	-0.167	(0)
UOH+3	1.899e-40	0.000e+00	-39.721	-40.098	-0.376	(0)
UF4	0.000e+00	0.000e+00	-40.632	-40.632	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.232	-42.609	-0.376	(0)
UF5-	0.000e+00	0.000e+00	-43.114	-43.156	-0.042	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.783	-43.783	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.268	-44.435	-0.167	(0)
UF6-2	0.000e+00	0.000e+00	-44.630	-44.797	-0.167	(0)
U+4	0.000e+00	0.000e+00	-47.118	-47.788	-0.669	(0)
UCl+3	0.000e+00	0.000e+00	-48.457	-48.833	-0.376	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-176.192	-179.580	-3.388	(0)
U (5)	1.552e-17					
UO2+	1.552e-17	1.409e-17	-16.809	-16.851	-0.042	(0)
U (6)	2.062e-08					
UO2 (CO3) 3-4	1.368e-08	2.929e-09	-7.864	-8.533	-0.669	(0)
UO2 (CO3) 2-2	6.919e-09	4.707e-09	-8.160	-8.327	-0.167	(0)
UO2CO3	1.900e-11	1.900e-11	-10.721	-10.721	0.000	(0)
UO2H3SiO4+	3.076e-13	2.793e-13	-12.512	-12.554	-0.042	(0)
UO2OH+	1.038e-13	9.428e-14	-12.984	-13.026	-0.042	(0)
UO2F+	4.419e-15	4.014e-15	-14.355	-14.396	-0.042	(0)
UO2F2	8.756e-16	8.756e-16	-15.058	-15.058	0.000	(0)
UO2+2	5.436e-16	3.844e-16	-15.265	-15.415	-0.151	(0)
UO2SO4	3.288e-16	3.288e-16	-15.483	-15.483	0.000	(0)
UO2F3-	1.832e-17	1.664e-17	-16.737	-16.779	-0.042	(0)
UO2 (SO4) 2-2	3.600e-18	2.449e-18	-17.444	-17.611	-0.167	(0)
UO2Cl+	1.233e-18	1.119e-18	-17.909	-17.951	-0.042	(0)

	(UO2) 2 (OH) 2+2	2.169e-20	1.475e-20	-19.664	-19.831	-0.167	(0)
	UO2F4-2	1.470e-20	9.997e-21	-19.833	-20.000	-0.167	(0)
	(UO2) 3 (OH) 5+	4.411e-21	4.006e-21	-20.355	-20.397	-0.042	(0)
	UO2NO3+	1.276e-25	1.159e-25	-24.894	-24.936	-0.042	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-44.617	-44.659	-0.042	(0)
	V+2	0.000e+00	0.000e+00	-46.291	-46.458	-0.167	(0)
V (3)	7.049e-17						
	V (OH) 3	7.049e-17	7.049e-17	-16.152	-16.152	0.000	(0)
	V (OH) 2+	2.591e-28	2.354e-28	-27.586	-27.628	-0.042	(0)
	VOH+2	1.696e-32	1.154e-32	-31.771	-31.938	-0.167	(0)
	V+3	2.811e-38	1.181e-38	-37.551	-37.928	-0.376	(0)
	VSO4+	3.470e-39	3.151e-39	-38.460	-38.502	-0.042	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-60.738	-61.114	-0.376	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-62.407	-63.076	-0.669	(0)
V (4)	6.370e-21						
	V (OH) 3+	6.338e-21	5.756e-21	-20.198	-20.240	-0.042	(0)
	VO+2	2.177e-23	1.481e-23	-22.662	-22.830	-0.167	(0)
	VOF+	7.398e-24	6.719e-24	-23.131	-23.173	-0.042	(0)
	VOSO4	2.305e-24	2.305e-24	-23.637	-23.637	0.000	(0)
	VOF2	1.906e-25	1.906e-25	-24.720	-24.720	0.000	(0)
	VOC1+	8.214e-26	7.460e-26	-25.085	-25.127	-0.042	(0)
	VOF3-	5.632e-28	5.115e-28	-27.249	-27.291	-0.042	(0)
	VOF4-2	2.296e-31	1.562e-31	-30.639	-30.806	-0.167	(0)
	H2V2O4+2	2.442e-36	1.661e-36	-35.612	-35.780	-0.167	(0)
V (5)	3.927e-10						
	H2VO4-	2.382e-10	2.163e-10	-9.623	-9.665	-0.042	(0)
	HVO4-2	1.546e-10	1.051e-10	-9.811	-9.978	-0.167	(0)
	H3VO4	1.118e-14	1.118e-14	-13.952	-13.952	0.000	(0)
	VO4-3	2.427e-16	1.020e-16	-15.615	-15.991	-0.376	(0)
	HV2O7-3	1.834e-17	7.707e-18	-16.737	-17.113	-0.376	(0)
	H3V2O7-	1.719e-17	1.561e-17	-16.765	-16.807	-0.042	(0)
	V2O7-4	1.875e-19	4.015e-20	-18.727	-19.396	-0.669	(0)
	VO2+	1.257e-19	1.153e-19	-18.901	-18.938	-0.038	(0)
	VO2F	1.529e-20	1.529e-20	-19.816	-19.816	0.000	(0)
	VO2SO4-	1.712e-21	1.555e-21	-20.766	-20.808	-0.042	(0)
	VO2F2-	4.624e-22	4.200e-22	-21.335	-21.377	-0.042	(0)
	V3O9-3	2.522e-23	1.060e-23	-22.598	-22.975	-0.376	(0)
	VO2F3-2	5.825e-25	3.963e-25	-24.235	-24.402	-0.167	(0)
	VO2F4-3	3.510e-29	1.475e-29	-28.455	-28.831	-0.376	(0)
	VO2NO3	8.810e-30	8.810e-30	-29.055	-29.055	0.000	(0)
	V4O12-4	4.464e-30	9.559e-31	-29.350	-30.020	-0.669	(0)
	V10O28-6	0.000e+00	0.000e+00	-79.384	-80.890	-1.506	(0)
	HV10O28-5	0.000e+00	0.000e+00	-79.944	-80.990	-1.046	(0)
	H2V10O28-4	0.000e+00	0.000e+00	-83.400	-84.069	-0.669	(0)
Zn	5.902e-07						
	Zn+2	3.217e-07	2.275e-07	-6.493	-6.643	-0.151	(0)
	ZnCO3	1.625e-07	1.625e-07	-6.789	-6.789	0.000	(0)
	ZnOH+	4.880e-08	4.432e-08	-7.312	-7.353	-0.042	(0)
	ZnSO4	2.812e-08	2.812e-08	-7.551	-7.551	0.000	(0)
	Zn (OH) 2	1.369e-08	1.369e-08	-7.864	-7.864	0.000	(0)
	ZnHCO3+	1.084e-08	9.844e-09	-7.965	-8.007	-0.042	(0)
	ZnOHC1	2.617e-09	2.617e-09	-8.582	-8.582	0.000	(0)
	ZnCl+	1.119e-09	1.026e-09	-8.951	-8.989	-0.038	(0)
	ZnF+	3.781e-10	3.433e-10	-9.422	-9.464	-0.042	(0)
	Zn (SO4) 2-2	2.035e-10	1.384e-10	-9.691	-9.859	-0.167	(0)
	Zn (OH) 3-	1.472e-10	1.337e-10	-9.832	-9.874	-0.042	(0)
	ZnCl2	2.920e-12	2.920e-12	-11.535	-11.535	0.000	(0)
	Zn (OH) 4-2	1.524e-14	1.037e-14	-13.817	-13.984	-0.167	(0)
	ZnCl3-	4.543e-15	4.165e-15	-14.343	-14.380	-0.038	(0)
	ZnSeO4	1.114e-16	1.114e-16	-15.953	-15.953	0.000	(0)
	ZnNO3+	9.508e-17	8.635e-17	-16.022	-16.064	-0.042	(0)
	ZnCl4-2	5.251e-18	3.739e-18	-17.280	-17.427	-0.147	(0)
	Zn (NO3) 2	2.603e-27	2.603e-27	-26.584	-26.584	0.000	(0)
	Zn (SeO4) 2-2	5.253e-28	3.573e-28	-27.280	-27.447	-0.167	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-147.373	-147.415	-0.042	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-149.691	-149.691	0.000	(0)
	Zn (HS) 3-	0.000e+00	0.000e+00	-224.304	-224.345	-0.042	(0)

ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.871	-226.039	-0.167	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.572	-303.740	-0.167	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-60.98	-54.70	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-45.06	-40.55	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-52.28	-40.55	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-78.79	-60.86	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-59.67	-39.64	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.60	-29.20	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-26.70	-26.25	0.45	(NH4) 2SeO4	
Acanthite	-52.74	-88.96	-36.22	Ag2S	
Ag2CO3	-13.12	-24.21	-11.09	Ag2CO3	
Ag2CrO4	-22.16	-33.75	-11.59	Ag2CrO4	
Ag2HVO4	-14.87	-13.39	1.48	Ag2HVO4	
Ag2MoO4	-15.01	-26.56	-11.55	Ag2MoO4	
Ag2O	-15.31	-2.73	12.57	Ag2O	
Ag2Se	-1.00	-49.70	-48.70	Ag2Se	
Ag2SeO3	-12.37	-19.52	-7.15	Ag2SeO3	
Ag2SeO4	-21.90	-30.81	-8.91	Ag2SeO4	
Ag2SO4	-17.74	-22.56	-4.82	Ag2SO4	
Ag3AsO3	-28.14	-25.99	2.16	Ag3AsO3	
Ag3AsO4	-17.08	-19.87	-2.79	Ag3AsO4	
Ag3H2VO5	-19.93	-14.75	5.18	Ag3H2VO5	
AgF:4H2O	-14.82	-13.78	1.05	AgF:4H2O	
Agmetal	-0.37	-13.87	-13.51	Ag	
AgVO3	-12.79	-12.02	0.77	AgVO3	
Al (OH) 3 (am)	-3.40	7.40	10.80	Al (OH) 3	
Al2 (MoO4) 3	-59.06	-56.69	2.37	Al2 (MoO4) 3	
Al2O3	-4.86	14.80	19.65	Al2O3	
Al4 (OH) 10SO4	-12.93	9.77	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-13.17	-8.37	4.80	AlAsO4:2H2O	
AlOHSO4	-9.19	-12.42	-3.23	AlOHSO4	
AlSb	-154.16	-88.53	65.62	AlSb	
Alunite	-11.42	-12.82	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-6.58	-14.37	-7.79	PbSO4	
Anhydrite	-2.42	-6.78	-4.36	CaSO4	
Anilite	-55.14	-87.02	-31.88	Cu0.25Cu1.5S	
Antlerite	-4.74	4.05	8.79	Cu3 (OH) 4SO4	
Aragonite	-0.14	-8.44	-8.30	CaCO3	
Arsenolite	-84.77	-87.53	-2.76	As4O6	
Artinite	-5.27	4.33	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-38.24	-31.53	6.71	As2O5	
Atacamite	-2.51	4.88	7.39	Cu2 (OH) 3Cl	
Azurite	-2.18	-19.09	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-16.46	7.93	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-21.31	-5.44	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	1.18	-7.73	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-30.44	2.50	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-13.41	-23.08	-9.67	BaCrO4	
BaF2	-11.06	-16.88	-5.82	BaF2	
BaMoO4	-8.94	-15.90	-6.96	BaMoO4	
Barite	-1.91	-11.89	-9.98	BaSO4	
BaS	-94.47	-78.29	16.18	BaS	
BaSeO3	-10.68	-8.85	1.83	BaSeO3	
BaSeO4	-12.68	-20.14	-7.46	BaSeO4	
Bianchite	-8.13	-9.89	-1.76	ZnSO4:6H2O	
Birnessite	-7.62	10.47	18.09	MnO2	
Bixbyite	-3.43	-4.08	-0.64	Mn2O3	
BlaubleiI	-55.27	-79.43	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-55.66	-82.94	-27.28	Cu0.6Cu0.8S	
Boehmite	-1.18	7.40	8.58	AlOOH	
Breithauptite	-56.86	-75.39	-18.52	NiSb	
Brochantite	-3.22	12.01	15.22	Cu4 (OH) 6SO4	
Brucite	-3.94	12.91	16.84	Mg (OH) 2	

Bunsenite	-4.41	8.04	12.45	NiO
Ca (VO3) 2	-13.92	-8.26	5.66	Ca (VO3) 2
Ca2V2O7	-12.72	4.78	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.77	4.78	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.71	7.59	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-21.14	17.82	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-22.04	17.82	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-295.71	-152.73	142.97	Ca3Sb2
CaCrO4	-15.71	-17.97	-2.27	CaCrO4
Calcite	0.04	-8.44	-8.48	CaCO3
Calomel	-12.35	-30.26	-17.91	Hg2Cl2
CaMoO4	-2.84	-10.79	-7.95	CaMoO4
Carnotite	-5.09	-4.86	0.23	KUO2VO4
CaSeO3:2H2O	-6.55	-3.74	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.01	-15.03	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.04	-3.20	9.84	Cd (BO2) 2
Cd (OH) 2	-6.63	7.01	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.72	7.01	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-25.31	-18.60	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.34	1.22	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-20.16	8.24	28.40	Cd4 (OH) 6SO4
CdCl2	-14.39	-15.05	-0.66	CdCl2
CdCl2:1H2O	-13.36	-15.05	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.14	-15.05	-1.91	CdCl2:2.5H2O
CdF2	-16.59	-17.80	-1.21	CdF2
Cdmetal (alpha)	-31.52	-18.00	13.51	Cd
Cdmetal (gamma)	-31.62	-18.00	13.62	Cd
CdMoO4	-2.67	-16.82	-14.15	CdMoO4
CdOHCl	-7.56	-4.02	3.54	CdOHCl
CdSb	-76.06	-76.41	-0.35	CdSb
CdSe	-19.75	-39.95	-20.20	CdSe
CdSeO4:2H2O	-19.21	-21.06	-1.85	CdSeO4:2H2O
CdSO4	-12.63	-12.81	-0.17	CdSO4
CdSO4:1H2O	-11.08	-12.81	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.93	-12.81	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.65	-12.40	-9.75	AgCl
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4 (g)	-80.49	-121.54	-41.05	CH4
Chalcanthite	-9.22	-11.86	-2.64	CuSO4:5H2O
Chalcedony	0.04	-3.51	-3.55	SiO2
Chalcocite	-55.02	-89.94	-34.92	Cu2S
Chalcopyrite	-125.45	-160.72	-35.27	CuFeS2
Chrysotile	-0.51	31.69	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-53.71	-99.40	-45.69	HgS
Claudetite	-84.47	-87.53	-3.06	As4O6
Clausthalite	-14.42	-41.52	-27.10	PbSe
Co (BO2) 2	-29.39	-2.32	27.07	Co (BO2) 2
Co (OH) 2	-5.20	7.89	13.09	Co (OH) 2
Co (OH) 3	-9.69	-12.00	-2.31	Co (OH) 3
CO2 (g)	-3.33	-21.48	-18.15	CO2
Co3 (AsO4) 2	-20.88	-7.85	13.03	Co3 (AsO4) 2
Co3O4	-5.61	-16.10	-10.50	Co3O4
CoCl2	-22.44	-14.17	8.27	CoCl2
CoCl2:6H2O	-16.71	-14.17	2.54	CoCl2:6H2O
CoCO3	-3.60	-13.58	-9.98	CoCO3
CoF2	-15.32	-16.92	-1.60	CoF2
CoF3	-47.76	-49.22	-1.46	CoF3
CoFe2O4	17.91	14.38	-3.53	CoFe2O4
CoMoO4	-8.17	-15.93	-7.76	CoMoO4
CoO	-5.69	7.89	13.59	CoO
CoS (alpha)	-70.89	-78.33	-7.44	CoS
CoS (beta)	-67.26	-78.33	-11.07	CoS
CoSe	-22.87	-39.07	-16.20	CoSe
CoSeO3	-10.21	-8.89	1.32	CoSeO3
CoSeO4:6H2O	-18.65	-20.18	-1.53	CoSeO4:6H2O
CoSO4	-14.73	-11.93	2.80	CoSO4
CoSO4:6H2O	-9.45	-11.93	-2.47	CoSO4:6H2O
Cotunnite	-11.84	-16.62	-4.78	PbCl2

Covellite	-55.96	-78.26	-22.30	CuS
Cr(OH)2	-21.54	-10.72	10.82	Cr(OH)2
Cr(OH)3	-2.50	-1.16	1.34	Cr(OH)3
Cr(OH)3(am)	-0.41	-1.16	-0.75	Cr(OH)3
Cr2O3	0.03	-2.32	-2.36	Cr2O3
CrCl2	-46.88	-32.79	14.09	CrCl2
CrCl3	-49.37	-34.26	15.11	CrCl3
CrF3	-27.05	-38.39	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-66.22	-35.74	30.48	Cr
CrO3	-27.81	-31.02	-3.21	CrO3
Cryolite	-15.83	-49.67	-33.84	Na3AlF6
Cu(OH)2	-0.72	7.96	8.67	Cu(OH)2
Cu(SbO3)2	-28.99	16.22	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-11.44	-2.19	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.95	-89.83	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.89	-50.69	-45.80	Cu2Se
Cu2SO4	-21.59	-23.54	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.76	-7.66	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.92	-101.51	-42.59	Cu3Sb
Cu3Se2	-26.20	-89.69	-63.49	Cu3Se2
CuCO3	-2.02	-13.52	-11.50	CuCO3
CuCrO4	-17.62	-23.06	-5.44	CuCrO4
CuF	-9.36	-14.27	-4.91	CuF
CuF2	-17.97	-16.86	1.12	CuF2
CuF2:2H2O	-12.31	-16.86	-4.55	CuF2:2H2O
Cumetal	-5.61	-14.37	-8.76	Cu
CuMoO4	-2.80	-15.87	-13.08	CuMoO4
CuOCuSO4	-14.21	-3.91	10.30	CuOCuSO4
Cupricferrite	8.46	14.45	5.99	CuFe2O4
Cuprite	-2.31	-3.72	-1.41	Cu2O
Cuprousferrite	10.30	1.38	-8.92	CuFeO2
CuSe	-5.91	-39.01	-33.10	CuSe
CuSe2	-27.59	-60.96	-33.37	CuSe2
CuSeO3:2H2O	-9.34	-8.82	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.68	-20.12	-2.44	CuSeO4:5H2O
CuSO4	-14.80	-11.86	2.94	CuSO4
Diaspore	0.52	7.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.47	-17.01	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.08	-17.01	-17.09	CaMg(CO3)2
Epsomite	-4.79	-6.92	-2.13	MgSO4:7H2O
Fe(OH)2	-9.79	3.77	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.98	-0.06	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-13.81	-17.53	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.84	-10.29	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-23.22	-43.85	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-49.24	-52.97	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.96	10.26	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.92	-12.52	0.40	FeAsO4:2H2O
FeCr2O4	-5.75	1.45	7.20	FeCr2O4
FeMoO4	-9.97	-20.06	-10.09	FeMoO4
Ferrihydrite	0.05	3.24	3.19	Fe(OH)3
Ferroselite	-46.55	-65.15	-18.60	FeSe2
FeS(ppt)	-79.50	-82.45	-2.95	FeS
FeSe	-32.20	-43.20	-11.00	FeSe
Fix_pe	-4.22	-4.22	0.00	e-
Fluorite	-1.27	-11.77	-10.50	CaF2
Galena	-66.80	-80.77	-13.97	PbS
Gibbsite	-0.89	7.40	8.29	Al(OH)3
Goethite	2.75	3.24	0.49	FeOOH
Goslarite	-7.88	-9.89	-2.01	ZnSO4:7H2O
Greenalite	-16.53	4.28	20.81	Fe3Si2O5(OH)4
Greenockite	-64.85	-79.21	-14.36	CdS
Greigite	-289.59	-334.62	-45.03	Fe3S4
Gummite	-6.51	1.16	7.67	UO3
Gypsum	-2.17	-6.78	-4.61	CaSO4:2H2O
H-Jarosite	-17.81	-29.91	-12.10	(H3O)Fe3(SO4)2(OH)6

H2MoO4	-10.95	-23.83	-12.88	H2MoO4
H2S (g)	-78.21	-86.22	-8.01	H2S
H2Se (g)	-42.00	-46.96	-4.96	H2Se
Halite	-6.84	-5.24	1.60	NaCl
Halloysite	-1.81	7.77	9.57	Al2Si2O5 (OH) 4
Hausmannite	-3.60	57.43	61.03	Mn3O4
Hematite	7.91	6.49	-1.42	Fe2O3
Hercynite	-4.33	18.56	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.55	-256.26	-73.71	Hg (CH3) 2
Hg (g)	-8.73	-16.61	-7.87	Hg
Hg (OH) 2	-9.69	-13.18	-3.50	Hg (OH) 2
Hg2 (g)	-18.26	-33.21	-14.96	Hg2
Hg2 (OH) 2	-13.46	-8.20	5.26	Hg2 (OH) 2
Hg2CO3	-13.63	-29.68	-16.05	Hg2CO3
Hg2CrO4	-30.51	-39.21	-8.70	Hg2CrO4
Hg2F2	-22.65	-33.01	-10.36	Hg2F2
Hg2S	-82.74	-94.42	-11.68	Hg2S
Hg2SeO3	-20.32	-24.98	-4.66	Hg2SeO3
Hg2SO4	-21.89	-28.02	-6.13	Hg2SO4
Hg3O2CO3	-31.35	-61.03	-29.68	Hg3O2CO3
HgCl (g)	-34.63	-15.13	19.50	HgCl
HgCl2	-13.99	-35.25	-21.26	HgCl2
HgF (g)	-49.18	-16.51	32.68	HgF
HgF2 (g)	-50.56	-38.00	12.57	HgF2
Hgmetal (l)	-3.15	-16.61	-13.45	Hg
HgSe	-4.45	-60.15	-55.69	HgSe
HgSeO3	-17.53	-29.96	-12.43	HgSeO3
HgSO4	-23.59	-33.00	-9.42	HgSO4
Huntite	-4.19	-34.16	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.84	-26.61	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.62	-21.39	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-22.45	-27.62	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-10.48	-25.28	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.53	-52.77	-17.24	K2Cr2O7
K2CrO4	-21.24	-21.76	-0.51	K2CrO4
K2MoO4	-17.83	-14.57	3.26	K2MoO4
K2SeO4	-18.08	-18.81	-0.73	K2SeO4
Kaolinite	0.33	7.77	7.43	Al2Si2O5 (OH) 4
Langite	-5.48	12.01	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-8.49	-8.92	-0.43	PbO : PbSO4
Laurionite	-6.21	-5.58	0.62	PbOHCl
Lepidocrocite	1.87	3.24	1.37	FeOOH
Lime	-19.66	13.04	32.70	CaO
Litharge	-7.24	5.45	12.69	PbO
Mackinawite	-78.85	-82.45	-3.60	FeS
Maghemite	0.10	6.49	6.39	Fe2O3
Magnesioferrite	2.54	19.40	16.86	Fe2MgO4
Magnesite	-1.11	-8.57	-7.46	MgCO3
Magnetite	6.86	10.26	3.40	Fe3O4
Malachite	-0.26	-5.57	-5.31	Cu2 (OH) 2CO3
Manganite	-2.03	23.31	25.34	MnOOH
Massicot	-7.44	5.45	12.89	PbO
Matlockite	-9.02	-17.99	-8.97	PbClF
Melanothallite	-20.37	-14.11	6.26	CuCl2
Melanterite	-13.84	-16.05	-2.21	FeSO4 : 7H2O
Metacinnabar	-54.31	-99.40	-45.09	HgS
Mg (OH) 2 (active)	-5.89	12.91	18.79	Mg (OH) 2
Mg (VO3) 2	-19.68	-8.40	11.28	Mg (VO3) 2
Mg2Sb3	-274.12	-199.44	74.68	Mg2Sb3
Mg2V2O7	-21.85	4.51	26.36	Mg2V2O7
MgCr2O4	-5.62	10.58	16.20	MgCr2O4
MgCrO4	-23.49	-18.11	5.38	MgCrO4
MgF2	-3.78	-11.91	-8.13	MgF2
MgMoO4	-9.07	-10.92	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.93	-3.87	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.97	-15.17	-1.20	MgSeO4 : 6H2O
Minium	-32.16	41.36	73.52	Pb3O4
Mirabilite	-7.12	-8.24	-1.11	Na2SO4 : 10H2O

Mn(VO3)2	-15.40	-10.50	4.90	Mn(VO3)2
Mn2(SO4)3	-57.83	-63.54	-5.71	Mn2(SO4)3
Mn2Sb	-147.91	-86.83	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.62	0.88	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.98	-11.26	2.72	MnCl2·4H2O
MnS (grn)	-75.59	-75.42	0.17	MnS
MnS (pnk)	-78.76	-75.42	3.34	MnS
MnSb	-95.06	-97.97	-2.91	MnSb
MnSe	-39.66	-36.16	3.50	MnSe
MnSeO3	-7.11	-5.98	1.13	MnSeO3
MnSeO3·2H2O	-6.96	-5.98	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-15.22	-17.27	-2.05	MnSeO4·5H2O
MnSO4	-11.60	-9.02	2.58	MnSO4
Monteponite	-8.09	7.01	15.10	CdO
Montroydite	-9.54	-13.18	-3.64	HgO
MoO3	-15.83	-23.83	-8.00	MoO3
Morenosite	-9.64	-11.79	-2.14	NiSO4·7H2O
MoS2	-151.03	-221.29	-70.26	MoS2
Na-Jarosite	-12.92	-24.12	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.55	-50.45	-9.90	Na2Cr2O7
Na2CrO4	-22.36	-19.43	2.93	Na2CrO4
Na2Mo2O7	-19.48	-36.08	-16.60	Na2Mo2O7
Na2MoO4	-13.74	-12.25	1.49	Na2MoO4
Na2MoO4·2H2O	-13.47	-12.25	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.50	-5.20	10.30	Na2SeO3·5H2O
Na2SeO4	-17.77	-16.49	1.28	Na2SeO4
Na3Sb	-173.01	-78.55	94.45	Na3Sb
Na3VO4	-29.96	6.72	36.68	Na3VO4
Na4V2O7	-35.54	1.86	37.40	Na4V2O7
Nantokite	-6.16	-12.89	-6.73	CuCl
NaSb	-88.29	-65.12	23.17	NaSb
Natron	-8.59	-9.90	-1.31	Na2CO3·10H2O
NaVO3	-8.72	-4.86	3.86	NaVO3
Nesquehonite	-3.90	-8.57	-4.67	MgCO3·3H2O
Ni(OH)2	-4.76	8.03	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-23.13	-7.43	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-19.68	12.32	32.00	Ni4(OH)6SO4
NiCO3	-6.57	-13.44	-6.87	NiCO3
NiMoO4	-4.65	-15.79	-11.14	NiMoO4
NiS (alpha)	-72.59	-78.19	-5.60	NiS
NiS (beta)	-67.09	-78.19	-11.10	NiS
NiS (gamma)	-65.39	-78.19	-12.80	NiS
NiSe	-21.23	-38.93	-17.70	NiSe
NiSeO3·2H2O	-11.56	-8.75	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-18.52	-20.04	-1.52	NiSeO4·6H2O
Nsutite	-7.03	10.47	17.50	MnO2
O2(g)	-33.06	50.03	83.09	O2
Orpiment	-241.36	-302.43	-61.07	As2S3
Otavite	-2.46	-14.46	-12.00	CdCO3
Pb(BO2)2	-11.28	-4.77	6.52	Pb(BO2)2
Pb(OH)2	-2.70	5.45	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-65.62	-74.38	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.93	-0.13	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.29	10.90	26.19	Pb2O(OH)2
Pb2O3	-25.13	35.91	61.04	Pb2O3
Pb2OCO3	-10.02	-10.58	-0.56	Pb2OCO3
Pb2V2O7	-8.50	-10.40	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.98	-15.18	5.80	Pb3(AsO4)2
Pb3(VO4)2	-11.09	-4.95	6.14	Pb3(VO4)2
Pb3O2CO3	-16.15	-5.13	11.02	Pb3O2CO3
Pb3O2SO4	-14.16	-3.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-19.12	1.98	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.90	1.98	21.88	Pb4O3SO4
PbCrO4	-12.97	-25.57	-12.60	PbCrO4
PbF2	-11.93	-19.37	-7.44	PbF2
Pbmetal	-23.81	-19.57	4.25	Pb
PbMoO4	-2.76	-18.38	-15.62	PbMoO4
PbO:0.3H2O	-7.53	5.45	12.98	PbO:0.33H2O

PbSeO4	-15.78	-22.62	-6.84	PbSeO4
Periclase	-8.68	12.91	21.58	MgO
Phosgenite	-12.84	-32.65	-19.81	PbCl2:PbCO3
Plattnerite	-19.14	30.46	49.60	PbO2
Portlandite	-9.76	13.04	22.80	Ca(OH)2
Pyrite	-125.15	-143.66	-18.51	FeS2
Pyrochroite	-4.39	10.80	15.19	Mn(OH)2
Pyrolusite	-5.56	35.82	41.38	MnO2
Quartz	0.49	-3.51	-4.00	SiO2
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-9.75	-11.79	-2.04	NiSO4:6H2O
Rhodochrosite	-0.09	-10.67	-10.58	MnCO3
Rutherfordine	-5.82	-20.32	-14.50	UO2CO3
Sb(OH)3	-13.77	-20.88	-7.11	Sb(OH)3
Sb2O4	-20.16	-16.75	3.40	Sb2O4
Sb2O5	-30.69	-40.36	-9.67	Sb2O5
Sb2Se3	-114.91	-182.66	-67.76	Sb2Se3
Sb4O6(cubic)	-65.28	-83.54	-18.26	Sb4O6
Sb4O6(orth)	-65.64	-83.54	-17.90	Sb4O6
SbCl3	-54.55	-53.98	0.57	SbCl3
SbF3	-47.88	-58.11	-10.23	SbF3
Sbmetal	-46.72	-58.41	-11.69	Sb
SbO2	-4.86	-32.69	-27.82	SbO2
Schoepite	-4.84	1.16	5.99	UO2(OH)2:H2O
Semetal(am)	-14.84	-21.95	-7.11	Se
Semetal(hex)	-14.24	-21.95	-7.71	Se
Senarmontite	-29.40	-41.77	-12.37	Sb2O3
SeO2	-16.90	-16.78	0.12	SeO2
SeO3	-49.12	-28.07	21.04	SeO3
Sepiolite	-0.49	15.27	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.51	15.27	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.47	-17.71	-10.24	FeCO3
SiO2(am-gel)	-0.80	-3.51	-2.71	SiO2
SiO2(am-ppt)	-0.77	-3.51	-2.74	SiO2
Smithsonite	-1.55	-11.55	-10.00	ZnCO3
Sphalerite	-64.84	-76.29	-11.45	ZnS
Spinel	-9.15	27.70	36.85	MgAl2O4
Stibnite	-249.97	-300.43	-50.46	Sb2S3
Sulfur	-59.06	-61.21	-2.14	S
Tenorite	0.31	7.96	7.64	CuO
Thenardite	-8.56	-8.24	0.32	Na2SO4
Thermonatrite	-10.53	-9.90	0.64	Na2CO3:H2O
Tyuyamunite	-10.03	-5.95	4.08	Ca(UO2)2(VO4)2
U3O8	-14.98	6.11	21.08	U3O8
U3Sb4	-580.02	-427.64	152.38	U3Sb4
U4O9	-30.53	-33.55	-3.02	U4O9
UF4	-34.74	-64.27	-29.54	UF4
UF4:2.5H2O	-31.55	-64.27	-32.72	UF4:2.5H2O
UO2(am)	-15.57	-14.64	0.93	UO2
UO2(NO3)2	-47.20	-35.06	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-39.91	-35.06	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-38.45	-35.06	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-37.10	-35.06	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.45	1.16	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.67	-26.92	-2.25	UO2SeO4:4H2O
UO3	-6.54	1.16	7.70	UO3
Uraninite	-9.97	-14.64	-4.67	UO2
USb2	-220.28	-190.70	29.58	USb2
V(OH)3	-20.66	-13.07	7.59	V(OH)3
V2O5	-19.94	-21.30	-1.36	V2O5
V3O5	-45.62	-43.78	1.84	V3O5
V4O7	-57.23	-50.04	7.19	V4O7
V6O13	-53.08	-113.94	-60.86	V6O13
Valentinite	-33.29	-41.77	-8.48	Sb2O3
VC12	-66.51	-47.64	18.87	VC12
VC13	-69.60	-46.17	23.43	VC13
VF4	-70.82	-55.89	14.93	VF4
Vmetal	-94.62	-50.59	44.03	V

VO	-40.33	-25.57	14.76	VO
VO(OH)2	-11.41	-6.26	5.15	VO(OH)2
VO2Cl	-24.53	-21.68	2.84	VO2Cl
VOC1	-35.25	-24.10	11.15	VOC1
VOC12	-41.08	-28.32	12.76	VOC12
VOSO4	-29.69	-26.08	3.61	VOSO4
Witherite	-4.98	-13.55	-8.57	BaCO3
Wurtzite	-67.34	-76.29	-8.95	ZnS
Zincite	-1.40	9.93	11.33	ZnO
Zincosite	-13.82	-9.89	3.93	ZnSO4
Zn(BO2)2	-8.57	-0.28	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-29.60	-26.28	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.27	9.93	12.20	Zn(OH)2
Zn(OH)2(am)	-2.54	9.93	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.82	9.93	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.60	9.93	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.80	9.93	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.46	0.04	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.36	8.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.39	-1.74	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.76	-9.85	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.50	19.90	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.91	27.59	38.50	Zn5(OH)8Cl2
ZnCl2	-19.18	-12.13	7.05	ZnCl2
ZnCO3:1H2O	-1.29	-11.55	-10.26	ZnCO3:1H2O
ZnF2	-14.35	-14.89	-0.53	ZnF2
Znmetal	-40.87	-15.08	25.79	Zn
ZnMoO4	-3.77	-13.90	-10.13	ZnMoO4
ZnO(active)	-1.26	9.93	11.19	ZnO
ZnS(am)	-67.24	-76.29	-9.05	ZnS
ZnSb	-84.51	-73.49	11.01	ZnSb
ZnSe	-22.63	-37.03	-14.40	ZnSe
ZnSeO4:6H2O	-16.62	-18.14	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.25	-9.89	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 64.

```
Title Return solution back to 1L
Mix 305
      312  1.0407
save solution 313
end
```

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 305.

Mixture 305.

1.041e+00 Solution 312 Solution after simulation 63.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.198e-09	1.198e-09
Al	1.084e-07	1.085e-07
As	6.160e-09	6.161e-09
B	8.780e-06	8.780e-06
Ba	3.288e-09	3.288e-09
C	1.545e-03	1.545e-03
Ca	4.677e-04	4.677e-04
Cd	5.691e-10	5.691e-10
Cl	1.958e-03	1.958e-03
Co	4.125e-09	4.126e-09
Cr	7.033e-10	7.033e-10
Cu	2.119e-07	2.119e-07
F	8.490e-05	8.491e-05
Fe	8.313e-10	8.314e-10
Hg	9.146e-11	9.147e-11
K	2.412e-04	2.413e-04
Mg	3.337e-04	3.337e-04
Mn	2.744e-06	2.745e-06
Mo	7.840e-08	7.841e-08
N	6.442e-07	6.442e-07
Na	3.504e-03	3.504e-03
Ni	6.409e-09	6.409e-09
Pb	3.600e-10	3.600e-10
S	8.711e-04	8.711e-04
Sb	1.206e-09	1.206e-09
Se	7.174e-09	7.174e-09
Si	3.148e-04	3.149e-04
U	2.062e-08	2.062e-08
V	3.927e-10	3.928e-10
Zn	5.902e-07	5.902e-07

-----Description of solution-----

	pH	=	8.287	Charge balance
	pe	=	4.221	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.728e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.569e-03	
	Total CO2 (mol/kg)	=	1.545e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.622e-08	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110252e+02	
	Total O	=	5.552060e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.128e-06	1.948e-06	-5.672	-5.710	-0.038	(0)
H+	5.635e-09	5.167e-09	-8.249	-8.287	-0.038	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.198e-09					
AgCl	8.130e-10	8.130e-10	-9.090	-9.090	0.000	(0)
Ag+	2.418e-10	2.218e-10	-9.616	-9.654	-0.038	(0)
AgCl2-	1.400e-10	1.272e-10	-9.854	-9.896	-0.042	(0)
AgSO4-	2.753e-12	2.500e-12	-11.560	-11.602	-0.042	(0)
AgCl3-2	2.991e-13	2.035e-13	-12.524	-12.691	-0.167	(0)
AgOH	4.321e-14	4.321e-14	-13.364	-13.364	0.000	(0)

	AgF	4.214e-14	4.214e-14	-13.375	-13.375	0.000	(0)
	AgNO2	2.514e-14	2.514e-14	-13.600	-13.600	0.000	(0)
	AgH2BO3	3.083e-15	3.083e-15	-14.511	-14.511	0.000	(0)
	AgNH3+	2.311e-15	2.098e-15	-14.636	-14.678	-0.042	(0)
	AgCl4-3	1.775e-15	7.460e-16	-14.751	-15.127	-0.376	(0)
	Ag2Se	1.627e-15	1.627e-15	-14.789	-14.789	0.000	(0)
	AgSeO3-	3.881e-16	3.524e-16	-15.411	-15.453	-0.042	(0)
	Ag (OH) 2-	9.059e-18	8.228e-18	-17.043	-17.085	-0.042	(0)
	Ag (NH3) 2+	8.704e-20	7.904e-20	-19.060	-19.102	-0.042	(0)
	AgNO3	2.662e-20	2.662e-20	-19.575	-19.575	0.000	(0)
	Ag (NO2) 2-	2.326e-20	2.112e-20	-19.633	-19.675	-0.042	(0)
	Ag (SeO3) 2-3	1.857e-23	7.803e-24	-22.731	-23.108	-0.376	(0)
	Ag2MoO4	1.032e-27	1.032e-27	-26.986	-26.986	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.774	-73.774	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.990	-82.659	-0.669	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.685	-146.805	-0.119	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.566	-147.608	-0.042	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-147.721	-147.958	-0.236	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.040	-148.269	-0.229	(0)
Al		1.084e-07					
	Al (OH) 4-	1.080e-07	9.914e-08	-6.966	-7.004	-0.037	(0)
	Al (OH) 3	4.042e-10	4.042e-10	-9.393	-9.393	0.000	(0)
	Al (OH) 2+	1.131e-11	1.040e-11	-10.947	-10.983	-0.037	(0)
	AlF2+	8.542e-14	7.853e-14	-13.068	-13.105	-0.037	(0)
	AlF3	7.479e-14	7.479e-14	-13.126	-13.126	0.000	(0)
	AlOH+2	9.403e-15	6.717e-15	-14.027	-14.173	-0.146	(0)
	AlF+2	3.650e-15	2.608e-15	-14.438	-14.584	-0.146	(0)
	AlF4-	3.090e-15	2.835e-15	-14.510	-14.547	-0.037	(0)
	AlSO4+	1.648e-17	1.512e-17	-16.783	-16.820	-0.037	(0)
	Al+3	7.519e-18	3.447e-18	-17.124	-17.463	-0.339	(0)
	Al (SO4) 2-	9.978e-20	9.157e-20	-19.001	-19.038	-0.037	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-55.351	-55.728	-0.376	(0)
As (3)		1.450e-22					
	H3AsO3	1.307e-22	1.307e-22	-21.884	-21.884	0.000	(0)
	H2AsO3-	1.429e-23	1.298e-23	-22.845	-22.887	-0.042	(0)
	HAsO3-2	3.367e-27	2.290e-27	-26.473	-26.640	-0.167	(0)
	H4AsO3+	3.685e-31	3.347e-31	-30.434	-30.475	-0.042	(0)
	AsO3-3	4.066e-32	1.709e-32	-31.391	-31.767	-0.376	(0)
As (5)		6.160e-09					
	HAsO4-2	5.945e-09	4.044e-09	-8.226	-8.393	-0.167	(0)
	H2AsO4-	2.098e-10	1.906e-10	-9.678	-9.720	-0.042	(0)
	AsO4-3	5.889e-12	2.475e-12	-11.230	-11.606	-0.376	(0)
	H3AsO4	1.708e-16	1.711e-16	-15.767	-15.767	0.001	(0)
B		8.780e-06					
	H3BO3	7.792e-06	7.804e-06	-5.108	-5.108	0.001	(0)
	H2BO3-	9.600e-07	8.771e-07	-6.018	-6.057	-0.039	(0)
	CaH2BO3+	1.623e-08	1.483e-08	-7.790	-7.829	-0.039	(0)
	MgH2BO3+	7.153e-09	6.536e-09	-8.145	-8.185	-0.039	(0)
	NaH2BO3	4.449e-09	4.449e-09	-8.352	-8.352	0.000	(0)
	BF (OH) 3-	2.578e-10	2.355e-10	-9.589	-9.628	-0.039	(0)
	H5 (BO3) 2-	6.376e-12	5.826e-12	-11.195	-11.235	-0.039	(0)
	BaH2BO3+	6.797e-14	6.211e-14	-13.168	-13.207	-0.039	(0)
	BF2 (OH) 2-	1.077e-14	9.844e-15	-13.968	-14.007	-0.039	(0)
	H8 (BO3) 3-	4.976e-15	4.546e-15	-14.303	-14.342	-0.039	(0)
	AgH2BO3	3.083e-15	3.083e-15	-14.511	-14.511	0.000	(0)
	BF3OH-	1.639e-21	1.497e-21	-20.786	-20.825	-0.039	(0)
	BF4-	3.152e-27	2.880e-27	-26.501	-26.541	-0.039	(0)
Ba		3.288e-09					
	Ba+2	3.241e-09	2.291e-09	-8.489	-8.640	-0.151	(0)
	BaHCO3+	3.253e-11	2.995e-11	-10.488	-10.524	-0.036	(0)
	BaCO3	1.459e-11	1.459e-11	-10.836	-10.836	0.000	(0)
	BaH2BO3+	6.797e-14	6.211e-14	-13.168	-13.207	-0.039	(0)
	BaOH+	2.122e-14	1.949e-14	-13.673	-13.710	-0.037	(0)
	BaNH3+2	9.850e-18	6.700e-18	-17.007	-17.174	-0.167	(0)
	BaNO3+	1.911e-18	1.735e-18	-17.719	-17.761	-0.042	(0)
C (4)		1.545e-03					
	HCO3-	1.489e-03	1.368e-03	-2.827	-2.864	-0.037	(0)
	CO3-2	1.756e-05	1.242e-05	-4.755	-4.906	-0.151	(0)

H2CO3	1.590e-05	1.590e-05	-4.799	-4.799	0.000	(0)
CaHCO3+	8.132e-06	7.485e-06	-5.090	-5.126	-0.036	(0)
CaCO3	5.780e-06	5.780e-06	-5.238	-5.238	0.000	(0)
MgHCO3+	3.283e-06	3.009e-06	-5.484	-5.522	-0.038	(0)
NaHCO3	2.463e-06	2.463e-06	-5.609	-5.609	0.000	(0)
MgCO3	2.219e-06	2.219e-06	-5.654	-5.654	0.000	(0)
NaCO3-	8.048e-07	7.399e-07	-6.094	-6.131	-0.037	(0)
CuCO3	1.768e-07	1.768e-07	-6.752	-6.752	0.000	(0)
ZnCO3	1.625e-07	1.625e-07	-6.789	-6.789	0.000	(0)
MnHCO3+	5.063e-08	4.651e-08	-7.296	-7.332	-0.037	(0)
UO2 (CO3) 3-4	1.368e-08	2.929e-09	-7.864	-8.533	-0.669	(0)
ZnHCO3+	1.084e-08	9.844e-09	-7.965	-8.007	-0.042	(0)
Cu (CO3) 2-2	8.686e-09	5.909e-09	-8.061	-8.229	-0.167	(0)
UO2 (CO3) 2-2	6.919e-09	4.707e-09	-8.160	-8.327	-0.167	(0)
NiCO3	1.341e-09	1.341e-09	-8.873	-8.873	0.000	(0)
NiHCO3+	5.378e-10	4.884e-10	-9.269	-9.311	-0.042	(0)
CoCO3	4.399e-10	4.399e-10	-9.357	-9.357	0.000	(0)
PbCO3	2.807e-10	2.807e-10	-9.552	-9.552	0.000	(0)
CoHCO3+	2.457e-10	2.231e-10	-9.610	-9.651	-0.042	(0)
CuHCO3+	2.299e-10	2.088e-10	-9.638	-9.680	-0.042	(0)
CdCO3	7.815e-11	7.815e-11	-10.107	-10.107	0.000	(0)
BaHCO3+	3.253e-11	2.995e-11	-10.488	-10.524	-0.036	(0)
UO2CO3	1.900e-11	1.900e-11	-10.721	-10.721	0.000	(0)
Pb (CO3) 2-2	1.477e-11	1.005e-11	-10.830	-10.998	-0.167	(0)
BaCO3	1.459e-11	1.459e-11	-10.836	-10.836	0.000	(0)
PbHCO3+	8.419e-12	7.646e-12	-11.075	-11.117	-0.042	(0)
Cd (CO3) 2-2	1.057e-12	7.193e-13	-11.976	-12.143	-0.167	(0)
CdHCO3+	9.473e-13	8.603e-13	-12.024	-12.065	-0.042	(0)
FeHCO3+	2.940e-15	2.706e-15	-14.532	-14.568	-0.036	(0)
HgCO3	4.065e-17	4.065e-17	-16.391	-16.391	0.000	(0)
Hg (CO3) 2-2	2.346e-18	1.596e-18	-17.630	-17.797	-0.167	(0)
HgHCO3+	4.307e-21	3.911e-21	-20.366	-20.408	-0.042	(0)
Ca	4.677e-04					
Ca+2	4.154e-04	2.937e-04	-3.382	-3.532	-0.151	(0)
CaSO4	3.803e-05	3.803e-05	-4.420	-4.420	0.000	(0)
CaHCO3+	8.132e-06	7.485e-06	-5.090	-5.126	-0.036	(0)
CaCO3	5.780e-06	5.780e-06	-5.238	-5.238	0.000	(0)
CaF+	2.640e-07	2.425e-07	-6.578	-6.615	-0.037	(0)
CaH2BO3+	1.623e-08	1.483e-08	-7.790	-7.829	-0.039	(0)
CaOH+	1.241e-08	1.142e-08	-7.906	-7.942	-0.036	(0)
CaNH3+2	2.519e-12	1.714e-12	-11.599	-11.766	-0.167	(0)
CaNO3+	1.546e-13	1.404e-13	-12.811	-12.853	-0.042	(0)
Ca (NH3) 2+2	4.648e-21	3.162e-21	-20.333	-20.500	-0.167	(0)
Cd	5.691e-10					
Cd+2	3.905e-10	2.761e-10	-9.408	-9.559	-0.151	(0)
CdCO3	7.815e-11	7.815e-11	-10.107	-10.107	0.000	(0)
CdCl+	5.214e-11	4.735e-11	-10.283	-10.325	-0.042	(0)
CdSO4	3.658e-11	3.658e-11	-10.437	-10.437	0.000	(0)
CdOH+	4.706e-12	4.274e-12	-11.327	-11.369	-0.042	(0)
CdOHC1	3.785e-12	3.785e-12	-11.422	-11.422	0.000	(0)
Cd (CO3) 2-2	1.057e-12	7.193e-13	-11.976	-12.143	-0.167	(0)
CdHCO3+	9.473e-13	8.603e-13	-12.024	-12.065	-0.042	(0)
Cd (SO4) 2-2	4.099e-13	2.789e-13	-12.387	-12.555	-0.167	(0)
CdF+	3.645e-13	3.311e-13	-12.438	-12.480	-0.042	(0)
CdCl2	3.544e-13	3.544e-13	-12.450	-12.450	0.000	(0)
Cd (OH) 2	5.254e-14	5.254e-14	-13.280	-13.280	0.000	(0)
CdCl3-	4.422e-16	4.016e-16	-15.354	-15.396	-0.042	(0)
CdF2	4.997e-17	4.997e-17	-16.301	-16.301	0.000	(0)
Cd (OH) 3-	6.887e-18	6.254e-18	-17.162	-17.204	-0.042	(0)
CdSeO4	1.626e-19	1.626e-19	-18.789	-18.789	0.000	(0)
CdNO3+	1.453e-19	1.320e-19	-18.838	-18.880	-0.042	(0)
Cd2OH+3	1.407e-20	5.915e-21	-19.852	-20.228	-0.376	(0)
Cd (SeO3) 2-2	2.046e-21	1.392e-21	-20.689	-20.856	-0.167	(0)
Cd (OH) 4-2	2.932e-24	1.995e-24	-23.533	-23.700	-0.167	(0)
Cd (NO3) 2	9.994e-30	9.994e-30	-29.000	-29.000	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.443	-79.485	-0.042	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.215	-150.215	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.207	-226.249	-0.042	(0)

Cd(HS) 4-2	0.000e+00	0.000e+00	-301.820	-301.987	-0.167	(0)
C1	1.958e-03					
Cl-	1.958e-03	1.796e-03	-2.708	-2.746	-0.038	(0)
MnCl+	4.191e-09	3.850e-09	-8.378	-8.415	-0.037	(0)
ZnOHCl	2.617e-09	2.617e-09	-8.582	-8.582	0.000	(0)
ZnCl+	1.119e-09	1.026e-09	-8.951	-8.989	-0.038	(0)
AgCl	8.130e-10	8.130e-10	-9.090	-9.090	0.000	(0)
CuCl	1.611e-10	1.611e-10	-9.793	-9.793	0.000	(0)
AgCl2-	1.400e-10	1.272e-10	-9.854	-9.896	-0.042	(0)
CuCl2-	6.591e-11	6.043e-11	-10.181	-10.219	-0.038	(0)
CdCl+	5.214e-11	4.735e-11	-10.283	-10.325	-0.042	(0)
NiCl+	1.464e-11	1.330e-11	-10.834	-10.876	-0.042	(0)
CoCl+	1.434e-11	1.302e-11	-10.844	-10.885	-0.042	(0)
MnCl2	9.766e-12	9.766e-12	-11.010	-11.010	0.000	(0)
CuCl+	7.507e-12	6.882e-12	-11.125	-11.162	-0.038	(0)
CdOHCl	3.785e-12	3.785e-12	-11.422	-11.422	0.000	(0)
ZnCl2	2.920e-12	2.920e-12	-11.535	-11.535	0.000	(0)
PbCl+	5.275e-13	4.791e-13	-12.278	-12.320	-0.042	(0)
CdCl2	3.544e-13	3.544e-13	-12.450	-12.450	0.000	(0)
AgCl3-2	2.991e-13	2.035e-13	-12.524	-12.691	-0.167	(0)
CuCl3-2	3.258e-14	2.320e-14	-13.487	-13.635	-0.147	(0)
HgClOH	1.690e-14	1.690e-14	-13.772	-13.772	0.000	(0)
MnCl3-	5.257e-15	4.830e-15	-14.279	-14.316	-0.037	(0)
ZnCl3-	4.543e-15	4.165e-15	-14.343	-14.380	-0.038	(0)
CuCl2	4.285e-15	4.285e-15	-14.368	-14.368	0.000	(0)
PbCl2	3.843e-15	3.843e-15	-14.415	-14.415	0.000	(0)
AgCl4-3	1.775e-15	7.460e-16	-14.751	-15.127	-0.376	(0)
HgCl2	8.821e-16	8.821e-16	-15.055	-15.055	0.000	(0)
CdCl3-	4.422e-16	4.016e-16	-15.354	-15.396	-0.042	(0)
NiCl2	1.202e-16	1.202e-16	-15.920	-15.920	0.000	(0)
HgCl3-	1.744e-17	1.584e-17	-16.758	-16.800	-0.042	(0)
ZnCl4-2	5.251e-18	3.739e-18	-17.280	-17.427	-0.147	(0)
PbCl3-	3.025e-18	2.747e-18	-17.519	-17.561	-0.042	(0)
UO2Cl+	1.233e-18	1.119e-18	-17.909	-17.951	-0.042	(0)
HgCl4-2	1.664e-19	1.132e-19	-18.779	-18.946	-0.167	(0)
CrCl+2	1.203e-19	8.182e-20	-18.920	-19.087	-0.167	(0)
HgCl+	1.079e-19	9.801e-20	-18.967	-19.009	-0.042	(0)
CuCl3-	7.833e-20	7.180e-20	-19.106	-19.144	-0.038	(0)
CrOHCl2	5.441e-21	5.441e-21	-20.264	-20.264	0.000	(0)
PbCl4-2	3.314e-21	2.254e-21	-20.480	-20.647	-0.167	(0)
FeCl+2	1.847e-23	1.315e-23	-22.734	-22.881	-0.147	(0)
CrCl2+	1.535e-23	1.394e-23	-22.814	-22.856	-0.042	(0)
CuCl4-2	9.074e-25	6.462e-25	-24.042	-24.190	-0.147	(0)
FeCl2+	1.148e-25	1.055e-25	-24.940	-24.977	-0.037	(0)
VOCl+	8.214e-26	7.460e-26	-25.085	-25.127	-0.042	(0)
CrO3Cl-	3.881e-27	3.525e-27	-26.411	-26.453	-0.042	(0)
FeCl3	1.894e-29	1.894e-29	-28.723	-28.723	0.000	(0)
CoCl+2	7.450e-38	5.068e-38	-37.128	-37.295	-0.167	(0)
UCl+3	0.000e+00	0.000e+00	-48.457	-48.833	-0.376	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.845	-53.012	-0.167	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.934	-55.101	-0.167	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.894	-68.062	-0.167	(0)
Co (2)	4.125e-09					
Co+2	3.081e-09	2.096e-09	-8.511	-8.679	-0.167	(0)
CoCO3	4.399e-10	4.399e-10	-9.357	-9.357	0.000	(0)
CoHCO3+	2.457e-10	2.231e-10	-9.610	-9.651	-0.042	(0)
CoSO4	2.363e-10	2.363e-10	-9.626	-9.626	0.000	(0)
CoOH+	8.972e-11	8.148e-11	-10.047	-10.089	-0.042	(0)
CoCl+	1.434e-11	1.302e-11	-10.844	-10.885	-0.042	(0)
Co (OH) 2	1.261e-11	1.261e-11	-10.899	-10.899	0.000	(0)
CoF+	5.521e-12	5.014e-12	-11.258	-11.300	-0.042	(0)
CoNO2+	8.824e-15	8.013e-15	-14.054	-14.096	-0.042	(0)
Co (NH3) +2	1.717e-15	1.168e-15	-14.765	-14.933	-0.167	(0)
Co (OH) 3-	5.399e-16	4.903e-16	-15.268	-15.310	-0.042	(0)
CoOOH-	1.355e-16	1.230e-16	-15.868	-15.910	-0.042	(0)
CoSeO4	3.322e-18	3.322e-18	-17.479	-17.479	0.000	(0)
CoNO3+	5.527e-19	5.020e-19	-18.257	-18.299	-0.042	(0)
Co2OH+3	2.037e-20	8.560e-21	-19.691	-20.068	-0.376	(0)

Co (NH3) 2+2	3.394e-22	2.309e-22	-21.469	-21.637	-0.167	(0)
Co (OH) 4-2	2.226e-22	1.514e-22	-21.653	-21.820	-0.167	(0)
Co (NO3) 2	1.543e-28	1.543e-28	-27.812	-27.812	0.000	(0)
Co (NH3) 3+2	1.980e-29	1.347e-29	-28.703	-28.871	-0.167	(0)
Co4 (OH) 4+4	4.108e-32	8.796e-33	-31.386	-32.056	-0.669	(0)
Co (NH3) 4+2	4.816e-37	3.276e-37	-36.317	-36.485	-0.167	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.431	-44.599	-0.167	(0)
Co (3)	2.019e-30					
CoOH+2	2.019e-30	1.373e-30	-29.695	-29.862	-0.167	(0)
Co+3	3.026e-37	1.387e-37	-36.519	-36.858	-0.339	(0)
CoCl+2	7.450e-38	5.068e-38	-37.128	-37.295	-0.167	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.845	-53.012	-0.167	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.597	-63.638	-0.042	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.659	-66.826	-0.167	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.894	-68.062	-0.167	(0)
Cr (2)	7.438e-28					
Cr+2	7.438e-28	5.060e-28	-27.129	-27.296	-0.167	(0)
Cr (3)	7.032e-10					
Cr (OH) 2+	3.918e-10	3.558e-10	-9.407	-9.449	-0.042	(0)
Cr (OH) 3	2.604e-10	2.604e-10	-9.584	-9.584	0.000	(0)
CrO2-	2.636e-11	2.394e-11	-10.579	-10.621	-0.042	(0)
Cr (OH) 4-	2.224e-11	2.020e-11	-10.653	-10.695	-0.042	(0)
Cr (OH) +2	2.206e-12	1.501e-12	-11.656	-11.824	-0.167	(0)
CrOHSO4	2.013e-13	2.013e-13	-12.696	-12.696	0.000	(0)
CrF+2	6.205e-16	4.221e-16	-15.207	-15.375	-0.167	(0)
Cr+3	8.378e-17	3.521e-17	-16.077	-16.453	-0.376	(0)
CrSO4+	5.116e-17	4.646e-17	-16.291	-16.333	-0.042	(0)
CrCl+2	1.203e-19	8.182e-20	-18.920	-19.087	-0.167	(0)
CrOHC12	5.441e-21	5.441e-21	-20.264	-20.264	0.000	(0)
Cr2 (OH) 2SO4+2	4.014e-23	2.730e-23	-22.396	-22.564	-0.167	(0)
CrCl2+	1.535e-23	1.394e-23	-22.814	-22.856	-0.042	(0)
Cr2 (OH) 2 (SO4) 2	9.165e-25	9.165e-25	-24.038	-24.038	0.000	(0)
CrNO3+2	3.419e-28	2.326e-28	-27.466	-27.633	-0.167	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.294	-43.461	-0.167	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.081	-53.457	-0.376	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.934	-55.101	-0.167	(0)
Cr (6)	5.242e-15					
CrO4-2	5.109e-15	3.612e-15	-14.292	-14.442	-0.151	(0)
HCrO4-	6.650e-17	6.040e-17	-16.177	-16.219	-0.042	(0)
NaCrO4-	6.325e-17	5.744e-17	-16.199	-16.241	-0.042	(0)
KCrO4-	3.256e-18	2.957e-18	-17.487	-17.529	-0.042	(0)
H2CrO4	2.530e-25	2.530e-25	-24.597	-24.597	0.000	(0)
CrO3SO4-2	7.897e-26	5.372e-26	-25.103	-25.270	-0.167	(0)
CrO3Cl-	3.881e-27	3.525e-27	-26.411	-26.453	-0.042	(0)
Cr2O7-2	1.860e-31	1.265e-31	-30.731	-30.898	-0.167	(0)
Cu (1)	3.055e-10					
CuCl	1.611e-10	1.611e-10	-9.793	-9.793	0.000	(0)
Cu+	7.846e-11	7.125e-11	-10.105	-10.147	-0.042	(0)
CuCl2-	6.591e-11	6.043e-11	-10.181	-10.219	-0.038	(0)
CuCl3-2	3.258e-14	2.320e-14	-13.487	-13.635	-0.147	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.819	-146.052	-0.232	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.557	-146.782	-0.225	(0)
Cu (2)	2.116e-07					
CuCO3	1.768e-07	1.768e-07	-6.752	-6.752	0.000	(0)
CuOH+	1.625e-08	1.490e-08	-7.789	-7.827	-0.038	(0)
Cu (CO3) 2-2	8.686e-09	5.909e-09	-8.061	-8.229	-0.167	(0)
Cu (OH) 2	5.793e-09	5.793e-09	-8.237	-8.237	0.000	(0)
Cu+2	3.420e-09	2.418e-09	-8.466	-8.616	-0.151	(0)
CuSO4	3.131e-10	3.131e-10	-9.504	-9.504	0.000	(0)
CuHCO3+	2.299e-10	2.088e-10	-9.638	-9.680	-0.042	(0)
Cu (OH) 3-	2.549e-11	2.315e-11	-10.594	-10.635	-0.042	(0)
CuF+	1.271e-11	1.154e-11	-10.896	-10.938	-0.042	(0)
Cu2 (OH) 2+2	8.198e-12	5.577e-12	-11.086	-11.254	-0.167	(0)
CuCl+	7.507e-12	6.882e-12	-11.125	-11.162	-0.038	(0)
CuNH3+2	1.686e-13	1.147e-13	-12.773	-12.941	-0.167	(0)
CuNO2+	1.513e-13	1.374e-13	-12.820	-12.862	-0.042	(0)
CuCl2	4.285e-15	4.285e-15	-14.368	-14.368	0.000	(0)
Cu (OH) 4-2	5.219e-16	3.550e-16	-15.282	-15.450	-0.167	(0)

	CuNO3+	1.272e-18	1.156e-18	-17.895	-17.937	-0.042	(0)
	Cu (NO2) 2	7.627e-19	7.627e-19	-18.118	-18.118	0.000	(0)
	CuCl3-	7.833e-20	7.180e-20	-19.106	-19.144	-0.038	(0)
	CuCl4-2	9.074e-25	6.462e-25	-24.042	-24.190	-0.147	(0)
	Cu (NO3) 2	2.198e-29	2.198e-29	-28.658	-28.658	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.478	-216.520	-0.042	(0)
F		8.490e-05					
	F-	8.249e-05	7.565e-05	-4.084	-4.121	-0.038	(0)
	MgF+	1.988e-06	1.824e-06	-5.702	-5.739	-0.037	(0)
	CaF+	2.640e-07	2.425e-07	-6.578	-6.615	-0.037	(0)
	NaF	1.527e-07	1.527e-07	-6.816	-6.816	0.000	(0)
	MnF+	5.584e-09	5.129e-09	-8.253	-8.290	-0.037	(0)
	HF	5.781e-10	5.781e-10	-9.238	-9.238	0.000	(0)
	ZnF+	3.781e-10	3.433e-10	-9.422	-9.464	-0.042	(0)
	BF (OH) 3-	2.578e-10	2.355e-10	-9.589	-9.628	-0.039	(0)
	CuF+	1.271e-11	1.154e-11	-10.896	-10.938	-0.042	(0)
	NiF+	6.057e-12	5.500e-12	-11.218	-11.260	-0.042	(0)
	CoF+	5.521e-12	5.014e-12	-11.258	-11.300	-0.042	(0)
	CdF+	3.645e-13	3.311e-13	-12.438	-12.480	-0.042	(0)
	HF2-	1.816e-13	1.663e-13	-12.741	-12.779	-0.038	(0)
	AlF2+	8.542e-14	7.853e-14	-13.068	-13.105	-0.037	(0)
	AlF3	7.479e-14	7.479e-14	-13.126	-13.126	0.000	(0)
	PbF+	4.414e-14	4.008e-14	-13.355	-13.397	-0.042	(0)
	AgF	4.214e-14	4.214e-14	-13.375	-13.375	0.000	(0)
	BF2 (OH) 2-	1.077e-14	9.844e-15	-13.968	-14.007	-0.039	(0)
	UO2F+	4.419e-15	4.014e-15	-14.355	-14.396	-0.042	(0)
	AlF+2	3.650e-15	2.608e-15	-14.438	-14.584	-0.146	(0)
	AlF4-	3.090e-15	2.835e-15	-14.510	-14.547	-0.037	(0)
	UO2F2	8.756e-16	8.756e-16	-15.058	-15.058	0.000	(0)
	CrF+2	6.205e-16	4.221e-16	-15.207	-15.375	-0.167	(0)
	PbF2	5.967e-17	5.967e-17	-16.224	-16.224	0.000	(0)
	CdF2	4.997e-17	4.997e-17	-16.301	-16.301	0.000	(0)
	UO2F3-	1.832e-17	1.664e-17	-16.737	-16.779	-0.042	(0)
	H2F2	8.955e-19	8.955e-19	-18.048	-18.048	0.000	(0)
	FeF2+	4.433e-20	4.072e-20	-19.353	-19.390	-0.037	(0)
	FeF+2	2.825e-20	2.012e-20	-19.549	-19.696	-0.147	(0)
	VO2F	1.529e-20	1.529e-20	-19.816	-19.816	0.000	(0)
	UO2F4-2	1.470e-20	9.997e-21	-19.833	-20.000	-0.167	(0)
	PbF3-	9.427e-21	8.561e-21	-20.026	-20.067	-0.042	(0)
	FeF3	4.346e-21	4.346e-21	-20.362	-20.362	0.000	(0)
	BF3OH-	1.639e-21	1.497e-21	-20.786	-20.825	-0.039	(0)
	VO2F2-	4.624e-22	4.200e-22	-21.335	-21.377	-0.042	(0)
	VOF+	7.398e-24	6.719e-24	-23.131	-23.173	-0.042	(0)
	VO2F3-2	5.825e-25	3.963e-25	-24.235	-24.402	-0.167	(0)
	PbF4-2	4.557e-25	3.100e-25	-24.341	-24.509	-0.167	(0)
	VOF2	1.906e-25	1.906e-25	-24.720	-24.720	0.000	(0)
	HgF+	8.447e-27	7.671e-27	-26.073	-26.115	-0.042	(0)
	BF4-	3.152e-27	2.880e-27	-26.501	-26.541	-0.039	(0)
	Sb (OH) 2F	7.963e-28	7.963e-28	-27.099	-27.099	0.000	(0)
	SbOF	7.831e-28	7.831e-28	-27.106	-27.106	0.000	(0)
	VOF3-	5.632e-28	5.115e-28	-27.249	-27.291	-0.042	(0)
	VO2F4-3	3.510e-29	1.475e-29	-28.455	-28.831	-0.376	(0)
	VOF4-2	2.296e-31	1.562e-31	-30.639	-30.806	-0.167	(0)
	SiF6-2	8.691e-32	6.189e-32	-31.061	-31.208	-0.147	(0)
	UF3+	3.095e-39	2.810e-39	-38.509	-38.551	-0.042	(0)
	UF2+2	3.446e-40	2.344e-40	-39.463	-39.630	-0.167	(0)
	UF4	0.000e+00	0.000e+00	-40.632	-40.632	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-42.232	-42.609	-0.376	(0)
	UF5-	0.000e+00	0.000e+00	-43.114	-43.156	-0.042	(0)
	UF6-2	0.000e+00	0.000e+00	-44.630	-44.797	-0.167	(0)
Fe (2)		2.689e-13					
	Fe+2	2.309e-13	1.571e-13	-12.637	-12.804	-0.167	(0)
	FeSO4	2.179e-14	2.179e-14	-13.662	-13.662	0.000	(0)
	FeOH+	1.326e-14	1.218e-14	-13.877	-13.914	-0.037	(0)
	FeHCO3+	2.940e-15	2.706e-15	-14.532	-14.568	-0.036	(0)
	Fe (OH) 2	1.885e-17	1.885e-17	-16.725	-16.725	0.000	(0)
	Fe (OH) 3-	1.265e-17	1.162e-17	-16.898	-16.935	-0.037	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-159.722	-159.722	0.000	(0)

Fe (HS) 3-	0.000e+00	0.000e+00	-235.577	-235.619	-0.042	(0)
Fe (3)	8.310e-10					
Fe (OH) 3	4.840e-10	4.840e-10	-9.315	-9.315	0.000	(0)
Fe (OH) 2+	2.516e-10	2.313e-10	-9.599	-9.636	-0.037	(0)
Fe (OH) 4-	9.551e-11	8.780e-11	-10.020	-10.056	-0.037	(0)
FeOH+2	4.285e-16	3.051e-16	-15.368	-15.516	-0.147	(0)
FeF2+	4.433e-20	4.072e-20	-19.353	-19.390	-0.037	(0)
FeF+2	2.825e-20	2.012e-20	-19.549	-19.696	-0.147	(0)
FeF3	4.346e-21	4.346e-21	-20.362	-20.362	0.000	(0)
FeSO4+	1.674e-21	1.538e-21	-20.776	-20.813	-0.037	(0)
Fe+3	5.290e-22	2.425e-22	-21.277	-21.615	-0.339	(0)
Fe (SO4) 2-	2.046e-23	1.858e-23	-22.689	-22.731	-0.042	(0)
FeCl+2	1.847e-23	1.315e-23	-22.734	-22.881	-0.147	(0)
FeCl2+	1.148e-25	1.055e-25	-24.940	-24.977	-0.037	(0)
FeHSeO3+2	3.024e-27	2.057e-27	-26.519	-26.687	-0.167	(0)
FeCl3	1.894e-29	1.894e-29	-28.723	-28.723	0.000	(0)
Fe2 (OH) 2+4	1.440e-29	3.082e-30	-28.842	-29.511	-0.669	(0)
FeNO3+2	5.388e-31	3.665e-31	-30.269	-30.436	-0.167	(0)
Fe3 (OH) 4+5	1.145e-37	1.030e-38	-36.941	-37.987	-1.046	(0)
H (0)	1.366e-28					
H2	6.829e-29	6.840e-29	-28.166	-28.165	0.001	(0)
Hg (0)	9.138e-11					
Hg	9.138e-11	9.138e-11	-10.039	-10.039	0.000	(0)
Hg (1)	4.990e-25					
Hg2+2	2.495e-25	1.697e-25	-24.603	-24.770	-0.167	(0)
Hg (2)	8.328e-14					
Hg (OH) 2	6.543e-14	6.553e-14	-13.184	-13.184	0.001	(0)
HgClOH	1.690e-14	1.690e-14	-13.772	-13.772	0.000	(0)
HgCl2	8.821e-16	8.821e-16	-15.055	-15.055	0.000	(0)
HgCO3	4.065e-17	4.065e-17	-16.391	-16.391	0.000	(0)
HgCl3-	1.744e-17	1.584e-17	-16.758	-16.800	-0.042	(0)
Hg (CO3) 2-2	2.346e-18	1.596e-18	-17.630	-17.797	-0.167	(0)
HgOH+	2.337e-19	2.122e-19	-18.631	-18.673	-0.042	(0)
HgCl4-2	1.664e-19	1.132e-19	-18.779	-18.946	-0.167	(0)
HgCl+	1.079e-19	9.801e-20	-18.967	-19.009	-0.042	(0)
Hg (OH) 3-	1.770e-20	1.607e-20	-19.752	-19.794	-0.042	(0)
HgHCO3+	4.307e-21	3.911e-21	-20.366	-20.408	-0.042	(0)
Hg (NH3) 2+2	5.450e-23	3.707e-23	-22.264	-22.431	-0.167	(0)
HgNH3+2	1.176e-23	7.999e-24	-22.930	-23.097	-0.167	(0)
Hg+2	4.022e-24	2.736e-24	-23.396	-23.563	-0.167	(0)
HgSO4	4.048e-25	4.048e-25	-24.393	-24.393	0.000	(0)
HgF+	8.447e-27	7.671e-27	-26.073	-26.115	-0.042	(0)
Hg (NH3) 3+2	1.005e-30	6.840e-31	-29.998	-30.165	-0.167	(0)
HgNO3+	1.681e-34	1.526e-34	-33.774	-33.816	-0.042	(0)
Hg (NH3) 4+2	3.701e-38	2.518e-38	-37.432	-37.599	-0.167	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.018	-44.018	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.175	-139.216	-0.042	(0)
HgS2-2	0.000e+00	0.000e+00	-139.470	-139.638	-0.167	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.109	-141.109	0.000	(0)
K	2.412e-04					
K+	2.403e-04	2.203e-04	-3.619	-3.657	-0.038	(0)
KSO4-	9.588e-07	8.815e-07	-6.018	-6.055	-0.037	(0)
KCrO4-	3.256e-18	2.957e-18	-17.487	-17.529	-0.042	(0)
Mg	3.337e-04					
Mg+2	3.039e-04	2.149e-04	-3.517	-3.668	-0.151	(0)
MgSO4	2.210e-05	2.210e-05	-4.656	-4.656	0.000	(0)
MgHCO3+	3.283e-06	3.009e-06	-5.484	-5.522	-0.038	(0)
MgCO3	2.219e-06	2.219e-06	-5.654	-5.654	0.000	(0)
MgF+	1.988e-06	1.824e-06	-5.702	-5.739	-0.037	(0)
MgOH+	1.809e-07	1.667e-07	-6.742	-6.778	-0.036	(0)
MgH2BO3+	7.153e-09	6.536e-09	-8.145	-8.185	-0.039	(0)
Mn (2)	2.744e-06					
Mn+2	2.504e-06	1.703e-06	-5.601	-5.769	-0.167	(0)
MnSO4	1.712e-07	1.712e-07	-6.767	-6.767	0.000	(0)
MnHCO3+	5.063e-08	4.651e-08	-7.296	-7.332	-0.037	(0)
MnOH+	9.075e-09	8.336e-09	-8.042	-8.079	-0.037	(0)
MnF+	5.584e-09	5.129e-09	-8.253	-8.290	-0.037	(0)
MnCl+	4.191e-09	3.850e-09	-8.378	-8.415	-0.037	(0)

MnCl2	9.766e-12	9.766e-12	-11.010	-11.010	0.000	(0)
MnCl3-	5.257e-15	4.830e-15	-14.279	-14.316	-0.037	(0)
MnSeO4	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
MnNO3+	4.492e-16	4.079e-16	-15.348	-15.389	-0.042	(0)
Mn (OH) 3-	2.129e-16	1.956e-16	-15.672	-15.709	-0.037	(0)
Mn (OH) 4-2	1.728e-21	1.230e-21	-20.763	-20.910	-0.147	(0)
Mn (NO3) 2	1.548e-25	1.548e-25	-24.810	-24.810	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.545	-41.545	0.000	(0)
Mn (3)	2.759e-27					
Mn+3	2.759e-27	1.265e-27	-26.559	-26.898	-0.339	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-40.867	-41.014	-0.147	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.127	-46.165	-0.039	(0)
Mo	7.840e-08					
MoO4-2	7.839e-08	5.543e-08	-7.106	-7.256	-0.151	(0)
HMoO4-	6.275e-12	5.699e-12	-11.202	-11.244	-0.042	(0)
H2MoO4	2.157e-16	2.157e-16	-15.666	-15.666	0.000	(0)
Ag2MoO4	1.032e-27	1.032e-27	-26.986	-26.986	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-55.351	-55.728	-0.376	(0)
Mo7O24-6	0.000e+00	0.000e+00	-62.591	-64.097	-1.506	(0)
HMo7O24-5	0.000e+00	0.000e+00	-64.952	-65.997	-1.046	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-68.833	-69.502	-0.669	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-74.166	-74.543	-0.376	(0)
N (-3)	5.088e-08					
NH4+	4.596e-08	4.200e-08	-7.338	-7.377	-0.039	(0)
NH3	4.634e-09	4.634e-09	-8.334	-8.334	0.000	(0)
NH4SO4-	2.768e-10	2.543e-10	-9.558	-9.595	-0.037	(0)
CaNH3+2	2.519e-12	1.714e-12	-11.599	-11.766	-0.167	(0)
CuNH3+2	1.686e-13	1.147e-13	-12.773	-12.941	-0.167	(0)
NiNH3+2	1.059e-14	7.204e-15	-13.975	-14.142	-0.167	(0)
AgNH3+	2.311e-15	2.098e-15	-14.636	-14.678	-0.042	(0)
Co (NH3) +2	1.717e-15	1.168e-15	-14.765	-14.933	-0.167	(0)
BaNH3+2	9.850e-18	6.700e-18	-17.007	-17.174	-0.167	(0)
Ag (NH3) 2+	8.704e-20	7.904e-20	-19.060	-19.102	-0.042	(0)
Ni (NH3) 2+2	7.094e-21	4.826e-21	-20.149	-20.316	-0.167	(0)
Ca (NH3) 2+2	4.648e-21	3.162e-21	-20.333	-20.500	-0.167	(0)
Co (NH3) 2+2	3.394e-22	2.309e-22	-21.469	-21.637	-0.167	(0)
Hg (NH3) 2+2	5.450e-23	3.707e-23	-22.264	-22.431	-0.167	(0)
HgNH3+2	1.176e-23	7.999e-24	-22.930	-23.097	-0.167	(0)
Co (NH3) 3+2	1.980e-29	1.347e-29	-28.703	-28.871	-0.167	(0)
Hg (NH3) 3+2	1.005e-30	6.840e-31	-29.998	-30.165	-0.167	(0)
Co (NH3) 4+2	4.816e-37	3.276e-37	-36.317	-36.485	-0.167	(0)
Hg (NH3) 4+2	3.701e-38	2.518e-38	-37.432	-37.599	-0.167	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.294	-43.461	-0.167	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.431	-44.599	-0.167	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-52.845	-53.012	-0.167	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-53.081	-53.457	-0.376	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.934	-55.101	-0.167	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.597	-63.638	-0.042	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-66.659	-66.826	-0.167	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-67.894	-68.062	-0.167	(0)
N (3)	5.931e-07					
NO2-	5.931e-07	5.425e-07	-6.227	-6.266	-0.039	(0)
CuNO2+	1.513e-13	1.374e-13	-12.820	-12.862	-0.042	(0)
AgNO2	2.514e-14	2.514e-14	-13.600	-13.600	0.000	(0)
CoNO2+	8.824e-15	8.013e-15	-14.054	-14.096	-0.042	(0)
Cu (NO2) 2	7.627e-19	7.627e-19	-18.118	-18.118	0.000	(0)
Ag (NO2) 2-	2.326e-20	2.112e-20	-19.633	-19.675	-0.042	(0)
N (5)	1.649e-10					
NO3-	1.648e-10	1.511e-10	-9.783	-9.821	-0.038	(0)
CaNO3+	1.546e-13	1.404e-13	-12.811	-12.853	-0.042	(0)
MnNO3+	4.492e-16	4.079e-16	-15.348	-15.389	-0.042	(0)
ZnNO3+	9.508e-17	8.635e-17	-16.022	-16.064	-0.042	(0)
BaNO3+	1.911e-18	1.735e-18	-17.719	-17.761	-0.042	(0)
CuNO3+	1.272e-18	1.156e-18	-17.895	-17.937	-0.042	(0)
NiNO3+	1.210e-18	1.099e-18	-17.917	-17.959	-0.042	(0)
CoNO3+	5.527e-19	5.020e-19	-18.257	-18.299	-0.042	(0)

CdNO3+	1.453e-19	1.320e-19	-18.838	-18.880	-0.042	(0)
AgNO3	2.662e-20	2.662e-20	-19.575	-19.575	0.000	(0)
PbNO3+	1.851e-20	1.681e-20	-19.733	-19.774	-0.042	(0)
Mn (NO3) 2	1.548e-25	1.548e-25	-24.810	-24.810	0.000	(0)
UO2NO3+	1.276e-25	1.159e-25	-24.894	-24.936	-0.042	(0)
Zn (NO3) 2	2.603e-27	2.603e-27	-26.584	-26.584	0.000	(0)
CrNO3+2	3.419e-28	2.326e-28	-27.466	-27.633	-0.167	(0)
Co (NO3) 2	1.543e-28	1.543e-28	-27.812	-27.812	0.000	(0)
Cu (NO3) 2	2.198e-29	2.198e-29	-28.658	-28.658	0.000	(0)
Cd (NO3) 2	9.994e-30	9.994e-30	-29.000	-29.000	0.000	(0)
VO2NO3	8.810e-30	8.810e-30	-29.055	-29.055	0.000	(0)
Pb (NO3) 2	4.313e-30	4.313e-30	-29.365	-29.365	0.000	(0)
FeNO3+2	5.388e-31	3.665e-31	-30.269	-30.436	-0.167	(0)
HgNO3+	1.681e-34	1.526e-34	-33.774	-33.816	-0.042	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.018	-44.018	0.000	(0)
Na	3.504e-03					
Na+	3.490e-03	3.200e-03	-2.457	-2.495	-0.038	(0)
NaSO4-	1.056e-05	9.712e-06	-4.976	-5.013	-0.037	(0)
NaHCO3	2.463e-06	2.463e-06	-5.609	-5.609	0.000	(0)
NaCO3-	8.048e-07	7.399e-07	-6.094	-6.131	-0.037	(0)
NaF	1.527e-07	1.527e-07	-6.816	-6.816	0.000	(0)
NaH2BO3	4.449e-09	4.449e-09	-8.352	-8.352	0.000	(0)
NaCrO4-	6.325e-17	5.744e-17	-16.199	-16.241	-0.042	(0)
Ni	6.409e-09					
Ni+2	4.094e-09	2.895e-09	-8.388	-8.538	-0.151	(0)
NiCO3	1.341e-09	1.341e-09	-8.873	-8.873	0.000	(0)
NiHCO3+	5.378e-10	4.884e-10	-9.269	-9.311	-0.042	(0)
NiSO4	3.264e-10	3.264e-10	-9.486	-9.486	0.000	(0)
NiOH+	7.819e-11	7.101e-11	-10.107	-10.149	-0.042	(0)
NiCl+	1.464e-11	1.330e-11	-10.834	-10.876	-0.042	(0)
Ni (OH) 2	1.099e-11	1.099e-11	-10.959	-10.959	0.000	(0)
NiF+	6.057e-12	5.500e-12	-11.218	-11.260	-0.042	(0)
Ni (OH) 3-	2.358e-14	2.141e-14	-13.627	-13.669	-0.042	(0)
NiNH3+2	1.059e-14	7.204e-15	-13.975	-14.142	-0.167	(0)
Ni (SO4) 2-2	8.979e-15	6.108e-15	-14.047	-14.214	-0.167	(0)
NiCl2	1.202e-16	1.202e-16	-15.920	-15.920	0.000	(0)
NiSeO4	4.282e-18	4.282e-18	-17.368	-17.368	0.000	(0)
NiNO3+	1.210e-18	1.099e-18	-17.917	-17.959	-0.042	(0)
Ni (NH3) 2+2	7.094e-21	4.826e-21	-20.149	-20.316	-0.167	(0)
O (0)	2.163e-36					
O2	1.081e-36	1.083e-36	-35.966	-35.965	0.001	(0)
Pb	3.600e-10					
PbCO3	2.807e-10	2.807e-10	-9.552	-9.552	0.000	(0)
PbOH+	4.052e-11	3.680e-11	-10.392	-10.434	-0.042	(0)
Pb (CO3) 2-2	1.477e-11	1.005e-11	-10.830	-10.998	-0.167	(0)
Pb+2	1.063e-11	7.520e-12	-10.973	-11.124	-0.151	(0)
PbHCO3+	8.419e-12	7.646e-12	-11.075	-11.117	-0.042	(0)
Pb (OH) 2	2.268e-12	2.268e-12	-11.644	-11.644	0.000	(0)
PbSO4	2.081e-12	2.081e-12	-11.682	-11.682	0.000	(0)
PbCl+	5.275e-13	4.791e-13	-12.278	-12.320	-0.042	(0)
PbF+	4.414e-14	4.008e-14	-13.355	-13.397	-0.042	(0)
Pb (SO4) 2-2	1.042e-14	7.087e-15	-13.982	-14.150	-0.167	(0)
Pb (OH) 3-	4.865e-15	4.418e-15	-14.313	-14.355	-0.042	(0)
PbCl2	3.843e-15	3.843e-15	-14.415	-14.415	0.000	(0)
PbF2	5.967e-17	5.967e-17	-16.224	-16.224	0.000	(0)
Pb (OH) 4-2	3.099e-18	2.108e-18	-17.509	-17.676	-0.167	(0)
PbCl3-	3.025e-18	2.747e-18	-17.519	-17.561	-0.042	(0)
PbNO3+	1.851e-20	1.681e-20	-19.733	-19.774	-0.042	(0)
Pb2OH+3	1.044e-20	4.386e-21	-19.981	-20.358	-0.376	(0)
PbF3-	9.427e-21	8.561e-21	-20.026	-20.067	-0.042	(0)
PbCl4-2	3.314e-21	2.254e-21	-20.480	-20.647	-0.167	(0)
Pb3 (OH) 4+2	1.134e-24	7.715e-25	-23.945	-24.113	-0.167	(0)
PbF4-2	4.557e-25	3.100e-25	-24.341	-24.509	-0.167	(0)
Pb (NO3) 2	4.313e-30	4.313e-30	-29.365	-29.365	0.000	(0)
Pb4 (OH) 4+4	2.152e-31	4.608e-32	-30.667	-31.336	-0.669	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.722	-151.722	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.314	-228.356	-0.042	(0)
S (-2)	0.000e+00					

AgHS	0.000e+00	0.000e+00	-73.774	-73.774	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.892	-77.934	-0.042	(0)
S5-2	0.000e+00	0.000e+00	-78.845	-79.012	-0.167	(0)
H2S	0.000e+00	0.000e+00	-79.201	-79.201	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.361	-79.528	-0.167	(0)
S4-2	0.000e+00	0.000e+00	-79.441	-79.608	-0.167	(0)
CdHS+	0.000e+00	0.000e+00	-79.443	-79.485	-0.042	(0)
S3-2	0.000e+00	0.000e+00	-80.247	-80.414	-0.167	(0)
S2-2	0.000e+00	0.000e+00	-81.263	-81.430	-0.167	(0)
S-2	0.000e+00	0.000e+00	-86.800	-86.947	-0.147	(0)
HgHS2-	0.000e+00	0.000e+00	-139.175	-139.216	-0.042	(0)
HgS2-2	0.000e+00	0.000e+00	-139.470	-139.638	-0.167	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.109	-141.109	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.819	-146.052	-0.232	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.557	-146.782	-0.225	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.685	-146.805	-0.119	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.373	-147.415	-0.042	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.566	-147.608	-0.042	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.721	-147.958	-0.236	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.040	-148.269	-0.229	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.691	-149.691	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.215	-150.215	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.722	-151.722	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.722	-159.722	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.478	-216.520	-0.042	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.304	-224.345	-0.042	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.871	-226.039	-0.167	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.207	-226.249	-0.042	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.314	-228.356	-0.042	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.577	-235.619	-0.042	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.820	-301.987	-0.167	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.572	-303.740	-0.167	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.523	-320.690	-0.167	(0)
S (6)	8.711e-04					
SO4-2	7.992e-04	5.651e-04	-3.097	-3.248	-0.151	(0)
CaSO4	3.803e-05	3.803e-05	-4.420	-4.420	0.000	(0)
MgSO4	2.210e-05	2.210e-05	-4.656	-4.656	0.000	(0)
NaSO4-	1.056e-05	9.712e-06	-4.976	-5.013	-0.037	(0)
KSO4-	9.588e-07	8.815e-07	-6.018	-6.055	-0.037	(0)
MnSO4	1.712e-07	1.712e-07	-6.767	-6.767	0.000	(0)
ZnSO4	2.812e-08	2.812e-08	-7.551	-7.551	0.000	(0)
NiSO4	3.264e-10	3.264e-10	-9.486	-9.486	0.000	(0)
CuSO4	3.131e-10	3.131e-10	-9.504	-9.504	0.000	(0)
HSO4-	3.109e-10	2.853e-10	-9.507	-9.545	-0.037	(0)
NH4SO4-	2.768e-10	2.543e-10	-9.558	-9.595	-0.037	(0)
CoSO4	2.363e-10	2.363e-10	-9.626	-9.626	0.000	(0)
Zn (SO4) 2-2	2.035e-10	1.384e-10	-9.691	-9.859	-0.167	(0)
CdSO4	3.658e-11	3.658e-11	-10.437	-10.437	0.000	(0)
AgSO4-	2.753e-12	2.500e-12	-11.560	-11.602	-0.042	(0)
PbSO4	2.081e-12	2.081e-12	-11.682	-11.682	0.000	(0)
Cd (SO4) 2-2	4.099e-13	2.789e-13	-12.387	-12.555	-0.167	(0)
CrOHSO4	2.013e-13	2.013e-13	-12.696	-12.696	0.000	(0)
FeSO4	2.179e-14	2.179e-14	-13.662	-13.662	0.000	(0)
Pb (SO4) 2-2	1.042e-14	7.087e-15	-13.982	-14.150	-0.167	(0)
Ni (SO4) 2-2	8.979e-15	6.108e-15	-14.047	-14.214	-0.167	(0)
UO2SO4	3.288e-16	3.288e-16	-15.483	-15.483	0.000	(0)
CrSO4+	5.116e-17	4.646e-17	-16.291	-16.333	-0.042	(0)
AlSO4+	1.648e-17	1.512e-17	-16.783	-16.820	-0.037	(0)
UO2 (SO4) 2-2	3.600e-18	2.449e-18	-17.444	-17.611	-0.167	(0)
Al (SO4) 2-	9.978e-20	9.157e-20	-19.001	-19.038	-0.037	(0)
VO2SO4-	1.712e-21	1.555e-21	-20.766	-20.808	-0.042	(0)
FeSO4+	1.674e-21	1.538e-21	-20.776	-20.813	-0.037	(0)
Cr2 (OH) 2SO4+2	4.014e-23	2.730e-23	-22.396	-22.564	-0.167	(0)
Fe (SO4) 2-	2.046e-23	1.858e-23	-22.689	-22.731	-0.042	(0)
VOSO4	2.305e-24	2.305e-24	-23.637	-23.637	0.000	(0)
Cr2 (OH) 2 (SO4) 2	9.165e-25	9.165e-25	-24.038	-24.038	0.000	(0)
HgSO4	4.048e-25	4.048e-25	-24.393	-24.393	0.000	(0)
CrO3SO4-2	7.897e-26	5.372e-26	-25.103	-25.270	-0.167	(0)

VSO4+	3.470e-39	3.151e-39	-38.460	-38.502	-0.042	(0)
U(SO4)2	0.000e+00	0.000e+00	-43.783	-43.783	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.268	-44.435	-0.167	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-63.597	-63.638	-0.042	(0)
Sb(3)	2.578e-21					
Sb(OH)3	1.304e-21	1.304e-21	-20.885	-20.885	0.000	(0)
HSbO2	1.273e-21	1.273e-21	-20.895	-20.895	0.000	(0)
SbO2-	4.394e-25	3.990e-25	-24.357	-24.399	-0.042	(0)
Sb(OH)4-	2.517e-25	2.286e-25	-24.599	-24.641	-0.042	(0)
Sb(OH)2F	7.963e-28	7.963e-28	-27.099	-27.099	0.000	(0)
SbOF	7.831e-28	7.831e-28	-27.106	-27.106	0.000	(0)
Sb(OH)2+	1.802e-28	1.636e-28	-27.744	-27.786	-0.042	(0)
SbO+	6.213e-29	5.642e-29	-28.207	-28.249	-0.042	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.523	-320.690	-0.167	(0)
Sb(5)	1.206e-09					
SbO3-	1.204e-09	1.094e-09	-8.919	-8.961	-0.042	(0)
Sb(OH)6-	1.394e-12	1.279e-12	-11.856	-11.893	-0.038	(0)
SbO2+	9.223e-27	8.376e-27	-26.035	-26.077	-0.042	(0)
Se(-2)	1.627e-15					
Ag2Se	1.627e-15	1.627e-15	-14.789	-14.789	0.000	(0)
HSe-	2.310e-39	2.098e-39	-38.636	-38.678	-0.042	(0)
MnSe	0.000e+00	0.000e+00	-41.545	-41.545	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.075	-43.075	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.224	-45.391	-0.167	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-81.990	-82.659	-0.669	(0)
Se(4)	7.169e-09					
SeO3-2	3.635e-09	2.473e-09	-8.439	-8.607	-0.167	(0)
HSeO3-	3.534e-09	3.210e-09	-8.452	-8.494	-0.042	(0)
H2SeO3	7.074e-15	7.074e-15	-14.150	-14.150	0.000	(0)
AgSeO3-	3.881e-16	3.524e-16	-15.411	-15.453	-0.042	(0)
Cd(SeO3)2-2	2.046e-21	1.392e-21	-20.689	-20.856	-0.167	(0)
Ag(SeO3)2-3	1.857e-23	7.803e-24	-22.731	-23.108	-0.376	(0)
FeHSeO3+2	3.024e-27	2.057e-27	-26.519	-26.687	-0.167	(0)
Se(6)	4.475e-12					
SeO4-2	4.473e-12	3.163e-12	-11.349	-11.500	-0.151	(0)
MnSeO4	1.450e-15	1.450e-15	-14.839	-14.839	0.000	(0)
ZnSeO4	1.114e-16	1.114e-16	-15.953	-15.953	0.000	(0)
NiSeO4	4.282e-18	4.282e-18	-17.368	-17.368	0.000	(0)
CoSeO4	3.322e-18	3.322e-18	-17.479	-17.479	0.000	(0)
HSeO4-	9.019e-19	8.191e-19	-18.045	-18.087	-0.042	(0)
CdSeO4	1.626e-19	1.626e-19	-18.789	-18.789	0.000	(0)
Zn(SeO4)2-2	5.253e-28	3.573e-28	-27.280	-27.447	-0.167	(0)
Si	3.148e-04					
H4SiO4	3.055e-04	3.060e-04	-3.515	-3.514	0.001	(0)
H3SiO4-	9.337e-06	8.559e-06	-5.030	-5.068	-0.038	(0)
H2SiO4-2	1.463e-10	1.045e-10	-9.835	-9.981	-0.146	(0)
UO2H3SiO4+	3.076e-13	2.793e-13	-12.512	-12.554	-0.042	(0)
SiF6-2	8.691e-32	6.189e-32	-31.061	-31.208	-0.147	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.428	-60.804	-0.376	(0)
U(4)	3.696e-20					
U(OH)5-	3.696e-20	3.356e-20	-19.432	-19.474	-0.042	(0)
U(OH)4	7.264e-24	7.264e-24	-23.139	-23.139	0.000	(0)
U(OH)3+	1.511e-28	1.372e-28	-27.821	-27.863	-0.042	(0)
U(OH)2+2	4.821e-34	3.279e-34	-33.317	-33.484	-0.167	(0)
UF3+	3.095e-39	2.810e-39	-38.509	-38.551	-0.042	(0)
UF2+2	3.446e-40	2.344e-40	-39.463	-39.630	-0.167	(0)
UOH+3	1.899e-40	0.000e+00	-39.721	-40.098	-0.376	(0)
UF4	0.000e+00	0.000e+00	-40.632	-40.632	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.232	-42.609	-0.376	(0)
UF5-	0.000e+00	0.000e+00	-43.114	-43.156	-0.042	(0)
U(SO4)2	0.000e+00	0.000e+00	-43.783	-43.783	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.268	-44.435	-0.167	(0)
UF6-2	0.000e+00	0.000e+00	-44.630	-44.797	-0.167	(0)
U+4	0.000e+00	0.000e+00	-47.118	-47.788	-0.669	(0)
UCl+3	0.000e+00	0.000e+00	-48.457	-48.833	-0.376	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-176.192	-179.580	-3.388	(0)
U(5)	1.552e-17					

UO2+	1.552e-17	1.409e-17	-16.809	-16.851	-0.042	(0)
U (6)	2.062e-08					
UO2 (CO3) 3-4	1.368e-08	2.929e-09	-7.864	-8.533	-0.669	(0)
UO2 (CO3) 2-2	6.919e-09	4.707e-09	-8.160	-8.327	-0.167	(0)
UO2CO3	1.900e-11	1.900e-11	-10.721	-10.721	0.000	(0)
UO2H3SiO4+	3.076e-13	2.793e-13	-12.512	-12.554	-0.042	(0)
UO2OH+	1.038e-13	9.428e-14	-12.984	-13.026	-0.042	(0)
UO2F+	4.419e-15	4.014e-15	-14.355	-14.396	-0.042	(0)
UO2F2	8.756e-16	8.756e-16	-15.058	-15.058	0.000	(0)
UO2+2	5.436e-16	3.844e-16	-15.265	-15.415	-0.151	(0)
UO2SO4	3.288e-16	3.288e-16	-15.483	-15.483	0.000	(0)
UO2F3-	1.832e-17	1.664e-17	-16.737	-16.779	-0.042	(0)
UO2 (SO4) 2-2	3.600e-18	2.449e-18	-17.444	-17.611	-0.167	(0)
UO2Cl+	1.233e-18	1.119e-18	-17.909	-17.951	-0.042	(0)
(UO2) 2 (OH) 2+2	2.169e-20	1.475e-20	-19.664	-19.831	-0.167	(0)
UO2F4-2	1.470e-20	9.997e-21	-19.833	-20.000	-0.167	(0)
(UO2) 3 (OH) 5+	4.411e-21	4.006e-21	-20.355	-20.397	-0.042	(0)
UO2NO3+	1.276e-25	1.159e-25	-24.894	-24.936	-0.042	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.617	-44.659	-0.042	(0)
V+2	0.000e+00	0.000e+00	-46.291	-46.458	-0.167	(0)
V (3)	7.049e-17					
V (OH) 3	7.049e-17	7.049e-17	-16.152	-16.152	0.000	(0)
V (OH) 2+	2.591e-28	2.354e-28	-27.586	-27.628	-0.042	(0)
VOH+2	1.696e-32	1.154e-32	-31.771	-31.938	-0.167	(0)
V+3	2.811e-38	1.181e-38	-37.551	-37.928	-0.376	(0)
VSO4+	3.470e-39	3.151e-39	-38.460	-38.502	-0.042	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-60.738	-61.114	-0.376	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-62.407	-63.076	-0.669	(0)
V (4)	6.370e-21					
V (OH) 3+	6.338e-21	5.756e-21	-20.198	-20.240	-0.042	(0)
VO+2	2.177e-23	1.481e-23	-22.662	-22.830	-0.167	(0)
VOF+	7.398e-24	6.719e-24	-23.131	-23.173	-0.042	(0)
VOSO4	2.305e-24	2.305e-24	-23.637	-23.637	0.000	(0)
VOF2	1.906e-25	1.906e-25	-24.720	-24.720	0.000	(0)
VOC1+	8.214e-26	7.460e-26	-25.085	-25.127	-0.042	(0)
VOF3-	5.632e-28	5.115e-28	-27.249	-27.291	-0.042	(0)
VOF4-2	2.296e-31	1.562e-31	-30.639	-30.806	-0.167	(0)
H2V2O4+2	2.442e-36	1.661e-36	-35.612	-35.780	-0.167	(0)
V (5)	3.927e-10					
H2VO4-	2.382e-10	2.163e-10	-9.623	-9.665	-0.042	(0)
HVO4-2	1.546e-10	1.051e-10	-9.811	-9.978	-0.167	(0)
H3VO4	1.118e-14	1.118e-14	-13.952	-13.952	0.000	(0)
VO4-3	2.427e-16	1.020e-16	-15.615	-15.991	-0.376	(0)
HV2O7-3	1.834e-17	7.707e-18	-16.737	-17.113	-0.376	(0)
H3V2O7-	1.719e-17	1.561e-17	-16.765	-16.807	-0.042	(0)
V2O7-4	1.875e-19	4.015e-20	-18.727	-19.396	-0.669	(0)
VO2+	1.257e-19	1.153e-19	-18.901	-18.938	-0.038	(0)
VO2F	1.529e-20	1.529e-20	-19.816	-19.816	0.000	(0)
VO2SO4-	1.712e-21	1.555e-21	-20.766	-20.808	-0.042	(0)
VO2F2-	4.624e-22	4.200e-22	-21.335	-21.377	-0.042	(0)
V3O9-3	2.522e-23	1.060e-23	-22.598	-22.975	-0.376	(0)
VO2F3-2	5.825e-25	3.963e-25	-24.235	-24.402	-0.167	(0)
VO2F4-3	3.510e-29	1.475e-29	-28.455	-28.831	-0.376	(0)
VO2NO3	8.810e-30	8.810e-30	-29.055	-29.055	0.000	(0)
V4O12-4	4.464e-30	9.559e-31	-29.350	-30.020	-0.669	(0)
V10O28-6	0.000e+00	0.000e+00	-79.384	-80.890	-1.506	(0)
HV10O28-5	0.000e+00	0.000e+00	-79.944	-80.990	-1.046	(0)
H2V10O28-4	0.000e+00	0.000e+00	-83.400	-84.069	-0.669	(0)
Zn	5.902e-07					
Zn+2	3.217e-07	2.275e-07	-6.493	-6.643	-0.151	(0)
ZnCO3	1.625e-07	1.625e-07	-6.789	-6.789	0.000	(0)
ZnOH+	4.880e-08	4.432e-08	-7.312	-7.353	-0.042	(0)
ZnSO4	2.812e-08	2.812e-08	-7.551	-7.551	0.000	(0)
Zn (OH) 2	1.369e-08	1.369e-08	-7.864	-7.864	0.000	(0)
ZnHCO3+	1.084e-08	9.844e-09	-7.965	-8.007	-0.042	(0)
ZnOHCl	2.617e-09	2.617e-09	-8.582	-8.582	0.000	(0)
ZnCl+	1.119e-09	1.026e-09	-8.951	-8.989	-0.038	(0)

ZnF+	3.781e-10	3.433e-10	-9.422	-9.464	-0.042	(0)
Zn(SO4)2-2	2.035e-10	1.384e-10	-9.691	-9.859	-0.167	(0)
Zn(OH)3-	1.472e-10	1.337e-10	-9.832	-9.874	-0.042	(0)
ZnCl2	2.920e-12	2.920e-12	-11.535	-11.535	0.000	(0)
Zn(OH)4-2	1.524e-14	1.037e-14	-13.817	-13.984	-0.167	(0)
ZnCl3-	4.543e-15	4.165e-15	-14.343	-14.380	-0.038	(0)
ZnSeO4	1.114e-16	1.114e-16	-15.953	-15.953	0.000	(0)
ZnNO3+	9.508e-17	8.635e-17	-16.022	-16.064	-0.042	(0)
ZnCl4-2	5.251e-18	3.739e-18	-17.280	-17.427	-0.147	(0)
Zn(NO3)2	2.603e-27	2.603e-27	-26.584	-26.584	0.000	(0)
Zn(SeO4)2-2	5.253e-28	3.573e-28	-27.280	-27.447	-0.167	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.373	-147.415	-0.042	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.691	-149.691	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.304	-224.345	-0.042	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.871	-226.039	-0.167	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.572	-303.740	-0.167	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-60.98	-54.70	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-45.06	-40.55	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-52.28	-40.55	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-78.79	-60.86	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-59.67	-39.64	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.60	-29.20	0.40	(NH4)2CrO4
(NH4)2SeO4	-26.70	-26.25	0.45	(NH4)2SeO4
Acanthite	-52.74	-88.96	-36.22	Ag2S
Ag2CO3	-13.12	-24.21	-11.09	Ag2CO3
Ag2CrO4	-22.16	-33.75	-11.59	Ag2CrO4
Ag2HVO4	-14.87	-13.39	1.48	Ag2HVO4
Ag2MoO4	-15.01	-26.56	-11.55	Ag2MoO4
Ag2O	-15.31	-2.73	12.57	Ag2O
Ag2Se	-1.00	-49.70	-48.70	Ag2Se
Ag2SeO3	-12.37	-19.52	-7.15	Ag2SeO3
Ag2SeO4	-21.90	-30.81	-8.91	Ag2SeO4
Ag2SO4	-17.74	-22.56	-4.82	Ag2SO4
Ag3AsO3	-28.14	-25.99	2.16	Ag3AsO3
Ag3AsO4	-17.08	-19.87	-2.79	Ag3AsO4
Ag3H2VO5	-19.93	-14.75	5.18	Ag3H2VO5
AgF:4H2O	-14.82	-13.78	1.05	AgF:4H2O
Agmetal	-0.37	-13.87	-13.51	Ag
AgVO3	-12.79	-12.02	0.77	AgVO3
Al(OH)3(am)	-3.40	7.40	10.80	Al(OH)3
Al2(MoO4)3	-59.06	-56.69	2.37	Al2(MoO4)3
Al2O3	-4.86	14.80	19.65	Al2O3
Al4(OH)10SO4	-12.93	9.77	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-13.17	-8.37	4.80	AlAsO4:2H2O
AlOHSO4	-9.19	-12.42	-3.23	AlOHSO4
AlSb	-154.16	-88.53	65.62	AlSb
Alunite	-11.42	-12.82	-1.40	KAl3(SO4)2(OH)6
Anglesite	-6.58	-14.37	-7.79	PbSO4
Anhydrite	-2.42	-6.78	-4.36	CaSO4
Anilite	-55.14	-87.02	-31.88	Cu0.25Cu1.5S
Antlerite	-4.74	4.05	8.79	Cu3(OH)4SO4
Aragonite	-0.14	-8.44	-8.30	CaCO3
Arsenolite	-84.77	-87.53	-2.76	As4O6
Artinite	-5.27	4.33	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.24	-31.53	6.71	As2O5
Atacamite	-2.51	4.88	7.39	Cu2(OH)3Cl
Azurite	-2.18	-19.09	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.46	7.93	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-21.31	-5.44	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	1.18	-7.73	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-30.44	2.50	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.41	-23.08	-9.67	BaCrO4
BaF2	-11.06	-16.88	-5.82	BaF2

BaMoO4	-8.94	-15.90	-6.96	BaMoO4
Barite	-1.91	-11.89	-9.98	BaSO4
BaS	-94.47	-78.29	16.18	BaS
BaSeO3	-10.68	-8.85	1.83	BaSeO3
BaSeO4	-12.68	-20.14	-7.46	BaSeO4
Bianchite	-8.13	-9.89	-1.76	ZnSO4:6H2O
Birnessite	-7.62	10.47	18.09	MnO2
Bixbyite	-3.43	-4.08	-0.64	Mn2O3
BlaubleiI	-55.27	-79.43	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.66	-82.94	-27.28	Cu0.6Cu0.8S
Boehmite	-1.18	7.40	8.58	AlOOH
Breithauptite	-56.86	-75.39	-18.52	NiSb
Brochantite	-3.22	12.01	15.22	Cu4(OH)6SO4
Brucite	-3.94	12.91	16.84	Mg(OH)2
Bunsenite	-4.41	8.04	12.45	NiO
Ca(VO3)2	-13.92	-8.26	5.66	Ca(VO3)2
Ca2V2O7	-12.72	4.78	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.77	4.78	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.71	7.59	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.14	17.82	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.04	17.82	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.71	-152.73	142.97	Ca3Sb2
CaCrO4	-15.71	-17.97	-2.27	CaCrO4
Calcite	0.04	-8.44	-8.48	CaCO3
Calomel	-12.35	-30.26	-17.91	Hg2Cl2
CaMoO4	-2.84	-10.79	-7.95	CaMoO4
Carnotite	-5.09	-4.86	0.23	KUO2VO4
CaSeO3:2H2O	-6.55	-3.74	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-12.01	-15.03	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.04	-3.20	9.84	Cd(BO2)2
Cd(OH)2	-6.63	7.01	13.64	Cd(OH)2
Cd(OH)2(am)	-6.72	7.01	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-25.31	-18.60	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.34	1.22	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.16	8.24	28.40	Cd4(OH)6SO4
CdCl2	-14.39	-15.05	-0.66	CdCl2
CdCl2:1H2O	-13.36	-15.05	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.14	-15.05	-1.91	CdCl2:2.5H2O
CdF2	-16.59	-17.80	-1.21	CdF2
Cdmetal(alpha)	-31.52	-18.00	13.51	Cd
Cdmetal(gamma)	-31.62	-18.00	13.62	Cd
CdMoO4	-2.67	-16.82	-14.15	CdMoO4
CdOHCl	-7.56	-4.02	3.54	CdOHCl
CdSb	-76.06	-76.41	-0.35	CdSb
CdSe	-19.75	-39.95	-20.20	CdSe
CdSeO4:2H2O	-19.21	-21.06	-1.85	CdSeO4:2H2O
CdSO4	-12.63	-12.81	-0.17	CdSO4
CdSO4:1H2O	-11.08	-12.81	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.93	-12.81	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.65	-12.40	-9.75	AgCl
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4(g)	-80.49	-121.54	-41.05	CH4
Chalcanthite	-9.22	-11.86	-2.64	CuSO4:5H2O
Chalcedony	0.04	-3.51	-3.55	SiO2
Chalcocite	-55.02	-89.94	-34.92	Cu2S
Chalcopyrite	-125.45	-160.72	-35.27	CuFeS2
Chrysotile	-0.51	31.69	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.71	-99.40	-45.69	HgS
Claudetite	-84.47	-87.53	-3.06	As4O6
Clausthalite	-14.42	-41.52	-27.10	PbSe
Co(BO2)2	-29.39	-2.32	27.07	Co(BO2)2
Co(OH)2	-5.20	7.89	13.09	Co(OH)2
Co(OH)3	-9.69	-12.00	-2.31	Co(OH)3
CO2(g)	-3.33	-21.48	-18.15	CO2
Co3(AsO4)2	-20.88	-7.85	13.03	Co3(AsO4)2
Co3O4	-5.61	-16.10	-10.50	Co3O4
CoCl2	-22.44	-14.17	8.27	CoCl2
CoCl2:6H2O	-16.71	-14.17	2.54	CoCl2:6H2O

CoCO3	-3.60	-13.58	-9.98	CoCO3
CoF2	-15.32	-16.92	-1.60	CoF2
CoF3	-47.76	-49.22	-1.46	CoF3
CoFe2O4	17.91	14.38	-3.53	CoFe2O4
CoMoO4	-8.17	-15.93	-7.76	CoMoO4
CoO	-5.69	7.89	13.59	CoO
CoS (alpha)	-70.89	-78.33	-7.44	CoS
CoS (beta)	-67.26	-78.33	-11.07	CoS
CoSe	-22.87	-39.07	-16.20	CoSe
CoSeO3	-10.21	-8.89	1.32	CoSeO3
CoSeO4:6H2O	-18.65	-20.18	-1.53	CoSeO4:6H2O
CoSO4	-14.73	-11.93	2.80	CoSO4
CoSO4:6H2O	-9.45	-11.93	-2.47	CoSO4:6H2O
Cotunnite	-11.84	-16.62	-4.78	PbCl2
Covellite	-55.96	-78.26	-22.30	CuS
Cr (OH) 2	-21.54	-10.72	10.82	Cr (OH) 2
Cr (OH) 3	-2.50	-1.16	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.41	-1.16	-0.75	Cr (OH) 3
Cr2O3	0.03	-2.32	-2.36	Cr2O3
CrCl2	-46.88	-32.79	14.09	CrCl2
CrCl3	-49.37	-34.26	15.11	CrCl3
CrF3	-27.05	-38.39	-11.34	CrF3
Cristobalite	-0.16	-3.51	-3.35	SiO2
Crmetal	-66.22	-35.74	30.48	Cr
CrO3	-27.81	-31.02	-3.21	CrO3
Cryolite	-15.83	-49.67	-33.84	Na3AlF6
Cu (OH) 2	-0.72	7.96	8.67	Cu (OH) 2
Cu (SbO3) 2	-28.99	16.22	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.44	-2.19	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.95	-89.83	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.89	-50.69	-45.80	Cu2Se
Cu2SO4	-21.59	-23.54	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.76	-7.66	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.92	-101.51	-42.59	Cu3Sb
Cu3Se2	-26.20	-89.69	-63.49	Cu3Se2
CuCO3	-2.02	-13.52	-11.50	CuCO3
CuCrO4	-17.62	-23.06	-5.44	CuCrO4
CuF	-9.36	-14.27	-4.91	CuF
CuF2	-17.97	-16.86	1.12	CuF2
CuF2:2H2O	-12.31	-16.86	-4.55	CuF2:2H2O
Cumetal	-5.61	-14.37	-8.76	Cu
CuMoO4	-2.80	-15.87	-13.08	CuMoO4
CuOCuSO4	-14.21	-3.91	10.30	CuOCuSO4
Cupricferrite	8.46	14.45	5.99	CuFe2O4
Cuprite	-2.31	-3.72	-1.41	Cu2O
Cuprousferrite	10.30	1.38	-8.92	CuFeO2
CuSe	-5.91	-39.01	-33.10	CuSe
CuSe2	-27.59	-60.96	-33.37	CuSe2
CuSeO3:2H2O	-9.34	-8.82	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.68	-20.12	-2.44	CuSeO4:5H2O
CuSO4	-14.80	-11.86	2.94	CuSO4
Diaspore	0.52	7.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.47	-17.01	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.08	-17.01	-17.09	CaMg (CO3) 2
Epsomite	-4.79	-6.92	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.79	3.77	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	2.98	-0.06	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-13.81	-17.53	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-11.84	-10.29	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-23.22	-43.85	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-49.24	-52.97	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.96	10.26	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.92	-12.52	0.40	FeAsO4:2H2O
FeCr2O4	-5.75	1.45	7.20	FeCr2O4
FeMoO4	-9.97	-20.06	-10.09	FeMoO4
Ferrihydrite	0.05	3.24	3.19	Fe (OH) 3
Ferroselite	-46.55	-65.15	-18.60	FeSe2

FeS (ppt)	-79.50	-82.45	-2.95	FeS
FeSe	-32.20	-43.20	-11.00	FeSe
Fix_pe	-4.22	-4.22	0.00	e-
Fluorite	-1.27	-11.77	-10.50	CaF2
Galena	-66.80	-80.77	-13.97	PbS
Gibbsite	-0.89	7.40	8.29	Al (OH) 3
Goethite	2.75	3.24	0.49	FeOOH
Goslarite	-7.88	-9.89	-2.01	ZnSO4:7H2O
Greenalite	-16.53	4.28	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.85	-79.21	-14.36	CdS
Greigite	-289.59	-334.62	-45.03	Fe3S4
Gummite	-6.51	1.16	7.67	UO3
Gypsum	-2.17	-6.78	-4.61	CaSO4:2H2O
H-Jarosite	-17.81	-29.91	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.95	-23.83	-12.88	H2MoO4
H2S (g)	-78.21	-86.22	-8.01	H2S
H2Se (g)	-42.00	-46.96	-4.96	H2Se
Halite	-6.84	-5.24	1.60	NaCl
Halloysite	-1.81	7.77	9.57	Al2Si2O5 (OH) 4
Hausmannite	-3.60	57.43	61.03	Mn3O4
Hematite	7.91	6.49	-1.42	Fe2O3
Hercynite	-4.33	18.56	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.55	-256.26	-73.71	Hg (CH3) 2
Hg (g)	-8.73	-16.61	-7.87	Hg
Hg (OH) 2	-9.69	-13.18	-3.50	Hg (OH) 2
Hg2 (g)	-18.26	-33.21	-14.96	Hg2
Hg2 (OH) 2	-13.46	-8.20	5.26	Hg2 (OH) 2
Hg2CO3	-13.63	-29.68	-16.05	Hg2CO3
Hg2CrO4	-30.51	-39.21	-8.70	Hg2CrO4
Hg2F2	-22.65	-33.01	-10.36	Hg2F2
Hg2S	-82.74	-94.42	-11.68	Hg2S
Hg2SeO3	-20.32	-24.98	-4.66	Hg2SeO3
Hg2SO4	-21.89	-28.02	-6.13	Hg2SO4
Hg3O2CO3	-31.35	-61.03	-29.68	Hg3O2CO3
HgCl (g)	-34.63	-15.13	19.50	HgCl
HgCl2	-13.99	-35.25	-21.26	HgCl2
HgF (g)	-49.18	-16.51	32.68	HgF
HgF2 (g)	-50.56	-38.00	12.57	HgF2
Hgmetal (l)	-3.15	-16.61	-13.45	Hg
HgSe	-4.45	-60.15	-55.69	HgSe
HgSeO3	-17.53	-29.96	-12.43	HgSeO3
HgSO4	-23.59	-33.00	-9.42	HgSO4
Huntite	-4.19	-34.16	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-7.84	-26.61	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.62	-21.39	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-22.45	-27.62	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-10.48	-25.28	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.53	-52.77	-17.24	K2Cr2O7
K2CrO4	-21.24	-21.76	-0.51	K2CrO4
K2MoO4	-17.83	-14.57	3.26	K2MoO4
K2SeO4	-18.08	-18.81	-0.73	K2SeO4
Kaolinite	0.33	7.77	7.43	Al2Si2O5 (OH) 4
Langite	-5.48	12.01	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-8.49	-8.92	-0.43	PbO:PbSO4
Laurionite	-6.21	-5.58	0.62	PbOHCl
Lepidocrocite	1.87	3.24	1.37	FeOOH
Lime	-19.66	13.04	32.70	CaO
Litharge	-7.24	5.45	12.69	PbO
Mackinawite	-78.85	-82.45	-3.60	FeS
Maghemite	0.10	6.49	6.39	Fe2O3
Magnesioferrite	2.54	19.40	16.86	Fe2MgO4
Magnesite	-1.11	-8.57	-7.46	MgCO3
Magnetite	6.86	10.26	3.40	Fe3O4
Malachite	-0.26	-5.57	-5.31	Cu2 (OH) 2CO3
Manganite	-2.03	23.31	25.34	MnOOH
Massicot	-7.44	5.45	12.89	PbO
Matlockite	-9.02	-17.99	-8.97	PbClF
Melanothallite	-20.37	-14.11	6.26	CuCl2

Melanterite	-13.84	-16.05	-2.21	FeSO4:7H2O
Metacinnabar	-54.31	-99.40	-45.09	HgS
Mg(OH)2(active)	-5.89	12.91	18.79	Mg(OH)2
Mg(VO3)2	-19.68	-8.40	11.28	Mg(VO3)2
Mg2Sb3	-274.12	-199.44	74.68	Mg2Sb3
Mg2V2O7	-21.85	4.51	26.36	Mg2V2O7
MgCr2O4	-5.62	10.58	16.20	MgCr2O4
MgCrO4	-23.49	-18.11	5.38	MgCrO4
MgF2	-3.78	-11.91	-8.13	MgF2
MgMoO4	-9.07	-10.92	-1.85	MgMoO4
MgSeO3:6H2O	-6.93	-3.87	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.97	-15.17	-1.20	MgSeO4:6H2O
Minium	-32.16	41.36	73.52	Pb3O4
Mirabilite	-7.12	-8.24	-1.11	Na2SO4:10H2O
Mn(VO3)2	-15.40	-10.50	4.90	Mn(VO3)2
Mn2(SO4)3	-57.83	-63.54	-5.71	Mn2(SO4)3
Mn2Sb	-147.91	-86.83	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.62	0.88	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.98	-11.26	2.72	MnCl2:4H2O
MnS(grn)	-75.59	-75.42	0.17	MnS
MnS(pnk)	-78.76	-75.42	3.34	MnS
MnSb	-95.06	-97.97	-2.91	MnSb
MnSe	-39.66	-36.16	3.50	MnSe
MnSeO3	-7.11	-5.98	1.13	MnSeO3
MnSeO3:2H2O	-6.96	-5.98	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.22	-17.27	-2.05	MnSeO4:5H2O
MnSO4	-11.60	-9.02	2.58	MnSO4
Monteponite	-8.09	7.01	15.10	CdO
Montroydite	-9.54	-13.18	-3.64	HgO
MoO3	-15.83	-23.83	-8.00	MoO3
Morenosite	-9.64	-11.79	-2.14	NiSO4:7H2O
MoS2	-151.03	-221.29	-70.26	MoS2
Na-Jarosite	-12.92	-24.12	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.55	-50.45	-9.90	Na2Cr2O7
Na2CrO4	-22.36	-19.43	2.93	Na2CrO4
Na2Mo2O7	-19.48	-36.08	-16.60	Na2Mo2O7
Na2MoO4	-13.74	-12.25	1.49	Na2MoO4
Na2MoO4:2H2O	-13.47	-12.25	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.50	-5.20	10.30	Na2SeO3:5H2O
Na2SeO4	-17.77	-16.49	1.28	Na2SeO4
Na3Sb	-173.01	-78.55	94.45	Na3Sb
Na3VO4	-29.96	6.72	36.68	Na3VO4
Na4V2O7	-35.54	1.86	37.40	Na4V2O7
Nantokite	-6.16	-12.89	-6.73	CuCl
NaSb	-88.29	-65.12	23.17	NaSb
Natron	-8.59	-9.90	-1.31	Na2CO3:10H2O
NaVO3	-8.72	-4.86	3.86	NaVO3
Nesquehonite	-3.90	-8.57	-4.67	MgCO3:3H2O
Ni(OH)2	-4.76	8.03	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.13	-7.43	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.68	12.32	32.00	Ni4(OH)6SO4
NiCO3	-6.57	-13.44	-6.87	NiCO3
NiMoO4	-4.65	-15.79	-11.14	NiMoO4
NiS(alpha)	-72.59	-78.19	-5.60	NiS
NiS(beta)	-67.09	-78.19	-11.10	NiS
NiS(gamma)	-65.39	-78.19	-12.80	NiS
NiSe	-21.23	-38.93	-17.70	NiSe
NiSeO3:2H2O	-11.56	-8.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.52	-20.04	-1.52	NiSeO4:6H2O
Nsutite	-7.03	10.47	17.50	MnO2
O2(g)	-33.06	50.03	83.09	O2
Orpiment	-241.36	-302.43	-61.07	As2S3
Otavite	-2.46	-14.46	-12.00	CdCO3
Pb(BO2)2	-11.28	-4.77	6.52	Pb(BO2)2
Pb(OH)2	-2.70	5.45	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-65.62	-74.38	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.93	-0.13	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.29	10.90	26.19	Pb2O(OH)2

Pb2O3	-25.13	35.91	61.04	Pb2O3
Pb2OCO3	-10.02	-10.58	-0.56	Pb2OCO3
Pb2V2O7	-8.50	-10.40	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.98	-15.18	5.80	Pb3(AsO4)2
Pb3(VO4)2	-11.09	-4.95	6.14	Pb3(VO4)2
Pb3O2CO3	-16.15	-5.13	11.02	Pb3O2CO3
Pb3O2SO4	-14.16	-3.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-19.12	1.98	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.90	1.98	21.88	Pb4O3SO4
PbCrO4	-12.97	-25.57	-12.60	PbCrO4
PbF2	-11.93	-19.37	-7.44	PbF2
Pbmetal	-23.81	-19.57	4.25	Pb
PbMoO4	-2.76	-18.38	-15.62	PbMoO4
PbO:0.3H2O	-7.53	5.45	12.98	PbO:0.33H2O
PbSeO4	-15.78	-22.62	-6.84	PbSeO4
Periclase	-8.68	12.91	21.58	MgO
Phosgenite	-12.84	-32.65	-19.81	PbCl2:PbCO3
Plattnerite	-19.14	30.46	49.60	PbO2
Portlandite	-9.76	13.04	22.80	Ca(OH)2
Pyrite	-125.15	-143.66	-18.51	FeS2
Pyrochroite	-4.39	10.80	15.19	Mn(OH)2
Pyrolusite	-5.56	35.82	41.38	MnO2
Quartz	0.49	-3.51	-4.00	SiO2
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-9.75	-11.79	-2.04	NiSO4:6H2O
Rhodochrosite	-0.09	-10.67	-10.58	MnCO3
Rutherfordine	-5.82	-20.32	-14.50	UO2CO3
Sb(OH)3	-13.77	-20.88	-7.11	Sb(OH)3
Sb2O4	-20.16	-16.75	3.40	Sb2O4
Sb2O5	-30.69	-40.36	-9.67	Sb2O5
Sb2Se3	-114.91	-182.66	-67.76	Sb2Se3
Sb4O6(cubic)	-65.28	-83.54	-18.26	Sb4O6
Sb4O6(orth)	-65.64	-83.54	-17.90	Sb4O6
SbCl3	-54.55	-53.98	0.57	SbCl3
SbF3	-47.88	-58.11	-10.23	SbF3
Sbmetal	-46.72	-58.41	-11.69	Sb
SbO2	-4.86	-32.69	-27.82	SbO2
Schoepite	-4.84	1.16	5.99	UO2(OH)2:H2O
Semetal(am)	-14.84	-21.95	-7.11	Se
Semetal(hex)	-14.24	-21.95	-7.71	Se
Senarmontite	-29.40	-41.77	-12.37	Sb2O3
SeO2	-16.90	-16.78	0.12	SeO2
SeO3	-49.12	-28.07	21.04	SeO3
Sepiolite	-0.49	15.27	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.51	15.27	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.47	-17.71	-10.24	FeCO3
SiO2(am-gel)	-0.80	-3.51	-2.71	SiO2
SiO2(am-ppt)	-0.77	-3.51	-2.74	SiO2
Smithsonite	-1.55	-11.55	-10.00	ZnCO3
Sphalerite	-64.84	-76.29	-11.45	ZnS
Spinel	-9.15	27.70	36.85	MgAl2O4
Stibnite	-249.97	-300.43	-50.46	Sb2S3
Sulfur	-59.06	-61.21	-2.14	S
Tenorite	0.31	7.96	7.64	CuO
Thenardite	-8.56	-8.24	0.32	Na2SO4
Thermonatrite	-10.53	-9.90	0.64	Na2CO3:H2O
Tyuyamunite	-10.03	-5.95	4.08	Ca(UO2)2(VO4)2
U3O8	-14.98	6.11	21.08	U3O8
U3Sb4	-580.02	-427.64	152.38	U3Sb4
U4O9	-30.53	-33.55	-3.02	U4O9
UF4	-34.74	-64.27	-29.54	UF4
UF4:2.5H2O	-31.55	-64.27	-32.72	UF4:2.5H2O
UO2(am)	-15.57	-14.64	0.93	UO2
UO2(NO3)2	-47.20	-35.06	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-39.91	-35.06	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-38.45	-35.06	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-37.10	-35.06	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.45	1.16	5.61	UO2(OH)2

UO2SeO4:4H2O	-24.67	-26.92	-2.25	UO2SeO4:4H2O
UO3	-6.54	1.16	7.70	UO3
Uraninite	-9.97	-14.64	-4.67	UO2
USb2	-220.28	-190.70	29.58	USb2
V(OH)3	-20.66	-13.07	7.59	V(OH)3
V2O5	-19.94	-21.30	-1.36	V2O5
V3O5	-45.62	-43.78	1.84	V3O5
V4O7	-57.23	-50.04	7.19	V4O7
V6O13	-53.08	-113.94	-60.86	V6O13
Valentinite	-33.29	-41.77	-8.48	Sb2O3
VC12	-66.51	-47.64	18.87	VC12
VC13	-69.60	-46.17	23.43	VC13
VF4	-70.82	-55.89	14.93	VF4
Vmetal	-94.62	-50.59	44.03	V
VO	-40.33	-25.57	14.76	VO
VO(OH)2	-11.41	-6.26	5.15	VO(OH)2
VO2Cl	-24.53	-21.68	2.84	VO2Cl
VOC1	-35.25	-24.10	11.15	VOC1
VOC12	-41.08	-28.32	12.76	VOC12
VOSO4	-29.69	-26.08	3.61	VOSO4
Witherite	-4.98	-13.55	-8.57	BaCO3
Wurtzite	-67.34	-76.29	-8.95	ZnS
Zincite	-1.40	9.93	11.33	ZnO
Zincosite	-13.82	-9.89	3.93	ZnSO4
Zn(BO2)2	-8.57	-0.28	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-29.60	-26.28	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.27	9.93	12.20	Zn(OH)2
Zn(OH)2(am)	-2.54	9.93	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.82	9.93	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.60	9.93	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.80	9.93	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.46	0.04	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.36	8.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.39	-1.74	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.76	-9.85	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.50	19.90	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.91	27.59	38.50	Zn5(OH)8Cl2
ZnCl2	-19.18	-12.13	7.05	ZnCl2
ZnCO3:1H2O	-1.29	-11.55	-10.26	ZnCO3:1H2O
ZnF2	-14.35	-14.89	-0.53	ZnF2
Znmetal	-40.87	-15.08	25.79	Zn
ZnMoO4	-3.77	-13.90	-10.13	ZnMoO4
ZnO(active)	-1.26	9.93	11.19	ZnO
ZnS(am)	-67.24	-76.29	-9.05	ZnS
ZnSb	-84.51	-73.49	11.01	ZnSb
ZnSe	-22.63	-37.03	-14.40	ZnSe
ZnSeO4:6H2O	-16.62	-18.14	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.25	-9.89	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 65.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0
EQUILIBRIUM_PHASES 305
  Ag2Se 0 0
  Alunite 0 0

```

```

Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 313
SAVE Solution 314 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 305
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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```

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 313. Solution after simulation 64.
Using pure phase assemblage 305.

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta

Ag2Se	-2.54	-51.24	-48.70	0.000e+00	0	0.000e+00
Alunite	-12.03	-13.43	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-2.50	-6.86	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	6.590e-10	6.590e-10
Barite	-2.30	-12.28	-9.98	0.000e+00	0	0.000e+00
Brochantite	-2.79	12.43	15.22	0.000e+00	0	0.000e+00
Brucite	-3.75	13.09	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.296e-04
CaMoO4	-2.92	-10.87	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.59	-3.77	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	8.262e-05	8.262e-05
Carnotite	-5.02	-4.79	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-12.86	-3.02	9.84	0.000e+00	0	0.000e+00
CdMoO4	-2.67	-16.82	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	0.000e+00	6.298e-06	6.298e-06
Cr2O3	0.00	-2.36	-2.36	0.000e+00	4.787e-11	4.787e-11
Cu2Se(alpha)	-6.85	-52.65	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-2.85	-15.92	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.81	-6.93	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	1.219e-10	1.219e-10
Fluorite	-1.35	-11.85	-10.50	0.000e+00	0	0.000e+00
Gummite	-6.40	1.27	7.67	0.000e+00	0	0.000e+00
Gypsum	-2.25	-6.86	-4.61	0.000e+00	0	0.000e+00
HgSe	-5.67	-61.37	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-7.12	-8.23	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.05	-5.92	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.56	8.24	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.13	-7.43	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.54	-13.41	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.65	-15.80	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-7.523e-08
Otavite	-2.43	-14.43	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-2.80	-18.42	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.88	-20.38	-14.50	0.000e+00	0	0.000e+00
SbO2	-5.23	-33.06	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.73	1.27	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.19	15.57	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-0.80	-3.54	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-9.97	-5.89	4.08	0.000e+00	0	0.000e+00
U3O8	-15.17	5.91	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.34	1.27	5.61	0.000e+00	0	0.000e+00
UO3	-6.43	1.27	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.80	-13.92	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	1.198e-09	1.198e-09
Al	1.084e-07	1.085e-07
As	4.842e-09	4.843e-09
B	8.780e-06	8.780e-06
Ba	1.311e-09	1.311e-09
C	1.333e-03	1.333e-03
Ca	3.850e-04	3.851e-04
Cd	5.691e-10	5.691e-10
Cl	1.958e-03	1.958e-03
Co	4.125e-09	4.126e-09
Cr	6.075e-10	6.076e-10
Cu	2.119e-07	2.119e-07
F	8.490e-05	8.491e-05
Fe	7.094e-10	7.094e-10
Hg	9.146e-11	9.147e-11
K	2.412e-04	2.413e-04
Mg	3.148e-04	3.149e-04
Mn	2.744e-06	2.745e-06

Mo	7.840e-08	7.841e-08
N	6.441e-07	6.442e-07
Na	3.504e-03	3.504e-03
Ni	6.409e-09	6.409e-09
Pb	3.600e-10	3.600e-10
S	8.711e-04	8.711e-04
Sb	1.206e-09	1.206e-09
Se	7.174e-09	7.174e-09
Si	3.022e-04	3.023e-04
U	2.062e-08	2.062e-08
V	3.927e-10	3.928e-10
Zn	5.902e-07	5.902e-07

-----Description of solution-----

	pH	=	8.391	Charge balance
	pe	=	4.382	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.459e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.366e-03	
	Total CO2 (mol/kg)	=	1.333e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.622e-08	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	21	
	Total H	=	1.110252e+02	
	Total O	=	5.552004e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.698e-06	2.475e-06	-5.569	-5.607	-0.038	(0)
H+	4.430e-09	4.069e-09	-8.354	-8.391	-0.037	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.198e-09					
AgCl	8.136e-10	8.136e-10	-9.090	-9.090	0.000	(0)
Ag+	2.412e-10	2.216e-10	-9.618	-9.655	-0.037	(0)
AgCl2-	1.400e-10	1.274e-10	-9.854	-9.895	-0.041	(0)
AgSO4-	2.786e-12	2.535e-12	-11.555	-11.596	-0.041	(0)
AgCl3-2	2.979e-13	2.043e-13	-12.526	-12.690	-0.164	(0)
AgOH	5.483e-14	5.483e-14	-13.261	-13.261	0.000	(0)
AgF	4.224e-14	4.224e-14	-13.374	-13.374	0.000	(0)
AgNO2	2.726e-14	2.726e-14	-13.565	-13.565	0.000	(0)
AgH2BO3	3.799e-15	3.799e-15	-14.420	-14.420	0.000	(0)
AgCl4-3	1.754e-15	7.500e-16	-14.756	-15.125	-0.369	(0)
AgSeO3-	4.338e-16	3.947e-16	-15.363	-15.404	-0.041	(0)
AgNH3+	5.067e-17	4.611e-17	-16.295	-16.336	-0.041	(0)
Ag2Se	4.685e-17	4.685e-17	-16.329	-16.329	0.000	(0)
Ag(OH) 2-	1.457e-17	1.326e-17	-16.837	-16.878	-0.041	(0)
AgNO3	9.776e-20	9.776e-20	-19.010	-19.010	0.000	(0)
Ag(NO2) 2-	2.732e-20	2.486e-20	-19.564	-19.605	-0.041	(0)
Ag(NH3) 2+	4.198e-23	3.820e-23	-22.377	-22.418	-0.041	(0)
Ag(SeO3) 2-3	2.291e-23	9.797e-24	-22.640	-23.009	-0.369	(0)
Ag2MoO4	1.036e-27	1.036e-27	-26.984	-26.984	0.000	(0)
AgHS	0.000e+00	0.000e+00	-75.991	-75.991	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-84.980	-85.636	-0.656	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-151.017	-151.135	-0.117	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-151.951	-152.184	-0.233	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-152.001	-152.042	-0.041	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.269	-152.495	-0.226	(0)
Al	1.084e-07					
Al(OH) 4-	1.081e-07	9.937e-08	-6.966	-7.003	-0.037	(0)
Al(OH) 3	3.190e-10	3.190e-10	-9.496	-9.496	0.000	(0)
Al(OH) 2+	7.017e-12	6.461e-12	-11.154	-11.190	-0.036	(0)

AlF2+	3.308e-14	3.046e-14	-13.480	-13.516	-0.036	(0)
AlF3	2.910e-14	2.910e-14	-13.536	-13.536	0.000	(0)
AlOH+2	4.574e-15	3.287e-15	-14.340	-14.483	-0.144	(0)
AlF+2	1.403e-15	1.008e-15	-14.853	-14.997	-0.144	(0)
AlF4-	1.204e-15	1.107e-15	-14.919	-14.956	-0.037	(0)
AlSO4+	6.433e-18	5.913e-18	-17.192	-17.228	-0.037	(0)
Al+3	2.857e-18	1.328e-18	-17.544	-17.877	-0.333	(0)
Al (SO4) 2-	3.953e-20	3.633e-20	-19.403	-19.440	-0.037	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-56.380	-56.749	-0.369	(0)
As (3)	2.173e-23					
H3AsO3	1.909e-23	1.909e-23	-22.719	-22.719	0.000	(0)
H2AsO3-	2.644e-24	2.406e-24	-23.578	-23.619	-0.041	(0)
HAsO3-2	7.868e-28	5.394e-28	-27.104	-27.268	-0.164	(0)
H4AsO3+	4.229e-32	3.848e-32	-31.374	-31.415	-0.041	(0)
AsO3-3	1.195e-32	5.110e-33	-31.923	-32.292	-0.369	(0)
As (5)	4.842e-09					
HAsO4-2	4.705e-09	3.225e-09	-8.327	-8.491	-0.164	(0)
H2AsO4-	1.315e-10	1.197e-10	-9.881	-9.922	-0.041	(0)
AsO4-3	5.862e-12	2.507e-12	-11.232	-11.601	-0.369	(0)
H3AsO4	8.449e-17	8.462e-17	-16.073	-16.073	0.001	(0)
B	8.780e-06					
H3BO3	7.567e-06	7.578e-06	-5.121	-5.120	0.001	(0)
H2BO3-	1.182e-06	1.082e-06	-5.927	-5.966	-0.038	(0)
CaH2BO3+	1.654e-08	1.514e-08	-7.781	-7.820	-0.038	(0)
MgH2BO3+	8.353e-09	7.645e-09	-8.078	-8.117	-0.038	(0)
NaH2BO3	5.495e-09	5.495e-09	-8.260	-8.260	0.000	(0)
BF (OH) 3-	2.508e-10	2.295e-10	-9.601	-9.639	-0.038	(0)
H5 (BO3) 2-	7.624e-12	6.978e-12	-11.118	-11.156	-0.038	(0)
BaH2BO3+	3.361e-14	3.076e-14	-13.474	-13.512	-0.038	(0)
BF2 (OH) 2-	8.279e-15	7.577e-15	-14.082	-14.120	-0.038	(0)
H8 (BO3) 3-	5.777e-15	5.288e-15	-14.238	-14.277	-0.038	(0)
AgH2BO3	3.799e-15	3.799e-15	-14.420	-14.420	0.000	(0)
BF3OH-	9.947e-22	9.104e-22	-21.002	-21.041	-0.038	(0)
BF4-	1.511e-27	1.383e-27	-26.821	-26.859	-0.038	(0)
Ba	1.311e-09					
Ba+2	1.293e-09	9.202e-10	-8.888	-9.036	-0.148	(0)
BaHCO3+	1.127e-11	1.038e-11	-10.948	-10.984	-0.035	(0)
BaCO3	6.426e-12	6.426e-12	-11.192	-11.192	0.000	(0)
BaH2BO3+	3.361e-14	3.076e-14	-13.474	-13.512	-0.038	(0)
BaOH+	1.080e-14	9.940e-15	-13.966	-14.003	-0.036	(0)
BaNO3+	2.816e-18	2.562e-18	-17.550	-17.591	-0.041	(0)
BaNH3+2	8.632e-20	5.918e-20	-19.064	-19.228	-0.164	(0)
C (4)	1.333e-03					
HCO3-	1.283e-03	1.182e-03	-2.892	-2.928	-0.036	(0)
CO3-2	1.914e-05	1.362e-05	-4.718	-4.866	-0.148	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	5.805e-06	5.351e-06	-5.236	-5.272	-0.035	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgHCO3+	2.684e-06	2.465e-06	-5.571	-5.608	-0.037	(0)
MgCO3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
NaHCO3	2.130e-06	2.130e-06	-5.672	-5.672	0.000	(0)
NaCO3-	8.826e-07	8.127e-07	-6.054	-6.090	-0.036	(0)
CuCO3	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
ZnCO3	1.683e-07	1.683e-07	-6.774	-6.774	0.000	(0)
MnHCO3+	4.399e-08	4.047e-08	-7.357	-7.393	-0.036	(0)
UO2 (CO3) 3-4	1.399e-08	3.091e-09	-7.854	-8.510	-0.656	(0)
Cu (CO3) 2-2	9.211e-09	6.314e-09	-8.036	-8.200	-0.164	(0)
ZnHCO3+	8.820e-09	8.025e-09	-8.055	-8.096	-0.041	(0)
UO2 (CO3) 2-2	6.607e-09	4.529e-09	-8.180	-8.344	-0.164	(0)
NiCO3	1.456e-09	1.456e-09	-8.837	-8.837	0.000	(0)
CoCO3	4.801e-10	4.801e-10	-9.319	-9.319	0.000	(0)
NiHCO3+	4.590e-10	4.176e-10	-9.338	-9.379	-0.041	(0)
PbCO3	2.763e-10	2.763e-10	-9.559	-9.559	0.000	(0)
CoHCO3+	2.107e-10	1.917e-10	-9.676	-9.717	-0.041	(0)
CuHCO3+	1.761e-10	1.602e-10	-9.754	-9.795	-0.041	(0)
CdCO3	8.451e-11	8.451e-11	-10.073	-10.073	0.000	(0)
UO2CO3	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
Pb (CO3) 2-2	1.583e-11	1.085e-11	-10.801	-10.965	-0.164	(0)

		BaHCO3+	1.127e-11	1.038e-11	-10.948	-10.984	-0.035	(0)
		PbHCO3+	6.514e-12	5.927e-12	-11.186	-11.227	-0.041	(0)
		BaCO3	6.426e-12	6.426e-12	-11.192	-11.192	0.000	(0)
		Cd (CO3) 2-2	1.244e-12	8.530e-13	-11.905	-12.069	-0.164	(0)
		CdHCO3+	8.050e-13	7.325e-13	-12.094	-12.135	-0.041	(0)
		FeHCO3+	7.543e-16	6.953e-16	-15.122	-15.158	-0.035	(0)
		HgCO3	9.342e-17	9.342e-17	-16.030	-16.030	0.000	(0)
		Hg (CO3) 2-2	5.868e-18	4.023e-18	-17.232	-17.395	-0.164	(0)
		HgHCO3+	7.778e-21	7.078e-21	-20.109	-20.150	-0.041	(0)
Ca	3.850e-04							
		Ca+2	3.418e-04	2.432e-04	-3.466	-3.614	-0.148	(0)
		CaSO4	3.195e-05	3.195e-05	-4.496	-4.496	0.000	(0)
		CaHCO3+	5.805e-06	5.351e-06	-5.236	-5.272	-0.035	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.190e-07	2.014e-07	-6.660	-6.696	-0.036	(0)
		CaH2BO3+	1.654e-08	1.514e-08	-7.781	-7.820	-0.038	(0)
		CaOH+	1.303e-08	1.201e-08	-7.885	-7.921	-0.035	(0)
		CaNO3+	4.695e-13	4.272e-13	-12.328	-12.369	-0.041	(0)
		CaNH3+2	4.552e-14	3.120e-14	-13.342	-13.506	-0.164	(0)
		Ca (NH3) 2+2	1.847e-24	1.266e-24	-23.734	-23.898	-0.164	(0)
Cd	5.691e-10							
		Cd+2	3.827e-10	2.723e-10	-9.417	-9.565	-0.148	(0)
		CdCO3	8.451e-11	8.451e-11	-10.073	-10.073	0.000	(0)
		CdCl+	5.139e-11	4.676e-11	-10.289	-10.330	-0.041	(0)
		CdSO4	3.660e-11	3.660e-11	-10.436	-10.436	0.000	(0)
		CdOH+	5.882e-12	5.352e-12	-11.230	-11.271	-0.041	(0)
		CdOHC1	4.747e-12	4.747e-12	-11.324	-11.324	0.000	(0)
		Cd (CO3) 2-2	1.244e-12	8.530e-13	-11.905	-12.069	-0.164	(0)
		CdHCO3+	8.050e-13	7.325e-13	-12.094	-12.135	-0.041	(0)
		Cd (SO4) 2-2	4.130e-13	2.831e-13	-12.384	-12.548	-0.164	(0)
		CdF+	3.599e-13	3.275e-13	-12.444	-12.485	-0.041	(0)
		CdCl2	3.506e-13	3.506e-13	-12.455	-12.455	0.000	(0)
		Cd (OH) 2	8.356e-14	8.356e-14	-13.078	-13.078	0.000	(0)
		CdCl3-	4.372e-16	3.978e-16	-15.359	-15.400	-0.041	(0)
		CdF2	4.960e-17	4.960e-17	-16.305	-16.305	0.000	(0)
		Cd (OH) 3-	1.388e-17	1.263e-17	-16.857	-16.898	-0.041	(0)
		CdSeO4	6.089e-19	6.089e-19	-18.215	-18.215	0.000	(0)
		CdNO3+	5.257e-19	4.783e-19	-18.279	-18.320	-0.041	(0)
		Cd2OH+3	1.708e-20	7.304e-21	-19.768	-20.136	-0.369	(0)
		Cd (SeO3) 2-2	2.515e-21	1.724e-21	-20.599	-20.763	-0.164	(0)
		Cd (OH) 4-2	7.464e-24	5.117e-24	-23.127	-23.291	-0.164	(0)
		Cd (NO3) 2	1.332e-28	1.332e-28	-27.876	-27.876	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-81.667	-81.708	-0.041	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-154.655	-154.655	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-232.865	-232.906	-0.041	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-310.696	-310.860	-0.164	(0)
Cl	1.958e-03							
		Cl-	1.958e-03	1.798e-03	-2.708	-2.745	-0.037	(0)
		MnCl+	4.224e-09	3.886e-09	-8.374	-8.410	-0.036	(0)
		ZnOHC1	3.143e-09	3.143e-09	-8.503	-8.503	0.000	(0)
		ZnCl+	1.057e-09	9.702e-10	-8.976	-9.013	-0.037	(0)
		AgCl	8.136e-10	8.136e-10	-9.090	-9.090	0.000	(0)
		AgCl2-	1.400e-10	1.274e-10	-9.854	-9.895	-0.041	(0)
		CuCl	9.892e-11	9.892e-11	-10.005	-10.005	0.000	(0)
		CdCl+	5.139e-11	4.676e-11	-10.289	-10.330	-0.041	(0)
		CuCl2-	4.048e-11	3.717e-11	-10.393	-10.430	-0.037	(0)
		NiCl+	1.450e-11	1.319e-11	-10.839	-10.880	-0.041	(0)
		CoCl+	1.426e-11	1.298e-11	-10.846	-10.887	-0.041	(0)
		MnCl2	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)
		CuCl+	6.671e-12	6.125e-12	-11.176	-11.213	-0.037	(0)
		CdOHC1	4.747e-12	4.747e-12	-11.324	-11.324	0.000	(0)
		ZnCl2	2.765e-12	2.765e-12	-11.558	-11.558	0.000	(0)
		PbCl+	4.734e-13	4.307e-13	-12.325	-12.366	-0.041	(0)
		CdCl2	3.506e-13	3.506e-13	-12.455	-12.455	0.000	(0)
		AgCl3-2	2.979e-13	2.043e-13	-12.526	-12.690	-0.164	(0)
		HgClOH	4.506e-14	4.506e-14	-13.346	-13.346	0.000	(0)
		CuCl3-2	1.995e-14	1.429e-14	-13.700	-13.845	-0.145	(0)
		MnCl3-	5.316e-15	4.890e-15	-14.274	-14.311	-0.036	(0)

ZnCl3-	4.302e-15	3.950e-15	-14.366	-14.403	-0.037	(0)
CuCl2	3.819e-15	3.819e-15	-14.418	-14.418	0.000	(0)
PbCl2	3.460e-15	3.460e-15	-14.461	-14.461	0.000	(0)
HgCl2	1.854e-15	1.854e-15	-14.732	-14.732	0.000	(0)
AgCl4-3	1.754e-15	7.500e-16	-14.756	-15.125	-0.369	(0)
CdCl3-	4.372e-16	3.978e-16	-15.359	-15.400	-0.041	(0)
NiCl2	1.195e-16	1.195e-16	-15.923	-15.923	0.000	(0)
HgCl3-	3.665e-17	3.335e-17	-16.436	-16.477	-0.041	(0)
ZnCl4-2	4.959e-18	3.552e-18	-17.305	-17.449	-0.145	(0)
PbCl3-	2.723e-18	2.477e-18	-17.565	-17.606	-0.041	(0)
UO2Cl+	9.858e-19	8.970e-19	-18.006	-18.047	-0.041	(0)
HgCl4-2	3.483e-19	2.388e-19	-18.458	-18.622	-0.164	(0)
HgCl+	2.261e-19	2.057e-19	-18.646	-18.687	-0.041	(0)
CuCl3-	6.982e-20	6.410e-20	-19.156	-19.193	-0.037	(0)
CrCl+2	5.614e-20	3.849e-20	-19.251	-19.415	-0.164	(0)
CrOHC12	3.255e-21	3.255e-21	-20.487	-20.487	0.000	(0)
PbCl4-2	2.971e-21	2.037e-21	-20.527	-20.691	-0.164	(0)
FeCl+2	7.929e-24	5.681e-24	-23.101	-23.246	-0.145	(0)
CrCl2+	7.217e-24	6.567e-24	-23.142	-23.183	-0.041	(0)
CuCl4-2	8.065e-25	5.778e-25	-24.093	-24.238	-0.145	(0)
FeCl2+	4.960e-26	4.563e-26	-25.304	-25.341	-0.036	(0)
CrO3Cl-	2.327e-26	2.117e-26	-25.633	-25.674	-0.041	(0)
VOCl+	1.978e-26	1.800e-26	-25.704	-25.745	-0.041	(0)
FeCl3	8.207e-30	8.207e-30	-29.086	-29.086	0.000	(0)
CoCl+2	1.068e-37	7.320e-38	-36.972	-37.136	-0.164	(0)
UCl+3	0.000e+00	0.000e+00	-49.298	-49.667	-0.369	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
Co (2)	4.125e-09					
Co+2	3.043e-09	2.086e-09	-8.517	-8.681	-0.164	(0)
CoCO3	4.801e-10	4.801e-10	-9.319	-9.319	0.000	(0)
CoSO4	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
CoHCO3+	2.107e-10	1.917e-10	-9.676	-9.717	-0.041	(0)
CoOH+	1.132e-10	1.030e-10	-9.946	-9.987	-0.041	(0)
Co (OH) 2	2.024e-11	2.024e-11	-10.694	-10.694	0.000	(0)
CoCl+	1.426e-11	1.298e-11	-10.846	-10.887	-0.041	(0)
CoF+	5.502e-12	5.006e-12	-11.260	-11.300	-0.041	(0)
CoNO2+	9.512e-15	8.655e-15	-14.022	-14.063	-0.041	(0)
Co (OH) 3-	1.098e-15	9.995e-16	-14.959	-15.000	-0.041	(0)
CoOOH-	2.756e-16	2.508e-16	-15.560	-15.601	-0.041	(0)
Co (NH3) +2	3.728e-17	2.556e-17	-16.428	-16.592	-0.164	(0)
CoSeO4	1.255e-17	1.255e-17	-16.901	-16.901	0.000	(0)
CoNO3+	2.018e-18	1.836e-18	-17.695	-17.736	-0.041	(0)
Co2OH+3	2.518e-20	1.077e-20	-19.599	-19.968	-0.369	(0)
Co (OH) 4-2	5.718e-22	3.920e-22	-21.243	-21.407	-0.164	(0)
Co (NH3) 2+2	1.621e-25	1.111e-25	-24.790	-24.954	-0.164	(0)
Co (NO3) 2	2.076e-27	2.076e-27	-26.683	-26.683	0.000	(0)
Co4 (OH) 4+4	1.016e-31	2.245e-32	-30.993	-31.649	-0.656	(0)
Co (NH3) 3+2	2.080e-34	1.426e-34	-33.682	-33.846	-0.164	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-42.954	-43.118	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.725	-52.889	-0.164	(0)
Co (3)	3.669e-30					
CoOH+2	3.669e-30	2.515e-30	-29.435	-29.599	-0.164	(0)
Co+3	4.302e-37	2.000e-37	-36.366	-36.699	-0.333	(0)
CoCl+2	1.068e-37	7.320e-38	-36.972	-37.136	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.346	-76.510	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
Cr (2)	2.392e-28					
Cr+2	2.392e-28	1.640e-28	-27.621	-27.785	-0.164	(0)
Cr (3)	6.075e-10					
Cr (OH) 2+	2.962e-10	2.695e-10	-9.528	-9.569	-0.041	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.215e-11	2.925e-11	-10.493	-10.534	-0.041	(0)
Cr (OH) 4-	2.713e-11	2.468e-11	-10.567	-10.608	-0.041	(0)
Cr (OH) +2	1.306e-12	8.952e-13	-11.884	-12.048	-0.164	(0)

CrOHSO4	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
CrF+2	2.901e-16	1.989e-16	-15.537	-15.701	-0.164	(0)
Cr+3	3.867e-17	1.654e-17	-16.413	-16.782	-0.369	(0)
CrSO4+	2.433e-17	2.214e-17	-16.614	-16.655	-0.041	(0)
CrCl+2	5.614e-20	3.849e-20	-19.251	-19.415	-0.164	(0)
CrOHC12	3.255e-21	3.255e-21	-20.487	-20.487	0.000	(0)
Cr2(OH)2SO4+2	1.438e-23	9.856e-24	-22.842	-23.006	-0.164	(0)
CrCl2+	7.217e-24	6.567e-24	-23.142	-23.183	-0.041	(0)
Cr2(OH)2(SO4)2	3.357e-25	3.357e-25	-24.474	-24.474	0.000	(0)
CrNO3+2	5.857e-28	4.015e-28	-27.232	-27.396	-0.164	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-51.811	-51.975	-0.164	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-63.363	-63.732	-0.369	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Cr(6)	5.025e-14					
CrO4-2	4.910e-14	3.494e-14	-13.309	-13.457	-0.148	(0)
NaCrO4-	6.116e-16	5.565e-16	-15.214	-15.255	-0.041	(0)
HCrO4-	5.055e-16	4.600e-16	-15.296	-15.337	-0.041	(0)
KCrO4-	3.148e-17	2.865e-17	-16.502	-16.543	-0.041	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	4.769e-25	3.269e-25	-24.322	-24.486	-0.164	(0)
CrO3Cl-	2.327e-26	2.117e-26	-25.633	-25.674	-0.041	(0)
Cr2O7-2	1.070e-29	7.338e-30	-28.970	-29.134	-0.164	(0)
Cu(1)	1.874e-10					
CuCl	9.892e-11	9.892e-11	-10.005	-10.005	0.000	(0)
Cu+	4.802e-11	4.369e-11	-10.319	-10.360	-0.041	(0)
CuCl2-	4.048e-11	3.717e-11	-10.393	-10.430	-0.037	(0)
CuCl3-2	1.995e-14	1.429e-14	-13.700	-13.845	-0.145	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-150.261	-150.490	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.998	-151.220	-0.222	(0)
Cu(2)	2.117e-07					
CuCO3	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
CuOH+	1.831e-08	1.682e-08	-7.737	-7.774	-0.037	(0)
Cu(CO3)2-2	9.211e-09	6.314e-09	-8.036	-8.200	-0.164	(0)
Cu(OH)2	8.302e-09	8.302e-09	-8.081	-8.081	0.000	(0)
Cu+2	3.020e-09	2.149e-09	-8.520	-8.668	-0.148	(0)
CuSO4	2.823e-10	2.823e-10	-9.549	-9.549	0.000	(0)
CuHCO3+	1.761e-10	1.602e-10	-9.754	-9.795	-0.041	(0)
Cu(OH)3-	4.631e-11	4.214e-11	-10.334	-10.375	-0.041	(0)
CuF+	1.131e-11	1.029e-11	-10.947	-10.988	-0.041	(0)
Cu2(OH)2+2	1.036e-11	7.102e-12	-10.985	-11.149	-0.164	(0)
CuCl+	6.671e-12	6.125e-12	-11.176	-11.213	-0.037	(0)
CuNO2+	1.456e-13	1.325e-13	-12.837	-12.878	-0.041	(0)
CuCl2	3.819e-15	3.819e-15	-14.418	-14.418	0.000	(0)
CuNH3+2	3.269e-15	2.241e-15	-14.486	-14.650	-0.164	(0)
Cu(OH)4-2	1.197e-15	8.207e-16	-14.922	-15.086	-0.164	(0)
CuNO3+	4.148e-18	3.775e-18	-17.382	-17.423	-0.041	(0)
Cu(NO2)2	7.983e-19	7.983e-19	-18.098	-18.098	0.000	(0)
CuCl3-	6.982e-20	6.410e-20	-19.156	-19.193	-0.037	(0)
CuCl4-2	8.065e-25	5.778e-25	-24.093	-24.238	-0.145	(0)
Cu(NO3)2	2.640e-28	2.640e-28	-27.578	-27.578	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-223.180	-223.221	-0.041	(0)
F	8.490e-05					
F-	8.264e-05	7.590e-05	-4.083	-4.120	-0.037	(0)
MgF+	1.888e-06	1.736e-06	-5.724	-5.761	-0.037	(0)
CaF+	2.190e-07	2.014e-07	-6.660	-6.696	-0.036	(0)
NaF	1.535e-07	1.535e-07	-6.814	-6.814	0.000	(0)
MnF+	5.638e-09	5.187e-09	-8.249	-8.285	-0.036	(0)
HF	4.567e-10	4.567e-10	-9.340	-9.340	0.000	(0)
ZnF+	3.574e-10	3.252e-10	-9.447	-9.488	-0.041	(0)
BF(OH)3-	2.508e-10	2.295e-10	-9.601	-9.639	-0.038	(0)
CuF+	1.131e-11	1.029e-11	-10.947	-10.988	-0.041	(0)
NiF+	6.006e-12	5.465e-12	-11.221	-11.262	-0.041	(0)
CoF+	5.502e-12	5.006e-12	-11.260	-11.300	-0.041	(0)
CdF+	3.599e-13	3.275e-13	-12.444	-12.485	-0.041	(0)
HF2-	1.437e-13	1.318e-13	-12.843	-12.880	-0.038	(0)
AgF	4.224e-14	4.224e-14	-13.374	-13.374	0.000	(0)
PbF+	3.968e-14	3.610e-14	-13.401	-13.442	-0.041	(0)
AlF2+	3.308e-14	3.046e-14	-13.480	-13.516	-0.036	(0)

AlF3	2.910e-14	2.910e-14	-13.536	-13.536	0.000	(0)
BF2 (OH) 2-	8.279e-15	7.577e-15	-14.082	-14.120	-0.038	(0)
UO2F+	3.541e-15	3.222e-15	-14.451	-14.492	-0.041	(0)
AlF+2	1.403e-15	1.008e-15	-14.853	-14.997	-0.144	(0)
AlF4-	1.204e-15	1.107e-15	-14.919	-14.956	-0.037	(0)
UO2F2	7.052e-16	7.052e-16	-15.152	-15.152	0.000	(0)
CrF+2	2.901e-16	1.989e-16	-15.537	-15.701	-0.164	(0)
PbF2	5.392e-17	5.392e-17	-16.268	-16.268	0.000	(0)
CdF2	4.960e-17	4.960e-17	-16.305	-16.305	0.000	(0)
UO2F3-	1.478e-17	1.344e-17	-16.830	-16.871	-0.041	(0)
H2F2	5.589e-19	5.589e-19	-18.253	-18.253	0.000	(0)
FeF2+	1.922e-20	1.768e-20	-19.716	-19.753	-0.036	(0)
FeF+2	1.215e-20	8.704e-21	-19.915	-20.060	-0.145	(0)
UO2F4-2	1.182e-20	8.105e-21	-19.927	-20.091	-0.164	(0)
VO2F	8.637e-21	8.637e-21	-20.064	-20.064	0.000	(0)
PbF3-	8.530e-21	7.762e-21	-20.069	-20.110	-0.041	(0)
FeF3	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
BF3OH-	9.947e-22	9.104e-22	-21.002	-21.041	-0.038	(0)
VO2F2-	2.616e-22	2.380e-22	-21.582	-21.623	-0.041	(0)
VOF+	1.784e-24	1.624e-24	-23.749	-23.790	-0.041	(0)
PbF4-2	4.113e-25	2.820e-25	-24.386	-24.550	-0.164	(0)
VO2F3-2	3.287e-25	2.253e-25	-24.483	-24.647	-0.164	(0)
VOF2	4.621e-26	4.621e-26	-25.335	-25.335	0.000	(0)
HgF+	1.773e-26	1.613e-26	-25.751	-25.792	-0.041	(0)
BF4-	1.511e-27	1.383e-27	-26.821	-26.859	-0.038	(0)
Sb (OH) 2F	1.465e-28	1.465e-28	-27.834	-27.834	0.000	(0)
SbOF	1.441e-28	1.441e-28	-27.841	-27.841	0.000	(0)
VOF3-	1.367e-28	1.244e-28	-27.864	-27.905	-0.041	(0)
VO2F4-3	1.968e-29	8.414e-30	-28.706	-29.075	-0.369	(0)
VOF4-2	5.560e-32	3.812e-32	-31.255	-31.419	-0.164	(0)
SiF6-2	3.226e-32	2.311e-32	-31.491	-31.636	-0.145	(0)
UF3+	4.569e-40	4.157e-40	-39.340	-39.381	-0.041	(0)
UF2+2	0.000e+00	0.000e+00	-40.297	-40.461	-0.164	(0)
UF4	0.000e+00	0.000e+00	-41.461	-41.461	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.073	-43.442	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.942	-43.983	-0.041	(0)
UF6-2	0.000e+00	0.000e+00	-45.459	-45.623	-0.164	(0)
Fe (2)	8.053e-14					
Fe+2	6.818e-14	4.674e-14	-13.166	-13.330	-0.164	(0)
FeSO4	6.579e-15	6.579e-15	-14.182	-14.182	0.000	(0)
FeOH+	5.005e-15	4.605e-15	-14.301	-14.337	-0.036	(0)
FeHCO3+	7.543e-16	6.953e-16	-15.122	-15.158	-0.035	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	7.698e-18	7.082e-18	-17.114	-17.150	-0.036	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-164.682	-164.682	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-242.755	-242.796	-0.041	(0)
Fe (3)	7.093e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	1.747e-10	1.609e-10	-9.758	-9.793	-0.036	(0)
Fe (OH) 4-	1.070e-10	9.851e-11	-9.971	-10.007	-0.036	(0)
FeOH+2	2.333e-16	1.671e-16	-15.632	-15.777	-0.145	(0)
FeF2+	1.922e-20	1.768e-20	-19.716	-19.753	-0.036	(0)
FeF+2	1.215e-20	8.704e-21	-19.915	-20.060	-0.145	(0)
FeF3	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
FeSO4+	7.315e-22	6.730e-22	-21.136	-21.172	-0.036	(0)
Fe+3	2.250e-22	1.046e-22	-21.648	-21.980	-0.333	(0)
Fe (SO4) 2-	9.067e-24	8.251e-24	-23.043	-23.084	-0.041	(0)
FeCl+2	7.929e-24	5.681e-24	-23.101	-23.246	-0.145	(0)
FeCl2+	4.960e-26	4.563e-26	-25.304	-25.341	-0.036	(0)
FeHSeO3+2	1.142e-27	7.830e-28	-26.942	-27.106	-0.164	(0)
FeCl3	8.207e-30	8.207e-30	-29.086	-29.086	0.000	(0)
Fe2 (OH) 2+4	4.187e-30	9.247e-31	-29.378	-30.034	-0.656	(0)
FeNO3+2	8.475e-31	5.810e-31	-30.072	-30.236	-0.164	(0)
Fe3 (OH) 4+5	2.277e-38	2.150e-39	-37.643	-38.667	-1.025	(0)
H (0)	4.033e-29					
H2	2.016e-29	2.019e-29	-28.695	-28.695	0.001	(0)
Hg (0)	9.119e-11					
Hg	9.119e-11	9.119e-11	-10.040	-10.040	0.000	(0)

Hg (1)	1.036e-24					
Hg2+2	5.178e-25	3.549e-25	-24.286	-24.450	-0.164	(0)
Hg (2)	2.682e-13					
Hg (OH) 2	2.212e-13	2.215e-13	-12.655	-12.655	0.001	(0)
HgClOH	4.506e-14	4.506e-14	-13.346	-13.346	0.000	(0)
HgCl2	1.854e-15	1.854e-15	-14.732	-14.732	0.000	(0)
HgCO3	9.342e-17	9.342e-17	-16.030	-16.030	0.000	(0)
HgCl3-	3.665e-17	3.335e-17	-16.436	-16.477	-0.041	(0)
Hg (CO3) 2-2	5.868e-18	4.023e-18	-17.232	-17.395	-0.164	(0)
HgOH+	6.207e-19	5.648e-19	-18.207	-18.248	-0.041	(0)
HgCl4-2	3.483e-19	2.388e-19	-18.458	-18.622	-0.164	(0)
HgCl+	2.261e-19	2.057e-19	-18.646	-18.687	-0.041	(0)
Hg (OH) 3-	7.584e-20	6.901e-20	-19.120	-19.161	-0.041	(0)
HgHCO3+	7.778e-21	7.078e-21	-20.109	-20.150	-0.041	(0)
Hg+2	8.363e-24	5.733e-24	-23.078	-23.242	-0.164	(0)
HgSO4	8.608e-25	8.608e-25	-24.065	-24.065	0.000	(0)
HgNH3+2	5.378e-25	3.687e-25	-24.269	-24.433	-0.164	(0)
Hg (NH3) 2+2	5.481e-26	3.758e-26	-25.261	-25.425	-0.164	(0)
HgF+	1.773e-26	1.613e-26	-25.751	-25.792	-0.041	(0)
HgNO3+	1.292e-33	1.176e-33	-32.889	-32.930	-0.041	(0)
Hg (NH3) 3+2	2.224e-35	1.525e-35	-34.653	-34.817	-0.164	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.566	-42.566	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-43.745	-43.909	-0.164	(0)
HgHS2-	0.000e+00	0.000e+00	-143.184	-143.225	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-143.378	-143.542	-0.164	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-145.221	-145.221	0.000	(0)
K	2.412e-04					
K+	2.403e-04	2.207e-04	-3.619	-3.656	-0.037	(0)
KSO4-	9.730e-07	8.959e-07	-6.012	-6.048	-0.036	(0)
KCrO4-	3.148e-17	2.865e-17	-16.502	-16.543	-0.041	(0)
Mg	3.148e-04					
Mg+2	2.865e-04	2.038e-04	-3.543	-3.691	-0.148	(0)
MgSO4	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
MgHCO3+	2.684e-06	2.465e-06	-5.571	-5.608	-0.037	(0)
MgCO3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
MgF+	1.888e-06	1.736e-06	-5.724	-5.761	-0.037	(0)
MgOH+	2.176e-07	2.008e-07	-6.662	-6.697	-0.035	(0)
MgH2BO3+	8.353e-09	7.645e-09	-8.078	-8.117	-0.038	(0)
Mn (2)	2.744e-06					
Mn+2	2.504e-06	1.717e-06	-5.601	-5.765	-0.164	(0)
MnSO4	1.750e-07	1.750e-07	-6.757	-6.757	0.000	(0)
MnHCO3+	4.399e-08	4.047e-08	-7.357	-7.393	-0.036	(0)
MnOH+	1.160e-08	1.067e-08	-7.936	-7.972	-0.036	(0)
MnF+	5.638e-09	5.187e-09	-8.249	-8.285	-0.036	(0)
MnCl+	4.224e-09	3.886e-09	-8.374	-8.410	-0.036	(0)
MnCl2	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)
MnSeO4	5.548e-15	5.548e-15	-14.256	-14.256	0.000	(0)
MnCl3-	5.316e-15	4.890e-15	-14.274	-14.311	-0.036	(0)
MnNO3+	1.661e-15	1.511e-15	-14.780	-14.821	-0.041	(0)
Mn (OH) 3-	4.389e-16	4.038e-16	-15.358	-15.394	-0.036	(0)
Mn (OH) 4-2	4.503e-21	3.226e-21	-20.347	-20.491	-0.145	(0)
Mn (NO3) 2	2.109e-24	2.109e-24	-23.676	-23.676	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.082	-43.082	0.000	(0)
Mn (3)	3.973e-27					
Mn+3	3.973e-27	1.847e-27	-26.401	-26.734	-0.333	(0)
Mn (6)	4.065e-40					
MnO4-2	4.065e-40	2.912e-40	-39.391	-39.536	-0.145	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.488	-44.526	-0.038	(0)
Mo	7.840e-08					
MoO4-2	7.840e-08	5.578e-08	-7.106	-7.254	-0.148	(0)
HMoO4-	4.963e-12	4.516e-12	-11.304	-11.345	-0.041	(0)
H2MoO4	1.346e-16	1.346e-16	-15.871	-15.871	0.000	(0)
Ag2MoO4	1.036e-27	1.036e-27	-26.984	-26.984	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-56.380	-56.749	-0.369	(0)
Mo7O24-6	0.000e+00	0.000e+00	-63.433	-64.909	-1.476	(0)
HMo7O24-5	0.000e+00	0.000e+00	-65.888	-66.913	-1.025	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-69.865	-70.521	-0.656	(0)

H3Mo7O24-3	0.000e+00	0.000e+00	-75.297	-75.666	-0.369	(0)
N (-3)	9.014e-10					
NH4+	7.946e-10	7.273e-10	-9.100	-9.138	-0.038	(0)
NH3	1.019e-10	1.019e-10	-9.992	-9.992	0.000	(0)
NH4SO4-	4.857e-12	4.469e-12	-11.314	-11.350	-0.036	(0)
CaNH3+2	4.552e-14	3.120e-14	-13.342	-13.506	-0.164	(0)
CuNH3+2	3.269e-15	2.241e-15	-14.486	-14.650	-0.164	(0)
NiNH3+2	2.289e-16	1.569e-16	-15.640	-15.804	-0.164	(0)
AgNH3+	5.067e-17	4.611e-17	-16.295	-16.336	-0.041	(0)
Co (NH3) +2	3.728e-17	2.556e-17	-16.428	-16.592	-0.164	(0)
BaNH3+2	8.632e-20	5.918e-20	-19.064	-19.228	-0.164	(0)
Ag (NH3) 2+	4.198e-23	3.820e-23	-22.377	-22.418	-0.041	(0)
Ni (NH3) 2+2	3.372e-24	2.312e-24	-23.472	-23.636	-0.164	(0)
Ca (NH3) 2+2	1.847e-24	1.266e-24	-23.734	-23.898	-0.164	(0)
HgNH3+2	5.378e-25	3.687e-25	-24.269	-24.433	-0.164	(0)
Co (NH3) 2+2	1.621e-25	1.111e-25	-24.790	-24.954	-0.164	(0)
Hg (NH3) 2+2	5.481e-26	3.758e-26	-25.261	-25.425	-0.164	(0)
Co (NH3) 3+2	2.080e-34	1.426e-34	-33.682	-33.846	-0.164	(0)
Hg (NH3) 3+2	2.224e-35	1.525e-35	-34.653	-34.817	-0.164	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-42.954	-43.118	-0.164	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-43.745	-43.909	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-51.811	-51.975	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.725	-52.889	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-63.363	-63.732	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.346	-76.510	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
N (3)	6.426e-07					
NO2-	6.426e-07	5.888e-07	-6.192	-6.230	-0.038	(0)
CuNO2+	1.456e-13	1.325e-13	-12.837	-12.878	-0.041	(0)
AgNO2	2.726e-14	2.726e-14	-13.565	-13.565	0.000	(0)
CoNO2+	9.512e-15	8.655e-15	-14.022	-14.063	-0.041	(0)
Cu (NO2) 2	7.983e-19	7.983e-19	-18.098	-18.098	0.000	(0)
Ag (NO2) 2-	2.732e-20	2.486e-20	-19.564	-19.605	-0.041	(0)
N (5)	6.053e-10					
NO3-	6.048e-10	5.555e-10	-9.218	-9.255	-0.037	(0)
CaNO3+	4.695e-13	4.272e-13	-12.328	-12.369	-0.041	(0)
MnNO3+	1.661e-15	1.511e-15	-14.780	-14.821	-0.041	(0)
ZnNO3+	3.293e-16	2.997e-16	-15.482	-15.523	-0.041	(0)
NiNO3+	4.396e-18	4.000e-18	-17.357	-17.398	-0.041	(0)
CuNO3+	4.148e-18	3.775e-18	-17.382	-17.423	-0.041	(0)
BaNO3+	2.816e-18	2.562e-18	-17.550	-17.591	-0.041	(0)
CoNO3+	2.018e-18	1.836e-18	-17.695	-17.736	-0.041	(0)
CdNO3+	5.257e-19	4.783e-19	-18.279	-18.320	-0.041	(0)
AgNO3	9.776e-20	9.776e-20	-19.010	-19.010	0.000	(0)
PbNO3+	6.095e-20	5.546e-20	-19.215	-19.256	-0.041	(0)
Mn (NO3) 2	2.109e-24	2.109e-24	-23.676	-23.676	0.000	(0)
UO2NO3+	3.746e-25	3.409e-25	-24.426	-24.467	-0.041	(0)
Zn (NO3) 2	3.321e-26	3.321e-26	-25.479	-25.479	0.000	(0)
Co (NO3) 2	2.076e-27	2.076e-27	-26.683	-26.683	0.000	(0)
CrNO3+2	5.857e-28	4.015e-28	-27.232	-27.396	-0.164	(0)
Cu (NO3) 2	2.640e-28	2.640e-28	-27.578	-27.578	0.000	(0)
Cd (NO3) 2	1.332e-28	1.332e-28	-27.876	-27.876	0.000	(0)
Pb (NO3) 2	5.232e-29	5.232e-29	-28.281	-28.281	0.000	(0)
VO2NO3	1.823e-29	1.823e-29	-28.739	-28.739	0.000	(0)
FeNO3+2	8.475e-31	5.810e-31	-30.072	-30.236	-0.164	(0)
HgNO3+	1.292e-33	1.176e-33	-32.889	-32.930	-0.041	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.566	-42.566	0.000	(0)
Na	3.504e-03					
Na+	3.490e-03	3.205e-03	-2.457	-2.494	-0.037	(0)
NaSO4-	1.072e-05	9.871e-06	-4.970	-5.006	-0.036	(0)
NaHCO3	2.130e-06	2.130e-06	-5.672	-5.672	0.000	(0)
NaCO3-	8.826e-07	8.127e-07	-6.054	-6.090	-0.036	(0)
NaF	1.535e-07	1.535e-07	-6.814	-6.814	0.000	(0)
NaH2BO3	5.495e-09	5.495e-09	-8.260	-8.260	0.000	(0)
NaCrO4-	6.116e-16	5.565e-16	-15.214	-15.255	-0.041	(0)

Ni	6.409e-09					
Ni+2	4.029e-09	2.867e-09	-8.395	-8.543	-0.148	(0)
NiCO3	1.456e-09	1.456e-09	-8.837	-8.837	0.000	(0)
NiHCO3+	4.590e-10	4.176e-10	-9.338	-9.379	-0.041	(0)
NiSO4	3.280e-10	3.280e-10	-9.484	-9.484	0.000	(0)
NiOH+	9.815e-11	8.931e-11	-10.008	-10.049	-0.041	(0)
Ni (OH) 2	1.756e-11	1.756e-11	-10.756	-10.756	0.000	(0)
NiCl+	1.450e-11	1.319e-11	-10.839	-10.880	-0.041	(0)
NiF+	6.006e-12	5.465e-12	-11.221	-11.262	-0.041	(0)
Ni (OH) 3-	4.774e-14	4.344e-14	-13.321	-13.362	-0.041	(0)
Ni (SO4) 2-2	9.086e-15	6.229e-15	-14.042	-14.206	-0.164	(0)
NiNH3+2	2.289e-16	1.569e-16	-15.640	-15.804	-0.164	(0)
NiCl2	1.195e-16	1.195e-16	-15.923	-15.923	0.000	(0)
NiSeO4	1.610e-17	1.610e-17	-16.793	-16.793	0.000	(0)
NiNO3+	4.396e-18	4.000e-18	-17.357	-17.398	-0.041	(0)
Ni (NH3) 2+2	3.372e-24	2.312e-24	-23.472	-23.636	-0.164	(0)
O (0)	2.481e-35					
O2	1.241e-35	1.243e-35	-34.906	-34.906	0.001	(0)
Pb	3.600e-10					
PbCO3	2.763e-10	2.763e-10	-9.559	-9.559	0.000	(0)
PbOH+	4.611e-11	4.196e-11	-10.336	-10.377	-0.041	(0)
Pb (CO3) 2-2	1.583e-11	1.085e-11	-10.801	-10.965	-0.164	(0)
Pb+2	9.487e-12	6.750e-12	-11.023	-11.171	-0.148	(0)
PbHCO3+	6.514e-12	5.927e-12	-11.186	-11.227	-0.041	(0)
Pb (OH) 2	3.283e-12	3.283e-12	-11.484	-11.484	0.000	(0)
PbSO4	1.896e-12	1.896e-12	-11.722	-11.722	0.000	(0)
PbCl+	4.734e-13	4.307e-13	-12.325	-12.366	-0.041	(0)
PbF+	3.968e-14	3.610e-14	-13.401	-13.442	-0.041	(0)
Pb (SO4) 2-2	9.556e-15	6.551e-15	-14.020	-14.184	-0.164	(0)
Pb (OH) 3-	8.929e-15	8.125e-15	-14.049	-14.090	-0.041	(0)
PbCl2	3.460e-15	3.460e-15	-14.461	-14.461	0.000	(0)
PbF2	5.392e-17	5.392e-17	-16.268	-16.268	0.000	(0)
Pb (OH) 4-2	7.183e-18	4.924e-18	-17.144	-17.308	-0.164	(0)
PbCl3-	2.723e-18	2.477e-18	-17.565	-17.606	-0.041	(0)
PbNO3+	6.095e-20	5.546e-20	-19.215	-19.256	-0.041	(0)
Pb2OH+3	1.050e-20	4.489e-21	-19.979	-20.348	-0.369	(0)
PbF3-	8.530e-21	7.762e-21	-20.069	-20.110	-0.041	(0)
PbCl4-2	2.971e-21	2.037e-21	-20.527	-20.691	-0.164	(0)
Pb3 (OH) 4+2	2.118e-24	1.452e-24	-23.674	-23.838	-0.164	(0)
PbF4-2	4.113e-25	2.820e-25	-24.386	-24.550	-0.164	(0)
Pb (NO3) 2	5.232e-29	5.232e-29	-28.281	-28.281	0.000	(0)
Pb4 (OH) 4+4	3.525e-31	7.786e-32	-30.453	-31.109	-0.656	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-156.202	-156.202	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-235.012	-235.053	-0.041	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-75.991	-75.991	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.110	-80.151	-0.041	(0)
S5-2	0.000e+00	0.000e+00	-80.961	-81.125	-0.164	(0)
S6-2	0.000e+00	0.000e+00	-81.477	-81.641	-0.164	(0)
H2S	0.000e+00	0.000e+00	-81.521	-81.521	0.000	(0)
S4-2	0.000e+00	0.000e+00	-81.557	-81.721	-0.164	(0)
CdHS+	0.000e+00	0.000e+00	-81.667	-81.708	-0.041	(0)
S3-2	0.000e+00	0.000e+00	-82.363	-82.527	-0.164	(0)
S2-2	0.000e+00	0.000e+00	-83.379	-83.543	-0.164	(0)
S-2	0.000e+00	0.000e+00	-88.915	-89.060	-0.145	(0)
HgHS2-	0.000e+00	0.000e+00	-143.184	-143.225	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-143.378	-143.542	-0.164	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-145.221	-145.221	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.261	-150.490	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.998	-151.220	-0.222	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-151.017	-151.135	-0.117	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-151.728	-151.769	-0.041	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.951	-152.184	-0.233	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-152.001	-152.042	-0.041	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.269	-152.495	-0.226	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.150	-154.150	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-154.655	-154.655	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-156.202	-156.202	0.000	(0)

Fe (HS) 2	0.000e+00	0.000e+00	-164.682	-164.682	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-223.180	-223.221	-0.041	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-230.980	-231.021	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-232.446	-232.610	-0.164	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.865	-232.906	-0.041	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-235.012	-235.053	-0.041	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-242.755	-242.796	-0.041	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-310.696	-310.860	-0.164	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.468	-312.632	-0.164	(0)
Sb2S4-2	0.000e+00	0.000e+00	-330.867	-331.031	-0.164	(0)
S (6)	8.711e-04					
SO4-2	8.059e-04	5.734e-04	-3.094	-3.242	-0.148	(0)
CaSO4	3.195e-05	3.195e-05	-4.496	-4.496	0.000	(0)
MgSO4	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
NaSO4-	1.072e-05	9.871e-06	-4.970	-5.006	-0.036	(0)
KSO4-	9.730e-07	8.959e-07	-6.012	-6.048	-0.036	(0)
MnSO4	1.750e-07	1.750e-07	-6.757	-6.757	0.000	(0)
ZnSO4	2.694e-08	2.694e-08	-7.570	-7.570	0.000	(0)
NiSO4	3.280e-10	3.280e-10	-9.484	-9.484	0.000	(0)
CuSO4	2.823e-10	2.823e-10	-9.549	-9.549	0.000	(0)
HSO4-	2.481e-10	2.280e-10	-9.605	-9.642	-0.037	(0)
CoSO4	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
Zn (SO4) 2-2	1.963e-10	1.346e-10	-9.707	-9.871	-0.164	(0)
CdSO4	3.660e-11	3.660e-11	-10.436	-10.436	0.000	(0)
NH4SO4-	4.857e-12	4.469e-12	-11.314	-11.350	-0.036	(0)
AgSO4-	2.786e-12	2.535e-12	-11.555	-11.596	-0.041	(0)
PbSO4	1.896e-12	1.896e-12	-11.722	-11.722	0.000	(0)
Cd (SO4) 2-2	4.130e-13	2.831e-13	-12.384	-12.548	-0.164	(0)
CrOHSO4	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
Pb (SO4) 2-2	9.556e-15	6.551e-15	-14.020	-14.184	-0.164	(0)
Ni (SO4) 2-2	9.086e-15	6.229e-15	-14.042	-14.206	-0.164	(0)
FeSO4	6.579e-15	6.579e-15	-14.182	-14.182	0.000	(0)
UO2SO4	2.669e-16	2.669e-16	-15.574	-15.574	0.000	(0)
CrSO4+	2.433e-17	2.214e-17	-16.614	-16.655	-0.041	(0)
AlSO4+	6.433e-18	5.913e-18	-17.192	-17.228	-0.037	(0)
UO2 (SO4) 2-2	2.943e-18	2.018e-18	-17.531	-17.695	-0.164	(0)
Al (SO4) 2-	3.953e-20	3.633e-20	-19.403	-19.440	-0.037	(0)
VO2SO4-	9.764e-22	8.885e-22	-21.010	-21.051	-0.041	(0)
FeSO4+	7.315e-22	6.730e-22	-21.136	-21.172	-0.036	(0)
Cr2 (OH) 2SO4+2	1.438e-23	9.856e-24	-22.842	-23.006	-0.164	(0)
Fe (SO4) 2-	9.067e-24	8.251e-24	-23.043	-23.084	-0.041	(0)
HgSO4	8.608e-25	8.608e-25	-24.065	-24.065	0.000	(0)
VOSO4	5.633e-25	5.633e-25	-24.249	-24.249	0.000	(0)
CrO3SO4-2	4.769e-25	3.269e-25	-24.322	-24.486	-0.164	(0)
Cr2 (OH) 2 (SO4) 2	3.357e-25	3.357e-25	-24.474	-24.474	0.000	(0)
VSO4+	3.621e-40	3.295e-40	-39.441	-39.482	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.605	-44.605	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.099	-45.263	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Sb (3)	6.004e-22					
Sb (OH) 3	3.037e-22	3.037e-22	-21.518	-21.518	0.000	(0)
HSbO2	2.965e-22	2.965e-22	-21.528	-21.528	0.000	(0)
SbO2-	1.297e-25	1.180e-25	-24.887	-24.928	-0.041	(0)
Sb (OH) 4-	7.431e-26	6.762e-26	-25.129	-25.170	-0.041	(0)
Sb (OH) 2F	1.465e-28	1.465e-28	-27.834	-27.834	0.000	(0)
SbOF	1.441e-28	1.441e-28	-27.841	-27.841	0.000	(0)
Sb (OH) 2+	3.298e-29	3.001e-29	-28.482	-28.523	-0.041	(0)
SbO+	1.137e-29	1.035e-29	-28.944	-28.985	-0.041	(0)
Sb2S4-2	0.000e+00	0.000e+00	-330.867	-331.031	-0.164	(0)
Sb (5)	1.206e-09					
SbO3-	1.204e-09	1.096e-09	-8.919	-8.960	-0.041	(0)
Sb (OH) 6-	1.395e-12	1.281e-12	-11.855	-11.892	-0.037	(0)
SbO2+	5.718e-27	5.203e-27	-26.243	-26.284	-0.041	(0)
Se (-2)	4.685e-17					
Ag2Se	4.685e-17	4.685e-17	-16.329	-16.329	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.281	-40.322	-0.041	(0)
MnSe	0.000e+00	0.000e+00	-43.082	-43.082	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.822	-44.822	0.000	(0)

Se-2	0.000e+00	0.000e+00	-46.767	-46.931	-0.164	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.980	-85.636	-0.656	(0)
Se (4)	7.157e-09					
SeO3-2	4.044e-09	2.772e-09	-8.393	-8.557	-0.164	(0)
HSeO3-	3.113e-09	2.833e-09	-8.507	-8.548	-0.041	(0)
H2SeO3	4.917e-15	4.917e-15	-14.308	-14.308	0.000	(0)
AgSeO3-	4.338e-16	3.947e-16	-15.363	-15.404	-0.041	(0)
Cd (SeO3) 2-2	2.515e-21	1.724e-21	-20.599	-20.763	-0.164	(0)
Ag (SeO3) 2-3	2.291e-23	9.797e-24	-22.640	-23.009	-0.369	(0)
FeHSeO3+2	1.142e-27	7.830e-28	-26.942	-27.106	-0.164	(0)
Se (6)	1.688e-11					
SeO4-2	1.688e-11	1.201e-11	-10.773	-10.921	-0.148	(0)
MnSeO4	5.548e-15	5.548e-15	-14.256	-14.256	0.000	(0)
ZnSeO4	3.994e-16	3.994e-16	-15.399	-15.399	0.000	(0)
NiSeO4	1.610e-17	1.610e-17	-16.793	-16.793	0.000	(0)
CoSeO4	1.255e-17	1.255e-17	-16.901	-16.901	0.000	(0)
HSeO4-	2.691e-18	2.449e-18	-17.570	-17.611	-0.041	(0)
CdSeO4	6.089e-19	6.089e-19	-18.215	-18.215	0.000	(0)
Zn (SeO4) 2-2	7.094e-27	4.864e-27	-26.149	-26.313	-0.164	(0)
Si	3.022e-04					
H4SiO4	2.910e-04	2.914e-04	-3.536	-3.536	0.001	(0)
H3SiO4-	1.128e-05	1.035e-05	-4.948	-4.985	-0.037	(0)
H2SiO4-2	2.234e-10	1.606e-10	-9.651	-9.794	-0.144	(0)
UO2H3SiO4+	2.971e-13	2.703e-13	-12.527	-12.568	-0.041	(0)
SiF6-2	3.226e-32	2.311e-32	-31.491	-31.636	-0.145	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.431	-61.800	-0.369	(0)
U (4)	1.785e-20					
U (OH) 5-	1.785e-20	1.624e-20	-19.748	-19.789	-0.041	(0)
U (OH) 4	2.768e-24	2.768e-24	-23.558	-23.558	0.000	(0)
U (OH) 3+	4.525e-29	4.117e-29	-28.344	-28.385	-0.041	(0)
U (OH) 2+2	1.130e-34	7.747e-35	-33.947	-34.111	-0.164	(0)
UF3+	4.569e-40	4.157e-40	-39.340	-39.381	-0.041	(0)
UF2+2	0.000e+00	0.000e+00	-40.297	-40.461	-0.164	(0)
UOH+3	0.000e+00	0.000e+00	-40.459	-40.828	-0.369	(0)
UF4	0.000e+00	0.000e+00	-41.461	-41.461	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.073	-43.442	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.942	-43.983	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.605	-44.605	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.099	-45.263	-0.164	(0)
UF6-2	0.000e+00	0.000e+00	-45.459	-45.623	-0.164	(0)
U+4	0.000e+00	0.000e+00	-47.966	-48.622	-0.656	(0)
UC1+3	0.000e+00	0.000e+00	-49.298	-49.667	-0.369	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-179.708	-183.029	-3.320	(0)
U (5)	8.552e-18					
UO2+	8.552e-18	7.782e-18	-17.068	-17.109	-0.041	(0)
U (6)	2.062e-08					
UO2 (CO3) 3-4	1.399e-08	3.091e-09	-7.854	-8.510	-0.656	(0)
UO2 (CO3) 2-2	6.607e-09	4.529e-09	-8.180	-8.344	-0.164	(0)
UO2CO3	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
UO2H3SiO4+	2.971e-13	2.703e-13	-12.527	-12.568	-0.041	(0)
UO2OH+	1.053e-13	9.581e-14	-12.978	-13.019	-0.041	(0)
UO2F+	3.541e-15	3.222e-15	-14.451	-14.492	-0.041	(0)
UO2F2	7.052e-16	7.052e-16	-15.152	-15.152	0.000	(0)
UO2+2	4.322e-16	3.075e-16	-15.364	-15.512	-0.148	(0)
UO2SO4	2.669e-16	2.669e-16	-15.574	-15.574	0.000	(0)
UO2F3-	1.478e-17	1.344e-17	-16.830	-16.871	-0.041	(0)
UO2 (SO4) 2-2	2.943e-18	2.018e-18	-17.531	-17.695	-0.164	(0)
UO2Cl+	9.858e-19	8.970e-19	-18.006	-18.047	-0.041	(0)
(UO2) 2 (OH) 2+2	2.222e-20	1.523e-20	-19.653	-19.817	-0.164	(0)
UO2F4-2	1.182e-20	8.105e-21	-19.927	-20.091	-0.164	(0)
(UO2) 3 (OH) 5+	7.450e-21	6.779e-21	-20.128	-20.169	-0.041	(0)
UO2NO3+	3.746e-25	3.409e-25	-24.426	-24.467	-0.041	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-45.662	-45.703	-0.041	(0)
V+2	0.000e+00	0.000e+00	-47.442	-47.606	-0.164	(0)
V (3)	1.488e-17					
V (OH) 3	1.488e-17	1.488e-17	-16.827	-16.827	0.000	(0)

V(OH) 2+	4.299e-29	3.912e-29	-28.367	-28.408	-0.041	(0)
VOH+2	2.202e-33	1.510e-33	-32.657	-32.821	-0.164	(0)
V+3	2.847e-39	1.217e-39	-38.546	-38.915	-0.369	(0)
VSO4+	3.621e-40	3.295e-40	-39.441	-39.482	-0.041	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-62.408	-62.777	-0.369	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-64.186	-64.842	-0.656	(0)
V(4)	1.943e-21					
V(OH) 3+	1.935e-21	1.761e-21	-20.713	-20.754	-0.041	(0)
VO+2	5.203e-24	3.567e-24	-23.284	-23.448	-0.164	(0)
VOF+	1.784e-24	1.624e-24	-23.749	-23.790	-0.041	(0)
VOSO4	5.633e-25	5.633e-25	-24.249	-24.249	0.000	(0)
VOF2	4.621e-26	4.621e-26	-25.335	-25.335	0.000	(0)
VOC1+	1.978e-26	1.800e-26	-25.704	-25.745	-0.041	(0)
VOF3-	1.367e-28	1.244e-28	-27.864	-27.905	-0.041	(0)
VOF4-2	5.560e-32	3.812e-32	-31.255	-31.419	-0.164	(0)
H2V2O4+2	2.267e-37	1.554e-37	-36.644	-36.808	-0.164	(0)
V(5)	3.927e-10					
H2VO4-	2.158e-10	1.964e-10	-9.666	-9.707	-0.041	(0)
HVO4-2	1.769e-10	1.213e-10	-9.752	-9.916	-0.164	(0)
H3VO4	7.991e-15	7.991e-15	-14.097	-14.097	0.000	(0)
VO4-3	3.493e-16	1.494e-16	-15.457	-15.826	-0.369	(0)
HV2O7-3	1.887e-17	8.071e-18	-16.724	-17.093	-0.369	(0)
H3V2O7-	1.114e-17	1.013e-17	-16.953	-16.994	-0.041	(0)
V2O7-4	2.417e-19	5.340e-20	-18.617	-19.272	-0.656	(0)
VO2+	7.065e-20	6.489e-20	-19.151	-19.188	-0.037	(0)
VO2F	8.637e-21	8.637e-21	-20.064	-20.064	0.000	(0)
VO2SO4-	9.764e-22	8.885e-22	-21.010	-21.051	-0.041	(0)
VO2F2-	2.616e-22	2.380e-22	-21.582	-21.623	-0.041	(0)
V3O9-3	1.856e-23	7.937e-24	-22.731	-23.100	-0.369	(0)
VO2F3-2	3.287e-25	2.253e-25	-24.483	-24.647	-0.164	(0)
VO2F4-3	1.968e-29	8.414e-30	-28.706	-29.075	-0.369	(0)
VO2NO3	1.823e-29	1.823e-29	-28.739	-28.739	0.000	(0)
V4O12-4	2.943e-30	6.500e-31	-29.531	-30.187	-0.656	(0)
V10O28-6	0.000e+00	0.000e+00	-80.249	-81.724	-1.476	(0)
HV10O28-5	0.000e+00	0.000e+00	-80.903	-81.928	-1.025	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.455	-85.111	-0.656	(0)
Zn	5.902e-07					
Zn+2	3.018e-07	2.148e-07	-6.520	-6.668	-0.148	(0)
ZnCO3	1.683e-07	1.683e-07	-6.774	-6.774	0.000	(0)
ZnOH+	5.840e-08	5.314e-08	-7.234	-7.275	-0.041	(0)
ZnSO4	2.694e-08	2.694e-08	-7.570	-7.570	0.000	(0)
Zn(OH) 2	2.084e-08	2.084e-08	-7.681	-7.681	0.000	(0)
ZnHCO3+	8.820e-09	8.025e-09	-8.055	-8.096	-0.041	(0)
ZnOHCl	3.143e-09	3.143e-09	-8.503	-8.503	0.000	(0)
ZnCl+	1.057e-09	9.702e-10	-8.976	-9.013	-0.037	(0)
ZnF+	3.574e-10	3.252e-10	-9.447	-9.488	-0.041	(0)
Zn(OH) 3-	2.841e-10	2.585e-10	-9.547	-9.588	-0.041	(0)
Zn(SO4) 2-2	1.963e-10	1.346e-10	-9.707	-9.871	-0.164	(0)
ZnCl2	2.765e-12	2.765e-12	-11.558	-11.558	0.000	(0)
Zn(OH) 4-2	3.715e-14	2.547e-14	-13.430	-13.594	-0.164	(0)
ZnCl3-	4.302e-15	3.950e-15	-14.366	-14.403	-0.037	(0)
ZnSeO4	3.994e-16	3.994e-16	-15.399	-15.399	0.000	(0)
ZnNO3+	3.293e-16	2.997e-16	-15.482	-15.523	-0.041	(0)
ZnCl4-2	4.959e-18	3.552e-18	-17.305	-17.449	-0.145	(0)
Zn(NO3) 2	3.321e-26	3.321e-26	-25.479	-25.479	0.000	(0)
Zn(SeO4) 2-2	7.094e-27	4.864e-27	-26.149	-26.313	-0.164	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-151.728	-151.769	-0.041	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.150	-154.150	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-230.980	-231.021	-0.041	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-232.446	-232.610	-0.164	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.468	-312.632	-0.164	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-67.98	-61.69	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-53.18	-48.67	4.51	(Co(NH3)5Cl)Cl2	

(Co (NH3) 5OH2) Cl3	-60.41	-48.67	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-86.89	-68.95	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-69.45	-49.42	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-32.14	-31.73	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-29.65	-29.20	0.45	(NH4) 2SeO4
Acanthite	-54.85	-91.07	-36.22	Ag2S
Ag2CO3	-13.08	-24.17	-11.09	Ag2CO3
Ag2CrO4	-21.18	-32.77	-11.59	Ag2CrO4
Ag2HVO4	-14.81	-13.33	1.48	Ag2HVO4
Ag2MoO4	-15.01	-26.56	-11.55	Ag2MoO4
Ag2O	-15.10	-2.53	12.57	Ag2O
Ag2Se	-2.54	-51.24	-48.70	Ag2Se
Ag2SeO3	-12.32	-19.47	-7.15	Ag2SeO3
Ag2SeO4	-21.32	-30.23	-8.91	Ag2SeO4
Ag2SO4	-17.73	-22.55	-4.82	Ag2SO4
Ag3AsO3	-28.67	-26.51	2.16	Ag3AsO3
Ag3AsO4	-17.08	-19.86	-2.79	Ag3AsO4
Ag3H2VO5	-19.77	-14.59	5.18	Ag3H2VO5
AgF:4H2O	-14.82	-13.77	1.05	AgF:4H2O
Agmetal	-0.53	-14.04	-13.51	Ag
AgVO3	-12.83	-12.06	0.77	AgVO3
Al (OH) 3 (am)	-3.51	7.29	10.80	Al (OH) 3
Al2 (MoO4) 3	-59.88	-57.51	2.37	Al2 (MoO4) 3
Al2O3	-5.06	14.59	19.65	Al2O3
Al4 (OH) 10SO4	-13.54	9.16	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.58	-8.78	4.80	AlAsO4:2H2O
AlOHSO4	-9.50	-12.73	-3.23	AlOHSO4
AlSb	-156.48	-90.86	65.62	AlSb
Alunite	-12.03	-13.43	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-6.62	-14.41	-7.79	PbSO4
Anhydrite	-2.50	-6.86	-4.36	CaSO4
Anilite	-57.59	-89.47	-31.88	Cu0.25Cu1.5S
Antlerite	-4.47	4.32	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.12	-90.88	-2.76	As4O6
Artinite	-5.07	4.53	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.85	-32.14	6.71	As2O5
Atacamite	-2.30	5.09	7.39	Cu2 (OH) 3Cl
Azurite	-2.05	-18.95	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.65	7.74	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-21.98	-6.10	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-31.30	1.64	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.82	-22.49	-9.67	BaCrO4
BaF2	-11.46	-17.28	-5.82	BaF2
BaMoO4	-9.33	-16.29	-6.96	BaMoO4
Barite	-2.30	-12.28	-9.98	BaSO4
BaS	-96.98	-80.80	16.18	BaS
BaSeO3	-11.02	-9.19	1.83	BaSeO3
BaSeO4	-12.50	-19.96	-7.46	BaSeO4
Bianchite	-8.14	-9.91	-1.76	ZnSO4:6H2O
Birnessite	-6.88	11.21	18.09	MnO2
Bixbyite	-2.48	-3.12	-0.64	Mn2O3
BlaubleiI	-57.47	-81.63	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.97	-85.25	-27.28	Cu0.6Cu0.8S
Boehmite	-1.28	7.29	8.58	AlOOH
Breithauptite	-58.62	-77.14	-18.52	NiSb
Brochantite	-2.79	12.43	15.22	Cu4 (OH) 6SO4
Brucite	-3.75	13.09	16.84	Mg (OH) 2
Bunsenite	-4.21	8.24	12.45	NiO
Ca (VO3) 2	-14.09	-8.43	5.66	Ca (VO3) 2
Ca2V2O7	-12.76	4.74	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.81	4.74	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.94	7.36	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-21.05	17.91	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.95	17.91	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-299.78	-156.80	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4

Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-12.03	-29.94	-17.91	Hg2Cl2
CaMoO4	-2.92	-10.87	-7.95	CaMoO4
Carnotite	-5.02	-4.79	0.23	KUO2VO4
CaSeO3:2H2O	-6.59	-3.77	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.51	-14.53	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.86	-3.02	9.84	Cd(BO2)2
Cd(OH)2	-6.43	7.22	13.64	Cd(OH)2
Cd(OH)2(am)	-6.51	7.22	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-25.11	-18.40	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.93	1.63	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.56	8.84	28.40	Cd4(OH)6SO4
CdCl2	-14.40	-15.06	-0.66	CdCl2
CdCl2:1H2O	-13.36	-15.06	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.14	-15.06	-1.91	CdCl2:2.5H2O
CdF2	-16.59	-17.80	-1.21	CdF2
Cdmetal(alpha)	-31.84	-18.33	13.51	Cd
Cdmetal(gamma)	-31.95	-18.33	13.62	Cd
CdMoO4	-2.67	-16.82	-14.15	CdMoO4
CdOHCl	-7.46	-3.92	3.54	CdOHCl
CdSb	-77.81	-78.16	-0.35	CdSb
CdSe	-21.30	-41.50	-20.20	CdSe
CdSeO4:2H2O	-18.64	-20.49	-1.85	CdSeO4:2H2O
CdSO4	-12.63	-12.81	-0.17	CdSO4
CdSO4:1H2O	-11.08	-12.81	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.93	-12.81	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.65	-12.40	-9.75	AgCl
Cerrusite	-2.91	-16.04	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-9.27	-11.91	-2.64	CuSO4:5H2O
Chalcedony	0.01	-3.54	-3.55	SiO2
Chalcocite	-57.56	-92.48	-34.92	Cu2S
Chalcopyrite	-130.25	-165.52	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-55.50	-101.20	-45.69	HgS
Claudetite	-87.81	-90.88	-3.06	As4O6
Clausthalite	-16.00	-43.10	-27.10	PbSe
Co(BO2)2	-29.21	-2.14	27.07	Co(BO2)2
Co(OH)2	-4.99	8.10	13.09	Co(OH)2
Co(OH)3	-9.22	-11.53	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.88	-7.84	13.03	Co3(AsO4)2
Co3O4	-4.46	-14.95	-10.50	Co3O4
CoCl2	-22.44	-14.17	8.27	CoCl2
CoCl2:6H2O	-16.71	-14.17	2.54	CoCl2:6H2O
CoCO3	-3.57	-13.55	-9.98	CoCO3
CoF2	-15.32	-16.92	-1.60	CoF2
CoF3	-47.60	-49.06	-1.46	CoF3
CoFe2O4	18.01	14.48	-3.53	CoFe2O4
CoMoO4	-8.17	-15.93	-7.76	CoMoO4
CoO	-5.49	8.10	13.59	CoO
CoS(alpha)	-73.00	-80.44	-7.44	CoS
CoS(beta)	-69.37	-80.44	-11.07	CoS
CoSe	-24.41	-40.61	-16.20	CoSe
CoSeO3	-10.16	-8.84	1.32	CoSeO3
CoSeO4:6H2O	-18.07	-19.60	-1.53	CoSeO4:6H2O
CoSO4	-14.72	-11.92	2.80	CoSO4
CoSO4:6H2O	-9.45	-11.92	-2.47	CoSO4:6H2O
Cotunnite	-11.88	-16.66	-4.78	PbCl2
Covellite	-58.13	-80.43	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.37	-33.28	14.09	CrCl2
CrCl3	-49.70	-34.59	15.11	CrCl3
CrF3	-27.37	-38.71	-11.34	CrF3
Cristobalite	-0.19	-3.54	-3.35	SiO2

Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-16.24	-50.08	-33.84	Na3AlF6
Cu(OH)2	-0.56	8.11	8.67	Cu(OH)2
Cu(SbO3)2	-29.04	16.17	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.67	-1.42	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.12	-92.01	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.85	-52.65	-45.80	Cu2Se
Cu2SO4	-22.01	-23.96	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.91	-7.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.47	-104.06	-42.59	Cu3Sb
Cu3Se2	-29.76	-93.25	-63.49	Cu3Se2
CuCO3	-2.03	-13.53	-11.50	CuCO3
CuCrO4	-16.68	-22.12	-5.44	CuCrO4
CuF	-9.57	-14.48	-4.91	CuF
CuF2	-18.02	-16.91	1.12	CuF2
CuF2:2H2O	-12.36	-16.91	-4.55	CuF2:2H2O
Cumetal	-5.99	-14.74	-8.76	Cu
CuMoO4	-2.85	-15.92	-13.08	CuMoO4
CuOCuSO4	-14.10	-3.80	10.30	CuOCuSO4
Cupricferrite	8.51	14.50	5.99	CuFe2O4
Cuprite	-2.53	-3.94	-1.41	Cu2O
Cuprousferrite	10.14	1.22	-8.92	CuFeO2
CuSe	-7.50	-40.60	-33.10	CuSe
CuSe2	-30.40	-63.77	-33.37	CuSe2
CuSeO3:2H2O	-9.34	-8.83	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.15	-19.59	-2.44	CuSeO4:5H2O
CuSO4	-14.85	-11.91	2.94	CuSO4
Diaspore	0.42	7.29	6.87	AlOOH
Djurleite	-57.76	-91.68	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.50	-17.04	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.05	-17.04	-17.09	CaMg(CO3)2
Epsomite	-4.81	-6.93	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.89	-0.15	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-14.42	-18.14	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.11	-10.56	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-23.81	-44.43	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-49.95	-53.69	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.28	-12.88	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.49	-20.58	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-49.83	-68.43	-18.60	FeSe2
FeS(ppt)	-82.14	-85.09	-2.95	FeS
FeSe	-34.26	-45.26	-11.00	FeSe
Fix_pe	-4.38	-4.38	0.00	e-
Fluorite	-1.35	-11.85	-10.50	CaF2
Galena	-68.96	-82.93	-13.97	PbS
Gibbsite	-1.00	7.29	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.90	-9.91	-2.01	ZnSO4:7H2O
Greenalite	-17.53	3.28	20.81	Fe3Si2O5(OH)4
Greenockite	-66.97	-81.33	-14.36	CdS
Greigite	-299.30	-344.33	-45.03	Fe3S4
Gummite	-6.40	1.27	7.67	UO3
Gypsum	-2.25	-6.86	-4.61	CaSO4:2H2O
H-Jarosite	-18.37	-30.47	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.16	-24.03	-12.88	H2MoO4
H2S(g)	-80.53	-88.54	-8.01	H2S
H2Se(g)	-43.75	-48.71	-4.96	H2Se
Halite	-6.84	-5.24	1.60	NaCl
Halloysite	-2.06	7.52	9.57	Al2Si2O5(OH)4
Hausmannite	-2.44	58.59	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-4.85	18.04	22.89	FeAl2O4
Hg(CH3)2(g)	-186.60	-260.31	-73.71	Hg(CH3)2

Hg (g)	-8.73	-16.61	-7.87	Hg
Hg (OH) 2	-9.16	-12.65	-3.50	Hg (OH) 2
Hg2 (g)	-18.26	-33.21	-14.96	Hg2
Hg2 (OH) 2	-12.93	-7.67	5.26	Hg2 (OH) 2
Hg2CO3	-13.27	-29.32	-16.05	Hg2CO3
Hg2CrO4	-29.21	-37.91	-8.70	Hg2CrO4
Hg2F2	-22.33	-32.69	-10.36	Hg2F2
Hg2S	-84.53	-96.21	-11.68	Hg2S
Hg2SeO3	-19.95	-24.61	-4.66	Hg2SeO3
Hg2SO4	-21.56	-27.69	-6.13	Hg2SO4
Hg3O2CO3	-29.93	-59.61	-29.68	Hg3O2CO3
HgCl (g)	-34.47	-14.97	19.50	HgCl
HgCl2	-13.66	-34.93	-21.26	HgCl2
HgF (g)	-49.02	-16.34	32.68	HgF
HgF2 (g)	-50.24	-37.68	12.57	HgF2
Hgmetal (l)	-3.16	-16.61	-13.45	Hg
HgSe	-5.67	-61.37	-55.69	HgSe
HgSeO3	-17.16	-29.59	-12.43	HgSeO3
HgSO4	-23.26	-32.68	-9.42	HgSO4
Huntite	-4.18	-34.15	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.69	-26.46	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.37	-21.14	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-22.85	-28.02	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-10.94	-25.74	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.76	-51.01	-17.24	K2Cr2O7
K2CrO4	-20.26	-20.77	-0.51	K2CrO4
K2MoO4	-17.83	-14.57	3.26	K2MoO4
K2SeO4	-17.50	-18.23	-0.73	K2SeO4
Kaolinite	0.08	7.52	7.43	Al2Si2O5 (OH) 4
Langite	-5.06	12.43	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-8.37	-8.80	-0.43	PbO : PbSO4
Laurionite	-6.15	-5.53	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-7.08	5.61	12.69	PbO
Mackinawite	-81.49	-85.09	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.61	19.47	16.86	Fe2MgO4
Magnesite	-1.10	-8.56	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-0.11	-5.42	-5.31	Cu2 (OH) 2CO3
Manganite	-1.55	23.79	25.34	MnOOH
Massicot	-7.28	5.61	12.89	PbO
Matlockite	-9.06	-18.04	-8.97	PbClF
Melanothallite	-20.42	-14.16	6.26	CuCl2
Melanterite	-14.36	-16.57	-2.21	FeSO4 : 7H2O
Metacinnabar	-56.10	-101.20	-45.09	HgS
Mg (OH) 2 (active)	-5.70	13.09	18.79	Mg (OH) 2
Mg (VO3) 2	-19.78	-8.50	11.28	Mg (VO3) 2
Mg2Sb3	-279.10	-204.41	74.68	Mg2Sb3
Mg2V2O7	-21.77	4.59	26.36	Mg2V2O7
MgCr2O4	-5.47	10.73	16.20	MgCr2O4
MgCrO4	-22.53	-17.15	5.38	MgCrO4
MgF2	-3.80	-11.93	-8.13	MgF2
MgMoO4	-9.09	-10.94	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.90	-3.85	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.41	-14.61	-1.20	MgSeO4 : 6H2O
Minium	-31.15	42.38	73.52	Pb3O4
Mirabilite	-7.12	-8.23	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-15.48	-10.58	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.48	-63.19	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.97	-88.89	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.60	0.90	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.97	-11.26	2.72	MnCl2 : 4H2O
MnS (grn)	-77.70	-77.53	0.17	MnS
MnS (pnk)	-80.87	-77.53	3.34	MnS
MnSb	-96.80	-99.71	-2.91	MnSb
MnSe	-41.20	-37.70	3.50	MnSe

MnSeO3	-7.05	-5.92	1.13	MnSeO3
MnSeO3:2H2O	-6.90	-5.92	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.64	-16.69	-2.05	MnSeO4:5H2O
MnSO4	-11.59	-9.01	2.58	MnSO4
Montepontite	-7.89	7.22	15.10	CdO
Montroydite	-9.01	-12.65	-3.64	HgO
MoO3	-16.03	-24.03	-8.00	MoO3
Morenosite	-9.64	-11.78	-2.14	NiSO4:7H2O
MoS2	-156.40	-226.66	-70.26	MoS2
Na-Jarosite	-13.38	-24.58	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.79	-48.68	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.44	2.93	Na2CrO4
Na2Mo2O7	-19.68	-36.28	-16.60	Na2Mo2O7
Na2MoO4	-13.73	-12.24	1.49	Na2MoO4
Na2MoO4:2H2O	-13.47	-12.24	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.45	-5.15	10.30	Na2SeO3:5H2O
Na2SeO4	-17.19	-15.91	1.28	Na2SeO4
Na3Sb	-174.91	-80.46	94.45	Na3Sb
Na3VO4	-29.79	6.89	36.68	Na3VO4
Na4V2O7	-35.41	1.99	37.40	Na4V2O7
Nantokite	-6.37	-13.10	-6.73	CuCl
NaSb	-89.88	-66.71	23.17	NaSb
Natron	-8.54	-9.85	-1.31	Na2CO3:10H2O
NaVO3	-8.76	-4.90	3.86	NaVO3
Nesquehonite	-3.89	-8.56	-4.67	MgCO3:3H2O
Ni(OH)2	-4.56	8.24	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.13	-7.43	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.07	12.93	32.00	Ni4(OH)6SO4
NiCO3	-6.54	-13.41	-6.87	NiCO3
NiMoO4	-4.65	-15.80	-11.14	NiMoO4
NiS(alpha)	-74.70	-80.30	-5.60	NiS
NiS(beta)	-69.20	-80.30	-11.10	NiS
NiS(gamma)	-67.50	-80.30	-12.80	NiS
NiSe	-22.77	-40.47	-17.70	NiSe
NiSeO3:2H2O	-11.51	-8.70	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.94	-19.46	-1.52	NiSeO4:6H2O
Nsutite	-6.29	11.21	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-250.00	-311.06	-61.07	As2S3
Otavite	-2.43	-14.43	-12.00	CdCO3
Pb(BO2)2	-11.15	-4.63	6.52	Pb(BO2)2
Pb(OH)2	-2.54	5.61	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-65.02	-73.78	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.71	0.09	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.97	11.22	26.19	Pb2O(OH)2
Pb2O3	-24.27	36.77	61.04	Pb2O3
Pb2OCO3	-9.87	-10.43	-0.56	Pb2OCO3
Pb2V2O7	-8.47	-10.37	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.11	-15.31	5.80	Pb3(AsO4)2
Pb3(VO4)2	-10.90	-4.76	6.14	Pb3(VO4)2
Pb3O2CO3	-15.84	-4.82	11.02	Pb3O2CO3
Pb3O2SO4	-13.88	-3.19	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.68	2.42	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.46	2.42	21.88	Pb4O3SO4
PbCrO4	-12.03	-24.63	-12.60	PbCrO4
PbF2	-11.97	-19.41	-7.44	PbF2
Pbmetal	-24.18	-19.93	4.25	Pb
PbMoO4	-2.80	-18.42	-15.62	PbMoO4
PbO:0.3H2O	-7.37	5.61	12.98	PbO:0.33H2O
PbSeO4	-15.25	-22.09	-6.84	PbSeO4
Periclase	-8.49	13.09	21.58	MgO
Phosgenite	-12.89	-32.70	-19.81	PbCl2:PbCO3
Plattnerite	-18.45	31.16	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-129.58	-148.09	-18.51	FeS2
Pyrochroite	-4.18	11.02	15.19	Mn(OH)2
Pyrolusite	-4.82	36.56	41.38	MnO2
Quartz	0.46	-3.54	-4.00	SiO2

Realgar	-104.29	-124.03	-19.75	AsS
Retgersite	-9.74	-11.78	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	-0.05	-10.63	-10.58	MnCO ₃
Rutherfordine	-5.88	-20.38	-14.50	UO ₂ CO ₃
Sb(OH)3	-14.41	-21.52	-7.11	Sb(OH)3
Sb ₂ O ₄	-20.89	-17.49	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-30.90	-40.57	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-121.41	-189.17	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-67.81	-86.07	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-68.17	-86.07	-17.90	Sb ₄ O ₆
SbCl ₃	-55.50	-54.92	0.57	SbCl ₃
SbF ₃	-48.82	-59.05	-10.23	SbF ₃
Sbmetal	-48.15	-59.83	-11.69	Sb
SbO ₂	-5.23	-33.06	-27.82	SbO ₂
Schoepite	-4.73	1.27	5.99	UO ₂ (OH)2:H ₂ O
Semetal(am)	-16.06	-23.17	-7.11	Se
Semetal(hex)	-15.46	-23.17	-7.71	Se
Senarmontite	-30.67	-43.03	-12.37	Sb ₂ O ₃
SeO ₂	-17.06	-16.94	0.12	SeO ₂
SeO ₃	-48.75	-27.70	21.04	SeO ₃
Sepiolite	-0.19	15.57	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-3.21	15.57	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.96	-18.20	-10.24	FeCO ₃
SiO ₂ (am-gel)	-0.83	-3.54	-2.71	SiO ₂
SiO ₂ (am-ppt)	-0.80	-3.54	-2.74	SiO ₂
Smithsonite	-1.53	-11.53	-10.00	ZnCO ₃
Sphalerite	-66.98	-78.43	-11.45	ZnS
Spinel	-9.17	27.68	36.85	MgAl ₂ O ₄
Stibnite	-258.20	-308.66	-50.46	Sb ₂ S ₃
Sulfur	-60.85	-63.00	-2.14	S
Tenorite	0.47	8.11	7.64	CuO
Thenardite	-8.55	-8.23	0.32	Na ₂ SO ₄
Thermonatrite	-10.49	-9.85	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-9.97	-5.89	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-15.17	5.91	21.08	U ₃ O ₈
U ₃ Sb ₄	-590.17	-437.79	152.38	U ₃ Sb ₄
U ₄ O ₉	-31.67	-34.69	-3.02	U ₄ O ₉
UF ₄	-35.56	-65.10	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-32.38	-65.10	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-15.99	-15.06	0.93	UO ₂
UO ₂ (NO ₃) ₂	-46.17	-34.02	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-38.87	-34.02	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-37.41	-34.02	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-36.07	-34.02	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.34	1.27	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-24.18	-26.43	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.43	1.27	7.70	UO ₃
Uraninite	-10.39	-15.06	-4.67	UO ₂
USb ₂	-224.61	-195.03	29.58	USb ₂
V(OH)3	-21.33	-13.74	7.59	V(OH)3
V ₂ O ₅	-20.23	-21.59	-1.36	V ₂ O ₅
V ₃ O ₅	-47.38	-45.54	1.84	V ₃ O ₅
V ₄ O ₇	-59.40	-52.21	7.19	V ₄ O ₇
V ₆ O ₁₃	-55.01	-115.87	-60.86	V ₆ O ₁₃
Valentinite	-34.55	-43.03	-8.48	Sb ₂ O ₃
VC12	-67.66	-48.79	18.87	VC12
VC13	-70.58	-47.15	23.43	VC13
VF ₄	-71.64	-56.71	14.93	VF ₄
Vmetal	-96.09	-52.06	44.03	V
VO	-41.27	-26.52	14.76	VO
VO(OH)2	-11.82	-6.67	5.15	VO(OH)2
VO ₂ Cl	-24.77	-21.93	2.84	VO ₂ Cl
VOC1	-36.03	-24.88	11.15	VOC1
VOC12	-41.70	-28.94	12.76	VOC12
VOSO ₄	-30.30	-26.69	3.61	VOSO ₄
Witherite	-5.33	-13.90	-8.57	BaCO ₃
Wurtzite	-69.48	-78.43	-8.95	ZnS
Zincite	-1.22	10.11	11.33	ZnO

Zincosite	-13.84	-9.91	3.93	ZnSO4
Zn(BO2)2	-8.42	-0.13	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.49	-25.18	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.09	10.11	12.20	Zn(OH)2
Zn(OH)2(am)	-2.36	10.11	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.64	10.11	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.42	10.11	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.62	10.11	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.30	0.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.10	9.09	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.46	-1.81	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.62	-9.71	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.97	20.43	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.21	28.29	38.50	Zn5(OH)8Cl2
ZnCl2	-19.21	-12.16	7.05	ZnCl2
ZnCO3:1H2O	-1.27	-11.53	-10.26	ZnCO3:1H2O
ZnF2	-14.37	-14.91	-0.53	ZnF2
Znmetal	-41.22	-15.43	25.79	Zn
ZnMoO4	-3.80	-13.92	-10.13	ZnMoO4
ZnO(active)	-1.08	10.11	11.19	ZnO
ZnS(am)	-69.38	-78.43	-9.05	ZnS
ZnSb	-86.28	-75.27	11.01	ZnSb
ZnSe	-24.20	-38.60	-14.40	ZnSe
ZnSeO4:6H2O	-16.07	-17.59	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.27	-9.91	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 66.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 305
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 305
USE Surface 305
USE Solution 314
SAVE Solution 315  #Initial Stage 3 Pit Water After Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 305.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

7.007e-23  Surface + diffuse layer charge, eq
3.569e-13  Surface charge, eq
4.399e-03  sigma, C/m^2
1.213e-01  psi, V

```

-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
7.829e-06 m² for 1.219e-10 moles of Ferrihydrite

Water in diffuse layer: 7.829e-11 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is +1).

Element	Moles
C	2.0000e-16
Ca	2.4787e-18
Cl	4.0051e-15
H	5.9000e-16
K	3.9322e-18
Mg	3.8403e-19
N	1.6214e-14
Na	1.6660e-17
O	7.2269e-13
S	1.6840e-13

Hfo_s
6.097e-13 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	4.076e-13	0.668	4.076e-13	-12.390
Hfo_sOH	1.999e-13	0.328	1.999e-13	-12.699
Hfo_sO-	2.246e-15	0.004	2.246e-15	-14.649
Hfo_sOHCa+2	7.440e-18	0.000	7.440e-18	-17.128

Hfo_w
2.439e-11 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.127e-11	0.462	1.127e-11	-10.948
Hfo_wOH	5.527e-12	0.227	5.527e-12	-11.258
Hfo_wSO4-	3.806e-12	0.156	3.806e-12	-11.419
Hfo_wOHSO4-2	3.725e-12	0.153	3.725e-12	-11.429
Hfo_wO-	6.210e-14	0.003	6.210e-14	-13.207
Hfo_wOMg+	8.777e-20	0.000	8.777e-20	-19.057
Hfo_wOCa+	2.978e-20	0.000	2.978e-20	-19.526

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.

Using solution 314. Solution after simulation 65.

Using surface 305.

Using pure phase assemblage 305. Pure-phase assemblage after simulation 65.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-2.54	-51.24	-48.70	0.000e+00	0	0.000e+00
Alunite	-12.03	-13.43	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-2.50	-6.86	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	6.590e-10	6.588e-10	-1.691e-13

Barite	-2.30	-12.28	-9.98	0.000e+00	0	0.000e+00
Brochantite	-2.79	12.43	15.22	0.000e+00	0	0.000e+00
Brucite	-3.75	13.09	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.432e-11
CaMoO4	-2.92	-10.87	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.59	-3.77	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	8.262e-05	8.262e-05	-3.306e-12
Carnotite	-5.02	-4.79	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-12.86	-3.02	9.84	0.000e+00	0	0.000e+00
CdMoO4	-2.67	-16.82	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	6.298e-06	6.298e-06	-1.422e-12
Cr2O3	0.00	-2.36	-2.36	4.787e-11	4.785e-11	-2.775e-14
Cu2Se(alpha)	-6.85	-52.65	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-2.85	-15.92	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.81	-6.93	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.219e-10	1.219e-10	-4.466e-19
Fluorite	-1.35	-11.85	-10.50	0.000e+00	0	0.000e+00
Gummite	-6.40	1.27	7.67	0.000e+00	0	0.000e+00
Gypsum	-2.25	-6.86	-4.61	0.000e+00	0	0.000e+00
HgSe	-5.67	-61.37	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-7.12	-8.23	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-7.05	-5.92	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.56	8.24	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-23.13	-7.43	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.54	-13.41	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.65	-15.80	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.066e-14
Otavite	-2.43	-14.43	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-2.80	-18.42	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.88	-20.38	-14.50	0.000e+00	0	0.000e+00
SbO2	-5.23	-33.06	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.73	1.27	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.19	15.57	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-0.80	-3.54	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-9.97	-5.89	4.08	0.000e+00	0	0.000e+00
U3O8	-15.17	5.91	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.34	1.27	5.61	0.000e+00	0	0.000e+00
UO3	-6.43	1.27	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.80	-13.92	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-8.426e-26 Surface + diffuse layer charge, eq
2.327e-13 Surface charge, eq
2.868e-03 sigma, C/m²
1.540e-02 psi, V
-5.994e-01 -F*psi/RT
5.492e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
7.829e-06 m² for 1.219e-10 moles of Ferrihydrite

Water in diffuse layer: 7.829e-11 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 5.739e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 7.998e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	9.2828e-20
Al	1.0609e-17
As	5.8927e-19
B	7.1015e-16
Ba	6.6010e-20

C	1.3024e-13
Ca	2.0409e-14
Cd	3.2915e-20
Cl	1.9168e-13
Co	2.3176e-19
Cr	4.4047e-20
Cu	1.6618e-17
F	8.2334e-15
Fe	5.4894e-20
H	2.2481e-13
Hg	7.1606e-21
K	1.5141e-14
Mg	1.6492e-14
Mn	1.4321e-16
Mo	9.5952e-18
N	6.3024e-17
Na	2.1984e-13
Ni	3.7905e-19
O	9.0476e-13
Pb	2.7776e-20
S	1.0397e-13
Sb	1.1801e-19
Se	8.0171e-19
Si	2.3884e-14
U	3.4873e-18
V	4.2758e-20
Zn	3.6628e-17

Hfo_s

6.097e-13 moles [0.005 mol/(mol Ferrihydrite)]				
Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.412e-13	0.396	2.412e-13	-12.618
Hfo_sOCu+	1.917e-13	0.314	1.917e-13	-12.717
Hfo_sOMn+	7.854e-14	0.129	7.854e-14	-13.105
Hfo_sOCrOH+	5.551e-14	0.091	5.550e-14	-13.256
Hfo_sOPb+	3.465e-14	0.057	3.465e-14	-13.460
Hfo_sOHCa+2	5.828e-15	0.010	5.828e-15	-14.235
Hfo_sOH	8.515e-16	0.001	8.514e-16	-15.070
Hfo_sONi+	7.724e-16	0.001	7.724e-16	-15.112
Hfo_sO-	4.478e-16	0.001	4.477e-16	-15.349
Hfo_sOCd+	9.236e-17	0.000	9.235e-17	-16.035
Hfo_sOCu+	8.313e-17	0.000	8.312e-17	-16.080
Hfo_sOH2+	3.710e-17	0.000	3.709e-17	-16.431
Hfo_sOAg	8.836e-19	0.000	8.835e-19	-18.054
Hfo_sOHBa+2	6.818e-20	0.000	6.817e-20	-19.166
Hfo_sOFe+	2.692e-20	0.000	2.692e-20	-19.570
Hfo_sOHg+	3.757e-23	0.000	3.757e-23	-22.425

Hfo_w

2.439e-11 moles [0.2 mol/(mol Ferrihydrite)]				
Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	6.319e-12	0.259	6.318e-12	-11.199
Hfo_wOH	5.472e-12	0.224	5.472e-12	-11.262
Hfo_wOMg+	3.782e-12	0.155	3.781e-12	-11.422
Hfo_wOHAsO4-3	3.148e-12	0.129	3.147e-12	-11.502
Hfo_wO-	2.878e-12	0.118	2.877e-12	-11.541
Hfo_wOZn+	1.623e-12	0.067	1.623e-12	-11.790
Hfo_wOMn+	4.010e-13	0.016	4.009e-13	-12.397
Hfo_wOCa+	2.537e-13	0.010	2.537e-13	-12.596
Hfo_wOH2+	2.384e-13	0.010	2.384e-13	-12.623
Hfo_wOHVO4-3	1.833e-13	0.008	1.833e-13	-12.737
Hfo_wOHSO4-2	6.416e-14	0.003	6.415e-14	-13.193
Hfo_wOPb+	9.947e-15	0.000	9.946e-15	-14.002
Hfo_wOHSeO3-2	7.440e-15	0.000	7.439e-15	-14.128

Hfo_wONi+	6.696e-15	0.000	6.696e-15	-14.174
Hfo_wOCo+	1.506e-15	0.000	1.506e-15	-14.822
Hfo_wSO4-	1.401e-15	0.000	1.401e-15	-14.854
Hfo_wSeO3-	5.505e-16	0.000	5.505e-16	-15.259
Hfo_wOHMoO4-2	2.542e-16	0.000	2.542e-16	-15.595
Hfo_wOCd+	2.532e-16	0.000	2.532e-16	-15.597
Hfo_wH2BO3	1.729e-16	0.000	1.729e-16	-15.762
Hfo_wHAsO4-	1.338e-16	0.000	1.337e-16	-15.874
Hfo_wMoO4-	7.152e-18	0.000	7.152e-18	-17.146
Hfo_wOAg	1.494e-18	0.000	1.493e-18	-17.826
Hfo_wH2AsO4	1.886e-19	0.000	1.885e-19	-18.725
Hfo_wOFe+	1.092e-19	0.000	1.092e-19	-18.962
Hfo_wOBa+	4.290e-20	0.000	4.290e-20	-19.368
Hfo_wOHg+	1.183e-20	0.000	1.182e-20	-19.927
Hfo_wOHCrO4-2	5.036e-21	0.000	5.036e-21	-20.298
Hfo_wOHSeO4-2	1.375e-21	0.000	1.375e-21	-20.862
Hfo_wOHSbO(OH) 4-	2.548e-22	0.000	2.547e-22	-21.594
Hfo_wCrO4-	1.003e-22	0.000	1.003e-22	-21.999
Hfo_wSeO4-	2.615e-23	0.000	2.615e-23	-22.583
Hfo_wSbO(OH) 4	7.167e-24	0.000	7.167e-24	-23.145
Hfo_wH2AsO3	2.684e-29	0.000	2.684e-29	-28.571

Elements	Molality	Moles
Ag	1.198e-09	1.198e-09
Al	1.084e-07	1.085e-07
As	4.840e-09	4.840e-09
B	8.780e-06	8.780e-06
Ba	1.312e-09	1.312e-09
C	1.333e-03	1.333e-03
Ca	3.850e-04	3.851e-04
Cd	5.691e-10	5.691e-10
Cl	1.958e-03	1.958e-03
Co	4.125e-09	4.126e-09
Cr	6.075e-10	6.076e-10
Cu	2.119e-07	2.119e-07
F	8.490e-05	8.491e-05
Fe	7.094e-10	7.094e-10
Hg	9.146e-11	9.147e-11
K	2.412e-04	2.413e-04
Mg	3.148e-04	3.149e-04
Mn	2.744e-06	2.745e-06
Mo	7.840e-08	7.841e-08
N	6.441e-07	6.442e-07
Na	3.504e-03	3.504e-03
Ni	6.409e-09	6.409e-09
Pb	3.599e-10	3.599e-10
S	8.711e-04	8.711e-04
Sb	1.206e-09	1.206e-09
Se	7.174e-09	7.174e-09
Si	3.022e-04	3.023e-04
U	2.062e-08	2.062e-08
V	3.926e-10	3.926e-10
Zn	5.902e-07	5.902e-07

equilibrium	pH	=	8.391	Charge balance
	pe	=	4.382	Adjusted to redox
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.459e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.366e-03	
	Total CO2 (mol/kg)	=	1.333e-03	
	Temperature (°C)	=	25.00	

Electrical balance (eq) = 7.622e-08
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 1
Total H = 1.110252e+02
Total O = 5.552004e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.698e-06	2.475e-06	-5.569	-5.607	-0.038	(0)
H+	4.430e-09	4.069e-09	-8.354	-8.391	-0.037	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.198e-09					
AgCl	8.136e-10	8.136e-10	-9.090	-9.090	0.000	(0)
Ag+	2.412e-10	2.216e-10	-9.618	-9.655	-0.037	(0)
AgCl2-	1.400e-10	1.274e-10	-9.854	-9.895	-0.041	(0)
AgSO4-	2.786e-12	2.535e-12	-11.555	-11.596	-0.041	(0)
AgCl3-2	2.979e-13	2.043e-13	-12.526	-12.690	-0.164	(0)
AgOH	5.483e-14	5.483e-14	-13.261	-13.261	0.000	(0)
AgF	4.224e-14	4.224e-14	-13.374	-13.374	0.000	(0)
AgNO2	2.726e-14	2.726e-14	-13.565	-13.565	0.000	(0)
AgH2BO3	3.799e-15	3.799e-15	-14.420	-14.420	0.000	(0)
AgCl4-3	1.754e-15	7.500e-16	-14.756	-15.125	-0.369	(0)
AgSeO3-	4.338e-16	3.947e-16	-15.363	-15.404	-0.041	(0)
AgNH3+	5.067e-17	4.611e-17	-16.295	-16.336	-0.041	(0)
Ag2Se	4.685e-17	4.685e-17	-16.329	-16.329	0.000	(0)
Ag (OH) 2-	1.457e-17	1.326e-17	-16.837	-16.878	-0.041	(0)
AgNO3	9.776e-20	9.776e-20	-19.010	-19.010	0.000	(0)
Ag (NO2) 2-	2.732e-20	2.486e-20	-19.564	-19.605	-0.041	(0)
Ag (NH3) 2+	4.198e-23	3.820e-23	-22.377	-22.418	-0.041	(0)
Ag (SeO3) 2-3	2.291e-23	9.797e-24	-22.640	-23.009	-0.369	(0)
Ag2MoO4	1.036e-27	1.036e-27	-26.984	-26.984	0.000	(0)
AgHS	0.000e+00	0.000e+00	-75.991	-75.991	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.980	-85.636	-0.656	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-151.017	-151.135	-0.117	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.951	-152.184	-0.233	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-152.001	-152.042	-0.041	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.269	-152.495	-0.226	(0)
Al	1.084e-07					
Al (OH) 4-	1.081e-07	9.937e-08	-6.966	-7.003	-0.037	(0)
Al (OH) 3	3.190e-10	3.190e-10	-9.496	-9.496	0.000	(0)
Al (OH) 2+	7.017e-12	6.461e-12	-11.154	-11.190	-0.036	(0)
AlF2+	3.308e-14	3.046e-14	-13.480	-13.516	-0.036	(0)
AlF3	2.910e-14	2.910e-14	-13.536	-13.536	0.000	(0)
AlOH+2	4.574e-15	3.287e-15	-14.340	-14.483	-0.144	(0)
AlF+2	1.403e-15	1.008e-15	-14.853	-14.997	-0.144	(0)
AlF4-	1.204e-15	1.107e-15	-14.919	-14.956	-0.037	(0)
AlSO4+	6.433e-18	5.913e-18	-17.192	-17.228	-0.037	(0)
Al+3	2.857e-18	1.328e-18	-17.544	-17.877	-0.333	(0)
Al (SO4) 2-	3.953e-20	3.633e-20	-19.403	-19.440	-0.037	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-56.380	-56.749	-0.369	(0)
As (3)	2.172e-23					
H3AsO3	1.908e-23	1.908e-23	-22.719	-22.719	0.000	(0)
H2AsO3-	2.643e-24	2.405e-24	-23.578	-23.619	-0.041	(0)
HAsO3-2	7.863e-28	5.391e-28	-27.104	-27.268	-0.164	(0)
H4AsO3+	4.226e-32	3.846e-32	-31.374	-31.415	-0.041	(0)
AsO3-3	1.194e-32	5.107e-33	-31.923	-32.292	-0.369	(0)
As (5)	4.840e-09					
HAsO4-2	4.702e-09	3.224e-09	-8.328	-8.492	-0.164	(0)
H2AsO4-	1.315e-10	1.196e-10	-9.881	-9.922	-0.041	(0)
AsO4-3	5.859e-12	2.506e-12	-11.232	-11.601	-0.369	(0)
H3AsO4	8.444e-17	8.457e-17	-16.073	-16.073	0.001	(0)
B	8.780e-06					
H3BO3	7.567e-06	7.578e-06	-5.121	-5.120	0.001	(0)
H2BO3-	1.182e-06	1.082e-06	-5.927	-5.966	-0.038	(0)
CaH2BO3+	1.654e-08	1.514e-08	-7.781	-7.820	-0.038	(0)

	MgH2BO3+	8.353e-09	7.645e-09	-8.078	-8.117	-0.038	(0)
	NaH2BO3	5.495e-09	5.495e-09	-8.260	-8.260	0.000	(0)
	BF (OH) 3-	2.508e-10	2.295e-10	-9.601	-9.639	-0.038	(0)
	H5 (BO3) 2-	7.624e-12	6.978e-12	-11.118	-11.156	-0.038	(0)
	BaH2BO3+	3.362e-14	3.078e-14	-13.473	-13.512	-0.038	(0)
	BF2 (OH) 2-	8.279e-15	7.577e-15	-14.082	-14.120	-0.038	(0)
	H8 (BO3) 3-	5.777e-15	5.288e-15	-14.238	-14.277	-0.038	(0)
	AgH2BO3	3.799e-15	3.799e-15	-14.420	-14.420	0.000	(0)
	BF3OH-	9.947e-22	9.104e-22	-21.002	-21.041	-0.038	(0)
	BF4-	1.511e-27	1.383e-27	-26.821	-26.859	-0.038	(0)
Ba	1.312e-09						
	Ba+2	1.294e-09	9.206e-10	-8.888	-9.036	-0.148	(0)
	BaHCO3+	1.127e-11	1.039e-11	-10.948	-10.983	-0.035	(0)
	BaCO3	6.429e-12	6.429e-12	-11.192	-11.192	0.000	(0)
	BaH2BO3+	3.362e-14	3.078e-14	-13.473	-13.512	-0.038	(0)
	BaOH+	1.081e-14	9.944e-15	-13.966	-14.002	-0.036	(0)
	BaNO3+	2.817e-18	2.563e-18	-17.550	-17.591	-0.041	(0)
	BaNH3+2	8.635e-20	5.920e-20	-19.064	-19.228	-0.164	(0)
C (4)	1.333e-03						
	HCO3-	1.283e-03	1.182e-03	-2.892	-2.928	-0.036	(0)
	CO3-2	1.914e-05	1.362e-05	-4.718	-4.866	-0.148	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CaHCO3+	5.805e-06	5.351e-06	-5.236	-5.272	-0.035	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgHCO3+	2.684e-06	2.465e-06	-5.571	-5.608	-0.037	(0)
	MgCO3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
	NaHCO3	2.130e-06	2.130e-06	-5.672	-5.672	0.000	(0)
	NaCO3-	8.826e-07	8.127e-07	-6.054	-6.090	-0.036	(0)
	CuCO3	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
	ZnCO3	1.683e-07	1.683e-07	-6.774	-6.774	0.000	(0)
	MnHCO3+	4.399e-08	4.047e-08	-7.357	-7.393	-0.036	(0)
	UO2 (CO3) 3-4	1.399e-08	3.091e-09	-7.854	-8.510	-0.656	(0)
	Cu (CO3) 2-2	9.210e-09	6.314e-09	-8.036	-8.200	-0.164	(0)
	ZnHCO3+	8.820e-09	8.025e-09	-8.055	-8.096	-0.041	(0)
	UO2 (CO3) 2-2	6.607e-09	4.529e-09	-8.180	-8.344	-0.164	(0)
	NiCO3	1.456e-09	1.456e-09	-8.837	-8.837	0.000	(0)
	CoCO3	4.801e-10	4.801e-10	-9.319	-9.319	0.000	(0)
	NiHCO3+	4.590e-10	4.176e-10	-9.338	-9.379	-0.041	(0)
	PbCO3	2.763e-10	2.763e-10	-9.559	-9.559	0.000	(0)
	CoHCO3+	2.107e-10	1.917e-10	-9.676	-9.717	-0.041	(0)
	CuHCO3+	1.761e-10	1.602e-10	-9.754	-9.795	-0.041	(0)
	CdCO3	8.450e-11	8.450e-11	-10.073	-10.073	0.000	(0)
	UO2CO3	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
	Pb (CO3) 2-2	1.583e-11	1.085e-11	-10.801	-10.965	-0.164	(0)
	BaHCO3+	1.127e-11	1.039e-11	-10.948	-10.983	-0.035	(0)
	PbHCO3+	6.513e-12	5.926e-12	-11.186	-11.227	-0.041	(0)
	BaCO3	6.429e-12	6.429e-12	-11.192	-11.192	0.000	(0)
	Cd (CO3) 2-2	1.244e-12	8.530e-13	-11.905	-12.069	-0.164	(0)
	CdHCO3+	8.050e-13	7.325e-13	-12.094	-12.135	-0.041	(0)
	FeHCO3+	7.543e-16	6.953e-16	-15.122	-15.158	-0.035	(0)
	HgCO3	9.342e-17	9.342e-17	-16.030	-16.030	0.000	(0)
	Hg (CO3) 2-2	5.868e-18	4.023e-18	-17.232	-17.395	-0.164	(0)
	HgHCO3+	7.778e-21	7.078e-21	-20.109	-20.150	-0.041	(0)
Ca	3.850e-04						
	Ca+2	3.418e-04	2.432e-04	-3.466	-3.614	-0.148	(0)
	CaSO4	3.195e-05	3.195e-05	-4.496	-4.496	0.000	(0)
	CaHCO3+	5.805e-06	5.351e-06	-5.236	-5.272	-0.035	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.190e-07	2.014e-07	-6.660	-6.696	-0.036	(0)
	CaH2BO3+	1.654e-08	1.514e-08	-7.781	-7.820	-0.038	(0)
	CaOH+	1.303e-08	1.201e-08	-7.885	-7.921	-0.035	(0)
	CaNO3+	4.695e-13	4.272e-13	-12.328	-12.369	-0.041	(0)
	CaNH3+2	4.552e-14	3.120e-14	-13.342	-13.506	-0.164	(0)
	Ca (NH3) 2+2	1.847e-24	1.266e-24	-23.734	-23.898	-0.164	(0)
Cd	5.691e-10						
	Cd+2	3.827e-10	2.723e-10	-9.417	-9.565	-0.148	(0)
	CdCO3	8.450e-11	8.450e-11	-10.073	-10.073	0.000	(0)
	CdCl+	5.139e-11	4.676e-11	-10.289	-10.330	-0.041	(0)

CdSO4	3.660e-11	3.660e-11	-10.436	-10.436	0.000	(0)
CdOH+	5.882e-12	5.352e-12	-11.230	-11.271	-0.041	(0)
CdOHC1	4.747e-12	4.747e-12	-11.324	-11.324	0.000	(0)
Cd(CO3) 2-2	1.244e-12	8.530e-13	-11.905	-12.069	-0.164	(0)
CdHCO3+	8.050e-13	7.325e-13	-12.094	-12.135	-0.041	(0)
Cd(SO4) 2-2	4.130e-13	2.831e-13	-12.384	-12.548	-0.164	(0)
CdF+	3.599e-13	3.275e-13	-12.444	-12.485	-0.041	(0)
CdCl2	3.506e-13	3.506e-13	-12.455	-12.455	0.000	(0)
Cd(OH) 2	8.356e-14	8.356e-14	-13.078	-13.078	0.000	(0)
CdCl3-	4.372e-16	3.978e-16	-15.359	-15.400	-0.041	(0)
CdF2	4.960e-17	4.960e-17	-16.305	-16.305	0.000	(0)
Cd(OH) 3-	1.388e-17	1.263e-17	-16.857	-16.898	-0.041	(0)
CdSeO4	6.089e-19	6.089e-19	-18.215	-18.215	0.000	(0)
CdNO3+	5.257e-19	4.783e-19	-18.279	-18.320	-0.041	(0)
Cd2OH+3	1.708e-20	7.304e-21	-19.768	-20.136	-0.369	(0)
Cd(SeO3) 2-2	2.515e-21	1.724e-21	-20.599	-20.763	-0.164	(0)
Cd(OH) 4-2	7.464e-24	5.117e-24	-23.127	-23.291	-0.164	(0)
Cd(NO3) 2	1.332e-28	1.332e-28	-27.876	-27.876	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-81.667	-81.708	-0.041	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-154.655	-154.655	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-232.865	-232.906	-0.041	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-310.696	-310.860	-0.164	(0)
C1	1.958e-03					
Cl-	1.958e-03	1.798e-03	-2.708	-2.745	-0.037	(0)
MnCl+	4.224e-09	3.886e-09	-8.374	-8.410	-0.036	(0)
ZnOHC1	3.143e-09	3.143e-09	-8.503	-8.503	0.000	(0)
ZnCl+	1.057e-09	9.702e-10	-8.976	-9.013	-0.037	(0)
AgCl	8.136e-10	8.136e-10	-9.090	-9.090	0.000	(0)
AgCl2-	1.400e-10	1.274e-10	-9.854	-9.895	-0.041	(0)
CuCl	9.892e-11	9.892e-11	-10.005	-10.005	0.000	(0)
CdCl+	5.139e-11	4.676e-11	-10.289	-10.330	-0.041	(0)
CuCl2-	4.048e-11	3.717e-11	-10.393	-10.430	-0.037	(0)
NiCl+	1.450e-11	1.319e-11	-10.839	-10.880	-0.041	(0)
CoCl+	1.426e-11	1.298e-11	-10.846	-10.887	-0.041	(0)
MnCl2	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)
CuCl+	6.671e-12	6.125e-12	-11.176	-11.213	-0.037	(0)
CdOHC1	4.747e-12	4.747e-12	-11.324	-11.324	0.000	(0)
ZnCl2	2.765e-12	2.765e-12	-11.558	-11.558	0.000	(0)
PbCl+	4.733e-13	4.307e-13	-12.325	-12.366	-0.041	(0)
CdCl2	3.506e-13	3.506e-13	-12.455	-12.455	0.000	(0)
AgCl3-2	2.979e-13	2.043e-13	-12.526	-12.690	-0.164	(0)
HgClOH	4.506e-14	4.506e-14	-13.346	-13.346	0.000	(0)
CuCl3-2	1.995e-14	1.429e-14	-13.700	-13.845	-0.145	(0)
MnCl3-	5.316e-15	4.890e-15	-14.274	-14.311	-0.036	(0)
ZnCl3-	4.302e-15	3.950e-15	-14.366	-14.403	-0.037	(0)
CuCl2	3.819e-15	3.819e-15	-14.418	-14.418	0.000	(0)
PbCl2	3.460e-15	3.460e-15	-14.461	-14.461	0.000	(0)
HgCl2	1.854e-15	1.854e-15	-14.732	-14.732	0.000	(0)
AgCl4-3	1.754e-15	7.500e-16	-14.756	-15.125	-0.369	(0)
CdCl3-	4.372e-16	3.978e-16	-15.359	-15.400	-0.041	(0)
NiCl2	1.195e-16	1.195e-16	-15.923	-15.923	0.000	(0)
HgCl3-	3.665e-17	3.335e-17	-16.436	-16.477	-0.041	(0)
ZnCl4-2	4.959e-18	3.552e-18	-17.305	-17.449	-0.145	(0)
PbCl3-	2.722e-18	2.477e-18	-17.565	-17.606	-0.041	(0)
UO2Cl+	9.858e-19	8.970e-19	-18.006	-18.047	-0.041	(0)
HgCl4-2	3.483e-19	2.388e-19	-18.458	-18.622	-0.164	(0)
HgCl+	2.261e-19	2.057e-19	-18.646	-18.687	-0.041	(0)
CuCl3-	6.981e-20	6.410e-20	-19.156	-19.193	-0.037	(0)
CrCl+2	5.614e-20	3.849e-20	-19.251	-19.415	-0.164	(0)
CrOHC12	3.255e-21	3.255e-21	-20.487	-20.487	0.000	(0)
PbCl4-2	2.970e-21	2.036e-21	-20.527	-20.691	-0.164	(0)
FeCl+2	7.929e-24	5.681e-24	-23.101	-23.246	-0.145	(0)
CrCl2+	7.217e-24	6.567e-24	-23.142	-23.183	-0.041	(0)
CuCl4-2	8.065e-25	5.778e-25	-24.093	-24.238	-0.145	(0)
FeCl2+	4.960e-26	4.563e-26	-25.304	-25.341	-0.036	(0)
CrO3Cl-	2.327e-26	2.117e-26	-25.633	-25.674	-0.041	(0)
VOCl+	1.977e-26	1.799e-26	-25.704	-25.745	-0.041	(0)
FeCl3	8.207e-30	8.207e-30	-29.086	-29.086	0.000	(0)

CoCl+2	1.068e-37	7.320e-38	-36.972	-37.136	-0.164	(0)
UCl+3	0.000e+00	0.000e+00	-49.298	-49.667	-0.369	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
Co (2)	4.125e-09					
Co+2	3.043e-09	2.086e-09	-8.517	-8.681	-0.164	(0)
CoCO3	4.801e-10	4.801e-10	-9.319	-9.319	0.000	(0)
CoSO4	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
CoHCO3+	2.107e-10	1.917e-10	-9.676	-9.717	-0.041	(0)
CoOH+	1.132e-10	1.030e-10	-9.946	-9.987	-0.041	(0)
Co (OH) 2	2.024e-11	2.024e-11	-10.694	-10.694	0.000	(0)
CoCl+	1.426e-11	1.298e-11	-10.846	-10.887	-0.041	(0)
CoF+	5.502e-12	5.006e-12	-11.260	-11.300	-0.041	(0)
CoNO2+	9.512e-15	8.655e-15	-14.022	-14.063	-0.041	(0)
Co (OH) 3-	1.098e-15	9.995e-16	-14.959	-15.000	-0.041	(0)
CoOOH-	2.756e-16	2.508e-16	-15.560	-15.601	-0.041	(0)
Co (NH3) +2	3.728e-17	2.556e-17	-16.428	-16.592	-0.164	(0)
CoSeO4	1.255e-17	1.255e-17	-16.901	-16.901	0.000	(0)
CoNO3+	2.018e-18	1.836e-18	-17.695	-17.736	-0.041	(0)
Co2OH+3	2.518e-20	1.077e-20	-19.599	-19.968	-0.369	(0)
Co (OH) 4-2	5.718e-22	3.920e-22	-21.243	-21.407	-0.164	(0)
Co (NH3) 2+2	1.621e-25	1.111e-25	-24.790	-24.954	-0.164	(0)
Co (NO3) 2	2.076e-27	2.076e-27	-26.683	-26.683	0.000	(0)
Co4 (OH) 4+4	1.016e-31	2.245e-32	-30.993	-31.649	-0.656	(0)
Co (NH3) 3+2	2.080e-34	1.426e-34	-33.682	-33.846	-0.164	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-42.954	-43.118	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.725	-52.889	-0.164	(0)
Co (3)	3.669e-30					
CoOH+2	3.669e-30	2.515e-30	-29.435	-29.599	-0.164	(0)
Co+3	4.302e-37	2.000e-37	-36.366	-36.699	-0.333	(0)
CoCl+2	1.068e-37	7.320e-38	-36.972	-37.136	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.346	-76.510	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
Cr (2)	2.392e-28					
Cr+2	2.392e-28	1.640e-28	-27.621	-27.785	-0.164	(0)
Cr (3)	6.075e-10					
Cr (OH) 2+	2.962e-10	2.695e-10	-9.528	-9.569	-0.041	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.215e-11	2.925e-11	-10.493	-10.534	-0.041	(0)
Cr (OH) 4-	2.713e-11	2.468e-11	-10.567	-10.608	-0.041	(0)
Cr (OH) +2	1.306e-12	8.952e-13	-11.884	-12.048	-0.164	(0)
CrOHSO4	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
CrF+2	2.901e-16	1.989e-16	-15.537	-15.701	-0.164	(0)
Cr+3	3.867e-17	1.654e-17	-16.413	-16.782	-0.369	(0)
CrSO4+	2.433e-17	2.214e-17	-16.614	-16.655	-0.041	(0)
CrCl+2	5.614e-20	3.849e-20	-19.251	-19.415	-0.164	(0)
CrOHC12	3.255e-21	3.255e-21	-20.487	-20.487	0.000	(0)
Cr2 (OH) 2SO4+2	1.438e-23	9.856e-24	-22.842	-23.006	-0.164	(0)
CrCl2+	7.217e-24	6.567e-24	-23.142	-23.183	-0.041	(0)
Cr2 (OH) 2 (SO4) 2	3.357e-25	3.357e-25	-24.474	-24.474	0.000	(0)
CrNO3+2	5.857e-28	4.015e-28	-27.232	-27.396	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-51.811	-51.975	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-63.363	-63.732	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Cr (6)	5.025e-14					
CrO4-2	4.910e-14	3.494e-14	-13.309	-13.457	-0.148	(0)
NaCrO4-	6.116e-16	5.565e-16	-15.214	-15.255	-0.041	(0)
HCrO4-	5.055e-16	4.600e-16	-15.296	-15.337	-0.041	(0)
KCrO4-	3.148e-17	2.865e-17	-16.502	-16.543	-0.041	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	4.769e-25	3.269e-25	-24.322	-24.486	-0.164	(0)
CrO3Cl-	2.327e-26	2.117e-26	-25.633	-25.674	-0.041	(0)
Cr2O7-2	1.070e-29	7.338e-30	-28.970	-29.134	-0.164	(0)
Cu (1)	1.874e-10					
CuCl	9.892e-11	9.892e-11	-10.005	-10.005	0.000	(0)

Cu+	4.801e-11	4.369e-11	-10.319	-10.360	-0.041	(0)
CuCl2-	4.048e-11	3.717e-11	-10.393	-10.430	-0.037	(0)
CuCl3-2	1.995e-14	1.429e-14	-13.700	-13.845	-0.145	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.261	-150.490	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.998	-151.220	-0.222	(0)
Cu (2)	2.117e-07					
CuCO3	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
CuOH+	1.831e-08	1.681e-08	-7.737	-7.774	-0.037	(0)
Cu (CO3) 2-2	9.210e-09	6.314e-09	-8.036	-8.200	-0.164	(0)
Cu (OH) 2	8.302e-09	8.302e-09	-8.081	-8.081	0.000	(0)
Cu+2	3.020e-09	2.149e-09	-8.520	-8.668	-0.148	(0)
CuSO4	2.823e-10	2.823e-10	-9.549	-9.549	0.000	(0)
CuHCO3+	1.761e-10	1.602e-10	-9.754	-9.795	-0.041	(0)
Cu (OH) 3-	4.631e-11	4.214e-11	-10.334	-10.375	-0.041	(0)
CuF+	1.131e-11	1.029e-11	-10.947	-10.988	-0.041	(0)
Cu2 (OH) 2+2	1.036e-11	7.102e-12	-10.985	-11.149	-0.164	(0)
CuCl+	6.671e-12	6.125e-12	-11.176	-11.213	-0.037	(0)
CuNO2+	1.456e-13	1.325e-13	-12.837	-12.878	-0.041	(0)
CuCl2	3.819e-15	3.819e-15	-14.418	-14.418	0.000	(0)
CuNH3+2	3.269e-15	2.241e-15	-14.486	-14.650	-0.164	(0)
Cu (OH) 4-2	1.197e-15	8.207e-16	-14.922	-15.086	-0.164	(0)
CuNO3+	4.148e-18	3.775e-18	-17.382	-17.423	-0.041	(0)
Cu (NO2) 2	7.983e-19	7.983e-19	-18.098	-18.098	0.000	(0)
CuCl3-	6.981e-20	6.410e-20	-19.156	-19.193	-0.037	(0)
CuCl4-2	8.065e-25	5.778e-25	-24.093	-24.238	-0.145	(0)
Cu (NO3) 2	2.640e-28	2.640e-28	-27.578	-27.578	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-223.180	-223.221	-0.041	(0)
F	8.490e-05					
F-	8.264e-05	7.590e-05	-4.083	-4.120	-0.037	(0)
MgF+	1.888e-06	1.736e-06	-5.724	-5.761	-0.037	(0)
CaF+	2.190e-07	2.014e-07	-6.660	-6.696	-0.036	(0)
NaF	1.535e-07	1.535e-07	-6.814	-6.814	0.000	(0)
MnF+	5.638e-09	5.187e-09	-8.249	-8.285	-0.036	(0)
HF	4.567e-10	4.567e-10	-9.340	-9.340	0.000	(0)
ZnF+	3.574e-10	3.252e-10	-9.447	-9.488	-0.041	(0)
BF (OH) 3-	2.508e-10	2.295e-10	-9.601	-9.639	-0.038	(0)
CuF+	1.131e-11	1.029e-11	-10.947	-10.988	-0.041	(0)
NiF+	6.006e-12	5.465e-12	-11.221	-11.262	-0.041	(0)
CoF+	5.502e-12	5.006e-12	-11.260	-11.300	-0.041	(0)
CdF+	3.599e-13	3.275e-13	-12.444	-12.485	-0.041	(0)
HF2-	1.437e-13	1.318e-13	-12.843	-12.880	-0.038	(0)
AgF	4.224e-14	4.224e-14	-13.374	-13.374	0.000	(0)
PbF+	3.967e-14	3.610e-14	-13.402	-13.443	-0.041	(0)
AlF2+	3.308e-14	3.046e-14	-13.480	-13.516	-0.036	(0)
AlF3	2.910e-14	2.910e-14	-13.536	-13.536	0.000	(0)
BF2 (OH) 2-	8.279e-15	7.577e-15	-14.082	-14.120	-0.038	(0)
UO2F+	3.541e-15	3.222e-15	-14.451	-14.492	-0.041	(0)
AlF4-	1.403e-15	1.008e-15	-14.853	-14.997	-0.144	(0)
AlF4-	1.204e-15	1.107e-15	-14.919	-14.956	-0.037	(0)
UO2F2	7.052e-16	7.052e-16	-15.152	-15.152	0.000	(0)
CrF+2	2.901e-16	1.989e-16	-15.537	-15.701	-0.164	(0)
PbF2	5.391e-17	5.391e-17	-16.268	-16.268	0.000	(0)
CdF2	4.960e-17	4.960e-17	-16.305	-16.305	0.000	(0)
UO2F3-	1.478e-17	1.344e-17	-16.830	-16.871	-0.041	(0)
H2F2	5.589e-19	5.589e-19	-18.253	-18.253	0.000	(0)
FeF2+	1.922e-20	1.768e-20	-19.716	-19.753	-0.036	(0)
FeF+2	1.215e-20	8.704e-21	-19.915	-20.060	-0.145	(0)
UO2F4-2	1.182e-20	8.105e-21	-19.927	-20.091	-0.164	(0)
VO2F	8.633e-21	8.633e-21	-20.064	-20.064	0.000	(0)
PbF3-	8.529e-21	7.761e-21	-20.069	-20.110	-0.041	(0)
FeF3	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
BF3OH-	9.947e-22	9.104e-22	-21.002	-21.041	-0.038	(0)
VO2F2-	2.614e-22	2.379e-22	-21.583	-21.624	-0.041	(0)
VOF+	1.784e-24	1.623e-24	-23.749	-23.790	-0.041	(0)
PbF4-2	4.112e-25	2.819e-25	-24.386	-24.550	-0.164	(0)
VO2F3-2	3.285e-25	2.252e-25	-24.483	-24.647	-0.164	(0)
VOF2	4.619e-26	4.619e-26	-25.335	-25.335	0.000	(0)
HgF+	1.773e-26	1.613e-26	-25.751	-25.792	-0.041	(0)

BF4-	1.511e-27	1.383e-27	-26.821	-26.859	-0.038	(0)
Sb(OH) 2F	1.465e-28	1.465e-28	-27.834	-27.834	0.000	(0)
SbOF	1.441e-28	1.441e-28	-27.841	-27.841	0.000	(0)
VOF3-	1.367e-28	1.244e-28	-27.864	-27.905	-0.041	(0)
VO2F4-3	1.967e-29	8.410e-30	-28.706	-29.075	-0.369	(0)
VOF4-2	5.558e-32	3.810e-32	-31.255	-31.419	-0.164	(0)
SiF6-2	3.226e-32	2.311e-32	-31.491	-31.636	-0.145	(0)
UF3+	4.569e-40	4.157e-40	-39.340	-39.381	-0.041	(0)
UF2+2	0.000e+00	0.000e+00	-40.297	-40.461	-0.164	(0)
UF4	0.000e+00	0.000e+00	-41.461	-41.461	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.073	-43.442	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.942	-43.983	-0.041	(0)
UF6-2	0.000e+00	0.000e+00	-45.459	-45.623	-0.164	(0)
Fe (2)	8.053e-14					
Fe+2	6.818e-14	4.674e-14	-13.166	-13.330	-0.164	(0)
FeSO4	6.579e-15	6.579e-15	-14.182	-14.182	0.000	(0)
FeOH+	5.005e-15	4.605e-15	-14.301	-14.337	-0.036	(0)
FeHCO3+	7.543e-16	6.953e-16	-15.122	-15.158	-0.035	(0)
Fe(OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	7.698e-18	7.082e-18	-17.114	-17.150	-0.036	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-164.682	-164.682	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-242.755	-242.796	-0.041	(0)
Fe (3)	7.093e-10					
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 2+	1.747e-10	1.609e-10	-9.758	-9.793	-0.036	(0)
Fe(OH) 4-	1.070e-10	9.851e-11	-9.971	-10.007	-0.036	(0)
FeOH+2	2.333e-16	1.671e-16	-15.632	-15.777	-0.145	(0)
FeF2+	1.922e-20	1.768e-20	-19.716	-19.753	-0.036	(0)
FeF+2	1.215e-20	8.704e-21	-19.915	-20.060	-0.145	(0)
FeF3	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
FeSO4+	7.315e-22	6.730e-22	-21.136	-21.172	-0.036	(0)
Fe+3	2.250e-22	1.046e-22	-21.648	-21.980	-0.333	(0)
Fe(SO4) 2-	9.067e-24	8.251e-24	-23.043	-23.084	-0.041	(0)
FeCl+2	7.929e-24	5.681e-24	-23.101	-23.246	-0.145	(0)
FeCl2+	4.960e-26	4.563e-26	-25.304	-25.341	-0.036	(0)
FeHSeO3+2	1.142e-27	7.830e-28	-26.942	-27.106	-0.164	(0)
FeCl3	8.207e-30	8.207e-30	-29.086	-29.086	0.000	(0)
Fe2(OH) 2+4	4.187e-30	9.247e-31	-29.378	-30.034	-0.656	(0)
FeNO3+2	8.475e-31	5.810e-31	-30.072	-30.236	-0.164	(0)
Fe3(OH) 4+5	2.277e-38	2.150e-39	-37.643	-38.667	-1.025	(0)
H (0)	4.033e-29					
H2	2.016e-29	2.019e-29	-28.695	-28.695	0.001	(0)
Hg (0)	9.119e-11					
Hg	9.119e-11	9.119e-11	-10.040	-10.040	0.000	(0)
Hg (1)	1.036e-24					
Hg2+2	5.178e-25	3.549e-25	-24.286	-24.450	-0.164	(0)
Hg (2)	2.682e-13					
Hg(OH) 2	2.212e-13	2.215e-13	-12.655	-12.655	0.001	(0)
HgClOH	4.506e-14	4.506e-14	-13.346	-13.346	0.000	(0)
HgCl2	1.854e-15	1.854e-15	-14.732	-14.732	0.000	(0)
HgCO3	9.342e-17	9.342e-17	-16.030	-16.030	0.000	(0)
HgCl3-	3.665e-17	3.335e-17	-16.436	-16.477	-0.041	(0)
Hg(CO3) 2-2	5.868e-18	4.023e-18	-17.232	-17.395	-0.164	(0)
HgOH+	6.207e-19	5.648e-19	-18.207	-18.248	-0.041	(0)
HgCl4-2	3.483e-19	2.388e-19	-18.458	-18.622	-0.164	(0)
HgCl+	2.261e-19	2.057e-19	-18.646	-18.687	-0.041	(0)
Hg(OH) 3-	7.584e-20	6.901e-20	-19.120	-19.161	-0.041	(0)
HgHCO3+	7.778e-21	7.078e-21	-20.109	-20.150	-0.041	(0)
Hg+2	8.363e-24	5.733e-24	-23.078	-23.242	-0.164	(0)
HgSO4	8.608e-25	8.608e-25	-24.065	-24.065	0.000	(0)
HgNH3+2	5.378e-25	3.687e-25	-24.269	-24.433	-0.164	(0)
Hg(NH3) 2+2	5.481e-26	3.758e-26	-25.261	-25.425	-0.164	(0)
HgF+	1.773e-26	1.613e-26	-25.751	-25.792	-0.041	(0)
HgNO3+	1.292e-33	1.176e-33	-32.889	-32.930	-0.041	(0)
Hg(NH3) 3+2	2.224e-35	1.525e-35	-34.653	-34.817	-0.164	(0)
Hg(NO3) 2	0.000e+00	0.000e+00	-42.566	-42.566	0.000	(0)
Hg(NH3) 4+2	0.000e+00	0.000e+00	-43.745	-43.909	-0.164	(0)
HgHS2-	0.000e+00	0.000e+00	-143.184	-143.225	-0.041	(0)

	HgS2-2	0.000e+00	0.000e+00	-143.378	-143.542	-0.164	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-145.221	-145.221	0.000	(0)
K		2.412e-04					
	K+	2.403e-04	2.207e-04	-3.619	-3.656	-0.037	(0)
	KSO4-	9.730e-07	8.959e-07	-6.012	-6.048	-0.036	(0)
	KCrO4-	3.148e-17	2.865e-17	-16.502	-16.543	-0.041	(0)
Mg		3.148e-04					
	Mg+2	2.865e-04	2.038e-04	-3.543	-3.691	-0.148	(0)
	MgSO4	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
	MgHCO3+	2.684e-06	2.465e-06	-5.571	-5.608	-0.037	(0)
	MgCO3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
	MgF+	1.888e-06	1.736e-06	-5.724	-5.761	-0.037	(0)
	MgOH+	2.176e-07	2.008e-07	-6.662	-6.697	-0.035	(0)
	MgH2BO3+	8.353e-09	7.645e-09	-8.078	-8.117	-0.038	(0)
Mn (2)		2.744e-06					
	Mn+2	2.504e-06	1.717e-06	-5.601	-5.765	-0.164	(0)
	MnSO4	1.750e-07	1.750e-07	-6.757	-6.757	0.000	(0)
	MnHCO3+	4.399e-08	4.047e-08	-7.357	-7.393	-0.036	(0)
	MnOH+	1.160e-08	1.067e-08	-7.936	-7.972	-0.036	(0)
	MnF+	5.638e-09	5.187e-09	-8.249	-8.285	-0.036	(0)
	MnCl+	4.224e-09	3.886e-09	-8.374	-8.410	-0.036	(0)
	MnCl2	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)
	MnSeO4	5.548e-15	5.548e-15	-14.256	-14.256	0.000	(0)
	MnCl3-	5.316e-15	4.890e-15	-14.274	-14.311	-0.036	(0)
	MnNO3+	1.661e-15	1.511e-15	-14.780	-14.821	-0.041	(0)
	Mn (OH) 3-	4.389e-16	4.038e-16	-15.358	-15.394	-0.036	(0)
	Mn (OH) 4-2	4.503e-21	3.226e-21	-20.347	-20.491	-0.145	(0)
	Mn (NO3) 2	2.109e-24	2.109e-24	-23.676	-23.676	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-43.082	-43.082	0.000	(0)
Mn (3)		3.973e-27					
	Mn+3	3.973e-27	1.847e-27	-26.401	-26.734	-0.333	(0)
Mn (6)		4.065e-40					
	MnO4-2	4.065e-40	2.912e-40	-39.391	-39.536	-0.145	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.488	-44.526	-0.038	(0)
Mo		7.840e-08					
	MoO4-2	7.840e-08	5.578e-08	-7.106	-7.254	-0.148	(0)
	HMoO4-	4.963e-12	4.516e-12	-11.304	-11.345	-0.041	(0)
	H2MoO4	1.346e-16	1.346e-16	-15.871	-15.871	0.000	(0)
	Ag2MoO4	1.036e-27	1.036e-27	-26.984	-26.984	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-56.380	-56.749	-0.369	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-63.433	-64.909	-1.476	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-65.888	-66.913	-1.025	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-69.865	-70.521	-0.656	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-75.297	-75.666	-0.369	(0)
N (-3)		9.014e-10					
	NH4+	7.946e-10	7.273e-10	-9.100	-9.138	-0.038	(0)
	NH3	1.019e-10	1.019e-10	-9.992	-9.992	0.000	(0)
	NH4SO4-	4.857e-12	4.469e-12	-11.314	-11.350	-0.036	(0)
	CaNH3+2	4.552e-14	3.120e-14	-13.342	-13.506	-0.164	(0)
	CuNH3+2	3.269e-15	2.241e-15	-14.486	-14.650	-0.164	(0)
	NiNH3+2	2.289e-16	1.569e-16	-15.640	-15.804	-0.164	(0)
	AgNH3+	5.067e-17	4.611e-17	-16.295	-16.336	-0.041	(0)
	Co (NH3) +2	3.728e-17	2.556e-17	-16.428	-16.592	-0.164	(0)
	BaNH3+2	8.635e-20	5.920e-20	-19.064	-19.228	-0.164	(0)
	Ag (NH3) 2+	4.198e-23	3.820e-23	-22.377	-22.418	-0.041	(0)
	Ni (NH3) 2+2	3.372e-24	2.312e-24	-23.472	-23.636	-0.164	(0)
	Ca (NH3) 2+2	1.847e-24	1.266e-24	-23.734	-23.898	-0.164	(0)
	HgNH3+2	5.378e-25	3.687e-25	-24.269	-24.433	-0.164	(0)
	Co (NH3) 2+2	1.621e-25	1.111e-25	-24.790	-24.954	-0.164	(0)
	Hg (NH3) 2+2	5.481e-26	3.758e-26	-25.261	-25.425	-0.164	(0)
	Co (NH3) 3+2	2.080e-34	1.426e-34	-33.682	-33.846	-0.164	(0)
	Hg (NH3) 3+2	2.224e-35	1.525e-35	-34.653	-34.817	-0.164	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-42.954	-43.118	-0.164	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-43.745	-43.909	-0.164	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-51.811	-51.975	-0.164	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-52.725	-52.889	-0.164	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)

Cr (NH3) 6+3	0.000e+00	0.000e+00	-63.363	-63.732	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.346	-76.510	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
N (3)	6.426e-07					
NO2-	6.426e-07	5.888e-07	-6.192	-6.230	-0.038	(0)
CuNO2+	1.456e-13	1.325e-13	-12.837	-12.878	-0.041	(0)
AgNO2	2.726e-14	2.726e-14	-13.565	-13.565	0.000	(0)
CoNO2+	9.512e-15	8.655e-15	-14.022	-14.063	-0.041	(0)
Cu (NO2) 2	7.983e-19	7.983e-19	-18.098	-18.098	0.000	(0)
Ag (NO2) 2-	2.732e-20	2.486e-20	-19.564	-19.605	-0.041	(0)
N (5)	6.053e-10					
NO3-	6.048e-10	5.555e-10	-9.218	-9.255	-0.037	(0)
CaNO3+	4.695e-13	4.272e-13	-12.328	-12.369	-0.041	(0)
MnNO3+	1.661e-15	1.511e-15	-14.780	-14.821	-0.041	(0)
ZnNO3+	3.293e-16	2.997e-16	-15.482	-15.523	-0.041	(0)
NiNO3+	4.396e-18	4.000e-18	-17.357	-17.398	-0.041	(0)
CuNO3+	4.148e-18	3.775e-18	-17.382	-17.423	-0.041	(0)
BaNO3+	2.817e-18	2.563e-18	-17.550	-17.591	-0.041	(0)
CoNO3+	2.018e-18	1.836e-18	-17.695	-17.736	-0.041	(0)
CdNO3+	5.257e-19	4.783e-19	-18.279	-18.320	-0.041	(0)
AgNO3	9.776e-20	9.776e-20	-19.010	-19.010	0.000	(0)
PbNO3+	6.095e-20	5.546e-20	-19.215	-19.256	-0.041	(0)
Mn (NO3) 2	2.109e-24	2.109e-24	-23.676	-23.676	0.000	(0)
UO2NO3+	3.746e-25	3.409e-25	-24.426	-24.467	-0.041	(0)
Zn (NO3) 2	3.321e-26	3.321e-26	-25.479	-25.479	0.000	(0)
Co (NO3) 2	2.076e-27	2.076e-27	-26.683	-26.683	0.000	(0)
CrNO3+2	5.857e-28	4.015e-28	-27.232	-27.396	-0.164	(0)
Cu (NO3) 2	2.640e-28	2.640e-28	-27.578	-27.578	0.000	(0)
Cd (NO3) 2	1.332e-28	1.332e-28	-27.876	-27.876	0.000	(0)
Pb (NO3) 2	5.232e-29	5.232e-29	-28.281	-28.281	0.000	(0)
VO2NO3	1.822e-29	1.822e-29	-28.739	-28.739	0.000	(0)
FeNO3+2	8.475e-31	5.810e-31	-30.072	-30.236	-0.164	(0)
HgNO3+	1.292e-33	1.176e-33	-32.889	-32.930	-0.041	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.566	-42.566	0.000	(0)
Na	3.504e-03					
Na+	3.490e-03	3.205e-03	-2.457	-2.494	-0.037	(0)
NaSO4-	1.072e-05	9.871e-06	-4.970	-5.006	-0.036	(0)
NaHCO3	2.130e-06	2.130e-06	-5.672	-5.672	0.000	(0)
NaCO3-	8.826e-07	8.127e-07	-6.054	-6.090	-0.036	(0)
NaF	1.535e-07	1.535e-07	-6.814	-6.814	0.000	(0)
NaH2BO3	5.495e-09	5.495e-09	-8.260	-8.260	0.000	(0)
NaCrO4-	6.116e-16	5.565e-16	-15.214	-15.255	-0.041	(0)
Ni	6.409e-09					
Ni+2	4.029e-09	2.867e-09	-8.395	-8.543	-0.148	(0)
NiCO3	1.456e-09	1.456e-09	-8.837	-8.837	0.000	(0)
NiHCO3+	4.590e-10	4.176e-10	-9.338	-9.379	-0.041	(0)
NiSO4	3.280e-10	3.280e-10	-9.484	-9.484	0.000	(0)
NiOH+	9.815e-11	8.931e-11	-10.008	-10.049	-0.041	(0)
Ni (OH) 2	1.756e-11	1.756e-11	-10.756	-10.756	0.000	(0)
NiCl+	1.450e-11	1.319e-11	-10.839	-10.880	-0.041	(0)
NiF+	6.006e-12	5.465e-12	-11.221	-11.262	-0.041	(0)
Ni (OH) 3-	4.774e-14	4.344e-14	-13.321	-13.362	-0.041	(0)
Ni (SO4) 2-2	9.086e-15	6.229e-15	-14.042	-14.206	-0.164	(0)
NiNH3+2	2.289e-16	1.569e-16	-15.640	-15.804	-0.164	(0)
NiCl2	1.195e-16	1.195e-16	-15.923	-15.923	0.000	(0)
NiSeO4	1.610e-17	1.610e-17	-16.793	-16.793	0.000	(0)
NiNO3+	4.396e-18	4.000e-18	-17.357	-17.398	-0.041	(0)
Ni (NH3) 2+2	3.372e-24	2.312e-24	-23.472	-23.636	-0.164	(0)
O (0)	2.481e-35					
O2	1.241e-35	1.243e-35	-34.906	-34.906	0.001	(0)
Pb	3.599e-10					
PbCO3	2.763e-10	2.763e-10	-9.559	-9.559	0.000	(0)
PbOH+	4.611e-11	4.195e-11	-10.336	-10.377	-0.041	(0)
Pb (CO3) 2-2	1.583e-11	1.085e-11	-10.801	-10.965	-0.164	(0)
Pb+2	9.486e-12	6.750e-12	-11.023	-11.171	-0.148	(0)
PbHCO3+	6.513e-12	5.926e-12	-11.186	-11.227	-0.041	(0)

Pb(OH) 2	3.283e-12	3.283e-12	-11.484	-11.484	0.000	(0)
PbSO4	1.896e-12	1.896e-12	-11.722	-11.722	0.000	(0)
PbCl+	4.733e-13	4.307e-13	-12.325	-12.366	-0.041	(0)
PbF+	3.967e-14	3.610e-14	-13.402	-13.443	-0.041	(0)
Pb(SO4) 2-2	9.555e-15	6.550e-15	-14.020	-14.184	-0.164	(0)
Pb(OH) 3-	8.928e-15	8.124e-15	-14.049	-14.090	-0.041	(0)
PbCl2	3.460e-15	3.460e-15	-14.461	-14.461	0.000	(0)
PbF2	5.391e-17	5.391e-17	-16.268	-16.268	0.000	(0)
Pb(OH) 4-2	7.182e-18	4.923e-18	-17.144	-17.308	-0.164	(0)
PbCl3-	2.722e-18	2.477e-18	-17.565	-17.606	-0.041	(0)
PbNO3+	6.095e-20	5.546e-20	-19.215	-19.256	-0.041	(0)
Pb2OH+3	1.049e-20	4.488e-21	-19.979	-20.348	-0.369	(0)
PbF3-	8.529e-21	7.761e-21	-20.069	-20.110	-0.041	(0)
PbCl4-2	2.970e-21	2.036e-21	-20.527	-20.691	-0.164	(0)
Pb3(OH) 4+2	2.117e-24	1.451e-24	-23.674	-23.838	-0.164	(0)
PbF4-2	4.112e-25	2.819e-25	-24.386	-24.550	-0.164	(0)
Pb(NO3) 2	5.232e-29	5.232e-29	-28.281	-28.281	0.000	(0)
Pb4(OH) 4+4	3.523e-31	7.782e-32	-30.453	-31.109	-0.656	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-156.202	-156.202	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-235.012	-235.053	-0.041	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-75.991	-75.991	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.110	-80.151	-0.041	(0)
S5-2	0.000e+00	0.000e+00	-80.961	-81.125	-0.164	(0)
S6-2	0.000e+00	0.000e+00	-81.477	-81.641	-0.164	(0)
H2S	0.000e+00	0.000e+00	-81.521	-81.521	0.000	(0)
S4-2	0.000e+00	0.000e+00	-81.557	-81.721	-0.164	(0)
CdHS+	0.000e+00	0.000e+00	-81.667	-81.708	-0.041	(0)
S3-2	0.000e+00	0.000e+00	-82.363	-82.527	-0.164	(0)
S2-2	0.000e+00	0.000e+00	-83.379	-83.543	-0.164	(0)
S-2	0.000e+00	0.000e+00	-88.915	-89.060	-0.145	(0)
HgHS2-	0.000e+00	0.000e+00	-143.184	-143.225	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-143.378	-143.542	-0.164	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-145.221	-145.221	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-150.261	-150.490	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.998	-151.220	-0.222	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-151.017	-151.135	-0.117	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-151.728	-151.769	-0.041	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-151.951	-152.184	-0.233	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-152.001	-152.042	-0.041	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.269	-152.495	-0.226	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.150	-154.150	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-154.655	-154.655	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-156.202	-156.202	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-164.682	-164.682	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-223.180	-223.221	-0.041	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-230.980	-231.021	-0.041	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-232.446	-232.610	-0.164	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-232.865	-232.906	-0.041	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-235.012	-235.053	-0.041	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-242.755	-242.796	-0.041	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-310.696	-310.860	-0.164	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.468	-312.632	-0.164	(0)
Sb2S4-2	0.000e+00	0.000e+00	-330.867	-331.031	-0.164	(0)
S(6)	8.711e-04					
SO4-2	8.059e-04	5.734e-04	-3.094	-3.242	-0.148	(0)
CaSO4	3.195e-05	3.195e-05	-4.496	-4.496	0.000	(0)
MgSO4	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
NaSO4-	1.072e-05	9.871e-06	-4.970	-5.006	-0.036	(0)
KSO4-	9.730e-07	8.959e-07	-6.012	-6.048	-0.036	(0)
MnSO4	1.750e-07	1.750e-07	-6.757	-6.757	0.000	(0)
ZnSO4	2.694e-08	2.694e-08	-7.570	-7.570	0.000	(0)
NiSO4	3.280e-10	3.280e-10	-9.484	-9.484	0.000	(0)
CuSO4	2.823e-10	2.823e-10	-9.549	-9.549	0.000	(0)
HSO4-	2.481e-10	2.280e-10	-9.605	-9.642	-0.037	(0)
CoSO4	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
Zn(SO4) 2-2	1.963e-10	1.346e-10	-9.707	-9.871	-0.164	(0)
CdSO4	3.660e-11	3.660e-11	-10.436	-10.436	0.000	(0)

NH4SO4-	4.857e-12	4.469e-12	-11.314	-11.350	-0.036	(0)
AgSO4-	2.786e-12	2.535e-12	-11.555	-11.596	-0.041	(0)
PbSO4	1.896e-12	1.896e-12	-11.722	-11.722	0.000	(0)
Cd (SO4) 2-2	4.130e-13	2.831e-13	-12.384	-12.548	-0.164	(0)
CrOHSO4	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
Pb (SO4) 2-2	9.555e-15	6.550e-15	-14.020	-14.184	-0.164	(0)
Ni (SO4) 2-2	9.086e-15	6.229e-15	-14.042	-14.206	-0.164	(0)
FeSO4	6.579e-15	6.579e-15	-14.182	-14.182	0.000	(0)
UO2SO4	2.669e-16	2.669e-16	-15.574	-15.574	0.000	(0)
CrSO4+	2.433e-17	2.214e-17	-16.614	-16.655	-0.041	(0)
AlSO4+	6.433e-18	5.913e-18	-17.192	-17.228	-0.037	(0)
UO2 (SO4) 2-2	2.943e-18	2.018e-18	-17.531	-17.695	-0.164	(0)
Al (SO4) 2-	3.953e-20	3.633e-20	-19.403	-19.440	-0.037	(0)
VO2SO4-	9.760e-22	8.881e-22	-21.011	-21.052	-0.041	(0)
FeSO4+	7.315e-22	6.730e-22	-21.136	-21.172	-0.036	(0)
Cr2 (OH) 2SO4+2	1.438e-23	9.856e-24	-22.842	-23.006	-0.164	(0)
Fe (SO4) 2-	9.067e-24	8.251e-24	-23.043	-23.084	-0.041	(0)
HgSO4	8.608e-25	8.608e-25	-24.065	-24.065	0.000	(0)
VOSO4	5.631e-25	5.631e-25	-24.249	-24.249	0.000	(0)
CrO3SO4-2	4.769e-25	3.269e-25	-24.322	-24.486	-0.164	(0)
Cr2 (OH) 2 (SO4) 2	3.357e-25	3.357e-25	-24.474	-24.474	0.000	(0)
VS04+	3.620e-40	3.294e-40	-39.441	-39.482	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.605	-44.605	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.099	-45.263	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Sb (3)	6.004e-22					
Sb (OH) 3	3.037e-22	3.037e-22	-21.518	-21.518	0.000	(0)
HSbO2	2.965e-22	2.965e-22	-21.528	-21.528	0.000	(0)
SbO2-	1.297e-25	1.180e-25	-24.887	-24.928	-0.041	(0)
Sb (OH) 4-	7.431e-26	6.762e-26	-25.129	-25.170	-0.041	(0)
Sb (OH) 2F	1.465e-28	1.465e-28	-27.834	-27.834	0.000	(0)
SbOF	1.441e-28	1.441e-28	-27.841	-27.841	0.000	(0)
Sb (OH) 2+	3.298e-29	3.001e-29	-28.482	-28.523	-0.041	(0)
SbO+	1.137e-29	1.035e-29	-28.944	-28.985	-0.041	(0)
Sb2S4-2	0.000e+00	0.000e+00	-330.867	-331.031	-0.164	(0)
Sb (5)	1.206e-09					
SbO3-	1.204e-09	1.096e-09	-8.919	-8.960	-0.041	(0)
Sb (OH) 6-	1.395e-12	1.281e-12	-11.855	-11.892	-0.037	(0)
SbO2+	5.718e-27	5.203e-27	-26.243	-26.284	-0.041	(0)
Se (-2)	4.685e-17					
Ag2Se	4.685e-17	4.685e-17	-16.329	-16.329	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.281	-40.322	-0.041	(0)
MnSe	0.000e+00	0.000e+00	-43.082	-43.082	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.822	-44.822	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.767	-46.931	-0.164	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.980	-85.636	-0.656	(0)
Se (4)	7.157e-09					
SeO3-2	4.044e-09	2.772e-09	-8.393	-8.557	-0.164	(0)
HSeO3-	3.113e-09	2.833e-09	-8.507	-8.548	-0.041	(0)
H2SeO3	4.917e-15	4.917e-15	-14.308	-14.308	0.000	(0)
AgSeO3-	4.338e-16	3.947e-16	-15.363	-15.404	-0.041	(0)
Cd (SeO3) 2-2	2.515e-21	1.724e-21	-20.599	-20.763	-0.164	(0)
Ag (SeO3) 2-3	2.291e-23	9.797e-24	-22.640	-23.009	-0.369	(0)
FeHSeO3+2	1.142e-27	7.830e-28	-26.942	-27.106	-0.164	(0)
Se (6)	1.688e-11					
SeO4-2	1.688e-11	1.201e-11	-10.773	-10.921	-0.148	(0)
MnSeO4	5.548e-15	5.548e-15	-14.256	-14.256	0.000	(0)
ZnSeO4	3.994e-16	3.994e-16	-15.399	-15.399	0.000	(0)
NiSeO4	1.610e-17	1.610e-17	-16.793	-16.793	0.000	(0)
CoSeO4	1.255e-17	1.255e-17	-16.901	-16.901	0.000	(0)
HSeO4-	2.691e-18	2.449e-18	-17.570	-17.611	-0.041	(0)
CdSeO4	6.089e-19	6.089e-19	-18.215	-18.215	0.000	(0)
Zn (SeO4) 2-2	7.094e-27	4.864e-27	-26.149	-26.313	-0.164	(0)
Si	3.022e-04					
H4SiO4	2.910e-04	2.914e-04	-3.536	-3.536	0.001	(0)
H3SiO4-	1.128e-05	1.035e-05	-4.948	-4.985	-0.037	(0)
H2SiO4-2	2.234e-10	1.606e-10	-9.651	-9.794	-0.144	(0)
UO2H3SiO4+	2.971e-13	2.703e-13	-12.527	-12.568	-0.041	(0)

SiF6-2	3.226e-32	2.311e-32	-31.491	-31.636	-0.145	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.431	-61.800	-0.369	(0)
U (4)	1.785e-20					
U (OH) 5-	1.785e-20	1.624e-20	-19.748	-19.789	-0.041	(0)
U (OH) 4	2.768e-24	2.768e-24	-23.558	-23.558	0.000	(0)
U (OH) 3+	4.525e-29	4.117e-29	-28.344	-28.385	-0.041	(0)
U (OH) 2+2	1.130e-34	7.747e-35	-33.947	-34.111	-0.164	(0)
UF3+	4.569e-40	4.157e-40	-39.340	-39.381	-0.041	(0)
UF2+2	0.000e+00	0.000e+00	-40.297	-40.461	-0.164	(0)
UOH+3	0.000e+00	0.000e+00	-40.459	-40.828	-0.369	(0)
UF4	0.000e+00	0.000e+00	-41.461	-41.461	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.073	-43.442	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.942	-43.983	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.605	-44.605	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.099	-45.263	-0.164	(0)
UF6-2	0.000e+00	0.000e+00	-45.459	-45.623	-0.164	(0)
U+4	0.000e+00	0.000e+00	-47.966	-48.622	-0.656	(0)
UCl+3	0.000e+00	0.000e+00	-49.298	-49.667	-0.369	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-179.708	-183.029	-3.320	(0)
U (5)	8.552e-18					
UO2+	8.552e-18	7.782e-18	-17.068	-17.109	-0.041	(0)
U (6)	2.062e-08					
UO2 (CO3) 3-4	1.399e-08	3.091e-09	-7.854	-8.510	-0.656	(0)
UO2 (CO3) 2-2	6.607e-09	4.529e-09	-8.180	-8.344	-0.164	(0)
UO2CO3	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
UO2H3SiO4+	2.971e-13	2.703e-13	-12.527	-12.568	-0.041	(0)
UO2OH+	1.053e-13	9.581e-14	-12.978	-13.019	-0.041	(0)
UO2F+	3.541e-15	3.222e-15	-14.451	-14.492	-0.041	(0)
UO2F2	7.052e-16	7.052e-16	-15.152	-15.152	0.000	(0)
UO2+2	4.322e-16	3.075e-16	-15.364	-15.512	-0.148	(0)
UO2SO4	2.669e-16	2.669e-16	-15.574	-15.574	0.000	(0)
UO2F3-	1.478e-17	1.344e-17	-16.830	-16.871	-0.041	(0)
UO2 (SO4) 2-2	2.943e-18	2.018e-18	-17.531	-17.695	-0.164	(0)
UO2Cl+	9.858e-19	8.970e-19	-18.006	-18.047	-0.041	(0)
(UO2) 2 (OH) 2+2	2.222e-20	1.523e-20	-19.653	-19.817	-0.164	(0)
UO2F4-2	1.182e-20	8.105e-21	-19.927	-20.091	-0.164	(0)
(UO2) 3 (OH) 5+	7.450e-21	6.779e-21	-20.128	-20.169	-0.041	(0)
UO2NO3+	3.746e-25	3.409e-25	-24.426	-24.467	-0.041	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-45.662	-45.703	-0.041	(0)
V+2	0.000e+00	0.000e+00	-47.443	-47.607	-0.164	(0)
V (3)	1.487e-17					
V (OH) 3	1.487e-17	1.487e-17	-16.828	-16.828	0.000	(0)
V (OH) 2+	4.297e-29	3.910e-29	-28.367	-28.408	-0.041	(0)
VOH+2	2.201e-33	1.509e-33	-32.657	-32.821	-0.164	(0)
V+3	2.845e-39	1.217e-39	-38.546	-38.915	-0.369	(0)
VSO4+	3.620e-40	3.294e-40	-39.441	-39.482	-0.041	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-62.408	-62.777	-0.369	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-64.187	-64.843	-0.656	(0)
V (4)	1.942e-21					
V (OH) 3+	1.934e-21	1.760e-21	-20.713	-20.754	-0.041	(0)
VO+2	5.201e-24	3.565e-24	-23.284	-23.448	-0.164	(0)
VOF+	1.784e-24	1.623e-24	-23.749	-23.790	-0.041	(0)
VOSO4	5.631e-25	5.631e-25	-24.249	-24.249	0.000	(0)
VOF2	4.619e-26	4.619e-26	-25.335	-25.335	0.000	(0)
VOC1+	1.977e-26	1.799e-26	-25.704	-25.745	-0.041	(0)
VOF3-	1.367e-28	1.244e-28	-27.864	-27.905	-0.041	(0)
VOF4-2	5.558e-32	3.810e-32	-31.255	-31.419	-0.164	(0)
H2V2O4+2	2.265e-37	1.553e-37	-36.645	-36.809	-0.164	(0)
V (5)	3.926e-10					
H2VO4-	2.157e-10	1.963e-10	-9.666	-9.707	-0.041	(0)
HVO4-2	1.768e-10	1.212e-10	-9.753	-9.916	-0.164	(0)
H3VO4	7.987e-15	7.987e-15	-14.098	-14.098	0.000	(0)
VO4-3	3.491e-16	1.493e-16	-15.457	-15.826	-0.369	(0)
HV2O7-3	1.886e-17	8.064e-18	-16.725	-17.093	-0.369	(0)
H3V2O7-	1.113e-17	1.013e-17	-16.954	-16.995	-0.041	(0)
V2O7-4	2.415e-19	5.335e-20	-18.617	-19.273	-0.656	(0)

VO2+	7.062e-20	6.486e-20	-19.151	-19.188	-0.037	(0)
VO2F	8.633e-21	8.633e-21	-20.064	-20.064	0.000	(0)
VO2SO4-	9.760e-22	8.881e-22	-21.011	-21.052	-0.041	(0)
VO2F2-	2.614e-22	2.379e-22	-21.583	-21.624	-0.041	(0)
V3O9-3	1.853e-23	7.926e-24	-22.732	-23.101	-0.369	(0)
VO2F3-2	3.285e-25	2.252e-25	-24.483	-24.647	-0.164	(0)
VO2F4-3	1.967e-29	8.410e-30	-28.706	-29.075	-0.369	(0)
VO2NO3	1.822e-29	1.822e-29	-28.739	-28.739	0.000	(0)
V4O12-4	2.937e-30	6.487e-31	-29.532	-30.188	-0.656	(0)
V10O28-6	0.000e+00	0.000e+00	-80.251	-81.726	-1.476	(0)
HV10O28-5	0.000e+00	0.000e+00	-80.905	-81.930	-1.025	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.457	-85.113	-0.656	(0)
Zn	5.902e-07					
Zn+2	3.018e-07	2.148e-07	-6.520	-6.668	-0.148	(0)
ZnCO3	1.683e-07	1.683e-07	-6.774	-6.774	0.000	(0)
ZnOH+	5.840e-08	5.314e-08	-7.234	-7.275	-0.041	(0)
ZnSO4	2.694e-08	2.694e-08	-7.570	-7.570	0.000	(0)
Zn(OH) 2	2.084e-08	2.084e-08	-7.681	-7.681	0.000	(0)
ZnHCO3+	8.820e-09	8.025e-09	-8.055	-8.096	-0.041	(0)
ZnOHCl	3.143e-09	3.143e-09	-8.503	-8.503	0.000	(0)
ZnCl+	1.057e-09	9.702e-10	-8.976	-9.013	-0.037	(0)
ZnF+	3.574e-10	3.252e-10	-9.447	-9.488	-0.041	(0)
Zn(OH) 3-	2.841e-10	2.585e-10	-9.547	-9.588	-0.041	(0)
Zn(SO4) 2-2	1.963e-10	1.346e-10	-9.707	-9.871	-0.164	(0)
ZnCl2	2.765e-12	2.765e-12	-11.558	-11.558	0.000	(0)
Zn(OH) 4-2	3.715e-14	2.547e-14	-13.430	-13.594	-0.164	(0)
ZnCl3-	4.302e-15	3.950e-15	-14.366	-14.403	-0.037	(0)
ZnSeO4	3.994e-16	3.994e-16	-15.399	-15.399	0.000	(0)
ZnNO3+	3.293e-16	2.997e-16	-15.482	-15.523	-0.041	(0)
ZnCl4-2	4.959e-18	3.552e-18	-17.305	-17.449	-0.145	(0)
Zn(NO3) 2	3.321e-26	3.321e-26	-25.479	-25.479	0.000	(0)
Zn(SeO4) 2-2	7.094e-27	4.864e-27	-26.149	-26.313	-0.164	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-151.728	-151.769	-0.041	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.150	-154.150	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-230.980	-231.021	-0.041	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-232.446	-232.610	-0.164	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.468	-312.632	-0.164	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-67.98	-61.69	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-53.18	-48.67	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-60.41	-48.67	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-86.89	-68.95	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-69.45	-49.42	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-32.14	-31.73	0.40	(NH4)2CrO4	
(NH4)2SeO4	-29.65	-29.20	0.45	(NH4)2SeO4	
Acanthite	-54.85	-91.07	-36.22	Ag2S	
Ag2CO3	-13.08	-24.17	-11.09	Ag2CO3	
Ag2CrO4	-21.18	-32.77	-11.59	Ag2CrO4	
Ag2HVO4	-14.81	-13.33	1.48	Ag2HVO4	
Ag2MoO4	-15.01	-26.56	-11.55	Ag2MoO4	
Ag2O	-15.10	-2.53	12.57	Ag2O	
Ag2Se	-2.54	-51.24	-48.70	Ag2Se	
Ag2SeO3	-12.32	-19.47	-7.15	Ag2SeO3	
Ag2SeO4	-21.32	-30.23	-8.91	Ag2SeO4	
Ag2SO4	-17.73	-22.55	-4.82	Ag2SO4	
Ag3AsO3	-28.67	-26.51	2.16	Ag3AsO3	
Ag3AsO4	-17.08	-19.86	-2.79	Ag3AsO4	
Ag3H2VO5	-19.77	-14.59	5.18	Ag3H2VO5	
AgF·4H2O	-14.82	-13.77	1.05	AgF·4H2O	
Agmetal	-0.53	-14.04	-13.51	Ag	
AgVO3	-12.83	-12.06	0.77	AgVO3	
Al(OH)3(am)	-3.51	7.29	10.80	Al(OH)3	
Al2(MoO4)3	-59.88	-57.51	2.37	Al2(MoO4)3	
Al2O3	-5.06	14.59	19.65	Al2O3	

Al4(OH)10SO4	-13.54	9.16	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-13.58	-8.78	4.80	AlAsO4:2H2O
AlOHSO4	-9.50	-12.73	-3.23	AlOHSO4
AlSb	-156.48	-90.86	65.62	AlSb
Alunite	-12.03	-13.43	-1.40	KAl3(SO4)2(OH)6
Anglesite	-6.62	-14.41	-7.79	PbSO4
Anhydrite	-2.50	-6.86	-4.36	CaSO4
Anilite	-57.59	-89.47	-31.88	Cu0.25Cu1.5S
Antlerite	-4.47	4.32	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.12	-90.88	-2.76	As4O6
Artinite	-5.07	4.53	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.85	-32.15	6.71	As2O5
Atacamite	-2.30	5.09	7.39	Cu2(OH)3Cl
Azurite	-2.05	-18.95	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.65	7.74	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-21.98	-6.10	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-31.30	1.64	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.82	-22.49	-9.67	BaCrO4
BaF2	-11.46	-17.28	-5.82	BaF2
BaMoO4	-9.33	-16.29	-6.96	BaMoO4
Barite	-2.30	-12.28	-9.98	BaSO4
BaS	-96.98	-80.80	16.18	BaS
BaSeO3	-11.02	-9.19	1.83	BaSeO3
BaSeO4	-12.50	-19.96	-7.46	BaSeO4
Bianchite	-8.14	-9.91	-1.76	ZnSO4:6H2O
Birnessite	-6.88	11.21	18.09	MnO2
Bixbyite	-2.48	-3.12	-0.64	Mn2O3
BlaubleiI	-57.47	-81.63	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.97	-85.25	-27.28	Cu0.6Cu0.8S
Boehmite	-1.28	7.29	8.58	AlOOH
Breithauptite	-58.62	-77.14	-18.52	NiSb
Brochantite	-2.79	12.43	15.22	Cu4(OH)6SO4
Brucite	-3.75	13.09	16.84	Mg(OH)2
Bunsenite	-4.21	8.24	12.45	NiO
Ca(VO3)2	-14.09	-8.43	5.66	Ca(VO3)2
Ca2V2O7	-12.76	4.74	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.81	4.74	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.94	7.36	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.05	17.91	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.95	17.91	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-299.78	-156.80	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-12.03	-29.94	-17.91	Hg2Cl2
CaMoO4	-2.92	-10.87	-7.95	CaMoO4
Carnotite	-5.02	-4.79	0.23	KUO2VO4
CaSeO3:2H2O	-6.59	-3.77	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.51	-14.53	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.86	-3.02	9.84	Cd(BO2)2
Cd(OH)2	-6.43	7.22	13.64	Cd(OH)2
Cd(OH)2(am)	-6.51	7.22	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-25.11	-18.40	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.93	1.63	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.56	8.84	28.40	Cd4(OH)6SO4
CdCl2	-14.40	-15.06	-0.66	CdCl2
CdCl2:1H2O	-13.36	-15.06	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.14	-15.06	-1.91	CdCl2:2.5H2O
CdF2	-16.59	-17.80	-1.21	CdF2
Cdmetal(alpha)	-31.84	-18.33	13.51	Cd
Cdmetal(gamma)	-31.95	-18.33	13.62	Cd
CdMoO4	-2.67	-16.82	-14.15	CdMoO4
CdOHCl	-7.46	-3.92	3.54	CdOHCl
CdSb	-77.81	-78.16	-0.35	CdSb
CdSe	-21.30	-41.50	-20.20	CdSe
CdSeO4:2H2O	-18.64	-20.49	-1.85	CdSeO4:2H2O
CdSO4	-12.63	-12.81	-0.17	CdSO4

CdSO4:1H2O	-11.08	-12.81	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.93	-12.81	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.65	-12.40	-9.75	AgCl
Cerrusite	-2.91	-16.04	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-9.27	-11.91	-2.64	CuSO4:5H2O
Chalcedony	0.01	-3.54	-3.55	SiO2
Chalcocite	-57.56	-92.48	-34.92	Cu2S
Chalcopyrite	-130.25	-165.52	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-55.50	-101.20	-45.69	HgS
Claudetite	-87.81	-90.88	-3.06	As4O6
Clausthalite	-16.00	-43.10	-27.10	PbSe
Co(BO2)2	-29.21	-2.14	27.07	Co(BO2)2
Co(OH)2	-4.99	8.10	13.09	Co(OH)2
Co(OH)3	-9.22	-11.53	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.88	-7.84	13.03	Co3(AsO4)2
Co3O4	-4.46	-14.95	-10.50	Co3O4
CoCl2	-22.44	-14.17	8.27	CoCl2
CoCl2:6H2O	-16.71	-14.17	2.54	CoCl2:6H2O
CoCO3	-3.57	-13.55	-9.98	CoCO3
CoF2	-15.32	-16.92	-1.60	CoF2
CoF3	-47.60	-49.06	-1.46	CoF3
CoFe2O4	18.01	14.48	-3.53	CoFe2O4
CoMoO4	-8.17	-15.93	-7.76	CoMoO4
CoO	-5.49	8.10	13.59	CoO
CoS(alpha)	-73.00	-80.44	-7.44	CoS
CoS(beta)	-69.37	-80.44	-11.07	CoS
CoSe	-24.41	-40.61	-16.20	CoSe
CoSeO3	-10.16	-8.84	1.32	CoSeO3
CoSeO4:6H2O	-18.07	-19.60	-1.53	CoSeO4:6H2O
CoSO4	-14.72	-11.92	2.80	CoSO4
CoSO4:6H2O	-9.45	-11.92	-2.47	CoSO4:6H2O
Cotunnite	-11.88	-16.66	-4.78	PbCl2
Covellite	-58.13	-80.43	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.37	-33.28	14.09	CrCl2
CrCl3	-49.70	-34.59	15.11	CrCl3
CrF3	-27.37	-38.71	-11.34	CrF3
Cristobalite	-0.19	-3.54	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-16.24	-50.08	-33.84	Na3AlF6
Cu(OH)2	-0.56	8.11	8.67	Cu(OH)2
Cu(SbO3)2	-29.04	16.17	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.67	-1.42	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.12	-92.01	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.85	-52.65	-45.80	Cu2Se
Cu2SO4	-22.01	-23.96	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.91	-7.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.47	-104.06	-42.59	Cu3Sb
Cu3Se2	-29.76	-93.25	-63.49	Cu3Se2
CuCO3	-2.03	-13.53	-11.50	CuCO3
CuCrO4	-16.68	-22.12	-5.44	CuCrO4
CuF	-9.57	-14.48	-4.91	CuF
CuF2	-18.02	-16.91	1.12	CuF2
CuF2:2H2O	-12.36	-16.91	-4.55	CuF2:2H2O
Cumetal	-5.99	-14.74	-8.76	Cu
CuMoO4	-2.85	-15.92	-13.08	CuMoO4
CuOCuSO4	-14.10	-3.80	10.30	CuOCuSO4
Cupricferrite	8.51	14.50	5.99	CuFe2O4
Cuprite	-2.53	-3.94	-1.41	Cu2O
Cuprousferrite	10.14	1.22	-8.92	CuFeO2
CuSe	-7.50	-40.60	-33.10	CuSe

CuSe2	-30.40	-63.77	-33.37	CuSe2
CuSeO3:2H2O	-9.34	-8.83	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.15	-19.59	-2.44	CuSeO4:5H2O
CuSO4	-14.85	-11.91	2.94	CuSO4
Diaspore	0.42	7.29	6.87	AlOOH
Djurleite	-57.76	-91.68	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.50	-17.04	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.05	-17.04	-17.09	CaMg(CO3)2
Epsomite	-4.81	-6.93	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.89	-0.15	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-14.42	-18.14	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.11	-10.56	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-23.81	-44.43	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-49.95	-53.69	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.28	-12.88	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.49	-20.58	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-49.83	-68.43	-18.60	FeSe2
FeS(ppt)	-82.14	-85.09	-2.95	FeS
FeSe	-34.26	-45.26	-11.00	FeSe
Fix_pe	-4.38	-4.38	0.00	e-
Fluorite	-1.35	-11.85	-10.50	CaF2
Galena	-68.96	-82.93	-13.97	PbS
Gibbsite	-1.00	7.29	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.90	-9.91	-2.01	ZnSO4:7H2O
Greenalite	-17.53	3.28	20.81	Fe3Si2O5(OH)4
Greenockite	-66.97	-81.33	-14.36	CdS
Greigite	-299.30	-344.33	-45.03	Fe3S4
Gummite	-6.40	1.27	7.67	UO3
Gypsum	-2.25	-6.86	-4.61	CaSO4:2H2O
H-Jarosite	-18.37	-30.47	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.16	-24.03	-12.88	H2MoO4
H2S(g)	-80.53	-88.54	-8.01	H2S
H2Se(g)	-43.75	-48.71	-4.96	H2Se
Halite	-6.84	-5.24	1.60	NaCl
Halloysite	-2.06	7.52	9.57	Al2Si2O5(OH)4
Hausmannite	-2.44	58.59	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-4.85	18.04	22.89	FeAl2O4
Hg(CH3)2(g)	-186.60	-260.31	-73.71	Hg(CH3)2
Hg(g)	-8.73	-16.61	-7.87	Hg
Hg(OH)2	-9.16	-12.65	-3.50	Hg(OH)2
Hg2(g)	-18.26	-33.21	-14.96	Hg2
Hg2(OH)2	-12.93	-7.67	5.26	Hg2(OH)2
Hg2CO3	-13.27	-29.32	-16.05	Hg2CO3
Hg2CrO4	-29.21	-37.91	-8.70	Hg2CrO4
Hg2F2	-22.33	-32.69	-10.36	Hg2F2
Hg2S	-84.53	-96.21	-11.68	Hg2S
Hg2SeO3	-19.95	-24.61	-4.66	Hg2SeO3
Hg2SO4	-21.56	-27.69	-6.13	Hg2SO4
Hg3O2CO3	-29.93	-59.61	-29.68	Hg3O2CO3
HgCl(g)	-34.47	-14.97	19.50	HgCl
HgCl2	-13.66	-34.93	-21.26	HgCl2
HgF(g)	-49.02	-16.34	32.68	HgF
HgF2(g)	-50.24	-37.68	12.57	HgF2
Hgmetal(l)	-3.16	-16.61	-13.45	Hg
HgSe	-5.67	-61.37	-55.69	HgSe
HgSeO3	-17.16	-29.59	-12.43	HgSeO3
HgSO4	-23.26	-32.68	-9.42	HgSO4
Huntite	-4.18	-34.15	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.69	-26.46	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.37	-21.14	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-22.85	-28.02	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-10.94	-25.74	-14.80	KFe3(SO4)2(OH)6

K2Cr2O7	-33.76	-51.01	-17.24	K2Cr2O7
K2CrO4	-20.26	-20.77	-0.51	K2CrO4
K2MoO4	-17.83	-14.57	3.26	K2MoO4
K2SeO4	-17.50	-18.23	-0.73	K2SeO4
Kaolinite	0.08	7.52	7.43	Al2Si2O5(OH)4
Langite	-5.06	12.43	17.49	Cu4(OH)6SO4·H2O
Larnakite	-8.37	-8.80	-0.43	PbO·PbSO4
Laurionite	-6.15	-5.53	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-7.08	5.61	12.69	PbO
Mackinawite	-81.49	-85.09	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.61	19.47	16.86	Fe2MgO4
Magnesite	-1.10	-8.56	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	-0.11	-5.42	-5.31	Cu2(OH)2CO3
Manganite	-1.55	23.79	25.34	MnOOH
Massicot	-7.28	5.61	12.89	PbO
Matlockite	-9.06	-18.04	-8.97	PbClF
Melanothallite	-20.42	-14.16	6.26	CuCl2
Melanterite	-14.36	-16.57	-2.21	FeSO4·7H2O
Metacinnabar	-56.10	-101.20	-45.09	HgS
Mg(OH)2 (active)	-5.70	13.09	18.79	Mg(OH)2
Mg(VO3)2	-19.78	-8.50	11.28	Mg(VO3)2
Mg2Sb3	-279.10	-204.41	74.68	Mg2Sb3
Mg2V2O7	-21.77	4.59	26.36	Mg2V2O7
MgCr2O4	-5.47	10.73	16.20	MgCr2O4
MgCrO4	-22.53	-17.15	5.38	MgCrO4
MgF2	-3.80	-11.93	-8.13	MgF2
MgMoO4	-9.09	-10.94	-1.85	MgMoO4
MgSeO3·6H2O	-6.90	-3.85	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-13.41	-14.61	-1.20	MgSeO4·6H2O
Minium	-31.15	42.38	73.52	Pb3O4
Mirabilite	-7.12	-8.23	-1.11	Na2SO4·10H2O
Mn(VO3)2	-15.48	-10.58	4.90	Mn(VO3)2
Mn2(SO4)3	-57.48	-63.19	-5.71	Mn2(SO4)3
Mn2Sb	-149.97	-88.89	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.60	0.90	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.97	-11.26	2.72	MnCl2·4H2O
MnS (grn)	-77.70	-77.53	0.17	MnS
MnS (pnk)	-80.87	-77.53	3.34	MnS
MnSb	-96.80	-99.71	-2.91	MnSb
MnSe	-41.20	-37.70	3.50	MnSe
MnSeO3	-7.05	-5.92	1.13	MnSeO3
MnSeO3·2H2O	-6.90	-5.92	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.64	-16.69	-2.05	MnSeO4·5H2O
MnSO4	-11.59	-9.01	2.58	MnSO4
Monteponite	-7.89	7.22	15.10	CdO
Montroydite	-9.01	-12.65	-3.64	HgO
MoO3	-16.03	-24.03	-8.00	MoO3
Morenosite	-9.64	-11.78	-2.14	NiSO4·7H2O
MoS2	-156.40	-226.66	-70.26	MoS2
Na-Jarosite	-13.38	-24.58	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.79	-48.68	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.44	2.93	Na2CrO4
Na2Mo2O7	-19.68	-36.28	-16.60	Na2Mo2O7
Na2MoO4	-13.73	-12.24	1.49	Na2MoO4
Na2MoO4·2H2O	-13.47	-12.24	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.45	-5.15	10.30	Na2SeO3·5H2O
Na2SeO4	-17.19	-15.91	1.28	Na2SeO4
Na3Sb	-174.91	-80.46	94.45	Na3Sb
Na3VO4	-29.79	6.89	36.68	Na3VO4
Na4V2O7	-35.41	1.99	37.40	Na4V2O7
Nantokite	-6.37	-13.10	-6.73	CuCl
NaSb	-89.88	-66.71	23.17	NaSb
Natron	-8.54	-9.85	-1.31	Na2CO3·10H2O
NaVO3	-8.76	-4.90	3.86	NaVO3

Nesquehonite	-3.89	-8.56	-4.67	MgCO3:3H2O
Ni(OH)2	-4.56	8.24	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.13	-7.43	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.07	12.93	32.00	Ni4(OH)6SO4
NiCO3	-6.54	-13.41	-6.87	NiCO3
NiMoO4	-4.65	-15.80	-11.14	NiMoO4
NiS(alpha)	-74.70	-80.30	-5.60	NiS
NiS(beta)	-69.20	-80.30	-11.10	NiS
NiS(gamma)	-67.50	-80.30	-12.80	NiS
NiSe	-22.77	-40.47	-17.70	NiSe
NiSeO3:2H2O	-11.51	-8.70	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.94	-19.46	-1.52	NiSeO4:6H2O
Nsutite	-6.29	11.21	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-250.00	-311.06	-61.07	As2S3
Otavite	-2.43	-14.43	-12.00	CdCO3
Pb(BO2)2	-11.15	-4.63	6.52	Pb(BO2)2
Pb(OH)2	-2.54	5.61	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-65.02	-73.78	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.71	0.08	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.97	11.22	26.19	Pb2O(OH)2
Pb2O3	-24.27	36.77	61.04	Pb2O3
Pb2OCO3	-9.87	-10.43	-0.56	Pb2OCO3
Pb2V2O7	-8.47	-10.37	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.11	-15.31	5.80	Pb3(AsO4)2
Pb3(VO4)2	-10.90	-4.76	6.14	Pb3(VO4)2
Pb3O2CO3	-15.84	-4.82	11.02	Pb3O2CO3
Pb3O2SO4	-13.88	-3.19	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.68	2.42	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.46	2.42	21.88	Pb4O3SO4
PbCrO4	-12.03	-24.63	-12.60	PbCrO4
PbF2	-11.97	-19.41	-7.44	PbF2
Pbmetal	-24.18	-19.93	4.25	Pb
PbMoO4	-2.80	-18.42	-15.62	PbMoO4
PbO:0.3H2O	-7.37	5.61	12.98	PbO:0.33H2O
PbSeO4	-15.25	-22.09	-6.84	PbSeO4
Periclase	-8.49	13.09	21.58	MgO
Phosgenite	-12.89	-32.70	-19.81	PbCl2:PbCO3
Plattnerite	-18.45	31.16	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-129.58	-148.09	-18.51	FeS2
Pyrochroite	-4.18	11.02	15.19	Mn(OH)2
Pyrolusite	-4.82	36.56	41.38	MnO2
Quartz	0.46	-3.54	-4.00	SiO2
Realgar	-104.29	-124.03	-19.75	AsS
Retgersite	-9.74	-11.78	-2.04	NiSO4:6H2O
Rhodochrosite	-0.05	-10.63	-10.58	MnCO3
Rutherfordine	-5.88	-20.38	-14.50	UO2CO3
Sb(OH)3	-14.41	-21.52	-7.11	Sb(OH)3
Sb2O4	-20.89	-17.49	3.40	Sb2O4
Sb2O5	-30.90	-40.57	-9.67	Sb2O5
Sb2Se3	-121.41	-189.17	-67.76	Sb2Se3
Sb4O6(cubic)	-67.81	-86.07	-18.26	Sb4O6
Sb4O6(orth)	-68.17	-86.07	-17.90	Sb4O6
SbCl3	-55.50	-54.92	0.57	SbCl3
SbF3	-48.82	-59.05	-10.23	SbF3
Sbmetal	-48.15	-59.83	-11.69	Sb
SbO2	-5.23	-33.06	-27.82	SbO2
Schoepite	-4.73	1.27	5.99	UO2(OH)2:H2O
Semetal(am)	-16.06	-23.17	-7.11	Se
Semetal(hex)	-15.46	-23.17	-7.71	Se
Senarmontite	-30.67	-43.03	-12.37	Sb2O3
SeO2	-17.06	-16.94	0.12	SeO2
SeO3	-48.75	-27.70	21.04	SeO3
Sepiolite	-0.19	15.57	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.21	15.57	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.83	-3.54	-2.71	SiO2

SiO2(am-ppt)	-0.80	-3.54	-2.74	SiO2
Smithsonite	-1.53	-11.53	-10.00	ZnCO3
Sphalerite	-66.98	-78.43	-11.45	ZnS
Spinel	-9.17	27.68	36.85	MgAl2O4
Stibnite	-258.20	-308.66	-50.46	Sb2S3
Sulfur	-60.85	-63.00	-2.14	S
Tenorite	0.47	8.11	7.64	CuO
Thenardite	-8.55	-8.23	0.32	Na2SO4
Thermonatrite	-10.49	-9.85	0.64	Na2CO3:H2O
Tyuyamunite	-9.97	-5.89	4.08	Ca(UO2)2(VO4)2
U3O8	-15.17	5.91	21.08	U3O8
U3Sb4	-590.17	-437.79	152.38	U3Sb4
U4O9	-31.67	-34.69	-3.02	U4O9
UF4	-35.56	-65.10	-29.54	UF4
UF4:2.5H2O	-32.38	-65.10	-32.72	UF4:2.5H2O
UO2(am)	-15.99	-15.06	0.93	UO2
UO2(NO3)2	-46.17	-34.02	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-38.87	-34.02	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-37.41	-34.02	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-36.07	-34.02	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.34	1.27	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.18	-26.43	-2.25	UO2SeO4:4H2O
UO3	-6.43	1.27	7.70	UO3
Uraninite	-10.39	-15.06	-4.67	UO2
USb2	-224.61	-195.03	29.58	USb2
V(OH)3	-21.33	-13.74	7.59	V(OH)3
V2O5	-20.24	-21.60	-1.36	V2O5
V3O5	-47.38	-45.55	1.84	V3O5
V4O7	-59.40	-52.21	7.19	V4O7
V6O13	-55.01	-115.87	-60.86	V6O13
Valentinite	-34.55	-43.03	-8.48	Sb2O3
VC12	-67.66	-48.79	18.87	VC12
VC13	-70.58	-47.15	23.43	VC13
VF4	-71.64	-56.71	14.93	VF4
Vmetal	-96.09	-52.06	44.03	V
VO	-41.27	-26.52	14.76	VO
VO(OH)2	-11.82	-6.67	5.15	VO(OH)2
VO2Cl	-24.77	-21.93	2.84	VO2Cl
VOC1	-36.03	-24.88	11.15	VOC1
VOC12	-41.70	-28.94	12.76	VOC12
VOSO4	-30.30	-26.69	3.61	VOSO4
Witherite	-5.33	-13.90	-8.57	BaCO3
Wurtzite	-69.48	-78.43	-8.95	ZnS
Zincite	-1.22	10.11	11.33	ZnO
Zincosite	-13.84	-9.91	3.93	ZnSO4
Zn(BO2)2	-8.42	-0.13	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.49	-25.18	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.09	10.11	12.20	Zn(OH)2
Zn(OH)2(am)	-2.36	10.11	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.64	10.11	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.42	10.11	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.62	10.11	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.30	0.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.10	9.09	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.46	-1.81	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.62	-9.71	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.97	20.43	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.21	28.29	38.50	Zn5(OH)8Cl2
ZnCl2	-19.21	-12.16	7.05	ZnCl2
ZnCO3:1H2O	-1.27	-11.53	-10.26	ZnCO3:1H2O
ZnF2	-14.37	-14.91	-0.53	ZnF2
Znmetal	-41.22	-15.43	25.79	Zn
ZnMoO4	-3.80	-13.92	-10.13	ZnMoO4
ZnO(active)	-1.08	10.11	11.19	ZnO
ZnS(am)	-69.38	-78.43	-9.05	ZnS
ZnSb	-86.28	-75.27	11.01	ZnSb
ZnSe	-24.20	-38.60	-14.40	ZnSe
ZnSeO4:6H2O	-16.07	-17.59	-1.52	ZnSeO4:6H2O

ZnSO4:1H2O -9.27 -9.91 -0.64 ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 67.

Title Use solution to allow model output
REACTION 306
 H2O -0.0
 0 moles
USE solution 315
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 315. Solution after simulation 66.
Using reaction 306.

Reaction 306.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.198e-09	1.198e-09
Al	1.084e-07	1.085e-07
As	4.840e-09	4.840e-09
B	8.780e-06	8.780e-06
Ba	1.312e-09	1.312e-09
C	1.333e-03	1.333e-03
Ca	3.850e-04	3.851e-04
Cd	5.691e-10	5.691e-10
Cl	1.958e-03	1.958e-03
Co	4.125e-09	4.126e-09
Cr	6.075e-10	6.076e-10
Cu	2.119e-07	2.119e-07
F	8.490e-05	8.491e-05
Fe	7.094e-10	7.094e-10
Hg	9.146e-11	9.147e-11
K	2.412e-04	2.413e-04

Mg	3.148e-04	3.149e-04
Mn	2.744e-06	2.745e-06
Mo	7.840e-08	7.841e-08
N	6.441e-07	6.442e-07
Na	3.504e-03	3.504e-03
Ni	6.409e-09	6.409e-09
Pb	3.599e-10	3.599e-10
S	8.711e-04	8.711e-04
Sb	1.206e-09	1.206e-09
Se	7.174e-09	7.174e-09
Si	3.022e-04	3.023e-04
U	2.062e-08	2.062e-08
V	3.926e-10	3.926e-10
Zn	5.902e-07	5.902e-07

-----Description of solution-----

	pH	=	8.391	Charge balance
	pe	=	4.382	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	6.459e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.366e-03	
	Total CO2 (mol/kg)	=	1.333e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	7.622e-08	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110252e+02	
	Total O	=	5.552004e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.698e-06	2.475e-06	-5.569	-5.607	-0.038	(0)
H+	4.430e-09	4.069e-09	-8.354	-8.391	-0.037	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	1.198e-09					
AgCl	8.136e-10	8.136e-10	-9.090	-9.090	0.000	(0)
Ag+	2.412e-10	2.216e-10	-9.618	-9.655	-0.037	(0)
AgCl2-	1.400e-10	1.274e-10	-9.854	-9.895	-0.041	(0)
AgSO4-	2.786e-12	2.535e-12	-11.555	-11.596	-0.041	(0)
AgCl3-2	2.979e-13	2.043e-13	-12.526	-12.690	-0.164	(0)
AgOH	5.483e-14	5.483e-14	-13.261	-13.261	0.000	(0)
AgF	4.224e-14	4.224e-14	-13.374	-13.374	0.000	(0)
AgNO2	2.726e-14	2.726e-14	-13.565	-13.565	0.000	(0)
AgH2BO3	3.799e-15	3.799e-15	-14.420	-14.420	0.000	(0)
AgCl4-3	1.754e-15	7.500e-16	-14.756	-15.125	-0.369	(0)
AgSeO3-	4.338e-16	3.947e-16	-15.363	-15.404	-0.041	(0)
AgNH3+	5.067e-17	4.611e-17	-16.295	-16.336	-0.041	(0)
Ag2Se	4.685e-17	4.685e-17	-16.329	-16.329	0.000	(0)
Ag (OH) 2-	1.457e-17	1.326e-17	-16.837	-16.878	-0.041	(0)
AgNO3	9.776e-20	9.776e-20	-19.010	-19.010	0.000	(0)
Ag (NO2) 2-	2.732e-20	2.486e-20	-19.564	-19.605	-0.041	(0)
Ag (NH3) 2+	4.198e-23	3.820e-23	-22.377	-22.418	-0.041	(0)
Ag (SeO3) 2-3	2.291e-23	9.797e-24	-22.640	-23.009	-0.369	(0)
Ag2MoO4	1.036e-27	1.036e-27	-26.984	-26.984	0.000	(0)
AgHS	0.000e+00	0.000e+00	-75.991	-75.991	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.980	-85.636	-0.656	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-151.017	-151.135	-0.117	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-151.951	-152.184	-0.233	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-152.001	-152.042	-0.041	(0)
AgS4S5-3	0.000e+00	0.000e+00	-152.269	-152.495	-0.226	(0)
Al	1.084e-07					
Al (OH) 4-	1.081e-07	9.937e-08	-6.966	-7.003	-0.037	(0)

Al(OH) 3	3.190e-10	3.190e-10	-9.496	-9.496	0.000	(0)
Al(OH) 2+	7.017e-12	6.461e-12	-11.154	-11.190	-0.036	(0)
AlF2+	3.308e-14	3.046e-14	-13.480	-13.516	-0.036	(0)
AlF3	2.910e-14	2.910e-14	-13.536	-13.536	0.000	(0)
AlOH+2	4.574e-15	3.287e-15	-14.340	-14.483	-0.144	(0)
AlF+2	1.403e-15	1.008e-15	-14.853	-14.997	-0.144	(0)
AlF4-	1.204e-15	1.107e-15	-14.919	-14.956	-0.037	(0)
AlSO4+	6.433e-18	5.913e-18	-17.192	-17.228	-0.037	(0)
Al+3	2.857e-18	1.328e-18	-17.544	-17.877	-0.333	(0)
Al(SO4) 2-	3.953e-20	3.633e-20	-19.403	-19.440	-0.037	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-56.380	-56.749	-0.369	(0)
As (3)	2.172e-23					
H3AsO3	1.908e-23	1.908e-23	-22.719	-22.719	0.000	(0)
H2AsO3-	2.643e-24	2.405e-24	-23.578	-23.619	-0.041	(0)
HAsO3-2	7.863e-28	5.391e-28	-27.104	-27.268	-0.164	(0)
H4AsO3+	4.226e-32	3.846e-32	-31.374	-31.415	-0.041	(0)
AsO3-3	1.194e-32	5.107e-33	-31.923	-32.292	-0.369	(0)
As (5)	4.840e-09					
HAsO4-2	4.702e-09	3.224e-09	-8.328	-8.492	-0.164	(0)
H2AsO4-	1.315e-10	1.196e-10	-9.881	-9.922	-0.041	(0)
AsO4-3	5.859e-12	2.506e-12	-11.232	-11.601	-0.369	(0)
H3AsO4	8.444e-17	8.457e-17	-16.073	-16.073	0.001	(0)
B	8.780e-06					
H3BO3	7.567e-06	7.578e-06	-5.121	-5.120	0.001	(0)
H2BO3-	1.182e-06	1.082e-06	-5.927	-5.966	-0.038	(0)
CaH2BO3+	1.654e-08	1.514e-08	-7.781	-7.820	-0.038	(0)
MgH2BO3+	8.353e-09	7.645e-09	-8.078	-8.117	-0.038	(0)
NaH2BO3	5.495e-09	5.495e-09	-8.260	-8.260	0.000	(0)
BF(OH) 3-	2.508e-10	2.295e-10	-9.601	-9.639	-0.038	(0)
H5(BO3) 2-	7.624e-12	6.978e-12	-11.118	-11.156	-0.038	(0)
BaH2BO3+	3.362e-14	3.078e-14	-13.473	-13.512	-0.038	(0)
BF2(OH) 2-	8.279e-15	7.577e-15	-14.082	-14.120	-0.038	(0)
H8(BO3) 3-	5.777e-15	5.288e-15	-14.238	-14.277	-0.038	(0)
AgH2BO3	3.799e-15	3.799e-15	-14.420	-14.420	0.000	(0)
BF3OH-	9.947e-22	9.104e-22	-21.002	-21.041	-0.038	(0)
BF4-	1.511e-27	1.383e-27	-26.821	-26.859	-0.038	(0)
Ba	1.312e-09					
Ba+2	1.294e-09	9.206e-10	-8.888	-9.036	-0.148	(0)
BaHCO3+	1.127e-11	1.039e-11	-10.948	-10.983	-0.035	(0)
BaCO3	6.429e-12	6.429e-12	-11.192	-11.192	0.000	(0)
BaH2BO3+	3.362e-14	3.078e-14	-13.473	-13.512	-0.038	(0)
BaOH+	1.081e-14	9.944e-15	-13.966	-14.002	-0.036	(0)
BaNO3+	2.817e-18	2.563e-18	-17.550	-17.591	-0.041	(0)
BaNH3+2	8.635e-20	5.920e-20	-19.064	-19.228	-0.164	(0)
C (4)	1.333e-03					
HCO3-	1.283e-03	1.182e-03	-2.892	-2.928	-0.036	(0)
CO3-2	1.914e-05	1.362e-05	-4.718	-4.866	-0.148	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	5.805e-06	5.351e-06	-5.236	-5.272	-0.035	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgHCO3+	2.684e-06	2.465e-06	-5.571	-5.608	-0.037	(0)
MgCO3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
NaHCO3	2.130e-06	2.130e-06	-5.672	-5.672	0.000	(0)
NaCO3-	8.826e-07	8.127e-07	-6.054	-6.090	-0.036	(0)
CuCO3	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
ZnCO3	1.683e-07	1.683e-07	-6.774	-6.774	0.000	(0)
MnHCO3+	4.399e-08	4.047e-08	-7.357	-7.393	-0.036	(0)
UO2(CO3) 3-4	1.399e-08	3.091e-09	-7.854	-8.510	-0.656	(0)
Cu(CO3) 2-2	9.210e-09	6.314e-09	-8.036	-8.200	-0.164	(0)
ZnHCO3+	8.820e-09	8.025e-09	-8.055	-8.096	-0.041	(0)
UO2(CO3) 2-2	6.607e-09	4.529e-09	-8.180	-8.344	-0.164	(0)
NiCO3	1.456e-09	1.456e-09	-8.837	-8.837	0.000	(0)
CoCO3	4.801e-10	4.801e-10	-9.319	-9.319	0.000	(0)
NiHCO3+	4.590e-10	4.176e-10	-9.338	-9.379	-0.041	(0)
PbCO3	2.763e-10	2.763e-10	-9.559	-9.559	0.000	(0)
CoHCO3+	2.107e-10	1.917e-10	-9.676	-9.717	-0.041	(0)
CuHCO3+	1.761e-10	1.602e-10	-9.754	-9.795	-0.041	(0)
CdCO3	8.450e-11	8.450e-11	-10.073	-10.073	0.000	(0)

	UO ₂ CO ₃	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
	Pb(CO ₃) 2-2	1.583e-11	1.085e-11	-10.801	-10.965	-0.164	(0)
	BaHCO ₃ +	1.127e-11	1.039e-11	-10.948	-10.983	-0.035	(0)
	PbHCO ₃ +	6.513e-12	5.926e-12	-11.186	-11.227	-0.041	(0)
	BaCO ₃	6.429e-12	6.429e-12	-11.192	-11.192	0.000	(0)
	Cd(CO ₃) 2-2	1.244e-12	8.530e-13	-11.905	-12.069	-0.164	(0)
	CdHCO ₃ +	8.050e-13	7.325e-13	-12.094	-12.135	-0.041	(0)
	FeHCO ₃ +	7.543e-16	6.953e-16	-15.122	-15.158	-0.035	(0)
	HgCO ₃	9.342e-17	9.342e-17	-16.030	-16.030	0.000	(0)
	Hg(CO ₃) 2-2	5.868e-18	4.023e-18	-17.232	-17.395	-0.164	(0)
	HgHCO ₃ +	7.778e-21	7.078e-21	-20.109	-20.150	-0.041	(0)
Ca	3.850e-04						
	Ca+2	3.418e-04	2.432e-04	-3.466	-3.614	-0.148	(0)
	CaSO ₄	3.195e-05	3.195e-05	-4.496	-4.496	0.000	(0)
	CaHCO ₃ +	5.805e-06	5.351e-06	-5.236	-5.272	-0.035	(0)
	CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.190e-07	2.014e-07	-6.660	-6.696	-0.036	(0)
	CaH ₂ BO ₃ +	1.654e-08	1.514e-08	-7.781	-7.820	-0.038	(0)
	CaOH+	1.303e-08	1.201e-08	-7.885	-7.921	-0.035	(0)
	CaNO ₃ +	4.695e-13	4.272e-13	-12.328	-12.369	-0.041	(0)
	CaNH ₃ +2	4.552e-14	3.120e-14	-13.342	-13.506	-0.164	(0)
	Ca(NH ₃) 2+2	1.847e-24	1.266e-24	-23.734	-23.898	-0.164	(0)
Cd	5.691e-10						
	Cd+2	3.827e-10	2.723e-10	-9.417	-9.565	-0.148	(0)
	CdCO ₃	8.450e-11	8.450e-11	-10.073	-10.073	0.000	(0)
	CdCl+	5.139e-11	4.676e-11	-10.289	-10.330	-0.041	(0)
	CdSO ₄	3.660e-11	3.660e-11	-10.436	-10.436	0.000	(0)
	CdOH+	5.882e-12	5.352e-12	-11.230	-11.271	-0.041	(0)
	CdOHC1	4.747e-12	4.747e-12	-11.324	-11.324	0.000	(0)
	Cd(CO ₃) 2-2	1.244e-12	8.530e-13	-11.905	-12.069	-0.164	(0)
	CdHCO ₃ +	8.050e-13	7.325e-13	-12.094	-12.135	-0.041	(0)
	Cd(SO ₄) 2-2	4.130e-13	2.831e-13	-12.384	-12.548	-0.164	(0)
	CdF+	3.599e-13	3.275e-13	-12.444	-12.485	-0.041	(0)
	CdCl ₂	3.506e-13	3.506e-13	-12.455	-12.455	0.000	(0)
	Cd(OH) 2	8.356e-14	8.356e-14	-13.078	-13.078	0.000	(0)
	CdCl ₃ -	4.372e-16	3.978e-16	-15.359	-15.400	-0.041	(0)
	CdF ₂	4.960e-17	4.960e-17	-16.305	-16.305	0.000	(0)
	Cd(OH) 3-	1.388e-17	1.263e-17	-16.857	-16.898	-0.041	(0)
	CdSeO ₄	6.089e-19	6.089e-19	-18.215	-18.215	0.000	(0)
	CdNO ₃ +	5.257e-19	4.783e-19	-18.279	-18.320	-0.041	(0)
	Cd ₂ OH+3	1.708e-20	7.304e-21	-19.768	-20.136	-0.369	(0)
	Cd(SeO ₃) 2-2	2.515e-21	1.724e-21	-20.599	-20.763	-0.164	(0)
	Cd(OH) 4-2	7.464e-24	5.117e-24	-23.127	-23.291	-0.164	(0)
	Cd(NO ₃) 2	1.332e-28	1.332e-28	-27.876	-27.876	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-81.667	-81.708	-0.041	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-154.655	-154.655	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-232.865	-232.906	-0.041	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-310.696	-310.860	-0.164	(0)
Cl	1.958e-03						
	Cl-	1.958e-03	1.798e-03	-2.708	-2.745	-0.037	(0)
	MnCl+	4.224e-09	3.886e-09	-8.374	-8.410	-0.036	(0)
	ZnOHC1	3.143e-09	3.143e-09	-8.503	-8.503	0.000	(0)
	ZnCl+	1.057e-09	9.702e-10	-8.976	-9.013	-0.037	(0)
	AgCl	8.136e-10	8.136e-10	-9.090	-9.090	0.000	(0)
	AgCl ₂ -	1.400e-10	1.274e-10	-9.854	-9.895	-0.041	(0)
	CuCl	9.892e-11	9.892e-11	-10.005	-10.005	0.000	(0)
	CdCl+	5.139e-11	4.676e-11	-10.289	-10.330	-0.041	(0)
	CuCl ₂ -	4.048e-11	3.717e-11	-10.393	-10.430	-0.037	(0)
	NiCl+	1.450e-11	1.319e-11	-10.839	-10.880	-0.041	(0)
	CoCl+	1.426e-11	1.298e-11	-10.846	-10.887	-0.041	(0)
	MnCl ₂	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)
	CuCl+	6.671e-12	6.125e-12	-11.176	-11.213	-0.037	(0)
	CdOHC1	4.747e-12	4.747e-12	-11.324	-11.324	0.000	(0)
	ZnCl ₂	2.765e-12	2.765e-12	-11.558	-11.558	0.000	(0)
	PbCl+	4.733e-13	4.307e-13	-12.325	-12.366	-0.041	(0)
	CdCl ₂	3.506e-13	3.506e-13	-12.455	-12.455	0.000	(0)
	AgCl ₃ -2	2.979e-13	2.043e-13	-12.526	-12.690	-0.164	(0)
	HgClOH	4.506e-14	4.506e-14	-13.346	-13.346	0.000	(0)

CuCl3-2	1.995e-14	1.429e-14	-13.700	-13.845	-0.145	(0)
MnCl3-	5.316e-15	4.890e-15	-14.274	-14.311	-0.036	(0)
ZnCl3-	4.302e-15	3.950e-15	-14.366	-14.403	-0.037	(0)
CuCl2	3.819e-15	3.819e-15	-14.418	-14.418	0.000	(0)
PbCl2	3.460e-15	3.460e-15	-14.461	-14.461	0.000	(0)
HgCl2	1.854e-15	1.854e-15	-14.732	-14.732	0.000	(0)
AgCl4-3	1.754e-15	7.500e-16	-14.756	-15.125	-0.369	(0)
CdCl3-	4.372e-16	3.978e-16	-15.359	-15.400	-0.041	(0)
NiCl2	1.195e-16	1.195e-16	-15.923	-15.923	0.000	(0)
HgCl3-	3.665e-17	3.335e-17	-16.436	-16.477	-0.041	(0)
ZnCl4-2	4.959e-18	3.552e-18	-17.305	-17.449	-0.145	(0)
PbCl3-	2.722e-18	2.477e-18	-17.565	-17.606	-0.041	(0)
UO2Cl+	9.858e-19	8.970e-19	-18.006	-18.047	-0.041	(0)
HgCl4-2	3.483e-19	2.388e-19	-18.458	-18.622	-0.164	(0)
HgCl+	2.261e-19	2.057e-19	-18.646	-18.687	-0.041	(0)
CuCl3-	6.981e-20	6.410e-20	-19.156	-19.193	-0.037	(0)
CrCl+2	5.614e-20	3.849e-20	-19.251	-19.415	-0.164	(0)
CrOHC12	3.255e-21	3.255e-21	-20.487	-20.487	0.000	(0)
PbCl4-2	2.970e-21	2.036e-21	-20.527	-20.691	-0.164	(0)
FeCl+2	7.929e-24	5.681e-24	-23.101	-23.246	-0.145	(0)
CrCl2+	7.217e-24	6.567e-24	-23.142	-23.183	-0.041	(0)
CuCl4-2	8.065e-25	5.778e-25	-24.093	-24.238	-0.145	(0)
FeCl2+	4.960e-26	4.563e-26	-25.304	-25.341	-0.036	(0)
CrO3Cl-	2.327e-26	2.117e-26	-25.633	-25.674	-0.041	(0)
VOCl+	1.977e-26	1.799e-26	-25.704	-25.745	-0.041	(0)
FeCl3	8.207e-30	8.207e-30	-29.086	-29.086	0.000	(0)
CoCl+2	1.068e-37	7.320e-38	-36.972	-37.136	-0.164	(0)
UCl+3	0.000e+00	0.000e+00	-49.298	-49.667	-0.369	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
Co (2)	4.125e-09					
Co+2	3.043e-09	2.086e-09	-8.517	-8.681	-0.164	(0)
CoCO3	4.801e-10	4.801e-10	-9.319	-9.319	0.000	(0)
CoSO4	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
CoHCO3+	2.107e-10	1.917e-10	-9.676	-9.717	-0.041	(0)
CoOH+	1.132e-10	1.030e-10	-9.946	-9.987	-0.041	(0)
Co (OH) 2	2.024e-11	2.024e-11	-10.694	-10.694	0.000	(0)
CoCl+	1.426e-11	1.298e-11	-10.846	-10.887	-0.041	(0)
CoF+	5.502e-12	5.006e-12	-11.260	-11.300	-0.041	(0)
CoNO2+	9.512e-15	8.655e-15	-14.022	-14.063	-0.041	(0)
Co (OH) 3-	1.098e-15	9.995e-16	-14.959	-15.000	-0.041	(0)
CoOOH-	2.756e-16	2.508e-16	-15.560	-15.601	-0.041	(0)
Co (NH3) +2	3.728e-17	2.556e-17	-16.428	-16.592	-0.164	(0)
CoSeO4	1.255e-17	1.255e-17	-16.901	-16.901	0.000	(0)
CoNO3+	2.018e-18	1.836e-18	-17.695	-17.736	-0.041	(0)
Co2OH+3	2.518e-20	1.077e-20	-19.599	-19.968	-0.369	(0)
Co (OH) 4-2	5.718e-22	3.920e-22	-21.243	-21.407	-0.164	(0)
Co (NH3) 2+2	1.621e-25	1.111e-25	-24.790	-24.954	-0.164	(0)
Co (NO3) 2	2.076e-27	2.076e-27	-26.683	-26.683	0.000	(0)
Co4 (OH) 4+4	1.016e-31	2.245e-32	-30.993	-31.649	-0.656	(0)
Co (NH3) 3+2	2.080e-34	1.426e-34	-33.682	-33.846	-0.164	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-42.954	-43.118	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.725	-52.889	-0.164	(0)
Co (3)	3.669e-30					
CoOH+2	3.669e-30	2.515e-30	-29.435	-29.599	-0.164	(0)
Co+3	4.302e-37	2.000e-37	-36.366	-36.699	-0.333	(0)
CoCl+2	1.068e-37	7.320e-38	-36.972	-37.136	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.346	-76.510	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
Cr (2)	2.392e-28					
Cr+2	2.392e-28	1.640e-28	-27.621	-27.785	-0.164	(0)
Cr (3)	6.075e-10					
Cr (OH) 2+	2.962e-10	2.695e-10	-9.528	-9.569	-0.041	(0)
Cr (OH) 3	2.506e-10	2.506e-10	-9.601	-9.601	0.000	(0)
CrO2-	3.215e-11	2.925e-11	-10.493	-10.534	-0.041	(0)

Cr (OH) 4-	2.713e-11	2.468e-11	-10.567	-10.608	-0.041	(0)
Cr (OH) +2	1.306e-12	8.952e-13	-11.884	-12.048	-0.164	(0)
CrOHSO4	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
CrF+2	2.901e-16	1.989e-16	-15.537	-15.701	-0.164	(0)
Cr+3	3.867e-17	1.654e-17	-16.413	-16.782	-0.369	(0)
CrSO4+	2.433e-17	2.214e-17	-16.614	-16.655	-0.041	(0)
CrCl+2	5.614e-20	3.849e-20	-19.251	-19.415	-0.164	(0)
CrOHC12	3.255e-21	3.255e-21	-20.487	-20.487	0.000	(0)
Cr2 (OH) 2SO4+2	1.438e-23	9.856e-24	-22.842	-23.006	-0.164	(0)
CrCl2+	7.217e-24	6.567e-24	-23.142	-23.183	-0.041	(0)
Cr2 (OH) 2 (SO4) 2	3.357e-25	3.357e-25	-24.474	-24.474	0.000	(0)
CrNO3+2	5.857e-28	4.015e-28	-27.232	-27.396	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-51.811	-51.975	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-63.363	-63.732	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Cr (6)	5.025e-14					
CrO4-2	4.910e-14	3.494e-14	-13.309	-13.457	-0.148	(0)
NaCrO4-	6.116e-16	5.565e-16	-15.214	-15.255	-0.041	(0)
HCrO4-	5.055e-16	4.600e-16	-15.296	-15.337	-0.041	(0)
KCrO4-	3.148e-17	2.865e-17	-16.502	-16.543	-0.041	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	4.769e-25	3.269e-25	-24.322	-24.486	-0.164	(0)
CrO3Cl-	2.327e-26	2.117e-26	-25.633	-25.674	-0.041	(0)
Cr2O7-2	1.070e-29	7.338e-30	-28.970	-29.134	-0.164	(0)
Cu (1)	1.874e-10					
CuCl	9.892e-11	9.892e-11	-10.005	-10.005	0.000	(0)
Cu+	4.801e-11	4.369e-11	-10.319	-10.360	-0.041	(0)
CuCl2-	4.048e-11	3.717e-11	-10.393	-10.430	-0.037	(0)
CuCl3-2	1.995e-14	1.429e-14	-13.700	-13.845	-0.145	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.261	-150.490	-0.230	(0)
CuS4S5-3	0.000e+00	0.000e+00	-150.998	-151.220	-0.222	(0)
Cu (2)	2.117e-07					
CuCO3	1.723e-07	1.723e-07	-6.764	-6.764	0.000	(0)
CuOH+	1.831e-08	1.681e-08	-7.737	-7.774	-0.037	(0)
Cu (CO3) 2-2	9.210e-09	6.314e-09	-8.036	-8.200	-0.164	(0)
Cu (OH) 2	8.302e-09	8.302e-09	-8.081	-8.081	0.000	(0)
Cu+2	3.020e-09	2.149e-09	-8.520	-8.668	-0.148	(0)
CuSO4	2.823e-10	2.823e-10	-9.549	-9.549	0.000	(0)
CuHCO3+	1.761e-10	1.602e-10	-9.754	-9.795	-0.041	(0)
Cu (OH) 3-	4.631e-11	4.214e-11	-10.334	-10.375	-0.041	(0)
CuF+	1.131e-11	1.029e-11	-10.947	-10.988	-0.041	(0)
Cu2 (OH) 2+2	1.036e-11	7.102e-12	-10.985	-11.149	-0.164	(0)
CuCl+	6.671e-12	6.125e-12	-11.176	-11.213	-0.037	(0)
CuNO2+	1.456e-13	1.325e-13	-12.837	-12.878	-0.041	(0)
CuCl2	3.819e-15	3.819e-15	-14.418	-14.418	0.000	(0)
CuNH3+2	3.269e-15	2.241e-15	-14.486	-14.650	-0.164	(0)
Cu (OH) 4-2	1.197e-15	8.207e-16	-14.922	-15.086	-0.164	(0)
CuNO3+	4.148e-18	3.775e-18	-17.382	-17.423	-0.041	(0)
Cu (NO2) 2	7.983e-19	7.983e-19	-18.098	-18.098	0.000	(0)
CuCl3-	6.981e-20	6.410e-20	-19.156	-19.193	-0.037	(0)
CuCl4-2	8.065e-25	5.778e-25	-24.093	-24.238	-0.145	(0)
Cu (NO3) 2	2.640e-28	2.640e-28	-27.578	-27.578	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-223.180	-223.221	-0.041	(0)
F	8.490e-05					
F-	8.264e-05	7.590e-05	-4.083	-4.120	-0.037	(0)
MgF+	1.888e-06	1.736e-06	-5.724	-5.761	-0.037	(0)
CaF+	2.190e-07	2.014e-07	-6.660	-6.696	-0.036	(0)
NaF	1.535e-07	1.535e-07	-6.814	-6.814	0.000	(0)
MnF+	5.638e-09	5.187e-09	-8.249	-8.285	-0.036	(0)
HF	4.567e-10	4.567e-10	-9.340	-9.340	0.000	(0)
ZnF+	3.574e-10	3.252e-10	-9.447	-9.488	-0.041	(0)
BF (OH) 3-	2.508e-10	2.295e-10	-9.601	-9.639	-0.038	(0)
CuF+	1.131e-11	1.029e-11	-10.947	-10.988	-0.041	(0)
NiF+	6.006e-12	5.465e-12	-11.221	-11.262	-0.041	(0)
CoF+	5.502e-12	5.006e-12	-11.260	-11.300	-0.041	(0)
CdF+	3.599e-13	3.275e-13	-12.444	-12.485	-0.041	(0)
HF2-	1.437e-13	1.318e-13	-12.843	-12.880	-0.038	(0)
AgF	4.224e-14	4.224e-14	-13.374	-13.374	0.000	(0)

PbF+	3.967e-14	3.610e-14	-13.402	-13.443	-0.041	(0)
AlF2+	3.308e-14	3.046e-14	-13.480	-13.516	-0.036	(0)
AlF3	2.910e-14	2.910e-14	-13.536	-13.536	0.000	(0)
BF2(OH) 2-	8.279e-15	7.577e-15	-14.082	-14.120	-0.038	(0)
UO2F+	3.541e-15	3.222e-15	-14.451	-14.492	-0.041	(0)
AlF+2	1.403e-15	1.008e-15	-14.853	-14.997	-0.144	(0)
AlF4-	1.204e-15	1.107e-15	-14.919	-14.956	-0.037	(0)
UO2F2	7.052e-16	7.052e-16	-15.152	-15.152	0.000	(0)
CrF+2	2.901e-16	1.989e-16	-15.537	-15.701	-0.164	(0)
PbF2	5.391e-17	5.391e-17	-16.268	-16.268	0.000	(0)
CdF2	4.960e-17	4.960e-17	-16.305	-16.305	0.000	(0)
UO2F3-	1.478e-17	1.344e-17	-16.830	-16.871	-0.041	(0)
H2F2	5.589e-19	5.589e-19	-18.253	-18.253	0.000	(0)
FeF2+	1.922e-20	1.768e-20	-19.716	-19.753	-0.036	(0)
FeF+2	1.215e-20	8.704e-21	-19.915	-20.060	-0.145	(0)
UO2F4-2	1.182e-20	8.105e-21	-19.927	-20.091	-0.164	(0)
VO2F	8.633e-21	8.633e-21	-20.064	-20.064	0.000	(0)
PbF3-	8.529e-21	7.761e-21	-20.069	-20.110	-0.041	(0)
FeF3	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
BF3OH-	9.947e-22	9.104e-22	-21.002	-21.041	-0.038	(0)
VO2F2-	2.614e-22	2.379e-22	-21.583	-21.624	-0.041	(0)
VOF+	1.784e-24	1.623e-24	-23.749	-23.790	-0.041	(0)
PbF4-2	4.112e-25	2.819e-25	-24.386	-24.550	-0.164	(0)
VO2F3-2	3.285e-25	2.252e-25	-24.483	-24.647	-0.164	(0)
VOF2	4.619e-26	4.619e-26	-25.335	-25.335	0.000	(0)
HgF+	1.773e-26	1.613e-26	-25.751	-25.792	-0.041	(0)
BF4-	1.511e-27	1.383e-27	-26.821	-26.859	-0.038	(0)
Sb(OH) 2F	1.465e-28	1.465e-28	-27.834	-27.834	0.000	(0)
SbOF	1.441e-28	1.441e-28	-27.841	-27.841	0.000	(0)
VOF3-	1.367e-28	1.244e-28	-27.864	-27.905	-0.041	(0)
VO2F4-3	1.967e-29	8.410e-30	-28.706	-29.075	-0.369	(0)
VOF4-2	5.558e-32	3.810e-32	-31.255	-31.419	-0.164	(0)
SiF6-2	3.226e-32	2.311e-32	-31.491	-31.636	-0.145	(0)
UF3+	4.569e-40	4.157e-40	-39.340	-39.381	-0.041	(0)
UF2+2	0.000e+00	0.000e+00	-40.297	-40.461	-0.164	(0)
UF4	0.000e+00	0.000e+00	-41.461	-41.461	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.073	-43.442	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.942	-43.983	-0.041	(0)
UF6-2	0.000e+00	0.000e+00	-45.459	-45.623	-0.164	(0)
Fe (2)	8.053e-14					
Fe+2	6.818e-14	4.674e-14	-13.166	-13.330	-0.164	(0)
FeSO4	6.579e-15	6.579e-15	-14.182	-14.182	0.000	(0)
FeOH+	5.005e-15	4.605e-15	-14.301	-14.337	-0.036	(0)
FeHCO3+	7.543e-16	6.953e-16	-15.122	-15.158	-0.035	(0)
Fe(OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	7.698e-18	7.082e-18	-17.114	-17.150	-0.036	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-164.682	-164.682	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-242.755	-242.796	-0.041	(0)
Fe (3)	7.093e-10					
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 2+	1.747e-10	1.609e-10	-9.758	-9.793	-0.036	(0)
Fe(OH) 4-	1.070e-10	9.851e-11	-9.971	-10.007	-0.036	(0)
FeOH+2	2.333e-16	1.671e-16	-15.632	-15.777	-0.145	(0)
FeF2+	1.922e-20	1.768e-20	-19.716	-19.753	-0.036	(0)
FeF+2	1.215e-20	8.704e-21	-19.915	-20.060	-0.145	(0)
FeF3	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
FeSO4+	7.315e-22	6.730e-22	-21.136	-21.172	-0.036	(0)
Fe+3	2.250e-22	1.046e-22	-21.648	-21.980	-0.333	(0)
Fe(SO4) 2-	9.067e-24	8.251e-24	-23.043	-23.084	-0.041	(0)
FeCl+2	7.929e-24	5.681e-24	-23.101	-23.246	-0.145	(0)
FeCl2+	4.960e-26	4.563e-26	-25.304	-25.341	-0.036	(0)
FeHSeO3+2	1.142e-27	7.830e-28	-26.942	-27.106	-0.164	(0)
FeCl3	8.207e-30	8.207e-30	-29.086	-29.086	0.000	(0)
Fe2(OH) 2+4	4.187e-30	9.247e-31	-29.378	-30.034	-0.656	(0)
FeNO3+2	8.475e-31	5.810e-31	-30.072	-30.236	-0.164	(0)
Fe3(OH) 4+5	2.277e-38	2.150e-39	-37.643	-38.667	-1.025	(0)
H (0)	4.033e-29					
H2	2.016e-29	2.019e-29	-28.695	-28.695	0.001	(0)

Hg (0)	9.119e-11					
Hg	9.119e-11	9.119e-11	-10.040	-10.040	0.000	(0)
Hg (1)	1.036e-24					
Hg2+2	5.178e-25	3.549e-25	-24.286	-24.450	-0.164	(0)
Hg (2)	2.682e-13					
Hg (OH) 2	2.212e-13	2.215e-13	-12.655	-12.655	0.001	(0)
HgClOH	4.506e-14	4.506e-14	-13.346	-13.346	0.000	(0)
HgCl2	1.854e-15	1.854e-15	-14.732	-14.732	0.000	(0)
HgCO3	9.342e-17	9.342e-17	-16.030	-16.030	0.000	(0)
HgCl3-	3.665e-17	3.335e-17	-16.436	-16.477	-0.041	(0)
Hg (CO3) 2-2	5.868e-18	4.023e-18	-17.232	-17.395	-0.164	(0)
HgOH+	6.207e-19	5.648e-19	-18.207	-18.248	-0.041	(0)
HgCl4-2	3.483e-19	2.388e-19	-18.458	-18.622	-0.164	(0)
HgCl+	2.261e-19	2.057e-19	-18.646	-18.687	-0.041	(0)
Hg (OH) 3-	7.584e-20	6.901e-20	-19.120	-19.161	-0.041	(0)
HgHCO3+	7.778e-21	7.078e-21	-20.109	-20.150	-0.041	(0)
Hg+2	8.363e-24	5.733e-24	-23.078	-23.242	-0.164	(0)
HgSO4	8.608e-25	8.608e-25	-24.065	-24.065	0.000	(0)
HgNH3+2	5.378e-25	3.687e-25	-24.269	-24.433	-0.164	(0)
Hg (NH3) 2+2	5.481e-26	3.758e-26	-25.261	-25.425	-0.164	(0)
HgF+	1.773e-26	1.613e-26	-25.751	-25.792	-0.041	(0)
HgNO3+	1.292e-33	1.176e-33	-32.889	-32.930	-0.041	(0)
Hg (NH3) 3+2	2.224e-35	1.525e-35	-34.653	-34.817	-0.164	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.566	-42.566	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-43.745	-43.909	-0.164	(0)
HgHS2-	0.000e+00	0.000e+00	-143.184	-143.225	-0.041	(0)
HgS2-2	0.000e+00	0.000e+00	-143.378	-143.542	-0.164	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-145.221	-145.221	0.000	(0)
K	2.412e-04					
K+	2.403e-04	2.207e-04	-3.619	-3.656	-0.037	(0)
KSO4-	9.730e-07	8.959e-07	-6.012	-6.048	-0.036	(0)
KCrO4-	3.148e-17	2.865e-17	-16.502	-16.543	-0.041	(0)
Mg	3.148e-04					
Mg+2	2.865e-04	2.038e-04	-3.543	-3.691	-0.148	(0)
MgSO4	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
MgHCO3+	2.684e-06	2.465e-06	-5.571	-5.608	-0.037	(0)
MgCO3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
MgF+	1.888e-06	1.736e-06	-5.724	-5.761	-0.037	(0)
MgOH+	2.176e-07	2.008e-07	-6.662	-6.697	-0.035	(0)
MgH2BO3+	8.353e-09	7.645e-09	-8.078	-8.117	-0.038	(0)
Mn (2)	2.744e-06					
Mn+2	2.504e-06	1.717e-06	-5.601	-5.765	-0.164	(0)
MnSO4	1.750e-07	1.750e-07	-6.757	-6.757	0.000	(0)
MnHCO3+	4.399e-08	4.047e-08	-7.357	-7.393	-0.036	(0)
MnOH+	1.160e-08	1.067e-08	-7.936	-7.972	-0.036	(0)
MnF+	5.638e-09	5.187e-09	-8.249	-8.285	-0.036	(0)
MnCl+	4.224e-09	3.886e-09	-8.374	-8.410	-0.036	(0)
MnCl2	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)
MnSeO4	5.548e-15	5.548e-15	-14.256	-14.256	0.000	(0)
MnCl3-	5.316e-15	4.890e-15	-14.274	-14.311	-0.036	(0)
MnNO3+	1.661e-15	1.511e-15	-14.780	-14.821	-0.041	(0)
Mn (OH) 3-	4.389e-16	4.038e-16	-15.358	-15.394	-0.036	(0)
Mn (OH) 4-2	4.503e-21	3.226e-21	-20.347	-20.491	-0.145	(0)
Mn (NO3) 2	2.109e-24	2.109e-24	-23.676	-23.676	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.082	-43.082	0.000	(0)
Mn (3)	3.973e-27					
Mn+3	3.973e-27	1.847e-27	-26.401	-26.734	-0.333	(0)
Mn (6)	4.065e-40					
MnO4-2	4.065e-40	2.912e-40	-39.391	-39.536	-0.145	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.488	-44.526	-0.038	(0)
Mo	7.840e-08					
MoO4-2	7.840e-08	5.578e-08	-7.106	-7.254	-0.148	(0)
HMoO4-	4.963e-12	4.516e-12	-11.304	-11.345	-0.041	(0)
H2MoO4	1.346e-16	1.346e-16	-15.871	-15.871	0.000	(0)
Ag2MoO4	1.036e-27	1.036e-27	-26.984	-26.984	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-56.380	-56.749	-0.369	(0)
Mo7O24-6	0.000e+00	0.000e+00	-63.433	-64.909	-1.476	(0)

HMo7O24-5	0.000e+00	0.000e+00	-65.888	-66.913	-1.025	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-69.865	-70.521	-0.656	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-75.297	-75.666	-0.369	(0)
N (-3)	9.014e-10					
NH4+	7.946e-10	7.273e-10	-9.100	-9.138	-0.038	(0)
NH3	1.019e-10	1.019e-10	-9.992	-9.992	0.000	(0)
NH4SO4-	4.857e-12	4.469e-12	-11.314	-11.350	-0.036	(0)
CaNH3+2	4.552e-14	3.120e-14	-13.342	-13.506	-0.164	(0)
CuNH3+2	3.269e-15	2.241e-15	-14.486	-14.650	-0.164	(0)
NiNH3+2	2.289e-16	1.569e-16	-15.640	-15.804	-0.164	(0)
AgNH3+	5.067e-17	4.611e-17	-16.295	-16.336	-0.041	(0)
Co (NH3) +2	3.728e-17	2.556e-17	-16.428	-16.592	-0.164	(0)
BaNH3+2	8.635e-20	5.920e-20	-19.064	-19.228	-0.164	(0)
Ag (NH3) 2+	4.198e-23	3.820e-23	-22.377	-22.418	-0.041	(0)
Ni (NH3) 2+2	3.372e-24	2.312e-24	-23.472	-23.636	-0.164	(0)
Ca (NH3) 2+2	1.847e-24	1.266e-24	-23.734	-23.898	-0.164	(0)
HgNH3+2	5.378e-25	3.687e-25	-24.269	-24.433	-0.164	(0)
Co (NH3) 2+2	1.621e-25	1.111e-25	-24.790	-24.954	-0.164	(0)
Hg (NH3) 2+2	5.481e-26	3.758e-26	-25.261	-25.425	-0.164	(0)
Co (NH3) 3+2	2.080e-34	1.426e-34	-33.682	-33.846	-0.164	(0)
Hg (NH3) 3+2	2.224e-35	1.525e-35	-34.653	-34.817	-0.164	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-42.954	-43.118	-0.164	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-43.745	-43.909	-0.164	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-51.811	-51.975	-0.164	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-52.725	-52.889	-0.164	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-60.977	-61.141	-0.164	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-63.363	-63.732	-0.369	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.211	-65.375	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-76.346	-76.510	-0.164	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-77.684	-77.848	-0.164	(0)
N (3)	6.426e-07					
NO2-	6.426e-07	5.888e-07	-6.192	-6.230	-0.038	(0)
CuNO2+	1.456e-13	1.325e-13	-12.837	-12.878	-0.041	(0)
AgNO2	2.726e-14	2.726e-14	-13.565	-13.565	0.000	(0)
CoNO2+	9.512e-15	8.655e-15	-14.022	-14.063	-0.041	(0)
Cu (NO2) 2	7.983e-19	7.983e-19	-18.098	-18.098	0.000	(0)
Ag (NO2) 2-	2.732e-20	2.486e-20	-19.564	-19.605	-0.041	(0)
N (5)	6.053e-10					
NO3-	6.048e-10	5.555e-10	-9.218	-9.255	-0.037	(0)
CaNO3+	4.695e-13	4.272e-13	-12.328	-12.369	-0.041	(0)
MnNO3+	1.661e-15	1.511e-15	-14.780	-14.821	-0.041	(0)
ZnNO3+	3.293e-16	2.997e-16	-15.482	-15.523	-0.041	(0)
NiNO3+	4.396e-18	4.000e-18	-17.357	-17.398	-0.041	(0)
CuNO3+	4.148e-18	3.775e-18	-17.382	-17.423	-0.041	(0)
BaNO3+	2.817e-18	2.563e-18	-17.550	-17.591	-0.041	(0)
CoNO3+	2.018e-18	1.836e-18	-17.695	-17.736	-0.041	(0)
CdNO3+	5.257e-19	4.783e-19	-18.279	-18.320	-0.041	(0)
AgNO3	9.776e-20	9.776e-20	-19.010	-19.010	0.000	(0)
PbNO3+	6.095e-20	5.546e-20	-19.215	-19.256	-0.041	(0)
Mn (NO3) 2	2.109e-24	2.109e-24	-23.676	-23.676	0.000	(0)
UO2NO3+	3.746e-25	3.409e-25	-24.426	-24.467	-0.041	(0)
Zn (NO3) 2	3.321e-26	3.321e-26	-25.479	-25.479	0.000	(0)
Co (NO3) 2	2.076e-27	2.076e-27	-26.683	-26.683	0.000	(0)
CrNO3+2	5.857e-28	4.015e-28	-27.232	-27.396	-0.164	(0)
Cu (NO3) 2	2.640e-28	2.640e-28	-27.578	-27.578	0.000	(0)
Cd (NO3) 2	1.332e-28	1.332e-28	-27.876	-27.876	0.000	(0)
Pb (NO3) 2	5.232e-29	5.232e-29	-28.281	-28.281	0.000	(0)
VO2NO3	1.822e-29	1.822e-29	-28.739	-28.739	0.000	(0)
FeNO3+2	8.475e-31	5.810e-31	-30.072	-30.236	-0.164	(0)
HgNO3+	1.292e-33	1.176e-33	-32.889	-32.930	-0.041	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.566	-42.566	0.000	(0)
Na	3.504e-03					
Na+	3.490e-03	3.205e-03	-2.457	-2.494	-0.037	(0)
NaSO4-	1.072e-05	9.871e-06	-4.970	-5.006	-0.036	(0)
NaHCO3	2.130e-06	2.130e-06	-5.672	-5.672	0.000	(0)
NaCO3-	8.826e-07	8.127e-07	-6.054	-6.090	-0.036	(0)
NaF	1.535e-07	1.535e-07	-6.814	-6.814	0.000	(0)

	NaH2BO3	5.495e-09	5.495e-09	-8.260	-8.260	0.000	(0)
	NaCrO4-	6.116e-16	5.565e-16	-15.214	-15.255	-0.041	(0)
Ni		6.409e-09					
	Ni+2	4.029e-09	2.867e-09	-8.395	-8.543	-0.148	(0)
	NiCO3	1.456e-09	1.456e-09	-8.837	-8.837	0.000	(0)
	NiHCO3+	4.590e-10	4.176e-10	-9.338	-9.379	-0.041	(0)
	NiSO4	3.280e-10	3.280e-10	-9.484	-9.484	0.000	(0)
	NiOH+	9.815e-11	8.931e-11	-10.008	-10.049	-0.041	(0)
	Ni (OH) 2	1.756e-11	1.756e-11	-10.756	-10.756	0.000	(0)
	NiCl+	1.450e-11	1.319e-11	-10.839	-10.880	-0.041	(0)
	NiF+	6.006e-12	5.465e-12	-11.221	-11.262	-0.041	(0)
	Ni (OH) 3-	4.774e-14	4.344e-14	-13.321	-13.362	-0.041	(0)
	Ni (SO4) 2-2	9.086e-15	6.229e-15	-14.042	-14.206	-0.164	(0)
	NiNH3+2	2.289e-16	1.569e-16	-15.640	-15.804	-0.164	(0)
	NiCl2	1.195e-16	1.195e-16	-15.923	-15.923	0.000	(0)
	NiSeO4	1.610e-17	1.610e-17	-16.793	-16.793	0.000	(0)
	NiNO3+	4.396e-18	4.000e-18	-17.357	-17.398	-0.041	(0)
	Ni (NH3) 2+2	3.372e-24	2.312e-24	-23.472	-23.636	-0.164	(0)
O (0)		2.481e-35					
	O2	1.241e-35	1.243e-35	-34.906	-34.906	0.001	(0)
Pb		3.599e-10					
	PbCO3	2.763e-10	2.763e-10	-9.559	-9.559	0.000	(0)
	PbOH+	4.611e-11	4.195e-11	-10.336	-10.377	-0.041	(0)
	Pb (CO3) 2-2	1.583e-11	1.085e-11	-10.801	-10.965	-0.164	(0)
	Pb+2	9.486e-12	6.750e-12	-11.023	-11.171	-0.148	(0)
	PbHCO3+	6.513e-12	5.926e-12	-11.186	-11.227	-0.041	(0)
	Pb (OH) 2	3.283e-12	3.283e-12	-11.484	-11.484	0.000	(0)
	PbSO4	1.896e-12	1.896e-12	-11.722	-11.722	0.000	(0)
	PbCl+	4.733e-13	4.307e-13	-12.325	-12.366	-0.041	(0)
	PbF+	3.967e-14	3.610e-14	-13.402	-13.443	-0.041	(0)
	Pb (SO4) 2-2	9.555e-15	6.550e-15	-14.020	-14.184	-0.164	(0)
	Pb (OH) 3-	8.928e-15	8.124e-15	-14.049	-14.090	-0.041	(0)
	PbCl2	3.460e-15	3.460e-15	-14.461	-14.461	0.000	(0)
	PbF2	5.391e-17	5.391e-17	-16.268	-16.268	0.000	(0)
	Pb (OH) 4-2	7.182e-18	4.923e-18	-17.144	-17.308	-0.164	(0)
	PbCl3-	2.722e-18	2.477e-18	-17.565	-17.606	-0.041	(0)
	PbNO3+	6.095e-20	5.546e-20	-19.215	-19.256	-0.041	(0)
	Pb2OH+3	1.049e-20	4.488e-21	-19.979	-20.348	-0.369	(0)
	PbF3-	8.529e-21	7.761e-21	-20.069	-20.110	-0.041	(0)
	PbCl4-2	2.970e-21	2.036e-21	-20.527	-20.691	-0.164	(0)
	Pb3 (OH) 4+2	2.117e-24	1.451e-24	-23.674	-23.838	-0.164	(0)
	PbF4-2	4.112e-25	2.819e-25	-24.386	-24.550	-0.164	(0)
	Pb (NO3) 2	5.232e-29	5.232e-29	-28.281	-28.281	0.000	(0)
	Pb4 (OH) 4+4	3.523e-31	7.782e-32	-30.453	-31.109	-0.656	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-156.202	-156.202	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-235.012	-235.053	-0.041	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-75.991	-75.991	0.000	(0)
	HS-	0.000e+00	0.000e+00	-80.110	-80.151	-0.041	(0)
	S5-2	0.000e+00	0.000e+00	-80.961	-81.125	-0.164	(0)
	S6-2	0.000e+00	0.000e+00	-81.477	-81.641	-0.164	(0)
	H2S	0.000e+00	0.000e+00	-81.521	-81.521	0.000	(0)
	S4-2	0.000e+00	0.000e+00	-81.557	-81.721	-0.164	(0)
	CdHS+	0.000e+00	0.000e+00	-81.667	-81.708	-0.041	(0)
	S3-2	0.000e+00	0.000e+00	-82.363	-82.527	-0.164	(0)
	S2-2	0.000e+00	0.000e+00	-83.379	-83.543	-0.164	(0)
	S-2	0.000e+00	0.000e+00	-88.915	-89.060	-0.145	(0)
	HgHS2-	0.000e+00	0.000e+00	-143.184	-143.225	-0.041	(0)
	HgS2-2	0.000e+00	0.000e+00	-143.378	-143.542	-0.164	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-145.221	-145.221	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-150.261	-150.490	-0.230	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-150.998	-151.220	-0.222	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-151.017	-151.135	-0.117	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-151.728	-151.769	-0.041	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-151.951	-152.184	-0.233	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-152.001	-152.042	-0.041	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-152.269	-152.495	-0.226	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-154.150	-154.150	0.000	(0)

Cd (HS) 2	0.000e+00	0.000e+00	-154.655	-154.655	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-156.202	-156.202	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-164.682	-164.682	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-223.180	-223.221	-0.041	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-230.980	-231.021	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-232.446	-232.610	-0.164	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.865	-232.906	-0.041	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-235.012	-235.053	-0.041	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-242.755	-242.796	-0.041	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-310.696	-310.860	-0.164	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.468	-312.632	-0.164	(0)
Sb2S4-2	0.000e+00	0.000e+00	-330.867	-331.031	-0.164	(0)
S (6)	8.711e-04					
SO4-2	8.059e-04	5.734e-04	-3.094	-3.242	-0.148	(0)
CaSO4	3.195e-05	3.195e-05	-4.496	-4.496	0.000	(0)
MgSO4	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
NaSO4-	1.072e-05	9.871e-06	-4.970	-5.006	-0.036	(0)
KSO4-	9.730e-07	8.959e-07	-6.012	-6.048	-0.036	(0)
MnSO4	1.750e-07	1.750e-07	-6.757	-6.757	0.000	(0)
ZnSO4	2.694e-08	2.694e-08	-7.570	-7.570	0.000	(0)
NiSO4	3.280e-10	3.280e-10	-9.484	-9.484	0.000	(0)
CuSO4	2.823e-10	2.823e-10	-9.549	-9.549	0.000	(0)
HSO4-	2.481e-10	2.280e-10	-9.605	-9.642	-0.037	(0)
CoSO4	2.387e-10	2.387e-10	-9.622	-9.622	0.000	(0)
Zn (SO4) 2-2	1.963e-10	1.346e-10	-9.707	-9.871	-0.164	(0)
CdSO4	3.660e-11	3.660e-11	-10.436	-10.436	0.000	(0)
NH4SO4-	4.857e-12	4.469e-12	-11.314	-11.350	-0.036	(0)
AgSO4-	2.786e-12	2.535e-12	-11.555	-11.596	-0.041	(0)
PbSO4	1.896e-12	1.896e-12	-11.722	-11.722	0.000	(0)
Cd (SO4) 2-2	4.130e-13	2.831e-13	-12.384	-12.548	-0.164	(0)
CrOHSO4	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
Pb (SO4) 2-2	9.555e-15	6.550e-15	-14.020	-14.184	-0.164	(0)
Ni (SO4) 2-2	9.086e-15	6.229e-15	-14.042	-14.206	-0.164	(0)
FeSO4	6.579e-15	6.579e-15	-14.182	-14.182	0.000	(0)
UO2SO4	2.669e-16	2.669e-16	-15.574	-15.574	0.000	(0)
CrSO4+	2.433e-17	2.214e-17	-16.614	-16.655	-0.041	(0)
AlSO4+	6.433e-18	5.913e-18	-17.192	-17.228	-0.037	(0)
UO2 (SO4) 2-2	2.943e-18	2.018e-18	-17.531	-17.695	-0.164	(0)
Al (SO4) 2-	3.953e-20	3.633e-20	-19.403	-19.440	-0.037	(0)
VO2SO4-	9.760e-22	8.881e-22	-21.011	-21.052	-0.041	(0)
FeSO4+	7.315e-22	6.730e-22	-21.136	-21.172	-0.036	(0)
Cr2 (OH) 2SO4+2	1.438e-23	9.856e-24	-22.842	-23.006	-0.164	(0)
Fe (SO4) 2-	9.067e-24	8.251e-24	-23.043	-23.084	-0.041	(0)
HgSO4	8.608e-25	8.608e-25	-24.065	-24.065	0.000	(0)
VOSO4	5.631e-25	5.631e-25	-24.249	-24.249	0.000	(0)
CrO3SO4-2	4.769e-25	3.269e-25	-24.322	-24.486	-0.164	(0)
Cr2 (OH) 2 (SO4) 2	3.357e-25	3.357e-25	-24.474	-24.474	0.000	(0)
VSO4+	3.620e-40	3.294e-40	-39.441	-39.482	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.605	-44.605	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.099	-45.263	-0.164	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-73.378	-73.419	-0.041	(0)
Sb (3)	6.004e-22					
Sb (OH) 3	3.037e-22	3.037e-22	-21.518	-21.518	0.000	(0)
HSbO2	2.965e-22	2.965e-22	-21.528	-21.528	0.000	(0)
SbO2-	1.297e-25	1.180e-25	-24.887	-24.928	-0.041	(0)
Sb (OH) 4-	7.431e-26	6.762e-26	-25.129	-25.170	-0.041	(0)
Sb (OH) 2F	1.465e-28	1.465e-28	-27.834	-27.834	0.000	(0)
SbOF	1.441e-28	1.441e-28	-27.841	-27.841	0.000	(0)
Sb (OH) 2+	3.298e-29	3.001e-29	-28.482	-28.523	-0.041	(0)
SbO+	1.137e-29	1.035e-29	-28.944	-28.985	-0.041	(0)
Sb2S4-2	0.000e+00	0.000e+00	-330.867	-331.031	-0.164	(0)
Sb (5)	1.206e-09					
SbO3-	1.204e-09	1.096e-09	-8.919	-8.960	-0.041	(0)
Sb (OH) 6-	1.395e-12	1.281e-12	-11.855	-11.892	-0.037	(0)
SbO2+	5.718e-27	5.203e-27	-26.243	-26.284	-0.041	(0)
Se (-2)	4.685e-17					
Ag2Se	4.685e-17	4.685e-17	-16.329	-16.329	0.000	(0)
HSe-	0.000e+00	0.000e+00	-40.281	-40.322	-0.041	(0)

MnSe	0.000e+00	0.000e+00	-43.082	-43.082	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.822	-44.822	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.767	-46.931	-0.164	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-84.980	-85.636	-0.656	(0)
Se (4)	7.157e-09					
SeO3-2	4.044e-09	2.772e-09	-8.393	-8.557	-0.164	(0)
HSeO3-	3.113e-09	2.833e-09	-8.507	-8.548	-0.041	(0)
H2SeO3	4.917e-15	4.917e-15	-14.308	-14.308	0.000	(0)
AgSeO3-	4.338e-16	3.947e-16	-15.363	-15.404	-0.041	(0)
Cd (SeO3) 2-2	2.515e-21	1.724e-21	-20.599	-20.763	-0.164	(0)
Ag (SeO3) 2-3	2.291e-23	9.797e-24	-22.640	-23.009	-0.369	(0)
FeHSeO3+2	1.142e-27	7.830e-28	-26.942	-27.106	-0.164	(0)
Se (6)	1.688e-11					
SeO4-2	1.688e-11	1.201e-11	-10.773	-10.921	-0.148	(0)
MnSeO4	5.548e-15	5.548e-15	-14.256	-14.256	0.000	(0)
ZnSeO4	3.994e-16	3.994e-16	-15.399	-15.399	0.000	(0)
NiSeO4	1.610e-17	1.610e-17	-16.793	-16.793	0.000	(0)
CoSeO4	1.255e-17	1.255e-17	-16.901	-16.901	0.000	(0)
HSeO4-	2.691e-18	2.449e-18	-17.570	-17.611	-0.041	(0)
CdSeO4	6.089e-19	6.089e-19	-18.215	-18.215	0.000	(0)
Zn (SeO4) 2-2	7.094e-27	4.864e-27	-26.149	-26.313	-0.164	(0)
Si	3.022e-04					
H4SiO4	2.910e-04	2.914e-04	-3.536	-3.536	0.001	(0)
H3SiO4-	1.128e-05	1.035e-05	-4.948	-4.985	-0.037	(0)
H2SiO4-2	2.234e-10	1.606e-10	-9.651	-9.794	-0.144	(0)
UO2H3SiO4+	2.971e-13	2.703e-13	-12.527	-12.568	-0.041	(0)
SiF6-2	3.226e-32	2.311e-32	-31.491	-31.636	-0.145	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-61.431	-61.800	-0.369	(0)
U (4)	1.785e-20					
U (OH) 5-	1.785e-20	1.624e-20	-19.748	-19.789	-0.041	(0)
U (OH) 4	2.768e-24	2.768e-24	-23.558	-23.558	0.000	(0)
U (OH) 3+	4.525e-29	4.117e-29	-28.344	-28.385	-0.041	(0)
U (OH) 2+2	1.130e-34	7.747e-35	-33.947	-34.111	-0.164	(0)
UF3+	4.569e-40	4.157e-40	-39.340	-39.381	-0.041	(0)
UF2+2	0.000e+00	0.000e+00	-40.297	-40.461	-0.164	(0)
UOH+3	0.000e+00	0.000e+00	-40.459	-40.828	-0.369	(0)
UF4	0.000e+00	0.000e+00	-41.461	-41.461	0.000	(0)
UF+3	0.000e+00	0.000e+00	-43.073	-43.442	-0.369	(0)
UF5-	0.000e+00	0.000e+00	-43.942	-43.983	-0.041	(0)
U (SO4) 2	0.000e+00	0.000e+00	-44.605	-44.605	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-45.099	-45.263	-0.164	(0)
UF6-2	0.000e+00	0.000e+00	-45.459	-45.623	-0.164	(0)
U+4	0.000e+00	0.000e+00	-47.966	-48.622	-0.656	(0)
UCl+3	0.000e+00	0.000e+00	-49.298	-49.667	-0.369	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-179.708	-183.029	-3.320	(0)
U (5)	8.552e-18					
UO2+	8.552e-18	7.782e-18	-17.068	-17.109	-0.041	(0)
U (6)	2.062e-08					
UO2 (CO3) 3-4	1.399e-08	3.091e-09	-7.854	-8.510	-0.656	(0)
UO2 (CO3) 2-2	6.607e-09	4.529e-09	-8.180	-8.344	-0.164	(0)
UO2CO3	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
UO2H3SiO4+	2.971e-13	2.703e-13	-12.527	-12.568	-0.041	(0)
UO2OH+	1.053e-13	9.581e-14	-12.978	-13.019	-0.041	(0)
UO2F+	3.541e-15	3.222e-15	-14.451	-14.492	-0.041	(0)
UO2F2	7.052e-16	7.052e-16	-15.152	-15.152	0.000	(0)
UO2+2	4.322e-16	3.075e-16	-15.364	-15.512	-0.148	(0)
UO2SO4	2.669e-16	2.669e-16	-15.574	-15.574	0.000	(0)
UO2F3-	1.478e-17	1.344e-17	-16.830	-16.871	-0.041	(0)
UO2 (SO4) 2-2	2.943e-18	2.018e-18	-17.531	-17.695	-0.164	(0)
UO2Cl+	9.858e-19	8.970e-19	-18.006	-18.047	-0.041	(0)
(UO2) 2 (OH) 2+2	2.222e-20	1.523e-20	-19.653	-19.817	-0.164	(0)
UO2F4-2	1.182e-20	8.105e-21	-19.927	-20.091	-0.164	(0)
(UO2) 3 (OH) 5+	7.450e-21	6.779e-21	-20.128	-20.169	-0.041	(0)
UO2NO3+	3.746e-25	3.409e-25	-24.426	-24.467	-0.041	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-45.662	-45.703	-0.041	(0)
V+2	0.000e+00	0.000e+00	-47.443	-47.607	-0.164	(0)

V (3)	1.487e-17					
V (OH) 3	1.487e-17	1.487e-17	-16.828	-16.828	0.000	(0)
V (OH) 2+	4.297e-29	3.910e-29	-28.367	-28.408	-0.041	(0)
VOH+2	2.201e-33	1.509e-33	-32.657	-32.821	-0.164	(0)
V+3	2.845e-39	1.217e-39	-38.546	-38.915	-0.369	(0)
VSO4+	3.620e-40	3.294e-40	-39.441	-39.482	-0.041	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-62.408	-62.777	-0.369	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-64.187	-64.843	-0.656	(0)
V (4)	1.942e-21					
V (OH) 3+	1.934e-21	1.760e-21	-20.713	-20.754	-0.041	(0)
VO+2	5.201e-24	3.565e-24	-23.284	-23.448	-0.164	(0)
VOF+	1.784e-24	1.623e-24	-23.749	-23.790	-0.041	(0)
VOSO4	5.631e-25	5.631e-25	-24.249	-24.249	0.000	(0)
VOF2	4.619e-26	4.619e-26	-25.335	-25.335	0.000	(0)
VOC1+	1.977e-26	1.799e-26	-25.704	-25.745	-0.041	(0)
VOF3-	1.367e-28	1.244e-28	-27.864	-27.905	-0.041	(0)
VOF4-2	5.558e-32	3.810e-32	-31.255	-31.419	-0.164	(0)
H2V2O4+2	2.265e-37	1.553e-37	-36.645	-36.809	-0.164	(0)
V (5)	3.926e-10					
H2VO4-	2.157e-10	1.963e-10	-9.666	-9.707	-0.041	(0)
HVO4-2	1.768e-10	1.212e-10	-9.753	-9.916	-0.164	(0)
H3VO4	7.987e-15	7.987e-15	-14.098	-14.098	0.000	(0)
VO4-3	3.491e-16	1.493e-16	-15.457	-15.826	-0.369	(0)
HV2O7-3	1.886e-17	8.064e-18	-16.725	-17.093	-0.369	(0)
H3V2O7-	1.113e-17	1.013e-17	-16.954	-16.995	-0.041	(0)
V2O7-4	2.415e-19	5.335e-20	-18.617	-19.273	-0.656	(0)
VO2+	7.062e-20	6.486e-20	-19.151	-19.188	-0.037	(0)
VO2F	8.633e-21	8.633e-21	-20.064	-20.064	0.000	(0)
VO2SO4-	9.760e-22	8.881e-22	-21.011	-21.052	-0.041	(0)
VO2F2-	2.614e-22	2.379e-22	-21.583	-21.624	-0.041	(0)
V3O9-3	1.853e-23	7.926e-24	-22.732	-23.101	-0.369	(0)
VO2F3-2	3.285e-25	2.252e-25	-24.483	-24.647	-0.164	(0)
VO2F4-3	1.967e-29	8.410e-30	-28.706	-29.075	-0.369	(0)
VO2NO3	1.822e-29	1.822e-29	-28.739	-28.739	0.000	(0)
V4O12-4	2.937e-30	6.487e-31	-29.532	-30.188	-0.656	(0)
V10O28-6	0.000e+00	0.000e+00	-80.251	-81.726	-1.476	(0)
HV10O28-5	0.000e+00	0.000e+00	-80.905	-81.930	-1.025	(0)
H2V10O28-4	0.000e+00	0.000e+00	-84.457	-85.113	-0.656	(0)
Zn	5.902e-07					
Zn+2	3.018e-07	2.148e-07	-6.520	-6.668	-0.148	(0)
ZnCO3	1.683e-07	1.683e-07	-6.774	-6.774	0.000	(0)
ZnOH+	5.840e-08	5.314e-08	-7.234	-7.275	-0.041	(0)
ZnSO4	2.694e-08	2.694e-08	-7.570	-7.570	0.000	(0)
Zn (OH) 2	2.084e-08	2.084e-08	-7.681	-7.681	0.000	(0)
ZnHCO3+	8.820e-09	8.025e-09	-8.055	-8.096	-0.041	(0)
ZnOHCl	3.143e-09	3.143e-09	-8.503	-8.503	0.000	(0)
ZnCl+	1.057e-09	9.702e-10	-8.976	-9.013	-0.037	(0)
ZnF+	3.574e-10	3.252e-10	-9.447	-9.488	-0.041	(0)
Zn (OH) 3-	2.841e-10	2.585e-10	-9.547	-9.588	-0.041	(0)
Zn (SO4) 2-2	1.963e-10	1.346e-10	-9.707	-9.871	-0.164	(0)
ZnCl2	2.765e-12	2.765e-12	-11.558	-11.558	0.000	(0)
Zn (OH) 4-2	3.715e-14	2.547e-14	-13.430	-13.594	-0.164	(0)
ZnCl3-	4.302e-15	3.950e-15	-14.366	-14.403	-0.037	(0)
ZnSeO4	3.994e-16	3.994e-16	-15.399	-15.399	0.000	(0)
ZnNO3+	3.293e-16	2.997e-16	-15.482	-15.523	-0.041	(0)
ZnCl4-2	4.959e-18	3.552e-18	-17.305	-17.449	-0.145	(0)
Zn (NO3) 2	3.321e-26	3.321e-26	-25.479	-25.479	0.000	(0)
Zn (SeO4) 2-2	7.094e-27	4.864e-27	-26.149	-26.313	-0.164	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-151.728	-151.769	-0.041	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.150	-154.150	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-230.980	-231.021	-0.041	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-232.446	-232.610	-0.164	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.468	-312.632	-0.164	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-67.98	-61.69	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-53.18	-48.67	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-60.41	-48.67	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-86.89	-68.95	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-69.45	-49.42	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-32.14	-31.73	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-29.65	-29.20	0.45	(NH4) 2SeO4
Acanthite	-54.85	-91.07	-36.22	Ag2S
Ag2CO3	-13.08	-24.17	-11.09	Ag2CO3
Ag2CrO4	-21.18	-32.77	-11.59	Ag2CrO4
Ag2HVO4	-14.81	-13.33	1.48	Ag2HVO4
Ag2MoO4	-15.01	-26.56	-11.55	Ag2MoO4
Ag2O	-15.10	-2.53	12.57	Ag2O
Ag2Se	-2.54	-51.24	-48.70	Ag2Se
Ag2SeO3	-12.32	-19.47	-7.15	Ag2SeO3
Ag2SeO4	-21.32	-30.23	-8.91	Ag2SeO4
Ag2SO4	-17.73	-22.55	-4.82	Ag2SO4
Ag3AsO3	-28.67	-26.51	2.16	Ag3AsO3
Ag3AsO4	-17.08	-19.86	-2.79	Ag3AsO4
Ag3H2VO5	-19.77	-14.59	5.18	Ag3H2VO5
AgF:4H2O	-14.82	-13.77	1.05	AgF:4H2O
Agmetal	-0.53	-14.04	-13.51	Ag
AgVO3	-12.83	-12.06	0.77	AgVO3
Al (OH) 3 (am)	-3.51	7.29	10.80	Al (OH) 3
Al2 (MoO4) 3	-59.88	-57.51	2.37	Al2 (MoO4) 3
Al2O3	-5.06	14.59	19.65	Al2O3
Al4 (OH) 10SO4	-13.54	9.16	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.58	-8.78	4.80	AlAsO4:2H2O
AlOHSO4	-9.50	-12.73	-3.23	AlOHSO4
AlSb	-156.48	-90.86	65.62	AlSb
Alunite	-12.03	-13.43	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-6.62	-14.41	-7.79	PbSO4
Anhydrite	-2.50	-6.86	-4.36	CaSO4
Anilite	-57.59	-89.47	-31.88	Cu0.25Cu1.5S
Antlerite	-4.47	4.32	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.12	-90.88	-2.76	As4O6
Artinite	-5.07	4.53	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.85	-32.15	6.71	As2O5
Atacamite	-2.30	5.09	7.39	Cu2 (OH) 3Cl
Azurite	-2.05	-18.95	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.65	7.74	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-21.98	-6.10	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-31.30	1.64	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.82	-22.49	-9.67	BaCrO4
BaF2	-11.46	-17.28	-5.82	BaF2
BaMoO4	-9.33	-16.29	-6.96	BaMoO4
Barite	-2.30	-12.28	-9.98	BaSO4
BaS	-96.98	-80.80	16.18	BaS
BaSeO3	-11.02	-9.19	1.83	BaSeO3
BaSeO4	-12.50	-19.96	-7.46	BaSeO4
Bianchite	-8.14	-9.91	-1.76	ZnSO4:6H2O
Birnessite	-6.88	11.21	18.09	MnO2
Bixbyite	-2.48	-3.12	-0.64	Mn2O3
BlaubleiI	-57.47	-81.63	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.97	-85.25	-27.28	Cu0.6Cu0.8S
Boehmite	-1.28	7.29	8.58	AlOOH
Breithauptite	-58.62	-77.14	-18.52	NiSb
Brochantite	-2.79	12.43	15.22	Cu4 (OH) 6SO4
Brucite	-3.75	13.09	16.84	Mg (OH) 2
Bunsenite	-4.21	8.24	12.45	NiO
Ca (VO3) 2	-14.09	-8.43	5.66	Ca (VO3) 2
Ca2V2O7	-12.76	4.74	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.81	4.74	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.94	7.36	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-21.05	17.91	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.95	17.91	39.86	Ca3 (VO4) 2:4H2O

Ca3Sb2	-299.78	-156.80	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-12.03	-29.94	-17.91	Hg2Cl2
CaMoO4	-2.92	-10.87	-7.95	CaMoO4
Carnotite	-5.02	-4.79	0.23	KUO2VO4
CaSeO3:2H2O	-6.59	-3.77	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.51	-14.53	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.86	-3.02	9.84	Cd(BO2)2
Cd(OH)2	-6.43	7.22	13.64	Cd(OH)2
Cd(OH)2(am)	-6.51	7.22	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-25.11	-18.40	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.93	1.63	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.56	8.84	28.40	Cd4(OH)6SO4
CdCl2	-14.40	-15.06	-0.66	CdCl2
CdCl2:1H2O	-13.36	-15.06	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-13.14	-15.06	-1.91	CdCl2:2.5H2O
CdF2	-16.59	-17.80	-1.21	CdF2
Cdmetal(alpha)	-31.84	-18.33	13.51	Cd
Cdmetal(gamma)	-31.95	-18.33	13.62	Cd
CdMoO4	-2.67	-16.82	-14.15	CdMoO4
CdOHCl	-7.46	-3.92	3.54	CdOHCl
CdSb	-77.81	-78.16	-0.35	CdSb
CdSe	-21.30	-41.50	-20.20	CdSe
CdSeO4:2H2O	-18.64	-20.49	-1.85	CdSeO4:2H2O
CdSO4	-12.63	-12.81	-0.17	CdSO4
CdSO4:1H2O	-11.08	-12.81	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.93	-12.81	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.65	-12.40	-9.75	AgCl
Cerrusite	-2.91	-16.04	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-9.27	-11.91	-2.64	CuSO4:5H2O
Chalcedony	0.01	-3.54	-3.55	SiO2
Chalcocite	-57.56	-92.48	-34.92	Cu2S
Chalcopyrite	-130.25	-165.52	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-55.50	-101.20	-45.69	HgS
Claudetite	-87.81	-90.88	-3.06	As4O6
Clausthalite	-16.00	-43.10	-27.10	PbSe
Co(BO2)2	-29.21	-2.14	27.07	Co(BO2)2
Co(OH)2	-4.99	8.10	13.09	Co(OH)2
Co(OH)3	-9.22	-11.53	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.88	-7.84	13.03	Co3(AsO4)2
Co3O4	-4.46	-14.95	-10.50	Co3O4
CoCl2	-22.44	-14.17	8.27	CoCl2
CoCl2:6H2O	-16.71	-14.17	2.54	CoCl2:6H2O
CoCO3	-3.57	-13.55	-9.98	CoCO3
CoF2	-15.32	-16.92	-1.60	CoF2
CoF3	-47.60	-49.06	-1.46	CoF3
CoFe2O4	18.01	14.48	-3.53	CoFe2O4
CoMoO4	-8.17	-15.93	-7.76	CoMoO4
CoO	-5.49	8.10	13.59	CoO
CoS(alpha)	-73.00	-80.44	-7.44	CoS
CoS(beta)	-69.37	-80.44	-11.07	CoS
CoSe	-24.41	-40.61	-16.20	CoSe
CoSeO3	-10.16	-8.84	1.32	CoSeO3
CoSeO4:6H2O	-18.07	-19.60	-1.53	CoSeO4:6H2O
CoSO4	-14.72	-11.92	2.80	CoSO4
CoSO4:6H2O	-9.45	-11.92	-2.47	CoSO4:6H2O
Cotunnite	-11.88	-16.66	-4.78	PbCl2
Covellite	-58.13	-80.43	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.37	-33.28	14.09	CrCl2
CrCl3	-49.70	-34.59	15.11	CrCl3

CrF3	-27.37	-38.71	-11.34	CrF3
Cristobalite	-0.19	-3.54	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-16.24	-50.08	-33.84	Na3AlF6
Cu(OH)2	-0.56	8.11	8.67	Cu(OH)2
Cu(SbO3)2	-29.04	16.17	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.67	-1.42	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-57.12	-92.01	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-6.85	-52.65	-45.80	Cu2Se
Cu2SO4	-22.01	-23.96	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.91	-7.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-61.47	-104.06	-42.59	Cu3Sb
Cu3Se2	-29.76	-93.25	-63.49	Cu3Se2
CuCO3	-2.03	-13.53	-11.50	CuCO3
CuCrO4	-16.68	-22.12	-5.44	CuCrO4
CuF	-9.57	-14.48	-4.91	CuF
CuF2	-18.02	-16.91	1.12	CuF2
CuF2:2H2O	-12.36	-16.91	-4.55	CuF2:2H2O
Cumetal	-5.99	-14.74	-8.76	Cu
CuMoO4	-2.85	-15.92	-13.08	CuMoO4
CuOCuSO4	-14.10	-3.80	10.30	CuOCuSO4
Cupricferrite	8.51	14.50	5.99	CuFe2O4
Cuprite	-2.53	-3.94	-1.41	Cu2O
Cuprousferriite	10.14	1.22	-8.92	CuFeO2
CuSe	-7.50	-40.60	-33.10	CuSe
CuSe2	-30.40	-63.77	-33.37	CuSe2
CuSeO3:2H2O	-9.34	-8.83	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.15	-19.59	-2.44	CuSeO4:5H2O
CuSO4	-14.85	-11.91	2.94	CuSO4
Diaspore	0.42	7.29	6.87	AlOOH
Djurlite	-57.76	-91.68	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.50	-17.04	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.05	-17.04	-17.09	CaMg(CO3)2
Epsomite	-4.81	-6.93	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.89	-0.15	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-14.42	-18.14	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-12.11	-10.56	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-23.81	-44.43	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-49.95	-53.69	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.28	-12.88	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.49	-20.58	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-49.83	-68.43	-18.60	FeSe2
FeS(ppt)	-82.14	-85.09	-2.95	FeS
FeSe	-34.26	-45.26	-11.00	FeSe
Fix_pe	-4.38	-4.38	0.00	e-
Fluorite	-1.35	-11.85	-10.50	CaF2
Galena	-68.96	-82.93	-13.97	PbS
Gibbsite	-1.00	7.29	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.90	-9.91	-2.01	ZnSO4:7H2O
Greenalite	-17.53	3.28	20.81	Fe3Si2O5(OH)4
Greenockite	-66.97	-81.33	-14.36	CdS
Greigite	-299.30	-344.33	-45.03	Fe3S4
Gummite	-6.40	1.27	7.67	UO3
Gypsum	-2.25	-6.86	-4.61	CaSO4:2H2O
H-Jarosite	-18.37	-30.47	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-11.16	-24.03	-12.88	H2MoO4
H2S(g)	-80.53	-88.54	-8.01	H2S
H2Se(g)	-43.75	-48.71	-4.96	H2Se
Halite	-6.84	-5.24	1.60	NaCl
Halloysite	-2.06	7.52	9.57	Al2Si2O5(OH)4
Hausmannite	-2.44	58.59	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3

Hercynite	-4.85	18.04	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-186.60	-260.31	-73.71	Hg (CH ₃) ₂
Hg (g)	-8.73	-16.61	-7.87	Hg
Hg (OH) ₂	-9.16	-12.65	-3.50	Hg (OH) ₂
Hg ₂ (g)	-18.26	-33.21	-14.96	Hg ₂
Hg ₂ (OH) ₂	-12.93	-7.67	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-13.27	-29.32	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-29.21	-37.91	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-22.33	-32.69	-10.36	Hg ₂ F ₂
Hg ₂ S	-84.53	-96.21	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-19.95	-24.61	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-21.56	-27.69	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-29.93	-59.61	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-34.47	-14.97	19.50	HgCl
HgCl ₂	-13.66	-34.93	-21.26	HgCl ₂
HgF (g)	-49.02	-16.34	32.68	HgF
HgF ₂ (g)	-50.24	-37.68	12.57	HgF ₂
Hgmetal (l)	-3.16	-16.61	-13.45	Hg
HgSe	-5.67	-61.37	-55.69	HgSe
HgSeO ₃	-17.16	-29.59	-12.43	HgSeO ₃
HgSO ₄	-23.26	-32.68	-9.42	HgSO ₄
Huntite	-4.18	-34.15	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-7.69	-26.46	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.37	-21.14	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-22.85	-28.02	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-10.94	-25.74	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-33.76	-51.01	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-20.26	-20.77	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-17.83	-14.57	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-17.50	-18.23	-0.73	K ₂ SeO ₄
Kaolinite	0.08	7.52	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-5.06	12.43	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-8.37	-8.80	-0.43	PbO : PbSO ₄
Laurionite	-6.15	-5.53	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-7.08	5.61	12.69	PbO
Mackinawite	-81.49	-85.09	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.61	19.47	16.86	Fe ₂ MgO ₄
Magnesite	-1.10	-8.56	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	-0.11	-5.42	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.55	23.79	25.34	MnOOH
Massicot	-7.28	5.61	12.89	PbO
Matlockite	-9.06	-18.04	-8.97	PbClF
Melanothallite	-20.42	-14.16	6.26	CuCl ₂
Melanterite	-14.36	-16.57	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-56.10	-101.20	-45.09	HgS
Mg (OH) ₂ (active)	-5.70	13.09	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-19.78	-8.50	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-279.10	-204.41	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-21.77	4.59	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.47	10.73	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.53	-17.15	5.38	MgCrO ₄
MgF ₂	-3.80	-11.93	-8.13	MgF ₂
MgMoO ₄	-9.09	-10.94	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-6.90	-3.85	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-13.41	-14.61	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-31.15	42.38	73.52	Pb ₃ O ₄
Mirabilite	-7.12	-8.23	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-15.48	-10.58	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.48	-63.19	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-149.97	-88.89	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-11.60	0.90	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O
MnCl ₂ : 4H ₂ O	-13.97	-11.26	2.72	MnCl ₂ : 4H ₂ O
MnS (grn)	-77.70	-77.53	0.17	MnS
MnS (pnk)	-80.87	-77.53	3.34	MnS

MnSb	-96.80	-99.71	-2.91	MnSb
MnSe	-41.20	-37.70	3.50	MnSe
MnSeO3	-7.05	-5.92	1.13	MnSeO3
MnSeO3:2H2O	-6.90	-5.92	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.64	-16.69	-2.05	MnSeO4:5H2O
MnSO4	-11.59	-9.01	2.58	MnSO4
Monteponite	-7.89	7.22	15.10	CdO
Montroydite	-9.01	-12.65	-3.64	HgO
MoO3	-16.03	-24.03	-8.00	MoO3
Morenosite	-9.64	-11.78	-2.14	NiSO4:7H2O
MoS2	-156.40	-226.66	-70.26	MoS2
Na-Jarosite	-13.38	-24.58	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.79	-48.68	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.44	2.93	Na2CrO4
Na2Mo2O7	-19.68	-36.28	-16.60	Na2Mo2O7
Na2MoO4	-13.73	-12.24	1.49	Na2MoO4
Na2MoO4:2H2O	-13.47	-12.24	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.45	-5.15	10.30	Na2SeO3:5H2O
Na2SeO4	-17.19	-15.91	1.28	Na2SeO4
Na3Sb	-174.91	-80.46	94.45	Na3Sb
Na3VO4	-29.79	6.89	36.68	Na3VO4
Na4V2O7	-35.41	1.99	37.40	Na4V2O7
Nantokite	-6.37	-13.10	-6.73	CuCl
NaSb	-89.88	-66.71	23.17	NaSb
Natron	-8.54	-9.85	-1.31	Na2CO3:10H2O
NaVO3	-8.76	-4.90	3.86	NaVO3
Nesquehonite	-3.89	-8.56	-4.67	MgCO3:3H2O
Ni(OH)2	-4.56	8.24	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.13	-7.43	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.07	12.93	32.00	Ni4(OH)6SO4
NiCO3	-6.54	-13.41	-6.87	NiCO3
NiMoO4	-4.65	-15.80	-11.14	NiMoO4
NiS(alpha)	-74.70	-80.30	-5.60	NiS
NiS(beta)	-69.20	-80.30	-11.10	NiS
NiS(gamma)	-67.50	-80.30	-12.80	NiS
NiSe	-22.77	-40.47	-17.70	NiSe
NiSeO3:2H2O	-11.51	-8.70	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.94	-19.46	-1.52	NiSeO4:6H2O
Nsutite	-6.29	11.21	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-250.00	-311.06	-61.07	As2S3
Otavite	-2.43	-14.43	-12.00	CdCO3
Pb(BO2)2	-11.15	-4.63	6.52	Pb(BO2)2
Pb(OH)2	-2.54	5.61	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-65.02	-73.78	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.71	0.08	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.97	11.22	26.19	Pb2O(OH)2
Pb2O3	-24.27	36.77	61.04	Pb2O3
Pb2OCO3	-9.87	-10.43	-0.56	Pb2OCO3
Pb2V2O7	-8.47	-10.37	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.11	-15.31	5.80	Pb3(AsO4)2
Pb3(VO4)2	-10.90	-4.76	6.14	Pb3(VO4)2
Pb3O2CO3	-15.84	-4.82	11.02	Pb3O2CO3
Pb3O2SO4	-13.88	-3.19	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.68	2.42	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.46	2.42	21.88	Pb4O3SO4
PbCrO4	-12.03	-24.63	-12.60	PbCrO4
PbF2	-11.97	-19.41	-7.44	PbF2
Pbmetal	-24.18	-19.93	4.25	Pb
PbMoO4	-2.80	-18.42	-15.62	PbMoO4
PbO:0.3H2O	-7.37	5.61	12.98	PbO:0.33H2O
PbSeO4	-15.25	-22.09	-6.84	PbSeO4
Periclase	-8.49	13.09	21.58	MgO
Phosgenite	-12.89	-32.70	-19.81	PbCl2:PbCO3
Plattnerite	-18.45	31.16	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-129.58	-148.09	-18.51	FeS2
Pyrochroite	-4.18	11.02	15.19	Mn(OH)2

Pyrolusite	-4.82	36.56	41.38	MnO2
Quartz	0.46	-3.54	-4.00	SiO2
Realgar	-104.29	-124.03	-19.75	AsS
Retgersite	-9.74	-11.78	-2.04	NiSO4:6H2O
Rhodochrosite	-0.05	-10.63	-10.58	MnCO3
Rutherfordine	-5.88	-20.38	-14.50	UO2CO3
Sb(OH)3	-14.41	-21.52	-7.11	Sb(OH)3
Sb2O4	-20.89	-17.49	3.40	Sb2O4
Sb2O5	-30.90	-40.57	-9.67	Sb2O5
Sb2Se3	-121.41	-189.17	-67.76	Sb2Se3
Sb4O6(cubic)	-67.81	-86.07	-18.26	Sb4O6
Sb4O6(orth)	-68.17	-86.07	-17.90	Sb4O6
SbCl3	-55.50	-54.92	0.57	SbCl3
SbF3	-48.82	-59.05	-10.23	SbF3
Sbmetal	-48.15	-59.83	-11.69	Sb
SbO2	-5.23	-33.06	-27.82	SbO2
Schoepite	-4.73	1.27	5.99	UO2(OH)2:H2O
Semetal(am)	-16.06	-23.17	-7.11	Se
Semetal(hex)	-15.46	-23.17	-7.71	Se
Senarmontite	-30.67	-43.03	-12.37	Sb2O3
SeO2	-17.06	-16.94	0.12	SeO2
SeO3	-48.75	-27.70	21.04	SeO3
Sepiolite	-0.19	15.57	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.21	15.57	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.83	-3.54	-2.71	SiO2
SiO2(am-ppt)	-0.80	-3.54	-2.74	SiO2
Smithsonite	-1.53	-11.53	-10.00	ZnCO3
Sphalerite	-66.98	-78.43	-11.45	ZnS
Spinel	-9.17	27.68	36.85	MgAl2O4
Stibnite	-258.20	-308.66	-50.46	Sb2S3
Sulfur	-60.85	-63.00	-2.14	S
Tenorite	0.47	8.11	7.64	CuO
Thenardite	-8.55	-8.23	0.32	Na2SO4
Thermonatrite	-10.49	-9.85	0.64	Na2CO3:H2O
Tyuyamunite	-9.97	-5.89	4.08	Ca(UO2)2(VO4)2
U3O8	-15.17	5.91	21.08	U3O8
U3Sb4	-590.17	-437.79	152.38	U3Sb4
U4O9	-31.67	-34.69	-3.02	U4O9
UF4	-35.56	-65.10	-29.54	UF4
UF4:2.5H2O	-32.38	-65.10	-32.72	UF4:2.5H2O
UO2(am)	-15.99	-15.06	0.93	UO2
UO2(NO3)2	-46.17	-34.02	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-38.87	-34.02	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-37.41	-34.02	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-36.07	-34.02	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.34	1.27	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.18	-26.43	-2.25	UO2SeO4:4H2O
UO3	-6.43	1.27	7.70	UO3
Uraninite	-10.39	-15.06	-4.67	UO2
USb2	-224.61	-195.03	29.58	USb2
V(OH)3	-21.33	-13.74	7.59	V(OH)3
V2O5	-20.24	-21.60	-1.36	V2O5
V3O5	-47.38	-45.55	1.84	V3O5
V4O7	-59.40	-52.21	7.19	V4O7
V6O13	-55.01	-115.87	-60.86	V6O13
Valentinite	-34.55	-43.03	-8.48	Sb2O3
VC12	-67.66	-48.79	18.87	VC12
VC13	-70.58	-47.15	23.43	VC13
VF4	-71.64	-56.71	14.93	VF4
Vmetal	-96.09	-52.06	44.03	V
VO	-41.27	-26.52	14.76	VO
VO(OH)2	-11.82	-6.67	5.15	VO(OH)2
VO2Cl	-24.77	-21.93	2.84	VO2Cl
VOC1	-36.03	-24.88	11.15	VOC1
VOC12	-41.70	-28.94	12.76	VOC12
VOSO4	-30.30	-26.69	3.61	VOSO4
Witherite	-5.33	-13.90	-8.57	BaCO3

Wurtzite	-69.48	-78.43	-8.95	ZnS
Zincite	-1.22	10.11	11.33	ZnO
Zincosite	-13.84	-9.91	3.93	ZnSO4
Zn(BO2)2	-8.42	-0.13	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.49	-25.18	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.09	10.11	12.20	Zn(OH)2
Zn(OH)2(am)	-2.36	10.11	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.64	10.11	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.42	10.11	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.62	10.11	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.30	0.20	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.10	9.09	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.46	-1.81	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.62	-9.71	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.97	20.43	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.21	28.29	38.50	Zn5(OH)8Cl2
ZnCl2	-19.21	-12.16	7.05	ZnCl2
ZnCO3:1H2O	-1.27	-11.53	-10.26	ZnCO3:1H2O
ZnF2	-14.37	-14.91	-0.53	ZnF2
Znmetal	-41.22	-15.43	25.79	Zn
ZnMoO4	-3.80	-13.92	-10.13	ZnMoO4
ZnO(active)	-1.08	10.11	11.19	ZnO
ZnS(am)	-69.38	-78.43	-9.05	ZnS
ZnSb	-86.28	-75.27	11.01	ZnSb
ZnSe	-24.20	-38.60	-14.40	ZnSe
ZnSeO4:6H2O	-16.07	-17.59	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.27	-9.91	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 68.

```

Title Stage 4 pit lake GW inflow
Title Stage 4 Groundwater mix
MIX 401
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.242991
11     1.968794
12     1.463415
13     3.436091
14     0
15     0
Save solution 401
end

```

TITLE

Stage 4 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 401.

Mixture 401.

1.000e+00 Solution 2 JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.430e-01 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.969e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.463e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.436e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	1.029e-08	8.350e-08
Al	5.521e-07	4.478e-06
As	4.989e-09	4.047e-08
B	1.954e-06	1.585e-05
Ba	1.787e-07	1.450e-06
C	1.493e-03	1.211e-02
Ca	6.654e-04	5.397e-03
Cd	1.424e-09	1.155e-08
Cl	2.101e-04	1.704e-03
Co	1.675e-08	1.359e-07
Cr	1.566e-08	1.270e-07
Cu	1.140e-06	9.250e-06
F	5.160e-05	4.185e-04
Fe	3.292e-06	2.671e-05
Hg	2.618e-11	2.124e-10
K	8.612e-05	6.985e-04
Mg	2.109e-04	1.711e-03
Mn	2.885e-06	2.340e-05
Mo	6.673e-08	5.413e-07
Na	6.092e-04	4.941e-03
Ni	2.628e-08	2.131e-07
Pb	3.162e-09	2.565e-08
S	4.337e-04	3.518e-03
Sb	1.598e-09	1.297e-08
Se	5.718e-09	4.638e-08
U	1.007e-08	8.172e-08
V	1.386e-08	1.124e-07
Zn	1.393e-07	1.130e-06

-----Description of solution-----

	pH	=	7.220	Charge balance
	pe	=	4.769	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	3.571e-03	
	Mass of water (kg)	=	8.111e+00	
	Total alkalinity (eq/kg)	=	1.332e-03	
	Total CO2 (mol/kg)	=	1.493e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.811e-17	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	12	
	Total H	=	9.004777e+02	
	Total O	=	4.502826e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.784e-07	1.670e-07	-6.749	-6.777	-0.029	(0)
H+	6.433e-08	6.028e-08	-7.192	-7.220	-0.028	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	1.029e-08					
Ag+	7.065e-09	6.621e-09	-8.151	-8.179	-0.028	(0)
AgCl	2.662e-09	2.662e-09	-8.575	-8.575	0.000	(0)
Ag2Se	2.374e-10	2.374e-10	-9.624	-9.624	0.000	(0)
AgCl2-	4.896e-11	4.564e-11	-10.310	-10.341	-0.030	(0)
AgSO4-	4.272e-11	3.983e-11	-10.369	-10.400	-0.030	(0)
AgF	7.859e-13	7.859e-13	-12.105	-12.105	0.000	(0)
AgOH	1.106e-13	1.106e-13	-12.956	-12.956	0.000	(0)
AgCl3-2	1.061e-14	8.009e-15	-13.974	-14.096	-0.122	(0)
AgH2BO3	1.956e-15	1.956e-15	-14.709	-14.709	0.000	(0)
AgSeO3-	1.424e-15	1.327e-15	-14.847	-14.877	-0.030	(0)
AgCl4-3	6.055e-18	3.220e-18	-17.218	-17.492	-0.274	(0)
Ag (OH) 2-	1.936e-18	1.805e-18	-17.713	-17.744	-0.030	(0)
Ag (SeO3) 2-3	6.973e-24	3.708e-24	-23.157	-23.431	-0.274	(0)
Ag2MoO4	8.531e-25	8.531e-25	-24.069	-24.069	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.354	-67.354	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.335	-77.823	-0.488	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.212	-136.243	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.412	-136.506	-0.094	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.535	-138.726	-0.192	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.851	-139.037	-0.186	(0)
Al	5.521e-07					
Al (OH) 4-	5.168e-07	4.845e-07	-6.287	-6.315	-0.028	(0)
Al (OH) 3	2.304e-08	2.304e-08	-7.637	-7.637	0.000	(0)
Al (OH) 2+	7.367e-09	6.915e-09	-8.133	-8.160	-0.028	(0)
AlF2+	2.956e-09	2.774e-09	-8.529	-8.557	-0.028	(0)
AlF3	1.650e-09	1.650e-09	-8.782	-8.782	0.000	(0)
AlF+2	1.901e-10	1.475e-10	-9.721	-9.831	-0.110	(0)
AlOH+2	6.718e-11	5.212e-11	-10.173	-10.283	-0.110	(0)
AlF4-	4.169e-11	3.909e-11	-10.380	-10.408	-0.028	(0)
AlSO4+	7.789e-13	7.303e-13	-12.109	-12.137	-0.028	(0)
Al+3	5.599e-13	3.120e-13	-12.252	-12.506	-0.254	(0)
Al (SO4) 2-	2.516e-15	2.359e-15	-14.599	-14.627	-0.028	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.291	-44.566	-0.274	(0)
As (3)	1.263e-19					
H3AsO3	1.251e-19	1.251e-19	-18.903	-18.903	0.000	(0)
H2AsO3-	1.142e-21	1.065e-21	-20.942	-20.973	-0.030	(0)
HAsO3-2	2.133e-26	1.611e-26	-25.671	-25.793	-0.122	(0)
H4AsO3+	4.009e-27	3.737e-27	-26.397	-26.427	-0.030	(0)
AsO3-3	1.937e-32	1.030e-32	-31.713	-31.987	-0.274	(0)
As (5)	4.989e-09					
HAsO4-2	3.452e-09	2.607e-09	-8.462	-8.584	-0.122	(0)

	H2AsO4-	1.537e-09	1.433e-09	-8.813	-8.844	-0.030	(0)
	AsO4-3	2.572e-13	1.367e-13	-12.590	-12.864	-0.274	(0)
	H3AsO4	1.500e-14	1.501e-14	-13.824	-13.824	0.000	(0)
B	1.954e-06						
	H3BO3	1.933e-06	1.935e-06	-5.714	-5.713	0.000	(0)
	H2BO3-	1.993e-08	1.864e-08	-7.700	-7.730	-0.029	(0)
	CaH2BO3+	5.481e-10	5.127e-10	-9.261	-9.290	-0.029	(0)
	MgH2BO3+	1.063e-10	9.938e-11	-9.974	-10.003	-0.029	(0)
	BF(OH) 3-	3.901e-11	3.649e-11	-10.409	-10.438	-0.029	(0)
	NaH2BO3	1.683e-11	1.683e-11	-10.774	-10.774	0.000	(0)
	BaH2BO3+	8.405e-14	7.861e-14	-13.075	-13.105	-0.029	(0)
	H5(BO3) 2-	3.282e-14	3.070e-14	-13.484	-13.513	-0.029	(0)
	BF2(OH) 2-	1.188e-14	1.111e-14	-13.925	-13.954	-0.029	(0)
	AgH2BO3	1.956e-15	1.956e-15	-14.709	-14.709	0.000	(0)
	H8(BO3) 3-	6.351e-18	5.940e-18	-17.197	-17.226	-0.029	(0)
	BF3OH-	1.317e-20	1.232e-20	-19.880	-19.910	-0.029	(0)
	BF4-	1.846e-25	1.726e-25	-24.734	-24.763	-0.029	(0)
Ba	1.787e-07						
	Ba+2	1.770e-07	1.365e-07	-6.752	-6.865	-0.113	(0)
	BaHCO3+	1.705e-09	1.602e-09	-8.768	-8.795	-0.027	(0)
	BaCO3	6.689e-11	6.689e-11	-10.175	-10.175	0.000	(0)
	BaOH+	1.061e-13	9.949e-14	-12.974	-13.002	-0.028	(0)
	BaH2BO3+	8.405e-14	7.861e-14	-13.075	-13.105	-0.029	(0)
C (4)	1.493e-03						
	HCO3-	1.309e-03	1.229e-03	-2.883	-2.910	-0.028	(0)
	H2CO3	1.666e-04	1.666e-04	-3.778	-3.778	0.000	(0)
	CaHCO3+	1.165e-05	1.094e-05	-4.934	-4.961	-0.027	(0)
	MgHCO3+	2.064e-06	1.934e-06	-5.685	-5.714	-0.028	(0)
	CO3-2	1.239e-06	9.557e-07	-5.907	-6.020	-0.113	(0)
	CuCO3	8.341e-07	8.341e-07	-6.079	-6.079	0.000	(0)
	CaCO3	7.239e-07	7.239e-07	-6.140	-6.140	0.000	(0)
	NaHCO3	3.936e-07	3.936e-07	-6.405	-6.405	0.000	(0)
	MgCO3	1.222e-07	1.222e-07	-6.913	-6.913	0.000	(0)
	MnHCO3+	5.362e-08	5.030e-08	-7.271	-7.298	-0.028	(0)
	CuHCO3+	1.233e-08	1.149e-08	-7.909	-7.940	-0.030	(0)
	NaCO3-	1.080e-08	1.014e-08	-7.967	-7.994	-0.028	(0)
	UO2(CO3) 2-2	8.752e-09	6.610e-09	-8.058	-8.180	-0.122	(0)
	ZnCO3	5.179e-09	5.179e-09	-8.286	-8.286	0.000	(0)
	ZnHCO3+	3.926e-09	3.660e-09	-8.406	-8.437	-0.030	(0)
	Cu(CO3) 2-2	2.841e-09	2.146e-09	-8.547	-8.668	-0.122	(0)
	NiHCO3+	2.739e-09	2.553e-09	-8.562	-8.593	-0.030	(0)
	BaHCO3+	1.705e-09	1.602e-09	-8.768	-8.795	-0.027	(0)
	PbCO3	1.574e-09	1.574e-09	-8.803	-8.803	0.000	(0)
	CoHCO3+	1.138e-09	1.061e-09	-8.944	-8.974	-0.030	(0)
	FeHCO3+	1.104e-09	1.037e-09	-8.957	-8.984	-0.027	(0)
	UO2(CO3) 3-4	9.732e-10	3.166e-10	-9.012	-9.499	-0.488	(0)
	NiCO3	6.009e-10	6.009e-10	-9.221	-9.221	0.000	(0)
	PbHCO3+	5.367e-10	5.003e-10	-9.270	-9.301	-0.030	(0)
	UO2CO3	3.466e-10	3.466e-10	-9.460	-9.460	0.000	(0)
	CoCO3	1.793e-10	1.793e-10	-9.746	-9.746	0.000	(0)
	BaCO3	6.689e-11	6.689e-11	-10.175	-10.175	0.000	(0)
	CdCO3	2.192e-11	2.192e-11	-10.659	-10.659	0.000	(0)
	Pb(CO3) 2-2	5.745e-12	4.339e-12	-11.241	-11.363	-0.122	(0)
	CdHCO3+	3.020e-12	2.815e-12	-11.520	-11.551	-0.030	(0)
	Cd(CO3) 2-2	2.056e-14	1.553e-14	-13.687	-13.809	-0.122	(0)
	HgCO3	1.119e-17	1.119e-17	-16.951	-16.951	0.000	(0)
	Hg(CO3) 2-2	4.476e-20	3.380e-20	-19.349	-19.471	-0.122	(0)
	HgHCO3+	1.347e-20	1.256e-20	-19.871	-19.901	-0.030	(0)
Ca	6.654e-04						
	Ca+2	6.198e-04	4.779e-04	-3.208	-3.321	-0.113	(0)
	CaSO4	3.301e-05	3.301e-05	-4.481	-4.481	0.000	(0)
	CaHCO3+	1.165e-05	1.094e-05	-4.934	-4.961	-0.027	(0)
	CaCO3	7.239e-07	7.239e-07	-6.140	-6.140	0.000	(0)
	CaF+	2.628e-07	2.465e-07	-6.580	-6.608	-0.028	(0)
	CaOH+	1.696e-09	1.593e-09	-8.771	-8.798	-0.027	(0)
	CaH2BO3+	5.481e-10	5.127e-10	-9.261	-9.290	-0.029	(0)
Cd	1.424e-09						
	Cd+2	1.305e-09	1.006e-09	-8.885	-8.997	-0.113	(0)

CdSO4	7.111e-11	7.111e-11	-10.148	-10.148	0.000	(0)
CdCO3	2.192e-11	2.192e-11	-10.659	-10.659	0.000	(0)
CdCl+	2.029e-11	1.892e-11	-10.693	-10.723	-0.030	(0)
CdHCO3+	3.020e-12	2.815e-12	-11.520	-11.551	-0.030	(0)
CdOH+	1.432e-12	1.335e-12	-11.844	-11.875	-0.030	(0)
CdF+	8.083e-13	7.535e-13	-12.092	-12.123	-0.030	(0)
Cd(SO4) 2-2	3.829e-13	2.892e-13	-12.417	-12.539	-0.122	(0)
CdOHC1	1.296e-13	1.296e-13	-12.887	-12.887	0.000	(0)
Cd(CO3) 2-2	2.056e-14	1.553e-14	-13.687	-13.809	-0.122	(0)
CdCl2	1.553e-14	1.553e-14	-13.809	-13.809	0.000	(0)
Cd(OH) 2	1.407e-15	1.407e-15	-14.852	-14.852	0.000	(0)
CdF2	7.105e-17	7.105e-17	-16.148	-16.148	0.000	(0)
CdCl3-	2.069e-18	1.929e-18	-17.684	-17.715	-0.030	(0)
Cd(OH) 3-	1.540e-20	1.435e-20	-19.813	-19.843	-0.030	(0)
Cd2OH+3	1.266e-20	6.731e-21	-19.898	-20.172	-0.274	(0)
CdSeO4	6.853e-21	6.853e-21	-20.164	-20.164	0.000	(0)
Cd(SeO3) 2-2	1.068e-22	8.069e-23	-21.971	-22.093	-0.122	(0)
Cd(OH) 4-2	5.196e-28	3.924e-28	-27.284	-27.406	-0.122	(0)
CdHS+	0.000e+00	0.000e+00	-73.948	-73.978	-0.030	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-139.763	-139.763	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-210.822	-210.852	-0.030	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-281.523	-281.645	-0.122	(0)
C1	2.101e-04					
Cl-	2.101e-04	1.969e-04	-3.678	-3.706	-0.028	(0)
AgCl	2.662e-09	2.662e-09	-8.575	-8.575	0.000	(0)
MnCl+	5.420e-10	5.085e-10	-9.266	-9.294	-0.028	(0)
CuCl	3.064e-10	3.064e-10	-9.514	-9.514	0.000	(0)
ZnCl+	4.971e-11	4.658e-11	-10.304	-10.332	-0.028	(0)
CuCl+	4.936e-11	4.625e-11	-10.307	-10.335	-0.028	(0)
AgCl2-	4.896e-11	4.564e-11	-10.310	-10.341	-0.030	(0)
CdCl+	2.029e-11	1.892e-11	-10.693	-10.723	-0.030	(0)
CuCl2-	1.345e-11	1.261e-11	-10.871	-10.899	-0.028	(0)
ZnOHC1	1.018e-11	1.018e-11	-10.992	-10.992	0.000	(0)
NiCl+	9.108e-12	8.490e-12	-11.041	-11.071	-0.030	(0)
CoCl+	8.110e-12	7.560e-12	-11.091	-11.121	-0.030	(0)
PbCl+	4.106e-12	3.828e-12	-11.387	-11.417	-0.030	(0)
MnCl2	1.414e-13	1.414e-13	-12.850	-12.850	0.000	(0)
CdOHC1	1.296e-13	1.296e-13	-12.887	-12.887	0.000	(0)
CdCl2	1.553e-14	1.553e-14	-13.809	-13.809	0.000	(0)
ZnCl2	1.453e-14	1.453e-14	-13.838	-13.838	0.000	(0)
AgCl3-2	1.061e-14	8.009e-15	-13.974	-14.096	-0.122	(0)
PbCl2	3.366e-15	3.366e-15	-14.473	-14.473	0.000	(0)
CuCl2	3.157e-15	3.157e-15	-14.501	-14.501	0.000	(0)
CuCl3-2	6.852e-16	5.306e-16	-15.164	-15.275	-0.111	(0)
HgClOH	5.680e-16	5.680e-16	-15.246	-15.246	0.000	(0)
CrCl+2	5.904e-17	4.459e-17	-16.229	-16.351	-0.122	(0)
HgCl2	3.791e-17	3.791e-17	-16.421	-16.421	0.000	(0)
UO2Cl+	3.121e-17	2.909e-17	-16.506	-16.536	-0.030	(0)
NiCl2	8.417e-18	8.417e-18	-17.075	-17.075	0.000	(0)
MnCl3-	8.175e-18	7.669e-18	-17.088	-17.115	-0.028	(0)
AgCl4-3	6.055e-18	3.220e-18	-17.218	-17.492	-0.274	(0)
FeCl+2	2.807e-18	2.174e-18	-17.552	-17.663	-0.111	(0)
ZnCl3-	2.426e-18	2.273e-18	-17.615	-17.643	-0.028	(0)
CdCl3-	2.069e-18	1.929e-18	-17.684	-17.715	-0.030	(0)
PbCl3-	2.831e-19	2.639e-19	-18.548	-18.579	-0.030	(0)
HgCl3-	8.007e-20	7.464e-20	-19.097	-19.127	-0.030	(0)
HgCl+	4.121e-20	3.842e-20	-19.385	-19.415	-0.030	(0)
CrOHC12	2.787e-20	2.787e-20	-19.555	-19.555	0.000	(0)
CuCl3-	6.192e-21	5.802e-21	-20.208	-20.236	-0.028	(0)
VOCl+	2.612e-21	2.435e-21	-20.583	-20.614	-0.030	(0)
FeCl2+	2.038e-21	1.912e-21	-20.691	-20.719	-0.028	(0)
CrCl2+	8.935e-22	8.330e-22	-21.049	-21.079	-0.030	(0)
ZnCl4-2	2.890e-22	2.238e-22	-21.539	-21.650	-0.111	(0)
HgCl4-2	7.747e-23	5.851e-23	-22.111	-22.233	-0.122	(0)
PbCl4-2	3.145e-23	2.375e-23	-22.502	-22.624	-0.122	(0)
FeCl3	3.765e-26	3.765e-26	-25.424	-25.424	0.000	(0)
CuCl4-2	7.393e-27	5.725e-27	-26.131	-26.242	-0.111	(0)
CrO3Cl-	3.602e-29	3.358e-29	-28.443	-28.474	-0.030	(0)

CoCl+2	1.376e-37	1.039e-37	-36.861	-36.983	-0.122	(0)
UCl+3	0.000e+00	0.000e+00	-43.973	-44.247	-0.274	(0)
Co (2)	1.675e-08					
Co+2	1.470e-08	1.110e-08	-7.833	-7.955	-0.122	(0)
CoHCO3+	1.138e-09	1.061e-09	-8.944	-8.974	-0.030	(0)
CoSO4	6.677e-10	6.677e-10	-9.175	-9.175	0.000	(0)
CoCO3	1.793e-10	1.793e-10	-9.746	-9.746	0.000	(0)
CoOH+	3.968e-11	3.699e-11	-10.401	-10.432	-0.030	(0)
CoF+	1.779e-11	1.659e-11	-10.750	-10.780	-0.030	(0)
CoCl+	8.110e-12	7.560e-12	-11.091	-11.121	-0.030	(0)
Co (OH) 2	4.908e-13	4.908e-13	-12.309	-12.309	0.000	(0)
Co (OH) 3-	1.754e-18	1.636e-18	-17.756	-17.786	-0.030	(0)
CoOOH-	4.402e-19	4.104e-19	-18.356	-18.387	-0.030	(0)
CoSeO4	2.035e-19	2.035e-19	-18.691	-18.691	0.000	(0)
Co2OH+3	3.870e-20	2.058e-20	-19.412	-19.687	-0.274	(0)
Co (OH) 4-2	5.733e-26	4.329e-26	-25.242	-25.364	-0.122	(0)
Co4 (OH) 4+4	1.148e-33	3.736e-34	-32.940	-33.428	-0.488	(0)
Co (3)	2.916e-30					
CoOH+2	2.916e-30	2.202e-30	-29.535	-29.657	-0.122	(0)
Co+3	4.656e-36	2.595e-36	-35.332	-35.586	-0.254	(0)
CoCl+2	1.376e-37	1.039e-37	-36.861	-36.983	-0.122	(0)
Cr (2)	9.426e-25					
Cr+2	9.426e-25	7.119e-25	-24.026	-24.148	-0.122	(0)
Cr (3)	1.566e-08					
Cr (OH) 2+	1.394e-08	1.299e-08	-7.856	-7.886	-0.030	(0)
Cr (OH) +2	8.466e-10	6.394e-10	-9.072	-9.194	-0.122	(0)
Cr (OH) 3	8.153e-10	8.153e-10	-9.089	-9.089	0.000	(0)
CrHSO4	4.575e-11	4.575e-11	-10.340	-10.340	0.000	(0)
CrO2-	6.890e-12	6.423e-12	-11.162	-11.192	-0.030	(0)
Cr (OH) 4-	5.815e-12	5.421e-12	-11.235	-11.266	-0.030	(0)
CrF+2	1.735e-12	1.310e-12	-11.761	-11.883	-0.122	(0)
Cr+3	3.291e-13	1.750e-13	-12.483	-12.757	-0.274	(0)
CrSO4+	1.321e-13	1.232e-13	-12.879	-12.909	-0.030	(0)
CrCl+2	5.904e-17	4.459e-17	-16.229	-16.351	-0.122	(0)
Cr2 (OH) 2SO4+2	3.500e-18	2.644e-18	-17.456	-17.578	-0.122	(0)
Cr2 (OH) 2 (SO4) 2	4.735e-20	4.735e-20	-19.325	-19.325	0.000	(0)
CrOHC12	2.787e-20	2.787e-20	-19.555	-19.555	0.000	(0)
CrCl2+	8.935e-22	8.330e-22	-21.049	-21.079	-0.030	(0)
Cr (6)	3.480e-18					
CrO4-2	2.990e-18	2.306e-18	-17.524	-17.637	-0.113	(0)
HCrO4-	4.825e-19	4.498e-19	-18.317	-18.347	-0.030	(0)
NaCrO4-	7.000e-21	6.526e-21	-20.155	-20.185	-0.030	(0)
KCrO4-	7.401e-22	6.899e-22	-21.131	-21.161	-0.030	(0)
H2CrO4	2.198e-26	2.198e-26	-25.658	-25.658	0.000	(0)
CrO3SO4-2	3.297e-27	2.490e-27	-26.482	-26.604	-0.122	(0)
CrO3Cl-	3.602e-29	3.358e-29	-28.443	-28.474	-0.030	(0)
Cr2O7-2	9.289e-36	7.016e-36	-35.032	-35.154	-0.122	(0)
Cu (1)	1.646e-09					
Cu+	1.326e-09	1.236e-09	-8.877	-8.908	-0.030	(0)
CuCl	3.064e-10	3.064e-10	-9.514	-9.514	0.000	(0)
CuCl2-	1.345e-11	1.261e-11	-10.871	-10.899	-0.028	(0)
CuCl3-2	6.852e-16	5.306e-16	-15.164	-15.275	-0.111	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.867	-137.056	-0.189	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.602	-137.786	-0.184	(0)
Cu (2)	1.139e-06					
CuCO3	8.341e-07	8.341e-07	-6.079	-6.079	0.000	(0)
Cu+2	1.922e-07	1.482e-07	-6.716	-6.829	-0.113	(0)
CuOH+	8.354e-08	7.828e-08	-7.078	-7.106	-0.028	(0)
CuHCO3+	1.233e-08	1.149e-08	-7.909	-7.940	-0.030	(0)
CuSO4	1.024e-08	1.024e-08	-7.990	-7.990	0.000	(0)
Cu (CO3) 2-2	2.841e-09	2.146e-09	-8.547	-8.668	-0.122	(0)
Cu (OH) 2	2.609e-09	2.609e-09	-8.584	-8.584	0.000	(0)
CuF+	4.740e-10	4.419e-10	-9.324	-9.355	-0.030	(0)
Cu2 (OH) 2+2	2.038e-10	1.539e-10	-9.691	-9.813	-0.122	(0)
CuCl+	4.936e-11	4.625e-11	-10.307	-10.335	-0.028	(0)
Cu (OH) 3-	9.587e-13	8.937e-13	-12.018	-12.049	-0.030	(0)
CuCl2	3.157e-15	3.157e-15	-14.501	-14.501	0.000	(0)
Cu (OH) 4-2	1.556e-18	1.175e-18	-17.808	-17.930	-0.122	(0)

	CuCl3-	6.192e-21	5.802e-21	-20.208	-20.236	-0.028	(0)
	CuCl4-2	7.393e-27	5.725e-27	-26.131	-26.242	-0.111	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-199.867	-199.897	-0.030	(0)
F	5.160e-05						
	F-	5.043e-05	4.726e-05	-4.297	-4.326	-0.028	(0)
	MgF+	8.696e-07	8.153e-07	-6.061	-6.089	-0.028	(0)
	CaF+	2.628e-07	2.465e-07	-6.580	-6.608	-0.028	(0)
	NaF	1.698e-08	1.698e-08	-7.770	-7.770	0.000	(0)
	HF	4.214e-09	4.214e-09	-8.375	-8.375	0.000	(0)
	MnF+	4.114e-09	3.859e-09	-8.386	-8.414	-0.028	(0)
	AlF2+	2.956e-09	2.774e-09	-8.529	-8.557	-0.028	(0)
	AlF3	1.650e-09	1.650e-09	-8.782	-8.782	0.000	(0)
	CuF+	4.740e-10	4.419e-10	-9.324	-9.355	-0.030	(0)
	AlF+2	1.901e-10	1.475e-10	-9.721	-9.831	-0.110	(0)
	ZnF+	9.525e-11	8.880e-11	-10.021	-10.052	-0.030	(0)
	AlF4-	4.169e-11	3.909e-11	-10.380	-10.408	-0.028	(0)
	BF (OH) 3-	3.901e-11	3.649e-11	-10.409	-10.438	-0.029	(0)
	NiF+	2.146e-11	2.001e-11	-10.668	-10.699	-0.030	(0)
	CoF+	1.779e-11	1.659e-11	-10.750	-10.780	-0.030	(0)
	PbF+	1.957e-12	1.825e-12	-11.708	-11.739	-0.030	(0)
	CrF+2	1.735e-12	1.310e-12	-11.761	-11.883	-0.122	(0)
	HF2-	8.084e-13	7.570e-13	-12.092	-12.121	-0.029	(0)
	CdF+	8.083e-13	7.535e-13	-12.092	-12.123	-0.030	(0)
	AgF	7.859e-13	7.859e-13	-12.105	-12.105	0.000	(0)
	UO2F+	6.375e-13	5.943e-13	-12.196	-12.226	-0.030	(0)
	UO2F2	8.099e-14	8.099e-14	-13.092	-13.092	0.000	(0)
	FeF2+	2.554e-14	2.396e-14	-13.593	-13.621	-0.028	(0)
	FeF+2	2.446e-14	1.894e-14	-13.611	-13.723	-0.111	(0)
	BF2 (OH) 2-	1.188e-14	1.111e-14	-13.925	-13.954	-0.029	(0)
	PbF2	1.697e-15	1.697e-15	-14.770	-14.770	0.000	(0)
	FeF3	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
	UO2F3-	1.031e-15	9.614e-16	-14.987	-15.017	-0.030	(0)
	VO2F	7.380e-17	7.380e-17	-16.132	-16.132	0.000	(0)
	CdF2	7.105e-17	7.105e-17	-16.148	-16.148	0.000	(0)
	H2F2	4.757e-17	4.757e-17	-16.323	-16.323	0.000	(0)
	VO2F2-	1.358e-18	1.266e-18	-17.867	-17.897	-0.030	(0)
	VOF+	1.340e-18	1.249e-18	-17.873	-17.903	-0.030	(0)
	UO2F4-2	4.778e-19	3.609e-19	-18.321	-18.443	-0.122	(0)
	PbF3-	1.631e-19	1.521e-19	-18.787	-18.818	-0.030	(0)
	VOF2	2.214e-20	2.214e-20	-19.655	-19.655	0.000	(0)
	BF3OH-	1.317e-20	1.232e-20	-19.880	-19.910	-0.029	(0)
	VO2F3-2	9.883e-22	7.464e-22	-21.005	-21.127	-0.122	(0)
	VOF3-	3.982e-23	3.712e-23	-22.400	-22.430	-0.030	(0)
	PbF4-2	4.555e-24	3.440e-24	-23.342	-23.463	-0.122	(0)
	Sb (OH) 2F	1.005e-24	1.005e-24	-23.998	-23.998	0.000	(0)
	SbOF	9.884e-25	9.884e-25	-24.005	-24.005	0.000	(0)
	BF4-	1.846e-25	1.726e-25	-24.734	-24.763	-0.029	(0)
	VO2F4-3	3.264e-26	1.736e-26	-25.486	-25.761	-0.274	(0)
	HgF+	1.838e-26	1.713e-26	-25.736	-25.766	-0.030	(0)
	VOF4-2	9.375e-27	7.081e-27	-26.028	-26.150	-0.122	(0)
	UF3+	2.586e-34	2.411e-34	-33.587	-33.618	-0.030	(0)
	UF2+2	4.262e-35	3.219e-35	-34.370	-34.492	-0.122	(0)
	UF4	1.249e-36	1.249e-36	-35.903	-35.903	0.000	(0)
	UF+3	1.018e-37	5.411e-38	-36.992	-37.267	-0.274	(0)
	UF5-	2.509e-39	2.339e-39	-38.600	-38.631	-0.030	(0)
	UF6-2	0.000e+00	0.000e+00	-40.355	-40.476	-0.122	(0)
Fe (2)	9.529e-08						
	Fe+2	8.875e-08	6.703e-08	-7.052	-7.174	-0.122	(0)
	FeSO4	4.961e-09	4.961e-09	-8.304	-8.304	0.000	(0)
	FeHCO3+	1.104e-09	1.037e-09	-8.957	-8.984	-0.027	(0)
	FeOH+	4.751e-10	4.457e-10	-9.323	-9.351	-0.028	(0)
	Fe (OH) 2	5.913e-14	5.913e-14	-13.228	-13.228	0.000	(0)
	Fe (OH) 3-	3.329e-15	3.123e-15	-14.478	-14.505	-0.028	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-144.202	-144.202	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-215.123	-215.154	-0.030	(0)
Fe (3)	3.197e-06						
	Fe (OH) 2+	2.730e-06	2.562e-06	-5.564	-5.591	-0.028	(0)
	Fe (OH) 3	4.596e-07	4.596e-07	-6.338	-6.338	0.000	(0)

Fe (OH) 4-	7.616e-09	7.147e-09	-8.118	-8.146	-0.028	(0)
FeOH+2	5.091e-11	3.943e-11	-10.293	-10.404	-0.111	(0)
FeF2+	2.554e-14	2.396e-14	-13.593	-13.621	-0.028	(0)
FeF+2	2.446e-14	1.894e-14	-13.611	-13.723	-0.111	(0)
FeF3	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
FeSO4+	1.318e-15	1.237e-15	-14.880	-14.908	-0.028	(0)
Fe+3	6.561e-16	3.656e-16	-15.183	-15.437	-0.254	(0)
Fe (SO4) 2-	8.552e-18	7.973e-18	-17.068	-17.098	-0.030	(0)
FeCl+2	2.807e-18	2.174e-18	-17.552	-17.663	-0.111	(0)
Fe2 (OH) 2+4	1.582e-19	5.148e-20	-18.801	-19.288	-0.488	(0)
FeHSeO3+2	6.043e-21	4.564e-21	-20.219	-20.341	-0.122	(0)
FeCl2+	2.038e-21	1.912e-21	-20.691	-20.719	-0.028	(0)
Fe3 (OH) 4+5	1.102e-23	1.906e-24	-22.958	-23.720	-0.762	(0)
FeCl3	3.765e-26	3.765e-26	-25.424	-25.424	0.000	(0)
H (0)	1.491e-27					
H2	7.456e-28	7.462e-28	-27.128	-27.127	0.000	(0)
Hg (0)	2.618e-11					
Hg	2.618e-11	2.618e-11	-10.582	-10.582	0.000	(0)
Hg (1)	4.603e-25					
Hg2+2	2.301e-25	1.738e-25	-24.638	-24.760	-0.122	(0)
Hg (2)	2.337e-15					
Hg (OH) 2	1.720e-15	1.721e-15	-14.764	-14.764	0.000	(0)
HgClOH	5.680e-16	5.680e-16	-15.246	-15.246	0.000	(0)
HgCl2	3.791e-17	3.791e-17	-16.421	-16.421	0.000	(0)
HgCO3	1.119e-17	1.119e-17	-16.951	-16.951	0.000	(0)
HgCl3-	8.007e-20	7.464e-20	-19.097	-19.127	-0.030	(0)
HgOH+	6.975e-20	6.502e-20	-19.156	-19.187	-0.030	(0)
Hg (CO3) 2-2	4.476e-20	3.380e-20	-19.349	-19.471	-0.122	(0)
HgCl+	4.121e-20	3.842e-20	-19.385	-19.415	-0.030	(0)
HgHCO3+	1.347e-20	1.256e-20	-19.871	-19.901	-0.030	(0)
HgCl4-2	7.747e-23	5.851e-23	-22.111	-22.233	-0.122	(0)
Hg (OH) 3-	3.883e-23	3.619e-23	-22.411	-22.441	-0.030	(0)
Hg+2	1.295e-23	9.779e-24	-22.888	-23.010	-0.122	(0)
HgSO4	7.720e-25	7.720e-25	-24.112	-24.112	0.000	(0)
HgF+	1.838e-26	1.713e-26	-25.736	-25.766	-0.030	(0)
HgHS2-	0.000e+00	0.000e+00	-129.809	-129.840	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.666	-130.666	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.206	-131.328	-0.122	(0)
K	8.612e-05					
K+	8.594e-05	8.053e-05	-4.066	-4.094	-0.028	(0)
KSO4-	1.832e-07	1.719e-07	-6.737	-6.765	-0.028	(0)
KCrO4-	7.401e-22	6.899e-22	-21.131	-21.161	-0.030	(0)
Mg	2.109e-04					
Mg+2	1.994e-04	1.538e-04	-3.700	-3.813	-0.113	(0)
MgSO4	8.436e-06	8.436e-06	-5.074	-5.074	0.000	(0)
MgHCO3+	2.064e-06	1.934e-06	-5.685	-5.714	-0.028	(0)
MgF+	8.696e-07	8.153e-07	-6.061	-6.089	-0.028	(0)
MgCO3	1.222e-07	1.222e-07	-6.913	-6.913	0.000	(0)
MgOH+	1.088e-08	1.022e-08	-7.963	-7.990	-0.027	(0)
MgH2BO3+	1.063e-10	9.938e-11	-9.974	-10.003	-0.029	(0)
Mn (2)	2.885e-06					
Mn+2	2.716e-06	2.051e-06	-5.566	-5.688	-0.122	(0)
MnSO4	1.100e-07	1.100e-07	-6.959	-6.959	0.000	(0)
MnHCO3+	5.362e-08	5.030e-08	-7.271	-7.298	-0.028	(0)
MnF+	4.114e-09	3.859e-09	-8.386	-8.414	-0.028	(0)
MnOH+	9.174e-10	8.606e-10	-9.037	-9.065	-0.028	(0)
MnCl+	5.420e-10	5.085e-10	-9.266	-9.294	-0.028	(0)
MnCl2	1.414e-13	1.414e-13	-12.850	-12.850	0.000	(0)
MnSeO4	2.020e-17	2.020e-17	-16.695	-16.695	0.000	(0)
MnCl3-	8.175e-18	7.669e-18	-17.088	-17.115	-0.028	(0)
Mn (OH) 3-	1.582e-19	1.484e-19	-18.801	-18.829	-0.028	(0)
Mn (OH) 4-2	1.033e-25	8.001e-26	-24.986	-25.097	-0.111	(0)
MnSe	5.620e-40	5.620e-40	-39.250	-39.250	0.000	(0)
Mn (3)	9.654e-27					
Mn+3	9.654e-27	5.380e-27	-26.015	-26.269	-0.254	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.166	-47.277	-0.111	(0)
Mn (7)	0.000e+00					

MnO4-	0.000e+00	0.000e+00	-51.851	-51.880	-0.029	(0)
Mo	6.673e-08					
MoO4-2	6.667e-08	5.141e-08	-7.176	-7.289	-0.113	(0)
HMoO4-	6.615e-11	6.167e-11	-10.179	-10.210	-0.030	(0)
H2MoO4	2.723e-14	2.723e-14	-13.565	-13.565	0.000	(0)
Ag2MoO4	8.531e-25	8.531e-25	-24.069	-24.069	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.291	-44.566	-0.274	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.694	-55.791	-1.097	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.862	-56.624	-0.762	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.574	-59.062	-0.488	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.761	-63.035	-0.274	(0)
Na	6.092e-04					
Na+	6.078e-04	5.695e-04	-3.216	-3.244	-0.028	(0)
NaSO4-	9.826e-07	9.222e-07	-6.008	-6.035	-0.028	(0)
NaHCO3	3.936e-07	3.936e-07	-6.405	-6.405	0.000	(0)
NaF	1.698e-08	1.698e-08	-7.770	-7.770	0.000	(0)
NaCO3-	1.080e-08	1.014e-08	-7.967	-7.994	-0.028	(0)
NaH2BO3	1.683e-11	1.683e-11	-10.774	-10.774	0.000	(0)
NaCrO4-	7.000e-21	6.526e-21	-20.155	-20.185	-0.030	(0)
Ni	2.628e-08					
Ni+2	2.185e-08	1.685e-08	-7.660	-7.773	-0.113	(0)
NiHCO3+	2.739e-09	2.553e-09	-8.562	-8.593	-0.030	(0)
NiSO4	1.014e-09	1.014e-09	-8.994	-8.994	0.000	(0)
NiCO3	6.009e-10	6.009e-10	-9.221	-9.221	0.000	(0)
NiOH+	3.801e-11	3.544e-11	-10.420	-10.451	-0.030	(0)
NiF+	2.146e-11	2.001e-11	-10.668	-10.699	-0.030	(0)
NiCl+	9.108e-12	8.490e-12	-11.041	-11.071	-0.030	(0)
Ni(OH)2	4.702e-13	4.702e-13	-12.328	-12.328	0.000	(0)
Ni(SO4)2-2	1.340e-14	1.012e-14	-13.873	-13.995	-0.122	(0)
Ni(OH)3-	8.424e-17	7.853e-17	-16.074	-16.105	-0.030	(0)
NiCl2	8.417e-18	8.417e-18	-17.075	-17.075	0.000	(0)
NiSeO4	2.883e-19	2.883e-19	-18.540	-18.540	0.000	(0)
O(0)	1.819e-38					
O2	9.095e-39	9.103e-39	-38.041	-38.041	0.000	(0)
Pb	3.162e-09					
PbCO3	1.574e-09	1.574e-09	-8.803	-8.803	0.000	(0)
Pb+2	7.105e-10	5.479e-10	-9.148	-9.261	-0.113	(0)
PbHCO3+	5.367e-10	5.003e-10	-9.270	-9.301	-0.030	(0)
PbOH+	2.466e-10	2.299e-10	-9.608	-9.639	-0.030	(0)
PbSO4	8.091e-11	8.091e-11	-10.092	-10.092	0.000	(0)
Pb(CO3)2-2	5.745e-12	4.339e-12	-11.241	-11.363	-0.122	(0)
PbCl+	4.106e-12	3.828e-12	-11.387	-11.417	-0.030	(0)
PbF+	1.957e-12	1.825e-12	-11.708	-11.739	-0.030	(0)
Pb(OH)2	1.214e-12	1.214e-12	-11.916	-11.916	0.000	(0)
Pb(SO4)2-2	1.946e-13	1.470e-13	-12.711	-12.833	-0.122	(0)
PbCl2	3.366e-15	3.366e-15	-14.473	-14.473	0.000	(0)
PbF2	1.697e-15	1.697e-15	-14.770	-14.770	0.000	(0)
Pb(OH)3-	2.175e-16	2.028e-16	-15.662	-15.693	-0.030	(0)
Pb2OH+3	3.754e-18	1.996e-18	-17.425	-17.700	-0.274	(0)
PbCl3-	2.831e-19	2.639e-19	-18.548	-18.579	-0.030	(0)
PbF3-	1.631e-19	1.521e-19	-18.787	-18.818	-0.030	(0)
Pb(OH)4-2	1.098e-20	8.295e-21	-19.959	-20.081	-0.122	(0)
PbCl4-2	3.145e-23	2.375e-23	-22.502	-22.624	-0.122	(0)
Pb3(OH)4+2	2.134e-23	1.612e-23	-22.671	-22.793	-0.122	(0)
PbF4-2	4.555e-24	3.440e-24	-23.342	-23.463	-0.122	(0)
Pb4(OH)4+4	2.156e-28	7.014e-29	-27.666	-28.154	-0.488	(0)
Pb(HS)2	0.000e+00	0.000e+00	-139.969	-139.969	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-211.628	-211.658	-0.030	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.354	-67.354	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.959	-72.989	-0.030	(0)
H2S	0.000e+00	0.000e+00	-73.189	-73.189	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.948	-73.978	-0.030	(0)
S5-2	0.000e+00	0.000e+00	-75.012	-75.134	-0.122	(0)
S6-2	0.000e+00	0.000e+00	-75.528	-75.650	-0.122	(0)
S4-2	0.000e+00	0.000e+00	-75.608	-75.730	-0.122	(0)
S3-2	0.000e+00	0.000e+00	-76.414	-76.536	-0.122	(0)
S2-2	0.000e+00	0.000e+00	-77.430	-77.552	-0.122	(0)

S-2	0.000e+00	0.000e+00	-82.958	-83.069	-0.111	(0)
HgHS2-	0.000e+00	0.000e+00	-129.809	-129.840	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.666	-130.666	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.206	-131.328	-0.122	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.212	-136.243	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.412	-136.506	-0.094	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.867	-137.056	-0.189	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.602	-137.786	-0.184	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.535	-138.726	-0.192	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.851	-139.037	-0.186	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.944	-138.974	-0.030	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.763	-139.763	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.969	-139.969	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.184	-140.184	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.202	-144.202	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.867	-199.897	-0.030	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.863	-209.893	-0.030	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.822	-210.852	-0.030	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.628	-211.658	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.531	-212.653	-0.122	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.123	-215.154	-0.030	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-281.523	-281.645	-0.122	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.220	-284.342	-0.122	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.177	-294.299	-0.122	(0)
S (6)	4.337e-04					
SO4-2	3.910e-04	3.015e-04	-3.408	-3.521	-0.113	(0)
CaSO4	3.301e-05	3.301e-05	-4.481	-4.481	0.000	(0)
MgSO4	8.436e-06	8.436e-06	-5.074	-5.074	0.000	(0)
NaSO4-	9.826e-07	9.222e-07	-6.008	-6.035	-0.028	(0)
KSO4-	1.832e-07	1.719e-07	-6.737	-6.765	-0.028	(0)
MnSO4	1.100e-07	1.100e-07	-6.959	-6.959	0.000	(0)
CuSO4	1.024e-08	1.024e-08	-7.990	-7.990	0.000	(0)
ZnSO4	6.212e-09	6.212e-09	-8.207	-8.207	0.000	(0)
FeSO4	4.961e-09	4.961e-09	-8.304	-8.304	0.000	(0)
HSO4-	1.894e-09	1.776e-09	-8.723	-8.751	-0.028	(0)
NiSO4	1.014e-09	1.014e-09	-8.994	-8.994	0.000	(0)
CoSO4	6.677e-10	6.677e-10	-9.175	-9.175	0.000	(0)
PbSO4	8.091e-11	8.091e-11	-10.092	-10.092	0.000	(0)
CdSO4	7.111e-11	7.111e-11	-10.148	-10.148	0.000	(0)
CrOHSO4	4.575e-11	4.575e-11	-10.340	-10.340	0.000	(0)
AgSO4-	4.272e-11	3.983e-11	-10.369	-10.400	-0.030	(0)
Zn (SO4) 2-2	2.160e-11	1.631e-11	-10.666	-10.787	-0.122	(0)
AlSO4+	7.789e-13	7.303e-13	-12.109	-12.137	-0.028	(0)
Cd (SO4) 2-2	3.829e-13	2.892e-13	-12.417	-12.539	-0.122	(0)
Pb (SO4) 2-2	1.946e-13	1.470e-13	-12.711	-12.833	-0.122	(0)
CrSO4+	1.321e-13	1.232e-13	-12.879	-12.909	-0.030	(0)
UO2SO4	4.157e-14	4.157e-14	-13.381	-13.381	0.000	(0)
Ni (SO4) 2-2	1.340e-14	1.012e-14	-13.873	-13.995	-0.122	(0)
Al (SO4) 2-	2.516e-15	2.359e-15	-14.599	-14.627	-0.028	(0)
FeSO4+	1.318e-15	1.237e-15	-14.880	-14.908	-0.028	(0)
UO2 (SO4) 2-2	2.188e-16	1.652e-16	-15.660	-15.782	-0.122	(0)
Fe (SO4) 2-	8.552e-18	7.973e-18	-17.068	-17.098	-0.030	(0)
VO2SO4-	6.877e-18	6.411e-18	-17.163	-17.193	-0.030	(0)
Cr2 (OH) 2SO4+2	3.500e-18	2.644e-18	-17.456	-17.578	-0.122	(0)
VOSO4	3.661e-19	3.661e-19	-18.436	-18.436	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.735e-20	4.735e-20	-19.325	-19.325	0.000	(0)
HgSO4	7.720e-25	7.720e-25	-24.112	-24.112	0.000	(0)
CrO3SO4-2	3.297e-27	2.490e-27	-26.482	-26.604	-0.122	(0)
VSO4+	2.069e-32	1.928e-32	-31.684	-31.715	-0.030	(0)
U (SO4) 2	1.650e-39	1.650e-39	-38.783	-38.783	0.000	(0)
USO4+2	9.121e-40	6.888e-40	-39.040	-39.162	-0.122	(0)
Sb (3)	4.464e-19					
Sb (OH) 3	2.259e-19	2.259e-19	-18.646	-18.646	0.000	(0)
HSbO2	2.205e-19	2.205e-19	-18.657	-18.657	0.000	(0)
SbO2-	6.354e-24	5.924e-24	-23.197	-23.227	-0.030	(0)
Sb (OH) 4-	3.641e-24	3.394e-24	-23.439	-23.469	-0.030	(0)
Sb (OH) 2F	1.005e-24	1.005e-24	-23.998	-23.998	0.000	(0)
SbOF	9.884e-25	9.884e-25	-24.005	-24.005	0.000	(0)

Sb(OH) 2+	3.547e-25	3.307e-25	-24.450	-24.481	-0.030	(0)
SbO+	1.223e-25	1.140e-25	-24.913	-24.943	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.177	-294.299	-0.122	(0)
Sb (5)	1.598e-09					
SbO3-	1.597e-09	1.488e-09	-8.797	-8.827	-0.030	(0)
Sb(OH) 6-	1.858e-12	1.741e-12	-11.731	-11.759	-0.028	(0)
SbO2+	1.664e-24	1.551e-24	-23.779	-23.809	-0.030	(0)
Se (-2)	2.374e-10					
Ag2Se	2.374e-10	2.374e-10	-9.624	-9.624	0.000	(0)
HSe-	4.299e-36	4.008e-36	-35.367	-35.397	-0.030	(0)
H2Se	1.876e-39	1.876e-39	-38.727	-38.727	0.000	(0)
MnSe	5.620e-40	5.620e-40	-39.250	-39.250	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.055	-43.177	-0.122	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.335	-77.823	-0.488	(0)
Se (4)	5.480e-09					
HSeO3-	5.067e-09	4.724e-09	-8.295	-8.326	-0.030	(0)
SeO3-2	4.131e-10	3.120e-10	-9.384	-9.506	-0.122	(0)
H2SeO3	1.215e-13	1.215e-13	-12.916	-12.916	0.000	(0)
AgSeO3-	1.424e-15	1.327e-15	-14.847	-14.877	-0.030	(0)
FeHSeO3+2	6.043e-21	4.564e-21	-20.219	-20.341	-0.122	(0)
Cd (SeO3) 2-2	1.068e-22	8.069e-23	-21.971	-22.093	-0.122	(0)
Ag (SeO3) 2-3	6.973e-24	3.708e-24	-23.157	-23.431	-0.274	(0)
Se (6)	4.745e-14					
SeO4-2	4.743e-14	3.658e-14	-13.324	-13.437	-0.113	(0)
MnSeO4	2.020e-17	2.020e-17	-16.695	-16.695	0.000	(0)
ZnSeO4	5.335e-19	5.335e-19	-18.273	-18.273	0.000	(0)
NiSeO4	2.883e-19	2.883e-19	-18.540	-18.540	0.000	(0)
CoSeO4	2.035e-19	2.035e-19	-18.691	-18.691	0.000	(0)
HSeO4-	1.185e-19	1.105e-19	-18.926	-18.957	-0.030	(0)
CdSeO4	6.853e-21	6.853e-21	-20.164	-20.164	0.000	(0)
Zn (SeO4) 2-2	2.620e-32	1.979e-32	-31.582	-31.704	-0.122	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.532	-55.806	-0.274	(0)
U (4)	5.878e-20					
U(OH) 5-	5.864e-20	5.467e-20	-19.232	-19.262	-0.030	(0)
U(OH) 4	1.380e-22	1.380e-22	-21.860	-21.860	0.000	(0)
U(OH) 3+	3.263e-26	3.042e-26	-25.486	-25.517	-0.030	(0)
U(OH) 2+2	1.123e-30	8.480e-31	-29.950	-30.072	-0.122	(0)
UF3+	2.586e-34	2.411e-34	-33.587	-33.618	-0.030	(0)
UF2+2	4.262e-35	3.219e-35	-34.370	-34.492	-0.122	(0)
UOH+3	4.528e-36	2.408e-36	-35.344	-35.618	-0.274	(0)
UF4	1.249e-36	1.249e-36	-35.903	-35.903	0.000	(0)
UF+3	1.018e-37	5.411e-38	-36.992	-37.267	-0.274	(0)
UF5-	2.509e-39	2.339e-39	-38.600	-38.631	-0.030	(0)
U(SO4) 2	1.650e-39	1.650e-39	-38.783	-38.783	0.000	(0)
USO4+2	9.121e-40	6.888e-40	-39.040	-39.162	-0.122	(0)
UF6-2	0.000e+00	0.000e+00	-40.355	-40.476	-0.122	(0)
U+4	0.000e+00	0.000e+00	-41.754	-42.241	-0.488	(0)
UCl+3	0.000e+00	0.000e+00	-43.973	-44.247	-0.274	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-159.837	-162.305	-2.469	(0)
U (5)	1.014e-15					
UO2+	1.014e-15	9.457e-16	-14.994	-15.024	-0.030	(0)
U (6)	1.007e-08					
UO2 (CO3) 2-2	8.752e-09	6.610e-09	-8.058	-8.180	-0.122	(0)
UO2 (CO3) 3-4	9.732e-10	3.166e-10	-9.012	-9.499	-0.488	(0)
UO2CO3	3.466e-10	3.466e-10	-9.460	-9.460	0.000	(0)
UO2OH+	2.055e-12	1.916e-12	-11.687	-11.718	-0.030	(0)
UO2F+	6.375e-13	5.943e-13	-12.196	-12.226	-0.030	(0)
UO2+2	1.181e-13	9.110e-14	-12.928	-13.040	-0.113	(0)
UO2F2	8.099e-14	8.099e-14	-13.092	-13.092	0.000	(0)
UO2SO4	4.157e-14	4.157e-14	-13.381	-13.381	0.000	(0)
UO2F3-	1.031e-15	9.614e-16	-14.987	-15.017	-0.030	(0)
UO2 (SO4) 2-2	2.188e-16	1.652e-16	-15.660	-15.782	-0.122	(0)
UO2Cl+	3.121e-17	2.909e-17	-16.506	-16.536	-0.030	(0)
(UO2) 2 (OH) 2+2	8.063e-18	6.090e-18	-17.093	-17.215	-0.122	(0)
UO2F4-2	4.778e-19	3.609e-19	-18.321	-18.443	-0.122	(0)
(UO2) 3 (OH) 5+	2.648e-19	2.469e-19	-18.577	-18.608	-0.030	(0)
V (2)	8.049e-40					

VOH+	6.552e-40	6.108e-40	-39.184	-39.214	-0.030	(0)
V+2	1.496e-40	1.130e-40	-39.825	-39.947	-0.122	(0)
V (3)	5.093e-13					
V (OH) 3	5.093e-13	5.093e-13	-12.293	-12.293	0.000	(0)
V (OH) 2+	2.128e-23	1.984e-23	-22.672	-22.703	-0.030	(0)
VOH+2	1.502e-26	1.134e-26	-25.823	-25.945	-0.122	(0)
V+3	2.548e-31	1.355e-31	-30.594	-30.868	-0.274	(0)
VSO4+	2.069e-32	1.928e-32	-31.684	-31.715	-0.030	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.922	-50.196	-0.274	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.603	-51.091	-0.488	(0)
V (4)	1.651e-16					
V (OH) 3+	1.576e-16	1.469e-16	-15.803	-15.833	-0.030	(0)
VO+2	5.837e-18	4.408e-18	-17.234	-17.356	-0.122	(0)
VOF+	1.340e-18	1.249e-18	-17.873	-17.903	-0.030	(0)
VOSO4	3.661e-19	3.661e-19	-18.436	-18.436	0.000	(0)
VOF2	2.214e-20	2.214e-20	-19.655	-19.655	0.000	(0)
VOC1+	2.612e-21	2.435e-21	-20.583	-20.614	-0.030	(0)
VOF3-	3.982e-23	3.712e-23	-22.400	-22.430	-0.030	(0)
VOF4-2	9.375e-27	7.081e-27	-26.028	-26.150	-0.122	(0)
H2V2O4+2	1.432e-27	1.082e-27	-26.844	-26.966	-0.122	(0)
V (5)	1.386e-08					
H2VO4-	1.317e-08	1.228e-08	-7.880	-7.911	-0.030	(0)
HVO4-2	6.775e-10	5.117e-10	-9.169	-9.291	-0.122	(0)
H3VO4	7.402e-12	7.402e-12	-11.131	-11.131	0.000	(0)
H3V2O7-	6.296e-13	5.869e-13	-12.201	-12.231	-0.030	(0)
HV2O7-3	4.004e-15	2.129e-15	-14.398	-14.672	-0.274	(0)
VO2+	9.502e-16	8.905e-16	-15.022	-15.050	-0.028	(0)
VO4-3	8.000e-17	4.254e-17	-16.097	-16.371	-0.274	(0)
VO2F	7.380e-17	7.380e-17	-16.132	-16.132	0.000	(0)
VO2SO4-	6.877e-18	6.411e-18	-17.163	-17.193	-0.030	(0)
V3O9-3	3.647e-18	1.939e-18	-17.438	-17.712	-0.274	(0)
V2O7-4	2.922e-18	9.506e-19	-17.534	-18.022	-0.488	(0)
VO2F2-	1.358e-18	1.266e-18	-17.867	-17.897	-0.030	(0)
VO2F3-2	9.883e-22	7.464e-22	-21.005	-21.127	-0.122	(0)
V4O12-4	3.051e-23	9.926e-24	-22.516	-23.003	-0.488	(0)
VO2F4-3	3.264e-26	1.736e-26	-25.486	-25.761	-0.274	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.353	-58.115	-0.762	(0)
V10O28-6	0.000e+00	0.000e+00	-57.984	-59.081	-1.097	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.639	-60.127	-0.488	(0)
Zn	1.393e-07					
Zn+2	1.221e-07	9.418e-08	-6.913	-7.026	-0.113	(0)
ZnSO4	6.212e-09	6.212e-09	-8.207	-8.207	0.000	(0)
ZnCO3	5.179e-09	5.179e-09	-8.286	-8.286	0.000	(0)
ZnHCO3+	3.926e-09	3.660e-09	-8.406	-8.437	-0.030	(0)
ZnOH+	1.687e-09	1.573e-09	-8.773	-8.803	-0.030	(0)
ZnF+	9.525e-11	8.880e-11	-10.021	-10.052	-0.030	(0)
ZnCl+	4.971e-11	4.658e-11	-10.304	-10.332	-0.028	(0)
Zn (OH) 2	4.164e-11	4.164e-11	-10.380	-10.380	0.000	(0)
Zn (SO4) 2-2	2.160e-11	1.631e-11	-10.666	-10.787	-0.122	(0)
ZnOHC1	1.018e-11	1.018e-11	-10.992	-10.992	0.000	(0)
Zn (OH) 3-	3.739e-14	3.486e-14	-13.427	-13.458	-0.030	(0)
ZnCl2	1.453e-14	1.453e-14	-13.838	-13.838	0.000	(0)
ZnCl3-	2.426e-18	2.273e-18	-17.615	-17.643	-0.028	(0)
ZnSeO4	5.335e-19	5.335e-19	-18.273	-18.273	0.000	(0)
Zn (OH) 4-2	3.069e-19	2.318e-19	-18.513	-18.635	-0.122	(0)
ZnCl4-2	2.890e-22	2.238e-22	-21.539	-21.650	-0.111	(0)
Zn (SeO4) 2-2	2.620e-32	1.979e-32	-31.582	-31.704	-0.122	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.944	-138.974	-0.030	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.184	-140.184	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.863	-209.893	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.531	-212.653	-0.122	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.220	-284.342	-0.122	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.91	-82.13	-36.22	Ag2S

Ag2CO3	-11.29	-22.38	-11.09	Ag2CO3
Ag2CrO4	-22.41	-34.00	-11.59	Ag2CrO4
Ag2HVO4	-11.23	-9.75	1.48	Ag2HVO4
Ag2MoO4	-12.10	-23.65	-11.55	Ag2MoO4
Ag2O	-14.49	-1.92	12.57	Ag2O
Ag2Se	4.16	-44.54	-48.70	Ag2Se
Ag2SeO3	-10.31	-17.46	-7.15	Ag2SeO3
Ag2SeO4	-20.88	-29.79	-8.91	Ag2SeO4
Ag2SO4	-15.06	-19.88	-4.82	Ag2SO4
Ag3AsO3	-23.94	-21.78	2.16	Ag3AsO3
Ag3AsO4	-13.91	-16.70	-2.79	Ag3AsO4
Ag3H2VO5	-15.89	-10.71	5.18	Ag3H2VO5
AgF:4H2O	-13.55	-12.50	1.05	AgF:4H2O
Agmetal	0.56	-12.95	-13.51	Ag
AgVO3	-9.56	-8.79	0.77	AgVO3
Al (OH) 3 (am)	-1.65	9.15	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.25	-46.88	2.37	Al2 (MoO4) 3
Al2O3	-1.35	18.31	19.65	Al2O3
Al4 (OH) 10SO4	-4.05	18.65	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.47	-4.67	4.80	AlAsO4:2H2O
AlOHSO4	-5.58	-8.81	-3.23	AlOHSO4
AlSb	-147.05	-81.42	65.62	AlSb
Alunite	-3.93	-5.33	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.99	-12.78	-7.79	PbSO4
Anhydrite	-2.48	-6.84	-4.36	CaSO4
Anilite	-48.96	-80.84	-31.88	Cu0.25Cu1.5S
Antlerite	-3.92	4.87	8.79	Cu3 (OH) 4SO4
Aragonite	-1.04	-9.34	-8.30	CaCO3
Arsenolite	-72.85	-75.61	-2.76	As4O6
Artinite	-8.81	0.79	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-34.35	-27.65	6.71	As2O5
Atacamite	-3.10	4.30	7.39	Cu2 (OH) 3Cl
Azurite	-1.18	-18.09	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.82	7.57	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.38	-0.51	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	3.99	-4.92	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.88	7.06	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-14.83	-24.50	-9.67	BaCrO4
BaF2	-9.70	-15.52	-5.82	BaF2
BaMoO4	-7.19	-14.15	-6.96	BaMoO4
Barite	-0.41	-10.39	-9.98	BaSO4
BaS	-88.81	-72.63	16.18	BaS
BaSeO3	-9.80	-7.97	1.83	BaSeO3
BaSeO4	-12.84	-20.30	-7.46	BaSeO4
Bianchite	-8.78	-10.55	-1.76	ZnSO4:6H2O
Birnessite	-10.71	7.38	18.09	MnO2
Bixbyite	-8.58	-9.22	-0.64	Mn2O3
BlaubleiI	-49.53	-73.70	-24.16	Cu0.9Cu0.2S
BlaubleiII	-49.71	-76.99	-27.28	Cu0.6Cu0.8S
Boehmite	0.58	9.15	8.58	AlOOH
Breithauptite	-53.40	-71.92	-18.52	NiSb
Brochantite	-2.74	12.48	15.22	Cu4 (OH) 6SO4
Brucite	-6.22	10.63	16.84	Mg (OH) 2
Bunsenite	-5.78	6.67	12.45	NiO
Ca (VO3) 2	-10.20	-4.54	5.66	Ca (VO3) 2
Ca2V2O7	-10.92	6.58	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.98	6.58	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-16.59	5.71	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-21.26	17.70	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-22.16	17.70	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-290.77	-147.80	142.97	Ca3Sb2
CaCrO4	-18.69	-20.96	-2.27	CaCrO4
Calcite	-0.86	-9.34	-8.48	CaCO3
Calomel	-14.26	-32.17	-17.91	Hg2Cl2
CaMoO4	-2.66	-10.61	-7.95	CaMoO4
Carnotite	-3.54	-3.31	0.23	KUO2VO4
CaSeO3:2H2O	-7.24	-4.43	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.74	-16.76	-3.02	CaSeO4:2H2O

Cd(BO ₂) ₂	-15.82	-5.98	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.20	5.44	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.29	5.44	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-26.30	-19.59	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-24.19	-1.63	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-24.59	3.81	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-15.75	-16.41	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-14.72	-16.41	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-14.50	-16.41	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.44	-17.65	-1.21	CdF ₂
Cdmetal(alpha)	-32.05	-18.53	13.51	Cd
Cdmetal(gamma)	-32.15	-18.53	13.62	Cd
CdMoO ₄	-2.14	-16.29	-14.15	CdMoO ₄
CdOHCl	-9.02	-5.48	3.54	CdOHCl
CdSb	-72.80	-73.15	-0.35	CdSb
CdSe	-16.97	-37.17	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-20.58	-22.43	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-12.35	-12.52	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-10.79	-12.52	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-10.65	-12.52	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-2.13	-11.88	-9.75	AgCl
Cerrusite	-2.15	-15.28	-13.13	PbCO ₃
CH ₄ (g)	-75.32	-116.37	-41.05	CH ₄
Chalcanthite	-7.71	-10.35	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-48.66	-83.58	-34.92	Cu ₂ S
Chalcopyrite	-110.27	-145.54	-35.27	CuFeS ₂
Cinnabar	-49.28	-94.97	-45.69	HgS
Claudetite	-72.55	-75.61	-3.06	As ₄ O ₆
Clausthalite	-10.34	-37.44	-27.10	PbSe
Co(BO ₂) ₂	-32.01	-4.94	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.61	6.48	13.09	Co(OH) ₂
Co(OH) ₃	-11.62	-13.93	-2.31	Co(OH) ₃
CO ₂ (g)	-2.31	-20.46	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-21.23	-8.19	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-10.87	-21.37	-10.50	Co ₃ O ₄
CoCl ₂	-23.63	-15.37	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-17.90	-15.37	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.99	-13.97	-9.98	CoCO ₃
CoF ₂	-15.01	-16.61	-1.60	CoF ₂
CoF ₃	-47.10	-48.56	-1.46	CoF ₃
CoFe ₂ O ₄	22.46	18.93	-3.53	CoFe ₂ O ₄
CoMoO ₄	-7.48	-15.24	-7.76	CoMoO ₄
CoO	-7.10	6.48	13.59	CoO
CoS(alpha)	-66.28	-73.72	-7.44	CoS
CoS(beta)	-62.65	-73.72	-11.07	CoS
CoSe	-19.93	-36.13	-16.20	CoSe
CoSeO ₃	-10.38	-9.06	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-19.86	-21.39	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-14.28	-11.48	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-9.00	-11.48	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-11.89	-16.67	-4.78	PbCl ₂
Covellite	-50.30	-72.60	-22.30	CuS
Cr(OH) ₂	-20.53	-9.71	10.82	Cr(OH) ₂
Cr(OH) ₃	-2.00	-0.67	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	0.08	-0.67	-0.75	Cr(OH) ₃
Cr ₂ O ₃	1.02	-1.33	-2.36	Cr ₂ O ₃
CrCl ₂	-45.65	-31.56	14.09	CrCl ₂
CrCl ₃	-48.56	-33.44	15.11	CrCl ₃
CrF ₃	-23.97	-35.30	-11.34	CrF ₃
Crmetal	-64.17	-33.69	30.48	Cr
CrO ₃	-28.87	-32.08	-3.21	CrO ₃
Cryolite	-14.35	-48.19	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-1.06	7.61	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-26.94	18.27	45.21	Cu(SbO ₃) ₂
Cu ₂ Sb:3H ₂ O	-49.77	-84.66	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se(alpha)	-0.19	-45.99	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.39	-21.34	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ :2H ₂ O	-10.92	-4.82	6.10	Cu ₃ (AsO ₄) ₂ :2H ₂ O

Cu3Sb	-53.05	-95.64	-42.59	Cu3Sb
Cu3Se2	-17.51	-81.00	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.03	-24.47	-5.44	CuCrO4
CuF	-8.33	-13.23	-4.91	CuF
CuF2	-16.60	-15.48	1.12	CuF2
CuF2:2H2O	-10.93	-15.48	-4.55	CuF2:2H2O
Cumetal	-4.92	-13.68	-8.76	Cu
CuMoO4	-1.04	-14.12	-13.08	CuMoO4
CuOCuSO4	-13.04	-2.74	10.30	CuOCuSO4
Cupricferrite	14.07	20.06	5.99	CuFe2O4
Cuprite	-1.97	-3.38	-1.41	Cu2O
Cuprousferrite	13.45	4.53	-8.92	CuFeO2
CuSe	-1.91	-35.01	-33.10	CuSe
CuSe2	-20.28	-53.65	-33.37	CuSe2
CuSeO3:2H2O	-8.45	-7.94	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.83	-20.27	-2.44	CuSeO4:5H2O
CuSO4	-13.29	-10.35	2.94	CuSO4
Diaspore	2.28	9.15	6.87	AlOOH
Djurleite	-48.94	-82.86	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-2.63	-19.17	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.08	-19.17	-17.09	CaMg(CO3)2
Epsomite	-5.21	-7.33	-2.13	MgSO4:7H2O
Fe(OH)2	-6.30	7.27	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	5.98	2.94	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.68	-8.40	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-4.65	-3.10	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-13.57	-34.19	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.70	-41.44	-3.73	Fe2(SO4)3
Fe3(OH)8	-0.51	19.71	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.00	-7.60	0.40	FeAsO4:2H2O
FeCr2O4	-1.27	5.93	7.20	FeCr2O4
FeMoO4	-4.37	-14.46	-10.09	FeMoO4
Ferrihydrite	3.03	6.22	3.19	Fe(OH)3
Ferroselite	-35.39	-53.99	-18.60	FeSe2
FeS(ppt)	-69.99	-72.94	-2.95	FeS
FeSe	-24.35	-35.35	-11.00	FeSe
Fix_pe	-4.77	-4.77	0.00	e-
Fluorite	-1.47	-11.97	-10.50	CaF2
Galena	-61.06	-75.03	-13.97	PbS
Gibbsite	0.86	9.15	8.29	Al(OH)3
Goethite	5.73	6.22	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO4:7H2O
Greenockite	-60.41	-74.77	-14.36	CdS
Greigite	-256.09	-301.12	-45.03	Fe3S4
Gummite	-6.27	1.40	7.67	UO3
Gypsum	-2.23	-6.84	-4.61	CaSO4:2H2O
H-Jarosite	-5.15	-17.25	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.85	-21.73	-12.88	H2MoO4
H2S(g)	-72.20	-80.21	-8.01	H2S
H2Se(g)	-37.66	-42.62	-4.96	H2Se
Halite	-8.55	-6.95	1.60	NaCl
Hausmannite	-10.80	50.23	61.03	Mn3O4
Hematite	13.86	12.44	-1.42	Fe2O3
Hercynite	2.68	25.57	22.89	FeAl2O4
Hg(CH3)2(g)	-173.79	-247.50	-73.71	Hg(CH3)2
Hg(g)	-9.28	-17.15	-7.87	Hg
Hg(OH)2	-11.27	-14.76	-3.50	Hg(OH)2
Hg2(g)	-19.34	-34.30	-14.96	Hg2
Hg2(OH)2	-15.58	-10.32	5.26	Hg2(OH)2
Hg2CO3	-14.73	-30.78	-16.05	Hg2CO3
Hg2CrO4	-33.70	-42.40	-8.70	Hg2CrO4
Hg2F2	-23.05	-33.41	-10.36	Hg2F2
Hg2S	-78.85	-90.53	-11.68	Hg2S
Hg2SeO3	-21.21	-25.87	-4.66	Hg2SeO3
Hg2SO4	-22.15	-28.28	-6.13	Hg2SO4
Hg3O2CO3	-35.07	-64.75	-29.68	Hg3O2CO3
HgCl(g)	-35.58	-16.09	19.50	HgCl

HgCl2	-15.35	-36.62	-21.26	HgCl2
HgF(g)	-49.38	-16.71	32.68	HgF
HgF2(g)	-50.42	-37.85	12.57	HgF2
Hgmetal(1)	-3.70	-17.15	-13.45	Hg
HgSe	-1.69	-57.38	-55.69	HgSe
HgSeO3	-17.88	-30.31	-12.43	HgSeO3
HgSO4	-23.31	-32.72	-9.42	HgSO4
Huntite	-8.87	-38.84	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.61	-25.38	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-19.94	-28.71	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-18.47	-23.64	-5.17	KAl(SO4)2·12H2O
K-Jarosite	0.67	-14.13	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-40.66	-57.90	-17.24	K2Cr2O7
K2CrO4	-25.31	-25.83	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.89	-21.62	-0.73	K2SeO4
Langite	-5.01	12.48	17.49	Cu4(OH)6SO4·H2O
Larnakite	-7.17	-7.60	-0.43	PbO:PbSO4
Laurionite	-6.37	-5.75	0.62	PbOHCl
Lepidocrocite	4.85	6.22	1.37	FeOOH
Lime	-21.58	11.12	32.70	CaO
Litharge	-7.52	5.18	12.69	PbO
Mackinawite	-69.34	-72.94	-3.60	FeS
Maghemite	6.06	12.44	6.39	Fe2O3
Magnesioferrite	6.21	23.07	16.86	Fe2MgO4
Magnesite	-2.37	-9.83	-7.46	MgCO3
Magnetite	16.31	19.71	3.40	Fe3O4
Malachite	0.07	-5.24	-5.31	Cu2(OH)2CO3
Manganite	-4.60	20.74	25.34	MnOOH
Massicot	-7.72	5.18	12.89	PbO
Matlockite	-8.32	-17.29	-8.97	PbClF
Melanothallite	-20.50	-14.24	6.26	CuCl2
Melanterite	-8.49	-10.69	-2.21	FeSO4·7H2O
Metacinnabar	-49.88	-94.97	-45.09	HgS
Mg(OH)2(active)	-8.17	10.63	18.79	Mg(OH)2
Mg(VO3)2	-16.31	-5.03	11.28	Mg(VO3)2
Mg2Sb3	-265.22	-190.54	74.68	Mg2Sb3
Mg2V2O7	-20.77	5.59	26.36	Mg2V2O7
MgCr2O4	-6.91	9.29	16.20	MgCr2O4
MgCrO4	-26.83	-21.45	5.38	MgCrO4
MgF2	-4.33	-12.46	-8.13	MgF2
MgMoO4	-9.25	-11.10	-1.85	MgMoO4
MgSeO3·6H2O	-7.97	-4.92	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-16.05	-17.25	-1.20	MgSeO4·6H2O
Minium	-34.01	39.51	73.52	Pb3O4
Mirabilite	-8.90	-10.01	-1.11	Na2SO4·10H2O
Mn(VO3)2	-11.81	-6.91	4.90	Mn(VO3)2
Mn2(SO4)3	-57.39	-63.10	-5.71	Mn2(SO4)3
Mn2Sb	-146.14	-85.06	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-13.89	-1.39	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-15.81	-13.10	2.72	MnCl2·4H2O
MnS(grn)	-71.63	-71.46	0.17	MnS
MnS(pnk)	-74.80	-71.46	3.34	MnS
MnSb	-92.28	-95.19	-2.91	MnSb
MnSe	-37.37	-33.87	3.50	MnSe
MnSeO3	-7.92	-6.79	1.13	MnSeO3
MnSeO3·2H2O	-7.78	-6.79	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-17.07	-19.12	-2.05	MnSeO4·5H2O
MnSO4	-11.79	-9.21	2.58	MnSO4
Monteponite	-9.66	5.44	15.10	CdO
Montroydite	-11.12	-14.76	-3.64	HgO
MoO3	-13.73	-21.73	-8.00	MoO3
Morenosite	-9.15	-11.29	-2.14	NiSO4·7H2O
MoS2	-135.86	-206.12	-70.26	MoS2
Na-Jarosite	-2.08	-13.28	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-46.31	-56.20	-9.90	Na2Cr2O7
Na2CrO4	-27.06	-24.13	2.93	Na2CrO4
Na2Mo2O7	-18.91	-35.51	-16.60	Na2Mo2O7

Na2MoO4	-15.27	-13.78	1.49	Na2MoO4
Na2MoO4:2H2O	-15.00	-13.78	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-17.89	-7.59	10.30	Na2SeO3:5H2O
Na2SeO4	-21.21	-19.93	1.28	Na2SeO4
Na3Sb	-173.10	-78.65	94.45	Na3Sb
Na3VO4	-32.59	4.10	36.68	Na3VO4
Na4V2O7	-37.16	0.24	37.40	Na4V2O7
Nantokite	-5.88	-12.61	-6.73	CuCl
NaSb	-85.79	-62.63	23.17	NaSb
Natron	-11.20	-12.51	-1.31	Na2CO3:10H2O
NaVO3	-7.71	-3.86	3.86	NaVO3
Nesquehonite	-5.16	-9.83	-4.67	MgCO3:3H2O
Ni(OH)2	-6.13	6.67	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.35	-7.65	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.30	8.70	32.00	Ni4(OH)6SO4
NiCO3	-6.92	-13.79	-6.87	NiCO3
NiMoO4	-3.92	-15.06	-11.14	NiMoO4
NiS(alpha)	-67.94	-73.54	-5.60	NiS
NiS(beta)	-62.44	-73.54	-11.10	NiS
NiS(gamma)	-60.74	-73.54	-12.80	NiS
NiSe	-18.25	-35.95	-17.70	NiSe
NiSeO3:2H2O	-11.69	-8.88	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.69	-21.21	-1.52	NiSeO4:6H2O
Nsutite	-10.13	7.38	17.50	MnO2
O2(g)	-35.14	47.95	83.09	O2
Orpiment	-217.37	-278.43	-61.07	As2S3
Otavite	-3.02	-15.02	-12.00	CdCO3
Pb(BO2)2	-12.77	-6.25	6.52	Pb(BO2)2
Pb(OH)2	-2.97	5.18	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.21	-70.97	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.36	-0.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.83	10.36	26.19	Pb2O(OH)2
Pb2O3	-26.71	34.33	61.04	Pb2O3
Pb2OCO3	-9.54	-10.10	-0.56	Pb2OCO3
Pb2V2O7	-3.40	-5.30	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.91	-12.11	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.27	-0.13	6.14	Pb3(VO4)2
Pb3O2CO3	-15.94	-4.92	11.02	Pb3O2CO3
Pb3O2SO4	-13.11	-2.43	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.35	2.75	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.12	2.75	21.88	Pb4O3SO4
PbCrO4	-14.30	-26.90	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.05	-18.80	4.25	Pb
PbMoO4	-0.93	-16.55	-15.62	PbMoO4
PbO:0.3H2O	-7.80	5.18	12.98	PbO:0.33H2O
PbSeO4	-15.86	-22.70	-6.84	PbSeO4
Periclase	-10.96	10.63	21.58	MgO
Phosgenite	-12.14	-31.95	-19.81	PbCl2:PbCO3
Plattnerite	-20.44	29.16	49.60	PbO2
Portlandite	-11.69	11.12	22.80	Ca(OH)2
Pyrite	-110.67	-129.17	-18.51	FeS2
Pyrochroite	-6.44	8.75	15.19	Mn(OH)2
Pyrolusite	-8.65	32.73	41.38	MnO2
Realgar	-91.35	-111.10	-19.75	AsS
Retgersite	-9.25	-11.29	-2.04	NiSO4:6H2O
Rhodochrosite	-1.13	-11.71	-10.58	MnCO3
Rutherfordine	-4.56	-19.06	-14.50	UO2CO3
Sb(OH)3	-11.54	-18.65	-7.11	Sb(OH)3
Sb2O4	-16.72	-13.32	3.40	Sb2O4
Sb2O5	-28.29	-37.96	-9.67	Sb2O5
Sb2Se3	-97.39	-165.14	-67.76	Sb2Se3
Sb4O6(cubic)	-56.32	-74.58	-18.26	Sb4O6
Sb4O6(orth)	-56.68	-74.58	-17.90	Sb4O6
SbCl3	-51.99	-51.42	0.57	SbCl3
SbF3	-43.06	-53.28	-10.23	SbF3
Sbmetal	-42.92	-54.61	-11.69	Sb
SbO2	-3.14	-30.97	-27.82	SbO2

Schoepite	-4.59	1.40	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.53	-18.64	-7.11	Se
Semetal (hex)	-10.93	-18.64	-7.71	Se
Senarmontite	-24.93	-37.29	-12.37	Sb2O3
SeO2	-15.67	-15.55	0.12	SeO2
SeO3	-48.92	-27.88	21.04	SeO3
Siderite	-2.95	-13.19	-10.24	FeCO3
Smithsonite	-3.05	-13.05	-10.00	ZnCO3
Sphalerite	-61.35	-72.80	-11.45	ZnS
Spinel	-7.91	28.93	36.85	MgAl2O4
Stibnite	-227.46	-277.92	-50.46	Sb2S3
Sulfur	-54.09	-56.23	-2.14	S
Tenorite	-0.03	7.61	7.64	CuO
Thenardite	-10.33	-10.01	0.32	Na2SO4
Thermonatrite	-13.15	-12.51	0.64	Na2CO3:H2O
Tyuyamunite	-5.82	-1.74	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.22	7.87	21.08	U3O8
U3Sb4	-554.78	-402.40	152.38	U3Sb4
U4O9	-26.45	-29.47	-3.02	U4O9
UF4	-30.01	-59.54	-29.54	UF4
UF4:2.5H2O	-26.83	-59.54	-32.72	UF4:2.5H2O
UO2 (am)	-14.30	-13.36	0.93	UO2
UO2 (OH) 2 (beta)	-4.21	1.40	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.23	-26.48	-2.25	UO2SeO4:4H2O
UO3	-6.30	1.40	7.70	UO3
Uraninite	-8.69	-13.36	-4.67	UO2
USb2	-209.33	-179.76	29.58	USb2
V (OH) 3	-16.80	-9.21	7.59	V (OH) 3
V2O5	-14.30	-15.66	-1.36	V2O5
V3O5	-34.56	-32.73	1.84	V3O5
V4O7	-42.83	-35.64	7.19	V4O7
V6O13	-34.08	-94.94	-60.86	V6O13
Valentinite	-28.81	-37.29	-8.48	Sb2O3
VC12	-61.92	-43.05	18.87	VC12
VC13	-65.42	-41.99	23.43	VC13
VF4	-64.03	-49.10	14.93	VF4
Vmetal	-89.20	-45.17	44.03	V
VO	-35.95	-21.20	14.76	VO
VO (OH) 2	-8.07	-2.92	5.15	VO (OH) 2
VO2Cl	-21.60	-18.76	2.84	VO2Cl
VOC1	-31.29	-20.13	11.15	VOC1
VOC12	-37.53	-24.77	12.76	VOC12
VOSO4	-24.49	-20.88	3.61	VOSO4
Witherite	-4.31	-12.88	-8.57	BaCO3
Wurtzite	-63.85	-72.80	-8.95	ZnS
Zincite	-3.92	7.41	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO4
Zn (BO2) 2	-12.30	-4.01	8.29	Zn (BO2) 2
Zn (OH) 2	-4.79	7.41	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-5.06	7.41	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.34	7.41	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-4.12	7.41	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.32	7.41	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.63	-3.13	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.29	3.90	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.06	-5.41	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-32.59	-13.68	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-16.71	11.69	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-23.28	15.22	38.50	Zn5 (OH) 8Cl2
ZnCl2	-21.49	-14.44	7.05	ZnCl2
ZnCO3:1H2O	-2.79	-13.05	-10.26	ZnCO3:1H2O
ZnF2	-15.14	-15.68	-0.53	ZnF2
Znmetal	-42.35	-16.56	25.79	Zn
ZnMoO4	-4.19	-14.31	-10.13	ZnMoO4
ZnO (active)	-3.77	7.41	11.19	ZnO
ZnS (am)	-63.74	-72.80	-9.05	ZnS
ZnSb	-82.19	-71.18	11.01	ZnSb
ZnSe	-20.80	-35.20	-14.40	ZnSe

ZnSeO4:6H2O	-18.94	-20.46	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 69.

```

      REACTION 401
      H2O      -1
      394.7309 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 401
      SAVE Solution 402
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 401. Solution after simulation 68.
Using reaction 401.

Reaction 401.

3.947e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.351e-08	8.350e-08
Al	4.479e-06	4.478e-06
As	4.047e-08	4.047e-08
B	1.585e-05	1.585e-05
Ba	1.450e-06	1.450e-06
C	1.211e-02	1.211e-02
Ca	5.398e-03	5.397e-03
Cd	1.155e-08	1.155e-08
Cl	1.704e-03	1.704e-03
Co	1.359e-07	1.359e-07
Cr	1.270e-07	1.270e-07
Cu	9.251e-06	9.250e-06
F	4.186e-04	4.185e-04
Fe	2.671e-05	2.671e-05
Hg	2.124e-10	2.124e-10
K	6.986e-04	6.985e-04
Mg	1.711e-03	1.711e-03
Mn	2.341e-05	2.340e-05
Mo	5.413e-07	5.413e-07
Na	4.942e-03	4.941e-03

Ni	2.132e-07	2.131e-07
Pb	2.565e-08	2.565e-08
S	3.518e-03	3.518e-03
Sb	1.297e-08	1.297e-08
Se	4.638e-08	4.638e-08
U	8.173e-08	8.172e-08
V	1.124e-07	1.124e-07
Zn	1.130e-06	1.130e-06

-----Description of solution-----

	pH	=	7.162	Charge balance
	pe	=	5.110	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	2.563e-02	
	Mass of water (kg)	=	9.999e-01	
	Total alkalinity (eq/kg)	=	1.081e-02	
	Total CO2 (mol/kg)	=	1.211e-02	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	-2.565e-18	
Percent error, 100*(Cat- An)/(Cat+ An)		=	-0.00	
	Iterations	=	15	
	Total H	=	1.110159e+02	
	Total O	=	5.555171e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.714e-07	1.463e-07	-6.766	-6.835	-0.069	(0)
H+	8.019e-08	6.881e-08	-7.096	-7.162	-0.066	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.351e-08					
AgCl	5.339e-08	5.339e-08	-7.273	-7.273	0.000	(0)
Ag+	2.084e-08	1.788e-08	-7.681	-7.748	-0.066	(0)
AgCl2-	8.208e-09	6.801e-09	-8.086	-8.167	-0.082	(0)
AgSO4-	5.967e-10	4.944e-10	-9.224	-9.306	-0.082	(0)
Ag2Se	2.201e-10	2.201e-10	-9.657	-9.657	0.000	(0)
AgCl3-2	1.881e-11	8.865e-12	-10.726	-11.052	-0.327	(0)
AgF	1.419e-11	1.419e-11	-10.848	-10.848	0.000	(0)
AgOH	2.615e-13	2.615e-13	-12.582	-12.582	0.000	(0)
AgCl4-3	1.438e-13	2.647e-14	-12.842	-13.577	-0.735	(0)
AgH2BO3	3.769e-14	3.769e-14	-13.424	-13.424	0.000	(0)
AgSeO3-	2.786e-14	2.308e-14	-13.555	-13.637	-0.082	(0)
Ag(OH) 2-	4.512e-18	3.738e-18	-17.346	-17.427	-0.082	(0)
Ag(SeO3) 2-3	2.255e-21	4.152e-22	-20.647	-21.382	-0.735	(0)
Ag2MoO4	3.549e-23	3.549e-23	-22.450	-22.450	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.475	-68.475	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.934	-79.241	-1.307	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-138.836	-138.917	-0.082	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-139.056	-139.238	-0.183	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-141.175	-141.516	-0.341	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.502	-141.827	-0.325	(0)
Al	4.479e-06					
AlF3	2.040e-06	2.040e-06	-5.690	-5.690	0.000	(0)
Al(OH) 4-	1.372e-06	1.179e-06	-5.863	-5.929	-0.066	(0)
AlF2+	5.937e-07	5.129e-07	-6.226	-6.290	-0.064	(0)
AlF4-	3.760e-07	3.230e-07	-6.425	-6.491	-0.066	(0)
Al(OH) 3	6.401e-08	6.401e-08	-7.194	-7.194	0.000	(0)
Al(OH) 2+	2.539e-08	2.193e-08	-7.595	-7.659	-0.064	(0)
AlF+2	7.325e-09	4.078e-09	-8.135	-8.390	-0.254	(0)
AlOH+2	3.391e-10	1.888e-10	-9.470	-9.724	-0.254	(0)
AlSO4+	1.616e-11	1.388e-11	-10.791	-10.857	-0.066	(0)
Al+3	5.117e-12	1.291e-12	-11.291	-11.889	-0.598	(0)
Al(SO4) 2-	2.400e-13	2.062e-13	-12.620	-12.686	-0.066	(0)
AlMo6O21-3	4.656e-39	8.573e-40	-38.332	-39.067	-0.735	(0)

As (3)	2.397e-19					
H3AsO3	2.376e-19	2.376e-19	-18.624	-18.624	0.000	(0)
H2AsO3-	2.137e-21	1.771e-21	-20.670	-20.752	-0.082	(0)
HAsO3-2	4.980e-26	2.347e-26	-25.303	-25.629	-0.327	(0)
H4AsO3+	9.776e-27	8.100e-27	-26.010	-26.092	-0.082	(0)
AsO3-3	7.142e-32	1.315e-32	-31.146	-31.881	-0.735	(0)
As (5)	4.047e-08					
HAsO4-2	2.982e-08	1.406e-08	-7.525	-7.852	-0.327	(0)
H2AsO4-	1.065e-08	8.822e-09	-7.973	-8.054	-0.082	(0)
AsO4-3	3.509e-12	6.461e-13	-11.455	-12.190	-0.735	(0)
H3AsO4	1.049e-13	1.055e-13	-12.979	-12.977	0.003	(0)
B	1.585e-05					
H3BO3	1.567e-05	1.576e-05	-4.805	-4.802	0.003	(0)
H2BO3-	1.571e-07	1.330e-07	-6.804	-6.876	-0.072	(0)
CaH2BO3+	2.063e-08	1.747e-08	-7.685	-7.758	-0.072	(0)
MgH2BO3+	4.144e-09	3.510e-09	-8.383	-8.455	-0.072	(0)
BF (OH) 3-	2.346e-09	1.987e-09	-8.630	-8.702	-0.072	(0)
NaH2BO3	8.833e-10	8.833e-10	-9.054	-9.054	0.000	(0)
BF2 (OH) 2-	5.454e-12	4.619e-12	-11.263	-11.335	-0.072	(0)
BaH2BO3+	3.619e-12	3.065e-12	-11.441	-11.514	-0.072	(0)
H5 (BO3) 2-	2.106e-12	1.784e-12	-11.676	-11.749	-0.072	(0)
AgH2BO3	3.769e-14	3.769e-14	-13.424	-13.424	0.000	(0)
H8 (BO3) 3-	3.319e-15	2.811e-15	-14.479	-14.551	-0.072	(0)
BF3OH-	4.615e-17	3.909e-17	-16.336	-16.408	-0.072	(0)
BF4-	4.939e-21	4.183e-21	-20.306	-20.379	-0.072	(0)
Ba	1.450e-06					
Ba+2	1.375e-06	7.457e-07	-5.862	-6.127	-0.266	(0)
BaHCO3+	7.219e-08	6.258e-08	-7.142	-7.204	-0.062	(0)
BaCO3	2.290e-09	2.290e-09	-8.640	-8.640	0.000	(0)
BaH2BO3+	3.619e-12	3.065e-12	-11.441	-11.514	-0.072	(0)
BaOH+	5.525e-13	4.761e-13	-12.258	-12.322	-0.065	(0)
C (4)	1.211e-02					
HCO3-	1.017e-02	8.787e-03	-1.993	-2.056	-0.064	(0)
H2CO3	1.360e-03	1.360e-03	-2.867	-2.867	0.000	(0)
CaHCO3+	4.310e-04	3.736e-04	-3.366	-3.428	-0.062	(0)
MgHCO3+	7.993e-05	6.843e-05	-4.097	-4.165	-0.067	(0)
CaCO3	2.166e-05	2.166e-05	-4.664	-4.664	0.000	(0)
NaHCO3	2.071e-05	2.071e-05	-4.684	-4.684	0.000	(0)
CO3-2	1.104e-05	5.987e-06	-4.957	-5.223	-0.266	(0)
CuCO3	8.176e-06	8.176e-06	-5.087	-5.087	0.000	(0)
MgCO3	3.790e-06	3.790e-06	-5.421	-5.421	0.000	(0)
MnHCO3+	1.840e-06	1.585e-06	-5.735	-5.800	-0.065	(0)
NaCO3-	5.408e-07	4.672e-07	-6.267	-6.331	-0.064	(0)
Cu (CO3) 2-2	2.795e-07	1.318e-07	-6.554	-6.880	-0.327	(0)
CuHCO3+	1.552e-07	1.286e-07	-6.809	-6.891	-0.082	(0)
ZnCO3	1.359e-07	1.359e-07	-6.867	-6.867	0.000	(0)
ZnHCO3+	1.323e-07	1.096e-07	-6.879	-6.960	-0.082	(0)
NiHCO3+	7.598e-08	6.296e-08	-7.119	-7.201	-0.082	(0)
BaHCO3+	7.219e-08	6.258e-08	-7.142	-7.204	-0.062	(0)
UO2 (CO3) 3-4	6.052e-08	2.988e-09	-7.218	-8.525	-1.307	(0)
FeHCO3+	3.900e-08	3.381e-08	-7.409	-7.471	-0.062	(0)
CoHCO3+	3.350e-08	2.776e-08	-7.475	-7.557	-0.082	(0)
UO2 (CO3) 2-2	2.112e-08	9.958e-09	-7.675	-8.002	-0.327	(0)
PbCO3	1.559e-08	1.559e-08	-7.807	-7.807	0.000	(0)
NiCO3	1.298e-08	1.298e-08	-7.887	-7.887	0.000	(0)
PbHCO3+	6.827e-09	5.657e-09	-8.166	-8.247	-0.082	(0)
CoCO3	4.110e-09	4.110e-09	-8.386	-8.386	0.000	(0)
BaCO3	2.290e-09	2.290e-09	-8.640	-8.640	0.000	(0)
CdCO3	6.250e-10	6.250e-10	-9.204	-9.204	0.000	(0)
Pb (CO3) 2-2	5.712e-10	2.692e-10	-9.243	-9.570	-0.327	(0)
CdHCO3+	1.106e-10	9.163e-11	-9.956	-10.038	-0.082	(0)
UO2CO3	8.336e-11	8.336e-11	-10.079	-10.079	0.000	(0)
Cd (CO3) 2-2	5.885e-12	2.774e-12	-11.230	-11.557	-0.327	(0)
HgCO3	2.738e-15	2.738e-15	-14.563	-14.563	0.000	(0)
Hg (CO3) 2-2	1.100e-16	5.184e-17	-15.959	-16.285	-0.327	(0)
HgHCO3+	4.234e-18	3.508e-18	-17.373	-17.455	-0.082	(0)
Ca	5.398e-03					
Ca+2	4.211e-03	2.283e-03	-2.376	-2.641	-0.266	(0)

	CaSO4	7.249e-04	7.249e-04	-3.140	-3.140	0.000	(0)
	CaHCO3+	4.310e-04	3.736e-04	-3.366	-3.428	-0.062	(0)
	CaCO3	2.166e-05	2.166e-05	-4.664	-4.664	0.000	(0)
	CaF+	9.137e-06	7.873e-06	-5.039	-5.104	-0.065	(0)
	CaH2BO3+	2.063e-08	1.747e-08	-7.685	-7.758	-0.072	(0)
	CaOH+	7.687e-09	6.663e-09	-8.114	-8.176	-0.062	(0)
Cd	1.155e-08						
	Cd+2	8.448e-09	4.580e-09	-8.073	-8.339	-0.266	(0)
	CdSO4	1.488e-09	1.488e-09	-8.827	-8.827	0.000	(0)
	CdCl+	7.720e-10	6.397e-10	-9.112	-9.194	-0.082	(0)
	CdCO3	6.250e-10	6.250e-10	-9.204	-9.204	0.000	(0)
	CdHCO3+	1.106e-10	9.163e-11	-9.956	-10.038	-0.082	(0)
	Cd(SO4) 2-2	5.901e-11	2.782e-11	-10.229	-10.556	-0.327	(0)
	CdF+	2.768e-11	2.293e-11	-10.558	-10.640	-0.082	(0)
	CdOH+	6.422e-12	5.321e-12	-11.192	-11.274	-0.082	(0)
	Cd(CO3) 2-2	5.885e-12	2.774e-12	-11.230	-11.557	-0.327	(0)
	CdCl2	3.900e-12	3.900e-12	-11.409	-11.409	0.000	(0)
	CdOHC1	3.838e-12	3.838e-12	-11.416	-11.416	0.000	(0)
	CdF2	1.446e-14	1.446e-14	-13.840	-13.840	0.000	(0)
	Cd(OH) 2	4.911e-15	4.911e-15	-14.309	-14.309	0.000	(0)
	CdCl3-	4.343e-15	3.599e-15	-14.362	-14.444	-0.082	(0)
	CdSeO4	7.433e-19	7.433e-19	-18.129	-18.129	0.000	(0)
	Cd2OH+3	6.634e-19	1.221e-19	-18.178	-18.913	-0.735	(0)
	Cd(OH) 3-	5.296e-20	4.388e-20	-19.276	-19.358	-0.082	(0)
	Cd(SeO3) 2-2	3.231e-20	1.523e-20	-19.491	-19.817	-0.327	(0)
	Cd(OH) 4-2	2.229e-27	1.051e-27	-26.652	-26.979	-0.327	(0)
	CdHS+	0.000e+00	0.000e+00	-74.791	-74.873	-0.082	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-142.211	-142.211	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-214.772	-214.853	-0.082	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-286.873	-287.199	-0.327	(0)
Cl	1.704e-03						
	Cl-	1.704e-03	1.463e-03	-2.768	-2.835	-0.066	(0)
	AgCl	5.339e-08	5.339e-08	-7.273	-7.273	0.000	(0)
	MnCl+	1.932e-08	1.665e-08	-7.714	-7.779	-0.065	(0)
	AgCl2-	8.208e-09	6.801e-09	-8.086	-8.167	-0.082	(0)
	ZnCl+	1.693e-09	1.449e-09	-8.771	-8.839	-0.067	(0)
	CuCl	1.622e-09	1.622e-09	-8.790	-8.790	0.000	(0)
	CdCl+	7.720e-10	6.397e-10	-9.112	-9.194	-0.082	(0)
	CuCl+	6.279e-10	5.375e-10	-9.202	-9.270	-0.067	(0)
	CuCl2-	5.788e-10	4.956e-10	-9.237	-9.305	-0.067	(0)
	ZnOHC1	2.775e-10	2.775e-10	-9.557	-9.557	0.000	(0)
	NiCl+	2.624e-10	2.175e-10	-9.581	-9.663	-0.082	(0)
	CoCl+	2.479e-10	2.054e-10	-9.606	-9.687	-0.082	(0)
	PbCl+	5.426e-11	4.496e-11	-10.266	-10.347	-0.082	(0)
	MnCl2	3.439e-11	3.439e-11	-10.464	-10.464	0.000	(0)
	AgCl3-2	1.881e-11	8.865e-12	-10.726	-11.052	-0.327	(0)
	CdCl2	3.900e-12	3.900e-12	-11.409	-11.409	0.000	(0)
	CdOHC1	3.838e-12	3.838e-12	-11.416	-11.416	0.000	(0)
	ZnCl2	3.359e-12	3.359e-12	-11.474	-11.474	0.000	(0)
	PbCl2	2.937e-13	2.937e-13	-12.532	-12.532	0.000	(0)
	CuCl3-2	2.811e-13	1.549e-13	-12.551	-12.810	-0.259	(0)
	CuCl2	2.726e-13	2.726e-13	-12.564	-12.564	0.000	(0)
	HgClOH	1.444e-13	1.444e-13	-12.841	-12.841	0.000	(0)
	AgCl4-3	1.438e-13	2.647e-14	-12.842	-13.577	-0.735	(0)
	HgCl2	8.173e-14	8.173e-14	-13.088	-13.088	0.000	(0)
	MnCl3-	1.608e-14	1.385e-14	-13.794	-13.858	-0.065	(0)
	CrCl+2	6.387e-15	3.011e-15	-14.195	-14.521	-0.327	(0)
	ZnCl3-	4.558e-15	3.902e-15	-14.341	-14.409	-0.067	(0)
	CdCl3-	4.343e-15	3.599e-15	-14.362	-14.444	-0.082	(0)
	NiCl2	1.601e-15	1.601e-15	-14.796	-14.796	0.000	(0)
	HgCl3-	1.443e-15	1.195e-15	-14.841	-14.923	-0.082	(0)
	FeCl+2	2.933e-16	1.617e-16	-15.533	-15.791	-0.259	(0)
	PbCl3-	2.064e-16	1.710e-16	-15.685	-15.767	-0.082	(0)
	HgCl4-2	1.476e-17	6.960e-18	-16.831	-17.157	-0.327	(0)
	HgCl+	1.346e-17	1.115e-17	-16.871	-16.953	-0.082	(0)
	CrOHC12	1.224e-17	1.224e-17	-16.912	-16.912	0.000	(0)
	UO2Cl+	1.001e-17	8.295e-18	-17.000	-17.081	-0.082	(0)
	ZnCl4-2	5.176e-18	2.853e-18	-17.286	-17.545	-0.259	(0)

CuCl3-	4.346e-18	3.721e-18	-17.362	-17.429	-0.067	(0)
FeCl2+	1.226e-18	1.056e-18	-17.912	-17.976	-0.065	(0)
CrCl2+	5.043e-19	4.178e-19	-18.297	-18.379	-0.082	(0)
PbCl4-2	2.425e-19	1.143e-19	-18.615	-18.942	-0.327	(0)
VOCl+	1.203e-19	9.966e-20	-18.920	-19.001	-0.082	(0)
FeCl3	1.545e-22	1.545e-22	-21.811	-21.811	0.000	(0)
CuCl4-2	4.947e-23	2.727e-23	-22.306	-22.564	-0.259	(0)
CrO3Cl-	1.309e-26	1.085e-26	-25.883	-25.965	-0.082	(0)
CoCl+2	1.316e-35	6.203e-36	-34.881	-35.207	-0.327	(0)
UCl+3	0.000e+00	0.000e+00	-44.510	-45.245	-0.735	(0)
Co (2)	1.359e-07					
Co+2	8.615e-08	4.061e-08	-7.065	-7.391	-0.327	(0)
CoHCO3+	3.350e-08	2.776e-08	-7.475	-7.557	-0.082	(0)
CoSO4	1.123e-08	1.123e-08	-7.950	-7.950	0.000	(0)
CoCO3	4.110e-09	4.110e-09	-8.386	-8.386	0.000	(0)
CoF+	4.896e-10	4.057e-10	-9.310	-9.392	-0.082	(0)
CoCl+	2.479e-10	2.054e-10	-9.606	-9.687	-0.082	(0)
CoOH+	1.430e-10	1.185e-10	-9.845	-9.926	-0.082	(0)
Co (OH) 2	1.377e-12	1.377e-12	-11.861	-11.861	0.000	(0)
CoSeO4	1.774e-17	1.774e-17	-16.751	-16.751	0.000	(0)
Co (OH) 3-	4.850e-18	4.018e-18	-17.314	-17.396	-0.082	(0)
Co2OH+3	1.310e-18	2.412e-19	-17.883	-18.618	-0.735	(0)
CoOOH-	1.217e-18	1.009e-18	-17.915	-17.996	-0.082	(0)
Co (OH) 4-2	1.976e-25	9.315e-26	-24.704	-25.031	-0.327	(0)
Co4 (OH) 4+4	7.971e-31	3.936e-32	-30.098	-31.405	-1.307	(0)
Co (3)	3.287e-29					
CoOH+2	3.287e-29	1.549e-29	-28.483	-28.810	-0.327	(0)
Co+3	8.265e-35	2.085e-35	-34.083	-34.681	-0.598	(0)
CoCl+2	1.316e-35	6.203e-36	-34.881	-35.207	-0.327	(0)
Cr (2)	6.252e-24					
Cr+2	6.252e-24	2.947e-24	-23.204	-23.531	-0.327	(0)
Cr (3)	1.270e-07					
Cr (OH) 2+	1.093e-07	9.059e-08	-6.961	-7.043	-0.082	(0)
Cr (OH) +2	1.080e-08	5.090e-09	-7.967	-8.293	-0.327	(0)
Cr (OH) 3	4.978e-09	4.978e-09	-8.303	-8.303	0.000	(0)
CrOHSO4	1.674e-09	1.674e-09	-8.776	-8.776	0.000	(0)
CrF+2	1.690e-10	7.965e-11	-9.772	-10.099	-0.327	(0)
CrO2-	4.148e-11	3.437e-11	-10.382	-10.464	-0.082	(0)
Cr (OH) 4-	3.498e-11	2.899e-11	-10.456	-10.538	-0.082	(0)
Cr+3	8.640e-12	1.591e-12	-11.063	-11.798	-0.735	(0)
CrSO4+	6.213e-12	5.148e-12	-11.207	-11.288	-0.082	(0)
CrCl+2	6.387e-15	3.011e-15	-14.195	-14.521	-0.327	(0)
Cr2 (OH) 2SO4+2	1.634e-15	7.702e-16	-14.787	-15.113	-0.327	(0)
Cr2 (OH) 2 (SO4) 2	6.341e-17	6.341e-17	-16.198	-16.198	0.000	(0)
CrOHC12	1.224e-17	1.224e-17	-16.912	-16.912	0.000	(0)
CrCl2+	5.043e-19	4.178e-19	-18.297	-18.379	-0.082	(0)
Cr (6)	1.647e-16					
CrO4-2	1.419e-16	7.693e-17	-15.848	-16.114	-0.266	(0)
HCrO4-	2.067e-17	1.713e-17	-16.685	-16.766	-0.082	(0)
NaCrO4-	1.933e-18	1.602e-18	-17.714	-17.795	-0.082	(0)
KCrO4-	2.048e-19	1.697e-19	-18.689	-18.770	-0.082	(0)
CrO3SO4-2	1.056e-24	4.977e-25	-23.976	-24.303	-0.327	(0)
H2CrO4	9.554e-25	9.554e-25	-24.020	-24.020	0.000	(0)
CrO3Cl-	1.309e-26	1.085e-26	-25.883	-25.965	-0.082	(0)
Cr2O7-2	2.159e-32	1.018e-32	-31.666	-31.992	-0.327	(0)
Cu (1)	3.264e-09					
CuCl	1.622e-09	1.622e-09	-8.790	-8.790	0.000	(0)
Cu+	1.063e-09	8.808e-10	-8.973	-9.055	-0.082	(0)
CuCl2-	5.788e-10	4.956e-10	-9.237	-9.305	-0.067	(0)
CuCl3-2	2.811e-13	1.549e-13	-12.551	-12.810	-0.259	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.092	-140.424	-0.333	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.837	-141.154	-0.317	(0)
Cu (2)	9.248e-06					
CuCO3	8.176e-06	8.176e-06	-5.087	-5.087	0.000	(0)
Cu+2	4.277e-07	2.319e-07	-6.369	-6.635	-0.266	(0)
Cu (CO3) 2-2	2.795e-07	1.318e-07	-6.554	-6.880	-0.327	(0)
CuHCO3+	1.552e-07	1.286e-07	-6.809	-6.891	-0.082	(0)
CuOH+	1.253e-07	1.073e-07	-6.902	-6.970	-0.067	(0)

	CuSO4	7.363e-08	7.363e-08	-7.133	-7.133	0.000	(0)
	CuF+	5.579e-09	4.623e-09	-8.253	-8.335	-0.082	(0)
	Cu (OH) 2	3.130e-09	3.130e-09	-8.504	-8.504	0.000	(0)
	CuCl+	6.279e-10	5.375e-10	-9.202	-9.270	-0.067	(0)
	Cu2 (OH) 2+2	6.131e-10	2.890e-10	-9.212	-9.539	-0.327	(0)
	Cu (OH) 3-	1.133e-12	9.392e-13	-11.946	-12.027	-0.082	(0)
	CuCl2	2.726e-13	2.726e-13	-12.564	-12.564	0.000	(0)
	CuCl3-	4.346e-18	3.721e-18	-17.362	-17.429	-0.067	(0)
	Cu (OH) 4-2	2.294e-18	1.081e-18	-17.639	-17.966	-0.327	(0)
	CuCl4-2	4.947e-23	2.727e-23	-22.306	-22.564	-0.259	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-204.280	-204.362	-0.082	(0)
F		4.186e-04					
	F-	3.682e-04	3.159e-04	-3.434	-3.500	-0.066	(0)
	MgF+	3.141e-05	2.698e-05	-4.503	-4.569	-0.066	(0)
	CaF+	9.137e-06	7.873e-06	-5.039	-5.104	-0.065	(0)
	AlF3	2.040e-06	2.040e-06	-5.690	-5.690	0.000	(0)
	NaF	8.353e-07	8.353e-07	-6.078	-6.078	0.000	(0)
	AlF2+	5.937e-07	5.129e-07	-6.226	-6.290	-0.064	(0)
	AlF4-	3.760e-07	3.230e-07	-6.425	-6.491	-0.066	(0)
	MnF+	1.320e-07	1.137e-07	-6.879	-6.944	-0.065	(0)
	HF	3.215e-08	3.215e-08	-7.493	-7.493	0.000	(0)
	AlF+2	7.325e-09	4.078e-09	-8.135	-8.390	-0.254	(0)
	CuF+	5.579e-09	4.623e-09	-8.253	-8.335	-0.082	(0)
	ZnF+	3.001e-09	2.486e-09	-8.523	-8.604	-0.082	(0)
	BF (OH) 3-	2.346e-09	1.987e-09	-8.630	-8.702	-0.072	(0)
	NiF+	5.566e-10	4.612e-10	-9.254	-9.336	-0.082	(0)
	CoF+	4.896e-10	4.057e-10	-9.310	-9.392	-0.082	(0)
	CrF+2	1.690e-10	7.965e-11	-9.772	-10.099	-0.327	(0)
	HF2-	4.527e-11	3.862e-11	-10.344	-10.413	-0.069	(0)
	CdF+	2.768e-11	2.293e-11	-10.558	-10.640	-0.082	(0)
	PbF+	2.328e-11	1.929e-11	-10.633	-10.715	-0.082	(0)
	AgF	1.419e-11	1.419e-11	-10.848	-10.848	0.000	(0)
	FeF2+	1.244e-11	1.072e-11	-10.905	-10.970	-0.065	(0)
	BF2 (OH) 2-	5.454e-12	4.619e-12	-11.263	-11.335	-0.072	(0)
	FeF3	4.780e-12	4.780e-12	-11.321	-11.321	0.000	(0)
	FeF+2	2.300e-12	1.268e-12	-11.638	-11.897	-0.259	(0)
	UO2F+	1.841e-13	1.525e-13	-12.735	-12.817	-0.082	(0)
	UO2F2	1.390e-13	1.390e-13	-12.857	-12.857	0.000	(0)
	PbF2	1.199e-13	1.199e-13	-12.921	-12.921	0.000	(0)
	CdF2	1.446e-14	1.446e-14	-13.840	-13.840	0.000	(0)
	UO2F3-	1.331e-14	1.103e-14	-13.876	-13.957	-0.082	(0)
	VO2F	4.581e-15	4.581e-15	-14.339	-14.339	0.000	(0)
	H2F2	2.770e-15	2.770e-15	-14.558	-14.558	0.000	(0)
	VO2F2-	6.342e-16	5.255e-16	-15.198	-15.279	-0.082	(0)
	PbF3-	8.673e-17	7.187e-17	-16.062	-16.143	-0.082	(0)
	UO2F4-2	5.872e-17	2.768e-17	-16.231	-16.558	-0.327	(0)
	VOF+	5.555e-17	4.603e-17	-16.255	-16.337	-0.082	(0)
	BF3OH-	4.615e-17	3.909e-17	-16.336	-16.408	-0.072	(0)
	VOF2	5.453e-18	5.453e-18	-17.263	-17.263	0.000	(0)
	VO2F3-2	4.393e-18	2.071e-18	-17.357	-17.684	-0.327	(0)
	VOF3-	7.377e-20	6.113e-20	-19.132	-19.214	-0.082	(0)
	PbF4-2	2.305e-20	1.087e-20	-19.637	-19.964	-0.327	(0)
	BF4-	4.939e-21	4.183e-21	-20.306	-20.379	-0.072	(0)
	VO2F4-3	1.749e-21	3.219e-22	-20.757	-21.492	-0.735	(0)
	VOF4-2	1.654e-22	7.795e-23	-21.782	-22.108	-0.327	(0)
	Sb (OH) 2F	1.706e-23	1.706e-23	-22.768	-22.768	0.000	(0)
	SbOF	1.679e-23	1.679e-23	-22.775	-22.775	0.000	(0)
	HgF+	5.401e-24	4.475e-24	-23.268	-23.349	-0.082	(0)
	UF3+	1.176e-33	9.743e-34	-32.930	-33.011	-0.082	(0)
	UF2+2	4.128e-35	1.946e-35	-34.384	-34.711	-0.327	(0)
	UF4	3.375e-35	3.375e-35	-34.472	-34.472	0.000	(0)
	UF5-	5.100e-37	4.226e-37	-36.292	-36.374	-0.082	(0)
	UF6-2	8.553e-38	4.032e-38	-37.068	-37.394	-0.327	(0)
	UF+3	2.657e-38	4.892e-39	-37.576	-38.311	-0.735	(0)
Fe (2)		7.934e-07					
	Fe+2	6.483e-07	3.056e-07	-6.188	-6.515	-0.327	(0)
	FeSO4	1.040e-07	1.040e-07	-6.983	-6.983	0.000	(0)
	FeHCO3+	3.900e-08	3.381e-08	-7.409	-7.471	-0.062	(0)

FeOH+	2.065e-09	1.780e-09	-8.685	-8.750	-0.065	(0)
Fe (OH) 2	2.068e-13	2.068e-13	-12.685	-12.685	0.000	(0)
Fe (OH) 3-	1.110e-14	9.563e-15	-13.955	-14.019	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.649	-146.649	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.072	-219.154	-0.082	(0)
Fe (3)	2.592e-05					
Fe (OH) 2+	2.278e-05	1.967e-05	-4.643	-4.706	-0.064	(0)
Fe (OH) 3	3.090e-06	3.090e-06	-5.510	-5.510	0.000	(0)
Fe (OH) 4-	4.873e-08	4.209e-08	-7.312	-7.376	-0.064	(0)
FeOH+2	6.271e-10	3.457e-10	-9.203	-9.461	-0.259	(0)
FeF2+	1.244e-11	1.072e-11	-10.905	-10.970	-0.065	(0)
FeF3	4.780e-12	4.780e-12	-11.321	-11.321	0.000	(0)
FeF+2	2.300e-12	1.268e-12	-11.638	-11.897	-0.259	(0)
FeSO4+	6.606e-14	5.693e-14	-13.180	-13.245	-0.065	(0)
Fe+3	1.451e-14	3.661e-15	-13.838	-14.436	-0.598	(0)
Fe (SO4) 2-	2.036e-15	1.687e-15	-14.691	-14.773	-0.082	(0)
FeCl+2	2.933e-16	1.617e-16	-15.533	-15.791	-0.259	(0)
Fe2 (OH) 2+4	8.016e-17	3.958e-18	-16.096	-17.403	-1.307	(0)
FeCl2+	1.226e-18	1.056e-18	-17.912	-17.976	-0.065	(0)
FeHSeO3+2	7.125e-19	3.358e-19	-18.147	-18.474	-0.327	(0)
Fe3 (OH) 4+5	1.238e-19	1.125e-21	-18.907	-20.949	-2.041	(0)
FeCl3	1.545e-22	1.545e-22	-21.811	-21.811	0.000	(0)
H (0)	4.008e-28					
H2	2.004e-28	2.016e-28	-27.698	-27.696	0.003	(0)
Hg (0)	2.121e-10					
Hg	2.121e-10	2.121e-10	-9.673	-9.673	0.000	(0)
Hg (1)	2.335e-22					
Hg2+2	1.167e-22	5.503e-23	-21.933	-22.259	-0.327	(0)
Hg (2)	2.817e-13					
HgClOH	1.444e-13	1.444e-13	-12.841	-12.841	0.000	(0)
HgCl2	8.173e-14	8.173e-14	-13.088	-13.088	0.000	(0)
Hg (OH) 2	5.128e-14	5.158e-14	-13.290	-13.288	0.003	(0)
HgCO3	2.738e-15	2.738e-15	-14.563	-14.563	0.000	(0)
HgCl3-	1.443e-15	1.195e-15	-14.841	-14.923	-0.082	(0)
Hg (CO3) 2-2	1.100e-16	5.184e-17	-15.959	-16.285	-0.327	(0)
HgCl4-2	1.476e-17	6.960e-18	-16.831	-17.157	-0.327	(0)
HgCl+	1.346e-17	1.115e-17	-16.871	-16.953	-0.082	(0)
HgHCO3+	4.234e-18	3.508e-18	-17.373	-17.455	-0.082	(0)
HgOH+	2.685e-18	2.225e-18	-17.571	-17.653	-0.082	(0)
Hg (OH) 3-	1.146e-21	9.498e-22	-20.941	-21.022	-0.082	(0)
Hg+2	8.107e-22	3.821e-22	-21.091	-21.418	-0.327	(0)
HgSO4	1.387e-22	1.387e-22	-21.858	-21.858	0.000	(0)
HgF+	5.401e-24	4.475e-24	-23.268	-23.349	-0.082	(0)
HgHS2-	0.000e+00	0.000e+00	-131.330	-131.411	-0.082	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.180	-132.180	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.630	-132.957	-0.327	(0)
K	6.986e-04					
K+	6.919e-04	5.937e-04	-3.160	-3.226	-0.066	(0)
KSO4-	6.743e-06	5.825e-06	-5.171	-5.235	-0.064	(0)
KCrO4-	2.048e-19	1.697e-19	-18.689	-18.770	-0.082	(0)
Mg	1.711e-03					
Mg+2	1.404e-03	7.610e-04	-2.853	-3.119	-0.266	(0)
MgSO4	1.919e-04	1.919e-04	-3.717	-3.717	0.000	(0)
MgHCO3+	7.993e-05	6.843e-05	-4.097	-4.165	-0.067	(0)
MgF+	3.141e-05	2.698e-05	-4.503	-4.569	-0.066	(0)
MgCO3	3.790e-06	3.790e-06	-5.421	-5.421	0.000	(0)
MgOH+	5.098e-08	4.431e-08	-7.293	-7.353	-0.061	(0)
MgH2BO3+	4.144e-09	3.510e-09	-8.383	-8.455	-0.072	(0)
Mn (2)	2.341e-05					
Mn+2	1.918e-05	9.042e-06	-4.717	-5.044	-0.327	(0)
MnSO4	2.228e-06	2.228e-06	-5.652	-5.652	0.000	(0)
MnHCO3+	1.840e-06	1.585e-06	-5.735	-5.800	-0.065	(0)
MnF+	1.320e-07	1.137e-07	-6.879	-6.944	-0.065	(0)
MnCl+	1.932e-08	1.665e-08	-7.714	-7.779	-0.065	(0)
MnOH+	3.855e-09	3.322e-09	-8.414	-8.479	-0.065	(0)
MnCl2	3.439e-11	3.439e-11	-10.464	-10.464	0.000	(0)
MnCl3-	1.608e-14	1.385e-14	-13.794	-13.858	-0.065	(0)
MnSeO4	2.121e-15	2.121e-15	-14.673	-14.673	0.000	(0)

Mn (OH) 3-	5.098e-19	4.392e-19	-18.293	-18.357	-0.065	(0)
Mn (OH) 4-2	3.762e-25	2.074e-25	-24.425	-24.683	-0.259	(0)
MnSe	3.149e-40	3.149e-40	-39.502	-39.502	0.000	(0)
Mn (3)	2.065e-25					
Mn+3	2.065e-25	5.208e-26	-24.685	-25.283	-0.598	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.467	-45.726	-0.259	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.917	-49.988	-0.071	(0)
Mo	5.413e-07					
MoO4-2	5.409e-07	2.932e-07	-6.267	-6.533	-0.266	(0)
HMoO4-	4.845e-10	4.015e-10	-9.315	-9.396	-0.082	(0)
H2MoO4	2.024e-13	2.024e-13	-12.694	-12.694	0.000	(0)
Ag2MoO4	3.549e-23	3.549e-23	-22.450	-22.450	0.000	(0)
AlMo6O21-3	4.656e-39	8.573e-40	-38.332	-39.067	-0.735	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.098	-50.037	-2.940	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.772	-50.813	-2.041	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.887	-53.193	-1.307	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.375	-57.110	-0.735	(0)
Na	4.942e-03					
Na+	4.883e-03	4.190e-03	-2.311	-2.378	-0.066	(0)
NaSO4-	3.611e-05	3.119e-05	-4.442	-4.506	-0.064	(0)
NaHCO3	2.071e-05	2.071e-05	-4.684	-4.684	0.000	(0)
NaF	8.353e-07	8.353e-07	-6.078	-6.078	0.000	(0)
NaCO3-	5.408e-07	4.672e-07	-6.267	-6.331	-0.064	(0)
NaH2BO3	8.833e-10	8.833e-10	-9.054	-9.054	0.000	(0)
NaCrO4-	1.933e-18	1.602e-18	-17.714	-17.795	-0.082	(0)
Ni	2.132e-07					
Ni+2	1.072e-07	5.811e-08	-6.970	-7.236	-0.266	(0)
NiHCO3+	7.598e-08	6.296e-08	-7.119	-7.201	-0.082	(0)
NiSO4	1.607e-08	1.607e-08	-7.794	-7.794	0.000	(0)
NiCO3	1.298e-08	1.298e-08	-7.887	-7.887	0.000	(0)
NiF+	5.566e-10	4.612e-10	-9.254	-9.336	-0.082	(0)
NiCl+	2.624e-10	2.175e-10	-9.581	-9.663	-0.082	(0)
NiOH+	1.291e-10	1.070e-10	-9.889	-9.971	-0.082	(0)
Ni (SO4) 2-2	1.564e-12	7.375e-13	-11.806	-12.132	-0.327	(0)
Ni (OH) 2	1.243e-12	1.243e-12	-11.905	-11.905	0.000	(0)
NiCl2	1.601e-15	1.601e-15	-14.796	-14.796	0.000	(0)
Ni (OH) 3-	2.195e-16	1.819e-16	-15.659	-15.740	-0.082	(0)
NiSeO4	2.369e-17	2.369e-17	-16.625	-16.625	0.000	(0)
O (0)	2.478e-37					
O2	1.239e-37	1.246e-37	-36.907	-36.904	0.003	(0)
Pb	2.565e-08					
PbCO3	1.559e-08	1.559e-08	-7.807	-7.807	0.000	(0)
PbHCO3+	6.827e-09	5.657e-09	-8.166	-8.247	-0.082	(0)
Pb+2	1.598e-09	8.664e-10	-8.796	-9.062	-0.266	(0)
PbSO4	5.881e-10	5.881e-10	-9.231	-9.231	0.000	(0)
Pb (CO3) 2-2	5.712e-10	2.692e-10	-9.243	-9.570	-0.327	(0)
PbOH+	3.842e-10	3.183e-10	-9.415	-9.497	-0.082	(0)
PbCl+	5.426e-11	4.496e-11	-10.266	-10.347	-0.082	(0)
PbF+	2.328e-11	1.929e-11	-10.633	-10.715	-0.082	(0)
Pb (SO4) 2-2	1.042e-11	4.911e-12	-10.982	-11.309	-0.327	(0)
Pb (OH) 2	1.472e-12	1.472e-12	-11.832	-11.832	0.000	(0)
PbCl2	2.937e-13	2.937e-13	-12.532	-12.532	0.000	(0)
PbF2	1.199e-13	1.199e-13	-12.921	-12.921	0.000	(0)
Pb (OH) 3-	2.599e-16	2.154e-16	-15.585	-15.667	-0.082	(0)
PbCl3-	2.064e-16	1.710e-16	-15.685	-15.767	-0.082	(0)
PbF3-	8.673e-17	7.187e-17	-16.062	-16.143	-0.082	(0)
Pb2OH+3	2.374e-17	4.371e-18	-16.625	-17.359	-0.735	(0)
PbCl4-2	2.425e-19	1.143e-19	-18.615	-18.942	-0.327	(0)
PbF4-2	2.305e-20	1.087e-20	-19.637	-19.964	-0.327	(0)
Pb (OH) 4-2	1.637e-20	7.714e-21	-19.786	-20.113	-0.327	(0)
Pb3 (OH) 4+2	7.950e-23	3.747e-23	-22.100	-22.426	-0.327	(0)
Pb4 (OH) 4+4	5.223e-27	2.579e-28	-26.282	-27.589	-1.307	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.876	-142.876	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.037	-216.118	-0.082	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-68.475	-68.475	0.000	(0)

HS-	0.000e+00	0.000e+00	-74.460	-74.542	-0.082	(0)
H2S	0.000e+00	0.000e+00	-74.684	-74.684	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.791	-74.873	-0.082	(0)
S5-2	0.000e+00	0.000e+00	-76.418	-76.745	-0.327	(0)
S6-2	0.000e+00	0.000e+00	-76.934	-77.261	-0.327	(0)
S4-2	0.000e+00	0.000e+00	-77.014	-77.340	-0.327	(0)
S3-2	0.000e+00	0.000e+00	-77.820	-78.146	-0.327	(0)
S2-2	0.000e+00	0.000e+00	-78.836	-79.162	-0.327	(0)
S-2	0.000e+00	0.000e+00	-84.421	-84.680	-0.259	(0)
HgHS2-	0.000e+00	0.000e+00	-131.330	-131.411	-0.082	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.180	-132.180	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.630	-132.957	-0.327	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.836	-138.917	-0.082	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.056	-139.238	-0.183	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.092	-140.424	-0.333	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.837	-141.154	-0.317	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.175	-141.516	-0.341	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.434	-141.516	-0.082	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.502	-141.827	-0.325	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.211	-142.211	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.668	-142.668	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.876	-142.876	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.649	-146.649	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.280	-204.362	-0.082	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.848	-213.930	-0.082	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.772	-214.853	-0.082	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.037	-216.118	-0.082	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.421	-216.748	-0.327	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.072	-219.154	-0.082	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.873	-287.199	-0.327	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.605	-289.932	-0.327	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.375	-299.701	-0.327	(0)
S (6)	3.518e-03					
SO4-2	2.556e-03	1.386e-03	-2.592	-2.858	-0.266	(0)
CaSO4	7.249e-04	7.249e-04	-3.140	-3.140	0.000	(0)
MgSO4	1.919e-04	1.919e-04	-3.717	-3.717	0.000	(0)
NaSO4-	3.611e-05	3.119e-05	-4.442	-4.506	-0.064	(0)
KSO4-	6.743e-06	5.825e-06	-5.171	-5.235	-0.064	(0)
MnSO4	2.228e-06	2.228e-06	-5.652	-5.652	0.000	(0)
ZnSO4	1.196e-07	1.196e-07	-6.922	-6.922	0.000	(0)
FeSO4	1.040e-07	1.040e-07	-6.983	-6.983	0.000	(0)
CuSO4	7.363e-08	7.363e-08	-7.133	-7.133	0.000	(0)
NiSO4	1.607e-08	1.607e-08	-7.794	-7.794	0.000	(0)
CoSO4	1.123e-08	1.123e-08	-7.950	-7.950	0.000	(0)
HSO4-	1.085e-08	9.319e-09	-7.965	-8.031	-0.066	(0)
Zn (SO4) 2-2	3.062e-09	1.444e-09	-8.514	-8.841	-0.327	(0)
CrOHSO4	1.674e-09	1.674e-09	-8.776	-8.776	0.000	(0)
CdSO4	1.488e-09	1.488e-09	-8.827	-8.827	0.000	(0)
AgSO4-	5.967e-10	4.944e-10	-9.224	-9.306	-0.082	(0)
PbSO4	5.881e-10	5.881e-10	-9.231	-9.231	0.000	(0)
Cd (SO4) 2-2	5.901e-11	2.782e-11	-10.229	-10.556	-0.327	(0)
AlSO4+	1.616e-11	1.388e-11	-10.791	-10.857	-0.066	(0)
Pb (SO4) 2-2	1.042e-11	4.911e-12	-10.982	-11.309	-0.327	(0)
CrSO4+	6.213e-12	5.148e-12	-11.207	-11.288	-0.082	(0)
Ni (SO4) 2-2	1.564e-12	7.375e-13	-11.806	-12.132	-0.327	(0)
Al (SO4) 2-	2.400e-13	2.062e-13	-12.620	-12.686	-0.066	(0)
FeSO4+	6.606e-14	5.693e-14	-13.180	-13.245	-0.065	(0)
UO2SO4	7.336e-15	7.336e-15	-14.135	-14.135	0.000	(0)
Fe (SO4) 2-	2.036e-15	1.687e-15	-14.691	-14.773	-0.082	(0)
Cr2 (OH) 2SO4+2	1.634e-15	7.702e-16	-14.787	-15.113	-0.327	(0)
VO2SO4-	3.302e-16	2.736e-16	-15.481	-15.563	-0.082	(0)
UO2 (SO4) 2-2	2.843e-16	1.340e-16	-15.546	-15.873	-0.327	(0)
Cr2 (OH) 2 (SO4) 2	6.341e-17	6.341e-17	-16.198	-16.198	0.000	(0)
VOSO4	9.271e-18	9.271e-18	-17.033	-17.033	0.000	(0)
HgSO4	1.387e-22	1.387e-22	-21.858	-21.858	0.000	(0)
CrO3SO4-2	1.056e-24	4.977e-25	-23.976	-24.303	-0.327	(0)
VSO4+	3.498e-31	2.899e-31	-30.456	-30.538	-0.082	(0)
U (SO4) 2	4.713e-40	4.713e-40	-39.327	-39.327	0.000	(0)

USO4+2	0.000e+00	0.000e+00	-40.042	-40.368	-0.327	(0)
Sb (3)	9.927e-19					
Sb (OH) 3	5.022e-19	5.022e-19	-18.299	-18.299	0.000	(0)
HSbO2	4.904e-19	4.904e-19	-18.309	-18.309	0.000	(0)
Sb (OH) 2F	1.706e-23	1.706e-23	-22.768	-22.768	0.000	(0)
SbOF	1.679e-23	1.679e-23	-22.775	-22.775	0.000	(0)
SbO2-	1.393e-23	1.154e-23	-22.856	-22.938	-0.082	(0)
Sb (OH) 4-	7.976e-24	6.608e-24	-23.098	-23.180	-0.082	(0)
Sb (OH) 2+	1.013e-24	8.395e-25	-23.994	-24.076	-0.082	(0)
SbO+	3.495e-25	2.896e-25	-24.457	-24.538	-0.082	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.375	-299.701	-0.327	(0)
Sb (5)	1.297e-08					
SbO3-	1.295e-08	1.073e-08	-7.888	-7.969	-0.082	(0)
Sb (OH) 6-	1.461e-11	1.254e-11	-10.835	-10.902	-0.066	(0)
SbO2+	1.760e-23	1.458e-23	-22.755	-22.836	-0.082	(0)
Se (-2)	2.201e-10					
Ag2Se	2.201e-10	2.201e-10	-9.657	-9.657	0.000	(0)
HSe-	7.017e-37	5.815e-37	-36.154	-36.235	-0.082	(0)
MnSe	3.149e-40	3.149e-40	-39.502	-39.502	0.000	(0)
H2Se	3.106e-40	3.106e-40	-39.508	-39.508	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.746	-44.073	-0.327	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.934	-79.241	-1.307	(0)
Se (4)	4.616e-08					
HSeO3-	4.190e-08	3.472e-08	-7.378	-7.459	-0.082	(0)
SeO3-2	4.261e-09	2.009e-09	-8.370	-8.697	-0.327	(0)
H2SeO3	1.019e-12	1.019e-12	-11.992	-11.992	0.000	(0)
AgSeO3-	2.786e-14	2.308e-14	-13.555	-13.637	-0.082	(0)
FeHSeO3+2	7.125e-19	3.358e-19	-18.147	-18.474	-0.327	(0)
Cd (SeO3) 2-2	3.231e-20	1.523e-20	-19.491	-19.817	-0.327	(0)
Ag (SeO3) 2-3	2.255e-21	4.152e-22	-20.647	-21.382	-0.735	(0)
Se (6)	1.610e-12					
SeO4-2	1.607e-12	8.715e-13	-11.794	-12.060	-0.266	(0)
MnSeO4	2.121e-15	2.121e-15	-14.673	-14.673	0.000	(0)
ZnSeO4	5.324e-17	5.324e-17	-16.274	-16.274	0.000	(0)
NiSeO4	2.369e-17	2.369e-17	-16.625	-16.625	0.000	(0)
CoSeO4	1.774e-17	1.774e-17	-16.751	-16.751	0.000	(0)
HSeO4-	3.627e-18	3.005e-18	-17.440	-17.522	-0.082	(0)
CdSeO4	7.433e-19	7.433e-19	-18.129	-18.129	0.000	(0)
Zn (SeO4) 2-2	9.980e-29	4.704e-29	-28.001	-28.327	-0.327	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.282	-58.017	-0.735	(0)
U (4)	4.606e-22					
U (OH) 5-	4.595e-22	3.807e-22	-21.338	-21.419	-0.082	(0)
U (OH) 4	1.098e-24	1.098e-24	-23.960	-23.960	0.000	(0)
U (OH) 3+	3.334e-28	2.763e-28	-27.477	-27.559	-0.082	(0)
U (OH) 2+2	1.866e-32	8.794e-33	-31.729	-32.056	-0.327	(0)
UF3+	1.176e-33	9.743e-34	-32.930	-33.011	-0.082	(0)
UF2+2	4.128e-35	1.946e-35	-34.384	-34.711	-0.327	(0)
UF4	3.375e-35	3.375e-35	-34.472	-34.472	0.000	(0)
UF5-	5.100e-37	4.226e-37	-36.292	-36.374	-0.082	(0)
UOH+3	1.549e-37	2.851e-38	-36.810	-37.545	-0.735	(0)
UF6-2	8.553e-38	4.032e-38	-37.068	-37.394	-0.327	(0)
UF+3	2.657e-38	4.892e-39	-37.576	-38.311	-0.735	(0)
U (SO4) 2	4.713e-40	4.713e-40	-39.327	-39.327	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.042	-40.368	-0.327	(0)
U+4	0.000e+00	0.000e+00	-42.804	-44.110	-1.307	(0)
UCl+3	0.000e+00	0.000e+00	-44.510	-45.245	-0.735	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.769	-174.384	-6.614	(0)
U (5)	1.995e-17					
UO2+	1.995e-17	1.653e-17	-16.700	-16.782	-0.082	(0)
U (6)	8.173e-08					
UO2 (CO3) 3-4	6.052e-08	2.988e-09	-7.218	-8.525	-1.307	(0)
UO2 (CO3) 2-2	2.112e-08	9.958e-09	-7.675	-8.002	-0.327	(0)
UO2CO3	8.336e-11	8.336e-11	-10.079	-10.079	0.000	(0)
UO2F+	1.841e-13	1.525e-13	-12.735	-12.817	-0.082	(0)
UO2F2	1.390e-13	1.390e-13	-12.857	-12.857	0.000	(0)
UO2OH+	7.772e-14	6.440e-14	-13.109	-13.191	-0.082	(0)
UO2F3-	1.331e-14	1.103e-14	-13.876	-13.957	-0.082	(0)

UO2SO4	7.336e-15	7.336e-15	-14.135	-14.135	0.000	(0)
UO2+2	6.451e-15	3.497e-15	-14.190	-14.456	-0.266	(0)
UO2 (SO4) 2-2	2.843e-16	1.340e-16	-15.546	-15.873	-0.327	(0)
UO2F4-2	5.872e-17	2.768e-17	-16.231	-16.558	-0.327	(0)
UO2Cl+	1.001e-17	8.295e-18	-17.000	-17.081	-0.082	(0)
(UO2) 2 (OH) 2+2	1.460e-20	6.883e-21	-19.836	-20.162	-0.327	(0)
(UO2) 3 (OH) 5+	8.681e-24	7.193e-24	-23.061	-23.143	-0.082	(0)
V (2)	1.318e-39					
VOH+	9.613e-40	7.965e-40	-39.017	-39.099	-0.082	(0)
V+2	3.570e-40	1.683e-40	-39.447	-39.774	-0.327	(0)
V (3)	1.118e-12					
V (OH) 3	1.118e-12	1.118e-12	-11.951	-11.951	0.000	(0)
V (OH) 2+	6.004e-23	4.975e-23	-22.222	-22.303	-0.082	(0)
VOH+2	6.891e-26	3.248e-26	-25.162	-25.488	-0.327	(0)
V+3	2.407e-30	4.431e-31	-29.619	-30.354	-0.735	(0)
VSO4+	3.498e-31	2.899e-31	-30.456	-30.538	-0.082	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.605	-49.340	-0.735	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.870	-50.177	-1.307	(0)
V (4)	9.771e-16					
V (OH) 3+	8.551e-16	7.085e-16	-15.068	-15.150	-0.082	(0)
VOF+	5.555e-17	4.603e-17	-16.255	-16.337	-0.082	(0)
VO+2	5.153e-17	2.429e-17	-16.288	-16.615	-0.327	(0)
VOSO4	9.271e-18	9.271e-18	-17.033	-17.033	0.000	(0)
VOF2	5.453e-18	5.453e-18	-17.263	-17.263	0.000	(0)
VOC1+	1.203e-19	9.966e-20	-18.920	-19.001	-0.082	(0)
VOF3-	7.377e-20	6.113e-20	-19.132	-19.214	-0.082	(0)
VOF4-2	1.654e-22	7.795e-23	-21.782	-22.108	-0.327	(0)
H2V2O4+2	5.342e-26	2.518e-26	-25.272	-25.599	-0.327	(0)
V (5)	1.124e-07					
H2VO4-	1.055e-07	8.742e-08	-6.977	-7.058	-0.082	(0)
HVO4-2	6.770e-09	3.191e-09	-8.169	-8.496	-0.327	(0)
H3VO4	6.015e-11	6.015e-11	-10.221	-10.221	0.000	(0)
H3V2O7-	4.100e-11	3.397e-11	-10.387	-10.469	-0.082	(0)
HV2O7-3	5.137e-13	9.459e-14	-12.289	-13.024	-0.735	(0)
VO2+	9.634e-15	8.267e-15	-14.016	-14.083	-0.066	(0)
VO2F	4.581e-15	4.581e-15	-14.339	-14.339	0.000	(0)
V3O9-3	3.806e-15	7.007e-16	-14.420	-15.154	-0.735	(0)
VO4-3	1.263e-15	2.325e-16	-14.899	-15.634	-0.735	(0)
V2O7-4	7.494e-16	3.700e-17	-15.125	-16.432	-1.307	(0)
VO2F2-	6.342e-16	5.255e-16	-15.198	-15.279	-0.082	(0)
VO2SO4-	3.302e-16	2.736e-16	-15.481	-15.563	-0.082	(0)
VO2F3-2	4.393e-18	2.071e-18	-17.357	-17.684	-0.327	(0)
V4O12-4	5.175e-19	2.555e-20	-18.286	-19.593	-1.307	(0)
VO2F4-3	1.749e-21	3.219e-22	-20.757	-21.492	-0.735	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.259	-49.301	-2.041	(0)
V10O28-6	0.000e+00	0.000e+00	-47.385	-50.325	-2.940	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.949	-51.255	-1.307	(0)
Zn	1.130e-06					
Zn+2	7.275e-07	3.944e-07	-6.138	-6.404	-0.266	(0)
ZnCO3	1.359e-07	1.359e-07	-6.867	-6.867	0.000	(0)
ZnHCO3+	1.323e-07	1.096e-07	-6.879	-6.960	-0.082	(0)
ZnSO4	1.196e-07	1.196e-07	-6.922	-6.922	0.000	(0)
ZnOH+	6.963e-09	5.769e-09	-8.157	-8.239	-0.082	(0)
Zn (SO4) 2-2	3.062e-09	1.444e-09	-8.514	-8.841	-0.327	(0)
ZnF+	3.001e-09	2.486e-09	-8.523	-8.604	-0.082	(0)
ZnCl+	1.693e-09	1.449e-09	-8.771	-8.839	-0.067	(0)
ZnOHC1	2.775e-10	2.775e-10	-9.557	-9.557	0.000	(0)
Zn (OH) 2	1.337e-10	1.337e-10	-9.874	-9.874	0.000	(0)
ZnCl2	3.359e-12	3.359e-12	-11.474	-11.474	0.000	(0)
Zn (OH) 3-	1.183e-13	9.804e-14	-12.927	-13.009	-0.082	(0)
ZnCl3-	4.558e-15	3.902e-15	-14.341	-14.409	-0.067	(0)
ZnSeO4	5.324e-17	5.324e-17	-16.274	-16.274	0.000	(0)
ZnCl4-2	5.176e-18	2.853e-18	-17.286	-17.545	-0.259	(0)
Zn (OH) 4-2	1.211e-18	5.709e-19	-17.917	-18.243	-0.327	(0)
Zn (SeO4) 2-2	9.980e-29	4.704e-29	-28.001	-28.327	-0.327	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.434	-141.516	-0.082	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.668	-142.668	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.848	-213.930	-0.082	(0)

ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.421	-216.748	-0.327	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.605	-289.932	-0.327	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Acanthite	-46.65	-82.87	-36.22	Ag2S
Ag2CO3	-9.63	-20.72	-11.09	Ag2CO3
Ag2CrO4	-20.02	-31.61	-11.59	Ag2CrO4
Ag2HVO4	-9.57	-8.09	1.48	Ag2HVO4
Ag2MoO4	-10.48	-22.03	-11.55	Ag2MoO4
Ag2O	-13.74	-1.17	12.57	Ag2O
Ag2Se	4.13	-44.57	-48.70	Ag2Se
Ag2SeO3	-8.64	-15.79	-7.15	Ag2SeO3
Ag2SeO4	-18.64	-27.55	-8.91	Ag2SeO4
Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.54	-20.38	2.16	Ag3AsO3
Ag3AsO4	-11.95	-14.73	-2.79	Ag3AsO4
Ag3H2VO5	-13.86	-8.68	5.18	Ag3H2VO5
AgF:4H2O	-12.30	-11.25	1.05	AgF:4H2O
Agmetal	0.65	-12.86	-13.51	Ag
AgVO3	-8.28	-7.51	0.77	AgVO3
Al (OH) 3 (am)	-1.20	9.60	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.74	-43.38	2.37	Al2 (MoO4) 3
Al2O3	-0.46	19.20	19.65	Al2O3
Al4 (OH) 10SO4	-1.49	21.21	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-8.18	-3.38	4.80	AlAsO4:2H2O
AlOHSO4	-4.36	-7.59	-3.23	AlOHSO4
AlSb	-147.96	-82.34	65.62	AlSb
Alunite	-0.24	-1.64	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.13	-11.92	-7.79	PbSO4
Anhydrite	-1.14	-5.50	-4.36	CaSO4
Anilite	-50.74	-82.62	-31.88	Cu0.25Cu1.5S
Antlerite	-2.90	5.89	8.79	Cu3 (OH) 4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-71.74	-74.50	-2.76	As4O6
Artinite	-6.74	2.86	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-32.66	-25.95	6.71	As2O5
Atacamite	-2.01	5.38	7.39	Cu2 (OH) 3Cl
Azurite	0.88	-16.03	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.20	8.20	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-13.32	2.55	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.55	-1.36	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-22.19	10.75	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.57	-22.24	-9.67	BaCrO4
BaF2	-7.31	-13.13	-5.82	BaF2
BaMoO4	-5.70	-12.66	-6.96	BaMoO4
Barite	0.99	-8.99	-9.98	BaSO4
BaS	-89.69	-73.51	16.18	BaS
BaSeO3	-8.25	-6.42	1.83	BaSeO3
BaSeO4	-10.73	-18.19	-7.46	BaSeO4
Bianchite	-7.50	-9.26	-1.76	ZnSO4:6H2O
Birnessite	-9.61	8.48	18.09	MnO2
Bixbyite	-6.95	-7.59	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.33	-78.60	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-54.05	-72.57	-18.52	NiSb
Brochantite	-1.65	13.58	15.22	Cu4 (OH) 6SO4
Brucite	-5.64	11.21	16.84	Mg (OH) 2
Bunsenite	-5.36	7.09	12.45	NiO
Ca (VO3) 2	-7.82	-2.16	5.66	Ca (VO3) 2
Ca2V2O7	-7.97	9.53	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.03	9.52	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-13.20	9.10	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.75	21.21	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.65	21.21	39.86	Ca3 (VO4) 2:4H2O

Ca3Sb2	-291.79	-148.82	142.97	Ca3Sb2
CaCrO4	-16.49	-18.76	-2.27	CaCrO4
Calcite	0.62	-7.86	-8.48	CaCO3
Calomel	-10.02	-27.93	-17.91	Hg2Cl2
CaMoO4	-1.22	-9.17	-7.95	CaMoO4
Carnotite	-3.35	-3.12	0.23	KUO2VO4
CaSeO3:2H2O	-5.75	-2.94	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.68	-14.70	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.46	-3.62	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.12	-16.41	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.79	0.77	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.64	6.76	28.40	Cd4(OH)6SO4
CdCl2	-13.35	-14.01	-0.66	CdCl2
CdCl2:1H2O	-12.32	-14.01	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.10	-14.01	-1.91	CdCl2:2.5H2O
CdF2	-14.13	-15.34	-1.21	CdF2
Cdmetal(alpha)	-32.07	-18.56	13.51	Cd
Cdmetal(gamma)	-32.18	-18.56	13.62	Cd
CdMoO4	-0.72	-14.87	-14.15	CdMoO4
CdOHCl	-7.55	-4.01	3.54	CdOHCl
CdSb	-73.33	-73.68	-0.35	CdSb
CdSe	-17.21	-37.41	-20.20	CdSe
CdSeO4:2H2O	-18.55	-20.40	-1.85	CdSeO4:2H2O
CdSO4	-11.03	-11.20	-0.17	CdSO4
CdSO4:1H2O	-9.47	-11.20	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.32	-11.20	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.16	-14.29	-13.13	PbCO3
CH4(g)	-76.68	-117.73	-41.05	CH4
Chalcanthite	-6.85	-9.49	-2.64	CuSO4:5H2O
Chalcocite	-50.57	-85.49	-34.92	Cu2S
Chalcopyrite	-112.64	-147.91	-35.27	CuFeS2
Cinnabar	-49.30	-94.99	-45.69	HgS
Claudetite	-71.43	-74.50	-3.06	As4O6
Clausthalite	-11.04	-38.14	-27.10	PbSe
Co(BO2)2	-29.74	-2.67	27.07	Co(BO2)2
Co(OH)2	-6.16	6.93	13.09	Co(OH)2
Co(OH)3	-10.89	-13.19	-2.31	Co(OH)3
CO2(g)	-1.40	-19.55	-18.15	CO2
Co3(AsO4)2	-18.19	-5.15	13.03	Co3(AsO4)2
Co3O4	-8.96	-19.46	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-2.63	-12.61	-9.98	CoCO3
CoF2	-12.80	-14.39	-1.60	CoF2
CoF3	-43.72	-45.18	-1.46	CoF3
CoFe2O4	24.56	21.03	-3.53	CoFe2O4
CoMoO4	-6.16	-13.92	-7.76	CoMoO4
CoO	-6.65	6.93	13.59	CoO
CoS(alpha)	-67.33	-74.77	-7.44	CoS
CoS(beta)	-63.70	-74.77	-11.07	CoS
CoSe	-20.26	-36.46	-16.20	CoSe
CoSeO3	-9.01	-7.69	1.32	CoSeO3
CoSeO4:6H2O	-17.92	-19.45	-1.53	CoSeO4:6H2O
CoSO4	-13.05	-10.25	2.80	CoSO4
CoSO4:6H2O	-7.78	-10.25	-2.47	CoSO4:6H2O
Cotunnite	-9.95	-14.73	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr(OH)2	-20.03	-9.21	10.82	Cr(OH)2
Cr(OH)3	-1.22	0.12	1.34	Cr(OH)3
Cr(OH)3(am)	0.87	0.12	-0.75	Cr(OH)3
Cr2O3	2.60	0.24	-2.36	Cr2O3
CrCl2	-43.29	-29.20	14.09	CrCl2
CrCl3	-44.99	-29.87	15.11	CrCl3
CrF3	-20.53	-31.87	-11.34	CrF3
Crmetal	-64.23	-33.75	30.48	Cr

CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.18	-40.02	-33.84	Na3AlF6
Cu(OH)2	-0.98	7.69	8.67	Cu(OH)2
Cu(SbO3)2	-25.03	20.18	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-51.26	-86.14	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-1.38	-47.18	-45.80	Cu2Se
Cu2SO4	-19.02	-20.97	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-8.98	-2.88	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-55.02	-97.61	-42.59	Cu3Sb
Cu3Se2	-19.40	-82.89	-63.49	Cu3Se2
CuCO3	-0.36	-11.86	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.65	-12.56	-4.91	CuF
CuF2	-14.75	-13.64	1.12	CuF2
CuF2:2H2O	-9.09	-13.64	-4.55	CuF2:2H2O
Cumetal	-5.41	-14.17	-8.76	Cu
CuMoO4	-0.09	-13.17	-13.08	CuMoO4
CuOCuSO4	-12.11	-1.80	10.30	CuOCuSO4
Cupricferrite	15.80	21.79	5.99	CuFe2O4
Cuprite	-2.38	-3.79	-1.41	Cu2O
Cuprousferrite	14.07	5.16	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.56	-33.37	CuSe2
CuSeO3:2H2O	-7.44	-6.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.26	-18.70	-2.44	CuSeO4:5H2O
CuSO4	-12.43	-9.49	2.94	CuSO4
Diaspore	2.72	9.60	6.87	AlOOH
Djurleite	-50.81	-84.73	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.33	-16.21	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.88	-16.21	-17.09	CaMg(CO3)2
Epsomite	-3.85	-5.98	-2.13	MgSO4:7H2O
Fe(OH)2	-5.75	7.81	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.09	4.05	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-2.31	-6.03	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.08	-0.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-9.14	-29.76	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.71	-37.45	-3.73	Fe2(SO4)3
Fe3(OH)8	1.69	21.91	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.33	-5.93	0.40	FeAsO4:2H2O
FeCr2O4	0.85	8.05	7.20	FeCr2O4
FeMoO4	-2.96	-13.05	-10.09	FeMoO4
Ferrihydrite	3.86	7.05	3.19	Fe(OH)3
Ferroselite	-35.84	-54.44	-18.60	FeSe2
FeS(ppt)	-70.94	-73.89	-2.95	FeS
FeSe	-24.59	-35.59	-11.00	FeSe
Fix_pe	-5.11	-5.11	0.00	e-
Fluorite	0.86	-9.64	-10.50	CaF2
Galena	-62.47	-76.44	-13.97	PbS
Gibbsite	1.31	9.60	8.29	Al(OH)3
Goethite	6.56	7.05	0.49	FeOOH
Goslarite	-7.25	-9.26	-2.01	ZnSO4:7H2O
Greenockite	-61.36	-75.72	-14.36	CdS
Greigite	-259.87	-304.91	-45.03	Fe3S4
Gummite	-7.80	-0.13	7.67	UO3
Gypsum	-0.89	-5.50	-4.61	CaSO4:2H2O
H-Jarosite	-1.12	-13.22	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.98	-20.86	-12.88	H2MoO4
H2S(g)	-73.69	-81.70	-8.01	H2S
H2Se(g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.82	-5.21	1.60	NaCl
Hausmannite	-8.64	52.39	61.03	Mn3O4
Hematite	15.52	14.10	-1.42	Fe2O3
Hercynite	4.11	27.00	22.89	FeAl2O4
Hg(CH3)2(g)	-175.04	-248.75	-73.71	Hg(CH3)2
Hg(g)	-8.37	-16.24	-7.87	Hg
Hg(OH)2	-9.79	-13.29	-3.50	Hg(OH)2
Hg2(g)	-17.52	-32.48	-14.96	Hg2
Hg2(OH)2	-13.20	-7.94	5.26	Hg2(OH)2

Hg2CO3	-11.43	-27.48	-16.05	Hg2CO3
Hg2CrO4	-29.67	-38.37	-8.70	Hg2CrO4
Hg2F2	-18.90	-29.26	-10.36	Hg2F2
Hg2S	-77.96	-89.64	-11.68	Hg2S
Hg2SeO3	-17.90	-22.56	-4.66	Hg2SeO3
Hg2SO4	-18.99	-25.12	-6.13	Hg2SO4
Hg3O2CO3	-29.73	-59.41	-29.68	Hg3O2CO3
HgCl (g)	-33.46	-13.96	19.50	HgCl
HgCl2	-12.02	-33.28	-21.26	HgCl2
HgF (g)	-47.31	-14.63	32.68	HgF
HgF2 (g)	-47.18	-34.61	12.57	HgF2
Hgmetal (l)	-2.79	-16.24	-13.45	Hg
HgSe	-0.99	-56.68	-55.69	HgSe
HgSeO3	-15.48	-27.91	-12.43	HgSeO3
HgSO4	-21.05	-30.47	-9.42	HgSO4
Huntite	-2.92	-32.89	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-4.54	-23.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.39	-22.16	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.66	-20.83	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	5.52	-9.28	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.76	-53.01	-17.24	K2Cr2O7
K2CrO4	-22.05	-22.57	-0.51	K2CrO4
K2MoO4	-16.25	-12.99	3.26	K2MoO4
K2SeO4	-17.78	-18.51	-0.73	K2SeO4
Langite	-3.91	13.58	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.22	-6.66	-0.43	PbO : PbSO4
Laurionite	-5.36	-4.74	0.62	PbOHCl
Lepidocrocite	5.68	7.05	1.37	FeOOH
Lime	-21.02	11.68	32.70	CaO
Litharge	-7.43	5.26	12.69	PbO
Mackinawite	-70.29	-73.89	-3.60	FeS
Maghemite	7.71	14.10	6.39	Fe2O3
Magnesioferrite	8.45	25.31	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	18.51	21.91	3.40	Fe3O4
Malachite	1.14	-4.17	-5.31	Cu2 (OH) 2CO3
Manganite	-3.79	21.55	25.34	MnOOH
Massicot	-7.63	5.26	12.89	PbO
Matlockite	-6.42	-15.40	-8.97	PbClF
Melanothallite	-18.56	-12.30	6.26	CuCl2
Melanterite	-7.17	-9.37	-2.21	FeSO4 : 7H2O
Metacinnabar	-49.90	-94.99	-45.09	HgS
Mg (OH) 2 (active)	-7.59	11.21	18.79	Mg (OH) 2
Mg (VO3) 2	-13.91	-2.63	11.28	Mg (VO3) 2
Mg2Sb3	-266.71	-192.03	74.68	Mg2Sb3
Mg2V2O7	-17.79	8.57	26.36	Mg2V2O7
MgCr2O4	-4.76	11.45	16.20	MgCr2O4
MgCrO4	-24.61	-19.23	5.38	MgCrO4
MgF2	-1.99	-10.12	-8.13	MgF2
MgMoO4	-7.80	-9.65	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.47	-3.42	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.98	-15.18	-1.20	MgSeO4 : 6H2O
Minium	-33.19	40.33	73.52	Pb3O4
Mirabilite	-6.50	-7.62	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.46	-4.56	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-53.43	-59.14	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.73	-85.65	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.61	1.89	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.43	-10.71	2.72	MnCl2 : 4H2O
MnS (grn)	-72.59	-72.42	0.17	MnS
MnS (pnk)	-75.76	-72.42	3.34	MnS
MnSb	-92.82	-95.73	-2.91	MnSb
MnSe	-37.62	-34.12	3.50	MnSe
MnSeO3	-6.47	-5.34	1.13	MnSeO3
MnSeO3 : 2H2O	-6.32	-5.34	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-15.05	-17.10	-2.05	MnSeO4 : 5H2O
MnSO4	-10.49	-7.90	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO

Montroydite	-9.65	-13.29	-3.64	HgO
MoO3	-12.86	-20.86	-8.00	MoO3
Morenosite	-7.95	-10.10	-2.14	NiSO4:7H2O
MoS2	-138.55	-208.81	-70.26	MoS2
Na-Jarosite	2.77	-8.43	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.41	-51.31	-9.90	Na2Cr2O7
Na2CrO4	-23.80	-20.87	2.93	Na2CrO4
Na2Mo2O7	-15.55	-32.15	-16.60	Na2Mo2O7
Na2MoO4	-12.78	-11.29	1.49	Na2MoO4
Na2MoO4:2H2O	-12.51	-11.29	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.35	-5.05	10.30	Na2SeO3:5H2O
Na2SeO4	-18.10	-16.82	1.28	Na2SeO4
Na3Sb	-172.03	-77.58	94.45	Na3Sb
Na3VO4	-29.25	7.43	36.68	Na3VO4
Na4V2O7	-32.10	5.30	37.40	Na4V2O7
Nantokite	-5.16	-11.89	-6.73	CuCl
NaSb	-85.77	-62.61	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-5.99	-2.14	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-5.71	7.09	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.39	-4.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.83	11.17	32.00	Ni4(OH)6SO4
NiCO3	-5.59	-12.46	-6.87	NiCO3
NiMoO4	-2.63	-13.77	-11.14	NiMoO4
NiS(alpha)	-69.02	-74.62	-5.60	NiS
NiS(beta)	-63.52	-74.62	-11.10	NiS
NiS(gamma)	-61.82	-74.62	-12.80	NiS
NiSe	-18.61	-36.31	-17.70	NiSe
NiSeO3:2H2O	-10.35	-7.53	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.78	-19.30	-1.52	NiSeO4:6H2O
Nsutite	-9.03	8.48	17.50	MnO2
O2(g)	-34.00	49.09	83.09	O2
Orpiment	-221.29	-282.36	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.86	-4.34	6.52	Pb(BO2)2
Pb(OH)2	-2.89	5.26	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.90	-64.66	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.27	0.53	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.66	10.52	26.19	Pb2O(OH)2
Pb2O3	-25.97	35.07	61.04	Pb2O3
Pb2OCO3	-8.47	-9.02	-0.56	Pb2OCO3
Pb2V2O7	-1.42	-3.32	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.97	-10.17	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.19	1.95	6.14	Pb3(VO4)2
Pb3O2CO3	-14.78	-3.76	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.23	3.87	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.01	3.87	21.88	Pb4O3SO4
PbCrO4	-12.58	-25.18	-12.60	PbCrO4
PbF2	-8.62	-16.06	-7.44	PbF2
Pbmetal	-23.53	-19.28	4.25	Pb
PbMoO4	0.02	-15.60	-15.62	PbMoO4
PbO:0.3H2O	-7.72	5.26	12.98	PbO:0.33H2O
PbSeO4	-14.28	-21.12	-6.84	PbSeO4
Periclase	-10.38	11.21	21.58	MgO
Phosgenite	-9.21	-29.02	-19.81	PbCl2:PbCO3
Plattnerite	-19.79	29.81	49.60	PbO2
Portlandite	-11.12	11.68	22.80	Ca(OH)2
Pyrite	-112.55	-131.05	-18.51	FeS2
Pyrochroite	-5.91	9.28	15.19	Mn(OH)2
Pyrolusite	-7.55	33.83	41.38	MnO2
Realgar	-92.85	-112.60	-19.75	AsS
Retgersite	-8.06	-10.10	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.18	-19.68	-14.50	UO2CO3
Sb(OH)3	-11.19	-18.30	-7.11	Sb(OH)3
Sb2O4	-15.45	-12.05	3.40	Sb2O4

Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-99.03	-166.79	-67.76	Sb2Se3
Sb4O6(cubic)	-54.93	-73.20	-18.26	Sb4O6
Sb4O6(orth)	-55.29	-73.20	-17.90	Sb4O6
SbCl3	-48.86	-48.29	0.57	SbCl3
SbF3	-40.06	-50.29	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.51	-30.34	-27.82	SbO2
Schoepite	-6.13	-0.13	5.99	UO2(OH) 2:H2O
Semetal(am)	-11.74	-18.85	-7.11	Se
Semetal(hex)	-11.14	-18.85	-7.71	Se
Senarmontite	-24.23	-36.60	-12.37	Sb2O3
SeO2	-14.75	-14.62	0.12	SeO2
SeO3	-47.43	-26.38	21.04	SeO3
Siderite	-1.50	-11.74	-10.24	FeCO3
Smithsonite	-1.63	-11.63	-10.00	ZnCO3
Sphalerite	-62.33	-73.78	-11.45	ZnS
Spinel	-6.45	30.40	36.85	MgAl2O4
Stibnite	-231.25	-281.71	-50.46	Sb2S3
Sulfur	-55.01	-57.16	-2.14	S
Tenorite	0.05	7.69	7.64	CuO
Thenardite	-7.94	-7.61	0.32	Na2SO4
Thermonatrite	-10.62	-9.98	0.64	Na2CO3:H2O
Tyuyamunite	-6.50	-2.42	4.08	Ca(UO2) 2(VO4) 2
U3O8	-18.38	2.71	21.08	U3O8
U3Sb4	-566.51	-414.12	152.38	U3Sb4
U4O9	-34.28	-37.30	-3.02	U4O9
UF4	-28.57	-58.11	-29.54	UF4
UF4:2.5H2O	-25.39	-58.11	-32.72	UF4:2.5H2O
UO2(am)	-16.40	-15.46	0.93	UO2
UO2(OH) 2(beta)	-5.74	-0.13	5.61	UO2(OH) 2
UO2SeO4:4H2O	-24.27	-26.52	-2.25	UO2SeO4:4H2O
UO3	-7.83	-0.13	7.70	UO3
Uraninite	-10.79	-15.46	-4.67	UO2
USb2	-213.58	-184.00	29.58	USb2
V(OH) 3	-16.46	-8.87	7.59	V(OH) 3
V2O5	-12.48	-13.84	-1.36	V2O5
V3O5	-33.25	-31.42	1.84	V3O5
V4O7	-40.89	-33.71	7.19	V4O7
V6O13	-29.75	-90.61	-60.86	V6O13
Valentinite	-28.12	-36.60	-8.48	Sb2O3
VC12	-60.01	-41.13	18.87	VC12
VC13	-62.29	-38.86	23.43	VC13
VF4	-59.87	-44.94	14.93	VF4
Vmetal	-89.71	-45.68	44.03	V
VO	-35.90	-21.14	14.76	VO
VO(OH) 2	-7.44	-2.29	5.15	VO(OH) 2
VO2Cl	-19.76	-16.92	2.84	VO2Cl
VOC1	-30.02	-18.86	11.15	VOC1
VOC12	-35.04	-22.28	12.76	VOC12
VOSO4	-23.08	-19.47	3.61	VOSO4
Witherite	-2.78	-11.35	-8.57	BaCO3
Wurtzite	-64.83	-73.78	-8.95	ZnS
Zincite	-3.41	7.92	11.33	ZnO
Zincosite	-13.19	-9.26	3.93	ZnSO4
Zn(BO2) 2	-9.97	-1.68	8.29	Zn(BO2) 2
Zn(OH) 2	-4.28	7.92	12.20	Zn(OH) 2
Zn(OH) 2(am)	-4.55	7.92	12.47	Zn(OH) 2
Zn(OH) 2(beta)	-3.83	7.92	11.75	Zn(OH) 2
Zn(OH) 2(epsilon)	-3.61	7.92	11.53	Zn(OH) 2
Zn(OH) 2(gamma)	-3.81	7.92	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-8.84	-1.34	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-9.35	5.84	15.19	Zn2(OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-15.84	-2.19	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-29.52	-10.60	18.91	Zn3O(SO4) 2
Zn4(OH) 6SO4	-13.90	14.50	28.40	Zn4(OH) 6SO4
Zn5(OH) 8Cl2	-18.89	19.61	38.50	Zn5(OH) 8Cl2
ZnCl2	-19.12	-12.07	7.05	ZnCl2

ZnCO3:1H2O	-1.37	-11.63	-10.26	ZnCO3:1H2O
ZnF2	-12.87	-13.40	-0.53	ZnF2
Znmetal	-42.41	-16.62	25.79	Zn
ZnMoO4	-2.81	-12.94	-10.13	ZnMoO4
ZnO(active)	-3.27	7.92	11.19	ZnO
ZnS(am)	-64.73	-73.78	-9.05	ZnS
ZnSb	-82.76	-71.74	11.01	ZnSb
ZnSe	-21.08	-35.48	-14.40	ZnSe
ZnSeO4:6H2O	-16.95	-18.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.62	-9.26	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 70.

Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
 e==e-
 log_k 0
EQUILIBRIUM_PHASES 401
 Ag2Se 0 0
 Alunite 0 0
 Anhydrite 0 0
 Alunite 0 0
 Ba3(AsO4)2 0 0
 Barite 0 0
 Brochantite 0 0
 Brucite 0 0
 Calcite 0 0
 CaMoO4 0 0
 CaSeO3:2H2O 0 0
 Carnotite 0 0
 Cd(BO2)2 0 0
 CdMoO4 0 0
 Chrysotile 0 0
 CO2(g) -1.69 10
 Cr2O3 0 0
 CuMoO4 0 0
 Cu2Se(alpha) 0 0
 Epsomite 0 0
 Ferrihydrite 0 0
 Fluorite 0 0
 Gummite 0 0
 Gypsum 0 0
 HgSe 0 0
 Mg3(PO4)2 0 0
 Mirabilite 0 0
 MnSeO3 0 0
 O2(g) -32 10
 Otavite 0 0
 NiCO3 0 0
 NiMoO4 0 0
 Ni(OH)2 0 0
 Ni3(AsO4)2:8H2O 0 0
 PbMoO4 0 0
 Rutherfordine 0 0
 SbO2 0 0
 Schoepite 0 0
 Sepiolite 0 0
 SiO2(am-ppt) 0 0

Tyuyamunite 0 0
 U3O8 0 0
 UO3 0 0
 UO2(OH)2(beta) 0 0
 ZnMoO4 0 0
 USE solution 402
 SAVE Solution 403 Initial Pit Water after Mineral Precipitation
 SAVE EQUILIBRIUM_PHASES 401
 END

 TITLE

Precipitate oversaturated phases in groundwater

 Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
 but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 402. Solution after simulation 69.
 Using pure phase assemblage 401.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.508e-08	2.508e-08
Alunite	-0.00	-1.40	-1.40	0.000e+00	8.217e-07	8.217e-07
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.011e-08	2.011e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.276e-06	1.276e-06
Brochantite	-0.52	14.70	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.21	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.459e-03
CaMoO4	-1.72	-9.67	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.39	-3.57	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.793e-03	2.793e-03
Carnotite	-2.39	-2.16	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.46	-3.62	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.89	-15.04	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.032e-08	6.032e-08
Cu2Se(alpha)	-5.17	-50.97	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.129e-07	2.129e-07
Epsomite	-3.75	-5.88	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	2.670e-05	2.670e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.032e-04	1.032e-04
Gummite	-6.87	0.81	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.30	-59.00	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00

Mirabilite	-6.41	-7.53	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.75	-5.62	1.13	0.000e+00	0	0.000e+00
Ni (OH) 2	-5.61	7.18	12.79	0.000e+00	0	0.000e+00
Ni3 (AsO4) 2:8H2O	-24.39	-8.69	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.70	-13.84	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.614e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	5.654e-09	5.654e-09
Rutherfordine	-4.53	-19.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.99	-30.81	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.19	0.81	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2 (am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.90	-0.82	4.08	0.000e+00	0	0.000e+00
U3O8	-16.56	4.52	21.08	0.000e+00	0	0.000e+00
UO2 (OH) 2 (beta)	-4.81	0.81	5.61	0.000e+00	0	0.000e+00
UO3	-6.89	0.81	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.93	-13.06	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.334e-08	3.334e-08
Al	2.013e-06	2.013e-06
As	2.561e-10	2.561e-10
B	1.585e-05	1.585e-05
Ba	1.133e-07	1.133e-07
C	5.860e-03	5.860e-03
Ca	2.501e-03	2.501e-03
Cd	1.155e-08	1.155e-08
Cl	1.704e-03	1.704e-03
Co	1.359e-07	1.359e-07
Cr	6.396e-09	6.395e-09
Cu	9.038e-06	9.037e-06
F	2.122e-04	2.122e-04
Fe	3.659e-09	3.658e-09
Hg	2.124e-10	2.124e-10
K	6.977e-04	6.977e-04
Mg	1.711e-03	1.711e-03
Mn	2.340e-05	2.340e-05
Mo	3.228e-07	3.228e-07
Na	4.941e-03	4.941e-03
Ni	2.132e-07	2.131e-07
Pb	2.000e-08	1.999e-08
S	3.515e-03	3.515e-03
Sb	1.297e-08	1.297e-08
Se	2.130e-08	2.130e-08
U	8.172e-08	8.172e-08
V	1.124e-07	1.124e-07
Zn	1.130e-06	1.130e-06

-----Description of solution-----

				pH =	7.149	Charge balance
				pe =	5.623	Adjusted to redox
equilibrium						
				Activity of water	=	1.000
				Ionic strength (mol/kgw)	=	1.871e-02
				Mass of water (kg)	=	1.000e+00
				Total alkalinity (eq/kg)	=	5.189e-03
				Total CO2 (mol/kg)	=	5.860e-03
				Temperature (°C)	=	25.00
				Electrical balance (eq)	=	-1.032e-17
				Percent error, 100*(Cat- An)/(Cat+ An)	=	-0.00
				Iterations	=	10
				Total H	=	1.110158e+02

Total O = 5.553632e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.631e-07	1.420e-07	-6.787	-6.848	-0.060	(0)
H+	8.112e-08	7.090e-08	-7.091	-7.149	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.334e-08					
AgCl	2.163e-08	2.163e-08	-7.665	-7.665	0.000	(0)
Ag+	8.138e-09	7.112e-09	-8.089	-8.148	-0.059	(0)
AgCl2-	3.295e-09	2.806e-09	-8.482	-8.552	-0.070	(0)
AgSO4-	2.714e-10	2.311e-10	-9.566	-9.636	-0.070	(0)
AgCl3-2	7.082e-12	3.725e-12	-11.150	-11.429	-0.279	(0)
AgF	2.970e-12	2.970e-12	-11.527	-11.527	0.000	(0)
AgOH	1.010e-13	1.010e-13	-12.996	-12.996	0.000	(0)
AgCl4-3	4.808e-14	1.133e-14	-13.318	-13.946	-0.628	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgH2BO3	1.455e-14	1.455e-14	-13.837	-13.837	0.000	(0)
AgSeO3-	5.010e-15	4.267e-15	-14.300	-14.370	-0.070	(0)
Ag (OH) 2-	1.645e-18	1.401e-18	-17.784	-17.854	-0.070	(0)
Ag (SeO3) 2-3	1.514e-22	3.566e-23	-21.820	-22.448	-0.628	(0)
Ag2MoO4	3.602e-24	3.602e-24	-23.443	-23.443	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.790	-72.790	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.200	-86.316	-1.116	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.076	-147.146	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.314	-147.480	-0.167	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.455	-149.771	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.780	-150.082	-0.302	(0)
Al	2.013e-06					
Al (OH) 4-	1.361e-06	1.191e-06	-5.866	-5.924	-0.058	(0)
AlF3	3.383e-07	3.383e-07	-6.471	-6.471	0.000	(0)
AlF2+	1.839e-07	1.616e-07	-6.735	-6.791	-0.056	(0)
Al (OH) 3	6.662e-08	6.662e-08	-7.176	-7.176	0.000	(0)
AlF4-	3.222e-08	2.819e-08	-7.492	-7.550	-0.058	(0)
Al (OH) 2+	2.676e-08	2.352e-08	-7.572	-7.629	-0.056	(0)
AlF+2	4.095e-09	2.442e-09	-8.388	-8.612	-0.225	(0)
AlOH+2	3.497e-10	2.085e-10	-9.456	-9.681	-0.225	(0)
AlSO4+	2.122e-11	1.857e-11	-10.673	-10.731	-0.058	(0)
Al+3	4.937e-12	1.469e-12	-11.307	-11.833	-0.527	(0)
Al (SO4) 2-	3.703e-13	3.240e-13	-12.431	-12.489	-0.058	(0)
AlMo6O21-3	3.454e-40	0.000e+00	-39.462	-40.090	-0.628	(0)
As (3)	1.744e-22					
H3AsO3	1.729e-22	1.729e-22	-21.762	-21.762	0.000	(0)
H2AsO3-	1.469e-24	1.251e-24	-23.833	-23.903	-0.070	(0)
HAsO3-2	3.060e-29	1.609e-29	-28.514	-28.793	-0.279	(0)
H4AsO3+	7.133e-30	6.075e-30	-29.147	-29.216	-0.070	(0)
AsO3-3	3.714e-35	8.751e-36	-34.430	-35.058	-0.628	(0)
As (5)	2.561e-10					
HAsO4-2	1.830e-10	9.624e-11	-9.738	-10.017	-0.279	(0)
H2AsO4-	7.307e-11	6.223e-11	-10.136	-10.206	-0.070	(0)
AsO4-3	1.822e-14	4.293e-15	-13.739	-14.367	-0.628	(0)
H3AsO4	7.634e-16	7.667e-16	-15.117	-15.115	0.002	(0)
B	1.585e-05					
H3BO3	1.568e-05	1.575e-05	-4.805	-4.803	0.002	(0)
H2BO3-	1.491e-07	1.290e-07	-6.827	-6.889	-0.063	(0)
CaH2BO3+	9.814e-09	8.494e-09	-8.008	-8.071	-0.063	(0)
MgH2BO3+	4.240e-09	3.670e-09	-8.373	-8.435	-0.063	(0)
BF (OH) 3-	1.207e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
NaH2BO3	8.736e-10	8.736e-10	-9.059	-9.059	0.000	(0)
H5 (BO3) 2-	1.999e-12	1.730e-12	-11.699	-11.762	-0.063	(0)
BF2 (OH) 2-	1.522e-12	1.317e-12	-11.818	-11.880	-0.063	(0)
BaH2BO3+	2.962e-13	2.564e-13	-12.528	-12.591	-0.063	(0)
AgH2BO3	1.455e-14	1.455e-14	-13.837	-13.837	0.000	(0)
H8 (BO3) 3-	3.149e-15	2.725e-15	-14.502	-14.565	-0.063	(0)
BF3OH-	6.983e-18	6.044e-18	-17.156	-17.219	-0.063	(0)

BF4-	4.051e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
Ba	1.133e-07					
Ba+2	1.102e-07	6.429e-08	-6.958	-7.192	-0.234	(0)
BaHCO3+	3.050e-09	2.688e-09	-8.516	-8.571	-0.055	(0)
BaCO3	9.545e-11	9.545e-11	-10.020	-10.020	0.000	(0)
BaH2BO3+	2.962e-13	2.564e-13	-12.528	-12.591	-0.063	(0)
BaOH+	4.543e-14	3.985e-14	-13.343	-13.400	-0.057	(0)
C (4)	5.860e-03					
HCO3-	4.982e-03	4.378e-03	-2.303	-2.359	-0.056	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	1.058e-04	9.324e-05	-3.975	-4.030	-0.055	(0)
MgHCO3+	4.210e-05	3.674e-05	-4.376	-4.435	-0.059	(0)
NaHCO3	1.052e-05	1.052e-05	-4.978	-4.978	0.000	(0)
CuCO3	7.602e-06	7.602e-06	-5.119	-5.119	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	4.962e-06	2.895e-06	-5.304	-5.538	-0.234	(0)
MgCO3	1.975e-06	1.975e-06	-5.704	-5.704	0.000	(0)
MnHCO3+	1.013e-06	8.886e-07	-5.994	-6.051	-0.057	(0)
NaCO3-	2.620e-07	2.303e-07	-6.582	-6.638	-0.056	(0)
CuHCO3+	1.446e-07	1.232e-07	-6.840	-6.909	-0.070	(0)
Cu (CO3) 2-2	1.126e-07	5.923e-08	-6.948	-7.227	-0.279	(0)
ZnCO3	7.733e-08	7.733e-08	-7.112	-7.112	0.000	(0)
ZnHCO3+	7.546e-08	6.426e-08	-7.122	-7.192	-0.070	(0)
NiHCO3+	4.838e-08	4.120e-08	-7.315	-7.385	-0.070	(0)
UO2 (CO3) 2-2	4.073e-08	2.143e-08	-7.390	-7.669	-0.279	(0)
UO2 (CO3) 3-4	4.062e-08	3.108e-09	-7.391	-8.507	-1.116	(0)
CoHCO3+	2.019e-08	1.719e-08	-7.695	-7.765	-0.070	(0)
PbCO3	1.110e-08	1.110e-08	-7.955	-7.955	0.000	(0)
NiCO3	8.244e-09	8.244e-09	-8.084	-8.084	0.000	(0)
PbHCO3+	4.870e-09	4.147e-09	-8.312	-8.382	-0.070	(0)
BaHCO3+	3.050e-09	2.688e-09	-8.516	-8.571	-0.055	(0)
CoCO3	2.471e-09	2.471e-09	-8.607	-8.607	0.000	(0)
UO2CO3	3.710e-10	3.710e-10	-9.431	-9.431	0.000	(0)
CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
Pb (CO3) 2-2	1.761e-10	9.263e-11	-9.754	-10.033	-0.279	(0)
BaCO3	9.545e-11	9.545e-11	-10.020	-10.020	0.000	(0)
CdHCO3+	5.720e-11	4.871e-11	-10.243	-10.312	-0.070	(0)
Cd (CO3) 2-2	1.316e-12	6.920e-13	-11.881	-12.160	-0.279	(0)
FeHCO3+	8.881e-13	7.825e-13	-12.052	-12.107	-0.055	(0)
HgCO3	1.385e-14	1.385e-14	-13.858	-13.858	0.000	(0)
Hg (CO3) 2-2	2.411e-16	1.268e-16	-15.618	-15.897	-0.279	(0)
HgHCO3+	2.148e-17	1.829e-17	-16.668	-16.738	-0.070	(0)
Ca	2.501e-03					
Ca+2	1.961e-03	1.144e-03	-2.708	-2.942	-0.234	(0)
CaSO4	4.268e-04	4.268e-04	-3.370	-3.370	0.000	(0)
CaHCO3+	1.058e-04	9.324e-05	-3.975	-4.030	-0.055	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.367e-06	2.076e-06	-5.626	-5.683	-0.057	(0)
CaH2BO3+	9.814e-09	8.494e-09	-8.008	-8.071	-0.063	(0)
CaOH+	3.678e-09	3.241e-09	-8.434	-8.489	-0.055	(0)
Cd	1.155e-08					
Cd+2	8.378e-09	4.888e-09	-8.077	-8.311	-0.234	(0)
CdSO4	1.866e-09	1.866e-09	-8.729	-8.729	0.000	(0)
CdCl+	8.164e-10	6.953e-10	-9.088	-9.158	-0.070	(0)
CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
Cd (SO4) 2-2	7.795e-11	4.100e-11	-10.108	-10.387	-0.279	(0)
CdHCO3+	5.720e-11	4.871e-11	-10.243	-10.312	-0.070	(0)
CdF+	1.512e-11	1.288e-11	-10.820	-10.890	-0.070	(0)
CdOH+	6.473e-12	5.512e-12	-11.189	-11.259	-0.070	(0)
CdCl2	4.317e-12	4.317e-12	-11.365	-11.365	0.000	(0)
CdOHC1	4.049e-12	4.049e-12	-11.393	-11.393	0.000	(0)
Cd (CO3) 2-2	1.316e-12	6.920e-13	-11.881	-12.160	-0.279	(0)
Cd (OH) 2	4.938e-15	4.938e-15	-14.306	-14.306	0.000	(0)
CdCl3-	4.764e-15	4.057e-15	-14.322	-14.392	-0.070	(0)
CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
CdSeO4	3.681e-18	3.681e-18	-17.434	-17.434	0.000	(0)
Cd2OH+3	5.732e-19	1.350e-19	-18.242	-18.870	-0.628	(0)
Cd (OH) 3-	5.030e-20	4.284e-20	-19.298	-19.368	-0.070	(0)

	Cd (SeO3) 2-2	6.673e-21	3.510e-21	-20.176	-20.455	-0.279	(0)
	Cd (OH) 4-2	1.893e-27	9.955e-28	-26.723	-27.002	-0.279	(0)
	CdHS+	0.000e+00	0.000e+00	-78.689	-78.759	-0.070	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.012	-150.012	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.498	-226.568	-0.070	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.549	-302.828	-0.279	(0)
Cl	1.704e-03						
	Cl-	1.704e-03	1.490e-03	-2.768	-2.827	-0.059	(0)
	MnCl+	2.175e-08	1.908e-08	-7.663	-7.719	-0.057	(0)
	AgCl	2.163e-08	2.163e-08	-7.665	-7.665	0.000	(0)
	AgCl2-	3.295e-09	2.806e-09	-8.482	-8.552	-0.070	(0)
	ZnCl+	1.990e-09	1.737e-09	-8.701	-8.760	-0.059	(0)
	CuCl+	1.206e-09	1.053e-09	-8.919	-8.978	-0.059	(0)
	CuCl	9.757e-10	9.757e-10	-9.011	-9.011	0.000	(0)
	CdCl+	8.164e-10	6.953e-10	-9.088	-9.158	-0.070	(0)
	CuCl2-	3.479e-10	3.036e-10	-9.459	-9.518	-0.059	(0)
	NiCl+	3.416e-10	2.909e-10	-9.466	-9.536	-0.070	(0)
	ZnOHC1	3.228e-10	3.228e-10	-9.491	-9.491	0.000	(0)
	CoCl+	3.055e-10	2.602e-10	-9.515	-9.585	-0.070	(0)
	PbCl+	7.913e-11	6.738e-11	-10.102	-10.171	-0.070	(0)
	MnCl2	4.014e-11	4.014e-11	-10.396	-10.396	0.000	(0)
	AgCl3-2	7.082e-12	3.725e-12	-11.150	-11.429	-0.279	(0)
	CdCl2	4.317e-12	4.317e-12	-11.365	-11.365	0.000	(0)
	ZnCl2	4.100e-12	4.100e-12	-11.387	-11.387	0.000	(0)
	CdOHC1	4.049e-12	4.049e-12	-11.393	-11.393	0.000	(0)
	HgClOH	1.494e-12	1.494e-12	-11.826	-11.826	0.000	(0)
	HgCl2	8.873e-13	8.873e-13	-12.052	-12.052	0.000	(0)
	CuCl2	5.437e-13	5.437e-13	-12.265	-12.265	0.000	(0)
	PbCl2	4.483e-13	4.483e-13	-12.348	-12.348	0.000	(0)
	CuCl3-2	1.634e-13	9.669e-14	-12.787	-13.015	-0.228	(0)
	AgCl4-3	4.808e-14	1.133e-14	-13.318	-13.946	-0.628	(0)
	MnCl3-	1.877e-14	1.647e-14	-13.726	-13.783	-0.057	(0)
	HgCl3-	1.552e-14	1.322e-14	-13.809	-13.879	-0.070	(0)
	ZnCl3-	5.559e-15	4.851e-15	-14.255	-14.314	-0.059	(0)
	CdCl3-	4.764e-15	4.057e-15	-14.322	-14.392	-0.070	(0)
	NiCl2	2.182e-15	2.182e-15	-14.661	-14.661	0.000	(0)
	CrCl+2	3.207e-16	1.687e-16	-15.494	-15.773	-0.279	(0)
	PbCl3-	3.122e-16	2.659e-16	-15.506	-15.575	-0.070	(0)
	HgCl4-2	1.490e-16	7.837e-17	-15.827	-16.106	-0.279	(0)
	HgCl+	1.396e-16	1.189e-16	-15.855	-15.925	-0.070	(0)
	UO2Cl+	9.131e-17	7.776e-17	-16.039	-16.109	-0.070	(0)
	CuCl3-	8.661e-18	7.559e-18	-17.062	-17.122	-0.059	(0)
	ZnCl4-2	6.106e-18	3.613e-18	-17.214	-17.442	-0.228	(0)
	CrOHC12	6.781e-19	6.781e-19	-18.169	-18.169	0.000	(0)
	PbCl4-2	3.441e-19	1.810e-19	-18.463	-18.742	-0.279	(0)
	VOCl+	4.265e-20	3.632e-20	-19.370	-19.440	-0.070	(0)
	FeCl+2	4.209e-20	2.491e-20	-19.376	-19.604	-0.228	(0)
	CrCl2+	2.800e-20	2.384e-20	-19.553	-19.623	-0.070	(0)
	FeCl2+	1.890e-22	1.657e-22	-21.724	-21.781	-0.057	(0)
	CuCl4-2	9.535e-23	5.643e-23	-22.021	-22.249	-0.228	(0)
	FeCl3	2.468e-26	2.468e-26	-25.608	-25.608	0.000	(0)
	CrO3Cl-	2.059e-26	1.753e-26	-25.686	-25.756	-0.070	(0)
	CoCl+2	4.863e-35	2.558e-35	-34.313	-34.592	-0.279	(0)
	UCl+3	0.000e+00	0.000e+00	-44.619	-45.247	-0.628	(0)
Co (2)	1.359e-07						
	Co+2	9.600e-08	5.049e-08	-7.018	-7.297	-0.279	(0)
	CoHCO3+	2.019e-08	1.719e-08	-7.695	-7.765	-0.070	(0)
	CoSO4	1.641e-08	1.641e-08	-7.785	-7.785	0.000	(0)
	CoCO3	2.471e-09	2.471e-09	-8.607	-8.607	0.000	(0)
	CoF+	3.117e-10	2.655e-10	-9.506	-9.576	-0.070	(0)
	CoCl+	3.055e-10	2.602e-10	-9.515	-9.585	-0.070	(0)
	CoOH+	1.680e-10	1.430e-10	-9.775	-9.845	-0.070	(0)
	Co (OH) 2	1.613e-12	1.613e-12	-11.792	-11.792	0.000	(0)
	CoSeO4	1.023e-16	1.023e-16	-15.990	-15.990	0.000	(0)
	Co (OH) 3-	5.366e-18	4.570e-18	-17.270	-17.340	-0.070	(0)
	Co2OH+3	1.537e-18	3.620e-19	-17.813	-18.441	-0.628	(0)
	CoOOH-	1.347e-18	1.147e-18	-17.871	-17.940	-0.070	(0)
	Co (OH) 4-2	1.955e-25	1.028e-25	-24.709	-24.988	-0.279	(0)

Co4 (OH) 4+4	1.092e-30	8.354e-32	-29.962	-31.078	-1.116	(0)
Co (3)	1.158e-28					
CoOH+2	1.158e-28	6.089e-29	-27.936	-28.215	-0.279	(0)
Co+3	2.837e-34	8.439e-35	-33.547	-34.074	-0.527	(0)
CoCl+2	4.863e-35	2.558e-35	-34.313	-34.592	-0.279	(0)
Cr (2)	9.468e-26					
Cr+2	9.468e-26	4.980e-26	-25.024	-25.303	-0.279	(0)
Cr (3)	6.396e-09					
Cr (OH) 2+	5.514e-09	4.696e-09	-8.258	-8.328	-0.070	(0)
Cr (OH) +2	5.168e-10	2.718e-10	-9.287	-9.566	-0.279	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.051e-10	1.051e-10	-9.979	-9.979	0.000	(0)
CrF+2	4.385e-12	2.306e-12	-11.358	-11.637	-0.279	(0)
CrO2-	1.971e-12	1.678e-12	-11.705	-11.775	-0.070	(0)
Cr (OH) 4-	1.663e-12	1.416e-12	-11.779	-11.849	-0.070	(0)
CrSO4+	3.908e-13	3.328e-13	-12.408	-12.478	-0.070	(0)
Cr+3	3.715e-13	8.751e-14	-12.430	-13.058	-0.628	(0)
CrCl+2	3.207e-16	1.687e-16	-15.494	-15.773	-0.279	(0)
Cr2 (OH) 2SO4+2	4.908e-18	2.581e-18	-17.309	-17.588	-0.279	(0)
CrOHC12	6.781e-19	6.781e-19	-18.169	-18.169	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.497e-19	2.497e-19	-18.603	-18.603	0.000	(0)
CrCl2+	2.800e-20	2.384e-20	-19.553	-19.623	-0.070	(0)
Cr (6)	2.313e-16					
CrO4-2	1.972e-16	1.150e-16	-15.705	-15.939	-0.234	(0)
HCrO4-	3.099e-17	2.639e-17	-16.509	-16.579	-0.070	(0)
NaCrO4-	2.868e-18	2.442e-18	-17.542	-17.612	-0.070	(0)
KCrO4-	3.026e-19	2.577e-19	-18.519	-18.589	-0.070	(0)
CrO3SO4-2	1.765e-24	9.285e-25	-23.753	-24.032	-0.279	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.059e-26	1.753e-26	-25.686	-25.756	-0.070	(0)
Cr2O7-2	4.594e-32	2.416e-32	-31.338	-31.617	-0.279	(0)
Cu (1)	1.935e-09					
CuCl	9.757e-10	9.757e-10	-9.011	-9.011	0.000	(0)
Cu+	6.110e-10	5.203e-10	-9.214	-9.284	-0.070	(0)
CuCl2-	3.479e-10	3.036e-10	-9.459	-9.518	-0.059	(0)
CuCl3-2	1.634e-13	9.669e-14	-12.787	-13.015	-0.228	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.199	-148.508	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.942	-149.238	-0.296	(0)
Cu (2)	9.036e-06					
CuCO3	7.602e-06	7.602e-06	-5.119	-5.119	0.000	(0)
Cu+2	7.644e-07	4.460e-07	-6.117	-6.351	-0.234	(0)
CuOH+	2.294e-07	2.002e-07	-6.639	-6.698	-0.059	(0)
CuSO4	1.664e-07	1.664e-07	-6.779	-6.779	0.000	(0)
CuHCO3+	1.446e-07	1.232e-07	-6.840	-6.909	-0.070	(0)
Cu (CO3) 2-2	1.126e-07	5.923e-08	-6.948	-7.227	-0.279	(0)
Cu (OH) 2	5.673e-09	5.673e-09	-8.246	-8.246	0.000	(0)
CuF+	5.494e-09	4.679e-09	-8.260	-8.330	-0.070	(0)
Cu2 (OH) 2+2	1.915e-09	1.007e-09	-8.718	-8.997	-0.279	(0)
CuCl+	1.206e-09	1.053e-09	-8.919	-8.978	-0.059	(0)
Cu (OH) 3-	1.940e-12	1.652e-12	-11.712	-11.782	-0.070	(0)
CuCl2	5.437e-13	5.437e-13	-12.265	-12.265	0.000	(0)
CuCl3-	8.661e-18	7.559e-18	-17.062	-17.122	-0.059	(0)
Cu (OH) 4-2	3.510e-18	1.846e-18	-17.455	-17.734	-0.279	(0)
CuCl4-2	9.535e-23	5.643e-23	-22.021	-22.249	-0.228	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.751	-215.821	-0.070	(0)
F	2.122e-04					
F-	1.902e-04	1.663e-04	-3.721	-3.779	-0.059	(0)
MgF+	1.749e-05	1.530e-05	-4.757	-4.815	-0.058	(0)
CaF+	2.367e-06	2.076e-06	-5.626	-5.683	-0.057	(0)
NaF	4.481e-07	4.481e-07	-6.349	-6.349	0.000	(0)
AlF3	3.383e-07	3.383e-07	-6.471	-6.471	0.000	(0)
AlF2+	1.839e-07	1.616e-07	-6.735	-6.791	-0.056	(0)
MnF+	7.678e-08	6.734e-08	-7.115	-7.172	-0.057	(0)
AlF4-	3.222e-08	2.819e-08	-7.492	-7.550	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	5.494e-09	4.679e-09	-8.260	-8.330	-0.070	(0)
AlF+2	4.095e-09	2.442e-09	-8.388	-8.612	-0.225	(0)
ZnF+	1.808e-09	1.540e-09	-8.743	-8.812	-0.070	(0)

BF(OH) 3-	1.207e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
NiF+	3.744e-10	3.188e-10	-9.427	-9.496	-0.070	(0)
CoF+	3.117e-10	2.655e-10	-9.506	-9.576	-0.070	(0)
PbF+	1.754e-11	1.494e-11	-10.756	-10.826	-0.070	(0)
CdF+	1.512e-11	1.288e-11	-10.820	-10.890	-0.070	(0)
HF2-	1.266e-11	1.102e-11	-10.897	-10.958	-0.060	(0)
CrF+2	4.385e-12	2.306e-12	-11.358	-11.637	-0.279	(0)
AgF	2.970e-12	2.970e-12	-11.527	-11.527	0.000	(0)
BF2(OH) 2-	1.522e-12	1.317e-12	-11.818	-11.880	-0.063	(0)
UO2F+	8.675e-13	7.388e-13	-12.062	-12.131	-0.070	(0)
UO2F2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
PbF2	4.888e-14	4.888e-14	-13.311	-13.311	0.000	(0)
UO2F3-	1.737e-14	1.480e-14	-13.760	-13.830	-0.070	(0)
CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
VO2F	2.646e-15	2.646e-15	-14.577	-14.577	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.121e-16	4.492e-16	-15.291	-15.348	-0.057	(0)
VO2F2-	1.876e-16	1.597e-16	-15.727	-15.797	-0.070	(0)
FeF+2	1.706e-16	1.010e-16	-15.768	-15.996	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	3.715e-17	1.954e-17	-16.430	-16.709	-0.279	(0)
PbF3-	1.810e-17	1.541e-17	-16.742	-16.812	-0.070	(0)
VOF+	1.018e-17	8.668e-18	-16.992	-17.062	-0.070	(0)
BF3OH-	6.983e-18	6.044e-18	-17.156	-17.219	-0.063	(0)
VO2F3-2	6.299e-19	3.313e-19	-18.201	-18.480	-0.279	(0)
VOF2	5.404e-19	5.404e-19	-18.267	-18.267	0.000	(0)
VOF3-	3.744e-21	3.188e-21	-20.427	-20.496	-0.070	(0)
PbF4-2	2.332e-21	1.227e-21	-20.632	-20.911	-0.279	(0)
BF4-	4.051e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
VO2F4-3	1.150e-22	2.710e-23	-21.939	-22.567	-0.628	(0)
HgF+	2.894e-23	2.465e-23	-22.538	-22.608	-0.070	(0)
VOF4-2	4.068e-24	2.140e-24	-23.391	-23.670	-0.279	(0)
Sb(OH) 2F	9.810e-25	9.810e-25	-24.008	-24.008	0.000	(0)
SbOF	9.650e-25	9.650e-25	-24.015	-24.015	0.000	(0)
UF3+	1.631e-34	1.389e-34	-33.787	-33.857	-0.070	(0)
UF2+2	1.002e-35	5.272e-36	-34.999	-35.278	-0.279	(0)
UF4	2.533e-36	2.533e-36	-35.596	-35.596	0.000	(0)
UF5-	1.960e-38	1.669e-38	-37.708	-37.778	-0.070	(0)
UF+3	1.069e-38	2.519e-39	-37.971	-38.599	-0.628	(0)
UF6-2	1.593e-39	8.380e-40	-38.798	-39.077	-0.279	(0)
Fe (2)	3.365e-11					
Fe+2	2.700e-11	1.420e-11	-10.569	-10.848	-0.279	(0)
FeSO4	5.677e-12	5.677e-12	-11.246	-11.246	0.000	(0)
FeHCO3+	8.881e-13	7.825e-13	-12.052	-12.107	-0.055	(0)
FeOH+	9.151e-14	8.026e-14	-13.039	-13.096	-0.057	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.634e-19	4.064e-19	-18.334	-18.391	-0.057	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.810	-158.810	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.160	-235.230	-0.070	(0)
Fe (3)	3.625e-09					
Fe(OH) 2+	3.191e-09	2.804e-09	-8.496	-8.552	-0.056	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.432e-12	5.652e-12	-11.192	-11.248	-0.056	(0)
FeOH+2	8.578e-14	5.076e-14	-13.067	-13.294	-0.228	(0)
FeF2+	5.121e-16	4.492e-16	-15.291	-15.348	-0.057	(0)
FeF+2	1.706e-16	1.010e-16	-15.768	-15.996	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.154e-17	1.012e-17	-16.938	-16.995	-0.057	(0)
Fe+3	1.861e-18	5.537e-19	-17.730	-18.257	-0.527	(0)
Fe(SO4) 2-	4.137e-19	3.524e-19	-18.383	-18.453	-0.070	(0)
FeCl+2	4.209e-20	2.491e-20	-19.376	-19.604	-0.228	(0)
FeCl2+	1.890e-22	1.657e-22	-21.724	-21.781	-0.057	(0)
FeHSeO3+2	4.624e-23	2.432e-23	-22.335	-22.614	-0.279	(0)
Fe2(OH) 2+4	1.115e-24	8.532e-26	-23.953	-25.069	-1.116	(0)
FeCl3	2.468e-26	2.468e-26	-25.608	-25.608	0.000	(0)
Fe3(OH) 4+5	1.918e-31	3.458e-33	-30.717	-32.461	-1.744	(0)
H (0)	4.021e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)

Hg (0)	2.095e-10					
Hg	2.095e-10	2.095e-10	-9.679	-9.679	0.000	(0)
Hg (1)	2.163e-21					
Hg2+2	1.081e-21	5.687e-22	-20.966	-21.245	-0.279	(0)
Hg (2)	2.917e-12					
HgClOH	1.494e-12	1.494e-12	-11.826	-11.826	0.000	(0)
HgCl2	8.873e-13	8.873e-13	-12.052	-12.052	0.000	(0)
Hg (OH) 2	5.065e-13	5.087e-13	-12.295	-12.294	0.002	(0)
HgCl3-	1.552e-14	1.322e-14	-13.809	-13.879	-0.070	(0)
HgCO3	1.385e-14	1.385e-14	-13.858	-13.858	0.000	(0)
Hg (CO3) 2-2	2.411e-16	1.268e-16	-15.618	-15.897	-0.279	(0)
HgCl4-2	1.490e-16	7.837e-17	-15.827	-16.106	-0.279	(0)
HgCl+	1.396e-16	1.189e-16	-15.855	-15.925	-0.070	(0)
HgOH+	2.655e-17	2.261e-17	-16.576	-16.646	-0.070	(0)
HgHCO3+	2.148e-17	1.829e-17	-16.668	-16.738	-0.070	(0)
Hg (OH) 3-	1.068e-20	9.093e-21	-19.972	-20.041	-0.070	(0)
Hg+2	7.604e-21	3.999e-21	-20.119	-20.398	-0.279	(0)
HgSO4	1.705e-21	1.705e-21	-20.768	-20.768	0.000	(0)
HgF+	2.894e-23	2.465e-23	-22.538	-22.608	-0.070	(0)
HgHS2-	0.000e+00	0.000e+00	-138.164	-138.233	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.989	-138.989	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.513	-139.792	-0.279	(0)
K	6.977e-04					
K+	6.898e-04	6.029e-04	-3.161	-3.220	-0.059	(0)
KSO4-	7.911e-06	6.951e-06	-5.102	-5.158	-0.056	(0)
KCrO4-	3.026e-19	2.577e-19	-18.519	-18.589	-0.070	(0)
Mg	1.711e-03					
Mg+2	1.406e-03	8.202e-04	-2.852	-3.086	-0.234	(0)
MgSO4	2.431e-04	2.431e-04	-3.614	-3.614	0.000	(0)
MgHCO3+	4.210e-05	3.674e-05	-4.376	-4.435	-0.059	(0)
MgF+	1.749e-05	1.530e-05	-4.757	-4.815	-0.058	(0)
MgCO3	1.975e-06	1.975e-06	-5.704	-5.704	0.000	(0)
MgOH+	5.250e-08	4.636e-08	-7.280	-7.334	-0.054	(0)
MgH2BO3+	4.240e-09	3.670e-09	-8.373	-8.435	-0.063	(0)
Mn (2)	2.340e-05					
Mn+2	1.934e-05	1.017e-05	-4.713	-4.993	-0.279	(0)
MnSO4	2.946e-06	2.946e-06	-5.531	-5.531	0.000	(0)
MnHCO3+	1.013e-06	8.886e-07	-5.994	-6.051	-0.057	(0)
MnF+	7.678e-08	6.734e-08	-7.115	-7.172	-0.057	(0)
MnCl+	2.175e-08	1.908e-08	-7.663	-7.719	-0.057	(0)
MnOH+	4.137e-09	3.628e-09	-8.383	-8.440	-0.057	(0)
MnCl2	4.014e-11	4.014e-11	-10.396	-10.396	0.000	(0)
MnCl3-	1.877e-14	1.647e-14	-13.726	-13.783	-0.057	(0)
MnSeO4	1.107e-14	1.107e-14	-13.956	-13.956	0.000	(0)
Mn (OH) 3-	5.154e-19	4.520e-19	-18.288	-18.345	-0.057	(0)
Mn (OH) 4-2	3.501e-25	2.072e-25	-24.456	-24.684	-0.228	(0)
MnSe	0.000e+00	0.000e+00	-42.782	-42.782	0.000	(0)
Mn (3)	6.413e-25					
Mn+3	6.413e-25	1.908e-25	-24.193	-24.719	-0.527	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.500	-43.728	-0.228	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.415	-47.477	-0.061	(0)
Mo	3.228e-07					
MoO4-2	3.225e-07	1.881e-07	-6.492	-6.726	-0.234	(0)
HMoO4-	3.116e-10	2.654e-10	-9.506	-9.576	-0.070	(0)
H2MoO4	1.378e-13	1.378e-13	-12.861	-12.861	0.000	(0)
Ag2MoO4	3.602e-24	3.602e-24	-23.443	-23.443	0.000	(0)
AlMo6O21-3	3.454e-40	0.000e+00	-39.462	-40.090	-0.628	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.772	-51.283	-2.511	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.302	-52.046	-1.744	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-53.297	-54.413	-1.116	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.688	-58.316	-0.628	(0)
Na	4.941e-03					
Na+	4.888e-03	4.272e-03	-2.311	-2.369	-0.059	(0)
NaSO4-	4.252e-05	3.736e-05	-4.371	-4.428	-0.056	(0)
NaHCO3	1.052e-05	1.052e-05	-4.978	-4.978	0.000	(0)
NaF	4.481e-07	4.481e-07	-6.349	-6.349	0.000	(0)

	NaCO3-	2.620e-07	2.303e-07	-6.582	-6.638	-0.056	(0)
	NaH2BO3	8.736e-10	8.736e-10	-9.059	-9.059	0.000	(0)
	NaCrO4-	2.868e-18	2.442e-18	-17.542	-17.612	-0.070	(0)
Ni		2.132e-07					
	Ni+2	1.308e-07	7.634e-08	-6.883	-7.117	-0.234	(0)
	NiHCO3+	4.838e-08	4.120e-08	-7.315	-7.385	-0.070	(0)
	NiSO4	2.481e-08	2.481e-08	-7.605	-7.605	0.000	(0)
	NiCO3	8.244e-09	8.244e-09	-8.084	-8.084	0.000	(0)
	NiF+	3.744e-10	3.188e-10	-9.427	-9.496	-0.070	(0)
	NiCl+	3.416e-10	2.909e-10	-9.466	-9.536	-0.070	(0)
	NiOH+	1.602e-10	1.365e-10	-9.795	-9.865	-0.070	(0)
	Ni(SO4)2-2	2.544e-12	1.338e-12	-11.595	-11.874	-0.279	(0)
	Ni(OH)2	1.539e-12	1.539e-12	-11.813	-11.813	0.000	(0)
	NiCl2	2.182e-15	2.182e-15	-14.661	-14.661	0.000	(0)
	Ni(OH)3-	2.566e-16	2.185e-16	-15.591	-15.661	-0.070	(0)
	NiSeO4	1.444e-16	1.444e-16	-15.840	-15.840	0.000	(0)
O(0)		2.474e-35					
	O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb		2.000e-08					
	PbCO3	1.110e-08	1.110e-08	-7.955	-7.955	0.000	(0)
	PbHCO3+	4.870e-09	4.147e-09	-8.312	-8.382	-0.070	(0)
	Pb+2	2.185e-09	1.275e-09	-8.660	-8.894	-0.234	(0)
	PbSO4	1.017e-09	1.017e-09	-8.993	-8.993	0.000	(0)
	PbOH+	5.340e-10	4.547e-10	-9.272	-9.342	-0.070	(0)
	Pb(CO3)2-2	1.761e-10	9.263e-11	-9.754	-10.033	-0.279	(0)
	PbCl+	7.913e-11	6.738e-11	-10.102	-10.171	-0.070	(0)
	Pb(SO4)2-2	1.898e-11	9.981e-12	-10.722	-11.001	-0.279	(0)
	PbF+	1.754e-11	1.494e-11	-10.756	-10.826	-0.070	(0)
	Pb(OH)2	2.042e-12	2.042e-12	-11.690	-11.690	0.000	(0)
	PbCl2	4.483e-13	4.483e-13	-12.348	-12.348	0.000	(0)
	PbF2	4.888e-14	4.888e-14	-13.311	-13.311	0.000	(0)
	Pb(OH)3-	3.404e-16	2.899e-16	-15.468	-15.538	-0.070	(0)
	PbCl3-	3.122e-16	2.659e-16	-15.506	-15.575	-0.070	(0)
	Pb2OH+3	3.900e-17	9.189e-18	-16.409	-17.037	-0.628	(0)
	PbF3-	1.810e-17	1.541e-17	-16.742	-16.812	-0.070	(0)
	PbCl4-2	3.441e-19	1.810e-19	-18.463	-18.742	-0.279	(0)
	Pb(OH)4-2	1.916e-20	1.008e-20	-19.718	-19.997	-0.279	(0)
	PbF4-2	2.332e-21	1.227e-21	-20.632	-20.911	-0.279	(0)
	Pb3(OH)4+2	2.016e-22	1.060e-22	-21.695	-21.975	-0.279	(0)
	Pb4(OH)4+4	1.403e-26	1.074e-27	-25.853	-26.969	-1.116	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-150.537	-150.537	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-227.624	-227.694	-0.070	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-72.790	-72.790	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.387	-78.456	-0.070	(0)
	H2S	0.000e+00	0.000e+00	-78.586	-78.586	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.689	-78.759	-0.070	(0)
	S5-2	0.000e+00	0.000e+00	-80.393	-80.672	-0.279	(0)
	S6-2	0.000e+00	0.000e+00	-80.909	-81.188	-0.279	(0)
	S4-2	0.000e+00	0.000e+00	-80.989	-81.268	-0.279	(0)
	S3-2	0.000e+00	0.000e+00	-81.795	-82.074	-0.279	(0)
	S2-2	0.000e+00	0.000e+00	-82.811	-83.090	-0.279	(0)
	S-2	0.000e+00	0.000e+00	-88.379	-88.607	-0.228	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.164	-138.233	-0.070	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-138.989	-138.989	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.513	-139.792	-0.279	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-147.076	-147.146	-0.070	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-147.314	-147.480	-0.167	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-148.199	-148.508	-0.309	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.942	-149.238	-0.296	(0)
	ZnS(HS)-	0.000e+00	0.000e+00	-149.217	-149.287	-0.070	(0)
	Ag(S4)2-3	0.000e+00	0.000e+00	-149.455	-149.771	-0.316	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.780	-150.082	-0.302	(0)
	Cd(HS)2	0.000e+00	0.000e+00	-150.012	-150.012	0.000	(0)
	Zn(HS)2	0.000e+00	0.000e+00	-150.426	-150.426	0.000	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-150.537	-150.537	0.000	(0)
	Fe(HS)2	0.000e+00	0.000e+00	-158.810	-158.810	0.000	(0)
	Cu(HS)3-	0.000e+00	0.000e+00	-215.751	-215.821	-0.070	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-225.533	-225.602	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.498	-226.568	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.624	-227.694	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.154	-228.433	-0.279	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.160	-235.230	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.549	-302.828	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.240	-305.519	-0.279	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.003	-317.282	-0.279	(0)
S (6)	3.515e-03					
SO4-2	2.792e-03	1.629e-03	-2.554	-2.788	-0.234	(0)
CaSO4	4.268e-04	4.268e-04	-3.370	-3.370	0.000	(0)
MgSO4	2.431e-04	2.431e-04	-3.614	-3.614	0.000	(0)
NaSO4-	4.252e-05	3.736e-05	-4.371	-4.428	-0.056	(0)
KSO4-	7.911e-06	6.951e-06	-5.102	-5.158	-0.056	(0)
MnSO4	2.946e-06	2.946e-06	-5.531	-5.531	0.000	(0)
CuSO4	1.664e-07	1.664e-07	-6.779	-6.779	0.000	(0)
ZnSO4	1.654e-07	1.654e-07	-6.781	-6.781	0.000	(0)
NiSO4	2.481e-08	2.481e-08	-7.605	-7.605	0.000	(0)
CoSO4	1.641e-08	1.641e-08	-7.785	-7.785	0.000	(0)
HSO4-	1.290e-08	1.128e-08	-7.890	-7.948	-0.058	(0)
Zn (SO4) 2-2	4.461e-09	2.346e-09	-8.351	-8.630	-0.279	(0)
CdSO4	1.866e-09	1.866e-09	-8.729	-8.729	0.000	(0)
PbSO4	1.017e-09	1.017e-09	-8.993	-8.993	0.000	(0)
AgSO4-	2.714e-10	2.311e-10	-9.566	-9.636	-0.070	(0)
CrOHSO4	1.051e-10	1.051e-10	-9.979	-9.979	0.000	(0)
Cd (SO4) 2-2	7.795e-11	4.100e-11	-10.108	-10.387	-0.279	(0)
AlSO4+	2.122e-11	1.857e-11	-10.673	-10.731	-0.058	(0)
Pb (SO4) 2-2	1.898e-11	9.981e-12	-10.722	-11.001	-0.279	(0)
FeSO4	5.677e-12	5.677e-12	-11.246	-11.246	0.000	(0)
Ni (SO4) 2-2	2.544e-12	1.338e-12	-11.595	-11.874	-0.279	(0)
CrSO4+	3.908e-13	3.328e-13	-12.408	-12.478	-0.070	(0)
Al (SO4) 2-	3.703e-13	3.240e-13	-12.431	-12.489	-0.058	(0)
UO2SO4	7.935e-14	7.935e-14	-13.100	-13.100	0.000	(0)
UO2 (SO4) 2-2	3.239e-15	1.704e-15	-14.490	-14.769	-0.279	(0)
VO2SO4-	4.144e-16	3.529e-16	-15.383	-15.452	-0.070	(0)
FeSO4+	1.154e-17	1.012e-17	-16.938	-16.995	-0.057	(0)
Cr2 (OH) 2SO4+2	4.908e-18	2.581e-18	-17.309	-17.588	-0.279	(0)
VOSO4	3.899e-18	3.899e-18	-17.409	-17.409	0.000	(0)
Fe (SO4) 2-	4.137e-19	3.524e-19	-18.383	-18.453	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.497e-19	2.497e-19	-18.603	-18.603	0.000	(0)
HgSO4	1.705e-21	1.705e-21	-20.768	-20.768	0.000	(0)
CrO3SO4-2	1.765e-24	9.285e-25	-23.753	-24.032	-0.279	(0)
VSO4+	4.667e-32	3.975e-32	-31.331	-31.401	-0.070	(0)
U (SO4) 2	6.369e-40	6.369e-40	-39.196	-39.196	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.029	-40.308	-0.279	(0)
Sb (3)	1.053e-19					
Sb (OH) 3	5.326e-20	5.326e-20	-19.274	-19.274	0.000	(0)
HSbO2	5.201e-20	5.201e-20	-19.284	-19.284	0.000	(0)
SbO2-	1.395e-24	1.188e-24	-23.855	-23.925	-0.070	(0)
Sb (OH) 2F	9.810e-25	9.810e-25	-24.008	-24.008	0.000	(0)
SbOF	9.650e-25	9.650e-25	-24.015	-24.015	0.000	(0)
Sb (OH) 4-	7.989e-25	6.804e-25	-24.097	-24.167	-0.070	(0)
Sb (OH) 2+	1.077e-25	9.172e-26	-24.968	-25.038	-0.070	(0)
SbO+	3.714e-26	3.163e-26	-25.430	-25.500	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.003	-317.282	-0.279	(0)
Sb (5)	1.297e-08					
SbO3-	1.295e-08	1.103e-08	-7.888	-7.957	-0.070	(0)
Sb (OH) 6-	1.475e-11	1.289e-11	-10.831	-10.890	-0.059	(0)
SbO2+	1.868e-23	1.590e-23	-22.729	-22.798	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.284e-40	2.797e-40	-39.484	-39.553	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.782	-42.782	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.813	-42.813	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.125	-47.404	-0.279	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.200	-86.316	-1.116	(0)
Se (4)	2.130e-08					
HSeO3-	1.952e-08	1.662e-08	-7.710	-7.779	-0.070	(0)

SeO3-2	1.775e-09	9.335e-10	-8.751	-9.030	-0.279	(0)
H2SeO3	5.027e-13	5.027e-13	-12.299	-12.299	0.000	(0)
AgSeO3-	5.010e-15	4.267e-15	-14.300	-14.370	-0.070	(0)
Cd (SeO3) 2-2	6.673e-21	3.510e-21	-20.176	-20.455	-0.279	(0)
Ag (SeO3) 2-3	1.514e-22	3.566e-23	-21.820	-22.448	-0.628	(0)
FeHSeO3+2	4.624e-23	2.432e-23	-22.335	-22.614	-0.279	(0)
Se (6)	6.943e-12					
SeO4-2	6.931e-12	4.044e-12	-11.159	-11.393	-0.234	(0)
MnSeO4	1.107e-14	1.107e-14	-13.956	-13.956	0.000	(0)
ZnSeO4	2.907e-16	2.907e-16	-15.536	-15.536	0.000	(0)
NiSeO4	1.444e-16	1.444e-16	-15.840	-15.840	0.000	(0)
CoSeO4	1.023e-16	1.023e-16	-15.990	-15.990	0.000	(0)
HSeO4-	1.687e-17	1.437e-17	-16.773	-16.843	-0.070	(0)
CdSeO4	3.681e-18	3.681e-18	-17.434	-17.434	0.000	(0)
Zn (SeO4) 2-2	2.266e-27	1.192e-27	-26.645	-26.924	-0.279	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.911	-58.539	-0.628	(0)
U (4)	3.779e-22					
U (OH) 5-	3.770e-22	3.210e-22	-21.424	-21.493	-0.070	(0)
U (OH) 4	9.535e-25	9.535e-25	-24.021	-24.021	0.000	(0)
U (OH) 3+	2.903e-28	2.472e-28	-27.537	-27.607	-0.070	(0)
U (OH) 2+2	1.541e-32	8.107e-33	-31.812	-32.091	-0.279	(0)
UF3+	1.631e-34	1.389e-34	-33.787	-33.857	-0.070	(0)
UF2+2	1.002e-35	5.272e-36	-34.999	-35.278	-0.279	(0)
UF4	2.533e-36	2.533e-36	-35.596	-35.596	0.000	(0)
UOH+3	1.149e-37	2.708e-38	-36.940	-37.567	-0.628	(0)
UF5-	1.960e-38	1.669e-38	-37.708	-37.778	-0.070	(0)
UF+3	1.069e-38	2.519e-39	-37.971	-38.599	-0.628	(0)
UF6-2	1.593e-39	8.380e-40	-38.798	-39.077	-0.279	(0)
U (SO4) 2	6.369e-40	6.369e-40	-39.196	-39.196	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.029	-40.308	-0.279	(0)
U+4	0.000e+00	0.000e+00	-43.003	-44.120	-1.116	(0)
UCl+3	0.000e+00	0.000e+00	-44.619	-45.247	-0.628	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.984	-174.634	-5.651	(0)
U (5)	5.488e-17					
UO2+	5.488e-17	4.674e-17	-16.261	-16.330	-0.070	(0)
U (6)	8.172e-08					
UO2 (CO3) 2-2	4.073e-08	2.143e-08	-7.390	-7.669	-0.279	(0)
UO2 (CO3) 3-4	4.062e-08	3.108e-09	-7.391	-8.507	-1.116	(0)
UO2CO3	3.710e-10	3.710e-10	-9.431	-9.431	0.000	(0)
UO2F+	8.675e-13	7.388e-13	-12.062	-12.131	-0.070	(0)
UO2OH+	6.756e-13	5.754e-13	-12.170	-12.240	-0.070	(0)
UO2F2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
UO2SO4	7.935e-14	7.935e-14	-13.100	-13.100	0.000	(0)
UO2+2	5.517e-14	3.219e-14	-13.258	-13.492	-0.234	(0)
UO2F3-	1.737e-14	1.480e-14	-13.760	-13.830	-0.070	(0)
UO2 (SO4) 2-2	3.239e-15	1.704e-15	-14.490	-14.769	-0.279	(0)
UO2Cl+	9.131e-17	7.776e-17	-16.039	-16.109	-0.070	(0)
UO2F4-2	3.715e-17	1.954e-17	-16.430	-16.709	-0.279	(0)
(UO2) 2 (OH) 2+2	1.045e-18	5.494e-19	-17.981	-18.260	-0.279	(0)
(UO2) 3 (OH) 5+	5.676e-21	4.834e-21	-20.246	-20.316	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.488	-40.557	-0.070	(0)
V+2	0.000e+00	0.000e+00	-40.941	-41.220	-0.279	(0)
V (3)	1.194e-13					
V (OH) 3	1.194e-13	1.194e-13	-12.923	-12.923	0.000	(0)
V (OH) 2+	6.422e-24	5.469e-24	-23.192	-23.262	-0.070	(0)
VOH+2	6.994e-27	3.679e-27	-26.155	-26.434	-0.279	(0)
V+3	2.194e-31	5.170e-32	-30.659	-31.287	-0.628	(0)
VSO4+	4.667e-32	3.975e-32	-31.331	-31.401	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.617	-51.244	-0.628	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.952	-52.069	-1.116	(0)
V (4)	3.202e-16					
V (OH) 3+	2.890e-16	2.462e-16	-15.539	-15.609	-0.070	(0)
VO+2	1.653e-17	8.692e-18	-16.782	-17.061	-0.279	(0)
VOF+	1.018e-17	8.668e-18	-16.992	-17.062	-0.070	(0)
VOSO4	3.899e-18	3.899e-18	-17.409	-17.409	0.000	(0)
VOF2	5.404e-19	5.404e-19	-18.267	-18.267	0.000	(0)

VOC1+	4.265e-20	3.632e-20	-19.370	-19.440	-0.070	(0)
VOF3-	3.744e-21	3.188e-21	-20.427	-20.496	-0.070	(0)
VOF4-2	4.068e-24	2.140e-24	-23.391	-23.670	-0.279	(0)
H2V2O4+2	5.778e-27	3.039e-27	-26.238	-26.517	-0.279	(0)
V (5)	1.124e-07					
H2VO4-	1.062e-07	9.042e-08	-6.974	-7.044	-0.070	(0)
HVO4-2	6.091e-09	3.204e-09	-8.215	-8.494	-0.279	(0)
H3VO4	6.410e-11	6.410e-11	-10.193	-10.193	0.000	(0)
H3V2O7-	4.396e-11	3.743e-11	-10.357	-10.427	-0.070	(0)
HV2O7-3	4.167e-13	9.818e-14	-12.380	-13.008	-0.628	(0)
VO2+	1.038e-14	9.074e-15	-13.984	-14.042	-0.059	(0)
V3O9-3	3.289e-15	7.748e-16	-14.483	-15.111	-0.628	(0)
VO2F	2.646e-15	2.646e-15	-14.577	-14.577	0.000	(0)
VO4-3	9.613e-16	2.265e-16	-15.017	-15.645	-0.628	(0)
V2O7-4	4.870e-16	3.727e-17	-15.312	-16.429	-1.116	(0)
VO2SO4-	4.144e-16	3.529e-16	-15.383	-15.452	-0.070	(0)
VO2F2-	1.876e-16	1.597e-16	-15.727	-15.797	-0.070	(0)
VO2F3-2	6.299e-19	3.313e-19	-18.201	-18.480	-0.279	(0)
V4O12-4	3.817e-19	2.921e-20	-18.418	-19.534	-1.116	(0)
VO2F4-3	1.150e-22	2.710e-23	-21.939	-22.567	-0.628	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.346	-49.090	-1.744	(0)
V10O28-6	0.000e+00	0.000e+00	-47.616	-50.128	-2.511	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.916	-51.032	-1.116	(0)
Zn	1.130e-06					
Zn+2	7.957e-07	4.642e-07	-6.099	-6.333	-0.234	(0)
ZnSO4	1.654e-07	1.654e-07	-6.781	-6.781	0.000	(0)
ZnCO3	7.733e-08	7.733e-08	-7.112	-7.112	0.000	(0)
ZnHCO3+	7.546e-08	6.426e-08	-7.122	-7.192	-0.070	(0)
ZnOH+	7.739e-09	6.591e-09	-8.111	-8.181	-0.070	(0)
Zn (SO4) 2-2	4.461e-09	2.346e-09	-8.351	-8.630	-0.279	(0)
ZnCl+	1.990e-09	1.737e-09	-8.701	-8.760	-0.059	(0)
ZnF+	1.808e-09	1.540e-09	-8.743	-8.812	-0.070	(0)
ZnOHCl	3.228e-10	3.228e-10	-9.491	-9.491	0.000	(0)
Zn (OH) 2	1.483e-10	1.483e-10	-9.829	-9.829	0.000	(0)
ZnCl2	4.100e-12	4.100e-12	-11.387	-11.387	0.000	(0)
Zn (OH) 3-	1.239e-13	1.055e-13	-12.907	-12.977	-0.070	(0)
ZnCl3-	5.559e-15	4.851e-15	-14.255	-14.314	-0.059	(0)
ZnSeO4	2.907e-16	2.907e-16	-15.536	-15.536	0.000	(0)
ZnCl4-2	6.106e-18	3.613e-18	-17.214	-17.442	-0.228	(0)
Zn (OH) 4-2	1.134e-18	5.965e-19	-17.945	-18.224	-0.279	(0)
Zn (SeO4) 2-2	2.266e-27	1.192e-27	-26.645	-26.924	-0.279	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.217	-149.287	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.426	-150.426	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.533	-225.602	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.154	-228.433	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.240	-305.519	-0.279	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.38	-87.60	-36.22	Ag2S
Ag2CO3	-10.74	-21.83	-11.09	Ag2CO3
Ag2CrO4	-20.65	-32.24	-11.59	Ag2CrO4
Ag2HVO4	-10.37	-8.89	1.48	Ag2HVO4
Ag2MoO4	-11.47	-23.02	-11.55	Ag2MoO4
Ag2O	-14.57	-2.00	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.26	-19.08	-4.82	Ag2SO4
Ag3AsO3	-26.92	-24.76	2.16	Ag3AsO3
Ag3AsO4	-15.32	-18.11	-2.79	Ag3AsO4
Ag3H2VO5	-15.07	-9.89	5.18	Ag3H2VO5
AgF:4H2O	-12.98	-11.93	1.05	AgF:4H2O
Agmetal	-0.26	-13.77	-13.51	Ag
AgVO3	-8.66	-7.89	0.77	AgVO3
Al (OH) 3 (am)	-1.19	9.61	10.80	Al (OH) 3

Al ₂ (MoO ₄) ₃	-46.21	-43.84	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	-0.42	19.23	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	-1.33	21.37	22.70	Al ₄ (OH) ₁₀ SO ₄
AlAsO ₄ :2H ₂ O	-10.30	-5.50	4.80	AlAsO ₄ :2H ₂ O
AlOHSO ₄	-4.24	-7.47	-3.23	AlOHSO ₄
AlSb	-151.92	-86.29	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-3.89	-11.68	-7.79	PbSO ₄
Anhydrite	-1.37	-5.73	-4.36	CaSO ₄
Anilite	-54.94	-86.82	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-2.03	6.76	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-84.29	-87.05	-2.76	As ₄ O ₆
Artinite	-7.01	2.59	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-36.94	-30.23	6.71	As ₂ O ₅
Atacamite	-1.47	5.92	7.39	Cu ₂ (OH) ₃ Cl
Azurite	1.08	-15.83	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.29	7.11	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-15.44	0.43	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-25.41	7.53	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.46	-23.13	-9.67	BaCrO ₄
BaF ₂	-8.93	-14.75	-5.82	BaF ₂
BaMoO ₄	-6.96	-13.92	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.65	-7.82	1.83	BaSeO ₃
BaSeO ₄	-11.13	-18.59	-7.46	BaSeO ₄
Bianchite	-7.36	-9.12	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-8.59	9.50	18.09	MnO ₂
Bixbyite	-5.90	-6.54	-0.64	Mn ₂ O ₃
BlaubleiI	-54.72	-78.88	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.27	-82.54	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.04	9.61	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.52	14.70	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.63	11.21	16.84	Mg(OH) ₂
Bunsenite	-5.26	7.18	12.45	NiO
Ca(VO ₃) ₂	-8.09	-2.43	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.57	8.93	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.62	8.93	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-18.46	3.84	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-18.67	20.29	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-19.58	20.28	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-300.72	-157.74	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-8.99	-26.90	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.72	-9.67	-7.95	CaMoO ₄
Carnotite	-2.39	-2.16	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.39	-3.57	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.32	-14.34	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.46	-3.62	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.66	5.99	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.74	5.99	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.92	-16.21	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.68	0.88	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.54	6.86	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.31	-13.96	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.27	-13.96	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.05	-13.97	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.66	-15.87	-1.21	CdF ₂
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.17	-19.56	13.62	Cd
CdMoO ₄	-0.89	-15.04	-14.15	CdMoO ₄
CdOHC1	-7.53	-3.99	3.54	CdOHC1
CdSb	-76.80	-77.15	-0.35	CdSb
CdSe	-20.51	-40.71	-20.20	CdSe

CdSeO4:2H2O	-17.85	-19.70	-1.85	CdSeO4:2H2O
CdSO4	-10.93	-11.10	-0.17	CdSO4
CdSO4:1H2O	-9.37	-11.10	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.23	-11.10	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.22	-10.97	-9.75	AgCl
Cerrusite	-1.30	-14.43	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.50	-9.14	-2.64	CuSO4:5H2O
Chalcocite	-54.95	-89.87	-34.92	Cu2S
Chalcopyrite	-124.54	-159.81	-35.27	CuFeS2
Cinnabar	-52.20	-97.90	-45.69	HgS
Claudetite	-83.98	-87.05	-3.06	As4O6
Clausthalite	-14.20	-41.30	-27.10	PbSe
Co (BO2) 2	-29.67	-2.60	27.07	Co (BO2) 2
Co (OH) 2	-6.09	7.00	13.09	Co (OH) 2
Co (OH) 3	-10.32	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-22.26	-9.22	13.03	Co3 (AsO4) 2
Co3O4	-7.75	-18.25	-10.50	Co3O4
CoCl2	-21.22	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.95	-45.41	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.26	-14.02	-7.76	CoMoO4
CoO	-6.58	7.00	13.59	CoO
CoS (alpha)	-71.16	-78.60	-7.44	CoS
CoS (beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.50	-39.70	-16.20	CoSe
CoSeO3	-9.25	-7.93	1.32	CoSeO3
CoSeO4:6H2O	-17.16	-18.69	-1.53	CoSeO4:6H2O
CoSO4	-12.89	-10.08	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.09	-2.47	CoSO4:6H2O
Cotunnite	-9.77	-14.55	-4.78	PbCl2
Covellite	-55.36	-77.66	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.05	-30.96	14.09	CrCl2
CrCl3	-46.22	-31.11	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.78	-41.62	-33.84	Na3AlF6
Cu (OH) 2	-0.73	7.95	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.72	20.49	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-55.21	-90.09	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.17	-50.97	-45.80	Cu2Se
Cu2SO4	-19.41	-21.36	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.49	-6.39	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.72	-102.31	-42.59	Cu3Sb
Cu3Se2	-26.24	-89.73	-63.49	Cu3Se2
CuCO3	-0.39	-11.89	-11.50	CuCO3
CuCrO4	-16.85	-22.29	-5.44	CuCrO4
CuF	-8.16	-13.06	-4.91	CuF
CuF2	-15.02	-13.91	1.12	CuF2
CuF2:2H2O	-9.36	-13.91	-4.55	CuF2:2H2O
Cumetal	-6.15	-14.91	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.49	-1.19	10.30	CuOCuSO4
Cupricferrite	8.34	14.33	5.99	CuFe2O4
Cuprite	-2.86	-4.27	-1.41	Cu2O
Cuprousferrite	9.97	1.06	-8.92	CuFeO2
CuSe	-5.65	-38.75	-33.10	CuSe
CuSe2	-26.55	-59.91	-33.37	CuSe2
CuSeO3:2H2O	-7.49	-6.98	0.51	CuSeO3:2H2O

CuSeO4:5H2O	-15.30	-17.74	-2.44	CuSeO4:5H2O
CuSO4	-12.08	-9.14	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-55.15	-89.07	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.75	-5.88	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.61	-10.33	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.10	-8.55	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.78	-38.40	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.14	-44.88	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.32	-11.92	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.48	-17.57	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.81	-64.41	-18.60	FeSe2
FeS(ppt)	-79.20	-82.15	-2.95	FeS
FeSe	-32.25	-43.25	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.23	-80.20	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.11	-9.12	-2.01	ZnSO4:7H2O
Greenockite	-65.26	-79.62	-14.36	CdS
Greigite	-287.55	-332.59	-45.03	Fe3S4
Gummite	-6.87	0.81	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-12.50	-24.60	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.15	-21.02	-12.88	H2MoO4
H2S(g)	-77.60	-85.61	-8.01	H2S
H2Se(g)	-41.74	-46.70	-4.96	H2Se
Halite	-6.80	-5.20	1.60	NaCl
Hausmannite	-7.57	53.46	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.21	22.68	22.89	FeAl2O4
Hg(CH3)2(g)	-182.62	-256.33	-73.71	Hg(CH3)2
Hg(g)	-8.37	-16.25	-7.87	Hg
Hg(OH)2	-8.80	-12.29	-3.50	Hg(OH)2
Hg2(g)	-17.54	-32.49	-14.96	Hg2
Hg2(OH)2	-12.21	-6.95	5.26	Hg2(OH)2
Hg2CO3	-10.73	-26.78	-16.05	Hg2CO3
Hg2CrO4	-28.48	-37.18	-8.70	Hg2CrO4
Hg2F2	-18.44	-28.80	-10.36	Hg2F2
Hg2S	-80.88	-92.55	-11.68	Hg2S
Hg2SeO3	-17.22	-21.88	-4.66	Hg2SeO3
Hg2SO4	-17.90	-24.03	-6.13	Hg2SO4
Hg3O2CO3	-27.04	-56.72	-29.68	Hg3O2CO3
HgCl(g)	-32.95	-13.45	19.50	HgCl
HgCl2	-10.98	-32.25	-21.26	HgCl2
HgF(g)	-47.08	-14.40	32.68	HgF
HgF2(g)	-46.72	-34.15	12.57	HgF2
Hgmetal(1)	-2.79	-16.25	-13.45	Hg
HgSe	-3.30	-59.00	-55.69	HgSe
HgSeO3	-14.79	-27.22	-12.43	HgSeO3
HgSO4	-19.96	-29.38	-9.42	HgSO4
Huntite	-4.39	-34.35	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.69	-23.46	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.52	-23.29	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.46	-20.63	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.87	-20.67	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.37	-52.62	-17.24	K2Cr2O7
K2CrO4	-21.87	-22.38	-0.51	K2CrO4
K2MoO4	-16.43	-13.17	3.26	K2MoO4
K2SeO4	-17.10	-17.83	-0.73	K2SeO4

Langite	-2.78	14.70	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.84	-6.28	-0.43	PbO:PbSO ₄
Laurionite	-5.20	-4.57	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.29	5.40	12.69	PbO
Mackinawite	-78.55	-82.15	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	0.74	17.60	16.86	Fe ₂ MgO ₄
Magnesite	-1.16	-8.62	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	1.36	-3.94	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.49	5.40	12.89	PbO
Matlockite	-6.53	-15.50	-8.97	PbClF
Melanothallite	-18.26	-12.00	6.26	CuCl ₂
Melanterite	-11.43	-13.64	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.80	-97.90	-45.09	HgS
Mg(OH) ₂ (active)	-7.58	11.21	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-13.85	-2.57	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.12	-201.44	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-17.72	8.64	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.35	8.85	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.41	-19.03	5.38	MgCrO ₄
MgF ₂	-2.51	-10.64	-8.13	MgF ₂
MgMoO ₄	-7.96	-9.81	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.77	-3.72	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-13.28	-14.48	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.76	41.76	73.52	Pb ₃ O ₄
Mirabilite	-6.41	-7.53	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-9.38	-4.48	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.09	-57.80	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.15	-90.07	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-14.81	-2.31	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.36	-10.65	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.47	-76.30	0.17	MnS
MnS (pnk)	-79.64	-76.30	3.34	MnS
MnSb	-96.27	-99.18	-2.91	MnSb
MnSe	-40.90	-37.40	3.50	MnSe
MnSeO ₃	-6.75	-5.62	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.60	-5.62	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-14.34	-16.39	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.36	-7.78	2.58	MnSO ₄
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.65	-12.29	-3.64	HgO
MoO ₃	-13.02	-21.02	-8.00	MoO ₃
Morenosite	-7.76	-9.91	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-147.52	-217.78	-70.26	MoS ₂
Na-Jarosite	-8.62	-19.82	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.02	-50.92	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.61	-20.68	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.89	-32.49	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.95	-11.46	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.69	-11.46	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.67	-5.37	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-17.41	-16.13	1.28	Na ₂ SeO ₄
Na ₃ Sb	-176.02	-81.57	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.23	7.45	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.07	5.33	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.38	-12.11	-6.73	CuCl
NaSb	-88.75	-65.58	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-5.97	-2.11	3.86	NaVO ₃
Nesquehonite	-3.95	-8.62	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.61	7.18	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-24.39	-8.69	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.36	11.64	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.79	-12.66	-6.87	NiCO ₃

NiMoO4	-2.70	-13.84	-11.14	NiMoO4
NiS (alpha)	-72.82	-78.42	-5.60	NiS
NiS (beta)	-67.32	-78.42	-11.10	NiS
NiS (gamma)	-65.62	-78.42	-12.80	NiS
NiSe	-21.82	-39.52	-17.70	NiSe
NiSeO3:2H2O	-10.56	-7.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.99	-18.51	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-239.27	-300.34	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb (BO2) 2	-10.72	-4.20	6.52	Pb (BO2) 2
Pb (OH) 2	-2.75	5.40	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-56.22	-64.98	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-7.96	0.83	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.38	10.81	26.19	Pb2O (OH) 2
Pb2O3	-24.69	36.35	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	-1.08	-2.98	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.82	-14.02	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-3.71	2.43	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.64	-3.62	11.02	Pb3O2CO3
Pb3O2SO4	-11.56	-0.87	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.57	4.53	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.35	4.53	21.88	Pb4O3SO4
PbCrO4	-12.23	-24.83	-12.60	PbCrO4
PbF2	-9.01	-16.45	-7.44	PbF2
Pbmetal	-24.39	-20.14	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.58	5.40	12.98	PbO:0.33H2O
PbSeO4	-13.45	-20.29	-6.84	PbSeO4
Periclase	-10.37	11.21	21.58	MgO
Phosgenite	-9.17	-28.98	-19.81	PbCl2:PbCO3
Plattnerite	-18.65	30.95	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca (OH) 2
Pyrite	-123.71	-142.22	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn (OH) 2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.39	-120.14	-19.75	AsS
Retgersite	-7.87	-9.91	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb (OH) 3	-12.16	-19.27	-7.11	Sb (OH) 3
Sb2O4	-16.40	-13.00	3.40	Sb2O4
Sb2O5	-26.41	-36.08	-9.67	Sb2O5
Sb2Se3	-110.90	-178.65	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.83	-77.09	-18.26	Sb4O6
Sb4O6 (orth)	-59.19	-77.09	-17.90	Sb4O6
SbCl3	-49.77	-49.20	0.57	SbCl3
SbF3	-41.83	-52.06	-10.23	SbF3
Sbmetal	-45.90	-57.59	-11.69	Sb
SbO2	-2.99	-30.81	-27.82	SbO2
Schoepite	-5.19	0.81	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.05	-21.16	-7.11	Se
Semetal (hex)	-13.45	-21.16	-7.71	Se
Senarmontite	-26.18	-38.55	-12.37	Sb2O3
SeO2	-15.05	-14.93	0.12	SeO2
SeO3	-46.74	-25.69	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.19	-77.64	-11.45	ZnS
Spinel	-6.41	30.44	36.85	MgAl2O4
Stibnite	-244.90	-295.36	-50.46	Sb2S3
Sulfur	-57.92	-60.06	-2.14	S
Tenorite	0.30	7.95	7.64	CuO
Thenardite	-7.85	-7.53	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3:H2O
Tyuyamunite	-4.90	-0.82	4.08	Ca (UO2) 2 (VO4) 2

U3O8	-16.56	4.52	21.08	U3O8
U3Sb4	-582.58	-430.20	152.38	U3Sb4
U4O9	-33.53	-36.54	-3.02	U4O9
UF4	-29.70	-59.24	-29.54	UF4
UF4:2.5H2O	-26.52	-59.24	-32.72	UF4:2.5H2O
UO2 (am)	-16.46	-15.52	0.93	UO2
UO2 (OH) 2 (beta)	-4.81	0.81	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.64	-24.89	-2.25	UO2SeO4:4H2O
UO3	-6.89	0.81	7.70	UO3
Uraninite	-10.85	-15.52	-4.67	UO2
USb2	-220.59	-191.01	29.58	USb2
V (OH) 3	-17.43	-9.84	7.59	V (OH) 3
V2O5	-12.43	-13.79	-1.36	V2O5
V3O5	-35.67	-33.83	1.84	V3O5
V4O7	-43.78	-36.59	7.19	V4O7
V6O13	-31.59	-92.45	-60.86	V6O13
Valentinite	-30.07	-38.55	-8.48	Sb2O3
VC12	-61.44	-42.56	18.87	VC12
VC13	-63.20	-39.77	23.43	VC13
VF4	-61.41	-46.48	14.93	VF4
Vmetal	-92.18	-48.16	44.03	V
VO	-37.37	-22.61	14.76	VO
VO (OH) 2	-7.91	-2.76	5.15	VO (OH) 2
VO2Cl	-19.71	-16.87	2.84	VO2Cl
VOC1	-30.97	-19.81	11.15	VOC1
VOC12	-35.48	-22.71	12.76	VOC12
VOSO4	-23.46	-19.85	3.61	VOSO4
Witherite	-4.16	-12.73	-8.57	BaCO3
Wurtzite	-68.69	-77.64	-8.95	ZnS
Zincite	-3.37	7.97	11.33	ZnO
Zincosite	-13.05	-9.12	3.93	ZnSO4
Zn (BO2) 2	-9.93	-1.64	8.29	Zn (BO2) 2
Zn (OH) 2	-4.23	7.97	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.51	7.97	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.79	7.97	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.57	7.97	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.77	7.97	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.66	-1.16	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.24	5.95	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.98	-6.33	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.19	-10.28	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.63	14.77	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.63	19.87	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.04	-11.99	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.36	-13.89	-0.53	ZnF2
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO4	-2.93	-13.06	-10.13	ZnMoO4
ZnO (active)	-3.22	7.97	11.19	ZnO
ZnS (am)	-68.59	-77.64	-9.05	ZnS
ZnSb	-86.18	-75.17	11.01	ZnSb
ZnSe	-24.34	-38.74	-14.40	ZnSe
ZnSeO4:6H2O	-16.21	-17.73	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.48	-9.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 71.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 401

```

        equilibrate with solution 1
        Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
        Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
        donnan 1e-008
    USE EQUILIBRIUM_PHASES 401
    USE Surface 401
    USE Solution 403
    SAVE Solution 404 #Initial Stage 4 groundwater after Mineral Precipitation
and Sorption Loss
    END

```

```

-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

```

-----
Beginning of initial surface-composition calculations.
-----

```

Surface 401.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

    1.144e-15  Surface + diffuse layer charge, eq
    7.815e-08  Surface charge, eq
    4.399e-03  sigma, C/m²
    1.213e-01  psi, V
    -4.722e+00 -F*psi/RT
    8.900e-03  exp(-F*psi/RT)
    6.420e+04  specific area, m²/mol Ferrihydrite
    1.714e+00  m² for 2.670e-05 moles of Ferrihydrite

```

Water in diffuse layer: 1.714e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is +1).

Element	Moles
C	4.3793e-11
Ca	5.4274e-13
Cl	8.7696e-10
H	1.2919e-10
K	8.6100e-13
Mg	8.4089e-14
N	3.5503e-09
Na	3.6480e-12
O	1.5824e-07
S	3.6872e-08

Hfo_s

```

    1.335e-07  moles  [0.005 mol/(mol Ferrihydrite)]

```

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.925e-08	0.668	8.925e-08	-7.049
Hfo_sOH	4.377e-08	0.328	4.377e-08	-7.359
Hfo_sO-	4.918e-10	0.004	4.918e-10	-9.308
Hfo_sOHCa+2	1.629e-12	0.000	1.629e-12	-11.788

Hfo_w

```

    5.340e-06  moles  [0.2 mol/(mol Ferrihydrite)]

```

Species	Moles	Mole Fraction	Molality	Log Molality
---------	-------	---------------	----------	--------------

Hfo_wOH2+	2.468e-06	0.462	2.468e-06	-5.608
Hfo_wOH	1.210e-06	0.227	1.210e-06	-5.917
Hfo_wSO4-	8.334e-07	0.156	8.334e-07	-6.079
Hfo_wOHSO4-2	8.156e-07	0.153	8.156e-07	-6.089
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.867
Hfo_wOMg+	1.922e-14	0.000	1.922e-14	-13.716
Hfo_wOCa+	6.520e-15	0.000	6.520e-15	-14.186

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 403. Solution after simulation 70.
Using surface 401.
Using pure phase assemblage 401. Pure-phase assemblage after simulation 70.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.508e-08	2.139e-08	-3.690e-09
Alunite	0.00	-1.40	-1.40	8.217e-07	8.219e-07	1.530e-10
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.01	-9.92	-8.91	2.011e-08	0	-2.011e-08
Barite	0.00	-9.98	-9.98	1.276e-06	1.336e-06	6.033e-08
Brochantite	-1.08	14.14	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.21	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.249e-06
CaMoO4	-1.58	-9.53	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.56	-3.75	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.793e-03	2.793e-03	-6.535e-07
Carnotite	-4.17	-3.94	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.46	-3.62	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.75	-14.90	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.032e-08	3.819e-08	-2.213e-08
Cu2Se(alpha)	-5.63	-51.43	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.129e-07	8.914e-08	-1.237e-07
Epsomite	-3.75	-5.88	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	2.670e-05	2.670e-05	-5.241e-13
Fluorite	0.00	-10.50	-10.50	1.032e-04	1.032e-04	9.829e-09
Gummite	-6.87	0.81	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.48	-59.17	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.41	-7.53	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.93	-5.80	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.61	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.40	-9.70	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.56	-13.70	-11.14	0.000e+00	0	0.000e+00

O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.435e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.654e-09	0	-5.654e-09
Rutherfordine	-4.53	-19.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.99	-30.81	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.19	0.81	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.45	-4.37	4.08	0.000e+00	0	0.000e+00
U3O8	-16.56	4.52	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.81	0.81	5.61	0.000e+00	0	0.000e+00
UO3	-6.89	0.81	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.80	-12.92	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-8.080e-20 Surface + diffuse layer charge, eq
 3.711e-07 Surface charge, eq
 2.089e-02 sigma, C/m²
 5.546e-02 psi, V
 -2.159e+00 -F*psi/RT
 1.155e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.714e+00 m² for 2.670e-05 moles of Ferrihydrite

Water in diffuse layer: 1.714e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.335e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.948e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	6.8020e-13
Al	4.9257e-11
As	3.4429e-15
B	2.7336e-10
Ba	7.0104e-13
C	1.5772e-07
Ca	2.0407e-08
Cd	1.0130e-13
Cl	4.9118e-08
Co	1.1190e-12
Cr	6.5604e-14
Cu	1.0668e-10
F	5.7185e-09
Fe	4.0327e-14
H	1.7018e-07
Hg	3.6405e-15
K	7.2620e-09
Mg	1.3336e-08
Mn	1.7915e-10
Mo	2.1582e-11
N	8.4301e-14
Na	5.1258e-08
Ni	1.8579e-12
O	1.0674e-06
Pb	1.7408e-13
S	1.4827e-07
Sb	3.7367e-13
Se	4.3507e-13
U	7.5414e-12
V	5.5937e-14
Zn	1.0003e-11

Hfo_s

1.335e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.566e-08	0.567	7.567e-08	-7.121
Hfo_sOCrOH+	4.426e-08	0.331	4.426e-08	-7.354
Hfo_sOPb+	1.044e-08	0.078	1.044e-08	-7.981
Hfo_sOZn+	1.356e-09	0.010	1.356e-09	-8.868
Hfo_sOMn+	1.222e-09	0.009	1.222e-09	-8.913
Hfo_sOHCa+2	2.637e-10	0.002	2.637e-10	-9.579
Hfo_sOH	1.853e-10	0.001	1.853e-10	-9.732
Hfo_sONi+	5.386e-11	0.000	5.386e-11	-10.269
Hfo_sOH2+	2.957e-11	0.000	2.958e-11	-10.529
Hfo_sO-	2.659e-11	0.000	2.660e-11	-10.575
Hfo_sOCu+	5.278e-12	0.000	5.278e-12	-11.277
Hfo_sOCd+	4.346e-12	0.000	4.346e-12	-11.362
Hfo_sOAg	4.325e-13	0.000	4.326e-13	-12.364
Hfo_sOHBa+2	4.579e-14	0.000	4.579e-14	-13.339
Hfo_sOFe+	2.148e-14	0.000	2.148e-14	-13.668
Hfo_sOHg+	6.881e-17	0.000	6.881e-17	-16.162

Hfo_w

5.340e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.541e-06	0.476	2.541e-06	-5.595
Hfo_wOH	1.213e-06	0.227	1.213e-06	-5.916
Hfo_wOHSO4-2	9.142e-07	0.171	9.142e-07	-6.039
Hfo_wOH2+	1.936e-07	0.036	1.936e-07	-6.713
Hfo_wO-	1.741e-07	0.033	1.741e-07	-6.759
Hfo_wOHVO4-3	1.105e-07	0.021	1.105e-07	-6.956
Hfo_wSO4-	7.315e-08	0.014	7.316e-08	-7.136
Hfo_wOMg+	4.070e-08	0.008	4.070e-08	-7.390
Hfo_wOHSO4-3	4.037e-08	0.008	4.037e-08	-7.394
Hfo_wOZn+	9.295e-09	0.002	9.296e-09	-8.032
Hfo_wOHSeO3-2	8.425e-09	0.002	8.425e-09	-8.074
Hfo_wOMn+	6.353e-09	0.001	6.353e-09	-8.197
Hfo_wOHMoO4-2	5.938e-09	0.001	5.938e-09	-8.226
Hfo_wOCa+	3.193e-09	0.001	3.193e-09	-8.496
Hfo_wOPb+	3.054e-09	0.001	3.054e-09	-8.515
Hfo_wSeO3-	2.284e-09	0.000	2.285e-09	-8.641
Hfo_wMoO4-	6.122e-10	0.000	6.122e-10	-9.213
Hfo_wONi+	4.757e-10	0.000	4.757e-10	-9.323
Hfo_wOCu+	9.740e-11	0.000	9.741e-11	-10.011
Hfo_wH2BO3	7.969e-11	0.000	7.969e-11	-10.099
Hfo_wHAsO4-	2.303e-11	0.000	2.303e-11	-10.638
Hfo_wOCd+	1.214e-11	0.000	1.214e-11	-10.916
Hfo_wOAg	7.449e-13	0.000	7.449e-13	-12.128
Hfo_wH2AsO4	1.189e-13	0.000	1.190e-13	-12.925
Hfo_wOFe+	8.872e-14	0.000	8.872e-14	-13.052
Hfo_wOHg+	2.206e-14	0.000	2.207e-14	-13.656
Hfo_wOBa+	8.013e-15	0.000	8.013e-15	-14.096
Hfo_wOHSbO(OH) 4-	2.703e-15	0.000	2.703e-15	-14.568
Hfo_wOHSeO4-2	1.557e-15	0.000	1.557e-15	-14.808
Hfo_wSbO(OH) 4	2.787e-16	0.000	2.787e-16	-15.555
Hfo_wSeO4-	1.085e-16	0.000	1.085e-16	-15.965
Hfo_wOHCrO4-2	8.316e-17	0.000	8.316e-17	-16.080
Hfo_wCrO4-	6.069e-18	0.000	6.069e-18	-17.217
Hfo_wH2AsO3	1.693e-23	0.000	1.693e-23	-22.771

-----Solution composition-----

Elements	Molality	Moles
Ag	4.072e-08	4.072e-08
Al	2.013e-06	2.013e-06

As	8.034e-11	8.034e-11
B	1.585e-05	1.585e-05
Ba	1.133e-07	1.133e-07
C	5.857e-03	5.857e-03
Ca	2.502e-03	2.501e-03
Cd	1.153e-08	1.153e-08
Cl	1.704e-03	1.704e-03
Co	1.358e-07	1.357e-07
Cr	6.396e-09	6.396e-09
Cu	6.545e-06	6.545e-06
F	2.121e-04	2.121e-04
Fe	3.659e-09	3.659e-09
Hg	2.124e-10	2.123e-10
K	6.977e-04	6.977e-04
Mg	1.711e-03	1.711e-03
Mn	2.340e-05	2.340e-05
Mo	4.456e-07	4.456e-07
N	3.550e-09	3.550e-09
Na	4.941e-03	4.941e-03
Ni	2.126e-07	2.126e-07
Pb	1.215e-08	1.215e-08
S	3.516e-03	3.516e-03
Sb	1.297e-08	1.296e-08
Se	1.428e-08	1.428e-08
U	8.172e-08	8.171e-08
V	1.872e-09	1.872e-09
Zn	1.120e-06	1.120e-06

-----Description of solution-----

equilibrium	pH	=	7.149	Charge balance
	pe	=	5.623	Adjusted to redox
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.871e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	5.184e-03	
	Total CO2 (mol/kg)	=	5.857e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.127e-15	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	1	
	Total H	=	1.110158e+02	
	Total O	=	5.553631e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.631e-07	1.420e-07	-6.788	-6.848	-0.060	(0)
H+	8.113e-08	7.090e-08	-7.091	-7.149	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.072e-08					
AgCl	2.642e-08	2.642e-08	-7.578	-7.578	0.000	(0)
Ag+	9.939e-09	8.686e-09	-8.003	-8.061	-0.059	(0)
AgCl2-	4.024e-09	3.427e-09	-8.395	-8.465	-0.070	(0)
AgSO4-	3.315e-10	2.823e-10	-9.480	-9.549	-0.070	(0)
AgCl3-2	8.649e-12	4.549e-12	-11.063	-11.342	-0.279	(0)
AgF	3.627e-12	3.627e-12	-11.440	-11.440	0.000	(0)
AgOH	1.233e-13	1.233e-13	-12.909	-12.909	0.000	(0)
AgCl4-3	5.872e-14	1.383e-14	-13.231	-13.859	-0.628	(0)
AgH2BO3	1.776e-14	1.776e-14	-13.750	-13.750	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	4.102e-15	3.494e-15	-14.387	-14.457	-0.070	(0)
AgNO2	4.035e-15	4.035e-15	-14.394	-14.394	0.000	(0)
AgNH3+	1.396e-16	1.189e-16	-15.855	-15.925	-0.070	(0)
Ag(OH) 2-	2.009e-18	1.711e-18	-17.697	-17.767	-0.070	(0)

	AgNO3	1.447e-20	1.447e-20	-19.839	-19.839	0.000	(0)
	Ag (SeO3) 2-3	8.309e-23	1.957e-23	-22.080	-22.708	-0.628	(0)
	Ag (NO2) 2-	1.631e-23	1.389e-23	-22.787	-22.857	-0.070	(0)
	Ag (NH3) 2+	7.610e-24	6.480e-24	-23.119	-23.188	-0.070	(0)
	Ag2MoO4	7.418e-24	7.418e-24	-23.130	-23.130	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.703	-72.703	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.460	-86.576	-1.116	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-146.989	-147.059	-0.070	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.227	-147.393	-0.167	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.368	-149.684	-0.316	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.693	-149.995	-0.302	(0)
Al	2.013e-06						
	Al (OH) 4-	1.361e-06	1.190e-06	-5.866	-5.924	-0.058	(0)
	AlF3	3.382e-07	3.382e-07	-6.471	-6.471	0.000	(0)
	AlF2+	1.839e-07	1.616e-07	-6.735	-6.792	-0.056	(0)
	Al (OH) 3	6.661e-08	6.661e-08	-7.176	-7.176	0.000	(0)
	AlF4-	3.221e-08	2.818e-08	-7.492	-7.550	-0.058	(0)
	Al (OH) 2+	2.676e-08	2.351e-08	-7.573	-7.629	-0.056	(0)
	AlF+2	4.095e-09	2.442e-09	-8.388	-8.612	-0.225	(0)
	AlOH+2	3.497e-10	2.085e-10	-9.456	-9.681	-0.225	(0)
	AlSO4+	2.123e-11	1.857e-11	-10.673	-10.731	-0.058	(0)
	Al+3	4.938e-12	1.469e-12	-11.306	-11.833	-0.527	(0)
	Al (SO4) 2-	3.705e-13	3.241e-13	-12.431	-12.489	-0.058	(0)
	AlMo6O21-3	2.392e-39	5.636e-40	-38.621	-39.249	-0.628	(0)
As (3)	5.473e-23						
	H3AsO3	5.427e-23	5.427e-23	-22.265	-22.265	0.000	(0)
	H2AsO3-	4.610e-25	3.926e-25	-24.336	-24.406	-0.070	(0)
	HAsO3-2	9.600e-30	5.049e-30	-29.018	-29.297	-0.279	(0)
	H4AsO3+	2.239e-30	1.907e-30	-29.650	-29.720	-0.070	(0)
	AsO3-3	1.165e-35	2.745e-36	-34.934	-35.561	-0.628	(0)
As (5)	8.034e-11						
	HAsO4-2	5.741e-11	3.020e-11	-10.241	-10.520	-0.279	(0)
	H2AsO4-	2.293e-11	1.953e-11	-10.640	-10.709	-0.070	(0)
	AsO4-3	5.716e-15	1.347e-15	-14.243	-14.871	-0.628	(0)
	H3AsO4	2.396e-16	2.406e-16	-15.621	-15.619	0.002	(0)
B	1.585e-05						
	H3BO3	1.568e-05	1.575e-05	-4.805	-4.803	0.002	(0)
	H2BO3-	1.491e-07	1.290e-07	-6.827	-6.889	-0.063	(0)
	CaH2BO3+	9.814e-09	8.495e-09	-8.008	-8.071	-0.063	(0)
	MgH2BO3+	4.239e-09	3.669e-09	-8.373	-8.435	-0.063	(0)
	BF (OH) 3-	1.207e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
	NaH2BO3	8.735e-10	8.735e-10	-9.059	-9.059	0.000	(0)
	H5 (BO3) 2-	1.999e-12	1.730e-12	-11.699	-11.762	-0.063	(0)
	BF2 (OH) 2-	1.522e-12	1.317e-12	-11.818	-11.880	-0.063	(0)
	BaH2BO3+	2.961e-13	2.563e-13	-12.529	-12.591	-0.063	(0)
	AgH2BO3	1.776e-14	1.776e-14	-13.750	-13.750	0.000	(0)
	H8 (BO3) 3-	3.148e-15	2.725e-15	-14.502	-14.565	-0.063	(0)
	BF3OH-	6.982e-18	6.043e-18	-17.156	-17.219	-0.063	(0)
	BF4-	4.051e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
Ba	1.133e-07						
	Ba+2	1.102e-07	6.429e-08	-6.958	-7.192	-0.234	(0)
	BaHCO3+	3.050e-09	2.687e-09	-8.516	-8.571	-0.055	(0)
	BaCO3	9.542e-11	9.542e-11	-10.020	-10.020	0.000	(0)
	BaH2BO3+	2.961e-13	2.563e-13	-12.529	-12.591	-0.063	(0)
	BaOH+	4.542e-14	3.984e-14	-13.343	-13.400	-0.057	(0)
	BaNO3+	7.935e-19	6.757e-19	-18.100	-18.170	-0.070	(0)
	BaNH3+2	5.171e-19	2.720e-19	-18.286	-18.566	-0.279	(0)
C (4)	5.857e-03						
	HCO3-	4.981e-03	4.377e-03	-2.303	-2.359	-0.056	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.058e-04	9.325e-05	-3.975	-4.030	-0.055	(0)
	MgHCO3+	4.210e-05	3.674e-05	-4.376	-4.435	-0.059	(0)
	NaHCO3	1.051e-05	1.051e-05	-4.978	-4.978	0.000	(0)
	CuCO3	5.506e-06	5.506e-06	-5.259	-5.259	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.961e-06	2.894e-06	-5.304	-5.538	-0.234	(0)
	MgCO3	1.974e-06	1.974e-06	-5.705	-5.705	0.000	(0)
	MnHCO3+	1.013e-06	8.882e-07	-5.995	-6.052	-0.057	(0)

	NaCO3-	2.620e-07	2.302e-07	-6.582	-6.638	-0.056	(0)
	CuHCO3+	1.048e-07	8.922e-08	-6.980	-7.050	-0.070	(0)
	Cu (CO3) 2-2	8.154e-08	4.289e-08	-7.089	-7.368	-0.279	(0)
	ZnCO3	7.658e-08	7.658e-08	-7.116	-7.116	0.000	(0)
	ZnHCO3+	7.474e-08	6.365e-08	-7.126	-7.196	-0.070	(0)
	NiHCO3+	4.825e-08	4.109e-08	-7.316	-7.386	-0.070	(0)
	UO2 (CO3) 2-2	4.073e-08	2.142e-08	-7.390	-7.669	-0.279	(0)
	UO2 (CO3) 3-4	4.061e-08	3.108e-09	-7.391	-8.508	-1.116	(0)
	CoHCO3+	2.017e-08	1.718e-08	-7.695	-7.765	-0.070	(0)
	NiCO3	8.222e-09	8.222e-09	-8.085	-8.085	0.000	(0)
	PbCO3	6.742e-09	6.742e-09	-8.171	-8.171	0.000	(0)
	BaHCO3+	3.050e-09	2.687e-09	-8.516	-8.571	-0.055	(0)
	PbHCO3+	2.959e-09	2.520e-09	-8.529	-8.599	-0.070	(0)
	CoCO3	2.468e-09	2.468e-09	-8.608	-8.608	0.000	(0)
	UO2CO3	3.710e-10	3.710e-10	-9.431	-9.431	0.000	(0)
	CdCO3	3.220e-10	3.220e-10	-9.492	-9.492	0.000	(0)
	Pb (CO3) 2-2	1.070e-10	5.627e-11	-9.971	-10.250	-0.279	(0)
	BaCO3	9.542e-11	9.542e-11	-10.020	-10.020	0.000	(0)
	CdHCO3+	5.711e-11	4.864e-11	-10.243	-10.313	-0.070	(0)
	Cd (CO3) 2-2	1.313e-12	6.907e-13	-11.882	-12.161	-0.279	(0)
	FeHCO3+	8.882e-13	7.826e-13	-12.052	-12.106	-0.055	(0)
	HgCO3	1.385e-14	1.385e-14	-13.858	-13.858	0.000	(0)
	Hg (CO3) 2-2	2.411e-16	1.268e-16	-15.618	-15.897	-0.279	(0)
	HgHCO3+	2.148e-17	1.829e-17	-16.668	-16.738	-0.070	(0)
Ca	2.502e-03						
	Ca+2	1.961e-03	1.144e-03	-2.707	-2.942	-0.234	(0)
	CaSO4	4.269e-04	4.269e-04	-3.370	-3.370	0.000	(0)
	CaHCO3+	1.058e-04	9.325e-05	-3.975	-4.030	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.367e-06	2.076e-06	-5.626	-5.683	-0.057	(0)
	CaH2BO3+	9.814e-09	8.495e-09	-8.008	-8.071	-0.063	(0)
	CaOH+	3.678e-09	3.241e-09	-8.434	-8.489	-0.055	(0)
	CaNH3+2	1.836e-14	9.658e-15	-13.736	-14.015	-0.279	(0)
	CaNO3+	8.911e-15	7.588e-15	-14.050	-14.120	-0.070	(0)
	Ca (NH3) 2+2	4.901e-26	2.578e-26	-25.310	-25.589	-0.279	(0)
Cd	1.153e-08						
	Cd+2	8.366e-09	4.881e-09	-8.078	-8.312	-0.234	(0)
	CdSO4	1.864e-09	1.864e-09	-8.730	-8.730	0.000	(0)
	CdCl+	8.152e-10	6.942e-10	-9.089	-9.158	-0.070	(0)
	CdCO3	3.220e-10	3.220e-10	-9.492	-9.492	0.000	(0)
	Cd (SO4) 2-2	7.786e-11	4.095e-11	-10.109	-10.388	-0.279	(0)
	CdHCO3+	5.711e-11	4.864e-11	-10.243	-10.313	-0.070	(0)
	CdF+	1.510e-11	1.286e-11	-10.821	-10.891	-0.070	(0)
	CdOH+	6.463e-12	5.504e-12	-11.190	-11.259	-0.070	(0)
	CdCl2	4.311e-12	4.311e-12	-11.365	-11.365	0.000	(0)
	CdOHC1	4.043e-12	4.043e-12	-11.393	-11.393	0.000	(0)
	Cd (CO3) 2-2	1.313e-12	6.907e-13	-11.882	-12.161	-0.279	(0)
	Cd (OH) 2	4.930e-15	4.930e-15	-14.307	-14.307	0.000	(0)
	CdCl3-	4.757e-15	4.051e-15	-14.323	-14.392	-0.070	(0)
	CdF2	4.266e-15	4.266e-15	-14.370	-14.370	0.000	(0)
	CdSeO4	2.464e-18	2.464e-18	-17.608	-17.608	0.000	(0)
	Cd2OH+3	5.715e-19	1.346e-19	-18.243	-18.871	-0.628	(0)
	Cd (OH) 3-	5.021e-20	4.276e-20	-19.299	-19.369	-0.070	(0)
	CdNO3+	3.801e-20	3.237e-20	-19.420	-19.490	-0.070	(0)
	Cd (SeO3) 2-2	2.995e-21	1.575e-21	-20.524	-20.803	-0.279	(0)
	Cd (OH) 4-2	1.889e-27	9.936e-28	-26.724	-27.003	-0.279	(0)
	Cd (NO3) 2	3.403e-32	3.403e-32	-31.468	-31.468	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.690	-78.760	-0.070	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.012	-150.012	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.498	-226.568	-0.070	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.549	-302.828	-0.279	(0)
Cl	1.704e-03						
	Cl-	1.704e-03	1.489e-03	-2.768	-2.827	-0.059	(0)
	AgCl	2.642e-08	2.642e-08	-7.578	-7.578	0.000	(0)
	MnCl+	2.174e-08	1.907e-08	-7.663	-7.720	-0.057	(0)
	AgCl2-	4.024e-09	3.427e-09	-8.395	-8.465	-0.070	(0)
	ZnCl+	1.971e-09	1.720e-09	-8.705	-8.764	-0.059	(0)
	CuCl+	8.739e-10	7.626e-10	-9.059	-9.118	-0.059	(0)

CdCl+	8.152e-10	6.942e-10	-9.089	-9.158	-0.070	(0)
CuCl	7.067e-10	7.067e-10	-9.151	-9.151	0.000	(0)
NiCl+	3.408e-10	2.902e-10	-9.468	-9.537	-0.070	(0)
ZnOHC1	3.198e-10	3.198e-10	-9.495	-9.495	0.000	(0)
CoCl+	3.053e-10	2.600e-10	-9.515	-9.585	-0.070	(0)
CuCl2-	2.520e-10	2.199e-10	-9.599	-9.658	-0.059	(0)
PbCl+	4.809e-11	4.095e-11	-10.318	-10.388	-0.070	(0)
MnCl2	4.012e-11	4.012e-11	-10.397	-10.397	0.000	(0)
AgCl3-2	8.649e-12	4.549e-12	-11.063	-11.342	-0.279	(0)
CdCl2	4.311e-12	4.311e-12	-11.365	-11.365	0.000	(0)
ZnCl2	4.061e-12	4.061e-12	-11.391	-11.391	0.000	(0)
CdOHC1	4.043e-12	4.043e-12	-11.393	-11.393	0.000	(0)
HgClOH	1.494e-12	1.494e-12	-11.826	-11.826	0.000	(0)
HgCl2	8.873e-13	8.873e-13	-12.052	-12.052	0.000	(0)
CuCl2	3.939e-13	3.939e-13	-12.405	-12.405	0.000	(0)
PbCl2	2.725e-13	2.725e-13	-12.565	-12.565	0.000	(0)
CuCl3-2	1.183e-13	7.003e-14	-12.927	-13.155	-0.228	(0)
AgCl4-3	5.872e-14	1.383e-14	-13.231	-13.859	-0.628	(0)
MnCl3-	1.877e-14	1.646e-14	-13.727	-13.784	-0.057	(0)
HgCl3-	1.552e-14	1.322e-14	-13.809	-13.879	-0.070	(0)
ZnCl3-	5.506e-15	4.805e-15	-14.259	-14.318	-0.059	(0)
CdCl3-	4.757e-15	4.051e-15	-14.323	-14.392	-0.070	(0)
NiCl2	2.176e-15	2.176e-15	-14.662	-14.662	0.000	(0)
CrCl+2	3.208e-16	1.688e-16	-15.494	-15.773	-0.279	(0)
PbCl3-	1.897e-16	1.616e-16	-15.722	-15.792	-0.070	(0)
HgCl4-2	1.490e-16	7.837e-17	-15.827	-16.106	-0.279	(0)
HgCl+	1.396e-16	1.189e-16	-15.855	-15.925	-0.070	(0)
UO2Cl+	9.134e-17	7.779e-17	-16.039	-16.109	-0.070	(0)
CuCl3-	6.273e-18	5.475e-18	-17.202	-17.262	-0.059	(0)
ZnCl4-2	6.047e-18	3.579e-18	-17.218	-17.446	-0.228	(0)
CrOHC12	6.782e-19	6.782e-19	-18.169	-18.169	0.000	(0)
PbCl4-2	2.091e-19	1.100e-19	-18.680	-18.959	-0.279	(0)
FeCl+2	4.211e-20	2.492e-20	-19.376	-19.604	-0.228	(0)
CrCl2+	2.801e-20	2.385e-20	-19.553	-19.623	-0.070	(0)
VOCl+	7.111e-22	6.056e-22	-21.148	-21.218	-0.070	(0)
FeCl2+	1.890e-22	1.658e-22	-21.724	-21.780	-0.057	(0)
CuCl4-2	6.906e-23	4.087e-23	-22.161	-22.389	-0.228	(0)
FeCl3	2.469e-26	2.469e-26	-25.607	-25.607	0.000	(0)
CrO3Cl-	2.059e-26	1.753e-26	-25.686	-25.756	-0.070	(0)
CoCl+2	4.859e-35	2.556e-35	-34.313	-34.592	-0.279	(0)
UCl+3	0.000e+00	0.000e+00	-44.618	-45.246	-0.628	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.228	-64.507	-0.279	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.545	-68.824	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.118	-82.397	-0.279	(0)
Co (2)	1.358e-07					
Co+2	9.593e-08	5.046e-08	-7.018	-7.297	-0.279	(0)
CoHCO3+	2.017e-08	1.718e-08	-7.695	-7.765	-0.070	(0)
CoSO4	1.640e-08	1.640e-08	-7.785	-7.785	0.000	(0)
CoCO3	2.468e-09	2.468e-09	-8.608	-8.608	0.000	(0)
CoF+	3.115e-10	2.653e-10	-9.507	-9.576	-0.070	(0)
CoCl+	3.053e-10	2.600e-10	-9.515	-9.585	-0.070	(0)
CoOH+	1.678e-10	1.429e-10	-9.775	-9.845	-0.070	(0)
Co (OH) 2	1.612e-12	1.612e-12	-11.793	-11.793	0.000	(0)
CoNO2+	9.282e-16	7.904e-16	-15.032	-15.102	-0.070	(0)
Co (NH3) +2	7.733e-17	4.067e-17	-16.112	-16.391	-0.279	(0)
CoSeO4	6.855e-17	6.855e-17	-16.164	-16.164	0.000	(0)
Co (OH) 3-	5.361e-18	4.565e-18	-17.271	-17.341	-0.070	(0)
Co2OH+3	1.534e-18	3.614e-19	-17.814	-18.442	-0.628	(0)
CoOOH-	1.345e-18	1.146e-18	-17.871	-17.941	-0.070	(0)
CoNO3+	1.969e-19	1.677e-19	-18.706	-18.775	-0.070	(0)
Co (OH) 4-2	1.953e-25	1.027e-25	-24.709	-24.988	-0.279	(0)
Co (NH3) 2+2	2.212e-26	1.163e-26	-25.655	-25.934	-0.279	(0)
Co4 (OH) 4+4	1.088e-30	8.324e-32	-29.963	-31.080	-1.116	(0)
Co (NO3) 2	7.157e-31	7.157e-31	-30.145	-30.145	0.000	(0)
Co (NH3) 3+2	1.867e-36	9.819e-37	-35.729	-36.008	-0.279	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.183	-46.462	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.136	-57.415	-0.279	(0)
Co (3)	1.157e-28					

	CoOH+2	1.157e-28	6.084e-29	-27.937	-28.216	-0.279	(0)
	Co+3	2.835e-34	8.433e-35	-33.547	-34.074	-0.527	(0)
	CoCl+2	4.859e-35	2.556e-35	-34.313	-34.592	-0.279	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.228	-64.507	-0.279	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.363	-77.432	-0.070	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.938	-82.217	-0.279	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.118	-82.397	-0.279	(0)
Cr (2)	9.471e-26						
	Cr+2	9.471e-26	4.981e-26	-25.024	-25.303	-0.279	(0)
Cr (3)	6.396e-09						
	Cr (OH) 2+	5.515e-09	4.697e-09	-8.258	-8.328	-0.070	(0)
	Cr (OH) +2	5.170e-10	2.719e-10	-9.287	-9.566	-0.279	(0)
	Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
	CrOHSO4	1.051e-10	1.051e-10	-9.978	-9.978	0.000	(0)
	CrF+2	4.386e-12	2.307e-12	-11.358	-11.637	-0.279	(0)
	CrO2-	1.971e-12	1.678e-12	-11.705	-11.775	-0.070	(0)
	Cr (OH) 4-	1.662e-12	1.416e-12	-11.779	-11.849	-0.070	(0)
	CrSO4+	3.910e-13	3.330e-13	-12.408	-12.478	-0.070	(0)
	Cr+3	3.716e-13	8.754e-14	-12.430	-13.058	-0.628	(0)
	CrCl+2	3.208e-16	1.688e-16	-15.494	-15.773	-0.279	(0)
	Cr2 (OH) 2SO4+2	4.911e-18	2.583e-18	-17.309	-17.588	-0.279	(0)
	CrOHC12	6.782e-19	6.782e-19	-18.169	-18.169	0.000	(0)
	Cr2 (OH) 2 (SO4) 2	2.499e-19	2.499e-19	-18.602	-18.602	0.000	(0)
	CrCl2+	2.801e-20	2.385e-20	-19.553	-19.623	-0.070	(0)
	CrNO3+2	1.526e-26	8.026e-27	-25.816	-26.096	-0.279	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.122	-55.401	-0.279	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.472	-67.099	-0.628	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.545	-68.824	-0.279	(0)
Cr (6)	2.313e-16						
	CrO4-2	1.971e-16	1.150e-16	-15.705	-15.939	-0.234	(0)
	HCrO4-	3.099e-17	2.639e-17	-16.509	-16.579	-0.070	(0)
	NaCrO4-	2.867e-18	2.441e-18	-17.543	-17.612	-0.070	(0)
	KCrO4-	3.025e-19	2.576e-19	-18.519	-18.589	-0.070	(0)
	CrO3SO4-2	1.766e-24	9.286e-25	-23.753	-24.032	-0.279	(0)
	H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
	CrO3Cl-	2.059e-26	1.753e-26	-25.686	-25.756	-0.070	(0)
	Cr2O7-2	4.593e-32	2.416e-32	-31.338	-31.617	-0.279	(0)
Cu (1)	1.401e-09						
	CuCl	7.067e-10	7.067e-10	-9.151	-9.151	0.000	(0)
	Cu+	4.425e-10	3.769e-10	-9.354	-9.424	-0.070	(0)
	CuCl2-	2.520e-10	2.199e-10	-9.599	-9.658	-0.059	(0)
	CuCl3-2	1.183e-13	7.003e-14	-12.927	-13.155	-0.228	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-148.339	-148.648	-0.309	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-149.082	-149.378	-0.296	(0)
Cu (2)	6.543e-06						
	CuCO3	5.506e-06	5.506e-06	-5.259	-5.259	0.000	(0)
	Cu+2	5.537e-07	3.231e-07	-6.257	-6.491	-0.234	(0)
	CuOH+	1.662e-07	1.450e-07	-6.779	-6.839	-0.059	(0)
	CuSO4	1.206e-07	1.206e-07	-6.919	-6.919	0.000	(0)
	CuHCO3+	1.048e-07	8.922e-08	-6.980	-7.050	-0.070	(0)
	Cu (CO3) 2-2	8.154e-08	4.289e-08	-7.089	-7.368	-0.279	(0)
	Cu (OH) 2	4.108e-09	4.108e-09	-8.386	-8.386	0.000	(0)
	CuF+	3.979e-09	3.389e-09	-8.400	-8.470	-0.070	(0)
	Cu2 (OH) 2+2	1.005e-09	5.284e-10	-8.998	-9.277	-0.279	(0)
	CuCl+	8.739e-10	7.626e-10	-9.059	-9.118	-0.059	(0)
	Cu (OH) 3-	1.405e-12	1.196e-12	-11.852	-11.922	-0.070	(0)
	CuCl2	3.939e-13	3.939e-13	-12.405	-12.405	0.000	(0)
	CuNO2+	8.831e-14	7.521e-14	-13.054	-13.124	-0.070	(0)
	CuNH3+2	4.214e-14	2.217e-14	-13.375	-13.654	-0.279	(0)
	CuCl3-	6.273e-18	5.475e-18	-17.202	-17.262	-0.059	(0)
	Cu (OH) 4-2	2.541e-18	1.337e-18	-17.595	-17.874	-0.279	(0)
	CuNO3+	2.516e-18	2.143e-18	-17.599	-17.669	-0.070	(0)
	Cu (NO2) 2	1.711e-21	1.711e-21	-20.767	-20.767	0.000	(0)
	CuCl4-2	6.906e-23	4.087e-23	-22.161	-22.389	-0.228	(0)
	Cu (NO3) 2	5.657e-31	5.657e-31	-30.247	-30.247	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.891	-215.960	-0.070	(0)
F	2.121e-04						
	F-	1.902e-04	1.662e-04	-3.721	-3.779	-0.059	(0)

MgF+	1.749e-05	1.530e-05	-4.757	-4.815	-0.058	(0)
CaF+	2.367e-06	2.076e-06	-5.626	-5.683	-0.057	(0)
NaF	4.481e-07	4.481e-07	-6.349	-6.349	0.000	(0)
AlF3	3.382e-07	3.382e-07	-6.471	-6.471	0.000	(0)
AlF2+	1.839e-07	1.616e-07	-6.735	-6.792	-0.056	(0)
MnF+	7.674e-08	6.731e-08	-7.115	-7.172	-0.057	(0)
AlF4-	3.221e-08	2.818e-08	-7.492	-7.550	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
AlF+2	4.095e-09	2.442e-09	-8.388	-8.612	-0.225	(0)
CuF+	3.979e-09	3.389e-09	-8.400	-8.470	-0.070	(0)
ZnF+	1.791e-09	1.525e-09	-8.747	-8.817	-0.070	(0)
BF(OH) 3-	1.207e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
NiF+	3.734e-10	3.180e-10	-9.428	-9.498	-0.070	(0)
CoF+	3.115e-10	2.653e-10	-9.507	-9.576	-0.070	(0)
CdF+	1.510e-11	1.286e-11	-10.821	-10.891	-0.070	(0)
HF2-	1.266e-11	1.102e-11	-10.898	-10.958	-0.060	(0)
PbF+	1.066e-11	9.079e-12	-10.972	-11.042	-0.070	(0)
CrF+2	4.386e-12	2.307e-12	-11.358	-11.637	-0.279	(0)
AgF	3.627e-12	3.627e-12	-11.440	-11.440	0.000	(0)
BF2(OH) 2-	1.522e-12	1.317e-12	-11.818	-11.880	-0.063	(0)
UO2F+	8.678e-13	7.390e-13	-12.062	-12.131	-0.070	(0)
UO2F2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
PbF2	2.970e-14	2.970e-14	-13.527	-13.527	0.000	(0)
UO2F3-	1.738e-14	1.480e-14	-13.760	-13.830	-0.070	(0)
CdF2	4.266e-15	4.266e-15	-14.370	-14.370	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.122e-16	4.492e-16	-15.291	-15.348	-0.057	(0)
FeF+2	1.706e-16	1.010e-16	-15.768	-15.996	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
VO2F	4.411e-17	4.411e-17	-16.355	-16.355	0.000	(0)
UO2F4-2	3.715e-17	1.954e-17	-16.430	-16.709	-0.279	(0)
PbF3-	1.100e-17	9.366e-18	-16.959	-17.028	-0.070	(0)
BF3OH-	6.982e-18	6.043e-18	-17.156	-17.219	-0.063	(0)
VO2F2-	3.126e-18	2.662e-18	-17.505	-17.575	-0.070	(0)
VOF+	1.697e-19	1.445e-19	-18.770	-18.840	-0.070	(0)
VO2F3-2	1.050e-20	5.521e-21	-19.979	-20.258	-0.279	(0)
VOF2	9.009e-21	9.009e-21	-20.045	-20.045	0.000	(0)
PbF4-2	1.417e-21	7.452e-22	-20.849	-21.128	-0.279	(0)
BF4-	4.051e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
VOF3-	6.240e-23	5.314e-23	-22.205	-22.275	-0.070	(0)
HgF+	2.894e-23	2.465e-23	-22.538	-22.608	-0.070	(0)
VO2F4-3	1.917e-24	4.516e-25	-23.717	-24.345	-0.628	(0)
Sb(OH) 2F	9.811e-25	9.811e-25	-24.008	-24.008	0.000	(0)
SbOF	9.651e-25	9.651e-25	-24.015	-24.015	0.000	(0)
VOF4-2	6.780e-26	3.566e-26	-25.169	-25.448	-0.279	(0)
UF3+	1.632e-34	1.390e-34	-33.787	-33.857	-0.070	(0)
UF2+2	1.003e-35	5.275e-36	-34.999	-35.278	-0.279	(0)
UF4	2.533e-36	2.533e-36	-35.596	-35.596	0.000	(0)
UF5-	1.960e-38	1.669e-38	-37.708	-37.778	-0.070	(0)
UF+3	1.070e-38	2.520e-39	-37.971	-38.599	-0.628	(0)
UF6-2	1.593e-39	8.380e-40	-38.798	-39.077	-0.279	(0)
Fe (2)	3.366e-11					
Fe+2	2.700e-11	1.420e-11	-10.569	-10.848	-0.279	(0)
FeSO4	5.679e-12	5.679e-12	-11.246	-11.246	0.000	(0)
FeHCO3+	8.882e-13	7.826e-13	-12.052	-12.106	-0.055	(0)
FeOH+	9.152e-14	8.027e-14	-13.038	-13.095	-0.057	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.633e-19	4.064e-19	-18.334	-18.391	-0.057	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.810	-158.810	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.160	-235.229	-0.070	(0)
Fe (3)	3.625e-09					
Fe(OH) 2+	3.191e-09	2.804e-09	-8.496	-8.552	-0.056	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.432e-12	5.652e-12	-11.192	-11.248	-0.056	(0)
FeOH+2	8.580e-14	5.077e-14	-13.067	-13.294	-0.228	(0)
FeF2+	5.122e-16	4.492e-16	-15.291	-15.348	-0.057	(0)
FeF+2	1.706e-16	1.010e-16	-15.768	-15.996	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)

FeSO4+	1.154e-17	1.012e-17	-16.938	-16.995	-0.057	(0)
Fe+3	1.862e-18	5.539e-19	-17.730	-18.257	-0.527	(0)
Fe (SO4) 2-	4.140e-19	3.526e-19	-18.383	-18.453	-0.070	(0)
FeCl+2	4.211e-20	2.492e-20	-19.376	-19.604	-0.228	(0)
FeCl2+	1.890e-22	1.658e-22	-21.724	-21.780	-0.057	(0)
FeHSeO3+2	3.102e-23	1.631e-23	-22.508	-22.787	-0.279	(0)
Fe2 (OH) 2+4	1.115e-24	8.536e-26	-23.953	-25.069	-1.116	(0)
FeCl3	2.469e-26	2.469e-26	-25.607	-25.607	0.000	(0)
FeNO3+2	2.209e-29	1.162e-29	-28.656	-28.935	-0.279	(0)
Fe3 (OH) 4+5	1.919e-31	3.460e-33	-30.717	-32.461	-1.744	(0)
H (0)	4.021e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.094e-10					
Hg	2.094e-10	2.094e-10	-9.679	-9.679	0.000	(0)
Hg (1)	2.163e-21					
Hg2+2	1.081e-21	5.687e-22	-20.966	-21.245	-0.279	(0)
Hg (2)	2.917e-12					
HgClOH	1.494e-12	1.494e-12	-11.826	-11.826	0.000	(0)
HgCl2	8.873e-13	8.873e-13	-12.052	-12.052	0.000	(0)
Hg (OH) 2	5.064e-13	5.086e-13	-12.295	-12.294	0.002	(0)
HgCl3-	1.552e-14	1.322e-14	-13.809	-13.879	-0.070	(0)
HgCO3	1.385e-14	1.385e-14	-13.858	-13.858	0.000	(0)
Hg (CO3) 2-2	2.411e-16	1.268e-16	-15.618	-15.897	-0.279	(0)
HgCl4-2	1.490e-16	7.837e-17	-15.827	-16.106	-0.279	(0)
HgCl+	1.396e-16	1.189e-16	-15.855	-15.925	-0.070	(0)
HgOH+	2.654e-17	2.261e-17	-16.576	-16.646	-0.070	(0)
HgHCO3+	2.148e-17	1.829e-17	-16.668	-16.738	-0.070	(0)
Hg (OH) 3-	1.067e-20	9.090e-21	-19.972	-20.041	-0.070	(0)
Hg+2	7.605e-21	4.000e-21	-20.119	-20.398	-0.279	(0)
HgSO4	1.706e-21	1.706e-21	-20.768	-20.768	0.000	(0)
HgNH3+2	3.217e-23	1.692e-23	-22.493	-22.772	-0.279	(0)
HgF+	2.894e-23	2.465e-23	-22.538	-22.608	-0.070	(0)
Hg (NH3) 2+2	2.157e-25	1.134e-25	-24.666	-24.945	-0.279	(0)
HgNO3+	3.637e-33	3.097e-33	-32.439	-32.509	-0.070	(0)
Hg (NH3) 3+2	5.757e-36	3.028e-36	-35.240	-35.519	-0.279	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.569	-44.569	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.513	-45.792	-0.279	(0)
HgHS2-	0.000e+00	0.000e+00	-138.163	-138.233	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.988	-138.988	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.513	-139.792	-0.279	(0)
K	6.977e-04					
K+	6.898e-04	6.029e-04	-3.161	-3.220	-0.059	(0)
KSO4-	7.912e-06	6.952e-06	-5.102	-5.158	-0.056	(0)
KCrO4-	3.025e-19	2.576e-19	-18.519	-18.589	-0.070	(0)
Mg	1.711e-03					
Mg+2	1.406e-03	8.202e-04	-2.852	-3.086	-0.234	(0)
MgSO4	2.431e-04	2.431e-04	-3.614	-3.614	0.000	(0)
MgHCO3+	4.210e-05	3.674e-05	-4.376	-4.435	-0.059	(0)
MgF+	1.749e-05	1.530e-05	-4.757	-4.815	-0.058	(0)
MgCO3	1.974e-06	1.974e-06	-5.705	-5.705	0.000	(0)
MgOH+	5.249e-08	4.636e-08	-7.280	-7.334	-0.054	(0)
MgH2BO3+	4.239e-09	3.669e-09	-8.373	-8.435	-0.063	(0)
Mn (2)	2.340e-05					
Mn+2	1.934e-05	1.017e-05	-4.714	-4.993	-0.279	(0)
MnSO4	2.946e-06	2.946e-06	-5.531	-5.531	0.000	(0)
MnHCO3+	1.013e-06	8.882e-07	-5.995	-6.052	-0.057	(0)
MnF+	7.674e-08	6.731e-08	-7.115	-7.172	-0.057	(0)
MnCl+	2.174e-08	1.907e-08	-7.663	-7.720	-0.057	(0)
MnOH+	4.135e-09	3.627e-09	-8.384	-8.441	-0.057	(0)
MnCl2	4.012e-11	4.012e-11	-10.397	-10.397	0.000	(0)
MnCl3-	1.877e-14	1.646e-14	-13.727	-13.784	-0.057	(0)
MnSeO4	7.421e-15	7.421e-15	-14.130	-14.130	0.000	(0)
MnNO3+	3.970e-17	3.380e-17	-16.401	-16.471	-0.070	(0)
Mn (OH) 3-	5.150e-19	4.517e-19	-18.288	-18.345	-0.057	(0)
Mn (OH) 4-2	3.499e-25	2.070e-25	-24.456	-24.684	-0.228	(0)
Mn (NO3) 2	1.781e-28	1.781e-28	-27.749	-27.749	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.955	-42.955	0.000	(0)
Mn (3)	6.411e-25					

Mn+3	6.411e-25	1.907e-25	-24.193	-24.720	-0.527	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.500	-43.728	-0.228	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.416	-47.477	-0.061	(0)
Mo	4.456e-07					
MoO4-2	4.452e-07	2.597e-07	-6.351	-6.585	-0.234	(0)
HMoO4-	4.303e-10	3.664e-10	-9.366	-9.436	-0.070	(0)
H2MoO4	1.903e-13	1.903e-13	-12.721	-12.721	0.000	(0)
Ag2MoO4	7.418e-24	7.418e-24	-23.130	-23.130	0.000	(0)
AlMo6O21-3	2.392e-39	5.636e-40	-38.621	-39.249	-0.628	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.791	-50.303	-2.511	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.321	-51.065	-1.744	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.316	-53.432	-1.116	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.708	-57.336	-0.628	(0)
N (-3)	9.867e-10					
NH4+	9.633e-10	8.338e-10	-9.016	-9.079	-0.063	(0)
NH4SO4-	1.659e-11	1.455e-11	-10.780	-10.837	-0.057	(0)
NH3	6.705e-12	6.705e-12	-11.174	-11.174	0.000	(0)
CuNH3+2	4.214e-14	2.217e-14	-13.375	-13.654	-0.279	(0)
CaNH3+2	1.836e-14	9.658e-15	-13.736	-14.015	-0.279	(0)
NiNH3+2	5.213e-16	2.742e-16	-15.283	-15.562	-0.279	(0)
AgNH3+	1.396e-16	1.189e-16	-15.855	-15.925	-0.070	(0)
Co (NH3) +2	7.733e-17	4.067e-17	-16.112	-16.391	-0.279	(0)
BaNH3+2	5.171e-19	2.720e-19	-18.286	-18.566	-0.279	(0)
HgNH3+2	3.217e-23	1.692e-23	-22.493	-22.772	-0.279	(0)
Ag (NH3) 2+	7.610e-24	6.480e-24	-23.119	-23.188	-0.070	(0)
Ni (NH3) 2+2	5.052e-25	2.657e-25	-24.297	-24.576	-0.279	(0)
Hg (NH3) 2+2	2.157e-25	1.134e-25	-24.666	-24.945	-0.279	(0)
Ca (NH3) 2+2	4.901e-26	2.578e-26	-25.310	-25.589	-0.279	(0)
Co (NH3) 2+2	2.212e-26	1.163e-26	-25.655	-25.934	-0.279	(0)
Hg (NH3) 3+2	5.757e-36	3.028e-36	-35.240	-35.519	-0.279	(0)
Co (NH3) 3+2	1.867e-36	9.819e-37	-35.729	-36.008	-0.279	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.513	-45.792	-0.279	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.183	-46.462	-0.279	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.122	-55.401	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.136	-57.415	-0.279	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.228	-64.507	-0.279	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.472	-67.099	-0.628	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.545	-68.824	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.363	-77.432	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.938	-82.217	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.118	-82.397	-0.279	(0)
N (3)	2.561e-09					
NO2-	2.561e-09	2.223e-09	-8.592	-8.653	-0.061	(0)
CuNO2+	8.831e-14	7.521e-14	-13.054	-13.124	-0.070	(0)
AgNO2	4.035e-15	4.035e-15	-14.394	-14.394	0.000	(0)
CoNO2+	9.282e-16	7.904e-16	-15.032	-15.102	-0.070	(0)
Cu (NO2) 2	1.711e-21	1.711e-21	-20.767	-20.767	0.000	(0)
Ag (NO2) 2-	1.631e-23	1.389e-23	-22.787	-22.857	-0.070	(0)
N (5)	2.409e-12					
NO3-	2.400e-12	2.097e-12	-11.620	-11.678	-0.059	(0)
CaNO3+	8.911e-15	7.588e-15	-14.050	-14.120	-0.070	(0)
MnNO3+	3.970e-17	3.380e-17	-16.401	-16.471	-0.070	(0)
ZnNO3+	2.845e-18	2.423e-18	-17.546	-17.616	-0.070	(0)
CuNO3+	2.516e-18	2.143e-18	-17.599	-17.669	-0.070	(0)
BaNO3+	7.935e-19	6.757e-19	-18.100	-18.170	-0.070	(0)
NiNO3+	4.711e-19	4.012e-19	-18.327	-18.397	-0.070	(0)
CoNO3+	1.969e-19	1.677e-19	-18.706	-18.775	-0.070	(0)
CdNO3+	3.801e-20	3.237e-20	-19.420	-19.490	-0.070	(0)
PbNO3+	2.823e-20	2.404e-20	-19.549	-19.619	-0.070	(0)
AgNO3	1.447e-20	1.447e-20	-19.839	-19.839	0.000	(0)
UO2NO3+	1.582e-25	1.348e-25	-24.801	-24.870	-0.070	(0)
CrNO3+2	1.526e-26	8.026e-27	-25.816	-26.096	-0.279	(0)
Mn (NO3) 2	1.781e-28	1.781e-28	-27.749	-27.749	0.000	(0)
VO2NO3	1.605e-28	1.605e-28	-27.795	-27.795	0.000	(0)
FeNO3+2	2.209e-29	1.162e-29	-28.656	-28.935	-0.279	(0)
Zn (NO3) 2	1.014e-30	1.014e-30	-29.994	-29.994	0.000	(0)

	Co (NO3) 2	7.157e-31	7.157e-31	-30.145	-30.145	0.000	(0)
	Cu (NO3) 2	5.657e-31	5.657e-31	-30.247	-30.247	0.000	(0)
	Pb (NO3) 2	8.562e-32	8.562e-32	-31.067	-31.067	0.000	(0)
	Cd (NO3) 2	3.403e-32	3.403e-32	-31.468	-31.468	0.000	(0)
	HgNO3+	3.637e-33	3.097e-33	-32.439	-32.509	-0.070	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-44.569	-44.569	0.000	(0)
Na	4.941e-03						
	Na+	4.888e-03	4.272e-03	-2.311	-2.369	-0.059	(0)
	NaSO4-	4.252e-05	3.737e-05	-4.371	-4.428	-0.056	(0)
	NaHCO3	1.051e-05	1.051e-05	-4.978	-4.978	0.000	(0)
	NaF	4.481e-07	4.481e-07	-6.349	-6.349	0.000	(0)
	NaCO3-	2.620e-07	2.302e-07	-6.582	-6.638	-0.056	(0)
	NaH2BO3	8.735e-10	8.735e-10	-9.059	-9.059	0.000	(0)
	NaCrO4-	2.867e-18	2.441e-18	-17.543	-17.612	-0.070	(0)
Ni	2.126e-07						
	Ni+2	1.305e-07	7.615e-08	-6.884	-7.118	-0.234	(0)
	NiHCO3+	4.825e-08	4.109e-08	-7.316	-7.386	-0.070	(0)
	NiSO4	2.475e-08	2.475e-08	-7.606	-7.606	0.000	(0)
	NiCO3	8.222e-09	8.222e-09	-8.085	-8.085	0.000	(0)
	NiF+	3.734e-10	3.180e-10	-9.428	-9.498	-0.070	(0)
	NiCl+	3.408e-10	2.902e-10	-9.468	-9.537	-0.070	(0)
	NiOH+	1.598e-10	1.361e-10	-9.796	-9.866	-0.070	(0)
	Ni (SO4) 2-2	2.538e-12	1.335e-12	-11.596	-11.875	-0.279	(0)
	Ni (OH) 2	1.535e-12	1.535e-12	-11.814	-11.814	0.000	(0)
	NiCl2	2.176e-15	2.176e-15	-14.662	-14.662	0.000	(0)
	NiNH3+2	5.213e-16	2.742e-16	-15.283	-15.562	-0.279	(0)
	Ni (OH) 3-	2.558e-16	2.179e-16	-15.592	-15.662	-0.070	(0)
	NiSeO4	9.656e-17	9.656e-17	-16.015	-16.015	0.000	(0)
	NiNO3+	4.711e-19	4.012e-19	-18.327	-18.397	-0.070	(0)
	Ni (NH3) 2+2	5.052e-25	2.657e-25	-24.297	-24.576	-0.279	(0)
O (0)	2.474e-35						
	O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	1.215e-08						
	PbCO3	6.742e-09	6.742e-09	-8.171	-8.171	0.000	(0)
	PbHCO3+	2.959e-09	2.520e-09	-8.529	-8.599	-0.070	(0)
	Pb+2	1.328e-09	7.749e-10	-8.877	-9.111	-0.234	(0)
	PbSO4	6.182e-10	6.182e-10	-9.209	-9.209	0.000	(0)
	PbOH+	3.245e-10	2.763e-10	-9.489	-9.559	-0.070	(0)
	Pb (CO3) 2-2	1.070e-10	5.627e-11	-9.971	-10.250	-0.279	(0)
	PbCl+	4.809e-11	4.095e-11	-10.318	-10.388	-0.070	(0)
	Pb (SO4) 2-2	1.154e-11	6.068e-12	-10.938	-11.217	-0.279	(0)
	PbF+	1.066e-11	9.079e-12	-10.972	-11.042	-0.070	(0)
	Pb (OH) 2	1.241e-12	1.241e-12	-11.906	-11.906	0.000	(0)
	PbCl2	2.725e-13	2.725e-13	-12.565	-12.565	0.000	(0)
	PbF2	2.970e-14	2.970e-14	-13.527	-13.527	0.000	(0)
	Pb (OH) 3-	2.068e-16	1.761e-16	-15.684	-15.754	-0.070	(0)
	PbCl3-	1.897e-16	1.616e-16	-15.722	-15.792	-0.070	(0)
	Pb2OH+3	1.441e-17	3.394e-18	-16.841	-17.469	-0.628	(0)
	PbF3-	1.100e-17	9.366e-18	-16.959	-17.028	-0.070	(0)
	PbCl4-2	2.091e-19	1.100e-19	-18.680	-18.959	-0.279	(0)
	PbNO3+	2.823e-20	2.404e-20	-19.549	-19.619	-0.070	(0)
	Pb (OH) 4-2	1.164e-20	6.123e-21	-19.934	-20.213	-0.279	(0)
	PbF4-2	1.417e-21	7.452e-22	-20.849	-21.128	-0.279	(0)
	Pb3 (OH) 4+2	4.524e-23	2.380e-23	-22.344	-22.623	-0.279	(0)
	Pb4 (OH) 4+4	1.914e-27	1.465e-28	-26.718	-27.834	-1.116	(0)
	Pb (NO3) 2	8.562e-32	8.562e-32	-31.067	-31.067	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.753	-150.753	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.840	-227.909	-0.070	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-72.703	-72.703	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.386	-78.456	-0.070	(0)
	H2S	0.000e+00	0.000e+00	-78.586	-78.586	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.690	-78.760	-0.070	(0)
	S5-2	0.000e+00	0.000e+00	-80.393	-80.672	-0.279	(0)
	S6-2	0.000e+00	0.000e+00	-80.909	-81.188	-0.279	(0)
	S4-2	0.000e+00	0.000e+00	-80.989	-81.268	-0.279	(0)
	S3-2	0.000e+00	0.000e+00	-81.795	-82.074	-0.279	(0)
	S2-2	0.000e+00	0.000e+00	-82.811	-83.090	-0.279	(0)

S-2	0.000e+00	0.000e+00	-88.379	-88.607	-0.228	(0)
HgHS2-	0.000e+00	0.000e+00	-138.163	-138.233	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.988	-138.988	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.513	-139.792	-0.279	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.989	-147.059	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.227	-147.393	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.339	-148.648	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.082	-149.378	-0.296	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.221	-149.291	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.368	-149.684	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.693	-149.995	-0.302	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.012	-150.012	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.430	-150.430	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.753	-150.753	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.810	-158.810	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.891	-215.960	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.536	-225.606	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.498	-226.568	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.840	-227.909	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.158	-228.437	-0.279	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.160	-235.229	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.549	-302.828	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.243	-305.522	-0.279	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.002	-317.281	-0.279	(0)
S (6)	3.516e-03					
SO4-2	2.792e-03	1.629e-03	-2.554	-2.788	-0.234	(0)
CaSO4	4.269e-04	4.269e-04	-3.370	-3.370	0.000	(0)
MgSO4	2.431e-04	2.431e-04	-3.614	-3.614	0.000	(0)
NaSO4-	4.252e-05	3.737e-05	-4.371	-4.428	-0.056	(0)
KSO4-	7.912e-06	6.952e-06	-5.102	-5.158	-0.056	(0)
MnSO4	2.946e-06	2.946e-06	-5.531	-5.531	0.000	(0)
ZnSO4	1.639e-07	1.639e-07	-6.786	-6.786	0.000	(0)
CuSO4	1.206e-07	1.206e-07	-6.919	-6.919	0.000	(0)
NiSO4	2.475e-08	2.475e-08	-7.606	-7.606	0.000	(0)
CoSO4	1.640e-08	1.640e-08	-7.785	-7.785	0.000	(0)
HSO4-	1.290e-08	1.129e-08	-7.889	-7.947	-0.058	(0)
Zn (SO4) 2-2	4.420e-09	2.325e-09	-8.355	-8.634	-0.279	(0)
CdSO4	1.864e-09	1.864e-09	-8.730	-8.730	0.000	(0)
PbSO4	6.182e-10	6.182e-10	-9.209	-9.209	0.000	(0)
AgSO4-	3.315e-10	2.823e-10	-9.480	-9.549	-0.070	(0)
CrOHSO4	1.051e-10	1.051e-10	-9.978	-9.978	0.000	(0)
Cd (SO4) 2-2	7.786e-11	4.095e-11	-10.109	-10.388	-0.279	(0)
ALSO4+	2.123e-11	1.857e-11	-10.673	-10.731	-0.058	(0)
NH4SO4-	1.659e-11	1.455e-11	-10.780	-10.837	-0.057	(0)
Pb (SO4) 2-2	1.154e-11	6.068e-12	-10.938	-11.217	-0.279	(0)
FeSO4	5.679e-12	5.679e-12	-11.246	-11.246	0.000	(0)
Ni (SO4) 2-2	2.538e-12	1.335e-12	-11.596	-11.875	-0.279	(0)
CrSO4+	3.910e-13	3.330e-13	-12.408	-12.478	-0.070	(0)
Al (SO4) 2-	3.705e-13	3.241e-13	-12.431	-12.489	-0.058	(0)
UO2SO4	7.939e-14	7.939e-14	-13.100	-13.100	0.000	(0)
UO2 (SO4) 2-2	3.241e-15	1.705e-15	-14.489	-14.768	-0.279	(0)
FeSO4+	1.154e-17	1.012e-17	-16.938	-16.995	-0.057	(0)
VO2SO4-	6.909e-18	5.883e-18	-17.161	-17.230	-0.070	(0)
Cr2 (OH) 2SO4+2	4.911e-18	2.583e-18	-17.309	-17.588	-0.279	(0)
Fe (SO4) 2-	4.140e-19	3.526e-19	-18.383	-18.453	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.499e-19	2.499e-19	-18.602	-18.602	0.000	(0)
VOSO4	6.502e-20	6.502e-20	-19.187	-19.187	0.000	(0)
HgSO4	1.706e-21	1.706e-21	-20.768	-20.768	0.000	(0)
CrO3SO4-2	1.766e-24	9.286e-25	-23.753	-24.032	-0.279	(0)
VSO4+	7.784e-34	6.629e-34	-33.109	-33.179	-0.070	(0)
U (SO4) 2	6.375e-40	6.375e-40	-39.196	-39.196	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.028	-40.307	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.363	-77.432	-0.070	(0)
Sb (3)	1.053e-19					
Sb (OH) 3	5.327e-20	5.327e-20	-19.274	-19.274	0.000	(0)
HSbO2	5.201e-20	5.201e-20	-19.284	-19.284	0.000	(0)
SbO2-	1.395e-24	1.188e-24	-23.855	-23.925	-0.070	(0)
Sb (OH) 2F	9.811e-25	9.811e-25	-24.008	-24.008	0.000	(0)

SbOF	9.651e-25	9.651e-25	-24.015	-24.015	0.000	(0)
Sb(OH) 4-	7.989e-25	6.803e-25	-24.098	-24.167	-0.070	(0)
Sb(OH) 2+	1.077e-25	9.174e-26	-24.968	-25.037	-0.070	(0)
SbO+	3.715e-26	3.164e-26	-25.430	-25.500	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.002	-317.281	-0.279	(0)
Sb(5)	1.297e-08					
SbO3-	1.295e-08	1.103e-08	-7.888	-7.957	-0.070	(0)
Sb(OH) 6-	1.475e-11	1.289e-11	-10.831	-10.890	-0.059	(0)
SbO2+	1.868e-23	1.591e-23	-22.729	-22.798	-0.070	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.202e-40	1.875e-40	-39.657	-39.727	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.955	-42.955	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.986	-42.986	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.299	-47.578	-0.279	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.460	-86.576	-1.116	(0)
Se(4)	1.428e-08					
HSeO3-	1.309e-08	1.115e-08	-7.883	-7.953	-0.070	(0)
SeO3-2	1.190e-09	6.258e-10	-8.925	-9.204	-0.279	(0)
H2SeO3	3.371e-13	3.371e-13	-12.472	-12.472	0.000	(0)
AgSeO3-	4.102e-15	3.494e-15	-14.387	-14.457	-0.070	(0)
Cd(SeO3) 2-2	2.995e-21	1.575e-21	-20.524	-20.803	-0.279	(0)
Ag(SeO3) 2-3	8.309e-23	1.957e-23	-22.080	-22.708	-0.628	(0)
FeHSeO3+2	3.102e-23	1.631e-23	-22.508	-22.787	-0.279	(0)
Se(6)	4.655e-12					
SeO4-2	4.647e-12	2.711e-12	-11.333	-11.567	-0.234	(0)
MnSeO4	7.421e-15	7.421e-15	-14.130	-14.130	0.000	(0)
ZnSeO4	1.931e-16	1.931e-16	-15.714	-15.714	0.000	(0)
NiSeO4	9.656e-17	9.656e-17	-16.015	-16.015	0.000	(0)
CoSeO4	6.855e-17	6.855e-17	-16.164	-16.164	0.000	(0)
HSeO4-	1.131e-17	9.634e-18	-16.946	-17.016	-0.070	(0)
CdSeO4	2.464e-18	2.464e-18	-17.608	-17.608	0.000	(0)
Zn(SeO4) 2-2	1.009e-27	5.307e-28	-26.996	-27.275	-0.279	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.911	-58.538	-0.628	(0)
U(4)	3.780e-22					
U(OH) 5-	3.770e-22	3.211e-22	-21.424	-21.493	-0.070	(0)
U(OH) 4	9.537e-25	9.537e-25	-24.021	-24.021	0.000	(0)
U(OH) 3+	2.904e-28	2.473e-28	-27.537	-27.607	-0.070	(0)
U(OH) 2+2	1.542e-32	8.110e-33	-31.812	-32.091	-0.279	(0)
UF3+	1.632e-34	1.390e-34	-33.787	-33.857	-0.070	(0)
UF2+2	1.003e-35	5.275e-36	-34.999	-35.278	-0.279	(0)
UF4	2.533e-36	2.533e-36	-35.596	-35.596	0.000	(0)
UOH+3	1.150e-37	2.709e-38	-36.939	-37.567	-0.628	(0)
UF5-	1.960e-38	1.669e-38	-37.708	-37.778	-0.070	(0)
UF+3	1.070e-38	2.520e-39	-37.971	-38.599	-0.628	(0)
UF6-2	1.593e-39	8.380e-40	-38.798	-39.077	-0.279	(0)
U(SO4) 2	6.375e-40	6.375e-40	-39.196	-39.196	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.028	-40.307	-0.279	(0)
U+4	0.000e+00	0.000e+00	-43.003	-44.119	-1.116	(0)
UC1+3	0.000e+00	0.000e+00	-44.618	-45.246	-0.628	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-168.983	-174.633	-5.651	(0)
U(5)	5.490e-17					
UO2+	5.490e-17	4.675e-17	-16.260	-16.330	-0.070	(0)
U(6)	8.172e-08					
UO2(CO3) 2-2	4.073e-08	2.142e-08	-7.390	-7.669	-0.279	(0)
UO2(CO3) 3-4	4.061e-08	3.108e-09	-7.391	-8.508	-1.116	(0)
UO2CO3	3.710e-10	3.710e-10	-9.431	-9.431	0.000	(0)
UO2F+	8.678e-13	7.390e-13	-12.062	-12.131	-0.070	(0)
UO2OH+	6.758e-13	5.755e-13	-12.170	-12.240	-0.070	(0)
UO2F2	3.543e-13	3.543e-13	-12.451	-12.451	0.000	(0)
UO2SO4	7.939e-14	7.939e-14	-13.100	-13.100	0.000	(0)
UO2+2	5.520e-14	3.220e-14	-13.258	-13.492	-0.234	(0)
UO2F3-	1.738e-14	1.480e-14	-13.760	-13.830	-0.070	(0)
UO2(SO4) 2-2	3.241e-15	1.705e-15	-14.489	-14.768	-0.279	(0)
UO2Cl+	9.134e-17	7.779e-17	-16.039	-16.109	-0.070	(0)
UO2F4-2	3.715e-17	1.954e-17	-16.430	-16.709	-0.279	(0)
(UO2) 2(OH) 2+2	1.045e-18	5.497e-19	-17.981	-18.260	-0.279	(0)

(UO2) 3 (OH) 5+	5.680e-21	4.837e-21	-20.246	-20.315	-0.070	(0)
UO2NO3+	1.582e-25	1.348e-25	-24.801	-24.870	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.266	-42.335	-0.070	(0)
V+2	0.000e+00	0.000e+00	-42.719	-42.998	-0.279	(0)
V (3)	1.990e-15					
V (OH) 3	1.990e-15	1.990e-15	-14.701	-14.701	0.000	(0)
V (OH) 2+	1.071e-25	9.118e-26	-24.970	-25.040	-0.070	(0)
VOH+2	1.166e-28	6.134e-29	-27.933	-28.212	-0.279	(0)
V+3	3.659e-33	8.620e-34	-32.437	-33.064	-0.628	(0)
VSO4+	7.784e-34	6.629e-34	-33.109	-33.179	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.173	-54.800	-0.628	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.508	-55.625	-1.116	(0)
V (4)	5.339e-18					
V (OH) 3+	4.819e-18	4.104e-18	-17.317	-17.387	-0.070	(0)
VO+2	2.755e-19	1.449e-19	-18.560	-18.839	-0.279	(0)
VOF+	1.697e-19	1.445e-19	-18.770	-18.840	-0.070	(0)
VOSO4	6.502e-20	6.502e-20	-19.187	-19.187	0.000	(0)
VOF2	9.009e-21	9.009e-21	-20.045	-20.045	0.000	(0)
VOC1+	7.111e-22	6.056e-22	-21.148	-21.218	-0.070	(0)
VOF3-	6.240e-23	5.314e-23	-22.205	-22.275	-0.070	(0)
VOF4-2	6.780e-26	3.566e-26	-25.169	-25.448	-0.279	(0)
H2V2O4+2	1.606e-30	8.446e-31	-29.794	-30.073	-0.279	(0)
V (5)	1.872e-09					
H2VO4-	1.770e-09	1.507e-09	-8.752	-8.822	-0.070	(0)
HVO4-2	1.015e-10	5.339e-11	-9.994	-10.273	-0.279	(0)
H3VO4	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
H3V2O7-	1.221e-14	1.040e-14	-13.913	-13.983	-0.070	(0)
VO2+	1.731e-16	1.513e-16	-15.762	-15.820	-0.059	(0)
HV2O7-3	1.158e-16	2.727e-17	-15.936	-16.564	-0.628	(0)
VO2F	4.411e-17	4.411e-17	-16.355	-16.355	0.000	(0)
VO4-3	1.602e-17	3.774e-18	-16.795	-17.423	-0.628	(0)
VO2SO4-	6.909e-18	5.883e-18	-17.161	-17.230	-0.070	(0)
VO2F2-	3.126e-18	2.662e-18	-17.505	-17.575	-0.070	(0)
V2O7-4	1.353e-19	1.035e-20	-18.869	-19.985	-1.116	(0)
V3O9-3	1.523e-20	3.587e-21	-19.817	-20.445	-0.628	(0)
VO2F3-2	1.050e-20	5.521e-21	-19.979	-20.258	-0.279	(0)
VO2F4-3	1.917e-24	4.516e-25	-23.717	-24.345	-0.628	(0)
V4O12-4	2.946e-26	2.254e-27	-25.531	-26.647	-1.116	(0)
VO2NO3	1.605e-28	1.605e-28	-27.795	-27.795	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.127	-66.871	-1.744	(0)
V10O28-6	0.000e+00	0.000e+00	-65.397	-67.909	-2.511	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.697	-68.813	-1.116	(0)
Zn	1.120e-06					
Zn+2	7.882e-07	4.598e-07	-6.103	-6.337	-0.234	(0)
ZnSO4	1.639e-07	1.639e-07	-6.786	-6.786	0.000	(0)
ZnCO3	7.658e-08	7.658e-08	-7.116	-7.116	0.000	(0)
ZnHCO3+	7.474e-08	6.365e-08	-7.126	-7.196	-0.070	(0)
ZnOH+	7.666e-09	6.528e-09	-8.115	-8.185	-0.070	(0)
Zn (SO4) 2-2	4.420e-09	2.325e-09	-8.355	-8.634	-0.279	(0)
ZnCl+	1.971e-09	1.720e-09	-8.705	-8.764	-0.059	(0)
ZnF+	1.791e-09	1.525e-09	-8.747	-8.817	-0.070	(0)
ZnOHC1	3.198e-10	3.198e-10	-9.495	-9.495	0.000	(0)
Zn (OH) 2	1.469e-10	1.469e-10	-9.833	-9.833	0.000	(0)
ZnCl2	4.061e-12	4.061e-12	-11.391	-11.391	0.000	(0)
Zn (OH) 3-	1.227e-13	1.045e-13	-12.911	-12.981	-0.070	(0)
ZnCl3-	5.506e-15	4.805e-15	-14.259	-14.318	-0.059	(0)
ZnSeO4	1.931e-16	1.931e-16	-15.714	-15.714	0.000	(0)
ZnCl4-2	6.047e-18	3.579e-18	-17.218	-17.446	-0.228	(0)
ZnNO3+	2.845e-18	2.423e-18	-17.546	-17.616	-0.070	(0)
Zn (OH) 4-2	1.123e-18	5.907e-19	-17.950	-18.229	-0.279	(0)
Zn (SeO4) 2-2	1.009e-27	5.307e-28	-26.996	-27.275	-0.279	(0)
Zn (NO3) 2	1.014e-30	1.014e-30	-29.994	-29.994	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.221	-149.291	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.430	-150.430	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.536	-225.606	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.158	-228.437	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.243	-305.522	-0.279	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-76.19	-69.91	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-56.71	-52.20	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-63.94	-52.20	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-98.62	-80.69	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-74.16	-54.13	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-34.50	-34.10	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-30.17	-29.72	0.45	(NH4) 2SeO4
Acanthite	-51.21	-87.43	-36.22	Ag2S
Ag2CO3	-10.57	-21.66	-11.09	Ag2CO3
Ag2CrO4	-20.47	-32.06	-11.59	Ag2CrO4
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4
Ag2MoO4	-11.16	-22.71	-11.55	Ag2MoO4
Ag2O	-14.40	-1.82	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.09	-18.91	-4.82	Ag2SO4
Ag3AsO3	-27.16	-25.00	2.16	Ag3AsO3
Ag3AsO4	-15.57	-18.35	-2.79	Ag3AsO4
Ag3H2VO5	-16.59	-11.41	5.18	Ag3H2VO5
AgF:4H2O	-12.89	-11.84	1.05	AgF:4H2O
Agmetal	-0.18	-13.68	-13.51	Ag
AgVO3	-10.35	-9.58	0.77	AgVO3
Al (OH) 3 (am)	-1.19	9.61	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.79	-43.42	2.37	Al2 (MoO4) 3
Al2O3	-0.42	19.23	19.65	Al2O3
Al4 (OH) 10SO4	-1.33	21.37	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.80	-6.00	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.29	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.11	-11.90	-7.79	PbSO4
Anhydrite	-1.37	-5.73	-4.36	CaSO4
Anilite	-55.19	-87.07	-31.88	Cu0.25Cu1.5S
Antlerite	-2.45	6.34	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-86.30	-89.06	-2.76	As4O6
Artinite	-7.01	2.59	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.94	-31.24	6.71	As2O5
Atacamite	-1.75	5.64	7.39	Cu2 (OH) 3Cl
Azurite	0.66	-16.25	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.29	7.11	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.00	-3.13	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-1.01	-9.92	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.96	3.98	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.46	-23.13	-9.67	BaCrO4
BaF2	-8.93	-14.75	-5.82	BaF2
BaMoO4	-6.82	-13.78	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.83	-8.00	1.83	BaSeO3
BaSeO4	-11.30	-18.76	-7.46	BaSeO4
Bianchite	-7.36	-9.13	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.90	-6.54	-0.64	Mn2O3
BlaubleiI	-54.87	-79.03	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.46	-82.74	-27.28	Cu0.6Cu0.8S
Boehmite	1.04	9.61	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-1.08	14.14	15.22	Cu4 (OH) 6SO4
Brucite	-5.63	11.21	16.84	Mg (OH) 2
Bunsenite	-5.27	7.18	12.45	NiO
Ca (VO3) 2	-11.64	-5.98	5.66	Ca (VO3) 2

Ca2V2O7	-12.13	5.37	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.18	5.37	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-19.47	2.83	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-22.23	16.73	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-23.13	16.73	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.72	-157.74	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.99	-26.90	-17.91	Hg2Cl2
CaMoO4	-1.58	-9.53	-7.95	CaMoO4
Carnotite	-4.17	-3.94	0.23	KUO2VO4
CaSeO3:2H2O	-6.56	-3.75	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.49	-14.51	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.46	-3.62	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.92	-16.21	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.69	0.87	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.54	6.86	28.40	Cd4(OH)6SO4
CdCl2	-13.31	-13.97	-0.66	CdCl2
CdCl2:1H2O	-12.27	-13.97	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.05	-13.97	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.18	-19.56	13.62	Cd
CdMoO4	-0.75	-14.90	-14.15	CdMoO4
CdOHCl	-7.53	-3.99	3.54	CdOHCl
CdSb	-76.80	-77.15	-0.35	CdSb
CdSe	-20.69	-40.89	-20.20	CdSe
CdSeO4:2H2O	-18.03	-19.88	-1.85	CdSeO4:2H2O
CdSO4	-10.93	-11.10	-0.17	CdSO4
CdSO4:1H2O	-9.37	-11.10	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.23	-11.10	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-1.52	-14.65	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.64	-9.28	-2.64	CuSO4:5H2O
Chalcocite	-55.23	-90.15	-34.92	Cu2S
Chalcopyrite	-124.68	-159.95	-35.27	CuFeS2
Cinnabar	-52.20	-97.90	-45.69	HgS
Claudetite	-86.00	-89.06	-3.06	As4O6
Clausthalite	-14.59	-41.69	-27.10	PbSe
Co(BO2)2	-29.67	-2.60	27.07	Co(BO2)2
Co(OH)2	-6.09	7.00	13.09	Co(OH)2
Co(OH)3	-10.32	-12.63	-2.31	Co(OH)3
CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-23.27	-10.23	13.03	Co3(AsO4)2
Co3O4	-7.76	-18.25	-10.50	Co3O4
CoCl2	-21.22	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.95	-45.41	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.12	-13.88	-7.76	CoMoO4
CoO	-6.58	7.00	13.59	CoO
CoS(alpha)	-71.16	-78.60	-7.44	CoS
CoS(beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-12.89	-10.09	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.09	-2.47	CoSO4:6H2O
Cotunnite	-9.98	-14.76	-4.78	PbCl2
Covellite	-55.50	-77.80	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3

Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.05	-30.96	14.09	CrCl2
CrCl3	-46.22	-31.11	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.78	-41.62	-33.84	Na3AlF6
Cu(OH)2	-0.87	7.81	8.67	Cu(OH)2
Cu(SbO3)2	-24.86	20.35	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-12.46	-3.21	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.49	-90.37	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.63	-51.43	-45.80	Cu2Se
Cu2SO4	-19.69	-21.64	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.91	-7.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-60.14	-102.73	-42.59	Cu3Sb
Cu3Se2	-27.00	-90.49	-63.49	Cu3Se2
CuCO3	-0.53	-12.03	-11.50	CuCO3
CuCrO4	-16.99	-22.43	-5.44	CuCrO4
CuF	-8.30	-13.20	-4.91	CuF
CuF2	-15.16	-14.05	1.12	CuF2
CuF2:2H2O	-9.50	-14.05	-4.55	CuF2:2H2O
Cumetal	-6.29	-15.05	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.77	-1.47	10.30	CuOCuSO4
Cupricferrite	8.20	14.19	5.99	CuFe2O4
Cuprite	-3.14	-4.55	-1.41	Cu2O
Cuprousferrite	9.83	0.92	-8.92	CuFeO2
CuSe	-5.97	-39.07	-33.10	CuSe
CuSe2	-27.03	-60.40	-33.37	CuSe2
CuSeO3:2H2O	-7.81	-7.29	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.62	-18.06	-2.44	CuSeO4:5H2O
CuSO4	-12.22	-9.28	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-55.42	-89.34	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.75	-5.88	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.17	-13.89	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.27	-8.72	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.30	-38.92	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.14	-44.88	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.83	-12.43	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.34	-17.43	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.16	-64.76	-18.60	FeSe2
FeS(ppt)	-79.20	-82.15	-2.95	FeS
FeSe	-32.43	-43.43	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.45	-80.42	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.12	-9.13	-2.01	ZnSO4:7H2O
Greenockite	-65.26	-79.62	-14.36	CdS
Greigite	-287.55	-332.59	-45.03	Fe3S4
Gummite	-6.87	0.81	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-12.50	-24.60	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.01	-20.88	-12.88	H2MoO4
H2S(g)	-77.60	-85.61	-8.01	H2S
H2Se(g)	-41.92	-46.88	-4.96	H2Se
Halite	-6.80	-5.20	1.60	NaCl
Hausmannite	-7.57	53.46	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3

Hercynite	-0.21	22.68	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-182.62	-256.33	-73.71	Hg (CH ₃) ₂
Hg (g)	-8.37	-16.25	-7.87	Hg
Hg (OH) ₂	-8.80	-12.29	-3.50	Hg (OH) ₂
Hg ₂ (g)	-17.54	-32.49	-14.96	Hg ₂
Hg ₂ (OH) ₂	-12.21	-6.95	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-10.73	-26.78	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-28.48	-37.18	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-18.44	-28.80	-10.36	Hg ₂ F ₂
Hg ₂ S	-80.88	-92.55	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-17.39	-22.05	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-17.90	-24.03	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-27.04	-56.72	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-32.95	-13.45	19.50	HgCl
HgCl ₂	-10.98	-32.25	-21.26	HgCl ₂
HgF (g)	-47.08	-14.40	32.68	HgF
HgF ₂ (g)	-46.72	-34.15	12.57	HgF ₂
Hgmetal (l)	-2.79	-16.25	-13.45	Hg
HgSe	-3.48	-59.17	-55.69	HgSe
HgSeO ₃	-14.97	-27.40	-12.43	HgSeO ₃
HgSO ₄	-19.96	-29.38	-9.42	HgSO ₄
Huntite	-4.39	-34.35	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-5.34	-24.11	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-14.52	-23.29	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-15.46	-20.63	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-5.87	-20.67	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-35.37	-52.62	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-21.87	-22.38	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.29	-13.03	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-17.28	-18.01	-0.73	K ₂ SeO ₄
Langite	-3.34	14.14	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-6.28	-6.71	-0.43	PbO : PbSO ₄
Laurionite	-5.41	-4.79	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.51	5.19	12.69	PbO
Mackinawite	-78.55	-82.15	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	0.74	17.59	16.86	Fe ₂ MgO ₄
Magnesite	-1.16	-8.62	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	1.08	-4.22	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.71	5.19	12.89	PbO
Matlockite	-6.74	-15.72	-8.97	PbClF
Melanothallite	-18.40	-12.14	6.26	CuCl ₂
Melanterite	-11.43	-13.64	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-52.80	-97.90	-45.09	HgS
Mg (OH) ₂ (active)	-7.58	11.21	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-17.41	-6.13	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-276.12	-201.44	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-21.28	5.08	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.35	8.85	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.41	-19.03	5.38	MgCrO ₄
MgF ₂	-2.51	-10.64	-8.13	MgF ₂
MgMoO ₄	-7.82	-9.67	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-6.95	-3.89	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-13.45	-14.65	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-32.41	41.11	73.52	Pb ₃ O ₄
Mirabilite	-6.41	-7.53	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-12.94	-8.04	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.09	-57.80	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.15	-90.07	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-15.82	-3.32	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O
MnCl ₂ : 4H ₂ O	-13.36	-10.65	2.72	MnCl ₂ : 4H ₂ O
MnS (grn)	-76.47	-76.30	0.17	MnS
MnS (pnk)	-79.64	-76.30	3.34	MnS
MnSb	-96.27	-99.18	-2.91	MnSb

MnSe	-41.07	-37.57	3.50	MnSe
MnSeO3	-6.93	-5.80	1.13	MnSeO3
MnSeO3:2H2O	-6.78	-5.80	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.51	-16.56	-2.05	MnSeO4:5H2O
MnSO4	-10.36	-7.78	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.65	-12.29	-3.64	HgO
MoO3	-12.88	-20.88	-8.00	MoO3
Morenosite	-7.76	-9.91	-2.14	NiSO4:7H2O
MoS2	-147.38	-217.64	-70.26	MoS2
Na-Jarosite	-8.62	-19.82	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.92	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.68	2.93	Na2CrO4
Na2Mo2O7	-15.61	-32.21	-16.60	Na2Mo2O7
Na2MoO4	-12.81	-11.32	1.49	Na2MoO4
Na2MoO4:2H2O	-12.55	-11.32	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.84	-5.54	10.30	Na2SeO3:5H2O
Na2SeO4	-17.59	-16.31	1.28	Na2SeO4
Na3Sb	-176.02	-81.57	94.45	Na3Sb
Na3VO4	-31.01	5.67	36.68	Na3VO4
Na4V2O7	-35.62	1.78	37.40	Na4V2O7
Nantokite	-5.52	-12.25	-6.73	CuCl
NaSb	-88.75	-65.58	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-7.75	-3.89	3.86	NaVO3
Nesquehonite	-3.96	-8.63	-4.67	MgCO3:3H2O
Ni(OH)2	-5.61	7.18	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.40	-9.70	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.56	-13.70	-11.14	NiMoO4
NiS(alpha)	-72.83	-78.43	-5.60	NiS
NiS(beta)	-67.33	-78.43	-11.10	NiS
NiS(gamma)	-65.63	-78.43	-12.80	NiS
NiSe	-22.00	-39.70	-17.70	NiSe
NiSeO3:2H2O	-10.74	-7.92	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.17	-18.69	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-240.28	-301.35	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.94	-4.42	6.52	Pb(BO2)2
Pb(OH)2	-2.96	5.19	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-58.38	-67.14	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.39	0.40	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.81	10.38	26.19	Pb2O(OH)2
Pb2O3	-25.12	35.92	61.04	Pb2O3
Pb2OCO3	-8.90	-9.46	-0.56	Pb2OCO3
Pb2V2O7	-5.07	-6.97	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.47	-15.67	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.92	-1.78	6.14	Pb3(VO4)2
Pb3O2CO3	-15.29	-4.27	11.02	Pb3O2CO3
Pb3O2SO4	-12.21	-1.52	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.44	3.66	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.21	3.66	21.88	Pb4O3SO4
PbCrO4	-12.45	-25.05	-12.60	PbCrO4
PbF2	-9.23	-16.67	-7.44	PbF2
Pbmetal	-24.60	-20.36	4.25	Pb
PbMoO4	-0.08	-15.70	-15.62	PbMoO4
PbO:0.3H2O	-7.79	5.19	12.98	PbO:0.33H2O
PbSeO4	-13.84	-20.68	-6.84	PbSeO4
Periclase	-10.37	11.21	21.58	MgO
Phosgenite	-9.60	-29.41	-19.81	PbCl2:PbCO3
Plattnerite	-18.87	30.73	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.71	-142.22	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2

Realgar	-100.90	-120.64	-19.75	AsS
Retgersite	-7.87	-9.91	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-12.16	-19.27	-7.11	Sb(OH)3
Sb2O4	-16.40	-13.00	3.40	Sb2O4
Sb2O5	-26.41	-36.08	-9.67	Sb2O5
Sb2Se3	-111.42	-179.18	-67.76	Sb2Se3
Sb4O6(cubic)	-58.83	-77.09	-18.26	Sb4O6
Sb4O6(orth)	-59.19	-77.09	-17.90	Sb4O6
SbCl3	-49.77	-49.20	0.57	SbCl3
SbF3	-41.83	-52.06	-10.23	SbF3
Sbmetal	-45.90	-57.59	-11.69	Sb
SbO2	-2.99	-30.81	-27.82	SbO2
Schoepite	-5.19	0.81	5.99	UO2(OH)2:H2O
Semetal(am)	-14.22	-21.33	-7.11	Se
Semetal(hex)	-13.62	-21.33	-7.71	Se
Senarmontite	-26.18	-38.55	-12.37	Sb2O3
SeO2	-15.23	-15.10	0.12	SeO2
SeO3	-46.91	-25.87	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.88	-11.88	-10.00	ZnCO3
Sphalerite	-66.19	-77.64	-11.45	ZnS
Spinel	-6.41	30.44	36.85	MgAl2O4
Stibnite	-244.90	-295.36	-50.46	Sb2S3
Sulfur	-57.92	-60.06	-2.14	S
Tenorite	0.16	7.81	7.64	CuO
Thenardite	-7.85	-7.53	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3:H2O
Tyuyamunite	-8.45	-4.37	4.08	Ca(UO2)2(VO4)2
U3O8	-16.56	4.52	21.08	U3O8
U3Sb4	-582.58	-430.20	152.38	U3Sb4
U4O9	-33.52	-36.54	-3.02	U4O9
UF4	-29.70	-59.24	-29.54	UF4
UF4:2.5H2O	-26.52	-59.24	-32.72	UF4:2.5H2O
UO2(am)	-16.46	-15.52	0.93	UO2
UO2(NO3)2	-49.00	-36.85	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.70	-36.85	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.24	-36.85	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.90	-36.85	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.81	0.81	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.81	-25.06	-2.25	UO2SeO4:4H2O
UO3	-6.89	0.81	7.70	UO3
Uraninite	-10.85	-15.52	-4.67	UO2
USb2	-220.59	-191.01	29.58	USb2
V(OH)3	-19.21	-11.62	7.59	V(OH)3
V2O5	-15.98	-17.34	-1.36	V2O5
V3O5	-41.00	-39.17	1.84	V3O5
V4O7	-50.89	-43.71	7.19	V4O7
V6O13	-42.26	-103.12	-60.86	V6O13
Valentinite	-30.07	-38.55	-8.48	Sb2O3
VC12	-63.22	-44.34	18.87	VC12
VC13	-64.98	-41.55	23.43	VC13
VF4	-63.18	-48.25	14.93	VF4
Vmetal	-93.96	-49.93	44.03	V
VO	-39.15	-24.39	14.76	VO
VO(OH)2	-9.69	-4.54	5.15	VO(OH)2
VO2Cl	-21.49	-18.65	2.84	VO2Cl
VOC1	-32.75	-21.59	11.15	VOC1
VOC12	-37.25	-24.49	12.76	VOC12
VOSO4	-25.24	-21.63	3.61	VOSO4
Witherite	-4.16	-12.73	-8.57	BaCO3
Wurtzite	-68.69	-77.64	-8.95	ZnS
Zincite	-3.37	7.96	11.33	ZnO
Zincosite	-13.06	-9.13	3.93	ZnSO4
Zn(BO2)2	-9.93	-1.64	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.01	-29.69	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.24	7.96	12.20	Zn(OH)2

Zn(OH)2(am)	-4.51	7.96	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.79	7.96	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.57	7.96	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.77	7.96	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.66	-1.16	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.25	5.95	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-21.00	-7.35	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.20	-10.29	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.64	14.76	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.65	19.85	38.50	Zn5(OH)8Cl2
ZnCl2	-19.04	-11.99	7.05	ZnCl2
ZnCO3:1H2O	-1.62	-11.88	-10.26	ZnCO3:1H2O
ZnF2	-13.36	-13.90	-0.53	ZnF2
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO4	-2.80	-12.92	-10.13	ZnMoO4
ZnO(active)	-3.23	7.96	11.19	ZnO
ZnS(am)	-68.59	-77.64	-9.05	ZnS
ZnSb	-86.19	-75.17	11.01	ZnSb
ZnSe	-24.52	-38.92	-14.40	ZnSe
ZnSeO4:6H2O	-16.39	-17.91	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.49	-9.13	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 72.

```
Title Stage 4 Run-off mix
Mix 402
1      1
3      0.001868
4      0.019620
5      0.010646
6      0.000000
7      0.035695
8      0.000000
9      5.374214
10     8.412976
11     16.255055
12     87.139351
13     67.158507
14     26.969520
15     13.653333
Save solution 405
end
```

TITLE

Stage 4 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 402.

Mixture 402.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

1.868e-03 Solution 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

1.962e-02 Solution 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

1.065e-02 Solution 5 Average HCT data for quartz monzonite - oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

3.569e-02 Solution 7 Average HCT data for coarse crystalline porphyry - oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry - oxide/transitional (ore) (cell CF-11-02, 0-27)

5.374e+00 Solution 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

8.413e+00 Solution 10 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

1.626e+01 Solution 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

8.714e+01 Solution 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

6.716e+01 Solution 13 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

2.697e+01 Solution 14 Average HCT data for coarse crystalline porphyry - sulfide (waste) (cell CF-11-02, 367-408)

1.365e+01 Solution 15 Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	9.831e-07	2.222e-04
As	4.520e-10	1.022e-07
B	4.446e-07	1.005e-04
Ba	1.334e-07	3.014e-05
C	7.225e-04	1.633e-01
Ca	3.125e-04	7.064e-02
Cd	1.167e-09	2.638e-07
Cl	3.745e-05	8.464e-03
Co	1.314e-11	2.970e-09
Cr	5.055e-12	1.143e-09
Cu	2.375e-06	5.368e-04
F	3.360e-05	7.595e-03
Fe	4.736e-08	1.071e-05
Hg	4.265e-11	9.640e-09
K	6.682e-05	1.510e-02
Mg	8.172e-05	1.847e-02
Mn	9.871e-07	2.231e-04
Mo	3.812e-08	8.617e-06
N	9.989e-08	2.258e-05
Na	1.198e-04	2.708e-02
Ni	2.140e-12	4.837e-10
Pb	3.329e-09	7.525e-07
S	2.508e-04	5.668e-02
Sb	4.007e-10	9.058e-08
Se	3.489e-09	7.886e-07
U	1.213e-08	2.741e-06
V	9.419e-09	2.129e-06
Zn	1.153e-07	2.606e-05

-----Description of solution-----

	pH = 6.451	Charge balance
	pe = 6.501	Adjusted to redox
equilibrium		

Activity of water = 1.000
 Ionic strength (mol/kgw) = 1.569e-03
 Mass of water (kg) = 2.260e+02
 Total alkalinity (eq/kg) = 4.127e-04
 Total CO2 (mol/kg) = 7.225e-04
 Temperature (°C) = 25.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 13
 Total H = 2.509274e+04
 Total O = 1.254697e+04

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.696e-07	3.536e-07	-6.432	-6.451	-0.019	0.00
OH-	2.977e-08	2.847e-08	-7.526	-7.546	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.831e-07					
AlF2+	4.673e-07	4.474e-07	-6.330	-6.349	-0.019	(0)
AlF3	1.711e-07	1.711e-07	-6.767	-6.767	0.000	(0)
Al(OH)4-	1.669e-07	1.597e-07	-6.778	-6.797	-0.019	(0)
Al(OH)2+	8.191e-08	7.843e-08	-7.087	-7.106	-0.019	(0)
Al(OH)3	4.456e-08	4.456e-08	-7.351	-7.351	0.000	(0)
AlF+2	4.402e-08	3.700e-08	-7.356	-7.432	-0.076	(0)
AlOH+2	4.126e-09	3.468e-09	-8.384	-8.460	-0.076	(0)
AlF4-	2.723e-09	2.606e-09	-8.565	-8.584	-0.019	(0)
AlSO4+	1.959e-10	1.875e-10	-9.708	-9.727	-0.019	(0)
Al+3	1.813e-10	1.218e-10	-9.742	-9.914	-0.173	(0)
Al(SO4)2-	4.162e-13	3.983e-13	-12.381	-12.400	-0.019	(0)
AlMo6O21-3	3.643e-39	2.397e-39	-38.438	-38.620	-0.182	(0)
As(3)	1.929e-21					
H3AsO3	1.926e-21	1.926e-21	-20.715	-20.715	0.000	(0)
H2AsO3-	2.926e-24	2.793e-24	-23.534	-23.554	-0.020	(0)
H4AsO3+	3.535e-28	3.374e-28	-27.452	-27.472	-0.020	(0)
HAsO3-2	8.676e-30	7.203e-30	-29.062	-29.142	-0.081	(0)
AsO3-3	1.193e-36	7.852e-37	-35.923	-36.105	-0.182	(0)
As(5)	4.520e-10					
H2AsO4-	3.332e-10	3.181e-10	-9.477	-9.497	-0.020	(0)
HAsO4-2	1.188e-10	9.862e-11	-9.925	-10.006	-0.081	(0)
H3AsO4	1.954e-14	1.955e-14	-13.709	-13.709	0.000	(0)
AsO4-3	1.340e-15	8.819e-16	-14.873	-15.055	-0.182	(0)
B	4.446e-07					
H3BO3	4.438e-07	4.440e-07	-6.353	-6.353	0.000	(0)
H2BO3-	7.627e-10	7.291e-10	-9.118	-9.137	-0.020	(0)
CaH2BO3+	1.100e-11	1.052e-11	-10.959	-10.978	-0.020	(0)
BF(OH)3-	5.630e-12	5.382e-12	-11.250	-11.269	-0.020	(0)
MgH2BO3+	1.747e-12	1.670e-12	-11.758	-11.777	-0.020	(0)
NaH2BO3	1.323e-13	1.323e-13	-12.878	-12.878	0.000	(0)
BF2(OH)2-	6.466e-15	6.181e-15	-14.189	-14.209	-0.020	(0)
BaH2BO3+	2.625e-15	2.509e-15	-14.581	-14.600	-0.020	(0)
H5(BO3)2-	2.882e-16	2.755e-16	-15.540	-15.560	-0.020	(0)
BF3OH-	2.703e-20	2.583e-20	-19.568	-19.588	-0.020	(0)
H8(BO3)3-	1.279e-20	1.223e-20	-19.893	-19.913	-0.020	(0)
BF4-	1.429e-24	1.366e-24	-23.845	-23.865	-0.020	(0)
Ba	1.334e-07					
Ba+2	1.329e-07	1.114e-07	-6.876	-6.953	-0.077	(0)
BaHCO3+	4.345e-10	4.161e-10	-9.362	-9.381	-0.019	(0)
BaCO3	2.963e-12	2.963e-12	-11.528	-11.528	0.000	(0)
BaOH+	1.446e-14	1.384e-14	-13.840	-13.859	-0.019	(0)
BaH2BO3+	2.625e-15	2.509e-15	-14.581	-14.600	-0.020	(0)
BaNO3+	6.767e-17	6.459e-17	-16.170	-16.190	-0.020	(0)
BaNH3+2	5.685e-18	4.720e-18	-17.245	-17.326	-0.081	(0)
C(4)	7.225e-04					
HCO3-	4.086e-04	3.912e-04	-3.389	-3.408	-0.019	(0)
H2CO3	3.111e-04	3.111e-04	-3.507	-3.507	0.000	(0)

		CaHCO ₃ ⁺	1.906e-06	1.826e-06	-5.720	-5.739	-0.019	(0)
		CuCO ₃	4.349e-07	4.349e-07	-6.362	-6.362	0.000	(0)
		MgHCO ₃ ⁺	2.764e-07	2.644e-07	-6.559	-6.578	-0.019	(0)
		CO ₃ -2	6.190e-08	5.187e-08	-7.208	-7.285	-0.077	(0)
		CuHCO ₃ ⁺	3.683e-08	3.515e-08	-7.434	-7.454	-0.020	(0)
		NaHCO ₃	2.519e-08	2.519e-08	-7.599	-7.599	0.000	(0)
		CaCO ₃	2.060e-08	2.060e-08	-7.686	-7.686	0.000	(0)
		UO ₂ (CO ₃) 2-2	6.570e-09	5.454e-09	-8.182	-8.263	-0.081	(0)
		MnHCO ₃ ⁺	6.443e-09	6.167e-09	-8.191	-8.210	-0.019	(0)
		UO ₂ CO ₃	5.271e-09	5.271e-09	-8.278	-8.278	0.000	(0)
		MgCO ₃	2.849e-09	2.849e-09	-8.545	-8.545	0.000	(0)
		ZnHCO ₃ ⁺	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
		PbHCO ₃ ⁺	5.541e-10	5.289e-10	-9.256	-9.277	-0.020	(0)
		BaHCO ₃ ⁺	4.345e-10	4.161e-10	-9.362	-9.381	-0.019	(0)
		PbCO ₃	2.837e-10	2.837e-10	-9.547	-9.547	0.000	(0)
		ZnCO ₃	2.738e-10	2.738e-10	-9.563	-9.563	0.000	(0)
		NaCO ₃ -	1.155e-10	1.106e-10	-9.938	-9.956	-0.019	(0)
		Cu (CO ₃) 2-2	7.314e-11	6.072e-11	-10.136	-10.217	-0.081	(0)
		UO ₂ (CO ₃) 3-4	2.985e-11	1.418e-11	-10.525	-10.848	-0.323	(0)
		FeHCO ₃ ⁺	3.707e-12	3.551e-12	-11.431	-11.450	-0.019	(0)
		BaCO ₃	2.963e-12	2.963e-12	-11.528	-11.528	0.000	(0)
		CdCO ₃	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
		CdHCO ₃ ⁺	8.738e-13	8.340e-13	-12.059	-12.079	-0.020	(0)
		CoHCO ₃ ⁺	3.276e-13	3.128e-13	-12.485	-12.505	-0.020	(0)
		NiHCO ₃ ⁺	8.403e-14	8.021e-14	-13.076	-13.096	-0.020	(0)
		Pb (CO ₃) 2-2	5.111e-14	4.243e-14	-13.291	-13.372	-0.081	(0)
		CoCO ₃	9.011e-15	9.011e-15	-14.045	-14.045	0.000	(0)
		NiCO ₃	3.218e-15	3.218e-15	-14.492	-14.492	0.000	(0)
		HgCO ₃	2.856e-15	2.856e-15	-14.544	-14.544	0.000	(0)
		Cd (CO ₃) 2-2	5.127e-17	4.256e-17	-16.290	-16.371	-0.081	(0)
		HgHCO ₃ ⁺	1.970e-17	1.881e-17	-16.705	-16.726	-0.020	(0)
		Hg (CO ₃) 2-2	5.643e-19	4.684e-19	-18.249	-18.329	-0.081	(0)
Ca	3.125e-04							
		Ca+2	2.991e-04	2.506e-04	-3.524	-3.601	-0.077	(0)
		CaSO ₄	1.139e-05	1.139e-05	-4.944	-4.944	0.000	(0)
		CaHCO ₃ ⁺	1.906e-06	1.826e-06	-5.720	-5.739	-0.019	(0)
		CaF ⁺	8.682e-08	8.311e-08	-7.061	-7.080	-0.019	(0)
		CaCO ₃	2.060e-08	2.060e-08	-7.686	-7.686	0.000	(0)
		CaOH ⁺	1.487e-10	1.424e-10	-9.828	-9.847	-0.019	(0)
		CaH ₂ BO ₃ ⁺	1.100e-11	1.052e-11	-10.959	-10.978	-0.020	(0)
		CaNO ₃ ⁺	9.609e-14	9.172e-14	-13.017	-13.038	-0.020	(0)
		CaNH ₃ +2	2.553e-14	2.119e-14	-13.593	-13.674	-0.081	(0)
		Ca (NH ₃) 2+2	6.826e-25	5.667e-25	-24.166	-24.247	-0.081	(0)
Cd	1.167e-09							
		Cd+2	1.118e-09	9.364e-10	-8.952	-9.029	-0.077	(0)
		CdSO ₄	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
		CdCl ⁺	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
		CdCO ₃	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
		CdHCO ₃ ⁺	8.738e-13	8.340e-13	-12.059	-12.079	-0.020	(0)
		CdF ⁺	4.723e-13	4.509e-13	-12.326	-12.346	-0.020	(0)
		CdOH ⁺	2.219e-13	2.118e-13	-12.654	-12.674	-0.020	(0)
		Cd (SO ₄) 2-2	1.403e-13	1.165e-13	-12.853	-12.934	-0.081	(0)
		CdOHC1	3.742e-15	3.742e-15	-14.427	-14.427	0.000	(0)
		CdCl ₂	4.785e-16	4.785e-16	-15.320	-15.320	0.000	(0)
		Cd (CO ₃) 2-2	5.127e-17	4.256e-17	-16.290	-16.371	-0.081	(0)
		Cd (OH) 2	3.805e-17	3.805e-17	-16.420	-16.420	0.000	(0)
		CdF ₂	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
		CdNO ₃ ⁺	3.590e-19	3.427e-19	-18.445	-18.465	-0.020	(0)
		CdSeO ₄	6.399e-20	6.399e-20	-19.194	-19.194	0.000	(0)
		CdCl ₃ -	1.133e-20	1.082e-20	-19.946	-19.966	-0.020	(0)
		Cd ₂ OH+3	1.511e-21	9.940e-22	-20.821	-21.003	-0.182	(0)
		Cd (OH) 3-	6.934e-23	6.619e-23	-22.159	-22.179	-0.020	(0)
		Cd (SeO ₃) 2-2	1.273e-24	1.057e-24	-23.895	-23.976	-0.081	(0)
		Cd (NO ₃) 2	1.987e-29	1.987e-29	-28.702	-28.702	0.000	(0)
		Cd (OH) 4-2	3.716e-31	3.085e-31	-30.430	-30.511	-0.081	(0)
		CdHS ⁺	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-232.232	-232.252	-0.020	(0)

Cd (HS) 4-2	0.000e+00	0.000e+00	-310.087	-310.168	-0.081	(0)
C1	3.745e-05					
Cl-	3.745e-05	3.583e-05	-4.427	-4.446	-0.019	(0)
CuCl+	8.452e-11	8.087e-11	-10.073	-10.092	-0.019	(0)
MnCl+	3.723e-11	3.564e-11	-10.429	-10.448	-0.019	(0)
CuCl	9.931e-12	9.931e-12	-11.003	-11.003	0.000	(0)
ZnCl+	8.631e-12	8.257e-12	-11.064	-11.083	-0.019	(0)
CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
PbCl+	2.423e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
ZnOHC1	3.078e-13	3.078e-13	-12.512	-12.512	0.000	(0)
HgClOH	8.290e-14	8.290e-14	-13.081	-13.081	0.000	(0)
CuCl2-	7.770e-14	7.434e-14	-13.110	-13.129	-0.019	(0)
HgCl2	5.907e-15	5.907e-15	-14.229	-14.229	0.000	(0)
CdOHC1	3.742e-15	3.742e-15	-14.427	-14.427	0.000	(0)
MnCl2	1.803e-15	1.803e-15	-14.744	-14.744	0.000	(0)
UO2Cl+	1.554e-15	1.483e-15	-14.809	-14.829	-0.020	(0)
CoCl+	1.334e-15	1.274e-15	-14.875	-14.895	-0.020	(0)
CuCl2	1.005e-15	1.005e-15	-14.998	-14.998	0.000	(0)
CdCl2	4.785e-16	4.785e-16	-15.320	-15.320	0.000	(0)
ZnCl2	4.689e-16	4.689e-16	-15.329	-15.329	0.000	(0)
PbCl2	3.702e-16	3.702e-16	-15.432	-15.432	0.000	(0)
NiCl+	1.597e-16	1.525e-16	-15.797	-15.817	-0.020	(0)
HgCl+	3.446e-17	3.289e-17	-16.463	-16.483	-0.020	(0)
HgCl3-	2.217e-18	2.116e-18	-17.654	-17.674	-0.020	(0)
CuCl3-2	6.782e-19	5.694e-19	-18.169	-18.245	-0.076	(0)
FeCl+2	2.734e-19	2.296e-19	-18.563	-18.639	-0.076	(0)
CrCl+2	9.192e-20	7.631e-20	-19.037	-19.117	-0.081	(0)
MnCl3-	1.859e-20	1.780e-20	-19.731	-19.750	-0.019	(0)
ZnCl3-	1.395e-20	1.334e-20	-19.856	-19.875	-0.019	(0)
CdCl3-	1.133e-20	1.082e-20	-19.946	-19.966	-0.020	(0)
VOCl+	7.370e-21	7.035e-21	-20.133	-20.153	-0.020	(0)
PbCl3-	5.531e-21	5.280e-21	-20.257	-20.277	-0.020	(0)
HgCl4-2	3.636e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
CuCl3-	3.511e-22	3.359e-22	-21.455	-21.474	-0.019	(0)
FeCl2+	3.838e-23	3.674e-23	-22.416	-22.435	-0.019	(0)
NiCl2	2.750e-23	2.750e-23	-22.561	-22.561	0.000	(0)
CrOHC12	1.480e-24	1.480e-24	-23.830	-23.830	0.000	(0)
ZnCl4-2	2.847e-25	2.391e-25	-24.546	-24.621	-0.076	(0)
CrCl2+	2.718e-25	2.594e-25	-24.566	-24.586	-0.020	(0)
PbCl4-2	1.042e-25	8.647e-26	-24.982	-25.063	-0.081	(0)
FeCl3	1.316e-28	1.316e-28	-27.881	-27.881	0.000	(0)
CuCl4-2	7.183e-29	6.032e-29	-28.144	-28.220	-0.076	(0)
CrO3Cl-	2.321e-31	2.215e-31	-30.634	-30.655	-0.020	(0)
CoCl+2	1.138e-39	9.449e-40	-38.944	-39.025	-0.081	(0)
UCl+3	0.000e+00	0.000e+00	-42.748	-42.930	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.855	-63.936	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.084	-66.165	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.743	-80.824	-0.081	(0)
Co (2)	1.314e-11					
Co+2	1.238e-11	1.028e-11	-10.907	-10.988	-0.081	(0)
CoSO4	4.066e-13	4.066e-13	-12.391	-12.391	0.000	(0)
CoHCO3+	3.276e-13	3.128e-13	-12.485	-12.505	-0.020	(0)
CoF+	1.034e-14	9.873e-15	-13.985	-14.006	-0.020	(0)
CoCO3	9.011e-15	9.011e-15	-14.045	-14.045	0.000	(0)
CoOH+	6.117e-15	5.839e-15	-14.213	-14.234	-0.020	(0)
CoCl+	1.334e-15	1.274e-15	-14.875	-14.895	-0.020	(0)
Co (OH) 2	1.321e-17	1.321e-17	-16.879	-16.879	0.000	(0)
CoNO2+	4.065e-18	3.880e-18	-17.391	-17.411	-0.020	(0)
Co (NH3) +2	9.996e-20	8.299e-20	-19.000	-19.081	-0.081	(0)
CoNO3+	1.975e-21	1.885e-21	-20.705	-20.725	-0.020	(0)
CoSeO4	1.890e-21	1.890e-21	-20.723	-20.723	0.000	(0)
Co (OH) 3-	7.860e-24	7.503e-24	-23.105	-23.125	-0.020	(0)
CoOOH-	1.972e-24	1.882e-24	-23.705	-23.725	-0.020	(0)
Co2OH+3	4.571e-27	3.007e-27	-26.340	-26.522	-0.182	(0)
Co (NH3) 2+2	2.864e-28	2.378e-28	-27.543	-27.624	-0.081	(0)
Co (NO3) 2	4.438e-31	4.438e-31	-30.353	-30.353	0.000	(0)
Co (OH) 4-2	4.078e-32	3.386e-32	-31.390	-31.470	-0.081	(0)
Co (NH3) 3+2	2.422e-37	2.011e-37	-36.616	-36.697	-0.081	(0)

Co (NH3) 4+2	0.000e+00	0.000e+00	-46.069	-46.150	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.311	-48.635	-0.323	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.022	-56.102	-0.081	(0)
Co (3)	2.259e-32					
CoOH+2	2.259e-32	1.875e-32	-31.646	-31.727	-0.081	(0)
Co+3	1.929e-37	1.296e-37	-36.715	-36.887	-0.173	(0)
CoCl+2	1.138e-39	9.449e-40	-38.944	-39.025	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.855	-63.936	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.136	-75.156	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.643	-79.724	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.743	-80.824	-0.081	(0)
Cr (2)	1.495e-28					
Cr+2	1.495e-28	1.241e-28	-27.825	-27.906	-0.081	(0)
Cr (3)	5.055e-12					
Cr (OH) 2+	3.721e-12	3.552e-12	-11.429	-11.450	-0.020	(0)
Cr (OH) +2	1.235e-12	1.025e-12	-11.908	-11.989	-0.081	(0)
CrOHSO4	4.825e-14	4.825e-14	-13.317	-13.317	0.000	(0)
Cr (OH) 3	3.799e-14	3.799e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.545e-15	7.924e-15	-14.020	-14.101	-0.081	(0)
Cr+3	2.502e-15	1.646e-15	-14.602	-14.784	-0.182	(0)
CrSO4+	7.984e-16	7.621e-16	-15.098	-15.118	-0.020	(0)
CrO2-	5.345e-17	5.102e-17	-16.272	-16.292	-0.020	(0)
Cr (OH) 4-	4.512e-17	4.307e-17	-16.346	-16.366	-0.020	(0)
CrCl+2	9.192e-20	7.631e-20	-19.037	-19.117	-0.081	(0)
Cr2 (OH) 2SO4+2	5.385e-24	4.471e-24	-23.269	-23.350	-0.081	(0)
CrOHC12	1.480e-24	1.480e-24	-23.830	-23.830	0.000	(0)
CrCl2+	2.718e-25	2.594e-25	-24.566	-24.586	-0.020	(0)
Cr2 (OH) 2 (SO4) 2	5.266e-26	5.266e-26	-25.278	-25.278	0.000	(0)
CrNO3+2	1.003e-26	8.325e-27	-25.999	-26.080	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.740	-52.821	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.639	-62.821	-0.182	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.084	-66.165	-0.081	(0)
Cr (6)	5.814e-21					
HCrO4-	2.912e-21	2.780e-21	-20.536	-20.556	-0.020	(0)
CrO4-2	2.899e-21	2.429e-21	-20.538	-20.615	-0.077	(0)
NaCrO4-	1.448e-24	1.382e-24	-23.839	-23.859	-0.020	(0)
KCrO4-	6.037e-25	5.763e-25	-24.219	-24.239	-0.020	(0)
H2CrO4	7.969e-28	7.969e-28	-27.099	-27.099	0.000	(0)
CrO3SO4-2	7.152e-29	5.938e-29	-28.146	-28.226	-0.081	(0)
CrO3Cl-	2.321e-31	2.215e-31	-30.634	-30.655	-0.020	(0)
Cr2O7-2	3.228e-40	2.680e-40	-39.491	-39.572	-0.081	(0)
Cu (1)	2.407e-10					
Cu+	2.307e-10	2.202e-10	-9.637	-9.657	-0.020	(0)
CuCl	9.931e-12	9.931e-12	-11.003	-11.003	0.000	(0)
CuCl2-	7.770e-14	7.434e-14	-13.110	-13.129	-0.019	(0)
CuCl3-2	6.782e-19	5.694e-19	-18.169	-18.245	-0.076	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.448	-153.588	-0.140	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.181	-154.318	-0.137	(0)
Cu (2)	2.375e-06					
Cu+2	1.700e-06	1.424e-06	-5.770	-5.846	-0.077	(0)
CuCO3	4.349e-07	4.349e-07	-6.362	-6.362	0.000	(0)
CuOH+	1.340e-07	1.282e-07	-6.873	-6.892	-0.019	(0)
CuSO4	6.470e-08	6.470e-08	-7.189	-7.189	0.000	(0)
CuHCO3+	3.683e-08	3.515e-08	-7.434	-7.454	-0.020	(0)
CuF+	2.860e-09	2.730e-09	-8.544	-8.564	-0.020	(0)
Cu (OH) 2	7.285e-10	7.285e-10	-9.138	-9.138	0.000	(0)
Cu2 (OH) 2+2	4.975e-10	4.130e-10	-9.303	-9.384	-0.081	(0)
CuCl+	8.452e-11	8.087e-11	-10.073	-10.092	-0.019	(0)
Cu (CO3) 2-2	7.314e-11	6.072e-11	-10.136	-10.217	-0.081	(0)
CuNO2+	8.370e-12	7.989e-12	-11.077	-11.097	-0.020	(0)
CuNH3+2	1.179e-12	9.788e-13	-11.928	-12.009	-0.081	(0)
Cu (OH) 3-	4.457e-14	4.255e-14	-13.351	-13.371	-0.020	(0)
CuCl2	1.005e-15	1.005e-15	-14.998	-14.998	0.000	(0)
CuNO3+	5.460e-16	5.211e-16	-15.263	-15.283	-0.020	(0)
Cu (NO2) 2	4.380e-18	4.380e-18	-17.359	-17.359	0.000	(0)
Cu (OH) 4-2	1.149e-20	9.535e-21	-19.940	-20.021	-0.081	(0)
CuCl3-	3.511e-22	3.359e-22	-21.455	-21.474	-0.019	(0)
Cu (NO3) 2	7.592e-27	7.592e-27	-26.120	-26.120	0.000	(0)

	CuCl4-2	7.183e-29	6.032e-29	-28.144	-28.220	-0.076	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.263	-220.283	-0.020	(0)
F		3.360e-05					
	F-	3.175e-05	3.038e-05	-4.498	-4.517	-0.019	(0)
	AlF2+	4.673e-07	4.474e-07	-6.330	-6.349	-0.019	(0)
	MgF+	2.352e-07	2.251e-07	-6.628	-6.648	-0.019	(0)
	AlF3	1.711e-07	1.711e-07	-6.767	-6.767	0.000	(0)
	CaF+	8.682e-08	8.311e-08	-7.061	-7.080	-0.019	(0)
	AlF+2	4.402e-08	3.700e-08	-7.356	-7.432	-0.076	(0)
	HF	1.589e-08	1.589e-08	-7.799	-7.799	0.000	(0)
	CuF+	2.860e-09	2.730e-09	-8.544	-8.564	-0.020	(0)
	AlF4-	2.723e-09	2.606e-09	-8.565	-8.584	-0.019	(0)
	NaF	2.194e-09	2.194e-09	-8.659	-8.659	0.000	(0)
	MnF+	9.982e-10	9.555e-10	-9.001	-9.020	-0.019	(0)
	UO2F+	1.121e-10	1.070e-10	-9.950	-9.970	-0.020	(0)
	ZnF+	5.826e-11	5.562e-11	-10.235	-10.255	-0.020	(0)
	UO2F2	9.379e-12	9.379e-12	-11.028	-11.028	0.000	(0)
	BF(OH) 3-	5.630e-12	5.382e-12	-11.250	-11.269	-0.020	(0)
	PbF+	4.081e-12	3.895e-12	-11.389	-11.409	-0.020	(0)
	HF2-	1.919e-12	1.835e-12	-11.717	-11.736	-0.019	(0)
	CdF+	4.723e-13	4.509e-13	-12.326	-12.346	-0.020	(0)
	UO2F3-	7.498e-14	7.157e-14	-13.125	-13.145	-0.020	(0)
	CoF+	1.034e-14	9.873e-15	-13.985	-14.006	-0.020	(0)
	CrF+2	9.545e-15	7.924e-15	-14.020	-14.101	-0.081	(0)
	FeF+2	8.417e-15	7.067e-15	-14.075	-14.151	-0.076	(0)
	BF2(OH) 2-	6.466e-15	6.181e-15	-14.189	-14.209	-0.020	(0)
	FeF2+	6.002e-15	5.746e-15	-14.222	-14.241	-0.019	(0)
	PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
	NiF+	1.330e-15	1.269e-15	-14.876	-14.896	-0.020	(0)
	VO2F	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
	H2F2	6.765e-16	6.765e-16	-15.170	-15.170	0.000	(0)
	FeF3	2.463e-16	2.463e-16	-15.609	-15.609	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	UO2F4-2	2.080e-17	1.727e-17	-16.682	-16.763	-0.081	(0)
	VO2F2-	1.365e-17	1.303e-17	-16.865	-16.885	-0.020	(0)
	VOF+	1.336e-17	1.275e-17	-16.874	-16.894	-0.020	(0)
	VOF2	1.453e-19	1.453e-19	-18.838	-18.838	0.000	(0)
	PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
	BF3OH-	2.703e-20	2.583e-20	-19.568	-19.588	-0.020	(0)
	VO2F3-2	5.947e-21	4.937e-21	-20.226	-20.307	-0.081	(0)
	VOF3-	1.641e-22	1.566e-22	-21.785	-21.805	-0.020	(0)
	HgF+	5.429e-23	5.182e-23	-22.265	-22.286	-0.020	(0)
	PbF4-2	2.350e-24	1.951e-24	-23.629	-23.710	-0.081	(0)
	BF4-	1.429e-24	1.366e-24	-23.845	-23.865	-0.020	(0)
	VO2F4-3	1.122e-25	7.380e-26	-24.950	-25.132	-0.182	(0)
	Sb(OH) 2F	6.748e-26	6.748e-26	-25.171	-25.171	0.000	(0)
	SbOF	6.636e-26	6.636e-26	-25.178	-25.178	0.000	(0)
	VOF4-2	2.313e-26	1.920e-26	-25.636	-25.717	-0.081	(0)
	UF3+	7.649e-33	7.301e-33	-32.116	-32.137	-0.020	(0)
	UF2+2	1.826e-33	1.516e-33	-32.738	-32.819	-0.081	(0)
	UF4	2.432e-35	2.432e-35	-34.614	-34.614	0.000	(0)
	UF+3	6.026e-36	3.965e-36	-35.220	-35.402	-0.182	(0)
	UF5-	3.067e-38	2.928e-38	-37.513	-37.533	-0.020	(0)
	UF6-2	3.236e-40	2.686e-40	-39.490	-39.571	-0.081	(0)
Fe (2)		9.080e-10					
	Fe+2	8.684e-10	7.209e-10	-9.061	-9.142	-0.081	(0)
	FeSO4	3.509e-11	3.509e-11	-10.455	-10.455	0.000	(0)
	FeHCO3+	3.707e-12	3.551e-12	-11.431	-11.450	-0.019	(0)
	FeOH+	8.537e-13	8.172e-13	-12.069	-12.088	-0.019	(0)
	Fe(OH) 2	1.848e-17	1.848e-17	-16.733	-16.733	0.000	(0)
	Fe(OH) 3-	1.739e-19	1.664e-19	-18.760	-18.779	-0.019	(0)
	Fe(HS) 2	0.000e+00	0.000e+00	-160.416	-160.416	0.000	(0)
	Fe(HS) 3-	0.000e+00	0.000e+00	-238.471	-238.491	-0.020	(0)
Fe (3)		4.646e-08					
	Fe(OH) 2+	4.513e-08	4.321e-08	-7.346	-7.364	-0.019	(0)
	Fe(OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
	FeOH+2	4.645e-12	3.900e-12	-11.333	-11.409	-0.076	(0)
	Fe(OH) 4-	3.659e-12	3.503e-12	-11.437	-11.456	-0.019	(0)

	FeF+2	8.417e-15	7.067e-15	-14.075	-14.151	-0.076	(0)
	FeF2+	6.002e-15	5.746e-15	-14.222	-14.241	-0.019	(0)
	FeSO4+	4.931e-16	4.721e-16	-15.307	-15.326	-0.019	(0)
	Fe+3	3.158e-16	2.122e-16	-15.501	-15.673	-0.173	(0)
	FeF3	2.463e-16	2.463e-16	-15.609	-15.609	0.000	(0)
	Fe(SO4) 2-	2.097e-18	2.001e-18	-17.678	-17.699	-0.020	(0)
	FeCl+2	2.734e-19	2.296e-19	-18.563	-18.639	-0.076	(0)
	FeHSeO3+2	2.220e-21	1.843e-21	-20.654	-20.735	-0.081	(0)
	Fe2(OH) 2+4	1.061e-21	5.038e-22	-20.974	-21.298	-0.323	(0)
	FeCl2+	3.838e-23	3.674e-23	-22.416	-22.435	-0.019	(0)
	FeNO3+2	2.957e-25	2.455e-25	-24.529	-24.610	-0.081	(0)
	Fe3(OH) 4+5	1.007e-27	3.146e-28	-26.997	-27.502	-0.505	(0)
	FeCl3	1.316e-28	1.316e-28	-27.881	-27.881	0.000	(0)
H (0)	1.764e-29						
	H2	8.818e-30	8.821e-30	-29.055	-29.054	0.000	(0)
Hg (0)	4.232e-11						
	Hg	4.232e-11	4.232e-11	-10.373	-10.373	0.000	(0)
Hg (1)	3.185e-21						
	Hg2+2	1.592e-21	1.322e-21	-20.798	-20.879	-0.081	(0)
Hg (2)	3.271e-13						
	Hg(OH) 2	2.353e-13	2.354e-13	-12.628	-12.628	0.000	(0)
	HgClOH	8.290e-14	8.290e-14	-13.081	-13.081	0.000	(0)
	HgCl2	5.907e-15	5.907e-15	-14.229	-14.229	0.000	(0)
	HgCO3	2.856e-15	2.856e-15	-14.544	-14.544	0.000	(0)
	HgOH+	5.464e-17	5.216e-17	-16.262	-16.283	-0.020	(0)
	HgCl+	3.446e-17	3.289e-17	-16.463	-16.483	-0.020	(0)
	HgHCO3+	1.970e-17	1.881e-17	-16.705	-16.726	-0.020	(0)
	HgCl3-	2.217e-18	2.116e-18	-17.654	-17.674	-0.020	(0)
	Hg(CO3) 2-2	5.643e-19	4.684e-19	-18.249	-18.329	-0.081	(0)
	Hg+2	5.543e-20	4.601e-20	-19.256	-19.337	-0.081	(0)
	HgSO4	2.389e-21	2.389e-21	-20.622	-20.622	0.000	(0)
	HgNH3+2	2.349e-21	1.950e-21	-20.629	-20.710	-0.081	(0)
	Hg(OH) 3-	8.840e-22	8.438e-22	-21.054	-21.074	-0.020	(0)
	HgCl4-2	3.636e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
	Hg(NH3) 2+2	1.578e-22	1.310e-22	-21.802	-21.883	-0.081	(0)
	HgF+	5.429e-23	5.182e-23	-22.265	-22.286	-0.020	(0)
	HgNO3+	2.060e-30	1.966e-30	-29.686	-29.706	-0.020	(0)
	Hg(NH3) 3+2	4.218e-32	3.502e-32	-31.375	-31.456	-0.081	(0)
	Hg(NO3) 2	0.000e+00	0.000e+00	-40.024	-40.024	0.000	(0)
	Hg(NH3) 4+2	0.000e+00	0.000e+00	-40.648	-40.729	-0.081	(0)
	HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
	Hg(HS) 2	0.000e+00	0.000e+00	-141.239	-141.239	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-143.357	-143.438	-0.081	(0)
K	6.682e-05						
	K+	6.673e-05	6.384e-05	-4.176	-4.195	-0.019	(0)
	KSO4-	9.361e-08	8.963e-08	-7.029	-7.048	-0.019	(0)
	KCrO4-	6.037e-25	5.763e-25	-24.219	-24.239	-0.020	(0)
Mg	8.172e-05						
	Mg+2	7.882e-05	6.605e-05	-4.103	-4.180	-0.077	(0)
	MgSO4	2.383e-06	2.383e-06	-5.623	-5.623	0.000	(0)
	MgHCO3+	2.764e-07	2.644e-07	-6.559	-6.578	-0.019	(0)
	MgF+	2.352e-07	2.251e-07	-6.628	-6.648	-0.019	(0)
	MgCO3	2.849e-09	2.849e-09	-8.545	-8.545	0.000	(0)
	MgOH+	7.815e-10	7.487e-10	-9.107	-9.126	-0.019	(0)
	MgH2BO3+	1.747e-12	1.670e-12	-11.758	-11.777	-0.020	(0)
Mn (2)	9.871e-07						
	Mn+2	9.517e-07	7.901e-07	-6.022	-6.102	-0.081	(0)
	MnSO4	2.786e-08	2.786e-08	-7.555	-7.555	0.000	(0)
	MnHCO3+	6.443e-09	6.167e-09	-8.191	-8.210	-0.019	(0)
	MnF+	9.982e-10	9.555e-10	-9.001	-9.020	-0.019	(0)
	MnOH+	5.903e-11	5.651e-11	-10.229	-10.248	-0.019	(0)
	MnCl+	3.723e-11	3.564e-11	-10.429	-10.448	-0.019	(0)
	MnCl2	1.803e-15	1.803e-15	-14.744	-14.744	0.000	(0)
	MnNO3+	1.518e-16	1.449e-16	-15.819	-15.839	-0.020	(0)
	MnSeO4	7.804e-17	7.804e-17	-16.108	-16.108	0.000	(0)
	MnCl3-	1.859e-20	1.780e-20	-19.731	-19.750	-0.019	(0)
	Mn(OH) 3-	2.958e-22	2.831e-22	-21.529	-21.548	-0.019	(0)
	Mn(NO3) 2	4.212e-26	4.212e-26	-25.376	-25.376	0.000	(0)

Mn (OH) 4-2	3.100e-29	2.603e-29	-28.509	-28.585	-0.076	(0)
MnSe	0.000e+00	0.000e+00	-46.372	-46.372	0.000	(0)
Mn (3)	1.664e-25					
Mn+3	1.664e-25	1.118e-25	-24.779	-24.952	-0.173	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.834	-46.910	-0.076	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.761	-49.781	-0.019	(0)
Mo	3.812e-08					
MoO4-2	3.789e-08	3.175e-08	-7.422	-7.498	-0.077	(0)
HMoO4-	2.340e-10	2.234e-10	-9.631	-9.651	-0.020	(0)
H2MoO4	5.786e-13	5.786e-13	-12.238	-12.238	0.000	(0)
AlMo6O21-3	3.643e-39	2.397e-39	-38.438	-38.620	-0.182	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.382	-51.110	-0.727	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.669	-51.174	-0.505	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.520	-52.844	-0.323	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.867	-56.049	-0.182	(0)
N (-3)	4.374e-08					
NH4+	4.358e-08	4.166e-08	-7.361	-7.380	-0.020	(0)
NH4SO4-	9.247e-11	8.852e-11	-10.034	-10.053	-0.019	(0)
NH3	6.716e-11	6.716e-11	-10.173	-10.173	0.000	(0)
CuNH3+2	1.179e-12	9.788e-13	-11.928	-12.009	-0.081	(0)
CaNH3+2	2.553e-14	2.119e-14	-13.593	-13.674	-0.081	(0)
BaNH3+2	5.685e-18	4.720e-18	-17.245	-17.326	-0.081	(0)
Co (NH3) +2	9.996e-20	8.299e-20	-19.000	-19.081	-0.081	(0)
NiNH3+2	7.226e-20	5.999e-20	-19.141	-19.222	-0.081	(0)
HgNH3+2	2.349e-21	1.950e-21	-20.629	-20.710	-0.081	(0)
Hg (NH3) 2+2	1.578e-22	1.310e-22	-21.802	-21.883	-0.081	(0)
Ca (NH3) 2+2	6.826e-25	5.667e-25	-24.166	-24.247	-0.081	(0)
Ni (NH3) 2+2	7.015e-28	5.824e-28	-27.154	-27.235	-0.081	(0)
Co (NH3) 2+2	2.864e-28	2.378e-28	-27.543	-27.624	-0.081	(0)
Hg (NH3) 3+2	4.218e-32	3.502e-32	-31.375	-31.456	-0.081	(0)
Co (NH3) 3+2	2.422e-37	2.011e-37	-36.616	-36.697	-0.081	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.648	-40.729	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.069	-46.150	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.740	-52.821	-0.081	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.022	-56.102	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.639	-62.821	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.855	-63.936	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.084	-66.165	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.136	-75.156	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.643	-79.724	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.743	-80.824	-0.081	(0)
N (3)	5.604e-08					
NO2-	5.603e-08	5.357e-08	-7.252	-7.271	-0.019	(0)
CuNO2+	8.370e-12	7.989e-12	-11.077	-11.097	-0.020	(0)
Cu (NO2) 2	4.380e-18	4.380e-18	-17.359	-17.359	0.000	(0)
CoNO2+	4.065e-18	3.880e-18	-17.391	-17.411	-0.020	(0)
N (5)	1.210e-10					
NO3-	1.209e-10	1.157e-10	-9.917	-9.937	-0.019	(0)
CaNO3+	9.609e-14	9.172e-14	-13.017	-13.038	-0.020	(0)
CuNO3+	5.460e-16	5.211e-16	-15.263	-15.283	-0.020	(0)
MnNO3+	1.518e-16	1.449e-16	-15.819	-15.839	-0.020	(0)
BaNO3+	6.767e-17	6.459e-17	-16.170	-16.190	-0.020	(0)
ZnNO3+	2.794e-17	2.667e-17	-16.554	-16.574	-0.020	(0)
PbNO3+	3.263e-18	3.114e-18	-17.486	-17.507	-0.020	(0)
CdNO3+	3.590e-19	3.427e-19	-18.445	-18.465	-0.020	(0)
UO2NO3+	6.174e-21	5.894e-21	-20.209	-20.230	-0.020	(0)
CoNO3+	1.975e-21	1.885e-21	-20.705	-20.725	-0.020	(0)
NiNO3+	5.064e-22	4.834e-22	-21.295	-21.316	-0.020	(0)
VO2NO3	1.298e-24	1.298e-24	-23.887	-23.887	0.000	(0)
FeNO3+2	2.957e-25	2.455e-25	-24.529	-24.610	-0.081	(0)
Mn (NO3) 2	4.212e-26	4.212e-26	-25.376	-25.376	0.000	(0)
CrNO3+2	1.003e-26	8.325e-27	-25.999	-26.080	-0.081	(0)
Cu (NO3) 2	7.592e-27	7.592e-27	-26.120	-26.120	0.000	(0)
Zn (NO3) 2	6.158e-28	6.158e-28	-27.211	-27.211	0.000	(0)
Pb (NO3) 2	6.120e-28	6.120e-28	-27.213	-27.213	0.000	(0)
Cd (NO3) 2	1.987e-29	1.987e-29	-28.702	-28.702	0.000	(0)

		HgNO3+	2.060e-30	1.966e-30	-29.686	-29.706	-0.020	(0)
		Co (NO3) 2	4.438e-31	4.438e-31	-30.353	-30.353	0.000	(0)
		Hg (NO3) 2	0.000e+00	0.000e+00	-40.024	-40.024	0.000	(0)
Na	1.198e-04							
		Na+	1.197e-04	1.145e-04	-3.922	-3.941	-0.019	(0)
		NaSO4-	1.273e-07	1.219e-07	-6.895	-6.914	-0.019	(0)
		NaHCO3	2.519e-08	2.519e-08	-7.599	-7.599	0.000	(0)
		NaF	2.194e-09	2.194e-09	-8.659	-8.659	0.000	(0)
		NaCO3-	1.155e-10	1.106e-10	-9.938	-9.956	-0.019	(0)
		NaH2BO3	1.323e-13	1.323e-13	-12.878	-12.878	0.000	(0)
		NaCrO4-	1.448e-24	1.382e-24	-23.839	-23.859	-0.020	(0)
Ni	2.140e-12							
		Ni+2	1.985e-12	1.663e-12	-11.702	-11.779	-0.077	(0)
		NiHCO3+	8.403e-14	8.021e-14	-13.076	-13.096	-0.020	(0)
		NiSO4	6.581e-14	6.581e-14	-13.182	-13.182	0.000	(0)
		NiCO3	3.218e-15	3.218e-15	-14.492	-14.492	0.000	(0)
		NiF+	1.330e-15	1.269e-15	-14.876	-14.896	-0.020	(0)
		NiOH+	6.246e-16	5.962e-16	-15.204	-15.225	-0.020	(0)
		NiCl+	1.597e-16	1.525e-16	-15.797	-15.817	-0.020	(0)
		Ni (OH) 2	1.348e-18	1.348e-18	-17.870	-17.870	0.000	(0)
		Ni (SO4) 2-2	5.205e-19	4.321e-19	-18.284	-18.364	-0.081	(0)
		NiNH3+2	7.226e-20	5.999e-20	-19.141	-19.222	-0.081	(0)
		NiNO3+	5.064e-22	4.834e-22	-21.295	-21.316	-0.020	(0)
		NiSeO4	2.855e-22	2.855e-22	-21.544	-21.544	0.000	(0)
		Ni (OH) 3-	4.022e-23	3.839e-23	-22.396	-22.416	-0.020	(0)
		NiCl2	2.750e-23	2.750e-23	-22.561	-22.561	0.000	(0)
		Ni (NH3) 2+2	7.015e-28	5.824e-28	-27.154	-27.235	-0.081	(0)
O (0)	1.302e-34							
		O2	6.511e-35	6.514e-35	-34.186	-34.186	0.000	(0)
Pb	3.329e-09							
		Pb+2	2.171e-09	1.819e-09	-8.663	-8.740	-0.077	(0)
		PbHCO3+	5.541e-10	5.289e-10	-9.256	-9.277	-0.020	(0)
		PbCO3	2.837e-10	2.837e-10	-9.547	-9.547	0.000	(0)
		PbSO4	1.767e-10	1.767e-10	-9.753	-9.753	0.000	(0)
		PbOH+	1.363e-10	1.301e-10	-9.865	-9.886	-0.020	(0)
		PbF+	4.081e-12	3.895e-12	-11.389	-11.409	-0.020	(0)
		PbCl+	2.423e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
		Pb (SO4) 2-2	2.544e-13	2.112e-13	-12.595	-12.675	-0.081	(0)
		Pb (OH) 2	1.172e-13	1.172e-13	-12.931	-12.931	0.000	(0)
		Pb (CO3) 2-2	5.111e-14	4.243e-14	-13.291	-13.372	-0.081	(0)
		PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
		PbCl2	3.702e-16	3.702e-16	-15.432	-15.432	0.000	(0)
		Pb2OH+3	5.704e-18	3.753e-18	-17.244	-17.426	-0.182	(0)
		Pb (OH) 3-	3.495e-18	3.336e-18	-17.457	-17.477	-0.020	(0)
		PbNO3+	3.263e-18	3.114e-18	-17.486	-17.507	-0.020	(0)
		PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
		PbCl3-	5.531e-21	5.280e-21	-20.257	-20.277	-0.020	(0)
		Pb (OH) 4-2	2.802e-23	2.327e-23	-22.552	-22.633	-0.081	(0)
		PbF4-2	2.350e-24	1.951e-24	-23.629	-23.710	-0.081	(0)
		Pb3 (OH) 4+2	6.004e-25	4.985e-25	-24.222	-24.302	-0.081	(0)
		PbCl4-2	1.042e-25	8.647e-26	-24.982	-25.063	-0.081	(0)
		Pb (NO3) 2	6.120e-28	6.120e-28	-27.213	-27.213	0.000	(0)
		Pb4 (OH) 4+4	1.517e-29	7.204e-30	-28.819	-29.142	-0.323	(0)
		Pb (HS) 2	0.000e+00	0.000e+00	-153.694	-153.694	0.000	(0)
		Pb (HS) 3-	0.000e+00	0.000e+00	-232.486	-232.506	-0.020	(0)
S (-2)	0.000e+00							
		H2S	0.000e+00	0.000e+00	-79.543	-79.543	0.000	(0)
		HS-	0.000e+00	0.000e+00	-80.092	-80.112	-0.020	(0)
		CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
		S5-2	0.000e+00	0.000e+00	-82.945	-83.026	-0.081	(0)
		S6-2	0.000e+00	0.000e+00	-83.461	-83.541	-0.081	(0)
		S4-2	0.000e+00	0.000e+00	-83.540	-83.621	-0.081	(0)
		S3-2	0.000e+00	0.000e+00	-84.346	-84.427	-0.081	(0)
		S2-2	0.000e+00	0.000e+00	-85.362	-85.443	-0.081	(0)
		S-2	0.000e+00	0.000e+00	-90.885	-90.960	-0.076	(0)
		HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
		Hg (HS) 2	0.000e+00	0.000e+00	-141.239	-141.239	0.000	(0)
		HgS2-2	0.000e+00	0.000e+00	-143.357	-143.438	-0.081	(0)

Cu (S4) 2-3	0.000e+00	0.000e+00	-153.448	-153.588	-0.140	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.694	-153.694	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.181	-154.318	-0.137	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.416	-160.416	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.263	-220.283	-0.020	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.253	-231.273	-0.020	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.232	-232.252	-0.020	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.486	-232.506	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.471	-238.491	-0.020	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-310.087	-310.168	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.764	-312.845	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.672	-324.753	-0.081	(0)
S (6)	2.508e-04					
SO4-2	2.367e-04	1.983e-04	-3.626	-3.703	-0.077	(0)
CaSO4	1.139e-05	1.139e-05	-4.944	-4.944	0.000	(0)
MgSO4	2.383e-06	2.383e-06	-5.623	-5.623	0.000	(0)
NaSO4-	1.273e-07	1.219e-07	-6.895	-6.914	-0.019	(0)
KSO4-	9.361e-08	8.963e-08	-7.029	-7.048	-0.019	(0)
CuSO4	6.470e-08	6.470e-08	-7.189	-7.189	0.000	(0)
MnSO4	2.786e-08	2.786e-08	-7.555	-7.555	0.000	(0)
HSO4-	7.161e-09	6.853e-09	-8.145	-8.164	-0.019	(0)
ZnSO4	3.981e-09	3.981e-09	-8.400	-8.400	0.000	(0)
AlSO4+	1.959e-10	1.875e-10	-9.708	-9.727	-0.019	(0)
PbSO4	1.767e-10	1.767e-10	-9.753	-9.753	0.000	(0)
NH4SO4-	9.247e-11	8.852e-11	-10.034	-10.053	-0.019	(0)
CdSO4	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
FeSO4	3.509e-11	3.509e-11	-10.455	-10.455	0.000	(0)
Zn (SO4) 2-2	8.282e-12	6.875e-12	-11.082	-11.163	-0.081	(0)
UO2SO4	7.662e-12	7.662e-12	-11.116	-11.116	0.000	(0)
Al (SO4) 2-	4.162e-13	3.983e-13	-12.381	-12.400	-0.019	(0)
CoSO4	4.066e-13	4.066e-13	-12.391	-12.391	0.000	(0)
Pb (SO4) 2-2	2.544e-13	2.112e-13	-12.595	-12.675	-0.081	(0)
Cd (SO4) 2-2	1.403e-13	1.165e-13	-12.853	-12.934	-0.081	(0)
NiSO4	6.581e-14	6.581e-14	-13.182	-13.182	0.000	(0)
CrOHSO4	4.825e-14	4.825e-14	-13.317	-13.317	0.000	(0)
UO2 (SO4) 2-2	2.413e-14	2.003e-14	-13.618	-13.698	-0.081	(0)
CrSO4+	7.984e-16	7.621e-16	-15.098	-15.118	-0.020	(0)
FeSO4+	4.931e-16	4.721e-16	-15.307	-15.326	-0.019	(0)
VO2SO4-	1.100e-16	1.050e-16	-15.959	-15.979	-0.020	(0)
VOSO4	3.823e-18	3.823e-18	-17.418	-17.418	0.000	(0)
Fe (SO4) 2-	2.097e-18	2.001e-18	-17.678	-17.699	-0.020	(0)
Ni (SO4) 2-2	5.205e-19	4.321e-19	-18.284	-18.364	-0.081	(0)
HgSO4	2.389e-21	2.389e-21	-20.622	-20.622	0.000	(0)
Cr2 (OH) 2SO4+2	5.385e-24	4.471e-24	-23.269	-23.350	-0.081	(0)
Cr2 (OH) 2 (SO4) 2	5.266e-26	5.266e-26	-25.278	-25.278	0.000	(0)
CrO3SO4-2	7.152e-29	5.938e-29	-28.146	-28.226	-0.081	(0)
VSO4+	1.346e-31	1.284e-31	-30.871	-30.891	-0.020	(0)
U (SO4) 2	8.134e-38	8.134e-38	-37.090	-37.090	0.000	(0)
USO4+2	6.220e-38	5.164e-38	-37.206	-37.287	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.136	-75.156	-0.020	(0)
Sb (3)	7.946e-21					
Sb (OH) 3	4.021e-21	4.021e-21	-20.396	-20.396	0.000	(0)
HSbO2	3.925e-21	3.925e-21	-20.406	-20.406	0.000	(0)
Sb (OH) 2F	6.748e-26	6.748e-26	-25.171	-25.171	0.000	(0)
SbOF	6.636e-26	6.636e-26	-25.178	-25.178	0.000	(0)
Sb (OH) 2+	3.617e-26	3.453e-26	-25.442	-25.462	-0.020	(0)
SbO2-	1.883e-26	1.798e-26	-25.725	-25.745	-0.020	(0)
SbO+	1.247e-26	1.190e-26	-25.904	-25.924	-0.020	(0)
Sb (OH) 4-	1.079e-26	1.030e-26	-25.967	-25.987	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.672	-324.753	-0.081	(0)
Sb (5)	4.007e-10					
SbO3-	4.003e-10	3.821e-10	-9.398	-9.418	-0.020	(0)
Sb (OH) 6-	4.671e-13	4.469e-13	-12.331	-12.350	-0.019	(0)
SbO2+	1.436e-23	1.370e-23	-22.843	-22.863	-0.020	(0)

Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.316	-41.337	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.898	-43.898	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.372	-46.372	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.804	-49.885	-0.081	(0)
Se (4)	3.488e-09					
HSeO3-	3.443e-09	3.287e-09	-8.463	-8.483	-0.020	(0)
SeO3-2	4.457e-11	3.700e-11	-10.351	-10.432	-0.081	(0)
H2SeO3	4.958e-13	4.958e-13	-12.305	-12.305	0.000	(0)
FeHSeO3+2	2.220e-21	1.843e-21	-20.654	-20.735	-0.081	(0)
Cd (SeO3) 2-2	1.273e-24	1.057e-24	-23.895	-23.976	-0.081	(0)
Se (6)	4.381e-13					
SeO4-2	4.380e-13	3.670e-13	-12.359	-12.435	-0.077	(0)
MnSeO4	7.804e-17	7.804e-17	-16.108	-16.108	0.000	(0)
HSeO4-	6.814e-18	6.505e-18	-17.167	-17.187	-0.020	(0)
ZnSeO4	5.215e-18	5.215e-18	-17.283	-17.283	0.000	(0)
CdSeO4	6.399e-20	6.399e-20	-19.194	-19.194	0.000	(0)
CoSeO4	1.890e-21	1.890e-21	-20.723	-20.723	0.000	(0)
NiSeO4	2.855e-22	2.855e-22	-21.544	-21.544	0.000	(0)
Zn (SeO4) 2-2	2.338e-30	1.941e-30	-29.631	-29.712	-0.081	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.299	-55.481	-0.182	(0)
U (4)	9.531e-22					
U (OH) 5-	9.398e-22	8.971e-22	-21.027	-21.047	-0.020	(0)
U (OH) 4	1.329e-23	1.329e-23	-22.877	-22.877	0.000	(0)
U (OH) 3+	1.800e-26	1.718e-26	-25.745	-25.765	-0.020	(0)
U (OH) 2+2	3.383e-30	2.809e-30	-29.471	-29.551	-0.081	(0)
UF3+	7.649e-33	7.301e-33	-32.116	-32.137	-0.020	(0)
UF2+2	1.826e-33	1.516e-33	-32.738	-32.819	-0.081	(0)
UOH+3	7.111e-35	4.678e-35	-34.148	-34.330	-0.182	(0)
UF4	2.432e-35	2.432e-35	-34.614	-34.614	0.000	(0)
UF+3	6.026e-36	3.965e-36	-35.220	-35.402	-0.182	(0)
U (SO4) 2	8.134e-38	8.134e-38	-37.090	-37.090	0.000	(0)
USO4+2	6.220e-38	5.164e-38	-37.206	-37.287	-0.081	(0)
UF5-	3.067e-38	2.928e-38	-37.513	-37.533	-0.020	(0)
UF6-2	3.236e-40	2.686e-40	-39.490	-39.571	-0.081	(0)
U+4	1.377e-40	0.000e+00	-39.861	-40.184	-0.323	(0)
UCl+3	0.000e+00	0.000e+00	-42.748	-42.930	-0.182	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.853	-161.490	-1.637	(0)
U (5)	5.145e-15					
UO2+	5.145e-15	4.911e-15	-14.289	-14.309	-0.020	(0)
U (6)	1.213e-08					
UO2 (CO3) 2-2	6.570e-09	5.454e-09	-8.182	-8.263	-0.081	(0)
UO2CO3	5.271e-09	5.271e-09	-8.278	-8.278	0.000	(0)
UO2F+	1.121e-10	1.070e-10	-9.950	-9.970	-0.020	(0)
UO2OH+	9.586e-11	9.150e-11	-10.018	-10.039	-0.020	(0)
UO2+2	3.046e-11	2.553e-11	-10.516	-10.593	-0.077	(0)
UO2 (CO3) 3-4	2.985e-11	1.418e-11	-10.525	-10.848	-0.323	(0)
UO2F2	9.379e-12	9.379e-12	-11.028	-11.028	0.000	(0)
UO2SO4	7.662e-12	7.662e-12	-11.116	-11.116	0.000	(0)
UO2F3-	7.498e-14	7.157e-14	-13.125	-13.145	-0.020	(0)
UO2 (SO4) 2-2	2.413e-14	2.003e-14	-13.618	-13.698	-0.081	(0)
(UO2) 2 (OH) 2+2	1.674e-14	1.389e-14	-13.776	-13.857	-0.081	(0)
UO2Cl+	1.554e-15	1.483e-15	-14.809	-14.829	-0.020	(0)
(UO2) 3 (OH) 5+	8.191e-16	7.819e-16	-15.087	-15.107	-0.020	(0)
UO2F4-2	2.080e-17	1.727e-17	-16.682	-16.763	-0.081	(0)
UO2NO3+	6.174e-21	5.894e-21	-20.209	-20.230	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.593	-40.673	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.689	-40.709	-0.020	(0)
V (3)	2.555e-14					
V (OH) 3	2.555e-14	2.555e-14	-13.593	-13.593	0.000	(0)
V (OH) 2+	6.116e-24	5.838e-24	-23.214	-23.234	-0.020	(0)
VOH+2	2.359e-26	1.958e-26	-25.627	-25.708	-0.081	(0)
V+3	2.086e-30	1.372e-30	-29.681	-29.863	-0.182	(0)
VSO4+	1.346e-31	1.284e-31	-30.871	-30.891	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.293	-50.616	-0.323	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.308	-50.490	-0.182	(0)

V(4)	5.182e-16					
V(OH) 3+	4.166e-16	3.976e-16	-15.380	-15.401	-0.020	(0)
VO+2	8.431e-17	6.999e-17	-16.074	-16.155	-0.081	(0)
VOF+	1.336e-17	1.275e-17	-16.874	-16.894	-0.020	(0)
VOSO4	3.823e-18	3.823e-18	-17.418	-17.418	0.000	(0)
VOF2	1.453e-19	1.453e-19	-18.838	-18.838	0.000	(0)
VOC1+	7.370e-21	7.035e-21	-20.133	-20.153	-0.020	(0)
VOF3-	1.641e-22	1.566e-22	-21.785	-21.805	-0.020	(0)
VOF4-2	2.313e-26	1.920e-26	-25.636	-25.717	-0.081	(0)
H2V2O4+2	9.546e-27	7.925e-27	-26.020	-26.101	-0.081	(0)
V(5)	9.419e-09					
H2VO4-	9.307e-09	8.884e-09	-8.031	-8.051	-0.020	(0)
HVO4-2	7.601e-11	6.311e-11	-10.119	-10.200	-0.081	(0)
H3VO4	3.142e-11	3.142e-11	-10.503	-10.503	0.000	(0)
H3V2O7-	1.888e-12	1.802e-12	-11.724	-11.744	-0.020	(0)
VO2+	2.317e-14	2.217e-14	-13.635	-13.654	-0.019	(0)
VO2F	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
HV2O7-3	2.888e-16	1.900e-16	-15.539	-15.721	-0.182	(0)
VO2SO4-	1.100e-16	1.050e-16	-15.959	-15.979	-0.020	(0)
VO2F2-	1.365e-17	1.303e-17	-16.865	-16.885	-0.020	(0)
VO4-3	1.360e-18	8.944e-19	-17.867	-18.048	-0.182	(0)
V3O9-3	1.116e-18	7.343e-19	-17.952	-18.134	-0.182	(0)
V2O7-4	3.044e-20	1.446e-20	-19.517	-19.840	-0.323	(0)
VO2F3-2	5.947e-21	4.937e-21	-20.226	-20.307	-0.081	(0)
V4O12-4	5.726e-24	2.720e-24	-23.242	-23.565	-0.323	(0)
VO2NO3	1.298e-24	1.298e-24	-23.887	-23.887	0.000	(0)
VO2F4-3	1.122e-25	7.380e-26	-24.950	-25.132	-0.182	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.173	-55.679	-0.505	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.599	-56.922	-0.323	(0)
V10O28-6	0.000e+00	0.000e+00	-56.686	-57.414	-0.727	(0)
Zn	1.153e-07					
Zn+2	1.095e-07	9.175e-08	-6.961	-7.037	-0.077	(0)
ZnSO4	3.981e-09	3.981e-09	-8.400	-8.400	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
ZnCO3	2.738e-10	2.738e-10	-9.563	-9.563	0.000	(0)
ZnOH+	2.737e-10	2.613e-10	-9.563	-9.583	-0.020	(0)
ZnF+	5.826e-11	5.562e-11	-10.235	-10.255	-0.020	(0)
ZnCl+	8.631e-12	8.257e-12	-11.064	-11.083	-0.019	(0)
Zn(SO4) 2-2	8.282e-12	6.875e-12	-11.082	-11.163	-0.081	(0)
Zn(OH) 2	1.179e-12	1.179e-12	-11.928	-11.928	0.000	(0)
ZnOHCl	3.078e-13	3.078e-13	-12.512	-12.512	0.000	(0)
ZnCl2	4.689e-16	4.689e-16	-15.329	-15.329	0.000	(0)
Zn(OH) 3-	1.763e-16	1.682e-16	-15.754	-15.774	-0.020	(0)
ZnNO3+	2.794e-17	2.667e-17	-16.554	-16.574	-0.020	(0)
ZnSeO4	5.215e-18	5.215e-18	-17.283	-17.283	0.000	(0)
ZnCl3-	1.395e-20	1.334e-20	-19.856	-19.875	-0.019	(0)
Zn(OH) 4-2	2.297e-22	1.907e-22	-21.639	-21.720	-0.081	(0)
ZnCl4-2	2.847e-25	2.391e-25	-24.546	-24.621	-0.076	(0)
Zn(NO3) 2	6.158e-28	6.158e-28	-27.211	-27.211	0.000	(0)
Zn(SeO4) 2-2	2.338e-30	1.941e-30	-29.631	-29.712	-0.081	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.253	-231.273	-0.020	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.764	-312.845	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-72.14	-65.85	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-59.38	-54.87	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-66.60	-54.87	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-90.20	-72.27	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-75.83	-55.80	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-35.78	-35.38	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.65	-27.20	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.36	9.44	10.80	Al(OH)3

Al ₂ (MoO ₄) ₃	-44.69	-42.32	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	-0.77	18.88	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	-1.55	21.15	22.70	Al ₄ (OH) ₁₀ SO ₄
AlAsO ₄ :2H ₂ O	-9.07	-4.27	4.80	AlAsO ₄ :2H ₂ O
AlOHSO ₄	-3.94	-7.17	-3.23	AlOHSO ₄
AlSb	-154.29	-88.67	65.62	AlSb
Alunite	-1.23	-2.63	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-4.65	-12.44	-7.79	PbSO ₄
Anhydrite	-2.94	-7.30	-4.36	CaSO ₄
Anilite	-57.73	-89.61	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-4.22	4.56	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-2.59	-10.89	-8.30	CaCO ₃
Arsenolite	-80.10	-82.86	-2.76	As ₄ O ₆
Artinite	-12.34	-2.74	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-34.12	-27.42	6.71	As ₂ O ₅
Atacamite	-4.18	3.22	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-2.30	-19.21	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-18.44	5.95	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-18.38	-2.51	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.66	-9.57	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-29.50	3.44	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-17.90	-27.57	-9.67	BaCrO ₄
BaF ₂	-10.17	-15.99	-5.82	BaF ₂
BaMoO ₄	-7.49	-14.45	-6.96	BaMoO ₄
Barite	-0.68	-10.66	-9.98	BaSO ₄
BaS	-96.79	-80.61	16.18	BaS
BaSeO ₃	-10.81	-8.98	1.83	BaSeO ₃
BaSeO ₄	-11.93	-19.39	-7.46	BaSeO ₄
Bianchite	-8.98	-10.74	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-10.74	7.36	18.09	MnO ₂
Bixbyite	-10.55	-11.19	-0.64	Mn ₂ O ₃
BlaubleiI	-56.69	-80.85	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-57.62	-84.89	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.86	9.44	8.58	AlOOH
Breithauptite	-65.51	-84.03	-18.52	NiSb
Brochantite	-3.60	11.62	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-8.12	8.72	16.84	Mg(OH) ₂
Bunsenite	-11.32	1.12	12.45	NiO
Ca(VO ₃) ₂	-10.76	-5.10	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-13.30	4.20	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.35	4.20	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-21.81	0.49	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-25.46	13.50	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-26.36	13.50	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-311.29	-168.31	142.97	Ca ₃ Sb ₂
CaCrO ₄	-21.95	-24.22	-2.27	CaCrO ₄
Calcite	-2.41	-10.89	-8.48	CaCO ₃
Calomel	-11.86	-29.77	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.15	-11.10	-7.95	CaMoO ₄
Carnotite	-2.87	-2.64	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-8.45	-5.63	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-13.02	-16.04	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-18.67	-8.83	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-9.77	3.87	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-9.86	3.87	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-28.30	-21.59	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-27.54	-4.98	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-29.51	-1.11	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-17.26	-17.92	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-16.23	-17.92	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-16.01	-17.92	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.85	-18.06	-1.21	CdF ₂
Cdmetal(alpha)	-35.54	-22.03	13.51	Cd
Cdmetal(gamma)	-35.65	-22.03	13.62	Cd
CdMoO ₄	-2.38	-16.53	-14.15	CdMoO ₄
CdOHC1	-10.56	-7.02	3.54	CdOHC1
CdSb	-80.93	-81.28	-0.35	CdSb
CdSe	-23.71	-43.91	-20.20	CdSe

CdSeO4:2H2O	-19.61	-21.46	-1.85	CdSeO4:2H2O
CdSO4	-12.56	-12.73	-0.17	CdSO4
CdSO4:1H2O	-11.01	-12.73	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.86	-12.73	-1.87	CdSO4:2.67H2O
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4 (g)	-82.76	-123.81	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-58.05	-92.97	-34.92	Cu2S
Chalcopyrite	-127.04	-162.31	-35.27	CuFeS2
Cinnabar	-53.50	-99.19	-45.69	HgS
Claudetite	-79.80	-82.86	-3.06	As4O6
Clausthalite	-16.53	-43.63	-27.10	PbSe
Co (BO2) 2	-37.86	-10.79	27.07	Co (BO2) 2
Co (OH) 2	-11.18	1.91	13.09	Co (OH) 2
Co (OH) 3	-15.22	-17.53	-2.31	Co (OH) 3
CO2 (g)	-2.04	-20.19	-18.15	CO2
Co3 (AsO4) 2	-34.71	-21.67	13.03	Co3 (AsO4) 2
Co3O4	-22.66	-33.15	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.43	-20.02	-1.60	CoF2
CoF3	-48.98	-50.44	-1.46	CoF3
CoFe2O4	12.80	9.28	-3.53	CoFe2O4
CoMoO4	-10.73	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS (alpha)	-77.21	-84.65	-7.44	CoS
CoS (beta)	-73.58	-84.65	-11.07	CoS
CoSe	-29.67	-45.87	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.89	-23.42	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.21	-79.51	-22.30	CuS
Cr (OH) 2	-25.82	-15.00	10.82	Cr (OH) 2
Cr (OH) 3	-6.33	-5.00	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-4.25	-5.00	-0.75	Cr (OH) 3
Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.89	-36.80	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.39	-40.91	30.48	Cr
CrO3	-30.31	-33.52	-3.21	CrO3
Cryolite	-15.00	-48.84	-33.84	Na3AlF6
Cu (OH) 2	-1.62	7.06	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.14	18.07	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.53	-2.28	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.38	-94.26	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.40	-54.20	-45.80	Cu2Se
Cu2SO4	-21.07	-23.02	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.13	-107.73	-42.59	Cu3Sb
Cu3Se2	-31.44	-94.93	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.02	-26.46	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.40	-16.16	-8.76	Cu
CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-5.01	-6.41	-1.41	Cu2O
Cuprousferrite	9.39	0.48	-8.92	CuFeO2
CuSe	-7.63	-40.73	-33.10	CuSe
CuSe2	-29.25	-62.62	-33.37	CuSe2
CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O

CuSeO4:5H2O	-15.84	-18.28	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.17	-92.09	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.81	-22.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.26	-22.35	-17.09	CaMg(CO3)2
Epsomite	-5.76	-7.88	-2.13	MgSO4:7H2O
Fe(OH)2	-9.80	3.76	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.45	0.41	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.92	-10.64	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.13	-7.57	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.82	-37.44	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.72	-42.45	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.10	11.12	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.44	-6.24	7.20	FeCr2O4
FeMoO4	-6.55	-16.64	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe(OH)3
Ferroselite	-47.31	-65.91	-18.60	FeSe2
FeS(ppt)	-79.85	-82.80	-2.95	FeS
FeSe	-33.03	-44.03	-11.00	FeSe
Fix_pe	-6.50	-6.50	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF2
Galena	-68.43	-82.40	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al(OH)3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4:7H2O
Greenockite	-68.33	-82.69	-14.36	CdS
Greigite	-290.10	-335.13	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.69	-7.30	-4.61	CaSO4:2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.52	-20.40	-12.88	H2MoO4
H2S(g)	-78.55	-86.56	-8.01	H2S
H2Se(g)	-42.83	-47.79	-4.96	H2Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.72	46.31	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3)2(g)	-186.53	-260.24	-73.71	Hg(CH3)2
Hg(g)	-9.07	-16.94	-7.87	Hg
Hg(OH)2	-9.13	-12.63	-3.50	Hg(OH)2
Hg2(g)	-18.92	-33.88	-14.96	Hg2
Hg2(OH)2	-13.24	-7.98	5.26	Hg2(OH)2
Hg2CO3	-12.11	-28.16	-16.05	Hg2CO3
Hg2CrO4	-32.79	-41.49	-8.70	Hg2CrO4
Hg2F2	-19.55	-29.91	-10.36	Hg2F2
Hg2S	-82.86	-94.54	-11.68	Hg2S
Hg2SeO3	-18.25	-22.91	-4.66	Hg2SeO3
Hg2SO4	-18.45	-24.58	-6.13	Hg2SO4
Hg3O2CO3	-28.39	-58.07	-29.68	Hg3O2CO3
HgCl(g)	-34.38	-14.89	19.50	HgCl
HgCl2	-13.16	-34.42	-21.26	HgCl2
HgF(g)	-47.63	-14.96	32.68	HgF
HgF2(g)	-47.13	-34.57	12.57	HgF2
Hgmetal(1)	-3.49	-16.94	-13.45	Hg
HgSe	-4.72	-60.42	-55.69	HgSe
HgSeO3	-15.13	-27.56	-12.43	HgSeO3
HgSO4	-19.81	-29.23	-9.42	HgSO4
Huntite	-15.31	-45.28	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.12	-27.89	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-28.37	-37.14	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.34	-21.51	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.11	-19.91	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-45.28	-62.52	-17.24	K2Cr2O7
K2CrO4	-28.49	-29.00	-0.51	K2CrO4
K2MoO4	-19.15	-15.89	3.26	K2MoO4
K2SeO4	-20.10	-20.83	-0.73	K2SeO4

Langite	-5.87	11.62	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-7.85	-8.28	-0.43	PbO:PbSO ₄
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.20	-82.80	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe ₂ O ₃
Magnesioferrite	-0.77	16.08	16.86	Fe ₂ MgO ₄
Magnesite	-4.01	-11.47	-7.46	MgCO ₃
Magnetite	7.72	11.12	3.40	Fe ₃ O ₄
Malachite	-0.77	-6.08	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-5.59	19.75	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl ₂
Melanterite	-10.64	-12.84	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-54.10	-99.19	-45.09	HgS
Mg(OH) ₂ (active)	-10.07	8.72	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.96	-5.68	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-286.80	-212.12	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.32	3.04	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-17.47	-1.27	16.20	MgCr ₂ O ₄
MgCrO ₄	-30.17	-24.79	5.38	MgCrO ₄
MgF ₂	-5.08	-13.21	-8.13	MgF ₂
MgMoO ₄	-9.83	-11.68	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-9.27	-6.21	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-15.42	-16.62	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-35.13	38.39	73.52	Pb ₃ O ₄
Mirabilite	-10.47	-11.59	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.51	-7.61	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.30	-61.01	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-158.54	-97.46	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-19.52	-7.02	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-17.71	-14.99	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-79.93	-79.76	0.17	MnS
MnS (pnk)	-83.10	-79.76	3.34	MnS
MnSb	-100.80	-103.71	-2.91	MnSb
MnSe	-44.49	-40.99	3.50	MnSe
MnSeO ₃	-9.26	-8.13	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-9.12	-8.13	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.49	-18.54	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-12.39	-9.81	2.58	MnSO ₄
Montepontite	-11.23	3.87	15.10	CdO
Montroydite	-8.99	-12.63	-3.64	HgO
MoO ₃	-12.40	-20.40	-8.00	MoO ₃
Morenosite	-13.34	-15.48	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.17	-219.43	-70.26	MoS ₂
Na-Jarosite	-8.46	-19.66	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-52.12	-62.01	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-31.43	-28.50	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-19.19	-35.78	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.87	-15.38	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-16.60	-15.38	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-20.21	-9.91	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-21.60	-20.32	1.28	Na ₂ SeO ₄
Na ₃ Sb	-185.03	-90.58	94.45	Na ₃ Sb
Na ₃ VO ₄	-36.35	0.33	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-41.76	-4.36	37.40	Na ₄ V ₂ O ₇
Nantokite	-7.37	-14.10	-6.73	CuCl
NaSb	-92.86	-69.69	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.55	-4.69	3.86	NaVO ₃
Nesquehonite	-6.80	-11.47	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-11.67	1.12	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-39.75	-24.05	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-44.11	-12.11	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-12.19	-19.06	-6.87	NiCO ₃

NiMoO4	-8.14	-19.28	-11.14	NiMoO4
NiS(alpha)	-79.84	-85.44	-5.60	NiS
NiS(beta)	-74.34	-85.44	-11.10	NiS
NiS(gamma)	-72.64	-85.44	-12.80	NiS
NiSe	-28.96	-46.66	-17.70	NiSe
NiSeO3:2H2O	-16.63	-13.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-22.69	-24.21	-1.52	NiSeO4:6H2O
Nsutite	-10.15	7.36	17.50	MnO2
O2(g)	-31.28	51.81	83.09	O2
Orpiment	-240.05	-301.12	-61.07	As2S3
Otavite	-4.31	-16.31	-12.00	CdCO3
Pb(BO2)2	-15.06	-8.54	6.52	Pb(BO2)2
Pb(OH)2	-3.99	4.16	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-70.74	-79.50	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-11.36	-2.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.86	8.33	26.19	Pb2O(OH)2
Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.30	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.73	-14.93	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.06	-1.92	6.14	Pb3(VO4)2
Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.05	0.05	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.05	21.88	Pb4O3SO4
PbCrO4	-16.75	-29.35	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.34	-21.18	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.53	30.07	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-124.95	-143.46	-18.51	FeS2
Pyrochroite	-8.39	6.80	15.19	Mn(OH)2
Pyrolusite	-8.67	32.71	41.38	MnO2
Realgar	-100.48	-120.23	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb(OH)3	-13.29	-20.40	-7.11	Sb(OH)3
Sb2O4	-18.29	-14.89	3.40	Sb2O4
Sb2O5	-27.93	-37.60	-9.67	Sb2O5
Sb2Se3	-116.40	-184.16	-67.76	Sb2Se3
Sb4O6(cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6(orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.66	-53.09	0.57	SbCl3
SbF3	-43.08	-53.30	-10.23	SbF3
Sbmetal	-47.56	-59.25	-11.69	Sb
SbO2	-3.93	-31.75	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2(OH)2:H2O
Semetal(am)	-14.77	-21.88	-7.11	Se
Semetal(hex)	-14.18	-21.88	-7.71	Se
Senarmontite	-28.43	-40.79	-12.37	Sb2O3
SeO2	-15.06	-14.93	0.12	SeO2
SeO3	-46.38	-25.34	21.04	SeO3
Siderite	-6.19	-16.43	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3
Sphalerite	-69.25	-80.70	-11.45	ZnS
Spinel	-9.25	27.60	36.85	MgAl2O4
Stibnite	-250.02	-300.48	-50.46	Sb2S3
Sulfur	-58.51	-60.66	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na2SO4
Thermonatrite	-15.80	-15.17	0.64	Na2CO3:H2O
Tyuyamunite	-4.56	-0.48	4.08	Ca(UO2)2(VO4)2

U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-587.95	-435.57	152.38	U3Sb4
U4O9	-28.59	-31.61	-3.02	U4O9
UF4	-28.72	-58.25	-29.54	UF4
UF4:2.5H2O	-25.54	-58.25	-32.72	UF4:2.5H2O
UO2 (am)	-15.31	-14.38	0.93	UO2
UO2 (NO3) 2	-42.61	-30.47	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.32	-30.47	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.86	-30.47	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.51	-30.47	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.30	2.31	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.78	-23.03	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3
Uraninite	-9.71	-14.38	-4.67	UO2
USb2	-223.49	-193.91	29.58	USb2
V (OH) 3	-18.10	-10.51	7.59	V (OH) 3
V2O5	-13.05	-14.41	-1.36	V2O5
V3O5	-37.50	-35.66	1.84	V3O5
V4O7	-46.10	-38.91	7.19	V4O7
V6O13	-34.17	-95.03	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VC12	-64.13	-45.25	18.87	VC12
VC13	-66.63	-43.20	23.43	VC13
VF4	-62.06	-47.13	14.93	VF4
Vmetal	-93.39	-49.36	44.03	V
VO	-38.22	-23.46	14.76	VO
VO (OH) 2	-8.40	-3.25	5.15	VO (OH) 2
VO2Cl	-20.94	-18.10	2.84	VO2Cl
VOC1	-32.56	-21.41	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO4	-23.47	-19.86	3.61	VOSO4
Witherite	-5.67	-14.24	-8.57	BaCO3
Wurtzite	-71.75	-80.70	-8.95	ZnS
Zincite	-5.47	5.87	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO4
Zn (BO2) 2	-15.13	-6.84	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-30.23	-26.91	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-6.33	5.87	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-6.61	5.87	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-5.89	5.87	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-5.67	5.87	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-5.87	5.87	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-12.37	-4.87	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-14.36	0.83	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-23.47	-9.82	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-34.53	-15.61	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-21.54	6.86	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-30.97	7.53	38.50	Zn5 (OH) 8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.83	-20.04	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO (active)	-5.32	5.87	11.19	ZnO
ZnS (am)	-71.65	-80.70	-9.05	ZnS
ZnSb	-90.31	-79.29	11.01	ZnSb
ZnSe	-27.52	-41.92	-14.40	ZnSe
ZnSeO4:6H2O	-17.95	-19.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 73.

```
-----
      REACTION 402
      H2O      -1
      12490.6 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 405
      SAVE Solution 406
      End
-----
```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 405. Solution after simulation 72.

Using reaction 402.

Reaction 402.

1.249e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.216e-04	2.222e-04
As	1.019e-07	1.022e-07
B	1.002e-04	1.005e-04
Ba	3.006e-05	3.014e-05
C	1.629e-01	1.633e-01
Ca	7.045e-02	7.064e-02
Cd	2.631e-07	2.638e-07
Cl	8.442e-03	8.464e-03
Co	2.962e-09	2.970e-09
Cr	1.140e-09	1.143e-09
Cu	5.354e-04	5.368e-04
F	7.575e-03	7.595e-03
Fe	1.068e-05	1.071e-05
Hg	9.614e-09	9.640e-09
K	1.506e-02	1.510e-02
Mg	1.842e-02	1.847e-02
Mn	2.225e-04	2.231e-04
Mo	8.594e-06	8.617e-06
N	2.252e-05	2.258e-05
Na	2.701e-02	2.708e-02
Ni	4.824e-10	4.837e-10
Pb	7.505e-07	7.525e-07
S	5.653e-02	5.668e-02
Sb	9.034e-08	9.058e-08
Se	7.865e-07	7.886e-07
U	2.734e-06	2.741e-06
V	2.123e-06	2.129e-06
Zn	2.599e-05	2.606e-05

-----Description of solution-----

pH = 6.246 Charge balance
 pe = 6.785 Adjusted to redox
 equilibrium
 Activity of water = 0.995
 Ionic strength (mol/kgw) = 2.207e-01
 Mass of water (kg) = 1.003e+00
 Total alkalinity (eq/kg) = 9.303e-02
 Total CO2 (mol/kg) = 1.629e-01
 Temperature (°C) = 25.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 33
 Total H = 1.115408e+02
 Total O = 5.637060e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	7.638e-07	5.672e-07	-6.117	-6.246	-0.129	0.00
OH-	2.526e-08	1.766e-08	-7.598	-7.753	-0.156	(0)
H2O	5.551e+01	9.946e-01	1.744	-0.002	0.000	18.07
Al	2.216e-04					
AlF4-	1.544e-04	1.115e-04	-3.811	-3.953	-0.141	(0)
AlF3	6.517e-05	6.517e-05	-4.186	-4.186	0.000	(0)
AlF2+	2.049e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
AlF+2	3.719e-09	1.116e-09	-8.430	-8.952	-0.523	(0)
Al (OH) 2+	1.094e-11	8.098e-12	-10.961	-11.092	-0.131	(0)
Al (OH) 4-	8.783e-12	6.342e-12	-11.056	-11.198	-0.141	(0)
AlSO4+	3.068e-12	2.215e-12	-11.513	-11.655	-0.141	(0)
Al (OH) 3	2.853e-12	2.853e-12	-11.545	-11.545	0.000	(0)
AlOH+2	1.924e-12	5.774e-13	-11.716	-12.239	-0.523	(0)
Al+3	4.761e-13	3.270e-14	-12.322	-13.485	-1.163	(0)
Al (SO4) 2-	2.869e-13	2.072e-13	-12.542	-12.684	-0.141	(0)
AlMo6O21-3	4.790e-28	3.343e-30	-27.320	-29.476	-2.156	(0)
As (3)	1.978e-19					
H3AsO3	1.975e-19	1.975e-19	-18.704	-18.704	0.000	(0)
H2AsO3-	3.101e-22	1.786e-22	-21.509	-21.748	-0.240	(0)
H4AsO3+	9.635e-26	5.550e-26	-25.016	-25.256	-0.240	(0)
HAsO3-2	2.609e-27	2.872e-28	-26.584	-27.542	-0.958	(0)
AsO3-3	2.797e-33	1.952e-35	-32.553	-34.710	-2.156	(0)
As (5)	1.019e-07					
HAsO4-2	5.124e-08	5.640e-09	-7.290	-8.249	-0.958	(0)
H2AsO4-	5.065e-08	2.917e-08	-7.295	-7.535	-0.240	(0)
AsO4-3	4.507e-12	3.145e-14	-11.346	-13.502	-2.156	(0)
H3AsO4	2.733e-12	2.875e-12	-11.563	-11.541	0.022	(0)
B	1.002e-04					
H3BO3	9.969e-05	1.049e-04	-4.001	-3.979	0.022	(0)
BF (OH) 3-	2.127e-07	1.429e-07	-6.672	-6.845	-0.173	(0)
H2BO3-	1.599e-07	1.074e-07	-6.796	-6.969	-0.173	(0)
CaH2BO3+	9.656e-08	6.485e-08	-7.015	-7.188	-0.173	(0)
BF2 (OH) 2-	4.426e-08	2.973e-08	-7.354	-7.527	-0.173	(0)
MgH2BO3+	1.646e-08	1.106e-08	-7.784	-7.956	-0.173	(0)
NaH2BO3	3.185e-09	3.185e-09	-8.497	-8.497	0.000	(0)
BaH2BO3+	3.721e-11	2.499e-11	-10.429	-10.602	-0.173	(0)
BF3OH-	3.352e-11	2.251e-11	-10.475	-10.648	-0.173	(0)
H5 (BO3) 2-	1.428e-11	9.588e-12	-10.845	-11.018	-0.173	(0)
BF4-	3.210e-13	2.156e-13	-12.493	-12.666	-0.173	(0)
H8 (BO3) 3-	1.497e-13	1.006e-13	-12.825	-12.998	-0.173	(0)
Ba	3.006e-05					
Ba+2	2.476e-05	7.530e-06	-4.606	-5.123	-0.517	(0)
BaHCO3+	5.284e-06	3.968e-06	-5.277	-5.401	-0.124	(0)
BaCO3	1.761e-08	1.761e-08	-7.754	-7.754	0.000	(0)
BaH2BO3+	3.721e-11	2.499e-11	-10.429	-10.602	-0.173	(0)
BaNO3+	1.789e-12	1.030e-12	-11.747	-11.987	-0.240	(0)
BaOH+	7.924e-13	5.804e-13	-12.101	-12.236	-0.135	(0)
BaNH3+2	2.577e-13	2.836e-14	-12.589	-13.547	-0.958	(0)

C (4)	1.629e-01					
HCO3-	7.455e-02	5.518e-02	-1.128	-1.258	-0.131	(0)
H2CO3	7.038e-02	7.038e-02	-1.153	-1.153	0.000	(0)
CaHCO3+	1.436e-02	1.078e-02	-1.843	-1.967	-0.124	(0)
MgHCO3+	2.358e-03	1.676e-03	-2.627	-2.776	-0.148	(0)
NaHCO3	5.807e-04	5.807e-04	-3.236	-3.236	0.000	(0)
CuCO3	3.451e-04	3.451e-04	-3.462	-3.462	0.000	(0)
CuHCO3+	7.766e-05	4.473e-05	-4.110	-4.349	-0.240	(0)
CaCO3	7.585e-05	7.585e-05	-4.120	-4.120	0.000	(0)
Cu (CO3) 2-2	3.849e-05	4.236e-06	-4.415	-5.373	-0.958	(0)
MnHCO3+	2.711e-05	1.986e-05	-4.567	-4.702	-0.135	(0)
CO3-2	1.500e-05	4.561e-06	-4.824	-5.341	-0.517	(0)
MgCO3	1.126e-05	1.126e-05	-4.948	-4.948	0.000	(0)
ZnHCO3+	7.911e-06	4.557e-06	-5.102	-5.341	-0.240	(0)
BaHCO3+	5.284e-06	3.968e-06	-5.277	-5.401	-0.124	(0)
UO2 (CO3) 3-4	2.718e-06	3.989e-10	-5.566	-9.399	-3.833	(0)
NaCO3-	2.147e-06	1.589e-06	-5.668	-5.799	-0.131	(0)
ZnCO3	6.854e-07	6.854e-07	-6.164	-6.164	0.000	(0)
PbHCO3+	5.505e-07	3.171e-07	-6.259	-6.499	-0.240	(0)
FeHCO3+	1.331e-07	9.996e-08	-6.876	-7.000	-0.124	(0)
PbCO3	1.060e-07	1.060e-07	-6.975	-6.975	0.000	(0)
BaCO3	1.761e-08	1.761e-08	-7.754	-7.754	0.000	(0)
UO2 (CO3) 2-2	1.585e-08	1.745e-09	-7.800	-8.758	-0.958	(0)
Pb (CO3) 2-2	1.267e-08	1.395e-09	-7.897	-8.855	-0.958	(0)
CdHCO3+	6.378e-09	3.674e-09	-8.195	-8.435	-0.240	(0)
CdCO3	3.040e-09	3.040e-09	-8.517	-8.517	0.000	(0)
CoHCO3+	1.188e-09	6.843e-10	-8.925	-9.165	-0.240	(0)
NiHCO3+	3.314e-10	1.909e-10	-9.480	-9.719	-0.240	(0)
Cd (CO3) 2-2	9.339e-11	1.028e-11	-10.030	-10.988	-0.958	(0)
UO2CO3	1.917e-11	1.917e-11	-10.717	-10.717	0.000	(0)
CoCO3	1.229e-11	1.229e-11	-10.910	-10.910	0.000	(0)
HgCO3	1.079e-11	1.079e-11	-10.967	-10.967	0.000	(0)
NiCO3	4.775e-12	4.775e-12	-11.321	-11.321	0.000	(0)
Hg (CO3) 2-2	1.414e-12	1.556e-13	-11.850	-12.808	-0.958	(0)
HgHCO3+	1.978e-13	1.139e-13	-12.704	-12.943	-0.240	(0)
Ca	7.045e-02					
Ca+2	3.451e-02	1.049e-02	-1.462	-1.979	-0.517	(0)
CaSO4	2.098e-02	2.098e-02	-1.678	-1.678	0.000	(0)
CaHCO3+	1.436e-02	1.078e-02	-1.843	-1.967	-0.124	(0)
CaF+	5.337e-04	3.909e-04	-3.273	-3.408	-0.135	(0)
CaCO3	7.585e-05	7.585e-05	-4.120	-4.120	0.000	(0)
CaH2BO3+	9.656e-08	6.485e-08	-7.015	-7.188	-0.173	(0)
CaOH+	4.923e-09	3.697e-09	-8.308	-8.432	-0.124	(0)
CaNO3+	1.573e-09	9.058e-10	-8.803	-9.043	-0.240	(0)
CaNH3+2	7.165e-10	7.886e-11	-9.145	-10.103	-0.958	(0)
Ca (NH3) 2+2	1.703e-18	1.874e-19	-17.769	-18.727	-0.958	(0)
Cd	2.631e-07					
Cd+2	9.616e-08	2.924e-08	-7.017	-7.534	-0.517	(0)
Cd (SO4) 2-2	6.400e-08	7.044e-09	-7.194	-8.152	-0.958	(0)
CdSO4	5.983e-08	5.983e-08	-7.223	-7.223	0.000	(0)
CdCl+	3.039e-08	1.751e-08	-7.517	-7.757	-0.240	(0)
CdHCO3+	6.378e-09	3.674e-09	-8.195	-8.435	-0.240	(0)
CdCO3	3.040e-09	3.040e-09	-8.517	-8.517	0.000	(0)
CdF+	2.746e-09	1.582e-09	-8.561	-8.801	-0.240	(0)
CdCl2	4.575e-10	4.575e-10	-9.340	-9.340	0.000	(0)
Cd (CO3) 2-2	9.339e-11	1.028e-11	-10.030	-10.988	-0.958	(0)
CdOHC1	1.268e-11	1.268e-11	-10.897	-10.897	0.000	(0)
CdF2	1.077e-11	1.077e-11	-10.968	-10.968	0.000	(0)
CdOH+	7.121e-12	4.102e-12	-11.147	-11.387	-0.240	(0)
CdCl3-	3.141e-12	1.809e-12	-11.503	-11.742	-0.240	(0)
CdNO3+	4.383e-15	2.524e-15	-14.358	-14.598	-0.240	(0)
Cd (OH) 2	4.570e-16	4.570e-16	-15.340	-15.340	0.000	(0)
CdSeO4	2.375e-16	2.375e-16	-15.624	-15.624	0.000	(0)
Cd2OH+3	8.614e-17	6.011e-19	-16.065	-18.221	-2.156	(0)
Cd (SeO3) 2-2	2.058e-18	2.266e-19	-17.686	-18.645	-0.958	(0)
Cd (OH) 3-	8.558e-22	4.930e-22	-21.068	-21.307	-0.240	(0)
Cd (NO3) 2	3.454e-23	3.454e-23	-22.462	-22.462	0.000	(0)
Cd (OH) 4-2	1.294e-29	1.425e-30	-28.888	-29.846	-0.958	(0)

	CdHS+	0.000e+00	0.000e+00	-78.176	-78.416	-0.240	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.102	-150.102	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.852	-227.092	-0.240	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.827	-303.786	-0.958	(0)
C1		8.442e-03					
	Cl-	8.441e-03	6.269e-03	-2.074	-2.203	-0.129	(0)
	MnCl+	1.943e-07	1.423e-07	-6.711	-6.847	-0.135	(0)
	CuCl+	1.795e-07	1.276e-07	-6.746	-6.894	-0.148	(0)
	ZnCl+	5.784e-08	4.112e-08	-7.238	-7.386	-0.148	(0)
	CdCl+	3.039e-08	1.751e-08	-7.517	-7.757	-0.240	(0)
	CuCl2-	1.499e-08	1.066e-08	-7.824	-7.972	-0.148	(0)
	CuCl	8.138e-09	8.138e-09	-8.089	-8.089	0.000	(0)
	HgCl2	7.766e-09	7.766e-09	-8.110	-8.110	0.000	(0)
	PbCl+	2.986e-09	1.720e-09	-8.525	-8.764	-0.240	(0)
	MnCl2	1.260e-09	1.260e-09	-8.900	-8.900	0.000	(0)
	ZnOHC1	9.506e-10	9.506e-10	-9.022	-9.022	0.000	(0)
	HgCl3-	8.452e-10	4.868e-10	-9.073	-9.313	-0.240	(0)
	CdCl2	4.575e-10	4.575e-10	-9.340	-9.340	0.000	(0)
	ZnCl2	4.085e-10	4.085e-10	-9.389	-9.389	0.000	(0)
	HgClOH	3.863e-10	3.863e-10	-9.413	-9.413	0.000	(0)
	CuCl2	2.774e-10	2.774e-10	-9.557	-9.557	0.000	(0)
	HgCl4-2	1.104e-10	1.215e-11	-9.957	-10.915	-0.958	(0)
	CuCl3-2	4.964e-11	1.428e-11	-10.304	-10.845	-0.541	(0)
	PbCl2	4.817e-11	4.817e-11	-10.317	-10.317	0.000	(0)
	CdOHC1	1.268e-11	1.268e-11	-10.897	-10.897	0.000	(0)
	CoCl+	6.002e-12	3.457e-12	-11.222	-11.461	-0.240	(0)
	CdCl3-	3.141e-12	1.809e-12	-11.503	-11.742	-0.240	(0)
	MnCl3-	2.971e-12	2.176e-12	-11.527	-11.662	-0.135	(0)
	ZnCl3-	2.861e-12	2.034e-12	-11.543	-11.692	-0.148	(0)
	NiCl+	7.814e-13	4.501e-13	-12.107	-12.347	-0.240	(0)
	HgCl+	4.291e-13	2.472e-13	-12.367	-12.607	-0.240	(0)
	PbCl3-	2.087e-13	1.202e-13	-12.681	-12.920	-0.240	(0)
	FeCl+2	5.366e-14	1.544e-14	-13.270	-13.811	-0.541	(0)
	CuCl3-	2.283e-14	1.623e-14	-13.642	-13.790	-0.148	(0)
	ZnCl4-2	2.216e-14	6.376e-15	-13.654	-14.195	-0.541	(0)
	CrCl+2	7.742e-15	8.521e-16	-14.111	-15.070	-0.958	(0)
	PbCl4-2	3.129e-15	3.444e-16	-14.505	-15.463	-0.958	(0)
	VOCl+	9.267e-16	5.338e-16	-15.033	-15.273	-0.240	(0)
	FeCl2+	5.903e-16	4.323e-16	-15.229	-15.364	-0.135	(0)
	UO2Cl+	1.864e-17	1.074e-17	-16.730	-16.969	-0.240	(0)
	NiCl2	1.420e-17	1.420e-17	-16.848	-16.848	0.000	(0)
	CrOHC12	1.793e-18	1.793e-18	-17.747	-17.747	0.000	(0)
	CuCl4-2	1.772e-18	5.099e-19	-17.752	-18.293	-0.541	(0)
	CrCl2+	8.799e-19	5.068e-19	-18.056	-18.295	-0.240	(0)
	FeCl3	2.710e-19	2.710e-19	-18.567	-18.567	0.000	(0)
	CrO3Cl-	1.774e-27	1.022e-27	-26.751	-26.991	-0.240	(0)
	CoCl+2	4.488e-35	4.939e-36	-34.348	-35.306	-0.958	(0)
	UCl+3	0.000e+00	0.000e+00	-42.658	-44.815	-2.156	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.465	-50.424	-0.958	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.515	-50.473	-0.958	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.455	-65.413	-0.958	(0)
Co (2)		2.962e-09					
	Co+2	1.448e-09	1.594e-10	-8.839	-9.797	-0.958	(0)
	CoHCO3+	1.188e-09	6.843e-10	-8.925	-9.165	-0.240	(0)
	CoSO4	2.776e-10	2.776e-10	-9.557	-9.557	0.000	(0)
	CoF+	2.988e-11	1.721e-11	-10.525	-10.764	-0.240	(0)
	CoCO3	1.229e-11	1.229e-11	-10.910	-10.910	0.000	(0)
	CoCl+	6.002e-12	3.457e-12	-11.222	-11.461	-0.240	(0)
	CoOH+	9.752e-14	5.617e-14	-13.011	-13.251	-0.240	(0)
	CoNO2+	1.719e-14	9.899e-15	-13.765	-14.004	-0.240	(0)
	Co (NH3) +2	1.040e-15	1.144e-16	-14.983	-15.941	-0.958	(0)
	Co (OH) 2	7.878e-17	7.878e-17	-16.104	-16.104	0.000	(0)
	CoNO3+	1.198e-17	6.898e-18	-16.922	-17.161	-0.240	(0)
	CoSeO4	3.486e-18	3.486e-18	-17.458	-17.458	0.000	(0)
	Co (NH3) 2+2	2.647e-22	2.914e-23	-21.577	-22.536	-0.958	(0)
	Co2OH+3	6.432e-23	4.488e-25	-22.192	-24.348	-2.156	(0)
	Co (OH) 3-	4.819e-23	2.776e-23	-22.317	-22.557	-0.240	(0)
	CoOOH-	1.216e-23	7.002e-24	-22.915	-23.155	-0.240	(0)

Co (NO3) 2	3.831e-25	3.831e-25	-24.417	-24.417	0.000	(0)
Co (NH3) 3+2	1.990e-29	2.190e-30	-28.701	-29.660	-0.958	(0)
Co (OH) 4-2	7.057e-31	7.768e-32	-30.151	-31.110	-0.958	(0)
Co (NH3) 4+2	6.234e-37	6.861e-38	-36.205	-37.164	-0.958	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.869	-44.702	-3.833	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.209	-45.168	-0.958	(0)
Co (3)	3.157e-30					
CoOH+2	3.157e-30	3.475e-31	-29.501	-30.459	-0.958	(0)
Co+3	5.639e-35	3.873e-36	-34.249	-35.412	-1.163	(0)
CoCl+2	4.488e-35	4.939e-36	-34.348	-35.306	-0.958	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.515	-50.473	-0.958	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.104	-60.344	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.455	-65.413	-0.958	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.805	-66.763	-0.958	(0)
Cr (2)	3.736e-26					
Cr+2	3.736e-26	4.112e-27	-25.428	-26.386	-0.958	(0)
Cr (3)	1.140e-09					
CrF+2	5.162e-10	5.682e-11	-9.287	-10.245	-0.958	(0)
Cr (OH) +2	3.686e-10	4.058e-11	-9.433	-10.392	-0.958	(0)
Cr (OH) 2+	1.513e-10	8.717e-11	-9.820	-10.060	-0.240	(0)
CrOHSO4	8.404e-11	8.404e-11	-10.076	-10.076	0.000	(0)
Cr+3	1.505e-11	1.050e-13	-10.822	-12.979	-2.156	(0)
CrSO4+	3.716e-12	2.141e-12	-11.430	-11.669	-0.240	(0)
Cr (OH) 3	5.783e-13	5.783e-13	-12.238	-12.238	0.000	(0)
CrCl+2	7.742e-15	8.521e-16	-14.111	-15.070	-0.958	(0)
CrO2-	8.452e-16	4.868e-16	-15.073	-15.313	-0.240	(0)
Cr (OH) 4-	7.057e-16	4.065e-16	-15.151	-15.391	-0.240	(0)
Cr2 (OH) 2SO4+2	2.800e-18	3.082e-19	-17.553	-18.511	-0.958	(0)
CrOHC12	1.793e-18	1.793e-18	-17.747	-17.747	0.000	(0)
CrCl2+	8.799e-19	5.068e-19	-18.056	-18.295	-0.240	(0)
Cr2 (OH) 2 (SO4) 2	1.598e-19	1.598e-19	-18.796	-18.796	0.000	(0)
CrNO3+2	1.139e-21	1.253e-22	-20.944	-21.902	-0.958	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.521	-41.480	-0.958	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.167	-49.323	-2.156	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.465	-50.424	-0.958	(0)
Cr (6)	1.660e-19					
CrO4-2	8.143e-20	2.476e-20	-19.089	-19.606	-0.517	(0)
HCrO4-	7.890e-20	4.545e-20	-19.103	-19.343	-0.240	(0)
NaCrO4-	3.998e-21	2.303e-21	-20.398	-20.638	-0.240	(0)
KCrO4-	1.682e-21	9.691e-22	-20.774	-21.014	-0.240	(0)
CrO3SO4-2	6.259e-25	6.889e-26	-24.203	-25.162	-0.958	(0)
H2CrO4	2.089e-26	2.089e-26	-25.680	-25.680	0.000	(0)
CrO3Cl-	1.774e-27	1.022e-27	-26.751	-26.991	-0.240	(0)
Cr2O7-2	6.542e-37	7.200e-38	-36.184	-37.143	-0.958	(0)
Cu (1)	2.497e-08					
CuCl2-	1.499e-08	1.066e-08	-7.824	-7.972	-0.148	(0)
CuCl	8.138e-09	8.138e-09	-8.089	-8.089	0.000	(0)
Cu+	1.790e-09	1.031e-09	-8.747	-8.987	-0.240	(0)
CuCl3-2	4.964e-11	1.428e-11	-10.304	-10.845	-0.541	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Cu (2)	5.354e-04					
CuCO3	3.451e-04	3.451e-04	-3.462	-3.462	0.000	(0)
CuHCO3+	7.766e-05	4.473e-05	-4.110	-4.349	-0.240	(0)
Cu+2	4.225e-05	1.285e-05	-4.374	-4.891	-0.517	(0)
Cu (CO3) 2-2	3.849e-05	4.236e-06	-4.415	-5.373	-0.958	(0)
CuSO4	2.569e-05	2.569e-05	-4.590	-4.590	0.000	(0)
CuF+	4.804e-06	2.767e-06	-5.318	-5.558	-0.240	(0)
CuOH+	1.009e-06	7.174e-07	-5.996	-6.144	-0.148	(0)
CuCl+	1.795e-07	1.276e-07	-6.746	-6.894	-0.148	(0)
Cu2 (OH) 2+2	1.174e-07	1.293e-08	-6.930	-7.888	-0.958	(0)
CuNO2+	2.058e-08	1.185e-08	-7.687	-7.926	-0.240	(0)
CuNH3+2	7.131e-09	7.848e-10	-8.147	-9.105	-0.958	(0)
Cu (OH) 2	2.527e-09	2.527e-09	-8.597	-8.597	0.000	(0)
CuCl2	2.774e-10	2.774e-10	-9.557	-9.557	0.000	(0)
CuNO3+	1.926e-12	1.109e-12	-11.715	-11.955	-0.240	(0)
Cu (NO2) 2	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
Cu (OH) 3-	1.589e-13	9.154e-14	-12.799	-13.038	-0.240	(0)

	CuCl3-	2.283e-14	1.623e-14	-13.642	-13.790	-0.148	(0)
	CuCl4-2	1.772e-18	5.099e-19	-17.752	-18.293	-0.541	(0)
	Cu (OH) 4-2	1.156e-19	1.272e-20	-18.937	-19.895	-0.958	(0)
	Cu (NO3) 2	3.812e-21	3.812e-21	-20.419	-20.419	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.422	-215.662	-0.240	(0)
F	7.575e-03						
	F-	4.596e-03	3.413e-03	-2.338	-2.467	-0.129	(0)
	MgF+	1.575e-03	1.137e-03	-2.803	-2.944	-0.141	(0)
	CaF+	5.337e-04	3.909e-04	-3.273	-3.408	-0.135	(0)
	AlF4-	1.544e-04	1.115e-04	-3.811	-3.953	-0.141	(0)
	AlF3	6.517e-05	6.517e-05	-4.186	-4.186	0.000	(0)
	NaF	4.030e-05	4.030e-05	-4.395	-4.395	0.000	(0)
	CuF+	4.804e-06	2.767e-06	-5.318	-5.558	-0.240	(0)
	MnF+	3.346e-06	2.451e-06	-5.475	-5.611	-0.135	(0)
	HF	2.863e-06	2.863e-06	-5.543	-5.543	0.000	(0)
	AlF2+	2.049e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
	ZnF+	3.088e-07	1.779e-07	-6.510	-6.750	-0.240	(0)
	BF (OH) 3-	2.127e-07	1.429e-07	-6.672	-6.845	-0.173	(0)
	FeF3	1.343e-07	1.343e-07	-6.872	-6.872	0.000	(0)
	HF2-	5.317e-08	3.716e-08	-7.274	-7.430	-0.156	(0)
	BF2 (OH) 2-	4.426e-08	2.973e-08	-7.354	-7.527	-0.173	(0)
	FeF2+	3.807e-08	2.788e-08	-7.419	-7.555	-0.135	(0)
	AlF+2	3.719e-09	1.116e-09	-8.430	-8.952	-0.523	(0)
	PbF+	3.230e-09	1.860e-09	-8.491	-8.730	-0.240	(0)
	CdF+	2.746e-09	1.582e-09	-8.561	-8.801	-0.240	(0)
	FeF+2	1.061e-09	3.053e-10	-8.974	-9.515	-0.541	(0)
	CrF+2	5.162e-10	5.682e-11	-9.287	-10.245	-0.958	(0)
	PbF2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
	VO2F2-	9.222e-11	5.312e-11	-10.035	-10.275	-0.240	(0)
	VO2F	4.286e-11	4.286e-11	-10.368	-10.368	0.000	(0)
	BF3OH-	3.352e-11	2.251e-11	-10.475	-10.648	-0.173	(0)
	CoF+	2.988e-11	1.721e-11	-10.525	-10.764	-0.240	(0)
	H2F2	2.197e-11	2.197e-11	-10.658	-10.658	0.000	(0)
	VO2F3-2	2.055e-11	2.262e-12	-10.687	-11.646	-0.958	(0)
	CdF2	1.077e-11	1.077e-11	-10.968	-10.968	0.000	(0)
	UO2F3-	7.291e-12	4.199e-12	-11.137	-11.377	-0.240	(0)
	UO2F2	4.898e-12	4.898e-12	-11.310	-11.310	0.000	(0)
	NiF+	4.177e-12	2.406e-12	-11.379	-11.619	-0.240	(0)
	PbF3-	1.405e-12	8.090e-13	-11.852	-12.092	-0.240	(0)
	VOF+	1.079e-12	6.214e-13	-11.967	-12.207	-0.240	(0)
	UO2F4-2	1.034e-12	1.139e-13	-11.985	-12.944	-0.958	(0)
	UO2F+	8.638e-13	4.975e-13	-12.064	-12.303	-0.240	(0)
	VOF2	7.953e-13	7.953e-13	-12.099	-12.099	0.000	(0)
	VO2F4-3	5.443e-13	3.798e-15	-12.264	-14.420	-2.156	(0)
	BF4-	3.210e-13	2.156e-13	-12.493	-12.666	-0.173	(0)
	VOF3-	1.672e-13	9.632e-14	-12.777	-13.016	-0.240	(0)
	VOF4-2	1.206e-14	1.327e-15	-13.919	-14.877	-0.958	(0)
	PbF4-2	1.201e-14	1.322e-15	-13.921	-14.879	-0.958	(0)
	HgF+	4.341e-19	2.501e-19	-18.362	-18.602	-0.240	(0)
	Sb (OH) 2F	1.850e-21	1.850e-21	-20.733	-20.733	0.000	(0)
	SbOF	1.829e-21	1.829e-21	-20.738	-20.738	0.000	(0)
	UF3+	1.341e-30	7.724e-31	-29.873	-30.112	-0.240	(0)
	UF6-2	3.662e-31	4.031e-32	-30.436	-31.395	-0.958	(0)
	UF4	2.891e-31	2.891e-31	-30.539	-30.539	0.000	(0)
	UF5-	6.789e-32	3.910e-32	-31.168	-31.408	-0.240	(0)
	UF2+2	1.297e-32	1.428e-33	-31.887	-32.845	-0.958	(0)
	UF+3	4.761e-36	3.323e-38	-35.322	-37.479	-2.156	(0)
Fe (2)	1.749e-06						
	Fe+2	1.307e-06	1.439e-07	-5.884	-6.842	-0.958	(0)
	FeSO4	3.083e-07	3.083e-07	-6.511	-6.511	0.000	(0)
	FeHCO3+	1.331e-07	9.996e-08	-6.876	-7.000	-0.124	(0)
	FeOH+	1.381e-10	1.012e-10	-9.860	-9.995	-0.135	(0)
	Fe (OH) 2	1.419e-15	1.419e-15	-14.848	-14.848	0.000	(0)
	Fe (OH) 3-	1.082e-17	7.922e-18	-16.966	-17.101	-0.135	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-155.672	-155.672	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-232.285	-232.525	-0.240	(0)
Fe (3)	8.929e-06						
	Fe (OH) 2+	8.631e-06	6.388e-06	-5.064	-5.195	-0.131	(0)

FeF3	1.343e-07	1.343e-07	-6.872	-6.872	0.000	(0)
Fe(OH) 3	1.211e-07	1.211e-07	-6.917	-6.917	0.000	(0)
FeF2+	3.807e-08	2.788e-08	-7.419	-7.555	-0.135	(0)
FeOH+2	3.231e-09	9.299e-10	-8.491	-9.032	-0.541	(0)
FeF+2	1.061e-09	3.053e-10	-8.974	-9.515	-0.541	(0)
Fe(OH) 4-	2.691e-10	1.992e-10	-9.570	-9.701	-0.131	(0)
FeSO4+	1.091e-11	7.987e-12	-10.962	-11.098	-0.135	(0)
Fe(SO4) 2-	2.588e-12	1.490e-12	-11.587	-11.827	-0.240	(0)
Fe+3	1.188e-12	8.156e-14	-11.925	-13.089	-1.163	(0)
Fe2(OH) 2+4	1.951e-13	2.863e-17	-12.710	-16.543	-3.833	(0)
FeCl+2	5.366e-14	1.544e-14	-13.270	-13.811	-0.541	(0)
Fe3(OH) 4+5	2.581e-15	2.644e-21	-14.588	-20.578	-5.990	(0)
FeHSeO3+2	8.553e-16	9.415e-17	-15.068	-16.026	-0.958	(0)
FeCl2+	5.903e-16	4.323e-16	-15.229	-15.364	-0.135	(0)
FeCl3	2.710e-19	2.710e-19	-18.567	-18.567	0.000	(0)
FeNO3+2	2.023e-19	2.227e-20	-18.694	-19.652	-0.958	(0)
H(0)	1.163e-29					
H2	5.814e-30	6.117e-30	-29.236	-29.213	0.022	(0)
Hg(0)	4.899e-10					
Hg	4.899e-10	4.899e-10	-9.310	-9.310	0.000	(0)
Hg(1)	1.194e-17					
Hg2+2	5.972e-18	6.573e-19	-17.224	-18.182	-0.958	(0)
Hg(2)	9.124e-09					
HgCl2	7.766e-09	7.766e-09	-8.110	-8.110	0.000	(0)
HgCl3-	8.452e-10	4.868e-10	-9.073	-9.313	-0.240	(0)
HgClOH	3.863e-10	3.863e-10	-9.413	-9.413	0.000	(0)
HgCl4-2	1.104e-10	1.215e-11	-9.957	-10.915	-0.958	(0)
HgCO3	1.079e-11	1.079e-11	-10.967	-10.967	0.000	(0)
Hg(OH) 2	3.695e-12	3.888e-12	-11.432	-11.410	0.022	(0)
Hg(CO3) 2-2	1.414e-12	1.556e-13	-11.850	-12.808	-0.958	(0)
HgCl+	4.291e-13	2.472e-13	-12.367	-12.607	-0.240	(0)
HgHCO3+	1.978e-13	1.139e-13	-12.704	-12.943	-0.240	(0)
HgOH+	2.412e-15	1.389e-15	-14.618	-14.857	-0.240	(0)
Hg(NH3) 2+2	4.038e-16	4.444e-17	-15.394	-16.352	-0.958	(0)
HgNH3+2	6.763e-17	7.444e-18	-16.170	-17.128	-0.958	(0)
Hg+2	1.796e-17	1.976e-18	-16.746	-17.704	-0.958	(0)
HgSO4	4.516e-18	4.516e-18	-17.345	-17.345	0.000	(0)
HgF+	4.341e-19	2.501e-19	-18.362	-18.602	-0.240	(0)
Hg(OH) 3-	1.500e-20	8.643e-21	-19.824	-20.063	-0.240	(0)
Hg(NH3) 3+2	9.596e-24	1.056e-24	-23.018	-23.976	-0.958	(0)
HgNO3+	3.459e-26	1.992e-26	-25.461	-25.701	-0.240	(0)
Hg(NH3) 4+2	4.550e-31	5.008e-32	-30.342	-31.300	-0.958	(0)
Hg(NO3) 2	2.260e-34	2.260e-34	-33.646	-33.646	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.771	-0.958	(0)
K	1.506e-02					
K+	1.418e-02	1.053e-02	-1.848	-1.977	-0.129	(0)
KSO4-	8.794e-04	6.509e-04	-3.056	-3.187	-0.131	(0)
KCrO4-	1.682e-21	9.691e-22	-20.774	-21.014	-0.240	(0)
Mg	1.842e-02					
Mg+2	9.763e-03	2.969e-03	-2.010	-2.527	-0.517	(0)
MgSO4	4.715e-03	4.715e-03	-2.326	-2.326	0.000	(0)
MgHCO3+	2.358e-03	1.676e-03	-2.627	-2.776	-0.148	(0)
MgF+	1.575e-03	1.137e-03	-2.803	-2.944	-0.141	(0)
MgCO3	1.126e-05	1.126e-05	-4.948	-4.948	0.000	(0)
MgOH+	2.749e-08	2.087e-08	-7.561	-7.680	-0.120	(0)
MgH2BO3+	1.646e-08	1.106e-08	-7.784	-7.956	-0.173	(0)
Mn(2)	2.225e-04					
Mn+2	1.639e-04	1.804e-05	-3.786	-4.744	-0.958	(0)
MnSO4	2.799e-05	2.799e-05	-4.553	-4.553	0.000	(0)
MnHCO3+	2.711e-05	1.986e-05	-4.567	-4.702	-0.135	(0)
MnF+	3.346e-06	2.451e-06	-5.475	-5.611	-0.135	(0)
MnCl+	1.943e-07	1.423e-07	-6.711	-6.847	-0.135	(0)
MnCl2	1.260e-09	1.260e-09	-8.900	-8.900	0.000	(0)
MnOH+	1.092e-09	8.000e-10	-8.962	-9.097	-0.135	(0)
MnCl3-	2.971e-12	2.176e-12	-11.527	-11.662	-0.135	(0)
MnNO3+	1.355e-12	7.804e-13	-11.868	-12.108	-0.240	(0)

MnSeO4	2.118e-13	2.118e-13	-12.674	-12.674	0.000	(0)
Mn (NO3) 2	5.351e-20	5.351e-20	-19.272	-19.272	0.000	(0)
Mn (OH) 3-	2.105e-21	1.542e-21	-20.677	-20.812	-0.135	(0)
Mn (OH) 4-2	3.054e-28	8.788e-29	-27.515	-28.056	-0.541	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Mn (3)	7.159e-23					
Mn+3	7.159e-23	4.916e-24	-22.145	-23.308	-1.163	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.522	-46.063	-0.541	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.486	-48.650	-0.164	(0)
Mo	8.594e-06					
MoO4-2	8.543e-06	2.598e-06	-5.068	-5.585	-0.517	(0)
HMoO4-	5.090e-08	2.932e-08	-7.293	-7.533	-0.240	(0)
H2MoO4	1.218e-10	1.218e-10	-9.914	-9.914	0.000	(0)
AlMo6O21-3	4.790e-28	3.343e-30	-27.320	-29.476	-2.156	(0)
Mo7O24-6	3.602e-28	8.540e-37	-27.443	-36.069	-8.625	(0)
HMo7O24-5	1.152e-30	1.180e-36	-29.938	-35.928	-5.990	(0)
H2Mo7O24-4	2.762e-34	4.054e-38	-33.559	-37.392	-3.833	(0)
H3Mo7O24-3	5.806e-39	0.000e+00	-38.236	-40.392	-2.156	(0)
N (-3)	9.614e-06					
NH4+	8.842e-06	5.938e-06	-5.053	-5.226	-0.173	(0)
NH4SO4-	7.583e-07	5.554e-07	-6.120	-6.255	-0.135	(0)
CuNH3+2	7.131e-09	7.848e-10	-8.147	-9.105	-0.958	(0)
NH3	5.970e-09	5.970e-09	-8.224	-8.224	0.000	(0)
CaNH3+2	7.165e-10	7.886e-11	-9.145	-10.103	-0.958	(0)
BaNH3+2	2.577e-13	2.836e-14	-12.589	-13.547	-0.958	(0)
Co (NH3) +2	1.040e-15	1.144e-16	-14.983	-15.941	-0.958	(0)
NiNH3+2	8.173e-16	8.996e-17	-15.088	-16.046	-0.958	(0)
Hg (NH3) 2+2	4.038e-16	4.444e-17	-15.394	-16.352	-0.958	(0)
HgNH3+2	6.763e-17	7.444e-18	-16.170	-17.128	-0.958	(0)
Ca (NH3) 2+2	1.703e-18	1.874e-19	-17.769	-18.727	-0.958	(0)
Ni (NH3) 2+2	7.053e-22	7.763e-23	-21.152	-22.110	-0.958	(0)
Co (NH3) 2+2	2.647e-22	2.914e-23	-21.577	-22.536	-0.958	(0)
Hg (NH3) 3+2	9.596e-24	1.056e-24	-23.018	-23.976	-0.958	(0)
Co (NH3) 3+2	1.990e-29	2.190e-30	-28.701	-29.660	-0.958	(0)
Hg (NH3) 4+2	4.550e-31	5.008e-32	-30.342	-31.300	-0.958	(0)
Co (NH3) 4+2	6.234e-37	6.861e-38	-36.205	-37.164	-0.958	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.521	-41.480	-0.958	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.209	-45.168	-0.958	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.167	-49.323	-2.156	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.465	-50.424	-0.958	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.515	-50.473	-0.958	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.104	-60.344	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.455	-65.413	-0.958	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.805	-66.763	-0.958	(0)
N (3)	1.287e-05					
NO2-	1.285e-05	8.811e-06	-4.891	-5.055	-0.164	(0)
CuNO2+	2.058e-08	1.185e-08	-7.687	-7.926	-0.240	(0)
Cu (NO2) 2	1.069e-12	1.069e-12	-11.971	-11.971	0.000	(0)
CoNO2+	1.719e-14	9.899e-15	-13.765	-14.004	-0.240	(0)
N (5)	3.834e-08					
NO3-	3.676e-08	2.730e-08	-7.435	-7.564	-0.129	(0)
CaNO3+	1.573e-09	9.058e-10	-8.803	-9.043	-0.240	(0)
CuNO3+	1.926e-12	1.109e-12	-11.715	-11.955	-0.240	(0)
BaNO3+	1.789e-12	1.030e-12	-11.747	-11.987	-0.240	(0)
MnNO3+	1.355e-12	7.804e-13	-11.868	-12.108	-0.240	(0)
ZnNO3+	3.109e-13	1.791e-13	-12.507	-12.747	-0.240	(0)
PbNO3+	5.422e-15	3.123e-15	-14.266	-14.505	-0.240	(0)
CdNO3+	4.383e-15	2.524e-15	-14.358	-14.598	-0.240	(0)
CoNO3+	1.198e-17	6.898e-18	-16.922	-17.161	-0.240	(0)
NiNO3+	3.341e-18	1.924e-18	-17.476	-17.716	-0.240	(0)
FeNO3+2	2.023e-19	2.227e-20	-18.694	-19.652	-0.958	(0)
VO2NO3	9.886e-20	9.886e-20	-19.005	-19.005	0.000	(0)
Mn (NO3) 2	5.351e-20	5.351e-20	-19.272	-19.272	0.000	(0)
Cu (NO3) 2	3.812e-21	3.812e-21	-20.419	-20.419	0.000	(0)
CrNO3+2	1.139e-21	1.253e-22	-20.944	-21.902	-0.958	(0)
Zn (NO3) 2	9.754e-22	9.754e-22	-21.011	-21.011	0.000	(0)

	Pb(NO3)2	1.448e-22	1.448e-22	-21.839	-21.839	0.000	(0)
	UO2NO3+	9.986e-23	5.752e-23	-22.001	-22.240	-0.240	(0)
	Cd(NO3)2	3.454e-23	3.454e-23	-22.462	-22.462	0.000	(0)
	Co(NO3)2	3.831e-25	3.831e-25	-24.417	-24.417	0.000	(0)
	HgNO3+	3.459e-26	1.992e-26	-25.461	-25.701	-0.240	(0)
	Hg(NO3)2	2.260e-34	2.260e-34	-33.646	-33.646	0.000	(0)
Na	2.701e-02						
	Na+	2.520e-02	1.871e-02	-1.599	-1.728	-0.129	(0)
	NaSO4-	1.185e-03	8.771e-04	-2.926	-3.057	-0.131	(0)
	NaHCO3	5.807e-04	5.807e-04	-3.236	-3.236	0.000	(0)
	NaF	4.030e-05	4.030e-05	-4.395	-4.395	0.000	(0)
	NaCO3-	2.147e-06	1.589e-06	-5.668	-5.799	-0.131	(0)
	NaH2BO3	3.185e-09	3.185e-09	-8.497	-8.497	0.000	(0)
	NaCrO4-	3.998e-21	2.303e-21	-20.398	-20.638	-0.240	(0)
Ni	4.824e-10						
	NiHCO3+	3.314e-10	1.909e-10	-9.480	-9.719	-0.240	(0)
	Ni+2	9.227e-11	2.806e-11	-10.035	-10.552	-0.517	(0)
	NiSO4	4.887e-11	4.887e-11	-10.311	-10.311	0.000	(0)
	NiCO3	4.775e-12	4.775e-12	-11.321	-11.321	0.000	(0)
	NiF+	4.177e-12	2.406e-12	-11.379	-11.619	-0.240	(0)
	NiCl+	7.814e-13	4.501e-13	-12.107	-12.347	-0.240	(0)
	Ni(SO4)2-2	1.283e-13	1.412e-14	-12.892	-13.850	-0.958	(0)
	NiOH+	1.083e-14	6.238e-15	-13.965	-14.205	-0.240	(0)
	NiNH3+2	8.173e-16	8.996e-17	-15.088	-16.046	-0.958	(0)
	NiCl2	1.420e-17	1.420e-17	-16.848	-16.848	0.000	(0)
	Ni(OH)2	8.749e-18	8.749e-18	-17.058	-17.058	0.000	(0)
	NiNO3+	3.341e-18	1.924e-18	-17.476	-17.716	-0.240	(0)
	NiSeO4	5.726e-19	5.726e-19	-18.242	-18.242	0.000	(0)
	Ni(NH3)2+2	7.053e-22	7.763e-23	-21.152	-22.110	-0.958	(0)
	Ni(OH)3-	2.682e-22	1.545e-22	-21.572	-21.811	-0.240	(0)
O(0)	2.548e-34						
	O2	1.274e-34	1.340e-34	-33.895	-33.873	0.022	(0)
Pb	7.505e-07						
	PbHCO3+	5.505e-07	3.171e-07	-6.259	-6.499	-0.240	(0)
	PbCO3	1.060e-07	1.060e-07	-6.975	-6.975	0.000	(0)
	PbSO4	3.306e-08	3.306e-08	-7.481	-7.481	0.000	(0)
	Pb+2	2.543e-08	7.734e-09	-7.595	-8.112	-0.517	(0)
	Pb(SO4)2-2	1.580e-08	1.739e-09	-7.801	-8.760	-0.958	(0)
	Pb(CO3)2-2	1.267e-08	1.395e-09	-7.897	-8.855	-0.958	(0)
	PbF+	3.230e-09	1.860e-09	-8.491	-8.730	-0.240	(0)
	PbCl+	2.986e-09	1.720e-09	-8.525	-8.764	-0.240	(0)
	PbOH+	5.956e-10	3.430e-10	-9.225	-9.465	-0.240	(0)
	PbF2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
	PbCl2	4.817e-11	4.817e-11	-10.317	-10.317	0.000	(0)
	PbF3-	1.405e-12	8.090e-13	-11.852	-12.092	-0.240	(0)
	PbCl3-	2.087e-13	1.202e-13	-12.681	-12.920	-0.240	(0)
	Pb(OH)2	1.915e-13	1.915e-13	-12.718	-12.718	0.000	(0)
	PbF4-2	1.201e-14	1.322e-15	-13.921	-14.879	-0.958	(0)
	Pb2OH+3	6.026e-15	4.205e-17	-14.220	-16.376	-2.156	(0)
	PbNO3+	5.422e-15	3.123e-15	-14.266	-14.505	-0.240	(0)
	PbCl4-2	3.129e-15	3.444e-16	-14.505	-15.463	-0.958	(0)
	Pb(OH)3-	5.872e-18	3.382e-18	-17.231	-17.471	-0.240	(0)
	Pb(NO3)2	1.448e-22	1.448e-22	-21.839	-21.839	0.000	(0)
	Pb(OH)4-2	1.329e-22	1.463e-23	-21.877	-22.835	-0.958	(0)
	Pb3(OH)4+2	5.144e-23	5.662e-24	-22.289	-23.247	-0.958	(0)
	Pb4(OH)4+4	2.370e-24	3.478e-28	-23.625	-27.459	-3.833	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-150.621	-150.621	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-227.972	-228.211	-0.240	(0)
S(-2)	0.000e+00						
	H2S	0.000e+00	0.000e+00	-78.116	-78.116	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.176	-78.416	-0.240	(0)
	HS-	0.000e+00	0.000e+00	-78.650	-78.890	-0.240	(0)
	S5-2	0.000e+00	0.000e+00	-81.050	-82.009	-0.958	(0)
	S6-2	0.000e+00	0.000e+00	-81.566	-82.525	-0.958	(0)
	S4-2	0.000e+00	0.000e+00	-81.646	-82.604	-0.958	(0)
	S3-2	0.000e+00	0.000e+00	-82.452	-83.410	-0.958	(0)
	S2-2	0.000e+00	0.000e+00	-83.468	-84.426	-0.958	(0)
	S-2	0.000e+00	0.000e+00	-89.403	-89.944	-0.541	(0)

HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.771	-0.958	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.067	-150.307	-0.240	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.102	-150.102	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.543	-150.543	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.621	-150.621	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.672	-155.672	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.422	-215.662	-0.240	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.913	-226.153	-0.240	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.852	-227.092	-0.240	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.972	-228.211	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.928	-229.887	-0.958	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.285	-232.525	-0.240	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.827	-303.786	-0.958	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.544	-306.503	-0.958	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.123	-315.081	-0.958	(0)
S (6)	5.653e-02					
SO4-2	2.870e-02	8.728e-03	-1.542	-2.059	-0.517	(0)
CaSO4	2.098e-02	2.098e-02	-1.678	-1.678	0.000	(0)
MgSO4	4.715e-03	4.715e-03	-2.326	-2.326	0.000	(0)
NaSO4-	1.185e-03	8.771e-04	-2.926	-3.057	-0.131	(0)
KSO4-	8.794e-04	6.509e-04	-3.056	-3.187	-0.131	(0)
MnSO4	2.799e-05	2.799e-05	-4.553	-4.553	0.000	(0)
CuSO4	2.569e-05	2.569e-05	-4.590	-4.590	0.000	(0)
ZnSO4	4.986e-06	4.986e-06	-5.302	-5.302	0.000	(0)
Zn (SO4) 2-2	3.444e-06	3.791e-07	-5.463	-6.421	-0.958	(0)
NH4SO4-	7.583e-07	5.554e-07	-6.120	-6.255	-0.135	(0)
HSO4-	6.699e-07	4.837e-07	-6.174	-6.315	-0.141	(0)
FeSO4	3.083e-07	3.083e-07	-6.511	-6.511	0.000	(0)
Cd (SO4) 2-2	6.400e-08	7.044e-09	-7.194	-8.152	-0.958	(0)
CdSO4	5.983e-08	5.983e-08	-7.223	-7.223	0.000	(0)
PbSO4	3.306e-08	3.306e-08	-7.481	-7.481	0.000	(0)
Pb (SO4) 2-2	1.580e-08	1.739e-09	-7.801	-8.760	-0.958	(0)
CoSO4	2.776e-10	2.776e-10	-9.557	-9.557	0.000	(0)
CrOHSO4	8.404e-11	8.404e-11	-10.076	-10.076	0.000	(0)
NiSO4	4.887e-11	4.887e-11	-10.311	-10.311	0.000	(0)
FeSO4+	1.091e-11	7.987e-12	-10.962	-11.098	-0.135	(0)
CrSO4+	3.716e-12	2.141e-12	-11.430	-11.669	-0.240	(0)
AlSO4+	3.068e-12	2.215e-12	-11.513	-11.655	-0.141	(0)
VO2SO4-	2.590e-12	1.492e-12	-11.587	-11.826	-0.240	(0)
Fe (SO4) 2-	2.588e-12	1.490e-12	-11.587	-11.827	-0.240	(0)
Al (SO4) 2-	2.869e-13	2.072e-13	-12.542	-12.684	-0.141	(0)
Ni (SO4) 2-2	1.283e-13	1.412e-14	-12.892	-13.850	-0.958	(0)
VOSO4	7.296e-14	7.296e-14	-13.137	-13.137	0.000	(0)
UO2 (SO4) 2-2	1.458e-14	1.605e-15	-13.836	-14.795	-0.958	(0)
UO2SO4	1.395e-14	1.395e-14	-13.855	-13.855	0.000	(0)
HgSO4	4.516e-18	4.516e-18	-17.345	-17.345	0.000	(0)
Cr2 (OH) 2SO4+2	2.800e-18	3.082e-19	-17.553	-18.511	-0.958	(0)
Cr2 (OH) 2 (SO4) 2	1.598e-19	1.598e-19	-18.796	-18.796	0.000	(0)
CrO3SO4-2	6.259e-25	6.889e-26	-24.203	-25.162	-0.958	(0)
VSO4+	5.715e-27	3.292e-27	-26.243	-26.483	-0.240	(0)
U (SO4) 2	1.175e-38	1.175e-38	-37.930	-37.930	0.000	(0)
USO4+2	1.540e-39	1.695e-40	-38.812	-39.771	-0.958	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.104	-60.344	-0.240	(0)
Sb (3)	1.209e-18					
Sb (OH) 3	6.085e-19	6.085e-19	-18.216	-18.216	0.000	(0)
HSbO2	5.972e-19	5.972e-19	-18.224	-18.224	0.000	(0)
Sb (OH) 2F	1.850e-21	1.850e-21	-20.733	-20.733	0.000	(0)
SbOF	1.829e-21	1.829e-21	-20.738	-20.738	0.000	(0)
Sb (OH) 2+	1.463e-23	8.426e-24	-22.835	-23.074	-0.240	(0)
SbO+	5.070e-24	2.921e-24	-23.295	-23.535	-0.240	(0)
SbO2-	2.961e-24	1.705e-24	-23.529	-23.768	-0.240	(0)
Sb (OH) 4-	1.678e-24	9.666e-25	-23.775	-24.015	-0.240	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.123	-315.081	-0.958	(0)
Sb (5)	9.034e-08					

SbO3-	9.026e-08	5.199e-08	-7.044	-7.284	-0.240	(0)
Sb(OH) 6-	8.057e-11	5.983e-11	-10.094	-10.223	-0.129	(0)
SbO2+	8.373e-21	4.823e-21	-20.077	-20.317	-0.240	(0)
Se (-2)	3.602e-40					
HSe-	3.602e-40	2.074e-40	-39.444	-39.683	-0.240	(0)
H2Se	0.000e+00	0.000e+00	-42.039	-42.039	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.478	-48.437	-0.958	(0)
Se (4)	7.863e-07					
HSeO3-	7.584e-07	4.368e-07	-6.120	-6.360	-0.240	(0)
SeO3-2	2.786e-08	3.066e-09	-7.555	-8.513	-0.958	(0)
H2SeO3	1.057e-10	1.057e-10	-9.976	-9.976	0.000	(0)
FeHSeO3+2	8.553e-16	9.415e-17	-15.068	-16.026	-0.958	(0)
Cd(SeO3) 2-2	2.058e-18	2.266e-19	-17.686	-18.645	-0.958	(0)
Se (6)	1.437e-10					
SeO4-2	1.435e-10	4.362e-11	-9.843	-10.360	-0.517	(0)
MnSeO4	2.118e-13	2.118e-13	-12.674	-12.674	0.000	(0)
ZnSeO4	1.764e-14	1.764e-14	-13.753	-13.753	0.000	(0)
HSeO4-	2.153e-15	1.240e-15	-14.667	-14.907	-0.240	(0)
CdSeO4	2.375e-16	2.375e-16	-15.624	-15.624	0.000	(0)
CoSeO4	3.486e-18	3.486e-18	-17.458	-17.458	0.000	(0)
NiSeO4	5.726e-19	5.726e-19	-18.242	-18.242	0.000	(0)
Zn(SeO4) 2-2	7.091e-24	7.805e-25	-23.149	-24.108	-0.958	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.737	-59.893	-2.156	(0)
U (4)	1.080e-26					
U(OH) 5-	1.065e-26	6.137e-27	-25.972	-26.212	-0.240	(0)
U(OH) 4	1.466e-28	1.466e-28	-27.834	-27.834	0.000	(0)
UF3+	1.341e-30	7.724e-31	-29.873	-30.112	-0.240	(0)
U(OH) 3+	5.305e-31	3.056e-31	-30.275	-30.515	-0.240	(0)
UF6-2	3.662e-31	4.031e-32	-30.436	-31.395	-0.958	(0)
UF4	2.891e-31	2.891e-31	-30.539	-30.539	0.000	(0)
UF5-	6.789e-32	3.910e-32	-31.168	-31.408	-0.240	(0)
UF2+2	1.297e-32	1.428e-33	-31.887	-32.845	-0.958	(0)
U(OH) 2+2	7.320e-34	8.057e-35	-33.136	-34.094	-0.958	(0)
UF+3	4.761e-36	3.323e-38	-35.322	-37.479	-2.156	(0)
UOH+3	3.101e-37	2.164e-39	-36.509	-38.665	-2.156	(0)
U(SO4) 2	1.175e-38	1.175e-38	-37.930	-37.930	0.000	(0)
USO4+2	1.540e-39	1.695e-40	-38.812	-39.771	-0.958	(0)
U+4	0.000e+00	0.000e+00	-40.478	-44.312	-3.833	(0)
UCl+3	0.000e+00	0.000e+00	-42.658	-44.815	-2.156	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-169.960	-189.366	-19.406	(0)
U (5)	1.831e-19					
UO2+	1.831e-19	1.055e-19	-18.737	-18.977	-0.240	(0)
U (6)	2.734e-06					
UO2(CO3) 3-4	2.718e-06	3.989e-10	-5.566	-9.399	-3.833	(0)
UO2(CO3) 2-2	1.585e-08	1.745e-09	-7.800	-8.758	-0.958	(0)
UO2CO3	1.917e-11	1.917e-11	-10.717	-10.717	0.000	(0)
UO2F3-	7.291e-12	4.199e-12	-11.137	-11.377	-0.240	(0)
UO2F2	4.898e-12	4.898e-12	-11.310	-11.310	0.000	(0)
UO2F4-2	1.034e-12	1.139e-13	-11.985	-12.944	-0.958	(0)
UO2F+	8.638e-13	4.975e-13	-12.064	-12.303	-0.240	(0)
UO2(SO4) 2-2	1.458e-14	1.605e-15	-13.836	-14.795	-0.958	(0)
UO2SO4	1.395e-14	1.395e-14	-13.855	-13.855	0.000	(0)
UO2OH+	4.075e-15	2.347e-15	-14.390	-14.629	-0.240	(0)
UO2+2	3.472e-15	1.056e-15	-14.459	-14.976	-0.517	(0)
UO2Cl+	1.864e-17	1.074e-17	-16.730	-16.969	-0.240	(0)
UO2NO3+	9.986e-23	5.752e-23	-22.001	-22.240	-0.240	(0)
(UO2) 2(OH) 2+2	8.308e-23	9.145e-24	-22.080	-23.039	-0.958	(0)
(UO2) 3(OH) 5+	8.815e-30	5.077e-30	-29.055	-29.294	-0.240	(0)
V (2)	6.462e-38					
V+2	5.826e-38	6.413e-39	-37.235	-38.193	-0.958	(0)
VOH+	6.362e-39	3.664e-39	-38.196	-38.436	-0.240	(0)
V (3)	3.548e-12					
V(OH) 3	3.548e-12	3.548e-12	-11.450	-11.450	0.000	(0)
V(OH) 2+	2.270e-21	1.307e-21	-20.644	-20.884	-0.240	(0)
VOH+2	6.424e-23	7.070e-24	-22.192	-23.151	-0.958	(0)
V+3	1.145e-25	7.989e-28	-24.941	-27.097	-2.156	(0)

VSO4+	5.715e-27	3.292e-27	-26.243	-26.483	-0.240	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-41.668	-45.501	-3.833	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-43.426	-45.582	-2.156	(0)
V (4)	2.588e-12					
VOF+	1.079e-12	6.214e-13	-11.967	-12.207	-0.240	(0)
VOF2	7.953e-13	7.953e-13	-12.099	-12.099	0.000	(0)
VO+2	2.758e-13	3.035e-14	-12.559	-13.518	-0.958	(0)
V (OH) 3+	1.846e-13	1.064e-13	-12.734	-12.973	-0.240	(0)
VOF3-	1.672e-13	9.632e-14	-12.777	-13.016	-0.240	(0)
VOSO4	7.296e-14	7.296e-14	-13.137	-13.137	0.000	(0)
VOF4-2	1.206e-14	1.327e-15	-13.919	-14.877	-0.958	(0)
VOC1+	9.267e-16	5.338e-16	-15.033	-15.273	-0.240	(0)
H2V2O4+2	5.207e-21	5.731e-22	-20.283	-21.242	-0.958	(0)
V (5)	2.123e-06					
H2VO4-	1.916e-06	1.103e-06	-5.718	-5.957	-0.240	(0)
H3VO2O7-	7.782e-08	4.483e-08	-7.109	-7.348	-0.240	(0)
HVO4-2	4.440e-08	4.887e-09	-7.353	-8.311	-0.958	(0)
H3VO4	6.258e-09	6.258e-09	-8.204	-8.204	0.000	(0)
HV2O7-3	2.633e-10	1.837e-12	-9.580	-11.736	-2.156	(0)
V3O9-3	2.049e-10	1.430e-12	-9.688	-11.845	-2.156	(0)
VO2F2-	9.222e-11	5.312e-11	-10.035	-10.275	-0.240	(0)
VO2F	4.286e-11	4.286e-11	-10.368	-10.368	0.000	(0)
VO2F3-2	2.055e-11	2.262e-12	-10.687	-11.646	-0.958	(0)
VO2+	9.641e-12	7.159e-12	-11.016	-11.145	-0.129	(0)
V4O12-4	4.505e-12	6.613e-16	-11.346	-15.180	-3.833	(0)
VO2SO4-	2.590e-12	1.492e-12	-11.587	-11.826	-0.240	(0)
V2O7-4	5.940e-13	8.718e-17	-12.226	-16.060	-3.833	(0)
VO2F4-3	5.443e-13	3.798e-15	-12.264	-14.420	-2.156	(0)
VO4-3	6.188e-15	4.318e-17	-14.208	-16.365	-2.156	(0)
VO2NO3	9.886e-20	9.886e-20	-19.005	-19.005	0.000	(0)
V10O28-6	1.003e-27	2.378e-36	-26.999	-35.624	-8.625	(0)
HV10O28-5	2.024e-28	2.073e-34	-27.694	-33.683	-5.990	(0)
H2V10O28-4	1.292e-31	1.896e-35	-30.889	-34.722	-3.833	(0)
Zn	2.599e-05					
Zn+2	8.588e-06	2.611e-06	-5.066	-5.583	-0.517	(0)
ZnHCO3+	7.911e-06	4.557e-06	-5.102	-5.341	-0.240	(0)
ZnSO4	4.986e-06	4.986e-06	-5.302	-5.302	0.000	(0)
Zn (SO4) 2-2	3.444e-06	3.791e-07	-5.463	-6.421	-0.958	(0)
ZnCO3	6.854e-07	6.854e-07	-6.164	-6.164	0.000	(0)
ZnF+	3.088e-07	1.779e-07	-6.510	-6.750	-0.240	(0)
ZnCl+	5.784e-08	4.112e-08	-7.238	-7.386	-0.148	(0)
ZnOH+	8.006e-09	4.611e-09	-8.097	-8.336	-0.240	(0)
ZnOHCl	9.506e-10	9.506e-10	-9.022	-9.022	0.000	(0)
ZnCl2	4.085e-10	4.085e-10	-9.389	-9.389	0.000	(0)
Zn (OH) 2	1.290e-11	1.290e-11	-10.889	-10.889	0.000	(0)
ZnCl3-	2.861e-12	2.034e-12	-11.543	-11.692	-0.148	(0)
ZnNO3+	3.109e-13	1.791e-13	-12.507	-12.747	-0.240	(0)
ZnCl4-2	2.216e-14	6.376e-15	-13.654	-14.195	-0.541	(0)
ZnSeO4	1.764e-14	1.764e-14	-13.753	-13.753	0.000	(0)
Zn (OH) 3-	1.983e-15	1.142e-15	-14.703	-14.942	-0.240	(0)
Zn (OH) 4-2	7.294e-21	8.028e-22	-20.137	-21.095	-0.958	(0)
Zn (NO3) 2	9.754e-22	9.754e-22	-21.011	-21.011	0.000	(0)
Zn (SeO4) 2-2	7.091e-24	7.805e-25	-23.149	-24.108	-0.958	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.067	-150.307	-0.240	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.543	-150.543	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.913	-226.153	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.928	-229.887	-0.958	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.544	-306.503	-0.958	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-53.93	-47.64	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.43	-36.92	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.66	-36.92	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-69.92	-51.98	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-55.93	-35.90	20.03	(Co (NH3) 6) Cl3

(NH4)2CrO4	-30.46	-30.06	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.26	-20.81	0.45	(NH4)2SeO4
Al(OH)3(am)	-5.55	5.25	10.80	Al(OH)3
Al2(MoO4)3	-46.09	-43.73	2.37	Al2(MoO4)3
Al2O3	-9.15	10.50	19.65	Al2O3
Al4(OH)10SO4	-16.26	6.44	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-11.09	-6.29	4.80	AlAsO4·2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-156.77	-91.15	65.62	AlSb
Alunite	-7.69	-9.09	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.38	-10.17	-7.79	PbSO4
Anhydrite	0.32	-4.04	-4.36	CaSO4
Anilite	-55.47	-87.35	-31.88	Cu0.25Cu1.5S
Antlerite	-0.54	8.24	8.79	Cu3(OH)4SO4
Aragonite	0.98	-7.32	-8.30	CaCO3
Arsenolite	-72.04	-74.80	-2.76	As4O6
Artinite	-7.51	2.09	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-29.78	-23.08	6.71	As2O5
Atacamite	-0.64	6.75	7.39	Cu2(OH)3Cl
Azurite	4.04	-12.87	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-17.05	7.35	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-10.94	4.93	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	7.94	-0.97	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-20.65	12.29	32.94	Ba3(VO4)2·4H2O
BaCrO4	-15.06	-24.73	-9.67	BaCrO4
BaF2	-4.24	-10.06	-5.82	BaF2
BaMoO4	-3.75	-10.71	-6.96	BaMoO4
Barite	2.80	-7.18	-9.98	BaSO4
BaS	-93.95	-77.77	16.18	BaS
BaSeO3	-7.07	-5.24	1.83	BaSeO3
BaSeO4	-8.02	-15.48	-7.46	BaSeO4
Bianchite	-5.89	-7.66	-1.76	ZnSO4·6H2O
Birnessite	-9.63	8.46	18.09	MnO2
Bixbyite	-8.50	-9.15	-0.64	Mn2O3
BlaubleiI	-54.68	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.49	-82.77	-27.28	Cu0.6Cu0.8S
Boehmite	-3.33	5.25	8.58	AlOOH
Breithauptite	-62.90	-81.43	-18.52	NiSb
Brochantite	0.62	15.84	15.22	Cu4(OH)6SO4
Brucite	-6.88	9.96	16.84	Mg(OH)2
Bunsenite	-10.51	1.94	12.45	NiO
Ca(VO3)2	-4.95	0.71	5.66	Ca(VO3)2
Ca2V2O7	-6.28	11.22	17.50	Ca2V2O7
Ca2V2O7·2H2O	-10.33	11.22	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-13.85	8.45	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-17.23	21.73	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-18.14	21.72	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-304.23	-161.26	142.97	Ca3Sb2
CaCrO4	-19.32	-21.59	-2.27	CaCrO4
Calcite	1.16	-7.32	-8.48	CaCO3
Calomel	-4.68	-22.59	-17.91	Hg2Cl2
CaMoO4	0.39	-7.56	-7.95	CaMoO4
Carnotite	-3.35	-3.12	0.23	KUO2VO4
CaSeO3·2H2O	-4.91	-2.10	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.32	-12.34	-3.02	CaSeO4·2H2O
Cd(BO2)2	-12.84	-3.00	9.84	Cd(BO2)2
Cd(OH)2	-8.69	4.95	13.64	Cd(OH)2
Cd(OH)2(am)	-8.78	4.95	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.94	-14.23	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.25	0.31	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.13	5.27	28.40	Cd4(OH)6SO4
CdCl2	-11.28	-11.94	-0.66	CdCl2
CdCl2·1H2O	-10.25	-11.94	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-10.03	-11.95	-1.91	CdCl2·2.5H2O
CdF2	-11.26	-12.47	-1.21	CdF2
Cdmetal(alpha)	-34.62	-21.10	13.51	Cd
Cdmetal(gamma)	-34.72	-21.10	13.62	Cd
CdMoO4	1.03	-13.12	-14.15	CdMoO4

CdOHC1	-7.03	-3.49	3.54	CdOHC1
CdSb	-78.06	-78.41	-0.35	CdSb
CdSe	-20.77	-40.97	-20.20	CdSe
CdSeO4:2H2O	-16.05	-17.90	-1.85	CdSeO4:2H2O
CdSO4	-9.42	-9.59	-0.17	CdSO4
CdSO4:1H2O	-7.87	-9.60	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.73	-9.60	-1.87	CdSO4:2.67H2O
Cerrusite	-0.32	-13.45	-13.13	PbCO3
CH4 (g)	-81.04	-122.08	-41.05	CH4
Chalcanthite	-4.32	-6.96	-2.64	CuSO4:5H2O
Chalcocite	-55.70	-90.62	-34.92	Cu2S
Chalcopyrite	-121.75	-157.02	-35.27	CuFeS2
Cinnabar	-50.85	-96.54	-45.69	HgS
Claudetite	-71.74	-74.80	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co (BO2) 2	-32.33	-5.26	27.07	Co (BO2) 2
Co (OH) 2	-10.40	2.69	13.09	Co (OH) 2
Co (OH) 3	-14.37	-16.68	-2.31	Co (OH) 3
CO2 (g)	0.32	-17.83	-18.15	CO2
Co3 (AsO4) 2	-28.03	-15.00	13.03	Co3 (AsO4) 2
Co3O4	-20.16	-30.66	-10.50	Co3O4
CoCl2	-22.47	-14.20	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.22	2.54	CoCl2:6H2O
CoCO3	-5.16	-15.14	-9.98	CoCO3
CoF2	-13.13	-14.73	-1.60	CoF2
CoF3	-41.35	-42.81	-1.46	CoF3
CoFe2O4	17.51	13.99	-3.53	CoFe2O4
CoMoO4	-7.62	-15.38	-7.76	CoMoO4
CoO	-10.89	2.69	13.59	CoO
CoS (alpha)	-75.00	-82.44	-7.44	CoS
CoS (beta)	-71.37	-82.44	-11.07	CoS
CoSe	-27.03	-43.23	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-18.64	-20.17	-1.53	CoSeO4:6H2O
CoSO4	-14.66	-11.86	2.80	CoSO4
CoSO4:6H2O	-9.40	-11.87	-2.47	CoSO4:6H2O
Cotunnite	-7.74	-12.52	-4.78	PbCl2
Covellite	-55.23	-77.53	-22.30	CuS
Cr (OH) 2	-24.72	-13.90	10.82	Cr (OH) 2
Cr (OH) 3	-5.15	-3.82	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-3.07	-3.82	-0.75	Cr (OH) 3
Cr2O3	-5.27	-7.62	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-44.27	-29.16	15.11	CrCl3
CrF3	-18.61	-29.95	-11.34	CrF3
Crmetal	-70.44	-39.96	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	0.37	-33.47	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.60	8.67	Cu (OH) 2
Cu (SbO3) 2	-21.91	23.30	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.87	1.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.66	-91.55	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.38	-0.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.03	-104.62	-42.59	Cu3Sb
Cu3Se2	-26.25	-89.74	-63.49	Cu3Se2
CuCO3	1.27	-10.23	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-6.55	-11.45	-4.91	CuF
CuF2	-10.94	-9.82	1.12	CuF2
CuF2:2H2O	-5.28	-9.83	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.60	-10.48	-13.08	CuMoO4
CuOCuSO4	-9.65	0.65	10.30	CuOCuSO4
Cupricferrite	12.90	18.89	5.99	CuFe2O4
Cuprite	-4.08	-5.48	-1.41	Cu2O
Cuprousferrite	11.82	2.91	-8.92	CuFeO2

CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-24.83	-58.19	-33.37	CuSe2
CuSeO3:2H2O	-5.52	-5.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.82	-15.26	-2.44	CuSeO4:5H2O
CuSO4	-9.89	-6.95	2.94	CuSO4
Diaspore	-1.62	5.25	6.87	AlOOH
Djurleite	-55.83	-89.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	1.35	-15.19	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.90	-15.19	-17.09	CaMg(CO3)2
Epsomite	-2.48	-4.60	-2.13	MgSO4:7H2O
Fe(OH)2	-7.92	5.65	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.15	3.11	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-0.43	-4.15	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.87	-1.31	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-5.90	-26.52	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-28.62	-32.35	-3.73	Fe2(SO4)3
Fe3(OH)8	-3.29	16.93	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.30	-5.90	0.40	FeAsO4:2H2O
FeCr2O4	-9.18	-1.98	7.20	FeCr2O4
FeMoO4	-2.34	-12.43	-10.09	FeMoO4
Ferrihydrite	2.45	5.64	3.19	Fe(OH)3
Ferroselite	-41.55	-60.14	-18.60	FeSe2
FeS(ppt)	-76.54	-79.49	-2.95	FeS
FeSe	-29.28	-40.28	-11.00	FeSe
Fix_pe	-6.79	-6.79	0.00	e-
Fluorite	3.59	-6.91	-10.50	CaF2
Galena	-66.79	-80.76	-13.97	PbS
Gibbsite	-3.04	5.25	8.29	Al(OH)3
Goethite	5.15	5.65	0.49	FeOOH
Goslarite	-5.65	-7.66	-2.01	ZnSO4:7H2O
Greenockite	-65.82	-80.18	-14.36	CdS
Greigite	-278.56	-323.59	-45.03	Fe3S4
Gummite	-10.16	-2.49	7.67	UO3
Gypsum	0.57	-4.04	-4.61	CaSO4:2H2O
H-Jarosite	-0.07	-12.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-5.20	-18.08	-12.88	H2MoO4
H2S(g)	-77.13	-85.14	-8.01	H2S
H2Se(g)	-40.97	-45.93	-4.96	H2Se
Halite	-5.53	-3.93	1.60	NaCl
Hausmannite	-11.73	49.30	61.03	Mn3O4
Hematite	12.71	11.29	-1.42	Fe2O3
Hercynite	-6.75	16.15	22.89	FeAl2O4
Hg(CH3)2(g)	-181.86	-255.57	-73.71	Hg(CH3)2
Hg(g)	-8.00	-15.88	-7.87	Hg
Hg(OH)2	-7.91	-11.41	-3.50	Hg(OH)2
Hg2(g)	-16.80	-31.75	-14.96	Hg2
Hg2(OH)2	-10.95	-5.69	5.26	Hg2(OH)2
Hg2CO3	-7.47	-23.52	-16.05	Hg2CO3
Hg2CrO4	-29.09	-37.79	-8.70	Hg2CrO4
Hg2F2	-12.75	-23.12	-10.36	Hg2F2
Hg2S	-79.15	-90.83	-11.68	Hg2S
Hg2SeO3	-13.64	-18.30	-4.66	Hg2SeO3
Hg2SO4	-14.11	-20.24	-6.13	Hg2SO4
Hg3O2CO3	-22.37	-52.05	-29.68	Hg3O2CO3
HgCl(g)	-30.79	-11.29	19.50	HgCl
HgCl2	-7.04	-28.30	-21.26	HgCl2
HgF(g)	-44.23	-11.56	32.68	HgF
HgF2(g)	-41.40	-28.83	12.57	HgF2
Hgmetal(l)	-2.42	-15.88	-13.45	Hg
HgSe	-1.64	-57.33	-55.69	HgSe
HgSeO3	-11.58	-24.01	-12.43	HgSeO3
HgSO4	-16.54	-25.96	-9.42	HgSO4
Huntite	-0.96	-30.93	-29.97	CaMg3(CO3)4
Hydrocerrusite	-3.76	-22.53	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.76	-21.52	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-14.44	-19.61	-5.17	KAl(SO4)2:12H2O
K-Jarosite	6.90	-7.90	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-38.42	-55.66	-17.24	K2Cr2O7

K2CrO4	-23.05	-23.56	-0.51	K2CrO4
K2MoO4	-12.80	-9.54	3.26	K2MoO4
K2SeO4	-13.59	-14.32	-0.73	K2SeO4
Langite	-1.65	15.84	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.36	-5.79	-0.43	PbO:PbSO4
Laurionite	-4.69	-4.07	0.62	PbOHCl
Lepidocrocite	4.27	5.65	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.32	4.38	12.69	PbO
Mackinawite	-75.89	-79.49	-3.60	FeS
Maghemite	4.91	11.29	6.39	Fe2O3
Magnesioferrite	4.40	21.26	16.86	Fe2MgO4
Magnesite	-0.41	-7.87	-7.46	MgCO3
Magnetite	13.54	16.94	3.40	Fe3O4
Malachite	2.67	-2.64	-5.31	Cu2 (OH) 2CO3
Manganite	-4.56	20.78	25.34	MnOOH
Massicot	-8.52	4.38	12.89	PbO
Matlockite	-3.81	-12.78	-8.97	PbClF
Melanothallite	-15.55	-9.30	6.26	CuCl2
Melanterite	-6.71	-8.92	-2.21	FeSO4:7H2O
Metacinnabar	-51.45	-96.54	-45.09	HgS
Mg (OH) 2 (active)	-8.83	9.96	18.79	Mg (OH) 2
Mg (VO3) 2	-11.12	0.16	11.28	Mg (VO3) 2
Mg2Sb3	-278.79	-204.11	74.68	Mg2Sb3
Mg2V2O7	-16.23	10.13	26.36	Mg2V2O7
MgCr2O4	-13.86	2.34	16.20	MgCr2O4
MgCrO4	-27.51	-22.13	5.38	MgCrO4
MgF2	0.67	-7.46	-8.13	MgF2
MgMoO4	-6.26	-8.11	-1.85	MgMoO4
MgSeO3:6H2O	-5.71	-2.65	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.70	-12.90	-1.20	MgSeO4:6H2O
Minium	-34.32	39.20	73.52	Pb3O4
Mirabilite	-4.42	-5.54	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-6.95	-2.05	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-47.08	-52.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-155.01	-93.93	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-12.36	0.14	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-11.87	-9.16	2.72	MnCl2:4H2O
MnS (grn)	-77.56	-77.39	0.17	MnS
MnS (pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.06	-100.97	-2.91	MnSb
MnSe	-41.68	-38.18	3.50	MnSe
MnSeO3	-5.99	-4.86	1.13	MnSeO3
MnSeO3:2H2O	-5.84	-4.86	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.07	-15.12	-2.05	MnSeO4:5H2O
MnSO4	-9.39	-6.80	2.58	MnSO4
Monteponite	-10.15	4.96	15.10	CdO
Montroydite	-7.77	-11.41	-3.64	HgO
MoO3	-10.08	-18.08	-8.00	MoO3
Morenosite	-10.48	-12.63	-2.14	NiSO4:7H2O
MoS2	-144.14	-214.40	-70.26	MoS2
Na-Jarosite	3.55	-7.65	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-45.26	-55.16	-9.90	Na2Cr2O7
Na2CrO4	-25.99	-23.06	2.93	Na2CrO4
Na2Mo2O7	-10.52	-27.12	-16.60	Na2Mo2O7
Na2MoO4	-10.53	-9.04	1.49	Na2MoO4
Na2MoO4:2H2O	-10.27	-9.05	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.88	-3.58	10.30	Na2SeO3:5H2O
Na2SeO4	-15.10	-13.82	1.28	Na2SeO4
Na3Sb	-177.30	-82.84	94.45	Na3Sb
Na3VO4	-28.03	8.65	36.68	Na3VO4
Na4V2O7	-29.13	8.27	37.40	Na4V2O7
Nantokite	-4.46	-11.19	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-4.24	-0.38	3.86	NaVO3
Nesquehonite	-3.21	-7.88	-4.67	MgCO3:3H2O
Ni (OH) 2	-10.86	1.94	12.79	Ni (OH) 2

Ni3(AsO4)2·8H2O	-32.98	-17.28	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-38.80	-6.80	32.00	Ni4(OH)6SO4
NiCO3	-9.02	-15.89	-6.87	NiCO3
NiMoO4	-5.00	-16.14	-11.14	NiMoO4
NiS(alpha)	-77.60	-83.20	-5.60	NiS
NiS(beta)	-72.10	-83.20	-11.10	NiS
NiS(gamma)	-70.40	-83.20	-12.80	NiS
NiSe	-26.29	-43.99	-17.70	NiSe
NiSeO3·2H2O	-13.48	-10.67	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-19.41	-20.93	-1.52	NiSeO4·6H2O
Nsutite	-9.05	8.46	17.50	MnO2
O2(g)	-30.97	52.12	83.09	O2
Orpiment	-231.74	-292.80	-61.07	As2S3
Otavite	-0.87	-12.87	-12.00	CdCO3
Pb(BO2)2	-10.09	-3.57	6.52	Pb(BO2)2
Pb(OH)2	-3.77	4.38	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-54.45	-63.21	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.49	0.31	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.43	8.75	26.19	Pb2O(OH)2
Pb2O3	-26.22	34.82	61.04	Pb2O3
Pb2OCO3	-8.52	-9.07	-0.56	Pb2OCO3
Pb2V2O7	0.86	-1.04	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.74	-9.94	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.80	3.34	6.14	Pb3(VO4)2
Pb3O2CO3	-15.72	-4.70	11.02	Pb3O2CO3
Pb3O2SO4	-12.10	-1.41	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.14	2.96	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.97	21.88	Pb4O3SO4
PbCrO4	-15.12	-27.72	-12.60	PbCrO4
PbF2	-5.61	-13.05	-7.44	PbF2
Pbmetal	-25.93	-21.68	4.25	Pb
PbMoO4	1.92	-13.70	-15.62	PbMoO4
PbO·0.3H2O	-8.60	4.38	12.98	PbO·0.33H2O
PbSeO4	-11.63	-18.47	-6.84	PbSeO4
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-6.16	-25.97	-19.81	PbCl2:PbCO3
Plattnerite	-19.16	30.44	49.60	PbO2
Portlandite	-12.30	10.51	22.80	Ca(OH)2
Pyrite	-120.05	-138.56	-18.51	FeS2
Pyrochroite	-7.45	7.74	15.19	Mn(OH)2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-97.12	-116.87	-19.75	AsS
Retgersite	-10.59	-12.63	-2.04	NiSO4·6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-5.82	-20.32	-14.50	UO2CO3
Sb(OH)3	-11.11	-18.22	-7.11	Sb(OH)3
Sb2O4	-13.77	-10.36	3.40	Sb2O4
Sb2O5	-23.25	-32.92	-9.67	Sb2O5
Sb2Se3	-106.45	-174.21	-67.76	Sb2Se3
Sb4O6(cubic)	-54.59	-72.85	-18.26	Sb4O6
Sb4O6(orth)	-54.95	-72.85	-17.90	Sb4O6
SbCl3	-44.13	-43.56	0.57	SbCl3
SbF3	-34.12	-44.35	-10.23	SbF3
Sbmetal	-45.62	-57.30	-11.69	Sb
SbO2	-1.67	-29.49	-27.82	SbO2
Schoepite	-8.48	-2.49	5.99	UO2(OH)2·H2O
Semetal(am)	-12.76	-19.87	-7.11	Se
Semetal(hex)	-12.16	-19.87	-7.71	Se
Senarmontite	-24.06	-36.42	-12.37	Sb2O3
SeO2	-12.73	-12.60	0.12	SeO2
SeO3	-43.89	-22.85	21.04	SeO3
Siderite	-1.94	-12.18	-10.24	FeCO3
Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-66.78	-78.23	-11.45	ZnS
Spinel	-16.39	20.46	36.85	MgAl2O4
Stibnite	-241.37	-291.83	-50.46	Sb2S3
Sulfur	-56.93	-59.07	-2.14	S
Tenorite	-0.04	7.60	7.64	CuO

Thenardite	-5.84	-5.51	0.32	Na2SO4
Thermonatrite	-9.44	-8.80	0.64	Na2CO3:H2O
Tyuyamunite	-8.34	-4.26	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-26.95	-5.87	21.08	U3O8
U3Sb4	-595.96	-443.58	152.38	U3Sb4
U4O9	-48.24	-51.26	-3.02	U4O9
UF4	-24.64	-54.18	-29.54	UF4
UF4:2.5H2O	-21.47	-54.18	-32.72	UF4:2.5H2O
UO2 (am)	-20.27	-19.33	0.93	UO2
UO2 (NO3) 2	-42.25	-30.10	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.96	-30.11	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.50	-30.11	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.16	-30.12	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-8.10	-2.49	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-23.10	-25.35	-2.25	UO2SeO4:4H2O
UO3	-10.19	-2.49	7.70	UO3
Uraninite	-14.66	-19.33	-4.67	UO2
USb2	-224.85	-195.28	29.58	USb2
V (OH) 3	-15.96	-8.37	7.59	V (OH) 3
V2O5	-8.44	-9.80	-1.36	V2O5
V3O5	-30.98	-29.14	1.84	V3O5
V4O7	-37.36	-30.17	7.19	V4O7
V6O13	-20.66	-81.52	-60.86	V6O13
Valentinite	-27.94	-36.42	-8.48	Sb2O3
VC12	-57.16	-38.29	18.87	VC12
VC13	-57.14	-33.71	23.43	VC13
VF4	-50.81	-35.88	14.93	VF4
Vmetal	-91.48	-47.45	44.03	V
VO	-36.15	-21.39	14.76	VO
VO (OH) 2	-6.18	-1.03	5.15	VO (OH) 2
VO2Cl	-16.19	-13.35	2.84	VO2Cl
VOC1	-27.96	-16.81	11.15	VOC1
VOC12	-30.68	-17.92	12.76	VOC12
VOSO4	-19.19	-15.58	3.61	VOSO4
Witherite	-1.89	-10.46	-8.57	BaCO3
Wurtzite	-69.28	-78.23	-8.95	ZnS
Zincite	-4.43	6.91	11.33	ZnO
Zincosite	-11.57	-7.64	3.93	ZnSO4
Zn (BO2) 2	-9.33	-1.04	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.04	-20.72	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-5.30	6.90	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-5.57	6.90	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.85	6.90	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-4.63	6.90	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.83	6.90	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.24	-0.74	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.83	5.36	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.01	-2.36	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-27.29	-8.38	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.33	13.07	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-20.87	17.63	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.04	-9.99	7.05	ZnCl2
ZnCO3:1H2O	-0.67	-10.93	-10.26	ZnCO3:1H2O
ZnF2	-9.98	-10.52	-0.53	ZnF2
Znmetal	-44.94	-19.15	25.79	Zn
ZnMoO4	-1.04	-11.17	-10.13	ZnMoO4
ZnO (active)	-4.28	6.91	11.19	ZnO
ZnS (am)	-69.17	-78.23	-9.05	ZnS
ZnSb	-87.47	-76.46	11.01	ZnSb
ZnSe	-24.62	-39.02	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.01	-7.64	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 74.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 402

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 406

SAVE Solution 407 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 402

END

TITLE

Precipitate oversaturated phases

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 406. Solution after simulation 73.
Using pure phase assemblage 402.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	7.221e-05	7.221e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	5.136e-08	5.136e-08
Barite	0.00	-9.98	-9.98	0.000e+00	2.998e-05	2.998e-05
Brochantite	0.00	15.22	15.22	0.000e+00	1.341e-04	1.341e-04
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.012e+01	1.170e-01
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00

CaSeO3:2H2O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	4.569e-02	4.569e-02
Carnotite	-0.00	0.23	0.23	0.000e+00	2.081e-06	2.081e-06
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	2.414e-07	2.414e-07
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.28	-2.64	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.071e-05	1.071e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	3.684e-03	3.684e-03
Gummite	-5.04	2.63	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	9.137e-03	9.137e-03
HgSe	-1.23	-56.93	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.34	-3.21	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.00	-15.87	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.47	-15.61	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.447e-05
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	7.508e-07	7.508e-07
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.37	2.63	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-11.09	9.99	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.98	2.63	5.61	0.000e+00	0	0.000e+00
UO3	-5.07	2.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.555e-06	5.579e-06
As	1.571e-09	1.578e-09
B	1.000e-04	1.005e-04
Ba	2.722e-08	2.734e-08
C	5.739e-04	5.764e-04
Ca	1.207e-02	1.212e-02
Cd	2.229e-08	2.239e-08
Cl	8.427e-03	8.464e-03
Co	2.957e-09	2.970e-09
Cr	1.138e-09	1.143e-09
Cu	4.982e-07	5.004e-07
F	2.255e-04	2.265e-04
Fe	1.104e-09	1.108e-09
Hg	9.597e-09	9.640e-09
K	1.496e-02	1.503e-02
Mg	1.839e-02	1.847e-02
Mn	2.221e-04	2.231e-04
Mo	7.602e-06	7.636e-06
N	2.248e-05	2.258e-05
Na	2.696e-02	2.708e-02
Ni	4.816e-10	4.837e-10
Pb	1.663e-09	1.670e-09
S	4.702e-02	4.723e-02
Sb	9.018e-08	9.058e-08
Se	7.863e-07	7.898e-07
U	6.570e-07	6.599e-07
V	4.777e-08	4.798e-08
Zn	2.594e-05	2.606e-05

-----Description of solution-----

	pH	=	7.908	Charge balance
	pe	=	4.865	Adjusted to redox
equilibrium				
	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.227e-01	
	Mass of water (kg)	=	1.004e+00	
	Total alkalinity (eq/kg)	=	6.143e-04	
	Total CO2 (mol/kg)	=	5.739e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	728	
	Total H	=	1.115030e+02	
	Total O	=	5.594211e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.090e-06	8.133e-07	-5.962	-6.090	-0.127	(0)
H+	1.605e-08	1.236e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.555e-06					
Al (OH) 4-	5.509e-06	4.202e-06	-5.259	-5.377	-0.118	(0)
Al (OH) 3	4.103e-08	4.103e-08	-7.387	-7.387	0.000	(0)
Al (OH) 2+	3.259e-09	2.529e-09	-8.487	-8.597	-0.110	(0)
AlF3	4.026e-10	4.026e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.474e-10	2.696e-10	-9.459	-9.569	-0.110	(0)
AlF4-	3.139e-11	2.394e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.575e-11	5.708e-12	-10.803	-11.243	-0.441	(0)
AlOH+2	1.080e-11	3.914e-12	-10.967	-11.407	-0.441	(0)
AlSO4+	5.371e-13	4.096e-13	-12.270	-12.388	-0.118	(0)
Al (SO4) 2-	6.311e-14	4.813e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.058e-14	4.812e-15	-13.296	-14.318	-1.022	(0)
AlMo6O21-3	2.494e-39	0.000e+00	-38.603	-40.211	-1.608	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.002e-24	6.640e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.539e-28	4.901e-29	-27.595	-28.310	-0.714	(0)
H4AsO3+	1.478e-31	9.794e-32	-30.830	-31.009	-0.179	(0)
AsO3-3	6.194e-33	1.529e-34	-32.208	-33.816	-1.608	(0)
As (5)	1.571e-09					
HAsO4-2	1.519e-09	2.931e-10	-8.819	-9.533	-0.714	(0)
H2AsO4-	4.983e-11	3.303e-11	-10.303	-10.481	-0.179	(0)
AsO4-3	3.038e-12	7.500e-14	-11.517	-13.125	-1.608	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.000e-04					
H3BO3	9.217e-05	9.481e-05	-4.035	-4.023	0.012	(0)
H2BO3-	6.133e-06	4.456e-06	-5.212	-5.351	-0.139	(0)
MgH2BO3+	8.038e-07	5.841e-07	-6.095	-6.234	-0.139	(0)
CaH2BO3+	7.931e-07	5.762e-07	-6.101	-6.239	-0.139	(0)
NaH2BO3	1.385e-07	1.385e-07	-6.859	-6.859	0.000	(0)
BF (OH) 3-	6.177e-09	4.488e-09	-8.209	-8.348	-0.139	(0)
H5 (BO3) 2-	4.949e-10	3.596e-10	-9.305	-9.444	-0.139	(0)
H8 (BO3) 3-	4.693e-12	3.409e-12	-11.329	-11.467	-0.139	(0)
BaH2BO3+	1.810e-12	1.315e-12	-11.742	-11.881	-0.139	(0)
BF2 (OH) 2-	9.698e-13	7.046e-13	-12.013	-12.152	-0.139	(0)
BF3OH-	5.541e-19	4.026e-19	-18.256	-18.395	-0.139	(0)
BF4-	4.004e-24	2.909e-24	-23.397	-23.536	-0.139	(0)
Ba	2.722e-08					
Ba+2	2.717e-08	9.549e-09	-7.566	-8.020	-0.454	(0)
BaHCO3+	4.517e-11	3.542e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.810e-12	1.315e-12	-11.742	-11.881	-0.139	(0)

BaOH+	4.402e-14	3.390e-14	-13.356	-13.470	-0.113	(0)
BaNO3+	1.112e-15	7.372e-16	-14.954	-15.132	-0.179	(0)
BaNH3+2	2.675e-16	5.162e-17	-15.573	-16.287	-0.714	(0)
C (4)	5.739e-04					
HCO3-	5.006e-04	3.884e-04	-3.301	-3.411	-0.110	(0)
CaHCO3+	2.073e-05	1.625e-05	-4.683	-4.789	-0.106	(0)
MgHCO3+	1.991e-05	1.502e-05	-4.701	-4.823	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.633e-06	4.633e-06	-5.334	-5.334	0.000	(0)
NaHCO3	4.283e-06	4.283e-06	-5.368	-5.368	0.000	(0)
CO3-2	4.192e-06	1.474e-06	-5.378	-5.832	-0.454	(0)
NaCO3-	6.934e-07	5.381e-07	-6.159	-6.269	-0.110	(0)
UO2 (CO3) 3-4	5.984e-07	8.300e-10	-6.223	-9.081	-2.858	(0)
ZnCO3	3.278e-07	3.278e-07	-6.484	-6.484	0.000	(0)
MnHCO3+	3.121e-07	2.404e-07	-6.506	-6.619	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
ZnHCO3+	7.164e-08	4.748e-08	-7.145	-7.323	-0.179	(0)
UO2 (CO3) 2-2	5.824e-08	1.124e-08	-7.235	-7.949	-0.714	(0)
Cu (CO3) 2-2	4.851e-09	9.361e-10	-8.314	-9.029	-0.714	(0)
CuHCO3+	1.006e-09	6.666e-10	-8.998	-9.176	-0.179	(0)
PbCO3	3.977e-10	3.977e-10	-9.400	-9.400	0.000	(0)
UO2CO3	3.822e-10	3.822e-10	-9.418	-9.418	0.000	(0)
CdCO3	8.906e-11	8.906e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.517e-11	3.542e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.909e-11	2.591e-11	-10.408	-10.587	-0.179	(0)
CoHCO3+	1.796e-11	1.190e-11	-10.746	-10.924	-0.179	(0)
CoCO3	9.815e-12	9.815e-12	-11.008	-11.008	0.000	(0)
Pb (CO3) 2-2	8.759e-12	1.690e-12	-11.058	-11.772	-0.714	(0)
BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
NiHCO3+	6.677e-12	4.426e-12	-11.175	-11.354	-0.179	(0)
NiCO3	5.082e-12	5.082e-12	-11.294	-11.294	0.000	(0)
CdHCO3+	3.538e-12	2.345e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.041e-13	9.729e-14	-12.297	-13.012	-0.714	(0)
HgCO3	9.730e-15	9.730e-15	-14.012	-14.012	0.000	(0)
FeHCO3+	2.701e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
Hg (CO3) 2-2	2.350e-16	4.534e-17	-15.629	-16.343	-0.714	(0)
HgHCO3+	3.378e-18	2.239e-18	-17.471	-17.650	-0.179	(0)
Ca	1.207e-02					
Ca+2	6.393e-03	2.247e-03	-2.194	-2.648	-0.454	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
CaHCO3+	2.073e-05	1.625e-05	-4.683	-4.789	-0.106	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
CaH2BO3+	7.931e-07	5.762e-07	-6.101	-6.239	-0.139	(0)
CaOH+	4.651e-08	3.647e-08	-7.332	-7.438	-0.106	(0)
CaNO3+	1.651e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
CaNH3+2	1.256e-10	2.424e-11	-9.901	-10.615	-0.714	(0)
Ca (NH3) 2+2	4.284e-19	8.268e-20	-18.368	-19.083	-0.714	(0)
Cd	2.229e-08					
Cd+2	7.544e-09	2.652e-09	-8.122	-8.576	-0.454	(0)
CdSO4	6.817e-09	6.817e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.225e-09	1.008e-09	-8.282	-8.996	-0.714	(0)
CdCl+	2.479e-09	1.643e-09	-8.606	-8.784	-0.179	(0)
CdCO3	8.906e-11	8.906e-11	-10.050	-10.050	0.000	(0)
CdOHC1	5.482e-11	5.482e-11	-10.261	-10.261	0.000	(0)
CdCl2	4.444e-11	4.444e-11	-10.352	-10.352	0.000	(0)
CdOH+	2.585e-11	1.713e-11	-10.588	-10.766	-0.179	(0)
CdF+	7.522e-12	4.985e-12	-11.124	-11.302	-0.179	(0)
CdHCO3+	3.538e-12	2.345e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.041e-13	9.729e-14	-12.297	-13.012	-0.714	(0)
CdCl3-	2.745e-13	1.819e-13	-12.561	-12.740	-0.179	(0)
Cd (OH) 2	8.791e-14	8.791e-14	-13.056	-13.056	0.000	(0)
CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
CdNO3+	1.949e-16	1.292e-16	-15.710	-15.889	-0.179	(0)
CdSeO4	1.703e-16	1.703e-16	-15.769	-15.769	0.000	(0)
Cd (SeO3) 2-2	7.177e-17	1.385e-17	-16.144	-16.859	-0.714	(0)
Cd2OH+3	9.223e-18	2.277e-19	-17.035	-18.643	-1.608	(0)

		Cd(OH) 3-	6.591e-18	4.369e-18	-17.181	-17.360	-0.179	(0)
		Cd(OH) 4-2	3.014e-24	5.816e-25	-23.521	-24.235	-0.714	(0)
		Cd(NO3) 2	9.972e-25	9.972e-25	-24.001	-24.001	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-302.101	-302.816	-0.714	(0)
Cl	8.427e-03	Cl-	8.427e-03	6.488e-03	-2.074	-2.188	-0.114	(0)
		MnCl+	3.290e-07	2.534e-07	-6.483	-6.596	-0.113	(0)
		ZnCl+	8.351e-08	6.301e-08	-7.078	-7.201	-0.122	(0)
		ZnOHC1	6.709e-08	6.709e-08	-7.173	-7.173	0.000	(0)
		CuCl2-	2.670e-09	2.015e-09	-8.573	-8.696	-0.122	(0)
		CdCl+	2.479e-09	1.643e-09	-8.606	-8.784	-0.179	(0)
		MnCl2	2.322e-09	2.322e-09	-8.634	-8.634	0.000	(0)
		CuCl	1.486e-09	1.486e-09	-8.828	-8.828	0.000	(0)
		ZnCl2	6.480e-10	6.480e-10	-9.188	-9.188	0.000	(0)
		CuCl+	3.707e-10	2.797e-10	-9.431	-9.553	-0.122	(0)
		CdOHC1	5.482e-11	5.482e-11	-10.261	-10.261	0.000	(0)
		HgClOH	5.142e-11	5.142e-11	-10.289	-10.289	0.000	(0)
		CdCl2	4.444e-11	4.444e-11	-10.352	-10.352	0.000	(0)
		PbCl+	3.119e-11	2.067e-11	-10.506	-10.685	-0.179	(0)
		HgCl2	2.323e-11	2.323e-11	-10.634	-10.634	0.000	(0)
		CoCl+	1.334e-11	8.844e-12	-10.875	-11.053	-0.179	(0)
		CuCl3-2	7.941e-12	2.795e-12	-11.100	-11.554	-0.454	(0)
		MnCl3-	5.388e-12	4.150e-12	-11.269	-11.382	-0.113	(0)
		ZnCl3-	4.426e-12	3.339e-12	-11.354	-11.476	-0.122	(0)
		NiCl+	2.315e-12	1.534e-12	-11.635	-11.814	-0.179	(0)
		HgCl3-	2.274e-12	1.507e-12	-11.643	-11.822	-0.179	(0)
		CuCl2	6.293e-13	6.293e-13	-12.201	-12.201	0.000	(0)
		PbCl2	5.991e-13	5.991e-13	-12.223	-12.223	0.000	(0)
		CdCl3-	2.745e-13	1.819e-13	-12.561	-12.740	-0.179	(0)
		HgCl4-2	2.017e-13	3.893e-14	-12.695	-13.410	-0.714	(0)
		ZnCl4-2	3.079e-14	1.083e-14	-13.512	-13.965	-0.454	(0)
		PbCl3-	2.335e-15	1.547e-15	-14.632	-14.810	-0.179	(0)
		HgCl+	1.078e-15	7.143e-16	-14.968	-15.146	-0.179	(0)
		UO2Cl+	1.034e-15	6.856e-16	-14.985	-15.164	-0.179	(0)
		CuCl3-	5.050e-17	3.810e-17	-16.297	-16.419	-0.122	(0)
		NiCl2	5.013e-17	5.013e-17	-16.300	-16.300	0.000	(0)
		PbCl4-2	2.378e-17	4.589e-18	-16.624	-17.338	-0.714	(0)
		CrCl+2	1.460e-17	2.817e-18	-16.836	-17.550	-0.714	(0)
		CrOHC12	2.825e-19	2.825e-19	-18.549	-18.549	0.000	(0)
		CuCl4-2	3.521e-21	1.239e-21	-20.453	-20.907	-0.454	(0)
		CrCl2+	2.617e-21	1.734e-21	-20.582	-20.761	-0.179	(0)
FeCl+2	1.640e-21	5.772e-22	-20.785	-21.239	-0.454	(0)		
VOCl+	2.616e-22	1.734e-22	-21.582	-21.761	-0.179	(0)		
FeCl2+	2.172e-23	1.673e-23	-22.663	-22.777	-0.113	(0)		
CrO3Cl-	8.324e-26	5.517e-26	-25.080	-25.258	-0.179	(0)		
FeCl3	1.085e-26	1.085e-26	-25.964	-25.964	0.000	(0)		
CoCl+2	7.857e-37	1.516e-37	-36.105	-36.819	-0.714	(0)		
UCl+3	0.000e+00	0.000e+00	-44.210	-45.818	-1.608	(0)		
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.714	(0)		
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-51.248	-51.963	-0.714	(0)		
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.984	-0.714	(0)		
Co(2)	2.957e-09	Co+2	2.042e-09	3.940e-10	-8.690	-9.405	-0.714	(0)
		CoSO4	8.621e-10	8.621e-10	-9.064	-9.064	0.000	(0)
		CoHCO3+	1.796e-11	1.190e-11	-10.746	-10.924	-0.179	(0)
		CoCl+	1.334e-11	8.844e-12	-10.875	-11.053	-0.179	(0)
		CoCO3	9.815e-12	9.815e-12	-11.008	-11.008	0.000	(0)
		CoOH+	9.647e-12	6.394e-12	-11.016	-11.194	-0.179	(0)
		CoF+	2.230e-12	1.478e-12	-11.652	-11.830	-0.179	(0)
		Co(OH) 2	4.131e-13	4.131e-13	-12.384	-12.384	0.000	(0)
		CoNO2+	6.840e-14	4.533e-14	-13.165	-13.344	-0.179	(0)
		Co(NH3) +2	2.103e-15	4.059e-16	-14.677	-15.392	-0.714	(0)
		CoSeO4	6.810e-17	6.810e-17	-16.167	-16.167	0.000	(0)
		CoNO3+	1.451e-17	9.619e-18	-16.838	-17.017	-0.179	(0)
		Co(OH) 3-	1.011e-17	6.704e-18	-16.995	-17.174	-0.179	(0)

CoOOH-	2.543e-18	1.685e-18	-17.595	-17.773	-0.179	(0)
Co2OH+3	5.115e-21	1.263e-22	-20.291	-21.899	-1.608	(0)
Co (NH3) 2+2	7.687e-22	1.483e-22	-21.114	-21.829	-0.714	(0)
Co (OH) 4-2	4.478e-24	8.642e-25	-23.349	-24.063	-0.714	(0)
Co (NO3) 2	3.015e-25	3.015e-25	-24.521	-24.521	0.000	(0)
Co (NH3) 3+2	8.291e-29	1.600e-29	-28.081	-28.796	-0.714	(0)
Co4 (OH) 4+4	2.404e-34	3.335e-37	-33.619	-36.477	-2.858	(0)
Co (NH3) 4+2	3.728e-36	7.195e-37	-35.428	-36.143	-0.714	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.990	-0.714	(0)
Co (3)	2.460e-30					
CoOH+2	2.460e-30	4.747e-31	-29.609	-30.324	-0.714	(0)
Co+3	1.207e-36	1.149e-37	-35.918	-36.940	-1.022	(0)
CoCl+2	7.857e-37	1.516e-37	-36.105	-36.819	-0.714	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.714	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.652	-60.831	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.972	-65.686	-0.714	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.984	-0.714	(0)
Cr (2)	5.671e-27					
Cr+2	5.671e-27	1.094e-27	-26.246	-26.961	-0.714	(0)
Cr (3)	1.138e-09					
Cr (OH) 2+	8.913e-10	5.907e-10	-9.050	-9.229	-0.179	(0)
Cr (OH) 3	1.805e-10	1.805e-10	-9.744	-9.744	0.000	(0)
Cr (OH) +2	3.093e-11	5.969e-12	-10.510	-11.224	-0.714	(0)
CrOHSO4	1.553e-11	1.553e-11	-10.809	-10.809	0.000	(0)
CrO2-	1.049e-11	6.951e-12	-10.979	-11.158	-0.179	(0)
Cr (OH) 4-	8.818e-12	5.844e-12	-11.055	-11.233	-0.179	(0)
CrF+2	3.268e-14	6.307e-15	-13.486	-14.200	-0.714	(0)
Cr+3	1.359e-14	3.355e-16	-13.867	-15.474	-1.608	(0)
CrSO4+	1.296e-14	8.590e-15	-13.887	-14.066	-0.179	(0)
CrCl+2	1.460e-17	2.817e-18	-16.836	-17.550	-0.714	(0)
CrOHC12	2.825e-19	2.825e-19	-18.549	-18.549	0.000	(0)
Cr2 (OH) 2SO4+2	4.343e-20	8.381e-21	-19.362	-20.077	-0.714	(0)
Cr2 (OH) 2 (SO4) 2	5.460e-21	5.460e-21	-20.263	-20.263	0.000	(0)
CrCl2+	2.617e-21	1.734e-21	-20.582	-20.761	-0.179	(0)
CrNO3+2	1.170e-24	2.259e-25	-23.932	-24.646	-0.714	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.813	-41.527	-0.714	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.269	-50.877	-1.608	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.248	-51.963	-0.714	(0)
Cr (6)	8.501e-15					
CrO4-2	7.770e-15	2.731e-15	-14.110	-14.564	-0.454	(0)
NaCrO4-	4.015e-16	2.661e-16	-15.396	-15.575	-0.179	(0)
HCrO4-	1.648e-16	1.092e-16	-15.783	-15.962	-0.179	(0)
KCrO4-	1.638e-16	1.086e-16	-15.786	-15.964	-0.179	(0)
CrO3SO4-2	2.340e-23	4.516e-24	-22.631	-23.345	-0.714	(0)
H2CrO4	1.094e-24	1.094e-24	-23.961	-23.961	0.000	(0)
CrO3Cl-	8.324e-26	5.517e-26	-25.080	-25.258	-0.179	(0)
Cr2O7-2	2.147e-30	4.143e-31	-29.668	-30.383	-0.714	(0)
Cu (1)	4.439e-09					
CuCl2-	2.670e-09	2.015e-09	-8.573	-8.696	-0.122	(0)
CuCl	1.486e-09	1.486e-09	-8.828	-8.828	0.000	(0)
Cu+	2.745e-10	1.819e-10	-9.561	-9.740	-0.179	(0)
CuCl3-2	7.941e-12	2.795e-12	-11.100	-11.554	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.867	-147.308	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.623	-148.038	-0.415	(0)
Cu (2)	4.937e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.272e-08	6.996e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.739e-08	2.720e-08	-7.111	-7.565	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.851e-09	9.361e-10	-8.314	-9.029	-0.714	(0)
CuHCO3+	1.006e-09	6.666e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.370e-10	1.229e-10	-9.196	-9.910	-0.714	(0)
CuCl+	3.707e-10	2.797e-10	-9.431	-9.553	-0.122	(0)
CuF+	3.072e-10	2.036e-10	-9.513	-9.691	-0.179	(0)
CuNO2+	7.017e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
Cu (OH) 3-	2.858e-11	1.894e-11	-10.544	-10.723	-0.179	(0)
CuNH3+2	1.236e-11	2.385e-12	-10.908	-11.623	-0.714	(0)

	CuCl2	6.293e-13	6.293e-13	-12.201	-12.201	0.000	(0)
	Cu(NO2)2	7.770e-15	7.770e-15	-14.110	-14.110	0.000	(0)
	CuNO3+	1.999e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
	Cu(OH)4-2	6.283e-16	1.212e-16	-15.202	-15.916	-0.714	(0)
	CuCl3-	5.050e-17	3.810e-17	-16.297	-16.419	-0.122	(0)
	CuCl4-2	3.521e-21	1.239e-21	-20.453	-20.907	-0.454	(0)
	Cu(NO3)2	2.569e-24	2.569e-24	-23.590	-23.590	0.000	(0)
	Cu(HS)3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F		2.255e-04					
	F-	1.541e-04	1.186e-04	-3.812	-3.926	-0.114	(0)
	MgF+	6.597e-05	5.031e-05	-4.181	-4.298	-0.118	(0)
	CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
	NaF	1.468e-06	1.468e-06	-5.833	-5.833	0.000	(0)
	MnF+	1.902e-07	1.465e-07	-6.721	-6.834	-0.113	(0)
	ZnF+	1.381e-08	9.151e-09	-7.860	-8.039	-0.179	(0)
	BF(OH)3-	6.177e-09	4.488e-09	-8.209	-8.348	-0.139	(0)
	HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
	AlF3	4.026e-10	4.026e-10	-9.395	-9.395	0.000	(0)
	AlF2+	3.474e-10	2.696e-10	-9.459	-9.569	-0.110	(0)
	CuF+	3.072e-10	2.036e-10	-9.513	-9.691	-0.179	(0)
	AlF4-	3.139e-11	2.394e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.575e-11	5.708e-12	-10.803	-11.243	-0.441	(0)
	CdF+	7.522e-12	4.985e-12	-11.124	-11.302	-0.179	(0)
	CoF+	2.230e-12	1.478e-12	-11.652	-11.830	-0.179	(0)
	UO2F+	1.610e-12	1.067e-12	-11.793	-11.972	-0.179	(0)
	HF2-	1.311e-12	9.779e-13	-11.882	-12.010	-0.127	(0)
	PbF+	1.132e-12	7.506e-13	-11.946	-12.125	-0.179	(0)
	BF2(OH)2-	9.698e-13	7.046e-13	-12.013	-12.152	-0.139	(0)
	NiF+	4.155e-13	2.754e-13	-12.381	-12.560	-0.179	(0)
	UO2F2	3.650e-13	3.650e-13	-12.438	-12.438	0.000	(0)
	CrF+2	3.268e-14	6.307e-15	-13.486	-14.200	-0.714	(0)
	UO2F3-	1.641e-14	1.088e-14	-13.785	-13.963	-0.179	(0)
	PbF2	1.752e-15	1.752e-15	-14.756	-14.756	0.000	(0)
	CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
	UO2F4-2	5.311e-17	1.025e-17	-16.275	-16.989	-0.714	(0)
	H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
	VO2F	1.186e-17	1.186e-17	-16.926	-16.926	0.000	(0)
	FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
	FeF+2	1.089e-18	3.832e-19	-17.963	-18.417	-0.454	(0)
	VO2F2-	7.709e-19	5.109e-19	-18.113	-18.292	-0.179	(0)
	PbF3-	5.948e-19	3.943e-19	-18.226	-18.404	-0.179	(0)
	BF3OH-	5.541e-19	4.026e-19	-18.256	-18.395	-0.139	(0)
	FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
	VOF+	1.023e-20	6.779e-21	-19.990	-20.169	-0.179	(0)
	VO2F3-2	3.918e-21	7.561e-22	-20.407	-21.121	-0.714	(0)
	VOF2	3.015e-22	3.015e-22	-21.521	-21.521	0.000	(0)
	PbF4-2	1.160e-22	2.239e-23	-21.936	-22.650	-0.714	(0)
	HgF+	3.661e-23	2.426e-23	-22.436	-22.615	-0.179	(0)
	BF4-	4.004e-24	2.909e-24	-23.397	-23.536	-0.139	(0)
	VOF3-	1.915e-24	1.269e-24	-23.718	-23.896	-0.179	(0)
	VO2F4-3	1.788e-24	4.413e-26	-23.748	-25.355	-1.608	(0)
	Sb(OH)2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
	SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
	VOF4-2	3.149e-27	6.077e-28	-26.502	-27.216	-0.714	(0)
	UF3+	4.689e-36	3.108e-36	-35.329	-35.508	-0.179	(0)
	UF2+2	8.565e-37	1.653e-37	-36.067	-36.782	-0.714	(0)
	UF4	4.042e-38	4.042e-38	-37.393	-37.393	0.000	(0)
	UF+3	4.484e-39	1.107e-40	-38.348	-39.956	-1.608	(0)
	UF5-	2.867e-40	1.900e-40	-39.543	-39.721	-0.179	(0)
	UF6-2	0.000e+00	0.000e+00	-40.453	-41.167	-0.714	(0)
Fe(2)		3.430e-12					
	Fe+2	2.244e-12	4.330e-13	-11.649	-12.363	-0.714	(0)
	FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
	FeOH+	1.820e-14	1.402e-14	-13.740	-13.853	-0.113	(0)
	FeHCO3+	2.701e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
	Fe(OH)2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
	Fe(OH)3-	3.025e-18	2.330e-18	-17.519	-17.633	-0.113	(0)
	Fe(HS)2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)

Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.308e-10	4.895e-10	-9.200	-9.310	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.173e-11	3.238e-11	-10.380	-10.490	-0.110	(0)
FeOH+2	4.396e-15	1.547e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.089e-18	3.832e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.706e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.282e-19	8.497e-20	-18.892	-19.071	-0.179	(0)
Fe+3	3.097e-20	2.946e-21	-19.509	-20.531	-1.022	(0)
FeCl+2	1.640e-21	5.772e-22	-20.785	-21.239	-0.454	(0)
FeCl2+	2.172e-23	1.673e-23	-22.663	-22.777	-0.113	(0)
FeHSeO3+2	9.966e-24	1.923e-24	-23.001	-23.716	-0.714	(0)
Fe2 (OH) 2+4	5.712e-26	7.923e-29	-25.243	-28.101	-2.858	(0)
FeCl3	1.085e-26	1.085e-26	-25.964	-25.964	0.000	(0)
FeNO3+2	2.351e-27	4.537e-28	-26.629	-27.343	-0.714	(0)
Fe3 (OH) 4+5	1.637e-32	5.606e-37	-31.786	-36.251	-4.465	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.498e-09					
Hg	9.498e-09	9.498e-09	-8.022	-8.022	0.000	(0)
Hg (1)	3.687e-19					
Hg2+2	1.843e-19	3.558e-20	-18.734	-19.449	-0.714	(0)
Hg (2)	9.952e-11					
HgClOH	5.142e-11	5.142e-11	-10.289	-10.289	0.000	(0)
HgCl2	2.323e-11	2.323e-11	-10.634	-10.634	0.000	(0)
Hg (OH) 2	2.239e-11	2.303e-11	-10.650	-10.638	0.012	(0)
HgCl3-	2.274e-12	1.507e-12	-11.643	-11.822	-0.179	(0)
HgCl4-2	2.017e-13	3.893e-14	-12.695	-13.410	-0.714	(0)
HgCO3	9.730e-15	9.730e-15	-14.012	-14.012	0.000	(0)
HgCl+	1.078e-15	7.143e-16	-14.968	-15.146	-0.179	(0)
HgOH+	2.695e-16	1.787e-16	-15.569	-15.748	-0.179	(0)
Hg (CO3) 2-2	2.350e-16	4.534e-17	-15.629	-16.343	-0.714	(0)
Hg (OH) 3-	3.558e-18	2.358e-18	-17.449	-17.627	-0.179	(0)
HgHCO3+	3.378e-18	2.239e-18	-17.471	-17.650	-0.179	(0)
Hg (NH3) 2+2	1.324e-18	2.556e-19	-17.878	-18.592	-0.714	(0)
HgNH3+2	1.546e-19	2.983e-20	-18.811	-19.525	-0.714	(0)
Hg+2	2.859e-20	5.517e-21	-19.544	-20.258	-0.714	(0)
HgSO4	1.584e-20	1.584e-20	-19.800	-19.800	0.000	(0)
HgF+	3.661e-23	2.426e-23	-22.436	-22.615	-0.179	(0)
Hg (NH3) 3+2	4.517e-26	8.717e-27	-25.345	-26.060	-0.714	(0)
HgNO3+	4.735e-29	3.138e-29	-28.325	-28.503	-0.179	(0)
Hg (NH3) 4+2	3.074e-33	5.933e-34	-32.512	-33.227	-0.714	(0)
Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.017	-137.196	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.281	-137.996	-0.714	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.710	-138.710	0.000	(0)
K	1.496e-02					
K+	1.389e-02	1.070e-02	-1.857	-1.971	-0.114	(0)
KSO4-	1.070e-03	8.305e-04	-2.970	-3.081	-0.110	(0)
KCrO4-	1.638e-16	1.086e-16	-15.786	-15.964	-0.179	(0)
Mg	1.839e-02					
Mg+2	1.075e-02	3.780e-03	-1.968	-2.423	-0.454	(0)
MgSO4	7.543e-03	7.543e-03	-2.122	-2.122	0.000	(0)
MgF+	6.597e-05	5.031e-05	-4.181	-4.298	-0.118	(0)
MgHCO3+	1.991e-05	1.502e-05	-4.701	-4.823	-0.122	(0)
MgCO3	4.633e-06	4.633e-06	-5.334	-5.334	0.000	(0)
MgOH+	1.549e-06	1.224e-06	-5.810	-5.912	-0.102	(0)
MgH2BO3+	8.038e-07	5.841e-07	-6.095	-6.234	-0.139	(0)
Mn (2)	2.221e-04					
Mn+2	1.607e-04	3.102e-05	-3.794	-4.508	-0.714	(0)
MnSO4	6.049e-05	6.049e-05	-4.218	-4.218	0.000	(0)
MnCl+	3.290e-07	2.534e-07	-6.483	-6.596	-0.113	(0)
MnHCO3+	3.121e-07	2.404e-07	-6.506	-6.619	-0.113	(0)
MnF+	1.902e-07	1.465e-07	-6.721	-6.834	-0.113	(0)
MnOH+	8.228e-08	6.337e-08	-7.085	-7.198	-0.113	(0)

MnCl2	2.322e-09	2.322e-09	-8.634	-8.634	0.000	(0)
MnCl3-	5.388e-12	4.150e-12	-11.269	-11.382	-0.113	(0)
MnSeO4	2.879e-12	2.879e-12	-11.541	-11.541	0.000	(0)
MnNO3+	1.143e-12	7.573e-13	-11.942	-12.121	-0.179	(0)
Mn (OH) 3-	3.364e-16	2.591e-16	-15.473	-15.587	-0.113	(0)
Mn (NO3) 2	2.930e-20	2.930e-20	-19.533	-19.533	0.000	(0)
Mn (OH) 4-2	1.933e-21	6.803e-22	-20.714	-21.167	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.367	-40.367	0.000	(0)
Mn (3)	1.067e-24					
Mn+3	1.067e-24	1.015e-25	-23.972	-24.994	-1.022	(0)
Mn (6)	1.751e-40					
MnO4-2	1.751e-40	0.000e+00	-39.757	-40.210	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.585	-44.718	-0.133	(0)
Mo	7.602e-06					
MoO4-2	7.601e-06	2.672e-06	-5.119	-5.573	-0.454	(0)
HMoO4-	9.910e-10	6.569e-10	-9.004	-9.183	-0.179	(0)
H2MoO4	5.945e-14	5.945e-14	-13.226	-13.226	0.000	(0)
AlMo6O21-3	2.494e-39	0.000e+00	-38.603	-40.211	-1.608	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.854	-49.284	-6.430	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.340	-50.805	-4.465	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.073	-53.931	-2.858	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.986	-58.593	-1.608	(0)
N (-3)	2.926e-07					
NH4+	2.556e-07	1.857e-07	-6.593	-6.731	-0.139	(0)
NH4SO4-	2.833e-08	2.182e-08	-7.548	-7.661	-0.113	(0)
NH3	8.568e-09	8.568e-09	-8.067	-8.067	0.000	(0)
CaNH3+2	1.256e-10	2.424e-11	-9.901	-10.615	-0.714	(0)
CuNH3+2	1.236e-11	2.385e-12	-10.908	-11.623	-0.714	(0)
NiNH3+2	2.204e-15	4.253e-16	-14.657	-15.371	-0.714	(0)
Co (NH3) +2	2.103e-15	4.059e-16	-14.677	-15.392	-0.714	(0)
BaNH3+2	2.675e-16	5.162e-17	-15.573	-16.287	-0.714	(0)
Hg (NH3) 2+2	1.324e-18	2.556e-19	-17.878	-18.592	-0.714	(0)
Ca (NH3) 2+2	4.284e-19	8.268e-20	-18.368	-19.083	-0.714	(0)
HgNH3+2	1.546e-19	2.983e-20	-18.811	-19.525	-0.714	(0)
Ni (NH3) 2+2	2.729e-21	5.267e-22	-20.564	-21.278	-0.714	(0)
Co (NH3) 2+2	7.687e-22	1.483e-22	-21.114	-21.829	-0.714	(0)
Hg (NH3) 3+2	4.517e-26	8.717e-27	-25.345	-26.060	-0.714	(0)
Co (NH3) 3+2	8.291e-29	1.600e-29	-28.081	-28.796	-0.714	(0)
Hg (NH3) 4+2	3.074e-33	5.933e-34	-32.512	-33.227	-0.714	(0)
Co (NH3) 4+2	3.728e-36	7.195e-37	-35.428	-36.143	-0.714	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.813	-41.527	-0.714	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.990	-0.714	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.269	-50.877	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.714	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.248	-51.963	-0.714	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.652	-60.831	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.972	-65.686	-0.714	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.984	-0.714	(0)
N (3)	2.217e-05					
NO2-	2.217e-05	1.633e-05	-4.654	-4.787	-0.133	(0)
CuNO2+	7.017e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
CoNO2+	6.840e-14	4.533e-14	-13.165	-13.344	-0.179	(0)
Cu (NO2) 2	7.770e-15	7.770e-15	-14.110	-14.110	0.000	(0)
N (5)	2.017e-08					
NO3-	2.001e-08	1.540e-08	-7.699	-7.812	-0.114	(0)
CaNO3+	1.651e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
MnNO3+	1.143e-12	7.573e-13	-11.942	-12.121	-0.179	(0)
ZnNO3+	2.257e-13	1.496e-13	-12.646	-12.825	-0.179	(0)
CuNO3+	1.999e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
BaNO3+	1.112e-15	7.372e-16	-14.954	-15.132	-0.179	(0)
CdNO3+	1.949e-16	1.292e-16	-15.710	-15.889	-0.179	(0)
PbNO3+	3.086e-17	2.046e-17	-16.511	-16.689	-0.179	(0)
CoNO3+	1.451e-17	9.619e-18	-16.838	-17.017	-0.179	(0)
NiNO3+	5.396e-18	3.576e-18	-17.268	-17.447	-0.179	(0)
Mn (NO3) 2	2.930e-20	2.930e-20	-19.533	-19.533	0.000	(0)
UO2NO3+	3.021e-21	2.003e-21	-20.520	-20.698	-0.179	(0)
Zn (NO3) 2	4.598e-22	4.598e-22	-21.337	-21.337	0.000	(0)

	Cu (NO3) 2	2.569e-24	2.569e-24	-23.590	-23.590	0.000	(0)
	CrNO3+2	1.170e-24	2.259e-25	-23.932	-24.646	-0.714	(0)
	Cd (NO3) 2	9.972e-25	9.972e-25	-24.001	-24.001	0.000	(0)
	Pb (NO3) 2	5.351e-25	5.351e-25	-24.272	-24.272	0.000	(0)
	VO2NO3	4.442e-25	4.442e-25	-24.352	-24.352	0.000	(0)
	Co (NO3) 2	3.015e-25	3.015e-25	-24.521	-24.521	0.000	(0)
	FeNO3+2	2.351e-27	4.537e-28	-26.629	-27.343	-0.714	(0)
	HgNO3+	4.735e-29	3.138e-29	-28.325	-28.503	-0.179	(0)
	Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
Na	2.696e-02						
	Na+	2.547e-02	1.961e-02	-1.594	-1.708	-0.114	(0)
	NaSO4-	1.488e-03	1.155e-03	-2.827	-2.938	-0.110	(0)
	NaHCO3	4.283e-06	4.283e-06	-5.368	-5.368	0.000	(0)
	NaF	1.468e-06	1.468e-06	-5.833	-5.833	0.000	(0)
	NaCO3-	6.934e-07	5.381e-07	-6.159	-6.269	-0.110	(0)
	NaH2BO3	1.385e-07	1.385e-07	-6.859	-6.859	0.000	(0)
	NaCrO4-	4.015e-16	2.661e-16	-15.396	-15.575	-0.179	(0)
Ni	4.816e-10						
	Ni+2	2.630e-10	9.243e-11	-9.580	-10.034	-0.454	(0)
	NiSO4	2.022e-10	2.022e-10	-9.694	-9.694	0.000	(0)
	NiHCO3+	6.677e-12	4.426e-12	-11.175	-11.354	-0.179	(0)
	NiCO3	5.082e-12	5.082e-12	-11.294	-11.294	0.000	(0)
	NiCl+	2.315e-12	1.534e-12	-11.635	-11.814	-0.179	(0)
	NiOH+	1.428e-12	9.464e-13	-11.845	-12.024	-0.179	(0)
	NiF+	4.155e-13	2.754e-13	-12.381	-12.560	-0.179	(0)
	Ni (SO4) 2-2	3.805e-13	7.344e-14	-12.420	-13.134	-0.714	(0)
	Ni (OH) 2	6.114e-14	6.114e-14	-13.214	-13.214	0.000	(0)
	NiNH3+2	2.204e-15	4.253e-16	-14.657	-15.371	-0.714	(0)
	Ni (OH) 3-	7.503e-17	4.973e-17	-16.125	-16.303	-0.179	(0)
	NiCl2	5.013e-17	5.013e-17	-16.300	-16.300	0.000	(0)
	NiSeO4	1.491e-17	1.491e-17	-16.827	-16.827	0.000	(0)
	NiNO3+	5.396e-18	3.576e-18	-17.268	-17.447	-0.179	(0)
	Ni (NH3) 2+2	2.729e-21	5.267e-22	-20.564	-21.278	-0.714	(0)
O (0)	2.416e-35						
	O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.663e-09						
	PbSO4	4.822e-10	4.822e-10	-9.317	-9.317	0.000	(0)
	PbCO3	3.977e-10	3.977e-10	-9.400	-9.400	0.000	(0)
	PbOH+	2.768e-10	1.834e-10	-9.558	-9.737	-0.179	(0)
	Pb+2	2.554e-10	8.979e-11	-9.593	-10.047	-0.454	(0)
	Pb (SO4) 2-2	1.651e-10	3.187e-11	-9.782	-10.497	-0.714	(0)
	PbHCO3+	3.909e-11	2.591e-11	-10.408	-10.587	-0.179	(0)
	PbCl+	3.119e-11	2.067e-11	-10.506	-10.685	-0.179	(0)
	Pb (CO3) 2-2	8.759e-12	1.690e-12	-11.058	-11.772	-0.714	(0)
	Pb (OH) 2	4.718e-12	4.718e-12	-11.326	-11.326	0.000	(0)
	PbF+	1.132e-12	7.506e-13	-11.946	-12.125	-0.179	(0)
	PbCl2	5.991e-13	5.991e-13	-12.223	-12.223	0.000	(0)
	Pb (OH) 3-	5.790e-15	3.837e-15	-14.237	-14.416	-0.179	(0)
	PbCl3-	2.335e-15	1.547e-15	-14.632	-14.810	-0.179	(0)
	PbF2	1.752e-15	1.752e-15	-14.756	-14.756	0.000	(0)
	PbNO3+	3.086e-17	2.046e-17	-16.511	-16.689	-0.179	(0)
	PbCl4-2	2.378e-17	4.589e-18	-16.624	-17.338	-0.714	(0)
	Pb2OH+3	1.057e-17	2.610e-19	-16.976	-18.583	-1.608	(0)
	Pb (OH) 4-2	3.961e-18	7.644e-19	-17.402	-18.117	-0.714	(0)
	PbF3-	5.948e-19	3.943e-19	-18.226	-18.404	-0.179	(0)
	Pb3 (OH) 4+2	2.066e-22	3.988e-23	-21.685	-22.399	-0.714	(0)
	PbF4-2	1.160e-22	2.239e-23	-21.936	-22.650	-0.714	(0)
	Pb (NO3) 2	5.351e-25	5.351e-25	-24.272	-24.272	0.000	(0)
	Pb4 (OH) 4+4	2.050e-26	2.844e-29	-25.688	-28.546	-2.858	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.459	-228.637	-0.179	(0)
S (-2)	0.000e+00						
	HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
	CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
	S5-2	0.000e+00	0.000e+00	-79.129	-79.844	-0.714	(0)
	H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-79.645	-80.360	-0.714	(0)
	S4-2	0.000e+00	0.000e+00	-79.725	-80.440	-0.714	(0)

S3-2	0.000e+00	0.000e+00	-80.531	-81.245	-0.714	(0)
S2-2	0.000e+00	0.000e+00	-81.547	-82.262	-0.714	(0)
S-2	0.000e+00	0.000e+00	-87.325	-87.779	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.017	-137.196	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.281	-137.996	-0.714	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.710	-138.710	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.867	-147.308	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.290	-147.468	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.623	-148.038	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.366	-149.366	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.295	-224.473	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.831	-226.545	-0.714	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.459	-228.637	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.101	-302.816	-0.714	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.606	-304.320	-0.714	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.714	(0)
S (6)	4.702e-02					
SO4-2	3.120e-02	1.097e-02	-1.506	-1.960	-0.454	(0)
MgSO4	7.543e-03	7.543e-03	-2.122	-2.122	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.488e-03	1.155e-03	-2.827	-2.938	-0.110	(0)
KSO4-	1.070e-03	8.305e-04	-2.970	-3.081	-0.110	(0)
MnSO4	6.049e-05	6.049e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.275e-06	9.275e-06	-5.033	-5.033	0.000	(0)
Zn (SO4) 2-2	4.590e-06	8.859e-07	-5.338	-6.053	-0.714	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.833e-08	2.182e-08	-7.548	-7.661	-0.113	(0)
HSO4-	1.736e-08	1.324e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.817e-09	6.817e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.225e-09	1.008e-09	-8.282	-8.996	-0.714	(0)
CoSO4	8.621e-10	8.621e-10	-9.064	-9.064	0.000	(0)
PbSO4	4.822e-10	4.822e-10	-9.317	-9.317	0.000	(0)
NiSO4	2.022e-10	2.022e-10	-9.694	-9.694	0.000	(0)
Pb (SO4) 2-2	1.651e-10	3.187e-11	-9.782	-10.497	-0.714	(0)
CrOHSO4	1.553e-11	1.553e-11	-10.809	-10.809	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2SO4	1.081e-12	1.081e-12	-11.966	-11.966	0.000	(0)
UO2 (SO4) 2-2	8.101e-13	1.563e-13	-12.091	-12.806	-0.714	(0)
AlSO4+	5.371e-13	4.096e-13	-12.270	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.805e-13	7.344e-14	-12.420	-13.134	-0.714	(0)
Al (SO4) 2-	6.311e-14	4.813e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	1.296e-14	8.590e-15	-13.887	-14.066	-0.179	(0)
VO2SO4-	2.252e-17	1.493e-17	-16.647	-16.826	-0.179	(0)
FeSO4+	4.706e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
Fe (SO4) 2-	1.282e-19	8.497e-20	-18.892	-19.071	-0.179	(0)
Cr2 (OH) 2SO4+2	4.343e-20	8.381e-21	-19.362	-20.077	-0.714	(0)
VOSO4	2.877e-20	2.877e-20	-19.541	-19.541	0.000	(0)
HgSO4	1.584e-20	1.584e-20	-19.800	-19.800	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.460e-21	5.460e-21	-20.263	-20.263	0.000	(0)
CrO3SO4-2	2.340e-23	4.516e-24	-22.631	-23.345	-0.714	(0)
VSO4+	7.719e-35	5.116e-35	-34.112	-34.291	-0.179	(0)
U (SO4) 2	1.778e-39	1.778e-39	-38.750	-38.750	0.000	(0)
USO4+2	1.058e-40	0.000e+00	-39.976	-40.690	-0.714	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.652	-60.831	-0.179	(0)
Sb (3)	9.927e-20					
Sb (OH) 3	5.018e-20	5.018e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.908e-20	4.908e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.705e-24	6.433e-24	-23.013	-23.192	-0.179	(0)
Sb (OH) 4-	5.540e-24	3.672e-24	-23.256	-23.435	-0.179	(0)
Sb (OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.276e-26	1.509e-26	-25.643	-25.821	-0.179	(0)

SbO+	7.862e-27	5.211e-27	-26.104	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.714	(0)
Sb (5)	9.018e-08					
SbO3-	9.009e-08	5.971e-08	-7.045	-7.224	-0.179	(0)
Sb (OH) 6-	9.020e-11	6.945e-11	-10.045	-10.158	-0.114	(0)
SbO2+	3.953e-24	2.620e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.272e-39					
HSe-	6.272e-39	4.157e-39	-38.203	-38.381	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.367	-40.367	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.399	-42.399	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.759	-45.473	-0.714	(0)
Se (4)	7.853e-07					
SeO3-2	4.125e-07	7.961e-08	-6.385	-7.099	-0.714	(0)
HSeO3-	3.728e-07	2.471e-07	-6.429	-6.607	-0.179	(0)
H2SeO3	1.302e-12	1.302e-12	-11.885	-11.885	0.000	(0)
Cd (SeO3) 2-2	7.177e-17	1.385e-17	-16.144	-16.859	-0.714	(0)
FeHSeO3+2	9.966e-24	1.923e-24	-23.001	-23.716	-0.714	(0)
Se (6)	9.843e-10					
SeO4-2	9.812e-10	3.449e-10	-9.008	-9.462	-0.454	(0)
MnSeO4	2.879e-12	2.879e-12	-11.541	-11.541	0.000	(0)
ZnSeO4	2.065e-13	2.065e-13	-12.685	-12.685	0.000	(0)
HSeO4-	3.222e-16	2.136e-16	-15.492	-15.670	-0.179	(0)
CdSeO4	1.703e-16	1.703e-16	-15.769	-15.769	0.000	(0)
CoSeO4	6.810e-17	6.810e-17	-16.167	-16.167	0.000	(0)
NiSeO4	1.491e-17	1.491e-17	-16.827	-16.827	0.000	(0)
Zn (SeO4) 2-2	3.742e-22	7.221e-23	-21.427	-22.141	-0.714	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.383	-58.991	-1.608	(0)
U (4)	1.841e-19					
U (OH) 5-	1.840e-19	1.220e-19	-18.735	-18.914	-0.179	(0)
U (OH) 4	6.324e-23	6.324e-23	-22.199	-22.199	0.000	(0)
U (OH) 3+	4.318e-27	2.862e-27	-26.365	-26.543	-0.179	(0)
U (OH) 2+2	8.490e-32	1.638e-32	-31.071	-31.786	-0.714	(0)
UF3+	4.689e-36	3.108e-36	-35.329	-35.508	-0.179	(0)
UF2+2	8.565e-37	1.653e-37	-36.067	-36.782	-0.714	(0)
UOH+3	3.870e-37	9.553e-39	-36.412	-38.020	-1.608	(0)
UF4	4.042e-38	4.042e-38	-37.393	-37.393	0.000	(0)
UF+3	4.484e-39	1.107e-40	-38.348	-39.956	-1.608	(0)
U (SO4) 2	1.778e-39	1.778e-39	-38.750	-38.750	0.000	(0)
UF5-	2.867e-40	1.900e-40	-39.543	-39.721	-0.179	(0)
USO4+2	1.058e-40	0.000e+00	-39.976	-40.690	-0.714	(0)
UF6-2	0.000e+00	0.000e+00	-40.453	-41.167	-0.714	(0)
U+4	0.000e+00	0.000e+00	-42.472	-45.330	-2.858	(0)
UC1+3	0.000e+00	0.000e+00	-44.210	-45.818	-1.608	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-156.059	-170.527	-14.468	(0)
U (5)	8.183e-16					
UO2+	8.183e-16	5.424e-16	-15.087	-15.266	-0.179	(0)
U (6)	6.570e-07					
UO2 (CO3) 3-4	5.984e-07	8.300e-10	-6.223	-9.081	-2.858	(0)
UO2 (CO3) 2-2	5.824e-08	1.124e-08	-7.235	-7.949	-0.714	(0)
UO2CO3	3.822e-10	3.822e-10	-9.418	-9.418	0.000	(0)
UO2OH+	1.007e-11	6.671e-12	-10.997	-11.176	-0.179	(0)
UO2F+	1.610e-12	1.067e-12	-11.793	-11.972	-0.179	(0)
UO2SO4	1.081e-12	1.081e-12	-11.966	-11.966	0.000	(0)
UO2 (SO4) 2-2	8.101e-13	1.563e-13	-12.091	-12.806	-0.714	(0)
UO2F2	3.650e-13	3.650e-13	-12.438	-12.438	0.000	(0)
UO2+2	1.854e-13	6.516e-14	-12.732	-13.186	-0.454	(0)
UO2F3-	1.641e-14	1.088e-14	-13.785	-13.963	-0.179	(0)
UO2Cl+	1.034e-15	6.856e-16	-14.985	-15.164	-0.179	(0)
(UO2) 2 (OH) 2+2	3.828e-16	7.387e-17	-15.417	-16.132	-0.714	(0)
(UO2) 3 (OH) 5+	3.731e-16	2.473e-16	-15.428	-15.607	-0.179	(0)
UO2F4-2	5.311e-17	1.025e-17	-16.275	-16.989	-0.714	(0)
UO2NO3+	3.021e-21	2.003e-21	-20.520	-20.698	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.581	-42.759	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.465	-44.180	-0.714	(0)
V (3)	4.290e-15					
V (OH) 3	4.290e-15	4.290e-15	-14.368	-14.368	0.000	(0)

V(OH) 2+	5.177e-26	3.431e-26	-25.286	-25.465	-0.179	(0)
VOH+2	2.088e-29	4.029e-30	-28.680	-29.395	-0.714	(0)
V+3	4.004e-34	9.883e-36	-33.398	-35.005	-1.608	(0)
VSO4+	7.719e-35	5.116e-35	-34.112	-34.291	-0.179	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.800	-56.407	-1.608	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-55.132	-57.990	-2.858	(0)
V(4)	2.417e-18					
V(OH) 3+	2.328e-18	1.543e-18	-17.633	-17.812	-0.179	(0)
VO+2	4.937e-20	9.527e-21	-19.307	-20.021	-0.714	(0)
VOSO4	2.877e-20	2.877e-20	-19.541	-19.541	0.000	(0)
VOF+	1.023e-20	6.779e-21	-19.990	-20.169	-0.179	(0)
VOF2	3.015e-22	3.015e-22	-21.521	-21.521	0.000	(0)
VOC1+	2.616e-22	1.734e-22	-21.582	-21.761	-0.179	(0)
VOF3-	1.915e-24	1.269e-24	-23.718	-23.896	-0.179	(0)
VOF4-2	3.149e-27	6.077e-28	-26.502	-27.216	-0.714	(0)
H2V2O4+2	6.208e-31	1.198e-31	-30.207	-30.922	-0.714	(0)
V(5)	4.777e-08					
H2VO4-	2.813e-08	1.864e-08	-7.551	-7.729	-0.179	(0)
HVO4-2	1.964e-08	3.790e-09	-7.707	-8.421	-0.714	(0)
H3VO4	2.304e-12	2.304e-12	-11.638	-11.638	0.000	(0)
HV2O7-3	9.718e-13	2.399e-14	-12.012	-13.620	-1.608	(0)
H3V2O7-	4.192e-13	2.778e-13	-12.378	-12.556	-0.179	(0)
VO4-3	6.228e-14	1.537e-15	-13.206	-14.813	-1.608	(0)
V2O7-4	3.767e-14	5.226e-17	-13.424	-16.282	-2.858	(0)
V3O9-3	2.765e-16	6.825e-18	-15.558	-17.166	-1.608	(0)
VO2+	7.405e-17	5.702e-17	-16.130	-16.244	-0.114	(0)
VO2SO4-	2.252e-17	1.493e-17	-16.647	-16.826	-0.179	(0)
VO2F	1.186e-17	1.186e-17	-16.926	-16.926	0.000	(0)
VO2F2-	7.709e-19	5.109e-19	-18.113	-18.292	-0.179	(0)
V4O12-4	3.832e-20	5.315e-23	-19.417	-22.274	-2.858	(0)
VO2F3-2	3.918e-21	7.561e-22	-20.407	-21.121	-0.714	(0)
VO2F4-3	1.788e-24	4.413e-26	-23.748	-25.355	-1.608	(0)
VO2NO3	4.442e-25	4.442e-25	-24.352	-24.352	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.581	-60.011	-6.430	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.267	-59.733	-4.465	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.575	-62.433	-2.858	(0)
Zn	2.594e-05					
Zn+2	1.100e-05	3.866e-06	-4.959	-5.413	-0.454	(0)
ZnSO4	9.275e-06	9.275e-06	-5.033	-5.033	0.000	(0)
Zn(SO4) 2-2	4.590e-06	8.859e-07	-5.338	-6.053	-0.714	(0)
ZnOH+	4.744e-07	3.145e-07	-6.324	-6.502	-0.179	(0)
ZnCO3	3.278e-07	3.278e-07	-6.484	-6.484	0.000	(0)
ZnCl+	8.351e-08	6.301e-08	-7.078	-7.201	-0.122	(0)
ZnHCO3+	7.164e-08	4.748e-08	-7.145	-7.323	-0.179	(0)
ZnOHCl	6.709e-08	6.709e-08	-7.173	-7.173	0.000	(0)
Zn(OH) 2	4.053e-08	4.053e-08	-7.392	-7.392	0.000	(0)
ZnF+	1.381e-08	9.151e-09	-7.860	-8.039	-0.179	(0)
ZnCl2	6.480e-10	6.480e-10	-9.188	-9.188	0.000	(0)
Zn(OH) 3-	2.493e-10	1.652e-10	-9.603	-9.782	-0.179	(0)
ZnCl3-	4.426e-12	3.339e-12	-11.354	-11.476	-0.122	(0)
ZnNO3+	2.257e-13	1.496e-13	-12.646	-12.825	-0.179	(0)
ZnSeO4	2.065e-13	2.065e-13	-12.685	-12.685	0.000	(0)
ZnCl4-2	3.079e-14	1.083e-14	-13.512	-13.965	-0.454	(0)
Zn(OH) 4-2	2.772e-14	5.350e-15	-13.557	-14.272	-0.714	(0)
Zn(NO3) 2	4.598e-22	4.598e-22	-21.337	-21.337	0.000	(0)
Zn(SeO4) 2-2	3.742e-22	7.221e-23	-21.427	-22.141	-0.714	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.290	-147.468	-0.179	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.366	-149.366	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.295	-224.473	-0.179	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.831	-226.545	-0.714	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.606	-304.320	-0.714	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.16	-48.87	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-42.13	-37.62	4.51	(Co(NH3)5Cl)Cl2	

(Co (NH3) 5OH2) Cl3	-49.35	-37.62	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.25	-53.32	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-56.47	-36.44	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.43	-28.03	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.37	-22.92	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.40	9.40	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.72	-45.36	2.37	Al2 (MoO4) 3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4 (OH) 10SO4	-2.86	19.84	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-16.96	-1.08	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.23	6.71	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.55	-6.72	1.83	BaSeO3
BaSeO4	-10.02	-17.48	-7.46	BaSeO4
Bianchite	-5.61	-7.38	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.86	-77.38	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.45	13.39	16.84	Mg (OH) 2
Bunsenite	-6.66	5.78	12.45	NiO
Ca (VO3) 2	-9.17	-3.51	5.66	Ca (VO3) 2
Ca2V2O7	-7.84	9.66	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.89	9.66	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-16.13	22.83	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-17.03	22.83	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-14.95	-17.21	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	-0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.16	-1.35	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.09	-12.11	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.64	-0.80	9.84	Cd (BO2) 2
Cd (OH) 2	-6.41	7.24	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.49	7.24	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.54	-13.83	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-18.62	3.94	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-17.22	11.18	28.40	Cd4 (OH) 6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2

Cdmetal (alpha)	-31.82	-18.31	13.51	Cd
Cdmetal (gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4:2H2O	-16.19	-18.04	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co (BO2) 2	-28.70	-1.63	27.07	Co (BO2) 2
Co (OH) 2	-6.68	6.41	13.09	Co (OH) 2
Co (OH) 3	-10.91	-13.22	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-26.10	-13.06	13.03	Co3 (AsO4) 2
Co3O4	-9.53	-20.02	-10.50	Co3O4
CoCl2	-22.05	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.79	2.54	CoCl2:6H2O
CoCO3	-5.26	-15.24	-9.98	CoCO3
CoF2	-15.66	-17.26	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.32	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.18	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.68	-39.88	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.34	-18.87	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.97	-11.15	10.82	Cr (OH) 2
Cr (OH) 3	-2.66	-1.32	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.57	-1.32	-0.75	Cr (OH) 3
Cr2O3	-0.28	-2.64	-2.36	Cr2O3
CrCl2	-45.43	-31.34	14.09	CrCl2
CrCl3	-46.72	-31.61	15.11	CrCl3
CrF3	-25.48	-36.82	-11.34	CrF3
Crmetal	-67.17	-36.69	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Cryolite	-9.16	-43.00	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.50	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.69	-22.13	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4

Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.42	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.78	-6.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg(CO3)2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.20	0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.50	-13.22	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.69	-8.13	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.53	-37.16	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.39	0.81	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.98	-63.58	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.84	-42.84	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.70	-79.06	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-5.04	2.63	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.50	-3.90	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg(CH3)2(g)	-184.58	-258.29	-73.71	Hg(CH3)2
Hg(g)	-6.72	-14.59	-7.87	Hg
Hg(OH)2	-7.14	-10.64	-3.50	Hg(OH)2
Hg2(g)	-14.22	-29.18	-14.96	Hg2
Hg2(OH)2	-8.89	-3.63	5.26	Hg2(OH)2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.31	-34.01	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.49	-18.15	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.88	-53.56	-29.68	Hg3O2CO3
HgCl(g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.57	-30.83	-21.26	HgCl2
HgF(g)	-46.33	-13.65	32.68	HgF
HgF2(g)	-46.87	-34.30	12.57	HgF2
Hgmetal(l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.23	-56.93	-55.69	HgSe
HgSeO3	-12.72	-25.15	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.86	-19.63	-8.77	Mg5(CO3)4(OH)2:4H2O

K-Alum	-15.05	-20.22	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-5.24	-20.04	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-31.64	-48.88	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-17.99	-18.51	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-12.78	-9.51	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-12.67	-13.40	-0.73	K ₂ SeO ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO ₄
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.93	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.92	19.78	16.86	Fe ₂ MgO ₄
Magnesite	-0.79	-8.25	-7.46	MgCO ₃
Magnetite	6.43	9.84	3.40	Fe ₃ O ₄
Malachite	0.16	-5.15	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.13	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl ₂
Melanterite	-12.12	-14.33	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg(OH) ₂ (active)	-5.40	13.39	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.56	-3.28	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-271.83	-197.15	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.25	10.11	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.45	10.75	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.37	-16.99	5.38	MgCrO ₄
MgF ₂	-2.14	-10.27	-8.13	MgF ₂
MgMoO ₄	-6.15	-8.00	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.18	-1.13	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-10.69	-11.89	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-30.67	42.85	73.52	Pb ₃ O ₄
Mirabilite	-4.27	-5.38	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-10.27	-5.37	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.16	-55.87	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.17	-86.09	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.88	1.62	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.60	-8.89	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.48	-34.98	3.50	MnSe
MnSeO ₃	-4.34	-3.21	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.19	-3.21	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-11.92	-13.97	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.05	-6.47	2.58	MnSO ₄
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO ₃	-13.39	-21.39	-8.00	MoO ₃
Morenosite	-9.86	-12.00	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.26	-219.52	-70.26	MoS ₂
Na-Jarosite	-8.58	-19.78	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.46	-48.36	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.91	-17.98	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-13.78	-30.38	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.48	-8.99	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.21	-8.99	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-12.42	-2.12	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-14.16	-12.88	1.28	Na ₂ SeO ₄
Na ₃ Sb	-171.78	-77.33	94.45	Na ₃ Sb
Na ₃ VO ₄	-26.42	10.26	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.27	8.13	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.26	-1.31	Na ₂ CO ₃ ·10H ₂ O

NaVO3	-5.99	-2.14	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.01	5.78	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-30.66	-14.96	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-26.65	5.35	32.00	Ni4 (OH) 6SO4
NiCO3	-9.00	-15.87	-6.87	NiCO3
NiMoO4	-4.47	-15.61	-11.14	NiMoO4
NiS (alpha)	-74.91	-80.51	-5.60	NiS
NiS (beta)	-69.41	-80.51	-11.10	NiS
NiS (gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.81	-40.51	-17.70	NiSe
NiSeO3:2H2O	-11.55	-8.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.98	-19.50	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb (BO2) 2	-8.79	-2.28	6.52	Pb (BO2) 2
Pb (OH) 2	-2.38	5.77	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-63.44	-72.20	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-7.35	1.44	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.65	11.54	26.19	Pb2O (OH) 2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.24	-5.14	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.79	-14.99	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.51	0.63	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.16	-0.47	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.80	5.30	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn (OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb (OH) 3	-12.19	-19.30	-7.11	Sb (OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.70	-177.46	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6 (orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.16	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.37	2.63	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.63	-20.74	-7.11	Se
Semetal (hex)	-13.04	-20.74	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.28	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.24	-11.24	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4

Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.70	-5.38	0.32	Na2SO4
Thermonatrite	-9.88	-9.25	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.09	9.99	21.08	U3O8
U3Sb4	-577.21	-424.83	152.38	U3Sb4
U4O9	-26.23	-29.25	-3.02	U4O9
UF4	-31.50	-61.03	-29.54	UF4
UF4:2.5H2O	-28.32	-61.04	-32.72	UF4:2.5H2O
UO2 (am)	-14.63	-13.70	0.93	UO2
UO2 (NO3) 2	-40.96	-28.81	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.66	-28.81	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.20	-28.81	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.86	-28.82	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.98	2.63	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.40	-22.65	-2.25	UO2SeO4:4H2O
UO3	-5.07	2.63	7.70	UO3
Uraninite	-9.03	-13.70	-4.67	UO2
USb2	-218.81	-189.24	29.58	USb2
V (OH) 3	-18.87	-11.28	7.59	V (OH) 3
V2O5	-15.31	-16.67	-1.36	V2O5
V3O5	-40.00	-38.16	1.84	V3O5
V4O7	-49.55	-42.37	7.19	V4O7
V6O13	-40.25	-101.11	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VC12	-63.12	-44.25	18.87	VC12
VC13	-65.00	-41.57	23.43	VC13
VF4	-66.47	-51.54	14.93	VF4
Vmetal	-93.62	-49.60	44.03	V
VO	-38.81	-24.05	14.76	VO
VO (OH) 2	-9.36	-4.21	5.15	VO (OH) 2
VO2Cl	-21.27	-18.43	2.84	VO2Cl
VOC1	-32.53	-21.38	11.15	VOC1
VOC12	-37.16	-24.40	12.76	VOC12
VOSO4	-25.59	-21.98	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO4
Zn (BO2) 2	-5.93	2.36	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.36	-21.04	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.80	10.40	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.07	10.40	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.35	10.40	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.13	10.40	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.33	10.40	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.47	3.03	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.48	10.71	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.74	-1.09	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.26	-4.34	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.57	23.83	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.68	31.82	38.50	Zn5 (OH) 8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.26	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO (active)	-0.79	10.40	11.19	ZnO
ZnS (am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.49	-35.89	-14.40	ZnSe
ZnSeO4:6H2O	-13.36	-14.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.37	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 75.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 402
 equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 donnan 1e-008
USE EQUILIBRIUM_PHASES 402
USE Surface 402
USE Solution 407
SAVE Solution 408 #Initial Stage 4 Run-off Water After Mineral
Precipitation and Sorption Loss
END

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 402.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.948e-19 Surface + diffuse layer charge, eq
3.133e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.873e-01 m² for 1.071e-05 moles of Ferrihydrite

Water in diffuse layer: 6.873e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is

+1).

Element	Moles
C	1.7557e-11
Ca	2.1760e-13
Cl	3.5159e-10
H	5.1793e-11
K	3.4519e-13
Mg	3.3713e-14
N	1.4234e-09
Na	1.4625e-12
O	6.3441e-08
S	1.4783e-08

Hfo_s

5.353e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
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Hfo_sOH2+	3.578e-08	0.668	3.578e-08	-7.446
Hfo_sOH	1.755e-08	0.328	1.755e-08	-7.756
Hfo_sO-	1.972e-10	0.004	1.972e-10	-9.705
Hfo_sOHCa+2	6.532e-13	0.000	6.532e-13	-12.185

Hfo_w

2.141e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	9.893e-07	0.462	9.893e-07	-6.005
Hfo_wOH	4.852e-07	0.227	4.852e-07	-6.314
Hfo_wSO4-	3.341e-07	0.156	3.341e-07	-6.476
Hfo_wOHSO4-2	3.270e-07	0.153	3.270e-07	-6.485
Hfo_wO-	5.451e-09	0.003	5.451e-09	-8.263
Hfo_wOMg+	7.705e-15	0.000	7.705e-15	-14.113
Hfo_wOCa+	2.614e-15	0.000	2.614e-15	-14.583

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Ag2Se, is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Ag2Se, is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 407. Solution after simulation 74.
 Using surface 402.
 Using pure phase assemblage 402. Pure-phase assemblage after simulation 74.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Initial	Moles in assemblage Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	7.221e-05	7.221e-05	6.113e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	5.136e-08	4.193e-08	-9.430e-09
Barite	0.00	-9.98	-9.98	2.998e-05	3.001e-05	2.829e-08
Brochantite	-0.00	15.22	15.22	1.341e-04	1.339e-04	-1.503e-07
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.012e+01	1.012e+01	9.786e-07
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.18	-1.36	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	4.569e-02	4.569e-02	-1.724e-06
Carnotite	-0.00	0.23	0.23	2.081e-06	1.823e-06	-2.580e-07
Cd(BO2)2	-10.65	-0.81	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	2.414e-07	2.414e-07	-1.673e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-1.23	-3.58	-2.36	0.000e+00	0	0.000e+00

Cu2Se(alpha)	-4.17	-49.97	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	1.071e-05	1.071e-05	-2.206e-14
Fluorite	0.00	-10.50	-10.50	3.684e-03	3.684e-03	1.244e-09
Gummite	-4.90	2.77	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	9.137e-03	9.139e-03	1.502e-06
HgSe	-1.25	-56.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.35	-3.22	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.02	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.00	-15.87	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.47	-15.61	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	7.546e-10
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	7.508e-07	7.470e-07	-3.761e-09
Rutherfordine	-4.37	-18.87	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.22	2.77	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-10.66	10.42	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.84	2.77	5.61	0.000e+00	0	0.000e+00
UO3	-4.93	2.77	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

1.295e-20 Surface + diffuse layer charge, eq
1.774e-07 Surface charge, eq
2.491e-02 sigma, C/m²
2.950e-02 psi, V
-1.148e+00 -F*psi/RT
3.172e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.873e-01 m² for 1.071e-05 moles of Ferrihydrite

Water in diffuse layer: 6.873e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 2.642e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.023e-01 (= c_DL / c_free if z is +1).

Element	Moles
Al	4.2273e-11
As	1.3228e-14
B	6.9110e-10
Ba	1.5235e-13
C	4.3105e-09
Ca	7.4763e-08
Cd	1.5003e-13
Cl	6.4190e-08
Co	1.7674e-14
Cr	2.4287e-15
Cu	3.2694e-12
F	1.6175e-09
Fe	7.1891e-15
H	6.4636e-09
Hg	6.5962e-14
K	9.4312e-08
Mg	1.1259e-07

Mn	1.3204e-09
Mo	6.4195e-11
N	1.7088e-10
Na	1.6930e-07
Ni	2.9565e-15
O	1.5121e-06
Pb	1.1137e-14
S	3.7406e-07
Sb	6.8695e-13
Se	6.1143e-12
U	9.3190e-12
V	2.7323e-13
Zn	1.6947e-10

Hfo_s

5.353e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.607e-08	0.487	2.595e-08	-7.586
Hfo_sOCu+	1.470e-08	0.275	1.464e-08	-7.835
Hfo_sOMn+	8.596e-09	0.161	8.558e-09	-8.068
Hfo_sOPb+	2.792e-09	0.052	2.779e-09	-8.556
Hfo_sOCrOH+	7.569e-10	0.014	7.536e-10	-9.123
Hfo_sOHCa+2	5.723e-10	0.011	5.698e-10	-9.244
Hfo_sOH	2.713e-11	0.001	2.701e-11	-10.569
Hfo_sO-	8.132e-12	0.000	8.096e-12	-11.092
Hfo_sOCd+	5.447e-12	0.000	5.423e-12	-11.266
Hfo_sOH2+	2.073e-12	0.000	2.064e-12	-11.685
Hfo_sONi+	1.503e-13	0.000	1.497e-13	-12.825
Hfo_sOCu+	9.505e-14	0.000	9.464e-14	-13.024
Hfo_sOHBa+2	7.515e-15	0.000	7.482e-15	-14.126
Hfo_sOFe+	1.511e-15	0.000	1.505e-15	-14.823
Hfo_sOHg+	2.190e-16	0.000	2.181e-16	-15.661

Hfo_w

2.141e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	5.866e-07	0.274	5.840e-07	-6.234
Hfo_wOMg+	5.143e-07	0.240	5.120e-07	-6.291
Hfo_wOHVO4-3	2.715e-07	0.127	2.703e-07	-6.568
Hfo_wOZn+	2.123e-07	0.099	2.114e-07	-6.675
Hfo_wOH	2.110e-07	0.099	2.101e-07	-6.678
Hfo_wOHSO4-2	1.418e-07	0.066	1.412e-07	-6.850
Hfo_wO-	6.326e-08	0.030	6.298e-08	-7.201
Hfo_wOMn+	5.312e-08	0.025	5.288e-08	-7.277
Hfo_wOHSeO3-2	2.386e-08	0.011	2.375e-08	-7.624
Hfo_wOHAsO4-3	1.886e-08	0.009	1.878e-08	-7.726
Hfo_wOCa+	1.719e-08	0.008	1.712e-08	-7.767
Hfo_wOH2+	1.613e-08	0.008	1.606e-08	-7.794
Hfo_wSO4-	5.443e-09	0.003	5.419e-09	-8.266
Hfo_wSeO3-	3.102e-09	0.001	3.088e-09	-8.510
Hfo_wOHMoO4-2	1.408e-09	0.001	1.402e-09	-8.853
Hfo_wOPb+	9.701e-10	0.000	9.658e-10	-9.015
Hfo_wH2BO3	8.356e-11	0.000	8.320e-11	-10.080
Hfo_wMoO4-	6.961e-11	0.000	6.931e-11	-10.159
Hfo_wOCd+	1.808e-11	0.000	1.800e-11	-10.745
Hfo_wHAsO4-	2.470e-12	0.000	2.459e-12	-11.609
Hfo_wOCu+	2.084e-12	0.000	2.075e-12	-11.683
Hfo_wONi+	1.578e-12	0.000	1.571e-12	-11.804
Hfo_wOHg+	8.346e-14	0.000	8.309e-14	-13.080
Hfo_wOFe+	7.418e-15	0.000	7.385e-15	-14.132
Hfo_wH2AsO4	6.108e-15	0.000	6.081e-15	-14.216
Hfo_wOHSeO4-2	4.409e-15	0.000	4.389e-15	-14.358
Hfo_wOBa+	3.264e-15	0.000	3.249e-15	-14.488
Hfo_wOHSbO(OH) 4-	9.237e-16	0.000	9.197e-16	-15.036

Hfo_wSeO4-	1.473e-16	0.000	1.467e-16	-15.834
Hfo_wSbO(OH) 4	4.566e-17	0.000	4.546e-17	-16.342
Hfo_wOHCrO4-2	1.536e-17	0.000	1.529e-17	-16.815
Hfo_wCrO4-	5.376e-19	0.000	5.352e-19	-18.271
Hfo_wH2AsO3	8.694e-25	0.000	8.656e-25	-24.063

-----Solution composition-----

Elements	Molality	Moles
Al	5.554e-06	5.579e-06
As	1.571e-09	1.578e-09
B	1.000e-04	1.005e-04
Ba	2.722e-08	2.734e-08
C	5.746e-04	5.772e-04
Ca	1.207e-02	1.212e-02
Cd	2.228e-08	2.238e-08
Cl	8.427e-03	8.464e-03
Co	2.955e-09	2.968e-09
Cr	3.840e-10	3.857e-10
Cu	4.982e-07	5.004e-07
F	2.255e-04	2.265e-04
Fe	1.104e-09	1.108e-09
Hg	9.597e-09	9.639e-09
K	1.496e-02	1.503e-02
Mg	1.839e-02	1.847e-02
Mn	2.221e-04	2.230e-04
Mo	7.604e-06	7.638e-06
N	2.248e-05	2.258e-05
Na	2.696e-02	2.708e-02
Ni	4.798e-10	4.820e-10
Pb	1.662e-09	1.670e-09
S	4.702e-02	4.723e-02
Sb	9.018e-08	9.058e-08
Se	7.595e-07	7.628e-07
U	9.139e-07	9.180e-07
V	3.434e-08	3.449e-08
Zn	2.571e-05	2.582e-05

-----Description of solution-----

	pH	=	7.908	Charge balance
	pe	=	4.865	Adjusted to redox
equilibrium	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.227e-01	
	Mass of water (kg)	=	1.004e+00	
	Total alkalinity (eq/kg)	=	6.158e-04	
	Total CO2 (mol/kg)	=	5.746e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.115030e+02	
	Total O	=	5.594210e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.090e-06	8.133e-07	-5.962	-6.090	-0.127	(0)
H+	1.605e-08	1.236e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.554e-06					
Al(OH) 4-	5.509e-06	4.202e-06	-5.259	-5.377	-0.118	(0)
Al(OH) 3	4.103e-08	4.103e-08	-7.387	-7.387	0.000	(0)
Al(OH) 2+	3.259e-09	2.529e-09	-8.487	-8.597	-0.110	(0)

AlF3	4.026e-10	4.026e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.474e-10	2.696e-10	-9.459	-9.569	-0.110	(0)
AlF4-	3.139e-11	2.394e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.575e-11	5.708e-12	-10.803	-11.243	-0.441	(0)
AlOH+2	1.080e-11	3.914e-12	-10.967	-11.407	-0.441	(0)
AlSO4+	5.371e-13	4.096e-13	-12.270	-12.388	-0.118	(0)
Al (SO4) 2-	6.311e-14	4.813e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.059e-14	4.812e-15	-13.296	-14.318	-1.022	(0)
AlMo6O21-3	2.499e-39	0.000e+00	-38.602	-40.210	-1.608	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.002e-24	6.640e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.539e-28	4.901e-29	-27.595	-28.310	-0.714	(0)
H4AsO3+	1.478e-31	9.794e-32	-30.830	-31.009	-0.179	(0)
AsO3-3	6.193e-33	1.529e-34	-32.208	-33.816	-1.608	(0)
As (5)	1.571e-09					
HAsO4-2	1.519e-09	2.931e-10	-8.819	-9.533	-0.714	(0)
H2AsO4-	4.983e-11	3.303e-11	-10.303	-10.481	-0.179	(0)
AsO4-3	3.038e-12	7.500e-14	-11.517	-13.125	-1.608	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.000e-04					
H3BO3	9.217e-05	9.481e-05	-4.035	-4.023	0.012	(0)
H2BO3-	6.133e-06	4.456e-06	-5.212	-5.351	-0.139	(0)
MgH2BO3+	8.038e-07	5.840e-07	-6.095	-6.234	-0.139	(0)
CaH2BO3+	7.931e-07	5.762e-07	-6.101	-6.239	-0.139	(0)
NaH2BO3	1.385e-07	1.385e-07	-6.859	-6.859	0.000	(0)
BF (OH) 3-	6.177e-09	4.488e-09	-8.209	-8.348	-0.139	(0)
H5 (BO3) 2-	4.949e-10	3.596e-10	-9.305	-9.444	-0.139	(0)
H8 (BO3) 3-	4.692e-12	3.409e-12	-11.329	-11.467	-0.139	(0)
BaH2BO3+	1.810e-12	1.315e-12	-11.742	-11.881	-0.139	(0)
BF2 (OH) 2-	9.698e-13	7.046e-13	-12.013	-12.152	-0.139	(0)
BF3OH-	5.541e-19	4.026e-19	-18.256	-18.395	-0.139	(0)
BF4-	4.004e-24	2.909e-24	-23.397	-23.536	-0.139	(0)
Ba	2.722e-08					
Ba+2	2.717e-08	9.549e-09	-7.566	-8.020	-0.454	(0)
BaHCO3+	4.518e-11	3.542e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.810e-12	1.315e-12	-11.742	-11.881	-0.139	(0)
BaOH+	4.402e-14	3.390e-14	-13.356	-13.470	-0.113	(0)
BaNO3+	1.112e-15	7.372e-16	-14.954	-15.132	-0.179	(0)
BaNH3+2	2.675e-16	5.163e-17	-15.573	-16.287	-0.714	(0)
C (4)	5.746e-04					
HCO3-	5.005e-04	3.884e-04	-3.301	-3.411	-0.110	(0)
CaHCO3+	2.073e-05	1.625e-05	-4.683	-4.789	-0.106	(0)
MgHCO3+	1.991e-05	1.502e-05	-4.701	-4.823	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.633e-06	4.633e-06	-5.334	-5.334	0.000	(0)
NaHCO3	4.283e-06	4.283e-06	-5.368	-5.368	0.000	(0)
CO3-2	4.192e-06	1.474e-06	-5.378	-5.832	-0.454	(0)
UO2 (CO3) 3-4	8.324e-07	1.155e-09	-6.080	-8.938	-2.858	(0)
NaCO3-	6.934e-07	5.380e-07	-6.159	-6.269	-0.110	(0)
ZnCO3	3.248e-07	3.248e-07	-6.488	-6.488	0.000	(0)
MnHCO3+	3.120e-07	2.403e-07	-6.506	-6.619	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
UO2 (CO3) 2-2	8.101e-08	1.563e-08	-7.091	-7.806	-0.714	(0)
ZnHCO3+	7.099e-08	4.705e-08	-7.149	-7.327	-0.179	(0)
Cu (CO3) 2-2	4.851e-09	9.361e-10	-8.314	-9.029	-0.714	(0)
CuHCO3+	1.006e-09	6.666e-10	-8.998	-9.176	-0.179	(0)
UO2CO3	5.317e-10	5.317e-10	-9.274	-9.274	0.000	(0)
PbCO3	3.976e-10	3.976e-10	-9.401	-9.401	0.000	(0)
CdCO3	8.903e-11	8.903e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.518e-11	3.542e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.908e-11	2.590e-11	-10.408	-10.587	-0.179	(0)
CoHCO3+	1.795e-11	1.189e-11	-10.746	-10.925	-0.179	(0)
CoCO3	9.807e-12	9.807e-12	-11.008	-11.008	0.000	(0)
Pb (CO3) 2-2	8.756e-12	1.690e-12	-11.058	-11.772	-0.714	(0)
BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)

	NiHCO3+	6.653e-12	4.410e-12	-11.177	-11.356	-0.179	(0)
	NiCO3	5.063e-12	5.063e-12	-11.296	-11.296	0.000	(0)
	CdHCO3+	3.537e-12	2.344e-12	-11.451	-11.630	-0.179	(0)
	Cd(CO3) 2-2	5.040e-13	9.726e-14	-12.298	-13.012	-0.714	(0)
	HgCO3	9.730e-15	9.730e-15	-14.012	-14.012	0.000	(0)
	FeHCO3+	2.701e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
	Hg(CO3) 2-2	2.349e-16	4.534e-17	-15.629	-16.344	-0.714	(0)
	HgHCO3+	3.378e-18	2.239e-18	-17.471	-17.650	-0.179	(0)
Ca	1.207e-02						
	Ca+2	6.393e-03	2.247e-03	-2.194	-2.648	-0.454	(0)
	CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
	CaHCO3+	2.073e-05	1.625e-05	-4.683	-4.789	-0.106	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.778e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
	CaH2BO3+	7.931e-07	5.762e-07	-6.101	-6.239	-0.139	(0)
	CaOH+	4.651e-08	3.647e-08	-7.332	-7.438	-0.106	(0)
	CaNO3+	1.652e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
	CaNH3+2	1.256e-10	2.424e-11	-9.901	-10.615	-0.714	(0)
	Ca(NH3) 2+2	4.285e-19	8.269e-20	-18.368	-19.083	-0.714	(0)
Cd	2.228e-08						
	Cd+2	7.542e-09	2.651e-09	-8.123	-8.577	-0.454	(0)
	CdSO4	6.814e-09	6.814e-09	-8.167	-8.167	0.000	(0)
	Cd(SO4) 2-2	5.223e-09	1.008e-09	-8.282	-8.997	-0.714	(0)
	CdCl+	2.478e-09	1.643e-09	-8.606	-8.784	-0.179	(0)
	CdCO3	8.903e-11	8.903e-11	-10.050	-10.050	0.000	(0)
	CdOHC1	5.480e-11	5.480e-11	-10.261	-10.261	0.000	(0)
	CdCl2	4.443e-11	4.443e-11	-10.352	-10.352	0.000	(0)
	CdOH+	2.584e-11	1.713e-11	-10.588	-10.766	-0.179	(0)
	CdF+	7.520e-12	4.984e-12	-11.124	-11.302	-0.179	(0)
	CdHCO3+	3.537e-12	2.344e-12	-11.451	-11.630	-0.179	(0)
	Cd(CO3) 2-2	5.040e-13	9.726e-14	-12.298	-13.012	-0.714	(0)
	CdCl3-	2.744e-13	1.819e-13	-12.562	-12.740	-0.179	(0)
	Cd(OH) 2	8.789e-14	8.789e-14	-13.056	-13.056	0.000	(0)
	CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
	CdNO3+	1.948e-16	1.291e-16	-15.710	-15.889	-0.179	(0)
	CdSeO4	1.644e-16	1.644e-16	-15.784	-15.784	0.000	(0)
	Cd(SeO3) 2-2	6.693e-17	1.292e-17	-16.174	-16.889	-0.714	(0)
	Cd2OH+3	9.217e-18	2.275e-19	-17.035	-18.643	-1.608	(0)
	Cd(OH) 3-	6.589e-18	4.367e-18	-17.181	-17.360	-0.179	(0)
	Cd(OH) 4-2	3.013e-24	5.814e-25	-23.521	-24.236	-0.714	(0)
	Cd(NO3) 2	9.970e-25	9.970e-25	-24.001	-24.001	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.447	-226.625	-0.179	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.102	-302.816	-0.714	(0)
Cl	8.427e-03						
	Cl-	8.427e-03	6.488e-03	-2.074	-2.188	-0.114	(0)
	MnCl+	3.289e-07	2.533e-07	-6.483	-6.596	-0.113	(0)
	ZnCl+	8.275e-08	6.243e-08	-7.082	-7.205	-0.122	(0)
	ZnOHC1	6.648e-08	6.648e-08	-7.177	-7.177	0.000	(0)
	CuCl2-	2.670e-09	2.015e-09	-8.573	-8.696	-0.122	(0)
	CdCl+	2.478e-09	1.643e-09	-8.606	-8.784	-0.179	(0)
	MnCl2	2.321e-09	2.321e-09	-8.634	-8.634	0.000	(0)
	CuCl	1.486e-09	1.486e-09	-8.828	-8.828	0.000	(0)
	ZnCl2	6.420e-10	6.420e-10	-9.192	-9.192	0.000	(0)
	CuCl+	3.707e-10	2.797e-10	-9.431	-9.553	-0.122	(0)
	CdOHC1	5.480e-11	5.480e-11	-10.261	-10.261	0.000	(0)
	HgClOH	5.142e-11	5.142e-11	-10.289	-10.289	0.000	(0)
	CdCl2	4.443e-11	4.443e-11	-10.352	-10.352	0.000	(0)
	PbCl+	3.118e-11	2.066e-11	-10.506	-10.685	-0.179	(0)
	HgCl2	2.323e-11	2.323e-11	-10.634	-10.634	0.000	(0)
	CoCl+	1.333e-11	8.837e-12	-10.875	-11.054	-0.179	(0)
	CuCl3-2	7.941e-12	2.795e-12	-11.100	-11.554	-0.454	(0)
	MnCl3-	5.386e-12	4.148e-12	-11.269	-11.382	-0.113	(0)
	ZnCl3-	4.385e-12	3.309e-12	-11.358	-11.480	-0.122	(0)
	NiCl+	2.307e-12	1.529e-12	-11.637	-11.816	-0.179	(0)
	HgCl3-	2.274e-12	1.507e-12	-11.643	-11.822	-0.179	(0)
	CuCl2	6.293e-13	6.293e-13	-12.201	-12.201	0.000	(0)

PbCl2	5.989e-13	5.989e-13	-12.223	-12.223	0.000	(0)
CdCl3-	2.744e-13	1.819e-13	-12.562	-12.740	-0.179	(0)
HgCl4-2	2.017e-13	3.893e-14	-12.695	-13.410	-0.714	(0)
ZnCl4-2	3.051e-14	1.074e-14	-13.516	-13.969	-0.454	(0)
PbCl3-	2.334e-15	1.547e-15	-14.632	-14.811	-0.179	(0)
UO2Cl+	1.439e-15	9.538e-16	-14.842	-15.021	-0.179	(0)
HgCl+	1.078e-15	7.143e-16	-14.968	-15.146	-0.179	(0)
CuCl3-	5.050e-17	3.810e-17	-16.297	-16.419	-0.122	(0)
NiCl2	4.995e-17	4.995e-17	-16.301	-16.301	0.000	(0)
PbCl4-2	2.377e-17	4.588e-18	-16.624	-17.338	-0.714	(0)
CrCl+2	4.927e-18	9.509e-19	-17.307	-18.022	-0.714	(0)
CrOHC12	9.537e-20	9.537e-20	-19.021	-19.021	0.000	(0)
CuCl4-2	3.521e-21	1.239e-21	-20.453	-20.907	-0.454	(0)
FeCl+2	1.640e-21	5.772e-22	-20.785	-21.239	-0.454	(0)
CrCl2+	8.832e-22	5.854e-22	-21.054	-21.233	-0.179	(0)
VOCl+	1.881e-22	1.247e-22	-21.726	-21.904	-0.179	(0)
FeCl2+	2.172e-23	1.673e-23	-22.663	-22.777	-0.113	(0)
CrO3Cl-	2.810e-26	1.862e-26	-25.551	-25.730	-0.179	(0)
FeCl3	1.085e-26	1.085e-26	-25.964	-25.964	0.000	(0)
CoCl+2	7.851e-37	1.515e-37	-36.105	-36.820	-0.714	(0)
UCl+3	0.000e+00	0.000e+00	-44.067	-45.675	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.714	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.720	-52.434	-0.714	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.984	-0.714	(0)
Co (2)	2.955e-09					
Co+2	2.040e-09	3.937e-10	-8.690	-9.405	-0.714	(0)
CoSO4	8.614e-10	8.614e-10	-9.065	-9.065	0.000	(0)
CoHCO3+	1.795e-11	1.189e-11	-10.746	-10.925	-0.179	(0)
CoCl+	1.333e-11	8.837e-12	-10.875	-11.054	-0.179	(0)
CoCO3	9.807e-12	9.807e-12	-11.008	-11.008	0.000	(0)
CoOH+	9.640e-12	6.389e-12	-11.016	-11.195	-0.179	(0)
CoF+	2.228e-12	1.477e-12	-11.652	-11.831	-0.179	(0)
Co (OH) 2	4.128e-13	4.128e-13	-12.384	-12.384	0.000	(0)
CoNO2+	6.835e-14	4.530e-14	-13.165	-13.344	-0.179	(0)
Co (NH3) +2	2.102e-15	4.056e-16	-14.677	-15.392	-0.714	(0)
CoSeO4	6.573e-17	6.573e-17	-16.182	-16.182	0.000	(0)
CoNO3+	1.450e-17	9.612e-18	-16.839	-17.017	-0.179	(0)
Co (OH) 3-	1.011e-17	6.699e-18	-16.995	-17.174	-0.179	(0)
CoOOH-	2.541e-18	1.684e-18	-17.595	-17.774	-0.179	(0)
Co2OH+3	5.107e-21	1.261e-22	-20.292	-21.899	-1.608	(0)
Co (NH3) 2+2	7.682e-22	1.483e-22	-21.115	-21.829	-0.714	(0)
Co (OH) 4-2	4.474e-24	8.635e-25	-23.349	-24.064	-0.714	(0)
Co (NO3) 2	3.013e-25	3.013e-25	-24.521	-24.521	0.000	(0)
Co (NH3) 3+2	8.287e-29	1.599e-29	-28.082	-28.796	-0.714	(0)
Co4 (OH) 4+4	2.397e-34	3.325e-37	-33.620	-36.478	-2.858	(0)
Co (NH3) 4+2	3.726e-36	7.192e-37	-35.429	-36.143	-0.714	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.990	-0.714	(0)
Co (3)	2.458e-30					
CoOH+2	2.458e-30	4.744e-31	-29.609	-30.324	-0.714	(0)
Co+3	1.207e-36	1.148e-37	-35.918	-36.940	-1.022	(0)
CoCl+2	7.851e-37	1.515e-37	-36.105	-36.820	-0.714	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.714	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.653	-60.831	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.972	-65.686	-0.714	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.984	-0.714	(0)
Cr (2)	1.914e-27					
Cr+2	1.914e-27	3.694e-28	-26.718	-27.432	-0.714	(0)
Cr (3)	3.840e-10					
Cr (OH) 2+	3.009e-10	1.994e-10	-9.522	-9.700	-0.179	(0)
Cr (OH) 3	6.093e-11	6.093e-11	-10.215	-10.215	0.000	(0)
Cr (OH) +2	1.044e-11	2.015e-12	-10.981	-11.696	-0.714	(0)
CrOHSO4	5.243e-12	5.243e-12	-11.280	-11.280	0.000	(0)
CrO2-	3.540e-12	2.346e-12	-11.451	-11.630	-0.179	(0)
Cr (OH) 4-	2.976e-12	1.973e-12	-11.526	-11.705	-0.179	(0)
CrF+2	1.103e-14	2.129e-15	-13.957	-14.672	-0.714	(0)
Cr+3	4.587e-15	1.132e-16	-14.338	-15.946	-1.608	(0)
CrSO4+	4.375e-15	2.900e-15	-14.359	-14.538	-0.179	(0)
CrCl+2	4.927e-18	9.509e-19	-17.307	-18.022	-0.714	(0)

	CrOHC12	9.537e-20	9.537e-20	-19.021	-19.021	0.000	(0)
	Cr2 (OH) 2SO4+2	4.948e-21	9.550e-22	-20.306	-21.020	-0.714	(0)
	CrCl2+	8.832e-22	5.854e-22	-21.054	-21.233	-0.179	(0)
	Cr2 (OH) 2 (SO4) 2	6.221e-22	6.221e-22	-21.206	-21.206	0.000	(0)
	CrNO3+2	3.951e-25	7.625e-26	-24.403	-25.118	-0.714	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.284	-41.999	-0.714	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.741	-51.349	-1.608	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.720	-52.434	-0.714	(0)
Cr (6)	2.869e-15						
	CrO4-2	2.623e-15	9.219e-16	-14.581	-15.035	-0.454	(0)
	NaCrO4-	1.355e-16	8.983e-17	-15.868	-16.047	-0.179	(0)
	HCrO4-	5.562e-17	3.686e-17	-16.255	-16.433	-0.179	(0)
	KCrO4-	5.528e-17	3.664e-17	-16.257	-16.436	-0.179	(0)
	CrO3SO4-2	7.898e-24	1.524e-24	-23.102	-23.817	-0.714	(0)
	H2CrO4	3.692e-25	3.692e-25	-24.433	-24.433	0.000	(0)
	CrO3Cl-	2.810e-26	1.862e-26	-25.551	-25.730	-0.179	(0)
	Cr2O7-2	2.446e-31	4.721e-32	-30.612	-31.326	-0.714	(0)
Cu (1)	4.439e-09						
	CuCl2-	2.670e-09	2.015e-09	-8.573	-8.696	-0.122	(0)
	CuCl	1.486e-09	1.486e-09	-8.828	-8.828	0.000	(0)
	Cu+	2.745e-10	1.819e-10	-9.561	-9.740	-0.179	(0)
	CuCl3-2	7.941e-12	2.795e-12	-11.100	-11.554	-0.454	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-146.867	-147.308	-0.441	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.623	-148.038	-0.415	(0)
Cu (2)	4.937e-07						
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	CuOH+	9.272e-08	6.996e-08	-7.033	-7.155	-0.122	(0)
	Cu+2	7.739e-08	2.720e-08	-7.111	-7.565	-0.454	(0)
	CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
	Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
	Cu (CO3) 2-2	4.851e-09	9.361e-10	-8.314	-9.029	-0.714	(0)
	CuHCO3+	1.006e-09	6.666e-10	-8.998	-9.176	-0.179	(0)
	Cu2 (OH) 2+2	6.371e-10	1.229e-10	-9.196	-9.910	-0.714	(0)
	CuCl+	3.707e-10	2.797e-10	-9.431	-9.553	-0.122	(0)
	CuF+	3.072e-10	2.036e-10	-9.513	-9.691	-0.179	(0)
	CuNO2+	7.017e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
	Cu (OH) 3-	2.858e-11	1.894e-11	-10.544	-10.723	-0.179	(0)
	CuNH3+2	1.236e-11	2.385e-12	-10.908	-11.623	-0.714	(0)
	CuCl2	6.293e-13	6.293e-13	-12.201	-12.201	0.000	(0)
	Cu (NO2) 2	7.771e-15	7.771e-15	-14.110	-14.110	0.000	(0)
	CuNO3+	1.999e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
	Cu (OH) 4-2	6.283e-16	1.212e-16	-15.202	-15.916	-0.714	(0)
	CuCl3-	5.050e-17	3.810e-17	-16.297	-16.419	-0.122	(0)
	CuCl4-2	3.521e-21	1.239e-21	-20.453	-20.907	-0.454	(0)
	Cu (NO3) 2	2.570e-24	2.570e-24	-23.590	-23.590	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.255e-04						
	F-	1.541e-04	1.186e-04	-3.812	-3.926	-0.114	(0)
	MgF+	6.597e-05	5.031e-05	-4.181	-4.298	-0.118	(0)
	CaF+	3.778e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
	NaF	1.468e-06	1.468e-06	-5.833	-5.833	0.000	(0)
	MnF+	1.901e-07	1.464e-07	-6.721	-6.834	-0.113	(0)
	ZnF+	1.368e-08	9.067e-09	-7.864	-8.043	-0.179	(0)
	BF (OH) 3-	6.177e-09	4.488e-09	-8.209	-8.348	-0.139	(0)
	HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
	AlF3	4.026e-10	4.026e-10	-9.395	-9.395	0.000	(0)
	AlF2+	3.474e-10	2.696e-10	-9.459	-9.569	-0.110	(0)
	CuF+	3.072e-10	2.036e-10	-9.513	-9.691	-0.179	(0)
	AlF4-	3.139e-11	2.394e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.575e-11	5.708e-12	-10.803	-11.243	-0.441	(0)
	CdF+	7.520e-12	4.984e-12	-11.124	-11.302	-0.179	(0)
	UO2F+	2.239e-12	1.484e-12	-11.650	-11.829	-0.179	(0)
	CoF+	2.228e-12	1.477e-12	-11.652	-11.831	-0.179	(0)
	HF2-	1.311e-12	9.778e-13	-11.882	-12.010	-0.127	(0)
	PbF+	1.132e-12	7.504e-13	-11.946	-12.125	-0.179	(0)
	BF2 (OH) 2-	9.698e-13	7.046e-13	-12.013	-12.152	-0.139	(0)
	UO2F2	5.078e-13	5.078e-13	-12.294	-12.294	0.000	(0)
	NiF+	4.141e-13	2.744e-13	-12.383	-12.562	-0.179	(0)

UO2F3-	2.283e-14	1.513e-14	-13.642	-13.820	-0.179	(0)
CrF+2	1.103e-14	2.129e-15	-13.957	-14.672	-0.714	(0)
PbF2	1.752e-15	1.752e-15	-14.757	-14.757	0.000	(0)
CdF2	1.180e-15	1.180e-15	-14.928	-14.928	0.000	(0)
UO2F4-2	7.388e-17	1.426e-17	-16.131	-16.846	-0.714	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	8.528e-18	8.528e-18	-17.069	-17.069	0.000	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.089e-18	3.832e-19	-17.963	-18.417	-0.454	(0)
PbF3-	5.947e-19	3.941e-19	-18.226	-18.404	-0.179	(0)
VO2F2-	5.542e-19	3.673e-19	-18.256	-18.435	-0.179	(0)
BF3OH-	5.541e-19	4.026e-19	-18.256	-18.395	-0.139	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	7.352e-21	4.873e-21	-20.134	-20.312	-0.179	(0)
VO2F3-2	2.816e-21	5.435e-22	-20.550	-21.265	-0.714	(0)
VOF2	2.168e-22	2.168e-22	-21.664	-21.664	0.000	(0)
PbF4-2	1.160e-22	2.238e-23	-21.936	-22.650	-0.714	(0)
HgF+	3.661e-23	2.426e-23	-22.436	-22.615	-0.179	(0)
BF4-	4.004e-24	2.909e-24	-23.397	-23.536	-0.139	(0)
VOF3-	1.377e-24	9.124e-25	-23.861	-24.040	-0.179	(0)
VO2F4-3	1.285e-24	3.172e-26	-23.891	-25.499	-1.608	(0)
Sb(OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
VOF4-2	2.264e-27	4.369e-28	-26.645	-27.360	-0.714	(0)
UF3+	6.522e-36	4.323e-36	-35.186	-35.364	-0.179	(0)
UF2+2	1.191e-36	2.299e-37	-35.924	-36.638	-0.714	(0)
UF4	5.623e-38	5.623e-38	-37.250	-37.250	0.000	(0)
UF+3	6.237e-39	1.540e-40	-38.205	-39.813	-1.608	(0)
UF5-	3.988e-40	2.643e-40	-39.399	-39.578	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.309	-41.024	-0.714	(0)
Fe (2)	3.430e-12					
Fe+2	2.244e-12	4.330e-13	-11.649	-12.363	-0.714	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.821e-14	1.402e-14	-13.740	-13.853	-0.113	(0)
FeHCO3+	2.701e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.025e-18	2.330e-18	-17.519	-17.633	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.308e-10	4.895e-10	-9.200	-9.310	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.173e-11	3.238e-11	-10.380	-10.490	-0.110	(0)
FeOH+2	4.396e-15	1.547e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.089e-18	3.832e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.706e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.282e-19	8.497e-20	-18.892	-19.071	-0.179	(0)
Fe+3	3.097e-20	2.946e-21	-19.509	-20.531	-1.022	(0)
FeCl+2	1.640e-21	5.772e-22	-20.785	-21.239	-0.454	(0)
FeCl2+	2.172e-23	1.673e-23	-22.663	-22.777	-0.113	(0)
FeHSeO3+2	9.626e-24	1.858e-24	-23.017	-23.731	-0.714	(0)
Fe2 (OH) 2+4	5.712e-26	7.924e-29	-25.243	-28.101	-2.858	(0)
FeCl3	1.085e-26	1.085e-26	-25.964	-25.964	0.000	(0)
FeNO3+2	2.351e-27	4.538e-28	-26.629	-27.343	-0.714	(0)
Fe3 (OH) 4+5	1.637e-32	5.606e-37	-31.786	-36.251	-4.465	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.498e-09					
Hg	9.498e-09	9.498e-09	-8.022	-8.022	0.000	(0)
Hg (1)	3.687e-19					
Hg2+2	1.843e-19	3.558e-20	-18.734	-19.449	-0.714	(0)
Hg (2)	9.952e-11					
HgClOH	5.142e-11	5.142e-11	-10.289	-10.289	0.000	(0)
HgCl2	2.323e-11	2.323e-11	-10.634	-10.634	0.000	(0)
Hg (OH) 2	2.239e-11	2.303e-11	-10.650	-10.638	0.012	(0)
HgCl3-	2.274e-12	1.507e-12	-11.643	-11.822	-0.179	(0)

	HgCl4-2	2.017e-13	3.893e-14	-12.695	-13.410	-0.714	(0)
	HgCO3	9.730e-15	9.730e-15	-14.012	-14.012	0.000	(0)
	HgCl+	1.078e-15	7.143e-16	-14.968	-15.146	-0.179	(0)
	HgOH+	2.695e-16	1.787e-16	-15.569	-15.748	-0.179	(0)
	Hg (CO3) 2-2	2.349e-16	4.534e-17	-15.629	-16.344	-0.714	(0)
	Hg (OH) 3-	3.558e-18	2.358e-18	-17.449	-17.627	-0.179	(0)
	HgHCO3+	3.378e-18	2.239e-18	-17.471	-17.650	-0.179	(0)
	Hg (NH3) 2+2	1.324e-18	2.556e-19	-17.878	-18.592	-0.714	(0)
	HgNH3+2	1.546e-19	2.983e-20	-18.811	-19.525	-0.714	(0)
	Hg+2	2.859e-20	5.517e-21	-19.544	-20.258	-0.714	(0)
	HgSO4	1.584e-20	1.584e-20	-19.800	-19.800	0.000	(0)
	HgF+	3.661e-23	2.426e-23	-22.436	-22.615	-0.179	(0)
	Hg (NH3) 3+2	4.518e-26	8.719e-27	-25.345	-26.060	-0.714	(0)
	HgNO3+	4.735e-29	3.138e-29	-28.325	-28.503	-0.179	(0)
	Hg (NH3) 4+2	3.075e-33	5.935e-34	-32.512	-33.227	-0.714	(0)
	Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.017	-137.196	-0.179	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.281	-137.996	-0.714	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.710	-138.710	0.000	(0)
K		1.496e-02					
	K+	1.389e-02	1.070e-02	-1.857	-1.971	-0.114	(0)
	KSO4-	1.070e-03	8.305e-04	-2.970	-3.081	-0.110	(0)
	KCrO4-	5.528e-17	3.664e-17	-16.257	-16.436	-0.179	(0)
Mg		1.839e-02					
	Mg+2	1.075e-02	3.780e-03	-1.968	-2.423	-0.454	(0)
	MgSO4	7.543e-03	7.543e-03	-2.122	-2.122	0.000	(0)
	MgF+	6.597e-05	5.031e-05	-4.181	-4.298	-0.118	(0)
	MgHCO3+	1.991e-05	1.502e-05	-4.701	-4.823	-0.122	(0)
	MgCO3	4.633e-06	4.633e-06	-5.334	-5.334	0.000	(0)
	MgOH+	1.549e-06	1.224e-06	-5.810	-5.912	-0.102	(0)
	MgH2BO3+	8.038e-07	5.840e-07	-6.095	-6.234	-0.139	(0)
Mn (2)		2.221e-04					
	Mn+2	1.607e-04	3.101e-05	-3.794	-4.509	-0.714	(0)
	MnSO4	6.047e-05	6.047e-05	-4.218	-4.218	0.000	(0)
	MnCl+	3.289e-07	2.533e-07	-6.483	-6.596	-0.113	(0)
	MnHCO3+	3.120e-07	2.403e-07	-6.506	-6.619	-0.113	(0)
	MnF+	1.901e-07	1.464e-07	-6.721	-6.834	-0.113	(0)
	MnOH+	8.225e-08	6.335e-08	-7.085	-7.198	-0.113	(0)
	MnCl2	2.321e-09	2.321e-09	-8.634	-8.634	0.000	(0)
	MnCl3-	5.386e-12	4.148e-12	-11.269	-11.382	-0.113	(0)
	MnSeO4	2.780e-12	2.780e-12	-11.556	-11.556	0.000	(0)
	MnNO3+	1.142e-12	7.571e-13	-11.942	-12.121	-0.179	(0)
	Mn (OH) 3-	3.363e-16	2.590e-16	-15.473	-15.587	-0.113	(0)
	Mn (NO3) 2	2.930e-20	2.930e-20	-19.533	-19.533	0.000	(0)
	Mn (OH) 4-2	1.933e-21	6.801e-22	-20.714	-21.167	-0.454	(0)
	MnSe	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
Mn (3)		1.066e-24					
	Mn+3	1.066e-24	1.014e-25	-23.972	-24.994	-1.022	(0)
Mn (6)		1.751e-40					
	MnO4-2	1.751e-40	0.000e+00	-39.757	-40.210	-0.454	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.585	-44.718	-0.133	(0)
Mo		7.604e-06					
	MoO4-2	7.603e-06	2.672e-06	-5.119	-5.573	-0.454	(0)
	HMoO4-	9.913e-10	6.571e-10	-9.004	-9.182	-0.179	(0)
	H2MoO4	5.947e-14	5.947e-14	-13.226	-13.226	0.000	(0)
	AlMo6O21-3	2.499e-39	0.000e+00	-38.602	-40.210	-1.608	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-42.853	-49.283	-6.430	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-46.339	-50.804	-4.465	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.072	-53.930	-2.858	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.985	-58.592	-1.608	(0)
N (-3)		2.926e-07					
	NH4+	2.556e-07	1.857e-07	-6.592	-6.731	-0.139	(0)
	NH4SO4-	2.833e-08	2.182e-08	-7.548	-7.661	-0.113	(0)
	NH3	8.569e-09	8.569e-09	-8.067	-8.067	0.000	(0)
	CaNH3+2	1.256e-10	2.424e-11	-9.901	-10.615	-0.714	(0)
	CuNH3+2	1.236e-11	2.385e-12	-10.908	-11.623	-0.714	(0)
	NiNH3+2	2.196e-15	4.238e-16	-14.658	-15.373	-0.714	(0)

Co (NH3) +2	2.102e-15	4.056e-16	-14.677	-15.392	-0.714	(0)
BaNH3+2	2.675e-16	5.163e-17	-15.573	-16.287	-0.714	(0)
Hg (NH3) 2+2	1.324e-18	2.556e-19	-17.878	-18.592	-0.714	(0)
Ca (NH3) 2+2	4.285e-19	8.269e-20	-18.368	-19.083	-0.714	(0)
HgNH3+2	1.546e-19	2.983e-20	-18.811	-19.525	-0.714	(0)
Ni (NH3) 2+2	2.720e-21	5.249e-22	-20.565	-21.280	-0.714	(0)
Co (NH3) 2+2	7.682e-22	1.483e-22	-21.115	-21.829	-0.714	(0)
Hg (NH3) 3+2	4.518e-26	8.719e-27	-25.345	-26.060	-0.714	(0)
Co (NH3) 3+2	8.287e-29	1.599e-29	-28.082	-28.796	-0.714	(0)
Hg (NH3) 4+2	3.075e-33	5.935e-34	-32.512	-33.227	-0.714	(0)
Co (NH3) 4+2	3.726e-36	7.192e-37	-35.429	-36.143	-0.714	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.284	-41.999	-0.714	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.990	-0.714	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.741	-51.349	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.714	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.720	-52.434	-0.714	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.653	-60.831	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.972	-65.686	-0.714	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.984	-0.714	(0)
N (3)	2.217e-05					
NO2-	2.217e-05	1.633e-05	-4.654	-4.787	-0.133	(0)
CuNO2+	7.017e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
CoNO2+	6.835e-14	4.530e-14	-13.165	-13.344	-0.179	(0)
Cu (NO2) 2	7.771e-15	7.771e-15	-14.110	-14.110	0.000	(0)
N (5)	2.017e-08					
NO3-	2.001e-08	1.540e-08	-7.699	-7.812	-0.114	(0)
CaNO3+	1.652e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
MnNO3+	1.142e-12	7.571e-13	-11.942	-12.121	-0.179	(0)
ZnNO3+	2.236e-13	1.482e-13	-12.650	-12.829	-0.179	(0)
CuNO3+	1.999e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
BaNO3+	1.112e-15	7.372e-16	-14.954	-15.132	-0.179	(0)
CdNO3+	1.948e-16	1.291e-16	-15.710	-15.889	-0.179	(0)
PbNO3+	3.086e-17	2.045e-17	-16.511	-16.689	-0.179	(0)
CoNO3+	1.450e-17	9.612e-18	-16.839	-17.017	-0.179	(0)
NiNO3+	5.377e-18	3.564e-18	-17.269	-17.448	-0.179	(0)
Mn (NO3) 2	2.930e-20	2.930e-20	-19.533	-19.533	0.000	(0)
UO2NO3+	4.203e-21	2.786e-21	-20.376	-20.555	-0.179	(0)
Zn (NO3) 2	4.556e-22	4.556e-22	-21.341	-21.341	0.000	(0)
Cu (NO3) 2	2.570e-24	2.570e-24	-23.590	-23.590	0.000	(0)
Cd (NO3) 2	9.970e-25	9.970e-25	-24.001	-24.001	0.000	(0)
Pb (NO3) 2	5.350e-25	5.350e-25	-24.272	-24.272	0.000	(0)
CrNO3+2	3.951e-25	7.625e-26	-24.403	-25.118	-0.714	(0)
VO2NO3	3.194e-25	3.194e-25	-24.496	-24.496	0.000	(0)
Co (NO3) 2	3.013e-25	3.013e-25	-24.521	-24.521	0.000	(0)
FeNO3+2	2.351e-27	4.538e-28	-26.629	-27.343	-0.714	(0)
HgNO3+	4.735e-29	3.138e-29	-28.325	-28.503	-0.179	(0)
Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
Na	2.696e-02					
Na+	2.547e-02	1.961e-02	-1.594	-1.708	-0.114	(0)
NaSO4-	1.488e-03	1.155e-03	-2.827	-2.938	-0.110	(0)
NaHCO3	4.283e-06	4.283e-06	-5.368	-5.368	0.000	(0)
NaF	1.468e-06	1.468e-06	-5.833	-5.833	0.000	(0)
NaCO3-	6.934e-07	5.380e-07	-6.159	-6.269	-0.110	(0)
NaH2BO3	1.385e-07	1.385e-07	-6.859	-6.859	0.000	(0)
NaCrO4-	1.355e-16	8.983e-17	-15.868	-16.047	-0.179	(0)
Ni	4.798e-10					
Ni+2	2.620e-10	9.210e-11	-9.582	-10.036	-0.454	(0)
NiSO4	2.015e-10	2.015e-10	-9.696	-9.696	0.000	(0)
NiHCO3+	6.653e-12	4.410e-12	-11.177	-11.356	-0.179	(0)
NiCO3	5.063e-12	5.063e-12	-11.296	-11.296	0.000	(0)
NiCl+	2.307e-12	1.529e-12	-11.637	-11.816	-0.179	(0)
NiOH+	1.423e-12	9.430e-13	-11.847	-12.025	-0.179	(0)
NiF+	4.141e-13	2.744e-13	-12.383	-12.562	-0.179	(0)
Ni (SO4) 2-2	3.792e-13	7.317e-14	-12.421	-13.136	-0.714	(0)
Ni (OH) 2	6.093e-14	6.093e-14	-13.215	-13.215	0.000	(0)
NiNH3+2	2.196e-15	4.238e-16	-14.658	-15.373	-0.714	(0)
Ni (OH) 3-	7.476e-17	4.955e-17	-16.126	-16.305	-0.179	(0)
NiCl2	4.995e-17	4.995e-17	-16.301	-16.301	0.000	(0)

NiSeO4	1.435e-17	1.435e-17	-16.843	-16.843	0.000	(0)
NiNO3+	5.377e-18	3.564e-18	-17.269	-17.448	-0.179	(0)
Ni (NH3) 2+2	2.720e-21	5.249e-22	-20.565	-21.280	-0.714	(0)
O (0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.662e-09					
PbSO4	4.821e-10	4.821e-10	-9.317	-9.317	0.000	(0)
PbCO3	3.976e-10	3.976e-10	-9.401	-9.401	0.000	(0)
PbOH+	2.767e-10	1.834e-10	-9.558	-9.737	-0.179	(0)
Pb+2	2.554e-10	8.976e-11	-9.593	-10.047	-0.454	(0)
Pb (SO4) 2-2	1.651e-10	3.185e-11	-9.782	-10.497	-0.714	(0)
PbHCO3+	3.908e-11	2.590e-11	-10.408	-10.587	-0.179	(0)
PbCl+	3.118e-11	2.066e-11	-10.506	-10.685	-0.179	(0)
Pb (CO3) 2-2	8.756e-12	1.690e-12	-11.058	-11.772	-0.714	(0)
Pb (OH) 2	4.717e-12	4.717e-12	-11.326	-11.326	0.000	(0)
PbF+	1.132e-12	7.504e-13	-11.946	-12.125	-0.179	(0)
PbCl2	5.989e-13	5.989e-13	-12.223	-12.223	0.000	(0)
Pb (OH) 3-	5.788e-15	3.836e-15	-14.237	-14.416	-0.179	(0)
PbCl3-	2.334e-15	1.547e-15	-14.632	-14.811	-0.179	(0)
PbF2	1.752e-15	1.752e-15	-14.757	-14.757	0.000	(0)
PbNO3+	3.086e-17	2.045e-17	-16.511	-16.689	-0.179	(0)
PbCl4-2	2.377e-17	4.588e-18	-16.624	-17.338	-0.714	(0)
Pb2OH+3	1.057e-17	2.609e-19	-16.976	-18.584	-1.608	(0)
Pb (OH) 4-2	3.959e-18	7.641e-19	-17.402	-18.117	-0.714	(0)
PbF3-	5.947e-19	3.941e-19	-18.226	-18.404	-0.179	(0)
Pb3 (OH) 4+2	2.064e-22	3.984e-23	-21.685	-22.400	-0.714	(0)
PbF4-2	1.160e-22	2.238e-23	-21.936	-22.650	-0.714	(0)
Pb (NO3) 2	5.350e-25	5.350e-25	-24.272	-24.272	0.000	(0)
Pb4 (OH) 4+4	2.048e-26	2.841e-29	-25.689	-28.547	-2.858	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.551	-151.551	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.459	-228.637	-0.179	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.129	-79.844	-0.714	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.645	-80.360	-0.714	(0)
S4-2	0.000e+00	0.000e+00	-79.725	-80.440	-0.714	(0)
S3-2	0.000e+00	0.000e+00	-80.531	-81.245	-0.714	(0)
S2-2	0.000e+00	0.000e+00	-81.547	-82.262	-0.714	(0)
S-2	0.000e+00	0.000e+00	-87.325	-87.779	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.017	-137.196	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.281	-137.996	-0.714	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.710	-138.710	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.867	-147.308	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.294	-147.472	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.623	-148.038	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.370	-149.370	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.551	-151.551	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.299	-224.477	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.835	-226.549	-0.714	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.447	-226.625	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.459	-228.637	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.102	-302.816	-0.714	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.610	-304.324	-0.714	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.714	(0)
S (6)	4.702e-02					
SO4-2	3.120e-02	1.097e-02	-1.506	-1.960	-0.454	(0)
MgSO4	7.543e-03	7.543e-03	-2.122	-2.122	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.488e-03	1.155e-03	-2.827	-2.938	-0.110	(0)
KSO4-	1.070e-03	8.305e-04	-2.970	-3.081	-0.110	(0)
MnSO4	6.047e-05	6.047e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.190e-06	9.190e-06	-5.037	-5.037	0.000	(0)

Zn(SO4) 2-2	4.548e-06	8.778e-07	-5.342	-6.057	-0.714	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.833e-08	2.182e-08	-7.548	-7.661	-0.113	(0)
HSO4-	1.736e-08	1.324e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.814e-09	6.814e-09	-8.167	-8.167	0.000	(0)
Cd(SO4) 2-2	5.223e-09	1.008e-09	-8.282	-8.997	-0.714	(0)
CoSO4	8.614e-10	8.614e-10	-9.065	-9.065	0.000	(0)
PbSO4	4.821e-10	4.821e-10	-9.317	-9.317	0.000	(0)
NiSO4	2.015e-10	2.015e-10	-9.696	-9.696	0.000	(0)
Pb(SO4) 2-2	1.651e-10	3.185e-11	-9.782	-10.497	-0.714	(0)
CrOHSO4	5.243e-12	5.243e-12	-11.280	-11.280	0.000	(0)
UO2SO4	1.504e-12	1.504e-12	-11.823	-11.823	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2(SO4) 2-2	1.127e-12	2.175e-13	-11.948	-12.663	-0.714	(0)
AlSO4+	5.371e-13	4.096e-13	-12.270	-12.388	-0.118	(0)
Ni(SO4) 2-2	3.792e-13	7.317e-14	-12.421	-13.136	-0.714	(0)
Al(SO4) 2-	6.311e-14	4.813e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	4.375e-15	2.900e-15	-14.359	-14.538	-0.179	(0)
VO2SO4-	1.619e-17	1.073e-17	-16.791	-16.969	-0.179	(0)
FeSO4+	4.706e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
Fe(SO4) 2-	1.282e-19	8.497e-20	-18.892	-19.071	-0.179	(0)
VOSO4	2.069e-20	2.069e-20	-19.684	-19.684	0.000	(0)
HgSO4	1.584e-20	1.584e-20	-19.800	-19.800	0.000	(0)
Cr2(OH) 2SO4+2	4.948e-21	9.550e-22	-20.306	-21.020	-0.714	(0)
Cr2(OH) 2(SO4) 2	6.221e-22	6.221e-22	-21.206	-21.206	0.000	(0)
CrO3SO4-2	7.898e-24	1.524e-24	-23.102	-23.817	-0.714	(0)
VSO4+	5.549e-35	3.678e-35	-34.256	-34.434	-0.179	(0)
U(SO4) 2	2.474e-39	2.474e-39	-38.607	-38.607	0.000	(0)
USO4+2	1.471e-40	0.000e+00	-39.832	-40.547	-0.714	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-60.653	-60.831	-0.179	(0)
Sb(3)	9.927e-20					
Sb(OH) 3	5.018e-20	5.018e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.908e-20	4.908e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.705e-24	6.432e-24	-23.013	-23.192	-0.179	(0)
Sb(OH) 4-	5.540e-24	3.672e-24	-23.256	-23.435	-0.179	(0)
Sb(OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
Sb(OH) 2+	2.276e-26	1.509e-26	-25.643	-25.821	-0.179	(0)
SbO+	7.862e-27	5.211e-27	-26.104	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.714	(0)
Sb(5)	9.018e-08					
SbO3-	9.009e-08	5.971e-08	-7.045	-7.224	-0.179	(0)
Sb(OH) 6-	9.020e-11	6.945e-11	-10.045	-10.158	-0.114	(0)
SbO2+	3.953e-24	2.620e-24	-23.403	-23.582	-0.179	(0)
Se(-2)	6.057e-39					
HSe-	6.057e-39	4.015e-39	-38.218	-38.396	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.414	-42.414	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.774	-45.488	-0.714	(0)
Se(4)	7.585e-07					
SeO3-2	3.984e-07	7.689e-08	-6.400	-7.114	-0.714	(0)
HSeO3-	3.601e-07	2.387e-07	-6.444	-6.622	-0.179	(0)
H2SeO3	1.258e-12	1.258e-12	-11.900	-11.900	0.000	(0)
Cd(SeO3) 2-2	6.693e-17	1.292e-17	-16.174	-16.889	-0.714	(0)
FeHSeO3+2	9.626e-24	1.858e-24	-23.017	-23.731	-0.714	(0)
Se(6)	9.507e-10					
SeO4-2	9.477e-10	3.331e-10	-9.023	-9.477	-0.454	(0)
MnSeO4	2.780e-12	2.780e-12	-11.556	-11.556	0.000	(0)
ZnSeO4	1.976e-13	1.976e-13	-12.704	-12.704	0.000	(0)
HSeO4-	3.112e-16	2.063e-16	-15.507	-15.686	-0.179	(0)
CdSeO4	1.644e-16	1.644e-16	-15.784	-15.784	0.000	(0)
CoSeO4	6.573e-17	6.573e-17	-16.182	-16.182	0.000	(0)
NiSeO4	1.435e-17	1.435e-17	-16.843	-16.843	0.000	(0)
Zn(SeO4) 2-2	3.459e-22	6.675e-23	-21.461	-22.176	-0.714	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.240	-58.847	-1.608	(0)
U(4)	2.561e-19					
U(OH) 5-	2.560e-19	1.697e-19	-18.592	-18.770	-0.179	(0)

U(OH) 4	8.796e-23	8.796e-23	-22.056	-22.056	0.000	(0)
U(OH) 3+	6.007e-27	3.981e-27	-26.221	-26.400	-0.179	(0)
U(OH) 2+2	1.181e-31	2.279e-32	-30.928	-31.642	-0.714	(0)
UF3+	6.522e-36	4.323e-36	-35.186	-35.364	-0.179	(0)
UF2+2	1.191e-36	2.299e-37	-35.924	-36.638	-0.714	(0)
UOH+3	5.384e-37	1.329e-38	-36.269	-37.876	-1.608	(0)
UF4	5.623e-38	5.623e-38	-37.250	-37.250	0.000	(0)
UF+3	6.237e-39	1.540e-40	-38.205	-39.813	-1.608	(0)
U(SO4) 2	2.474e-39	2.474e-39	-38.607	-38.607	0.000	(0)
UF5-	3.988e-40	2.643e-40	-39.399	-39.578	-0.179	(0)
USO4+2	1.471e-40	0.000e+00	-39.832	-40.547	-0.714	(0)
UF6-2	0.000e+00	0.000e+00	-40.309	-41.024	-0.714	(0)
U+4	0.000e+00	0.000e+00	-42.329	-45.187	-2.858	(0)
UC1+3	0.000e+00	0.000e+00	-44.067	-45.675	-1.608	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-155.198	-169.667	-14.468	(0)
U(5)	1.138e-15					
UO2+	1.138e-15	7.545e-16	-14.944	-15.122	-0.179	(0)
U(6)	9.139e-07					
UO2(CO3) 3-4	8.324e-07	1.155e-09	-6.080	-8.938	-2.858	(0)
UO2(CO3) 2-2	8.101e-08	1.563e-08	-7.091	-7.806	-0.714	(0)
UO2CO3	5.317e-10	5.317e-10	-9.274	-9.274	0.000	(0)
UO2OH+	1.400e-11	9.281e-12	-10.854	-11.032	-0.179	(0)
UO2F+	2.239e-12	1.484e-12	-11.650	-11.829	-0.179	(0)
UO2SO4	1.504e-12	1.504e-12	-11.823	-11.823	0.000	(0)
UO2(SO4) 2-2	1.127e-12	2.175e-13	-11.948	-12.663	-0.714	(0)
UO2F2	5.078e-13	5.078e-13	-12.294	-12.294	0.000	(0)
UO2+2	2.579e-13	9.064e-14	-12.589	-13.043	-0.454	(0)
UO2F3-	2.283e-14	1.513e-14	-13.642	-13.820	-0.179	(0)
UO2Cl+	1.439e-15	9.538e-16	-14.842	-15.021	-0.179	(0)
(UO2) 3(OH) 5+	1.004e-15	6.657e-16	-14.998	-15.177	-0.179	(0)
(UO2) 2(OH) 2+2	7.407e-16	1.429e-16	-15.130	-15.845	-0.714	(0)
UO2F4-2	7.388e-17	1.426e-17	-16.131	-16.846	-0.714	(0)
UO2NO3+	4.203e-21	2.786e-21	-20.376	-20.555	-0.179	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.724	-42.903	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.609	-44.323	-0.714	(0)
V(3)	3.084e-15					
V(OH) 3	3.084e-15	3.084e-15	-14.511	-14.511	0.000	(0)
V(OH) 2+	3.722e-26	2.467e-26	-25.429	-25.608	-0.179	(0)
VOH+2	1.501e-29	2.896e-30	-28.824	-29.538	-0.714	(0)
V+3	2.878e-34	7.105e-36	-33.541	-35.148	-1.608	(0)
VSO4+	5.549e-35	3.678e-35	-34.256	-34.434	-0.179	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-55.087	-56.694	-1.608	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-55.418	-58.276	-2.858	(0)
V(4)	1.738e-18					
V(OH) 3+	1.674e-18	1.109e-18	-17.776	-17.955	-0.179	(0)
VO+2	3.549e-20	6.849e-21	-19.450	-20.164	-0.714	(0)
VOSO4	2.069e-20	2.069e-20	-19.684	-19.684	0.000	(0)
VOF+	7.352e-21	4.873e-21	-20.134	-20.312	-0.179	(0)
VOF2	2.168e-22	2.168e-22	-21.664	-21.664	0.000	(0)
VOC1+	1.881e-22	1.247e-22	-21.726	-21.904	-0.179	(0)
VOF3-	1.377e-24	9.124e-25	-23.861	-24.040	-0.179	(0)
VOF4-2	2.264e-27	4.369e-28	-26.645	-27.360	-0.714	(0)
H2V2O4+2	3.208e-31	6.191e-32	-30.494	-31.208	-0.714	(0)
V(5)	3.434e-08					
H2VO4-	2.022e-08	1.340e-08	-7.694	-7.873	-0.179	(0)
HVO4-2	1.412e-08	2.725e-09	-7.850	-8.565	-0.714	(0)
H3VO4	1.656e-12	1.656e-12	-11.781	-11.781	0.000	(0)
HV2O7-3	5.022e-13	1.240e-14	-12.299	-13.907	-1.608	(0)
H3V2O7-	2.166e-13	1.436e-13	-12.664	-12.843	-0.179	(0)
VO4-3	4.477e-14	1.105e-15	-13.349	-14.957	-1.608	(0)
V2O7-4	1.947e-14	2.700e-17	-13.711	-16.569	-2.858	(0)
V3O9-3	1.027e-16	2.536e-18	-15.988	-17.596	-1.608	(0)
VO2+	5.323e-17	4.099e-17	-16.274	-16.387	-0.114	(0)
VO2SO4-	1.619e-17	1.073e-17	-16.791	-16.969	-0.179	(0)
VO2F	8.528e-18	8.528e-18	-17.069	-17.069	0.000	(0)
VO2F2-	5.542e-19	3.673e-19	-18.256	-18.435	-0.179	(0)
V4O12-4	1.023e-20	1.419e-23	-19.990	-22.848	-2.858	(0)

VO2F3-2	2.816e-21	5.435e-22	-20.550	-21.265	-0.714	(0)
VO2F4-3	1.285e-24	3.172e-26	-23.891	-25.499	-1.608	(0)
VO2NO3	3.194e-25	3.194e-25	-24.496	-24.496	0.000	(0)
V10028-6	0.000e+00	0.000e+00	-55.015	-61.445	-6.430	(0)
HV10028-5	0.000e+00	0.000e+00	-56.701	-61.166	-4.465	(0)
H2V10028-4	0.000e+00	0.000e+00	-61.009	-63.867	-2.858	(0)
Zn	2.571e-05					
Zn+2	1.090e-05	3.831e-06	-4.963	-5.417	-0.454	(0)
ZnSO4	9.190e-06	9.190e-06	-5.037	-5.037	0.000	(0)
Zn (SO4) 2-2	4.548e-06	8.778e-07	-5.342	-6.057	-0.714	(0)
ZnOH+	4.701e-07	3.116e-07	-6.328	-6.506	-0.179	(0)
ZnCO3	3.248e-07	3.248e-07	-6.488	-6.488	0.000	(0)
ZnCl+	8.275e-08	6.243e-08	-7.082	-7.205	-0.122	(0)
ZnHCO3+	7.099e-08	4.705e-08	-7.149	-7.327	-0.179	(0)
ZnOHCl	6.648e-08	6.648e-08	-7.177	-7.177	0.000	(0)
Zn (OH) 2	4.016e-08	4.016e-08	-7.396	-7.396	0.000	(0)
ZnF+	1.368e-08	9.067e-09	-7.864	-8.043	-0.179	(0)
ZnCl2	6.420e-10	6.420e-10	-9.192	-9.192	0.000	(0)
Zn (OH) 3-	2.470e-10	1.637e-10	-9.607	-9.786	-0.179	(0)
ZnCl3-	4.385e-12	3.309e-12	-11.358	-11.480	-0.122	(0)
ZnNO3+	2.236e-13	1.482e-13	-12.650	-12.829	-0.179	(0)
ZnSeO4	1.976e-13	1.976e-13	-12.704	-12.704	0.000	(0)
ZnCl4-2	3.051e-14	1.074e-14	-13.516	-13.969	-0.454	(0)
Zn (OH) 4-2	2.747e-14	5.301e-15	-13.561	-14.276	-0.714	(0)
Zn (NO3) 2	4.556e-22	4.556e-22	-21.341	-21.341	0.000	(0)
Zn (SeO4) 2-2	3.459e-22	6.675e-23	-21.461	-22.176	-0.714	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.294	-147.472	-0.179	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.370	-149.370	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.299	-224.477	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.835	-226.549	-0.714	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.610	-304.324	-0.714	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.16	-48.87	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-42.13	-37.62	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-49.36	-37.62	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-71.25	-53.32	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-56.47	-36.44	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-28.90	-28.50	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-23.39	-22.94	0.45	(NH4) 2SeO4	
Al (OH) 3 (am)	-1.40	9.40	10.80	Al (OH) 3	
Al2 (MoO4) 3	-47.72	-45.35	2.37	Al2 (MoO4) 3	
Al2O3	-0.84	18.81	19.65	Al2O3	
Al4 (OH) 10SO4	-2.86	19.84	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O	
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4	
AlSb	-152.15	-86.53	65.62	AlSb	
Alunite	-0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-4.22	-12.01	-7.79	PbSO4	
Anhydrite	-0.25	-4.61	-4.36	CaSO4	
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S	
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-88.42	-91.18	-2.76	As4O6	
Artinite	-4.46	5.14	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-39.00	-32.30	6.71	As2O5	
Atacamite	-0.99	6.40	7.39	Cu2 (OH) 3Cl	
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-17.24	-1.37	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-26.52	6.42	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-13.39	-23.06	-9.67	BaCrO4	
BaF2	-10.05	-15.87	-5.82	BaF2	
BaMoO4	-6.63	-13.59	-6.96	BaMoO4	

Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-8.56	-6.73	1.83	BaSeO ₃
BaSeO ₄	-10.04	-17.50	-7.46	BaSeO ₄
Bianchite	-5.62	-7.38	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-6.59	11.50	18.09	MnO ₂
Bixbyite	-1.90	-2.54	-0.64	Mn ₂ O ₃
BlaubleiI	-55.07	-79.24	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.53	-82.81	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.86	-77.38	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.45	13.39	16.84	Mg(OH) ₂
Bunsenite	-6.67	5.78	12.45	NiO
Ca(VO ₃) ₂	-9.45	-3.79	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.13	9.37	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-12.18	9.37	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-15.10	7.20	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-16.42	22.54	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-17.32	22.54	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-295.34	-152.36	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.42	-17.68	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-5.91	-23.82	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.27	-8.22	-7.95	CaMoO ₄
Carnotite	-0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.18	-1.36	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.11	-12.13	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-10.65	-0.81	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.41	7.24	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.49	7.24	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.55	-13.84	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.62	3.94	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-17.22	11.18	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.29	-12.95	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-11.26	-12.95	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.04	-12.95	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.22	-16.43	-1.21	CdF ₂
Cdmetal(alpha)	-31.82	-18.31	13.51	Cd
Cdmetal(gamma)	-31.92	-18.31	13.62	Cd
CdMoO ₄	0.00	-14.15	-14.15	CdMoO ₄
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.21	-18.06	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.36	-10.54	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-8.81	-10.54	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.67	-10.54	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-2.75	-15.88	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-6.89	-9.53	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.04	-89.96	-34.92	Cu ₂ S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS ₂
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As ₄ O ₆
Clausthalite	-13.44	-40.54	-27.10	PbSe
Co(BO ₂) ₂	-28.70	-1.63	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.68	6.41	13.09	Co(OH) ₂
Co(OH) ₃	-10.91	-13.22	-2.31	Co(OH) ₃
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-26.10	-13.06	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-9.53	-20.02	-10.50	Co ₃ O ₄
CoCl ₂	-22.05	-13.78	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-16.32	-13.79	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-5.26	-15.24	-9.98	CoCO ₃
CoF ₂	-15.66	-17.26	-1.60	CoF ₂
CoF ₃	-47.26	-48.72	-1.46	CoF ₃
CoFe ₂ O ₄	16.32	12.80	-3.53	CoFe ₂ O ₄

CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.18	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.69	-39.89	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.36	-18.89	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-22.44	-11.62	10.82	Cr (OH) 2
Cr (OH) 3	-3.13	-1.79	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-1.04	-1.79	-0.75	Cr (OH) 3
Cr2O3	-1.23	-3.58	-2.36	Cr2O3
CrCl2	-45.90	-31.81	14.09	CrCl2
CrCl3	-47.19	-32.08	15.11	CrCl3
CrF3	-25.96	-37.29	-11.34	CrF3
Crmetal	-67.64	-37.16	30.48	Cr
CrO3	-27.64	-30.85	-3.21	CrO3
Cryolite	-9.16	-43.00	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.17	-49.97	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.53	-88.02	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-17.16	-22.60	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.95	-38.05	-33.10	CuSe
CuSe2	-25.45	-58.81	-33.37	CuSe2
CuSeO3:2H2O	-6.79	-6.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.61	-17.05	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.79	-13.51	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.70	-8.15	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.58	-37.21	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-7.33	-0.13	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.01	-63.61	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.85	-42.85	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS

Gibbsite	1.11	9.40	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.70	-79.06	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.90	2.77	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.34	-46.30	-4.96	H2Se
Halite	-5.50	-3.90	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.58	-258.29	-73.71	Hg (CH3) 2
Hg (g)	-6.72	-14.59	-7.87	Hg
Hg (OH) 2	-7.14	-10.64	-3.50	Hg (OH) 2
Hg2 (g)	-14.22	-29.18	-14.96	Hg2
Hg2 (OH) 2	-8.89	-3.63	5.26	Hg2 (OH) 2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.78	-34.48	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.51	-18.16	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.88	-53.56	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.57	-30.83	-21.26	HgCl2
HgF (g)	-46.33	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.25	-56.94	-55.69	HgSe
HgSeO3	-12.74	-25.17	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.86	-19.63	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.59	-49.83	-17.24	K2Cr2O7
K2CrO4	-18.46	-18.98	-0.51	K2CrO4
K2MoO4	-12.78	-9.51	3.26	K2MoO4
K2SeO4	-12.69	-13.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.93	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.13	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.85	-3.57	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.53	9.83	26.36	Mg2V2O7
MgCr2O4	-6.39	9.81	16.20	MgCr2O4
MgCrO4	-22.84	-17.46	5.38	MgCrO4

MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.15	-8.00	-1.85	MgMoO4
MgSeO3:6H2O	-4.20	-1.14	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.70	-11.90	-1.20	MgSeO4:6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4:10H2O
Mn(VO3)2	-10.55	-5.65	4.90	Mn(VO3)2
Mn2(SO4)3	-50.16	-55.87	-5.71	Mn2(SO4)3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-10.88	1.62	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.60	-8.89	2.72	MnCl2:4H2O
MnS(grn)	-75.16	-74.99	0.17	MnS
MnS(pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.50	-35.00	3.50	MnSe
MnSeO3	-4.35	-3.22	1.13	MnSeO3
MnSeO3:2H2O	-4.21	-3.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.94	-13.99	-2.05	MnSeO4:5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.86	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.41	-49.30	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.45	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.43	-2.13	10.30	Na2SeO3:5H2O
Na2SeO4	-14.17	-12.89	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.56	10.12	36.68	Na3VO4
Na4V2O7	-29.56	7.84	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.26	-1.31	Na2CO3:10H2O
NaVO3	-6.14	-2.28	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni(OH)2	-7.02	5.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-26.66	5.34	32.00	Ni4(OH)6SO4
NiCO3	-9.00	-15.87	-6.87	NiCO3
NiMoO4	-4.47	-15.61	-11.14	NiMoO4
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.82	-40.52	-17.70	NiSe
NiSeO3:2H2O	-11.57	-8.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.00	-19.52	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb(BO2)2	-8.79	-2.28	6.52	Pb(BO2)2
Pb(OH)2	-2.38	5.77	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-63.44	-72.20	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.65	11.54	26.19	Pb2O(OH)2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.52	-5.42	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.79	0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.16	-0.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.80	5.30	21.10	Pb4(OH)6SO4

Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.48	-25.08	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.37	-18.87	-14.50	UO2CO3
Sb(OH)3	-12.19	-19.30	-7.11	Sb(OH)3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.75	-177.51	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.16	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.22	2.77	5.99	UO2(OH)2:H2O
Semetal(am)	-13.65	-20.76	-7.11	Se
Semetal(hex)	-13.05	-20.76	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.25	-11.25	-10.00	ZnCO3
Sphalerite	-64.45	-75.90	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.70	-5.38	0.32	Na2SO4
Thermonatrite	-9.88	-9.25	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca(UO2)2(VO4)2
U3O8	-10.66	10.42	21.08	U3O8
U3Sb4	-576.78	-424.40	152.38	U3Sb4
U4O9	-25.66	-28.68	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.17	-60.89	-32.72	UF4:2.5H2O
UO2(am)	-14.49	-13.56	0.93	UO2
UO2(NO3)2	-40.81	-28.67	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.52	-28.67	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.06	-28.67	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-30.72	-28.67	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.84	2.77	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.27	-22.52	-2.25	UO2SeO4:4H2O
UO3	-4.93	2.77	7.70	UO3
Uraninite	-8.89	-13.56	-4.67	UO2
USb2	-218.67	-189.09	29.58	USb2
V(OH)3	-19.02	-11.43	7.59	V(OH)3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-40.43	-38.59	1.84	V3O5
V4O7	-50.13	-42.94	7.19	V4O7
V6O13	-41.11	-101.97	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VC12	-63.26	-44.39	18.87	VC12
VC13	-65.14	-41.71	23.43	VC13
VF4	-66.61	-51.68	14.93	VF4

Vmetal	-93.77	-49.74	44.03	V
VO	-38.95	-24.20	14.76	VO
VO(OH)2	-9.50	-4.35	5.15	VO(OH)2
VO2Cl	-21.42	-18.58	2.84	VO2Cl
VOC1	-32.67	-21.52	11.15	VOC1
VOC12	-37.30	-24.54	12.76	VOC12
VOSO4	-25.73	-22.12	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.95	-75.90	-8.95	ZnS
Zincite	-0.94	10.40	11.33	ZnO
Zincosite	-11.31	-7.38	3.93	ZnSO4
Zn(BO2)2	-5.94	2.35	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.36	-21.05	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.80	10.40	12.20	Zn(OH)2
Zn(OH)2(am)	-2.08	10.40	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.36	10.40	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.14	10.40	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.34	10.40	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.48	3.02	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.49	10.70	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.75	-1.10	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.27	-4.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.70	31.80	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.27	-0.53	ZnF2
Znmetal	-40.93	-15.15	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.79	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.90	-9.05	ZnS
ZnSb	-83.78	-72.76	11.01	ZnSb
ZnSe	-21.50	-35.90	-14.40	ZnSe
ZnSeO4:6H2O	-13.38	-14.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 76.

```

Title Stage 4 Pit lake Mix
Mix 403
404 0.044597
408 0.011630
1 0.027303
17 0.029472
16 0.000000
315 0.886998
Save solution 409
end

```

TITLE

Stage 4 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 403.

Mixture 403.

2.730e-02 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1 and PW-3 (representative of water used to rapidly re-fill pit)

2.947e-02 Solution 17 Average water quality for Background Surface Water SWQ-1 (representative of haul road and watershed run-off)

8.870e-01 Solution 315 Solution after simulation 66.

4.460e-02 Solution 404 Solution after simulation 71.

1.163e-02 Solution 408 Solution after simulation 75.

-----Solution composition-----

Elements	Molality	Moles
Ag	2.878e-09	2.879e-09
Al	2.508e-07	2.508e-07
As	4.314e-09	4.315e-09
B	9.717e-06	9.718e-06
Ba	6.535e-09	6.536e-09
C	1.653e-03	1.653e-03
Ca	6.744e-04	6.745e-04
Cd	1.279e-09	1.279e-09
Cl	1.929e-03	1.929e-03
Co	9.747e-09	9.748e-09
Cr	8.285e-10	8.286e-10
Cu	4.856e-07	4.856e-07
F	8.786e-05	8.788e-05
Fe	8.052e-10	8.053e-10
Hg	2.027e-10	2.027e-10
K	4.212e-04	4.213e-04
Mg	6.140e-04	6.141e-04
Mn	6.071e-06	6.072e-06
Mo	1.782e-07	1.782e-07
N	1.450e-06	1.451e-06
Na	3.780e-03	3.781e-03
Ni	1.517e-08	1.517e-08
Pb	8.805e-10	8.806e-10
S	1.559e-03	1.559e-03
Sb	2.701e-09	2.701e-09
Se	1.587e-08	1.587e-08
Si	2.681e-04	2.681e-04
U	3.261e-08	3.261e-08
V	8.328e-10	8.329e-10
Zn	8.736e-07	8.737e-07

-----Description of solution-----

	pH	=	8.096	Charge balance
	pe	=	4.460	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	8.961e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.657e-03	
	Total CO2 (mol/kg)	=	1.653e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.717e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	8	
	Total H	=	1.110299e+02	
	Total O	=	5.552585e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.388e-06	1.256e-06	-5.858	-5.901	-0.044	(0)
H+	8.845e-09	8.016e-09	-8.053	-8.096	-0.043	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.878e-09					
AgCl	1.937e-09	1.937e-09	-8.713	-8.713	0.000	(0)
Ag+	5.989e-10	5.427e-10	-9.223	-9.265	-0.043	(0)
AgCl2-	3.297e-10	2.950e-10	-9.482	-9.530	-0.048	(0)
AgSO4-	1.136e-11	1.016e-11	-10.945	-10.993	-0.048	(0)
AgCl3-2	7.172e-13	4.597e-13	-12.144	-12.338	-0.193	(0)
AgNO2	1.346e-13	1.346e-13	-12.871	-12.871	0.000	(0)
AgF	1.037e-13	1.037e-13	-12.984	-12.984	0.000	(0)
AgOH	6.816e-14	6.816e-14	-13.166	-13.166	0.000	(0)
AgNH3+	1.003e-14	8.976e-15	-13.999	-14.047	-0.048	(0)
Ag2Se	8.444e-15	8.444e-15	-14.073	-14.073	0.000	(0)
AgH2BO3	5.599e-15	5.599e-15	-14.252	-14.252	0.000	(0)
AgCl4-3	4.463e-15	1.641e-15	-14.350	-14.785	-0.435	(0)
AgSeO3-	1.623e-15	1.452e-15	-14.790	-14.838	-0.048	(0)
Ag (OH) 2-	9.349e-18	8.365e-18	-17.029	-17.078	-0.048	(0)
Ag (NH3) 2+	6.604e-19	5.909e-19	-18.180	-18.228	-0.048	(0)
Ag (NO2) 2-	2.767e-19	2.476e-19	-18.558	-18.606	-0.048	(0)
AgNO3	1.779e-19	1.779e-19	-18.750	-18.750	0.000	(0)
Ag (SeO3) 2-3	1.472e-22	5.411e-23	-21.832	-22.267	-0.435	(0)
Ag2MoO4	1.340e-26	1.340e-26	-25.873	-25.873	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.358	-73.358	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.813	-82.586	-0.772	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.422	-146.554	-0.132	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.118	-147.166	-0.048	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.639	-147.897	-0.258	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.960	-148.208	-0.249	(0)
Al	2.508e-07					
Al (OH) 4-	2.493e-07	2.262e-07	-6.603	-6.646	-0.042	(0)
Al (OH) 3	1.430e-09	1.430e-09	-8.845	-8.845	0.000	(0)
Al (OH) 2+	6.278e-11	5.708e-11	-10.202	-10.243	-0.041	(0)
AlF2+	1.154e-12	1.049e-12	-11.938	-11.979	-0.041	(0)
AlF3	1.004e-12	1.004e-12	-11.998	-11.998	0.000	(0)
AlOH+2	8.374e-14	5.722e-14	-13.077	-13.242	-0.165	(0)
AlF+2	5.070e-14	3.465e-14	-13.295	-13.460	-0.165	(0)
AlF4-	4.220e-14	3.828e-14	-13.375	-13.417	-0.042	(0)
AlSO4+	3.660e-16	3.319e-16	-15.437	-15.479	-0.042	(0)
Al+3	1.105e-16	4.556e-17	-15.957	-16.341	-0.385	(0)
Al (SO4) 2-	3.680e-18	3.338e-18	-17.434	-17.476	-0.042	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.010	-51.445	-0.435	(0)
As (3)	1.755e-22					
H3AsO3	1.638e-22	1.638e-22	-21.786	-21.786	0.000	(0)
H2AsO3-	1.171e-23	1.048e-23	-22.931	-22.980	-0.048	(0)
HAsO3-2	1.860e-27	1.192e-27	-26.731	-26.924	-0.193	(0)
H4AsO3+	7.270e-31	6.505e-31	-30.138	-30.187	-0.048	(0)
AsO3-3	1.559e-32	5.733e-33	-31.807	-32.242	-0.435	(0)
As (5)	4.314e-09					
HAsO4-2	4.097e-09	2.626e-09	-8.388	-8.581	-0.193	(0)
H2AsO4-	2.146e-10	1.920e-10	-9.668	-9.717	-0.048	(0)
AsO4-3	2.818e-12	1.036e-12	-11.550	-11.985	-0.435	(0)
H3AsO4	2.669e-16	2.675e-16	-15.574	-15.573	0.001	(0)
B	9.717e-06					
H3BO3	8.966e-06	8.985e-06	-5.047	-5.046	0.001	(0)
H2BO3-	7.217e-07	6.509e-07	-6.142	-6.186	-0.045	(0)
CaH2BO3+	1.608e-08	1.451e-08	-7.794	-7.838	-0.045	(0)
MgH2BO3+	9.111e-09	8.218e-09	-8.040	-8.085	-0.045	(0)
NaH2BO3	3.514e-09	3.514e-09	-8.454	-8.454	0.000	(0)
BF (OH) 3-	3.023e-10	2.726e-10	-9.520	-9.564	-0.045	(0)
H5 (BO3) 2-	5.519e-12	4.978e-12	-11.258	-11.303	-0.045	(0)
BaH2BO3+	9.704e-14	8.753e-14	-13.013	-13.058	-0.045	(0)
BF2 (OH) 2-	1.970e-14	1.777e-14	-13.705	-13.750	-0.045	(0)

	AgH2BO3	5.599e-15	5.599e-15	-14.252	-14.252	0.000	(0)
	H8 (BO3) 3-	4.959e-15	4.473e-15	-14.305	-14.349	-0.045	(0)
	BF3OH-	4.674e-21	4.215e-21	-20.330	-20.375	-0.045	(0)
	BF4-	1.402e-26	1.265e-26	-25.853	-25.898	-0.045	(0)
Ba	6.535e-09						
	Ba+2	6.450e-09	4.351e-09	-8.190	-8.361	-0.171	(0)
	BaHCO3+	6.578e-11	5.990e-11	-10.182	-10.223	-0.041	(0)
	BaCO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
	BaH2BO3+	9.704e-14	8.753e-14	-13.013	-13.058	-0.045	(0)
	BaOH+	2.626e-14	2.385e-14	-13.581	-13.622	-0.042	(0)
	BaNH3+2	3.469e-17	2.224e-17	-16.460	-16.653	-0.193	(0)
	BaNO3+	1.006e-17	8.999e-18	-16.998	-17.046	-0.048	(0)
C (4)	1.653e-03						
	HCO3-	1.585e-03	1.441e-03	-2.800	-2.841	-0.041	(0)
	H2CO3	2.599e-05	2.599e-05	-4.585	-4.585	0.000	(0)
	CO3-2	1.250e-05	8.429e-06	-4.903	-5.074	-0.171	(0)
	CaHCO3+	1.142e-05	1.040e-05	-4.942	-4.983	-0.041	(0)
	MgHCO3+	5.928e-06	5.370e-06	-5.227	-5.270	-0.043	(0)
	CaCO3	5.175e-06	5.175e-06	-5.286	-5.286	0.000	(0)
	NaHCO3	2.760e-06	2.760e-06	-5.559	-5.559	0.000	(0)
	MgCO3	2.553e-06	2.553e-06	-5.593	-5.593	0.000	(0)
	NaCO3-	5.880e-07	5.346e-07	-6.231	-6.272	-0.041	(0)
	CuCO3	4.108e-07	4.108e-07	-6.386	-6.386	0.000	(0)
	ZnCO3	1.762e-07	1.762e-07	-6.754	-6.754	0.000	(0)
	MnHCO3+	1.087e-07	9.877e-08	-6.964	-7.005	-0.042	(0)
	UO2 (CO3) 3-4	2.005e-08	3.386e-09	-7.698	-8.470	-0.772	(0)
	ZnHCO3+	1.850e-08	1.655e-08	-7.733	-7.781	-0.048	(0)
	Cu (CO3) 2-2	1.454e-08	9.321e-09	-7.837	-8.031	-0.193	(0)
	UO2 (CO3) 2-2	1.250e-08	8.015e-09	-7.903	-8.096	-0.193	(0)
	NiCO3	2.160e-09	2.160e-09	-8.666	-8.666	0.000	(0)
	NiHCO3+	1.364e-09	1.220e-09	-8.865	-8.914	-0.048	(0)
	CuHCO3+	8.413e-10	7.527e-10	-9.075	-9.123	-0.048	(0)
	CoCO3	6.758e-10	6.758e-10	-9.170	-9.170	0.000	(0)
	PbCO3	6.726e-10	6.726e-10	-9.172	-9.172	0.000	(0)
	CoHCO3+	5.943e-10	5.318e-10	-9.226	-9.274	-0.048	(0)
	CdCO3	1.163e-10	1.163e-10	-9.934	-9.934	0.000	(0)
	BaHCO3+	6.578e-11	5.990e-11	-10.182	-10.223	-0.041	(0)
	UO2CO3	4.765e-11	4.765e-11	-10.322	-10.322	0.000	(0)
	PbHCO3+	3.177e-11	2.843e-11	-10.498	-10.546	-0.048	(0)
	Pb (CO3) 2-2	2.551e-11	1.635e-11	-10.593	-10.786	-0.193	(0)
	BaCO3	1.881e-11	1.881e-11	-10.726	-10.726	0.000	(0)
	CdHCO3+	2.220e-12	1.986e-12	-11.654	-11.702	-0.048	(0)
	Cd (CO3) 2-2	1.134e-12	7.267e-13	-11.945	-12.139	-0.193	(0)
	FeHCO3+	5.768e-15	5.252e-15	-14.239	-14.280	-0.041	(0)
	HgCO3	1.836e-16	1.836e-16	-15.736	-15.736	0.000	(0)
	Hg (CO3) 2-2	7.635e-18	4.894e-18	-17.117	-17.310	-0.193	(0)
	HgHCO3+	3.063e-20	2.741e-20	-19.514	-19.562	-0.048	(0)
Ca	6.744e-04						
	Ca+2	5.741e-04	3.873e-04	-3.241	-3.412	-0.171	(0)
	CaSO4	8.328e-05	8.328e-05	-4.079	-4.079	0.000	(0)
	CaHCO3+	1.142e-05	1.040e-05	-4.942	-4.983	-0.041	(0)
	CaCO3	5.175e-06	5.175e-06	-5.286	-5.286	0.000	(0)
	CaF+	3.539e-07	3.215e-07	-6.451	-6.493	-0.042	(0)
	CaH2BO3+	1.608e-08	1.451e-08	-7.794	-7.838	-0.045	(0)
	CaOH+	1.066e-08	9.706e-09	-7.972	-8.013	-0.041	(0)
	CaNH3+2	6.161e-12	3.949e-12	-11.210	-11.403	-0.193	(0)
	CaNO3+	5.648e-13	5.054e-13	-12.248	-12.296	-0.048	(0)
	Ca (NH3) 2+2	1.987e-20	1.274e-20	-19.702	-19.895	-0.193	(0)
Cd	1.279e-09						
	Cd+2	8.973e-10	6.053e-10	-9.047	-9.218	-0.171	(0)
	CdSO4	1.332e-10	1.332e-10	-9.876	-9.876	0.000	(0)
	CdCO3	1.163e-10	1.163e-10	-9.934	-9.934	0.000	(0)
	CdCl+	1.130e-10	1.011e-10	-9.947	-9.995	-0.048	(0)
	CdOH+	6.749e-12	6.039e-12	-11.171	-11.219	-0.048	(0)
	CdOHC1	5.207e-12	5.207e-12	-11.283	-11.283	0.000	(0)
	Cd (SO4) 2-2	2.630e-12	1.686e-12	-11.580	-11.773	-0.193	(0)
	CdHCO3+	2.220e-12	1.986e-12	-11.654	-11.702	-0.048	(0)
	Cd (CO3) 2-2	1.134e-12	7.267e-13	-11.945	-12.139	-0.193	(0)

CdF+	8.153e-13	7.296e-13	-12.089	-12.137	-0.048	(0)
CdCl2	7.366e-13	7.366e-13	-12.133	-12.133	0.000	(0)
Cd(OH)2	4.785e-14	4.785e-14	-13.320	-13.320	0.000	(0)
CdCl3-	9.082e-16	8.126e-16	-15.042	-15.090	-0.048	(0)
CdF2	1.107e-16	1.107e-16	-15.956	-15.956	0.000	(0)
Cd(OH)3-	4.103e-18	3.671e-18	-17.387	-17.435	-0.048	(0)
CdNO3+	8.827e-19	7.899e-19	-18.054	-18.102	-0.048	(0)
CdSeO4	7.487e-19	7.487e-19	-18.126	-18.126	0.000	(0)
Cd2OH+3	4.983e-20	1.832e-20	-19.303	-19.737	-0.435	(0)
Cd(SeO3)2-2	1.348e-20	8.643e-21	-19.870	-20.063	-0.193	(0)
Cd(OH)4-2	1.177e-24	7.547e-25	-23.929	-24.122	-0.193	(0)
Cd(NO3)2	1.634e-28	1.634e-28	-27.787	-27.787	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.069	-79.118	-0.048	(0)
Cd(HS)2	0.000e+00	0.000e+00	-149.821	-149.821	0.000	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-225.780	-225.829	-0.048	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-301.347	-301.540	-0.193	(0)
Cl1	1.929e-03					
Cl-	1.929e-03	1.748e-03	-2.715	-2.757	-0.043	(0)
MnCl+	8.323e-09	7.559e-09	-8.080	-8.122	-0.042	(0)
ZnOHCl	2.622e-09	2.622e-09	-8.581	-8.581	0.000	(0)
AgCl	1.937e-09	1.937e-09	-8.713	-8.713	0.000	(0)
ZnCl+	1.761e-09	1.595e-09	-8.754	-8.797	-0.043	(0)
AgCl2-	3.297e-10	2.950e-10	-9.482	-9.530	-0.048	(0)
CuCl	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
CuCl2-	1.249e-10	1.131e-10	-9.903	-9.946	-0.043	(0)
CdCl+	1.130e-10	1.011e-10	-9.947	-9.995	-0.048	(0)
NiCl+	3.433e-11	3.072e-11	-10.464	-10.513	-0.048	(0)
CoCl+	3.206e-11	2.869e-11	-10.494	-10.542	-0.048	(0)
CuCl+	2.532e-11	2.294e-11	-10.597	-10.639	-0.043	(0)
MnCl2	1.867e-11	1.867e-11	-10.729	-10.729	0.000	(0)
CdOHCl	5.207e-12	5.207e-12	-11.283	-11.283	0.000	(0)
ZnCl2	4.420e-12	4.420e-12	-11.355	-11.355	0.000	(0)
PbCl+	1.840e-12	1.647e-12	-11.735	-11.783	-0.048	(0)
CdCl2	7.366e-13	7.366e-13	-12.133	-12.133	0.000	(0)
AgCl3-2	7.172e-13	4.597e-13	-12.144	-12.338	-0.193	(0)
HgClOH	7.058e-14	7.058e-14	-13.151	-13.151	0.000	(0)
CuCl3-2	6.214e-14	4.229e-14	-13.207	-13.374	-0.167	(0)
CuCl2	1.390e-14	1.390e-14	-13.857	-13.857	0.000	(0)
PbCl2	1.286e-14	1.286e-14	-13.891	-13.891	0.000	(0)
MnCl3-	9.897e-15	8.990e-15	-14.004	-14.046	-0.042	(0)
ZnCl3-	6.776e-15	6.138e-15	-14.169	-14.212	-0.043	(0)
HgCl2	5.564e-15	5.564e-15	-14.255	-14.255	0.000	(0)
AgCl4-3	4.463e-15	1.641e-15	-14.350	-14.785	-0.435	(0)
CdCl3-	9.082e-16	8.126e-16	-15.042	-15.090	-0.048	(0)
NiCl2	2.704e-16	2.704e-16	-15.568	-15.568	0.000	(0)
HgCl3-	1.087e-16	9.727e-17	-15.964	-16.012	-0.048	(0)
PbCl3-	1.000e-17	8.951e-18	-17.000	-17.048	-0.048	(0)
ZnCl4-2	7.885e-18	5.366e-18	-17.103	-17.270	-0.167	(0)
UO2Cl+	4.500e-18	4.027e-18	-17.347	-17.395	-0.048	(0)
HgCl4-2	1.056e-18	6.771e-19	-17.976	-18.169	-0.193	(0)
HgCl+	7.096e-19	6.349e-19	-18.149	-18.197	-0.048	(0)
CrCl+2	4.200e-19	2.692e-19	-18.377	-18.570	-0.193	(0)
CuCl3-	2.504e-19	2.269e-19	-18.601	-18.644	-0.043	(0)
CrOHCl2	1.124e-20	1.124e-20	-19.949	-19.949	0.000	(0)
PbCl4-2	1.116e-20	7.153e-21	-19.952	-20.146	-0.193	(0)
FeCl+2	6.010e-23	4.090e-23	-22.221	-22.388	-0.167	(0)
CrCl2+	4.991e-23	4.466e-23	-22.302	-22.350	-0.048	(0)
CuCl4-2	2.921e-24	1.988e-24	-23.534	-23.702	-0.167	(0)
VOCl+	6.504e-25	5.820e-25	-24.187	-24.235	-0.048	(0)
FeCl2+	3.517e-25	3.194e-25	-24.454	-24.496	-0.042	(0)
CrO3Cl-	4.838e-27	4.329e-27	-26.315	-26.364	-0.048	(0)
FeCl3	5.584e-29	5.584e-29	-28.253	-28.253	0.000	(0)
CoCl+2	3.019e-37	1.935e-37	-36.520	-36.713	-0.193	(0)
UCl+3	0.000e+00	0.000e+00	-47.558	-47.992	-0.435	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-51.025	-51.218	-0.193	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-52.936	-53.129	-0.193	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-65.832	-66.025	-0.193	(0)
Co(2)	9.747e-09					

Co+2	7.399e-09	4.743e-09	-8.131	-8.324	-0.193	(0)
CoSO4	8.882e-10	8.882e-10	-9.052	-9.052	0.000	(0)
CoCO3	6.758e-10	6.758e-10	-9.170	-9.170	0.000	(0)
CoHCO3+	5.943e-10	5.318e-10	-9.226	-9.274	-0.048	(0)
CoOH+	1.328e-10	1.188e-10	-9.877	-9.925	-0.048	(0)
CoCl+	3.206e-11	2.869e-11	-10.494	-10.542	-0.048	(0)
CoF+	1.275e-11	1.141e-11	-10.895	-10.943	-0.048	(0)
Co(OH)2	1.186e-11	1.186e-11	-10.926	-10.926	0.000	(0)
CoNO2+	4.435e-14	3.968e-14	-13.353	-13.401	-0.048	(0)
Co(NH3)+2	7.205e-15	4.619e-15	-14.142	-14.335	-0.193	(0)
Co(OH)3-	3.320e-16	2.971e-16	-15.479	-15.527	-0.048	(0)
CoOOH-	8.332e-17	7.455e-17	-16.079	-16.128	-0.048	(0)
CoSeO4	1.579e-17	1.579e-17	-16.802	-16.802	0.000	(0)
CoNO3+	3.467e-18	3.102e-18	-17.460	-17.508	-0.048	(0)
Co2OH+3	7.684e-20	2.825e-20	-19.114	-19.549	-0.435	(0)
Co(NH3)2+2	2.489e-21	1.596e-21	-20.604	-20.797	-0.193	(0)
Co(OH)4-2	9.225e-23	5.913e-23	-22.035	-22.228	-0.193	(0)
Co(NO3)2	2.604e-27	2.604e-27	-26.584	-26.584	0.000	(0)
Co(NH3)3+2	2.538e-28	1.627e-28	-27.595	-27.789	-0.193	(0)
Co4(OH)4+4	2.358e-31	3.981e-32	-30.628	-31.400	-0.772	(0)
Co(NH3)4+2	1.079e-35	6.917e-36	-34.967	-35.160	-0.193	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-42.839	-43.032	-0.193	(0)
Co(3)	5.415e-30					
CoOH+2	5.415e-30	3.471e-30	-29.266	-29.459	-0.193	(0)
Co+3	1.319e-36	5.439e-37	-35.880	-36.264	-0.385	(0)
CoCl+2	3.019e-37	1.935e-37	-36.520	-36.713	-0.193	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-51.025	-51.218	-0.193	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-61.322	-61.370	-0.048	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-64.775	-64.969	-0.193	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-65.832	-66.025	-0.193	(0)
Cr(2)	1.539e-27					
Cr+2	1.539e-27	9.866e-28	-26.813	-27.006	-0.193	(0)
Cr(3)	8.285e-10					
Cr(OH)2+	5.583e-10	4.995e-10	-9.253	-9.301	-0.048	(0)
Cr(OH)3	2.357e-10	2.357e-10	-9.628	-9.628	0.000	(0)
CrO2-	1.561e-11	1.396e-11	-10.807	-10.855	-0.048	(0)
Cr(OH)4-	1.317e-11	1.178e-11	-10.880	-10.929	-0.048	(0)
Cr(OH)+2	5.100e-12	3.269e-12	-11.292	-11.486	-0.193	(0)
CrOHSO4	7.281e-13	7.281e-13	-12.138	-12.138	0.000	(0)
CrF+2	2.237e-15	1.434e-15	-14.650	-14.843	-0.193	(0)
Cr+3	3.236e-16	1.190e-16	-15.490	-15.925	-0.435	(0)
CrSO4+	2.914e-16	2.607e-16	-15.535	-15.584	-0.048	(0)
CrCl+2	4.200e-19	2.692e-19	-18.377	-18.570	-0.193	(0)
CrOHC12	1.124e-20	1.124e-20	-19.949	-19.949	0.000	(0)
Cr2(OH)2SO4+2	3.356e-22	2.151e-22	-21.474	-21.667	-0.193	(0)
CrCl2+	4.991e-23	4.466e-23	-22.302	-22.350	-0.048	(0)
Cr2(OH)2(SO4)2	1.199e-23	1.199e-23	-22.921	-22.921	0.000	(0)
CrNO3+2	3.348e-27	2.146e-27	-26.475	-26.668	-0.193	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-41.718	-41.911	-0.193	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-51.039	-51.474	-0.435	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-52.936	-53.129	-0.193	(0)
Cr(6)	2.899e-15					
CrO4-2	2.806e-15	1.893e-15	-14.552	-14.723	-0.171	(0)
HCrO4-	5.487e-17	4.910e-17	-16.261	-16.309	-0.048	(0)
NaCrO4-	3.580e-17	3.203e-17	-16.446	-16.494	-0.048	(0)
KCrO4-	2.981e-18	2.667e-18	-17.526	-17.574	-0.048	(0)
H2CrO4	3.190e-25	3.190e-25	-24.496	-24.496	0.000	(0)
CrO3SO4-2	1.755e-25	1.125e-25	-24.756	-24.949	-0.193	(0)
CrO3Cl-	4.838e-27	4.329e-27	-26.315	-26.364	-0.048	(0)
Cr2O7-2	1.304e-31	8.360e-32	-30.885	-31.078	-0.193	(0)
Cu(1)	5.920e-10					
CuCl	3.097e-10	3.097e-10	-9.509	-9.509	0.000	(0)
Cu+	1.573e-10	1.407e-10	-9.803	-9.852	-0.048	(0)
CuCl2-	1.249e-10	1.131e-10	-9.903	-9.946	-0.043	(0)
CuCl3-2	6.214e-14	4.229e-14	-13.207	-13.374	-0.167	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-145.831	-146.085	-0.253	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.570	-146.815	-0.244	(0)
Cu(2)	4.850e-07					

	CuCO3	4.108e-07	4.108e-07	-6.386	-6.386	0.000	(0)
	CuOH+	3.629e-08	3.287e-08	-7.440	-7.483	-0.043	(0)
	Cu (CO3) 2-2	1.454e-08	9.321e-09	-7.837	-8.031	-0.193	(0)
	Cu+2	1.227e-08	8.277e-09	-7.911	-8.082	-0.171	(0)
	Cu (OH) 2	8.237e-09	8.237e-09	-8.084	-8.084	0.000	(0)
	CuSO4	1.780e-09	1.780e-09	-8.750	-8.750	0.000	(0)
	CuHCO3+	8.413e-10	7.527e-10	-9.075	-9.123	-0.048	(0)
	CuF+	4.438e-11	3.971e-11	-10.353	-10.401	-0.048	(0)
	Cu2 (OH) 2+2	4.234e-11	2.714e-11	-10.373	-10.566	-0.193	(0)
	CuCl+	2.532e-11	2.294e-11	-10.597	-10.639	-0.043	(0)
	Cu (OH) 3-	2.371e-11	2.122e-11	-10.625	-10.673	-0.048	(0)
	CuNO2+	1.150e-12	1.029e-12	-11.939	-11.988	-0.048	(0)
	CuNH3+2	1.070e-12	6.860e-13	-11.971	-12.164	-0.193	(0)
	CuCl2	1.390e-14	1.390e-14	-13.857	-13.857	0.000	(0)
	Cu (OH) 4-2	3.272e-16	2.097e-16	-15.485	-15.678	-0.193	(0)
	Cu (NO2) 2	1.250e-17	1.250e-17	-16.903	-16.903	0.000	(0)
	CuNO3+	1.207e-17	1.080e-17	-16.918	-16.967	-0.048	(0)
	CuCl3-	2.504e-19	2.269e-19	-18.601	-18.644	-0.043	(0)
	CuCl4-2	2.921e-24	1.988e-24	-23.534	-23.702	-0.167	(0)
	Cu (NO3) 2	5.611e-28	5.611e-28	-27.251	-27.251	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.858	-215.906	-0.048	(0)
F		8.786e-05					
	F-	8.391e-05	7.605e-05	-4.076	-4.119	-0.043	(0)
	MgF+	3.425e-06	3.107e-06	-5.465	-5.508	-0.042	(0)
	CaF+	3.539e-07	3.215e-07	-6.451	-6.493	-0.042	(0)
	NaF	1.634e-07	1.634e-07	-6.787	-6.787	0.000	(0)
	MnF+	1.145e-08	1.040e-08	-7.941	-7.983	-0.042	(0)
	HF	9.017e-10	9.017e-10	-9.045	-9.045	0.000	(0)
	ZnF+	6.158e-10	5.510e-10	-9.211	-9.259	-0.048	(0)
	BF (OH) 3-	3.023e-10	2.726e-10	-9.520	-9.564	-0.045	(0)
	CuF+	4.438e-11	3.971e-11	-10.353	-10.401	-0.048	(0)
	NiF+	1.466e-11	1.312e-11	-10.834	-10.882	-0.048	(0)
	CoF+	1.275e-11	1.141e-11	-10.895	-10.943	-0.048	(0)
	AlF2+	1.154e-12	1.049e-12	-11.938	-11.979	-0.041	(0)
	AlF3	1.004e-12	1.004e-12	-11.998	-11.998	0.000	(0)
	CdF+	8.153e-13	7.296e-13	-12.089	-12.137	-0.048	(0)
	HF2-	2.882e-13	2.607e-13	-12.540	-12.584	-0.044	(0)
	PbF+	1.590e-13	1.422e-13	-12.799	-12.847	-0.048	(0)
	AgF	1.037e-13	1.037e-13	-12.984	-12.984	0.000	(0)
	AlF+2	5.070e-14	3.465e-14	-13.295	-13.460	-0.165	(0)
	AlF4-	4.220e-14	3.828e-14	-13.375	-13.417	-0.042	(0)
	BF2 (OH) 2-	1.970e-14	1.777e-14	-13.705	-13.750	-0.045	(0)
	UO2F+	1.666e-14	1.491e-14	-13.778	-13.827	-0.048	(0)
	UO2F2	3.269e-15	3.269e-15	-14.486	-14.486	0.000	(0)
	CrF+2	2.237e-15	1.434e-15	-14.650	-14.843	-0.193	(0)
	PbF2	2.129e-16	2.129e-16	-15.672	-15.672	0.000	(0)
	CdF2	1.107e-16	1.107e-16	-15.956	-15.956	0.000	(0)
	UO2F3-	6.979e-17	6.245e-17	-16.156	-16.204	-0.048	(0)
	H2F2	2.178e-18	2.178e-18	-17.662	-17.662	0.000	(0)
	FeF2+	1.447e-19	1.314e-19	-18.839	-18.881	-0.042	(0)
	FeF+2	9.491e-20	6.459e-20	-19.023	-19.190	-0.167	(0)
	VO2F	8.868e-20	8.868e-20	-19.052	-19.052	0.000	(0)
	UO2F4-2	5.885e-20	3.772e-20	-19.230	-19.423	-0.193	(0)
	PbF3-	3.431e-20	3.070e-20	-19.465	-19.513	-0.048	(0)
	FeF3	1.410e-20	1.410e-20	-19.851	-19.851	0.000	(0)
	BF3OH-	4.674e-21	4.215e-21	-20.330	-20.375	-0.045	(0)
	VO2F2-	2.736e-21	2.449e-21	-20.563	-20.611	-0.048	(0)
	VOF+	6.048e-23	5.412e-23	-22.218	-22.267	-0.048	(0)
	VO2F3-2	3.623e-24	2.323e-24	-23.441	-23.634	-0.193	(0)
	PbF4-2	1.743e-24	1.118e-24	-23.759	-23.952	-0.193	(0)
	VOF2	1.543e-24	1.543e-24	-23.812	-23.812	0.000	(0)
	HgF+	5.734e-26	5.131e-26	-25.242	-25.290	-0.048	(0)
	BF4-	1.402e-26	1.265e-26	-25.853	-25.898	-0.045	(0)
	VOF3-	4.653e-27	4.164e-27	-26.332	-26.381	-0.048	(0)
	Sb (OH) 2F	3.408e-27	3.408e-27	-26.467	-26.467	0.000	(0)
	SbOF	3.352e-27	3.352e-27	-26.475	-26.475	0.000	(0)
	VO2F4-3	2.364e-28	8.691e-29	-27.626	-28.061	-0.435	(0)
	VOF4-2	1.994e-30	1.278e-30	-29.700	-29.893	-0.193	(0)

SiF6-2	4.682e-31	3.186e-31	-30.330	-30.497	-0.167	(0)
UF3+	2.274e-38	2.035e-38	-37.643	-37.691	-0.048	(0)
UF2+2	2.634e-39	1.688e-39	-38.579	-38.773	-0.193	(0)
UF4	1.697e-40	1.697e-40	-39.770	-39.770	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.319	-41.754	-0.435	(0)
UF5-	0.000e+00	0.000e+00	-42.243	-42.291	-0.048	(0)
UF6-2	0.000e+00	0.000e+00	-43.737	-43.930	-0.193	(0)
Fe (2)	5.399e-13					
Fe+2	4.515e-13	2.894e-13	-12.345	-12.538	-0.193	(0)
FeSO4	6.668e-14	6.668e-14	-13.176	-13.176	0.000	(0)
FeOH+	1.593e-14	1.447e-14	-13.798	-13.839	-0.042	(0)
FeHCO3+	5.768e-15	5.252e-15	-14.239	-14.280	-0.041	(0)
Fe (OH) 2	1.444e-17	1.444e-17	-16.841	-16.841	0.000	(0)
Fe (OH) 3-	6.312e-18	5.733e-18	-17.200	-17.242	-0.042	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.404	-159.404	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.226	-235.274	-0.048	(0)
Fe (3)	8.047e-10					
Fe (OH) 3	4.139e-10	4.139e-10	-9.383	-9.383	0.000	(0)
Fe (OH) 2+	3.375e-10	3.069e-10	-9.472	-9.513	-0.041	(0)
Fe (OH) 4-	5.324e-11	4.840e-11	-10.274	-10.315	-0.041	(0)
FeOH+2	9.229e-16	6.281e-16	-15.035	-15.202	-0.167	(0)
FeF2+	1.447e-19	1.314e-19	-18.839	-18.881	-0.042	(0)
FeF+2	9.491e-20	6.459e-20	-19.023	-19.190	-0.167	(0)
FeF3	1.410e-20	1.410e-20	-19.851	-19.851	0.000	(0)
FeSO4+	8.981e-21	8.157e-21	-20.047	-20.088	-0.042	(0)
Fe+3	1.878e-21	7.746e-22	-20.726	-21.111	-0.385	(0)
Fe (SO4) 2-	1.829e-22	1.637e-22	-21.738	-21.786	-0.048	(0)
FeCl+2	6.010e-23	4.090e-23	-22.221	-22.388	-0.167	(0)
FeCl2+	3.517e-25	3.194e-25	-24.454	-24.496	-0.042	(0)
FeHSeO3+2	2.676e-26	1.716e-26	-25.572	-25.766	-0.193	(0)
Fe2 (OH) 2+4	7.737e-29	1.306e-29	-28.111	-28.884	-0.772	(0)
FeCl3	5.584e-29	5.584e-29	-28.253	-28.253	0.000	(0)
FeNO3+2	4.986e-30	3.196e-30	-29.302	-29.495	-0.193	(0)
Fe3 (OH) 4+5	9.334e-37	5.795e-38	-36.030	-37.237	-1.207	(0)
H (0)	1.094e-28					
H2	5.470e-29	5.482e-29	-28.262	-28.261	0.001	(0)
Hg (0)	2.024e-10					
Hg	2.024e-10	2.024e-10	-9.694	-9.694	0.000	(0)
Hg (1)	7.804e-24					
Hg2+2	3.902e-24	2.501e-24	-23.409	-23.602	-0.193	(0)
Hg (2)	2.572e-13					
Hg (OH) 2	1.808e-13	1.811e-13	-12.743	-12.742	0.001	(0)
HgClOH	7.058e-14	7.058e-14	-13.151	-13.151	0.000	(0)
HgCl2	5.564e-15	5.564e-15	-14.255	-14.255	0.000	(0)
HgCO3	1.836e-16	1.836e-16	-15.736	-15.736	0.000	(0)
HgCl3-	1.087e-16	9.727e-17	-15.964	-16.012	-0.048	(0)
Hg (CO3) 2-2	7.635e-18	4.894e-18	-17.117	-17.310	-0.193	(0)
HgCl4-2	1.056e-18	6.771e-19	-17.976	-18.169	-0.193	(0)
HgOH+	1.017e-18	9.100e-19	-17.993	-18.041	-0.048	(0)
HgCl+	7.096e-19	6.349e-19	-18.149	-18.197	-0.048	(0)
Hg (OH) 3-	3.200e-20	2.864e-20	-19.495	-19.543	-0.048	(0)
HgHCO3+	3.063e-20	2.741e-20	-19.514	-19.562	-0.048	(0)
Hg (NH3) 2+2	1.175e-21	7.534e-22	-20.930	-21.123	-0.193	(0)
HgNH3+2	1.451e-22	9.302e-23	-21.838	-22.031	-0.193	(0)
Hg+2	2.839e-23	1.820e-23	-22.547	-22.740	-0.193	(0)
HgSO4	4.472e-24	4.472e-24	-23.349	-23.349	0.000	(0)
HgF+	5.734e-26	5.131e-26	-25.242	-25.290	-0.048	(0)
Hg (NH3) 3+2	3.790e-29	2.429e-29	-28.421	-28.615	-0.193	(0)
HgNO3+	3.099e-33	2.773e-33	-32.509	-32.557	-0.048	(0)
Hg (NH3) 4+2	2.438e-36	1.563e-36	-35.613	-35.806	-0.193	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.323	-42.323	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.483	-138.531	-0.048	(0)
HgS2-2	0.000e+00	0.000e+00	-138.950	-139.143	-0.193	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.233	-140.233	0.000	(0)
K	4.212e-04					
K+	4.185e-04	3.793e-04	-3.378	-3.421	-0.043	(0)
KSO4-	2.772e-06	2.520e-06	-5.557	-5.599	-0.041	(0)
KCrO4-	2.981e-18	2.667e-18	-17.526	-17.574	-0.048	(0)

Mg	6.140e-04					
Mg+2	5.397e-04	3.641e-04	-3.268	-3.439	-0.171	(0)
MgSO4	6.218e-05	6.218e-05	-4.206	-4.206	0.000	(0)
MgHCO3+	5.928e-06	5.370e-06	-5.227	-5.270	-0.043	(0)
MgF+	3.425e-06	3.107e-06	-5.465	-5.508	-0.042	(0)
MgCO3	2.553e-06	2.553e-06	-5.593	-5.593	0.000	(0)
MgOH+	1.997e-07	1.820e-07	-6.700	-6.740	-0.040	(0)
MgH2BO3+	9.111e-09	8.218e-09	-8.040	-8.085	-0.045	(0)
Mn (2)	6.071e-06					
Mn+2	5.358e-06	3.434e-06	-5.271	-5.464	-0.193	(0)
MnSO4	5.732e-07	5.732e-07	-6.242	-6.242	0.000	(0)
MnHCO3+	1.087e-07	9.877e-08	-6.964	-7.005	-0.042	(0)
MnOH+	1.193e-08	1.083e-08	-7.923	-7.965	-0.042	(0)
MnF+	1.145e-08	1.040e-08	-7.941	-7.983	-0.042	(0)
MnCl+	8.323e-09	7.559e-09	-8.080	-8.122	-0.042	(0)
MnCl2	1.867e-11	1.867e-11	-10.729	-10.729	0.000	(0)
MnCl3-	9.897e-15	8.990e-15	-14.004	-14.046	-0.042	(0)
MnSeO4	6.140e-15	6.140e-15	-14.212	-14.212	0.000	(0)
MnNO3+	2.510e-15	2.246e-15	-14.600	-14.649	-0.048	(0)
Mn (OH) 3-	1.163e-16	1.056e-16	-15.935	-15.976	-0.042	(0)
Mn (OH) 4-2	6.292e-22	4.282e-22	-21.201	-21.368	-0.167	(0)
Mn (NO3) 2	2.328e-24	2.328e-24	-23.633	-23.633	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.303	-41.303	0.000	(0)
Mn (3)	1.071e-26					
Mn+3	1.071e-26	4.419e-27	-25.970	-26.355	-0.385	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.113	-41.280	-0.167	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.149	-46.193	-0.044	(0)
Mo	1.782e-07					
MoO4-2	1.782e-07	1.202e-07	-6.749	-6.920	-0.171	(0)
HMoO4-	2.143e-11	1.918e-11	-10.669	-10.717	-0.048	(0)
H2MoO4	1.126e-15	1.126e-15	-14.948	-14.948	0.000	(0)
Ag2MoO4	1.340e-26	1.340e-26	-25.873	-25.873	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-51.010	-51.445	-0.435	(0)
Mo7O24-6	0.000e+00	0.000e+00	-58.480	-60.218	-1.738	(0)
HMo7O24-5	0.000e+00	0.000e+00	-60.720	-61.927	-1.207	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-64.469	-65.241	-0.772	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-69.657	-70.091	-0.435	(0)
N (-3)	1.356e-07					
NH4+	1.263e-07	1.139e-07	-6.899	-6.944	-0.045	(0)
NH3	8.100e-09	8.100e-09	-8.092	-8.092	0.000	(0)
NH4SO4-	1.261e-09	1.145e-09	-8.899	-8.941	-0.042	(0)
CaNH3+2	6.161e-12	3.949e-12	-11.210	-11.403	-0.193	(0)
CuNH3+2	1.070e-12	6.860e-13	-11.971	-12.164	-0.193	(0)
NiNH3+2	4.660e-14	2.987e-14	-13.332	-13.525	-0.193	(0)
AgNH3+	1.003e-14	8.976e-15	-13.999	-14.047	-0.048	(0)
Co (NH3) +2	7.205e-15	4.619e-15	-14.142	-14.335	-0.193	(0)
BaNH3+2	3.469e-17	2.224e-17	-16.460	-16.653	-0.193	(0)
Ag (NH3) 2+	6.604e-19	5.909e-19	-18.180	-18.228	-0.048	(0)
Ni (NH3) 2+2	5.456e-20	3.497e-20	-19.263	-19.456	-0.193	(0)
Ca (NH3) 2+2	1.987e-20	1.274e-20	-19.702	-19.895	-0.193	(0)
Co (NH3) 2+2	2.489e-21	1.596e-21	-20.604	-20.797	-0.193	(0)
Hg (NH3) 2+2	1.175e-21	7.534e-22	-20.930	-21.123	-0.193	(0)
HgNH3+2	1.451e-22	9.302e-23	-21.838	-22.031	-0.193	(0)
Co (NH3) 3+2	2.538e-28	1.627e-28	-27.595	-27.789	-0.193	(0)
Hg (NH3) 3+2	3.790e-29	2.429e-29	-28.421	-28.615	-0.193	(0)
Co (NH3) 4+2	1.079e-35	6.917e-36	-34.967	-35.160	-0.193	(0)
Hg (NH3) 4+2	2.438e-36	1.563e-36	-35.613	-35.806	-0.193	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.718	-41.911	-0.193	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.839	-43.032	-0.193	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.025	-51.218	-0.193	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.039	-51.474	-0.435	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.936	-53.129	-0.193	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.322	-61.370	-0.048	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.775	-64.969	-0.193	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.832	-66.025	-0.193	(0)
N (3)	1.314e-06					

NO2-	1.314e-06	1.187e-06	-5.881	-5.925	-0.044	(0)
CuNO2+	1.150e-12	1.029e-12	-11.939	-11.988	-0.048	(0)
AgNO2	1.346e-13	1.346e-13	-12.871	-12.871	0.000	(0)
CoNO2+	4.435e-14	3.968e-14	-13.353	-13.401	-0.048	(0)
Cu (NO2) 2	1.250e-17	1.250e-17	-16.903	-16.903	0.000	(0)
Ag (NO2) 2-	2.767e-19	2.476e-19	-18.558	-18.606	-0.048	(0)
N (5)	4.559e-10					
NO3-	4.553e-10	4.126e-10	-9.342	-9.384	-0.043	(0)
CaNO3+	5.648e-13	5.054e-13	-12.248	-12.296	-0.048	(0)
MnNO3+	2.510e-15	2.246e-15	-14.600	-14.649	-0.048	(0)
ZnNO3+	4.207e-16	3.764e-16	-15.376	-15.424	-0.048	(0)
CuNO3+	1.207e-17	1.080e-17	-16.918	-16.967	-0.048	(0)
BaNO3+	1.006e-17	8.999e-18	-16.998	-17.046	-0.048	(0)
NiNO3+	7.955e-18	7.118e-18	-17.099	-17.148	-0.048	(0)
CoNO3+	3.467e-18	3.102e-18	-17.460	-17.508	-0.048	(0)
CdNO3+	8.827e-19	7.899e-19	-18.054	-18.102	-0.048	(0)
PbNO3+	1.811e-19	1.620e-19	-18.742	-18.790	-0.048	(0)
AgNO3	1.779e-19	1.779e-19	-18.750	-18.750	0.000	(0)
Mn (NO3) 2	2.328e-24	2.328e-24	-23.633	-23.633	0.000	(0)
UO2NO3+	1.307e-24	1.169e-24	-23.884	-23.932	-0.048	(0)
Zn (NO3) 2	3.099e-26	3.099e-26	-25.509	-25.509	0.000	(0)
CrNO3+2	3.348e-27	2.146e-27	-26.475	-26.668	-0.193	(0)
Co (NO3) 2	2.604e-27	2.604e-27	-26.584	-26.584	0.000	(0)
Cu (NO3) 2	5.611e-28	5.611e-28	-27.251	-27.251	0.000	(0)
Cd (NO3) 2	1.634e-28	1.634e-28	-27.787	-27.787	0.000	(0)
VO2NO3	1.388e-28	1.388e-28	-27.858	-27.858	0.000	(0)
Pb (NO3) 2	1.135e-28	1.135e-28	-27.945	-27.945	0.000	(0)
FeNO3+2	4.986e-30	3.196e-30	-29.302	-29.495	-0.193	(0)
HgNO3+	3.099e-33	2.773e-33	-32.509	-32.557	-0.048	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.323	-42.323	0.000	(0)
Na	3.780e-03					
Na+	3.758e-03	3.406e-03	-2.425	-2.468	-0.043	(0)
NaSO4-	1.888e-05	1.717e-05	-4.724	-4.765	-0.041	(0)
NaHCO3	2.760e-06	2.760e-06	-5.559	-5.559	0.000	(0)
NaCO3-	5.880e-07	5.346e-07	-6.231	-6.272	-0.041	(0)
NaF	1.634e-07	1.634e-07	-6.787	-6.787	0.000	(0)
NaH2BO3	3.514e-09	3.514e-09	-8.454	-8.454	0.000	(0)
NaCrO4-	3.580e-17	3.203e-17	-16.446	-16.494	-0.048	(0)
Ni	1.517e-08					
Ni+2	1.018e-08	6.868e-09	-7.992	-8.163	-0.171	(0)
NiCO3	2.160e-09	2.160e-09	-8.666	-8.666	0.000	(0)
NiHCO3+	1.364e-09	1.220e-09	-8.865	-8.914	-0.048	(0)
NiSO4	1.286e-09	1.286e-09	-8.891	-8.891	0.000	(0)
NiOH+	1.213e-10	1.086e-10	-9.916	-9.964	-0.048	(0)
NiCl+	3.433e-11	3.072e-11	-10.464	-10.513	-0.048	(0)
NiF+	1.466e-11	1.312e-11	-10.834	-10.882	-0.048	(0)
Ni (OH) 2	1.083e-11	1.083e-11	-10.965	-10.965	0.000	(0)
Ni (SO4) 2-2	6.235e-14	3.997e-14	-13.205	-13.398	-0.193	(0)
NiNH3+2	4.660e-14	2.987e-14	-13.332	-13.525	-0.193	(0)
Ni (OH) 3-	1.520e-14	1.360e-14	-13.818	-13.866	-0.048	(0)
NiCl2	2.704e-16	2.704e-16	-15.568	-15.568	0.000	(0)
NiSeO4	2.134e-17	2.134e-17	-16.671	-16.671	0.000	(0)
NiNO3+	7.955e-18	7.118e-18	-17.099	-17.148	-0.048	(0)
Ni (NH3) 2+2	5.456e-20	3.497e-20	-19.263	-19.456	-0.193	(0)
O (0)	3.366e-36					
O2	1.683e-36	1.686e-36	-35.774	-35.773	0.001	(0)
Pb	8.805e-10					
PbCO3	6.726e-10	6.726e-10	-9.172	-9.172	0.000	(0)
PbOH+	9.358e-11	8.373e-11	-10.029	-10.077	-0.048	(0)
Pb+2	3.935e-11	2.654e-11	-10.405	-10.576	-0.171	(0)
PbHCO3+	3.177e-11	2.843e-11	-10.498	-10.546	-0.048	(0)
Pb (CO3) 2-2	2.551e-11	1.635e-11	-10.593	-10.786	-0.193	(0)
PbSO4	1.220e-11	1.220e-11	-10.914	-10.914	0.000	(0)
Pb (OH) 2	3.325e-12	3.325e-12	-11.478	-11.478	0.000	(0)
PbCl+	1.840e-12	1.647e-12	-11.735	-11.783	-0.048	(0)
PbF+	1.590e-13	1.422e-13	-12.799	-12.847	-0.048	(0)
Pb (SO4) 2-2	1.076e-13	6.900e-14	-12.968	-13.161	-0.193	(0)
PbCl2	1.286e-14	1.286e-14	-13.891	-13.891	0.000	(0)

Pb(OH) 3-	4.667e-15	4.176e-15	-14.331	-14.379	-0.048	(0)
PbF2	2.129e-16	2.129e-16	-15.672	-15.672	0.000	(0)
PbCl3-	1.000e-17	8.951e-18	-17.000	-17.048	-0.048	(0)
Pb(OH) 4-2	2.004e-18	1.285e-18	-17.698	-17.891	-0.193	(0)
PbNO3+	1.811e-19	1.620e-19	-18.742	-18.790	-0.048	(0)
Pb2OH+3	9.581e-20	3.523e-20	-19.019	-19.453	-0.435	(0)
PbF3-	3.431e-20	3.070e-20	-19.465	-19.513	-0.048	(0)
PbCl4-2	1.116e-20	7.153e-21	-19.952	-20.146	-0.193	(0)
Pb3(OH) 4+2	9.137e-24	5.857e-24	-23.039	-23.232	-0.193	(0)
PbF4-2	1.743e-24	1.118e-24	-23.759	-23.952	-0.193	(0)
Pb(NO3) 2	1.135e-28	1.135e-28	-27.945	-27.945	0.000	(0)
Pb4(OH) 4+4	7.313e-30	1.235e-30	-29.136	-29.908	-0.772	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.121	-151.121	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.680	-227.729	-0.048	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.358	-73.358	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.859	-77.908	-0.048	(0)
S5-2	0.000e+00	0.000e+00	-78.984	-79.177	-0.193	(0)
H2S	0.000e+00	0.000e+00	-78.984	-78.984	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.069	-79.118	-0.048	(0)
S6-2	0.000e+00	0.000e+00	-79.499	-79.693	-0.193	(0)
S4-2	0.000e+00	0.000e+00	-79.579	-79.772	-0.193	(0)
S3-2	0.000e+00	0.000e+00	-80.385	-80.578	-0.193	(0)
S2-2	0.000e+00	0.000e+00	-81.401	-81.594	-0.193	(0)
S-2	0.000e+00	0.000e+00	-86.944	-87.112	-0.167	(0)
HgHS2-	0.000e+00	0.000e+00	-138.483	-138.531	-0.048	(0)
HgS2-2	0.000e+00	0.000e+00	-138.950	-139.143	-0.193	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.233	-140.233	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-145.831	-146.085	-0.253	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-146.422	-146.554	-0.132	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.570	-146.815	-0.244	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.118	-147.166	-0.048	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.301	-147.349	-0.048	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-147.639	-147.897	-0.258	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.960	-148.208	-0.249	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.435	-149.435	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-149.821	-149.821	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.121	-151.121	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.404	-159.404	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.858	-215.906	-0.048	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.014	-224.063	-0.048	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.753	-225.947	-0.193	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.780	-225.829	-0.048	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.680	-227.729	-0.048	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.226	-235.274	-0.048	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.347	-301.540	-0.193	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.237	-303.430	-0.193	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.133	-319.326	-0.193	(0)
S(6)	1.559e-03					
SO4-2	1.391e-03	9.385e-04	-2.857	-3.028	-0.171	(0)
CaSO4	8.328e-05	8.328e-05	-4.079	-4.079	0.000	(0)
MgSO4	6.218e-05	6.218e-05	-4.206	-4.206	0.000	(0)
NaSO4-	1.888e-05	1.717e-05	-4.724	-4.765	-0.041	(0)
KSO4-	2.772e-06	2.520e-06	-5.557	-5.599	-0.041	(0)
MnSO4	5.732e-07	5.732e-07	-6.242	-6.242	0.000	(0)
ZnSO4	7.457e-08	7.457e-08	-7.127	-7.127	0.000	(0)
CuSO4	1.780e-09	1.780e-09	-8.750	-8.750	0.000	(0)
NiSO4	1.286e-09	1.286e-09	-8.891	-8.891	0.000	(0)
NH4SO4-	1.261e-09	1.145e-09	-8.899	-8.941	-0.042	(0)
Zn(SO4) 2-2	9.509e-10	6.096e-10	-9.022	-9.215	-0.193	(0)
CoSO4	8.882e-10	8.882e-10	-9.052	-9.052	0.000	(0)
HSO4-	8.106e-10	7.352e-10	-9.091	-9.134	-0.042	(0)
CdSO4	1.332e-10	1.332e-10	-9.876	-9.876	0.000	(0)
PbSO4	1.220e-11	1.220e-11	-10.914	-10.914	0.000	(0)
AgSO4-	1.136e-11	1.016e-11	-10.945	-10.993	-0.048	(0)
Cd(SO4) 2-2	2.630e-12	1.686e-12	-11.580	-11.773	-0.193	(0)
CrOHSO4	7.281e-13	7.281e-13	-12.138	-12.138	0.000	(0)
Pb(SO4) 2-2	1.076e-13	6.900e-14	-12.968	-13.161	-0.193	(0)

FeSO4	6.668e-14	6.668e-14	-13.176	-13.176	0.000	(0)
Ni (SO4) 2-2	6.235e-14	3.997e-14	-13.205	-13.398	-0.193	(0)
UO2SO4	2.017e-15	2.017e-15	-14.695	-14.695	0.000	(0)
AlSO4+	3.660e-16	3.319e-16	-15.437	-15.479	-0.042	(0)
CrSO4+	2.914e-16	2.607e-16	-15.535	-15.584	-0.048	(0)
UO2 (SO4) 2-2	3.893e-17	2.496e-17	-16.410	-16.603	-0.193	(0)
Al (SO4) 2-	3.680e-18	3.338e-18	-17.434	-17.476	-0.042	(0)
VO2SO4-	1.665e-20	1.490e-20	-19.779	-19.827	-0.048	(0)
FeSO4+	8.981e-21	8.157e-21	-20.047	-20.088	-0.042	(0)
Cr2 (OH) 2SO4+2	3.356e-22	2.151e-22	-21.474	-21.667	-0.193	(0)
Fe (SO4) 2-	1.829e-22	1.637e-22	-21.738	-21.786	-0.048	(0)
VOSO4	3.067e-23	3.067e-23	-22.513	-22.513	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.199e-23	1.199e-23	-22.921	-22.921	0.000	(0)
HgSO4	4.472e-24	4.472e-24	-23.349	-23.349	0.000	(0)
CrO3SO4-2	1.755e-25	1.125e-25	-24.756	-24.949	-0.193	(0)
VSO4+	6.509e-38	5.824e-38	-37.186	-37.235	-0.048	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.490	-42.490	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.169	-43.362	-0.193	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.322	-61.370	-0.048	(0)
Sb (3)	7.073e-21					
Sb (OH) 3	3.578e-21	3.578e-21	-20.446	-20.446	0.000	(0)
HSbO2	3.494e-21	3.494e-21	-20.457	-20.457	0.000	(0)
SbO2-	7.888e-25	7.058e-25	-24.103	-24.151	-0.048	(0)
Sb (OH) 4-	4.519e-25	4.043e-25	-24.345	-24.393	-0.048	(0)
Sb (OH) 2F	3.408e-27	3.408e-27	-26.467	-26.467	0.000	(0)
SbOF	3.352e-27	3.352e-27	-26.475	-26.475	0.000	(0)
Sb (OH) 2+	7.786e-28	6.967e-28	-27.109	-27.157	-0.048	(0)
SbO+	2.685e-28	2.402e-28	-27.571	-27.619	-0.048	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.133	-319.326	-0.193	(0)
Sb (5)	2.701e-09					
SbO3-	2.698e-09	2.414e-09	-8.569	-8.617	-0.048	(0)
Sb (OH) 6-	3.114e-12	2.822e-12	-11.507	-11.549	-0.043	(0)
SbO2+	4.973e-26	4.450e-26	-25.303	-25.352	-0.048	(0)
Se (-2)	8.444e-15					
Ag2Se	8.444e-15	8.444e-15	-14.073	-14.073	0.000	(0)
HSe-	3.152e-39	2.820e-39	-38.501	-38.550	-0.048	(0)
MnSe	0.000e+00	0.000e+00	-41.303	-41.303	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.756	-42.756	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.261	-45.454	-0.193	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.813	-82.586	-0.772	(0)
Se (4)	1.586e-08					
HSeO3-	9.367e-09	8.381e-09	-8.028	-8.077	-0.048	(0)
SeO3-2	6.493e-09	4.162e-09	-8.188	-8.381	-0.193	(0)
H2SeO3	2.866e-14	2.866e-14	-13.543	-13.543	0.000	(0)
AgSeO3-	1.623e-15	1.452e-15	-14.790	-14.838	-0.048	(0)
Cd (SeO3) 2-2	1.348e-20	8.643e-21	-19.870	-20.063	-0.193	(0)
Ag (SeO3) 2-3	1.472e-22	5.411e-23	-21.832	-22.267	-0.435	(0)
FeHSeO3+2	2.676e-26	1.716e-26	-25.572	-25.766	-0.193	(0)
Se (6)	9.853e-12					
SeO4-2	9.846e-12	6.643e-12	-11.007	-11.178	-0.171	(0)
MnSeO4	6.140e-15	6.140e-15	-14.212	-14.212	0.000	(0)
ZnSeO4	3.736e-16	3.736e-16	-15.428	-15.428	0.000	(0)
NiSeO4	2.134e-17	2.134e-17	-16.671	-16.671	0.000	(0)
CoSeO4	1.579e-17	1.579e-17	-16.802	-16.802	0.000	(0)
HSeO4-	2.983e-18	2.669e-18	-17.525	-17.574	-0.048	(0)
CdSeO4	7.487e-19	7.487e-19	-18.126	-18.126	0.000	(0)
Zn (SeO4) 2-2	3.926e-27	2.516e-27	-26.406	-26.599	-0.193	(0)
Si	2.681e-04					
H4SiO4	2.628e-04	2.634e-04	-3.580	-3.579	0.001	(0)
H3SiO4-	5.243e-06	4.749e-06	-5.280	-5.323	-0.043	(0)
H2SiO4-2	5.470e-11	3.738e-11	-10.262	-10.427	-0.165	(0)
UO2H3SiO4+	6.399e-13	5.725e-13	-12.194	-12.242	-0.048	(0)
SiF6-2	4.682e-31	3.186e-31	-30.330	-30.497	-0.167	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.756	-60.190	-0.435	(0)
U (4)	2.975e-20					
U (OH) 5-	2.974e-20	2.661e-20	-19.527	-19.575	-0.048	(0)
U (OH) 4	8.935e-24	8.935e-24	-23.049	-23.049	0.000	(0)

U (OH) 3+	2.927e-28	2.619e-28	-27.534	-27.582	-0.048	(0)
U (OH) 2+2	1.515e-33	9.710e-34	-32.820	-33.013	-0.193	(0)
UF3+	2.274e-38	2.035e-38	-37.643	-37.691	-0.048	(0)
UF2+2	2.634e-39	1.688e-39	-38.579	-38.773	-0.193	(0)
UOH+3	9.972e-40	3.667e-40	-39.001	-39.436	-0.435	(0)
UF4	1.697e-40	1.697e-40	-39.770	-39.770	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.319	-41.754	-0.435	(0)
UF5-	0.000e+00	0.000e+00	-42.243	-42.291	-0.048	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.490	-42.490	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.169	-43.362	-0.193	(0)
UF6-2	0.000e+00	0.000e+00	-43.737	-43.930	-0.193	(0)
U+4	0.000e+00	0.000e+00	-46.162	-46.935	-0.772	(0)
UCl+3	0.000e+00	0.000e+00	-47.558	-47.992	-0.435	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-173.413	-177.324	-3.911	(0)
U (5)	3.358e-17					
UO2+	3.358e-17	3.005e-17	-16.474	-16.522	-0.048	(0)
U (6)	3.261e-08					
UO2 (CO3) 3-4	2.005e-08	3.386e-09	-7.698	-8.470	-0.772	(0)
UO2 (CO3) 2-2	1.250e-08	8.015e-09	-7.903	-8.096	-0.193	(0)
UO2CO3	4.765e-11	4.765e-11	-10.322	-10.322	0.000	(0)
UO2H3SiO4+	6.399e-13	5.725e-13	-12.194	-12.242	-0.048	(0)
UO2OH+	2.509e-13	2.245e-13	-12.600	-12.649	-0.048	(0)
UO2F+	1.666e-14	1.491e-14	-13.778	-13.827	-0.048	(0)
UO2F2	3.269e-15	3.269e-15	-14.486	-14.486	0.000	(0)
UO2+2	2.105e-15	1.420e-15	-14.677	-14.848	-0.171	(0)
UO2SO4	2.017e-15	2.017e-15	-14.695	-14.695	0.000	(0)
UO2F3-	6.979e-17	6.245e-17	-16.156	-16.204	-0.048	(0)
UO2 (SO4) 2-2	3.893e-17	2.496e-17	-16.410	-16.603	-0.193	(0)
UO2Cl+	4.500e-18	4.027e-18	-17.347	-17.395	-0.048	(0)
(UO2) 2 (OH) 2+2	1.305e-19	8.365e-20	-18.884	-19.078	-0.193	(0)
UO2F4-2	5.885e-20	3.772e-20	-19.230	-19.423	-0.193	(0)
(UO2) 3 (OH) 5+	2.511e-20	2.247e-20	-19.600	-19.648	-0.048	(0)
UO2NO3+	1.307e-24	1.169e-24	-23.884	-23.932	-0.048	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.994	-44.042	-0.048	(0)
V+2	0.000e+00	0.000e+00	-45.458	-45.651	-0.193	(0)
V (3)	2.100e-16					
V (OH) 3	2.100e-16	2.100e-16	-15.678	-15.678	0.000	(0)
V (OH) 2+	1.216e-27	1.088e-27	-26.915	-26.963	-0.048	(0)
VOH+2	1.291e-31	8.274e-32	-30.889	-31.082	-0.193	(0)
V+3	3.575e-37	1.315e-37	-36.447	-36.881	-0.435	(0)
VSO4+	6.509e-38	5.824e-38	-37.186	-37.235	-0.048	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-59.159	-59.594	-0.435	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-60.592	-61.365	-0.772	(0)
V (4)	3.350e-20					
V (OH) 3+	3.322e-20	2.973e-20	-19.479	-19.527	-0.048	(0)
VO+2	1.851e-22	1.187e-22	-21.733	-21.926	-0.193	(0)
VOF+	6.048e-23	5.412e-23	-22.218	-22.267	-0.048	(0)
VOSO4	3.067e-23	3.067e-23	-22.513	-22.513	0.000	(0)
VOF2	1.543e-24	1.543e-24	-23.812	-23.812	0.000	(0)
VOC1+	6.504e-25	5.820e-25	-24.187	-24.235	-0.048	(0)
VOF3-	4.653e-27	4.164e-27	-26.332	-26.381	-0.048	(0)
VOF4-2	1.994e-30	1.278e-30	-29.700	-29.893	-0.193	(0)
H2V2O4+2	6.911e-35	4.430e-35	-34.160	-34.354	-0.193	(0)
V (5)	8.328e-10					
H2VO4-	5.793e-10	5.184e-10	-9.237	-9.285	-0.048	(0)
HVO4-2	2.534e-10	1.624e-10	-9.596	-9.789	-0.193	(0)
H3VO4	4.155e-14	4.155e-14	-13.381	-13.381	0.000	(0)
VO4-3	2.762e-16	1.016e-16	-15.559	-15.993	-0.435	(0)
H3V2O7-	1.555e-16	1.391e-16	-15.808	-15.857	-0.048	(0)
HV2O7-3	7.761e-17	2.854e-17	-16.110	-16.545	-0.435	(0)
VO2+	7.337e-19	6.649e-19	-18.135	-18.177	-0.043	(0)
V2O7-4	5.674e-19	9.581e-20	-18.246	-19.019	-0.772	(0)
VO2F	8.868e-20	8.868e-20	-19.052	-19.052	0.000	(0)
VO2SO4-	1.665e-20	1.490e-20	-19.779	-19.827	-0.048	(0)
VO2F2-	2.736e-21	2.449e-21	-20.563	-20.611	-0.048	(0)
V3O9-3	3.969e-22	1.459e-22	-21.401	-21.836	-0.435	(0)
VO2F3-2	3.623e-24	2.323e-24	-23.441	-23.634	-0.193	(0)

VO2F4-3	2.364e-28	8.691e-29	-27.626	-28.061	-0.435	(0)
V4O12-4	1.868e-28	3.154e-29	-27.729	-28.501	-0.772	(0)
VO2NO3	1.388e-28	1.388e-28	-27.858	-27.858	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-74.593	-76.331	-1.738	(0)
HV10O28-5	0.000e+00	0.000e+00	-75.033	-76.240	-1.207	(0)
H2V10O28-4	0.000e+00	0.000e+00	-78.356	-79.129	-0.772	(0)
Zn	8.736e-07					
Zn+2	5.383e-07	3.632e-07	-6.269	-6.440	-0.171	(0)
ZnCO3	1.762e-07	1.762e-07	-6.754	-6.754	0.000	(0)
ZnSO4	7.457e-08	7.457e-08	-7.127	-7.127	0.000	(0)
ZnOH+	5.097e-08	4.561e-08	-7.293	-7.341	-0.048	(0)
ZnHCO3+	1.850e-08	1.655e-08	-7.733	-7.781	-0.048	(0)
Zn (OH) 2	9.078e-09	9.078e-09	-8.042	-8.042	0.000	(0)
ZnOHCl	2.622e-09	2.622e-09	-8.581	-8.581	0.000	(0)
ZnCl+	1.761e-09	1.595e-09	-8.754	-8.797	-0.043	(0)
Zn (SO4) 2-2	9.509e-10	6.096e-10	-9.022	-9.215	-0.193	(0)
ZnF+	6.158e-10	5.510e-10	-9.211	-9.259	-0.048	(0)
Zn (OH) 3-	6.386e-11	5.714e-11	-10.195	-10.243	-0.048	(0)
ZnCl2	4.420e-12	4.420e-12	-11.355	-11.355	0.000	(0)
ZnCl3-	6.776e-15	6.138e-15	-14.169	-14.212	-0.043	(0)
Zn (OH) 4-2	4.457e-15	2.857e-15	-14.351	-14.544	-0.193	(0)
ZnNO3+	4.207e-16	3.764e-16	-15.376	-15.424	-0.048	(0)
ZnSeO4	3.736e-16	3.736e-16	-15.428	-15.428	0.000	(0)
ZnCl4-2	7.885e-18	5.366e-18	-17.103	-17.270	-0.167	(0)
Zn (NO3) 2	3.099e-26	3.099e-26	-25.509	-25.509	0.000	(0)
Zn (SeO4) 2-2	3.926e-27	2.516e-27	-26.406	-26.599	-0.193	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.301	-147.349	-0.048	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.435	-149.435	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.014	-224.063	-0.048	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.753	-225.947	-0.193	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.237	-303.430	-0.193	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-58.32	-52.03	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-43.28	-38.77	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-50.51	-38.77	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-75.44	-57.50	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-57.65	-37.62	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.01	-28.61	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-25.51	-25.06	0.45	(NH4) 2SeO4	
Acanthite	-52.12	-88.34	-36.22	Ag2S	
Ag2CO3	-12.52	-23.61	-11.09	Ag2CO3	
Ag2CrO4	-21.66	-33.25	-11.59	Ag2CrO4	
Ag2HVO4	-13.90	-12.42	1.48	Ag2HVO4	
Ag2MoO4	-13.90	-25.45	-11.55	Ag2MoO4	
Ag2O	-14.91	-2.34	12.57	Ag2O	
Ag2Se	-0.28	-48.98	-48.70	Ag2Se	
Ag2SeO3	-11.36	-18.51	-7.15	Ag2SeO3	
Ag2SeO4	-20.80	-29.71	-8.91	Ag2SeO4	
Ag2SO4	-16.74	-21.56	-4.82	Ag2SO4	
Ag3AsO3	-27.45	-25.29	2.16	Ag3AsO3	
Ag3AsO4	-16.29	-19.08	-2.79	Ag3AsO4	
Ag3H2VO5	-18.77	-13.59	5.18	Ag3H2VO5	
AgF:4H2O	-14.43	-13.38	1.05	AgF:4H2O	
Agmetal	-0.22	-13.72	-13.51	Ag	
AgVO3	-12.02	-11.25	0.77	AgVO3	
Al (OH) 3 (am)	-2.85	7.95	10.80	Al (OH) 3	
Al2 (MoO4) 3	-55.81	-53.44	2.37	Al2 (MoO4) 3	
Al2O3	-3.76	15.89	19.65	Al2O3	
Al4 (OH) 10SO4	-10.13	12.57	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-12.43	-7.63	4.80	AlAsO4:2H2O	
AlOHSO4	-8.04	-11.27	-3.23	AlOHSO4	
AlSb	-153.46	-87.83	65.62	AlSb	
Alunite	-8.52	-9.92	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-5.81	-13.60	-7.79	PbSO4	

Anhydrite	-2.08	-6.44	-4.36	CaSO ₄
Anilite	-54.73	-86.61	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-3.68	5.11	8.79	Cu ₃ (OH) 4SO ₄
Aragonite	-0.19	-8.49	-8.30	CaCO ₃
Arsenolite	-84.38	-87.14	-2.76	As ₄ O ₆
Artinite	-5.36	4.24	9.60	MgCO ₃ :Mg(OH) 2:3H ₂ O
As ₂ O ₅	-37.85	-31.15	6.71	As ₂ O ₅
Atacamite	-2.02	5.37	7.39	Cu ₂ (OH) 3Cl
Azurite	-1.30	-18.20	-16.91	Cu ₃ (OH) 2 (CO ₃) 2
Ba(OH) 2:8H ₂ O	-16.56	7.83	24.39	Ba(OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-20.37	-4.50	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	1.26	-7.65	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-29.61	3.33	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-13.41	-23.08	-9.67	BaCrO ₄
BaF ₂	-10.78	-16.60	-5.82	BaF ₂
BaMoO ₄	-8.32	-15.28	-6.96	BaMoO ₄
Barite	-1.41	-11.39	-9.98	BaSO ₄
BaS	-94.35	-78.17	16.18	BaS
BaSeO ₃	-10.17	-8.34	1.83	BaSeO ₃
BaSeO ₄	-12.08	-19.54	-7.46	BaSeO ₄
Bianchite	-7.70	-9.47	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.60	10.49	18.09	MnO ₂
Bixbyite	-3.49	-4.13	-0.64	Mn ₂ O ₃
BlaubleiI	-54.89	-79.06	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.26	-82.54	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-0.63	7.95	8.58	AlOOH
Breithauptite	-56.67	-75.19	-18.52	NiSb
Brochantite	-2.00	13.22	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-4.09	12.75	16.84	Mg(OH) 2
Bunsenite	-4.42	8.03	12.45	NiO
Ca(VO ₃) 2	-13.04	-7.38	5.66	Ca(VO ₃) 2
Ca ₂ V ₂ O ₇	-12.10	5.40	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-16.15	5.40	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-15.11	7.19	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-20.78	18.18	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-21.68	18.18	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-296.19	-153.22	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.87	-18.13	-2.27	CaCrO ₄
Calcite	-0.01	-8.49	-8.48	CaCO ₃
Calomel	-11.21	-29.12	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.38	-10.33	-7.95	CaMoO ₄
Carnotite	-4.29	-4.06	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.21	-3.39	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.57	-14.59	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) 2	-12.96	-3.12	9.84	Cd(BO ₂) 2
Cd(OH) 2	-6.67	6.97	13.64	Cd(OH) 2
Cd(OH) 2 (am)	-6.76	6.97	13.73	Cd(OH) 2
Cd ₃ (OH) 2 (SO ₄) 2	-24.23	-17.52	6.71	Cd ₃ (OH) 2 (SO ₄) 2
Cd ₃ (OH) 4SO ₄	-20.86	1.70	22.56	Cd ₃ (OH) 4SO ₄
Cd ₄ (OH) 6SO ₄	-19.72	8.68	28.40	Cd ₄ (OH) 6SO ₄
CdCl ₂	-14.07	-14.73	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-13.04	-14.73	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.82	-14.73	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.24	-17.46	-1.21	CdF ₂
Cdmetal (alpha)	-31.65	-18.14	13.51	Cd
Cdmetal (gamma)	-31.76	-18.14	13.62	Cd
CdMoO ₄	-1.99	-16.14	-14.15	CdMoO ₄
CdOHCl	-7.42	-3.88	3.54	CdOHCl
CdSb	-75.90	-76.25	-0.35	CdSb
CdSe	-19.47	-39.67	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.55	-20.40	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-12.07	-12.25	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-10.52	-12.25	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-10.37	-12.25	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-2.27	-12.02	-9.75	AgCl
Cerrusite	-2.52	-15.65	-13.13	PbCO ₃
CH ₄ (g)	-80.67	-121.71	-41.05	CH ₄
Chalcanthite	-8.47	-11.11	-2.64	CuSO ₄ :5H ₂ O

Chalcedony	-0.03	-3.58	-3.55	SiO2
Chalcocite	-54.59	-89.51	-34.92	Cu2S
Chalcopyrite	-124.97	-160.24	-35.27	CuFeS2
Chrysotile	-1.10	31.10	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.05	-98.75	-45.69	HgS
Claudetite	-84.08	-87.14	-3.06	As4O6
Clausthalite	-13.93	-41.03	-27.10	PbSe
Co(BO2)2	-29.30	-2.22	27.07	Co(BO2)2
Co(OH)2	-5.23	7.87	13.09	Co(OH)2
Co(OH)3	-9.67	-11.98	-2.31	Co(OH)3
CO2(g)	-3.12	-21.27	-18.15	CO2
Co3(AsO4)2	-20.58	-7.54	13.03	Co3(AsO4)2
Co3O4	-5.59	-16.08	-10.50	Co3O4
CoCl2	-22.11	-13.84	8.27	CoCl2
CoCl2:6H2O	-16.38	-13.84	2.54	CoCl2:6H2O
CoCO3	-3.42	-13.40	-9.98	CoCO3
CoF2	-14.96	-16.56	-1.60	CoF2
CoF3	-47.16	-48.62	-1.46	CoF3
CoFe2O4	17.75	14.22	-3.53	CoFe2O4
CoMoO4	-7.48	-15.24	-7.76	CoMoO4
CoO	-5.72	7.87	13.59	CoO
CoS(alpha)	-70.70	-78.14	-7.44	CoS
CoS(beta)	-67.07	-78.14	-11.07	CoS
CoSe	-22.58	-38.78	-16.20	CoSe
CoSeO3	-9.62	-8.30	1.32	CoSeO3
CoSeO4:6H2O	-17.97	-19.50	-1.53	CoSeO4:6H2O
CoSO4	-14.15	-11.35	2.80	CoSO4
CoSO4:6H2O	-8.88	-11.35	-2.47	CoSO4:6H2O
Cotunnite	-11.31	-16.09	-4.78	PbCl2
Covellite	-55.59	-77.89	-22.30	CuS
Cr(OH)2	-21.63	-10.81	10.82	Cr(OH)2
Cr(OH)3	-2.54	-1.21	1.34	Cr(OH)3
Cr(OH)3(am)	-0.46	-1.21	-0.75	Cr(OH)3
Cr2O3	-0.05	-2.41	-2.36	Cr2O3
CrCl2	-46.61	-32.52	14.09	CrCl2
CrCl3	-48.88	-33.77	15.11	CrCl3
CrF3	-26.51	-37.85	-11.34	CrF3
Cristobalite	-0.23	-3.58	-3.35	SiO2
Crmetal	-66.41	-35.92	30.48	Cr
CrO3	-27.70	-30.91	-3.21	CrO3
Cryolite	-14.62	-48.46	-33.84	Na3AlF6
Cu(OH)2	-0.56	8.11	8.67	Cu(OH)2
Cu(SbO3)2	-27.77	17.44	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.51	-1.26	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.54	-89.43	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.36	-50.16	-45.80	Cu2Se
Cu2SO4	-20.78	-22.73	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.92	-6.82	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.45	-101.05	-42.59	Cu3Sb
Cu3Se2	-25.20	-88.69	-63.49	Cu3Se2
CuCO3	-1.66	-13.16	-11.50	CuCO3
CuCrO4	-17.37	-22.81	-5.44	CuCrO4
CuF	-9.06	-13.97	-4.91	CuF
CuF2	-17.43	-16.32	1.12	CuF2
CuF2:2H2O	-11.77	-16.32	-4.55	CuF2:2H2O
Cumetal	-5.56	-14.31	-8.76	Cu
CuMoO4	-1.93	-15.00	-13.08	CuMoO4
CuOCuSO4	-13.30	-3.00	10.30	CuOCuSO4
Cupricferrite	8.48	14.46	5.99	CuFe2O4
Cuprite	-2.11	-3.51	-1.41	Cu2O
Cuprousferrite	10.34	1.42	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe
CuSe2	-26.70	-60.07	-33.37	CuSe2
CuSeO3:2H2O	-8.57	-8.06	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.82	-19.26	-2.44	CuSeO4:5H2O
CuSO4	-14.05	-11.11	2.94	CuSO4
Diaspore	1.07	7.95	6.87	AlOOH
Djurleite	-54.83	-88.75	-33.92	Cu0.066Cu1.868S

Dolomite (disordered)	-0.46	-17.00	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	0.09	-17.00	-17.09	CaMg (CO ₃) ₂
Epsomite	-4.34	-6.47	-2.13	MgSO ₄ :7H ₂ O
Fe (OH) ₂	-9.91	3.65	13.56	Fe (OH) ₂
Fe (OH) ₂ .7Cl _{1.3}	2.96	-0.08	-3.04	Fe (OH) ₂ .7Cl _{1.3}
Fe (VO ₃) ₂	-12.79	-16.51	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-11.37	-9.82	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ :2H ₂ O	-21.54	-42.16	-20.63	Fe ₂ (SeO ₃) ₃ :2H ₂ O
Fe ₂ (SO ₄) ₃	-47.57	-51.30	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.21	10.01	20.22	Fe ₃ (OH) ₈
FeAsO ₄ :2H ₂ O	-12.80	-12.40	0.40	FeAsO ₄ :2H ₂ O
FeCr ₂ O ₄	-5.96	1.24	7.20	FeCr ₂ O ₄
FeMoO ₄	-9.37	-19.46	-10.09	FeMoO ₄
Ferrihydrite	-0.01	3.18	3.19	Fe (OH) ₃
Ferroselite	-45.93	-64.53	-18.60	FeSe ₂
FeS (ppt)	-79.40	-82.35	-2.95	FeS
FeSe	-31.99	-42.99	-11.00	FeSe
Fix_pe	-4.46	-4.46	0.00	e-
Fluorite	-1.15	-11.65	-10.50	CaF ₂
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	-0.34	7.95	8.29	Al (OH) ₃
Goethite	2.69	3.18	0.49	FeOOH
Goslarite	-7.46	-9.47	-2.01	ZnSO ₄ :7H ₂ O
Greenalite	-17.01	3.80	20.81	Fe ₃ Si ₂ O ₅ (OH) ₄
Greenockite	-64.67	-79.03	-14.36	CdS
Greigite	-288.97	-334.01	-45.03	Fe ₃ S ₄
Gummite	-6.33	1.34	7.67	UO ₃
Gypsum	-1.83	-6.44	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-16.81	-28.91	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-10.24	-23.11	-12.88	H ₂ MoO ₄
H ₂ S (g)	-77.99	-86.00	-8.01	H ₂ S
H ₂ Se (g)	-41.69	-46.65	-4.96	H ₂ Se
Halite	-6.83	-5.23	1.60	NaCl
Halloysite	-0.84	8.73	9.57	Al ₂ Si ₂ O ₅ (OH) ₄
Hausmannite	-3.74	57.29	61.03	Mn ₃ O ₄
Hematite	7.77	6.35	-1.42	Fe ₂ O ₃
Hercynite	-3.35	19.55	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-182.46	-256.16	-73.71	Hg (CH ₃) ₂
Hg (g)	-8.39	-16.26	-7.87	Hg
Hg (OH) ₂	-9.25	-12.74	-3.50	Hg (OH) ₂
Hg ₂ (g)	-17.57	-32.52	-14.96	Hg ₂
Hg ₂ (OH) ₂	-12.67	-7.41	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-12.63	-28.68	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-29.62	-38.32	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-21.48	-31.84	-10.36	Hg ₂ F ₂
Hg ₂ S	-81.74	-93.41	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-18.93	-23.58	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-20.50	-26.63	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-29.81	-59.49	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-34.05	-14.56	19.50	HgCl
HgCl ₂	-13.19	-34.45	-21.26	HgCl ₂
HgF (g)	-48.60	-15.92	32.68	HgF
HgF ₂ (g)	-49.74	-37.17	12.57	HgF ₂
Hgmetal (l)	-2.81	-16.26	-13.45	Hg
HgSe	-3.69	-59.39	-55.69	HgSe
HgSeO ₃	-16.48	-28.91	-12.43	HgSeO ₃
HgSO ₄	-22.54	-31.96	-9.42	HgSO ₄
Huntite	-4.06	-34.03	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-6.91	-25.68	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.53	-21.30	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ :4H ₂ O
K-Alum	-20.65	-25.82	-5.17	KAl (SO ₄) ₂ :12H ₂ O
K-Jarosite	-9.43	-24.23	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-35.24	-52.48	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-21.05	-21.57	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-17.02	-13.76	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-17.29	-18.02	-0.73	K ₂ SeO ₄
Kaolinite	1.30	8.73	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-4.27	13.22	17.49	Cu ₄ (OH) ₆ SO ₄ :H ₂ O

Larnakite	-7.55	-7.99	-0.43	PbO:PbSO4
Laurionite	-5.86	-5.24	0.62	PbOHCl
Lepidocrocite	1.81	3.18	1.37	FeOOH
Lime	-19.92	12.78	32.70	CaO
Litharge	-7.08	5.62	12.69	PbO
Mackinawite	-78.75	-82.35	-3.60	FeS
Maghemite	-0.03	6.35	6.39	Fe2O3
Magnesioferrite	2.25	19.11	16.86	Fe2MgO4
Magnesite	-1.05	-8.51	-7.46	MgCO3
Magnetite	6.60	10.01	3.40	Fe3O4
Malachite	0.26	-5.05	-5.31	Cu2 (OH) 2CO3
Manganite	-2.06	23.28	25.34	MnOOH
Massicot	-7.28	5.62	12.89	PbO
Matlockite	-8.48	-17.45	-8.97	PbClF
Melanothallite	-19.85	-13.60	6.26	CuCl2
Melanterite	-13.36	-15.57	-2.21	FeSO4:7H2O
Metacinnabar	-53.65	-98.75	-45.09	HgS
Mg (OH) 2 (active)	-6.04	12.75	18.79	Mg (OH) 2
Mg (VO3) 2	-18.69	-7.41	11.28	Mg (VO3) 2
Mg2Sb3	-273.74	-199.05	74.68	Mg2Sb3
Mg2V2O7	-21.02	5.34	26.36	Mg2V2O7
MgCr2O4	-5.86	10.34	16.20	MgCr2O4
MgCrO4	-23.54	-18.16	5.38	MgCrO4
MgF2	-3.55	-11.68	-8.13	MgF2
MgMoO4	-8.51	-10.36	-1.85	MgMoO4
MgSeO3:6H2O	-6.48	-3.42	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.42	-14.62	-1.20	MgSeO4:6H2O
Minium	-31.56	41.96	73.52	Pb3O4
Mirabilite	-6.85	-7.96	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-14.33	-9.43	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-56.08	-61.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.96	-86.88	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-11.46	1.04	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.69	-10.98	2.72	MnCl2:4H2O
MnS (grn)	-75.45	-75.28	0.17	MnS
MnS (pnk)	-78.62	-75.28	3.34	MnS
MnSb	-94.94	-97.85	-2.91	MnSb
MnSe	-39.42	-35.92	3.50	MnSe
MnSeO3	-6.57	-5.44	1.13	MnSeO3
MnSeO3:2H2O	-6.43	-5.44	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.59	-16.64	-2.05	MnSeO4:5H2O
MnSO4	-11.07	-8.49	2.58	MnSO4
Monteponite	-8.13	6.97	15.10	CdO
Montroydite	-9.10	-12.74	-3.64	HgO
MoO3	-15.11	-23.11	-8.00	MoO3
Morenosite	-9.05	-11.19	-2.14	NiSO4:7H2O
MoS2	-149.97	-220.23	-70.26	MoS2
Na-Jarosite	-12.08	-23.28	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.68	-50.57	-9.90	Na2Cr2O7
Na2CrO4	-22.59	-19.66	2.93	Na2CrO4
Na2Mo2O7	-18.37	-34.97	-16.60	Na2Mo2O7
Na2MoO4	-13.35	-11.86	1.49	Na2MoO4
Na2MoO4:2H2O	-13.08	-11.86	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.22	-4.92	10.30	Na2SeO3:5H2O
Na2SeO4	-17.39	-16.11	1.28	Na2SeO4
Na3Sb	-173.35	-78.89	94.45	Na3Sb
Na3VO4	-29.88	6.80	36.68	Na3VO4
Na4V2O7	-35.05	2.35	37.40	Na4V2O7
Nantokite	-5.88	-12.61	-6.73	CuCl
NaSb	-88.21	-65.04	23.17	NaSb
Natron	-8.70	-10.01	-1.31	Na2CO3:10H2O
NaVO3	-8.31	-4.45	3.86	NaVO3
Nesquehonite	-3.84	-8.51	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.77	8.03	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-22.76	-7.06	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-19.10	12.90	32.00	Ni4 (OH) 6SO4
NiCO3	-6.37	-13.24	-6.87	NiCO3
NiMoO4	-3.94	-15.08	-11.14	NiMoO4

NiS(alpha)	-72.37	-77.97	-5.60	NiS
NiS(beta)	-66.87	-77.97	-11.10	NiS
NiS(gamma)	-65.17	-77.97	-12.80	NiS
NiSe	-20.92	-38.62	-17.70	NiSe
NiSeO3:2H2O	-10.96	-8.14	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.82	-19.34	-1.52	NiSeO4:6H2O
Nsutite	-7.02	10.49	17.50	MnO2
O2(g)	-32.87	50.22	83.09	O2
Orpiment	-240.52	-301.58	-61.07	As2S3
Otavite	-2.29	-14.29	-12.00	CdCO3
Pb(BO2)2	-11.00	-4.48	6.52	Pb(BO2)2
Pb(OH)2	-2.53	5.62	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.68	-71.44	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.41	0.38	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.96	11.23	26.19	Pb2O(OH)2
Pb2O3	-24.70	36.34	61.04	Pb2O3
Pb2OCO3	-9.48	-10.03	-0.56	Pb2OCO3
Pb2V2O7	-7.03	-8.93	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.10	-14.30	5.80	Pb3(AsO4)2
Pb3(VO4)2	-9.45	-3.31	6.14	Pb3(VO4)2
Pb3O2CO3	-15.44	-4.42	11.02	Pb3O2CO3
Pb3O2SO4	-13.06	-2.37	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.86	3.24	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.63	3.24	21.88	Pb4O3SO4
PbCrO4	-12.70	-25.30	-12.60	PbCrO4
PbF2	-11.37	-18.81	-7.44	PbF2
Pbmetal	-23.74	-19.50	4.25	Pb
PbMoO4	-1.88	-17.50	-15.62	PbMoO4
PbO:0.3H2O	-7.36	5.62	12.98	PbO:0.3H2O
PbSeO4	-14.91	-21.75	-6.84	PbSeO4
Periclase	-8.83	12.75	21.58	MgO
Phosgenite	-11.93	-31.74	-19.81	PbCl2:PbCO3
Plattnerite	-18.87	30.73	49.60	PbO2
Portlandite	-10.02	12.78	22.80	Ca(OH)2
Pyrite	-124.73	-143.24	-18.51	FeS2
Pyrochroite	-4.47	10.73	15.19	Mn(OH)2
Pyrolusite	-5.54	35.84	41.38	MnO2
Quartz	0.42	-3.58	-4.00	SiO2
Realgar	-100.60	-120.34	-19.75	AsS
Retgersite	-9.15	-11.19	-2.04	NiSO4:6H2O
Rhodochrosite	0.04	-10.54	-10.58	MnCO3
Rutherfordine	-5.42	-19.92	-14.50	UO2CO3
Sb(OH)3	-13.34	-20.45	-7.11	Sb(OH)3
Sb2O4	-19.18	-15.78	3.40	Sb2O4
Sb2O5	-29.62	-39.29	-9.67	Sb2O5
Sb2Se3	-113.07	-180.83	-67.76	Sb2Se3
Sb4O6(cubic)	-63.52	-81.78	-18.26	Sb4O6
Sb4O6(orth)	-63.88	-81.78	-17.90	Sb4O6
SbCl3	-53.58	-53.01	0.57	SbCl3
SbF3	-46.87	-57.09	-10.23	SbF3
Sbmetal	-46.42	-58.11	-11.69	Sb
SbO2	-4.38	-32.20	-27.82	SbO2
Schoepite	-4.65	1.34	5.99	UO2(OH)2:H2O
Semetal(am)	-14.42	-21.53	-7.11	Se
Semetal(hex)	-13.83	-21.53	-7.71	Se
Senarmontite	-28.53	-40.89	-12.37	Sb2O3
SeO2	-16.30	-16.17	0.12	SeO2
SeO3	-48.41	-27.37	21.04	SeO3
Sepiolite	-0.99	14.77	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.01	14.77	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.37	-17.61	-10.24	FeCO3
SiO2(am-gel)	-0.87	-3.58	-2.71	SiO2
SiO2(am-ppt)	-0.84	-3.58	-2.74	SiO2
Smithsonite	-1.51	-11.51	-10.00	ZnCO3
Sphalerite	-64.80	-76.25	-11.45	ZnS
Spinel	-8.20	28.65	36.85	MgAl2O4
Stibnite	-248.44	-298.90	-50.46	Sb2S3
Sulfur	-58.75	-60.89	-2.14	S

Tenorite	0.47	8.11	7.64	CuO
Thenardite	-8.28	-7.96	0.32	Na2SO4
Thermonatrite	-10.65	-10.01	0.64	Na2CO3:H2O
Tyuyamunite	-8.77	-4.69	4.08	Ca(UO2)2(VO4)2
U3O8	-14.51	6.57	21.08	U3O8
U3Sb4	-579.15	-426.77	152.38	U3Sb4
U4O9	-30.07	-33.09	-3.02	U4O9
UF4	-33.87	-63.41	-29.54	UF4
UF4:2.5H2O	-30.69	-63.41	-32.72	UF4:2.5H2O
UO2(am)	-15.48	-14.55	0.93	UO2
UO2(NO3)2	-45.76	-33.62	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-38.47	-33.62	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-37.01	-33.62	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-35.66	-33.62	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.27	1.34	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.78	-26.03	-2.25	UO2SeO4:4H2O
UO3	-6.36	1.34	7.70	UO3
Uraninite	-9.88	-14.55	-4.67	UO2
USb2	-219.79	-190.21	29.58	USb2
V(OH)3	-20.18	-12.59	7.59	V(OH)3
V2O5	-18.80	-20.16	-1.36	V2O5
V3O5	-44.15	-42.31	1.84	V3O5
V4O7	-55.23	-48.05	7.19	V4O7
V6O13	-49.85	-110.71	-60.86	V6O13
Valentinite	-32.41	-40.89	-8.48	Sb2O3
VC12	-65.73	-46.86	18.87	VC12
VC13	-68.59	-45.15	23.43	VC13
VF4	-69.52	-54.59	14.93	VF4
Vmetal	-94.29	-50.26	44.03	V
VO	-39.91	-25.15	14.76	VO
VO(OH)2	-10.88	-5.73	5.15	VO(OH)2
VO2Cl	-23.78	-20.93	2.84	VO2Cl
VOC1	-34.60	-23.45	11.15	VOC1
VOC12	-40.20	-27.44	12.76	VOC12
VOSO4	-28.56	-24.95	3.61	VOSO4
Witherite	-4.87	-13.44	-8.57	BaCO3
Wurtzite	-67.30	-76.25	-8.95	ZnS
Zincite	-1.58	9.75	11.33	ZnO
Zincosite	-13.40	-9.47	3.93	ZnSO4
Zn(BO2)2	-8.63	-0.34	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.52	-25.21	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.45	9.75	12.20	Zn(OH)2
Zn(OH)2(am)	-2.72	9.75	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.00	9.75	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.78	9.75	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.98	9.75	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.22	0.28	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.54	8.65	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.54	-1.89	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.10	-9.18	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.61	19.79	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.45	27.05	38.50	Zn5(OH)8Cl2
ZnCl2	-19.00	-11.95	7.05	ZnCl2
ZnCO3:1H2O	-1.25	-11.51	-10.26	ZnCO3:1H2O
ZnF2	-14.14	-14.68	-0.53	ZnF2
Znmetal	-41.15	-15.36	25.79	Zn
ZnMoO4	-3.23	-13.36	-10.13	ZnMoO4
ZnO(active)	-1.44	9.75	11.19	ZnO
ZnS(am)	-67.20	-76.25	-9.05	ZnS
ZnSb	-84.49	-73.47	11.01	ZnSb
ZnSe	-22.49	-36.89	-14.40	ZnSe
ZnSeO4:6H2O	-16.10	-17.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.83	-9.47	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 77.

```
Title Stage 4 Pit wall interaction mix calculator
MIX 404
409    1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.000078
11     0.000632
12     0.000469
13     0.001102
14     0
15     0
Save solution 410
end
```

TITLE

Stage 4 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 404.

Mixture 404.

```
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
7.800e-05 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
6.320e-04 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
4.690e-04 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
1.102e-03 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 409    Solution after simulation 76.
```

-----Solution composition-----

Elements	Molality	Moles
Ag	2.872e-09	2.879e-09
Al	2.513e-07	2.519e-07
As	4.308e-09	4.318e-09
B	9.696e-06	9.719e-06
Ba	6.776e-09	6.792e-09
C	1.651e-03	1.655e-03
Ca	6.739e-04	6.755e-04
Cd	1.278e-09	1.281e-09
Cl	1.925e-03	1.930e-03
Co	9.725e-09	9.748e-09
Cr	8.267e-10	8.286e-10
Cu	4.874e-07	4.886e-07
F	8.776e-05	8.797e-05
Fe	8.624e-10	8.644e-10
Hg	2.023e-10	2.028e-10
K	4.205e-04	4.215e-04
Mg	6.129e-04	6.144e-04
Mn	6.061e-06	6.076e-06
Mo	1.780e-07	1.784e-07
N	1.447e-06	1.451e-06
Na	3.772e-03	3.781e-03
Ni	1.514e-08	1.517e-08
Pb	8.828e-10	8.849e-10
S	1.556e-03	1.560e-03
Sb	2.696e-09	2.703e-09
Se	1.584e-08	1.588e-08
Si	2.675e-04	2.681e-04
U	3.256e-08	3.263e-08
V	8.612e-10	8.633e-10
Zn	8.719e-07	8.740e-07

-----Description of solution-----

	pH	=	8.093	Charge balance
	pe	=	4.464	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	8.946e-03	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	1.655e-03	
	Total CO2 (mol/kg)	=	1.651e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.717e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	4	
	Total H	=	1.112831e+02	
	Total O	=	5.565247e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.378e-06	1.247e-06	-5.861	-5.904	-0.044	(0)
H+	8.907e-09	8.073e-09	-8.050	-8.093	-0.043	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.872e-09					
AgCl	1.933e-09	1.933e-09	-8.714	-8.714	0.000	(0)
Ag+	5.986e-10	5.426e-10	-9.223	-9.266	-0.043	(0)
AgCl2-	3.282e-10	2.937e-10	-9.484	-9.532	-0.048	(0)
AgSO4-	1.134e-11	1.015e-11	-10.945	-10.994	-0.048	(0)
AgCl3-2	7.121e-13	4.566e-13	-12.147	-12.340	-0.193	(0)
AgNO2	1.343e-13	1.343e-13	-12.872	-12.872	0.000	(0)

	AgF	1.035e-13	1.035e-13	-12.985	-12.985	0.000	(0)
	AgOH	6.766e-14	6.766e-14	-13.170	-13.170	0.000	(0)
	AgNH3+	9.941e-15	8.896e-15	-14.003	-14.051	-0.048	(0)
	Ag2Se	8.278e-15	8.278e-15	-14.082	-14.082	0.000	(0)
	AgH2BO3	5.549e-15	5.549e-15	-14.256	-14.256	0.000	(0)
	AgCl4-3	4.420e-15	1.627e-15	-14.355	-14.789	-0.434	(0)
	AgSeO3-	1.613e-15	1.443e-15	-14.792	-14.841	-0.048	(0)
	Ag (OH) 2-	9.214e-18	8.246e-18	-17.036	-17.084	-0.048	(0)
	Ag (NH3) 2+	6.488e-19	5.806e-19	-18.188	-18.236	-0.048	(0)
	Ag (NO2) 2-	2.754e-19	2.464e-19	-18.560	-18.608	-0.048	(0)
	AgNO3	1.782e-19	1.782e-19	-18.749	-18.749	0.000	(0)
	Ag (SeO3) 2-3	1.453e-22	5.348e-23	-21.838	-22.272	-0.434	(0)
	Ag2MoO4	1.338e-26	1.338e-26	-25.874	-25.874	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.364	-73.364	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.834	-82.606	-0.772	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.436	-146.567	-0.132	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.129	-147.177	-0.048	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-147.657	-147.914	-0.258	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-147.977	-148.225	-0.249	(0)
Al		2.513e-07					
	Al (OH) 4-	2.498e-07	2.266e-07	-6.602	-6.645	-0.042	(0)
	Al (OH) 3	1.444e-09	1.444e-09	-8.841	-8.841	0.000	(0)
	Al (OH) 2+	6.380e-11	5.801e-11	-10.195	-10.236	-0.041	(0)
	AlF2+	1.187e-12	1.079e-12	-11.926	-11.967	-0.041	(0)
	AlF3	1.032e-12	1.032e-12	-11.986	-11.986	0.000	(0)
	AlOH+2	8.568e-14	5.857e-14	-13.067	-13.232	-0.165	(0)
	AlF+2	5.220e-14	3.568e-14	-13.282	-13.448	-0.165	(0)
	AlF4-	4.331e-14	3.929e-14	-13.363	-13.406	-0.042	(0)
	AlSO4+	3.767e-16	3.417e-16	-15.424	-15.466	-0.042	(0)
	Al+3	1.138e-16	4.696e-17	-15.944	-16.328	-0.384	(0)
	Al (SO4) 2-	3.783e-18	3.431e-18	-17.422	-17.465	-0.042	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-50.982	-51.417	-0.434	(0)
As (3)		1.768e-22					
	H3AsO3	1.651e-22	1.651e-22	-21.782	-21.782	0.000	(0)
	H2AsO3-	1.172e-23	1.049e-23	-22.931	-22.979	-0.048	(0)
	HAsO3-2	1.848e-27	1.185e-27	-26.733	-26.926	-0.193	(0)
	H4AsO3+	7.380e-31	6.605e-31	-30.132	-30.180	-0.048	(0)
	AsO3-3	1.538e-32	5.658e-33	-31.813	-32.247	-0.434	(0)
As (5)		4.308e-09					
	HAsO4-2	4.089e-09	2.622e-09	-8.388	-8.581	-0.193	(0)
	H2AsO4-	2.158e-10	1.931e-10	-9.666	-9.714	-0.048	(0)
	AsO4-3	2.791e-12	1.027e-12	-11.554	-11.988	-0.434	(0)
	H3AsO4	2.703e-16	2.709e-16	-15.568	-15.567	0.001	(0)
B		9.696e-06					
	H3BO3	8.952e-06	8.970e-06	-5.048	-5.047	0.001	(0)
	H2BO3-	7.154e-07	6.453e-07	-6.145	-6.190	-0.045	(0)
	CaH2BO3+	1.594e-08	1.438e-08	-7.797	-7.842	-0.045	(0)
	MgH2BO3+	9.019e-09	8.136e-09	-8.045	-8.090	-0.045	(0)
	NaH2BO3	3.476e-09	3.476e-09	-8.459	-8.459	0.000	(0)
	BF (OH) 3-	3.014e-10	2.719e-10	-9.521	-9.566	-0.045	(0)
	H5 (BO3) 2-	5.462e-12	4.927e-12	-11.263	-11.307	-0.045	(0)
	BaH2BO3+	9.978e-14	9.001e-14	-13.001	-13.046	-0.045	(0)
	BF2 (OH) 2-	1.977e-14	1.783e-14	-13.704	-13.749	-0.045	(0)
	AgH2BO3	5.549e-15	5.549e-15	-14.256	-14.256	0.000	(0)
	H8 (BO3) 3-	4.899e-15	4.420e-15	-14.310	-14.355	-0.045	(0)
	BF3OH-	4.717e-21	4.255e-21	-20.326	-20.371	-0.045	(0)
	BF4-	1.424e-26	1.284e-26	-25.847	-25.891	-0.045	(0)
Ba		6.776e-09					
	Ba+2	6.689e-09	4.514e-09	-8.175	-8.345	-0.171	(0)
	BaHCO3+	6.815e-11	6.205e-11	-10.167	-10.207	-0.041	(0)
	BaCO3	1.935e-11	1.935e-11	-10.713	-10.713	0.000	(0)
	BaH2BO3+	9.978e-14	9.001e-14	-13.001	-13.046	-0.045	(0)
	BaOH+	2.705e-14	2.457e-14	-13.568	-13.610	-0.042	(0)
	BaNH3+2	3.566e-17	2.287e-17	-16.448	-16.641	-0.193	(0)
	BaNO3+	1.045e-17	9.356e-18	-16.981	-17.029	-0.048	(0)
C (4)		1.651e-03					
	HCO3-	1.583e-03	1.440e-03	-2.800	-2.842	-0.041	(0)
	H2CO3	2.614e-05	2.614e-05	-4.583	-4.583	0.000	(0)

	CO3-2	1.239e-05	8.360e-06	-4.907	-5.078	-0.171	(0)
	CaHCO3+	1.140e-05	1.038e-05	-4.943	-4.984	-0.041	(0)
	MgHCO3+	5.913e-06	5.357e-06	-5.228	-5.271	-0.043	(0)
	CaCO3	5.131e-06	5.131e-06	-5.290	-5.290	0.000	(0)
	NaHCO3	2.751e-06	2.751e-06	-5.560	-5.560	0.000	(0)
	MgCO3	2.528e-06	2.528e-06	-5.597	-5.597	0.000	(0)
	NaCO3-	5.819e-07	5.291e-07	-6.235	-6.276	-0.041	(0)
	CuCO3	4.124e-07	4.124e-07	-6.385	-6.385	0.000	(0)
	ZnCO3	1.748e-07	1.748e-07	-6.757	-6.757	0.000	(0)
	MnHCO3+	1.085e-07	9.853e-08	-6.965	-7.006	-0.042	(0)
	UO2 (CO3) 3-4	1.995e-08	3.374e-09	-7.700	-8.472	-0.772	(0)
	ZnHCO3+	1.849e-08	1.654e-08	-7.733	-7.781	-0.048	(0)
	Cu (CO3) 2-2	1.447e-08	9.280e-09	-7.840	-8.032	-0.193	(0)
	UO2 (CO3) 2-2	1.256e-08	8.051e-09	-7.901	-8.094	-0.193	(0)
	NiCO3	2.141e-09	2.141e-09	-8.669	-8.669	0.000	(0)
	NiHCO3+	1.361e-09	1.218e-09	-8.866	-8.914	-0.048	(0)
	CuHCO3+	8.503e-10	7.609e-10	-9.070	-9.119	-0.048	(0)
	PbCO3	6.740e-10	6.740e-10	-9.171	-9.171	0.000	(0)
	CoCO3	6.696e-10	6.696e-10	-9.174	-9.174	0.000	(0)
	CoHCO3+	5.929e-10	5.305e-10	-9.227	-9.275	-0.048	(0)
	CdCO3	1.154e-10	1.154e-10	-9.938	-9.938	0.000	(0)
	BaHCO3+	6.815e-11	6.205e-11	-10.167	-10.207	-0.041	(0)
	UO2CO3	4.827e-11	4.827e-11	-10.316	-10.316	0.000	(0)
	PbHCO3+	3.206e-11	2.869e-11	-10.494	-10.542	-0.048	(0)
	Pb (CO3) 2-2	2.534e-11	1.625e-11	-10.596	-10.789	-0.193	(0)
	BaCO3	1.935e-11	1.935e-11	-10.713	-10.713	0.000	(0)
	CdHCO3+	2.218e-12	1.984e-12	-11.654	-11.702	-0.048	(0)
	Cd (CO3) 2-2	1.115e-12	7.150e-13	-11.953	-12.146	-0.193	(0)
	FeHCO3+	6.228e-15	5.671e-15	-14.206	-14.246	-0.041	(0)
	HgCO3	1.852e-16	1.852e-16	-15.732	-15.732	0.000	(0)
	Hg (CO3) 2-2	7.633e-18	4.895e-18	-17.117	-17.310	-0.193	(0)
	HgHCO3+	3.110e-20	2.783e-20	-19.507	-19.555	-0.048	(0)
Ca		6.739e-04					
	Ca+2	5.738e-04	3.872e-04	-3.241	-3.412	-0.171	(0)
	CaSO4	8.314e-05	8.314e-05	-4.080	-4.080	0.000	(0)
	CaHCO3+	1.140e-05	1.038e-05	-4.943	-4.984	-0.041	(0)
	CaCO3	5.131e-06	5.131e-06	-5.290	-5.290	0.000	(0)
	CaF+	3.535e-07	3.211e-07	-6.452	-6.493	-0.042	(0)
	CaH2BO3+	1.594e-08	1.438e-08	-7.797	-7.842	-0.045	(0)
	CaOH+	1.058e-08	9.635e-09	-7.975	-8.016	-0.041	(0)
	CaNH3+2	6.105e-12	3.915e-12	-11.214	-11.407	-0.193	(0)
	CaNO3+	5.659e-13	5.064e-13	-12.247	-12.295	-0.048	(0)
	Ca (NH3) 2+2	1.952e-20	1.251e-20	-19.710	-19.903	-0.193	(0)
Cd		1.278e-09					
	Cd+2	8.972e-10	6.055e-10	-9.047	-9.218	-0.171	(0)
	CdSO4	1.330e-10	1.330e-10	-9.876	-9.876	0.000	(0)
	CdCO3	1.154e-10	1.154e-10	-9.938	-9.938	0.000	(0)
	CdCl+	1.127e-10	1.009e-10	-9.948	-9.996	-0.048	(0)
	CdOH+	6.702e-12	5.997e-12	-11.174	-11.222	-0.048	(0)
	CdOHC1	5.160e-12	5.160e-12	-11.287	-11.287	0.000	(0)
	Cd (SO4) 2-2	2.623e-12	1.682e-12	-11.581	-11.774	-0.193	(0)
	CdHCO3+	2.218e-12	1.984e-12	-11.654	-11.702	-0.048	(0)
	Cd (CO3) 2-2	1.115e-12	7.150e-13	-11.953	-12.146	-0.193	(0)
	CdF+	8.146e-13	7.290e-13	-12.089	-12.137	-0.048	(0)
	CdCl2	7.336e-13	7.336e-13	-12.135	-12.135	0.000	(0)
	Cd (OH) 2	4.719e-14	4.719e-14	-13.326	-13.326	0.000	(0)
	CdCl3-	9.024e-16	8.076e-16	-15.045	-15.093	-0.048	(0)
	CdF2	1.105e-16	1.105e-16	-15.957	-15.957	0.000	(0)
	Cd (OH) 3-	4.018e-18	3.595e-18	-17.396	-17.444	-0.048	(0)
	CdNO3+	8.849e-19	7.918e-19	-18.053	-18.101	-0.048	(0)
	CdSeO4	7.480e-19	7.480e-19	-18.126	-18.126	0.000	(0)
	Cd2OH+3	4.946e-20	1.820e-20	-19.306	-19.740	-0.434	(0)
	Cd (SeO3) 2-2	1.333e-20	8.547e-21	-19.875	-20.068	-0.193	(0)
	Cd (OH) 4-2	1.144e-24	7.339e-25	-23.941	-24.134	-0.193	(0)
	Cd (NO3) 2	1.641e-28	1.641e-28	-27.785	-27.785	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.075	-79.123	-0.048	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.832	-149.832	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.796	-225.845	-0.048	(0)

Cd(HS) 4-2	0.000e+00	0.000e+00	-301.369	-301.562	-0.193	(0)
C1	1.925e-03					
Cl-	1.925e-03	1.745e-03	-2.716	-2.758	-0.043	(0)
MnCl+	8.294e-09	7.534e-09	-8.081	-8.123	-0.042	(0)
ZnOHC1	2.600e-09	2.600e-09	-8.585	-8.585	0.000	(0)
AgCl	1.933e-09	1.933e-09	-8.714	-8.714	0.000	(0)
ZnCl+	1.758e-09	1.592e-09	-8.755	-8.798	-0.043	(0)
AgCl2-	3.282e-10	2.937e-10	-9.484	-9.532	-0.048	(0)
CuCl	3.099e-10	3.099e-10	-9.509	-9.509	0.000	(0)
CuCl2-	1.247e-10	1.130e-10	-9.904	-9.947	-0.043	(0)
CdCl+	1.127e-10	1.009e-10	-9.948	-9.996	-0.048	(0)
NiCl+	3.424e-11	3.064e-11	-10.466	-10.514	-0.048	(0)
CoCl+	3.195e-11	2.859e-11	-10.495	-10.544	-0.048	(0)
CuCl+	2.557e-11	2.316e-11	-10.592	-10.635	-0.043	(0)
MnCl2	1.857e-11	1.857e-11	-10.731	-10.731	0.000	(0)
CdOHC1	5.160e-12	5.160e-12	-11.287	-11.287	0.000	(0)
ZnCl2	4.403e-12	4.403e-12	-11.356	-11.356	0.000	(0)
PbCl+	1.855e-12	1.660e-12	-11.732	-11.780	-0.048	(0)
CdCl2	7.336e-13	7.336e-13	-12.135	-12.135	0.000	(0)
AgCl3-2	7.121e-13	4.566e-13	-12.147	-12.340	-0.193	(0)
HgClOH	7.110e-14	7.110e-14	-13.148	-13.148	0.000	(0)
CuCl3-2	6.189e-14	4.213e-14	-13.208	-13.375	-0.167	(0)
CuCl2	1.401e-14	1.401e-14	-13.854	-13.854	0.000	(0)
PbCl2	1.294e-14	1.294e-14	-13.888	-13.888	0.000	(0)
MnCl3-	9.822e-15	8.921e-15	-14.008	-14.050	-0.042	(0)
ZnCl3-	6.735e-15	6.102e-15	-14.172	-14.215	-0.043	(0)
HgCl2	5.633e-15	5.633e-15	-14.249	-14.249	0.000	(0)
AgCl4-3	4.420e-15	1.627e-15	-14.355	-14.789	-0.434	(0)
CdCl3-	9.024e-16	8.076e-16	-15.045	-15.093	-0.048	(0)
NiCl2	2.691e-16	2.691e-16	-15.570	-15.570	0.000	(0)
HgCl3-	1.098e-16	9.827e-17	-15.959	-16.008	-0.048	(0)
PbCl3-	1.004e-17	8.985e-18	-16.998	-17.046	-0.048	(0)
ZnCl4-2	7.819e-18	5.323e-18	-17.107	-17.274	-0.167	(0)
UO2Cl+	4.585e-18	4.103e-18	-17.339	-17.387	-0.048	(0)
HgCl4-2	1.064e-18	6.825e-19	-17.973	-18.166	-0.193	(0)
HgCl+	7.199e-19	6.442e-19	-18.143	-18.191	-0.048	(0)
CrCl+2	4.250e-19	2.725e-19	-18.372	-18.565	-0.193	(0)
CuCl3-	2.518e-19	2.281e-19	-18.599	-18.642	-0.043	(0)
CrOHC12	1.127e-20	1.127e-20	-19.948	-19.948	0.000	(0)
PbCl4-2	1.117e-20	7.165e-21	-19.952	-20.145	-0.193	(0)
FeCl+2	6.542e-23	4.453e-23	-22.184	-22.351	-0.167	(0)
CrCl2+	5.041e-23	4.511e-23	-22.297	-22.346	-0.048	(0)
CuCl4-2	2.930e-24	1.995e-24	-23.533	-23.700	-0.167	(0)
VOCl+	6.855e-25	6.134e-25	-24.164	-24.212	-0.048	(0)
FeCl2+	3.820e-25	3.470e-25	-24.418	-24.460	-0.042	(0)
CrO3Cl-	4.826e-27	4.319e-27	-26.316	-26.365	-0.048	(0)
FeCl3	6.054e-29	6.054e-29	-28.218	-28.218	0.000	(0)
CoCl+2	3.036e-37	1.947e-37	-36.518	-36.711	-0.193	(0)
UCl+3	0.000e+00	0.000e+00	-47.545	-47.980	-0.434	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.041	-51.234	-0.193	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.953	-53.146	-0.193	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.852	-66.045	-0.193	(0)
Co (2)	9.725e-09					
Co+2	7.388e-09	4.738e-09	-8.131	-8.324	-0.193	(0)
CoSO4	8.860e-10	8.860e-10	-9.053	-9.053	0.000	(0)
CoCO3	6.696e-10	6.696e-10	-9.174	-9.174	0.000	(0)
CoHCO3+	5.929e-10	5.305e-10	-9.227	-9.275	-0.048	(0)
CoOH+	1.317e-10	1.179e-10	-9.880	-9.929	-0.048	(0)
CoCl+	3.195e-11	2.859e-11	-10.495	-10.544	-0.048	(0)
CoF+	1.272e-11	1.138e-11	-10.896	-10.944	-0.048	(0)
Co (OH) 2	1.168e-11	1.168e-11	-10.933	-10.933	0.000	(0)
CoNO2+	4.420e-14	3.955e-14	-13.355	-13.403	-0.048	(0)
Co (NH3) +2	7.133e-15	4.574e-15	-14.147	-14.340	-0.193	(0)
Co (OH) 3-	3.247e-16	2.905e-16	-15.489	-15.537	-0.048	(0)
CoOOH-	8.148e-17	7.291e-17	-16.089	-16.137	-0.048	(0)
CoSeO4	1.575e-17	1.575e-17	-16.803	-16.803	0.000	(0)
CoNO3+	3.470e-18	3.105e-18	-17.460	-17.508	-0.048	(0)
Co2OH+3	7.606e-20	2.799e-20	-19.119	-19.553	-0.434	(0)

Co (NH3) 2+2	2.443e-21	1.567e-21	-20.612	-20.805	-0.193	(0)
Co (OH) 4-2	8.955e-23	5.742e-23	-22.048	-22.241	-0.193	(0)
Co (NO3) 2	2.613e-27	2.613e-27	-26.583	-26.583	0.000	(0)
Co (NH3) 3+2	2.470e-28	1.584e-28	-27.607	-27.800	-0.193	(0)
Co4 (OH) 4+4	2.278e-31	3.853e-32	-30.642	-31.414	-0.772	(0)
Co (NH3) 4+2	1.041e-35	6.675e-36	-34.983	-35.176	-0.193	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.858	-43.051	-0.193	(0)
Co (3)	5.420e-30					
CoOH+2	5.420e-30	3.475e-30	-29.266	-29.459	-0.193	(0)
Co+3	1.329e-36	5.484e-37	-35.877	-36.261	-0.384	(0)
CoCl+2	3.036e-37	1.947e-37	-36.518	-36.711	-0.193	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.041	-51.234	-0.193	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.341	-61.389	-0.048	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.798	-64.990	-0.193	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.852	-66.045	-0.193	(0)
Cr (2)	1.546e-27					
Cr+2	1.546e-27	9.916e-28	-26.811	-27.004	-0.193	(0)
Cr (3)	8.267e-10					
Cr (OH) 2+	5.583e-10	4.996e-10	-9.253	-9.301	-0.048	(0)
Cr (OH) 3	2.341e-10	2.341e-10	-9.631	-9.631	0.000	(0)
CrO2-	1.539e-11	1.377e-11	-10.813	-10.861	-0.048	(0)
Cr (OH) 4-	1.299e-11	1.162e-11	-10.887	-10.935	-0.048	(0)
Cr (OH) +2	5.135e-12	3.293e-12	-11.289	-11.482	-0.193	(0)
CrOHSO4	7.324e-13	7.324e-13	-12.135	-12.135	0.000	(0)
CrF+2	2.266e-15	1.453e-15	-14.645	-14.838	-0.193	(0)
Cr+3	3.280e-16	1.207e-16	-15.484	-15.918	-0.434	(0)
CrSO4+	2.952e-16	2.641e-16	-15.530	-15.578	-0.048	(0)
CrCl+2	4.250e-19	2.725e-19	-18.372	-18.565	-0.193	(0)
CrOHC12	1.127e-20	1.127e-20	-19.948	-19.948	0.000	(0)
Cr2 (OH) 2SO4+2	3.399e-22	2.180e-22	-21.469	-21.662	-0.193	(0)
CrCl2+	5.041e-23	4.511e-23	-22.297	-22.346	-0.048	(0)
Cr2 (OH) 2 (SO4) 2	1.214e-23	1.214e-23	-22.916	-22.916	0.000	(0)
CrNO3+2	3.403e-27	2.182e-27	-26.468	-26.661	-0.193	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.734	-41.927	-0.193	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.056	-51.490	-0.434	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.953	-53.146	-0.193	(0)
Cr (6)	2.858e-15					
CrO4-2	2.765e-15	1.866e-15	-14.558	-14.729	-0.171	(0)
HCrO4-	5.448e-17	4.875e-17	-16.264	-16.312	-0.048	(0)
NaCrO4-	3.522e-17	3.151e-17	-16.453	-16.501	-0.048	(0)
KCrO4-	2.933e-18	2.625e-18	-17.533	-17.581	-0.048	(0)
H2CrO4	3.190e-25	3.190e-25	-24.496	-24.496	0.000	(0)
CrO3SO4-2	1.752e-25	1.124e-25	-24.756	-24.949	-0.193	(0)
CrO3Cl-	4.826e-27	4.319e-27	-26.316	-26.365	-0.048	(0)
Cr2O7-2	1.285e-31	8.242e-32	-30.891	-31.084	-0.193	(0)
Cu (1)	5.924e-10					
CuCl	3.099e-10	3.099e-10	-9.509	-9.509	0.000	(0)
Cu+	1.577e-10	1.411e-10	-9.802	-9.850	-0.048	(0)
CuCl2-	1.247e-10	1.130e-10	-9.904	-9.947	-0.043	(0)
CuCl3-2	6.189e-14	4.213e-14	-13.208	-13.375	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.847	-146.100	-0.253	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.586	-146.830	-0.244	(0)
Cu (2)	4.868e-07					
CuCO3	4.124e-07	4.124e-07	-6.385	-6.385	0.000	(0)
CuOH+	3.647e-08	3.304e-08	-7.438	-7.481	-0.043	(0)
Cu (CO3) 2-2	1.447e-08	9.280e-09	-7.840	-8.032	-0.193	(0)
Cu+2	1.241e-08	8.377e-09	-7.906	-8.077	-0.171	(0)
Cu (OH) 2	8.220e-09	8.220e-09	-8.085	-8.085	0.000	(0)
CuSO4	1.799e-09	1.799e-09	-8.745	-8.745	0.000	(0)
CuHCO3+	8.503e-10	7.609e-10	-9.070	-9.119	-0.048	(0)
CuF+	4.487e-11	4.015e-11	-10.348	-10.396	-0.048	(0)
Cu2 (OH) 2+2	4.275e-11	2.741e-11	-10.369	-10.562	-0.193	(0)
CuCl+	2.557e-11	2.316e-11	-10.592	-10.635	-0.043	(0)
Cu (OH) 3-	2.350e-11	2.103e-11	-10.629	-10.677	-0.048	(0)
CuNO2+	1.161e-12	1.039e-12	-11.935	-11.983	-0.048	(0)
CuNH3+2	1.073e-12	6.884e-13	-11.969	-12.162	-0.193	(0)
CuCl2	1.401e-14	1.401e-14	-13.854	-13.854	0.000	(0)
Cu (OH) 4-2	3.218e-16	2.064e-16	-15.492	-15.685	-0.193	(0)

	Cu (NO ₂) ₂	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
	CuNO ₃ +	1.224e-17	1.096e-17	-16.912	-16.960	-0.048	(0)
	CuCl ₃ -	2.518e-19	2.281e-19	-18.599	-18.642	-0.043	(0)
	CuCl ₄ - ₂	2.930e-24	1.995e-24	-23.533	-23.700	-0.167	(0)
	Cu (NO ₃) ₂	5.704e-28	5.704e-28	-27.244	-27.244	0.000	(0)
	Cu (HS) ₃ -	0.000e+00	0.000e+00	-215.868	-215.917	-0.048	(0)
F		8.776e-05					
	F-	8.382e-05	7.597e-05	-4.077	-4.119	-0.043	(0)
	MgF+	3.417e-06	3.099e-06	-5.466	-5.509	-0.042	(0)
	CaF+	3.535e-07	3.211e-07	-6.452	-6.493	-0.042	(0)
	NaF	1.629e-07	1.629e-07	-6.788	-6.788	0.000	(0)
	MnF+	1.142e-08	1.037e-08	-7.942	-7.984	-0.042	(0)
	HF	9.071e-10	9.071e-10	-9.042	-9.042	0.000	(0)
	ZnF+	6.155e-10	5.508e-10	-9.211	-9.259	-0.048	(0)
	BF (OH) ₃ -	3.014e-10	2.719e-10	-9.521	-9.566	-0.045	(0)
	CuF+	4.487e-11	4.015e-11	-10.348	-10.396	-0.048	(0)
	NiF+	1.464e-11	1.310e-11	-10.835	-10.883	-0.048	(0)
	CoF+	1.272e-11	1.138e-11	-10.896	-10.944	-0.048	(0)
	AlF ₂ +	1.187e-12	1.079e-12	-11.926	-11.967	-0.041	(0)
	AlF ₃	1.032e-12	1.032e-12	-11.986	-11.986	0.000	(0)
	CdF+	8.146e-13	7.290e-13	-12.089	-12.137	-0.048	(0)
	HF ₂ -	2.896e-13	2.620e-13	-12.538	-12.582	-0.044	(0)
	PbF+	1.604e-13	1.436e-13	-12.795	-12.843	-0.048	(0)
	AgF	1.035e-13	1.035e-13	-12.985	-12.985	0.000	(0)
	AlF ₄ + ₂	5.220e-14	3.568e-14	-13.282	-13.448	-0.165	(0)
	AlF ₄ -	4.331e-14	3.929e-14	-13.363	-13.406	-0.042	(0)
	BF ₂ (OH) ₂ -	1.977e-14	1.783e-14	-13.704	-13.749	-0.045	(0)
	UO ₂ F+	1.699e-14	1.521e-14	-13.770	-13.818	-0.048	(0)
	UO ₂ F ₂	3.332e-15	3.332e-15	-14.477	-14.477	0.000	(0)
	CrF ₂ + ₂	2.266e-15	1.453e-15	-14.645	-14.838	-0.193	(0)
	PbF ₂	2.146e-16	2.146e-16	-15.668	-15.668	0.000	(0)
	CdF ₂	1.105e-16	1.105e-16	-15.957	-15.957	0.000	(0)
	UO ₂ F ₃ -	7.105e-17	6.358e-17	-16.148	-16.197	-0.048	(0)
	H ₂ F ₂	2.205e-18	2.205e-18	-17.657	-17.657	0.000	(0)
	FeF ₂ +	1.576e-19	1.431e-19	-18.803	-18.844	-0.042	(0)
	FeF ₂ + ₂	1.034e-19	7.040e-20	-18.985	-19.152	-0.167	(0)
	VO ₂ F	9.313e-20	9.313e-20	-19.031	-19.031	0.000	(0)
	UO ₂ F ₄ - ₂	5.983e-20	3.837e-20	-19.223	-19.416	-0.193	(0)
	PbF ₃ -	3.456e-20	3.093e-20	-19.461	-19.510	-0.048	(0)
	FeF ₃	1.534e-20	1.534e-20	-19.814	-19.814	0.000	(0)
	BF ₃ OH-	4.717e-21	4.255e-21	-20.326	-20.371	-0.045	(0)
	VO ₂ F ₂ -	2.871e-21	2.569e-21	-20.542	-20.590	-0.048	(0)
	VOF+	6.382e-23	5.711e-23	-22.195	-22.243	-0.048	(0)
	VO ₂ F ₃ - ₂	3.796e-24	2.434e-24	-23.421	-23.614	-0.193	(0)
	PbF ₄ - ₂	1.754e-24	1.125e-24	-23.756	-23.949	-0.193	(0)
	VOF ₂	1.627e-24	1.627e-24	-23.789	-23.789	0.000	(0)
	HgF+	5.824e-26	5.211e-26	-25.235	-25.283	-0.048	(0)
	BF ₄ -	1.424e-26	1.284e-26	-25.847	-25.891	-0.045	(0)
	VOF ₃ -	4.900e-27	4.385e-27	-26.310	-26.358	-0.048	(0)
	Sb (OH) ₂ F	3.432e-27	3.432e-27	-26.464	-26.464	0.000	(0)
	SbOF	3.376e-27	3.376e-27	-26.472	-26.472	0.000	(0)
	VO ₂ F ₄ - ₃	2.473e-28	9.099e-29	-27.607	-28.041	-0.434	(0)
	VOF ₄ - ₂	2.097e-30	1.345e-30	-29.678	-29.871	-0.193	(0)
	SiF ₆ - ₂	4.774e-31	3.250e-31	-30.321	-30.488	-0.167	(0)
	UF ₃ +	2.338e-38	2.092e-38	-37.631	-37.679	-0.048	(0)
	UF ₂ + ₂	2.709e-39	1.737e-39	-38.567	-38.760	-0.193	(0)
	UF ₄	1.742e-40	1.742e-40	-39.759	-39.759	0.000	(0)
	UF ₄ + ₃	0.000e+00	0.000e+00	-41.307	-41.741	-0.434	(0)
	UF ₅ -	0.000e+00	0.000e+00	-42.232	-42.280	-0.048	(0)
	UF ₆ - ₂	0.000e+00	0.000e+00	-43.727	-43.920	-0.193	(0)
Fe (2)		5.833e-13					
	Fe+ ₂	4.880e-13	3.129e-13	-12.312	-12.505	-0.193	(0)
	FeSO ₄	7.199e-14	7.199e-14	-13.143	-13.143	0.000	(0)
	FeOH+	1.710e-14	1.553e-14	-13.767	-13.809	-0.042	(0)
	FeHCO ₃ +	6.228e-15	5.671e-15	-14.206	-14.246	-0.041	(0)
	Fe (OH) ₂	1.539e-17	1.539e-17	-16.813	-16.813	0.000	(0)
	Fe (OH) ₃ -	6.681e-18	6.068e-18	-17.175	-17.217	-0.042	(0)
	Fe (HS) ₂	0.000e+00	0.000e+00	-159.380	-159.380	0.000	(0)

Fe (HS) 3-	0.000e+00	0.000e+00	-235.208	-235.256	-0.048	(0)
Fe (3)	8.618e-10					
Fe (OH) 3	4.422e-10	4.422e-10	-9.354	-9.354	0.000	(0)
Fe (OH) 2+	3.631e-10	3.302e-10	-9.440	-9.481	-0.041	(0)
Fe (OH) 4-	5.647e-11	5.134e-11	-10.248	-10.290	-0.041	(0)
FeOH+2	9.997e-16	6.805e-16	-15.000	-15.167	-0.167	(0)
FeF2+	1.576e-19	1.431e-19	-18.803	-18.844	-0.042	(0)
FeF+2	1.034e-19	7.040e-20	-18.985	-19.152	-0.167	(0)
FeF3	1.534e-20	1.534e-20	-19.814	-19.814	0.000	(0)
FeSO4+	9.785e-21	8.888e-21	-20.009	-20.051	-0.042	(0)
Fe+3	2.048e-21	8.452e-22	-20.689	-21.073	-0.384	(0)
Fe (SO4) 2-	1.990e-22	1.781e-22	-21.701	-21.749	-0.048	(0)
FeCl+2	6.542e-23	4.453e-23	-22.184	-22.351	-0.167	(0)
FeCl2+	3.820e-25	3.470e-25	-24.418	-24.460	-0.042	(0)
FeHSeO3+2	2.923e-26	1.874e-26	-25.534	-25.727	-0.193	(0)
Fe2 (OH) 2+4	9.069e-29	1.534e-29	-28.042	-28.814	-0.772	(0)
FeCl3	6.054e-29	6.054e-29	-28.218	-28.218	0.000	(0)
FeNO3+2	5.451e-30	3.496e-30	-29.264	-29.456	-0.193	(0)
Fe3 (OH) 4+5	1.176e-36	7.319e-38	-35.930	-37.136	-1.206	(0)
H (0)	1.089e-28					
H2	5.446e-29	5.457e-29	-28.264	-28.263	0.001	(0)
Hg (0)	2.020e-10					
Hg	2.020e-10	2.020e-10	-9.695	-9.695	0.000	(0)
Hg (1)	7.916e-24					
Hg2+2	3.958e-24	2.538e-24	-23.403	-23.595	-0.193	(0)
Hg (2)	2.583e-13					
Hg (OH) 2	1.812e-13	1.816e-13	-12.742	-12.741	0.001	(0)
HgClOH	7.110e-14	7.110e-14	-13.148	-13.148	0.000	(0)
HgCl2	5.633e-15	5.633e-15	-14.249	-14.249	0.000	(0)
HgCO3	1.852e-16	1.852e-16	-15.732	-15.732	0.000	(0)
HgCl3-	1.098e-16	9.827e-17	-15.959	-16.008	-0.048	(0)
Hg (CO3) 2-2	7.633e-18	4.895e-18	-17.117	-17.310	-0.193	(0)
HgCl4-2	1.064e-18	6.825e-19	-17.973	-18.166	-0.193	(0)
HgOH+	1.027e-18	9.188e-19	-17.989	-18.037	-0.048	(0)
HgCl+	7.199e-19	6.442e-19	-18.143	-18.191	-0.048	(0)
Hg (OH) 3-	3.186e-20	2.851e-20	-19.497	-19.545	-0.048	(0)
HgHCO3+	3.110e-20	2.783e-20	-19.507	-19.555	-0.048	(0)
Hg (NH3) 2+2	1.174e-21	7.529e-22	-20.930	-21.123	-0.193	(0)
HgNH3+2	1.462e-22	9.376e-23	-21.835	-22.028	-0.193	(0)
Hg+2	2.886e-23	1.851e-23	-22.540	-22.733	-0.193	(0)
HgSO4	4.541e-24	4.541e-24	-23.343	-23.343	0.000	(0)
HgF+	5.824e-26	5.211e-26	-25.235	-25.283	-0.048	(0)
Hg (NH3) 3+2	3.753e-29	2.407e-29	-28.426	-28.619	-0.193	(0)
HgNO3+	3.158e-33	2.826e-33	-32.501	-32.549	-0.048	(0)
Hg (NH3) 4+2	2.394e-36	1.535e-36	-35.621	-35.814	-0.193	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.314	-42.314	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.489	-138.538	-0.048	(0)
HgS2-2	0.000e+00	0.000e+00	-138.960	-139.153	-0.193	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.236	-140.236	0.000	(0)
K	4.205e-04					
K+	4.177e-04	3.786e-04	-3.379	-3.422	-0.043	(0)
KSO4-	2.763e-06	2.512e-06	-5.559	-5.600	-0.041	(0)
KCrO4-	2.933e-18	2.625e-18	-17.533	-17.581	-0.048	(0)
Mg	6.129e-04					
Mg+2	5.388e-04	3.636e-04	-3.269	-3.439	-0.171	(0)
MgSO4	6.201e-05	6.201e-05	-4.208	-4.208	0.000	(0)
MgHCO3+	5.913e-06	5.357e-06	-5.228	-5.271	-0.043	(0)
MgF+	3.417e-06	3.099e-06	-5.466	-5.509	-0.042	(0)
MgCO3	2.528e-06	2.528e-06	-5.597	-5.597	0.000	(0)
MgOH+	1.980e-07	1.805e-07	-6.703	-6.743	-0.040	(0)
MgH2BO3+	9.019e-09	8.136e-09	-8.045	-8.090	-0.045	(0)
Mn (2)	6.061e-06					
Mn+2	5.349e-06	3.430e-06	-5.272	-5.465	-0.193	(0)
MnSO4	5.717e-07	5.717e-07	-6.243	-6.243	0.000	(0)
MnHCO3+	1.085e-07	9.853e-08	-6.965	-7.006	-0.042	(0)
MnOH+	1.183e-08	1.075e-08	-7.927	-7.969	-0.042	(0)
MnF+	1.142e-08	1.037e-08	-7.942	-7.984	-0.042	(0)
MnCl+	8.294e-09	7.534e-09	-8.081	-8.123	-0.042	(0)

MnCl2	1.857e-11	1.857e-11	-10.731	-10.731	0.000	(0)
MnCl3-	9.822e-15	8.921e-15	-14.008	-14.050	-0.042	(0)
MnSeO4	6.126e-15	6.126e-15	-14.213	-14.213	0.000	(0)
MnNO3+	2.513e-15	2.248e-15	-14.600	-14.648	-0.048	(0)
Mn (OH) 3-	1.137e-16	1.033e-16	-15.944	-15.986	-0.042	(0)
Mn (OH) 4-2	6.108e-22	4.158e-22	-21.214	-21.381	-0.167	(0)
Mn (NO3) 2	2.336e-24	2.336e-24	-23.632	-23.632	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.312	-41.312	0.000	(0)
Mn (3)	1.079e-26					
Mn+3	1.079e-26	4.455e-27	-25.967	-26.351	-0.384	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.122	-41.289	-0.167	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.153	-46.198	-0.044	(0)
Mo	1.780e-07					
MoO4-2	1.779e-07	1.201e-07	-6.750	-6.921	-0.171	(0)
HMoO4-	2.155e-11	1.929e-11	-10.666	-10.715	-0.048	(0)
H2MoO4	1.141e-15	1.141e-15	-14.943	-14.943	0.000	(0)
Ag2MoO4	1.338e-26	1.338e-26	-25.874	-25.874	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.982	-51.417	-0.434	(0)
Mo7O24-6	0.000e+00	0.000e+00	-58.461	-60.197	-1.737	(0)
HMo7O24-5	0.000e+00	0.000e+00	-60.697	-61.903	-1.206	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-64.442	-65.214	-0.772	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-69.627	-70.061	-0.434	(0)
N (-3)	1.353e-07					
NH4+	1.260e-07	1.137e-07	-6.899	-6.944	-0.045	(0)
NH3	8.030e-09	8.030e-09	-8.095	-8.095	0.000	(0)
NH4SO4-	1.257e-09	1.142e-09	-8.901	-8.942	-0.042	(0)
CaNH3+2	6.105e-12	3.915e-12	-11.214	-11.407	-0.193	(0)
CuNH3+2	1.073e-12	6.884e-13	-11.969	-12.162	-0.193	(0)
NiNH3+2	4.616e-14	2.960e-14	-13.336	-13.529	-0.193	(0)
AgNH3+	9.941e-15	8.896e-15	-14.003	-14.051	-0.048	(0)
Co (NH3) +2	7.133e-15	4.574e-15	-14.147	-14.340	-0.193	(0)
BaNH3+2	3.566e-17	2.287e-17	-16.448	-16.641	-0.193	(0)
Ag (NH3) 2+	6.488e-19	5.806e-19	-18.188	-18.236	-0.048	(0)
Ni (NH3) 2+2	5.357e-20	3.435e-20	-19.271	-19.464	-0.193	(0)
Ca (NH3) 2+2	1.952e-20	1.251e-20	-19.710	-19.903	-0.193	(0)
Co (NH3) 2+2	2.443e-21	1.567e-21	-20.612	-20.805	-0.193	(0)
Hg (NH3) 2+2	1.174e-21	7.529e-22	-20.930	-21.123	-0.193	(0)
HgNH3+2	1.462e-22	9.376e-23	-21.835	-22.028	-0.193	(0)
Co (NH3) 3+2	2.470e-28	1.584e-28	-27.607	-27.800	-0.193	(0)
Hg (NH3) 3+2	3.753e-29	2.407e-29	-28.426	-28.619	-0.193	(0)
Co (NH3) 4+2	1.041e-35	6.675e-36	-34.983	-35.176	-0.193	(0)
Hg (NH3) 4+2	2.394e-36	1.535e-36	-35.621	-35.814	-0.193	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.734	-41.927	-0.193	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.858	-43.051	-0.193	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.041	-51.234	-0.193	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.056	-51.490	-0.434	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.953	-53.146	-0.193	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.341	-61.389	-0.048	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.798	-64.990	-0.193	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.852	-66.045	-0.193	(0)
N (3)	1.311e-06					
NO2-	1.311e-06	1.185e-06	-5.882	-5.926	-0.044	(0)
CuNO2+	1.161e-12	1.039e-12	-11.935	-11.983	-0.048	(0)
AgNO2	1.343e-13	1.343e-13	-12.872	-12.872	0.000	(0)
CoNO2+	4.420e-14	3.955e-14	-13.355	-13.403	-0.048	(0)
Cu (NO2) 2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
Ag (NO2) 2-	2.754e-19	2.464e-19	-18.560	-18.608	-0.048	(0)
N (5)	4.569e-10					
NO3-	4.563e-10	4.136e-10	-9.341	-9.383	-0.043	(0)
CaNO3+	5.659e-13	5.064e-13	-12.247	-12.295	-0.048	(0)
MnNO3+	2.513e-15	2.248e-15	-14.600	-14.648	-0.048	(0)
ZnNO3+	4.218e-16	3.775e-16	-15.375	-15.423	-0.048	(0)
CuNO3+	1.224e-17	1.096e-17	-16.912	-16.960	-0.048	(0)
BaNO3+	1.045e-17	9.356e-18	-16.981	-17.029	-0.048	(0)
NiNO3+	7.968e-18	7.130e-18	-17.099	-17.147	-0.048	(0)
CoNO3+	3.470e-18	3.105e-18	-17.460	-17.508	-0.048	(0)

CdNO3+	8.849e-19	7.918e-19	-18.053	-18.101	-0.048	(0)
PbNO3+	1.833e-19	1.641e-19	-18.737	-18.785	-0.048	(0)
AgNO3	1.782e-19	1.782e-19	-18.749	-18.749	0.000	(0)
Mn (NO3) 2	2.336e-24	2.336e-24	-23.632	-23.632	0.000	(0)
UO2NO3+	1.337e-24	1.197e-24	-23.874	-23.922	-0.048	(0)
Zn (NO3) 2	3.115e-26	3.115e-26	-25.507	-25.507	0.000	(0)
CrNO3+2	3.403e-27	2.182e-27	-26.468	-26.661	-0.193	(0)
Co (NO3) 2	2.613e-27	2.613e-27	-26.583	-26.583	0.000	(0)
Cu (NO3) 2	5.704e-28	5.704e-28	-27.244	-27.244	0.000	(0)
Cd (NO3) 2	1.641e-28	1.641e-28	-27.785	-27.785	0.000	(0)
VO2NO3	1.462e-28	1.462e-28	-27.835	-27.835	0.000	(0)
Pb (NO3) 2	1.152e-28	1.152e-28	-27.938	-27.938	0.000	(0)
FeNO3+2	5.451e-30	3.496e-30	-29.264	-29.456	-0.193	(0)
HgNO3+	3.158e-33	2.826e-33	-32.501	-32.549	-0.048	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.314	-42.314	0.000	(0)
Na	3.772e-03					
Na+	3.750e-03	3.399e-03	-2.426	-2.469	-0.043	(0)
NaSO4-	1.881e-05	1.711e-05	-4.726	-4.767	-0.041	(0)
NaHCO3	2.751e-06	2.751e-06	-5.560	-5.560	0.000	(0)
NaCO3-	5.819e-07	5.291e-07	-6.235	-6.276	-0.041	(0)
NaF	1.629e-07	1.629e-07	-6.788	-6.788	0.000	(0)
NaH2BO3	3.476e-09	3.476e-09	-8.459	-8.459	0.000	(0)
NaCrO4-	3.522e-17	3.151e-17	-16.453	-16.501	-0.048	(0)
Ni	1.514e-08					
Ni+2	1.017e-08	6.863e-09	-7.993	-8.163	-0.171	(0)
NiCO3	2.141e-09	2.141e-09	-8.669	-8.669	0.000	(0)
NiHCO3+	1.361e-09	1.218e-09	-8.866	-8.914	-0.048	(0)
NiSO4	1.284e-09	1.284e-09	-8.892	-8.892	0.000	(0)
NiOH+	1.204e-10	1.078e-10	-9.919	-9.968	-0.048	(0)
NiCl+	3.424e-11	3.064e-11	-10.466	-10.514	-0.048	(0)
NiF+	1.464e-11	1.310e-11	-10.835	-10.883	-0.048	(0)
Ni (OH) 2	1.067e-11	1.067e-11	-10.972	-10.972	0.000	(0)
Ni (SO4) 2-2	6.212e-14	3.983e-14	-13.207	-13.400	-0.193	(0)
NiNH3+2	4.616e-14	2.960e-14	-13.336	-13.529	-0.193	(0)
Ni (OH) 3-	1.487e-14	1.331e-14	-13.828	-13.876	-0.048	(0)
NiCl2	2.691e-16	2.691e-16	-15.570	-15.570	0.000	(0)
NiSeO4	2.130e-17	2.130e-17	-16.672	-16.672	0.000	(0)
NiNO3+	7.968e-18	7.130e-18	-17.099	-17.147	-0.048	(0)
Ni (NH3) 2+2	5.357e-20	3.435e-20	-19.271	-19.464	-0.193	(0)
O (0)	3.396e-36					
O2	1.698e-36	1.701e-36	-35.770	-35.769	0.001	(0)
Pb	8.828e-10					
PbCO3	6.740e-10	6.740e-10	-9.171	-9.171	0.000	(0)
PbOH+	9.388e-11	8.401e-11	-10.027	-10.076	-0.048	(0)
Pb+2	3.974e-11	2.682e-11	-10.401	-10.572	-0.171	(0)
PbHCO3+	3.206e-11	2.869e-11	-10.494	-10.542	-0.048	(0)
Pb (CO3) 2-2	2.534e-11	1.625e-11	-10.596	-10.789	-0.193	(0)
PbSO4	1.231e-11	1.231e-11	-10.910	-10.910	0.000	(0)
Pb (OH) 2	3.313e-12	3.313e-12	-11.480	-11.480	0.000	(0)
PbCl+	1.855e-12	1.660e-12	-11.732	-11.780	-0.048	(0)
PbF+	1.604e-13	1.436e-13	-12.795	-12.843	-0.048	(0)
Pb (SO4) 2-2	1.084e-13	6.953e-14	-12.965	-13.158	-0.193	(0)
PbCl2	1.294e-14	1.294e-14	-13.888	-13.888	0.000	(0)
Pb (OH) 3-	4.617e-15	4.131e-15	-14.336	-14.384	-0.048	(0)
PbF2	2.146e-16	2.146e-16	-15.668	-15.668	0.000	(0)
PbCl3-	1.004e-17	8.985e-18	-16.998	-17.046	-0.048	(0)
Pb (OH) 4-2	1.968e-18	1.262e-18	-17.706	-17.899	-0.193	(0)
PbNO3+	1.833e-19	1.641e-19	-18.737	-18.785	-0.048	(0)
Pb2OH+3	9.704e-20	3.571e-20	-19.013	-19.447	-0.434	(0)
PbF3-	3.456e-20	3.093e-20	-19.461	-19.510	-0.048	(0)
PbCl4-2	1.117e-20	7.165e-21	-19.952	-20.145	-0.193	(0)
Pb3 (OH) 4+2	9.159e-24	5.873e-24	-23.038	-23.231	-0.193	(0)
PbF4-2	1.754e-24	1.125e-24	-23.756	-23.949	-0.193	(0)
Pb (NO3) 2	1.152e-28	1.152e-28	-27.938	-27.938	0.000	(0)
Pb4 (OH) 4+4	7.399e-30	1.251e-30	-29.131	-29.903	-0.772	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.127	-151.127	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.692	-227.740	-0.048	(0)
S (-2)	0.000e+00					

AgHS	0.000e+00	0.000e+00	-73.364	-73.364	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.865	-77.913	-0.048	(0)
H2S	0.000e+00	0.000e+00	-78.986	-78.986	0.000	(0)
S5-2	0.000e+00	0.000e+00	-78.992	-79.185	-0.193	(0)
CdHS+	0.000e+00	0.000e+00	-79.075	-79.123	-0.048	(0)
S6-2	0.000e+00	0.000e+00	-79.508	-79.701	-0.193	(0)
S4-2	0.000e+00	0.000e+00	-79.588	-79.781	-0.193	(0)
S3-2	0.000e+00	0.000e+00	-80.394	-80.587	-0.193	(0)
S2-2	0.000e+00	0.000e+00	-81.410	-81.603	-0.193	(0)
S-2	0.000e+00	0.000e+00	-86.953	-87.120	-0.167	(0)
HgHS2-	0.000e+00	0.000e+00	-138.489	-138.538	-0.048	(0)
HgS2-2	0.000e+00	0.000e+00	-138.960	-139.153	-0.193	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.236	-140.236	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.847	-146.100	-0.253	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.436	-146.567	-0.132	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.586	-146.830	-0.244	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.129	-147.177	-0.048	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.314	-147.362	-0.048	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.657	-147.914	-0.258	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.977	-148.225	-0.249	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.445	-149.445	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.832	-149.832	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.127	-151.127	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.380	-159.380	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.868	-215.917	-0.048	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.030	-224.078	-0.048	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.772	-225.965	-0.193	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.796	-225.845	-0.048	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.692	-227.740	-0.048	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.208	-235.256	-0.048	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.369	-301.562	-0.193	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.258	-303.451	-0.193	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.147	-319.340	-0.193	(0)
S (6)	1.556e-03					
SO4-2	1.389e-03	9.372e-04	-2.857	-3.028	-0.171	(0)
CaSO4	8.314e-05	8.314e-05	-4.080	-4.080	0.000	(0)
MgSO4	6.201e-05	6.201e-05	-4.208	-4.208	0.000	(0)
NaSO4-	1.881e-05	1.711e-05	-4.726	-4.767	-0.041	(0)
KSO4-	2.763e-06	2.512e-06	-5.559	-5.600	-0.041	(0)
MnSO4	5.717e-07	5.717e-07	-6.243	-6.243	0.000	(0)
ZnSO4	7.451e-08	7.451e-08	-7.128	-7.128	0.000	(0)
CuSO4	1.799e-09	1.799e-09	-8.745	-8.745	0.000	(0)
NiSO4	1.284e-09	1.284e-09	-8.892	-8.892	0.000	(0)
NH4SO4-	1.257e-09	1.142e-09	-8.901	-8.942	-0.042	(0)
Zn (SO4) 2-2	9.485e-10	6.082e-10	-9.023	-9.216	-0.193	(0)
CoSO4	8.860e-10	8.860e-10	-9.053	-9.053	0.000	(0)
HSO4-	8.151e-10	7.394e-10	-9.089	-9.131	-0.042	(0)
CdSO4	1.330e-10	1.330e-10	-9.876	-9.876	0.000	(0)
PbSO4	1.231e-11	1.231e-11	-10.910	-10.910	0.000	(0)
AgSO4-	1.134e-11	1.015e-11	-10.945	-10.994	-0.048	(0)
Cd (SO4) 2-2	2.623e-12	1.682e-12	-11.581	-11.774	-0.193	(0)
CrOHSO4	7.324e-13	7.324e-13	-12.135	-12.135	0.000	(0)
Pb (SO4) 2-2	1.084e-13	6.953e-14	-12.965	-13.158	-0.193	(0)
FeSO4	7.199e-14	7.199e-14	-13.143	-13.143	0.000	(0)
Ni (SO4) 2-2	6.212e-14	3.983e-14	-13.207	-13.400	-0.193	(0)
UO2SO4	2.057e-15	2.057e-15	-14.687	-14.687	0.000	(0)
AlSO4+	3.767e-16	3.417e-16	-15.424	-15.466	-0.042	(0)
CrSO4+	2.952e-16	2.641e-16	-15.530	-15.578	-0.048	(0)
UO2 (SO4) 2-2	3.964e-17	2.542e-17	-16.402	-16.595	-0.193	(0)
Al (SO4) 2-	3.783e-18	3.431e-18	-17.422	-17.465	-0.042	(0)
VO2SO4-	1.748e-20	1.564e-20	-19.757	-19.806	-0.048	(0)
FeSO4+	9.785e-21	8.888e-21	-20.009	-20.051	-0.042	(0)
Cr2 (OH) 2SO4+2	3.399e-22	2.180e-22	-21.469	-21.662	-0.193	(0)
Fe (SO4) 2-	1.990e-22	1.781e-22	-21.701	-21.749	-0.048	(0)
VOSO4	3.235e-23	3.235e-23	-22.490	-22.490	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.214e-23	1.214e-23	-22.916	-22.916	0.000	(0)
HgSO4	4.541e-24	4.541e-24	-23.343	-23.343	0.000	(0)
CrO3SO4-2	1.752e-25	1.124e-25	-24.756	-24.949	-0.193	(0)

VSO4+	6.899e-38	6.173e-38	-37.161	-37.209	-0.048	(0)
U(SO4)2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.157	-43.350	-0.193	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-61.341	-61.389	-0.048	(0)
Sb(3)	7.081e-21					
Sb(OH)3	3.582e-21	3.582e-21	-20.446	-20.446	0.000	(0)
HSbO2	3.497e-21	3.497e-21	-20.456	-20.456	0.000	(0)
SbO2-	7.840e-25	7.016e-25	-24.106	-24.154	-0.048	(0)
Sb(OH)4-	4.491e-25	4.019e-25	-24.348	-24.396	-0.048	(0)
Sb(OH)2F	3.432e-27	3.432e-27	-26.464	-26.464	0.000	(0)
SbOF	3.376e-27	3.376e-27	-26.472	-26.472	0.000	(0)
Sb(OH)2+	7.849e-28	7.024e-28	-27.105	-27.153	-0.048	(0)
SbO+	2.706e-28	2.422e-28	-27.568	-27.616	-0.048	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.147	-319.340	-0.193	(0)
Sb(5)	2.696e-09					
SbO3-	2.693e-09	2.410e-09	-8.570	-8.618	-0.048	(0)
Sb(OH)6-	3.109e-12	2.818e-12	-11.507	-11.550	-0.043	(0)
SbO2+	5.035e-26	4.506e-26	-25.298	-25.346	-0.048	(0)
Se(-2)	8.278e-15					
Ag2Se	8.278e-15	8.278e-15	-14.082	-14.082	0.000	(0)
HSe-	3.114e-39	2.787e-39	-38.507	-38.555	-0.048	(0)
MnSe	0.000e+00	0.000e+00	-41.312	-41.312	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.758	-42.758	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.269	-45.462	-0.193	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-81.834	-82.606	-0.772	(0)
Se(4)	1.583e-08					
HSeO3-	9.379e-09	8.393e-09	-8.028	-8.076	-0.048	(0)
SeO3-2	6.454e-09	4.139e-09	-8.190	-8.383	-0.193	(0)
H2SeO3	2.890e-14	2.890e-14	-13.539	-13.539	0.000	(0)
AgSeO3-	1.613e-15	1.443e-15	-14.792	-14.841	-0.048	(0)
Cd(SeO3)2-2	1.333e-20	8.547e-21	-19.875	-20.068	-0.193	(0)
Ag(SeO3)2-3	1.453e-22	5.348e-23	-21.838	-22.272	-0.434	(0)
FeHSeO3+2	2.923e-26	1.874e-26	-25.534	-25.727	-0.193	(0)
Se(6)	9.838e-12					
SeO4-2	9.832e-12	6.635e-12	-11.007	-11.178	-0.171	(0)
MnSeO4	6.126e-15	6.126e-15	-14.213	-14.213	0.000	(0)
ZnSeO4	3.734e-16	3.734e-16	-15.428	-15.428	0.000	(0)
NiSeO4	2.130e-17	2.130e-17	-16.672	-16.672	0.000	(0)
CoSeO4	1.575e-17	1.575e-17	-16.803	-16.803	0.000	(0)
HSeO4-	3.000e-18	2.684e-18	-17.523	-17.571	-0.048	(0)
CdSeO4	7.480e-19	7.480e-19	-18.126	-18.126	0.000	(0)
Zn(SeO4)2-2	3.917e-27	2.512e-27	-26.407	-26.600	-0.193	(0)
Si	2.675e-04					
H4SiO4	2.623e-04	2.628e-04	-3.581	-3.580	0.001	(0)
H3SiO4-	5.194e-06	4.706e-06	-5.284	-5.327	-0.043	(0)
H2SiO4-2	5.380e-11	3.678e-11	-10.269	-10.434	-0.165	(0)
UO2H3SiO4+	6.474e-13	5.794e-13	-12.189	-12.237	-0.048	(0)
SiF6-2	4.774e-31	3.250e-31	-30.321	-30.488	-0.167	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.747	-60.181	-0.434	(0)
U(4)	2.961e-20					
U(OH)5-	2.960e-20	2.649e-20	-19.529	-19.577	-0.048	(0)
U(OH)4	8.957e-24	8.957e-24	-23.048	-23.048	0.000	(0)
U(OH)3+	2.955e-28	2.644e-28	-27.529	-27.578	-0.048	(0)
U(OH)2+2	1.539e-33	9.872e-34	-32.813	-33.006	-0.193	(0)
UF3+	2.338e-38	2.092e-38	-37.631	-37.679	-0.048	(0)
UF2+2	2.709e-39	1.737e-39	-38.567	-38.760	-0.193	(0)
UOH+3	1.020e-39	3.754e-40	-38.991	-39.425	-0.434	(0)
UF4	1.742e-40	1.742e-40	-39.759	-39.759	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.307	-41.741	-0.434	(0)
UF5-	0.000e+00	0.000e+00	-42.232	-42.280	-0.048	(0)
U(SO4)2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.157	-43.350	-0.193	(0)
UF6-2	0.000e+00	0.000e+00	-43.727	-43.920	-0.193	(0)
U+4	0.000e+00	0.000e+00	-46.150	-46.921	-0.772	(0)
UCl+3	0.000e+00	0.000e+00	-47.545	-47.980	-0.434	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-173.382	-177.290	-3.908	(0)
U(5)	3.397e-17					

UO2+	3.397e-17	3.040e-17	-16.469	-16.517	-0.048	(0)
U(6)	3.256e-08					
UO2 (CO3) 3-4	1.995e-08	3.374e-09	-7.700	-8.472	-0.772	(0)
UO2 (CO3) 2-2	1.256e-08	8.051e-09	-7.901	-8.094	-0.193	(0)
UO2CO3	4.827e-11	4.827e-11	-10.316	-10.316	0.000	(0)
UO2H3SiO4+	6.474e-13	5.794e-13	-12.189	-12.237	-0.048	(0)
UO2OH+	2.544e-13	2.277e-13	-12.594	-12.643	-0.048	(0)
UO2F+	1.699e-14	1.521e-14	-13.770	-13.818	-0.048	(0)
UO2F2	3.332e-15	3.332e-15	-14.477	-14.477	0.000	(0)
UO2+2	2.149e-15	1.450e-15	-14.668	-14.839	-0.171	(0)
UO2SO4	2.057e-15	2.057e-15	-14.687	-14.687	0.000	(0)
UO2F3-	7.105e-17	6.358e-17	-16.148	-16.197	-0.048	(0)
UO2 (SO4) 2-2	3.964e-17	2.542e-17	-16.402	-16.595	-0.193	(0)
UO2Cl+	4.585e-18	4.103e-18	-17.339	-17.387	-0.048	(0)
(UO2) 2 (OH) 2+2	1.342e-19	8.603e-20	-18.872	-19.065	-0.193	(0)
UO2F4-2	5.983e-20	3.837e-20	-19.223	-19.416	-0.193	(0)
(UO2) 3 (OH) 5+	2.582e-20	2.311e-20	-19.588	-19.636	-0.048	(0)
UO2NO3+	1.337e-24	1.197e-24	-23.874	-23.922	-0.048	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.975	-44.023	-0.048	(0)
V+2	0.000e+00	0.000e+00	-45.436	-45.629	-0.193	(0)
V(3)	2.183e-16					
V (OH) 3	2.183e-16	2.183e-16	-15.661	-15.661	0.000	(0)
V (OH) 2+	1.273e-27	1.139e-27	-26.895	-26.944	-0.048	(0)
VOH+2	1.360e-31	8.721e-32	-30.866	-31.059	-0.193	(0)
V+3	3.792e-37	1.395e-37	-36.421	-36.855	-0.434	(0)
VSO4+	6.899e-38	6.173e-38	-37.161	-37.209	-0.048	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-59.117	-59.551	-0.434	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-60.547	-61.319	-0.772	(0)
V(4)	3.514e-20					
V (OH) 3+	3.484e-20	3.118e-20	-19.458	-19.506	-0.048	(0)
VO+2	1.954e-22	1.253e-22	-21.709	-21.902	-0.193	(0)
VOF+	6.382e-23	5.711e-23	-22.195	-22.243	-0.048	(0)
VOSO4	3.235e-23	3.235e-23	-22.490	-22.490	0.000	(0)
VOF2	1.627e-24	1.627e-24	-23.789	-23.789	0.000	(0)
VOC1+	6.855e-25	6.134e-25	-24.164	-24.212	-0.048	(0)
VOF3-	4.900e-27	4.385e-27	-26.310	-26.358	-0.048	(0)
VOF4-2	2.097e-30	1.345e-30	-29.678	-29.871	-0.193	(0)
H2V2O4+2	7.601e-35	4.874e-35	-34.119	-34.312	-0.193	(0)
V(5)	8.612e-10					
H2VO4-	6.004e-10	5.373e-10	-9.222	-9.270	-0.048	(0)
HVO4-2	2.607e-10	1.672e-10	-9.584	-9.777	-0.193	(0)
H3VO4	4.338e-14	4.338e-14	-13.363	-13.363	0.000	(0)
VO4-3	2.820e-16	1.038e-16	-15.550	-15.984	-0.434	(0)
H3V2O7-	1.682e-16	1.505e-16	-15.774	-15.822	-0.048	(0)
HV2O7-3	8.273e-17	3.044e-17	-16.082	-16.517	-0.434	(0)
VO2+	7.712e-19	6.990e-19	-18.113	-18.156	-0.043	(0)
V2O7-4	6.002e-19	1.015e-19	-18.222	-18.994	-0.772	(0)
VO2F	9.313e-20	9.313e-20	-19.031	-19.031	0.000	(0)
VO2SO4-	1.748e-20	1.564e-20	-19.757	-19.806	-0.048	(0)
VO2F2-	2.871e-21	2.569e-21	-20.542	-20.590	-0.048	(0)
V3O9-3	4.417e-22	1.625e-22	-21.355	-21.789	-0.434	(0)
VO2F3-2	3.796e-24	2.434e-24	-23.421	-23.614	-0.193	(0)
VO2F4-3	2.473e-28	9.099e-29	-27.607	-28.041	-0.434	(0)
V4O12-4	2.153e-28	3.641e-29	-27.667	-28.439	-0.772	(0)
VO2NO3	1.462e-28	1.462e-28	-27.835	-27.835	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-74.426	-76.163	-1.737	(0)
HV10O28-5	0.000e+00	0.000e+00	-74.863	-76.069	-1.206	(0)
H2V10O28-4	0.000e+00	0.000e+00	-78.183	-78.955	-0.772	(0)
Zn	8.719e-07					
Zn+2	5.385e-07	3.634e-07	-6.269	-6.440	-0.171	(0)
ZnCO3	1.748e-07	1.748e-07	-6.757	-6.757	0.000	(0)
ZnSO4	7.451e-08	7.451e-08	-7.128	-7.128	0.000	(0)
ZnOH+	5.064e-08	4.531e-08	-7.296	-7.344	-0.048	(0)
ZnHCO3+	1.849e-08	1.654e-08	-7.733	-7.781	-0.048	(0)
Zn (OH) 2	8.956e-09	8.956e-09	-8.048	-8.048	0.000	(0)
ZnOHCl	2.600e-09	2.600e-09	-8.585	-8.585	0.000	(0)
ZnCl+	1.758e-09	1.592e-09	-8.755	-8.798	-0.043	(0)

Zn(SO4)2-2	9.485e-10	6.082e-10	-9.023	-9.216	-0.193	(0)
ZnF+	6.155e-10	5.508e-10	-9.211	-9.259	-0.048	(0)
Zn(OH)3-	6.255e-11	5.598e-11	-10.204	-10.252	-0.048	(0)
ZnCl2	4.403e-12	4.403e-12	-11.356	-11.356	0.000	(0)
ZnCl3-	6.735e-15	6.102e-15	-14.172	-14.215	-0.043	(0)
Zn(OH)4-2	4.334e-15	2.779e-15	-14.363	-14.556	-0.193	(0)
ZnNO3+	4.218e-16	3.775e-16	-15.375	-15.423	-0.048	(0)
ZnSeO4	3.734e-16	3.734e-16	-15.428	-15.428	0.000	(0)
ZnCl4-2	7.819e-18	5.323e-18	-17.107	-17.274	-0.167	(0)
Zn(NO3)2	3.115e-26	3.115e-26	-25.507	-25.507	0.000	(0)
Zn(SeO4)2-2	3.917e-27	2.512e-27	-26.407	-26.600	-0.193	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.314	-147.362	-0.048	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.445	-149.445	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.030	-224.078	-0.048	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.772	-225.965	-0.193	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.258	-303.451	-0.193	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-58.33	-52.04	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-43.30	-38.79	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-50.53	-38.79	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-75.45	-57.52	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-57.68	-37.64	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.02	-28.62	0.40	(NH4)2CrO4
(NH4)2SeO4	-25.52	-25.07	0.45	(NH4)2SeO4
Acanthite	-52.13	-88.35	-36.22	Ag2S
Ag2CO3	-12.52	-23.61	-11.09	Ag2CO3
Ag2CrO4	-21.67	-33.26	-11.59	Ag2CrO4
Ag2HVO4	-13.89	-12.41	1.48	Ag2HVO4
Ag2MoO4	-13.90	-25.45	-11.55	Ag2MoO4
Ag2O	-14.92	-2.35	12.57	Ag2O
Ag2Se	-0.29	-48.99	-48.70	Ag2Se
Ag2SeO3	-11.36	-18.51	-7.15	Ag2SeO3
Ag2SeO4	-20.80	-29.71	-8.91	Ag2SeO4
Ag2SO4	-16.74	-21.56	-4.82	Ag2SO4
Ag3AsO3	-27.46	-25.30	2.16	Ag3AsO3
Ag3AsO4	-16.30	-19.08	-2.79	Ag3AsO4
Ag3H2VO5	-18.76	-13.58	5.18	Ag3H2VO5
AgF:4H2O	-14.43	-13.39	1.05	AgF:4H2O
Agmetal	-0.22	-13.73	-13.51	Ag
AgVO3	-12.01	-11.24	0.77	AgVO3
Al(OH)3(am)	-2.85	7.95	10.80	Al(OH)3
Al2(MoO4)3	-55.79	-53.42	2.37	Al2(MoO4)3
Al2O3	-3.75	15.90	19.65	Al2O3
Al4(OH)10SO4	-10.11	12.59	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.42	-7.62	4.80	AlAsO4:2H2O
AlOHSO4	-8.03	-11.26	-3.23	AlOHSO4
AlSb	-153.46	-87.83	65.62	AlSb
Alunite	-8.51	-9.91	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.81	-13.60	-7.79	PbSO4
Anhydrite	-2.08	-6.44	-4.36	CaSO4
Anilite	-54.74	-86.61	-31.88	Cu0.25Cu1.5S
Antlerite	-3.68	5.11	8.79	Cu3(OH)4SO4
Aragonite	-0.19	-8.49	-8.30	CaCO3
Arsenolite	-84.37	-87.13	-2.76	As4O6
Artinite	-5.37	4.23	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-37.84	-31.13	6.71	As2O5
Atacamite	-2.02	5.37	7.39	Cu2(OH)3Cl
Azurite	-1.29	-18.20	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.55	7.84	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-20.32	-4.44	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	1.30	-7.61	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-29.54	3.40	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.40	-23.07	-9.67	BaCrO4
BaF2	-10.76	-16.58	-5.82	BaF2

BaMoO4	-8.31	-15.27	-6.96	BaMoO4
Barite	-1.39	-11.37	-9.98	BaSO4
BaS	-94.35	-78.17	16.18	BaS
BaSeO3	-10.16	-8.33	1.83	BaSeO3
BaSeO4	-12.06	-19.52	-7.46	BaSeO4
Bianchite	-7.70	-9.47	-1.76	ZnSO4:6H2O
Birnessite	-7.61	10.48	18.09	MnO2
Bixbyite	-3.50	-4.14	-0.64	Mn2O3
BlaubleiI	-54.90	-79.06	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.27	-82.55	-27.28	Cu0.6Cu0.8S
Boehmite	-0.63	7.95	8.58	AlOOH
Breithauptite	-56.68	-75.21	-18.52	NiSb
Brochantite	-2.00	13.22	15.22	Cu4(OH)6SO4
Brucite	-4.10	12.75	16.84	Mg(OH)2
Bunsenite	-4.42	8.02	12.45	NiO
Ca(VO3)2	-13.01	-7.35	5.66	Ca(VO3)2
Ca2V2O7	-12.08	5.42	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.13	5.42	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.11	7.19	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.76	18.20	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.66	18.20	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.22	-153.25	142.97	Ca3Sb2
CaCrO4	-15.88	-18.14	-2.27	CaCrO4
Calcite	-0.01	-8.49	-8.48	CaCO3
Calomel	-11.20	-29.11	-17.91	Hg2Cl2
CaMoO4	-2.38	-10.33	-7.95	CaMoO4
Carnotite	-4.27	-4.04	0.23	KUO2VO4
CaSeO3:2H2O	-6.21	-3.40	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.57	-14.59	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.97	-3.13	9.84	Cd(BO2)2
Cd(OH)2	-6.68	6.97	13.64	Cd(OH)2
Cd(OH)2(am)	-6.76	6.97	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-24.23	-17.52	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.87	1.69	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.74	8.66	28.40	Cd4(OH)6SO4
CdCl2	-14.08	-14.73	-0.66	CdCl2
CdCl2:1H2O	-13.04	-14.73	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.82	-14.73	-1.91	CdCl2:2.5H2O
CdF2	-16.24	-17.46	-1.21	CdF2
Cdmetal(alpha)	-31.66	-18.15	13.51	Cd
Cdmetal(gamma)	-31.76	-18.15	13.62	Cd
CdMoO4	-1.99	-16.14	-14.15	CdMoO4
CdOHCl	-7.42	-3.88	3.54	CdOHCl
CdSb	-75.91	-76.26	-0.35	CdSb
CdSe	-19.48	-39.68	-20.20	CdSe
CdSeO4:2H2O	-18.55	-20.40	-1.85	CdSeO4:2H2O
CdSO4	-12.07	-12.25	-0.17	CdSO4
CdSO4:1H2O	-10.52	-12.25	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.37	-12.25	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.27	-12.02	-9.75	AgCl
Cerrusite	-2.52	-15.65	-13.13	PbCO3
CH4(g)	-80.67	-121.72	-41.05	CH4
Chalcanthite	-8.47	-11.11	-2.64	CuSO4:5H2O
Chalcedony	-0.03	-3.58	-3.55	SiO2
Chalcocite	-54.60	-89.52	-34.92	Cu2S
Chalcopyrite	-124.95	-160.22	-35.27	CuFeS2
Chrysotile	-1.12	31.08	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.05	-98.75	-45.69	HgS
Claudetite	-84.06	-87.13	-3.06	As4O6
Clausthalite	-13.93	-41.03	-27.10	PbSe
Co(BO2)2	-29.30	-2.23	27.07	Co(BO2)2
Co(OH)2	-5.23	7.86	13.09	Co(OH)2
Co(OH)3	-9.67	-11.98	-2.31	Co(OH)3
CO2(g)	-3.12	-21.26	-18.15	CO2
Co3(AsO4)2	-20.58	-7.55	13.03	Co3(AsO4)2
Co3O4	-5.61	-16.10	-10.50	Co3O4
CoCl2	-22.11	-13.84	8.27	CoCl2
CoCl2:6H2O	-16.38	-13.84	2.54	CoCl2:6H2O

CoCO3	-3.42	-13.40	-9.98	CoCO3
CoF2	-14.97	-16.56	-1.60	CoF2
CoF3	-47.16	-48.62	-1.46	CoF3
CoFe2O4	17.80	14.27	-3.53	CoFe2O4
CoMoO4	-7.48	-15.24	-7.76	CoMoO4
CoO	-5.72	7.86	13.59	CoO
CoS (alpha)	-70.70	-78.14	-7.44	CoS
CoS (beta)	-67.07	-78.14	-11.07	CoS
CoSe	-22.59	-38.79	-16.20	CoSe
CoSeO3	-9.63	-8.31	1.32	CoSeO3
CoSeO4:6H2O	-17.97	-19.50	-1.53	CoSeO4:6H2O
CoSO4	-14.15	-11.35	2.80	CoSO4
CoSO4:6H2O	-8.88	-11.35	-2.47	CoSO4:6H2O
Cotunnite	-11.31	-16.09	-4.78	PbCl2
Covellite	-55.60	-77.90	-22.30	CuS
Cr (OH) 2	-21.64	-10.82	10.82	Cr (OH) 2
Cr (OH) 3	-2.54	-1.21	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.46	-1.21	-0.75	Cr (OH) 3
Cr2O3	-0.06	-2.42	-2.36	Cr2O3
CrCl2	-46.61	-32.52	14.09	CrCl2
CrCl3	-48.88	-33.76	15.11	CrCl3
CrF3	-26.51	-37.85	-11.34	CrF3
Cristobalite	-0.23	-3.58	-3.35	SiO2
Crmetal	-66.41	-35.93	30.48	Cr
CrO3	-27.70	-30.91	-3.21	CrO3
Cryolite	-14.61	-48.45	-33.84	Na3AlF6
Cu (OH) 2	-0.57	8.11	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.77	17.44	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-10.51	-1.26	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.55	-89.43	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.36	-50.16	-45.80	Cu2Se
Cu2SO4	-20.78	-22.73	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.91	-6.81	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.46	-101.06	-42.59	Cu3Sb
Cu3Se2	-25.21	-88.70	-63.49	Cu3Se2
CuCO3	-1.65	-13.15	-11.50	CuCO3
CuCrO4	-17.37	-22.81	-5.44	CuCrO4
CuF	-9.06	-13.97	-4.91	CuF
CuF2	-17.43	-16.32	1.12	CuF2
CuF2:2H2O	-11.77	-16.32	-4.55	CuF2:2H2O
Cumetal	-5.56	-14.31	-8.76	Cu
CuMoO4	-1.92	-15.00	-13.08	CuMoO4
CuOCuSO4	-13.30	-3.00	10.30	CuOCuSO4
Cupricferrite	8.53	14.52	5.99	CuFe2O4
Cuprite	-2.11	-3.52	-1.41	Cu2O
Cuprousferrite	10.37	1.45	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe
CuSe2	-26.71	-60.07	-33.37	CuSe2
CuSeO3:2H2O	-8.57	-8.06	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.82	-19.26	-2.44	CuSeO4:5H2O
CuSO4	-14.04	-11.11	2.94	CuSO4
Diaspore	1.08	7.95	6.87	AlOOH
Djurleite	-54.83	-88.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.47	-17.01	-16.54	CaMg (CO3) 2
Dolomite(ordered)	0.08	-17.01	-17.09	CaMg (CO3) 2
Epsomite	-4.34	-6.47	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.88	3.68	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	2.99	-0.05	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-12.72	-16.44	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-11.31	-9.76	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-21.47	-42.10	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-47.50	-51.23	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.13	10.09	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.76	-12.36	0.40	FeAsO4:2H2O
FeCr2O4	-5.94	1.26	7.20	FeCr2O4
FeMoO4	-9.33	-19.43	-10.09	FeMoO4
Ferrihydrite	0.01	3.21	3.19	Fe (OH) 3
Ferroselite	-45.91	-64.50	-18.60	FeSe2

FeS (ppt)	-79.37	-82.32	-2.95	FeS
FeSe	-31.97	-42.97	-11.00	FeSe
Fix_pe	-4.46	-4.46	0.00	e-
Fluorite	-1.15	-11.65	-10.50	CaF2
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	-0.34	7.95	8.29	Al (OH) 3
Goethite	2.71	3.21	0.49	FeOOH
Goslarite	-7.46	-9.47	-2.01	ZnSO4:7H2O
Greenalite	-16.93	3.88	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.68	-79.04	-14.36	CdS
Greigite	-288.90	-333.93	-45.03	Fe3S4
Gummite	-6.32	1.35	7.67	UO3
Gypsum	-1.83	-6.44	-4.61	CaSO4:2H2O
H-Jarosite	-16.71	-28.81	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.23	-23.11	-12.88	H2MoO4
H2S (g)	-78.00	-86.01	-8.01	H2S
H2Se (g)	-41.69	-46.65	-4.96	H2Se
Halite	-6.83	-5.23	1.60	NaCl
Halloysite	-0.83	8.74	9.57	Al2Si2O5 (OH) 4
Hausmannite	-3.75	57.28	61.03	Mn3O4
Hematite	7.83	6.41	-1.42	Fe2O3
Hercynite	-3.31	19.58	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.47	-256.17	-73.71	Hg (CH3) 2
Hg (g)	-8.39	-16.26	-7.87	Hg
Hg (OH) 2	-9.24	-12.74	-3.50	Hg (OH) 2
Hg2 (g)	-17.57	-32.52	-14.96	Hg2
Hg2 (OH) 2	-12.67	-7.41	5.26	Hg2 (OH) 2
Hg2CO3	-12.62	-28.67	-16.05	Hg2CO3
Hg2CrO4	-29.62	-38.32	-8.70	Hg2CrO4
Hg2F2	-21.47	-31.83	-10.36	Hg2F2
Hg2S	-81.74	-93.42	-11.68	Hg2S
Hg2SeO3	-18.92	-23.58	-4.66	Hg2SeO3
Hg2SO4	-20.49	-26.62	-6.13	Hg2SO4
Hg3O2CO3	-29.80	-59.49	-29.68	Hg3O2CO3
HgCl (g)	-34.05	-14.56	19.50	HgCl
HgCl2	-13.18	-34.44	-21.26	HgCl2
HgF (g)	-48.59	-15.92	32.68	HgF
HgF2 (g)	-49.73	-37.17	12.57	HgF2
Hgmetal (l)	-2.81	-16.26	-13.45	Hg
HgSe	-3.69	-59.39	-55.69	HgSe
HgSeO3	-16.48	-28.91	-12.43	HgSeO3
HgSO4	-22.54	-31.95	-9.42	HgSO4
Huntite	-4.07	-34.04	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-6.91	-25.68	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.56	-21.32	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-20.64	-25.81	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-9.34	-24.14	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.25	-52.49	-17.24	K2Cr2O7
K2CrO4	-21.06	-21.57	-0.51	K2CrO4
K2MoO4	-17.03	-13.76	3.26	K2MoO4
K2SeO4	-17.29	-18.02	-0.73	K2SeO4
Kaolinite	1.31	8.74	7.43	Al2Si2O5 (OH) 4
Langite	-4.27	13.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.55	-7.99	-0.43	PbO:PbSO4
Laurionite	-5.86	-5.24	0.62	PbOHCl
Lepidocrocite	1.83	3.21	1.37	FeOOH
Lime	-19.93	12.77	32.70	CaO
Litharge	-7.08	5.61	12.69	PbO
Mackinawite	-78.72	-82.32	-3.60	FeS
Maghemite	0.03	6.41	6.39	Fe2O3
Magnesioferrite	2.30	19.16	16.86	Fe2MgO4
Magnesite	-1.06	-8.52	-7.46	MgCO3
Magnetite	6.69	10.09	3.40	Fe3O4
Malachite	0.26	-5.05	-5.31	Cu2 (OH) 2CO3
Manganite	-2.06	23.28	25.34	MnOOH
Massicot	-7.28	5.61	12.89	PbO
Matlockite	-8.48	-17.45	-8.97	PbClF
Melanothallite	-19.85	-13.59	6.26	CuCl2

Melanterite	-13.32	-15.53	-2.21	FeSO4:7H2O
Metacinnabar	-53.65	-98.75	-45.09	HgS
Mg(OH)2(active)	-6.05	12.75	18.79	Mg(OH)2
Mg(VO3)2	-18.66	-7.38	11.28	Mg(VO3)2
Mg2Sb3	-273.76	-199.08	74.68	Mg2Sb3
Mg2V2O7	-20.99	5.37	26.36	Mg2V2O7
MgCr2O4	-5.87	10.33	16.20	MgCr2O4
MgCrO4	-23.55	-18.17	5.38	MgCrO4
MgF2	-3.55	-11.68	-8.13	MgF2
MgMoO4	-8.51	-10.36	-1.85	MgMoO4
MgSeO3:6H2O	-6.48	-3.42	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.42	-14.62	-1.20	MgSeO4:6H2O
Minium	-31.57	41.96	73.52	Pb3O4
Mirabilite	-6.85	-7.97	-1.11	Na2SO4:10H2O
Mn(VO3)2	-14.30	-9.40	4.90	Mn(VO3)2
Mn2(SO4)3	-56.08	-61.79	-5.71	Mn2(SO4)3
Mn2Sb	-147.98	-86.90	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.47	1.03	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.70	-10.98	2.72	MnCl2:4H2O
MnS(grn)	-75.45	-75.28	0.17	MnS
MnS(pnk)	-78.62	-75.28	3.34	MnS
MnSb	-94.95	-97.86	-2.91	MnSb
MnSe	-39.43	-35.93	3.50	MnSe
MnSeO3	-6.58	-5.45	1.13	MnSeO3
MnSeO3:2H2O	-6.43	-5.45	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.59	-16.64	-2.05	MnSeO4:5H2O
MnSO4	-11.08	-8.49	2.58	MnSO4
Monteponite	-8.14	6.97	15.10	CdO
Montroydite	-9.10	-12.74	-3.64	HgO
MoO3	-15.11	-23.11	-8.00	MoO3
Morenosite	-9.05	-11.19	-2.14	NiSO4:7H2O
MoS2	-149.97	-220.23	-70.26	MoS2
Na-Jarosite	-11.99	-23.19	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.69	-50.58	-9.90	Na2Cr2O7
Na2CrO4	-22.60	-19.67	2.93	Na2CrO4
Na2Mo2O7	-18.37	-34.96	-16.60	Na2Mo2O7
Na2MoO4	-13.35	-11.86	1.49	Na2MoO4
Na2MoO4:2H2O	-13.08	-11.86	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.22	-4.92	10.30	Na2SeO3:5H2O
Na2SeO4	-17.40	-16.12	1.28	Na2SeO4
Na3Sb	-173.36	-78.91	94.45	Na3Sb
Na3VO4	-29.87	6.81	36.68	Na3VO4
Na4V2O7	-35.03	2.37	37.40	Na4V2O7
Nantokite	-5.88	-12.61	-6.73	CuCl
NaSb	-88.21	-65.05	23.17	NaSb
Natron	-8.70	-10.02	-1.31	Na2CO3:10H2O
NaVO3	-8.30	-4.44	3.86	NaVO3
Nesquehonite	-3.85	-8.52	-4.67	MgCO3:3H2O
Ni(OH)2	-4.77	8.02	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.77	-7.07	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.12	12.88	32.00	Ni4(OH)6SO4
NiCO3	-6.37	-13.24	-6.87	NiCO3
NiMoO4	-3.94	-15.08	-11.14	NiMoO4
NiS(alpha)	-72.38	-77.98	-5.60	NiS
NiS(beta)	-66.88	-77.98	-11.10	NiS
NiS(gamma)	-65.18	-77.98	-12.80	NiS
NiSe	-20.93	-38.63	-17.70	NiSe
NiSeO3:2H2O	-10.96	-8.15	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.82	-19.34	-1.52	NiSeO4:6H2O
Nsutite	-7.02	10.48	17.50	MnO2
O2(g)	-32.86	50.23	83.09	O2
Orpiment	-240.52	-301.58	-61.07	As2S3
Otavite	-2.30	-14.30	-12.00	CdCO3
Pb(BO2)2	-11.00	-4.48	6.52	Pb(BO2)2
Pb(OH)2	-2.54	5.61	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.68	-71.44	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.42	0.38	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.96	11.23	26.19	Pb2O(OH)2

Pb2O3	-24.70	36.34	61.04	Pb2O3
Pb2OCO3	-9.48	-10.04	-0.56	Pb2OCO3
Pb2V2O7	-7.00	-8.90	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.09	-14.29	5.80	Pb3(AsO4)2
Pb3(VO4)2	-9.42	-3.28	6.14	Pb3(VO4)2
Pb3O2CO3	-15.44	-4.42	11.02	Pb3O2CO3
Pb3O2SO4	-13.06	-2.37	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.86	3.24	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.63	3.24	21.88	Pb4O3SO4
PbCrO4	-12.70	-25.30	-12.60	PbCrO4
PbF2	-11.37	-18.81	-7.44	PbF2
Pbmetal	-23.74	-19.50	4.25	Pb
PbMoO4	-1.87	-17.49	-15.62	PbMoO4
PbO:0.3H2O	-7.37	5.61	12.98	PbO:0.33H2O
PbSeO4	-14.91	-21.75	-6.84	PbSeO4
Periclase	-8.84	12.75	21.58	MgO
Phosgenite	-11.93	-31.74	-19.81	PbCl2:PbCO3
Plattnerite	-18.87	30.73	49.60	PbO2
Portlandite	-10.03	12.77	22.80	Ca(OH)2
Pyrite	-124.71	-143.22	-18.51	FeS2
Pyrochroite	-4.47	10.72	15.19	Mn(OH)2
Pyrolusite	-5.55	35.83	41.38	MnO2
Quartz	0.42	-3.58	-4.00	SiO2
Realgar	-100.60	-120.34	-19.75	AsS
Retgersite	-9.15	-11.19	-2.04	NiSO4:6H2O
Rhodochrosite	0.04	-10.54	-10.58	MnCO3
Rutherfordine	-5.42	-19.92	-14.50	UO2CO3
Sb(OH)3	-13.34	-20.45	-7.11	Sb(OH)3
Sb2O4	-19.18	-15.78	3.40	Sb2O4
Sb2O5	-29.62	-39.29	-9.67	Sb2O5
Sb2Se3	-113.08	-180.83	-67.76	Sb2Se3
Sb4O6(cubic)	-63.52	-81.78	-18.26	Sb4O6
Sb4O6(orth)	-63.88	-81.78	-17.90	Sb4O6
SbCl3	-53.57	-53.00	0.57	SbCl3
SbF3	-46.86	-57.08	-10.23	SbF3
Sbmetal	-46.43	-58.12	-11.69	Sb
SbO2	-4.38	-32.20	-27.82	SbO2
Schoepite	-4.65	1.35	5.99	UO2(OH)2:H2O
Semetal(am)	-14.42	-21.53	-7.11	Se
Semetal(hex)	-13.83	-21.53	-7.71	Se
Senarmontite	-28.53	-40.89	-12.37	Sb2O3
SeO2	-16.29	-16.17	0.12	SeO2
SeO3	-48.41	-27.36	21.04	SeO3
Sepiolite	-1.01	14.75	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.03	14.75	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.34	-17.58	-10.24	FeCO3
SiO2(am-gel)	-0.87	-3.58	-2.71	SiO2
SiO2(am-ppt)	-0.84	-3.58	-2.74	SiO2
Smithsonite	-1.52	-11.52	-10.00	ZnCO3
Sphalerite	-64.81	-76.26	-11.45	ZnS
Spinel	-8.20	28.65	36.85	MgAl2O4
Stibnite	-248.45	-298.91	-50.46	Sb2S3
Sulfur	-58.75	-60.89	-2.14	S
Tenorite	0.46	8.11	7.64	CuO
Thenardite	-8.29	-7.97	0.32	Na2SO4
Thermonatrite	-10.65	-10.02	0.64	Na2CO3:H2O
Tyuyamunite	-8.74	-4.66	4.08	Ca(UO2)2(VO4)2
U3O8	-14.51	6.58	21.08	U3O8
U3Sb4	-579.17	-426.79	152.38	U3Sb4
U4O9	-30.07	-33.09	-3.02	U4O9
UF4	-33.86	-63.40	-29.54	UF4
UF4:2.5H2O	-30.68	-63.40	-32.72	UF4:2.5H2O
UO2(am)	-15.48	-14.55	0.93	UO2
UO2(NO3)2	-45.75	-33.61	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-38.46	-33.61	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-37.00	-33.61	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-35.65	-33.61	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.26	1.35	5.61	UO2(OH)2

UO2SeO4:4H2O	-23.77	-26.02	-2.25	UO2SeO4:4H2O
UO3	-6.35	1.35	7.70	UO3
Uraninite	-9.88	-14.55	-4.67	UO2
USb2	-219.80	-190.22	29.58	USb2
V(OH)3	-20.17	-12.58	7.59	V(OH)3
V2O5	-18.77	-20.13	-1.36	V2O5
V3O5	-44.10	-42.26	1.84	V3O5
V4O7	-55.16	-47.98	7.19	V4O7
V6O13	-49.74	-110.60	-60.86	V6O13
Valentinite	-32.41	-40.89	-8.48	Sb2O3
VC12	-65.71	-46.84	18.87	VC12
VC13	-68.56	-45.13	23.43	VC13
VF4	-69.50	-54.57	14.93	VF4
Vmetal	-94.27	-50.25	44.03	V
VO	-39.89	-25.13	14.76	VO
VO(OH)2	-10.87	-5.72	5.15	VO(OH)2
VO2Cl	-23.76	-20.91	2.84	VO2Cl
VOC1	-34.58	-23.43	11.15	VOC1
VOC12	-40.18	-27.42	12.76	VOC12
VOSO4	-28.54	-24.93	3.61	VOSO4
Witherite	-4.85	-13.42	-8.57	BaCO3
Wurtzite	-67.31	-76.26	-8.95	ZnS
Zincite	-1.59	9.75	11.33	ZnO
Zincosite	-13.40	-9.47	3.93	ZnSO4
Zn(BO2)2	-8.64	-0.35	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.52	-25.21	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.45	9.75	12.20	Zn(OH)2
Zn(OH)2(am)	-2.73	9.75	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.01	9.75	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.79	9.75	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.99	9.75	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.22	0.28	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.55	8.64	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.55	-1.90	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.10	-9.19	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.63	19.77	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.47	27.03	38.50	Zn5(OH)8Cl2
ZnCl2	-19.01	-11.96	7.05	ZnCl2
ZnCO3:1H2O	-1.26	-11.52	-10.26	ZnCO3:1H2O
ZnF2	-14.14	-14.68	-0.53	ZnF2
Znmetal	-41.16	-15.37	25.79	Zn
ZnMoO4	-3.23	-13.36	-10.13	ZnMoO4
ZnO(active)	-1.44	9.75	11.19	ZnO
ZnS(am)	-67.21	-76.26	-9.05	ZnS
ZnSb	-84.50	-73.48	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-16.10	-17.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.83	-9.47	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 78.

REACTION 404
H2O -1
0.126739 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 410
SAVE Solution 411
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 410. Solution after simulation 77.

Using reaction 404.

Reaction 404.

1.267e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.878e-09	2.879e-09
Al	2.519e-07	2.519e-07
As	4.318e-09	4.318e-09
B	9.718e-06	9.719e-06
Ba	6.792e-09	6.792e-09
C	1.655e-03	1.655e-03
Ca	6.754e-04	6.755e-04
Cd	1.281e-09	1.281e-09
Cl	1.929e-03	1.930e-03
Co	9.747e-09	9.748e-09
Cr	8.285e-10	8.286e-10
Cu	4.885e-07	4.886e-07
F	8.796e-05	8.797e-05
Fe	8.643e-10	8.644e-10
Hg	2.027e-10	2.028e-10
K	4.214e-04	4.215e-04
Mg	6.143e-04	6.144e-04
Mn	6.075e-06	6.076e-06
Mo	1.784e-07	1.784e-07
N	1.450e-06	1.451e-06
Na	3.781e-03	3.781e-03
Ni	1.517e-08	1.517e-08
Pb	8.848e-10	8.849e-10
S	1.560e-03	1.560e-03
Sb	2.703e-09	2.703e-09
Se	1.588e-08	1.588e-08
Si	2.681e-04	2.681e-04
U	3.263e-08	3.263e-08
V	8.632e-10	8.633e-10
Zn	8.739e-07	8.740e-07

-----Description of solution-----

	pH =	8.093	Charge balance
	pe =	4.464	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	8.966e-03	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	1.659e-03	
	Total CO2 (mol/kg) =	1.655e-03	
	Temperature (°C) =	25.00	

Electrical balance (eq) = 1.717e-07
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 3
Total H = 1.110296e+02
Total O = 5.552573e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.378e-06	1.247e-06	-5.861	-5.904	-0.044	(0)
H+	8.911e-09	8.076e-09	-8.050	-8.093	-0.043	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	2.878e-09					
AgCl	1.937e-09	1.937e-09	-8.713	-8.713	0.000	(0)
Ag+	5.989e-10	5.427e-10	-9.223	-9.265	-0.043	(0)
AgCl2-	3.297e-10	2.950e-10	-9.482	-9.530	-0.048	(0)
AgSO4-	1.136e-11	1.017e-11	-10.945	-10.993	-0.048	(0)
AgCl3-2	7.173e-13	4.597e-13	-12.144	-12.337	-0.193	(0)
AgNO2	1.346e-13	1.346e-13	-12.871	-12.871	0.000	(0)
AgF	1.038e-13	1.038e-13	-12.984	-12.984	0.000	(0)
AgOH	6.766e-14	6.766e-14	-13.170	-13.170	0.000	(0)
AgNH3+	9.963e-15	8.915e-15	-14.002	-14.050	-0.048	(0)
Ag2Se	8.293e-15	8.293e-15	-14.081	-14.081	0.000	(0)
AgH2BO3	5.562e-15	5.562e-15	-14.255	-14.255	0.000	(0)
AgCl4-3	4.465e-15	1.641e-15	-14.350	-14.785	-0.435	(0)
AgSeO3-	1.616e-15	1.446e-15	-14.791	-14.840	-0.048	(0)
Ag (OH) 2-	9.212e-18	8.243e-18	-17.036	-17.084	-0.048	(0)
Ag (NH3) 2+	6.515e-19	5.830e-19	-18.186	-18.234	-0.048	(0)
Ag (NO2) 2-	2.767e-19	2.476e-19	-18.558	-18.606	-0.048	(0)
AgNO3	1.787e-19	1.787e-19	-18.748	-18.748	0.000	(0)
Ag (SeO3) 2-3	1.461e-22	5.369e-23	-21.835	-22.270	-0.435	(0)
Ag2MoO4	1.341e-26	1.341e-26	-25.872	-25.872	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.363	-73.363	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.832	-82.605	-0.773	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.435	-146.566	-0.132	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.127	-147.176	-0.048	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.655	-147.914	-0.258	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.976	-148.225	-0.249	(0)
Al	2.519e-07					
Al (OH) 4-	2.504e-07	2.271e-07	-6.601	-6.644	-0.042	(0)
Al (OH) 3	1.447e-09	1.447e-09	-8.839	-8.839	0.000	(0)
Al (OH) 2+	6.399e-11	5.818e-11	-10.194	-10.235	-0.041	(0)
AlF2+	1.196e-12	1.087e-12	-11.922	-11.964	-0.041	(0)
AlF3	1.042e-12	1.042e-12	-11.982	-11.982	0.000	(0)
AlOH+2	8.598e-14	5.875e-14	-13.066	-13.231	-0.165	(0)
AlF+2	5.251e-14	3.588e-14	-13.280	-13.445	-0.165	(0)
AlF4-	4.384e-14	3.976e-14	-13.358	-13.401	-0.042	(0)
AlSO4+	3.787e-16	3.435e-16	-15.422	-15.464	-0.042	(0)
Al+3	1.143e-16	4.713e-17	-15.942	-16.327	-0.385	(0)
Al (SO4) 2-	3.810e-18	3.455e-18	-17.419	-17.461	-0.042	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.975	-51.409	-0.435	(0)
As (3)	1.772e-22					
H3AsO3	1.655e-22	1.655e-22	-21.781	-21.781	0.000	(0)
H2AsO3-	1.175e-23	1.051e-23	-22.930	-22.978	-0.048	(0)
HAsO3-2	1.852e-27	1.187e-27	-26.732	-26.926	-0.193	(0)
H4AsO3+	7.400e-31	6.621e-31	-30.131	-30.179	-0.048	(0)
AsO3-3	1.541e-32	5.666e-33	-31.812	-32.247	-0.435	(0)
As (5)	4.318e-09					
HAsO4-2	4.099e-09	2.627e-09	-8.387	-8.581	-0.193	(0)
H2AsO4-	2.162e-10	1.935e-10	-9.665	-9.713	-0.048	(0)
AsO4-3	2.798e-12	1.029e-12	-11.553	-11.988	-0.435	(0)
H3AsO4	2.710e-16	2.715e-16	-15.567	-15.566	0.001	(0)
B	9.718e-06					
H3BO3	8.972e-06	8.991e-06	-5.047	-5.046	0.001	(0)
H2BO3-	7.169e-07	6.466e-07	-6.145	-6.189	-0.045	(0)
CaH2BO3+	1.600e-08	1.443e-08	-7.796	-7.841	-0.045	(0)

	MgH2BO3+	9.054e-09	8.166e-09	-8.043	-8.088	-0.045	(0)
	NaH2BO3	3.490e-09	3.490e-09	-8.457	-8.457	0.000	(0)
	BF (OH) 3-	3.028e-10	2.731e-10	-9.519	-9.564	-0.045	(0)
	H5 (BO3) 2-	5.486e-12	4.948e-12	-11.261	-11.306	-0.045	(0)
	BaH2BO3+	1.002e-13	9.036e-14	-12.999	-13.044	-0.045	(0)
	BF2 (OH) 2-	1.990e-14	1.795e-14	-13.701	-13.746	-0.045	(0)
	AgH2BO3	5.562e-15	5.562e-15	-14.255	-14.255	0.000	(0)
	H8 (BO3) 3-	4.932e-15	4.449e-15	-14.307	-14.352	-0.045	(0)
	BF3OH-	4.762e-21	4.295e-21	-20.322	-20.367	-0.045	(0)
	BF4-	1.441e-26	1.299e-26	-25.841	-25.886	-0.045	(0)
Ba		6.792e-09					
	Ba+2	6.704e-09	4.522e-09	-8.174	-8.345	-0.171	(0)
	BaHCO3+	6.843e-11	6.231e-11	-10.165	-10.205	-0.041	(0)
	BaCO3	1.942e-11	1.942e-11	-10.712	-10.712	0.000	(0)
	BaH2BO3+	1.002e-13	9.036e-14	-12.999	-13.044	-0.045	(0)
	BaOH+	2.709e-14	2.461e-14	-13.567	-13.609	-0.042	(0)
	BaNH3+2	3.581e-17	2.295e-17	-16.446	-16.639	-0.193	(0)
	BaNO3+	1.050e-17	9.396e-18	-16.979	-17.027	-0.048	(0)
C (4)		1.655e-03					
	HCO3-	1.587e-03	1.443e-03	-2.799	-2.841	-0.041	(0)
	H2CO3	2.620e-05	2.620e-05	-4.582	-4.582	0.000	(0)
	CO3-2	1.242e-05	8.376e-06	-4.906	-5.077	-0.171	(0)
	CaHCO3+	1.144e-05	1.042e-05	-4.941	-4.982	-0.041	(0)
	MgHCO3+	5.937e-06	5.378e-06	-5.226	-5.269	-0.043	(0)
	CaCO3	5.149e-06	5.149e-06	-5.288	-5.288	0.000	(0)
	NaHCO3	2.763e-06	2.763e-06	-5.559	-5.559	0.000	(0)
	MgCO3	2.537e-06	2.537e-06	-5.596	-5.596	0.000	(0)
	NaCO3-	5.843e-07	5.312e-07	-6.233	-6.275	-0.041	(0)
	CuCO3	4.134e-07	4.134e-07	-6.384	-6.384	0.000	(0)
	ZnCO3	1.754e-07	1.754e-07	-6.756	-6.756	0.000	(0)
	MnHCO3+	1.089e-07	9.891e-08	-6.963	-7.005	-0.042	(0)
	UO2 (CO3) 3-4	2.002e-08	3.379e-09	-7.699	-8.471	-0.773	(0)
	ZnHCO3+	1.856e-08	1.660e-08	-7.732	-7.780	-0.048	(0)
	Cu (CO3) 2-2	1.454e-08	9.320e-09	-7.837	-8.031	-0.193	(0)
	UO2 (CO3) 2-2	1.256e-08	8.050e-09	-7.901	-8.094	-0.193	(0)
	NiCO3	2.148e-09	2.148e-09	-8.668	-8.668	0.000	(0)
	NiHCO3+	1.366e-09	1.223e-09	-8.864	-8.913	-0.048	(0)
	CuHCO3+	8.528e-10	7.630e-10	-9.069	-9.117	-0.048	(0)
	PbCO3	6.757e-10	6.757e-10	-9.170	-9.170	0.000	(0)
	CoCO3	6.718e-10	6.718e-10	-9.173	-9.173	0.000	(0)
	CoHCO3+	5.951e-10	5.325e-10	-9.225	-9.274	-0.048	(0)
	CdCO3	1.158e-10	1.158e-10	-9.936	-9.936	0.000	(0)
	BaHCO3+	6.843e-11	6.231e-11	-10.165	-10.205	-0.041	(0)
	UO2CO3	4.817e-11	4.817e-11	-10.317	-10.317	0.000	(0)
	PbHCO3+	3.215e-11	2.877e-11	-10.493	-10.541	-0.048	(0)
	Pb (CO3) 2-2	2.546e-11	1.632e-11	-10.594	-10.787	-0.193	(0)
	BaCO3	1.942e-11	1.942e-11	-10.712	-10.712	0.000	(0)
	CdHCO3+	2.226e-12	1.992e-12	-11.653	-11.701	-0.048	(0)
	Cd (CO3) 2-2	1.121e-12	7.187e-13	-11.950	-12.143	-0.193	(0)
	FeHCO3+	6.258e-15	5.699e-15	-14.204	-14.244	-0.041	(0)
	HgCO3	1.861e-16	1.861e-16	-15.730	-15.730	0.000	(0)
	Hg (CO3) 2-2	7.689e-18	4.929e-18	-17.114	-17.307	-0.193	(0)
	HgHCO3+	3.127e-20	2.798e-20	-19.505	-19.553	-0.048	(0)
Ca		6.754e-04					
	Ca+2	5.750e-04	3.879e-04	-3.240	-3.411	-0.171	(0)
	CaSO4	8.343e-05	8.343e-05	-4.079	-4.079	0.000	(0)
	CaHCO3+	1.144e-05	1.042e-05	-4.941	-4.982	-0.041	(0)
	CaCO3	5.149e-06	5.149e-06	-5.288	-5.288	0.000	(0)
	CaF+	3.549e-07	3.223e-07	-6.450	-6.492	-0.042	(0)
	CaH2BO3+	1.600e-08	1.443e-08	-7.796	-7.841	-0.045	(0)
	CaOH+	1.060e-08	9.648e-09	-7.975	-8.016	-0.041	(0)
	CaNH3+2	6.129e-12	3.929e-12	-11.213	-11.406	-0.193	(0)
	CaNO3+	5.683e-13	5.085e-13	-12.245	-12.294	-0.048	(0)
	Ca (NH3) 2+2	1.963e-20	1.258e-20	-19.707	-19.900	-0.193	(0)
Cd		1.281e-09					
	Cd+2	8.988e-10	6.063e-10	-9.046	-9.217	-0.171	(0)
	CdSO4	1.335e-10	1.335e-10	-9.875	-9.875	0.000	(0)
	CdCO3	1.158e-10	1.158e-10	-9.936	-9.936	0.000	(0)

CdCl+	1.131e-10	1.012e-10	-9.946	-9.995	-0.048	(0)
CdOH+	6.710e-12	6.004e-12	-11.173	-11.222	-0.048	(0)
CdOHC1	5.177e-12	5.177e-12	-11.286	-11.286	0.000	(0)
Cd(SO4) 2-2	2.637e-12	1.690e-12	-11.579	-11.772	-0.193	(0)
CdHCO3+	2.226e-12	1.992e-12	-11.653	-11.701	-0.048	(0)
Cd(CO3) 2-2	1.121e-12	7.187e-13	-11.950	-12.143	-0.193	(0)
CdF+	8.176e-13	7.316e-13	-12.087	-12.136	-0.048	(0)
CdCl2	7.379e-13	7.379e-13	-12.132	-12.132	0.000	(0)
Cd(OH) 2	4.723e-14	4.723e-14	-13.326	-13.326	0.000	(0)
CdCl3-	9.098e-16	8.140e-16	-15.041	-15.089	-0.048	(0)
CdF2	1.111e-16	1.111e-16	-15.954	-15.954	0.000	(0)
Cd(OH) 3-	4.020e-18	3.597e-18	-17.396	-17.444	-0.048	(0)
CdNO3+	8.884e-19	7.949e-19	-18.051	-18.100	-0.048	(0)
CdSeO4	7.506e-19	7.506e-19	-18.125	-18.125	0.000	(0)
Cd2OH+3	4.964e-20	1.825e-20	-19.304	-19.739	-0.435	(0)
Cd(SeO3) 2-2	1.340e-20	8.591e-21	-19.873	-20.066	-0.193	(0)
Cd(OH) 4-2	1.145e-24	7.340e-25	-23.941	-24.134	-0.193	(0)
Cd(NO3) 2	1.652e-28	1.652e-28	-27.782	-27.782	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.073	-79.122	-0.048	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-149.830	-149.830	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.794	-225.842	-0.048	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.366	-301.559	-0.193	(0)
C1	1.929e-03					
Cl-	1.929e-03	1.748e-03	-2.715	-2.757	-0.043	(0)
MnCl+	8.327e-09	7.563e-09	-8.080	-8.121	-0.042	(0)
ZnOHC1	2.608e-09	2.608e-09	-8.584	-8.584	0.000	(0)
AgCl	1.937e-09	1.937e-09	-8.713	-8.713	0.000	(0)
ZnCl+	1.764e-09	1.598e-09	-8.753	-8.796	-0.043	(0)
AgCl2-	3.297e-10	2.950e-10	-9.482	-9.530	-0.048	(0)
CuCl	3.106e-10	3.106e-10	-9.508	-9.508	0.000	(0)
CuCl2-	1.253e-10	1.135e-10	-9.902	-9.945	-0.043	(0)
CdCl+	1.131e-10	1.012e-10	-9.946	-9.995	-0.048	(0)
NiCl+	3.436e-11	3.075e-11	-10.464	-10.512	-0.048	(0)
CoCl+	3.207e-11	2.870e-11	-10.494	-10.542	-0.048	(0)
CuCl+	2.564e-11	2.323e-11	-10.591	-10.634	-0.043	(0)
MnCl2	1.868e-11	1.868e-11	-10.729	-10.729	0.000	(0)
CdOHC1	5.177e-12	5.177e-12	-11.286	-11.286	0.000	(0)
ZnCl2	4.429e-12	4.429e-12	-11.354	-11.354	0.000	(0)
PbCl+	1.861e-12	1.665e-12	-11.730	-11.779	-0.048	(0)
CdCl2	7.379e-13	7.379e-13	-12.132	-12.132	0.000	(0)
AgCl3-2	7.173e-13	4.597e-13	-12.144	-12.337	-0.193	(0)
HgClOH	7.146e-14	7.146e-14	-13.146	-13.146	0.000	(0)
CuCl3-2	6.234e-14	4.242e-14	-13.205	-13.372	-0.167	(0)
CuCl2	1.408e-14	1.408e-14	-13.851	-13.851	0.000	(0)
PbCl2	1.300e-14	1.300e-14	-13.886	-13.886	0.000	(0)
MnCl3-	9.903e-15	8.995e-15	-14.004	-14.046	-0.042	(0)
ZnCl3-	6.790e-15	6.151e-15	-14.168	-14.211	-0.043	(0)
HgCl2	5.675e-15	5.675e-15	-14.246	-14.246	0.000	(0)
AgCl4-3	4.465e-15	1.641e-15	-14.350	-14.785	-0.435	(0)
CdCl3-	9.098e-16	8.140e-16	-15.041	-15.089	-0.048	(0)
NiCl2	2.707e-16	2.707e-16	-15.568	-15.568	0.000	(0)
HgCl3-	1.109e-16	9.922e-17	-15.955	-16.003	-0.048	(0)
PbCl3-	1.011e-17	9.050e-18	-16.995	-17.043	-0.048	(0)
ZnCl4-2	7.902e-18	5.378e-18	-17.102	-17.269	-0.167	(0)
UO2Cl+	4.578e-18	4.096e-18	-17.339	-17.388	-0.048	(0)
HgCl4-2	1.078e-18	6.907e-19	-17.968	-18.161	-0.193	(0)
HgCl+	7.238e-19	6.476e-19	-18.140	-18.189	-0.048	(0)
CrCl+2	4.274e-19	2.739e-19	-18.369	-18.562	-0.193	(0)
CuCl3-	2.537e-19	2.298e-19	-18.596	-18.639	-0.043	(0)
CrOHC12	1.135e-20	1.135e-20	-19.945	-19.945	0.000	(0)
PbCl4-2	1.128e-20	7.233e-21	-19.948	-20.141	-0.193	(0)
FeCl+2	6.579e-23	4.477e-23	-22.182	-22.349	-0.167	(0)
CrCl2+	5.079e-23	4.544e-23	-22.294	-22.343	-0.048	(0)
CuCl4-2	2.959e-24	2.013e-24	-23.529	-23.696	-0.167	(0)
VOCl+	6.891e-25	6.166e-25	-24.162	-24.210	-0.048	(0)
FeCl2+	3.849e-25	3.496e-25	-24.415	-24.456	-0.042	(0)
CrO3Cl-	4.849e-27	4.338e-27	-26.314	-26.363	-0.048	(0)
FeCl3	6.113e-29	6.113e-29	-28.214	-28.214	0.000	(0)

CoCl+2	3.050e-37	1.955e-37	-36.516	-36.709	-0.193	(0)
UCl+3	0.000e+00	0.000e+00	-47.546	-47.980	-0.435	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.035	-51.228	-0.193	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.946	-53.139	-0.193	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.845	-66.038	-0.193	(0)
Co (2)	9.747e-09					
Co+2	7.403e-09	4.745e-09	-8.131	-8.324	-0.193	(0)
CoSO4	8.888e-10	8.888e-10	-9.051	-9.051	0.000	(0)
CoCO3	6.718e-10	6.718e-10	-9.173	-9.173	0.000	(0)
CoHCO3+	5.951e-10	5.325e-10	-9.225	-9.274	-0.048	(0)
CoOH+	1.319e-10	1.180e-10	-9.880	-9.928	-0.048	(0)
CoCl+	3.207e-11	2.870e-11	-10.494	-10.542	-0.048	(0)
CoF+	1.277e-11	1.142e-11	-10.894	-10.942	-0.048	(0)
Co (OH) 2	1.169e-11	1.169e-11	-10.932	-10.932	0.000	(0)
CoNO2+	4.437e-14	3.970e-14	-13.353	-13.401	-0.048	(0)
Co (NH3) +2	7.160e-15	4.589e-15	-14.145	-14.338	-0.193	(0)
Co (OH) 3-	3.249e-16	2.907e-16	-15.488	-15.537	-0.048	(0)
CoOH-	8.153e-17	7.295e-17	-16.089	-16.137	-0.048	(0)
CoSeO4	1.581e-17	1.581e-17	-16.801	-16.801	0.000	(0)
CoNO3+	3.484e-18	3.117e-18	-17.458	-17.506	-0.048	(0)
Co2OH+3	7.635e-20	2.806e-20	-19.117	-19.552	-0.435	(0)
Co (NH3) 2+2	2.457e-21	1.575e-21	-20.610	-20.803	-0.193	(0)
Co (OH) 4-2	8.961e-23	5.744e-23	-22.048	-22.241	-0.193	(0)
Co (NO3) 2	2.630e-27	2.630e-27	-26.580	-26.580	0.000	(0)
Co (NH3) 3+2	2.489e-28	1.595e-28	-27.604	-27.797	-0.193	(0)
Co4 (OH) 4+4	2.294e-31	3.871e-32	-30.639	-31.412	-0.773	(0)
Co (NH3) 4+2	1.051e-35	6.735e-36	-34.979	-35.172	-0.193	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.853	-43.046	-0.193	(0)
Co (3)	5.431e-30					
CoOH+2	5.431e-30	3.481e-30	-29.265	-29.458	-0.193	(0)
Co+3	1.332e-36	5.495e-37	-35.875	-36.260	-0.385	(0)
CoCl+2	3.050e-37	1.955e-37	-36.516	-36.709	-0.193	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.035	-51.228	-0.193	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.335	-61.383	-0.048	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.792	-64.985	-0.193	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.845	-66.038	-0.193	(0)
Cr (2)	1.551e-27					
Cr+2	1.551e-27	9.941e-28	-26.809	-27.003	-0.193	(0)
Cr (3)	8.285e-10					
Cr (OH) 2+	5.597e-10	5.008e-10	-9.252	-9.300	-0.048	(0)
Cr (OH) 3	2.345e-10	2.345e-10	-9.630	-9.630	0.000	(0)
CrO2-	1.542e-11	1.379e-11	-10.812	-10.860	-0.048	(0)
Cr (OH) 4-	1.301e-11	1.164e-11	-10.886	-10.934	-0.048	(0)
Cr (OH) +2	5.151e-12	3.302e-12	-11.288	-11.481	-0.193	(0)
CrOHSO4	7.356e-13	7.356e-13	-12.133	-12.133	0.000	(0)
CrF+2	2.279e-15	1.461e-15	-14.642	-14.835	-0.193	(0)
Cr+3	3.293e-16	1.211e-16	-15.482	-15.917	-0.435	(0)
CrSO4+	2.966e-16	2.654e-16	-15.528	-15.576	-0.048	(0)
CrCl+2	4.274e-19	2.739e-19	-18.369	-18.562	-0.193	(0)
CrOHC12	1.135e-20	1.135e-20	-19.945	-19.945	0.000	(0)
Cr2 (OH) 2SO4+2	3.425e-22	2.195e-22	-21.465	-21.659	-0.193	(0)
CrCl2+	5.079e-23	4.544e-23	-22.294	-22.343	-0.048	(0)
Cr2 (OH) 2 (SO4) 2	1.224e-23	1.224e-23	-22.912	-22.912	0.000	(0)
CrNO3+2	3.422e-27	2.194e-27	-26.466	-26.659	-0.193	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.728	-41.921	-0.193	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.049	-51.484	-0.435	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.946	-53.139	-0.193	(0)
Cr (6)	2.864e-15					
CrO4-2	2.771e-15	1.869e-15	-14.557	-14.728	-0.171	(0)
HCrO4-	5.459e-17	4.885e-17	-16.263	-16.311	-0.048	(0)
NaCrO4-	3.536e-17	3.164e-17	-16.452	-16.500	-0.048	(0)
KCrO4-	2.945e-18	2.635e-18	-17.531	-17.579	-0.048	(0)
H2CrO4	3.197e-25	3.197e-25	-24.495	-24.495	0.000	(0)
CrO3SO4-2	1.760e-25	1.128e-25	-24.754	-24.948	-0.193	(0)
CrO3Cl-	4.849e-27	4.338e-27	-26.314	-26.363	-0.048	(0)
Cr2O7-2	1.291e-31	8.274e-32	-30.889	-31.082	-0.193	(0)
Cu (1)	5.937e-10					
CuCl	3.106e-10	3.106e-10	-9.508	-9.508	0.000	(0)

Cu+	1.577e-10	1.411e-10	-9.802	-9.850	-0.048	(0)
CuCl2-	1.253e-10	1.135e-10	-9.902	-9.945	-0.043	(0)
CuCl3-2	6.234e-14	4.242e-14	-13.205	-13.372	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.846	-146.099	-0.253	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.585	-146.829	-0.245	(0)
Cu (2)	4.879e-07					
CuCO3	4.134e-07	4.134e-07	-6.384	-6.384	0.000	(0)
CuOH+	3.648e-08	3.304e-08	-7.438	-7.481	-0.043	(0)
Cu (CO3) 2-2	1.454e-08	9.320e-09	-7.837	-8.031	-0.193	(0)
Cu+2	1.243e-08	8.382e-09	-7.906	-8.077	-0.171	(0)
Cu (OH) 2	8.219e-09	8.219e-09	-8.085	-8.085	0.000	(0)
CuSO4	1.803e-09	1.803e-09	-8.744	-8.744	0.000	(0)
CuHCO3+	8.528e-10	7.630e-10	-9.069	-9.117	-0.048	(0)
CuF+	4.500e-11	4.026e-11	-10.347	-10.395	-0.048	(0)
Cu2 (OH) 2+2	4.279e-11	2.743e-11	-10.369	-10.562	-0.193	(0)
CuCl+	2.564e-11	2.323e-11	-10.591	-10.634	-0.043	(0)
Cu (OH) 3-	2.349e-11	2.102e-11	-10.629	-10.677	-0.048	(0)
CuNO2+	1.165e-12	1.042e-12	-11.934	-11.982	-0.048	(0)
CuNH3+2	1.077e-12	6.901e-13	-11.968	-12.161	-0.193	(0)
CuCl2	1.408e-14	1.408e-14	-13.851	-13.851	0.000	(0)
Cu (OH) 4-2	3.217e-16	2.062e-16	-15.492	-15.686	-0.193	(0)
Cu (NO2) 2	1.266e-17	1.266e-17	-16.898	-16.898	0.000	(0)
CuNO3+	1.228e-17	1.099e-17	-16.911	-16.959	-0.048	(0)
CuCl3-	2.537e-19	2.298e-19	-18.596	-18.639	-0.043	(0)
CuCl4-2	2.959e-24	2.013e-24	-23.529	-23.696	-0.167	(0)
Cu (NO3) 2	5.735e-28	5.735e-28	-27.241	-27.241	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.866	-215.915	-0.048	(0)
F	8.796e-05					
F-	8.400e-05	7.613e-05	-4.076	-4.118	-0.043	(0)
MgF+	3.430e-06	3.111e-06	-5.465	-5.507	-0.042	(0)
CaF+	3.549e-07	3.223e-07	-6.450	-6.492	-0.042	(0)
NaF	1.636e-07	1.636e-07	-6.786	-6.786	0.000	(0)
MnF+	1.147e-08	1.041e-08	-7.941	-7.982	-0.042	(0)
HF	9.093e-10	9.093e-10	-9.041	-9.041	0.000	(0)
ZnF+	6.178e-10	5.528e-10	-9.209	-9.257	-0.048	(0)
BF (OH) 3-	3.028e-10	2.731e-10	-9.519	-9.564	-0.045	(0)
CuF+	4.500e-11	4.026e-11	-10.347	-10.395	-0.048	(0)
NiF+	1.469e-11	1.314e-11	-10.833	-10.881	-0.048	(0)
CoF+	1.277e-11	1.142e-11	-10.894	-10.942	-0.048	(0)
AlF2+	1.196e-12	1.087e-12	-11.922	-11.964	-0.041	(0)
AlF3	1.042e-12	1.042e-12	-11.982	-11.982	0.000	(0)
CdF+	8.176e-13	7.316e-13	-12.087	-12.136	-0.048	(0)
HF2-	2.910e-13	2.632e-13	-12.536	-12.580	-0.044	(0)
PbF+	1.609e-13	1.440e-13	-12.793	-12.842	-0.048	(0)
AgF	1.038e-13	1.038e-13	-12.984	-12.984	0.000	(0)
AlF+2	5.251e-14	3.588e-14	-13.280	-13.445	-0.165	(0)
AlF4-	4.384e-14	3.976e-14	-13.358	-13.401	-0.042	(0)
BF2 (OH) 2-	1.990e-14	1.795e-14	-13.701	-13.746	-0.045	(0)
UO2F+	1.697e-14	1.518e-14	-13.770	-13.819	-0.048	(0)
UO2F2	3.333e-15	3.333e-15	-14.477	-14.477	0.000	(0)
CrF+2	2.279e-15	1.461e-15	-14.642	-14.835	-0.193	(0)
PbF2	2.157e-16	2.157e-16	-15.666	-15.666	0.000	(0)
CdF2	1.111e-16	1.111e-16	-15.954	-15.954	0.000	(0)
UO2F3-	7.123e-17	6.373e-17	-16.147	-16.196	-0.048	(0)
H2F2	2.215e-18	2.215e-18	-17.655	-17.655	0.000	(0)
FeF2+	1.587e-19	1.442e-19	-18.799	-18.841	-0.042	(0)
FeF+2	1.040e-19	7.077e-20	-18.983	-19.150	-0.167	(0)
VO2F	9.359e-20	9.359e-20	-19.029	-19.029	0.000	(0)
UO2F4-2	6.013e-20	3.854e-20	-19.221	-19.414	-0.193	(0)
PbF3-	3.481e-20	3.114e-20	-19.458	-19.507	-0.048	(0)
FeF3	1.549e-20	1.549e-20	-19.810	-19.810	0.000	(0)
BF3OH-	4.762e-21	4.295e-21	-20.322	-20.367	-0.045	(0)
VO2F2-	2.891e-21	2.587e-21	-20.539	-20.587	-0.048	(0)
VOF+	6.415e-23	5.740e-23	-22.193	-22.241	-0.048	(0)
VO2F3-2	3.833e-24	2.456e-24	-23.417	-23.610	-0.193	(0)
PbF4-2	1.770e-24	1.135e-24	-23.752	-23.945	-0.193	(0)
VOF2	1.639e-24	1.639e-24	-23.786	-23.786	0.000	(0)
HgF+	5.855e-26	5.239e-26	-25.232	-25.281	-0.048	(0)

BF4-	1.441e-26	1.299e-26	-25.841	-25.886	-0.045	(0)
VOF3-	4.947e-27	4.426e-27	-26.306	-26.354	-0.048	(0)
Sb (OH) 2F	3.449e-27	3.449e-27	-26.462	-26.462	0.000	(0)
SbOF	3.392e-27	3.392e-27	-26.470	-26.470	0.000	(0)
VO2F4-3	2.503e-28	9.201e-29	-27.602	-28.036	-0.435	(0)
VOF4-2	2.122e-30	1.360e-30	-29.673	-29.866	-0.193	(0)
SiF6-2	4.854e-31	3.303e-31	-30.314	-30.481	-0.167	(0)
UF3+	2.345e-38	2.098e-38	-37.630	-37.678	-0.048	(0)
UF2+2	2.713e-39	1.739e-39	-38.567	-38.760	-0.193	(0)
UF4	1.751e-40	1.751e-40	-39.757	-39.757	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.307	-41.741	-0.435	(0)
UF5-	0.000e+00	0.000e+00	-42.229	-42.277	-0.048	(0)
UF6-2	0.000e+00	0.000e+00	-43.722	-43.916	-0.193	(0)
Fe (2)	5.852e-13					
Fe+2	4.895e-13	3.137e-13	-12.310	-12.503	-0.193	(0)
FeSO4	7.231e-14	7.231e-14	-13.141	-13.141	0.000	(0)
FeOH+	1.714e-14	1.557e-14	-13.766	-13.808	-0.042	(0)
FeHCO3+	6.258e-15	5.699e-15	-14.204	-14.244	-0.041	(0)
Fe (OH) 2	1.542e-17	1.542e-17	-16.812	-16.812	0.000	(0)
Fe (OH) 3-	6.693e-18	6.079e-18	-17.174	-17.216	-0.042	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.378	-159.378	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.205	-235.254	-0.048	(0)
Fe (3)	8.637e-10					
Fe (OH) 3	4.431e-10	4.431e-10	-9.353	-9.353	0.000	(0)
Fe (OH) 2+	3.640e-10	3.310e-10	-9.439	-9.480	-0.041	(0)
Fe (OH) 4-	5.658e-11	5.144e-11	-10.247	-10.289	-0.041	(0)
FeOH+2	1.003e-15	6.824e-16	-14.999	-15.166	-0.167	(0)
FeF2+	1.587e-19	1.442e-19	-18.799	-18.841	-0.042	(0)
FeF+2	1.040e-19	7.077e-20	-18.983	-19.150	-0.167	(0)
FeF3	1.549e-20	1.549e-20	-19.810	-19.810	0.000	(0)
FeSO4+	9.834e-21	8.931e-21	-20.007	-20.049	-0.042	(0)
Fe+3	2.056e-21	8.478e-22	-20.687	-21.072	-0.385	(0)
Fe (SO4) 2-	2.004e-22	1.793e-22	-21.698	-21.746	-0.048	(0)
FeCl+2	6.579e-23	4.477e-23	-22.182	-22.349	-0.167	(0)
FeCl2+	3.849e-25	3.496e-25	-24.415	-24.456	-0.042	(0)
FeHSeO3+2	2.940e-26	1.884e-26	-25.532	-25.725	-0.193	(0)
Fe2 (OH) 2+4	9.137e-29	1.542e-29	-28.039	-28.812	-0.773	(0)
FeCl3	6.113e-29	6.113e-29	-28.214	-28.214	0.000	(0)
FeNO3+2	5.484e-30	3.515e-30	-29.261	-29.454	-0.193	(0)
Fe3 (OH) 4+5	1.189e-36	7.377e-38	-35.925	-37.132	-1.207	(0)
H (0)	1.089e-28					
H2	5.445e-29	5.456e-29	-28.264	-28.263	0.001	(0)
Hg (0)	2.025e-10					
Hg	2.025e-10	2.025e-10	-9.694	-9.694	0.000	(0)
Hg (1)	7.963e-24					
Hg2+2	3.982e-24	2.552e-24	-23.400	-23.593	-0.193	(0)
Hg (2)	2.591e-13					
Hg (OH) 2	1.817e-13	1.820e-13	-12.741	-12.740	0.001	(0)
HgClOH	7.146e-14	7.146e-14	-13.146	-13.146	0.000	(0)
HgCl2	5.675e-15	5.675e-15	-14.246	-14.246	0.000	(0)
HgCO3	1.861e-16	1.861e-16	-15.730	-15.730	0.000	(0)
HgCl3-	1.109e-16	9.922e-17	-15.955	-16.003	-0.048	(0)
Hg (CO3) 2-2	7.689e-18	4.929e-18	-17.114	-17.307	-0.193	(0)
HgCl4-2	1.078e-18	6.907e-19	-17.968	-18.161	-0.193	(0)
HgOH+	1.030e-18	9.213e-19	-17.987	-18.036	-0.048	(0)
HgCl+	7.238e-19	6.476e-19	-18.140	-18.189	-0.048	(0)
Hg (OH) 3-	3.193e-20	2.857e-20	-19.496	-19.544	-0.048	(0)
HgHCO3+	3.127e-20	2.798e-20	-19.505	-19.553	-0.048	(0)
Hg (NH3) 2+2	1.183e-21	7.581e-22	-20.927	-21.120	-0.193	(0)
HgNH3+2	1.470e-22	9.423e-23	-21.833	-22.026	-0.193	(0)
Hg+2	2.896e-23	1.856e-23	-22.538	-22.731	-0.193	(0)
HgSO4	4.563e-24	4.563e-24	-23.341	-23.341	0.000	(0)
HgF+	5.855e-26	5.239e-26	-25.232	-25.281	-0.048	(0)
Hg (NH3) 3+2	3.788e-29	2.428e-29	-28.422	-28.615	-0.193	(0)
HgNO3+	3.176e-33	2.842e-33	-32.498	-32.546	-0.048	(0)
Hg (NH3) 4+2	2.421e-36	1.552e-36	-35.616	-35.809	-0.193	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.310	-42.310	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.487	-138.535	-0.048	(0)

	HgS2-2	0.000e+00	0.000e+00	-138.957	-139.150	-0.193	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.234	-140.234	0.000	(0)
K		4.214e-04					
	K+	4.187e-04	3.794e-04	-3.378	-3.421	-0.043	(0)
	KSO4-	2.774e-06	2.522e-06	-5.557	-5.598	-0.041	(0)
	KCrO4-	2.945e-18	2.635e-18	-17.531	-17.579	-0.048	(0)
Mg		6.143e-04					
	Mg+2	5.400e-04	3.642e-04	-3.268	-3.439	-0.171	(0)
	MgSO4	6.223e-05	6.223e-05	-4.206	-4.206	0.000	(0)
	MgHCO3+	5.937e-06	5.378e-06	-5.226	-5.269	-0.043	(0)
	MgF+	3.430e-06	3.111e-06	-5.465	-5.507	-0.042	(0)
	MgCO3	2.537e-06	2.537e-06	-5.596	-5.596	0.000	(0)
	MgOH+	1.983e-07	1.808e-07	-6.703	-6.743	-0.040	(0)
	MgH2BO3+	9.054e-09	8.166e-09	-8.043	-8.088	-0.045	(0)
Mn (2)		6.075e-06					
	Mn+2	5.361e-06	3.436e-06	-5.271	-5.464	-0.193	(0)
	MnSO4	5.737e-07	5.737e-07	-6.241	-6.241	0.000	(0)
	MnHCO3+	1.089e-07	9.891e-08	-6.963	-7.005	-0.042	(0)
	MnOH+	1.185e-08	1.076e-08	-7.926	-7.968	-0.042	(0)
	MnF+	1.147e-08	1.041e-08	-7.941	-7.982	-0.042	(0)
	MnCl+	8.327e-09	7.563e-09	-8.080	-8.121	-0.042	(0)
	MnCl2	1.868e-11	1.868e-11	-10.729	-10.729	0.000	(0)
	MnCl3-	9.903e-15	8.995e-15	-14.004	-14.046	-0.042	(0)
	MnSeO4	6.148e-15	6.148e-15	-14.211	-14.211	0.000	(0)
	MnNO3+	2.523e-15	2.258e-15	-14.598	-14.646	-0.048	(0)
	Mn (OH) 3-	1.138e-16	1.033e-16	-15.944	-15.986	-0.042	(0)
	Mn (OH) 4-2	6.112e-22	4.159e-22	-21.214	-21.381	-0.167	(0)
	Mn (NO3) 2	2.351e-24	2.351e-24	-23.629	-23.629	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.310	-41.310	0.000	(0)
Mn (3)		1.083e-26					
	Mn+3	1.083e-26	4.465e-27	-25.966	-26.350	-0.385	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.122	-41.289	-0.167	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-46.153	-46.197	-0.044	(0)
Mo		1.784e-07					
	MoO4-2	1.783e-07	1.203e-07	-6.749	-6.920	-0.171	(0)
	HMoO4-	2.160e-11	1.933e-11	-10.665	-10.714	-0.048	(0)
	H2MoO4	1.143e-15	1.143e-15	-14.942	-14.942	0.000	(0)
	Ag2MoO4	1.341e-26	1.341e-26	-25.872	-25.872	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-50.975	-51.409	-0.435	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-58.452	-60.190	-1.739	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-60.689	-61.896	-1.207	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-64.434	-65.207	-0.773	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-69.619	-70.054	-0.435	(0)
N (-3)		1.356e-07					
	NH4+	1.263e-07	1.139e-07	-6.898	-6.943	-0.045	(0)
	NH3	8.045e-09	8.045e-09	-8.094	-8.094	0.000	(0)
	NH4SO4-	1.262e-09	1.146e-09	-8.899	-8.941	-0.042	(0)
	CaNH3+2	6.129e-12	3.929e-12	-11.213	-11.406	-0.193	(0)
	CuNH3+2	1.077e-12	6.901e-13	-11.968	-12.161	-0.193	(0)
	NiNH3+2	4.633e-14	2.970e-14	-13.334	-13.527	-0.193	(0)
	AgNH3+	9.963e-15	8.915e-15	-14.002	-14.050	-0.048	(0)
	Co (NH3) +2	7.160e-15	4.589e-15	-14.145	-14.338	-0.193	(0)
	BaNH3+2	3.581e-17	2.295e-17	-16.446	-16.639	-0.193	(0)
	Ag (NH3) 2+	6.515e-19	5.830e-19	-18.186	-18.234	-0.048	(0)
	Ni (NH3) 2+2	5.388e-20	3.453e-20	-19.269	-19.462	-0.193	(0)
	Ca (NH3) 2+2	1.963e-20	1.258e-20	-19.707	-19.900	-0.193	(0)
	Co (NH3) 2+2	2.457e-21	1.575e-21	-20.610	-20.803	-0.193	(0)
	Hg (NH3) 2+2	1.183e-21	7.581e-22	-20.927	-21.120	-0.193	(0)
	HgNH3+2	1.470e-22	9.423e-23	-21.833	-22.026	-0.193	(0)
	Co (NH3) 3+2	2.489e-28	1.595e-28	-27.604	-27.797	-0.193	(0)
	Hg (NH3) 3+2	3.788e-29	2.428e-29	-28.422	-28.615	-0.193	(0)
	Co (NH3) 4+2	1.051e-35	6.735e-36	-34.979	-35.172	-0.193	(0)
	Hg (NH3) 4+2	2.421e-36	1.552e-36	-35.616	-35.809	-0.193	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.728	-41.921	-0.193	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-42.853	-43.046	-0.193	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.035	-51.228	-0.193	(0)

Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.049	-51.484	-0.435	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.946	-53.139	-0.193	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.335	-61.383	-0.048	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.792	-64.985	-0.193	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.845	-66.038	-0.193	(0)
N (3)	1.314e-06					
NO2-	1.314e-06	1.187e-06	-5.881	-5.925	-0.044	(0)
CuNO2+	1.165e-12	1.042e-12	-11.934	-11.982	-0.048	(0)
AgNO2	1.346e-13	1.346e-13	-12.871	-12.871	0.000	(0)
CoNO2+	4.437e-14	3.970e-14	-13.353	-13.401	-0.048	(0)
Cu (NO2) 2	1.266e-17	1.266e-17	-16.898	-16.898	0.000	(0)
Ag (NO2) 2-	2.767e-19	2.476e-19	-18.558	-18.606	-0.048	(0)
N (5)	4.580e-10					
NO3-	4.574e-10	4.146e-10	-9.340	-9.382	-0.043	(0)
CaNO3+	5.683e-13	5.085e-13	-12.245	-12.294	-0.048	(0)
MnNO3+	2.523e-15	2.258e-15	-14.598	-14.646	-0.048	(0)
ZnNO3+	4.235e-16	3.789e-16	-15.373	-15.421	-0.048	(0)
CuNO3+	1.228e-17	1.099e-17	-16.911	-16.959	-0.048	(0)
BaNO3+	1.050e-17	9.396e-18	-16.979	-17.027	-0.048	(0)
NiNO3+	7.999e-18	7.157e-18	-17.097	-17.145	-0.048	(0)
CoNO3+	3.484e-18	3.117e-18	-17.458	-17.506	-0.048	(0)
CdNO3+	8.884e-19	7.949e-19	-18.051	-18.100	-0.048	(0)
PbNO3+	1.839e-19	1.646e-19	-18.735	-18.784	-0.048	(0)
AgNO3	1.787e-19	1.787e-19	-18.748	-18.748	0.000	(0)
Mn (NO3) 2	2.351e-24	2.351e-24	-23.629	-23.629	0.000	(0)
UO2NO3+	1.335e-24	1.195e-24	-23.874	-23.923	-0.048	(0)
Zn (NO3) 2	3.135e-26	3.135e-26	-25.504	-25.504	0.000	(0)
CrNO3+2	3.422e-27	2.194e-27	-26.466	-26.659	-0.193	(0)
Co (NO3) 2	2.630e-27	2.630e-27	-26.580	-26.580	0.000	(0)
Cu (NO3) 2	5.735e-28	5.735e-28	-27.241	-27.241	0.000	(0)
Cd (NO3) 2	1.652e-28	1.652e-28	-27.782	-27.782	0.000	(0)
VO2NO3	1.470e-28	1.470e-28	-27.833	-27.833	0.000	(0)
Pb (NO3) 2	1.159e-28	1.159e-28	-27.936	-27.936	0.000	(0)
FeNO3+2	5.484e-30	3.515e-30	-29.261	-29.454	-0.193	(0)
HgNO3+	3.176e-33	2.842e-33	-32.498	-32.546	-0.048	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.310	-42.310	0.000	(0)
Na	3.781e-03					
Na+	3.758e-03	3.406e-03	-2.425	-2.468	-0.043	(0)
NaSO4-	1.889e-05	1.717e-05	-4.724	-4.765	-0.041	(0)
NaHCO3	2.763e-06	2.763e-06	-5.559	-5.559	0.000	(0)
NaCO3-	5.843e-07	5.312e-07	-6.233	-6.275	-0.041	(0)
NaF	1.636e-07	1.636e-07	-6.786	-6.786	0.000	(0)
NaH2BO3	3.490e-09	3.490e-09	-8.457	-8.457	0.000	(0)
NaCrO4-	3.536e-17	3.164e-17	-16.452	-16.500	-0.048	(0)
Ni	1.517e-08					
Ni+2	1.019e-08	6.873e-09	-7.992	-8.163	-0.171	(0)
NiCO3	2.148e-09	2.148e-09	-8.668	-8.668	0.000	(0)
NiHCO3+	1.366e-09	1.223e-09	-8.864	-8.913	-0.048	(0)
NiSO4	1.288e-09	1.288e-09	-8.890	-8.890	0.000	(0)
NiOH+	1.206e-10	1.079e-10	-9.919	-9.967	-0.048	(0)
NiCl+	3.436e-11	3.075e-11	-10.464	-10.512	-0.048	(0)
NiF+	1.469e-11	1.314e-11	-10.833	-10.881	-0.048	(0)
Ni (OH) 2	1.068e-11	1.068e-11	-10.971	-10.971	0.000	(0)
Ni (SO4) 2-2	6.245e-14	4.003e-14	-13.204	-13.398	-0.193	(0)
NiNH3+2	4.633e-14	2.970e-14	-13.334	-13.527	-0.193	(0)
Ni (OH) 3-	1.488e-14	1.332e-14	-13.827	-13.876	-0.048	(0)
NiCl2	2.707e-16	2.707e-16	-15.568	-15.568	0.000	(0)
NiSeO4	2.137e-17	2.137e-17	-16.670	-16.670	0.000	(0)
NiNO3+	7.999e-18	7.157e-18	-17.097	-17.145	-0.048	(0)
Ni (NH3) 2+2	5.388e-20	3.453e-20	-19.269	-19.462	-0.193	(0)
O (0)	3.397e-36					
O2	1.699e-36	1.702e-36	-35.770	-35.769	0.001	(0)
Pb	8.848e-10					
PbCO3	6.757e-10	6.757e-10	-9.170	-9.170	0.000	(0)
PbOH+	9.392e-11	8.404e-11	-10.027	-10.076	-0.048	(0)
Pb+2	3.978e-11	2.684e-11	-10.400	-10.571	-0.171	(0)
PbHCO3+	3.215e-11	2.877e-11	-10.493	-10.541	-0.048	(0)
Pb (CO3) 2-2	2.546e-11	1.632e-11	-10.594	-10.787	-0.193	(0)

PbSO4	1.234e-11	1.234e-11	-10.909	-10.909	0.000	(0)
Pb(OH) 2	3.313e-12	3.313e-12	-11.480	-11.480	0.000	(0)
PbCl+	1.861e-12	1.665e-12	-11.730	-11.779	-0.048	(0)
PbF+	1.609e-13	1.440e-13	-12.793	-12.842	-0.048	(0)
Pb(SO4) 2-2	1.089e-13	6.982e-14	-12.963	-13.156	-0.193	(0)
PbCl2	1.300e-14	1.300e-14	-13.886	-13.886	0.000	(0)
Pb(OH) 3-	4.616e-15	4.130e-15	-14.336	-14.384	-0.048	(0)
PbF2	2.157e-16	2.157e-16	-15.666	-15.666	0.000	(0)
PbCl3-	1.011e-17	9.050e-18	-16.995	-17.043	-0.048	(0)
Pb(OH) 4-2	1.967e-18	1.261e-18	-17.706	-17.899	-0.193	(0)
PbNO3+	1.839e-19	1.646e-19	-18.735	-18.784	-0.048	(0)
Pb2OH+3	9.724e-20	3.574e-20	-19.012	-19.447	-0.435	(0)
PbF3-	3.481e-20	3.114e-20	-19.458	-19.507	-0.048	(0)
PbCl4-2	1.128e-20	7.233e-21	-19.948	-20.141	-0.193	(0)
Pb3(OH) 4+2	9.169e-24	5.877e-24	-23.038	-23.231	-0.193	(0)
PbF4-2	1.770e-24	1.135e-24	-23.752	-23.945	-0.193	(0)
Pb(NO3) 2	1.159e-28	1.159e-28	-27.936	-27.936	0.000	(0)
Pb4(OH) 4+4	7.423e-30	1.253e-30	-29.129	-29.902	-0.773	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.126	-151.126	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.690	-227.738	-0.048	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.363	-73.363	0.000	(0)
HS-	0.000e+00	0.000e+00	-77.864	-77.912	-0.048	(0)
H2S	0.000e+00	0.000e+00	-78.985	-78.985	0.000	(0)
S5-2	0.000e+00	0.000e+00	-78.991	-79.185	-0.193	(0)
CdHS+	0.000e+00	0.000e+00	-79.073	-79.122	-0.048	(0)
S6-2	0.000e+00	0.000e+00	-79.507	-79.701	-0.193	(0)
S4-2	0.000e+00	0.000e+00	-79.587	-79.780	-0.193	(0)
S3-2	0.000e+00	0.000e+00	-80.393	-80.586	-0.193	(0)
S2-2	0.000e+00	0.000e+00	-81.409	-81.602	-0.193	(0)
S-2	0.000e+00	0.000e+00	-86.952	-87.120	-0.167	(0)
HgHS2-	0.000e+00	0.000e+00	-138.487	-138.535	-0.048	(0)
HgS2-2	0.000e+00	0.000e+00	-138.957	-139.150	-0.193	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.234	-140.234	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-145.846	-146.099	-0.253	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-146.435	-146.566	-0.132	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.585	-146.829	-0.245	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.127	-147.176	-0.048	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.313	-147.361	-0.048	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-147.655	-147.914	-0.258	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.976	-148.225	-0.249	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.444	-149.444	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-149.830	-149.830	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.126	-151.126	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.378	-159.378	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.866	-215.915	-0.048	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.028	-224.076	-0.048	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.770	-225.963	-0.193	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.794	-225.842	-0.048	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.690	-227.738	-0.048	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.205	-235.254	-0.048	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.366	-301.559	-0.193	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.255	-303.448	-0.193	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.143	-319.336	-0.193	(0)
S(6)	1.560e-03					
SO4-2	1.392e-03	9.389e-04	-2.856	-3.027	-0.171	(0)
CaSO4	8.343e-05	8.343e-05	-4.079	-4.079	0.000	(0)
MgSO4	6.223e-05	6.223e-05	-4.206	-4.206	0.000	(0)
NaSO4-	1.889e-05	1.717e-05	-4.724	-4.765	-0.041	(0)
KSO4-	2.774e-06	2.522e-06	-5.557	-5.598	-0.041	(0)
MnSO4	5.737e-07	5.737e-07	-6.241	-6.241	0.000	(0)
ZnSO4	7.475e-08	7.475e-08	-7.126	-7.126	0.000	(0)
CuSO4	1.803e-09	1.803e-09	-8.744	-8.744	0.000	(0)
NiSO4	1.288e-09	1.288e-09	-8.890	-8.890	0.000	(0)
NH4SO4-	1.262e-09	1.146e-09	-8.899	-8.941	-0.042	(0)
Zn(SO4) 2-2	9.537e-10	6.113e-10	-9.021	-9.214	-0.193	(0)
CoSO4	8.888e-10	8.888e-10	-9.051	-9.051	0.000	(0)
HSO4-	8.169e-10	7.410e-10	-9.088	-9.130	-0.042	(0)

CdSO4	1.335e-10	1.335e-10	-9.875	-9.875	0.000	(0)
PbSO4	1.234e-11	1.234e-11	-10.909	-10.909	0.000	(0)
AgSO4-	1.136e-11	1.017e-11	-10.945	-10.993	-0.048	(0)
Cd (SO4) 2-2	2.637e-12	1.690e-12	-11.579	-11.772	-0.193	(0)
CrOHSO4	7.356e-13	7.356e-13	-12.133	-12.133	0.000	(0)
Pb (SO4) 2-2	1.089e-13	6.982e-14	-12.963	-13.156	-0.193	(0)
FeSO4	7.231e-14	7.231e-14	-13.141	-13.141	0.000	(0)
Ni (SO4) 2-2	6.245e-14	4.003e-14	-13.204	-13.398	-0.193	(0)
UO2SO4	2.053e-15	2.053e-15	-14.688	-14.688	0.000	(0)
AlSO4+	3.787e-16	3.435e-16	-15.422	-15.464	-0.042	(0)
CrSO4+	2.966e-16	2.654e-16	-15.528	-15.576	-0.048	(0)
UO2 (SO4) 2-2	3.964e-17	2.541e-17	-16.402	-16.595	-0.193	(0)
Al (SO4) 2-	3.810e-18	3.455e-18	-17.419	-17.461	-0.042	(0)
VO2SO4-	1.756e-20	1.571e-20	-19.755	-19.804	-0.048	(0)
FeSO4+	9.834e-21	8.931e-21	-20.007	-20.049	-0.042	(0)
Cr2 (OH) 2SO4+2	3.425e-22	2.195e-22	-21.465	-21.659	-0.193	(0)
Fe (SO4) 2-	2.004e-22	1.793e-22	-21.698	-21.746	-0.048	(0)
VOSO4	3.251e-23	3.251e-23	-22.488	-22.488	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.224e-23	1.224e-23	-22.912	-22.912	0.000	(0)
HgSO4	4.563e-24	4.563e-24	-23.341	-23.341	0.000	(0)
CrO3SO4-2	1.760e-25	1.128e-25	-24.754	-24.948	-0.193	(0)
VS04+	6.934e-38	6.204e-38	-37.159	-37.207	-0.048	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.157	-43.350	-0.193	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.335	-61.383	-0.048	(0)
Sb (3)	7.097e-21					
Sb (OH) 3	3.590e-21	3.590e-21	-20.445	-20.445	0.000	(0)
HSbO2	3.505e-21	3.505e-21	-20.455	-20.455	0.000	(0)
SbO2-	7.857e-25	7.030e-25	-24.105	-24.153	-0.048	(0)
Sb (OH) 4-	4.501e-25	4.027e-25	-24.347	-24.395	-0.048	(0)
Sb (OH) 2F	3.449e-27	3.449e-27	-26.462	-26.462	0.000	(0)
SbOF	3.392e-27	3.392e-27	-26.470	-26.470	0.000	(0)
Sb (OH) 2+	7.870e-28	7.042e-28	-27.104	-27.152	-0.048	(0)
SbO+	2.714e-28	2.428e-28	-27.566	-27.615	-0.048	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.143	-319.336	-0.193	(0)
Sb (5)	2.703e-09					
SbO3-	2.699e-09	2.415e-09	-8.569	-8.617	-0.048	(0)
Sb (OH) 6-	3.116e-12	2.824e-12	-11.506	-11.549	-0.043	(0)
SbO2+	5.050e-26	4.519e-26	-25.297	-25.345	-0.048	(0)
Se (-2)	8.293e-15					
Ag2Se	8.293e-15	8.293e-15	-14.081	-14.081	0.000	(0)
HSe-	3.119e-39	2.791e-39	-38.506	-38.554	-0.048	(0)
MnSe	0.000e+00	0.000e+00	-41.310	-41.310	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.757	-42.757	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.268	-45.461	-0.193	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.832	-82.605	-0.773	(0)
Se (4)	1.587e-08					
HSeO3-	9.400e-09	8.411e-09	-8.027	-8.075	-0.048	(0)
SeO3-2	6.469e-09	4.146e-09	-8.189	-8.382	-0.193	(0)
H2SeO3	2.897e-14	2.897e-14	-13.538	-13.538	0.000	(0)
AgSeO3-	1.616e-15	1.446e-15	-14.791	-14.840	-0.048	(0)
Cd (SeO3) 2-2	1.340e-20	8.591e-21	-19.873	-20.066	-0.193	(0)
Ag (SeO3) 2-3	1.461e-22	5.369e-23	-21.835	-22.270	-0.435	(0)
FeHSeO3+2	2.940e-26	1.884e-26	-25.532	-25.725	-0.193	(0)
Se (6)	9.862e-12					
SeO4-2	9.855e-12	6.648e-12	-11.006	-11.177	-0.171	(0)
MnSeO4	6.148e-15	6.148e-15	-14.211	-14.211	0.000	(0)
ZnSeO4	3.747e-16	3.747e-16	-15.426	-15.426	0.000	(0)
NiSeO4	2.137e-17	2.137e-17	-16.670	-16.670	0.000	(0)
CoSeO4	1.581e-17	1.581e-17	-16.801	-16.801	0.000	(0)
HSeO4-	3.007e-18	2.691e-18	-17.522	-17.570	-0.048	(0)
CdSeO4	7.506e-19	7.506e-19	-18.125	-18.125	0.000	(0)
Zn (SeO4) 2-2	3.941e-27	2.526e-27	-26.404	-26.598	-0.193	(0)
Si	2.681e-04					
H4SiO4	2.629e-04	2.634e-04	-3.580	-3.579	0.001	(0)
H3SiO4-	5.205e-06	4.715e-06	-5.284	-5.327	-0.043	(0)
H2SiO4-2	5.391e-11	3.684e-11	-10.268	-10.434	-0.165	(0)
UO2H3SiO4+	6.462e-13	5.782e-13	-12.190	-12.238	-0.048	(0)

SiF6-2	4.854e-31	3.303e-31	-30.314	-30.481	-0.167	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.748	-60.183	-0.435	(0)
U (4)	2.946e-20					
U (OH) 5-	2.945e-20	2.635e-20	-19.531	-19.579	-0.048	(0)
U (OH) 4	8.915e-24	8.915e-24	-23.050	-23.050	0.000	(0)
U (OH) 3+	2.942e-28	2.632e-28	-27.531	-27.580	-0.048	(0)
U (OH) 2+2	1.534e-33	9.832e-34	-32.814	-33.007	-0.193	(0)
UF3+	2.345e-38	2.098e-38	-37.630	-37.678	-0.048	(0)
UF2+2	2.713e-39	1.739e-39	-38.567	-38.760	-0.193	(0)
UOH+3	1.017e-39	3.740e-40	-38.992	-39.427	-0.435	(0)
UF4	1.751e-40	1.751e-40	-39.757	-39.757	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.307	-41.741	-0.435	(0)
UF5-	0.000e+00	0.000e+00	-42.229	-42.277	-0.048	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.157	-43.350	-0.193	(0)
UF6-2	0.000e+00	0.000e+00	-43.722	-43.916	-0.193	(0)
U+4	0.000e+00	0.000e+00	-46.150	-46.923	-0.773	(0)
UCl+3	0.000e+00	0.000e+00	-47.546	-47.980	-0.435	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-173.389	-177.301	-3.912	(0)
U (5)	3.383e-17					
UO2+	3.383e-17	3.027e-17	-16.471	-16.519	-0.048	(0)
U (6)	3.263e-08					
UO2 (CO3) 3-4	2.002e-08	3.379e-09	-7.699	-8.471	-0.773	(0)
UO2 (CO3) 2-2	1.256e-08	8.050e-09	-7.901	-8.094	-0.193	(0)
UO2CO3	4.817e-11	4.817e-11	-10.317	-10.317	0.000	(0)
UO2H3SiO4+	6.462e-13	5.782e-13	-12.190	-12.238	-0.048	(0)
UO2OH+	2.534e-13	2.267e-13	-12.596	-12.645	-0.048	(0)
UO2F+	1.697e-14	1.518e-14	-13.770	-13.819	-0.048	(0)
UO2F2	3.333e-15	3.333e-15	-14.477	-14.477	0.000	(0)
UO2+2	2.141e-15	1.445e-15	-14.669	-14.840	-0.171	(0)
UO2SO4	2.053e-15	2.053e-15	-14.688	-14.688	0.000	(0)
UO2F3-	7.123e-17	6.373e-17	-16.147	-16.196	-0.048	(0)
UO2 (SO4) 2-2	3.964e-17	2.541e-17	-16.402	-16.595	-0.193	(0)
UO2Cl+	4.578e-18	4.096e-18	-17.339	-17.388	-0.048	(0)
(UO2) 2 (OH) 2+2	1.331e-19	8.530e-20	-18.876	-19.069	-0.193	(0)
UO2F4-2	6.013e-20	3.854e-20	-19.221	-19.414	-0.193	(0)
(UO2) 3 (OH) 5+	2.548e-20	2.280e-20	-19.594	-19.642	-0.048	(0)
UO2NO3+	1.335e-24	1.195e-24	-23.874	-23.923	-0.048	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.974	-44.022	-0.048	(0)
V+2	0.000e+00	0.000e+00	-45.434	-45.628	-0.193	(0)
V (3)	2.188e-16					
V (OH) 3	2.188e-16	2.188e-16	-15.660	-15.660	0.000	(0)
V (OH) 2+	1.276e-27	1.142e-27	-26.894	-26.942	-0.048	(0)
VOH+2	1.365e-31	8.746e-32	-30.865	-31.058	-0.193	(0)
V+3	3.808e-37	1.400e-37	-36.419	-36.854	-0.435	(0)
VSO4+	6.934e-38	6.204e-38	-37.159	-37.207	-0.048	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-59.114	-59.549	-0.435	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-60.544	-61.316	-0.773	(0)
V (4)	3.524e-20					
V (OH) 3+	3.494e-20	3.126e-20	-19.457	-19.505	-0.048	(0)
VO+2	1.961e-22	1.257e-22	-21.707	-21.901	-0.193	(0)
VOF+	6.415e-23	5.740e-23	-22.193	-22.241	-0.048	(0)
VOSO4	3.251e-23	3.251e-23	-22.488	-22.488	0.000	(0)
VOF2	1.639e-24	1.639e-24	-23.786	-23.786	0.000	(0)
VOC1+	6.891e-25	6.166e-25	-24.162	-24.210	-0.048	(0)
VOF3-	4.947e-27	4.426e-27	-26.306	-26.354	-0.048	(0)
VOF4-2	2.122e-30	1.360e-30	-29.673	-29.866	-0.193	(0)
H2V2O4+2	7.645e-35	4.900e-35	-34.117	-34.310	-0.193	(0)
V (5)	8.632e-10					
H2VO4-	6.018e-10	5.385e-10	-9.221	-9.269	-0.048	(0)
HVO4-2	2.613e-10	1.675e-10	-9.583	-9.776	-0.193	(0)
H3VO4	4.348e-14	4.348e-14	-13.362	-13.362	0.000	(0)
VO4-3	2.828e-16	1.039e-16	-15.549	-15.983	-0.435	(0)
H3V2O7-	1.690e-16	1.512e-16	-15.772	-15.820	-0.048	(0)
HV2O7-3	8.315e-17	3.056e-17	-16.080	-16.515	-0.435	(0)
VO2+	7.734e-19	7.009e-19	-18.112	-18.154	-0.043	(0)

V2O7-4	6.036e-19	1.019e-19	-18.219	-18.992	-0.773	(0)
VO2F	9.359e-20	9.359e-20	-19.029	-19.029	0.000	(0)
VO2SO4-	1.756e-20	1.571e-20	-19.755	-19.804	-0.048	(0)
VO2F2-	2.891e-21	2.587e-21	-20.539	-20.587	-0.048	(0)
V3O9-3	4.450e-22	1.636e-22	-21.352	-21.786	-0.435	(0)
VO2F3-2	3.833e-24	2.456e-24	-23.417	-23.610	-0.193	(0)
VO2F4-3	2.503e-28	9.201e-29	-27.602	-28.036	-0.435	(0)
V4O12-4	2.176e-28	3.672e-29	-27.662	-28.435	-0.773	(0)
VO2NO3	1.470e-28	1.470e-28	-27.833	-27.833	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-74.414	-76.153	-1.739	(0)
HV10O28-5	0.000e+00	0.000e+00	-74.852	-76.059	-1.207	(0)
H2V10O28-4	0.000e+00	0.000e+00	-78.172	-78.944	-0.773	(0)
Zn	8.739e-07					
Zn+2	5.395e-07	3.639e-07	-6.268	-6.439	-0.171	(0)
ZnCO3	1.754e-07	1.754e-07	-6.756	-6.756	0.000	(0)
ZnSO4	7.475e-08	7.475e-08	-7.126	-7.126	0.000	(0)
ZnOH+	5.070e-08	4.537e-08	-7.295	-7.343	-0.048	(0)
ZnHCO3+	1.856e-08	1.660e-08	-7.732	-7.780	-0.048	(0)
Zn (OH) 2	8.964e-09	8.964e-09	-8.048	-8.048	0.000	(0)
ZnOHCl	2.608e-09	2.608e-09	-8.584	-8.584	0.000	(0)
ZnCl+	1.764e-09	1.598e-09	-8.753	-8.796	-0.043	(0)
Zn (SO4) 2-2	9.537e-10	6.113e-10	-9.021	-9.214	-0.193	(0)
ZnF+	6.178e-10	5.528e-10	-9.209	-9.257	-0.048	(0)
Zn (OH) 3-	6.259e-11	5.600e-11	-10.203	-10.252	-0.048	(0)
ZnCl2	4.429e-12	4.429e-12	-11.354	-11.354	0.000	(0)
ZnCl3-	6.790e-15	6.151e-15	-14.168	-14.211	-0.043	(0)
Zn (OH) 4-2	4.337e-15	2.780e-15	-14.363	-14.556	-0.193	(0)
ZnNO3+	4.235e-16	3.789e-16	-15.373	-15.421	-0.048	(0)
ZnSeO4	3.747e-16	3.747e-16	-15.426	-15.426	0.000	(0)
ZnCl4-2	7.902e-18	5.378e-18	-17.102	-17.269	-0.167	(0)
Zn (NO3) 2	3.135e-26	3.135e-26	-25.504	-25.504	0.000	(0)
Zn (SeO4) 2-2	3.941e-27	2.526e-27	-26.404	-26.598	-0.193	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.313	-147.361	-0.048	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.444	-149.444	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.028	-224.076	-0.048	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.770	-225.963	-0.193	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.255	-303.448	-0.193	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-58.32	-52.03	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-43.29	-38.78	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-50.52	-38.78	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-75.44	-57.51	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-57.67	-37.63	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.02	-28.61	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-25.51	-25.06	0.45	(NH4) 2SeO4	
Acanthite	-52.13	-88.35	-36.22	Ag2S	
Ag2CO3	-12.52	-23.61	-11.09	Ag2CO3	
Ag2CrO4	-21.67	-33.26	-11.59	Ag2CrO4	
Ag2HVO4	-13.89	-12.41	1.48	Ag2HVO4	
Ag2MoO4	-13.90	-25.45	-11.55	Ag2MoO4	
Ag2O	-14.92	-2.35	12.57	Ag2O	
Ag2Se	-0.29	-48.99	-48.70	Ag2Se	
Ag2SeO3	-11.36	-18.51	-7.15	Ag2SeO3	
Ag2SeO4	-20.80	-29.71	-8.91	Ag2SeO4	
Ag2SO4	-16.74	-21.56	-4.82	Ag2SO4	
Ag3AsO3	-27.46	-25.30	2.16	Ag3AsO3	
Ag3AsO4	-16.30	-19.08	-2.79	Ag3AsO4	
Ag3H2VO5	-18.76	-13.58	5.18	Ag3H2VO5	
AgF:4H2O	-14.43	-13.38	1.05	AgF:4H2O	
Agmetal	-0.22	-13.73	-13.51	Ag	
AgVO3	-12.00	-11.23	0.77	AgVO3	
Al (OH) 3 (am)	-2.85	7.95	10.80	Al (OH) 3	
Al2 (MoO4) 3	-55.78	-53.41	2.37	Al2 (MoO4) 3	
Al2O3	-3.75	15.90	19.65	Al2O3	

Al4(OH)10SO4	-10.11	12.59	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.41	-7.61	4.80	AlAsO4:2H2O
AlOHSO4	-8.03	-11.26	-3.23	AlOHSO4
AlSb	-153.46	-87.83	65.62	AlSb
Alunite	-8.50	-9.90	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.81	-13.60	-7.79	PbSO4
Anhydrite	-2.08	-6.44	-4.36	CaSO4
Anilite	-54.74	-86.61	-31.88	Cu0.25Cu1.5S
Antlerite	-3.67	5.11	8.79	Cu3(OH)4SO4
Aragonite	-0.19	-8.49	-8.30	CaCO3
Arsenolite	-84.36	-87.12	-2.76	As4O6
Artinite	-5.37	4.23	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-37.84	-31.13	6.71	As2O5
Atacamite	-2.02	5.37	7.39	Cu2(OH)3Cl
Azurite	-1.29	-18.20	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.55	7.84	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-20.31	-4.44	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	1.30	-7.61	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-29.54	3.40	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.40	-23.07	-9.67	BaCrO4
BaF2	-10.76	-16.58	-5.82	BaF2
BaMoO4	-8.30	-15.26	-6.96	BaMoO4
Barite	-1.39	-11.37	-9.98	BaSO4
BaS	-94.34	-78.16	16.18	BaS
BaSeO3	-10.16	-8.33	1.83	BaSeO3
BaSeO4	-12.06	-19.52	-7.46	BaSeO4
Bianchite	-7.70	-9.47	-1.76	ZnSO4:6H2O
Birnessite	-7.61	10.48	18.09	MnO2
Bixbyite	-3.50	-4.14	-0.64	Mn2O3
BlaubleiI	-54.90	-79.06	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.27	-82.55	-27.28	Cu0.6Cu0.8S
Boehmite	-0.63	7.95	8.58	AlOOH
Breithauptite	-56.68	-75.20	-18.52	NiSb
Brochantite	-2.00	13.22	15.22	Cu4(OH)6SO4
Brucite	-4.10	12.75	16.84	Mg(OH)2
Bunsenite	-4.42	8.02	12.45	NiO
Ca(VO3)2	-13.01	-7.35	5.66	Ca(VO3)2
Ca2V2O7	-12.07	5.43	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.13	5.43	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.11	7.19	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.76	18.20	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.66	18.20	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.22	-153.24	142.97	Ca3Sb2
CaCrO4	-15.87	-18.14	-2.27	CaCrO4
Calcite	-0.01	-8.49	-8.48	CaCO3
Calomel	-11.20	-29.11	-17.91	Hg2Cl2
CaMoO4	-2.38	-10.33	-7.95	CaMoO4
Carnotite	-4.27	-4.04	0.23	KUO2VO4
CaSeO3:2H2O	-6.21	-3.39	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.57	-14.59	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.96	-3.12	9.84	Cd(BO2)2
Cd(OH)2	-6.68	6.97	13.64	Cd(OH)2
Cd(OH)2(am)	-6.76	6.97	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-24.23	-17.52	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.87	1.69	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.74	8.66	28.40	Cd4(OH)6SO4
CdCl2	-14.07	-14.73	-0.66	CdCl2
CdCl2:1H2O	-13.04	-14.73	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.82	-14.73	-1.91	CdCl2:2.5H2O
CdF2	-16.24	-17.45	-1.21	CdF2
Cdmetal(alpha)	-31.66	-18.14	13.51	Cd
Cdmetal(gamma)	-31.76	-18.14	13.62	Cd
CdMoO4	-1.99	-16.14	-14.15	CdMoO4
CdOHCl	-7.42	-3.88	3.54	CdOHCl
CdSb	-75.91	-76.26	-0.35	CdSb
CdSe	-19.48	-39.68	-20.20	CdSe
CdSeO4:2H2O	-18.54	-20.39	-1.85	CdSeO4:2H2O
CdSO4	-12.07	-12.24	-0.17	CdSO4

CdSO4:1H2O	-10.52	-12.24	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.37	-12.24	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.27	-12.02	-9.75	AgCl
Cerrusite	-2.52	-15.65	-13.13	PbCO3
CH4(g)	-80.67	-121.71	-41.05	CH4
Chalcanthite	-8.46	-11.10	-2.64	CuSO4:5H2O
Chalcedony	-0.03	-3.58	-3.55	SiO2
Chalcocite	-54.60	-89.52	-34.92	Cu2S
Chalcopyrite	-124.95	-160.22	-35.27	CuFeS2
Chrysotile	-1.12	31.08	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.05	-98.74	-45.69	HgS
Claudetite	-84.06	-87.12	-3.06	As4O6
Clausthalite	-13.93	-41.03	-27.10	PbSe
Co(BO2)2	-29.30	-2.23	27.07	Co(BO2)2
Co(OH)2	-5.23	7.86	13.09	Co(OH)2
Co(OH)3	-9.67	-11.98	-2.31	Co(OH)3
CO2(g)	-3.12	-21.26	-18.15	CO2
Co3(AsO4)2	-20.58	-7.55	13.03	Co3(AsO4)2
Co3O4	-5.61	-16.10	-10.50	Co3O4
CoCl2	-22.11	-13.84	8.27	CoCl2
CoCl2:6H2O	-16.38	-13.84	2.54	CoCl2:6H2O
CoCO3	-3.42	-13.40	-9.98	CoCO3
CoF2	-14.96	-16.56	-1.60	CoF2
CoF3	-47.16	-48.62	-1.46	CoF3
CoFe2O4	17.80	14.28	-3.53	CoFe2O4
CoMoO4	-7.48	-15.24	-7.76	CoMoO4
CoO	-5.72	7.86	13.59	CoO
CoS(alpha)	-70.70	-78.14	-7.44	CoS
CoS(beta)	-67.07	-78.14	-11.07	CoS
CoSe	-22.59	-38.79	-16.20	CoSe
CoSeO3	-9.63	-8.31	1.32	CoSeO3
CoSeO4:6H2O	-17.97	-19.50	-1.53	CoSeO4:6H2O
CoSO4	-14.15	-11.35	2.80	CoSO4
CoSO4:6H2O	-8.88	-11.35	-2.47	CoSO4:6H2O
Cotunnite	-11.31	-16.09	-4.78	PbCl2
Covellite	-55.60	-77.90	-22.30	CuS
Cr(OH)2	-21.64	-10.82	10.82	Cr(OH)2
Cr(OH)3	-2.54	-1.21	1.34	Cr(OH)3
Cr(OH)3(am)	-0.46	-1.21	-0.75	Cr(OH)3
Cr2O3	-0.06	-2.41	-2.36	Cr2O3
CrCl2	-46.61	-32.52	14.09	CrCl2
CrCl3	-48.87	-33.76	15.11	CrCl3
CrF3	-26.50	-37.84	-11.34	CrF3
Cristobalite	-0.23	-3.58	-3.35	SiO2
Crmetal	-66.41	-35.93	30.48	Cr
CrO3	-27.70	-30.91	-3.21	CrO3
Cryolite	-14.60	-48.44	-33.84	Na3AlF6
Cu(OH)2	-0.57	8.11	8.67	Cu(OH)2
Cu(SbO3)2	-27.76	17.45	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.51	-1.26	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.55	-89.43	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.36	-50.16	-45.80	Cu2Se
Cu2SO4	-20.78	-22.73	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.91	-6.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.46	-101.06	-42.59	Cu3Sb
Cu3Se2	-25.21	-88.70	-63.49	Cu3Se2
CuCO3	-1.65	-13.15	-11.50	CuCO3
CuCrO4	-17.36	-22.80	-5.44	CuCrO4
CuF	-9.06	-13.97	-4.91	CuF
CuF2	-17.43	-16.31	1.12	CuF2
CuF2:2H2O	-11.76	-16.31	-4.55	CuF2:2H2O
Cumetal	-5.56	-14.31	-8.76	Cu
CuMoO4	-1.92	-15.00	-13.08	CuMoO4
CuOCuSO4	-13.30	-3.00	10.30	CuOCuSO4
Cupricferrite	8.53	14.52	5.99	CuFe2O4
Cuprite	-2.11	-3.52	-1.41	Cu2O
Cuprousferrite	10.37	1.45	-8.92	CuFeO2
CuSe	-5.44	-38.54	-33.10	CuSe

CuSe2	-26.71	-60.07	-33.37	CuSe2
CuSeO3:2H2O	-8.57	-8.06	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.81	-19.25	-2.44	CuSeO4:5H2O
CuSO4	-14.04	-11.10	2.94	CuSO4
Diaspore	1.08	7.95	6.87	AlOOH
Djurleite	-54.83	-88.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.46	-17.00	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.09	-17.00	-17.09	CaMg(CO3)2
Epsomite	-4.34	-6.47	-2.13	MgSO4:7H2O
Fe(OH)2	-9.88	3.68	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.99	-0.05	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-12.72	-16.44	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.31	-9.75	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-21.46	-42.09	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-47.49	-51.23	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.13	10.10	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.76	-12.36	0.40	FeAsO4:2H2O
FeCr2O4	-5.93	1.27	7.20	FeCr2O4
FeMoO4	-9.33	-19.42	-10.09	FeMoO4
Ferrihydrite	0.02	3.21	3.19	Fe(OH)3
Ferroselite	-45.90	-64.50	-18.60	FeSe2
FeS(ppt)	-79.37	-82.32	-2.95	FeS
FeSe	-31.96	-42.96	-11.00	FeSe
Fix_pe	-4.46	-4.46	0.00	e-
Fluorite	-1.15	-11.65	-10.50	CaF2
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	-0.34	7.95	8.29	Al(OH)3
Goethite	2.72	3.21	0.49	FeOOH
Goslarite	-7.46	-9.47	-2.01	ZnSO4:7H2O
Greenalite	-16.92	3.89	20.81	Fe3Si2O5(OH)4
Greenockite	-64.68	-79.04	-14.36	CdS
Greigite	-288.89	-333.92	-45.03	Fe3S4
Gummite	-6.33	1.35	7.67	UO3
Gypsum	-1.83	-6.44	-4.61	CaSO4:2H2O
H-Jarosite	-16.71	-28.81	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.23	-23.11	-12.88	H2MoO4
H2S(g)	-78.00	-86.01	-8.01	H2S
H2Se(g)	-41.69	-46.65	-4.96	H2Se
Halite	-6.83	-5.23	1.60	NaCl
Halloysite	-0.83	8.74	9.57	Al2Si2O5(OH)4
Hausmannite	-3.75	57.28	61.03	Mn3O4
Hematite	7.83	6.41	-1.42	Fe2O3
Hercynite	-3.31	19.59	22.89	FeAl2O4
Hg(CH3)2(g)	-182.46	-256.17	-73.71	Hg(CH3)2
Hg(g)	-8.39	-16.26	-7.87	Hg
Hg(OH)2	-9.24	-12.74	-3.50	Hg(OH)2
Hg2(g)	-17.57	-32.52	-14.96	Hg2
Hg2(OH)2	-12.67	-7.41	5.26	Hg2(OH)2
Hg2CO3	-12.62	-28.67	-16.05	Hg2CO3
Hg2CrO4	-29.62	-38.32	-8.70	Hg2CrO4
Hg2F2	-21.47	-31.83	-10.36	Hg2F2
Hg2S	-81.74	-93.41	-11.68	Hg2S
Hg2SeO3	-18.92	-23.58	-4.66	Hg2SeO3
Hg2SO4	-20.49	-26.62	-6.13	Hg2SO4
Hg3O2CO3	-29.80	-59.48	-29.68	Hg3O2CO3
HgCl(g)	-34.05	-14.55	19.50	HgCl
HgCl2	-13.18	-34.44	-21.26	HgCl2
HgF(g)	-48.59	-15.92	32.68	HgF
HgF2(g)	-49.73	-37.16	12.57	HgF2
Hgmetal(l)	-2.81	-16.26	-13.45	Hg
HgSe	-3.69	-59.39	-55.69	HgSe
HgSeO3	-16.48	-28.91	-12.43	HgSeO3
HgSO4	-22.53	-31.95	-9.42	HgSO4
Huntite	-4.07	-34.04	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.91	-25.68	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.55	-21.32	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-20.63	-25.80	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-9.33	-24.13	-14.80	KFe3(SO4)2(OH)6

K2Cr2O7	-35.24	-52.48	-17.24	K2Cr2O7
K2CrO4	-21.06	-21.57	-0.51	K2CrO4
K2MoO4	-17.02	-13.76	3.26	K2MoO4
K2SeO4	-17.29	-18.02	-0.73	K2SeO4
Kaolinite	1.31	8.74	7.43	Al2Si2O5(OH)4
Langite	-4.27	13.22	17.49	Cu4(OH)6SO4·H2O
Larnakite	-7.55	-7.98	-0.43	PbO:PbSO4
Laurionite	-5.86	-5.24	0.62	PbOHCl
Lepidocrocite	1.84	3.21	1.37	FeOOH
Lime	-19.93	12.77	32.70	CaO
Litharge	-7.08	5.61	12.69	PbO
Mackinawite	-78.72	-82.32	-3.60	FeS
Maghemite	0.03	6.41	6.39	Fe2O3
Magnesioferrite	2.30	19.16	16.86	Fe2MgO4
Magnesite	-1.06	-8.52	-7.46	MgCO3
Magnetite	6.69	10.10	3.40	Fe3O4
Malachite	0.26	-5.04	-5.31	Cu2(OH)2CO3
Manganite	-2.06	23.28	25.34	MnOOH
Massicot	-7.28	5.61	12.89	PbO
Matlockite	-8.47	-17.45	-8.97	PbClF
Melanothallite	-19.85	-13.59	6.26	CuCl2
Melanterite	-13.32	-15.53	-2.21	FeSO4·7H2O
Metacinnabar	-53.65	-98.74	-45.09	HgS
Mg(OH)2 (active)	-6.05	12.75	18.79	Mg(OH)2
Mg(VO3)2	-18.66	-7.38	11.28	Mg(VO3)2
Mg2Sb3	-273.76	-199.08	74.68	Mg2Sb3
Mg2V2O7	-20.99	5.37	26.36	Mg2V2O7
MgCr2O4	-5.87	10.33	16.20	MgCr2O4
MgCrO4	-23.55	-18.17	5.38	MgCrO4
MgF2	-3.55	-11.68	-8.13	MgF2
MgMoO4	-8.51	-10.36	-1.85	MgMoO4
MgSeO3·6H2O	-6.48	-3.42	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-13.42	-14.62	-1.20	MgSeO4·6H2O
Minium	-31.57	41.96	73.52	Pb3O4
Mirabilite	-6.85	-7.96	-1.11	Na2SO4·10H2O
Mn(VO3)2	-14.30	-9.40	4.90	Mn(VO3)2
Mn2(SO4)3	-56.07	-61.78	-5.71	Mn2(SO4)3
Mn2Sb	-147.98	-86.90	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.47	1.03	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.69	-10.98	2.72	MnCl2·4H2O
MnS (grn)	-75.45	-75.28	0.17	MnS
MnS (pnk)	-78.62	-75.28	3.34	MnS
MnSb	-94.95	-97.86	-2.91	MnSb
MnSe	-39.43	-35.93	3.50	MnSe
MnSeO3	-6.58	-5.45	1.13	MnSeO3
MnSeO3·2H2O	-6.43	-5.45	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.59	-16.64	-2.05	MnSeO4·5H2O
MnSO4	-11.07	-8.49	2.58	MnSO4
Monteponite	-8.14	6.97	15.10	CdO
Montroydite	-9.10	-12.74	-3.64	HgO
MoO3	-15.11	-23.11	-8.00	MoO3
Morenosite	-9.05	-11.19	-2.14	NiSO4·7H2O
MoS2	-149.97	-220.23	-70.26	MoS2
Na-Jarosite	-11.98	-23.18	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.68	-50.58	-9.90	Na2Cr2O7
Na2CrO4	-22.59	-19.66	2.93	Na2CrO4
Na2Mo2O7	-18.36	-34.96	-16.60	Na2Mo2O7
Na2MoO4	-13.35	-11.86	1.49	Na2MoO4
Na2MoO4·2H2O	-13.08	-11.86	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.22	-4.92	10.30	Na2SeO3·5H2O
Na2SeO4	-17.39	-16.11	1.28	Na2SeO4
Na3Sb	-173.36	-78.91	94.45	Na3Sb
Na3VO4	-29.87	6.81	36.68	Na3VO4
Na4V2O7	-35.02	2.38	37.40	Na4V2O7
Nantokite	-5.88	-12.61	-6.73	CuCl
NaSb	-88.21	-65.05	23.17	NaSb
Natron	-8.70	-10.01	-1.31	Na2CO3·10H2O
NaVO3	-8.29	-4.44	3.86	NaVO3

Nesquehonite	-3.85	-8.52	-4.67	MgCO3:3H2O
Ni(OH)2	-4.77	8.02	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.76	-7.06	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.12	12.88	32.00	Ni4(OH)6SO4
NiCO3	-6.37	-13.24	-6.87	NiCO3
NiMoO4	-3.94	-15.08	-11.14	NiMoO4
NiS(alpha)	-72.38	-77.98	-5.60	NiS
NiS(beta)	-66.88	-77.98	-11.10	NiS
NiS(gamma)	-65.18	-77.98	-12.80	NiS
NiSe	-20.92	-38.62	-17.70	NiSe
NiSeO3:2H2O	-10.96	-8.15	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.82	-19.34	-1.52	NiSeO4:6H2O
Nsutite	-7.02	10.48	17.50	MnO2
O2(g)	-32.86	50.23	83.09	O2
Orpiment	-240.51	-301.58	-61.07	As2S3
Otavite	-2.29	-14.29	-12.00	CdCO3
Pb(BO2)2	-11.00	-4.48	6.52	Pb(BO2)2
Pb(OH)2	-2.54	5.61	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.67	-71.43	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.41	0.38	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.96	11.23	26.19	Pb2O(OH)2
Pb2O3	-24.70	36.34	61.04	Pb2O3
Pb2OCO3	-9.48	-10.03	-0.56	Pb2OCO3
Pb2V2O7	-6.99	-8.89	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.09	-14.29	5.80	Pb3(AsO4)2
Pb3(VO4)2	-9.42	-3.28	6.14	Pb3(VO4)2
Pb3O2CO3	-15.44	-4.42	11.02	Pb3O2CO3
Pb3O2SO4	-13.06	-2.37	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.86	3.24	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.63	3.24	21.88	Pb4O3SO4
PbCrO4	-12.70	-25.30	-12.60	PbCrO4
PbF2	-11.37	-18.81	-7.44	PbF2
Pbmetal	-23.74	-19.50	4.25	Pb
PbMoO4	-1.87	-17.49	-15.62	PbMoO4
PbO:0.3H2O	-7.37	5.61	12.98	PbO:0.33H2O
PbSeO4	-14.91	-21.75	-6.84	PbSeO4
Periclase	-8.84	12.75	21.58	MgO
Phosgenite	-11.92	-31.73	-19.81	PbCl2:PbCO3
Plattnerite	-18.87	30.73	49.60	PbO2
Portlandite	-10.03	12.77	22.80	Ca(OH)2
Pyrite	-124.71	-143.22	-18.51	FeS2
Pyrochroite	-4.47	10.72	15.19	Mn(OH)2
Pyrolusite	-5.55	35.83	41.38	MnO2
Quartz	0.42	-3.58	-4.00	SiO2
Realgar	-100.60	-120.34	-19.75	AsS
Retgersite	-9.15	-11.19	-2.04	NiSO4:6H2O
Rhodochrosite	0.04	-10.54	-10.58	MnCO3
Rutherfordine	-5.42	-19.92	-14.50	UO2CO3
Sb(OH)3	-13.33	-20.44	-7.11	Sb(OH)3
Sb2O4	-19.18	-15.78	3.40	Sb2O4
Sb2O5	-29.62	-39.28	-9.67	Sb2O5
Sb2Se3	-113.07	-180.83	-67.76	Sb2Se3
Sb4O6(cubic)	-63.52	-81.78	-18.26	Sb4O6
Sb4O6(orth)	-63.88	-81.78	-17.90	Sb4O6
SbCl3	-53.57	-53.00	0.57	SbCl3
SbF3	-46.85	-57.08	-10.23	SbF3
Sbmetal	-46.43	-58.11	-11.69	Sb
SbO2	-4.37	-32.20	-27.82	SbO2
Schoepite	-4.65	1.35	5.99	UO2(OH)2:H2O
Semetal(am)	-14.42	-21.53	-7.11	Se
Semetal(hex)	-13.83	-21.53	-7.71	Se
Senarmontite	-28.52	-40.89	-12.37	Sb2O3
SeO2	-16.29	-16.17	0.12	SeO2
SeO3	-48.41	-27.36	21.04	SeO3
Sepiolite	-1.00	14.76	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.02	14.76	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.34	-17.58	-10.24	FeCO3
SiO2(am-gel)	-0.87	-3.58	-2.71	SiO2

SiO2(am-ppt)	-0.84	-3.58	-2.74	SiO2
Smithsonite	-1.52	-11.52	-10.00	ZnCO3
Sphalerite	-64.81	-76.26	-11.45	ZnS
Spinel	-8.20	28.65	36.85	MgAl2O4
Stibnite	-248.44	-298.90	-50.46	Sb2S3
Sulfur	-58.75	-60.89	-2.14	S
Tenorite	0.46	8.11	7.64	CuO
Thenardite	-8.28	-7.96	0.32	Na2SO4
Thermonatrite	-10.65	-10.01	0.64	Na2CO3:H2O
Tyuyamunite	-8.74	-4.66	4.08	Ca(UO2)2(VO4)2
U3O8	-14.51	6.57	21.08	U3O8
U3Sb4	-579.17	-426.79	152.38	U3Sb4
U4O9	-30.07	-33.09	-3.02	U4O9
UF4	-33.86	-63.40	-29.54	UF4
UF4:2.5H2O	-30.68	-63.40	-32.72	UF4:2.5H2O
UO2(am)	-15.49	-14.55	0.93	UO2
UO2(NO3)2	-45.75	-33.61	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-38.46	-33.61	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-37.00	-33.61	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-35.65	-33.61	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.27	1.35	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.77	-26.02	-2.25	UO2SeO4:4H2O
UO3	-6.35	1.35	7.70	UO3
Uraninite	-9.88	-14.55	-4.67	UO2
USb2	-219.80	-190.22	29.58	USb2
V(OH)3	-20.17	-12.58	7.59	V(OH)3
V2O5	-18.76	-20.12	-1.36	V2O5
V3O5	-44.09	-42.26	1.84	V3O5
V4O7	-55.16	-47.97	7.19	V4O7
V6O13	-49.74	-110.60	-60.86	V6O13
Valentinite	-32.41	-40.89	-8.48	Sb2O3
VC12	-65.71	-46.83	18.87	VC12
VC13	-68.56	-45.13	23.43	VC13
VF4	-69.49	-54.56	14.93	VF4
Vmetal	-94.27	-50.25	44.03	V
VO	-39.89	-25.13	14.76	VO
VO(OH)2	-10.87	-5.72	5.15	VO(OH)2
VO2Cl	-23.75	-20.91	2.84	VO2Cl
VOC1	-34.58	-23.43	11.15	VOC1
VOC12	-40.18	-27.42	12.76	VOC12
VOSO4	-28.54	-24.93	3.61	VOSO4
Witherite	-4.85	-13.42	-8.57	BaCO3
Wurtzite	-67.31	-76.26	-8.95	ZnS
Zincite	-1.59	9.75	11.33	ZnO
Zincosite	-13.40	-9.47	3.93	ZnSO4
Zn(BO2)2	-8.64	-0.35	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.52	-25.20	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.45	9.75	12.20	Zn(OH)2
Zn(OH)2(am)	-2.73	9.75	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.01	9.75	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.79	9.75	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.99	9.75	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.22	0.28	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.55	8.64	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.54	-1.89	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-28.10	-9.19	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.63	19.77	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.47	27.03	38.50	Zn5(OH)8Cl2
ZnCl2	-19.00	-11.95	7.05	ZnCl2
ZnCO3:1H2O	-1.26	-11.52	-10.26	ZnCO3:1H2O
ZnF2	-14.14	-14.68	-0.53	ZnF2
Znmetal	-41.16	-15.37	25.79	Zn
ZnMoO4	-3.23	-13.36	-10.13	ZnMoO4
ZnO(active)	-1.44	9.75	11.19	ZnO
ZnS(am)	-67.21	-76.26	-9.05	ZnS
ZnSb	-84.49	-73.48	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-16.10	-17.62	-1.52	ZnSeO4:6H2O

ZnSO4:1H2O -8.83 -9.47 -0.64 ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 79.

Title Evaporate Stage 4 lake water to produce initial Stage 5 Lake water
REACTION 405
 H2O -1
 6.04 moles ## Removes x m3 water, but solute mass remains the same
USE solution 411
Save Solution 412
END

TITLE

Evaporate Stage 4 lake water to produce initial Stage 5 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 411. Solution after simulation 78.
Using reaction 405.

Reaction 405.

6.040e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	3.230e-09	2.879e-09
Al	2.827e-07	2.519e-07
As	4.845e-09	4.318e-09
B	1.090e-05	9.719e-06
Ba	7.621e-09	6.792e-09
C	1.857e-03	1.655e-03
Ca	7.579e-04	6.755e-04
Cd	1.437e-09	1.281e-09
Cl	2.165e-03	1.930e-03
Co	1.094e-08	9.748e-09
Cr	9.297e-10	8.286e-10
Cu	5.481e-07	4.886e-07
F	9.870e-05	8.797e-05
Fe	9.699e-10	8.644e-10
Hg	2.275e-10	2.028e-10

K	4.729e-04	4.215e-04
Mg	6.893e-04	6.144e-04
Mn	6.817e-06	6.076e-06
Mo	2.001e-07	1.784e-07
N	1.628e-06	1.451e-06
Na	4.242e-03	3.781e-03
Ni	1.702e-08	1.517e-08
Pb	9.928e-10	8.849e-10
S	1.750e-03	1.560e-03
Sb	3.032e-09	2.703e-09
Se	1.782e-08	1.588e-08
Si	3.008e-04	2.681e-04
U	3.661e-08	3.263e-08
V	9.685e-10	8.633e-10
Zn	9.805e-07	8.740e-07

-----Description of solution-----

	pH	=	8.086	Charge balance
	pe	=	4.473	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.001e-02	
	Mass of water (kg)	=	8.913e-01	
	Total alkalinity (eq/kg)	=	1.861e-03	
	Total CO2 (mol/kg)	=	1.857e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.717e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	4	
	Total H	=	9.894960e+01	
	Total O	=	4.948573e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.362e-06	1.226e-06	-5.866	-5.912	-0.046	(0)
H+	9.106e-09	8.212e-09	-8.041	-8.086	-0.045	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	3.230e-09					
AgCl	2.189e-09	2.189e-09	-8.660	-8.660	0.000	(0)
Ag+	6.088e-10	5.490e-10	-9.216	-9.260	-0.045	(0)
AgCl2-	4.185e-10	3.721e-10	-9.378	-9.429	-0.051	(0)
AgSO4-	1.263e-11	1.123e-11	-10.899	-10.950	-0.051	(0)
AgCl3-2	1.036e-12	6.475e-13	-11.985	-12.189	-0.204	(0)
AgNO2	1.520e-13	1.520e-13	-12.818	-12.818	0.000	(0)
AgF	1.168e-13	1.168e-13	-12.933	-12.933	0.000	(0)
AgOH	6.730e-14	6.730e-14	-13.172	-13.172	0.000	(0)
AgNH3+	1.114e-14	9.902e-15	-13.953	-14.004	-0.051	(0)
Ag2Se	8.993e-15	8.993e-15	-14.046	-14.046	0.000	(0)
AgCl4-3	7.432e-15	2.581e-15	-14.129	-14.588	-0.459	(0)
AgH2BO3	6.213e-15	6.213e-15	-14.207	-14.207	0.000	(0)
AgSeO3-	1.803e-15	1.603e-15	-14.744	-14.795	-0.051	(0)
Ag (OH) 2-	9.068e-18	8.062e-18	-17.043	-17.094	-0.051	(0)
Ag (NH3) 2+	7.995e-19	7.109e-19	-18.097	-18.148	-0.051	(0)
Ag (NO2) 2-	3.509e-19	3.120e-19	-18.455	-18.506	-0.051	(0)
AgNO3	2.041e-19	2.041e-19	-18.690	-18.690	0.000	(0)
Ag (SeO3) 2-3	1.877e-22	6.518e-23	-21.727	-22.186	-0.459	(0)
Ag2MoO4	1.510e-26	1.510e-26	-25.821	-25.821	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.332	-73.332	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.740	-82.557	-0.816	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.379	-146.516	-0.137	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.067	-147.118	-0.051	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.604	-147.871	-0.267	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.925	-148.182	-0.257	(0)
Al	2.827e-07					

Al (OH) 4-	2.809e-07	2.536e-07	-6.551	-6.596	-0.044	(0)
Al (OH) 3	1.643e-09	1.643e-09	-8.784	-8.784	0.000	(0)
Al (OH) 2+	7.424e-11	6.719e-11	-10.129	-10.173	-0.043	(0)
AlF2+	1.775e-12	1.606e-12	-11.751	-11.794	-0.043	(0)
AlF3	1.712e-12	1.712e-12	-11.767	-11.767	0.000	(0)
AlOH+2	1.028e-13	6.900e-14	-12.988	-13.161	-0.173	(0)
AlF4-	8.046e-14	7.263e-14	-13.094	-13.139	-0.044	(0)
AlF+2	7.103e-14	4.765e-14	-13.149	-13.322	-0.173	(0)
AlSO4+	4.962e-16	4.479e-16	-15.304	-15.349	-0.044	(0)
Al+3	1.426e-16	5.629e-17	-15.846	-16.250	-0.404	(0)
Al (SO4) 2-	5.451e-18	4.921e-18	-17.264	-17.308	-0.044	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.580	-51.039	-0.459	(0)
As (3)	1.982e-22					
H3AsO3	1.852e-22	1.852e-22	-21.732	-21.732	0.000	(0)
H2AsO3-	1.301e-23	1.157e-23	-22.886	-22.937	-0.051	(0)
HAsO3-2	2.055e-27	1.284e-27	-26.687	-26.891	-0.204	(0)
H4AsO3+	8.476e-31	7.536e-31	-30.072	-30.123	-0.051	(0)
AsO3-3	1.736e-32	6.029e-33	-31.760	-32.220	-0.459	(0)
As (5)	4.845e-09					
HAsO4-2	4.599e-09	2.875e-09	-8.337	-8.541	-0.204	(0)
H2AsO4-	2.422e-10	2.153e-10	-9.616	-9.667	-0.051	(0)
AsO4-3	3.187e-12	1.107e-12	-11.497	-11.956	-0.459	(0)
H3AsO4	3.066e-16	3.073e-16	-15.513	-15.512	0.001	(0)
B	1.090e-05					
H3BO3	1.007e-05	1.010e-05	-4.997	-4.996	0.001	(0)
H2BO3-	7.959e-07	7.140e-07	-6.099	-6.146	-0.047	(0)
CaH2BO3+	1.934e-08	1.735e-08	-7.714	-7.761	-0.047	(0)
MgH2BO3+	1.096e-08	9.836e-09	-7.960	-8.007	-0.047	(0)
NaH2BO3	4.302e-09	4.302e-09	-8.366	-8.366	0.000	(0)
BF (OH) 3-	3.802e-10	3.411e-10	-9.420	-9.467	-0.047	(0)
H5 (BO3) 2-	6.840e-12	6.136e-12	-11.165	-11.212	-0.047	(0)
BaH2BO3+	1.223e-13	1.097e-13	-12.913	-12.960	-0.047	(0)
BF2 (OH) 2-	2.827e-14	2.536e-14	-13.549	-13.596	-0.047	(0)
H8 (BO3) 3-	6.906e-15	6.196e-15	-14.161	-14.208	-0.047	(0)
AgH2BO3	6.213e-15	6.213e-15	-14.207	-14.207	0.000	(0)
BF3OH-	7.647e-21	6.860e-21	-20.116	-20.164	-0.047	(0)
BF4-	2.617e-26	2.347e-26	-25.582	-25.629	-0.047	(0)
Ba	7.621e-09					
Ba+2	7.513e-09	4.970e-09	-8.124	-8.304	-0.179	(0)
BaHCO3+	8.424e-11	7.637e-11	-10.074	-10.117	-0.043	(0)
BaCO3	2.341e-11	2.341e-11	-10.631	-10.631	0.000	(0)
BaH2BO3+	1.223e-13	1.097e-13	-12.913	-12.960	-0.047	(0)
BaOH+	2.942e-14	2.660e-14	-13.531	-13.575	-0.044	(0)
BaNH3+2	4.432e-17	2.770e-17	-16.353	-16.557	-0.204	(0)
BaNO3+	1.311e-17	1.166e-17	-16.882	-16.933	-0.051	(0)
C (4)	1.857e-03					
HCO3-	1.778e-03	1.609e-03	-2.750	-2.793	-0.043	(0)
H2CO3	2.972e-05	2.972e-05	-4.527	-4.527	0.000	(0)
CaHCO3+	1.395e-05	1.265e-05	-4.855	-4.898	-0.043	(0)
CO3-2	1.388e-05	9.184e-06	-4.858	-5.037	-0.179	(0)
MgHCO3+	7.256e-06	6.540e-06	-5.139	-5.184	-0.045	(0)
CaCO3	6.145e-06	6.145e-06	-5.211	-5.211	0.000	(0)
NaHCO3	3.439e-06	3.439e-06	-5.464	-5.464	0.000	(0)
MgCO3	3.035e-06	3.035e-06	-5.518	-5.518	0.000	(0)
NaCO3-	7.183e-07	6.500e-07	-6.144	-6.187	-0.043	(0)
CuCO3	4.674e-07	4.674e-07	-6.330	-6.330	0.000	(0)
ZnCO3	2.071e-07	2.071e-07	-6.684	-6.684	0.000	(0)
MnHCO3+	1.324e-07	1.197e-07	-6.878	-6.922	-0.044	(0)
UO2 (CO3) 3-4	2.389e-08	3.646e-09	-7.622	-8.438	-0.816	(0)
ZnHCO3+	2.243e-08	1.994e-08	-7.649	-7.700	-0.051	(0)
Cu (CO3) 2-2	1.848e-08	1.155e-08	-7.733	-7.937	-0.204	(0)
UO2 (CO3) 2-2	1.267e-08	7.921e-09	-7.897	-8.101	-0.204	(0)
NiCO3	2.526e-09	2.526e-09	-8.597	-8.597	0.000	(0)
NiHCO3+	1.645e-09	1.462e-09	-8.784	-8.835	-0.051	(0)
CuHCO3+	9.866e-10	8.772e-10	-9.006	-9.057	-0.051	(0)
CoCO3	7.930e-10	7.930e-10	-9.101	-9.101	0.000	(0)
PbCO3	7.655e-10	7.655e-10	-9.116	-9.116	0.000	(0)
CoHCO3+	7.190e-10	6.393e-10	-9.143	-9.194	-0.051	(0)

	CdCO ₃	1.364e-10	1.364e-10	-9.865	-9.865	0.000	(0)
	BaHCO ₃ +	8.424e-11	7.637e-11	-10.074	-10.117	-0.043	(0)
	UO ₂ CO ₃	4.323e-11	4.323e-11	-10.364	-10.364	0.000	(0)
	PbHCO ₃ +	3.728e-11	3.314e-11	-10.429	-10.480	-0.051	(0)
	Pb (CO ₃) 2-2	3.244e-11	2.027e-11	-10.489	-10.693	-0.204	(0)
	BaCO ₃	2.341e-11	2.341e-11	-10.631	-10.631	0.000	(0)
	CdHCO ₃ +	2.683e-12	2.386e-12	-11.571	-11.622	-0.051	(0)
	Cd (CO ₃) 2-2	1.485e-12	9.284e-13	-11.828	-12.032	-0.204	(0)
	FeHCO ₃ +	8.023e-15	7.273e-15	-14.096	-14.138	-0.043	(0)
	HgCO ₃	2.394e-16	2.394e-16	-15.621	-15.621	0.000	(0)
	Hg (CO ₃) 2-2	1.112e-17	6.953e-18	-16.954	-17.158	-0.204	(0)
	HgHCO ₃ +	4.117e-20	3.661e-20	-19.385	-19.436	-0.051	(0)
Ca	7.579e-04						
	Ca+2	6.382e-04	4.222e-04	-3.195	-3.374	-0.179	(0)
	CaSO ₄	9.916e-05	9.916e-05	-4.004	-4.004	0.000	(0)
	CaHCO ₃ +	1.395e-05	1.265e-05	-4.855	-4.898	-0.043	(0)
	CaCO ₃	6.145e-06	6.145e-06	-5.211	-5.211	0.000	(0)
	CaF+	4.315e-07	3.901e-07	-6.365	-6.409	-0.044	(0)
	CaH ₂ BO ₃ +	1.934e-08	1.735e-08	-7.714	-7.761	-0.047	(0)
	CaOH+	1.139e-08	1.033e-08	-7.943	-7.986	-0.043	(0)
	CaNH ₃ +2	7.512e-12	4.695e-12	-11.124	-11.328	-0.204	(0)
	CaNO ₃ +	7.026e-13	6.247e-13	-12.153	-12.204	-0.051	(0)
	Ca (NH ₃) 2+2	2.642e-20	1.651e-20	-19.578	-19.782	-0.204	(0)
Cd	1.437e-09						
	Cd+2	9.846e-10	6.514e-10	-9.007	-9.186	-0.179	(0)
	CdSO ₄	1.566e-10	1.566e-10	-9.805	-9.805	0.000	(0)
	CdCl+	1.366e-10	1.215e-10	-9.865	-9.916	-0.051	(0)
	CdCO ₃	1.364e-10	1.364e-10	-9.865	-9.865	0.000	(0)
	CdOH+	7.134e-12	6.343e-12	-11.147	-11.198	-0.051	(0)
	CdOHC1	6.107e-12	6.107e-12	-11.214	-11.214	0.000	(0)
	Cd (SO ₄) 2-2	3.464e-12	2.165e-12	-11.460	-11.665	-0.204	(0)
	CdHCO ₃ +	2.683e-12	2.386e-12	-11.571	-11.622	-0.051	(0)
	Cd (CO ₃) 2-2	1.485e-12	9.284e-13	-11.828	-12.032	-0.204	(0)
	CdCl ₂	9.885e-13	9.885e-13	-12.005	-12.005	0.000	(0)
	CdF+	9.830e-13	8.740e-13	-12.007	-12.058	-0.051	(0)
	Cd (OH) 2	4.906e-14	4.906e-14	-13.309	-13.309	0.000	(0)
	CdCl ₃ -	1.369e-15	1.218e-15	-14.863	-14.914	-0.051	(0)
	CdF ₂	1.476e-16	1.476e-16	-15.831	-15.831	0.000	(0)
	Cd (OH) 3-	4.132e-18	3.674e-18	-17.384	-17.435	-0.051	(0)
	CdNO ₃ +	1.084e-18	9.638e-19	-17.965	-18.016	-0.051	(0)
	CdSeO ₄	8.933e-19	8.933e-19	-18.049	-18.049	0.000	(0)
	Cd ₂ OH+3	5.962e-20	2.071e-20	-19.225	-19.684	-0.459	(0)
	Cd (SeO ₃) 2-2	1.772e-20	1.108e-20	-19.751	-19.956	-0.204	(0)
	Cd (OH) 4-2	1.180e-24	7.372e-25	-23.928	-24.132	-0.204	(0)
	Cd (NO ₃) 2	2.260e-28	2.260e-28	-27.646	-27.646	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.013	-79.064	-0.051	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.746	-149.746	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.682	-225.733	-0.051	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.219	-301.423	-0.204	(0)
Cl	2.165e-03						
	Cl-	2.165e-03	1.952e-03	-2.665	-2.709	-0.045	(0)
	MnCl+	1.014e-08	9.167e-09	-7.994	-8.038	-0.044	(0)
	ZnOHC1	3.085e-09	3.085e-09	-8.511	-8.511	0.000	(0)
	AgCl	2.189e-09	2.189e-09	-8.660	-8.660	0.000	(0)
	ZnCl+	2.132e-09	1.922e-09	-8.671	-8.716	-0.045	(0)
	AgCl ₂ -	4.185e-10	3.721e-10	-9.378	-9.429	-0.051	(0)
	CuCl	3.497e-10	3.497e-10	-9.456	-9.456	0.000	(0)
	CuCl ₂ -	1.583e-10	1.427e-10	-9.801	-9.846	-0.045	(0)
	CdCl+	1.366e-10	1.215e-10	-9.865	-9.916	-0.051	(0)
	NiCl+	4.142e-11	3.683e-11	-10.383	-10.434	-0.051	(0)
	CoCl+	3.880e-11	3.450e-11	-10.411	-10.462	-0.051	(0)
	CuCl+	2.967e-11	2.674e-11	-10.528	-10.573	-0.045	(0)
	MnCl ₂	2.528e-11	2.528e-11	-10.597	-10.597	0.000	(0)
	CdOHC1	6.107e-12	6.107e-12	-11.214	-11.214	0.000	(0)
	ZnCl ₂	5.947e-12	5.947e-12	-11.226	-11.226	0.000	(0)
	PbCl+	2.160e-12	1.921e-12	-11.666	-11.717	-0.051	(0)
	AgCl ₃ -2	1.036e-12	6.475e-13	-11.985	-12.189	-0.204	(0)
	CdCl ₂	9.885e-13	9.885e-13	-12.005	-12.005	0.000	(0)

HgClOH	9.206e-14	9.206e-14	-13.036	-13.036	0.000	(0)
CuCl3-2	8.916e-14	5.954e-14	-13.050	-13.225	-0.175	(0)
CuCl2	1.810e-14	1.810e-14	-13.742	-13.742	0.000	(0)
PbCl2	1.675e-14	1.675e-14	-13.776	-13.776	0.000	(0)
MnCl3-	1.504e-14	1.359e-14	-13.823	-13.867	-0.044	(0)
ZnCl3-	1.023e-14	9.223e-15	-13.990	-14.035	-0.045	(0)
HgCl2	8.303e-15	8.303e-15	-14.081	-14.081	0.000	(0)
AgCl4-3	7.432e-15	2.581e-15	-14.129	-14.588	-0.459	(0)
CdCl3-	1.369e-15	1.218e-15	-14.863	-14.914	-0.051	(0)
NiCl2	3.621e-16	3.621e-16	-15.441	-15.441	0.000	(0)
HgCl3-	1.823e-16	1.621e-16	-15.739	-15.790	-0.051	(0)
PbCl3-	1.464e-17	1.302e-17	-16.834	-16.885	-0.051	(0)
ZnCl4-2	1.348e-17	9.004e-18	-16.870	-17.046	-0.175	(0)
UO2Cl+	4.210e-18	3.744e-18	-17.376	-17.427	-0.051	(0)
HgCl4-2	2.016e-18	1.260e-18	-17.696	-17.900	-0.204	(0)
HgCl+	9.543e-19	8.485e-19	-18.020	-18.071	-0.051	(0)
CrCl+2	5.685e-19	3.553e-19	-18.245	-18.449	-0.204	(0)
CuCl3-	3.659e-19	3.298e-19	-18.437	-18.482	-0.045	(0)
PbCl4-2	1.859e-20	1.162e-20	-19.731	-19.935	-0.204	(0)
CrOHC12	1.616e-20	1.616e-20	-19.791	-19.791	0.000	(0)
FeCl+2	8.760e-23	5.850e-23	-22.058	-22.233	-0.175	(0)
CrCl2+	7.403e-23	6.582e-23	-22.131	-22.182	-0.051	(0)
CuCl4-2	4.832e-24	3.227e-24	-23.316	-23.491	-0.175	(0)
VOCl+	9.026e-25	8.025e-25	-24.045	-24.096	-0.051	(0)
FeCl2+	5.644e-25	5.102e-25	-24.248	-24.292	-0.044	(0)
CrO3Cl-	6.119e-27	5.441e-27	-26.213	-26.264	-0.051	(0)
FeCl3	9.961e-29	9.961e-29	-28.002	-28.002	0.000	(0)
CoCl+2	3.845e-37	2.403e-37	-36.415	-36.619	-0.204	(0)
UCl+3	0.000e+00	0.000e+00	-47.550	-48.010	-0.459	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.731	-50.936	-0.204	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.579	-52.783	-0.204	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.501	-65.705	-0.204	(0)
Co (2)	1.094e-08					
Co+2	8.173e-09	5.108e-09	-8.088	-8.292	-0.204	(0)
CoSO4	1.045e-09	1.045e-09	-8.981	-8.981	0.000	(0)
CoCO3	7.930e-10	7.930e-10	-9.101	-9.101	0.000	(0)
CoHCO3+	7.190e-10	6.393e-10	-9.143	-9.194	-0.051	(0)
CoOH+	1.405e-10	1.249e-10	-9.852	-9.903	-0.051	(0)
CoCl+	3.880e-11	3.450e-11	-10.411	-10.462	-0.051	(0)
CoF+	1.538e-11	1.368e-11	-10.813	-10.864	-0.051	(0)
Co (OH) 2	1.217e-11	1.217e-11	-10.915	-10.915	0.000	(0)
CoNO2+	5.365e-14	4.770e-14	-13.270	-13.321	-0.051	(0)
Co (NH3) +2	8.679e-15	5.425e-15	-14.062	-14.266	-0.204	(0)
Co (OH) 3-	3.347e-16	2.976e-16	-15.475	-15.526	-0.051	(0)
CoOOH-	8.398e-17	7.467e-17	-16.076	-16.127	-0.051	(0)
CoSeO4	1.885e-17	1.885e-17	-16.725	-16.725	0.000	(0)
CoNO3+	4.260e-18	3.788e-18	-17.371	-17.422	-0.051	(0)
Co2OH+3	9.209e-20	3.199e-20	-19.036	-19.495	-0.459	(0)
Co (NH3) 2+2	3.270e-21	2.044e-21	-20.485	-20.690	-0.204	(0)
Co (OH) 4-2	9.250e-23	5.781e-23	-22.034	-22.238	-0.204	(0)
Co (NO3) 2	3.606e-27	3.606e-27	-26.443	-26.443	0.000	(0)
Co (NH3) 3+2	3.637e-28	2.273e-28	-27.439	-27.643	-0.204	(0)
Co4 (OH) 4+4	3.186e-31	4.862e-32	-30.497	-31.313	-0.816	(0)
Co (NH3) 4+2	1.686e-35	1.054e-35	-34.773	-34.977	-0.204	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.607	-42.811	-0.204	(0)
Co (3)	6.029e-30					
CoOH+2	6.029e-30	3.768e-30	-29.220	-29.424	-0.204	(0)
Co+3	1.533e-36	6.049e-37	-35.815	-36.218	-0.404	(0)
CoCl+2	3.845e-37	2.403e-37	-36.415	-36.619	-0.204	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.731	-50.936	-0.204	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.008	-61.059	-0.051	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.503	-64.707	-0.204	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.501	-65.705	-0.204	(0)
Cr (2)	1.807e-27					
Cr+2	1.807e-27	1.129e-27	-26.743	-26.947	-0.204	(0)
Cr (3)	9.297e-10					
Cr (OH) 2+	6.326e-10	5.625e-10	-9.199	-9.250	-0.051	(0)
Cr (OH) 3	2.590e-10	2.590e-10	-9.587	-9.587	0.000	(0)

CrO2-	1.685e-11	1.498e-11	-10.773	-10.824	-0.051	(0)
Cr(OH) 4-	1.422e-11	1.264e-11	-10.847	-10.898	-0.051	(0)
Cr(OH) +2	6.034e-12	3.771e-12	-11.219	-11.424	-0.204	(0)
CrOHSO4	9.175e-13	9.175e-13	-12.037	-12.037	0.000	(0)
CrF+2	3.019e-15	1.887e-15	-14.520	-14.724	-0.204	(0)
Cr+3	4.049e-16	1.406e-16	-15.393	-15.852	-0.459	(0)
CrSO4+	3.786e-16	3.366e-16	-15.422	-15.473	-0.051	(0)
CrCl+2	5.685e-19	3.553e-19	-18.245	-18.449	-0.204	(0)
CrOHC12	1.616e-20	1.616e-20	-19.791	-19.791	0.000	(0)
Cr2(OH) 2SO4+2	5.004e-22	3.127e-22	-21.301	-21.505	-0.204	(0)
CrCl2+	7.403e-23	6.582e-23	-22.131	-22.182	-0.051	(0)
Cr2(OH) 2(SO4) 2	1.905e-23	1.905e-23	-22.720	-22.720	0.000	(0)
CrNO3+2	4.602e-27	2.876e-27	-26.337	-26.541	-0.204	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-41.457	-41.661	-0.204	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-50.716	-51.175	-0.459	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-52.579	-52.783	-0.204	(0)
Cr(6)	3.175e-15					
CrO4-2	3.068e-15	2.030e-15	-14.513	-14.693	-0.179	(0)
HCrO4-	6.067e-17	5.394e-17	-16.217	-16.268	-0.051	(0)
NaCrO4-	4.312e-17	3.834e-17	-16.365	-16.416	-0.051	(0)
KCrO4-	3.591e-18	3.193e-18	-17.445	-17.496	-0.051	(0)
H2CrO4	3.591e-25	3.591e-25	-24.445	-24.445	0.000	(0)
CrO3SO4-2	2.214e-25	1.384e-25	-24.655	-24.859	-0.204	(0)
CrO3Cl-	6.119e-27	5.441e-27	-26.213	-26.264	-0.051	(0)
Cr2O7-2	1.614e-31	1.009e-31	-30.792	-30.996	-0.204	(0)
Cu(1)	6.681e-10					
CuCl	3.497e-10	3.497e-10	-9.456	-9.456	0.000	(0)
Cu+	1.600e-10	1.423e-10	-9.796	-9.847	-0.051	(0)
CuCl2-	1.583e-10	1.427e-10	-9.801	-9.846	-0.045	(0)
CuCl3-2	8.916e-14	5.954e-14	-13.050	-13.225	-0.175	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-145.796	-146.058	-0.262	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.536	-146.788	-0.252	(0)
Cu(2)	5.475e-07					
CuCO3	4.674e-07	4.674e-07	-6.330	-6.330	0.000	(0)
CuOH+	3.717e-08	3.350e-08	-7.430	-7.475	-0.045	(0)
Cu(CO3) 2-2	1.848e-08	1.155e-08	-7.733	-7.937	-0.204	(0)
Cu+2	1.306e-08	8.642e-09	-7.884	-8.063	-0.179	(0)
Cu(OH) 2	8.194e-09	8.194e-09	-8.087	-8.087	0.000	(0)
CuSO4	2.030e-09	2.030e-09	-8.693	-8.693	0.000	(0)
CuHCO3+	9.866e-10	8.772e-10	-9.006	-9.057	-0.051	(0)
CuF+	5.192e-11	4.616e-11	-10.285	-10.336	-0.051	(0)
Cu2(OH) 2+2	4.510e-11	2.819e-11	-10.346	-10.550	-0.204	(0)
CuCl+	2.967e-11	2.674e-11	-10.528	-10.573	-0.045	(0)
Cu(OH) 3-	2.317e-11	2.060e-11	-10.635	-10.686	-0.051	(0)
CuNO2+	1.349e-12	1.199e-12	-11.870	-11.921	-0.051	(0)
CuNH3+2	1.250e-12	7.811e-13	-11.903	-12.107	-0.204	(0)
CuCl2	1.810e-14	1.810e-14	-13.742	-13.742	0.000	(0)
Cu(OH) 4-2	3.180e-16	1.988e-16	-15.498	-15.702	-0.204	(0)
Cu(NO2) 2	1.626e-17	1.626e-17	-16.789	-16.789	0.000	(0)
CuNO3+	1.438e-17	1.279e-17	-16.842	-16.893	-0.051	(0)
CuCl3-	3.659e-19	3.298e-19	-18.437	-18.482	-0.045	(0)
CuCl4-2	4.832e-24	3.227e-24	-23.316	-23.491	-0.175	(0)
Cu(NO3) 2	7.532e-28	7.532e-28	-27.123	-27.123	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.772	-215.823	-0.051	(0)
F	9.870e-05					
F-	9.387e-05	8.466e-05	-4.027	-4.072	-0.045	(0)
MgF+	4.180e-06	3.774e-06	-5.379	-5.423	-0.044	(0)
CaF+	4.315e-07	3.901e-07	-6.365	-6.409	-0.044	(0)
NaF	2.030e-07	2.030e-07	-6.692	-6.692	0.000	(0)
MnF+	1.391e-08	1.257e-08	-7.857	-7.901	-0.044	(0)
HF	1.028e-09	1.028e-09	-8.988	-8.988	0.000	(0)
ZnF+	7.446e-10	6.620e-10	-9.128	-9.179	-0.051	(0)
BF(OH) 3-	3.802e-10	3.411e-10	-9.420	-9.467	-0.047	(0)
CuF+	5.192e-11	4.616e-11	-10.285	-10.336	-0.051	(0)
NiF+	1.764e-11	1.568e-11	-10.754	-10.805	-0.051	(0)
CoF+	1.538e-11	1.368e-11	-10.813	-10.864	-0.051	(0)
AlF2+	1.775e-12	1.606e-12	-11.751	-11.794	-0.043	(0)
AlF3	1.712e-12	1.712e-12	-11.767	-11.767	0.000	(0)

CdF+	9.830e-13	8.740e-13	-12.007	-12.058	-0.051	(0)
HF2-	3.678e-13	3.310e-13	-12.434	-12.480	-0.046	(0)
PbF+	1.860e-13	1.654e-13	-12.730	-12.781	-0.051	(0)
AgF	1.168e-13	1.168e-13	-12.933	-12.933	0.000	(0)
AlF4-	8.046e-14	7.263e-14	-13.094	-13.139	-0.044	(0)
AlF+2	7.103e-14	4.765e-14	-13.149	-13.322	-0.173	(0)
BF2(OH) 2-	2.827e-14	2.536e-14	-13.549	-13.596	-0.047	(0)
UO2F+	1.554e-14	1.382e-14	-13.809	-13.860	-0.051	(0)
UO2F2	3.374e-15	3.374e-15	-14.472	-14.472	0.000	(0)
CrF+2	3.019e-15	1.887e-15	-14.520	-14.724	-0.204	(0)
PbF2	2.756e-16	2.756e-16	-15.560	-15.560	0.000	(0)
CdF2	1.476e-16	1.476e-16	-15.831	-15.831	0.000	(0)
UO2F3-	8.068e-17	7.174e-17	-16.093	-16.144	-0.051	(0)
H2F2	2.833e-18	2.833e-18	-17.548	-17.548	0.000	(0)
FeF2+	2.308e-19	2.087e-19	-18.637	-18.681	-0.044	(0)
FeF+2	1.379e-19	9.211e-20	-18.860	-19.036	-0.175	(0)
VO2F	1.199e-19	1.199e-19	-18.921	-18.921	0.000	(0)
UO2F4-2	7.719e-20	4.824e-20	-19.112	-19.317	-0.204	(0)
PbF3-	4.977e-20	4.425e-20	-19.303	-19.354	-0.051	(0)
FeF3	2.493e-20	2.493e-20	-19.603	-19.603	0.000	(0)
BF3OH-	7.647e-21	6.860e-21	-20.116	-20.164	-0.047	(0)
VO2F2-	4.147e-21	3.687e-21	-20.382	-20.433	-0.051	(0)
VOF+	8.367e-23	7.440e-23	-22.077	-22.128	-0.051	(0)
VO2F3-2	6.229e-24	3.893e-24	-23.206	-23.410	-0.204	(0)
PbF4-2	2.869e-24	1.793e-24	-23.542	-23.746	-0.204	(0)
VOF2	2.362e-24	2.362e-24	-23.627	-23.627	0.000	(0)
HgF+	7.688e-26	6.835e-26	-25.114	-25.165	-0.051	(0)
BF4-	2.617e-26	2.347e-26	-25.582	-25.629	-0.047	(0)
VOF3-	7.979e-27	7.095e-27	-26.098	-26.149	-0.051	(0)
Sb(OH) 2F	4.374e-27	4.374e-27	-26.359	-26.359	0.000	(0)
SbOF	4.302e-27	4.302e-27	-26.366	-26.366	0.000	(0)
VO2F4-3	4.670e-28	1.622e-28	-27.331	-27.790	-0.459	(0)
VOF4-2	3.879e-30	2.424e-30	-29.411	-29.615	-0.204	(0)
SiF6-2	1.123e-30	7.502e-31	-29.949	-30.125	-0.175	(0)
UF3+	2.716e-38	2.415e-38	-37.566	-37.617	-0.051	(0)
UF2+2	2.880e-39	1.800e-39	-38.541	-38.745	-0.204	(0)
UF4	2.242e-40	2.242e-40	-39.649	-39.649	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.313	-41.772	-0.459	(0)
UF5-	0.000e+00	0.000e+00	-42.073	-42.124	-0.051	(0)
UF6-2	0.000e+00	0.000e+00	-43.512	-43.716	-0.204	(0)
Fe (2)	6.923e-13					
Fe+2	5.745e-13	3.591e-13	-12.241	-12.445	-0.204	(0)
FeSO4	9.037e-14	9.037e-14	-13.044	-13.044	0.000	(0)
FeOH+	1.938e-14	1.752e-14	-13.713	-13.756	-0.044	(0)
FeHCO3+	8.023e-15	7.273e-15	-14.096	-14.138	-0.043	(0)
Fe(OH) 2	1.706e-17	1.706e-17	-16.768	-16.768	0.000	(0)
Fe(OH) 3-	7.317e-18	6.615e-18	-17.136	-17.179	-0.044	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.267	-159.267	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.065	-235.116	-0.051	(0)
Fe (3)	9.692e-10					
Fe(OH) 3	4.931e-10	4.931e-10	-9.307	-9.307	0.000	(0)
Fe(OH) 2+	4.139e-10	3.745e-10	-9.383	-9.426	-0.043	(0)
Fe(OH) 4-	6.219e-11	5.628e-11	-10.206	-10.250	-0.043	(0)
FeOH+2	1.176e-15	7.854e-16	-14.930	-15.105	-0.175	(0)
FeF2+	2.308e-19	2.087e-19	-18.637	-18.681	-0.044	(0)
FeF+2	1.379e-19	9.211e-20	-18.860	-19.036	-0.175	(0)
FeF3	2.493e-20	2.493e-20	-19.603	-19.603	0.000	(0)
FeSO4+	1.263e-20	1.141e-20	-19.899	-19.943	-0.044	(0)
Fe+3	2.514e-21	9.923e-22	-20.600	-21.003	-0.404	(0)
Fe(SO4) 2-	2.814e-22	2.502e-22	-21.551	-21.602	-0.051	(0)
FeCl+2	8.760e-23	5.850e-23	-22.058	-22.233	-0.175	(0)
FeCl2+	5.644e-25	5.102e-25	-24.248	-24.292	-0.044	(0)
FeHSeO3+2	3.931e-26	2.457e-26	-25.406	-25.610	-0.204	(0)
Fe2(OH) 2+4	1.338e-28	2.042e-29	-27.873	-28.690	-0.816	(0)
FeCl3	9.961e-29	9.961e-29	-28.002	-28.002	0.000	(0)
FeNO3+2	7.428e-30	4.643e-30	-29.129	-29.333	-0.204	(0)
Fe3(OH) 4+5	2.086e-36	1.106e-37	-35.681	-36.956	-1.276	(0)
H (0)	1.077e-28					

H2	5.383e-29	5.396e-29	-28.269	-28.268	0.001	(0)
Hg (0)	2.272e-10					
Hg	2.272e-10	2.272e-10	-9.644	-9.644	0.000	(0)
Hg (1)	1.075e-23					
Hg2+2	5.375e-24	3.360e-24	-23.270	-23.474	-0.204	(0)
Hg (2)	3.068e-13					
Hg (OH) 2	2.060e-13	2.065e-13	-12.686	-12.685	0.001	(0)
HgClOH	9.206e-14	9.206e-14	-13.036	-13.036	0.000	(0)
HgCl2	8.303e-15	8.303e-15	-14.081	-14.081	0.000	(0)
HgCO3	2.394e-16	2.394e-16	-15.621	-15.621	0.000	(0)
HgCl3-	1.823e-16	1.621e-16	-15.739	-15.790	-0.051	(0)
Hg (CO3) 2-2	1.112e-17	6.953e-18	-16.954	-17.158	-0.204	(0)
HgCl4-2	2.016e-18	1.260e-18	-17.696	-17.900	-0.204	(0)
HgOH+	1.196e-18	1.063e-18	-17.922	-17.973	-0.051	(0)
HgCl+	9.543e-19	8.485e-19	-18.020	-18.071	-0.051	(0)
HgHCO3+	4.117e-20	3.661e-20	-19.385	-19.436	-0.051	(0)
Hg (OH) 3-	3.585e-20	3.187e-20	-19.446	-19.497	-0.051	(0)
Hg (NH3) 2+2	1.716e-21	1.072e-21	-20.766	-20.970	-0.204	(0)
HgNH3+2	1.942e-22	1.214e-22	-21.712	-21.916	-0.204	(0)
Hg+2	3.485e-23	2.178e-23	-22.458	-22.662	-0.204	(0)
HgSO4	5.847e-24	5.847e-24	-23.233	-23.233	0.000	(0)
HgF+	7.688e-26	6.835e-26	-25.114	-25.165	-0.051	(0)
Hg (NH3) 3+2	6.033e-29	3.771e-29	-28.219	-28.424	-0.204	(0)
HgNO3+	4.232e-33	3.763e-33	-32.373	-32.424	-0.051	(0)
Hg (NH3) 4+2	4.233e-36	2.646e-36	-35.373	-35.577	-0.204	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.136	-42.136	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.370	-138.421	-0.051	(0)
HgS2-2	0.000e+00	0.000e+00	-138.839	-139.043	-0.204	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.112	-140.112	0.000	(0)
K	4.729e-04					
K+	4.695e-04	4.234e-04	-3.328	-3.373	-0.045	(0)
KSO4-	3.396e-06	3.073e-06	-5.469	-5.512	-0.043	(0)
KCrO4-	3.591e-18	3.193e-18	-17.445	-17.496	-0.051	(0)
Mg	6.893e-04					
Mg+2	6.005e-04	3.973e-04	-3.221	-3.401	-0.179	(0)
MgSO4	7.411e-05	7.411e-05	-4.130	-4.130	0.000	(0)
MgHCO3+	7.256e-06	6.540e-06	-5.139	-5.184	-0.045	(0)
MgF+	4.180e-06	3.774e-06	-5.379	-5.423	-0.044	(0)
MgCO3	3.035e-06	3.035e-06	-5.518	-5.518	0.000	(0)
MgOH+	2.136e-07	1.939e-07	-6.670	-6.712	-0.042	(0)
MgH2BO3+	1.096e-08	9.836e-09	-7.960	-8.007	-0.047	(0)
Mn (2)	6.817e-06					
Mn+2	5.967e-06	3.730e-06	-5.224	-5.428	-0.204	(0)
MnSO4	6.800e-07	6.800e-07	-6.168	-6.168	0.000	(0)
MnHCO3+	1.324e-07	1.197e-07	-6.878	-6.922	-0.044	(0)
MnF+	1.391e-08	1.257e-08	-7.857	-7.901	-0.044	(0)
MnOH+	1.270e-08	1.148e-08	-7.896	-7.940	-0.044	(0)
MnCl+	1.014e-08	9.167e-09	-7.994	-8.038	-0.044	(0)
MnCl2	2.528e-11	2.528e-11	-10.597	-10.597	0.000	(0)
MnCl3-	1.504e-14	1.359e-14	-13.823	-13.867	-0.044	(0)
MnSeO4	7.393e-15	7.393e-15	-14.131	-14.131	0.000	(0)
MnNO3+	3.111e-15	2.766e-15	-14.507	-14.558	-0.051	(0)
Mn (OH) 3-	1.180e-16	1.067e-16	-15.928	-15.972	-0.044	(0)
Mn (OH) 4-2	6.320e-22	4.221e-22	-21.199	-21.375	-0.175	(0)
Mn (NO3) 2	3.251e-24	3.251e-24	-23.488	-23.488	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.250	-41.250	0.000	(0)
Mn (3)	1.255e-26					
Mn+3	1.255e-26	4.956e-27	-25.901	-26.305	-0.404	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.097	-41.273	-0.175	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.125	-46.171	-0.046	(0)
Mo	2.001e-07					
MoO4-2	2.001e-07	1.324e-07	-6.699	-6.878	-0.179	(0)
HMoO4-	2.433e-11	2.163e-11	-10.614	-10.665	-0.051	(0)
H2MoO4	1.301e-15	1.301e-15	-14.886	-14.886	0.000	(0)
Ag2MoO4	1.510e-26	1.510e-26	-25.821	-25.821	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.580	-51.039	-0.459	(0)

Mo7O24-6	0.000e+00	0.000e+00	-58.004	-59.841	-1.837	(0)
HMo7O24-5	0.000e+00	0.000e+00	-60.264	-61.540	-1.276	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-64.027	-64.843	-0.816	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-69.223	-69.683	-0.459	(0)
N (-3)	1.522e-07					
NH4+	1.418e-07	1.272e-07	-6.848	-6.895	-0.047	(0)
NH3	8.833e-09	8.833e-09	-8.054	-8.054	0.000	(0)
NH4SO4-	1.546e-09	1.398e-09	-8.811	-8.855	-0.044	(0)
CaNH3+2	7.512e-12	4.695e-12	-11.124	-11.328	-0.204	(0)
CuNH3+2	1.250e-12	7.811e-13	-11.903	-12.107	-0.204	(0)
NiNH3+2	5.596e-14	3.498e-14	-13.252	-13.456	-0.204	(0)
AgNH3+	1.114e-14	9.902e-15	-13.953	-14.004	-0.051	(0)
Co (NH3) +2	8.679e-15	5.425e-15	-14.062	-14.266	-0.204	(0)
BaNH3+2	4.432e-17	2.770e-17	-16.353	-16.557	-0.204	(0)
Ag (NH3) 2+	7.995e-19	7.109e-19	-18.097	-18.148	-0.051	(0)
Ni (NH3) 2+2	7.145e-20	4.466e-20	-19.146	-19.350	-0.204	(0)
Ca (NH3) 2+2	2.642e-20	1.651e-20	-19.578	-19.782	-0.204	(0)
Co (NH3) 2+2	3.270e-21	2.044e-21	-20.485	-20.690	-0.204	(0)
Hg (NH3) 2+2	1.716e-21	1.072e-21	-20.766	-20.970	-0.204	(0)
HgNH3+2	1.942e-22	1.214e-22	-21.712	-21.916	-0.204	(0)
Co (NH3) 3+2	3.637e-28	2.273e-28	-27.439	-27.643	-0.204	(0)
Hg (NH3) 3+2	6.033e-29	3.771e-29	-28.219	-28.424	-0.204	(0)
Co (NH3) 4+2	1.686e-35	1.054e-35	-34.773	-34.977	-0.204	(0)
Hg (NH3) 4+2	4.233e-36	2.646e-36	-35.373	-35.577	-0.204	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.457	-41.661	-0.204	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.607	-42.811	-0.204	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.716	-51.175	-0.459	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.731	-50.936	-0.204	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.579	-52.783	-0.204	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.008	-61.059	-0.051	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.503	-64.707	-0.204	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.501	-65.705	-0.204	(0)
N (3)	1.475e-06					
NO2-	1.475e-06	1.325e-06	-5.831	-5.878	-0.046	(0)
CuNO2+	1.349e-12	1.199e-12	-11.870	-11.921	-0.051	(0)
AgNO2	1.520e-13	1.520e-13	-12.818	-12.818	0.000	(0)
CoNO2+	5.365e-14	4.770e-14	-13.270	-13.321	-0.051	(0)
Cu (NO2) 2	1.626e-17	1.626e-17	-16.789	-16.789	0.000	(0)
Ag (NO2) 2-	3.509e-19	3.120e-19	-18.455	-18.506	-0.051	(0)
N (5)	5.195e-10					
NO3-	5.188e-10	4.679e-10	-9.285	-9.330	-0.045	(0)
CaNO3+	7.026e-13	6.247e-13	-12.153	-12.204	-0.051	(0)
MnNO3+	3.111e-15	2.766e-15	-14.507	-14.558	-0.051	(0)
ZnNO3+	5.181e-16	4.606e-16	-15.286	-15.337	-0.051	(0)
CuNO3+	1.438e-17	1.279e-17	-16.842	-16.893	-0.051	(0)
BaNO3+	1.311e-17	1.166e-17	-16.882	-16.933	-0.051	(0)
NiNO3+	9.747e-18	8.666e-18	-17.011	-17.062	-0.051	(0)
CoNO3+	4.260e-18	3.788e-18	-17.371	-17.422	-0.051	(0)
CdNO3+	1.084e-18	9.638e-19	-17.965	-18.016	-0.051	(0)
PbNO3+	2.158e-19	1.919e-19	-18.666	-18.717	-0.051	(0)
AgNO3	2.041e-19	2.041e-19	-18.690	-18.690	0.000	(0)
Mn (NO3) 2	3.251e-24	3.251e-24	-23.488	-23.488	0.000	(0)
UO2NO3+	1.241e-24	1.104e-24	-23.906	-23.957	-0.051	(0)
Zn (NO3) 2	4.300e-26	4.300e-26	-25.366	-25.366	0.000	(0)
CrNO3+2	4.602e-27	2.876e-27	-26.337	-26.541	-0.204	(0)
Co (NO3) 2	3.606e-27	3.606e-27	-26.443	-26.443	0.000	(0)
Cu (NO3) 2	7.532e-28	7.532e-28	-27.123	-27.123	0.000	(0)
Cd (NO3) 2	2.260e-28	2.260e-28	-27.646	-27.646	0.000	(0)
VO2NO3	1.912e-28	1.912e-28	-27.719	-27.719	0.000	(0)
Pb (NO3) 2	1.525e-28	1.525e-28	-27.817	-27.817	0.000	(0)
FeNO3+2	7.428e-30	4.643e-30	-29.129	-29.333	-0.204	(0)
HgNO3+	4.232e-33	3.763e-33	-32.373	-32.424	-0.051	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-42.136	-42.136	0.000	(0)
Na	4.242e-03					
Na+	4.215e-03	3.801e-03	-2.375	-2.420	-0.045	(0)
NaSO4-	2.312e-05	2.093e-05	-4.636	-4.679	-0.043	(0)
NaHCO3	3.439e-06	3.439e-06	-5.464	-5.464	0.000	(0)
NaCO3-	7.183e-07	6.500e-07	-6.144	-6.187	-0.043	(0)

	NaF	2.030e-07	2.030e-07	-6.692	-6.692	0.000	(0)
	NaH2BO3	4.302e-09	4.302e-09	-8.366	-8.366	0.000	(0)
	NaCrO4-	4.312e-17	3.834e-17	-16.365	-16.416	-0.051	(0)
Ni		1.702e-08					
	Ni+2	1.115e-08	7.373e-09	-7.953	-8.132	-0.179	(0)
	NiCO3	2.526e-09	2.526e-09	-8.597	-8.597	0.000	(0)
	NiHCO3+	1.645e-09	1.462e-09	-8.784	-8.835	-0.051	(0)
	NiSO4	1.508e-09	1.508e-09	-8.822	-8.822	0.000	(0)
	NiOH+	1.280e-10	1.138e-10	-9.893	-9.944	-0.051	(0)
	NiCl+	4.142e-11	3.683e-11	-10.383	-10.434	-0.051	(0)
	NiF+	1.764e-11	1.568e-11	-10.754	-10.805	-0.051	(0)
	Ni(OH)2	1.108e-11	1.108e-11	-10.955	-10.955	0.000	(0)
	Ni(SO4)2-2	8.193e-14	5.120e-14	-13.087	-13.291	-0.204	(0)
	NiNH3+2	5.596e-14	3.498e-14	-13.252	-13.456	-0.204	(0)
	Ni(OH)3-	1.528e-14	1.358e-14	-13.816	-13.867	-0.051	(0)
	NiCl2	3.621e-16	3.621e-16	-15.441	-15.441	0.000	(0)
	NiSeO4	2.540e-17	2.540e-17	-16.595	-16.595	0.000	(0)
	NiNO3+	9.747e-18	8.666e-18	-17.011	-17.062	-0.051	(0)
	Ni(NH3)2+2	7.145e-20	4.466e-20	-19.146	-19.350	-0.204	(0)
O(0)		3.473e-36					
	O2	1.736e-36	1.740e-36	-35.760	-35.759	0.001	(0)
Pb		9.928e-10					
	PbCO3	7.655e-10	7.655e-10	-9.116	-9.116	0.000	(0)
	PbOH+	9.602e-11	8.537e-11	-10.018	-10.069	-0.051	(0)
	Pb+2	4.191e-11	2.773e-11	-10.378	-10.557	-0.179	(0)
	PbHCO3+	3.728e-11	3.314e-11	-10.429	-10.480	-0.051	(0)
	Pb(CO3)2-2	3.244e-11	2.027e-11	-10.489	-10.693	-0.204	(0)
	PbSO4	1.392e-11	1.392e-11	-10.856	-10.856	0.000	(0)
	Pb(OH)2	3.309e-12	3.309e-12	-11.480	-11.480	0.000	(0)
	PbCl+	2.160e-12	1.921e-12	-11.666	-11.717	-0.051	(0)
	PbF+	1.860e-13	1.654e-13	-12.730	-12.781	-0.051	(0)
	Pb(SO4)2-2	1.376e-13	8.600e-14	-12.861	-13.065	-0.204	(0)
	PbCl2	1.675e-14	1.675e-14	-13.776	-13.776	0.000	(0)
	Pb(OH)3-	4.563e-15	4.057e-15	-14.341	-14.392	-0.051	(0)
	PbF2	2.756e-16	2.756e-16	-15.560	-15.560	0.000	(0)
	PbCl3-	1.464e-17	1.302e-17	-16.834	-16.885	-0.051	(0)
	Pb(OH)4-2	1.949e-18	1.218e-18	-17.710	-17.914	-0.204	(0)
	PbNO3+	2.158e-19	1.919e-19	-18.666	-18.717	-0.051	(0)
	Pb2OH+3	1.080e-19	3.751e-20	-18.967	-19.426	-0.459	(0)
	PbF3-	4.977e-20	4.425e-20	-19.303	-19.354	-0.051	(0)
	PbCl4-2	1.859e-20	1.162e-20	-19.731	-19.935	-0.204	(0)
	Pb3(OH)4+2	9.694e-24	6.059e-24	-23.013	-23.218	-0.204	(0)
	PbF4-2	2.869e-24	1.793e-24	-23.542	-23.746	-0.204	(0)
	Pb(NO3)2	1.525e-28	1.525e-28	-27.817	-27.817	0.000	(0)
	Pb4(OH)4+4	8.744e-30	1.334e-30	-29.058	-29.875	-0.816	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-151.059	-151.059	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-227.594	-227.646	-0.051	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.332	-73.332	0.000	(0)
	HS-	0.000e+00	0.000e+00	-77.835	-77.886	-0.051	(0)
	H2S	0.000e+00	0.000e+00	-78.952	-78.952	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-78.962	-79.166	-0.204	(0)
	CdHS+	0.000e+00	0.000e+00	-79.013	-79.064	-0.051	(0)
	S6-2	0.000e+00	0.000e+00	-79.477	-79.682	-0.204	(0)
	S4-2	0.000e+00	0.000e+00	-79.557	-79.761	-0.204	(0)
	S3-2	0.000e+00	0.000e+00	-80.363	-80.567	-0.204	(0)
	S2-2	0.000e+00	0.000e+00	-81.379	-81.583	-0.204	(0)
	S-2	0.000e+00	0.000e+00	-86.925	-87.101	-0.175	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.370	-138.421	-0.051	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.839	-139.043	-0.204	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-140.112	-140.112	0.000	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-145.796	-146.058	-0.262	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-146.379	-146.516	-0.137	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-146.536	-146.788	-0.252	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-147.067	-147.118	-0.051	(0)
	ZnS(HS)-	0.000e+00	0.000e+00	-147.232	-147.284	-0.051	(0)
	Ag(S4)2-3	0.000e+00	0.000e+00	-147.604	-147.871	-0.267	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-147.925	-148.182	-0.257	(0)

Zn (HS) 2	0.000e+00	0.000e+00	-149.359	-149.359	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.746	-149.746	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.059	-151.059	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.267	-159.267	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.772	-215.823	-0.051	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.914	-223.965	-0.051	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.656	-225.860	-0.204	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.682	-225.733	-0.051	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.594	-227.646	-0.051	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.065	-235.116	-0.051	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.219	-301.423	-0.204	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.107	-303.311	-0.204	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.913	-319.117	-0.204	(0)
S (6)	1.750e-03					
SO4-2	1.550e-03	1.025e-03	-2.810	-2.989	-0.179	(0)
CaSO4	9.916e-05	9.916e-05	-4.004	-4.004	0.000	(0)
MgSO4	7.411e-05	7.411e-05	-4.130	-4.130	0.000	(0)
NaSO4-	2.312e-05	2.093e-05	-4.636	-4.679	-0.043	(0)
KSO4-	3.396e-06	3.073e-06	-5.469	-5.512	-0.043	(0)
MnSO4	6.800e-07	6.800e-07	-6.168	-6.168	0.000	(0)
ZnSO4	8.791e-08	8.791e-08	-7.056	-7.056	0.000	(0)
CuSO4	2.030e-09	2.030e-09	-8.693	-8.693	0.000	(0)
NH4SO4-	1.546e-09	1.398e-09	-8.811	-8.855	-0.044	(0)
NiSO4	1.508e-09	1.508e-09	-8.822	-8.822	0.000	(0)
Zn (SO4) 2-2	1.256e-09	7.850e-10	-8.901	-9.105	-0.204	(0)
CoSO4	1.045e-09	1.045e-09	-8.981	-8.981	0.000	(0)
HSO4-	9.115e-10	8.228e-10	-9.040	-9.085	-0.044	(0)
CdSO4	1.566e-10	1.566e-10	-9.805	-9.805	0.000	(0)
PbSO4	1.392e-11	1.392e-11	-10.856	-10.856	0.000	(0)
AgSO4-	1.263e-11	1.123e-11	-10.899	-10.950	-0.051	(0)
Cd (SO4) 2-2	3.464e-12	2.165e-12	-11.460	-11.665	-0.204	(0)
CrOHSO4	9.175e-13	9.175e-13	-12.037	-12.037	0.000	(0)
Pb (SO4) 2-2	1.376e-13	8.600e-14	-12.861	-13.065	-0.204	(0)
FeSO4	9.037e-14	9.037e-14	-13.044	-13.044	0.000	(0)
Ni (SO4) 2-2	8.193e-14	5.120e-14	-13.087	-13.291	-0.204	(0)
UO2SO4	1.835e-15	1.835e-15	-14.736	-14.736	0.000	(0)
AlSO4+	4.962e-16	4.479e-16	-15.304	-15.349	-0.044	(0)
CrSO4+	3.786e-16	3.366e-16	-15.422	-15.473	-0.051	(0)
UO2 (SO4) 2-2	3.967e-17	2.479e-17	-16.402	-16.606	-0.204	(0)
Al (SO4) 2-	5.451e-18	4.921e-18	-17.264	-17.308	-0.044	(0)
VO2SO4-	2.224e-20	1.978e-20	-19.653	-19.704	-0.051	(0)
FeSO4+	1.263e-20	1.141e-20	-19.899	-19.943	-0.044	(0)
Cr2 (OH) 2SO4+2	5.004e-22	3.127e-22	-21.301	-21.505	-0.204	(0)
Fe (SO4) 2-	2.814e-22	2.502e-22	-21.551	-21.602	-0.051	(0)
VOSO4	4.137e-23	4.137e-23	-22.383	-22.383	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.905e-23	1.905e-23	-22.720	-22.720	0.000	(0)
HgSO4	5.847e-24	5.847e-24	-23.233	-23.233	0.000	(0)
CrO3SO4-2	2.214e-25	1.384e-25	-24.655	-24.859	-0.204	(0)
VSO4+	8.981e-38	7.985e-38	-37.047	-37.098	-0.051	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.185	-43.389	-0.204	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.008	-61.059	-0.051	(0)
Sb (3)	7.958e-21					
Sb (OH) 3	4.026e-21	4.026e-21	-20.395	-20.395	0.000	(0)
HSbO2	3.931e-21	3.931e-21	-20.406	-20.406	0.000	(0)
SbO2-	8.719e-25	7.752e-25	-24.060	-24.111	-0.051	(0)
Sb (OH) 4-	4.994e-25	4.441e-25	-24.302	-24.353	-0.051	(0)
Sb (OH) 2F	4.374e-27	4.374e-27	-26.359	-26.359	0.000	(0)
SbOF	4.302e-27	4.302e-27	-26.366	-26.366	0.000	(0)
Sb (OH) 2+	9.032e-28	8.031e-28	-27.044	-27.095	-0.051	(0)
SbO+	3.114e-28	2.769e-28	-27.507	-27.558	-0.051	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.913	-319.117	-0.204	(0)
Sb (5)	3.032e-09					
SbO3-	3.029e-09	2.693e-09	-8.519	-8.570	-0.051	(0)
Sb (OH) 6-	3.491e-12	3.148e-12	-11.457	-11.502	-0.045	(0)
SbO2+	5.860e-26	5.211e-26	-25.232	-25.283	-0.051	(0)
Se (-2)	8.993e-15					
Ag2Se	8.993e-15	8.993e-15	-14.046	-14.046	0.000	(0)

HSe-	3.382e-39	3.007e-39	-38.471	-38.522	-0.051	(0)
MnSe	0.000e+00	0.000e+00	-41.250	-41.250	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.717	-42.717	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.232	-45.436	-0.204	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.740	-82.557	-0.816	(0)
Se (4)	1.781e-08					
HSeO3-	1.054e-08	9.370e-09	-7.977	-8.028	-0.051	(0)
SeO3-2	7.268e-09	4.542e-09	-8.139	-8.343	-0.204	(0)
H2SeO3	3.283e-14	3.283e-14	-13.484	-13.484	0.000	(0)
AgSeO3-	1.803e-15	1.603e-15	-14.744	-14.795	-0.051	(0)
Cd (SeO3) 2-2	1.772e-20	1.108e-20	-19.751	-19.956	-0.204	(0)
Ag (SeO3) 2-3	1.877e-22	6.518e-23	-21.727	-22.186	-0.459	(0)
FeHSeO3+2	3.931e-26	2.457e-26	-25.406	-25.610	-0.204	(0)
Se (6)	1.114e-11					
SeO4-2	1.113e-11	7.364e-12	-10.953	-11.133	-0.179	(0)
MnSeO4	7.393e-15	7.393e-15	-14.131	-14.131	0.000	(0)
ZnSeO4	4.470e-16	4.470e-16	-15.350	-15.350	0.000	(0)
NiSeO4	2.540e-17	2.540e-17	-16.595	-16.595	0.000	(0)
CoSeO4	1.885e-17	1.885e-17	-16.725	-16.725	0.000	(0)
HSeO4-	3.409e-18	3.031e-18	-17.467	-17.518	-0.051	(0)
CdSeO4	8.933e-19	8.933e-19	-18.049	-18.049	0.000	(0)
Zn (SeO4) 2-2	5.341e-27	3.338e-27	-26.272	-26.477	-0.204	(0)
Si	3.008e-04					
H4SiO4	2.950e-04	2.957e-04	-3.530	-3.529	0.001	(0)
H3SiO4-	5.774e-06	5.205e-06	-5.238	-5.284	-0.045	(0)
H2SiO4-2	5.960e-11	3.999e-11	-10.225	-10.398	-0.173	(0)
UO2H3SiO4+	5.876e-13	5.224e-13	-12.231	-12.282	-0.051	(0)
SiF6-2	1.123e-30	7.502e-31	-29.949	-30.125	-0.175	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.810	-60.270	-0.459	(0)
U (4)	2.282e-20					
U (OH) 5-	2.281e-20	2.028e-20	-19.642	-19.693	-0.051	(0)
U (OH) 4	6.977e-24	6.977e-24	-23.156	-23.156	0.000	(0)
U (OH) 3+	2.356e-28	2.095e-28	-27.628	-27.679	-0.051	(0)
U (OH) 2+2	1.273e-33	7.958e-34	-32.895	-33.099	-0.204	(0)
UF3+	2.716e-38	2.415e-38	-37.566	-37.617	-0.051	(0)
UF2+2	2.880e-39	1.800e-39	-38.541	-38.745	-0.204	(0)
UOH+3	8.863e-40	3.079e-40	-39.052	-39.512	-0.459	(0)
UF4	2.242e-40	2.242e-40	-39.649	-39.649	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.313	-41.772	-0.459	(0)
UF5-	0.000e+00	0.000e+00	-42.073	-42.124	-0.051	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.185	-43.389	-0.204	(0)
UF6-2	0.000e+00	0.000e+00	-43.512	-43.716	-0.204	(0)
U+4	0.000e+00	0.000e+00	-46.184	-47.000	-0.816	(0)
UCl+3	0.000e+00	0.000e+00	-47.550	-48.010	-0.459	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-173.741	-177.874	-4.133	(0)
U (5)	2.725e-17					
UO2+	2.725e-17	2.423e-17	-16.565	-16.616	-0.051	(0)
U (6)	3.661e-08					
UO2 (CO3) 3-4	2.389e-08	3.646e-09	-7.622	-8.438	-0.816	(0)
UO2 (CO3) 2-2	1.267e-08	7.921e-09	-7.897	-8.101	-0.204	(0)
UO2CO3	4.323e-11	4.323e-11	-10.364	-10.364	0.000	(0)
UO2H3SiO4+	5.876e-13	5.224e-13	-12.231	-12.282	-0.051	(0)
UO2OH+	2.052e-13	1.825e-13	-12.688	-12.739	-0.051	(0)
UO2F+	1.554e-14	1.382e-14	-13.809	-13.860	-0.051	(0)
UO2F2	3.374e-15	3.374e-15	-14.472	-14.472	0.000	(0)
UO2SO4	1.835e-15	1.835e-15	-14.736	-14.736	0.000	(0)
UO2+2	1.787e-15	1.182e-15	-14.748	-14.927	-0.179	(0)
UO2F3-	8.068e-17	7.174e-17	-16.093	-16.144	-0.051	(0)
UO2 (SO4) 2-2	3.967e-17	2.479e-17	-16.402	-16.606	-0.204	(0)
UO2Cl+	4.210e-18	3.744e-18	-17.376	-17.427	-0.051	(0)
(UO2) 2 (OH) 2+2	8.840e-20	5.525e-20	-19.054	-19.258	-0.204	(0)
UO2F4-2	7.719e-20	4.824e-20	-19.112	-19.317	-0.204	(0)
(UO2) 3 (OH) 5+	1.292e-20	1.149e-20	-19.889	-19.940	-0.051	(0)
UO2NO3+	1.241e-24	1.104e-24	-23.906	-23.957	-0.051	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.917	-43.968	-0.051	(0)

V+2	0.000e+00	0.000e+00	-45.362	-45.566	-0.204	(0)
V(3)	2.452e-16					
V(OH) 3	2.452e-16	2.452e-16	-15.611	-15.611	0.000	(0)
V(OH) 2+	1.463e-27	1.301e-27	-26.835	-26.886	-0.051	(0)
VOH+2	1.622e-31	1.014e-31	-30.790	-30.994	-0.204	(0)
V+3	4.750e-37	1.650e-37	-36.323	-36.783	-0.459	(0)
VSO4+	8.981e-38	7.985e-38	-37.047	-37.098	-0.051	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-58.969	-59.428	-0.459	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-60.372	-61.188	-0.816	(0)
V(4)	4.066e-20					
V(OH) 3+	4.030e-20	3.583e-20	-19.395	-19.446	-0.051	(0)
VO+2	2.344e-22	1.465e-22	-21.630	-21.834	-0.204	(0)
VOF+	8.367e-23	7.440e-23	-22.077	-22.128	-0.051	(0)
VOSO4	4.137e-23	4.137e-23	-22.383	-22.383	0.000	(0)
VOF2	2.362e-24	2.362e-24	-23.627	-23.627	0.000	(0)
VOC1+	9.026e-25	8.025e-25	-24.045	-24.096	-0.051	(0)
VOF3-	7.979e-27	7.095e-27	-26.098	-26.149	-0.051	(0)
VOF4-2	3.879e-30	2.424e-30	-29.411	-29.615	-0.204	(0)
H2V2O4+2	1.030e-34	6.437e-35	-33.987	-34.191	-0.204	(0)
V(5)	9.685e-10					
H2VO4-	6.748e-10	6.000e-10	-9.171	-9.222	-0.051	(0)
HVO4-2	2.936e-10	1.835e-10	-9.532	-9.736	-0.204	(0)
H3VO4	4.928e-14	4.928e-14	-13.307	-13.307	0.000	(0)
VO4-3	3.225e-16	1.120e-16	-15.492	-15.951	-0.459	(0)
H3V2O7-	2.148e-16	1.909e-16	-15.668	-15.719	-0.051	(0)
HV2O7-3	1.075e-16	3.732e-17	-15.969	-16.428	-0.459	(0)
VO2+	8.957e-19	8.078e-19	-18.048	-18.093	-0.045	(0)
V2O7-4	8.016e-19	1.223e-19	-18.096	-18.913	-0.816	(0)
VO2F	1.199e-19	1.199e-19	-18.921	-18.921	0.000	(0)
VO2SO4-	2.224e-20	1.978e-20	-19.653	-19.704	-0.051	(0)
VO2F2-	4.147e-21	3.687e-21	-20.382	-20.433	-0.051	(0)
V3O9-3	6.517e-22	2.264e-22	-21.186	-21.645	-0.459	(0)
VO2F3-2	6.229e-24	3.893e-24	-23.206	-23.410	-0.204	(0)
VO2F4-3	4.670e-28	1.622e-28	-27.331	-27.790	-0.459	(0)
V4O12-4	3.711e-28	5.663e-29	-27.430	-28.247	-0.816	(0)
VO2NO3	1.912e-28	1.912e-28	-27.719	-27.719	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-73.817	-75.654	-1.837	(0)
HV10O28-5	0.000e+00	0.000e+00	-74.277	-75.552	-1.276	(0)
H2V10O28-4	0.000e+00	0.000e+00	-77.614	-78.430	-0.816	(0)
Zn	9.805e-07					
Zn+2	5.924e-07	3.919e-07	-6.227	-6.407	-0.179	(0)
ZnCO3	2.071e-07	2.071e-07	-6.684	-6.684	0.000	(0)
ZnSO4	8.791e-08	8.791e-08	-7.056	-7.056	0.000	(0)
ZnOH+	5.403e-08	4.804e-08	-7.267	-7.318	-0.051	(0)
ZnHCO3+	2.243e-08	1.994e-08	-7.649	-7.700	-0.051	(0)
Zn(OH) 2	9.334e-09	9.334e-09	-8.030	-8.030	0.000	(0)
ZnOHCl	3.085e-09	3.085e-09	-8.511	-8.511	0.000	(0)
ZnCl+	2.132e-09	1.922e-09	-8.671	-8.716	-0.045	(0)
Zn(SO4) 2-2	1.256e-09	7.850e-10	-8.901	-9.105	-0.204	(0)
ZnF+	7.446e-10	6.620e-10	-9.128	-9.179	-0.051	(0)
Zn(OH) 3-	6.450e-11	5.735e-11	-10.190	-10.241	-0.051	(0)
ZnCl2	5.947e-12	5.947e-12	-11.226	-11.226	0.000	(0)
ZnCl3-	1.023e-14	9.223e-15	-13.990	-14.035	-0.045	(0)
Zn(OH) 4-2	4.478e-15	2.799e-15	-14.349	-14.553	-0.204	(0)
ZnNO3+	5.181e-16	4.606e-16	-15.286	-15.337	-0.051	(0)
ZnSeO4	4.470e-16	4.470e-16	-15.350	-15.350	0.000	(0)
ZnCl4-2	1.348e-17	9.004e-18	-16.870	-17.046	-0.175	(0)
Zn(NO3) 2	4.300e-26	4.300e-26	-25.366	-25.366	0.000	(0)
Zn(SeO4) 2-2	5.341e-27	3.338e-27	-26.272	-26.477	-0.204	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.232	-147.284	-0.051	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.359	-149.359	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-223.914	-223.965	-0.051	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.656	-225.860	-0.204	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.107	-303.311	-0.204	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-57.93	-51.64	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.91	-38.40	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-50.13	-38.40	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-75.00	-57.07	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-57.24	-37.21	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.89	-28.48	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-25.37	-24.92	0.45	(NH4) 2SeO4
Acanthite	-52.10	-88.32	-36.22	Ag2S
Ag2CO3	-12.47	-23.56	-11.09	Ag2CO3
Ag2CrO4	-21.62	-33.21	-11.59	Ag2CrO4
Ag2HVO4	-13.84	-12.36	1.48	Ag2HVO4
Ag2MoO4	-13.85	-25.40	-11.55	Ag2MoO4
Ag2O	-14.92	-2.35	12.57	Ag2O
Ag2Se	-0.26	-48.96	-48.70	Ag2Se
Ag2SeO3	-11.31	-18.46	-7.15	Ag2SeO3
Ag2SeO4	-20.74	-29.65	-8.91	Ag2SeO4
Ag2SO4	-16.69	-21.51	-4.82	Ag2SO4
Ag3AsO3	-27.41	-25.26	2.16	Ag3AsO3
Ag3AsO4	-16.25	-19.04	-2.79	Ag3AsO4
Ag3H2VO5	-18.71	-13.53	5.18	Ag3H2VO5
AgF:4H2O	-14.38	-13.33	1.05	AgF:4H2O
Agmetal	-0.23	-13.73	-13.51	Ag
AgVO3	-11.95	-11.18	0.77	AgVO3
Al (OH) 3 (am)	-2.79	8.01	10.80	Al (OH) 3
Al2 (MoO4) 3	-55.50	-53.13	2.37	Al2 (MoO4) 3
Al2O3	-3.64	16.01	19.65	Al2O3
Al4 (OH) 10SO4	-9.83	12.87	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.31	-7.51	4.80	AlAsO4:2H2O
AlOHSO4	-7.92	-11.15	-3.23	AlOHSO4
AlSb	-153.37	-87.74	65.62	AlSb
Alunite	-8.19	-9.59	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.76	-13.55	-7.79	PbSO4
Anhydrite	-2.00	-6.36	-4.36	CaSO4
Anilite	-54.71	-86.59	-31.88	Cu0.25Cu1.5S
Antlerite	-3.63	5.16	8.79	Cu3 (OH) 4SO4
Aragonite	-0.11	-8.41	-8.30	CaCO3
Arsenolite	-84.17	-86.93	-2.76	As4O6
Artinite	-5.27	4.33	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.73	-31.02	6.71	As2O5
Atacamite	-1.97	5.42	7.39	Cu2 (OH) 3Cl
Azurite	-1.19	-18.09	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.53	7.87	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-20.15	-4.28	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	1.49	-7.42	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-29.35	3.59	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.33	-23.00	-9.67	BaCrO4
BaF2	-10.63	-16.45	-5.82	BaF2
BaMoO4	-8.22	-15.18	-6.96	BaMoO4
Barite	-1.31	-11.29	-9.98	BaSO4
BaS	-94.28	-78.10	16.18	BaS
BaSeO3	-10.08	-8.25	1.83	BaSeO3
BaSeO4	-11.98	-19.44	-7.46	BaSeO4
Bianchite	-7.63	-9.40	-1.76	ZnSO4:6H2O
Birnessite	-7.58	10.51	18.09	MnO2
Bixbyite	-3.45	-4.10	-0.64	Mn2O3
BlaubleiI	-54.87	-79.03	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.24	-82.52	-27.28	Cu0.6Cu0.8S
Boehmite	-0.57	8.01	8.58	AlOOH
Breithauptite	-56.63	-75.15	-18.52	NiSb
Brochantite	-1.95	13.27	15.22	Cu4 (OH) 6SO4
Brucite	-4.07	12.77	16.84	Mg (OH) 2
Bunsenite	-4.41	8.04	12.45	NiO
Ca (VO3) 2	-12.88	-7.22	5.66	Ca (VO3) 2
Ca2V2O7	-11.92	5.58	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.97	5.58	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-14.94	7.36	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-20.59	18.37	38.96	Ca3 (VO4) 2

Ca3(VO4)2·4H2O	-21.49	18.37	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-296.08	-153.11	142.97	Ca3Sb2
CaCrO4	-15.80	-18.07	-2.27	CaCrO4
Calcite	0.07	-8.41	-8.48	CaCO3
Calomel	-10.98	-28.89	-17.91	Hg2Cl2
CaMoO4	-2.30	-10.25	-7.95	CaMoO4
Carnotite	-4.28	-4.05	0.23	KUO2VO4
CaSeO3·2H2O	-6.13	-3.32	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.49	-14.51	-3.02	CaSeO4·2H2O
Cd(BO2)2	-12.85	-3.01	9.84	Cd(BO2)2
Cd(OH)2	-6.66	6.98	13.64	Cd(OH)2
Cd(OH)2(am)	-6.75	6.98	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-24.08	-17.37	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.77	1.79	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.62	8.78	28.40	Cd4(OH)6SO4
CdCl2	-13.95	-14.61	-0.66	CdCl2
CdCl2·1H2O	-12.91	-14.61	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.69	-14.61	-1.91	CdCl2·2.5H2O
CdF2	-16.12	-17.33	-1.21	CdF2
Cdmetal(alpha)	-31.65	-18.13	13.51	Cd
Cdmetal(gamma)	-31.75	-18.13	13.62	Cd
CdMoO4	-1.91	-16.06	-14.15	CdMoO4
CdOHCl	-7.35	-3.81	3.54	CdOHCl
CdSb	-75.85	-76.20	-0.35	CdSb
CdSe	-19.42	-39.62	-20.20	CdSe
CdSeO4·2H2O	-18.47	-20.32	-1.85	CdSeO4·2H2O
CdSO4	-12.00	-12.18	-0.17	CdSO4
CdSO4·1H2O	-10.45	-12.18	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-10.30	-12.18	-1.87	CdSO4·2.67H2O
Cerargyrite	-2.22	-11.97	-9.75	AgCl
Cerrusite	-2.46	-15.59	-13.13	PbCO3
CH4(g)	-80.63	-121.68	-41.05	CH4
Chalcanthite	-8.41	-11.05	-2.64	CuSO4·5H2O
Chalcedony	0.02	-3.53	-3.55	SiO2
Chalcocite	-54.57	-89.49	-34.92	Cu2S
Chalcopyrite	-124.84	-160.11	-35.27	CuFeS2
Chrysotile	-0.95	31.25	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.96	-98.66	-45.69	HgS
Claudetite	-83.86	-86.93	-3.06	As4O6
Clausthalite	-13.89	-40.99	-27.10	PbSe
Co(BO2)2	-29.18	-2.11	27.07	Co(BO2)2
Co(OH)2	-5.21	7.88	13.09	Co(OH)2
Co(OH)3	-9.65	-11.96	-2.31	Co(OH)3
CO2(g)	-3.06	-21.21	-18.15	CO2
Co3(AsO4)2	-20.42	-7.39	13.03	Co3(AsO4)2
Co3O4	-5.55	-16.04	-10.50	Co3O4
CoCl2	-21.98	-13.71	8.27	CoCl2
CoCl2·6H2O	-16.25	-13.71	2.54	CoCl2·6H2O
CoCO3	-3.35	-13.33	-9.98	CoCO3
CoF2	-14.84	-16.44	-1.60	CoF2
CoF3	-46.98	-48.44	-1.46	CoF3
CoFe2O4	17.91	14.39	-3.53	CoFe2O4
CoMoO4	-7.41	-15.17	-7.76	CoMoO4
CoO	-5.71	7.88	13.59	CoO
CoS(alpha)	-70.65	-78.09	-7.44	CoS
CoS(beta)	-67.02	-78.09	-11.07	CoS
CoSe	-22.53	-38.73	-16.20	CoSe
CoSeO3	-9.55	-8.23	1.32	CoSeO3
CoSeO4·6H2O	-17.90	-19.43	-1.53	CoSeO4·6H2O
CoSO4	-14.08	-11.28	2.80	CoSO4
CoSO4·6H2O	-8.81	-11.28	-2.47	CoSO4·6H2O
Cotunnite	-11.20	-15.98	-4.78	PbCl2
Covellite	-55.56	-77.86	-22.30	CuS
Cr(OH)2	-21.60	-10.78	10.82	Cr(OH)2
Cr(OH)3	-2.50	-1.16	1.34	Cr(OH)3
Cr(OH)3(am)	-0.41	-1.16	-0.75	Cr(OH)3
Cr2O3	0.03	-2.33	-2.36	Cr2O3
CrCl2	-46.46	-32.37	14.09	CrCl2

CrCl3	-48.66	-33.55	15.11	CrCl3
CrF3	-26.30	-37.64	-11.34	CrF3
Cristobalite	-0.18	-3.53	-3.35	SiO2
Crmetal	-66.38	-35.89	30.48	Cr
CrO3	-27.65	-30.86	-3.21	CrO3
Cryolite	-14.10	-47.94	-33.84	Na3AlF6
Cu(OH)2	-0.57	8.11	8.67	Cu(OH)2
Cu(SbO3)2	-27.66	17.55	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-10.45	-1.20	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.52	-89.40	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.33	-50.13	-45.80	Cu2Se
Cu2SO4	-20.73	-22.68	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.80	-6.70	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.44	-101.03	-42.59	Cu3Sb
Cu3Se2	-25.14	-88.63	-63.49	Cu3Se2
CuCO3	-1.60	-13.10	-11.50	CuCO3
CuCrO4	-17.32	-22.76	-5.44	CuCrO4
CuF	-9.01	-13.92	-4.91	CuF
CuF2	-17.32	-16.21	1.12	CuF2
CuF2:2H2O	-11.66	-16.21	-4.55	CuF2:2H2O
Cumetal	-5.56	-14.32	-8.76	Cu
CuMoO4	-1.87	-14.94	-13.08	CuMoO4
CuOCuSO4	-13.25	-2.95	10.30	CuOCuSO4
Cupricferrite	8.63	14.61	5.99	CuFe2O4
Cuprite	-2.12	-3.52	-1.41	Cu2O
Cuprousferrite	10.41	1.49	-8.92	CuFeO2
CuSe	-5.40	-38.50	-33.10	CuSe
CuSe2	-26.62	-59.99	-33.37	CuSe2
CuSeO3:2H2O	-8.52	-8.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.76	-19.20	-2.44	CuSeO4:5H2O
CuSO4	-13.99	-11.05	2.94	CuSO4
Diaspore	1.13	8.01	6.87	AlOOH
Djurleite	-54.81	-88.73	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.31	-16.85	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.24	-16.85	-17.09	CaMg(CO3)2
Epsomite	-4.26	-6.39	-2.13	MgSO4:7H2O
Fe(OH)2	-9.84	3.73	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.05	0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-12.57	-16.29	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.16	-9.61	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-21.21	-41.84	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-47.24	-50.97	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.99	10.23	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.66	-12.26	0.40	FeAsO4:2H2O
FeCr2O4	-5.80	1.40	7.20	FeCr2O4
FeMoO4	-9.23	-19.32	-10.09	FeMoO4
Ferrihydrite	0.06	3.25	3.19	Fe(OH)3
Ferroselite	-45.77	-64.37	-18.60	FeSe2
FeS(ppt)	-79.30	-82.25	-2.95	FeS
FeSe	-31.88	-42.88	-11.00	FeSe
Fix_pe	-4.47	-4.47	0.00	e-
Fluorite	-1.02	-11.52	-10.50	CaF2
Galena	-66.39	-80.36	-13.97	PbS
Gibbsite	-0.28	8.01	8.29	Al(OH)3
Goethite	2.76	3.25	0.49	FeOOH
Goslarite	-7.39	-9.40	-2.01	ZnSO4:7H2O
Greenalite	-16.69	4.12	20.81	Fe3Si2O5(OH)4
Greenockite	-64.63	-78.99	-14.36	CdS
Greigite	-288.62	-333.65	-45.03	Fe3S4
Gummite	-6.43	1.24	7.67	UO3
Gypsum	-1.75	-6.36	-4.61	CaSO4:2H2O
H-Jarosite	-16.46	-28.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.17	-23.05	-12.88	H2MoO4
H2S(g)	-77.96	-85.97	-8.01	H2S
H2Se(g)	-41.65	-46.61	-4.96	H2Se
Halite	-6.73	-5.13	1.60	NaCl
Halloysite	-0.62	8.96	9.57	Al2Si2O5(OH)4
Hausmannite	-3.68	57.35	61.03	Mn3O4

Hematite	7.92	6.51	-1.42	Fe2O3
Hercynite	-3.15	19.74	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.34	-256.04	-73.71	Hg (CH3) 2
Hg (g)	-8.34	-16.21	-7.87	Hg
Hg (OH) 2	-9.19	-12.69	-3.50	Hg (OH) 2
Hg2 (g)	-17.47	-32.42	-14.96	Hg2
Hg2 (OH) 2	-12.56	-7.30	5.26	Hg2 (OH) 2
Hg2CO3	-12.46	-28.51	-16.05	Hg2CO3
Hg2CrO4	-29.47	-38.17	-8.70	Hg2CrO4
Hg2F2	-21.26	-31.62	-10.36	Hg2F2
Hg2S	-81.60	-93.27	-11.68	Hg2S
Hg2SeO3	-18.76	-23.42	-4.66	Hg2SeO3
Hg2SO4	-20.33	-26.46	-6.13	Hg2SO4
Hg3O2CO3	-29.58	-59.26	-29.68	Hg3O2CO3
HgCl (g)	-33.94	-14.45	19.50	HgCl
HgCl2	-13.01	-34.27	-21.26	HgCl2
HgF (g)	-48.48	-15.81	32.68	HgF
HgF2 (g)	-49.57	-37.00	12.57	HgF2
Hgmetal (l)	-2.76	-16.21	-13.45	Hg
HgSe	-3.60	-59.29	-55.69	HgSe
HgSeO3	-16.37	-28.80	-12.43	HgSeO3
HgSO4	-22.43	-31.85	-9.42	HgSO4
Huntite	-3.76	-33.73	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-6.80	-25.57	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.22	-20.98	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-20.43	-25.60	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-9.05	-23.85	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.06	-52.30	-17.24	K2Cr2O7
K2CrO4	-20.93	-21.44	-0.51	K2CrO4
K2MoO4	-16.89	-13.62	3.26	K2MoO4
K2SeO4	-17.15	-17.88	-0.73	K2SeO4
Kaolinite	1.52	8.96	7.43	Al2Si2O5 (OH) 4
Langite	-4.22	13.27	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.50	-7.93	-0.43	PbO : PbSO4
Laurionite	-5.80	-5.18	0.62	PbOHCl
Lepidocrocite	1.88	3.25	1.37	FeOOH
Lime	-19.90	12.80	32.70	CaO
Litharge	-7.08	5.61	12.69	PbO
Mackinawite	-78.65	-82.25	-3.60	FeS
Maghemite	0.12	6.51	6.39	Fe2O3
Magnesioferrite	2.42	19.28	16.86	Fe2MgO4
Magnesite	-0.98	-8.44	-7.46	MgCO3
Magnetite	6.83	10.23	3.40	Fe3O4
Malachite	0.31	-4.99	-5.31	Cu2 (OH) 2CO3
Manganite	-2.04	23.30	25.34	MnOOH
Massicot	-7.28	5.61	12.89	PbO
Matlockite	-8.37	-17.34	-8.97	PbClF
Melanothallite	-19.74	-13.48	6.26	CuCl2
Melanterite	-13.23	-15.43	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.56	-98.66	-45.09	HgS
Mg (OH) 2 (active)	-6.02	12.77	18.79	Mg (OH) 2
Mg (VO3) 2	-18.52	-7.24	11.28	Mg (VO3) 2
Mg2Sb3	-273.59	-198.91	74.68	Mg2Sb3
Mg2V2O7	-20.83	5.53	26.36	Mg2V2O7
MgCr2O4	-5.76	10.44	16.20	MgCr2O4
MgCrO4	-23.47	-18.09	5.38	MgCrO4
MgF2	-3.42	-11.55	-8.13	MgF2
MgMoO4	-8.43	-10.28	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.40	-3.34	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.33	-14.53	-1.20	MgSeO4 : 6H2O
Minium	-31.56	41.96	73.52	Pb3O4
Mirabilite	-6.72	-7.83	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-14.17	-9.27	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-55.87	-61.58	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.90	-86.82	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.30	1.20	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.56	-10.85	2.72	MnCl2 : 4H2O
MnS (grn)	-75.40	-75.23	0.17	MnS

MnS (pnk)	-78.57	-75.23	3.34	MnS
MnSb	-94.89	-97.80	-2.91	MnSb
MnSe	-39.36	-35.86	3.50	MnSe
MnSeO3	-6.50	-5.37	1.13	MnSeO3
MnSeO3:2H2O	-6.35	-5.37	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.51	-16.56	-2.05	MnSeO4:5H2O
MnSO4	-11.00	-8.42	2.58	MnSO4
Monteponite	-8.12	6.98	15.10	CdO
Montroydite	-9.04	-12.68	-3.64	HgO
MoO3	-15.05	-23.05	-8.00	MoO3
Morenosite	-8.98	-11.12	-2.14	NiSO4:7H2O
MoS2	-149.85	-220.11	-70.26	MoS2
Na-Jarosite	-11.70	-22.90	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.50	-50.40	-9.90	Na2Cr2O7
Na2CrO4	-22.46	-19.53	2.93	Na2CrO4
Na2Mo2O7	-18.17	-34.77	-16.60	Na2Mo2O7
Na2MoO4	-13.21	-11.72	1.49	Na2MoO4
Na2MoO4:2H2O	-12.94	-11.72	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.08	-4.78	10.30	Na2SeO3:5H2O
Na2SeO4	-17.25	-15.97	1.28	Na2SeO4
Na3Sb	-173.20	-78.75	94.45	Na3Sb
Na3VO4	-29.69	6.99	36.68	Na3VO4
Na4V2O7	-34.75	2.65	37.40	Na4V2O7
Nantokite	-5.83	-12.56	-6.73	CuCl
NaSb	-88.13	-64.97	23.17	NaSb
Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-8.20	-4.34	3.86	NaVO3
Nesquehonite	-3.77	-8.44	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.76	8.04	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-22.61	-6.91	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-19.01	12.99	32.00	Ni4 (OH) 6SO4
NiCO3	-6.30	-13.17	-6.87	NiCO3
NiMoO4	-3.87	-15.01	-11.14	NiMoO4
NiS (alpha)	-72.33	-77.93	-5.60	NiS
NiS (beta)	-66.83	-77.93	-11.10	NiS
NiS (gamma)	-65.13	-77.93	-12.80	NiS
NiSe	-20.87	-38.57	-17.70	NiSe
NiSeO3:2H2O	-10.89	-8.08	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.75	-19.27	-1.52	NiSeO4:6H2O
Nsutite	-6.99	10.51	17.50	MnO2
O2 (g)	-32.85	50.24	83.09	O2
Orpiment	-240.31	-301.38	-61.07	As2S3
Otavite	-2.22	-14.22	-12.00	CdCO3
Pb (BO2) 2	-10.90	-4.38	6.52	Pb (BO2) 2
Pb (OH) 2	-2.54	5.61	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-62.35	-71.11	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.36	0.43	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.96	11.23	26.19	Pb2O (OH) 2
Pb2O3	-24.69	36.35	61.04	Pb2O3
Pb2OCO3	-9.42	-9.98	-0.56	Pb2OCO3
Pb2V2O7	-6.89	-8.79	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.98	-14.18	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-9.31	-3.17	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.39	-4.37	11.02	Pb3O2CO3
Pb3O2SO4	-13.01	-2.32	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.81	3.29	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.58	3.30	21.88	Pb4O3SO4
PbCrO4	-12.65	-25.25	-12.60	PbCrO4
PbF2	-11.26	-18.70	-7.44	PbF2
Pbmetal	-23.75	-19.50	4.25	Pb
PbMoO4	-1.82	-17.44	-15.62	PbMoO4
PbO:0.3H2O	-7.37	5.61	12.98	PbO:0.33H2O
PbSeO4	-14.85	-21.69	-6.84	PbSeO4
Periclase	-8.81	12.77	21.58	MgO
Phosgenite	-11.76	-31.57	-19.81	PbCl2:PbCO3
Plattnerite	-18.87	30.73	49.60	PbO2
Portlandite	-10.01	12.80	22.80	Ca (OH) 2
Pyrite	-124.59	-143.10	-18.51	FeS2

Pyrochroite	-4.45	10.74	15.19	Mn(OH)2
Pyrolusite	-5.52	35.86	41.38	MnO2
Quartz	0.47	-3.53	-4.00	SiO2
Realgar	-100.52	-120.26	-19.75	AsS
Retgersite	-9.08	-11.12	-2.04	NiSO4:6H2O
Rhodochrosite	0.11	-10.47	-10.58	MnCO3
Rutherfordine	-5.46	-19.96	-14.50	UO2CO3
Sb(OH)3	-13.29	-20.40	-7.11	Sb(OH)3
Sb2O4	-19.07	-15.67	3.40	Sb2O4
Sb2O5	-29.51	-39.17	-9.67	Sb2O5
Sb2Se3	-112.85	-180.61	-67.76	Sb2Se3
Sb4O6(cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6(orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.35	-52.78	0.57	SbCl3
SbF3	-46.64	-56.87	-10.23	SbF3
Sbmetal	-46.38	-58.07	-11.69	Sb
SbO2	-4.32	-32.15	-27.82	SbO2
Schoepite	-4.75	1.24	5.99	UO2(OH)2:H2O
Semetal(am)	-14.38	-21.49	-7.11	Se
Semetal(hex)	-13.78	-21.49	-7.71	Se
Senarmontite	-28.42	-40.79	-12.37	Sb2O3
SeO2	-16.24	-16.11	0.12	SeO2
SeO3	-48.35	-27.30	21.04	SeO3
Sepiolite	-0.81	14.95	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.83	14.95	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.24	-17.48	-10.24	FeCO3
SiO2(am-gel)	-0.82	-3.53	-2.71	SiO2
SiO2(am-ppt)	-0.79	-3.53	-2.74	SiO2
Smithsonite	-1.44	-11.44	-10.00	ZnCO3
Sphalerite	-64.76	-76.21	-11.45	ZnS
Spinel	-8.06	28.78	36.85	MgAl2O4
Stibnite	-248.24	-298.70	-50.46	Sb2S3
Sulfur	-58.71	-60.85	-2.14	S
Tenorite	0.46	8.11	7.64	CuO
Thenardite	-8.15	-7.83	0.32	Na2SO4
Thermonatrite	-10.51	-9.88	0.64	Na2CO3:H2O
Tyuyamunite	-8.81	-4.73	4.08	Ca(UO2)2(VO4)2
U3O8	-14.82	6.26	21.08	U3O8
U3Sb4	-579.35	-426.97	152.38	U3Sb4
U4O9	-30.50	-33.51	-3.02	U4O9
UF4	-33.75	-63.29	-29.54	UF4
UF4:2.5H2O	-30.57	-63.29	-32.72	UF4:2.5H2O
UO2(am)	-15.59	-14.66	0.93	UO2
UO2(NO3)2	-45.73	-33.59	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-38.44	-33.59	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-36.98	-33.59	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-35.63	-33.59	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.37	1.24	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.81	-26.06	-2.25	UO2SeO4:4H2O
UO3	-6.46	1.24	7.70	UO3
Uraninite	-9.99	-14.66	-4.67	UO2
USb2	-219.83	-190.25	29.58	USb2
V(OH)3	-20.12	-12.53	7.59	V(OH)3
V2O5	-18.65	-20.01	-1.36	V2O5
V3O5	-43.94	-42.11	1.84	V3O5
V4O7	-54.96	-47.77	7.19	V4O7
V6O13	-49.42	-110.28	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VC12	-65.55	-46.67	18.87	VC12
VC13	-68.34	-44.91	23.43	VC13
VF4	-69.22	-54.29	14.93	VF4
Vmetal	-94.23	-50.20	44.03	V
VO	-39.84	-25.09	14.76	VO
VO(OH)2	-10.81	-5.66	5.15	VO(OH)2
VO2Cl	-23.64	-20.80	2.84	VO2Cl
VOC1	-34.47	-23.32	11.15	VOC1
VOC12	-40.01	-27.25	12.76	VOC12
VOSO4	-28.43	-24.82	3.61	VOSO4

Witherite	-4.77	-13.34	-8.57	BaCO3
Wurtzite	-67.26	-76.21	-8.95	ZnS
Zincite	-1.57	9.76	11.33	ZnO
Zincosite	-13.33	-9.40	3.93	ZnSO4
Zn(BO2)2	-8.52	-0.23	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.38	-25.07	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.44	9.76	12.20	Zn(OH)2
Zn(OH)2(am)	-2.71	9.76	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.99	9.76	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.77	9.76	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.97	9.76	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.13	0.37	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.46	8.73	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.38	-1.73	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.94	-9.03	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.50	19.90	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.27	27.23	38.50	Zn5(OH)8Cl2
ZnCl2	-18.88	-11.83	7.05	ZnCl2
ZnCO3:1H2O	-1.18	-11.44	-10.26	ZnCO3:1H2O
ZnF2	-14.02	-14.55	-0.53	ZnF2
Znmetal	-41.14	-15.35	25.79	Zn
ZnMoO4	-3.16	-13.28	-10.13	ZnMoO4
ZnO(active)	-1.42	9.76	11.19	ZnO
ZnS(am)	-67.16	-76.21	-9.05	ZnS
ZnSb	-84.44	-73.43	11.01	ZnSb
ZnSe	-22.44	-36.84	-14.40	ZnSe
ZnSeO4:6H2O	-16.02	-17.54	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.76	-9.40	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 80.

```
Title Return solution back to 1L
Mix 405
      412  1.1221
save solution 413
end
```

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 405.

Mixture 405.

1.122e+00 Solution 412 Solution after simulation 79.

-----Solution composition-----

Elements	Molality	Moles
Ag	3.230e-09	3.230e-09

Al	2.827e-07	2.827e-07
As	4.845e-09	4.845e-09
B	1.090e-05	1.091e-05
Ba	7.621e-09	7.622e-09
C	1.857e-03	1.857e-03
Ca	7.579e-04	7.580e-04
Cd	1.437e-09	1.437e-09
Cl	2.165e-03	2.165e-03
Co	1.094e-08	1.094e-08
Cr	9.297e-10	9.298e-10
Cu	5.481e-07	5.482e-07
F	9.870e-05	9.872e-05
Fe	9.699e-10	9.700e-10
Hg	2.275e-10	2.275e-10
K	4.729e-04	4.730e-04
Mg	6.893e-04	6.894e-04
Mn	6.817e-06	6.817e-06
Mo	2.001e-07	2.002e-07
N	1.628e-06	1.628e-06
Na	4.242e-03	4.243e-03
Ni	1.702e-08	1.703e-08
Pb	9.928e-10	9.930e-10
S	1.750e-03	1.750e-03
Sb	3.032e-09	3.033e-09
Se	1.782e-08	1.782e-08
Si	3.008e-04	3.008e-04
U	3.661e-08	3.662e-08
V	9.685e-10	9.687e-10
Zn	9.805e-07	9.807e-07

-----Description of solution-----

	pH	=	8.086	Charge balance
	pe	=	4.473	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.001e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.861e-03	
	Total CO2 (mol/kg)	=	1.857e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.926e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.110313e+02	
	Total O	=	5.552794e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.362e-06	1.226e-06	-5.866	-5.912	-0.046	(0)
H+	9.106e-09	8.212e-09	-8.041	-8.086	-0.045	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	3.230e-09					
AgCl	2.189e-09	2.189e-09	-8.660	-8.660	0.000	(0)
Ag+	6.088e-10	5.490e-10	-9.216	-9.260	-0.045	(0)
AgCl2-	4.185e-10	3.721e-10	-9.378	-9.429	-0.051	(0)
AgSO4-	1.263e-11	1.123e-11	-10.899	-10.950	-0.051	(0)
AgCl3-2	1.036e-12	6.475e-13	-11.985	-12.189	-0.204	(0)
AgNO2	1.520e-13	1.520e-13	-12.818	-12.818	0.000	(0)
AgF	1.168e-13	1.168e-13	-12.933	-12.933	0.000	(0)
AgOH	6.730e-14	6.730e-14	-13.172	-13.172	0.000	(0)
AgNH3+	1.114e-14	9.902e-15	-13.953	-14.004	-0.051	(0)
Ag2Se	8.993e-15	8.993e-15	-14.046	-14.046	0.000	(0)
AgCl4-3	7.432e-15	2.581e-15	-14.129	-14.588	-0.459	(0)
AgH2BO3	6.213e-15	6.213e-15	-14.207	-14.207	0.000	(0)

	AgSeO3-	1.803e-15	1.603e-15	-14.744	-14.795	-0.051	(0)
	Ag (OH) 2-	9.068e-18	8.062e-18	-17.043	-17.094	-0.051	(0)
	Ag (NH3) 2+	7.995e-19	7.109e-19	-18.097	-18.148	-0.051	(0)
	Ag (NO2) 2-	3.509e-19	3.120e-19	-18.455	-18.506	-0.051	(0)
	AgNO3	2.041e-19	2.041e-19	-18.690	-18.690	0.000	(0)
	Ag (SeO3) 2-3	1.877e-22	6.518e-23	-21.727	-22.186	-0.459	(0)
	Ag2MoO4	1.510e-26	1.510e-26	-25.821	-25.821	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.332	-73.332	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.740	-82.557	-0.816	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.379	-146.516	-0.137	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.067	-147.118	-0.051	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-147.604	-147.871	-0.267	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-147.925	-148.182	-0.257	(0)
Al		2.827e-07					
	Al (OH) 4-	2.809e-07	2.536e-07	-6.551	-6.596	-0.044	(0)
	Al (OH) 3	1.643e-09	1.643e-09	-8.784	-8.784	0.000	(0)
	Al (OH) 2+	7.424e-11	6.719e-11	-10.129	-10.173	-0.043	(0)
	AlF2+	1.775e-12	1.606e-12	-11.751	-11.794	-0.043	(0)
	AlF3	1.712e-12	1.712e-12	-11.767	-11.767	0.000	(0)
	AlOH+2	1.028e-13	6.900e-14	-12.988	-13.161	-0.173	(0)
	AlF4-	8.046e-14	7.263e-14	-13.094	-13.139	-0.044	(0)
	AlF+2	7.103e-14	4.765e-14	-13.149	-13.322	-0.173	(0)
	AlSO4+	4.962e-16	4.479e-16	-15.304	-15.349	-0.044	(0)
	Al+3	1.426e-16	5.629e-17	-15.846	-16.250	-0.404	(0)
	Al (SO4) 2-	5.451e-18	4.921e-18	-17.264	-17.308	-0.044	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-50.580	-51.039	-0.459	(0)
As (3)		1.982e-22					
	H3AsO3	1.852e-22	1.852e-22	-21.732	-21.732	0.000	(0)
	H2AsO3-	1.301e-23	1.157e-23	-22.886	-22.937	-0.051	(0)
	HAsO3-2	2.055e-27	1.284e-27	-26.687	-26.891	-0.204	(0)
	H4AsO3+	8.476e-31	7.536e-31	-30.072	-30.123	-0.051	(0)
	AsO3-3	1.736e-32	6.029e-33	-31.760	-32.220	-0.459	(0)
As (5)		4.845e-09					
	HAsO4-2	4.599e-09	2.875e-09	-8.337	-8.541	-0.204	(0)
	H2AsO4-	2.422e-10	2.153e-10	-9.616	-9.667	-0.051	(0)
	AsO4-3	3.187e-12	1.107e-12	-11.497	-11.956	-0.459	(0)
	H3AsO4	3.066e-16	3.073e-16	-15.513	-15.512	0.001	(0)
B		1.090e-05					
	H3BO3	1.007e-05	1.010e-05	-4.997	-4.996	0.001	(0)
	H2BO3-	7.959e-07	7.140e-07	-6.099	-6.146	-0.047	(0)
	CaH2BO3+	1.934e-08	1.735e-08	-7.714	-7.761	-0.047	(0)
	MgH2BO3+	1.096e-08	9.836e-09	-7.960	-8.007	-0.047	(0)
	NaH2BO3	4.302e-09	4.302e-09	-8.366	-8.366	0.000	(0)
	BF (OH) 3-	3.802e-10	3.411e-10	-9.420	-9.467	-0.047	(0)
	H5 (BO3) 2-	6.840e-12	6.136e-12	-11.165	-11.212	-0.047	(0)
	BaH2BO3+	1.223e-13	1.097e-13	-12.913	-12.960	-0.047	(0)
	BF2 (OH) 2-	2.827e-14	2.536e-14	-13.549	-13.596	-0.047	(0)
	H8 (BO3) 3-	6.906e-15	6.196e-15	-14.161	-14.208	-0.047	(0)
	AgH2BO3	6.213e-15	6.213e-15	-14.207	-14.207	0.000	(0)
	BF3OH-	7.647e-21	6.860e-21	-20.116	-20.164	-0.047	(0)
	BF4-	2.617e-26	2.347e-26	-25.582	-25.629	-0.047	(0)
Ba		7.621e-09					
	Ba+2	7.513e-09	4.970e-09	-8.124	-8.304	-0.179	(0)
	BaHCO3+	8.424e-11	7.637e-11	-10.074	-10.117	-0.043	(0)
	BaCO3	2.341e-11	2.341e-11	-10.631	-10.631	0.000	(0)
	BaH2BO3+	1.223e-13	1.097e-13	-12.913	-12.960	-0.047	(0)
	BaOH+	2.942e-14	2.660e-14	-13.531	-13.575	-0.044	(0)
	BaNH3+2	4.432e-17	2.770e-17	-16.353	-16.557	-0.204	(0)
	BaNO3+	1.311e-17	1.166e-17	-16.882	-16.933	-0.051	(0)
C (4)		1.857e-03					
	HCO3-	1.778e-03	1.609e-03	-2.750	-2.793	-0.043	(0)
	H2CO3	2.972e-05	2.972e-05	-4.527	-4.527	0.000	(0)
	CaHCO3+	1.395e-05	1.265e-05	-4.855	-4.898	-0.043	(0)
	CO3-2	1.388e-05	9.184e-06	-4.858	-5.037	-0.179	(0)
	MgHCO3+	7.256e-06	6.540e-06	-5.139	-5.184	-0.045	(0)
	CaCO3	6.145e-06	6.145e-06	-5.211	-5.211	0.000	(0)
	NaHCO3	3.439e-06	3.439e-06	-5.464	-5.464	0.000	(0)
	MgCO3	3.035e-06	3.035e-06	-5.518	-5.518	0.000	(0)

	NaCO3-	7.183e-07	6.500e-07	-6.144	-6.187	-0.043	(0)
	CuCO3	4.674e-07	4.674e-07	-6.330	-6.330	0.000	(0)
	ZnCO3	2.071e-07	2.071e-07	-6.684	-6.684	0.000	(0)
	MnHCO3+	1.324e-07	1.197e-07	-6.878	-6.922	-0.044	(0)
	UO2 (CO3) 3-4	2.389e-08	3.646e-09	-7.622	-8.438	-0.816	(0)
	ZnHCO3+	2.243e-08	1.994e-08	-7.649	-7.700	-0.051	(0)
	Cu (CO3) 2-2	1.848e-08	1.155e-08	-7.733	-7.937	-0.204	(0)
	UO2 (CO3) 2-2	1.267e-08	7.921e-09	-7.897	-8.101	-0.204	(0)
	NiCO3	2.526e-09	2.526e-09	-8.597	-8.597	0.000	(0)
	NiHCO3+	1.645e-09	1.462e-09	-8.784	-8.835	-0.051	(0)
	CuHCO3+	9.866e-10	8.772e-10	-9.006	-9.057	-0.051	(0)
	CoCO3	7.930e-10	7.930e-10	-9.101	-9.101	0.000	(0)
	PbCO3	7.655e-10	7.655e-10	-9.116	-9.116	0.000	(0)
	CoHCO3+	7.190e-10	6.393e-10	-9.143	-9.194	-0.051	(0)
	CdCO3	1.364e-10	1.364e-10	-9.865	-9.865	0.000	(0)
	BaHCO3+	8.424e-11	7.637e-11	-10.074	-10.117	-0.043	(0)
	UO2CO3	4.323e-11	4.323e-11	-10.364	-10.364	0.000	(0)
	PbHCO3+	3.728e-11	3.314e-11	-10.429	-10.480	-0.051	(0)
	Pb (CO3) 2-2	3.244e-11	2.027e-11	-10.489	-10.693	-0.204	(0)
	BaCO3	2.341e-11	2.341e-11	-10.631	-10.631	0.000	(0)
	CdHCO3+	2.683e-12	2.386e-12	-11.571	-11.622	-0.051	(0)
	Cd (CO3) 2-2	1.485e-12	9.284e-13	-11.828	-12.032	-0.204	(0)
	FeHCO3+	8.023e-15	7.273e-15	-14.096	-14.138	-0.043	(0)
	HgCO3	2.394e-16	2.394e-16	-15.621	-15.621	0.000	(0)
	Hg (CO3) 2-2	1.112e-17	6.953e-18	-16.954	-17.158	-0.204	(0)
	HgHCO3+	4.117e-20	3.661e-20	-19.385	-19.436	-0.051	(0)
Ca		7.579e-04					
	Ca+2	6.382e-04	4.222e-04	-3.195	-3.374	-0.179	(0)
	CaSO4	9.916e-05	9.916e-05	-4.004	-4.004	0.000	(0)
	CaHCO3+	1.395e-05	1.265e-05	-4.855	-4.898	-0.043	(0)
	CaCO3	6.145e-06	6.145e-06	-5.211	-5.211	0.000	(0)
	CaF+	4.315e-07	3.901e-07	-6.365	-6.409	-0.044	(0)
	CaH2BO3+	1.934e-08	1.735e-08	-7.714	-7.761	-0.047	(0)
	CaOH+	1.139e-08	1.033e-08	-7.943	-7.986	-0.043	(0)
	CaNH3+2	7.512e-12	4.695e-12	-11.124	-11.328	-0.204	(0)
	CaNO3+	7.026e-13	6.247e-13	-12.153	-12.204	-0.051	(0)
	Ca (NH3) 2+2	2.642e-20	1.651e-20	-19.578	-19.782	-0.204	(0)
Cd		1.437e-09					
	Cd+2	9.846e-10	6.514e-10	-9.007	-9.186	-0.179	(0)
	CdSO4	1.566e-10	1.566e-10	-9.805	-9.805	0.000	(0)
	CdCl+	1.366e-10	1.215e-10	-9.865	-9.916	-0.051	(0)
	CdCO3	1.364e-10	1.364e-10	-9.865	-9.865	0.000	(0)
	CdOH+	7.134e-12	6.343e-12	-11.147	-11.198	-0.051	(0)
	CdOHC1	6.107e-12	6.107e-12	-11.214	-11.214	0.000	(0)
	Cd (SO4) 2-2	3.464e-12	2.165e-12	-11.460	-11.665	-0.204	(0)
	CdHCO3+	2.683e-12	2.386e-12	-11.571	-11.622	-0.051	(0)
	Cd (CO3) 2-2	1.485e-12	9.284e-13	-11.828	-12.032	-0.204	(0)
	CdCl2	9.885e-13	9.885e-13	-12.005	-12.005	0.000	(0)
	CdF+	9.830e-13	8.740e-13	-12.007	-12.058	-0.051	(0)
	Cd (OH) 2	4.906e-14	4.906e-14	-13.309	-13.309	0.000	(0)
	CdCl3-	1.369e-15	1.218e-15	-14.863	-14.914	-0.051	(0)
	CdF2	1.476e-16	1.476e-16	-15.831	-15.831	0.000	(0)
	Cd (OH) 3-	4.132e-18	3.674e-18	-17.384	-17.435	-0.051	(0)
	CdNO3+	1.084e-18	9.638e-19	-17.965	-18.016	-0.051	(0)
	CdSeO4	8.933e-19	8.933e-19	-18.049	-18.049	0.000	(0)
	Cd2OH+3	5.962e-20	2.071e-20	-19.225	-19.684	-0.459	(0)
	Cd (SeO3) 2-2	1.772e-20	1.108e-20	-19.751	-19.956	-0.204	(0)
	Cd (OH) 4-2	1.180e-24	7.372e-25	-23.928	-24.132	-0.204	(0)
	Cd (NO3) 2	2.260e-28	2.260e-28	-27.646	-27.646	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.013	-79.064	-0.051	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.746	-149.746	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.682	-225.733	-0.051	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.219	-301.423	-0.204	(0)
Cl		2.165e-03					
	Cl-	2.165e-03	1.952e-03	-2.665	-2.709	-0.045	(0)
	MnCl+	1.014e-08	9.167e-09	-7.994	-8.038	-0.044	(0)
	ZnOHC1	3.085e-09	3.085e-09	-8.511	-8.511	0.000	(0)
	AgCl	2.189e-09	2.189e-09	-8.660	-8.660	0.000	(0)

ZnCl+	2.132e-09	1.922e-09	-8.671	-8.716	-0.045	(0)
AgCl2-	4.185e-10	3.721e-10	-9.378	-9.429	-0.051	(0)
CuCl	3.497e-10	3.497e-10	-9.456	-9.456	0.000	(0)
CuCl2-	1.583e-10	1.427e-10	-9.801	-9.846	-0.045	(0)
CdCl+	1.366e-10	1.215e-10	-9.865	-9.916	-0.051	(0)
NiCl+	4.142e-11	3.683e-11	-10.383	-10.434	-0.051	(0)
CoCl+	3.880e-11	3.450e-11	-10.411	-10.462	-0.051	(0)
CuCl+	2.967e-11	2.674e-11	-10.528	-10.573	-0.045	(0)
MnCl2	2.528e-11	2.528e-11	-10.597	-10.597	0.000	(0)
CdOHC1	6.107e-12	6.107e-12	-11.214	-11.214	0.000	(0)
ZnCl2	5.947e-12	5.947e-12	-11.226	-11.226	0.000	(0)
PbCl+	2.160e-12	1.921e-12	-11.666	-11.717	-0.051	(0)
AgCl3-2	1.036e-12	6.475e-13	-11.985	-12.189	-0.204	(0)
CdCl2	9.885e-13	9.885e-13	-12.005	-12.005	0.000	(0)
HgClOH	9.206e-14	9.206e-14	-13.036	-13.036	0.000	(0)
CuCl3-2	8.916e-14	5.954e-14	-13.050	-13.225	-0.175	(0)
CuCl2	1.810e-14	1.810e-14	-13.742	-13.742	0.000	(0)
PbCl2	1.675e-14	1.675e-14	-13.776	-13.776	0.000	(0)
MnCl3-	1.504e-14	1.359e-14	-13.823	-13.867	-0.044	(0)
ZnCl3-	1.023e-14	9.223e-15	-13.990	-14.035	-0.045	(0)
HgCl2	8.303e-15	8.303e-15	-14.081	-14.081	0.000	(0)
AgCl4-3	7.432e-15	2.581e-15	-14.129	-14.588	-0.459	(0)
CdCl3-	1.369e-15	1.218e-15	-14.863	-14.914	-0.051	(0)
NiCl2	3.621e-16	3.621e-16	-15.441	-15.441	0.000	(0)
HgCl3-	1.823e-16	1.621e-16	-15.739	-15.790	-0.051	(0)
PbCl3-	1.464e-17	1.302e-17	-16.834	-16.885	-0.051	(0)
ZnCl4-2	1.348e-17	9.004e-18	-16.870	-17.046	-0.175	(0)
UO2Cl+	4.210e-18	3.744e-18	-17.376	-17.427	-0.051	(0)
HgCl4-2	2.016e-18	1.260e-18	-17.696	-17.900	-0.204	(0)
HgCl+	9.543e-19	8.485e-19	-18.020	-18.071	-0.051	(0)
CrCl+2	5.685e-19	3.553e-19	-18.245	-18.449	-0.204	(0)
CuCl3-	3.659e-19	3.298e-19	-18.437	-18.482	-0.045	(0)
PbCl4-2	1.859e-20	1.162e-20	-19.731	-19.935	-0.204	(0)
CrOHC12	1.616e-20	1.616e-20	-19.791	-19.791	0.000	(0)
FeCl+2	8.760e-23	5.850e-23	-22.058	-22.233	-0.175	(0)
CrCl2+	7.403e-23	6.582e-23	-22.131	-22.182	-0.051	(0)
CuCl4-2	4.832e-24	3.227e-24	-23.316	-23.491	-0.175	(0)
VOCl+	9.026e-25	8.025e-25	-24.045	-24.096	-0.051	(0)
FeCl2+	5.644e-25	5.102e-25	-24.248	-24.292	-0.044	(0)
CrO3Cl-	6.119e-27	5.441e-27	-26.213	-26.264	-0.051	(0)
FeCl3	9.961e-29	9.961e-29	-28.002	-28.002	0.000	(0)
CoCl+2	3.845e-37	2.403e-37	-36.415	-36.619	-0.204	(0)
UCl+3	0.000e+00	0.000e+00	-47.550	-48.010	-0.459	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.731	-50.936	-0.204	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.579	-52.783	-0.204	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.501	-65.705	-0.204	(0)
Co (2)	1.094e-08					
Co+2	8.173e-09	5.108e-09	-8.088	-8.292	-0.204	(0)
CoSO4	1.045e-09	1.045e-09	-8.981	-8.981	0.000	(0)
CoCO3	7.930e-10	7.930e-10	-9.101	-9.101	0.000	(0)
CoHCO3+	7.190e-10	6.393e-10	-9.143	-9.194	-0.051	(0)
CoOH+	1.405e-10	1.249e-10	-9.852	-9.903	-0.051	(0)
CoCl+	3.880e-11	3.450e-11	-10.411	-10.462	-0.051	(0)
CoF+	1.538e-11	1.368e-11	-10.813	-10.864	-0.051	(0)
Co (OH) 2	1.217e-11	1.217e-11	-10.915	-10.915	0.000	(0)
CoNO2+	5.365e-14	4.770e-14	-13.270	-13.321	-0.051	(0)
Co (NH3) +2	8.679e-15	5.425e-15	-14.062	-14.266	-0.204	(0)
Co (OH) 3-	3.347e-16	2.976e-16	-15.475	-15.526	-0.051	(0)
CoOOH-	8.398e-17	7.467e-17	-16.076	-16.127	-0.051	(0)
CoSeO4	1.885e-17	1.885e-17	-16.725	-16.725	0.000	(0)
CoNO3+	4.260e-18	3.788e-18	-17.371	-17.422	-0.051	(0)
Co2OH+3	9.209e-20	3.199e-20	-19.036	-19.495	-0.459	(0)
Co (NH3) 2+2	3.270e-21	2.044e-21	-20.485	-20.690	-0.204	(0)
Co (OH) 4-2	9.250e-23	5.781e-23	-22.034	-22.238	-0.204	(0)
Co (NO3) 2	3.606e-27	3.606e-27	-26.443	-26.443	0.000	(0)
Co (NH3) 3+2	3.637e-28	2.273e-28	-27.439	-27.643	-0.204	(0)
Co4 (OH) 4+4	3.186e-31	4.862e-32	-30.497	-31.313	-0.816	(0)
Co (NH3) 4+2	1.686e-35	1.054e-35	-34.773	-34.977	-0.204	(0)

Co (NH3) 5+2	0.000e+00	0.000e+00	-42.607	-42.811	-0.204	(0)
Co (3)	6.029e-30					
CoOH+2	6.029e-30	3.768e-30	-29.220	-29.424	-0.204	(0)
Co+3	1.533e-36	6.049e-37	-35.815	-36.218	-0.404	(0)
CoCl+2	3.845e-37	2.403e-37	-36.415	-36.619	-0.204	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.731	-50.936	-0.204	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.008	-61.059	-0.051	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.503	-64.707	-0.204	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.501	-65.705	-0.204	(0)
Cr (2)	1.807e-27					
Cr+2	1.807e-27	1.129e-27	-26.743	-26.947	-0.204	(0)
Cr (3)	9.297e-10					
Cr (OH) 2+	6.326e-10	5.625e-10	-9.199	-9.250	-0.051	(0)
Cr (OH) 3	2.590e-10	2.590e-10	-9.587	-9.587	0.000	(0)
CrO2-	1.685e-11	1.498e-11	-10.773	-10.824	-0.051	(0)
Cr (OH) 4-	1.422e-11	1.264e-11	-10.847	-10.898	-0.051	(0)
Cr (OH) +2	6.034e-12	3.771e-12	-11.219	-11.424	-0.204	(0)
CrHSO4	9.175e-13	9.175e-13	-12.037	-12.037	0.000	(0)
CrF+2	3.019e-15	1.887e-15	-14.520	-14.724	-0.204	(0)
Cr+3	4.049e-16	1.406e-16	-15.393	-15.852	-0.459	(0)
CrSO4+	3.786e-16	3.366e-16	-15.422	-15.473	-0.051	(0)
CrCl+2	5.685e-19	3.553e-19	-18.245	-18.449	-0.204	(0)
CrOHC12	1.616e-20	1.616e-20	-19.791	-19.791	0.000	(0)
Cr2 (OH) 2SO4+2	5.004e-22	3.127e-22	-21.301	-21.505	-0.204	(0)
CrCl2+	7.403e-23	6.582e-23	-22.131	-22.182	-0.051	(0)
Cr2 (OH) 2 (SO4) 2	1.905e-23	1.905e-23	-22.720	-22.720	0.000	(0)
CrNO3+2	4.602e-27	2.876e-27	-26.337	-26.541	-0.204	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.457	-41.661	-0.204	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.716	-51.175	-0.459	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.579	-52.783	-0.204	(0)
Cr (6)	3.175e-15					
CrO4-2	3.068e-15	2.030e-15	-14.513	-14.693	-0.179	(0)
HCrO4-	6.067e-17	5.394e-17	-16.217	-16.268	-0.051	(0)
NaCrO4-	4.312e-17	3.834e-17	-16.365	-16.416	-0.051	(0)
KCrO4-	3.591e-18	3.193e-18	-17.445	-17.496	-0.051	(0)
H2CrO4	3.591e-25	3.591e-25	-24.445	-24.445	0.000	(0)
CrO3SO4-2	2.214e-25	1.384e-25	-24.655	-24.859	-0.204	(0)
CrO3Cl-	6.119e-27	5.441e-27	-26.213	-26.264	-0.051	(0)
Cr2O7-2	1.614e-31	1.009e-31	-30.792	-30.996	-0.204	(0)
Cu (1)	6.681e-10					
CuCl	3.497e-10	3.497e-10	-9.456	-9.456	0.000	(0)
Cu+	1.600e-10	1.423e-10	-9.796	-9.847	-0.051	(0)
CuCl2-	1.583e-10	1.427e-10	-9.801	-9.846	-0.045	(0)
CuCl3-2	8.916e-14	5.954e-14	-13.050	-13.225	-0.175	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.796	-146.058	-0.262	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.536	-146.788	-0.252	(0)
Cu (2)	5.475e-07					
CuCO3	4.674e-07	4.674e-07	-6.330	-6.330	0.000	(0)
CuOH+	3.717e-08	3.350e-08	-7.430	-7.475	-0.045	(0)
Cu (CO3) 2-2	1.848e-08	1.155e-08	-7.733	-7.937	-0.204	(0)
Cu+2	1.306e-08	8.642e-09	-7.884	-8.063	-0.179	(0)
Cu (OH) 2	8.194e-09	8.194e-09	-8.087	-8.087	0.000	(0)
CuSO4	2.030e-09	2.030e-09	-8.693	-8.693	0.000	(0)
CuHCO3+	9.866e-10	8.772e-10	-9.006	-9.057	-0.051	(0)
CuF+	5.192e-11	4.616e-11	-10.285	-10.336	-0.051	(0)
Cu2 (OH) 2+2	4.510e-11	2.819e-11	-10.346	-10.550	-0.204	(0)
CuCl+	2.967e-11	2.674e-11	-10.528	-10.573	-0.045	(0)
Cu (OH) 3-	2.317e-11	2.060e-11	-10.635	-10.686	-0.051	(0)
CuNO2+	1.349e-12	1.199e-12	-11.870	-11.921	-0.051	(0)
CuNH3+2	1.250e-12	7.811e-13	-11.903	-12.107	-0.204	(0)
CuCl2	1.810e-14	1.810e-14	-13.742	-13.742	0.000	(0)
Cu (OH) 4-2	3.180e-16	1.988e-16	-15.498	-15.702	-0.204	(0)
Cu (NO2) 2	1.626e-17	1.626e-17	-16.789	-16.789	0.000	(0)
CuNO3+	1.438e-17	1.279e-17	-16.842	-16.893	-0.051	(0)
CuCl3-	3.659e-19	3.298e-19	-18.437	-18.482	-0.045	(0)
CuCl4-2	4.832e-24	3.227e-24	-23.316	-23.491	-0.175	(0)
Cu (NO3) 2	7.532e-28	7.532e-28	-27.123	-27.123	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.772	-215.823	-0.051	(0)

F	9.870e-05					
F-	9.387e-05	8.466e-05	-4.027	-4.072	-0.045	(0)
MgF+	4.180e-06	3.774e-06	-5.379	-5.423	-0.044	(0)
CaF+	4.315e-07	3.901e-07	-6.365	-6.409	-0.044	(0)
NaF	2.030e-07	2.030e-07	-6.692	-6.692	0.000	(0)
MnF+	1.391e-08	1.257e-08	-7.857	-7.901	-0.044	(0)
HF	1.028e-09	1.028e-09	-8.988	-8.988	0.000	(0)
ZnF+	7.446e-10	6.620e-10	-9.128	-9.179	-0.051	(0)
BF(OH) 3-	3.802e-10	3.411e-10	-9.420	-9.467	-0.047	(0)
CuF+	5.192e-11	4.616e-11	-10.285	-10.336	-0.051	(0)
NiF+	1.764e-11	1.568e-11	-10.754	-10.805	-0.051	(0)
CoF+	1.538e-11	1.368e-11	-10.813	-10.864	-0.051	(0)
AlF2+	1.775e-12	1.606e-12	-11.751	-11.794	-0.043	(0)
AlF3	1.712e-12	1.712e-12	-11.767	-11.767	0.000	(0)
CdF+	9.830e-13	8.740e-13	-12.007	-12.058	-0.051	(0)
HF2-	3.678e-13	3.310e-13	-12.434	-12.480	-0.046	(0)
PbF+	1.860e-13	1.654e-13	-12.730	-12.781	-0.051	(0)
AgF	1.168e-13	1.168e-13	-12.933	-12.933	0.000	(0)
AlF4-	8.046e-14	7.263e-14	-13.094	-13.139	-0.044	(0)
AlF+2	7.103e-14	4.765e-14	-13.149	-13.322	-0.173	(0)
BF2(OH) 2-	2.827e-14	2.536e-14	-13.549	-13.596	-0.047	(0)
UO2F+	1.554e-14	1.382e-14	-13.809	-13.860	-0.051	(0)
UO2F2	3.374e-15	3.374e-15	-14.472	-14.472	0.000	(0)
CrF+2	3.019e-15	1.887e-15	-14.520	-14.724	-0.204	(0)
PbF2	2.756e-16	2.756e-16	-15.560	-15.560	0.000	(0)
CdF2	1.476e-16	1.476e-16	-15.831	-15.831	0.000	(0)
UO2F3-	8.068e-17	7.174e-17	-16.093	-16.144	-0.051	(0)
H2F2	2.833e-18	2.833e-18	-17.548	-17.548	0.000	(0)
FeF2+	2.308e-19	2.087e-19	-18.637	-18.681	-0.044	(0)
FeF+2	1.379e-19	9.211e-20	-18.860	-19.036	-0.175	(0)
VO2F	1.199e-19	1.199e-19	-18.921	-18.921	0.000	(0)
UO2F4-2	7.719e-20	4.824e-20	-19.112	-19.317	-0.204	(0)
PbF3-	4.977e-20	4.425e-20	-19.303	-19.354	-0.051	(0)
FeF3	2.493e-20	2.493e-20	-19.603	-19.603	0.000	(0)
BF3OH-	7.647e-21	6.860e-21	-20.116	-20.164	-0.047	(0)
VO2F2-	4.147e-21	3.687e-21	-20.382	-20.433	-0.051	(0)
VOF+	8.367e-23	7.440e-23	-22.077	-22.128	-0.051	(0)
VO2F3-2	6.229e-24	3.893e-24	-23.206	-23.410	-0.204	(0)
PbF4-2	2.869e-24	1.793e-24	-23.542	-23.746	-0.204	(0)
VOF2	2.362e-24	2.362e-24	-23.627	-23.627	0.000	(0)
HgF+	7.688e-26	6.835e-26	-25.114	-25.165	-0.051	(0)
BF4-	2.617e-26	2.347e-26	-25.582	-25.629	-0.047	(0)
VOF3-	7.979e-27	7.095e-27	-26.098	-26.149	-0.051	(0)
Sb(OH) 2F	4.374e-27	4.374e-27	-26.359	-26.359	0.000	(0)
SbOF	4.302e-27	4.302e-27	-26.366	-26.366	0.000	(0)
VO2F4-3	4.670e-28	1.622e-28	-27.331	-27.790	-0.459	(0)
VOF4-2	3.879e-30	2.424e-30	-29.411	-29.615	-0.204	(0)
SiF6-2	1.123e-30	7.502e-31	-29.949	-30.125	-0.175	(0)
UF3+	2.716e-38	2.415e-38	-37.566	-37.617	-0.051	(0)
UF2+2	2.880e-39	1.800e-39	-38.541	-38.745	-0.204	(0)
UF4	2.242e-40	2.242e-40	-39.649	-39.649	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.313	-41.772	-0.459	(0)
UF5-	0.000e+00	0.000e+00	-42.073	-42.124	-0.051	(0)
UF6-2	0.000e+00	0.000e+00	-43.512	-43.716	-0.204	(0)
Fe (2)	6.923e-13					
Fe+2	5.745e-13	3.591e-13	-12.241	-12.445	-0.204	(0)
FeSO4	9.037e-14	9.037e-14	-13.044	-13.044	0.000	(0)
FeOH+	1.938e-14	1.752e-14	-13.713	-13.756	-0.044	(0)
FeHCO3+	8.023e-15	7.273e-15	-14.096	-14.138	-0.043	(0)
Fe(OH) 2	1.706e-17	1.706e-17	-16.768	-16.768	0.000	(0)
Fe(OH) 3-	7.317e-18	6.615e-18	-17.136	-17.179	-0.044	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.267	-159.267	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.065	-235.116	-0.051	(0)
Fe (3)	9.692e-10					
Fe(OH) 3	4.931e-10	4.931e-10	-9.307	-9.307	0.000	(0)
Fe(OH) 2+	4.139e-10	3.745e-10	-9.383	-9.426	-0.043	(0)
Fe(OH) 4-	6.219e-11	5.628e-11	-10.206	-10.250	-0.043	(0)
FeOH+2	1.176e-15	7.854e-16	-14.930	-15.105	-0.175	(0)

FeF2+	2.308e-19	2.087e-19	-18.637	-18.681	-0.044	(0)
FeF+2	1.379e-19	9.211e-20	-18.860	-19.036	-0.175	(0)
FeF3	2.493e-20	2.493e-20	-19.603	-19.603	0.000	(0)
FeSO4+	1.263e-20	1.141e-20	-19.899	-19.943	-0.044	(0)
Fe+3	2.514e-21	9.923e-22	-20.600	-21.003	-0.404	(0)
Fe(SO4) 2-	2.814e-22	2.502e-22	-21.551	-21.602	-0.051	(0)
FeCl+2	8.760e-23	5.850e-23	-22.058	-22.233	-0.175	(0)
FeCl2+	5.644e-25	5.102e-25	-24.248	-24.292	-0.044	(0)
FeHSeO3+2	3.931e-26	2.457e-26	-25.406	-25.610	-0.204	(0)
Fe2(OH) 2+4	1.338e-28	2.042e-29	-27.873	-28.690	-0.816	(0)
FeCl3	9.961e-29	9.961e-29	-28.002	-28.002	0.000	(0)
FeNO3+2	7.428e-30	4.643e-30	-29.129	-29.333	-0.204	(0)
Fe3(OH) 4+5	2.086e-36	1.106e-37	-35.681	-36.956	-1.276	(0)
H(0)	1.077e-28					
H2	5.383e-29	5.396e-29	-28.269	-28.268	0.001	(0)
Hg(0)	2.272e-10					
Hg	2.272e-10	2.272e-10	-9.644	-9.644	0.000	(0)
Hg(1)	1.075e-23					
Hg2+2	5.375e-24	3.360e-24	-23.270	-23.474	-0.204	(0)
Hg(2)	3.068e-13					
Hg(OH) 2	2.060e-13	2.065e-13	-12.686	-12.685	0.001	(0)
HgClOH	9.206e-14	9.206e-14	-13.036	-13.036	0.000	(0)
HgCl2	8.303e-15	8.303e-15	-14.081	-14.081	0.000	(0)
HgCO3	2.394e-16	2.394e-16	-15.621	-15.621	0.000	(0)
HgCl3-	1.823e-16	1.621e-16	-15.739	-15.790	-0.051	(0)
Hg(CO3) 2-2	1.112e-17	6.953e-18	-16.954	-17.158	-0.204	(0)
HgCl4-2	2.016e-18	1.260e-18	-17.696	-17.900	-0.204	(0)
HgOH+	1.196e-18	1.063e-18	-17.922	-17.973	-0.051	(0)
HgCl+	9.543e-19	8.485e-19	-18.020	-18.071	-0.051	(0)
HgHCO3+	4.117e-20	3.661e-20	-19.385	-19.436	-0.051	(0)
Hg(OH) 3-	3.585e-20	3.187e-20	-19.446	-19.497	-0.051	(0)
Hg(NH3) 2+2	1.716e-21	1.072e-21	-20.766	-20.970	-0.204	(0)
HgNH3+2	1.942e-22	1.214e-22	-21.712	-21.916	-0.204	(0)
Hg+2	3.485e-23	2.178e-23	-22.458	-22.662	-0.204	(0)
HgSO4	5.847e-24	5.847e-24	-23.233	-23.233	0.000	(0)
HgF+	7.688e-26	6.835e-26	-25.114	-25.165	-0.051	(0)
Hg(NH3) 3+2	6.033e-29	3.771e-29	-28.219	-28.424	-0.204	(0)
HgNO3+	4.232e-33	3.763e-33	-32.373	-32.424	-0.051	(0)
Hg(NH3) 4+2	4.233e-36	2.646e-36	-35.373	-35.577	-0.204	(0)
Hg(NO3) 2	0.000e+00	0.000e+00	-42.136	-42.136	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.370	-138.421	-0.051	(0)
HgS2-2	0.000e+00	0.000e+00	-138.839	-139.043	-0.204	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-140.112	-140.112	0.000	(0)
K	4.729e-04					
K+	4.695e-04	4.234e-04	-3.328	-3.373	-0.045	(0)
KSO4-	3.396e-06	3.073e-06	-5.469	-5.512	-0.043	(0)
KCrO4-	3.591e-18	3.193e-18	-17.445	-17.496	-0.051	(0)
Mg	6.893e-04					
Mg+2	6.005e-04	3.973e-04	-3.221	-3.401	-0.179	(0)
MgSO4	7.411e-05	7.411e-05	-4.130	-4.130	0.000	(0)
MgHCO3+	7.256e-06	6.540e-06	-5.139	-5.184	-0.045	(0)
MgF+	4.180e-06	3.774e-06	-5.379	-5.423	-0.044	(0)
MgCO3	3.035e-06	3.035e-06	-5.518	-5.518	0.000	(0)
MgOH+	2.136e-07	1.939e-07	-6.670	-6.712	-0.042	(0)
MgH2BO3+	1.096e-08	9.836e-09	-7.960	-8.007	-0.047	(0)
Mn(2)	6.817e-06					
Mn+2	5.967e-06	3.730e-06	-5.224	-5.428	-0.204	(0)
MnSO4	6.800e-07	6.800e-07	-6.168	-6.168	0.000	(0)
MnHCO3+	1.324e-07	1.197e-07	-6.878	-6.922	-0.044	(0)
MnF+	1.391e-08	1.257e-08	-7.857	-7.901	-0.044	(0)
MnOH+	1.270e-08	1.148e-08	-7.896	-7.940	-0.044	(0)
MnCl+	1.014e-08	9.167e-09	-7.994	-8.038	-0.044	(0)
MnCl2	2.528e-11	2.528e-11	-10.597	-10.597	0.000	(0)
MnCl3-	1.504e-14	1.359e-14	-13.823	-13.867	-0.044	(0)
MnSeO4	7.393e-15	7.393e-15	-14.131	-14.131	0.000	(0)
MnNO3+	3.111e-15	2.766e-15	-14.507	-14.558	-0.051	(0)
Mn(OH) 3-	1.180e-16	1.067e-16	-15.928	-15.972	-0.044	(0)
Mn(OH) 4-2	6.320e-22	4.221e-22	-21.199	-21.375	-0.175	(0)

Mn (NO3) 2	3.251e-24	3.251e-24	-23.488	-23.488	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.250	-41.250	0.000	(0)
Mn (3)	1.255e-26					
Mn+3	1.255e-26	4.956e-27	-25.901	-26.305	-0.404	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.097	-41.273	-0.175	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.125	-46.171	-0.046	(0)
Mo	2.001e-07					
MoO4-2	2.001e-07	1.324e-07	-6.699	-6.878	-0.179	(0)
HMoO4-	2.433e-11	2.163e-11	-10.614	-10.665	-0.051	(0)
H2MoO4	1.301e-15	1.301e-15	-14.886	-14.886	0.000	(0)
Ag2MoO4	1.510e-26	1.510e-26	-25.821	-25.821	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.580	-51.039	-0.459	(0)
Mo7O24-6	0.000e+00	0.000e+00	-58.004	-59.841	-1.837	(0)
HMo7O24-5	0.000e+00	0.000e+00	-60.264	-61.540	-1.276	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-64.027	-64.843	-0.816	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-69.223	-69.683	-0.459	(0)
N (-3)	1.522e-07					
NH4+	1.418e-07	1.272e-07	-6.848	-6.895	-0.047	(0)
NH3	8.833e-09	8.833e-09	-8.054	-8.054	0.000	(0)
NH4SO4-	1.546e-09	1.398e-09	-8.811	-8.855	-0.044	(0)
CaNH3+2	7.512e-12	4.695e-12	-11.124	-11.328	-0.204	(0)
CuNH3+2	1.250e-12	7.811e-13	-11.903	-12.107	-0.204	(0)
NiNH3+2	5.596e-14	3.498e-14	-13.252	-13.456	-0.204	(0)
AgNH3+	1.114e-14	9.902e-15	-13.953	-14.004	-0.051	(0)
Co (NH3) +2	8.679e-15	5.425e-15	-14.062	-14.266	-0.204	(0)
BaNH3+2	4.432e-17	2.770e-17	-16.353	-16.557	-0.204	(0)
Ag (NH3) 2+	7.995e-19	7.109e-19	-18.097	-18.148	-0.051	(0)
Ni (NH3) 2+2	7.145e-20	4.466e-20	-19.146	-19.350	-0.204	(0)
Ca (NH3) 2+2	2.642e-20	1.651e-20	-19.578	-19.782	-0.204	(0)
Co (NH3) 2+2	3.270e-21	2.044e-21	-20.485	-20.690	-0.204	(0)
Hg (NH3) 2+2	1.716e-21	1.072e-21	-20.766	-20.970	-0.204	(0)
HgNH3+2	1.942e-22	1.214e-22	-21.712	-21.916	-0.204	(0)
Co (NH3) 3+2	3.637e-28	2.273e-28	-27.439	-27.643	-0.204	(0)
Hg (NH3) 3+2	6.033e-29	3.771e-29	-28.219	-28.424	-0.204	(0)
Co (NH3) 4+2	1.686e-35	1.054e-35	-34.773	-34.977	-0.204	(0)
Hg (NH3) 4+2	4.233e-36	2.646e-36	-35.373	-35.577	-0.204	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.457	-41.661	-0.204	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.607	-42.811	-0.204	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.716	-51.175	-0.459	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.731	-50.936	-0.204	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.579	-52.783	-0.204	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.008	-61.059	-0.051	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.503	-64.707	-0.204	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.501	-65.705	-0.204	(0)
N (3)	1.475e-06					
NO2-	1.475e-06	1.325e-06	-5.831	-5.878	-0.046	(0)
CuNO2+	1.349e-12	1.199e-12	-11.870	-11.921	-0.051	(0)
AgNO2	1.520e-13	1.520e-13	-12.818	-12.818	0.000	(0)
CoNO2+	5.365e-14	4.770e-14	-13.270	-13.321	-0.051	(0)
Cu (NO2) 2	1.626e-17	1.626e-17	-16.789	-16.789	0.000	(0)
Ag (NO2) 2-	3.509e-19	3.120e-19	-18.455	-18.506	-0.051	(0)
N (5)	5.195e-10					
NO3-	5.188e-10	4.679e-10	-9.285	-9.330	-0.045	(0)
CaNO3+	7.026e-13	6.247e-13	-12.153	-12.204	-0.051	(0)
MnNO3+	3.111e-15	2.766e-15	-14.507	-14.558	-0.051	(0)
ZnNO3+	5.181e-16	4.606e-16	-15.286	-15.337	-0.051	(0)
CuNO3+	1.438e-17	1.279e-17	-16.842	-16.893	-0.051	(0)
BaNO3+	1.311e-17	1.166e-17	-16.882	-16.933	-0.051	(0)
NiNO3+	9.747e-18	8.666e-18	-17.011	-17.062	-0.051	(0)
CoNO3+	4.260e-18	3.788e-18	-17.371	-17.422	-0.051	(0)
CdNO3+	1.084e-18	9.638e-19	-17.965	-18.016	-0.051	(0)
PbNO3+	2.158e-19	1.919e-19	-18.666	-18.717	-0.051	(0)
AgNO3	2.041e-19	2.041e-19	-18.690	-18.690	0.000	(0)
Mn (NO3) 2	3.251e-24	3.251e-24	-23.488	-23.488	0.000	(0)
UO2NO3+	1.241e-24	1.104e-24	-23.906	-23.957	-0.051	(0)
Zn (NO3) 2	4.300e-26	4.300e-26	-25.366	-25.366	0.000	(0)

	CrNO3+2	4.602e-27	2.876e-27	-26.337	-26.541	-0.204	(0)
	Co (NO3) 2	3.606e-27	3.606e-27	-26.443	-26.443	0.000	(0)
	Cu (NO3) 2	7.532e-28	7.532e-28	-27.123	-27.123	0.000	(0)
	Cd (NO3) 2	2.260e-28	2.260e-28	-27.646	-27.646	0.000	(0)
	VO2NO3	1.912e-28	1.912e-28	-27.719	-27.719	0.000	(0)
	Pb (NO3) 2	1.525e-28	1.525e-28	-27.817	-27.817	0.000	(0)
	FeNO3+2	7.428e-30	4.643e-30	-29.129	-29.333	-0.204	(0)
	HgNO3+	4.232e-33	3.763e-33	-32.373	-32.424	-0.051	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-42.136	-42.136	0.000	(0)
Na	4.242e-03						
	Na+	4.215e-03	3.801e-03	-2.375	-2.420	-0.045	(0)
	NaSO4-	2.312e-05	2.093e-05	-4.636	-4.679	-0.043	(0)
	NaHCO3	3.439e-06	3.439e-06	-5.464	-5.464	0.000	(0)
	NaCO3-	7.183e-07	6.500e-07	-6.144	-6.187	-0.043	(0)
	NaF	2.030e-07	2.030e-07	-6.692	-6.692	0.000	(0)
	NaH2BO3	4.302e-09	4.302e-09	-8.366	-8.366	0.000	(0)
	NaCrO4-	4.312e-17	3.834e-17	-16.365	-16.416	-0.051	(0)
Ni	1.702e-08						
	Ni+2	1.115e-08	7.373e-09	-7.953	-8.132	-0.179	(0)
	NiCO3	2.526e-09	2.526e-09	-8.597	-8.597	0.000	(0)
	NiHCO3+	1.645e-09	1.462e-09	-8.784	-8.835	-0.051	(0)
	NiSO4	1.508e-09	1.508e-09	-8.822	-8.822	0.000	(0)
	NiOH+	1.280e-10	1.138e-10	-9.893	-9.944	-0.051	(0)
	NiCl+	4.142e-11	3.683e-11	-10.383	-10.434	-0.051	(0)
	NiF+	1.764e-11	1.568e-11	-10.754	-10.805	-0.051	(0)
	Ni (OH) 2	1.108e-11	1.108e-11	-10.955	-10.955	0.000	(0)
	Ni (SO4) 2-2	8.193e-14	5.120e-14	-13.087	-13.291	-0.204	(0)
	NiNH3+2	5.596e-14	3.498e-14	-13.252	-13.456	-0.204	(0)
	Ni (OH) 3-	1.528e-14	1.358e-14	-13.816	-13.867	-0.051	(0)
	NiCl2	3.621e-16	3.621e-16	-15.441	-15.441	0.000	(0)
	NiSeO4	2.540e-17	2.540e-17	-16.595	-16.595	0.000	(0)
	NiNO3+	9.747e-18	8.666e-18	-17.011	-17.062	-0.051	(0)
	Ni (NH3) 2+2	7.145e-20	4.466e-20	-19.146	-19.350	-0.204	(0)
O (0)	3.473e-36						
	O2	1.736e-36	1.740e-36	-35.760	-35.759	0.001	(0)
Pb	9.928e-10						
	PbCO3	7.655e-10	7.655e-10	-9.116	-9.116	0.000	(0)
	PbOH+	9.602e-11	8.537e-11	-10.018	-10.069	-0.051	(0)
	Pb+2	4.191e-11	2.773e-11	-10.378	-10.557	-0.179	(0)
	PbHCO3+	3.728e-11	3.314e-11	-10.429	-10.480	-0.051	(0)
	Pb (CO3) 2-2	3.244e-11	2.027e-11	-10.489	-10.693	-0.204	(0)
	PbSO4	1.392e-11	1.392e-11	-10.856	-10.856	0.000	(0)
	Pb (OH) 2	3.309e-12	3.309e-12	-11.480	-11.480	0.000	(0)
	PbCl+	2.160e-12	1.921e-12	-11.666	-11.717	-0.051	(0)
	PbF+	1.860e-13	1.654e-13	-12.730	-12.781	-0.051	(0)
	Pb (SO4) 2-2	1.376e-13	8.600e-14	-12.861	-13.065	-0.204	(0)
	PbCl2	1.675e-14	1.675e-14	-13.776	-13.776	0.000	(0)
	Pb (OH) 3-	4.563e-15	4.057e-15	-14.341	-14.392	-0.051	(0)
	PbF2	2.756e-16	2.756e-16	-15.560	-15.560	0.000	(0)
	PbCl3-	1.464e-17	1.302e-17	-16.834	-16.885	-0.051	(0)
	Pb (OH) 4-2	1.949e-18	1.218e-18	-17.710	-17.914	-0.204	(0)
	PbNO3+	2.158e-19	1.919e-19	-18.666	-18.717	-0.051	(0)
	Pb2OH+3	1.080e-19	3.751e-20	-18.967	-19.426	-0.459	(0)
	PbF3-	4.977e-20	4.425e-20	-19.303	-19.354	-0.051	(0)
	PbCl4-2	1.859e-20	1.162e-20	-19.731	-19.935	-0.204	(0)
	Pb3 (OH) 4+2	9.694e-24	6.059e-24	-23.013	-23.218	-0.204	(0)
	PbF4-2	2.869e-24	1.793e-24	-23.542	-23.746	-0.204	(0)
	Pb (NO3) 2	1.525e-28	1.525e-28	-27.817	-27.817	0.000	(0)
	Pb4 (OH) 4+4	8.744e-30	1.334e-30	-29.058	-29.875	-0.816	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.059	-151.059	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.594	-227.646	-0.051	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.332	-73.332	0.000	(0)
	HS-	0.000e+00	0.000e+00	-77.835	-77.886	-0.051	(0)
	H2S	0.000e+00	0.000e+00	-78.952	-78.952	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-78.962	-79.166	-0.204	(0)
	CdHS+	0.000e+00	0.000e+00	-79.013	-79.064	-0.051	(0)
	S6-2	0.000e+00	0.000e+00	-79.477	-79.682	-0.204	(0)

S4-2	0.000e+00	0.000e+00	-79.557	-79.761	-0.204	(0)
S3-2	0.000e+00	0.000e+00	-80.363	-80.567	-0.204	(0)
S2-2	0.000e+00	0.000e+00	-81.379	-81.583	-0.204	(0)
S-2	0.000e+00	0.000e+00	-86.925	-87.101	-0.175	(0)
HgHS2-	0.000e+00	0.000e+00	-138.370	-138.421	-0.051	(0)
HgS2-2	0.000e+00	0.000e+00	-138.839	-139.043	-0.204	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.112	-140.112	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-145.796	-146.058	-0.262	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.379	-146.516	-0.137	(0)
CuS4S5-3	0.000e+00	0.000e+00	-146.536	-146.788	-0.252	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.067	-147.118	-0.051	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.232	-147.284	-0.051	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-147.604	-147.871	-0.267	(0)
AgS4S5-3	0.000e+00	0.000e+00	-147.925	-148.182	-0.257	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.359	-149.359	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.746	-149.746	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.059	-151.059	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.267	-159.267	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.772	-215.823	-0.051	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-223.914	-223.965	-0.051	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.656	-225.860	-0.204	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.682	-225.733	-0.051	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.594	-227.646	-0.051	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.065	-235.116	-0.051	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.219	-301.423	-0.204	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.107	-303.311	-0.204	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.913	-319.117	-0.204	(0)
S (6)	1.750e-03					
SO4-2	1.550e-03	1.025e-03	-2.810	-2.989	-0.179	(0)
CaSO4	9.916e-05	9.916e-05	-4.004	-4.004	0.000	(0)
MgSO4	7.411e-05	7.411e-05	-4.130	-4.130	0.000	(0)
NaSO4-	2.312e-05	2.093e-05	-4.636	-4.679	-0.043	(0)
KSO4-	3.396e-06	3.073e-06	-5.469	-5.512	-0.043	(0)
MnSO4	6.800e-07	6.800e-07	-6.168	-6.168	0.000	(0)
ZnSO4	8.791e-08	8.791e-08	-7.056	-7.056	0.000	(0)
CuSO4	2.030e-09	2.030e-09	-8.693	-8.693	0.000	(0)
NH4SO4-	1.546e-09	1.398e-09	-8.811	-8.855	-0.044	(0)
NiSO4	1.508e-09	1.508e-09	-8.822	-8.822	0.000	(0)
Zn (SO4) 2-2	1.256e-09	7.850e-10	-8.901	-9.105	-0.204	(0)
CoSO4	1.045e-09	1.045e-09	-8.981	-8.981	0.000	(0)
HSO4-	9.115e-10	8.228e-10	-9.040	-9.085	-0.044	(0)
CdSO4	1.566e-10	1.566e-10	-9.805	-9.805	0.000	(0)
PbSO4	1.392e-11	1.392e-11	-10.856	-10.856	0.000	(0)
AgSO4-	1.263e-11	1.123e-11	-10.899	-10.950	-0.051	(0)
Cd (SO4) 2-2	3.464e-12	2.165e-12	-11.460	-11.665	-0.204	(0)
CrOHSO4	9.175e-13	9.175e-13	-12.037	-12.037	0.000	(0)
Pb (SO4) 2-2	1.376e-13	8.600e-14	-12.861	-13.065	-0.204	(0)
FeSO4	9.037e-14	9.037e-14	-13.044	-13.044	0.000	(0)
Ni (SO4) 2-2	8.193e-14	5.120e-14	-13.087	-13.291	-0.204	(0)
UO2SO4	1.835e-15	1.835e-15	-14.736	-14.736	0.000	(0)
AlSO4+	4.962e-16	4.479e-16	-15.304	-15.349	-0.044	(0)
CrSO4+	3.786e-16	3.366e-16	-15.422	-15.473	-0.051	(0)
UO2 (SO4) 2-2	3.967e-17	2.479e-17	-16.402	-16.606	-0.204	(0)
Al (SO4) 2-	5.451e-18	4.921e-18	-17.264	-17.308	-0.044	(0)
VO2SO4-	2.224e-20	1.978e-20	-19.653	-19.704	-0.051	(0)
FeSO4+	1.263e-20	1.141e-20	-19.899	-19.943	-0.044	(0)
Cr2 (OH) 2SO4+2	5.004e-22	3.127e-22	-21.301	-21.505	-0.204	(0)
Fe (SO4) 2-	2.814e-22	2.502e-22	-21.551	-21.602	-0.051	(0)
VOSO4	4.137e-23	4.137e-23	-22.383	-22.383	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.905e-23	1.905e-23	-22.720	-22.720	0.000	(0)
HgSO4	5.847e-24	5.847e-24	-23.233	-23.233	0.000	(0)
CrO3SO4-2	2.214e-25	1.384e-25	-24.655	-24.859	-0.204	(0)
VSO4+	8.981e-38	7.985e-38	-37.047	-37.098	-0.051	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.185	-43.389	-0.204	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.008	-61.059	-0.051	(0)
Sb (3)	7.958e-21					
Sb (OH) 3	4.026e-21	4.026e-21	-20.395	-20.395	0.000	(0)

HSbO2	3.931e-21	3.931e-21	-20.406	-20.406	0.000	(0)
SbO2-	8.719e-25	7.752e-25	-24.060	-24.111	-0.051	(0)
Sb (OH) 4-	4.994e-25	4.441e-25	-24.302	-24.353	-0.051	(0)
Sb (OH) 2F	4.374e-27	4.374e-27	-26.359	-26.359	0.000	(0)
SbOF	4.302e-27	4.302e-27	-26.366	-26.366	0.000	(0)
Sb (OH) 2+	9.032e-28	8.031e-28	-27.044	-27.095	-0.051	(0)
SbO+	3.114e-28	2.769e-28	-27.507	-27.558	-0.051	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.913	-319.117	-0.204	(0)
Sb (5)	3.032e-09					
SbO3-	3.029e-09	2.693e-09	-8.519	-8.570	-0.051	(0)
Sb (OH) 6-	3.491e-12	3.148e-12	-11.457	-11.502	-0.045	(0)
SbO2+	5.860e-26	5.211e-26	-25.232	-25.283	-0.051	(0)
Se (-2)	8.993e-15					
Ag2Se	8.993e-15	8.993e-15	-14.046	-14.046	0.000	(0)
HSe-	3.382e-39	3.007e-39	-38.471	-38.522	-0.051	(0)
MnSe	0.000e+00	0.000e+00	-41.250	-41.250	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.717	-42.717	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.232	-45.436	-0.204	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.740	-82.557	-0.816	(0)
Se (4)	1.781e-08					
HSeO3-	1.054e-08	9.370e-09	-7.977	-8.028	-0.051	(0)
SeO3-2	7.268e-09	4.542e-09	-8.139	-8.343	-0.204	(0)
H2SeO3	3.283e-14	3.283e-14	-13.484	-13.484	0.000	(0)
AgSeO3-	1.803e-15	1.603e-15	-14.744	-14.795	-0.051	(0)
Cd (SeO3) 2-2	1.772e-20	1.108e-20	-19.751	-19.956	-0.204	(0)
Ag (SeO3) 2-3	1.877e-22	6.518e-23	-21.727	-22.186	-0.459	(0)
FeHSeO3+2	3.931e-26	2.457e-26	-25.406	-25.610	-0.204	(0)
Se (6)	1.114e-11					
SeO4-2	1.113e-11	7.364e-12	-10.953	-11.133	-0.179	(0)
MnSeO4	7.393e-15	7.393e-15	-14.131	-14.131	0.000	(0)
ZnSeO4	4.470e-16	4.470e-16	-15.350	-15.350	0.000	(0)
NiSeO4	2.540e-17	2.540e-17	-16.595	-16.595	0.000	(0)
CoSeO4	1.885e-17	1.885e-17	-16.725	-16.725	0.000	(0)
HSeO4-	3.409e-18	3.031e-18	-17.467	-17.518	-0.051	(0)
CdSeO4	8.933e-19	8.933e-19	-18.049	-18.049	0.000	(0)
Zn (SeO4) 2-2	5.341e-27	3.338e-27	-26.272	-26.477	-0.204	(0)
Si	3.008e-04					
H4SiO4	2.950e-04	2.957e-04	-3.530	-3.529	0.001	(0)
H3SiO4-	5.774e-06	5.205e-06	-5.238	-5.284	-0.045	(0)
H2SiO4-2	5.960e-11	3.999e-11	-10.225	-10.398	-0.173	(0)
UO2H3SiO4+	5.876e-13	5.224e-13	-12.231	-12.282	-0.051	(0)
SiF6-2	1.123e-30	7.502e-31	-29.949	-30.125	-0.175	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.810	-60.270	-0.459	(0)
U (4)	2.282e-20					
U (OH) 5-	2.281e-20	2.028e-20	-19.642	-19.693	-0.051	(0)
U (OH) 4	6.977e-24	6.977e-24	-23.156	-23.156	0.000	(0)
U (OH) 3+	2.356e-28	2.095e-28	-27.628	-27.679	-0.051	(0)
U (OH) 2+2	1.273e-33	7.958e-34	-32.895	-33.099	-0.204	(0)
UF3+	2.716e-38	2.415e-38	-37.566	-37.617	-0.051	(0)
UF2+2	2.880e-39	1.800e-39	-38.541	-38.745	-0.204	(0)
UOH+3	8.863e-40	3.079e-40	-39.052	-39.512	-0.459	(0)
UF4	2.242e-40	2.242e-40	-39.649	-39.649	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.313	-41.772	-0.459	(0)
UF5-	0.000e+00	0.000e+00	-42.073	-42.124	-0.051	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.478	-42.478	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.185	-43.389	-0.204	(0)
UF6-2	0.000e+00	0.000e+00	-43.512	-43.716	-0.204	(0)
U+4	0.000e+00	0.000e+00	-46.184	-47.000	-0.816	(0)
UC1+3	0.000e+00	0.000e+00	-47.550	-48.010	-0.459	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-173.741	-177.874	-4.133	(0)
U (5)	2.725e-17					
UO2+	2.725e-17	2.423e-17	-16.565	-16.616	-0.051	(0)
U (6)	3.661e-08					
UO2 (CO3) 3-4	2.389e-08	3.646e-09	-7.622	-8.438	-0.816	(0)
UO2 (CO3) 2-2	1.267e-08	7.921e-09	-7.897	-8.101	-0.204	(0)
UO2CO3	4.323e-11	4.323e-11	-10.364	-10.364	0.000	(0)
UO2H3SiO4+	5.876e-13	5.224e-13	-12.231	-12.282	-0.051	(0)

UO2OH+	2.052e-13	1.825e-13	-12.688	-12.739	-0.051	(0)
UO2F+	1.554e-14	1.382e-14	-13.809	-13.860	-0.051	(0)
UO2F2	3.374e-15	3.374e-15	-14.472	-14.472	0.000	(0)
UO2SO4	1.835e-15	1.835e-15	-14.736	-14.736	0.000	(0)
UO2+2	1.787e-15	1.182e-15	-14.748	-14.927	-0.179	(0)
UO2F3-	8.068e-17	7.174e-17	-16.093	-16.144	-0.051	(0)
UO2(SO4) 2-2	3.967e-17	2.479e-17	-16.402	-16.606	-0.204	(0)
UO2Cl+	4.210e-18	3.744e-18	-17.376	-17.427	-0.051	(0)
(UO2) 2 (OH) 2+2	8.840e-20	5.525e-20	-19.054	-19.258	-0.204	(0)
UO2F4-2	7.719e-20	4.824e-20	-19.112	-19.317	-0.204	(0)
(UO2) 3 (OH) 5+	1.292e-20	1.149e-20	-19.889	-19.940	-0.051	(0)
UO2NO3+	1.241e-24	1.104e-24	-23.906	-23.957	-0.051	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.917	-43.968	-0.051	(0)
V+2	0.000e+00	0.000e+00	-45.362	-45.566	-0.204	(0)
V (3)	2.452e-16					
V (OH) 3	2.452e-16	2.452e-16	-15.611	-15.611	0.000	(0)
V (OH) 2+	1.463e-27	1.301e-27	-26.835	-26.886	-0.051	(0)
VOH+2	1.622e-31	1.014e-31	-30.790	-30.994	-0.204	(0)
V+3	4.750e-37	1.650e-37	-36.323	-36.783	-0.459	(0)
VSO4+	8.981e-38	7.985e-38	-37.047	-37.098	-0.051	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-58.969	-59.428	-0.459	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-60.372	-61.188	-0.816	(0)
V (4)	4.066e-20					
V (OH) 3+	4.030e-20	3.583e-20	-19.395	-19.446	-0.051	(0)
VO+2	2.344e-22	1.465e-22	-21.630	-21.834	-0.204	(0)
VOF+	8.367e-23	7.440e-23	-22.077	-22.128	-0.051	(0)
VOSO4	4.137e-23	4.137e-23	-22.383	-22.383	0.000	(0)
VOF2	2.362e-24	2.362e-24	-23.627	-23.627	0.000	(0)
VOC1+	9.026e-25	8.025e-25	-24.045	-24.096	-0.051	(0)
VOF3-	7.979e-27	7.095e-27	-26.098	-26.149	-0.051	(0)
VOF4-2	3.879e-30	2.424e-30	-29.411	-29.615	-0.204	(0)
H2V2O4+2	1.030e-34	6.437e-35	-33.987	-34.191	-0.204	(0)
V (5)	9.685e-10					
H2VO4-	6.748e-10	6.000e-10	-9.171	-9.222	-0.051	(0)
HVO4-2	2.936e-10	1.835e-10	-9.532	-9.736	-0.204	(0)
H3VO4	4.928e-14	4.928e-14	-13.307	-13.307	0.000	(0)
VO4-3	3.225e-16	1.120e-16	-15.492	-15.951	-0.459	(0)
H3V2O7-	2.148e-16	1.909e-16	-15.668	-15.719	-0.051	(0)
HV2O7-3	1.075e-16	3.732e-17	-15.969	-16.428	-0.459	(0)
VO2+	8.957e-19	8.078e-19	-18.048	-18.093	-0.045	(0)
V2O7-4	8.016e-19	1.223e-19	-18.096	-18.913	-0.816	(0)
VO2F	1.199e-19	1.199e-19	-18.921	-18.921	0.000	(0)
VO2SO4-	2.224e-20	1.978e-20	-19.653	-19.704	-0.051	(0)
VO2F2-	4.147e-21	3.687e-21	-20.382	-20.433	-0.051	(0)
V3O9-3	6.517e-22	2.264e-22	-21.186	-21.645	-0.459	(0)
VO2F3-2	6.229e-24	3.893e-24	-23.206	-23.410	-0.204	(0)
VO2F4-3	4.670e-28	1.622e-28	-27.331	-27.790	-0.459	(0)
V4O12-4	3.711e-28	5.663e-29	-27.430	-28.247	-0.816	(0)
VO2NO3	1.912e-28	1.912e-28	-27.719	-27.719	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-73.817	-75.654	-1.837	(0)
HV10O28-5	0.000e+00	0.000e+00	-74.277	-75.552	-1.276	(0)
H2V10O28-4	0.000e+00	0.000e+00	-77.614	-78.430	-0.816	(0)
Zn	9.805e-07					
Zn+2	5.924e-07	3.919e-07	-6.227	-6.407	-0.179	(0)
ZnCO3	2.071e-07	2.071e-07	-6.684	-6.684	0.000	(0)
ZnSO4	8.791e-08	8.791e-08	-7.056	-7.056	0.000	(0)
ZnOH+	5.403e-08	4.804e-08	-7.267	-7.318	-0.051	(0)
ZnHCO3+	2.243e-08	1.994e-08	-7.649	-7.700	-0.051	(0)
Zn (OH) 2	9.334e-09	9.334e-09	-8.030	-8.030	0.000	(0)
ZnOHC1	3.085e-09	3.085e-09	-8.511	-8.511	0.000	(0)
ZnCl+	2.132e-09	1.922e-09	-8.671	-8.716	-0.045	(0)
Zn (SO4) 2-2	1.256e-09	7.850e-10	-8.901	-9.105	-0.204	(0)
ZnF+	7.446e-10	6.620e-10	-9.128	-9.179	-0.051	(0)
Zn (OH) 3-	6.450e-11	5.735e-11	-10.190	-10.241	-0.051	(0)
ZnCl2	5.947e-12	5.947e-12	-11.226	-11.226	0.000	(0)
ZnCl3-	1.023e-14	9.223e-15	-13.990	-14.035	-0.045	(0)
Zn (OH) 4-2	4.478e-15	2.799e-15	-14.349	-14.553	-0.204	(0)

ZnNO3+	5.181e-16	4.606e-16	-15.286	-15.337	-0.051	(0)
ZnSeO4	4.470e-16	4.470e-16	-15.350	-15.350	0.000	(0)
ZnCl4-2	1.348e-17	9.004e-18	-16.870	-17.046	-0.175	(0)
Zn(NO3)2	4.300e-26	4.300e-26	-25.366	-25.366	0.000	(0)
Zn(SeO4)2-2	5.341e-27	3.338e-27	-26.272	-26.477	-0.204	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.232	-147.284	-0.051	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.359	-149.359	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-223.914	-223.965	-0.051	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.656	-225.860	-0.204	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.107	-303.311	-0.204	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-57.93	-51.64	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-42.91	-38.40	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-50.13	-38.40	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-75.00	-57.07	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-57.24	-37.21	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-28.89	-28.48	0.40	(NH4)2CrO4	
(NH4)2SeO4	-25.37	-24.92	0.45	(NH4)2SeO4	
Acanthite	-52.10	-88.32	-36.22	Ag2S	
Ag2CO3	-12.47	-23.56	-11.09	Ag2CO3	
Ag2CrO4	-21.62	-33.21	-11.59	Ag2CrO4	
Ag2HVO4	-13.84	-12.36	1.48	Ag2HVO4	
Ag2MoO4	-13.85	-25.40	-11.55	Ag2MoO4	
Ag2O	-14.92	-2.35	12.57	Ag2O	
Ag2Se	-0.26	-48.96	-48.70	Ag2Se	
Ag2SeO3	-11.31	-18.46	-7.15	Ag2SeO3	
Ag2SeO4	-20.74	-29.65	-8.91	Ag2SeO4	
Ag2SO4	-16.69	-21.51	-4.82	Ag2SO4	
Ag3AsO3	-27.41	-25.26	2.16	Ag3AsO3	
Ag3AsO4	-16.25	-19.04	-2.79	Ag3AsO4	
Ag3H2VO5	-18.71	-13.53	5.18	Ag3H2VO5	
AgF·4H2O	-14.38	-13.33	1.05	AgF·4H2O	
Agmetal	-0.23	-13.73	-13.51	Ag	
AgVO3	-11.95	-11.18	0.77	AgVO3	
Al(OH)3(am)	-2.79	8.01	10.80	Al(OH)3	
Al2(MoO4)3	-55.50	-53.13	2.37	Al2(MoO4)3	
Al2O3	-3.64	16.01	19.65	Al2O3	
Al4(OH)10SO4	-9.83	12.87	22.70	Al4(OH)10SO4	
AlAsO4·2H2O	-12.31	-7.51	4.80	AlAsO4·2H2O	
AlOHSO4	-7.92	-11.15	-3.23	AlOHSO4	
AlSb	-153.37	-87.74	65.62	AlSb	
Alunite	-8.19	-9.59	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-5.76	-13.55	-7.79	PbSO4	
Anhydrite	-2.00	-6.36	-4.36	CaSO4	
Anilite	-54.71	-86.59	-31.88	Cu0.25Cu1.5S	
Antlerite	-3.63	5.16	8.79	Cu3(OH)4SO4	
Aragonite	-0.11	-8.41	-8.30	CaCO3	
Arsenolite	-84.17	-86.93	-2.76	As4O6	
Artinite	-5.27	4.33	9.60	MgCO3:Mg(OH)2·3H2O	
As2O5	-37.73	-31.02	6.71	As2O5	
Atacamite	-1.97	5.42	7.39	Cu2(OH)3Cl	
Azurite	-1.19	-18.09	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2·8H2O	-16.53	7.87	24.39	Ba(OH)2·8H2O	
Ba2V2O7·2H2O	-20.15	-4.28	15.87	Ba2V2O7·2H2O	
Ba3(AsO4)2	1.49	-7.42	-8.91	Ba3(AsO4)2	
Ba3(VO4)2·4H2O	-29.35	3.59	32.94	Ba3(VO4)2·4H2O	
BaCrO4	-13.33	-23.00	-9.67	BaCrO4	
BaF2	-10.63	-16.45	-5.82	BaF2	
BaMoO4	-8.22	-15.18	-6.96	BaMoO4	
Barite	-1.31	-11.29	-9.98	BaSO4	
BaS	-94.28	-78.10	16.18	BaS	
BaSeO3	-10.08	-8.25	1.83	BaSeO3	
BaSeO4	-11.98	-19.44	-7.46	BaSeO4	
Bianchite	-7.63	-9.40	-1.76	ZnSO4·6H2O	

Birnessite	-7.58	10.51	18.09	MnO2
Bixbyite	-3.45	-4.10	-0.64	Mn2O3
BlaubleiI	-54.87	-79.03	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-55.24	-82.52	-27.28	Cu0.6Cu0.8S
Boehmite	-0.57	8.01	8.58	AlOOH
Breithauptite	-56.63	-75.15	-18.52	NiSb
Brochantite	-1.95	13.27	15.22	Cu4(OH)6SO4
Brucite	-4.07	12.77	16.84	Mg(OH)2
Bunsenite	-4.41	8.04	12.45	NiO
Ca(VO3)2	-12.88	-7.22	5.66	Ca(VO3)2
Ca2V2O7	-11.92	5.58	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.97	5.58	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-14.94	7.36	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.59	18.37	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.49	18.37	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.08	-153.11	142.97	Ca3Sb2
CaCrO4	-15.80	-18.07	-2.27	CaCrO4
Calcite	0.07	-8.41	-8.48	CaCO3
Calomel	-10.98	-28.89	-17.91	Hg2Cl2
CaMoO4	-2.30	-10.25	-7.95	CaMoO4
Carnotite	-4.28	-4.05	0.23	KUO2VO4
CaSeO3:2H2O	-6.13	-3.32	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.49	-14.51	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.85	-3.01	9.84	Cd(BO2)2
Cd(OH)2	-6.66	6.98	13.64	Cd(OH)2
Cd(OH)2(am)	-6.75	6.98	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-24.08	-17.37	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.77	1.79	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.62	8.78	28.40	Cd4(OH)6SO4
CdCl2	-13.95	-14.61	-0.66	CdCl2
CdCl2:1H2O	-12.91	-14.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.69	-14.61	-1.91	CdCl2:2.5H2O
CdF2	-16.12	-17.33	-1.21	CdF2
Cdmetal(alpha)	-31.65	-18.13	13.51	Cd
Cdmetal(gamma)	-31.75	-18.13	13.62	Cd
CdMoO4	-1.91	-16.06	-14.15	CdMoO4
CdOHCl	-7.35	-3.81	3.54	CdOHCl
CdSb	-75.85	-76.20	-0.35	CdSb
CdSe	-19.42	-39.62	-20.20	CdSe
CdSeO4:2H2O	-18.47	-20.32	-1.85	CdSeO4:2H2O
CdSO4	-12.00	-12.18	-0.17	CdSO4
CdSO4:1H2O	-10.45	-12.18	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.30	-12.18	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.22	-11.97	-9.75	AgCl
Cerrusite	-2.46	-15.59	-13.13	PbCO3
CH4(g)	-80.63	-121.68	-41.05	CH4
Chalcanthite	-8.41	-11.05	-2.64	CuSO4:5H2O
Chalcedony	0.02	-3.53	-3.55	SiO2
Chalcocite	-54.57	-89.49	-34.92	Cu2S
Chalcopyrite	-124.84	-160.11	-35.27	CuFeS2
Chrysotile	-0.95	31.25	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.96	-98.66	-45.69	HgS
Claudetite	-83.86	-86.93	-3.06	As4O6
Clausthalite	-13.89	-40.99	-27.10	PbSe
Co(BO2)2	-29.18	-2.11	27.07	Co(BO2)2
Co(OH)2	-5.21	7.88	13.09	Co(OH)2
Co(OH)3	-9.65	-11.96	-2.31	Co(OH)3
CO2(g)	-3.06	-21.21	-18.15	CO2
Co3(AsO4)2	-20.42	-7.39	13.03	Co3(AsO4)2
Co3O4	-5.55	-16.04	-10.50	Co3O4
CoCl2	-21.98	-13.71	8.27	CoCl2
CoCl2:6H2O	-16.25	-13.71	2.54	CoCl2:6H2O
CoCO3	-3.35	-13.33	-9.98	CoCO3
CoF2	-14.84	-16.44	-1.60	CoF2
CoF3	-46.98	-48.44	-1.46	CoF3
CoFe2O4	17.91	14.39	-3.53	CoFe2O4
CoMoO4	-7.41	-15.17	-7.76	CoMoO4
CoO	-5.71	7.88	13.59	CoO

CoS (alpha)	-70.65	-78.09	-7.44	CoS
CoS (beta)	-67.02	-78.09	-11.07	CoS
CoSe	-22.53	-38.73	-16.20	CoSe
CoSeO3	-9.55	-8.23	1.32	CoSeO3
CoSeO4:6H2O	-17.90	-19.43	-1.53	CoSeO4:6H2O
CoSO4	-14.08	-11.28	2.80	CoSO4
CoSO4:6H2O	-8.81	-11.28	-2.47	CoSO4:6H2O
Cotunnite	-11.20	-15.98	-4.78	PbCl2
Covellite	-55.56	-77.86	-22.30	CuS
Cr (OH) 2	-21.60	-10.78	10.82	Cr (OH) 2
Cr (OH) 3	-2.50	-1.16	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.41	-1.16	-0.75	Cr (OH) 3
Cr2O3	0.03	-2.33	-2.36	Cr2O3
CrCl2	-46.46	-32.37	14.09	CrCl2
CrCl3	-48.66	-33.55	15.11	CrCl3
CrF3	-26.30	-37.64	-11.34	CrF3
Cristobalite	-0.18	-3.53	-3.35	SiO2
Crmetal	-66.38	-35.89	30.48	Cr
CrO3	-27.65	-30.86	-3.21	CrO3
Cryolite	-14.10	-47.94	-33.84	Na3AlF6
Cu (OH) 2	-0.57	8.11	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.66	17.55	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-10.45	-1.20	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.52	-89.40	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.33	-50.13	-45.80	Cu2Se
Cu2SO4	-20.73	-22.68	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.80	-6.70	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.44	-101.03	-42.59	Cu3Sb
Cu3Se2	-25.14	-88.63	-63.49	Cu3Se2
CuCO3	-1.60	-13.10	-11.50	CuCO3
CuCrO4	-17.32	-22.76	-5.44	CuCrO4
CuF	-9.01	-13.92	-4.91	CuF
CuF2	-17.32	-16.21	1.12	CuF2
CuF2:2H2O	-11.66	-16.21	-4.55	CuF2:2H2O
Cumetal	-5.56	-14.32	-8.76	Cu
CuMoO4	-1.87	-14.94	-13.08	CuMoO4
CuOCuSO4	-13.25	-2.95	10.30	CuOCuSO4
Cupricferrite	8.63	14.61	5.99	CuFe2O4
Cuprite	-2.12	-3.52	-1.41	Cu2O
Cuprousferrite	10.41	1.49	-8.92	CuFeO2
CuSe	-5.40	-38.50	-33.10	CuSe
CuSe2	-26.62	-59.99	-33.37	CuSe2
CuSeO3:2H2O	-8.52	-8.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.76	-19.20	-2.44	CuSeO4:5H2O
CuSO4	-13.99	-11.05	2.94	CuSO4
Diaspore	1.13	8.01	6.87	AlOOH
Djurleite	-54.81	-88.73	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.31	-16.85	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.24	-16.85	-17.09	CaMg (CO3) 2
Epsomite	-4.26	-6.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.84	3.73	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.05	0.01	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-12.57	-16.29	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-11.16	-9.61	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-21.21	-41.84	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-47.24	-50.97	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.99	10.23	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.66	-12.26	0.40	FeAsO4:2H2O
FeCr2O4	-5.80	1.40	7.20	FeCr2O4
FeMoO4	-9.23	-19.32	-10.09	FeMoO4
Ferrihydrite	0.06	3.25	3.19	Fe (OH) 3
Ferroselite	-45.77	-64.37	-18.60	FeSe2
FeS (ppt)	-79.30	-82.25	-2.95	FeS
FeSe	-31.88	-42.88	-11.00	FeSe
Fix_pe	-4.47	-4.47	0.00	e-
Fluorite	-1.02	-11.52	-10.50	CaF2
Galena	-66.39	-80.36	-13.97	PbS
Gibbsite	-0.28	8.01	8.29	Al (OH) 3

Goethite	2.76	3.25	0.49	FeOOH
Goslarite	-7.39	-9.40	-2.01	ZnSO ₄ :7H ₂ O
Greenalite	-16.69	4.12	20.81	Fe ₃ Si ₂ O ₅ (OH) ₄
Greenockite	-64.63	-78.99	-14.36	CdS
Greigite	-288.62	-333.65	-45.03	Fe ₃ S ₄
Gummite	-6.43	1.24	7.67	UO ₃
Gypsum	-1.75	-6.36	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-16.46	-28.56	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-10.17	-23.05	-12.88	H ₂ MoO ₄
H ₂ S(g)	-77.96	-85.97	-8.01	H ₂ S
H ₂ Se(g)	-41.65	-46.61	-4.96	H ₂ Se
Halite	-6.73	-5.13	1.60	NaCl
Halloysite	-0.62	8.96	9.57	Al ₂ Si ₂ O ₅ (OH) ₄
Hausmannite	-3.68	57.35	61.03	Mn ₃ O ₄
Hematite	7.92	6.51	-1.42	Fe ₂ O ₃
Hercynite	-3.15	19.74	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-182.34	-256.04	-73.71	Hg(CH ₃) ₂
Hg(g)	-8.34	-16.21	-7.87	Hg
Hg(OH) ₂	-9.19	-12.69	-3.50	Hg(OH) ₂
Hg ₂ (g)	-17.47	-32.42	-14.96	Hg ₂
Hg ₂ (OH) ₂	-12.56	-7.30	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-12.46	-28.51	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-29.47	-38.17	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-21.26	-31.62	-10.36	Hg ₂ F ₂
Hg ₂ S	-81.60	-93.27	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-18.76	-23.42	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-20.33	-26.46	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-29.58	-59.26	-29.68	Hg ₃ O ₂ CO ₃
HgCl(g)	-33.94	-14.45	19.50	HgCl
HgCl ₂	-13.01	-34.27	-21.26	HgCl ₂
HgF(g)	-48.48	-15.81	32.68	HgF
HgF ₂ (g)	-49.57	-37.00	12.57	HgF ₂
Hgmetal(l)	-2.76	-16.21	-13.45	Hg
HgSe	-3.60	-59.29	-55.69	HgSe
HgSeO ₃	-16.37	-28.80	-12.43	HgSeO ₃
HgSO ₄	-22.43	-31.85	-9.42	HgSO ₄
Huntite	-3.76	-33.73	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-6.80	-25.57	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.22	-20.98	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ :4H ₂ O
K-Alum	-20.43	-25.60	-5.17	KAl(SO ₄) ₂ :12H ₂ O
K-Jarosite	-9.05	-23.85	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-35.06	-52.30	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-20.93	-21.44	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.89	-13.62	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-17.15	-17.88	-0.73	K ₂ SeO ₄
Kaolinite	1.52	8.96	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-4.22	13.27	17.49	Cu ₄ (OH) ₆ SO ₄ :H ₂ O
Larnakite	-7.50	-7.93	-0.43	PbO:PbSO ₄
Laurionite	-5.80	-5.18	0.62	PbOHCl
Lepidocrocite	1.88	3.25	1.37	FeOOH
Lime	-19.90	12.80	32.70	CaO
Litharge	-7.08	5.61	12.69	PbO
Mackinawite	-78.65	-82.25	-3.60	FeS
Maghemite	0.12	6.51	6.39	Fe ₂ O ₃
Magnesioferrite	2.42	19.28	16.86	Fe ₂ MgO ₄
Magnesite	-0.98	-8.44	-7.46	MgCO ₃
Magnetite	6.83	10.23	3.40	Fe ₃ O ₄
Malachite	0.31	-4.99	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.04	23.30	25.34	MnOOH
Massicot	-7.28	5.61	12.89	PbO
Matlockite	-8.37	-17.34	-8.97	PbClF
Melanothallite	-19.74	-13.48	6.26	CuCl ₂
Melanterite	-13.23	-15.43	-2.21	FeSO ₄ :7H ₂ O
Metacinnabar	-53.56	-98.66	-45.09	HgS
Mg(OH) ₂ (active)	-6.02	12.77	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-18.52	-7.24	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-273.59	-198.91	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.83	5.53	26.36	Mg ₂ V ₂ O ₇

MgCr2O4	-5.76	10.44	16.20	MgCr2O4
MgCrO4	-23.47	-18.09	5.38	MgCrO4
MgF2	-3.42	-11.55	-8.13	MgF2
MgMoO4	-8.43	-10.28	-1.85	MgMoO4
MgSeO3:6H2O	-6.40	-3.34	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.33	-14.53	-1.20	MgSeO4:6H2O
Minium	-31.56	41.96	73.52	Pb3O4
Mirabilite	-6.72	-7.83	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-14.17	-9.27	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-55.87	-61.58	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.90	-86.82	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-11.30	1.20	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.56	-10.85	2.72	MnCl2:4H2O
MnS (grn)	-75.40	-75.23	0.17	MnS
MnS (pnk)	-78.57	-75.23	3.34	MnS
MnSb	-94.89	-97.80	-2.91	MnSb
MnSe	-39.36	-35.86	3.50	MnSe
MnSeO3	-6.50	-5.37	1.13	MnSeO3
MnSeO3:2H2O	-6.35	-5.37	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.51	-16.56	-2.05	MnSeO4:5H2O
MnSO4	-11.00	-8.42	2.58	MnSO4
Monteponite	-8.12	6.98	15.10	CdO
Montroydite	-9.04	-12.68	-3.64	HgO
MoO3	-15.05	-23.05	-8.00	MoO3
Morenosite	-8.98	-11.12	-2.14	NiSO4:7H2O
MoS2	-149.85	-220.11	-70.26	MoS2
Na-Jarosite	-11.70	-22.90	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.50	-50.40	-9.90	Na2Cr2O7
Na2CrO4	-22.46	-19.53	2.93	Na2CrO4
Na2Mo2O7	-18.17	-34.77	-16.60	Na2Mo2O7
Na2MoO4	-13.21	-11.72	1.49	Na2MoO4
Na2MoO4:2H2O	-12.94	-11.72	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.08	-4.78	10.30	Na2SeO3:5H2O
Na2SeO4	-17.25	-15.97	1.28	Na2SeO4
Na3Sb	-173.20	-78.75	94.45	Na3Sb
Na3VO4	-29.69	6.99	36.68	Na3VO4
Na4V2O7	-34.75	2.65	37.40	Na4V2O7
Nantokite	-5.83	-12.56	-6.73	CuCl
NaSb	-88.13	-64.97	23.17	NaSb
Natron	-8.57	-9.88	-1.31	Na2CO3:10H2O
NaVO3	-8.20	-4.34	3.86	NaVO3
Nesquehonite	-3.77	-8.44	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.76	8.04	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-22.61	-6.91	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-19.01	12.99	32.00	Ni4 (OH) 6SO4
NiCO3	-6.30	-13.17	-6.87	NiCO3
NiMoO4	-3.87	-15.01	-11.14	NiMoO4
NiS (alpha)	-72.33	-77.93	-5.60	NiS
NiS (beta)	-66.83	-77.93	-11.10	NiS
NiS (gamma)	-65.13	-77.93	-12.80	NiS
NiSe	-20.87	-38.57	-17.70	NiSe
NiSeO3:2H2O	-10.89	-8.08	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.75	-19.27	-1.52	NiSeO4:6H2O
Nsutite	-6.99	10.51	17.50	MnO2
O2 (g)	-32.85	50.24	83.09	O2
Orpiment	-240.31	-301.38	-61.07	As2S3
Otavite	-2.22	-14.22	-12.00	CdCO3
Pb (BO2) 2	-10.90	-4.38	6.52	Pb (BO2) 2
Pb (OH) 2	-2.54	5.61	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-62.35	-71.11	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-8.36	0.43	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.96	11.23	26.19	Pb2O (OH) 2
Pb2O3	-24.69	36.35	61.04	Pb2O3
Pb2OCO3	-9.42	-9.98	-0.56	Pb2OCO3
Pb2V2O7	-6.89	-8.79	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.98	-14.18	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-9.31	-3.17	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.39	-4.37	11.02	Pb3O2CO3

Pb3O2SO4	-13.01	-2.32	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-17.81	3.29	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-18.58	3.30	21.88	Pb4O3SO4
PbCrO4	-12.65	-25.25	-12.60	PbCrO4
PbF2	-11.26	-18.70	-7.44	PbF2
Pbmetal	-23.75	-19.50	4.25	Pb
PbMoO4	-1.82	-17.44	-15.62	PbMoO4
PbO:0.3H2O	-7.37	5.61	12.98	PbO:0.33H2O
PbSeO4	-14.85	-21.69	-6.84	PbSeO4
Periclase	-8.81	12.77	21.58	MgO
Phosgenite	-11.76	-31.57	-19.81	PbCl2:PbCO3
Plattnerite	-18.87	30.73	49.60	PbO2
Portlandite	-10.01	12.80	22.80	Ca (OH) 2
Pyrite	-124.59	-143.10	-18.51	FeS2
Pyrochroite	-4.45	10.74	15.19	Mn (OH) 2
Pyrolusite	-5.52	35.86	41.38	MnO2
Quartz	0.47	-3.53	-4.00	SiO2
Realgar	-100.52	-120.26	-19.75	AsS
Retgersite	-9.08	-11.12	-2.04	NiSO4:6H2O
Rhodochrosite	0.11	-10.47	-10.58	MnCO3
Rutherfordine	-5.46	-19.96	-14.50	UO2CO3
Sb (OH) 3	-13.29	-20.40	-7.11	Sb (OH) 3
Sb2O4	-19.07	-15.67	3.40	Sb2O4
Sb2O5	-29.51	-39.17	-9.67	Sb2O5
Sb2Se3	-112.85	-180.61	-67.76	Sb2Se3
Sb4O6 (cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6 (orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.35	-52.78	0.57	SbCl3
SbF3	-46.64	-56.87	-10.23	SbF3
Sbmetal	-46.38	-58.07	-11.69	Sb
SbO2	-4.32	-32.15	-27.82	SbO2
Schoepite	-4.75	1.24	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.38	-21.49	-7.11	Se
Semetal (hex)	-13.78	-21.49	-7.71	Se
Senarmontite	-28.42	-40.79	-12.37	Sb2O3
SeO2	-16.24	-16.11	0.12	SeO2
SeO3	-48.35	-27.30	21.04	SeO3
Sepiolite	-0.81	14.95	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.83	14.95	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.24	-17.48	-10.24	FeCO3
SiO2 (am-gel)	-0.82	-3.53	-2.71	SiO2
SiO2 (am-ppt)	-0.79	-3.53	-2.74	SiO2
Smithsonite	-1.44	-11.44	-10.00	ZnCO3
Sphalerite	-64.76	-76.21	-11.45	ZnS
Spinel	-8.06	28.78	36.85	MgAl2O4
Stibnite	-248.24	-298.70	-50.46	Sb2S3
Sulfur	-58.71	-60.85	-2.14	S
Tenorite	0.46	8.11	7.64	CuO
Thenardite	-8.15	-7.83	0.32	Na2SO4
Thermonatrite	-10.51	-9.88	0.64	Na2CO3:H2O
Tyuyamunite	-8.81	-4.73	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.82	6.26	21.08	U3O8
U3Sb4	-579.35	-426.97	152.38	U3Sb4
U4O9	-30.50	-33.51	-3.02	U4O9
UF4	-33.75	-63.29	-29.54	UF4
UF4:2.5H2O	-30.57	-63.29	-32.72	UF4:2.5H2O
UO2 (am)	-15.59	-14.66	0.93	UO2
UO2 (NO3) 2	-45.73	-33.59	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-38.44	-33.59	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-36.98	-33.59	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-35.63	-33.59	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.37	1.24	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-23.81	-26.06	-2.25	UO2SeO4:4H2O
UO3	-6.46	1.24	7.70	UO3
Uraninite	-9.99	-14.66	-4.67	UO2
USb2	-219.83	-190.25	29.58	USb2
V (OH) 3	-20.12	-12.53	7.59	V (OH) 3
V2O5	-18.65	-20.01	-1.36	V2O5

V3O5	-43.94	-42.11	1.84	V3O5
V4O7	-54.96	-47.77	7.19	V4O7
V6O13	-49.42	-110.28	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VC12	-65.55	-46.67	18.87	VC12
VC13	-68.34	-44.91	23.43	VC13
VF4	-69.22	-54.29	14.93	VF4
Vmetal	-94.23	-50.20	44.03	V
VO	-39.84	-25.09	14.76	VO
VO(OH)2	-10.81	-5.66	5.15	VO(OH)2
VO2Cl	-23.64	-20.80	2.84	VO2Cl
VOC1	-34.47	-23.32	11.15	VOC1
VOC12	-40.01	-27.25	12.76	VOC12
VOSO4	-28.43	-24.82	3.61	VOSO4
Witherite	-4.77	-13.34	-8.57	BaCO3
Wurtzite	-67.26	-76.21	-8.95	ZnS
Zincite	-1.57	9.76	11.33	ZnO
Zincosite	-13.33	-9.40	3.93	ZnSO4
Zn(BO2)2	-8.52	-0.23	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-28.38	-25.07	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.44	9.76	12.20	Zn(OH)2
Zn(OH)2(am)	-2.71	9.76	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.99	9.76	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.77	9.76	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.97	9.76	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.13	0.37	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.46	8.73	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.38	-1.73	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.94	-9.03	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.50	19.90	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.27	27.23	38.50	Zn5(OH)8Cl2
ZnCl2	-18.88	-11.83	7.05	ZnCl2
ZnCO3:1H2O	-1.18	-11.44	-10.26	ZnCO3:1H2O
ZnF2	-14.02	-14.55	-0.53	ZnF2
Znmetal	-41.14	-15.35	25.79	Zn
ZnMoO4	-3.16	-13.28	-10.13	ZnMoO4
ZnO(active)	-1.42	9.76	11.19	ZnO
ZnS(am)	-67.16	-76.21	-9.05	ZnS
ZnSb	-84.44	-73.43	11.01	ZnSb
ZnSe	-22.44	-36.84	-14.40	ZnSe
ZnSeO4:6H2O	-16.02	-17.54	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.76	-9.40	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 81.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e-=e-
  log_k      0
EQUILIBRIUM_PHASES 405
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0

```



```

Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 413
SAVE Solution 414 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 405
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Maximum iterations exceeded, 10000

WARNING: Numerical method failed with this set of convergence parameters.

WARNING: Trying smaller step size, pe step size 10, 5 ...

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 413. Solution after simulation 80.
Using pure phase assemblage 405.

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-1.41	-50.11	-48.70	0.000e+00	0	0.000e+00
Alunite	-9.63	-11.03	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-2.11	-6.47	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	1.518e-09	1.518e-09
Barite	-1.68	-11.66	-9.98	0.000e+00	0	0.000e+00
Brochantite	-0.78	14.44	15.22	0.000e+00	0	0.000e+00
Brucite	-3.66	13.18	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	4.702e-04
CaMoO4	-2.42	-10.37	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.12	-3.31	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.972e-04	1.972e-04
Carnotite	-4.00	-3.77	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-12.41	-2.57	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.91	-16.06	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	0.000e+00	4.163e-05	4.163e-05
Cr2O3	0.00	-2.36	-2.36	0.000e+00	1.400e-10	1.400e-10
Cu2Se(alpha)	-5.57	-51.37	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.94	-15.02	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.33	-6.46	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	2.450e-10	2.450e-10
Fluorite	-1.13	-11.63	-10.50	0.000e+00	0	0.000e+00
Gummite	-6.06	1.61	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.86	-6.47	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.81	-60.51	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.70	-7.81	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.36	-5.23	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.25	8.54	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-22.92	-7.22	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.24	-13.11	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.86	-15.00	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.245e-07
Otavite	-2.17	-14.17	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-1.88	-17.50	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.53	-20.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-4.78	-32.61	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.38	1.61	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.42	15.34	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-0.94	-3.68	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-8.37	-4.29	4.08	0.000e+00	0	0.000e+00
U3O8	-14.14	6.95	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.00	1.61	5.61	0.000e+00	0	0.000e+00
UO3	-6.09	1.61	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.19	-13.31	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.230e-09	3.230e-09
Al	2.827e-07	2.827e-07
As	1.808e-09	1.809e-09
B	1.090e-05	1.091e-05
Ba	3.066e-09	3.067e-09
C	1.189e-03	1.190e-03
Ca	5.607e-04	5.608e-04
Cd	1.437e-09	1.437e-09
Cl	2.165e-03	2.165e-03
Co	1.094e-08	1.094e-08
Cr	6.498e-10	6.499e-10
Cu	5.481e-07	5.482e-07
F	9.870e-05	9.872e-05
Fe	7.249e-10	7.250e-10
Hg	2.275e-10	2.275e-10
K	4.729e-04	4.730e-04

Mg	5.644e-04	5.645e-04
Mn	6.816e-06	6.817e-06
Mo	2.001e-07	2.002e-07
N	1.628e-06	1.628e-06
Na	4.242e-03	4.243e-03
Ni	1.702e-08	1.703e-08
Pb	9.928e-10	9.930e-10
S	1.750e-03	1.750e-03
Sb	3.032e-09	3.033e-09
Se	1.782e-08	1.782e-08
Si	2.176e-04	2.176e-04
U	3.661e-08	3.662e-08
V	9.685e-10	9.687e-10
Zn	9.805e-07	9.807e-07

-----Description of solution-----

	pH	=	8.333	Charge balance
	pe	=	4.439	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	9.201e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.217e-03	
	Total CO2 (mol/kg)	=	1.189e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.926e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	6	
	Total H	=	1.110312e+02	
	Total O	=	5.552603e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.401e-06	2.169e-06	-5.620	-5.664	-0.044	(0)
H+	5.127e-09	4.642e-09	-8.290	-8.333	-0.043	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	3.230e-09					
AgCl	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
Ag+	6.051e-10	5.478e-10	-9.218	-9.261	-0.043	(0)
AgCl2-	4.187e-10	3.741e-10	-9.378	-9.427	-0.049	(0)
AgSO4-	1.299e-11	1.161e-11	-10.886	-10.935	-0.049	(0)
AgCl3-2	1.025e-12	6.533e-13	-11.989	-12.185	-0.196	(0)
AgNO2	1.676e-13	1.676e-13	-12.776	-12.776	0.000	(0)
AgOH	1.188e-13	1.188e-13	-12.925	-12.925	0.000	(0)
AgF	1.179e-13	1.179e-13	-12.928	-12.928	0.000	(0)
AgH2BO3	1.037e-14	1.037e-14	-13.984	-13.984	0.000	(0)
AgCl4-3	7.205e-15	2.614e-15	-14.142	-14.583	-0.440	(0)
AgSeO3-	2.437e-15	2.177e-15	-14.613	-14.662	-0.049	(0)
Ag2Se	6.389e-16	6.389e-16	-15.195	-15.195	0.000	(0)
AgNH3+	3.619e-16	3.234e-16	-15.441	-15.490	-0.049	(0)
Ag (OH) 2-	2.818e-17	2.518e-17	-16.550	-16.599	-0.049	(0)
AgNO3	6.011e-19	6.011e-19	-18.221	-18.221	0.000	(0)
Ag (NO2) 2-	4.254e-19	3.801e-19	-18.371	-18.420	-0.049	(0)
Ag (NH3) 2+	8.507e-22	7.601e-22	-21.070	-21.119	-0.049	(0)
Ag (SeO3) 2-3	3.323e-22	1.206e-22	-21.478	-21.919	-0.440	(0)
Ag2MoO4	1.526e-26	1.526e-26	-25.816	-25.816	0.000	(0)
AgHS	0.000e+00	0.000e+00	-75.273	-75.273	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.820	-84.603	-0.783	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-150.016	-150.149	-0.133	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.950	-150.999	-0.049	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.996	-151.256	-0.260	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.316	-151.567	-0.251	(0)
Al	2.827e-07					
Al (OH) 4-	2.817e-07	2.552e-07	-6.550	-6.593	-0.043	(0)

Al(OH) 3	9.347e-10	9.347e-10	-9.029	-9.029	0.000	(0)
Al(OH) 2+	2.378e-11	2.160e-11	-10.624	-10.666	-0.042	(0)
AlF2+	1.860e-13	1.690e-13	-12.730	-12.772	-0.042	(0)
AlF3	1.823e-13	1.823e-13	-12.739	-12.739	0.000	(0)
AlOH+2	1.843e-14	1.254e-14	-13.735	-13.902	-0.167	(0)
AlF4-	8.640e-15	7.828e-15	-14.063	-14.106	-0.043	(0)
AlF+2	7.279e-15	4.953e-15	-14.138	-14.305	-0.167	(0)
AlSO4+	5.259e-17	4.764e-17	-16.279	-16.322	-0.043	(0)
Al+3	1.416e-17	5.780e-18	-16.849	-17.238	-0.389	(0)
Al(SO4) 2-	5.984e-19	5.421e-19	-18.223	-18.266	-0.043	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-53.035	-53.475	-0.440	(0)
As (3)	9.671e-24					
H3AsO3	8.607e-24	8.607e-24	-23.065	-23.065	0.000	(0)
H2AsO3-	1.064e-24	9.510e-25	-23.973	-24.022	-0.049	(0)
HAsO3-2	2.932e-28	1.869e-28	-27.533	-27.728	-0.196	(0)
H4AsO3+	2.215e-32	1.979e-32	-31.655	-31.704	-0.049	(0)
AsO3-3	4.277e-33	1.552e-33	-32.369	-32.809	-0.440	(0)
As (5)	1.808e-09					
HAsO4-2	1.753e-09	1.117e-09	-8.756	-8.952	-0.196	(0)
H2AsO4-	5.294e-11	4.730e-11	-10.276	-10.325	-0.049	(0)
AsO4-3	2.098e-12	7.613e-13	-11.678	-12.118	-0.440	(0)
H3AsO4	3.807e-17	3.815e-17	-16.419	-16.418	0.001	(0)
B	1.090e-05					
H3BO3	9.531e-06	9.551e-06	-5.021	-5.020	0.001	(0)
H2BO3-	1.327e-06	1.195e-06	-5.877	-5.923	-0.045	(0)
CaH2BO3+	2.416e-08	2.177e-08	-7.617	-7.662	-0.045	(0)
MgH2BO3+	1.514e-08	1.364e-08	-7.820	-7.865	-0.045	(0)
NaH2BO3	7.227e-09	7.227e-09	-8.141	-8.141	0.000	(0)
BF(OH) 3-	3.625e-10	3.266e-10	-9.441	-9.486	-0.045	(0)
H5(BO3) 2-	1.078e-11	9.715e-12	-10.967	-11.013	-0.045	(0)
BaH2BO3+	8.351e-14	7.523e-14	-13.078	-13.124	-0.045	(0)
BF2(OH) 2-	1.542e-14	1.389e-14	-13.812	-13.857	-0.045	(0)
AgH2BO3	1.037e-14	1.037e-14	-13.984	-13.984	0.000	(0)
H8(BO3) 3-	1.030e-14	9.279e-15	-13.987	-14.032	-0.045	(0)
BF3OH-	2.386e-21	2.150e-21	-20.622	-20.668	-0.045	(0)
BF4-	4.671e-27	4.208e-27	-26.331	-26.376	-0.045	(0)
Ba	3.066e-09					
Ba+2	3.033e-09	2.037e-09	-8.518	-8.691	-0.173	(0)
BaHCO3+	2.215e-11	2.015e-11	-10.655	-10.696	-0.041	(0)
BaCO3	1.093e-11	1.093e-11	-10.961	-10.961	0.000	(0)
BaH2BO3+	8.351e-14	7.523e-14	-13.078	-13.124	-0.045	(0)
BaOH+	2.126e-14	1.929e-14	-13.673	-13.715	-0.042	(0)
BaNO3+	1.579e-17	1.410e-17	-16.802	-16.851	-0.049	(0)
BaNH3+2	5.832e-19	3.716e-19	-18.234	-18.430	-0.196	(0)
C (4)	1.189e-03					
HCO3-	1.140e-03	1.036e-03	-2.943	-2.985	-0.042	(0)
CO3-2	1.558e-05	1.046e-05	-4.807	-4.980	-0.173	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	6.711e-06	6.105e-06	-5.173	-5.214	-0.041	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgHCO3+	3.857e-06	3.489e-06	-5.414	-5.457	-0.043	(0)
MgCO3	2.865e-06	2.865e-06	-5.543	-5.543	0.000	(0)
NaHCO3	2.222e-06	2.222e-06	-5.653	-5.653	0.000	(0)
NaCO3-	8.184e-07	7.433e-07	-6.087	-6.129	-0.042	(0)
CuCO3	4.396e-07	4.396e-07	-6.357	-6.357	0.000	(0)
ZnCO3	2.184e-07	2.184e-07	-6.661	-6.661	0.000	(0)
MnHCO3+	8.658e-08	7.855e-08	-7.063	-7.105	-0.042	(0)
UO2(CO3) 3-4	2.449e-08	4.038e-09	-7.611	-8.394	-0.783	(0)
Cu(CO3) 2-2	1.942e-08	1.238e-08	-7.712	-7.907	-0.196	(0)
ZnHCO3+	1.330e-08	1.188e-08	-7.876	-7.925	-0.049	(0)
UO2(CO3) 2-2	1.209e-08	7.702e-09	-7.918	-8.113	-0.196	(0)
NiCO3	2.917e-09	2.917e-09	-8.535	-8.535	0.000	(0)
NiHCO3+	1.068e-09	9.544e-10	-8.971	-9.020	-0.049	(0)
CoCO3	9.146e-10	9.146e-10	-9.039	-9.039	0.000	(0)
PbCO3	7.369e-10	7.369e-10	-9.133	-9.133	0.000	(0)
CuHCO3+	5.220e-10	4.664e-10	-9.282	-9.331	-0.049	(0)
CoHCO3+	4.664e-10	4.167e-10	-9.331	-9.380	-0.049	(0)
CdCO3	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)

		UO2CO3	3.690e-11	3.690e-11	-10.433	-10.433	0.000	(0)
		Pb(CO3) 2-2	3.489e-11	2.223e-11	-10.457	-10.653	-0.196	(0)
		BaHCO3+	2.215e-11	2.015e-11	-10.655	-10.696	-0.041	(0)
		PbHCO3+	2.018e-11	1.803e-11	-10.695	-10.744	-0.049	(0)
		BaCO3	1.093e-11	1.093e-11	-10.961	-10.961	0.000	(0)
		Cd(CO3) 2-2	1.865e-12	1.188e-12	-11.729	-11.925	-0.196	(0)
		CdHCO3+	1.696e-12	1.515e-12	-11.771	-11.820	-0.049	(0)
		FeHCO3+	8.721e-16	7.933e-16	-15.059	-15.101	-0.041	(0)
		HgCO3	2.324e-16	2.324e-16	-15.634	-15.634	0.000	(0)
		Hg(CO3) 2-2	1.206e-17	7.687e-18	-16.919	-17.114	-0.196	(0)
		HgHCO3+	2.248e-20	2.008e-20	-19.648	-19.697	-0.049	(0)
Ca	5.607e-04							
		Ca+2	4.714e-04	3.165e-04	-3.327	-3.500	-0.173	(0)
		CaSO4	7.700e-05	7.700e-05	-4.113	-4.113	0.000	(0)
		CaHCO3+	6.711e-06	6.105e-06	-5.173	-5.214	-0.041	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.263e-07	2.960e-07	-6.486	-6.529	-0.042	(0)
		CaH2BO3+	2.416e-08	2.177e-08	-7.617	-7.662	-0.045	(0)
		CaOH+	1.506e-08	1.370e-08	-7.822	-7.863	-0.041	(0)
		CaNO3+	1.548e-12	1.383e-12	-11.810	-11.859	-0.049	(0)
		CaNH3+2	1.808e-13	1.152e-13	-12.743	-12.938	-0.196	(0)
		Ca(NH3) 2+2	2.081e-23	1.326e-23	-22.682	-22.877	-0.196	(0)
Cd	1.437e-09							
		Cd+2	9.569e-10	6.426e-10	-9.019	-9.192	-0.173	(0)
		CdSO4	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
		CdCO3	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)
		CdCl+	1.346e-10	1.203e-10	-9.871	-9.920	-0.049	(0)
		CdOH+	1.239e-11	1.107e-11	-10.907	-10.956	-0.049	(0)
		CdOHC1	1.070e-11	1.070e-11	-10.971	-10.971	0.000	(0)
		Cd(SO4) 2-2	3.596e-12	2.291e-12	-11.444	-11.640	-0.196	(0)
		Cd(CO3) 2-2	1.865e-12	1.188e-12	-11.729	-11.925	-0.196	(0)
		CdHCO3+	1.696e-12	1.515e-12	-11.771	-11.820	-0.049	(0)
		CdCl2	9.824e-13	9.824e-13	-12.008	-12.008	0.000	(0)
		CdF+	9.767e-13	8.727e-13	-12.010	-12.059	-0.049	(0)
		Cd(OH) 2	1.515e-13	1.515e-13	-12.820	-12.820	0.000	(0)
		CdCl3-	1.360e-15	1.215e-15	-14.867	-14.916	-0.049	(0)
		CdF2	1.492e-16	1.492e-16	-15.826	-15.826	0.000	(0)
		Cd(OH) 3-	2.247e-17	2.008e-17	-16.648	-16.697	-0.049	(0)
		CdSeO4	3.206e-18	3.206e-18	-17.494	-17.494	0.000	(0)
		CdNO3+	3.142e-18	2.807e-18	-17.503	-17.552	-0.049	(0)
		Cd2OH+3	9.827e-20	3.565e-20	-19.008	-19.448	-0.440	(0)
		Cd(SeO3) 2-2	3.179e-20	2.026e-20	-19.498	-19.693	-0.196	(0)
		Cd(OH) 4-2	1.118e-23	7.127e-24	-22.951	-23.147	-0.196	(0)
		Cd(NO3) 2	1.944e-27	1.944e-27	-26.711	-26.711	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-80.961	-81.010	-0.049	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-153.632	-153.632	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-231.509	-231.558	-0.049	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-308.993	-309.188	-0.196	(0)
Cl	2.165e-03							
		Cl-	2.165e-03	1.960e-03	-2.665	-2.708	-0.043	(0)
		MnCl+	1.034e-08	9.377e-09	-7.986	-8.028	-0.042	(0)
		ZnOHC1	5.070e-09	5.070e-09	-8.295	-8.295	0.000	(0)
		AgCl	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
		ZnCl+	1.973e-09	1.786e-09	-8.705	-8.748	-0.043	(0)
		AgCl2-	4.187e-10	3.741e-10	-9.378	-9.427	-0.049	(0)
		CuCl	3.138e-10	3.138e-10	-9.503	-9.503	0.000	(0)
		CuCl2-	1.420e-10	1.285e-10	-9.848	-9.891	-0.043	(0)
		CdCl+	1.346e-10	1.203e-10	-9.871	-9.920	-0.049	(0)
		NiCl+	4.194e-11	3.748e-11	-10.377	-10.426	-0.049	(0)
		CoCl+	3.924e-11	3.506e-11	-10.406	-10.455	-0.049	(0)
		MnCl2	2.596e-11	2.596e-11	-10.586	-10.586	0.000	(0)
		CuCl+	2.450e-11	2.216e-11	-10.611	-10.654	-0.043	(0)
		CdOHC1	1.070e-11	1.070e-11	-10.971	-10.971	0.000	(0)
		ZnCl2	5.546e-12	5.546e-12	-11.256	-11.256	0.000	(0)
		PbCl+	1.824e-12	1.629e-12	-11.739	-11.788	-0.049	(0)
		AgCl3-2	1.025e-12	6.533e-13	-11.989	-12.185	-0.196	(0)
		CdCl2	9.824e-13	9.824e-13	-12.008	-12.008	0.000	(0)
		HgClOH	1.393e-13	1.393e-13	-12.856	-12.856	0.000	(0)

CuCl3-2	7.943e-14	5.382e-14	-13.100	-13.269	-0.169	(0)
MnCl3-	1.544e-14	1.401e-14	-13.811	-13.854	-0.042	(0)
CuCl2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
PbCl2	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
ZnCl3-	9.541e-15	8.633e-15	-14.020	-14.064	-0.043	(0)
AgCl4-3	7.205e-15	2.614e-15	-14.142	-14.583	-0.440	(0)
HgCl2	7.127e-15	7.127e-15	-14.147	-14.147	0.000	(0)
CdCl3-	1.360e-15	1.215e-15	-14.867	-14.916	-0.049	(0)
NiCl2	3.698e-16	3.698e-16	-15.432	-15.432	0.000	(0)
HgCl3-	1.563e-16	1.397e-16	-15.806	-15.855	-0.049	(0)
ZnCl4-2	1.248e-17	8.459e-18	-16.904	-17.073	-0.169	(0)
PbCl3-	1.245e-17	1.113e-17	-16.905	-16.954	-0.049	(0)
UO2Cl+	3.152e-18	2.816e-18	-17.501	-17.550	-0.049	(0)
HgCl4-2	1.710e-18	1.090e-18	-17.767	-17.963	-0.196	(0)
HgCl+	8.122e-19	7.257e-19	-18.090	-18.139	-0.049	(0)
CuCl3-	3.044e-19	2.754e-19	-18.517	-18.560	-0.043	(0)
CrCl+2	9.772e-20	6.227e-20	-19.010	-19.206	-0.196	(0)
PbCl4-2	1.564e-20	9.966e-21	-19.806	-20.001	-0.196	(0)
CrOHC12	5.031e-21	5.031e-21	-20.298	-20.298	0.000	(0)
FeCl+2	1.357e-23	9.192e-24	-22.868	-23.037	-0.169	(0)
CrCl2+	1.296e-23	1.158e-23	-22.887	-22.936	-0.049	(0)
CuCl4-2	3.992e-24	2.705e-24	-23.399	-23.568	-0.169	(0)
FeCl2+	8.869e-26	8.046e-26	-25.052	-25.094	-0.042	(0)
VOC1+	8.164e-26	7.295e-26	-25.088	-25.137	-0.049	(0)
CrO3Cl-	2.582e-26	2.307e-26	-25.588	-25.637	-0.049	(0)
FeCl3	1.577e-29	1.577e-29	-28.802	-28.802	0.000	(0)
CoCl+2	3.541e-37	2.256e-37	-36.451	-36.647	-0.196	(0)
UCl+3	0.000e+00	0.000e+00	-48.615	-49.056	-0.440	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
Co (2)	1.094e-08					
Co+2	8.116e-09	5.172e-09	-8.091	-8.286	-0.196	(0)
CoSO4	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
CoCO3	9.146e-10	9.146e-10	-9.039	-9.039	0.000	(0)
CoHCO3+	4.664e-10	4.167e-10	-9.331	-9.380	-0.049	(0)
CoOH+	2.505e-10	2.238e-10	-9.601	-9.650	-0.049	(0)
CoCl+	3.924e-11	3.506e-11	-10.406	-10.455	-0.049	(0)
Co (OH) 2	3.856e-11	3.856e-11	-10.414	-10.414	0.000	(0)
CoF+	1.569e-11	1.401e-11	-10.805	-10.853	-0.049	(0)
CoNO2+	5.973e-14	5.337e-14	-13.224	-13.273	-0.049	(0)
Co (OH) 3-	1.868e-15	1.669e-15	-14.729	-14.778	-0.049	(0)
CoOOH-	4.687e-16	4.188e-16	-15.329	-15.378	-0.049	(0)
Co (NH3) +2	2.821e-16	1.798e-16	-15.550	-15.745	-0.196	(0)
CoSeO4	6.945e-17	6.945e-17	-16.158	-16.158	0.000	(0)
CoNO3+	1.267e-17	1.132e-17	-16.897	-16.946	-0.049	(0)
Co2OH+3	1.599e-19	5.801e-20	-18.796	-19.236	-0.440	(0)
Co (OH) 4-2	9.002e-22	5.737e-22	-21.046	-21.241	-0.196	(0)
Co (NH3) 2+2	3.480e-24	2.218e-24	-23.458	-23.654	-0.196	(0)
Co (NO3) 2	3.183e-26	3.183e-26	-25.497	-25.497	0.000	(0)
Co4 (OH) 4+4	3.036e-30	5.007e-31	-29.518	-30.300	-0.783	(0)
Co (NH3) 3+2	1.267e-32	8.073e-33	-31.897	-32.093	-0.196	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.716	-40.912	-0.196	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.035	-50.231	-0.196	(0)
Co (3)	9.787e-30					
CoOH+2	9.787e-30	6.237e-30	-29.009	-29.205	-0.196	(0)
Co+3	1.386e-36	5.658e-37	-35.858	-36.247	-0.389	(0)
CoCl+2	3.541e-37	2.256e-37	-36.451	-36.647	-0.196	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.202	-73.398	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
Cr (2)	3.349e-28					
Cr+2	3.349e-28	2.134e-28	-27.475	-27.671	-0.196	(0)
Cr (3)	6.497e-10					
Cr (OH) 2+	3.441e-10	3.075e-10	-9.463	-9.512	-0.049	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.870e-11	2.564e-11	-10.542	-10.591	-0.049	(0)

Cr (OH) 4-	2.421e-11	2.163e-11	-10.616	-10.665	-0.049	(0)
Cr (OH) +2	1.828e-12	1.165e-12	-11.738	-11.934	-0.196	(0)
CrOHSO4	2.936e-13	2.936e-13	-12.532	-12.532	0.000	(0)
CrF+2	5.233e-16	3.335e-16	-15.281	-15.477	-0.196	(0)
CrSO4+	6.815e-17	6.089e-17	-16.167	-16.215	-0.049	(0)
Cr+3	6.767e-17	2.455e-17	-16.170	-16.610	-0.440	(0)
CrCl+2	9.772e-20	6.227e-20	-19.010	-19.206	-0.196	(0)
CrOHC12	5.031e-21	5.031e-21	-20.298	-20.298	0.000	(0)
Cr2 (OH) 2SO4+2	4.852e-23	3.092e-23	-22.314	-22.510	-0.196	(0)
CrCl2+	1.296e-23	1.158e-23	-22.887	-22.936	-0.049	(0)
Cr2 (OH) 2 (SO4) 2	1.950e-24	1.950e-24	-23.710	-23.710	0.000	(0)
CrNO3+2	2.327e-27	1.483e-27	-26.633	-26.829	-0.196	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.400	-49.596	-0.196	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-60.403	-60.843	-0.440	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Cr (6)	4.104e-14					
CrO4-2	3.997e-14	2.684e-14	-13.398	-13.571	-0.173	(0)
NaCrO4-	5.697e-16	5.090e-16	-15.244	-15.293	-0.049	(0)
HCrO4-	4.513e-16	4.032e-16	-15.346	-15.394	-0.049	(0)
KCrO4-	4.743e-17	4.238e-17	-16.324	-16.373	-0.049	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	9.500e-25	6.054e-25	-24.022	-24.218	-0.196	(0)
CrO3Cl-	2.582e-26	2.307e-26	-25.588	-25.637	-0.049	(0)
Cr2O7-2	8.847e-30	5.638e-30	-29.053	-29.249	-0.196	(0)
Cu (1)	5.981e-10					
CuCl	3.138e-10	3.138e-10	-9.503	-9.503	0.000	(0)
Cu+	1.423e-10	1.272e-10	-9.847	-9.896	-0.049	(0)
CuCl2-	1.420e-10	1.285e-10	-9.848	-9.891	-0.043	(0)
CuCl3-2	7.943e-14	5.382e-14	-13.100	-13.269	-0.169	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.236	-149.491	-0.255	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.975	-150.221	-0.246	(0)
Cu (2)	5.475e-07					
CuCO3	4.396e-07	4.396e-07	-6.357	-6.357	0.000	(0)
CuOH+	5.410e-08	4.895e-08	-7.267	-7.310	-0.043	(0)
Cu (OH) 2	2.118e-08	2.118e-08	-7.674	-7.674	0.000	(0)
Cu (CO3) 2-2	1.942e-08	1.238e-08	-7.712	-7.907	-0.196	(0)
Cu+2	1.063e-08	7.136e-09	-7.974	-8.147	-0.173	(0)
CuSO4	1.736e-09	1.736e-09	-8.760	-8.760	0.000	(0)
CuHCO3+	5.220e-10	4.664e-10	-9.282	-9.331	-0.049	(0)
Cu (OH) 3-	1.055e-10	9.424e-11	-9.977	-10.026	-0.049	(0)
Cu2 (OH) 2+2	9.443e-11	6.018e-11	-10.025	-10.221	-0.196	(0)
CuF+	4.318e-11	3.858e-11	-10.365	-10.414	-0.049	(0)
CuCl+	2.450e-11	2.216e-11	-10.611	-10.654	-0.043	(0)
CuNO2+	1.225e-12	1.094e-12	-11.912	-11.961	-0.049	(0)
CuNH3+2	3.313e-14	2.111e-14	-13.480	-13.675	-0.196	(0)
CuCl2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
Cu (OH) 4-2	2.524e-15	1.609e-15	-14.598	-14.794	-0.196	(0)
CuNO3+	3.489e-17	3.118e-17	-16.457	-16.506	-0.049	(0)
Cu (NO2) 2	1.640e-17	1.640e-17	-16.785	-16.785	0.000	(0)
CuCl3-	3.044e-19	2.754e-19	-18.517	-18.560	-0.043	(0)
CuCl4-2	3.992e-24	2.705e-24	-23.399	-23.568	-0.169	(0)
Cu (NO3) 2	5.422e-27	5.422e-27	-26.266	-26.266	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-221.677	-221.726	-0.049	(0)
F	9.870e-05					
F-	9.466e-05	8.569e-05	-4.024	-4.067	-0.043	(0)
MgF+	3.494e-06	3.165e-06	-5.457	-5.500	-0.043	(0)
CaF+	3.263e-07	2.960e-07	-6.486	-6.529	-0.042	(0)
NaF	2.063e-07	2.063e-07	-6.686	-6.686	0.000	(0)
MnF+	1.429e-08	1.297e-08	-7.845	-7.887	-0.042	(0)
ZnF+	6.942e-10	6.202e-10	-9.159	-9.207	-0.049	(0)
HF	5.883e-10	5.883e-10	-9.230	-9.230	0.000	(0)
BF (OH) 3-	3.625e-10	3.266e-10	-9.441	-9.486	-0.045	(0)
CuF+	4.318e-11	3.858e-11	-10.365	-10.414	-0.049	(0)
NiF+	1.801e-11	1.609e-11	-10.745	-10.793	-0.049	(0)
CoF+	1.569e-11	1.401e-11	-10.805	-10.853	-0.049	(0)
CdF+	9.767e-13	8.727e-13	-12.010	-12.059	-0.049	(0)
HF2-	2.121e-13	1.917e-13	-12.673	-12.717	-0.044	(0)
AlF2+	1.860e-13	1.690e-13	-12.730	-12.772	-0.042	(0)

AlF3	1.823e-13	1.823e-13	-12.739	-12.739	0.000	(0)
PbF+	1.584e-13	1.415e-13	-12.800	-12.849	-0.049	(0)
AgF	1.179e-13	1.179e-13	-12.928	-12.928	0.000	(0)
BF2 (OH) 2-	1.542e-14	1.389e-14	-13.812	-13.857	-0.045	(0)
UO2F+	1.173e-14	1.048e-14	-13.931	-13.980	-0.049	(0)
AlF4-	8.640e-15	7.828e-15	-14.063	-14.106	-0.043	(0)
AlF+2	7.279e-15	4.953e-15	-14.138	-14.305	-0.167	(0)
UO2F2	2.590e-15	2.590e-15	-14.587	-14.587	0.000	(0)
CrF+2	5.233e-16	3.335e-16	-15.281	-15.477	-0.196	(0)
PbF2	2.386e-16	2.386e-16	-15.622	-15.622	0.000	(0)
CdF2	1.492e-16	1.492e-16	-15.826	-15.826	0.000	(0)
UO2F3-	6.240e-17	5.575e-17	-16.205	-16.254	-0.049	(0)
H2F2	9.273e-19	9.273e-19	-18.033	-18.033	0.000	(0)
UO2F4-2	5.955e-20	3.795e-20	-19.225	-19.421	-0.196	(0)
PbF3-	4.340e-20	3.878e-20	-19.362	-19.411	-0.049	(0)
FeF2+	3.689e-20	3.347e-20	-19.433	-19.475	-0.042	(0)
VO2F	3.180e-20	3.180e-20	-19.498	-19.498	0.000	(0)
FeF+2	2.154e-20	1.459e-20	-19.667	-19.836	-0.169	(0)
FeF3	4.046e-21	4.046e-21	-20.393	-20.393	0.000	(0)
BF3OH-	2.386e-21	2.150e-21	-20.622	-20.668	-0.045	(0)
VO2F2-	1.107e-21	9.893e-22	-20.956	-21.005	-0.049	(0)
VOF+	7.633e-24	6.820e-24	-23.117	-23.166	-0.049	(0)
PbF4-2	2.496e-24	1.591e-24	-23.603	-23.798	-0.196	(0)
VO2F3-2	1.659e-24	1.057e-24	-23.780	-23.976	-0.196	(0)
VOF2	2.191e-25	2.191e-25	-24.659	-24.659	0.000	(0)
HgF+	6.598e-26	5.895e-26	-25.181	-25.230	-0.049	(0)
BF4-	4.671e-27	4.208e-27	-26.331	-26.376	-0.045	(0)
VOF3-	7.457e-28	6.662e-28	-27.127	-27.176	-0.049	(0)
Sb (OH) 2F	5.318e-28	5.318e-28	-27.274	-27.274	0.000	(0)
SbOF	5.230e-28	5.230e-28	-27.281	-27.281	0.000	(0)
VO2F4-3	1.229e-28	4.459e-29	-27.910	-28.351	-0.440	(0)
VOF4-2	3.616e-31	2.304e-31	-30.442	-30.637	-0.196	(0)
SiF6-2	8.658e-32	5.866e-32	-31.063	-31.232	-0.169	(0)
UF3+	2.511e-39	2.244e-39	-38.600	-38.649	-0.049	(0)
UF2+2	2.592e-40	1.652e-40	-39.586	-39.782	-0.196	(0)
UF4	0.000e+00	0.000e+00	-40.676	-40.676	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.375	-42.815	-0.440	(0)
UF5-	0.000e+00	0.000e+00	-43.096	-43.145	-0.049	(0)
UF6-2	0.000e+00	0.000e+00	-44.537	-44.732	-0.196	(0)
Fe (2)	1.180e-13					
Fe+2	9.547e-14	6.084e-14	-13.020	-13.216	-0.196	(0)
FeSO4	1.586e-14	1.586e-14	-13.800	-13.800	0.000	(0)
FeOH+	5.790e-15	5.253e-15	-14.237	-14.280	-0.042	(0)
FeHCO3+	8.721e-16	7.933e-16	-15.059	-15.101	-0.041	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	6.842e-18	6.208e-18	-17.165	-17.207	-0.042	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.918	-163.918	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-241.658	-241.707	-0.049	(0)
Fe (3)	7.247e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.021e-10	1.835e-10	-9.694	-9.736	-0.042	(0)
Fe (OH) 4-	9.507e-11	8.635e-11	-10.022	-10.064	-0.042	(0)
FeOH+2	3.210e-16	2.175e-16	-15.493	-15.663	-0.169	(0)
FeF2+	3.689e-20	3.347e-20	-19.433	-19.475	-0.042	(0)
FeF+2	2.154e-20	1.459e-20	-19.667	-19.836	-0.169	(0)
FeF3	4.046e-21	4.046e-21	-20.393	-20.393	0.000	(0)
FeSO4+	2.040e-21	1.851e-21	-20.690	-20.733	-0.042	(0)
Fe+3	3.805e-22	1.553e-22	-21.420	-21.809	-0.389	(0)
Fe (SO4) 2-	4.703e-23	4.202e-23	-22.328	-22.377	-0.049	(0)
FeCl+2	1.357e-23	9.192e-24	-22.868	-23.037	-0.169	(0)
FeCl2+	8.869e-26	8.046e-26	-25.052	-25.094	-0.042	(0)
FeHSeO3+2	4.645e-27	2.960e-27	-26.333	-26.529	-0.196	(0)
FeCl3	1.577e-29	1.577e-29	-28.802	-28.802	0.000	(0)
Fe2 (OH) 2+4	9.501e-30	1.567e-30	-29.022	-29.805	-0.783	(0)
FeNO3+2	3.367e-30	2.146e-30	-29.473	-29.668	-0.196	(0)
Fe3 (OH) 4+5	6.947e-38	4.157e-39	-37.158	-38.381	-1.223	(0)
H (0)	4.030e-29					
H2	2.015e-29	2.019e-29	-28.696	-28.695	0.001	(0)

Hg (0)	2.268e-10					
Hg	2.268e-10	2.268e-10	-9.644	-9.644	0.000	(0)
Hg (1)	8.969e-24					
Hg2+2	4.484e-24	2.858e-24	-23.348	-23.544	-0.196	(0)
Hg (2)	6.966e-13					
Hg (OH) 2	5.497e-13	5.509e-13	-12.260	-12.259	0.001	(0)
HgClOH	1.393e-13	1.393e-13	-12.856	-12.856	0.000	(0)
HgCl2	7.127e-15	7.127e-15	-14.147	-14.147	0.000	(0)
HgCO3	2.324e-16	2.324e-16	-15.634	-15.634	0.000	(0)
HgCl3-	1.563e-16	1.397e-16	-15.806	-15.855	-0.049	(0)
Hg (CO3) 2-2	1.206e-17	7.687e-18	-16.919	-17.114	-0.196	(0)
HgOH+	1.794e-18	1.603e-18	-17.746	-17.795	-0.049	(0)
HgCl4-2	1.710e-18	1.090e-18	-17.767	-17.963	-0.196	(0)
HgCl+	8.122e-19	7.257e-19	-18.090	-18.139	-0.049	(0)
Hg (OH) 3-	1.684e-19	1.504e-19	-18.774	-18.823	-0.049	(0)
HgHCO3+	2.248e-20	2.008e-20	-19.648	-19.697	-0.049	(0)
Hg+2	2.912e-23	1.856e-23	-22.536	-22.731	-0.196	(0)
HgNH3+2	5.314e-24	3.386e-24	-23.275	-23.470	-0.196	(0)
HgSO4	5.160e-24	5.160e-24	-23.287	-23.287	0.000	(0)
Hg (NH3) 2+2	1.536e-24	9.791e-25	-23.813	-24.009	-0.196	(0)
HgF+	6.598e-26	5.895e-26	-25.181	-25.230	-0.049	(0)
HgNO3+	1.060e-32	9.467e-33	-31.975	-32.024	-0.049	(0)
Hg (NH3) 3+2	1.769e-33	1.127e-33	-32.752	-32.948	-0.196	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-41.265	-41.265	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.391	-41.587	-0.196	(0)
HgHS2-	0.000e+00	0.000e+00	-142.073	-142.122	-0.049	(0)
HgS2-2	0.000e+00	0.000e+00	-142.301	-142.497	-0.196	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-144.062	-144.062	0.000	(0)
K	4.729e-04					
K+	4.694e-04	4.249e-04	-3.328	-3.372	-0.043	(0)
KSO4-	3.517e-06	3.194e-06	-5.454	-5.496	-0.042	(0)
KCrO4-	4.743e-17	4.238e-17	-16.324	-16.373	-0.049	(0)
Mg	5.644e-04					
Mg+2	4.903e-04	3.292e-04	-3.310	-3.482	-0.173	(0)
MgSO4	6.362e-05	6.362e-05	-4.196	-4.196	0.000	(0)
MgHCO3+	3.857e-06	3.489e-06	-5.414	-5.457	-0.043	(0)
MgF+	3.494e-06	3.165e-06	-5.457	-5.500	-0.043	(0)
MgCO3	2.865e-06	2.865e-06	-5.543	-5.543	0.000	(0)
MgOH+	3.122e-07	2.843e-07	-6.506	-6.546	-0.041	(0)
MgH2BO3+	1.514e-08	1.364e-08	-7.820	-7.865	-0.045	(0)
Mn (2)	6.816e-06					
Mn+2	5.965e-06	3.801e-06	-5.224	-5.420	-0.196	(0)
MnSO4	7.178e-07	7.178e-07	-6.144	-6.144	0.000	(0)
MnHCO3+	8.658e-08	7.855e-08	-7.063	-7.105	-0.042	(0)
MnOH+	2.283e-08	2.071e-08	-7.642	-7.684	-0.042	(0)
MnF+	1.429e-08	1.297e-08	-7.845	-7.887	-0.042	(0)
MnCl+	1.034e-08	9.377e-09	-7.986	-8.028	-0.042	(0)
MnCl2	2.596e-11	2.596e-11	-10.586	-10.586	0.000	(0)
MnSeO4	2.741e-14	2.741e-14	-13.562	-13.562	0.000	(0)
MnCl3-	1.544e-14	1.401e-14	-13.811	-13.854	-0.042	(0)
MnNO3+	9.315e-15	8.322e-15	-14.031	-14.080	-0.049	(0)
Mn (OH) 3-	6.636e-16	6.021e-16	-15.178	-15.220	-0.042	(0)
Mn (OH) 4-2	6.222e-21	4.216e-21	-20.206	-20.375	-0.169	(0)
Mn (NO3) 2	2.888e-23	2.888e-23	-22.539	-22.539	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.388	-42.388	0.000	(0)
Mn (3)	1.143e-26					
Mn+3	1.143e-26	4.666e-27	-25.942	-26.331	-0.389	(0)
Mn (6)	5.617e-40					
MnO4-2	5.617e-40	3.806e-40	-39.250	-39.420	-0.169	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.308	-44.352	-0.045	(0)
Mo	2.001e-07					
MoO4-2	2.001e-07	1.344e-07	-6.699	-6.872	-0.173	(0)
HMoO4-	1.389e-11	1.241e-11	-10.857	-10.906	-0.049	(0)
H2MoO4	4.220e-16	4.220e-16	-15.375	-15.375	0.000	(0)
Ag2MoO4	1.526e-26	1.526e-26	-25.816	-25.816	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-53.035	-53.475	-0.440	(0)
Mo7O24-6	0.000e+00	0.000e+00	-60.017	-61.778	-1.761	(0)

HMo7O24-5	0.000e+00	0.000e+00	-62.501	-63.724	-1.223	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-66.493	-67.276	-0.783	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-71.923	-72.363	-0.440	(0)
N (-3)	2.932e-09					
NH4+	2.613e-09	2.354e-09	-8.583	-8.628	-0.045	(0)
NH3	2.892e-10	2.892e-10	-9.539	-9.539	0.000	(0)
NH4SO4-	2.952e-11	2.678e-11	-10.530	-10.572	-0.042	(0)
CaNH3+2	1.808e-13	1.152e-13	-12.743	-12.938	-0.196	(0)
CuNH3+2	3.313e-14	2.111e-14	-13.480	-13.675	-0.196	(0)
NiNH3+2	1.821e-15	1.161e-15	-14.740	-14.935	-0.196	(0)
AgNH3+	3.619e-16	3.234e-16	-15.441	-15.490	-0.049	(0)
Co (NH3) +2	2.821e-16	1.798e-16	-15.550	-15.745	-0.196	(0)
BaNH3+2	5.832e-19	3.716e-19	-18.234	-18.430	-0.196	(0)
Ag (NH3) 2+	8.507e-22	7.601e-22	-21.070	-21.119	-0.049	(0)
Ni (NH3) 2+2	7.612e-23	4.851e-23	-22.118	-22.314	-0.196	(0)
Ca (NH3) 2+2	2.081e-23	1.326e-23	-22.682	-22.877	-0.196	(0)
HgNH3+2	5.314e-24	3.386e-24	-23.275	-23.470	-0.196	(0)
Co (NH3) 2+2	3.480e-24	2.218e-24	-23.458	-23.654	-0.196	(0)
Hg (NH3) 2+2	1.536e-24	9.791e-25	-23.813	-24.009	-0.196	(0)
Co (NH3) 3+2	1.267e-32	8.073e-33	-31.897	-32.093	-0.196	(0)
Hg (NH3) 3+2	1.769e-33	1.127e-33	-32.752	-32.948	-0.196	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.716	-40.912	-0.196	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.391	-41.587	-0.196	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.400	-49.596	-0.196	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.035	-50.231	-0.196	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-60.403	-60.843	-0.440	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.202	-73.398	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
N (3)	1.623e-06					
NO2-	1.623e-06	1.464e-06	-5.790	-5.834	-0.045	(0)
CuNO2+	1.225e-12	1.094e-12	-11.912	-11.961	-0.049	(0)
AgNO2	1.676e-13	1.676e-13	-12.776	-12.776	0.000	(0)
CoNO2+	5.973e-14	5.337e-14	-13.224	-13.273	-0.049	(0)
Cu (NO2) 2	1.640e-17	1.640e-17	-16.785	-16.785	0.000	(0)
Ag (NO2) 2-	4.254e-19	3.801e-19	-18.371	-18.420	-0.049	(0)
N (5)	1.528e-09					
NO3-	1.526e-09	1.381e-09	-8.816	-8.860	-0.043	(0)
CaNO3+	1.548e-12	1.383e-12	-11.810	-11.859	-0.049	(0)
MnNO3+	9.315e-15	8.322e-15	-14.031	-14.080	-0.049	(0)
ZnNO3+	1.409e-15	1.259e-15	-14.851	-14.900	-0.049	(0)
CuNO3+	3.489e-17	3.118e-17	-16.457	-16.506	-0.049	(0)
NiNO3+	2.903e-17	2.594e-17	-16.537	-16.586	-0.049	(0)
BaNO3+	1.579e-17	1.410e-17	-16.802	-16.851	-0.049	(0)
CoNO3+	1.267e-17	1.132e-17	-16.897	-16.946	-0.049	(0)
CdNO3+	3.142e-18	2.807e-18	-17.503	-17.552	-0.049	(0)
AgNO3	6.011e-19	6.011e-19	-18.221	-18.221	0.000	(0)
PbNO3+	5.359e-19	4.788e-19	-18.271	-18.320	-0.049	(0)
Mn (NO3) 2	2.888e-23	2.888e-23	-22.539	-22.539	0.000	(0)
UO2NO3+	2.733e-24	2.442e-24	-23.563	-23.612	-0.049	(0)
Zn (NO3) 2	3.470e-25	3.470e-25	-24.460	-24.460	0.000	(0)
Co (NO3) 2	3.183e-26	3.183e-26	-25.497	-25.497	0.000	(0)
Cu (NO3) 2	5.422e-27	5.422e-27	-26.266	-26.266	0.000	(0)
CrNO3+2	2.327e-27	1.483e-27	-26.633	-26.829	-0.196	(0)
Cd (NO3) 2	1.944e-27	1.944e-27	-26.711	-26.711	0.000	(0)
Pb (NO3) 2	1.123e-27	1.123e-27	-26.949	-26.949	0.000	(0)
VO2NO3	1.478e-28	1.478e-28	-27.830	-27.830	0.000	(0)
FeNO3+2	3.367e-30	2.146e-30	-29.473	-29.668	-0.196	(0)
HgNO3+	1.060e-32	9.467e-33	-31.975	-32.024	-0.049	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-41.265	-41.265	0.000	(0)
Na	4.242e-03					
Na+	4.215e-03	3.816e-03	-2.375	-2.418	-0.043	(0)
NaSO4-	2.396e-05	2.176e-05	-4.621	-4.662	-0.042	(0)
NaHCO3	2.222e-06	2.222e-06	-5.653	-5.653	0.000	(0)
NaCO3-	8.184e-07	7.433e-07	-6.087	-6.129	-0.042	(0)
NaF	2.063e-07	2.063e-07	-6.686	-6.686	0.000	(0)

	NaH2BO3	7.227e-09	7.227e-09	-8.141	-8.141	0.000	(0)
	NaCrO4-	5.697e-16	5.090e-16	-15.244	-15.293	-0.049	(0)
Ni		1.702e-08					
	Ni+2	1.113e-08	7.474e-09	-7.953	-8.126	-0.173	(0)
	NiCO3	2.917e-09	2.917e-09	-8.535	-8.535	0.000	(0)
	NiSO4	1.584e-09	1.584e-09	-8.800	-8.800	0.000	(0)
	NiHCO3+	1.068e-09	9.544e-10	-8.971	-9.020	-0.049	(0)
	NiOH+	2.284e-10	2.041e-10	-9.641	-9.690	-0.049	(0)
	NiCl+	4.194e-11	3.748e-11	-10.377	-10.426	-0.049	(0)
	Ni (OH) 2	3.516e-11	3.516e-11	-10.454	-10.454	0.000	(0)
	NiF+	1.801e-11	1.609e-11	-10.745	-10.793	-0.049	(0)
	Ni (SO4) 2-2	8.739e-14	5.569e-14	-13.059	-13.254	-0.196	(0)
	Ni (OH) 3-	8.536e-14	7.627e-14	-13.069	-13.118	-0.049	(0)
	NiNH3+2	1.821e-15	1.161e-15	-14.740	-14.935	-0.196	(0)
	NiCl2	3.698e-16	3.698e-16	-15.432	-15.432	0.000	(0)
	NiSeO4	9.368e-17	9.368e-17	-16.028	-16.028	0.000	(0)
	NiNO3+	2.903e-17	2.594e-17	-16.537	-16.586	-0.049	(0)
	Ni (NH3) 2+2	7.612e-23	4.851e-23	-22.118	-22.314	-0.196	(0)
O (0)		2.480e-35					
	O2	1.240e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb		9.928e-10					
	PbCO3	7.369e-10	7.369e-10	-9.133	-9.133	0.000	(0)
	PbOH+	1.429e-10	1.277e-10	-9.845	-9.894	-0.049	(0)
	Pb+2	3.489e-11	2.343e-11	-10.457	-10.630	-0.173	(0)
	Pb (CO3) 2-2	3.489e-11	2.223e-11	-10.457	-10.653	-0.196	(0)
	PbHCO3+	2.018e-11	1.803e-11	-10.695	-10.744	-0.049	(0)
	PbSO4	1.219e-11	1.219e-11	-10.914	-10.914	0.000	(0)
	Pb (OH) 2	8.756e-12	8.756e-12	-11.058	-11.058	0.000	(0)
	PbCl+	1.824e-12	1.629e-12	-11.739	-11.788	-0.049	(0)
	PbF+	1.584e-13	1.415e-13	-12.800	-12.849	-0.049	(0)
	Pb (SO4) 2-2	1.224e-13	7.798e-14	-12.912	-13.108	-0.196	(0)
	Pb (OH) 3-	2.126e-14	1.899e-14	-13.673	-13.721	-0.049	(0)
	PbCl2	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
	PbF2	2.386e-16	2.386e-16	-15.622	-15.622	0.000	(0)
	Pb (OH) 4-2	1.583e-17	1.009e-17	-16.800	-16.996	-0.196	(0)
	PbCl3-	1.245e-17	1.113e-17	-16.905	-16.954	-0.049	(0)
	PbNO3+	5.359e-19	4.788e-19	-18.271	-18.320	-0.049	(0)
	Pb2OH+3	1.307e-19	4.741e-20	-18.884	-19.324	-0.440	(0)
	PbF3-	4.340e-20	3.878e-20	-19.362	-19.411	-0.049	(0)
	PbCl4-2	1.564e-20	9.966e-21	-19.806	-20.001	-0.196	(0)
	Pb3 (OH) 4+2	5.625e-23	3.585e-23	-22.250	-22.446	-0.196	(0)
	PbF4-2	2.496e-24	1.591e-24	-23.603	-23.798	-0.196	(0)
	Pb (NO3) 2	1.123e-27	1.123e-27	-26.949	-26.949	0.000	(0)
	Pb4 (OH) 4+4	4.046e-29	6.672e-30	-28.393	-29.176	-0.783	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-155.012	-155.012	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-233.489	-233.538	-0.049	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-75.273	-75.273	0.000	(0)
	HS-	0.000e+00	0.000e+00	-79.777	-79.826	-0.049	(0)
	S5-2	0.000e+00	0.000e+00	-80.662	-80.858	-0.196	(0)
	CdHS+	0.000e+00	0.000e+00	-80.961	-81.010	-0.049	(0)
	H2S	0.000e+00	0.000e+00	-81.139	-81.139	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-81.178	-81.374	-0.196	(0)
	S4-2	0.000e+00	0.000e+00	-81.258	-81.454	-0.196	(0)
	S3-2	0.000e+00	0.000e+00	-82.064	-82.259	-0.196	(0)
	S2-2	0.000e+00	0.000e+00	-83.080	-83.276	-0.196	(0)
	S-2	0.000e+00	0.000e+00	-88.624	-88.793	-0.169	(0)
	HgHS2-	0.000e+00	0.000e+00	-142.073	-142.122	-0.049	(0)
	HgS2-2	0.000e+00	0.000e+00	-142.301	-142.497	-0.196	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-144.062	-144.062	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-149.236	-149.491	-0.255	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-149.975	-150.221	-0.246	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-150.016	-150.149	-0.133	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-150.900	-150.949	-0.049	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-150.950	-150.999	-0.049	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.996	-151.256	-0.260	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-151.316	-151.567	-0.251	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-153.272	-153.272	0.000	(0)

Cd (HS) 2	0.000e+00	0.000e+00	-153.632	-153.632	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-155.012	-155.012	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.918	-163.918	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-221.677	-221.726	-0.049	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-229.770	-229.819	-0.049	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-231.269	-231.465	-0.196	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-231.509	-231.558	-0.049	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-233.489	-233.538	-0.049	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-241.658	-241.707	-0.049	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-308.993	-309.188	-0.196	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-310.909	-311.105	-0.196	(0)
Sb2S4-2	0.000e+00	0.000e+00	-328.521	-328.717	-0.196	(0)
S (6)	1.750e-03					
SO4-2	1.581e-03	1.062e-03	-2.801	-2.974	-0.173	(0)
CaSO4	7.700e-05	7.700e-05	-4.113	-4.113	0.000	(0)
MgSO4	6.362e-05	6.362e-05	-4.196	-4.196	0.000	(0)
NaSO4-	2.396e-05	2.176e-05	-4.621	-4.662	-0.042	(0)
KSO4-	3.517e-06	3.194e-06	-5.454	-5.496	-0.042	(0)
MnSO4	7.178e-07	7.178e-07	-6.144	-6.144	0.000	(0)
ZnSO4	8.428e-08	8.428e-08	-7.074	-7.074	0.000	(0)
CuSO4	1.736e-09	1.736e-09	-8.760	-8.760	0.000	(0)
NiSO4	1.584e-09	1.584e-09	-8.800	-8.800	0.000	(0)
Zn (SO4) 2-2	1.223e-09	7.795e-10	-8.913	-9.108	-0.196	(0)
CoSO4	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
HSO4-	5.316e-10	4.817e-10	-9.274	-9.317	-0.043	(0)
CdSO4	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
NH4SO4-	2.952e-11	2.678e-11	-10.530	-10.572	-0.042	(0)
AgSO4-	1.299e-11	1.161e-11	-10.886	-10.935	-0.049	(0)
PbSO4	1.219e-11	1.219e-11	-10.914	-10.914	0.000	(0)
Cd (SO4) 2-2	3.596e-12	2.291e-12	-11.444	-11.640	-0.196	(0)
CrOHSO4	2.936e-13	2.936e-13	-12.532	-12.532	0.000	(0)
Pb (SO4) 2-2	1.224e-13	7.798e-14	-12.912	-13.108	-0.196	(0)
Ni (SO4) 2-2	8.739e-14	5.569e-14	-13.059	-13.254	-0.196	(0)
FeSO4	1.586e-14	1.586e-14	-13.800	-13.800	0.000	(0)
UO2SO4	1.424e-15	1.424e-15	-14.846	-14.846	0.000	(0)
CrSO4+	6.815e-17	6.089e-17	-16.167	-16.215	-0.049	(0)
AlSO4+	5.259e-17	4.764e-17	-16.279	-16.322	-0.043	(0)
UO2 (SO4) 2-2	3.128e-17	1.994e-17	-16.505	-16.700	-0.196	(0)
Al (SO4) 2-	5.984e-19	5.421e-19	-18.223	-18.266	-0.043	(0)
VO2SO4-	6.005e-21	5.365e-21	-20.222	-20.270	-0.049	(0)
FeSO4+	2.040e-21	1.851e-21	-20.690	-20.733	-0.042	(0)
Cr2 (OH) 2SO4+2	4.852e-23	3.092e-23	-22.314	-22.510	-0.196	(0)
Fe (SO4) 2-	4.703e-23	4.202e-23	-22.328	-22.377	-0.049	(0)
HgSO4	5.160e-24	5.160e-24	-23.287	-23.287	0.000	(0)
VOSO4	3.881e-24	3.881e-24	-23.411	-23.411	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.950e-24	1.950e-24	-23.710	-23.710	0.000	(0)
CrO3SO4-2	9.500e-25	6.054e-25	-24.022	-24.218	-0.196	(0)
VSO4+	2.899e-39	2.590e-39	-38.538	-38.587	-0.049	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.496	-43.496	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.226	-44.422	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Sb (3)	1.692e-21					
Sb (OH) 3	8.558e-22	8.558e-22	-21.068	-21.068	0.000	(0)
HSbO2	8.355e-22	8.355e-22	-21.078	-21.078	0.000	(0)
SbO2-	3.263e-25	2.915e-25	-24.486	-24.535	-0.049	(0)
Sb (OH) 4-	1.869e-25	1.670e-25	-24.728	-24.777	-0.049	(0)
Sb (OH) 2F	5.318e-28	5.318e-28	-27.274	-27.274	0.000	(0)
SbOF	5.230e-28	5.230e-28	-27.281	-27.281	0.000	(0)
Sb (OH) 2+	1.080e-28	9.647e-29	-27.967	-28.016	-0.049	(0)
SbO+	3.723e-29	3.326e-29	-28.429	-28.478	-0.049	(0)
Sb2S4-2	0.000e+00	0.000e+00	-328.521	-328.717	-0.196	(0)
Sb (5)	3.032e-09					
SbO3-	3.029e-09	2.706e-09	-8.519	-8.568	-0.049	(0)
Sb (OH) 6-	3.495e-12	3.164e-12	-11.457	-11.500	-0.043	(0)
SbO2+	1.872e-26	1.673e-26	-25.728	-25.777	-0.049	(0)
Se (-2)	6.389e-16					
Ag2Se	6.389e-16	6.389e-16	-15.195	-15.195	0.000	(0)
HSe-	1.358e-40	1.213e-40	-39.867	-39.916	-0.049	(0)

MnSe	0.000e+00	0.000e+00	-42.388	-42.388	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.359	-44.359	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.387	-46.583	-0.196	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.820	-84.603	-0.783	(0)
Se (4)	1.778e-08					
SeO3-2	9.706e-09	6.185e-09	-8.013	-8.209	-0.196	(0)
HSeO3-	8.071e-09	7.211e-09	-8.093	-8.142	-0.049	(0)
H2SeO3	1.428e-14	1.428e-14	-13.845	-13.845	0.000	(0)
AgSeO3-	2.437e-15	2.177e-15	-14.613	-14.662	-0.049	(0)
Cd (SeO3) 2-2	3.179e-20	2.026e-20	-19.498	-19.693	-0.196	(0)
Ag (SeO3) 2-3	3.323e-22	1.206e-22	-21.478	-21.919	-0.440	(0)
FeHSeO3+2	4.645e-27	2.960e-27	-26.333	-26.529	-0.196	(0)
Se (6)	3.993e-11					
SeO4-2	3.990e-11	2.679e-11	-10.399	-10.572	-0.173	(0)
MnSeO4	2.741e-14	2.741e-14	-13.562	-13.562	0.000	(0)
ZnSeO4	1.505e-15	1.505e-15	-14.822	-14.822	0.000	(0)
NiSeO4	9.368e-17	9.368e-17	-16.028	-16.028	0.000	(0)
CoSeO4	6.945e-17	6.945e-17	-16.158	-16.158	0.000	(0)
HSeO4-	6.977e-18	6.233e-18	-17.156	-17.205	-0.049	(0)
CdSeO4	3.206e-18	3.206e-18	-17.494	-17.494	0.000	(0)
Zn (SeO4) 2-2	6.418e-26	4.090e-26	-25.193	-25.388	-0.196	(0)
Si	2.176e-04					
H4SiO4	2.103e-04	2.108e-04	-3.677	-3.676	0.001	(0)
H3SiO4-	7.254e-06	6.563e-06	-5.139	-5.183	-0.043	(0)
H2SiO4-2	1.311e-10	8.922e-11	-9.882	-10.050	-0.167	(0)
UO2H3SiO4+	5.526e-13	4.937e-13	-12.258	-12.307	-0.049	(0)
SiF6-2	8.658e-32	5.866e-32	-31.063	-31.232	-0.169	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.843	-61.283	-0.440	(0)
U (4)	3.527e-20					
U (OH) 5-	3.526e-20	3.151e-20	-19.453	-19.502	-0.049	(0)
U (OH) 4	6.126e-24	6.126e-24	-23.213	-23.213	0.000	(0)
U (OH) 3+	1.164e-28	1.040e-28	-27.934	-27.983	-0.049	(0)
U (OH) 2+2	3.502e-34	2.232e-34	-33.456	-33.651	-0.196	(0)
UF3+	2.511e-39	2.244e-39	-38.600	-38.649	-0.049	(0)
UF2+2	2.592e-40	1.652e-40	-39.586	-39.782	-0.196	(0)
UOH+3	1.345e-40	0.000e+00	-39.871	-40.312	-0.440	(0)
UF4	0.000e+00	0.000e+00	-40.676	-40.676	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.375	-42.815	-0.440	(0)
UF5-	0.000e+00	0.000e+00	-43.096	-43.145	-0.049	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.496	-43.496	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.226	-44.422	-0.196	(0)
UF6-2	0.000e+00	0.000e+00	-44.537	-44.732	-0.196	(0)
U+4	0.000e+00	0.000e+00	-47.265	-48.048	-0.783	(0)
UCl+3	0.000e+00	0.000e+00	-48.615	-49.056	-0.440	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-176.481	-180.443	-3.963	(0)
U (5)	2.199e-17					
UO2+	2.199e-17	1.965e-17	-16.658	-16.707	-0.049	(0)
U (6)	3.661e-08					
UO2 (CO3) 3-4	2.449e-08	4.038e-09	-7.611	-8.394	-0.783	(0)
UO2 (CO3) 2-2	1.209e-08	7.702e-09	-7.918	-8.113	-0.196	(0)
UO2CO3	3.690e-11	3.690e-11	-10.433	-10.433	0.000	(0)
UO2H3SiO4+	5.526e-13	4.937e-13	-12.258	-12.307	-0.049	(0)
UO2OH+	2.708e-13	2.419e-13	-12.567	-12.616	-0.049	(0)
UO2F+	1.173e-14	1.048e-14	-13.931	-13.980	-0.049	(0)
UO2F2	2.590e-15	2.590e-15	-14.587	-14.587	0.000	(0)
UO2SO4	1.424e-15	1.424e-15	-14.846	-14.846	0.000	(0)
UO2+2	1.319e-15	8.860e-16	-14.880	-15.053	-0.173	(0)
UO2F3-	6.240e-17	5.575e-17	-16.205	-16.254	-0.049	(0)
UO2 (SO4) 2-2	3.128e-17	1.994e-17	-16.505	-16.700	-0.196	(0)
UO2Cl+	3.152e-18	2.816e-18	-17.501	-17.550	-0.049	(0)
(UO2) 2 (OH) 2+2	1.524e-19	9.714e-20	-18.817	-19.013	-0.196	(0)
(UO2) 3 (OH) 5+	9.386e-20	8.386e-20	-19.027	-19.076	-0.049	(0)
UO2F4-2	5.955e-20	3.795e-20	-19.225	-19.421	-0.196	(0)
UO2NO3+	2.733e-24	2.442e-24	-23.563	-23.612	-0.049	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-45.141	-45.190	-0.049	(0)
V+2	0.000e+00	0.000e+00	-46.840	-47.036	-0.196	(0)

V (3)	4.252e-17					
V (OH) 3	4.252e-17	4.252e-17	-16.371	-16.371	0.000	(0)
V (OH) 2+	1.428e-28	1.276e-28	-27.845	-27.894	-0.049	(0)
VOH+2	8.813e-33	5.616e-33	-32.055	-32.251	-0.196	(0)
V+3	1.424e-38	5.166e-39	-37.847	-38.287	-0.440	(0)
VSO4+	2.899e-39	2.590e-39	-38.538	-38.587	-0.049	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-61.253	-61.693	-0.440	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-62.918	-63.701	-0.783	(0)
V (4)	6.458e-21					
V (OH) 3+	6.426e-21	5.741e-21	-20.192	-20.241	-0.049	(0)
VO+2	2.082e-23	1.327e-23	-22.681	-22.877	-0.196	(0)
VOF+	7.633e-24	6.820e-24	-23.117	-23.166	-0.049	(0)
VOSO4	3.881e-24	3.881e-24	-23.411	-23.411	0.000	(0)
VOF2	2.191e-25	2.191e-25	-24.659	-24.659	0.000	(0)
VOC1+	8.164e-26	7.295e-26	-25.088	-25.137	-0.049	(0)
VOF3-	7.457e-28	6.662e-28	-27.127	-27.176	-0.049	(0)
VOF4-2	3.616e-31	2.304e-31	-30.442	-30.637	-0.196	(0)
H2V2O4+2	2.593e-36	1.653e-36	-35.586	-35.782	-0.196	(0)
V (5)	9.685e-10					
H2VO4-	5.507e-10	4.920e-10	-9.259	-9.308	-0.049	(0)
HVO4-2	4.178e-10	2.663e-10	-9.379	-9.575	-0.196	(0)
H3VO4	2.284e-14	2.284e-14	-13.641	-13.641	0.000	(0)
VO4-3	7.924e-16	2.875e-16	-15.101	-15.541	-0.440	(0)
HV2O7-3	1.224e-16	4.440e-17	-15.912	-16.353	-0.440	(0)
H3V2O7-	8.121e-17	7.256e-17	-16.090	-16.139	-0.049	(0)
V2O7-4	1.561e-18	2.575e-19	-17.807	-18.589	-0.783	(0)
VO2+	2.337e-19	2.116e-19	-18.631	-18.675	-0.043	(0)
VO2F	3.180e-20	3.180e-20	-19.498	-19.498	0.000	(0)
VO2SO4-	6.005e-21	5.365e-21	-20.222	-20.270	-0.049	(0)
VO2F2-	1.107e-21	9.893e-22	-20.956	-21.005	-0.049	(0)
V3O9-3	3.439e-22	1.248e-22	-21.464	-21.904	-0.440	(0)
VO2F3-2	1.659e-24	1.057e-24	-23.780	-23.976	-0.196	(0)
V4O12-4	1.552e-28	2.560e-29	-27.809	-28.592	-0.783	(0)
VO2NO3	1.478e-28	1.478e-28	-27.830	-27.830	0.000	(0)
VO2F4-3	1.229e-28	4.459e-29	-27.910	-28.351	-0.440	(0)
V10O28-6	0.000e+00	0.000e+00	-75.746	-77.507	-1.761	(0)
HV10O28-5	0.000e+00	0.000e+00	-76.430	-77.654	-1.223	(0)
H2V10O28-4	0.000e+00	0.000e+00	-79.997	-80.779	-0.783	(0)
Zn	9.805e-07					
Zn+2	5.402e-07	3.628e-07	-6.267	-6.440	-0.173	(0)
ZnCO3	2.184e-07	2.184e-07	-6.661	-6.661	0.000	(0)
ZnOH+	8.806e-08	7.868e-08	-7.055	-7.104	-0.049	(0)
ZnSO4	8.428e-08	8.428e-08	-7.074	-7.074	0.000	(0)
Zn (OH) 2	2.705e-08	2.705e-08	-7.568	-7.568	0.000	(0)
ZnHCO3+	1.330e-08	1.188e-08	-7.876	-7.925	-0.049	(0)
ZnOHCl	5.070e-09	5.070e-09	-8.295	-8.295	0.000	(0)
ZnCl+	1.973e-09	1.786e-09	-8.705	-8.748	-0.043	(0)
Zn (SO4) 2-2	1.223e-09	7.795e-10	-8.913	-9.108	-0.196	(0)
ZnF+	6.942e-10	6.202e-10	-9.159	-9.207	-0.049	(0)
Zn (OH) 3-	3.291e-10	2.940e-10	-9.483	-9.532	-0.049	(0)
ZnCl2	5.546e-12	5.546e-12	-11.256	-11.256	0.000	(0)
Zn (OH) 4-2	3.984e-14	2.539e-14	-13.400	-13.595	-0.196	(0)
ZnCl3-	9.541e-15	8.633e-15	-14.020	-14.064	-0.043	(0)
ZnSeO4	1.505e-15	1.505e-15	-14.822	-14.822	0.000	(0)
ZnNO3+	1.409e-15	1.259e-15	-14.851	-14.900	-0.049	(0)
ZnCl4-2	1.248e-17	8.459e-18	-16.904	-17.073	-0.169	(0)
Zn (NO3) 2	3.470e-25	3.470e-25	-24.460	-24.460	0.000	(0)
Zn (SeO4) 2-2	6.418e-26	4.090e-26	-25.193	-25.388	-0.196	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.900	-150.949	-0.049	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-153.272	-153.272	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-229.770	-229.819	-0.049	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-231.269	-231.465	-0.196	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-310.909	-311.105	-0.196	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-64.44	-58.15	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-50.36	-45.85	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-57.58	-45.85	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-82.53	-64.60	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-66.17	-46.14	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-31.23	-30.83	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-28.28	-27.83	0.45	(NH4) 2SeO4
Acanthite	-53.80	-90.02	-36.22	Ag2S
Ag2CO3	-12.41	-23.50	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-13.68	-12.20	1.48	Ag2HVO4
Ag2MoO4	-13.84	-25.39	-11.55	Ag2MoO4
Ag2O	-14.43	-1.86	12.57	Ag2O
Ag2Se	-1.41	-50.11	-48.70	Ag2Se
Ag2SeO3	-11.18	-18.33	-7.15	Ag2SeO3
Ag2SeO4	-20.18	-29.09	-8.91	Ag2SeO4
Ag2SO4	-16.68	-21.50	-4.82	Ag2SO4
Ag3AsO3	-28.01	-25.85	2.16	Ag3AsO3
Ag3AsO4	-16.42	-19.20	-2.79	Ag3AsO4
Ag3H2VO5	-18.31	-13.13	5.18	Ag3H2VO5
AgF:4H2O	-14.38	-13.33	1.05	AgF:4H2O
Agmetal	-0.19	-13.70	-13.51	Ag
AgVO3	-12.04	-11.27	0.77	AgVO3
Al (OH) 3 (am)	-3.04	7.76	10.80	Al (OH) 3
Al2 (MoO4) 3	-57.46	-55.09	2.37	Al2 (MoO4) 3
Al2O3	-4.13	15.52	19.65	Al2O3
Al4 (OH) 10SO4	-11.29	11.41	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.46	-8.66	4.80	AlAsO4:2H2O
AlOHSO4	-8.65	-11.88	-3.23	AlOHSO4
AlSb	-155.56	-89.94	65.62	AlSb
Alunite	-9.63	-11.03	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.81	-13.60	-7.79	PbSO4
Anhydrite	-2.11	-6.47	-4.36	CaSO4
Anilite	-56.49	-88.37	-31.88	Cu0.25Cu1.5S
Antlerite	-2.87	5.92	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-89.50	-92.26	-2.76	As4O6
Artinite	-4.88	4.72	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.54	-32.84	6.71	As2O5
Atacamite	-1.39	6.00	7.39	Cu2 (OH) 3Cl
Azurite	-0.83	-17.73	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.42	7.97	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-20.60	-4.73	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-29.70	3.24	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.59	-22.26	-9.67	BaCrO4
BaF2	-11.01	-16.83	-5.82	BaF2
BaMoO4	-8.60	-15.56	-6.96	BaMoO4
Barite	-1.68	-11.66	-9.98	BaSO4
BaS	-96.36	-80.18	16.18	BaS
BaSeO3	-10.33	-8.50	1.83	BaSeO3
BaSeO4	-11.80	-19.26	-7.46	BaSeO4
Bianchite	-7.65	-9.41	-1.76	ZnSO4:6H2O
Birnessite	-6.65	11.44	18.09	MnO2
Bixbyite	-2.02	-2.66	-0.64	Mn2O3
BlaubleiI	-56.64	-80.80	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-57.02	-84.30	-27.28	Cu0.6Cu0.8S
Boehmite	-0.82	7.76	8.58	AlOOH
Breithauptite	-57.87	-76.39	-18.52	NiSb
Brochantite	-0.78	14.44	15.22	Cu4 (OH) 6SO4
Brucite	-3.66	13.18	16.84	Mg (OH) 2
Bunsenite	-3.91	8.54	12.45	NiO
Ca (VO3) 2	-13.18	-7.52	5.66	Ca (VO3) 2
Ca2V2O7	-11.85	5.65	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.90	5.65	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.64	6.66	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-20.14	18.82	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.04	18.82	39.86	Ca3 (VO4) 2:4H2O

Ca3Sb2	-298.88	-155.90	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-11.05	-28.96	-17.91	Hg2Cl2
CaMoO4	-2.42	-10.37	-7.95	CaMoO4
Carnotite	-4.00	-3.77	0.23	KUO2VO4
CaSeO3:2H2O	-6.12	-3.31	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.05	-14.07	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.41	-2.57	9.84	Cd(BO2)2
Cd(OH)2	-6.17	7.47	13.64	Cd(OH)2
Cd(OH)2(am)	-6.26	7.47	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.57	-16.86	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-19.78	2.78	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-18.14	10.26	28.40	Cd4(OH)6SO4
CdCl2	-13.95	-14.61	-0.66	CdCl2
CdCl2:1H2O	-12.91	-14.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.69	-14.61	-1.91	CdCl2:2.5H2O
CdF2	-16.11	-17.33	-1.21	CdF2
Cdmetal(alpha)	-31.58	-18.07	13.51	Cd
Cdmetal(gamma)	-31.69	-18.07	13.62	Cd
CdMoO4	-1.91	-16.06	-14.15	CdMoO4
CdOHCl	-7.10	-3.57	3.54	CdOHCl
CdSb	-77.10	-77.45	-0.35	CdSb
CdSe	-20.57	-40.77	-20.20	CdSe
CdSeO4:2H2O	-17.91	-19.76	-1.85	CdSeO4:2H2O
CdSO4	-11.99	-12.17	-0.17	CdSO4
CdSO4:1H2O	-10.44	-12.17	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.29	-12.17	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.22	-11.97	-9.75	AgCl
Cerrusite	-2.48	-15.61	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-8.48	-11.12	-2.64	CuSO4:5H2O
Chalcedony	-0.13	-3.68	-3.55	SiO2
Chalcocite	-56.36	-91.28	-34.92	Cu2S
Chalcopyrite	-129.08	-164.35	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-54.72	-100.42	-45.69	HgS
Claudetite	-89.20	-92.26	-3.06	As4O6
Clausthalite	-15.11	-42.21	-27.10	PbSe
Co(BO2)2	-28.73	-1.66	27.07	Co(BO2)2
Co(OH)2	-4.71	8.38	13.09	Co(OH)2
Co(OH)3	-8.94	-11.25	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.73	-7.70	13.03	Co3(AsO4)2
Co3O4	-3.62	-14.11	-10.50	Co3O4
CoCl2	-21.97	-13.70	8.27	CoCl2
CoCl2:6H2O	-16.24	-13.70	2.54	CoCl2:6H2O
CoCO3	-3.29	-13.27	-9.98	CoCO3
CoF2	-14.82	-16.42	-1.60	CoF2
CoF3	-46.99	-48.45	-1.46	CoF3
CoFe2O4	18.29	14.76	-3.53	CoFe2O4
CoMoO4	-7.40	-15.16	-7.76	CoMoO4
CoO	-5.21	8.38	13.59	CoO
CoS(alpha)	-72.34	-79.78	-7.44	CoS
CoS(beta)	-68.71	-79.78	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-14.06	-11.26	2.80	CoSO4
CoSO4:6H2O	-8.79	-11.26	-2.47	CoSO4:6H2O
Cotunnite	-11.27	-16.05	-4.78	PbCl2
Covellite	-57.34	-79.64	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.18	-33.09	14.09	CrCl2
CrCl3	-49.42	-34.30	15.11	CrCl3

CrF3	-27.04	-38.38	-11.34	CrF3
Cristobalite	-0.33	-3.68	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-15.06	-48.90	-33.84	Na3AlF6
Cu(OH)2	-0.15	8.52	8.67	Cu(OH)2
Cu(SbO3)2	-27.74	17.47	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.40	-0.15	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.86	-90.74	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.57	-51.37	-45.80	Cu2Se
Cu2SO4	-20.82	-22.77	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.38	-7.28	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.79	-102.39	-42.59	Cu3Sb
Cu3Se2	-27.61	-91.10	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-16.28	-21.72	-5.44	CuCrO4
CuF	-9.06	-13.96	-4.91	CuF
CuF2	-17.40	-16.28	1.12	CuF2
CuF2:2H2O	-11.73	-16.28	-4.55	CuF2:2H2O
Cumetal	-5.58	-14.33	-8.76	Cu
CuMoO4	-1.94	-15.02	-13.08	CuMoO4
CuOCuSO4	-12.90	-2.60	10.30	CuOCuSO4
Cupricferrite	8.91	14.90	5.99	CuFe2O4
Cuprite	-1.72	-3.12	-1.41	Cu2O
Cuprousferriite	10.55	1.63	-8.92	CuFeO2
CuSe	-6.63	-39.73	-33.10	CuSe
CuSe2	-29.07	-62.43	-33.37	CuSe2
CuSeO3:2H2O	-8.47	-7.96	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.28	-18.72	-2.44	CuSeO4:5H2O
CuSO4	-14.06	-11.12	2.94	CuSO4
Diaspore	0.89	7.76	6.87	AlOOH
Djurlite	-56.60	-90.52	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.40	-16.94	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.15	-16.94	-17.09	CaMg(CO3)2
Epsomite	-4.33	-6.46	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.92	-0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-13.51	-17.23	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.65	-10.09	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-22.42	-43.04	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-48.80	-52.54	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.63	-13.23	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.00	-20.09	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-48.91	-67.50	-18.60	FeSe2
FeS(ppt)	-81.76	-84.71	-2.95	FeS
FeSe	-33.80	-44.80	-11.00	FeSe
Fix_pe	-4.44	-4.44	0.00	e-
Fluorite	-1.13	-11.63	-10.50	CaF2
Galena	-68.15	-82.12	-13.97	PbS
Gibbsite	-0.53	7.76	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.40	-9.41	-2.01	ZnSO4:7H2O
Greenalite	-17.81	3.00	20.81	Fe3Si2O5(OH)4
Greenockite	-66.32	-80.68	-14.36	CdS
Greigite	-297.77	-342.80	-45.03	Fe3S4
Gummite	-6.06	1.61	7.67	UO3
Gypsum	-1.86	-6.47	-4.61	CaSO4:2H2O
H-Jarosite	-17.61	-29.71	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.66	-23.54	-12.88	H2MoO4
H2S(g)	-80.15	-88.16	-8.01	H2S
H2Se(g)	-43.29	-48.25	-4.96	H2Se
Halite	-6.73	-5.13	1.60	NaCl
Halloysite	-1.40	8.17	9.57	Al2Si2O5(OH)4
Hausmannite	-1.75	59.28	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3

Hercynite	-3.92	18.97	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-186.20	-259.91	-73.71	Hg (CH ₃) ₂
Hg (g)	-8.34	-16.21	-7.87	Hg
Hg (OH) ₂	-8.76	-12.26	-3.50	Hg (OH) ₂
Hg ₂ (g)	-17.47	-32.42	-14.96	Hg ₂
Hg ₂ (OH) ₂	-12.14	-6.88	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-12.47	-28.52	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-28.42	-37.12	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-21.32	-31.68	-10.36	Hg ₂ F ₂
Hg ₂ S	-83.36	-95.04	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-18.70	-23.35	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-20.39	-26.52	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-28.74	-58.42	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-33.98	-14.48	19.50	HgCl
HgCl ₂	-13.08	-34.34	-21.26	HgCl ₂
HgF (g)	-48.51	-15.84	32.68	HgF
HgF ₂ (g)	-49.62	-37.06	12.57	HgF ₂
Hgmetal (l)	-2.76	-16.21	-13.45	Hg
HgSe	-4.81	-60.51	-55.69	HgSe
HgSeO ₃	-16.30	-28.73	-12.43	HgSeO ₃
HgSO ₄	-22.48	-31.90	-9.42	HgSO ₄
Huntite	-3.90	-33.87	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-6.41	-25.18	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-11.90	-20.67	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-21.39	-26.56	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-9.95	-24.75	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-33.31	-50.55	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-19.80	-20.31	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.88	-13.62	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-16.59	-17.32	-0.73	K ₂ SeO ₄
Kaolinite	0.74	8.17	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-3.05	14.44	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-7.13	-7.57	-0.43	PbO : PbSO ₄
Laurionite	-5.63	-5.00	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.66	6.04	12.69	PbO
Mackinawite	-81.11	-84.71	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.71	19.57	16.86	Fe ₂ MgO ₄
Magnesite	-1.00	-8.46	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	0.70	-4.61	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.32	24.02	25.34	MnOOH
Massicot	-6.86	6.04	12.89	PbO
Matlockite	-8.43	-17.41	-8.97	PbClF
Melanothallite	-19.82	-13.56	6.26	CuCl ₂
Melanterite	-13.98	-16.19	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-55.32	-100.42	-45.09	HgS
Mg (OH) ₂ (active)	-5.61	13.18	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-18.78	-7.50	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-277.56	-202.87	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.67	5.69	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.37	10.83	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.43	-17.05	5.38	MgCrO ₄
MgF ₂	-3.49	-11.62	-8.13	MgF ₂
MgMoO ₄	-8.50	-10.35	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-6.35	-3.29	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-12.85	-14.05	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-29.87	43.65	73.52	Pb ₃ O ₄
Mirabilite	-6.70	-7.81	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-14.34	-9.44	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.87	-61.58	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-149.06	-87.98	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-11.60	0.90	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O
MnCl ₂ : 4H ₂ O	-13.55	-10.84	2.72	MnCl ₂ : 4H ₂ O
MnS (grn)	-77.08	-76.91	0.17	MnS
MnS (pnk)	-80.25	-76.91	3.34	MnS

MnSb	-96.12	-99.03	-2.91	MnSb
MnSe	-40.50	-37.00	3.50	MnSe
MnSeO3	-6.36	-5.23	1.13	MnSeO3
MnSeO3:2H2O	-6.21	-5.23	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.94	-15.99	-2.05	MnSeO4:5H2O
MnSO4	-10.98	-8.39	2.58	MnSO4
Monteponite	-7.63	7.47	15.10	CdO
Montroydite	-8.62	-12.26	-3.64	HgO
MoO3	-15.54	-23.54	-8.00	MoO3
Morenosite	-8.96	-11.10	-2.14	NiSO4:7H2O
MoS2	-155.14	-225.40	-70.26	MoS2
Na-Jarosite	-12.59	-23.79	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.75	-48.65	-9.90	Na2Cr2O7
Na2CrO4	-21.34	-18.41	2.93	Na2CrO4
Na2Mo2O7	-18.65	-35.25	-16.60	Na2Mo2O7
Na2MoO4	-13.20	-11.71	1.49	Na2MoO4
Na2MoO4:2H2O	-12.93	-11.71	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.95	-4.65	10.30	Na2SeO3:5H2O
Na2SeO4	-16.69	-15.41	1.28	Na2SeO4
Na3Sb	-174.41	-79.96	94.45	Na3Sb
Na3VO4	-29.28	7.40	36.68	Na3VO4
Na4V2O7	-34.42	2.98	37.40	Na4V2O7
Nantokite	-5.87	-12.60	-6.73	CuCl
NaSb	-89.41	-66.24	23.17	NaSb
Natron	-8.51	-9.82	-1.31	Na2CO3:10H2O
NaVO3	-8.28	-4.43	3.86	NaVO3
Nesquehonite	-3.79	-8.46	-4.67	MgCO3:3H2O
Ni(OH)2	-4.25	8.54	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.92	-7.22	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.48	14.52	32.00	Ni4(OH)6SO4
NiCO3	-6.24	-13.11	-6.87	NiCO3
NiMoO4	-3.86	-15.00	-11.14	NiMoO4
NiS(alpha)	-74.02	-79.62	-5.60	NiS
NiS(beta)	-68.52	-79.62	-11.10	NiS
NiS(gamma)	-66.82	-79.62	-12.80	NiS
NiSe	-22.01	-39.71	-17.70	NiSe
NiSeO3:2H2O	-10.75	-7.94	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.18	-18.70	-1.52	NiSeO4:6H2O
Nsutite	-6.06	11.44	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-249.54	-310.61	-61.07	As2S3
Otavite	-2.17	-14.17	-12.00	CdCO3
Pb(BO2)2	-10.52	-4.00	6.52	Pb(BO2)2
Pb(OH)2	-2.11	6.04	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-60.76	-69.52	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.76	1.03	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.12	12.07	26.19	Pb2O(OH)2
Pb2O3	-23.42	37.62	61.04	Pb2O3
Pb2OCO3	-9.02	-9.57	-0.56	Pb2OCO3
Pb2V2O7	-6.71	-8.61	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.53	-14.73	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.71	-2.57	6.14	Pb3(VO4)2
Pb3O2CO3	-14.56	-3.54	11.02	Pb3O2CO3
Pb3O2SO4	-12.22	-1.53	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.60	4.50	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.37	4.51	21.88	Pb4O3SO4
PbCrO4	-11.60	-24.20	-12.60	PbCrO4
PbF2	-11.32	-18.76	-7.44	PbF2
Pbmetal	-23.75	-19.51	4.25	Pb
PbMoO4	-1.88	-17.50	-15.62	PbMoO4
PbO:0.3H2O	-6.94	6.04	12.98	PbO:0.33H2O
PbSeO4	-14.36	-21.20	-6.84	PbSeO4
Periclase	-8.40	13.18	21.58	MgO
Phosgenite	-11.85	-31.66	-19.81	PbCl2:PbCO3
Plattnerite	-18.02	31.58	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-128.81	-147.32	-18.51	FeS2
Pyrochroite	-3.95	11.25	15.19	Mn(OH)2

Pyrolusite	-4.59	36.79	41.38	MnO2
Quartz	0.32	-3.68	-4.00	SiO2
Realgar	-104.25	-124.00	-19.75	AsS
Retgersite	-9.06	-11.10	-2.04	NiSO4:6H2O
Rhodochrosite	0.18	-10.40	-10.58	MnCO3
Rutherfordine	-5.53	-20.03	-14.50	UO2CO3
Sb(OH)3	-13.96	-21.07	-7.11	Sb(OH)3
Sb2O4	-19.99	-16.59	3.40	Sb2O4
Sb2O5	-30.00	-39.67	-9.67	Sb2O5
Sb2Se3	-119.13	-186.88	-67.76	Sb2Se3
Sb4O6(cubic)	-66.01	-84.27	-18.26	Sb4O6
Sb4O6(orth)	-66.37	-84.27	-17.90	Sb4O6
SbCl3	-54.76	-54.19	0.57	SbCl3
SbF3	-48.04	-58.27	-10.23	SbF3
Sbmetal	-47.70	-59.38	-11.69	Sb
SbO2	-4.78	-32.61	-27.82	SbO2
Schoepite	-4.38	1.61	5.99	UO2(OH)2:H2O
Semetal(am)	-15.59	-22.70	-7.11	Se
Semetal(hex)	-15.00	-22.70	-7.71	Se
Senarmontite	-29.77	-42.14	-12.37	Sb2O3
SeO2	-16.60	-16.48	0.12	SeO2
SeO3	-48.28	-27.24	21.04	SeO3
Sepiolite	-0.42	15.34	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.44	15.34	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.97	-3.68	-2.71	SiO2
SiO2(am-ppt)	-0.94	-3.68	-2.74	SiO2
Smithsonite	-1.42	-11.42	-10.00	ZnCO3
Sphalerite	-66.48	-77.93	-11.45	ZnS
Spinel	-8.14	28.71	36.85	MgAl2O4
Stibnite	-256.15	-306.61	-50.46	Sb2S3
Sulfur	-60.47	-62.61	-2.14	S
Tenorite	0.88	8.52	7.64	CuO
Thenardite	-8.13	-7.81	0.32	Na2SO4
Thermonatrite	-10.45	-9.82	0.64	Na2CO3:H2O
Tyuyamunite	-8.37	-4.29	4.08	Ca(UO2)2(VO4)2
U3O8	-14.14	6.95	21.08	U3O8
U3Sb4	-587.33	-434.95	152.38	U3Sb4
U4O9	-30.29	-33.31	-3.02	U4O9
UF4	-34.78	-64.32	-29.54	UF4
UF4:2.5H2O	-31.60	-64.32	-32.72	UF4:2.5H2O
UO2(am)	-15.65	-14.71	0.93	UO2
UO2(NO3)2	-44.92	-32.77	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-37.62	-32.77	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-36.16	-32.77	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.82	-32.77	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.00	1.61	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.37	-25.62	-2.25	UO2SeO4:4H2O
UO3	-6.09	1.61	7.70	UO3
Uraninite	-10.05	-14.71	-4.67	UO2
USb2	-223.37	-193.79	29.58	USb2
V(OH)3	-20.88	-13.29	7.59	V(OH)3
V2O5	-19.32	-20.68	-1.36	V2O5
V3O5	-46.01	-44.18	1.84	V3O5
V4O7	-57.57	-50.39	7.19	V4O7
V6O13	-52.28	-113.14	-60.86	V6O13
Valentinite	-33.65	-42.14	-8.48	Sb2O3
VC12	-67.02	-48.14	18.87	VC12
VC13	-69.84	-46.41	23.43	VC13
VF4	-70.74	-55.81	14.93	VF4
Vmetal	-95.63	-51.60	44.03	V
VO	-40.82	-26.06	14.76	VO
VO(OH)2	-11.36	-6.21	5.15	VO(OH)2
VO2Cl	-24.22	-21.38	2.84	VO2Cl
VOC1	-35.48	-24.33	11.15	VOC1
VOC12	-41.05	-28.29	12.76	VOC12
VOSO4	-29.46	-25.85	3.61	VOSO4
Witherite	-5.10	-13.67	-8.57	BaCO3

Wurtzite	-68.98	-77.93	-8.95	ZnS
Zincite	-1.11	10.23	11.33	ZnO
Zincosite	-13.34	-9.41	3.93	ZnSO4
Zn(BO2)2	-8.10	0.19	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-27.48	-24.16	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.97	10.23	12.20	Zn(OH)2
Zn(OH)2(am)	-2.25	10.23	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.53	10.23	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.31	10.23	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.51	10.23	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.69	0.81	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.78	9.41	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.81	-2.16	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.52	-8.60	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.14	21.26	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.45	29.05	38.50	Zn5(OH)8Cl2
ZnCl2	-18.91	-11.86	7.05	ZnCl2
ZnCO3:1H2O	-1.16	-11.42	-10.26	ZnCO3:1H2O
ZnF2	-14.04	-14.57	-0.53	ZnF2
Znmetal	-41.11	-15.32	25.79	Zn
ZnMoO4	-3.19	-13.31	-10.13	ZnMoO4
ZnO(active)	-0.96	10.23	11.19	ZnO
ZnS(am)	-68.88	-77.93	-9.05	ZnS
ZnSb	-85.72	-74.70	11.01	ZnSb
ZnSe	-23.62	-38.02	-14.40	ZnSe
ZnSeO4:6H2O	-15.49	-17.01	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.78	-9.41	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 82.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 405
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 405
USE Surface 405
USE Solution 414
SAVE Solution 415  #Initial Stage 5 Pit Water After Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 405.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

9.157e-23  Surface + diffuse layer charge, eq
7.171e-13  Surface charge, eq

```

4.399e-03 sigma, C/m²
 1.213e-01 psi, V
 -4.722e+00 -F*psi/RT
 8.900e-03 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.573e-05 m² for 2.450e-10 moles of Ferrihydrite

Water in diffuse layer: 1.573e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is +1).

Element	Moles
C	4.0186e-16
Ca	4.9804e-18
Cl	8.0472e-15
H	1.1855e-15
K	7.9008e-18
Mg	7.7162e-19
N	3.2578e-14
Na	3.3475e-17
O	1.4521e-12
S	3.3835e-13

Hfo_s

1.225e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.190e-13	0.668	8.190e-13	-12.087
Hfo_sOH	4.017e-13	0.328	4.017e-13	-12.396
Hfo_sO-	4.513e-15	0.004	4.513e-15	-14.346
Hfo_sOHCa+2	1.495e-17	0.000	1.495e-17	-16.825

Hfo_w

4.901e-11 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.264e-11	0.462	2.264e-11	-10.645
Hfo_wOH	1.111e-11	0.227	1.111e-11	-10.954
Hfo_wSO4-	7.648e-12	0.156	7.648e-12	-11.116
Hfo_wOHSO4-2	7.484e-12	0.153	7.484e-12	-11.126
Hfo_wO-	1.248e-13	0.003	1.248e-13	-12.904
Hfo_wOMg+	1.763e-19	0.000	1.763e-19	-18.754
Hfo_wOCa+	5.983e-20	0.000	5.983e-20	-19.223

 Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
 but is not in solution or other phases.

Using solution 414. Solution after simulation 81.

Using surface 405.

Using pure phase assemblage 405. Pure-phase assemblage after simulation 81.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-1.41	-50.11	-48.70	0.000e+00	0	0.000e+00
Alunite	-9.63	-11.03	-1.40	0.000e+00	0	0.000e+00

Anhydrite	-2.11	-6.47	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	1.518e-09	1.517e-09	-1.095e-12
Barite	-1.68	-11.66	-9.98	0.000e+00	0	0.000e+00
Brochantite	-0.78	14.44	15.22	0.000e+00	0	0.000e+00
Brucite	-3.66	13.18	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	3.079e-11
CaMoO4	-2.42	-10.37	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.12	-3.31	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.972e-04	1.972e-04	-7.337e-12
Carnotite	-4.00	-3.77	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-12.41	-2.57	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.91	-16.06	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	4.163e-05	4.163e-05	-1.913e-12
Cr2O3	0.00	-2.36	-2.36	1.400e-10	1.400e-10	-3.114e-14
Cu2Se(alpha)	-5.57	-51.37	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.94	-15.02	-13.08	0.000e+00	0	0.000e+00
Epsomite	-4.33	-6.46	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	2.450e-10	2.450e-10	-8.981e-19
Fluorite	-1.13	-11.63	-10.50	0.000e+00	0	0.000e+00
Gummite	-6.06	1.61	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.86	-6.47	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.81	-60.51	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.70	-7.81	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.36	-5.23	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.25	8.54	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-22.92	-7.22	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.24	-13.11	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.86	-15.00	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	0.000e+00
Otavite	-2.17	-14.17	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-1.88	-17.50	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.53	-20.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-4.78	-32.61	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.38	1.61	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.42	15.34	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-0.94	-3.68	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-8.37	-4.29	4.08	0.000e+00	0	0.000e+00
U3O8	-14.14	6.95	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.00	1.61	5.61	0.000e+00	0	0.000e+00
UO3	-6.09	1.61	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-3.19	-13.31	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-4.644e-26 Surface + diffuse layer charge, eq
9.754e-13 Surface charge, eq
5.983e-03 sigma, C/m²
2.617e-02 psi, V
-1.019e+00 -F*psi/RT
3.610e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.573e-05 m² for 2.450e-10 moles of Ferrihydrite

Water in diffuse layer: 1.573e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 8.033e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 7.315e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	5.0759e-19
Al	6.0729e-17
As	5.2688e-19

B	1.7903e-15
Ba	2.5987e-19
C	2.5472e-13
Ca	5.3427e-14
Cd	1.5049e-19
Cl	4.6554e-13
Co	1.0942e-18
Cr	9.0602e-20
Cu	8.5785e-17
F	2.0831e-14
Fe	1.1097e-19
H	3.9316e-13
Hg	3.5787e-20
K	5.4766e-14
Mg	5.2608e-14
Mn	6.3038e-16
Mo	5.8836e-17
N	3.4973e-16
Na	4.9071e-13
Ni	1.8065e-18
O	2.8822e-12
Pb	1.5142e-19
S	4.9306e-13
Sb	6.5214e-19
Se	4.6010e-18
Si	3.4643e-14
U	1.7014e-17
V	2.4080e-19
Zn	1.1053e-16

Hfo_s

1.225e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	5.488e-13	0.448	5.487e-13	-12.261
Hfo_sOZn+	3.512e-13	0.287	3.512e-13	-12.454
Hfo_sOMn+	1.499e-13	0.122	1.499e-13	-12.824
Hfo_sOPb+	1.037e-13	0.085	1.037e-13	-12.984
Hfo_sOCrOH+	6.228e-14	0.051	6.227e-14	-13.206
Hfo_sOHCa+2	4.905e-15	0.004	4.904e-15	-14.309
Hfo_sONi+	1.736e-15	0.001	1.736e-15	-14.761
Hfo_sOH	1.274e-15	0.001	1.274e-15	-14.895
Hfo_sO-	8.930e-16	0.001	8.929e-16	-15.049
Hfo_sOCd+	1.879e-16	0.000	1.879e-16	-15.726
Hfo_sOCu+	1.777e-16	0.000	1.776e-16	-15.750
Hfo_sOH2+	4.162e-17	0.000	4.161e-17	-16.381
Hfo_sOAg	2.864e-18	0.000	2.864e-18	-17.543
Hfo_sOHBa+2	9.764e-20	0.000	9.763e-20	-19.010
Hfo_sOFe+	3.021e-20	0.000	3.021e-20	-19.520
Hfo_sOHg+	1.048e-22	0.000	1.048e-22	-21.980

Hfo_w

4.901e-11 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	1.833e-11	0.374	1.832e-11	-10.737
Hfo_wOH	8.293e-12	0.169	8.292e-12	-11.081
Hfo_wO-	5.814e-12	0.119	5.814e-12	-11.236
Hfo_wOMg+	5.335e-12	0.109	5.334e-12	-11.273
Hfo_wOHAsO4-3	5.092e-12	0.104	5.091e-12	-11.293
Hfo_wOZn+	2.395e-12	0.049	2.394e-12	-11.621
Hfo_wOHVO4-3	1.879e-12	0.038	1.878e-12	-11.726
Hfo_wOMn+	7.754e-13	0.016	7.753e-13	-12.111
Hfo_wOHSO4-2	4.166e-13	0.009	4.165e-13	-12.380
Hfo_wOCa+	2.884e-13	0.006	2.884e-13	-12.540
Hfo_wOH2+	2.710e-13	0.006	2.710e-13	-12.567

Hfo_wOHSeO3-2	5.821e-14	0.001	5.820e-14	-13.235
Hfo_wOPb+	3.016e-14	0.001	3.015e-14	-13.521
Hfo_wONi+	1.525e-14	0.000	1.525e-14	-13.817
Hfo_wSO4-	6.824e-15	0.000	6.823e-15	-14.166
Hfo_wOCo+	3.260e-15	0.000	3.260e-15	-14.487
Hfo_wSeO3-	3.230e-15	0.000	3.230e-15	-14.491
Hfo_wOHMoO4-2	2.148e-15	0.000	2.147e-15	-14.668
Hfo_wOCd+	5.218e-16	0.000	5.218e-16	-15.283
Hfo_wH2BO3	3.303e-16	0.000	3.302e-16	-15.481
Hfo_wHAsO4-	1.217e-16	0.000	1.217e-16	-15.915
Hfo_wMoO4-	4.532e-17	0.000	4.531e-17	-16.344
Hfo_wOAg	4.905e-18	0.000	4.904e-18	-17.309
Hfo_wH2AsO4	1.287e-19	0.000	1.287e-19	-18.890
Hfo_wOFe+	1.241e-19	0.000	1.241e-19	-18.906
Hfo_wOBa+	8.300e-20	0.000	8.299e-20	-19.081
Hfo_wOHg+	3.343e-20	0.000	3.343e-20	-19.476
Hfo_wOHCrO4-2	1.357e-20	0.000	1.356e-20	-19.868
Hfo_wOHSeO4-2	1.076e-20	0.000	1.075e-20	-19.968
Hfo_wOHSbO(OH) 4-	1.450e-21	0.000	1.450e-21	-20.839
Hfo_wCrO4-	2.027e-22	0.000	2.026e-22	-21.693
Hfo_wSeO4-	1.535e-22	0.000	1.534e-22	-21.814
Hfo_wSbO(OH) 4	3.060e-23	0.000	3.060e-23	-22.514
Hfo_wH2AsO3	1.832e-29	0.000	1.832e-29	-28.737

-----Solution composition-----

Elements	Molality	Moles
Ag	3.230e-09	3.230e-09
Al	2.827e-07	2.827e-07
As	1.806e-09	1.806e-09
B	1.090e-05	1.091e-05
Ba	3.070e-09	3.070e-09
C	1.189e-03	1.190e-03
Ca	5.607e-04	5.608e-04
Cd	1.437e-09	1.437e-09
Cl	2.165e-03	2.165e-03
Co	1.094e-08	1.094e-08
Cr	6.498e-10	6.499e-10
Cu	5.481e-07	5.482e-07
F	9.870e-05	9.872e-05
Fe	7.249e-10	7.250e-10
Hg	2.275e-10	2.275e-10
K	4.729e-04	4.730e-04
Mg	5.644e-04	5.645e-04
Mn	6.816e-06	6.817e-06
Mo	2.001e-07	2.002e-07
N	1.628e-06	1.628e-06
Na	4.242e-03	4.243e-03
Ni	1.702e-08	1.703e-08
Pb	9.927e-10	9.928e-10
S	1.750e-03	1.750e-03
Sb	3.032e-09	3.033e-09
Se	1.782e-08	1.782e-08
Si	2.176e-04	2.176e-04
U	3.661e-08	3.662e-08
V	9.667e-10	9.668e-10
Zn	9.805e-07	9.807e-07

-----Description of solution-----

	pH	=	8.333	Charge balance
	pe	=	4.439	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	9.201e-03	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.217e-03	

Total CO2 (mol/kg) = 1.189e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 1.926e-07
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 1
 Total H = 1.110312e+02
 Total O = 5.552603e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.401e-06	2.169e-06	-5.620	-5.664	-0.044	(0)
H+	5.127e-09	4.642e-09	-8.290	-8.333	-0.043	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	3.230e-09					
AgCl	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
Ag+	6.051e-10	5.478e-10	-9.218	-9.261	-0.043	(0)
AgCl2-	4.187e-10	3.741e-10	-9.378	-9.427	-0.049	(0)
AgSO4-	1.299e-11	1.161e-11	-10.886	-10.935	-0.049	(0)
AgCl3-2	1.025e-12	6.533e-13	-11.989	-12.185	-0.196	(0)
AgNO2	1.676e-13	1.676e-13	-12.776	-12.776	0.000	(0)
AgOH	1.188e-13	1.188e-13	-12.925	-12.925	0.000	(0)
AgF	1.179e-13	1.179e-13	-12.928	-12.928	0.000	(0)
AgH2BO3	1.037e-14	1.037e-14	-13.984	-13.984	0.000	(0)
AgCl4-3	7.205e-15	2.614e-15	-14.142	-14.583	-0.440	(0)
AgSeO3-	2.437e-15	2.177e-15	-14.613	-14.662	-0.049	(0)
Ag2Se	6.389e-16	6.389e-16	-15.195	-15.195	0.000	(0)
AgNH3+	3.619e-16	3.234e-16	-15.441	-15.490	-0.049	(0)
Ag (OH) 2-	2.818e-17	2.518e-17	-16.550	-16.599	-0.049	(0)
AgNO3	6.011e-19	6.011e-19	-18.221	-18.221	0.000	(0)
Ag (NO2) 2-	4.254e-19	3.801e-19	-18.371	-18.420	-0.049	(0)
Ag (NH3) 2+	8.507e-22	7.601e-22	-21.070	-21.119	-0.049	(0)
Ag (SeO3) 2-3	3.323e-22	1.206e-22	-21.478	-21.919	-0.440	(0)
Ag2MoO4	1.526e-26	1.526e-26	-25.816	-25.816	0.000	(0)
AgHS	0.000e+00	0.000e+00	-75.273	-75.273	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.820	-84.603	-0.783	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-150.016	-150.149	-0.133	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.950	-150.999	-0.049	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.996	-151.256	-0.260	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.316	-151.567	-0.251	(0)
Al	2.827e-07					
Al (OH) 4-	2.817e-07	2.552e-07	-6.550	-6.593	-0.043	(0)
Al (OH) 3	9.347e-10	9.347e-10	-9.029	-9.029	0.000	(0)
Al (OH) 2+	2.378e-11	2.160e-11	-10.624	-10.666	-0.042	(0)
AlF2+	1.860e-13	1.690e-13	-12.730	-12.772	-0.042	(0)
AlF3	1.823e-13	1.823e-13	-12.739	-12.739	0.000	(0)
AlOH+2	1.843e-14	1.254e-14	-13.735	-13.902	-0.167	(0)
AlF4-	8.640e-15	7.828e-15	-14.063	-14.106	-0.043	(0)
AlF+2	7.279e-15	4.953e-15	-14.138	-14.305	-0.167	(0)
AlSO4+	5.259e-17	4.764e-17	-16.279	-16.322	-0.043	(0)
Al+3	1.416e-17	5.780e-18	-16.849	-17.238	-0.389	(0)
Al (SO4) 2-	5.984e-19	5.421e-19	-18.223	-18.266	-0.043	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-53.035	-53.475	-0.440	(0)
As (3)	9.656e-24					
H3AsO3	8.593e-24	8.593e-24	-23.066	-23.066	0.000	(0)
H2AsO3-	1.063e-24	9.494e-25	-23.974	-24.023	-0.049	(0)
HAsO3-2	2.927e-28	1.866e-28	-27.534	-27.729	-0.196	(0)
H4AsO3+	2.212e-32	1.976e-32	-31.655	-31.704	-0.049	(0)
AsO3-3	4.270e-33	1.549e-33	-32.370	-32.810	-0.440	(0)
As (5)	1.806e-09					
HAsO4-2	1.751e-09	1.116e-09	-8.757	-8.952	-0.196	(0)
H2AsO4-	5.286e-11	4.722e-11	-10.277	-10.326	-0.049	(0)
AsO4-3	2.095e-12	7.600e-13	-11.679	-12.119	-0.440	(0)
H3AsO4	3.801e-17	3.809e-17	-16.420	-16.419	0.001	(0)
B	1.090e-05					
H3BO3	9.531e-06	9.551e-06	-5.021	-5.020	0.001	(0)

	H2BO3-	1.327e-06	1.195e-06	-5.877	-5.923	-0.045	(0)
	CaH2BO3+	2.416e-08	2.177e-08	-7.617	-7.662	-0.045	(0)
	MgH2BO3+	1.514e-08	1.364e-08	-7.820	-7.865	-0.045	(0)
	NaH2BO3	7.227e-09	7.227e-09	-8.141	-8.141	0.000	(0)
	BF(OH) 3-	3.625e-10	3.266e-10	-9.441	-9.486	-0.045	(0)
	H5(BO3) 2-	1.078e-11	9.715e-12	-10.967	-11.013	-0.045	(0)
	BaH2BO3+	8.360e-14	7.531e-14	-13.078	-13.123	-0.045	(0)
	BF2(OH) 2-	1.542e-14	1.389e-14	-13.812	-13.857	-0.045	(0)
	AgH2BO3	1.037e-14	1.037e-14	-13.984	-13.984	0.000	(0)
	H8(BO3) 3-	1.030e-14	9.279e-15	-13.987	-14.032	-0.045	(0)
	BF3OH-	2.386e-21	2.150e-21	-20.622	-20.668	-0.045	(0)
	BF4-	4.671e-27	4.208e-27	-26.331	-26.376	-0.045	(0)
Ba		3.070e-09					
	Ba+2	3.036e-09	2.039e-09	-8.518	-8.691	-0.173	(0)
	BaHCO3+	2.217e-11	2.017e-11	-10.654	-10.695	-0.041	(0)
	BaCO3	1.094e-11	1.094e-11	-10.961	-10.961	0.000	(0)
	BaH2BO3+	8.360e-14	7.531e-14	-13.078	-13.123	-0.045	(0)
	BaOH+	2.128e-14	1.931e-14	-13.672	-13.714	-0.042	(0)
	BaNO3+	1.580e-17	1.412e-17	-16.801	-16.850	-0.049	(0)
	BaNH3+2	5.838e-19	3.720e-19	-18.234	-18.429	-0.196	(0)
C(4)		1.189e-03					
	HCO3-	1.140e-03	1.036e-03	-2.943	-2.985	-0.042	(0)
	CO3-2	1.558e-05	1.046e-05	-4.807	-4.980	-0.173	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CaHCO3+	6.711e-06	6.105e-06	-5.173	-5.214	-0.041	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgHCO3+	3.857e-06	3.489e-06	-5.414	-5.457	-0.043	(0)
	MgCO3	2.865e-06	2.865e-06	-5.543	-5.543	0.000	(0)
	NaHCO3	2.222e-06	2.222e-06	-5.653	-5.653	0.000	(0)
	NaCO3-	8.184e-07	7.433e-07	-6.087	-6.129	-0.042	(0)
	CuCO3	4.396e-07	4.396e-07	-6.357	-6.357	0.000	(0)
	ZnCO3	2.184e-07	2.184e-07	-6.661	-6.661	0.000	(0)
	MnHCO3+	8.658e-08	7.855e-08	-7.063	-7.105	-0.042	(0)
	UO2(CO3) 3-4	2.449e-08	4.038e-09	-7.611	-8.394	-0.783	(0)
	Cu(CO3) 2-2	1.942e-08	1.238e-08	-7.712	-7.907	-0.196	(0)
	ZnHCO3+	1.330e-08	1.188e-08	-7.876	-7.925	-0.049	(0)
	UO2(CO3) 2-2	1.209e-08	7.702e-09	-7.918	-8.113	-0.196	(0)
	NiCO3	2.917e-09	2.917e-09	-8.535	-8.535	0.000	(0)
	NiHCO3+	1.068e-09	9.544e-10	-8.971	-9.020	-0.049	(0)
	CoCO3	9.146e-10	9.146e-10	-9.039	-9.039	0.000	(0)
	PbCO3	7.368e-10	7.368e-10	-9.133	-9.133	0.000	(0)
	CuHCO3+	5.219e-10	4.663e-10	-9.282	-9.331	-0.049	(0)
	CoHCO3+	4.664e-10	4.167e-10	-9.331	-9.380	-0.049	(0)
	CdCO3	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)
	UO2CO3	3.690e-11	3.690e-11	-10.433	-10.433	0.000	(0)
	Pb(CO3) 2-2	3.488e-11	2.223e-11	-10.457	-10.653	-0.196	(0)
	BaHCO3+	2.217e-11	2.017e-11	-10.654	-10.695	-0.041	(0)
	PbHCO3+	2.018e-11	1.803e-11	-10.695	-10.744	-0.049	(0)
	BaCO3	1.094e-11	1.094e-11	-10.961	-10.961	0.000	(0)
	Cd(CO3) 2-2	1.865e-12	1.188e-12	-11.729	-11.925	-0.196	(0)
	CdHCO3+	1.696e-12	1.515e-12	-11.771	-11.820	-0.049	(0)
	FeHCO3+	8.721e-16	7.933e-16	-15.059	-15.101	-0.041	(0)
	HgCO3	2.324e-16	2.324e-16	-15.634	-15.634	0.000	(0)
	Hg(CO3) 2-2	1.206e-17	7.687e-18	-16.919	-17.114	-0.196	(0)
	HgHCO3+	2.248e-20	2.008e-20	-19.648	-19.697	-0.049	(0)
Ca		5.607e-04					
	Ca+2	4.714e-04	3.165e-04	-3.327	-3.500	-0.173	(0)
	CaSO4	7.700e-05	7.700e-05	-4.113	-4.113	0.000	(0)
	CaHCO3+	6.711e-06	6.105e-06	-5.173	-5.214	-0.041	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.263e-07	2.960e-07	-6.486	-6.529	-0.042	(0)
	CaH2BO3+	2.416e-08	2.177e-08	-7.617	-7.662	-0.045	(0)
	CaOH+	1.506e-08	1.370e-08	-7.822	-7.863	-0.041	(0)
	CaNO3+	1.548e-12	1.383e-12	-11.810	-11.859	-0.049	(0)
	CaNH3+2	1.808e-13	1.152e-13	-12.743	-12.938	-0.196	(0)
	Ca(NH3) 2+2	2.081e-23	1.326e-23	-22.682	-22.877	-0.196	(0)
Cd		1.437e-09					
	Cd+2	9.569e-10	6.426e-10	-9.019	-9.192	-0.173	(0)

CdSO4	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
CdCO3	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)
CdCl+	1.346e-10	1.203e-10	-9.871	-9.920	-0.049	(0)
CdOH+	1.239e-11	1.107e-11	-10.907	-10.956	-0.049	(0)
CdOHCl	1.070e-11	1.070e-11	-10.971	-10.971	0.000	(0)
Cd(SO4) 2-2	3.596e-12	2.291e-12	-11.444	-11.640	-0.196	(0)
Cd(CO3) 2-2	1.865e-12	1.188e-12	-11.729	-11.925	-0.196	(0)
CdHCO3+	1.696e-12	1.515e-12	-11.771	-11.820	-0.049	(0)
CdCl2	9.824e-13	9.824e-13	-12.008	-12.008	0.000	(0)
CdF+	9.767e-13	8.727e-13	-12.010	-12.059	-0.049	(0)
Cd(OH) 2	1.515e-13	1.515e-13	-12.820	-12.820	0.000	(0)
CdCl3-	1.360e-15	1.215e-15	-14.867	-14.916	-0.049	(0)
CdF2	1.492e-16	1.492e-16	-15.826	-15.826	0.000	(0)
Cd(OH) 3-	2.247e-17	2.008e-17	-16.648	-16.697	-0.049	(0)
CdSeO4	3.206e-18	3.206e-18	-17.494	-17.494	0.000	(0)
CdNO3+	3.142e-18	2.807e-18	-17.503	-17.552	-0.049	(0)
Cd2OH+3	9.827e-20	3.565e-20	-19.008	-19.448	-0.440	(0)
Cd(SeO3) 2-2	3.179e-20	2.026e-20	-19.498	-19.693	-0.196	(0)
Cd(OH) 4-2	1.118e-23	7.127e-24	-22.951	-23.147	-0.196	(0)
Cd(NO3) 2	1.944e-27	1.944e-27	-26.711	-26.711	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-80.961	-81.010	-0.049	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-153.632	-153.632	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-231.509	-231.558	-0.049	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-308.993	-309.188	-0.196	(0)
C1	2.165e-03					
Cl-	2.165e-03	1.960e-03	-2.665	-2.708	-0.043	(0)
MnCl+	1.034e-08	9.377e-09	-7.986	-8.028	-0.042	(0)
ZnOHCl	5.070e-09	5.070e-09	-8.295	-8.295	0.000	(0)
AgCl	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
ZnCl+	1.973e-09	1.786e-09	-8.705	-8.748	-0.043	(0)
AgCl2-	4.187e-10	3.741e-10	-9.378	-9.427	-0.049	(0)
CuCl	3.137e-10	3.137e-10	-9.503	-9.503	0.000	(0)
CuCl2-	1.420e-10	1.285e-10	-9.848	-9.891	-0.043	(0)
CdCl+	1.346e-10	1.203e-10	-9.871	-9.920	-0.049	(0)
NiCl+	4.194e-11	3.748e-11	-10.377	-10.426	-0.049	(0)
CoCl+	3.924e-11	3.506e-11	-10.406	-10.455	-0.049	(0)
MnCl2	2.596e-11	2.596e-11	-10.586	-10.586	0.000	(0)
CuCl+	2.449e-11	2.216e-11	-10.611	-10.654	-0.043	(0)
CdOHCl	1.070e-11	1.070e-11	-10.971	-10.971	0.000	(0)
ZnCl2	5.546e-12	5.546e-12	-11.256	-11.256	0.000	(0)
PbCl+	1.823e-12	1.629e-12	-11.739	-11.788	-0.049	(0)
AgCl3-2	1.025e-12	6.533e-13	-11.989	-12.185	-0.196	(0)
CdCl2	9.824e-13	9.824e-13	-12.008	-12.008	0.000	(0)
HgClOH	1.393e-13	1.393e-13	-12.856	-12.856	0.000	(0)
CuCl3-2	7.943e-14	5.382e-14	-13.100	-13.269	-0.169	(0)
MnCl3-	1.544e-14	1.401e-14	-13.811	-13.854	-0.042	(0)
CuCl2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
PbCl2	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
ZnCl3-	9.541e-15	8.633e-15	-14.020	-14.064	-0.043	(0)
AgCl4-3	7.205e-15	2.614e-15	-14.142	-14.583	-0.440	(0)
HgCl2	7.127e-15	7.127e-15	-14.147	-14.147	0.000	(0)
CdCl3-	1.360e-15	1.215e-15	-14.867	-14.916	-0.049	(0)
NiCl2	3.698e-16	3.698e-16	-15.432	-15.432	0.000	(0)
HgCl3-	1.563e-16	1.397e-16	-15.806	-15.855	-0.049	(0)
ZnCl4-2	1.248e-17	8.459e-18	-16.904	-17.073	-0.169	(0)
PbCl3-	1.245e-17	1.113e-17	-16.905	-16.954	-0.049	(0)
UO2Cl+	3.152e-18	2.816e-18	-17.501	-17.550	-0.049	(0)
HgCl4-2	1.710e-18	1.090e-18	-17.767	-17.963	-0.196	(0)
HgCl+	8.122e-19	7.257e-19	-18.090	-18.139	-0.049	(0)
CuCl3-	3.044e-19	2.754e-19	-18.517	-18.560	-0.043	(0)
CrCl+2	9.772e-20	6.227e-20	-19.010	-19.206	-0.196	(0)
PbCl4-2	1.564e-20	9.965e-21	-19.806	-20.002	-0.196	(0)
CrOHC12	5.031e-21	5.031e-21	-20.298	-20.298	0.000	(0)
FeCl+2	1.357e-23	9.192e-24	-22.868	-23.037	-0.169	(0)
CrCl2+	1.296e-23	1.158e-23	-22.887	-22.936	-0.049	(0)
CuCl4-2	3.992e-24	2.705e-24	-23.399	-23.568	-0.169	(0)
FeCl2+	8.869e-26	8.046e-26	-25.052	-25.094	-0.042	(0)
VOCl+	8.149e-26	7.281e-26	-25.089	-25.138	-0.049	(0)

CrO3Cl-	2.582e-26	2.307e-26	-25.588	-25.637	-0.049	(0)
FeCl3	1.577e-29	1.577e-29	-28.802	-28.802	0.000	(0)
CoCl+2	3.541e-37	2.256e-37	-36.451	-36.647	-0.196	(0)
UCl+3	0.000e+00	0.000e+00	-48.615	-49.056	-0.440	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
Co (2)	1.094e-08					
Co+2	8.116e-09	5.172e-09	-8.091	-8.286	-0.196	(0)
CoSO4	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
CoCO3	9.146e-10	9.146e-10	-9.039	-9.039	0.000	(0)
CoHCO3+	4.664e-10	4.167e-10	-9.331	-9.380	-0.049	(0)
CoOH+	2.505e-10	2.238e-10	-9.601	-9.650	-0.049	(0)
CoCl+	3.924e-11	3.506e-11	-10.406	-10.455	-0.049	(0)
Co (OH) 2	3.856e-11	3.856e-11	-10.414	-10.414	0.000	(0)
CoF+	1.569e-11	1.401e-11	-10.805	-10.853	-0.049	(0)
CoNO2+	5.973e-14	5.337e-14	-13.224	-13.273	-0.049	(0)
Co (OH) 3-	1.868e-15	1.669e-15	-14.729	-14.778	-0.049	(0)
CoOOH-	4.687e-16	4.188e-16	-15.329	-15.378	-0.049	(0)
Co (NH3) +2	2.821e-16	1.798e-16	-15.550	-15.745	-0.196	(0)
CoSeO4	6.945e-17	6.945e-17	-16.158	-16.158	0.000	(0)
CoNO3+	1.267e-17	1.132e-17	-16.897	-16.946	-0.049	(0)
Co2OH+3	1.599e-19	5.801e-20	-18.796	-19.236	-0.440	(0)
Co (OH) 4-2	9.002e-22	5.737e-22	-21.046	-21.241	-0.196	(0)
Co (NH3) 2+2	3.480e-24	2.218e-24	-23.458	-23.654	-0.196	(0)
Co (NO3) 2	3.183e-26	3.183e-26	-25.497	-25.497	0.000	(0)
Co4 (OH) 4+4	3.036e-30	5.007e-31	-29.518	-30.300	-0.783	(0)
Co (NH3) 3+2	1.267e-32	8.073e-33	-31.897	-32.093	-0.196	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.716	-40.912	-0.196	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.035	-50.231	-0.196	(0)
Co (3)	9.787e-30					
CoOH+2	9.787e-30	6.237e-30	-29.009	-29.205	-0.196	(0)
Co+3	1.386e-36	5.658e-37	-35.858	-36.247	-0.389	(0)
CoCl+2	3.541e-37	2.256e-37	-36.451	-36.647	-0.196	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.202	-73.398	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
Cr (2)	3.349e-28					
Cr+2	3.349e-28	2.134e-28	-27.475	-27.671	-0.196	(0)
Cr (3)	6.497e-10					
Cr (OH) 2+	3.441e-10	3.075e-10	-9.463	-9.512	-0.049	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.870e-11	2.564e-11	-10.542	-10.591	-0.049	(0)
Cr (OH) 4-	2.421e-11	2.163e-11	-10.616	-10.665	-0.049	(0)
Cr (OH) +2	1.828e-12	1.165e-12	-11.738	-11.934	-0.196	(0)
CrOHSO4	2.936e-13	2.936e-13	-12.532	-12.532	0.000	(0)
CrF+2	5.233e-16	3.335e-16	-15.281	-15.477	-0.196	(0)
CrSO4+	6.815e-17	6.089e-17	-16.167	-16.215	-0.049	(0)
Cr+3	6.767e-17	2.455e-17	-16.170	-16.610	-0.440	(0)
CrCl+2	9.772e-20	6.227e-20	-19.010	-19.206	-0.196	(0)
CrOHC12	5.031e-21	5.031e-21	-20.298	-20.298	0.000	(0)
Cr2 (OH) 2SO4+2	4.852e-23	3.092e-23	-22.314	-22.510	-0.196	(0)
CrCl2+	1.296e-23	1.158e-23	-22.887	-22.936	-0.049	(0)
Cr2 (OH) 2 (SO4) 2	1.950e-24	1.950e-24	-23.710	-23.710	0.000	(0)
CrNO3+2	2.327e-27	1.483e-27	-26.633	-26.829	-0.196	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.400	-49.596	-0.196	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-60.403	-60.843	-0.440	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Cr (6)	4.104e-14					
CrO4-2	3.997e-14	2.684e-14	-13.398	-13.571	-0.173	(0)
NaCrO4-	5.697e-16	5.090e-16	-15.244	-15.293	-0.049	(0)
HCrO4-	4.513e-16	4.032e-16	-15.346	-15.394	-0.049	(0)
KCrO4-	4.743e-17	4.238e-17	-16.324	-16.373	-0.049	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	9.500e-25	6.054e-25	-24.022	-24.218	-0.196	(0)
CrO3Cl-	2.582e-26	2.307e-26	-25.588	-25.637	-0.049	(0)
Cr2O7-2	8.847e-30	5.638e-30	-29.053	-29.249	-0.196	(0)

Cu (1)	5.981e-10					
CuCl	3.137e-10	3.137e-10	-9.503	-9.503	0.000	(0)
Cu+	1.423e-10	1.272e-10	-9.847	-9.896	-0.049	(0)
CuCl2-	1.420e-10	1.285e-10	-9.848	-9.891	-0.043	(0)
CuCl3-2	7.943e-14	5.382e-14	-13.100	-13.269	-0.169	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.236	-149.491	-0.255	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.975	-150.221	-0.246	(0)
Cu (2)	5.475e-07					
CuCO3	4.396e-07	4.396e-07	-6.357	-6.357	0.000	(0)
CuOH+	5.409e-08	4.894e-08	-7.267	-7.310	-0.043	(0)
Cu (OH) 2	2.118e-08	2.118e-08	-7.674	-7.674	0.000	(0)
Cu (CO3) 2-2	1.942e-08	1.238e-08	-7.712	-7.907	-0.196	(0)
Cu+2	1.063e-08	7.136e-09	-7.974	-8.147	-0.173	(0)
CuSO4	1.736e-09	1.736e-09	-8.760	-8.760	0.000	(0)
CuHCO3+	5.219e-10	4.663e-10	-9.282	-9.331	-0.049	(0)
Cu (OH) 3-	1.055e-10	9.423e-11	-9.977	-10.026	-0.049	(0)
Cu2 (OH) 2+2	9.442e-11	6.017e-11	-10.025	-10.221	-0.196	(0)
CuF+	4.318e-11	3.858e-11	-10.365	-10.414	-0.049	(0)
CuCl+	2.449e-11	2.216e-11	-10.611	-10.654	-0.043	(0)
CuNO2+	1.225e-12	1.094e-12	-11.912	-11.961	-0.049	(0)
CuNH3+2	3.313e-14	2.111e-14	-13.480	-13.675	-0.196	(0)
CuCl2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
Cu (OH) 4-2	2.524e-15	1.609e-15	-14.598	-14.794	-0.196	(0)
CuNO3+	3.489e-17	3.117e-17	-16.457	-16.506	-0.049	(0)
Cu (NO2) 2	1.640e-17	1.640e-17	-16.785	-16.785	0.000	(0)
CuCl3-	3.044e-19	2.754e-19	-18.517	-18.560	-0.043	(0)
CuCl4-2	3.992e-24	2.705e-24	-23.399	-23.568	-0.169	(0)
Cu (NO3) 2	5.422e-27	5.422e-27	-26.266	-26.266	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-221.677	-221.726	-0.049	(0)
F	9.870e-05					
F-	9.466e-05	8.569e-05	-4.024	-4.067	-0.043	(0)
MgF+	3.494e-06	3.165e-06	-5.457	-5.500	-0.043	(0)
CaF+	3.263e-07	2.960e-07	-6.486	-6.529	-0.042	(0)
NaF	2.063e-07	2.063e-07	-6.686	-6.686	0.000	(0)
MnF+	1.429e-08	1.297e-08	-7.845	-7.887	-0.042	(0)
ZnF+	6.942e-10	6.202e-10	-9.159	-9.207	-0.049	(0)
HF	5.883e-10	5.883e-10	-9.230	-9.230	0.000	(0)
BF (OH) 3-	3.625e-10	3.266e-10	-9.441	-9.486	-0.045	(0)
CuF+	4.318e-11	3.858e-11	-10.365	-10.414	-0.049	(0)
NiF+	1.801e-11	1.609e-11	-10.745	-10.793	-0.049	(0)
CoF+	1.569e-11	1.401e-11	-10.805	-10.853	-0.049	(0)
CdF+	9.767e-13	8.727e-13	-12.010	-12.059	-0.049	(0)
HF2-	2.121e-13	1.917e-13	-12.673	-12.717	-0.044	(0)
AlF2+	1.860e-13	1.690e-13	-12.730	-12.772	-0.042	(0)
AlF3	1.823e-13	1.823e-13	-12.739	-12.739	0.000	(0)
PbF+	1.583e-13	1.415e-13	-12.800	-12.849	-0.049	(0)
AgF	1.179e-13	1.179e-13	-12.928	-12.928	0.000	(0)
BF2 (OH) 2-	1.542e-14	1.389e-14	-13.812	-13.857	-0.045	(0)
UO2F+	1.173e-14	1.048e-14	-13.931	-13.980	-0.049	(0)
AlF4-	8.640e-15	7.828e-15	-14.063	-14.106	-0.043	(0)
AlF+2	7.279e-15	4.953e-15	-14.138	-14.305	-0.167	(0)
UO2F2	2.590e-15	2.590e-15	-14.587	-14.587	0.000	(0)
CrF+2	5.233e-16	3.335e-16	-15.281	-15.477	-0.196	(0)
PbF2	2.386e-16	2.386e-16	-15.622	-15.622	0.000	(0)
CdF2	1.492e-16	1.492e-16	-15.826	-15.826	0.000	(0)
UO2F3-	6.240e-17	5.575e-17	-16.205	-16.254	-0.049	(0)
H2F2	9.273e-19	9.273e-19	-18.033	-18.033	0.000	(0)
UO2F4-2	5.955e-20	3.795e-20	-19.225	-19.421	-0.196	(0)
PbF3-	4.340e-20	3.878e-20	-19.363	-19.411	-0.049	(0)
FeF2+	3.689e-20	3.347e-20	-19.433	-19.475	-0.042	(0)
VO2F	3.174e-20	3.174e-20	-19.498	-19.498	0.000	(0)
FeF+2	2.154e-20	1.459e-20	-19.667	-19.836	-0.169	(0)
FeF3	4.046e-21	4.046e-21	-20.393	-20.393	0.000	(0)
BF3OH-	2.386e-21	2.150e-21	-20.622	-20.668	-0.045	(0)
VO2F2-	1.105e-21	9.874e-22	-20.957	-21.006	-0.049	(0)
VOF+	7.618e-24	6.806e-24	-23.118	-23.167	-0.049	(0)
PbF4-2	2.496e-24	1.590e-24	-23.603	-23.799	-0.196	(0)
VO2F3-2	1.656e-24	1.055e-24	-23.781	-23.977	-0.196	(0)

VOF2	2.187e-25	2.187e-25	-24.660	-24.660	0.000	(0)
HgF+	6.598e-26	5.895e-26	-25.181	-25.230	-0.049	(0)
BF4-	4.671e-27	4.208e-27	-26.331	-26.376	-0.045	(0)
VOF3-	7.442e-28	6.649e-28	-27.128	-27.177	-0.049	(0)
Sb(OH) 2F	5.318e-28	5.318e-28	-27.274	-27.274	0.000	(0)
SbOF	5.230e-28	5.230e-28	-27.281	-27.281	0.000	(0)
VO2F4-3	1.226e-28	4.450e-29	-27.911	-28.352	-0.440	(0)
VOF4-2	3.609e-31	2.300e-31	-30.443	-30.638	-0.196	(0)
SiF6-2	8.658e-32	5.866e-32	-31.063	-31.232	-0.169	(0)
UF3+	2.511e-39	2.244e-39	-38.600	-38.649	-0.049	(0)
UF2+2	2.592e-40	1.652e-40	-39.586	-39.782	-0.196	(0)
UF4	0.000e+00	0.000e+00	-40.676	-40.676	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.375	-42.815	-0.440	(0)
UF5-	0.000e+00	0.000e+00	-43.096	-43.145	-0.049	(0)
UF6-2	0.000e+00	0.000e+00	-44.537	-44.732	-0.196	(0)
Fe (2)	1.180e-13					
Fe+2	9.547e-14	6.084e-14	-13.020	-13.216	-0.196	(0)
FeSO4	1.586e-14	1.586e-14	-13.800	-13.800	0.000	(0)
FeOH+	5.790e-15	5.253e-15	-14.237	-14.280	-0.042	(0)
FeHCO3+	8.721e-16	7.933e-16	-15.059	-15.101	-0.041	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	6.842e-18	6.208e-18	-17.165	-17.207	-0.042	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.918	-163.918	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-241.658	-241.707	-0.049	(0)
Fe (3)	7.247e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.021e-10	1.835e-10	-9.694	-9.736	-0.042	(0)
Fe (OH) 4-	9.507e-11	8.635e-11	-10.022	-10.064	-0.042	(0)
FeOH+2	3.210e-16	2.175e-16	-15.493	-15.663	-0.169	(0)
FeF2+	3.689e-20	3.347e-20	-19.433	-19.475	-0.042	(0)
FeF+2	2.154e-20	1.459e-20	-19.667	-19.836	-0.169	(0)
FeF3	4.046e-21	4.046e-21	-20.393	-20.393	0.000	(0)
FeSO4+	2.040e-21	1.851e-21	-20.690	-20.733	-0.042	(0)
Fe+3	3.805e-22	1.553e-22	-21.420	-21.809	-0.389	(0)
Fe (SO4) 2-	4.703e-23	4.202e-23	-22.328	-22.377	-0.049	(0)
FeCl+2	1.357e-23	9.192e-24	-22.868	-23.037	-0.169	(0)
FeCl2+	8.869e-26	8.046e-26	-25.052	-25.094	-0.042	(0)
FeHSeO3+2	4.645e-27	2.960e-27	-26.333	-26.529	-0.196	(0)
FeCl3	1.577e-29	1.577e-29	-28.802	-28.802	0.000	(0)
Fe2 (OH) 2+4	9.501e-30	1.567e-30	-29.022	-29.805	-0.783	(0)
FeNO3+2	3.367e-30	2.146e-30	-29.473	-29.668	-0.196	(0)
Fe3 (OH) 4+5	6.947e-38	4.157e-39	-37.158	-38.381	-1.223	(0)
H (0)	4.030e-29					
H2	2.015e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	2.268e-10					
Hg	2.268e-10	2.268e-10	-9.644	-9.644	0.000	(0)
Hg (1)	8.969e-24					
Hg2+2	4.484e-24	2.858e-24	-23.348	-23.544	-0.196	(0)
Hg (2)	6.966e-13					
Hg (OH) 2	5.497e-13	5.509e-13	-12.260	-12.259	0.001	(0)
HgClOH	1.393e-13	1.393e-13	-12.856	-12.856	0.000	(0)
HgCl2	7.127e-15	7.127e-15	-14.147	-14.147	0.000	(0)
HgCO3	2.324e-16	2.324e-16	-15.634	-15.634	0.000	(0)
HgCl3-	1.563e-16	1.397e-16	-15.806	-15.855	-0.049	(0)
Hg (CO3) 2-2	1.206e-17	7.687e-18	-16.919	-17.114	-0.196	(0)
HgOH+	1.794e-18	1.603e-18	-17.746	-17.795	-0.049	(0)
HgCl4-2	1.710e-18	1.090e-18	-17.767	-17.963	-0.196	(0)
HgCl+	8.122e-19	7.257e-19	-18.090	-18.139	-0.049	(0)
Hg (OH) 3-	1.684e-19	1.504e-19	-18.774	-18.823	-0.049	(0)
HgHCO3+	2.248e-20	2.008e-20	-19.648	-19.697	-0.049	(0)
Hg+2	2.912e-23	1.856e-23	-22.536	-22.731	-0.196	(0)
HgNH3+2	5.314e-24	3.386e-24	-23.275	-23.470	-0.196	(0)
HgSO4	5.160e-24	5.160e-24	-23.287	-23.287	0.000	(0)
Hg (NH3) 2+2	1.536e-24	9.791e-25	-23.813	-24.009	-0.196	(0)
HgF+	6.598e-26	5.895e-26	-25.181	-25.230	-0.049	(0)
HgNO3+	1.060e-32	9.467e-33	-31.975	-32.024	-0.049	(0)
Hg (NH3) 3+2	1.769e-33	1.127e-33	-32.752	-32.948	-0.196	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-41.265	-41.265	0.000	(0)

	Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.391	-41.587	-0.196	(0)
	HgHS2-	0.000e+00	0.000e+00	-142.073	-142.122	-0.049	(0)
	HgS2-2	0.000e+00	0.000e+00	-142.301	-142.497	-0.196	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-144.062	-144.062	0.000	(0)
K	4.729e-04						
	K+	4.694e-04	4.249e-04	-3.328	-3.372	-0.043	(0)
	KSO4-	3.517e-06	3.194e-06	-5.454	-5.496	-0.042	(0)
	KCrO4-	4.743e-17	4.238e-17	-16.324	-16.373	-0.049	(0)
Mg	5.644e-04						
	Mg+2	4.903e-04	3.292e-04	-3.310	-3.482	-0.173	(0)
	MgSO4	6.362e-05	6.362e-05	-4.196	-4.196	0.000	(0)
	MgHCO3+	3.857e-06	3.489e-06	-5.414	-5.457	-0.043	(0)
	MgF+	3.494e-06	3.165e-06	-5.457	-5.500	-0.043	(0)
	MgCO3	2.865e-06	2.865e-06	-5.543	-5.543	0.000	(0)
	MgOH+	3.122e-07	2.843e-07	-6.506	-6.546	-0.041	(0)
	MgH2BO3+	1.514e-08	1.364e-08	-7.820	-7.865	-0.045	(0)
Mn (2)	6.816e-06						
	Mn+2	5.965e-06	3.801e-06	-5.224	-5.420	-0.196	(0)
	MnSO4	7.178e-07	7.178e-07	-6.144	-6.144	0.000	(0)
	MnHCO3+	8.658e-08	7.855e-08	-7.063	-7.105	-0.042	(0)
	MnOH+	2.283e-08	2.071e-08	-7.642	-7.684	-0.042	(0)
	MnF+	1.429e-08	1.297e-08	-7.845	-7.887	-0.042	(0)
	MnCl+	1.034e-08	9.377e-09	-7.986	-8.028	-0.042	(0)
	MnCl2	2.596e-11	2.596e-11	-10.586	-10.586	0.000	(0)
	MnSeO4	2.741e-14	2.741e-14	-13.562	-13.562	0.000	(0)
	MnCl3-	1.544e-14	1.401e-14	-13.811	-13.854	-0.042	(0)
	MnNO3+	9.315e-15	8.322e-15	-14.031	-14.080	-0.049	(0)
	Mn (OH) 3-	6.636e-16	6.021e-16	-15.178	-15.220	-0.042	(0)
	Mn (OH) 4-2	6.222e-21	4.216e-21	-20.206	-20.375	-0.169	(0)
	Mn (NO3) 2	2.888e-23	2.888e-23	-22.539	-22.539	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-42.388	-42.388	0.000	(0)
Mn (3)	1.143e-26						
	Mn+3	1.143e-26	4.666e-27	-25.942	-26.331	-0.389	(0)
Mn (6)	5.617e-40						
	MnO4-2	5.617e-40	3.806e-40	-39.250	-39.420	-0.169	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.308	-44.352	-0.045	(0)
Mo	2.001e-07						
	MoO4-2	2.001e-07	1.344e-07	-6.699	-6.872	-0.173	(0)
	HMoO4-	1.389e-11	1.241e-11	-10.857	-10.906	-0.049	(0)
	H2MoO4	4.220e-16	4.220e-16	-15.375	-15.375	0.000	(0)
	Ag2MoO4	1.526e-26	1.526e-26	-25.816	-25.816	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-53.035	-53.475	-0.440	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-60.017	-61.778	-1.761	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-62.501	-63.724	-1.223	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-66.493	-67.276	-0.783	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-71.923	-72.363	-0.440	(0)
N (-3)	2.932e-09						
	NH4+	2.613e-09	2.354e-09	-8.583	-8.628	-0.045	(0)
	NH3	2.892e-10	2.892e-10	-9.539	-9.539	0.000	(0)
	NH4SO4-	2.952e-11	2.678e-11	-10.530	-10.572	-0.042	(0)
	CaNH3+2	1.808e-13	1.152e-13	-12.743	-12.938	-0.196	(0)
	CuNH3+2	3.313e-14	2.111e-14	-13.480	-13.675	-0.196	(0)
	NiNH3+2	1.821e-15	1.161e-15	-14.740	-14.935	-0.196	(0)
	AgNH3+	3.619e-16	3.234e-16	-15.441	-15.490	-0.049	(0)
	Co (NH3) +2	2.821e-16	1.798e-16	-15.550	-15.745	-0.196	(0)
	BaNH3+2	5.838e-19	3.720e-19	-18.234	-18.429	-0.196	(0)
	Ag (NH3) 2+	8.507e-22	7.601e-22	-21.070	-21.119	-0.049	(0)
	Ni (NH3) 2+2	7.612e-23	4.851e-23	-22.118	-22.314	-0.196	(0)
	Ca (NH3) 2+2	2.081e-23	1.326e-23	-22.682	-22.877	-0.196	(0)
	HgNH3+2	5.314e-24	3.386e-24	-23.275	-23.470	-0.196	(0)
	Co (NH3) 2+2	3.480e-24	2.218e-24	-23.458	-23.654	-0.196	(0)
	Hg (NH3) 2+2	1.536e-24	9.791e-25	-23.813	-24.009	-0.196	(0)
	Co (NH3) 3+2	1.267e-32	8.073e-33	-31.897	-32.093	-0.196	(0)
	Hg (NH3) 3+2	1.769e-33	1.127e-33	-32.752	-32.948	-0.196	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-40.716	-40.912	-0.196	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.391	-41.587	-0.196	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.400	-49.596	-0.196	(0)

Co (NH3) 5+2	0.000e+00	0.000e+00	-50.035	-50.231	-0.196	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-60.403	-60.843	-0.440	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.202	-73.398	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
N (3)	1.623e-06					
NO2-	1.623e-06	1.464e-06	-5.790	-5.834	-0.045	(0)
CuNO2+	1.225e-12	1.094e-12	-11.912	-11.961	-0.049	(0)
AgNO2	1.676e-13	1.676e-13	-12.776	-12.776	0.000	(0)
CoNO2+	5.973e-14	5.337e-14	-13.224	-13.273	-0.049	(0)
Cu (NO2) 2	1.640e-17	1.640e-17	-16.785	-16.785	0.000	(0)
Ag (NO2) 2-	4.254e-19	3.801e-19	-18.371	-18.420	-0.049	(0)
N (5)	1.528e-09					
NO3-	1.526e-09	1.381e-09	-8.816	-8.860	-0.043	(0)
CaNO3+	1.548e-12	1.383e-12	-11.810	-11.859	-0.049	(0)
MnNO3+	9.315e-15	8.322e-15	-14.031	-14.080	-0.049	(0)
ZnNO3+	1.409e-15	1.259e-15	-14.851	-14.900	-0.049	(0)
CuNO3+	3.489e-17	3.117e-17	-16.457	-16.506	-0.049	(0)
NiNO3+	2.903e-17	2.594e-17	-16.537	-16.586	-0.049	(0)
BaNO3+	1.580e-17	1.412e-17	-16.801	-16.850	-0.049	(0)
CoNO3+	1.267e-17	1.132e-17	-16.897	-16.946	-0.049	(0)
CdNO3+	3.142e-18	2.807e-18	-17.503	-17.552	-0.049	(0)
AgNO3	6.011e-19	6.011e-19	-18.221	-18.221	0.000	(0)
PbNO3+	5.358e-19	4.787e-19	-18.271	-18.320	-0.049	(0)
Mn (NO3) 2	2.888e-23	2.888e-23	-22.539	-22.539	0.000	(0)
UO2NO3+	2.733e-24	2.442e-24	-23.563	-23.612	-0.049	(0)
Zn (NO3) 2	3.470e-25	3.470e-25	-24.460	-24.460	0.000	(0)
Co (NO3) 2	3.183e-26	3.183e-26	-25.497	-25.497	0.000	(0)
Cu (NO3) 2	5.422e-27	5.422e-27	-26.266	-26.266	0.000	(0)
CrNO3+2	2.327e-27	1.483e-27	-26.633	-26.829	-0.196	(0)
Cd (NO3) 2	1.944e-27	1.944e-27	-26.711	-26.711	0.000	(0)
Pb (NO3) 2	1.123e-27	1.123e-27	-26.950	-26.950	0.000	(0)
VO2NO3	1.476e-28	1.476e-28	-27.831	-27.831	0.000	(0)
FeNO3+2	3.367e-30	2.146e-30	-29.473	-29.668	-0.196	(0)
HgNO3+	1.060e-32	9.467e-33	-31.975	-32.024	-0.049	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-41.265	-41.265	0.000	(0)
Na	4.242e-03					
Na+	4.215e-03	3.816e-03	-2.375	-2.418	-0.043	(0)
NaSO4-	2.396e-05	2.176e-05	-4.621	-4.662	-0.042	(0)
NaHCO3	2.222e-06	2.222e-06	-5.653	-5.653	0.000	(0)
NaCO3-	8.184e-07	7.433e-07	-6.087	-6.129	-0.042	(0)
NaF	2.063e-07	2.063e-07	-6.686	-6.686	0.000	(0)
NaH2BO3	7.227e-09	7.227e-09	-8.141	-8.141	0.000	(0)
NaCrO4-	5.697e-16	5.090e-16	-15.244	-15.293	-0.049	(0)
Ni	1.702e-08					
Ni+2	1.113e-08	7.474e-09	-7.953	-8.126	-0.173	(0)
NiCO3	2.917e-09	2.917e-09	-8.535	-8.535	0.000	(0)
NiSO4	1.584e-09	1.584e-09	-8.800	-8.800	0.000	(0)
NiHCO3+	1.068e-09	9.544e-10	-8.971	-9.020	-0.049	(0)
NiOH+	2.284e-10	2.041e-10	-9.641	-9.690	-0.049	(0)
NiCl+	4.194e-11	3.748e-11	-10.377	-10.426	-0.049	(0)
Ni (OH) 2	3.516e-11	3.516e-11	-10.454	-10.454	0.000	(0)
NiF+	1.801e-11	1.609e-11	-10.745	-10.793	-0.049	(0)
Ni (SO4) 2-2	8.739e-14	5.569e-14	-13.059	-13.254	-0.196	(0)
Ni (OH) 3-	8.536e-14	7.627e-14	-13.069	-13.118	-0.049	(0)
NiNH3+2	1.821e-15	1.161e-15	-14.740	-14.935	-0.196	(0)
NiCl2	3.698e-16	3.698e-16	-15.432	-15.432	0.000	(0)
NiSeO4	9.368e-17	9.368e-17	-16.028	-16.028	0.000	(0)
NiNO3+	2.903e-17	2.594e-17	-16.537	-16.586	-0.049	(0)
Ni (NH3) 2+2	7.612e-23	4.851e-23	-22.118	-22.314	-0.196	(0)
O (0)	2.480e-35					
O2	1.240e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	9.927e-10					
PbCO3	7.368e-10	7.368e-10	-9.133	-9.133	0.000	(0)
PbOH+	1.429e-10	1.276e-10	-9.845	-9.894	-0.049	(0)
Pb+2	3.489e-11	2.343e-11	-10.457	-10.630	-0.173	(0)

Pb(CO3) 2-2	3.488e-11	2.223e-11	-10.457	-10.653	-0.196	(0)
PbHCO3+	2.018e-11	1.803e-11	-10.695	-10.744	-0.049	(0)
PbSO4	1.219e-11	1.219e-11	-10.914	-10.914	0.000	(0)
Pb(OH) 2	8.755e-12	8.755e-12	-11.058	-11.058	0.000	(0)
PbCl+	1.823e-12	1.629e-12	-11.739	-11.788	-0.049	(0)
PbF+	1.583e-13	1.415e-13	-12.800	-12.849	-0.049	(0)
Pb(SO4) 2-2	1.224e-13	7.797e-14	-12.912	-13.108	-0.196	(0)
Pb(OH) 3-	2.125e-14	1.899e-14	-13.673	-13.721	-0.049	(0)
PbCl2	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
PbF2	2.386e-16	2.386e-16	-15.622	-15.622	0.000	(0)
Pb(OH) 4-2	1.583e-17	1.009e-17	-16.801	-16.996	-0.196	(0)
PbCl3-	1.245e-17	1.113e-17	-16.905	-16.954	-0.049	(0)
PbNO3+	5.358e-19	4.787e-19	-18.271	-18.320	-0.049	(0)
Pb2OH+3	1.306e-19	4.740e-20	-18.884	-19.324	-0.440	(0)
PbF3-	4.340e-20	3.878e-20	-19.363	-19.411	-0.049	(0)
PbCl4-2	1.564e-20	9.965e-21	-19.806	-20.002	-0.196	(0)
Pb3(OH) 4+2	5.623e-23	3.583e-23	-22.250	-22.446	-0.196	(0)
PbF4-2	2.496e-24	1.590e-24	-23.603	-23.799	-0.196	(0)
Pb(NO3) 2	1.123e-27	1.123e-27	-26.950	-26.950	0.000	(0)
Pb4(OH) 4+4	4.044e-29	6.669e-30	-28.393	-29.176	-0.783	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-155.012	-155.012	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-233.489	-233.538	-0.049	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-75.273	-75.273	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.777	-79.826	-0.049	(0)
S5-2	0.000e+00	0.000e+00	-80.662	-80.858	-0.196	(0)
CdHS+	0.000e+00	0.000e+00	-80.961	-81.010	-0.049	(0)
H2S	0.000e+00	0.000e+00	-81.139	-81.139	0.000	(0)
S6-2	0.000e+00	0.000e+00	-81.178	-81.374	-0.196	(0)
S4-2	0.000e+00	0.000e+00	-81.258	-81.454	-0.196	(0)
S3-2	0.000e+00	0.000e+00	-82.064	-82.259	-0.196	(0)
S2-2	0.000e+00	0.000e+00	-83.080	-83.276	-0.196	(0)
S-2	0.000e+00	0.000e+00	-88.624	-88.793	-0.169	(0)
HgHS2-	0.000e+00	0.000e+00	-142.073	-142.122	-0.049	(0)
HgS2-2	0.000e+00	0.000e+00	-142.301	-142.497	-0.196	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-144.062	-144.062	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-149.236	-149.491	-0.255	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.975	-150.221	-0.246	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-150.016	-150.149	-0.133	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.900	-150.949	-0.049	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-150.950	-150.999	-0.049	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-150.996	-151.256	-0.260	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.316	-151.567	-0.251	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-153.272	-153.272	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-153.632	-153.632	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-155.012	-155.012	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-163.918	-163.918	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-221.677	-221.726	-0.049	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-229.770	-229.819	-0.049	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-231.269	-231.465	-0.196	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-231.509	-231.558	-0.049	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-233.489	-233.538	-0.049	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-241.658	-241.707	-0.049	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-308.993	-309.188	-0.196	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-310.909	-311.105	-0.196	(0)
Sb2S4-2	0.000e+00	0.000e+00	-328.521	-328.717	-0.196	(0)
S(6)	1.750e-03					
SO4-2	1.581e-03	1.062e-03	-2.801	-2.974	-0.173	(0)
CaSO4	7.700e-05	7.700e-05	-4.113	-4.113	0.000	(0)
MgSO4	6.362e-05	6.362e-05	-4.196	-4.196	0.000	(0)
NaSO4-	2.396e-05	2.176e-05	-4.621	-4.662	-0.042	(0)
KSO4-	3.517e-06	3.194e-06	-5.454	-5.496	-0.042	(0)
MnSO4	7.178e-07	7.178e-07	-6.144	-6.144	0.000	(0)
ZnSO4	8.428e-08	8.428e-08	-7.074	-7.074	0.000	(0)
CuSO4	1.736e-09	1.736e-09	-8.760	-8.760	0.000	(0)
NiSO4	1.584e-09	1.584e-09	-8.800	-8.800	0.000	(0)
Zn(SO4) 2-2	1.223e-09	7.795e-10	-8.913	-9.108	-0.196	(0)
CoSO4	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)

HSO4-	5.316e-10	4.817e-10	-9.274	-9.317	-0.043	(0)
CdSO4	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
NH4SO4-	2.952e-11	2.678e-11	-10.530	-10.572	-0.042	(0)
AgSO4-	1.299e-11	1.161e-11	-10.886	-10.935	-0.049	(0)
PbSO4	1.219e-11	1.219e-11	-10.914	-10.914	0.000	(0)
Cd(SO4) 2-2	3.596e-12	2.291e-12	-11.444	-11.640	-0.196	(0)
CrOHSO4	2.936e-13	2.936e-13	-12.532	-12.532	0.000	(0)
Pb(SO4) 2-2	1.224e-13	7.797e-14	-12.912	-13.108	-0.196	(0)
Ni(SO4) 2-2	8.739e-14	5.569e-14	-13.059	-13.254	-0.196	(0)
FeSO4	1.586e-14	1.586e-14	-13.800	-13.800	0.000	(0)
UO2SO4	1.424e-15	1.424e-15	-14.846	-14.846	0.000	(0)
CrSO4+	6.815e-17	6.089e-17	-16.167	-16.215	-0.049	(0)
AlSO4+	5.259e-17	4.764e-17	-16.279	-16.322	-0.043	(0)
UO2(SO4) 2-2	3.128e-17	1.994e-17	-16.505	-16.700	-0.196	(0)
Al(SO4) 2-	5.984e-19	5.421e-19	-18.223	-18.266	-0.043	(0)
VO2SO4-	5.993e-21	5.354e-21	-20.222	-20.271	-0.049	(0)
FeSO4+	2.040e-21	1.851e-21	-20.690	-20.733	-0.042	(0)
Cr2(OH) 2SO4+2	4.852e-23	3.092e-23	-22.314	-22.510	-0.196	(0)
Fe(SO4) 2-	4.703e-23	4.202e-23	-22.328	-22.377	-0.049	(0)
HgSO4	5.160e-24	5.160e-24	-23.287	-23.287	0.000	(0)
VOSO4	3.873e-24	3.873e-24	-23.412	-23.412	0.000	(0)
Cr2(OH) 2(SO4) 2	1.950e-24	1.950e-24	-23.710	-23.710	0.000	(0)
CrO3SO4-2	9.500e-25	6.054e-25	-24.022	-24.218	-0.196	(0)
VSO4+	2.893e-39	2.585e-39	-38.539	-38.588	-0.049	(0)
U(SO4) 2	0.000e+00	0.000e+00	-43.496	-43.496	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.226	-44.422	-0.196	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Sb(3)	1.692e-21					
Sb(OH) 3	8.558e-22	8.558e-22	-21.068	-21.068	0.000	(0)
HSbO2	8.355e-22	8.355e-22	-21.078	-21.078	0.000	(0)
SbO2-	3.263e-25	2.915e-25	-24.486	-24.535	-0.049	(0)
Sb(OH) 4-	1.869e-25	1.670e-25	-24.728	-24.777	-0.049	(0)
Sb(OH) 2F	5.318e-28	5.318e-28	-27.274	-27.274	0.000	(0)
SbOF	5.230e-28	5.230e-28	-27.281	-27.281	0.000	(0)
Sb(OH) 2+	1.080e-28	9.647e-29	-27.967	-28.016	-0.049	(0)
SbO+	3.723e-29	3.326e-29	-28.429	-28.478	-0.049	(0)
Sb2S4-2	0.000e+00	0.000e+00	-328.521	-328.717	-0.196	(0)
Sb(5)	3.032e-09					
SbO3-	3.029e-09	2.706e-09	-8.519	-8.568	-0.049	(0)
Sb(OH) 6-	3.495e-12	3.164e-12	-11.457	-11.500	-0.043	(0)
SbO2+	1.872e-26	1.673e-26	-25.728	-25.777	-0.049	(0)
Se(-2)	6.389e-16					
Ag2Se	6.389e-16	6.389e-16	-15.195	-15.195	0.000	(0)
HSe-	1.358e-40	1.213e-40	-39.867	-39.916	-0.049	(0)
MnSe	0.000e+00	0.000e+00	-42.388	-42.388	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.359	-44.359	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.387	-46.583	-0.196	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-83.820	-84.603	-0.783	(0)
Se(4)	1.778e-08					
SeO3-2	9.706e-09	6.185e-09	-8.013	-8.209	-0.196	(0)
HSeO3-	8.071e-09	7.211e-09	-8.093	-8.142	-0.049	(0)
H2SeO3	1.428e-14	1.428e-14	-13.845	-13.845	0.000	(0)
AgSeO3-	2.437e-15	2.177e-15	-14.613	-14.662	-0.049	(0)
Cd(SeO3) 2-2	3.179e-20	2.026e-20	-19.498	-19.693	-0.196	(0)
Ag(SeO3) 2-3	3.323e-22	1.206e-22	-21.478	-21.919	-0.440	(0)
FeHSeO3+2	4.645e-27	2.960e-27	-26.333	-26.529	-0.196	(0)
Se(6)	3.993e-11					
SeO4-2	3.990e-11	2.679e-11	-10.399	-10.572	-0.173	(0)
MnSeO4	2.741e-14	2.741e-14	-13.562	-13.562	0.000	(0)
ZnSeO4	1.505e-15	1.505e-15	-14.822	-14.822	0.000	(0)
NiSeO4	9.368e-17	9.368e-17	-16.028	-16.028	0.000	(0)
CoSeO4	6.945e-17	6.945e-17	-16.158	-16.158	0.000	(0)
HSeO4-	6.976e-18	6.233e-18	-17.156	-17.205	-0.049	(0)
CdSeO4	3.206e-18	3.206e-18	-17.494	-17.494	0.000	(0)
Zn(SeO4) 2-2	6.418e-26	4.090e-26	-25.193	-25.388	-0.196	(0)
Si	2.176e-04					
H4SiO4	2.103e-04	2.108e-04	-3.677	-3.676	0.001	(0)
H3SiO4-	7.254e-06	6.563e-06	-5.139	-5.183	-0.043	(0)

H2SiO4-2	1.311e-10	8.922e-11	-9.882	-10.050	-0.167	(0)
UO2H3SiO4+	5.526e-13	4.937e-13	-12.258	-12.307	-0.049	(0)
SiF6-2	8.658e-32	5.866e-32	-31.063	-31.232	-0.169	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.843	-61.283	-0.440	(0)
U (4)	3.527e-20					
U (OH) 5-	3.526e-20	3.151e-20	-19.453	-19.502	-0.049	(0)
U (OH) 4	6.126e-24	6.126e-24	-23.213	-23.213	0.000	(0)
U (OH) 3+	1.164e-28	1.040e-28	-27.934	-27.983	-0.049	(0)
U (OH) 2+2	3.502e-34	2.232e-34	-33.456	-33.651	-0.196	(0)
UF3+	2.511e-39	2.244e-39	-38.600	-38.649	-0.049	(0)
UF2+2	2.592e-40	1.652e-40	-39.586	-39.782	-0.196	(0)
UOH+3	1.345e-40	0.000e+00	-39.871	-40.312	-0.440	(0)
UF4	0.000e+00	0.000e+00	-40.676	-40.676	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.375	-42.815	-0.440	(0)
UF5-	0.000e+00	0.000e+00	-43.096	-43.145	-0.049	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.496	-43.496	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.226	-44.422	-0.196	(0)
UF6-2	0.000e+00	0.000e+00	-44.537	-44.732	-0.196	(0)
U+4	0.000e+00	0.000e+00	-47.265	-48.048	-0.783	(0)
UCl+3	0.000e+00	0.000e+00	-48.615	-49.056	-0.440	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-176.481	-180.443	-3.963	(0)
U (5)	2.199e-17					
UO2+	2.199e-17	1.965e-17	-16.658	-16.707	-0.049	(0)
U (6)	3.661e-08					
UO2 (CO3) 3-4	2.449e-08	4.038e-09	-7.611	-8.394	-0.783	(0)
UO2 (CO3) 2-2	1.209e-08	7.702e-09	-7.918	-8.113	-0.196	(0)
UO2CO3	3.690e-11	3.690e-11	-10.433	-10.433	0.000	(0)
UO2H3SiO4+	5.526e-13	4.937e-13	-12.258	-12.307	-0.049	(0)
UO2OH+	2.708e-13	2.419e-13	-12.567	-12.616	-0.049	(0)
UO2F+	1.173e-14	1.048e-14	-13.931	-13.980	-0.049	(0)
UO2F2	2.590e-15	2.590e-15	-14.587	-14.587	0.000	(0)
UO2SO4	1.424e-15	1.424e-15	-14.846	-14.846	0.000	(0)
UO2+2	1.319e-15	8.860e-16	-14.880	-15.053	-0.173	(0)
UO2F3-	6.240e-17	5.575e-17	-16.205	-16.254	-0.049	(0)
UO2 (SO4) 2-2	3.128e-17	1.994e-17	-16.505	-16.700	-0.196	(0)
UO2Cl+	3.152e-18	2.816e-18	-17.501	-17.550	-0.049	(0)
(UO2) 2 (OH) 2+2	1.524e-19	9.714e-20	-18.817	-19.013	-0.196	(0)
(UO2) 3 (OH) 5+	9.386e-20	8.386e-20	-19.027	-19.076	-0.049	(0)
UO2F4-2	5.955e-20	3.795e-20	-19.225	-19.421	-0.196	(0)
UO2NO3+	2.733e-24	2.442e-24	-23.563	-23.612	-0.049	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-45.142	-45.190	-0.049	(0)
V+2	0.000e+00	0.000e+00	-46.841	-47.037	-0.196	(0)
V (3)	4.244e-17					
V (OH) 3	4.244e-17	4.244e-17	-16.372	-16.372	0.000	(0)
V (OH) 2+	1.425e-28	1.273e-28	-27.846	-27.895	-0.049	(0)
VOH+2	8.796e-33	5.605e-33	-32.056	-32.251	-0.196	(0)
V+3	1.421e-38	5.156e-39	-37.847	-38.288	-0.440	(0)
VSO4+	2.893e-39	2.585e-39	-38.539	-38.588	-0.049	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-61.254	-61.695	-0.440	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-62.920	-63.703	-0.783	(0)
V (4)	6.446e-21					
V (OH) 3+	6.413e-21	5.730e-21	-20.193	-20.242	-0.049	(0)
VO+2	2.078e-23	1.324e-23	-22.682	-22.878	-0.196	(0)
VOF+	7.618e-24	6.806e-24	-23.118	-23.167	-0.049	(0)
VOSO4	3.873e-24	3.873e-24	-23.412	-23.412	0.000	(0)
VOF2	2.187e-25	2.187e-25	-24.660	-24.660	0.000	(0)
VOC1+	8.149e-26	7.281e-26	-25.089	-25.138	-0.049	(0)
VOF3-	7.442e-28	6.649e-28	-27.128	-27.177	-0.049	(0)
VOF4-2	3.609e-31	2.300e-31	-30.443	-30.638	-0.196	(0)
H2V2O4+2	2.583e-36	1.646e-36	-35.588	-35.784	-0.196	(0)
V (5)	9.667e-10					
H2VO4-	5.496e-10	4.911e-10	-9.260	-9.309	-0.049	(0)
HVO4-2	4.170e-10	2.657e-10	-9.380	-9.576	-0.196	(0)
H3VO4	2.279e-14	2.279e-14	-13.642	-13.642	0.000	(0)
VO4-3	7.909e-16	2.869e-16	-15.102	-15.542	-0.440	(0)
HV2O7-3	1.219e-16	4.423e-17	-15.914	-16.354	-0.440	(0)

H3V2O7-	8.090e-17	7.228e-17	-16.092	-16.141	-0.049	(0)
V2O7-4	1.555e-18	2.565e-19	-17.808	-18.591	-0.783	(0)
VO2+	2.333e-19	2.112e-19	-18.632	-18.675	-0.043	(0)
VO2F	3.174e-20	3.174e-20	-19.498	-19.498	0.000	(0)
VO2SO4-	5.993e-21	5.354e-21	-20.222	-20.271	-0.049	(0)
VO2F2-	1.105e-21	9.874e-22	-20.957	-21.006	-0.049	(0)
V3O9-3	3.419e-22	1.241e-22	-21.466	-21.906	-0.440	(0)
VO2F3-2	1.656e-24	1.055e-24	-23.781	-23.977	-0.196	(0)
V4O12-4	1.540e-28	2.540e-29	-27.812	-28.595	-0.783	(0)
VO2NO3	1.476e-28	1.476e-28	-27.831	-27.831	0.000	(0)
VO2F4-3	1.226e-28	4.450e-29	-27.911	-28.352	-0.440	(0)
V10O28-6	0.000e+00	0.000e+00	-75.754	-77.515	-1.761	(0)
HV10O28-5	0.000e+00	0.000e+00	-76.439	-77.662	-1.223	(0)
H2V10O28-4	0.000e+00	0.000e+00	-80.005	-80.788	-0.783	(0)
Zn	9.805e-07					
Zn+2	5.402e-07	3.627e-07	-6.267	-6.440	-0.173	(0)
ZnCO3	2.184e-07	2.184e-07	-6.661	-6.661	0.000	(0)
ZnOH+	8.806e-08	7.868e-08	-7.055	-7.104	-0.049	(0)
ZnSO4	8.428e-08	8.428e-08	-7.074	-7.074	0.000	(0)
Zn (OH) 2	2.705e-08	2.705e-08	-7.568	-7.568	0.000	(0)
ZnHCO3+	1.330e-08	1.188e-08	-7.876	-7.925	-0.049	(0)
ZnOHCl	5.070e-09	5.070e-09	-8.295	-8.295	0.000	(0)
ZnCl+	1.973e-09	1.786e-09	-8.705	-8.748	-0.043	(0)
Zn (SO4) 2-2	1.223e-09	7.795e-10	-8.913	-9.108	-0.196	(0)
ZnF+	6.942e-10	6.202e-10	-9.159	-9.207	-0.049	(0)
Zn (OH) 3-	3.291e-10	2.940e-10	-9.483	-9.532	-0.049	(0)
ZnCl2	5.546e-12	5.546e-12	-11.256	-11.256	0.000	(0)
Zn (OH) 4-2	3.984e-14	2.539e-14	-13.400	-13.595	-0.196	(0)
ZnCl3-	9.541e-15	8.633e-15	-14.020	-14.064	-0.043	(0)
ZnSeO4	1.505e-15	1.505e-15	-14.822	-14.822	0.000	(0)
ZnNO3+	1.409e-15	1.259e-15	-14.851	-14.900	-0.049	(0)
ZnCl4-2	1.248e-17	8.459e-18	-16.904	-17.073	-0.169	(0)
Zn (NO3) 2	3.470e-25	3.470e-25	-24.460	-24.460	0.000	(0)
Zn (SeO4) 2-2	6.418e-26	4.090e-26	-25.193	-25.388	-0.196	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.900	-150.949	-0.049	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-153.272	-153.272	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-229.770	-229.819	-0.049	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-231.269	-231.465	-0.196	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-310.909	-311.105	-0.196	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-64.44	-58.15	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-50.36	-45.85	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-57.58	-45.85	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-82.53	-64.60	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-66.17	-46.14	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-31.23	-30.83	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-28.28	-27.83	0.45	(NH4) 2SeO4
Acanthite	-53.80	-90.02	-36.22	Ag2S
Ag2CO3	-12.41	-23.50	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-13.68	-12.20	1.48	Ag2HVO4
Ag2MoO4	-13.84	-25.39	-11.55	Ag2MoO4
Ag2O	-14.43	-1.86	12.57	Ag2O
Ag2Se	-1.41	-50.11	-48.70	Ag2Se
Ag2SeO3	-11.18	-18.33	-7.15	Ag2SeO3
Ag2SeO4	-20.18	-29.09	-8.91	Ag2SeO4
Ag2SO4	-16.68	-21.50	-4.82	Ag2SO4
Ag3AsO3	-28.01	-25.85	2.16	Ag3AsO3
Ag3AsO4	-16.42	-19.20	-2.79	Ag3AsO4
Ag3H2VO5	-18.31	-13.13	5.18	Ag3H2VO5
AgF:4H2O	-14.38	-13.33	1.05	AgF:4H2O
Agmetal	-0.19	-13.70	-13.51	Ag
AgVO3	-12.04	-11.27	0.77	AgVO3
Al (OH) 3 (am)	-3.04	7.76	10.80	Al (OH) 3

Al ₂ (MoO ₄) ₃	-57.46	-55.09	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	-4.13	15.52	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	-11.29	11.41	22.70	Al ₄ (OH) ₁₀ SO ₄
AlAsO ₄ :2H ₂ O	-13.46	-8.66	4.80	AlAsO ₄ :2H ₂ O
AlOHSO ₄	-8.65	-11.88	-3.23	AlOHSO ₄
AlSb	-155.56	-89.94	65.62	AlSb
Alunite	-9.63	-11.03	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-5.81	-13.60	-7.79	PbSO ₄
Anhydrite	-2.11	-6.47	-4.36	CaSO ₄
Anilite	-56.49	-88.37	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-2.87	5.92	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-89.50	-92.26	-2.76	As ₄ O ₆
Artinite	-4.88	4.72	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-39.54	-32.84	6.71	As ₂ O ₅
Atacamite	-1.39	6.00	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-0.83	-17.73	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.42	7.98	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-20.60	-4.73	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-29.70	3.24	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-12.59	-22.26	-9.67	BaCrO ₄
BaF ₂	-11.00	-16.82	-5.82	BaF ₂
BaMoO ₄	-8.60	-15.56	-6.96	BaMoO ₄
Barite	-1.68	-11.66	-9.98	BaSO ₄
BaS	-96.36	-80.18	16.18	BaS
BaSeO ₃	-10.33	-8.50	1.83	BaSeO ₃
BaSeO ₄	-11.80	-19.26	-7.46	BaSeO ₄
Bianchite	-7.65	-9.41	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-6.65	11.44	18.09	MnO ₂
Bixbyite	-2.02	-2.66	-0.64	Mn ₂ O ₃
BlaubleiI	-56.64	-80.80	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-57.02	-84.30	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-0.82	7.76	8.58	AlOOH
Breithauptite	-57.87	-76.39	-18.52	NiSb
Brochantite	-0.78	14.44	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.66	13.18	16.84	Mg(OH) ₂
Bunsenite	-3.91	8.54	12.45	NiO
Ca(VO ₃) ₂	-13.18	-7.52	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-11.85	5.65	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-15.90	5.65	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-15.64	6.66	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-20.14	18.82	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-21.04	18.82	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-298.88	-155.90	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-11.05	-28.96	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.42	-10.37	-7.95	CaMoO ₄
Carnotite	-4.00	-3.77	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.12	-3.31	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.05	-14.07	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.41	-2.57	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.17	7.47	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.26	7.47	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-23.57	-16.86	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-19.78	2.78	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-18.14	10.26	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.95	-14.61	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.91	-14.61	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.69	-14.61	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.11	-17.33	-1.21	CdF ₂
Cdmetal(alpha)	-31.58	-18.07	13.51	Cd
Cdmetal(gamma)	-31.69	-18.07	13.62	Cd
CdMoO ₄	-1.91	-16.06	-14.15	CdMoO ₄
CdOHC1	-7.10	-3.57	3.54	CdOHC1
CdSb	-77.10	-77.45	-0.35	CdSb
CdSe	-20.57	-40.77	-20.20	CdSe

CdSeO4:2H2O	-17.91	-19.76	-1.85	CdSeO4:2H2O
CdSO4	-11.99	-12.17	-0.17	CdSO4
CdSO4:1H2O	-10.44	-12.17	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.29	-12.17	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.22	-11.97	-9.75	AgCl
Cerrusite	-2.48	-15.61	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-8.48	-11.12	-2.64	CuSO4:5H2O
Chalcedony	-0.13	-3.68	-3.55	SiO2
Chalcocite	-56.36	-91.28	-34.92	Cu2S
Chalcopyrite	-129.08	-164.35	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-54.72	-100.42	-45.69	HgS
Claudetite	-89.20	-92.26	-3.06	As4O6
Clausthalite	-15.11	-42.21	-27.10	PbSe
Co (BO2) 2	-28.73	-1.66	27.07	Co (BO2) 2
Co (OH) 2	-4.71	8.38	13.09	Co (OH) 2
Co (OH) 3	-8.94	-11.25	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-20.73	-7.70	13.03	Co3 (AsO4) 2
Co3O4	-3.62	-14.11	-10.50	Co3O4
CoCl2	-21.97	-13.70	8.27	CoCl2
CoCl2:6H2O	-16.24	-13.70	2.54	CoCl2:6H2O
CoCO3	-3.29	-13.27	-9.98	CoCO3
CoF2	-14.82	-16.42	-1.60	CoF2
CoF3	-46.99	-48.45	-1.46	CoF3
CoFe2O4	18.29	14.76	-3.53	CoFe2O4
CoMoO4	-7.40	-15.16	-7.76	CoMoO4
CoO	-5.21	8.38	13.59	CoO
CoS (alpha)	-72.34	-79.78	-7.44	CoS
CoS (beta)	-68.71	-79.78	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-14.06	-11.26	2.80	CoSO4
CoSO4:6H2O	-8.79	-11.26	-2.47	CoSO4:6H2O
Cotunnite	-11.27	-16.05	-4.78	PbCl2
Covellite	-57.34	-79.64	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-47.18	-33.09	14.09	CrCl2
CrCl3	-49.42	-34.30	15.11	CrCl3
CrF3	-27.04	-38.38	-11.34	CrF3
Cristobalite	-0.33	-3.68	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-15.06	-48.90	-33.84	Na3AlF6
Cu (OH) 2	-0.15	8.52	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.74	17.47	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.40	-0.15	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.86	-90.74	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.57	-51.37	-45.80	Cu2Se
Cu2SO4	-20.82	-22.77	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.38	-7.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.79	-102.39	-42.59	Cu3Sb
Cu3Se2	-27.61	-91.10	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-16.28	-21.72	-5.44	CuCrO4
CuF	-9.06	-13.96	-4.91	CuF
CuF2	-17.40	-16.28	1.12	CuF2
CuF2:2H2O	-11.73	-16.28	-4.55	CuF2:2H2O
Cumetal	-5.58	-14.33	-8.76	Cu
CuMoO4	-1.94	-15.02	-13.08	CuMoO4
CuOCuSO4	-12.90	-2.60	10.30	CuOCuSO4
Cupricferrite	8.91	14.90	5.99	CuFe2O4
Cuprite	-1.72	-3.12	-1.41	Cu2O

Cuprousferrite	10.55	1.63	-8.92	CuFeO2
CuSe	-6.63	-39.73	-33.10	CuSe
CuSe2	-29.07	-62.43	-33.37	CuSe2
CuSeO3:2H2O	-8.47	-7.96	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.28	-18.72	-2.44	CuSeO4:5H2O
CuSO4	-14.06	-11.12	2.94	CuSO4
Diaspore	0.89	7.76	6.87	AlOOH
Djurleite	-56.60	-90.52	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.40	-16.94	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.15	-16.94	-17.09	CaMg(CO3)2
Epsomite	-4.33	-6.46	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.92	-0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-13.51	-17.23	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.65	-10.09	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-22.42	-43.04	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-48.80	-52.54	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.63	-13.23	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.00	-20.09	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-48.91	-67.50	-18.60	FeSe2
FeS(ppt)	-81.76	-84.71	-2.95	FeS
FeSe	-33.80	-44.80	-11.00	FeSe
Fix_pe	-4.44	-4.44	0.00	e-
Fluorite	-1.13	-11.63	-10.50	CaF2
Galena	-68.15	-82.12	-13.97	PbS
Gibbsite	-0.53	7.76	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.40	-9.41	-2.01	ZnSO4:7H2O
Greenalite	-17.81	3.00	20.81	Fe3Si2O5(OH)4
Greenockite	-66.32	-80.68	-14.36	CdS
Greigite	-297.77	-342.80	-45.03	Fe3S4
Gummite	-6.06	1.61	7.67	UO3
Gypsum	-1.86	-6.47	-4.61	CaSO4:2H2O
H-Jarosite	-17.61	-29.71	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.66	-23.54	-12.88	H2MoO4
H2S(g)	-80.15	-88.16	-8.01	H2S
H2Se(g)	-43.29	-48.25	-4.96	H2Se
Halite	-6.73	-5.13	1.60	NaCl
Halloysite	-1.40	8.17	9.57	Al2Si2O5(OH)4
Hausmannite	-1.75	59.28	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-3.92	18.97	22.89	FeAl2O4
Hg(CH3)2(g)	-186.20	-259.91	-73.71	Hg(CH3)2
Hg(g)	-8.34	-16.21	-7.87	Hg
Hg(OH)2	-8.76	-12.26	-3.50	Hg(OH)2
Hg2(g)	-17.47	-32.42	-14.96	Hg2
Hg2(OH)2	-12.14	-6.88	5.26	Hg2(OH)2
Hg2CO3	-12.47	-28.52	-16.05	Hg2CO3
Hg2CrO4	-28.42	-37.12	-8.70	Hg2CrO4
Hg2F2	-21.32	-31.68	-10.36	Hg2F2
Hg2S	-83.36	-95.04	-11.68	Hg2S
Hg2SeO3	-18.70	-23.35	-4.66	Hg2SeO3
Hg2SO4	-20.39	-26.52	-6.13	Hg2SO4
Hg3O2CO3	-28.74	-58.42	-29.68	Hg3O2CO3
HgCl(g)	-33.98	-14.48	19.50	HgCl
HgCl2	-13.08	-34.34	-21.26	HgCl2
HgF(g)	-48.51	-15.84	32.68	HgF
HgF2(g)	-49.62	-37.06	12.57	HgF2
Hgmetal(l)	-2.76	-16.21	-13.45	Hg
HgSe	-4.81	-60.51	-55.69	HgSe
HgSeO3	-16.30	-28.73	-12.43	HgSeO3
HgSO4	-22.48	-31.90	-9.42	HgSO4
Huntite	-3.90	-33.87	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.41	-25.19	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.90	-20.67	-8.77	Mg5(CO3)4(OH)2:4H2O

K-Alum	-21.39	-26.56	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-9.95	-24.75	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-33.31	-50.55	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-19.80	-20.31	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.88	-13.62	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-16.59	-17.32	-0.73	K ₂ SeO ₄
Kaolinite	0.74	8.17	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-3.05	14.44	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-7.13	-7.57	-0.43	PbO:PbSO ₄
Laurionite	-5.63	-5.00	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.66	6.04	12.69	PbO
Mackinawite	-81.11	-84.71	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	2.71	19.57	16.86	Fe ₂ MgO ₄
Magnesite	-1.00	-8.46	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	0.70	-4.61	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.32	24.02	25.34	MnOOH
Massicot	-6.86	6.04	12.89	PbO
Matlockite	-8.43	-17.41	-8.97	PbClF
Melanothallite	-19.82	-13.56	6.26	CuCl ₂
Melanterite	-13.98	-16.19	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-55.32	-100.42	-45.09	HgS
Mg(OH) ₂ (active)	-5.61	13.18	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-18.78	-7.50	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-277.56	-202.87	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.68	5.68	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.37	10.83	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.43	-17.05	5.38	MgCrO ₄
MgF ₂	-3.49	-11.62	-8.13	MgF ₂
MgMoO ₄	-8.50	-10.35	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.35	-3.29	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-12.85	-14.05	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-29.87	43.65	73.52	Pb ₃ O ₄
Mirabilite	-6.70	-7.81	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-14.34	-9.44	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.87	-61.58	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-149.06	-87.98	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-11.60	0.90	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.55	-10.84	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-77.08	-76.91	0.17	MnS
MnS (pnk)	-80.25	-76.91	3.34	MnS
MnSb	-96.12	-99.03	-2.91	MnSb
MnSe	-40.50	-37.00	3.50	MnSe
MnSeO ₃	-6.36	-5.23	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.21	-5.23	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.94	-15.99	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.98	-8.39	2.58	MnSO ₄
Monteponite	-7.63	7.47	15.10	CdO
Montroydite	-8.62	-12.26	-3.64	HgO
MoO ₃	-15.54	-23.54	-8.00	MoO ₃
Morenosite	-8.96	-11.10	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-155.14	-225.40	-70.26	MoS ₂
Na-Jarosite	-12.59	-23.79	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.75	-48.65	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-21.34	-18.41	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-18.65	-35.25	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-13.20	-11.71	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.93	-11.71	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.95	-4.65	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-16.69	-15.41	1.28	Na ₂ SeO ₄
Na ₃ Sb	-174.41	-79.96	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.28	7.40	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-34.42	2.98	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.87	-12.60	-6.73	CuCl
NaSb	-89.41	-66.24	23.17	NaSb

Natron	-8.51	-9.82	-1.31	Na2CO3:10H2O
NaVO3	-8.29	-4.43	3.86	NaVO3
Nesquehonite	-3.79	-8.46	-4.67	MgCO3:3H2O
Ni (OH) 2	-4.25	8.54	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-22.92	-7.22	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-17.48	14.52	32.00	Ni4 (OH) 6SO4
NiCO3	-6.24	-13.11	-6.87	NiCO3
NiMoO4	-3.86	-15.00	-11.14	NiMoO4
NiS (alpha)	-74.02	-79.62	-5.60	NiS
NiS (beta)	-68.52	-79.62	-11.10	NiS
NiS (gamma)	-66.82	-79.62	-12.80	NiS
NiSe	-22.01	-39.71	-17.70	NiSe
NiSeO3:2H2O	-10.75	-7.94	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.18	-18.70	-1.52	NiSeO4:6H2O
Nsutite	-6.06	11.44	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-249.54	-310.61	-61.07	As2S3
Otavite	-2.17	-14.17	-12.00	CdCO3
Pb (BO2) 2	-10.52	-4.00	6.52	Pb (BO2) 2
Pb (OH) 2	-2.11	6.04	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-60.76	-69.52	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-7.76	1.03	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.12	12.07	26.19	Pb2O (OH) 2
Pb2O3	-23.42	37.62	61.04	Pb2O3
Pb2OCO3	-9.02	-9.57	-0.56	Pb2OCO3
Pb2V2O7	-6.71	-8.61	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.53	-14.73	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-8.72	-2.58	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.56	-3.54	11.02	Pb3O2CO3
Pb3O2SO4	-12.22	-1.53	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.60	4.50	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.37	4.50	21.88	Pb4O3SO4
PbCrO4	-11.60	-24.20	-12.60	PbCrO4
PbF2	-11.32	-18.76	-7.44	PbF2
Pbmetal	-23.75	-19.51	4.25	Pb
PbMoO4	-1.88	-17.50	-15.62	PbMoO4
PbO:0.3H2O	-6.94	6.04	12.98	PbO:0.33H2O
PbSeO4	-14.36	-21.20	-6.84	PbSeO4
Periclase	-8.40	13.18	21.58	MgO
Phosgenite	-11.85	-31.66	-19.81	PbCl2:PbCO3
Plattnerite	-18.02	31.58	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-128.81	-147.32	-18.51	FeS2
Pyrochroite	-3.95	11.25	15.19	Mn (OH) 2
Pyrolusite	-4.59	36.79	41.38	MnO2
Quartz	0.32	-3.68	-4.00	SiO2
Realgar	-104.25	-124.00	-19.75	AsS
Retgersite	-9.06	-11.10	-2.04	NiSO4:6H2O
Rhodochrosite	0.18	-10.40	-10.58	MnCO3
Rutherfordine	-5.53	-20.03	-14.50	UO2CO3
Sb (OH) 3	-13.96	-21.07	-7.11	Sb (OH) 3
Sb2O4	-19.99	-16.59	3.40	Sb2O4
Sb2O5	-30.00	-39.67	-9.67	Sb2O5
Sb2Se3	-119.13	-186.88	-67.76	Sb2Se3
Sb4O6 (cubic)	-66.01	-84.27	-18.26	Sb4O6
Sb4O6 (orth)	-66.37	-84.27	-17.90	Sb4O6
SbCl3	-54.76	-54.19	0.57	SbCl3
SbF3	-48.04	-58.27	-10.23	SbF3
Sbmetal	-47.70	-59.38	-11.69	Sb
SbO2	-4.78	-32.61	-27.82	SbO2
Schoepite	-4.38	1.61	5.99	UO2 (OH) 2:H2O
Semetal (am)	-15.59	-22.70	-7.11	Se
Semetal (hex)	-15.00	-22.70	-7.71	Se
Senarmontite	-29.77	-42.14	-12.37	Sb2O3
SeO2	-16.60	-16.48	0.12	SeO2
SeO3	-48.28	-27.24	21.04	SeO3
Sepiolite	-0.42	15.34	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.44	15.34	18.78	Mg2Si3O7.5OH:3H2O

Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.97	-3.68	-2.71	SiO2
SiO2(am-ppt)	-0.94	-3.68	-2.74	SiO2
Smithsonite	-1.42	-11.42	-10.00	ZnCO3
Sphalerite	-66.48	-77.93	-11.45	ZnS
Spinel	-8.14	28.71	36.85	MgAl2O4
Stibnite	-256.15	-306.61	-50.46	Sb2S3
Sulfur	-60.47	-62.61	-2.14	S
Tenorite	0.88	8.52	7.64	CuO
Thenardite	-8.13	-7.81	0.32	Na2SO4
Thermonatrite	-10.45	-9.82	0.64	Na2CO3:H2O
Tyuyamunite	-8.37	-4.29	4.08	Ca(UO2)2(VO4)2
U3O8	-14.14	6.95	21.08	U3O8
U3Sb4	-587.33	-434.95	152.38	U3Sb4
U4O9	-30.29	-33.31	-3.02	U4O9
UF4	-34.78	-64.32	-29.54	UF4
UF4:2.5H2O	-31.60	-64.32	-32.72	UF4:2.5H2O
UO2(am)	-15.65	-14.71	0.93	UO2
UO2(NO3)2	-44.92	-32.77	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-37.62	-32.77	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-36.16	-32.77	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.82	-32.77	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.00	1.61	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.37	-25.62	-2.25	UO2SeO4:4H2O
UO3	-6.09	1.61	7.70	UO3
Uraninite	-10.05	-14.71	-4.67	UO2
USb2	-223.37	-193.79	29.58	USb2
V(OH)3	-20.88	-13.29	7.59	V(OH)3
V2O5	-19.32	-20.68	-1.36	V2O5
V3O5	-46.02	-44.18	1.84	V3O5
V4O7	-57.58	-50.39	7.19	V4O7
V6O13	-52.28	-113.14	-60.86	V6O13
Valentinite	-33.65	-42.14	-8.48	Sb2O3
VC12	-67.02	-48.14	18.87	VC12
VC13	-69.84	-46.41	23.43	VC13
VF4	-70.74	-55.81	14.93	VF4
Vmetal	-95.63	-51.60	44.03	V
VO	-40.82	-26.06	14.76	VO
VO(OH)2	-11.36	-6.21	5.15	VO(OH)2
VO2Cl	-24.22	-21.38	2.84	VO2Cl
VOC1	-35.48	-24.33	11.15	VOC1
VOC12	-41.05	-28.29	12.76	VOC12
VOSO4	-29.46	-25.85	3.61	VOSO4
Witherite	-5.10	-13.67	-8.57	BaCO3
Wurtzite	-68.98	-77.93	-8.95	ZnS
Zincite	-1.11	10.23	11.33	ZnO
Zincosite	-13.34	-9.41	3.93	ZnSO4
Zn(BO2)2	-8.10	0.19	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-27.48	-24.16	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.97	10.23	12.20	Zn(OH)2
Zn(OH)2(am)	-2.25	10.23	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.53	10.23	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.31	10.23	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.51	10.23	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.69	0.81	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.78	9.41	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.81	-2.16	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.52	-8.60	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.14	21.26	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.45	29.05	38.50	Zn5(OH)8Cl2
ZnCl2	-18.91	-11.86	7.05	ZnCl2
ZnCO3:1H2O	-1.16	-11.42	-10.26	ZnCO3:1H2O
ZnF2	-14.04	-14.57	-0.53	ZnF2
Znmetal	-41.11	-15.32	25.79	Zn
ZnMoO4	-3.19	-13.31	-10.13	ZnMoO4
ZnO(active)	-0.96	10.23	11.19	ZnO
ZnS(am)	-68.88	-77.93	-9.05	ZnS
ZnSb	-85.72	-74.70	11.01	ZnSb

ZnSe	-23.62	-38.02	-14.40	ZnSe
ZnSeO4:6H2O	-15.49	-17.01	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.78	-9.41	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 83.

Title Use solution to allow model output
REACTION 406
H2O -0.0
0 moles
USE solution 415
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 415. Solution after simulation 82.
Using reaction 406.

Reaction 406.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	3.230e-09	3.230e-09
Al	2.827e-07	2.827e-07
As	1.806e-09	1.806e-09
B	1.090e-05	1.091e-05
Ba	3.070e-09	3.070e-09
C	1.189e-03	1.190e-03
Ca	5.607e-04	5.608e-04
Cd	1.437e-09	1.437e-09
Cl	2.165e-03	2.165e-03
Co	1.094e-08	1.094e-08
Cr	6.498e-10	6.499e-10
Cu	5.481e-07	5.482e-07
F	9.870e-05	9.872e-05
Fe	7.249e-10	7.250e-10

Hg	2.275e-10	2.275e-10
K	4.729e-04	4.730e-04
Mg	5.644e-04	5.645e-04
Mn	6.816e-06	6.817e-06
Mo	2.001e-07	2.002e-07
N	1.628e-06	1.628e-06
Na	4.242e-03	4.243e-03
Ni	1.702e-08	1.703e-08
Pb	9.927e-10	9.928e-10
S	1.750e-03	1.750e-03
Sb	3.032e-09	3.033e-09
Se	1.782e-08	1.782e-08
Si	2.176e-04	2.176e-04
U	3.661e-08	3.662e-08
V	9.667e-10	9.668e-10
Zn	9.805e-07	9.807e-07

-----Description of solution-----

	pH =	8.333	Charge balance
	pe =	4.439	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	9.201e-03	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	1.217e-03	
	Total CO2 (mol/kg) =	1.189e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.926e-07	
Percent error, 100*(Cat- An)/(Cat+ An) =	0.00		
	Iterations =	0	
	Total H =	1.110312e+02	
	Total O =	5.552603e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.401e-06	2.169e-06	-5.620	-5.664	-0.044	(0)
H+	5.127e-09	4.642e-09	-8.290	-8.333	-0.043	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	3.230e-09					
AgCl	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
Ag+	6.051e-10	5.478e-10	-9.218	-9.261	-0.043	(0)
AgCl2-	4.187e-10	3.741e-10	-9.378	-9.427	-0.049	(0)
AgSO4-	1.299e-11	1.161e-11	-10.886	-10.935	-0.049	(0)
AgCl3-2	1.025e-12	6.533e-13	-11.989	-12.185	-0.196	(0)
AgNO2	1.676e-13	1.676e-13	-12.776	-12.776	0.000	(0)
AgOH	1.188e-13	1.188e-13	-12.925	-12.925	0.000	(0)
AgF	1.179e-13	1.179e-13	-12.928	-12.928	0.000	(0)
AgH2BO3	1.037e-14	1.037e-14	-13.984	-13.984	0.000	(0)
AgCl4-3	7.205e-15	2.614e-15	-14.142	-14.583	-0.440	(0)
AgSeO3-	2.437e-15	2.177e-15	-14.613	-14.662	-0.049	(0)
Ag2Se	6.389e-16	6.389e-16	-15.195	-15.195	0.000	(0)
AgNH3+	3.619e-16	3.234e-16	-15.441	-15.490	-0.049	(0)
Ag (OH) 2-	2.818e-17	2.518e-17	-16.550	-16.599	-0.049	(0)
AgNO3	6.011e-19	6.011e-19	-18.221	-18.221	0.000	(0)
Ag (NO2) 2-	4.254e-19	3.801e-19	-18.371	-18.420	-0.049	(0)
Ag (NH3) 2+	8.507e-22	7.601e-22	-21.070	-21.119	-0.049	(0)
Ag (SeO3) 2-3	3.323e-22	1.206e-22	-21.478	-21.919	-0.440	(0)
Ag2MoO4	1.526e-26	1.526e-26	-25.816	-25.816	0.000	(0)
AgHS	0.000e+00	0.000e+00	-75.273	-75.273	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.820	-84.603	-0.783	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-150.016	-150.149	-0.133	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.950	-150.999	-0.049	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.996	-151.256	-0.260	(0)
AgS4S5-3	0.000e+00	0.000e+00	-151.316	-151.567	-0.251	(0)

Al	2.827e-07					
Al (OH) 4-	2.817e-07	2.552e-07	-6.550	-6.593	-0.043	(0)
Al (OH) 3	9.347e-10	9.347e-10	-9.029	-9.029	0.000	(0)
Al (OH) 2+	2.378e-11	2.160e-11	-10.624	-10.666	-0.042	(0)
AlF2+	1.860e-13	1.690e-13	-12.730	-12.772	-0.042	(0)
AlF3	1.823e-13	1.823e-13	-12.739	-12.739	0.000	(0)
AlOH+2	1.843e-14	1.254e-14	-13.735	-13.902	-0.167	(0)
AlF4-	8.640e-15	7.828e-15	-14.063	-14.106	-0.043	(0)
AlF+2	7.279e-15	4.953e-15	-14.138	-14.305	-0.167	(0)
AlSO4+	5.259e-17	4.764e-17	-16.279	-16.322	-0.043	(0)
Al+3	1.416e-17	5.780e-18	-16.849	-17.238	-0.389	(0)
Al (SO4) 2-	5.984e-19	5.421e-19	-18.223	-18.266	-0.043	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-53.035	-53.475	-0.440	(0)
As (3)	9.656e-24					
H3AsO3	8.593e-24	8.593e-24	-23.066	-23.066	0.000	(0)
H2AsO3-	1.063e-24	9.494e-25	-23.974	-24.023	-0.049	(0)
HAsO3-2	2.927e-28	1.866e-28	-27.534	-27.729	-0.196	(0)
H4AsO3+	2.212e-32	1.976e-32	-31.655	-31.704	-0.049	(0)
AsO3-3	4.270e-33	1.549e-33	-32.370	-32.810	-0.440	(0)
As (5)	1.806e-09					
HAsO4-2	1.751e-09	1.116e-09	-8.757	-8.952	-0.196	(0)
H2AsO4-	5.286e-11	4.722e-11	-10.277	-10.326	-0.049	(0)
AsO4-3	2.095e-12	7.600e-13	-11.679	-12.119	-0.440	(0)
H3AsO4	3.801e-17	3.809e-17	-16.420	-16.419	0.001	(0)
B	1.090e-05					
H3BO3	9.531e-06	9.551e-06	-5.021	-5.020	0.001	(0)
H2BO3-	1.327e-06	1.195e-06	-5.877	-5.923	-0.045	(0)
CaH2BO3+	2.416e-08	2.177e-08	-7.617	-7.662	-0.045	(0)
MgH2BO3+	1.514e-08	1.364e-08	-7.820	-7.865	-0.045	(0)
NaH2BO3	7.227e-09	7.227e-09	-8.141	-8.141	0.000	(0)
BF (OH) 3-	3.625e-10	3.266e-10	-9.441	-9.486	-0.045	(0)
H5 (BO3) 2-	1.078e-11	9.715e-12	-10.967	-11.013	-0.045	(0)
BaH2BO3+	8.360e-14	7.531e-14	-13.078	-13.123	-0.045	(0)
BF2 (OH) 2-	1.542e-14	1.389e-14	-13.812	-13.857	-0.045	(0)
AgH2BO3	1.037e-14	1.037e-14	-13.984	-13.984	0.000	(0)
H8 (BO3) 3-	1.030e-14	9.279e-15	-13.987	-14.032	-0.045	(0)
BF3OH-	2.386e-21	2.150e-21	-20.622	-20.668	-0.045	(0)
BF4-	4.671e-27	4.208e-27	-26.331	-26.376	-0.045	(0)
Ba	3.070e-09					
Ba+2	3.036e-09	2.039e-09	-8.518	-8.691	-0.173	(0)
BaHCO3+	2.217e-11	2.017e-11	-10.654	-10.695	-0.041	(0)
BaCO3	1.094e-11	1.094e-11	-10.961	-10.961	0.000	(0)
BaH2BO3+	8.360e-14	7.531e-14	-13.078	-13.123	-0.045	(0)
BaOH+	2.128e-14	1.931e-14	-13.672	-13.714	-0.042	(0)
BaNO3+	1.580e-17	1.412e-17	-16.801	-16.850	-0.049	(0)
BaNH3+2	5.838e-19	3.720e-19	-18.234	-18.429	-0.196	(0)
C (4)	1.189e-03					
HCO3-	1.140e-03	1.036e-03	-2.943	-2.985	-0.042	(0)
CO3-2	1.558e-05	1.046e-05	-4.807	-4.980	-0.173	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	6.711e-06	6.105e-06	-5.173	-5.214	-0.041	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgHCO3+	3.857e-06	3.489e-06	-5.414	-5.457	-0.043	(0)
MgCO3	2.865e-06	2.865e-06	-5.543	-5.543	0.000	(0)
NaHCO3	2.222e-06	2.222e-06	-5.653	-5.653	0.000	(0)
NaCO3-	8.184e-07	7.433e-07	-6.087	-6.129	-0.042	(0)
CuCO3	4.396e-07	4.396e-07	-6.357	-6.357	0.000	(0)
ZnCO3	2.184e-07	2.184e-07	-6.661	-6.661	0.000	(0)
MnHCO3+	8.658e-08	7.855e-08	-7.063	-7.105	-0.042	(0)
UO2 (CO3) 3-4	2.449e-08	4.038e-09	-7.611	-8.394	-0.783	(0)
Cu (CO3) 2-2	1.942e-08	1.238e-08	-7.712	-7.907	-0.196	(0)
ZnHCO3+	1.330e-08	1.188e-08	-7.876	-7.925	-0.049	(0)
UO2 (CO3) 2-2	1.209e-08	7.702e-09	-7.918	-8.113	-0.196	(0)
NiCO3	2.917e-09	2.917e-09	-8.535	-8.535	0.000	(0)
NiHCO3+	1.068e-09	9.544e-10	-8.971	-9.020	-0.049	(0)
CoCO3	9.146e-10	9.146e-10	-9.039	-9.039	0.000	(0)
PbCO3	7.368e-10	7.368e-10	-9.133	-9.133	0.000	(0)
CuHCO3+	5.219e-10	4.663e-10	-9.282	-9.331	-0.049	(0)

		CoHCO3+	4.664e-10	4.167e-10	-9.331	-9.380	-0.049	(0)
		CdCO3	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)
		UO2CO3	3.690e-11	3.690e-11	-10.433	-10.433	0.000	(0)
		Pb (CO3) 2-2	3.488e-11	2.223e-11	-10.457	-10.653	-0.196	(0)
		BaHCO3+	2.217e-11	2.017e-11	-10.654	-10.695	-0.041	(0)
		PbHCO3+	2.018e-11	1.803e-11	-10.695	-10.744	-0.049	(0)
		BaCO3	1.094e-11	1.094e-11	-10.961	-10.961	0.000	(0)
		Cd (CO3) 2-2	1.865e-12	1.188e-12	-11.729	-11.925	-0.196	(0)
		CdHCO3+	1.696e-12	1.515e-12	-11.771	-11.820	-0.049	(0)
		FeHCO3+	8.721e-16	7.933e-16	-15.059	-15.101	-0.041	(0)
		HgCO3	2.324e-16	2.324e-16	-15.634	-15.634	0.000	(0)
		Hg (CO3) 2-2	1.206e-17	7.687e-18	-16.919	-17.114	-0.196	(0)
		HgHCO3+	2.248e-20	2.008e-20	-19.648	-19.697	-0.049	(0)
Ca	5.607e-04							
		Ca+2	4.714e-04	3.165e-04	-3.327	-3.500	-0.173	(0)
		CaSO4	7.700e-05	7.700e-05	-4.113	-4.113	0.000	(0)
		CaHCO3+	6.711e-06	6.105e-06	-5.173	-5.214	-0.041	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.263e-07	2.960e-07	-6.486	-6.529	-0.042	(0)
		CaH2BO3+	2.416e-08	2.177e-08	-7.617	-7.662	-0.045	(0)
		CaOH+	1.506e-08	1.370e-08	-7.822	-7.863	-0.041	(0)
		CaNO3+	1.548e-12	1.383e-12	-11.810	-11.859	-0.049	(0)
		CaNH3+2	1.808e-13	1.152e-13	-12.743	-12.938	-0.196	(0)
		Ca (NH3) 2+2	2.081e-23	1.326e-23	-22.682	-22.877	-0.196	(0)
Cd	1.437e-09							
		Cd+2	9.569e-10	6.426e-10	-9.019	-9.192	-0.173	(0)
		CdSO4	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
		CdCO3	1.532e-10	1.532e-10	-9.815	-9.815	0.000	(0)
		CdCl+	1.346e-10	1.203e-10	-9.871	-9.920	-0.049	(0)
		CdOH+	1.239e-11	1.107e-11	-10.907	-10.956	-0.049	(0)
		CdOHC1	1.070e-11	1.070e-11	-10.971	-10.971	0.000	(0)
		Cd (SO4) 2-2	3.596e-12	2.291e-12	-11.444	-11.640	-0.196	(0)
		Cd (CO3) 2-2	1.865e-12	1.188e-12	-11.729	-11.925	-0.196	(0)
		CdHCO3+	1.696e-12	1.515e-12	-11.771	-11.820	-0.049	(0)
		CdCl2	9.824e-13	9.824e-13	-12.008	-12.008	0.000	(0)
		CdF+	9.767e-13	8.727e-13	-12.010	-12.059	-0.049	(0)
		Cd (OH) 2	1.515e-13	1.515e-13	-12.820	-12.820	0.000	(0)
		CdCl3-	1.360e-15	1.215e-15	-14.867	-14.916	-0.049	(0)
		CdF2	1.492e-16	1.492e-16	-15.826	-15.826	0.000	(0)
		Cd (OH) 3-	2.247e-17	2.008e-17	-16.648	-16.697	-0.049	(0)
		CdSeO4	3.206e-18	3.206e-18	-17.494	-17.494	0.000	(0)
		CdNO3+	3.142e-18	2.807e-18	-17.503	-17.552	-0.049	(0)
		Cd2OH+3	9.827e-20	3.565e-20	-19.008	-19.448	-0.440	(0)
		Cd (SeO3) 2-2	3.179e-20	2.026e-20	-19.498	-19.693	-0.196	(0)
		Cd (OH) 4-2	1.118e-23	7.127e-24	-22.951	-23.147	-0.196	(0)
		Cd (NO3) 2	1.944e-27	1.944e-27	-26.711	-26.711	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-80.961	-81.010	-0.049	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-153.632	-153.632	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-231.509	-231.558	-0.049	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-308.993	-309.188	-0.196	(0)
Cl	2.165e-03							
		Cl-	2.165e-03	1.960e-03	-2.665	-2.708	-0.043	(0)
		MnCl+	1.034e-08	9.377e-09	-7.986	-8.028	-0.042	(0)
		ZnOHC1	5.070e-09	5.070e-09	-8.295	-8.295	0.000	(0)
		AgCl	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
		ZnCl+	1.973e-09	1.786e-09	-8.705	-8.748	-0.043	(0)
		AgCl2-	4.187e-10	3.741e-10	-9.378	-9.427	-0.049	(0)
		CuCl	3.137e-10	3.137e-10	-9.503	-9.503	0.000	(0)
		CuCl2-	1.420e-10	1.285e-10	-9.848	-9.891	-0.043	(0)
		CdCl+	1.346e-10	1.203e-10	-9.871	-9.920	-0.049	(0)
		NiCl+	4.194e-11	3.748e-11	-10.377	-10.426	-0.049	(0)
		CoCl+	3.924e-11	3.506e-11	-10.406	-10.455	-0.049	(0)
		MnCl2	2.596e-11	2.596e-11	-10.586	-10.586	0.000	(0)
		CuCl+	2.449e-11	2.216e-11	-10.611	-10.654	-0.043	(0)
		CdOHC1	1.070e-11	1.070e-11	-10.971	-10.971	0.000	(0)
		ZnCl2	5.546e-12	5.546e-12	-11.256	-11.256	0.000	(0)
		PbCl+	1.823e-12	1.629e-12	-11.739	-11.788	-0.049	(0)
		AgCl3-2	1.025e-12	6.533e-13	-11.989	-12.185	-0.196	(0)

CdCl2	9.824e-13	9.824e-13	-12.008	-12.008	0.000	(0)
HgClOH	1.393e-13	1.393e-13	-12.856	-12.856	0.000	(0)
CuCl3-2	7.943e-14	5.382e-14	-13.100	-13.269	-0.169	(0)
MnCl3-	1.544e-14	1.401e-14	-13.811	-13.854	-0.042	(0)
CuCl2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
PbCl2	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
ZnCl3-	9.541e-15	8.633e-15	-14.020	-14.064	-0.043	(0)
AgCl4-3	7.205e-15	2.614e-15	-14.142	-14.583	-0.440	(0)
HgCl2	7.127e-15	7.127e-15	-14.147	-14.147	0.000	(0)
CdCl3-	1.360e-15	1.215e-15	-14.867	-14.916	-0.049	(0)
NiCl2	3.698e-16	3.698e-16	-15.432	-15.432	0.000	(0)
HgCl3-	1.563e-16	1.397e-16	-15.806	-15.855	-0.049	(0)
ZnCl4-2	1.248e-17	8.459e-18	-16.904	-17.073	-0.169	(0)
PbCl3-	1.245e-17	1.113e-17	-16.905	-16.954	-0.049	(0)
UO2Cl+	3.152e-18	2.816e-18	-17.501	-17.550	-0.049	(0)
HgCl4-2	1.710e-18	1.090e-18	-17.767	-17.963	-0.196	(0)
HgCl+	8.122e-19	7.257e-19	-18.090	-18.139	-0.049	(0)
CuCl3-	3.044e-19	2.754e-19	-18.517	-18.560	-0.043	(0)
CrCl+2	9.772e-20	6.227e-20	-19.010	-19.206	-0.196	(0)
PbCl4-2	1.564e-20	9.965e-21	-19.806	-20.002	-0.196	(0)
CrOHCl2	5.031e-21	5.031e-21	-20.298	-20.298	0.000	(0)
FeCl+2	1.357e-23	9.192e-24	-22.868	-23.037	-0.169	(0)
CrCl2+	1.296e-23	1.158e-23	-22.887	-22.936	-0.049	(0)
CuCl4-2	3.992e-24	2.705e-24	-23.399	-23.568	-0.169	(0)
FeCl2+	8.869e-26	8.046e-26	-25.052	-25.094	-0.042	(0)
VOCl+	8.149e-26	7.281e-26	-25.089	-25.138	-0.049	(0)
CrO3Cl-	2.582e-26	2.307e-26	-25.588	-25.637	-0.049	(0)
FeCl3	1.577e-29	1.577e-29	-28.802	-28.802	0.000	(0)
CoCl+2	3.541e-37	2.256e-37	-36.451	-36.647	-0.196	(0)
UCl+3	0.000e+00	0.000e+00	-48.615	-49.056	-0.440	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
Co (2)	1.094e-08					
Co+2	8.116e-09	5.172e-09	-8.091	-8.286	-0.196	(0)
CoSO4	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
CoCO3	9.146e-10	9.146e-10	-9.039	-9.039	0.000	(0)
CoHCO3+	4.664e-10	4.167e-10	-9.331	-9.380	-0.049	(0)
CoOH+	2.505e-10	2.238e-10	-9.601	-9.650	-0.049	(0)
CoCl+	3.924e-11	3.506e-11	-10.406	-10.455	-0.049	(0)
Co (OH) 2	3.856e-11	3.856e-11	-10.414	-10.414	0.000	(0)
CoF+	1.569e-11	1.401e-11	-10.805	-10.853	-0.049	(0)
CoNO2+	5.973e-14	5.337e-14	-13.224	-13.273	-0.049	(0)
Co (OH) 3-	1.868e-15	1.669e-15	-14.729	-14.778	-0.049	(0)
CoOOH-	4.687e-16	4.188e-16	-15.329	-15.378	-0.049	(0)
Co (NH3) +2	2.821e-16	1.798e-16	-15.550	-15.745	-0.196	(0)
CoSeO4	6.945e-17	6.945e-17	-16.158	-16.158	0.000	(0)
CoNO3+	1.267e-17	1.132e-17	-16.897	-16.946	-0.049	(0)
Co2OH+3	1.599e-19	5.801e-20	-18.796	-19.236	-0.440	(0)
Co (OH) 4-2	9.002e-22	5.737e-22	-21.046	-21.241	-0.196	(0)
Co (NH3) 2+2	3.480e-24	2.218e-24	-23.458	-23.654	-0.196	(0)
Co (NO3) 2	3.183e-26	3.183e-26	-25.497	-25.497	0.000	(0)
Co4 (OH) 4+4	3.036e-30	5.007e-31	-29.518	-30.300	-0.783	(0)
Co (NH3) 3+2	1.267e-32	8.073e-33	-31.897	-32.093	-0.196	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.716	-40.912	-0.196	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.035	-50.231	-0.196	(0)
Co (3)	9.787e-30					
CoOH+2	9.787e-30	6.237e-30	-29.009	-29.205	-0.196	(0)
Co+3	1.386e-36	5.658e-37	-35.858	-36.247	-0.389	(0)
CoCl+2	3.541e-37	2.256e-37	-36.451	-36.647	-0.196	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.202	-73.398	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
Cr (2)	3.349e-28					
Cr+2	3.349e-28	2.134e-28	-27.475	-27.671	-0.196	(0)
Cr (3)	6.497e-10					
Cr (OH) 2+	3.441e-10	3.075e-10	-9.463	-9.512	-0.049	(0)

Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.870e-11	2.564e-11	-10.542	-10.591	-0.049	(0)
Cr (OH) 4-	2.421e-11	2.163e-11	-10.616	-10.665	-0.049	(0)
Cr (OH) +2	1.828e-12	1.165e-12	-11.738	-11.934	-0.196	(0)
CrOHSO4	2.936e-13	2.936e-13	-12.532	-12.532	0.000	(0)
CrF+2	5.233e-16	3.335e-16	-15.281	-15.477	-0.196	(0)
CrSO4+	6.815e-17	6.089e-17	-16.167	-16.215	-0.049	(0)
Cr+3	6.767e-17	2.455e-17	-16.170	-16.610	-0.440	(0)
CrCl+2	9.772e-20	6.227e-20	-19.010	-19.206	-0.196	(0)
CrOHC12	5.031e-21	5.031e-21	-20.298	-20.298	0.000	(0)
Cr2 (OH) 2SO4+2	4.852e-23	3.092e-23	-22.314	-22.510	-0.196	(0)
CrCl2+	1.296e-23	1.158e-23	-22.887	-22.936	-0.049	(0)
Cr2 (OH) 2 (SO4) 2	1.950e-24	1.950e-24	-23.710	-23.710	0.000	(0)
CrNO3+2	2.327e-27	1.483e-27	-26.633	-26.829	-0.196	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.400	-49.596	-0.196	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-60.403	-60.843	-0.440	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Cr (6)	4.104e-14					
CrO4-2	3.997e-14	2.684e-14	-13.398	-13.571	-0.173	(0)
NaCrO4-	5.697e-16	5.090e-16	-15.244	-15.293	-0.049	(0)
HCrO4-	4.513e-16	4.032e-16	-15.346	-15.394	-0.049	(0)
KCrO4-	4.743e-17	4.238e-17	-16.324	-16.373	-0.049	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3SO4-2	9.500e-25	6.054e-25	-24.022	-24.218	-0.196	(0)
CrO3Cl-	2.582e-26	2.307e-26	-25.588	-25.637	-0.049	(0)
Cr2O7-2	8.847e-30	5.638e-30	-29.053	-29.249	-0.196	(0)
Cu (1)	5.981e-10					
CuCl	3.137e-10	3.137e-10	-9.503	-9.503	0.000	(0)
Cu+	1.423e-10	1.272e-10	-9.847	-9.896	-0.049	(0)
CuCl2-	1.420e-10	1.285e-10	-9.848	-9.891	-0.043	(0)
CuCl3-2	7.943e-14	5.382e-14	-13.100	-13.269	-0.169	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-149.236	-149.491	-0.255	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.975	-150.221	-0.246	(0)
Cu (2)	5.475e-07					
CuCO3	4.396e-07	4.396e-07	-6.357	-6.357	0.000	(0)
CuOH+	5.409e-08	4.894e-08	-7.267	-7.310	-0.043	(0)
Cu (OH) 2	2.118e-08	2.118e-08	-7.674	-7.674	0.000	(0)
Cu (CO3) 2-2	1.942e-08	1.238e-08	-7.712	-7.907	-0.196	(0)
Cu+2	1.063e-08	7.136e-09	-7.974	-8.147	-0.173	(0)
CuSO4	1.736e-09	1.736e-09	-8.760	-8.760	0.000	(0)
CuHCO3+	5.219e-10	4.663e-10	-9.282	-9.331	-0.049	(0)
Cu (OH) 3-	1.055e-10	9.423e-11	-9.977	-10.026	-0.049	(0)
Cu2 (OH) 2+2	9.442e-11	6.017e-11	-10.025	-10.221	-0.196	(0)
CuF+	4.318e-11	3.858e-11	-10.365	-10.414	-0.049	(0)
CuCl+	2.449e-11	2.216e-11	-10.611	-10.654	-0.043	(0)
CuNO2+	1.225e-12	1.094e-12	-11.912	-11.961	-0.049	(0)
CuNH3+2	3.313e-14	2.111e-14	-13.480	-13.675	-0.196	(0)
CuCl2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
Cu (OH) 4-2	2.524e-15	1.609e-15	-14.598	-14.794	-0.196	(0)
CuNO3+	3.489e-17	3.117e-17	-16.457	-16.506	-0.049	(0)
Cu (NO2) 2	1.640e-17	1.640e-17	-16.785	-16.785	0.000	(0)
CuCl3-	3.044e-19	2.754e-19	-18.517	-18.560	-0.043	(0)
CuCl4-2	3.992e-24	2.705e-24	-23.399	-23.568	-0.169	(0)
Cu (NO3) 2	5.422e-27	5.422e-27	-26.266	-26.266	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-221.677	-221.726	-0.049	(0)
F	9.870e-05					
F-	9.466e-05	8.569e-05	-4.024	-4.067	-0.043	(0)
MgF+	3.494e-06	3.165e-06	-5.457	-5.500	-0.043	(0)
CaF+	3.263e-07	2.960e-07	-6.486	-6.529	-0.042	(0)
NaF	2.063e-07	2.063e-07	-6.686	-6.686	0.000	(0)
MnF+	1.429e-08	1.297e-08	-7.845	-7.887	-0.042	(0)
ZnF+	6.942e-10	6.202e-10	-9.159	-9.207	-0.049	(0)
HF	5.883e-10	5.883e-10	-9.230	-9.230	0.000	(0)
BF (OH) 3-	3.625e-10	3.266e-10	-9.441	-9.486	-0.045	(0)
CuF+	4.318e-11	3.858e-11	-10.365	-10.414	-0.049	(0)
NiF+	1.801e-11	1.609e-11	-10.745	-10.793	-0.049	(0)
CoF+	1.569e-11	1.401e-11	-10.805	-10.853	-0.049	(0)
CdF+	9.767e-13	8.727e-13	-12.010	-12.059	-0.049	(0)

HF2-	2.121e-13	1.917e-13	-12.673	-12.717	-0.044	(0)
AlF2+	1.860e-13	1.690e-13	-12.730	-12.772	-0.042	(0)
AlF3	1.823e-13	1.823e-13	-12.739	-12.739	0.000	(0)
PbF+	1.583e-13	1.415e-13	-12.800	-12.849	-0.049	(0)
AgF	1.179e-13	1.179e-13	-12.928	-12.928	0.000	(0)
BF2 (OH) 2-	1.542e-14	1.389e-14	-13.812	-13.857	-0.045	(0)
UO2F+	1.173e-14	1.048e-14	-13.931	-13.980	-0.049	(0)
AlF4-	8.640e-15	7.828e-15	-14.063	-14.106	-0.043	(0)
AlF+2	7.279e-15	4.953e-15	-14.138	-14.305	-0.167	(0)
UO2F2	2.590e-15	2.590e-15	-14.587	-14.587	0.000	(0)
CrF+2	5.233e-16	3.335e-16	-15.281	-15.477	-0.196	(0)
PbF2	2.386e-16	2.386e-16	-15.622	-15.622	0.000	(0)
CdF2	1.492e-16	1.492e-16	-15.826	-15.826	0.000	(0)
UO2F3-	6.240e-17	5.575e-17	-16.205	-16.254	-0.049	(0)
H2F2	9.273e-19	9.273e-19	-18.033	-18.033	0.000	(0)
UO2F4-2	5.955e-20	3.795e-20	-19.225	-19.421	-0.196	(0)
PbF3-	4.340e-20	3.878e-20	-19.363	-19.411	-0.049	(0)
FeF2+	3.689e-20	3.347e-20	-19.433	-19.475	-0.042	(0)
VO2F	3.174e-20	3.174e-20	-19.498	-19.498	0.000	(0)
FeF+2	2.154e-20	1.459e-20	-19.667	-19.836	-0.169	(0)
FeF3	4.046e-21	4.046e-21	-20.393	-20.393	0.000	(0)
BF3OH-	2.386e-21	2.150e-21	-20.622	-20.668	-0.045	(0)
VO2F2-	1.105e-21	9.874e-22	-20.957	-21.006	-0.049	(0)
VOF+	7.618e-24	6.806e-24	-23.118	-23.167	-0.049	(0)
PbF4-2	2.496e-24	1.590e-24	-23.603	-23.799	-0.196	(0)
VO2F3-2	1.656e-24	1.055e-24	-23.781	-23.977	-0.196	(0)
VOF2	2.187e-25	2.187e-25	-24.660	-24.660	0.000	(0)
HgF+	6.598e-26	5.895e-26	-25.181	-25.230	-0.049	(0)
BF4-	4.671e-27	4.208e-27	-26.331	-26.376	-0.045	(0)
VOF3-	7.442e-28	6.649e-28	-27.128	-27.177	-0.049	(0)
Sb (OH) 2F	5.318e-28	5.318e-28	-27.274	-27.274	0.000	(0)
SbOF	5.230e-28	5.230e-28	-27.281	-27.281	0.000	(0)
VO2F4-3	1.226e-28	4.450e-29	-27.911	-28.352	-0.440	(0)
VOF4-2	3.609e-31	2.300e-31	-30.443	-30.638	-0.196	(0)
SiF6-2	8.658e-32	5.866e-32	-31.063	-31.232	-0.169	(0)
UF3+	2.511e-39	2.244e-39	-38.600	-38.649	-0.049	(0)
UF2+2	2.592e-40	1.652e-40	-39.586	-39.782	-0.196	(0)
UF4	0.000e+00	0.000e+00	-40.676	-40.676	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.375	-42.815	-0.440	(0)
UF5-	0.000e+00	0.000e+00	-43.096	-43.145	-0.049	(0)
UF6-2	0.000e+00	0.000e+00	-44.537	-44.732	-0.196	(0)
Fe (2)	1.180e-13					
Fe+2	9.547e-14	6.084e-14	-13.020	-13.216	-0.196	(0)
FeSO4	1.586e-14	1.586e-14	-13.800	-13.800	0.000	(0)
FeOH+	5.790e-15	5.253e-15	-14.237	-14.280	-0.042	(0)
FeHCO3+	8.721e-16	7.933e-16	-15.059	-15.101	-0.041	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	6.842e-18	6.208e-18	-17.165	-17.207	-0.042	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.918	-163.918	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-241.658	-241.707	-0.049	(0)
Fe (3)	7.247e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.021e-10	1.835e-10	-9.694	-9.736	-0.042	(0)
Fe (OH) 4-	9.507e-11	8.635e-11	-10.022	-10.064	-0.042	(0)
FeOH+2	3.210e-16	2.175e-16	-15.493	-15.663	-0.169	(0)
FeF2+	3.689e-20	3.347e-20	-19.433	-19.475	-0.042	(0)
FeF+2	2.154e-20	1.459e-20	-19.667	-19.836	-0.169	(0)
FeF3	4.046e-21	4.046e-21	-20.393	-20.393	0.000	(0)
FeSO4+	2.040e-21	1.851e-21	-20.690	-20.733	-0.042	(0)
Fe+3	3.805e-22	1.553e-22	-21.420	-21.809	-0.389	(0)
Fe (SO4) 2-	4.703e-23	4.202e-23	-22.328	-22.377	-0.049	(0)
FeCl+2	1.357e-23	9.192e-24	-22.868	-23.037	-0.169	(0)
FeCl2+	8.869e-26	8.046e-26	-25.052	-25.094	-0.042	(0)
FeHSeO3+2	4.645e-27	2.960e-27	-26.333	-26.529	-0.196	(0)
FeCl3	1.577e-29	1.577e-29	-28.802	-28.802	0.000	(0)
Fe2 (OH) 2+4	9.501e-30	1.567e-30	-29.022	-29.805	-0.783	(0)
FeNO3+2	3.367e-30	2.146e-30	-29.473	-29.668	-0.196	(0)
Fe3 (OH) 4+5	6.947e-38	4.157e-39	-37.158	-38.381	-1.223	(0)

H (0)	4.030e-29					
H2	2.015e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	2.268e-10					
Hg	2.268e-10	2.268e-10	-9.644	-9.644	0.000	(0)
Hg (1)	8.969e-24					
Hg2+2	4.484e-24	2.858e-24	-23.348	-23.544	-0.196	(0)
Hg (2)	6.966e-13					
Hg (OH) 2	5.497e-13	5.509e-13	-12.260	-12.259	0.001	(0)
HgClOH	1.393e-13	1.393e-13	-12.856	-12.856	0.000	(0)
HgCl2	7.127e-15	7.127e-15	-14.147	-14.147	0.000	(0)
HgCO3	2.324e-16	2.324e-16	-15.634	-15.634	0.000	(0)
HgCl3-	1.563e-16	1.397e-16	-15.806	-15.855	-0.049	(0)
Hg (CO3) 2-2	1.206e-17	7.687e-18	-16.919	-17.114	-0.196	(0)
HgOH+	1.794e-18	1.603e-18	-17.746	-17.795	-0.049	(0)
HgCl4-2	1.710e-18	1.090e-18	-17.767	-17.963	-0.196	(0)
HgCl+	8.122e-19	7.257e-19	-18.090	-18.139	-0.049	(0)
Hg (OH) 3-	1.684e-19	1.504e-19	-18.774	-18.823	-0.049	(0)
HgHCO3+	2.248e-20	2.008e-20	-19.648	-19.697	-0.049	(0)
Hg+2	2.912e-23	1.856e-23	-22.536	-22.731	-0.196	(0)
HgNH3+2	5.314e-24	3.386e-24	-23.275	-23.470	-0.196	(0)
HgSO4	5.160e-24	5.160e-24	-23.287	-23.287	0.000	(0)
Hg (NH3) 2+2	1.536e-24	9.791e-25	-23.813	-24.009	-0.196	(0)
HgF+	6.598e-26	5.895e-26	-25.181	-25.230	-0.049	(0)
HgNO3+	1.060e-32	9.467e-33	-31.975	-32.024	-0.049	(0)
Hg (NH3) 3+2	1.769e-33	1.127e-33	-32.752	-32.948	-0.196	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-41.265	-41.265	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.391	-41.587	-0.196	(0)
HgHS2-	0.000e+00	0.000e+00	-142.073	-142.122	-0.049	(0)
HgS2-2	0.000e+00	0.000e+00	-142.301	-142.497	-0.196	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-144.062	-144.062	0.000	(0)
K	4.729e-04					
K+	4.694e-04	4.249e-04	-3.328	-3.372	-0.043	(0)
KSO4-	3.517e-06	3.194e-06	-5.454	-5.496	-0.042	(0)
KCrO4-	4.743e-17	4.238e-17	-16.324	-16.373	-0.049	(0)
Mg	5.644e-04					
Mg+2	4.903e-04	3.292e-04	-3.310	-3.482	-0.173	(0)
MgSO4	6.362e-05	6.362e-05	-4.196	-4.196	0.000	(0)
MgHCO3+	3.857e-06	3.489e-06	-5.414	-5.457	-0.043	(0)
MgF+	3.494e-06	3.165e-06	-5.457	-5.500	-0.043	(0)
MgCO3	2.865e-06	2.865e-06	-5.543	-5.543	0.000	(0)
MgOH+	3.122e-07	2.843e-07	-6.506	-6.546	-0.041	(0)
MgH2BO3+	1.514e-08	1.364e-08	-7.820	-7.865	-0.045	(0)
Mn (2)	6.816e-06					
Mn+2	5.965e-06	3.801e-06	-5.224	-5.420	-0.196	(0)
MnSO4	7.178e-07	7.178e-07	-6.144	-6.144	0.000	(0)
MnHCO3+	8.658e-08	7.855e-08	-7.063	-7.105	-0.042	(0)
MnOH+	2.283e-08	2.071e-08	-7.642	-7.684	-0.042	(0)
MnF+	1.429e-08	1.297e-08	-7.845	-7.887	-0.042	(0)
MnCl+	1.034e-08	9.377e-09	-7.986	-8.028	-0.042	(0)
MnCl2	2.596e-11	2.596e-11	-10.586	-10.586	0.000	(0)
MnSeO4	2.741e-14	2.741e-14	-13.562	-13.562	0.000	(0)
MnCl3-	1.544e-14	1.401e-14	-13.811	-13.854	-0.042	(0)
MnNO3+	9.315e-15	8.322e-15	-14.031	-14.080	-0.049	(0)
Mn (OH) 3-	6.636e-16	6.021e-16	-15.178	-15.220	-0.042	(0)
Mn (OH) 4-2	6.222e-21	4.216e-21	-20.206	-20.375	-0.169	(0)
Mn (NO3) 2	2.888e-23	2.888e-23	-22.539	-22.539	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.388	-42.388	0.000	(0)
Mn (3)	1.143e-26					
Mn+3	1.143e-26	4.666e-27	-25.942	-26.331	-0.389	(0)
Mn (6)	5.617e-40					
MnO4-2	5.617e-40	3.806e-40	-39.250	-39.420	-0.169	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.308	-44.352	-0.045	(0)
Mo	2.001e-07					
MoO4-2	2.001e-07	1.344e-07	-6.699	-6.872	-0.173	(0)
HMoO4-	1.389e-11	1.241e-11	-10.857	-10.906	-0.049	(0)
H2MoO4	4.220e-16	4.220e-16	-15.375	-15.375	0.000	(0)
Ag2MoO4	1.526e-26	1.526e-26	-25.816	-25.816	0.000	(0)

AlMo6O21-3	0.000e+00	0.000e+00	-53.035	-53.475	-0.440	(0)
Mo7O24-6	0.000e+00	0.000e+00	-60.017	-61.778	-1.761	(0)
HMo7O24-5	0.000e+00	0.000e+00	-62.501	-63.724	-1.223	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-66.493	-67.276	-0.783	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-71.923	-72.363	-0.440	(0)
N (-3)	2.932e-09					
NH4+	2.613e-09	2.354e-09	-8.583	-8.628	-0.045	(0)
NH3	2.892e-10	2.892e-10	-9.539	-9.539	0.000	(0)
NH4SO4-	2.952e-11	2.678e-11	-10.530	-10.572	-0.042	(0)
CaNH3+2	1.808e-13	1.152e-13	-12.743	-12.938	-0.196	(0)
CuNH3+2	3.313e-14	2.111e-14	-13.480	-13.675	-0.196	(0)
NiNH3+2	1.821e-15	1.161e-15	-14.740	-14.935	-0.196	(0)
AgNH3+	3.619e-16	3.234e-16	-15.441	-15.490	-0.049	(0)
Co (NH3) +2	2.821e-16	1.798e-16	-15.550	-15.745	-0.196	(0)
BaNH3+2	5.838e-19	3.720e-19	-18.234	-18.429	-0.196	(0)
Ag (NH3) 2+	8.507e-22	7.601e-22	-21.070	-21.119	-0.049	(0)
Ni (NH3) 2+2	7.612e-23	4.851e-23	-22.118	-22.314	-0.196	(0)
Ca (NH3) 2+2	2.081e-23	1.326e-23	-22.682	-22.877	-0.196	(0)
HgNH3+2	5.314e-24	3.386e-24	-23.275	-23.470	-0.196	(0)
Co (NH3) 2+2	3.480e-24	2.218e-24	-23.458	-23.654	-0.196	(0)
Hg (NH3) 2+2	1.536e-24	9.791e-25	-23.813	-24.009	-0.196	(0)
Co (NH3) 3+2	1.267e-32	8.073e-33	-31.897	-32.093	-0.196	(0)
Hg (NH3) 3+2	1.769e-33	1.127e-33	-32.752	-32.948	-0.196	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-40.716	-40.912	-0.196	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-41.391	-41.587	-0.196	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-49.400	-49.596	-0.196	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-50.035	-50.231	-0.196	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-58.192	-58.388	-0.196	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-60.403	-60.843	-0.440	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.253	-62.449	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-73.202	-73.398	-0.196	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-74.447	-74.642	-0.196	(0)
N (3)	1.623e-06					
NO2-	1.623e-06	1.464e-06	-5.790	-5.834	-0.045	(0)
CuNO2+	1.225e-12	1.094e-12	-11.912	-11.961	-0.049	(0)
AgNO2	1.676e-13	1.676e-13	-12.776	-12.776	0.000	(0)
CoNO2+	5.973e-14	5.337e-14	-13.224	-13.273	-0.049	(0)
Cu (NO2) 2	1.640e-17	1.640e-17	-16.785	-16.785	0.000	(0)
Ag (NO2) 2-	4.254e-19	3.801e-19	-18.371	-18.420	-0.049	(0)
N (5)	1.528e-09					
NO3-	1.526e-09	1.381e-09	-8.816	-8.860	-0.043	(0)
CaNO3+	1.548e-12	1.383e-12	-11.810	-11.859	-0.049	(0)
MnNO3+	9.315e-15	8.322e-15	-14.031	-14.080	-0.049	(0)
ZnNO3+	1.409e-15	1.259e-15	-14.851	-14.900	-0.049	(0)
CuNO3+	3.489e-17	3.117e-17	-16.457	-16.506	-0.049	(0)
NiNO3+	2.903e-17	2.594e-17	-16.537	-16.586	-0.049	(0)
BaNO3+	1.580e-17	1.412e-17	-16.801	-16.850	-0.049	(0)
CoNO3+	1.267e-17	1.132e-17	-16.897	-16.946	-0.049	(0)
CdNO3+	3.142e-18	2.807e-18	-17.503	-17.552	-0.049	(0)
AgNO3	6.011e-19	6.011e-19	-18.221	-18.221	0.000	(0)
PbNO3+	5.358e-19	4.787e-19	-18.271	-18.320	-0.049	(0)
Mn (NO3) 2	2.888e-23	2.888e-23	-22.539	-22.539	0.000	(0)
UO2NO3+	2.733e-24	2.442e-24	-23.563	-23.612	-0.049	(0)
Zn (NO3) 2	3.470e-25	3.470e-25	-24.460	-24.460	0.000	(0)
Co (NO3) 2	3.183e-26	3.183e-26	-25.497	-25.497	0.000	(0)
Cu (NO3) 2	5.422e-27	5.422e-27	-26.266	-26.266	0.000	(0)
CrNO3+2	2.327e-27	1.483e-27	-26.633	-26.829	-0.196	(0)
Cd (NO3) 2	1.944e-27	1.944e-27	-26.711	-26.711	0.000	(0)
Pb (NO3) 2	1.123e-27	1.123e-27	-26.950	-26.950	0.000	(0)
VO2NO3	1.476e-28	1.476e-28	-27.831	-27.831	0.000	(0)
FeNO3+2	3.367e-30	2.146e-30	-29.473	-29.668	-0.196	(0)
HgNO3+	1.060e-32	9.467e-33	-31.975	-32.024	-0.049	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-41.265	-41.265	0.000	(0)
Na	4.242e-03					
Na+	4.215e-03	3.816e-03	-2.375	-2.418	-0.043	(0)
NaSO4-	2.396e-05	2.176e-05	-4.621	-4.662	-0.042	(0)
NaHCO3	2.222e-06	2.222e-06	-5.653	-5.653	0.000	(0)

	NaCO3-	8.184e-07	7.433e-07	-6.087	-6.129	-0.042	(0)
	NaF	2.063e-07	2.063e-07	-6.686	-6.686	0.000	(0)
	NaH2BO3	7.227e-09	7.227e-09	-8.141	-8.141	0.000	(0)
	NaCrO4-	5.697e-16	5.090e-16	-15.244	-15.293	-0.049	(0)
Ni	1.702e-08						
	Ni+2	1.113e-08	7.474e-09	-7.953	-8.126	-0.173	(0)
	NiCO3	2.917e-09	2.917e-09	-8.535	-8.535	0.000	(0)
	NiSO4	1.584e-09	1.584e-09	-8.800	-8.800	0.000	(0)
	NiHCO3+	1.068e-09	9.544e-10	-8.971	-9.020	-0.049	(0)
	NiOH+	2.284e-10	2.041e-10	-9.641	-9.690	-0.049	(0)
	NiCl+	4.194e-11	3.748e-11	-10.377	-10.426	-0.049	(0)
	Ni(OH)2	3.516e-11	3.516e-11	-10.454	-10.454	0.000	(0)
	NiF+	1.801e-11	1.609e-11	-10.745	-10.793	-0.049	(0)
	Ni(SO4)2-2	8.739e-14	5.569e-14	-13.059	-13.254	-0.196	(0)
	Ni(OH)3-	8.536e-14	7.627e-14	-13.069	-13.118	-0.049	(0)
	NiNH3+2	1.821e-15	1.161e-15	-14.740	-14.935	-0.196	(0)
	NiCl2	3.698e-16	3.698e-16	-15.432	-15.432	0.000	(0)
	NiSeO4	9.368e-17	9.368e-17	-16.028	-16.028	0.000	(0)
	NiNO3+	2.903e-17	2.594e-17	-16.537	-16.586	-0.049	(0)
	Ni(NH3)2+2	7.612e-23	4.851e-23	-22.118	-22.314	-0.196	(0)
O(0)	2.480e-35						
	O2	1.240e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	9.927e-10						
	PbCO3	7.368e-10	7.368e-10	-9.133	-9.133	0.000	(0)
	PbOH+	1.429e-10	1.276e-10	-9.845	-9.894	-0.049	(0)
	Pb+2	3.489e-11	2.343e-11	-10.457	-10.630	-0.173	(0)
	Pb(CO3)2-2	3.488e-11	2.223e-11	-10.457	-10.653	-0.196	(0)
	PbHCO3+	2.018e-11	1.803e-11	-10.695	-10.744	-0.049	(0)
	PbSO4	1.219e-11	1.219e-11	-10.914	-10.914	0.000	(0)
	Pb(OH)2	8.755e-12	8.755e-12	-11.058	-11.058	0.000	(0)
	PbCl+	1.823e-12	1.629e-12	-11.739	-11.788	-0.049	(0)
	PbF+	1.583e-13	1.415e-13	-12.800	-12.849	-0.049	(0)
	Pb(SO4)2-2	1.224e-13	7.797e-14	-12.912	-13.108	-0.196	(0)
	Pb(OH)3-	2.125e-14	1.899e-14	-13.673	-13.721	-0.049	(0)
	PbCl2	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
	PbF2	2.386e-16	2.386e-16	-15.622	-15.622	0.000	(0)
	Pb(OH)4-2	1.583e-17	1.009e-17	-16.801	-16.996	-0.196	(0)
	PbCl3-	1.245e-17	1.113e-17	-16.905	-16.954	-0.049	(0)
	PbNO3+	5.358e-19	4.787e-19	-18.271	-18.320	-0.049	(0)
	Pb2OH+3	1.306e-19	4.740e-20	-18.884	-19.324	-0.440	(0)
	PbF3-	4.340e-20	3.878e-20	-19.363	-19.411	-0.049	(0)
	PbCl4-2	1.564e-20	9.965e-21	-19.806	-20.002	-0.196	(0)
	Pb3(OH)4+2	5.623e-23	3.583e-23	-22.250	-22.446	-0.196	(0)
	PbF4-2	2.496e-24	1.590e-24	-23.603	-23.799	-0.196	(0)
	Pb(NO3)2	1.123e-27	1.123e-27	-26.950	-26.950	0.000	(0)
	Pb4(OH)4+4	4.044e-29	6.669e-30	-28.393	-29.176	-0.783	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-155.012	-155.012	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-233.489	-233.538	-0.049	(0)
S(-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-75.273	-75.273	0.000	(0)
	HS-	0.000e+00	0.000e+00	-79.777	-79.826	-0.049	(0)
	S5-2	0.000e+00	0.000e+00	-80.662	-80.858	-0.196	(0)
	CdHS+	0.000e+00	0.000e+00	-80.961	-81.010	-0.049	(0)
	H2S	0.000e+00	0.000e+00	-81.139	-81.139	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-81.178	-81.374	-0.196	(0)
	S4-2	0.000e+00	0.000e+00	-81.258	-81.454	-0.196	(0)
	S3-2	0.000e+00	0.000e+00	-82.064	-82.259	-0.196	(0)
	S2-2	0.000e+00	0.000e+00	-83.080	-83.276	-0.196	(0)
	S-2	0.000e+00	0.000e+00	-88.624	-88.793	-0.169	(0)
	HgHS2-	0.000e+00	0.000e+00	-142.073	-142.122	-0.049	(0)
	HgS2-2	0.000e+00	0.000e+00	-142.301	-142.497	-0.196	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-144.062	-144.062	0.000	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-149.236	-149.491	-0.255	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-149.975	-150.221	-0.246	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-150.016	-150.149	-0.133	(0)
	ZnS(HS)-	0.000e+00	0.000e+00	-150.900	-150.949	-0.049	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-150.950	-150.999	-0.049	(0)
	Ag(S4)2-3	0.000e+00	0.000e+00	-150.996	-151.256	-0.260	(0)

AgS4S5-3	0.000e+00	0.000e+00	-151.316	-151.567	-0.251	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-153.272	-153.272	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-153.632	-153.632	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-155.012	-155.012	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.918	-163.918	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-221.677	-221.726	-0.049	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-229.770	-229.819	-0.049	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-231.269	-231.465	-0.196	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-231.509	-231.558	-0.049	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-233.489	-233.538	-0.049	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-241.658	-241.707	-0.049	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-308.993	-309.188	-0.196	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-310.909	-311.105	-0.196	(0)
Sb2S4-2	0.000e+00	0.000e+00	-328.521	-328.717	-0.196	(0)
S (6)	1.750e-03					
SO4-2	1.581e-03	1.062e-03	-2.801	-2.974	-0.173	(0)
CaSO4	7.700e-05	7.700e-05	-4.113	-4.113	0.000	(0)
MgSO4	6.362e-05	6.362e-05	-4.196	-4.196	0.000	(0)
NaSO4-	2.396e-05	2.176e-05	-4.621	-4.662	-0.042	(0)
KSO4-	3.517e-06	3.194e-06	-5.454	-5.496	-0.042	(0)
MnSO4	7.178e-07	7.178e-07	-6.144	-6.144	0.000	(0)
ZnSO4	8.428e-08	8.428e-08	-7.074	-7.074	0.000	(0)
CuSO4	1.736e-09	1.736e-09	-8.760	-8.760	0.000	(0)
NiSO4	1.584e-09	1.584e-09	-8.800	-8.800	0.000	(0)
Zn (SO4) 2-2	1.223e-09	7.795e-10	-8.913	-9.108	-0.196	(0)
CoSO4	1.096e-09	1.096e-09	-8.960	-8.960	0.000	(0)
HSO4-	5.316e-10	4.817e-10	-9.274	-9.317	-0.043	(0)
CdSO4	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
NH4SO4-	2.952e-11	2.678e-11	-10.530	-10.572	-0.042	(0)
AgSO4-	1.299e-11	1.161e-11	-10.886	-10.935	-0.049	(0)
PbSO4	1.219e-11	1.219e-11	-10.914	-10.914	0.000	(0)
Cd (SO4) 2-2	3.596e-12	2.291e-12	-11.444	-11.640	-0.196	(0)
CrOHSO4	2.936e-13	2.936e-13	-12.532	-12.532	0.000	(0)
Pb (SO4) 2-2	1.224e-13	7.797e-14	-12.912	-13.108	-0.196	(0)
Ni (SO4) 2-2	8.739e-14	5.569e-14	-13.059	-13.254	-0.196	(0)
FeSO4	1.586e-14	1.586e-14	-13.800	-13.800	0.000	(0)
UO2SO4	1.424e-15	1.424e-15	-14.846	-14.846	0.000	(0)
CrSO4+	6.815e-17	6.089e-17	-16.167	-16.215	-0.049	(0)
AlSO4+	5.259e-17	4.764e-17	-16.279	-16.322	-0.043	(0)
UO2 (SO4) 2-2	3.128e-17	1.994e-17	-16.505	-16.700	-0.196	(0)
Al (SO4) 2-	5.984e-19	5.421e-19	-18.223	-18.266	-0.043	(0)
VO2SO4-	5.993e-21	5.354e-21	-20.222	-20.271	-0.049	(0)
FeSO4+	2.040e-21	1.851e-21	-20.690	-20.733	-0.042	(0)
Cr2 (OH) 2SO4+2	4.852e-23	3.092e-23	-22.314	-22.510	-0.196	(0)
Fe (SO4) 2-	4.703e-23	4.202e-23	-22.328	-22.377	-0.049	(0)
HgSO4	5.160e-24	5.160e-24	-23.287	-23.287	0.000	(0)
VOSO4	3.873e-24	3.873e-24	-23.412	-23.412	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.950e-24	1.950e-24	-23.710	-23.710	0.000	(0)
CrO3SO4-2	9.500e-25	6.054e-25	-24.022	-24.218	-0.196	(0)
VSO4+	2.893e-39	2.585e-39	-38.539	-38.588	-0.049	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.496	-43.496	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.226	-44.422	-0.196	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-69.934	-69.983	-0.049	(0)
Sb (3)	1.692e-21					
Sb (OH) 3	8.558e-22	8.558e-22	-21.068	-21.068	0.000	(0)
HSbO2	8.355e-22	8.355e-22	-21.078	-21.078	0.000	(0)
SbO2-	3.263e-25	2.915e-25	-24.486	-24.535	-0.049	(0)
Sb (OH) 4-	1.869e-25	1.670e-25	-24.728	-24.777	-0.049	(0)
Sb (OH) 2F	5.318e-28	5.318e-28	-27.274	-27.274	0.000	(0)
SbOF	5.230e-28	5.230e-28	-27.281	-27.281	0.000	(0)
Sb (OH) 2+	1.080e-28	9.647e-29	-27.967	-28.016	-0.049	(0)
SbO+	3.723e-29	3.326e-29	-28.429	-28.478	-0.049	(0)
Sb2S4-2	0.000e+00	0.000e+00	-328.521	-328.717	-0.196	(0)
Sb (5)	3.032e-09					
SbO3-	3.029e-09	2.706e-09	-8.519	-8.568	-0.049	(0)
Sb (OH) 6-	3.495e-12	3.164e-12	-11.457	-11.500	-0.043	(0)
SbO2+	1.872e-26	1.673e-26	-25.728	-25.777	-0.049	(0)
Se (-2)	6.389e-16					

Ag2Se	6.389e-16	6.389e-16	-15.195	-15.195	0.000	(0)
HSe-	1.358e-40	1.213e-40	-39.867	-39.916	-0.049	(0)
MnSe	0.000e+00	0.000e+00	-42.388	-42.388	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.359	-44.359	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.387	-46.583	-0.196	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-83.820	-84.603	-0.783	(0)
Se (4)	1.778e-08					
SeO3-2	9.706e-09	6.185e-09	-8.013	-8.209	-0.196	(0)
HSeO3-	8.071e-09	7.211e-09	-8.093	-8.142	-0.049	(0)
H2SeO3	1.428e-14	1.428e-14	-13.845	-13.845	0.000	(0)
AgSeO3-	2.437e-15	2.177e-15	-14.613	-14.662	-0.049	(0)
Cd (SeO3) 2-2	3.179e-20	2.026e-20	-19.498	-19.693	-0.196	(0)
Ag (SeO3) 2-3	3.323e-22	1.206e-22	-21.478	-21.919	-0.440	(0)
FeHSeO3+2	4.645e-27	2.960e-27	-26.333	-26.529	-0.196	(0)
Se (6)	3.993e-11					
SeO4-2	3.990e-11	2.679e-11	-10.399	-10.572	-0.173	(0)
MnSeO4	2.741e-14	2.741e-14	-13.562	-13.562	0.000	(0)
ZnSeO4	1.505e-15	1.505e-15	-14.822	-14.822	0.000	(0)
NiSeO4	9.368e-17	9.368e-17	-16.028	-16.028	0.000	(0)
CoSeO4	6.945e-17	6.945e-17	-16.158	-16.158	0.000	(0)
HSeO4-	6.976e-18	6.233e-18	-17.156	-17.205	-0.049	(0)
CdSeO4	3.206e-18	3.206e-18	-17.494	-17.494	0.000	(0)
Zn (SeO4) 2-2	6.418e-26	4.090e-26	-25.193	-25.388	-0.196	(0)
Si	2.176e-04					
H4SiO4	2.103e-04	2.108e-04	-3.677	-3.676	0.001	(0)
H3SiO4-	7.254e-06	6.563e-06	-5.139	-5.183	-0.043	(0)
H2SiO4-2	1.311e-10	8.922e-11	-9.882	-10.050	-0.167	(0)
UO2H3SiO4+	5.526e-13	4.937e-13	-12.258	-12.307	-0.049	(0)
SiF6-2	8.658e-32	5.866e-32	-31.063	-31.232	-0.169	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.843	-61.283	-0.440	(0)
U (4)	3.527e-20					
U (OH) 5-	3.526e-20	3.151e-20	-19.453	-19.502	-0.049	(0)
U (OH) 4	6.126e-24	6.126e-24	-23.213	-23.213	0.000	(0)
U (OH) 3+	1.164e-28	1.040e-28	-27.934	-27.983	-0.049	(0)
U (OH) 2+2	3.502e-34	2.232e-34	-33.456	-33.651	-0.196	(0)
UF3+	2.511e-39	2.244e-39	-38.600	-38.649	-0.049	(0)
UF2+2	2.592e-40	1.652e-40	-39.586	-39.782	-0.196	(0)
UOH+3	1.345e-40	0.000e+00	-39.871	-40.312	-0.440	(0)
UF4	0.000e+00	0.000e+00	-40.676	-40.676	0.000	(0)
UF+3	0.000e+00	0.000e+00	-42.375	-42.815	-0.440	(0)
UF5-	0.000e+00	0.000e+00	-43.096	-43.145	-0.049	(0)
U (SO4) 2	0.000e+00	0.000e+00	-43.496	-43.496	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-44.226	-44.422	-0.196	(0)
UF6-2	0.000e+00	0.000e+00	-44.537	-44.732	-0.196	(0)
U+4	0.000e+00	0.000e+00	-47.265	-48.048	-0.783	(0)
UCl+3	0.000e+00	0.000e+00	-48.615	-49.056	-0.440	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-176.481	-180.443	-3.963	(0)
U (5)	2.199e-17					
UO2+	2.199e-17	1.965e-17	-16.658	-16.707	-0.049	(0)
U (6)	3.661e-08					
UO2 (CO3) 3-4	2.449e-08	4.038e-09	-7.611	-8.394	-0.783	(0)
UO2 (CO3) 2-2	1.209e-08	7.702e-09	-7.918	-8.113	-0.196	(0)
UO2CO3	3.690e-11	3.690e-11	-10.433	-10.433	0.000	(0)
UO2H3SiO4+	5.526e-13	4.937e-13	-12.258	-12.307	-0.049	(0)
UO2OH+	2.708e-13	2.419e-13	-12.567	-12.616	-0.049	(0)
UO2F+	1.173e-14	1.048e-14	-13.931	-13.980	-0.049	(0)
UO2F2	2.590e-15	2.590e-15	-14.587	-14.587	0.000	(0)
UO2SO4	1.424e-15	1.424e-15	-14.846	-14.846	0.000	(0)
UO2+2	1.319e-15	8.860e-16	-14.880	-15.053	-0.173	(0)
UO2F3-	6.240e-17	5.575e-17	-16.205	-16.254	-0.049	(0)
UO2 (SO4) 2-2	3.128e-17	1.994e-17	-16.505	-16.700	-0.196	(0)
UO2Cl+	3.152e-18	2.816e-18	-17.501	-17.550	-0.049	(0)
(UO2) 2 (OH) 2+2	1.524e-19	9.714e-20	-18.817	-19.013	-0.196	(0)
(UO2) 3 (OH) 5+	9.386e-20	8.386e-20	-19.027	-19.076	-0.049	(0)
UO2F4-2	5.955e-20	3.795e-20	-19.225	-19.421	-0.196	(0)
UO2NO3+	2.733e-24	2.442e-24	-23.563	-23.612	-0.049	(0)
V (2)	0.000e+00					

VOH+	0.000e+00	0.000e+00	-45.142	-45.190	-0.049	(0)
V+2	0.000e+00	0.000e+00	-46.841	-47.037	-0.196	(0)
V (3)	4.244e-17					
V (OH) 3	4.244e-17	4.244e-17	-16.372	-16.372	0.000	(0)
V (OH) 2+	1.425e-28	1.273e-28	-27.846	-27.895	-0.049	(0)
VOH+2	8.796e-33	5.605e-33	-32.056	-32.251	-0.196	(0)
V+3	1.421e-38	5.156e-39	-37.847	-38.288	-0.440	(0)
VSO4+	2.893e-39	2.585e-39	-38.539	-38.588	-0.049	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-61.254	-61.695	-0.440	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-62.920	-63.703	-0.783	(0)
V (4)	6.446e-21					
V (OH) 3+	6.413e-21	5.730e-21	-20.193	-20.242	-0.049	(0)
VO+2	2.078e-23	1.324e-23	-22.682	-22.878	-0.196	(0)
VOF+	7.618e-24	6.806e-24	-23.118	-23.167	-0.049	(0)
VOSO4	3.873e-24	3.873e-24	-23.412	-23.412	0.000	(0)
VOF2	2.187e-25	2.187e-25	-24.660	-24.660	0.000	(0)
VOC1+	8.149e-26	7.281e-26	-25.089	-25.138	-0.049	(0)
VOF3-	7.442e-28	6.649e-28	-27.128	-27.177	-0.049	(0)
VOF4-2	3.609e-31	2.300e-31	-30.443	-30.638	-0.196	(0)
H2V2O4+2	2.583e-36	1.646e-36	-35.588	-35.784	-0.196	(0)
V (5)	9.667e-10					
H2VO4-	5.496e-10	4.911e-10	-9.260	-9.309	-0.049	(0)
HVO4-2	4.170e-10	2.657e-10	-9.380	-9.576	-0.196	(0)
H3VO4	2.279e-14	2.279e-14	-13.642	-13.642	0.000	(0)
VO4-3	7.909e-16	2.869e-16	-15.102	-15.542	-0.440	(0)
HV2O7-3	1.219e-16	4.423e-17	-15.914	-16.354	-0.440	(0)
H3V2O7-	8.090e-17	7.228e-17	-16.092	-16.141	-0.049	(0)
V2O7-4	1.555e-18	2.565e-19	-17.808	-18.591	-0.783	(0)
VO2+	2.333e-19	2.112e-19	-18.632	-18.675	-0.043	(0)
VO2F	3.174e-20	3.174e-20	-19.498	-19.498	0.000	(0)
VO2SO4-	5.993e-21	5.354e-21	-20.222	-20.271	-0.049	(0)
VO2F2-	1.105e-21	9.874e-22	-20.957	-21.006	-0.049	(0)
V3O9-3	3.419e-22	1.241e-22	-21.466	-21.906	-0.440	(0)
VO2F3-2	1.656e-24	1.055e-24	-23.781	-23.977	-0.196	(0)
V4O12-4	1.540e-28	2.540e-29	-27.812	-28.595	-0.783	(0)
VO2NO3	1.476e-28	1.476e-28	-27.831	-27.831	0.000	(0)
VO2F4-3	1.226e-28	4.450e-29	-27.911	-28.352	-0.440	(0)
V10O28-6	0.000e+00	0.000e+00	-75.754	-77.515	-1.761	(0)
HV10O28-5	0.000e+00	0.000e+00	-76.439	-77.662	-1.223	(0)
H2V10O28-4	0.000e+00	0.000e+00	-80.005	-80.788	-0.783	(0)
Zn	9.805e-07					
Zn+2	5.402e-07	3.627e-07	-6.267	-6.440	-0.173	(0)
ZnCO3	2.184e-07	2.184e-07	-6.661	-6.661	0.000	(0)
ZnOH+	8.806e-08	7.868e-08	-7.055	-7.104	-0.049	(0)
ZnSO4	8.428e-08	8.428e-08	-7.074	-7.074	0.000	(0)
Zn (OH) 2	2.705e-08	2.705e-08	-7.568	-7.568	0.000	(0)
ZnHCO3+	1.330e-08	1.188e-08	-7.876	-7.925	-0.049	(0)
ZnOHCl	5.070e-09	5.070e-09	-8.295	-8.295	0.000	(0)
ZnCl+	1.973e-09	1.786e-09	-8.705	-8.748	-0.043	(0)
Zn (SO4) 2-2	1.223e-09	7.795e-10	-8.913	-9.108	-0.196	(0)
ZnF+	6.942e-10	6.202e-10	-9.159	-9.207	-0.049	(0)
Zn (OH) 3-	3.291e-10	2.940e-10	-9.483	-9.532	-0.049	(0)
ZnCl2	5.546e-12	5.546e-12	-11.256	-11.256	0.000	(0)
Zn (OH) 4-2	3.984e-14	2.539e-14	-13.400	-13.595	-0.196	(0)
ZnCl3-	9.541e-15	8.633e-15	-14.020	-14.064	-0.043	(0)
ZnSeO4	1.505e-15	1.505e-15	-14.822	-14.822	0.000	(0)
ZnNO3+	1.409e-15	1.259e-15	-14.851	-14.900	-0.049	(0)
ZnCl4-2	1.248e-17	8.459e-18	-16.904	-17.073	-0.169	(0)
Zn (NO3) 2	3.470e-25	3.470e-25	-24.460	-24.460	0.000	(0)
Zn (SeO4) 2-2	6.418e-26	4.090e-26	-25.193	-25.388	-0.196	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.900	-150.949	-0.049	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-153.272	-153.272	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-229.770	-229.819	-0.049	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-231.269	-231.465	-0.196	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-310.909	-311.105	-0.196	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-64.44	-58.15	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-50.36	-45.85	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-57.58	-45.85	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-82.53	-64.60	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-66.17	-46.14	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-31.23	-30.83	0.40	(NH4)2CrO4
(NH4)2SeO4	-28.28	-27.83	0.45	(NH4)2SeO4
Acanthite	-53.80	-90.02	-36.22	Ag2S
Ag2CO3	-12.41	-23.50	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-13.68	-12.20	1.48	Ag2HVO4
Ag2MoO4	-13.84	-25.39	-11.55	Ag2MoO4
Ag2O	-14.43	-1.86	12.57	Ag2O
Ag2Se	-1.41	-50.11	-48.70	Ag2Se
Ag2SeO3	-11.18	-18.33	-7.15	Ag2SeO3
Ag2SeO4	-20.18	-29.09	-8.91	Ag2SeO4
Ag2SO4	-16.68	-21.50	-4.82	Ag2SO4
Ag3AsO3	-28.01	-25.85	2.16	Ag3AsO3
Ag3AsO4	-16.42	-19.20	-2.79	Ag3AsO4
Ag3H2VO5	-18.31	-13.13	5.18	Ag3H2VO5
AgF·4H2O	-14.38	-13.33	1.05	AgF·4H2O
Agmetal	-0.19	-13.70	-13.51	Ag
AgVO3	-12.04	-11.27	0.77	AgVO3
Al(OH)3(am)	-3.04	7.76	10.80	Al(OH)3
Al2(MoO4)3	-57.46	-55.09	2.37	Al2(MoO4)3
Al2O3	-4.13	15.52	19.65	Al2O3
Al4(OH)10SO4	-11.29	11.41	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-13.46	-8.66	4.80	AlAsO4·2H2O
AlOHSO4	-8.65	-11.88	-3.23	AlOHSO4
AlSb	-155.56	-89.94	65.62	AlSb
Alunite	-9.63	-11.03	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.81	-13.60	-7.79	PbSO4
Anhydrite	-2.11	-6.47	-4.36	CaSO4
Anilite	-56.49	-88.37	-31.88	Cu0.25Cu1.5S
Antlerite	-2.87	5.92	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-89.50	-92.26	-2.76	As4O6
Artinite	-4.88	4.72	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-39.54	-32.84	6.71	As2O5
Atacamite	-1.39	6.00	7.39	Cu2(OH)3Cl
Azurite	-0.83	-17.73	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-16.42	7.98	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-20.60	-4.73	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-29.70	3.24	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.59	-22.26	-9.67	BaCrO4
BaF2	-11.00	-16.82	-5.82	BaF2
BaMoO4	-8.60	-15.56	-6.96	BaMoO4
Barite	-1.68	-11.66	-9.98	BaSO4
BaS	-96.36	-80.18	16.18	BaS
BaSeO3	-10.33	-8.50	1.83	BaSeO3
BaSeO4	-11.80	-19.26	-7.46	BaSeO4
Bianchite	-7.65	-9.41	-1.76	ZnSO4·6H2O
Birnessite	-6.65	11.44	18.09	MnO2
Bixbyite	-2.02	-2.66	-0.64	Mn2O3
BlaubleiI	-56.64	-80.80	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.02	-84.30	-27.28	Cu0.6Cu0.8S
Boehmite	-0.82	7.76	8.58	AlOOH
Breithauptite	-57.87	-76.39	-18.52	NiSb
Brochantite	-0.78	14.44	15.22	Cu4(OH)6SO4
Brucite	-3.66	13.18	16.84	Mg(OH)2
Bunsenite	-3.91	8.54	12.45	NiO
Ca(VO3)2	-13.18	-7.52	5.66	Ca(VO3)2
Ca2V2O7	-11.85	5.65	17.50	Ca2V2O7
Ca2V2O7·2H2O	-15.90	5.65	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-15.64	6.66	22.30	Ca3(AsO4)2·4H2O

Ca3(VO4)2	-20.14	18.82	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.04	18.82	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.88	-155.90	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-11.05	-28.96	-17.91	Hg2Cl2
CaMoO4	-2.42	-10.37	-7.95	CaMoO4
Carnotite	-4.00	-3.77	0.23	KUO2VO4
CaSeO3:2H2O	-6.12	-3.31	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.05	-14.07	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.41	-2.57	9.84	Cd(BO2)2
Cd(OH)2	-6.17	7.47	13.64	Cd(OH)2
Cd(OH)2(am)	-6.26	7.47	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.57	-16.86	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-19.78	2.78	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-18.14	10.26	28.40	Cd4(OH)6SO4
CdCl2	-13.95	-14.61	-0.66	CdCl2
CdCl2:1H2O	-12.91	-14.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.69	-14.61	-1.91	CdCl2:2.5H2O
CdF2	-16.11	-17.33	-1.21	CdF2
Cdmetal(alpha)	-31.58	-18.07	13.51	Cd
Cdmetal(gamma)	-31.69	-18.07	13.62	Cd
CdMoO4	-1.91	-16.06	-14.15	CdMoO4
CdOHCl	-7.10	-3.57	3.54	CdOHCl
CdSb	-77.10	-77.45	-0.35	CdSb
CdSe	-20.57	-40.77	-20.20	CdSe
CdSeO4:2H2O	-17.91	-19.76	-1.85	CdSeO4:2H2O
CdSO4	-11.99	-12.17	-0.17	CdSO4
CdSO4:1H2O	-10.44	-12.17	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.29	-12.17	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.22	-11.97	-9.75	AgCl
Cerrusite	-2.48	-15.61	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-8.48	-11.12	-2.64	CuSO4:5H2O
Chalcedony	-0.13	-3.68	-3.55	SiO2
Chalcocite	-56.36	-91.28	-34.92	Cu2S
Chalcopyrite	-129.08	-164.35	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-54.72	-100.42	-45.69	HgS
Claudetite	-89.20	-92.26	-3.06	As4O6
Clausthalite	-15.11	-42.21	-27.10	PbSe
Co(BO2)2	-28.73	-1.66	27.07	Co(BO2)2
Co(OH)2	-4.71	8.38	13.09	Co(OH)2
Co(OH)3	-8.94	-11.25	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.73	-7.70	13.03	Co3(AsO4)2
Co3O4	-3.62	-14.11	-10.50	Co3O4
CoCl2	-21.97	-13.70	8.27	CoCl2
CoCl2:6H2O	-16.24	-13.70	2.54	CoCl2:6H2O
CoCO3	-3.29	-13.27	-9.98	CoCO3
CoF2	-14.82	-16.42	-1.60	CoF2
CoF3	-46.99	-48.45	-1.46	CoF3
CoFe2O4	18.29	14.76	-3.53	CoFe2O4
CoMoO4	-7.40	-15.16	-7.76	CoMoO4
CoO	-5.21	8.38	13.59	CoO
CoS(alpha)	-72.34	-79.78	-7.44	CoS
CoS(beta)	-68.71	-79.78	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-14.06	-11.26	2.80	CoSO4
CoSO4:6H2O	-8.79	-11.26	-2.47	CoSO4:6H2O
Cotunnite	-11.27	-16.05	-4.78	PbCl2
Covellite	-57.34	-79.64	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3

CrCl2	-47.18	-33.09	14.09	CrCl2
CrCl3	-49.42	-34.30	15.11	CrCl3
CrF3	-27.04	-38.38	-11.34	CrF3
Cristobalite	-0.33	-3.68	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-15.06	-48.90	-33.84	Na3AlF6
Cu(OH)2	-0.15	8.52	8.67	Cu(OH)2
Cu(SbO3)2	-27.74	17.47	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.40	-0.15	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.86	-90.74	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.57	-51.37	-45.80	Cu2Se
Cu2SO4	-20.82	-22.77	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.38	-7.28	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.79	-102.39	-42.59	Cu3Sb
Cu3Se2	-27.61	-91.10	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-16.28	-21.72	-5.44	CuCrO4
CuF	-9.06	-13.96	-4.91	CuF
CuF2	-17.40	-16.28	1.12	CuF2
CuF2:2H2O	-11.73	-16.28	-4.55	CuF2:2H2O
Cumetal	-5.58	-14.33	-8.76	Cu
CuMoO4	-1.94	-15.02	-13.08	CuMoO4
CuOCuSO4	-12.90	-2.60	10.30	CuOCuSO4
Cupricferrite	8.91	14.90	5.99	CuFe2O4
Cuprite	-1.72	-3.12	-1.41	Cu2O
Cuprousferrite	10.55	1.63	-8.92	CuFeO2
CuSe	-6.63	-39.73	-33.10	CuSe
CuSe2	-29.07	-62.43	-33.37	CuSe2
CuSeO3:2H2O	-8.47	-7.96	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.28	-18.72	-2.44	CuSeO4:5H2O
CuSO4	-14.06	-11.12	2.94	CuSO4
Diaspore	0.89	7.76	6.87	AlOOH
Djurleite	-56.60	-90.52	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.40	-16.94	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.15	-16.94	-17.09	CaMg(CO3)2
Epsomite	-4.33	-6.46	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.92	-0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-13.51	-17.23	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.65	-10.09	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-22.42	-43.04	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-48.80	-52.54	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.63	-13.23	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-10.00	-20.09	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-48.91	-67.50	-18.60	FeSe2
FeS(ppt)	-81.76	-84.71	-2.95	FeS
FeSe	-33.80	-44.80	-11.00	FeSe
Fix_pe	-4.44	-4.44	0.00	e-
Fluorite	-1.13	-11.63	-10.50	CaF2
Galena	-68.15	-82.12	-13.97	PbS
Gibbsite	-0.53	7.76	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.40	-9.41	-2.01	ZnSO4:7H2O
Greenalite	-17.81	3.00	20.81	Fe3Si2O5(OH)4
Greenockite	-66.32	-80.68	-14.36	CdS
Greigite	-297.77	-342.80	-45.03	Fe3S4
Gummite	-6.06	1.61	7.67	UO3
Gypsum	-1.86	-6.47	-4.61	CaSO4:2H2O
H-Jarosite	-17.61	-29.71	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.66	-23.54	-12.88	H2MoO4
H2S(g)	-80.15	-88.16	-8.01	H2S
H2Se(g)	-43.29	-48.25	-4.96	H2Se
Halite	-6.73	-5.13	1.60	NaCl
Halloysite	-1.40	8.17	9.57	Al2Si2O5(OH)4

Hausmannite	-1.75	59.28	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-3.92	18.97	22.89	FeAl2O4
Hg (CH3) 2 (g)	-186.20	-259.91	-73.71	Hg (CH3) 2
Hg (g)	-8.34	-16.21	-7.87	Hg
Hg (OH) 2	-8.76	-12.26	-3.50	Hg (OH) 2
Hg2 (g)	-17.47	-32.42	-14.96	Hg2
Hg2 (OH) 2	-12.14	-6.88	5.26	Hg2 (OH) 2
Hg2CO3	-12.47	-28.52	-16.05	Hg2CO3
Hg2CrO4	-28.42	-37.12	-8.70	Hg2CrO4
Hg2F2	-21.32	-31.68	-10.36	Hg2F2
Hg2S	-83.36	-95.04	-11.68	Hg2S
Hg2SeO3	-18.70	-23.35	-4.66	Hg2SeO3
Hg2SO4	-20.39	-26.52	-6.13	Hg2SO4
Hg3O2CO3	-28.74	-58.42	-29.68	Hg3O2CO3
HgCl (g)	-33.98	-14.48	19.50	HgCl
HgCl2	-13.08	-34.34	-21.26	HgCl2
HgF (g)	-48.51	-15.84	32.68	HgF
HgF2 (g)	-49.62	-37.06	12.57	HgF2
Hgmetal (l)	-2.76	-16.21	-13.45	Hg
HgSe	-4.81	-60.51	-55.69	HgSe
HgSeO3	-16.30	-28.73	-12.43	HgSeO3
HgSO4	-22.48	-31.90	-9.42	HgSO4
Huntite	-3.90	-33.87	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.41	-25.19	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.90	-20.67	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-21.39	-26.56	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-9.95	-24.75	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.31	-50.55	-17.24	K2Cr2O7
K2CrO4	-19.80	-20.31	-0.51	K2CrO4
K2MoO4	-16.88	-13.62	3.26	K2MoO4
K2SeO4	-16.59	-17.32	-0.73	K2SeO4
Kaolinite	0.74	8.17	7.43	Al2Si2O5 (OH) 4
Langite	-3.05	14.44	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.13	-7.57	-0.43	PbO : PbSO4
Laurionite	-5.63	-5.00	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.66	6.04	12.69	PbO
Mackinawite	-81.11	-84.71	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.71	19.57	16.86	Fe2MgO4
Magnesite	-1.00	-8.46	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.70	-4.61	-5.31	Cu2 (OH) 2CO3
Manganite	-1.32	24.02	25.34	MnOOH
Massicot	-6.86	6.04	12.89	PbO
Matlockite	-8.43	-17.41	-8.97	PbClF
Melanothallite	-19.82	-13.56	6.26	CuCl2
Melanterite	-13.98	-16.19	-2.21	FeSO4 : 7H2O
Metacinnabar	-55.32	-100.42	-45.09	HgS
Mg (OH) 2 (active)	-5.61	13.18	18.79	Mg (OH) 2
Mg (VO3) 2	-18.78	-7.50	11.28	Mg (VO3) 2
Mg2Sb3	-277.56	-202.87	74.68	Mg2Sb3
Mg2V2O7	-20.68	5.68	26.36	Mg2V2O7
MgCr2O4	-5.37	10.83	16.20	MgCr2O4
MgCrO4	-22.43	-17.05	5.38	MgCrO4
MgF2	-3.49	-11.62	-8.13	MgF2
MgMoO4	-8.50	-10.35	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.35	-3.29	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.85	-14.05	-1.20	MgSeO4 : 6H2O
Minium	-29.87	43.65	73.52	Pb3O4
Mirabilite	-6.70	-7.81	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-14.34	-9.44	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-55.87	-61.58	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.06	-87.98	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.60	0.90	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.55	-10.84	2.72	MnCl2 : 4H2O

MnS (grn)	-77.08	-76.91	0.17	MnS
MnS (pnk)	-80.25	-76.91	3.34	MnS
MnSb	-96.12	-99.03	-2.91	MnSb
MnSe	-40.50	-37.00	3.50	MnSe
MnSeO3	-6.36	-5.23	1.13	MnSeO3
MnSeO3:2H2O	-6.21	-5.23	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.94	-15.99	-2.05	MnSeO4:5H2O
MnSO4	-10.98	-8.39	2.58	MnSO4
Monteponite	-7.63	7.47	15.10	CdO
Montroydite	-8.62	-12.26	-3.64	HgO
MoO3	-15.54	-23.54	-8.00	MoO3
Morenosite	-8.96	-11.10	-2.14	NiSO4:7H2O
MoS2	-155.14	-225.40	-70.26	MoS2
Na-Jarosite	-12.59	-23.79	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.75	-48.65	-9.90	Na2Cr2O7
Na2CrO4	-21.34	-18.41	2.93	Na2CrO4
Na2Mo2O7	-18.65	-35.25	-16.60	Na2Mo2O7
Na2MoO4	-13.20	-11.71	1.49	Na2MoO4
Na2MoO4:2H2O	-12.93	-11.71	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.95	-4.65	10.30	Na2SeO3:5H2O
Na2SeO4	-16.69	-15.41	1.28	Na2SeO4
Na3Sb	-174.41	-79.96	94.45	Na3Sb
Na3VO4	-29.28	7.40	36.68	Na3VO4
Na4V2O7	-34.42	2.98	37.40	Na4V2O7
Nantokite	-5.87	-12.60	-6.73	CuCl
NaSb	-89.41	-66.24	23.17	NaSb
Natron	-8.51	-9.82	-1.31	Na2CO3:10H2O
NaVO3	-8.29	-4.43	3.86	NaVO3
Nesquehonite	-3.79	-8.46	-4.67	MgCO3:3H2O
Ni(OH)2	-4.25	8.54	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.92	-7.22	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.48	14.52	32.00	Ni4(OH)6SO4
NiCO3	-6.24	-13.11	-6.87	NiCO3
NiMoO4	-3.86	-15.00	-11.14	NiMoO4
NiS(alpha)	-74.02	-79.62	-5.60	NiS
NiS(beta)	-68.52	-79.62	-11.10	NiS
NiS(gamma)	-66.82	-79.62	-12.80	NiS
NiSe	-22.01	-39.71	-17.70	NiSe
NiSeO3:2H2O	-10.75	-7.94	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.18	-18.70	-1.52	NiSeO4:6H2O
Nsutite	-6.06	11.44	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-249.54	-310.61	-61.07	As2S3
Otavite	-2.17	-14.17	-12.00	CdCO3
Pb(BO2)2	-10.52	-4.00	6.52	Pb(BO2)2
Pb(OH)2	-2.11	6.04	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.76	-69.52	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.76	1.03	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.12	12.07	26.19	Pb2O(OH)2
Pb2O3	-23.42	37.62	61.04	Pb2O3
Pb2OCO3	-9.02	-9.57	-0.56	Pb2OCO3
Pb2V2O7	-6.71	-8.61	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.53	-14.73	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.72	-2.58	6.14	Pb3(VO4)2
Pb3O2CO3	-14.56	-3.54	11.02	Pb3O2CO3
Pb3O2SO4	-12.22	-1.53	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.60	4.50	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.37	4.50	21.88	Pb4O3SO4
PbCrO4	-11.60	-24.20	-12.60	PbCrO4
PbF2	-11.32	-18.76	-7.44	PbF2
Pbmetal	-23.75	-19.51	4.25	Pb
PbMoO4	-1.88	-17.50	-15.62	PbMoO4
PbO:0.3H2O	-6.94	6.04	12.98	PbO:0.33H2O
PbSeO4	-14.36	-21.20	-6.84	PbSeO4
Periclase	-8.40	13.18	21.58	MgO
Phosgenite	-11.85	-31.66	-19.81	PbCl2:PbCO3
Plattnerite	-18.02	31.58	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2

Pyrite	-128.81	-147.32	-18.51	FeS2
Pyrochroite	-3.95	11.25	15.19	Mn(OH)2
Pyrolusite	-4.59	36.79	41.38	MnO2
Quartz	0.32	-3.68	-4.00	SiO2
Realgar	-104.25	-124.00	-19.75	AsS
Retgersite	-9.06	-11.10	-2.04	NiSO4:6H2O
Rhodochrosite	0.18	-10.40	-10.58	MnCO3
Rutherfordine	-5.53	-20.03	-14.50	UO2CO3
Sb(OH)3	-13.96	-21.07	-7.11	Sb(OH)3
Sb2O4	-19.99	-16.59	3.40	Sb2O4
Sb2O5	-30.00	-39.67	-9.67	Sb2O5
Sb2Se3	-119.13	-186.88	-67.76	Sb2Se3
Sb4O6(cubic)	-66.01	-84.27	-18.26	Sb4O6
Sb4O6(orth)	-66.37	-84.27	-17.90	Sb4O6
SbCl3	-54.76	-54.19	0.57	SbCl3
SbF3	-48.04	-58.27	-10.23	SbF3
Sbmetal	-47.70	-59.38	-11.69	Sb
SbO2	-4.78	-32.61	-27.82	SbO2
Schoepite	-4.38	1.61	5.99	UO2(OH)2:H2O
Semetal(am)	-15.59	-22.70	-7.11	Se
Semetal(hex)	-15.00	-22.70	-7.71	Se
Senarmontite	-29.77	-42.14	-12.37	Sb2O3
SeO2	-16.60	-16.48	0.12	SeO2
SeO3	-48.28	-27.24	21.04	SeO3
Sepiolite	-0.42	15.34	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-3.44	15.34	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-0.97	-3.68	-2.71	SiO2
SiO2(am-ppt)	-0.94	-3.68	-2.74	SiO2
Smithsonite	-1.42	-11.42	-10.00	ZnCO3
Sphalerite	-66.48	-77.93	-11.45	ZnS
Spinel	-8.14	28.71	36.85	MgAl2O4
Stibnite	-256.15	-306.61	-50.46	Sb2S3
Sulfur	-60.47	-62.61	-2.14	S
Tenorite	0.88	8.52	7.64	CuO
Thenardite	-8.13	-7.81	0.32	Na2SO4
Thermonatrite	-10.45	-9.82	0.64	Na2CO3:H2O
Tyuyamunite	-8.37	-4.29	4.08	Ca(UO2)2(VO4)2
U3O8	-14.14	6.95	21.08	U3O8
U3Sb4	-587.33	-434.95	152.38	U3Sb4
U4O9	-30.29	-33.31	-3.02	U4O9
UF4	-34.78	-64.32	-29.54	UF4
UF4:2.5H2O	-31.60	-64.32	-32.72	UF4:2.5H2O
UO2(am)	-15.65	-14.71	0.93	UO2
UO2(NO3)2	-44.92	-32.77	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-37.62	-32.77	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-36.16	-32.77	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.82	-32.77	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.00	1.61	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.37	-25.62	-2.25	UO2SeO4:4H2O
UO3	-6.09	1.61	7.70	UO3
Uraninite	-10.05	-14.71	-4.67	UO2
USb2	-223.37	-193.79	29.58	USb2
V(OH)3	-20.88	-13.29	7.59	V(OH)3
V2O5	-19.32	-20.68	-1.36	V2O5
V3O5	-46.02	-44.18	1.84	V3O5
V4O7	-57.58	-50.39	7.19	V4O7
V6O13	-52.28	-113.14	-60.86	V6O13
Valentinite	-33.65	-42.14	-8.48	Sb2O3
VC12	-67.02	-48.14	18.87	VC12
VC13	-69.84	-46.41	23.43	VC13
VF4	-70.74	-55.81	14.93	VF4
Vmetal	-95.63	-51.60	44.03	V
VO	-40.82	-26.06	14.76	VO
VO(OH)2	-11.36	-6.21	5.15	VO(OH)2
VO2Cl	-24.22	-21.38	2.84	VO2Cl
VOC1	-35.48	-24.33	11.15	VOC1
VOC12	-41.05	-28.29	12.76	VOC12

VOSO4	-29.46	-25.85	3.61	VOSO4
Witherite	-5.10	-13.67	-8.57	BaCO3
Wurtzite	-68.98	-77.93	-8.95	ZnS
Zincite	-1.11	10.23	11.33	ZnO
Zincosite	-13.34	-9.41	3.93	ZnSO4
Zn(BO2)2	-8.10	0.19	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-27.48	-24.16	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.97	10.23	12.20	Zn(OH)2
Zn(OH)2(am)	-2.25	10.23	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.53	10.23	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.31	10.23	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.51	10.23	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.69	0.81	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.78	9.41	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.81	-2.16	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.52	-8.60	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.14	21.26	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-9.45	29.05	38.50	Zn5(OH)8Cl2
ZnCl2	-18.91	-11.86	7.05	ZnCl2
ZnCO3:1H2O	-1.16	-11.42	-10.26	ZnCO3:1H2O
ZnF2	-14.04	-14.57	-0.53	ZnF2
Znmetal	-41.11	-15.32	25.79	Zn
ZnMoO4	-3.19	-13.31	-10.13	ZnMoO4
ZnO(active)	-0.96	10.23	11.19	ZnO
ZnS(am)	-68.88	-77.93	-9.05	ZnS
ZnSb	-85.72	-74.70	11.01	ZnSb
ZnSe	-23.62	-38.02	-14.40	ZnSe
ZnSeO4:6H2O	-15.49	-17.01	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.78	-9.41	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 84.

```

Title Stage 5 pit lake GW inflow
Title Stage 5 Groundwater mix
MIX 501
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.244362
11     1.981130
12     1.482260
13     3.481749
14     0
15     0
Save solution 501
end

```

TITLE

Stage 5 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 501.

Mixture 501.

1.000e+00 Solution 2 JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.444e-01 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.981e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.482e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.482e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	1.020e-08	8.350e-08
Al	5.519e-07	4.520e-06
As	4.949e-09	4.053e-08
B	1.940e-06	1.588e-05
Ba	1.782e-07	1.459e-06
C	1.486e-03	1.217e-02
Ca	6.631e-04	5.431e-03
Cd	1.417e-09	1.161e-08
Cl	2.086e-04	1.708e-03
Co	1.659e-08	1.359e-07
Cr	1.551e-08	1.270e-07
Cu	1.144e-06	9.366e-06
F	5.149e-05	4.217e-04
Fe	3.261e-06	2.671e-05
Hg	2.625e-11	2.150e-10
K	8.612e-05	7.052e-04
Mg	2.100e-04	1.720e-03
Mn	2.874e-06	2.354e-05
Mo	6.666e-08	5.460e-07
Na	6.047e-04	4.953e-03
Ni	2.603e-08	2.131e-07
Pb	3.153e-09	2.582e-08
S	4.330e-04	3.546e-03
Sb	1.590e-09	1.302e-08
Se	5.700e-09	4.668e-08
U	1.007e-08	8.251e-08

V	1.384e-08	1.133e-07
Zn	1.390e-07	1.138e-06

-----Description of solution-----

	pH =	7.217	Charge balance
	pe =	4.772	Adjusted to redox
equilibrium	Activity of water	=	1.000
	Ionic strength (mol/kgw)	=	3.558e-03
	Mass of water (kg)	=	8.190e+00
	Total alkalinity (eq/kg)	=	1.325e-03
	Total CO2 (mol/kg)	=	1.486e-03
	Temperature (°C)	=	25.00
	Electrical balance (eq)	=	8.787e-19
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	13
	Total H	=	9.091602e+02
	Total O	=	4.546241e+02

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.770e-07	1.658e-07	-6.752	-6.780	-0.028	(0)
H+	6.480e-08	6.073e-08	-7.188	-7.217	-0.028	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	1.020e-08					
Ag+	7.016e-09	6.575e-09	-8.154	-8.182	-0.028	(0)
AgCl	2.624e-09	2.624e-09	-8.581	-8.581	0.000	(0)
Ag2Se	2.325e-10	2.325e-10	-9.634	-9.634	0.000	(0)
AgCl2-	4.791e-11	4.467e-11	-10.320	-10.350	-0.030	(0)
AgSO4-	4.238e-11	3.951e-11	-10.373	-10.403	-0.030	(0)
AgF	7.790e-13	7.790e-13	-12.108	-12.108	0.000	(0)
AgOH	1.090e-13	1.090e-13	-12.963	-12.963	0.000	(0)
AgCl3-2	1.030e-14	7.781e-15	-13.987	-14.109	-0.122	(0)
AgH2BO3	1.914e-15	1.914e-15	-14.718	-14.718	0.000	(0)
AgSeO3-	1.401e-15	1.306e-15	-14.853	-14.884	-0.030	(0)
AgCl4-3	5.833e-18	3.105e-18	-17.234	-17.508	-0.274	(0)
Ag (OH) 2-	1.895e-18	1.766e-18	-17.722	-17.753	-0.030	(0)
Ag (SeO3) 2-3	6.793e-24	3.616e-24	-23.168	-23.442	-0.274	(0)
Ag2MoO4	8.409e-25	8.409e-25	-24.075	-24.075	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.353	-67.353	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.349	-77.835	-0.487	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.208	-136.238	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.411	-136.505	-0.094	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.728	-0.191	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.039	-0.186	(0)
Al	5.519e-07					
Al (OH) 4-	5.162e-07	4.841e-07	-6.287	-6.315	-0.028	(0)
Al (OH) 3	2.319e-08	2.319e-08	-7.635	-7.635	0.000	(0)
Al (OH) 2+	7.469e-09	7.010e-09	-8.127	-8.154	-0.028	(0)
AlF2+	3.029e-09	2.843e-09	-8.519	-8.546	-0.028	(0)
AlF3	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
AlF+2	1.951e-10	1.514e-10	-9.710	-9.820	-0.110	(0)
AlOH+2	6.858e-11	5.323e-11	-10.164	-10.274	-0.110	(0)
AlF4-	4.257e-11	3.991e-11	-10.371	-10.399	-0.028	(0)
AlSO4+	8.005e-13	7.506e-13	-12.097	-12.125	-0.028	(0)
Al+3	5.755e-13	3.210e-13	-12.240	-12.493	-0.253	(0)
Al (SO4) 2-	2.583e-15	2.422e-15	-14.588	-14.616	-0.028	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.262	-44.536	-0.274	(0)
As (3)	1.269e-19					
H3AsO3	1.258e-19	1.258e-19	-18.900	-18.900	0.000	(0)
H2AsO3-	1.140e-21	1.062e-21	-20.943	-20.974	-0.030	(0)
HAsO3-2	2.112e-26	1.596e-26	-25.675	-25.797	-0.122	(0)
H4AsO3+	4.060e-27	3.785e-27	-26.392	-26.422	-0.030	(0)
AsO3-3	1.902e-32	1.013e-32	-31.721	-31.994	-0.274	(0)

As (5)	4.949e-09					
HAsO4-2	3.416e-09	2.581e-09	-8.467	-8.588	-0.122	(0)
H2AsO4-	1.533e-09	1.429e-09	-8.814	-8.845	-0.030	(0)
AsO4-3	2.525e-13	1.344e-13	-12.598	-12.872	-0.274	(0)
H3AsO4	1.507e-14	1.509e-14	-13.822	-13.821	0.000	(0)
B	1.940e-06					
H3BO3	1.919e-06	1.921e-06	-5.717	-5.716	0.000	(0)
H2BO3-	1.964e-08	1.837e-08	-7.707	-7.736	-0.029	(0)
CaH2BO3+	5.386e-10	5.038e-10	-9.269	-9.298	-0.029	(0)
MgH2BO3+	1.043e-10	9.760e-11	-9.982	-10.011	-0.029	(0)
BF(OH) 3-	3.865e-11	3.615e-11	-10.413	-10.442	-0.029	(0)
NaH2BO3	1.646e-11	1.646e-11	-10.783	-10.783	0.000	(0)
BaH2BO3+	8.261e-14	7.727e-14	-13.083	-13.112	-0.029	(0)
H5 (BO3) 2-	3.211e-14	3.003e-14	-13.493	-13.522	-0.029	(0)
BF2 (OH) 2-	1.184e-14	1.107e-14	-13.927	-13.956	-0.029	(0)
AgH2BO3	1.914e-15	1.914e-15	-14.718	-14.718	0.000	(0)
H8 (BO3) 3-	6.168e-18	5.769e-18	-17.210	-17.239	-0.029	(0)
BF3OH-	1.319e-20	1.234e-20	-19.880	-19.909	-0.029	(0)
BF4-	1.859e-25	1.739e-25	-24.731	-24.760	-0.029	(0)
Ba	1.782e-07					
Ba+2	1.764e-07	1.361e-07	-6.753	-6.866	-0.113	(0)
BaHCO3+	1.692e-09	1.589e-09	-8.772	-8.799	-0.027	(0)
BaCO3	6.587e-11	6.587e-11	-10.181	-10.181	0.000	(0)
BaOH+	1.050e-13	9.851e-14	-12.979	-13.007	-0.028	(0)
BaH2BO3+	8.261e-14	7.727e-14	-13.083	-13.112	-0.029	(0)
C (4)	1.486e-03					
HCO3-	1.302e-03	1.222e-03	-2.885	-2.913	-0.028	(0)
H2CO3	1.669e-04	1.669e-04	-3.777	-3.777	0.000	(0)
CaHCO3+	1.155e-05	1.085e-05	-4.937	-4.965	-0.027	(0)
MgHCO3+	2.045e-06	1.916e-06	-5.689	-5.718	-0.028	(0)
CO3-2	1.223e-06	9.435e-07	-5.913	-6.025	-0.113	(0)
CuCO3	8.342e-07	8.342e-07	-6.079	-6.079	0.000	(0)
CaCO3	7.127e-07	7.127e-07	-6.147	-6.147	0.000	(0)
NaHCO3	3.886e-07	3.886e-07	-6.410	-6.410	0.000	(0)
MgCO3	1.203e-07	1.203e-07	-6.920	-6.920	0.000	(0)
MnHCO3+	5.314e-08	4.986e-08	-7.275	-7.302	-0.028	(0)
CuHCO3+	1.242e-08	1.158e-08	-7.906	-7.936	-0.030	(0)
NaCO3-	1.058e-08	9.935e-09	-7.975	-8.003	-0.028	(0)
UO2 (CO3) 2-2	8.760e-09	6.619e-09	-8.058	-8.179	-0.122	(0)
ZnCO3	5.107e-09	5.107e-09	-8.292	-8.292	0.000	(0)
ZnHCO3+	3.899e-09	3.635e-09	-8.409	-8.439	-0.030	(0)
Cu (CO3) 2-2	2.804e-09	2.119e-09	-8.552	-8.674	-0.122	(0)
NiHCO3+	2.701e-09	2.518e-09	-8.568	-8.599	-0.030	(0)
BaHCO3+	1.692e-09	1.589e-09	-8.772	-8.799	-0.027	(0)
PbCO3	1.562e-09	1.562e-09	-8.806	-8.806	0.000	(0)
CoHCO3+	1.122e-09	1.046e-09	-8.950	-8.980	-0.030	(0)
FeHCO3+	1.097e-09	1.030e-09	-8.960	-8.987	-0.027	(0)
UO2 (CO3) 3-4	9.601e-10	3.130e-10	-9.018	-9.504	-0.487	(0)
NiCO3	5.884e-10	5.884e-10	-9.230	-9.230	0.000	(0)
PbHCO3+	5.365e-10	5.002e-10	-9.270	-9.301	-0.030	(0)
UO2CO3	3.516e-10	3.516e-10	-9.454	-9.454	0.000	(0)
CoCO3	1.755e-10	1.755e-10	-9.756	-9.756	0.000	(0)
BaCO3	6.587e-11	6.587e-11	-10.181	-10.181	0.000	(0)
CdCO3	2.155e-11	2.155e-11	-10.666	-10.666	0.000	(0)
Pb (CO3) 2-2	5.626e-12	4.252e-12	-11.250	-11.371	-0.122	(0)
CdHCO3+	2.991e-12	2.789e-12	-11.524	-11.555	-0.030	(0)
Cd (CO3) 2-2	1.995e-14	1.508e-14	-13.700	-13.822	-0.122	(0)
HgCO3	1.123e-17	1.123e-17	-16.950	-16.950	0.000	(0)
Hg (CO3) 2-2	4.434e-20	3.351e-20	-19.353	-19.475	-0.122	(0)
HgHCO3+	1.362e-20	1.270e-20	-19.866	-19.896	-0.030	(0)
Ca	6.631e-04					
Ca+2	6.177e-04	4.766e-04	-3.209	-3.322	-0.113	(0)
CaSO4	3.288e-05	3.288e-05	-4.483	-4.483	0.000	(0)
CaHCO3+	1.155e-05	1.085e-05	-4.937	-4.965	-0.027	(0)
CaCO3	7.127e-07	7.127e-07	-6.147	-6.147	0.000	(0)
CaF+	2.615e-07	2.453e-07	-6.583	-6.610	-0.028	(0)
CaOH+	1.679e-09	1.577e-09	-8.775	-8.802	-0.027	(0)
CaH2BO3+	5.386e-10	5.038e-10	-9.269	-9.298	-0.029	(0)

Cd	1.417e-09					
Cd+2	1.299e-09	1.002e-09	-8.886	-8.999	-0.113	(0)
CdSO4	7.076e-11	7.076e-11	-10.150	-10.150	0.000	(0)
CdCO3	2.155e-11	2.155e-11	-10.666	-10.666	0.000	(0)
CdCl+	2.006e-11	1.871e-11	-10.698	-10.728	-0.030	(0)
CdHCO3+	2.991e-12	2.789e-12	-11.524	-11.555	-0.030	(0)
CdOH+	1.416e-12	1.320e-12	-11.849	-11.879	-0.030	(0)
CdF+	8.036e-13	7.492e-13	-12.095	-12.125	-0.030	(0)
Cd(SO4)2-2	3.805e-13	2.875e-13	-12.420	-12.541	-0.122	(0)
CdOHC1	1.272e-13	1.272e-13	-12.895	-12.895	0.000	(0)
Cd(CO3)2-2	1.995e-14	1.508e-14	-13.700	-13.822	-0.122	(0)
CdCl2	1.524e-14	1.524e-14	-13.817	-13.817	0.000	(0)
Cd(OH)2	1.381e-15	1.381e-15	-14.860	-14.860	0.000	(0)
CdF2	7.051e-17	7.051e-17	-16.152	-16.152	0.000	(0)
CdCl3-	2.016e-18	1.880e-18	-17.695	-17.726	-0.030	(0)
Cd(OH)3-	1.500e-20	1.399e-20	-19.824	-19.854	-0.030	(0)
Cd2OH+3	1.245e-20	6.630e-21	-19.905	-20.178	-0.274	(0)
CdSeO4	6.761e-21	6.761e-21	-20.170	-20.170	0.000	(0)
Cd(SeO3)2-2	1.045e-22	7.894e-23	-21.981	-22.103	-0.122	(0)
Cd(OH)4-2	5.023e-28	3.796e-28	-27.299	-27.421	-0.122	(0)
CdHS+	0.000e+00	0.000e+00	-73.946	-73.976	-0.030	(0)
Cd(HS)2	0.000e+00	0.000e+00	-139.758	-139.758	0.000	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-210.812	-210.843	-0.030	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-281.510	-281.632	-0.122	(0)
Cl	2.086e-04					
Cl-	2.086e-04	1.955e-04	-3.681	-3.709	-0.028	(0)
AgCl	2.624e-09	2.624e-09	-8.581	-8.581	0.000	(0)
MnCl+	5.362e-10	5.031e-10	-9.271	-9.298	-0.028	(0)
CuCl	3.060e-10	3.060e-10	-9.514	-9.514	0.000	(0)
CuCl+	4.964e-11	4.651e-11	-10.304	-10.332	-0.028	(0)
ZnCl+	4.928e-11	4.618e-11	-10.307	-10.336	-0.028	(0)
AgCl2-	4.791e-11	4.467e-11	-10.320	-10.350	-0.030	(0)
CdCl+	2.006e-11	1.871e-11	-10.698	-10.728	-0.030	(0)
CuCl2-	1.334e-11	1.250e-11	-10.875	-10.903	-0.028	(0)
ZnOHC1	1.002e-11	1.002e-11	-10.999	-10.999	0.000	(0)
NiCl+	8.965e-12	8.359e-12	-11.047	-11.078	-0.030	(0)
CoCl+	7.981e-12	7.441e-12	-11.098	-11.128	-0.030	(0)
PbCl+	4.097e-12	3.820e-12	-11.387	-11.418	-0.030	(0)
MnCl2	1.389e-13	1.389e-13	-12.857	-12.857	0.000	(0)
CdOHC1	1.272e-13	1.272e-13	-12.895	-12.895	0.000	(0)
CdCl2	1.524e-14	1.524e-14	-13.817	-13.817	0.000	(0)
ZnCl2	1.431e-14	1.431e-14	-13.844	-13.844	0.000	(0)
AgCl3-2	1.030e-14	7.781e-15	-13.987	-14.109	-0.122	(0)
PbCl2	3.335e-15	3.335e-15	-14.477	-14.477	0.000	(0)
CuCl2	3.152e-15	3.152e-15	-14.501	-14.501	0.000	(0)
CuCl3-2	6.740e-16	5.222e-16	-15.171	-15.282	-0.111	(0)
HgClOH	5.692e-16	5.692e-16	-15.245	-15.245	0.000	(0)
CrCl+2	5.888e-17	4.449e-17	-16.230	-16.352	-0.122	(0)
HgCl2	3.799e-17	3.799e-17	-16.420	-16.420	0.000	(0)
UO2Cl+	3.182e-17	2.967e-17	-16.497	-16.528	-0.030	(0)
NiCl2	8.226e-18	8.226e-18	-17.085	-17.085	0.000	(0)
MnCl3-	7.970e-18	7.477e-18	-17.099	-17.126	-0.028	(0)
AgCl4-3	5.833e-18	3.105e-18	-17.234	-17.508	-0.274	(0)
FeCl+2	2.803e-18	2.171e-18	-17.552	-17.663	-0.111	(0)
ZnCl3-	2.370e-18	2.221e-18	-17.625	-17.653	-0.028	(0)
CdCl3-	2.016e-18	1.880e-18	-17.695	-17.726	-0.030	(0)
PbCl3-	2.784e-19	2.595e-19	-18.555	-18.586	-0.030	(0)
HgCl3-	7.965e-20	7.426e-20	-19.099	-19.129	-0.030	(0)
HgCl+	4.160e-20	3.879e-20	-19.381	-19.411	-0.030	(0)
CrOHC12	2.741e-20	2.741e-20	-19.562	-19.562	0.000	(0)
CuCl3-	6.136e-21	5.750e-21	-20.212	-20.240	-0.028	(0)
VOCl+	2.649e-21	2.469e-21	-20.577	-20.607	-0.030	(0)
FeCl2+	2.021e-21	1.896e-21	-20.695	-20.722	-0.028	(0)
CrCl2+	8.850e-22	8.252e-22	-21.053	-21.083	-0.030	(0)
ZnCl4-2	2.802e-22	2.171e-22	-21.553	-21.663	-0.111	(0)
HgCl4-2	7.647e-23	5.779e-23	-22.116	-22.238	-0.122	(0)
PbCl4-2	3.068e-23	2.319e-23	-22.513	-22.635	-0.122	(0)
FeCl3	3.705e-26	3.705e-26	-25.431	-25.431	0.000	(0)

CuCl4-2	7.270e-27	5.633e-27	-26.138	-26.249	-0.111	(0)
CrO3Cl-	3.512e-29	3.275e-29	-28.454	-28.485	-0.030	(0)
CoCl+2	1.364e-37	1.030e-37	-36.865	-36.987	-0.122	(0)
UCl+3	0.000e+00	0.000e+00	-43.958	-44.232	-0.274	(0)
Co (2)	1.659e-08					
Co+2	1.456e-08	1.101e-08	-7.837	-7.958	-0.122	(0)
CoHCO3+	1.122e-09	1.046e-09	-8.950	-8.980	-0.030	(0)
CoSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
CoCO3	1.755e-10	1.755e-10	-9.756	-9.756	0.000	(0)
CoOH+	3.905e-11	3.641e-11	-10.408	-10.439	-0.030	(0)
CoF+	1.761e-11	1.642e-11	-10.754	-10.785	-0.030	(0)
CoCl+	7.981e-12	7.441e-12	-11.098	-11.128	-0.030	(0)
Co (OH) 2	4.795e-13	4.795e-13	-12.319	-12.319	0.000	(0)
Co (OH) 3-	1.701e-18	1.586e-18	-17.769	-17.800	-0.030	(0)
CoOOH-	4.269e-19	3.980e-19	-18.370	-18.400	-0.030	(0)
CoSeO4	1.998e-19	1.998e-19	-18.699	-18.699	0.000	(0)
Co2OH+3	3.772e-20	2.008e-20	-19.423	-19.697	-0.274	(0)
Co (OH) 4-2	5.516e-26	4.168e-26	-25.258	-25.380	-0.122	(0)
Co4 (OH) 4+4	1.075e-33	3.506e-34	-32.968	-33.455	-0.487	(0)
Co (3)	2.889e-30					
CoOH+2	2.889e-30	2.183e-30	-29.539	-29.661	-0.122	(0)
Co+3	4.644e-36	2.591e-36	-35.333	-35.587	-0.253	(0)
CoCl+2	1.364e-37	1.030e-37	-36.865	-36.987	-0.122	(0)
Cr (2)	9.404e-25					
Cr+2	9.404e-25	7.106e-25	-24.027	-24.148	-0.122	(0)
Cr (3)	1.551e-08					
Cr (OH) 2+	1.381e-08	1.287e-08	-7.860	-7.890	-0.030	(0)
Cr (OH) +2	8.443e-10	6.380e-10	-9.073	-9.195	-0.122	(0)
Cr (OH) 3	8.017e-10	8.017e-10	-9.096	-9.096	0.000	(0)
CrOHSO4	4.560e-11	4.560e-11	-10.341	-10.341	0.000	(0)
CrO2-	6.725e-12	6.270e-12	-11.172	-11.203	-0.030	(0)
Cr (OH) 4-	5.676e-12	5.292e-12	-11.246	-11.276	-0.030	(0)
CrF+2	1.740e-12	1.315e-12	-11.759	-11.881	-0.122	(0)
Cr+3	3.304e-13	1.759e-13	-12.481	-12.755	-0.274	(0)
CrSO4+	1.327e-13	1.237e-13	-12.877	-12.908	-0.030	(0)
CrCl+2	5.888e-17	4.449e-17	-16.230	-16.352	-0.122	(0)
Cr2 (OH) 2SO4+2	3.480e-18	2.630e-18	-17.458	-17.580	-0.122	(0)
Cr2 (OH) 2 (SO4) 2	4.705e-20	4.705e-20	-19.327	-19.327	0.000	(0)
CrOHC12	2.741e-20	2.741e-20	-19.562	-19.562	0.000	(0)
CrCl2+	8.850e-22	8.252e-22	-21.053	-21.083	-0.030	(0)
Cr (6)	3.371e-18					
CrO4-2	2.893e-18	2.232e-18	-17.539	-17.651	-0.113	(0)
HCrO4-	4.705e-19	4.387e-19	-18.327	-18.358	-0.030	(0)
NaCrO4-	6.728e-21	6.273e-21	-20.172	-20.203	-0.030	(0)
KCrO4-	7.164e-22	6.680e-22	-21.145	-21.175	-0.030	(0)
H2CrO4	2.159e-26	2.159e-26	-25.666	-25.666	0.000	(0)
CrO3SO4-2	3.234e-27	2.444e-27	-26.490	-26.612	-0.122	(0)
CrO3Cl-	3.512e-29	3.275e-29	-28.454	-28.485	-0.030	(0)
Cr2O7-2	8.830e-36	6.673e-36	-35.054	-35.176	-0.122	(0)
Cu (1)	1.653e-09					
Cu+	1.334e-09	1.244e-09	-8.875	-8.905	-0.030	(0)
CuCl	3.060e-10	3.060e-10	-9.514	-9.514	0.000	(0)
CuCl2-	1.334e-11	1.250e-11	-10.875	-10.903	-0.028	(0)
CuCl3-2	6.740e-16	5.222e-16	-15.171	-15.282	-0.111	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.864	-137.053	-0.189	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.599	-137.783	-0.184	(0)
Cu (2)	1.142e-06					
CuCO3	8.342e-07	8.342e-07	-6.079	-6.079	0.000	(0)
Cu+2	1.946e-07	1.502e-07	-6.711	-6.823	-0.113	(0)
CuOH+	8.401e-08	7.873e-08	-7.076	-7.104	-0.028	(0)
CuHCO3+	1.242e-08	1.158e-08	-7.906	-7.936	-0.030	(0)
CuSO4	1.036e-08	1.036e-08	-7.985	-7.985	0.000	(0)
Cu (CO3) 2-2	2.804e-09	2.119e-09	-8.552	-8.674	-0.122	(0)
Cu (OH) 2	2.604e-09	2.604e-09	-8.584	-8.584	0.000	(0)
CuF+	4.793e-10	4.469e-10	-9.319	-9.350	-0.030	(0)
Cu2 (OH) 2+2	2.060e-10	1.557e-10	-9.686	-9.808	-0.122	(0)
CuCl+	4.964e-11	4.651e-11	-10.304	-10.332	-0.028	(0)
Cu (OH) 3-	9.500e-13	8.857e-13	-12.022	-12.053	-0.030	(0)

		CuCl2	3.152e-15	3.152e-15	-14.501	-14.501	0.000	(0)
		Cu (OH) 4-2	1.530e-18	1.156e-18	-17.815	-17.937	-0.122	(0)
		CuCl3-	6.136e-21	5.750e-21	-20.212	-20.240	-0.028	(0)
		CuCl4-2	7.270e-27	5.633e-27	-26.138	-26.249	-0.111	(0)
		Cu (HS) 3-	0.000e+00	0.000e+00	-199.850	-199.880	-0.030	(0)
F	5.149e-05							
		F-	5.033e-05	4.717e-05	-4.298	-4.326	-0.028	(0)
		MgF+	8.648e-07	8.109e-07	-6.063	-6.091	-0.028	(0)
		CaF+	2.615e-07	2.453e-07	-6.583	-6.610	-0.028	(0)
		NaF	1.683e-08	1.683e-08	-7.774	-7.774	0.000	(0)
		HF	4.237e-09	4.237e-09	-8.373	-8.373	0.000	(0)
		MnF+	4.092e-09	3.839e-09	-8.388	-8.416	-0.028	(0)
		AlF2+	3.029e-09	2.843e-09	-8.519	-8.546	-0.028	(0)
		AlF3	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
		CuF+	4.793e-10	4.469e-10	-9.319	-9.350	-0.030	(0)
		AlF+2	1.951e-10	1.514e-10	-9.710	-9.820	-0.110	(0)
		ZnF+	9.495e-11	8.852e-11	-10.023	-10.053	-0.030	(0)
		AlF4-	4.257e-11	3.991e-11	-10.371	-10.399	-0.028	(0)
		BF (OH) 3-	3.865e-11	3.615e-11	-10.413	-10.442	-0.029	(0)
		NiF+	2.124e-11	1.980e-11	-10.673	-10.703	-0.030	(0)
		CoF+	1.761e-11	1.642e-11	-10.754	-10.785	-0.030	(0)
		PbF+	1.964e-12	1.831e-12	-11.707	-11.737	-0.030	(0)
		CrF+2	1.740e-12	1.315e-12	-11.759	-11.881	-0.122	(0)
		HF2-	8.112e-13	7.597e-13	-12.091	-12.119	-0.028	(0)
		CdF+	8.036e-13	7.492e-13	-12.095	-12.125	-0.030	(0)
		AgF	7.790e-13	7.790e-13	-12.108	-12.108	0.000	(0)
		UO2F+	6.537e-13	6.094e-13	-12.185	-12.215	-0.030	(0)
		UO2F2	8.290e-14	8.290e-14	-13.081	-13.081	0.000	(0)
		FeF2+	2.560e-14	2.401e-14	-13.592	-13.620	-0.028	(0)
		FeF+2	2.456e-14	1.903e-14	-13.610	-13.721	-0.111	(0)
		BF2 (OH) 2-	1.184e-14	1.107e-14	-13.927	-13.956	-0.029	(0)
		PbF2	1.699e-15	1.699e-15	-14.770	-14.770	0.000	(0)
		FeF3	1.598e-15	1.598e-15	-14.796	-14.796	0.000	(0)
		UO2F3-	1.053e-15	9.822e-16	-14.977	-15.008	-0.030	(0)
		VO2F	7.468e-17	7.468e-17	-16.127	-16.127	0.000	(0)
		CdF2	7.051e-17	7.051e-17	-16.152	-16.152	0.000	(0)
		H2F2	4.809e-17	4.809e-17	-16.318	-16.318	0.000	(0)
		VO2F2-	1.372e-18	1.279e-18	-17.863	-17.893	-0.030	(0)
		VOF+	1.366e-18	1.274e-18	-17.864	-17.895	-0.030	(0)
		UO2F4-2	4.870e-19	3.680e-19	-18.312	-18.434	-0.122	(0)
		PbF3-	1.631e-19	1.520e-19	-18.788	-18.818	-0.030	(0)
		VOF2	2.253e-20	2.253e-20	-19.647	-19.647	0.000	(0)
		BF3OH-	1.319e-20	1.234e-20	-19.880	-19.909	-0.029	(0)
		VO2F3-2	9.958e-22	7.525e-22	-21.002	-21.124	-0.122	(0)
		VOF3-	4.045e-23	3.771e-23	-22.393	-22.424	-0.030	(0)
		PbF4-2	4.542e-24	3.432e-24	-23.343	-23.464	-0.122	(0)
		Sb (OH) 2F	1.014e-24	1.014e-24	-23.994	-23.994	0.000	(0)
		SbOF	9.968e-25	9.968e-25	-24.001	-24.001	0.000	(0)
		BF4-	1.859e-25	1.739e-25	-24.731	-24.760	-0.029	(0)
		VO2F4-3	3.280e-26	1.746e-26	-25.484	-25.758	-0.274	(0)
		HgF+	1.865e-26	1.739e-26	-25.729	-25.760	-0.030	(0)
		VOF4-2	9.501e-27	7.180e-27	-26.022	-26.144	-0.122	(0)
		UF3+	2.683e-34	2.501e-34	-33.571	-33.602	-0.030	(0)
		UF2+2	4.428e-35	3.346e-35	-34.354	-34.475	-0.122	(0)
		UF4	1.294e-36	1.294e-36	-35.888	-35.888	0.000	(0)
		UF+3	1.058e-37	5.635e-38	-36.975	-37.249	-0.274	(0)
		UF5-	2.593e-39	2.418e-39	-38.586	-38.617	-0.030	(0)
		UF6-2	0.000e+00	0.000e+00	-40.341	-40.463	-0.122	(0)
Fe (2)	9.514e-08							
		Fe+2	8.862e-08	6.697e-08	-7.052	-7.174	-0.122	(0)
		FeSO4	4.951e-09	4.951e-09	-8.305	-8.305	0.000	(0)
		FeHCO3+	1.097e-09	1.030e-09	-8.960	-8.987	-0.027	(0)
		FeOH+	4.711e-10	4.420e-10	-9.327	-9.355	-0.028	(0)
		Fe (OH) 2	5.821e-14	5.821e-14	-13.235	-13.235	0.000	(0)
		Fe (OH) 3-	3.253e-15	3.052e-15	-14.488	-14.515	-0.028	(0)
		Fe (HS) 2	0.000e+00	0.000e+00	-144.195	-144.195	0.000	(0)
		Fe (HS) 3-	0.000e+00	0.000e+00	-215.112	-215.143	-0.030	(0)
Fe (3)	3.166e-06							

Fe (OH) 2+	2.706e-06	2.540e-06	-5.568	-5.595	-0.028	(0)
Fe (OH) 3	4.523e-07	4.523e-07	-6.345	-6.345	0.000	(0)
Fe (OH) 4-	7.440e-09	6.983e-09	-8.128	-8.156	-0.028	(0)
FeOH+2	5.083e-11	3.938e-11	-10.294	-10.405	-0.111	(0)
FeF2+	2.560e-14	2.401e-14	-13.592	-13.620	-0.028	(0)
FeF+2	2.456e-14	1.903e-14	-13.610	-13.721	-0.111	(0)
FeF3	1.598e-15	1.598e-15	-14.796	-14.796	0.000	(0)
FeSO4+	1.325e-15	1.243e-15	-14.878	-14.905	-0.028	(0)
Fe+3	6.594e-16	3.679e-16	-15.181	-15.434	-0.253	(0)
Fe (SO4) 2-	8.586e-18	8.005e-18	-17.066	-17.097	-0.030	(0)
FeCl+2	2.803e-18	2.171e-18	-17.552	-17.663	-0.111	(0)
Fe2 (OH) 2+4	1.575e-19	5.135e-20	-18.803	-19.289	-0.487	(0)
FeHSeO3+2	6.067e-21	4.584e-21	-20.217	-20.339	-0.122	(0)
FeCl2+	2.021e-21	1.896e-21	-20.695	-20.722	-0.028	(0)
Fe3 (OH) 4+5	1.086e-23	1.885e-24	-22.964	-23.725	-0.761	(0)
FeCl3	3.705e-26	3.705e-26	-25.431	-25.431	0.000	(0)
H (0)	1.492e-27					
H2	7.460e-28	7.466e-28	-27.127	-27.127	0.000	(0)
Hg (0)	2.625e-11					
Hg	2.625e-11	2.625e-11	-10.581	-10.581	0.000	(0)
Hg (1)	4.691e-25					
Hg2+2	2.346e-25	1.773e-25	-24.630	-24.751	-0.122	(0)
Hg (2)	2.342e-15					
Hg (OH) 2	1.724e-15	1.725e-15	-14.764	-14.763	0.000	(0)
HgClOH	5.692e-16	5.692e-16	-15.245	-15.245	0.000	(0)
HgCl2	3.799e-17	3.799e-17	-16.420	-16.420	0.000	(0)
HgCO3	1.123e-17	1.123e-17	-16.950	-16.950	0.000	(0)
HgCl3-	7.965e-20	7.426e-20	-19.099	-19.129	-0.030	(0)
HgOH+	7.041e-20	6.565e-20	-19.152	-19.183	-0.030	(0)
Hg (CO3) 2-2	4.434e-20	3.351e-20	-19.353	-19.475	-0.122	(0)
HgCl+	4.160e-20	3.879e-20	-19.381	-19.411	-0.030	(0)
HgHCO3+	1.362e-20	1.270e-20	-19.866	-19.896	-0.030	(0)
HgCl4-2	7.647e-23	5.779e-23	-22.116	-22.238	-0.122	(0)
Hg (OH) 3-	3.862e-23	3.601e-23	-22.413	-22.444	-0.030	(0)
Hg+2	1.316e-23	9.946e-24	-22.881	-23.002	-0.122	(0)
HgSO4	7.843e-25	7.843e-25	-24.106	-24.106	0.000	(0)
HgF+	1.865e-26	1.739e-26	-25.729	-25.760	-0.030	(0)
HgHS2-	0.000e+00	0.000e+00	-129.798	-129.828	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.651	-130.651	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.198	-131.320	-0.122	(0)
K	8.612e-05					
K+	8.593e-05	8.054e-05	-4.066	-4.094	-0.028	(0)
KSO4-	1.830e-07	1.717e-07	-6.738	-6.765	-0.028	(0)
KCrO4-	7.164e-22	6.680e-22	-21.145	-21.175	-0.030	(0)
Mg	2.100e-04					
Mg+2	1.986e-04	1.532e-04	-3.702	-3.815	-0.113	(0)
MgSO4	8.398e-06	8.398e-06	-5.076	-5.076	0.000	(0)
MgHCO3+	2.045e-06	1.916e-06	-5.689	-5.718	-0.028	(0)
MgF+	8.648e-07	8.109e-07	-6.063	-6.091	-0.028	(0)
MgCO3	1.203e-07	1.203e-07	-6.920	-6.920	0.000	(0)
MgOH+	1.076e-08	1.011e-08	-7.968	-7.995	-0.027	(0)
MgH2BO3+	1.043e-10	9.760e-11	-9.982	-10.011	-0.029	(0)
Mn (2)	2.874e-06					
Mn+2	2.706e-06	2.044e-06	-5.568	-5.689	-0.122	(0)
MnSO4	1.095e-07	1.095e-07	-6.961	-6.961	0.000	(0)
MnHCO3+	5.314e-08	4.986e-08	-7.275	-7.302	-0.028	(0)
MnF+	4.092e-09	3.839e-09	-8.388	-8.416	-0.028	(0)
MnOH+	9.076e-10	8.515e-10	-9.042	-9.070	-0.028	(0)
MnCl+	5.362e-10	5.031e-10	-9.271	-9.298	-0.028	(0)
MnCl2	1.389e-13	1.389e-13	-12.857	-12.857	0.000	(0)
MnSeO4	1.994e-17	1.994e-17	-16.700	-16.700	0.000	(0)
MnCl3-	7.970e-18	7.477e-18	-17.099	-17.126	-0.028	(0)
Mn (OH) 3-	1.542e-19	1.447e-19	-18.812	-18.840	-0.028	(0)
Mn (OH) 4-2	9.994e-26	7.743e-26	-25.000	-25.111	-0.111	(0)
MnSe	5.561e-40	5.561e-40	-39.255	-39.255	0.000	(0)
Mn (3)	9.680e-27					
Mn+3	9.680e-27	5.400e-27	-26.014	-26.268	-0.253	(0)
Mn (6)	0.000e+00					

MnO4-2	0.000e+00	0.000e+00	-47.180	-47.291	-0.111	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-51.863	-51.891	-0.029	(0)
Mo	6.666e-08					
MoO4-2	6.660e-08	5.138e-08	-7.177	-7.289	-0.113	(0)
HMoO4-	6.659e-11	6.209e-11	-10.177	-10.207	-0.030	(0)
H2MoO4	2.762e-14	2.762e-14	-13.559	-13.559	0.000	(0)
Ag2MoO4	8.409e-25	8.409e-25	-24.075	-24.075	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.262	-44.536	-0.274	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.672	-55.767	-1.095	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.836	-56.597	-0.761	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.545	-59.031	-0.487	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.728	-63.002	-0.274	(0)
Na	6.047e-04					
Na+	6.033e-04	5.655e-04	-3.219	-3.248	-0.028	(0)
NaSO4-	9.744e-07	9.146e-07	-6.011	-6.039	-0.028	(0)
NaHCO3	3.886e-07	3.886e-07	-6.410	-6.410	0.000	(0)
NaF	1.683e-08	1.683e-08	-7.774	-7.774	0.000	(0)
NaCO3-	1.058e-08	9.935e-09	-7.975	-8.003	-0.028	(0)
NaH2BO3	1.646e-11	1.646e-11	-10.783	-10.783	0.000	(0)
NaCrO4-	6.728e-21	6.273e-21	-20.172	-20.203	-0.030	(0)
Ni	2.603e-08					
Ni+2	2.166e-08	1.671e-08	-7.664	-7.777	-0.113	(0)
NiHCO3+	2.701e-09	2.518e-09	-8.568	-8.599	-0.030	(0)
NiSO4	1.004e-09	1.004e-09	-8.998	-8.998	0.000	(0)
NiCO3	5.884e-10	5.884e-10	-9.230	-9.230	0.000	(0)
NiOH+	3.742e-11	3.489e-11	-10.427	-10.457	-0.030	(0)
NiF+	2.124e-11	1.980e-11	-10.673	-10.703	-0.030	(0)
NiCl+	8.965e-12	8.359e-12	-11.047	-11.078	-0.030	(0)
Ni (OH) 2	4.595e-13	4.595e-13	-12.338	-12.338	0.000	(0)
Ni (SO4) 2-2	1.326e-14	1.002e-14	-13.878	-13.999	-0.122	(0)
Ni (OH) 3-	8.171e-17	7.618e-17	-16.088	-16.118	-0.030	(0)
NiCl2	8.226e-18	8.226e-18	-17.085	-17.085	0.000	(0)
NiSeO4	2.832e-19	2.832e-19	-18.548	-18.548	0.000	(0)
O (0)	1.817e-38					
O2	9.084e-39	9.092e-39	-38.042	-38.041	0.000	(0)
Pb	3.153e-09					
PbCO3	1.562e-09	1.562e-09	-8.806	-8.806	0.000	(0)
Pb+2	7.140e-10	5.509e-10	-9.146	-9.259	-0.113	(0)
PbHCO3+	5.365e-10	5.002e-10	-9.270	-9.301	-0.030	(0)
PbOH+	2.461e-10	2.294e-10	-9.609	-9.639	-0.030	(0)
PbSO4	8.126e-11	8.126e-11	-10.090	-10.090	0.000	(0)
Pb (CO3) 2-2	5.626e-12	4.252e-12	-11.250	-11.371	-0.122	(0)
PbCl+	4.097e-12	3.820e-12	-11.387	-11.418	-0.030	(0)
PbF+	1.964e-12	1.831e-12	-11.707	-11.737	-0.030	(0)
Pb (OH) 2	1.203e-12	1.203e-12	-11.920	-11.920	0.000	(0)
Pb (SO4) 2-2	1.952e-13	1.475e-13	-12.710	-12.831	-0.122	(0)
PbCl2	3.335e-15	3.335e-15	-14.477	-14.477	0.000	(0)
PbF2	1.699e-15	1.699e-15	-14.770	-14.770	0.000	(0)
Pb (OH) 3-	2.139e-16	1.994e-16	-15.670	-15.700	-0.030	(0)
Pb2OH+3	3.762e-18	2.003e-18	-17.425	-17.698	-0.274	(0)
PbCl3-	2.784e-19	2.595e-19	-18.555	-18.586	-0.030	(0)
PbF3-	1.631e-19	1.520e-19	-18.788	-18.818	-0.030	(0)
Pb (OH) 4-2	1.072e-20	8.098e-21	-19.970	-20.092	-0.122	(0)
PbCl4-2	3.068e-23	2.319e-23	-22.513	-22.635	-0.122	(0)
Pb3 (OH) 4+2	2.104e-23	1.590e-23	-22.677	-22.799	-0.122	(0)
PbF4-2	4.542e-24	3.432e-24	-23.343	-23.464	-0.122	(0)
Pb4 (OH) 4+4	2.134e-28	6.958e-29	-27.671	-28.158	-0.487	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.959	-139.959	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.614	-211.645	-0.030	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.353	-67.353	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.955	-72.985	-0.030	(0)
H2S	0.000e+00	0.000e+00	-73.182	-73.182	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.946	-73.976	-0.030	(0)
S5-2	0.000e+00	0.000e+00	-75.012	-75.134	-0.122	(0)
S6-2	0.000e+00	0.000e+00	-75.528	-75.650	-0.122	(0)
S4-2	0.000e+00	0.000e+00	-75.608	-75.729	-0.122	(0)

S3-2	0.000e+00	0.000e+00	-76.414	-76.535	-0.122	(0)
S2-2	0.000e+00	0.000e+00	-77.430	-77.551	-0.122	(0)
S-2	0.000e+00	0.000e+00	-82.958	-83.069	-0.111	(0)
HgHS2-	0.000e+00	0.000e+00	-129.798	-129.828	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.651	-130.651	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.198	-131.320	-0.122	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.208	-136.238	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.411	-136.505	-0.094	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.864	-137.053	-0.189	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.599	-137.783	-0.184	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.728	-0.191	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.039	-0.186	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.940	-138.970	-0.030	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.758	-139.758	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.959	-139.959	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.177	-140.177	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.195	-144.195	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.850	-199.880	-0.030	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.852	-209.882	-0.030	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.812	-210.843	-0.030	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.614	-211.645	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.524	-212.646	-0.122	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.112	-215.143	-0.030	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-281.510	-281.632	-0.122	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.206	-284.328	-0.122	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.153	-294.275	-0.122	(0)
S (6)	4.330e-04					
SO4-2	3.904e-04	3.012e-04	-3.409	-3.521	-0.113	(0)
CaSO4	3.288e-05	3.288e-05	-4.483	-4.483	0.000	(0)
MgSO4	8.398e-06	8.398e-06	-5.076	-5.076	0.000	(0)
NaSO4-	9.744e-07	9.146e-07	-6.011	-6.039	-0.028	(0)
KSO4-	1.830e-07	1.717e-07	-6.738	-6.765	-0.028	(0)
MnSO4	1.095e-07	1.095e-07	-6.961	-6.961	0.000	(0)
CuSO4	1.036e-08	1.036e-08	-7.985	-7.985	0.000	(0)
ZnSO4	6.198e-09	6.198e-09	-8.208	-8.208	0.000	(0)
FeSO4	4.951e-09	4.951e-09	-8.305	-8.305	0.000	(0)
HSO4-	1.906e-09	1.787e-09	-8.720	-8.748	-0.028	(0)
NiSO4	1.004e-09	1.004e-09	-8.998	-8.998	0.000	(0)
CoSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
PbSO4	8.126e-11	8.126e-11	-10.090	-10.090	0.000	(0)
CdSO4	7.076e-11	7.076e-11	-10.150	-10.150	0.000	(0)
CrOHSO4	4.560e-11	4.560e-11	-10.341	-10.341	0.000	(0)
AgSO4-	4.238e-11	3.951e-11	-10.373	-10.403	-0.030	(0)
Zn (SO4) 2-2	2.152e-11	1.626e-11	-10.667	-10.789	-0.122	(0)
AlSO4+	8.005e-13	7.506e-13	-12.097	-12.125	-0.028	(0)
Cd (SO4) 2-2	3.805e-13	2.875e-13	-12.420	-12.541	-0.122	(0)
Pb (SO4) 2-2	1.952e-13	1.475e-13	-12.710	-12.831	-0.122	(0)
CrSO4+	1.327e-13	1.237e-13	-12.877	-12.908	-0.030	(0)
UO2SO4	4.267e-14	4.267e-14	-13.370	-13.370	0.000	(0)
Ni (SO4) 2-2	1.326e-14	1.002e-14	-13.878	-13.999	-0.122	(0)
Al (SO4) 2-	2.583e-15	2.422e-15	-14.588	-14.616	-0.028	(0)
FeSO4+	1.325e-15	1.243e-15	-14.878	-14.905	-0.028	(0)
UO2 (SO4) 2-2	2.242e-16	1.694e-16	-15.649	-15.771	-0.122	(0)
Fe (SO4) 2-	8.586e-18	8.005e-18	-17.066	-17.097	-0.030	(0)
VO2SO4-	6.964e-18	6.492e-18	-17.157	-17.188	-0.030	(0)
Cr2 (OH) 2SO4+2	3.480e-18	2.630e-18	-17.458	-17.580	-0.122	(0)
VOSO4	3.736e-19	3.736e-19	-18.428	-18.428	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.705e-20	4.705e-20	-19.327	-19.327	0.000	(0)
HgSO4	7.843e-25	7.843e-25	-24.106	-24.106	0.000	(0)
CrO3SO4-2	3.234e-27	2.444e-27	-26.490	-26.612	-0.122	(0)
VSO4+	2.127e-32	1.983e-32	-31.672	-31.703	-0.030	(0)
U (SO4) 2	1.718e-39	1.718e-39	-38.765	-38.765	0.000	(0)
USO4+2	9.501e-40	7.179e-40	-39.022	-39.144	-0.122	(0)
Sb (3)	4.477e-19					
Sb (OH) 3	2.265e-19	2.265e-19	-18.645	-18.645	0.000	(0)
HSbO2	2.211e-19	2.211e-19	-18.655	-18.655	0.000	(0)
SbO2-	6.326e-24	5.898e-24	-23.199	-23.229	-0.030	(0)
Sb (OH) 4-	3.625e-24	3.379e-24	-23.441	-23.471	-0.030	(0)

Sb(OH) 2F	1.014e-24	1.014e-24	-23.994	-23.994	0.000	(0)
SbOF	9.968e-25	9.968e-25	-24.001	-24.001	0.000	(0)
Sb(OH) 2+	3.583e-25	3.341e-25	-24.446	-24.476	-0.030	(0)
SbO+	1.235e-25	1.152e-25	-24.908	-24.939	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.153	-294.275	-0.122	(0)
Sb (5)	1.590e-09					
SbO3-	1.588e-09	1.481e-09	-8.799	-8.829	-0.030	(0)
Sb(OH) 6-	1.848e-12	1.732e-12	-11.733	-11.761	-0.028	(0)
SbO2+	1.680e-24	1.567e-24	-23.775	-23.805	-0.030	(0)
Se (-2)	2.325e-10					
Ag2Se	2.325e-10	2.325e-10	-9.634	-9.634	0.000	(0)
HSe-	4.299e-36	4.008e-36	-35.367	-35.397	-0.030	(0)
H2Se	1.890e-39	1.890e-39	-38.724	-38.724	0.000	(0)
MnSe	5.561e-40	5.561e-40	-39.255	-39.255	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.059	-43.180	-0.122	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.349	-77.835	-0.487	(0)
Se (4)	5.467e-09					
HSeO3-	5.058e-09	4.716e-09	-8.296	-8.326	-0.030	(0)
SeO3-2	4.091e-10	3.092e-10	-9.388	-9.510	-0.122	(0)
H2SeO3	1.222e-13	1.222e-13	-12.913	-12.913	0.000	(0)
AgSeO3-	1.401e-15	1.306e-15	-14.853	-14.884	-0.030	(0)
FeHSeO3+2	6.067e-21	4.584e-21	-20.217	-20.339	-0.122	(0)
Cd(SeO3) 2-2	1.045e-22	7.894e-23	-21.981	-22.103	-0.122	(0)
Ag(SeO3) 2-3	6.793e-24	3.616e-24	-23.168	-23.442	-0.274	(0)
Se (6)	4.698e-14					
SeO4-2	4.696e-14	3.623e-14	-13.328	-13.441	-0.113	(0)
MnSeO4	1.994e-17	1.994e-17	-16.700	-16.700	0.000	(0)
ZnSeO4	5.278e-19	5.278e-19	-18.278	-18.278	0.000	(0)
NiSeO4	2.832e-19	2.832e-19	-18.548	-18.548	0.000	(0)
CoSeO4	1.998e-19	1.998e-19	-18.699	-18.699	0.000	(0)
HSeO4-	1.183e-19	1.103e-19	-18.927	-18.958	-0.030	(0)
CdSeO4	6.761e-21	6.761e-21	-20.170	-20.170	0.000	(0)
Zn(SeO4) 2-2	2.566e-32	1.939e-32	-31.591	-31.712	-0.122	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.517	-55.791	-0.274	(0)
U (4)	5.910e-20					
U(OH) 5-	5.896e-20	5.498e-20	-19.229	-19.260	-0.030	(0)
U(OH) 4	1.398e-22	1.398e-22	-21.854	-21.854	0.000	(0)
U(OH) 3+	3.330e-26	3.105e-26	-25.478	-25.508	-0.030	(0)
U(OH) 2+2	1.154e-30	8.718e-31	-29.938	-30.060	-0.122	(0)
UF3+	2.683e-34	2.501e-34	-33.571	-33.602	-0.030	(0)
UF2+2	4.428e-35	3.346e-35	-34.354	-34.475	-0.122	(0)
UOH+3	4.684e-36	2.494e-36	-35.329	-35.603	-0.274	(0)
UF4	1.294e-36	1.294e-36	-35.888	-35.888	0.000	(0)
UF+3	1.058e-37	5.635e-38	-36.975	-37.249	-0.274	(0)
UF5-	2.593e-39	2.418e-39	-38.586	-38.617	-0.030	(0)
U(SO4) 2	1.718e-39	1.718e-39	-38.765	-38.765	0.000	(0)
USO4+2	9.501e-40	7.179e-40	-39.022	-39.144	-0.122	(0)
UF6-2	0.000e+00	0.000e+00	-40.341	-40.463	-0.122	(0)
U+4	0.000e+00	0.000e+00	-41.736	-42.223	-0.487	(0)
UCl+3	0.000e+00	0.000e+00	-43.958	-44.232	-0.274	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-159.779	-162.243	-2.464	(0)
U (5)	1.035e-15					
UO2+	1.035e-15	9.649e-16	-14.985	-15.016	-0.030	(0)
U (6)	1.007e-08					
UO2(CO3) 2-2	8.760e-09	6.619e-09	-8.058	-8.179	-0.122	(0)
UO2(CO3) 3-4	9.601e-10	3.130e-10	-9.018	-9.504	-0.487	(0)
UO2CO3	3.516e-10	3.516e-10	-9.454	-9.454	0.000	(0)
UO2OH+	2.096e-12	1.954e-12	-11.679	-11.709	-0.030	(0)
UO2F+	6.537e-13	6.094e-13	-12.185	-12.215	-0.030	(0)
UO2+2	1.213e-13	9.360e-14	-12.916	-13.029	-0.113	(0)
UO2F2	8.290e-14	8.290e-14	-13.081	-13.081	0.000	(0)
UO2SO4	4.267e-14	4.267e-14	-13.370	-13.370	0.000	(0)
UO2F3-	1.053e-15	9.822e-16	-14.977	-15.008	-0.030	(0)
UO2(SO4) 2-2	2.242e-16	1.694e-16	-15.649	-15.771	-0.122	(0)
UO2Cl+	3.182e-17	2.967e-17	-16.497	-16.528	-0.030	(0)
(UO2) 2(OH) 2+2	8.384e-18	6.335e-18	-17.077	-17.198	-0.122	(0)
UO2F4-2	4.870e-19	3.680e-19	-18.312	-18.434	-0.122	(0)

(UO2) 3 (OH) 5+	2.769e-19	2.581e-19	-18.558	-18.588	-0.030	(0)
V (2)	8.177e-40					
VOH+	6.648e-40	6.198e-40	-39.177	-39.208	-0.030	(0)
V+2	1.529e-40	1.155e-40	-39.816	-39.937	-0.122	(0)
V (3)	5.128e-13					
V (OH) 3	5.128e-13	5.128e-13	-12.290	-12.290	0.000	(0)
V (OH) 2+	2.158e-23	2.012e-23	-22.666	-22.696	-0.030	(0)
VOH+2	1.534e-26	1.159e-26	-25.814	-25.936	-0.122	(0)
V+3	2.620e-31	1.395e-31	-30.582	-30.855	-0.274	(0)
VSO4+	2.127e-32	1.983e-32	-31.672	-31.703	-0.030	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.907	-50.180	-0.274	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.585	-51.072	-0.487	(0)
V (4)	1.675e-16					
V (OH) 3+	1.598e-16	1.490e-16	-15.796	-15.827	-0.030	(0)
VO+2	5.960e-18	4.503e-18	-17.225	-17.346	-0.122	(0)
VOF+	1.366e-18	1.274e-18	-17.864	-17.895	-0.030	(0)
VOSO4	3.736e-19	3.736e-19	-18.428	-18.428	0.000	(0)
VOF2	2.253e-20	2.253e-20	-19.647	-19.647	0.000	(0)
VOC1+	2.649e-21	2.469e-21	-20.577	-20.607	-0.030	(0)
VOF3-	4.045e-23	3.771e-23	-22.393	-22.424	-0.030	(0)
VOF4-2	9.501e-27	7.180e-27	-26.022	-26.144	-0.122	(0)
H2V2O4+2	1.472e-27	1.112e-27	-26.832	-26.954	-0.122	(0)
V (5)	1.384e-08					
H2VO4-	1.316e-08	1.227e-08	-7.881	-7.911	-0.030	(0)
HVO4-2	6.715e-10	5.074e-10	-9.173	-9.295	-0.122	(0)
H3VO4	7.450e-12	7.450e-12	-11.128	-11.128	0.000	(0)
H3V2O7-	6.329e-13	5.901e-13	-12.199	-12.229	-0.030	(0)
HV2O7-3	3.962e-15	2.109e-15	-14.402	-14.676	-0.274	(0)
VO2+	9.632e-16	9.028e-16	-15.016	-15.044	-0.028	(0)
VO4-3	7.866e-17	4.188e-17	-16.104	-16.378	-0.274	(0)
VO2F	7.468e-17	7.468e-17	-16.127	-16.127	0.000	(0)
VO2SO4-	6.964e-18	6.492e-18	-17.157	-17.188	-0.030	(0)
V3O9-3	3.632e-18	1.933e-18	-17.440	-17.714	-0.274	(0)
V2O7-4	2.867e-18	9.349e-19	-17.543	-18.029	-0.487	(0)
VO2F2-	1.372e-18	1.279e-18	-17.863	-17.893	-0.030	(0)
VO2F3-2	9.958e-22	7.525e-22	-21.002	-21.124	-0.122	(0)
V4O12-4	3.033e-23	9.888e-24	-22.518	-23.005	-0.487	(0)
VO2F4-3	3.280e-26	1.746e-26	-25.484	-25.758	-0.274	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.342	-58.103	-0.761	(0)
V10O28-6	0.000e+00	0.000e+00	-57.978	-59.073	-1.095	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.625	-60.112	-0.487	(0)
Zn	1.390e-07					
Zn+2	1.219e-07	9.406e-08	-6.914	-7.027	-0.113	(0)
ZnSO4	6.198e-09	6.198e-09	-8.208	-8.208	0.000	(0)
ZnCO3	5.107e-09	5.107e-09	-8.292	-8.292	0.000	(0)
ZnHCO3+	3.899e-09	3.635e-09	-8.409	-8.439	-0.030	(0)
ZnOH+	1.673e-09	1.560e-09	-8.777	-8.807	-0.030	(0)
ZnF+	9.495e-11	8.852e-11	-10.023	-10.053	-0.030	(0)
ZnCl+	4.928e-11	4.618e-11	-10.307	-10.336	-0.028	(0)
Zn (OH) 2	4.098e-11	4.098e-11	-10.387	-10.387	0.000	(0)
Zn (SO4) 2-2	2.152e-11	1.626e-11	-10.667	-10.789	-0.122	(0)
ZnOHCl	1.002e-11	1.002e-11	-10.999	-10.999	0.000	(0)
Zn (OH) 3-	3.653e-14	3.405e-14	-13.437	-13.468	-0.030	(0)
ZnCl2	1.431e-14	1.431e-14	-13.844	-13.844	0.000	(0)
ZnCl3-	2.370e-18	2.221e-18	-17.625	-17.653	-0.028	(0)
ZnSeO4	5.278e-19	5.278e-19	-18.278	-18.278	0.000	(0)
Zn (OH) 4-2	2.975e-19	2.248e-19	-18.527	-18.648	-0.122	(0)
ZnCl4-2	2.802e-22	2.171e-22	-21.553	-21.663	-0.111	(0)
Zn (SeO4) 2-2	2.566e-32	1.939e-32	-31.591	-31.712	-0.122	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.940	-138.970	-0.030	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.177	-140.177	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.852	-209.882	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.524	-212.646	-0.122	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.206	-284.328	-0.122	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

Acanthite	-45.91	-82.13	-36.22	Ag ₂ S
Ag ₂ CO ₃	-11.30	-22.39	-11.09	Ag ₂ CO ₃
Ag ₂ CrO ₄	-22.43	-34.02	-11.59	Ag ₂ CrO ₄
Ag ₂ HVO ₄	-11.24	-9.76	1.48	Ag ₂ HVO ₄
Ag ₂ MoO ₄	-12.10	-23.65	-11.55	Ag ₂ MoO ₄
Ag ₂ O	-14.50	-1.93	12.57	Ag ₂ O
Ag ₂ Se	4.16	-44.54	-48.70	Ag ₂ Se
Ag ₂ SeO ₃	-10.32	-17.47	-7.15	Ag ₂ SeO ₃
Ag ₂ SeO ₄	-20.90	-29.81	-8.91	Ag ₂ SeO ₄
Ag ₂ SO ₄	-15.07	-19.89	-4.82	Ag ₂ SO ₄
Ag ₃ AsO ₃	-23.95	-21.80	2.16	Ag ₃ AsO ₃
Ag ₃ AsO ₄	-13.93	-16.72	-2.79	Ag ₃ AsO ₄
Ag ₃ H ₂ VO ₅	-15.90	-10.72	5.18	Ag ₃ H ₂ VO ₅
AgF·4H ₂ O	-13.56	-12.51	1.05	AgF·4H ₂ O
Agmetal	0.55	-12.95	-13.51	Ag
AgVO ₃	-9.56	-8.79	0.77	AgVO ₃
Al (OH) 3 (am)	-1.64	9.16	10.80	Al (OH) 3
Al ₂ (MoO ₄) 3	-49.22	-46.85	2.37	Al ₂ (MoO ₄) 3
Al ₂ O ₃	-1.34	18.31	19.65	Al ₂ O ₃
Al ₄ (OH) 10SO ₄	-4.03	18.67	22.70	Al ₄ (OH) 10SO ₄
AlAsO ₄ ·2H ₂ O	-9.47	-4.67	4.80	AlAsO ₄ ·2H ₂ O
AlOHSO ₄	-5.57	-8.80	-3.23	AlOHSO ₄
AlSb	-147.04	-81.42	65.62	AlSb
Alunite	-3.92	-5.32	-1.40	KAl ₃ (SO ₄) 2 (OH) 6
Anglesite	-4.99	-12.78	-7.79	PbSO ₄
Anhydrite	-2.48	-6.84	-4.36	CaSO ₄
Anilite	-48.95	-80.83	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-3.91	4.87	8.79	Cu ₃ (OH) 4SO ₄
Aragonite	-1.05	-9.35	-8.30	CaCO ₃
Arsenolite	-72.84	-75.60	-2.76	As ₄ O ₆
Artinite	-8.82	0.78	9.60	MgCO ₃ :Mg (OH) 2:3H ₂ O
As ₂ O ₅	-34.35	-27.64	6.71	As ₂ O ₅
Atacamite	-3.10	4.29	7.39	Cu ₂ (OH) 3Cl
Azurite	-1.18	-18.09	-16.91	Cu ₃ (OH) 2 (CO ₃) 2
Ba (OH) 2:8H ₂ O	-16.83	7.57	24.39	Ba (OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-16.39	-0.52	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	3.97	-4.94	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-25.89	7.05	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-14.85	-24.52	-9.67	BaCrO ₄
BaF ₂	-9.70	-15.52	-5.82	BaF ₂
BaMoO ₄	-7.19	-14.16	-6.96	BaMoO ₄
Barite	-0.41	-10.39	-9.98	BaSO ₄
BaS	-88.81	-72.63	16.18	BaS
BaSeO ₃	-9.81	-7.98	1.83	BaSeO ₃
BaSeO ₄	-12.85	-20.31	-7.46	BaSeO ₄
Bianchite	-8.78	-10.55	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-10.72	7.37	18.09	MnO ₂
Bixbyite	-8.59	-9.24	-0.64	Mn ₂ O ₃
BlaubleiI	-49.53	-73.69	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-49.71	-76.99	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.58	9.16	8.58	AlOOH
Breithauptite	-53.41	-71.93	-18.52	NiSb
Brochantite	-2.74	12.48	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-6.23	10.62	16.84	Mg (OH) 2
Bunsenite	-5.79	6.66	12.45	NiO
Ca (VO ₃) 2	-10.20	-4.54	5.66	Ca (VO ₃) 2
Ca ₂ V ₂ O ₇	-10.93	6.57	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.99	6.57	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-16.61	5.69	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-21.28	17.68	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-22.18	17.68	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-290.79	-147.82	142.97	Ca ₃ Sb ₂
CaCrO ₄	-18.71	-20.97	-2.27	CaCrO ₄
Calcite	-0.87	-9.35	-8.48	CaCO ₃
Calomel	-14.26	-32.17	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.66	-10.61	-7.95	CaMoO ₄
Carnotite	-3.53	-3.30	0.23	KUO ₂ VO ₄

CaSeO3:2H2O	-7.25	-4.43	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.74	-16.76	-3.02	CaSeO4:2H2O
Cd(BO2)2	-15.84	-6.00	9.84	Cd(BO2)2
Cd(OH)2	-8.21	5.43	13.64	Cd(OH)2
Cd(OH)2(am)	-8.30	5.43	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.32	-19.61	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.21	-1.65	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.62	3.78	28.40	Cd4(OH)6SO4
CdCl2	-15.76	-16.42	-0.66	CdCl2
CdCl2:1H2O	-14.72	-16.42	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-14.50	-16.42	-1.91	CdCl2:2.5H2O
CdF2	-16.44	-17.65	-1.21	CdF2
Cdmetal(alpha)	-32.06	-18.54	13.51	Cd
Cdmetal(gamma)	-32.16	-18.54	13.62	Cd
CdMoO4	-2.14	-16.29	-14.15	CdMoO4
CdOHCl	-9.03	-5.49	3.54	CdOHCl
CdSb	-72.80	-73.15	-0.35	CdSb
CdSe	-16.98	-37.18	-20.20	CdSe
CdSeO4:2H2O	-20.59	-22.44	-1.85	CdSeO4:2H2O
CdSO4	-12.35	-12.52	-0.17	CdSO4
CdSO4:1H2O	-10.79	-12.52	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.65	-12.52	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.14	-11.89	-9.75	AgCl
Cerrusite	-2.15	-15.28	-13.13	PbCO3
CH4(g)	-75.32	-116.37	-41.05	CH4
Chalcanthite	-7.70	-10.34	-2.64	CuSO4:5H2O
Chalcocite	-48.66	-83.58	-34.92	Cu2S
Chalcopyrite	-110.26	-145.53	-35.27	CuFeS2
Cinnabar	-49.27	-94.96	-45.69	HgS
Claudetite	-72.54	-75.60	-3.06	As4O6
Clausthalite	-10.34	-37.44	-27.10	PbSe
Co(BO2)2	-32.03	-4.96	27.07	Co(BO2)2
Co(OH)2	-6.62	6.47	13.09	Co(OH)2
Co(OH)3	-11.63	-13.94	-2.31	Co(OH)3
CO2(g)	-2.31	-20.46	-18.15	CO2
Co3(AsO4)2	-21.25	-8.22	13.03	Co3(AsO4)2
Co3O4	-10.90	-21.40	-10.50	Co3O4
CoCl2	-23.64	-15.38	8.27	CoCl2
CoCl2:6H2O	-17.91	-15.38	2.54	CoCl2:6H2O
CoCO3	-4.00	-13.98	-9.98	CoCO3
CoF2	-15.01	-16.61	-1.60	CoF2
CoF3	-47.11	-48.57	-1.46	CoF3
CoFe2O4	22.43	18.91	-3.53	CoFe2O4
CoMoO4	-7.49	-15.25	-7.76	CoMoO4
CoO	-7.11	6.47	13.59	CoO
CoS(alpha)	-66.29	-73.73	-7.44	CoS
CoS(beta)	-62.66	-73.73	-11.07	CoS
CoSe	-19.94	-36.14	-16.20	CoSe
CoSeO3	-10.39	-9.07	1.32	CoSeO3
CoSeO4:6H2O	-19.87	-21.40	-1.53	CoSeO4:6H2O
CoSO4	-14.28	-11.48	2.80	CoSO4
CoSO4:6H2O	-9.01	-11.48	-2.47	CoSO4:6H2O
Cotunnite	-11.90	-16.68	-4.78	PbCl2
Covellite	-50.29	-72.59	-22.30	CuS
Cr(OH)2	-20.53	-9.72	10.82	Cr(OH)2
Cr(OH)3	-2.01	-0.67	1.34	Cr(OH)3
Cr(OH)3(am)	0.08	-0.67	-0.75	Cr(OH)3
Cr2O3	1.01	-1.35	-2.36	Cr2O3
CrCl2	-45.66	-31.57	14.09	CrCl2
CrCl3	-48.56	-33.45	15.11	CrCl3
CrF3	-23.97	-35.30	-11.34	CrF3
Crmetal	-64.18	-33.69	30.48	Cr
CrO3	-28.87	-32.08	-3.21	CrO3
Cryolite	-14.35	-48.19	-33.84	Na3AlF6
Cu(OH)2	-1.06	7.61	8.67	Cu(OH)2
Cu(SbO3)2	-26.94	18.27	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-49.77	-84.65	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-0.19	-45.99	-45.80	Cu2Se

Cu2SO4	-19.38	-21.33	-1.95	Cu2SO4
Cu3(AsO4)2·2H2O	-10.91	-4.81	6.10	Cu3(AsO4)2·2H2O
Cu3Sb	-53.05	-95.64	-42.59	Cu3Sb
Cu3Se2	-17.50	-80.99	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.03	-24.47	-5.44	CuCrO4
CuF	-8.33	-13.23	-4.91	CuF
CuF2	-16.59	-15.48	1.12	CuF2
CuF2·2H2O	-10.93	-15.48	-4.55	CuF2·2H2O
Cumetal	-4.92	-13.68	-8.76	Cu
CuMoO4	-1.04	-14.11	-13.08	CuMoO4
CuOCuSO4	-13.04	-2.73	10.30	CuOCuSO4
Cupricferrite	14.05	20.04	5.99	CuFe2O4
Cuprite	-1.97	-3.38	-1.41	Cu2O
Cuprousferrite	13.44	4.53	-8.92	CuFeO2
CuSe	-1.90	-35.00	-33.10	CuSe
CuSe2	-20.28	-53.64	-33.37	CuSe2
CuSeO3·2H2O	-8.44	-7.93	0.51	CuSeO3·2H2O
CuSeO4·5H2O	-17.82	-20.26	-2.44	CuSeO4·5H2O
CuSO4	-13.28	-10.34	2.94	CuSO4
Diaspore	2.28	9.16	6.87	AlOOH
Djurleite	-48.93	-82.85	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-2.65	-19.19	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.10	-19.19	-17.09	CaMg(CO3)2
Epsomite	-5.21	-7.34	-2.13	MgSO4·7H2O
Fe(OH)2	-6.30	7.26	13.56	Fe(OH)2
Fe(OH)2·7Cl.3	5.98	2.94	-3.04	Fe(OH)2·7Cl.3
Fe(VO3)2	-4.68	-8.40	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-4.67	-3.11	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3·2H2O	-13.57	-34.20	-20.63	Fe2(SeO3)3·2H2O
Fe2(SO4)3	-37.70	-41.43	-3.73	Fe2(SO4)3
Fe3(OH)8	-0.53	19.69	20.22	Fe3(OH)8
FeAsO4·2H2O	-8.01	-7.61	0.40	FeAsO4·2H2O
FeCr2O4	-1.29	5.91	7.20	FeCr2O4
FeMoO4	-4.37	-14.46	-10.09	FeMoO4
Ferrihydrite	3.02	6.22	3.19	Fe(OH)3
Ferroselite	-35.40	-53.99	-18.60	FeSe2
FeS(ppt)	-69.99	-72.94	-2.95	FeS
FeSe	-24.35	-35.35	-11.00	FeSe
Fix_pe	-4.77	-4.77	0.00	e-
Fluorite	-1.47	-11.97	-10.50	CaF2
Galena	-61.06	-75.03	-13.97	PbS
Gibbsite	0.87	9.16	8.29	Al(OH)3
Goethite	5.72	6.22	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO4·7H2O
Greenockite	-60.41	-74.77	-14.36	CdS
Greigite	-256.08	-301.12	-45.03	Fe3S4
Gummite	-6.27	1.40	7.67	UO3
Gypsum	-2.23	-6.84	-4.61	CaSO4·2H2O
H-Jarosite	-5.16	-17.26	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.85	-21.72	-12.88	H2MoO4
H2S(g)	-72.19	-80.20	-8.01	H2S
H2Se(g)	-37.65	-42.61	-4.96	H2Se
Halite	-8.56	-6.96	1.60	NaCl
Hausmannite	-10.82	50.21	61.03	Mn3O4
Hematite	13.85	12.43	-1.42	Fe2O3
Hercynite	2.68	25.57	22.89	FeAl2O4
Hg(CH3)2(g)	-173.79	-247.50	-73.71	Hg(CH3)2
Hg(g)	-9.27	-17.15	-7.87	Hg
Hg(OH)2	-11.27	-14.76	-3.50	Hg(OH)2
Hg2(g)	-19.34	-34.30	-14.96	Hg2
Hg2(OH)2	-15.58	-10.32	5.26	Hg2(OH)2
Hg2CO3	-14.73	-30.78	-16.05	Hg2CO3
Hg2CrO4	-33.70	-42.40	-8.70	Hg2CrO4
Hg2F2	-23.04	-33.40	-10.36	Hg2F2
Hg2S	-78.84	-90.52	-11.68	Hg2S
Hg2SeO3	-21.20	-25.86	-4.66	Hg2SeO3
Hg2SO4	-22.14	-28.27	-6.13	Hg2SO4

Hg3O2CO3	-35.07	-64.75	-29.68	Hg3O2CO3
HgCl (g)	-35.58	-16.08	19.50	HgCl
HgCl2	-15.35	-36.61	-21.26	HgCl2
HgF (g)	-49.38	-16.70	32.68	HgF
HgF2 (g)	-50.41	-37.85	12.57	HgF2
Hgmetal (l)	-3.70	-17.15	-13.45	Hg
HgSe	-1.68	-57.38	-55.69	HgSe
HgSeO3	-17.88	-30.31	-12.43	HgSeO3
HgSO4	-23.30	-32.72	-9.42	HgSO4
Huntite	-8.90	-38.87	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-6.62	-25.39	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-19.98	-28.74	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-18.46	-23.63	-5.17	KA1 (SO4) 2 : 12H2O
K-Jarosite	0.66	-14.14	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-40.68	-57.92	-17.24	K2Cr2O7
K2CrO4	-25.33	-25.84	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.90	-21.63	-0.73	K2SeO4
Langite	-5.00	12.48	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.17	-7.61	-0.43	PbO : PbSO4
Laurionite	-6.37	-5.75	0.62	PbOHCl
Lepidocrocite	4.84	6.22	1.37	FeOOH
Lime	-21.59	11.11	32.70	CaO
Litharge	-7.52	5.17	12.69	PbO
Mackinawite	-69.34	-72.94	-3.60	FeS
Maghemite	6.04	12.43	6.39	Fe2O3
Magnesioferrite	6.19	23.05	16.86	Fe2MgO4
Magnesite	-2.38	-9.84	-7.46	MgCO3
Magnetite	16.29	19.69	3.40	Fe3O4
Malachite	0.07	-5.24	-5.31	Cu2 (OH) 2CO3
Manganite	-4.61	20.73	25.34	MnOOH
Massicot	-7.72	5.17	12.89	PbO
Matlockite	-8.32	-17.29	-8.97	PbClF
Melanothallite	-20.50	-14.24	6.26	CuCl2
Melanterite	-8.49	-10.70	-2.21	FeSO4 : 7H2O
Metacinnabar	-49.87	-94.96	-45.09	HgS
Mg (OH) 2 (active)	-8.18	10.62	18.79	Mg (OH) 2
Mg (VO3) 2	-16.32	-5.04	11.28	Mg (VO3) 2
Mg2Sb3	-265.23	-190.55	74.68	Mg2Sb3
Mg2V2O7	-20.78	5.58	26.36	Mg2V2O7
MgCr2O4	-6.93	9.27	16.20	MgCr2O4
MgCrO4	-26.85	-21.47	5.38	MgCrO4
MgF2	-4.34	-12.47	-8.13	MgF2
MgMoO4	-9.25	-11.10	-1.85	MgMoO4
MgSeO3 : 6H2O	-7.98	-4.92	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-16.06	-17.26	-1.20	MgSeO4 : 6H2O
Minium	-34.02	39.50	73.52	Pb3O4
Mirabilite	-8.90	-10.02	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.81	-6.91	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.39	-63.10	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.16	-85.08	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.91	-1.41	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-15.82	-13.11	2.72	MnCl2 : 4H2O
MnS (grn)	-71.63	-71.46	0.17	MnS
MnS (pnk)	-74.80	-71.46	3.34	MnS
MnSb	-92.28	-95.19	-2.91	MnSb
MnSe	-37.37	-33.87	3.50	MnSe
MnSeO3	-7.93	-6.80	1.13	MnSeO3
MnSeO3 : 2H2O	-7.78	-6.80	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-17.08	-19.13	-2.05	MnSeO4 : 5H2O
MnSO4	-11.79	-9.21	2.58	MnSO4
Monteponite	-9.67	5.43	15.10	CdO
Montroydite	-11.12	-14.76	-3.64	HgO
MoO3	-13.72	-21.72	-8.00	MoO3
Morenosite	-9.15	-11.30	-2.14	NiSO4 : 7H2O
MoS2	-135.84	-206.10	-70.26	MoS2
Na-Jarosite	-2.09	-13.29	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-46.34	-56.23	-9.90	Na2Cr2O7

Na2CrO4	-27.08	-24.15	2.93	Na2CrO4
Na2Mo2O7	-18.91	-35.51	-16.60	Na2Mo2O7
Na2MoO4	-15.27	-13.78	1.49	Na2MoO4
Na2MoO4:2H2O	-15.01	-13.78	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-17.91	-7.61	10.30	Na2SeO3:5H2O
Na2SeO4	-21.22	-19.94	1.28	Na2SeO4
Na3Sb	-173.12	-78.67	94.45	Na3Sb
Na3VO4	-32.60	4.08	36.68	Na3VO4
Na4V2O7	-37.18	0.22	37.40	Na4V2O7
Nantokite	-5.88	-12.61	-6.73	CuCl
NaSb	-85.80	-62.63	23.17	NaSb
Natron	-11.21	-12.52	-1.31	Na2CO3:10H2O
NaVO3	-7.72	-3.86	3.86	NaVO3
Nesquehonite	-5.17	-9.84	-4.67	MgCO3:3H2O
Ni(OH)2	-6.14	6.66	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.37	-7.67	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.33	8.67	32.00	Ni4(OH)6SO4
NiCO3	-6.93	-13.80	-6.87	NiCO3
NiMoO4	-3.92	-15.07	-11.14	NiMoO4
NiS(alpha)	-67.95	-73.55	-5.60	NiS
NiS(beta)	-62.45	-73.55	-11.10	NiS
NiS(gamma)	-60.75	-73.55	-12.80	NiS
NiSe	-18.26	-35.96	-17.70	NiSe
NiSeO3:2H2O	-11.70	-8.89	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.70	-21.22	-1.52	NiSeO4:6H2O
Nsutite	-10.13	7.37	17.50	MnO2
O2(g)	-35.14	47.95	83.09	O2
Orpiment	-217.34	-278.41	-61.07	As2S3
Otavite	-3.02	-15.02	-12.00	CdCO3
Pb(BO2)2	-12.78	-6.26	6.52	Pb(BO2)2
Pb(OH)2	-2.98	5.17	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.25	-71.01	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.37	-0.58	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.84	10.35	26.19	Pb2O(OH)2
Pb2O3	-26.71	34.33	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.41	-5.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.92	-12.12	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.27	-0.13	6.14	Pb3(VO4)2
Pb3O2CO3	-15.96	-4.94	11.02	Pb3O2CO3
Pb3O2SO4	-13.12	-2.43	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.36	2.74	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.13	2.74	21.88	Pb4O3SO4
PbCrO4	-14.31	-26.91	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.05	-18.80	4.25	Pb
PbMoO4	-0.93	-16.55	-15.62	PbMoO4
PbO:0.3H2O	-7.81	5.17	12.98	PbO:0.33H2O
PbSeO4	-15.86	-22.70	-6.84	PbSeO4
Periclase	-10.97	10.62	21.58	MgO
Phosgenite	-12.15	-31.96	-19.81	PbCl2:PbCO3
Plattnerite	-20.45	29.15	49.60	PbO2
Portlandite	-11.69	11.11	22.80	Ca(OH)2
Pyrite	-110.66	-129.17	-18.51	FeS2
Pyrochroite	-6.45	8.74	15.19	Mn(OH)2
Pyrolusite	-8.66	32.72	41.38	MnO2
Realgar	-91.34	-111.09	-19.75	AsS
Retgersite	-9.26	-11.30	-2.04	NiSO4:6H2O
Rhodochrosite	-1.13	-11.71	-10.58	MnCO3
Rutherfordine	-4.55	-19.05	-14.50	UO2CO3
Sb(OH)3	-11.53	-18.64	-7.11	Sb(OH)3
Sb2O4	-16.71	-13.31	3.40	Sb2O4
Sb2O5	-28.29	-37.96	-9.67	Sb2O5
Sb2Se3	-97.37	-165.13	-67.76	Sb2Se3
Sb4O6(cubic)	-56.32	-74.58	-18.26	Sb4O6
Sb4O6(orth)	-56.68	-74.58	-17.90	Sb4O6
SbCl3	-51.99	-51.42	0.57	SbCl3
SbF3	-43.05	-53.27	-10.23	SbF3

Sbmetal	-42.92	-54.61	-11.69	Sb
SbO2	-3.14	-30.97	-27.82	SbO2
Schoepite	-4.59	1.40	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.53	-18.64	-7.11	Se
Semetal (hex)	-10.93	-18.64	-7.71	Se
Senarmontite	-24.92	-37.29	-12.37	Sb2O3
SeO2	-15.67	-15.54	0.12	SeO2
SeO3	-48.92	-27.87	21.04	SeO3
Siderite	-2.96	-13.20	-10.24	FeCO3
Smithsonite	-3.05	-13.05	-10.00	ZnCO3
Sphalerite	-61.35	-72.80	-11.45	ZnS
Spinel	-7.92	28.93	36.85	MgAl2O4
Stibnite	-227.44	-277.90	-50.46	Sb2S3
Sulfur	-54.08	-56.22	-2.14	S
Tenorite	-0.03	7.61	7.64	CuO
Thenardite	-10.34	-10.02	0.32	Na2SO4
Thermonatrite	-13.16	-12.52	0.64	Na2CO3:H2O
Tyuyamunite	-5.82	-1.74	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.20	7.88	21.08	U3O8
U3Sb4	-554.75	-402.37	152.38	U3Sb4
U4O9	-26.43	-29.45	-3.02	U4O9
UF4	-29.99	-59.53	-29.54	UF4
UF4:2.5H2O	-26.81	-59.53	-32.72	UF4:2.5H2O
UO2 (am)	-14.29	-13.36	0.93	UO2
UO2 (OH) 2 (beta)	-4.21	1.40	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.22	-26.47	-2.25	UO2SeO4:4H2O
UO3	-6.30	1.40	7.70	UO3
Uraninite	-8.69	-13.36	-4.67	UO2
USb2	-209.32	-179.75	29.58	USb2
V (OH) 3	-16.80	-9.21	7.59	V (OH) 3
V2O5	-14.30	-15.66	-1.36	V2O5
V3O5	-34.55	-32.72	1.84	V3O5
V4O7	-42.82	-35.63	7.19	V4O7
V6O13	-34.06	-94.92	-60.86	V6O13
Valentinite	-28.81	-37.29	-8.48	Sb2O3
VC12	-61.92	-43.05	18.87	VC12
VC13	-65.41	-41.98	23.43	VC13
VF4	-64.02	-49.09	14.93	VF4
Vmetal	-89.20	-45.17	44.03	V
VO	-35.95	-21.19	14.76	VO
VO (OH) 2	-8.06	-2.91	5.15	VO (OH) 2
VO2Cl	-21.59	-18.75	2.84	VO2Cl
VOC1	-31.28	-20.13	11.15	VOC1
VOC12	-37.52	-24.76	12.76	VOC12
VOSO4	-24.48	-20.87	3.61	VOSO4
Witherite	-4.32	-12.89	-8.57	BaCO3
Wurtzite	-63.85	-72.80	-8.95	ZnS
Zincite	-3.93	7.41	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO4
Zn (BO2) 2	-12.32	-4.03	8.29	Zn (BO2) 2
Zn (OH) 2	-4.79	7.41	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-5.07	7.41	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.35	7.41	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-4.13	7.41	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.33	7.41	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.64	-3.14	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.30	3.89	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.07	-5.42	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-32.60	-13.69	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-16.73	11.67	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-23.32	15.18	38.50	Zn5 (OH) 8Cl2
ZnCl2	-21.49	-14.44	7.05	ZnCl2
ZnCO3:1H2O	-2.79	-13.05	-10.26	ZnCO3:1H2O
ZnF2	-15.15	-15.68	-0.53	ZnF2
Znmetal	-42.36	-16.57	25.79	Zn
ZnMoO4	-4.19	-14.32	-10.13	ZnMoO4
ZnO (active)	-3.78	7.41	11.19	ZnO
ZnS (am)	-63.74	-72.80	-9.05	ZnS

ZnSb	-82.19	-71.18	11.01	ZnSb
ZnSe	-20.81	-35.21	-14.40	ZnSe
ZnSeO4:6H2O	-18.95	-20.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 85.

```

REACTION 501
  H2O      -1
  399 moles ### Addition step. Removes HTC water but solute mass remains
USE solution 501
SAVE Solution 502
End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 501. Solution after simulation 84.
Using reaction 501.

Reaction 501.

3.990e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.340e-08	8.350e-08
Al	4.515e-06	4.520e-06
As	4.048e-08	4.053e-08
B	1.587e-05	1.588e-05
Ba	1.458e-06	1.459e-06
C	1.216e-02	1.217e-02
Ca	5.424e-03	5.431e-03
Cd	1.159e-08	1.161e-08
Cl	1.706e-03	1.708e-03
Co	1.357e-07	1.359e-07
Cr	1.269e-07	1.270e-07
Cu	9.355e-06	9.366e-06
F	4.212e-04	4.217e-04
Fe	2.668e-05	2.671e-05
Hg	2.148e-10	2.150e-10
K	7.044e-04	7.052e-04
Mg	1.718e-03	1.720e-03
Mn	2.351e-05	2.354e-05
Mo	5.453e-07	5.460e-07

Na	4.947e-03	4.953e-03
Ni	2.129e-07	2.131e-07
Pb	2.579e-08	2.582e-08
S	3.541e-03	3.546e-03
Sb	1.301e-08	1.302e-08
Se	4.662e-08	4.668e-08
U	8.241e-08	8.251e-08
V	1.132e-07	1.133e-07
Zn	1.137e-06	1.138e-06

-----Description of solution-----

	pH	=	7.159	Charge balance
	pe	=	5.115	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	2.573e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	1.084e-02	
	Total CO2 (mol/kg)	=	1.216e-02	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	3.177e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	15	
	Total H	=	1.111602e+02	
	Total O	=	5.562409e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.702e-07	1.452e-07	-6.769	-6.838	-0.069	(0)
H+	8.082e-08	6.933e-08	-7.092	-7.159	-0.067	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.340e-08					
AgCl	5.333e-08	5.333e-08	-7.273	-7.273	0.000	(0)
Ag+	2.080e-08	1.785e-08	-7.682	-7.748	-0.067	(0)
AgCl2-	8.206e-09	6.797e-09	-8.086	-8.168	-0.082	(0)
AgSO4-	5.988e-10	4.960e-10	-9.223	-9.305	-0.082	(0)
Ag2Se	2.159e-10	2.159e-10	-9.666	-9.666	0.000	(0)
AgCl3-2	1.883e-11	8.865e-12	-10.725	-11.052	-0.327	(0)
AgF	1.424e-11	1.424e-11	-10.846	-10.846	0.000	(0)
AgOH	2.591e-13	2.591e-13	-12.587	-12.587	0.000	(0)
AgCl4-3	1.443e-13	2.649e-14	-12.841	-13.577	-0.736	(0)
AgH2BO3	3.738e-14	3.738e-14	-13.427	-13.427	0.000	(0)
AgSeO3-	2.776e-14	2.299e-14	-13.557	-13.638	-0.082	(0)
Ag(OH) 2-	4.437e-18	3.675e-18	-17.353	-17.435	-0.082	(0)
Ag(SeO3) 2-3	2.249e-21	4.126e-22	-20.648	-21.384	-0.736	(0)
Ag2MoO4	3.558e-23	3.558e-23	-22.449	-22.449	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.478	-68.478	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.949	-79.258	-1.309	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-138.841	-138.923	-0.082	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-139.064	-139.247	-0.183	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-141.187	-141.528	-0.341	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.514	-141.839	-0.325	(0)
Al	4.515e-06					
AlF3	2.087e-06	2.087e-06	-5.680	-5.680	0.000	(0)
Al(OH) 4-	1.340e-06	1.151e-06	-5.873	-5.939	-0.066	(0)
AlF2+	6.044e-07	5.219e-07	-6.219	-6.282	-0.064	(0)
AlF4-	3.869e-07	3.322e-07	-6.412	-6.479	-0.066	(0)
Al(OH) 3	6.299e-08	6.299e-08	-7.201	-7.201	0.000	(0)
Al(OH) 2+	2.518e-08	2.175e-08	-7.599	-7.663	-0.064	(0)
AlF+2	7.421e-09	4.127e-09	-8.130	-8.384	-0.255	(0)
AlOH+2	3.391e-10	1.886e-10	-9.470	-9.724	-0.255	(0)
AlSO4+	1.636e-11	1.405e-11	-10.786	-10.852	-0.066	(0)
Al+3	5.162e-12	1.299e-12	-11.287	-11.886	-0.599	(0)
Al(SO4) 2-	2.442e-13	2.097e-13	-12.612	-12.678	-0.066	(0)

AlMo6O21-3	5.114e-39	9.385e-40	-38.291	-39.028	-0.736	(0)
As (3)	2.416e-19					
H3AsO3	2.395e-19	2.395e-19	-18.621	-18.621	0.000	(0)
H2AsO3-	2.138e-21	1.771e-21	-20.670	-20.752	-0.082	(0)
HAsO3-2	4.950e-26	2.330e-26	-25.305	-25.633	-0.327	(0)
H4AsO3+	9.931e-27	8.226e-27	-26.003	-26.085	-0.082	(0)
AsO3-3	7.058e-32	1.295e-32	-31.151	-31.888	-0.736	(0)
As (5)	4.048e-08					
HAsO4-2	2.978e-08	1.402e-08	-7.526	-7.853	-0.327	(0)
H2AsO4-	1.070e-08	8.863e-09	-7.971	-8.052	-0.082	(0)
AsO4-3	3.483e-12	6.393e-13	-11.458	-12.194	-0.736	(0)
H3AsO4	1.062e-13	1.068e-13	-12.974	-12.971	0.003	(0)
B	1.587e-05					
H3BO3	1.568e-05	1.578e-05	-4.805	-4.802	0.003	(0)
H2BO3-	1.561e-07	1.321e-07	-6.807	-6.879	-0.072	(0)
CaH2BO3+	2.057e-08	1.742e-08	-7.687	-7.759	-0.072	(0)
MgH2BO3+	4.130e-09	3.496e-09	-8.384	-8.456	-0.072	(0)
BF(OH) 3-	2.362e-09	1.999e-09	-8.627	-8.699	-0.072	(0)
NaH2BO3	8.782e-10	8.782e-10	-9.056	-9.056	0.000	(0)
BF2(OH) 2-	5.563e-12	4.710e-12	-11.255	-11.327	-0.072	(0)
BaH2BO3+	3.612e-12	3.058e-12	-11.442	-11.515	-0.072	(0)
H5(BO3) 2-	2.095e-12	1.774e-12	-11.679	-11.751	-0.072	(0)
AgH2BO3	3.738e-14	3.738e-14	-13.427	-13.427	0.000	(0)
H8(BO3) 3-	3.306e-15	2.799e-15	-14.481	-14.553	-0.072	(0)
BF3OH-	4.768e-17	4.037e-17	-16.322	-16.394	-0.072	(0)
BF4-	5.170e-21	4.377e-21	-20.287	-20.359	-0.072	(0)
Ba	1.458e-06					
Ba+2	1.383e-06	7.489e-07	-5.859	-6.126	-0.266	(0)
BaHCO3+	7.268e-08	6.299e-08	-7.139	-7.201	-0.062	(0)
BaCO3	2.287e-09	2.287e-09	-8.641	-8.641	0.000	(0)
BaH2BO3+	3.612e-12	3.058e-12	-11.442	-11.515	-0.072	(0)
BaOH+	5.508e-13	4.745e-13	-12.259	-12.324	-0.065	(0)
C (4)	1.216e-02					
HCO3-	1.020e-02	8.808e-03	-1.991	-2.055	-0.064	(0)
H2CO3	1.373e-03	1.373e-03	-2.862	-2.862	0.000	(0)
CaHCO3+	4.335e-04	3.757e-04	-3.363	-3.425	-0.062	(0)
MgHCO3+	8.036e-05	6.878e-05	-4.095	-4.163	-0.068	(0)
CaCO3	2.162e-05	2.162e-05	-4.665	-4.665	0.000	(0)
NaHCO3	2.077e-05	2.077e-05	-4.683	-4.683	0.000	(0)
CO3-2	1.099e-05	5.955e-06	-4.959	-5.225	-0.266	(0)
CuCO3	8.265e-06	8.265e-06	-5.083	-5.083	0.000	(0)
MgCO3	3.780e-06	3.780e-06	-5.423	-5.423	0.000	(0)
MnHCO3+	1.849e-06	1.593e-06	-5.733	-5.798	-0.065	(0)
NaCO3-	5.385e-07	4.650e-07	-6.269	-6.333	-0.064	(0)
Cu(CO3) 2-2	2.814e-07	1.325e-07	-6.551	-6.878	-0.327	(0)
CuHCO3+	1.581e-07	1.310e-07	-6.801	-6.883	-0.082	(0)
ZnCO3	1.359e-07	1.359e-07	-6.867	-6.867	0.000	(0)
ZnHCO3+	1.333e-07	1.104e-07	-6.875	-6.957	-0.082	(0)
NiHCO3+	7.597e-08	6.293e-08	-7.119	-7.201	-0.082	(0)
BaHCO3+	7.268e-08	6.299e-08	-7.139	-7.201	-0.062	(0)
UO2(CO3) 3-4	6.101e-08	2.995e-09	-7.215	-8.524	-1.309	(0)
FeHCO3+	3.928e-08	3.404e-08	-7.406	-7.468	-0.062	(0)
CoHCO3+	3.348e-08	2.773e-08	-7.475	-7.557	-0.082	(0)
UO2(CO3) 2-2	2.132e-08	1.003e-08	-7.671	-7.999	-0.327	(0)
PbCO3	1.564e-08	1.564e-08	-7.806	-7.806	0.000	(0)
NiCO3	1.288e-08	1.288e-08	-7.890	-7.890	0.000	(0)
PbHCO3+	6.901e-09	5.716e-09	-8.161	-8.243	-0.082	(0)
CoCO3	4.075e-09	4.075e-09	-8.390	-8.390	0.000	(0)
BaCO3	2.287e-09	2.287e-09	-8.641	-8.641	0.000	(0)
CdCO3	6.232e-10	6.232e-10	-9.205	-9.205	0.000	(0)
Pb(CO3) 2-2	5.706e-10	2.686e-10	-9.244	-9.571	-0.327	(0)
CdHCO3+	1.111e-10	9.206e-11	-9.954	-10.036	-0.082	(0)
UO2CO3	8.444e-11	8.444e-11	-10.073	-10.073	0.000	(0)
Cd(CO3) 2-2	5.845e-12	2.751e-12	-11.233	-11.560	-0.327	(0)
HgCO3	2.809e-15	2.809e-15	-14.552	-14.552	0.000	(0)
Hg(CO3) 2-2	1.124e-16	5.289e-17	-15.949	-16.277	-0.327	(0)
HgHCO3+	4.378e-18	3.626e-18	-17.359	-17.441	-0.082	(0)
Ca	5.424e-03					

	Ca+2	4.229e-03	2.291e-03	-2.374	-2.640	-0.266	(0)
	CaSO4	7.309e-04	7.309e-04	-3.136	-3.136	0.000	(0)
	CaHCO3+	4.335e-04	3.757e-04	-3.363	-3.425	-0.062	(0)
	CaCO3	2.162e-05	2.162e-05	-4.665	-4.665	0.000	(0)
	CaF+	9.218e-06	7.941e-06	-5.035	-5.100	-0.065	(0)
	CaH2BO3+	2.057e-08	1.742e-08	-7.687	-7.759	-0.072	(0)
	CaOH+	7.655e-09	6.634e-09	-8.116	-8.178	-0.062	(0)
Cd		1.159e-08					
	Cd+2	8.476e-09	4.591e-09	-8.072	-8.338	-0.266	(0)
	CdSO4	1.499e-09	1.499e-09	-8.824	-8.824	0.000	(0)
	CdCl+	7.747e-10	6.416e-10	-9.111	-9.193	-0.082	(0)
	CdCO3	6.232e-10	6.232e-10	-9.205	-9.205	0.000	(0)
	CdHCO3+	1.111e-10	9.206e-11	-9.954	-10.036	-0.082	(0)
	Cd(SO4) 2-2	5.984e-11	2.817e-11	-10.223	-10.550	-0.327	(0)
	CdF+	2.790e-11	2.311e-11	-10.554	-10.636	-0.082	(0)
	CdOH+	6.391e-12	5.294e-12	-11.194	-11.276	-0.082	(0)
	Cd(CO3) 2-2	5.845e-12	2.751e-12	-11.233	-11.560	-0.327	(0)
	CdCl2	3.914e-12	3.914e-12	-11.407	-11.407	0.000	(0)
	CdOHC1	3.821e-12	3.821e-12	-11.418	-11.418	0.000	(0)
	CdF2	1.465e-14	1.465e-14	-13.834	-13.834	0.000	(0)
	Cd(OH) 2	4.848e-15	4.848e-15	-14.314	-14.314	0.000	(0)
	CdCl3-	4.364e-15	3.614e-15	-14.360	-14.442	-0.082	(0)
	CdSeO4	7.468e-19	7.468e-19	-18.127	-18.127	0.000	(0)
	Cd2OH+3	6.638e-19	1.218e-19	-18.178	-18.914	-0.736	(0)
	Cd(OH) 3-	5.191e-20	4.300e-20	-19.285	-19.367	-0.082	(0)
	Cd(SeO3) 2-2	3.230e-20	1.520e-20	-19.491	-19.818	-0.327	(0)
	Cd(OH) 4-2	2.170e-27	1.022e-27	-26.663	-26.991	-0.327	(0)
	CdHS+	0.000e+00	0.000e+00	-74.793	-74.874	-0.082	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-142.215	-142.215	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-214.777	-214.859	-0.082	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-286.880	-287.208	-0.327	(0)
Cl		1.706e-03					
	Cl-	1.706e-03	1.463e-03	-2.768	-2.835	-0.067	(0)
	AgCl	5.333e-08	5.333e-08	-7.273	-7.273	0.000	(0)
	MnCl+	1.938e-08	1.670e-08	-7.713	-7.777	-0.065	(0)
	AgCl2-	8.206e-09	6.797e-09	-8.086	-8.168	-0.082	(0)
	ZnCl+	1.703e-09	1.457e-09	-8.769	-8.836	-0.068	(0)
	CuCl	1.633e-09	1.633e-09	-8.787	-8.787	0.000	(0)
	CdCl+	7.747e-10	6.416e-10	-9.111	-9.193	-0.082	(0)
	CuCl+	6.386e-10	5.466e-10	-9.195	-9.262	-0.068	(0)
	CuCl2-	5.833e-10	4.993e-10	-9.234	-9.302	-0.068	(0)
	ZnOHC1	2.769e-10	2.769e-10	-9.558	-9.558	0.000	(0)
	NiCl+	2.620e-10	2.170e-10	-9.582	-9.664	-0.082	(0)
	CoCl+	2.474e-10	2.049e-10	-9.607	-9.688	-0.082	(0)
	PbCl+	5.476e-11	4.535e-11	-10.262	-10.343	-0.082	(0)
	MnCl2	3.452e-11	3.452e-11	-10.462	-10.462	0.000	(0)
	AgCl3-2	1.883e-11	8.865e-12	-10.725	-11.052	-0.327	(0)
	CdCl2	3.914e-12	3.914e-12	-11.407	-11.407	0.000	(0)
	CdOHC1	3.821e-12	3.821e-12	-11.418	-11.418	0.000	(0)
	ZnCl2	3.380e-12	3.380e-12	-11.471	-11.471	0.000	(0)
	PbCl2	2.965e-13	2.965e-13	-12.528	-12.528	0.000	(0)
	CuCl3-2	2.836e-13	1.562e-13	-12.547	-12.806	-0.259	(0)
	CuCl2	2.774e-13	2.774e-13	-12.557	-12.557	0.000	(0)
	HgClOH	1.478e-13	1.478e-13	-12.830	-12.830	0.000	(0)
	AgCl4-3	1.443e-13	2.649e-14	-12.841	-13.577	-0.736	(0)
	HgCl2	8.439e-14	8.439e-14	-13.074	-13.074	0.000	(0)
	MnCl3-	1.615e-14	1.391e-14	-13.792	-13.857	-0.065	(0)
	CrCl+2	6.484e-15	3.052e-15	-14.188	-14.515	-0.327	(0)
	ZnCl3-	4.591e-15	3.929e-15	-14.338	-14.406	-0.068	(0)
	CdCl3-	4.364e-15	3.614e-15	-14.360	-14.442	-0.082	(0)
	NiCl2	1.599e-15	1.599e-15	-14.796	-14.796	0.000	(0)
	HgCl3-	1.491e-15	1.235e-15	-14.827	-14.908	-0.082	(0)
	FeCl+2	2.980e-16	1.642e-16	-15.526	-15.785	-0.259	(0)
	PbCl3-	2.085e-16	1.727e-16	-15.681	-15.763	-0.082	(0)
	HgCl4-2	1.529e-17	7.195e-18	-16.816	-17.143	-0.327	(0)
	HgCl+	1.389e-17	1.151e-17	-16.857	-16.939	-0.082	(0)
	CrOHC12	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
	UO2Cl+	1.020e-17	8.452e-18	-16.991	-17.073	-0.082	(0)

ZnCl4-2	5.220e-18	2.875e-18	-17.282	-17.541	-0.259	(0)
CuCl3-	4.426e-18	3.788e-18	-17.354	-17.422	-0.068	(0)
FeCl2+	1.246e-18	1.073e-18	-17.905	-17.969	-0.065	(0)
CrCl2+	5.117e-19	4.238e-19	-18.291	-18.373	-0.082	(0)
PbCl4-2	2.455e-19	1.155e-19	-18.610	-18.937	-0.327	(0)
VOCl+	1.237e-19	1.025e-19	-18.907	-18.989	-0.082	(0)
FeCl3	1.570e-22	1.570e-22	-21.804	-21.804	0.000	(0)
CuCl4-2	5.044e-23	2.778e-23	-22.297	-22.556	-0.259	(0)
CrO3Cl-	1.306e-26	1.082e-26	-25.884	-25.966	-0.082	(0)
CoCl+2	1.328e-35	6.249e-36	-34.877	-35.204	-0.327	(0)
UCl+3	0.000e+00	0.000e+00	-44.496	-45.232	-0.736	(0)
Co (2)	1.357e-07					
Co+2	8.600e-08	4.048e-08	-7.065	-7.393	-0.327	(0)
CoHCO3+	3.348e-08	2.773e-08	-7.475	-7.557	-0.082	(0)
CoSO4	1.125e-08	1.125e-08	-7.949	-7.949	0.000	(0)
CoCO3	4.075e-09	4.075e-09	-8.390	-8.390	0.000	(0)
CoF+	4.909e-10	4.066e-10	-9.309	-9.391	-0.082	(0)
CoCl+	2.474e-10	2.049e-10	-9.607	-9.688	-0.082	(0)
CoOH+	1.415e-10	1.172e-10	-9.849	-9.931	-0.082	(0)
Co (OH) 2	1.352e-12	1.352e-12	-11.869	-11.869	0.000	(0)
CoSeO4	1.772e-17	1.772e-17	-16.751	-16.751	0.000	(0)
Co (OH) 3-	4.727e-18	3.915e-18	-17.325	-17.407	-0.082	(0)
Co2OH+3	1.296e-18	2.379e-19	-17.887	-18.624	-0.736	(0)
CoOOH-	1.187e-18	9.828e-19	-17.926	-18.008	-0.082	(0)
Co (OH) 4-2	1.914e-25	9.007e-26	-24.718	-25.045	-0.327	(0)
Co4 (OH) 4+4	7.680e-31	3.770e-32	-30.115	-31.424	-1.309	(0)
Co (3)	3.289e-29					
CoOH+2	3.289e-29	1.548e-29	-28.483	-28.810	-0.327	(0)
Co+3	8.338e-35	2.099e-35	-34.079	-34.678	-0.599	(0)
CoCl+2	1.328e-35	6.249e-36	-34.877	-35.204	-0.327	(0)
Cr (2)	6.280e-24					
Cr+2	6.280e-24	2.956e-24	-23.202	-23.529	-0.327	(0)
Cr (3)	1.269e-07					
Cr (OH) 2+	1.091e-07	9.039e-08	-6.962	-7.044	-0.082	(0)
Cr (OH) +2	1.087e-08	5.118e-09	-7.964	-8.291	-0.327	(0)
Cr (OH) 3	4.929e-09	4.929e-09	-8.307	-8.307	0.000	(0)
CrOHSO4	1.691e-09	1.691e-09	-8.772	-8.772	0.000	(0)
CrF+2	1.724e-10	8.113e-11	-9.764	-10.091	-0.327	(0)
CrO2-	4.078e-11	3.378e-11	-10.390	-10.471	-0.082	(0)
Cr (OH) 4-	3.439e-11	2.848e-11	-10.464	-10.545	-0.082	(0)
Cr+3	8.781e-12	1.612e-12	-11.056	-11.793	-0.736	(0)
CrSO4+	6.328e-12	5.241e-12	-11.199	-11.281	-0.082	(0)
CrCl+2	6.484e-15	3.052e-15	-14.188	-14.515	-0.327	(0)
Cr2 (OH) 2SO4+2	1.662e-15	7.824e-16	-14.779	-15.107	-0.327	(0)
Cr2 (OH) 2 (SO4) 2	6.474e-17	6.474e-17	-16.189	-16.189	0.000	(0)
CrOHC12	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
CrCl2+	5.117e-19	4.238e-19	-18.291	-18.373	-0.082	(0)
Cr (6)	1.620e-16					
CrO4-2	1.394e-16	7.553e-17	-15.856	-16.122	-0.266	(0)
HCrO4-	2.046e-17	1.695e-17	-16.689	-16.771	-0.082	(0)
NaCrO4-	1.900e-18	1.574e-18	-17.721	-17.803	-0.082	(0)
KCrO4-	2.027e-19	1.679e-19	-18.693	-18.775	-0.082	(0)
CrO3SO4-2	1.059e-24	4.987e-25	-23.975	-24.302	-0.327	(0)
H2CrO4	9.524e-25	9.524e-25	-24.021	-24.021	0.000	(0)
CrO3Cl-	1.306e-26	1.082e-26	-25.884	-25.966	-0.082	(0)
Cr2O7-2	2.116e-32	9.962e-33	-31.674	-32.002	-0.327	(0)
Cu (1)	3.287e-09					
CuCl	1.633e-09	1.633e-09	-8.787	-8.787	0.000	(0)
Cu+	1.070e-09	8.863e-10	-8.971	-9.052	-0.082	(0)
CuCl2-	5.833e-10	4.993e-10	-9.234	-9.302	-0.068	(0)
CuCl3-2	2.836e-13	1.562e-13	-12.547	-12.806	-0.259	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.100	-140.433	-0.333	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.845	-141.163	-0.318	(0)
Cu (2)	9.351e-06					
CuCO3	8.265e-06	8.265e-06	-5.083	-5.083	0.000	(0)
Cu+2	4.351e-07	2.357e-07	-6.361	-6.628	-0.266	(0)
Cu (CO3) 2-2	2.814e-07	1.325e-07	-6.551	-6.878	-0.327	(0)
CuHCO3+	1.581e-07	1.310e-07	-6.801	-6.883	-0.082	(0)

	CuOH+	1.264e-07	1.082e-07	-6.898	-6.966	-0.068	(0)
	CuSO4	7.520e-08	7.520e-08	-7.124	-7.124	0.000	(0)
	CuF+	5.702e-09	4.723e-09	-8.244	-8.326	-0.082	(0)
	Cu(OH) 2	3.133e-09	3.133e-09	-8.504	-8.504	0.000	(0)
	CuCl+	6.386e-10	5.466e-10	-9.195	-9.262	-0.068	(0)
	Cu2(OH) 2+2	6.245e-10	2.940e-10	-9.204	-9.532	-0.327	(0)
	Cu(OH) 3-	1.126e-12	9.329e-13	-11.948	-12.030	-0.082	(0)
	CuCl2	2.774e-13	2.774e-13	-12.557	-12.557	0.000	(0)
	CuCl3-	4.426e-18	3.788e-18	-17.354	-17.422	-0.068	(0)
	Cu(OH) 4-2	2.264e-18	1.066e-18	-17.645	-17.972	-0.327	(0)
	CuCl4-2	5.044e-23	2.778e-23	-22.297	-22.556	-0.259	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-204.280	-204.362	-0.082	(0)
F		4.212e-04					
	F-	3.702e-04	3.176e-04	-3.432	-3.498	-0.067	(0)
	MgF+	3.167e-05	2.720e-05	-4.499	-4.565	-0.066	(0)
	CaF+	9.218e-06	7.941e-06	-5.035	-5.100	-0.065	(0)
	AlF3	2.087e-06	2.087e-06	-5.680	-5.680	0.000	(0)
	NaF	8.404e-07	8.404e-07	-6.075	-6.075	0.000	(0)
	AlF2+	6.044e-07	5.219e-07	-6.219	-6.282	-0.064	(0)
	AlF4-	3.869e-07	3.322e-07	-6.412	-6.479	-0.066	(0)
	MnF+	1.330e-07	1.146e-07	-6.876	-6.941	-0.065	(0)
	HF	3.257e-08	3.257e-08	-7.487	-7.487	0.000	(0)
	AlF+2	7.421e-09	4.127e-09	-8.130	-8.384	-0.255	(0)
	CuF+	5.702e-09	4.723e-09	-8.244	-8.326	-0.082	(0)
	ZnF+	3.033e-09	2.513e-09	-8.518	-8.600	-0.082	(0)
	BF(OH) 3-	2.362e-09	1.999e-09	-8.627	-8.699	-0.072	(0)
	NiF+	5.582e-10	4.624e-10	-9.253	-9.335	-0.082	(0)
	CoF+	4.909e-10	4.066e-10	-9.309	-9.391	-0.082	(0)
	CrF+2	1.724e-10	8.113e-11	-9.764	-10.091	-0.327	(0)
	HF2-	4.612e-11	3.934e-11	-10.336	-10.405	-0.069	(0)
	CdF+	2.790e-11	2.311e-11	-10.554	-10.636	-0.082	(0)
	PbF+	2.360e-11	1.955e-11	-10.627	-10.709	-0.082	(0)
	AgF	1.424e-11	1.424e-11	-10.846	-10.846	0.000	(0)
	FeF2+	1.276e-11	1.100e-11	-10.894	-10.959	-0.065	(0)
	BF2(OH) 2-	5.563e-12	4.710e-12	-11.255	-11.327	-0.072	(0)
	FeF3	4.928e-12	4.928e-12	-11.307	-11.307	0.000	(0)
	FeF+2	2.349e-12	1.294e-12	-11.629	-11.888	-0.259	(0)
	UO2F+	1.885e-13	1.561e-13	-12.725	-12.806	-0.082	(0)
	UO2F2	1.430e-13	1.430e-13	-12.845	-12.845	0.000	(0)
	PbF2	1.222e-13	1.222e-13	-12.913	-12.913	0.000	(0)
	CdF2	1.465e-14	1.465e-14	-13.834	-13.834	0.000	(0)
	UO2F3-	1.378e-14	1.141e-14	-13.861	-13.943	-0.082	(0)
	VO2F	4.708e-15	4.708e-15	-14.327	-14.327	0.000	(0)
	H2F2	2.843e-15	2.843e-15	-14.546	-14.546	0.000	(0)
	VO2F2-	6.555e-16	5.430e-16	-15.183	-15.265	-0.082	(0)
	PbF3-	8.889e-17	7.363e-17	-16.051	-16.133	-0.082	(0)
	UO2F4-2	6.118e-17	2.880e-17	-16.213	-16.541	-0.327	(0)
	VOF+	5.742e-17	4.756e-17	-16.241	-16.323	-0.082	(0)
	BF3OH-	4.768e-17	4.037e-17	-16.322	-16.394	-0.072	(0)
	VOF2	5.665e-18	5.665e-18	-17.247	-17.247	0.000	(0)
	VO2F3-2	4.570e-18	2.151e-18	-17.340	-17.667	-0.327	(0)
	VOF3-	7.708e-20	6.384e-20	-19.113	-19.195	-0.082	(0)
	PbF4-2	2.378e-20	1.119e-20	-19.624	-19.951	-0.327	(0)
	BF4-	5.170e-21	4.377e-21	-20.287	-20.359	-0.072	(0)
	VO2F4-3	1.832e-21	3.362e-22	-20.737	-21.473	-0.736	(0)
	VOF4-2	1.739e-22	8.185e-23	-21.760	-22.087	-0.327	(0)
	Sb(OH) 2F	1.739e-23	1.739e-23	-22.760	-22.760	0.000	(0)
	SbOF	1.711e-23	1.711e-23	-22.767	-22.767	0.000	(0)
	HgF+	5.602e-24	4.640e-24	-23.252	-23.333	-0.082	(0)
	UF3+	1.230e-33	1.019e-33	-32.910	-32.992	-0.082	(0)
	UF2+2	4.301e-35	2.024e-35	-34.366	-34.694	-0.327	(0)
	UF4	3.549e-35	3.549e-35	-34.450	-34.450	0.000	(0)
	UF5-	5.393e-37	4.467e-37	-36.268	-36.350	-0.082	(0)
	UF6-2	9.104e-38	4.285e-38	-37.041	-37.368	-0.327	(0)
	UF+3	2.758e-38	5.062e-39	-37.559	-38.296	-0.736	(0)
Fe (2)		7.986e-07					
	Fe+2	6.523e-07	3.070e-07	-6.186	-6.513	-0.327	(0)
	FeSO4	1.050e-07	1.050e-07	-6.979	-6.979	0.000	(0)

FeHCO3+	3.928e-08	3.404e-08	-7.406	-7.468	-0.062	(0)
FeOH+	2.060e-09	1.774e-09	-8.686	-8.751	-0.065	(0)
Fe (OH) 2	2.046e-13	2.046e-13	-12.689	-12.689	0.000	(0)
Fe (OH) 3-	1.090e-14	9.390e-15	-13.963	-14.027	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.652	-146.652	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.077	-219.159	-0.082	(0)
Fe (3)	2.588e-05					
Fe (OH) 2+	2.276e-05	1.966e-05	-4.643	-4.706	-0.064	(0)
Fe (OH) 3	3.065e-06	3.065e-06	-5.514	-5.514	0.000	(0)
Fe (OH) 4-	4.797e-08	4.142e-08	-7.319	-7.383	-0.064	(0)
FeOH+2	6.320e-10	3.481e-10	-9.199	-9.458	-0.259	(0)
FeF2+	1.276e-11	1.100e-11	-10.894	-10.959	-0.065	(0)
FeF3	4.928e-12	4.928e-12	-11.307	-11.307	0.000	(0)
FeF+2	2.349e-12	1.294e-12	-11.629	-11.888	-0.259	(0)
FeSO4+	6.738e-14	5.805e-14	-13.171	-13.236	-0.065	(0)
Fe+3	1.476e-14	3.714e-15	-13.831	-14.430	-0.599	(0)
Fe (SO4) 2-	2.087e-15	1.729e-15	-14.680	-14.762	-0.082	(0)
FeCl+2	2.980e-16	1.642e-16	-15.526	-15.785	-0.259	(0)
Fe2 (OH) 2+4	8.175e-17	4.013e-18	-16.088	-17.397	-1.309	(0)
FeCl2+	1.246e-18	1.073e-18	-17.905	-17.969	-0.065	(0)
FeHSeO3+2	7.279e-19	3.426e-19	-18.138	-18.465	-0.327	(0)
Fe3 (OH) 4+5	1.266e-19	1.140e-21	-18.898	-20.943	-2.045	(0)
FeCl3	1.570e-22	1.570e-22	-21.804	-21.804	0.000	(0)
H (0)	3.990e-28					
H2	1.995e-28	2.007e-28	-27.700	-27.698	0.003	(0)
Hg (0)	2.145e-10					
Hg	2.145e-10	2.145e-10	-9.669	-9.669	0.000	(0)
Hg (1)	2.438e-22					
Hg2+2	1.219e-22	5.738e-23	-21.914	-22.241	-0.327	(0)
Hg (2)	2.888e-13					
HgClOH	1.478e-13	1.478e-13	-12.830	-12.830	0.000	(0)
HgCl2	8.439e-14	8.439e-14	-13.074	-13.074	0.000	(0)
Hg (OH) 2	5.208e-14	5.239e-14	-13.283	-13.281	0.003	(0)
HgCO3	2.809e-15	2.809e-15	-14.552	-14.552	0.000	(0)
HgCl3-	1.491e-15	1.235e-15	-14.827	-14.908	-0.082	(0)
Hg (CO3) 2-2	1.124e-16	5.289e-17	-15.949	-16.277	-0.327	(0)
HgCl4-2	1.529e-17	7.195e-18	-16.816	-17.143	-0.327	(0)
HgCl+	1.389e-17	1.151e-17	-16.857	-16.939	-0.082	(0)
HgHCO3+	4.378e-18	3.626e-18	-17.359	-17.441	-0.082	(0)
HgOH+	2.749e-18	2.277e-18	-17.561	-17.643	-0.082	(0)
Hg (OH) 3-	1.156e-21	9.574e-22	-20.937	-21.019	-0.082	(0)
Hg+2	8.372e-22	3.941e-22	-21.077	-21.404	-0.327	(0)
HgSO4	1.437e-22	1.437e-22	-21.843	-21.843	0.000	(0)
HgF+	5.602e-24	4.640e-24	-23.252	-23.333	-0.082	(0)
HgHS2-	0.000e+00	0.000e+00	-131.324	-131.406	-0.082	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.171	-132.171	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.628	-132.955	-0.327	(0)
K	7.044e-04					
K+	6.976e-04	5.984e-04	-3.156	-3.223	-0.067	(0)
KSO4-	6.833e-06	5.901e-06	-5.165	-5.229	-0.064	(0)
KCrO4-	2.027e-19	1.679e-19	-18.693	-18.775	-0.082	(0)
Mg	1.718e-03					
Mg+2	1.409e-03	7.631e-04	-2.851	-3.117	-0.266	(0)
MgSO4	1.934e-04	1.934e-04	-3.714	-3.714	0.000	(0)
MgHCO3+	8.036e-05	6.878e-05	-4.095	-4.163	-0.068	(0)
MgF+	3.167e-05	2.720e-05	-4.499	-4.565	-0.066	(0)
MgCO3	3.780e-06	3.780e-06	-5.423	-5.423	0.000	(0)
MgOH+	5.074e-08	4.410e-08	-7.295	-7.356	-0.061	(0)
MgH2BO3+	4.130e-09	3.496e-09	-8.384	-8.456	-0.072	(0)
Mn (2)	2.351e-05					
Mn+2	1.926e-05	9.064e-06	-4.715	-5.043	-0.327	(0)
MnSO4	2.245e-06	2.245e-06	-5.649	-5.649	0.000	(0)
MnHCO3+	1.849e-06	1.593e-06	-5.733	-5.798	-0.065	(0)
MnF+	1.330e-07	1.146e-07	-6.876	-6.941	-0.065	(0)
MnCl+	1.938e-08	1.670e-08	-7.713	-7.777	-0.065	(0)
MnOH+	3.836e-09	3.305e-09	-8.416	-8.481	-0.065	(0)
MnCl2	3.452e-11	3.452e-11	-10.462	-10.462	0.000	(0)
MnCl3-	1.615e-14	1.391e-14	-13.792	-13.857	-0.065	(0)

MnSeO4	2.131e-15	2.131e-15	-14.671	-14.671	0.000	(0)
Mn (OH) 3-	4.996e-19	4.304e-19	-18.301	-18.366	-0.065	(0)
Mn (OH) 4-2	3.662e-25	2.017e-25	-24.436	-24.695	-0.259	(0)
MnSe	3.107e-40	3.107e-40	-39.508	-39.508	0.000	(0)
Mn (3)	2.095e-25					
Mn+3	2.095e-25	5.273e-26	-24.679	-25.278	-0.599	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.475	-45.734	-0.259	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.921	-49.992	-0.071	(0)
Mo	5.453e-07					
MoO4-2	5.448e-07	2.951e-07	-6.264	-6.530	-0.266	(0)
HMoO4-	4.915e-10	4.071e-10	-9.308	-9.390	-0.082	(0)
H2MoO4	2.068e-13	2.068e-13	-12.685	-12.685	0.000	(0)
Ag2MoO4	3.558e-23	3.558e-23	-22.449	-22.449	0.000	(0)
AlMo6O21-3	5.114e-39	9.385e-40	-38.291	-39.028	-0.736	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.046	-49.992	-2.945	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.719	-50.764	-2.045	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.832	-53.141	-1.309	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.318	-57.054	-0.736	(0)
Na	4.947e-03					
Na+	4.888e-03	4.193e-03	-2.311	-2.377	-0.067	(0)
NaSO4-	3.632e-05	3.137e-05	-4.440	-4.504	-0.064	(0)
NaHCO3	2.077e-05	2.077e-05	-4.683	-4.683	0.000	(0)
NaF	8.404e-07	8.404e-07	-6.075	-6.075	0.000	(0)
NaCO3-	5.385e-07	4.650e-07	-6.269	-6.333	-0.064	(0)
NaH2BO3	8.782e-10	8.782e-10	-9.056	-9.056	0.000	(0)
NaCrO4-	1.900e-18	1.574e-18	-17.721	-17.803	-0.082	(0)
Ni	2.129e-07					
Ni+2	1.070e-07	5.795e-08	-6.971	-7.237	-0.266	(0)
NiHCO3+	7.597e-08	6.293e-08	-7.119	-7.201	-0.082	(0)
NiSO4	1.611e-08	1.611e-08	-7.793	-7.793	0.000	(0)
NiCO3	1.288e-08	1.288e-08	-7.890	-7.890	0.000	(0)
NiF+	5.582e-10	4.624e-10	-9.253	-9.335	-0.082	(0)
NiCl+	2.620e-10	2.170e-10	-9.582	-9.664	-0.082	(0)
NiOH+	1.279e-10	1.059e-10	-9.893	-9.975	-0.082	(0)
Ni (SO4) 2-2	1.578e-12	7.428e-13	-11.802	-12.129	-0.327	(0)
Ni (OH) 2	1.221e-12	1.221e-12	-11.913	-11.913	0.000	(0)
NiCl2	1.599e-15	1.599e-15	-14.796	-14.796	0.000	(0)
Ni (OH) 3-	2.140e-16	1.772e-16	-15.670	-15.751	-0.082	(0)
NiSeO4	2.368e-17	2.368e-17	-16.626	-16.626	0.000	(0)
O (0)	2.500e-37					
O2	1.250e-37	1.258e-37	-36.903	-36.900	0.003	(0)
Pb	2.579e-08					
PbCO3	1.564e-08	1.564e-08	-7.806	-7.806	0.000	(0)
PbHCO3+	6.901e-09	5.716e-09	-8.161	-8.243	-0.082	(0)
Pb+2	1.613e-09	8.735e-10	-8.792	-9.059	-0.266	(0)
PbSO4	5.959e-10	5.959e-10	-9.225	-9.225	0.000	(0)
Pb (CO3) 2-2	5.706e-10	2.686e-10	-9.244	-9.571	-0.327	(0)
PbOH+	3.845e-10	3.185e-10	-9.415	-9.497	-0.082	(0)
PbCl+	5.476e-11	4.535e-11	-10.262	-10.343	-0.082	(0)
PbF+	2.360e-11	1.955e-11	-10.627	-10.709	-0.082	(0)
Pb (SO4) 2-2	1.062e-11	5.001e-12	-10.974	-11.301	-0.327	(0)
Pb (OH) 2	1.462e-12	1.462e-12	-11.835	-11.835	0.000	(0)
PbCl2	2.965e-13	2.965e-13	-12.528	-12.528	0.000	(0)
PbF2	1.222e-13	1.222e-13	-12.913	-12.913	0.000	(0)
Pb (OH) 3-	2.562e-16	2.122e-16	-15.591	-15.673	-0.082	(0)
PbCl3-	2.085e-16	1.727e-16	-15.681	-15.763	-0.082	(0)
PbF3-	8.889e-17	7.363e-17	-16.051	-16.133	-0.082	(0)
Pb2OH+3	2.403e-17	4.409e-18	-16.619	-17.356	-0.736	(0)
PbCl4-2	2.455e-19	1.155e-19	-18.610	-18.937	-0.327	(0)
PbF4-2	2.378e-20	1.119e-20	-19.624	-19.951	-0.327	(0)
Pb (OH) 4-2	1.603e-20	7.544e-21	-19.795	-20.122	-0.327	(0)
Pb3 (OH) 4+2	7.914e-23	3.725e-23	-22.102	-22.429	-0.327	(0)
Pb4 (OH) 4+4	5.265e-27	2.585e-28	-26.279	-27.588	-1.309	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.878	-142.878	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.040	-216.122	-0.082	(0)
S (-2)	0.000e+00					

AgHS	0.000e+00	0.000e+00	-68.478	-68.478	0.000	(0)
HS-	0.000e+00	0.000e+00	-74.463	-74.544	-0.082	(0)
H2S	0.000e+00	0.000e+00	-74.683	-74.683	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.793	-74.874	-0.082	(0)
S5-2	0.000e+00	0.000e+00	-76.423	-76.750	-0.327	(0)
S6-2	0.000e+00	0.000e+00	-76.939	-77.266	-0.327	(0)
S4-2	0.000e+00	0.000e+00	-77.019	-77.346	-0.327	(0)
S3-2	0.000e+00	0.000e+00	-77.825	-78.152	-0.327	(0)
S2-2	0.000e+00	0.000e+00	-78.841	-79.168	-0.327	(0)
S-2	0.000e+00	0.000e+00	-84.426	-84.685	-0.259	(0)
HgHS2-	0.000e+00	0.000e+00	-131.324	-131.406	-0.082	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.171	-132.171	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.628	-132.955	-0.327	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.841	-138.923	-0.082	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.064	-139.247	-0.183	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.100	-140.433	-0.333	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.845	-141.163	-0.318	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.187	-141.528	-0.341	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.440	-141.522	-0.082	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.514	-141.839	-0.325	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.215	-142.215	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.671	-142.671	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.878	-142.878	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.652	-146.652	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.280	-204.362	-0.082	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.853	-213.935	-0.082	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.777	-214.859	-0.082	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.040	-216.122	-0.082	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.429	-216.756	-0.327	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.077	-219.159	-0.082	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.880	-287.208	-0.327	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.612	-289.939	-0.327	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.372	-299.699	-0.327	(0)
S (6)	3.541e-03					
SO4-2	2.571e-03	1.393e-03	-2.590	-2.856	-0.266	(0)
CaSO4	7.309e-04	7.309e-04	-3.136	-3.136	0.000	(0)
MgSO4	1.934e-04	1.934e-04	-3.714	-3.714	0.000	(0)
NaSO4-	3.632e-05	3.137e-05	-4.440	-4.504	-0.064	(0)
KSO4-	6.833e-06	5.901e-06	-5.165	-5.229	-0.064	(0)
MnSO4	2.245e-06	2.245e-06	-5.649	-5.649	0.000	(0)
ZnSO4	1.208e-07	1.208e-07	-6.918	-6.918	0.000	(0)
FeSO4	1.050e-07	1.050e-07	-6.979	-6.979	0.000	(0)
CuSO4	7.520e-08	7.520e-08	-7.124	-7.124	0.000	(0)
NiSO4	1.611e-08	1.611e-08	-7.793	-7.793	0.000	(0)
CoSO4	1.125e-08	1.125e-08	-7.949	-7.949	0.000	(0)
HSO4-	1.099e-08	9.437e-09	-7.959	-8.025	-0.066	(0)
Zn (SO4) 2-2	3.113e-09	1.466e-09	-8.507	-8.834	-0.327	(0)
CrOHSO4	1.691e-09	1.691e-09	-8.772	-8.772	0.000	(0)
CdSO4	1.499e-09	1.499e-09	-8.824	-8.824	0.000	(0)
AgSO4-	5.988e-10	4.960e-10	-9.223	-9.305	-0.082	(0)
PbSO4	5.959e-10	5.959e-10	-9.225	-9.225	0.000	(0)
Cd (SO4) 2-2	5.984e-11	2.817e-11	-10.223	-10.550	-0.327	(0)
AlSO4+	1.636e-11	1.405e-11	-10.786	-10.852	-0.066	(0)
Pb (SO4) 2-2	1.062e-11	5.001e-12	-10.974	-11.301	-0.327	(0)
CrSO4+	6.328e-12	5.241e-12	-11.199	-11.281	-0.082	(0)
Ni (SO4) 2-2	1.578e-12	7.428e-13	-11.802	-12.129	-0.327	(0)
Al (SO4) 2-	2.442e-13	2.097e-13	-12.612	-12.678	-0.066	(0)
FeSO4+	6.738e-14	5.805e-14	-13.171	-13.236	-0.065	(0)
UO2SO4	7.508e-15	7.508e-15	-14.124	-14.124	0.000	(0)
Fe (SO4) 2-	2.087e-15	1.729e-15	-14.680	-14.762	-0.082	(0)
Cr2 (OH) 2SO4+2	1.662e-15	7.824e-16	-14.779	-15.107	-0.327	(0)
VO2SO4-	3.393e-16	2.811e-16	-15.469	-15.551	-0.082	(0)
UO2 (SO4) 2-2	2.929e-16	1.379e-16	-15.533	-15.861	-0.327	(0)
Cr2 (OH) 2 (SO4) 2	6.474e-17	6.474e-17	-16.189	-16.189	0.000	(0)
VOSO4	9.577e-18	9.577e-18	-17.019	-17.019	0.000	(0)
HgSO4	1.437e-22	1.437e-22	-21.843	-21.843	0.000	(0)
CrO3SO4-2	1.059e-24	4.987e-25	-23.975	-24.302	-0.327	(0)
VSO4+	3.634e-31	3.010e-31	-30.440	-30.521	-0.082	(0)

U(SO4)2	4.900e-40	4.900e-40	-39.310	-39.310	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.026	-40.354	-0.327	(0)
Sb(3)	9.986e-19					
Sb(OH)3	5.052e-19	5.052e-19	-18.297	-18.297	0.000	(0)
HSbO2	4.933e-19	4.933e-19	-18.307	-18.307	0.000	(0)
Sb(OH)2F	1.739e-23	1.739e-23	-22.760	-22.760	0.000	(0)
SbOF	1.711e-23	1.711e-23	-22.767	-22.767	0.000	(0)
SbO2-	1.391e-23	1.152e-23	-22.857	-22.938	-0.082	(0)
Sb(OH)4-	7.965e-24	6.597e-24	-23.099	-23.181	-0.082	(0)
Sb(OH)2+	1.027e-24	8.509e-25	-23.988	-24.070	-0.082	(0)
SbO+	3.543e-25	2.935e-25	-24.451	-24.532	-0.082	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.372	-299.699	-0.327	(0)
Sb(5)	1.301e-08					
SbO3-	1.299e-08	1.076e-08	-7.886	-7.968	-0.082	(0)
Sb(OH)6-	1.465e-11	1.257e-11	-10.834	-10.901	-0.067	(0)
SbO2+	1.792e-23	1.485e-23	-22.747	-22.828	-0.082	(0)
Se(-2)	2.159e-10					
Ag2Se	2.159e-10	2.159e-10	-9.666	-9.666	0.000	(0)
HSe-	6.964e-37	5.768e-37	-36.157	-36.239	-0.082	(0)
MnSe	3.107e-40	3.107e-40	-39.508	-39.508	0.000	(0)
H2Se	3.104e-40	3.104e-40	-39.508	-39.508	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.753	-44.080	-0.327	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-77.949	-79.258	-1.309	(0)
Se(4)	4.641e-08					
HSeO3-	4.215e-08	3.491e-08	-7.375	-7.457	-0.082	(0)
SeO3-2	4.258e-09	2.004e-09	-8.371	-8.698	-0.327	(0)
H2SeO3	1.033e-12	1.033e-12	-11.986	-11.986	0.000	(0)
AgSeO3-	2.776e-14	2.299e-14	-13.557	-13.638	-0.082	(0)
FeHSeO3+2	7.279e-19	3.426e-19	-18.138	-18.465	-0.327	(0)
Cd(SeO3)2-2	3.230e-20	1.520e-20	-19.491	-19.818	-0.327	(0)
Ag(SeO3)2-3	2.249e-21	4.126e-22	-20.648	-21.384	-0.736	(0)
Se(6)	1.615e-12					
SeO4-2	1.613e-12	8.736e-13	-11.792	-12.059	-0.266	(0)
MnSeO4	2.131e-15	2.131e-15	-14.671	-14.671	0.000	(0)
ZnSeO4	5.364e-17	5.364e-17	-16.271	-16.271	0.000	(0)
NiSeO4	2.368e-17	2.368e-17	-16.626	-16.626	0.000	(0)
CoSeO4	1.772e-17	1.772e-17	-16.751	-16.751	0.000	(0)
HSeO4-	3.665e-18	3.036e-18	-17.436	-17.518	-0.082	(0)
CdSeO4	7.468e-19	7.468e-19	-18.127	-18.127	0.000	(0)
Zn(SeO4)2-2	1.009e-28	4.751e-29	-27.996	-28.323	-0.327	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.272	-58.008	-0.736	(0)
U(4)	4.565e-22					
U(OH)5-	4.554e-22	3.772e-22	-21.342	-21.423	-0.082	(0)
U(OH)4	1.096e-24	1.096e-24	-23.960	-23.960	0.000	(0)
U(OH)3+	3.355e-28	2.779e-28	-27.474	-27.556	-0.082	(0)
U(OH)2+2	1.894e-32	8.914e-33	-31.723	-32.050	-0.327	(0)
UF3+	1.230e-33	1.019e-33	-32.910	-32.992	-0.082	(0)
UF2+2	4.301e-35	2.024e-35	-34.366	-34.694	-0.327	(0)
UF4	3.549e-35	3.549e-35	-34.450	-34.450	0.000	(0)
UF5-	5.393e-37	4.467e-37	-36.268	-36.350	-0.082	(0)
UOH+3	1.587e-37	2.912e-38	-36.799	-37.536	-0.736	(0)
UF6-2	9.104e-38	4.285e-38	-37.041	-37.368	-0.327	(0)
UF+3	2.758e-38	5.062e-39	-37.559	-38.296	-0.736	(0)
U(SO4)2	4.900e-40	4.900e-40	-39.310	-39.310	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.026	-40.354	-0.327	(0)
U+4	0.000e+00	0.000e+00	-42.789	-44.098	-1.309	(0)
UCl+3	0.000e+00	0.000e+00	-44.496	-45.232	-0.736	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-167.731	-174.358	-6.627	(0)
U(5)	2.012e-17					
UO2+	2.012e-17	1.667e-17	-16.696	-16.778	-0.082	(0)
U(6)	8.241e-08					
UO2(CO3)3-4	6.101e-08	2.995e-09	-7.215	-8.524	-1.309	(0)
UO2(CO3)2-2	2.132e-08	1.003e-08	-7.671	-7.999	-0.327	(0)
UO2CO3	8.444e-11	8.444e-11	-10.073	-10.073	0.000	(0)
UO2F+	1.885e-13	1.561e-13	-12.725	-12.806	-0.082	(0)
UO2F2	1.430e-13	1.430e-13	-12.845	-12.845	0.000	(0)
UO2OH+	7.857e-14	6.508e-14	-13.105	-13.187	-0.082	(0)

UO2F3-	1.378e-14	1.141e-14	-13.861	-13.943	-0.082	(0)
UO2SO4	7.508e-15	7.508e-15	-14.124	-14.124	0.000	(0)
UO2+2	6.575e-15	3.561e-15	-14.182	-14.448	-0.266	(0)
UO2(SO4) 2-2	2.929e-16	1.379e-16	-15.533	-15.861	-0.327	(0)
UO2F4-2	6.118e-17	2.880e-17	-16.213	-16.541	-0.327	(0)
UO2Cl+	1.020e-17	8.452e-18	-16.991	-17.073	-0.082	(0)
(UO2) 2 (OH) 2+2	1.493e-20	7.029e-21	-19.826	-20.153	-0.327	(0)
(UO2) 3 (OH) 5+	8.828e-24	7.312e-24	-23.054	-23.136	-0.082	(0)
V (2)	1.342e-39					
VOH+	9.765e-40	8.088e-40	-39.010	-39.092	-0.082	(0)
V+2	3.658e-40	1.722e-40	-39.437	-39.764	-0.327	(0)
V (3)	1.130e-12					
V (OH) 3	1.130e-12	1.130e-12	-11.947	-11.947	0.000	(0)
V (OH) 2+	6.112e-23	5.063e-23	-22.214	-22.296	-0.082	(0)
VOH+2	7.076e-26	3.331e-26	-25.150	-25.477	-0.327	(0)
V+3	2.495e-30	4.578e-31	-29.603	-30.339	-0.736	(0)
VSO4+	3.634e-31	3.010e-31	-30.440	-30.521	-0.082	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.585	-49.321	-0.736	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.846	-50.155	-1.309	(0)
V (4)	9.984e-16					
V (OH) 3+	8.725e-16	7.227e-16	-15.059	-15.141	-0.082	(0)
VOF+	5.742e-17	4.756e-17	-16.241	-16.323	-0.082	(0)
VO+2	5.304e-17	2.496e-17	-16.275	-16.603	-0.327	(0)
VOSO4	9.577e-18	9.577e-18	-17.019	-17.019	0.000	(0)
VOF2	5.665e-18	5.665e-18	-17.247	-17.247	0.000	(0)
VOC1+	1.237e-19	1.025e-19	-18.907	-18.989	-0.082	(0)
VOF3-	7.708e-20	6.384e-20	-19.113	-19.195	-0.082	(0)
VOF4-2	1.739e-22	8.185e-23	-21.760	-22.087	-0.327	(0)
H2V2O4+2	5.566e-26	2.620e-26	-25.254	-25.582	-0.327	(0)
V (5)	1.132e-07					
H2VO4-	1.063e-07	8.802e-08	-6.974	-7.055	-0.082	(0)
HVO4-2	6.775e-09	3.189e-09	-8.169	-8.496	-0.327	(0)
H3VO4	6.103e-11	6.103e-11	-10.214	-10.214	0.000	(0)
H3V2O7-	4.190e-11	3.470e-11	-10.378	-10.460	-0.082	(0)
HV2O7-3	5.185e-13	9.516e-14	-12.285	-13.022	-0.736	(0)
VO2+	9.851e-15	8.451e-15	-14.007	-14.073	-0.067	(0)
VO2F	4.708e-15	4.708e-15	-14.327	-14.327	0.000	(0)
V3O9-3	3.897e-15	7.152e-16	-14.409	-15.146	-0.736	(0)
VO4-3	1.256e-15	2.305e-16	-14.901	-15.637	-0.736	(0)
V2O7-4	7.525e-16	3.694e-17	-15.123	-16.432	-1.309	(0)
VO2F2-	6.555e-16	5.430e-16	-15.183	-15.265	-0.082	(0)
VO2SO4-	3.393e-16	2.811e-16	-15.469	-15.551	-0.082	(0)
VO2F3-2	4.570e-18	2.151e-18	-17.340	-17.667	-0.327	(0)
V4O12-4	5.349e-19	2.626e-20	-18.272	-19.581	-1.309	(0)
VO2F4-3	1.832e-21	3.362e-22	-20.737	-21.473	-0.736	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.209	-49.254	-2.045	(0)
V10O28-6	0.000e+00	0.000e+00	-47.337	-50.282	-2.945	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.897	-51.206	-1.309	(0)
Zn	1.137e-06					
Zn+2	7.319e-07	3.964e-07	-6.136	-6.402	-0.266	(0)
ZnCO3	1.359e-07	1.359e-07	-6.867	-6.867	0.000	(0)
ZnHCO3+	1.333e-07	1.104e-07	-6.875	-6.957	-0.082	(0)
ZnSO4	1.208e-07	1.208e-07	-6.918	-6.918	0.000	(0)
ZnOH+	6.948e-09	5.755e-09	-8.158	-8.240	-0.082	(0)
Zn (SO4) 2-2	3.113e-09	1.466e-09	-8.507	-8.834	-0.327	(0)
ZnF+	3.033e-09	2.513e-09	-8.518	-8.600	-0.082	(0)
ZnCl+	1.703e-09	1.457e-09	-8.769	-8.836	-0.068	(0)
ZnOHCl	2.769e-10	2.769e-10	-9.558	-9.558	0.000	(0)
Zn (OH) 2	1.324e-10	1.324e-10	-9.878	-9.878	0.000	(0)
ZnCl2	3.380e-12	3.380e-12	-11.471	-11.471	0.000	(0)
Zn (OH) 3-	1.163e-13	9.632e-14	-12.934	-13.016	-0.082	(0)
ZnCl3-	4.591e-15	3.929e-15	-14.338	-14.406	-0.068	(0)
ZnSeO4	5.364e-17	5.364e-17	-16.271	-16.271	0.000	(0)
ZnCl4-2	5.220e-18	2.875e-18	-17.282	-17.541	-0.259	(0)
Zn (OH) 4-2	1.182e-18	5.566e-19	-17.927	-18.254	-0.327	(0)
Zn (SeO4) 2-2	1.009e-28	4.751e-29	-27.996	-28.323	-0.327	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.440	-141.522	-0.082	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.671	-142.671	0.000	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-213.853	-213.935	-0.082	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.429	-216.756	-0.327	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.612	-289.939	-0.327	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.66	-82.88	-36.22	Ag2S
Ag2CO3	-9.63	-20.72	-11.09	Ag2CO3
Ag2CrO4	-20.03	-31.62	-11.59	Ag2CrO4
Ag2HVO4	-9.57	-8.09	1.48	Ag2HVO4
Ag2MoO4	-10.48	-22.03	-11.55	Ag2MoO4
Ag2O	-13.75	-1.18	12.57	Ag2O
Ag2Se	4.12	-44.58	-48.70	Ag2Se
Ag2SeO3	-8.64	-15.79	-7.15	Ag2SeO3
Ag2SeO4	-18.65	-27.56	-8.91	Ag2SeO4
Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.55	-20.39	2.16	Ag3AsO3
Ag3AsO4	-11.95	-14.74	-2.79	Ag3AsO4
Ag3H2VO5	-13.86	-8.68	5.18	Ag3H2VO5
AgF:4H2O	-12.30	-11.25	1.05	AgF:4H2O
Agmetal	0.64	-12.86	-13.51	Ag
AgVO3	-8.27	-7.50	0.77	AgVO3
Al (OH) 3 (am)	-1.21	9.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.73	-43.36	2.37	Al2 (MoO4) 3
Al2O3	-0.47	19.18	19.65	Al2O3
Al4 (OH) 10SO4	-1.51	21.19	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-8.18	-3.38	4.80	AlAsO4:2H2O
AlOHSO4	-4.35	-7.58	-3.23	AlOHSO4
AlSb	-147.97	-82.35	65.62	AlSb
Alunite	-0.24	-1.64	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.12	-11.91	-7.79	PbSO4
Anhydrite	-1.14	-5.50	-4.36	CaSO4
Anilite	-50.74	-82.62	-31.88	Cu0.25Cu1.5S
Antlerite	-2.89	5.90	8.79	Cu3 (OH) 4SO4
Aragonite	0.43	-7.87	-8.30	CaCO3
Arsenolite	-71.72	-74.48	-2.76	As4O6
Artinite	-6.74	2.86	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-32.65	-25.94	6.71	As2O5
Atacamite	-2.00	5.39	7.39	Cu2 (OH) 3Cl
Azurite	0.89	-16.02	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.20	8.19	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-13.32	2.56	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.54	-1.37	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-22.19	10.75	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.58	-22.25	-9.67	BaCrO4
BaF2	-7.30	-13.12	-5.82	BaF2
BaMoO4	-5.70	-12.66	-6.96	BaMoO4
Barite	1.00	-8.98	-9.98	BaSO4
BaS	-89.69	-73.51	16.18	BaS
BaSeO3	-8.25	-6.42	1.83	BaSeO3
BaSeO4	-10.72	-18.18	-7.46	BaSeO4
Bianchite	-7.49	-9.26	-1.76	ZnSO4:6H2O
Birnessite	-9.62	8.47	18.09	MnO2
Bixbyite	-6.96	-7.60	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.32	-78.60	-27.28	Cu0.6Cu0.8S
Boehmite	1.01	9.59	8.58	AlOOH
Breithauptite	-54.06	-72.58	-18.52	NiSb
Brochantite	-1.64	13.59	15.22	Cu4 (OH) 6SO4
Brucite	-5.64	11.20	16.84	Mg (OH) 2
Bunsenite	-5.36	7.08	12.45	NiO
Ca (VO3) 2	-7.81	-2.15	5.66	Ca (VO3) 2
Ca2V2O7	-7.97	9.53	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.02	9.53	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-13.21	9.09	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.75	21.21	38.96	Ca3 (VO4) 2

Ca3(VO4)2·4H2O	-18.66	21.20	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-291.82	-148.84	142.97	Ca3Sb2
CaCrO4	-16.50	-18.76	-2.27	CaCrO4
Calcite	0.61	-7.87	-8.48	CaCO3
Calomel	-10.00	-27.91	-17.91	Hg2Cl2
CaMoO4	-1.22	-9.17	-7.95	CaMoO4
Carnotite	-3.34	-3.11	0.23	KUO2VO4
CaSeO3·2H2O	-5.75	-2.94	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.68	-14.70	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.46	-3.62	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.98	13.64	Cd(OH)2
Cd(OH)2(am)	-7.75	5.98	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.12	-16.41	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.79	0.77	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.66	6.74	28.40	Cd4(OH)6SO4
CdCl2	-13.35	-14.01	-0.66	CdCl2
CdCl2·1H2O	-12.31	-14.01	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.09	-14.01	-1.91	CdCl2·2.5H2O
CdF2	-14.12	-15.33	-1.21	CdF2
Cdmetal(alpha)	-32.08	-18.57	13.51	Cd
Cdmetal(gamma)	-32.19	-18.57	13.62	Cd
CdMoO4	-0.72	-14.87	-14.15	CdMoO4
CdOHCl	-7.55	-4.01	3.54	CdOHCl
CdSb	-73.33	-73.68	-0.35	CdSb
CdSe	-17.22	-37.42	-20.20	CdSe
CdSeO4·2H2O	-18.55	-20.40	-1.85	CdSeO4·2H2O
CdSO4	-11.02	-11.19	-0.17	CdSO4
CdSO4·1H2O	-9.47	-11.19	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-9.32	-11.19	-1.87	CdSO4·2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.15	-14.28	-13.13	PbCO3
CH4(g)	-76.69	-117.73	-41.05	CH4
Chalcanthite	-6.84	-9.48	-2.64	CuSO4·5H2O
Chalcocite	-50.57	-85.49	-34.92	Cu2S
Chalcopyrite	-112.64	-147.91	-35.27	CuFeS2
Cinnabar	-49.29	-94.98	-45.69	HgS
Claudetite	-71.42	-74.48	-3.06	As4O6
Clausthalite	-11.04	-38.14	-27.10	PbSe
Co(BO2)2	-29.75	-2.68	27.07	Co(BO2)2
Co(OH)2	-6.17	6.92	13.09	Co(OH)2
Co(OH)3	-10.89	-13.20	-2.31	Co(OH)3
CO2(g)	-1.40	-19.54	-18.15	CO2
Co3(AsO4)2	-18.20	-5.17	13.03	Co3(AsO4)2
Co3O4	-8.98	-19.48	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2·6H2O	-15.60	-13.06	2.54	CoCl2·6H2O
CoCO3	-2.64	-12.62	-9.98	CoCO3
CoF2	-12.79	-14.39	-1.60	CoF2
CoF3	-43.71	-45.17	-1.46	CoF3
CoFe2O4	24.55	21.02	-3.53	CoFe2O4
CoMoO4	-6.16	-13.92	-7.76	CoMoO4
CoO	-6.66	6.93	13.59	CoO
CoS(alpha)	-67.34	-74.78	-7.44	CoS
CoS(beta)	-63.71	-74.78	-11.07	CoS
CoSe	-20.27	-36.47	-16.20	CoSe
CoSeO3	-9.01	-7.69	1.32	CoSeO3
CoSeO4·6H2O	-17.92	-19.45	-1.53	CoSeO4·6H2O
CoSO4	-13.05	-10.25	2.80	CoSO4
CoSO4·6H2O	-7.78	-10.25	-2.47	CoSO4·6H2O
Cotunnite	-9.95	-14.73	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr(OH)2	-20.03	-9.21	10.82	Cr(OH)2
Cr(OH)3	-1.22	0.11	1.34	Cr(OH)3
Cr(OH)3(am)	0.86	0.11	-0.75	Cr(OH)3
Cr2O3	2.59	0.23	-2.36	Cr2O3
CrCl2	-43.29	-29.20	14.09	CrCl2
CrCl3	-44.98	-29.87	15.11	CrCl3
CrF3	-20.52	-31.86	-11.34	CrF3

Crmetal	-64.24	-33.76	30.48	Cr
CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.17	-40.01	-33.84	Na3AlF6
Cu(OH)2	-0.98	7.69	8.67	Cu(OH)2
Cu(SbO3)2	-25.02	20.19	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-51.26	-86.14	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-1.38	-47.18	-45.80	Cu2Se
Cu2SO4	-19.01	-20.96	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-8.97	-2.87	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-55.02	-97.62	-42.59	Cu3Sb
Cu3Se2	-19.40	-82.89	-63.49	Cu3Se2
CuCO3	-0.35	-11.85	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.64	-12.55	-4.91	CuF
CuF2	-14.74	-13.62	1.12	CuF2
CuF2:2H2O	-9.07	-13.62	-4.55	CuF2:2H2O
Cumetal	-5.41	-14.17	-8.76	Cu
CuMoO4	-0.08	-13.16	-13.08	CuMoO4
CuOCuSO4	-12.10	-1.79	10.30	CuOCuSO4
Cupricferrite	15.80	21.78	5.99	CuFe2O4
Cuprite	-2.38	-3.79	-1.41	Cu2O
Cuprousferrite	14.07	5.15	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.56	-33.37	CuSe2
CuSeO3:2H2O	-7.44	-6.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.25	-18.69	-2.44	CuSeO4:5H2O
CuSO4	-12.42	-9.48	2.94	CuSO4
Diaspore	2.72	9.59	6.87	AlOOH
Djurleite	-50.81	-84.73	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.33	-16.21	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.88	-16.21	-17.09	CaMg(CO3)2
Epsomite	-3.85	-5.98	-2.13	MgSO4:7H2O
Fe(OH)2	-5.76	7.80	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.09	4.05	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-2.30	-6.02	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.08	-0.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-9.13	-29.75	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.69	-37.43	-3.73	Fe2(SO4)3
Fe3(OH)8	1.68	21.90	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.32	-5.92	0.40	FeAsO4:2H2O
FeCr2O4	0.84	8.04	7.20	FeCr2O4
FeMoO4	-2.95	-13.04	-10.09	FeMoO4
Ferrihydrite	3.86	7.05	3.19	Fe(OH)3
Ferroselite	-35.85	-54.44	-18.60	FeSe2
FeS(ppt)	-70.95	-73.90	-2.95	FeS
FeSe	-24.59	-35.59	-11.00	FeSe
Fix_pe	-5.11	-5.11	0.00	e-
Fluorite	0.86	-9.64	-10.50	CaF2
Galena	-62.47	-76.44	-13.97	PbS
Gibbsite	1.30	9.59	8.29	Al(OH)3
Goethite	6.56	7.05	0.49	FeOOH
Goslarite	-7.25	-9.26	-2.01	ZnSO4:7H2O
Greenockite	-61.36	-75.72	-14.36	CdS
Greigite	-259.88	-304.91	-45.03	Fe3S4
Gummite	-7.80	-0.13	7.67	UO3
Gypsum	-0.89	-5.50	-4.61	CaSO4:2H2O
H-Jarosite	-1.11	-13.21	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.97	-20.85	-12.88	H2MoO4
H2S(g)	-73.69	-81.70	-8.01	H2S
H2Se(g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.81	-5.21	1.60	NaCl
Hausmannite	-8.66	52.37	61.03	Mn3O4
Hematite	15.51	14.09	-1.42	Fe2O3
Hercynite	4.09	26.99	22.89	FeAl2O4
Hg(CH3)2(g)	-175.04	-248.75	-73.71	Hg(CH3)2
Hg(g)	-8.36	-16.24	-7.87	Hg
Hg(OH)2	-9.78	-13.28	-3.50	Hg(OH)2
Hg2(g)	-17.52	-32.47	-14.96	Hg2

Hg2 (OH) 2	-13.18	-7.92	5.26	Hg2 (OH) 2
Hg2CO3	-11.42	-27.47	-16.05	Hg2CO3
Hg2CrO4	-29.66	-38.36	-8.70	Hg2CrO4
Hg2F2	-18.88	-29.24	-10.36	Hg2F2
Hg2S	-77.95	-89.63	-11.68	Hg2S
Hg2SeO3	-17.88	-22.54	-4.66	Hg2SeO3
Hg2SO4	-18.97	-25.10	-6.13	Hg2SO4
Hg3O2CO3	-29.70	-59.38	-29.68	Hg3O2CO3
HgCl (g)	-33.45	-13.96	19.50	HgCl
HgCl2	-12.01	-33.27	-21.26	HgCl2
HgF (g)	-47.29	-14.62	32.68	HgF
HgF2 (g)	-47.16	-34.59	12.57	HgF2
Hgmetal (l)	-2.78	-16.24	-13.45	Hg
HgSe	-0.98	-56.68	-55.69	HgSe
HgSeO3	-15.47	-27.90	-12.43	HgSeO3
HgSO4	-21.04	-30.45	-9.42	HgSO4
Huntite	-2.92	-32.89	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.54	-23.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.40	-22.17	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.65	-20.82	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	5.53	-9.27	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.77	-53.01	-17.24	K2Cr2O7
K2CrO4	-22.05	-22.57	-0.51	K2CrO4
K2MoO4	-16.24	-12.98	3.26	K2MoO4
K2SeO4	-17.77	-18.50	-0.73	K2SeO4
Langite	-3.90	13.59	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.22	-6.66	-0.43	PbO : PbSO4
Laurionite	-5.36	-4.73	0.62	PbOHCl
Lepidocrocite	5.68	7.05	1.37	FeOOH
Lime	-21.02	11.68	32.70	CaO
Litharge	-7.43	5.26	12.69	PbO
Mackinawite	-70.30	-73.90	-3.60	FeS
Maghemite	7.71	14.09	6.39	Fe2O3
Magnesioferrite	8.43	25.29	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	18.50	21.90	3.40	Fe3O4
Malachite	1.14	-4.16	-5.31	Cu2 (OH) 2CO3
Manganite	-3.79	21.55	25.34	MnOOH
Massicot	-7.63	5.26	12.89	PbO
Matlockite	-6.42	-15.39	-8.97	PbClF
Melanothallite	-18.55	-12.30	6.26	CuCl2
Melanterite	-7.16	-9.37	-2.21	FeSO4 : 7H2O
Metacinnabar	-49.89	-94.98	-45.09	HgS
Mg (OH) 2 (active)	-7.59	11.20	18.79	Mg (OH) 2
Mg (VO3) 2	-13.91	-2.63	11.28	Mg (VO3) 2
Mg2Sb3	-266.73	-192.05	74.68	Mg2Sb3
Mg2V2O7	-17.79	8.57	26.36	Mg2V2O7
MgCr2O4	-4.77	11.43	16.20	MgCr2O4
MgCrO4	-24.62	-19.24	5.38	MgCrO4
MgF2	-1.98	-10.11	-8.13	MgF2
MgMoO4	-7.80	-9.65	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.47	-3.42	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.98	-15.18	-1.20	MgSeO4 : 6H2O
Minium	-33.20	40.32	73.52	Pb3O4
Mirabilite	-6.50	-7.61	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.45	-4.55	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-53.41	-59.12	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.74	-85.66	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.62	1.88	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.43	-10.71	2.72	MnCl2 : 4H2O
MnS (grn)	-72.60	-72.43	0.17	MnS
MnS (pnk)	-75.77	-72.43	3.34	MnS
MnSb	-92.83	-95.74	-2.91	MnSb
MnSe	-37.62	-34.12	3.50	MnSe
MnSeO3	-6.47	-5.34	1.13	MnSeO3
MnSeO3 : 2H2O	-6.32	-5.34	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-15.05	-17.10	-2.05	MnSeO4 : 5H2O
MnSO4	-10.48	-7.90	2.58	MnSO4

Monteponite	-9.12	5.98	15.10	CdO
Montroydite	-9.64	-13.28	-3.64	HgO
MoO3	-12.85	-20.85	-8.00	MoO3
Morenosite	-7.95	-10.09	-2.14	NiSO4:7H2O
MoS2	-138.54	-208.80	-70.26	MoS2
Na-Jarosite	2.77	-8.43	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.42	-51.32	-9.90	Na2Cr2O7
Na2CrO4	-23.81	-20.88	2.93	Na2CrO4
Na2Mo2O7	-15.54	-32.13	-16.60	Na2Mo2O7
Na2MoO4	-12.77	-11.28	1.49	Na2MoO4
Na2MoO4:2H2O	-12.51	-11.29	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.35	-5.05	10.30	Na2SeO3:5H2O
Na2SeO4	-18.09	-16.81	1.28	Na2SeO4
Na3Sb	-172.05	-77.59	94.45	Na3Sb
Na3VO4	-29.25	7.43	36.68	Na3VO4
Na4V2O7	-32.10	5.30	37.40	Na4V2O7
Nantokite	-5.16	-11.89	-6.73	CuCl
NaSb	-85.78	-62.61	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-5.99	-2.13	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-5.71	7.08	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.40	-4.70	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.85	11.15	32.00	Ni4(OH)6SO4
NiCO3	-5.59	-12.46	-6.87	NiCO3
NiMoO4	-2.62	-13.77	-11.14	NiMoO4
NiS(alpha)	-69.02	-74.62	-5.60	NiS
NiS(beta)	-63.52	-74.62	-11.10	NiS
NiS(gamma)	-61.82	-74.62	-12.80	NiS
NiSe	-18.62	-36.32	-17.70	NiSe
NiSeO3:2H2O	-10.35	-7.54	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.78	-19.30	-1.52	NiSeO4:6H2O
Nsutite	-9.03	8.47	17.50	MnO2
O2(g)	-33.99	49.09	83.09	O2
Orpiment	-221.28	-282.35	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.86	-4.34	6.52	Pb(BO2)2
Pb(OH)2	-2.89	5.26	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.91	-64.67	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.27	0.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.67	10.52	26.19	Pb2O(OH)2
Pb2O3	-25.97	35.07	61.04	Pb2O3
Pb2OCO3	-8.47	-9.02	-0.56	Pb2OCO3
Pb2V2O7	-1.41	-3.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.96	-10.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.19	1.95	6.14	Pb3(VO4)2
Pb3O2CO3	-14.79	-3.77	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.24	3.86	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.01	3.86	21.88	Pb4O3SO4
PbCrO4	-12.58	-25.18	-12.60	PbCrO4
PbF2	-8.61	-16.05	-7.44	PbF2
Pbmetal	-23.53	-19.29	4.25	Pb
PbMoO4	0.03	-15.59	-15.62	PbMoO4
PbO:0.3H2O	-7.72	5.26	12.98	PbO:0.33H2O
PbSeO4	-14.28	-21.12	-6.84	PbSeO4
Periclase	-10.38	11.20	21.58	MgO
Phosgenite	-9.20	-29.01	-19.81	PbCl2:PbCO3
Plattnerite	-19.79	29.81	49.60	PbO2
Portlandite	-11.13	11.68	22.80	Ca(OH)2
Pyrite	-112.55	-131.05	-18.51	FeS2
Pyrochroite	-5.92	9.27	15.19	Mn(OH)2
Pyrolusite	-7.56	33.82	41.38	MnO2
Realgar	-92.85	-112.60	-19.75	AsS
Retgersite	-8.05	-10.09	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.17	-19.67	-14.50	UO2CO3
Sb(OH)3	-11.19	-18.30	-7.11	Sb(OH)3

Sb2O4	-15.45	-12.05	3.40	Sb2O4
Sb2O5	-26.45	-36.12	-9.67	Sb2O5
Sb2Se3	-99.03	-166.79	-67.76	Sb2Se3
Sb4O6(cubic)	-54.92	-73.18	-18.26	Sb4O6
Sb4O6(orth)	-55.28	-73.18	-17.90	Sb4O6
SbCl3	-48.85	-48.28	0.57	SbCl3
SbF3	-40.04	-50.27	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.51	-30.33	-27.82	SbO2
Schoepite	-6.12	-0.13	5.99	UO2(OH)2·H2O
Semetal(am)	-11.74	-18.85	-7.11	Se
Semetal(hex)	-11.14	-18.85	-7.71	Se
Senarmontite	-24.23	-36.59	-12.37	Sb2O3
SeO2	-14.74	-14.62	0.12	SeO2
SeO3	-47.42	-26.38	21.04	SeO3
Siderite	-1.50	-11.74	-10.24	FeCO3
Smithsonite	-1.63	-11.63	-10.00	ZnCO3
Sphalerite	-62.34	-73.79	-11.45	ZnS
Spinel	-6.47	30.38	36.85	MgAl2O4
Stibnite	-231.24	-281.70	-50.46	Sb2S3
Sulfur	-55.01	-57.16	-2.14	S
Tenorite	0.05	7.69	7.64	CuO
Thenardite	-7.93	-7.61	0.32	Na2SO4
Thermonatrite	-10.62	-9.98	0.64	Na2CO3·H2O
Tyuyamunite	-6.49	-2.41	4.08	Ca(UO2)2(VO4)2
U3O8	-18.37	2.71	21.08	U3O8
U3Sb4	-566.52	-414.14	152.38	U3Sb4
U4O9	-34.28	-37.30	-3.02	U4O9
UF4	-28.55	-58.09	-29.54	UF4
UF4·2.5H2O	-25.37	-58.09	-32.72	UF4·2.5H2O
UO2(am)	-16.40	-15.46	0.93	UO2
UO2(OH)2(beta)	-5.74	-0.13	5.61	UO2(OH)2
UO2SeO4·4H2O	-24.26	-26.51	-2.25	UO2SeO4·4H2O
UO3	-7.83	-0.13	7.70	UO3
Uraninite	-10.79	-15.46	-4.67	UO2
USb2	-213.58	-184.01	29.58	USb2
V(OH)3	-16.45	-8.86	7.59	V(OH)3
V2O5	-12.47	-13.83	-1.36	V2O5
V3O5	-33.24	-31.40	1.84	V3O5
V4O7	-40.87	-33.69	7.19	V4O7
V6O13	-29.72	-90.58	-60.86	V6O13
Valentinite	-28.11	-36.59	-8.48	Sb2O3
VC12	-60.00	-41.12	18.87	VC12
VC13	-62.28	-38.84	23.43	VC13
VF4	-59.84	-44.91	14.93	VF4
Vmetal	-89.71	-45.68	44.03	V
VO	-35.89	-21.14	14.76	VO
VO(OH)2	-7.44	-2.29	5.15	VO(OH)2
VO2Cl	-19.75	-16.91	2.84	VO2Cl
VOC1	-30.01	-18.86	11.15	VOC1
VOC12	-35.03	-22.27	12.76	VOC12
VOSO4	-23.07	-19.46	3.61	VOSO4
Witherite	-2.78	-11.35	-8.57	BaCO3
Wurtzite	-64.84	-73.79	-8.95	ZnS
Zincite	-3.42	7.92	11.33	ZnO
Zincosite	-13.19	-9.26	3.93	ZnSO4
Zn(BO2)2	-9.98	-1.69	8.29	Zn(BO2)2
Zn(OH)2	-4.28	7.92	12.20	Zn(OH)2
Zn(OH)2(am)	-4.56	7.92	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.84	7.92	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.62	7.92	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.82	7.92	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.84	-1.34	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.35	5.84	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-15.84	-2.19	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-29.51	-10.60	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.91	14.49	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.91	19.59	38.50	Zn5(OH)8Cl2

ZnCl2	-19.12	-12.07	7.05	ZnCl2
ZnCO3:1H2O	-1.37	-11.63	-10.26	ZnCO3:1H2O
ZnF2	-12.86	-13.40	-0.53	ZnF2
Znmetal	-42.42	-16.63	25.79	Zn
ZnMoO4	-2.81	-12.93	-10.13	ZnMoO4
ZnO(active)	-3.27	7.92	11.19	ZnO
ZnS(am)	-64.74	-73.79	-9.05	ZnS
ZnSb	-82.76	-71.75	11.01	ZnSb
ZnSe	-21.08	-35.48	-14.40	ZnSe
ZnSeO4:6H2O	-16.94	-18.46	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.62	-9.26	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 86.

Title Precipitate oversaturated phases in groundwater
PHASES

Fix_pe
e-=e-
log_k 0
EQUILIBRIUM_PHASES 501
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0

```

SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 502
SAVE Solution 503 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 501
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases in groundwater

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 502. Solution after simulation 85.
Using pure phase assemblage 501.

```

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.512e-08	2.512e-08
Alunite	-0.00	-1.40	-1.40	0.000e+00	8.400e-07	8.400e-07
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	2.014e-08	2.014e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.286e-06	1.286e-06
Brochantite	-0.50	14.73	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.21	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.494e-03
CaMoO4	-1.72	-9.67	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.38	-3.57	2.81	0.000e+00	0	0.000e+00
Calcite	-0.00	-8.48	-8.48	0.000e+00	2.813e-03	2.813e-03
Carnotite	-2.38	-2.15	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.46	-3.62	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.89	-15.04	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.031e-08	6.031e-08
Cu2Se(alpha)	-5.16	-50.96	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.209e-07	2.209e-07
Epsomite	-3.75	-5.87	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.670e-05	2.670e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.047e-04	1.047e-04
Gummite	-6.86	0.81	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.29	-58.99	-55.69	0.000e+00	0	0.000e+00

Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.41	-7.53	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.75	-5.62	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.61	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-24.38	-8.68	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.71	-13.85	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.629e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	5.578e-09	5.578e-09
Rutherfordine	-4.53	-19.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.99	-30.81	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.18	0.81	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.88	-0.80	4.08	0.000e+00	0	0.000e+00
U3O8	-16.55	4.53	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.80	0.81	5.61	0.000e+00	0	0.000e+00
UO3	-6.89	0.81	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.94	-13.06	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.321e-08	3.325e-08
Al	1.998e-06	2.000e-06
As	2.587e-10	2.591e-10
B	1.586e-05	1.588e-05
Ba	1.128e-07	1.129e-07
C	5.856e-03	5.863e-03
Ca	2.510e-03	2.513e-03
Cd	1.159e-08	1.161e-08
Cl	1.706e-03	1.708e-03
Co	1.357e-07	1.359e-07
Cr	6.405e-09	6.413e-09
Cu	9.134e-06	9.145e-06
F	2.120e-04	2.123e-04
Fe	3.663e-09	3.667e-09
Hg	2.147e-10	2.150e-10
K	7.035e-04	7.044e-04
Mg	1.718e-03	1.720e-03
Mn	2.351e-05	2.354e-05
Mo	3.191e-07	3.195e-07
Na	4.946e-03	4.953e-03
Ni	2.129e-07	2.131e-07
Pb	2.022e-08	2.025e-08
S	3.538e-03	3.543e-03
Sb	1.301e-08	1.302e-08
Se	2.153e-08	2.156e-08
U	8.240e-08	8.251e-08
V	1.132e-07	1.133e-07
Zn	1.137e-06	1.138e-06

-----Description of solution-----

	pH =	7.149	Charge balance
	pe =	5.623	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.877e-02	
	Mass of water (kg) =	1.001e+00	
	Total alkalinity (eq/kg) =	5.185e-03	
	Total CO2 (mol/kg) =	5.856e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.349e-17	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.00	
	Iterations =	10	

Total H = 1.111601e+02
Total O = 5.560856e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.630e-07	1.418e-07	-6.788	-6.848	-0.060	(0)
H+	8.122e-08	7.097e-08	-7.090	-7.149	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.321e-08					
AgCl	2.154e-08	2.154e-08	-7.667	-7.667	0.000	(0)
Ag+	8.101e-09	7.079e-09	-8.091	-8.150	-0.059	(0)
AgCl2-	3.285e-09	2.797e-09	-8.483	-8.553	-0.070	(0)
AgSO4-	2.717e-10	2.313e-10	-9.566	-9.636	-0.070	(0)
AgCl3-2	7.071e-12	3.715e-12	-11.151	-11.430	-0.279	(0)
AgF	2.953e-12	2.953e-12	-11.530	-11.530	0.000	(0)
AgOH	1.004e-13	1.004e-13	-12.998	-12.998	0.000	(0)
AgCl4-3	4.810e-14	1.131e-14	-13.318	-13.947	-0.629	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgH2BO3	1.448e-14	1.448e-14	-13.839	-13.839	0.000	(0)
AgSeO3-	5.035e-15	4.287e-15	-14.298	-14.368	-0.070	(0)
Ag (OH) 2-	1.635e-18	1.392e-18	-17.787	-17.856	-0.070	(0)
Ag (SeO3) 2-3	1.539e-22	3.616e-23	-21.813	-22.442	-0.629	(0)
Ag2MoO4	3.526e-24	3.526e-24	-23.453	-23.453	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.789	-72.789	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.192	-86.310	-1.118	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.073	-147.143	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.310	-147.477	-0.167	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.452	-149.768	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.777	-150.079	-0.302	(0)
Al	1.998e-06					
Al (OH) 4-	1.350e-06	1.181e-06	-5.870	-5.928	-0.058	(0)
AlF3	3.358e-07	3.358e-07	-6.474	-6.474	0.000	(0)
AlF2+	1.828e-07	1.606e-07	-6.738	-6.794	-0.056	(0)
Al (OH) 3	6.613e-08	6.613e-08	-7.180	-7.180	0.000	(0)
AlF4-	3.196e-08	2.796e-08	-7.495	-7.554	-0.058	(0)
Al (OH) 2+	2.660e-08	2.337e-08	-7.575	-7.631	-0.056	(0)
AlF+2	4.076e-09	2.429e-09	-8.390	-8.615	-0.225	(0)
AlOH+2	3.481e-10	2.074e-10	-9.458	-9.683	-0.225	(0)
AlSO4+	2.125e-11	1.859e-11	-10.673	-10.731	-0.058	(0)
Al+3	4.924e-12	1.462e-12	-11.308	-11.835	-0.527	(0)
Al (SO4) 2-	3.729e-13	3.262e-13	-12.428	-12.487	-0.058	(0)
AlMo6O21-3	3.224e-40	0.000e+00	-39.492	-40.120	-0.629	(0)
As (3)	1.764e-22					
H3AsO3	1.749e-22	1.749e-22	-21.757	-21.757	0.000	(0)
H2AsO3-	1.485e-24	1.264e-24	-23.828	-23.898	-0.070	(0)
HAsO3-2	3.092e-29	1.624e-29	-28.510	-28.789	-0.279	(0)
H4AsO3+	7.224e-30	6.150e-30	-29.141	-29.211	-0.070	(0)
AsO3-3	3.754e-35	8.823e-36	-34.426	-35.054	-0.629	(0)
As (5)	2.587e-10					
HAsO4-2	1.849e-10	9.714e-11	-9.733	-10.013	-0.279	(0)
H2AsO4-	7.385e-11	6.287e-11	-10.132	-10.202	-0.070	(0)
AsO4-3	1.841e-14	4.328e-15	-13.735	-14.364	-0.629	(0)
H3AsO4	7.721e-16	7.754e-16	-15.112	-15.110	0.002	(0)
B	1.586e-05					
H3BO3	1.570e-05	1.577e-05	-4.804	-4.802	0.002	(0)
H2BO3-	1.491e-07	1.290e-07	-6.826	-6.889	-0.063	(0)
CaH2BO3+	9.835e-09	8.511e-09	-8.007	-8.070	-0.063	(0)
MgH2BO3+	4.253e-09	3.681e-09	-8.371	-8.434	-0.063	(0)
BF (OH) 3-	1.208e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
NaH2BO3	8.742e-10	8.742e-10	-9.058	-9.058	0.000	(0)
H5 (BO3) 2-	2.001e-12	1.732e-12	-11.699	-11.762	-0.063	(0)
BF2 (OH) 2-	1.522e-12	1.317e-12	-11.817	-11.880	-0.063	(0)
BaH2BO3+	2.946e-13	2.550e-13	-12.531	-12.594	-0.063	(0)
AgH2BO3	1.448e-14	1.448e-14	-13.839	-13.839	0.000	(0)
H8 (BO3) 3-	3.155e-15	2.730e-15	-14.501	-14.564	-0.063	(0)

	BF3OH-	6.984e-18	6.043e-18	-17.156	-17.219	-0.063	(0)
	BF4-	4.052e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
Ba	1.128e-07						
	Ba+2	1.097e-07	6.394e-08	-6.960	-7.194	-0.234	(0)
	BaHCO3+	3.031e-09	2.670e-09	-8.518	-8.573	-0.055	(0)
	BaCO3	9.473e-11	9.473e-11	-10.024	-10.024	0.000	(0)
	BaH2BO3+	2.946e-13	2.550e-13	-12.531	-12.594	-0.063	(0)
	BaOH+	4.514e-14	3.959e-14	-13.345	-13.402	-0.057	(0)
C (4)	5.856e-03						
	HCO3-	4.977e-03	4.373e-03	-2.303	-2.359	-0.056	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.059e-04	9.334e-05	-3.975	-4.030	-0.055	(0)
	MgHCO3+	4.219e-05	3.681e-05	-4.375	-4.434	-0.059	(0)
	NaHCO3	1.051e-05	1.051e-05	-4.978	-4.978	0.000	(0)
	CuCO3	7.679e-06	7.679e-06	-5.115	-5.115	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.955e-06	2.889e-06	-5.305	-5.539	-0.234	(0)
	MgCO3	1.977e-06	1.977e-06	-5.704	-5.704	0.000	(0)
	MnHCO3+	1.015e-06	8.901e-07	-5.993	-6.051	-0.057	(0)
	NaCO3-	2.617e-07	2.300e-07	-6.582	-6.638	-0.056	(0)
	CuHCO3+	1.463e-07	1.246e-07	-6.835	-6.905	-0.070	(0)
	Cu (CO3) 2-2	1.136e-07	5.971e-08	-6.944	-7.224	-0.279	(0)
	ZnCO3	7.753e-08	7.753e-08	-7.111	-7.111	0.000	(0)
	ZnHCO3+	7.576e-08	6.450e-08	-7.121	-7.190	-0.070	(0)
	NiHCO3+	4.824e-08	4.107e-08	-7.317	-7.386	-0.070	(0)
	UO2 (CO3) 2-2	4.105e-08	2.157e-08	-7.387	-7.666	-0.279	(0)
	UO2 (CO3) 3-4	4.097e-08	3.123e-09	-7.387	-8.505	-1.118	(0)
	CoHCO3+	2.012e-08	1.713e-08	-7.696	-7.766	-0.070	(0)
	PbCO3	1.121e-08	1.121e-08	-7.950	-7.950	0.000	(0)
	NiCO3	8.210e-09	8.210e-09	-8.086	-8.086	0.000	(0)
	PbHCO3+	4.926e-09	4.194e-09	-8.308	-8.377	-0.070	(0)
	BaHCO3+	3.031e-09	2.670e-09	-8.518	-8.573	-0.055	(0)
	CoCO3	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
	UO2CO3	3.742e-10	3.742e-10	-9.427	-9.427	0.000	(0)
	CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
	Pb (CO3) 2-2	1.777e-10	9.338e-11	-9.750	-10.030	-0.279	(0)
	BaCO3	9.473e-11	9.473e-11	-10.024	-10.024	0.000	(0)
	CdHCO3+	5.728e-11	4.877e-11	-10.242	-10.312	-0.070	(0)
	Cd (CO3) 2-2	1.314e-12	6.907e-13	-11.881	-12.161	-0.279	(0)
	FeHCO3+	8.891e-13	7.833e-13	-12.051	-12.106	-0.055	(0)
	HgCO3	1.401e-14	1.401e-14	-13.854	-13.854	0.000	(0)
	Hg (CO3) 2-2	2.436e-16	1.280e-16	-15.613	-15.893	-0.279	(0)
	HgHCO3+	2.174e-17	1.851e-17	-16.663	-16.733	-0.070	(0)
Ca	2.510e-03						
	Ca+2	1.966e-03	1.146e-03	-2.706	-2.941	-0.234	(0)
	CaSO4	4.300e-04	4.300e-04	-3.366	-3.366	0.000	(0)
	CaHCO3+	1.059e-04	9.334e-05	-3.975	-4.030	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
	CaH2BO3+	9.835e-09	8.511e-09	-8.007	-8.070	-0.063	(0)
	CaOH+	3.682e-09	3.244e-09	-8.434	-8.489	-0.055	(0)
Cd	1.159e-08						
	Cd+2	8.402e-09	4.898e-09	-8.076	-8.310	-0.234	(0)
	CdSO4	1.880e-09	1.880e-09	-8.726	-8.726	0.000	(0)
	CdCl+	8.189e-10	6.972e-10	-9.087	-9.157	-0.070	(0)
	CdCO3	3.225e-10	3.225e-10	-9.491	-9.491	0.000	(0)
	Cd (SO4) 2-2	7.906e-11	4.154e-11	-10.102	-10.382	-0.279	(0)
	CdHCO3+	5.728e-11	4.877e-11	-10.242	-10.312	-0.070	(0)
	CdF+	1.514e-11	1.289e-11	-10.820	-10.890	-0.070	(0)
	CdOH+	6.482e-12	5.518e-12	-11.188	-11.258	-0.070	(0)
	CdCl2	4.332e-12	4.332e-12	-11.363	-11.363	0.000	(0)
	CdOHCl	4.057e-12	4.057e-12	-11.392	-11.392	0.000	(0)
	Cd (CO3) 2-2	1.314e-12	6.907e-13	-11.881	-12.161	-0.279	(0)
	Cd (OH) 2	4.939e-15	4.939e-15	-14.306	-14.306	0.000	(0)
	CdCl3-	4.785e-15	4.074e-15	-14.320	-14.390	-0.070	(0)
	CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
	CdSeO4	3.723e-18	3.723e-18	-17.429	-17.429	0.000	(0)
	Cd2OH+3	5.764e-19	1.355e-19	-18.239	-18.868	-0.629	(0)

		Cd(OH) 3-	5.026e-20	4.279e-20	-19.299	-19.369	-0.070	(0)
		Cd(SeO3) 2-2	6.820e-21	3.584e-21	-20.166	-20.446	-0.279	(0)
		Cd(OH) 4-2	1.891e-27	9.935e-28	-26.723	-27.003	-0.279	(0)
		CdHS+	0.000e+00	0.000e+00	-78.686	-78.755	-0.070	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-150.005	-150.005	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-226.489	-226.559	-0.070	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-302.537	-302.816	-0.279	(0)
Cl	1.706e-03							
		Cl-	1.706e-03	1.491e-03	-2.768	-2.827	-0.059	(0)
		MnCl+	2.183e-08	1.914e-08	-7.661	-7.718	-0.057	(0)
		AgCl	2.154e-08	2.154e-08	-7.667	-7.667	0.000	(0)
		AgCl2-	3.285e-09	2.797e-09	-8.483	-8.553	-0.070	(0)
		ZnCl+	2.001e-09	1.746e-09	-8.699	-8.758	-0.059	(0)
		CuCl+	1.222e-09	1.066e-09	-8.913	-8.972	-0.059	(0)
		CuCl	9.873e-10	9.873e-10	-9.006	-9.006	0.000	(0)
		CdCl+	8.189e-10	6.972e-10	-9.087	-9.157	-0.070	(0)
		CuCl2-	3.524e-10	3.075e-10	-9.453	-9.512	-0.059	(0)
		NiCl+	3.412e-10	2.905e-10	-9.467	-9.537	-0.070	(0)
		ZnOHCl	3.243e-10	3.243e-10	-9.489	-9.489	0.000	(0)
		CoCl+	3.050e-10	2.597e-10	-9.516	-9.586	-0.070	(0)
		PbCl+	8.017e-11	6.826e-11	-10.096	-10.166	-0.070	(0)
		MnCl2	4.030e-11	4.030e-11	-10.395	-10.395	0.000	(0)
		AgCl3-2	7.071e-12	3.715e-12	-11.151	-11.430	-0.279	(0)
		CdCl2	4.332e-12	4.332e-12	-11.363	-11.363	0.000	(0)
		ZnCl2	4.125e-12	4.125e-12	-11.385	-11.385	0.000	(0)
		CdOHCl	4.057e-12	4.057e-12	-11.392	-11.392	0.000	(0)
		HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
		HgCl2	9.002e-13	9.002e-13	-12.046	-12.046	0.000	(0)
		CuCl2	5.512e-13	5.512e-13	-12.259	-12.259	0.000	(0)
		PbCl2	4.545e-13	4.545e-13	-12.343	-12.343	0.000	(0)
		CuCl3-2	1.657e-13	9.798e-14	-12.781	-13.009	-0.228	(0)
		AgCl4-3	4.810e-14	1.131e-14	-13.318	-13.947	-0.629	(0)
		MnCl3-	1.887e-14	1.655e-14	-13.724	-13.781	-0.057	(0)
		HgCl3-	1.576e-14	1.342e-14	-13.802	-13.872	-0.070	(0)
		ZnCl3-	5.598e-15	4.884e-15	-14.252	-14.311	-0.059	(0)
		CdCl3-	4.785e-15	4.074e-15	-14.320	-14.390	-0.070	(0)
		NiCl2	2.180e-15	2.180e-15	-14.661	-14.661	0.000	(0)
		CrCl+2	3.223e-16	1.693e-16	-15.492	-15.771	-0.279	(0)
		PbCl3-	3.167e-16	2.697e-16	-15.499	-15.569	-0.070	(0)
		HgCl4-2	1.515e-16	7.962e-17	-15.819	-16.099	-0.279	(0)
		HgCl+	1.415e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
		UO2Cl+	9.239e-17	7.866e-17	-16.034	-16.104	-0.070	(0)
		CuCl3-	8.787e-18	7.667e-18	-17.056	-17.115	-0.059	(0)
		ZnCl4-2	6.156e-18	3.640e-18	-17.211	-17.439	-0.228	(0)
		CrOHCl2	6.804e-19	6.804e-19	-18.167	-18.167	0.000	(0)
		PbCl4-2	3.497e-19	1.837e-19	-18.456	-18.736	-0.279	(0)
		VOCl+	4.311e-20	3.670e-20	-19.365	-19.435	-0.070	(0)
		FeCl+2	4.228e-20	2.500e-20	-19.374	-19.602	-0.228	(0)
		CrCl2+	2.813e-20	2.395e-20	-19.551	-19.621	-0.070	(0)
		FeCl2+	1.898e-22	1.665e-22	-21.722	-21.779	-0.057	(0)
		CuCl4-2	9.685e-23	5.727e-23	-22.014	-22.242	-0.228	(0)
		FeCl3	2.481e-26	2.481e-26	-25.605	-25.605	0.000	(0)
		CrO3Cl-	2.061e-26	1.755e-26	-25.686	-25.756	-0.070	(0)
		CoCl+2	4.864e-35	2.555e-35	-34.313	-34.593	-0.279	(0)
		UCl+3	0.000e+00	0.000e+00	-44.612	-45.241	-0.629	(0)
Co (2)	1.357e-07							
		Co+2	9.586e-08	5.037e-08	-7.018	-7.298	-0.279	(0)
		CoHCO3+	2.012e-08	1.713e-08	-7.696	-7.766	-0.070	(0)
		CoSO4	1.646e-08	1.646e-08	-7.784	-7.784	0.000	(0)
		CoCO3	2.460e-09	2.460e-09	-8.609	-8.609	0.000	(0)
		CoF+	3.107e-10	2.645e-10	-9.508	-9.578	-0.070	(0)
		CoCl+	3.050e-10	2.597e-10	-9.516	-9.586	-0.070	(0)
		CoOH+	1.674e-10	1.425e-10	-9.776	-9.846	-0.070	(0)
		Co(OH) 2	1.606e-12	1.606e-12	-11.794	-11.794	0.000	(0)
		CoSeO4	1.030e-16	1.030e-16	-15.987	-15.987	0.000	(0)
		Co(OH) 3-	5.338e-18	4.544e-18	-17.273	-17.343	-0.070	(0)
		Co2OH+3	1.531e-18	3.598e-19	-17.815	-18.444	-0.629	(0)
		CoOOH-	1.340e-18	1.141e-18	-17.873	-17.943	-0.070	(0)

Co (OH) 4-2	1.944e-25	1.022e-25	-24.711	-24.991	-0.279	(0)
Co4 (OH) 4+4	1.080e-30	8.235e-32	-29.966	-31.084	-1.118	(0)
Co (3)	1.156e-28					
CoOH+2	1.156e-28	6.073e-29	-27.937	-28.217	-0.279	(0)
Co+3	2.837e-34	8.426e-35	-33.547	-34.074	-0.527	(0)
CoCl+2	4.864e-35	2.555e-35	-34.313	-34.593	-0.279	(0)
Cr (2)	9.498e-26					
Cr+2	9.498e-26	4.990e-26	-25.022	-25.302	-0.279	(0)
Cr (3)	6.405e-09					
Cr (OH) 2+	5.522e-09	4.701e-09	-8.258	-8.328	-0.070	(0)
Cr (OH) +2	5.184e-10	2.724e-10	-9.285	-9.565	-0.279	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.059e-10	1.059e-10	-9.975	-9.975	0.000	(0)
CrF+2	4.398e-12	2.311e-12	-11.357	-11.636	-0.279	(0)
CrO2-	1.969e-12	1.677e-12	-11.706	-11.776	-0.070	(0)
Cr (OH) 4-	1.661e-12	1.414e-12	-11.780	-11.849	-0.070	(0)
CrSO4+	3.943e-13	3.357e-13	-12.404	-12.474	-0.070	(0)
Cr+3	3.735e-13	8.779e-14	-12.428	-13.057	-0.629	(0)
CrCl+2	3.223e-16	1.693e-16	-15.492	-15.771	-0.279	(0)
Cr2 (OH) 2SO4+2	4.961e-18	2.606e-18	-17.304	-17.584	-0.279	(0)
CrOHCl2	6.804e-19	6.804e-19	-18.167	-18.167	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.535e-19	2.535e-19	-18.596	-18.596	0.000	(0)
CrCl2+	2.813e-20	2.395e-20	-19.551	-19.621	-0.070	(0)
Cr (6)	2.311e-16					
CrO4-2	1.969e-16	1.148e-16	-15.706	-15.940	-0.234	(0)
HCrO4-	3.097e-17	2.637e-17	-16.509	-16.579	-0.070	(0)
NaCrO4-	2.865e-18	2.439e-18	-17.543	-17.613	-0.070	(0)
KCrO4-	3.045e-19	2.592e-19	-18.516	-18.586	-0.070	(0)
CrO3SO4-2	1.777e-24	9.336e-25	-23.750	-24.030	-0.279	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.061e-26	1.755e-26	-25.686	-25.756	-0.070	(0)
Cr2O7-2	4.589e-32	2.411e-32	-31.338	-31.618	-0.279	(0)
Cu (1)	1.958e-09					
CuCl	9.873e-10	9.873e-10	-9.006	-9.006	0.000	(0)
Cu+	6.180e-10	5.262e-10	-9.209	-9.279	-0.070	(0)
CuCl2-	3.524e-10	3.075e-10	-9.453	-9.512	-0.059	(0)
CuCl3-2	1.657e-13	9.798e-14	-12.781	-13.009	-0.228	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.189	-148.498	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.932	-149.228	-0.296	(0)
Cu (2)	9.132e-06					
CuCO3	7.679e-06	7.679e-06	-5.115	-5.115	0.000	(0)
Cu+2	7.744e-07	4.515e-07	-6.111	-6.345	-0.234	(0)
CuOH+	2.321e-07	2.025e-07	-6.634	-6.694	-0.059	(0)
CuSO4	1.694e-07	1.694e-07	-6.771	-6.771	0.000	(0)
CuHCO3+	1.463e-07	1.246e-07	-6.835	-6.905	-0.070	(0)
Cu (CO3) 2-2	1.136e-07	5.971e-08	-6.944	-7.224	-0.279	(0)
Cu (OH) 2	5.730e-09	5.730e-09	-8.242	-8.242	0.000	(0)
CuF+	5.557e-09	4.731e-09	-8.255	-8.325	-0.070	(0)
Cu2 (OH) 2+2	1.960e-09	1.030e-09	-8.708	-8.987	-0.279	(0)
CuCl+	1.222e-09	1.066e-09	-8.913	-8.972	-0.059	(0)
Cu (OH) 3-	1.958e-12	1.667e-12	-11.708	-11.778	-0.070	(0)
CuCl2	5.512e-13	5.512e-13	-12.259	-12.259	0.000	(0)
CuCl3-	8.787e-18	7.667e-18	-17.056	-17.115	-0.059	(0)
Cu (OH) 4-2	3.542e-18	1.861e-18	-17.451	-17.730	-0.279	(0)
CuCl4-2	9.685e-23	5.727e-23	-22.014	-22.242	-0.228	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.737	-215.807	-0.070	(0)
F	2.120e-04					
F-	1.901e-04	1.661e-04	-3.721	-3.780	-0.059	(0)
MgF+	1.753e-05	1.533e-05	-4.756	-4.814	-0.058	(0)
CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
NaF	4.480e-07	4.480e-07	-6.349	-6.349	0.000	(0)
AlF3	3.358e-07	3.358e-07	-6.474	-6.474	0.000	(0)
AlF2+	1.828e-07	1.606e-07	-6.738	-6.794	-0.056	(0)
MnF+	7.693e-08	6.746e-08	-7.114	-7.171	-0.057	(0)
AlF4-	3.196e-08	2.796e-08	-7.495	-7.554	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	5.557e-09	4.731e-09	-8.255	-8.325	-0.070	(0)
AlF+2	4.076e-09	2.429e-09	-8.390	-8.615	-0.225	(0)

ZnF+	1.816e-09	1.546e-09	-8.741	-8.811	-0.070	(0)
BF(OH) 3-	1.208e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
NiF+	3.733e-10	3.178e-10	-9.428	-9.498	-0.070	(0)
CoF+	3.107e-10	2.645e-10	-9.508	-9.578	-0.070	(0)
PbF+	1.774e-11	1.511e-11	-10.751	-10.821	-0.070	(0)
CdF+	1.514e-11	1.289e-11	-10.820	-10.890	-0.070	(0)
HF2-	1.265e-11	1.101e-11	-10.898	-10.958	-0.060	(0)
CrF+2	4.398e-12	2.311e-12	-11.357	-11.636	-0.279	(0)
AgF	2.953e-12	2.953e-12	-11.530	-11.530	0.000	(0)
BF2(OH) 2-	1.522e-12	1.317e-12	-11.817	-11.880	-0.063	(0)
UO2F+	8.763e-13	7.461e-13	-12.057	-12.127	-0.070	(0)
UO2F2	3.574e-13	3.574e-13	-12.447	-12.447	0.000	(0)
PbF2	4.938e-14	4.938e-14	-13.306	-13.306	0.000	(0)
UO2F3-	1.751e-14	1.491e-14	-13.757	-13.827	-0.070	(0)
CdF2	4.273e-15	4.273e-15	-14.369	-14.369	0.000	(0)
VO2F	2.666e-15	2.666e-15	-14.574	-14.574	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.128e-16	4.496e-16	-15.290	-15.347	-0.057	(0)
VO2F2-	1.889e-16	1.608e-16	-15.724	-15.794	-0.070	(0)
FeF+2	1.711e-16	1.012e-16	-15.767	-15.995	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	3.744e-17	1.967e-17	-16.427	-16.706	-0.279	(0)
PbF3-	1.827e-17	1.556e-17	-16.738	-16.808	-0.070	(0)
VOF+	1.027e-17	8.744e-18	-16.988	-17.058	-0.070	(0)
BF3OH-	6.984e-18	6.043e-18	-17.156	-17.219	-0.063	(0)
VO2F3-2	6.340e-19	3.331e-19	-18.198	-18.477	-0.279	(0)
VOF2	5.446e-19	5.446e-19	-18.264	-18.264	0.000	(0)
VOF3-	3.769e-21	3.209e-21	-20.424	-20.494	-0.070	(0)
PbF4-2	2.354e-21	1.237e-21	-20.628	-20.908	-0.279	(0)
BF4-	4.052e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
VO2F4-3	1.158e-22	2.722e-23	-21.936	-22.565	-0.629	(0)
HgF+	2.930e-23	2.495e-23	-22.533	-22.603	-0.070	(0)
VOF4-2	4.095e-24	2.152e-24	-23.388	-23.667	-0.279	(0)
Sb(OH) 2F	9.850e-25	9.850e-25	-24.007	-24.007	0.000	(0)
SbOF	9.689e-25	9.689e-25	-24.014	-24.014	0.000	(0)
UF3+	1.648e-34	1.403e-34	-33.783	-33.853	-0.070	(0)
UF2+2	1.014e-35	5.330e-36	-34.994	-35.273	-0.279	(0)
UF4	2.555e-36	2.555e-36	-35.593	-35.593	0.000	(0)
UF5-	1.975e-38	1.682e-38	-37.704	-37.774	-0.070	(0)
UF+3	1.084e-38	2.549e-39	-37.965	-38.594	-0.629	(0)
UF6-2	1.606e-39	8.436e-40	-38.794	-39.074	-0.279	(0)
Fe (2)	3.378e-11					
Fe+2	2.708e-11	1.423e-11	-10.567	-10.847	-0.279	(0)
FeSO4	5.720e-12	5.720e-12	-11.243	-11.243	0.000	(0)
FeHCO3+	8.891e-13	7.833e-13	-12.051	-12.106	-0.055	(0)
FeOH+	9.162e-14	8.034e-14	-13.038	-13.095	-0.057	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.630e-19	4.060e-19	-18.334	-18.391	-0.057	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.804	-158.804	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.151	-235.220	-0.070	(0)
Fe (3)	3.629e-09					
Fe(OH) 2+	3.195e-09	2.807e-09	-8.496	-8.552	-0.056	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.427e-12	5.647e-12	-11.192	-11.248	-0.056	(0)
FeOH+2	8.602e-14	5.087e-14	-13.065	-13.294	-0.228	(0)
FeF2+	5.128e-16	4.496e-16	-15.290	-15.347	-0.057	(0)
FeF+2	1.711e-16	1.012e-16	-15.767	-15.995	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.164e-17	1.021e-17	-16.934	-16.991	-0.057	(0)
Fe+3	1.870e-18	5.555e-19	-17.728	-18.255	-0.527	(0)
Fe(SO4) 2-	4.197e-19	3.573e-19	-18.377	-18.447	-0.070	(0)
FeCl+2	4.228e-20	2.500e-20	-19.374	-19.602	-0.228	(0)
FeCl2+	1.898e-22	1.665e-22	-21.722	-21.779	-0.057	(0)
FeHSeO3+2	4.692e-23	2.465e-23	-22.329	-22.608	-0.279	(0)
Fe2(OH) 2+4	1.124e-24	8.568e-26	-23.949	-25.067	-1.118	(0)
FeCl3	2.481e-26	2.481e-26	-25.605	-25.605	0.000	(0)
Fe3(OH) 4+5	1.940e-31	3.476e-33	-30.712	-32.459	-1.747	(0)
H (0)	4.021e-29					

H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.118e-10					
Hg	2.118e-10	2.118e-10	-9.674	-9.674	0.000	(0)
Hg (1)	2.218e-21					
Hg2+2	1.109e-21	5.826e-22	-20.955	-21.235	-0.279	(0)
Hg (2)	2.956e-12					
HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
HgCl2	9.002e-13	9.002e-13	-12.046	-12.046	0.000	(0)
Hg (OH) 2	5.121e-13	5.143e-13	-12.291	-12.289	0.002	(0)
HgCl3-	1.576e-14	1.342e-14	-13.802	-13.872	-0.070	(0)
HgCO3	1.401e-14	1.401e-14	-13.854	-13.854	0.000	(0)
Hg (CO3) 2-2	2.436e-16	1.280e-16	-15.613	-15.893	-0.279	(0)
HgCl4-2	1.515e-16	7.962e-17	-15.819	-16.099	-0.279	(0)
HgCl+	1.415e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
HgOH+	2.687e-17	2.288e-17	-16.571	-16.641	-0.070	(0)
HgHCO3+	2.174e-17	1.851e-17	-16.663	-16.733	-0.070	(0)
Hg (OH) 3-	1.079e-20	9.184e-21	-19.967	-20.037	-0.070	(0)
Hg+2	7.712e-21	4.052e-21	-20.113	-20.392	-0.279	(0)
HgSO4	1.737e-21	1.737e-21	-20.760	-20.760	0.000	(0)
HgF+	2.930e-23	2.495e-23	-22.533	-22.603	-0.070	(0)
HgHS2-	0.000e+00	0.000e+00	-138.153	-138.222	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.977	-138.977	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.502	-139.781	-0.279	(0)
K	7.035e-04					
K+	6.955e-04	6.077e-04	-3.158	-3.216	-0.059	(0)
KSO4-	8.019e-06	7.046e-06	-5.096	-5.152	-0.056	(0)
KCrO4-	3.045e-19	2.592e-19	-18.516	-18.586	-0.070	(0)
Mg	1.718e-03					
Mg+2	1.411e-03	8.227e-04	-2.850	-3.085	-0.234	(0)
MgSO4	2.452e-04	2.452e-04	-3.611	-3.611	0.000	(0)
MgHCO3+	4.219e-05	3.681e-05	-4.375	-4.434	-0.059	(0)
MgF+	1.753e-05	1.533e-05	-4.756	-4.814	-0.058	(0)
MgCO3	1.977e-06	1.977e-06	-5.704	-5.704	0.000	(0)
MgOH+	5.261e-08	4.645e-08	-7.279	-7.333	-0.054	(0)
MgH2BO3+	4.253e-09	3.681e-09	-8.371	-8.434	-0.063	(0)
Mn (2)	2.351e-05					
Mn+2	1.942e-05	1.020e-05	-4.712	-4.991	-0.279	(0)
MnSO4	2.971e-06	2.971e-06	-5.527	-5.527	0.000	(0)
MnHCO3+	1.015e-06	8.901e-07	-5.993	-6.051	-0.057	(0)
MnF+	7.693e-08	6.746e-08	-7.114	-7.171	-0.057	(0)
MnCl+	2.183e-08	1.914e-08	-7.661	-7.718	-0.057	(0)
MnOH+	4.145e-09	3.635e-09	-8.382	-8.440	-0.057	(0)
MnCl2	4.030e-11	4.030e-11	-10.395	-10.395	0.000	(0)
MnCl3-	1.887e-14	1.655e-14	-13.724	-13.781	-0.057	(0)
MnSeO4	1.121e-14	1.121e-14	-13.950	-13.950	0.000	(0)
Mn (OH) 3-	5.153e-19	4.519e-19	-18.288	-18.345	-0.057	(0)
Mn (OH) 4-2	3.499e-25	2.069e-25	-24.456	-24.684	-0.228	(0)
MnSe	0.000e+00	0.000e+00	-42.776	-42.776	0.000	(0)
Mn (3)	6.448e-25					
Mn+3	6.448e-25	1.915e-25	-24.191	-24.718	-0.527	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.500	-43.728	-0.228	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.415	-47.477	-0.062	(0)
Mo	3.191e-07					
MoO4-2	3.188e-07	1.859e-07	-6.496	-6.731	-0.234	(0)
HMoO4-	3.083e-10	2.625e-10	-9.511	-9.581	-0.070	(0)
H2MoO4	1.364e-13	1.364e-13	-12.865	-12.865	0.000	(0)
Ag2MoO4	3.526e-24	3.526e-24	-23.453	-23.453	0.000	(0)
AlMo6O21-3	3.224e-40	0.000e+00	-39.492	-40.120	-0.629	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.801	-51.317	-2.515	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.332	-52.079	-1.747	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-53.327	-54.445	-1.118	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.720	-58.348	-0.629	(0)
Na	4.946e-03					
Na+	4.892e-03	4.275e-03	-2.310	-2.369	-0.059	(0)
NaSO4-	4.279e-05	3.760e-05	-4.369	-4.425	-0.056	(0)
NaHCO3	1.051e-05	1.051e-05	-4.978	-4.978	0.000	(0)

	NaF	4.480e-07	4.480e-07	-6.349	-6.349	0.000	(0)
	NaCO3-	2.617e-07	2.300e-07	-6.582	-6.638	-0.056	(0)
	NaH2BO3	8.742e-10	8.742e-10	-9.058	-9.058	0.000	(0)
	NaCrO4-	2.865e-18	2.439e-18	-17.543	-17.613	-0.070	(0)
Ni	2.129e-07						
	Ni+2	1.307e-07	7.618e-08	-6.884	-7.118	-0.234	(0)
	NiHCO3+	4.824e-08	4.107e-08	-7.317	-7.386	-0.070	(0)
	NiSO4	2.489e-08	2.489e-08	-7.604	-7.604	0.000	(0)
	NiCO3	8.210e-09	8.210e-09	-8.086	-8.086	0.000	(0)
	NiF+	3.733e-10	3.178e-10	-9.428	-9.498	-0.070	(0)
	NiCl+	3.412e-10	2.905e-10	-9.467	-9.537	-0.070	(0)
	NiOH+	1.598e-10	1.360e-10	-9.797	-9.866	-0.070	(0)
	Ni (SO4) 2-2	2.569e-12	1.350e-12	-11.590	-11.870	-0.279	(0)
	Ni (OH) 2	1.532e-12	1.532e-12	-11.815	-11.815	0.000	(0)
	NiCl2	2.180e-15	2.180e-15	-14.661	-14.661	0.000	(0)
	Ni (OH) 3-	2.553e-16	2.174e-16	-15.593	-15.663	-0.070	(0)
	NiSeO4	1.454e-16	1.454e-16	-15.837	-15.837	0.000	(0)
O (0)	2.474e-35						
	O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.022e-08						
	PbCO3	1.121e-08	1.121e-08	-7.950	-7.950	0.000	(0)
	PbHCO3+	4.926e-09	4.194e-09	-8.308	-8.377	-0.070	(0)
	Pb+2	2.214e-09	1.291e-09	-8.655	-8.889	-0.234	(0)
	PbSO4	1.035e-09	1.035e-09	-8.985	-8.985	0.000	(0)
	PbOH+	5.401e-10	4.598e-10	-9.268	-9.337	-0.070	(0)
	Pb (CO3) 2-2	1.777e-10	9.338e-11	-9.750	-10.030	-0.279	(0)
	PbCl+	8.017e-11	6.826e-11	-10.096	-10.166	-0.070	(0)
	Pb (SO4) 2-2	1.944e-11	1.022e-11	-10.711	-10.991	-0.279	(0)
	PbF+	1.774e-11	1.511e-11	-10.751	-10.821	-0.070	(0)
	Pb (OH) 2	2.062e-12	2.062e-12	-11.686	-11.686	0.000	(0)
	PbCl2	4.545e-13	4.545e-13	-12.343	-12.343	0.000	(0)
	PbF2	4.938e-14	4.938e-14	-13.306	-13.306	0.000	(0)
	Pb (OH) 3-	3.436e-16	2.925e-16	-15.464	-15.534	-0.070	(0)
	PbCl3-	3.167e-16	2.697e-16	-15.499	-15.569	-0.070	(0)
	Pb2OH+3	4.002e-17	9.406e-18	-16.398	-17.027	-0.629	(0)
	PbF3-	1.827e-17	1.556e-17	-16.738	-16.808	-0.070	(0)
	PbCl4-2	3.497e-19	1.837e-19	-18.456	-18.736	-0.279	(0)
	Pb (OH) 4-2	1.934e-20	1.016e-20	-19.714	-19.993	-0.279	(0)
	PbF4-2	2.354e-21	1.237e-21	-20.628	-20.908	-0.279	(0)
	Pb3 (OH) 4+2	2.085e-22	1.095e-22	-21.681	-21.960	-0.279	(0)
	Pb4 (OH) 4+4	1.473e-26	1.123e-27	-25.832	-26.950	-1.118	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.526	-150.526	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.610	-227.680	-0.070	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-72.789	-72.789	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.384	-78.454	-0.070	(0)
	H2S	0.000e+00	0.000e+00	-78.582	-78.582	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.686	-78.755	-0.070	(0)
	S5-2	0.000e+00	0.000e+00	-80.390	-80.670	-0.279	(0)
	S6-2	0.000e+00	0.000e+00	-80.906	-81.186	-0.279	(0)
	S4-2	0.000e+00	0.000e+00	-80.986	-81.265	-0.279	(0)
	S3-2	0.000e+00	0.000e+00	-81.792	-82.071	-0.279	(0)
	S2-2	0.000e+00	0.000e+00	-82.808	-83.087	-0.279	(0)
	S-2	0.000e+00	0.000e+00	-88.376	-88.605	-0.228	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.153	-138.222	-0.070	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.977	-138.977	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.502	-139.781	-0.279	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.073	-147.143	-0.070	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.310	-147.477	-0.167	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-148.189	-148.498	-0.309	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.932	-149.228	-0.296	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-149.209	-149.279	-0.070	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.452	-149.768	-0.316	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.777	-150.079	-0.302	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.005	-150.005	0.000	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-150.418	-150.418	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.526	-150.526	0.000	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-158.804	-158.804	0.000	(0)

Cu (HS) 3-	0.000e+00	0.000e+00	-215.737	-215.807	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.522	-225.592	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.489	-226.559	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.610	-227.680	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.143	-228.423	-0.279	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.151	-235.220	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.537	-302.816	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.226	-305.505	-0.279	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.987	-317.266	-0.279	(0)
S (6)	3.538e-03					
SO4-2	2.809e-03	1.638e-03	-2.551	-2.786	-0.234	(0)
CaSO4	4.300e-04	4.300e-04	-3.366	-3.366	0.000	(0)
MgSO4	2.452e-04	2.452e-04	-3.611	-3.611	0.000	(0)
NaSO4-	4.279e-05	3.760e-05	-4.369	-4.425	-0.056	(0)
KSO4-	8.019e-06	7.046e-06	-5.096	-5.152	-0.056	(0)
MnSO4	2.971e-06	2.971e-06	-5.527	-5.527	0.000	(0)
CuSO4	1.694e-07	1.694e-07	-6.771	-6.771	0.000	(0)
ZnSO4	1.671e-07	1.671e-07	-6.777	-6.777	0.000	(0)
NiSO4	2.489e-08	2.489e-08	-7.604	-7.604	0.000	(0)
CoSO4	1.646e-08	1.646e-08	-7.784	-7.784	0.000	(0)
HSO4-	1.298e-08	1.136e-08	-7.887	-7.945	-0.058	(0)
Zn (SO4) 2-2	4.536e-09	2.383e-09	-8.343	-8.623	-0.279	(0)
CdSO4	1.880e-09	1.880e-09	-8.726	-8.726	0.000	(0)
PbSO4	1.035e-09	1.035e-09	-8.985	-8.985	0.000	(0)
AgSO4-	2.717e-10	2.313e-10	-9.566	-9.636	-0.070	(0)
CrOHSO4	1.059e-10	1.059e-10	-9.975	-9.975	0.000	(0)
Cd (SO4) 2-2	7.906e-11	4.154e-11	-10.102	-10.382	-0.279	(0)
AlSO4+	2.125e-11	1.859e-11	-10.673	-10.731	-0.058	(0)
Pb (SO4) 2-2	1.944e-11	1.022e-11	-10.711	-10.991	-0.279	(0)
FeSO4	5.720e-12	5.720e-12	-11.243	-11.243	0.000	(0)
Ni (SO4) 2-2	2.569e-12	1.350e-12	-11.590	-11.870	-0.279	(0)
CrSO4+	3.943e-13	3.357e-13	-12.404	-12.474	-0.070	(0)
Al (SO4) 2-	3.729e-13	3.262e-13	-12.428	-12.487	-0.058	(0)
UO2SO4	8.066e-14	8.066e-14	-13.093	-13.093	0.000	(0)
UO2 (SO4) 2-2	3.314e-15	1.741e-15	-14.480	-14.759	-0.279	(0)
VO2SO4-	4.204e-16	3.579e-16	-15.376	-15.446	-0.070	(0)
FeSO4+	1.164e-17	1.021e-17	-16.934	-16.991	-0.057	(0)
Cr2 (OH) 2SO4+2	4.961e-18	2.606e-18	-17.304	-17.584	-0.279	(0)
VOSO4	3.959e-18	3.959e-18	-17.402	-17.402	0.000	(0)
Fe (SO4) 2-	4.197e-19	3.573e-19	-18.377	-18.447	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.535e-19	2.535e-19	-18.596	-18.596	0.000	(0)
HgSO4	1.737e-21	1.737e-21	-20.760	-20.760	0.000	(0)
CrO3SO4-2	1.777e-24	9.336e-25	-23.750	-24.030	-0.279	(0)
VSO4+	4.745e-32	4.040e-32	-31.324	-31.394	-0.070	(0)
U (SO4) 2	6.523e-40	6.523e-40	-39.186	-39.186	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.020	-40.300	-0.279	(0)
Sb (3)	1.057e-19					
Sb (OH) 3	5.347e-20	5.347e-20	-19.272	-19.272	0.000	(0)
HSbO2	5.221e-20	5.221e-20	-19.282	-19.282	0.000	(0)
SbO2-	1.400e-24	1.192e-24	-23.854	-23.924	-0.070	(0)
Sb (OH) 2F	9.850e-25	9.850e-25	-24.007	-24.007	0.000	(0)
SbOF	9.689e-25	9.689e-25	-24.014	-24.014	0.000	(0)
Sb (OH) 4-	8.015e-25	6.824e-25	-24.096	-24.166	-0.070	(0)
Sb (OH) 2+	1.083e-25	9.219e-26	-24.965	-25.035	-0.070	(0)
SbO+	3.734e-26	3.179e-26	-25.428	-25.498	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.987	-317.266	-0.279	(0)
Sb (5)	1.301e-08					
SbO3-	1.299e-08	1.106e-08	-7.886	-7.956	-0.070	(0)
Sb (OH) 6-	1.479e-11	1.293e-11	-10.830	-10.889	-0.059	(0)
SbO2+	1.878e-23	1.598e-23	-22.726	-22.796	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.319e-40	2.826e-40	-39.479	-39.549	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.776	-42.776	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.808	-42.808	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.120	-47.400	-0.279	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.192	-86.310	-1.118	(0)
Se (4)	2.152e-08					

HSeO3-	1.973e-08	1.680e-08	-7.705	-7.775	-0.070	(0)
SeO3-2	1.793e-09	9.422e-10	-8.746	-9.026	-0.279	(0)
H2SeO3	5.085e-13	5.085e-13	-12.294	-12.294	0.000	(0)
AgSeO3-	5.035e-15	4.287e-15	-14.298	-14.368	-0.070	(0)
Cd (SeO3) 2-2	6.820e-21	3.584e-21	-20.166	-20.446	-0.279	(0)
Ag (SeO3) 2-3	1.539e-22	3.616e-23	-21.813	-22.442	-0.629	(0)
FeHSeO3+2	4.692e-23	2.465e-23	-22.329	-22.608	-0.279	(0)
Se (6)	7.013e-12					
SeO4-2	7.001e-12	4.082e-12	-11.155	-11.389	-0.234	(0)
MnSeO4	1.121e-14	1.121e-14	-13.950	-13.950	0.000	(0)
ZnSeO4	2.949e-16	2.949e-16	-15.530	-15.530	0.000	(0)
NiSeO4	1.454e-16	1.454e-16	-15.837	-15.837	0.000	(0)
CoSeO4	1.030e-16	1.030e-16	-15.987	-15.987	0.000	(0)
HSeO4-	1.705e-17	1.452e-17	-16.768	-16.838	-0.070	(0)
CdSeO4	3.723e-18	3.723e-18	-17.429	-17.429	0.000	(0)
Zn (SeO4) 2-2	2.322e-27	1.220e-27	-26.634	-26.914	-0.279	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.905	-58.533	-0.629	(0)
U (4)	3.810e-22					
U (OH) 5-	3.800e-22	3.235e-22	-21.420	-21.490	-0.070	(0)
U (OH) 4	9.619e-25	9.619e-25	-24.017	-24.017	0.000	(0)
U (OH) 3+	2.932e-28	2.497e-28	-27.533	-27.603	-0.070	(0)
U (OH) 2+2	1.560e-32	8.195e-33	-31.807	-32.086	-0.279	(0)
UF3+	1.648e-34	1.403e-34	-33.783	-33.853	-0.070	(0)
UF2+2	1.014e-35	5.330e-36	-34.994	-35.273	-0.279	(0)
UF4	2.555e-36	2.555e-36	-35.593	-35.593	0.000	(0)
UOH+3	1.166e-37	2.740e-38	-36.933	-37.562	-0.629	(0)
UF5-	1.975e-38	1.682e-38	-37.704	-37.774	-0.070	(0)
UF+3	1.084e-38	2.549e-39	-37.965	-38.594	-0.629	(0)
UF6-2	1.606e-39	8.436e-40	-38.794	-39.074	-0.279	(0)
U (SO4) 2	6.523e-40	6.523e-40	-39.186	-39.186	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.020	-40.300	-0.279	(0)
U+4	0.000e+00	0.000e+00	-42.996	-44.114	-1.118	(0)
UCl+3	0.000e+00	0.000e+00	-44.612	-45.241	-0.629	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.948	-174.607	-5.660	(0)
U (5)	5.544e-17					
UO2+	5.544e-17	4.720e-17	-16.256	-16.326	-0.070	(0)
U (6)	8.240e-08					
UO2 (CO3) 2-2	4.105e-08	2.157e-08	-7.387	-7.666	-0.279	(0)
UO2 (CO3) 3-4	4.097e-08	3.123e-09	-7.387	-8.505	-1.118	(0)
UO2CO3	3.742e-10	3.742e-10	-9.427	-9.427	0.000	(0)
UO2F+	8.763e-13	7.461e-13	-12.057	-12.127	-0.070	(0)
UO2OH+	6.825e-13	5.810e-13	-12.166	-12.236	-0.070	(0)
UO2F2	3.574e-13	3.574e-13	-12.447	-12.447	0.000	(0)
UO2SO4	8.066e-14	8.066e-14	-13.093	-13.093	0.000	(0)
UO2+2	5.581e-14	3.254e-14	-13.253	-13.488	-0.234	(0)
UO2F3-	1.751e-14	1.491e-14	-13.757	-13.827	-0.070	(0)
UO2 (SO4) 2-2	3.314e-15	1.741e-15	-14.480	-14.759	-0.279	(0)
UO2Cl+	9.239e-17	7.866e-17	-16.034	-16.104	-0.070	(0)
UO2F4-2	3.744e-17	1.967e-17	-16.427	-16.706	-0.279	(0)
(UO2) 2 (OH) 2+2	1.066e-18	5.603e-19	-17.972	-18.252	-0.279	(0)
(UO2) 3 (OH) 5+	5.835e-21	4.968e-21	-20.234	-20.304	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.484	-40.554	-0.070	(0)
V+2	0.000e+00	0.000e+00	-40.936	-41.215	-0.279	(0)
V (3)	1.203e-13					
V (OH) 3	1.203e-13	1.203e-13	-12.920	-12.920	0.000	(0)
V (OH) 2+	6.480e-24	5.517e-24	-23.188	-23.258	-0.070	(0)
VOH+2	7.070e-27	3.715e-27	-26.151	-26.430	-0.279	(0)
V+3	2.223e-31	5.225e-32	-30.653	-31.282	-0.629	(0)
VSO4+	4.745e-32	4.040e-32	-31.324	-31.394	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.608	-51.237	-0.629	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.942	-52.060	-1.118	(0)
V (4)	3.232e-16					
V (OH) 3+	2.916e-16	2.483e-16	-15.535	-15.605	-0.070	(0)
VO+2	1.670e-17	8.777e-18	-16.777	-17.057	-0.279	(0)
VOF+	1.027e-17	8.744e-18	-16.988	-17.058	-0.070	(0)
VOSO4	3.959e-18	3.959e-18	-17.402	-17.402	0.000	(0)

VOF2	5.446e-19	5.446e-19	-18.264	-18.264	0.000	(0)
VOC1+	4.311e-20	3.670e-20	-19.365	-19.435	-0.070	(0)
VOF3-	3.769e-21	3.209e-21	-20.424	-20.494	-0.070	(0)
VOF4-2	4.095e-24	2.152e-24	-23.388	-23.667	-0.279	(0)
H2V2O4+2	5.885e-27	3.092e-27	-26.230	-26.510	-0.279	(0)
V (5)	1.132e-07					
H2VO4-	1.069e-07	9.101e-08	-6.971	-7.041	-0.070	(0)
HVO4-2	6.131e-09	3.221e-09	-8.212	-8.492	-0.279	(0)
H3VO4	6.459e-11	6.459e-11	-10.190	-10.190	0.000	(0)
H3V2O7-	4.460e-11	3.797e-11	-10.351	-10.421	-0.070	(0)
HV2O7-3	4.228e-13	9.938e-14	-12.374	-13.003	-0.629	(0)
VO2+	1.047e-14	9.152e-15	-13.980	-14.038	-0.059	(0)
V3O9-3	3.362e-15	7.902e-16	-14.473	-15.102	-0.629	(0)
VO2F	2.666e-15	2.666e-15	-14.574	-14.574	0.000	(0)
VO4-3	9.679e-16	2.275e-16	-15.014	-15.643	-0.629	(0)
V2O7-4	4.945e-16	3.769e-17	-15.306	-16.424	-1.118	(0)
VO2SO4-	4.204e-16	3.579e-16	-15.376	-15.446	-0.070	(0)
VO2F2-	1.889e-16	1.608e-16	-15.724	-15.794	-0.070	(0)
VO2F3-2	6.340e-19	3.331e-19	-18.198	-18.477	-0.279	(0)
V4O12-4	3.935e-19	2.999e-20	-18.405	-19.523	-1.118	(0)
VO2F4-3	1.158e-22	2.722e-23	-21.936	-22.565	-0.629	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.313	-49.059	-1.747	(0)
V10O28-6	0.000e+00	0.000e+00	-47.582	-50.097	-2.515	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.883	-51.001	-1.118	(0)
Zn	1.137e-06					
Zn+2	8.000e-07	4.664e-07	-6.097	-6.331	-0.234	(0)
ZnSO4	1.671e-07	1.671e-07	-6.777	-6.777	0.000	(0)
ZnCO3	7.753e-08	7.753e-08	-7.111	-7.111	0.000	(0)
ZnHCO3+	7.576e-08	6.450e-08	-7.121	-7.190	-0.070	(0)
ZnOH+	7.770e-09	6.615e-09	-8.110	-8.179	-0.070	(0)
Zn (SO4) 2-2	4.536e-09	2.383e-09	-8.343	-8.623	-0.279	(0)
ZnCl+	2.001e-09	1.746e-09	-8.699	-8.758	-0.059	(0)
ZnF+	1.816e-09	1.546e-09	-8.741	-8.811	-0.070	(0)
ZnOHCl	3.243e-10	3.243e-10	-9.489	-9.489	0.000	(0)
Zn (OH) 2	1.487e-10	1.487e-10	-9.828	-9.828	0.000	(0)
ZnCl2	4.125e-12	4.125e-12	-11.385	-11.385	0.000	(0)
Zn (OH) 3-	1.242e-13	1.057e-13	-12.906	-12.976	-0.070	(0)
ZnCl3-	5.598e-15	4.884e-15	-14.252	-14.311	-0.059	(0)
ZnSeO4	2.949e-16	2.949e-16	-15.530	-15.530	0.000	(0)
ZnCl4-2	6.156e-18	3.640e-18	-17.211	-17.439	-0.228	(0)
Zn (OH) 4-2	1.136e-18	5.969e-19	-17.945	-18.224	-0.279	(0)
Zn (SeO4) 2-2	2.322e-27	1.220e-27	-26.634	-26.914	-0.279	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.209	-149.279	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.418	-150.418	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.522	-225.592	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.143	-228.423	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.226	-305.505	-0.279	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.38	-87.60	-36.22	Ag2S
Ag2CO3	-10.75	-21.84	-11.09	Ag2CO3
Ag2CrO4	-20.65	-32.24	-11.59	Ag2CrO4
Ag2HVO4	-10.37	-8.89	1.48	Ag2HVO4
Ag2MoO4	-11.48	-23.03	-11.55	Ag2MoO4
Ag2O	-14.58	-2.00	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-26.92	-24.76	2.16	Ag3AsO3
Ag3AsO4	-15.33	-18.11	-2.79	Ag3AsO4
Ag3H2VO5	-15.07	-9.89	5.18	Ag3H2VO5
AgF:4H2O	-12.98	-11.93	1.05	AgF:4H2O
Agmetal	-0.27	-13.77	-13.51	Ag
AgVO3	-8.66	-7.89	0.77	AgVO3

Al(OH)3(am)	-1.19	9.61	10.80	Al(OH)3
Al2(MoO4)3	-46.23	-43.86	2.37	Al2(MoO4)3
Al2O3	-0.43	19.22	19.65	Al2O3
Al4(OH)10SO4	-1.34	21.36	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-10.30	-5.50	4.80	AlAsO4·2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.29	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.88	-11.67	-7.79	PbSO4
Anhydrite	-1.37	-5.73	-4.36	CaSO4
Anilite	-54.93	-86.81	-31.88	Cu0.25Cu1.5S
Antlerite	-2.01	6.77	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-84.27	-87.03	-2.76	As4O6
Artinite	-7.01	2.59	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-36.93	-30.22	6.71	As2O5
Atacamite	-1.46	5.93	7.39	Cu2(OH)3Cl
Azurite	1.09	-15.82	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-17.29	7.10	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-15.44	0.43	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-25.41	7.53	32.94	Ba3(VO4)2·4H2O
BaCrO4	-13.46	-23.13	-9.67	BaCrO4
BaF2	-8.93	-14.75	-5.82	BaF2
BaMoO4	-6.96	-13.93	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.65	-7.82	1.83	BaSeO3
BaSeO4	-11.12	-18.58	-7.46	BaSeO4
Bianchite	-7.35	-9.12	-1.76	ZnSO4·6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.90	-6.54	-0.64	Mn2O3
BlaubleiI	-54.71	-78.87	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.26	-82.53	-27.28	Cu0.6Cu0.8S
Boehmite	1.03	9.61	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.50	14.73	15.22	Cu4(OH)6SO4
Brucite	-5.63	11.21	16.84	Mg(OH)2
Bunsenite	-5.27	7.18	12.45	NiO
Ca(VO3)2	-8.08	-2.42	5.66	Ca(VO3)2
Ca2V2O7	-8.57	8.93	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.62	8.93	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-18.45	3.85	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-18.67	20.29	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-19.57	20.29	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-300.71	-157.74	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	-0.00	-8.48	-8.48	CaCO3
Calomel	-8.98	-26.89	-17.91	Hg2Cl2
CaMoO4	-1.72	-9.67	-7.95	CaMoO4
Carnotite	-2.38	-2.15	0.23	KUO2VO4
CaSeO3·2H2O	-6.38	-3.57	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.31	-14.33	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.46	-3.62	9.84	Cd(BO2)2
Cd(OH)2	-7.66	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.91	-16.20	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.68	0.88	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.53	6.87	28.40	Cd4(OH)6SO4
CdCl2	-13.30	-13.96	-0.66	CdCl2
CdCl2·1H2O	-12.27	-13.96	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.05	-13.96	-1.91	CdCl2·2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.17	-19.56	13.62	Cd
CdMoO4	-0.89	-15.04	-14.15	CdMoO4
CdOHCl	-7.53	-3.99	3.54	CdOHCl
CdSb	-76.80	-77.15	-0.35	CdSb

CdSe	-20.51	-40.71	-20.20	CdSe
CdSeO4:2H2O	-17.85	-19.70	-1.85	CdSeO4:2H2O
CdSO4	-10.92	-11.10	-0.17	CdSO4
CdSO4:1H2O	-9.37	-11.10	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.22	-11.10	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.23	-10.98	-9.75	AgCl
Cerrusite	-1.30	-14.43	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.49	-9.13	-2.64	CuSO4:5H2O
Chalcocite	-54.94	-89.86	-34.92	Cu2S
Chalcopyrite	-124.53	-159.80	-35.27	CuFeS2
Cinnabar	-52.20	-97.89	-45.69	HgS
Claudetite	-83.96	-87.03	-3.06	As4O6
Clausthalite	-14.19	-41.29	-27.10	PbSe
Co (BO2) 2	-29.67	-2.60	27.07	Co (BO2) 2
Co (OH) 2	-6.09	7.00	13.09	Co (OH) 2
Co (OH) 3	-10.32	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-22.26	-9.22	13.03	Co3 (AsO4) 2
Co3O4	-7.76	-18.26	-10.50	Co3O4
CoCl2	-21.22	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.96	-45.41	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.27	-14.03	-7.76	CoMoO4
CoO	-6.59	7.00	13.59	CoO
CoS (alpha)	-71.16	-78.60	-7.44	CoS
CoS (beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.50	-39.70	-16.20	CoSe
CoSeO3	-9.24	-7.92	1.32	CoSeO3
CoSeO4:6H2O	-17.16	-18.69	-1.53	CoSeO4:6H2O
CoSO4	-12.89	-10.08	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.76	-14.54	-4.78	PbCl2
Covellite	-55.35	-77.65	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.05	-30.96	14.09	CrCl2
CrCl3	-46.22	-31.11	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.78	-41.62	-33.84	Na3AlF6
Cu (OH) 2	-0.72	7.95	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.71	20.50	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-55.20	-90.08	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.16	-50.96	-45.80	Cu2Se
Cu2SO4	-19.39	-21.34	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.46	-6.36	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.70	-102.30	-42.59	Cu3Sb
Cu3Se2	-26.21	-89.70	-63.49	Cu3Se2
CuCO3	-0.38	-11.88	-11.50	CuCO3
CuCrO4	-16.85	-22.29	-5.44	CuCrO4
CuF	-8.15	-13.06	-4.91	CuF
CuF2	-15.02	-13.90	1.12	CuF2
CuF2:2H2O	-9.35	-13.90	-4.55	CuF2:2H2O
Cumetal	-6.15	-14.90	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.48	-1.18	10.30	CuOCuSO4
Cupricferrite	8.35	14.33	5.99	CuFe2O4
Cuprite	-2.85	-4.26	-1.41	Cu2O
Cuprousferrite	9.98	1.06	-8.92	CuFeO2
CuSe	-5.65	-38.75	-33.10	CuSe
CuSe2	-26.53	-59.90	-33.37	CuSe2

CuSeO3:2H2O	-7.48	-6.97	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.30	-17.74	-2.44	CuSeO4:5H2O
CuSO4	-12.07	-9.13	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-55.14	-89.06	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.75	-5.87	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.61	-10.33	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.10	-8.54	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.76	-38.39	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.13	-44.87	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.32	-11.92	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.49	-17.58	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.80	-64.40	-18.60	FeSe2
FeS(ppt)	-79.20	-82.15	-2.95	FeS
FeSe	-32.25	-43.25	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.22	-80.19	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.11	-9.12	-2.01	ZnSO4:7H2O
Greenockite	-65.25	-79.61	-14.36	CdS
Greigite	-287.54	-332.58	-45.03	Fe3S4
Gummite	-6.86	0.81	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-12.49	-24.59	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.15	-21.03	-12.88	H2MoO4
H2S(g)	-77.59	-85.60	-8.01	H2S
H2Se(g)	-41.74	-46.70	-4.96	H2Se
Halite	-6.80	-5.20	1.60	NaCl
Hausmannite	-7.57	53.46	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.22	22.67	22.89	FeAl2O4
Hg(CH3)2(g)	-182.61	-256.32	-73.71	Hg(CH3)2
Hg(g)	-8.37	-16.24	-7.87	Hg
Hg(OH)2	-8.79	-12.29	-3.50	Hg(OH)2
Hg2(g)	-17.53	-32.48	-14.96	Hg2
Hg2(OH)2	-12.20	-6.94	5.26	Hg2(OH)2
Hg2CO3	-10.72	-26.77	-16.05	Hg2CO3
Hg2CrO4	-28.47	-37.17	-8.70	Hg2CrO4
Hg2F2	-18.43	-28.79	-10.36	Hg2F2
Hg2S	-80.86	-92.54	-11.68	Hg2S
Hg2SeO3	-17.20	-21.86	-4.66	Hg2SeO3
Hg2SO4	-17.89	-24.02	-6.13	Hg2SO4
Hg3O2CO3	-27.02	-56.70	-29.68	Hg3O2CO3
HgCl(g)	-32.94	-13.44	19.50	HgCl
HgCl2	-10.98	-32.24	-21.26	HgCl2
HgF(g)	-47.07	-14.40	32.68	HgF
HgF2(g)	-46.71	-34.15	12.57	HgF2
Hgmetal(l)	-2.79	-16.24	-13.45	Hg
HgSe	-3.29	-58.99	-55.69	HgSe
HgSeO3	-14.78	-27.21	-12.43	HgSeO3
HgSO4	-19.95	-29.37	-9.42	HgSO4
Huntite	-4.38	-34.35	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.68	-23.45	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.52	-23.28	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.45	-20.62	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.86	-20.66	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.37	-52.61	-17.24	K2Cr2O7
K2CrO4	-21.86	-22.37	-0.51	K2CrO4
K2MoO4	-16.43	-13.16	3.26	K2MoO4

K2SeO4	-17.09	-17.82	-0.73	K2SeO4
Langite	-2.76	14.73	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.83	-6.27	-0.43	PbO:PbSO4
Laurionite	-5.19	-4.57	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.29	5.41	12.69	PbO
Mackinawite	-78.55	-82.15	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.37	-3.93	-5.31	Cu2 (OH) 2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.49	5.41	12.89	PbO
Matlockite	-6.52	-15.50	-8.97	PbClF
Melanothallite	-18.26	-12.00	6.26	CuCl2
Melanterite	-11.42	-13.63	-2.21	FeSO4:7H2O
Metacinnabar	-52.80	-97.89	-45.09	HgS
Mg (OH) 2 (active)	-7.58	11.21	18.79	Mg (OH) 2
Mg (VO3) 2	-13.85	-2.57	11.28	Mg (VO3) 2
Mg2Sb3	-276.11	-201.43	74.68	Mg2Sb3
Mg2V2O7	-17.71	8.65	26.36	Mg2V2O7
MgCr2O4	-7.35	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.97	-9.82	-1.85	MgMoO4
MgSeO3:6H2O	-6.77	-3.71	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.27	-14.47	-1.20	MgSeO4:6H2O
Minium	-31.75	41.77	73.52	Pb3O4
Mirabilite	-6.41	-7.53	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-9.37	-4.47	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.08	-57.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.14	-90.07	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-14.80	-2.30	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.36	-10.65	2.72	MnCl2:4H2O
MnS (grn)	-76.47	-76.30	0.17	MnS
MnS (pnk)	-79.64	-76.30	3.34	MnS
MnSb	-96.27	-99.18	-2.91	MnSb
MnSe	-40.89	-37.39	3.50	MnSe
MnSeO3	-6.75	-5.62	1.13	MnSeO3
MnSeO3:2H2O	-6.60	-5.62	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.33	-16.38	-2.05	MnSeO4:5H2O
MnSO4	-10.36	-7.78	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.65	-12.29	-3.64	HgO
MoO3	-13.03	-21.03	-8.00	MoO3
Morenosite	-7.76	-9.91	-2.14	NiSO4:7H2O
MoS2	-147.52	-217.78	-70.26	MoS2
Na-Jarosite	-8.61	-19.81	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-41.02	-50.92	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.68	2.93	Na2CrO4
Na2Mo2O7	-15.90	-32.50	-16.60	Na2Mo2O7
Na2MoO4	-12.96	-11.47	1.49	Na2MoO4
Na2MoO4:2H2O	-12.69	-11.47	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.66	-5.36	10.30	Na2SeO3:5H2O
Na2SeO4	-17.41	-16.13	1.28	Na2SeO4
Na3Sb	-176.02	-81.57	94.45	Na3Sb
Na3VO4	-29.23	7.45	36.68	Na3VO4
Na4V2O7	-32.06	5.34	37.40	Na4V2O7
Nantokite	-5.38	-12.11	-6.73	CuCl
NaSb	-88.75	-65.58	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-5.97	-2.11	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.61	7.18	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-24.38	-8.68	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-20.37	11.63	32.00	Ni4 (OH) 6SO4

NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.71	-13.85	-11.14	NiMoO4
NiS (alpha)	-72.82	-78.42	-5.60	NiS
NiS (beta)	-67.32	-78.42	-11.10	NiS
NiS (gamma)	-65.62	-78.42	-12.80	NiS
NiSe	-21.82	-39.52	-17.70	NiSe
NiSeO3:2H2O	-10.56	-7.74	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.99	-18.51	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-239.25	-300.32	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb (BO2) 2	-10.71	-4.20	6.52	Pb (BO2) 2
Pb (OH) 2	-2.74	5.41	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-56.18	-64.94	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-7.95	0.84	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.37	10.82	26.19	Pb2O (OH) 2
Pb2O3	-24.68	36.36	61.04	Pb2O3
Pb2OCO3	-8.46	-9.02	-0.56	Pb2OCO3
Pb2V2O7	-1.06	-2.96	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.79	-13.99	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-3.69	2.45	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.63	-3.61	11.02	Pb3O2CO3
Pb3O2SO4	-11.54	-0.86	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.55	4.55	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.33	4.55	21.88	Pb4O3SO4
PbCrO4	-12.23	-24.83	-12.60	PbCrO4
PbF2	-9.01	-16.45	-7.44	PbF2
Pbmetal	-24.38	-20.14	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.57	5.41	12.98	PbO:0.33H2O
PbSeO4	-13.44	-20.28	-6.84	PbSeO4
Periclase	-10.37	11.21	21.58	MgO
Phosgenite	-9.16	-28.97	-19.81	PbCl2:PbCO3
Plattnerite	-18.65	30.95	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca (OH) 2
Pyrite	-123.70	-142.21	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn (OH) 2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.38	-120.13	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb (OH) 3	-12.16	-19.27	-7.11	Sb (OH) 3
Sb2O4	-16.40	-13.00	3.40	Sb2O4
Sb2O5	-26.41	-36.07	-9.67	Sb2O5
Sb2Se3	-110.88	-178.64	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.83	-77.09	-18.26	Sb4O6
Sb4O6 (orth)	-59.19	-77.09	-17.90	Sb4O6
SbCl3	-49.77	-49.20	0.57	SbCl3
SbF3	-41.83	-52.06	-10.23	SbF3
Sbmetal	-45.90	-57.59	-11.69	Sb
SbO2	-2.99	-30.81	-27.82	SbO2
Schoepite	-5.18	0.81	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.04	-21.15	-7.11	Se
Semetal (hex)	-13.44	-21.15	-7.71	Se
Senarmontite	-26.18	-38.54	-12.37	Sb2O3
SeO2	-15.05	-14.92	0.12	SeO2
SeO3	-46.73	-25.69	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.19	-77.64	-11.45	ZnS
Spinel	-6.41	30.44	36.85	MgAl2O4
Stibnite	-244.89	-295.35	-50.46	Sb2S3
Sulfur	-57.91	-60.06	-2.14	S
Tenorite	0.31	7.95	7.64	CuO
Thenardite	-7.85	-7.52	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3:H2O

Tyuyamunite	-4.88	-0.80	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-16.55	4.53	21.08	U ₃ O ₈
U ₃ Sb ₄	-582.56	-430.18	152.38	U ₃ Sb ₄
U ₄ O ₉	-33.51	-36.53	-3.02	U ₄ O ₉
UF ₄	-29.70	-59.23	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-26.52	-59.23	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.45	-15.52	0.93	UO ₂
UO ₂ (OH) ₂ (beta)	-4.80	0.81	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-22.63	-24.88	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.89	0.81	7.70	UO ₃
Uraninite	-10.85	-15.52	-4.67	UO ₂
USb ₂	-220.58	-191.00	29.58	USb ₂
V(OH) ₃	-17.43	-9.84	7.59	V(OH) ₃
V ₂ O ₅	-12.42	-13.78	-1.36	V ₂ O ₅
V ₃ O ₅	-35.66	-33.82	1.84	V ₃ O ₅
V ₄ O ₇	-43.77	-36.58	7.19	V ₄ O ₇
V ₆ O ₁₃	-31.57	-92.43	-60.86	V ₆ O ₁₃
Valentinite	-30.06	-38.54	-8.48	Sb ₂ O ₃
VC ₁₂	-61.43	-42.56	18.87	VC ₁₂
VC ₁₃	-63.19	-39.76	23.43	VC ₁₃
VF ₄	-61.40	-46.47	14.93	VF ₄
Vmetal	-92.18	-48.15	44.03	V
VO	-37.36	-22.61	14.76	VO
VO(OH) ₂	-7.91	-2.76	5.15	VO(OH) ₂
VO ₂ Cl	-19.71	-16.87	2.84	VO ₂ Cl
VOC ₁	-30.96	-19.81	11.15	VOC ₁
VOC ₁₂	-35.47	-22.71	12.76	VOC ₁₂
VOSO ₄	-23.45	-19.84	3.61	VOSO ₄
Witherite	-4.16	-12.73	-8.57	BaCO ₃
Wurtzite	-68.69	-77.64	-8.95	ZnS
Zincite	-3.37	7.97	11.33	ZnO
Zincosite	-13.05	-9.12	3.93	ZnSO ₄
Zn(BO ₂) ₂	-9.93	-1.64	8.29	Zn(BO ₂) ₂
Zn(OH) ₂	-4.23	7.97	12.20	Zn(OH) ₂
Zn(OH) ₂ (am)	-4.51	7.97	12.47	Zn(OH) ₂
Zn(OH) ₂ (beta)	-3.79	7.97	11.75	Zn(OH) ₂
Zn(OH) ₂ (epsilon)	-3.57	7.97	11.53	Zn(OH) ₂
Zn(OH) ₂ (gamma)	-3.77	7.97	11.73	Zn(OH) ₂
Zn ₂ (OH) ₂ SO ₄	-8.65	-1.15	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-9.23	5.96	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-19.97	-6.32	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ (SO ₄) ₂	-29.18	-10.27	18.91	Zn ₃ (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-13.62	14.78	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-18.62	19.88	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-19.03	-11.98	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-1.61	-11.87	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-13.36	-13.89	-0.53	ZnF ₂
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO ₄	-2.94	-13.06	-10.13	ZnMoO ₄
ZnO (active)	-3.22	7.97	11.19	ZnO
ZnS (am)	-68.58	-77.64	-9.05	ZnS
ZnSb	-86.18	-75.17	11.01	ZnSb
ZnSe	-24.33	-38.73	-14.40	ZnSe
ZnSeO ₄ :6H ₂ O	-16.20	-17.72	-1.52	ZnSeO ₄ :6H ₂ O
ZnSO ₄ :1H ₂ O	-8.48	-9.12	-0.64	ZnSO ₄ :1H ₂ O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 87.

Title Determine loss of metals due to HFO sorption and sedimentation

```

SURFACE 501
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 501
USE Surface 501
USE Solution 503
SAVE Solution 504 #Initial Stage 5 groundwater after Mineral Precipitation
and Sorption Loss
END

```

```

-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

```

-----
Beginning of initial surface-composition calculations.
-----

```

Surface 501.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

1.142e-15 Surface + diffuse layer charge, eq
7.815e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.714e+00 m² for 2.670e-05 moles of Ferrihydrite

```

Water in diffuse layer: 1.714e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is +1).

Element	Moles
C	4.3797e-11
Ca	5.4279e-13
Cl	8.7703e-10
H	1.2920e-10
K	8.6107e-13
Mg	8.4095e-14
N	3.5506e-09
Na	3.6483e-12
O	1.5825e-07
S	3.6875e-08

Hfo_s

Species	Moles	Mole Fraction	Molality	Log Molality
1.335e-07 moles [0.005 mol/(mol Ferrihydrite)]				
Hfo_sOH2+	8.925e-08	0.668	8.925e-08	-7.049
Hfo_sOH	4.377e-08	0.328	4.377e-08	-7.359
Hfo_sO-	4.918e-10	0.004	4.918e-10	-9.308
Hfo_sOHCa+2	1.629e-12	0.000	1.629e-12	-11.788

Hfo_w

Species	Moles	Mole Fraction	Molality	Log Molality
5.341e-06 moles [0.2 mol/(mol Ferrihydrite)]				

Hfo_wOH2+	2.468e-06	0.462	2.468e-06	-5.608
Hfo_wOH	1.210e-06	0.227	1.210e-06	-5.917
Hfo_wSO4-	8.335e-07	0.156	8.335e-07	-6.079
Hfo_wOHSO4-2	8.156e-07	0.153	8.156e-07	-6.088
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.867
Hfo_wOMg+	1.922e-14	0.000	1.922e-14	-13.716
Hfo_wOCa+	6.520e-15	0.000	6.520e-15	-14.186

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 503. Solution after simulation 86.
 Using surface 501.
 Using pure phase assemblage 501. Pure-phase assemblage after simulation 86.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.512e-08	2.145e-08	-3.678e-09
Alunite	-0.00	-1.40	-1.40	8.400e-07	8.401e-07	1.504e-10
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.01	-9.92	-8.91	2.014e-08	0	-2.014e-08
Barite	0.00	-9.98	-9.98	1.286e-06	1.346e-06	6.042e-08
Brochantite	-1.05	14.17	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.21	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.253e-06
CaMoO4	-1.58	-9.53	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.55	-3.74	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.813e-03	2.813e-03	-6.515e-07
Carnotite	-4.15	-3.92	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.46	-3.62	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.75	-14.90	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.031e-08	3.835e-08	-2.195e-08
Cu2Se(alpha)	-5.61	-51.41	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.209e-07	9.958e-08	-1.213e-07
Epsomite	-3.75	-5.87	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.670e-05	2.670e-05	-5.212e-13
Fluorite	0.00	-10.50	-10.50	1.047e-04	1.047e-04	9.755e-09
Gummite	-6.86	0.81	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.47	-59.16	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.41	-7.53	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.92	-5.79	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.40	-9.70	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00

NiMoO4	-2.57	-13.71	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.414e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.578e-09	0	-5.578e-09
Rutherfordine	-4.53	-19.03	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.99	-30.81	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.18	0.81	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.43	-4.35	4.08	0.000e+00	0	0.000e+00
U3O8	-16.55	4.53	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.80	0.81	5.61	0.000e+00	0	0.000e+00
UO3	-6.89	0.81	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.80	-12.93	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-4.651e-20 Surface + diffuse layer charge, eq
 3.723e-07 Surface charge, eq
 2.095e-02 sigma, C/m²
 5.552e-02 psi, V
 -2.161e+00 -F*psi/RT
 1.152e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.714e+00 m² for 2.670e-05 moles of Ferrihydrite

Water in diffuse layer: 1.714e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.334e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.950e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	6.7757e-13
Al	4.8858e-11
As	3.4563e-15
B	2.7364e-10
Ba	6.9805e-13
C	1.5758e-07
Ca	2.0505e-08
Cd	1.0181e-13
Cl	4.9152e-08
Co	1.1185e-12
Cr	6.5721e-14
Cu	1.0808e-10
F	5.7132e-09
Fe	4.0379e-14
H	1.7003e-07
Hg	3.6813e-15
K	7.3253e-09
Mg	1.3410e-08
Mn	1.8012e-10
Mo	2.1271e-11
N	8.4162e-14
Na	5.1330e-08
Ni	1.8570e-12
O	1.0705e-06
Pb	1.7601e-13
S	1.4916e-07
Sb	3.7480e-13
Se	4.3972e-13
U	7.5997e-12
V	5.6545e-14
Zn	1.0073e-11

Hfo_s

1.335e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.602e-08	0.569	7.593e-08	-7.120
Hfo_sOCrOH+	4.391e-08	0.329	4.385e-08	-7.358
Hfo_sOPb+	1.046e-08	0.078	1.045e-08	-7.981
Hfo_sOZn+	1.349e-09	0.010	1.347e-09	-8.871
Hfo_sOMn+	1.213e-09	0.009	1.211e-09	-8.917
Hfo_sOHCa+2	2.613e-10	0.002	2.610e-10	-9.583
Hfo_sOH	1.841e-10	0.001	1.838e-10	-9.736
Hfo_sONi+	5.321e-11	0.000	5.314e-11	-10.275
Hfo_sOH2+	2.934e-11	0.000	2.930e-11	-10.533
Hfo_sO-	2.645e-11	0.000	2.642e-11	-10.578
Hfo_sOCu+	5.212e-12	0.000	5.206e-12	-11.284
Hfo_sOCd+	4.312e-12	0.000	4.306e-12	-11.366
Hfo_sOAg	4.272e-13	0.000	4.266e-13	-12.370
Hfo_sOHBa+2	4.503e-14	0.000	4.497e-14	-13.347
Hfo_sOFe+	2.131e-14	0.000	2.128e-14	-13.672
Hfo_sOHg+	6.902e-17	0.000	6.893e-17	-16.162

Hfo_w

5.341e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.550e-06	0.478	2.547e-06	-5.594
Hfo_wOH	1.204e-06	0.225	1.202e-06	-5.920
Hfo_wOHSO4-2	9.165e-07	0.172	9.153e-07	-6.038
Hfo_wOH2+	1.919e-07	0.036	1.917e-07	-6.717
Hfo_wO-	1.730e-07	0.032	1.728e-07	-6.762
Hfo_wOHVO4-3	1.114e-07	0.021	1.113e-07	-6.954
Hfo_wSO4-	7.324e-08	0.014	7.315e-08	-7.136
Hfo_wOHAsO4-3	4.043e-08	0.008	4.037e-08	-7.394
Hfo_wOMg+	4.037e-08	0.008	4.032e-08	-7.394
Hfo_wOZn+	9.238e-09	0.002	9.227e-09	-8.035
Hfo_wOHSeO3-2	8.481e-09	0.002	8.470e-09	-8.072
Hfo_wOMn+	6.301e-09	0.001	6.293e-09	-8.201
Hfo_wOHMoO4-2	5.833e-09	0.001	5.826e-09	-8.235
Hfo_wOCa+	3.164e-09	0.001	3.160e-09	-8.500
Hfo_wOPb+	3.058e-09	0.001	3.054e-09	-8.515
Hfo_wSeO3-	2.297e-09	0.000	2.294e-09	-8.639
Hfo_wMoO4-	6.006e-10	0.000	5.998e-10	-9.222
Hfo_wONi+	4.695e-10	0.000	4.689e-10	-9.329
Hfo_wOCO+	9.609e-11	0.000	9.597e-11	-10.018
Hfo_wH2BO3	7.916e-11	0.000	7.906e-11	-10.102
Hfo_wHAsO4-	2.300e-11	0.000	2.298e-11	-10.639
Hfo_wOCd+	1.203e-11	0.000	1.202e-11	-10.920
Hfo_wOAg	7.349e-13	0.000	7.340e-13	-12.134
Hfo_wH2AsO4	1.187e-13	0.000	1.185e-13	-12.926
Hfo_wOFe+	8.793e-14	0.000	8.782e-14	-13.056
Hfo_wOHg+	2.211e-14	0.000	2.208e-14	-13.656
Hfo_wOBa+	7.882e-15	0.000	7.872e-15	-14.104
Hfo_wOHSbO(OH) 4-	2.697e-15	0.000	2.693e-15	-14.570
Hfo_wOHSeO4-2	1.567e-15	0.000	1.565e-15	-14.805
Hfo_wSbO(OH) 4	2.776e-16	0.000	2.773e-16	-15.557
Hfo_wSeO4-	1.091e-16	0.000	1.090e-16	-15.963
Hfo_wOHCrO4-2	8.274e-17	0.000	8.263e-17	-16.083
Hfo_wCrO4-	6.031e-18	0.000	6.023e-18	-17.220
Hfo_wH2AsO3	1.689e-23	0.000	1.687e-23	-22.773

-----Solution composition-----

Elements	Molality	Moles
Ag	4.056e-08	4.061e-08

Al	1.997e-06	2.000e-06
As	8.069e-11	8.079e-11
B	1.586e-05	1.588e-05
Ba	1.128e-07	1.129e-07
C	5.853e-03	5.861e-03
Ca	2.510e-03	2.514e-03
Cd	1.157e-08	1.159e-08
Cl	1.706e-03	1.708e-03
Co	1.356e-07	1.357e-07
Cr	6.406e-09	6.414e-09
Cu	6.632e-06	6.640e-06
F	2.120e-04	2.123e-04
Fe	3.663e-09	3.668e-09
Hg	2.147e-10	2.150e-10
K	7.035e-04	7.044e-04
Mg	1.718e-03	1.720e-03
Mn	2.350e-05	2.353e-05
Mo	4.394e-07	4.399e-07
N	3.546e-09	3.550e-09
Na	4.946e-03	4.952e-03
Ni	2.124e-07	2.126e-07
Pb	1.229e-08	1.230e-08
S	3.539e-03	3.543e-03
Sb	1.301e-08	1.302e-08
Se	1.444e-08	1.446e-08
U	8.239e-08	8.250e-08
V	1.893e-09	1.895e-09
Zn	1.126e-06	1.128e-06

-----Description of solution-----

	pH	=	7.149	Charge balance
	pe	=	5.624	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.877e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	5.180e-03	
	Total CO2 (mol/kg)	=	5.853e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.151e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.111601e+02	
	Total O	=	5.560856e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.630e-07	1.418e-07	-6.788	-6.848	-0.060	(0)
H+	8.123e-08	7.098e-08	-7.090	-7.149	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.056e-08					
AgCl	2.631e-08	2.631e-08	-7.580	-7.580	0.000	(0)
Ag+	9.893e-09	8.645e-09	-8.005	-8.063	-0.059	(0)
AgCl2-	4.011e-09	3.415e-09	-8.397	-8.467	-0.070	(0)
AgSO4-	3.318e-10	2.825e-10	-9.479	-9.549	-0.070	(0)
AgCl3-2	8.634e-12	4.537e-12	-11.064	-11.343	-0.279	(0)
AgF	3.606e-12	3.606e-12	-11.443	-11.443	0.000	(0)
AgOH	1.226e-13	1.226e-13	-12.912	-12.912	0.000	(0)
AgCl4-3	5.874e-14	1.381e-14	-13.231	-13.860	-0.629	(0)
AgH2BO3	1.768e-14	1.768e-14	-13.753	-13.753	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	4.123e-15	3.510e-15	-14.385	-14.455	-0.070	(0)
AgNO2	4.007e-15	4.007e-15	-14.397	-14.397	0.000	(0)
AgNH3+	1.389e-16	1.182e-16	-15.857	-15.927	-0.070	(0)

	Ag (OH) 2-	1.996e-18	1.699e-18	-17.700	-17.770	-0.070	(0)
	AgNO3	1.437e-20	1.437e-20	-19.842	-19.842	0.000	(0)
	Ag (SeO3) 2-3	8.449e-23	1.986e-23	-22.073	-22.702	-0.629	(0)
	Ag (NO2) 2-	1.617e-23	1.377e-23	-22.791	-22.861	-0.070	(0)
	Ag (NH3) 2+	7.560e-24	6.437e-24	-23.121	-23.191	-0.070	(0)
	Ag2MoO4	7.239e-24	7.239e-24	-23.140	-23.140	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.702	-72.702	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.453	-86.571	-1.118	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-146.986	-147.056	-0.070	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.223	-147.390	-0.167	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.365	-149.681	-0.316	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.690	-149.992	-0.302	(0)
Al		1.997e-06					
	Al (OH) 4-	1.349e-06	1.180e-06	-5.870	-5.928	-0.058	(0)
	AlF3	3.358e-07	3.358e-07	-6.474	-6.474	0.000	(0)
	AlF2+	1.828e-07	1.606e-07	-6.738	-6.794	-0.056	(0)
	Al (OH) 3	6.612e-08	6.612e-08	-7.180	-7.180	0.000	(0)
	AlF4-	3.195e-08	2.795e-08	-7.496	-7.554	-0.058	(0)
	Al (OH) 2+	2.659e-08	2.337e-08	-7.575	-7.631	-0.056	(0)
	AlF+2	4.076e-09	2.429e-09	-8.390	-8.615	-0.225	(0)
	AlOH+2	3.481e-10	2.074e-10	-9.458	-9.683	-0.225	(0)
	AlSO4+	2.126e-11	1.859e-11	-10.673	-10.731	-0.058	(0)
	Al+3	4.924e-12	1.463e-12	-11.308	-11.835	-0.527	(0)
	Al (SO4) 2-	3.730e-13	3.263e-13	-12.428	-12.486	-0.058	(0)
	AlMo6O21-3	2.198e-39	5.167e-40	-38.658	-39.287	-0.629	(0)
As (3)		5.502e-23					
	H3AsO3	5.456e-23	5.456e-23	-22.263	-22.263	0.000	(0)
	H2AsO3-	4.630e-25	3.942e-25	-24.334	-24.404	-0.070	(0)
	HAsO3-2	9.641e-30	5.065e-30	-29.016	-29.295	-0.279	(0)
	H4AsO3+	2.253e-30	1.919e-30	-29.647	-29.717	-0.070	(0)
	AsO3-3	1.170e-35	2.751e-36	-34.932	-35.560	-0.629	(0)
As (5)		8.069e-11					
	HAsO4-2	5.765e-11	3.029e-11	-10.239	-10.519	-0.279	(0)
	H2AsO4-	2.303e-11	1.961e-11	-10.638	-10.708	-0.070	(0)
	AsO4-3	5.742e-15	1.350e-15	-14.241	-14.870	-0.629	(0)
	H3AsO4	2.408e-16	2.419e-16	-15.618	-15.616	0.002	(0)
B		1.586e-05					
	H3BO3	1.570e-05	1.577e-05	-4.804	-4.802	0.002	(0)
	H2BO3-	1.491e-07	1.290e-07	-6.827	-6.889	-0.063	(0)
	CaH2BO3+	9.836e-09	8.512e-09	-8.007	-8.070	-0.063	(0)
	MgH2BO3+	4.253e-09	3.680e-09	-8.371	-8.434	-0.063	(0)
	BF (OH) 3-	1.207e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
	NaH2BO3	8.741e-10	8.741e-10	-9.058	-9.058	0.000	(0)
	H5 (BO3) 2-	2.001e-12	1.731e-12	-11.699	-11.762	-0.063	(0)
	BF2 (OH) 2-	1.522e-12	1.317e-12	-11.818	-11.880	-0.063	(0)
	BaH2BO3+	2.946e-13	2.549e-13	-12.531	-12.594	-0.063	(0)
	AgH2BO3	1.768e-14	1.768e-14	-13.753	-13.753	0.000	(0)
	H8 (BO3) 3-	3.155e-15	2.730e-15	-14.501	-14.564	-0.063	(0)
	BF3OH-	6.983e-18	6.042e-18	-17.156	-17.219	-0.063	(0)
	BF4-	4.051e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
Ba		1.128e-07					
	Ba+2	1.097e-07	6.393e-08	-6.960	-7.194	-0.234	(0)
	BaHCO3+	3.030e-09	2.670e-09	-8.519	-8.574	-0.055	(0)
	BaCO3	9.470e-11	9.470e-11	-10.024	-10.024	0.000	(0)
	BaH2BO3+	2.946e-13	2.549e-13	-12.531	-12.594	-0.063	(0)
	BaOH+	4.513e-14	3.958e-14	-13.345	-13.403	-0.057	(0)
	BaNO3+	7.878e-19	6.707e-19	-18.104	-18.173	-0.070	(0)
	BaNH3+2	5.143e-19	2.702e-19	-18.289	-18.568	-0.279	(0)
C (4)		5.853e-03					
	HCO3-	4.977e-03	4.373e-03	-2.303	-2.359	-0.056	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.060e-04	9.335e-05	-3.975	-4.030	-0.055	(0)
	MgHCO3+	4.218e-05	3.681e-05	-4.375	-4.434	-0.059	(0)
	NaHCO3	1.051e-05	1.051e-05	-4.978	-4.978	0.000	(0)
	CuCO3	5.576e-06	5.576e-06	-5.254	-5.254	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.954e-06	2.888e-06	-5.305	-5.539	-0.234	(0)
	MgCO3	1.976e-06	1.976e-06	-5.704	-5.704	0.000	(0)

MnHCO3+	1.015e-06	8.897e-07	-5.994	-6.051	-0.057	(0)
NaCO3-	2.617e-07	2.299e-07	-6.582	-6.638	-0.056	(0)
CuHCO3+	1.063e-07	9.046e-08	-6.974	-7.044	-0.070	(0)
Cu (CO3) 2-2	8.250e-08	4.335e-08	-7.084	-7.363	-0.279	(0)
ZnCO3	7.679e-08	7.679e-08	-7.115	-7.115	0.000	(0)
ZnHCO3+	7.504e-08	6.389e-08	-7.125	-7.195	-0.070	(0)
NiHCO3+	4.811e-08	4.096e-08	-7.318	-7.388	-0.070	(0)
UO2 (CO3) 2-2	4.105e-08	2.157e-08	-7.387	-7.666	-0.279	(0)
UO2 (CO3) 3-4	4.097e-08	3.122e-09	-7.388	-8.506	-1.118	(0)
CoHCO3+	2.011e-08	1.712e-08	-7.697	-7.767	-0.070	(0)
NiCO3	8.188e-09	8.188e-09	-8.087	-8.087	0.000	(0)
PbCO3	6.810e-09	6.810e-09	-8.167	-8.167	0.000	(0)
BaHCO3+	3.030e-09	2.670e-09	-8.519	-8.574	-0.055	(0)
PbHCO3+	2.993e-09	2.548e-09	-8.524	-8.594	-0.070	(0)
CoCO3	2.457e-09	2.457e-09	-8.610	-8.610	0.000	(0)
UO2CO3	3.743e-10	3.743e-10	-9.427	-9.427	0.000	(0)
CdCO3	3.220e-10	3.220e-10	-9.492	-9.492	0.000	(0)
Pb (CO3) 2-2	1.080e-10	5.672e-11	-9.967	-10.246	-0.279	(0)
BaCO3	9.470e-11	9.470e-11	-10.024	-10.024	0.000	(0)
CdHCO3+	5.719e-11	4.869e-11	-10.243	-10.313	-0.070	(0)
Cd (CO3) 2-2	1.312e-12	6.894e-13	-11.882	-12.162	-0.279	(0)
FeHCO3+	8.892e-13	7.834e-13	-12.051	-12.106	-0.055	(0)
HgCO3	1.401e-14	1.401e-14	-13.854	-13.854	0.000	(0)
Hg (CO3) 2-2	2.435e-16	1.279e-16	-15.614	-15.893	-0.279	(0)
HgHCO3+	2.174e-17	1.851e-17	-16.663	-16.733	-0.070	(0)
Ca	2.510e-03					
Ca+2	1.967e-03	1.147e-03	-2.706	-2.941	-0.234	(0)
CaSO4	4.302e-04	4.302e-04	-3.366	-3.366	0.000	(0)
CaHCO3+	1.060e-04	9.335e-05	-3.975	-4.030	-0.055	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
CaH2BO3+	9.836e-09	8.512e-09	-8.007	-8.070	-0.063	(0)
CaOH+	3.682e-09	3.244e-09	-8.434	-8.489	-0.055	(0)
CaNH3+2	1.840e-14	9.668e-15	-13.735	-14.015	-0.279	(0)
CaNO3+	8.913e-15	7.589e-15	-14.050	-14.120	-0.070	(0)
Ca (NH3) 2+2	4.907e-26	2.578e-26	-25.309	-25.589	-0.279	(0)
Cd	1.157e-08					
Cd+2	8.390e-09	4.891e-09	-8.076	-8.311	-0.234	(0)
CdSO4	1.878e-09	1.878e-09	-8.726	-8.726	0.000	(0)
CdCl+	8.177e-10	6.962e-10	-9.087	-9.157	-0.070	(0)
CdCO3	3.220e-10	3.220e-10	-9.492	-9.492	0.000	(0)
Cd (SO4) 2-2	7.897e-11	4.149e-11	-10.103	-10.382	-0.279	(0)
CdHCO3+	5.719e-11	4.869e-11	-10.243	-10.313	-0.070	(0)
CdF+	1.512e-11	1.287e-11	-10.820	-10.890	-0.070	(0)
CdOH+	6.472e-12	5.510e-12	-11.189	-11.259	-0.070	(0)
CdCl2	4.326e-12	4.326e-12	-11.364	-11.364	0.000	(0)
CdOHCl	4.050e-12	4.050e-12	-11.393	-11.393	0.000	(0)
Cd (CO3) 2-2	1.312e-12	6.894e-13	-11.882	-12.162	-0.279	(0)
Cd (OH) 2	4.930e-15	4.930e-15	-14.307	-14.307	0.000	(0)
CdCl3-	4.778e-15	4.068e-15	-14.321	-14.391	-0.070	(0)
CdF2	4.266e-15	4.266e-15	-14.370	-14.370	0.000	(0)
CdSeO4	2.493e-18	2.493e-18	-17.603	-17.603	0.000	(0)
Cd2OH+3	5.747e-19	1.351e-19	-18.241	-18.869	-0.629	(0)
Cd (OH) 3-	5.017e-20	4.272e-20	-19.300	-19.369	-0.070	(0)
CdNO3+	3.803e-20	3.237e-20	-19.420	-19.490	-0.070	(0)
Cd (SeO3) 2-2	3.063e-21	1.609e-21	-20.514	-20.793	-0.279	(0)
Cd (OH) 4-2	1.887e-27	9.916e-28	-26.724	-27.004	-0.279	(0)
Cd (NO3) 2	3.396e-32	3.396e-32	-31.469	-31.469	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.686	-78.756	-0.070	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.005	-150.005	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.489	-226.559	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.537	-302.816	-0.279	(0)
Cl	1.706e-03					
Cl-	1.706e-03	1.490e-03	-2.768	-2.827	-0.059	(0)
AgCl	2.631e-08	2.631e-08	-7.580	-7.580	0.000	(0)
MnCl+	2.182e-08	1.914e-08	-7.661	-7.718	-0.057	(0)
AgCl2-	4.011e-09	3.415e-09	-8.397	-8.467	-0.070	(0)
ZnCl+	1.983e-09	1.730e-09	-8.703	-8.762	-0.059	(0)

CuCl+	8.877e-10	7.745e-10	-9.052	-9.111	-0.059	(0)
CdCl+	8.177e-10	6.962e-10	-9.087	-9.157	-0.070	(0)
CuCl	7.170e-10	7.170e-10	-9.144	-9.144	0.000	(0)
NiCl+	3.404e-10	2.898e-10	-9.468	-9.538	-0.070	(0)
ZnOHCl	3.212e-10	3.212e-10	-9.493	-9.493	0.000	(0)
CoCl+	3.048e-10	2.595e-10	-9.516	-9.586	-0.070	(0)
CuCl2-	2.559e-10	2.233e-10	-9.592	-9.651	-0.059	(0)
PbCl+	4.872e-11	4.148e-11	-10.312	-10.382	-0.070	(0)
MnCl2	4.029e-11	4.029e-11	-10.395	-10.395	0.000	(0)
AgCl3-2	8.634e-12	4.537e-12	-11.064	-11.343	-0.279	(0)
CdCl2	4.326e-12	4.326e-12	-11.364	-11.364	0.000	(0)
ZnCl2	4.087e-12	4.087e-12	-11.389	-11.389	0.000	(0)
CdOHCl	4.050e-12	4.050e-12	-11.393	-11.393	0.000	(0)
HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
HgCl2	9.003e-13	9.003e-13	-12.046	-12.046	0.000	(0)
CuCl2	4.003e-13	4.003e-13	-12.398	-12.398	0.000	(0)
PbCl2	2.762e-13	2.762e-13	-12.559	-12.559	0.000	(0)
CuCl3-2	1.203e-13	7.115e-14	-12.920	-13.148	-0.228	(0)
AgCl4-3	5.874e-14	1.381e-14	-13.231	-13.860	-0.629	(0)
MnCl3-	1.886e-14	1.654e-14	-13.724	-13.782	-0.057	(0)
HgCl3-	1.576e-14	1.342e-14	-13.802	-13.872	-0.070	(0)
ZnCl3-	5.545e-15	4.838e-15	-14.256	-14.315	-0.059	(0)
CdCl3-	4.778e-15	4.068e-15	-14.321	-14.391	-0.070	(0)
NiCl2	2.175e-15	2.175e-15	-14.663	-14.663	0.000	(0)
CrCl+2	3.224e-16	1.694e-16	-15.492	-15.771	-0.279	(0)
PbCl3-	1.925e-16	1.639e-16	-15.716	-15.786	-0.070	(0)
HgCl4-2	1.515e-16	7.962e-17	-15.819	-16.099	-0.279	(0)
HgCl+	1.416e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
UO2Cl+	9.243e-17	7.869e-17	-16.034	-16.104	-0.070	(0)
CuCl3-	6.381e-18	5.568e-18	-17.195	-17.254	-0.059	(0)
ZnCl4-2	6.098e-18	3.606e-18	-17.215	-17.443	-0.228	(0)
CrOHCl2	6.805e-19	6.805e-19	-18.167	-18.167	0.000	(0)
PbCl4-2	2.125e-19	1.116e-19	-18.673	-18.952	-0.279	(0)
FeCl+2	4.229e-20	2.501e-20	-19.374	-19.602	-0.228	(0)
CrCl2+	2.814e-20	2.396e-20	-19.551	-19.621	-0.070	(0)
VOCl+	7.217e-22	6.144e-22	-21.142	-21.212	-0.070	(0)
FeCl2+	1.899e-22	1.665e-22	-21.722	-21.779	-0.057	(0)
CuCl4-2	7.033e-23	4.159e-23	-22.153	-22.381	-0.228	(0)
FeCl3	2.482e-26	2.482e-26	-25.605	-25.605	0.000	(0)
CrO3Cl-	2.061e-26	1.755e-26	-25.686	-25.756	-0.070	(0)
CoCl+2	4.860e-35	2.554e-35	-34.313	-34.593	-0.279	(0)
UCl+3	0.000e+00	0.000e+00	-44.612	-45.240	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.230	-64.510	-0.279	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.546	-68.825	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.120	-82.399	-0.279	(0)
Co (2)	1.356e-07					
Co+2	9.579e-08	5.033e-08	-7.019	-7.298	-0.279	(0)
CoHCO3+	2.011e-08	1.712e-08	-7.697	-7.767	-0.070	(0)
CoSO4	1.645e-08	1.645e-08	-7.784	-7.784	0.000	(0)
CoCO3	2.457e-09	2.457e-09	-8.610	-8.610	0.000	(0)
CoF+	3.104e-10	2.643e-10	-9.508	-9.578	-0.070	(0)
CoCl+	3.048e-10	2.595e-10	-9.516	-9.586	-0.070	(0)
CoOH+	1.673e-10	1.424e-10	-9.777	-9.846	-0.070	(0)
Co (OH) 2	1.604e-12	1.604e-12	-11.795	-11.795	0.000	(0)
CoNO2+	9.242e-16	7.869e-16	-15.034	-15.104	-0.070	(0)
Co (NH3) +2	7.714e-17	4.053e-17	-16.113	-16.392	-0.279	(0)
CoSeO4	6.904e-17	6.904e-17	-16.161	-16.161	0.000	(0)
Co (OH) 3-	5.332e-18	4.539e-18	-17.273	-17.343	-0.070	(0)
Co2OH+3	1.528e-18	3.592e-19	-17.816	-18.445	-0.629	(0)
CoOOH-	1.338e-18	1.139e-18	-17.873	-17.943	-0.070	(0)
CoNO3+	1.961e-19	1.670e-19	-18.708	-18.777	-0.070	(0)
Co (OH) 4-2	1.942e-25	1.020e-25	-24.712	-24.991	-0.279	(0)
Co (NH3) 2+2	2.204e-26	1.158e-26	-25.657	-25.936	-0.279	(0)
Co4 (OH) 4+4	1.077e-30	8.206e-32	-29.968	-31.086	-1.118	(0)
Co (NO3) 2	7.110e-31	7.110e-31	-30.148	-30.148	0.000	(0)
Co (NH3) 3+2	1.859e-36	9.765e-37	-35.731	-36.010	-0.279	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.185	-46.464	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.139	-57.418	-0.279	(0)

Co (3)	1.155e-28						
CoOH+2	1.155e-28	6.069e-29	-27.937	-28.217	-0.279	(0)	
Co+3	2.835e-34	8.421e-35	-33.547	-34.075	-0.527	(0)	
CoCl+2	4.860e-35	2.554e-35	-34.313	-34.593	-0.279	(0)	
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.230	-64.510	-0.279	(0)	
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.363	-77.433	-0.070	(0)	
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.941	-82.221	-0.279	(0)	
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.120	-82.399	-0.279	(0)	
Cr (2)	9.500e-26						
Cr+2	9.500e-26	4.992e-26	-25.022	-25.302	-0.279	(0)	
Cr (3)	6.406e-09						
Cr (OH) 2+	5.522e-09	4.702e-09	-8.258	-8.328	-0.070	(0)	
Cr (OH) +2	5.186e-10	2.725e-10	-9.285	-9.565	-0.279	(0)	
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)	
CrOHSO4	1.059e-10	1.059e-10	-9.975	-9.975	0.000	(0)	
CrF+2	4.399e-12	2.311e-12	-11.357	-11.636	-0.279	(0)	
CrO2-	1.969e-12	1.677e-12	-11.706	-11.776	-0.070	(0)	
Cr (OH) 4-	1.661e-12	1.414e-12	-11.780	-11.849	-0.070	(0)	
CrSO4+	3.945e-13	3.359e-13	-12.404	-12.474	-0.070	(0)	
Cr+3	3.736e-13	8.782e-14	-12.428	-13.056	-0.629	(0)	
CrCl+2	3.224e-16	1.694e-16	-15.492	-15.771	-0.279	(0)	
Cr2 (OH) 2SO4+2	4.963e-18	2.608e-18	-17.304	-17.584	-0.279	(0)	
CrOHC12	6.805e-19	6.805e-19	-18.167	-18.167	0.000	(0)	
Cr2 (OH) 2 (SO4) 2	2.537e-19	2.537e-19	-18.596	-18.596	0.000	(0)	
CrCl2+	2.814e-20	2.396e-20	-19.551	-19.621	-0.070	(0)	
CrNO3+2	1.529e-26	8.035e-27	-25.816	-26.095	-0.279	(0)	
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.123	-55.403	-0.279	(0)	
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.472	-67.101	-0.629	(0)	
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.546	-68.825	-0.279	(0)	
Cr (6)	2.310e-16						
CrO4-2	1.969e-16	1.148e-16	-15.706	-15.940	-0.234	(0)	
HCrO4-	3.096e-17	2.636e-17	-16.509	-16.579	-0.070	(0)	
NaCrO4-	2.864e-18	2.438e-18	-17.543	-17.613	-0.070	(0)	
KCrO4-	3.044e-19	2.592e-19	-18.517	-18.586	-0.070	(0)	
CrO3SO4-2	1.777e-24	9.337e-25	-23.750	-24.030	-0.279	(0)	
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)	
CrO3Cl-	2.061e-26	1.755e-26	-25.686	-25.756	-0.070	(0)	
Cr2O7-2	4.588e-32	2.411e-32	-31.338	-31.618	-0.279	(0)	
Cu (1)	1.422e-09						
CuCl	7.170e-10	7.170e-10	-9.144	-9.144	0.000	(0)	
Cu+	4.488e-10	3.821e-10	-9.348	-9.418	-0.070	(0)	
CuCl2-	2.559e-10	2.233e-10	-9.592	-9.651	-0.059	(0)	
CuCl3-2	1.203e-13	7.115e-14	-12.920	-13.148	-0.228	(0)	
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.328	-148.637	-0.309	(0)	
CuS4S5-3	0.000e+00	0.000e+00	-149.071	-149.367	-0.296	(0)	
Cu (2)	6.630e-06						
CuCO3	5.576e-06	5.576e-06	-5.254	-5.254	0.000	(0)	
Cu+2	5.624e-07	3.279e-07	-6.250	-6.484	-0.234	(0)	
CuOH+	1.685e-07	1.470e-07	-6.773	-6.833	-0.059	(0)	
CuSO4	1.230e-07	1.230e-07	-6.910	-6.910	0.000	(0)	
CuHCO3+	1.063e-07	9.046e-08	-6.974	-7.044	-0.070	(0)	
Cu (CO3) 2-2	8.250e-08	4.335e-08	-7.084	-7.363	-0.279	(0)	
Cu (OH) 2	4.161e-09	4.161e-09	-8.381	-8.381	0.000	(0)	
CuF+	4.036e-09	3.436e-09	-8.394	-8.464	-0.070	(0)	
Cu2 (OH) 2+2	1.034e-09	5.431e-10	-8.986	-9.265	-0.279	(0)	
CuCl+	8.877e-10	7.745e-10	-9.052	-9.111	-0.059	(0)	
Cu (OH) 3-	1.422e-12	1.210e-12	-11.847	-11.917	-0.070	(0)	
CuCl2	4.003e-13	4.003e-13	-12.398	-12.398	0.000	(0)	
CuNO2+	8.947e-14	7.618e-14	-13.048	-13.118	-0.070	(0)	
CuNH3+2	4.277e-14	2.247e-14	-13.369	-13.648	-0.279	(0)	
CuCl3-	6.381e-18	5.568e-18	-17.195	-17.254	-0.059	(0)	
Cu (OH) 4-2	2.571e-18	1.351e-18	-17.590	-17.869	-0.279	(0)	
CuNO3+	2.549e-18	2.170e-18	-17.594	-17.663	-0.070	(0)	
Cu (NO2) 2	1.729e-21	1.729e-21	-20.762	-20.762	0.000	(0)	
CuCl4-2	7.033e-23	4.159e-23	-22.153	-22.381	-0.228	(0)	
Cu (NO3) 2	5.719e-31	5.719e-31	-30.243	-30.243	0.000	(0)	
Cu (HS) 3-	0.000e+00	0.000e+00	-215.876	-215.946	-0.070	(0)	
F	2.120e-04						

F-	1.901e-04	1.661e-04	-3.721	-3.780	-0.059	(0)
MgF+	1.752e-05	1.533e-05	-4.756	-4.814	-0.058	(0)
CaF+	2.370e-06	2.078e-06	-5.625	-5.682	-0.057	(0)
NaF	4.480e-07	4.480e-07	-6.349	-6.349	0.000	(0)
AlF3	3.358e-07	3.358e-07	-6.474	-6.474	0.000	(0)
AlF2+	1.828e-07	1.606e-07	-6.738	-6.794	-0.056	(0)
MnF+	7.689e-08	6.743e-08	-7.114	-7.171	-0.057	(0)
AlF4-	3.195e-08	2.795e-08	-7.496	-7.554	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
AlF+2	4.076e-09	2.429e-09	-8.390	-8.615	-0.225	(0)
CuF+	4.036e-09	3.436e-09	-8.394	-8.464	-0.070	(0)
ZnF+	1.798e-09	1.531e-09	-8.745	-8.815	-0.070	(0)
BF(OH) 3-	1.207e-09	1.045e-09	-8.918	-8.981	-0.063	(0)
NiF+	3.723e-10	3.170e-10	-9.429	-9.499	-0.070	(0)
CoF+	3.104e-10	2.643e-10	-9.508	-9.578	-0.070	(0)
CdF+	1.512e-11	1.287e-11	-10.820	-10.890	-0.070	(0)
HF2-	1.265e-11	1.101e-11	-10.898	-10.958	-0.060	(0)
PbF+	1.078e-11	9.179e-12	-10.967	-11.037	-0.070	(0)
CrF+2	4.399e-12	2.311e-12	-11.357	-11.636	-0.279	(0)
AgF	3.606e-12	3.606e-12	-11.443	-11.443	0.000	(0)
BF2(OH) 2-	1.522e-12	1.317e-12	-11.818	-11.880	-0.063	(0)
UO2F+	8.766e-13	7.463e-13	-12.057	-12.127	-0.070	(0)
UO2F2	3.575e-13	3.575e-13	-12.447	-12.447	0.000	(0)
PbF2	3.000e-14	3.000e-14	-13.523	-13.523	0.000	(0)
UO2F3-	1.751e-14	1.491e-14	-13.757	-13.826	-0.070	(0)
CdF2	4.266e-15	4.266e-15	-14.370	-14.370	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.128e-16	4.497e-16	-15.290	-15.347	-0.057	(0)
FeF+2	1.711e-16	1.012e-16	-15.767	-15.995	-0.228	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
VO2F	4.463e-17	4.463e-17	-16.350	-16.350	0.000	(0)
UO2F4-2	3.744e-17	1.967e-17	-16.427	-16.706	-0.279	(0)
PbF3-	1.110e-17	9.450e-18	-16.955	-17.025	-0.070	(0)
BF3OH-	6.983e-18	6.042e-18	-17.156	-17.219	-0.063	(0)
VO2F2-	3.161e-18	2.691e-18	-17.500	-17.570	-0.070	(0)
VOF+	1.719e-19	1.464e-19	-18.765	-18.835	-0.070	(0)
VO2F3-2	1.061e-20	5.575e-21	-19.974	-20.254	-0.279	(0)
VOF2	9.115e-21	9.115e-21	-20.040	-20.040	0.000	(0)
PbF4-2	1.430e-21	7.512e-22	-20.845	-21.124	-0.279	(0)
BF4-	4.051e-22	3.506e-22	-21.392	-21.455	-0.063	(0)
VOF3-	6.309e-23	5.371e-23	-22.200	-22.270	-0.070	(0)
HgF+	2.930e-23	2.495e-23	-22.533	-22.603	-0.070	(0)
VO2F4-3	1.938e-24	4.556e-25	-23.713	-24.341	-0.629	(0)
Sb(OH) 2F	9.850e-25	9.850e-25	-24.007	-24.007	0.000	(0)
SbOF	9.690e-25	9.690e-25	-24.014	-24.014	0.000	(0)
VOF4-2	6.853e-26	3.601e-26	-25.164	-25.444	-0.279	(0)
UF3+	1.648e-34	1.404e-34	-33.783	-33.853	-0.070	(0)
UF2+2	1.015e-35	5.332e-36	-34.994	-35.273	-0.279	(0)
UF4	2.556e-36	2.556e-36	-35.592	-35.592	0.000	(0)
UF5-	1.976e-38	1.682e-38	-37.704	-37.774	-0.070	(0)
UF+3	1.085e-38	2.550e-39	-37.965	-38.593	-0.629	(0)
UF6-2	1.606e-39	8.436e-40	-38.794	-39.074	-0.279	(0)
Fe (2)	3.379e-11					
Fe+2	2.709e-11	1.423e-11	-10.567	-10.847	-0.279	(0)
FeSO4	5.722e-12	5.722e-12	-11.242	-11.242	0.000	(0)
FeHCO3+	8.892e-13	7.834e-13	-12.051	-12.106	-0.055	(0)
FeOH+	9.163e-14	8.035e-14	-13.038	-13.095	-0.057	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.629e-19	4.059e-19	-18.335	-18.392	-0.057	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.804	-158.804	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.150	-235.220	-0.070	(0)
Fe (3)	3.629e-09					
Fe(OH) 2+	3.195e-09	2.807e-09	-8.496	-8.552	-0.056	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.426e-12	5.646e-12	-11.192	-11.248	-0.056	(0)
FeOH+2	8.604e-14	5.088e-14	-13.065	-13.293	-0.228	(0)
FeF2+	5.128e-16	4.497e-16	-15.290	-15.347	-0.057	(0)
FeF+2	1.711e-16	1.012e-16	-15.767	-15.995	-0.228	(0)

FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.164e-17	1.021e-17	-16.934	-16.991	-0.057	(0)
Fe+3	1.871e-18	5.557e-19	-17.728	-18.255	-0.527	(0)
Fe (SO4) 2-	4.200e-19	3.576e-19	-18.377	-18.447	-0.070	(0)
FeCl+2	4.229e-20	2.501e-20	-19.374	-19.602	-0.228	(0)
FeCl2+	1.899e-22	1.665e-22	-21.722	-21.779	-0.057	(0)
FeHSeO3+2	3.148e-23	1.654e-23	-22.502	-22.781	-0.279	(0)
Fe2 (OH) 2+4	1.125e-24	8.572e-26	-23.949	-25.067	-1.118	(0)
FeCl3	2.482e-26	2.482e-26	-25.605	-25.605	0.000	(0)
FeNO3+2	2.214e-29	1.163e-29	-28.655	-28.934	-0.279	(0)
Fe3 (OH) 4+5	1.942e-31	3.478e-33	-30.712	-32.459	-1.747	(0)
H (0)	4.021e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.118e-10					
Hg	2.118e-10	2.118e-10	-9.674	-9.674	0.000	(0)
Hg (1)	2.218e-21					
Hg2+2	1.109e-21	5.826e-22	-20.955	-21.235	-0.279	(0)
Hg (2)	2.955e-12					
HgClOH	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
HgCl2	9.003e-13	9.003e-13	-12.046	-12.046	0.000	(0)
Hg (OH) 2	5.121e-13	5.143e-13	-12.291	-12.289	0.002	(0)
HgCl3-	1.576e-14	1.342e-14	-13.802	-13.872	-0.070	(0)
HgCO3	1.401e-14	1.401e-14	-13.854	-13.854	0.000	(0)
Hg (CO3) 2-2	2.435e-16	1.279e-16	-15.614	-15.893	-0.279	(0)
HgCl4-2	1.515e-16	7.962e-17	-15.819	-16.099	-0.279	(0)
HgCl+	1.416e-16	1.205e-16	-15.849	-15.919	-0.070	(0)
HgOH+	2.687e-17	2.288e-17	-16.571	-16.641	-0.070	(0)
HgHCO3+	2.174e-17	1.851e-17	-16.663	-16.733	-0.070	(0)
Hg (OH) 3-	1.078e-20	9.182e-21	-19.967	-20.037	-0.070	(0)
Hg+2	7.713e-21	4.053e-21	-20.113	-20.392	-0.279	(0)
HgSO4	1.738e-21	1.738e-21	-20.760	-20.760	0.000	(0)
HgNH3+2	3.260e-23	1.713e-23	-22.487	-22.766	-0.279	(0)
HgF+	2.930e-23	2.495e-23	-22.533	-22.603	-0.070	(0)
Hg (NH3) 2+2	2.183e-25	1.147e-25	-24.661	-24.940	-0.279	(0)
HgNO3+	3.679e-33	3.132e-33	-32.434	-32.504	-0.070	(0)
Hg (NH3) 3+2	5.822e-36	3.059e-36	-35.235	-35.514	-0.279	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.565	-44.565	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.509	-45.788	-0.279	(0)
HgHS2-	0.000e+00	0.000e+00	-138.152	-138.222	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.977	-138.977	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.502	-139.781	-0.279	(0)
K	7.035e-04					
K+	6.955e-04	6.077e-04	-3.158	-3.216	-0.059	(0)
KSO4-	8.020e-06	7.047e-06	-5.096	-5.152	-0.056	(0)
KCrO4-	3.044e-19	2.592e-19	-18.517	-18.586	-0.070	(0)
Mg	1.718e-03					
Mg+2	1.411e-03	8.226e-04	-2.850	-3.085	-0.234	(0)
MgSO4	2.452e-04	2.452e-04	-3.611	-3.611	0.000	(0)
MgHCO3+	4.218e-05	3.681e-05	-4.375	-4.434	-0.059	(0)
MgF+	1.752e-05	1.533e-05	-4.756	-4.814	-0.058	(0)
MgCO3	1.976e-06	1.976e-06	-5.704	-5.704	0.000	(0)
MgOH+	5.260e-08	4.644e-08	-7.279	-7.333	-0.054	(0)
MgH2BO3+	4.253e-09	3.680e-09	-8.371	-8.434	-0.063	(0)
Mn (2)	2.350e-05					
Mn+2	1.941e-05	1.020e-05	-4.712	-4.991	-0.279	(0)
MnSO4	2.970e-06	2.970e-06	-5.527	-5.527	0.000	(0)
MnHCO3+	1.015e-06	8.897e-07	-5.994	-6.051	-0.057	(0)
MnF+	7.689e-08	6.743e-08	-7.114	-7.171	-0.057	(0)
MnCl+	2.182e-08	1.914e-08	-7.661	-7.718	-0.057	(0)
MnOH+	4.143e-09	3.633e-09	-8.383	-8.440	-0.057	(0)
MnCl2	4.029e-11	4.029e-11	-10.395	-10.395	0.000	(0)
MnCl3-	1.886e-14	1.654e-14	-13.724	-13.782	-0.057	(0)
MnSeO4	7.513e-15	7.513e-15	-14.124	-14.124	0.000	(0)
MnNO3+	3.974e-17	3.383e-17	-16.401	-16.471	-0.070	(0)
Mn (OH) 3-	5.150e-19	4.516e-19	-18.288	-18.345	-0.057	(0)
Mn (OH) 4-2	3.496e-25	2.068e-25	-24.456	-24.685	-0.228	(0)
Mn (NO3) 2	1.779e-28	1.779e-28	-27.750	-27.750	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.950	-42.950	0.000	(0)

Mn (3)	6.446e-25					
Mn+3	6.446e-25	1.915e-25	-24.191	-24.718	-0.527	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.501	-43.729	-0.228	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.416	-47.477	-0.062	(0)
Mo	4.394e-07					
MoO4-2	4.389e-07	2.559e-07	-6.358	-6.592	-0.234	(0)
HMoO4-	4.245e-10	3.614e-10	-9.372	-9.442	-0.070	(0)
H2MoO4	1.879e-13	1.879e-13	-12.726	-12.726	0.000	(0)
Ag2MoO4	7.239e-24	7.239e-24	-23.140	-23.140	0.000	(0)
AlMo6O21-3	2.198e-39	5.167e-40	-38.658	-39.287	-0.629	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.828	-50.344	-2.515	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.359	-51.106	-1.747	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.355	-53.473	-1.118	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.747	-57.376	-0.629	(0)
N (-3)	9.870e-10					
NH4+	9.636e-10	8.338e-10	-9.016	-9.079	-0.063	(0)
NH4SO4-	1.669e-11	1.463e-11	-10.778	-10.835	-0.057	(0)
NH3	6.698e-12	6.698e-12	-11.174	-11.174	0.000	(0)
CuNH3+2	4.277e-14	2.247e-14	-13.369	-13.648	-0.279	(0)
CaNH3+2	1.840e-14	9.668e-15	-13.735	-14.015	-0.279	(0)
NiNH3+2	5.203e-16	2.734e-16	-15.284	-15.563	-0.279	(0)
AgNH3+	1.389e-16	1.182e-16	-15.857	-15.927	-0.070	(0)
Co (NH3) +2	7.714e-17	4.053e-17	-16.113	-16.392	-0.279	(0)
BaNH3+2	5.143e-19	2.702e-19	-18.289	-18.568	-0.279	(0)
HgNH3+2	3.260e-23	1.713e-23	-22.487	-22.766	-0.279	(0)
Ag (NH3) 2+	7.560e-24	6.437e-24	-23.121	-23.191	-0.070	(0)
Ni (NH3) 2+2	5.037e-25	2.647e-25	-24.298	-24.577	-0.279	(0)
Hg (NH3) 2+2	2.183e-25	1.147e-25	-24.661	-24.940	-0.279	(0)
Ca (NH3) 2+2	4.907e-26	2.578e-26	-25.309	-25.589	-0.279	(0)
Co (NH3) 2+2	2.204e-26	1.158e-26	-25.657	-25.936	-0.279	(0)
Hg (NH3) 3+2	5.822e-36	3.059e-36	-35.235	-35.514	-0.279	(0)
Co (NH3) 3+2	1.859e-36	9.765e-37	-35.731	-36.010	-0.279	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.509	-45.788	-0.279	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.185	-46.464	-0.279	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.123	-55.403	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.139	-57.418	-0.279	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.230	-64.510	-0.279	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.472	-67.101	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.546	-68.825	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.363	-77.433	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.941	-82.221	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.120	-82.399	-0.279	(0)
N (3)	2.557e-09					
NO2-	2.557e-09	2.219e-09	-8.592	-8.654	-0.062	(0)
CuNO2+	8.947e-14	7.618e-14	-13.048	-13.118	-0.070	(0)
AgNO2	4.007e-15	4.007e-15	-14.397	-14.397	0.000	(0)
CoNO2+	9.242e-16	7.869e-16	-15.034	-15.104	-0.070	(0)
Cu (NO2) 2	1.729e-21	1.729e-21	-20.762	-20.762	0.000	(0)
Ag (NO2) 2-	1.617e-23	1.377e-23	-22.791	-22.861	-0.070	(0)
N (5)	2.404e-12					
NO3-	2.395e-12	2.093e-12	-11.621	-11.679	-0.059	(0)
CaNO3+	8.913e-15	7.589e-15	-14.050	-14.120	-0.070	(0)
MnNO3+	3.974e-17	3.383e-17	-16.401	-16.471	-0.070	(0)
ZnNO3+	2.853e-18	2.429e-18	-17.545	-17.614	-0.070	(0)
CuNO3+	2.549e-18	2.170e-18	-17.594	-17.663	-0.070	(0)
BaNO3+	7.878e-19	6.707e-19	-18.104	-18.173	-0.070	(0)
NiNO3+	4.693e-19	3.995e-19	-18.329	-18.398	-0.070	(0)
CoNO3+	1.961e-19	1.670e-19	-18.708	-18.777	-0.070	(0)
CdNO3+	3.803e-20	3.237e-20	-19.420	-19.490	-0.070	(0)
PbNO3+	2.852e-20	2.428e-20	-19.545	-19.615	-0.070	(0)
AgNO3	1.437e-20	1.437e-20	-19.842	-19.842	0.000	(0)
UO2NO3+	1.597e-25	1.360e-25	-24.797	-24.867	-0.070	(0)
CrNO3+2	1.529e-26	8.035e-27	-25.816	-26.095	-0.279	(0)
Mn (NO3) 2	1.779e-28	1.779e-28	-27.750	-27.750	0.000	(0)
VO2NO3	1.622e-28	1.622e-28	-27.790	-27.790	0.000	(0)
FeNO3+2	2.214e-29	1.163e-29	-28.655	-28.934	-0.279	(0)

	Zn(NO3)2	1.015e-30	1.015e-30	-29.994	-29.994	0.000	(0)
	Co(NO3)2	7.110e-31	7.110e-31	-30.148	-30.148	0.000	(0)
	Cu(NO3)2	5.719e-31	5.719e-31	-30.243	-30.243	0.000	(0)
	Pb(NO3)2	8.631e-32	8.631e-32	-31.064	-31.064	0.000	(0)
	Cd(NO3)2	3.396e-32	3.396e-32	-31.469	-31.469	0.000	(0)
	HgNO3+	3.679e-33	3.132e-33	-32.434	-32.504	-0.070	(0)
	Hg(NO3)2	0.000e+00	0.000e+00	-44.565	-44.565	0.000	(0)
Na		4.946e-03					
	Na+	4.892e-03	4.275e-03	-2.310	-2.369	-0.059	(0)
	NaSO4-	4.280e-05	3.760e-05	-4.369	-4.425	-0.056	(0)
	NaHCO3	1.051e-05	1.051e-05	-4.978	-4.978	0.000	(0)
	NaF	4.480e-07	4.480e-07	-6.349	-6.349	0.000	(0)
	NaCO3-	2.617e-07	2.299e-07	-6.582	-6.638	-0.056	(0)
	NaH2BO3	8.741e-10	8.741e-10	-9.058	-9.058	0.000	(0)
	NaCrO4-	2.864e-18	2.438e-18	-17.543	-17.613	-0.070	(0)
Ni		2.124e-07					
	Ni+2	1.303e-07	7.599e-08	-6.885	-7.119	-0.234	(0)
	NiHCO3+	4.811e-08	4.096e-08	-7.318	-7.388	-0.070	(0)
	NiSO4	2.483e-08	2.483e-08	-7.605	-7.605	0.000	(0)
	NiCO3	8.188e-09	8.188e-09	-8.087	-8.087	0.000	(0)
	NiF+	3.723e-10	3.170e-10	-9.429	-9.499	-0.070	(0)
	NiCl+	3.404e-10	2.898e-10	-9.468	-9.538	-0.070	(0)
	NiOH+	1.594e-10	1.357e-10	-9.798	-9.868	-0.070	(0)
	Ni(SO4)2-2	2.563e-12	1.347e-12	-11.591	-11.871	-0.279	(0)
	Ni(OH)2	1.528e-12	1.528e-12	-11.816	-11.816	0.000	(0)
	NiCl2	2.175e-15	2.175e-15	-14.663	-14.663	0.000	(0)
	NiNH3+2	5.203e-16	2.734e-16	-15.284	-15.563	-0.279	(0)
	Ni(OH)3-	2.546e-16	2.168e-16	-15.594	-15.664	-0.070	(0)
	NiSeO4	9.729e-17	9.729e-17	-16.012	-16.012	0.000	(0)
	NiNO3+	4.693e-19	3.995e-19	-18.329	-18.398	-0.070	(0)
	Ni(NH3)2+2	5.037e-25	2.647e-25	-24.298	-24.577	-0.279	(0)
O(0)		2.474e-35					
	O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb		1.229e-08					
	PbCO3	6.810e-09	6.810e-09	-8.167	-8.167	0.000	(0)
	PbHCO3+	2.993e-09	2.548e-09	-8.524	-8.594	-0.070	(0)
	Pb+2	1.345e-09	7.843e-10	-8.871	-9.105	-0.234	(0)
	PbSO4	6.292e-10	6.292e-10	-9.201	-9.201	0.000	(0)
	PbOH+	3.282e-10	2.794e-10	-9.484	-9.554	-0.070	(0)
	Pb(CO3)2-2	1.080e-10	5.672e-11	-9.967	-10.246	-0.279	(0)
	PbCl+	4.872e-11	4.148e-11	-10.312	-10.382	-0.070	(0)
	Pb(SO4)2-2	1.182e-11	6.209e-12	-10.927	-11.207	-0.279	(0)
	PbF+	1.078e-11	9.179e-12	-10.967	-11.037	-0.070	(0)
	Pb(OH)2	1.253e-12	1.253e-12	-11.902	-11.902	0.000	(0)
	PbCl2	2.762e-13	2.762e-13	-12.559	-12.559	0.000	(0)
	PbF2	3.000e-14	3.000e-14	-13.523	-13.523	0.000	(0)
	Pb(OH)3-	2.087e-16	1.777e-16	-15.680	-15.750	-0.070	(0)
	PbCl3-	1.925e-16	1.639e-16	-15.716	-15.786	-0.070	(0)
	Pb2OH+3	1.478e-17	3.473e-18	-16.830	-17.459	-0.629	(0)
	PbF3-	1.110e-17	9.450e-18	-16.955	-17.025	-0.070	(0)
	PbCl4-2	2.125e-19	1.116e-19	-18.673	-18.952	-0.279	(0)
	PbNO3+	2.852e-20	2.428e-20	-19.545	-19.615	-0.070	(0)
	Pb(OH)4-2	1.175e-20	6.172e-21	-19.930	-20.210	-0.279	(0)
	PbF4-2	1.430e-21	7.512e-22	-20.845	-21.124	-0.279	(0)
	Pb3(OH)4+2	4.677e-23	2.457e-23	-22.330	-22.610	-0.279	(0)
	Pb4(OH)4+4	2.009e-27	1.531e-28	-26.697	-27.815	-1.118	(0)
	Pb(NO3)2	8.631e-32	8.631e-32	-31.064	-31.064	0.000	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-150.742	-150.742	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-227.826	-227.896	-0.070	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-72.702	-72.702	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.384	-78.453	-0.070	(0)
	H2S	0.000e+00	0.000e+00	-78.582	-78.582	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.686	-78.756	-0.070	(0)
	S5-2	0.000e+00	0.000e+00	-80.390	-80.670	-0.279	(0)
	S6-2	0.000e+00	0.000e+00	-80.906	-81.186	-0.279	(0)
	S4-2	0.000e+00	0.000e+00	-80.986	-81.265	-0.279	(0)
	S3-2	0.000e+00	0.000e+00	-81.792	-82.071	-0.279	(0)

S2-2	0.000e+00	0.000e+00	-82.808	-83.087	-0.279	(0)
S-2	0.000e+00	0.000e+00	-88.376	-88.605	-0.228	(0)
HgHS2-	0.000e+00	0.000e+00	-138.152	-138.222	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.977	-138.977	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.502	-139.781	-0.279	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.986	-147.056	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.223	-147.390	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.328	-148.637	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.071	-149.367	-0.296	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.213	-149.283	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.365	-149.681	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.690	-149.992	-0.302	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.005	-150.005	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.422	-150.422	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.742	-150.742	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.804	-158.804	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.876	-215.946	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.526	-225.596	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.489	-226.559	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.826	-227.896	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.147	-228.427	-0.279	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.150	-235.220	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.537	-302.816	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.229	-305.509	-0.279	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.986	-317.266	-0.279	(0)
S (6)	3.539e-03					
SO4-2	2.809e-03	1.638e-03	-2.551	-2.786	-0.234	(0)
CaSO4	4.302e-04	4.302e-04	-3.366	-3.366	0.000	(0)
MgSO4	2.452e-04	2.452e-04	-3.611	-3.611	0.000	(0)
NaSO4-	4.280e-05	3.760e-05	-4.369	-4.425	-0.056	(0)
KSO4-	8.020e-06	7.047e-06	-5.096	-5.152	-0.056	(0)
MnSO4	2.970e-06	2.970e-06	-5.527	-5.527	0.000	(0)
ZnSO4	1.656e-07	1.656e-07	-6.781	-6.781	0.000	(0)
CuSO4	1.230e-07	1.230e-07	-6.910	-6.910	0.000	(0)
NiSO4	2.483e-08	2.483e-08	-7.605	-7.605	0.000	(0)
CoSO4	1.645e-08	1.645e-08	-7.784	-7.784	0.000	(0)
HSO4-	1.299e-08	1.136e-08	-7.887	-7.945	-0.058	(0)
Zn (SO4) 2-2	4.495e-09	2.362e-09	-8.347	-8.627	-0.279	(0)
CdSO4	1.878e-09	1.878e-09	-8.726	-8.726	0.000	(0)
PbSO4	6.292e-10	6.292e-10	-9.201	-9.201	0.000	(0)
AgSO4-	3.318e-10	2.825e-10	-9.479	-9.549	-0.070	(0)
CrOHSO4	1.059e-10	1.059e-10	-9.975	-9.975	0.000	(0)
Cd (SO4) 2-2	7.897e-11	4.149e-11	-10.103	-10.382	-0.279	(0)
AlSO4+	2.126e-11	1.859e-11	-10.673	-10.731	-0.058	(0)
NH4SO4-	1.669e-11	1.463e-11	-10.778	-10.835	-0.057	(0)
Pb (SO4) 2-2	1.182e-11	6.209e-12	-10.927	-11.207	-0.279	(0)
FeSO4	5.722e-12	5.722e-12	-11.242	-11.242	0.000	(0)
Ni (SO4) 2-2	2.563e-12	1.347e-12	-11.591	-11.871	-0.279	(0)
CrSO4+	3.945e-13	3.359e-13	-12.404	-12.474	-0.070	(0)
Al (SO4) 2-	3.730e-13	3.263e-13	-12.428	-12.486	-0.058	(0)
UO2SO4	8.070e-14	8.070e-14	-13.093	-13.093	0.000	(0)
UO2 (SO4) 2-2	3.316e-15	1.742e-15	-14.479	-14.759	-0.279	(0)
FeSO4+	1.164e-17	1.021e-17	-16.934	-16.991	-0.057	(0)
VO2SO4-	7.038e-18	5.992e-18	-17.153	-17.222	-0.070	(0)
Cr2 (OH) 2SO4+2	4.963e-18	2.608e-18	-17.304	-17.584	-0.279	(0)
Fe (SO4) 2-	4.200e-19	3.576e-19	-18.377	-18.447	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.537e-19	2.537e-19	-18.596	-18.596	0.000	(0)
VOSO4	6.629e-20	6.629e-20	-19.179	-19.179	0.000	(0)
HgSO4	1.738e-21	1.738e-21	-20.760	-20.760	0.000	(0)
CrO3SO4-2	1.777e-24	9.337e-25	-23.750	-24.030	-0.279	(0)
VSO4+	7.946e-34	6.765e-34	-33.100	-33.170	-0.070	(0)
U (SO4) 2	6.529e-40	6.529e-40	-39.185	-39.185	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.020	-40.299	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.363	-77.433	-0.070	(0)
Sb (3)	1.057e-19					
Sb (OH) 3	5.348e-20	5.348e-20	-19.272	-19.272	0.000	(0)
HSbO2	5.222e-20	5.222e-20	-19.282	-19.282	0.000	(0)
SbO2-	1.400e-24	1.192e-24	-23.854	-23.924	-0.070	(0)

Sb(OH) 2F	9.850e-25	9.850e-25	-24.007	-24.007	0.000	(0)
SbOF	9.690e-25	9.690e-25	-24.014	-24.014	0.000	(0)
Sb(OH) 4-	8.015e-25	6.824e-25	-24.096	-24.166	-0.070	(0)
Sb(OH) 2+	1.083e-25	9.220e-26	-24.965	-25.035	-0.070	(0)
SbO+	3.735e-26	3.180e-26	-25.428	-25.498	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.986	-317.266	-0.279	(0)
Sb(5)	1.301e-08					
SbO3-	1.299e-08	1.106e-08	-7.886	-7.956	-0.070	(0)
Sb(OH) 6-	1.479e-11	1.293e-11	-10.830	-10.889	-0.059	(0)
SbO2+	1.878e-23	1.599e-23	-22.726	-22.796	-0.070	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.226e-40	1.895e-40	-39.653	-39.722	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.950	-42.950	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.981	-42.981	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.294	-47.574	-0.279	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.453	-86.571	-1.118	(0)
Se(4)	1.443e-08					
HSeO3-	1.323e-08	1.126e-08	-7.878	-7.948	-0.070	(0)
SeO3-2	1.202e-09	6.318e-10	-8.920	-9.199	-0.279	(0)
H2SeO3	3.411e-13	3.411e-13	-12.467	-12.467	0.000	(0)
AgSeO3-	4.123e-15	3.510e-15	-14.385	-14.455	-0.070	(0)
Cd(SeO3) 2-2	3.063e-21	1.609e-21	-20.514	-20.793	-0.279	(0)
Ag(SeO3) 2-3	8.449e-23	1.986e-23	-22.073	-22.702	-0.629	(0)
FeHSeO3+2	3.148e-23	1.654e-23	-22.502	-22.781	-0.279	(0)
Se(6)	4.703e-12					
SeO4-2	4.695e-12	2.737e-12	-11.328	-11.563	-0.234	(0)
MnSeO4	7.513e-15	7.513e-15	-14.124	-14.124	0.000	(0)
ZnSeO4	1.959e-16	1.959e-16	-15.708	-15.708	0.000	(0)
NiSeO4	9.729e-17	9.729e-17	-16.012	-16.012	0.000	(0)
CoSeO4	6.904e-17	6.904e-17	-16.161	-16.161	0.000	(0)
HSeO4-	1.144e-17	9.736e-18	-16.942	-17.012	-0.070	(0)
CdSeO4	2.493e-18	2.493e-18	-17.603	-17.603	0.000	(0)
Zn(SeO4) 2-2	1.035e-27	5.436e-28	-26.985	-27.265	-0.279	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.904	-58.533	-0.629	(0)
U(4)	3.810e-22					
U(OH) 5-	3.800e-22	3.236e-22	-21.420	-21.490	-0.070	(0)
U(OH) 4	9.621e-25	9.621e-25	-24.017	-24.017	0.000	(0)
U(OH) 3+	2.933e-28	2.497e-28	-27.533	-27.603	-0.070	(0)
U(OH) 2+2	1.560e-32	8.199e-33	-31.807	-32.086	-0.279	(0)
UF3+	1.648e-34	1.404e-34	-33.783	-33.853	-0.070	(0)
UF2+2	1.015e-35	5.332e-36	-34.994	-35.273	-0.279	(0)
UF4	2.556e-36	2.556e-36	-35.592	-35.592	0.000	(0)
UOH+3	1.166e-37	2.742e-38	-36.933	-37.562	-0.629	(0)
UF5-	1.976e-38	1.682e-38	-37.704	-37.774	-0.070	(0)
UF+3	1.085e-38	2.550e-39	-37.965	-38.593	-0.629	(0)
UF6-2	1.606e-39	8.436e-40	-38.794	-39.074	-0.279	(0)
U(SO4) 2	6.529e-40	6.529e-40	-39.185	-39.185	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.020	-40.299	-0.279	(0)
U+4	0.000e+00	0.000e+00	-42.996	-44.114	-1.118	(0)
UCl+3	0.000e+00	0.000e+00	-44.612	-45.240	-0.629	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-168.947	-174.606	-5.660	(0)
U(5)	5.545e-17					
UO2+	5.545e-17	4.721e-17	-16.256	-16.326	-0.070	(0)
U(6)	8.239e-08					
UO2(CO3) 2-2	4.105e-08	2.157e-08	-7.387	-7.666	-0.279	(0)
UO2(CO3) 3-4	4.097e-08	3.122e-09	-7.388	-8.506	-1.118	(0)
UO2CO3	3.743e-10	3.743e-10	-9.427	-9.427	0.000	(0)
UO2F+	8.766e-13	7.463e-13	-12.057	-12.127	-0.070	(0)
UO2OH+	6.827e-13	5.812e-13	-12.166	-12.236	-0.070	(0)
UO2F2	3.575e-13	3.575e-13	-12.447	-12.447	0.000	(0)
UO2SO4	8.070e-14	8.070e-14	-13.093	-13.093	0.000	(0)
UO2+2	5.584e-14	3.255e-14	-13.253	-13.487	-0.234	(0)
UO2F3-	1.751e-14	1.491e-14	-13.757	-13.826	-0.070	(0)
UO2(SO4) 2-2	3.316e-15	1.742e-15	-14.479	-14.759	-0.279	(0)
UO2Cl+	9.243e-17	7.869e-17	-16.034	-16.104	-0.070	(0)
UO2F4-2	3.744e-17	1.967e-17	-16.427	-16.706	-0.279	(0)

(UO2) 2 (OH) 2+2	1.067e-18	5.606e-19	-17.972	-18.251	-0.279	(0)
(UO2) 3 (OH) 5+	5.839e-21	4.971e-21	-20.234	-20.304	-0.070	(0)
UO2NO3+	1.597e-25	1.360e-25	-24.797	-24.867	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.260	-42.330	-0.070	(0)
V+2	0.000e+00	0.000e+00	-42.712	-42.992	-0.279	(0)
V (3)	2.013e-15					
V (OH) 3	2.013e-15	2.013e-15	-14.696	-14.696	0.000	(0)
V (OH) 2+	1.085e-25	9.236e-26	-24.965	-25.035	-0.070	(0)
VOH+2	1.184e-28	6.219e-29	-27.927	-28.206	-0.279	(0)
V+3	3.723e-33	8.750e-34	-32.429	-33.058	-0.629	(0)
VSO4+	7.946e-34	6.765e-34	-33.100	-33.170	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.160	-54.789	-0.629	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.495	-55.613	-1.118	(0)
V (4)	5.410e-18					
V (OH) 3+	4.882e-18	4.157e-18	-17.311	-17.381	-0.070	(0)
VO+2	2.797e-19	1.469e-19	-18.553	-18.833	-0.279	(0)
VOF+	1.719e-19	1.464e-19	-18.765	-18.835	-0.070	(0)
VOSO4	6.629e-20	6.629e-20	-19.179	-19.179	0.000	(0)
VOF2	9.115e-21	9.115e-21	-20.040	-20.040	0.000	(0)
VOCl+	7.217e-22	6.144e-22	-21.142	-21.212	-0.070	(0)
VOF3-	6.309e-23	5.371e-23	-22.200	-22.270	-0.070	(0)
VOF4-2	6.853e-26	3.601e-26	-25.164	-25.444	-0.279	(0)
H2V2O4+2	1.649e-30	8.665e-31	-29.783	-30.062	-0.279	(0)
V (5)	1.893e-09					
H2VO4-	1.789e-09	1.523e-09	-8.747	-8.817	-0.070	(0)
HVO4-2	1.026e-10	5.391e-11	-9.989	-10.268	-0.279	(0)
H3VO4	1.081e-12	1.081e-12	-11.966	-11.966	0.000	(0)
H3V2O7-	1.249e-14	1.064e-14	-13.903	-13.973	-0.070	(0)
VO2+	1.753e-16	1.532e-16	-15.756	-15.815	-0.059	(0)
HV2O7-3	1.184e-16	2.784e-17	-15.927	-16.555	-0.629	(0)
VO2F	4.463e-17	4.463e-17	-16.350	-16.350	0.000	(0)
VO4-3	1.620e-17	3.807e-18	-16.791	-17.419	-0.629	(0)
VO2SO4-	7.038e-18	5.992e-18	-17.153	-17.222	-0.070	(0)
VO2F2-	3.161e-18	2.691e-18	-17.500	-17.570	-0.070	(0)
V2O7-4	1.385e-19	1.056e-20	-18.859	-19.977	-1.118	(0)
V3O9-3	1.576e-20	3.705e-21	-19.802	-20.431	-0.629	(0)
VO2F3-2	1.061e-20	5.575e-21	-19.974	-20.254	-0.279	(0)
VO2F4-3	1.938e-24	4.556e-25	-23.713	-24.341	-0.629	(0)
V4O12-4	3.088e-26	2.354e-27	-25.510	-26.628	-1.118	(0)
VO2NO3	1.622e-28	1.622e-28	-27.790	-27.790	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-65.076	-66.822	-1.747	(0)
V10O28-6	0.000e+00	0.000e+00	-65.345	-67.860	-2.515	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.646	-68.764	-1.118	(0)
Zn	1.126e-06					
Zn+2	7.926e-07	4.621e-07	-6.101	-6.335	-0.234	(0)
ZnSO4	1.656e-07	1.656e-07	-6.781	-6.781	0.000	(0)
ZnCO3	7.679e-08	7.679e-08	-7.115	-7.115	0.000	(0)
ZnHCO3+	7.504e-08	6.389e-08	-7.125	-7.195	-0.070	(0)
ZnOH+	7.697e-09	6.553e-09	-8.114	-8.184	-0.070	(0)
Zn (SO4) 2-2	4.495e-09	2.362e-09	-8.347	-8.627	-0.279	(0)
ZnCl+	1.983e-09	1.730e-09	-8.703	-8.762	-0.059	(0)
ZnF+	1.798e-09	1.531e-09	-8.745	-8.815	-0.070	(0)
ZnOHCl	3.212e-10	3.212e-10	-9.493	-9.493	0.000	(0)
Zn (OH) 2	1.473e-10	1.473e-10	-9.832	-9.832	0.000	(0)
ZnCl2	4.087e-12	4.087e-12	-11.389	-11.389	0.000	(0)
Zn (OH) 3-	1.230e-13	1.047e-13	-12.910	-12.980	-0.070	(0)
ZnCl3-	5.545e-15	4.838e-15	-14.256	-14.315	-0.059	(0)
ZnSeO4	1.959e-16	1.959e-16	-15.708	-15.708	0.000	(0)
ZnCl4-2	6.098e-18	3.606e-18	-17.215	-17.443	-0.228	(0)
ZnNO3+	2.853e-18	2.429e-18	-17.545	-17.614	-0.070	(0)
Zn (OH) 4-2	1.125e-18	5.911e-19	-17.949	-18.228	-0.279	(0)
Zn (SeO4) 2-2	1.035e-27	5.436e-28	-26.985	-27.265	-0.279	(0)
Zn (NO3) 2	1.015e-30	1.015e-30	-29.994	-29.994	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.213	-149.283	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.422	-150.422	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.526	-225.596	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.147	-228.427	-0.279	(0)

Zn(HS) 4-2 0.000e+00 0.000e+00 -305.229 -305.509 -0.279 (0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-76.20	-69.91	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-56.72	-52.20	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-63.94	-52.21	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-98.63	-80.69	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-74.17	-54.13	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.50	-34.10	0.40	(NH4)2CrO4
(NH4)2SeO4	-30.17	-29.72	0.45	(NH4)2SeO4
Acanthite	-51.21	-87.43	-36.22	Ag2S
Ag2CO3	-10.58	-21.67	-11.09	Ag2CO3
Ag2CrO4	-20.48	-32.07	-11.59	Ag2CrO4
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4
Ag2MoO4	-11.17	-22.72	-11.55	Ag2MoO4
Ag2O	-14.40	-1.83	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.09	-18.91	-4.82	Ag2SO4
Ag3AsO3	-27.16	-25.01	2.16	Ag3AsO3
Ag3AsO4	-15.57	-18.36	-2.79	Ag3AsO4
Ag3H2VO5	-16.59	-11.41	5.18	Ag3H2VO5
AgF:4H2O	-12.89	-11.84	1.05	AgF:4H2O
Agmetal	-0.18	-13.69	-13.51	Ag
AgVO3	-10.35	-9.58	0.77	AgVO3
Al(OH)3(am)	-1.19	9.61	10.80	Al(OH)3
Al2(MoO4)3	-45.81	-43.45	2.37	Al2(MoO4)3
Al2O3	-0.43	19.22	19.65	Al2O3
Al4(OH)10SO4	-1.34	21.36	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.80	-6.00	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.29	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.10	-11.89	-7.79	PbSO4
Anhydrite	-1.37	-5.73	-4.36	CaSO4
Anilite	-55.17	-87.05	-31.88	Cu0.25Cu1.5S
Antlerite	-2.43	6.36	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-86.29	-89.05	-2.76	As4O6
Artinite	-7.01	2.59	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-37.94	-31.23	6.71	As2O5
Atacamite	-1.74	5.65	7.39	Cu2(OH)3Cl
Azurite	0.67	-16.23	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.29	7.10	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-19.00	-3.13	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-1.01	-9.92	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-28.96	3.98	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.46	-23.13	-9.67	BaCrO4
BaF2	-8.93	-14.75	-5.82	BaF2
BaMoO4	-6.83	-13.79	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-11.30	-18.76	-7.46	BaSeO4
Bianchite	-7.36	-9.12	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.90	-6.54	-0.64	Mn2O3
BlaubleiI	-54.86	-79.02	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.45	-82.73	-27.28	Cu0.6Cu0.8S
Boehmite	1.03	9.61	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-1.05	14.17	15.22	Cu4(OH)6SO4
Brucite	-5.63	11.21	16.84	Mg(OH)2
Bunsenite	-5.27	7.18	12.45	NiO

Ca (VO3) 2	-11.63	-5.97	5.66	Ca (VO3) 2
Ca2V2O7	-12.12	5.38	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.17	5.38	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-19.46	2.84	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-22.22	16.74	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.12	16.74	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.71	-157.74	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.98	-26.89	-17.91	Hg2Cl2
CaMoO4	-1.58	-9.53	-7.95	CaMoO4
Carnotite	-4.15	-3.92	0.23	KUO2VO4
CaSeO3:2H2O	-6.55	-3.74	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.48	-14.50	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.46	-3.62	9.84	Cd (BO2) 2
Cd (OH) 2	-7.66	5.99	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.74	5.99	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-22.92	-16.21	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.68	0.88	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-21.54	6.86	28.40	Cd4 (OH) 6SO4
CdCl2	-13.31	-13.96	-0.66	CdCl2
CdCl2:1H2O	-12.27	-13.96	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.05	-13.96	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal (alpha)	-33.07	-19.56	13.51	Cd
Cdmetal (gamma)	-33.18	-19.56	13.62	Cd
CdMoO4	-0.75	-14.90	-14.15	CdMoO4
CdOHC1	-7.53	-3.99	3.54	CdOHC1
CdSb	-76.80	-77.15	-0.35	CdSb
CdSe	-20.68	-40.88	-20.20	CdSe
CdSeO4:2H2O	-18.02	-19.87	-1.85	CdSeO4:2H2O
CdSO4	-10.92	-11.10	-0.17	CdSO4
CdSO4:1H2O	-9.37	-11.10	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.22	-11.10	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-1.51	-14.64	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.63	-9.27	-2.64	CuSO4:5H2O
Chalcocite	-55.22	-90.14	-34.92	Cu2S
Chalcopyrite	-124.67	-159.94	-35.27	CuFeS2
Cinnabar	-52.20	-97.89	-45.69	HgS
Claudetite	-85.99	-89.05	-3.06	As4O6
Clausthalite	-14.58	-41.68	-27.10	PbSe
Co (BO2) 2	-29.67	-2.60	27.07	Co (BO2) 2
Co (OH) 2	-6.09	7.00	13.09	Co (OH) 2
Co (OH) 3	-10.32	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-23.27	-10.23	13.03	Co3 (AsO4) 2
Co3O4	-7.76	-18.26	-10.50	Co3O4
CoCl2	-21.22	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.96	-45.41	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.13	-13.89	-7.76	CoMoO4
CoO	-6.59	7.00	13.59	CoO
CoS (alpha)	-71.16	-78.60	-7.44	CoS
CoS (beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-12.89	-10.08	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.98	-14.76	-4.78	PbCl2
Covellite	-55.49	-77.79	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3

Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.05	-30.96	14.09	CrCl2
CrCl3	-46.22	-31.11	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.78	-41.62	-33.84	Na3AlF6
Cu(OH)2	-0.86	7.81	8.67	Cu(OH)2
Cu(SbO3)2	-24.85	20.36	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-12.45	-3.20	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.48	-90.36	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-19.67	-21.62	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.89	-7.79	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-60.12	-102.71	-42.59	Cu3Sb
Cu3Se2	-26.98	-90.47	-63.49	Cu3Se2
CuCO3	-0.52	-12.02	-11.50	CuCO3
CuCrO4	-16.98	-22.42	-5.44	CuCrO4
CuF	-8.29	-13.20	-4.91	CuF
CuF2	-15.16	-14.04	1.12	CuF2
CuF2:2H2O	-9.49	-14.04	-4.55	CuF2:2H2O
Cumetal	-6.29	-15.04	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.76	-1.46	10.30	CuOCuSO4
Cupricferrite	8.21	14.20	5.99	CuFe2O4
Cuprite	-3.13	-4.54	-1.41	Cu2O
Cuprousferrite	9.84	0.92	-8.92	CuFeO2
CuSe	-5.96	-39.06	-33.10	CuSe
CuSe2	-27.02	-60.38	-33.37	CuSe2
CuSeO3:2H2O	-7.80	-7.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.61	-18.05	-2.44	CuSeO4:5H2O
CuSO4	-12.21	-9.27	2.94	CuSO4
Diaspore	2.74	9.61	6.87	AlOOH
Djurleite	-55.40	-89.32	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.75	-5.87	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.16	-13.88	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.27	-8.71	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.28	-38.91	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.13	-44.87	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.83	-12.43	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.35	-17.44	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.15	-64.75	-18.60	FeSe2
FeS(ppt)	-79.20	-82.15	-2.95	FeS
FeSe	-32.42	-43.42	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.44	-80.41	-13.97	PbS
Gibbsite	1.32	9.61	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.11	-9.12	-2.01	ZnSO4:7H2O
Greenockite	-65.26	-79.62	-14.36	CdS
Greigite	-287.54	-332.58	-45.03	Fe3S4
Gummite	-6.86	0.81	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-12.49	-24.59	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.01	-20.89	-12.88	H2MoO4
H2S(g)	-77.59	-85.60	-8.01	H2S
H2Se(g)	-41.91	-46.87	-4.96	H2Se
Halite	-6.80	-5.20	1.60	NaCl
Hausmannite	-7.57	53.46	61.03	Mn3O4

Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.22	22.67	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.61	-256.32	-73.71	Hg (CH3) 2
Hg (g)	-8.37	-16.24	-7.87	Hg
Hg (OH) 2	-8.79	-12.29	-3.50	Hg (OH) 2
Hg2 (g)	-17.53	-32.48	-14.96	Hg2
Hg2 (OH) 2	-12.20	-6.94	5.26	Hg2 (OH) 2
Hg2CO3	-10.72	-26.77	-16.05	Hg2CO3
Hg2CrO4	-28.47	-37.17	-8.70	Hg2CrO4
Hg2F2	-18.43	-28.79	-10.36	Hg2F2
Hg2S	-80.86	-92.54	-11.68	Hg2S
Hg2SeO3	-17.38	-22.03	-4.66	Hg2SeO3
Hg2SO4	-17.89	-24.02	-6.13	Hg2SO4
Hg3O2CO3	-27.02	-56.70	-29.68	Hg3O2CO3
HgCl (g)	-32.94	-13.44	19.50	HgCl
HgCl2	-10.98	-32.24	-21.26	HgCl2
HgF (g)	-47.07	-14.40	32.68	HgF
HgF2 (g)	-46.71	-34.15	12.57	HgF2
Hgmetal (l)	-2.79	-16.24	-13.45	Hg
HgSe	-3.47	-59.16	-55.69	HgSe
HgSeO3	-14.96	-27.39	-12.43	HgSeO3
HgSO4	-19.95	-29.37	-9.42	HgSO4
Huntite	-4.38	-34.35	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-5.33	-24.10	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.52	-23.28	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.45	-20.62	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.86	-20.66	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.37	-52.61	-17.24	K2Cr2O7
K2CrO4	-21.86	-22.37	-0.51	K2CrO4
K2MoO4	-16.29	-13.02	3.26	K2MoO4
K2SeO4	-17.27	-18.00	-0.73	K2SeO4
Langite	-3.32	14.17	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.26	-6.70	-0.43	PbO : PbSO4
Laurionite	-5.41	-4.78	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.50	5.19	12.69	PbO
Mackinawite	-78.55	-82.15	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.10	-4.21	-5.31	Cu2 (OH) 2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.70	5.19	12.89	PbO
Matlockite	-6.74	-15.71	-8.97	PbClF
Melanothallite	-18.39	-12.14	6.26	CuCl2
Melanterite	-11.42	-13.63	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.80	-97.89	-45.09	HgS
Mg (OH) 2 (active)	-7.58	11.21	18.79	Mg (OH) 2
Mg (VO3) 2	-17.40	-6.12	11.28	Mg (VO3) 2
Mg2Sb3	-276.11	-201.43	74.68	Mg2Sb3
Mg2V2O7	-21.27	5.09	26.36	Mg2V2O7
MgCr2O4	-7.35	8.86	16.20	MgCr2O4
MgCrO4	-24.41	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.83	-9.68	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.94	-3.89	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.45	-14.65	-1.20	MgSeO4 : 6H2O
Minium	-32.40	41.12	73.52	Pb3O4
Mirabilite	-6.41	-7.53	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-12.93	-8.03	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.08	-57.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.15	-90.07	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-15.82	-3.32	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.36	-10.65	2.72	MnCl2 : 4H2O
MnS (grn)	-76.47	-76.30	0.17	MnS
MnS (pnk)	-79.64	-76.30	3.34	MnS

MnSb	-96.27	-99.18	-2.91	MnSb
MnSe	-41.06	-37.56	3.50	MnSe
MnSeO3	-6.92	-5.79	1.13	MnSeO3
MnSeO3:2H2O	-6.77	-5.79	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.50	-16.55	-2.05	MnSeO4:5H2O
MnSO4	-10.36	-7.78	2.58	MnSO4
Monteponite	-9.12	5.99	15.10	CdO
Montroydite	-8.65	-12.29	-3.64	HgO
MoO3	-12.89	-20.89	-8.00	MoO3
Morenosite	-7.76	-9.91	-2.14	NiSO4:7H2O
MoS2	-147.38	-217.64	-70.26	MoS2
Na-Jarosite	-8.61	-19.81	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.92	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.68	2.93	Na2CrO4
Na2Mo2O7	-15.62	-32.22	-16.60	Na2Mo2O7
Na2MoO4	-12.82	-11.33	1.49	Na2MoO4
Na2MoO4:2H2O	-12.55	-11.33	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.84	-5.54	10.30	Na2SeO3:5H2O
Na2SeO4	-17.58	-16.30	1.28	Na2SeO4
Na3Sb	-176.02	-81.57	94.45	Na3Sb
Na3VO4	-31.01	5.67	36.68	Na3VO4
Na4V2O7	-35.61	1.79	37.40	Na4V2O7
Nantokite	-5.51	-12.24	-6.73	CuCl
NaSb	-88.75	-65.58	23.17	NaSb
Natron	-8.97	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-7.74	-3.89	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.62	7.18	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.40	-9.70	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.57	-13.71	-11.14	NiMoO4
NiS(alpha)	-72.82	-78.42	-5.60	NiS
NiS(beta)	-67.32	-78.42	-11.10	NiS
NiS(gamma)	-65.62	-78.42	-12.80	NiS
NiSe	-21.99	-39.69	-17.70	NiSe
NiSeO3:2H2O	-10.73	-7.92	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.16	-18.68	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-240.27	-301.33	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.93	-4.41	6.52	Pb(BO2)2
Pb(OH)2	-2.96	5.19	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.34	-67.10	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.38	0.41	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.80	10.38	26.19	Pb2O(OH)2
Pb2O3	-25.11	35.93	61.04	Pb2O3
Pb2OCO3	-8.89	-9.45	-0.56	Pb2OCO3
Pb2V2O7	-5.05	-6.95	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.46	-15.66	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.90	-1.76	6.14	Pb3(VO4)2
Pb3O2CO3	-15.28	-4.26	11.02	Pb3O2CO3
Pb3O2SO4	-12.19	-1.51	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.42	3.68	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.19	3.69	21.88	Pb4O3SO4
PbCrO4	-12.45	-25.05	-12.60	PbCrO4
PbF2	-9.22	-16.66	-7.44	PbF2
Pbmetal	-24.60	-20.35	4.25	Pb
PbMoO4	-0.08	-15.70	-15.62	PbMoO4
PbO:0.3H2O	-7.79	5.19	12.98	PbO:0.33H2O
PbSeO4	-13.83	-20.67	-6.84	PbSeO4
Periclase	-10.37	11.21	21.58	MgO
Phosgenite	-9.59	-29.40	-19.81	PbCl2:PbCO3
Plattnerite	-18.86	30.74	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.70	-142.21	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn(OH)2

Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.89	-120.64	-19.75	AsS
Retgersite	-7.87	-9.91	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-12.16	-19.27	-7.11	Sb(OH)3
Sb2O4	-16.40	-13.00	3.40	Sb2O4
Sb2O5	-26.41	-36.07	-9.67	Sb2O5
Sb2Se3	-111.40	-179.16	-67.76	Sb2Se3
Sb4O6(cubic)	-58.83	-77.09	-18.26	Sb4O6
Sb4O6(orth)	-59.19	-77.09	-17.90	Sb4O6
SbCl3	-49.77	-49.20	0.57	SbCl3
SbF3	-41.83	-52.06	-10.23	SbF3
Sbmetal	-45.90	-57.59	-11.69	Sb
SbO2	-2.99	-30.81	-27.82	SbO2
Schoepite	-5.18	0.81	5.99	UO2(OH)2:H2O
Semetal(am)	-14.22	-21.33	-7.11	Se
Semetal(hex)	-13.62	-21.33	-7.71	Se
Senarmontite	-26.18	-38.54	-12.37	Sb2O3
SeO2	-15.22	-15.10	0.12	SeO2
SeO3	-46.90	-25.86	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.19	-77.64	-11.45	ZnS
Spinel	-6.41	30.44	36.85	MgAl2O4
Stibnite	-244.89	-295.35	-50.46	Sb2S3
Sulfur	-57.91	-60.06	-2.14	S
Tenorite	0.17	7.81	7.64	CuO
Thenardite	-7.85	-7.52	0.32	Na2SO4
Thermonatrite	-10.91	-10.28	0.64	Na2CO3:H2O
Tyuyamunite	-8.43	-4.35	4.08	Ca(UO2)2(VO4)2
U3O8	-16.55	4.53	21.08	U3O8
U3Sb4	-582.56	-430.18	152.38	U3Sb4
U4O9	-33.51	-36.53	-3.02	U4O9
UF4	-29.70	-59.23	-29.54	UF4
UF4:2.5H2O	-26.51	-59.23	-32.72	UF4:2.5H2O
UO2(am)	-16.45	-15.52	0.93	UO2
UO2(NO3)2	-48.99	-36.85	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.70	-36.85	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.24	-36.85	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.89	-36.85	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.80	0.81	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.80	-25.05	-2.25	UO2SeO4:4H2O
UO3	-6.89	0.81	7.70	UO3
Uraninite	-10.85	-15.52	-4.67	UO2
USb2	-220.58	-191.00	29.58	USb2
V(OH)3	-19.20	-11.61	7.59	V(OH)3
V2O5	-15.97	-17.33	-1.36	V2O5
V3O5	-40.99	-39.15	1.84	V3O5
V4O7	-50.87	-43.69	7.19	V4O7
V6O13	-42.22	-103.08	-60.86	V6O13
Valentinite	-30.06	-38.54	-8.48	Sb2O3
VC12	-63.21	-44.33	18.87	VC12
VC13	-64.97	-41.54	23.43	VC13
VF4	-63.18	-48.25	14.93	VF4
Vmetal	-93.95	-49.93	44.03	V
VO	-39.14	-24.38	14.76	VO
VO(OH)2	-9.69	-4.54	5.15	VO(OH)2
VO2Cl	-21.48	-18.64	2.84	VO2Cl
VOC1	-32.74	-21.59	11.15	VOC1
VOC12	-37.25	-24.49	12.76	VOC12
VOSO4	-25.23	-21.62	3.61	VOSO4
Witherite	-4.16	-12.73	-8.57	BaCO3
Wurtzite	-68.69	-77.64	-8.95	ZnS
Zincite	-3.37	7.96	11.33	ZnO
Zincosite	-13.05	-9.12	3.93	ZnSO4
Zn(BO2)2	-9.93	-1.64	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.01	-29.69	3.32	Zn(NO3)2:6H2O

Zn(OH)2	-4.24	7.96	12.20	Zn(OH)2
Zn(OH)2(am)	-4.51	7.96	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.79	7.96	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.57	7.96	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.77	7.96	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.66	-1.16	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.24	5.95	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-21.00	-7.35	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.19	-10.28	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.63	14.77	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.64	19.86	38.50	Zn5(OH)8Cl2
ZnCl2	-19.04	-11.99	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.36	-13.89	-0.53	ZnF2
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO4	-2.80	-12.93	-10.13	ZnMoO4
ZnO(active)	-3.23	7.96	11.19	ZnO
ZnS(am)	-68.59	-77.64	-9.05	ZnS
ZnSb	-86.18	-75.17	11.01	ZnSb
ZnSe	-24.51	-38.91	-14.40	ZnSe
ZnSeO4:6H2O	-16.38	-17.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.48	-9.12	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 88.

```
Title Stage 5 Run-off mix
Mix 502
1      1
3      0.001870
4      0.019645
5      0.010660
6      0.000000
7      0.035741
8      0.000000
9      5.381124
10     8.423469
11     16.268645
12     87.208998
13     67.139944
14     27.004194
15     13.670886
Save solution 505
end
```

TITLE

Stage 5 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 502.

Mixture 502.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

1.870e-03 Solution 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

1.964e-02 Solution 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

1.066e-02 Solution 5 Average HCT data for quartz monzonite - oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

3.574e-02 Solution 7 Average HCT data for coarse crystalline porphyry - oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry - oxide/transitional (ore) (cell CF-11-02, 0-27)

5.381e+00 Solution 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

8.423e+00 Solution 10 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

1.627e+01 Solution 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

8.721e+01 Solution 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

6.714e+01 Solution 13 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

2.700e+01 Solution 14 Average HCT data for coarse crystalline porphyry - sulfide (waste) (cell CF-11-02, 367-408)

1.367e+01 Solution 15 Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	9.833e-07	2.224e-04
As	4.522e-10	1.023e-07
B	4.446e-07	1.005e-04
Ba	1.334e-07	3.016e-05
C	7.225e-04	1.634e-01
Ca	3.125e-04	7.067e-02
Cd	1.167e-09	2.640e-07
Cl	3.744e-05	8.468e-03
Co	1.315e-11	2.974e-09
Cr	5.059e-12	1.144e-09
Cu	2.376e-06	5.373e-04
F	3.360e-05	7.598e-03
Fe	4.738e-08	1.071e-05
Hg	4.265e-11	9.646e-09
K	6.681e-05	1.511e-02
Mg	8.169e-05	1.848e-02
Mn	9.865e-07	2.231e-04
Mo	3.811e-08	8.618e-06
N	9.984e-08	2.258e-05
Na	1.198e-04	2.709e-02
Ni	2.141e-12	4.843e-10
Pb	3.330e-09	7.531e-07
S	2.507e-04	5.670e-02
Sb	4.005e-10	9.059e-08
Se	3.489e-09	7.890e-07
U	1.213e-08	2.743e-06
V	9.418e-09	2.130e-06
Zn	1.153e-07	2.608e-05

-----Description of solution-----

	pH = 6.451	Charge balance
	pe = 6.501	Adjusted to redox
equilibrium		

Activity of water = 1.000
 Ionic strength (mol/kgw) = 1.569e-03
 Mass of water (kg) = 2.262e+02
 Total alkalinity (eq/kg) = 4.126e-04
 Total CO2 (mol/kg) = 7.225e-04
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 13
 Total H = 2.510766e+04
 Total O = 1.255443e+04

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.697e-07	3.538e-07	-6.432	-6.451	-0.019	0.00
OH-	2.976e-08	2.846e-08	-7.526	-7.546	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.833e-07					
AlF2+	4.676e-07	4.477e-07	-6.330	-6.349	-0.019	(0)
AlF3	1.712e-07	1.712e-07	-6.766	-6.766	0.000	(0)
Al(OH) 4-	1.668e-07	1.596e-07	-6.778	-6.797	-0.019	(0)
Al(OH) 2+	8.192e-08	7.843e-08	-7.087	-7.105	-0.019	(0)
Al(OH) 3	4.454e-08	4.454e-08	-7.351	-7.351	0.000	(0)
AlF+2	4.405e-08	3.702e-08	-7.356	-7.432	-0.076	(0)
AlOH+2	4.128e-09	3.469e-09	-8.384	-8.460	-0.076	(0)
AlF4-	2.724e-09	2.607e-09	-8.565	-8.584	-0.019	(0)
AlSO4+	1.960e-10	1.876e-10	-9.708	-9.727	-0.019	(0)
Al+3	1.814e-10	1.219e-10	-9.741	-9.914	-0.173	(0)
Al(SO4) 2-	4.164e-13	3.985e-13	-12.380	-12.400	-0.019	(0)
AlMo6O21-3	3.646e-39	2.398e-39	-38.438	-38.620	-0.182	(0)
As (3)	1.930e-21					
H3AsO3	1.927e-21	1.927e-21	-20.715	-20.715	0.000	(0)
H2AsO3-	2.927e-24	2.794e-24	-23.534	-23.554	-0.020	(0)
H4AsO3+	3.539e-28	3.378e-28	-27.451	-27.471	-0.020	(0)
HAsO3-2	8.677e-30	7.204e-30	-29.062	-29.142	-0.081	(0)
AsO3-3	1.193e-36	7.850e-37	-35.923	-36.105	-0.182	(0)
As (5)	4.522e-10					
H2AsO4-	3.334e-10	3.182e-10	-9.477	-9.497	-0.020	(0)
HAsO4-2	1.188e-10	9.863e-11	-9.925	-10.006	-0.081	(0)
H3AsO4	1.955e-14	1.956e-14	-13.709	-13.709	0.000	(0)
AsO4-3	1.340e-15	8.817e-16	-14.873	-15.055	-0.182	(0)
B	4.446e-07					
H3BO3	4.438e-07	4.439e-07	-6.353	-6.353	0.000	(0)
H2BO3-	7.624e-10	7.288e-10	-9.118	-9.137	-0.020	(0)
CaH2BO3+	1.099e-11	1.051e-11	-10.959	-10.978	-0.020	(0)
BF(OH) 3-	5.629e-12	5.381e-12	-11.250	-11.269	-0.020	(0)
MgH2BO3+	1.746e-12	1.669e-12	-11.758	-11.778	-0.020	(0)
NaH2BO3	1.322e-13	1.322e-13	-12.879	-12.879	0.000	(0)
BF2(OH) 2-	6.467e-15	6.182e-15	-14.189	-14.209	-0.020	(0)
BaH2BO3+	2.624e-15	2.509e-15	-14.581	-14.601	-0.020	(0)
H5(BO3) 2-	2.881e-16	2.754e-16	-15.540	-15.560	-0.020	(0)
BF3OH-	2.704e-20	2.584e-20	-19.568	-19.588	-0.020	(0)
H8(BO3) 3-	1.279e-20	1.223e-20	-19.893	-19.913	-0.020	(0)
BF4-	1.429e-24	1.367e-24	-23.845	-23.864	-0.020	(0)
Ba	1.334e-07					
Ba+2	1.329e-07	1.114e-07	-6.876	-6.953	-0.077	(0)
BaHCO3+	4.344e-10	4.161e-10	-9.362	-9.381	-0.019	(0)
BaCO3	2.961e-12	2.961e-12	-11.529	-11.529	0.000	(0)
BaOH+	1.446e-14	1.384e-14	-13.840	-13.859	-0.019	(0)
BaH2BO3+	2.624e-15	2.509e-15	-14.581	-14.601	-0.020	(0)
BaNO3+	6.761e-17	6.454e-17	-16.170	-16.190	-0.020	(0)
BaNH3+2	5.682e-18	4.718e-18	-17.245	-17.326	-0.081	(0)
C (4)	7.225e-04					
HCO3-	4.085e-04	3.912e-04	-3.389	-3.408	-0.019	(0)

	H2CO3	3.112e-04	3.112e-04	-3.507	-3.507	0.000	(0)
	CaHCO3+	1.906e-06	1.825e-06	-5.720	-5.739	-0.019	(0)
	CuCO3	4.349e-07	4.349e-07	-6.362	-6.362	0.000	(0)
	MgHCO3+	2.762e-07	2.643e-07	-6.559	-6.578	-0.019	(0)
	CO3-2	6.186e-08	5.184e-08	-7.209	-7.285	-0.077	(0)
	CuHCO3+	3.683e-08	3.516e-08	-7.434	-7.454	-0.020	(0)
	NaHCO3	2.518e-08	2.518e-08	-7.599	-7.599	0.000	(0)
	CaCO3	2.059e-08	2.059e-08	-7.686	-7.686	0.000	(0)
	UO2 (CO3) 2-2	6.569e-09	5.454e-09	-8.182	-8.263	-0.081	(0)
	MnHCO3+	6.438e-09	6.163e-09	-8.191	-8.210	-0.019	(0)
	UO2CO3	5.273e-09	5.273e-09	-8.278	-8.278	0.000	(0)
	MgCO3	2.847e-09	2.847e-09	-8.546	-8.546	0.000	(0)
	ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
	PbHCO3+	5.541e-10	5.290e-10	-9.256	-9.277	-0.020	(0)
	BaHCO3+	4.344e-10	4.161e-10	-9.362	-9.381	-0.019	(0)
	PbCO3	2.836e-10	2.836e-10	-9.547	-9.547	0.000	(0)
	ZnCO3	2.737e-10	2.737e-10	-9.563	-9.563	0.000	(0)
	NaCO3-	1.154e-10	1.105e-10	-9.938	-9.957	-0.019	(0)
	Cu (CO3) 2-2	7.308e-11	6.068e-11	-10.136	-10.217	-0.081	(0)
	UO2 (CO3) 3-4	2.983e-11	1.417e-11	-10.525	-10.849	-0.323	(0)
	FeHCO3+	3.709e-12	3.552e-12	-11.431	-11.449	-0.019	(0)
	BaCO3	2.961e-12	2.961e-12	-11.529	-11.529	0.000	(0)
	CdCO3	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
	CdHCO3+	8.738e-13	8.341e-13	-12.059	-12.079	-0.020	(0)
	CoHCO3+	3.278e-13	3.129e-13	-12.484	-12.505	-0.020	(0)
	NiHCO3+	8.408e-14	8.026e-14	-13.075	-13.096	-0.020	(0)
	Pb (CO3) 2-2	5.107e-14	4.240e-14	-13.292	-13.373	-0.081	(0)
	CoCO3	9.013e-15	9.013e-15	-14.045	-14.045	0.000	(0)
	NiCO3	3.219e-15	3.219e-15	-14.492	-14.492	0.000	(0)
	HgCO3	2.857e-15	2.857e-15	-14.544	-14.544	0.000	(0)
	Cd (CO3) 2-2	5.123e-17	4.253e-17	-16.291	-16.371	-0.081	(0)
	HgHCO3+	1.971e-17	1.882e-17	-16.705	-16.725	-0.020	(0)
	Hg (CO3) 2-2	5.641e-19	4.683e-19	-18.249	-18.329	-0.081	(0)
Ca		3.125e-04					
	Ca+2	2.991e-04	2.506e-04	-3.524	-3.601	-0.077	(0)
	CaSO4	1.138e-05	1.138e-05	-4.944	-4.944	0.000	(0)
	CaHCO3+	1.906e-06	1.825e-06	-5.720	-5.739	-0.019	(0)
	CaF+	8.679e-08	8.308e-08	-7.062	-7.080	-0.019	(0)
	CaCO3	2.059e-08	2.059e-08	-7.686	-7.686	0.000	(0)
	CaOH+	1.486e-10	1.423e-10	-9.828	-9.847	-0.019	(0)
	CaH2BO3+	1.099e-11	1.051e-11	-10.959	-10.978	-0.020	(0)
	CaNO3+	9.598e-14	9.162e-14	-13.018	-13.038	-0.020	(0)
	CaNH3+2	2.551e-14	2.118e-14	-13.593	-13.674	-0.081	(0)
	Ca (NH3) 2+2	6.818e-25	5.660e-25	-24.166	-24.247	-0.081	(0)
Cd		1.167e-09					
	Cd+2	1.118e-09	9.366e-10	-8.952	-9.028	-0.077	(0)
	CdSO4	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	CdCO3	1.107e-12	1.107e-12	-11.956	-11.956	0.000	(0)
	CdHCO3+	8.738e-13	8.341e-13	-12.059	-12.079	-0.020	(0)
	CdF+	4.724e-13	4.509e-13	-12.326	-12.346	-0.020	(0)
	CdOH+	2.219e-13	2.118e-13	-12.654	-12.674	-0.020	(0)
	Cd (SO4) 2-2	1.402e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
	CdOHC1	3.741e-15	3.741e-15	-14.427	-14.427	0.000	(0)
	CdCl2	4.785e-16	4.785e-16	-15.320	-15.320	0.000	(0)
	Cd (CO3) 2-2	5.123e-17	4.253e-17	-16.291	-16.371	-0.081	(0)
	Cd (OH) 2	3.803e-17	3.803e-17	-16.420	-16.420	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	CdNO3+	3.587e-19	3.424e-19	-18.445	-18.465	-0.020	(0)
	CdSeO4	6.398e-20	6.398e-20	-19.194	-19.194	0.000	(0)
	CdCl3-	1.133e-20	1.081e-20	-19.946	-19.966	-0.020	(0)
	Cd2OH+3	1.511e-21	9.941e-22	-20.821	-21.003	-0.182	(0)
	Cd (OH) 3-	6.929e-23	6.614e-23	-22.159	-22.180	-0.020	(0)
	Cd (SeO3) 2-2	1.272e-24	1.056e-24	-23.896	-23.976	-0.081	(0)
	Cd (NO3) 2	1.984e-29	1.984e-29	-28.702	-28.702	0.000	(0)
	Cd (OH) 4-2	3.711e-31	3.081e-31	-30.430	-30.511	-0.081	(0)
	CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)

	Cd (HS) 3-	0.000e+00	0.000e+00	-232.232	-232.252	-0.020	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-310.087	-310.168	-0.081	(0)
C1		3.744e-05					
	C1-	3.744e-05	3.582e-05	-4.427	-4.446	-0.019	(0)
	CuCl+	8.454e-11	8.088e-11	-10.073	-10.092	-0.019	(0)
	MnCl+	3.720e-11	3.561e-11	-10.429	-10.448	-0.019	(0)
	CuCl	9.929e-12	9.929e-12	-11.003	-11.003	0.000	(0)
	ZnCl+	8.629e-12	8.256e-12	-11.064	-11.083	-0.019	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	PbCl+	2.423e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
	ZnOHC1	3.077e-13	3.077e-13	-12.512	-12.512	0.000	(0)
	HgClOH	8.292e-14	8.292e-14	-13.081	-13.081	0.000	(0)
	CuCl2-	7.767e-14	7.431e-14	-13.110	-13.129	-0.019	(0)
	HgCl2	5.909e-15	5.909e-15	-14.228	-14.228	0.000	(0)
	CdOHC1	3.741e-15	3.741e-15	-14.427	-14.427	0.000	(0)
	MnCl2	1.802e-15	1.802e-15	-14.744	-14.744	0.000	(0)
	UO2Cl+	1.555e-15	1.484e-15	-14.808	-14.828	-0.020	(0)
	CoCl+	1.335e-15	1.275e-15	-14.874	-14.895	-0.020	(0)
	CuCl2	1.005e-15	1.005e-15	-14.998	-14.998	0.000	(0)
	CdCl2	4.785e-16	4.785e-16	-15.320	-15.320	0.000	(0)
	ZnCl2	4.687e-16	4.687e-16	-15.329	-15.329	0.000	(0)
	PbCl2	3.701e-16	3.701e-16	-15.432	-15.432	0.000	(0)
	NiCl+	1.598e-16	1.525e-16	-15.796	-15.817	-0.020	(0)
	HgCl+	3.448e-17	3.291e-17	-16.462	-16.483	-0.020	(0)
	HgCl3-	2.217e-18	2.117e-18	-17.654	-17.674	-0.020	(0)
	CuCl3-2	6.777e-19	5.691e-19	-18.169	-18.245	-0.076	(0)
	FeCl+2	2.736e-19	2.297e-19	-18.563	-18.639	-0.076	(0)
	CrCl+2	9.203e-20	7.640e-20	-19.036	-19.117	-0.081	(0)
	MnCl3-	1.857e-20	1.778e-20	-19.731	-19.750	-0.019	(0)
	ZnCl3-	1.394e-20	1.334e-20	-19.856	-19.875	-0.019	(0)
	CdCl3-	1.133e-20	1.081e-20	-19.946	-19.966	-0.020	(0)
	VOCl+	7.376e-21	7.041e-21	-20.132	-20.152	-0.020	(0)
	PbCl3-	5.529e-21	5.278e-21	-20.257	-20.278	-0.020	(0)
	HgCl4-2	3.636e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
	CuCl3-	3.510e-22	3.358e-22	-21.455	-21.474	-0.019	(0)
	FeCl2+	3.840e-23	3.676e-23	-22.416	-22.435	-0.019	(0)
	NiCl2	2.751e-23	2.751e-23	-22.560	-22.560	0.000	(0)
	CrOHC12	1.481e-24	1.481e-24	-23.830	-23.830	0.000	(0)
	ZnCl4-2	2.845e-25	2.389e-25	-24.546	-24.622	-0.076	(0)
	CrCl2+	2.720e-25	2.597e-25	-24.565	-24.586	-0.020	(0)
	PbCl4-2	1.041e-25	8.642e-26	-24.983	-25.063	-0.081	(0)
	FeCl3	1.317e-28	1.317e-28	-27.880	-27.880	0.000	(0)
	CuCl4-2	7.180e-29	6.029e-29	-28.144	-28.220	-0.076	(0)
	CrO3Cl-	2.321e-31	2.215e-31	-30.634	-30.655	-0.020	(0)
	CoCl+2	1.139e-39	9.457e-40	-38.943	-39.024	-0.081	(0)
	UCl+3	0.000e+00	0.000e+00	-42.748	-42.930	-0.182	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.856	-63.937	-0.081	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.085	-66.165	-0.081	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.744	-80.825	-0.081	(0)
Co (2)		1.315e-11					
	Co+2	1.239e-11	1.028e-11	-10.907	-10.988	-0.081	(0)
	CoSO4	4.069e-13	4.069e-13	-12.391	-12.391	0.000	(0)
	CoHCO3+	3.278e-13	3.129e-13	-12.484	-12.505	-0.020	(0)
	CoF+	1.035e-14	9.880e-15	-13.985	-14.005	-0.020	(0)
	CoCO3	9.013e-15	9.013e-15	-14.045	-14.045	0.000	(0)
	CoOH+	6.119e-15	5.841e-15	-14.213	-14.234	-0.020	(0)
	CoCl+	1.335e-15	1.275e-15	-14.874	-14.895	-0.020	(0)
	Co (OH) 2	1.321e-17	1.321e-17	-16.879	-16.879	0.000	(0)
	CoNO2+	4.064e-18	3.879e-18	-17.391	-17.411	-0.020	(0)
	Co (NH3) +2	9.998e-20	8.301e-20	-19.000	-19.081	-0.081	(0)
	CoNO3+	1.974e-21	1.885e-21	-20.705	-20.725	-0.020	(0)
	CoSeO4	1.891e-21	1.891e-21	-20.723	-20.723	0.000	(0)
	Co (OH) 3-	7.857e-24	7.500e-24	-23.105	-23.125	-0.020	(0)
	CoOOH-	1.971e-24	1.882e-24	-23.705	-23.725	-0.020	(0)
	Co2OH+3	4.576e-27	3.011e-27	-26.339	-26.521	-0.182	(0)
	Co (NH3) 2+2	2.863e-28	2.377e-28	-27.543	-27.624	-0.081	(0)
	Co (NO3) 2	4.433e-31	4.433e-31	-30.353	-30.353	0.000	(0)
	Co (OH) 4-2	4.075e-32	3.383e-32	-31.390	-31.471	-0.081	(0)

Co (NH3) 3+2	2.420e-37	2.009e-37	-36.616	-36.697	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.069	-46.150	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.311	-48.634	-0.323	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.022	-56.103	-0.081	(0)
Co (3)	2.261e-32					
CoOH+2	2.261e-32	1.877e-32	-31.646	-31.727	-0.081	(0)
Co+3	1.931e-37	1.298e-37	-36.714	-36.887	-0.173	(0)
CoCl+2	1.139e-39	9.457e-40	-38.943	-39.024	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.856	-63.937	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.137	-75.157	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.644	-79.725	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.744	-80.825	-0.081	(0)
Cr (2)	1.496e-28					
Cr+2	1.496e-28	1.242e-28	-27.825	-27.906	-0.081	(0)
Cr (3)	5.059e-12					
Cr (OH) 2+	3.723e-12	3.554e-12	-11.429	-11.449	-0.020	(0)
Cr (OH) +2	1.236e-12	1.026e-12	-11.908	-11.989	-0.081	(0)
CrOHSO4	4.828e-14	4.828e-14	-13.316	-13.316	0.000	(0)
Cr (OH) 3	3.800e-14	3.800e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.557e-15	7.934e-15	-14.020	-14.101	-0.081	(0)
Cr+3	2.505e-15	1.648e-15	-14.601	-14.783	-0.182	(0)
CrSO4+	7.993e-16	7.630e-16	-15.097	-15.117	-0.020	(0)
CrO2-	5.345e-17	5.102e-17	-16.272	-16.292	-0.020	(0)
Cr (OH) 4-	4.512e-17	4.306e-17	-16.346	-16.366	-0.020	(0)
CrCl+2	9.203e-20	7.640e-20	-19.036	-19.117	-0.081	(0)
Cr2 (OH) 2SO4+2	5.395e-24	4.479e-24	-23.268	-23.349	-0.081	(0)
CrOHC12	1.481e-24	1.481e-24	-23.830	-23.830	0.000	(0)
CrCl2+	2.720e-25	2.597e-25	-24.565	-24.586	-0.020	(0)
Cr2 (OH) 2 (SO4) 2	5.275e-26	5.275e-26	-25.278	-25.278	0.000	(0)
CrNO3+2	1.003e-26	8.328e-27	-25.999	-26.079	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.741	-52.822	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.640	-62.822	-0.182	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.085	-66.165	-0.081	(0)
Cr (6)	5.812e-21					
HCrO4-	2.912e-21	2.780e-21	-20.536	-20.556	-0.020	(0)
CrO4-2	2.898e-21	2.428e-21	-20.538	-20.615	-0.077	(0)
NaCrO4-	1.447e-24	1.381e-24	-23.840	-23.860	-0.020	(0)
KCrO4-	6.033e-25	5.759e-25	-24.219	-24.240	-0.020	(0)
H2CrO4	7.971e-28	7.971e-28	-27.099	-27.099	0.000	(0)
CrO3SO4-2	7.153e-29	5.938e-29	-28.146	-28.226	-0.081	(0)
CrO3Cl-	2.321e-31	2.215e-31	-30.634	-30.655	-0.020	(0)
Cr2O7-2	3.227e-40	2.679e-40	-39.491	-39.572	-0.081	(0)
Cu (1)	2.407e-10					
Cu+	2.307e-10	2.202e-10	-9.637	-9.657	-0.020	(0)
CuCl	9.929e-12	9.929e-12	-11.003	-11.003	0.000	(0)
CuCl2-	7.767e-14	7.431e-14	-13.110	-13.129	-0.019	(0)
CuCl3-2	6.777e-19	5.691e-19	-18.169	-18.245	-0.076	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.448	-153.588	-0.140	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.181	-154.318	-0.137	(0)
Cu (2)	2.375e-06					
Cu+2	1.700e-06	1.425e-06	-5.770	-5.846	-0.077	(0)
CuCO3	4.349e-07	4.349e-07	-6.362	-6.362	0.000	(0)
CuOH+	1.340e-07	1.282e-07	-6.873	-6.892	-0.019	(0)
CuSO4	6.471e-08	6.471e-08	-7.189	-7.189	0.000	(0)
CuHCO3+	3.683e-08	3.516e-08	-7.434	-7.454	-0.020	(0)
CuF+	2.861e-09	2.730e-09	-8.544	-8.564	-0.020	(0)
Cu (OH) 2	7.283e-10	7.283e-10	-9.138	-9.138	0.000	(0)
Cu2 (OH) 2+2	4.975e-10	4.130e-10	-9.303	-9.384	-0.081	(0)
CuCl+	8.454e-11	8.088e-11	-10.073	-10.092	-0.019	(0)
Cu (CO3) 2-2	7.308e-11	6.068e-11	-10.136	-10.217	-0.081	(0)
CuNO2+	8.365e-12	7.985e-12	-11.078	-11.098	-0.020	(0)
CuNH3+2	1.179e-12	9.786e-13	-11.929	-12.009	-0.081	(0)
Cu (OH) 3-	4.454e-14	4.252e-14	-13.351	-13.371	-0.020	(0)
CuCl2	1.005e-15	1.005e-15	-14.998	-14.998	0.000	(0)
CuNO3+	5.456e-16	5.208e-16	-15.263	-15.283	-0.020	(0)
Cu (NO2) 2	4.373e-18	4.373e-18	-17.359	-17.359	0.000	(0)
Cu (OH) 4-2	1.147e-20	9.525e-21	-19.940	-20.021	-0.081	(0)
CuCl3-	3.510e-22	3.358e-22	-21.455	-21.474	-0.019	(0)

	Cu (NO3) 2	7.581e-27	7.581e-27	-26.120	-26.120	0.000	(0)
	CuCl4-2	7.180e-29	6.029e-29	-28.144	-28.220	-0.076	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.263	-220.283	-0.020	(0)
F	3.360e-05						
	F-	3.175e-05	3.038e-05	-4.498	-4.517	-0.019	(0)
	AlF2+	4.676e-07	4.477e-07	-6.330	-6.349	-0.019	(0)
	MgF+	2.352e-07	2.250e-07	-6.629	-6.648	-0.019	(0)
	AlF3	1.712e-07	1.712e-07	-6.766	-6.766	0.000	(0)
	CaF+	8.679e-08	8.308e-08	-7.062	-7.080	-0.019	(0)
	AlF+2	4.405e-08	3.702e-08	-7.356	-7.432	-0.076	(0)
	HF	1.589e-08	1.589e-08	-7.799	-7.799	0.000	(0)
	CuF+	2.861e-09	2.730e-09	-8.544	-8.564	-0.020	(0)
	AlF4-	2.724e-09	2.607e-09	-8.565	-8.584	-0.019	(0)
	NaF	2.194e-09	2.194e-09	-8.659	-8.659	0.000	(0)
	MnF+	9.976e-10	9.550e-10	-9.001	-9.020	-0.019	(0)
	UO2F+	1.122e-10	1.071e-10	-9.950	-9.970	-0.020	(0)
	ZnF+	5.826e-11	5.561e-11	-10.235	-10.255	-0.020	(0)
	UO2F2	9.386e-12	9.386e-12	-11.028	-11.028	0.000	(0)
	BF (OH) 3-	5.629e-12	5.381e-12	-11.250	-11.269	-0.020	(0)
	PbF+	4.081e-12	3.896e-12	-11.389	-11.409	-0.020	(0)
	HF2-	1.919e-12	1.836e-12	-11.717	-11.736	-0.019	(0)
	CdF+	4.724e-13	4.509e-13	-12.326	-12.346	-0.020	(0)
	UO2F3-	7.503e-14	7.162e-14	-13.125	-13.145	-0.020	(0)
	CoF+	1.035e-14	9.880e-15	-13.985	-14.005	-0.020	(0)
	CrF+2	9.557e-15	7.934e-15	-14.020	-14.101	-0.081	(0)
	FeF+2	8.424e-15	7.073e-15	-14.074	-14.150	-0.076	(0)
	BF2 (OH) 2-	6.467e-15	6.182e-15	-14.189	-14.209	-0.020	(0)
	FeF2+	6.007e-15	5.750e-15	-14.221	-14.240	-0.019	(0)
	PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
	NiF+	1.330e-15	1.270e-15	-14.876	-14.896	-0.020	(0)
	VO2F	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
	H2F2	6.768e-16	6.768e-16	-15.170	-15.170	0.000	(0)
	FeF3	2.464e-16	2.464e-16	-15.608	-15.608	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	UO2F4-2	2.081e-17	1.728e-17	-16.682	-16.762	-0.081	(0)
	VO2F2-	1.366e-17	1.303e-17	-16.865	-16.885	-0.020	(0)
	VOF+	1.337e-17	1.277e-17	-16.874	-16.894	-0.020	(0)
	VOF2	1.454e-19	1.454e-19	-18.837	-18.837	0.000	(0)
	PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
	BF3OH-	2.704e-20	2.584e-20	-19.568	-19.588	-0.020	(0)
	VO2F3-2	5.949e-21	4.939e-21	-20.226	-20.306	-0.081	(0)
	VOF3-	1.642e-22	1.567e-22	-21.785	-21.805	-0.020	(0)
	HgF+	5.432e-23	5.185e-23	-22.265	-22.285	-0.020	(0)
	PbF4-2	2.350e-24	1.951e-24	-23.629	-23.710	-0.081	(0)
	BF4-	1.429e-24	1.367e-24	-23.845	-23.864	-0.020	(0)
	VO2F4-3	1.122e-25	7.382e-26	-24.950	-25.132	-0.182	(0)
	Sb (OH) 2F	6.749e-26	6.749e-26	-25.171	-25.171	0.000	(0)
	SbOF	6.636e-26	6.636e-26	-25.178	-25.178	0.000	(0)
	VOF4-2	2.315e-26	1.922e-26	-25.636	-25.716	-0.081	(0)
	UF3+	7.659e-33	7.311e-33	-32.116	-32.136	-0.020	(0)
	UF2+2	1.829e-33	1.519e-33	-32.738	-32.819	-0.081	(0)
	UF4	2.435e-35	2.435e-35	-34.613	-34.613	0.000	(0)
	UF+3	6.036e-36	3.971e-36	-35.219	-35.401	-0.182	(0)
	UF5-	3.071e-38	2.931e-38	-37.513	-37.533	-0.020	(0)
	UF6-2	3.239e-40	2.689e-40	-39.490	-39.570	-0.081	(0)
Fe (2)	9.086e-10						
	Fe+2	8.689e-10	7.214e-10	-9.061	-9.142	-0.081	(0)
	FeSO4	3.511e-11	3.511e-11	-10.455	-10.455	0.000	(0)
	FeHCO3+	3.709e-12	3.552e-12	-11.431	-11.449	-0.019	(0)
	FeOH+	8.539e-13	8.174e-13	-12.069	-12.088	-0.019	(0)
	Fe (OH) 2	1.848e-17	1.848e-17	-16.733	-16.733	0.000	(0)
	Fe (OH) 3-	1.738e-19	1.664e-19	-18.760	-18.779	-0.019	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-238.470	-238.490	-0.020	(0)
Fe (3)	4.647e-08						
	Fe (OH) 2+	4.514e-08	4.322e-08	-7.345	-7.364	-0.019	(0)
	Fe (OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
	FeOH+2	4.648e-12	3.903e-12	-11.333	-11.409	-0.076	(0)

Fe (OH) 4-	3.657e-12	3.501e-12	-11.437	-11.456	-0.019	(0)
FeF+2	8.424e-15	7.073e-15	-14.074	-14.150	-0.076	(0)
FeF2+	6.007e-15	5.750e-15	-14.221	-14.240	-0.019	(0)
FeSO4+	4.935e-16	4.724e-16	-15.307	-15.326	-0.019	(0)
Fe+3	3.161e-16	2.124e-16	-15.500	-15.673	-0.173	(0)
FeF3	2.464e-16	2.464e-16	-15.608	-15.608	0.000	(0)
Fe (SO4) 2-	2.098e-18	2.003e-18	-17.678	-17.698	-0.020	(0)
FeCl+2	2.736e-19	2.297e-19	-18.563	-18.639	-0.076	(0)
FeHSeO3+2	2.222e-21	1.844e-21	-20.653	-20.734	-0.081	(0)
Fe2 (OH) 2+4	1.062e-21	5.044e-22	-20.974	-21.297	-0.323	(0)
FeCl2+	3.840e-23	3.676e-23	-22.416	-22.435	-0.019	(0)
FeNO3+2	2.957e-25	2.455e-25	-24.529	-24.610	-0.081	(0)
Fe3 (OH) 4+5	1.008e-27	3.151e-28	-26.996	-27.502	-0.505	(0)
FeCl3	1.317e-28	1.317e-28	-27.880	-27.880	0.000	(0)
H (0)	1.764e-29					
H2	8.818e-30	8.822e-30	-29.055	-29.054	0.000	(0)
Hg (0)	4.232e-11					
Hg	4.232e-11	4.232e-11	-10.373	-10.373	0.000	(0)
Hg (1)	3.187e-21					
Hg2+2	1.594e-21	1.323e-21	-20.798	-20.878	-0.081	(0)
Hg (2)	3.271e-13					
Hg (OH) 2	2.353e-13	2.354e-13	-12.628	-12.628	0.000	(0)
HgClOH	8.292e-14	8.292e-14	-13.081	-13.081	0.000	(0)
HgCl2	5.909e-15	5.909e-15	-14.228	-14.228	0.000	(0)
HgCO3	2.857e-15	2.857e-15	-14.544	-14.544	0.000	(0)
HgOH+	5.467e-17	5.218e-17	-16.262	-16.282	-0.020	(0)
HgCl+	3.448e-17	3.291e-17	-16.462	-16.483	-0.020	(0)
HgHCO3+	1.971e-17	1.882e-17	-16.705	-16.725	-0.020	(0)
HgCl3-	2.217e-18	2.117e-18	-17.654	-17.674	-0.020	(0)
Hg (CO3) 2-2	5.641e-19	4.683e-19	-18.249	-18.329	-0.081	(0)
Hg+2	5.547e-20	4.605e-20	-19.256	-19.337	-0.081	(0)
HgSO4	2.390e-21	2.390e-21	-20.622	-20.622	0.000	(0)
HgNH3+2	2.349e-21	1.950e-21	-20.629	-20.710	-0.081	(0)
Hg (OH) 3-	8.837e-22	8.435e-22	-21.054	-21.074	-0.020	(0)
HgCl4-2	3.636e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
Hg (NH3) 2+2	1.577e-22	1.309e-22	-21.802	-21.883	-0.081	(0)
HgF+	5.432e-23	5.185e-23	-22.265	-22.285	-0.020	(0)
HgNO3+	2.059e-30	1.966e-30	-29.686	-29.706	-0.020	(0)
Hg (NH3) 3+2	4.215e-32	3.499e-32	-31.375	-31.456	-0.081	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.025	-40.025	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.648	-40.729	-0.081	(0)
HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.357	-143.438	-0.081	(0)
K	6.681e-05					
K+	6.672e-05	6.383e-05	-4.176	-4.195	-0.019	(0)
KSO4-	9.358e-08	8.960e-08	-7.029	-7.048	-0.019	(0)
KCrO4-	6.033e-25	5.759e-25	-24.219	-24.240	-0.020	(0)
Mg	8.169e-05					
Mg+2	7.880e-05	6.603e-05	-4.103	-4.180	-0.077	(0)
MgSO4	2.382e-06	2.382e-06	-5.623	-5.623	0.000	(0)
MgHCO3+	2.762e-07	2.643e-07	-6.559	-6.578	-0.019	(0)
MgF+	2.352e-07	2.250e-07	-6.629	-6.648	-0.019	(0)
MgCO3	2.847e-09	2.847e-09	-8.546	-8.546	0.000	(0)
MgOH+	7.810e-10	7.482e-10	-9.107	-9.126	-0.019	(0)
MgH2BO3+	1.746e-12	1.669e-12	-11.758	-11.778	-0.020	(0)
Mn (2)	9.865e-07					
Mn+2	9.512e-07	7.897e-07	-6.022	-6.103	-0.081	(0)
MnSO4	2.784e-08	2.784e-08	-7.555	-7.555	0.000	(0)
MnHCO3+	6.438e-09	6.163e-09	-8.191	-8.210	-0.019	(0)
MnF+	9.976e-10	9.550e-10	-9.001	-9.020	-0.019	(0)
MnOH+	5.898e-11	5.646e-11	-10.229	-10.248	-0.019	(0)
MnCl+	3.720e-11	3.561e-11	-10.429	-10.448	-0.019	(0)
MnCl2	1.802e-15	1.802e-15	-14.744	-14.744	0.000	(0)
MnNO3+	1.516e-16	1.447e-16	-15.819	-15.840	-0.020	(0)
MnSeO4	7.797e-17	7.797e-17	-16.108	-16.108	0.000	(0)
MnCl3-	1.857e-20	1.778e-20	-19.731	-19.750	-0.019	(0)
Mn (OH) 3-	2.953e-22	2.827e-22	-21.530	-21.549	-0.019	(0)

Mn (NO3) 2	4.202e-26	4.202e-26	-25.377	-25.377	0.000	(0)
Mn (OH) 4-2	3.094e-29	2.598e-29	-28.510	-28.585	-0.076	(0)
MnSe	0.000e+00	0.000e+00	-46.373	-46.373	0.000	(0)
Mn (3)	1.664e-25					
Mn+3	1.664e-25	1.118e-25	-24.779	-24.952	-0.173	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.835	-46.910	-0.076	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.762	-49.782	-0.019	(0)
Mo	3.811e-08					
MoO4-2	3.787e-08	3.174e-08	-7.422	-7.498	-0.077	(0)
HMoO4-	2.340e-10	2.234e-10	-9.631	-9.651	-0.020	(0)
H2MoO4	5.788e-13	5.788e-13	-12.237	-12.237	0.000	(0)
AlMo6O21-3	3.646e-39	2.398e-39	-38.438	-38.620	-0.182	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.382	-51.110	-0.727	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.669	-51.174	-0.505	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.520	-52.843	-0.323	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.867	-56.048	-0.182	(0)
N (-3)	4.373e-08					
NH4+	4.357e-08	4.165e-08	-7.361	-7.380	-0.020	(0)
NH4SO4-	9.243e-11	8.848e-11	-10.034	-10.053	-0.019	(0)
NH3	6.713e-11	6.713e-11	-10.173	-10.173	0.000	(0)
CuNH3+2	1.179e-12	9.786e-13	-11.929	-12.009	-0.081	(0)
CaNH3+2	2.551e-14	2.118e-14	-13.593	-13.674	-0.081	(0)
BaNH3+2	5.682e-18	4.718e-18	-17.245	-17.326	-0.081	(0)
Co (NH3) +2	9.998e-20	8.301e-20	-19.000	-19.081	-0.081	(0)
NiNH3+2	7.227e-20	6.000e-20	-19.141	-19.222	-0.081	(0)
HgNH3+2	2.349e-21	1.950e-21	-20.629	-20.710	-0.081	(0)
Hg (NH3) 2+2	1.577e-22	1.309e-22	-21.802	-21.883	-0.081	(0)
Ca (NH3) 2+2	6.818e-25	5.660e-25	-24.166	-24.247	-0.081	(0)
Ni (NH3) 2+2	7.013e-28	5.822e-28	-27.154	-27.235	-0.081	(0)
Co (NH3) 2+2	2.863e-28	2.377e-28	-27.543	-27.624	-0.081	(0)
Hg (NH3) 3+2	4.215e-32	3.499e-32	-31.375	-31.456	-0.081	(0)
Co (NH3) 3+2	2.420e-37	2.009e-37	-36.616	-36.697	-0.081	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.648	-40.729	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.069	-46.150	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.741	-52.822	-0.081	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.022	-56.103	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.640	-62.822	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.856	-63.937	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.085	-66.165	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.137	-75.157	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.644	-79.725	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.744	-80.825	-0.081	(0)
N (3)	5.598e-08					
NO2-	5.598e-08	5.353e-08	-7.252	-7.271	-0.019	(0)
CuNO2+	8.365e-12	7.985e-12	-11.078	-11.098	-0.020	(0)
Cu (NO2) 2	4.373e-18	4.373e-18	-17.359	-17.359	0.000	(0)
CoNO2+	4.064e-18	3.879e-18	-17.391	-17.411	-0.020	(0)
N (5)	1.209e-10					
NO3-	1.208e-10	1.156e-10	-9.918	-9.937	-0.019	(0)
CaNO3+	9.598e-14	9.162e-14	-13.018	-13.038	-0.020	(0)
CuNO3+	5.456e-16	5.208e-16	-15.263	-15.283	-0.020	(0)
MnNO3+	1.516e-16	1.447e-16	-15.819	-15.840	-0.020	(0)
BaNO3+	6.761e-17	6.454e-17	-16.170	-16.190	-0.020	(0)
ZnNO3+	2.792e-17	2.665e-17	-16.554	-16.574	-0.020	(0)
PbNO3+	3.260e-18	3.112e-18	-17.487	-17.507	-0.020	(0)
CdNO3+	3.587e-19	3.424e-19	-18.445	-18.465	-0.020	(0)
UO2NO3+	6.174e-21	5.894e-21	-20.209	-20.230	-0.020	(0)
CoNO3+	1.974e-21	1.885e-21	-20.705	-20.725	-0.020	(0)
NiNO3+	5.063e-22	4.833e-22	-21.296	-21.316	-0.020	(0)
VO2NO3	1.297e-24	1.297e-24	-23.887	-23.887	0.000	(0)
FeNO3+2	2.957e-25	2.455e-25	-24.529	-24.610	-0.081	(0)
Mn (NO3) 2	4.202e-26	4.202e-26	-25.377	-25.377	0.000	(0)
CrNO3+2	1.003e-26	8.328e-27	-25.999	-26.079	-0.081	(0)
Cu (NO3) 2	7.581e-27	7.581e-27	-26.120	-26.120	0.000	(0)
Zn (NO3) 2	6.147e-28	6.147e-28	-27.211	-27.211	0.000	(0)
Pb (NO3) 2	6.110e-28	6.110e-28	-27.214	-27.214	0.000	(0)

	Cd(NO3)2	1.984e-29	1.984e-29	-28.702	-28.702	0.000	(0)
	HgNO3+	2.059e-30	1.966e-30	-29.686	-29.706	-0.020	(0)
	Co(NO3)2	4.433e-31	4.433e-31	-30.353	-30.353	0.000	(0)
	Hg(NO3)2	0.000e+00	0.000e+00	-40.025	-40.025	0.000	(0)
Na		1.198e-04					
	Na+	1.196e-04	1.145e-04	-3.922	-3.941	-0.019	(0)
	NaSO4-	1.273e-07	1.219e-07	-6.895	-6.914	-0.019	(0)
	NaHCO3	2.518e-08	2.518e-08	-7.599	-7.599	0.000	(0)
	NaF	2.194e-09	2.194e-09	-8.659	-8.659	0.000	(0)
	NaCO3-	1.154e-10	1.105e-10	-9.938	-9.957	-0.019	(0)
	NaH2BO3	1.322e-13	1.322e-13	-12.879	-12.879	0.000	(0)
	NaCrO4-	1.447e-24	1.381e-24	-23.840	-23.860	-0.020	(0)
Ni		2.141e-12					
	Ni+2	1.986e-12	1.664e-12	-11.702	-11.779	-0.077	(0)
	NiHCO3+	8.408e-14	8.026e-14	-13.075	-13.096	-0.020	(0)
	NiSO4	6.584e-14	6.584e-14	-13.182	-13.182	0.000	(0)
	NiCO3	3.219e-15	3.219e-15	-14.492	-14.492	0.000	(0)
	NiF+	1.330e-15	1.270e-15	-14.876	-14.896	-0.020	(0)
	NiOH+	6.248e-16	5.964e-16	-15.204	-15.224	-0.020	(0)
	NiCl+	1.598e-16	1.525e-16	-15.796	-15.817	-0.020	(0)
	Ni(OH)2	1.348e-18	1.348e-18	-17.870	-17.870	0.000	(0)
	Ni(SO4)2-2	5.207e-19	4.323e-19	-18.283	-18.364	-0.081	(0)
	NiNH3+2	7.227e-20	6.000e-20	-19.141	-19.222	-0.081	(0)
	NiNO3+	5.063e-22	4.833e-22	-21.296	-21.316	-0.020	(0)
	NiSeO4	2.856e-22	2.856e-22	-21.544	-21.544	0.000	(0)
	Ni(OH)3-	4.021e-23	3.838e-23	-22.396	-22.416	-0.020	(0)
	NiCl2	2.751e-23	2.751e-23	-22.560	-22.560	0.000	(0)
	Ni(NH3)2+2	7.013e-28	5.822e-28	-27.154	-27.235	-0.081	(0)
O(0)		1.302e-34					
	O2	6.511e-35	6.513e-35	-34.186	-34.186	0.000	(0)
Pb		3.330e-09					
	Pb+2	2.172e-09	1.820e-09	-8.663	-8.740	-0.077	(0)
	PbHCO3+	5.541e-10	5.290e-10	-9.256	-9.277	-0.020	(0)
	PbCO3	2.836e-10	2.836e-10	-9.547	-9.547	0.000	(0)
	PbSO4	1.767e-10	1.767e-10	-9.753	-9.753	0.000	(0)
	PbOH+	1.363e-10	1.301e-10	-9.865	-9.886	-0.020	(0)
	PbF+	4.081e-12	3.896e-12	-11.389	-11.409	-0.020	(0)
	PbCl+	2.423e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
	Pb(SO4)2-2	2.543e-13	2.111e-13	-12.595	-12.675	-0.081	(0)
	Pb(OH)2	1.171e-13	1.171e-13	-12.931	-12.931	0.000	(0)
	Pb(CO3)2-2	5.107e-14	4.240e-14	-13.292	-13.373	-0.081	(0)
	PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
	PbCl2	3.701e-16	3.701e-16	-15.432	-15.432	0.000	(0)
	Pb2OH+3	5.705e-18	3.753e-18	-17.244	-17.426	-0.182	(0)
	Pb(OH)3-	3.493e-18	3.334e-18	-17.457	-17.477	-0.020	(0)
	PbNO3+	3.260e-18	3.112e-18	-17.487	-17.507	-0.020	(0)
	PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
	PbCl3-	5.529e-21	5.278e-21	-20.257	-20.278	-0.020	(0)
	Pb(OH)4-2	2.799e-23	2.324e-23	-22.553	-22.634	-0.081	(0)
	PbF4-2	2.350e-24	1.951e-24	-23.629	-23.710	-0.081	(0)
	Pb3(OH)4+2	6.000e-25	4.982e-25	-24.222	-24.303	-0.081	(0)
	PbCl4-2	1.041e-25	8.642e-26	-24.983	-25.063	-0.081	(0)
	Pb(NO3)2	6.110e-28	6.110e-28	-27.214	-27.214	0.000	(0)
	Pb4(OH)4+4	1.516e-29	7.202e-30	-28.819	-29.143	-0.323	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-153.694	-153.694	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-232.485	-232.505	-0.020	(0)
S(-2)		0.000e+00					
	H2S	0.000e+00	0.000e+00	-79.543	-79.543	0.000	(0)
	HS-	0.000e+00	0.000e+00	-80.092	-80.112	-0.020	(0)
	CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
	S5-2	0.000e+00	0.000e+00	-82.945	-83.026	-0.081	(0)
	S6-2	0.000e+00	0.000e+00	-83.461	-83.542	-0.081	(0)
	S4-2	0.000e+00	0.000e+00	-83.541	-83.621	-0.081	(0)
	S3-2	0.000e+00	0.000e+00	-84.346	-84.427	-0.081	(0)
	S2-2	0.000e+00	0.000e+00	-85.363	-85.443	-0.081	(0)
	S-2	0.000e+00	0.000e+00	-90.885	-90.961	-0.076	(0)
	HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)

HgS2-2	0.000e+00	0.000e+00	-143.357	-143.438	-0.081	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.448	-153.588	-0.140	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.694	-153.694	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.181	-154.318	-0.137	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.263	-220.283	-0.020	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.253	-231.273	-0.020	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.232	-232.252	-0.020	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.485	-232.505	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.470	-238.490	-0.020	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-310.087	-310.168	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.764	-312.845	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.672	-324.753	-0.081	(0)
S (6)	2.507e-04					
SO4-2	2.366e-04	1.983e-04	-3.626	-3.703	-0.077	(0)
CaSO4	1.138e-05	1.138e-05	-4.944	-4.944	0.000	(0)
MgSO4	2.382e-06	2.382e-06	-5.623	-5.623	0.000	(0)
NaSO4-	1.273e-07	1.219e-07	-6.895	-6.914	-0.019	(0)
KSO4-	9.358e-08	8.960e-08	-7.029	-7.048	-0.019	(0)
CuSO4	6.471e-08	6.471e-08	-7.189	-7.189	0.000	(0)
MnSO4	2.784e-08	2.784e-08	-7.555	-7.555	0.000	(0)
HSO4-	7.162e-09	6.854e-09	-8.145	-8.164	-0.019	(0)
ZnSO4	3.980e-09	3.980e-09	-8.400	-8.400	0.000	(0)
AlSO4+	1.960e-10	1.876e-10	-9.708	-9.727	-0.019	(0)
PbSO4	1.767e-10	1.767e-10	-9.753	-9.753	0.000	(0)
NH4SO4-	9.243e-11	8.848e-11	-10.034	-10.053	-0.019	(0)
CdSO4	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
FeSO4	3.511e-11	3.511e-11	-10.455	-10.455	0.000	(0)
Zn (SO4) 2-2	8.278e-12	6.873e-12	-11.082	-11.163	-0.081	(0)
UO2SO4	7.667e-12	7.667e-12	-11.115	-11.115	0.000	(0)
Al (SO4) 2-	4.164e-13	3.985e-13	-12.380	-12.400	-0.019	(0)
CoSO4	4.069e-13	4.069e-13	-12.391	-12.391	0.000	(0)
Pb (SO4) 2-2	2.543e-13	2.111e-13	-12.595	-12.675	-0.081	(0)
Cd (SO4) 2-2	1.402e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
NiSO4	6.584e-14	6.584e-14	-13.182	-13.182	0.000	(0)
CrOHSO4	4.828e-14	4.828e-14	-13.316	-13.316	0.000	(0)
UO2 (SO4) 2-2	2.414e-14	2.004e-14	-13.617	-13.698	-0.081	(0)
CrSO4+	7.993e-16	7.630e-16	-15.097	-15.117	-0.020	(0)
FeSO4+	4.935e-16	4.724e-16	-15.307	-15.326	-0.019	(0)
VO2SO4-	1.100e-16	1.050e-16	-15.959	-15.979	-0.020	(0)
VOSO4	3.826e-18	3.826e-18	-17.417	-17.417	0.000	(0)
Fe (SO4) 2-	2.098e-18	2.003e-18	-17.678	-17.698	-0.020	(0)
Ni (SO4) 2-2	5.207e-19	4.323e-19	-18.283	-18.364	-0.081	(0)
HgSO4	2.390e-21	2.390e-21	-20.622	-20.622	0.000	(0)
Cr2 (OH) 2SO4+2	5.395e-24	4.479e-24	-23.268	-23.349	-0.081	(0)
Cr2 (OH) 2 (SO4) 2	5.275e-26	5.275e-26	-25.278	-25.278	0.000	(0)
CrO3SO4-2	7.153e-29	5.938e-29	-28.146	-28.226	-0.081	(0)
VSO4+	1.347e-31	1.286e-31	-30.871	-30.891	-0.020	(0)
U (SO4) 2	8.144e-38	8.144e-38	-37.089	-37.089	0.000	(0)
USO4+2	6.229e-38	5.171e-38	-37.206	-37.286	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.137	-75.157	-0.020	(0)
Sb (3)	7.945e-21					
Sb (OH) 3	4.020e-21	4.020e-21	-20.396	-20.396	0.000	(0)
HSbo2	3.925e-21	3.925e-21	-20.406	-20.406	0.000	(0)
Sb (OH) 2F	6.749e-26	6.749e-26	-25.171	-25.171	0.000	(0)
SbOF	6.636e-26	6.636e-26	-25.178	-25.178	0.000	(0)
Sb (OH) 2+	3.618e-26	3.454e-26	-25.442	-25.462	-0.020	(0)
SbO2-	1.882e-26	1.797e-26	-25.725	-25.746	-0.020	(0)
SbO+	1.247e-26	1.191e-26	-25.904	-25.924	-0.020	(0)
Sb (OH) 4-	1.079e-26	1.030e-26	-25.967	-25.987	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.672	-324.753	-0.081	(0)
Sb (5)	4.005e-10					
SbO3-	4.001e-10	3.819e-10	-9.398	-9.418	-0.020	(0)
Sb (OH) 6-	4.669e-13	4.467e-13	-12.331	-12.350	-0.019	(0)

SbO2+	1.436e-23	1.371e-23	-22.843	-22.863	-0.020	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.316	-41.337	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.898	-43.898	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.373	-46.373	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.804	-49.885	-0.081	(0)
Se (4)	3.488e-09					
HSeO3-	3.443e-09	3.287e-09	-8.463	-8.483	-0.020	(0)
SeO3-2	4.455e-11	3.699e-11	-10.351	-10.432	-0.081	(0)
H2SeO3	4.960e-13	4.960e-13	-12.305	-12.305	0.000	(0)
FeHSeO3+2	2.222e-21	1.844e-21	-20.653	-20.734	-0.081	(0)
Cd (SeO3) 2-2	1.272e-24	1.056e-24	-23.896	-23.976	-0.081	(0)
Se (6)	4.379e-13					
SeO4-2	4.378e-13	3.669e-13	-12.359	-12.436	-0.077	(0)
MnSeO4	7.797e-17	7.797e-17	-16.108	-16.108	0.000	(0)
HSeO4-	6.814e-18	6.504e-18	-17.167	-17.187	-0.020	(0)
ZnSeO4	5.213e-18	5.213e-18	-17.283	-17.283	0.000	(0)
CdSeO4	6.398e-20	6.398e-20	-19.194	-19.194	0.000	(0)
CoSeO4	1.891e-21	1.891e-21	-20.723	-20.723	0.000	(0)
NiSeO4	2.856e-22	2.856e-22	-21.544	-21.544	0.000	(0)
Zn (SeO4) 2-2	2.336e-30	1.939e-30	-29.632	-29.712	-0.081	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.299	-55.481	-0.182	(0)
U (4)	9.530e-22					
U (OH) 5-	9.397e-22	8.970e-22	-21.027	-21.047	-0.020	(0)
U (OH) 4	1.329e-23	1.329e-23	-22.876	-22.876	0.000	(0)
U (OH) 3+	1.801e-26	1.719e-26	-25.745	-25.765	-0.020	(0)
U (OH) 2+2	3.386e-30	2.811e-30	-29.470	-29.551	-0.081	(0)
UF3+	7.659e-33	7.311e-33	-32.116	-32.136	-0.020	(0)
UF2+2	1.829e-33	1.519e-33	-32.738	-32.819	-0.081	(0)
UOH+3	7.120e-35	4.684e-35	-34.148	-34.329	-0.182	(0)
UF4	2.435e-35	2.435e-35	-34.613	-34.613	0.000	(0)
UF+3	6.036e-36	3.971e-36	-35.219	-35.401	-0.182	(0)
U (SO4) 2	8.144e-38	8.144e-38	-37.089	-37.089	0.000	(0)
USO4+2	6.229e-38	5.171e-38	-37.206	-37.286	-0.081	(0)
UF5-	3.071e-38	2.931e-38	-37.513	-37.533	-0.020	(0)
UF6-2	3.239e-40	2.689e-40	-39.490	-39.570	-0.081	(0)
U+4	1.379e-40	0.000e+00	-39.860	-40.184	-0.323	(0)
UCl+3	0.000e+00	0.000e+00	-42.748	-42.930	-0.182	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.851	-161.488	-1.636	(0)
U (5)	5.148e-15					
UO2+	5.148e-15	4.914e-15	-14.288	-14.309	-0.020	(0)
U (6)	1.213e-08					
UO2 (CO3) 2-2	6.569e-09	5.454e-09	-8.182	-8.263	-0.081	(0)
UO2CO3	5.273e-09	5.273e-09	-8.278	-8.278	0.000	(0)
UO2F+	1.122e-10	1.071e-10	-9.950	-9.970	-0.020	(0)
UO2OH+	9.591e-11	9.155e-11	-10.018	-10.038	-0.020	(0)
UO2+2	3.049e-11	2.555e-11	-10.516	-10.593	-0.077	(0)
UO2 (CO3) 3-4	2.983e-11	1.417e-11	-10.525	-10.849	-0.323	(0)
UO2F2	9.386e-12	9.386e-12	-11.028	-11.028	0.000	(0)
UO2SO4	7.667e-12	7.667e-12	-11.115	-11.115	0.000	(0)
UO2F3-	7.503e-14	7.162e-14	-13.125	-13.145	-0.020	(0)
UO2 (SO4) 2-2	2.414e-14	2.004e-14	-13.617	-13.698	-0.081	(0)
(UO2) 2 (OH) 2+2	1.676e-14	1.391e-14	-13.776	-13.857	-0.081	(0)
UO2Cl+	1.555e-15	1.484e-15	-14.808	-14.828	-0.020	(0)
(UO2) 3 (OH) 5+	8.200e-16	7.827e-16	-15.086	-15.106	-0.020	(0)
UO2F4-2	2.081e-17	1.728e-17	-16.682	-16.762	-0.081	(0)
UO2NO3+	6.174e-21	5.894e-21	-20.209	-20.230	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.592	-40.673	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.688	-40.709	-0.020	(0)
V (3)	2.556e-14					
V (OH) 3	2.556e-14	2.556e-14	-13.592	-13.592	0.000	(0)
V (OH) 2+	6.120e-24	5.842e-24	-23.213	-23.233	-0.020	(0)
VOH+2	2.361e-26	1.960e-26	-25.627	-25.708	-0.081	(0)
V+3	2.088e-30	1.374e-30	-29.680	-29.862	-0.182	(0)
VSO4+	1.347e-31	1.286e-31	-30.871	-30.891	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.292	-50.615	-0.323	(0)

V2(OH) 3+3	0.000e+00	0.000e+00	-50.307	-50.489	-0.182	(0)
V(4)	5.186e-16					
V(OH) 3+	4.169e-16	3.979e-16	-15.380	-15.400	-0.020	(0)
VO+2	8.440e-17	7.007e-17	-16.074	-16.154	-0.081	(0)
VOF+	1.337e-17	1.277e-17	-16.874	-16.894	-0.020	(0)
VOSO4	3.826e-18	3.826e-18	-17.417	-17.417	0.000	(0)
VOF2	1.454e-19	1.454e-19	-18.837	-18.837	0.000	(0)
VOC1+	7.376e-21	7.041e-21	-20.132	-20.152	-0.020	(0)
VOF3-	1.642e-22	1.567e-22	-21.785	-21.805	-0.020	(0)
VOF4-2	2.315e-26	1.922e-26	-25.636	-25.716	-0.081	(0)
H2V2O4+2	9.559e-27	7.936e-27	-26.020	-26.100	-0.081	(0)
V(5)	9.418e-09					
H2VO4-	9.307e-09	8.884e-09	-8.031	-8.051	-0.020	(0)
HVO4-2	7.598e-11	6.308e-11	-10.119	-10.200	-0.081	(0)
H3VO4	3.143e-11	3.143e-11	-10.503	-10.503	0.000	(0)
H3V2O7-	1.889e-12	1.803e-12	-11.724	-11.744	-0.020	(0)
VO2+	2.319e-14	2.218e-14	-13.635	-13.654	-0.019	(0)
VO2F	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
HV2O7-3	2.886e-16	1.899e-16	-15.540	-15.721	-0.182	(0)
VO2SO4-	1.100e-16	1.050e-16	-15.959	-15.979	-0.020	(0)
VO2F2-	1.366e-17	1.303e-17	-16.865	-16.885	-0.020	(0)
VO4-3	1.358e-18	8.937e-19	-17.867	-18.049	-0.182	(0)
V3O9-3	1.116e-18	7.342e-19	-17.952	-18.134	-0.182	(0)
V2O7-4	3.041e-20	1.445e-20	-19.517	-19.840	-0.323	(0)
VO2F3-2	5.949e-21	4.939e-21	-20.226	-20.306	-0.081	(0)
V4O12-4	5.724e-24	2.719e-24	-23.242	-23.566	-0.323	(0)
VO2NO3	1.297e-24	1.297e-24	-23.887	-23.887	0.000	(0)
VO2F4-3	1.122e-25	7.382e-26	-24.950	-25.132	-0.182	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.173	-55.678	-0.505	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.598	-56.922	-0.323	(0)
V10O28-6	0.000e+00	0.000e+00	-56.686	-57.413	-0.727	(0)
Zn	1.153e-07					
Zn+2	1.095e-07	9.176e-08	-6.961	-7.037	-0.077	(0)
ZnSO4	3.980e-09	3.980e-09	-8.400	-8.400	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
ZnCO3	2.737e-10	2.737e-10	-9.563	-9.563	0.000	(0)
ZnOH+	2.736e-10	2.612e-10	-9.563	-9.583	-0.020	(0)
ZnF+	5.826e-11	5.561e-11	-10.235	-10.255	-0.020	(0)
ZnCl+	8.629e-12	8.256e-12	-11.064	-11.083	-0.019	(0)
Zn(SO4) 2-2	8.278e-12	6.873e-12	-11.082	-11.163	-0.081	(0)
Zn(OH) 2	1.178e-12	1.178e-12	-11.929	-11.929	0.000	(0)
ZnOHCl	3.077e-13	3.077e-13	-12.512	-12.512	0.000	(0)
ZnCl2	4.687e-16	4.687e-16	-15.329	-15.329	0.000	(0)
Zn(OH) 3-	1.761e-16	1.681e-16	-15.754	-15.774	-0.020	(0)
ZnNO3+	2.792e-17	2.665e-17	-16.554	-16.574	-0.020	(0)
ZnSeO4	5.213e-18	5.213e-18	-17.283	-17.283	0.000	(0)
ZnCl3-	1.394e-20	1.334e-20	-19.856	-19.875	-0.019	(0)
Zn(OH) 4-2	2.294e-22	1.905e-22	-21.639	-21.720	-0.081	(0)
ZnCl4-2	2.845e-25	2.389e-25	-24.546	-24.622	-0.076	(0)
Zn(NO3) 2	6.147e-28	6.147e-28	-27.211	-27.211	0.000	(0)
Zn(SeO4) 2-2	2.336e-30	1.939e-30	-29.632	-29.712	-0.081	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.253	-231.273	-0.020	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.764	-312.845	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-72.14	-65.85	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-59.38	-54.87	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-66.60	-54.87	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-90.21	-72.27	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-75.83	-55.80	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-35.78	-35.38	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.65	-27.20	0.45	(NH4)2SeO4

Al(OH)3(am)	-1.36	9.44	10.80	Al(OH)3
Al2(MoO4)3	-44.69	-42.32	2.37	Al2(MoO4)3
Al2O3	-0.77	18.88	19.65	Al2O3
Al4(OH)10SO4	-1.55	21.15	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-9.07	-4.27	4.80	AlAsO4·2H2O
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4
AlSb	-154.29	-88.67	65.62	AlSb
Alunite	-1.23	-2.63	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.65	-12.44	-7.79	PbSO4
Anhydrite	-2.94	-7.30	-4.36	CaSO4
Anilite	-57.73	-89.61	-31.88	Cu0.25Cu1.5S
Antlerite	-4.22	4.56	8.79	Cu3(OH)4SO4
Aragonite	-2.59	-10.89	-8.30	CaCO3
Arsenolite	-80.10	-82.86	-2.76	As4O6
Artinite	-12.34	-2.74	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-34.12	-27.42	6.71	As2O5
Atacamite	-4.18	3.22	7.39	Cu2(OH)3Cl
Azurite	-2.30	-19.21	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-18.44	5.95	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-18.38	-2.51	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.66	-9.57	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-29.50	3.44	32.94	Ba3(VO4)2·4H2O
BaCrO4	-17.90	-27.57	-9.67	BaCrO4
BaF2	-10.17	-15.99	-5.82	BaF2
BaMoO4	-7.49	-14.45	-6.96	BaMoO4
Barite	-0.68	-10.66	-9.98	BaSO4
BaS	-96.79	-80.61	16.18	BaS
BaSeO3	-10.82	-8.99	1.83	BaSeO3
BaSeO4	-11.93	-19.39	-7.46	BaSeO4
Bianchite	-8.98	-10.74	-1.76	ZnSO4·6H2O
Birnessite	-10.74	7.35	18.09	MnO2
Bixbyite	-10.55	-11.20	-0.64	Mn2O3
BlaubleiI	-56.69	-80.85	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.62	-84.89	-27.28	Cu0.6Cu0.8S
Boehmite	0.86	9.44	8.58	AlOOH
Breithauptite	-65.51	-84.03	-18.52	NiSb
Brochantite	-3.60	11.62	15.22	Cu4(OH)6SO4
Brucite	-8.12	8.72	16.84	Mg(OH)2
Bunsenite	-11.32	1.12	12.45	NiO
Ca(VO3)2	-10.76	-5.10	5.66	Ca(VO3)2
Ca2V2O7	-13.30	4.20	17.50	Ca2V2O7
Ca2V2O7·2H2O	-17.35	4.20	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-21.81	0.49	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-25.46	13.50	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-26.36	13.50	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-311.29	-168.31	142.97	Ca3Sb2
CaCrO4	-21.95	-24.22	-2.27	CaCrO4
Calcite	-2.41	-10.89	-8.48	CaCO3
Calomel	-11.86	-29.77	-17.91	Hg2Cl2
CaMoO4	-3.15	-11.10	-7.95	CaMoO4
Carnotite	-2.87	-2.64	0.23	KUO2VO4
CaSeO3·2H2O	-8.45	-5.63	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-13.02	-16.04	-3.02	CaSeO4·2H2O
Cd(BO2)2	-18.67	-8.83	9.84	Cd(BO2)2
Cd(OH)2	-9.77	3.87	13.64	Cd(OH)2
Cd(OH)2(am)	-9.86	3.87	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.30	-21.59	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.54	-4.98	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.51	-1.11	28.40	Cd4(OH)6SO4
CdCl2	-17.26	-17.92	-0.66	CdCl2
CdCl2·1H2O	-16.23	-17.92	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-16.01	-17.92	-1.91	CdCl2·2.5H2O
CdF2	-16.85	-18.06	-1.21	CdF2
Cdmetal(alpha)	-35.54	-22.03	13.51	Cd
Cdmetal(gamma)	-35.65	-22.03	13.62	Cd
CdMoO4	-2.38	-16.53	-14.15	CdMoO4
CdOHCl	-10.56	-7.02	3.54	CdOHCl
CdSb	-80.93	-81.28	-0.35	CdSb

CdSe	-23.71	-43.91	-20.20	CdSe
CdSeO4:2H2O	-19.61	-21.46	-1.85	CdSeO4:2H2O
CdSO4	-12.56	-12.73	-0.17	CdSO4
CdSO4:1H2O	-11.01	-12.73	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.86	-12.73	-1.87	CdSO4:2.67H2O
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4 (g)	-82.76	-123.81	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-58.05	-92.97	-34.92	Cu2S
Chalcopyrite	-127.04	-162.31	-35.27	CuFeS2
Cinnabar	-53.50	-99.19	-45.69	HgS
Claudetite	-79.80	-82.86	-3.06	As4O6
Clausthalite	-16.53	-43.63	-27.10	PbSe
Co (BO2) 2	-37.86	-10.79	27.07	Co (BO2) 2
Co (OH) 2	-11.18	1.91	13.09	Co (OH) 2
Co (OH) 3	-15.22	-17.53	-2.31	Co (OH) 3
CO2 (g)	-2.04	-20.19	-18.15	CO2
Co3 (AsO4) 2	-34.71	-21.67	13.03	Co3 (AsO4) 2
Co3O4	-22.66	-33.15	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.43	-20.02	-1.60	CoF2
CoF3	-48.98	-50.44	-1.46	CoF3
CoFe2O4	12.80	9.28	-3.53	CoFe2O4
CoMoO4	-10.73	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS (alpha)	-77.21	-84.65	-7.44	CoS
CoS (beta)	-73.58	-84.65	-11.07	CoS
CoSe	-29.67	-45.87	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.89	-23.42	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.21	-79.51	-22.30	CuS
Cr (OH) 2	-25.82	-15.00	10.82	Cr (OH) 2
Cr (OH) 3	-6.33	-5.00	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-4.25	-5.00	-0.75	Cr (OH) 3
Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.89	-36.80	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.39	-40.91	30.48	Cr
CrO3	-30.31	-33.52	-3.21	CrO3
Cryolite	-15.00	-48.84	-33.84	Na3AlF6
Cu (OH) 2	-1.62	7.06	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.14	18.07	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.53	-2.28	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.38	-94.26	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.40	-54.20	-45.80	Cu2Se
Cu2SO4	-21.07	-23.02	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.13	-107.73	-42.59	Cu3Sb
Cu3Se2	-31.44	-94.93	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.02	-26.46	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.40	-16.16	-8.76	Cu
CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-5.01	-6.41	-1.41	Cu2O
Cuprousferrite	9.39	0.48	-8.92	CuFeO2
CuSe	-7.63	-40.73	-33.10	CuSe
CuSe2	-29.25	-62.62	-33.37	CuSe2

CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.84	-18.28	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.17	-92.09	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.81	-22.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.26	-22.35	-17.09	CaMg(CO3)2
Epsomite	-5.76	-7.88	-2.13	MgSO4:7H2O
Fe(OH)2	-9.80	3.76	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.45	0.41	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.92	-10.64	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.13	-7.57	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.82	-37.44	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.72	-42.45	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.10	11.12	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.44	-6.24	7.20	FeCr2O4
FeMoO4	-6.55	-16.64	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe(OH)3
Ferroselite	-47.31	-65.91	-18.60	FeSe2
FeS(ppt)	-79.85	-82.80	-2.95	FeS
FeSe	-33.03	-44.03	-11.00	FeSe
Fix_pe	-6.50	-6.50	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF2
Galena	-68.43	-82.40	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al(OH)3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4:7H2O
Greenockite	-68.33	-82.69	-14.36	CdS
Greigite	-290.09	-335.13	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.69	-7.30	-4.61	CaSO4:2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.52	-20.40	-12.88	H2MoO4
H2S(g)	-78.55	-86.56	-8.01	H2S
H2Se(g)	-42.83	-47.79	-4.96	H2Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.73	46.30	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3)2(g)	-186.53	-260.24	-73.71	Hg(CH3)2
Hg(g)	-9.07	-16.94	-7.87	Hg
Hg(OH)2	-9.13	-12.63	-3.50	Hg(OH)2
Hg2(g)	-18.92	-33.88	-14.96	Hg2
Hg2(OH)2	-13.24	-7.98	5.26	Hg2(OH)2
Hg2CO3	-12.11	-28.16	-16.05	Hg2CO3
Hg2CrO4	-32.79	-41.49	-8.70	Hg2CrO4
Hg2F2	-19.55	-29.91	-10.36	Hg2F2
Hg2S	-82.86	-94.54	-11.68	Hg2S
Hg2SeO3	-18.25	-22.91	-4.66	Hg2SeO3
Hg2SO4	-18.45	-24.58	-6.13	Hg2SO4
Hg3O2CO3	-28.39	-58.07	-29.68	Hg3O2CO3
HgCl(g)	-34.38	-14.89	19.50	HgCl
HgCl2	-13.16	-34.42	-21.26	HgCl2
HgF(g)	-47.63	-14.96	32.68	HgF
HgF2(g)	-47.13	-34.57	12.57	HgF2
Hgmetal(l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.72	-60.42	-55.69	HgSe
HgSeO3	-15.13	-27.56	-12.43	HgSeO3
HgSO4	-19.81	-29.23	-9.42	HgSO4
Huntite	-15.32	-45.28	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.12	-27.89	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-28.37	-37.14	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.34	-21.51	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.11	-19.91	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-45.28	-62.52	-17.24	K2Cr2O7
K2CrO4	-28.49	-29.00	-0.51	K2CrO4
K2MoO4	-19.15	-15.89	3.26	K2MoO4

K2SeO4	-20.10	-20.83	-0.73	K2SeO4
Langite	-5.87	11.62	17.49	Cu4(OH)6SO4:H2O
Larnakite	-7.85	-8.28	-0.43	PbO:PbSO4
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.20	-82.80	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe2O3
Magnesioferrite	-0.78	16.08	16.86	Fe2MgO4
Magnesite	-4.01	-11.47	-7.46	MgCO3
Magnetite	7.72	11.12	3.40	Fe3O4
Malachite	-0.77	-6.08	-5.31	Cu2(OH)2CO3
Manganite	-5.59	19.75	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl2
Melanterite	-10.64	-12.84	-2.21	FeSO4:7H2O
Metacinnabar	-54.10	-99.19	-45.09	HgS
Mg(OH)2(active)	-10.07	8.72	18.79	Mg(OH)2
Mg(VO3)2	-16.96	-5.68	11.28	Mg(VO3)2
Mg2Sb3	-286.81	-212.12	74.68	Mg2Sb3
Mg2V2O7	-23.32	3.04	26.36	Mg2V2O7
MgCr2O4	-17.47	-1.27	16.20	MgCr2O4
MgCrO4	-30.18	-24.79	5.38	MgCrO4
MgF2	-5.09	-13.22	-8.13	MgF2
MgMoO4	-9.83	-11.68	-1.85	MgMoO4
MgSeO3:6H2O	-9.27	-6.21	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.42	-16.62	-1.20	MgSeO4:6H2O
Minium	-35.13	38.39	73.52	Pb3O4
Mirabilite	-10.47	-11.59	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.51	-7.61	4.90	Mn(VO3)2
Mn2(SO4)3	-55.30	-61.01	-5.71	Mn2(SO4)3
Mn2Sb	-158.54	-97.46	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-19.52	-7.02	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.71	-14.99	2.72	MnCl2:4H2O
MnS(grn)	-79.93	-79.76	0.17	MnS
MnS(pnk)	-83.10	-79.76	3.34	MnS
MnSb	-100.80	-103.71	-2.91	MnSb
MnSe	-44.49	-40.99	3.50	MnSe
MnSeO3	-9.26	-8.13	1.13	MnSeO3
MnSeO3:2H2O	-9.12	-8.13	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.49	-18.54	-2.05	MnSeO4:5H2O
MnSO4	-12.39	-9.81	2.58	MnSO4
Monteponite	-11.23	3.87	15.10	CdO
Montroydite	-8.99	-12.63	-3.64	HgO
MoO3	-12.40	-20.40	-8.00	MoO3
Morenosite	-13.34	-15.48	-2.14	NiSO4:7H2O
MoS2	-149.17	-219.43	-70.26	MoS2
Na-Jarosite	-8.46	-19.66	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-52.12	-62.01	-9.90	Na2Cr2O7
Na2CrO4	-31.43	-28.50	2.93	Na2CrO4
Na2Mo2O7	-19.19	-35.78	-16.60	Na2Mo2O7
Na2MoO4	-16.87	-15.38	1.49	Na2MoO4
Na2MoO4:2H2O	-16.61	-15.38	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.21	-9.91	10.30	Na2SeO3:5H2O
Na2SeO4	-21.60	-20.32	1.28	Na2SeO4
Na3Sb	-185.03	-90.58	94.45	Na3Sb
Na3VO4	-36.35	0.33	36.68	Na3VO4
Na4V2O7	-41.77	-4.37	37.40	Na4V2O7
Nantokite	-7.37	-14.10	-6.73	CuCl
NaSb	-92.86	-69.69	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na2CO3:10H2O
NaVO3	-8.55	-4.69	3.86	NaVO3
Nesquehonite	-6.80	-11.47	-4.67	MgCO3:3H2O
Ni(OH)2	-11.67	1.12	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-39.75	-24.05	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-44.11	-12.11	32.00	Ni4(OH)6SO4

NiCO3	-12.19	-19.06	-6.87	NiCO3
NiMoO4	-8.14	-19.28	-11.14	NiMoO4
NiS (alpha)	-79.84	-85.44	-5.60	NiS
NiS (beta)	-74.34	-85.44	-11.10	NiS
NiS (gamma)	-72.64	-85.44	-12.80	NiS
NiSe	-28.96	-46.66	-17.70	NiSe
NiSeO3:2H2O	-16.63	-13.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-22.69	-24.21	-1.52	NiSeO4:6H2O
Nsutite	-10.15	7.35	17.50	MnO2
O2 (g)	-31.28	51.81	83.09	O2
Orpiment	-240.05	-301.12	-61.07	As2S3
Otavite	-4.31	-16.31	-12.00	CdCO3
Pb (BO2) 2	-15.06	-8.54	6.52	Pb (BO2) 2
Pb (OH) 2	-3.99	4.16	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-70.74	-79.50	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-11.36	-2.57	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-17.86	8.33	26.19	Pb2O (OH) 2
Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.30	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.73	-14.93	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-8.06	-1.92	6.14	Pb3 (VO4) 2
Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.12	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-21.05	0.05	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-21.83	0.05	21.88	Pb4O3SO4
PbCrO4	-16.75	-29.35	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.34	-21.18	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.53	30.07	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca (OH) 2
Pyrite	-124.95	-143.46	-18.51	FeS2
Pyrochroite	-8.39	6.80	15.19	Mn (OH) 2
Pyrolusite	-8.68	32.70	41.38	MnO2
Realgar	-100.48	-120.23	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb (OH) 3	-13.29	-20.40	-7.11	Sb (OH) 3
Sb2O4	-18.29	-14.89	3.40	Sb2O4
Sb2O5	-27.94	-37.60	-9.67	Sb2O5
Sb2Se3	-116.40	-184.16	-67.76	Sb2Se3
Sb4O6 (cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6 (orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.66	-53.09	0.57	SbCl3
SbF3	-43.08	-53.30	-10.23	SbF3
Sbmetal	-47.56	-59.25	-11.69	Sb
SbO2	-3.93	-31.75	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.77	-21.88	-7.11	Se
Semetal (hex)	-14.18	-21.88	-7.71	Se
Senarmontite	-28.43	-40.79	-12.37	Sb2O3
SeO2	-15.06	-14.93	0.12	SeO2
SeO3	-46.38	-25.34	21.04	SeO3
Siderite	-6.19	-16.43	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3
Sphalerite	-69.25	-80.70	-11.45	ZnS
Spinel	-9.25	27.60	36.85	MgAl2O4
Stibnite	-250.02	-300.48	-50.46	Sb2S3
Sulfur	-58.51	-60.66	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na2SO4
Thermonatrite	-15.81	-15.17	0.64	Na2CO3:H2O

Tyuyamunite	-4.56	-0.48	4.08	Ca(UO2)2(VO4)2
U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-587.95	-435.57	152.38	U3Sb4
U4O9	-28.59	-31.61	-3.02	U4O9
UF4	-28.72	-58.25	-29.54	UF4
UF4:2.5H2O	-25.54	-58.25	-32.72	UF4:2.5H2O
UO2(am)	-15.31	-14.38	0.93	UO2
UO2(NO3)2	-42.61	-30.47	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.32	-30.47	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.86	-30.47	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.51	-30.47	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.30	2.31	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.78	-23.03	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3
Uraninite	-9.71	-14.38	-4.67	UO2
USb2	-223.49	-193.91	29.58	USb2
V(OH)3	-18.10	-10.51	7.59	V(OH)3
V2O5	-13.05	-14.41	-1.36	V2O5
V3O5	-37.50	-35.66	1.84	V3O5
V4O7	-46.10	-38.91	7.19	V4O7
V6O13	-34.16	-95.02	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VC12	-64.13	-45.25	18.87	VC12
VC13	-66.63	-43.20	23.43	VC13
VF4	-62.06	-47.13	14.93	VF4
Vmetal	-93.39	-49.36	44.03	V
VO	-38.22	-23.46	14.76	VO
VO(OH)2	-8.40	-3.25	5.15	VO(OH)2
VO2Cl	-20.94	-18.10	2.84	VO2Cl
VOC1	-32.56	-21.41	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO4	-23.47	-19.86	3.61	VOSO4
Witherite	-5.67	-14.24	-8.57	BaCO3
Wurtzite	-71.75	-80.70	-8.95	ZnS
Zincite	-5.47	5.87	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO4
Zn(BO2)2	-15.13	-6.84	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-30.23	-26.91	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-6.33	5.87	12.20	Zn(OH)2
Zn(OH)2(am)	-6.61	5.87	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.89	5.87	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.67	5.87	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.87	5.87	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.37	-4.87	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.36	0.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.47	-9.82	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.53	-15.62	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.54	6.86	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.97	7.53	38.50	Zn5(OH)8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.83	-20.04	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO(active)	-5.32	5.87	11.19	ZnO
ZnS(am)	-71.65	-80.70	-9.05	ZnS
ZnSb	-90.31	-79.29	11.01	ZnSb
ZnSe	-27.52	-41.92	-14.40	ZnSe
ZnSeO4:6H2O	-17.95	-19.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 89.

REACTION 502
H2O -1
12498.2 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 505
SAVE Solution 506
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 505. Solution after simulation 88.
Using reaction 502.

Reaction 502.

1.250e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.224e-04	2.224e-04
As	1.023e-07	1.023e-07
B	1.005e-04	1.005e-04
Ba	3.016e-05	3.016e-05
C	1.634e-01	1.634e-01
Ca	7.066e-02	7.067e-02
Cd	2.640e-07	2.640e-07
Cl	8.467e-03	8.468e-03
Co	2.974e-09	2.974e-09
Cr	1.144e-09	1.144e-09
Cu	5.372e-04	5.373e-04
F	7.598e-03	7.598e-03
Fe	1.071e-05	1.071e-05
Hg	9.645e-09	9.646e-09
K	1.511e-02	1.511e-02
Mg	1.847e-02	1.848e-02
Mn	2.231e-04	2.231e-04
Mo	8.617e-06	8.618e-06
N	2.258e-05	2.258e-05
Na	2.709e-02	2.709e-02
Ni	4.843e-10	4.843e-10
Pb	7.530e-07	7.531e-07
S	5.669e-02	5.670e-02
Sb	9.058e-08	9.059e-08
Se	7.889e-07	7.890e-07
U	2.743e-06	2.743e-06
V	2.130e-06	2.130e-06
Zn	2.607e-05	2.608e-05

-----Description of solution-----

pH = 6.246 Charge balance
 pe = 6.786 Adjusted to redox
 equilibrium
 Activity of water = 0.995
 Ionic strength (mol/kgw) = 2.212e-01
 Mass of water (kg) = 1.000e+00
 Total alkalinity (eq/kg) = 9.331e-02
 Total CO2 (mol/kg) = 1.634e-01
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 2.673e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 33
 Total H = 1.112602e+02
 Total O = 5.623059e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	7.645e-07	5.677e-07	-6.117	-6.246	-0.129	0.00
OH-	2.525e-08	1.764e-08	-7.598	-7.753	-0.156	(0)
H2O	5.551e+01	9.946e-01	1.744	-0.002	0.000	18.07
Al	2.224e-04					
AlF4-	1.550e-04	1.119e-04	-3.810	-3.951	-0.141	(0)
AlF3	6.528e-05	6.528e-05	-4.185	-4.185	0.000	(0)
AlF2+	2.048e-06	1.516e-06	-5.689	-5.819	-0.131	(0)
AlF+2	3.711e-09	1.113e-09	-8.431	-8.954	-0.523	(0)
Al(OH)2+	1.087e-11	8.041e-12	-10.964	-11.095	-0.131	(0)
Al(OH)4-	8.707e-12	6.286e-12	-11.060	-11.202	-0.141	(0)
AlSO4+	3.058e-12	2.208e-12	-11.515	-11.656	-0.141	(0)
Al(OH)3	2.830e-12	2.830e-12	-11.548	-11.548	0.000	(0)
AlOH+2	1.914e-12	5.738e-13	-11.718	-12.241	-0.523	(0)
Al+3	4.741e-13	3.252e-14	-12.324	-13.488	-1.164	(0)
Al(SO4)2-	2.865e-13	2.068e-13	-12.543	-12.684	-0.141	(0)
AlMo6O21-3	4.884e-28	3.388e-30	-27.311	-29.470	-2.159	(0)
As (3)	1.983e-19					
H3AsO3	1.980e-19	1.980e-19	-18.703	-18.703	0.000	(0)
H2AsO3-	3.108e-22	1.789e-22	-21.507	-21.747	-0.240	(0)
H4AsO3+	9.676e-26	5.570e-26	-25.014	-25.254	-0.240	(0)
HAsO3-2	2.619e-27	2.874e-28	-26.582	-27.541	-0.960	(0)
AsO3-3	2.814e-33	1.952e-35	-32.551	-34.710	-2.159	(0)
As (5)	1.023e-07					
HAsO4-2	5.145e-08	5.648e-09	-7.289	-8.248	-0.960	(0)
H2AsO4-	5.080e-08	2.924e-08	-7.294	-7.534	-0.240	(0)
AsO4-3	4.536e-12	3.146e-14	-11.343	-13.502	-2.159	(0)
H3AsO4	2.741e-12	2.884e-12	-11.562	-11.540	0.022	(0)
B	1.005e-04					
H3BO3	1.000e-04	1.052e-04	-4.000	-3.978	0.022	(0)
BF(OH)3-	2.140e-07	1.436e-07	-6.670	-6.843	-0.173	(0)
H2BO3-	1.603e-07	1.077e-07	-6.795	-6.968	-0.173	(0)
CaH2BO3+	9.697e-08	6.510e-08	-7.013	-7.186	-0.173	(0)
BF2(OH)2-	4.467e-08	2.999e-08	-7.350	-7.523	-0.173	(0)
MgH2BO3+	1.653e-08	1.110e-08	-7.782	-7.955	-0.173	(0)
NaH2BO3	3.202e-09	3.202e-09	-8.495	-8.495	0.000	(0)
BaH2BO3+	3.740e-11	2.511e-11	-10.427	-10.600	-0.173	(0)
BF3OH-	3.393e-11	2.278e-11	-10.469	-10.642	-0.173	(0)
H5(BO3)2-	1.436e-11	9.641e-12	-10.843	-11.016	-0.173	(0)
BF4-	3.260e-13	2.189e-13	-12.487	-12.660	-0.173	(0)
H8(BO3)3-	1.511e-13	1.014e-13	-12.821	-12.994	-0.173	(0)
Ba	3.016e-05					
Ba+2	2.483e-05	7.547e-06	-4.605	-5.122	-0.517	(0)
BaHCO3+	5.310e-06	3.987e-06	-5.275	-5.399	-0.124	(0)
BaCO3	1.768e-08	1.768e-08	-7.752	-7.752	0.000	(0)
BaH2BO3+	3.740e-11	2.511e-11	-10.427	-10.600	-0.173	(0)
BaNO3+	1.798e-12	1.035e-12	-11.745	-11.985	-0.240	(0)

BaOH+	7.937e-13	5.812e-13	-12.100	-12.236	-0.135	(0)
BaNH3+2	2.593e-13	2.847e-14	-12.586	-13.546	-0.960	(0)
C (4)	1.634e-01					
HCO3-	7.475e-02	5.531e-02	-1.126	-1.257	-0.131	(0)
H2CO3	7.062e-02	7.062e-02	-1.151	-1.151	0.000	(0)
CaHCO3+	1.442e-02	1.082e-02	-1.841	-1.966	-0.124	(0)
MgHCO3+	2.368e-03	1.683e-03	-2.626	-2.774	-0.148	(0)
NaHCO3	5.837e-04	5.837e-04	-3.234	-3.234	0.000	(0)
CuCO3	3.460e-04	3.460e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.800e-05	4.490e-05	-4.108	-4.348	-0.240	(0)
CaCO3	7.609e-05	7.609e-05	-4.119	-4.119	0.000	(0)
Cu (CO3) 2-2	3.876e-05	4.255e-06	-4.412	-5.371	-0.960	(0)
MnHCO3+	2.719e-05	1.991e-05	-4.566	-4.701	-0.135	(0)
CO3-2	1.503e-05	4.568e-06	-4.823	-5.340	-0.517	(0)
MgCO3	1.130e-05	1.130e-05	-4.947	-4.947	0.000	(0)
ZnHCO3+	7.942e-06	4.571e-06	-5.100	-5.340	-0.240	(0)
BaHCO3+	5.310e-06	3.987e-06	-5.275	-5.399	-0.124	(0)
UO2 (CO3) 3-4	2.727e-06	3.960e-10	-5.564	-9.402	-3.838	(0)
NaCO3-	2.157e-06	1.596e-06	-5.666	-5.797	-0.131	(0)
ZnCO3	6.870e-07	6.870e-07	-6.163	-6.163	0.000	(0)
PbHCO3+	5.525e-07	3.180e-07	-6.258	-6.498	-0.240	(0)
FeHCO3+	1.339e-07	1.005e-07	-6.873	-6.998	-0.124	(0)
PbCO3	1.063e-07	1.063e-07	-6.974	-6.974	0.000	(0)
BaCO3	1.768e-08	1.768e-08	-7.752	-7.752	0.000	(0)
UO2 (CO3) 2-2	1.575e-08	1.729e-09	-7.803	-8.762	-0.960	(0)
Pb (CO3) 2-2	1.275e-08	1.400e-09	-7.894	-8.854	-0.960	(0)
CdHCO3+	6.402e-09	3.685e-09	-8.194	-8.434	-0.240	(0)
CdCO3	3.047e-09	3.047e-09	-8.516	-8.516	0.000	(0)
CoHCO3+	1.193e-09	6.867e-10	-8.923	-9.163	-0.240	(0)
NiHCO3+	3.329e-10	1.916e-10	-9.478	-9.718	-0.240	(0)
Cd (CO3) 2-2	9.399e-11	1.032e-11	-10.027	-10.986	-0.960	(0)
UO2CO3	1.897e-11	1.897e-11	-10.722	-10.722	0.000	(0)
CoCO3	1.232e-11	1.232e-11	-10.909	-10.909	0.000	(0)
HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
NiCO3	4.789e-12	4.789e-12	-11.320	-11.320	0.000	(0)
Hg (CO3) 2-2	1.419e-12	1.557e-13	-11.848	-12.808	-0.960	(0)
HgHCO3+	1.980e-13	1.139e-13	-12.703	-12.943	-0.240	(0)
Ca	7.066e-02					
Ca+2	3.458e-02	1.051e-02	-1.461	-1.978	-0.517	(0)
CaSO4	2.105e-02	2.105e-02	-1.677	-1.677	0.000	(0)
CaHCO3+	1.442e-02	1.082e-02	-1.841	-1.966	-0.124	(0)
CaF+	5.359e-04	3.924e-04	-3.271	-3.406	-0.135	(0)
CaCO3	7.609e-05	7.609e-05	-4.119	-4.119	0.000	(0)
CaH2BO3+	9.697e-08	6.510e-08	-7.013	-7.186	-0.173	(0)
CaOH+	4.927e-09	3.699e-09	-8.307	-8.432	-0.124	(0)
CaNO3+	1.580e-09	9.095e-10	-8.801	-9.041	-0.240	(0)
CaNH3+2	7.206e-10	7.911e-11	-9.142	-10.102	-0.960	(0)
Ca (NH3) 2+2	1.715e-18	1.883e-19	-17.766	-18.725	-0.960	(0)
Cd	2.640e-07					
Cd+2	9.627e-08	2.926e-08	-7.017	-7.534	-0.517	(0)
Cd (SO4) 2-2	6.445e-08	7.074e-09	-7.191	-8.150	-0.960	(0)
CdSO4	5.998e-08	5.998e-08	-7.222	-7.222	0.000	(0)
CdCl+	3.052e-08	1.757e-08	-7.515	-7.755	-0.240	(0)
CdHCO3+	6.402e-09	3.685e-09	-8.194	-8.434	-0.240	(0)
CdCO3	3.047e-09	3.047e-09	-8.516	-8.516	0.000	(0)
CdF+	2.757e-09	1.587e-09	-8.560	-8.800	-0.240	(0)
CdCl2	4.603e-10	4.603e-10	-9.337	-9.337	0.000	(0)
Cd (CO3) 2-2	9.399e-11	1.032e-11	-10.027	-10.986	-0.960	(0)
CdOHCl	1.271e-11	1.271e-11	-10.896	-10.896	0.000	(0)
CdF2	1.083e-11	1.083e-11	-10.965	-10.965	0.000	(0)
CdOH+	7.124e-12	4.101e-12	-11.147	-11.387	-0.240	(0)
CdCl3-	3.172e-12	1.826e-12	-11.499	-11.739	-0.240	(0)
CdNO3+	4.399e-15	2.532e-15	-14.357	-14.597	-0.240	(0)
Cd (OH) 2	4.564e-16	4.564e-16	-15.341	-15.341	0.000	(0)
CdSeO4	2.382e-16	2.382e-16	-15.623	-15.623	0.000	(0)
Cd2OH+3	8.670e-17	6.014e-19	-16.062	-18.221	-2.159	(0)
Cd (SeO3) 2-2	2.071e-18	2.274e-19	-17.684	-18.643	-0.960	(0)
Cd (OH) 3-	8.547e-22	4.920e-22	-21.068	-21.308	-0.240	(0)

	Cd(NO3)2	3.473e-23	3.473e-23	-22.459	-22.459	0.000	(0)
	Cd(OH)4-2	1.294e-29	1.421e-30	-28.888	-29.848	-0.960	(0)
	CdHS+	0.000e+00	0.000e+00	-78.175	-78.415	-0.240	(0)
	Cd(HS)2	0.000e+00	0.000e+00	-150.101	-150.101	0.000	(0)
	Cd(HS)3-	0.000e+00	0.000e+00	-226.850	-227.090	-0.240	(0)
	Cd(HS)4-2	0.000e+00	0.000e+00	-302.824	-303.784	-0.960	(0)
Cl		8.467e-03					
	Cl-	8.466e-03	6.286e-03	-2.072	-2.202	-0.129	(0)
	MnCl+	1.949e-07	1.427e-07	-6.710	-6.845	-0.135	(0)
	CuCl+	1.803e-07	1.282e-07	-6.744	-6.892	-0.148	(0)
	ZnCl+	5.806e-08	4.127e-08	-7.236	-7.384	-0.148	(0)
	CdCl+	3.052e-08	1.757e-08	-7.515	-7.755	-0.240	(0)
	CuCl2-	1.508e-08	1.072e-08	-7.822	-7.970	-0.148	(0)
	CuCl	8.163e-09	8.163e-09	-8.088	-8.088	0.000	(0)
	HgCl2	7.792e-09	7.792e-09	-8.108	-8.108	0.000	(0)
	PbCl+	2.998e-09	1.726e-09	-8.523	-8.763	-0.240	(0)
	MnCl2	1.267e-09	1.267e-09	-8.897	-8.897	0.000	(0)
	ZnOHC1	9.531e-10	9.531e-10	-9.021	-9.021	0.000	(0)
	HgCl3-	8.509e-10	4.898e-10	-9.070	-9.310	-0.240	(0)
	CdCl2	4.603e-10	4.603e-10	-9.337	-9.337	0.000	(0)
	ZnCl2	4.111e-10	4.111e-10	-9.386	-9.386	0.000	(0)
	HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
	CuCl2	2.794e-10	2.794e-10	-9.554	-9.554	0.000	(0)
	HgCl4-2	1.117e-10	1.226e-11	-9.952	-10.912	-0.960	(0)
	CuCl3-2	5.011e-11	1.441e-11	-10.300	-10.841	-0.541	(0)
	PbCl2	4.846e-11	4.846e-11	-10.315	-10.315	0.000	(0)
	CdOHC1	1.271e-11	1.271e-11	-10.896	-10.896	0.000	(0)
	CoCl+	6.029e-12	3.471e-12	-11.220	-11.460	-0.240	(0)
	CdCl3-	3.172e-12	1.826e-12	-11.499	-11.739	-0.240	(0)
	MnCl3-	2.997e-12	2.194e-12	-11.523	-11.659	-0.135	(0)
	ZnCl3-	2.888e-12	2.053e-12	-11.539	-11.688	-0.148	(0)
	NiCl+	7.851e-13	4.519e-13	-12.105	-12.345	-0.240	(0)
	HgCl+	4.297e-13	2.473e-13	-12.367	-12.607	-0.240	(0)
	PbCl3-	2.107e-13	1.213e-13	-12.676	-12.916	-0.240	(0)
	FeCl+2	5.409e-14	1.555e-14	-13.267	-13.808	-0.541	(0)
	CuCl3-	2.306e-14	1.639e-14	-13.637	-13.785	-0.148	(0)
	ZnCl4-2	2.244e-14	6.453e-15	-13.649	-14.190	-0.541	(0)
	CrCl+2	7.792e-15	8.553e-16	-14.108	-15.068	-0.960	(0)
	PbCl4-2	3.174e-15	3.484e-16	-14.498	-15.458	-0.960	(0)
	VOCl+	9.342e-16	5.377e-16	-15.030	-15.269	-0.240	(0)
	FeCl2+	5.963e-16	4.367e-16	-15.225	-15.360	-0.135	(0)
	UO2Cl+	1.848e-17	1.064e-17	-16.733	-16.973	-0.240	(0)
	NiCl2	1.430e-17	1.430e-17	-16.845	-16.845	0.000	(0)
	CrOHC12	1.803e-18	1.803e-18	-17.744	-17.744	0.000	(0)
	CuCl4-2	1.796e-18	5.163e-19	-17.746	-18.287	-0.541	(0)
	CrCl2+	8.863e-19	5.102e-19	-18.052	-18.292	-0.240	(0)
	FeCl3	2.745e-19	2.745e-19	-18.561	-18.561	0.000	(0)
	CrO3Cl-	1.778e-27	1.024e-27	-26.750	-26.990	-0.240	(0)
	CoCl+2	4.522e-35	4.964e-36	-34.345	-35.304	-0.960	(0)
	UCl+3	0.000e+00	0.000e+00	-42.659	-44.818	-2.159	(0)
	Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
	Co(NH3)5Cl+2	0.000e+00	0.000e+00	-49.508	-50.468	-0.960	(0)
	Co(NH3)6Cl+2	0.000e+00	0.000e+00	-64.447	-65.407	-0.960	(0)
Co(2)		2.974e-09					
	Co+2	1.454e-09	1.596e-10	-8.837	-9.797	-0.960	(0)
	CoHCO3+	1.193e-09	6.867e-10	-8.923	-9.163	-0.240	(0)
	CoSO4	2.784e-10	2.784e-10	-9.555	-9.555	0.000	(0)
	CoF+	3.000e-11	1.727e-11	-10.523	-10.763	-0.240	(0)
	CoCO3	1.232e-11	1.232e-11	-10.909	-10.909	0.000	(0)
	CoCl+	6.029e-12	3.471e-12	-11.220	-11.460	-0.240	(0)
	CoOH+	9.760e-14	5.618e-14	-13.011	-13.250	-0.240	(0)
	CoNO2+	1.725e-14	9.929e-15	-13.763	-14.003	-0.240	(0)
	Co(NH3)+2	1.045e-15	1.147e-16	-14.981	-15.940	-0.960	(0)
	Co(OH)2	7.872e-17	7.872e-17	-16.104	-16.104	0.000	(0)
	CoNO3+	1.203e-17	6.922e-18	-16.920	-17.160	-0.240	(0)
	CoSeO4	3.496e-18	3.496e-18	-17.456	-17.456	0.000	(0)
	Co(NH3)2+2	2.665e-22	2.926e-23	-21.574	-22.534	-0.960	(0)
	Co2OH+3	6.478e-23	4.494e-25	-22.189	-24.347	-2.159	(0)

Co (OH) 3-	4.814e-23	2.771e-23	-22.317	-22.557	-0.240	(0)
CoOH-	1.215e-23	6.991e-24	-22.916	-23.155	-0.240	(0)
Co (NO3) 2	3.854e-25	3.854e-25	-24.414	-24.414	0.000	(0)
Co (NH3) 3+2	2.006e-29	2.202e-30	-28.698	-29.657	-0.960	(0)
Co (OH) 4-2	7.058e-31	7.748e-32	-30.151	-31.111	-0.960	(0)
Co (NH3) 4+2	6.295e-37	6.910e-38	-36.201	-37.161	-0.960	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.864	-44.702	-3.838	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.204	-45.164	-0.960	(0)
Co (3)	3.170e-30					
CoOH+2	3.170e-30	3.479e-31	-29.499	-30.458	-0.960	(0)
Co+3	5.658e-35	3.881e-36	-34.247	-35.411	-1.164	(0)
CoCl+2	4.522e-35	4.964e-36	-34.345	-35.304	-0.960	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.508	-50.468	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.098	-60.338	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.447	-65.407	-0.960	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.799	-66.759	-0.960	(0)
Cr (2)	3.746e-26					
Cr+2	3.746e-26	4.112e-27	-25.426	-26.386	-0.960	(0)
Cr (3)	1.144e-09					
CrF+2	5.193e-10	5.701e-11	-9.285	-10.244	-0.960	(0)
Cr (OH) +2	3.697e-10	4.058e-11	-9.432	-10.392	-0.960	(0)
Cr (OH) 2+	1.513e-10	8.711e-11	-9.820	-10.060	-0.240	(0)
CrOHSO4	8.420e-11	8.420e-11	-10.075	-10.075	0.000	(0)
Cr+3	1.516e-11	1.051e-13	-10.819	-12.978	-2.159	(0)
CrSO4+	3.729e-12	2.147e-12	-11.428	-11.668	-0.240	(0)
Cr (OH) 3	5.773e-13	5.773e-13	-12.239	-12.239	0.000	(0)
CrCl+2	7.792e-15	8.553e-16	-14.108	-15.068	-0.960	(0)
CrO2-	8.436e-16	4.856e-16	-15.074	-15.314	-0.240	(0)
Cr (OH) 4-	7.044e-16	4.055e-16	-15.152	-15.392	-0.240	(0)
Cr2 (OH) 2SO4+2	2.813e-18	3.088e-19	-17.551	-18.510	-0.960	(0)
CrOHC12	1.803e-18	1.803e-18	-17.744	-17.744	0.000	(0)
CrCl2+	8.863e-19	5.102e-19	-18.052	-18.292	-0.240	(0)
Cr2 (OH) 2 (SO4) 2	1.604e-19	1.604e-19	-18.795	-18.795	0.000	(0)
CrNO3+2	1.146e-21	1.258e-22	-20.941	-21.900	-0.960	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.517	-41.476	-0.960	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.160	-49.319	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
Cr (6)	1.657e-19					
CrO4-2	8.124e-20	2.469e-20	-19.090	-19.607	-0.517	(0)
HCrO4-	7.880e-20	4.536e-20	-19.103	-19.343	-0.240	(0)
NaCrO4-	4.000e-21	2.303e-21	-20.398	-20.638	-0.240	(0)
KCrO4-	1.684e-21	9.691e-22	-20.774	-21.014	-0.240	(0)
CrO3SO4-2	6.281e-25	6.895e-26	-24.202	-25.161	-0.960	(0)
H2CrO4	2.087e-26	2.087e-26	-25.680	-25.680	0.000	(0)
CrO3Cl-	1.778e-27	1.024e-27	-26.750	-26.990	-0.240	(0)
Cr2O7-2	6.535e-37	7.173e-38	-36.185	-37.144	-0.960	(0)
Cu (1)	2.509e-08					
CuCl2-	1.508e-08	1.072e-08	-7.822	-7.970	-0.148	(0)
CuCl	8.163e-09	8.163e-09	-8.088	-8.088	0.000	(0)
Cu+	1.792e-09	1.031e-09	-8.747	-8.987	-0.240	(0)
CuCl3-2	5.011e-11	1.441e-11	-10.300	-10.841	-0.541	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Cu (2)	5.372e-04					
CuCO3	3.460e-04	3.460e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.800e-05	4.490e-05	-4.108	-4.348	-0.240	(0)
Cu+2	4.232e-05	1.286e-05	-4.373	-4.891	-0.517	(0)
Cu (CO3) 2-2	3.876e-05	4.255e-06	-4.412	-5.371	-0.960	(0)
CuSO4	2.577e-05	2.577e-05	-4.589	-4.589	0.000	(0)
CuF+	4.824e-06	2.777e-06	-5.317	-5.556	-0.240	(0)
CuOH+	1.010e-06	7.177e-07	-5.996	-6.144	-0.148	(0)
CuCl+	1.803e-07	1.282e-07	-6.744	-6.892	-0.148	(0)
Cu2 (OH) 2+2	1.179e-07	1.294e-08	-6.929	-7.888	-0.960	(0)
CuNO2+	2.066e-08	1.189e-08	-7.685	-7.925	-0.240	(0)
CuNH3+2	7.170e-09	7.871e-10	-8.144	-9.104	-0.960	(0)
Cu (OH) 2	2.526e-09	2.526e-09	-8.598	-8.598	0.000	(0)
CuCl2	2.794e-10	2.794e-10	-9.554	-9.554	0.000	(0)
CuNO3+	1.934e-12	1.113e-12	-11.714	-11.953	-0.240	(0)

	Cu (NO2) 2	1.074e-12	1.074e-12	-11.969	-11.969	0.000	(0)
	Cu (OH) 3-	1.588e-13	9.142e-14	-12.799	-13.039	-0.240	(0)
	CuCl3-	2.306e-14	1.639e-14	-13.637	-13.785	-0.148	(0)
	CuCl4-2	1.796e-18	5.163e-19	-17.746	-18.287	-0.541	(0)
	Cu (OH) 4-2	1.156e-19	1.269e-20	-18.937	-19.896	-0.960	(0)
	Cu (NO3) 2	3.835e-21	3.835e-21	-20.416	-20.416	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.420	-215.660	-0.240	(0)
F		7.598e-03					
	F-	4.608e-03	3.421e-03	-2.337	-2.466	-0.129	(0)
	MgF+	1.581e-03	1.141e-03	-2.801	-2.943	-0.141	(0)
	CaF+	5.359e-04	3.924e-04	-3.271	-3.406	-0.135	(0)
	AlF4-	1.550e-04	1.119e-04	-3.810	-3.951	-0.141	(0)
	AlF3	6.528e-05	6.528e-05	-4.185	-4.185	0.000	(0)
	NaF	4.051e-05	4.051e-05	-4.392	-4.392	0.000	(0)
	CuF+	4.824e-06	2.777e-06	-5.317	-5.556	-0.240	(0)
	MnF+	3.355e-06	2.457e-06	-5.474	-5.610	-0.135	(0)
	HF	2.873e-06	2.873e-06	-5.542	-5.542	0.000	(0)
	AlF2+	2.048e-06	1.516e-06	-5.689	-5.819	-0.131	(0)
	ZnF+	3.099e-07	1.784e-07	-6.509	-6.749	-0.240	(0)
	BF (OH) 3-	2.140e-07	1.436e-07	-6.670	-6.843	-0.173	(0)
	FeF3	1.358e-07	1.358e-07	-6.867	-6.867	0.000	(0)
	HF2-	5.347e-08	3.736e-08	-7.272	-7.428	-0.156	(0)
	BF2 (OH) 2-	4.467e-08	2.999e-08	-7.350	-7.523	-0.173	(0)
	FeF2+	3.842e-08	2.814e-08	-7.415	-7.551	-0.135	(0)
	AlF+2	3.711e-09	1.113e-09	-8.431	-8.954	-0.523	(0)
	PbF+	3.241e-09	1.865e-09	-8.489	-8.729	-0.240	(0)
	CdF+	2.757e-09	1.587e-09	-8.560	-8.800	-0.240	(0)
	FeF+2	1.069e-09	3.073e-10	-8.971	-9.512	-0.541	(0)
	CrF+2	5.193e-10	5.701e-11	-9.285	-10.244	-0.960	(0)
	PbF2	1.256e-10	1.256e-10	-9.901	-9.901	0.000	(0)
	VO2F2-	9.307e-11	5.357e-11	-10.031	-10.271	-0.240	(0)
	VO2F	4.313e-11	4.313e-11	-10.365	-10.365	0.000	(0)
	BF3OH-	3.393e-11	2.278e-11	-10.469	-10.642	-0.173	(0)
	CoF+	3.000e-11	1.727e-11	-10.523	-10.763	-0.240	(0)
	H2F2	2.211e-11	2.211e-11	-10.655	-10.655	0.000	(0)
	VO2F3-2	2.083e-11	2.286e-12	-10.681	-11.641	-0.960	(0)
	CdF2	1.083e-11	1.083e-11	-10.965	-10.965	0.000	(0)
	UO2F3-	7.258e-12	4.178e-12	-11.139	-11.379	-0.240	(0)
	UO2F2	4.862e-12	4.862e-12	-11.313	-11.313	0.000	(0)
	NiF+	4.195e-12	2.415e-12	-11.377	-11.617	-0.240	(0)
	PbF3-	1.416e-12	8.150e-13	-11.849	-12.089	-0.240	(0)
	VOF+	1.087e-12	6.257e-13	-11.964	-12.204	-0.240	(0)
	UO2F4-2	1.034e-12	1.135e-13	-11.985	-12.945	-0.960	(0)
	UO2F+	8.560e-13	4.927e-13	-12.068	-12.307	-0.240	(0)
	VOF2	8.027e-13	8.027e-13	-12.095	-12.095	0.000	(0)
	VO2F4-3	5.549e-13	3.849e-15	-12.256	-14.415	-2.159	(0)
	BF4-	3.260e-13	2.189e-13	-12.487	-12.660	-0.173	(0)
	VOF3-	1.693e-13	9.744e-14	-12.771	-13.011	-0.240	(0)
	VOF4-2	1.226e-14	1.346e-15	-13.912	-14.871	-0.960	(0)
	PbF4-2	1.216e-14	1.335e-15	-13.915	-14.875	-0.960	(0)
	HgF+	4.344e-19	2.501e-19	-18.362	-18.602	-0.240	(0)
	Sb (OH) 2F	1.860e-21	1.860e-21	-20.730	-20.730	0.000	(0)
	SbOF	1.839e-21	1.839e-21	-20.735	-20.735	0.000	(0)
	UF3+	1.337e-30	7.695e-31	-29.874	-30.114	-0.240	(0)
	UF6-2	3.683e-31	4.043e-32	-30.434	-31.393	-0.960	(0)
	UF4	2.887e-31	2.887e-31	-30.540	-30.540	0.000	(0)
	UF5-	6.799e-32	3.913e-32	-31.168	-31.407	-0.240	(0)
	UF2+2	1.293e-32	1.419e-33	-31.888	-32.848	-0.960	(0)
	UF+3	4.750e-36	3.295e-38	-35.323	-37.482	-2.159	(0)
Fe (2)		1.759e-06					
	Fe+2	1.315e-06	1.444e-07	-5.881	-6.841	-0.960	(0)
	FeSO4	3.098e-07	3.098e-07	-6.509	-6.509	0.000	(0)
	FeHCO3+	1.339e-07	1.005e-07	-6.873	-6.998	-0.124	(0)
	FeOH+	1.385e-10	1.014e-10	-9.859	-9.994	-0.135	(0)
	Fe (OH) 2	1.421e-15	1.421e-15	-14.847	-14.847	0.000	(0)
	Fe (OH) 3-	1.082e-17	7.927e-18	-16.966	-17.101	-0.135	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-155.670	-155.670	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-232.282	-232.522	-0.240	(0)

Fe (3)	8.955e-06					
Fe (OH) 2+	8.655e-06	6.404e-06	-5.063	-5.194	-0.131	(0)
FeF3	1.358e-07	1.358e-07	-6.867	-6.867	0.000	(0)
Fe (OH) 3	1.213e-07	1.213e-07	-6.916	-6.916	0.000	(0)
FeF2+	3.842e-08	2.814e-08	-7.415	-7.551	-0.135	(0)
FeOH+2	3.245e-09	9.331e-10	-8.489	-9.030	-0.541	(0)
FeF+2	1.069e-09	3.073e-10	-8.971	-9.512	-0.541	(0)
Fe (OH) 4-	2.694e-10	1.993e-10	-9.570	-9.700	-0.131	(0)
FeSO4+	1.098e-11	8.037e-12	-10.960	-11.095	-0.135	(0)
Fe (SO4) 2-	2.610e-12	1.502e-12	-11.583	-11.823	-0.240	(0)
Fe+3	1.194e-12	8.192e-14	-11.923	-13.087	-1.164	(0)
Fe2 (OH) 2+4	1.985e-13	2.883e-17	-12.702	-16.540	-3.838	(0)
FeCl+2	5.409e-14	1.555e-14	-13.267	-13.808	-0.541	(0)
Fe3 (OH) 4+5	2.650e-15	2.669e-21	-14.577	-20.574	-5.997	(0)
FeHSeO3+2	8.634e-16	9.478e-17	-15.064	-16.023	-0.960	(0)
FeCl2+	5.963e-16	4.367e-16	-15.225	-15.360	-0.135	(0)
FeCl3	2.745e-19	2.745e-19	-18.561	-18.561	0.000	(0)
FeNO3+2	2.042e-19	2.242e-20	-18.690	-19.649	-0.960	(0)
H (0)	1.162e-29					
H2	5.810e-30	6.114e-30	-29.236	-29.214	0.022	(0)
Hg (0)	4.878e-10					
Hg	4.878e-10	4.878e-10	-9.312	-9.312	0.000	(0)
Hg (1)	1.190e-17					
Hg2+2	5.948e-18	6.529e-19	-17.226	-18.185	-0.960	(0)
Hg (2)	9.157e-09					
HgCl2	7.792e-09	7.792e-09	-8.108	-8.108	0.000	(0)
HgCl3-	8.509e-10	4.898e-10	-9.070	-9.310	-0.240	(0)
HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
HgCl4-2	1.117e-10	1.226e-11	-9.952	-10.912	-0.960	(0)
HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
Hg (OH) 2	3.680e-12	3.872e-12	-11.434	-11.412	0.022	(0)
Hg (CO3) 2-2	1.419e-12	1.557e-13	-11.848	-12.808	-0.960	(0)
HgCl+	4.297e-13	2.473e-13	-12.367	-12.607	-0.240	(0)
HgHCO3+	1.980e-13	1.139e-13	-12.703	-12.943	-0.240	(0)
HgOH+	2.406e-15	1.385e-15	-14.619	-14.859	-0.240	(0)
Hg (NH3) 2+2	4.051e-16	4.447e-17	-15.392	-16.352	-0.960	(0)
HgNH3+2	6.776e-17	7.439e-18	-16.169	-17.129	-0.960	(0)
Hg+2	1.796e-17	1.972e-18	-16.746	-17.705	-0.960	(0)
HgSO4	4.514e-18	4.514e-18	-17.345	-17.345	0.000	(0)
HgF+	4.344e-19	2.501e-19	-18.362	-18.602	-0.240	(0)
Hg (OH) 3-	1.494e-20	8.600e-21	-19.826	-20.065	-0.240	(0)
Hg (NH3) 3+2	9.643e-24	1.059e-24	-23.016	-23.975	-0.960	(0)
HgNO3+	3.461e-26	1.992e-26	-25.461	-25.701	-0.240	(0)
Hg (NH3) 4+2	4.580e-31	5.027e-32	-30.339	-31.299	-0.960	(0)
Hg (NO3) 2	2.266e-34	2.266e-34	-33.645	-33.645	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.960	(0)
K	1.511e-02					
K+	1.423e-02	1.056e-02	-1.847	-1.976	-0.129	(0)
KSO4-	8.835e-04	6.538e-04	-3.054	-3.185	-0.131	(0)
KCrO4-	1.684e-21	9.691e-22	-20.774	-21.014	-0.240	(0)
Mg	1.847e-02					
Mg+2	9.783e-03	2.974e-03	-2.010	-2.527	-0.517	(0)
MgSO4	4.731e-03	4.731e-03	-2.325	-2.325	0.000	(0)
MgHCO3+	2.368e-03	1.683e-03	-2.626	-2.774	-0.148	(0)
MgF+	1.581e-03	1.141e-03	-2.801	-2.943	-0.141	(0)
MgCO3	1.130e-05	1.130e-05	-4.947	-4.947	0.000	(0)
MgOH+	2.751e-08	2.088e-08	-7.561	-7.680	-0.120	(0)
MgH2BO3+	1.653e-08	1.110e-08	-7.782	-7.955	-0.173	(0)
Mn (2)	2.231e-04					
Mn+2	1.643e-04	1.804e-05	-3.784	-4.744	-0.960	(0)
MnSO4	2.805e-05	2.805e-05	-4.552	-4.552	0.000	(0)
MnHCO3+	2.719e-05	1.991e-05	-4.566	-4.701	-0.135	(0)
MnF+	3.355e-06	2.457e-06	-5.474	-5.610	-0.135	(0)
MnCl+	1.949e-07	1.427e-07	-6.710	-6.845	-0.135	(0)
MnCl2	1.267e-09	1.267e-09	-8.897	-8.897	0.000	(0)
MnOH+	1.092e-09	7.993e-10	-8.962	-9.097	-0.135	(0)

MnCl3-	2.997e-12	2.194e-12	-11.523	-11.659	-0.135	(0)
MnNO3+	1.359e-12	7.823e-13	-11.867	-12.107	-0.240	(0)
MnSeO4	2.122e-13	2.122e-13	-12.673	-12.673	0.000	(0)
Mn (NO3) 2	5.377e-20	5.377e-20	-19.269	-19.269	0.000	(0)
Mn (OH) 3-	2.100e-21	1.537e-21	-20.678	-20.813	-0.135	(0)
Mn (OH) 4-2	3.046e-28	8.757e-29	-27.516	-28.058	-0.541	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Mn (3)	7.175e-23					
Mn+3	7.175e-23	4.922e-24	-22.144	-23.308	-1.164	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.523	-46.064	-0.541	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.486	-48.650	-0.164	(0)
Mo	8.617e-06					
MoO4-2	8.566e-06	2.604e-06	-5.067	-5.584	-0.517	(0)
HMoO4-	5.109e-08	2.941e-08	-7.292	-7.532	-0.240	(0)
H2MoO4	1.223e-10	1.223e-10	-9.913	-9.913	0.000	(0)
AlMo6O21-3	4.884e-28	3.388e-30	-27.311	-29.470	-2.159	(0)
Mo7O24-6	3.774e-28	8.736e-37	-27.423	-36.059	-8.636	(0)
HMo7O24-5	1.200e-30	1.208e-36	-29.921	-35.918	-5.997	(0)
H2Mo7O24-4	2.861e-34	4.154e-38	-33.543	-37.381	-3.838	(0)
H3Mo7O24-3	5.991e-39	0.000e+00	-38.223	-40.381	-2.159	(0)
N (-3)	9.642e-06					
NH4+	8.866e-06	5.953e-06	-5.052	-5.225	-0.173	(0)
NH4SO4-	7.616e-07	5.577e-07	-6.118	-6.254	-0.135	(0)
CuNH3+2	7.170e-09	7.871e-10	-8.144	-9.104	-0.960	(0)
NH3	5.979e-09	5.979e-09	-8.223	-8.223	0.000	(0)
CaNH3+2	7.206e-10	7.911e-11	-9.142	-10.102	-0.960	(0)
BaNH3+2	2.593e-13	2.847e-14	-12.586	-13.546	-0.960	(0)
Co (NH3) +2	1.045e-15	1.147e-16	-14.981	-15.940	-0.960	(0)
NiNH3+2	8.219e-16	9.022e-17	-15.085	-16.045	-0.960	(0)
Hg (NH3) 2+2	4.051e-16	4.447e-17	-15.392	-16.352	-0.960	(0)
HgNH3+2	6.776e-17	7.439e-18	-16.169	-17.129	-0.960	(0)
Ca (NH3) 2+2	1.715e-18	1.883e-19	-17.766	-18.725	-0.960	(0)
Ni (NH3) 2+2	7.103e-22	7.797e-23	-21.149	-22.108	-0.960	(0)
Co (NH3) 2+2	2.665e-22	2.926e-23	-21.574	-22.534	-0.960	(0)
Hg (NH3) 3+2	9.643e-24	1.059e-24	-23.016	-23.975	-0.960	(0)
Co (NH3) 3+2	2.006e-29	2.202e-30	-28.698	-29.657	-0.960	(0)
Hg (NH3) 4+2	4.580e-31	5.027e-32	-30.339	-31.299	-0.960	(0)
Co (NH3) 4+2	6.295e-37	6.910e-38	-36.201	-37.161	-0.960	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.517	-41.476	-0.960	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.204	-45.164	-0.960	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.160	-49.319	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.508	-50.468	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.098	-60.338	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.447	-65.407	-0.960	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.799	-66.759	-0.960	(0)
N (3)	1.290e-05					
NO2-	1.288e-05	8.828e-06	-4.890	-5.054	-0.164	(0)
CuNO2+	2.066e-08	1.189e-08	-7.685	-7.925	-0.240	(0)
Cu (NO2) 2	1.074e-12	1.074e-12	-11.969	-11.969	0.000	(0)
CoNO2+	1.725e-14	9.929e-15	-13.763	-14.003	-0.240	(0)
N (5)	3.844e-08					
NO3-	3.685e-08	2.736e-08	-7.434	-7.563	-0.129	(0)
CaNO3+	1.580e-09	9.095e-10	-8.801	-9.041	-0.240	(0)
CuNO3+	1.934e-12	1.113e-12	-11.714	-11.953	-0.240	(0)
BaNO3+	1.798e-12	1.035e-12	-11.745	-11.985	-0.240	(0)
MnNO3+	1.359e-12	7.823e-13	-11.867	-12.107	-0.240	(0)
ZnNO3+	3.121e-13	1.796e-13	-12.506	-12.746	-0.240	(0)
PbNO3+	5.441e-15	3.132e-15	-14.264	-14.504	-0.240	(0)
CdNO3+	4.399e-15	2.532e-15	-14.357	-14.597	-0.240	(0)
CoNO3+	1.203e-17	6.922e-18	-16.920	-17.160	-0.240	(0)
NiNO3+	3.355e-18	1.931e-18	-17.474	-17.714	-0.240	(0)
FeNO3+2	2.042e-19	2.242e-20	-18.690	-19.649	-0.960	(0)
VO2NO3	9.949e-20	9.949e-20	-19.002	-19.002	0.000	(0)
Mn (NO3) 2	5.377e-20	5.377e-20	-19.269	-19.269	0.000	(0)
Cu (NO3) 2	3.835e-21	3.835e-21	-20.416	-20.416	0.000	(0)

CrNO3+2	1.146e-21	1.258e-22	-20.941	-21.900	-0.960	(0)
Zn(NO3)2	9.808e-22	9.808e-22	-21.008	-21.008	0.000	(0)
Pb(NO3)2	1.455e-22	1.455e-22	-21.837	-21.837	0.000	(0)
UO2NO3+	9.896e-23	5.696e-23	-22.005	-22.244	-0.240	(0)
Cd(NO3)2	3.473e-23	3.473e-23	-22.459	-22.459	0.000	(0)
Co(NO3)2	3.854e-25	3.854e-25	-24.414	-24.414	0.000	(0)
HgNO3+	3.461e-26	1.992e-26	-25.461	-25.701	-0.240	(0)
Hg(NO3)2	2.266e-34	2.266e-34	-33.645	-33.645	0.000	(0)
Na	2.709e-02					
Na+	2.527e-02	1.876e-02	-1.597	-1.727	-0.129	(0)
NaSO4-	1.191e-03	8.811e-04	-2.924	-3.055	-0.131	(0)
NaHCO3	5.837e-04	5.837e-04	-3.234	-3.234	0.000	(0)
NaF	4.051e-05	4.051e-05	-4.392	-4.392	0.000	(0)
NaCO3-	2.157e-06	1.596e-06	-5.666	-5.797	-0.131	(0)
NaH2BO3	3.202e-09	3.202e-09	-8.495	-8.495	0.000	(0)
NaCrO4-	4.000e-21	2.303e-21	-20.398	-20.638	-0.240	(0)
Ni	4.843e-10					
NiHCO3+	3.329e-10	1.916e-10	-9.478	-9.718	-0.240	(0)
Ni+2	9.245e-11	2.810e-11	-10.034	-10.551	-0.517	(0)
NiSO4	4.902e-11	4.902e-11	-10.310	-10.310	0.000	(0)
NiCO3	4.789e-12	4.789e-12	-11.320	-11.320	0.000	(0)
NiF+	4.195e-12	2.415e-12	-11.377	-11.617	-0.240	(0)
NiCl+	7.851e-13	4.519e-13	-12.105	-12.345	-0.240	(0)
Ni(SO4)2-2	1.293e-13	1.419e-14	-12.888	-13.848	-0.960	(0)
NiOH+	1.084e-14	6.241e-15	-13.965	-14.205	-0.240	(0)
NiNH3+2	8.219e-16	9.022e-17	-15.085	-16.045	-0.960	(0)
NiCl2	1.430e-17	1.430e-17	-16.845	-16.845	0.000	(0)
Ni(OH)2	8.745e-18	8.745e-18	-17.058	-17.058	0.000	(0)
NiNO3+	3.355e-18	1.931e-18	-17.474	-17.714	-0.240	(0)
NiSeO4	5.744e-19	5.744e-19	-18.241	-18.241	0.000	(0)
Ni(NH3)2+2	7.103e-22	7.797e-23	-21.149	-22.108	-0.960	(0)
Ni(OH)3-	2.680e-22	1.543e-22	-21.572	-21.812	-0.240	(0)
O(0)	2.550e-34					
O2	1.275e-34	1.341e-34	-33.895	-33.872	0.022	(0)
Pb	7.530e-07					
PbHCO3+	5.525e-07	3.180e-07	-6.258	-6.498	-0.240	(0)
PbCO3	1.063e-07	1.063e-07	-6.974	-6.974	0.000	(0)
PbSO4	3.313e-08	3.313e-08	-7.480	-7.480	0.000	(0)
Pb+2	2.546e-08	7.737e-09	-7.594	-8.111	-0.517	(0)
Pb(SO4)2-2	1.590e-08	1.746e-09	-7.799	-8.758	-0.960	(0)
Pb(CO3)2-2	1.275e-08	1.400e-09	-7.894	-8.854	-0.960	(0)
PbF+	3.241e-09	1.865e-09	-8.489	-8.729	-0.240	(0)
PbCl+	2.998e-09	1.726e-09	-8.523	-8.763	-0.240	(0)
PbOH+	5.957e-10	3.429e-10	-9.225	-9.465	-0.240	(0)
PbF2	1.256e-10	1.256e-10	-9.901	-9.901	0.000	(0)
PbCl2	4.846e-11	4.846e-11	-10.315	-10.315	0.000	(0)
PbF3-	1.416e-12	8.150e-13	-11.849	-12.089	-0.240	(0)
PbCl3-	2.107e-13	1.213e-13	-12.676	-12.916	-0.240	(0)
Pb(OH)2	1.913e-13	1.913e-13	-12.718	-12.718	0.000	(0)
PbF4-2	1.216e-14	1.335e-15	-13.915	-14.875	-0.960	(0)
Pb2OH+3	6.062e-15	4.205e-17	-14.217	-16.376	-2.159	(0)
PbNO3+	5.441e-15	3.132e-15	-14.264	-14.504	-0.240	(0)
PbCl4-2	3.174e-15	3.484e-16	-14.498	-15.458	-0.960	(0)
Pb(OH)3-	5.863e-18	3.375e-18	-17.232	-17.472	-0.240	(0)
Pb(NO3)2	1.455e-22	1.455e-22	-21.837	-21.837	0.000	(0)
Pb(OH)4-2	1.328e-22	1.458e-23	-21.877	-22.836	-0.960	(0)
Pb3(OH)4+2	5.146e-23	5.649e-24	-22.289	-23.248	-0.960	(0)
Pb4(OH)4+4	2.391e-24	3.472e-28	-23.621	-27.459	-3.838	(0)
Pb(HS)2	0.000e+00	0.000e+00	-150.620	-150.620	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-227.970	-228.210	-0.240	(0)
S(-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.115	-78.115	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.175	-78.415	-0.240	(0)
HS-	0.000e+00	0.000e+00	-78.650	-78.890	-0.240	(0)
S5-2	0.000e+00	0.000e+00	-81.049	-82.009	-0.960	(0)
S6-2	0.000e+00	0.000e+00	-81.565	-82.525	-0.960	(0)
S4-2	0.000e+00	0.000e+00	-81.645	-82.604	-0.960	(0)
S3-2	0.000e+00	0.000e+00	-82.451	-83.410	-0.960	(0)

S2-2	0.000e+00	0.000e+00	-83.467	-84.426	-0.960	(0)
S-2	0.000e+00	0.000e+00	-89.402	-89.944	-0.541	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.960	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.066	-150.306	-0.240	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.101	-150.101	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.542	-150.542	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.620	-150.620	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.670	-155.670	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.420	-215.660	-0.240	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.911	-226.151	-0.240	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.850	-227.090	-0.240	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.970	-228.210	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.926	-229.885	-0.960	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.282	-232.522	-0.240	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.824	-303.784	-0.960	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.541	-306.501	-0.960	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.117	-315.077	-0.960	(0)
S (6)	5.669e-02					
SO4-2	2.877e-02	8.744e-03	-1.541	-2.058	-0.517	(0)
CaSO4	2.105e-02	2.105e-02	-1.677	-1.677	0.000	(0)
MgSO4	4.731e-03	4.731e-03	-2.325	-2.325	0.000	(0)
NaSO4-	1.191e-03	8.811e-04	-2.924	-3.055	-0.131	(0)
KSO4-	8.835e-04	6.538e-04	-3.054	-3.185	-0.131	(0)
MnSO4	2.805e-05	2.805e-05	-4.552	-4.552	0.000	(0)
CuSO4	2.577e-05	2.577e-05	-4.589	-4.589	0.000	(0)
ZnSO4	4.999e-06	4.999e-06	-5.301	-5.301	0.000	(0)
Zn (SO4) 2-2	3.468e-06	3.807e-07	-5.460	-6.419	-0.960	(0)
NH4SO4-	7.616e-07	5.577e-07	-6.118	-6.254	-0.135	(0)
HSO4-	6.719e-07	4.850e-07	-6.173	-6.314	-0.141	(0)
FeSO4	3.098e-07	3.098e-07	-6.509	-6.509	0.000	(0)
Cd (SO4) 2-2	6.445e-08	7.074e-09	-7.191	-8.150	-0.960	(0)
CdSO4	5.998e-08	5.998e-08	-7.222	-7.222	0.000	(0)
PbSO4	3.313e-08	3.313e-08	-7.480	-7.480	0.000	(0)
Pb (SO4) 2-2	1.590e-08	1.746e-09	-7.799	-8.758	-0.960	(0)
CoSO4	2.784e-10	2.784e-10	-9.555	-9.555	0.000	(0)
CrOHSO4	8.420e-11	8.420e-11	-10.075	-10.075	0.000	(0)
NiSO4	4.902e-11	4.902e-11	-10.310	-10.310	0.000	(0)
FeSO4+	1.098e-11	8.037e-12	-10.960	-11.095	-0.135	(0)
CrSO4+	3.729e-12	2.147e-12	-11.428	-11.668	-0.240	(0)
AlSO4+	3.058e-12	2.208e-12	-11.515	-11.656	-0.141	(0)
Fe (SO4) 2-	2.610e-12	1.502e-12	-11.583	-11.823	-0.240	(0)
VO2SO4-	2.607e-12	1.501e-12	-11.584	-11.824	-0.240	(0)
Al (SO4) 2-	2.865e-13	2.068e-13	-12.543	-12.684	-0.141	(0)
Ni (SO4) 2-2	1.293e-13	1.419e-14	-12.888	-13.848	-0.960	(0)
VOSO4	7.343e-14	7.343e-14	-13.134	-13.134	0.000	(0)
UO2 (SO4) 2-2	1.450e-14	1.591e-15	-13.839	-14.798	-0.960	(0)
UO2SO4	1.381e-14	1.381e-14	-13.860	-13.860	0.000	(0)
HgSO4	4.514e-18	4.514e-18	-17.345	-17.345	0.000	(0)
Cr2 (OH) 2SO4+2	2.813e-18	3.088e-19	-17.551	-18.510	-0.960	(0)
Cr2 (OH) 2 (SO4) 2	1.604e-19	1.604e-19	-18.795	-18.795	0.000	(0)
CrO3SO4-2	6.281e-25	6.895e-26	-24.202	-25.161	-0.960	(0)
VSO4+	5.759e-27	3.315e-27	-26.240	-26.480	-0.240	(0)
U (SO4) 2	1.167e-38	1.167e-38	-37.933	-37.933	0.000	(0)
USO4+2	1.530e-39	1.680e-40	-38.815	-39.775	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.098	-60.338	-0.240	(0)
Sb (3)	1.212e-18					
Sb (OH) 3	6.099e-19	6.099e-19	-18.215	-18.215	0.000	(0)
HSbO2	5.986e-19	5.986e-19	-18.223	-18.223	0.000	(0)
Sb (OH) 2F	1.860e-21	1.860e-21	-20.730	-20.730	0.000	(0)
SbOF	1.839e-21	1.839e-21	-20.735	-20.735	0.000	(0)
Sb (OH) 2+	1.469e-23	8.453e-24	-22.833	-23.073	-0.240	(0)
SbO+	5.090e-24	2.930e-24	-23.293	-23.533	-0.240	(0)
SbO2-	2.967e-24	1.708e-24	-23.528	-23.768	-0.240	(0)
Sb (OH) 4-	1.682e-24	9.680e-25	-23.774	-24.014	-0.240	(0)

Sb2S4-2	0.000e+00	0.000e+00	-314.117	-315.077	-0.960	(0)
Sb (5)	9.058e-08					
SbO3-	9.050e-08	5.209e-08	-7.043	-7.283	-0.240	(0)
Sb (OH) 6-	8.073e-11	5.995e-11	-10.093	-10.222	-0.129	(0)
SbO2+	8.410e-21	4.841e-21	-20.075	-20.315	-0.240	(0)
Se (-2)	3.608e-40					
HSe-	3.608e-40	2.077e-40	-39.443	-39.683	-0.240	(0)
H2Se	0.000e+00	0.000e+00	-42.039	-42.039	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.477	-48.437	-0.960	(0)
Se (4)	7.888e-07					
HSeO3-	7.607e-07	4.379e-07	-6.119	-6.359	-0.240	(0)
SeO3-2	2.797e-08	3.071e-09	-7.553	-8.513	-0.960	(0)
H2SeO3	1.060e-10	1.060e-10	-9.975	-9.975	0.000	(0)
FeHSeO3+2	8.634e-16	9.478e-17	-15.064	-16.023	-0.960	(0)
Cd (SeO3) 2-2	2.071e-18	2.274e-19	-17.684	-18.643	-0.960	(0)
Se (6)	1.440e-10					
SeO4-2	1.438e-10	4.371e-11	-9.842	-10.359	-0.517	(0)
MnSeO4	2.122e-13	2.122e-13	-12.673	-12.673	0.000	(0)
ZnSeO4	1.769e-14	1.769e-14	-13.752	-13.752	0.000	(0)
HSeO4-	2.160e-15	1.244e-15	-14.665	-14.905	-0.240	(0)
CdSeO4	2.382e-16	2.382e-16	-15.623	-15.623	0.000	(0)
CoSeO4	3.496e-18	3.496e-18	-17.456	-17.456	0.000	(0)
NiSeO4	5.744e-19	5.744e-19	-18.241	-18.241	0.000	(0)
Zn (SeO4) 2-2	7.142e-24	7.841e-25	-23.146	-24.106	-0.960	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.739	-59.898	-2.159	(0)
U (4)	1.065e-26					
U (OH) 5-	1.050e-26	6.044e-27	-25.979	-26.219	-0.240	(0)
U (OH) 4	1.445e-28	1.445e-28	-27.840	-27.840	0.000	(0)
UF3+	1.337e-30	7.695e-31	-29.874	-30.114	-0.240	(0)
U (OH) 3+	5.238e-31	3.015e-31	-30.281	-30.521	-0.240	(0)
UF6-2	3.683e-31	4.043e-32	-30.434	-31.393	-0.960	(0)
UF4	2.887e-31	2.887e-31	-30.540	-30.540	0.000	(0)
UF5-	6.799e-32	3.913e-32	-31.168	-31.407	-0.240	(0)
UF2+2	1.293e-32	1.419e-33	-31.888	-32.848	-0.960	(0)
U (OH) 2+2	7.248e-34	7.956e-35	-33.140	-34.099	-0.960	(0)
UF+3	4.750e-36	3.295e-38	-35.323	-37.482	-2.159	(0)
UOH+3	3.084e-37	2.139e-39	-36.511	-38.670	-2.159	(0)
U (SO4) 2	1.167e-38	1.167e-38	-37.933	-37.933	0.000	(0)
USO4+2	1.530e-39	1.680e-40	-38.815	-39.775	-0.960	(0)
U+4	0.000e+00	0.000e+00	-40.478	-44.316	-3.838	(0)
UC1+3	0.000e+00	0.000e+00	-42.659	-44.818	-2.159	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-169.970	-189.400	-19.430	(0)
U (5)	1.809e-19					
UO2+	1.809e-19	1.041e-19	-18.743	-18.983	-0.240	(0)
U (6)	2.743e-06					
UO2 (CO3) 3-4	2.727e-06	3.960e-10	-5.564	-9.402	-3.838	(0)
UO2 (CO3) 2-2	1.575e-08	1.729e-09	-7.803	-8.762	-0.960	(0)
UO2CO3	1.897e-11	1.897e-11	-10.722	-10.722	0.000	(0)
UO2F3-	7.258e-12	4.178e-12	-11.139	-11.379	-0.240	(0)
UO2F2	4.862e-12	4.862e-12	-11.313	-11.313	0.000	(0)
UO2F4-2	1.034e-12	1.135e-13	-11.985	-12.945	-0.960	(0)
UO2F+	8.560e-13	4.927e-13	-12.068	-12.307	-0.240	(0)
UO2 (SO4) 2-2	1.450e-14	1.591e-15	-13.839	-14.798	-0.960	(0)
UO2SO4	1.381e-14	1.381e-14	-13.860	-13.860	0.000	(0)
UO2OH+	4.026e-15	2.317e-15	-14.395	-14.635	-0.240	(0)
UO2+2	3.432e-15	1.043e-15	-14.464	-14.982	-0.517	(0)
UO2Cl+	1.848e-17	1.064e-17	-16.733	-16.973	-0.240	(0)
UO2NO3+	9.896e-23	5.696e-23	-22.005	-22.244	-0.240	(0)
(UO2) 2 (OH) 2+2	8.117e-23	8.911e-24	-22.091	-23.050	-0.960	(0)
(UO2) 3 (OH) 5+	8.469e-30	4.875e-30	-29.072	-29.312	-0.240	(0)
V (2)	6.505e-38					
V+2	5.866e-38	6.440e-39	-37.232	-38.191	-0.960	(0)
VOH+	6.387e-39	3.676e-39	-38.195	-38.435	-0.240	(0)
V (3)	3.557e-12					
V (OH) 3	3.557e-12	3.557e-12	-11.449	-11.449	0.000	(0)
V (OH) 2+	2.279e-21	1.312e-21	-20.642	-20.882	-0.240	(0)

VOH+2	6.469e-23	7.101e-24	-22.189	-23.149	-0.960	(0)
V+3	1.158e-25	8.031e-28	-24.936	-27.095	-2.159	(0)
VSO4+	5.759e-27	3.315e-27	-26.240	-26.480	-0.240	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-41.659	-45.497	-3.838	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-43.420	-45.579	-2.159	(0)
V (4)	2.609e-12					
VOF+	1.087e-12	6.257e-13	-11.964	-12.204	-0.240	(0)
VOF2	8.027e-13	8.027e-13	-12.095	-12.095	0.000	(0)
VO+2	2.778e-13	3.049e-14	-12.556	-13.516	-0.960	(0)
V (OH) 3+	1.855e-13	1.067e-13	-12.732	-12.972	-0.240	(0)
VOF3-	1.693e-13	9.744e-14	-12.771	-13.011	-0.240	(0)
VOSO4	7.343e-14	7.343e-14	-13.134	-13.134	0.000	(0)
VOF4-2	1.226e-14	1.346e-15	-13.912	-14.871	-0.960	(0)
VOC1+	9.342e-16	5.377e-16	-15.030	-15.269	-0.240	(0)
H2V2O4+2	5.260e-21	5.774e-22	-20.279	-21.239	-0.960	(0)
V (5)	2.130e-06					
H2VO4-	1.921e-06	1.106e-06	-5.716	-5.956	-0.240	(0)
H3V2O7-	7.828e-08	4.506e-08	-7.106	-7.346	-0.240	(0)
HVO4-2	4.457e-08	4.893e-09	-7.351	-8.310	-0.960	(0)
H3VO4	6.277e-09	6.277e-09	-8.202	-8.202	0.000	(0)
HV2O7-3	2.658e-10	1.843e-12	-9.576	-11.734	-2.159	(0)
V3O9-3	2.075e-10	1.439e-12	-9.683	-11.842	-2.159	(0)
VO2F2-	9.307e-11	5.357e-11	-10.031	-10.271	-0.240	(0)
VO2F	4.313e-11	4.313e-11	-10.365	-10.365	0.000	(0)
VO2F3-2	2.083e-11	2.286e-12	-10.681	-11.641	-0.960	(0)
VO2+	9.680e-12	7.187e-12	-11.014	-11.143	-0.129	(0)
V4O12-4	4.593e-12	6.670e-16	-11.338	-15.176	-3.838	(0)
VO2SO4-	2.607e-12	1.501e-12	-11.584	-11.824	-0.240	(0)
V2O7-4	6.019e-13	8.740e-17	-12.220	-16.058	-3.838	(0)
VO2F4-3	5.549e-13	3.849e-15	-12.256	-14.415	-2.159	(0)
VO4-3	6.228e-15	4.320e-17	-14.206	-16.365	-2.159	(0)
VO2NO3	9.949e-20	9.949e-20	-19.002	-19.002	0.000	(0)
V10O28-6	1.053e-27	2.438e-36	-26.977	-35.613	-8.636	(0)
HV10O28-5	2.112e-28	2.128e-34	-27.675	-33.672	-5.997	(0)
H2V10O28-4	1.341e-31	1.948e-35	-30.872	-34.710	-3.838	(0)
Zn	2.607e-05					
Zn+2	8.598e-06	2.613e-06	-5.066	-5.583	-0.517	(0)
ZnHCO3+	7.942e-06	4.571e-06	-5.100	-5.340	-0.240	(0)
ZnSO4	4.999e-06	4.999e-06	-5.301	-5.301	0.000	(0)
Zn (SO4) 2-2	3.468e-06	3.807e-07	-5.460	-6.419	-0.960	(0)
ZnCO3	6.870e-07	6.870e-07	-6.163	-6.163	0.000	(0)
ZnF+	3.099e-07	1.784e-07	-6.509	-6.749	-0.240	(0)
ZnCl+	5.806e-08	4.127e-08	-7.236	-7.384	-0.148	(0)
ZnOH+	8.010e-09	4.611e-09	-8.096	-8.336	-0.240	(0)
ZnOHCl	9.531e-10	9.531e-10	-9.021	-9.021	0.000	(0)
ZnCl2	4.111e-10	4.111e-10	-9.386	-9.386	0.000	(0)
Zn (OH) 2	1.289e-11	1.289e-11	-10.890	-10.890	0.000	(0)
ZnCl3-	2.888e-12	2.053e-12	-11.539	-11.688	-0.148	(0)
ZnNO3+	3.121e-13	1.796e-13	-12.506	-12.746	-0.240	(0)
ZnCl4-2	2.244e-14	6.453e-15	-13.649	-14.190	-0.541	(0)
ZnSeO4	1.769e-14	1.769e-14	-13.752	-13.752	0.000	(0)
Zn (OH) 3-	1.980e-15	1.140e-15	-14.703	-14.943	-0.240	(0)
Zn (OH) 4-2	7.293e-21	8.006e-22	-20.137	-21.097	-0.960	(0)
Zn (NO3) 2	9.808e-22	9.808e-22	-21.008	-21.008	0.000	(0)
Zn (SeO4) 2-2	7.142e-24	7.841e-25	-23.146	-24.106	-0.960	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.066	-150.306	-0.240	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.542	-150.542	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.911	-226.151	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.926	-229.885	-0.960	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.541	-306.501	-0.960	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-53.92	-47.64	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.42	-36.91	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.65	-36.92	11.74	(Co (NH3) 5OH2) Cl3

(Co(NH3)6)(NO3)3	-69.91	-51.98	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.92	-35.89	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.46	-30.06	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.26	-20.81	0.45	(NH4)2SeO4
Al(OH)3(am)	-5.56	5.24	10.80	Al(OH)3
Al2(MoO4)3	-46.10	-43.73	2.37	Al2(MoO4)3
Al2O3	-9.16	10.49	19.65	Al2O3
Al4(OH)10SO4	-16.27	6.43	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.09	-6.29	4.80	AlAsO4:2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-156.77	-91.15	65.62	AlSb
Alunite	-7.69	-9.09	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.38	-10.17	-7.79	PbSO4
Anhydrite	0.32	-4.04	-4.36	CaSO4
Anilite	-55.47	-87.35	-31.88	Cu0.25Cu1.5S
Antlerite	-0.54	8.24	8.79	Cu3(OH)4SO4
Aragonite	0.98	-7.32	-8.30	CaCO3
Arsenolite	-72.04	-74.80	-2.76	As4O6
Artinite	-7.51	2.09	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-29.78	-23.07	6.71	As2O5
Atacamite	-0.64	6.75	7.39	Cu2(OH)3Cl
Azurite	4.04	-12.87	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.05	7.35	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-10.94	4.93	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	7.94	-0.97	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-20.65	12.29	32.94	Ba3(VO4)2:4H2O
BaCrO4	-15.06	-24.73	-9.67	BaCrO4
BaF2	-4.23	-10.05	-5.82	BaF2
BaMoO4	-3.75	-10.71	-6.96	BaMoO4
Barite	2.80	-7.18	-9.98	BaSO4
BaS	-93.95	-77.77	16.18	BaS
BaSeO3	-7.06	-5.23	1.83	BaSeO3
BaSeO4	-8.02	-15.48	-7.46	BaSeO4
Bianchite	-5.89	-7.66	-1.76	ZnSO4:6H2O
Birnessite	-9.63	8.46	18.09	MnO2
Bixbyite	-8.50	-9.15	-0.64	Mn2O3
BlaubleiI	-54.68	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.49	-82.77	-27.28	Cu0.6Cu0.8S
Boehmite	-3.33	5.25	8.58	AlOOH
Breithauptite	-62.90	-81.43	-18.52	NiSb
Brochantite	0.62	15.84	15.22	Cu4(OH)6SO4
Brucite	-6.88	9.96	16.84	Mg(OH)2
Bunsenite	-10.51	1.94	12.45	NiO
Ca(VO3)2	-4.95	0.71	5.66	Ca(VO3)2
Ca2V2O7	-6.28	11.22	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.33	11.22	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.85	8.45	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.22	21.74	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.13	21.73	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-304.23	-161.26	142.97	Ca3Sb2
CaCrO4	-19.32	-21.59	-2.27	CaCrO4
Calcite	1.16	-7.32	-8.48	CaCO3
Calomel	-4.68	-22.59	-17.91	Hg2Cl2
CaMoO4	0.39	-7.56	-7.95	CaMoO4
Carnotite	-3.35	-3.12	0.23	KUO2VO4
CaSeO3:2H2O	-4.91	-2.10	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.32	-12.34	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.83	-2.99	9.84	Cd(BO2)2
Cd(OH)2	-8.69	4.95	13.64	Cd(OH)2
Cd(OH)2(am)	-8.78	4.95	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.94	-14.23	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.25	0.31	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.13	5.27	28.40	Cd4(OH)6SO4
CdCl2	-11.28	-11.94	-0.66	CdCl2
CdCl2:1H2O	-10.25	-11.94	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.03	-11.94	-1.91	CdCl2:2.5H2O
CdF2	-11.25	-12.47	-1.21	CdF2
Cdmetal(alpha)	-34.62	-21.11	13.51	Cd

Cdmetal (gamma)	-34.72	-21.11	13.62	Cd
CdMoO4	1.03	-13.12	-14.15	CdMoO4
CdOHCl	-7.03	-3.49	3.54	CdOHCl
CdSb	-78.06	-78.41	-0.35	CdSb
CdSe	-20.77	-40.97	-20.20	CdSe
CdSeO4:2H2O	-16.05	-17.90	-1.85	CdSeO4:2H2O
CdSO4	-9.42	-9.59	-0.17	CdSO4
CdSO4:1H2O	-7.87	-9.59	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.73	-9.60	-1.87	CdSO4:2.67H2O
Cerrusite	-0.32	-13.45	-13.13	PbCO3
CH4 (g)	-81.03	-122.08	-41.05	CH4
Chalcanthite	-4.32	-6.96	-2.64	CuSO4:5H2O
Chalcocite	-55.70	-90.62	-34.92	Cu2S
Chalcopyrite	-121.75	-157.02	-35.27	CuFeS2
Cinnabar	-50.85	-96.54	-45.69	HgS
Claudetite	-71.73	-74.80	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co (BO2) 2	-32.33	-5.26	27.07	Co (BO2) 2
Co (OH) 2	-10.40	2.69	13.09	Co (OH) 2
Co (OH) 3	-14.37	-16.68	-2.31	Co (OH) 3
CO2 (g)	0.32	-17.83	-18.15	CO2
Co3 (AsO4) 2	-28.03	-15.00	13.03	Co3 (AsO4) 2
Co3O4	-20.17	-30.66	-10.50	Co3O4
CoCl2	-22.47	-14.20	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.21	2.54	CoCl2:6H2O
CoCO3	-5.16	-15.14	-9.98	CoCO3
CoF2	-13.13	-14.73	-1.60	CoF2
CoF3	-41.35	-42.81	-1.46	CoF3
CoFe2O4	17.52	13.99	-3.53	CoFe2O4
CoMoO4	-7.62	-15.38	-7.76	CoMoO4
CoO	-10.89	2.69	13.59	CoO
CoS (alpha)	-75.00	-82.44	-7.44	CoS
CoS (beta)	-71.37	-82.44	-11.07	CoS
CoSe	-27.03	-43.23	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-18.64	-20.17	-1.53	CoSeO4:6H2O
CoSO4	-14.66	-11.86	2.80	CoSO4
CoSO4:6H2O	-9.40	-11.87	-2.47	CoSO4:6H2O
Cotunnite	-7.73	-12.51	-4.78	PbCl2
Covellite	-55.23	-77.53	-22.30	CuS
Cr (OH) 2	-24.72	-13.90	10.82	Cr (OH) 2
Cr (OH) 3	-5.15	-3.82	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-3.07	-3.82	-0.75	Cr (OH) 3
Cr2O3	-5.27	-7.63	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-44.27	-29.15	15.11	CrCl3
CrF3	-18.61	-29.94	-11.34	CrF3
Crmetal	-70.44	-39.96	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	0.38	-33.46	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.60	8.67	Cu (OH) 2
Cu (SbO3) 2	-21.91	23.30	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.86	1.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.66	-91.55	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.38	-0.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.03	-104.62	-42.59	Cu3Sb
Cu3Se2	-26.25	-89.74	-63.49	Cu3Se2
CuCO3	1.27	-10.23	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-6.55	-11.45	-4.91	CuF
CuF2	-10.94	-9.82	1.12	CuF2
CuF2:2H2O	-5.28	-9.83	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.60	-10.48	-13.08	CuMoO4
CuOCuSO4	-9.65	0.65	10.30	CuOCuSO4
Cupricferrite	12.91	18.89	5.99	CuFe2O4

Cuprite	-4.08	-5.48	-1.41	Cu2O
Cuprousferrite	11.82	2.91	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-24.83	-58.19	-33.37	CuSe2
CuSeO3:2H2O	-5.52	-5.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.82	-15.26	-2.44	CuSeO4:5H2O
CuSO4	-9.89	-6.95	2.94	CuSO4
Diaspore	-1.63	5.25	6.87	AlOOH
Djurleite	-55.83	-89.75	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	1.35	-15.19	-16.54	CaMg (CO3) 2
Dolomite (ordered)	1.90	-15.19	-17.09	CaMg (CO3) 2
Epsomite	-2.48	-4.60	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.92	5.65	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.15	3.11	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-0.43	-4.15	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-2.87	-1.31	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-5.89	-26.52	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-28.61	-32.35	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-3.29	16.93	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.29	-5.89	0.40	FeAsO4:2H2O
FeCr2O4	-9.18	-1.98	7.20	FeCr2O4
FeMoO4	-2.33	-12.42	-10.09	FeMoO4
Ferrihydrite	2.45	5.64	3.19	Fe (OH) 3
Ferroselite	-41.55	-60.14	-18.60	FeSe2
FeS (ppt)	-76.53	-79.48	-2.95	FeS
FeSe	-29.28	-40.28	-11.00	FeSe
Fix_pe	-6.79	-6.79	0.00	e-
Fluorite	3.59	-6.91	-10.50	CaF2
Galena	-66.79	-80.76	-13.97	PbS
Gibbsite	-3.05	5.24	8.29	Al (OH) 3
Goethite	5.16	5.65	0.49	FeOOH
Goslarite	-5.65	-7.66	-2.01	ZnSO4:7H2O
Greenockite	-65.82	-80.18	-14.36	CdS
Greigite	-278.55	-323.59	-45.03	Fe3S4
Gummite	-10.16	-2.49	7.67	UO3
Gypsum	0.57	-4.04	-4.61	CaSO4:2H2O
H-Jarosite	-0.06	-12.16	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-5.20	-18.08	-12.88	H2MoO4
H2S (g)	-77.13	-85.14	-8.01	H2S
H2Se (g)	-40.97	-45.93	-4.96	H2Se
Halite	-5.53	-3.93	1.60	NaCl
Hausmannite	-11.73	49.30	61.03	Mn3O4
Hematite	12.71	11.30	-1.42	Fe2O3
Hercynite	-6.75	16.14	22.89	FeAl2O4
Hg (CH3) 2 (g)	-181.86	-255.57	-73.71	Hg (CH3) 2
Hg (g)	-8.01	-15.88	-7.87	Hg
Hg (OH) 2	-7.92	-11.41	-3.50	Hg (OH) 2
Hg2 (g)	-16.80	-31.76	-14.96	Hg2
Hg2 (OH) 2	-10.96	-5.70	5.26	Hg2 (OH) 2
Hg2CO3	-7.48	-23.53	-16.05	Hg2CO3
Hg2CrO4	-29.09	-37.79	-8.70	Hg2CrO4
Hg2F2	-12.75	-23.12	-10.36	Hg2F2
Hg2S	-79.15	-90.83	-11.68	Hg2S
Hg2SeO3	-13.64	-18.30	-4.66	Hg2SeO3
Hg2SO4	-14.11	-20.24	-6.13	Hg2SO4
Hg3O2CO3	-22.38	-52.06	-29.68	Hg3O2CO3
HgCl (g)	-30.79	-11.29	19.50	HgCl
HgCl2	-7.04	-28.30	-21.26	HgCl2
HgF (g)	-44.23	-11.56	32.68	HgF
HgF2 (g)	-41.40	-28.83	12.57	HgF2
Hgmetal (l)	-2.43	-15.88	-13.45	Hg
HgSe	-1.64	-57.34	-55.69	HgSe
HgSeO3	-11.58	-24.01	-12.43	HgSeO3
HgSO4	-16.54	-25.96	-9.42	HgSO4
Huntite	-0.95	-30.92	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-3.76	-22.53	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.75	-21.52	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-14.44	-19.61	-5.17	KAl (SO4) 2:12H2O

K-Jarosite	6.91	-7.89	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-38.41	-55.66	-17.24	K2Cr2O7
K2CrO4	-23.05	-23.56	-0.51	K2CrO4
K2MoO4	-12.80	-9.54	3.26	K2MoO4
K2SeO4	-13.58	-14.31	-0.73	K2SeO4
Langite	-1.65	15.84	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.36	-5.79	-0.43	PbO:PbSO4
Laurionite	-4.69	-4.07	0.62	PbOHCl
Lepidocrocite	4.28	5.65	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.32	4.38	12.69	PbO
Mackinawite	-75.88	-79.48	-3.60	FeS
Maghemite	4.91	11.30	6.39	Fe2O3
Magnesioferrite	4.40	21.26	16.86	Fe2MgO4
Magnesite	-0.41	-7.87	-7.46	MgCO3
Magnetite	13.54	16.94	3.40	Fe3O4
Malachite	2.67	-2.63	-5.31	Cu2(OH)2CO3
Manganite	-4.56	20.78	25.34	MnOOH
Massicot	-8.52	4.38	12.89	PbO
Matlockite	-3.81	-12.78	-8.97	PbClF
Melanothallite	-15.55	-9.29	6.26	CuCl2
Melanterite	-6.71	-8.92	-2.21	FeSO4:7H2O
Metacinnabar	-51.45	-96.54	-45.09	HgS
Mg(OH)2(active)	-8.83	9.96	18.79	Mg(OH)2
Mg(VO3)2	-11.11	0.17	11.28	Mg(VO3)2
Mg2Sb3	-278.79	-204.11	74.68	Mg2Sb3
Mg2V2O7	-16.23	10.13	26.36	Mg2V2O7
MgCr2O4	-13.86	2.34	16.20	MgCr2O4
MgCrO4	-27.51	-22.13	5.38	MgCrO4
MgF2	0.67	-7.46	-8.13	MgF2
MgMoO4	-6.26	-8.11	-1.85	MgMoO4
MgSeO3:6H2O	-5.71	-2.65	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.70	-12.90	-1.20	MgSeO4:6H2O
Minium	-34.33	39.20	73.52	Pb3O4
Mirabilite	-4.42	-5.54	-1.11	Na2SO4:10H2O
Mn(VO3)2	-6.95	-2.05	4.90	Mn(VO3)2
Mn2(SO4)3	-47.08	-52.79	-5.71	Mn2(SO4)3
Mn2Sb	-155.01	-93.93	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.35	0.15	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.87	-9.16	2.72	MnCl2:4H2O
MnS(grn)	-77.56	-77.39	0.17	MnS
MnS(pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.06	-100.97	-2.91	MnSb
MnSe	-41.68	-38.18	3.50	MnSe
MnSeO3	-5.99	-4.86	1.13	MnSeO3
MnSeO3:2H2O	-5.84	-4.86	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.07	-15.12	-2.05	MnSeO4:5H2O
MnSO4	-9.39	-6.80	2.58	MnSO4
Monteponite	-10.15	4.96	15.10	CdO
Montroydite	-7.77	-11.41	-3.64	HgO
MoO3	-10.07	-18.07	-8.00	MoO3
Morenosite	-10.48	-12.63	-2.14	NiSO4:7H2O
MoS2	-144.14	-214.40	-70.26	MoS2
Na-Jarosite	3.56	-7.64	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-45.26	-55.16	-9.90	Na2Cr2O7
Na2CrO4	-25.99	-23.06	2.93	Na2CrO4
Na2Mo2O7	-10.52	-27.11	-16.60	Na2Mo2O7
Na2MoO4	-10.53	-9.04	1.49	Na2MoO4
Na2MoO4:2H2O	-10.27	-9.04	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.88	-3.58	10.30	Na2SeO3:5H2O
Na2SeO4	-15.09	-13.81	1.28	Na2SeO4
Na3Sb	-177.29	-82.84	94.45	Na3Sb
Na3VO4	-28.03	8.66	36.68	Na3VO4
Na4V2O7	-29.13	8.27	37.40	Na4V2O7
Nantokite	-4.46	-11.19	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-4.24	-0.38	3.86	NaVO3

Nesquehonite	-3.20	-7.87	-4.67	MgCO3:3H2O
Ni(OH)2	-10.86	1.94	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-32.98	-17.28	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-38.80	-6.80	32.00	Ni4(OH)6SO4
NiCO3	-9.02	-15.89	-6.87	NiCO3
NiMoO4	-4.99	-16.14	-11.14	NiMoO4
NiS(alpha)	-77.59	-83.19	-5.60	NiS
NiS(beta)	-72.09	-83.19	-11.10	NiS
NiS(gamma)	-70.39	-83.19	-12.80	NiS
NiSe	-26.29	-43.99	-17.70	NiSe
NiSeO3:2H2O	-13.48	-10.67	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.40	-20.92	-1.52	NiSeO4:6H2O
Nsutite	-9.05	8.46	17.50	MnO2
O2(g)	-30.97	52.12	83.09	O2
Orpiment	-231.73	-292.80	-61.07	As2S3
Otavite	-0.87	-12.87	-12.00	CdCO3
Pb(BO2)2	-10.09	-3.57	6.52	Pb(BO2)2
Pb(OH)2	-3.77	4.38	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-54.44	-63.20	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.49	0.31	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.43	8.75	26.19	Pb2O(OH)2
Pb2O3	-26.22	34.82	61.04	Pb2O3
Pb2OCO3	-8.52	-9.07	-0.56	Pb2OCO3
Pb2V2O7	0.86	-1.04	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.74	-9.94	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.80	3.34	6.14	Pb3(VO4)2
Pb3O2CO3	-15.72	-4.70	11.02	Pb3O2CO3
Pb3O2SO4	-12.10	-1.41	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.14	2.96	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.96	21.88	Pb4O3SO4
PbCrO4	-15.12	-27.72	-12.60	PbCrO4
PbF2	-5.60	-13.04	-7.44	PbF2
Pbmetal	-25.93	-21.68	4.25	Pb
PbMoO4	1.92	-13.70	-15.62	PbMoO4
PbO:0.3H2O	-8.60	4.38	12.98	PbO:0.33H2O
PbSeO4	-11.63	-18.47	-6.84	PbSeO4
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-6.16	-25.97	-19.81	PbCl2:PbCO3
Plattnerite	-19.16	30.44	49.60	PbO2
Portlandite	-12.30	10.51	22.80	Ca(OH)2
Pyrite	-120.05	-138.56	-18.51	FeS2
Pyrochroite	-7.45	7.74	15.19	Mn(OH)2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-97.12	-116.86	-19.75	AsS
Retgersite	-10.58	-12.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-5.82	-20.32	-14.50	UO2CO3
Sb(OH)3	-11.10	-18.21	-7.11	Sb(OH)3
Sb2O4	-13.76	-10.36	3.40	Sb2O4
Sb2O5	-23.25	-32.92	-9.67	Sb2O5
Sb2Se3	-106.44	-174.20	-67.76	Sb2Se3
Sb4O6(cubic)	-54.58	-72.84	-18.26	Sb4O6
Sb4O6(orth)	-54.94	-72.84	-17.90	Sb4O6
SbCl3	-44.12	-43.55	0.57	SbCl3
SbF3	-34.12	-44.34	-10.23	SbF3
Sbmetal	-45.61	-57.30	-11.69	Sb
SbO2	-1.67	-29.49	-27.82	SbO2
Schoepite	-8.49	-2.50	5.99	UO2(OH)2:H2O
Semetal(am)	-12.75	-19.86	-7.11	Se
Semetal(hex)	-12.16	-19.86	-7.71	Se
Senarmontite	-24.06	-36.42	-12.37	Sb2O3
SeO2	-12.73	-12.60	0.12	SeO2
SeO3	-43.89	-22.85	21.04	SeO3
Siderite	-1.94	-12.18	-10.24	FeCO3
Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-66.78	-78.23	-11.45	ZnS
Spinel	-16.39	20.46	36.85	MgAl2O4
Stibnite	-241.36	-291.82	-50.46	Sb2S3

Sulfur	-56.93	-59.07	-2.14	S
Tenorite	-0.05	7.60	7.64	CuO
Thenardite	-5.83	-5.51	0.32	Na2SO4
Thermonatrite	-9.43	-8.80	0.64	Na2CO3:H2O
Tyuyamunite	-8.35	-4.27	4.08	Ca(UO2)2(VO4)2
U3O8	-26.97	-5.89	21.08	U3O8
U3Sb4	-595.98	-443.59	152.38	U3Sb4
U4O9	-48.27	-51.29	-3.02	U4O9
UF4	-24.64	-54.18	-29.54	UF4
UF4:2.5H2O	-21.47	-54.19	-32.72	UF4:2.5H2O
UO2(am)	-20.27	-19.34	0.93	UO2
UO2(NO3)2	-42.25	-30.11	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.96	-30.11	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.50	-30.11	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.17	-30.12	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-8.11	-2.49	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.10	-25.35	-2.25	UO2SeO4:4H2O
UO3	-10.19	-2.49	7.70	UO3
Uraninite	-14.67	-19.34	-4.67	UO2
USb2	-224.86	-195.28	29.58	USb2
V(OH)3	-15.96	-8.36	7.59	V(OH)3
V2O5	-8.44	-9.80	-1.36	V2O5
V3O5	-30.98	-29.14	1.84	V3O5
V4O7	-37.35	-30.17	7.19	V4O7
V6O13	-20.65	-81.51	-60.86	V6O13
Valentinite	-27.94	-36.42	-8.48	Sb2O3
VC12	-57.16	-38.28	18.87	VC12
VC13	-57.13	-33.70	23.43	VC13
VF4	-50.80	-35.87	14.93	VF4
Vmetal	-91.48	-47.45	44.03	V
VO	-36.15	-21.39	14.76	VO
VO(OH)2	-6.18	-1.03	5.15	VO(OH)2
VO2Cl	-16.19	-13.35	2.84	VO2Cl
VOC1	-27.96	-16.81	11.15	VOC1
VOC12	-30.68	-17.92	12.76	VOC12
VOSO4	-19.18	-15.57	3.61	VOSO4
Witherite	-1.89	-10.46	-8.57	BaCO3
Wurtzite	-69.28	-78.23	-8.95	ZnS
Zincite	-4.43	6.91	11.33	ZnO
Zincosite	-11.57	-7.64	3.93	ZnSO4
Zn(BO2)2	-9.33	-1.04	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.04	-20.72	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.30	6.90	12.20	Zn(OH)2
Zn(OH)2(am)	-5.57	6.90	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.85	6.90	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.63	6.90	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.83	6.90	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.24	-0.74	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.83	5.36	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.01	-2.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.29	-8.38	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.33	13.07	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.87	17.63	38.50	Zn5(OH)8Cl2
ZnCl2	-17.04	-9.99	7.05	ZnCl2
ZnCO3:1H2O	-0.67	-10.93	-10.26	ZnCO3:1H2O
ZnF2	-9.98	-10.51	-0.53	ZnF2
Znmetal	-44.94	-19.15	25.79	Zn
ZnMoO4	-1.04	-11.17	-10.13	ZnMoO4
ZnO(active)	-4.28	6.91	11.19	ZnO
ZnS(am)	-69.17	-78.23	-9.05	ZnS
ZnSb	-87.47	-76.46	11.01	ZnSb
ZnSe	-24.62	-39.02	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.01	-7.64	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 90.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 502

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3·2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2·8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 506

SAVE Solution 507 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 502

END

TITLE

Precipitate oversaturated phases

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag₂Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg₃(PO₄)₂ (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO₂(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag₂Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO₂(am-ppt), is not in model.
WARNING: Element in phase, Ag₂Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO₂(am-ppt), is not in model.
WARNING: Element in phase, Ag₂Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO₂(am-ppt), is not in model.
Using solution 506. Solution after simulation 89.
Using pure phase assemblage 502.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag ₂ Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	7.228e-05	7.228e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba ₃ (AsO ₄) ₂	-0.00	-8.91	-8.91	0.000e+00	5.034e-08	5.034e-08
Barite	0.00	-9.98	-9.98	0.000e+00	2.998e-05	2.998e-05
Brochantite	-0.00	15.22	15.22	0.000e+00	1.342e-04	1.342e-04
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO ₂ (g)	-3.50	-21.65	-18.15	1.000e+01	1.012e+01	1.171e-01
CaMoO ₄	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO ₃ ·2H ₂ O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	-0.00	-8.48	-8.48	0.000e+00	4.571e-02	4.571e-02
Carnotite	0.00	0.23	0.23	0.000e+00	2.082e-06	2.082e-06
Cd(BO ₂) ₂	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO ₄	0.00	-14.15	-14.15	0.000e+00	2.417e-07	2.417e-07
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr ₂ O ₃	-0.28	-2.64	-2.36	0.000e+00	0	0.000e+00
Cu ₂ Se(alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO ₄	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.071e-05	1.071e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	3.686e-03	3.686e-03
Gummite	-5.04	2.63	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	9.180e-03	9.180e-03
HgSe	-1.23	-56.92	-55.69	0.000e+00	0	0.000e+00
Mg ₃ (PO ₄) ₂		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO ₃	-4.34	-3.21	1.13	0.000e+00	0	0.000e+00
Ni(OH) ₂	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-30.65	-14.95	15.70	0.000e+00	0	0.000e+00
NiCO ₃	-8.99	-15.86	-6.87	0.000e+00	0	0.000e+00
NiMoO ₄	-4.46	-15.61	-11.14	0.000e+00	0	0.000e+00

O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.446e-05
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	7.514e-07	7.514e-07
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.37	2.63	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-11.10	9.99	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.99	2.63	5.61	0.000e+00	0	0.000e+00
UO3	-5.07	2.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.98	-10.13	0.000e+00	0	0.000e+00

Elements	Molality	Moles
Al	5.553e-06	5.563e-06
As	1.576e-09	1.579e-09
B	1.004e-04	1.005e-04
Ba	2.720e-08	2.725e-08
C	5.744e-04	5.755e-04
Ca	1.206e-02	1.209e-02
Cd	2.232e-08	2.236e-08
Cl	8.452e-03	8.468e-03
Co	2.969e-09	2.974e-09
Cr	1.142e-09	1.144e-09
Cu	4.981e-07	4.990e-07
F	2.258e-04	2.262e-04
Fe	1.103e-09	1.105e-09
Hg	9.628e-09	9.646e-09
K	1.501e-02	1.504e-02
Mg	1.844e-02	1.848e-02
Mn	2.227e-04	2.231e-04
Mo	7.611e-06	7.625e-06
N	2.254e-05	2.258e-05
Na	2.704e-02	2.709e-02
Ni	4.834e-10	4.843e-10
Pb	1.664e-09	1.667e-09
S	4.712e-02	4.721e-02
Sb	9.042e-08	9.059e-08
Se	7.875e-07	7.890e-07
U	6.596e-07	6.608e-07
V	4.793e-08	4.802e-08
Zn	2.603e-05	2.608e-05

	pH	=	7.908	Charge balance
	pe	=	4.864	Adjusted to redox
equilibrium				
	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.229e-01	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	6.149e-04	
	Total CO2 (mol/kg)	=	5.744e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error,	$100 \cdot (\text{Cat} - \text{An}) / (\text{Cat} + \text{An})$	=	0.00	
	Iterations	=	24	
	Total H	=	1.112222e+02	
	Total O	=	5.580163e+01	

Log Log Log mole V

	Species	Molality	Activity	Molality	Activity	Gamma	cm ³ /mol
	OH-	1.091e-06	8.139e-07	-5.962	-6.089	-0.127	(0)
	H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
	H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al		5.553e-06					
	Al (OH) 4-	5.508e-06	4.200e-06	-5.259	-5.377	-0.118	(0)
	Al (OH) 3	4.099e-08	4.099e-08	-7.387	-7.387	0.000	(0)
	Al (OH) 2+	3.253e-09	2.524e-09	-8.488	-8.598	-0.110	(0)
	AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
	AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
	AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
	AlOH+2	1.078e-11	3.904e-12	-10.968	-11.408	-0.441	(0)
	AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
	Al (SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
	Al+3	5.048e-14	4.797e-15	-13.297	-14.319	-1.022	(0)
	AlMo6O21-3	2.495e-39	0.000e+00	-38.603	-40.212	-1.609	(0)
As (3)		1.700e-23					
	H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
	H2AsO3-	1.003e-24	6.645e-25	-23.999	-24.178	-0.179	(0)
	HAsO3-2	2.547e-28	4.908e-29	-27.594	-28.309	-0.715	(0)
	H4AsO3+	1.477e-31	9.787e-32	-30.831	-31.009	-0.179	(0)
	AsO3-3	6.229e-33	1.532e-34	-32.206	-33.815	-1.609	(0)
As (5)		1.576e-09					
	HAsO4-2	1.523e-09	2.935e-10	-8.817	-9.532	-0.715	(0)
	H2AsO4-	4.988e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
	AsO4-3	3.056e-12	7.516e-14	-11.515	-13.124	-1.609	(0)
	H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B		1.004e-04					
	H3BO3	9.245e-05	9.510e-05	-4.034	-4.022	0.012	(0)
	H2BO3-	6.158e-06	4.473e-06	-5.211	-5.349	-0.139	(0)
	MgH2BO3+	8.086e-07	5.874e-07	-6.092	-6.231	-0.139	(0)
	CaH2BO3+	7.951e-07	5.776e-07	-6.100	-6.238	-0.139	(0)
	NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
	BF (OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
	H5 (BO3) 2-	4.985e-10	3.621e-10	-9.302	-9.441	-0.139	(0)
	H8 (BO3) 3-	4.740e-12	3.443e-12	-11.324	-11.463	-0.139	(0)
	BaH2BO3+	1.815e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
	BF2 (OH) 2-	9.737e-13	7.073e-13	-12.012	-12.150	-0.139	(0)
	BF3OH-	5.563e-19	4.041e-19	-18.255	-18.393	-0.139	(0)
	BF4-	4.020e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
Ba		2.720e-08					
	Ba+2	2.714e-08	9.535e-09	-7.566	-8.021	-0.454	(0)
	BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
	BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
	BaH2BO3+	1.815e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
	BaOH+	4.399e-14	3.388e-14	-13.357	-13.470	-0.113	(0)
	BaNO3+	1.114e-15	7.379e-16	-14.953	-15.132	-0.179	(0)
	BaNH3+2	2.680e-16	5.163e-17	-15.572	-16.287	-0.715	(0)
C (4)		5.744e-04					
	HCO3-	5.010e-04	3.887e-04	-3.300	-3.410	-0.110	(0)
	CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
	MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
	H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	4.648e-06	4.648e-06	-5.333	-5.333	0.000	(0)
	NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
	CO3-2	4.201e-06	1.476e-06	-5.377	-5.831	-0.454	(0)
	NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
	UO2 (CO3) 3-4	6.011e-07	8.284e-10	-6.221	-9.082	-2.861	(0)
	ZnCO3	3.288e-07	3.288e-07	-6.483	-6.483	0.000	(0)
	MnHCO3+	3.127e-07	2.408e-07	-6.505	-6.618	-0.113	(0)
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	ZnHCO3+	7.183e-08	4.759e-08	-7.144	-7.322	-0.179	(0)
	UO2 (CO3) 2-2	5.813e-08	1.120e-08	-7.236	-7.951	-0.715	(0)
	Cu (CO3) 2-2	4.865e-09	9.374e-10	-8.313	-9.028	-0.715	(0)
	CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)

	PbCO3	3.980e-10	3.980e-10	-9.400	-9.400	0.000	(0)
	UO2CO3	3.804e-10	3.804e-10	-9.420	-9.420	0.000	(0)
	CdCO3	8.913e-11	8.913e-11	-10.050	-10.050	0.000	(0)
	BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
	PbHCO3+	3.911e-11	2.591e-11	-10.408	-10.586	-0.179	(0)
	CoHCO3+	1.802e-11	1.194e-11	-10.744	-10.923	-0.179	(0)
	CoCO3	9.851e-12	9.851e-12	-11.007	-11.007	0.000	(0)
	Pb(CO3) 2-2	8.791e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
	BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
	NiHCO3+	6.704e-12	4.442e-12	-11.174	-11.352	-0.179	(0)
	NiCO3	5.103e-12	5.103e-12	-11.292	-11.292	0.000	(0)
	CdHCO3+	3.539e-12	2.345e-12	-11.451	-11.630	-0.179	(0)
	Cd(CO3) 2-2	5.060e-13	9.750e-14	-12.296	-13.011	-0.715	(0)
	HgCO3	9.761e-15	9.761e-15	-14.011	-14.011	0.000	(0)
	FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
	Hg(CO3) 2-2	2.364e-16	4.555e-17	-15.626	-16.342	-0.715	(0)
	HgHCO3+	3.387e-18	2.244e-18	-17.470	-17.649	-0.179	(0)
Ca	1.206e-02						
	Ca+2	6.388e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
	CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
	CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.775e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
	CaH2BO3+	7.951e-07	5.776e-07	-6.100	-6.238	-0.139	(0)
	CaOH+	4.649e-08	3.644e-08	-7.333	-7.438	-0.106	(0)
	CaNO3+	1.654e-10	1.096e-10	-9.782	-9.960	-0.179	(0)
	CaNH3+2	1.258e-10	2.424e-11	-9.900	-10.615	-0.715	(0)
	Ca (NH3) 2+2	4.299e-19	8.283e-20	-18.367	-19.082	-0.715	(0)
Cd	2.232e-08						
	Cd+2	7.543e-09	2.650e-09	-8.122	-8.577	-0.454	(0)
	CdSO4	6.822e-09	6.822e-09	-8.166	-8.166	0.000	(0)
	Cd(SO4) 2-2	5.245e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
	CdCl+	2.485e-09	1.647e-09	-8.605	-8.783	-0.179	(0)
	CdCO3	8.913e-11	8.913e-11	-10.050	-10.050	0.000	(0)
	CdOHC1	5.497e-11	5.497e-11	-10.260	-10.260	0.000	(0)
	CdCl2	4.466e-11	4.466e-11	-10.350	-10.350	0.000	(0)
	CdOH+	2.586e-11	1.713e-11	-10.587	-10.766	-0.179	(0)
	CdF+	7.525e-12	4.986e-12	-11.123	-11.302	-0.179	(0)
	CdHCO3+	3.539e-12	2.345e-12	-11.451	-11.630	-0.179	(0)
	Cd(CO3) 2-2	5.060e-13	9.750e-14	-12.296	-13.011	-0.715	(0)
	CdCl3-	2.767e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
	Cd(OH) 2	8.798e-14	8.798e-14	-13.056	-13.056	0.000	(0)
	CdF2	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
	CdNO3+	1.953e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
	CdSeO4	1.703e-16	1.703e-16	-15.769	-15.769	0.000	(0)
	Cd(SeO3) 2-2	7.196e-17	1.386e-17	-16.143	-16.858	-0.715	(0)
	Cd2OH+3	9.250e-18	2.275e-19	-17.034	-18.643	-1.609	(0)
	Cd(OH) 3-	6.603e-18	4.375e-18	-17.180	-17.359	-0.179	(0)
	Cd(OH) 4-2	3.025e-24	5.828e-25	-23.519	-24.234	-0.715	(0)
	Cd(NO3) 2	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.446	-226.624	-0.179	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Cl	8.452e-03						
	Cl-	8.451e-03	6.506e-03	-2.073	-2.187	-0.114	(0)
	MnCl+	3.303e-07	2.543e-07	-6.481	-6.595	-0.113	(0)
	ZnCl+	8.389e-08	6.328e-08	-7.076	-7.199	-0.122	(0)
	ZnOHC1	6.743e-08	6.743e-08	-7.171	-7.171	0.000	(0)
	CuCl2-	2.684e-09	2.024e-09	-8.571	-8.694	-0.122	(0)
	CdCl+	2.485e-09	1.647e-09	-8.605	-8.783	-0.179	(0)
	MnCl2	2.337e-09	2.337e-09	-8.631	-8.631	0.000	(0)
	CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
	ZnCl2	6.526e-10	6.526e-10	-9.185	-9.185	0.000	(0)
	CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
	CdOHC1	5.497e-11	5.497e-11	-10.260	-10.260	0.000	(0)
	HgClOH	5.169e-11	5.169e-11	-10.287	-10.287	0.000	(0)
	CdCl2	4.466e-11	4.466e-11	-10.350	-10.350	0.000	(0)

PbCl+	3.127e-11	2.071e-11	-10.505	-10.684	-0.179	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
CoCl+	1.342e-11	8.889e-12	-10.872	-11.051	-0.179	(0)
CuCl3-2	8.007e-12	2.816e-12	-11.097	-11.550	-0.454	(0)
MnCl3-	5.439e-12	4.189e-12	-11.264	-11.378	-0.113	(0)
ZnCl3-	4.471e-12	3.373e-12	-11.350	-11.472	-0.122	(0)
NiCl+	2.329e-12	1.543e-12	-11.633	-11.812	-0.179	(0)
HgCl3-	2.298e-12	1.522e-12	-11.639	-11.817	-0.179	(0)
CuCl2	6.319e-13	6.319e-13	-12.199	-12.199	0.000	(0)
PbCl2	6.020e-13	6.020e-13	-12.220	-12.220	0.000	(0)
CdCl3-	2.767e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
HgCl4-2	2.047e-13	3.943e-14	-12.689	-13.404	-0.715	(0)
ZnCl4-2	3.120e-14	1.097e-14	-13.506	-13.960	-0.454	(0)
PbCl3-	2.354e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
HgCl+	1.083e-15	7.176e-16	-14.965	-15.144	-0.179	(0)
UO2Cl+	1.031e-15	6.834e-16	-14.987	-15.165	-0.179	(0)
CuCl3-	5.086e-17	3.837e-17	-16.294	-16.416	-0.122	(0)
NiCl2	5.055e-17	5.055e-17	-16.296	-16.296	0.000	(0)
PbCl4-2	2.407e-17	4.638e-18	-16.619	-17.334	-0.715	(0)
CrCl+2	1.469e-17	2.830e-18	-16.833	-17.548	-0.715	(0)
CrOHCl2	2.849e-19	2.849e-19	-18.545	-18.545	0.000	(0)
CuCl4-2	3.558e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
CrCl2+	2.637e-21	1.747e-21	-20.579	-20.758	-0.179	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
VOC1+	2.625e-22	1.739e-22	-21.581	-21.760	-0.179	(0)
FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
CrO3Cl-	8.384e-26	5.555e-26	-25.077	-25.255	-0.179	(0)
FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
CoCl+2	7.904e-37	1.523e-37	-36.102	-36.817	-0.715	(0)
UCl+3	0.000e+00	0.000e+00	-44.211	-45.820	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.241	-51.957	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
Co (2)	2.969e-09					
Co+2	2.050e-09	3.949e-10	-8.688	-9.404	-0.715	(0)
CoSO4	8.653e-10	8.653e-10	-9.063	-9.063	0.000	(0)
CoHCO3+	1.802e-11	1.194e-11	-10.744	-10.923	-0.179	(0)
CoCl+	1.342e-11	8.889e-12	-10.872	-11.051	-0.179	(0)
CoCO3	9.851e-12	9.851e-12	-11.007	-11.007	0.000	(0)
CoOH+	9.680e-12	6.413e-12	-11.014	-11.193	-0.179	(0)
CoF+	2.238e-12	1.482e-12	-11.650	-11.829	-0.179	(0)
Co (OH) 2	4.146e-13	4.146e-13	-12.382	-12.382	0.000	(0)
CoNO2+	6.874e-14	4.554e-14	-13.163	-13.342	-0.179	(0)
Co (NH3) +2	2.115e-15	4.075e-16	-14.675	-15.390	-0.715	(0)
CoSeO4	6.832e-17	6.832e-17	-16.165	-16.165	0.000	(0)
CoNO3+	1.459e-17	9.663e-18	-16.836	-17.015	-0.179	(0)
Co (OH) 3-	1.016e-17	6.733e-18	-16.993	-17.172	-0.179	(0)
CoOOH-	2.555e-18	1.693e-18	-17.593	-17.771	-0.179	(0)
Co2OH+3	5.160e-21	1.269e-22	-20.287	-21.896	-1.609	(0)
Co (NH3) 2+2	7.742e-22	1.492e-22	-21.111	-21.826	-0.715	(0)
Co (OH) 4-2	4.508e-24	8.685e-25	-23.346	-24.061	-0.715	(0)
Co (NO3) 2	3.036e-25	3.036e-25	-24.518	-24.518	0.000	(0)
Co (NH3) 3+2	8.364e-29	1.612e-29	-28.078	-28.793	-0.715	(0)
Co4 (OH) 4+4	2.449e-34	3.375e-37	-33.611	-36.472	-2.861	(0)
Co (NH3) 4+2	3.767e-36	7.258e-37	-35.424	-36.139	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.270	-43.986	-0.715	(0)
Co (3)	2.469e-30					
CoOH+2	2.469e-30	4.758e-31	-29.607	-30.323	-0.715	(0)
Co+3	1.211e-36	1.150e-37	-35.917	-36.939	-1.022	(0)
CoCl+2	7.904e-37	1.523e-37	-36.102	-36.817	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
Cr (2)	5.695e-27					
Cr+2	5.695e-27	1.097e-27	-26.244	-26.960	-0.715	(0)
Cr (3)	1.142e-09					
Cr (OH) 2+	8.946e-10	5.927e-10	-9.048	-9.227	-0.179	(0)

Cr(OH) 3	1.812e-10	1.812e-10	-9.742	-9.742	0.000	(0)
Cr(OH)+2	3.106e-11	5.985e-12	-10.508	-11.223	-0.715	(0)
CrOHSO4	1.560e-11	1.560e-11	-10.807	-10.807	0.000	(0)
CrO2-	1.054e-11	6.983e-12	-10.977	-11.156	-0.179	(0)
Cr(OH) 4-	8.863e-12	5.872e-12	-11.052	-11.231	-0.179	(0)
CrF+2	3.282e-14	6.324e-15	-13.484	-14.199	-0.715	(0)
Cr+3	1.367e-14	3.361e-16	-13.864	-15.473	-1.609	(0)
CrSO4+	1.301e-14	8.619e-15	-13.886	-14.065	-0.179	(0)
CrCl+2	1.469e-17	2.830e-18	-16.833	-17.548	-0.715	(0)
CrOHC12	2.849e-19	2.849e-19	-18.545	-18.545	0.000	(0)
Cr2(OH) 2SO4+2	4.379e-20	8.438e-21	-19.359	-20.074	-0.715	(0)
Cr2(OH) 2(SO4) 2	5.504e-21	5.504e-21	-20.259	-20.259	0.000	(0)
CrCl2+	2.637e-21	1.747e-21	-20.579	-20.758	-0.179	(0)
CrNO3+2	1.177e-24	2.269e-25	-23.929	-24.644	-0.715	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.808	-41.523	-0.715	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-49.263	-50.872	-1.609	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-51.241	-51.957	-0.715	(0)
Cr(6)	8.553e-15					
CrO4-2	7.817e-15	2.746e-15	-14.107	-14.561	-0.454	(0)
NaCrO4-	4.050e-16	2.683e-16	-15.393	-15.571	-0.179	(0)
HCrO4-	1.656e-16	1.097e-16	-15.781	-15.960	-0.179	(0)
KCrO4-	1.652e-16	1.094e-16	-15.782	-15.961	-0.179	(0)
CrO3SO4-2	2.356e-23	4.540e-24	-22.628	-23.343	-0.715	(0)
H2CrO4	1.098e-24	1.098e-24	-23.959	-23.959	0.000	(0)
CrO3Cl-	8.384e-26	5.555e-26	-25.077	-25.255	-0.179	(0)
Cr2O7-2	2.171e-30	4.183e-31	-29.663	-30.379	-0.715	(0)
Cu(1)	4.455e-09					
CuCl2-	2.684e-09	2.024e-09	-8.571	-8.694	-0.122	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	8.007e-12	2.816e-12	-11.097	-11.550	-0.454	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu(2)	4.936e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.267e-08	6.991e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.732e-08	2.716e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu(OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu(CO3) 2-2	4.865e-09	9.374e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
Cu2(OH) 2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)
CuNO2+	7.026e-11	4.655e-11	-10.153	-10.332	-0.179	(0)
Cu(OH) 3-	2.861e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
CuNH3+2	1.238e-11	2.385e-12	-10.907	-11.622	-0.715	(0)
CuCl2	6.319e-13	6.319e-13	-12.199	-12.199	0.000	(0)
Cu(NO2) 2	7.796e-15	7.796e-15	-14.108	-14.108	0.000	(0)
CuNO3+	2.002e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
Cu(OH) 4-2	6.301e-16	1.214e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.086e-17	3.837e-17	-16.294	-16.416	-0.122	(0)
CuCl4-2	3.558e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
Cu(NO3) 2	2.578e-24	2.578e-24	-23.589	-23.589	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.258e-04					
F-	1.542e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.616e-05	5.044e-05	-4.179	-4.297	-0.118	(0)
CaF+	3.775e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
MnF+	1.906e-07	1.467e-07	-6.720	-6.833	-0.113	(0)
ZnF+	1.384e-08	9.172e-09	-7.859	-8.038	-0.179	(0)
BF(OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)

AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
CdF+	7.525e-12	4.986e-12	-11.123	-11.302	-0.179	(0)
CoF+	2.238e-12	1.482e-12	-11.650	-11.829	-0.179	(0)
UO2F+	1.602e-12	1.061e-12	-11.795	-11.974	-0.179	(0)
HF2-	1.312e-12	9.785e-13	-11.882	-12.009	-0.127	(0)
PbF+	1.133e-12	7.506e-13	-11.946	-12.125	-0.179	(0)
BF2(OH) 2-	9.737e-13	7.073e-13	-12.012	-12.150	-0.139	(0)
NiF+	4.172e-13	2.764e-13	-12.380	-12.558	-0.179	(0)
UO2F2	3.633e-13	3.633e-13	-12.440	-12.440	0.000	(0)
CrF+2	3.282e-14	6.324e-15	-13.484	-14.199	-0.715	(0)
UO2F3-	1.635e-14	1.083e-14	-13.786	-13.965	-0.179	(0)
PbF2	1.754e-15	1.754e-15	-14.756	-14.756	0.000	(0)
CdF2	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
UO2F4-2	5.302e-17	1.022e-17	-16.276	-16.991	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	1.188e-17	1.188e-17	-16.925	-16.925	0.000	(0)
FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
VO2F2-	7.727e-19	5.120e-19	-18.112	-18.291	-0.179	(0)
PbF3-	5.959e-19	3.948e-19	-18.225	-18.404	-0.179	(0)
BF3OH-	5.563e-19	4.041e-19	-18.255	-18.393	-0.139	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	1.024e-20	6.783e-21	-19.990	-20.169	-0.179	(0)
VO2F3-2	3.935e-21	7.581e-22	-20.405	-21.120	-0.715	(0)
VOF2	3.019e-22	3.019e-22	-21.520	-21.520	0.000	(0)
PbF4-2	1.164e-22	2.243e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.671e-23	2.432e-23	-22.435	-22.614	-0.179	(0)
BF4-	4.020e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
VOF3-	1.919e-24	1.272e-24	-23.717	-23.896	-0.179	(0)
VO2F4-3	1.800e-24	4.428e-26	-23.745	-25.354	-1.609	(0)
Sb(OH) 2F	1.153e-25	1.153e-25	-24.938	-24.938	0.000	(0)
SbOF	1.136e-25	1.136e-25	-24.945	-24.945	0.000	(0)
VOF4-2	3.163e-27	6.094e-28	-26.500	-27.215	-0.715	(0)
UF3+	4.665e-36	3.091e-36	-35.331	-35.510	-0.179	(0)
UF2+2	8.527e-37	1.643e-37	-36.069	-36.784	-0.715	(0)
UF4	4.023e-38	4.023e-38	-37.395	-37.395	0.000	(0)
UF+3	4.469e-39	1.099e-40	-38.350	-39.959	-1.609	(0)
UF5-	2.857e-40	1.893e-40	-39.544	-39.723	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.453	-41.168	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.324e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.401e-14	-13.740	-13.854	-0.113	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
Fe(OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	3.028e-18	2.332e-18	-17.519	-17.632	-0.113	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe(OH) 2+	6.305e-10	4.891e-10	-9.200	-9.311	-0.110	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	4.177e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
FeOH+2	4.392e-15	1.545e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe(SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
Fe+3	3.094e-20	2.940e-21	-19.509	-20.532	-1.022	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
FeHSeO3+2	9.963e-24	1.920e-24	-23.002	-23.717	-0.715	(0)
Fe2(OH) 2+4	5.733e-26	7.902e-29	-25.242	-28.102	-2.861	(0)
FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
FeNO3+2	2.356e-27	4.539e-28	-26.628	-27.343	-0.715	(0)
Fe3(OH) 4+5	1.648e-32	5.586e-37	-31.783	-36.253	-4.470	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)

Hg (0)	9.528e-09					
Hg	9.528e-09	9.528e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.711e-19					
Hg2+2	1.856e-19	3.575e-20	-18.732	-19.447	-0.715	(0)
Hg (2)	1.001e-10					
HgClOH	5.169e-11	5.169e-11	-10.287	-10.287	0.000	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
Hg (OH) 2	2.246e-11	2.310e-11	-10.649	-10.636	0.012	(0)
HgCl3-	2.298e-12	1.522e-12	-11.639	-11.817	-0.179	(0)
HgCl4-2	2.047e-13	3.943e-14	-12.689	-13.404	-0.715	(0)
HgCO3	9.761e-15	9.761e-15	-14.011	-14.011	0.000	(0)
HgCl+	1.083e-15	7.176e-16	-14.965	-15.144	-0.179	(0)
HgOH+	2.703e-16	1.791e-16	-15.568	-15.747	-0.179	(0)
Hg (CO3) 2-2	2.364e-16	4.555e-17	-15.626	-16.342	-0.715	(0)
Hg (OH) 3-	3.573e-18	2.367e-18	-17.447	-17.626	-0.179	(0)
HgHCO3+	3.387e-18	2.244e-18	-17.470	-17.649	-0.179	(0)
Hg (NH3) 2+2	1.333e-18	2.569e-19	-17.875	-18.590	-0.715	(0)
HgNH3+2	1.553e-19	2.993e-20	-18.809	-19.524	-0.715	(0)
Hg+2	2.869e-20	5.527e-21	-19.542	-20.257	-0.715	(0)
HgSO4	1.589e-20	1.589e-20	-19.799	-19.799	0.000	(0)
HgF+	3.671e-23	2.432e-23	-22.435	-22.614	-0.179	(0)
Hg (NH3) 3+2	4.555e-26	8.776e-27	-25.342	-26.057	-0.715	(0)
HgNO3+	4.756e-29	3.151e-29	-28.323	-28.502	-0.179	(0)
Hg (NH3) 4+2	3.105e-33	5.982e-34	-32.508	-33.223	-0.715	(0)
Hg (NO3) 2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K	1.501e-02					
K+	1.393e-02	1.073e-02	-1.856	-1.970	-0.114	(0)
KSO4-	1.075e-03	8.339e-04	-2.969	-3.079	-0.110	(0)
KCrO4-	1.652e-16	1.094e-16	-15.782	-15.961	-0.179	(0)
Mg	1.844e-02					
Mg+2	1.078e-02	3.787e-03	-1.967	-2.422	-0.454	(0)
MgSO4	7.568e-03	7.568e-03	-2.121	-2.121	0.000	(0)
MgF+	6.616e-05	5.044e-05	-4.179	-4.297	-0.118	(0)
MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
MgCO3	4.648e-06	4.648e-06	-5.333	-5.333	0.000	(0)
MgOH+	1.553e-06	1.227e-06	-5.809	-5.911	-0.102	(0)
MgH2BO3+	8.086e-07	5.874e-07	-6.092	-6.231	-0.139	(0)
Mn (2)	2.227e-04					
Mn+2	1.612e-04	3.105e-05	-3.793	-4.508	-0.715	(0)
MnSO4	6.064e-05	6.064e-05	-4.217	-4.217	0.000	(0)
MnCl+	3.303e-07	2.543e-07	-6.481	-6.595	-0.113	(0)
MnHCO3+	3.127e-07	2.408e-07	-6.505	-6.618	-0.113	(0)
MnF+	1.906e-07	1.467e-07	-6.720	-6.833	-0.113	(0)
MnOH+	8.243e-08	6.348e-08	-7.084	-7.197	-0.113	(0)
MnCl2	2.337e-09	2.337e-09	-8.631	-8.631	0.000	(0)
MnCl3-	5.439e-12	4.189e-12	-11.264	-11.378	-0.113	(0)
MnSeO4	2.885e-12	2.885e-12	-11.540	-11.540	0.000	(0)
MnNO3+	1.147e-12	7.598e-13	-11.941	-12.119	-0.179	(0)
Mn (OH) 3-	3.375e-16	2.599e-16	-15.472	-15.585	-0.113	(0)
Mn (NO3) 2	2.947e-20	2.947e-20	-19.531	-19.531	0.000	(0)
Mn (OH) 4-2	1.942e-21	6.829e-22	-20.712	-21.166	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
Mn (3)	1.068e-24					
Mn+3	1.068e-24	1.015e-25	-23.971	-24.994	-1.022	(0)
Mn (6)	1.759e-40					
MnO4-2	1.759e-40	0.000e+00	-39.755	-40.209	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.583	-44.716	-0.133	(0)
Mo	7.611e-06					
MoO4-2	7.610e-06	2.673e-06	-5.119	-5.573	-0.454	(0)
HMoO4-	9.914e-10	6.568e-10	-9.004	-9.183	-0.179	(0)
H2MoO4	5.941e-14	5.941e-14	-13.226	-13.226	0.000	(0)
AlMo6O21-3	2.495e-39	0.000e+00	-38.603	-40.212	-1.609	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.848	-49.284	-6.437	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.336	-50.806	-4.470	(0)

H2Mo7O24-4	0.000e+00	0.000e+00	-51.072	-53.932	-2.861	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.986	-58.595	-1.609	(0)
N (-3)	2.930e-07					
NH4+	2.559e-07	1.859e-07	-6.592	-6.731	-0.139	(0)
NH4SO4-	2.840e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
NH3	8.582e-09	8.582e-09	-8.066	-8.066	0.000	(0)
CaNH3+2	1.258e-10	2.424e-11	-9.900	-10.615	-0.715	(0)
CuNH3+2	1.238e-11	2.385e-12	-10.907	-11.622	-0.715	(0)
NiNH3+2	2.217e-15	4.272e-16	-14.654	-15.369	-0.715	(0)
Co (NH3) +2	2.115e-15	4.075e-16	-14.675	-15.390	-0.715	(0)
BaNH3+2	2.680e-16	5.163e-17	-15.572	-16.287	-0.715	(0)
Hg (NH3) 2+2	1.333e-18	2.569e-19	-17.875	-18.590	-0.715	(0)
Ca (NH3) 2+2	4.299e-19	8.283e-20	-18.367	-19.082	-0.715	(0)
HgNH3+2	1.553e-19	2.993e-20	-18.809	-19.524	-0.715	(0)
Ni (NH3) 2+2	2.750e-21	5.300e-22	-20.561	-21.276	-0.715	(0)
Co (NH3) 2+2	7.742e-22	1.492e-22	-21.111	-21.826	-0.715	(0)
Hg (NH3) 3+2	4.555e-26	8.776e-27	-25.342	-26.057	-0.715	(0)
Co (NH3) 3+2	8.364e-29	1.612e-29	-28.078	-28.793	-0.715	(0)
Hg (NH3) 4+2	3.105e-33	5.982e-34	-32.508	-33.223	-0.715	(0)
Co (NH3) 4+2	3.767e-36	7.258e-37	-35.424	-36.139	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.808	-41.523	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.270	-43.986	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.263	-50.872	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.241	-51.957	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
N (3)	2.222e-05					
NO2-	2.222e-05	1.637e-05	-4.653	-4.786	-0.133	(0)
CuNO2+	7.026e-11	4.655e-11	-10.153	-10.332	-0.179	(0)
CoNO2+	6.874e-14	4.554e-14	-13.163	-13.342	-0.179	(0)
Cu (NO2) 2	7.796e-15	7.796e-15	-14.108	-14.108	0.000	(0)
N (5)	2.022e-08					
NO3-	2.005e-08	1.544e-08	-7.698	-7.811	-0.114	(0)
CaNO3+	1.654e-10	1.096e-10	-9.782	-9.960	-0.179	(0)
MnNO3+	1.147e-12	7.598e-13	-11.941	-12.119	-0.179	(0)
ZnNO3+	2.267e-13	1.502e-13	-12.645	-12.823	-0.179	(0)
CuNO3+	2.002e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
BaNO3+	1.114e-15	7.379e-16	-14.953	-15.132	-0.179	(0)
CdNO3+	1.953e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
PbNO3+	3.093e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
CoNO3+	1.459e-17	9.663e-18	-16.836	-17.015	-0.179	(0)
NiNO3+	5.426e-18	3.595e-18	-17.266	-17.444	-0.179	(0)
Mn (NO3) 2	2.947e-20	2.947e-20	-19.531	-19.531	0.000	(0)
UO2NO3+	3.011e-21	1.995e-21	-20.521	-20.700	-0.179	(0)
Zn (NO3) 2	4.626e-22	4.626e-22	-21.335	-21.335	0.000	(0)
Cu (NO3) 2	2.578e-24	2.578e-24	-23.589	-23.589	0.000	(0)
CrNO3+2	1.177e-24	2.269e-25	-23.929	-24.644	-0.715	(0)
Cd (NO3) 2	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
Pb (NO3) 2	5.373e-25	5.373e-25	-24.270	-24.270	0.000	(0)
VO2NO3	4.456e-25	4.456e-25	-24.351	-24.351	0.000	(0)
Co (NO3) 2	3.036e-25	3.036e-25	-24.518	-24.518	0.000	(0)
FeNO3+2	2.356e-27	4.539e-28	-26.628	-27.343	-0.715	(0)
HgNO3+	4.756e-29	3.151e-29	-28.323	-28.502	-0.179	(0)
Hg (NO3) 2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
Na	2.704e-02					
Na+	2.554e-02	1.966e-02	-1.593	-1.706	-0.114	(0)
NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)
NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
NaCrO4-	4.050e-16	2.683e-16	-15.393	-15.571	-0.179	(0)
Ni	4.834e-10					
Ni+2	2.639e-10	9.270e-11	-9.579	-10.033	-0.454	(0)
NiSO4	2.031e-10	2.031e-10	-9.692	-9.692	0.000	(0)
NiHCO3+	6.704e-12	4.442e-12	-11.174	-11.352	-0.179	(0)

NiCO3	5.103e-12	5.103e-12	-11.292	-11.292	0.000	(0)
NiCl+	2.329e-12	1.543e-12	-11.633	-11.812	-0.179	(0)
NiOH+	1.434e-12	9.498e-13	-11.844	-12.022	-0.179	(0)
NiF+	4.172e-13	2.764e-13	-12.380	-12.558	-0.179	(0)
Ni(SO4)2-2	3.833e-13	7.386e-14	-12.416	-13.132	-0.715	(0)
Ni(OH)2	6.141e-14	6.141e-14	-13.212	-13.212	0.000	(0)
NiNH3+2	2.217e-15	4.272e-16	-14.654	-15.369	-0.715	(0)
Ni(OH)3-	7.544e-17	4.998e-17	-16.122	-16.301	-0.179	(0)
NiCl2	5.055e-17	5.055e-17	-16.296	-16.296	0.000	(0)
NiSeO4	1.497e-17	1.497e-17	-16.825	-16.825	0.000	(0)
NiNO3+	5.426e-18	3.595e-18	-17.266	-17.444	-0.179	(0)
Ni(NH3)2+2	2.750e-21	5.300e-22	-20.561	-21.276	-0.715	(0)
O(0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.664e-09					
PbSO4	4.826e-10	4.826e-10	-9.316	-9.316	0.000	(0)
PbCO3	3.980e-10	3.980e-10	-9.400	-9.400	0.000	(0)
PbOH+	2.769e-10	1.834e-10	-9.558	-9.736	-0.179	(0)
Pb+2	2.554e-10	8.973e-11	-9.593	-10.047	-0.454	(0)
Pb(SO4)2-2	1.657e-10	3.193e-11	-9.781	-10.496	-0.715	(0)
PbHCO3+	3.911e-11	2.591e-11	-10.408	-10.586	-0.179	(0)
PbCl+	3.127e-11	2.071e-11	-10.505	-10.684	-0.179	(0)
Pb(CO3)2-2	8.791e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
Pb(OH)2	4.721e-12	4.721e-12	-11.326	-11.326	0.000	(0)
PbF+	1.133e-12	7.506e-13	-11.946	-12.125	-0.179	(0)
PbCl2	6.020e-13	6.020e-13	-12.220	-12.220	0.000	(0)
Pb(OH)3-	5.800e-15	3.843e-15	-14.237	-14.415	-0.179	(0)
PbCl3-	2.354e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
PbF2	1.754e-15	1.754e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.093e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
PbCl4-2	2.407e-17	4.638e-18	-16.619	-17.334	-0.715	(0)
Pb2OH+3	1.061e-17	2.609e-19	-16.974	-18.584	-1.609	(0)
Pb(OH)4-2	3.975e-18	7.660e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.959e-19	3.948e-19	-18.225	-18.404	-0.179	(0)
Pb3(OH)4+2	2.071e-22	3.991e-23	-21.684	-22.399	-0.715	(0)
PbF4-2	1.164e-22	2.243e-23	-21.934	-22.649	-0.715	(0)
Pb(NO3)2	5.373e-25	5.373e-25	-24.270	-24.270	0.000	(0)
Pb4(OH)4+4	2.064e-26	2.845e-29	-25.685	-28.546	-2.861	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg(HS)2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.288	-147.467	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Cd(HS)2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe(HS)2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.293	-224.472	-0.179	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-226.446	-226.624	-0.179	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.603	-304.318	-0.715	(0)

Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.567	-0.715	(0)
S (6)	4.712e-02					
SO4-2	3.126e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.568e-03	7.568e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)
KSO4-	1.075e-03	8.339e-04	-2.969	-3.079	-0.110	(0)
MnSO4	6.064e-05	6.064e-05	-4.217	-4.217	0.000	(0)
ZnSO4	9.303e-06	9.303e-06	-5.031	-5.031	0.000	(0)
Zn (SO4) 2-2	4.618e-06	8.898e-07	-5.336	-6.051	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.840e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.822e-09	6.822e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.245e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CoSO4	8.653e-10	8.653e-10	-9.063	-9.063	0.000	(0)
PbSO4	4.826e-10	4.826e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.031e-10	2.031e-10	-9.692	-9.692	0.000	(0)
Pb (SO4) 2-2	1.657e-10	3.193e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	1.560e-11	1.560e-11	-10.807	-10.807	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2SO4	1.076e-12	1.076e-12	-11.968	-11.968	0.000	(0)
UO2 (SO4) 2-2	8.087e-13	1.558e-13	-12.092	-12.807	-0.715	(0)
AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.833e-13	7.386e-14	-12.416	-13.132	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	1.301e-14	8.619e-15	-13.886	-14.065	-0.179	(0)
VO2SO4-	2.258e-17	1.496e-17	-16.646	-16.825	-0.179	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
Fe (SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
Cr2 (OH) 2SO4+2	4.379e-20	8.438e-21	-19.359	-20.074	-0.715	(0)
VOSO4	2.881e-20	2.881e-20	-19.540	-19.540	0.000	(0)
HgSO4	1.589e-20	1.589e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.504e-21	5.504e-21	-20.259	-20.259	0.000	(0)
CrO3SO4-2	2.356e-23	4.540e-24	-22.628	-23.343	-0.715	(0)
VSO4+	7.727e-35	5.120e-35	-34.112	-34.291	-0.179	(0)
U (SO4) 2	1.770e-39	1.770e-39	-38.752	-38.752	0.000	(0)
USO4+2	1.053e-40	0.000e+00	-39.978	-40.693	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Sb (3)	9.942e-20					
Sb (OH) 3	5.026e-20	5.026e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.915e-20	4.915e-20	-19.308	-19.308	0.000	(0)
SbO2-	9.730e-24	6.447e-24	-23.012	-23.191	-0.179	(0)
Sb (OH) 4-	5.555e-24	3.680e-24	-23.255	-23.434	-0.179	(0)
Sb (OH) 2F	1.153e-25	1.153e-25	-24.938	-24.938	0.000	(0)
SbOF	1.136e-25	1.136e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.279e-26	1.510e-26	-25.642	-25.821	-0.179	(0)
SbO+	7.871e-27	5.215e-27	-26.104	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.567	-0.715	(0)
Sb (5)	9.042e-08					
SbO3-	9.033e-08	5.985e-08	-7.044	-7.223	-0.179	(0)
Sb (OH) 6-	9.041e-11	6.960e-11	-10.044	-10.157	-0.114	(0)
SbO2+	3.958e-24	2.622e-24	-23.403	-23.581	-0.179	(0)
Se (-2)	6.275e-39					
HSe-	6.275e-39	4.157e-39	-38.202	-38.381	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.400	-42.400	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.758	-45.473	-0.715	(0)
Se (4)	7.865e-07					
SeO3-2	4.135e-07	7.968e-08	-6.383	-7.099	-0.715	(0)
HSeO3-	3.730e-07	2.471e-07	-6.428	-6.607	-0.179	(0)
H2SeO3	1.302e-12	1.302e-12	-11.885	-11.885	0.000	(0)
Cd (SeO3) 2-2	7.196e-17	1.386e-17	-16.143	-16.858	-0.715	(0)
FeHSeO3+2	9.963e-24	1.920e-24	-23.002	-23.717	-0.715	(0)
Se (6)	9.857e-10					
SeO4-2	9.826e-10	3.452e-10	-9.008	-9.462	-0.454	(0)
MnSeO4	2.885e-12	2.885e-12	-11.540	-11.540	0.000	(0)
ZnSeO4	2.070e-13	2.070e-13	-12.684	-12.684	0.000	(0)

HSeO4-	3.224e-16	2.136e-16	-15.492	-15.670	-0.179	(0)
CdSeO4	1.703e-16	1.703e-16	-15.769	-15.769	0.000	(0)
CoSeO4	6.832e-17	6.832e-17	-16.165	-16.165	0.000	(0)
NiSeO4	1.497e-17	1.497e-17	-16.825	-16.825	0.000	(0)
Zn (SeO4) 2-2	3.760e-22	7.245e-23	-21.425	-22.140	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.385	-58.994	-1.609	(0)
U (4)	1.834e-19					
U (OH) 5-	1.833e-19	1.215e-19	-18.737	-18.916	-0.179	(0)
U (OH) 4	6.294e-23	6.294e-23	-22.201	-22.201	0.000	(0)
U (OH) 3+	4.297e-27	2.847e-27	-26.367	-26.546	-0.179	(0)
U (OH) 2+2	8.452e-32	1.628e-32	-31.073	-31.788	-0.715	(0)
UF3+	4.665e-36	3.091e-36	-35.331	-35.510	-0.179	(0)
UF2+2	8.527e-37	1.643e-37	-36.069	-36.784	-0.715	(0)
UOH+3	3.858e-37	9.488e-39	-36.414	-38.023	-1.609	(0)
UF4	4.023e-38	4.023e-38	-37.395	-37.395	0.000	(0)
UF+3	4.469e-39	1.099e-40	-38.350	-39.959	-1.609	(0)
U (SO4) 2	1.770e-39	1.770e-39	-38.752	-38.752	0.000	(0)
UF5-	2.857e-40	1.893e-40	-39.544	-39.723	-0.179	(0)
USO4+2	1.053e-40	0.000e+00	-39.978	-40.693	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.453	-41.168	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.473	-45.333	-2.861	(0)
UCl+3	0.000e+00	0.000e+00	-44.211	-45.820	-1.609	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-156.060	-170.542	-14.482	(0)
U (5)	8.142e-16					
UO2+	8.142e-16	5.394e-16	-15.089	-15.268	-0.179	(0)
U (6)	6.596e-07					
UO2 (CO3) 3-4	6.011e-07	8.284e-10	-6.221	-9.082	-2.861	(0)
UO2 (CO3) 2-2	5.813e-08	1.120e-08	-7.236	-7.951	-0.715	(0)
UO2CO3	3.804e-10	3.804e-10	-9.420	-9.420	0.000	(0)
UO2OH+	1.002e-11	6.636e-12	-10.999	-11.178	-0.179	(0)
UO2F+	1.602e-12	1.061e-12	-11.795	-11.974	-0.179	(0)
UO2SO4	1.076e-12	1.076e-12	-11.968	-11.968	0.000	(0)
UO2 (SO4) 2-2	8.087e-13	1.558e-13	-12.092	-12.807	-0.715	(0)
UO2F2	3.633e-13	3.633e-13	-12.440	-12.440	0.000	(0)
UO2+2	1.843e-13	6.476e-14	-12.734	-13.189	-0.454	(0)
UO2F3-	1.635e-14	1.083e-14	-13.786	-13.965	-0.179	(0)
UO2Cl+	1.031e-15	6.834e-16	-14.987	-15.165	-0.179	(0)
(UO2) 2 (OH) 2+2	3.792e-16	7.307e-17	-15.421	-16.136	-0.715	(0)
(UO2) 3 (OH) 5+	3.678e-16	2.437e-16	-15.434	-15.613	-0.179	(0)
UO2F4-2	5.302e-17	1.022e-17	-16.276	-16.991	-0.715	(0)
UO2NO3+	3.011e-21	1.995e-21	-20.521	-20.700	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.580	-42.759	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.465	-44.180	-0.715	(0)
V (3)	4.295e-15					
V (OH) 3	4.295e-15	4.295e-15	-14.367	-14.367	0.000	(0)
V (OH) 2+	5.182e-26	3.433e-26	-25.285	-25.464	-0.179	(0)
VOH+2	2.091e-29	4.029e-30	-28.680	-29.395	-0.715	(0)
V+3	4.015e-34	9.876e-36	-33.396	-35.005	-1.609	(0)
VSO4+	7.727e-35	5.120e-35	-34.112	-34.291	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.798	-56.407	-1.609	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.129	-57.990	-2.861	(0)
V (4)	2.420e-18					
V (OH) 3+	2.331e-18	1.544e-18	-17.633	-17.811	-0.179	(0)
VO+2	4.944e-20	9.526e-21	-19.306	-20.021	-0.715	(0)
VOSO4	2.881e-20	2.881e-20	-19.540	-19.540	0.000	(0)
VOF+	1.024e-20	6.783e-21	-19.990	-20.169	-0.179	(0)
VOF2	3.019e-22	3.019e-22	-21.520	-21.520	0.000	(0)
VOC1+	2.625e-22	1.739e-22	-21.581	-21.760	-0.179	(0)
VOF3-	1.919e-24	1.272e-24	-23.717	-23.896	-0.179	(0)
VOF4-2	3.163e-27	6.094e-28	-26.500	-27.215	-0.715	(0)
H2V2O4+2	6.225e-31	1.199e-31	-30.206	-30.921	-0.715	(0)
V (5)	4.793e-08					
H2VO4-	2.820e-08	1.868e-08	-7.550	-7.729	-0.179	(0)
HVO4-2	1.972e-08	3.800e-09	-7.705	-8.420	-0.715	(0)
H3VO4	2.307e-12	2.307e-12	-11.637	-11.637	0.000	(0)
HV2O7-3	9.799e-13	2.410e-14	-12.009	-13.618	-1.609	(0)

H3V2O7-	4.208e-13	2.788e-13	-12.376	-12.555	-0.179	(0)
VO4-3	6.271e-14	1.543e-15	-13.203	-14.812	-1.609	(0)
V2O7-4	3.812e-14	5.254e-17	-13.419	-16.280	-2.861	(0)
V3O9-3	2.792e-16	6.867e-18	-15.554	-17.163	-1.609	(0)
VO2+	7.410e-17	5.705e-17	-16.130	-16.244	-0.114	(0)
VO2SO4-	2.258e-17	1.496e-17	-16.646	-16.825	-0.179	(0)
VO2F	1.188e-17	1.188e-17	-16.925	-16.925	0.000	(0)
VO2F2-	7.727e-19	5.120e-19	-18.112	-18.291	-0.179	(0)
V4O12-4	3.887e-20	5.358e-23	-19.410	-22.271	-2.861	(0)
VO2F3-2	3.935e-21	7.581e-22	-20.405	-21.120	-0.715	(0)
VO2F4-3	1.800e-24	4.428e-26	-23.745	-25.354	-1.609	(0)
VO2NO3	4.456e-25	4.456e-25	-24.351	-24.351	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.567	-60.004	-6.437	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.256	-59.726	-4.470	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.566	-62.426	-2.861	(0)
Zn	2.603e-05					
Zn+2	1.102e-05	3.872e-06	-4.958	-5.412	-0.454	(0)
ZnSO4	9.303e-06	9.303e-06	-5.031	-5.031	0.000	(0)
Zn(SO4)2-2	4.618e-06	8.898e-07	-5.336	-6.051	-0.715	(0)
ZnOH+	4.757e-07	3.152e-07	-6.323	-6.501	-0.179	(0)
ZnCO3	3.288e-07	3.288e-07	-6.483	-6.483	0.000	(0)
ZnCl+	8.389e-08	6.328e-08	-7.076	-7.199	-0.122	(0)
ZnHCO3+	7.183e-08	4.759e-08	-7.144	-7.322	-0.179	(0)
ZnOHC1	6.743e-08	6.743e-08	-7.171	-7.171	0.000	(0)
Zn(OH)2	4.065e-08	4.065e-08	-7.391	-7.391	0.000	(0)
ZnF+	1.384e-08	9.172e-09	-7.859	-8.038	-0.179	(0)
ZnCl2	6.526e-10	6.526e-10	-9.185	-9.185	0.000	(0)
Zn(OH)3-	2.503e-10	1.658e-10	-9.602	-9.780	-0.179	(0)
ZnCl3-	4.471e-12	3.373e-12	-11.350	-11.472	-0.122	(0)
ZnNO3+	2.267e-13	1.502e-13	-12.645	-12.823	-0.179	(0)
ZnSeO4	2.070e-13	2.070e-13	-12.684	-12.684	0.000	(0)
ZnCl4-2	3.120e-14	1.097e-14	-13.506	-13.960	-0.454	(0)
Zn(OH)4-2	2.789e-14	5.373e-15	-13.555	-14.270	-0.715	(0)
Zn(NO3)2	4.626e-22	4.626e-22	-21.335	-21.335	0.000	(0)
Zn(SeO4)2-2	3.760e-22	7.245e-23	-21.425	-22.140	-0.715	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.288	-147.467	-0.179	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.293	-224.472	-0.179	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.603	-304.318	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.15	-48.86	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-42.12	-37.61	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.35	-37.61	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.24	-53.31	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-56.47	-36.43	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.43	-28.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.37	-22.92	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3
Al2(MoO4)3	-47.72	-45.36	2.37	Al2(MoO4)3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5

Atacamite	-0.99	6.40	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.64	-18.54	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-16.61	7.79	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-16.95	-1.08	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-26.23	6.71	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-12.91	-22.58	-9.67	BaCrO ₄
BaF ₂	-10.05	-15.87	-5.82	BaF ₂
BaMoO ₄	-6.63	-13.59	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-8.55	-6.72	1.83	BaSeO ₃
BaSeO ₄	-10.02	-17.48	-7.46	BaSeO ₄
Bianchite	-5.61	-7.38	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-6.59	11.50	18.09	MnO ₂
Bixbyite	-1.89	-2.54	-0.64	Mn ₂ O ₃
BlaubleiI	-55.07	-79.24	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.53	-82.81	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.85	-77.38	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.45	13.39	16.84	Mg(OH) ₂
Bunsenite	-6.66	5.78	12.45	NiO
Ca(VO ₃) ₂	-9.16	-3.50	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-7.84	9.66	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-11.89	9.66	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-15.10	7.20	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-16.13	22.83	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-17.03	22.83	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-295.34	-152.36	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.94	-17.21	-2.27	CaCrO ₄
Calcite	-0.00	-8.48	-8.48	CaCO ₃
Calomel	-5.91	-23.82	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.27	-8.22	-7.95	CaMoO ₄
Carnotite	0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-4.16	-1.35	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-9.09	-12.11	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-10.64	-0.80	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.41	7.24	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.49	7.24	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.54	-13.83	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.62	3.94	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-17.22	11.18	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.29	-12.95	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-11.26	-12.95	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.04	-12.95	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.22	-16.43	-1.21	CdF ₂
Cdmetal(α)	-31.82	-18.31	13.51	Cd
Cdmetal(γ)	-31.92	-18.31	13.62	Cd
CdMoO ₄	0.00	-14.15	-14.15	CdMoO ₄
CdOHC1	-6.39	-2.86	3.54	CdOHC1
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.19	-18.04	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.36	-10.54	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-8.81	-10.54	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-8.67	-10.54	-1.87	CdSO ₄ ·2.67H ₂ O
Cerrusite	-2.75	-15.88	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-6.89	-9.53	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-55.04	-89.96	-34.92	Cu ₂ S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS ₂
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As ₄ O ₆
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co(BO ₂) ₂	-28.70	-1.63	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.68	6.41	13.09	Co(OH) ₂
Co(OH) ₃	-10.91	-13.22	-2.31	Co(OH) ₃

CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-26.09	-13.06	13.03	Co3 (AsO4) 2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.68	-39.88	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.34	-18.87	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.96	-11.14	10.82	Cr (OH) 2
Cr (OH) 3	-2.66	-1.32	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.57	-1.32	-0.75	Cr (OH) 3
Cr2O3	-0.28	-2.64	-2.36	Cr2O3
CrCl2	-45.42	-31.33	14.09	CrCl2
CrCl3	-46.72	-31.60	15.11	CrCl3
CrF3	-25.48	-36.82	-11.34	CrF3
Crmetal	-67.17	-36.69	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.50	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.69	-22.13	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.42	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.78	-6.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.50	-13.22	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.69	-8.13	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.53	-37.16	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O

FeCr2O4	-6.39	0.82	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.98	-63.58	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.84	-42.84	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-5.04	2.63	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg(CH3)2(g)	-184.58	-258.29	-73.71	Hg(CH3)2
Hg(g)	-6.71	-14.59	-7.87	Hg
Hg(OH)2	-7.14	-10.64	-3.50	Hg(OH)2
Hg2(g)	-14.22	-29.18	-14.96	Hg2
Hg2(OH)2	-8.89	-3.63	5.26	Hg2(OH)2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.31	-34.01	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.92	-11.68	Hg2S
Hg2SeO3	-13.49	-18.15	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl(g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF(g)	-46.32	-13.65	32.68	HgF
HgF2(g)	-46.87	-34.30	12.57	HgF2
Hgmetal(l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.23	-56.92	-55.69	HgSe
HgSeO3	-12.72	-25.15	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.85	-19.62	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.05	-20.22	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-31.64	-48.88	-17.24	K2Cr2O7
K2CrO4	-17.99	-18.50	-0.51	K2CrO4
K2MoO4	-12.77	-9.51	3.26	K2MoO4
K2SeO4	-12.67	-13.40	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.93	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2(OH)2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.13	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF

Melanothallite	-18.20	-11.94	6.26	CuCl ₂
Melanterite	-12.12	-14.33	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg(OH) ₂ (active)	-5.40	13.39	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.56	-3.28	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-271.83	-197.14	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.24	10.12	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.44	10.76	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.36	-16.98	5.38	MgCrO ₄
MgF ₂	-2.14	-10.27	-8.13	MgF ₂
MgMoO ₄	-6.14	-7.99	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.18	-1.13	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-10.69	-11.89	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-30.67	42.85	73.52	Pb ₃ O ₄
Mirabilite	-4.27	-5.38	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-10.26	-5.36	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.15	-55.87	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.17	-86.09	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.88	1.62	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.60	-8.88	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-75.16	-74.99	0.17	MnS
MnS(pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.48	-34.98	3.50	MnSe
MnSeO ₃	-4.34	-3.21	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.19	-3.21	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-11.92	-13.97	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.05	-6.47	2.58	MnSO ₄
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO ₃	-13.39	-21.39	-8.00	MoO ₃
Morenosite	-9.85	-12.00	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.26	-219.52	-70.26	MoS ₂
Na-Jarosite	-8.57	-19.77	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.46	-48.35	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.90	-17.97	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-13.78	-30.37	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.48	-8.99	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.21	-8.99	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-12.42	-2.12	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-14.15	-12.87	1.28	Na ₂ SeO ₄
Na ₃ Sb	-171.78	-77.33	94.45	Na ₃ Sb
Na ₃ VO ₄	-26.41	10.27	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.26	8.14	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-5.99	-2.13	3.86	NaVO ₃
Nesquehonite	-3.59	-8.26	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-7.01	5.78	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-30.65	-14.95	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-26.65	5.35	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-8.99	-15.86	-6.87	NiCO ₃
NiMoO ₄	-4.46	-15.61	-11.14	NiMoO ₄
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.81	-40.51	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-11.55	-8.73	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.98	-19.50	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-6.00	11.50	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-243.41	-304.47	-61.07	As ₂ S ₃
Otavite	-2.41	-14.41	-12.00	CdCO ₃
Pb(BO ₂) ₂	-8.79	-2.27	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.38	5.77	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-63.44	-72.20	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-7.35	1.44	8.79	Pb ₂ (OH) ₃ Cl

Pb2O(OH) 2	-14.65	11.54	26.19	Pb2O(OH) 2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.23	-5.13	-1.90	Pb2V2O7
Pb3(AsO4) 2	-20.79	-14.99	5.80	Pb3(AsO4) 2
Pb3(VO4) 2	-5.50	0.64	6.14	Pb3(VO4) 2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4(OH) 6SO4	-15.80	5.30	21.10	Pb4(OH) 6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb(OH) 3	-12.19	-19.30	-7.11	Sb(OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.70	-177.46	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.61	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.37	2.63	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.63	-20.74	-7.11	Se
Semetal(hex)	-13.04	-20.74	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.28	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.24	-11.24	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca(UO2) 2(VO4) 2
U3O8	-11.10	9.99	21.08	U3O8
U3Sb4	-577.21	-424.83	152.38	U3Sb4
U4O9	-26.24	-29.26	-3.02	U4O9
UF4	-31.50	-61.04	-29.54	UF4
UF4:2.5H2O	-28.32	-61.04	-32.72	UF4:2.5H2O
UO2(am)	-14.64	-13.70	0.93	UO2
UO2(NO3) 2	-40.96	-28.81	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-33.66	-28.81	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-32.20	-28.81	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-30.86	-28.82	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-2.99	2.63	5.61	UO2(OH) 2
UO2SeO4:4H2O	-20.40	-22.65	-2.25	UO2SeO4:4H2O
UO3	-5.07	2.63	7.70	UO3
Uraninite	-9.03	-13.70	-4.67	UO2
USb2	-218.81	-189.24	29.58	USb2

V(OH)3	-18.87	-11.28	7.59	V(OH)3
V2O5	-15.31	-16.67	-1.36	V2O5
V3O5	-40.00	-38.16	1.84	V3O5
V4O7	-49.55	-42.37	7.19	V4O7
V6O13	-40.24	-101.10	-60.86	V6O13
Valentinite	-30.11	-38.60	-8.48	Sb2O3
VC12	-63.12	-44.24	18.87	VC12
VC13	-65.00	-41.57	23.43	VC13
VF4	-66.47	-51.54	14.93	VF4
Vmetal	-93.62	-49.60	44.03	V
VO	-38.81	-24.05	14.76	VO
VO(OH)2	-9.36	-4.21	5.15	VO(OH)2
VO2Cl	-21.27	-18.43	2.84	VO2Cl
VOC1	-32.53	-21.38	11.15	VOC1
VOC12	-37.15	-24.39	12.76	VOC12
VOSO4	-25.59	-21.98	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO4
Zn(BO2)2	-5.93	2.36	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.36	-21.04	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.80	10.40	12.20	Zn(OH)2
Zn(OH)2(am)	-2.07	10.40	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.35	10.40	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.13	10.40	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.33	10.40	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.47	3.03	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.48	10.71	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.74	-1.09	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.25	-4.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.56	23.84	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.67	31.83	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.98	-11.24	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.26	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.98	-10.13	ZnMoO4
ZnO(active)	-0.78	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.48	-35.88	-14.40	ZnSe
ZnSeO4:6H2O	-13.36	-14.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.73	-7.37	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 91.

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 502
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 502
USE Surface 502
USE Solution 507
SAVE Solution 508 #Initial Stage 5 Run-off Water After Mineral
Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 502.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.980e-19 Surface + diffuse layer charge, eq
3.135e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.878e-01 m² for 1.071e-05 moles of Ferrihydrite

Water in diffuse layer: 6.878e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is
+1).

Element	Moles
C	1.7571e-11
Ca	2.1777e-13
Cl	3.5187e-10
H	5.1834e-11
K	3.4546e-13
Mg	3.3739e-14
N	1.4245e-09
Na	1.4637e-12
O	6.3492e-08
S	1.4794e-08

Hfo_s

5.357e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.581e-08	0.668	3.581e-08	-7.446
Hfo_sOH	1.756e-08	0.328	1.756e-08	-7.755
Hfo_sO-	1.973e-10	0.004	1.973e-10	-9.705
Hfo_sOHCa+2	6.537e-13	0.000	6.537e-13	-12.185

Hfo_w

2.143e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	9.901e-07	0.462	9.901e-07	-6.004
Hfo_wOH	4.856e-07	0.227	4.856e-07	-6.314
Hfo_wSO4-	3.344e-07	0.156	3.344e-07	-6.476
Hfo_wOHSO4-2	3.272e-07	0.153	3.272e-07	-6.485
Hfo_wO-	5.456e-09	0.003	5.456e-09	-8.263
Hfo_wOMg+	7.711e-15	0.000	7.711e-15	-14.113
Hfo_wOCa+	2.616e-15	0.000	2.616e-15	-14.582

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 507. Solution after simulation 90.
Using surface 502.
Using pure phase assemblage 502. Pure-phase assemblage after simulation 90.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	7.228e-05	7.228e-05	6.091e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	5.034e-08	4.091e-08	-9.433e-09
Barite	0.00	-9.98	-9.98	2.998e-05	3.001e-05	2.830e-08
Brochantite	0.00	15.22	15.22	1.342e-04	1.340e-04	-1.502e-07
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.012e+01	1.012e+01	9.802e-07
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-4.18	-1.36	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	4.571e-02	4.571e-02	-1.727e-06
Carnotite	-0.00	0.23	0.23	2.082e-06	1.824e-06	-2.584e-07
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	2.417e-07	2.417e-07	-1.673e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-1.22	-3.58	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.17	-49.97	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.071e-05	1.071e-05	-2.205e-14
Fluorite	0.00	-10.50	-10.50	3.686e-03	3.686e-03	1.246e-09
Gummite	-4.90	2.77	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	9.180e-03	9.181e-03	1.505e-06
HgSe	-1.25	-56.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.35	-3.22	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.00	-15.87	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.47	-15.61	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	7.551e-10
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	7.514e-07	7.476e-07	-3.760e-09
Rutherfordine	-4.38	-18.88	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.23	2.77	5.99	0.000e+00	0	0.000e+00

Sepiolite	Element not present.				0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.				0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00	
U3O8	-10.67	10.42	21.08	0.000e+00	0	0.000e+00	
UO2(OH)2(beta)	-2.84	2.77	5.61	0.000e+00	0	0.000e+00	
UO3	-4.93	2.77	7.70	0.000e+00	0	0.000e+00	
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00	

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

8.553e-21	Surface + diffuse layer charge, eq
1.776e-07	Surface charge, eq
2.492e-02	sigma, C/m ²
2.949e-02	psi, V
-1.148e+00	-F*psi/RT
3.173e-01	exp(-F*psi/RT)
6.420e+04	specific area, m ² /mol Ferrihydrite
6.878e-01	m ² for 1.071e-05 moles of Ferrihydrite

Water in diffuse layer: 6.878e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 2.638e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.024e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Al	4.2288e-11
As	1.3274e-14
B	6.9379e-10
Ba	1.5238e-13
C	4.3173e-09
Ca	7.4802e-08
Cd	1.5038e-13
Cl	6.4419e-08
Co	1.7759e-14
Cr	2.4376e-15
Cu	3.2718e-12
F	1.6208e-09
Fe	7.1934e-15
H	6.4780e-09
Hg	6.6224e-14
K	9.4678e-08
Mg	1.1302e-07
Mn	1.3251e-09
Mo	6.4304e-11
N	1.7142e-10
Na	1.6996e-07
Ni	2.9707e-15
O	1.5160e-06
Pb	1.1158e-14
S	3.7505e-07
Sb	6.8917e-13
Se	6.1275e-12
U	9.3591e-12
V	2.7426e-13
Zn	1.7017e-10

Hfo_s

5.357e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.611e-08	0.487	2.606e-08	-7.584
Hfo_sOCu+	1.469e-08	0.274	1.466e-08	-7.834

Hfo_sOMn+	8.607e-09	0.161	8.591e-09	-8.066
Hfo_sOPb+	2.791e-09	0.052	2.785e-09	-8.555
Hfo_sOCrOH+	7.583e-10	0.014	7.569e-10	-9.121
Hfo_sOHCa+2	5.715e-10	0.011	5.704e-10	-9.244
Hfo_sOH	2.710e-11	0.001	2.705e-11	-10.568
Hfo_sO-	8.127e-12	0.000	8.112e-12	-11.091
Hfo_sOCd+	5.445e-12	0.000	5.435e-12	-11.265
Hfo_sOH2+	2.071e-12	0.000	2.067e-12	-11.685
Hfo_sONi+	1.508e-13	0.000	1.505e-13	-12.822
Hfo_sOCo+	9.530e-14	0.000	9.512e-14	-13.022
Hfo_sOHBa+2	7.505e-15	0.000	7.491e-15	-14.125
Hfo_sOFe+	1.509e-15	0.000	1.507e-15	-14.822
Hfo_sOHg+	2.195e-16	0.000	2.191e-16	-15.659

Hfo_w

2.143e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	5.861e-07	0.274	5.850e-07	-6.233
Hfo_wOMg+	5.156e-07	0.241	5.146e-07	-6.288
Hfo_wOHVO4-3	2.719e-07	0.127	2.714e-07	-6.566
Hfo_wOZn+	2.128e-07	0.099	2.124e-07	-6.673
Hfo_wOH	2.109e-07	0.098	2.105e-07	-6.677
Hfo_wOHSeO4-2	1.418e-07	0.066	1.416e-07	-6.849
Hfo_wO-	6.324e-08	0.030	6.313e-08	-7.200
Hfo_wOMn+	5.320e-08	0.025	5.311e-08	-7.275
Hfo_wOHSeO3-2	2.384e-08	0.011	2.380e-08	-7.623
Hfo_wOHAsO4-3	1.886e-08	0.009	1.883e-08	-7.725
Hfo_wOCa+	1.718e-08	0.008	1.715e-08	-7.766
Hfo_wOH2+	1.611e-08	0.008	1.608e-08	-7.794
Hfo_wSO4-	5.441e-09	0.003	5.431e-09	-8.265
Hfo_wSeO3-	3.100e-09	0.001	3.094e-09	-8.510
Hfo_wOHMoO4-2	1.407e-09	0.001	1.404e-09	-8.852
Hfo_wOPb+	9.701e-10	0.000	9.683e-10	-9.014
Hfo_wH2BO3	8.378e-11	0.000	8.362e-11	-10.078
Hfo_wMOO4-	6.954e-11	0.000	6.941e-11	-10.159
Hfo_wOCd+	1.808e-11	0.000	1.804e-11	-10.744
Hfo_wHAsO4-	2.470e-12	0.000	2.465e-12	-11.608
Hfo_wOCo+	2.090e-12	0.000	2.086e-12	-11.681
Hfo_wONi+	1.583e-12	0.000	1.580e-12	-11.801
Hfo_wOHg+	8.366e-14	0.000	8.350e-14	-13.078
Hfo_wOFe+	7.412e-15	0.000	7.398e-15	-14.131
Hfo_wH2AsO4	6.105e-15	0.000	6.094e-15	-14.215
Hfo_wOHSeO4-2	4.406e-15	0.000	4.398e-15	-14.357
Hfo_wOBa+	3.261e-15	0.000	3.255e-15	-14.487
Hfo_wOHSbO(OH) 4-	9.248e-16	0.000	9.231e-16	-15.035
Hfo_wSeO4-	1.472e-16	0.000	1.470e-16	-15.833
Hfo_wSbO(OH) 4	4.571e-17	0.000	4.562e-17	-16.341
Hfo_wOHCrO4-2	1.541e-17	0.000	1.538e-17	-16.813
Hfo_wCrO4-	5.390e-19	0.000	5.380e-19	-18.269
Hfo_wH2AsO3	8.690e-25	0.000	8.673e-25	-24.062

-----Solution composition-----

Elements	Molality	Moles
Al	5.553e-06	5.563e-06
As	1.576e-09	1.579e-09
B	1.004e-04	1.005e-04
Ba	2.720e-08	2.725e-08
C	5.752e-04	5.762e-04
Ca	1.206e-02	1.209e-02
Cd	2.231e-08	2.236e-08
Cl	8.452e-03	8.467e-03
Co	2.966e-09	2.972e-09
Cr	3.851e-10	3.858e-10
Cu	4.981e-07	4.990e-07

F	2.258e-04	2.262e-04
Fe	1.103e-09	1.105e-09
Hg	9.628e-09	9.646e-09
K	1.501e-02	1.504e-02
Mg	1.844e-02	1.848e-02
Mn	2.226e-04	2.231e-04
Mo	7.613e-06	7.628e-06
N	2.254e-05	2.258e-05
Na	2.704e-02	2.709e-02
Ni	4.817e-10	4.826e-10
Pb	1.664e-09	1.667e-09
S	4.712e-02	4.721e-02
Sb	9.042e-08	9.059e-08
Se	7.606e-07	7.620e-07
U	9.176e-07	9.193e-07
V	3.445e-08	3.451e-08
Zn	2.579e-05	2.584e-05

-----Description of solution-----

equilibrium	pH	=	7.908	Charge balance
	pe	=	4.864	Adjusted to redox
Activity of water				
= 0.998				
Ionic strength (mol/kgw)				
= 1.229e-01				
Mass of water (kg)				
= 1.002e+00				
Total alkalinity (eq/kg)				
= 6.164e-04				
Total CO2 (mol/kg)				
= 5.752e-04				
Temperature (°C)				
= 25.00				
Pressure (atm)				
= 1.00				
Electrical balance (eq)				
= 2.673e-06				
Percent error, 100*(Cat- An)/(Cat+ An)				
= 0.00				
Iterations				
= 1				
Total H				
= 1.112222e+02				
Total O				
= 5.580162e+01				

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.091e-06	8.139e-07	-5.962	-6.089	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.553e-06					
Al(OH)4-	5.508e-06	4.200e-06	-5.259	-5.377	-0.118	(0)
Al(OH)3	4.099e-08	4.099e-08	-7.387	-7.387	0.000	(0)
Al(OH)2+	3.253e-09	2.524e-09	-8.488	-8.598	-0.110	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
AlOH+2	1.078e-11	3.904e-12	-10.968	-11.408	-0.441	(0)
AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
Al(SO4)2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.049e-14	4.797e-15	-13.297	-14.319	-1.022	(0)
AlMo6O21-3	2.499e-39	0.000e+00	-38.602	-40.211	-1.609	(0)
As(3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.003e-24	6.644e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.547e-28	4.908e-29	-27.594	-28.309	-0.715	(0)
H4AsO3+	1.477e-31	9.787e-32	-30.831	-31.009	-0.179	(0)
AsO3-3	6.229e-33	1.532e-34	-32.206	-33.815	-1.609	(0)
As(5)	1.576e-09					
HAsO4-2	1.523e-09	2.935e-10	-8.817	-9.532	-0.715	(0)
H2AsO4-	4.988e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.056e-12	7.516e-14	-11.515	-13.124	-1.609	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)

B	1.004e-04					
H3BO3	9.245e-05	9.510e-05	-4.034	-4.022	0.012	(0)
H2BO3-	6.158e-06	4.473e-06	-5.211	-5.349	-0.139	(0)
MgH2BO3+	8.086e-07	5.874e-07	-6.092	-6.231	-0.139	(0)
CaH2BO3+	7.951e-07	5.776e-07	-6.100	-6.238	-0.139	(0)
NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
BF(OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
H5(BO3) 2-	4.984e-10	3.621e-10	-9.302	-9.441	-0.139	(0)
H8(BO3) 3-	4.740e-12	3.443e-12	-11.324	-11.463	-0.139	(0)
BaH2BO3+	1.815e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
BF2(OH) 2-	9.737e-13	7.073e-13	-12.012	-12.150	-0.139	(0)
BF3OH-	5.563e-19	4.041e-19	-18.255	-18.393	-0.139	(0)
BF4-	4.020e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
Ba	2.720e-08					
Ba+2	2.714e-08	9.536e-09	-7.566	-8.021	-0.454	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.815e-12	1.318e-12	-11.741	-11.880	-0.139	(0)
BaOH+	4.399e-14	3.388e-14	-13.357	-13.470	-0.113	(0)
BaNO3+	1.114e-15	7.379e-16	-14.953	-15.132	-0.179	(0)
BaNH3+2	2.680e-16	5.164e-17	-15.572	-16.287	-0.715	(0)
C(4)	5.752e-04					
HCO3-	5.010e-04	3.887e-04	-3.300	-3.410	-0.110	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.648e-06	4.648e-06	-5.333	-5.333	0.000	(0)
NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
CO3-2	4.200e-06	1.476e-06	-5.377	-5.831	-0.454	(0)
UO2(CO3) 3-4	8.361e-07	1.152e-09	-6.078	-8.938	-2.861	(0)
NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
ZnCO3	3.258e-07	3.258e-07	-6.487	-6.487	0.000	(0)
MnHCO3+	3.126e-07	2.407e-07	-6.505	-6.618	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
UO2(CO3) 2-2	8.087e-08	1.558e-08	-7.092	-7.807	-0.715	(0)
ZnHCO3+	7.117e-08	4.716e-08	-7.148	-7.326	-0.179	(0)
Cu(CO3) 2-2	4.865e-09	9.374e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
UO2CO3	5.292e-10	5.292e-10	-9.276	-9.276	0.000	(0)
PbCO3	3.979e-10	3.979e-10	-9.400	-9.400	0.000	(0)
CdCO3	8.910e-11	8.910e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.910e-11	2.590e-11	-10.408	-10.587	-0.179	(0)
CoHCO3+	1.801e-11	1.193e-11	-10.745	-10.923	-0.179	(0)
CoCO3	9.843e-12	9.843e-12	-11.007	-11.007	0.000	(0)
Pb(CO3) 2-2	8.789e-12	1.693e-12	-11.056	-11.771	-0.715	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
NiHCO3+	6.680e-12	4.426e-12	-11.175	-11.354	-0.179	(0)
NiCO3	5.085e-12	5.085e-12	-11.294	-11.294	0.000	(0)
CdHCO3+	3.538e-12	2.344e-12	-11.451	-11.630	-0.179	(0)
Cd(CO3) 2-2	5.058e-13	9.747e-14	-12.296	-13.011	-0.715	(0)
HgCO3	9.761e-15	9.761e-15	-14.011	-14.011	0.000	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.674	-0.106	(0)
Hg(CO3) 2-2	2.364e-16	4.555e-17	-15.626	-16.342	-0.715	(0)
HgHCO3+	3.387e-18	2.244e-18	-17.470	-17.649	-0.179	(0)
Ca	1.206e-02					
Ca+2	6.388e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	3.776e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
CaH2BO3+	7.951e-07	5.776e-07	-6.100	-6.238	-0.139	(0)
CaOH+	4.649e-08	3.644e-08	-7.333	-7.438	-0.106	(0)
CaNO3+	1.654e-10	1.096e-10	-9.782	-9.960	-0.179	(0)
CaNH3+2	1.258e-10	2.425e-11	-9.900	-10.615	-0.715	(0)
Ca(NH3) 2+2	4.300e-19	8.284e-20	-18.367	-19.082	-0.715	(0)
Cd	2.231e-08					

Cd+2	7.541e-09	2.649e-09	-8.123	-8.577	-0.454	(0)
CdSO4	6.819e-09	6.819e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.243e-09	1.010e-09	-8.280	-8.996	-0.715	(0)
CdCl+	2.484e-09	1.646e-09	-8.605	-8.784	-0.179	(0)
CdCO3	8.910e-11	8.910e-11	-10.050	-10.050	0.000	(0)
CdOHC1	5.495e-11	5.495e-11	-10.260	-10.260	0.000	(0)
CdCl2	4.465e-11	4.465e-11	-10.350	-10.350	0.000	(0)
CdOH+	2.585e-11	1.713e-11	-10.588	-10.766	-0.179	(0)
CdF+	7.523e-12	4.984e-12	-11.124	-11.302	-0.179	(0)
CdHCO3+	3.538e-12	2.344e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.058e-13	9.747e-14	-12.296	-13.011	-0.715	(0)
CdCl3-	2.766e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
Cd (OH) 2	8.795e-14	8.795e-14	-13.056	-13.056	0.000	(0)
CdF2	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
CdNO3+	1.952e-16	1.293e-16	-15.709	-15.888	-0.179	(0)
CdSeO4	1.645e-16	1.645e-16	-15.784	-15.784	0.000	(0)
Cd (SeO3) 2-2	6.710e-17	1.293e-17	-16.173	-16.888	-0.715	(0)
Cd2OH+3	9.245e-18	2.274e-19	-17.034	-18.643	-1.609	(0)
Cd (OH) 3-	6.601e-18	4.373e-18	-17.180	-17.359	-0.179	(0)
Cd (OH) 4-2	3.024e-24	5.826e-25	-23.519	-24.235	-0.715	(0)
Cd (NO3) 2	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
C1	8.452e-03					
C1-	8.451e-03	6.506e-03	-2.073	-2.187	-0.114	(0)
MnCl+	3.302e-07	2.543e-07	-6.481	-6.595	-0.113	(0)
ZnCl+	8.312e-08	6.270e-08	-7.080	-7.203	-0.122	(0)
ZnOHC1	6.681e-08	6.681e-08	-7.175	-7.175	0.000	(0)
CuCl2-	2.684e-09	2.024e-09	-8.571	-8.694	-0.122	(0)
CdCl+	2.484e-09	1.646e-09	-8.605	-8.784	-0.179	(0)
MnCl2	2.337e-09	2.337e-09	-8.631	-8.631	0.000	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
ZnCl2	6.466e-10	6.466e-10	-9.189	-9.189	0.000	(0)
CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CdOHC1	5.495e-11	5.495e-11	-10.260	-10.260	0.000	(0)
HgClOH	5.169e-11	5.169e-11	-10.287	-10.287	0.000	(0)
CdCl2	4.465e-11	4.465e-11	-10.350	-10.350	0.000	(0)
PbCl+	3.126e-11	2.071e-11	-10.505	-10.684	-0.179	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
CoCl+	1.341e-11	8.882e-12	-10.873	-11.051	-0.179	(0)
CuCl3-2	8.007e-12	2.816e-12	-11.097	-11.550	-0.454	(0)
MnCl3-	5.438e-12	4.188e-12	-11.265	-11.378	-0.113	(0)
ZnCl3-	4.430e-12	3.342e-12	-11.354	-11.476	-0.122	(0)
NiCl+	2.321e-12	1.538e-12	-11.634	-11.813	-0.179	(0)
HgCl3-	2.298e-12	1.522e-12	-11.639	-11.817	-0.179	(0)
CuCl2	6.319e-13	6.319e-13	-12.199	-12.199	0.000	(0)
PbCl2	6.018e-13	6.018e-13	-12.221	-12.221	0.000	(0)
CdCl3-	2.766e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
HgCl4-2	2.047e-13	3.943e-14	-12.689	-13.404	-0.715	(0)
ZnCl4-2	3.091e-14	1.087e-14	-13.510	-13.964	-0.454	(0)
PbCl3-	2.353e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
UO2Cl+	1.435e-15	9.506e-16	-14.843	-15.022	-0.179	(0)
HgCl+	1.083e-15	7.175e-16	-14.965	-15.144	-0.179	(0)
CuCl3-	5.086e-17	3.837e-17	-16.294	-16.416	-0.122	(0)
NiCl2	5.037e-17	5.037e-17	-16.298	-16.298	0.000	(0)
PbCl4-2	2.406e-17	4.636e-18	-16.619	-17.334	-0.715	(0)
CrCl+2	4.953e-18	9.544e-19	-17.305	-18.020	-0.715	(0)
CrOHC12	9.606e-20	9.606e-20	-19.017	-19.017	0.000	(0)
CuCl4-2	3.558e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
CrCl2+	8.893e-22	5.892e-22	-21.051	-21.230	-0.179	(0)
VOCl+	1.887e-22	1.250e-22	-21.724	-21.903	-0.179	(0)
FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
CrO3Cl-	2.827e-26	1.873e-26	-25.549	-25.727	-0.179	(0)
FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
CoCl+2	7.898e-37	1.522e-37	-36.102	-36.818	-0.715	(0)

UCl+3	0.000e+00	0.000e+00	-44.068	-45.677	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.713	-52.429	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
Co (2)	2.966e-09					
Co+2	2.048e-09	3.946e-10	-8.689	-9.404	-0.715	(0)
CoSO4	8.646e-10	8.646e-10	-9.063	-9.063	0.000	(0)
CoHCO3+	1.801e-11	1.193e-11	-10.745	-10.923	-0.179	(0)
CoCl+	1.341e-11	8.882e-12	-10.873	-11.051	-0.179	(0)
CoCO3	9.843e-12	9.843e-12	-11.007	-11.007	0.000	(0)
CoOH+	9.672e-12	6.408e-12	-11.014	-11.193	-0.179	(0)
CoF+	2.236e-12	1.481e-12	-11.651	-11.829	-0.179	(0)
Co (OH) 2	4.143e-13	4.143e-13	-12.383	-12.383	0.000	(0)
CoNO2+	6.869e-14	4.551e-14	-13.163	-13.342	-0.179	(0)
Co (NH3) +2	2.113e-15	4.072e-16	-14.675	-15.390	-0.715	(0)
CoSeO4	6.593e-17	6.593e-17	-16.181	-16.181	0.000	(0)
CoNO3+	1.458e-17	9.657e-18	-16.836	-17.015	-0.179	(0)
Co (OH) 3-	1.015e-17	6.728e-18	-16.993	-17.172	-0.179	(0)
CoOOH-	2.553e-18	1.691e-18	-17.593	-17.772	-0.179	(0)
Co2OH+3	5.153e-21	1.267e-22	-20.288	-21.897	-1.609	(0)
Co (NH3) 2+2	7.737e-22	1.491e-22	-21.111	-21.827	-0.715	(0)
Co (OH) 4-2	4.504e-24	8.679e-25	-23.346	-24.062	-0.715	(0)
Co (NO3) 2	3.034e-25	3.034e-25	-24.518	-24.518	0.000	(0)
Co (NH3) 3+2	8.360e-29	1.611e-29	-28.078	-28.793	-0.715	(0)
Co4 (OH) 4+4	2.441e-34	3.365e-37	-33.612	-36.473	-2.861	(0)
Co (NH3) 4+2	3.765e-36	7.255e-37	-35.424	-36.139	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.271	-43.986	-0.715	(0)
Co (3)	2.468e-30					
CoOH+2	2.468e-30	4.755e-31	-29.608	-30.323	-0.715	(0)
Co+3	1.210e-36	1.150e-37	-35.917	-36.939	-1.022	(0)
CoCl+2	7.898e-37	1.522e-37	-36.102	-36.818	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
Cr (2)	1.920e-27					
Cr+2	1.920e-27	3.700e-28	-26.717	-27.432	-0.715	(0)
Cr (3)	3.851e-10					
Cr (OH) 2+	3.017e-10	1.999e-10	-9.520	-9.699	-0.179	(0)
Cr (OH) 3	6.111e-11	6.111e-11	-10.214	-10.214	0.000	(0)
Cr (OH) +2	1.047e-11	2.018e-12	-10.980	-11.695	-0.715	(0)
CrOHSO4	5.259e-12	5.259e-12	-11.279	-11.279	0.000	(0)
CrO2-	3.554e-12	2.355e-12	-11.449	-11.628	-0.179	(0)
Cr (OH) 4-	2.989e-12	1.980e-12	-11.525	-11.703	-0.179	(0)
CrF+2	1.107e-14	2.132e-15	-13.956	-14.671	-0.715	(0)
Cr+3	4.608e-15	1.133e-16	-14.336	-15.946	-1.609	(0)
CrSO4+	4.387e-15	2.906e-15	-14.358	-14.537	-0.179	(0)
CrCl+2	4.953e-18	9.544e-19	-17.305	-18.020	-0.715	(0)
CrOHC12	9.606e-20	9.606e-20	-19.017	-19.017	0.000	(0)
Cr2 (OH) 2SO4+2	4.979e-21	9.593e-22	-20.303	-21.018	-0.715	(0)
CrCl2+	8.893e-22	5.892e-22	-21.051	-21.230	-0.179	(0)
Cr2 (OH) 2 (SO4) 2	6.258e-22	6.258e-22	-21.204	-21.204	0.000	(0)
CrNO3+2	3.970e-25	7.650e-26	-24.401	-25.116	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.279	-41.995	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.735	-51.344	-1.609	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.713	-52.429	-0.715	(0)
Cr (6)	2.884e-15					
CrO4-2	2.636e-15	9.259e-16	-14.579	-15.033	-0.454	(0)
NaCrO4-	1.366e-16	9.047e-17	-15.865	-16.043	-0.179	(0)
HCrO4-	5.584e-17	3.700e-17	-16.253	-16.432	-0.179	(0)
KCrO4-	5.570e-17	3.690e-17	-16.254	-16.433	-0.179	(0)
CrO3SO4-2	7.945e-24	1.531e-24	-23.100	-23.815	-0.715	(0)
H2CrO4	3.703e-25	3.703e-25	-24.431	-24.431	0.000	(0)
CrO3Cl-	2.827e-26	1.873e-26	-25.549	-25.727	-0.179	(0)
Cr2O7-2	2.468e-31	4.755e-32	-30.608	-31.323	-0.715	(0)
Cu (1)	4.455e-09					
CuCl2-	2.684e-09	2.024e-09	-8.571	-8.694	-0.122	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)

Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	8.007e-12	2.816e-12	-11.097	-11.550	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu (2)	4.936e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.268e-08	6.991e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.732e-08	2.716e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.865e-09	9.374e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.713e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)
CuNO2+	7.026e-11	4.655e-11	-10.153	-10.332	-0.179	(0)
Cu (OH) 3-	2.861e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
CuNH3+2	1.238e-11	2.386e-12	-10.907	-11.622	-0.715	(0)
CuCl2	6.319e-13	6.319e-13	-12.199	-12.199	0.000	(0)
Cu (NO2) 2	7.797e-15	7.797e-15	-14.108	-14.108	0.000	(0)
CuNO3+	2.002e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
Cu (OH) 4-2	6.301e-16	1.214e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.086e-17	3.837e-17	-16.294	-16.416	-0.122	(0)
CuCl4-2	3.558e-21	1.251e-21	-20.449	-20.903	-0.454	(0)
Cu (NO3) 2	2.578e-24	2.578e-24	-23.589	-23.589	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.258e-04					
F-	1.542e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.616e-05	5.044e-05	-4.179	-4.297	-0.118	(0)
CaF+	3.776e-06	2.907e-06	-5.423	-5.536	-0.113	(0)
NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
MnF+	1.905e-07	1.467e-07	-6.720	-6.834	-0.113	(0)
ZnF+	1.372e-08	9.088e-09	-7.863	-8.042	-0.179	(0)
BF (OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.691e-10	-9.460	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.692	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.572e-11	5.694e-12	-10.804	-11.245	-0.441	(0)
CdF+	7.523e-12	4.984e-12	-11.124	-11.302	-0.179	(0)
CoF+	2.236e-12	1.481e-12	-11.651	-11.829	-0.179	(0)
UO2F+	2.228e-12	1.476e-12	-11.652	-11.831	-0.179	(0)
HF2-	1.312e-12	9.785e-13	-11.882	-12.009	-0.127	(0)
PbF+	1.133e-12	7.504e-13	-11.946	-12.125	-0.179	(0)
BF2 (OH) 2-	9.737e-13	7.073e-13	-12.012	-12.150	-0.139	(0)
UO2F2	5.054e-13	5.054e-13	-12.296	-12.296	0.000	(0)
NiF+	4.157e-13	2.754e-13	-12.381	-12.560	-0.179	(0)
UO2F3-	2.275e-14	1.507e-14	-13.643	-13.822	-0.179	(0)
CrF+2	1.107e-14	2.132e-15	-13.956	-14.671	-0.715	(0)
PbF2	1.753e-15	1.753e-15	-14.756	-14.756	0.000	(0)
CdF2	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
UO2F4-2	7.376e-17	1.421e-17	-16.132	-16.847	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	8.539e-18	8.539e-18	-17.069	-17.069	0.000	(0)
FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
PbF3-	5.957e-19	3.947e-19	-18.225	-18.404	-0.179	(0)
BF3OH-	5.563e-19	4.041e-19	-18.255	-18.393	-0.139	(0)
VO2F2-	5.555e-19	3.680e-19	-18.255	-18.434	-0.179	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	7.359e-21	4.876e-21	-20.133	-20.312	-0.179	(0)
VO2F3-2	2.828e-21	5.449e-22	-20.548	-21.264	-0.715	(0)
VOF2	2.170e-22	2.170e-22	-21.663	-21.663	0.000	(0)
PbF4-2	1.164e-22	2.243e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.671e-23	2.432e-23	-22.435	-22.614	-0.179	(0)
BF4-	4.020e-24	2.920e-24	-23.396	-23.535	-0.139	(0)
VOF3-	1.380e-24	9.142e-25	-23.860	-24.039	-0.179	(0)

VO2F4-3	1.294e-24	3.183e-26	-23.888	-25.497	-1.609	(0)
Sb(OH) 2F	1.153e-25	1.153e-25	-24.938	-24.938	0.000	(0)
SbOF	1.136e-25	1.136e-25	-24.945	-24.945	0.000	(0)
VOF4-2	2.273e-27	4.380e-28	-26.643	-27.358	-0.715	(0)
UF3+	6.490e-36	4.300e-36	-35.188	-35.367	-0.179	(0)
UF2+2	1.186e-36	2.286e-37	-35.926	-36.641	-0.715	(0)
UF4	5.597e-38	5.597e-38	-37.252	-37.252	0.000	(0)
UF+3	6.218e-39	1.529e-40	-38.206	-39.816	-1.609	(0)
UF5-	3.974e-40	2.633e-40	-39.401	-39.580	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.310	-41.025	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.324e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.401e-14	-13.740	-13.853	-0.113	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.674	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.028e-18	2.332e-18	-17.519	-17.632	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.305e-10	4.891e-10	-9.200	-9.311	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.176e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
FeOH+2	4.393e-15	1.545e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.578e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
Fe+3	3.094e-20	2.940e-21	-19.509	-20.532	-1.022	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
FeCl2+	2.180e-23	1.679e-23	-22.662	-22.775	-0.113	(0)
FeHSeO3+2	9.623e-24	1.854e-24	-23.017	-23.732	-0.715	(0)
Fe2 (OH) 2+4	5.733e-26	7.902e-29	-25.242	-28.102	-2.861	(0)
FeCl3	1.092e-26	1.092e-26	-25.962	-25.962	0.000	(0)
FeNO3+2	2.356e-27	4.539e-28	-26.628	-27.343	-0.715	(0)
Fe3 (OH) 4+5	1.648e-32	5.587e-37	-31.783	-36.253	-4.470	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.528e-09					
Hg	9.528e-09	9.528e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.711e-19					
Hg2+2	1.856e-19	3.575e-20	-18.732	-19.447	-0.715	(0)
Hg (2)	1.001e-10					
HgClOH	5.169e-11	5.169e-11	-10.287	-10.287	0.000	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
Hg (OH) 2	2.246e-11	2.310e-11	-10.649	-10.636	0.012	(0)
HgCl3-	2.298e-12	1.522e-12	-11.639	-11.817	-0.179	(0)
HgCl4-2	2.047e-13	3.943e-14	-12.689	-13.404	-0.715	(0)
HgCO3	9.761e-15	9.761e-15	-14.011	-14.011	0.000	(0)
HgCl+	1.083e-15	7.175e-16	-14.965	-15.144	-0.179	(0)
HgOH+	2.703e-16	1.791e-16	-15.568	-15.747	-0.179	(0)
Hg (CO3) 2-2	2.364e-16	4.555e-17	-15.626	-16.342	-0.715	(0)
Hg (OH) 3-	3.573e-18	2.367e-18	-17.447	-17.626	-0.179	(0)
HgHCO3+	3.387e-18	2.244e-18	-17.470	-17.649	-0.179	(0)
Hg (NH3) 2+2	1.333e-18	2.569e-19	-17.875	-18.590	-0.715	(0)
HgNH3+2	1.553e-19	2.993e-20	-18.809	-19.524	-0.715	(0)
Hg+2	2.869e-20	5.527e-21	-19.542	-20.257	-0.715	(0)
HgSO4	1.589e-20	1.589e-20	-19.799	-19.799	0.000	(0)
HgF+	3.671e-23	2.432e-23	-22.435	-22.614	-0.179	(0)
Hg (NH3) 3+2	4.555e-26	8.777e-27	-25.341	-26.057	-0.715	(0)
HgNO3+	4.756e-29	3.151e-29	-28.323	-28.502	-0.179	(0)
Hg (NH3) 4+2	3.106e-33	5.984e-34	-32.508	-33.223	-0.715	(0)
Hg (NO3) 2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K	1.501e-02					

K+	1.393e-02	1.073e-02	-1.856	-1.970	-0.114	(0)
KSO4-	1.075e-03	8.339e-04	-2.969	-3.079	-0.110	(0)
KCrO4-	5.570e-17	3.690e-17	-16.254	-16.433	-0.179	(0)
Mg	1.844e-02					
Mg+2	1.078e-02	3.787e-03	-1.967	-2.422	-0.454	(0)
MgSO4	7.568e-03	7.568e-03	-2.121	-2.121	0.000	(0)
MgF+	6.616e-05	5.044e-05	-4.179	-4.297	-0.118	(0)
MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
MgCO3	4.648e-06	4.648e-06	-5.333	-5.333	0.000	(0)
MgOH+	1.553e-06	1.227e-06	-5.809	-5.911	-0.102	(0)
MgH2BO3+	8.086e-07	5.874e-07	-6.092	-6.231	-0.139	(0)
Mn (2)	2.226e-04					
Mn+2	1.611e-04	3.104e-05	-3.793	-4.508	-0.715	(0)
MnSO4	6.062e-05	6.062e-05	-4.217	-4.217	0.000	(0)
MnCl+	3.302e-07	2.543e-07	-6.481	-6.595	-0.113	(0)
MnHCO3+	3.126e-07	2.407e-07	-6.505	-6.618	-0.113	(0)
MnF+	1.905e-07	1.467e-07	-6.720	-6.834	-0.113	(0)
MnOH+	8.241e-08	6.346e-08	-7.084	-7.197	-0.113	(0)
MnCl2	2.337e-09	2.337e-09	-8.631	-8.631	0.000	(0)
MnCl3-	5.438e-12	4.188e-12	-11.265	-11.378	-0.113	(0)
MnSeO4	2.785e-12	2.785e-12	-11.555	-11.555	0.000	(0)
MnNO3+	1.147e-12	7.596e-13	-11.941	-12.119	-0.179	(0)
Mn (OH) 3-	3.374e-16	2.598e-16	-15.472	-15.585	-0.113	(0)
Mn (NO3) 2	2.946e-20	2.946e-20	-19.531	-19.531	0.000	(0)
Mn (OH) 4-2	1.941e-21	6.827e-22	-20.712	-21.166	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
Mn (3)	1.068e-24					
Mn+3	1.068e-24	1.015e-25	-23.971	-24.994	-1.022	(0)
Mn (6)	1.759e-40					
MnO4-2	1.759e-40	0.000e+00	-39.755	-40.209	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.583	-44.716	-0.133	(0)
Mo	7.613e-06					
MoO4-2	7.612e-06	2.674e-06	-5.118	-5.573	-0.454	(0)
HMoO4-	9.917e-10	6.570e-10	-9.004	-9.182	-0.179	(0)
H2MoO4	5.943e-14	5.943e-14	-13.226	-13.226	0.000	(0)
AlMo6O21-3	2.499e-39	0.000e+00	-38.602	-40.211	-1.609	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.847	-49.284	-6.437	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.335	-50.805	-4.470	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.071	-53.931	-2.861	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.985	-58.594	-1.609	(0)
N (-3)	2.930e-07					
NH4+	2.559e-07	1.859e-07	-6.592	-6.731	-0.139	(0)
NH4SO4-	2.840e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
NH3	8.583e-09	8.583e-09	-8.066	-8.066	0.000	(0)
CaNH3+2	1.258e-10	2.425e-11	-9.900	-10.615	-0.715	(0)
CuNH3+2	1.238e-11	2.386e-12	-10.907	-11.622	-0.715	(0)
NiNH3+2	2.210e-15	4.257e-16	-14.656	-15.371	-0.715	(0)
Co (NH3) +2	2.113e-15	4.072e-16	-14.675	-15.390	-0.715	(0)
BaNH3+2	2.680e-16	5.164e-17	-15.572	-16.287	-0.715	(0)
Hg (NH3) 2+2	1.333e-18	2.569e-19	-17.875	-18.590	-0.715	(0)
Ca (NH3) 2+2	4.300e-19	8.284e-20	-18.367	-19.082	-0.715	(0)
HgNH3+2	1.553e-19	2.993e-20	-18.809	-19.524	-0.715	(0)
Ni (NH3) 2+2	2.741e-21	5.281e-22	-20.562	-21.277	-0.715	(0)
Co (NH3) 2+2	7.737e-22	1.491e-22	-21.111	-21.827	-0.715	(0)
Hg (NH3) 3+2	4.555e-26	8.777e-27	-25.341	-26.057	-0.715	(0)
Co (NH3) 3+2	8.360e-29	1.611e-29	-28.078	-28.793	-0.715	(0)
Hg (NH3) 4+2	3.106e-33	5.984e-34	-32.508	-33.223	-0.715	(0)
Co (NH3) 4+2	3.765e-36	7.255e-37	-35.424	-36.139	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.279	-41.995	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.271	-43.986	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.735	-51.344	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.713	-52.429	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
N (3)	2.223e-05					

	NO2-	2.223e-05	1.637e-05	-4.653	-4.786	-0.133	(0)
	CuNO2+	7.026e-11	4.655e-11	-10.153	-10.332	-0.179	(0)
	CoNO2+	6.869e-14	4.551e-14	-13.163	-13.342	-0.179	(0)
	Cu (NO2) 2	7.797e-15	7.797e-15	-14.108	-14.108	0.000	(0)
N (5)	2.022e-08						
	NO3-	2.006e-08	1.544e-08	-7.698	-7.811	-0.114	(0)
	CaNO3+	1.654e-10	1.096e-10	-9.782	-9.960	-0.179	(0)
	MnNO3+	1.147e-12	7.596e-13	-11.941	-12.119	-0.179	(0)
	ZnNO3+	2.246e-13	1.488e-13	-12.649	-12.827	-0.179	(0)
	CuNO3+	2.002e-15	1.326e-15	-14.699	-14.877	-0.179	(0)
	BaNO3+	1.114e-15	7.379e-16	-14.953	-15.132	-0.179	(0)
	CdNO3+	1.952e-16	1.293e-16	-15.709	-15.888	-0.179	(0)
	PbNO3+	3.092e-17	2.049e-17	-16.510	-16.689	-0.179	(0)
	CoNO3+	1.458e-17	9.657e-18	-16.836	-17.015	-0.179	(0)
	NiNO3+	5.407e-18	3.582e-18	-17.267	-17.446	-0.179	(0)
	Mn (NO3) 2	2.946e-20	2.946e-20	-19.531	-19.531	0.000	(0)
	UO2NO3+	4.189e-21	2.776e-21	-20.378	-20.557	-0.179	(0)
	Zn (NO3) 2	4.584e-22	4.584e-22	-21.339	-21.339	0.000	(0)
	Cu (NO3) 2	2.578e-24	2.578e-24	-23.589	-23.589	0.000	(0)
	Cd (NO3) 2	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
	Pb (NO3) 2	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
	CrNO3+2	3.970e-25	7.650e-26	-24.401	-25.116	-0.715	(0)
	VO2NO3	3.203e-25	3.203e-25	-24.494	-24.494	0.000	(0)
	Co (NO3) 2	3.034e-25	3.034e-25	-24.518	-24.518	0.000	(0)
	FeNO3+2	2.356e-27	4.539e-28	-26.628	-27.343	-0.715	(0)
	HgNO3+	4.756e-29	3.151e-29	-28.323	-28.502	-0.179	(0)
	Hg (NO3) 2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
Na	2.704e-02						
	Na+	2.554e-02	1.966e-02	-1.593	-1.706	-0.114	(0)
	NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)
	NaHCO3	4.297e-06	4.297e-06	-5.367	-5.367	0.000	(0)
	NaF	1.473e-06	1.473e-06	-5.832	-5.832	0.000	(0)
	NaCO3-	6.964e-07	5.403e-07	-6.157	-6.267	-0.110	(0)
	NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
	NaCrO4-	1.366e-16	9.047e-17	-15.865	-16.043	-0.179	(0)
Ni	4.817e-10						
	Ni+2	2.629e-10	9.237e-11	-9.580	-10.034	-0.454	(0)
	NiSO4	2.024e-10	2.024e-10	-9.694	-9.694	0.000	(0)
	NiHCO3+	6.680e-12	4.426e-12	-11.175	-11.354	-0.179	(0)
	NiCO3	5.085e-12	5.085e-12	-11.294	-11.294	0.000	(0)
	NiCl+	2.321e-12	1.538e-12	-11.634	-11.813	-0.179	(0)
	NiOH+	1.428e-12	9.464e-13	-11.845	-12.024	-0.179	(0)
	NiF+	4.157e-13	2.754e-13	-12.381	-12.560	-0.179	(0)
	Ni (SO4) 2-2	3.819e-13	7.359e-14	-12.418	-13.133	-0.715	(0)
	Ni (OH) 2	6.119e-14	6.119e-14	-13.213	-13.213	0.000	(0)
	NiNH3+2	2.210e-15	4.257e-16	-14.656	-15.371	-0.715	(0)
	Ni (OH) 3-	7.516e-17	4.980e-17	-16.124	-16.303	-0.179	(0)
	NiCl2	5.037e-17	5.037e-17	-16.298	-16.298	0.000	(0)
	NiSeO4	1.440e-17	1.440e-17	-16.842	-16.842	0.000	(0)
	NiNO3+	5.407e-18	3.582e-18	-17.267	-17.446	-0.179	(0)
	Ni (NH3) 2+2	2.741e-21	5.281e-22	-20.562	-21.277	-0.715	(0)
O (0)	2.416e-35						
	O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.664e-09						
	PbSO4	4.824e-10	4.824e-10	-9.317	-9.317	0.000	(0)
	PbCO3	3.979e-10	3.979e-10	-9.400	-9.400	0.000	(0)
	PbOH+	2.768e-10	1.834e-10	-9.558	-9.737	-0.179	(0)
	Pb+2	2.553e-10	8.970e-11	-9.593	-10.047	-0.454	(0)
	Pb (SO4) 2-2	1.657e-10	3.192e-11	-9.781	-10.496	-0.715	(0)
	PbHCO3+	3.910e-11	2.590e-11	-10.408	-10.587	-0.179	(0)
	PbCl+	3.126e-11	2.071e-11	-10.505	-10.684	-0.179	(0)
	Pb (CO3) 2-2	8.789e-12	1.693e-12	-11.056	-11.771	-0.715	(0)
	Pb (OH) 2	4.720e-12	4.720e-12	-11.326	-11.326	0.000	(0)
	PbF+	1.133e-12	7.504e-13	-11.946	-12.125	-0.179	(0)
	PbCl2	6.018e-13	6.018e-13	-12.221	-12.221	0.000	(0)
	Pb (OH) 3-	5.798e-15	3.842e-15	-14.237	-14.415	-0.179	(0)
	PbCl3-	2.353e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
	PbF2	1.753e-15	1.753e-15	-14.756	-14.756	0.000	(0)

PbNO3+	3.092e-17	2.049e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.406e-17	4.636e-18	-16.619	-17.334	-0.715	(0)
Pb2OH+3	1.060e-17	2.607e-19	-16.975	-18.584	-1.609	(0)
Pb(OH) 4-2	3.974e-18	7.657e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.957e-19	3.947e-19	-18.225	-18.404	-0.179	(0)
Pb3(OH) 4+2	2.069e-22	3.987e-23	-21.684	-22.399	-0.715	(0)
PbF4-2	1.164e-22	2.243e-23	-21.934	-22.649	-0.715	(0)
Pb(NO3) 2	5.372e-25	5.372e-25	-24.270	-24.270	0.000	(0)
Pb4(OH) 4+4	2.061e-26	2.841e-29	-25.686	-28.547	-2.861	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.777	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.292	-147.471	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.297	-224.476	-0.179	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.446	-226.625	-0.179	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.567	-0.715	(0)
S(6)	4.712e-02					
SO4-2	3.126e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.568e-03	7.568e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.495e-03	1.160e-03	-2.825	-2.936	-0.110	(0)
KSO4-	1.075e-03	8.339e-04	-2.969	-3.079	-0.110	(0)
MnSO4	6.062e-05	6.062e-05	-4.217	-4.217	0.000	(0)
ZnSO4	9.218e-06	9.218e-06	-5.035	-5.035	0.000	(0)
Zn(SO4) 2-2	4.575e-06	8.816e-07	-5.340	-6.055	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.840e-08	2.187e-08	-7.547	-7.660	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.819e-09	6.819e-09	-8.166	-8.166	0.000	(0)
Cd(SO4) 2-2	5.243e-09	1.010e-09	-8.280	-8.996	-0.715	(0)
CoSO4	8.646e-10	8.646e-10	-9.063	-9.063	0.000	(0)
PbSO4	4.824e-10	4.824e-10	-9.317	-9.317	0.000	(0)
NiSO4	2.024e-10	2.024e-10	-9.694	-9.694	0.000	(0)
Pb(SO4) 2-2	1.657e-10	3.192e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	5.259e-12	5.259e-12	-11.279	-11.279	0.000	(0)
UO2SO4	1.497e-12	1.497e-12	-11.825	-11.825	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2(SO4) 2-2	1.125e-12	2.168e-13	-11.949	-12.664	-0.715	(0)
AlSO4+	5.362e-13	4.089e-13	-12.271	-12.388	-0.118	(0)
Ni(SO4) 2-2	3.819e-13	7.359e-14	-12.418	-13.133	-0.715	(0)
Al(SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	4.387e-15	2.906e-15	-14.358	-14.537	-0.179	(0)
VO2SO4-	1.623e-17	1.075e-17	-16.790	-16.968	-0.179	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)

Fe (SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
VOSO4	2.071e-20	2.071e-20	-19.684	-19.684	0.000	(0)
HgSO4	1.589e-20	1.589e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2SO4+2	4.979e-21	9.593e-22	-20.303	-21.018	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	6.258e-22	6.258e-22	-21.204	-21.204	0.000	(0)
CrO3SO4-2	7.945e-24	1.531e-24	-23.100	-23.815	-0.715	(0)
VSO4+	5.555e-35	3.680e-35	-34.255	-34.434	-0.179	(0)
U (SO4) 2	2.462e-39	2.462e-39	-38.609	-38.609	0.000	(0)
USO4+2	1.465e-40	0.000e+00	-39.834	-40.549	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Sb (3)	9.942e-20					
Sb (OH) 3	5.026e-20	5.026e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.915e-20	4.915e-20	-19.308	-19.308	0.000	(0)
SbO2-	9.730e-24	6.447e-24	-23.012	-23.191	-0.179	(0)
Sb (OH) 4-	5.554e-24	3.680e-24	-23.255	-23.434	-0.179	(0)
Sb (OH) 2F	1.153e-25	1.153e-25	-24.938	-24.938	0.000	(0)
SbOF	1.136e-25	1.136e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.279e-26	1.510e-26	-25.642	-25.821	-0.179	(0)
SbO+	7.871e-27	5.215e-27	-26.104	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.567	-0.715	(0)
Sb (5)	9.042e-08					
SbO3-	9.033e-08	5.984e-08	-7.044	-7.223	-0.179	(0)
Sb (OH) 6-	9.041e-11	6.960e-11	-10.044	-10.157	-0.114	(0)
SbO2+	3.958e-24	2.622e-24	-23.403	-23.581	-0.179	(0)
Se (-2)	6.061e-39					
HSe-	6.061e-39	4.015e-39	-38.217	-38.396	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.415	-42.415	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.773	-45.488	-0.715	(0)
Se (4)	7.597e-07					
SeO3-2	3.994e-07	7.696e-08	-6.399	-7.114	-0.715	(0)
HSeO3-	3.603e-07	2.387e-07	-6.443	-6.622	-0.179	(0)
H2SeO3	1.257e-12	1.257e-12	-11.901	-11.901	0.000	(0)
Cd (SeO3) 2-2	6.710e-17	1.293e-17	-16.173	-16.888	-0.715	(0)
FeHSeO3+2	9.623e-24	1.854e-24	-23.017	-23.732	-0.715	(0)
Se (6)	9.520e-10					
SeO4-2	9.490e-10	3.334e-10	-9.023	-9.477	-0.454	(0)
MnSeO4	2.785e-12	2.785e-12	-11.555	-11.555	0.000	(0)
ZnSeO4	1.981e-13	1.981e-13	-12.703	-12.703	0.000	(0)
HSeO4-	3.114e-16	2.063e-16	-15.507	-15.685	-0.179	(0)
CdSeO4	1.645e-16	1.645e-16	-15.784	-15.784	0.000	(0)
CoSeO4	6.593e-17	6.593e-17	-16.181	-16.181	0.000	(0)
NiSeO4	1.440e-17	1.440e-17	-16.842	-16.842	0.000	(0)
Zn (SeO4) 2-2	3.475e-22	6.696e-23	-21.459	-22.174	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.241	-58.850	-1.609	(0)
U (4)	2.551e-19					
U (OH) 5-	2.551e-19	1.690e-19	-18.593	-18.772	-0.179	(0)
U (OH) 4	8.756e-23	8.756e-23	-22.058	-22.058	0.000	(0)
U (OH) 3+	5.977e-27	3.960e-27	-26.223	-26.402	-0.179	(0)
U (OH) 2+2	1.176e-31	2.265e-32	-30.930	-31.645	-0.715	(0)
UF3+	6.490e-36	4.300e-36	-35.188	-35.367	-0.179	(0)
UF2+2	1.186e-36	2.286e-37	-35.926	-36.641	-0.715	(0)
UOH+3	5.367e-37	1.320e-38	-36.270	-37.879	-1.609	(0)
UF4	5.597e-38	5.597e-38	-37.252	-37.252	0.000	(0)
UF+3	6.218e-39	1.529e-40	-38.206	-39.816	-1.609	(0)
U (SO4) 2	2.462e-39	2.462e-39	-38.609	-38.609	0.000	(0)
UF5-	3.974e-40	2.633e-40	-39.401	-39.580	-0.179	(0)
USO4+2	1.465e-40	0.000e+00	-39.834	-40.549	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.310	-41.025	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.329	-45.190	-2.861	(0)
UCl+3	0.000e+00	0.000e+00	-44.068	-45.677	-1.609	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.199	-169.681	-14.482	(0)
U (5)	1.133e-15					
UO2+	1.133e-15	7.504e-16	-14.946	-15.125	-0.179	(0)
U (6)	9.176e-07					
UO2 (CO3) 3-4	8.361e-07	1.152e-09	-6.078	-8.938	-2.861	(0)
UO2 (CO3) 2-2	8.087e-08	1.558e-08	-7.092	-7.807	-0.715	(0)

UO2CO3	5.292e-10	5.292e-10	-9.276	-9.276	0.000	(0)
UO2OH+	1.393e-11	9.231e-12	-10.856	-11.035	-0.179	(0)
UO2F+	2.228e-12	1.476e-12	-11.652	-11.831	-0.179	(0)
UO2SO4	1.497e-12	1.497e-12	-11.825	-11.825	0.000	(0)
UO2 (SO4) 2-2	1.125e-12	2.168e-13	-11.949	-12.664	-0.715	(0)
UO2F2	5.054e-13	5.054e-13	-12.296	-12.296	0.000	(0)
UO2+2	2.565e-13	9.009e-14	-12.591	-13.045	-0.454	(0)
UO2F3-	2.275e-14	1.507e-14	-13.643	-13.822	-0.179	(0)
UO2Cl+	1.435e-15	9.506e-16	-14.843	-15.022	-0.179	(0)
(UO2) 3 (OH) 5+	9.901e-16	6.560e-16	-15.004	-15.183	-0.179	(0)
(UO2) 2 (OH) 2+2	7.340e-16	1.414e-16	-15.134	-15.849	-0.715	(0)
UO2F4-2	7.376e-17	1.421e-17	-16.132	-16.847	-0.715	(0)
UO2NO3+	4.189e-21	2.776e-21	-20.378	-20.557	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.724	-42.903	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.608	-44.323	-0.715	(0)
V (3)	3.088e-15					
V (OH) 3	3.088e-15	3.088e-15	-14.510	-14.510	0.000	(0)
V (OH) 2+	3.725e-26	2.468e-26	-25.429	-25.608	-0.179	(0)
VOH+2	1.503e-29	2.896e-30	-28.823	-29.538	-0.715	(0)
V+3	2.886e-34	7.099e-36	-33.540	-35.149	-1.609	(0)
VSO4+	5.555e-35	3.680e-35	-34.255	-34.434	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.085	-56.694	-1.609	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.416	-58.276	-2.861	(0)
V (4)	1.739e-18					
V (OH) 3+	1.675e-18	1.110e-18	-17.776	-17.955	-0.179	(0)
VO+2	3.554e-20	6.848e-21	-19.449	-20.164	-0.715	(0)
VOSO4	2.071e-20	2.071e-20	-19.684	-19.684	0.000	(0)
VOF+	7.359e-21	4.876e-21	-20.133	-20.312	-0.179	(0)
VOF2	2.170e-22	2.170e-22	-21.663	-21.663	0.000	(0)
VOCl+	1.887e-22	1.250e-22	-21.724	-21.903	-0.179	(0)
VOF3-	1.380e-24	9.142e-25	-23.860	-24.039	-0.179	(0)
VOF4-2	2.273e-27	4.380e-28	-26.643	-27.358	-0.715	(0)
H2V2O4+2	3.217e-31	6.198e-32	-30.493	-31.208	-0.715	(0)
V (5)	3.445e-08					
H2VO4-	2.027e-08	1.343e-08	-7.693	-7.872	-0.179	(0)
HVO4-2	1.418e-08	2.732e-09	-7.848	-8.564	-0.715	(0)
H3VO4	1.658e-12	1.658e-12	-11.780	-11.780	0.000	(0)
HV2O7-3	5.063e-13	1.245e-14	-12.296	-13.905	-1.609	(0)
H3V2O7-	2.174e-13	1.440e-13	-12.663	-12.842	-0.179	(0)
VO4-3	4.508e-14	1.109e-15	-13.346	-14.955	-1.609	(0)
V2O7-4	1.970e-14	2.715e-17	-13.706	-16.566	-2.861	(0)
V3O9-3	1.037e-16	2.550e-18	-15.984	-17.593	-1.609	(0)
VO2+	5.327e-17	4.101e-17	-16.274	-16.387	-0.114	(0)
VO2SO4-	1.623e-17	1.075e-17	-16.790	-16.968	-0.179	(0)
VO2F	8.539e-18	8.539e-18	-17.069	-17.069	0.000	(0)
VO2F2-	5.555e-19	3.680e-19	-18.255	-18.434	-0.179	(0)
V4O12-4	1.038e-20	1.430e-23	-19.984	-22.845	-2.861	(0)
VO2F3-2	2.828e-21	5.449e-22	-20.548	-21.264	-0.715	(0)
VO2F4-3	1.294e-24	3.183e-26	-23.888	-25.497	-1.609	(0)
VO2NO3	3.203e-25	3.203e-25	-24.494	-24.494	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.001	-61.438	-6.437	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.689	-61.159	-4.470	(0)
H2V10O28-4	0.000e+00	0.000e+00	-60.999	-63.860	-2.861	(0)
Zn	2.579e-05					
Zn+2	1.092e-05	3.837e-06	-4.962	-5.416	-0.454	(0)
ZnSO4	9.218e-06	9.218e-06	-5.035	-5.035	0.000	(0)
Zn (SO4) 2-2	4.575e-06	8.816e-07	-5.340	-6.055	-0.715	(0)
ZnOH+	4.713e-07	3.123e-07	-6.327	-6.505	-0.179	(0)
ZnCO3	3.258e-07	3.258e-07	-6.487	-6.487	0.000	(0)
ZnCl+	8.312e-08	6.270e-08	-7.080	-7.203	-0.122	(0)
ZnHCO3+	7.117e-08	4.716e-08	-7.148	-7.326	-0.179	(0)
ZnOHC1	6.681e-08	6.681e-08	-7.175	-7.175	0.000	(0)
Zn (OH) 2	4.028e-08	4.028e-08	-7.395	-7.395	0.000	(0)
ZnF+	1.372e-08	9.088e-09	-7.863	-8.042	-0.179	(0)
ZnCl2	6.466e-10	6.466e-10	-9.189	-9.189	0.000	(0)
Zn (OH) 3-	2.480e-10	1.643e-10	-9.606	-9.784	-0.179	(0)
ZnCl3-	4.430e-12	3.342e-12	-11.354	-11.476	-0.122	(0)

ZnNO3+	2.246e-13	1.488e-13	-12.649	-12.827	-0.179	(0)
ZnSeO4	1.981e-13	1.981e-13	-12.703	-12.703	0.000	(0)
ZnCl4-2	3.091e-14	1.087e-14	-13.510	-13.964	-0.454	(0)
Zn(OH)4-2	2.763e-14	5.324e-15	-13.559	-14.274	-0.715	(0)
Zn(NO3)2	4.584e-22	4.584e-22	-21.339	-21.339	0.000	(0)
Zn(SeO4)2-2	3.475e-22	6.696e-23	-21.459	-22.174	-0.715	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.292	-147.471	-0.179	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.297	-224.476	-0.179	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.15	-48.86	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-42.12	-37.61	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-49.35	-37.61	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-71.24	-53.31	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-56.47	-36.43	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-28.90	-28.50	0.40	(NH4)2CrO4	
(NH4)2SeO4	-23.39	-22.94	0.45	(NH4)2SeO4	
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3	
Al2(MoO4)3	-47.72	-45.36	2.37	Al2(MoO4)3	
Al2O3	-0.84	18.81	19.65	Al2O3	
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O	
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4	
AlSb	-152.15	-86.53	65.62	AlSb	
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.22	-12.01	-7.79	PbSO4	
Anhydrite	-0.25	-4.61	-4.36	CaSO4	
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S	
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-88.42	-91.18	-2.76	As4O6	
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O	
As2O5	-39.00	-32.30	6.71	As2O5	
Atacamite	-0.99	6.40	7.39	Cu2(OH)3Cl	
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2:8H2O	-16.61	7.79	24.39	Ba(OH)2:8H2O	
Ba2V2O7:2H2O	-17.24	-1.37	15.87	Ba2V2O7:2H2O	
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2	
Ba3(VO4)2:4H2O	-26.52	6.42	32.94	Ba3(VO4)2:4H2O	
BaCrO4	-13.38	-23.05	-9.67	BaCrO4	
BaF2	-10.05	-15.87	-5.82	BaF2	
BaMoO4	-6.63	-13.59	-6.96	BaMoO4	
Barite	0.00	-9.98	-9.98	BaSO4	
BaS	-94.68	-78.50	16.18	BaS	
BaSeO3	-8.56	-6.73	1.83	BaSeO3	
BaSeO4	-10.04	-17.50	-7.46	BaSeO4	
Bianchite	-5.62	-7.38	-1.76	ZnSO4:6H2O	
Birnessite	-6.59	11.50	18.09	MnO2	
Bixbyite	-1.89	-2.54	-0.64	Mn2O3	
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S	
Boehmite	0.83	9.40	8.58	AlOOH	
Breithauptite	-58.86	-77.38	-18.52	NiSb	
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4	
Brucite	-3.45	13.39	16.84	Mg(OH)2	
Bunsenite	-6.66	5.78	12.45	NiO	
Ca(VO3)2	-9.45	-3.79	5.66	Ca(VO3)2	
Ca2V2O7	-8.12	9.38	17.50	Ca2V2O7	
Ca2V2O7:2H2O	-12.18	9.37	21.55	Ca2V2O7:2H2O	
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O	
Ca3(VO4)2	-16.42	22.54	38.96	Ca3(VO4)2	
Ca3(VO4)2:4H2O	-17.32	22.54	39.86	Ca3(VO4)2:4H2O	

Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-15.42	-17.68	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	-0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.18	-1.36	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.11	-12.13	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.41	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal(alpha)	-31.82	-18.31	13.51	Cd
Cdmetal(gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO4:2H2O	-16.21	-18.06	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.44	-40.54	-27.10	PbSe
Co(BO2)2	-28.70	-1.63	27.07	Co(BO2)2
Co(OH)2	-6.68	6.41	13.09	Co(OH)2
Co(OH)3	-10.91	-13.22	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-26.09	-13.06	13.03	Co3(AsO4)2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.32	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS(alpha)	-72.44	-79.88	-7.44	CoS
CoS(beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.69	-39.89	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.36	-18.89	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-22.44	-11.62	10.82	Cr(OH)2
Cr(OH)3	-3.13	-1.79	1.34	Cr(OH)3
Cr(OH)3(am)	-1.04	-1.79	-0.75	Cr(OH)3
Cr2O3	-1.22	-3.58	-2.36	Cr2O3
CrCl2	-45.90	-31.81	14.09	CrCl2
CrCl3	-47.19	-32.07	15.11	CrCl3
CrF3	-25.95	-37.29	-11.34	CrF3
Crmetal	-67.64	-37.16	30.48	Cr
CrO3	-27.64	-30.85	-3.21	CrO3

Cryolite	-9.15	-42.99	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.42	8.25	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-24.47	20.74	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-8.47	0.78	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb·3H ₂ O	-54.63	-89.52	-34.88	Cu ₂ Sb·3H ₂ O
Cu ₂ Se(alpha)	-4.17	-49.97	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.49	-21.44	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-13.65	-7.55	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-58.84	-101.43	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-24.53	-88.02	-63.49	Cu ₃ Se ₂
CuCO ₃	-1.90	-13.40	-11.50	CuCO ₃
CuCrO ₄	-17.16	-22.60	-5.44	CuCrO ₄
CuF	-8.76	-13.67	-4.91	CuF
CuF ₂	-16.53	-15.42	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-10.87	-15.42	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO ₄	-0.06	-13.14	-13.08	CuMoO ₄
CuOCuSO ₄	-11.58	-1.28	10.30	CuOCuSO ₄
Cupricferrite	8.65	14.63	5.99	CuFe ₂ O ₄
Cuprite	-2.26	-3.66	-1.41	Cu ₂ O
Cuprousferrite	10.28	1.36	-8.92	CuFeO ₂
CuSe	-4.95	-38.05	-33.10	CuSe
CuSe ₂	-25.45	-58.81	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-6.79	-6.28	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-14.61	-17.05	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.46	-9.53	2.94	CuSO ₄
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg(CO ₃) ₂
Epsomite	-2.26	-4.39	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.11	3.45	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.20	0.16	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-9.79	-13.51	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.70	-8.15	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-16.58	-37.21	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-43.21	-46.94	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-13.36	-12.96	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-7.33	-0.13	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.85	-17.94	-10.09	FeMoO ₄
Ferrihydrite	-0.00	3.19	3.19	Fe(OH) ₃
Ferroselite	-45.02	-63.61	-18.60	FeSe ₂
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.85	-42.85	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF ₂
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-64.70	-79.06	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe ₃ S ₄
Gummite	-4.90	2.77	7.67	UO ₃
Gypsum	0.00	-4.61	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-13.88	-25.98	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.51	-21.39	-12.88	H ₂ MoO ₄
H ₂ S(g)	-78.28	-86.29	-8.01	H ₂ S
H ₂ Se(g)	-41.34	-46.30	-4.96	H ₂ Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-0.63	22.26	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-184.58	-258.29	-73.71	Hg(CH ₃) ₂
Hg(g)	-6.71	-14.59	-7.87	Hg
Hg(OH) ₂	-7.14	-10.64	-3.50	Hg(OH) ₂
Hg ₂ (g)	-14.22	-29.18	-14.96	Hg ₂
Hg ₂ (OH) ₂	-8.89	-3.63	5.26	Hg ₂ (OH) ₂

Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.78	-34.48	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.92	-11.68	Hg2S
Hg2SeO3	-13.50	-18.16	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF (g)	-46.32	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.25	-56.94	-55.69	HgSe
HgSeO3	-12.74	-25.17	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.85	-19.62	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.58	-49.82	-17.24	K2Cr2O7
K2CrO4	-18.46	-18.97	-0.51	K2CrO4
K2MoO4	-12.77	-9.51	3.26	K2MoO4
K2SeO4	-12.69	-13.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.80	-6.24	-0.43	PbO : PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.93	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.13	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.84	-3.56	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.14	74.68	Mg2Sb3
Mg2V2O7	-16.53	9.83	26.36	Mg2V2O7
MgCr2O4	-6.39	9.81	16.20	MgCr2O4
MgCrO4	-22.84	-17.46	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.14	-7.99	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.20	-1.14	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.70	-11.90	-1.20	MgSeO4 : 6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.55	-5.65	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.15	-55.87	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.88	1.62	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.60	-8.88	2.72	MnCl2 : 4H2O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.50	-35.00	3.50	MnSe
MnSeO3	-4.35	-3.22	1.13	MnSeO3
MnSeO3 : 2H2O	-4.21	-3.22	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-11.94	-13.99	-2.05	MnSeO4 : 5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO

Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.57	-19.77	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.40	-49.30	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.45	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.37	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.43	-2.13	10.30	Na2SeO3:5H2O
Na2SeO4	-14.17	-12.89	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.56	10.13	36.68	Na3VO4
Na4V2O7	-29.55	7.85	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-6.14	-2.28	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni(OH)2	-7.01	5.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-26.65	5.35	32.00	Ni4(OH)6SO4
NiCO3	-9.00	-15.87	-6.87	NiCO3
NiMoO4	-4.47	-15.61	-11.14	NiMoO4
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.82	-40.52	-17.70	NiSe
NiSeO3:2H2O	-11.56	-8.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.00	-19.52	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb(BO2)2	-8.79	-2.27	6.52	Pb(BO2)2
Pb(OH)2	-2.38	5.77	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-63.44	-72.20	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.65	11.54	26.19	Pb2O(OH)2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.52	-5.42	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.79	0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.16	-0.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.80	5.30	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.48	-25.08	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.38	-18.88	-14.50	UO2CO3
Sb(OH)3	-12.19	-19.30	-7.11	Sb(OH)3
Sb2O4	-16.45	-13.05	3.40	Sb2O4

Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.75	-177.51	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.61	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.23	2.77	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.65	-20.76	-7.11	Se
Semetal(hex)	-13.05	-20.76	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.25	-11.25	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca(UO2) 2(VO4) 2
U3O8	-10.67	10.42	21.08	U3O8
U3Sb4	-576.78	-424.40	152.38	U3Sb4
U4O9	-25.67	-28.69	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.18	-60.89	-32.72	UF4:2.5H2O
UO2(am)	-14.49	-13.56	0.93	UO2
UO2(NO3) 2	-40.82	-28.67	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-33.52	-28.67	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-32.06	-28.67	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-30.72	-28.67	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-2.84	2.77	5.61	UO2(OH) 2
UO2SeO4:4H2O	-20.28	-22.53	-2.25	UO2SeO4:4H2O
UO3	-4.93	2.77	7.70	UO3
Uraninite	-8.89	-13.56	-4.67	UO2
USb2	-218.67	-189.09	29.58	USb2
V(OH) 3	-19.02	-11.43	7.59	V(OH) 3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-40.43	-38.59	1.84	V3O5
V4O7	-50.13	-42.94	7.19	V4O7
V6O13	-41.10	-101.96	-60.86	V6O13
Valentinite	-30.11	-38.60	-8.48	Sb2O3
VC12	-63.26	-44.39	18.87	VC12
VC13	-65.14	-41.71	23.43	VC13
VF4	-66.61	-51.68	14.93	VF4
Vmetal	-93.77	-49.74	44.03	V
VO	-38.95	-24.20	14.76	VO
VO(OH) 2	-9.50	-4.35	5.15	VO(OH) 2
VO2Cl	-21.42	-18.57	2.84	VO2Cl
VOC1	-32.67	-21.52	11.15	VOC1
VOC12	-37.30	-24.54	12.76	VOC12
VOSO4	-25.73	-22.12	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.31	-7.38	3.93	ZnSO4
Zn(BO2) 2	-5.93	2.36	8.29	Zn(BO2) 2
Zn(NO3) 2:6H2O	-24.36	-21.04	3.32	Zn(NO3) 2:6H2O
Zn(OH) 2	-1.80	10.40	12.20	Zn(OH) 2
Zn(OH) 2(am)	-2.07	10.40	12.47	Zn(OH) 2
Zn(OH) 2(beta)	-1.35	10.40	11.75	Zn(OH) 2
Zn(OH) 2(epsilon)	-1.13	10.40	11.53	Zn(OH) 2
Zn(OH) 2(gamma)	-1.33	10.40	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-4.48	3.02	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-4.49	10.70	15.19	Zn2(OH) 3Cl

Zn3(AsO4)2:2.5H2O	-14.75	-1.10	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.26	-4.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.69	31.81	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.27	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.79	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.50	-35.90	-14.40	ZnSe
ZnSeO4:6H2O	-13.38	-14.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 92.

```
Title Stage 5 Pit lake Mix
Mix 503
504 0.068502
508 0.017936
1 0.042385
17 0.045476
16 0.000000
415 0.825701
Save solution 509
end
```

TITLE

Stage 5 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 503.

Mixture 503.

```
4.238e-02 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)
4.548e-02 Solution 17 Average water quality for Background Surface Water
SWQ-1 (representative of haul road and watershed run-off)
8.257e-01 Solution 415 Solution after simulation 82.
6.850e-02 Solution 504 Solution after simulation 87.
1.794e-02 Solution 508 Solution after simulation 91.
```

-----Solution composition-----

Elements	Molality	Moles
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Ag	5.448e-09	5.449e-09
Al	4.701e-07	4.702e-07
As	1.525e-09	1.525e-09
B	1.198e-05	1.198e-05
Ba	1.076e-08	1.076e-08
C	1.707e-03	1.707e-03
Ca	9.758e-04	9.760e-04
Cd	2.381e-09	2.382e-09
Cl	2.084e-03	2.084e-03
Co	1.838e-08	1.838e-08
Cr	9.826e-10	9.829e-10
Cu	9.162e-07	9.164e-07
F	1.008e-04	1.008e-04
Fe	8.694e-10	8.697e-10
Hg	3.755e-10	3.756e-10
K	7.104e-04	7.106e-04
Mg	9.826e-04	9.828e-04
Mn	1.124e-05	1.124e-05
Mo	3.321e-07	3.322e-07
N	2.706e-06	2.706e-06
Na	4.539e-03	4.540e-03
Ni	2.863e-08	2.863e-08
Pb	1.692e-09	1.692e-09
S	2.658e-03	2.659e-03
Sb	5.020e-09	5.021e-09
Se	2.937e-08	2.937e-08
Si	1.796e-04	1.797e-04
U	5.236e-08	5.237e-08
V	1.547e-09	1.547e-09
Zn	1.350e-06	1.350e-06

-----Description of solution-----

	pH	=	7.916	Charge balance
	pe	=	4.713	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.242e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	1.691e-03	
	Total CO2 (mol/kg)	=	1.707e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.203e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	10	
	Total H	=	1.110422e+02	
	Total O	=	5.553638e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.311e-07	8.291e-07	-6.031	-6.081	-0.050	(0)
H+	1.360e-08	1.214e-08	-7.866	-7.916	-0.049	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	5.448e-09					
AgCl	3.659e-09	3.659e-09	-8.437	-8.437	0.000	(0)
Ag+	1.079e-09	9.632e-10	-8.967	-9.016	-0.049	(0)
AgCl2-	6.757e-10	5.928e-10	-9.170	-9.227	-0.057	(0)
AgSO4-	3.210e-11	2.816e-11	-10.494	-10.550	-0.057	(0)
AgCl3-2	1.659e-12	9.830e-13	-11.780	-12.007	-0.227	(0)
AgNO2	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)
AgF	2.041e-13	2.041e-13	-12.690	-12.690	0.000	(0)
AgOH	7.985e-14	7.985e-14	-13.098	-13.098	0.000	(0)
AgNH3+	1.869e-14	1.640e-14	-13.728	-13.785	-0.057	(0)
Ag2Se	1.322e-14	1.322e-14	-13.879	-13.879	0.000	(0)

	AgCl4-3	1.213e-14	3.734e-15	-13.916	-14.428	-0.512	(0)
	AgH2BO3	8.298e-15	8.298e-15	-14.081	-14.081	0.000	(0)
	AgSeO3-	4.009e-15	3.517e-15	-14.397	-14.454	-0.057	(0)
	Ag (OH) 2-	7.374e-18	6.470e-18	-17.132	-17.189	-0.057	(0)
	Ag (NO2) 2-	1.744e-18	1.530e-18	-17.759	-17.815	-0.057	(0)
	Ag (NH3) 2+	1.267e-18	1.112e-18	-17.897	-17.954	-0.057	(0)
	AgNO3	8.248e-19	8.248e-19	-18.084	-18.084	0.000	(0)
	Ag (SeO3) 2-3	5.811e-22	1.789e-22	-21.236	-21.747	-0.512	(0)
	Ag2MoO4	7.409e-26	7.409e-26	-25.130	-25.130	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.320	-73.320	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.214	-83.124	-0.909	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.760	-146.907	-0.147	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.282	-147.339	-0.057	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.148	-148.431	-0.283	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.470	-148.742	-0.272	(0)
Al		4.701e-07					
	Al (OH) 4-	4.658e-07	4.163e-07	-6.332	-6.381	-0.049	(0)
	Al (OH) 3	3.988e-09	3.988e-09	-8.399	-8.399	0.000	(0)
	Al (OH) 2+	2.689e-10	2.411e-10	-9.570	-9.618	-0.047	(0)
	AlF2+	1.396e-11	1.251e-11	-10.855	-10.903	-0.047	(0)
	AlF3	1.329e-11	1.329e-11	-10.876	-10.876	0.000	(0)
	AlF4-	6.288e-13	5.619e-13	-12.202	-12.250	-0.049	(0)
	AlF+2	5.768e-13	3.726e-13	-12.239	-12.429	-0.190	(0)
	AlOH+2	5.668e-13	3.661e-13	-12.247	-12.436	-0.190	(0)
	AlSO4+	5.620e-15	5.023e-15	-14.250	-14.299	-0.049	(0)
	Al+3	1.225e-15	4.416e-16	-14.912	-15.355	-0.443	(0)
	Al (SO4) 2-	8.824e-17	7.886e-17	-16.054	-16.103	-0.049	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-47.399	-47.911	-0.512	(0)
As (3)		8.998e-23					
	H3AsO3	8.584e-23	8.584e-23	-22.066	-22.066	0.000	(0)
	H2AsO3-	4.133e-24	3.626e-24	-23.384	-23.441	-0.057	(0)
	HAsO3-2	4.597e-28	2.723e-28	-27.338	-27.565	-0.227	(0)
	H4AsO3+	5.887e-31	5.164e-31	-30.230	-30.287	-0.057	(0)
	AsO3-3	2.808e-33	8.645e-34	-32.552	-33.063	-0.512	(0)
As (5)		1.525e-09					
	HAsO4-2	1.418e-09	8.400e-10	-8.848	-9.076	-0.227	(0)
	H2AsO4-	1.060e-10	9.302e-11	-9.975	-10.031	-0.057	(0)
	AsO4-3	7.104e-13	2.187e-13	-12.148	-12.660	-0.512	(0)
	H3AsO4	1.957e-16	1.963e-16	-15.708	-15.707	0.001	(0)
B		1.198e-05					
	H3BO3	1.133e-05	1.136e-05	-4.946	-4.944	0.001	(0)
	H2BO3-	6.128e-07	5.436e-07	-6.213	-6.265	-0.052	(0)
	CaH2BO3+	1.765e-08	1.565e-08	-7.753	-7.805	-0.052	(0)
	MgH2BO3+	1.115e-08	9.888e-09	-7.953	-8.005	-0.052	(0)
	NaH2BO3	3.461e-09	3.461e-09	-8.461	-8.461	0.000	(0)
	BF (OH) 3-	4.313e-10	3.826e-10	-9.365	-9.417	-0.052	(0)
	H5 (BO3) 2-	5.928e-12	5.258e-12	-11.227	-11.279	-0.052	(0)
	BaH2BO3+	1.279e-13	1.135e-13	-12.893	-12.945	-0.052	(0)
	BF2 (OH) 2-	4.725e-14	4.191e-14	-13.326	-13.378	-0.052	(0)
	AgH2BO3	8.298e-15	8.298e-15	-14.081	-14.081	0.000	(0)
	H8 (BO3) 3-	6.737e-15	5.976e-15	-14.172	-14.224	-0.052	(0)
	BF3OH-	1.883e-20	1.671e-20	-19.725	-19.777	-0.052	(0)
	BF4-	9.496e-26	8.423e-26	-25.022	-25.075	-0.052	(0)
Ba		1.076e-08					
	Ba+2	1.063e-08	6.756e-09	-7.973	-8.170	-0.197	(0)
	BaHCO3+	1.045e-10	9.384e-11	-9.981	-10.028	-0.047	(0)
	BaCO3	1.946e-11	1.946e-11	-10.711	-10.711	0.000	(0)
	BaH2BO3+	1.279e-13	1.135e-13	-12.893	-12.945	-0.052	(0)
	BaOH+	2.731e-14	2.445e-14	-13.564	-13.612	-0.048	(0)
	BaNH3+2	6.001e-17	3.555e-17	-16.222	-16.449	-0.227	(0)
	BaNO3+	4.161e-17	3.650e-17	-16.381	-16.438	-0.057	(0)
C (4)		1.707e-03					
	HCO3-	1.622e-03	1.454e-03	-2.790	-2.837	-0.047	(0)
	H2CO3	3.972e-05	3.972e-05	-4.401	-4.401	0.000	(0)
	CaHCO3+	1.509e-05	1.355e-05	-4.821	-4.868	-0.047	(0)
	CO3-2	8.838e-06	5.615e-06	-5.054	-5.251	-0.197	(0)
	MgHCO3+	8.753e-06	7.808e-06	-5.058	-5.107	-0.050	(0)
	CaCO3	4.454e-06	4.454e-06	-5.351	-5.351	0.000	(0)

	NaHCO ₃	3.286e-06	3.286e-06	-5.483	-5.483	0.000	(0)
	MgCO ₃	2.450e-06	2.450e-06	-5.611	-5.611	0.000	(0)
	CuCO ₃	7.697e-07	7.697e-07	-6.114	-6.114	0.000	(0)
	NaCO ₃ -	4.686e-07	4.201e-07	-6.329	-6.377	-0.047	(0)
	MnHCO ₃ +	1.831e-07	1.639e-07	-6.737	-6.785	-0.048	(0)
	ZnCO ₃	1.822e-07	1.822e-07	-6.739	-6.739	0.000	(0)
	UO ₂ (CO ₃) 3-4	3.005e-08	3.701e-09	-7.522	-8.432	-0.909	(0)
	ZnHCO ₃ +	2.956e-08	2.593e-08	-7.529	-7.586	-0.057	(0)
	UO ₂ (CO ₃) 2-2	2.220e-08	1.315e-08	-7.654	-7.881	-0.227	(0)
	Cu (CO ₃) 2-2	1.964e-08	1.163e-08	-7.707	-7.934	-0.227	(0)
	NiCO ₃	2.607e-09	2.607e-09	-8.584	-8.584	0.000	(0)
	NiHCO ₃ +	2.543e-09	2.231e-09	-8.595	-8.651	-0.057	(0)
	CuHCO ₃ +	2.435e-09	2.136e-09	-8.614	-8.670	-0.057	(0)
	PbCO ₃	1.221e-09	1.221e-09	-8.913	-8.913	0.000	(0)
	CoHCO ₃ +	1.061e-09	9.305e-10	-8.974	-9.031	-0.057	(0)
	CoCO ₃	7.808e-10	7.808e-10	-9.107	-9.107	0.000	(0)
	CdCO ₃	1.336e-10	1.336e-10	-9.874	-9.874	0.000	(0)
	UO ₂ CO ₃	1.174e-10	1.174e-10	-9.930	-9.930	0.000	(0)
	BaHCO ₃ +	1.045e-10	9.384e-11	-9.981	-10.028	-0.047	(0)
	PbHCO ₃ +	8.912e-11	7.818e-11	-10.050	-10.107	-0.057	(0)
	Pb (CO ₃) 2-2	3.339e-11	1.978e-11	-10.476	-10.704	-0.227	(0)
	BaCO ₃	1.946e-11	1.946e-11	-10.711	-10.711	0.000	(0)
	CdHCO ₃ +	3.941e-12	3.457e-12	-11.404	-11.461	-0.057	(0)
	Cd (CO ₃) 2-2	9.390e-13	5.563e-13	-12.027	-12.255	-0.227	(0)
	FeHCO ₃ +	1.026e-14	9.219e-15	-13.989	-14.035	-0.047	(0)
	HgCO ₃	7.274e-16	7.274e-16	-15.138	-15.138	0.000	(0)
	Hg (CO ₃) 2-2	2.180e-17	1.292e-17	-16.661	-16.889	-0.227	(0)
	HgHCO ₃ +	1.875e-19	1.645e-19	-18.727	-18.784	-0.057	(0)
Ca		9.758e-04					
	Ca+2	7.877e-04	5.005e-04	-3.104	-3.301	-0.197	(0)
	CaSO ₄	1.680e-04	1.680e-04	-3.775	-3.775	0.000	(0)
	CaHCO ₃ +	1.509e-05	1.355e-05	-4.821	-4.868	-0.047	(0)
	CaCO ₃	4.454e-06	4.454e-06	-5.351	-5.351	0.000	(0)
	CaF+	5.147e-07	4.608e-07	-6.288	-6.336	-0.048	(0)
	CaH ₂ BO ₃ +	1.765e-08	1.565e-08	-7.753	-7.805	-0.052	(0)
	CaOH+	9.217e-09	8.279e-09	-8.035	-8.082	-0.047	(0)
	CaNH ₃ +2	8.870e-12	5.255e-12	-11.052	-11.279	-0.227	(0)
	CaNO ₃ +	1.945e-12	1.706e-12	-11.711	-11.768	-0.057	(0)
	Ca (NH ₃) 2+2	2.945e-20	1.745e-20	-19.531	-19.758	-0.227	(0)
Cd		2.381e-09					
	Cd+2	1.643e-09	1.044e-09	-8.784	-8.981	-0.197	(0)
	CdSO ₄	3.586e-10	3.586e-10	-9.445	-9.445	0.000	(0)
	CdCl+	2.114e-10	1.855e-10	-9.675	-9.732	-0.057	(0)
	CdCO ₃	1.336e-10	1.336e-10	-9.874	-9.874	0.000	(0)
	Cd (SO ₄) 2-2	1.197e-11	7.089e-12	-10.922	-11.149	-0.227	(0)
	CdOH+	7.837e-12	6.876e-12	-11.106	-11.163	-0.057	(0)
	CdOHCl	6.309e-12	6.309e-12	-11.200	-11.200	0.000	(0)
	CdHCO ₃ +	3.941e-12	3.457e-12	-11.404	-11.461	-0.057	(0)
	CdF+	1.591e-12	1.396e-12	-11.798	-11.855	-0.057	(0)
	CdCl ₂	1.439e-12	1.439e-12	-11.842	-11.842	0.000	(0)
	Cd (CO ₃) 2-2	9.390e-13	5.563e-13	-12.027	-12.255	-0.227	(0)
	Cd (OH) 2	3.597e-14	3.597e-14	-13.444	-13.444	0.000	(0)
	CdCl ₃ -	1.925e-15	1.689e-15	-14.716	-14.772	-0.057	(0)
	CdF ₂	2.350e-16	2.350e-16	-15.629	-15.629	0.000	(0)
	CdNO ₃ +	4.057e-18	3.559e-18	-17.392	-17.449	-0.057	(0)
	CdSeO ₄	2.468e-18	2.468e-18	-17.608	-17.608	0.000	(0)
	Cd (OH) 3-	2.077e-18	1.822e-18	-17.683	-17.740	-0.057	(0)
	Cd ₂ OH+3	1.169e-19	3.598e-20	-18.932	-19.444	-0.512	(0)
	Cd (SeO ₃) 2-2	4.689e-20	2.778e-20	-19.329	-19.556	-0.227	(0)
	Cd (OH) 4-2	4.173e-25	2.472e-25	-24.380	-24.607	-0.227	(0)
	Cd (NO ₃) 2	1.923e-27	1.923e-27	-26.716	-26.716	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.035	-79.092	-0.057	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.006	-150.006	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.168	-226.225	-0.057	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.920	-302.147	-0.227	(0)
Cl		2.084e-03					
	Cl-	2.084e-03	1.860e-03	-2.681	-2.730	-0.049	(0)
	MnCl+	1.478e-08	1.323e-08	-7.830	-7.878	-0.048	(0)

AgCl	3.659e-09	3.659e-09	-8.437	-8.437	0.000	(0)
ZnCl+	2.953e-09	2.635e-09	-8.530	-8.579	-0.050	(0)
ZnOHCl	2.860e-09	2.860e-09	-8.544	-8.544	0.000	(0)
AgCl2-	6.757e-10	5.928e-10	-9.170	-9.227	-0.057	(0)
CuCl	5.171e-10	5.171e-10	-9.286	-9.286	0.000	(0)
CuCl2-	2.253e-10	2.010e-10	-9.647	-9.697	-0.050	(0)
CdCl+	2.114e-10	1.855e-10	-9.675	-9.732	-0.057	(0)
CuCl+	7.693e-11	6.863e-11	-10.114	-10.163	-0.050	(0)
NiCl+	6.751e-11	5.923e-11	-10.171	-10.227	-0.057	(0)
CoCl+	6.034e-11	5.294e-11	-10.219	-10.276	-0.057	(0)
MnCl2	3.477e-11	3.477e-11	-10.459	-10.459	0.000	(0)
ZnCl2	7.769e-12	7.769e-12	-11.110	-11.110	0.000	(0)
CdOHCl	6.309e-12	6.309e-12	-11.200	-11.200	0.000	(0)
PbCl+	5.443e-12	4.776e-12	-11.264	-11.321	-0.057	(0)
AgCl3-2	1.659e-12	9.830e-13	-11.780	-12.007	-0.227	(0)
CdCl2	1.439e-12	1.439e-12	-11.842	-11.842	0.000	(0)
HgClOH	2.949e-13	2.949e-13	-12.530	-12.530	0.000	(0)
CuCl3-2	1.244e-13	7.995e-14	-12.905	-13.097	-0.192	(0)
CuCl2	4.427e-14	4.427e-14	-13.354	-13.354	0.000	(0)
PbCl2	3.969e-14	3.969e-14	-13.401	-13.401	0.000	(0)
HgCl2	3.746e-14	3.746e-14	-13.426	-13.426	0.000	(0)
MnCl3-	1.990e-14	1.781e-14	-13.701	-13.749	-0.048	(0)
ZnCl3-	1.287e-14	1.148e-14	-13.890	-13.940	-0.050	(0)
AgCl4-3	1.213e-14	3.734e-15	-13.916	-14.428	-0.512	(0)
CdCl3-	1.925e-15	1.689e-15	-14.716	-14.772	-0.057	(0)
HgCl3-	7.945e-16	6.970e-16	-15.100	-15.157	-0.057	(0)
NiCl2	5.548e-16	5.548e-16	-15.256	-15.256	0.000	(0)
PbCl3-	3.350e-17	2.939e-17	-16.475	-16.532	-0.057	(0)
UO2Cl+	1.806e-17	1.584e-17	-16.743	-16.800	-0.057	(0)
ZnCl4-2	1.662e-17	1.068e-17	-16.779	-16.971	-0.192	(0)
HgCl4-2	8.714e-18	5.162e-18	-17.060	-17.287	-0.227	(0)
HgCl+	4.580e-18	4.018e-18	-17.339	-17.396	-0.057	(0)
CrCl+2	1.458e-18	8.637e-19	-17.836	-18.064	-0.227	(0)
CuCl3-	8.616e-19	7.687e-19	-18.065	-18.114	-0.050	(0)
PbCl4-2	4.219e-20	2.500e-20	-19.375	-19.602	-0.227	(0)
CrOHCl2	2.532e-20	2.532e-20	-19.597	-19.597	0.000	(0)
FeCl+2	2.112e-22	1.357e-22	-21.675	-21.867	-0.192	(0)
CrCl2+	1.738e-22	1.525e-22	-21.760	-21.817	-0.057	(0)
CuCl4-2	1.116e-23	7.167e-24	-22.952	-23.145	-0.192	(0)
VOCl+	4.155e-24	3.645e-24	-23.381	-23.438	-0.057	(0)
FeCl2+	1.260e-24	1.128e-24	-23.900	-23.948	-0.048	(0)
CrO3Cl-	7.546e-27	6.620e-27	-26.122	-26.179	-0.057	(0)
FeCl3	2.098e-28	2.098e-28	-27.678	-27.678	0.000	(0)
CoCl+2	1.080e-36	6.400e-37	-35.966	-36.194	-0.227	(0)
UCl+3	0.000e+00	0.000e+00	-46.671	-47.183	-0.512	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.408	-50.635	-0.227	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.319	-52.547	-0.227	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.202	-65.429	-0.227	(0)
Co (2)	1.838e-08					
Co+2	1.388e-08	8.225e-09	-7.857	-8.085	-0.227	(0)
CoSO4	2.405e-09	2.405e-09	-8.619	-8.619	0.000	(0)
CoHCO3+	1.061e-09	9.305e-10	-8.974	-9.031	-0.057	(0)
CoCO3	7.808e-10	7.808e-10	-9.107	-9.107	0.000	(0)
CoOH+	1.551e-10	1.361e-10	-9.809	-9.866	-0.057	(0)
CoCl+	6.034e-11	5.294e-11	-10.219	-10.276	-0.057	(0)
CoF+	2.501e-11	2.194e-11	-10.602	-10.659	-0.057	(0)
Co (OH) 2	8.960e-12	8.960e-12	-11.048	-11.048	0.000	(0)
CoNO2+	1.464e-13	1.284e-13	-12.835	-12.891	-0.057	(0)
Co (NH3) +2	1.392e-14	8.247e-15	-13.856	-14.084	-0.227	(0)
Co (OH) 3-	1.689e-16	1.482e-16	-15.772	-15.829	-0.057	(0)
CoSeO4	5.234e-17	5.234e-17	-16.281	-16.281	0.000	(0)
CoOOH-	4.240e-17	3.720e-17	-16.373	-16.429	-0.057	(0)
CoNO3+	1.602e-17	1.405e-17	-16.795	-16.852	-0.057	(0)
Co2OH+3	1.822e-19	5.609e-20	-18.740	-19.251	-0.512	(0)
Co (NH3) 2+2	4.952e-21	2.934e-21	-20.305	-20.533	-0.227	(0)
Co (OH) 4-2	3.287e-23	1.948e-23	-22.483	-22.711	-0.227	(0)
Co (NO3) 2	3.083e-26	3.083e-26	-25.511	-25.511	0.000	(0)
Co (NH3) 3+2	5.199e-28	3.080e-28	-27.284	-27.511	-0.227	(0)

Co4 (OH) 4+4	5.551e-31	6.838e-32	-30.256	-31.165	-0.909	(0)
Co (NH3) 4+2	2.276e-35	1.348e-35	-34.643	-34.870	-0.227	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.502	-42.729	-0.227	(0)
Co (3)	1.202e-29					
CoOH+2	1.202e-29	7.123e-30	-28.920	-29.147	-0.227	(0)
Co+3	4.691e-36	1.691e-36	-35.329	-35.772	-0.443	(0)
CoCl+2	1.080e-36	6.400e-37	-35.966	-36.194	-0.227	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.408	-50.635	-0.227	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.551	-60.608	-0.057	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.353	-64.580	-0.227	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.202	-65.429	-0.227	(0)
Cr (2)	2.802e-27					
Cr+2	2.802e-27	1.660e-27	-26.553	-26.780	-0.227	(0)
Cr (3)	9.826e-10					
Cr (OH) 2+	7.482e-10	6.564e-10	-9.126	-9.183	-0.057	(0)
Cr (OH) 3	2.044e-10	2.044e-10	-9.689	-9.689	0.000	(0)
Cr (OH) +2	1.098e-11	6.507e-12	-10.959	-11.187	-0.227	(0)
CrO2-	9.115e-12	7.997e-12	-11.040	-11.097	-0.057	(0)
Cr (OH) 4-	7.691e-12	6.747e-12	-11.114	-11.171	-0.057	(0)
CrOHSO4	2.262e-12	2.262e-12	-11.645	-11.645	0.000	(0)
CrF+2	8.097e-15	4.797e-15	-14.092	-14.319	-0.227	(0)
CrSO4+	1.399e-15	1.227e-15	-14.854	-14.911	-0.057	(0)
Cr+3	1.165e-15	3.587e-16	-14.934	-15.445	-0.512	(0)
CrCl+2	1.458e-18	8.637e-19	-17.836	-18.064	-0.227	(0)
CrOHC12	2.532e-20	2.532e-20	-19.597	-19.597	0.000	(0)
Cr2 (OH) 2SO4+2	2.246e-21	1.331e-21	-20.649	-20.876	-0.227	(0)
CrCl2+	1.738e-22	1.525e-22	-21.760	-21.817	-0.057	(0)
Cr2 (OH) 2 (SO4) 2	1.158e-22	1.158e-22	-21.936	-21.936	0.000	(0)
CrNO3+2	2.854e-26	1.691e-26	-25.545	-25.772	-0.227	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.321	-41.549	-0.227	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.407	-50.918	-0.512	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.319	-52.547	-0.227	(0)
Cr (6)	1.949e-15					
CrO4-2	1.866e-15	1.186e-15	-14.729	-14.926	-0.197	(0)
HCrO4-	5.310e-17	4.658e-17	-16.275	-16.332	-0.057	(0)
NaCrO4-	2.698e-17	2.367e-17	-16.569	-16.626	-0.057	(0)
KCrO4-	3.152e-18	2.765e-18	-17.501	-17.558	-0.057	(0)
H2CrO4	4.585e-25	4.585e-25	-24.339	-24.339	0.000	(0)
CrO3SO4-2	4.262e-25	2.525e-25	-24.370	-24.598	-0.227	(0)
CrO3Cl-	7.546e-27	6.620e-27	-26.122	-26.179	-0.057	(0)
Cr2O7-2	1.270e-31	7.526e-32	-30.896	-31.123	-0.227	(0)
Cu (1)	9.942e-10					
CuCl	5.171e-10	5.171e-10	-9.286	-9.286	0.000	(0)
Cu+	2.517e-10	2.208e-10	-9.599	-9.656	-0.057	(0)
CuCl2-	2.253e-10	2.010e-10	-9.647	-9.697	-0.050	(0)
CuCl3-2	1.244e-13	7.995e-14	-12.905	-13.097	-0.192	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.394	-146.672	-0.278	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.135	-147.402	-0.267	(0)
Cu (2)	9.152e-07					
CuCO3	7.697e-07	7.697e-07	-6.114	-6.114	0.000	(0)
CuOH+	6.840e-08	6.102e-08	-7.165	-7.214	-0.050	(0)
Cu+2	3.663e-08	2.328e-08	-7.436	-7.633	-0.197	(0)
Cu (CO3) 2-2	1.964e-08	1.163e-08	-7.707	-7.934	-0.227	(0)
Cu (OH) 2	1.009e-08	1.009e-08	-7.996	-7.996	0.000	(0)
CuSO4	7.813e-09	7.813e-09	-8.107	-8.107	0.000	(0)
CuHCO3+	2.435e-09	2.136e-09	-8.614	-8.670	-0.057	(0)
Cu2 (OH) 2+2	1.579e-10	9.354e-11	-9.802	-10.029	-0.227	(0)
CuF+	1.412e-10	1.239e-10	-9.850	-9.907	-0.057	(0)
CuCl+	7.693e-11	6.863e-11	-10.114	-10.163	-0.050	(0)
Cu (OH) 3-	1.957e-11	1.717e-11	-10.708	-10.765	-0.057	(0)
CuNO2+	6.155e-12	5.400e-12	-11.211	-11.268	-0.057	(0)
CuNH3+2	3.353e-12	1.986e-12	-11.475	-11.702	-0.227	(0)
CuCl2	4.427e-14	4.427e-14	-13.354	-13.354	0.000	(0)
Cu (OH) 4-2	1.891e-16	1.120e-16	-15.723	-15.951	-0.227	(0)
Cu (NO2) 2	1.224e-16	1.224e-16	-15.912	-15.912	0.000	(0)
CuNO3+	9.045e-17	7.935e-17	-16.044	-16.100	-0.057	(0)
CuCl3-	8.616e-19	7.687e-19	-18.065	-18.114	-0.050	(0)
CuCl4-2	1.116e-23	7.167e-24	-22.952	-23.145	-0.192	(0)

	Cu (NO3) 2	1.077e-26	1.077e-26	-25.968	-25.968	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.033	-216.090	-0.057	(0)
F		1.008e-04					
	F-	9.449e-05	8.437e-05	-4.025	-4.074	-0.049	(0)
	MgF+	5.557e-06	4.966e-06	-5.255	-5.304	-0.049	(0)
	CaF+	5.147e-07	4.608e-07	-6.288	-6.336	-0.048	(0)
	NaF	2.139e-07	2.139e-07	-6.670	-6.670	0.000	(0)
	MnF+	2.119e-08	1.897e-08	-7.674	-7.722	-0.048	(0)
	HF	1.515e-09	1.515e-09	-8.820	-8.820	0.000	(0)
	ZnF+	1.082e-09	9.491e-10	-8.966	-9.023	-0.057	(0)
	BF (OH) 3-	4.313e-10	3.826e-10	-9.365	-9.417	-0.052	(0)
	CuF+	1.412e-10	1.239e-10	-9.850	-9.907	-0.057	(0)
	NiF+	3.006e-11	2.637e-11	-10.522	-10.579	-0.057	(0)
	CoF+	2.501e-11	2.194e-11	-10.602	-10.659	-0.057	(0)
	AlF2+	1.396e-11	1.251e-11	-10.855	-10.903	-0.047	(0)
	AlF3	1.329e-11	1.329e-11	-10.876	-10.876	0.000	(0)
	CdF+	1.591e-12	1.396e-12	-11.798	-11.855	-0.057	(0)
	AlF4-	6.288e-13	5.619e-13	-12.202	-12.250	-0.049	(0)
	AlF+2	5.768e-13	3.726e-13	-12.239	-12.429	-0.190	(0)
	HF2-	5.458e-13	4.860e-13	-12.263	-12.313	-0.050	(0)
	PbF+	4.903e-13	4.301e-13	-12.310	-12.366	-0.057	(0)
	AgF	2.041e-13	2.041e-13	-12.690	-12.690	0.000	(0)
	UO2F+	6.969e-14	6.114e-14	-13.157	-13.214	-0.057	(0)
	BF2 (OH) 2-	4.725e-14	4.191e-14	-13.326	-13.378	-0.052	(0)
	UO2F2	1.488e-14	1.488e-14	-13.828	-13.828	0.000	(0)
	CrF+2	8.097e-15	4.797e-15	-14.092	-14.319	-0.227	(0)
	PbF2	7.141e-16	7.141e-16	-15.146	-15.146	0.000	(0)
	UO2F3-	3.593e-16	3.153e-16	-15.444	-15.501	-0.057	(0)
	CdF2	2.350e-16	2.350e-16	-15.629	-15.629	0.000	(0)
	H2F2	6.151e-18	6.151e-18	-17.211	-17.211	0.000	(0)
	FeF2+	5.634e-19	5.044e-19	-18.249	-18.297	-0.048	(0)
	VO2F	4.524e-19	4.524e-19	-18.345	-18.345	0.000	(0)
	UO2F4-2	3.566e-19	2.113e-19	-18.448	-18.675	-0.227	(0)
	FeF+2	3.478e-19	2.234e-19	-18.459	-18.651	-0.192	(0)
	PbF3-	1.302e-19	1.143e-19	-18.885	-18.942	-0.057	(0)
	FeF3	6.004e-20	6.004e-20	-19.222	-19.222	0.000	(0)
	BF3OH-	1.883e-20	1.671e-20	-19.725	-19.777	-0.052	(0)
	VO2F2-	1.579e-20	1.386e-20	-19.802	-19.858	-0.057	(0)
	VOF+	4.028e-22	3.534e-22	-21.395	-21.452	-0.057	(0)
	VO2F3-2	2.461e-23	1.458e-23	-22.609	-22.836	-0.227	(0)
	VOF2	1.118e-23	1.118e-23	-22.952	-22.952	0.000	(0)
	PbF4-2	7.788e-24	4.614e-24	-23.109	-23.336	-0.227	(0)
	HgF+	3.858e-25	3.385e-25	-24.414	-24.470	-0.057	(0)
	BF4-	9.496e-26	8.423e-26	-25.022	-25.075	-0.052	(0)
	VOF3-	3.814e-26	3.346e-26	-25.419	-25.475	-0.057	(0)
	Sb (OH) 2F	1.129e-26	1.129e-26	-25.947	-25.947	0.000	(0)
	SbOF	1.111e-26	1.111e-26	-25.954	-25.954	0.000	(0)
	VO2F4-3	1.966e-27	6.053e-28	-26.706	-27.218	-0.512	(0)
	VOF4-2	1.924e-29	1.140e-29	-28.716	-28.943	-0.227	(0)
	SiF6-2	3.286e-30	2.111e-30	-29.483	-29.676	-0.192	(0)
	UF3+	1.919e-37	1.683e-37	-36.717	-36.774	-0.057	(0)
	UF2+2	2.125e-38	1.259e-38	-37.673	-37.900	-0.227	(0)
	UF4	1.557e-39	1.557e-39	-38.808	-38.808	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.415	-40.926	-0.512	(0)
	UF5-	0.000e+00	0.000e+00	-41.227	-41.283	-0.057	(0)
	UF6-2	0.000e+00	0.000e+00	-42.650	-42.877	-0.227	(0)
Fe (2)		1.060e-12					
	Fe+2	8.499e-13	5.035e-13	-12.071	-12.298	-0.227	(0)
	FeSO4	1.811e-13	1.811e-13	-12.742	-12.742	0.000	(0)
	FeOH+	1.856e-14	1.662e-14	-13.731	-13.779	-0.048	(0)
	FeHCO3+	1.026e-14	9.219e-15	-13.989	-14.035	-0.047	(0)
	Fe (OH) 2	1.094e-17	1.094e-17	-16.961	-16.961	0.000	(0)
	Fe (OH) 3-	3.205e-18	2.869e-18	-17.494	-17.542	-0.048	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-159.585	-159.585	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-235.610	-235.666	-0.057	(0)
Fe (3)		8.684e-10					
	Fe (OH) 2+	4.651e-10	4.170e-10	-9.332	-9.380	-0.047	(0)
	Fe (OH) 3	3.713e-10	3.713e-10	-9.430	-9.430	0.000	(0)

Fe (OH) 4-	3.197e-11	2.866e-11	-10.495	-10.543	-0.047	(0)
FeOH+2	2.012e-15	1.293e-15	-14.696	-14.888	-0.192	(0)
FeF2+	5.634e-19	5.044e-19	-18.249	-18.297	-0.048	(0)
FeF+2	3.478e-19	2.234e-19	-18.459	-18.651	-0.192	(0)
FeF3	6.004e-20	6.004e-20	-19.222	-19.222	0.000	(0)
FeSO4+	4.435e-20	3.971e-20	-19.353	-19.401	-0.048	(0)
Fe+3	6.701e-21	2.415e-21	-20.174	-20.617	-0.443	(0)
Fe (SO4) 2-	1.418e-21	1.244e-21	-20.848	-20.905	-0.057	(0)
FeCl+2	2.112e-22	1.357e-22	-21.675	-21.867	-0.192	(0)
FeCl2+	1.260e-24	1.128e-24	-23.900	-23.948	-0.048	(0)
FeHSeO3+2	1.867e-25	1.106e-25	-24.729	-24.956	-0.227	(0)
Fe2 (OH) 2+4	4.493e-28	5.534e-29	-27.347	-28.257	-0.909	(0)
FeCl3	2.098e-28	2.098e-28	-27.678	-27.678	0.000	(0)
FeNO3+2	4.395e-29	2.604e-29	-28.357	-28.584	-0.227	(0)
Fe3 (OH) 4+5	8.795e-36	3.336e-37	-35.056	-36.477	-1.421	(0)
H (0)	7.807e-29					
H2	3.904e-29	3.915e-29	-28.409	-28.407	0.001	(0)
Hg (0)	3.747e-10					
Hg	3.747e-10	3.747e-10	-9.426	-9.426	0.000	(0)
Hg (1)	9.296e-23					
Hg2+2	4.648e-23	2.754e-23	-22.333	-22.560	-0.227	(0)
Hg (2)	8.020e-13					
Hg (OH) 2	4.681e-13	4.694e-13	-12.330	-12.328	0.001	(0)
HgClOH	2.949e-13	2.949e-13	-12.530	-12.530	0.000	(0)
HgCl2	3.746e-14	3.746e-14	-13.426	-13.426	0.000	(0)
HgCl3-	7.945e-16	6.970e-16	-15.100	-15.157	-0.057	(0)
HgCO3	7.274e-16	7.274e-16	-15.138	-15.138	0.000	(0)
Hg (CO3) 2-2	2.180e-17	1.292e-17	-16.661	-16.889	-0.227	(0)
HgCl4-2	8.714e-18	5.162e-18	-17.060	-17.287	-0.227	(0)
HgCl+	4.580e-18	4.018e-18	-17.339	-17.396	-0.057	(0)
HgOH+	4.072e-18	3.573e-18	-17.390	-17.447	-0.057	(0)
HgHCO3+	1.875e-19	1.645e-19	-18.727	-18.784	-0.057	(0)
Hg (OH) 3-	5.585e-20	4.900e-20	-19.253	-19.310	-0.057	(0)
Hg (NH3) 2+2	8.018e-21	4.750e-21	-20.096	-20.323	-0.227	(0)
HgNH3+2	9.614e-22	5.696e-22	-21.017	-21.244	-0.227	(0)
Hg+2	1.827e-22	1.082e-22	-21.738	-21.966	-0.227	(0)
HgSO4	4.153e-23	4.153e-23	-22.382	-22.382	0.000	(0)
HgF+	3.858e-25	3.385e-25	-24.414	-24.470	-0.057	(0)
Hg (NH3) 3+2	2.662e-28	1.577e-28	-27.575	-27.802	-0.227	(0)
HgNO3+	4.911e-32	4.309e-32	-31.309	-31.366	-0.057	(0)
Hg (NH3) 4+2	1.763e-35	1.045e-35	-34.754	-34.981	-0.227	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.714	-40.714	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.302	-138.359	-0.057	(0)
HgS2-2	0.000e+00	0.000e+00	-138.924	-139.151	-0.227	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.881	-139.881	0.000	(0)
K	7.104e-04					
K+	7.032e-04	6.278e-04	-3.153	-3.202	-0.049	(0)
KSO4-	7.264e-06	6.512e-06	-5.139	-5.186	-0.047	(0)
KCrO4-	3.152e-18	2.765e-18	-17.501	-17.558	-0.057	(0)
Mg	9.826e-04					
Mg+2	8.257e-04	5.246e-04	-3.083	-3.280	-0.197	(0)
MgSO4	1.399e-04	1.399e-04	-3.854	-3.854	0.000	(0)
MgHCO3+	8.753e-06	7.808e-06	-5.058	-5.107	-0.050	(0)
MgF+	5.557e-06	4.966e-06	-5.255	-5.304	-0.049	(0)
MgCO3	2.450e-06	2.450e-06	-5.611	-5.611	0.000	(0)
MgOH+	1.925e-07	1.732e-07	-6.716	-6.762	-0.046	(0)
MgH2BO3+	1.115e-08	9.888e-09	-7.953	-8.005	-0.052	(0)
Mn (2)	1.124e-05					
Mn+2	9.535e-06	5.649e-06	-5.021	-5.248	-0.227	(0)
MnSO4	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)
MnHCO3+	1.831e-07	1.639e-07	-6.737	-6.785	-0.048	(0)
MnF+	2.119e-08	1.897e-08	-7.674	-7.722	-0.048	(0)
MnCl+	1.478e-08	1.323e-08	-7.830	-7.878	-0.048	(0)
MnOH+	1.314e-08	1.176e-08	-7.881	-7.929	-0.048	(0)
MnCl2	3.477e-11	3.477e-11	-10.459	-10.459	0.000	(0)
MnCl3-	1.990e-14	1.781e-14	-13.701	-13.749	-0.048	(0)
MnSeO4	1.930e-14	1.930e-14	-13.714	-13.714	0.000	(0)
MnNO3+	1.100e-14	9.651e-15	-13.959	-14.015	-0.057	(0)

Mn (OH) 3-	5.582e-17	4.997e-17	-16.253	-16.301	-0.048	(0)
Mn (OH) 4-2	2.082e-22	1.338e-22	-21.682	-21.874	-0.192	(0)
Mn (NO3) 2	2.614e-23	2.614e-23	-22.583	-22.583	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.390	-41.390	0.000	(0)
Mn (3)	3.615e-26					
Mn+3	3.615e-26	1.303e-26	-25.442	-25.885	-0.443	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.301	-41.493	-0.192	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.101	-46.152	-0.051	(0)
Mo	3.321e-07					
MoO4-2	3.321e-07	2.110e-07	-6.479	-6.676	-0.197	(0)
HMoO4-	5.811e-11	5.098e-11	-10.236	-10.293	-0.057	(0)
H2MoO4	4.534e-15	4.534e-15	-14.344	-14.344	0.000	(0)
Ag2MoO4	7.409e-26	7.409e-26	-25.130	-25.130	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.399	-47.911	-0.512	(0)
Mo7O24-6	0.000e+00	0.000e+00	-55.019	-57.065	-2.046	(0)
HMo7O24-5	0.000e+00	0.000e+00	-57.173	-58.594	-1.421	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-60.818	-61.728	-0.909	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-65.886	-66.397	-0.512	(0)
N (-3)	2.117e-07					
NH4+	2.002e-07	1.776e-07	-6.698	-6.751	-0.052	(0)
NH3	8.340e-09	8.340e-09	-8.079	-8.079	0.000	(0)
NH4SO4-	3.115e-09	2.789e-09	-8.507	-8.555	-0.048	(0)
CaNH3+2	8.870e-12	5.255e-12	-11.052	-11.279	-0.227	(0)
CuNH3+2	3.353e-12	1.986e-12	-11.475	-11.702	-0.227	(0)
NiNH3+2	9.407e-14	5.573e-14	-13.027	-13.254	-0.227	(0)
AgNH3+	1.869e-14	1.640e-14	-13.728	-13.785	-0.057	(0)
Co (NH3) +2	1.392e-14	8.247e-15	-13.856	-14.084	-0.227	(0)
BaNH3+2	6.001e-17	3.555e-17	-16.222	-16.449	-0.227	(0)
Ag (NH3) 2+	1.267e-18	1.112e-18	-17.897	-17.954	-0.057	(0)
Ni (NH3) 2+2	1.134e-19	6.718e-20	-18.945	-19.173	-0.227	(0)
Ca (NH3) 2+2	2.945e-20	1.745e-20	-19.531	-19.758	-0.227	(0)
Hg (NH3) 2+2	8.018e-21	4.750e-21	-20.096	-20.323	-0.227	(0)
Co (NH3) 2+2	4.952e-21	2.934e-21	-20.305	-20.533	-0.227	(0)
HgNH3+2	9.614e-22	5.696e-22	-21.017	-21.244	-0.227	(0)
Co (NH3) 3+2	5.199e-28	3.080e-28	-27.284	-27.511	-0.227	(0)
Hg (NH3) 3+2	2.662e-28	1.577e-28	-27.575	-27.802	-0.227	(0)
Co (NH3) 4+2	2.276e-35	1.348e-35	-34.643	-34.870	-0.227	(0)
Hg (NH3) 4+2	1.763e-35	1.045e-35	-34.754	-34.981	-0.227	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.321	-41.549	-0.227	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.502	-42.729	-0.227	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.407	-50.918	-0.512	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.408	-50.635	-0.227	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.319	-52.547	-0.227	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.551	-60.608	-0.057	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.353	-64.580	-0.227	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.202	-65.429	-0.227	(0)
N (3)	2.493e-06					
NO2-	2.493e-06	2.215e-06	-5.603	-5.655	-0.051	(0)
CuNO2+	6.155e-12	5.400e-12	-11.211	-11.268	-0.057	(0)
AgNO2	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)
CoNO2+	1.464e-13	1.284e-13	-12.835	-12.891	-0.057	(0)
Cu (NO2) 2	1.224e-16	1.224e-16	-15.912	-15.912	0.000	(0)
Ag (NO2) 2-	1.744e-18	1.530e-18	-17.759	-17.815	-0.057	(0)
N (5)	1.209e-09					
NO3-	1.207e-09	1.078e-09	-8.918	-8.967	-0.049	(0)
CaNO3+	1.945e-12	1.706e-12	-11.711	-11.768	-0.057	(0)
MnNO3+	1.100e-14	9.651e-15	-13.959	-14.015	-0.057	(0)
ZnNO3+	1.740e-15	1.527e-15	-14.759	-14.816	-0.057	(0)
CuNO3+	9.045e-17	7.935e-17	-16.044	-16.100	-0.057	(0)
BaNO3+	4.161e-17	3.650e-17	-16.381	-16.438	-0.057	(0)
NiNO3+	3.841e-17	3.369e-17	-16.416	-16.472	-0.057	(0)
CoNO3+	1.602e-17	1.405e-17	-16.795	-16.852	-0.057	(0)
CdNO3+	4.057e-18	3.559e-18	-17.392	-17.449	-0.057	(0)
PbNO3+	1.315e-18	1.154e-18	-17.881	-17.938	-0.057	(0)
AgNO3	8.248e-19	8.248e-19	-18.084	-18.084	0.000	(0)
Mn (NO3) 2	2.614e-23	2.614e-23	-22.583	-22.583	0.000	(0)

UO2NO3+	1.287e-23	1.129e-23	-22.890	-22.947	-0.057	(0)
Zn(NO3)2	3.284e-25	3.284e-25	-24.484	-24.484	0.000	(0)
Co(NO3)2	3.083e-26	3.083e-26	-25.511	-25.511	0.000	(0)
CrNO3+2	2.854e-26	1.691e-26	-25.545	-25.772	-0.227	(0)
Cu(NO3)2	1.077e-26	1.077e-26	-25.968	-25.968	0.000	(0)
Pb(NO3)2	2.112e-27	2.112e-27	-26.675	-26.675	0.000	(0)
Cd(NO3)2	1.923e-27	1.923e-27	-26.716	-26.716	0.000	(0)
VO2NO3	1.667e-27	1.667e-27	-26.778	-26.778	0.000	(0)
FeNO3+2	4.395e-29	2.604e-29	-28.357	-28.584	-0.227	(0)
HgNO3+	4.911e-32	4.309e-32	-31.309	-31.366	-0.057	(0)
Hg(NO3)2	0.000e+00	0.000e+00	-40.714	-40.714	0.000	(0)
Na	4.539e-03					
Na+	4.500e-03	4.018e-03	-2.347	-2.396	-0.049	(0)
NaSO4-	3.527e-05	3.162e-05	-4.453	-4.500	-0.047	(0)
NaHCO3	3.286e-06	3.286e-06	-5.483	-5.483	0.000	(0)
NaCO3-	4.686e-07	4.201e-07	-6.329	-6.377	-0.047	(0)
NaF	2.139e-07	2.139e-07	-6.670	-6.670	0.000	(0)
NaH2BO3	3.461e-09	3.461e-09	-8.461	-8.461	0.000	(0)
NaCrO4-	2.698e-17	2.367e-17	-16.569	-16.626	-0.057	(0)
Ni	2.863e-08					
Ni+2	1.958e-08	1.244e-08	-7.708	-7.905	-0.197	(0)
NiSO4	3.638e-09	3.638e-09	-8.439	-8.439	0.000	(0)
NiCO3	2.607e-09	2.607e-09	-8.584	-8.584	0.000	(0)
NiHCO3+	2.543e-09	2.231e-09	-8.595	-8.651	-0.057	(0)
NiOH+	1.480e-10	1.299e-10	-9.830	-9.887	-0.057	(0)
NiCl+	6.751e-11	5.923e-11	-10.171	-10.227	-0.057	(0)
NiF+	3.006e-11	2.637e-11	-10.522	-10.579	-0.057	(0)
Ni(OH)2	8.552e-12	8.552e-12	-11.068	-11.068	0.000	(0)
Ni(SO4)2-2	2.979e-13	1.765e-13	-12.526	-12.753	-0.227	(0)
NiNH3+2	9.407e-14	5.573e-14	-13.027	-13.254	-0.227	(0)
Ni(OH)3-	8.082e-15	7.090e-15	-14.092	-14.149	-0.057	(0)
NiCl2	5.548e-16	5.548e-16	-15.256	-15.256	0.000	(0)
NiSeO4	7.389e-17	7.389e-17	-16.131	-16.131	0.000	(0)
NiNO3+	3.841e-17	3.369e-17	-16.416	-16.472	-0.057	(0)
Ni(NH3)2+2	1.134e-19	6.718e-20	-18.945	-19.173	-0.227	(0)
O(0)	6.593e-36					
O2	3.296e-36	3.306e-36	-35.482	-35.481	0.001	(0)
Pb	1.692e-09					
PbCO3	1.221e-09	1.221e-09	-8.913	-8.913	0.000	(0)
PbOH+	1.717e-10	1.507e-10	-9.765	-9.822	-0.057	(0)
Pb+2	1.139e-10	7.235e-11	-9.944	-10.141	-0.197	(0)
PbHCO3+	8.912e-11	7.818e-11	-10.050	-10.107	-0.057	(0)
PbSO4	5.192e-11	5.192e-11	-10.285	-10.285	0.000	(0)
Pb(CO3)2-2	3.339e-11	1.978e-11	-10.476	-10.704	-0.227	(0)
PbCl+	5.443e-12	4.776e-12	-11.264	-11.321	-0.057	(0)
Pb(OH)2	3.950e-12	3.950e-12	-11.403	-11.403	0.000	(0)
Pb(SO4)2-2	7.738e-13	4.584e-13	-12.111	-12.339	-0.227	(0)
PbF+	4.903e-13	4.301e-13	-12.310	-12.366	-0.057	(0)
PbCl2	3.969e-14	3.969e-14	-13.401	-13.401	0.000	(0)
Pb(OH)3-	3.733e-15	3.275e-15	-14.428	-14.485	-0.057	(0)
PbF2	7.141e-16	7.141e-16	-15.146	-15.146	0.000	(0)
PbCl3-	3.350e-17	2.939e-17	-16.475	-16.532	-0.057	(0)
PbNO3+	1.315e-18	1.154e-18	-17.881	-17.938	-0.057	(0)
Pb(OH)4-2	1.122e-18	6.649e-19	-17.950	-18.177	-0.227	(0)
Pb2OH+3	5.611e-19	1.728e-19	-18.251	-18.763	-0.512	(0)
PbF3-	1.302e-19	1.143e-19	-18.885	-18.942	-0.057	(0)
PbCl4-2	4.219e-20	2.500e-20	-19.375	-19.602	-0.227	(0)
Pb3(OH)4+2	3.802e-23	2.252e-23	-22.420	-22.647	-0.227	(0)
PbF4-2	7.788e-24	4.614e-24	-23.109	-23.336	-0.227	(0)
Pb(NO3)2	2.112e-27	2.112e-27	-26.675	-26.675	0.000	(0)
Pb4(OH)4+4	1.051e-28	1.294e-29	-27.978	-28.888	-0.909	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.108	-151.108	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-227.869	-227.926	-0.057	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.320	-73.320	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.062	-78.118	-0.057	(0)
H2S	0.000e+00	0.000e+00	-79.014	-79.014	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.035	-79.092	-0.057	(0)

S5-2	0.000e+00	0.000e+00	-79.341	-79.568	-0.227	(0)
S6-2	0.000e+00	0.000e+00	-79.856	-80.084	-0.227	(0)
S4-2	0.000e+00	0.000e+00	-79.936	-80.164	-0.227	(0)
S3-2	0.000e+00	0.000e+00	-80.742	-80.969	-0.227	(0)
S2-2	0.000e+00	0.000e+00	-81.758	-81.986	-0.227	(0)
S-2	0.000e+00	0.000e+00	-87.311	-87.503	-0.192	(0)
HgHS2-	0.000e+00	0.000e+00	-138.302	-138.359	-0.057	(0)
HgS2-2	0.000e+00	0.000e+00	-138.924	-139.151	-0.227	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.881	-139.881	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.394	-146.672	-0.278	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.760	-146.907	-0.147	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.135	-147.402	-0.267	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.282	-147.339	-0.057	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.703	-147.760	-0.057	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.148	-148.431	-0.283	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.470	-148.742	-0.272	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.666	-149.666	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.006	-150.006	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.108	-151.108	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.585	-159.585	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.033	-216.090	-0.057	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.447	-224.504	-0.057	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.168	-226.225	-0.057	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.341	-226.569	-0.227	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.869	-227.926	-0.057	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.610	-235.666	-0.057	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.920	-302.147	-0.227	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.855	-304.083	-0.227	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.992	-319.219	-0.227	(0)
S (6)	2.658e-03					
SO4-2	2.306e-03	1.465e-03	-2.637	-2.834	-0.197	(0)
CaSO4	1.680e-04	1.680e-04	-3.775	-3.775	0.000	(0)
MgSO4	1.399e-04	1.399e-04	-3.854	-3.854	0.000	(0)
NaSO4-	3.527e-05	3.162e-05	-4.453	-4.500	-0.047	(0)
KSO4-	7.264e-06	6.512e-06	-5.139	-5.186	-0.047	(0)
MnSO4	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)
ZnSO4	1.807e-07	1.807e-07	-6.743	-6.743	0.000	(0)
CuSO4	7.813e-09	7.813e-09	-8.107	-8.107	0.000	(0)
Zn (SO4) 2-2	3.893e-09	2.307e-09	-8.410	-8.637	-0.227	(0)
NiSO4	3.638e-09	3.638e-09	-8.439	-8.439	0.000	(0)
NH4SO4-	3.115e-09	2.789e-09	-8.507	-8.555	-0.048	(0)
CoSO4	2.405e-09	2.405e-09	-8.619	-8.619	0.000	(0)
HSO4-	1.946e-09	1.739e-09	-8.711	-8.760	-0.049	(0)
CdSO4	3.586e-10	3.586e-10	-9.445	-9.445	0.000	(0)
PbSO4	5.192e-11	5.192e-11	-10.285	-10.285	0.000	(0)
AgSO4-	3.210e-11	2.816e-11	-10.494	-10.550	-0.057	(0)
Cd (SO4) 2-2	1.197e-11	7.089e-12	-10.922	-11.149	-0.227	(0)
CrOHSO4	2.262e-12	2.262e-12	-11.645	-11.645	0.000	(0)
Pb (SO4) 2-2	7.738e-13	4.584e-13	-12.111	-12.339	-0.227	(0)
Ni (SO4) 2-2	2.979e-13	1.765e-13	-12.526	-12.753	-0.227	(0)
FeSO4	1.811e-13	1.811e-13	-12.742	-12.742	0.000	(0)
UO2SO4	1.164e-14	1.164e-14	-13.934	-13.934	0.000	(0)
AlSO4+	5.620e-15	5.023e-15	-14.250	-14.299	-0.049	(0)
CrSO4+	1.399e-15	1.227e-15	-14.854	-14.911	-0.057	(0)
UO2 (SO4) 2-2	3.797e-16	2.249e-16	-15.421	-15.648	-0.227	(0)
Al (SO4) 2-	8.824e-17	7.886e-17	-16.054	-16.103	-0.049	(0)
VO2SO4-	1.219e-19	1.070e-19	-18.914	-18.971	-0.057	(0)
FeSO4+	4.435e-20	3.971e-20	-19.353	-19.401	-0.048	(0)
Cr2 (OH) 2SO4+2	2.246e-21	1.331e-21	-20.649	-20.876	-0.227	(0)
Fe (SO4) 2-	1.418e-21	1.244e-21	-20.848	-20.905	-0.057	(0)
VOSO4	2.818e-22	2.818e-22	-21.550	-21.550	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.158e-22	1.158e-22	-21.936	-21.936	0.000	(0)
HgSO4	4.153e-23	4.153e-23	-22.382	-22.382	0.000	(0)
CrO3SO4-2	4.262e-25	2.525e-25	-24.370	-24.598	-0.227	(0)
VSO4+	7.810e-37	6.852e-37	-36.107	-36.164	-0.057	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.320	-41.320	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.159	-42.386	-0.227	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.551	-60.608	-0.057	(0)

Sb (3)	1.394e-20					
Sb (OH) 3	7.055e-21	7.055e-21	-20.152	-20.152	0.000	(0)
HSbO2	6.888e-21	6.888e-21	-20.162	-20.162	0.000	(0)
SbO2-	1.047e-24	9.187e-25	-23.980	-24.037	-0.057	(0)
Sb (OH) 4-	5.998e-25	5.262e-25	-24.222	-24.279	-0.057	(0)
Sb (OH) 2F	1.129e-26	1.129e-26	-25.947	-25.947	0.000	(0)
SbOF	1.111e-26	1.111e-26	-25.954	-25.954	0.000	(0)
Sb (OH) 2+	2.372e-27	2.081e-27	-26.625	-26.682	-0.057	(0)
SbO+	8.178e-28	7.175e-28	-27.087	-27.144	-0.057	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.992	-319.219	-0.227	(0)
Sb (5)	5.020e-09					
SbO3-	5.014e-09	4.399e-09	-8.300	-8.357	-0.057	(0)
Sb (OH) 6-	5.760e-12	5.142e-12	-11.240	-11.289	-0.049	(0)
SbO2+	2.121e-25	1.861e-25	-24.673	-24.730	-0.057	(0)
Se (-2)	1.322e-14					
Ag2Se	1.322e-14	1.322e-14	-13.879	-13.879	0.000	(0)
HSe-	2.422e-39	2.125e-39	-38.616	-38.673	-0.057	(0)
MnSe	0.000e+00	0.000e+00	-41.390	-41.390	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.698	-42.698	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.530	-45.757	-0.227	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.214	-83.124	-0.909	(0)
Se (4)	2.935e-08					
HSeO3-	1.975e-08	1.733e-08	-7.704	-7.761	-0.057	(0)
SeO3-2	9.591e-09	5.682e-09	-8.018	-8.246	-0.227	(0)
H2SeO3	8.977e-14	8.977e-14	-13.047	-13.047	0.000	(0)
AgSeO3-	4.009e-15	3.517e-15	-14.397	-14.454	-0.057	(0)
Cd (SeO3) 2-2	4.689e-20	2.778e-20	-19.329	-19.556	-0.227	(0)
Ag (SeO3) 2-3	5.811e-22	1.789e-22	-21.236	-21.747	-0.512	(0)
FeHSeO3+2	1.867e-25	1.106e-25	-24.729	-24.956	-0.227	(0)
Se (6)	2.000e-11					
SeO4-2	1.998e-11	1.270e-11	-10.699	-10.896	-0.197	(0)
MnSeO4	1.930e-14	1.930e-14	-13.714	-13.714	0.000	(0)
ZnSeO4	1.109e-15	1.109e-15	-14.955	-14.955	0.000	(0)
NiSeO4	7.389e-17	7.389e-17	-16.131	-16.131	0.000	(0)
CoSeO4	5.234e-17	5.234e-17	-16.281	-16.281	0.000	(0)
HSeO4-	8.807e-18	7.727e-18	-17.055	-17.112	-0.057	(0)
CdSeO4	2.468e-18	2.468e-18	-17.608	-17.608	0.000	(0)
Zn (SeO4) 2-2	2.409e-26	1.427e-26	-25.618	-25.846	-0.227	(0)
Si	1.796e-04					
H4SiO4	1.773e-04	1.778e-04	-3.751	-3.750	0.001	(0)
H3SiO4-	2.372e-06	2.116e-06	-5.625	-5.674	-0.050	(0)
H2SiO4-2	1.702e-11	1.100e-11	-10.769	-10.959	-0.190	(0)
UO2H3SiO4+	1.075e-12	9.432e-13	-11.969	-12.025	-0.057	(0)
SiF6-2	3.286e-30	2.111e-30	-29.483	-29.676	-0.192	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.150	-59.661	-0.512	(0)
U (4)	2.305e-20					
U (OH) 5-	2.304e-20	2.021e-20	-19.638	-19.694	-0.057	(0)
U (OH) 4	1.028e-23	1.028e-23	-22.988	-22.988	0.000	(0)
U (OH) 3+	5.204e-28	4.565e-28	-27.284	-27.341	-0.057	(0)
U (OH) 2+2	4.328e-33	2.564e-33	-32.364	-32.591	-0.227	(0)
UF3+	1.919e-37	1.683e-37	-36.717	-36.774	-0.057	(0)
UF2+2	2.125e-38	1.259e-38	-37.673	-37.900	-0.227	(0)
UOH+3	4.763e-39	1.467e-39	-38.322	-38.834	-0.512	(0)
UF4	1.557e-39	1.557e-39	-38.808	-38.808	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.415	-40.926	-0.512	(0)
UF5-	0.000e+00	0.000e+00	-41.227	-41.283	-0.057	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.320	-41.320	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.159	-42.386	-0.227	(0)
UF6-2	0.000e+00	0.000e+00	-42.650	-42.877	-0.227	(0)
U+4	0.000e+00	0.000e+00	-45.243	-46.152	-0.909	(0)
UCl+3	0.000e+00	0.000e+00	-46.671	-47.183	-0.512	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-170.731	-175.335	-4.604	(0)
U (5)	7.064e-17					
UO2+	7.064e-17	6.198e-17	-16.151	-16.208	-0.057	(0)
U (6)	5.236e-08					
UO2 (CO3) 3-4	3.005e-08	3.701e-09	-7.522	-8.432	-0.909	(0)
UO2 (CO3) 2-2	2.220e-08	1.315e-08	-7.654	-7.881	-0.227	(0)

UO2CO3	1.174e-10	1.174e-10	-9.930	-9.930	0.000	(0)
UO2H3SiO4+	1.075e-12	9.432e-13	-11.969	-12.025	-0.057	(0)
UO2OH+	6.246e-13	5.480e-13	-12.204	-12.261	-0.057	(0)
UO2F+	6.969e-14	6.114e-14	-13.157	-13.214	-0.057	(0)
UO2F2	1.488e-14	1.488e-14	-13.828	-13.828	0.000	(0)
UO2SO4	1.164e-14	1.164e-14	-13.934	-13.934	0.000	(0)
UO2+2	8.263e-15	5.250e-15	-14.083	-14.280	-0.197	(0)
UO2 (SO4) 2-2	3.797e-16	2.249e-16	-15.421	-15.648	-0.227	(0)
UO2F3-	3.593e-16	3.153e-16	-15.444	-15.501	-0.057	(0)
UO2Cl+	1.806e-17	1.584e-17	-16.743	-16.800	-0.057	(0)
(UO2) 2 (OH) 2+2	8.412e-19	4.983e-19	-18.075	-18.302	-0.227	(0)
UO2F4-2	3.566e-19	2.113e-19	-18.448	-18.675	-0.227	(0)
(UO2) 3 (OH) 5+	1.623e-19	1.424e-19	-18.790	-18.847	-0.057	(0)
UO2NO3+	1.287e-23	1.129e-23	-22.890	-22.947	-0.057	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.542	-43.598	-0.057	(0)
V+2	0.000e+00	0.000e+00	-44.800	-45.027	-0.227	(0)
V (3)	4.553e-16					
V (OH) 3	4.553e-16	4.553e-16	-15.342	-15.342	0.000	(0)
V (OH) 2+	4.073e-27	3.573e-27	-26.390	-26.447	-0.057	(0)
VOH+2	6.947e-31	4.116e-31	-30.158	-30.386	-0.227	(0)
V+3	3.217e-36	9.905e-37	-35.493	-36.004	-0.512	(0)
VSO4+	7.810e-37	6.852e-37	-36.107	-36.164	-0.057	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.869	-58.381	-0.512	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-59.062	-59.971	-0.909	(0)
V (4)	1.335e-19					
V (OH) 3+	1.317e-19	1.155e-19	-18.881	-18.937	-0.057	(0)
VO+2	1.179e-21	6.984e-22	-20.929	-21.156	-0.227	(0)
VOF+	4.028e-22	3.534e-22	-21.395	-21.452	-0.057	(0)
VOSO4	2.818e-22	2.818e-22	-21.550	-21.550	0.000	(0)
VOF2	1.118e-23	1.118e-23	-22.952	-22.952	0.000	(0)
VOC1+	4.155e-24	3.645e-24	-23.381	-23.438	-0.057	(0)
VOF3-	3.814e-26	3.346e-26	-25.419	-25.475	-0.057	(0)
VOF4-2	1.924e-29	1.140e-29	-28.716	-28.943	-0.227	(0)
H2V2O4+2	1.129e-33	6.689e-34	-32.947	-33.175	-0.227	(0)
V (5)	1.547e-09					
H2VO4-	1.184e-09	1.039e-09	-8.927	-8.984	-0.057	(0)
HVO4-2	3.627e-10	2.149e-10	-9.440	-9.668	-0.227	(0)
H3VO4	1.261e-13	1.261e-13	-12.899	-12.899	0.000	(0)
H3V2O7-	9.644e-16	8.461e-16	-15.016	-15.073	-0.057	(0)
VO4-3	2.880e-16	8.869e-17	-15.541	-16.052	-0.512	(0)
HV2O7-3	2.457e-16	7.564e-17	-15.610	-16.121	-0.512	(0)
VO2+	3.424e-18	3.057e-18	-17.465	-17.515	-0.049	(0)
V2O7-4	1.361e-18	1.677e-19	-17.866	-18.776	-0.909	(0)
VO2F	4.524e-19	4.524e-19	-18.345	-18.345	0.000	(0)
VO2SO4-	1.219e-19	1.070e-19	-18.914	-18.971	-0.057	(0)
VO2F2-	1.579e-20	1.386e-20	-19.802	-19.858	-0.057	(0)
V3O9-3	3.814e-21	1.174e-21	-20.419	-20.930	-0.512	(0)
VO2F3-2	2.461e-23	1.458e-23	-22.609	-22.836	-0.227	(0)
V4O12-4	4.129e-27	5.086e-28	-26.384	-27.294	-0.909	(0)
VO2F4-3	1.966e-27	6.053e-28	-26.706	-27.218	-0.512	(0)
VO2NO3	1.667e-27	1.667e-27	-26.778	-26.778	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-70.545	-72.591	-2.046	(0)
HV10O28-5	0.000e+00	0.000e+00	-70.899	-72.320	-1.421	(0)
H2V10O28-4	0.000e+00	0.000e+00	-74.119	-75.028	-0.909	(0)
Zn	1.350e-06					
Zn+2	8.873e-07	5.638e-07	-6.052	-6.249	-0.197	(0)
ZnCO3	1.822e-07	1.822e-07	-6.739	-6.739	0.000	(0)
ZnSO4	1.807e-07	1.807e-07	-6.743	-6.743	0.000	(0)
ZnOH+	5.328e-08	4.674e-08	-7.273	-7.330	-0.057	(0)
ZnHCO3+	2.956e-08	2.593e-08	-7.529	-7.586	-0.057	(0)
Zn (OH) 2	6.142e-09	6.142e-09	-8.212	-8.212	0.000	(0)
Zn (SO4) 2-2	3.893e-09	2.307e-09	-8.410	-8.637	-0.227	(0)
ZnCl+	2.953e-09	2.635e-09	-8.530	-8.579	-0.050	(0)
ZnOHC1	2.860e-09	2.860e-09	-8.544	-8.544	0.000	(0)
ZnF+	1.082e-09	9.491e-10	-8.966	-9.023	-0.057	(0)
Zn (OH) 3-	2.909e-11	2.552e-11	-10.536	-10.593	-0.057	(0)
ZnCl2	7.769e-12	7.769e-12	-11.110	-11.110	0.000	(0)

ZnCl3-	1.287e-14	1.148e-14	-13.890	-13.940	-0.050	(0)
ZnNO3+	1.740e-15	1.527e-15	-14.759	-14.816	-0.057	(0)
Zn (OH) 4-2	1.422e-15	8.423e-16	-14.847	-15.075	-0.227	(0)
ZnSeO4	1.109e-15	1.109e-15	-14.955	-14.955	0.000	(0)
ZnCl4-2	1.662e-17	1.068e-17	-16.779	-16.971	-0.192	(0)
Zn (NO3) 2	3.284e-25	3.284e-25	-24.484	-24.484	0.000	(0)
Zn (SeO4) 2-2	2.409e-26	1.427e-26	-25.618	-25.846	-0.227	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.703	-147.760	-0.057	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.666	-149.666	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.447	-224.504	-0.057	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.341	-226.569	-0.227	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.855	-304.083	-0.227	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-56.90	-50.61	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.65	-38.14	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.87	-38.14	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-73.62	-55.68	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-57.00	-36.97	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.83	-28.43	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.85	-24.40	0.45	(NH4) 2SeO4
Acanthite	-52.02	-88.24	-36.22	Ag2S
Ag2CO3	-12.19	-23.28	-11.09	Ag2CO3
Ag2CrO4	-21.37	-32.96	-11.59	Ag2CrO4
Ag2HVO4	-13.28	-11.80	1.48	Ag2HVO4
Ag2MoO4	-13.16	-24.71	-11.55	Ag2MoO4
Ag2O	-14.78	-2.20	12.57	Ag2O
Ag2Se	-0.09	-48.79	-48.70	Ag2Se
Ag2SeO3	-10.73	-17.88	-7.15	Ag2SeO3
Ag2SeO4	-20.02	-28.93	-8.91	Ag2SeO4
Ag2SO4	-16.05	-20.87	-4.82	Ag2SO4
Ag3AsO3	-27.53	-25.37	2.16	Ag3AsO3
Ag3AsO4	-16.22	-19.01	-2.79	Ag3AsO4
Ag3H2VO5	-18.08	-12.90	5.18	Ag3H2VO5
AgF:4H2O	-14.14	-13.09	1.05	AgF:4H2O
Agmetal	-0.22	-13.73	-13.51	Ag
AgVO3	-11.47	-10.70	0.77	AgVO3
Al (OH) 3 (am)	-2.41	8.39	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.10	-50.74	2.37	Al2 (MoO4) 3
Al2O3	-2.87	16.78	19.65	Al2O3
Al4 (OH) 10SO4	-7.80	14.90	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.12	-7.32	4.80	AlAsO4:2H2O
AlOHSO4	-7.04	-10.27	-3.23	AlOHSO4
AlSb	-153.16	-87.53	65.62	AlSb
Alunite	-6.04	-7.44	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.18	-12.97	-7.79	PbSO4
Anhydrite	-1.77	-6.13	-4.36	CaSO4
Anilite	-54.72	-86.60	-31.88	Cu0.25Cu1.5S
Antlerite	-2.86	5.93	8.79	Cu3 (OH) 4SO4
Aragonite	-0.25	-8.55	-8.30	CaCO3
Arsenolite	-85.50	-88.26	-2.76	As4O6
Artinite	-5.58	4.02	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.12	-31.41	6.71	As2O5
Atacamite	-1.64	5.75	7.39	Cu2 (OH) 3Cl
Azurite	-0.66	-17.57	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.73	7.66	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.75	-3.88	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.48	-8.43	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-29.16	3.78	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.43	-23.10	-9.67	BaCrO4
BaF2	-10.50	-16.32	-5.82	BaF2
BaMoO4	-7.89	-14.85	-6.96	BaMoO4
Barite	-1.02	-11.00	-9.98	BaSO4
BaS	-94.55	-78.37	16.18	BaS
BaSeO3	-9.85	-8.02	1.83	BaSeO3

BaSeO4	-11.61	-19.07	-7.46	BaSeO4
Bianchite	-7.32	-9.08	-1.76	ZnSO4:6H2O
Birnessite	-7.60	10.49	18.09	MnO2
Bixbyite	-3.63	-4.28	-0.64	Mn2O3
BlaubleiI	-54.84	-79.00	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.23	-82.51	-27.28	Cu0.6Cu0.8S
Boehmite	-0.19	8.39	8.58	AlOOH
Breithauptite	-56.85	-75.37	-18.52	NiSb
Brochantite	-1.09	14.13	15.22	Cu4(OH)6SO4
Brucite	-4.29	12.55	16.84	Mg(OH)2
Bunsenite	-4.52	7.93	12.45	NiO
Ca(VO3)2	-12.33	-6.67	5.66	Ca(VO3)2
Ca2V2O7	-11.64	5.86	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.69	5.86	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.12	6.18	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.57	18.39	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.47	18.39	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-297.23	-154.25	142.97	Ca3Sb2
CaCrO4	-15.96	-18.23	-2.27	CaCrO4
Calcite	-0.07	-8.55	-8.48	CaCO3
Calomel	-10.11	-28.02	-17.91	Hg2Cl2
CaMoO4	-2.03	-9.98	-7.95	CaMoO4
Carnotite	-3.56	-3.33	0.23	KUO2VO4
CaSeO3:2H2O	-5.96	-3.15	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.18	-14.20	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.88	-3.04	9.84	Cd(BO2)2
Cd(OH)2	-6.79	6.85	13.64	Cd(OH)2
Cd(OH)2(am)	-6.88	6.85	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.49	-16.78	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.68	1.88	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.67	8.73	28.40	Cd4(OH)6SO4
CdCl2	-13.78	-14.44	-0.66	CdCl2
CdCl2:1H2O	-12.75	-14.44	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.53	-14.44	-1.91	CdCl2:2.5H2O
CdF2	-15.92	-17.13	-1.21	CdF2
Cdmetal(alpha)	-31.92	-18.41	13.51	Cd
Cdmetal(gamma)	-32.03	-18.41	13.62	Cd
CdMoO4	-1.51	-15.66	-14.15	CdMoO4
CdOHCl	-7.33	-3.80	3.54	CdOHCl
CdSb	-76.09	-76.44	-0.35	CdSb
CdSe	-19.54	-39.74	-20.20	CdSe
CdSeO4:2H2O	-18.03	-19.88	-1.85	CdSeO4:2H2O
CdSO4	-11.64	-11.82	-0.17	CdSO4
CdSO4:1H2O	-10.09	-11.82	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.94	-11.82	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.00	-11.75	-9.75	AgCl
Cerrusite	-2.26	-15.39	-13.13	PbCO3
CH4(g)	-81.07	-122.11	-41.05	CH4
Chalcanthite	-7.83	-10.47	-2.64	CuSO4:5H2O
Chalcedony	-0.20	-3.75	-3.55	SiO2
Chalcocite	-54.59	-89.51	-34.92	Cu2S
Chalcopyrite	-125.07	-160.34	-35.27	CuFeS2
Chrysotile	-2.05	30.15	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.67	-98.36	-45.69	HgS
Claudetite	-85.20	-88.26	-3.06	As4O6
Clausthalite	-13.80	-40.90	-27.10	PbSe
Co(BO2)2	-29.21	-2.14	27.07	Co(BO2)2
Co(OH)2	-5.35	7.75	13.09	Co(OH)2
Co(OH)3	-9.72	-12.03	-2.31	Co(OH)3
CO2(g)	-2.93	-21.08	-18.15	CO2
Co3(AsO4)2	-21.21	-8.17	13.03	Co3(AsO4)2
Co3O4	-5.81	-16.30	-10.50	Co3O4
CoCl2	-21.81	-13.55	8.27	CoCl2
CoCl2:6H2O	-16.08	-13.55	2.54	CoCl2:6H2O
CoCO3	-3.36	-13.34	-9.98	CoCO3
CoF2	-14.64	-16.23	-1.60	CoF2
CoF3	-46.54	-47.99	-1.46	CoF3
CoFe2O4	17.53	14.01	-3.53	CoFe2O4

CoMoO4	-7.00	-14.76	-7.76	CoMoO4
CoO	-5.84	7.75	13.59	CoO
CoS (alpha)	-70.85	-78.29	-7.44	CoS
CoS (beta)	-67.22	-78.29	-11.07	CoS
CoSe	-22.64	-38.84	-16.20	CoSe
CoSeO3	-9.25	-7.93	1.32	CoSeO3
CoSeO4:6H2O	-17.45	-18.98	-1.53	CoSeO4:6H2O
CoSO4	-13.72	-10.92	2.80	CoSO4
CoSO4:6H2O	-8.45	-10.92	-2.47	CoSO4:6H2O
Cotunnite	-10.82	-15.60	-4.78	PbCl2
Covellite	-55.54	-77.84	-22.30	CuS
Cr (OH) 2	-21.77	-10.95	10.82	Cr (OH) 2
Cr (OH) 3	-2.60	-1.27	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.52	-1.27	-0.75	Cr (OH) 3
Cr2O3	-0.18	-2.53	-2.36	Cr2O3
CrCl2	-46.33	-32.24	14.09	CrCl2
CrCl3	-48.32	-33.21	15.11	CrCl3
CrF3	-25.90	-37.24	-11.34	CrF3
Cristobalite	-0.40	-3.75	-3.35	SiO2
Crmetal	-66.69	-36.21	30.48	Cr
CrO3	-27.55	-30.76	-3.21	CrO3
Cryolite	-13.15	-46.99	-33.84	Na3AlF6
Cu (OH) 2	-0.48	8.20	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.80	18.41	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.74	-0.49	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.58	-89.47	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.27	-50.07	-45.80	Cu2Se
Cu2SO4	-20.20	-22.15	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.92	-6.82	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.55	-101.14	-42.59	Cu3Sb
Cu3Se2	-24.97	-88.46	-63.49	Cu3Se2
CuCO3	-1.38	-12.88	-11.50	CuCO3
CuCrO4	-17.12	-22.56	-5.44	CuCrO4
CuF	-8.82	-13.73	-4.91	CuF
CuF2	-16.90	-15.78	1.12	CuF2
CuF2:2H2O	-11.23	-15.78	-4.55	CuF2:2H2O
Cumetal	-5.61	-14.37	-8.76	Cu
CuMoO4	-1.23	-14.31	-13.08	CuMoO4
CuOCuSO4	-12.57	-2.27	10.30	CuOCuSO4
Cupricferrite	8.47	14.46	5.99	CuFe2O4
Cuprite	-2.07	-3.48	-1.41	Cu2O
Cuprousferrite	10.31	1.39	-8.92	CuFeO2
CuSe	-5.29	-38.39	-33.10	CuSe
CuSe2	-26.36	-59.72	-33.37	CuSe2
CuSeO3:2H2O	-7.99	-7.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.09	-18.53	-2.44	CuSeO4:5H2O
CuSO4	-13.41	-10.47	2.94	CuSO4
Diaspore	1.52	8.39	6.87	AlOOH
Djurleite	-54.82	-88.74	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.54	-17.08	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.01	-17.08	-17.09	CaMg (CO3) 2
Epsomite	-3.99	-6.11	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.03	3.53	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	2.98	-0.06	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-11.94	-15.66	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.97	-9.42	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-20.14	-40.77	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-46.00	-49.74	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.43	9.79	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.98	-12.58	0.40	FeAsO4:2H2O
FeCr2O4	-6.20	1.00	7.20	FeCr2O4
FeMoO4	-8.88	-18.97	-10.09	FeMoO4
Ferrihydrite	-0.06	3.13	3.19	Fe (OH) 3
Ferroselite	-45.79	-64.39	-18.60	FeSe2
FeS (ppt)	-79.55	-82.50	-2.95	FeS
FeSe	-32.06	-43.06	-11.00	FeSe
Fix_pe	-4.71	-4.71	0.00	e-
Fluorite	-0.95	-11.45	-10.50	CaF2

Galena	-66.37	-80.34	-13.97	PbS
Gibbsite	0.10	8.39	8.29	Al (OH) 3
Goethite	2.64	3.13	0.49	FeOOH
Goslarite	-7.07	-9.08	-2.01	ZnSO4:7H2O
Greenalite	-17.71	3.10	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.82	-79.18	-14.36	CdS
Greigite	-289.31	-334.34	-45.03	Fe3S4
Gummite	-6.12	1.55	7.67	UO3
Gypsum	-1.52	-6.13	-4.61	CaSO4:2H2O
H-Jarosite	-15.84	-27.94	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.63	-22.51	-12.88	H2MoO4
H2S (g)	-78.02	-86.03	-8.01	H2S
H2Se (g)	-41.63	-46.59	-4.96	H2Se
Halite	-6.73	-5.13	1.60	NaCl
Halloysite	-0.29	9.28	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.02	57.01	61.03	Mn3O4
Hematite	7.68	6.26	-1.42	Fe2O3
Hercynite	-2.58	20.32	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.84	-256.55	-73.71	Hg (CH3) 2
Hg (g)	-8.12	-15.99	-7.87	Hg
Hg (OH) 2	-8.83	-12.33	-3.50	Hg (OH) 2
Hg2 (g)	-17.03	-31.99	-14.96	Hg2
Hg2 (OH) 2	-11.99	-6.73	5.26	Hg2 (OH) 2
Hg2CO3	-11.76	-27.81	-16.05	Hg2CO3
Hg2CrO4	-28.79	-37.49	-8.70	Hg2CrO4
Hg2F2	-20.35	-30.71	-10.36	Hg2F2
Hg2S	-81.09	-92.76	-11.68	Hg2S
Hg2SeO3	-17.75	-22.41	-4.66	Hg2SeO3
Hg2SO4	-19.26	-25.39	-6.13	Hg2SO4
Hg3O2CO3	-28.38	-58.07	-29.68	Hg3O2CO3
HgCl (g)	-33.51	-14.01	19.50	HgCl
HgCl2	-12.36	-33.62	-21.26	HgCl2
HgF (g)	-48.03	-15.35	32.68	HgF
HgF2 (g)	-48.87	-36.31	12.57	HgF2
Hgmetal (l)	-2.54	-15.99	-13.45	Hg
HgSe	-3.22	-58.92	-55.69	HgSe
HgSeO3	-15.58	-28.01	-12.43	HgSeO3
HgSO4	-21.57	-30.99	-9.42	HgSO4
Huntite	-4.18	-34.14	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.32	-25.09	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.81	-21.57	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-19.06	-24.23	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-8.43	-23.23	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.85	-52.09	-17.24	K2Cr2O7
K2CrO4	-20.82	-21.33	-0.51	K2CrO4
K2MoO4	-16.34	-13.08	3.26	K2MoO4
K2SeO4	-16.57	-17.30	-0.73	K2SeO4
Kaolinite	1.85	9.28	7.43	Al2Si2O5 (OH) 4
Langite	-3.36	14.13	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.85	-7.28	-0.43	PbO:PbSO4
Laurionite	-5.58	-4.96	0.62	PbOHCl
Lepidocrocite	1.76	3.13	1.37	FeOOH
Lime	-20.17	12.53	32.70	CaO
Litharge	-7.00	5.69	12.69	PbO
Mackinawite	-78.90	-82.50	-3.60	FeS
Maghemite	-0.13	6.26	6.39	Fe2O3
Magnesianoferrite	1.95	18.81	16.86	Fe2MgO4
Magnesite	-1.07	-8.53	-7.46	MgCO3
Magnetite	6.39	9.79	3.40	Fe3O4
Malachite	0.62	-4.69	-5.31	Cu2 (OH) 2CO3
Manganite	-2.13	23.21	25.34	MnOOH
Massicot	-7.20	5.69	12.89	PbO
Matlockite	-7.97	-16.94	-8.97	PbClF
Melanothallite	-19.35	-13.09	6.26	CuCl2
Melanterite	-12.92	-15.13	-2.21	FeSO4:7H2O
Metacinnabar	-53.27	-98.36	-45.09	HgS
Mg (OH) 2 (active)	-6.24	12.55	18.79	Mg (OH) 2
Mg (VO3) 2	-17.93	-6.65	11.28	Mg (VO3) 2

Mg2Sb3	-274.21	-199.52	74.68	Mg2Sb3
Mg2V2O7	-20.46	5.90	26.36	Mg2V2O7
MgCr2O4	-6.18	10.02	16.20	MgCr2O4
MgCrO4	-23.59	-18.21	5.38	MgCrO4
MgF2	-3.30	-11.43	-8.13	MgF2
MgMoO4	-8.11	-9.96	-1.85	MgMoO4
MgSeO3:6H2O	-6.18	-3.13	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-12.98	-14.18	-1.20	MgSeO4:6H2O
Minium	-31.19	42.33	73.52	Pb3O4
Mirabilite	-6.51	-7.63	-1.11	Na2SO4:10H2O
Mn(VO3)2	-13.51	-8.61	4.90	Mn(VO3)2
Mn2(SO4)3	-54.56	-60.27	-5.71	Mn2(SO4)3
Mn2Sb	-148.46	-87.39	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.17	0.33	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.42	-10.71	2.72	MnCl2:4H2O
MnS (grn)	-75.62	-75.45	0.17	MnS
MnS (pnk)	-78.79	-75.45	3.34	MnS
MnSb	-95.15	-98.06	-2.91	MnSb
MnSe	-39.51	-36.01	3.50	MnSe
MnSeO3	-6.22	-5.09	1.13	MnSeO3
MnSeO3:2H2O	-6.08	-5.09	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.09	-16.14	-2.05	MnSeO4:5H2O
MnSO4	-10.67	-8.08	2.58	MnSO4
Monteponite	-8.25	6.85	15.10	CdO
Montroydite	-8.69	-12.33	-3.64	HgO
MoO3	-14.51	-22.51	-8.00	MoO3
Morenosite	-8.59	-10.74	-2.14	NiSO4:7H2O
MoS2	-149.57	-219.83	-70.26	MoS2
Na-Jarosite	-11.22	-22.42	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.58	-50.48	-9.90	Na2Cr2O7
Na2CrO4	-22.65	-19.72	2.93	Na2CrO4
Na2Mo2O7	-17.38	-33.97	-16.60	Na2Mo2O7
Na2MoO4	-12.96	-11.47	1.49	Na2MoO4
Na2MoO4:2H2O	-12.69	-11.47	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.94	-4.64	10.30	Na2SeO3:5H2O
Na2SeO4	-16.97	-15.69	1.28	Na2SeO4
Na3Sb	-173.82	-79.36	94.45	Na3Sb
Na3VO4	-29.72	6.96	36.68	Na3VO4
Na4V2O7	-34.52	2.88	37.40	Na4V2O7
Nantokite	-5.66	-12.39	-6.73	CuCl
NaSb	-88.31	-65.15	23.17	NaSb
Natron	-8.73	-10.04	-1.31	Na2CO3:10H2O
NaVO3	-7.94	-4.08	3.86	NaVO3
Nesquehonite	-3.86	-8.53	-4.67	MgCO3:3H2O
Ni(OH)2	-4.87	7.93	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.34	-7.64	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.96	13.04	32.00	Ni4(OH)6SO4
NiCO3	-6.29	-13.16	-6.87	NiCO3
NiMoO4	-3.44	-14.58	-11.14	NiMoO4
NiS (alpha)	-72.51	-78.11	-5.60	NiS
NiS (beta)	-67.01	-78.11	-11.10	NiS
NiS (gamma)	-65.31	-78.11	-12.80	NiS
NiSe	-20.96	-38.66	-17.70	NiSe
NiSeO3:2H2O	-10.57	-7.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.28	-18.80	-1.52	NiSeO4:6H2O
Nsutite	-7.01	10.49	17.50	MnO2
O2 (g)	-32.58	50.51	83.09	O2
Orpiment	-241.17	-302.23	-61.07	As2S3
Otavite	-2.23	-14.23	-12.00	CdCO3
Pb(BO2)2	-10.72	-4.20	6.52	Pb(BO2)2
Pb(OH)2	-2.46	5.69	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.82	-69.58	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.06	0.74	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.81	11.38	26.19	Pb2O(OH)2
Pb2O3	-24.40	36.64	61.04	Pb2O3
Pb2OCO3	-9.14	-9.70	-0.56	Pb2OCO3
Pb2V2O7	-5.92	-7.82	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.14	-14.34	5.80	Pb3(AsO4)2

Pb3(VO4)2	-8.27	-2.13	6.14	Pb3(VO4)2
Pb3O2CO3	-15.03	-4.01	11.02	Pb3O2CO3
Pb3O2SO4	-12.28	-1.59	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.00	4.10	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.78	4.10	21.88	Pb4O3SO4
PbCrO4	-12.47	-25.07	-12.60	PbCrO4
PbF2	-10.85	-18.29	-7.44	PbF2
Pbmetal	-23.81	-19.57	4.25	Pb
PbMoO4	-1.20	-16.82	-15.62	PbMoO4
PbO:0.3H2O	-7.29	5.69	12.98	PbO:0.33H2O
PbSeO4	-14.20	-21.04	-6.84	PbSeO4
Periclase	-9.03	12.55	21.58	MgO
Phosgenite	-11.18	-30.99	-19.81	PbCl2:PbCO3
Plattnerite	-18.65	30.95	49.60	PbO2
Portlandite	-10.27	12.53	22.80	Ca(OH)2
Pyrite	-124.77	-143.28	-18.51	FeS2
Pyrochroite	-4.61	10.58	15.19	Mn(OH)2
Pyrolusite	-5.54	35.84	41.38	MnO2
Quartz	0.25	-3.75	-4.00	SiO2
Realgar	-100.98	-120.73	-19.75	AsS
Retgersite	-8.70	-10.74	-2.04	NiSO4:6H2O
Rhodochrosite	0.08	-10.50	-10.58	MnCO3
Rutherfordine	-5.03	-19.53	-14.50	UO2CO3
Sb(OH)3	-13.04	-20.15	-7.11	Sb(OH)3
Sb2O4	-18.45	-15.05	3.40	Sb2O4
Sb2O5	-28.74	-38.41	-9.67	Sb2O5
Sb2Se3	-112.31	-180.07	-67.76	Sb2Se3
Sb4O6(cubic)	-62.34	-80.61	-18.26	Sb4O6
Sb4O6(orth)	-62.70	-80.61	-17.90	Sb4O6
SbCl3	-52.66	-52.09	0.57	SbCl3
SbF3	-45.89	-56.12	-10.23	SbF3
Sbmetal	-46.35	-58.04	-11.69	Sb
SbO2	-4.01	-31.83	-27.82	SbO2
Schoepite	-4.44	1.55	5.99	UO2(OH)2:H2O
Semetal(am)	-14.22	-21.33	-7.11	Se
Semetal(hex)	-13.62	-21.33	-7.71	Se
Senarmontite	-27.94	-40.30	-12.37	Sb2O3
SeO2	-15.80	-15.68	0.12	SeO2
SeO3	-47.77	-26.73	21.04	SeO3
Sepiolite	-1.91	13.85	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.93	13.85	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.31	-17.55	-10.24	FeCO3
SiO2(am-gel)	-1.04	-3.75	-2.71	SiO2
SiO2(am-ppt)	-1.01	-3.75	-2.74	SiO2
Smithsonite	-1.50	-11.50	-10.00	ZnCO3
Sphalerite	-65.00	-76.45	-11.45	ZnS
Spinel	-7.51	29.34	36.85	MgAl2O4
Stibnite	-247.94	-298.40	-50.46	Sb2S3
Sulfur	-58.63	-60.78	-2.14	S
Tenorite	0.55	8.20	7.64	CuO
Thenardite	-7.95	-7.63	0.32	Na2SO4
Thermonatrite	-10.68	-10.04	0.64	Na2CO3:H2O
Tyuyamunite	-7.64	-3.56	4.08	Ca(UO2)2(VO4)2
U3O8	-14.04	7.05	21.08	U3O8
U3Sb4	-579.54	-427.16	152.38	U3Sb4
U4O9	-29.68	-32.70	-3.02	U4O9
UF4	-32.91	-62.45	-29.54	UF4
UF4:2.5H2O	-29.73	-62.45	-32.72	UF4:2.5H2O
UO2(am)	-15.42	-14.49	0.93	UO2
UO2(NO3)2	-44.36	-32.21	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-37.07	-32.21	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-35.60	-32.21	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.26	-32.22	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.06	1.55	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.93	-25.18	-2.25	UO2SeO4:4H2O
UO3	-6.15	1.55	7.70	UO3
Uraninite	-9.82	-14.49	-4.67	UO2
USb2	-219.87	-190.29	29.58	USb2

V(OH)3	-19.85	-12.26	7.59	V(OH)3
V2O5	-17.84	-19.20	-1.36	V2O5
V3O5	-43.07	-41.23	1.84	V3O5
V4O7	-53.74	-46.56	7.19	V4O7
V6O13	-47.25	-108.11	-60.86	V6O13
Valentinite	-31.82	-40.30	-8.48	Sb2O3
VC12	-65.05	-46.18	18.87	VC12
VC13	-67.63	-44.20	23.43	VC13
VF4	-68.21	-53.28	14.93	VF4
Vmetal	-94.17	-50.14	44.03	V
VO	-39.64	-24.89	14.76	VO
VO(OH)2	-10.48	-5.32	5.15	VO(OH)2
VO2Cl	-23.09	-20.25	2.84	VO2Cl
VOC1	-34.06	-22.90	11.15	VOC1
VOC12	-39.38	-26.62	12.76	VOC12
VOSO4	-27.60	-23.99	3.61	VOSO4
Witherite	-4.85	-13.42	-8.57	BaCO3
Wurtzite	-67.50	-76.45	-8.95	ZnS
Zincite	-1.75	9.58	11.33	ZnO
Zincosite	-13.01	-9.08	3.93	ZnSO4
Zn(BO2)2	-8.60	-0.31	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-27.50	-24.18	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.62	9.58	12.20	Zn(OH)2
Zn(OH)2(am)	-2.89	9.58	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.17	9.58	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.95	9.58	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.15	9.58	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.00	0.50	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.67	8.52	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.32	-2.67	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.50	-8.58	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.74	19.66	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.88	26.62	38.50	Zn5(OH)8Cl2
ZnCl2	-18.76	-11.71	7.05	ZnCl2
ZnCO3:1H2O	-1.24	-11.50	-10.26	ZnCO3:1H2O
ZnF2	-13.86	-14.40	-0.53	ZnF2
Znmetal	-41.46	-15.67	25.79	Zn
ZnMoO4	-2.80	-12.92	-10.13	ZnMoO4
ZnO(active)	-1.61	9.58	11.19	ZnO
ZnS(am)	-67.40	-76.45	-9.05	ZnS
ZnSb	-84.73	-73.71	11.01	ZnSb
ZnSe	-22.61	-37.01	-14.40	ZnSe
ZnSeO4:6H2O	-15.63	-17.15	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.45	-9.08	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 93.

```

Title Stage 5 Pit wall interaction mix calculator
MIX 504
509 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000077
11 0.000628

```

```

12      0.000470
13      0.001104
14      0
15      0
Save solution 510
end

```

```

-----
TITLE
-----

```

Stage 5 Pit wall interaction mix calculator

```

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Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

Using mix 504.

Mixture 504.

```

      0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
      0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
      0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
      0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
      0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
      0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
      0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
      7.700e-05 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
      6.280e-04 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
      4.700e-04 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
      1.104e-03 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
      0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
      0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
      1.000e+00 Solution 509     Solution after simulation 92.

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-----Solution composition-----

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Elements	Molality	Moles
Ag	5.435e-09	5.449e-09
Al	4.701e-07	4.713e-07
As	1.524e-09	1.528e-09
B	1.195e-05	1.198e-05
Ba	1.099e-08	1.102e-08
C	1.705e-03	1.709e-03
Ca	9.746e-04	9.770e-04
Cd	2.377e-09	2.383e-09
Cl	2.079e-03	2.084e-03
Co	1.834e-08	1.838e-08
Cr	9.804e-10	9.829e-10
Cu	9.171e-07	9.194e-07
F	1.007e-04	1.009e-04
Fe	9.265e-10	9.288e-10

Hg	3.747e-10	3.757e-10
K	7.090e-04	7.108e-04
Mg	9.806e-04	9.831e-04
Mn	1.122e-05	1.125e-05
Mo	3.315e-07	3.323e-07
N	2.700e-06	2.706e-06
Na	4.529e-03	4.541e-03
Ni	2.856e-08	2.863e-08
Pb	1.692e-09	1.697e-09
S	2.653e-03	2.660e-03
Sb	5.010e-09	5.023e-09
Se	2.931e-08	2.938e-08
Si	1.792e-04	1.797e-04
U	5.227e-08	5.240e-08
V	1.574e-09	1.577e-09
Zn	1.347e-06	1.351e-06

-----Description of solution-----

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                                pH = 7.913      Charge balance
                                pe = 4.716      Adjusted to redox
equilibrium
      Activity of water = 1.000
      Ionic strength (mol/kgw) = 1.240e-02
      Mass of water (kg) = 1.003e+00
      Total alkalinity (eq/kg) = 1.688e-03
      Total CO2 (mol/kg) = 1.705e-03
      Temperature (°C) = 25.00
      Pressure (atm) = 1.00
      Electrical balance (eq) = 3.203e-07
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
      Iterations = 4
      Total H = 1.112952e+02
      Total O = 5.566289e+01

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-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.254e-07	8.241e-07	-6.034	-6.084	-0.050	(0)
H+	1.368e-08	1.222e-08	-7.864	-7.913	-0.049	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	5.435e-09					
AgCl	3.650e-09	3.650e-09	-8.438	-8.438	0.000	(0)
Ag+	1.078e-09	9.629e-10	-8.967	-9.016	-0.049	(0)
AgCl2-	6.726e-10	5.901e-10	-9.172	-9.229	-0.057	(0)
AgSO4-	3.204e-11	2.811e-11	-10.494	-10.551	-0.057	(0)
AgCl3-2	1.647e-12	9.764e-13	-11.783	-12.010	-0.227	(0)
AgNO2	4.447e-13	4.447e-13	-12.352	-12.352	0.000	(0)
AgF	2.038e-13	2.038e-13	-12.691	-12.691	0.000	(0)
AgOH	7.935e-14	7.935e-14	-13.100	-13.100	0.000	(0)
AgNH3+	1.854e-14	1.627e-14	-13.732	-13.789	-0.057	(0)
Ag2Se	1.299e-14	1.299e-14	-13.886	-13.886	0.000	(0)
AgCl4-3	1.201e-14	3.701e-15	-13.921	-14.432	-0.511	(0)
AgH2BO3	8.230e-15	8.230e-15	-14.085	-14.085	0.000	(0)
AgSeO3-	3.984e-15	3.496e-15	-14.400	-14.456	-0.057	(0)
Ag (OH) 2-	7.283e-18	6.390e-18	-17.138	-17.194	-0.057	(0)
Ag (NO2) 2-	1.735e-18	1.523e-18	-17.761	-17.817	-0.057	(0)
Ag (NH3) 2+	1.247e-18	1.094e-18	-17.904	-17.961	-0.057	(0)
AgNO3	8.260e-19	8.260e-19	-18.083	-18.083	0.000	(0)
Ag (SeO3) 2-3	5.737e-22	1.768e-22	-21.241	-21.752	-0.511	(0)
Ag2MoO4	7.394e-26	7.394e-26	-25.131	-25.131	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.325	-73.325	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.233	-83.142	-0.909	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.772	-146.919	-0.147	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.292	-147.348	-0.057	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.163	-148.446	-0.283	(0)

AgS4S5-3	0.000e+00	0.000e+00	-148.485	-148.757	-0.272	(0)
Al	4.701e-07					
Al (OH) 4-	4.658e-07	4.163e-07	-6.332	-6.381	-0.049	(0)
Al (OH) 3	4.013e-09	4.013e-09	-8.397	-8.397	0.000	(0)
Al (OH) 2+	2.722e-10	2.441e-10	-9.565	-9.613	-0.047	(0)
AlF2+	1.427e-11	1.279e-11	-10.846	-10.893	-0.047	(0)
AlF3	1.357e-11	1.357e-11	-10.867	-10.867	0.000	(0)
AlF4-	6.412e-13	5.731e-13	-12.193	-12.242	-0.049	(0)
AlF+2	5.901e-13	3.813e-13	-12.229	-12.419	-0.190	(0)
AlOH+2	5.770e-13	3.728e-13	-12.239	-12.428	-0.190	(0)
AlSO4+	5.749e-15	5.138e-15	-14.240	-14.289	-0.049	(0)
Al+3	1.254e-15	4.524e-16	-14.902	-15.344	-0.443	(0)
Al (SO4) 2-	9.013e-17	8.055e-17	-16.045	-16.094	-0.049	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.377	-47.888	-0.511	(0)
As (3)	9.067e-23					
H3AsO3	8.653e-23	8.653e-23	-22.063	-22.063	0.000	(0)
H2AsO3-	4.140e-24	3.633e-24	-23.383	-23.440	-0.057	(0)
HAsO3-2	4.576e-28	2.712e-28	-27.340	-27.567	-0.227	(0)
H4AsO3+	5.969e-31	5.237e-31	-30.224	-30.281	-0.057	(0)
AsO3-3	2.776e-33	8.558e-34	-32.557	-33.068	-0.511	(0)
As (5)	1.524e-09					
HAsO4-2	1.417e-09	8.398e-10	-8.849	-9.076	-0.227	(0)
H2AsO4-	1.066e-10	9.356e-11	-9.972	-10.029	-0.057	(0)
AsO4-3	7.053e-13	2.174e-13	-12.152	-12.663	-0.511	(0)
H3AsO4	1.981e-16	1.986e-16	-15.703	-15.702	0.001	(0)
B	1.195e-05					
H3BO3	1.131e-05	1.134e-05	-4.946	-4.945	0.001	(0)
H2BO3-	6.079e-07	5.393e-07	-6.216	-6.268	-0.052	(0)
CaH2BO3+	1.750e-08	1.552e-08	-7.757	-7.809	-0.052	(0)
MgH2BO3+	1.104e-08	9.796e-09	-7.957	-8.009	-0.052	(0)
NaH2BO3	3.427e-09	3.427e-09	-8.465	-8.465	0.000	(0)
BF (OH) 3-	4.300e-10	3.814e-10	-9.367	-9.419	-0.052	(0)
H5 (BO3) 2-	5.870e-12	5.207e-12	-11.231	-11.283	-0.052	(0)
BaH2BO3+	1.297e-13	1.151e-13	-12.887	-12.939	-0.052	(0)
BF2 (OH) 2-	4.733e-14	4.199e-14	-13.325	-13.377	-0.052	(0)
AgH2BO3	8.230e-15	8.230e-15	-14.085	-14.085	0.000	(0)
H8 (BO3) 3-	6.658e-15	5.907e-15	-14.177	-14.229	-0.052	(0)
BF3OH-	1.896e-20	1.682e-20	-19.722	-19.774	-0.052	(0)
BF4-	9.607e-26	8.522e-26	-25.017	-25.069	-0.052	(0)
Ba	1.099e-08					
Ba+2	1.086e-08	6.904e-09	-7.964	-8.161	-0.197	(0)
BaHCO3+	1.066e-10	9.578e-11	-9.972	-10.019	-0.047	(0)
BaCO3	1.974e-11	1.974e-11	-10.705	-10.705	0.000	(0)
BaH2BO3+	1.297e-13	1.151e-13	-12.887	-12.939	-0.052	(0)
BaOH+	2.774e-14	2.484e-14	-13.557	-13.605	-0.048	(0)
BaNH3+2	6.082e-17	3.605e-17	-16.216	-16.443	-0.227	(0)
BaNO3+	4.259e-17	3.737e-17	-16.371	-16.428	-0.057	(0)
C (4)	1.705e-03					
HCO3-	1.620e-03	1.453e-03	-2.790	-2.838	-0.047	(0)
H2CO3	3.991e-05	3.991e-05	-4.399	-4.399	0.000	(0)
CaHCO3+	1.506e-05	1.353e-05	-4.822	-4.869	-0.047	(0)
CO3-2	8.771e-06	5.575e-06	-5.057	-5.254	-0.197	(0)
MgHCO3+	8.728e-06	7.787e-06	-5.059	-5.109	-0.050	(0)
CaCO3	4.419e-06	4.419e-06	-5.355	-5.355	0.000	(0)
NaHCO3	3.275e-06	3.275e-06	-5.485	-5.485	0.000	(0)
MgCO3	2.429e-06	2.429e-06	-5.615	-5.615	0.000	(0)
CuCO3	7.702e-07	7.702e-07	-6.113	-6.113	0.000	(0)
NaCO3-	4.642e-07	4.162e-07	-6.333	-6.381	-0.047	(0)
MnHCO3+	1.826e-07	1.635e-07	-6.738	-6.786	-0.048	(0)
ZnCO3	1.808e-07	1.808e-07	-6.743	-6.743	0.000	(0)
UO2 (CO3) 3-4	2.988e-08	3.687e-09	-7.525	-8.433	-0.909	(0)
ZnHCO3+	2.951e-08	2.589e-08	-7.530	-7.587	-0.057	(0)
UO2 (CO3) 2-2	2.227e-08	1.320e-08	-7.652	-7.879	-0.227	(0)
Cu (CO3) 2-2	1.950e-08	1.156e-08	-7.710	-7.937	-0.227	(0)
NiCO3	2.585e-09	2.585e-09	-8.588	-8.588	0.000	(0)
NiHCO3+	2.537e-09	2.226e-09	-8.596	-8.652	-0.057	(0)
CuHCO3+	2.451e-09	2.150e-09	-8.611	-8.667	-0.057	(0)
PbCO3	1.220e-09	1.220e-09	-8.913	-8.913	0.000	(0)

	CoHCO3+	1.058e-09	9.282e-10	-8.976	-9.032	-0.057	(0)
	CoCO3	7.741e-10	7.741e-10	-9.111	-9.111	0.000	(0)
	CdCO3	1.326e-10	1.326e-10	-9.877	-9.877	0.000	(0)
	UO2CO3	1.187e-10	1.187e-10	-9.926	-9.926	0.000	(0)
	BaHCO3+	1.066e-10	9.578e-11	-9.972	-10.019	-0.047	(0)
	PbHCO3+	8.959e-11	7.861e-11	-10.048	-10.105	-0.057	(0)
	Pb (CO3) 2-2	3.311e-11	1.962e-11	-10.480	-10.707	-0.227	(0)
	BaCO3	1.974e-11	1.974e-11	-10.705	-10.705	0.000	(0)
	CdHCO3+	3.933e-12	3.451e-12	-11.405	-11.462	-0.057	(0)
	Cd (CO3) 2-2	9.245e-13	5.479e-13	-12.034	-12.261	-0.227	(0)
	FeHCO3+	1.100e-14	9.882e-15	-13.959	-14.005	-0.047	(0)
	HgCO3	7.322e-16	7.322e-16	-15.135	-15.135	0.000	(0)
	Hg (CO3) 2-2	2.178e-17	1.291e-17	-16.662	-16.889	-0.227	(0)
	HgHCO3+	1.898e-19	1.666e-19	-18.722	-18.778	-0.057	(0)
Ca		9.746e-04					
	Ca+2	7.869e-04	5.002e-04	-3.104	-3.301	-0.197	(0)
	CaSO4	1.676e-04	1.676e-04	-3.776	-3.776	0.000	(0)
	CaHCO3+	1.506e-05	1.353e-05	-4.822	-4.869	-0.047	(0)
	CaCO3	4.419e-06	4.419e-06	-5.355	-5.355	0.000	(0)
	CaF+	5.138e-07	4.600e-07	-6.289	-6.337	-0.048	(0)
	CaH2BO3+	1.750e-08	1.552e-08	-7.757	-7.809	-0.052	(0)
	CaOH+	9.155e-09	8.224e-09	-8.038	-8.085	-0.047	(0)
	CaNH3+2	8.791e-12	5.210e-12	-11.056	-11.283	-0.227	(0)
	CaNO3+	1.947e-12	1.708e-12	-11.711	-11.768	-0.057	(0)
	Ca (NH3) 2+2	2.896e-20	1.716e-20	-19.538	-19.765	-0.227	(0)
Cd		2.377e-09					
	Cd+2	1.642e-09	1.044e-09	-8.785	-8.981	-0.197	(0)
	CdSO4	3.579e-10	3.579e-10	-9.446	-9.446	0.000	(0)
	CdCl+	2.109e-10	1.850e-10	-9.676	-9.733	-0.057	(0)
	CdCO3	1.326e-10	1.326e-10	-9.877	-9.877	0.000	(0)
	Cd (SO4) 2-2	1.192e-11	7.064e-12	-10.924	-11.151	-0.227	(0)
	CdOH+	7.785e-12	6.831e-12	-11.109	-11.166	-0.057	(0)
	CdOHC1	6.254e-12	6.254e-12	-11.204	-11.204	0.000	(0)
	CdHCO3+	3.933e-12	3.451e-12	-11.405	-11.462	-0.057	(0)
	CdF+	1.588e-12	1.394e-12	-11.799	-11.856	-0.057	(0)
	CdCl2	1.432e-12	1.432e-12	-11.844	-11.844	0.000	(0)
	Cd (CO3) 2-2	9.245e-13	5.479e-13	-12.034	-12.261	-0.227	(0)
	Cd (OH) 2	3.552e-14	3.552e-14	-13.450	-13.450	0.000	(0)
	CdCl3-	1.911e-15	1.677e-15	-14.719	-14.775	-0.057	(0)
	CdF2	2.343e-16	2.343e-16	-15.630	-15.630	0.000	(0)
	CdNO3+	4.061e-18	3.564e-18	-17.391	-17.448	-0.057	(0)
	CdSeO4	2.462e-18	2.462e-18	-17.609	-17.609	0.000	(0)
	Cd (OH) 3-	2.038e-18	1.788e-18	-17.691	-17.748	-0.057	(0)
	Cd2OH+3	1.159e-19	3.573e-20	-18.936	-19.447	-0.511	(0)
	Cd (SeO3) 2-2	4.630e-20	2.744e-20	-19.334	-19.562	-0.227	(0)
	Cd (OH) 4-2	4.069e-25	2.412e-25	-24.390	-24.618	-0.227	(0)
	Cd (NO3) 2	1.929e-27	1.929e-27	-26.715	-26.715	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.040	-79.097	-0.057	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.016	-150.016	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.182	-226.239	-0.057	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.939	-302.167	-0.227	(0)
Cl		2.079e-03					
	Cl-	2.079e-03	1.856e-03	-2.682	-2.731	-0.049	(0)
	MnCl+	1.473e-08	1.318e-08	-7.832	-7.880	-0.048	(0)
	AgCl	3.650e-09	3.650e-09	-8.438	-8.438	0.000	(0)
	ZnCl+	2.946e-09	2.628e-09	-8.531	-8.580	-0.050	(0)
	ZnOHC1	2.835e-09	2.835e-09	-8.547	-8.547	0.000	(0)
	AgCl2-	6.726e-10	5.901e-10	-9.172	-9.229	-0.057	(0)
	CuCl	5.160e-10	5.160e-10	-9.287	-9.287	0.000	(0)
	CuCl2-	2.243e-10	2.001e-10	-9.649	-9.699	-0.050	(0)
	CdCl+	2.109e-10	1.850e-10	-9.676	-9.733	-0.057	(0)
	CuCl+	7.738e-11	6.904e-11	-10.111	-10.161	-0.050	(0)
	NiCl+	6.729e-11	5.904e-11	-10.172	-10.229	-0.057	(0)
	CoCl+	6.013e-11	5.276e-11	-10.221	-10.278	-0.057	(0)
	MnCl2	3.457e-11	3.457e-11	-10.461	-10.461	0.000	(0)
	ZnCl2	7.733e-12	7.733e-12	-11.112	-11.112	0.000	(0)
	CdOHC1	6.254e-12	6.254e-12	-11.204	-11.204	0.000	(0)
	PbCl+	5.467e-12	4.797e-12	-11.262	-11.319	-0.057	(0)

AgCl3-2	1.647e-12	9.764e-13	-11.783	-12.010	-0.227	(0)
CdCl2	1.432e-12	1.432e-12	-11.844	-11.844	0.000	(0)
HgClOH	2.965e-13	2.965e-13	-12.528	-12.528	0.000	(0)
CuCl3-2	1.236e-13	7.944e-14	-12.908	-13.100	-0.192	(0)
CuCl2	4.444e-14	4.444e-14	-13.352	-13.352	0.000	(0)
PbCl2	3.978e-14	3.978e-14	-13.400	-13.400	0.000	(0)
HgCl2	3.783e-14	3.783e-14	-13.422	-13.422	0.000	(0)
MnCl3-	1.974e-14	1.768e-14	-13.705	-13.753	-0.048	(0)
ZnCl3-	1.278e-14	1.140e-14	-13.893	-13.943	-0.050	(0)
AgCl4-3	1.201e-14	3.701e-15	-13.921	-14.432	-0.511	(0)
CdCl3-	1.911e-15	1.677e-15	-14.719	-14.775	-0.057	(0)
HgCl3-	8.003e-16	7.022e-16	-15.097	-15.154	-0.057	(0)
NiCl2	5.519e-16	5.519e-16	-15.258	-15.258	0.000	(0)
PbCl3-	3.351e-17	2.940e-17	-16.475	-16.532	-0.057	(0)
UO2Cl+	1.835e-17	1.610e-17	-16.736	-16.793	-0.057	(0)
ZnCl4-2	1.647e-17	1.059e-17	-16.783	-16.975	-0.192	(0)
HgCl4-2	8.756e-18	5.190e-18	-17.058	-17.285	-0.227	(0)
HgCl+	4.633e-18	4.065e-18	-17.334	-17.391	-0.057	(0)
CrCl+2	1.471e-18	8.717e-19	-17.832	-18.060	-0.227	(0)
CuCl3-	8.629e-19	7.699e-19	-18.064	-18.114	-0.050	(0)
PbCl4-2	4.209e-20	2.495e-20	-19.376	-19.603	-0.227	(0)
CrOHCl2	2.535e-20	2.535e-20	-19.596	-19.596	0.000	(0)
FeCl+2	2.279e-22	1.465e-22	-21.642	-21.834	-0.192	(0)
CrCl2+	1.750e-22	1.535e-22	-21.757	-21.814	-0.057	(0)
CuCl4-2	1.115e-23	7.163e-24	-22.953	-23.145	-0.192	(0)
VOCl+	4.293e-24	3.766e-24	-23.367	-23.424	-0.057	(0)
FeCl2+	1.357e-24	1.215e-24	-23.868	-23.916	-0.048	(0)
CrO3Cl-	7.521e-27	6.599e-27	-26.124	-26.180	-0.057	(0)
FeCl3	2.255e-28	2.255e-28	-27.647	-27.647	0.000	(0)
CoCl+2	1.085e-36	6.430e-37	-35.965	-36.192	-0.227	(0)
UCl+3	0.000e+00	0.000e+00	-46.661	-47.172	-0.511	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.423	-50.650	-0.227	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.336	-52.563	-0.227	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.221	-65.448	-0.227	(0)
Co (2)	1.834e-08					
Co+2	1.386e-08	8.215e-09	-7.858	-8.085	-0.227	(0)
CoSO4	2.398e-09	2.398e-09	-8.620	-8.620	0.000	(0)
CoHCO3+	1.058e-09	9.282e-10	-8.976	-9.032	-0.057	(0)
CoCO3	7.741e-10	7.741e-10	-9.111	-9.111	0.000	(0)
CoOH+	1.539e-10	1.351e-10	-9.813	-9.869	-0.057	(0)
CoCl+	6.013e-11	5.276e-11	-10.221	-10.278	-0.057	(0)
CoF+	2.495e-11	2.189e-11	-10.603	-10.660	-0.057	(0)
Co (OH) 2	8.842e-12	8.842e-12	-11.053	-11.053	0.000	(0)
CoNO2+	1.458e-13	1.280e-13	-12.836	-12.893	-0.057	(0)
Co (NH3) +2	1.379e-14	8.172e-15	-13.860	-14.088	-0.227	(0)
Co (OH) 3-	1.657e-16	1.454e-16	-15.781	-15.838	-0.057	(0)
CoSeO4	5.217e-17	5.217e-17	-16.283	-16.283	0.000	(0)
CoOOH-	4.158e-17	3.648e-17	-16.381	-16.438	-0.057	(0)
CoNO3+	1.602e-17	1.406e-17	-16.795	-16.852	-0.057	(0)
Co2OH+3	1.804e-19	5.561e-20	-18.744	-19.255	-0.511	(0)
Co (NH3) 2+2	4.867e-21	2.885e-21	-20.313	-20.540	-0.227	(0)
Co (OH) 4-2	3.204e-23	1.899e-23	-22.494	-22.722	-0.227	(0)
Co (NO3) 2	3.089e-26	3.089e-26	-25.510	-25.510	0.000	(0)
Co (NH3) 3+2	5.070e-28	3.005e-28	-27.295	-27.522	-0.227	(0)
Co4 (OH) 4+4	5.381e-31	6.641e-32	-30.269	-31.178	-0.909	(0)
Co (NH3) 4+2	2.202e-35	1.305e-35	-34.657	-34.884	-0.227	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.519	-42.747	-0.227	(0)
Co (3)	1.203e-29					
CoOH+2	1.203e-29	7.128e-30	-28.920	-29.147	-0.227	(0)
Co+3	4.719e-36	1.702e-36	-35.326	-35.769	-0.443	(0)
CoCl+2	1.085e-36	6.430e-37	-35.965	-36.192	-0.227	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.423	-50.650	-0.227	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.569	-60.626	-0.057	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.373	-64.600	-0.227	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.221	-65.448	-0.227	(0)
Cr (2)	2.809e-27					
Cr+2	2.809e-27	1.665e-27	-26.551	-26.779	-0.227	(0)
Cr (3)	9.804e-10					

Cr (OH) 2+	7.475e-10	6.558e-10	-9.126	-9.183	-0.057	(0)
Cr (OH) 3	2.030e-10	2.030e-10	-9.692	-9.692	0.000	(0)
Cr (OH) +2	1.104e-11	6.541e-12	-10.957	-11.184	-0.227	(0)
CrO2-	8.998e-12	7.895e-12	-11.046	-11.103	-0.057	(0)
Cr (OH) 4-	7.592e-12	6.661e-12	-11.120	-11.176	-0.057	(0)
CrOHSO4	2.271e-12	2.271e-12	-11.644	-11.644	0.000	(0)
CrF+2	8.175e-15	4.846e-15	-14.087	-14.315	-0.227	(0)
CrSO4+	1.413e-15	1.239e-15	-14.850	-14.907	-0.057	(0)
Cr+3	1.177e-15	3.628e-16	-14.929	-15.440	-0.511	(0)
CrCl+2	1.471e-18	8.717e-19	-17.832	-18.060	-0.227	(0)
CrOHC12	2.535e-20	2.535e-20	-19.596	-19.596	0.000	(0)
Cr2 (OH) 2SO4+2	2.265e-21	1.343e-21	-20.645	-20.872	-0.227	(0)
CrCl2+	1.750e-22	1.535e-22	-21.757	-21.814	-0.057	(0)
Cr2 (OH) 2 (SO4) 2	1.167e-22	1.167e-22	-21.933	-21.933	0.000	(0)
CrNO3+2	2.889e-26	1.713e-26	-25.539	-25.766	-0.227	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.336	-41.563	-0.227	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.423	-50.934	-0.511	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.336	-52.563	-0.227	(0)
Cr (6)	1.923e-15					
CrO4-2	1.841e-15	1.170e-15	-14.735	-14.932	-0.197	(0)
HCrO4-	5.272e-17	4.626e-17	-16.278	-16.335	-0.057	(0)
NaCrO4-	2.657e-17	2.331e-17	-16.576	-16.632	-0.057	(0)
KCrO4-	3.105e-18	2.724e-18	-17.508	-17.565	-0.057	(0)
H2CrO4	4.581e-25	4.581e-25	-24.339	-24.339	0.000	(0)
CrO3SO4-2	4.250e-25	2.519e-25	-24.372	-24.599	-0.227	(0)
CrO3Cl-	7.521e-27	6.599e-27	-26.124	-26.180	-0.057	(0)
Cr2O7-2	1.252e-31	7.421e-32	-30.902	-31.130	-0.227	(0)
Cu (1)	9.921e-10					
CuCl	5.160e-10	5.160e-10	-9.287	-9.287	0.000	(0)
Cu+	2.516e-10	2.208e-10	-9.599	-9.656	-0.057	(0)
CuCl2-	2.243e-10	2.001e-10	-9.649	-9.699	-0.050	(0)
CuCl3-2	1.236e-13	7.944e-14	-12.908	-13.100	-0.192	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.409	-146.686	-0.278	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.149	-147.416	-0.267	(0)
Cu (2)	9.161e-07					
CuCO3	7.702e-07	7.702e-07	-6.113	-6.113	0.000	(0)
CuOH+	6.853e-08	6.114e-08	-7.164	-7.214	-0.050	(0)
Cu+2	3.692e-08	2.346e-08	-7.433	-7.630	-0.197	(0)
Cu (CO3) 2-2	1.950e-08	1.156e-08	-7.710	-7.937	-0.227	(0)
Cu (OH) 2	1.005e-08	1.005e-08	-7.998	-7.998	0.000	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
CuHCO3+	2.451e-09	2.150e-09	-8.611	-8.667	-0.057	(0)
Cu2 (OH) 2+2	1.584e-10	9.391e-11	-9.800	-10.027	-0.227	(0)
CuF+	1.422e-10	1.248e-10	-9.847	-9.904	-0.057	(0)
CuCl+	7.738e-11	6.904e-11	-10.111	-10.161	-0.050	(0)
Cu (OH) 3-	1.937e-11	1.699e-11	-10.713	-10.770	-0.057	(0)
CuNO2+	6.190e-12	5.431e-12	-11.208	-11.265	-0.057	(0)
CuNH3+2	3.352e-12	1.987e-12	-11.475	-11.702	-0.227	(0)
CuCl2	4.444e-14	4.444e-14	-13.352	-13.352	0.000	(0)
Cu (OH) 4-2	1.860e-16	1.102e-16	-15.731	-15.958	-0.227	(0)
Cu (NO2) 2	1.229e-16	1.229e-16	-15.911	-15.911	0.000	(0)
CuNO3+	9.132e-17	8.013e-17	-16.039	-16.096	-0.057	(0)
CuCl3-	8.629e-19	7.699e-19	-18.064	-18.114	-0.050	(0)
CuCl4-2	1.115e-23	7.163e-24	-22.953	-23.145	-0.192	(0)
Cu (NO3) 2	1.089e-26	1.089e-26	-25.963	-25.963	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.044	-216.100	-0.057	(0)
F	1.007e-04					
F-	9.438e-05	8.427e-05	-4.025	-4.074	-0.049	(0)
MgF+	5.542e-06	4.953e-06	-5.256	-5.305	-0.049	(0)
CaF+	5.138e-07	4.600e-07	-6.289	-6.337	-0.048	(0)
NaF	2.132e-07	2.132e-07	-6.671	-6.671	0.000	(0)
MnF+	2.114e-08	1.893e-08	-7.675	-7.723	-0.048	(0)
HF	1.523e-09	1.523e-09	-8.817	-8.817	0.000	(0)
ZnF+	1.080e-09	9.477e-10	-8.967	-9.023	-0.057	(0)
BF (OH) 3-	4.300e-10	3.814e-10	-9.367	-9.419	-0.052	(0)
CuF+	1.422e-10	1.248e-10	-9.847	-9.904	-0.057	(0)
NiF+	2.999e-11	2.631e-11	-10.523	-10.580	-0.057	(0)
CoF+	2.495e-11	2.189e-11	-10.603	-10.660	-0.057	(0)

AlF2+	1.427e-11	1.279e-11	-10.846	-10.893	-0.047	(0)
AlF3	1.357e-11	1.357e-11	-10.867	-10.867	0.000	(0)
CdF+	1.588e-12	1.394e-12	-11.799	-11.856	-0.057	(0)
AlF4-	6.412e-13	5.731e-13	-12.193	-12.242	-0.049	(0)
AlF+2	5.901e-13	3.813e-13	-12.229	-12.419	-0.190	(0)
HF2-	5.478e-13	4.878e-13	-12.261	-12.312	-0.050	(0)
PbF+	4.929e-13	4.325e-13	-12.307	-12.364	-0.057	(0)
AgF	2.038e-13	2.038e-13	-12.691	-12.691	0.000	(0)
UO2F+	7.088e-14	6.219e-14	-13.149	-13.206	-0.057	(0)
BF2 (OH) 2-	4.733e-14	4.199e-14	-13.325	-13.377	-0.052	(0)
UO2F2	1.512e-14	1.512e-14	-13.821	-13.821	0.000	(0)
CrF+2	8.175e-15	4.846e-15	-14.087	-14.315	-0.227	(0)
PbF2	7.172e-16	7.172e-16	-15.144	-15.144	0.000	(0)
UO2F3-	3.647e-16	3.200e-16	-15.438	-15.495	-0.057	(0)
CdF2	2.343e-16	2.343e-16	-15.630	-15.630	0.000	(0)
H2F2	6.212e-18	6.212e-18	-17.207	-17.207	0.000	(0)
FeF2+	6.081e-19	5.444e-19	-18.216	-18.264	-0.048	(0)
VO2F	4.660e-19	4.660e-19	-18.332	-18.332	0.000	(0)
FeF+2	3.757e-19	2.414e-19	-18.425	-18.617	-0.192	(0)
UO2F4-2	3.614e-19	2.142e-19	-18.442	-18.669	-0.227	(0)
PbF3-	1.307e-19	1.146e-19	-18.884	-18.941	-0.057	(0)
FeF3	6.473e-20	6.473e-20	-19.189	-19.189	0.000	(0)
BF3OH-	1.896e-20	1.682e-20	-19.722	-19.774	-0.052	(0)
VO2F2-	1.625e-20	1.426e-20	-19.789	-19.846	-0.057	(0)
VOF+	4.166e-22	3.655e-22	-21.380	-21.437	-0.057	(0)
VO2F3-2	2.529e-23	1.499e-23	-22.597	-22.824	-0.227	(0)
VOF2	1.155e-23	1.155e-23	-22.937	-22.937	0.000	(0)
PbF4-2	7.801e-24	4.624e-24	-23.108	-23.335	-0.227	(0)
HgF+	3.907e-25	3.428e-25	-24.408	-24.465	-0.057	(0)
BF4-	9.607e-26	8.522e-26	-25.017	-25.069	-0.052	(0)
VOF3-	3.936e-26	3.454e-26	-25.405	-25.462	-0.057	(0)
Sb (OH) 2F	1.135e-26	1.135e-26	-25.945	-25.945	0.000	(0)
SbOF	1.116e-26	1.116e-26	-25.952	-25.952	0.000	(0)
VO2F4-3	2.016e-27	6.214e-28	-26.695	-27.207	-0.511	(0)
VOF4-2	1.982e-29	1.175e-29	-28.703	-28.930	-0.227	(0)
SiF6-2	3.335e-30	2.143e-30	-29.477	-29.669	-0.192	(0)
UF3+	1.963e-37	1.723e-37	-36.707	-36.764	-0.057	(0)
UF2+2	2.176e-38	1.290e-38	-37.662	-37.889	-0.227	(0)
UF4	1.592e-39	1.592e-39	-38.798	-38.798	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.404	-40.915	-0.511	(0)
UF5-	0.000e+00	0.000e+00	-41.218	-41.274	-0.057	(0)
UF6-2	0.000e+00	0.000e+00	-42.642	-42.869	-0.227	(0)
Fe (2)	1.137e-12					
Fe+2	9.117e-13	5.404e-13	-12.040	-12.267	-0.227	(0)
FeSO4	1.941e-13	1.941e-13	-12.712	-12.712	0.000	(0)
FeOH+	1.980e-14	1.773e-14	-13.703	-13.751	-0.048	(0)
FeHCO3+	1.100e-14	9.882e-15	-13.959	-14.005	-0.047	(0)
Fe (OH) 2	1.160e-17	1.160e-17	-16.935	-16.935	0.000	(0)
Fe (OH) 3-	3.377e-18	3.024e-18	-17.471	-17.519	-0.048	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.564	-159.564	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.593	-235.650	-0.057	(0)
Fe (3)	9.253e-10					
Fe (OH) 2+	4.971e-10	4.457e-10	-9.304	-9.351	-0.047	(0)
Fe (OH) 3	3.945e-10	3.945e-10	-9.404	-9.404	0.000	(0)
Fe (OH) 4-	3.376e-11	3.027e-11	-10.472	-10.519	-0.047	(0)
FeOH+2	2.163e-15	1.390e-15	-14.665	-14.857	-0.192	(0)
FeF2+	6.081e-19	5.444e-19	-18.216	-18.264	-0.048	(0)
FeF+2	3.757e-19	2.414e-19	-18.425	-18.617	-0.192	(0)
FeF3	6.473e-20	6.473e-20	-19.189	-19.189	0.000	(0)
FeSO4+	4.790e-20	4.289e-20	-19.320	-19.368	-0.048	(0)
Fe+3	7.243e-21	2.613e-21	-20.140	-20.583	-0.443	(0)
Fe (SO4) 2-	1.529e-21	1.342e-21	-20.816	-20.872	-0.057	(0)
FeCl+2	2.279e-22	1.465e-22	-21.642	-21.834	-0.192	(0)
FeCl2+	1.357e-24	1.215e-24	-23.868	-23.916	-0.048	(0)
FeHSeO3+2	2.019e-25	1.197e-25	-24.695	-24.922	-0.227	(0)
Fe2 (OH) 2+4	5.185e-28	6.399e-29	-27.285	-28.194	-0.909	(0)
FeCl3	2.255e-28	2.255e-28	-27.647	-27.647	0.000	(0)
FeNO3+2	4.760e-29	2.821e-29	-28.322	-28.550	-0.227	(0)

Fe3(OH) 4+5	1.084e-35	4.122e-37	-34.965	-36.385	-1.420	(0)
H(0)	7.777e-29					
H2	3.889e-29	3.900e-29	-28.410	-28.409	0.001	(0)
Hg(0)	3.739e-10					
Hg	3.739e-10	3.739e-10	-9.427	-9.427	0.000	(0)
Hg(1)	9.401e-23					
Hg2+2	4.701e-23	2.786e-23	-22.328	-22.555	-0.227	(0)
Hg(2)	8.049e-13					
Hg(OH) 2	4.689e-13	4.703e-13	-12.329	-12.328	0.001	(0)
HgClOH	2.965e-13	2.965e-13	-12.528	-12.528	0.000	(0)
HgCl2	3.783e-14	3.783e-14	-13.422	-13.422	0.000	(0)
HgCl3-	8.003e-16	7.022e-16	-15.097	-15.154	-0.057	(0)
HgCO3	7.322e-16	7.322e-16	-15.135	-15.135	0.000	(0)
Hg(CO3) 2-2	2.178e-17	1.291e-17	-16.662	-16.889	-0.227	(0)
HgCl4-2	8.756e-18	5.190e-18	-17.058	-17.285	-0.227	(0)
HgCl+	4.633e-18	4.065e-18	-17.334	-17.391	-0.057	(0)
HgOH+	4.104e-18	3.601e-18	-17.387	-17.444	-0.057	(0)
HgHCO3+	1.898e-19	1.666e-19	-18.722	-18.778	-0.057	(0)
Hg(OH) 3-	5.560e-20	4.879e-20	-19.255	-19.312	-0.057	(0)
Hg(NH3) 2+2	8.000e-21	4.742e-21	-20.097	-20.324	-0.227	(0)
HgNH3+2	9.668e-22	5.730e-22	-21.015	-21.242	-0.227	(0)
Hg+2	1.852e-22	1.098e-22	-21.732	-21.960	-0.227	(0)
HgSO4	4.204e-23	4.204e-23	-22.376	-22.376	0.000	(0)
HgF+	3.907e-25	3.428e-25	-24.408	-24.465	-0.057	(0)
Hg(NH3) 3+2	2.635e-28	1.562e-28	-27.579	-27.806	-0.227	(0)
HgNO3+	4.988e-32	4.376e-32	-31.302	-31.359	-0.057	(0)
Hg(NH3) 4+2	1.732e-35	1.027e-35	-34.761	-34.989	-0.227	(0)
Hg(NO3) 2	0.000e+00	0.000e+00	-40.707	-40.707	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.308	-138.365	-0.057	(0)
HgS2-2	0.000e+00	0.000e+00	-138.933	-139.160	-0.227	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-139.884	-139.884	0.000	(0)
K	7.090e-04					
K+	7.018e-04	6.266e-04	-3.154	-3.203	-0.049	(0)
KSO4-	7.239e-06	6.490e-06	-5.140	-5.188	-0.047	(0)
KCrO4-	3.105e-18	2.724e-18	-17.508	-17.565	-0.057	(0)
Mg	9.806e-04					
Mg+2	8.242e-04	5.239e-04	-3.084	-3.281	-0.197	(0)
MgSO4	1.395e-04	1.395e-04	-3.855	-3.855	0.000	(0)
MgHCO3+	8.728e-06	7.787e-06	-5.059	-5.109	-0.050	(0)
MgF+	5.542e-06	4.953e-06	-5.256	-5.305	-0.049	(0)
MgCO3	2.429e-06	2.429e-06	-5.615	-5.615	0.000	(0)
MgOH+	1.910e-07	1.719e-07	-6.719	-6.765	-0.046	(0)
MgH2BO3+	1.104e-08	9.796e-09	-7.957	-8.009	-0.052	(0)
Mn(2)	1.122e-05					
Mn+2	9.518e-06	5.641e-06	-5.021	-5.249	-0.227	(0)
MnSO4	1.468e-06	1.468e-06	-5.833	-5.833	0.000	(0)
MnHCO3+	1.826e-07	1.635e-07	-6.738	-6.786	-0.048	(0)
MnF+	2.114e-08	1.893e-08	-7.675	-7.723	-0.048	(0)
MnCl+	1.473e-08	1.318e-08	-7.832	-7.880	-0.048	(0)
MnOH+	1.304e-08	1.168e-08	-7.885	-7.933	-0.048	(0)
MnCl2	3.457e-11	3.457e-11	-10.461	-10.461	0.000	(0)
MnCl3-	1.974e-14	1.768e-14	-13.705	-13.753	-0.048	(0)
MnSeO4	1.924e-14	1.924e-14	-13.716	-13.716	0.000	(0)
MnNO3+	1.100e-14	9.655e-15	-13.958	-14.015	-0.057	(0)
Mn(OH) 3-	5.474e-17	4.901e-17	-16.262	-16.310	-0.048	(0)
Mn(OH) 4-2	2.029e-22	1.304e-22	-21.693	-21.885	-0.192	(0)
Mn(NO3) 2	2.619e-23	2.619e-23	-22.582	-22.582	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.398	-41.398	0.000	(0)
Mn(3)	3.636e-26					
Mn+3	3.636e-26	1.312e-26	-25.439	-25.882	-0.443	(0)
Mn(6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.309	-41.501	-0.192	(0)
Mn(7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.105	-46.156	-0.051	(0)
Mo	3.315e-07					
MoO4-2	3.315e-07	2.107e-07	-6.480	-6.676	-0.197	(0)
HMoO4-	5.836e-11	5.121e-11	-10.234	-10.291	-0.057	(0)
H2MoO4	4.582e-15	4.582e-15	-14.339	-14.339	0.000	(0)

Ag ₂ MoO ₄	7.394e-26	7.394e-26	-25.131	-25.131	0.000	(0)
AlMo ₆ O ₂₁ -3	0.000e+00	0.000e+00	-47.377	-47.888	-0.511	(0)
Mo ₇ O ₂₄ -6	0.000e+00	0.000e+00	-55.004	-57.049	-2.044	(0)
HMo ₇ O ₂₄ -5	0.000e+00	0.000e+00	-57.155	-58.575	-1.420	(0)
H ₂ Mo ₇ O ₂₄ -4	0.000e+00	0.000e+00	-60.797	-61.706	-0.909	(0)
H ₃ Mo ₇ O ₂₄ -3	0.000e+00	0.000e+00	-65.862	-66.373	-0.511	(0)
N (-3)	2.112e-07					
NH ₄ ⁺	1.999e-07	1.773e-07	-6.699	-6.751	-0.052	(0)
NH ₃	8.275e-09	8.275e-09	-8.082	-8.082	0.000	(0)
NH ₄ SO ₄ -	3.104e-09	2.779e-09	-8.508	-8.556	-0.048	(0)
CaNH ₃ +2	8.791e-12	5.210e-12	-11.056	-11.283	-0.227	(0)
CuNH ₃ +2	3.352e-12	1.987e-12	-11.475	-11.702	-0.227	(0)
NiNH ₃ +2	9.319e-14	5.524e-14	-13.031	-13.258	-0.227	(0)
AgNH ₃ ⁺	1.854e-14	1.627e-14	-13.732	-13.789	-0.057	(0)
Co (NH ₃) +2	1.379e-14	8.172e-15	-13.860	-14.088	-0.227	(0)
BaNH ₃ +2	6.082e-17	3.605e-17	-16.216	-16.443	-0.227	(0)
Ag (NH ₃) 2+	1.247e-18	1.094e-18	-17.904	-17.961	-0.057	(0)
Ni (NH ₃) 2+2	1.115e-19	6.606e-20	-18.953	-19.180	-0.227	(0)
Ca (NH ₃) 2+2	2.896e-20	1.716e-20	-19.538	-19.765	-0.227	(0)
Hg (NH ₃) 2+2	8.000e-21	4.742e-21	-20.097	-20.324	-0.227	(0)
Co (NH ₃) 2+2	4.867e-21	2.885e-21	-20.313	-20.540	-0.227	(0)
HgNH ₃ +2	9.668e-22	5.730e-22	-21.015	-21.242	-0.227	(0)
Co (NH ₃) 3+2	5.070e-28	3.005e-28	-27.295	-27.522	-0.227	(0)
Hg (NH ₃) 3+2	2.635e-28	1.562e-28	-27.579	-27.806	-0.227	(0)
Co (NH ₃) 4+2	2.202e-35	1.305e-35	-34.657	-34.884	-0.227	(0)
Hg (NH ₃) 4+2	1.732e-35	1.027e-35	-34.761	-34.989	-0.227	(0)
Cr (NH ₃) 5OH+2	0.000e+00	0.000e+00	-41.336	-41.563	-0.227	(0)
Co (NH ₃) 5+2	0.000e+00	0.000e+00	-42.519	-42.747	-0.227	(0)
Cr (NH ₃) 6+3	0.000e+00	0.000e+00	-50.423	-50.934	-0.511	(0)
Co (NH ₃) 5Cl+2	0.000e+00	0.000e+00	-50.423	-50.650	-0.227	(0)
Cr (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-52.336	-52.563	-0.227	(0)
Co (NH ₃) 6SO ₄ ⁺	0.000e+00	0.000e+00	-60.569	-60.626	-0.057	(0)
Co (NH ₃) 6OH+2	0.000e+00	0.000e+00	-64.373	-64.600	-0.227	(0)
Co (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-65.221	-65.448	-0.227	(0)
N (3)	2.487e-06					
NO ₂ ⁻	2.487e-06	2.211e-06	-5.604	-5.655	-0.051	(0)
CuNO ₂ ⁺	6.190e-12	5.431e-12	-11.208	-11.265	-0.057	(0)
AgNO ₂	4.447e-13	4.447e-13	-12.352	-12.352	0.000	(0)
CoNO ₂ ⁺	1.458e-13	1.280e-13	-12.836	-12.893	-0.057	(0)
Cu (NO ₂) 2	1.229e-16	1.229e-16	-15.911	-15.911	0.000	(0)
Ag (NO ₂) 2-	1.735e-18	1.523e-18	-17.761	-17.817	-0.057	(0)
N (5)	1.211e-09					
NO ₃ ⁻	1.209e-09	1.080e-09	-8.917	-8.967	-0.049	(0)
CaNO ₃ ⁺	1.947e-12	1.708e-12	-11.711	-11.768	-0.057	(0)
MnNO ₃ ⁺	1.100e-14	9.655e-15	-13.958	-14.015	-0.057	(0)
ZnNO ₃ ⁺	1.742e-15	1.529e-15	-14.759	-14.816	-0.057	(0)
CuNO ₃ ⁺	9.132e-17	8.013e-17	-16.039	-16.096	-0.057	(0)
BaNO ₃ ⁺	4.259e-17	3.737e-17	-16.371	-16.428	-0.057	(0)
NiNO ₃ ⁺	3.843e-17	3.372e-17	-16.415	-16.472	-0.057	(0)
CoNO ₃ ⁺	1.602e-17	1.406e-17	-16.795	-16.852	-0.057	(0)
CdNO ₃ ⁺	4.061e-18	3.564e-18	-17.391	-17.448	-0.057	(0)
PbNO ₃ ⁺	1.326e-18	1.163e-18	-17.878	-17.934	-0.057	(0)
AgNO ₃	8.260e-19	8.260e-19	-18.083	-18.083	0.000	(0)
Mn (NO ₃) 2	2.619e-23	2.619e-23	-22.582	-22.582	0.000	(0)
UO ₂ NO ₃ ⁺	1.313e-23	1.152e-23	-22.882	-22.939	-0.057	(0)
Zn (NO ₃) 2	3.294e-25	3.294e-25	-24.482	-24.482	0.000	(0)
Co (NO ₃) 2	3.089e-26	3.089e-26	-25.510	-25.510	0.000	(0)
CrNO ₃ +2	2.889e-26	1.713e-26	-25.539	-25.766	-0.227	(0)
Cu (NO ₃) 2	1.089e-26	1.089e-26	-25.963	-25.963	0.000	(0)
Pb (NO ₃) 2	2.133e-27	2.133e-27	-26.671	-26.671	0.000	(0)
Cd (NO ₃) 2	1.929e-27	1.929e-27	-26.715	-26.715	0.000	(0)
VO ₂ NO ₃	1.722e-27	1.722e-27	-26.764	-26.764	0.000	(0)
FeNO ₃ +2	4.760e-29	2.821e-29	-28.322	-28.550	-0.227	(0)
HgNO ₃ ⁺	4.988e-32	4.376e-32	-31.302	-31.359	-0.057	(0)
Hg (NO ₃) 2	0.000e+00	0.000e+00	-40.707	-40.707	0.000	(0)
Na	4.529e-03					
Na ⁺	4.490e-03	4.009e-03	-2.348	-2.397	-0.049	(0)
NaSO ₄ ⁻	3.514e-05	3.150e-05	-4.454	-4.502	-0.047	(0)

	NaHCO ₃	3.275e-06	3.275e-06	-5.485	-5.485	0.000	(0)
	NaCO ₃ -	4.642e-07	4.162e-07	-6.333	-6.381	-0.047	(0)
	NaF	2.132e-07	2.132e-07	-6.671	-6.671	0.000	(0)
	NaH ₂ BO ₃	3.427e-09	3.427e-09	-8.465	-8.465	0.000	(0)
	NaCrO ₄ -	2.657e-17	2.331e-17	-16.576	-16.632	-0.057	(0)
Ni	2.856e-08						
	Ni+2	1.956e-08	1.243e-08	-7.709	-7.906	-0.197	(0)
	NiSO ₄	3.629e-09	3.629e-09	-8.440	-8.440	0.000	(0)
	NiCO ₃	2.585e-09	2.585e-09	-8.588	-8.588	0.000	(0)
	NiHCO ₃ +	2.537e-09	2.226e-09	-8.596	-8.652	-0.057	(0)
	NiOH+	1.470e-10	1.290e-10	-9.833	-9.890	-0.057	(0)
	NiCl+	6.729e-11	5.904e-11	-10.172	-10.229	-0.057	(0)
	NiF+	2.999e-11	2.631e-11	-10.523	-10.580	-0.057	(0)
	Ni (OH) 2	8.441e-12	8.441e-12	-11.074	-11.074	0.000	(0)
	Ni (SO ₄) 2-2	2.966e-13	1.758e-13	-12.528	-12.755	-0.227	(0)
	NiNH ₃ +2	9.319e-14	5.524e-14	-13.031	-13.258	-0.227	(0)
	Ni (OH) 3-	7.928e-15	6.956e-15	-14.101	-14.158	-0.057	(0)
	NiCl ₂	5.519e-16	5.519e-16	-15.258	-15.258	0.000	(0)
	NiSeO ₄	7.367e-17	7.367e-17	-16.133	-16.133	0.000	(0)
	NiNO ₃ +	3.843e-17	3.372e-17	-16.415	-16.472	-0.057	(0)
	Ni (NH ₃) 2+2	1.115e-19	6.606e-20	-18.953	-19.180	-0.227	(0)
O (0)	6.644e-36						
	O ₂	3.322e-36	3.332e-36	-35.479	-35.477	0.001	(0)
Pb	1.692e-09						
	PbCO ₃	1.220e-09	1.220e-09	-8.913	-8.913	0.000	(0)
	PbOH+	1.718e-10	1.508e-10	-9.765	-9.822	-0.057	(0)
	Pb+2	1.146e-10	7.283e-11	-9.941	-10.138	-0.197	(0)
	PbHCO ₃ +	8.959e-11	7.861e-11	-10.048	-10.105	-0.057	(0)
	PbSO ₄	5.219e-11	5.219e-11	-10.282	-10.282	0.000	(0)
	Pb (CO ₃) 2-2	3.311e-11	1.962e-11	-10.480	-10.707	-0.227	(0)
	PbCl+	5.467e-12	4.797e-12	-11.262	-11.319	-0.057	(0)
	Pb (OH) 2	3.929e-12	3.929e-12	-11.406	-11.406	0.000	(0)
	Pb (SO ₄) 2-2	7.763e-13	4.601e-13	-12.110	-12.337	-0.227	(0)
	PbF+	4.929e-13	4.325e-13	-12.307	-12.364	-0.057	(0)
	PbCl ₂	3.978e-14	3.978e-14	-13.400	-13.400	0.000	(0)
	Pb (OH) 3-	3.690e-15	3.238e-15	-14.433	-14.490	-0.057	(0)
	PbF ₂	7.172e-16	7.172e-16	-15.144	-15.144	0.000	(0)
	PbCl ₃ -	3.351e-17	2.940e-17	-16.475	-16.532	-0.057	(0)
	PbNO ₃ +	1.326e-18	1.163e-18	-17.878	-17.934	-0.057	(0)
	Pb (OH) 4-2	1.102e-18	6.534e-19	-17.958	-18.185	-0.227	(0)
	Pb ₂ OH+3	5.646e-19	1.740e-19	-18.248	-18.759	-0.511	(0)
	PbF ₃ -	1.307e-19	1.146e-19	-18.884	-18.941	-0.057	(0)
	PbCl ₄ -2	4.209e-20	2.495e-20	-19.376	-19.603	-0.227	(0)
	Pb ₃ (OH) 4+2	3.784e-23	2.243e-23	-22.422	-22.649	-0.227	(0)
	PbF ₄ -2	7.801e-24	4.624e-24	-23.108	-23.335	-0.227	(0)
	Pb (NO ₃) 2	2.133e-27	2.133e-27	-26.671	-26.671	0.000	(0)
	Pb ₄ (OH) 4+4	1.051e-28	1.298e-29	-27.978	-28.887	-0.909	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.114	-151.114	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.881	-227.937	-0.057	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.325	-73.325	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.066	-78.123	-0.057	(0)
	H ₂ S	0.000e+00	0.000e+00	-79.016	-79.016	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.040	-79.097	-0.057	(0)
	S ₅ -2	0.000e+00	0.000e+00	-79.348	-79.575	-0.227	(0)
	S ₆ -2	0.000e+00	0.000e+00	-79.864	-80.091	-0.227	(0)
	S ₄ -2	0.000e+00	0.000e+00	-79.944	-80.171	-0.227	(0)
	S ₃ -2	0.000e+00	0.000e+00	-80.750	-80.977	-0.227	(0)
	S ₂ -2	0.000e+00	0.000e+00	-81.766	-81.993	-0.227	(0)
	S-2	0.000e+00	0.000e+00	-87.318	-87.510	-0.192	(0)
	HgHS ₂ -	0.000e+00	0.000e+00	-138.308	-138.365	-0.057	(0)
	HgS ₂ -2	0.000e+00	0.000e+00	-138.933	-139.160	-0.227	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.884	-139.884	0.000	(0)
	Cu (S ₄) 2-3	0.000e+00	0.000e+00	-146.409	-146.686	-0.278	(0)
	Ag (HS) S ₄ -2	0.000e+00	0.000e+00	-146.772	-146.919	-0.147	(0)
	CuS ₄ S ₅ -3	0.000e+00	0.000e+00	-147.149	-147.416	-0.267	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.292	-147.348	-0.057	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-147.716	-147.772	-0.057	(0)

Ag (S4) 2-3	0.000e+00	0.000e+00	-148.163	-148.446	-0.283	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.485	-148.757	-0.272	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.676	-149.676	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.016	-150.016	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.114	-151.114	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.564	-159.564	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.044	-216.100	-0.057	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.462	-224.519	-0.057	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.182	-226.239	-0.057	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.359	-226.586	-0.227	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.881	-227.937	-0.057	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.593	-235.650	-0.057	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.939	-302.167	-0.227	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.875	-304.102	-0.227	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.006	-319.233	-0.227	(0)
S (6)	2.653e-03					
SO4-2	2.302e-03	1.463e-03	-2.638	-2.835	-0.197	(0)
CaSO4	1.676e-04	1.676e-04	-3.776	-3.776	0.000	(0)
MgSO4	1.395e-04	1.395e-04	-3.855	-3.855	0.000	(0)
NaSO4-	3.514e-05	3.150e-05	-4.454	-4.502	-0.047	(0)
KSO4-	7.239e-06	6.490e-06	-5.140	-5.188	-0.047	(0)
MnSO4	1.468e-06	1.468e-06	-5.833	-5.833	0.000	(0)
ZnSO4	1.804e-07	1.804e-07	-6.744	-6.744	0.000	(0)
CuSO4	7.864e-09	7.864e-09	-8.104	-8.104	0.000	(0)
Zn (SO4) 2-2	3.879e-09	2.299e-09	-8.411	-8.638	-0.227	(0)
NiSO4	3.629e-09	3.629e-09	-8.440	-8.440	0.000	(0)
NH4SO4-	3.104e-09	2.779e-09	-8.508	-8.556	-0.048	(0)
CoSO4	2.398e-09	2.398e-09	-8.620	-8.620	0.000	(0)
HSO4-	1.954e-09	1.747e-09	-8.709	-8.758	-0.049	(0)
CdSO4	3.579e-10	3.579e-10	-9.446	-9.446	0.000	(0)
PbSO4	5.219e-11	5.219e-11	-10.282	-10.282	0.000	(0)
AgSO4-	3.204e-11	2.811e-11	-10.494	-10.551	-0.057	(0)
Cd (SO4) 2-2	1.192e-11	7.064e-12	-10.924	-11.151	-0.227	(0)
CrOHSO4	2.271e-12	2.271e-12	-11.644	-11.644	0.000	(0)
Pb (SO4) 2-2	7.763e-13	4.601e-13	-12.110	-12.337	-0.227	(0)
Ni (SO4) 2-2	2.966e-13	1.758e-13	-12.528	-12.755	-0.227	(0)
FeSO4	1.941e-13	1.941e-13	-12.712	-12.712	0.000	(0)
UO2SO4	1.184e-14	1.184e-14	-13.927	-13.927	0.000	(0)
AlSO4+	5.749e-15	5.138e-15	-14.240	-14.289	-0.049	(0)
CrSO4+	1.413e-15	1.239e-15	-14.850	-14.907	-0.057	(0)
UO2 (SO4) 2-2	3.853e-16	2.284e-16	-15.414	-15.641	-0.227	(0)
Al (SO4) 2-	9.013e-17	8.055e-17	-16.045	-16.094	-0.049	(0)
VO2SO4-	1.255e-19	1.101e-19	-18.901	-18.958	-0.057	(0)
FeSO4+	4.790e-20	4.289e-20	-19.320	-19.368	-0.048	(0)
Cr2 (OH) 2SO4+2	2.265e-21	1.343e-21	-20.645	-20.872	-0.227	(0)
Fe (SO4) 2-	1.529e-21	1.342e-21	-20.816	-20.872	-0.057	(0)
VOSO4	2.914e-22	2.914e-22	-21.535	-21.535	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.167e-22	1.167e-22	-21.933	-21.933	0.000	(0)
HgSO4	4.204e-23	4.204e-23	-22.376	-22.376	0.000	(0)
CrO3SO4-2	4.250e-25	2.519e-25	-24.372	-24.599	-0.227	(0)
VSO4+	8.107e-37	7.113e-37	-36.091	-36.148	-0.057	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.310	-41.310	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.148	-42.376	-0.227	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.569	-60.626	-0.057	(0)
Sb (3)	1.395e-20					
Sb (OH) 3	7.057e-21	7.057e-21	-20.151	-20.151	0.000	(0)
HSbO2	6.890e-21	6.890e-21	-20.162	-20.162	0.000	(0)
SbO2-	1.041e-24	9.135e-25	-23.982	-24.039	-0.057	(0)
Sb (OH) 4-	5.964e-25	5.233e-25	-24.224	-24.281	-0.057	(0)
Sb (OH) 2F	1.135e-26	1.135e-26	-25.945	-25.945	0.000	(0)
SbOF	1.116e-26	1.116e-26	-25.952	-25.952	0.000	(0)
Sb (OH) 2+	2.387e-27	2.094e-27	-26.622	-26.679	-0.057	(0)
SbO+	8.229e-28	7.221e-28	-27.085	-27.141	-0.057	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.006	-319.233	-0.227	(0)
Sb (5)	5.010e-09					
SbO3-	5.005e-09	4.391e-09	-8.301	-8.357	-0.057	(0)
Sb (OH) 6-	5.749e-12	5.133e-12	-11.240	-11.290	-0.049	(0)
SbO2+	2.143e-25	1.880e-25	-24.669	-24.726	-0.057	(0)

Se (-2)	1.299e-14					
Ag2Se	1.299e-14	1.299e-14	-13.886	-13.886	0.000	(0)
HSe-	2.394e-39	2.100e-39	-38.621	-38.678	-0.057	(0)
MnSe	0.000e+00	0.000e+00	-41.398	-41.398	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.701	-42.701	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.537	-45.765	-0.227	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.233	-83.142	-0.909	(0)
Se (4)	2.929e-08					
HSeO3-	1.976e-08	1.733e-08	-7.704	-7.761	-0.057	(0)
SeO3-2	9.531e-09	5.649e-09	-8.021	-8.248	-0.227	(0)
H2SeO3	9.033e-14	9.033e-14	-13.044	-13.044	0.000	(0)
AgSeO3-	3.984e-15	3.496e-15	-14.400	-14.456	-0.057	(0)
Cd (SeO3) 2-2	4.630e-20	2.744e-20	-19.334	-19.562	-0.227	(0)
Ag (SeO3) 2-3	5.737e-22	1.768e-22	-21.241	-21.752	-0.511	(0)
FeHSeO3+2	2.019e-25	1.197e-25	-24.695	-24.922	-0.227	(0)
Se (6)	1.996e-11					
SeO4-2	1.994e-11	1.267e-11	-10.700	-10.897	-0.197	(0)
MnSeO4	1.924e-14	1.924e-14	-13.716	-13.716	0.000	(0)
ZnSeO4	1.106e-15	1.106e-15	-14.956	-14.956	0.000	(0)
NiSeO4	7.367e-17	7.367e-17	-16.133	-16.133	0.000	(0)
CoSeO4	5.217e-17	5.217e-17	-16.283	-16.283	0.000	(0)
HSeO4-	8.842e-18	7.758e-18	-17.053	-17.110	-0.057	(0)
CdSeO4	2.462e-18	2.462e-18	-17.609	-17.609	0.000	(0)
Zn (SeO4) 2-2	2.398e-26	1.421e-26	-25.620	-25.847	-0.227	(0)
Si	1.792e-04					
H4SiO4	1.769e-04	1.774e-04	-3.752	-3.751	0.001	(0)
H3SiO4-	2.352e-06	2.099e-06	-5.629	-5.678	-0.050	(0)
H2SiO4-2	1.678e-11	1.084e-11	-10.775	-10.965	-0.190	(0)
UO2H3SiO4+	1.086e-12	9.526e-13	-11.964	-12.021	-0.057	(0)
SiF6-2	3.335e-30	2.143e-30	-29.477	-29.669	-0.192	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.142	-59.653	-0.511	(0)
U (4)	2.296e-20					
U (OH) 5-	2.295e-20	2.014e-20	-19.639	-19.696	-0.057	(0)
U (OH) 4	1.030e-23	1.030e-23	-22.987	-22.987	0.000	(0)
U (OH) 3+	5.247e-28	4.603e-28	-27.280	-27.337	-0.057	(0)
U (OH) 2+2	4.388e-33	2.601e-33	-32.358	-32.585	-0.227	(0)
UF3+	1.963e-37	1.723e-37	-36.707	-36.764	-0.057	(0)
UF2+2	2.176e-38	1.290e-38	-37.662	-37.889	-0.227	(0)
UOH+3	4.856e-39	1.497e-39	-38.314	-38.825	-0.511	(0)
UF4	1.592e-39	1.592e-39	-38.798	-38.798	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.404	-40.915	-0.511	(0)
UF5-	0.000e+00	0.000e+00	-41.218	-41.274	-0.057	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.310	-41.310	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.148	-42.376	-0.227	(0)
UF6-2	0.000e+00	0.000e+00	-42.642	-42.869	-0.227	(0)
U+4	0.000e+00	0.000e+00	-45.232	-46.141	-0.909	(0)
UCl+3	0.000e+00	0.000e+00	-46.661	-47.172	-0.511	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-170.705	-175.305	-4.600	(0)
U (5)	7.136e-17					
UO2+	7.136e-17	6.261e-17	-16.147	-16.203	-0.057	(0)
U (6)	5.227e-08					
UO2 (CO3) 3-4	2.988e-08	3.687e-09	-7.525	-8.433	-0.909	(0)
UO2 (CO3) 2-2	2.227e-08	1.320e-08	-7.652	-7.879	-0.227	(0)
UO2CO3	1.187e-10	1.187e-10	-9.926	-9.926	0.000	(0)
UO2H3SiO4+	1.086e-12	9.526e-13	-11.964	-12.021	-0.057	(0)
UO2OH+	6.322e-13	5.547e-13	-12.199	-12.256	-0.057	(0)
UO2F+	7.088e-14	6.219e-14	-13.149	-13.206	-0.057	(0)
UO2F2	1.512e-14	1.512e-14	-13.821	-13.821	0.000	(0)
UO2SO4	1.184e-14	1.184e-14	-13.927	-13.927	0.000	(0)
UO2+2	8.412e-15	5.347e-15	-14.075	-14.272	-0.197	(0)
UO2 (SO4) 2-2	3.853e-16	2.284e-16	-15.414	-15.641	-0.227	(0)
UO2F3-	3.647e-16	3.200e-16	-15.438	-15.495	-0.057	(0)
UO2Cl+	1.835e-17	1.610e-17	-16.736	-16.793	-0.057	(0)
(UO2) 2 (OH) 2+2	8.615e-19	5.106e-19	-18.065	-18.292	-0.227	(0)
UO2F4-2	3.614e-19	2.142e-19	-18.442	-18.669	-0.227	(0)
(UO2) 3 (OH) 5+	1.663e-19	1.459e-19	-18.779	-18.836	-0.057	(0)
UO2NO3+	1.313e-23	1.152e-23	-22.882	-22.939	-0.057	(0)

V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.531	-43.588	-0.057	(0)
V+2	0.000e+00	0.000e+00	-44.786	-45.014	-0.227	(0)
V (3)	4.649e-16					
V (OH) 3	4.649e-16	4.649e-16	-15.333	-15.333	0.000	(0)
V (OH) 2+	4.183e-27	3.671e-27	-26.378	-26.435	-0.057	(0)
VOH+2	7.177e-31	4.254e-31	-30.144	-30.371	-0.227	(0)
V+3	3.341e-36	1.030e-36	-35.476	-35.987	-0.511	(0)
VSO4+	8.107e-37	7.113e-37	-36.091	-36.148	-0.057	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.843	-58.355	-0.511	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-59.034	-59.942	-0.909	(0)
V (4)	1.374e-19					
V (OH) 3+	1.355e-19	1.189e-19	-18.868	-18.925	-0.057	(0)
VO+2	1.220e-21	7.232e-22	-20.914	-21.141	-0.227	(0)
VOF+	4.166e-22	3.655e-22	-21.380	-21.437	-0.057	(0)
VOSO4	2.914e-22	2.914e-22	-21.535	-21.535	0.000	(0)
VOF2	1.155e-23	1.155e-23	-22.937	-22.937	0.000	(0)
VOC1+	4.293e-24	3.766e-24	-23.367	-23.424	-0.057	(0)
VOF3-	3.936e-26	3.454e-26	-25.405	-25.462	-0.057	(0)
VOF4-2	1.982e-29	1.175e-29	-28.703	-28.930	-0.227	(0)
H2V2O4+2	1.196e-33	7.086e-34	-32.922	-33.150	-0.227	(0)
V (5)	1.574e-09					
H2VO4-	1.206e-09	1.058e-09	-8.919	-8.975	-0.057	(0)
HVO4-2	3.672e-10	2.176e-10	-9.435	-9.662	-0.227	(0)
H3VO4	1.293e-13	1.293e-13	-12.888	-12.888	0.000	(0)
H3V2O7-	1.007e-15	8.837e-16	-14.997	-15.054	-0.057	(0)
VO4-3	2.897e-16	8.928e-17	-15.538	-16.049	-0.511	(0)
HV2O7-3	2.532e-16	7.806e-17	-15.596	-16.108	-0.511	(0)
VO2+	3.531e-18	3.153e-18	-17.452	-17.501	-0.049	(0)
V2O7-4	1.394e-18	1.720e-19	-17.856	-18.765	-0.909	(0)
VO2F	4.660e-19	4.660e-19	-18.332	-18.332	0.000	(0)
VO2SO4-	1.255e-19	1.101e-19	-18.901	-18.958	-0.057	(0)
VO2F2-	1.625e-20	1.426e-20	-19.789	-19.846	-0.057	(0)
V3O9-3	4.030e-21	1.242e-21	-20.395	-20.906	-0.511	(0)
VO2F3-2	2.529e-23	1.499e-23	-22.597	-22.824	-0.227	(0)
V4O12-4	4.442e-27	5.482e-28	-26.352	-27.261	-0.909	(0)
VO2F4-3	2.016e-27	6.214e-28	-26.695	-27.207	-0.511	(0)
VO2NO3	1.722e-27	1.722e-27	-26.764	-26.764	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-70.455	-72.499	-2.044	(0)
HV10O28-5	0.000e+00	0.000e+00	-70.806	-72.225	-1.420	(0)
H2V10O28-4	0.000e+00	0.000e+00	-74.022	-74.931	-0.909	(0)
Zn	1.347e-06					
Zn+2	8.867e-07	5.636e-07	-6.052	-6.249	-0.197	(0)
ZnCO3	1.808e-07	1.808e-07	-6.743	-6.743	0.000	(0)
ZnSO4	1.804e-07	1.804e-07	-6.744	-6.744	0.000	(0)
ZnOH+	5.293e-08	4.645e-08	-7.276	-7.333	-0.057	(0)
ZnHCO3+	2.951e-08	2.589e-08	-7.530	-7.587	-0.057	(0)
Zn (OH) 2	6.066e-09	6.066e-09	-8.217	-8.217	0.000	(0)
Zn (SO4) 2-2	3.879e-09	2.299e-09	-8.411	-8.638	-0.227	(0)
ZnCl+	2.946e-09	2.628e-09	-8.531	-8.580	-0.050	(0)
ZnOHCl	2.835e-09	2.835e-09	-8.547	-8.547	0.000	(0)
ZnF+	1.080e-09	9.477e-10	-8.967	-9.023	-0.057	(0)
Zn (OH) 3-	2.855e-11	2.505e-11	-10.544	-10.601	-0.057	(0)
ZnCl2	7.733e-12	7.733e-12	-11.112	-11.112	0.000	(0)
ZnCl3-	1.278e-14	1.140e-14	-13.893	-13.943	-0.050	(0)
ZnNO3+	1.742e-15	1.529e-15	-14.759	-14.816	-0.057	(0)
Zn (OH) 4-2	1.387e-15	8.219e-16	-14.858	-15.085	-0.227	(0)
ZnSeO4	1.106e-15	1.106e-15	-14.956	-14.956	0.000	(0)
ZnCl4-2	1.647e-17	1.059e-17	-16.783	-16.975	-0.192	(0)
Zn (NO3) 2	3.294e-25	3.294e-25	-24.482	-24.482	0.000	(0)
Zn (SeO4) 2-2	2.398e-26	1.421e-26	-25.620	-25.847	-0.227	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.716	-147.772	-0.057	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.676	-149.676	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.462	-224.519	-0.057	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.359	-226.586	-0.227	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.875	-304.102	-0.227	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-56.91	-50.62	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.66	-38.15	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.89	-38.15	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-73.63	-55.70	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-57.02	-36.99	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.84	-28.43	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.85	-24.40	0.45	(NH4) 2SeO4
Acanthite	-52.02	-88.24	-36.22	Ag2S
Ag2CO3	-12.20	-23.29	-11.09	Ag2CO3
Ag2CrO4	-21.37	-32.96	-11.59	Ag2CrO4
Ag2HVO4	-13.28	-11.80	1.48	Ag2HVO4
Ag2MoO4	-13.16	-24.71	-11.55	Ag2MoO4
Ag2O	-14.78	-2.21	12.57	Ag2O
Ag2Se	-0.10	-48.80	-48.70	Ag2Se
Ag2SeO3	-10.73	-17.88	-7.15	Ag2SeO3
Ag2SeO4	-20.02	-28.93	-8.91	Ag2SeO4
Ag2SO4	-16.05	-20.87	-4.82	Ag2SO4
Ag3AsO3	-27.53	-25.37	2.16	Ag3AsO3
Ag3AsO4	-16.23	-19.01	-2.79	Ag3AsO4
Ag3H2VO5	-18.08	-12.90	5.18	Ag3H2VO5
AgF:4H2O	-14.14	-13.09	1.05	AgF:4H2O
Agmetal	-0.23	-13.73	-13.51	Ag
AgVO3	-11.46	-10.69	0.77	AgVO3
Al (OH) 3 (am)	-2.41	8.39	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.09	-50.72	2.37	Al2 (MoO4) 3
Al2O3	-2.86	16.79	19.65	Al2O3
Al4 (OH) 10SO4	-7.78	14.92	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.11	-7.31	4.80	AlAsO4:2H2O
AlOHSO4	-7.04	-10.27	-3.23	AlOHSO4
AlSb	-153.16	-87.53	65.62	AlSb
Alunite	-6.03	-7.43	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.18	-12.97	-7.79	PbSO4
Anhydrite	-1.78	-6.14	-4.36	CaSO4
Anilite	-54.72	-86.60	-31.88	Cu0.25Cu1.5S
Antlerite	-2.86	5.93	8.79	Cu3 (OH) 4SO4
Aragonite	-0.25	-8.55	-8.30	CaCO3
Arsenolite	-85.49	-88.25	-2.76	As4O6
Artinite	-5.59	4.01	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.11	-31.40	6.71	As2O5
Atacamite	-1.64	5.75	7.39	Cu2 (OH) 3Cl
Azurite	-0.66	-17.57	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.73	7.66	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.72	-3.85	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.50	-8.41	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-29.12	3.82	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.42	-23.09	-9.67	BaCrO4
BaF2	-10.49	-16.31	-5.82	BaF2
BaMoO4	-7.88	-14.84	-6.96	BaMoO4
Barite	-1.02	-11.00	-9.98	BaSO4
BaS	-94.55	-78.37	16.18	BaS
BaSeO3	-9.84	-8.01	1.83	BaSeO3
BaSeO4	-11.60	-19.06	-7.46	BaSeO4
Bianchite	-7.32	-9.08	-1.76	ZnSO4:6H2O
Birnessite	-7.60	10.49	18.09	MnO2
Bixbyite	-3.64	-4.29	-0.64	Mn2O3
BlaubleiI	-54.85	-79.01	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.23	-82.51	-27.28	Cu0.6Cu0.8S
Boehmite	-0.18	8.39	8.58	AlOOH
Breithauptite	-56.86	-75.38	-18.52	NiSb
Brochantite	-1.10	14.12	15.22	Cu4 (OH) 6SO4
Brucite	-4.30	12.55	16.84	Mg (OH) 2
Bunsenite	-4.53	7.92	12.45	NiO
Ca (VO3) 2	-12.31	-6.65	5.66	Ca (VO3) 2
Ca2V2O7	-11.63	5.87	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.68	5.87	21.55	Ca2V2O7:2H2O

Ca3(AsO4)2·4H2O	-16.13	6.17	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-20.56	18.40	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-21.46	18.40	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-297.25	-154.28	142.97	Ca3Sb2
CaCrO4	-15.97	-18.23	-2.27	CaCrO4
Calcite	-0.07	-8.55	-8.48	CaCO3
Calomel	-10.11	-28.02	-17.91	Hg2Cl2
CaMoO4	-2.03	-9.98	-7.95	CaMoO4
Carnotite	-3.55	-3.32	0.23	KUO2VO4
CaSeO3·2H2O	-5.96	-3.15	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.18	-14.20	-3.02	CaSeO4·2H2O
Cd(BO2)2	-12.89	-3.05	9.84	Cd(BO2)2
Cd(OH)2	-6.80	6.84	13.64	Cd(OH)2
Cd(OH)2(am)	-6.89	6.84	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.50	-16.79	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.69	1.87	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.68	8.72	28.40	Cd4(OH)6SO4
CdCl2	-13.79	-14.44	-0.66	CdCl2
CdCl2·1H2O	-12.75	-14.44	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.53	-14.44	-1.91	CdCl2·2.5H2O
CdF2	-15.92	-17.13	-1.21	CdF2
Cdmetal(alpha)	-31.93	-18.41	13.51	Cd
Cdmetal(gamma)	-32.03	-18.41	13.62	Cd
CdMoO4	-1.51	-15.66	-14.15	CdMoO4
CdOHCl	-7.34	-3.80	3.54	CdOHCl
CdSb	-76.10	-76.45	-0.35	CdSb
CdSe	-19.55	-39.75	-20.20	CdSe
CdSeO4·2H2O	-18.03	-19.88	-1.85	CdSeO4·2H2O
CdSO4	-11.64	-11.82	-0.17	CdSO4
CdSO4·1H2O	-10.09	-11.82	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-9.94	-11.82	-1.87	CdSO4·2.67H2O
Cerargyrite	-2.00	-11.75	-9.75	AgCl
Cerrusite	-2.26	-15.39	-13.13	PbCO3
CH4(g)	-81.07	-122.12	-41.05	CH4
Chalcanthite	-7.82	-10.46	-2.64	CuSO4·5H2O
Chalcedony	-0.20	-3.75	-3.55	SiO2
Chalcocite	-54.60	-89.52	-34.92	Cu2S
Chalcopyrite	-125.05	-160.32	-35.27	CuFeS2
Chrysotile	-2.07	30.13	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.67	-98.36	-45.69	HgS
Claudetite	-85.19	-88.25	-3.06	As4O6
Clausthalite	-13.80	-40.90	-27.10	PbSe
Co(BO2)2	-29.22	-2.15	27.07	Co(BO2)2
Co(OH)2	-5.35	7.74	13.09	Co(OH)2
Co(OH)3	-9.72	-12.03	-2.31	Co(OH)3
CO2(g)	-2.93	-21.08	-18.15	CO2
Co3(AsO4)2	-21.22	-8.18	13.03	Co3(AsO4)2
Co3O4	-5.82	-16.32	-10.50	Co3O4
CoCl2	-21.82	-13.55	8.27	CoCl2
CoCl2·6H2O	-16.09	-13.55	2.54	CoCl2·6H2O
CoCO3	-3.36	-13.34	-9.98	CoCO3
CoF2	-14.64	-16.23	-1.60	CoF2
CoF3	-46.53	-47.99	-1.46	CoF3
CoFe2O4	17.58	14.05	-3.53	CoFe2O4
CoMoO4	-7.00	-14.76	-7.76	CoMoO4
CoO	-5.85	7.74	13.59	CoO
CoS(alpha)	-70.86	-78.30	-7.44	CoS
CoS(beta)	-67.23	-78.30	-11.07	CoS
CoSe	-22.65	-38.85	-16.20	CoSe
CoSeO3	-9.25	-7.93	1.32	CoSeO3
CoSeO4·6H2O	-17.45	-18.98	-1.53	CoSeO4·6H2O
CoSO4	-13.72	-10.92	2.80	CoSO4
CoSO4·6H2O	-8.45	-10.92	-2.47	CoSO4·6H2O
Cotunnite	-10.82	-15.60	-4.78	PbCl2
Covellite	-55.54	-77.84	-22.30	CuS
Cr(OH)2	-21.77	-10.95	10.82	Cr(OH)2
Cr(OH)3	-2.61	-1.27	1.34	Cr(OH)3
Cr(OH)3(am)	-0.52	-1.27	-0.75	Cr(OH)3

Cr2O3	-0.18	-2.54	-2.36	Cr2O3
CrCl2	-46.33	-32.24	14.09	CrCl2
CrCl3	-48.32	-33.20	15.11	CrCl3
CrF3	-25.90	-37.23	-11.34	CrF3
Cristobalite	-0.40	-3.75	-3.35	SiO2
Crmetal	-66.69	-36.21	30.48	Cr
CrO3	-27.55	-30.76	-3.21	CrO3
Cryolite	-13.14	-46.98	-33.84	Na3AlF6
Cu(OH)2	-0.48	8.20	8.67	Cu(OH)2
Cu(SbO3)2	-26.80	18.41	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.74	-0.49	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.59	-89.47	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.28	-50.08	-45.80	Cu2Se
Cu2SO4	-20.20	-22.15	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.91	-6.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.56	-101.16	-42.59	Cu3Sb
Cu3Se2	-24.98	-88.47	-63.49	Cu3Se2
CuCO3	-1.38	-12.88	-11.50	CuCO3
CuCrO4	-17.12	-22.56	-5.44	CuCrO4
CuF	-8.82	-13.73	-4.91	CuF
CuF2	-16.89	-15.78	1.12	CuF2
CuF2:2H2O	-11.23	-15.78	-4.55	CuF2:2H2O
Cumetal	-5.62	-14.37	-8.76	Cu
CuMoO4	-1.23	-14.31	-13.08	CuMoO4
CuOCuSO4	-12.57	-2.27	10.30	CuOCuSO4
Cupricferrite	8.52	14.51	5.99	CuFe2O4
Cuprite	-2.08	-3.49	-1.41	Cu2O
Cuprousferrite	10.33	1.41	-8.92	CuFeO2
CuSe	-5.29	-38.39	-33.10	CuSe
CuSe2	-26.36	-59.73	-33.37	CuSe2
CuSeO3:2H2O	-7.99	-7.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.09	-18.53	-2.44	CuSeO4:5H2O
CuSO4	-13.40	-10.46	2.94	CuSO4
Diaspore	1.52	8.39	6.87	AlOOH
Djurleite	-54.83	-88.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.55	-17.09	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.00	-17.09	-17.09	CaMg(CO3)2
Epsomite	-3.99	-6.12	-2.13	MgSO4:7H2O
Fe(OH)2	-10.01	3.56	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.00	-0.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.90	-15.62	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.92	-9.36	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.08	-40.71	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.94	-49.67	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.35	9.87	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.95	-12.55	0.40	FeAsO4:2H2O
FeCr2O4	-6.18	1.02	7.20	FeCr2O4
FeMoO4	-8.85	-18.94	-10.09	FeMoO4
Ferrihydrite	-0.04	3.16	3.19	Fe(OH)3
Ferroselite	-45.77	-64.36	-18.60	FeSe2
FeS(ppt)	-79.53	-82.48	-2.95	FeS
FeSe	-32.03	-43.03	-11.00	FeSe
Fix_pe	-4.72	-4.72	0.00	e-
Fluorite	-0.95	-11.45	-10.50	CaF2
Galena	-66.38	-80.35	-13.97	PbS
Gibbsite	0.10	8.39	8.29	Al(OH)3
Goethite	2.67	3.16	0.49	FeOOH
Goslarite	-7.07	-9.08	-2.01	ZnSO4:7H2O
Greenalite	-17.64	3.17	20.81	Fe3Si2O5(OH)4
Greenockite	-64.83	-79.19	-14.36	CdS
Greigite	-289.24	-334.27	-45.03	Fe3S4
Gummite	-6.12	1.55	7.67	UO3
Gypsum	-1.53	-6.14	-4.61	CaSO4:2H2O
H-Jarosite	-15.75	-27.85	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.63	-22.50	-12.88	H2MoO4
H2S(g)	-78.03	-86.04	-8.01	H2S
H2Se(g)	-41.63	-46.59	-4.96	H2Se
Halite	-6.73	-5.13	1.60	NaCl

Halloysite	-0.29	9.29	9.57	Al ₂ Si ₂ O ₅ (OH) 4
Hausmannite	-4.04	56.99	61.03	Mn ₃ O ₄
Hematite	7.73	6.31	-1.42	Fe ₂ O ₃
Hercynite	-2.55	20.35	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-182.85	-256.56	-73.71	Hg (CH ₃) ₂
Hg (g)	-8.12	-15.99	-7.87	Hg
Hg (OH) ₂	-8.83	-12.33	-3.50	Hg (OH) ₂
Hg ₂ (g)	-17.03	-31.99	-14.96	Hg ₂
Hg ₂ (OH) ₂	-11.99	-6.73	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-11.76	-27.81	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-28.79	-37.49	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-20.34	-30.70	-10.36	Hg ₂ F ₂
Hg ₂ S	-81.09	-92.77	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-17.75	-22.40	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-19.26	-25.39	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-28.38	-58.06	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-33.51	-14.01	19.50	HgCl
HgCl ₂	-12.35	-33.62	-21.26	HgCl ₂
HgF (g)	-48.03	-15.35	32.68	HgF
HgF ₂ (g)	-48.87	-36.30	12.57	HgF ₂
Hgmetal (l)	-2.54	-15.99	-13.45	Hg
HgSe	-3.22	-58.92	-55.69	HgSe
HgSeO ₃	-15.57	-28.00	-12.43	HgSeO ₃
HgSO ₄	-21.57	-30.99	-9.42	HgSO ₄
Huntite	-4.19	-34.16	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-6.32	-25.09	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.83	-21.59	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-19.05	-24.22	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-8.34	-23.14	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-34.85	-52.10	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-20.82	-21.34	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.34	-13.08	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-16.57	-17.30	-0.73	K ₂ SeO ₄
Kaolinite	1.85	9.29	7.43	Al ₂ Si ₂ O ₅ (OH) 4
Langite	-3.36	14.12	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-6.85	-7.28	-0.43	PbO : PbSO ₄
Laurionite	-5.58	-4.96	0.62	PbOHCl
Lepidocrocite	1.79	3.16	1.37	FeOOH
Lime	-20.17	12.53	32.70	CaO
Litharge	-7.01	5.69	12.69	PbO
Mackinawite	-78.88	-82.48	-3.60	FeS
Maghemite	-0.07	6.31	6.39	Fe ₂ O ₃
Magnesioferrite	2.00	18.86	16.86	Fe ₂ MgO ₄
Magnesite	-1.07	-8.53	-7.46	MgCO ₃
Magnetite	6.47	9.87	3.40	Fe ₃ O ₄
Malachite	0.62	-4.69	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.13	23.21	25.34	MnOOH
Massicot	-7.21	5.69	12.89	PbO
Matlockite	-7.97	-16.94	-8.97	PbClF
Melanothallite	-19.35	-13.09	6.26	CuCl ₂
Melanterite	-12.89	-15.10	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-53.27	-98.36	-45.09	HgS
Mg (OH) ₂ (active)	-6.25	12.55	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-17.91	-6.63	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-274.23	-199.55	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.45	5.91	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.20	10.01	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.59	-18.21	5.38	MgCrO ₄
MgF ₂	-3.30	-11.43	-8.13	MgF ₂
MgMoO ₄	-8.11	-9.96	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-6.18	-3.13	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-12.98	-14.18	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-31.20	42.32	73.52	Pb ₃ O ₄
Mirabilite	-6.52	-7.63	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-13.50	-8.60	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-54.56	-60.27	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-148.48	-87.40	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-12.17	0.33	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O

MnCl2:4H2O	-13.43	-10.71	2.72	MnCl2:4H2O
MnS (grn)	-75.63	-75.46	0.17	MnS
MnS (pnk)	-78.80	-75.46	3.34	MnS
MnSb	-95.16	-98.07	-2.91	MnSb
MnSe	-39.51	-36.01	3.50	MnSe
MnSeO3	-6.23	-5.10	1.13	MnSeO3
MnSeO3:2H2O	-6.08	-5.10	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.10	-16.15	-2.05	MnSeO4:5H2O
MnSO4	-10.67	-8.08	2.58	MnSO4
Monteponite	-8.26	6.84	15.10	CdO
Montroydite	-8.69	-12.33	-3.64	HgO
MoO3	-14.50	-22.50	-8.00	MoO3
Morenosite	-8.60	-10.74	-2.14	NiSO4:7H2O
MoS2	-149.57	-219.83	-70.26	MoS2
Na-Jarosite	-11.14	-22.34	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.59	-50.48	-9.90	Na2Cr2O7
Na2CrO4	-22.66	-19.73	2.93	Na2CrO4
Na2Mo2O7	-17.38	-33.97	-16.60	Na2Mo2O7
Na2MoO4	-12.96	-11.47	1.49	Na2MoO4
Na2MoO4:2H2O	-12.69	-11.47	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.94	-4.64	10.30	Na2SeO3:5H2O
Na2SeO4	-16.97	-15.69	1.28	Na2SeO4
Na3Sb	-173.83	-79.38	94.45	Na3Sb
Na3VO4	-29.72	6.96	36.68	Na3VO4
Na4V2O7	-34.51	2.89	37.40	Na4V2O7
Nantokite	-5.66	-12.39	-6.73	CuCl
NaSb	-88.32	-65.15	23.17	NaSb
Natron	-8.74	-10.05	-1.31	Na2CO3:10H2O
NaVO3	-7.93	-4.07	3.86	NaVO3
Nesquehonite	-3.86	-8.53	-4.67	MgCO3:3H2O
Ni(OH)2	-4.87	7.92	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.34	-7.64	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.98	13.02	32.00	Ni4(OH)6SO4
NiCO3	-6.29	-13.16	-6.87	NiCO3
NiMoO4	-3.44	-14.58	-11.14	NiMoO4
NiS (alpha)	-72.52	-78.12	-5.60	NiS
NiS (beta)	-67.02	-78.12	-11.10	NiS
NiS (gamma)	-65.32	-78.12	-12.80	NiS
NiSe	-20.97	-38.67	-17.70	NiSe
NiSeO3:2H2O	-10.57	-7.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.28	-18.80	-1.52	NiSeO4:6H2O
Nsutite	-7.02	10.49	17.50	MnO2
O2 (g)	-32.57	50.52	83.09	O2
Orpiment	-241.17	-302.23	-61.07	As2S3
Otavite	-2.24	-14.24	-12.00	CdCO3
Pb(BO2)2	-10.72	-4.20	6.52	Pb(BO2)2
Pb(OH)2	-2.46	5.69	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-60.84	-69.60	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.06	0.73	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.81	11.38	26.19	Pb2O(OH)2
Pb2O3	-24.40	36.64	61.04	Pb2O3
Pb2OCO3	-9.15	-9.70	-0.56	Pb2OCO3
Pb2V2O7	-5.90	-7.80	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.14	-14.34	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.25	-2.11	6.14	Pb3(VO4)2
Pb3O2CO3	-15.03	-4.01	11.02	Pb3O2CO3
Pb3O2SO4	-12.28	-1.60	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.01	4.09	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.78	4.09	21.88	Pb4O3SO4
PbCrO4	-12.47	-25.07	-12.60	PbCrO4
PbF2	-10.85	-18.29	-7.44	PbF2
Pbmetal	-23.82	-19.57	4.25	Pb
PbMoO4	-1.19	-16.81	-15.62	PbMoO4
PbO:0.3H2O	-7.29	5.69	12.98	PbO:0.33H2O
PbSeO4	-14.19	-21.03	-6.84	PbSeO4
Periclase	-9.04	12.55	21.58	MgO
Phosgenite	-11.18	-30.99	-19.81	PbCl2:PbCO3
Plattnerite	-18.65	30.95	49.60	PbO2

Portlandite	-10.28	12.53	22.80	Ca (OH) 2
Pyrite	-124.75	-143.25	-18.51	FeS2
Pyrochroite	-4.62	10.58	15.19	Mn (OH) 2
Pyrolusite	-5.54	35.84	41.38	MnO2
Quartz	0.25	-3.75	-4.00	SiO2
Realgar	-100.98	-120.73	-19.75	AsS
Retgersite	-8.70	-10.74	-2.04	NiSO4:6H2O
Rhodochrosite	0.08	-10.50	-10.58	MnCO3
Rutherfordine	-5.03	-19.53	-14.50	UO2CO3
Sb (OH) 3	-13.04	-20.15	-7.11	Sb (OH) 3
Sb2O4	-18.45	-15.04	3.40	Sb2O4
Sb2O5	-28.74	-38.40	-9.67	Sb2O5
Sb2Se3	-112.32	-180.07	-67.76	Sb2Se3
Sb4O6 (cubic)	-62.34	-80.60	-18.26	Sb4O6
Sb4O6 (orth)	-62.70	-80.60	-17.90	Sb4O6
SbCl3	-52.66	-52.08	0.57	SbCl3
SbF3	-45.89	-56.11	-10.23	SbF3
Sbmetal	-46.35	-58.04	-11.69	Sb
SbO2	-4.01	-31.83	-27.82	SbO2
Schoepite	-4.44	1.55	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.22	-21.33	-7.11	Se
Semetal (hex)	-13.62	-21.33	-7.71	Se
Senarmontite	-27.94	-40.30	-12.37	Sb2O3
SeO2	-15.80	-15.67	0.12	SeO2
SeO3	-47.77	-26.72	21.04	SeO3
Sepiolite	-1.92	13.84	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-4.94	13.84	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.28	-17.52	-10.24	FeCO3
SiO2 (am-gel)	-1.04	-3.75	-2.71	SiO2
SiO2 (am-ppt)	-1.01	-3.75	-2.74	SiO2
Smithsonite	-1.50	-11.50	-10.00	ZnCO3
Sphalerite	-65.01	-76.46	-11.45	ZnS
Spinel	-7.51	29.33	36.85	MgAl2O4
Stibnite	-247.95	-298.41	-50.46	Sb2S3
Sulfur	-58.63	-60.78	-2.14	S
Tenorite	0.55	8.20	7.64	CuO
Thenardite	-7.95	-7.63	0.32	Na2SO4
Thermonatrite	-10.68	-10.05	0.64	Na2CO3:H2O
Tyuyamunite	-7.62	-3.54	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.03	7.05	21.08	U3O8
U3Sb4	-579.56	-427.18	152.38	U3Sb4
U4O9	-29.68	-32.70	-3.02	U4O9
UF4	-32.90	-62.44	-29.54	UF4
UF4:2.5H2O	-29.72	-62.44	-32.72	UF4:2.5H2O
UO2 (am)	-15.42	-14.49	0.93	UO2
UO2 (NO3) 2	-44.35	-32.21	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-37.06	-32.21	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-35.60	-32.21	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-34.25	-32.21	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.06	1.55	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.92	-25.17	-2.25	UO2SeO4:4H2O
UO3	-6.15	1.55	7.70	UO3
Uraninite	-9.82	-14.49	-4.67	UO2
USb2	-219.88	-190.30	29.58	USb2
V (OH) 3	-19.84	-12.25	7.59	V (OH) 3
V2O5	-17.82	-19.18	-1.36	V2O5
V3O5	-43.04	-41.20	1.84	V3O5
V4O7	-53.70	-46.52	7.19	V4O7
V6O13	-47.19	-108.05	-60.86	V6O13
Valentinite	-31.82	-40.30	-8.48	Sb2O3
VC12	-65.04	-46.17	18.87	VC12
VC13	-67.61	-44.18	23.43	VC13
VF4	-68.19	-53.26	14.93	VF4
Vmetal	-94.16	-50.14	44.03	V
VO	-39.63	-24.88	14.76	VO
VO (OH) 2	-10.47	-5.31	5.15	VO (OH) 2
VO2Cl	-23.07	-20.23	2.84	VO2Cl
VOC1	-34.04	-22.89	11.15	VOC1

VOC12	-39.36	-26.60	12.76	VOC12
VOSO4	-27.59	-23.98	3.61	VOSO4
Witherite	-4.84	-13.41	-8.57	BaCO3
Wurtzite	-67.51	-76.46	-8.95	ZnS
Zincite	-1.76	9.58	11.33	ZnO
Zincosite	-13.01	-9.08	3.93	ZnSO4
Zn(BO2)2	-8.60	-0.31	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-27.50	-24.18	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.62	9.58	12.20	Zn(OH)2
Zn(OH)2(am)	-2.90	9.58	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.18	9.58	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.96	9.58	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.16	9.58	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.01	0.49	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.68	8.51	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.32	-2.67	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.50	-8.59	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.75	19.65	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.90	26.60	38.50	Zn5(OH)8Cl2
ZnCl2	-18.76	-11.71	7.05	ZnCl2
ZnCO3:1H2O	-1.24	-11.50	-10.26	ZnCO3:1H2O
ZnF2	-13.86	-14.40	-0.53	ZnF2
Znmetal	-41.47	-15.68	25.79	Zn
ZnMoO4	-2.80	-12.93	-10.13	ZnMoO4
ZnO(active)	-1.61	9.58	11.19	ZnO
ZnS(am)	-67.41	-76.46	-9.05	ZnS
ZnSb	-84.74	-73.72	11.01	ZnSb
ZnSe	-22.61	-37.01	-14.40	ZnSe
ZnSeO4:6H2O	-15.63	-17.15	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.45	-9.08	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 94.

REACTION 504
H2O -1
0.126626 moles ### Addition step. Removes HTC water but solute mass remains
USE solution 510
SAVE Solution 511
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 510. Solution after simulation 93.
Using reaction 504.

Reaction 504.

1.266e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000
	Relative

Element	moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	5.448e-09	5.449e-09
Al	4.712e-07	4.713e-07
As	1.528e-09	1.528e-09
B	1.198e-05	1.198e-05
Ba	1.101e-08	1.102e-08
C	1.708e-03	1.709e-03
Ca	9.768e-04	9.770e-04
Cd	2.382e-09	2.383e-09
Cl	2.084e-03	2.084e-03
Co	1.838e-08	1.838e-08
Cr	9.827e-10	9.829e-10
Cu	9.192e-07	9.194e-07
F	1.009e-04	1.009e-04
Fe	9.286e-10	9.288e-10
Hg	3.756e-10	3.757e-10
K	7.106e-04	7.108e-04
Mg	9.829e-04	9.831e-04
Mn	1.124e-05	1.125e-05
Mo	3.323e-07	3.323e-07
N	2.706e-06	2.706e-06
Na	4.540e-03	4.541e-03
Ni	2.863e-08	2.863e-08
Pb	1.696e-09	1.697e-09
S	2.659e-03	2.660e-03
Sb	5.022e-09	5.023e-09
Se	2.937e-08	2.938e-08
Si	1.796e-04	1.797e-04
U	5.239e-08	5.240e-08
V	1.577e-09	1.577e-09
Zn	1.350e-06	1.351e-06

-----Description of solution-----

	pH =	7.913	Charge balance
	pe =	4.717	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.243e-02	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	1.692e-03	
	Total CO2 (mol/kg) =	1.708e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	3.203e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	3	
	Total H =	1.110420e+02	
	Total O =	5.553626e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.252e-07	8.238e-07	-6.034	-6.084	-0.050	(0)
H+	1.369e-08	1.222e-08	-7.864	-7.913	-0.049	0.00
H2O	5.551e+01	9.998e-01	1.744	-0.000	0.000	18.07
Ag	5.448e-09					
AgCl	3.659e-09	3.659e-09	-8.437	-8.437	0.000	(0)
Ag+	1.079e-09	9.631e-10	-8.967	-9.016	-0.049	(0)

	AgCl2-	6.758e-10	5.928e-10	-9.170	-9.227	-0.057	(0)
	AgSO4-	3.210e-11	2.816e-11	-10.493	-10.550	-0.057	(0)
	AgCl3-2	1.659e-12	9.830e-13	-11.780	-12.007	-0.227	(0)
	AgNO2	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)
	AgF	2.043e-13	2.043e-13	-12.690	-12.690	0.000	(0)
	AgOH	7.935e-14	7.935e-14	-13.100	-13.100	0.000	(0)
	AgNH3+	1.858e-14	1.630e-14	-13.731	-13.788	-0.057	(0)
	Ag2Se	1.301e-14	1.301e-14	-13.886	-13.886	0.000	(0)
	AgCl4-3	1.213e-14	3.734e-15	-13.916	-14.428	-0.512	(0)
	AgH2BO3	8.249e-15	8.249e-15	-14.084	-14.084	0.000	(0)
	AgSeO3-	3.993e-15	3.503e-15	-14.399	-14.456	-0.057	(0)
	Ag (OH) 2-	7.281e-18	6.388e-18	-17.138	-17.195	-0.057	(0)
	Ag (NO2) 2-	1.744e-18	1.530e-18	-17.759	-17.815	-0.057	(0)
	Ag (NH3) 2+	1.252e-18	1.098e-18	-17.902	-17.959	-0.057	(0)
	AgNO3	8.281e-19	8.281e-19	-18.082	-18.082	0.000	(0)
	Ag (SeO3) 2-3	5.766e-22	1.775e-22	-21.239	-21.751	-0.512	(0)
	Ag2MoO4	7.411e-26	7.411e-26	-25.130	-25.130	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.325	-73.325	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.231	-83.141	-0.910	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.771	-146.918	-0.147	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.290	-147.347	-0.057	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.162	-148.445	-0.283	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.484	-148.756	-0.272	(0)
Al		4.712e-07					
	Al (OH) 4-	4.668e-07	4.172e-07	-6.331	-6.380	-0.049	(0)
	Al (OH) 3	4.023e-09	4.023e-09	-8.395	-8.395	0.000	(0)
	Al (OH) 2+	2.730e-10	2.447e-10	-9.564	-9.611	-0.047	(0)
	AlF2+	1.438e-11	1.289e-11	-10.842	-10.890	-0.047	(0)
	AlF3	1.370e-11	1.370e-11	-10.863	-10.863	0.000	(0)
	AlF4-	6.488e-13	5.798e-13	-12.188	-12.237	-0.049	(0)
	AlF+2	5.935e-13	3.833e-13	-12.227	-12.416	-0.190	(0)
	AlOH+2	5.790e-13	3.740e-13	-12.237	-12.427	-0.190	(0)
	AlSO4+	5.778e-15	5.164e-15	-14.238	-14.287	-0.049	(0)
	Al+3	1.260e-15	4.539e-16	-14.900	-15.343	-0.443	(0)
	Al (SO4) 2-	9.074e-17	8.110e-17	-16.042	-16.091	-0.049	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-47.370	-47.881	-0.512	(0)
As (3)		9.086e-23					
	H3AsO3	8.671e-23	8.671e-23	-22.062	-22.062	0.000	(0)
	H2AsO3-	4.148e-24	3.639e-24	-23.382	-23.439	-0.057	(0)
	HAsO3-2	4.585e-28	2.716e-28	-27.339	-27.566	-0.227	(0)
	H4AsO3+	5.984e-31	5.250e-31	-30.223	-30.280	-0.057	(0)
	AsO3-3	2.783e-33	8.568e-34	-32.555	-33.067	-0.512	(0)
As (5)		1.528e-09					
	HAsO4-2	1.420e-09	8.412e-10	-8.848	-9.075	-0.227	(0)
	H2AsO4-	1.069e-10	9.375e-11	-9.971	-10.028	-0.057	(0)
	AsO4-3	7.072e-13	2.177e-13	-12.150	-12.662	-0.512	(0)
	H3AsO4	1.985e-16	1.991e-16	-15.702	-15.701	0.001	(0)
B		1.198e-05					
	H3BO3	1.134e-05	1.137e-05	-4.945	-4.944	0.001	(0)
	H2BO3-	6.092e-07	5.404e-07	-6.215	-6.267	-0.052	(0)
	CaH2BO3+	1.756e-08	1.558e-08	-7.755	-7.807	-0.052	(0)
	MgH2BO3+	1.108e-08	9.832e-09	-7.955	-8.007	-0.052	(0)
	NaH2BO3	3.441e-09	3.441e-09	-8.463	-8.463	0.000	(0)
	BF (OH) 3-	4.319e-10	3.831e-10	-9.365	-9.417	-0.052	(0)
	H5 (BO3) 2-	5.896e-12	5.229e-12	-11.229	-11.282	-0.052	(0)
	BaH2BO3+	1.302e-13	1.155e-13	-12.885	-12.937	-0.052	(0)
	BF2 (OH) 2-	4.766e-14	4.227e-14	-13.322	-13.374	-0.052	(0)
	AgH2BO3	8.249e-15	8.249e-15	-14.084	-14.084	0.000	(0)
	H8 (BO3) 3-	6.703e-15	5.946e-15	-14.174	-14.226	-0.052	(0)
	BF3OH-	1.914e-20	1.697e-20	-19.718	-19.770	-0.052	(0)
	BF4-	9.719e-26	8.620e-26	-25.012	-25.064	-0.052	(0)
Ba		1.101e-08					
	Ba+2	1.089e-08	6.917e-09	-7.963	-8.160	-0.197	(0)
	BaHCO3+	1.071e-10	9.616e-11	-9.970	-10.017	-0.047	(0)
	BaCO3	1.981e-11	1.981e-11	-10.703	-10.703	0.000	(0)
	BaH2BO3+	1.302e-13	1.155e-13	-12.885	-12.937	-0.052	(0)
	BaOH+	2.779e-14	2.487e-14	-13.556	-13.604	-0.048	(0)
	BaNH3+2	6.108e-17	3.618e-17	-16.214	-16.442	-0.227	(0)

BaNO3+	4.277e-17	3.753e-17	-16.369	-16.426	-0.057	(0)
C(4)	1.708e-03					
HCO3-	1.624e-03	1.456e-03	-2.789	-2.837	-0.047	(0)
H2CO3	4.001e-05	4.001e-05	-4.398	-4.398	0.000	(0)
CaHCO3+	1.512e-05	1.358e-05	-4.820	-4.867	-0.047	(0)
CO3-2	8.790e-06	5.585e-06	-5.056	-5.253	-0.197	(0)
MgHCO3+	8.762e-06	7.817e-06	-5.057	-5.107	-0.050	(0)
CaCO3	4.434e-06	4.434e-06	-5.353	-5.353	0.000	(0)
NaHCO3	3.289e-06	3.289e-06	-5.483	-5.483	0.000	(0)
MgCO3	2.438e-06	2.438e-06	-5.613	-5.613	0.000	(0)
CuCO3	7.721e-07	7.721e-07	-6.112	-6.112	0.000	(0)
NaCO3-	4.661e-07	4.178e-07	-6.332	-6.379	-0.047	(0)
MnHCO3+	1.833e-07	1.641e-07	-6.737	-6.785	-0.048	(0)
ZnCO3	1.814e-07	1.814e-07	-6.741	-6.741	0.000	(0)
UO2 (CO3) 3-4	2.999e-08	3.693e-09	-7.523	-8.433	-0.910	(0)
ZnHCO3+	2.962e-08	2.598e-08	-7.528	-7.585	-0.057	(0)
UO2 (CO3) 2-2	2.227e-08	1.319e-08	-7.652	-7.880	-0.227	(0)
Cu (CO3) 2-2	1.959e-08	1.161e-08	-7.708	-7.935	-0.227	(0)
NiCO3	2.594e-09	2.594e-09	-8.586	-8.586	0.000	(0)
NiHCO3+	2.546e-09	2.234e-09	-8.594	-8.651	-0.057	(0)
CuHCO3+	2.458e-09	2.156e-09	-8.609	-8.666	-0.057	(0)
PbCO3	1.224e-09	1.224e-09	-8.912	-8.912	0.000	(0)
CoHCO3+	1.062e-09	9.315e-10	-8.974	-9.031	-0.057	(0)
CoCO3	7.766e-10	7.766e-10	-9.110	-9.110	0.000	(0)
CdCO3	1.330e-10	1.330e-10	-9.876	-9.876	0.000	(0)
UO2CO3	1.184e-10	1.184e-10	-9.927	-9.927	0.000	(0)
BaHCO3+	1.071e-10	9.616e-11	-9.970	-10.017	-0.047	(0)
PbHCO3+	8.985e-11	7.883e-11	-10.046	-10.103	-0.057	(0)
Pb (CO3) 2-2	3.327e-11	1.971e-11	-10.478	-10.705	-0.227	(0)
BaCO3	1.981e-11	1.981e-11	-10.703	-10.703	0.000	(0)
CdHCO3+	3.948e-12	3.463e-12	-11.404	-11.461	-0.057	(0)
Cd (CO3) 2-2	9.297e-13	5.507e-13	-12.032	-12.259	-0.227	(0)
FeHCO3+	1.105e-14	9.928e-15	-13.957	-14.003	-0.047	(0)
HgCO3	7.358e-16	7.358e-16	-15.133	-15.133	0.000	(0)
Hg (CO3) 2-2	2.194e-17	1.300e-17	-16.659	-16.886	-0.227	(0)
HgHCO3+	1.908e-19	1.674e-19	-18.719	-18.776	-0.057	(0)
Ca	9.768e-04					
Ca+2	7.885e-04	5.010e-04	-3.103	-3.300	-0.197	(0)
CaSO4	1.682e-04	1.682e-04	-3.774	-3.774	0.000	(0)
CaHCO3+	1.512e-05	1.358e-05	-4.820	-4.867	-0.047	(0)
CaCO3	4.434e-06	4.434e-06	-5.353	-5.353	0.000	(0)
CaF+	5.158e-07	4.617e-07	-6.288	-6.336	-0.048	(0)
CaH2BO3+	1.756e-08	1.558e-08	-7.755	-7.807	-0.052	(0)
CaOH+	9.168e-09	8.235e-09	-8.038	-8.084	-0.047	(0)
CaNH3+2	8.826e-12	5.228e-12	-11.054	-11.282	-0.227	(0)
CaNO3+	1.955e-12	1.715e-12	-11.709	-11.766	-0.057	(0)
Ca (NH3) 2+2	2.913e-20	1.726e-20	-19.536	-19.763	-0.227	(0)
Cd	2.382e-09					
Cd+2	1.645e-09	1.045e-09	-8.784	-8.981	-0.197	(0)
CdSO4	3.590e-10	3.590e-10	-9.445	-9.445	0.000	(0)
CdCl+	2.116e-10	1.857e-10	-9.674	-9.731	-0.057	(0)
CdCO3	1.330e-10	1.330e-10	-9.876	-9.876	0.000	(0)
Cd (SO4) 2-2	1.198e-11	7.098e-12	-10.921	-11.149	-0.227	(0)
CdOH+	7.795e-12	6.838e-12	-11.108	-11.165	-0.057	(0)
CdOHC1	6.274e-12	6.274e-12	-11.202	-11.202	0.000	(0)
CdHCO3+	3.948e-12	3.463e-12	-11.404	-11.461	-0.057	(0)
CdF+	1.594e-12	1.399e-12	-11.797	-11.854	-0.057	(0)
CdCl2	1.440e-12	1.440e-12	-11.842	-11.842	0.000	(0)
Cd (CO3) 2-2	9.297e-13	5.507e-13	-12.032	-12.259	-0.227	(0)
Cd (OH) 2	3.555e-14	3.555e-14	-13.449	-13.449	0.000	(0)
CdCl3-	1.927e-15	1.690e-15	-14.715	-14.772	-0.057	(0)
CdF2	2.356e-16	2.356e-16	-15.628	-15.628	0.000	(0)
CdNO3+	4.077e-18	3.577e-18	-17.390	-17.446	-0.057	(0)
CdSeO4	2.471e-18	2.471e-18	-17.607	-17.607	0.000	(0)
Cd (OH) 3-	2.039e-18	1.789e-18	-17.691	-17.747	-0.057	(0)
Cd2OH+3	1.163e-19	3.581e-20	-18.934	-19.446	-0.512	(0)
Cd (SeO3) 2-2	4.656e-20	2.758e-20	-19.332	-19.559	-0.227	(0)
Cd (OH) 4-2	4.073e-25	2.412e-25	-24.390	-24.618	-0.227	(0)

	Cd(NO3)2	1.941e-27	1.941e-27	-26.712	-26.712	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.039	-79.096	-0.057	(0)
	Cd(HS)2	0.000e+00	0.000e+00	-150.014	-150.014	0.000	(0)
	Cd(HS)3-	0.000e+00	0.000e+00	-226.180	-226.237	-0.057	(0)
	Cd(HS)4-2	0.000e+00	0.000e+00	-301.936	-302.164	-0.227	(0)
C1		2.084e-03					
	Cl-	2.084e-03	1.860e-03	-2.681	-2.730	-0.049	(0)
	MnCl+	1.478e-08	1.323e-08	-7.830	-7.878	-0.048	(0)
	AgCl	3.659e-09	3.659e-09	-8.437	-8.437	0.000	(0)
	ZnCl+	2.957e-09	2.638e-09	-8.529	-8.579	-0.050	(0)
	ZnOHC1	2.845e-09	2.845e-09	-8.546	-8.546	0.000	(0)
	AgCl2-	6.758e-10	5.928e-10	-9.170	-9.227	-0.057	(0)
	CuCl	5.172e-10	5.172e-10	-9.286	-9.286	0.000	(0)
	CuCl2-	2.254e-10	2.011e-10	-9.647	-9.697	-0.050	(0)
	CdCl+	2.116e-10	1.857e-10	-9.674	-9.731	-0.057	(0)
	CuCl+	7.760e-11	6.923e-11	-10.110	-10.160	-0.050	(0)
	NiCl+	6.754e-11	5.925e-11	-10.170	-10.227	-0.057	(0)
	CoCl+	6.035e-11	5.295e-11	-10.219	-10.276	-0.057	(0)
	MnCl2	3.478e-11	3.478e-11	-10.459	-10.459	0.000	(0)
	ZnCl2	7.778e-12	7.778e-12	-11.109	-11.109	0.000	(0)
	CdOHC1	6.274e-12	6.274e-12	-11.202	-11.202	0.000	(0)
	PbCl+	5.484e-12	4.811e-12	-11.261	-11.318	-0.057	(0)
	AgCl3-2	1.659e-12	9.830e-13	-11.780	-12.007	-0.227	(0)
	CdCl2	1.440e-12	1.440e-12	-11.842	-11.842	0.000	(0)
	HgClOH	2.980e-13	2.980e-13	-12.526	-12.526	0.000	(0)
	CuCl3-2	1.245e-13	7.997e-14	-12.905	-13.097	-0.192	(0)
	CuCl2	4.466e-14	4.466e-14	-13.350	-13.350	0.000	(0)
	PbCl2	3.998e-14	3.998e-14	-13.398	-13.398	0.000	(0)
	HgCl2	3.811e-14	3.811e-14	-13.419	-13.419	0.000	(0)
	MnCl3-	1.991e-14	1.782e-14	-13.701	-13.749	-0.048	(0)
	ZnCl3-	1.288e-14	1.149e-14	-13.890	-13.940	-0.050	(0)
	AgCl4-3	1.213e-14	3.734e-15	-13.916	-14.428	-0.512	(0)
	CdCl3-	1.927e-15	1.690e-15	-14.715	-14.772	-0.057	(0)
	HgCl3-	8.081e-16	7.090e-16	-15.093	-15.149	-0.057	(0)
	NiCl2	5.550e-16	5.550e-16	-15.256	-15.256	0.000	(0)
	PbCl3-	3.375e-17	2.961e-17	-16.472	-16.529	-0.057	(0)
	UO2Cl+	1.832e-17	1.607e-17	-16.737	-16.794	-0.057	(0)
	ZnCl4-2	1.665e-17	1.069e-17	-16.779	-16.971	-0.192	(0)
	HgCl4-2	8.865e-18	5.251e-18	-17.052	-17.280	-0.227	(0)
	HgCl+	4.658e-18	4.087e-18	-17.332	-17.389	-0.057	(0)
	CrCl+2	1.479e-18	8.760e-19	-17.830	-18.057	-0.227	(0)
	CuCl3-	8.692e-19	7.754e-19	-18.061	-18.110	-0.050	(0)
	PbCl4-2	4.251e-20	2.518e-20	-19.371	-19.599	-0.227	(0)
	CrOHC12	2.552e-20	2.552e-20	-19.593	-19.593	0.000	(0)
	FeCl+2	2.292e-22	1.472e-22	-21.640	-21.832	-0.192	(0)
	CrCl2+	1.763e-22	1.546e-22	-21.754	-21.811	-0.057	(0)
	CuCl4-2	1.126e-23	7.230e-24	-22.949	-23.141	-0.192	(0)
	VOCl+	4.315e-24	3.786e-24	-23.365	-23.422	-0.057	(0)
	FeCl2+	1.367e-24	1.224e-24	-23.864	-23.912	-0.048	(0)
	CrO3Cl-	7.556e-27	6.628e-27	-26.122	-26.179	-0.057	(0)
	FeCl3	2.276e-28	2.276e-28	-27.643	-27.643	0.000	(0)
	CoCl+2	1.090e-36	6.455e-37	-35.963	-36.190	-0.227	(0)
	UCl+3	0.000e+00	0.000e+00	-46.661	-47.173	-0.512	(0)
	Co(NH3)5Cl+2	0.000e+00	0.000e+00	-50.417	-50.644	-0.227	(0)
	Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-52.329	-52.556	-0.227	(0)
	Co(NH3)6Cl+2	0.000e+00	0.000e+00	-65.214	-65.441	-0.227	(0)
Co(2)		1.838e-08					
	Co+2	1.389e-08	8.226e-09	-7.857	-8.085	-0.227	(0)
	CoSO4	2.406e-09	2.406e-09	-8.619	-8.619	0.000	(0)
	CoHCO3+	1.062e-09	9.315e-10	-8.974	-9.031	-0.057	(0)
	CoCO3	7.766e-10	7.766e-10	-9.110	-9.110	0.000	(0)
	CoOH+	1.541e-10	1.352e-10	-9.812	-9.869	-0.057	(0)
	CoCl+	6.035e-11	5.295e-11	-10.219	-10.276	-0.057	(0)
	CoF+	2.504e-11	2.197e-11	-10.601	-10.658	-0.057	(0)
	Co(OH)2	8.849e-12	8.849e-12	-11.053	-11.053	0.000	(0)
	CoNO2+	1.464e-13	1.284e-13	-12.834	-12.891	-0.057	(0)
	Co(NH3)+2	1.384e-14	8.199e-15	-13.859	-14.086	-0.227	(0)
	Co(OH)3-	1.658e-16	1.455e-16	-15.780	-15.837	-0.057	(0)

CoSeO4	5.235e-17	5.235e-17	-16.281	-16.281	0.000	(0)
CoOOH-	4.161e-17	3.650e-17	-16.381	-16.438	-0.057	(0)
CoNO3+	1.609e-17	1.411e-17	-16.794	-16.850	-0.057	(0)
Co2OH+3	1.811e-19	5.575e-20	-18.742	-19.254	-0.512	(0)
Co (NH3) 2+2	4.895e-21	2.899e-21	-20.310	-20.538	-0.227	(0)
Co (OH) 4-2	3.206e-23	1.899e-23	-22.494	-22.721	-0.227	(0)
Co (NO3) 2	3.108e-26	3.108e-26	-25.507	-25.507	0.000	(0)
Co (NH3) 3+2	5.108e-28	3.026e-28	-27.292	-27.519	-0.227	(0)
Co4 (OH) 4+4	5.418e-31	6.671e-32	-30.266	-31.176	-0.910	(0)
Co (NH3) 4+2	2.223e-35	1.317e-35	-34.653	-34.881	-0.227	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.515	-42.742	-0.227	(0)
Co (3)	1.205e-29					
CoOH+2	1.205e-29	7.139e-30	-28.919	-29.146	-0.227	(0)
Co+3	4.732e-36	1.705e-36	-35.325	-35.768	-0.443	(0)
CoCl+2	1.090e-36	6.455e-37	-35.963	-36.190	-0.227	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.417	-50.644	-0.227	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.563	-60.619	-0.057	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.367	-64.595	-0.227	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.214	-65.441	-0.227	(0)
Cr (2)	2.818e-27					
Cr+2	2.818e-27	1.669e-27	-26.550	-26.777	-0.227	(0)
Cr (3)	9.826e-10					
Cr (OH) 2+	7.492e-10	6.573e-10	-9.125	-9.182	-0.057	(0)
Cr (OH) 3	2.034e-10	2.034e-10	-9.692	-9.692	0.000	(0)
Cr (OH) +2	1.107e-11	6.557e-12	-10.956	-11.183	-0.227	(0)
CrO2-	9.014e-12	7.908e-12	-11.045	-11.102	-0.057	(0)
Cr (OH) 4-	7.605e-12	6.672e-12	-11.119	-11.176	-0.057	(0)
CrOHSO4	2.281e-12	2.281e-12	-11.642	-11.642	0.000	(0)
CrF+2	8.220e-15	4.869e-15	-14.085	-14.313	-0.227	(0)
CrSO4+	1.419e-15	1.245e-15	-14.848	-14.905	-0.057	(0)
Cr+3	1.182e-15	3.638e-16	-14.927	-15.439	-0.512	(0)
CrCl+2	1.479e-18	8.760e-19	-17.830	-18.057	-0.227	(0)
CrOHC12	2.552e-20	2.552e-20	-19.593	-19.593	0.000	(0)
Cr2 (OH) 2SO4+2	2.282e-21	1.352e-21	-20.642	-20.869	-0.227	(0)
CrCl2+	1.763e-22	1.546e-22	-21.754	-21.811	-0.057	(0)
Cr2 (OH) 2 (SO4) 2	1.177e-22	1.177e-22	-21.929	-21.929	0.000	(0)
CrNO3+2	2.906e-26	1.721e-26	-25.537	-25.764	-0.227	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.331	-41.558	-0.227	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.416	-50.928	-0.512	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.329	-52.556	-0.227	(0)
Cr (6)	1.927e-15					
CrO4-2	1.845e-15	1.172e-15	-14.734	-14.931	-0.197	(0)
HCrO4-	5.283e-17	4.635e-17	-16.277	-16.334	-0.057	(0)
NaCrO4-	2.668e-17	2.340e-17	-16.574	-16.631	-0.057	(0)
KCrO4-	3.117e-18	2.735e-18	-17.506	-17.563	-0.057	(0)
H2CrO4	4.591e-25	4.591e-25	-24.338	-24.338	0.000	(0)
CrO3SO4-2	4.269e-25	2.529e-25	-24.370	-24.597	-0.227	(0)
CrO3Cl-	7.556e-27	6.628e-27	-26.122	-26.179	-0.057	(0)
Cr2O7-2	1.258e-31	7.450e-32	-30.900	-31.128	-0.227	(0)
Cu (1)	9.945e-10					
CuCl	5.172e-10	5.172e-10	-9.286	-9.286	0.000	(0)
Cu+	2.517e-10	2.208e-10	-9.599	-9.656	-0.057	(0)
CuCl2-	2.254e-10	2.011e-10	-9.647	-9.697	-0.050	(0)
CuCl3-2	1.245e-13	7.997e-14	-12.905	-13.097	-0.192	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.408	-146.686	-0.278	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.148	-147.416	-0.267	(0)
Cu (2)	9.182e-07					
CuCO3	7.721e-07	7.721e-07	-6.112	-6.112	0.000	(0)
CuOH+	6.856e-08	6.116e-08	-7.164	-7.214	-0.050	(0)
Cu+2	3.695e-08	2.348e-08	-7.432	-7.629	-0.197	(0)
Cu (CO3) 2-2	1.959e-08	1.161e-08	-7.708	-7.935	-0.227	(0)
Cu (OH) 2	1.005e-08	1.005e-08	-7.998	-7.998	0.000	(0)
CuSO4	7.882e-09	7.882e-09	-8.103	-8.103	0.000	(0)
CuHCO3+	2.458e-09	2.156e-09	-8.609	-8.666	-0.057	(0)
Cu2 (OH) 2+2	1.586e-10	9.397e-11	-9.800	-10.027	-0.227	(0)
CuF+	1.426e-10	1.251e-10	-9.846	-9.903	-0.057	(0)
CuCl+	7.760e-11	6.923e-11	-10.110	-10.160	-0.050	(0)
Cu (OH) 3-	1.937e-11	1.699e-11	-10.713	-10.770	-0.057	(0)

	CuNO2+	6.208e-12	5.446e-12	-11.207	-11.264	-0.057	(0)
	CuNH3+2	3.362e-12	1.992e-12	-11.473	-11.701	-0.227	(0)
	CuCl2	4.466e-14	4.466e-14	-13.350	-13.350	0.000	(0)
	Cu(OH) 4-2	1.860e-16	1.102e-16	-15.731	-15.958	-0.227	(0)
	Cu(NO2) 2	1.235e-16	1.235e-16	-15.908	-15.908	0.000	(0)
	CuNO3+	9.160e-17	8.036e-17	-16.038	-16.095	-0.057	(0)
	CuCl3-	8.692e-19	7.754e-19	-18.061	-18.110	-0.050	(0)
	CuCl4-2	1.126e-23	7.230e-24	-22.949	-23.141	-0.192	(0)
	Cu(NO3) 2	1.095e-26	1.095e-26	-25.961	-25.961	0.000	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-216.042	-216.099	-0.057	(0)
F		1.009e-04					
	F-	9.459e-05	8.444e-05	-4.024	-4.073	-0.049	(0)
	MgF+	5.563e-06	4.972e-06	-5.255	-5.303	-0.049	(0)
	CaF+	5.158e-07	4.617e-07	-6.288	-6.336	-0.048	(0)
	NaF	2.141e-07	2.141e-07	-6.669	-6.669	0.000	(0)
	MnF+	2.122e-08	1.899e-08	-7.673	-7.721	-0.048	(0)
	HF	1.526e-09	1.526e-09	-8.816	-8.816	0.000	(0)
	ZnF+	1.084e-09	9.510e-10	-8.965	-9.022	-0.057	(0)
	BF(OH) 3-	4.319e-10	3.831e-10	-9.365	-9.417	-0.052	(0)
	CuF+	1.426e-10	1.251e-10	-9.846	-9.903	-0.057	(0)
	NiF+	3.010e-11	2.640e-11	-10.521	-10.578	-0.057	(0)
	CoF+	2.504e-11	2.197e-11	-10.601	-10.658	-0.057	(0)
	AlF2+	1.438e-11	1.289e-11	-10.842	-10.890	-0.047	(0)
	AlF3	1.370e-11	1.370e-11	-10.863	-10.863	0.000	(0)
	CdF+	1.594e-12	1.399e-12	-11.797	-11.854	-0.057	(0)
	AlF4-	6.488e-13	5.798e-13	-12.188	-12.237	-0.049	(0)
	AlF+2	5.935e-13	3.833e-13	-12.227	-12.416	-0.190	(0)
	HF2-	5.503e-13	4.900e-13	-12.259	-12.310	-0.050	(0)
	PbF+	4.943e-13	4.337e-13	-12.306	-12.363	-0.057	(0)
	AgF	2.043e-13	2.043e-13	-12.690	-12.690	0.000	(0)
	UO2F+	7.076e-14	6.207e-14	-13.150	-13.207	-0.057	(0)
	BF2(OH) 2-	4.766e-14	4.227e-14	-13.322	-13.374	-0.052	(0)
	UO2F2	1.512e-14	1.512e-14	-13.821	-13.821	0.000	(0)
	CrF+2	8.220e-15	4.869e-15	-14.085	-14.313	-0.227	(0)
	PbF2	7.207e-16	7.207e-16	-15.142	-15.142	0.000	(0)
	UO2F3-	3.655e-16	3.207e-16	-15.437	-15.494	-0.057	(0)
	CdF2	2.356e-16	2.356e-16	-15.628	-15.628	0.000	(0)
	H2F2	6.241e-18	6.241e-18	-17.205	-17.205	0.000	(0)
	FeF2+	6.125e-19	5.483e-19	-18.213	-18.261	-0.048	(0)
	VO2F	4.682e-19	4.682e-19	-18.330	-18.330	0.000	(0)
	FeF+2	3.777e-19	2.426e-19	-18.423	-18.615	-0.192	(0)
	UO2F4-2	3.631e-19	2.151e-19	-18.440	-18.667	-0.227	(0)
	PbF3-	1.316e-19	1.154e-19	-18.881	-18.938	-0.057	(0)
	FeF3	6.533e-20	6.533e-20	-19.185	-19.185	0.000	(0)
	BF3OH-	1.914e-20	1.697e-20	-19.718	-19.770	-0.052	(0)
	VO2F2-	1.636e-20	1.436e-20	-19.786	-19.843	-0.057	(0)
	VOF+	4.187e-22	3.673e-22	-21.378	-21.435	-0.057	(0)
	VO2F3-2	2.553e-23	1.512e-23	-22.593	-22.820	-0.227	(0)
	VOF2	1.163e-23	1.163e-23	-22.934	-22.934	0.000	(0)
	PbF4-2	7.876e-24	4.666e-24	-23.104	-23.331	-0.227	(0)
	HgF+	3.928e-25	3.446e-25	-24.406	-24.463	-0.057	(0)
	BF4-	9.719e-26	8.620e-26	-25.012	-25.064	-0.052	(0)
	VOF3-	3.973e-26	3.485e-26	-25.401	-25.458	-0.057	(0)
	Sb(OH) 2F	1.140e-26	1.140e-26	-25.943	-25.943	0.000	(0)
	SbOF	1.122e-26	1.122e-26	-25.950	-25.950	0.000	(0)
	VO2F4-3	2.041e-27	6.283e-28	-26.690	-27.202	-0.512	(0)
	VOF4-2	2.005e-29	1.188e-29	-28.698	-28.925	-0.227	(0)
	SiF6-2	3.390e-30	2.178e-30	-29.470	-29.662	-0.192	(0)
	UF3+	1.969e-37	1.727e-37	-36.706	-36.763	-0.057	(0)
	UF2+2	2.179e-38	1.290e-38	-37.662	-37.889	-0.227	(0)
	UF4	1.599e-39	1.599e-39	-38.796	-38.796	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.404	-40.916	-0.512	(0)
	UF5-	0.000e+00	0.000e+00	-41.215	-41.272	-0.057	(0)
	UF6-2	0.000e+00	0.000e+00	-42.638	-42.865	-0.227	(0)
Fe(2)		1.140e-12					
	Fe+2	9.145e-13	5.417e-13	-12.039	-12.266	-0.227	(0)
	FeSO4	1.949e-13	1.949e-13	-12.710	-12.710	0.000	(0)
	FeOH+	1.985e-14	1.777e-14	-13.702	-13.750	-0.048	(0)

FeHCO3+	1.105e-14	9.928e-15	-13.957	-14.003	-0.047	(0)
Fe (OH) 2	1.163e-17	1.163e-17	-16.935	-16.935	0.000	(0)
Fe (OH) 3-	3.383e-18	3.029e-18	-17.471	-17.519	-0.048	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.562	-159.562	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.591	-235.647	-0.057	(0)
Fe (3)	9.274e-10					
Fe (OH) 2+	4.983e-10	4.467e-10	-9.302	-9.350	-0.047	(0)
Fe (OH) 3	3.953e-10	3.953e-10	-9.403	-9.403	0.000	(0)
Fe (OH) 4-	3.382e-11	3.032e-11	-10.471	-10.518	-0.047	(0)
FeOH+2	2.170e-15	1.394e-15	-14.664	-14.856	-0.192	(0)
FeF2+	6.125e-19	5.483e-19	-18.213	-18.261	-0.048	(0)
FeF+2	3.777e-19	2.426e-19	-18.423	-18.615	-0.192	(0)
FeF3	6.533e-20	6.533e-20	-19.185	-19.185	0.000	(0)
FeSO4+	4.813e-20	4.309e-20	-19.318	-19.366	-0.048	(0)
Fe+3	7.271e-21	2.620e-21	-20.138	-20.582	-0.443	(0)
Fe (SO4) 2-	1.539e-21	1.350e-21	-20.813	-20.870	-0.057	(0)
FeCl+2	2.292e-22	1.472e-22	-21.640	-21.832	-0.192	(0)
FeCl2+	1.367e-24	1.224e-24	-23.864	-23.912	-0.048	(0)
FeHSeO3+2	2.031e-25	1.203e-25	-24.692	-24.920	-0.227	(0)
Fe2 (OH) 2+4	5.225e-28	6.433e-29	-27.282	-28.192	-0.910	(0)
FeCl3	2.276e-28	2.276e-28	-27.643	-27.643	0.000	(0)
FeNO3+2	4.788e-29	2.837e-29	-28.320	-28.547	-0.227	(0)
Fe3 (OH) 4+5	1.096e-35	4.154e-37	-34.960	-36.382	-1.421	(0)
H (0)	7.776e-29					
H2	3.888e-29	3.899e-29	-28.410	-28.409	0.001	(0)
Hg (0)	3.748e-10					
Hg	3.748e-10	3.748e-10	-9.426	-9.426	0.000	(0)
Hg (1)	9.457e-23					
Hg2+2	4.729e-23	2.801e-23	-22.325	-22.553	-0.227	(0)
Hg (2)	8.078e-13					
Hg (OH) 2	4.701e-13	4.714e-13	-12.328	-12.327	0.001	(0)
HgClOH	2.980e-13	2.980e-13	-12.526	-12.526	0.000	(0)
HgCl2	3.811e-14	3.811e-14	-13.419	-13.419	0.000	(0)
HgCl3-	8.081e-16	7.090e-16	-15.093	-15.149	-0.057	(0)
HgCO3	7.358e-16	7.358e-16	-15.133	-15.133	0.000	(0)
Hg (CO3) 2-2	2.194e-17	1.300e-17	-16.659	-16.886	-0.227	(0)
HgCl4-2	8.865e-18	5.251e-18	-17.052	-17.280	-0.227	(0)
HgCl+	4.658e-18	4.087e-18	-17.332	-17.389	-0.057	(0)
HgOH+	4.116e-18	3.611e-18	-17.386	-17.442	-0.057	(0)
HgHCO3+	1.908e-19	1.674e-19	-18.719	-18.776	-0.057	(0)
Hg (OH) 3-	5.573e-20	4.890e-20	-19.254	-19.311	-0.057	(0)
Hg (NH3) 2+2	8.059e-21	4.774e-21	-20.094	-20.321	-0.227	(0)
HgNH3+2	9.721e-22	5.758e-22	-21.012	-21.240	-0.227	(0)
Hg+2	1.858e-22	1.101e-22	-21.731	-21.958	-0.227	(0)
HgSO4	4.224e-23	4.224e-23	-22.374	-22.374	0.000	(0)
HgF+	3.928e-25	3.446e-25	-24.406	-24.463	-0.057	(0)
Hg (NH3) 3+2	2.660e-28	1.575e-28	-27.575	-27.803	-0.227	(0)
HgNO3+	5.015e-32	4.400e-32	-31.300	-31.357	-0.057	(0)
Hg (NH3) 4+2	1.751e-35	1.037e-35	-34.757	-34.984	-0.227	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.703	-40.703	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.306	-138.363	-0.057	(0)
HgS2-2	0.000e+00	0.000e+00	-138.930	-139.158	-0.227	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.882	-139.882	0.000	(0)
K	7.106e-04					
K+	7.034e-04	6.280e-04	-3.153	-3.202	-0.049	(0)
KSO4-	7.268e-06	6.515e-06	-5.139	-5.186	-0.047	(0)
KCrO4-	3.117e-18	2.735e-18	-17.506	-17.563	-0.057	(0)
Mg	9.829e-04					
Mg+2	8.259e-04	5.248e-04	-3.083	-3.280	-0.197	(0)
MgSO4	1.399e-04	1.399e-04	-3.854	-3.854	0.000	(0)
MgHCO3+	8.762e-06	7.817e-06	-5.057	-5.107	-0.050	(0)
MgF+	5.563e-06	4.972e-06	-5.255	-5.303	-0.049	(0)
MgCO3	2.438e-06	2.438e-06	-5.613	-5.613	0.000	(0)
MgOH+	1.913e-07	1.721e-07	-6.718	-6.764	-0.046	(0)
MgH2BO3+	1.108e-08	9.832e-09	-7.955	-8.007	-0.052	(0)
Mn (2)	1.124e-05					
Mn+2	9.538e-06	5.650e-06	-5.021	-5.248	-0.227	(0)
MnSO4	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)

MnHCO3+	1.833e-07	1.641e-07	-6.737	-6.785	-0.048	(0)
MnF+	2.122e-08	1.899e-08	-7.673	-7.721	-0.048	(0)
MnCl+	1.478e-08	1.323e-08	-7.830	-7.878	-0.048	(0)
MnOH+	1.306e-08	1.169e-08	-7.884	-7.932	-0.048	(0)
MnCl2	3.478e-11	3.478e-11	-10.459	-10.459	0.000	(0)
MnCl3-	1.991e-14	1.782e-14	-13.701	-13.749	-0.048	(0)
MnSeO4	1.931e-14	1.931e-14	-13.714	-13.714	0.000	(0)
MnNO3+	1.105e-14	9.693e-15	-13.957	-14.014	-0.057	(0)
Mn (OH) 3-	5.478e-17	4.904e-17	-16.261	-16.309	-0.048	(0)
Mn (OH) 4-2	2.031e-22	1.304e-22	-21.692	-21.885	-0.192	(0)
Mn (NO3) 2	2.635e-23	2.635e-23	-22.579	-22.579	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.397	-41.397	0.000	(0)
Mn (3)	3.646e-26					
Mn+3	3.646e-26	1.314e-26	-25.438	-25.881	-0.443	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.308	-41.500	-0.192	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.105	-46.156	-0.051	(0)
Mo	3.323e-07					
MoO4-2	3.322e-07	2.111e-07	-6.479	-6.676	-0.197	(0)
HMoO4-	5.850e-11	5.132e-11	-10.233	-10.290	-0.057	(0)
H2MoO4	4.593e-15	4.593e-15	-14.338	-14.338	0.000	(0)
Ag2MoO4	7.411e-26	7.411e-26	-25.130	-25.130	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.370	-47.881	-0.512	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.995	-57.042	-2.047	(0)
HMo7O24-5	0.000e+00	0.000e+00	-57.147	-58.568	-1.421	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-60.789	-61.699	-0.910	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-65.854	-66.366	-0.512	(0)
N (-3)	2.117e-07					
NH4+	2.003e-07	1.777e-07	-6.698	-6.750	-0.052	(0)
NH3	8.290e-09	8.290e-09	-8.081	-8.081	0.000	(0)
NH4SO4-	3.117e-09	2.790e-09	-8.506	-8.554	-0.048	(0)
CaNH3+2	8.826e-12	5.228e-12	-11.054	-11.282	-0.227	(0)
CuNH3+2	3.362e-12	1.992e-12	-11.473	-11.701	-0.227	(0)
NiNH3+2	9.355e-14	5.542e-14	-13.029	-13.256	-0.227	(0)
AgNH3+	1.858e-14	1.630e-14	-13.731	-13.788	-0.057	(0)
Co (NH3) +2	1.384e-14	8.199e-15	-13.859	-14.086	-0.227	(0)
BaNH3+2	6.108e-17	3.618e-17	-16.214	-16.442	-0.227	(0)
Ag (NH3) 2+	1.252e-18	1.098e-18	-17.902	-17.959	-0.057	(0)
Ni (NH3) 2+2	1.121e-19	6.640e-20	-18.950	-19.178	-0.227	(0)
Ca (NH3) 2+2	2.913e-20	1.726e-20	-19.536	-19.763	-0.227	(0)
Hg (NH3) 2+2	8.059e-21	4.774e-21	-20.094	-20.321	-0.227	(0)
Co (NH3) 2+2	4.895e-21	2.899e-21	-20.310	-20.538	-0.227	(0)
HgNH3+2	9.721e-22	5.758e-22	-21.012	-21.240	-0.227	(0)
Co (NH3) 3+2	5.108e-28	3.026e-28	-27.292	-27.519	-0.227	(0)
Hg (NH3) 3+2	2.660e-28	1.575e-28	-27.575	-27.803	-0.227	(0)
Co (NH3) 4+2	2.223e-35	1.317e-35	-34.653	-34.881	-0.227	(0)
Hg (NH3) 4+2	1.751e-35	1.037e-35	-34.757	-34.984	-0.227	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.331	-41.558	-0.227	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.515	-42.742	-0.227	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-50.416	-50.928	-0.512	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.417	-50.644	-0.227	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.329	-52.556	-0.227	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.563	-60.619	-0.057	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.367	-64.595	-0.227	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.214	-65.441	-0.227	(0)
N (3)	2.493e-06					
NO2-	2.493e-06	2.215e-06	-5.603	-5.655	-0.051	(0)
CuNO2+	6.208e-12	5.446e-12	-11.207	-11.264	-0.057	(0)
AgNO2	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)
CoNO2+	1.464e-13	1.284e-13	-12.834	-12.891	-0.057	(0)
Cu (NO2) 2	1.235e-16	1.235e-16	-15.908	-15.908	0.000	(0)
Ag (NO2) 2-	1.744e-18	1.530e-18	-17.759	-17.815	-0.057	(0)
N (5)	1.214e-09					
NO3-	1.212e-09	1.082e-09	-8.916	-8.966	-0.049	(0)
CaNO3+	1.955e-12	1.715e-12	-11.709	-11.766	-0.057	(0)
MnNO3+	1.105e-14	9.693e-15	-13.957	-14.014	-0.057	(0)
ZnNO3+	1.749e-15	1.535e-15	-14.757	-14.814	-0.057	(0)

CuNO3+	9.160e-17	8.036e-17	-16.038	-16.095	-0.057	(0)
BaNO3+	4.277e-17	3.753e-17	-16.369	-16.426	-0.057	(0)
NiNO3+	3.858e-17	3.384e-17	-16.414	-16.471	-0.057	(0)
CoNO3+	1.609e-17	1.411e-17	-16.794	-16.850	-0.057	(0)
CdNO3+	4.077e-18	3.577e-18	-17.390	-17.446	-0.057	(0)
PbNO3+	1.330e-18	1.167e-18	-17.876	-17.933	-0.057	(0)
AgNO3	8.281e-19	8.281e-19	-18.082	-18.082	0.000	(0)
Mn (NO3) 2	2.635e-23	2.635e-23	-22.579	-22.579	0.000	(0)
UO2NO3+	1.311e-23	1.150e-23	-22.882	-22.939	-0.057	(0)
Zn (NO3) 2	3.315e-25	3.315e-25	-24.480	-24.480	0.000	(0)
Co (NO3) 2	3.108e-26	3.108e-26	-25.507	-25.507	0.000	(0)
CrNO3+2	2.906e-26	1.721e-26	-25.537	-25.764	-0.227	(0)
Cu (NO3) 2	1.095e-26	1.095e-26	-25.961	-25.961	0.000	(0)
Pb (NO3) 2	2.145e-27	2.145e-27	-26.669	-26.669	0.000	(0)
Cd (NO3) 2	1.941e-27	1.941e-27	-26.712	-26.712	0.000	(0)
VO2NO3	1.731e-27	1.731e-27	-26.762	-26.762	0.000	(0)
FeNO3+2	4.788e-29	2.837e-29	-28.320	-28.547	-0.227	(0)
HgNO3+	5.015e-32	4.400e-32	-31.300	-31.357	-0.057	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.703	-40.703	0.000	(0)
Na	4.540e-03					
Na+	4.500e-03	4.018e-03	-2.347	-2.396	-0.049	(0)
NaSO4-	3.528e-05	3.162e-05	-4.453	-4.500	-0.047	(0)
NaHCO3	3.289e-06	3.289e-06	-5.483	-5.483	0.000	(0)
NaCO3-	4.661e-07	4.178e-07	-6.332	-6.379	-0.047	(0)
NaF	2.141e-07	2.141e-07	-6.669	-6.669	0.000	(0)
NaH2BO3	3.441e-09	3.441e-09	-8.463	-8.463	0.000	(0)
NaCrO4-	2.668e-17	2.340e-17	-16.574	-16.631	-0.057	(0)
Ni	2.863e-08					
Ni+2	1.959e-08	1.245e-08	-7.708	-7.905	-0.197	(0)
NiSO4	3.640e-09	3.640e-09	-8.439	-8.439	0.000	(0)
NiCO3	2.594e-09	2.594e-09	-8.586	-8.586	0.000	(0)
NiHCO3+	2.546e-09	2.234e-09	-8.594	-8.651	-0.057	(0)
NiOH+	1.472e-10	1.291e-10	-9.832	-9.889	-0.057	(0)
NiCl+	6.754e-11	5.925e-11	-10.170	-10.227	-0.057	(0)
NiF+	3.010e-11	2.640e-11	-10.521	-10.578	-0.057	(0)
Ni (OH) 2	8.448e-12	8.448e-12	-11.073	-11.073	0.000	(0)
Ni (SO4) 2-2	2.982e-13	1.766e-13	-12.526	-12.753	-0.227	(0)
NiNH3+2	9.355e-14	5.542e-14	-13.029	-13.256	-0.227	(0)
Ni (OH) 3-	7.933e-15	6.960e-15	-14.101	-14.157	-0.057	(0)
NiCl2	5.550e-16	5.550e-16	-15.256	-15.256	0.000	(0)
NiSeO4	7.392e-17	7.392e-17	-16.131	-16.131	0.000	(0)
NiNO3+	3.858e-17	3.384e-17	-16.414	-16.471	-0.057	(0)
Ni (NH3) 2+2	1.121e-19	6.640e-20	-18.950	-19.178	-0.227	(0)
O (0)	6.647e-36					
O2	3.323e-36	3.333e-36	-35.478	-35.477	0.001	(0)
Pb	1.696e-09					
PbCO3	1.224e-09	1.224e-09	-8.912	-8.912	0.000	(0)
PbOH+	1.719e-10	1.508e-10	-9.765	-9.822	-0.057	(0)
Pb+2	1.147e-10	7.288e-11	-9.940	-10.137	-0.197	(0)
PbHCO3+	8.985e-11	7.883e-11	-10.046	-10.103	-0.057	(0)
PbSO4	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
Pb (CO3) 2-2	3.327e-11	1.971e-11	-10.478	-10.705	-0.227	(0)
PbCl+	5.484e-12	4.811e-12	-11.261	-11.318	-0.057	(0)
Pb (OH) 2	3.929e-12	3.929e-12	-11.406	-11.406	0.000	(0)
Pb (SO4) 2-2	7.799e-13	4.620e-13	-12.108	-12.335	-0.227	(0)
PbF+	4.943e-13	4.337e-13	-12.306	-12.363	-0.057	(0)
PbCl2	3.998e-14	3.998e-14	-13.398	-13.398	0.000	(0)
Pb (OH) 3-	3.690e-15	3.237e-15	-14.433	-14.490	-0.057	(0)
PbF2	7.207e-16	7.207e-16	-15.142	-15.142	0.000	(0)
PbCl3-	3.375e-17	2.961e-17	-16.472	-16.529	-0.057	(0)
PbNO3+	1.330e-18	1.167e-18	-17.876	-17.933	-0.057	(0)
Pb (OH) 4-2	1.102e-18	6.531e-19	-17.958	-18.185	-0.227	(0)
Pb2OH+3	5.659e-19	1.742e-19	-18.247	-18.759	-0.512	(0)
PbF3-	1.316e-19	1.154e-19	-18.881	-18.938	-0.057	(0)
PbCl4-2	4.251e-20	2.518e-20	-19.371	-19.599	-0.227	(0)
Pb3 (OH) 4+2	3.789e-23	2.245e-23	-22.421	-22.649	-0.227	(0)
PbF4-2	7.876e-24	4.666e-24	-23.104	-23.331	-0.227	(0)
Pb (NO3) 2	2.145e-27	2.145e-27	-26.669	-26.669	0.000	(0)

Pb4 (OH) 4+4	1.055e-28	1.299e-29	-27.977	-28.886	-0.910	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.113	-151.113	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.879	-227.936	-0.057	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.325	-73.325	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.066	-78.123	-0.057	(0)
H2S	0.000e+00	0.000e+00	-79.016	-79.016	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.039	-79.096	-0.057	(0)
S5-2	0.000e+00	0.000e+00	-79.347	-79.575	-0.227	(0)
S6-2	0.000e+00	0.000e+00	-79.863	-80.091	-0.227	(0)
S4-2	0.000e+00	0.000e+00	-79.943	-80.171	-0.227	(0)
S3-2	0.000e+00	0.000e+00	-80.749	-80.977	-0.227	(0)
S2-2	0.000e+00	0.000e+00	-81.765	-81.993	-0.227	(0)
S-2	0.000e+00	0.000e+00	-87.318	-87.510	-0.192	(0)
HgHS2-	0.000e+00	0.000e+00	-138.306	-138.363	-0.057	(0)
HgS2-2	0.000e+00	0.000e+00	-138.930	-139.158	-0.227	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.882	-139.882	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.408	-146.686	-0.278	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.771	-146.918	-0.147	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.148	-147.416	-0.267	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.290	-147.347	-0.057	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.714	-147.771	-0.057	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.162	-148.445	-0.283	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.484	-148.756	-0.272	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.674	-149.674	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.014	-150.014	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.113	-151.113	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.562	-159.562	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.042	-216.099	-0.057	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.460	-224.517	-0.057	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.180	-226.237	-0.057	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.356	-226.584	-0.227	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.879	-227.936	-0.057	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.591	-235.647	-0.057	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.936	-302.164	-0.227	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.872	-304.099	-0.227	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.001	-319.228	-0.227	(0)
S (6)	2.659e-03					
SO4-2	2.307e-03	1.466e-03	-2.637	-2.834	-0.197	(0)
CaSO4	1.682e-04	1.682e-04	-3.774	-3.774	0.000	(0)
MgSO4	1.399e-04	1.399e-04	-3.854	-3.854	0.000	(0)
NaSO4-	3.528e-05	3.162e-05	-4.453	-4.500	-0.047	(0)
KSO4-	7.268e-06	6.515e-06	-5.139	-5.186	-0.047	(0)
MnSO4	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)
ZnSO4	1.810e-07	1.810e-07	-6.742	-6.742	0.000	(0)
CuSO4	7.882e-09	7.882e-09	-8.103	-8.103	0.000	(0)
Zn (SO4) 2-2	3.900e-09	2.310e-09	-8.409	-8.636	-0.227	(0)
NiSO4	3.640e-09	3.640e-09	-8.439	-8.439	0.000	(0)
NH4SO4-	3.117e-09	2.790e-09	-8.506	-8.554	-0.048	(0)
CoSO4	2.406e-09	2.406e-09	-8.619	-8.619	0.000	(0)
HSO4-	1.958e-09	1.750e-09	-8.708	-8.757	-0.049	(0)
CdSO4	3.590e-10	3.590e-10	-9.445	-9.445	0.000	(0)
PbSO4	5.231e-11	5.231e-11	-10.281	-10.281	0.000	(0)
AgSO4-	3.210e-11	2.816e-11	-10.493	-10.550	-0.057	(0)
Cd (SO4) 2-2	1.198e-11	7.098e-12	-10.921	-11.149	-0.227	(0)
CrOHSO4	2.281e-12	2.281e-12	-11.642	-11.642	0.000	(0)
Pb (SO4) 2-2	7.799e-13	4.620e-13	-12.108	-12.335	-0.227	(0)
Ni (SO4) 2-2	2.982e-13	1.766e-13	-12.526	-12.753	-0.227	(0)
FeSO4	1.949e-13	1.949e-13	-12.710	-12.710	0.000	(0)
UO2SO4	1.181e-14	1.181e-14	-13.928	-13.928	0.000	(0)
AlSO4+	5.778e-15	5.164e-15	-14.238	-14.287	-0.049	(0)
CrSO4+	1.419e-15	1.245e-15	-14.848	-14.905	-0.057	(0)
UO2 (SO4) 2-2	3.853e-16	2.282e-16	-15.414	-15.642	-0.227	(0)
Al (SO4) 2-	9.074e-17	8.110e-17	-16.042	-16.091	-0.049	(0)
VO2SO4-	1.261e-19	1.106e-19	-18.899	-18.956	-0.057	(0)
FeSO4+	4.813e-20	4.309e-20	-19.318	-19.366	-0.048	(0)
Cr2 (OH) 2SO4+2	2.282e-21	1.352e-21	-20.642	-20.869	-0.227	(0)
Fe (SO4) 2-	1.539e-21	1.350e-21	-20.813	-20.870	-0.057	(0)

VOSO4	2.928e-22	2.928e-22	-21.533	-21.533	0.000	(0)
Cr2(OH)2(SO4)2	1.177e-22	1.177e-22	-21.929	-21.929	0.000	(0)
HgSO4	4.224e-23	4.224e-23	-22.374	-22.374	0.000	(0)
CrO3SO4-2	4.269e-25	2.529e-25	-24.370	-24.597	-0.227	(0)
VSO4+	8.147e-37	7.147e-37	-36.089	-36.146	-0.057	(0)
U(SO4)2	0.000e+00	0.000e+00	-41.310	-41.310	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.149	-42.376	-0.227	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-60.563	-60.619	-0.057	(0)
Sb(3)	1.398e-20					
Sb(OH)3	7.073e-21	7.073e-21	-20.150	-20.150	0.000	(0)
HSbO2	6.906e-21	6.906e-21	-20.161	-20.161	0.000	(0)
SbO2-	1.043e-24	9.153e-25	-23.982	-24.038	-0.057	(0)
Sb(OH)4-	5.976e-25	5.243e-25	-24.224	-24.280	-0.057	(0)
Sb(OH)2F	1.140e-26	1.140e-26	-25.943	-25.943	0.000	(0)
SbOF	1.122e-26	1.122e-26	-25.950	-25.950	0.000	(0)
Sb(OH)2+	2.393e-27	2.099e-27	-26.621	-26.678	-0.057	(0)
SbO+	8.251e-28	7.239e-28	-27.083	-27.140	-0.057	(0)
Sb2S4-2	0.000e+00	0.000e+00	-319.001	-319.228	-0.227	(0)
Sb(5)	5.022e-09					
SbO3-	5.016e-09	4.401e-09	-8.300	-8.356	-0.057	(0)
Sb(OH)6-	5.762e-12	5.144e-12	-11.239	-11.289	-0.049	(0)
SbO2+	2.149e-25	1.885e-25	-24.668	-24.725	-0.057	(0)
Se(-2)	1.301e-14					
Ag2Se	1.301e-14	1.301e-14	-13.886	-13.886	0.000	(0)
HSe-	2.398e-39	2.104e-39	-38.620	-38.677	-0.057	(0)
MnSe	0.000e+00	0.000e+00	-41.397	-41.397	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.700	-42.700	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.537	-45.764	-0.227	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.231	-83.141	-0.910	(0)
Se(4)	2.935e-08					
HSeO3-	1.980e-08	1.737e-08	-7.703	-7.760	-0.057	(0)
SeO3-2	9.554e-09	5.659e-09	-8.020	-8.247	-0.227	(0)
H2SeO3	9.055e-14	9.055e-14	-13.043	-13.043	0.000	(0)
AgSeO3-	3.993e-15	3.503e-15	-14.399	-14.456	-0.057	(0)
Cd(SeO3)2-2	4.656e-20	2.758e-20	-19.332	-19.559	-0.227	(0)
Ag(SeO3)2-3	5.766e-22	1.775e-22	-21.239	-21.751	-0.512	(0)
FeHSeO3+2	2.031e-25	1.203e-25	-24.692	-24.920	-0.227	(0)
Se(6)	2.001e-11					
SeO4-2	1.999e-11	1.270e-11	-10.699	-10.896	-0.197	(0)
MnSeO4	1.931e-14	1.931e-14	-13.714	-13.714	0.000	(0)
ZnSeO4	1.110e-15	1.110e-15	-14.955	-14.955	0.000	(0)
NiSeO4	7.392e-17	7.392e-17	-16.131	-16.131	0.000	(0)
CoSeO4	5.235e-17	5.235e-17	-16.281	-16.281	0.000	(0)
HSeO4-	8.864e-18	7.776e-18	-17.052	-17.109	-0.057	(0)
CdSeO4	2.471e-18	2.471e-18	-17.607	-17.607	0.000	(0)
Zn(SeO4)2-2	2.412e-26	1.429e-26	-25.618	-25.845	-0.227	(0)
Si	1.796e-04					
H4SiO4	1.773e-04	1.778e-04	-3.751	-3.750	0.001	(0)
H3SiO4-	2.357e-06	2.103e-06	-5.628	-5.677	-0.050	(0)
H2SiO4-2	1.681e-11	1.086e-11	-10.774	-10.964	-0.190	(0)
UO2H3SiO4+	1.084e-12	9.507e-13	-11.965	-12.022	-0.057	(0)
SiF6-2	3.390e-30	2.178e-30	-29.470	-29.662	-0.192	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.143	-59.655	-0.512	(0)
U(4)	2.285e-20					
U(OH)5-	2.284e-20	2.004e-20	-19.641	-19.698	-0.057	(0)
U(OH)4	1.026e-23	1.026e-23	-22.989	-22.989	0.000	(0)
U(OH)3+	5.224e-28	4.583e-28	-27.282	-27.339	-0.057	(0)
U(OH)2+2	4.372e-33	2.590e-33	-32.359	-32.587	-0.227	(0)
UF3+	1.969e-37	1.727e-37	-36.706	-36.763	-0.057	(0)
UF2+2	2.179e-38	1.290e-38	-37.662	-37.889	-0.227	(0)
UOH+3	4.843e-39	1.491e-39	-38.315	-38.827	-0.512	(0)
UF4	1.599e-39	1.599e-39	-38.796	-38.796	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.404	-40.916	-0.512	(0)
UF5-	0.000e+00	0.000e+00	-41.215	-41.272	-0.057	(0)
U(SO4)2	0.000e+00	0.000e+00	-41.310	-41.310	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.149	-42.376	-0.227	(0)
UF6-2	0.000e+00	0.000e+00	-42.638	-42.865	-0.227	(0)

U+4	0.000e+00	0.000e+00	-45.233	-46.142	-0.910	(0)
UC1+3	0.000e+00	0.000e+00	-46.661	-47.173	-0.512	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-170.712	-175.317	-4.605	(0)
U (5)	7.106e-17					
UO2+	7.106e-17	6.234e-17	-16.148	-16.205	-0.057	(0)
U (6)	5.239e-08					
UO2 (CO3) 3-4	2.999e-08	3.693e-09	-7.523	-8.433	-0.910	(0)
UO2 (CO3) 2-2	2.227e-08	1.319e-08	-7.652	-7.880	-0.227	(0)
UO2CO3	1.184e-10	1.184e-10	-9.927	-9.927	0.000	(0)
UO2H3SiO4+	1.084e-12	9.507e-13	-11.965	-12.022	-0.057	(0)
UO2OH+	6.296e-13	5.523e-13	-12.201	-12.258	-0.057	(0)
UO2F+	7.076e-14	6.207e-14	-13.150	-13.207	-0.057	(0)
UO2F2	1.512e-14	1.512e-14	-13.821	-13.821	0.000	(0)
UO2SO4	1.181e-14	1.181e-14	-13.928	-13.928	0.000	(0)
UO2+2	8.382e-15	5.325e-15	-14.077	-14.274	-0.197	(0)
UO2 (SO4) 2-2	3.853e-16	2.282e-16	-15.414	-15.642	-0.227	(0)
UO2F3-	3.655e-16	3.207e-16	-15.437	-15.494	-0.057	(0)
UO2Cl+	1.832e-17	1.607e-17	-16.737	-16.794	-0.057	(0)
(UO2) 2 (OH) 2+2	8.546e-19	5.062e-19	-18.068	-18.296	-0.227	(0)
UO2F4-2	3.631e-19	2.151e-19	-18.440	-18.667	-0.227	(0)
(UO2) 3 (OH) 5+	1.641e-19	1.440e-19	-18.785	-18.842	-0.057	(0)
UO2NO3+	1.311e-23	1.150e-23	-22.882	-22.939	-0.057	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.530	-43.587	-0.057	(0)
V+2	0.000e+00	0.000e+00	-44.785	-45.012	-0.227	(0)
V (3)	4.660e-16					
V (OH) 3	4.660e-16	4.660e-16	-15.332	-15.332	0.000	(0)
V (OH) 2+	4.194e-27	3.680e-27	-26.377	-26.434	-0.057	(0)
VOH+2	7.201e-31	4.266e-31	-30.143	-30.370	-0.227	(0)
V+3	3.356e-36	1.033e-36	-35.474	-35.986	-0.512	(0)
VSO4+	8.147e-37	7.147e-37	-36.089	-36.146	-0.057	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.841	-58.352	-0.512	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-59.030	-59.940	-0.910	(0)
V (4)	1.378e-19					
V (OH) 3+	1.359e-19	1.192e-19	-18.867	-18.924	-0.057	(0)
VO+2	1.224e-21	7.253e-22	-20.912	-21.139	-0.227	(0)
VOF+	4.187e-22	3.673e-22	-21.378	-21.435	-0.057	(0)
VOSO4	2.928e-22	2.928e-22	-21.533	-21.533	0.000	(0)
VOF2	1.163e-23	1.163e-23	-22.934	-22.934	0.000	(0)
VOC1+	4.315e-24	3.786e-24	-23.365	-23.422	-0.057	(0)
VOF3-	3.973e-26	3.485e-26	-25.401	-25.458	-0.057	(0)
VOF4-2	2.005e-29	1.188e-29	-28.698	-28.925	-0.227	(0)
H2V2O4+2	1.203e-33	7.123e-34	-32.920	-33.147	-0.227	(0)
V (5)	1.577e-09					
H2VO4-	1.209e-09	1.061e-09	-8.918	-8.974	-0.057	(0)
HVO4-2	3.680e-10	2.180e-10	-9.434	-9.662	-0.227	(0)
H3VO4	1.296e-13	1.296e-13	-12.887	-12.887	0.000	(0)
H3V2O7-	1.012e-15	8.877e-16	-14.995	-15.052	-0.057	(0)
VO4-3	2.905e-16	8.942e-17	-15.537	-16.049	-0.512	(0)
HV2O7-3	2.546e-16	7.837e-17	-15.594	-16.106	-0.512	(0)
VO2+	3.541e-18	3.161e-18	-17.451	-17.500	-0.049	(0)
V2O7-4	1.402e-18	1.726e-19	-17.853	-18.763	-0.910	(0)
VO2F	4.682e-19	4.682e-19	-18.330	-18.330	0.000	(0)
VO2SO4-	1.261e-19	1.106e-19	-18.899	-18.956	-0.057	(0)
VO2F2-	1.636e-20	1.436e-20	-19.786	-19.843	-0.057	(0)
V3O9-3	4.061e-21	1.250e-21	-20.391	-20.903	-0.512	(0)
VO2F3-2	2.553e-23	1.512e-23	-22.593	-22.820	-0.227	(0)
V4O12-4	4.490e-27	5.528e-28	-26.348	-27.257	-0.910	(0)
VO2F4-3	2.041e-27	6.283e-28	-26.690	-27.202	-0.512	(0)
VO2NO3	1.731e-27	1.731e-27	-26.762	-26.762	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-70.443	-72.489	-2.047	(0)
HV10O28-5	0.000e+00	0.000e+00	-70.794	-72.216	-1.421	(0)
H2V10O28-4	0.000e+00	0.000e+00	-74.011	-74.921	-0.910	(0)
Zn	1.350e-06					
Zn+2	8.884e-07	5.644e-07	-6.051	-6.248	-0.197	(0)
ZnCO3	1.814e-07	1.814e-07	-6.741	-6.741	0.000	(0)
ZnSO4	1.810e-07	1.810e-07	-6.742	-6.742	0.000	(0)
ZnOH+	5.300e-08	4.650e-08	-7.276	-7.333	-0.057	(0)

ZnHCO3+	2.962e-08	2.598e-08	-7.528	-7.585	-0.057	(0)
Zn(OH)2	6.071e-09	6.071e-09	-8.217	-8.217	0.000	(0)
Zn(SO4)2-2	3.900e-09	2.310e-09	-8.409	-8.636	-0.227	(0)
ZnCl+	2.957e-09	2.638e-09	-8.529	-8.579	-0.050	(0)
ZnOHCl	2.845e-09	2.845e-09	-8.546	-8.546	0.000	(0)
ZnF+	1.084e-09	9.510e-10	-8.965	-9.022	-0.057	(0)
Zn(OH)3-	2.857e-11	2.507e-11	-10.544	-10.601	-0.057	(0)
ZnCl2	7.778e-12	7.778e-12	-11.109	-11.109	0.000	(0)
ZnCl3-	1.288e-14	1.149e-14	-13.890	-13.940	-0.050	(0)
ZnNO3+	1.749e-15	1.535e-15	-14.757	-14.814	-0.057	(0)
Zn(OH)4-2	1.388e-15	8.222e-16	-14.858	-15.085	-0.227	(0)
ZnSeO4	1.110e-15	1.110e-15	-14.955	-14.955	0.000	(0)
ZnCl4-2	1.665e-17	1.069e-17	-16.779	-16.971	-0.192	(0)
Zn(NO3)2	3.315e-25	3.315e-25	-24.480	-24.480	0.000	(0)
Zn(SeO4)2-2	2.412e-26	1.429e-26	-25.618	-25.845	-0.227	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.714	-147.771	-0.057	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.674	-149.674	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.460	-224.517	-0.057	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-226.356	-226.584	-0.227	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.872	-304.099	-0.227	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-56.91	-50.62	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-42.66	-38.15	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.88	-38.15	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-73.62	-55.69	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-57.02	-36.98	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.84	-28.43	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.85	-24.40	0.45	(NH4)2SeO4
Acanthite	-52.02	-88.24	-36.22	Ag2S
Ag2CO3	-12.20	-23.29	-11.09	Ag2CO3
Ag2CrO4	-21.37	-32.96	-11.59	Ag2CrO4
Ag2HVO4	-13.27	-11.79	1.48	Ag2HVO4
Ag2MoO4	-13.16	-24.71	-11.55	Ag2MoO4
Ag2O	-14.78	-2.21	12.57	Ag2O
Ag2Se	-0.10	-48.80	-48.70	Ag2Se
Ag2SeO3	-10.73	-17.88	-7.15	Ag2SeO3
Ag2SeO4	-20.02	-28.93	-8.91	Ag2SeO4
Ag2SO4	-16.05	-20.87	-4.82	Ag2SO4
Ag3AsO3	-27.53	-25.37	2.16	Ag3AsO3
Ag3AsO4	-16.22	-19.01	-2.79	Ag3AsO4
Ag3H2VO5	-18.08	-12.90	5.18	Ag3H2VO5
AgF:4H2O	-14.14	-13.09	1.05	AgF:4H2O
Agmetal	-0.23	-13.73	-13.51	Ag
AgVO3	-11.46	-10.69	0.77	AgVO3
Al(OH)3(am)	-2.40	8.40	10.80	Al(OH)3
Al2(MoO4)3	-53.08	-50.71	2.37	Al2(MoO4)3
Al2O3	-2.86	16.79	19.65	Al2O3
Al4(OH)10SO4	-7.78	14.92	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.11	-7.31	4.80	AlAsO4:2H2O
AlOHSO4	-7.03	-10.26	-3.23	AlOHSO4
AlSb	-153.16	-87.53	65.62	AlSb
Alunite	-6.02	-7.42	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.18	-12.97	-7.79	PbSO4
Anhydrite	-1.77	-6.13	-4.36	CaSO4
Anilite	-54.72	-86.60	-31.88	Cu0.25Cu1.5S
Antlerite	-2.86	5.93	8.79	Cu3(OH)4SO4
Aragonite	-0.25	-8.55	-8.30	CaCO3
Arsenolite	-85.49	-88.25	-2.76	As4O6
Artinite	-5.59	4.01	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.11	-31.40	6.71	As2O5
Atacamite	-1.64	5.75	7.39	Cu2(OH)3Cl
Azurite	-0.66	-17.57	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.73	7.66	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-19.72	-3.84	15.87	Ba2V2O7:2H2O

Ba3(AsO4)2	0.51	-8.40	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-29.12	3.82	32.94	Ba3(VO4)2·4H2O
BaCrO4	-13.42	-23.09	-9.67	BaCrO4
BaF2	-10.49	-16.31	-5.82	BaF2
BaMoO4	-7.88	-14.84	-6.96	BaMoO4
Barite	-1.01	-10.99	-9.98	BaSO4
BaS	-94.55	-78.37	16.18	BaS
BaSeO3	-9.84	-8.01	1.83	BaSeO3
BaSeO4	-11.60	-19.06	-7.46	BaSeO4
Bianchite	-7.32	-9.08	-1.76	ZnSO4·6H2O
Birnessite	-7.60	10.49	18.09	MnO2
Bixbyite	-3.64	-4.29	-0.64	Mn2O3
BlaubleiI	-54.85	-79.01	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.23	-82.51	-27.28	Cu0.6Cu0.8S
Boehmite	-0.18	8.40	8.58	AlOOH
Breithauptite	-56.85	-75.38	-18.52	NiSb
Brochantite	-1.10	14.13	15.22	Cu4(OH)6SO4
Brucite	-4.30	12.55	16.84	Mg(OH)2
Bunsenite	-4.52	7.92	12.45	NiO
Ca(VO3)2	-12.31	-6.65	5.66	Ca(VO3)2
Ca2V2O7	-11.62	5.88	17.50	Ca2V2O7
Ca2V2O7·2H2O	-15.68	5.88	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-16.13	6.17	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-20.56	18.40	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-21.46	18.40	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-297.25	-154.28	142.97	Ca3Sb2
CaCrO4	-15.97	-18.23	-2.27	CaCrO4
Calcite	-0.07	-8.55	-8.48	CaCO3
Calomel	-10.10	-28.01	-17.91	Hg2Cl2
CaMoO4	-2.03	-9.98	-7.95	CaMoO4
Carnotite	-3.55	-3.32	0.23	KUO2VO4
CaSeO3·2H2O	-5.96	-3.15	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.18	-14.20	-3.02	CaSeO4·2H2O
Cd(BO2)2	-12.88	-3.04	9.84	Cd(BO2)2
Cd(OH)2	-6.80	6.84	13.64	Cd(OH)2
Cd(OH)2(am)	-6.89	6.84	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.49	-16.78	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.69	1.87	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.68	8.72	28.40	Cd4(OH)6SO4
CdCl2	-13.78	-14.44	-0.66	CdCl2
CdCl2·1H2O	-12.75	-14.44	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.53	-14.44	-1.91	CdCl2·2.5H2O
CdF2	-15.92	-17.13	-1.21	CdF2
Cdmetal(alpha)	-31.93	-18.41	13.51	Cd
Cdmetal(gamma)	-32.03	-18.41	13.62	Cd
CdMoO4	-1.51	-15.66	-14.15	CdMoO4
CdOHCl	-7.34	-3.80	3.54	CdOHCl
CdSb	-76.10	-76.45	-0.35	CdSb
CdSe	-19.54	-39.74	-20.20	CdSe
CdSeO4·2H2O	-18.03	-19.88	-1.85	CdSeO4·2H2O
CdSO4	-11.64	-11.81	-0.17	CdSO4
CdSO4·1H2O	-10.09	-11.81	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-9.94	-11.82	-1.87	CdSO4·2.67H2O
Cerargyrite	-2.00	-11.75	-9.75	AgCl
Cerrusite	-2.26	-15.39	-13.13	PbCO3
CH4(g)	-81.07	-122.11	-41.05	CH4
Chalcanthite	-7.82	-10.46	-2.64	CuSO4·5H2O
Chalcedony	-0.20	-3.75	-3.55	SiO2
Chalcocite	-54.60	-89.52	-34.92	Cu2S
Chalcopyrite	-125.05	-160.32	-35.27	CuFeS2
Chrysotile	-2.06	30.14	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.67	-98.36	-45.69	HgS
Claudetite	-85.18	-88.25	-3.06	As4O6
Clausthalite	-13.80	-40.90	-27.10	PbSe
Co(BO2)2	-29.22	-2.15	27.07	Co(BO2)2
Co(OH)2	-5.35	7.74	13.09	Co(OH)2
Co(OH)3	-9.72	-12.03	-2.31	Co(OH)3
CO2(g)	-2.93	-21.08	-18.15	CO2

Co3(AsO4)2	-21.21	-8.18	13.03	Co3(AsO4)2
Co3O4	-5.82	-16.32	-10.50	Co3O4
CoCl2	-21.81	-13.55	8.27	CoCl2
CoCl2:6H2O	-16.08	-13.55	2.54	CoCl2:6H2O
CoCO3	-3.36	-13.34	-9.98	CoCO3
CoF2	-14.63	-16.23	-1.60	CoF2
CoF3	-46.53	-47.99	-1.46	CoF3
CoFe2O4	17.58	14.06	-3.53	CoFe2O4
CoMoO4	-7.00	-14.76	-7.76	CoMoO4
CoO	-5.85	7.74	13.59	CoO
CoS(alpha)	-70.85	-78.29	-7.44	CoS
CoS(beta)	-67.22	-78.29	-11.07	CoS
CoSe	-22.65	-38.85	-16.20	CoSe
CoSeO3	-9.25	-7.93	1.32	CoSeO3
CoSeO4:6H2O	-17.45	-18.98	-1.53	CoSeO4:6H2O
CoSO4	-13.72	-10.92	2.80	CoSO4
CoSO4:6H2O	-8.45	-10.92	-2.47	CoSO4:6H2O
Cotunnite	-10.82	-15.60	-4.78	PbCl2
Covellite	-55.54	-77.84	-22.30	CuS
Cr(OH)2	-21.77	-10.95	10.82	Cr(OH)2
Cr(OH)3	-2.60	-1.27	1.34	Cr(OH)3
Cr(OH)3(am)	-0.52	-1.27	-0.75	Cr(OH)3
Cr2O3	-0.18	-2.54	-2.36	Cr2O3
CrCl2	-46.33	-32.24	14.09	CrCl2
CrCl3	-48.31	-33.20	15.11	CrCl3
CrF3	-25.89	-37.23	-11.34	CrF3
Cristobalite	-0.40	-3.75	-3.35	SiO2
Crmetal	-66.69	-36.21	30.48	Cr
CrO3	-27.55	-30.76	-3.21	CrO3
Cryolite	-13.13	-46.97	-33.84	Na3AlF6
Cu(OH)2	-0.48	8.20	8.67	Cu(OH)2
Cu(SbO3)2	-26.80	18.41	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.74	-0.49	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.59	-89.47	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.28	-50.08	-45.80	Cu2Se
Cu2SO4	-20.20	-22.15	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.91	-6.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.56	-101.16	-42.59	Cu3Sb
Cu3Se2	-24.98	-88.47	-63.49	Cu3Se2
CuCO3	-1.38	-12.88	-11.50	CuCO3
CuCrO4	-17.12	-22.56	-5.44	CuCrO4
CuF	-8.82	-13.73	-4.91	CuF
CuF2	-16.89	-15.78	1.12	CuF2
CuF2:2H2O	-11.23	-15.78	-4.55	CuF2:2H2O
Cumetal	-5.62	-14.37	-8.76	Cu
CuMoO4	-1.23	-14.30	-13.08	CuMoO4
CuOCuSO4	-12.57	-2.27	10.30	CuOCuSO4
Cupricferrite	8.52	14.51	5.99	CuFe2O4
Cuprite	-2.08	-3.49	-1.41	Cu2O
Cuprousferrite	10.33	1.41	-8.92	CuFeO2
CuSe	-5.29	-38.39	-33.10	CuSe
CuSe2	-26.36	-59.72	-33.37	CuSe2
CuSeO3:2H2O	-7.99	-7.48	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.09	-18.53	-2.44	CuSeO4:5H2O
CuSO4	-13.40	-10.46	2.94	CuSO4
Diaspore	1.52	8.40	6.87	AlOOH
Djurleite	-54.83	-88.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.55	-17.09	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.00	-17.09	-17.09	CaMg(CO3)2
Epsomite	-3.99	-6.11	-2.13	MgSO4:7H2O
Fe(OH)2	-10.00	3.56	13.56	Fe(OH)2
Fe(OH)2:7Cl.3	3.00	-0.04	-3.04	Fe(OH)2:7Cl.3
Fe(VO3)2	-11.89	-15.61	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.91	-9.36	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.08	-40.71	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.93	-49.67	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.35	9.87	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.94	-12.54	0.40	FeAsO4:2H2O

FeCr2O4	-6.18	1.02	7.20	FeCr2O4
FeMoO4	-8.85	-18.94	-10.09	FeMoO4
Ferrihydrite	-0.03	3.16	3.19	Fe(OH)3
Ferroselite	-45.77	-64.36	-18.60	FeSe2
FeS (ppt)	-79.53	-82.48	-2.95	FeS
FeSe	-32.03	-43.03	-11.00	FeSe
Fix_pe	-4.72	-4.72	0.00	e-
Fluorite	-0.95	-11.45	-10.50	CaF2
Galena	-66.38	-80.35	-13.97	PbS
Gibbsite	0.10	8.40	8.29	Al(OH)3
Goethite	2.67	3.16	0.49	FeOOH
Goslarite	-7.07	-9.08	-2.01	ZnSO4:7H2O
Greenalite	-17.63	3.18	20.81	Fe3Si2O5(OH)4
Greenockite	-64.83	-79.19	-14.36	CdS
Greigite	-289.23	-334.27	-45.03	Fe3S4
Gummite	-6.12	1.55	7.67	UO3
Gypsum	-1.52	-6.13	-4.61	CaSO4:2H2O
H-Jarosite	-15.75	-27.85	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.62	-22.50	-12.88	H2MoO4
H2S (g)	-78.03	-86.04	-8.01	H2S
H2Se (g)	-41.63	-46.59	-4.96	H2Se
Halite	-6.73	-5.13	1.60	NaCl
Halloysite	-0.28	9.29	9.57	Al2Si2O5(OH)4
Hausmannite	-4.04	56.99	61.03	Mn3O4
Hematite	7.73	6.31	-1.42	Fe2O3
Hercynite	-2.54	20.35	22.89	FeAl2O4
Hg(CH3)2 (g)	-182.85	-256.56	-73.71	Hg(CH3)2
Hg (g)	-8.12	-15.99	-7.87	Hg
Hg(OH)2	-8.83	-12.33	-3.50	Hg(OH)2
Hg2 (g)	-17.03	-31.99	-14.96	Hg2
Hg2(OH)2	-11.99	-6.73	5.26	Hg2(OH)2
Hg2CO3	-11.76	-27.81	-16.05	Hg2CO3
Hg2CrO4	-28.78	-37.48	-8.70	Hg2CrO4
Hg2F2	-20.34	-30.70	-10.36	Hg2F2
Hg2S	-81.09	-92.76	-11.68	Hg2S
Hg2SeO3	-17.74	-22.40	-4.66	Hg2SeO3
Hg2SO4	-19.26	-25.39	-6.13	Hg2SO4
Hg3O2CO3	-28.38	-58.06	-29.68	Hg3O2CO3
HgCl (g)	-33.50	-14.01	19.50	HgCl
HgCl2	-12.35	-33.61	-21.26	HgCl2
HgF (g)	-48.03	-15.35	32.68	HgF
HgF2 (g)	-48.86	-36.30	12.57	HgF2
Hgmetal (l)	-2.54	-15.99	-13.45	Hg
HgSe	-3.22	-58.92	-55.69	HgSe
HgSeO3	-15.57	-28.00	-12.43	HgSeO3
HgSO4	-21.57	-30.99	-9.42	HgSO4
Huntite	-4.18	-34.15	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.32	-25.09	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.82	-21.59	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-19.04	-24.21	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-8.34	-23.14	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-34.85	-52.09	-17.24	K2Cr2O7
K2CrO4	-20.82	-21.34	-0.51	K2CrO4
K2MoO4	-16.34	-13.08	3.26	K2MoO4
K2SeO4	-16.57	-17.30	-0.73	K2SeO4
Kaolinite	1.86	9.29	7.43	Al2Si2O5(OH)4
Langite	-3.36	14.13	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.85	-7.28	-0.43	PbO:PbSO4
Laurionite	-5.58	-4.95	0.62	PbOHCl
Lepidocrocite	1.79	3.16	1.37	FeOOH
Lime	-20.17	12.53	32.70	CaO
Litharge	-7.01	5.69	12.69	PbO
Mackinawite	-78.88	-82.48	-3.60	FeS
Maghemite	-0.07	6.31	6.39	Fe2O3
Magnesianoferrite	2.00	18.86	16.86	Fe2MgO4
Magnesite	-1.07	-8.53	-7.46	MgCO3
Magnetite	6.47	9.87	3.40	Fe3O4
Malachite	0.62	-4.69	-5.31	Cu2(OH)2CO3

Manganite	-2.13	23.21	25.34	MnOOH
Massicot	-7.21	5.69	12.89	PbO
Matlockite	-7.97	-16.94	-8.97	PbClF
Melanothallite	-19.35	-13.09	6.26	CuCl ₂
Melanterite	-12.89	-15.10	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-53.27	-98.36	-45.09	HgS
Mg(OH) ₂ (active)	-6.25	12.55	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.91	-6.63	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-274.23	-199.54	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.44	5.92	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.19	10.01	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.59	-18.21	5.38	MgCrO ₄
MgF ₂	-3.30	-11.43	-8.13	MgF ₂
MgMoO ₄	-8.11	-9.96	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.18	-3.13	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-12.98	-14.18	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.20	42.32	73.52	Pb ₃ O ₄
Mirabilite	-6.51	-7.63	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-13.50	-8.60	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-54.55	-60.26	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-148.48	-87.40	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-12.17	0.33	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.42	-10.71	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-75.63	-75.46	0.17	MnS
MnS(pnk)	-78.80	-75.46	3.34	MnS
MnSb	-95.16	-98.07	-2.91	MnSb
MnSe	-39.51	-36.01	3.50	MnSe
MnSeO ₃	-6.23	-5.10	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.08	-5.10	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-14.09	-16.14	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.67	-8.08	2.58	MnSO ₄
Monteponite	-8.26	6.84	15.10	CdO
Montroydite	-8.69	-12.33	-3.64	HgO
MoO ₃	-14.50	-22.50	-8.00	MoO ₃
Morenosite	-8.59	-10.74	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.57	-219.83	-70.26	MoS ₂
Na-Jarosite	-11.13	-22.33	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-40.58	-50.48	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.65	-19.72	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-17.37	-33.97	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.96	-11.47	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.69	-11.47	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.94	-4.64	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-16.97	-15.69	1.28	Na ₂ SeO ₄
Na ₃ Sb	-173.83	-79.38	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.72	6.96	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-34.51	2.89	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.66	-12.39	-6.73	CuCl
NaSb	-88.32	-65.15	23.17	NaSb
Natron	-8.73	-10.05	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.93	-4.07	3.86	NaVO ₃
Nesquehonite	-3.86	-8.53	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-4.87	7.92	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-23.34	-7.64	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-18.98	13.02	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.29	-13.16	-6.87	NiCO ₃
NiMoO ₄	-3.44	-14.58	-11.14	NiMoO ₄
NiS(alpha)	-72.51	-78.11	-5.60	NiS
NiS(beta)	-67.01	-78.11	-11.10	NiS
NiS(gamma)	-65.31	-78.11	-12.80	NiS
NiSe	-20.97	-38.67	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.57	-7.75	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.28	-18.80	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-7.02	10.49	17.50	MnO ₂
O ₂ (g)	-32.57	50.52	83.09	O ₂
Orpiment	-241.16	-302.23	-61.07	As ₂ S ₃
Otavite	-2.23	-14.23	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.72	-4.20	6.52	Pb(BO ₂) ₂

Pb(OH) 2	-2.46	5.69	8.15	Pb(OH) 2
Pb10(OH) 60(CO3) 6	-60.83	-69.59	-8.76	Pb10(OH) 60(CO3) 6
Pb2(OH) 3Cl	-8.06	0.73	8.79	Pb2(OH) 3Cl
Pb2O(OH) 2	-14.81	11.38	26.19	Pb2O(OH) 2
Pb2O3	-24.40	36.64	61.04	Pb2O3
Pb2OCO3	-9.14	-9.70	-0.56	Pb2OCO3
Pb2V2O7	-5.90	-7.80	-1.90	Pb2V2O7
Pb3(AsO4) 2	-20.14	-14.34	5.80	Pb3(AsO4) 2
Pb3(VO4) 2	-8.25	-2.11	6.14	Pb3(VO4) 2
Pb3O2CO3	-15.03	-4.01	11.02	Pb3O2CO3
Pb3O2SO4	-12.28	-1.59	10.69	Pb3O2SO4
Pb4(OH) 6SO4	-17.01	4.09	21.10	Pb4(OH) 6SO4
Pb4O3SO4	-17.78	4.09	21.88	Pb4O3SO4
PbCrO4	-12.47	-25.07	-12.60	PbCrO4
PbF2	-10.84	-18.28	-7.44	PbF2
Pbmetal	-23.82	-19.57	4.25	Pb
PbMoO4	-1.19	-16.81	-15.62	PbMoO4
PbO:0.3H2O	-7.29	5.69	12.98	PbO:0.33H2O
PbSeO4	-14.19	-21.03	-6.84	PbSeO4
Periclase	-9.04	12.55	21.58	MgO
Phosgenite	-11.18	-30.99	-19.81	PbCl2:PbCO3
Plattnerite	-18.65	30.95	49.60	PbO2
Portlandite	-10.28	12.53	22.80	Ca(OH) 2
Pyrite	-124.74	-143.25	-18.51	FeS2
Pyrochroite	-4.62	10.58	15.19	Mn(OH) 2
Pyrolusite	-5.54	35.84	41.38	MnO2
Quartz	0.25	-3.75	-4.00	SiO2
Realgar	-100.98	-120.73	-19.75	AsS
Retgersite	-8.70	-10.74	-2.04	NiSO4:6H2O
Rhodochrosite	0.08	-10.50	-10.58	MnCO3
Rutherfordine	-5.03	-19.53	-14.50	UO2CO3
Sb(OH) 3	-13.04	-20.15	-7.11	Sb(OH) 3
Sb2O4	-18.44	-15.04	3.40	Sb2O4
Sb2O5	-28.74	-38.40	-9.67	Sb2O5
Sb2Se3	-112.31	-180.07	-67.76	Sb2Se3
Sb4O6(cubic)	-62.34	-80.60	-18.26	Sb4O6
Sb4O6(orth)	-62.70	-80.60	-17.90	Sb4O6
SbCl3	-52.65	-52.08	0.57	SbCl3
SbF3	-45.88	-56.11	-10.23	SbF3
Sbmetal	-46.35	-58.04	-11.69	Sb
SbO2	-4.01	-31.83	-27.82	SbO2
Schoepite	-4.44	1.55	5.99	UO2(OH) 2:H2O
Semetal(am)	-14.22	-21.33	-7.11	Se
Semetal(hex)	-13.62	-21.33	-7.71	Se
Senarmontite	-27.94	-40.30	-12.37	Sb2O3
SeO2	-15.80	-15.67	0.12	SeO2
SeO3	-47.77	-26.72	21.04	SeO3
Sepiolite	-1.92	13.84	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.94	13.84	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.28	-17.52	-10.24	FeCO3
SiO2(am-gel)	-1.04	-3.75	-2.71	SiO2
SiO2(am-ppt)	-1.01	-3.75	-2.74	SiO2
Smithsonite	-1.50	-11.50	-10.00	ZnCO3
Sphalerite	-65.01	-76.46	-11.45	ZnS
Spinel	-7.51	29.34	36.85	MgAl2O4
Stibnite	-247.95	-298.41	-50.46	Sb2S3
Sulfur	-58.63	-60.78	-2.14	S
Tenorite	0.55	8.20	7.64	CuO
Thenardite	-7.95	-7.63	0.32	Na2SO4
Thermonatrite	-10.68	-10.05	0.64	Na2CO3:H2O
Tyuyamunite	-7.62	-3.54	4.08	Ca(UO2) 2(VO4) 2
U3O8	-14.04	7.05	21.08	U3O8
U3Sb4	-579.56	-427.18	152.38	U3Sb4
U4O9	-29.68	-32.70	-3.02	U4O9
UF4	-32.90	-62.44	-29.54	UF4
UF4:2.5H2O	-29.72	-62.44	-32.72	UF4:2.5H2O
UO2(am)	-15.42	-14.49	0.93	UO2
UO2(NO3) 2	-44.35	-32.20	12.15	UO2(NO3) 2

UO2(NO3)2:2H2O	-37.06	-32.21	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-35.60	-32.21	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.25	-32.21	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.06	1.55	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.92	-25.17	-2.25	UO2SeO4:4H2O
UO3	-6.15	1.55	7.70	UO3
Uraninite	-9.82	-14.49	-4.67	UO2
USb2	-219.88	-190.30	29.58	USb2
V(OH)3	-19.84	-12.25	7.59	V(OH)3
V2O5	-17.81	-19.17	-1.36	V2O5
V3O5	-43.04	-41.20	1.84	V3O5
V4O7	-53.70	-46.51	7.19	V4O7
V6O13	-47.18	-108.04	-60.86	V6O13
Valentinite	-31.82	-40.30	-8.48	Sb2O3
VC12	-65.04	-46.16	18.87	VC12
VC13	-67.61	-44.18	23.43	VC13
VF4	-68.19	-53.26	14.93	VF4
Vmetal	-94.16	-50.14	44.03	V
VO	-39.63	-24.88	14.76	VO
VO(OH)2	-10.46	-5.31	5.15	VO(OH)2
VO2Cl	-23.07	-20.23	2.84	VO2Cl
VOC1	-34.04	-22.89	11.15	VOC1
VOC12	-39.36	-26.60	12.76	VOC12
VOSO4	-27.58	-23.97	3.61	VOSO4
Witherite	-4.84	-13.41	-8.57	BaCO3
Wurtzite	-67.51	-76.46	-8.95	ZnS
Zincite	-1.76	9.58	11.33	ZnO
Zincosite	-13.01	-9.08	3.93	ZnSO4
Zn(BO2)2	-8.60	-0.31	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-27.50	-24.18	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.62	9.58	12.20	Zn(OH)2
Zn(OH)2(am)	-2.90	9.58	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.18	9.58	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.96	9.58	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.16	9.58	11.73	Zn(OH)2
Zn2(OH)2SO4	-7.01	0.49	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.68	8.51	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.32	-2.67	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.50	-8.59	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.75	19.65	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.90	26.60	38.50	Zn5(OH)8Cl2
ZnCl2	-18.76	-11.71	7.05	ZnCl2
ZnCO3:1H2O	-1.24	-11.50	-10.26	ZnCO3:1H2O
ZnF2	-13.86	-14.40	-0.53	ZnF2
Znmetal	-41.47	-15.68	25.79	Zn
ZnMoO4	-2.80	-12.92	-10.13	ZnMoO4
ZnO(active)	-1.61	9.58	11.19	ZnO
ZnS(am)	-67.41	-76.46	-9.05	ZnS
ZnSb	-84.73	-73.72	11.01	ZnSb
ZnSe	-22.61	-37.01	-14.40	ZnSe
ZnSeO4:6H2O	-15.63	-17.15	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.44	-9.08	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 95.

Title Evaporate Stage 5 lake water to produce initial Stage 5 Lake water
REACTION 505

H2O -1
9.38 moles ## Removes x m3 water, but solute mass remains the same

USE solution 511
Save Solution 512
END

TITLE

Evaporate Stage 5 lake water to produce initial Stage 5 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 511. Solution after simulation 94.
Using reaction 505.

Reaction 505.

9.380e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	6.555e-09	5.449e-09
Al	5.670e-07	4.713e-07
As	1.838e-09	1.528e-09
B	1.441e-05	1.198e-05
Ba	1.325e-08	1.102e-08
C	2.056e-03	1.709e-03
Ca	1.175e-03	9.770e-04
Cd	2.867e-09	2.383e-09
Cl	2.508e-03	2.084e-03
Co	2.212e-08	1.838e-08
Cr	1.182e-09	9.829e-10
Cu	1.106e-06	9.194e-07
F	1.214e-04	1.009e-04
Fe	1.117e-09	9.288e-10
Hg	4.519e-10	3.757e-10
K	8.551e-04	7.108e-04
Mg	1.183e-03	9.831e-04
Mn	1.353e-05	1.125e-05
Mo	3.998e-07	3.323e-07
N	3.256e-06	2.706e-06
Na	5.463e-03	4.541e-03
Ni	3.444e-08	2.863e-08
Pb	2.041e-09	1.697e-09
S	3.200e-03	2.660e-03
Sb	6.043e-09	5.023e-09
Se	3.535e-08	2.938e-08
Si	2.161e-04	1.797e-04
U	6.304e-08	5.240e-08
V	1.898e-09	1.577e-09
Zn	1.625e-06	1.351e-06

-----Description of solution-----

pH = 7.902 Charge balance
 pe = 4.731 Adjusted to redox
 equilibrium
 Activity of water = 1.000
 Ionic strength (mol/kgw) = 1.480e-02
 Mass of water (kg) = 8.312e-01
 Total alkalinity (eq/kg) = 2.036e-03
 Total CO2 (mol/kg) = 2.056e-03
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 3.203e-07
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 4
 Total H = 9.228196e+01
 Total O = 4.615626e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.109e-07	8.036e-07	-6.041	-6.095	-0.054	(0)
H+	1.415e-08	1.253e-08	-7.849	-7.902	-0.053	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	6.555e-09					
AgCl	4.424e-09	4.424e-09	-8.354	-8.354	0.000	(0)
Ag+	1.103e-09	9.764e-10	-8.957	-9.010	-0.053	(0)
AgCl2-	9.864e-10	8.551e-10	-9.006	-9.068	-0.062	(0)
AgSO4-	3.773e-11	3.271e-11	-10.423	-10.485	-0.062	(0)
AgCl3-2	2.995e-12	1.691e-12	-11.524	-11.772	-0.248	(0)
AgNO2	5.386e-13	5.386e-13	-12.269	-12.269	0.000	(0)
AgF	2.448e-13	2.448e-13	-12.611	-12.611	0.000	(0)
AgOH	7.846e-14	7.846e-14	-13.105	-13.105	0.000	(0)
AgCl4-3	2.772e-14	7.663e-15	-13.557	-14.116	-0.558	(0)
AgNH3+	2.214e-14	1.919e-14	-13.655	-13.717	-0.062	(0)
Ag2Se	1.469e-14	1.469e-14	-13.833	-13.833	0.000	(0)
AgH2BO3	9.824e-15	9.824e-15	-14.008	-14.008	0.000	(0)
AgSeO3-	4.734e-15	4.104e-15	-14.325	-14.387	-0.062	(0)
Ag (OH) 2-	7.108e-18	6.162e-18	-17.148	-17.210	-0.062	(0)
Ag (NO2) 2-	2.541e-18	2.202e-18	-17.595	-17.657	-0.062	(0)
Ag (NH3) 2+	1.732e-18	1.502e-18	-17.761	-17.823	-0.062	(0)
AgNO3	1.018e-18	1.018e-18	-17.992	-17.992	0.000	(0)
Ag (SeO3) 2-3	8.693e-22	2.403e-22	-21.061	-21.619	-0.558	(0)
Ag2MoO4	8.849e-26	8.849e-26	-25.053	-25.053	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.278	-73.278	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.071	-83.064	-0.993	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.687	-146.842	-0.155	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.198	-147.260	-0.062	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.082	-148.380	-0.297	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.406	-148.691	-0.285	(0)
Al	5.670e-07					
Al (OH) 4-	5.616e-07	4.976e-07	-6.251	-6.303	-0.053	(0)
Al (OH) 3	4.918e-09	4.918e-09	-8.308	-8.308	0.000	(0)
Al (OH) 2+	3.450e-10	3.067e-10	-9.462	-9.513	-0.051	(0)
AlF3	2.982e-11	2.982e-11	-10.525	-10.525	0.000	(0)
AlF2+	2.669e-11	2.373e-11	-10.574	-10.625	-0.051	(0)
AlF4-	1.684e-12	1.492e-12	-11.774	-11.826	-0.053	(0)
AlF+2	9.552e-13	5.970e-13	-12.020	-12.224	-0.204	(0)
AlOH+2	7.689e-13	4.805e-13	-12.114	-12.318	-0.204	(0)
AlSO4+	8.796e-15	7.793e-15	-14.056	-14.108	-0.053	(0)
Al+3	1.795e-15	5.980e-16	-14.746	-15.223	-0.477	(0)
Al (SO4) 2-	1.582e-16	1.402e-16	-15.801	-15.853	-0.053	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-46.748	-47.306	-0.558	(0)
As (3)	1.077e-22					
H3AsO3	1.029e-22	1.029e-22	-21.988	-21.988	0.000	(0)
H2AsO3-	4.858e-24	4.211e-24	-23.314	-23.376	-0.062	(0)
HAsO3-2	5.429e-28	3.066e-28	-27.265	-27.513	-0.248	(0)

		H4AsO3+	7.364e-31	6.384e-31	-30.133	-30.195	-0.062	(0)
		AsO3-3	3.413e-33	9.435e-34	-32.467	-33.025	-0.558	(0)
As (5)	1.838e-09							
		HAsO4-2	1.710e-09	9.657e-10	-8.767	-9.015	-0.248	(0)
		H2AsO4-	1.273e-10	1.103e-10	-9.895	-9.957	-0.062	(0)
		AsO4-3	8.818e-13	2.438e-13	-12.055	-12.613	-0.558	(0)
		H3AsO4	2.394e-16	2.402e-16	-15.621	-15.619	0.001	(0)
B	1.441e-05							
		H3BO3	1.365e-05	1.369e-05	-4.865	-4.863	0.001	(0)
		H2BO3-	7.229e-07	6.349e-07	-6.141	-6.197	-0.056	(0)
		CaH2BO3+	2.371e-08	2.082e-08	-7.625	-7.681	-0.056	(0)
		MgH2BO3+	1.502e-08	1.319e-08	-7.823	-7.880	-0.056	(0)
		NaH2BO3	4.816e-09	4.816e-09	-8.317	-8.317	0.000	(0)
		BF(OH) 3-	6.212e-10	5.455e-10	-9.207	-9.263	-0.056	(0)
		H5(BO3) 2-	8.426e-12	7.400e-12	-11.074	-11.131	-0.056	(0)
		BaH2BO3+	1.792e-13	1.574e-13	-12.747	-12.803	-0.056	(0)
		BF2(OH) 2-	8.307e-14	7.295e-14	-13.081	-13.137	-0.056	(0)
		H8(BO3) 3-	1.154e-14	1.013e-14	-13.938	-13.994	-0.056	(0)
		AgH2BO3	9.824e-15	9.824e-15	-14.008	-14.008	0.000	(0)
		BF3OH-	4.043e-20	3.551e-20	-19.393	-19.450	-0.056	(0)
		BF4-	2.489e-25	2.185e-25	-24.604	-24.660	-0.056	(0)
Ba	1.325e-08							
		Ba+2	1.308e-08	8.023e-09	-7.883	-8.096	-0.212	(0)
		BaHCO3+	1.489e-10	1.327e-10	-9.827	-9.877	-0.050	(0)
		BaCO3	2.667e-11	2.667e-11	-10.574	-10.574	0.000	(0)
		BaH2BO3+	1.792e-13	1.574e-13	-12.747	-12.803	-0.056	(0)
		BaOH+	3.170e-14	2.814e-14	-13.499	-13.551	-0.052	(0)
		BaNH3+2	8.630e-17	4.873e-17	-16.064	-16.312	-0.248	(0)
		BaNO3+	6.086e-17	5.276e-17	-16.216	-16.278	-0.062	(0)
C (4)	2.056e-03							
		HCO3-	1.948e-03	1.732e-03	-2.710	-2.761	-0.051	(0)
		H2CO3	4.879e-05	4.879e-05	-4.312	-4.312	0.000	(0)
		CaHCO3+	2.062e-05	1.838e-05	-4.686	-4.736	-0.050	(0)
		MgHCO3+	1.201e-05	1.062e-05	-4.920	-4.974	-0.053	(0)
		CO3-2	1.056e-05	6.481e-06	-4.976	-5.188	-0.212	(0)
		CaCO3	5.854e-06	5.854e-06	-5.233	-5.233	0.000	(0)
		NaHCO3	4.661e-06	4.661e-06	-5.331	-5.331	0.000	(0)
		MgCO3	3.230e-06	3.230e-06	-5.491	-5.491	0.000	(0)
		CuCO3	9.413e-07	9.413e-07	-6.026	-6.026	0.000	(0)
		NaCO3-	6.497e-07	5.777e-07	-6.187	-6.238	-0.051	(0)
		MnHCO3+	2.486e-07	2.207e-07	-6.605	-6.656	-0.052	(0)
		ZnCO3	2.367e-07	2.367e-07	-6.626	-6.626	0.000	(0)
		UO2(CO3) 3-4	4.049e-08	4.118e-09	-7.393	-8.385	-0.993	(0)
		ZnHCO3+	4.009e-08	3.475e-08	-7.397	-7.459	-0.062	(0)
		Cu(CO3) 2-2	2.908e-08	1.642e-08	-7.536	-7.785	-0.248	(0)
		UO2(CO3) 2-2	2.245e-08	1.268e-08	-7.649	-7.897	-0.248	(0)
		NiHCO3+	3.428e-09	2.971e-09	-8.465	-8.527	-0.062	(0)
		NiCO3	3.365e-09	3.365e-09	-8.473	-8.473	0.000	(0)
		CuHCO3+	3.109e-09	2.695e-09	-8.507	-8.569	-0.062	(0)
		PbCO3	1.497e-09	1.497e-09	-8.825	-8.825	0.000	(0)
		CoHCO3+	1.430e-09	1.240e-09	-8.845	-8.907	-0.062	(0)
		CoCO3	1.008e-09	1.008e-09	-8.996	-8.996	0.000	(0)
		CdCO3	1.725e-10	1.725e-10	-9.763	-9.763	0.000	(0)
		BaHCO3+	1.489e-10	1.327e-10	-9.827	-9.877	-0.050	(0)
		PbHCO3+	1.141e-10	9.889e-11	-9.943	-10.005	-0.062	(0)
		UO2CO3	9.803e-11	9.803e-11	-10.009	-10.009	0.000	(0)
		Pb(CO3) 2-2	4.956e-11	2.799e-11	-10.305	-10.553	-0.248	(0)
		BaCO3	2.667e-11	2.667e-11	-10.574	-10.574	0.000	(0)
		CdHCO3+	5.310e-12	4.603e-12	-11.275	-11.337	-0.062	(0)
		Cd(CO3) 2-2	1.467e-12	8.287e-13	-11.833	-12.082	-0.248	(0)
		FeHCO3+	1.633e-14	1.456e-14	-13.787	-13.837	-0.050	(0)
		HgCO3	1.098e-15	1.098e-15	-14.959	-14.959	0.000	(0)
		Hg(CO3) 2-2	3.985e-17	2.250e-17	-16.400	-16.648	-0.248	(0)
		HgHCO3+	2.954e-19	2.561e-19	-18.530	-18.592	-0.062	(0)
Ca	1.175e-03							
		Ca+2	9.290e-04	5.699e-04	-3.032	-3.244	-0.212	(0)
		CaSO4	2.192e-04	2.192e-04	-3.659	-3.659	0.000	(0)
		CaHCO3+	2.062e-05	1.838e-05	-4.686	-4.736	-0.050	(0)

	CaCO3	5.854e-06	5.854e-06	-5.233	-5.233	0.000	(0)
	CaF+	6.995e-07	6.210e-07	-6.155	-6.207	-0.052	(0)
	CaH2BO3+	2.371e-08	2.082e-08	-7.625	-7.681	-0.056	(0)
	CaOH+	1.025e-08	9.138e-09	-7.989	-8.039	-0.050	(0)
	CaNH3+2	1.223e-11	6.907e-12	-10.913	-11.161	-0.248	(0)
	CaNO3+	2.728e-12	2.365e-12	-11.564	-11.626	-0.062	(0)
	Ca (NH3) 2+2	4.688e-20	2.647e-20	-19.329	-19.577	-0.248	(0)
Cd		2.867e-09					
	Cd+2	1.903e-09	1.167e-09	-8.721	-8.933	-0.212	(0)
	CdSO4	4.595e-10	4.595e-10	-9.338	-9.338	0.000	(0)
	CdCl+	2.854e-10	2.474e-10	-9.545	-9.607	-0.062	(0)
	CdCO3	1.725e-10	1.725e-10	-9.763	-9.763	0.000	(0)
	Cd (SO4) 2-2	1.843e-11	1.041e-11	-10.735	-10.983	-0.248	(0)
	CdOH+	8.597e-12	7.452e-12	-11.066	-11.128	-0.062	(0)
	CdOHC1	8.156e-12	8.156e-12	-11.089	-11.089	0.000	(0)
	CdHCO3+	5.310e-12	4.603e-12	-11.275	-11.337	-0.062	(0)
	CdCl2	2.289e-12	2.289e-12	-11.640	-11.640	0.000	(0)
	CdF+	2.131e-12	1.847e-12	-11.671	-11.733	-0.062	(0)
	Cd (CO3) 2-2	1.467e-12	8.287e-13	-11.833	-12.082	-0.248	(0)
	Cd (OH) 2	3.779e-14	3.779e-14	-13.423	-13.423	0.000	(0)
	CdCl3-	3.697e-15	3.205e-15	-14.432	-14.494	-0.062	(0)
	CdF2	3.680e-16	3.680e-16	-15.434	-15.434	0.000	(0)
	CdNO3+	5.587e-18	4.844e-18	-17.253	-17.315	-0.062	(0)
	CdSeO4	3.244e-18	3.244e-18	-17.489	-17.489	0.000	(0)
	Cd (OH) 3-	2.140e-18	1.855e-18	-17.670	-17.732	-0.062	(0)
	Cd2OH+3	1.577e-19	4.360e-20	-18.802	-19.360	-0.558	(0)
	Cd (SeO3) 2-2	7.288e-20	4.116e-20	-19.137	-19.386	-0.248	(0)
	Cd (OH) 4-2	4.321e-25	2.440e-25	-24.364	-24.613	-0.248	(0)
	Cd (NO3) 2	3.185e-27	3.185e-27	-26.497	-26.497	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.945	-79.007	-0.062	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.885	-149.885	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.006	-226.068	-0.062	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.706	-301.954	-0.248	(0)
Cl		2.508e-03					
	Cl-	2.508e-03	2.219e-03	-2.601	-2.654	-0.053	(0)
	MnCl+	2.010e-08	1.784e-08	-7.697	-7.749	-0.052	(0)
	AgCl	4.424e-09	4.424e-09	-8.354	-8.354	0.000	(0)
	ZnCl+	4.001e-09	3.537e-09	-8.398	-8.451	-0.053	(0)
	ZnOHC1	3.722e-09	3.722e-09	-8.429	-8.429	0.000	(0)
	AgCl2-	9.864e-10	8.551e-10	-9.006	-9.068	-0.062	(0)
	CuCl	6.270e-10	6.270e-10	-9.203	-9.203	0.000	(0)
	CuCl2-	3.288e-10	2.907e-10	-9.483	-9.537	-0.053	(0)
	CdCl+	2.854e-10	2.474e-10	-9.545	-9.607	-0.062	(0)
	CuCl+	9.812e-11	8.675e-11	-10.008	-10.062	-0.053	(0)
	NiCl+	9.116e-11	7.902e-11	-10.040	-10.102	-0.062	(0)
	CoCl+	8.151e-11	7.066e-11	-10.089	-10.151	-0.062	(0)
	MnCl2	5.593e-11	5.593e-11	-10.252	-10.252	0.000	(0)
	ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
	CdOHC1	8.156e-12	8.156e-12	-11.089	-11.089	0.000	(0)
	PbCl+	6.981e-12	6.051e-12	-11.156	-11.218	-0.062	(0)
	AgCl3-2	2.995e-12	1.691e-12	-11.524	-11.772	-0.248	(0)
	CdCl2	2.289e-12	2.289e-12	-11.640	-11.640	0.000	(0)
	HgClOH	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)
	CuCl3-2	2.221e-13	1.379e-13	-12.654	-12.860	-0.207	(0)
	HgCl2	6.971e-14	6.971e-14	-13.157	-13.157	0.000	(0)
	CuCl2	6.675e-14	6.675e-14	-13.176	-13.176	0.000	(0)
	PbCl2	5.999e-14	5.999e-14	-13.222	-13.222	0.000	(0)
	MnCl3-	3.851e-14	3.419e-14	-13.414	-13.466	-0.052	(0)
	AgCl4-3	2.772e-14	7.663e-15	-13.557	-14.116	-0.558	(0)
	ZnCl3-	2.481e-14	2.193e-14	-13.605	-13.659	-0.053	(0)
	CdCl3-	3.697e-15	3.205e-15	-14.432	-14.494	-0.062	(0)
	HgCl3-	1.785e-15	1.547e-15	-14.748	-14.811	-0.062	(0)
	NiCl2	8.830e-16	8.830e-16	-15.054	-15.054	0.000	(0)
	PbCl3-	6.114e-17	5.300e-17	-16.214	-16.276	-0.062	(0)
	ZnCl4-2	3.918e-17	2.434e-17	-16.407	-16.614	-0.207	(0)
	HgCl4-2	2.420e-17	1.367e-17	-16.616	-16.864	-0.248	(0)
	UO2Cl+	1.577e-17	1.367e-17	-16.802	-16.864	-0.062	(0)
	HgCl+	7.230e-18	6.268e-18	-17.141	-17.203	-0.062	(0)

CrCl+2	2.329e-18	1.315e-18	-17.633	-17.881	-0.248	(0)
CuCl3-	1.564e-18	1.383e-18	-17.806	-17.859	-0.053	(0)
PbCl4-2	9.520e-20	5.376e-20	-19.021	-19.270	-0.248	(0)
CrOHC12	4.458e-20	4.458e-20	-19.351	-19.351	0.000	(0)
FeCl+2	3.602e-22	2.237e-22	-21.443	-21.650	-0.207	(0)
CrCl2+	3.195e-22	2.769e-22	-21.496	-21.558	-0.062	(0)
CuCl4-2	2.476e-23	1.538e-23	-22.606	-22.813	-0.207	(0)
VOCl+	6.599e-24	5.721e-24	-23.180	-23.243	-0.062	(0)
FeCl2+	2.498e-24	2.218e-24	-23.602	-23.654	-0.052	(0)
CrO3Cl-	1.093e-26	9.474e-27	-25.961	-26.023	-0.062	(0)
FeCl3	4.922e-28	4.922e-28	-27.308	-27.308	0.000	(0)
CoCl+2	1.577e-36	8.907e-37	-35.802	-36.050	-0.248	(0)
UCl+3	0.000e+00	0.000e+00	-46.670	-47.229	-0.558	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.931	-50.180	-0.248	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.742	-51.990	-0.248	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.663	-64.912	-0.248	(0)
Co (2)	2.212e-08					
Co+2	1.630e-08	9.204e-09	-7.788	-8.036	-0.248	(0)
CoSO4	3.083e-09	3.083e-09	-8.511	-8.511	0.000	(0)
CoHCO3+	1.430e-09	1.240e-09	-8.845	-8.907	-0.062	(0)
CoCO3	1.008e-09	1.008e-09	-8.996	-8.996	0.000	(0)
CoOH+	1.702e-10	1.476e-10	-9.769	-9.831	-0.062	(0)
CoCl+	8.151e-11	7.066e-11	-10.089	-10.151	-0.062	(0)
CoF+	3.352e-11	2.906e-11	-10.475	-10.537	-0.062	(0)
Co (OH) 2	9.421e-12	9.421e-12	-11.026	-11.026	0.000	(0)
CoNO2+	1.976e-13	1.713e-13	-12.704	-12.766	-0.062	(0)
Co (NH3) +2	1.887e-14	1.065e-14	-13.724	-13.973	-0.248	(0)
Co (OH) 3-	1.743e-16	1.511e-16	-15.759	-15.821	-0.062	(0)
CoSeO4	6.885e-17	6.885e-17	-16.162	-16.162	0.000	(0)
CoOOH-	4.373e-17	3.791e-17	-16.359	-16.421	-0.062	(0)
CoNO3+	2.208e-17	1.914e-17	-16.656	-16.718	-0.062	(0)
Co2OH+3	2.463e-19	6.808e-20	-18.609	-19.167	-0.558	(0)
Co (NH3) 2+2	7.748e-21	4.375e-21	-20.111	-20.359	-0.248	(0)
Co (OH) 4-2	3.407e-23	1.924e-23	-22.468	-22.716	-0.248	(0)
Co (NO3) 2	5.109e-26	5.109e-26	-25.292	-25.292	0.000	(0)
Co (NH3) 3+2	9.390e-28	5.303e-28	-27.027	-27.275	-0.248	(0)
Co4 (OH) 4+4	9.308e-31	9.466e-32	-30.031	-31.024	-0.993	(0)
Co (NH3) 4+2	4.744e-35	2.679e-35	-34.324	-34.572	-0.248	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.120	-42.368	-0.248	(0)
Co (3)	1.426e-29					
CoOH+2	1.426e-29	8.055e-30	-28.846	-29.094	-0.248	(0)
Co+3	5.922e-36	1.973e-36	-35.228	-35.705	-0.477	(0)
CoCl+2	1.577e-36	8.907e-37	-35.802	-36.050	-0.248	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.931	-50.180	-0.248	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.045	-60.108	-0.062	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.905	-64.153	-0.248	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.663	-64.912	-0.248	(0)
Cr (2)	3.599e-27					
Cr+2	3.599e-27	2.032e-27	-26.444	-26.692	-0.248	(0)
Cr (3)	1.182e-09					
Cr (OH) 2+	9.081e-10	7.872e-10	-9.042	-9.104	-0.062	(0)
Cr (OH) 3	2.377e-10	2.377e-10	-9.624	-9.624	0.000	(0)
Cr (OH) +2	1.426e-11	8.051e-12	-10.846	-11.094	-0.248	(0)
CrO2-	1.040e-11	9.012e-12	-10.983	-11.045	-0.062	(0)
Cr (OH) 4-	8.771e-12	7.603e-12	-11.057	-11.119	-0.062	(0)
CrOHSO4	3.208e-12	3.208e-12	-11.494	-11.494	0.000	(0)
CrF+2	1.283e-14	7.246e-15	-13.892	-14.140	-0.248	(0)
CrSO4+	2.071e-15	1.795e-15	-14.684	-14.746	-0.062	(0)
Cr+3	1.656e-15	4.579e-16	-14.781	-15.339	-0.558	(0)
CrCl+2	2.329e-18	1.315e-18	-17.633	-17.881	-0.248	(0)
CrOHC12	4.458e-20	4.458e-20	-19.351	-19.351	0.000	(0)
Cr2 (OH) 2SO4+2	4.133e-21	2.334e-21	-20.384	-20.632	-0.248	(0)
CrCl2+	3.195e-22	2.769e-22	-21.496	-21.558	-0.062	(0)
Cr2 (OH) 2 (SO4) 2	2.328e-22	2.328e-22	-21.633	-21.633	0.000	(0)
CrNO3+2	4.651e-26	2.626e-26	-25.332	-25.581	-0.248	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.896	-41.144	-0.248	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.880	-50.438	-0.558	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.742	-51.990	-0.248	(0)

Cr (6)	2.282e-15					
CrO4-2	2.179e-15	1.336e-15	-14.662	-14.874	-0.212	(0)
HCrO4-	6.249e-17	5.418e-17	-16.204	-16.266	-0.062	(0)
NaCrO4-	3.667e-17	3.179e-17	-16.436	-16.498	-0.062	(0)
KCrO4-	4.284e-18	3.714e-18	-17.368	-17.430	-0.062	(0)
CrO3SO4-2	6.147e-25	3.471e-25	-24.211	-24.460	-0.248	(0)
H2CrO4	5.501e-25	5.501e-25	-24.260	-24.260	0.000	(0)
CrO3Cl-	1.093e-26	9.474e-27	-25.961	-26.023	-0.062	(0)
Cr2O7-2	1.803e-31	1.018e-31	-30.744	-30.992	-0.248	(0)
Cu (1)	1.215e-09					
CuCl	6.270e-10	6.270e-10	-9.203	-9.203	0.000	(0)
CuCl2-	3.288e-10	2.907e-10	-9.483	-9.537	-0.053	(0)
Cu+	2.589e-10	2.244e-10	-9.587	-9.649	-0.062	(0)
CuCl3-2	2.221e-13	1.379e-13	-12.654	-12.860	-0.207	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.328	-146.619	-0.291	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.070	-147.349	-0.279	(0)
Cu (2)	1.105e-06					
CuCO3	9.413e-07	9.413e-07	-6.026	-6.026	0.000	(0)
CuOH+	7.089e-08	6.268e-08	-7.149	-7.203	-0.053	(0)
Cu+2	4.020e-08	2.466e-08	-7.396	-7.608	-0.212	(0)
Cu (CO3) 2-2	2.908e-08	1.642e-08	-7.536	-7.785	-0.248	(0)
Cu (OH) 2	1.005e-08	1.005e-08	-7.998	-7.998	0.000	(0)
CuSO4	9.487e-09	9.487e-09	-8.023	-8.023	0.000	(0)
CuHCO3+	3.109e-09	2.695e-09	-8.507	-8.569	-0.062	(0)
CuF+	1.792e-10	1.554e-10	-9.747	-9.809	-0.062	(0)
Cu2 (OH) 2+2	1.747e-10	9.868e-11	-9.758	-10.006	-0.248	(0)
CuCl+	9.812e-11	8.675e-11	-10.008	-10.062	-0.053	(0)
Cu (OH) 3-	1.911e-11	1.657e-11	-10.719	-10.781	-0.062	(0)
CuNO2+	7.866e-12	6.819e-12	-11.104	-11.166	-0.062	(0)
CuNH3+2	4.303e-12	2.430e-12	-11.366	-11.614	-0.248	(0)
CuCl2	6.675e-14	6.675e-14	-13.176	-13.176	0.000	(0)
Cu (OH) 4-2	1.855e-16	1.048e-16	-15.732	-15.980	-0.248	(0)
Cu (NO2) 2	1.842e-16	1.842e-16	-15.735	-15.735	0.000	(0)
CuNO3+	1.180e-16	1.023e-16	-15.928	-15.990	-0.062	(0)
CuCl3-	1.564e-18	1.383e-18	-17.806	-17.859	-0.053	(0)
CuCl4-2	2.476e-23	1.538e-23	-22.606	-22.813	-0.207	(0)
Cu (NO3) 2	1.690e-26	1.690e-26	-25.772	-25.772	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.894	-215.956	-0.062	(0)
F	1.214e-04					
F-	1.128e-04	9.984e-05	-3.948	-4.001	-0.053	(0)
MgF+	7.575e-06	6.711e-06	-5.121	-5.173	-0.053	(0)
CaF+	6.995e-07	6.210e-07	-6.155	-6.207	-0.052	(0)
NaF	3.015e-07	3.015e-07	-6.521	-6.521	0.000	(0)
MnF+	2.859e-08	2.538e-08	-7.544	-7.595	-0.052	(0)
HF	1.850e-09	1.850e-09	-8.733	-8.733	0.000	(0)
ZnF+	1.458e-09	1.264e-09	-8.836	-8.898	-0.062	(0)
BF (OH) 3-	6.212e-10	5.455e-10	-9.207	-9.263	-0.056	(0)
CuF+	1.792e-10	1.554e-10	-9.747	-9.809	-0.062	(0)
NiF+	4.026e-11	3.490e-11	-10.395	-10.457	-0.062	(0)
CoF+	3.352e-11	2.906e-11	-10.475	-10.537	-0.062	(0)
AlF3	2.982e-11	2.982e-11	-10.525	-10.525	0.000	(0)
AlF2+	2.669e-11	2.373e-11	-10.574	-10.625	-0.051	(0)
CdF+	2.131e-12	1.847e-12	-11.671	-11.733	-0.062	(0)
AlF4-	1.684e-12	1.492e-12	-11.774	-11.826	-0.053	(0)
AlF+2	9.552e-13	5.970e-13	-12.020	-12.224	-0.204	(0)
HF2-	7.959e-13	7.021e-13	-12.099	-12.154	-0.054	(0)
PbF+	6.237e-13	5.407e-13	-12.205	-12.267	-0.062	(0)
AgF	2.448e-13	2.448e-13	-12.611	-12.611	0.000	(0)
BF2 (OH) 2-	8.307e-14	7.295e-14	-13.081	-13.137	-0.056	(0)
UO2F+	6.040e-14	5.236e-14	-13.219	-13.281	-0.062	(0)
UO2F2	1.507e-14	1.507e-14	-13.822	-13.822	0.000	(0)
CrF+2	1.283e-14	7.246e-15	-13.892	-14.140	-0.248	(0)
PbF2	1.062e-15	1.062e-15	-14.974	-14.974	0.000	(0)
UO2F3-	4.361e-16	3.780e-16	-15.360	-15.422	-0.062	(0)
CdF2	3.680e-16	3.680e-16	-15.434	-15.434	0.000	(0)
H2F2	9.167e-18	9.167e-18	-17.038	-17.038	0.000	(0)
FeF2+	1.100e-18	9.764e-19	-17.959	-18.010	-0.052	(0)
VO2F	6.899e-19	6.899e-19	-18.161	-18.161	0.000	(0)

FeF+2	5.884e-19	3.655e-19	-18.230	-18.437	-0.207	(0)
UO2F4-2	5.309e-19	2.998e-19	-18.275	-18.523	-0.248	(0)
PbF3-	2.320e-19	2.012e-19	-18.634	-18.696	-0.062	(0)
FeF3	1.375e-19	1.375e-19	-18.862	-18.862	0.000	(0)
BF3OH-	4.043e-20	3.551e-20	-19.393	-19.450	-0.056	(0)
VO2F2-	2.885e-20	2.501e-20	-19.540	-19.602	-0.062	(0)
VOF+	6.347e-22	5.502e-22	-21.197	-21.259	-0.062	(0)
VO2F3-2	5.515e-23	3.114e-23	-22.258	-22.507	-0.248	(0)
VOF2	2.060e-23	2.060e-23	-22.686	-22.686	0.000	(0)
PbF4-2	1.702e-23	9.612e-24	-22.769	-23.017	-0.248	(0)
HgF+	6.043e-25	5.238e-25	-24.219	-24.281	-0.062	(0)
BF4-	2.489e-25	2.185e-25	-24.604	-24.660	-0.056	(0)
VOF3-	8.417e-26	7.297e-26	-25.075	-25.137	-0.062	(0)
Sb(OH) 2F	1.656e-26	1.656e-26	-25.781	-25.781	0.000	(0)
SbOF	1.629e-26	1.629e-26	-25.788	-25.788	0.000	(0)
VO2F4-3	5.534e-27	1.530e-27	-26.257	-26.815	-0.558	(0)
VOF4-2	5.207e-29	2.940e-29	-28.283	-28.532	-0.248	(0)
SiF6-2	1.273e-29	7.909e-30	-28.895	-29.102	-0.207	(0)
UF3+	2.427e-37	2.104e-37	-36.615	-36.677	-0.062	(0)
UF2+2	2.355e-38	1.330e-38	-37.628	-37.876	-0.248	(0)
UF4	2.303e-39	2.303e-39	-38.638	-38.638	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.417	-40.976	-0.558	(0)
UF5-	0.000e+00	0.000e+00	-40.978	-41.040	-0.062	(0)
UF6-2	0.000e+00	0.000e+00	-42.313	-42.561	-0.248	(0)
Fe (2)	1.498e-12					
Fe+2	1.182e-12	6.676e-13	-11.927	-12.175	-0.248	(0)
FeSO4	2.751e-13	2.751e-13	-12.560	-12.560	0.000	(0)
FeOH+	2.406e-14	2.136e-14	-13.619	-13.670	-0.052	(0)
FeHCO3+	1.633e-14	1.456e-14	-13.787	-13.837	-0.050	(0)
Fe (OH) 2	1.363e-17	1.363e-17	-16.865	-16.865	0.000	(0)
Fe (OH) 3-	3.903e-18	3.465e-18	-17.409	-17.460	-0.052	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.390	-159.390	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.373	-235.435	-0.062	(0)
Fe (3)	1.116e-09					
Fe (OH) 2+	6.091e-10	5.416e-10	-9.215	-9.266	-0.051	(0)
Fe (OH) 3	4.674e-10	4.674e-10	-9.330	-9.330	0.000	(0)
Fe (OH) 4-	3.934e-11	3.497e-11	-10.405	-10.456	-0.051	(0)
FeOH+2	2.789e-15	1.732e-15	-14.555	-14.761	-0.207	(0)
FeF2+	1.100e-18	9.764e-19	-17.959	-18.010	-0.052	(0)
FeF+2	5.884e-19	3.655e-19	-18.230	-18.437	-0.207	(0)
FeF3	1.375e-19	1.375e-19	-18.862	-18.862	0.000	(0)
FeSO4+	7.085e-20	6.289e-20	-19.150	-19.201	-0.052	(0)
Fe+3	1.002e-20	3.339e-21	-19.999	-20.476	-0.477	(0)
Fe (SO4) 2-	2.604e-21	2.258e-21	-20.584	-20.646	-0.062	(0)
FeCl+2	3.602e-22	2.237e-22	-21.443	-21.650	-0.207	(0)
FeCl2+	2.498e-24	2.218e-24	-23.602	-23.654	-0.052	(0)
FeHSeO3+2	3.215e-25	1.816e-25	-24.493	-24.741	-0.248	(0)
Fe2 (OH) 2+4	9.770e-28	9.936e-29	-27.010	-28.003	-0.993	(0)
FeCl3	4.922e-28	4.922e-28	-27.308	-27.308	0.000	(0)
FeNO3+2	7.756e-29	4.380e-29	-28.110	-28.359	-0.248	(0)
Fe3 (OH) 4+5	2.766e-35	7.778e-37	-34.558	-36.109	-1.551	(0)
H (0)	7.641e-29					
H2	3.820e-29	3.833e-29	-28.418	-28.416	0.001	(0)
Hg (0)	4.508e-10					
Hg	4.508e-10	4.508e-10	-9.346	-9.346	0.000	(0)
Hg (1)	1.534e-22					
Hg2+2	7.672e-23	4.332e-23	-22.115	-22.363	-0.248	(0)
Hg (2)	1.093e-12					
Hg (OH) 2	5.748e-13	5.768e-13	-12.240	-12.239	0.001	(0)
HgClOH	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)
HgCl2	6.971e-14	6.971e-14	-13.157	-13.157	0.000	(0)
HgCl3-	1.785e-15	1.547e-15	-14.748	-14.811	-0.062	(0)
HgCO3	1.098e-15	1.098e-15	-14.959	-14.959	0.000	(0)
Hg (CO3) 2-2	3.985e-17	2.250e-17	-16.400	-16.648	-0.248	(0)
HgCl4-2	2.420e-17	1.367e-17	-16.616	-16.864	-0.248	(0)
HgCl+	7.230e-18	6.268e-18	-17.141	-17.203	-0.062	(0)
HgOH+	5.224e-18	4.528e-18	-17.282	-17.344	-0.062	(0)
HgHCO3+	2.954e-19	2.561e-19	-18.530	-18.592	-0.062	(0)

	Hg (OH) 3-	6.731e-20	5.835e-20	-19.172	-19.234	-0.062	(0)
	Hg (NH3) 2+2	1.466e-20	8.278e-21	-19.834	-20.082	-0.248	(0)
	HgNH3+2	1.523e-21	8.598e-22	-20.817	-21.066	-0.248	(0)
	Hg+2	2.506e-22	1.415e-22	-21.601	-21.849	-0.248	(0)
	HgSO4	6.222e-23	6.222e-23	-22.206	-22.206	0.000	(0)
	HgF+	6.043e-25	5.238e-25	-24.219	-24.281	-0.062	(0)
	Hg (NH3) 3+2	5.618e-28	3.173e-28	-27.250	-27.499	-0.248	(0)
	HgNO3+	7.910e-32	6.857e-32	-31.102	-31.164	-0.062	(0)
	Hg (NH3) 4+2	4.296e-35	2.426e-35	-34.367	-34.615	-0.248	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.427	-40.427	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.121	-138.183	-0.062	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.741	-138.989	-0.248	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.692	-139.692	0.000	(0)
K		8.551e-04					
	K+	8.451e-04	7.479e-04	-3.073	-3.126	-0.053	(0)
	KSO4-	9.998e-06	8.890e-06	-5.000	-5.051	-0.051	(0)
	KCrO4-	4.284e-18	3.714e-18	-17.368	-17.430	-0.062	(0)
Mg		1.183e-03					
	Mg+2	9.766e-04	5.991e-04	-3.010	-3.222	-0.212	(0)
	MgSO4	1.830e-04	1.830e-04	-3.737	-3.737	0.000	(0)
	MgHCO3+	1.201e-05	1.062e-05	-4.920	-4.974	-0.053	(0)
	MgF+	7.575e-06	6.711e-06	-5.121	-5.173	-0.053	(0)
	MgCO3	3.230e-06	3.230e-06	-5.491	-5.491	0.000	(0)
	MgOH+	2.147e-07	1.917e-07	-6.668	-6.717	-0.049	(0)
	MgH2BO3+	1.502e-08	1.319e-08	-7.823	-7.880	-0.056	(0)
Mn (2)		1.353e-05					
	Mn+2	1.131e-05	6.387e-06	-4.947	-5.195	-0.248	(0)
	MnSO4	1.907e-06	1.907e-06	-5.720	-5.720	0.000	(0)
	MnHCO3+	2.486e-07	2.207e-07	-6.605	-6.656	-0.052	(0)
	MnF+	2.859e-08	2.538e-08	-7.544	-7.595	-0.052	(0)
	MnCl+	2.010e-08	1.784e-08	-7.697	-7.749	-0.052	(0)
	MnOH+	1.452e-08	1.289e-08	-7.838	-7.890	-0.052	(0)
	MnCl2	5.593e-11	5.593e-11	-10.252	-10.252	0.000	(0)
	MnCl3-	3.851e-14	3.419e-14	-13.414	-13.466	-0.052	(0)
	MnSeO4	2.565e-14	2.565e-14	-13.591	-13.591	0.000	(0)
	MnNO3+	1.532e-14	1.328e-14	-13.815	-13.877	-0.062	(0)
	Mn (OH) 3-	5.796e-17	5.145e-17	-16.237	-16.289	-0.052	(0)
	Mn (OH) 4-2	2.149e-22	1.335e-22	-21.668	-21.875	-0.207	(0)
	Mn (NO3) 2	4.377e-23	4.377e-23	-22.359	-22.359	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.303	-41.303	0.000	(0)
Mn (3)		4.611e-26					
	Mn+3	4.611e-26	1.536e-26	-25.336	-25.814	-0.477	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.269	-41.476	-0.207	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-46.061	-46.117	-0.055	(0)
Mo		3.998e-07					
	MoO4-2	3.998e-07	2.452e-07	-6.398	-6.610	-0.212	(0)
	HMoO4-	7.051e-11	6.113e-11	-10.152	-10.214	-0.062	(0)
	H2MoO4	5.609e-15	5.609e-15	-14.251	-14.251	0.000	(0)
	Ag2MoO4	8.849e-26	8.849e-26	-25.053	-25.053	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-46.748	-47.306	-0.558	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-54.266	-56.500	-2.233	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-56.464	-58.015	-1.551	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-60.142	-61.135	-0.993	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-65.233	-65.791	-0.558	(0)
N (-3)		2.548e-07					
	NH4+	2.408e-07	2.115e-07	-6.618	-6.675	-0.056	(0)
	NH3	9.627e-09	9.627e-09	-8.016	-8.016	0.000	(0)
	NH4SO4-	4.286e-09	3.805e-09	-8.368	-8.420	-0.052	(0)
	CaNH3+2	1.223e-11	6.907e-12	-10.913	-11.161	-0.248	(0)
	CuNH3+2	4.303e-12	2.430e-12	-11.366	-11.614	-0.248	(0)
	NiNH3+2	1.274e-13	7.195e-14	-12.895	-13.143	-0.248	(0)
	AgNH3+	2.214e-14	1.919e-14	-13.655	-13.717	-0.062	(0)
	Co (NH3) +2	1.887e-14	1.065e-14	-13.724	-13.973	-0.248	(0)
	BaNH3+2	8.630e-17	4.873e-17	-16.064	-16.312	-0.248	(0)
	Ag (NH3) 2+	1.732e-18	1.502e-18	-17.761	-17.823	-0.062	(0)
	Ni (NH3) 2+2	1.773e-19	1.001e-19	-18.751	-18.999	-0.248	(0)

Ca (NH3) 2+2	4.688e-20	2.647e-20	-19.329	-19.577	-0.248	(0)
Hg (NH3) 2+2	1.466e-20	8.278e-21	-19.834	-20.082	-0.248	(0)
Co (NH3) 2+2	7.748e-21	4.375e-21	-20.111	-20.359	-0.248	(0)
HgNH3+2	1.523e-21	8.598e-22	-20.817	-21.066	-0.248	(0)
Co (NH3) 3+2	9.390e-28	5.303e-28	-27.027	-27.275	-0.248	(0)
Hg (NH3) 3+2	5.618e-28	3.173e-28	-27.250	-27.499	-0.248	(0)
Co (NH3) 4+2	4.744e-35	2.679e-35	-34.324	-34.572	-0.248	(0)
Hg (NH3) 4+2	4.296e-35	2.426e-35	-34.367	-34.615	-0.248	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.896	-41.144	-0.248	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.120	-42.368	-0.248	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.880	-50.438	-0.558	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.931	-50.180	-0.248	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.742	-51.990	-0.248	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.045	-60.108	-0.062	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.905	-64.153	-0.248	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.663	-64.912	-0.248	(0)
N (3)	2.999e-06					
NO2-	2.999e-06	2.640e-06	-5.523	-5.578	-0.055	(0)
CuNO2+	7.866e-12	6.819e-12	-11.104	-11.166	-0.062	(0)
AgNO2	5.386e-13	5.386e-13	-12.269	-12.269	0.000	(0)
CoNO2+	1.976e-13	1.713e-13	-12.704	-12.766	-0.062	(0)
Cu (NO2) 2	1.842e-16	1.842e-16	-15.735	-15.735	0.000	(0)
Ag (NO2) 2-	2.541e-18	2.202e-18	-17.595	-17.657	-0.062	(0)
N (5)	1.485e-09					
NO3-	1.482e-09	1.312e-09	-8.829	-8.882	-0.053	(0)
CaNO3+	2.728e-12	2.365e-12	-11.564	-11.626	-0.062	(0)
MnNO3+	1.532e-14	1.328e-14	-13.815	-13.877	-0.062	(0)
ZnNO3+	2.412e-15	2.091e-15	-14.618	-14.680	-0.062	(0)
CuNO3+	1.180e-16	1.023e-16	-15.928	-15.990	-0.062	(0)
BaNO3+	6.086e-17	5.276e-17	-16.216	-16.278	-0.062	(0)
NiNO3+	5.291e-17	4.587e-17	-16.276	-16.339	-0.062	(0)
CoNO3+	2.208e-17	1.914e-17	-16.656	-16.718	-0.062	(0)
CdNO3+	5.587e-18	4.844e-18	-17.253	-17.315	-0.062	(0)
PbNO3+	1.720e-18	1.491e-18	-17.764	-17.826	-0.062	(0)
AgNO3	1.018e-18	1.018e-18	-17.992	-17.992	0.000	(0)
Mn (NO3) 2	4.377e-23	4.377e-23	-22.359	-22.359	0.000	(0)
UO2NO3+	1.147e-23	9.945e-24	-22.940	-23.002	-0.062	(0)
Zn (NO3) 2	5.475e-25	5.475e-25	-24.262	-24.262	0.000	(0)
Co (NO3) 2	5.109e-26	5.109e-26	-25.292	-25.292	0.000	(0)
CrNO3+2	4.651e-26	2.626e-26	-25.332	-25.581	-0.248	(0)
Cu (NO3) 2	1.690e-26	1.690e-26	-25.772	-25.772	0.000	(0)
Pb (NO3) 2	3.323e-27	3.323e-27	-26.478	-26.478	0.000	(0)
Cd (NO3) 2	3.185e-27	3.185e-27	-26.497	-26.497	0.000	(0)
VO2NO3	2.615e-27	2.615e-27	-26.583	-26.583	0.000	(0)
FeNO3+2	7.756e-29	4.380e-29	-28.110	-28.359	-0.248	(0)
HgNO3+	7.910e-32	6.857e-32	-31.102	-31.164	-0.062	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.427	-40.427	0.000	(0)
Na	5.463e-03					
Na+	5.408e-03	4.786e-03	-2.267	-2.320	-0.053	(0)
NaSO4-	4.854e-05	4.316e-05	-4.314	-4.365	-0.051	(0)
NaHCO3	4.661e-06	4.661e-06	-5.331	-5.331	0.000	(0)
NaCO3-	6.497e-07	5.777e-07	-6.187	-6.238	-0.051	(0)
NaF	3.015e-07	3.015e-07	-6.521	-6.521	0.000	(0)
NaH2BO3	4.816e-09	4.816e-09	-8.317	-8.317	0.000	(0)
NaCrO4-	3.667e-17	3.179e-17	-16.436	-16.498	-0.062	(0)
Ni	3.444e-08					
Ni+2	2.269e-08	1.392e-08	-7.644	-7.856	-0.212	(0)
NiSO4	4.662e-09	4.662e-09	-8.331	-8.331	0.000	(0)
NiHCO3+	3.428e-09	2.971e-09	-8.465	-8.527	-0.062	(0)
NiCO3	3.365e-09	3.365e-09	-8.473	-8.473	0.000	(0)
NiOH+	1.624e-10	1.408e-10	-9.789	-9.851	-0.062	(0)
NiCl+	9.116e-11	7.902e-11	-10.040	-10.102	-0.062	(0)
NiF+	4.026e-11	3.490e-11	-10.395	-10.457	-0.062	(0)
Ni (OH) 2	8.988e-12	8.988e-12	-11.046	-11.046	0.000	(0)
Ni (SO4) 2-2	4.590e-13	2.592e-13	-12.338	-12.586	-0.248	(0)
NiNH3+2	1.274e-13	7.195e-14	-12.895	-13.143	-0.248	(0)
Ni (OH) 3-	8.332e-15	7.223e-15	-14.079	-14.141	-0.062	(0)
NiCl2	8.830e-16	8.830e-16	-15.054	-15.054	0.000	(0)

	NiSeO4	9.715e-17	9.715e-17	-16.013	-16.013	0.000	(0)
	NiNO3+	5.291e-17	4.587e-17	-16.276	-16.339	-0.062	(0)
	Ni (NH3) 2+2	1.773e-19	1.001e-19	-18.751	-18.999	-0.248	(0)
O (0)	6.871e-36						
	O2	3.436e-36	3.447e-36	-35.464	-35.463	0.001	(0)
Pb	2.041e-09						
	PbCO3	1.497e-09	1.497e-09	-8.825	-8.825	0.000	(0)
	PbOH+	1.790e-10	1.551e-10	-9.747	-9.809	-0.062	(0)
	Pb+2	1.253e-10	7.685e-11	-9.902	-10.114	-0.212	(0)
	PbHCO3+	1.141e-10	9.889e-11	-9.943	-10.005	-0.062	(0)
	PbSO4	6.320e-11	6.320e-11	-10.199	-10.199	0.000	(0)
	Pb (CO3) 2-2	4.956e-11	2.799e-11	-10.305	-10.553	-0.248	(0)
	PbCl+	6.981e-12	6.051e-12	-11.156	-11.218	-0.062	(0)
	Pb (OH) 2	3.942e-12	3.942e-12	-11.404	-11.404	0.000	(0)
	Pb (SO4) 2-2	1.132e-12	6.393e-13	-11.946	-12.194	-0.248	(0)
	PbF+	6.237e-13	5.407e-13	-12.205	-12.267	-0.062	(0)
	PbCl2	5.999e-14	5.999e-14	-13.222	-13.222	0.000	(0)
	Pb (OH) 3-	3.655e-15	3.168e-15	-14.437	-14.499	-0.062	(0)
	PbF2	1.062e-15	1.062e-15	-14.974	-14.974	0.000	(0)
	PbCl3-	6.114e-17	5.300e-17	-16.214	-16.276	-0.062	(0)
	PbNO3+	1.720e-18	1.491e-18	-17.764	-17.826	-0.062	(0)
	Pb (OH) 4-2	1.104e-18	6.235e-19	-17.957	-18.205	-0.248	(0)
	Pb2OH+3	6.835e-19	1.890e-19	-18.165	-18.724	-0.558	(0)
	PbF3-	2.320e-19	2.012e-19	-18.634	-18.696	-0.062	(0)
	PbCl4-2	9.520e-20	5.376e-20	-19.021	-19.270	-0.248	(0)
	Pb3 (OH) 4+2	4.220e-23	2.383e-23	-22.375	-22.623	-0.248	(0)
	PbF4-2	1.702e-23	9.612e-24	-22.769	-23.017	-0.248	(0)
	Pb (NO3) 2	3.323e-27	3.323e-27	-26.478	-26.478	0.000	(0)
	Pb4 (OH) 4+4	1.431e-28	1.455e-29	-27.845	-28.837	-0.993	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.009	-151.009	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.729	-227.791	-0.062	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.278	-73.278	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.020	-78.082	-0.062	(0)
	CdHS+	0.000e+00	0.000e+00	-78.945	-79.007	-0.062	(0)
	H2S	0.000e+00	0.000e+00	-78.964	-78.964	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.297	-79.545	-0.248	(0)
	S6-2	0.000e+00	0.000e+00	-79.813	-80.061	-0.248	(0)
	S4-2	0.000e+00	0.000e+00	-79.893	-80.141	-0.248	(0)
	S3-2	0.000e+00	0.000e+00	-80.699	-80.947	-0.248	(0)
	S2-2	0.000e+00	0.000e+00	-81.715	-81.963	-0.248	(0)
	S-2	0.000e+00	0.000e+00	-87.273	-87.480	-0.207	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.121	-138.183	-0.062	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.741	-138.989	-0.248	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.692	-139.692	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-146.328	-146.619	-0.291	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.687	-146.842	-0.155	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.070	-147.349	-0.279	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.198	-147.260	-0.062	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-147.588	-147.650	-0.062	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.082	-148.380	-0.297	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.406	-148.691	-0.285	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-149.542	-149.542	0.000	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.885	-149.885	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.009	-151.009	0.000	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-159.390	-159.390	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.894	-215.956	-0.062	(0)
	Zn (HS) 3-	0.000e+00	0.000e+00	-224.282	-224.344	-0.062	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.006	-226.068	-0.062	(0)
	ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.174	-226.422	-0.248	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.729	-227.791	-0.062	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-235.373	-235.435	-0.062	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.706	-301.954	-0.248	(0)
	Zn (HS) 4-2	0.000e+00	0.000e+00	-303.638	-303.887	-0.248	(0)
	Sb2S4-2	0.000e+00	0.000e+00	-318.640	-318.888	-0.248	(0)
S (6)	3.200e-03						
	SO4-2	2.737e-03	1.679e-03	-2.563	-2.775	-0.212	(0)
	CaSO4	2.192e-04	2.192e-04	-3.659	-3.659	0.000	(0)

MgSO4	1.830e-04	1.830e-04	-3.737	-3.737	0.000	(0)
NaSO4-	4.854e-05	4.316e-05	-4.314	-4.365	-0.051	(0)
KSO4-	9.998e-06	8.890e-06	-5.000	-5.051	-0.051	(0)
MnSO4	1.907e-06	1.907e-06	-5.720	-5.720	0.000	(0)
ZnSO4	2.331e-07	2.331e-07	-6.632	-6.632	0.000	(0)
CuSO4	9.487e-09	9.487e-09	-8.023	-8.023	0.000	(0)
Zn (SO4) 2-2	6.036e-09	3.408e-09	-8.219	-8.467	-0.248	(0)
NiSO4	4.662e-09	4.662e-09	-8.331	-8.331	0.000	(0)
NH4SO4-	4.286e-09	3.805e-09	-8.368	-8.420	-0.052	(0)
CoSO4	3.083e-09	3.083e-09	-8.511	-8.511	0.000	(0)
HSO4-	2.320e-09	2.055e-09	-8.635	-8.687	-0.053	(0)
CdSO4	4.595e-10	4.595e-10	-9.338	-9.338	0.000	(0)
PbSO4	6.320e-11	6.320e-11	-10.199	-10.199	0.000	(0)
AgSO4-	3.773e-11	3.271e-11	-10.423	-10.485	-0.062	(0)
Cd (SO4) 2-2	1.843e-11	1.041e-11	-10.735	-10.983	-0.248	(0)
CrOHSO4	3.208e-12	3.208e-12	-11.494	-11.494	0.000	(0)
Pb (SO4) 2-2	1.132e-12	6.393e-13	-11.946	-12.194	-0.248	(0)
Ni (SO4) 2-2	4.590e-13	2.592e-13	-12.338	-12.586	-0.248	(0)
FeSO4	2.751e-13	2.751e-13	-12.560	-12.560	0.000	(0)
UO2SO4	9.654e-15	9.654e-15	-14.015	-14.015	0.000	(0)
AlSO4+	8.796e-15	7.793e-15	-14.056	-14.108	-0.053	(0)
CrSO4+	2.071e-15	1.795e-15	-14.684	-14.746	-0.062	(0)
UO2 (SO4) 2-2	3.784e-16	2.137e-16	-15.422	-15.670	-0.248	(0)
Al (SO4) 2-	1.582e-16	1.402e-16	-15.801	-15.853	-0.053	(0)
VO2SO4-	1.822e-19	1.580e-19	-18.739	-18.801	-0.062	(0)
FeSO4+	7.085e-20	6.289e-20	-19.150	-19.201	-0.052	(0)
Cr2 (OH) 2SO4+2	4.133e-21	2.334e-21	-20.384	-20.632	-0.248	(0)
Fe (SO4) 2-	2.604e-21	2.258e-21	-20.584	-20.646	-0.062	(0)
VOSO4	4.249e-22	4.249e-22	-21.372	-21.372	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.328e-22	2.328e-22	-21.633	-21.633	0.000	(0)
HgSO4	6.222e-23	6.222e-23	-22.206	-22.206	0.000	(0)
CrO3SO4-2	6.147e-25	3.471e-25	-24.211	-24.460	-0.248	(0)
VSO4+	1.216e-36	1.055e-36	-35.915	-35.977	-0.062	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.325	-41.325	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.202	-42.450	-0.248	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.045	-60.108	-0.062	(0)
Sb (3)	1.675e-20					
Sb (OH) 3	8.477e-21	8.477e-21	-20.072	-20.072	0.000	(0)
HSbO2	8.276e-21	8.276e-21	-20.082	-20.082	0.000	(0)
SbO2-	1.234e-24	1.070e-24	-23.909	-23.971	-0.062	(0)
Sb (OH) 4-	7.070e-25	6.129e-25	-24.151	-24.213	-0.062	(0)
Sb (OH) 2F	1.656e-26	1.656e-26	-25.781	-25.781	0.000	(0)
SbOF	1.629e-26	1.629e-26	-25.788	-25.788	0.000	(0)
Sb (OH) 2+	2.975e-27	2.579e-27	-26.526	-26.589	-0.062	(0)
SbO+	1.026e-27	8.894e-28	-26.989	-27.051	-0.062	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.640	-318.888	-0.248	(0)
Sb (5)	6.043e-09					
SbO3-	6.036e-09	5.232e-09	-8.219	-8.281	-0.062	(0)
Sb (OH) 6-	6.910e-12	6.115e-12	-11.161	-11.214	-0.053	(0)
SbO2+	2.717e-25	2.355e-25	-24.566	-24.628	-0.062	(0)
Se (-2)	1.469e-14					
Ag2Se	1.469e-14	1.469e-14	-13.833	-13.833	0.000	(0)
HSe-	2.733e-39	2.369e-39	-38.563	-38.625	-0.062	(0)
MnSe	0.000e+00	0.000e+00	-41.303	-41.303	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.638	-42.638	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.475	-45.723	-0.248	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.071	-83.064	-0.993	(0)
Se (4)	3.532e-08					
HSeO3-	2.374e-08	2.058e-08	-7.625	-7.687	-0.062	(0)
SeO3-2	1.158e-08	6.540e-09	-7.936	-8.184	-0.248	(0)
H2SeO3	1.100e-13	1.100e-13	-12.959	-12.959	0.000	(0)
AgSeO3-	4.734e-15	4.104e-15	-14.325	-14.387	-0.062	(0)
Cd (SeO3) 2-2	7.288e-20	4.116e-20	-19.137	-19.386	-0.248	(0)
Ag (SeO3) 2-3	8.693e-22	2.403e-22	-21.061	-21.619	-0.558	(0)
FeHSeO3+2	3.215e-25	1.816e-25	-24.493	-24.741	-0.248	(0)
Se (6)	2.435e-11					
SeO4-2	2.433e-11	1.492e-11	-10.614	-10.826	-0.212	(0)
MnSeO4	2.565e-14	2.565e-14	-13.591	-13.591	0.000	(0)

	ZnSeO4	1.467e-15	1.467e-15	-14.834	-14.834	0.000	(0)
	NiSeO4	9.715e-17	9.715e-17	-16.013	-16.013	0.000	(0)
	CoSeO4	6.885e-17	6.885e-17	-16.162	-16.162	0.000	(0)
	HSeO4-	1.081e-17	9.370e-18	-16.966	-17.028	-0.062	(0)
	CdSeO4	3.244e-18	3.244e-18	-17.489	-17.489	0.000	(0)
	Zn (SeO4) 2-2	3.930e-26	2.219e-26	-25.406	-25.654	-0.248	(0)
Si	2.161e-04						
	H4SiO4	2.133e-04	2.141e-04	-3.671	-3.669	0.001	(0)
	H3SiO4-	2.794e-06	2.470e-06	-5.554	-5.607	-0.053	(0)
	H2SiO4-2	1.991e-11	1.244e-11	-10.701	-10.905	-0.204	(0)
	UO2H3SiO4+	9.191e-13	7.967e-13	-12.037	-12.099	-0.062	(0)
	SiF6-2	1.273e-29	7.909e-30	-28.895	-29.102	-0.207	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-59.243	-59.802	-0.558	(0)
U (4)	1.505e-20						
	U (OH) 5-	1.505e-20	1.304e-20	-19.823	-19.885	-0.062	(0)
	U (OH) 4	6.845e-24	6.845e-24	-23.165	-23.165	0.000	(0)
	U (OH) 3+	3.617e-28	3.136e-28	-27.442	-27.504	-0.062	(0)
	U (OH) 2+2	3.217e-33	1.817e-33	-32.493	-32.741	-0.248	(0)
	UF3+	2.427e-37	2.104e-37	-36.615	-36.677	-0.062	(0)
	UF2+2	2.355e-38	1.330e-38	-37.628	-37.876	-0.248	(0)
	UOH+3	3.878e-39	1.072e-39	-38.411	-38.970	-0.558	(0)
	UF4	2.303e-39	2.303e-39	-38.638	-38.638	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.417	-40.976	-0.558	(0)
	UF5-	0.000e+00	0.000e+00	-40.978	-41.040	-0.062	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-41.325	-41.325	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-42.202	-42.450	-0.248	(0)
	UF6-2	0.000e+00	0.000e+00	-42.313	-42.561	-0.248	(0)
	U+4	0.000e+00	0.000e+00	-45.282	-46.275	-0.993	(0)
	UC1+3	0.000e+00	0.000e+00	-46.670	-47.229	-0.558	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-171.248	-176.273	-5.025	(0)
U (5)	4.962e-17						
	UO2+	4.962e-17	4.302e-17	-16.304	-16.366	-0.062	(0)
U (6)	6.304e-08						
	UO2 (CO3) 3-4	4.049e-08	4.118e-09	-7.393	-8.385	-0.993	(0)
	UO2 (CO3) 2-2	2.245e-08	1.268e-08	-7.649	-7.897	-0.248	(0)
	UO2CO3	9.803e-11	9.803e-11	-10.009	-10.009	0.000	(0)
	UO2H3SiO4+	9.191e-13	7.967e-13	-12.037	-12.099	-0.062	(0)
	UO2OH+	4.434e-13	3.843e-13	-12.353	-12.415	-0.062	(0)
	UO2F+	6.040e-14	5.236e-14	-13.219	-13.281	-0.062	(0)
	UO2F2	1.507e-14	1.507e-14	-13.822	-13.822	0.000	(0)
	UO2SO4	9.654e-15	9.654e-15	-14.015	-14.015	0.000	(0)
	UO2+2	6.193e-15	3.799e-15	-14.208	-14.420	-0.212	(0)
	UO2F3-	4.361e-16	3.780e-16	-15.360	-15.422	-0.062	(0)
	UO2 (SO4) 2-2	3.784e-16	2.137e-16	-15.422	-15.670	-0.248	(0)
	UO2Cl+	1.577e-17	1.367e-17	-16.802	-16.864	-0.062	(0)
	UO2F4-2	5.309e-19	2.998e-19	-18.275	-18.523	-0.248	(0)
	(UO2) 2 (OH) 2+2	4.341e-19	2.452e-19	-18.362	-18.611	-0.248	(0)
	(UO2) 3 (OH) 5+	5.325e-20	4.616e-20	-19.274	-19.336	-0.062	(0)
	UO2NO3+	1.147e-23	9.945e-24	-22.940	-23.002	-0.062	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-43.440	-43.502	-0.062	(0)
	V+2	0.000e+00	0.000e+00	-44.669	-44.917	-0.248	(0)
V (3)	5.570e-16						
	V (OH) 3	5.570e-16	5.570e-16	-15.254	-15.254	0.000	(0)
	V (OH) 2+	5.202e-27	4.509e-27	-26.284	-26.346	-0.062	(0)
	VOH+2	9.489e-31	5.359e-31	-30.023	-30.271	-0.248	(0)
	V+3	4.813e-36	1.330e-36	-35.318	-35.876	-0.558	(0)
	VSO4+	1.216e-36	1.055e-36	-35.915	-35.977	-0.062	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-57.607	-58.165	-0.558	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-58.749	-59.742	-0.993	(0)
V (4)	1.726e-19						
	V (OH) 3+	1.699e-19	1.473e-19	-18.770	-18.832	-0.062	(0)
	VO+2	1.627e-21	9.189e-22	-20.789	-21.037	-0.248	(0)
	VOF+	6.347e-22	5.502e-22	-21.197	-21.259	-0.062	(0)
	VOSO4	4.249e-22	4.249e-22	-21.372	-21.372	0.000	(0)
	VOF2	2.060e-23	2.060e-23	-22.686	-22.686	0.000	(0)
	VOC1+	6.599e-24	5.721e-24	-23.180	-23.243	-0.062	(0)

VOF3-	8.417e-26	7.297e-26	-25.075	-25.137	-0.062	(0)
VOF4-2	5.207e-29	2.940e-29	-28.283	-28.532	-0.248	(0)
H2V2O4+2	1.927e-33	1.088e-33	-32.715	-32.963	-0.248	(0)
V (5)	1.898e-09					
H2VO4-	1.451e-09	1.258e-09	-8.838	-8.900	-0.062	(0)
HVO4-2	4.466e-10	2.522e-10	-9.350	-9.598	-0.248	(0)
H3VO4	1.576e-13	1.576e-13	-12.803	-12.803	0.000	(0)
H3V2O7-	1.476e-15	1.280e-15	-14.831	-14.893	-0.062	(0)
HV2O7-3	3.889e-16	1.075e-16	-15.410	-15.969	-0.558	(0)
VO4-3	3.650e-16	1.009e-16	-15.438	-15.996	-0.558	(0)
VO2+	4.452e-18	3.940e-18	-17.351	-17.404	-0.053	(0)
V2O7-4	2.272e-18	2.310e-19	-17.644	-18.636	-0.993	(0)
VO2F	6.899e-19	6.899e-19	-18.161	-18.161	0.000	(0)
VO2SO4-	1.822e-19	1.580e-19	-18.739	-18.801	-0.062	(0)
VO2F2-	2.885e-20	2.501e-20	-19.540	-19.602	-0.062	(0)
V3O9-3	7.543e-21	2.085e-21	-20.122	-20.681	-0.558	(0)
VO2F3-2	5.515e-23	3.114e-23	-22.258	-22.507	-0.248	(0)
V4O12-4	1.075e-26	1.094e-27	-25.968	-26.961	-0.993	(0)
VO2F4-3	5.534e-27	1.530e-27	-26.257	-26.815	-0.558	(0)
VO2NO3	2.615e-27	2.615e-27	-26.583	-26.583	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-69.472	-71.705	-2.233	(0)
HV10O28-5	0.000e+00	0.000e+00	-69.870	-71.421	-1.551	(0)
H2V10O28-4	0.000e+00	0.000e+00	-73.123	-74.116	-0.993	(0)
Zn	1.625e-06					
Zn+2	1.034e-06	6.346e-07	-5.985	-6.198	-0.212	(0)
ZnCO3	2.367e-07	2.367e-07	-6.626	-6.626	0.000	(0)
ZnSO4	2.331e-07	2.331e-07	-6.632	-6.632	0.000	(0)
ZnOH+	5.883e-08	5.099e-08	-7.230	-7.292	-0.062	(0)
ZnHCO3+	4.009e-08	3.475e-08	-7.397	-7.459	-0.062	(0)
Zn (OH) 2	6.495e-09	6.495e-09	-8.187	-8.187	0.000	(0)
Zn (SO4) 2-2	6.036e-09	3.408e-09	-8.219	-8.467	-0.248	(0)
ZnCl+	4.001e-09	3.537e-09	-8.398	-8.451	-0.053	(0)
ZnOHCl	3.722e-09	3.722e-09	-8.429	-8.429	0.000	(0)
ZnF+	1.458e-09	1.264e-09	-8.836	-8.898	-0.062	(0)
Zn (OH) 3-	3.018e-11	2.616e-11	-10.520	-10.582	-0.062	(0)
ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
ZnCl3-	2.481e-14	2.193e-14	-13.605	-13.659	-0.053	(0)
ZnNO3+	2.412e-15	2.091e-15	-14.618	-14.680	-0.062	(0)
Zn (OH) 4-2	1.482e-15	8.369e-16	-14.829	-15.077	-0.248	(0)
ZnSeO4	1.467e-15	1.467e-15	-14.834	-14.834	0.000	(0)
ZnCl4-2	3.918e-17	2.434e-17	-16.407	-16.614	-0.207	(0)
Zn (NO3) 2	5.475e-25	5.475e-25	-24.262	-24.262	0.000	(0)
Zn (SeO4) 2-2	3.930e-26	2.219e-26	-25.406	-25.654	-0.248	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.588	-147.650	-0.062	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.542	-149.542	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.282	-224.344	-0.062	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.174	-226.422	-0.248	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.638	-303.887	-0.248	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-56.27	-49.99	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.04	-37.53	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.26	-37.53	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-72.92	-54.99	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-56.33	-36.30	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.63	-28.22	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.63	-24.18	0.45	(NH4) 2SeO4
Acanthite	-51.98	-88.20	-36.22	Ag2S
Ag2CO3	-12.12	-23.21	-11.09	Ag2CO3
Ag2CrO4	-21.30	-32.89	-11.59	Ag2CrO4
Ag2HVO4	-13.20	-11.72	1.48	Ag2HVO4
Ag2MoO4	-13.08	-24.63	-11.55	Ag2MoO4
Ag2O	-14.79	-2.22	12.57	Ag2O
Ag2Se	-0.04	-48.74	-48.70	Ag2Se
Ag2SeO3	-10.66	-17.81	-7.15	Ag2SeO3

Ag2SeO4	-19.94	-28.85	-8.91	Ag2SeO4
Ag2SO4	-15.98	-20.80	-4.82	Ag2SO4
Ag3AsO3	-27.47	-25.31	2.16	Ag3AsO3
Ag3AsO4	-16.16	-18.94	-2.79	Ag3AsO4
Ag3H2VO5	-18.01	-12.83	5.18	Ag3H2VO5
AgF·4H2O	-14.06	-13.01	1.05	AgF·4H2O
Agmetal	-0.23	-13.74	-13.51	Ag
AgVO3	-11.38	-10.61	0.77	AgVO3
Al (OH) 3 (am)	-2.32	8.48	10.80	Al (OH) 3
Al2 (MoO4) 3	-52.65	-50.28	2.37	Al2 (MoO4) 3
Al2O3	-2.69	16.97	19.65	Al2O3
Al4 (OH) 10SO4	-7.35	15.35	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-11.94	-7.14	4.80	AlAsO4·2H2O
AlOHSO4	-6.87	-10.10	-3.23	AlOHSO4
AlSb	-153.01	-87.39	65.62	AlSb
Alunite	-5.53	-6.93	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.10	-12.89	-7.79	PbSO4
Anhydrite	-1.66	-6.02	-4.36	CaSO4
Anilite	-54.68	-86.56	-31.88	Cu0.25Cu1.5S
Antlerite	-2.78	6.01	8.79	Cu3 (OH) 4SO4
Aragonite	-0.13	-8.43	-8.30	CaCO3
Arsenolite	-85.19	-87.95	-2.76	As4O6
Artinite	-5.43	4.17	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.94	-31.24	6.71	As2O5
Atacamite	-1.55	5.84	7.39	Cu2 (OH) 3Cl
Azurite	-0.49	-17.40	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.69	7.71	24.39	Ba (OH) 2:8H2O
Ba2V2O7·2H2O	-19.46	-3.59	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	0.80	-8.11	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.82	4.12	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.30	-22.97	-9.67	BaCrO4
BaF2	-10.28	-16.10	-5.82	BaF2
BaMoO4	-7.75	-14.71	-6.96	BaMoO4
Barite	-0.89	-10.87	-9.98	BaSO4
BaS	-94.46	-78.28	16.18	BaS
BaSeO3	-9.71	-7.88	1.83	BaSeO3
BaSeO4	-11.46	-18.92	-7.46	BaSeO4
Bianchite	-7.21	-8.97	-1.76	ZnSO4·6H2O
Birnessite	-7.57	10.53	18.09	MnO2
Bixbyite	-3.57	-4.21	-0.64	Mn2O3
BlaubleiI	-54.80	-78.96	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.19	-82.46	-27.28	Cu0.6Cu0.8S
Boehmite	-0.10	8.48	8.58	AlOOH
Breithauptite	-56.77	-75.29	-18.52	NiSb
Brochantite	-1.02	14.21	15.22	Cu4 (OH) 6SO4
Brucite	-4.26	12.58	16.84	Mg (OH) 2
Bunsenite	-4.50	7.95	12.45	NiO
Ca (VO3) 2	-12.10	-6.44	5.66	Ca (VO3) 2
Ca2V2O7	-11.38	6.12	17.50	Ca2V2O7
Ca2V2O7·2H2O	-15.44	6.12	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2:4H2O	-15.86	6.44	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-20.28	18.68	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.19	18.67	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-297.03	-154.06	142.97	Ca3Sb2
CaCrO4	-15.85	-18.12	-2.27	CaCrO4
Calcite	0.05	-8.43	-8.48	CaCO3
Calomel	-9.76	-27.67	-17.91	Hg2Cl2
CaMoO4	-1.90	-9.85	-7.95	CaMoO4
Carnotite	-3.57	-3.34	0.23	KUO2VO4
CaSeO3·2H2O	-5.84	-3.03	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.05	-14.07	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-12.70	-2.86	9.84	Cd (BO2) 2
Cd (OH) 2	-6.77	6.87	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.86	6.87	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.25	-16.54	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.53	2.03	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-19.49	8.91	28.40	Cd4 (OH) 6SO4
CdCl2	-13.58	-14.24	-0.66	CdCl2

CdCl2:1H2O	-12.55	-14.24	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.33	-14.24	-1.91	CdCl2:2.5H2O
CdF2	-15.72	-16.93	-1.21	CdF2
Cdmetal (alpha)	-31.91	-18.39	13.51	Cd
Cdmetal (gamma)	-32.01	-18.39	13.62	Cd
CdMoO4	-1.39	-15.54	-14.15	CdMoO4
CdOHC1	-7.22	-3.68	3.54	CdOHC1
CdSb	-76.02	-76.37	-0.35	CdSb
CdSe	-19.46	-39.66	-20.20	CdSe
CdSeO4:2H2O	-17.91	-19.76	-1.85	CdSeO4:2H2O
CdSO4	-11.54	-11.71	-0.17	CdSO4
CdSO4:1H2O	-9.98	-11.71	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.84	-11.71	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.91	-11.66	-9.75	AgCl
Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4 (g)	-81.01	-122.06	-41.05	CH4
Chalcanthite	-7.74	-10.38	-2.64	CuSO4:5H2O
Chalcedony	-0.12	-3.67	-3.55	SiO2
Chalcocite	-54.56	-89.48	-34.92	Cu2S
Chalcopyrite	-124.87	-160.14	-35.27	CuFeS2
Chrysotile	-1.79	30.41	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-52.53	-98.22	-45.69	HgS
Claudetite	-84.89	-87.95	-3.06	As4O6
Clausthalite	-13.74	-40.84	-27.10	PbSe
Co (BO2) 2	-29.03	-1.96	27.07	Co (BO2) 2
Co (OH) 2	-5.33	7.77	13.09	Co (OH) 2
Co (OH) 3	-9.69	-12.00	-2.31	Co (OH) 3
CO2 (g)	-2.85	-20.99	-18.15	CO2
Co3 (AsO4) 2	-20.97	-7.93	13.03	Co3 (AsO4) 2
Co3O4	-5.73	-16.23	-10.50	Co3O4
CoCl2	-21.61	-13.34	8.27	CoCl2
CoCl2:6H2O	-15.88	-13.34	2.54	CoCl2:6H2O
CoCO3	-3.24	-13.22	-9.98	CoCO3
CoF2	-14.44	-16.04	-1.60	CoF2
CoF3	-46.25	-47.71	-1.46	CoF3
CoFe2O4	17.76	14.23	-3.53	CoFe2O4
CoMoO4	-6.89	-14.65	-7.76	CoMoO4
CoO	-5.82	7.77	13.59	CoO
CoS (alpha)	-70.78	-78.22	-7.44	CoS
CoS (beta)	-67.15	-78.22	-11.07	CoS
CoSe	-22.56	-38.76	-16.20	CoSe
CoSeO3	-9.14	-7.82	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-13.61	-10.81	2.80	CoSO4
CoSO4:6H2O	-8.34	-10.81	-2.47	CoSO4:6H2O
Cotunnite	-10.64	-15.42	-4.78	PbCl2
Covellite	-55.49	-77.79	-22.30	CuS
Cr (OH) 2	-21.71	-10.89	10.82	Cr (OH) 2
Cr (OH) 3	-2.54	-1.20	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.45	-1.20	-0.75	Cr (OH) 3
Cr2O3	-0.05	-2.40	-2.36	Cr2O3
CrCl2	-46.09	-32.00	14.09	CrCl2
CrCl3	-47.98	-32.87	15.11	CrCl3
CrF3	-25.57	-36.91	-11.34	CrF3
Cristobalite	-0.32	-3.67	-3.35	SiO2
Crmetal	-66.64	-36.15	30.48	Cr
CrO3	-27.47	-30.68	-3.21	CrO3
Cryolite	-12.35	-46.19	-33.84	Na3AlF6
Cu (OH) 2	-0.48	8.20	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.62	18.59	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.64	-0.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.54	-89.42	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.22	-50.02	-45.80	Cu2Se
Cu2SO4	-20.12	-22.07	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.75	-6.65	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.52	-101.11	-42.59	Cu3Sb
Cu3Se2	-24.86	-88.35	-63.49	Cu3Se2
CuCO3	-1.30	-12.80	-11.50	CuCO3

CuCrO4	-17.04	-22.48	-5.44	CuCrO4
CuF	-8.74	-13.65	-4.91	CuF
CuF2	-16.72	-15.61	1.12	CuF2
CuF2:2H2O	-11.06	-15.61	-4.55	CuF2:2H2O
Cumetal	-5.62	-14.38	-8.76	Cu
CuMoO4	-1.14	-14.22	-13.08	CuMoO4
CuOCuSO4	-12.49	-2.19	10.30	CuOCuSO4
Cupricferrite	8.67	14.66	5.99	CuFe2O4
Cuprite	-2.09	-3.49	-1.41	Cu2O
Cuprousferrite	10.40	1.48	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-26.23	-59.59	-33.37	CuSe2
CuSeO3:2H2O	-7.90	-7.39	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.99	-18.43	-2.44	CuSeO4:5H2O
CuSO4	-13.32	-10.38	2.94	CuSO4
Diaspore	1.61	8.48	6.87	AlOOH
Djurleite	-54.79	-88.71	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.30	-16.84	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.25	-16.84	-17.09	CaMg(CO3)2
Epsomite	-3.87	-6.00	-2.13	MgSO4:7H2O
Fe(OH)2	-9.94	3.63	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.10	0.06	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.66	-15.38	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.68	-9.13	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.68	-40.31	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.54	-49.28	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.13	10.09	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.79	-12.39	0.40	FeAsO4:2H2O
FeCr2O4	-5.97	1.23	7.20	FeCr2O4
FeMoO4	-8.69	-18.79	-10.09	FeMoO4
Ferrihydrite	0.04	3.23	3.19	Fe(OH)3
Ferroselite	-45.56	-64.16	-18.60	FeSe2
FeS(ppt)	-79.41	-82.36	-2.95	FeS
FeSe	-31.90	-42.90	-11.00	FeSe
Fix_pe	-4.73	-4.73	0.00	e-
Fluorite	-0.75	-11.25	-10.50	CaF2
Galena	-66.32	-80.29	-13.97	PbS
Gibbsite	0.19	8.48	8.29	Al(OH)3
Goethite	2.74	3.23	0.49	FeOOH
Goslarite	-6.96	-8.97	-2.01	ZnSO4:7H2O
Greenalite	-17.26	3.55	20.81	Fe3Si2O5(OH)4
Greenockite	-64.75	-79.11	-14.36	CdS
Greigite	-288.81	-333.85	-45.03	Fe3S4
Gummite	-6.29	1.38	7.67	UO3
Gypsum	-1.41	-6.02	-4.61	CaSO4:2H2O
H-Jarosite	-15.37	-27.47	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.54	-22.41	-12.88	H2MoO4
H2S(g)	-77.97	-85.98	-8.01	H2S
H2Se(g)	-41.57	-46.53	-4.96	H2Se
Halite	-6.58	-4.97	1.60	NaCl
Halloysite	0.05	9.63	9.57	Al2Si2O5(OH)4
Hausmannite	-3.94	57.09	61.03	Mn3O4
Hematite	7.88	6.46	-1.42	Fe2O3
Hercynite	-2.30	20.59	22.89	FeAl2O4
Hg(CH3)2(g)	-182.65	-256.35	-73.71	Hg(CH3)2
Hg(g)	-8.04	-15.91	-7.87	Hg
Hg(OH)2	-8.74	-12.24	-3.50	Hg(OH)2
Hg2(g)	-16.87	-31.83	-14.96	Hg2
Hg2(OH)2	-11.82	-6.56	5.26	Hg2(OH)2
Hg2CO3	-11.50	-27.55	-16.05	Hg2CO3
Hg2CrO4	-28.54	-37.24	-8.70	Hg2CrO4
Hg2F2	-20.00	-30.36	-10.36	Hg2F2
Hg2S	-80.87	-92.54	-11.68	Hg2S
Hg2SeO3	-17.49	-22.15	-4.66	Hg2SeO3
Hg2SO4	-19.01	-25.14	-6.13	Hg2SO4
Hg3O2CO3	-28.03	-57.71	-29.68	Hg3O2CO3
HgCl(g)	-33.33	-13.84	19.50	HgCl
HgCl2	-12.09	-33.35	-21.26	HgCl2

HgF(g)	-47.86	-15.18	32.68	HgF
HgF2(g)	-48.61	-36.04	12.57	HgF2
Hgmetal(l)	-2.46	-15.91	-13.45	Hg
HgSe	-3.07	-58.77	-55.69	HgSe
HgSeO3	-15.40	-27.83	-12.43	HgSeO3
HgSO4	-21.40	-30.82	-9.42	HgSO4
Huntite	-3.70	-33.66	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.15	-24.92	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.30	-21.06	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-18.73	-23.90	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-7.89	-22.69	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-34.56	-51.80	-17.24	K2Cr2O7
K2CrO4	-20.61	-21.13	-0.51	K2CrO4
K2MoO4	-16.12	-12.86	3.26	K2MoO4
K2SeO4	-16.35	-17.08	-0.73	K2SeO4
Kaolinite	2.19	9.63	7.43	Al2Si2O5(OH)4
Langite	-3.28	14.21	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.77	-7.20	-0.43	PbO:PbSO4
Laurionite	-5.49	-4.87	0.62	PbOHCl
Lepidocrocite	1.86	3.23	1.37	FeOOH
Lime	-20.14	12.56	32.70	CaO
Litharge	-7.00	5.69	12.69	PbO
Mackinawite	-78.76	-82.36	-3.60	FeS
Maghemite	0.07	6.46	6.39	Fe2O3
Magnesioferrite	2.18	19.04	16.86	Fe2MgO4
Magnesite	-0.95	-8.41	-7.46	MgCO3
Magnetite	6.69	10.09	3.40	Fe3O4
Malachite	0.71	-4.60	-5.31	Cu2(OH)2CO3
Manganite	-2.10	23.24	25.34	MnOOH
Massicot	-7.20	5.69	12.89	PbO
Matlockite	-7.80	-16.77	-8.97	PbClF
Melanothallite	-19.17	-12.92	6.26	CuCl2
Melanterite	-12.74	-14.95	-2.21	FeSO4·7H2O
Metacinnabar	-53.13	-98.22	-45.09	HgS
Mg(OH)2(active)	-6.21	12.58	18.79	Mg(OH)2
Mg(VO3)2	-17.70	-6.42	11.28	Mg(VO3)2
Mg2Sb3	-273.97	-199.28	74.68	Mg2Sb3
Mg2V2O7	-20.20	6.16	26.36	Mg2V2O7
MgCr2O4	-6.02	10.18	16.20	MgCr2O4
MgCrO4	-23.48	-18.10	5.38	MgCrO4
MgF2	-3.09	-11.22	-8.13	MgF2
MgMoO4	-7.98	-9.83	-1.85	MgMoO4
MgSeO3·6H2O	-6.06	-3.01	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-12.85	-14.05	-1.20	MgSeO4·6H2O
Minium	-31.19	42.34	73.52	Pb3O4
Mirabilite	-6.30	-7.42	-1.11	Na2SO4·10H2O
Mn(VO3)2	-13.30	-8.40	4.90	Mn(VO3)2
Mn2(SO4)3	-54.24	-59.95	-5.71	Mn2(SO4)3
Mn2Sb	-148.36	-87.28	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.91	0.59	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.22	-10.50	2.72	MnCl2·4H2O
MnS(grn)	-75.54	-75.37	0.17	MnS
MnS(pnk)	-78.71	-75.37	3.34	MnS
MnSb	-95.07	-97.98	-2.91	MnSb
MnSe	-39.42	-35.92	3.50	MnSe
MnSeO3	-6.11	-4.98	1.13	MnSeO3
MnSeO3·2H2O	-5.96	-4.98	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-13.97	-16.02	-2.05	MnSeO4·5H2O
MnSO4	-10.55	-7.97	2.58	MnSO4
Monteponite	-8.23	6.87	15.10	CdO
Montroydite	-8.60	-12.24	-3.64	HgO
MoO3	-14.41	-22.41	-8.00	MoO3
Morenosite	-8.49	-10.63	-2.14	NiSO4·7H2O
MoS2	-149.39	-219.65	-70.26	MoS2
Na-Jarosite	-10.69	-21.89	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.30	-50.19	-9.90	Na2Cr2O7
Na2CrO4	-22.44	-19.51	2.93	Na2CrO4
Na2Mo2O7	-17.07	-33.66	-16.60	Na2Mo2O7

Na2MoO4	-12.74	-11.25	1.49	Na2MoO4
Na2MoO4:2H2O	-12.47	-11.25	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.72	-4.42	10.30	Na2SeO3:5H2O
Na2SeO4	-16.75	-15.47	1.28	Na2SeO4
Na3Sb	-173.58	-79.12	94.45	Na3Sb
Na3VO4	-29.44	7.24	36.68	Na3VO4
Na4V2O7	-34.08	3.32	37.40	Na4V2O7
Nantokite	-5.57	-12.30	-6.73	CuCl
NaSb	-88.19	-65.02	23.17	NaSb
Natron	-8.52	-9.83	-1.31	Na2CO3:10H2O
NaVO3	-7.78	-3.92	3.86	NaVO3
Nesquehonite	-3.74	-8.41	-4.67	MgCO3:3H2O
Ni(OH)2	-4.85	7.95	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.10	-7.40	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.79	13.21	32.00	Ni4(OH)6SO4
NiCO3	-6.17	-13.04	-6.87	NiCO3
NiMoO4	-3.32	-14.47	-11.14	NiMoO4
NiS(alpha)	-72.44	-78.04	-5.60	NiS
NiS(beta)	-66.94	-78.04	-11.10	NiS
NiS(gamma)	-65.24	-78.04	-12.80	NiS
NiSe	-20.88	-38.58	-17.70	NiSe
NiSeO3:2H2O	-10.46	-7.64	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.16	-18.68	-1.52	NiSeO4:6H2O
Nsutite	-6.98	10.53	17.50	MnO2
O2(g)	-32.56	50.53	83.09	O2
Orpiment	-240.86	-301.93	-61.07	As2S3
Otavite	-2.12	-14.12	-12.00	CdCO3
Pb(BO2)2	-10.56	-4.04	6.52	Pb(BO2)2
Pb(OH)2	-2.46	5.69	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-60.30	-69.06	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.97	0.82	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.81	11.38	26.19	Pb2O(OH)2
Pb2O3	-24.39	36.65	61.04	Pb2O3
Pb2OCO3	-9.05	-9.61	-0.56	Pb2OCO3
Pb2V2O7	-5.73	-7.63	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.97	-14.17	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.08	-1.94	6.14	Pb3(VO4)2
Pb3O2CO3	-14.94	-3.92	11.02	Pb3O2CO3
Pb3O2SO4	-12.20	-1.51	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.92	4.18	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.70	4.18	21.88	Pb4O3SO4
PbCrO4	-12.39	-24.99	-12.60	PbCrO4
PbF2	-10.68	-18.12	-7.44	PbF2
Pbmetal	-23.82	-19.58	4.25	Pb
PbMoO4	-1.10	-16.72	-15.62	PbMoO4
PbO:0.3H2O	-7.29	5.69	12.98	PbO:0.33H2O
PbSeO4	-14.10	-20.94	-6.84	PbSeO4
Periclase	-9.00	12.58	21.58	MgO
Phosgenite	-10.91	-30.72	-19.81	PbCl2:PbCO3
Plattnerite	-18.64	30.96	49.60	PbO2
Portlandite	-10.24	12.56	22.80	Ca(OH)2
Pyrite	-124.57	-143.07	-18.51	FeS2
Pyrochroite	-4.58	10.61	15.19	Mn(OH)2
Pyrolusite	-5.50	35.88	41.38	MnO2
Quartz	0.33	-3.67	-4.00	SiO2
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-8.59	-10.63	-2.04	NiSO4:6H2O
Rhodochrosite	0.20	-10.38	-10.58	MnCO3
Rutherfordine	-5.11	-19.61	-14.50	UO2CO3
Sb(OH)3	-12.96	-20.07	-7.11	Sb(OH)3
Sb2O4	-18.28	-14.88	3.40	Sb2O4
Sb2O5	-28.56	-38.23	-9.67	Sb2O5
Sb2Se3	-111.97	-179.73	-67.76	Sb2Se3
Sb4O6(cubic)	-62.03	-80.29	-18.26	Sb4O6
Sb4O6(orth)	-62.39	-80.29	-17.90	Sb4O6
SbCl3	-52.31	-51.74	0.57	SbCl3
SbF3	-45.55	-55.78	-10.23	SbF3
Sbmetal	-46.28	-57.97	-11.69	Sb

SbO2	-3.92	-31.75	-27.82	SbO2
Schoepite	-4.61	1.38	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.15	-21.26	-7.11	Se
Semetal (hex)	-13.55	-21.26	-7.71	Se
Senarmontite	-27.78	-40.14	-12.37	Sb2O3
SeO2	-15.71	-15.59	0.12	SeO2
SeO3	-47.67	-26.63	21.04	SeO3
Sepiolite	-1.60	14.16	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-4.62	14.16	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.12	-17.36	-10.24	FeCO3
SiO2 (am-gel)	-0.96	-3.67	-2.71	SiO2
SiO2 (am-ppt)	-0.93	-3.67	-2.74	SiO2
Smithsonite	-1.39	-11.39	-10.00	ZnCO3
Sphalerite	-64.93	-76.38	-11.45	ZnS
Spinel	-7.30	29.55	36.85	MgAl2O4
Stibnite	-247.64	-298.10	-50.46	Sb2S3
Sulfur	-58.57	-60.72	-2.14	S
Tenorite	0.55	8.20	7.64	CuO
Thenardite	-7.74	-7.41	0.32	Na2SO4
Thermonatrite	-10.47	-9.83	0.64	Na2CO3:H2O
Tyuyamunite	-7.76	-3.68	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.55	6.53	21.08	U3O8
U3Sb4	-579.86	-427.48	152.38	U3Sb4
U4O9	-30.38	-33.40	-3.02	U4O9
UF4	-32.74	-62.28	-29.54	UF4
UF4:2.5H2O	-29.56	-62.28	-32.72	UF4:2.5H2O
UO2 (am)	-15.60	-14.67	0.93	UO2
UO2 (NO3) 2	-44.33	-32.18	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-37.04	-32.18	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-35.57	-32.18	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-34.23	-32.19	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.23	1.38	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-23.00	-25.25	-2.25	UO2SeO4:4H2O
UO3	-6.32	1.38	7.70	UO3
Uraninite	-10.00	-14.67	-4.67	UO2
USb2	-219.93	-190.36	29.58	USb2
V (OH) 3	-19.76	-12.17	7.59	V (OH) 3
V2O5	-17.64	-19.00	-1.36	V2O5
V3O5	-42.80	-40.96	1.84	V3O5
V4O7	-53.38	-46.20	7.19	V4O7
V6O13	-46.69	-107.55	-60.86	V6O13
Valentinite	-31.66	-40.14	-8.48	Sb2O3
VC12	-64.79	-45.91	18.87	VC12
VC13	-67.27	-43.84	23.43	VC13
VF4	-67.77	-52.84	14.93	VF4
Vmetal	-94.09	-50.07	44.03	V
VO	-39.56	-24.80	14.76	VO
VO (OH) 2	-10.38	-5.23	5.15	VO (OH) 2
VO2Cl	-22.90	-20.06	2.84	VO2Cl
VOC1	-33.88	-22.73	11.15	VOC1
VOC12	-39.10	-26.34	12.76	VOC12
VOSO4	-27.42	-23.81	3.61	VOSO4
Witherite	-4.71	-13.28	-8.57	BaCO3
Wurtzite	-67.43	-76.38	-8.95	ZnS
Zincite	-1.73	9.61	11.33	ZnO
Zincosite	-12.90	-8.97	3.93	ZnSO4
Zn (BO2) 2	-8.41	-0.12	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-27.28	-23.96	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.59	9.61	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.87	9.61	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.15	9.61	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.93	9.61	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.13	9.61	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.87	0.63	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-6.53	8.66	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.07	-2.42	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-27.25	-8.34	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-8.55	19.85	28.40	Zn4 (OH) 6SO4

Zn5(OH)8Cl2	-11.58	26.92	38.50	Zn5(OH)8Cl2
ZnCl2	-18.56	-11.51	7.05	ZnCl2
ZnCO3:1H2O	-1.13	-11.39	-10.26	ZnCO3:1H2O
ZnF2	-13.66	-14.20	-0.53	ZnF2
Znmetal	-41.45	-15.66	25.79	Zn
ZnMoO4	-2.68	-12.81	-10.13	ZnMoO4
ZnO(active)	-1.58	9.61	11.19	ZnO
ZnS(am)	-67.33	-76.38	-9.05	ZnS
ZnSb	-84.64	-73.63	11.01	ZnSb
ZnSe	-22.52	-36.92	-14.40	ZnSe
ZnSeO4:6H2O	-15.50	-17.02	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.33	-8.97	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 96.

```

Title Return solution back to 1L
Mix 505
      512  1.2032
save solution 513
end

```

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 505.

Mixture 505.

1.203e+00 Solution 512 Solution after simulation 95.

-----Solution composition-----

Elements	Molality	Moles
Ag	6.555e-09	6.556e-09
Al	5.670e-07	5.670e-07
As	1.838e-09	1.839e-09
B	1.441e-05	1.442e-05
Ba	1.325e-08	1.326e-08
C	2.056e-03	2.056e-03
Ca	1.175e-03	1.176e-03
Cd	2.867e-09	2.867e-09
Cl	2.508e-03	2.508e-03
Co	2.212e-08	2.212e-08
Cr	1.182e-09	1.183e-09
Cu	1.106e-06	1.106e-06
F	1.214e-04	1.214e-04
Fe	1.117e-09	1.118e-09
Hg	4.519e-10	4.520e-10
K	8.551e-04	8.552e-04
Mg	1.183e-03	1.183e-03

Mn	1.353e-05	1.353e-05
Mo	3.998e-07	3.999e-07
N	3.256e-06	3.256e-06
Na	5.463e-03	5.463e-03
Ni	3.444e-08	3.445e-08
Pb	2.041e-09	2.042e-09
S	3.200e-03	3.200e-03
Sb	6.043e-09	6.044e-09
Se	3.535e-08	3.535e-08
Si	2.161e-04	2.162e-04
U	6.304e-08	6.305e-08
V	1.898e-09	1.898e-09
Zn	1.625e-06	1.625e-06

-----Description of solution-----

	pH	=	7.902	Charge balance
	pe	=	4.731	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.480e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.036e-03	
	Total CO2 (mol/kg)	=	2.056e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.853e-07	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	0	
	Total H	=	1.110336e+02	
	Total O	=	5.553522e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	9.109e-07	8.036e-07	-6.041	-6.095	-0.054	(0)
H+	1.415e-08	1.253e-08	-7.849	-7.902	-0.053	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	6.555e-09					
AgCl	4.424e-09	4.424e-09	-8.354	-8.354	0.000	(0)
Ag+	1.103e-09	9.764e-10	-8.957	-9.010	-0.053	(0)
AgCl2-	9.864e-10	8.551e-10	-9.006	-9.068	-0.062	(0)
AgSO4-	3.773e-11	3.271e-11	-10.423	-10.485	-0.062	(0)
AgCl3-2	2.995e-12	1.691e-12	-11.524	-11.772	-0.248	(0)
AgNO2	5.386e-13	5.386e-13	-12.269	-12.269	0.000	(0)
AgF	2.448e-13	2.448e-13	-12.611	-12.611	0.000	(0)
AgOH	7.846e-14	7.846e-14	-13.105	-13.105	0.000	(0)
AgCl4-3	2.772e-14	7.663e-15	-13.557	-14.116	-0.558	(0)
AgNH3+	2.214e-14	1.919e-14	-13.655	-13.717	-0.062	(0)
Ag2Se	1.469e-14	1.469e-14	-13.833	-13.833	0.000	(0)
AgH2BO3	9.824e-15	9.824e-15	-14.008	-14.008	0.000	(0)
AgSeO3-	4.734e-15	4.104e-15	-14.325	-14.387	-0.062	(0)
Ag (OH) 2-	7.108e-18	6.162e-18	-17.148	-17.210	-0.062	(0)
Ag (NO2) 2-	2.541e-18	2.202e-18	-17.595	-17.657	-0.062	(0)
Ag (NH3) 2+	1.732e-18	1.502e-18	-17.761	-17.823	-0.062	(0)
AgNO3	1.018e-18	1.018e-18	-17.992	-17.992	0.000	(0)
Ag (SeO3) 2-3	8.693e-22	2.403e-22	-21.061	-21.619	-0.558	(0)
Ag2MoO4	8.849e-26	8.849e-26	-25.053	-25.053	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.278	-73.278	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.071	-83.064	-0.993	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.687	-146.842	-0.155	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.198	-147.260	-0.062	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.082	-148.380	-0.297	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.406	-148.691	-0.285	(0)
Al	5.670e-07					
Al (OH) 4-	5.616e-07	4.976e-07	-6.251	-6.303	-0.053	(0)

Al (OH) 3	4.918e-09	4.918e-09	-8.308	-8.308	0.000	(0)
Al (OH) 2+	3.450e-10	3.067e-10	-9.462	-9.513	-0.051	(0)
AlF3	2.982e-11	2.982e-11	-10.525	-10.525	0.000	(0)
AlF2+	2.669e-11	2.373e-11	-10.574	-10.625	-0.051	(0)
AlF4-	1.684e-12	1.492e-12	-11.774	-11.826	-0.053	(0)
AlF+2	9.552e-13	5.970e-13	-12.020	-12.224	-0.204	(0)
AlOH+2	7.689e-13	4.805e-13	-12.114	-12.318	-0.204	(0)
AlSO4+	8.796e-15	7.793e-15	-14.056	-14.108	-0.053	(0)
Al+3	1.795e-15	5.980e-16	-14.746	-15.223	-0.477	(0)
Al (SO4) 2-	1.582e-16	1.402e-16	-15.801	-15.853	-0.053	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-46.748	-47.306	-0.558	(0)
As (3)	1.077e-22					
H3AsO3	1.029e-22	1.029e-22	-21.988	-21.988	0.000	(0)
H2AsO3-	4.858e-24	4.211e-24	-23.314	-23.376	-0.062	(0)
HAsO3-2	5.429e-28	3.066e-28	-27.265	-27.513	-0.248	(0)
H4AsO3+	7.364e-31	6.384e-31	-30.133	-30.195	-0.062	(0)
AsO3-3	3.413e-33	9.435e-34	-32.467	-33.025	-0.558	(0)
As (5)	1.838e-09					
HAsO4-2	1.710e-09	9.657e-10	-8.767	-9.015	-0.248	(0)
H2AsO4-	1.273e-10	1.103e-10	-9.895	-9.957	-0.062	(0)
AsO4-3	8.818e-13	2.438e-13	-12.055	-12.613	-0.558	(0)
H3AsO4	2.394e-16	2.402e-16	-15.621	-15.619	0.001	(0)
B	1.441e-05					
H3BO3	1.365e-05	1.369e-05	-4.865	-4.863	0.001	(0)
H2BO3-	7.229e-07	6.349e-07	-6.141	-6.197	-0.056	(0)
CaH2BO3+	2.371e-08	2.082e-08	-7.625	-7.681	-0.056	(0)
MgH2BO3+	1.502e-08	1.319e-08	-7.823	-7.880	-0.056	(0)
NaH2BO3	4.816e-09	4.816e-09	-8.317	-8.317	0.000	(0)
BF (OH) 3-	6.212e-10	5.455e-10	-9.207	-9.263	-0.056	(0)
H5 (BO3) 2-	8.426e-12	7.400e-12	-11.074	-11.131	-0.056	(0)
BaH2BO3+	1.792e-13	1.574e-13	-12.747	-12.803	-0.056	(0)
BF2 (OH) 2-	8.307e-14	7.295e-14	-13.081	-13.137	-0.056	(0)
H8 (BO3) 3-	1.154e-14	1.013e-14	-13.938	-13.994	-0.056	(0)
AgH2BO3	9.824e-15	9.824e-15	-14.008	-14.008	0.000	(0)
BF3OH-	4.043e-20	3.551e-20	-19.393	-19.450	-0.056	(0)
BF4-	2.489e-25	2.185e-25	-24.604	-24.660	-0.056	(0)
Ba	1.325e-08					
Ba+2	1.308e-08	8.023e-09	-7.883	-8.096	-0.212	(0)
BaHCO3+	1.489e-10	1.327e-10	-9.827	-9.877	-0.050	(0)
BaCO3	2.667e-11	2.667e-11	-10.574	-10.574	0.000	(0)
BaH2BO3+	1.792e-13	1.574e-13	-12.747	-12.803	-0.056	(0)
BaOH+	3.170e-14	2.814e-14	-13.499	-13.551	-0.052	(0)
BaNH3+2	8.630e-17	4.873e-17	-16.064	-16.312	-0.248	(0)
BaNO3+	6.086e-17	5.276e-17	-16.216	-16.278	-0.062	(0)
C (4)	2.056e-03					
HCO3-	1.948e-03	1.732e-03	-2.710	-2.761	-0.051	(0)
H2CO3	4.879e-05	4.879e-05	-4.312	-4.312	0.000	(0)
CaHCO3+	2.062e-05	1.838e-05	-4.686	-4.736	-0.050	(0)
MgHCO3+	1.201e-05	1.062e-05	-4.920	-4.974	-0.053	(0)
CO3-2	1.056e-05	6.481e-06	-4.976	-5.188	-0.212	(0)
CaCO3	5.854e-06	5.854e-06	-5.233	-5.233	0.000	(0)
NaHCO3	4.661e-06	4.661e-06	-5.331	-5.331	0.000	(0)
MgCO3	3.230e-06	3.230e-06	-5.491	-5.491	0.000	(0)
CuCO3	9.413e-07	9.413e-07	-6.026	-6.026	0.000	(0)
NaCO3-	6.497e-07	5.777e-07	-6.187	-6.238	-0.051	(0)
MnHCO3+	2.486e-07	2.207e-07	-6.605	-6.656	-0.052	(0)
ZnCO3	2.367e-07	2.367e-07	-6.626	-6.626	0.000	(0)
UO2 (CO3) 3-4	4.049e-08	4.118e-09	-7.393	-8.385	-0.993	(0)
ZnHCO3+	4.009e-08	3.475e-08	-7.397	-7.459	-0.062	(0)
Cu (CO3) 2-2	2.908e-08	1.642e-08	-7.536	-7.785	-0.248	(0)
UO2 (CO3) 2-2	2.245e-08	1.268e-08	-7.649	-7.897	-0.248	(0)
NiHCO3+	3.428e-09	2.971e-09	-8.465	-8.527	-0.062	(0)
NiCO3	3.365e-09	3.365e-09	-8.473	-8.473	0.000	(0)
CuHCO3+	3.109e-09	2.695e-09	-8.507	-8.569	-0.062	(0)
PbCO3	1.497e-09	1.497e-09	-8.825	-8.825	0.000	(0)
CoHCO3+	1.430e-09	1.240e-09	-8.845	-8.907	-0.062	(0)
CoCO3	1.008e-09	1.008e-09	-8.996	-8.996	0.000	(0)
CdCO3	1.725e-10	1.725e-10	-9.763	-9.763	0.000	(0)

		BaHCO3+	1.489e-10	1.327e-10	-9.827	-9.877	-0.050	(0)
		PbHCO3+	1.141e-10	9.889e-11	-9.943	-10.005	-0.062	(0)
		UO2CO3	9.803e-11	9.803e-11	-10.009	-10.009	0.000	(0)
		Pb (CO3) 2-2	4.956e-11	2.799e-11	-10.305	-10.553	-0.248	(0)
		BaCO3	2.667e-11	2.667e-11	-10.574	-10.574	0.000	(0)
		CdHCO3+	5.310e-12	4.603e-12	-11.275	-11.337	-0.062	(0)
		Cd (CO3) 2-2	1.467e-12	8.287e-13	-11.833	-12.082	-0.248	(0)
		FeHCO3+	1.633e-14	1.456e-14	-13.787	-13.837	-0.050	(0)
		HgCO3	1.098e-15	1.098e-15	-14.959	-14.959	0.000	(0)
		Hg (CO3) 2-2	3.985e-17	2.250e-17	-16.400	-16.648	-0.248	(0)
		HgHCO3+	2.954e-19	2.561e-19	-18.530	-18.592	-0.062	(0)
Ca	1.175e-03							
		Ca+2	9.290e-04	5.699e-04	-3.032	-3.244	-0.212	(0)
		CaSO4	2.192e-04	2.192e-04	-3.659	-3.659	0.000	(0)
		CaHCO3+	2.062e-05	1.838e-05	-4.686	-4.736	-0.050	(0)
		CaCO3	5.854e-06	5.854e-06	-5.233	-5.233	0.000	(0)
		CaF+	6.995e-07	6.210e-07	-6.155	-6.207	-0.052	(0)
		CaH2BO3+	2.371e-08	2.082e-08	-7.625	-7.681	-0.056	(0)
		CaOH+	1.025e-08	9.138e-09	-7.989	-8.039	-0.050	(0)
		CaNH3+2	1.223e-11	6.907e-12	-10.913	-11.161	-0.248	(0)
		CaNO3+	2.728e-12	2.365e-12	-11.564	-11.626	-0.062	(0)
		Ca (NH3) 2+2	4.688e-20	2.647e-20	-19.329	-19.577	-0.248	(0)
Cd	2.867e-09							
		Cd+2	1.903e-09	1.167e-09	-8.721	-8.933	-0.212	(0)
		CdSO4	4.595e-10	4.595e-10	-9.338	-9.338	0.000	(0)
		CdCl+	2.854e-10	2.474e-10	-9.545	-9.607	-0.062	(0)
		CdCO3	1.725e-10	1.725e-10	-9.763	-9.763	0.000	(0)
		Cd (SO4) 2-2	1.843e-11	1.041e-11	-10.735	-10.983	-0.248	(0)
		CdOH+	8.597e-12	7.452e-12	-11.066	-11.128	-0.062	(0)
		CdOHC1	8.156e-12	8.156e-12	-11.089	-11.089	0.000	(0)
		CdHCO3+	5.310e-12	4.603e-12	-11.275	-11.337	-0.062	(0)
		CdCl2	2.289e-12	2.289e-12	-11.640	-11.640	0.000	(0)
		CdF+	2.131e-12	1.847e-12	-11.671	-11.733	-0.062	(0)
		Cd (CO3) 2-2	1.467e-12	8.287e-13	-11.833	-12.082	-0.248	(0)
		Cd (OH) 2	3.779e-14	3.779e-14	-13.423	-13.423	0.000	(0)
		CdCl3-	3.697e-15	3.205e-15	-14.432	-14.494	-0.062	(0)
		CdF2	3.680e-16	3.680e-16	-15.434	-15.434	0.000	(0)
		CdNO3+	5.587e-18	4.844e-18	-17.253	-17.315	-0.062	(0)
		CdSeO4	3.244e-18	3.244e-18	-17.489	-17.489	0.000	(0)
		Cd (OH) 3-	2.140e-18	1.855e-18	-17.670	-17.732	-0.062	(0)
		Cd2OH+3	1.577e-19	4.360e-20	-18.802	-19.360	-0.558	(0)
		Cd (SeO3) 2-2	7.288e-20	4.116e-20	-19.137	-19.386	-0.248	(0)
		Cd (OH) 4-2	4.321e-25	2.440e-25	-24.364	-24.613	-0.248	(0)
		Cd (NO3) 2	3.185e-27	3.185e-27	-26.497	-26.497	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.945	-79.007	-0.062	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-149.885	-149.885	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.006	-226.068	-0.062	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-301.706	-301.954	-0.248	(0)
Cl	2.508e-03							
		Cl-	2.508e-03	2.219e-03	-2.601	-2.654	-0.053	(0)
		MnCl+	2.010e-08	1.784e-08	-7.697	-7.749	-0.052	(0)
		AgCl	4.424e-09	4.424e-09	-8.354	-8.354	0.000	(0)
		ZnCl+	4.001e-09	3.537e-09	-8.398	-8.451	-0.053	(0)
		ZnOHC1	3.722e-09	3.722e-09	-8.429	-8.429	0.000	(0)
		AgCl2-	9.864e-10	8.551e-10	-9.006	-9.068	-0.062	(0)
		CuCl	6.270e-10	6.270e-10	-9.203	-9.203	0.000	(0)
		CuCl2-	3.288e-10	2.907e-10	-9.483	-9.537	-0.053	(0)
		CdCl+	2.854e-10	2.474e-10	-9.545	-9.607	-0.062	(0)
		CuCl+	9.812e-11	8.675e-11	-10.008	-10.062	-0.053	(0)
		NiCl+	9.116e-11	7.902e-11	-10.040	-10.102	-0.062	(0)
		CoCl+	8.151e-11	7.066e-11	-10.089	-10.151	-0.062	(0)
		MnCl2	5.593e-11	5.593e-11	-10.252	-10.252	0.000	(0)
		ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
		CdOHC1	8.156e-12	8.156e-12	-11.089	-11.089	0.000	(0)
		PbCl+	6.981e-12	6.051e-12	-11.156	-11.218	-0.062	(0)
		AgCl3-2	2.995e-12	1.691e-12	-11.524	-11.772	-0.248	(0)
		CdCl2	2.289e-12	2.289e-12	-11.640	-11.640	0.000	(0)
		HgClOH	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)

CuCl3-2	2.221e-13	1.379e-13	-12.654	-12.860	-0.207	(0)
HgCl2	6.971e-14	6.971e-14	-13.157	-13.157	0.000	(0)
CuCl2	6.675e-14	6.675e-14	-13.176	-13.176	0.000	(0)
PbCl2	5.999e-14	5.999e-14	-13.222	-13.222	0.000	(0)
MnCl3-	3.851e-14	3.419e-14	-13.414	-13.466	-0.052	(0)
AgCl4-3	2.772e-14	7.663e-15	-13.557	-14.116	-0.558	(0)
ZnCl3-	2.481e-14	2.193e-14	-13.605	-13.659	-0.053	(0)
CdCl3-	3.697e-15	3.205e-15	-14.432	-14.494	-0.062	(0)
HgCl3-	1.785e-15	1.547e-15	-14.748	-14.811	-0.062	(0)
NiCl2	8.830e-16	8.830e-16	-15.054	-15.054	0.000	(0)
PbCl3-	6.114e-17	5.300e-17	-16.214	-16.276	-0.062	(0)
ZnCl4-2	3.918e-17	2.434e-17	-16.407	-16.614	-0.207	(0)
HgCl4-2	2.420e-17	1.367e-17	-16.616	-16.864	-0.248	(0)
UO2Cl+	1.577e-17	1.367e-17	-16.802	-16.864	-0.062	(0)
HgCl+	7.230e-18	6.268e-18	-17.141	-17.203	-0.062	(0)
CrCl+2	2.329e-18	1.315e-18	-17.633	-17.881	-0.248	(0)
CuCl3-	1.564e-18	1.383e-18	-17.806	-17.859	-0.053	(0)
PbCl4-2	9.520e-20	5.376e-20	-19.021	-19.270	-0.248	(0)
CrOHC12	4.458e-20	4.458e-20	-19.351	-19.351	0.000	(0)
FeCl+2	3.602e-22	2.237e-22	-21.443	-21.650	-0.207	(0)
CrCl2+	3.195e-22	2.769e-22	-21.496	-21.558	-0.062	(0)
CuCl4-2	2.476e-23	1.538e-23	-22.606	-22.813	-0.207	(0)
VOCl+	6.599e-24	5.721e-24	-23.180	-23.243	-0.062	(0)
FeCl2+	2.498e-24	2.218e-24	-23.602	-23.654	-0.052	(0)
CrO3Cl-	1.093e-26	9.474e-27	-25.961	-26.023	-0.062	(0)
FeCl3	4.922e-28	4.922e-28	-27.308	-27.308	0.000	(0)
CoCl+2	1.577e-36	8.907e-37	-35.802	-36.050	-0.248	(0)
UCl+3	0.000e+00	0.000e+00	-46.670	-47.229	-0.558	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.931	-50.180	-0.248	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.742	-51.990	-0.248	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.663	-64.912	-0.248	(0)
Co (2)	2.212e-08					
Co+2	1.630e-08	9.204e-09	-7.788	-8.036	-0.248	(0)
CoSO4	3.083e-09	3.083e-09	-8.511	-8.511	0.000	(0)
CoHCO3+	1.430e-09	1.240e-09	-8.845	-8.907	-0.062	(0)
CoCO3	1.008e-09	1.008e-09	-8.996	-8.996	0.000	(0)
CoOH+	1.702e-10	1.476e-10	-9.769	-9.831	-0.062	(0)
CoCl+	8.151e-11	7.066e-11	-10.089	-10.151	-0.062	(0)
CoF+	3.352e-11	2.906e-11	-10.475	-10.537	-0.062	(0)
Co (OH) 2	9.421e-12	9.421e-12	-11.026	-11.026	0.000	(0)
CoNO2+	1.976e-13	1.713e-13	-12.704	-12.766	-0.062	(0)
Co (NH3) +2	1.887e-14	1.065e-14	-13.724	-13.973	-0.248	(0)
Co (OH) 3-	1.743e-16	1.511e-16	-15.759	-15.821	-0.062	(0)
CoSeO4	6.885e-17	6.885e-17	-16.162	-16.162	0.000	(0)
CoOOH-	4.373e-17	3.791e-17	-16.359	-16.421	-0.062	(0)
CoNO3+	2.208e-17	1.914e-17	-16.656	-16.718	-0.062	(0)
Co2OH+3	2.463e-19	6.808e-20	-18.609	-19.167	-0.558	(0)
Co (NH3) 2+2	7.748e-21	4.375e-21	-20.111	-20.359	-0.248	(0)
Co (OH) 4-2	3.407e-23	1.924e-23	-22.468	-22.716	-0.248	(0)
Co (NO3) 2	5.109e-26	5.109e-26	-25.292	-25.292	0.000	(0)
Co (NH3) 3+2	9.390e-28	5.303e-28	-27.027	-27.275	-0.248	(0)
Co4 (OH) 4+4	9.308e-31	9.466e-32	-30.031	-31.024	-0.993	(0)
Co (NH3) 4+2	4.744e-35	2.679e-35	-34.324	-34.572	-0.248	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.120	-42.368	-0.248	(0)
Co (3)	1.426e-29					
CoOH+2	1.426e-29	8.055e-30	-28.846	-29.094	-0.248	(0)
Co+3	5.922e-36	1.973e-36	-35.228	-35.705	-0.477	(0)
CoCl+2	1.577e-36	8.907e-37	-35.802	-36.050	-0.248	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.931	-50.180	-0.248	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.045	-60.108	-0.062	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.905	-64.153	-0.248	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.663	-64.912	-0.248	(0)
Cr (2)	3.599e-27					
Cr+2	3.599e-27	2.032e-27	-26.444	-26.692	-0.248	(0)
Cr (3)	1.182e-09					
Cr (OH) 2+	9.081e-10	7.872e-10	-9.042	-9.104	-0.062	(0)
Cr (OH) 3	2.377e-10	2.377e-10	-9.624	-9.624	0.000	(0)
Cr (OH) +2	1.426e-11	8.051e-12	-10.846	-11.094	-0.248	(0)

CrO2-	1.040e-11	9.012e-12	-10.983	-11.045	-0.062	(0)
Cr(OH) 4-	8.771e-12	7.603e-12	-11.057	-11.119	-0.062	(0)
CrOHSO4	3.208e-12	3.208e-12	-11.494	-11.494	0.000	(0)
CrF+2	1.283e-14	7.246e-15	-13.892	-14.140	-0.248	(0)
CrSO4+	2.071e-15	1.795e-15	-14.684	-14.746	-0.062	(0)
Cr+3	1.656e-15	4.579e-16	-14.781	-15.339	-0.558	(0)
CrCl+2	2.329e-18	1.315e-18	-17.633	-17.881	-0.248	(0)
CrOHC12	4.458e-20	4.458e-20	-19.351	-19.351	0.000	(0)
Cr2(OH) 2SO4+2	4.133e-21	2.334e-21	-20.384	-20.632	-0.248	(0)
CrCl2+	3.195e-22	2.769e-22	-21.496	-21.558	-0.062	(0)
Cr2(OH) 2(SO4) 2	2.328e-22	2.328e-22	-21.633	-21.633	0.000	(0)
CrNO3+2	4.651e-26	2.626e-26	-25.332	-25.581	-0.248	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.896	-41.144	-0.248	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-49.880	-50.438	-0.558	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-51.742	-51.990	-0.248	(0)
Cr(6)	2.282e-15					
CrO4-2	2.179e-15	1.336e-15	-14.662	-14.874	-0.212	(0)
HCro4-	6.249e-17	5.418e-17	-16.204	-16.266	-0.062	(0)
NaCrO4-	3.667e-17	3.179e-17	-16.436	-16.498	-0.062	(0)
KCrO4-	4.284e-18	3.714e-18	-17.368	-17.430	-0.062	(0)
CrO3SO4-2	6.147e-25	3.471e-25	-24.211	-24.460	-0.248	(0)
H2CrO4	5.501e-25	5.501e-25	-24.260	-24.260	0.000	(0)
CrO3Cl-	1.093e-26	9.474e-27	-25.961	-26.023	-0.062	(0)
Cr2O7-2	1.803e-31	1.018e-31	-30.744	-30.992	-0.248	(0)
Cu(1)	1.215e-09					
CuCl	6.270e-10	6.270e-10	-9.203	-9.203	0.000	(0)
CuCl2-	3.288e-10	2.907e-10	-9.483	-9.537	-0.053	(0)
Cu+	2.589e-10	2.244e-10	-9.587	-9.649	-0.062	(0)
CuCl3-2	2.221e-13	1.379e-13	-12.654	-12.860	-0.207	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.328	-146.619	-0.291	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.070	-147.349	-0.279	(0)
Cu(2)	1.105e-06					
CuCO3	9.413e-07	9.413e-07	-6.026	-6.026	0.000	(0)
CuOH+	7.089e-08	6.268e-08	-7.149	-7.203	-0.053	(0)
Cu+2	4.020e-08	2.466e-08	-7.396	-7.608	-0.212	(0)
Cu(CO3) 2-2	2.908e-08	1.642e-08	-7.536	-7.785	-0.248	(0)
Cu(OH) 2	1.005e-08	1.005e-08	-7.998	-7.998	0.000	(0)
CuSO4	9.487e-09	9.487e-09	-8.023	-8.023	0.000	(0)
CuHCO3+	3.109e-09	2.695e-09	-8.507	-8.569	-0.062	(0)
CuF+	1.792e-10	1.554e-10	-9.747	-9.809	-0.062	(0)
Cu2(OH) 2+2	1.747e-10	9.868e-11	-9.758	-10.006	-0.248	(0)
CuCl+	9.812e-11	8.675e-11	-10.008	-10.062	-0.053	(0)
Cu(OH) 3-	1.911e-11	1.657e-11	-10.719	-10.781	-0.062	(0)
CuNO2+	7.866e-12	6.819e-12	-11.104	-11.166	-0.062	(0)
CuNH3+2	4.303e-12	2.430e-12	-11.366	-11.614	-0.248	(0)
CuCl2	6.675e-14	6.675e-14	-13.176	-13.176	0.000	(0)
Cu(OH) 4-2	1.855e-16	1.048e-16	-15.732	-15.980	-0.248	(0)
Cu(NO2) 2	1.842e-16	1.842e-16	-15.735	-15.735	0.000	(0)
CuNO3+	1.180e-16	1.023e-16	-15.928	-15.990	-0.062	(0)
CuCl3-	1.564e-18	1.383e-18	-17.806	-17.859	-0.053	(0)
CuCl4-2	2.476e-23	1.538e-23	-22.606	-22.813	-0.207	(0)
Cu(NO3) 2	1.690e-26	1.690e-26	-25.772	-25.772	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.894	-215.956	-0.062	(0)
F	1.214e-04					
F-	1.128e-04	9.984e-05	-3.948	-4.001	-0.053	(0)
MgF+	7.575e-06	6.711e-06	-5.121	-5.173	-0.053	(0)
CaF+	6.995e-07	6.210e-07	-6.155	-6.207	-0.052	(0)
NaF	3.015e-07	3.015e-07	-6.521	-6.521	0.000	(0)
MnF+	2.859e-08	2.538e-08	-7.544	-7.595	-0.052	(0)
HF	1.850e-09	1.850e-09	-8.733	-8.733	0.000	(0)
ZnF+	1.458e-09	1.264e-09	-8.836	-8.898	-0.062	(0)
BF(OH) 3-	6.212e-10	5.455e-10	-9.207	-9.263	-0.056	(0)
CuF+	1.792e-10	1.554e-10	-9.747	-9.809	-0.062	(0)
NiF+	4.026e-11	3.490e-11	-10.395	-10.457	-0.062	(0)
CoF+	3.352e-11	2.906e-11	-10.475	-10.537	-0.062	(0)
AlF3	2.982e-11	2.982e-11	-10.525	-10.525	0.000	(0)
AlF2+	2.669e-11	2.373e-11	-10.574	-10.625	-0.051	(0)
CdF+	2.131e-12	1.847e-12	-11.671	-11.733	-0.062	(0)

AlF4-	1.684e-12	1.492e-12	-11.774	-11.826	-0.053	(0)
AlF+2	9.552e-13	5.970e-13	-12.020	-12.224	-0.204	(0)
HF2-	7.959e-13	7.021e-13	-12.099	-12.154	-0.054	(0)
PbF+	6.237e-13	5.407e-13	-12.205	-12.267	-0.062	(0)
AgF	2.448e-13	2.448e-13	-12.611	-12.611	0.000	(0)
BF2 (OH) 2-	8.307e-14	7.295e-14	-13.081	-13.137	-0.056	(0)
UO2F+	6.040e-14	5.236e-14	-13.219	-13.281	-0.062	(0)
UO2F2	1.507e-14	1.507e-14	-13.822	-13.822	0.000	(0)
CrF+2	1.283e-14	7.246e-15	-13.892	-14.140	-0.248	(0)
PbF2	1.062e-15	1.062e-15	-14.974	-14.974	0.000	(0)
UO2F3-	4.361e-16	3.780e-16	-15.360	-15.422	-0.062	(0)
CdF2	3.680e-16	3.680e-16	-15.434	-15.434	0.000	(0)
H2F2	9.167e-18	9.167e-18	-17.038	-17.038	0.000	(0)
FeF2+	1.100e-18	9.764e-19	-17.959	-18.010	-0.052	(0)
VO2F	6.899e-19	6.899e-19	-18.161	-18.161	0.000	(0)
FeF+2	5.884e-19	3.655e-19	-18.230	-18.437	-0.207	(0)
UO2F4-2	5.309e-19	2.998e-19	-18.275	-18.523	-0.248	(0)
PbF3-	2.320e-19	2.012e-19	-18.634	-18.696	-0.062	(0)
FeF3	1.375e-19	1.375e-19	-18.862	-18.862	0.000	(0)
BF3OH-	4.043e-20	3.551e-20	-19.393	-19.450	-0.056	(0)
VO2F2-	2.885e-20	2.501e-20	-19.540	-19.602	-0.062	(0)
VOF+	6.347e-22	5.502e-22	-21.197	-21.259	-0.062	(0)
VO2F3-2	5.515e-23	3.114e-23	-22.258	-22.507	-0.248	(0)
VOF2	2.060e-23	2.060e-23	-22.686	-22.686	0.000	(0)
PbF4-2	1.702e-23	9.612e-24	-22.769	-23.017	-0.248	(0)
HgF+	6.043e-25	5.238e-25	-24.219	-24.281	-0.062	(0)
BF4-	2.489e-25	2.185e-25	-24.604	-24.660	-0.056	(0)
VOF3-	8.417e-26	7.297e-26	-25.075	-25.137	-0.062	(0)
Sb (OH) 2F	1.656e-26	1.656e-26	-25.781	-25.781	0.000	(0)
SbOF	1.629e-26	1.629e-26	-25.788	-25.788	0.000	(0)
VO2F4-3	5.534e-27	1.530e-27	-26.257	-26.815	-0.558	(0)
VOF4-2	5.207e-29	2.940e-29	-28.283	-28.532	-0.248	(0)
SiF6-2	1.273e-29	7.909e-30	-28.895	-29.102	-0.207	(0)
UF3+	2.427e-37	2.104e-37	-36.615	-36.677	-0.062	(0)
UF2+2	2.355e-38	1.330e-38	-37.628	-37.876	-0.248	(0)
UF4	2.303e-39	2.303e-39	-38.638	-38.638	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.417	-40.976	-0.558	(0)
UF5-	0.000e+00	0.000e+00	-40.978	-41.040	-0.062	(0)
UF6-2	0.000e+00	0.000e+00	-42.313	-42.561	-0.248	(0)
Fe (2)	1.498e-12					
Fe+2	1.182e-12	6.676e-13	-11.927	-12.175	-0.248	(0)
FeSO4	2.751e-13	2.751e-13	-12.560	-12.560	0.000	(0)
FeOH+	2.406e-14	2.136e-14	-13.619	-13.670	-0.052	(0)
FeHCO3+	1.633e-14	1.456e-14	-13.787	-13.837	-0.050	(0)
Fe (OH) 2	1.363e-17	1.363e-17	-16.865	-16.865	0.000	(0)
Fe (OH) 3-	3.903e-18	3.465e-18	-17.409	-17.460	-0.052	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.390	-159.390	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.373	-235.435	-0.062	(0)
Fe (3)	1.116e-09					
Fe (OH) 2+	6.091e-10	5.416e-10	-9.215	-9.266	-0.051	(0)
Fe (OH) 3	4.674e-10	4.674e-10	-9.330	-9.330	0.000	(0)
Fe (OH) 4-	3.934e-11	3.497e-11	-10.405	-10.456	-0.051	(0)
FeOH+2	2.789e-15	1.732e-15	-14.555	-14.761	-0.207	(0)
FeF2+	1.100e-18	9.764e-19	-17.959	-18.010	-0.052	(0)
FeF+2	5.884e-19	3.655e-19	-18.230	-18.437	-0.207	(0)
FeF3	1.375e-19	1.375e-19	-18.862	-18.862	0.000	(0)
FeSO4+	7.085e-20	6.289e-20	-19.150	-19.201	-0.052	(0)
Fe+3	1.002e-20	3.339e-21	-19.999	-20.476	-0.477	(0)
Fe (SO4) 2-	2.604e-21	2.258e-21	-20.584	-20.646	-0.062	(0)
FeCl+2	3.602e-22	2.237e-22	-21.443	-21.650	-0.207	(0)
FeCl2+	2.498e-24	2.218e-24	-23.602	-23.654	-0.052	(0)
FeHSeO3+2	3.215e-25	1.816e-25	-24.493	-24.741	-0.248	(0)
Fe2 (OH) 2+4	9.770e-28	9.936e-29	-27.010	-28.003	-0.993	(0)
FeCl3	4.922e-28	4.922e-28	-27.308	-27.308	0.000	(0)
FeNO3+2	7.756e-29	4.380e-29	-28.110	-28.359	-0.248	(0)
Fe3 (OH) 4+5	2.766e-35	7.778e-37	-34.558	-36.109	-1.551	(0)
H (0)	7.641e-29					
H2	3.820e-29	3.833e-29	-28.418	-28.416	0.001	(0)

Hg (0)	4.508e-10					
Hg	4.508e-10	4.508e-10	-9.346	-9.346	0.000	(0)
Hg (1)	1.534e-22					
Hg2+2	7.672e-23	4.332e-23	-22.115	-22.363	-0.248	(0)
Hg (2)	1.093e-12					
Hg (OH) 2	5.748e-13	5.768e-13	-12.240	-12.239	0.001	(0)
HgClOH	4.458e-13	4.458e-13	-12.351	-12.351	0.000	(0)
HgCl2	6.971e-14	6.971e-14	-13.157	-13.157	0.000	(0)
HgCl3-	1.785e-15	1.547e-15	-14.748	-14.811	-0.062	(0)
HgCO3	1.098e-15	1.098e-15	-14.959	-14.959	0.000	(0)
Hg (CO3) 2-2	3.985e-17	2.250e-17	-16.400	-16.648	-0.248	(0)
HgCl4-2	2.420e-17	1.367e-17	-16.616	-16.864	-0.248	(0)
HgCl+	7.230e-18	6.268e-18	-17.141	-17.203	-0.062	(0)
HgOH+	5.224e-18	4.528e-18	-17.282	-17.344	-0.062	(0)
HgHCO3+	2.954e-19	2.561e-19	-18.530	-18.592	-0.062	(0)
Hg (OH) 3-	6.731e-20	5.835e-20	-19.172	-19.234	-0.062	(0)
Hg (NH3) 2+2	1.466e-20	8.278e-21	-19.834	-20.082	-0.248	(0)
HgNH3+2	1.523e-21	8.598e-22	-20.817	-21.066	-0.248	(0)
Hg+2	2.506e-22	1.415e-22	-21.601	-21.849	-0.248	(0)
HgSO4	6.222e-23	6.222e-23	-22.206	-22.206	0.000	(0)
HgF+	6.043e-25	5.238e-25	-24.219	-24.281	-0.062	(0)
Hg (NH3) 3+2	5.618e-28	3.173e-28	-27.250	-27.499	-0.248	(0)
HgNO3+	7.910e-32	6.857e-32	-31.102	-31.164	-0.062	(0)
Hg (NH3) 4+2	4.296e-35	2.426e-35	-34.367	-34.615	-0.248	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.427	-40.427	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.121	-138.183	-0.062	(0)
HgS2-2	0.000e+00	0.000e+00	-138.741	-138.989	-0.248	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.692	-139.692	0.000	(0)
K	8.551e-04					
K+	8.451e-04	7.479e-04	-3.073	-3.126	-0.053	(0)
KSO4-	9.998e-06	8.890e-06	-5.000	-5.051	-0.051	(0)
KCrO4-	4.284e-18	3.714e-18	-17.368	-17.430	-0.062	(0)
Mg	1.183e-03					
Mg+2	9.766e-04	5.991e-04	-3.010	-3.222	-0.212	(0)
MgSO4	1.830e-04	1.830e-04	-3.737	-3.737	0.000	(0)
MgHCO3+	1.201e-05	1.062e-05	-4.920	-4.974	-0.053	(0)
MgF+	7.575e-06	6.711e-06	-5.121	-5.173	-0.053	(0)
MgCO3	3.230e-06	3.230e-06	-5.491	-5.491	0.000	(0)
MgOH+	2.147e-07	1.917e-07	-6.668	-6.717	-0.049	(0)
MgH2BO3+	1.502e-08	1.319e-08	-7.823	-7.880	-0.056	(0)
Mn (2)	1.353e-05					
Mn+2	1.131e-05	6.387e-06	-4.947	-5.195	-0.248	(0)
MnSO4	1.907e-06	1.907e-06	-5.720	-5.720	0.000	(0)
MnHCO3+	2.486e-07	2.207e-07	-6.605	-6.656	-0.052	(0)
MnF+	2.859e-08	2.538e-08	-7.544	-7.595	-0.052	(0)
MnCl+	2.010e-08	1.784e-08	-7.697	-7.749	-0.052	(0)
MnOH+	1.452e-08	1.289e-08	-7.838	-7.890	-0.052	(0)
MnCl2	5.593e-11	5.593e-11	-10.252	-10.252	0.000	(0)
MnCl3-	3.851e-14	3.419e-14	-13.414	-13.466	-0.052	(0)
MnSeO4	2.565e-14	2.565e-14	-13.591	-13.591	0.000	(0)
MnNO3+	1.532e-14	1.328e-14	-13.815	-13.877	-0.062	(0)
Mn (OH) 3-	5.796e-17	5.145e-17	-16.237	-16.289	-0.052	(0)
Mn (OH) 4-2	2.149e-22	1.335e-22	-21.668	-21.875	-0.207	(0)
Mn (NO3) 2	4.377e-23	4.377e-23	-22.359	-22.359	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.303	-41.303	0.000	(0)
Mn (3)	4.611e-26					
Mn+3	4.611e-26	1.536e-26	-25.336	-25.814	-0.477	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.269	-41.476	-0.207	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.061	-46.117	-0.055	(0)
Mo	3.998e-07					
MoO4-2	3.998e-07	2.452e-07	-6.398	-6.610	-0.212	(0)
HMoO4-	7.051e-11	6.113e-11	-10.152	-10.214	-0.062	(0)
H2MoO4	5.609e-15	5.609e-15	-14.251	-14.251	0.000	(0)
Ag2MoO4	8.849e-26	8.849e-26	-25.053	-25.053	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-46.748	-47.306	-0.558	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.266	-56.500	-2.233	(0)

HMo7O24-5	0.000e+00	0.000e+00	-56.464	-58.015	-1.551	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-60.142	-61.135	-0.993	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-65.233	-65.791	-0.558	(0)
N (-3)	2.548e-07					
NH4+	2.408e-07	2.115e-07	-6.618	-6.675	-0.056	(0)
NH3	9.627e-09	9.627e-09	-8.016	-8.016	0.000	(0)
NH4SO4-	4.286e-09	3.805e-09	-8.368	-8.420	-0.052	(0)
CaNH3+2	1.223e-11	6.907e-12	-10.913	-11.161	-0.248	(0)
CuNH3+2	4.303e-12	2.430e-12	-11.366	-11.614	-0.248	(0)
NiNH3+2	1.274e-13	7.195e-14	-12.895	-13.143	-0.248	(0)
AgNH3+	2.214e-14	1.919e-14	-13.655	-13.717	-0.062	(0)
Co (NH3) +2	1.887e-14	1.065e-14	-13.724	-13.973	-0.248	(0)
BaNH3+2	8.630e-17	4.873e-17	-16.064	-16.312	-0.248	(0)
Ag (NH3) 2+	1.732e-18	1.502e-18	-17.761	-17.823	-0.062	(0)
Ni (NH3) 2+2	1.773e-19	1.001e-19	-18.751	-18.999	-0.248	(0)
Ca (NH3) 2+2	4.688e-20	2.647e-20	-19.329	-19.577	-0.248	(0)
Hg (NH3) 2+2	1.466e-20	8.278e-21	-19.834	-20.082	-0.248	(0)
Co (NH3) 2+2	7.748e-21	4.375e-21	-20.111	-20.359	-0.248	(0)
HgNH3+2	1.523e-21	8.598e-22	-20.817	-21.066	-0.248	(0)
Co (NH3) 3+2	9.390e-28	5.303e-28	-27.027	-27.275	-0.248	(0)
Hg (NH3) 3+2	5.618e-28	3.173e-28	-27.250	-27.499	-0.248	(0)
Co (NH3) 4+2	4.744e-35	2.679e-35	-34.324	-34.572	-0.248	(0)
Hg (NH3) 4+2	4.296e-35	2.426e-35	-34.367	-34.615	-0.248	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.896	-41.144	-0.248	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.120	-42.368	-0.248	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.880	-50.438	-0.558	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.931	-50.180	-0.248	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.742	-51.990	-0.248	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.045	-60.108	-0.062	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.905	-64.153	-0.248	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.663	-64.912	-0.248	(0)
N (3)	2.999e-06					
NO2-	2.999e-06	2.640e-06	-5.523	-5.578	-0.055	(0)
CuNO2+	7.866e-12	6.819e-12	-11.104	-11.166	-0.062	(0)
AgNO2	5.386e-13	5.386e-13	-12.269	-12.269	0.000	(0)
CoNO2+	1.976e-13	1.713e-13	-12.704	-12.766	-0.062	(0)
Cu (NO2) 2	1.842e-16	1.842e-16	-15.735	-15.735	0.000	(0)
Ag (NO2) 2-	2.541e-18	2.202e-18	-17.595	-17.657	-0.062	(0)
N (5)	1.485e-09					
NO3-	1.482e-09	1.312e-09	-8.829	-8.882	-0.053	(0)
CaNO3+	2.728e-12	2.365e-12	-11.564	-11.626	-0.062	(0)
MnNO3+	1.532e-14	1.328e-14	-13.815	-13.877	-0.062	(0)
ZnNO3+	2.412e-15	2.091e-15	-14.618	-14.680	-0.062	(0)
CuNO3+	1.180e-16	1.023e-16	-15.928	-15.990	-0.062	(0)
BaNO3+	6.086e-17	5.276e-17	-16.216	-16.278	-0.062	(0)
NiNO3+	5.291e-17	4.587e-17	-16.276	-16.339	-0.062	(0)
CoNO3+	2.208e-17	1.914e-17	-16.656	-16.718	-0.062	(0)
CdNO3+	5.587e-18	4.844e-18	-17.253	-17.315	-0.062	(0)
PbNO3+	1.720e-18	1.491e-18	-17.764	-17.826	-0.062	(0)
AgNO3	1.018e-18	1.018e-18	-17.992	-17.992	0.000	(0)
Mn (NO3) 2	4.377e-23	4.377e-23	-22.359	-22.359	0.000	(0)
UO2NO3+	1.147e-23	9.945e-24	-22.940	-23.002	-0.062	(0)
Zn (NO3) 2	5.475e-25	5.475e-25	-24.262	-24.262	0.000	(0)
Co (NO3) 2	5.109e-26	5.109e-26	-25.292	-25.292	0.000	(0)
CrNO3+2	4.651e-26	2.626e-26	-25.332	-25.581	-0.248	(0)
Cu (NO3) 2	1.690e-26	1.690e-26	-25.772	-25.772	0.000	(0)
Pb (NO3) 2	3.323e-27	3.323e-27	-26.478	-26.478	0.000	(0)
Cd (NO3) 2	3.185e-27	3.185e-27	-26.497	-26.497	0.000	(0)
VO2NO3	2.615e-27	2.615e-27	-26.583	-26.583	0.000	(0)
FeNO3+2	7.756e-29	4.380e-29	-28.110	-28.359	-0.248	(0)
HgNO3+	7.910e-32	6.857e-32	-31.102	-31.164	-0.062	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.427	-40.427	0.000	(0)
Na	5.463e-03					
Na+	5.408e-03	4.786e-03	-2.267	-2.320	-0.053	(0)
NaSO4-	4.854e-05	4.316e-05	-4.314	-4.365	-0.051	(0)
NaHCO3	4.661e-06	4.661e-06	-5.331	-5.331	0.000	(0)
NaCO3-	6.497e-07	5.777e-07	-6.187	-6.238	-0.051	(0)
NaF	3.015e-07	3.015e-07	-6.521	-6.521	0.000	(0)

	NaH2BO3	4.816e-09	4.816e-09	-8.317	-8.317	0.000	(0)
	NaCrO4-	3.667e-17	3.179e-17	-16.436	-16.498	-0.062	(0)
Ni		3.444e-08					
	Ni+2	2.269e-08	1.392e-08	-7.644	-7.856	-0.212	(0)
	NiSO4	4.662e-09	4.662e-09	-8.331	-8.331	0.000	(0)
	NiHCO3+	3.428e-09	2.971e-09	-8.465	-8.527	-0.062	(0)
	NiCO3	3.365e-09	3.365e-09	-8.473	-8.473	0.000	(0)
	NiOH+	1.624e-10	1.408e-10	-9.789	-9.851	-0.062	(0)
	NiCl+	9.116e-11	7.902e-11	-10.040	-10.102	-0.062	(0)
	NiF+	4.026e-11	3.490e-11	-10.395	-10.457	-0.062	(0)
	Ni (OH) 2	8.988e-12	8.988e-12	-11.046	-11.046	0.000	(0)
	Ni (SO4) 2-2	4.590e-13	2.592e-13	-12.338	-12.586	-0.248	(0)
	NiNH3+2	1.274e-13	7.195e-14	-12.895	-13.143	-0.248	(0)
	Ni (OH) 3-	8.332e-15	7.223e-15	-14.079	-14.141	-0.062	(0)
	NiCl2	8.830e-16	8.830e-16	-15.054	-15.054	0.000	(0)
	NiSeO4	9.715e-17	9.715e-17	-16.013	-16.013	0.000	(0)
	NiNO3+	5.291e-17	4.587e-17	-16.276	-16.339	-0.062	(0)
	Ni (NH3) 2+2	1.773e-19	1.001e-19	-18.751	-18.999	-0.248	(0)
O (0)		6.871e-36					
	O2	3.436e-36	3.447e-36	-35.464	-35.463	0.001	(0)
Pb		2.041e-09					
	PbCO3	1.497e-09	1.497e-09	-8.825	-8.825	0.000	(0)
	PbOH+	1.790e-10	1.551e-10	-9.747	-9.809	-0.062	(0)
	Pb+2	1.253e-10	7.685e-11	-9.902	-10.114	-0.212	(0)
	PbHCO3+	1.141e-10	9.889e-11	-9.943	-10.005	-0.062	(0)
	PbSO4	6.320e-11	6.320e-11	-10.199	-10.199	0.000	(0)
	Pb (CO3) 2-2	4.956e-11	2.799e-11	-10.305	-10.553	-0.248	(0)
	PbCl+	6.981e-12	6.051e-12	-11.156	-11.218	-0.062	(0)
	Pb (OH) 2	3.942e-12	3.942e-12	-11.404	-11.404	0.000	(0)
	Pb (SO4) 2-2	1.132e-12	6.393e-13	-11.946	-12.194	-0.248	(0)
	PbF+	6.237e-13	5.407e-13	-12.205	-12.267	-0.062	(0)
	PbCl2	5.999e-14	5.999e-14	-13.222	-13.222	0.000	(0)
	Pb (OH) 3-	3.655e-15	3.168e-15	-14.437	-14.499	-0.062	(0)
	PbF2	1.062e-15	1.062e-15	-14.974	-14.974	0.000	(0)
	PbCl3-	6.114e-17	5.300e-17	-16.214	-16.276	-0.062	(0)
	PbNO3+	1.720e-18	1.491e-18	-17.764	-17.826	-0.062	(0)
	Pb (OH) 4-2	1.104e-18	6.235e-19	-17.957	-18.205	-0.248	(0)
	Pb2OH+3	6.835e-19	1.890e-19	-18.165	-18.724	-0.558	(0)
	PbF3-	2.320e-19	2.012e-19	-18.634	-18.696	-0.062	(0)
	PbCl4-2	9.520e-20	5.376e-20	-19.021	-19.270	-0.248	(0)
	Pb3 (OH) 4+2	4.220e-23	2.383e-23	-22.375	-22.623	-0.248	(0)
	PbF4-2	1.702e-23	9.612e-24	-22.769	-23.017	-0.248	(0)
	Pb (NO3) 2	3.323e-27	3.323e-27	-26.478	-26.478	0.000	(0)
	Pb4 (OH) 4+4	1.431e-28	1.455e-29	-27.845	-28.837	-0.993	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.009	-151.009	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.729	-227.791	-0.062	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.278	-73.278	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.020	-78.082	-0.062	(0)
	CdHS+	0.000e+00	0.000e+00	-78.945	-79.007	-0.062	(0)
	H2S	0.000e+00	0.000e+00	-78.964	-78.964	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.297	-79.545	-0.248	(0)
	S6-2	0.000e+00	0.000e+00	-79.813	-80.061	-0.248	(0)
	S4-2	0.000e+00	0.000e+00	-79.893	-80.141	-0.248	(0)
	S3-2	0.000e+00	0.000e+00	-80.699	-80.947	-0.248	(0)
	S2-2	0.000e+00	0.000e+00	-81.715	-81.963	-0.248	(0)
	S-2	0.000e+00	0.000e+00	-87.273	-87.480	-0.207	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.121	-138.183	-0.062	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.741	-138.989	-0.248	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.692	-139.692	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-146.328	-146.619	-0.291	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.687	-146.842	-0.155	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.070	-147.349	-0.279	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.198	-147.260	-0.062	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-147.588	-147.650	-0.062	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.082	-148.380	-0.297	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.406	-148.691	-0.285	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-149.542	-149.542	0.000	(0)

Cd (HS) 2	0.000e+00	0.000e+00	-149.885	-149.885	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.009	-151.009	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.390	-159.390	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.894	-215.956	-0.062	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.282	-224.344	-0.062	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.006	-226.068	-0.062	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.174	-226.422	-0.248	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.729	-227.791	-0.062	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.373	-235.435	-0.062	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.706	-301.954	-0.248	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.638	-303.887	-0.248	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.640	-318.888	-0.248	(0)
S (6)	3.200e-03					
SO4-2	2.737e-03	1.679e-03	-2.563	-2.775	-0.212	(0)
CaSO4	2.192e-04	2.192e-04	-3.659	-3.659	0.000	(0)
MgSO4	1.830e-04	1.830e-04	-3.737	-3.737	0.000	(0)
NaSO4-	4.854e-05	4.316e-05	-4.314	-4.365	-0.051	(0)
KSO4-	9.998e-06	8.890e-06	-5.000	-5.051	-0.051	(0)
MnSO4	1.907e-06	1.907e-06	-5.720	-5.720	0.000	(0)
ZnSO4	2.331e-07	2.331e-07	-6.632	-6.632	0.000	(0)
CuSO4	9.487e-09	9.487e-09	-8.023	-8.023	0.000	(0)
Zn (SO4) 2-2	6.036e-09	3.408e-09	-8.219	-8.467	-0.248	(0)
NiSO4	4.662e-09	4.662e-09	-8.331	-8.331	0.000	(0)
NH4SO4-	4.286e-09	3.805e-09	-8.368	-8.420	-0.052	(0)
CoSO4	3.083e-09	3.083e-09	-8.511	-8.511	0.000	(0)
HSO4-	2.320e-09	2.055e-09	-8.635	-8.687	-0.053	(0)
CdSO4	4.595e-10	4.595e-10	-9.338	-9.338	0.000	(0)
PbSO4	6.320e-11	6.320e-11	-10.199	-10.199	0.000	(0)
AgSO4-	3.773e-11	3.271e-11	-10.423	-10.485	-0.062	(0)
Cd (SO4) 2-2	1.843e-11	1.041e-11	-10.735	-10.983	-0.248	(0)
CrOHSO4	3.208e-12	3.208e-12	-11.494	-11.494	0.000	(0)
Pb (SO4) 2-2	1.132e-12	6.393e-13	-11.946	-12.194	-0.248	(0)
Ni (SO4) 2-2	4.590e-13	2.592e-13	-12.338	-12.586	-0.248	(0)
FeSO4	2.751e-13	2.751e-13	-12.560	-12.560	0.000	(0)
UO2SO4	9.654e-15	9.654e-15	-14.015	-14.015	0.000	(0)
AlSO4+	8.796e-15	7.793e-15	-14.056	-14.108	-0.053	(0)
CrSO4+	2.071e-15	1.795e-15	-14.684	-14.746	-0.062	(0)
UO2 (SO4) 2-2	3.784e-16	2.137e-16	-15.422	-15.670	-0.248	(0)
Al (SO4) 2-	1.582e-16	1.402e-16	-15.801	-15.853	-0.053	(0)
VO2SO4-	1.822e-19	1.580e-19	-18.739	-18.801	-0.062	(0)
FeSO4+	7.085e-20	6.289e-20	-19.150	-19.201	-0.052	(0)
Cr2 (OH) 2SO4+2	4.133e-21	2.334e-21	-20.384	-20.632	-0.248	(0)
Fe (SO4) 2-	2.604e-21	2.258e-21	-20.584	-20.646	-0.062	(0)
VOSO4	4.249e-22	4.249e-22	-21.372	-21.372	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.328e-22	2.328e-22	-21.633	-21.633	0.000	(0)
HgSO4	6.222e-23	6.222e-23	-22.206	-22.206	0.000	(0)
CrO3SO4-2	6.147e-25	3.471e-25	-24.211	-24.460	-0.248	(0)
VS04+	1.216e-36	1.055e-36	-35.915	-35.977	-0.062	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.325	-41.325	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.202	-42.450	-0.248	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.045	-60.108	-0.062	(0)
Sb (3)	1.675e-20					
Sb (OH) 3	8.477e-21	8.477e-21	-20.072	-20.072	0.000	(0)
HSbO2	8.276e-21	8.276e-21	-20.082	-20.082	0.000	(0)
SbO2-	1.234e-24	1.070e-24	-23.909	-23.971	-0.062	(0)
Sb (OH) 4-	7.070e-25	6.129e-25	-24.151	-24.213	-0.062	(0)
Sb (OH) 2F	1.656e-26	1.656e-26	-25.781	-25.781	0.000	(0)
SbOF	1.629e-26	1.629e-26	-25.788	-25.788	0.000	(0)
Sb (OH) 2+	2.975e-27	2.579e-27	-26.526	-26.589	-0.062	(0)
SbO+	1.026e-27	8.894e-28	-26.989	-27.051	-0.062	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.640	-318.888	-0.248	(0)
Sb (5)	6.043e-09					
SbO3-	6.036e-09	5.232e-09	-8.219	-8.281	-0.062	(0)
Sb (OH) 6-	6.910e-12	6.115e-12	-11.161	-11.214	-0.053	(0)
SbO2+	2.717e-25	2.355e-25	-24.566	-24.628	-0.062	(0)
Se (-2)	1.469e-14					
Ag2Se	1.469e-14	1.469e-14	-13.833	-13.833	0.000	(0)
HSe-	2.733e-39	2.369e-39	-38.563	-38.625	-0.062	(0)

MnSe	0.000e+00	0.000e+00	-41.303	-41.303	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.638	-42.638	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.475	-45.723	-0.248	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.071	-83.064	-0.993	(0)
Se (4)	3.532e-08					
HSeO3-	2.374e-08	2.058e-08	-7.625	-7.687	-0.062	(0)
SeO3-2	1.158e-08	6.540e-09	-7.936	-8.184	-0.248	(0)
H2SeO3	1.100e-13	1.100e-13	-12.959	-12.959	0.000	(0)
AgSeO3-	4.734e-15	4.104e-15	-14.325	-14.387	-0.062	(0)
Cd (SeO3) 2-2	7.288e-20	4.116e-20	-19.137	-19.386	-0.248	(0)
Ag (SeO3) 2-3	8.693e-22	2.403e-22	-21.061	-21.619	-0.558	(0)
FeHSeO3+2	3.215e-25	1.816e-25	-24.493	-24.741	-0.248	(0)
Se (6)	2.435e-11					
SeO4-2	2.433e-11	1.492e-11	-10.614	-10.826	-0.212	(0)
MnSeO4	2.565e-14	2.565e-14	-13.591	-13.591	0.000	(0)
ZnSeO4	1.467e-15	1.467e-15	-14.834	-14.834	0.000	(0)
NiSeO4	9.715e-17	9.715e-17	-16.013	-16.013	0.000	(0)
CoSeO4	6.885e-17	6.885e-17	-16.162	-16.162	0.000	(0)
HSeO4-	1.081e-17	9.370e-18	-16.966	-17.028	-0.062	(0)
CdSeO4	3.244e-18	3.244e-18	-17.489	-17.489	0.000	(0)
Zn (SeO4) 2-2	3.930e-26	2.219e-26	-25.406	-25.654	-0.248	(0)
Si	2.161e-04					
H4SiO4	2.133e-04	2.141e-04	-3.671	-3.669	0.001	(0)
H3SiO4-	2.794e-06	2.470e-06	-5.554	-5.607	-0.053	(0)
H2SiO4-2	1.991e-11	1.244e-11	-10.701	-10.905	-0.204	(0)
UO2H3SiO4+	9.191e-13	7.967e-13	-12.037	-12.099	-0.062	(0)
SiF6-2	1.273e-29	7.909e-30	-28.895	-29.102	-0.207	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.243	-59.802	-0.558	(0)
U (4)	1.505e-20					
U (OH) 5-	1.505e-20	1.304e-20	-19.823	-19.885	-0.062	(0)
U (OH) 4	6.845e-24	6.845e-24	-23.165	-23.165	0.000	(0)
U (OH) 3+	3.617e-28	3.136e-28	-27.442	-27.504	-0.062	(0)
U (OH) 2+2	3.217e-33	1.817e-33	-32.493	-32.741	-0.248	(0)
UF3+	2.427e-37	2.104e-37	-36.615	-36.677	-0.062	(0)
UF2+2	2.355e-38	1.330e-38	-37.628	-37.876	-0.248	(0)
UOH+3	3.878e-39	1.072e-39	-38.411	-38.970	-0.558	(0)
UF4	2.303e-39	2.303e-39	-38.638	-38.638	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.417	-40.976	-0.558	(0)
UF5-	0.000e+00	0.000e+00	-40.978	-41.040	-0.062	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.325	-41.325	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.202	-42.450	-0.248	(0)
UF6-2	0.000e+00	0.000e+00	-42.313	-42.561	-0.248	(0)
U+4	0.000e+00	0.000e+00	-45.282	-46.275	-0.993	(0)
UCl+3	0.000e+00	0.000e+00	-46.670	-47.229	-0.558	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-171.248	-176.273	-5.025	(0)
U (5)	4.962e-17					
UO2+	4.962e-17	4.302e-17	-16.304	-16.366	-0.062	(0)
U (6)	6.304e-08					
UO2 (CO3) 3-4	4.049e-08	4.118e-09	-7.393	-8.385	-0.993	(0)
UO2 (CO3) 2-2	2.245e-08	1.268e-08	-7.649	-7.897	-0.248	(0)
UO2CO3	9.803e-11	9.803e-11	-10.009	-10.009	0.000	(0)
UO2H3SiO4+	9.191e-13	7.967e-13	-12.037	-12.099	-0.062	(0)
UO2OH+	4.434e-13	3.843e-13	-12.353	-12.415	-0.062	(0)
UO2F+	6.040e-14	5.236e-14	-13.219	-13.281	-0.062	(0)
UO2F2	1.507e-14	1.507e-14	-13.822	-13.822	0.000	(0)
UO2SO4	9.654e-15	9.654e-15	-14.015	-14.015	0.000	(0)
UO2+2	6.193e-15	3.799e-15	-14.208	-14.420	-0.212	(0)
UO2F3-	4.361e-16	3.780e-16	-15.360	-15.422	-0.062	(0)
UO2 (SO4) 2-2	3.784e-16	2.137e-16	-15.422	-15.670	-0.248	(0)
UO2Cl+	1.577e-17	1.367e-17	-16.802	-16.864	-0.062	(0)
UO2F4-2	5.309e-19	2.998e-19	-18.275	-18.523	-0.248	(0)
(UO2) 2 (OH) 2+2	4.341e-19	2.452e-19	-18.362	-18.611	-0.248	(0)
(UO2) 3 (OH) 5+	5.325e-20	4.616e-20	-19.274	-19.336	-0.062	(0)
UO2NO3+	1.147e-23	9.945e-24	-22.940	-23.002	-0.062	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.440	-43.502	-0.062	(0)
V+2	0.000e+00	0.000e+00	-44.669	-44.917	-0.248	(0)

V (3)	5.570e-16					
V (OH) 3	5.570e-16	5.570e-16	-15.254	-15.254	0.000	(0)
V (OH) 2+	5.202e-27	4.509e-27	-26.284	-26.346	-0.062	(0)
VOH+2	9.489e-31	5.359e-31	-30.023	-30.271	-0.248	(0)
V+3	4.813e-36	1.330e-36	-35.318	-35.876	-0.558	(0)
VSO4+	1.216e-36	1.055e-36	-35.915	-35.977	-0.062	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.607	-58.165	-0.558	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-58.749	-59.742	-0.993	(0)
V (4)	1.726e-19					
V (OH) 3+	1.699e-19	1.473e-19	-18.770	-18.832	-0.062	(0)
VO+2	1.627e-21	9.189e-22	-20.789	-21.037	-0.248	(0)
VOF+	6.347e-22	5.502e-22	-21.197	-21.259	-0.062	(0)
VOSO4	4.249e-22	4.249e-22	-21.372	-21.372	0.000	(0)
VOF2	2.060e-23	2.060e-23	-22.686	-22.686	0.000	(0)
VOC1+	6.599e-24	5.721e-24	-23.180	-23.243	-0.062	(0)
VOF3-	8.417e-26	7.297e-26	-25.075	-25.137	-0.062	(0)
VOF4-2	5.207e-29	2.940e-29	-28.283	-28.532	-0.248	(0)
H2V2O4+2	1.927e-33	1.088e-33	-32.715	-32.963	-0.248	(0)
V (5)	1.898e-09					
H2VO4-	1.451e-09	1.258e-09	-8.838	-8.900	-0.062	(0)
HVO4-2	4.466e-10	2.522e-10	-9.350	-9.598	-0.248	(0)
H3VO4	1.576e-13	1.576e-13	-12.803	-12.803	0.000	(0)
H3V2O7-	1.476e-15	1.280e-15	-14.831	-14.893	-0.062	(0)
HV2O7-3	3.889e-16	1.075e-16	-15.410	-15.969	-0.558	(0)
VO4-3	3.650e-16	1.009e-16	-15.438	-15.996	-0.558	(0)
VO2+	4.452e-18	3.940e-18	-17.351	-17.404	-0.053	(0)
V2O7-4	2.272e-18	2.310e-19	-17.644	-18.636	-0.993	(0)
VO2F	6.899e-19	6.899e-19	-18.161	-18.161	0.000	(0)
VO2SO4-	1.822e-19	1.580e-19	-18.739	-18.801	-0.062	(0)
VO2F2-	2.885e-20	2.501e-20	-19.540	-19.602	-0.062	(0)
V3O9-3	7.543e-21	2.085e-21	-20.122	-20.681	-0.558	(0)
VO2F3-2	5.515e-23	3.114e-23	-22.258	-22.507	-0.248	(0)
V4O12-4	1.075e-26	1.094e-27	-25.968	-26.961	-0.993	(0)
VO2F4-3	5.534e-27	1.530e-27	-26.257	-26.815	-0.558	(0)
VO2NO3	2.615e-27	2.615e-27	-26.583	-26.583	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-69.472	-71.705	-2.233	(0)
HV10O28-5	0.000e+00	0.000e+00	-69.870	-71.421	-1.551	(0)
H2V10O28-4	0.000e+00	0.000e+00	-73.123	-74.116	-0.993	(0)
Zn	1.625e-06					
Zn+2	1.034e-06	6.346e-07	-5.985	-6.198	-0.212	(0)
ZnCO3	2.367e-07	2.367e-07	-6.626	-6.626	0.000	(0)
ZnSO4	2.331e-07	2.331e-07	-6.632	-6.632	0.000	(0)
ZnOH+	5.883e-08	5.099e-08	-7.230	-7.292	-0.062	(0)
ZnHCO3+	4.009e-08	3.475e-08	-7.397	-7.459	-0.062	(0)
Zn (OH) 2	6.495e-09	6.495e-09	-8.187	-8.187	0.000	(0)
Zn (SO4) 2-2	6.036e-09	3.408e-09	-8.219	-8.467	-0.248	(0)
ZnCl+	4.001e-09	3.537e-09	-8.398	-8.451	-0.053	(0)
ZnOHCl	3.722e-09	3.722e-09	-8.429	-8.429	0.000	(0)
ZnF+	1.458e-09	1.264e-09	-8.836	-8.898	-0.062	(0)
Zn (OH) 3-	3.018e-11	2.616e-11	-10.520	-10.582	-0.062	(0)
ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
ZnCl3-	2.481e-14	2.193e-14	-13.605	-13.659	-0.053	(0)
ZnNO3+	2.412e-15	2.091e-15	-14.618	-14.680	-0.062	(0)
Zn (OH) 4-2	1.482e-15	8.369e-16	-14.829	-15.077	-0.248	(0)
ZnSeO4	1.467e-15	1.467e-15	-14.834	-14.834	0.000	(0)
ZnCl4-2	3.918e-17	2.434e-17	-16.407	-16.614	-0.207	(0)
Zn (NO3) 2	5.475e-25	5.475e-25	-24.262	-24.262	0.000	(0)
Zn (SeO4) 2-2	3.930e-26	2.219e-26	-25.406	-25.654	-0.248	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.588	-147.650	-0.062	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.542	-149.542	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.282	-224.344	-0.062	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.174	-226.422	-0.248	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.638	-303.887	-0.248	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-56.27	-49.99	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.04	-37.53	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.26	-37.53	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-72.92	-54.99	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-56.33	-36.30	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.63	-28.22	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.63	-24.18	0.45	(NH4) 2SeO4
Acanthite	-51.98	-88.20	-36.22	Ag2S
Ag2CO3	-12.12	-23.21	-11.09	Ag2CO3
Ag2CrO4	-21.30	-32.89	-11.59	Ag2CrO4
Ag2HVO4	-13.20	-11.72	1.48	Ag2HVO4
Ag2MoO4	-13.08	-24.63	-11.55	Ag2MoO4
Ag2O	-14.79	-2.22	12.57	Ag2O
Ag2Se	-0.04	-48.74	-48.70	Ag2Se
Ag2SeO3	-10.66	-17.81	-7.15	Ag2SeO3
Ag2SeO4	-19.94	-28.85	-8.91	Ag2SeO4
Ag2SO4	-15.98	-20.80	-4.82	Ag2SO4
Ag3AsO3	-27.47	-25.31	2.16	Ag3AsO3
Ag3AsO4	-16.16	-18.94	-2.79	Ag3AsO4
Ag3H2VO5	-18.01	-12.83	5.18	Ag3H2VO5
AgF:4H2O	-14.06	-13.01	1.05	AgF:4H2O
Agmetal	-0.23	-13.74	-13.51	Ag
AgVO3	-11.38	-10.61	0.77	AgVO3
Al (OH) 3 (am)	-2.32	8.48	10.80	Al (OH) 3
Al2 (MoO4) 3	-52.65	-50.28	2.37	Al2 (MoO4) 3
Al2O3	-2.69	16.97	19.65	Al2O3
Al4 (OH) 10SO4	-7.35	15.35	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.94	-7.14	4.80	AlAsO4:2H2O
AlOHSO4	-6.87	-10.10	-3.23	AlOHSO4
AlSb	-153.01	-87.39	65.62	AlSb
Alunite	-5.53	-6.93	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.10	-12.89	-7.79	PbSO4
Anhydrite	-1.66	-6.02	-4.36	CaSO4
Anilite	-54.68	-86.56	-31.88	Cu0.25Cu1.5S
Antlerite	-2.78	6.01	8.79	Cu3 (OH) 4SO4
Aragonite	-0.13	-8.43	-8.30	CaCO3
Arsenolite	-85.19	-87.95	-2.76	As4O6
Artinite	-5.43	4.17	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.94	-31.24	6.71	As2O5
Atacamite	-1.55	5.84	7.39	Cu2 (OH) 3Cl
Azurite	-0.49	-17.40	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.69	7.71	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.46	-3.59	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.80	-8.11	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.82	4.12	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.30	-22.97	-9.67	BaCrO4
BaF2	-10.28	-16.10	-5.82	BaF2
BaMoO4	-7.75	-14.71	-6.96	BaMoO4
Barite	-0.89	-10.87	-9.98	BaSO4
BaS	-94.46	-78.28	16.18	BaS
BaSeO3	-9.71	-7.88	1.83	BaSeO3
BaSeO4	-11.46	-18.92	-7.46	BaSeO4
Bianchite	-7.21	-8.97	-1.76	ZnSO4:6H2O
Birnessite	-7.57	10.53	18.09	MnO2
Bixbyite	-3.57	-4.21	-0.64	Mn2O3
BlaubleiI	-54.80	-78.96	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.19	-82.46	-27.28	Cu0.6Cu0.8S
Boehmite	-0.10	8.48	8.58	AlOOH
Breithauptite	-56.77	-75.29	-18.52	NiSb
Brochantite	-1.02	14.21	15.22	Cu4 (OH) 6SO4
Brucite	-4.26	12.58	16.84	Mg (OH) 2
Bunsenite	-4.50	7.95	12.45	NiO
Ca (VO3) 2	-12.10	-6.44	5.66	Ca (VO3) 2
Ca2V2O7	-11.38	6.12	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.44	6.12	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.86	6.44	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-20.28	18.68	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.19	18.67	39.86	Ca3 (VO4) 2:4H2O

Ca3Sb2	-297.03	-154.06	142.97	Ca3Sb2
CaCrO4	-15.85	-18.12	-2.27	CaCrO4
Calcite	0.05	-8.43	-8.48	CaCO3
Calomel	-9.76	-27.67	-17.91	Hg2Cl2
CaMoO4	-1.90	-9.85	-7.95	CaMoO4
Carnotite	-3.57	-3.34	0.23	KUO2VO4
CaSeO3:2H2O	-5.84	-3.03	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.05	-14.07	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.70	-2.86	9.84	Cd(BO2)2
Cd(OH)2	-6.77	6.87	13.64	Cd(OH)2
Cd(OH)2(am)	-6.86	6.87	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.25	-16.54	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.53	2.03	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.49	8.91	28.40	Cd4(OH)6SO4
CdCl2	-13.58	-14.24	-0.66	CdCl2
CdCl2:1H2O	-12.55	-14.24	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.33	-14.24	-1.91	CdCl2:2.5H2O
CdF2	-15.72	-16.93	-1.21	CdF2
Cdmetal(alpha)	-31.91	-18.39	13.51	Cd
Cdmetal(gamma)	-32.01	-18.39	13.62	Cd
CdMoO4	-1.39	-15.54	-14.15	CdMoO4
CdOHCl	-7.22	-3.68	3.54	CdOHCl
CdSb	-76.02	-76.37	-0.35	CdSb
CdSe	-19.46	-39.66	-20.20	CdSe
CdSeO4:2H2O	-17.91	-19.76	-1.85	CdSeO4:2H2O
CdSO4	-11.54	-11.71	-0.17	CdSO4
CdSO4:1H2O	-9.98	-11.71	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.84	-11.71	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.91	-11.66	-9.75	AgCl
Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4(g)	-81.01	-122.06	-41.05	CH4
Chalcanthite	-7.74	-10.38	-2.64	CuSO4:5H2O
Chalcedony	-0.12	-3.67	-3.55	SiO2
Chalcocite	-54.56	-89.48	-34.92	Cu2S
Chalcopyrite	-124.87	-160.14	-35.27	CuFeS2
Chrysotile	-1.79	30.41	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.53	-98.22	-45.69	HgS
Claudetite	-84.89	-87.95	-3.06	As4O6
Clausthalite	-13.74	-40.84	-27.10	PbSe
Co(BO2)2	-29.03	-1.96	27.07	Co(BO2)2
Co(OH)2	-5.33	7.77	13.09	Co(OH)2
Co(OH)3	-9.69	-12.00	-2.31	Co(OH)3
CO2(g)	-2.85	-20.99	-18.15	CO2
Co3(AsO4)2	-20.97	-7.93	13.03	Co3(AsO4)2
Co3O4	-5.73	-16.23	-10.50	Co3O4
CoCl2	-21.61	-13.34	8.27	CoCl2
CoCl2:6H2O	-15.88	-13.34	2.54	CoCl2:6H2O
CoCO3	-3.24	-13.22	-9.98	CoCO3
CoF2	-14.44	-16.04	-1.60	CoF2
CoF3	-46.25	-47.71	-1.46	CoF3
CoFe2O4	17.76	14.23	-3.53	CoFe2O4
CoMoO4	-6.89	-14.65	-7.76	CoMoO4
CoO	-5.82	7.77	13.59	CoO
CoS(alpha)	-70.78	-78.22	-7.44	CoS
CoS(beta)	-67.15	-78.22	-11.07	CoS
CoSe	-22.56	-38.76	-16.20	CoSe
CoSeO3	-9.14	-7.82	1.32	CoSeO3
CoSeO4:6H2O	-17.33	-18.86	-1.53	CoSeO4:6H2O
CoSO4	-13.61	-10.81	2.80	CoSO4
CoSO4:6H2O	-8.34	-10.81	-2.47	CoSO4:6H2O
Cotunnite	-10.64	-15.42	-4.78	PbCl2
Covellite	-55.49	-77.79	-22.30	CuS
Cr(OH)2	-21.71	-10.89	10.82	Cr(OH)2
Cr(OH)3	-2.54	-1.20	1.34	Cr(OH)3
Cr(OH)3(am)	-0.45	-1.20	-0.75	Cr(OH)3
Cr2O3	-0.05	-2.40	-2.36	Cr2O3
CrCl2	-46.09	-32.00	14.09	CrCl2
CrCl3	-47.98	-32.87	15.11	CrCl3

CrF3	-25.57	-36.91	-11.34	CrF3
Cristobalite	-0.32	-3.67	-3.35	SiO2
Crmetal	-66.64	-36.15	30.48	Cr
CrO3	-27.47	-30.68	-3.21	CrO3
Cryolite	-12.35	-46.19	-33.84	Na3AlF6
Cu(OH)2	-0.48	8.20	8.67	Cu(OH)2
Cu(SbO3)2	-26.62	18.59	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.64	-0.39	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.54	-89.42	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.22	-50.02	-45.80	Cu2Se
Cu2SO4	-20.12	-22.07	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.75	-6.65	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.52	-101.11	-42.59	Cu3Sb
Cu3Se2	-24.86	-88.35	-63.49	Cu3Se2
CuCO3	-1.30	-12.80	-11.50	CuCO3
CuCrO4	-17.04	-22.48	-5.44	CuCrO4
CuF	-8.74	-13.65	-4.91	CuF
CuF2	-16.72	-15.61	1.12	CuF2
CuF2:2H2O	-11.06	-15.61	-4.55	CuF2:2H2O
Cumetal	-5.62	-14.38	-8.76	Cu
CuMoO4	-1.14	-14.22	-13.08	CuMoO4
CuOCuSO4	-12.49	-2.19	10.30	CuOCuSO4
Cupricferrite	8.67	14.66	5.99	CuFe2O4
Cuprite	-2.09	-3.49	-1.41	Cu2O
Cuprousferrite	10.40	1.48	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-26.23	-59.59	-33.37	CuSe2
CuSeO3:2H2O	-7.90	-7.39	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.99	-18.43	-2.44	CuSeO4:5H2O
CuSO4	-13.32	-10.38	2.94	CuSO4
Diaspore	1.61	8.48	6.87	AlOOH
Djurlite	-54.79	-88.71	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.30	-16.84	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.25	-16.84	-17.09	CaMg(CO3)2
Epsomite	-3.87	-6.00	-2.13	MgSO4:7H2O
Fe(OH)2	-9.94	3.63	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.10	0.06	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.66	-15.38	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.68	-9.13	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.68	-40.31	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.54	-49.28	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.13	10.09	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.79	-12.39	0.40	FeAsO4:2H2O
FeCr2O4	-5.97	1.23	7.20	FeCr2O4
FeMoO4	-8.69	-18.79	-10.09	FeMoO4
Ferrihydrite	0.04	3.23	3.19	Fe(OH)3
Ferroselite	-45.56	-64.16	-18.60	FeSe2
FeS(ppt)	-79.41	-82.36	-2.95	FeS
FeSe	-31.90	-42.90	-11.00	FeSe
Fix_pe	-4.73	-4.73	0.00	e-
Fluorite	-0.75	-11.25	-10.50	CaF2
Galena	-66.32	-80.29	-13.97	PbS
Gibbsite	0.19	8.48	8.29	Al(OH)3
Goethite	2.74	3.23	0.49	FeOOH
Goslarite	-6.96	-8.97	-2.01	ZnSO4:7H2O
Greenalite	-17.26	3.55	20.81	Fe3Si2O5(OH)4
Greenockite	-64.75	-79.11	-14.36	CdS
Greigite	-288.81	-333.85	-45.03	Fe3S4
Gummite	-6.29	1.38	7.67	UO3
Gypsum	-1.41	-6.02	-4.61	CaSO4:2H2O
H-Jarosite	-15.37	-27.47	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.54	-22.41	-12.88	H2MoO4
H2S(g)	-77.97	-85.98	-8.01	H2S
H2Se(g)	-41.57	-46.53	-4.96	H2Se
Halite	-6.58	-4.97	1.60	NaCl
Halloysite	0.05	9.63	9.57	Al2Si2O5(OH)4
Hausmannite	-3.94	57.09	61.03	Mn3O4
Hematite	7.88	6.46	-1.42	Fe2O3

Hercynite	-2.30	20.59	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-182.65	-256.35	-73.71	Hg (CH ₃) ₂
Hg (g)	-8.04	-15.91	-7.87	Hg
Hg (OH) ₂	-8.74	-12.24	-3.50	Hg (OH) ₂
Hg ₂ (g)	-16.87	-31.83	-14.96	Hg ₂
Hg ₂ (OH) ₂	-11.82	-6.56	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-11.50	-27.55	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-28.54	-37.24	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-20.00	-30.36	-10.36	Hg ₂ F ₂
Hg ₂ S	-80.87	-92.54	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-17.49	-22.15	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-19.01	-25.14	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-28.03	-57.71	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-33.33	-13.84	19.50	HgCl
HgCl ₂	-12.09	-33.35	-21.26	HgCl ₂
HgF (g)	-47.86	-15.18	32.68	HgF
HgF ₂ (g)	-48.61	-36.04	12.57	HgF ₂
Hgmetal (l)	-2.46	-15.91	-13.45	Hg
HgSe	-3.07	-58.77	-55.69	HgSe
HgSeO ₃	-15.40	-27.83	-12.43	HgSeO ₃
HgSO ₄	-21.40	-30.82	-9.42	HgSO ₄
Huntite	-3.70	-33.66	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-6.15	-24.92	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.30	-21.06	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-18.73	-23.90	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-7.89	-22.69	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-34.56	-51.80	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-20.61	-21.13	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.12	-12.86	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-16.35	-17.08	-0.73	K ₂ SeO ₄
Kaolinite	2.19	9.63	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-3.28	14.21	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-6.77	-7.20	-0.43	PbO : PbSO ₄
Laurionite	-5.49	-4.87	0.62	PbOHCl
Lepidocrocite	1.86	3.23	1.37	FeOOH
Lime	-20.14	12.56	32.70	CaO
Litharge	-7.00	5.69	12.69	PbO
Mackinawite	-78.76	-82.36	-3.60	FeS
Maghemite	0.07	6.46	6.39	Fe ₂ O ₃
Magnesioferrite	2.18	19.04	16.86	Fe ₂ MgO ₄
Magnesite	-0.95	-8.41	-7.46	MgCO ₃
Magnetite	6.69	10.09	3.40	Fe ₃ O ₄
Malachite	0.71	-4.60	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.10	23.24	25.34	MnOOH
Massicot	-7.20	5.69	12.89	PbO
Matlockite	-7.80	-16.77	-8.97	PbClF
Melanothallite	-19.17	-12.92	6.26	CuCl ₂
Melanterite	-12.74	-14.95	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-53.13	-98.22	-45.09	HgS
Mg (OH) ₂ (active)	-6.21	12.58	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-17.70	-6.42	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-273.97	-199.28	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.20	6.16	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.02	10.18	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.48	-18.10	5.38	MgCrO ₄
MgF ₂	-3.09	-11.22	-8.13	MgF ₂
MgMoO ₄	-7.98	-9.83	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-6.06	-3.01	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-12.85	-14.05	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-31.19	42.34	73.52	Pb ₃ O ₄
Mirabilite	-6.30	-7.42	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-13.30	-8.40	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-54.24	-59.95	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-148.36	-87.28	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-11.91	0.59	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O
MnCl ₂ : 4H ₂ O	-13.22	-10.50	2.72	MnCl ₂ : 4H ₂ O
MnS (grn)	-75.54	-75.37	0.17	MnS
MnS (pnk)	-78.71	-75.37	3.34	MnS

MnSb	-95.07	-97.98	-2.91	MnSb
MnSe	-39.42	-35.92	3.50	MnSe
MnSeO3	-6.11	-4.98	1.13	MnSeO3
MnSeO3:2H2O	-5.96	-4.98	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.97	-16.02	-2.05	MnSeO4:5H2O
MnSO4	-10.55	-7.97	2.58	MnSO4
Monteponite	-8.23	6.87	15.10	CdO
Montroydite	-8.60	-12.24	-3.64	HgO
MoO3	-14.41	-22.41	-8.00	MoO3
Morenosite	-8.49	-10.63	-2.14	NiSO4:7H2O
MoS2	-149.39	-219.65	-70.26	MoS2
Na-Jarosite	-10.69	-21.89	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.30	-50.19	-9.90	Na2Cr2O7
Na2CrO4	-22.44	-19.51	2.93	Na2CrO4
Na2Mo2O7	-17.07	-33.66	-16.60	Na2Mo2O7
Na2MoO4	-12.74	-11.25	1.49	Na2MoO4
Na2MoO4:2H2O	-12.47	-11.25	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.72	-4.42	10.30	Na2SeO3:5H2O
Na2SeO4	-16.75	-15.47	1.28	Na2SeO4
Na3Sb	-173.58	-79.12	94.45	Na3Sb
Na3VO4	-29.44	7.24	36.68	Na3VO4
Na4V2O7	-34.08	3.32	37.40	Na4V2O7
Nantokite	-5.57	-12.30	-6.73	CuCl
NaSb	-88.19	-65.02	23.17	NaSb
Natron	-8.52	-9.83	-1.31	Na2CO3:10H2O
NaVO3	-7.78	-3.92	3.86	NaVO3
Nesquehonite	-3.74	-8.41	-4.67	MgCO3:3H2O
Ni(OH)2	-4.85	7.95	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.10	-7.40	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.79	13.21	32.00	Ni4(OH)6SO4
NiCO3	-6.17	-13.04	-6.87	NiCO3
NiMoO4	-3.32	-14.47	-11.14	NiMoO4
NiS(alpha)	-72.44	-78.04	-5.60	NiS
NiS(beta)	-66.94	-78.04	-11.10	NiS
NiS(gamma)	-65.24	-78.04	-12.80	NiS
NiSe	-20.88	-38.58	-17.70	NiSe
NiSeO3:2H2O	-10.46	-7.64	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.16	-18.68	-1.52	NiSeO4:6H2O
Nsutite	-6.98	10.53	17.50	MnO2
O2(g)	-32.56	50.53	83.09	O2
Orpiment	-240.86	-301.93	-61.07	As2S3
Otavite	-2.12	-14.12	-12.00	CdCO3
Pb(BO2)2	-10.56	-4.04	6.52	Pb(BO2)2
Pb(OH)2	-2.46	5.69	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-60.30	-69.06	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.97	0.82	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.81	11.38	26.19	Pb2O(OH)2
Pb2O3	-24.39	36.65	61.04	Pb2O3
Pb2OCO3	-9.05	-9.61	-0.56	Pb2OCO3
Pb2V2O7	-5.73	-7.63	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.97	-14.17	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.08	-1.94	6.14	Pb3(VO4)2
Pb3O2CO3	-14.94	-3.92	11.02	Pb3O2CO3
Pb3O2SO4	-12.20	-1.51	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.92	4.18	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.70	4.18	21.88	Pb4O3SO4
PbCrO4	-12.39	-24.99	-12.60	PbCrO4
PbF2	-10.68	-18.12	-7.44	PbF2
Pbmetal	-23.82	-19.58	4.25	Pb
PbMoO4	-1.10	-16.72	-15.62	PbMoO4
PbO:0.3H2O	-7.29	5.69	12.98	PbO:0.33H2O
PbSeO4	-14.10	-20.94	-6.84	PbSeO4
Periclase	-9.00	12.58	21.58	MgO
Phosgenite	-10.91	-30.72	-19.81	PbCl2:PbCO3
Plattnerite	-18.64	30.96	49.60	PbO2
Portlandite	-10.24	12.56	22.80	Ca(OH)2
Pyrite	-124.57	-143.07	-18.51	FeS2
Pyrochroite	-4.58	10.61	15.19	Mn(OH)2

Pyrolusite	-5.50	35.88	41.38	MnO2
Quartz	0.33	-3.67	-4.00	SiO2
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-8.59	-10.63	-2.04	NiSO4:6H2O
Rhodochrosite	0.20	-10.38	-10.58	MnCO3
Rutherfordine	-5.11	-19.61	-14.50	UO2CO3
Sb(OH)3	-12.96	-20.07	-7.11	Sb(OH)3
Sb2O4	-18.28	-14.88	3.40	Sb2O4
Sb2O5	-28.56	-38.23	-9.67	Sb2O5
Sb2Se3	-111.97	-179.73	-67.76	Sb2Se3
Sb4O6(cubic)	-62.03	-80.29	-18.26	Sb4O6
Sb4O6(orth)	-62.39	-80.29	-17.90	Sb4O6
SbCl3	-52.31	-51.74	0.57	SbCl3
SbF3	-45.55	-55.78	-10.23	SbF3
Sbmetal	-46.28	-57.97	-11.69	Sb
SbO2	-3.92	-31.75	-27.82	SbO2
Schoepite	-4.61	1.38	5.99	UO2(OH)2:H2O
Semetal(am)	-14.15	-21.26	-7.11	Se
Semetal(hex)	-13.55	-21.26	-7.71	Se
Senarmontite	-27.78	-40.14	-12.37	Sb2O3
SeO2	-15.71	-15.59	0.12	SeO2
SeO3	-47.67	-26.63	21.04	SeO3
Sepiolite	-1.60	14.16	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.62	14.16	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.12	-17.36	-10.24	FeCO3
SiO2(am-gel)	-0.96	-3.67	-2.71	SiO2
SiO2(am-ppt)	-0.93	-3.67	-2.74	SiO2
Smithsonite	-1.39	-11.39	-10.00	ZnCO3
Sphalerite	-64.93	-76.38	-11.45	ZnS
Spinel	-7.30	29.55	36.85	MgAl2O4
Stibnite	-247.64	-298.10	-50.46	Sb2S3
Sulfur	-58.57	-60.72	-2.14	S
Tenorite	0.55	8.20	7.64	CuO
Thenardite	-7.74	-7.41	0.32	Na2SO4
Thermonatrite	-10.47	-9.83	0.64	Na2CO3:H2O
Tyuyamunite	-7.76	-3.68	4.08	Ca(UO2)2(VO4)2
U3O8	-14.55	6.53	21.08	U3O8
U3Sb4	-579.86	-427.48	152.38	U3Sb4
U4O9	-30.38	-33.40	-3.02	U4O9
UF4	-32.74	-62.28	-29.54	UF4
UF4:2.5H2O	-29.56	-62.28	-32.72	UF4:2.5H2O
UO2(am)	-15.60	-14.67	0.93	UO2
UO2(NO3)2	-44.33	-32.18	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-37.04	-32.18	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-35.57	-32.18	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-34.23	-32.19	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.23	1.38	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.00	-25.25	-2.25	UO2SeO4:4H2O
UO3	-6.32	1.38	7.70	UO3
Uraninite	-10.00	-14.67	-4.67	UO2
USb2	-219.93	-190.36	29.58	USb2
V(OH)3	-19.76	-12.17	7.59	V(OH)3
V2O5	-17.64	-19.00	-1.36	V2O5
V3O5	-42.80	-40.96	1.84	V3O5
V4O7	-53.38	-46.20	7.19	V4O7
V6O13	-46.69	-107.55	-60.86	V6O13
Valentinite	-31.66	-40.14	-8.48	Sb2O3
VC12	-64.79	-45.91	18.87	VC12
VC13	-67.27	-43.84	23.43	VC13
VF4	-67.77	-52.84	14.93	VF4
Vmetal	-94.09	-50.07	44.03	V
VO	-39.56	-24.80	14.76	VO
VO(OH)2	-10.38	-5.23	5.15	VO(OH)2
VO2Cl	-22.90	-20.06	2.84	VO2Cl
VOC1	-33.88	-22.73	11.15	VOC1
VOC12	-39.10	-26.34	12.76	VOC12
VOSO4	-27.42	-23.81	3.61	VOSO4
Witherite	-4.71	-13.28	-8.57	BaCO3

Wurtzite	-67.43	-76.38	-8.95	ZnS
Zincite	-1.73	9.61	11.33	ZnO
Zincosite	-12.90	-8.97	3.93	ZnSO4
Zn(BO2)2	-8.41	-0.12	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-27.28	-23.96	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.59	9.61	12.20	Zn(OH)2
Zn(OH)2(am)	-2.87	9.61	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.15	9.61	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.93	9.61	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.13	9.61	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.87	0.63	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.53	8.66	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.07	-2.42	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.25	-8.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.55	19.85	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.58	26.92	38.50	Zn5(OH)8Cl2
ZnCl2	-18.56	-11.51	7.05	ZnCl2
ZnCO3:1H2O	-1.13	-11.39	-10.26	ZnCO3:1H2O
ZnF2	-13.66	-14.20	-0.53	ZnF2
Znmetal	-41.45	-15.66	25.79	Zn
ZnMoO4	-2.68	-12.81	-10.13	ZnMoO4
ZnO(active)	-1.58	9.61	11.19	ZnO
ZnS(am)	-67.33	-76.38	-9.05	ZnS
ZnSb	-84.64	-73.63	11.01	ZnSb
ZnSe	-22.52	-36.92	-14.40	ZnSe
ZnSeO4:6H2O	-15.50	-17.02	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.33	-8.97	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 97.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 505

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

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Gypsum      0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 513
SAVE Solution 514 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 505
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 513. Solution after simulation 96.
Using pure phase assemblage 505.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-0.66	-49.36	-48.70	0.000e+00	0	0.000e+00
Alunite	-7.76	-9.16	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.79	-6.15	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	7.354e-10	7.354e-10
Barite	-0.94	-10.92	-9.98	0.000e+00	0	0.000e+00
Brochantite	-0.00	15.22	15.22	0.000e+00	9.379e-08	9.379e-08
Brucite	-3.54	13.30	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	6.190e-04
CaMoO4	-2.05	-10.00	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-5.77	-2.96	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	3.560e-04	3.560e-04
Carnotite	-3.18	-2.95	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-12.01	-2.17	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.40	-15.55	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	0.000e+00	3.622e-05	3.622e-05
Cr2O3	0.00	-2.36	-2.36	0.000e+00	2.415e-10	2.415e-10
Cu2Se(alpha)	-4.99	-50.79	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.45	-14.53	-13.08	0.000e+00	0	0.000e+00
Epsomite	-3.89	-6.02	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	3.720e-10	3.720e-10

Fluorite	-0.89	-11.39	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.78	1.89	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.54	-6.15	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.17	-59.86	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.28	-7.40	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.88	-4.75	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.08	8.71	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.66	-7.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.06	-12.93	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.31	-14.45	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-3.720e-07
Otavite	-2.03	-14.03	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-1.22	-16.84	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.25	-19.75	-14.50	0.000e+00	0	0.000e+00
SbO2	-4.44	-32.26	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.10	1.89	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.72	15.04	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.11	-3.85	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-7.13	-3.05	4.08	0.000e+00	0	0.000e+00
U3O8	-13.30	7.78	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.72	1.89	5.61	0.000e+00	0	0.000e+00
UO3	-5.81	1.89	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.72	-12.84	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	6.555e-09	6.556e-09
Al	5.669e-07	5.670e-07
As	3.676e-10	3.677e-10
B	1.441e-05	1.442e-05
Ba	1.105e-08	1.105e-08
C	1.081e-03	1.081e-03
Ca	8.194e-04	8.196e-04
Cd	2.867e-09	2.867e-09
Cl	2.508e-03	2.508e-03
Co	2.212e-08	2.212e-08
Cr	6.994e-10	6.996e-10
Cu	7.309e-07	7.310e-07
F	1.214e-04	1.214e-04
Fe	7.454e-10	7.455e-10
Hg	4.519e-10	4.520e-10
K	8.551e-04	8.552e-04
Mg	1.074e-03	1.074e-03
Mn	1.353e-05	1.353e-05
Mo	3.998e-07	3.999e-07
N	3.256e-06	3.256e-06
Na	5.462e-03	5.463e-03
Ni	3.444e-08	3.445e-08
Pb	2.041e-09	2.042e-09
S	3.200e-03	3.200e-03
Sb	6.043e-09	6.044e-09
Se	3.535e-08	3.535e-08
Si	1.437e-04	1.437e-04
U	6.304e-08	6.305e-08
V	1.898e-09	1.898e-09
Zn	1.625e-06	1.625e-06

-----Description of solution-----

	pH	=	8.281	Charge balance
	pe	=	4.491	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.371e-02	
	Mass of water (kg)	=	1.000e+00	

Total alkalinity (eq/kg) = 1.106e-03
 Total CO2 (mol/kg) = 1.081e-03
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 3.853e-07
 Percent error, $100 * (Cat - |An|) / (Cat + |An|)$ = 0.00
 Iterations = 12
 Total H = 1.110335e+02
 Total O = 5.553258e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.172e-06	1.925e-06	-5.663	-5.716	-0.053	(0)
H+	5.887e-09	5.231e-09	-8.230	-8.281	-0.051	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	6.555e-09					
AgCl	4.430e-09	4.430e-09	-8.354	-8.354	0.000	(0)
Ag+	1.096e-09	9.739e-10	-8.960	-9.011	-0.051	(0)
AgCl2-	9.862e-10	8.595e-10	-9.006	-9.066	-0.060	(0)
AgSO4-	3.891e-11	3.391e-11	-10.410	-10.470	-0.060	(0)
AgCl3-2	2.958e-12	1.707e-12	-11.529	-11.768	-0.239	(0)
AgNO2	5.837e-13	5.837e-13	-12.234	-12.234	0.000	(0)
AgF	2.469e-13	2.469e-13	-12.608	-12.608	0.000	(0)
AgOH	1.874e-13	1.874e-13	-12.727	-12.727	0.000	(0)
AgCl4-3	2.676e-14	7.763e-15	-13.573	-14.110	-0.537	(0)
AgH2BO3	2.188e-14	2.188e-14	-13.660	-13.660	0.000	(0)
AgSeO3-	7.815e-15	6.811e-15	-14.107	-14.167	-0.060	(0)
Ag2Se	3.553e-15	3.553e-15	-14.449	-14.449	0.000	(0)
AgNH3+	1.456e-15	1.269e-15	-14.837	-14.896	-0.060	(0)
Ag (OH) 2-	4.044e-17	3.525e-17	-16.393	-16.453	-0.060	(0)
Ag (NO2) 2-	2.976e-18	2.594e-18	-17.526	-17.586	-0.060	(0)
AgNO3	2.094e-18	2.094e-18	-17.679	-17.679	0.000	(0)
Ag (NH3) 2+	7.557e-21	6.586e-21	-20.122	-20.181	-0.060	(0)
Ag (SeO3) 2-3	2.288e-21	6.637e-22	-20.641	-21.178	-0.537	(0)
Ag2MoO4	8.943e-26	8.943e-26	-25.049	-25.049	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.755	-74.755	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.958	-83.914	-0.955	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.264	-149.416	-0.151	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.154	-150.214	-0.060	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.283	-150.574	-0.291	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.606	-150.885	-0.279	(0)
Al	5.669e-07					
Al (OH) 4-	5.648e-07	5.023e-07	-6.248	-6.299	-0.051	(0)
Al (OH) 3	2.073e-09	2.073e-09	-8.683	-8.683	0.000	(0)
Al (OH) 2+	6.051e-11	5.399e-11	-10.218	-10.268	-0.049	(0)
AlF3	9.452e-13	9.452e-13	-12.024	-12.024	0.000	(0)
AlF2+	8.338e-13	7.440e-13	-12.079	-12.128	-0.049	(0)
AlOH+2	5.570e-14	3.532e-14	-13.254	-13.452	-0.198	(0)
AlF4-	5.375e-14	4.781e-14	-13.270	-13.321	-0.051	(0)
AlF+2	2.920e-14	1.852e-14	-13.535	-13.732	-0.198	(0)
AlSO4+	2.796e-16	2.487e-16	-15.553	-15.604	-0.051	(0)
Al+3	5.321e-17	1.835e-17	-16.274	-16.736	-0.462	(0)
Al (SO4) 2-	5.229e-18	4.650e-18	-17.282	-17.333	-0.051	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.516	-51.054	-0.537	(0)
As (3)	2.235e-24					
H3AsO3	2.009e-24	2.009e-24	-23.697	-23.697	0.000	(0)
H2AsO3-	2.260e-25	1.970e-25	-24.646	-24.706	-0.060	(0)
HAsO3-2	5.953e-29	3.434e-29	-28.225	-28.464	-0.239	(0)
H4AsO3+	5.974e-33	5.207e-33	-32.224	-32.283	-0.060	(0)
AsO3-3	8.724e-34	2.531e-34	-33.059	-33.597	-0.537	(0)
As (5)	3.676e-10					
HAsO4-2	3.560e-10	2.054e-10	-9.449	-9.687	-0.239	(0)
H2AsO4-	1.124e-11	9.797e-12	-10.949	-11.009	-0.060	(0)
AsO4-3	4.280e-13	1.242e-13	-12.369	-12.906	-0.537	(0)
H3AsO4	8.878e-18	8.906e-18	-17.052	-17.050	0.001	(0)

B	1.441e-05					
H3BO3	1.273e-05	1.277e-05	-4.895	-4.894	0.001	(0)
H2BO3-	1.607e-06	1.418e-06	-5.794	-5.848	-0.054	(0)
CaH2BO3+	3.718e-08	3.279e-08	-7.430	-7.484	-0.054	(0)
MgH2BO3+	3.063e-08	2.702e-08	-7.514	-7.568	-0.054	(0)
NaH2BO3	1.080e-08	1.080e-08	-7.967	-7.967	0.000	(0)
BF(OH) 3-	5.828e-10	5.141e-10	-9.234	-9.289	-0.054	(0)
H5(BO3) 2-	1.746e-11	1.541e-11	-10.758	-10.812	-0.054	(0)
BaH2BO3+	3.389e-13	2.989e-13	-12.470	-12.524	-0.054	(0)
BF2(OH) 2-	3.290e-14	2.902e-14	-13.483	-13.537	-0.054	(0)
H8(BO3) 3-	2.230e-14	1.967e-14	-13.652	-13.706	-0.054	(0)
AgH2BO3	2.188e-14	2.188e-14	-13.660	-13.660	0.000	(0)
BF3OH-	6.758e-21	5.961e-21	-20.170	-20.225	-0.054	(0)
BF4-	1.756e-26	1.549e-26	-25.756	-25.810	-0.054	(0)
Ba	1.105e-08					
Ba+2	1.095e-08	6.824e-09	-7.961	-8.166	-0.205	(0)
BaHCO3+	6.697e-11	5.989e-11	-10.174	-10.223	-0.049	(0)
BaCO3	2.882e-11	2.882e-11	-10.540	-10.540	0.000	(0)
BaH2BO3+	3.389e-13	2.989e-13	-12.470	-12.524	-0.054	(0)
BaOH+	6.433e-14	5.732e-14	-13.192	-13.242	-0.050	(0)
BaNO3+	1.062e-16	9.256e-17	-15.974	-16.034	-0.060	(0)
BaNH3+2	4.764e-18	2.748e-18	-17.322	-17.561	-0.239	(0)
C(4)	1.081e-03					
HCO3-	1.030e-03	9.190e-04	-2.987	-3.037	-0.049	(0)
CO3-2	1.322e-05	8.237e-06	-4.879	-5.084	-0.205	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	7.693e-06	6.880e-06	-5.114	-5.162	-0.049	(0)
MgHCO3+	5.824e-06	5.170e-06	-5.235	-5.287	-0.052	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	3.766e-06	3.766e-06	-5.424	-5.424	0.000	(0)
NaHCO3	2.483e-06	2.483e-06	-5.605	-5.605	0.000	(0)
NaCO3-	8.259e-07	7.370e-07	-6.083	-6.133	-0.049	(0)
CuCO3	5.739e-07	5.739e-07	-6.241	-6.241	0.000	(0)
ZnCO3	2.743e-07	2.743e-07	-6.562	-6.562	0.000	(0)
MnHCO3+	1.340e-07	1.194e-07	-6.873	-6.923	-0.050	(0)
UO2(CO3) 3-4	4.297e-08	4.761e-09	-7.367	-8.322	-0.955	(0)
Cu(CO3) 2-2	2.205e-08	1.272e-08	-7.657	-7.895	-0.239	(0)
UO2(CO3) 2-2	1.999e-08	1.153e-08	-7.699	-7.938	-0.239	(0)
ZnHCO3+	1.930e-08	1.682e-08	-7.714	-7.774	-0.060	(0)
NiCO3	4.353e-09	4.353e-09	-8.361	-8.361	0.000	(0)
NiHCO3+	1.842e-09	1.605e-09	-8.735	-8.795	-0.060	(0)
PbCO3	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)
CoCO3	1.302e-09	1.302e-09	-8.885	-8.885	0.000	(0)
CuHCO3+	7.872e-10	6.861e-10	-9.104	-9.164	-0.060	(0)
CoHCO3+	7.670e-10	6.684e-10	-9.115	-9.175	-0.060	(0)
CdCO3	2.148e-10	2.148e-10	-9.668	-9.668	0.000	(0)
UO2CO3	7.018e-11	7.018e-11	-10.154	-10.154	0.000	(0)
BaHCO3+	6.697e-11	5.989e-11	-10.174	-10.223	-0.049	(0)
Pb(CO3) 2-2	5.949e-11	3.432e-11	-10.226	-10.464	-0.239	(0)
PbHCO3+	4.572e-11	3.985e-11	-10.340	-10.400	-0.060	(0)
BaCO3	2.882e-11	2.882e-11	-10.540	-10.540	0.000	(0)
CdHCO3+	2.747e-12	2.394e-12	-11.561	-11.621	-0.060	(0)
Cd(CO3) 2-2	2.274e-12	1.312e-12	-11.643	-11.882	-0.239	(0)
FeHCO3+	9.998e-16	8.941e-16	-15.000	-15.049	-0.049	(0)
HgCO3	4.615e-16	4.615e-16	-15.336	-15.336	0.000	(0)
Hg(CO3) 2-2	2.083e-17	1.202e-17	-16.681	-16.920	-0.239	(0)
HgHCO3+	5.158e-20	4.495e-20	-19.288	-19.347	-0.060	(0)
Ca	8.194e-04					
Ca+2	6.452e-04	4.020e-04	-3.190	-3.396	-0.205	(0)
CaSO4	1.607e-04	1.607e-04	-3.794	-3.794	0.000	(0)
CaHCO3+	7.693e-06	6.880e-06	-5.114	-5.162	-0.049	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	4.969e-07	4.428e-07	-6.304	-6.354	-0.050	(0)
CaH2BO3+	3.718e-08	3.279e-08	-7.430	-7.484	-0.054	(0)
CaOH+	1.726e-08	1.544e-08	-7.763	-7.811	-0.049	(0)
CaNO3+	3.948e-12	3.441e-12	-11.404	-11.463	-0.060	(0)
CaNH3+2	5.600e-13	3.231e-13	-12.252	-12.491	-0.239	(0)
Ca(NH3) 2+2	1.423e-22	8.211e-23	-21.847	-22.086	-0.239	(0)

Cd	2.867e-09					
Cd+2	1.836e-09	1.144e-09	-8.736	-8.941	-0.205	(0)
CdSO4	4.682e-10	4.682e-10	-9.330	-9.330	0.000	(0)
CdCl+	2.793e-10	2.435e-10	-9.554	-9.614	-0.060	(0)
CdCO3	2.148e-10	2.148e-10	-9.668	-9.668	0.000	(0)
CdOH+	2.007e-11	1.749e-11	-10.697	-10.757	-0.060	(0)
CdOHC1	1.922e-11	1.922e-11	-10.716	-10.716	0.000	(0)
Cd (SO4) 2-2	1.911e-11	1.102e-11	-10.719	-10.958	-0.239	(0)
CdHCO3+	2.747e-12	2.394e-12	-11.561	-11.621	-0.060	(0)
Cd (CO3) 2-2	2.274e-12	1.312e-12	-11.643	-11.882	-0.239	(0)
CdCl2	2.261e-12	2.261e-12	-11.646	-11.646	0.000	(0)
CdF+	2.100e-12	1.830e-12	-11.678	-11.738	-0.060	(0)
Cd (OH) 2	2.124e-13	2.124e-13	-12.673	-12.673	0.000	(0)
CdCl3-	3.647e-15	3.178e-15	-14.438	-14.498	-0.060	(0)
CdF2	3.685e-16	3.685e-16	-15.434	-15.434	0.000	(0)
Cd (OH) 3-	2.866e-17	2.497e-17	-16.543	-16.603	-0.060	(0)
CdNO3+	1.124e-17	9.794e-18	-16.949	-17.009	-0.060	(0)
CdSeO4	1.005e-17	1.005e-17	-16.998	-16.998	0.000	(0)
Cd2OH+3	3.458e-19	1.003e-19	-18.461	-18.999	-0.537	(0)
Cd (SeO3) 2-2	1.936e-19	1.117e-19	-18.713	-18.952	-0.239	(0)
Cd (OH) 4-2	1.364e-23	7.867e-24	-22.865	-23.104	-0.239	(0)
Cd (NO3) 2	1.328e-26	1.328e-26	-25.877	-25.877	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-80.432	-80.492	-0.060	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.846	-152.846	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-230.445	-230.505	-0.060	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-307.628	-307.867	-0.239	(0)
Cl	2.508e-03					
Cl-	2.507e-03	2.228e-03	-2.601	-2.652	-0.051	(0)
MnCl+	2.050e-08	1.826e-08	-7.688	-7.738	-0.050	(0)
ZnOHC1	8.161e-09	8.161e-09	-8.088	-8.088	0.000	(0)
AgCl	4.430e-09	4.430e-09	-8.354	-8.354	0.000	(0)
ZnCl+	3.649e-09	3.239e-09	-8.438	-8.490	-0.052	(0)
AgCl2-	9.862e-10	8.595e-10	-9.006	-9.066	-0.060	(0)
CuCl	5.248e-10	5.248e-10	-9.280	-9.280	0.000	(0)
CdCl+	2.793e-10	2.435e-10	-9.554	-9.614	-0.060	(0)
CuCl2-	2.752e-10	2.442e-10	-9.560	-9.612	-0.052	(0)
NiCl+	9.265e-11	8.075e-11	-10.033	-10.093	-0.060	(0)
CoCl+	8.269e-11	7.206e-11	-10.083	-10.142	-0.060	(0)
MnCl2	5.748e-11	5.748e-11	-10.241	-10.241	0.000	(0)
CuCl+	4.706e-11	4.178e-11	-10.327	-10.379	-0.052	(0)
CdOHC1	1.922e-11	1.922e-11	-10.716	-10.716	0.000	(0)
ZnCl2	1.144e-11	1.144e-11	-10.942	-10.942	0.000	(0)
PbCl+	5.293e-12	4.613e-12	-11.276	-11.336	-0.060	(0)
AgCl3-2	2.958e-12	1.707e-12	-11.529	-11.768	-0.239	(0)
CdCl2	2.261e-12	2.261e-12	-11.646	-11.646	0.000	(0)
HgClOH	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
CuCl3-2	1.845e-13	1.163e-13	-12.734	-12.934	-0.200	(0)
PbCl2	4.590e-14	4.590e-14	-13.338	-13.338	0.000	(0)
MnCl3-	3.958e-14	3.527e-14	-13.403	-13.453	-0.050	(0)
CuCl2	3.227e-14	3.227e-14	-13.491	-13.491	0.000	(0)
AgCl4-3	2.676e-14	7.763e-15	-13.573	-14.110	-0.537	(0)
HgCl2	2.324e-14	2.324e-14	-13.634	-13.634	0.000	(0)
ZnCl3-	2.280e-14	2.024e-14	-13.642	-13.694	-0.052	(0)
CdCl3-	3.647e-15	3.178e-15	-14.438	-14.498	-0.060	(0)
NiCl2	9.058e-16	9.058e-16	-15.043	-15.043	0.000	(0)
HgCl3-	5.940e-16	5.177e-16	-15.226	-15.286	-0.060	(0)
PbCl3-	4.671e-17	4.071e-17	-16.331	-16.390	-0.060	(0)
ZnCl4-2	3.576e-17	2.255e-17	-16.447	-16.647	-0.200	(0)
UO2Cl+	8.873e-18	7.733e-18	-17.052	-17.112	-0.060	(0)
HgCl4-2	7.958e-18	4.591e-18	-17.099	-17.338	-0.239	(0)
HgCl+	2.388e-18	2.081e-18	-17.622	-17.682	-0.060	(0)
CuCl3-	7.559e-19	6.709e-19	-18.122	-18.173	-0.052	(0)
CrCl+2	1.756e-19	1.013e-19	-18.755	-18.994	-0.239	(0)
PbCl4-2	7.185e-20	4.146e-20	-19.144	-19.382	-0.239	(0)
CrOHC12	8.258e-21	8.258e-21	-20.083	-20.083	0.000	(0)
CrCl2+	2.458e-23	2.142e-23	-22.609	-22.669	-0.060	(0)
FeCl+2	2.373e-23	1.496e-23	-22.625	-22.825	-0.200	(0)
CuCl4-2	1.188e-23	7.492e-24	-22.925	-23.125	-0.200	(0)

VOC1+	2.654e-25	2.313e-25	-24.576	-24.636	-0.060	(0)
FeCl2+	1.671e-25	1.489e-25	-24.777	-24.827	-0.050	(0)
CrO3Cl-	3.009e-26	2.623e-26	-25.522	-25.581	-0.060	(0)
FeCl3	3.316e-29	3.316e-29	-28.479	-28.479	0.000	(0)
CoCl+2	9.058e-37	5.226e-37	-36.043	-36.282	-0.239	(0)
UCl+3	0.000e+00	0.000e+00	-47.976	-48.513	-0.537	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
Co (2)	2.212e-08					
Co+2	1.621e-08	9.350e-09	-7.790	-8.029	-0.239	(0)
CoSO4	3.256e-09	3.256e-09	-8.487	-8.487	0.000	(0)
CoCO3	1.302e-09	1.302e-09	-8.885	-8.885	0.000	(0)
CoHCO3+	7.670e-10	6.684e-10	-9.115	-9.175	-0.060	(0)
CoOH+	4.120e-10	3.590e-10	-9.385	-9.445	-0.060	(0)
CoCl+	8.269e-11	7.206e-11	-10.083	-10.142	-0.060	(0)
Co (OH) 2	5.489e-11	5.489e-11	-10.261	-10.261	0.000	(0)
CoF+	3.424e-11	2.984e-11	-10.466	-10.525	-0.060	(0)
CoNO2+	2.169e-13	1.890e-13	-12.664	-12.723	-0.060	(0)
Co (OH) 3-	2.418e-15	2.108e-15	-14.616	-14.676	-0.060	(0)
Co (NH3) +2	1.244e-15	7.176e-16	-14.905	-15.144	-0.239	(0)
CoOOH-	6.069e-16	5.289e-16	-15.217	-15.277	-0.060	(0)
CoSeO4	2.209e-16	2.209e-16	-15.656	-15.656	0.000	(0)
CoNO3+	4.602e-17	4.011e-17	-16.337	-16.397	-0.060	(0)
Co2OH+3	5.800e-19	1.683e-19	-18.237	-18.774	-0.537	(0)
Co (OH) 4-2	1.114e-21	6.429e-22	-20.953	-21.192	-0.239	(0)
Co (NH3) 2+2	3.387e-23	1.954e-23	-22.470	-22.709	-0.239	(0)
Co (NO3) 2	2.209e-25	2.209e-25	-24.656	-24.656	0.000	(0)
Co4 (OH) 4+4	2.993e-29	3.316e-30	-28.524	-29.479	-0.955	(0)
Co (NH3) 3+2	2.722e-31	1.571e-31	-30.565	-30.804	-0.239	(0)
Co (NH3) 4+2	9.120e-40	5.262e-40	-39.040	-39.279	-0.239	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-48.015	-48.254	-0.239	(0)
Co (3)	1.954e-29					
CoOH+2	1.954e-29	1.128e-29	-28.709	-28.948	-0.239	(0)
Co+3	3.342e-36	1.153e-36	-35.476	-35.938	-0.462	(0)
CoCl+2	9.058e-37	5.226e-37	-36.043	-36.282	-0.239	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-70.838	-71.077	-0.239	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
Cr (2)	4.699e-28					
Cr+2	4.699e-28	2.711e-28	-27.328	-27.567	-0.239	(0)
Cr (3)	6.994e-10					
Cr (OH) 2+	3.976e-10	3.465e-10	-9.401	-9.460	-0.060	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.610e-11	2.275e-11	-10.583	-10.643	-0.060	(0)
Cr (OH) 4-	2.202e-11	1.919e-11	-10.657	-10.717	-0.060	(0)
Cr (OH) +2	2.565e-12	1.480e-12	-11.591	-11.830	-0.239	(0)
CrOHSO4	6.129e-13	6.129e-13	-12.213	-12.213	0.000	(0)
CrF+2	9.743e-16	5.621e-16	-15.011	-15.250	-0.239	(0)
CrSO4+	1.644e-16	1.432e-16	-15.784	-15.844	-0.060	(0)
Cr+3	1.212e-16	3.515e-17	-15.917	-16.454	-0.537	(0)
CrCl+2	1.756e-19	1.013e-19	-18.755	-18.994	-0.239	(0)
CrOHC12	8.258e-21	8.258e-21	-20.083	-20.083	0.000	(0)
Cr2 (OH) 2SO4+2	1.421e-22	8.197e-23	-21.847	-22.086	-0.239	(0)
CrCl2+	2.458e-23	2.142e-23	-22.609	-22.669	-0.060	(0)
Cr2 (OH) 2 (SO4) 2	8.499e-24	8.499e-24	-23.071	-23.071	0.000	(0)
CrNO3+2	7.207e-27	4.158e-27	-26.142	-26.381	-0.239	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-47.533	-47.772	-0.239	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.086	-58.624	-0.537	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
Cr (6)	3.498e-14					
CrO4-2	3.392e-14	2.113e-14	-13.470	-13.675	-0.205	(0)
NaCrO4-	5.791e-16	5.047e-16	-15.237	-15.297	-0.060	(0)
HCrO4-	4.105e-16	3.577e-16	-15.387	-15.446	-0.060	(0)
KCrO4-	6.762e-17	5.893e-17	-16.170	-16.230	-0.060	(0)
CrO3SO4-2	1.725e-24	9.950e-25	-23.763	-24.002	-0.239	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)

CrO3Cl-	3.009e-26	2.623e-26	-25.522	-25.581	-0.060	(0)
Cr2O7-2	7.693e-30	4.439e-30	-29.114	-29.353	-0.239	(0)
Cu (1)	1.015e-09					
CuCl	5.248e-10	5.248e-10	-9.280	-9.280	0.000	(0)
CuCl2-	2.752e-10	2.442e-10	-9.560	-9.612	-0.052	(0)
Cu+	2.147e-10	1.871e-10	-9.668	-9.728	-0.060	(0)
CuCl3-2	1.845e-13	1.163e-13	-12.734	-12.934	-0.200	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.607	-148.892	-0.285	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.348	-149.622	-0.274	(0)
Cu (2)	7.299e-07					
CuCO3	5.739e-07	5.739e-07	-6.241	-6.241	0.000	(0)
CuOH+	8.112e-08	7.201e-08	-7.091	-7.143	-0.052	(0)
Cu (OH) 2	2.765e-08	2.765e-08	-7.558	-7.558	0.000	(0)
Cu (CO3) 2-2	2.205e-08	1.272e-08	-7.657	-7.895	-0.239	(0)
Cu+2	1.899e-08	1.183e-08	-7.722	-7.927	-0.205	(0)
CuSO4	4.731e-09	4.731e-09	-8.325	-8.325	0.000	(0)
CuHCO3+	7.872e-10	6.861e-10	-9.104	-9.164	-0.060	(0)
Cu2 (OH) 2+2	2.257e-10	1.302e-10	-9.646	-9.885	-0.239	(0)
Cu (OH) 3-	1.252e-10	1.091e-10	-9.902	-9.962	-0.060	(0)
CuF+	8.644e-11	7.533e-11	-10.063	-10.123	-0.060	(0)
CuCl+	4.706e-11	4.178e-11	-10.327	-10.379	-0.052	(0)
CuNO2+	4.078e-12	3.554e-12	-11.390	-11.449	-0.060	(0)
CuNH3+2	1.340e-13	7.729e-14	-12.873	-13.112	-0.239	(0)
CuCl2	3.227e-14	3.227e-14	-13.491	-13.491	0.000	(0)
Cu (OH) 4-2	2.865e-15	1.653e-15	-14.543	-14.782	-0.239	(0)
CuNO3+	1.162e-16	1.013e-16	-15.935	-15.995	-0.060	(0)
Cu (NO2) 2	1.043e-16	1.043e-16	-15.982	-15.982	0.000	(0)
CuCl3-	7.559e-19	6.709e-19	-18.122	-18.173	-0.052	(0)
CuCl4-2	1.188e-23	7.492e-24	-22.925	-23.125	-0.200	(0)
Cu (NO3) 2	3.450e-26	3.450e-26	-25.462	-25.462	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.643	-220.703	-0.060	(0)
F	1.214e-04					
F-	1.136e-04	1.009e-04	-3.945	-3.996	-0.051	(0)
MgF+	6.999e-06	6.225e-06	-5.155	-5.206	-0.051	(0)
CaF+	4.969e-07	4.428e-07	-6.304	-6.354	-0.050	(0)
NaF	3.059e-07	3.059e-07	-6.514	-6.514	0.000	(0)
MnF+	2.936e-08	2.616e-08	-7.532	-7.582	-0.050	(0)
ZnF+	1.337e-09	1.165e-09	-8.874	-8.934	-0.060	(0)
HF	7.808e-10	7.808e-10	-9.107	-9.107	0.000	(0)
BF (OH) 3-	5.828e-10	5.141e-10	-9.234	-9.289	-0.054	(0)
CuF+	8.644e-11	7.533e-11	-10.063	-10.123	-0.060	(0)
NiF+	4.120e-11	3.591e-11	-10.385	-10.445	-0.060	(0)
CoF+	3.424e-11	2.984e-11	-10.466	-10.525	-0.060	(0)
CdF+	2.100e-12	1.830e-12	-11.678	-11.738	-0.060	(0)
AlF3	9.452e-13	9.452e-13	-12.024	-12.024	0.000	(0)
AlF2+	8.338e-13	7.440e-13	-12.079	-12.128	-0.049	(0)
PbF+	4.761e-13	4.150e-13	-12.322	-12.382	-0.060	(0)
HF2-	3.381e-13	2.995e-13	-12.471	-12.524	-0.053	(0)
AgF	2.469e-13	2.469e-13	-12.608	-12.608	0.000	(0)
AlF4-	5.375e-14	4.781e-14	-13.270	-13.321	-0.051	(0)
UO2F+	3.421e-14	2.981e-14	-13.466	-13.526	-0.060	(0)
BF2 (OH) 2-	3.290e-14	2.902e-14	-13.483	-13.537	-0.054	(0)
AlF+2	2.920e-14	1.852e-14	-13.535	-13.732	-0.198	(0)
UO2F2	8.677e-15	8.677e-15	-14.062	-14.062	0.000	(0)
CrF+2	9.743e-16	5.621e-16	-15.011	-15.250	-0.239	(0)
PbF2	8.240e-16	8.240e-16	-15.084	-15.084	0.000	(0)
CdF2	3.685e-16	3.685e-16	-15.434	-15.434	0.000	(0)
UO2F3-	2.524e-16	2.199e-16	-15.598	-15.658	-0.060	(0)
H2F2	1.633e-18	1.633e-18	-17.787	-17.787	0.000	(0)
UO2F4-2	3.056e-19	1.763e-19	-18.515	-18.754	-0.239	(0)
PbF3-	1.810e-19	1.577e-19	-18.742	-18.802	-0.060	(0)
VO2F	9.266e-20	9.266e-20	-19.033	-19.033	0.000	(0)
FeF2+	7.456e-20	6.644e-20	-19.127	-19.178	-0.050	(0)
FeF+2	3.902e-20	2.460e-20	-19.409	-19.609	-0.200	(0)
FeF3	9.460e-21	9.460e-21	-20.024	-20.024	0.000	(0)
BF3OH-	6.758e-21	5.961e-21	-20.170	-20.225	-0.054	(0)
VO2F2-	3.896e-21	3.395e-21	-20.409	-20.469	-0.060	(0)
VOF+	2.570e-23	2.240e-23	-22.590	-22.650	-0.060	(0)

PbF4-2	1.320e-23	7.618e-24	-22.879	-23.118	-0.239	(0)
VO2F3-2	7.407e-24	4.274e-24	-23.130	-23.369	-0.239	(0)
VOF2	8.475e-25	8.475e-25	-24.072	-24.072	0.000	(0)
HgF+	2.009e-25	1.751e-25	-24.697	-24.757	-0.060	(0)
BF4-	1.756e-26	1.549e-26	-25.756	-25.810	-0.054	(0)
VOF3-	3.482e-27	3.034e-27	-26.458	-26.518	-0.060	(0)
Sb (OH) 2F	1.546e-27	1.546e-27	-26.811	-26.811	0.000	(0)
SbOF	1.521e-27	1.521e-27	-26.818	-26.818	0.000	(0)
VO2F4-3	7.315e-28	2.122e-28	-27.136	-27.673	-0.537	(0)
VOF4-2	2.142e-30	1.236e-30	-29.669	-29.908	-0.239	(0)
SiF6-2	2.656e-31	1.674e-31	-30.576	-30.776	-0.200	(0)
UF3+	1.290e-38	1.124e-38	-37.889	-37.949	-0.060	(0)
UF2+2	1.218e-39	7.029e-40	-38.914	-39.153	-0.239	(0)
UF4	1.244e-40	1.244e-40	-39.905	-39.905	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.720	-42.257	-0.537	(0)
UF5-	0.000e+00	0.000e+00	-42.244	-42.303	-0.060	(0)
UF6-2	0.000e+00	0.000e+00	-43.580	-43.819	-0.239	(0)
Fe (2)	1.747e-13					
Fe+2	1.339e-13	7.728e-14	-12.873	-13.112	-0.239	(0)
FeSO4	3.311e-14	3.311e-14	-13.480	-13.480	0.000	(0)
FeOH+	6.645e-15	5.921e-15	-14.178	-14.228	-0.050	(0)
FeHCO3+	9.998e-16	8.941e-16	-15.000	-15.049	-0.049	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	6.182e-18	5.508e-18	-17.209	-17.259	-0.050	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.279	-163.279	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-240.740	-240.800	-0.060	(0)
Fe (3)	7.452e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.318e-10	2.069e-10	-9.635	-9.684	-0.049	(0)
Fe (OH) 4-	8.586e-11	7.662e-11	-10.066	-10.116	-0.049	(0)
FeOH+2	4.382e-16	2.763e-16	-15.358	-15.559	-0.200	(0)
FeF2+	7.456e-20	6.644e-20	-19.127	-19.178	-0.050	(0)
FeF+2	3.902e-20	2.460e-20	-19.409	-19.609	-0.200	(0)
FeF3	9.460e-21	9.460e-21	-20.024	-20.024	0.000	(0)
FeSO4+	4.887e-21	4.354e-21	-20.311	-20.361	-0.050	(0)
Fe+3	6.446e-22	2.224e-22	-21.191	-21.653	-0.462	(0)
Fe (SO4) 2-	1.864e-22	1.625e-22	-21.729	-21.789	-0.060	(0)
FeCl+2	2.373e-23	1.496e-23	-22.625	-22.825	-0.200	(0)
FeCl2+	1.671e-25	1.489e-25	-24.777	-24.827	-0.050	(0)
FeHSeO3+2	1.456e-26	8.401e-27	-25.837	-26.076	-0.239	(0)
FeCl3	3.316e-29	3.316e-29	-28.479	-28.479	0.000	(0)
Fe2 (OH) 2+4	2.281e-29	2.528e-30	-28.642	-29.597	-0.955	(0)
FeNO3+2	1.043e-29	6.018e-30	-28.982	-29.221	-0.239	(0)
Fe3 (OH) 4+5	2.351e-37	7.558e-39	-36.629	-38.122	-1.493	(0)
H (0)	4.026e-29					
H2	2.013e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	4.505e-10					
Hg	4.505e-10	4.505e-10	-9.346	-9.346	0.000	(0)
Hg (1)	4.963e-23					
Hg2+2	2.482e-23	1.432e-23	-22.605	-22.844	-0.239	(0)
Hg (2)	1.469e-12					
Hg (OH) 2	1.091e-12	1.094e-12	-11.962	-11.961	0.001	(0)
HgClOH	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
HgCl2	2.324e-14	2.324e-14	-13.634	-13.634	0.000	(0)
HgCl3-	5.940e-16	5.177e-16	-15.226	-15.286	-0.060	(0)
HgCO3	4.615e-16	4.615e-16	-15.336	-15.336	0.000	(0)
Hg (CO3) 2-2	2.083e-17	1.202e-17	-16.681	-16.920	-0.239	(0)
HgCl4-2	7.958e-18	4.591e-18	-17.099	-17.338	-0.239	(0)
HgOH+	4.116e-18	3.587e-18	-17.386	-17.445	-0.060	(0)
HgCl+	2.388e-18	2.081e-18	-17.622	-17.682	-0.060	(0)
Hg (OH) 3-	3.042e-19	2.651e-19	-18.517	-18.577	-0.060	(0)
HgHCO3+	5.158e-20	4.495e-20	-19.288	-19.347	-0.060	(0)
Hg+2	8.115e-23	4.682e-23	-22.091	-22.330	-0.239	(0)
HgNH3+2	3.269e-23	1.886e-23	-22.486	-22.725	-0.239	(0)
HgSO4	2.139e-23	2.139e-23	-22.670	-22.670	0.000	(0)
Hg (NH3) 2+2	2.087e-23	1.204e-23	-22.681	-22.919	-0.239	(0)
HgF+	2.009e-25	1.751e-25	-24.697	-24.757	-0.060	(0)
HgNO3+	5.368e-32	4.679e-32	-31.270	-31.330	-0.060	(0)

	Hg (NH3) 3+2	5.303e-32	3.059e-32	-31.276	-31.514	-0.239	(0)
	Hg (NH3) 4+2	2.689e-40	1.551e-40	-39.570	-39.809	-0.239	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.279	-40.279	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-141.177	-141.237	-0.060	(0)
	HgS2-2	0.000e+00	0.000e+00	-141.425	-141.663	-0.239	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-143.124	-143.124	0.000	(0)
K	8.551e-04						
	K+	8.447e-04	7.505e-04	-3.073	-3.125	-0.051	(0)
	KSO4-	1.039e-05	9.273e-06	-4.983	-5.033	-0.049	(0)
	KCrO4-	6.762e-17	5.893e-17	-16.170	-16.230	-0.060	(0)
Mg	1.074e-03						
	Mg+2	8.823e-04	5.498e-04	-3.054	-3.260	-0.205	(0)
	MgSO4	1.746e-04	1.746e-04	-3.758	-3.758	0.000	(0)
	MgF+	6.999e-06	6.225e-06	-5.155	-5.206	-0.051	(0)
	MgHCO3+	5.824e-06	5.170e-06	-5.235	-5.287	-0.052	(0)
	MgCO3	3.766e-06	3.766e-06	-5.424	-5.424	0.000	(0)
	MgOH+	4.702e-07	4.212e-07	-6.328	-6.376	-0.048	(0)
	MgH2BO3+	3.063e-08	2.702e-08	-7.514	-7.568	-0.054	(0)
Mn (2)	1.353e-05						
	Mn+2	1.129e-05	6.512e-06	-4.947	-5.186	-0.239	(0)
	MnSO4	2.021e-06	2.021e-06	-5.694	-5.694	0.000	(0)
	MnHCO3+	1.340e-07	1.194e-07	-6.873	-6.923	-0.050	(0)
	MnOH+	3.533e-08	3.148e-08	-7.452	-7.502	-0.050	(0)
	MnF+	2.936e-08	2.616e-08	-7.532	-7.582	-0.050	(0)
	MnCl+	2.050e-08	1.826e-08	-7.688	-7.738	-0.050	(0)
	MnCl2	5.748e-11	5.748e-11	-10.241	-10.241	0.000	(0)
	MnSeO4	8.264e-14	8.264e-14	-13.083	-13.083	0.000	(0)
	MnCl3-	3.958e-14	3.527e-14	-13.403	-13.453	-0.050	(0)
	MnNO3+	3.205e-14	2.793e-14	-13.494	-13.554	-0.060	(0)
	Mn (OH) 3-	8.087e-16	7.206e-16	-15.092	-15.142	-0.050	(0)
	Mn (OH) 4-2	7.102e-21	4.477e-21	-20.149	-20.349	-0.200	(0)
	Mn (NO3) 2	1.899e-22	1.899e-22	-21.721	-21.721	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.909	-41.909	0.000	(0)
Mn (3)	2.612e-26						
	Mn+3	2.612e-26	9.010e-27	-25.583	-26.045	-0.462	(0)
Mn (6)	6.412e-40						
	MnO4-2	6.412e-40	4.042e-40	-39.193	-39.393	-0.200	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.221	-44.274	-0.054	(0)
Mo	3.998e-07						
	MoO4-2	3.998e-07	2.491e-07	-6.398	-6.604	-0.205	(0)
	HMoO4-	2.975e-11	2.593e-11	-10.527	-10.586	-0.060	(0)
	H2MoO4	9.934e-16	9.934e-16	-15.003	-15.003	0.000	(0)
	Ag2MoO4	8.943e-26	8.943e-26	-25.049	-25.049	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-50.516	-51.054	-0.537	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-57.336	-59.486	-2.150	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-59.888	-61.381	-1.493	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-63.925	-64.880	-0.955	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-69.378	-69.916	-0.537	(0)
N (-3)	7.401e-09						
	NH4+	6.639e-09	5.857e-09	-8.178	-8.232	-0.054	(0)
	NH3	6.384e-10	6.384e-10	-9.195	-9.195	0.000	(0)
	NH4SO4-	1.229e-10	1.095e-10	-9.910	-9.960	-0.050	(0)
	CaNH3+2	5.600e-13	3.231e-13	-12.252	-12.491	-0.239	(0)
	CuNH3+2	1.340e-13	7.729e-14	-12.873	-13.112	-0.239	(0)
	NiNH3+2	8.418e-15	4.857e-15	-14.075	-14.314	-0.239	(0)
	AgNH3+	1.456e-15	1.269e-15	-14.837	-14.896	-0.060	(0)
	Co (NH3) +2	1.244e-15	7.176e-16	-14.905	-15.144	-0.239	(0)
	BaNH3+2	4.764e-18	2.748e-18	-17.322	-17.561	-0.239	(0)
	Ag (NH3) 2+	7.557e-21	6.586e-21	-20.122	-20.181	-0.060	(0)
	Ni (NH3) 2+2	7.767e-22	4.481e-22	-21.110	-21.349	-0.239	(0)
	Ca (NH3) 2+2	1.423e-22	8.211e-23	-21.847	-22.086	-0.239	(0)
	Co (NH3) 2+2	3.387e-23	1.954e-23	-22.470	-22.709	-0.239	(0)
	HgNH3+2	3.269e-23	1.886e-23	-22.486	-22.725	-0.239	(0)
	Hg (NH3) 2+2	2.087e-23	1.204e-23	-22.681	-22.919	-0.239	(0)
	Co (NH3) 3+2	2.722e-31	1.571e-31	-30.565	-30.804	-0.239	(0)
	Hg (NH3) 3+2	5.303e-32	3.059e-32	-31.276	-31.514	-0.239	(0)
	Co (NH3) 4+2	9.120e-40	5.262e-40	-39.040	-39.279	-0.239	(0)

	Hg (NH3) 4+2	2.689e-40	1.551e-40	-39.570	-39.809	-0.239	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-47.533	-47.772	-0.239	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-48.015	-48.254	-0.239	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.086	-58.624	-0.537	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-70.838	-71.077	-0.239	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
N (3)	3.245e-06						
	NO2-	3.245e-06	2.869e-06	-5.489	-5.542	-0.054	(0)
	CuNO2+	4.078e-12	3.554e-12	-11.390	-11.449	-0.060	(0)
	AgNO2	5.837e-13	5.837e-13	-12.234	-12.234	0.000	(0)
	CoNO2+	2.169e-13	1.890e-13	-12.664	-12.723	-0.060	(0)
	Cu (NO2) 2	1.043e-16	1.043e-16	-15.982	-15.982	0.000	(0)
	Ag (NO2) 2-	2.976e-18	2.594e-18	-17.526	-17.586	-0.060	(0)
N (5)	3.050e-09						
	NO3-	3.046e-09	2.707e-09	-8.516	-8.568	-0.051	(0)
	CaNO3+	3.948e-12	3.441e-12	-11.404	-11.463	-0.060	(0)
	MnNO3+	3.205e-14	2.793e-14	-13.494	-13.554	-0.060	(0)
	ZnNO3+	4.515e-15	3.935e-15	-14.345	-14.405	-0.060	(0)
	CuNO3+	1.162e-16	1.013e-16	-15.935	-15.995	-0.060	(0)
	NiNO3+	1.105e-16	9.631e-17	-15.957	-16.016	-0.060	(0)
	BaNO3+	1.062e-16	9.256e-17	-15.974	-16.034	-0.060	(0)
	CoNO3+	4.602e-17	4.011e-17	-16.337	-16.397	-0.060	(0)
	CdNO3+	1.124e-17	9.794e-18	-16.949	-17.009	-0.060	(0)
	PbNO3+	2.680e-18	2.336e-18	-17.572	-17.632	-0.060	(0)
	AgNO3	2.094e-18	2.094e-18	-17.679	-17.679	0.000	(0)
	Mn (NO3) 2	1.899e-22	1.899e-22	-21.721	-21.721	0.000	(0)
	UO2NO3+	1.326e-23	1.156e-23	-22.877	-22.937	-0.060	(0)
	Zn (NO3) 2	2.125e-24	2.125e-24	-23.673	-23.673	0.000	(0)
	Co (NO3) 2	2.209e-25	2.209e-25	-24.656	-24.656	0.000	(0)
	Cu (NO3) 2	3.450e-26	3.450e-26	-25.462	-25.462	0.000	(0)
	Cd (NO3) 2	1.328e-26	1.328e-26	-25.877	-25.877	0.000	(0)
	Pb (NO3) 2	1.074e-26	1.074e-26	-25.969	-25.969	0.000	(0)
	CrNO3+2	7.207e-27	4.158e-27	-26.142	-26.381	-0.239	(0)
	VO2NO3	7.168e-28	7.168e-28	-27.145	-27.145	0.000	(0)
	FeNO3+2	1.043e-29	6.018e-30	-28.982	-29.221	-0.239	(0)
	HgNO3+	5.368e-32	4.679e-32	-31.270	-31.330	-0.060	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.279	-40.279	0.000	(0)
Na	5.462e-03						
	Na+	5.408e-03	4.805e-03	-2.267	-2.318	-0.051	(0)
	NaSO4-	5.047e-05	4.504e-05	-4.297	-4.346	-0.049	(0)
	NaHCO3	2.483e-06	2.483e-06	-5.605	-5.605	0.000	(0)
	NaCO3-	8.259e-07	7.370e-07	-6.083	-6.133	-0.049	(0)
	NaF	3.059e-07	3.059e-07	-6.514	-6.514	0.000	(0)
	NaH2BO3	1.080e-08	1.080e-08	-7.967	-7.967	0.000	(0)
	NaCrO4-	5.791e-16	5.047e-16	-15.237	-15.297	-0.060	(0)
Ni	3.444e-08						
	Ni+2	2.274e-08	1.417e-08	-7.643	-7.849	-0.205	(0)
	NiSO4	4.933e-09	4.933e-09	-8.307	-8.307	0.000	(0)
	NiCO3	4.353e-09	4.353e-09	-8.361	-8.361	0.000	(0)
	NiHCO3+	1.842e-09	1.605e-09	-8.735	-8.795	-0.060	(0)
	NiOH+	3.938e-10	3.432e-10	-9.405	-9.464	-0.060	(0)
	NiCl+	9.265e-11	8.075e-11	-10.033	-10.093	-0.060	(0)
	Ni (OH) 2	5.247e-11	5.247e-11	-10.280	-10.280	0.000	(0)
	NiF+	4.120e-11	3.591e-11	-10.385	-10.445	-0.060	(0)
	Ni (SO4) 2-2	4.942e-13	2.851e-13	-12.306	-12.545	-0.239	(0)
	Ni (OH) 3-	1.159e-13	1.010e-13	-12.936	-12.996	-0.060	(0)
	NiNH3+2	8.418e-15	4.857e-15	-14.075	-14.314	-0.239	(0)
	NiCl2	9.058e-16	9.058e-16	-15.043	-15.043	0.000	(0)
	NiSeO4	3.124e-16	3.124e-16	-15.505	-15.505	0.000	(0)
	NiNO3+	1.105e-16	9.631e-17	-15.957	-16.016	-0.060	(0)
	Ni (NH3) 2+2	7.767e-22	4.481e-22	-21.110	-21.349	-0.239	(0)
O (0)	2.477e-35						
	O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	2.041e-09						
	PbCO3	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)

PbOH+	3.237e-10	2.821e-10	-9.490	-9.550	-0.060	(0)
Pb+2	9.365e-11	5.835e-11	-10.028	-10.234	-0.205	(0)
Pb (CO3) 2-2	5.949e-11	3.432e-11	-10.226	-10.464	-0.239	(0)
PbSO4	4.988e-11	4.988e-11	-10.302	-10.302	0.000	(0)
PbHCO3+	4.572e-11	3.985e-11	-10.340	-10.400	-0.060	(0)
Pb (OH) 2	1.717e-11	1.717e-11	-10.765	-10.765	0.000	(0)
PbCl+	5.293e-12	4.613e-12	-11.276	-11.336	-0.060	(0)
Pb (SO4) 2-2	9.093e-13	5.246e-13	-12.041	-12.280	-0.239	(0)
PbF+	4.761e-13	4.150e-13	-12.322	-12.382	-0.060	(0)
PbCl2	4.590e-14	4.590e-14	-13.338	-13.338	0.000	(0)
Pb (OH) 3-	3.791e-14	3.304e-14	-13.421	-13.481	-0.060	(0)
PbF2	8.240e-16	8.240e-16	-15.084	-15.084	0.000	(0)
PbCl3-	4.671e-17	4.071e-17	-16.331	-16.390	-0.060	(0)
Pb (OH) 4-2	2.699e-17	1.557e-17	-16.569	-16.808	-0.239	(0)
PbNO3+	2.680e-18	2.336e-18	-17.572	-17.632	-0.060	(0)
Pb2OH+3	8.993e-19	2.609e-19	-18.046	-18.584	-0.537	(0)
PbF3-	1.810e-19	1.577e-19	-18.742	-18.802	-0.060	(0)
PbCl4-2	7.185e-20	4.146e-20	-19.144	-19.382	-0.239	(0)
Pb3 (OH) 4+2	5.948e-22	3.431e-22	-21.226	-21.465	-0.239	(0)
PbF4-2	1.320e-23	7.618e-24	-22.879	-23.118	-0.239	(0)
Pb (NO3) 2	1.074e-26	1.074e-26	-25.969	-25.969	0.000	(0)
Pb4 (OH) 4+4	1.436e-27	1.591e-28	-26.843	-27.798	-0.955	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.081	-154.081	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.279	-232.339	-0.060	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.755	-74.755	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.499	-79.558	-0.060	(0)
S5-2	0.000e+00	0.000e+00	-80.403	-80.642	-0.239	(0)
CdHS+	0.000e+00	0.000e+00	-80.432	-80.492	-0.060	(0)
H2S	0.000e+00	0.000e+00	-80.820	-80.820	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.919	-81.158	-0.239	(0)
S4-2	0.000e+00	0.000e+00	-80.999	-81.238	-0.239	(0)
S3-2	0.000e+00	0.000e+00	-81.805	-82.044	-0.239	(0)
S2-2	0.000e+00	0.000e+00	-82.821	-83.060	-0.239	(0)
S-2	0.000e+00	0.000e+00	-88.377	-88.577	-0.200	(0)
HgHS2-	0.000e+00	0.000e+00	-141.177	-141.237	-0.060	(0)
HgS2-2	0.000e+00	0.000e+00	-141.425	-141.663	-0.239	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-143.124	-143.124	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.607	-148.892	-0.285	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.264	-149.416	-0.151	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.348	-149.622	-0.274	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.154	-150.214	-0.060	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.203	-150.263	-0.060	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.283	-150.574	-0.291	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.606	-150.885	-0.279	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-152.534	-152.534	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.846	-152.846	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.081	-154.081	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.279	-163.279	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.643	-220.703	-0.060	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-228.753	-228.812	-0.060	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.272	-230.511	-0.239	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-230.445	-230.505	-0.060	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.279	-232.339	-0.060	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-240.740	-240.800	-0.060	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-307.628	-307.867	-0.239	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-309.592	-309.831	-0.239	(0)
Sb2S4-2	0.000e+00	0.000e+00	-326.622	-326.861	-0.239	(0)
S (6)	3.200e-03					
SO4-2	2.801e-03	1.745e-03	-2.553	-2.758	-0.205	(0)
MgSO4	1.746e-04	1.746e-04	-3.758	-3.758	0.000	(0)
CaSO4	1.607e-04	1.607e-04	-3.794	-3.794	0.000	(0)
NaSO4-	5.047e-05	4.504e-05	-4.297	-4.346	-0.049	(0)
KSO4-	1.039e-05	9.273e-06	-4.983	-5.033	-0.049	(0)
MnSO4	2.021e-06	2.021e-06	-5.694	-5.694	0.000	(0)
ZnSO4	2.210e-07	2.210e-07	-6.656	-6.656	0.000	(0)
Zn (SO4) 2-2	5.824e-09	3.360e-09	-8.235	-8.474	-0.239	(0)
NiSO4	4.933e-09	4.933e-09	-8.307	-8.307	0.000	(0)

CuSO4	4.731e-09	4.731e-09	-8.325	-8.325	0.000	(0)
CoSO4	3.256e-09	3.256e-09	-8.487	-8.487	0.000	(0)
HSO4-	1.003e-09	8.922e-10	-8.999	-9.050	-0.051	(0)
CdSO4	4.682e-10	4.682e-10	-9.330	-9.330	0.000	(0)
NH4SO4-	1.229e-10	1.095e-10	-9.910	-9.960	-0.050	(0)
PbSO4	4.988e-11	4.988e-11	-10.302	-10.302	0.000	(0)
AgSO4-	3.891e-11	3.391e-11	-10.410	-10.470	-0.060	(0)
Cd (SO4) 2-2	1.911e-11	1.102e-11	-10.719	-10.958	-0.239	(0)
Pb (SO4) 2-2	9.093e-13	5.246e-13	-12.041	-12.280	-0.239	(0)
CrOHSO4	6.129e-13	6.129e-13	-12.213	-12.213	0.000	(0)
Ni (SO4) 2-2	4.942e-13	2.851e-13	-12.306	-12.545	-0.239	(0)
FeSO4	3.311e-14	3.311e-14	-13.480	-13.480	0.000	(0)
UO2SO4	5.654e-15	5.654e-15	-14.248	-14.248	0.000	(0)
AlSO4+	2.796e-16	2.487e-16	-15.553	-15.604	-0.051	(0)
UO2 (SO4) 2-2	2.255e-16	1.301e-16	-15.647	-15.886	-0.239	(0)
CrSO4+	1.644e-16	1.432e-16	-15.784	-15.844	-0.060	(0)
Al (SO4) 2-	5.229e-18	4.650e-18	-17.282	-17.333	-0.051	(0)
VO2SO4-	2.504e-20	2.182e-20	-19.601	-19.661	-0.060	(0)
FeSO4+	4.887e-21	4.354e-21	-20.311	-20.361	-0.050	(0)
Fe (SO4) 2-	1.864e-22	1.625e-22	-21.729	-21.789	-0.060	(0)
Cr2 (OH) 2SO4+2	1.421e-22	8.197e-23	-21.847	-22.086	-0.239	(0)
HgSO4	2.139e-23	2.139e-23	-22.670	-22.670	0.000	(0)
VOSO4	1.779e-23	1.779e-23	-22.750	-22.750	0.000	(0)
Cr2 (OH) 2 (SO4) 2	8.499e-24	8.499e-24	-23.071	-23.071	0.000	(0)
CrO3SO4-2	1.725e-24	9.950e-25	-23.763	-24.002	-0.239	(0)
VSO4+	1.535e-38	1.338e-38	-37.814	-37.874	-0.060	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.577	-42.577	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.480	-43.719	-0.239	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Sb (3)	3.706e-21					
Sb (OH) 3	1.874e-21	1.874e-21	-20.727	-20.727	0.000	(0)
HSbO2	1.830e-21	1.830e-21	-20.738	-20.738	0.000	(0)
SbO2-	6.502e-25	5.666e-25	-24.187	-24.247	-0.060	(0)
Sb (OH) 4-	3.724e-25	3.246e-25	-24.429	-24.489	-0.060	(0)
Sb (OH) 2F	1.546e-27	1.546e-27	-26.811	-26.811	0.000	(0)
SbOF	1.521e-27	1.521e-27	-26.818	-26.818	0.000	(0)
Sb (OH) 2+	2.733e-28	2.381e-28	-27.563	-27.623	-0.060	(0)
SbO+	9.423e-29	8.212e-29	-28.026	-28.086	-0.060	(0)
Sb2S4-2	0.000e+00	0.000e+00	-326.622	-326.861	-0.239	(0)
Sb (5)	6.043e-09					
SbO3-	6.036e-09	5.260e-09	-8.219	-8.279	-0.060	(0)
Sb (OH) 6-	6.921e-12	6.149e-12	-11.160	-11.211	-0.051	(0)
SbO2+	4.738e-26	4.129e-26	-25.324	-25.384	-0.060	(0)
Se (-2)	3.553e-15					
Ag2Se	3.553e-15	3.553e-15	-14.449	-14.449	0.000	(0)
HSe-	2.760e-40	2.405e-40	-39.559	-39.619	-0.060	(0)
MnSe	0.000e+00	0.000e+00	-41.909	-41.909	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.010	-44.010	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.098	-46.337	-0.239	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.958	-83.914	-0.955	(0)
Se (4)	3.527e-08					
SeO3-2	1.886e-08	1.088e-08	-7.724	-7.963	-0.239	(0)
HSeO3-	1.641e-08	1.430e-08	-7.785	-7.845	-0.060	(0)
H2SeO3	3.191e-14	3.191e-14	-13.496	-13.496	0.000	(0)
AgSeO3-	7.815e-15	6.811e-15	-14.107	-14.167	-0.060	(0)
Cd (SeO3) 2-2	1.936e-19	1.117e-19	-18.713	-18.952	-0.239	(0)
Ag (SeO3) 2-3	2.288e-21	6.637e-22	-20.641	-21.178	-0.537	(0)
FeHSeO3+2	1.456e-26	8.401e-27	-25.837	-26.076	-0.239	(0)
Se (6)	7.575e-11					
SeO4-2	7.566e-11	4.714e-11	-10.121	-10.327	-0.205	(0)
MnSeO4	8.264e-14	8.264e-14	-13.083	-13.083	0.000	(0)
ZnSeO4	4.227e-15	4.227e-15	-14.374	-14.374	0.000	(0)
NiSeO4	3.124e-16	3.124e-16	-15.505	-15.505	0.000	(0)
CoSeO4	2.209e-16	2.209e-16	-15.656	-15.656	0.000	(0)
HSeO4-	1.418e-17	1.236e-17	-16.848	-16.908	-0.060	(0)
CdSeO4	1.005e-17	1.005e-17	-16.998	-16.998	0.000	(0)
Zn (SeO4) 2-2	3.502e-25	2.020e-25	-24.456	-24.695	-0.239	(0)
Si	1.437e-04					

H4SiO4	1.394e-04	1.398e-04	-3.856	-3.855	0.001	(0)
H3SiO4-	4.352e-06	3.863e-06	-5.361	-5.413	-0.052	(0)
H2SiO4-2	7.348e-11	4.660e-11	-10.134	-10.332	-0.198	(0)
UO2H3SiO4+	8.054e-13	7.019e-13	-12.094	-12.154	-0.060	(0)
SiF6-2	2.656e-31	1.674e-31	-30.576	-30.776	-0.200	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.311	-60.848	-0.537	(0)
U (4)	6.101e-20					
U (OH) 5-	6.100e-20	5.316e-20	-19.215	-19.274	-0.060	(0)
U (OH) 4	1.165e-23	1.165e-23	-22.934	-22.934	0.000	(0)
U (OH) 3+	2.557e-28	2.228e-28	-27.592	-27.652	-0.060	(0)
U (OH) 2+2	9.344e-34	5.391e-34	-33.029	-33.268	-0.239	(0)
UF3+	1.290e-38	1.124e-38	-37.889	-37.949	-0.060	(0)
UF2+2	1.218e-39	7.029e-40	-38.914	-39.153	-0.239	(0)
UOH+3	4.579e-40	1.328e-40	-39.339	-39.877	-0.537	(0)
UF4	1.244e-40	1.244e-40	-39.905	-39.905	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.720	-42.257	-0.537	(0)
UF5-	0.000e+00	0.000e+00	-42.244	-42.303	-0.060	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.577	-42.577	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.480	-43.719	-0.239	(0)
UF6-2	0.000e+00	0.000e+00	-43.580	-43.819	-0.239	(0)
U+4	0.000e+00	0.000e+00	-46.606	-47.561	-0.955	(0)
UCl+3	0.000e+00	0.000e+00	-47.976	-48.513	-0.537	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-173.464	-178.301	-4.837	(0)
U (5)	4.833e-17					
UO2+	4.833e-17	4.212e-17	-16.316	-16.376	-0.060	(0)
U (6)	6.304e-08					
UO2 (CO3) 3-4	4.297e-08	4.761e-09	-7.367	-8.322	-0.955	(0)
UO2 (CO3) 2-2	1.999e-08	1.153e-08	-7.699	-7.938	-0.239	(0)
UO2CO3	7.018e-11	7.018e-11	-10.154	-10.154	0.000	(0)
UO2H3SiO4+	8.054e-13	7.019e-13	-12.094	-12.154	-0.060	(0)
UO2OH+	5.950e-13	5.185e-13	-12.225	-12.285	-0.060	(0)
UO2F+	3.421e-14	2.981e-14	-13.466	-13.526	-0.060	(0)
UO2F2	8.677e-15	8.677e-15	-14.062	-14.062	0.000	(0)
UO2SO4	5.654e-15	5.654e-15	-14.248	-14.248	0.000	(0)
UO2+2	3.435e-15	2.140e-15	-14.464	-14.670	-0.205	(0)
UO2F3-	2.524e-16	2.199e-16	-15.598	-15.658	-0.060	(0)
UO2 (SO4) 2-2	2.255e-16	1.301e-16	-15.647	-15.886	-0.239	(0)
UO2Cl+	8.873e-18	7.733e-18	-17.052	-17.112	-0.060	(0)
(UO2) 2 (OH) 2+2	7.735e-19	4.463e-19	-18.112	-18.350	-0.239	(0)
(UO2) 3 (OH) 5+	7.460e-19	6.501e-19	-18.127	-18.187	-0.060	(0)
UO2F4-2	3.056e-19	1.763e-19	-18.515	-18.754	-0.239	(0)
UO2NO3+	1.326e-23	1.156e-23	-22.877	-22.937	-0.060	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.736	-44.796	-0.060	(0)
V+2	0.000e+00	0.000e+00	-46.352	-46.590	-0.239	(0)
V (3)	9.336e-17					
V (OH) 3	9.336e-17	9.336e-17	-16.030	-16.030	0.000	(0)
V (OH) 2+	3.621e-28	3.156e-28	-27.441	-27.501	-0.060	(0)
VOH+2	2.715e-32	1.566e-32	-31.566	-31.805	-0.239	(0)
V+3	5.597e-38	1.624e-38	-37.252	-37.789	-0.537	(0)
VSO4+	1.535e-38	1.338e-38	-37.814	-37.874	-0.060	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-60.317	-60.854	-0.537	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-61.855	-62.810	-0.955	(0)
V (4)	1.641e-20					
V (OH) 3+	1.630e-20	1.421e-20	-19.788	-19.848	-0.060	(0)
VO+2	6.414e-23	3.700e-23	-22.193	-22.432	-0.239	(0)
VOF+	2.570e-23	2.240e-23	-22.590	-22.650	-0.060	(0)
VOSO4	1.779e-23	1.779e-23	-22.750	-22.750	0.000	(0)
VOF2	8.475e-25	8.475e-25	-24.072	-24.072	0.000	(0)
VOC1+	2.654e-25	2.313e-25	-24.576	-24.636	-0.060	(0)
VOF3-	3.482e-27	3.034e-27	-26.458	-26.518	-0.060	(0)
VOF4-2	2.142e-30	1.236e-30	-29.669	-29.908	-0.239	(0)
H2V2O4+2	1.754e-35	1.012e-35	-34.756	-34.995	-0.239	(0)
V (5)	1.898e-09					
H2VO4-	1.100e-09	9.585e-10	-8.959	-9.018	-0.060	(0)
HVO4-2	7.978e-10	4.603e-10	-9.098	-9.337	-0.239	(0)
H3VO4	5.014e-14	5.014e-14	-13.300	-13.300	0.000	(0)

VO4-3	1.520e-15	4.410e-16	-14.818	-15.356	-0.537	(0)
HV2O7-3	5.155e-16	1.495e-16	-15.288	-15.825	-0.537	(0)
H3V2O7-	3.561e-16	3.104e-16	-15.448	-15.508	-0.060	(0)
V2O7-4	6.945e-18	7.694e-19	-17.158	-18.114	-0.955	(0)
VO2+	5.893e-19	5.236e-19	-18.230	-18.281	-0.051	(0)
VO2F	9.266e-20	9.266e-20	-19.033	-19.033	0.000	(0)
VO2SO4-	2.504e-20	2.182e-20	-19.601	-19.661	-0.060	(0)
VO2F2-	3.896e-21	3.395e-21	-20.409	-20.469	-0.060	(0)
V3O9-3	3.181e-21	9.229e-22	-20.497	-21.035	-0.537	(0)
VO2F3-2	7.407e-24	4.274e-24	-23.130	-23.369	-0.239	(0)
V4O12-4	3.329e-27	3.689e-28	-26.478	-27.433	-0.955	(0)
VO2F4-3	7.315e-28	2.122e-28	-27.136	-27.673	-0.537	(0)
VO2NO3	7.168e-28	7.168e-28	-27.145	-27.145	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-72.253	-74.403	-2.150	(0)
HV10O28-5	0.000e+00	0.000e+00	-73.004	-74.497	-1.493	(0)
H2V10O28-4	0.000e+00	0.000e+00	-76.616	-77.571	-0.955	(0)
Zn	1.625e-06					
Zn+2	9.290e-07	5.788e-07	-6.032	-6.237	-0.205	(0)
ZnCO3	2.743e-07	2.743e-07	-6.562	-6.562	0.000	(0)
ZnSO4	2.210e-07	2.210e-07	-6.656	-6.656	0.000	(0)
ZnOH+	1.278e-07	1.114e-07	-6.893	-6.953	-0.060	(0)
Zn(OH) 2	3.398e-08	3.398e-08	-7.469	-7.469	0.000	(0)
ZnHCO3+	1.930e-08	1.682e-08	-7.714	-7.774	-0.060	(0)
ZnOHC1	8.161e-09	8.161e-09	-8.088	-8.088	0.000	(0)
Zn(SO4) 2-2	5.824e-09	3.360e-09	-8.235	-8.474	-0.239	(0)
ZnCl+	3.649e-09	3.239e-09	-8.438	-8.490	-0.052	(0)
ZnF+	1.337e-09	1.165e-09	-8.874	-8.934	-0.060	(0)
Zn(OH) 3-	3.760e-10	3.277e-10	-9.425	-9.484	-0.060	(0)
ZnCl2	1.144e-11	1.144e-11	-10.942	-10.942	0.000	(0)
Zn(OH) 4-2	4.352e-14	2.511e-14	-13.361	-13.600	-0.239	(0)
ZnCl3-	2.280e-14	2.024e-14	-13.642	-13.694	-0.052	(0)
ZnNO3+	4.515e-15	3.935e-15	-14.345	-14.405	-0.060	(0)
ZnSeO4	4.227e-15	4.227e-15	-14.374	-14.374	0.000	(0)
ZnCl4-2	3.576e-17	2.255e-17	-16.447	-16.647	-0.200	(0)
Zn(NO3) 2	2.125e-24	2.125e-24	-23.673	-23.673	0.000	(0)
Zn(SeO4) 2-2	3.502e-25	2.020e-25	-24.456	-24.695	-0.239	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.203	-150.263	-0.060	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-152.534	-152.534	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-228.753	-228.812	-0.060	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-230.272	-230.511	-0.239	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-309.592	-309.831	-0.239	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-61.77	-55.48	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-48.16	-43.65	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-55.38	-43.65	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-79.28	-61.35	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-63.63	-43.60	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.54	-30.14	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.24	-26.79	0.45	(NH4)2SeO4
Acanthite	-53.08	-89.30	-36.22	Ag2S
Ag2CO3	-12.02	-23.11	-11.09	Ag2CO3
Ag2CrO4	-20.11	-31.70	-11.59	Ag2CrO4
Ag2HVO4	-12.94	-11.46	1.48	Ag2HVO4
Ag2MoO4	-13.08	-24.63	-11.55	Ag2MoO4
Ag2O	-14.03	-1.46	12.57	Ag2O
Ag2Se	-0.66	-49.36	-48.70	Ag2Se
Ag2SeO3	-10.44	-17.59	-7.15	Ag2SeO3
Ag2SeO4	-19.44	-28.35	-8.91	Ag2SeO4
Ag2SO4	-15.96	-20.78	-4.82	Ag2SO4
Ag3AsO3	-28.04	-25.89	2.16	Ag3AsO3
Ag3AsO4	-16.45	-19.24	-2.79	Ag3AsO4
Ag3H2VO5	-17.37	-12.19	5.18	Ag3H2VO5
AgF:4H2O	-14.06	-13.01	1.05	AgF:4H2O
Agmetal	0.00	-13.50	-13.51	Ag

AgVO3	-11.50	-10.73	0.77	AgVO3
Al (OH) 3 (am)	-2.69	8.11	10.80	Al (OH) 3
Al2 (MoO4) 3	-55.65	-53.28	2.37	Al2 (MoO4) 3
Al2O3	-3.44	16.22	19.65	Al2O3
Al4 (OH) 10SO4	-9.59	13.11	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.74	-8.94	4.80	AlAsO4:2H2O
AlOHSO4	-7.98	-11.21	-3.23	AlOHSO4
AlSb	-154.88	-89.25	65.62	AlSb
Alunite	-7.76	-9.16	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.20	-12.99	-7.79	PbSO4
Anhydrite	-1.79	-6.15	-4.36	CaSO4
Anilite	-55.97	-87.85	-31.88	Cu0.25Cu1.5S
Antlerite	-2.20	6.59	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.03	-94.79	-2.76	As4O6
Artinite	-4.64	4.96	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.81	-34.10	6.71	As2O5
Atacamite	-1.05	6.34	7.39	Cu2 (OH) 3Cl
Azurite	-0.48	-17.39	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.00	8.40	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.08	-3.21	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.75	5.19	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.17	-21.84	-9.67	BaCrO4
BaF2	-10.34	-16.16	-5.82	BaF2
BaMoO4	-7.81	-14.77	-6.96	BaMoO4
Barite	-0.94	-10.92	-9.98	BaSO4
BaS	-95.62	-79.44	16.18	BaS
BaSeO3	-9.56	-7.73	1.83	BaSeO3
BaSeO4	-11.03	-18.49	-7.46	BaSeO4
Bianchite	-7.23	-9.00	-1.76	ZnSO4:6H2O
Birnessite	-6.52	11.57	18.09	MnO2
Bixbyite	-1.76	-2.40	-0.64	Mn2O3
BlaubleiI	-56.19	-80.36	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.54	-83.82	-27.28	Cu0.6Cu0.8S
Boehmite	-0.47	8.11	8.58	AlOOH
Breithauptite	-57.35	-75.87	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.54	13.30	16.84	Mg (OH) 2
Bunsenite	-3.73	8.71	12.45	NiO
Ca (VO3) 2	-12.49	-6.83	5.66	Ca (VO3) 2
Ca2V2O7	-11.17	6.33	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.22	6.33	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-16.90	5.40	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.46	19.50	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.36	19.50	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-298.20	-155.22	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-10.24	-28.15	-17.91	Hg2Cl2
CaMoO4	-2.05	-10.00	-7.95	CaMoO4
Carnotite	-3.18	-2.95	0.23	KUO2VO4
CaSeO3:2H2O	-5.77	-2.96	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.70	-13.72	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-12.01	-2.17	9.84	Cd (BO2) 2
Cd (OH) 2	-6.02	7.62	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.11	7.62	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-22.49	-15.78	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-19.02	3.54	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-17.24	11.16	28.40	Cd4 (OH) 6SO4
CdCl2	-13.59	-14.25	-0.66	CdCl2
CdCl2:1H2O	-12.55	-14.25	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.33	-14.25	-1.91	CdCl2:2.5H2O
CdF2	-15.72	-16.93	-1.21	CdF2
Cdmetal (alpha)	-31.44	-17.92	13.51	Cd
Cdmetal (gamma)	-31.54	-17.92	13.62	Cd
CdMoO4	-1.40	-15.55	-14.15	CdMoO4
CdOHCl	-6.85	-3.31	3.54	CdOHCl

CdSb	-76.62	-76.97	-0.35	CdSb
CdSe	-20.08	-40.28	-20.20	CdSe
CdSeO4:2H2O	-17.42	-19.27	-1.85	CdSeO4:2H2O
CdSO4	-11.53	-11.70	-0.17	CdSO4
CdSO4:1H2O	-9.97	-11.70	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.83	-11.70	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.91	-11.66	-9.75	AgCl
Cerrusite	-2.19	-15.32	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-8.05	-10.69	-2.64	CuSO4:5H2O
Chalcedony	-0.30	-3.85	-3.55	SiO2
Chalcocite	-55.81	-90.73	-34.92	Cu2S
Chalcopyrite	-128.32	-163.59	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-54.11	-99.80	-45.69	HgS
Claudetite	-91.72	-94.79	-3.06	As4O6
Clausthalite	-14.47	-41.57	-27.10	PbSe
Co(BO2)2	-28.32	-1.25	27.07	Co(BO2)2
Co(OH)2	-4.56	8.53	13.09	Co(OH)2
Co(OH)3	-8.79	-11.09	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.53	-8.50	13.03	Co3(AsO4)2
Co3O4	-3.16	-13.65	-10.50	Co3O4
CoCl2	-21.60	-13.33	8.27	CoCl2
CoCl2:6H2O	-15.87	-13.33	2.54	CoCl2:6H2O
CoCO3	-3.13	-13.11	-9.98	CoCO3
CoF2	-14.42	-16.02	-1.60	CoF2
CoF3	-46.47	-47.93	-1.46	CoF3
CoFe2O4	18.44	14.92	-3.53	CoFe2O4
CoMoO4	-6.87	-14.63	-7.76	CoMoO4
CoO	-5.05	8.53	13.59	CoO
CoS(alpha)	-71.87	-79.31	-7.44	CoS
CoS(beta)	-68.24	-79.31	-11.07	CoS
CoSe	-23.17	-39.37	-16.20	CoSe
CoSeO3	-8.91	-7.59	1.32	CoSeO3
CoSeO4:6H2O	-16.83	-18.36	-1.53	CoSeO4:6H2O
CoSO4	-13.59	-10.79	2.80	CoSO4
CoSO4:6H2O	-8.32	-10.79	-2.47	CoSO4:6H2O
Cotunnite	-10.76	-15.54	-4.78	PbCl2
Covellite	-56.90	-79.20	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.96	-32.87	14.09	CrCl2
CrCl3	-49.09	-33.98	15.11	CrCl3
CrF3	-26.67	-38.01	-11.34	CrF3
Cristobalite	-0.50	-3.85	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-13.83	-47.67	-33.84	Na3AlF6
Cu(OH)2	-0.04	8.64	8.67	Cu(OH)2
Cu(SbO3)2	-26.94	18.27	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.83	0.42	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.29	-90.17	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.99	-50.79	-45.80	Cu2Se
Cu2SO4	-20.26	-22.21	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.29	-8.19	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.11	-101.70	-42.59	Cu3Sb
Cu3Se2	-26.57	-90.06	-63.49	Cu3Se2
CuCO3	-1.51	-13.01	-11.50	CuCO3
CuCrO4	-16.16	-21.60	-5.44	CuCrO4
CuF	-8.82	-13.72	-4.91	CuF
CuF2	-17.03	-15.92	1.12	CuF2
CuF2:2H2O	-11.37	-15.92	-4.55	CuF2:2H2O
Cumetal	-5.46	-14.22	-8.76	Cu
CuMoO4	-1.45	-14.53	-13.08	CuMoO4
CuOCuSO4	-12.35	-2.05	10.30	CuOCuSO4

Cupricferrite	9.03	15.02	5.99	CuFe2O4
Cuprite	-1.49	-2.89	-1.41	Cu2O
Cuprousferrite	10.66	1.74	-8.92	CuFeO2
CuSe	-6.16	-39.26	-33.10	CuSe
CuSe2	-28.25	-61.62	-33.37	CuSe2
CuSeO3:2H2O	-8.00	-7.49	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.81	-18.25	-2.44	CuSeO4:5H2O
CuSO4	-13.62	-10.69	2.94	CuSO4
Diaspore	1.23	8.11	6.87	AlOOH
Djurleite	-56.05	-89.97	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.28	-16.82	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.27	-16.82	-17.09	CaMg(CO3)2
Epsomite	-3.89	-6.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.95	-0.09	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-12.83	-16.55	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.30	-9.74	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-21.37	-42.00	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-47.85	-51.58	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.26	-13.86	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-9.62	-19.72	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-48.21	-66.80	-18.60	FeSe2
FeS(ppt)	-81.44	-84.39	-2.95	FeS
FeSe	-33.45	-44.45	-11.00	FeSe
Fix_pe	-4.49	-4.49	0.00	e-
Fluorite	-0.89	-11.39	-10.50	CaF2
Galena	-67.54	-81.51	-13.97	PbS
Gibbsite	-0.18	8.11	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.99	-9.00	-2.01	ZnSO4:7H2O
Greenalite	-18.17	2.64	20.81	Fe3Si2O5(OH)4
Greenockite	-65.86	-80.22	-14.36	CdS
Greigite	-296.49	-341.53	-45.03	Fe3S4
Gummite	-5.78	1.89	7.67	UO3
Gypsum	-1.54	-6.15	-4.61	CaSO4:2H2O
H-Jarosite	-16.97	-29.07	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.29	-23.17	-12.88	H2MoO4
H2S(g)	-79.83	-87.84	-8.01	H2S
H2Se(g)	-42.94	-47.90	-4.96	H2Se
Halite	-6.57	-4.97	1.60	NaCl
Halloysite	-1.07	8.51	9.57	Al2Si2O5(OH)4
Hausmannite	-1.36	59.67	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-3.23	19.67	22.89	FeAl2O4
Hg(CH3)2(g)	-185.91	-259.61	-73.71	Hg(CH3)2
Hg(g)	-8.04	-15.91	-7.87	Hg
Hg(OH)2	-8.46	-11.96	-3.50	Hg(OH)2
Hg2(g)	-16.87	-31.83	-14.96	Hg2
Hg2(OH)2	-11.54	-6.28	5.26	Hg2(OH)2
Hg2CO3	-11.88	-27.93	-16.05	Hg2CO3
Hg2CrO4	-27.82	-36.52	-8.70	Hg2CrO4
Hg2F2	-20.47	-30.84	-10.36	Hg2F2
Hg2S	-82.44	-94.12	-11.68	Hg2S
Hg2SeO3	-17.75	-22.41	-4.66	Hg2SeO3
Hg2SO4	-19.47	-25.60	-6.13	Hg2SO4
Hg3O2CO3	-27.85	-57.53	-29.68	Hg3O2CO3
HgCl(g)	-33.57	-14.07	19.50	HgCl
HgCl2	-12.57	-33.83	-21.26	HgCl2
HgF(g)	-48.09	-15.42	32.68	HgF
HgF2(g)	-49.08	-36.52	12.57	HgF2
Hgmetal(l)	-2.46	-15.91	-13.45	Hg
HgSe	-4.17	-59.86	-55.69	HgSe
HgSeO3	-15.66	-28.09	-12.43	HgSeO3
HgSO4	-21.86	-31.28	-9.42	HgSO4
Huntite	-3.54	-33.51	-29.97	CaMg3(CO3)4

Hydrocerrusite	-5.54	-24.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.31	-20.07	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-20.21	-25.38	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-9.11	-23.91	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.92	-50.16	-17.24	K2Cr2O7
K2CrO4	-19.41	-19.92	-0.51	K2CrO4
K2MoO4	-16.11	-12.85	3.26	K2MoO4
K2SeO4	-15.85	-16.58	-0.73	K2SeO4
Kaolinite	1.07	8.51	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.23	-6.66	-0.43	PbO : PbSO4
Laurionite	-5.23	-4.60	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.37	6.33	12.69	PbO
Mackinawite	-80.79	-84.39	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.83	19.69	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.93	-4.38	-5.31	Cu2 (OH) 2CO3
Manganite	-1.19	24.15	25.34	MnOOH
Massicot	-6.57	6.33	12.89	PbO
Matlockite	-7.91	-16.88	-8.97	PbClF
Melanothallite	-19.49	-13.23	6.26	CuCl2
Melanterite	-13.66	-15.87	-2.21	FeSO4 : 7H2O
Metacinnabar	-54.71	-99.80	-45.09	HgS
Mg (OH) 2 (active)	-5.49	13.30	18.79	Mg (OH) 2
Mg (VO3) 2	-17.98	-6.70	11.28	Mg (VO3) 2
Mg2Sb3	-276.30	-201.62	74.68	Mg2Sb3
Mg2V2O7	-19.75	6.61	26.36	Mg2V2O7
MgCr2O4	-5.26	10.95	16.20	MgCr2O4
MgCrO4	-22.31	-16.93	5.38	MgCrO4
MgF2	-3.12	-11.25	-8.13	MgF2
MgMoO4	-8.01	-9.86	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.88	-2.82	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.39	-13.59	-1.20	MgSeO4 : 6H2O
Minium	-28.99	44.53	73.52	Pb3O4
Mirabilite	-6.28	-7.40	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-13.52	-8.62	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-54.65	-60.36	-5.71	Mn2 (SO4) 3
Mn2Sb	-148.46	-87.38	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.47	0.03	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.21	-10.49	2.72	MnCl2 : 4H2O
MnS (grn)	-76.63	-76.46	0.17	MnS
MnS (pnk)	-79.80	-76.46	3.34	MnS
MnSb	-95.65	-98.56	-2.91	MnSb
MnSe	-40.02	-36.52	3.50	MnSe
MnSeO3	-5.88	-4.75	1.13	MnSeO3
MnSeO3 : 2H2O	-5.73	-4.75	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.46	-15.51	-2.05	MnSeO4 : 5H2O
MnSO4	-10.53	-7.94	2.58	MnSO4
Monteponite	-7.48	7.62	15.10	CdO
Montroydite	-8.32	-11.96	-3.64	HgO
MoO3	-15.17	-23.17	-8.00	MoO3
Morenosite	-8.46	-10.61	-2.14	NiSO4 : 7H2O
MoS2	-154.13	-224.39	-70.26	MoS2
Na-Jarosite	-11.91	-23.11	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.65	-48.55	-9.90	Na2Cr2O7
Na2CrO4	-21.24	-18.31	2.93	Na2CrO4
Na2Mo2O7	-17.81	-34.41	-16.60	Na2Mo2O7
Na2MoO4	-12.73	-11.24	1.49	Na2MoO4
Na2MoO4 : 2H2O	-12.46	-11.24	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-14.50	-4.20	10.30	Na2SeO3 : 5H2O
Na2SeO4	-16.24	-14.96	1.28	Na2SeO4
Na3Sb	-173.92	-79.47	94.45	Na3Sb
Na3VO4	-28.79	7.89	36.68	Na3VO4
Na4V2O7	-33.55	3.85	37.40	Na4V2O7

Nantokite	-5.65	-12.38	-6.73	CuCl
NaSb	-89.02	-65.85	23.17	NaSb
Natron	-8.41	-9.72	-1.31	Na2CO3:10H2O
NaVO3	-7.89	-4.04	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-4.08	8.71	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.66	-7.96	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.47	15.53	32.00	Ni4(OH)6SO4
NiCO3	-6.06	-12.93	-6.87	NiCO3
NiMoO4	-3.31	-14.45	-11.14	NiMoO4
NiS(alpha)	-73.53	-79.13	-5.60	NiS
NiS(beta)	-68.03	-79.13	-11.10	NiS
NiS(gamma)	-66.33	-79.13	-12.80	NiS
NiSe	-21.49	-39.19	-17.70	NiSe
NiSeO3:2H2O	-10.23	-7.41	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.66	-18.18	-1.52	NiSeO4:6H2O
Nsutite	-5.93	11.57	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-249.85	-310.91	-61.07	As2S3
Otavite	-2.03	-14.03	-12.00	CdCO3
Pb(BO2)2	-9.98	-3.46	6.52	Pb(BO2)2
Pb(OH)2	-1.82	6.33	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-57.83	-66.59	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.07	1.72	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.53	12.66	26.19	Pb2O(OH)2
Pb2O3	-22.84	38.20	61.04	Pb2O3
Pb2OCO3	-8.43	-8.99	-0.56	Pb2OCO3
Pb2V2O7	-5.44	-7.34	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.91	-15.11	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.15	-1.01	6.14	Pb3(VO4)2
Pb3O2CO3	-13.68	-2.66	11.02	Pb3O2CO3
Pb3O2SO4	-11.02	-0.33	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.11	5.99	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.88	5.99	21.88	Pb4O3SO4
PbCrO4	-11.31	-23.91	-12.60	PbCrO4
PbF2	-10.79	-18.23	-7.44	PbF2
Pbmetal	-23.46	-19.22	4.25	Pb
PbMoO4	-1.22	-16.84	-15.62	PbMoO4
PbO:0.3H2O	-6.65	6.33	12.98	PbO:0.33H2O
PbSeO4	-13.72	-20.56	-6.84	PbSeO4
Periclase	-8.28	13.30	21.58	MgO
Phosgenite	-11.05	-30.86	-19.81	PbCl2:PbCO3
Plattnerite	-17.73	31.87	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-128.18	-146.68	-18.51	FeS2
Pyrochroite	-3.82	11.38	15.19	Mn(OH)2
Pyrolusite	-4.46	36.92	41.38	MnO2
Quartz	0.15	-3.85	-4.00	SiO2
Realgar	-104.56	-124.31	-19.75	AsS
Retgersite	-8.57	-10.61	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.25	-19.75	-14.50	UO2CO3
Sb(OH)3	-13.62	-20.73	-7.11	Sb(OH)3
Sb2O4	-19.31	-15.91	3.40	Sb2O4
Sb2O5	-29.32	-38.98	-9.67	Sb2O5
Sb2Se3	-117.40	-185.15	-67.76	Sb2Se3
Sb4O6(cubic)	-64.65	-82.91	-18.26	Sb4O6
Sb4O6(orth)	-65.01	-82.91	-17.90	Sb4O6
SbCl3	-54.10	-53.53	0.57	SbCl3
SbF3	-47.33	-57.56	-10.23	SbF3
Sbmetal	-47.36	-59.04	-11.69	Sb
SbO2	-4.44	-32.26	-27.82	SbO2
Schoepite	-4.10	1.89	5.99	UO2(OH)2:H2O
Semetal(am)	-15.25	-22.36	-7.11	Se
Semetal(hex)	-14.65	-22.36	-7.71	Se
Senarmontite	-29.09	-41.45	-12.37	Sb2O3
SeO2	-16.25	-16.13	0.12	SeO2
SeO3	-47.93	-26.89	21.04	SeO3

Sepiolite	-0.72	15.04	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-3.74	15.04	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.96	-18.20	-10.24	FeCO ₃
SiO ₂ (am-gel)	-1.14	-3.85	-2.71	SiO ₂
SiO ₂ (am-ppt)	-1.11	-3.85	-2.74	SiO ₂
Smithsonite	-1.32	-11.32	-10.00	ZnCO ₃
Sphalerite	-66.06	-77.51	-11.45	ZnS
Spinel	-7.33	29.52	36.85	MgAl ₂ O ₄
Stibnite	-254.51	-304.97	-50.46	Sb ₂ S ₃
Sulfur	-60.15	-62.29	-2.14	S
Tenorite	0.99	8.64	7.64	CuO
Thenardite	-7.72	-7.39	0.32	Na ₂ SO ₄
Thermonatrite	-10.36	-9.72	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-7.13	-3.05	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-13.30	7.78	21.08	U ₃ O ₈
U ₃ Sb ₄	-585.13	-432.75	152.38	U ₃ Sb ₄
U ₄ O ₉	-29.18	-32.20	-3.02	U ₄ O ₉
UF ₄	-34.01	-63.55	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-30.83	-63.55	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-15.37	-14.44	0.93	UO ₂
UO ₂ (NO ₃) ₂	-43.95	-31.80	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-36.66	-31.80	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-35.20	-31.81	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-33.85	-31.81	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.72	1.89	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-22.75	-25.00	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-5.81	1.89	7.70	UO ₃
Uraninite	-9.77	-14.44	-4.67	UO ₂
USb ₂	-222.41	-192.83	29.58	USb ₂
V(OH) ₃	-20.54	-12.95	7.59	V(OH) ₃
V ₂ O ₅	-18.64	-20.00	-1.36	V ₂ O ₅
V ₃ O ₅	-44.99	-43.15	1.84	V ₃ O ₅
V ₄ O ₇	-56.21	-49.02	7.19	V ₄ O ₇
V ₆ O ₁₃	-50.23	-111.09	-60.86	V ₆ O ₁₃
Valentinite	-32.97	-41.45	-8.48	Sb ₂ O ₃
VC ₁₂	-66.46	-47.58	18.87	VC ₁₂
VC ₁₃	-69.18	-45.75	23.43	VC ₁₃
VF ₄	-69.91	-54.98	14.93	VF ₄
Vmetal	-95.29	-51.26	44.03	V
VO	-40.47	-25.72	14.76	VO
VO(OH) ₂	-11.02	-5.87	5.15	VO(OH) ₂
VO ₂ Cl	-23.77	-20.93	2.84	VO ₂ Cl
VOC ₁	-35.03	-23.88	11.15	VOC ₁
VOC ₁₂	-40.50	-27.74	12.76	VOC ₁₂
VOSO ₄	-28.80	-25.19	3.61	VOSO ₄
Witherite	-4.68	-13.25	-8.57	BaCO ₃
Wurtzite	-68.56	-77.51	-8.95	ZnS
Zincite	-1.01	10.33	11.33	ZnO
Zincosite	-12.93	-9.00	3.93	ZnSO ₄
Zn(BO ₂) ₂	-7.75	0.54	8.29	Zn(BO ₂) ₂
Zn(NO ₃) ₂ :6H ₂ O	-26.69	-23.37	3.32	Zn(NO ₃) ₂ :6H ₂ O
Zn(OH) ₂	-1.87	10.33	12.20	Zn(OH) ₂
Zn(OH) ₂ (am)	-2.15	10.33	12.47	Zn(OH) ₂
Zn(OH) ₂ (beta)	-1.43	10.33	11.75	Zn(OH) ₂
Zn(OH) ₂ (epsilon)	-1.21	10.33	11.53	Zn(OH) ₂
Zn(OH) ₂ (gamma)	-1.41	10.33	11.73	Zn(OH) ₂
Zn ₂ (OH) ₂ SO ₄	-6.17	1.33	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-5.47	9.72	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-16.77	-3.12	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O(SO ₄) ₂	-26.58	-7.67	18.91	Zn ₃ O(SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-6.42	21.98	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-8.74	29.76	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-18.59	-11.54	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-1.06	-11.32	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-13.70	-14.23	-0.53	ZnF ₂
Znmetal	-41.01	-15.22	25.79	Zn
ZnMoO ₄	-2.72	-12.84	-10.13	ZnMoO ₄
ZnO(active)	-0.86	10.33	11.19	ZnO

ZnS(am)	-68.46	-77.51	-9.05	ZnS
ZnSb	-85.28	-74.26	11.01	ZnSb
ZnSe	-23.17	-37.57	-14.40	ZnSe
ZnSeO4:6H2O	-15.04	-16.56	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.36	-9.00	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 98.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 505
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 505
USE Surface 505
USE Solution 514
SAVE Solution 515  #Stage 5 Pit Water After Mineral Precipitation and
Sorption Loss
    END
-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 505.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

3.199e-20  Surface + diffuse layer charge, eq
1.089e-12  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
2.388e-05  m² for 3.720e-10 moles of Ferrihydrite

```

Water in diffuse layer: 2.388e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, $\psi_{DL} = 7.042e-02$ V.

Boltzmann factor, $\exp(-\psi_{DL} * F / RT) = 6.451e-02$ (= c_{DL} / c_{free} if z is +1).

Element	Moles
C	6.1010e-16
Ca	7.5612e-18
Cl	1.2217e-14
H	1.7998e-15
K	1.1995e-17
Mg	1.1715e-18
N	4.9461e-14

Na	5.0821e-17
O	2.2045e-12
S	5.1369e-13

Hfo_s

1.860e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	1.243e-12	0.668	1.243e-12	-11.905
Hfo_sOH	6.098e-13	0.328	6.098e-13	-12.215
Hfo_sO-	6.851e-15	0.004	6.851e-15	-14.164
Hfo_sOHCa+2	2.270e-17	0.000	2.270e-17	-16.644

Hfo_w

7.440e-11 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	3.438e-11	0.462	3.438e-11	-10.464
Hfo_wOH	1.686e-11	0.227	1.686e-11	-10.773
Hfo_wSO4-	1.161e-11	0.156	1.161e-11	-10.935
Hfo_wOHSO4-2	1.136e-11	0.153	1.136e-11	-10.945
Hfo_wO-	1.894e-13	0.003	1.894e-13	-12.723
Hfo_wOMg+	2.677e-19	0.000	2.677e-19	-18.572
Hfo_wOCa+	9.083e-20	0.000	9.083e-20	-19.042

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 514. Solution after simulation 97.
Using surface 505.
Using pure phase assemblage 505. Pure-phase assemblage after simulation 97.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-0.66	-49.36	-48.70	0.000e+00	0	0.000e+00
Alunite	-7.76	-9.16	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.79	-6.15	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	7.354e-10	7.344e-10	-1.048e-12
Barite	-0.94	-10.92	-9.98	0.000e+00	0	0.000e+00
Brochantite	-0.00	15.22	15.22	9.379e-08	9.379e-08	-7.373e-12
Brucite	-3.54	13.30	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	3.125e-11
CaMoO4	-2.05	-10.00	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-5.77	-2.96	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	3.560e-04	3.560e-04	-1.944e-11
Carnotite	-3.18	-2.95	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-12.01	-2.17	9.84	0.000e+00	0	0.000e+00
CdMoO4	-1.40	-15.55	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	3.622e-05	3.622e-05	-2.563e-12
Cr2O3	0.00	-2.36	-2.36	2.415e-10	2.415e-10	-3.541e-14
Cu2Se(alpha)	-4.99	-50.79	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.45	-14.53	-13.08	0.000e+00	0	0.000e+00
Epsomite	-3.89	-6.02	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	3.720e-10	3.720e-10	-1.972e-18
Fluorite	-0.89	-11.39	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.78	1.89	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.54	-6.15	-4.61	0.000e+00	0	0.000e+00
HgSe	-4.17	-59.86	-55.69	0.000e+00	0	0.000e+00

Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.28	-7.40	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.88	-4.75	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-4.08	8.71	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.66	-7.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-6.06	-12.93	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-3.31	-14.45	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	2.309e-14
Otavite	-2.03	-14.03	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-1.22	-16.84	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-5.25	-19.75	-14.50	0.000e+00	0	0.000e+00
SbO2	-4.44	-32.26	-27.82	0.000e+00	0	0.000e+00
Schoepite	-4.10	1.89	5.99	0.000e+00	0	0.000e+00
Sepiolite	-0.72	15.04	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.11	-3.85	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-7.13	-3.05	4.08	0.000e+00	0	0.000e+00
U3O8	-13.30	7.78	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.72	1.89	5.61	0.000e+00	0	0.000e+00
UO3	-5.81	1.89	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.72	-12.84	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-2.061e-24 Surface + diffuse layer charge, eq
 2.271e-12 Surface charge, eq
 9.176e-03 sigma, C/m²
 3.218e-02 psi, V
 -1.252e+00 -F*psi/RT
 2.858e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 2.388e-05 m² for 3.720e-10 moles of Ferrihydrite

Water in diffuse layer: 2.388e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 8.134e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 7.286e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	1.5863e-18
Al	1.8564e-16
As	1.6401e-19
B	3.5811e-15
Ba	1.4075e-18
C	3.5183e-13
Ca	1.2288e-13
Cd	4.6370e-19
Cl	8.2191e-13
Co	3.3821e-18
Cr	1.4528e-19
Cu	1.7174e-16
F	3.8612e-14
Fe	1.7062e-19
H	4.9493e-13
Hg	1.0793e-19
K	1.5039e-13
Mg	1.5679e-13
Mn	1.9520e-15
Mo	1.7986e-16
N	1.0661e-15
Na	9.5861e-13
Ni	5.5255e-18
O	6.6524e-12
Pb	4.6535e-19

S	1.3607e-12
Sb	1.9806e-18
Se	1.3897e-17
Si	3.4708e-14
U	4.5424e-17
V	7.1646e-19
Zn	2.7537e-16

Hfo_s

1.860e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	8.147e-13	0.438	8.146e-13	-12.089
Hfo_sOZn+	5.018e-13	0.270	5.017e-13	-12.300
Hfo_sOPb+	2.312e-13	0.124	2.312e-13	-12.636
Hfo_sOMn+	2.300e-13	0.124	2.300e-13	-12.638
Hfo_sOCrOH+	7.082e-14	0.038	7.081e-14	-13.150
Hfo_sOHCa+2	4.976e-15	0.003	4.975e-15	-14.303
Hfo_sONi+	2.946e-15	0.002	2.946e-15	-14.531
Hfo_sOH	1.624e-15	0.001	1.623e-15	-14.790
Hfo_sO-	1.276e-15	0.001	1.276e-15	-14.894
Hfo_sOCd+	2.996e-16	0.000	2.995e-16	-15.524
Hfo_sOCO+	2.876e-16	0.000	2.876e-16	-15.541
Hfo_sOH2+	4.733e-17	0.000	4.732e-17	-16.325
Hfo_sOAg	5.760e-18	0.000	5.759e-18	-17.240
Hfo_sOHBa+2	2.611e-19	0.000	2.610e-19	-18.583
Hfo_sOFe+	3.436e-20	0.000	3.435e-20	-19.464
Hfo_sOHg+	2.368e-22	0.000	2.368e-22	-21.626

Hfo_w

7.440e-11 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.868e-11	0.385	2.868e-11	-10.542
Hfo_wOH	1.114e-11	0.150	1.114e-11	-10.953
Hfo_wO-	8.759e-12	0.118	8.757e-12	-11.058
Hfo_wOMg+	8.408e-12	0.113	8.407e-12	-11.075
Hfo_wOHVO4-3	7.791e-12	0.105	7.789e-12	-11.108
Hfo_wOZn+	3.607e-12	0.048	3.606e-12	-11.443
Hfo_wOHAsO4-3	2.253e-12	0.030	2.252e-12	-11.647
Hfo_wOHSO4-2	1.468e-12	0.020	1.468e-12	-11.833
Hfo_wOMn+	1.254e-12	0.017	1.254e-12	-11.902
Hfo_wOCa+	3.458e-13	0.005	3.457e-13	-12.461
Hfo_wOH2+	3.248e-13	0.004	3.248e-13	-12.488
Hfo_wOHSeO3-2	2.196e-13	0.003	2.196e-13	-12.658
Hfo_wOPb+	7.088e-14	0.001	7.087e-14	-13.150
Hfo_wONi+	2.728e-14	0.000	2.727e-14	-13.564
Hfo_wSO4-	2.146e-14	0.000	2.145e-14	-13.669
Hfo_wSeO3-	1.087e-14	0.000	1.087e-14	-13.964
Hfo_wOHMoO4-2	8.538e-15	0.000	8.536e-15	-14.069
Hfo_wOCO+	5.564e-15	0.000	5.563e-15	-14.255
Hfo_wOCd+	8.771e-16	0.000	8.770e-16	-15.057
Hfo_wH2BO3	5.933e-16	0.000	5.932e-16	-15.227
Hfo_wMoO4-	1.607e-16	0.000	1.607e-16	-15.794
Hfo_wHAsO4-	4.286e-17	0.000	4.285e-17	-16.368
Hfo_wOAg	1.040e-17	0.000	1.040e-17	-16.983
Hfo_wOBa+	2.622e-19	0.000	2.622e-19	-18.581
Hfo_wOFe+	1.488e-19	0.000	1.488e-19	-18.827
Hfo_wOHg+	7.961e-20	0.000	7.959e-20	-19.099
Hfo_wOHSeO4-2	4.059e-20	0.000	4.058e-20	-19.392
Hfo_wH2AsO4	4.043e-20	0.000	4.042e-20	-19.393
Hfo_wOHCrO4-2	2.291e-20	0.000	2.290e-20	-19.640
Hfo_wOHSbO(OH) 4-	4.785e-21	0.000	4.784e-21	-20.320
Hfo_wSeO4-	5.166e-22	0.000	5.165e-22	-21.287
Hfo_wCrO4-	3.053e-22	0.000	3.052e-22	-21.515
Hfo_wSbO(OH) 4	9.008e-23	0.000	9.006e-23	-22.045

Hfo_wH2AsO3 5.754e-30 0.000 5.753e-30 -29.240

-----Solution composition-----

Elements	Molality	Moles
Ag	6.555e-09	6.556e-09
Al	5.669e-07	5.670e-07
As	3.675e-10	3.675e-10
B	1.441e-05	1.442e-05
Ba	1.105e-08	1.105e-08
C	1.081e-03	1.081e-03
Ca	8.194e-04	8.196e-04
Cd	2.867e-09	2.867e-09
Cl	2.508e-03	2.508e-03
Co	2.212e-08	2.212e-08
Cr	6.994e-10	6.996e-10
Cu	7.309e-07	7.310e-07
F	1.214e-04	1.214e-04
Fe	7.454e-10	7.455e-10
Hg	4.519e-10	4.520e-10
K	8.551e-04	8.552e-04
Mg	1.074e-03	1.074e-03
Mn	1.353e-05	1.353e-05
Mo	3.998e-07	3.999e-07
N	3.256e-06	3.256e-06
Na	5.462e-03	5.463e-03
Ni	3.444e-08	3.445e-08
Pb	2.041e-09	2.041e-09
S	3.200e-03	3.200e-03
Sb	6.043e-09	6.044e-09
Se	3.534e-08	3.535e-08
Si	1.437e-04	1.437e-04
U	6.304e-08	6.305e-08
V	1.890e-09	1.890e-09
Zn	1.625e-06	1.625e-06

-----Description of solution-----

	pH =	8.281	Charge balance
	pe =	4.491	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.371e-02	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	1.106e-03	
	Total CO2 (mol/kg) =	1.081e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	3.853e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	1	
	Total H =	1.110335e+02	
	Total O =	5.553258e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.172e-06	1.925e-06	-5.663	-5.716	-0.053	(0)
H+	5.887e-09	5.231e-09	-8.230	-8.281	-0.051	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	6.555e-09					
AgCl	4.430e-09	4.430e-09	-8.354	-8.354	0.000	(0)
Ag+	1.096e-09	9.739e-10	-8.960	-9.011	-0.051	(0)
AgCl2-	9.862e-10	8.595e-10	-9.006	-9.066	-0.060	(0)
AgSO4-	3.891e-11	3.391e-11	-10.410	-10.470	-0.060	(0)

	AgCl3-2	2.958e-12	1.707e-12	-11.529	-11.768	-0.239	(0)
	AgNO2	5.837e-13	5.837e-13	-12.234	-12.234	0.000	(0)
	AgF	2.469e-13	2.469e-13	-12.608	-12.608	0.000	(0)
	AgOH	1.874e-13	1.874e-13	-12.727	-12.727	0.000	(0)
	AgCl4-3	2.676e-14	7.763e-15	-13.573	-14.110	-0.537	(0)
	AgH2BO3	2.188e-14	2.188e-14	-13.660	-13.660	0.000	(0)
	AgSeO3-	7.815e-15	6.811e-15	-14.107	-14.167	-0.060	(0)
	Ag2Se	3.553e-15	3.553e-15	-14.449	-14.449	0.000	(0)
	AgNH3+	1.456e-15	1.269e-15	-14.837	-14.896	-0.060	(0)
	Ag (OH) 2-	4.044e-17	3.525e-17	-16.393	-16.453	-0.060	(0)
	Ag (NO2) 2-	2.976e-18	2.594e-18	-17.526	-17.586	-0.060	(0)
	AgNO3	2.094e-18	2.094e-18	-17.679	-17.679	0.000	(0)
	Ag (NH3) 2+	7.557e-21	6.586e-21	-20.122	-20.181	-0.060	(0)
	Ag (SeO3) 2-3	2.288e-21	6.637e-22	-20.641	-21.178	-0.537	(0)
	Ag2MoO4	8.943e-26	8.943e-26	-25.049	-25.049	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.755	-74.755	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.958	-83.914	-0.955	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-149.264	-149.416	-0.151	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-150.154	-150.214	-0.060	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-150.283	-150.574	-0.291	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-150.606	-150.885	-0.279	(0)
Al		5.669e-07					
	Al (OH) 4-	5.648e-07	5.023e-07	-6.248	-6.299	-0.051	(0)
	Al (OH) 3	2.073e-09	2.073e-09	-8.683	-8.683	0.000	(0)
	Al (OH) 2+	6.051e-11	5.399e-11	-10.218	-10.268	-0.049	(0)
	AlF3	9.452e-13	9.452e-13	-12.024	-12.024	0.000	(0)
	AlF2+	8.338e-13	7.440e-13	-12.079	-12.128	-0.049	(0)
	AlOH+2	5.570e-14	3.532e-14	-13.254	-13.452	-0.198	(0)
	AlF4-	5.375e-14	4.781e-14	-13.270	-13.321	-0.051	(0)
	AlF+2	2.920e-14	1.852e-14	-13.535	-13.732	-0.198	(0)
	AlSO4+	2.796e-16	2.487e-16	-15.553	-15.604	-0.051	(0)
	Al+3	5.321e-17	1.835e-17	-16.274	-16.736	-0.462	(0)
	Al (SO4) 2-	5.229e-18	4.650e-18	-17.282	-17.333	-0.051	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-50.516	-51.054	-0.537	(0)
As (3)		2.234e-24					
	H3AsO3	2.008e-24	2.008e-24	-23.697	-23.697	0.000	(0)
	H2AsO3-	2.259e-25	1.969e-25	-24.646	-24.706	-0.060	(0)
	HAsO3-2	5.950e-29	3.433e-29	-28.225	-28.464	-0.239	(0)
	H4AsO3+	5.972e-33	5.204e-33	-32.224	-32.284	-0.060	(0)
	AsO3-3	8.721e-34	2.530e-34	-33.059	-33.597	-0.537	(0)
As (5)		3.675e-10					
	HAsO4-2	3.558e-10	2.053e-10	-9.449	-9.688	-0.239	(0)
	H2AsO4-	1.124e-11	9.793e-12	-10.949	-11.009	-0.060	(0)
	AsO4-3	4.278e-13	1.241e-13	-12.369	-12.906	-0.537	(0)
	H3AsO4	8.874e-18	8.902e-18	-17.052	-17.051	0.001	(0)
B		1.441e-05					
	H3BO3	1.273e-05	1.277e-05	-4.895	-4.894	0.001	(0)
	H2BO3-	1.607e-06	1.418e-06	-5.794	-5.848	-0.054	(0)
	CaH2BO3+	3.718e-08	3.279e-08	-7.430	-7.484	-0.054	(0)
	MgH2BO3+	3.063e-08	2.702e-08	-7.514	-7.568	-0.054	(0)
	NaH2BO3	1.080e-08	1.080e-08	-7.967	-7.967	0.000	(0)
	BF (OH) 3-	5.828e-10	5.141e-10	-9.234	-9.289	-0.054	(0)
	H5 (BO3) 2-	1.746e-11	1.541e-11	-10.758	-10.812	-0.054	(0)
	BaH2BO3+	3.390e-13	2.990e-13	-12.470	-12.524	-0.054	(0)
	BF2 (OH) 2-	3.290e-14	2.902e-14	-13.483	-13.537	-0.054	(0)
	H8 (BO3) 3-	2.230e-14	1.967e-14	-13.652	-13.706	-0.054	(0)
	AgH2BO3	2.188e-14	2.188e-14	-13.660	-13.660	0.000	(0)
	BF3OH-	6.758e-21	5.961e-21	-20.170	-20.225	-0.054	(0)
	BF4-	1.756e-26	1.549e-26	-25.756	-25.810	-0.054	(0)
Ba		1.105e-08					
	Ba+2	1.095e-08	6.826e-09	-7.960	-8.166	-0.205	(0)
	BaHCO3+	6.699e-11	5.990e-11	-10.174	-10.223	-0.049	(0)
	BaCO3	2.883e-11	2.883e-11	-10.540	-10.540	0.000	(0)
	BaH2BO3+	3.390e-13	2.990e-13	-12.470	-12.524	-0.054	(0)
	BaOH+	6.435e-14	5.734e-14	-13.191	-13.242	-0.050	(0)
	BaNO3+	1.062e-16	9.259e-17	-15.974	-16.033	-0.060	(0)
	BaNH3+2	4.765e-18	2.749e-18	-17.322	-17.561	-0.239	(0)
C (4)		1.081e-03					

HCO3-	1.030e-03	9.190e-04	-2.987	-3.037	-0.049	(0)
CO3-2	1.322e-05	8.237e-06	-4.879	-5.084	-0.205	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	7.693e-06	6.880e-06	-5.114	-5.162	-0.049	(0)
MgHCO3+	5.824e-06	5.170e-06	-5.235	-5.287	-0.052	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	3.766e-06	3.766e-06	-5.424	-5.424	0.000	(0)
NaHCO3	2.483e-06	2.483e-06	-5.605	-5.605	0.000	(0)
NaCO3-	8.259e-07	7.370e-07	-6.083	-6.133	-0.049	(0)
CuCO3	5.739e-07	5.739e-07	-6.241	-6.241	0.000	(0)
ZnCO3	2.743e-07	2.743e-07	-6.562	-6.562	0.000	(0)
MnHCO3+	1.340e-07	1.194e-07	-6.873	-6.923	-0.050	(0)
UO2 (CO3) 3-4	4.297e-08	4.761e-09	-7.367	-8.322	-0.955	(0)
Cu (CO3) 2-2	2.205e-08	1.272e-08	-7.657	-7.895	-0.239	(0)
UO2 (CO3) 2-2	1.999e-08	1.153e-08	-7.699	-7.938	-0.239	(0)
ZnHCO3+	1.930e-08	1.682e-08	-7.714	-7.774	-0.060	(0)
NiCO3	4.353e-09	4.353e-09	-8.361	-8.361	0.000	(0)
NiHCO3+	1.842e-09	1.605e-09	-8.735	-8.795	-0.060	(0)
PbCO3	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)
CoCO3	1.302e-09	1.302e-09	-8.885	-8.885	0.000	(0)
CuHCO3+	7.872e-10	6.861e-10	-9.104	-9.164	-0.060	(0)
CoHCO3+	7.670e-10	6.684e-10	-9.115	-9.175	-0.060	(0)
CdCO3	2.148e-10	2.148e-10	-9.668	-9.668	0.000	(0)
UO2CO3	7.018e-11	7.018e-11	-10.154	-10.154	0.000	(0)
BaHCO3+	6.699e-11	5.990e-11	-10.174	-10.223	-0.049	(0)
Pb (CO3) 2-2	5.948e-11	3.432e-11	-10.226	-10.464	-0.239	(0)
PbHCO3+	4.571e-11	3.984e-11	-10.340	-10.400	-0.060	(0)
BaCO3	2.883e-11	2.883e-11	-10.540	-10.540	0.000	(0)
CdHCO3+	2.747e-12	2.394e-12	-11.561	-11.621	-0.060	(0)
Cd (CO3) 2-2	2.274e-12	1.312e-12	-11.643	-11.882	-0.239	(0)
FeHCO3+	9.998e-16	8.941e-16	-15.000	-15.049	-0.049	(0)
HgCO3	4.615e-16	4.615e-16	-15.336	-15.336	0.000	(0)
Hg (CO3) 2-2	2.083e-17	1.202e-17	-16.681	-16.920	-0.239	(0)
HgHCO3+	5.158e-20	4.495e-20	-19.288	-19.347	-0.060	(0)
Ca	8.194e-04					
Ca+2	6.452e-04	4.020e-04	-3.190	-3.396	-0.205	(0)
CaSO4	1.607e-04	1.607e-04	-3.794	-3.794	0.000	(0)
CaHCO3+	7.693e-06	6.880e-06	-5.114	-5.162	-0.049	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	4.969e-07	4.428e-07	-6.304	-6.354	-0.050	(0)
CaH2BO3+	3.718e-08	3.279e-08	-7.430	-7.484	-0.054	(0)
CaOH+	1.726e-08	1.544e-08	-7.763	-7.811	-0.049	(0)
CaNO3+	3.948e-12	3.441e-12	-11.404	-11.463	-0.060	(0)
CaNH3+2	5.600e-13	3.231e-13	-12.252	-12.491	-0.239	(0)
Ca (NH3) 2+2	1.423e-22	8.211e-23	-21.847	-22.086	-0.239	(0)
Cd	2.867e-09					
Cd+2	1.836e-09	1.144e-09	-8.736	-8.941	-0.205	(0)
CdSO4	4.682e-10	4.682e-10	-9.330	-9.330	0.000	(0)
CdCl+	2.793e-10	2.435e-10	-9.554	-9.614	-0.060	(0)
CdCO3	2.148e-10	2.148e-10	-9.668	-9.668	0.000	(0)
CdOH+	2.007e-11	1.749e-11	-10.697	-10.757	-0.060	(0)
CdOHC1	1.922e-11	1.922e-11	-10.716	-10.716	0.000	(0)
Cd (SO4) 2-2	1.911e-11	1.102e-11	-10.719	-10.958	-0.239	(0)
CdHCO3+	2.747e-12	2.394e-12	-11.561	-11.621	-0.060	(0)
Cd (CO3) 2-2	2.274e-12	1.312e-12	-11.643	-11.882	-0.239	(0)
CdCl2	2.261e-12	2.261e-12	-11.646	-11.646	0.000	(0)
CdF+	2.100e-12	1.830e-12	-11.678	-11.738	-0.060	(0)
Cd (OH) 2	2.124e-13	2.124e-13	-12.673	-12.673	0.000	(0)
CdCl3-	3.647e-15	3.178e-15	-14.438	-14.498	-0.060	(0)
CdF2	3.685e-16	3.685e-16	-15.434	-15.434	0.000	(0)
Cd (OH) 3-	2.866e-17	2.497e-17	-16.543	-16.603	-0.060	(0)
CdNO3+	1.124e-17	9.794e-18	-16.949	-17.009	-0.060	(0)
CdSeO4	1.005e-17	1.005e-17	-16.998	-16.998	0.000	(0)
Cd2OH+3	3.458e-19	1.003e-19	-18.461	-18.999	-0.537	(0)
Cd (SeO3) 2-2	1.936e-19	1.117e-19	-18.713	-18.952	-0.239	(0)
Cd (OH) 4-2	1.364e-23	7.867e-24	-22.865	-23.104	-0.239	(0)
Cd (NO3) 2	1.328e-26	1.328e-26	-25.877	-25.877	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-80.432	-80.492	-0.060	(0)

	Cd (HS) 2	0.000e+00	0.000e+00	-152.846	-152.846	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-230.445	-230.505	-0.060	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-307.628	-307.867	-0.239	(0)
C1	2.508e-03						
	Cl-	2.507e-03	2.228e-03	-2.601	-2.652	-0.051	(0)
	MnCl+	2.050e-08	1.826e-08	-7.688	-7.738	-0.050	(0)
	ZnOHCl	8.161e-09	8.161e-09	-8.088	-8.088	0.000	(0)
	AgCl	4.430e-09	4.430e-09	-8.354	-8.354	0.000	(0)
	ZnCl+	3.649e-09	3.239e-09	-8.438	-8.490	-0.052	(0)
	AgCl2-	9.862e-10	8.595e-10	-9.006	-9.066	-0.060	(0)
	CuCl	5.248e-10	5.248e-10	-9.280	-9.280	0.000	(0)
	CdCl+	2.793e-10	2.435e-10	-9.554	-9.614	-0.060	(0)
	CuCl2-	2.752e-10	2.442e-10	-9.560	-9.612	-0.052	(0)
	NiCl+	9.265e-11	8.075e-11	-10.033	-10.093	-0.060	(0)
	CoCl+	8.269e-11	7.206e-11	-10.083	-10.142	-0.060	(0)
	MnCl2	5.748e-11	5.748e-11	-10.241	-10.241	0.000	(0)
	CuCl+	4.706e-11	4.178e-11	-10.327	-10.379	-0.052	(0)
	CdOHCl	1.922e-11	1.922e-11	-10.716	-10.716	0.000	(0)
	ZnCl2	1.144e-11	1.144e-11	-10.942	-10.942	0.000	(0)
	PbCl+	5.292e-12	4.612e-12	-11.276	-11.336	-0.060	(0)
	AgCl3-2	2.958e-12	1.707e-12	-11.529	-11.768	-0.239	(0)
	CdCl2	2.261e-12	2.261e-12	-11.646	-11.646	0.000	(0)
	HgClOH	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
	CuCl3-2	1.845e-13	1.163e-13	-12.734	-12.934	-0.200	(0)
	PbCl2	4.589e-14	4.589e-14	-13.338	-13.338	0.000	(0)
	MnCl3-	3.958e-14	3.527e-14	-13.403	-13.453	-0.050	(0)
	CuCl2	3.227e-14	3.227e-14	-13.491	-13.491	0.000	(0)
	AgCl4-3	2.676e-14	7.763e-15	-13.573	-14.110	-0.537	(0)
	HgCl2	2.324e-14	2.324e-14	-13.634	-13.634	0.000	(0)
	ZnCl3-	2.280e-14	2.024e-14	-13.642	-13.694	-0.052	(0)
	CdCl3-	3.647e-15	3.178e-15	-14.438	-14.498	-0.060	(0)
	NiCl2	9.058e-16	9.058e-16	-15.043	-15.043	0.000	(0)
	HgCl3-	5.940e-16	5.177e-16	-15.226	-15.286	-0.060	(0)
	PbCl3-	4.670e-17	4.070e-17	-16.331	-16.390	-0.060	(0)
	ZnCl4-2	3.576e-17	2.255e-17	-16.447	-16.647	-0.200	(0)
	UO2Cl+	8.873e-18	7.733e-18	-17.052	-17.112	-0.060	(0)
	HgCl4-2	7.958e-18	4.591e-18	-17.099	-17.338	-0.239	(0)
	HgCl+	2.388e-18	2.081e-18	-17.622	-17.682	-0.060	(0)
	CuCl3-	7.559e-19	6.709e-19	-18.122	-18.173	-0.052	(0)
	CrCl+2	1.756e-19	1.013e-19	-18.755	-18.994	-0.239	(0)
	PbCl4-2	7.184e-20	4.145e-20	-19.144	-19.382	-0.239	(0)
	CrOHCl2	8.258e-21	8.258e-21	-20.083	-20.083	0.000	(0)
	CrCl2+	2.458e-23	2.142e-23	-22.609	-22.669	-0.060	(0)
	FeCl+2	2.373e-23	1.496e-23	-22.625	-22.825	-0.200	(0)
	CuCl4-2	1.188e-23	7.492e-24	-22.925	-23.125	-0.200	(0)
	VOCl+	2.643e-25	2.303e-25	-24.578	-24.638	-0.060	(0)
	FeCl2+	1.671e-25	1.489e-25	-24.777	-24.827	-0.050	(0)
	CrO3Cl-	3.009e-26	2.623e-26	-25.522	-25.581	-0.060	(0)
	FeCl3	3.316e-29	3.316e-29	-28.479	-28.479	0.000	(0)
	CoCl+2	9.058e-37	5.226e-37	-36.043	-36.282	-0.239	(0)
	UCl+3	0.000e+00	0.000e+00	-47.976	-48.513	-0.537	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
Co (2)	2.212e-08						
	Co+2	1.621e-08	9.350e-09	-7.790	-8.029	-0.239	(0)
	CoSO4	3.256e-09	3.256e-09	-8.487	-8.487	0.000	(0)
	CoCO3	1.302e-09	1.302e-09	-8.885	-8.885	0.000	(0)
	CoHCO3+	7.670e-10	6.684e-10	-9.115	-9.175	-0.060	(0)
	CoOH+	4.120e-10	3.590e-10	-9.385	-9.445	-0.060	(0)
	CoCl+	8.269e-11	7.206e-11	-10.083	-10.142	-0.060	(0)
	Co (OH) 2	5.489e-11	5.489e-11	-10.261	-10.261	0.000	(0)
	CoF+	3.424e-11	2.984e-11	-10.466	-10.525	-0.060	(0)
	CoNO2+	2.169e-13	1.890e-13	-12.664	-12.723	-0.060	(0)
	Co (OH) 3-	2.418e-15	2.108e-15	-14.616	-14.676	-0.060	(0)
	Co (NH3) +2	1.244e-15	7.176e-16	-14.905	-15.144	-0.239	(0)
	CoOOH-	6.069e-16	5.289e-16	-15.217	-15.277	-0.060	(0)
	CoSeO4	2.209e-16	2.209e-16	-15.656	-15.656	0.000	(0)

CoNO3+	4.602e-17	4.011e-17	-16.337	-16.397	-0.060	(0)
Co2OH+3	5.800e-19	1.683e-19	-18.237	-18.774	-0.537	(0)
Co (OH) 4-2	1.114e-21	6.429e-22	-20.953	-21.192	-0.239	(0)
Co (NH3) 2+2	3.387e-23	1.954e-23	-22.470	-22.709	-0.239	(0)
Co (NO3) 2	2.209e-25	2.209e-25	-24.656	-24.656	0.000	(0)
Co4 (OH) 4+4	2.993e-29	3.316e-30	-28.524	-29.479	-0.955	(0)
Co (NH3) 3+2	2.722e-31	1.571e-31	-30.565	-30.804	-0.239	(0)
Co (NH3) 4+2	9.120e-40	5.262e-40	-39.040	-39.279	-0.239	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-48.015	-48.254	-0.239	(0)
Co (3)	1.954e-29					
CoOH+2	1.954e-29	1.128e-29	-28.709	-28.948	-0.239	(0)
Co+3	3.342e-36	1.153e-36	-35.476	-35.938	-0.462	(0)
CoCl+2	9.058e-37	5.226e-37	-36.043	-36.282	-0.239	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-70.838	-71.077	-0.239	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
Cr (2)	4.699e-28					
Cr+2	4.699e-28	2.711e-28	-27.328	-27.567	-0.239	(0)
Cr (3)	6.994e-10					
Cr (OH) 2+	3.976e-10	3.465e-10	-9.401	-9.460	-0.060	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.610e-11	2.275e-11	-10.583	-10.643	-0.060	(0)
Cr (OH) 4-	2.202e-11	1.919e-11	-10.657	-10.717	-0.060	(0)
Cr (OH) +2	2.565e-12	1.480e-12	-11.591	-11.830	-0.239	(0)
CrOHSO4	6.129e-13	6.129e-13	-12.213	-12.213	0.000	(0)
CrF+2	9.743e-16	5.621e-16	-15.011	-15.250	-0.239	(0)
CrSO4+	1.644e-16	1.432e-16	-15.784	-15.844	-0.060	(0)
Cr+3	1.212e-16	3.515e-17	-15.917	-16.454	-0.537	(0)
CrCl+2	1.756e-19	1.013e-19	-18.755	-18.994	-0.239	(0)
CrOHC12	8.258e-21	8.258e-21	-20.083	-20.083	0.000	(0)
Cr2 (OH) 2SO4+2	1.421e-22	8.197e-23	-21.847	-22.086	-0.239	(0)
CrCl2+	2.458e-23	2.142e-23	-22.609	-22.669	-0.060	(0)
Cr2 (OH) 2 (SO4) 2	8.499e-24	8.499e-24	-23.071	-23.071	0.000	(0)
CrNO3+2	7.207e-27	4.158e-27	-26.142	-26.381	-0.239	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-47.533	-47.772	-0.239	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.086	-58.624	-0.537	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
Cr (6)	3.498e-14					
CrO4-2	3.392e-14	2.113e-14	-13.470	-13.675	-0.205	(0)
NaCrO4-	5.791e-16	5.047e-16	-15.237	-15.297	-0.060	(0)
HCrO4-	4.105e-16	3.577e-16	-15.387	-15.446	-0.060	(0)
KCrO4-	6.762e-17	5.893e-17	-16.170	-16.230	-0.060	(0)
CrO3SO4-2	1.725e-24	9.950e-25	-23.763	-24.002	-0.239	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.009e-26	2.623e-26	-25.522	-25.581	-0.060	(0)
Cr2O7-2	7.693e-30	4.439e-30	-29.114	-29.353	-0.239	(0)
Cu (1)	1.015e-09					
CuCl	5.248e-10	5.248e-10	-9.280	-9.280	0.000	(0)
CuCl2-	2.752e-10	2.442e-10	-9.560	-9.612	-0.052	(0)
Cu+	2.147e-10	1.871e-10	-9.668	-9.728	-0.060	(0)
CuCl3-2	1.845e-13	1.163e-13	-12.734	-12.934	-0.200	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.607	-148.892	-0.285	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.348	-149.622	-0.274	(0)
Cu (2)	7.299e-07					
CuCO3	5.739e-07	5.739e-07	-6.241	-6.241	0.000	(0)
CuOH+	8.112e-08	7.201e-08	-7.091	-7.143	-0.052	(0)
Cu (OH) 2	2.765e-08	2.765e-08	-7.558	-7.558	0.000	(0)
Cu (CO3) 2-2	2.205e-08	1.272e-08	-7.657	-7.895	-0.239	(0)
Cu+2	1.899e-08	1.183e-08	-7.722	-7.927	-0.205	(0)
CuSO4	4.731e-09	4.731e-09	-8.325	-8.325	0.000	(0)
CuHCO3+	7.872e-10	6.861e-10	-9.104	-9.164	-0.060	(0)
Cu2 (OH) 2+2	2.257e-10	1.302e-10	-9.646	-9.885	-0.239	(0)
Cu (OH) 3-	1.252e-10	1.091e-10	-9.902	-9.962	-0.060	(0)
CuF+	8.644e-11	7.533e-11	-10.063	-10.123	-0.060	(0)
CuCl+	4.706e-11	4.178e-11	-10.327	-10.379	-0.052	(0)
CuNO2+	4.078e-12	3.554e-12	-11.390	-11.449	-0.060	(0)
CuNH3+2	1.340e-13	7.729e-14	-12.873	-13.112	-0.239	(0)

	CuCl2	3.227e-14	3.227e-14	-13.491	-13.491	0.000	(0)
	Cu (OH) 4-2	2.865e-15	1.653e-15	-14.543	-14.782	-0.239	(0)
	CuNO3+	1.162e-16	1.013e-16	-15.935	-15.995	-0.060	(0)
	Cu (NO2) 2	1.043e-16	1.043e-16	-15.982	-15.982	0.000	(0)
	CuCl3-	7.559e-19	6.709e-19	-18.122	-18.173	-0.052	(0)
	CuCl4-2	1.188e-23	7.492e-24	-22.925	-23.125	-0.200	(0)
	Cu (NO3) 2	3.450e-26	3.450e-26	-25.462	-25.462	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.643	-220.703	-0.060	(0)
F		1.214e-04					
	F-	1.136e-04	1.009e-04	-3.945	-3.996	-0.051	(0)
	MgF+	6.999e-06	6.225e-06	-5.155	-5.206	-0.051	(0)
	CaF+	4.969e-07	4.428e-07	-6.304	-6.354	-0.050	(0)
	NaF	3.059e-07	3.059e-07	-6.514	-6.514	0.000	(0)
	MnF+	2.936e-08	2.616e-08	-7.532	-7.582	-0.050	(0)
	ZnF+	1.337e-09	1.165e-09	-8.874	-8.934	-0.060	(0)
	HF	7.808e-10	7.808e-10	-9.107	-9.107	0.000	(0)
	BF (OH) 3-	5.828e-10	5.141e-10	-9.234	-9.289	-0.054	(0)
	CuF+	8.644e-11	7.533e-11	-10.063	-10.123	-0.060	(0)
	NiF+	4.120e-11	3.591e-11	-10.385	-10.445	-0.060	(0)
	CoF+	3.424e-11	2.984e-11	-10.466	-10.525	-0.060	(0)
	CdF+	2.100e-12	1.830e-12	-11.678	-11.738	-0.060	(0)
	AlF3	9.452e-13	9.452e-13	-12.024	-12.024	0.000	(0)
	AlF2+	8.338e-13	7.440e-13	-12.079	-12.128	-0.049	(0)
	PbF+	4.761e-13	4.149e-13	-12.322	-12.382	-0.060	(0)
	HF2-	3.381e-13	2.995e-13	-12.471	-12.524	-0.053	(0)
	AgF	2.469e-13	2.469e-13	-12.608	-12.608	0.000	(0)
	AlF4-	5.375e-14	4.781e-14	-13.270	-13.321	-0.051	(0)
	UO2F+	3.421e-14	2.981e-14	-13.466	-13.526	-0.060	(0)
	BF2 (OH) 2-	3.290e-14	2.902e-14	-13.483	-13.537	-0.054	(0)
	AlF+2	2.920e-14	1.852e-14	-13.535	-13.732	-0.198	(0)
	UO2F2	8.677e-15	8.677e-15	-14.062	-14.062	0.000	(0)
	CrF+2	9.743e-16	5.621e-16	-15.011	-15.250	-0.239	(0)
	PbF2	8.239e-16	8.239e-16	-15.084	-15.084	0.000	(0)
	CdF2	3.685e-16	3.685e-16	-15.434	-15.434	0.000	(0)
	UO2F3-	2.524e-16	2.199e-16	-15.598	-15.658	-0.060	(0)
	H2F2	1.633e-18	1.633e-18	-17.787	-17.787	0.000	(0)
	UO2F4-2	3.056e-19	1.763e-19	-18.515	-18.754	-0.239	(0)
	PbF3-	1.809e-19	1.577e-19	-18.742	-18.802	-0.060	(0)
	VO2F	9.228e-20	9.228e-20	-19.035	-19.035	0.000	(0)
	FeF2+	7.456e-20	6.644e-20	-19.127	-19.178	-0.050	(0)
	FeF+2	3.902e-20	2.460e-20	-19.409	-19.609	-0.200	(0)
	FeF3	9.460e-21	9.460e-21	-20.024	-20.024	0.000	(0)
	BF3OH-	6.758e-21	5.961e-21	-20.170	-20.225	-0.054	(0)
	VO2F2-	3.880e-21	3.381e-21	-20.411	-20.471	-0.060	(0)
	VOF+	2.559e-23	2.230e-23	-22.592	-22.652	-0.060	(0)
	PbF4-2	1.320e-23	7.617e-24	-22.879	-23.118	-0.239	(0)
	VO2F3-2	7.377e-24	4.256e-24	-23.132	-23.371	-0.239	(0)
	VOF2	8.440e-25	8.440e-25	-24.074	-24.074	0.000	(0)
	HgF+	2.009e-25	1.751e-25	-24.697	-24.757	-0.060	(0)
	BF4-	1.756e-26	1.549e-26	-25.756	-25.810	-0.054	(0)
	VOF3-	3.467e-27	3.022e-27	-26.460	-26.520	-0.060	(0)
	Sb (OH) 2F	1.546e-27	1.546e-27	-26.811	-26.811	0.000	(0)
	SbOF	1.521e-27	1.521e-27	-26.818	-26.818	0.000	(0)
	VO2F4-3	7.285e-28	2.113e-28	-27.138	-27.675	-0.537	(0)
	VOF4-2	2.134e-30	1.231e-30	-29.671	-29.910	-0.239	(0)
	SiF6-2	2.656e-31	1.674e-31	-30.576	-30.776	-0.200	(0)
	UF3+	1.290e-38	1.124e-38	-37.889	-37.949	-0.060	(0)
	UF2+2	1.218e-39	7.029e-40	-38.914	-39.153	-0.239	(0)
	UF4	1.244e-40	1.244e-40	-39.905	-39.905	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-41.720	-42.257	-0.537	(0)
	UF5-	0.000e+00	0.000e+00	-42.244	-42.303	-0.060	(0)
	UF6-2	0.000e+00	0.000e+00	-43.580	-43.819	-0.239	(0)
Fe (2)		1.747e-13					
	Fe+2	1.339e-13	7.728e-14	-12.873	-13.112	-0.239	(0)
	FeSO4	3.311e-14	3.311e-14	-13.480	-13.480	0.000	(0)
	FeOH+	6.645e-15	5.921e-15	-14.178	-14.228	-0.050	(0)
	FeHCO3+	9.998e-16	8.941e-16	-15.000	-15.049	-0.049	(0)
	Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)

Fe (OH) 3-	6.182e-18	5.508e-18	-17.209	-17.259	-0.050	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.279	-163.279	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-240.740	-240.800	-0.060	(0)
Fe (3)	7.452e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.318e-10	2.069e-10	-9.635	-9.684	-0.049	(0)
Fe (OH) 4-	8.586e-11	7.662e-11	-10.066	-10.116	-0.049	(0)
FeOH+2	4.382e-16	2.763e-16	-15.358	-15.559	-0.200	(0)
FeF2+	7.456e-20	6.644e-20	-19.127	-19.178	-0.050	(0)
FeF+2	3.902e-20	2.460e-20	-19.409	-19.609	-0.200	(0)
FeF3	9.460e-21	9.460e-21	-20.024	-20.024	0.000	(0)
FeSO4+	4.887e-21	4.354e-21	-20.311	-20.361	-0.050	(0)
Fe+3	6.446e-22	2.224e-22	-21.191	-21.653	-0.462	(0)
Fe (SO4) 2-	1.864e-22	1.625e-22	-21.729	-21.789	-0.060	(0)
FeCl+2	2.373e-23	1.496e-23	-22.625	-22.825	-0.200	(0)
FeCl2+	1.671e-25	1.489e-25	-24.777	-24.827	-0.050	(0)
FeHSeO3+2	1.456e-26	8.401e-27	-25.837	-26.076	-0.239	(0)
FeCl3	3.316e-29	3.316e-29	-28.479	-28.479	0.000	(0)
Fe2 (OH) 2+4	2.281e-29	2.528e-30	-28.642	-29.597	-0.955	(0)
FeNO3+2	1.043e-29	6.018e-30	-28.982	-29.221	-0.239	(0)
Fe3 (OH) 4+5	2.351e-37	7.558e-39	-36.629	-38.122	-1.493	(0)
H (0)	4.026e-29					
H2	2.013e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	4.505e-10					
Hg	4.505e-10	4.505e-10	-9.346	-9.346	0.000	(0)
Hg (1)	4.963e-23					
Hg2+2	2.482e-23	1.432e-23	-22.605	-22.844	-0.239	(0)
Hg (2)	1.469e-12					
Hg (OH) 2	1.091e-12	1.094e-12	-11.962	-11.961	0.001	(0)
HgClOH	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
HgCl2	2.324e-14	2.324e-14	-13.634	-13.634	0.000	(0)
HgCl3-	5.940e-16	5.177e-16	-15.226	-15.286	-0.060	(0)
HgCO3	4.615e-16	4.615e-16	-15.336	-15.336	0.000	(0)
Hg (CO3) 2-2	2.083e-17	1.202e-17	-16.681	-16.920	-0.239	(0)
HgCl4-2	7.958e-18	4.591e-18	-17.099	-17.338	-0.239	(0)
HgOH+	4.116e-18	3.587e-18	-17.386	-17.445	-0.060	(0)
HgCl+	2.388e-18	2.081e-18	-17.622	-17.682	-0.060	(0)
Hg (OH) 3-	3.042e-19	2.651e-19	-18.517	-18.577	-0.060	(0)
HgHCO3+	5.158e-20	4.495e-20	-19.288	-19.347	-0.060	(0)
Hg+2	8.115e-23	4.682e-23	-22.091	-22.330	-0.239	(0)
HgNH3+2	3.269e-23	1.886e-23	-22.486	-22.725	-0.239	(0)
HgSO4	2.139e-23	2.139e-23	-22.670	-22.670	0.000	(0)
Hg (NH3) 2+2	2.087e-23	1.204e-23	-22.681	-22.919	-0.239	(0)
HgF+	2.009e-25	1.751e-25	-24.697	-24.757	-0.060	(0)
HgNO3+	5.368e-32	4.679e-32	-31.270	-31.330	-0.060	(0)
Hg (NH3) 3+2	5.303e-32	3.059e-32	-31.276	-31.514	-0.239	(0)
Hg (NH3) 4+2	2.689e-40	1.551e-40	-39.570	-39.809	-0.239	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.279	-40.279	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-141.177	-141.237	-0.060	(0)
HgS2-2	0.000e+00	0.000e+00	-141.425	-141.663	-0.239	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-143.124	-143.124	0.000	(0)
K	8.551e-04					
K+	8.447e-04	7.505e-04	-3.073	-3.125	-0.051	(0)
KSO4-	1.039e-05	9.273e-06	-4.983	-5.033	-0.049	(0)
KCrO4-	6.762e-17	5.893e-17	-16.170	-16.230	-0.060	(0)
Mg	1.074e-03					
Mg+2	8.823e-04	5.498e-04	-3.054	-3.260	-0.205	(0)
MgSO4	1.746e-04	1.746e-04	-3.758	-3.758	0.000	(0)
MgF+	6.999e-06	6.225e-06	-5.155	-5.206	-0.051	(0)
MgHCO3+	5.824e-06	5.170e-06	-5.235	-5.287	-0.052	(0)
MgCO3	3.766e-06	3.766e-06	-5.424	-5.424	0.000	(0)
MgOH+	4.702e-07	4.212e-07	-6.328	-6.376	-0.048	(0)
MgH2BO3+	3.063e-08	2.702e-08	-7.514	-7.568	-0.054	(0)
Mn (2)	1.353e-05					
Mn+2	1.129e-05	6.512e-06	-4.947	-5.186	-0.239	(0)
MnSO4	2.021e-06	2.021e-06	-5.694	-5.694	0.000	(0)
MnHCO3+	1.340e-07	1.194e-07	-6.873	-6.923	-0.050	(0)
MnOH+	3.533e-08	3.148e-08	-7.452	-7.502	-0.050	(0)

MnF+	2.936e-08	2.616e-08	-7.532	-7.582	-0.050	(0)
MnCl+	2.050e-08	1.826e-08	-7.688	-7.738	-0.050	(0)
MnCl2	5.748e-11	5.748e-11	-10.241	-10.241	0.000	(0)
MnSeO4	8.264e-14	8.264e-14	-13.083	-13.083	0.000	(0)
MnCl3-	3.958e-14	3.527e-14	-13.403	-13.453	-0.050	(0)
MnNO3+	3.205e-14	2.793e-14	-13.494	-13.554	-0.060	(0)
Mn (OH) 3-	8.087e-16	7.206e-16	-15.092	-15.142	-0.050	(0)
Mn (OH) 4-2	7.102e-21	4.477e-21	-20.149	-20.349	-0.200	(0)
Mn (NO3) 2	1.899e-22	1.899e-22	-21.721	-21.721	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.909	-41.909	0.000	(0)
Mn (3)	2.612e-26					
Mn+3	2.612e-26	9.010e-27	-25.583	-26.045	-0.462	(0)
Mn (6)	6.412e-40					
MnO4-2	6.412e-40	4.042e-40	-39.193	-39.393	-0.200	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.221	-44.274	-0.054	(0)
Mo	3.998e-07					
MoO4-2	3.998e-07	2.491e-07	-6.398	-6.604	-0.205	(0)
HMoO4-	2.975e-11	2.593e-11	-10.527	-10.586	-0.060	(0)
H2MoO4	9.934e-16	9.934e-16	-15.003	-15.003	0.000	(0)
Ag2MoO4	8.943e-26	8.943e-26	-25.049	-25.049	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.516	-51.054	-0.537	(0)
Mo7O24-6	0.000e+00	0.000e+00	-57.336	-59.486	-2.150	(0)
HMo7O24-5	0.000e+00	0.000e+00	-59.888	-61.381	-1.493	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-63.925	-64.880	-0.955	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-69.378	-69.916	-0.537	(0)
N (-3)	7.401e-09					
NH4+	6.639e-09	5.857e-09	-8.178	-8.232	-0.054	(0)
NH3	6.384e-10	6.384e-10	-9.195	-9.195	0.000	(0)
NH4SO4-	1.229e-10	1.095e-10	-9.910	-9.960	-0.050	(0)
CaNH3+2	5.600e-13	3.231e-13	-12.252	-12.491	-0.239	(0)
CuNH3+2	1.340e-13	7.729e-14	-12.873	-13.112	-0.239	(0)
NiNH3+2	8.418e-15	4.857e-15	-14.075	-14.314	-0.239	(0)
AgNH3+	1.456e-15	1.269e-15	-14.837	-14.896	-0.060	(0)
Co (NH3) +2	1.244e-15	7.176e-16	-14.905	-15.144	-0.239	(0)
BaNH3+2	4.765e-18	2.749e-18	-17.322	-17.561	-0.239	(0)
Ag (NH3) 2+	7.557e-21	6.586e-21	-20.122	-20.181	-0.060	(0)
Ni (NH3) 2+2	7.767e-22	4.481e-22	-21.110	-21.349	-0.239	(0)
Ca (NH3) 2+2	1.423e-22	8.211e-23	-21.847	-22.086	-0.239	(0)
Co (NH3) 2+2	3.387e-23	1.954e-23	-22.470	-22.709	-0.239	(0)
HgNH3+2	3.269e-23	1.886e-23	-22.486	-22.725	-0.239	(0)
Hg (NH3) 2+2	2.087e-23	1.204e-23	-22.681	-22.919	-0.239	(0)
Co (NH3) 3+2	2.722e-31	1.571e-31	-30.565	-30.804	-0.239	(0)
Hg (NH3) 3+2	5.303e-32	3.059e-32	-31.276	-31.514	-0.239	(0)
Co (NH3) 4+2	9.120e-40	5.262e-40	-39.040	-39.279	-0.239	(0)
Hg (NH3) 4+2	2.689e-40	1.551e-40	-39.570	-39.809	-0.239	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-47.533	-47.772	-0.239	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-48.015	-48.254	-0.239	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.086	-58.624	-0.537	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-70.838	-71.077	-0.239	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
N (3)	3.245e-06					
NO2-	3.245e-06	2.869e-06	-5.489	-5.542	-0.054	(0)
CuNO2+	4.078e-12	3.554e-12	-11.390	-11.449	-0.060	(0)
AgNO2	5.837e-13	5.837e-13	-12.234	-12.234	0.000	(0)
CoNO2+	2.169e-13	1.890e-13	-12.664	-12.723	-0.060	(0)
Cu (NO2) 2	1.043e-16	1.043e-16	-15.982	-15.982	0.000	(0)
Ag (NO2) 2-	2.976e-18	2.594e-18	-17.526	-17.586	-0.060	(0)
N (5)	3.050e-09					
NO3-	3.046e-09	2.707e-09	-8.516	-8.568	-0.051	(0)
CaNO3+	3.948e-12	3.441e-12	-11.404	-11.463	-0.060	(0)
MnNO3+	3.205e-14	2.793e-14	-13.494	-13.554	-0.060	(0)
ZnNO3+	4.515e-15	3.935e-15	-14.345	-14.405	-0.060	(0)
CuNO3+	1.162e-16	1.013e-16	-15.935	-15.995	-0.060	(0)
NiNO3+	1.105e-16	9.631e-17	-15.957	-16.016	-0.060	(0)

BaNO3+	1.062e-16	9.259e-17	-15.974	-16.033	-0.060	(0)
CoNO3+	4.602e-17	4.011e-17	-16.337	-16.397	-0.060	(0)
CdNO3+	1.124e-17	9.794e-18	-16.949	-17.009	-0.060	(0)
PbNO3+	2.680e-18	2.336e-18	-17.572	-17.632	-0.060	(0)
AgNO3	2.094e-18	2.094e-18	-17.679	-17.679	0.000	(0)
Mn (NO3) 2	1.899e-22	1.899e-22	-21.721	-21.721	0.000	(0)
UO2NO3+	1.326e-23	1.156e-23	-22.877	-22.937	-0.060	(0)
Zn (NO3) 2	2.125e-24	2.125e-24	-23.673	-23.673	0.000	(0)
Co (NO3) 2	2.209e-25	2.209e-25	-24.656	-24.656	0.000	(0)
Cu (NO3) 2	3.450e-26	3.450e-26	-25.462	-25.462	0.000	(0)
Cd (NO3) 2	1.328e-26	1.328e-26	-25.877	-25.877	0.000	(0)
Pb (NO3) 2	1.074e-26	1.074e-26	-25.969	-25.969	0.000	(0)
CrNO3+2	7.207e-27	4.158e-27	-26.142	-26.381	-0.239	(0)
VO2NO3	7.138e-28	7.138e-28	-27.146	-27.146	0.000	(0)
FeNO3+2	1.043e-29	6.018e-30	-28.982	-29.221	-0.239	(0)
HgNO3+	5.368e-32	4.679e-32	-31.270	-31.330	-0.060	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.279	-40.279	0.000	(0)
Na	5.462e-03					
Na+	5.408e-03	4.805e-03	-2.267	-2.318	-0.051	(0)
NaSO4-	5.047e-05	4.504e-05	-4.297	-4.346	-0.049	(0)
NaHCO3	2.483e-06	2.483e-06	-5.605	-5.605	0.000	(0)
NaCO3-	8.259e-07	7.370e-07	-6.083	-6.133	-0.049	(0)
NaF	3.059e-07	3.059e-07	-6.514	-6.514	0.000	(0)
NaH2BO3	1.080e-08	1.080e-08	-7.967	-7.967	0.000	(0)
NaCrO4-	5.791e-16	5.047e-16	-15.237	-15.297	-0.060	(0)
Ni	3.444e-08					
Ni+2	2.274e-08	1.417e-08	-7.643	-7.849	-0.205	(0)
NiSO4	4.933e-09	4.933e-09	-8.307	-8.307	0.000	(0)
NiCO3	4.353e-09	4.353e-09	-8.361	-8.361	0.000	(0)
NiHCO3+	1.842e-09	1.605e-09	-8.735	-8.795	-0.060	(0)
NiOH+	3.938e-10	3.432e-10	-9.405	-9.464	-0.060	(0)
NiCl+	9.265e-11	8.075e-11	-10.033	-10.093	-0.060	(0)
Ni (OH) 2	5.247e-11	5.247e-11	-10.280	-10.280	0.000	(0)
NiF+	4.120e-11	3.591e-11	-10.385	-10.445	-0.060	(0)
Ni (SO4) 2-2	4.942e-13	2.851e-13	-12.306	-12.545	-0.239	(0)
Ni (OH) 3-	1.159e-13	1.010e-13	-12.936	-12.996	-0.060	(0)
NiNH3+2	8.418e-15	4.857e-15	-14.075	-14.314	-0.239	(0)
NiCl2	9.058e-16	9.058e-16	-15.043	-15.043	0.000	(0)
NiSeO4	3.124e-16	3.124e-16	-15.505	-15.505	0.000	(0)
NiNO3+	1.105e-16	9.631e-17	-15.957	-16.016	-0.060	(0)
Ni (NH3) 2+2	7.767e-22	4.481e-22	-21.110	-21.349	-0.239	(0)
O (0)	2.477e-35					
O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	2.041e-09					
PbCO3	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)
PbOH+	3.236e-10	2.820e-10	-9.490	-9.550	-0.060	(0)
Pb+2	9.364e-11	5.834e-11	-10.029	-10.234	-0.205	(0)
Pb (CO3) 2-2	5.948e-11	3.432e-11	-10.226	-10.464	-0.239	(0)
PbSO4	4.988e-11	4.988e-11	-10.302	-10.302	0.000	(0)
PbHCO3+	4.571e-11	3.984e-11	-10.340	-10.400	-0.060	(0)
Pb (OH) 2	1.716e-11	1.716e-11	-10.765	-10.765	0.000	(0)
PbCl+	5.292e-12	4.612e-12	-11.276	-11.336	-0.060	(0)
Pb (SO4) 2-2	9.092e-13	5.245e-13	-12.041	-12.280	-0.239	(0)
PbF+	4.761e-13	4.149e-13	-12.322	-12.382	-0.060	(0)
PbCl2	4.589e-14	4.589e-14	-13.338	-13.338	0.000	(0)
Pb (OH) 3-	3.790e-14	3.303e-14	-13.421	-13.481	-0.060	(0)
PbF2	8.239e-16	8.239e-16	-15.084	-15.084	0.000	(0)
PbCl3-	4.670e-17	4.070e-17	-16.331	-16.390	-0.060	(0)
Pb (OH) 4-2	2.699e-17	1.557e-17	-16.569	-16.808	-0.239	(0)
PbNO3+	2.680e-18	2.336e-18	-17.572	-17.632	-0.060	(0)
Pb2OH+3	8.990e-19	2.608e-19	-18.046	-18.584	-0.537	(0)
PbF3-	1.809e-19	1.577e-19	-18.742	-18.802	-0.060	(0)
PbCl4-2	7.184e-20	4.145e-20	-19.144	-19.382	-0.239	(0)
Pb3 (OH) 4+2	5.945e-22	3.430e-22	-21.226	-21.465	-0.239	(0)
PbF4-2	1.320e-23	7.617e-24	-22.879	-23.118	-0.239	(0)
Pb (NO3) 2	1.074e-26	1.074e-26	-25.969	-25.969	0.000	(0)
Pb4 (OH) 4+4	1.435e-27	1.590e-28	-26.843	-27.799	-0.955	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.081	-154.081	0.000	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-232.279	-232.339	-0.060	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.755	-74.755	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.499	-79.558	-0.060	(0)
S5-2	0.000e+00	0.000e+00	-80.403	-80.642	-0.239	(0)
CdHS+	0.000e+00	0.000e+00	-80.432	-80.492	-0.060	(0)
H2S	0.000e+00	0.000e+00	-80.820	-80.820	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.919	-81.158	-0.239	(0)
S4-2	0.000e+00	0.000e+00	-80.999	-81.238	-0.239	(0)
S3-2	0.000e+00	0.000e+00	-81.805	-82.044	-0.239	(0)
S2-2	0.000e+00	0.000e+00	-82.821	-83.060	-0.239	(0)
S-2	0.000e+00	0.000e+00	-88.377	-88.577	-0.200	(0)
HgHS2-	0.000e+00	0.000e+00	-141.177	-141.237	-0.060	(0)
HgS2-2	0.000e+00	0.000e+00	-141.425	-141.663	-0.239	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-143.124	-143.124	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.607	-148.892	-0.285	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.264	-149.416	-0.151	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.348	-149.622	-0.274	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.154	-150.214	-0.060	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.203	-150.263	-0.060	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.283	-150.574	-0.291	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.606	-150.885	-0.279	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-152.534	-152.534	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.846	-152.846	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.081	-154.081	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.279	-163.279	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.643	-220.703	-0.060	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-228.753	-228.812	-0.060	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.272	-230.511	-0.239	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-230.445	-230.505	-0.060	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.279	-232.339	-0.060	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-240.740	-240.800	-0.060	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-307.628	-307.867	-0.239	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-309.592	-309.831	-0.239	(0)
Sb2S4-2	0.000e+00	0.000e+00	-326.622	-326.861	-0.239	(0)
S (6)	3.200e-03					
SO4-2	2.801e-03	1.745e-03	-2.553	-2.758	-0.205	(0)
MgSO4	1.746e-04	1.746e-04	-3.758	-3.758	0.000	(0)
CaSO4	1.607e-04	1.607e-04	-3.794	-3.794	0.000	(0)
NaSO4-	5.047e-05	4.504e-05	-4.297	-4.346	-0.049	(0)
KSO4-	1.039e-05	9.273e-06	-4.983	-5.033	-0.049	(0)
MnSO4	2.021e-06	2.021e-06	-5.694	-5.694	0.000	(0)
ZnSO4	2.210e-07	2.210e-07	-6.656	-6.656	0.000	(0)
Zn (SO4) 2-2	5.824e-09	3.360e-09	-8.235	-8.474	-0.239	(0)
NiSO4	4.933e-09	4.933e-09	-8.307	-8.307	0.000	(0)
CuSO4	4.731e-09	4.731e-09	-8.325	-8.325	0.000	(0)
CoSO4	3.256e-09	3.256e-09	-8.487	-8.487	0.000	(0)
HSO4-	1.003e-09	8.922e-10	-8.999	-9.050	-0.051	(0)
CdSO4	4.682e-10	4.682e-10	-9.330	-9.330	0.000	(0)
NH4SO4-	1.229e-10	1.095e-10	-9.910	-9.960	-0.050	(0)
PbSO4	4.988e-11	4.988e-11	-10.302	-10.302	0.000	(0)
AgSO4-	3.891e-11	3.391e-11	-10.410	-10.470	-0.060	(0)
Cd (SO4) 2-2	1.911e-11	1.102e-11	-10.719	-10.958	-0.239	(0)
Pb (SO4) 2-2	9.092e-13	5.245e-13	-12.041	-12.280	-0.239	(0)
CrOHSO4	6.129e-13	6.129e-13	-12.213	-12.213	0.000	(0)
Ni (SO4) 2-2	4.942e-13	2.851e-13	-12.306	-12.545	-0.239	(0)
FeSO4	3.311e-14	3.311e-14	-13.480	-13.480	0.000	(0)
UO2SO4	5.654e-15	5.654e-15	-14.248	-14.248	0.000	(0)
AlSO4+	2.796e-16	2.487e-16	-15.553	-15.604	-0.051	(0)
UO2 (SO4) 2-2	2.255e-16	1.301e-16	-15.647	-15.886	-0.239	(0)
CrSO4+	1.644e-16	1.432e-16	-15.784	-15.844	-0.060	(0)
Al (SO4) 2-	5.229e-18	4.650e-18	-17.282	-17.333	-0.051	(0)
VO2SO4-	2.493e-20	2.173e-20	-19.603	-19.663	-0.060	(0)
FeSO4+	4.887e-21	4.354e-21	-20.311	-20.361	-0.050	(0)
Fe (SO4) 2-	1.864e-22	1.625e-22	-21.729	-21.789	-0.060	(0)
Cr2 (OH) 2SO4+2	1.421e-22	8.197e-23	-21.847	-22.086	-0.239	(0)
HgSO4	2.139e-23	2.139e-23	-22.670	-22.670	0.000	(0)
VO4SO4	1.771e-23	1.771e-23	-22.752	-22.752	0.000	(0)

Cr2(OH)2(SO4)2	8.499e-24	8.499e-24	-23.071	-23.071	0.000	(0)
CrO3SO4-2	1.725e-24	9.950e-25	-23.763	-24.002	-0.239	(0)
VSO4+	1.529e-38	1.332e-38	-37.816	-37.875	-0.060	(0)
U(SO4)2	0.000e+00	0.000e+00	-42.577	-42.577	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.480	-43.719	-0.239	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Sb(3)	3.706e-21					
Sb(OH)3	1.874e-21	1.874e-21	-20.727	-20.727	0.000	(0)
HSbO2	1.830e-21	1.830e-21	-20.738	-20.738	0.000	(0)
SbO2-	6.502e-25	5.666e-25	-24.187	-24.247	-0.060	(0)
Sb(OH)4-	3.724e-25	3.246e-25	-24.429	-24.489	-0.060	(0)
Sb(OH)2F	1.546e-27	1.546e-27	-26.811	-26.811	0.000	(0)
SbOF	1.521e-27	1.521e-27	-26.818	-26.818	0.000	(0)
Sb(OH)2+	2.733e-28	2.381e-28	-27.563	-27.623	-0.060	(0)
SbO+	9.423e-29	8.212e-29	-28.026	-28.086	-0.060	(0)
Sb2S4-2	0.000e+00	0.000e+00	-326.622	-326.861	-0.239	(0)
Sb(5)	6.043e-09					
SbO3-	6.036e-09	5.260e-09	-8.219	-8.279	-0.060	(0)
Sb(OH)6-	6.921e-12	6.149e-12	-11.160	-11.211	-0.051	(0)
SbO2+	4.738e-26	4.129e-26	-25.324	-25.384	-0.060	(0)
Se(-2)	3.553e-15					
Ag2Se	3.553e-15	3.553e-15	-14.449	-14.449	0.000	(0)
HSe-	2.760e-40	2.405e-40	-39.559	-39.619	-0.060	(0)
MnSe	0.000e+00	0.000e+00	-41.909	-41.909	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.010	-44.010	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.098	-46.337	-0.239	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.958	-83.914	-0.955	(0)
Se(4)	3.527e-08					
SeO3-2	1.886e-08	1.088e-08	-7.724	-7.963	-0.239	(0)
HSeO3-	1.641e-08	1.430e-08	-7.785	-7.845	-0.060	(0)
H2SeO3	3.191e-14	3.191e-14	-13.496	-13.496	0.000	(0)
AgSeO3-	7.815e-15	6.811e-15	-14.107	-14.167	-0.060	(0)
Cd(SeO3)2-2	1.936e-19	1.117e-19	-18.713	-18.952	-0.239	(0)
Ag(SeO3)2-3	2.288e-21	6.637e-22	-20.641	-21.178	-0.537	(0)
FeHSeO3+2	1.456e-26	8.401e-27	-25.837	-26.076	-0.239	(0)
Se(6)	7.575e-11					
SeO4-2	7.566e-11	4.714e-11	-10.121	-10.327	-0.205	(0)
MnSeO4	8.264e-14	8.264e-14	-13.083	-13.083	0.000	(0)
ZnSeO4	4.227e-15	4.227e-15	-14.374	-14.374	0.000	(0)
NiSeO4	3.124e-16	3.124e-16	-15.505	-15.505	0.000	(0)
CoSeO4	2.209e-16	2.209e-16	-15.656	-15.656	0.000	(0)
HSeO4-	1.418e-17	1.236e-17	-16.848	-16.908	-0.060	(0)
CdSeO4	1.005e-17	1.005e-17	-16.998	-16.998	0.000	(0)
Zn(SeO4)2-2	3.502e-25	2.020e-25	-24.456	-24.695	-0.239	(0)
Si	1.437e-04					
H4SiO4	1.394e-04	1.398e-04	-3.856	-3.855	0.001	(0)
H3SiO4-	4.352e-06	3.863e-06	-5.361	-5.413	-0.052	(0)
H2SiO4-2	7.348e-11	4.660e-11	-10.134	-10.332	-0.198	(0)
UO2H3SiO4+	8.054e-13	7.019e-13	-12.094	-12.154	-0.060	(0)
SiF6-2	2.656e-31	1.674e-31	-30.576	-30.776	-0.200	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-60.311	-60.848	-0.537	(0)
U(4)	6.101e-20					
U(OH)5-	6.100e-20	5.316e-20	-19.215	-19.274	-0.060	(0)
U(OH)4	1.165e-23	1.165e-23	-22.934	-22.934	0.000	(0)
U(OH)3+	2.557e-28	2.228e-28	-27.592	-27.652	-0.060	(0)
U(OH)2+2	9.344e-34	5.391e-34	-33.029	-33.268	-0.239	(0)
UF3+	1.290e-38	1.124e-38	-37.889	-37.949	-0.060	(0)
UF2+2	1.218e-39	7.029e-40	-38.914	-39.153	-0.239	(0)
UOH+3	4.579e-40	1.328e-40	-39.339	-39.877	-0.537	(0)
UF4	1.244e-40	1.244e-40	-39.905	-39.905	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.720	-42.257	-0.537	(0)
UF5-	0.000e+00	0.000e+00	-42.244	-42.303	-0.060	(0)
U(SO4)2	0.000e+00	0.000e+00	-42.577	-42.577	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.480	-43.719	-0.239	(0)
UF6-2	0.000e+00	0.000e+00	-43.580	-43.819	-0.239	(0)
U+4	0.000e+00	0.000e+00	-46.606	-47.561	-0.955	(0)
UC1+3	0.000e+00	0.000e+00	-47.976	-48.513	-0.537	(0)

U6(OH) 15+9	0.000e+00	0.000e+00	-173.464	-178.301	-4.837	(0)
U(5)	4.833e-17					
UO2+	4.833e-17	4.212e-17	-16.316	-16.376	-0.060	(0)
U(6)	6.304e-08					
UO2(CO3) 3-4	4.297e-08	4.761e-09	-7.367	-8.322	-0.955	(0)
UO2(CO3) 2-2	1.999e-08	1.153e-08	-7.699	-7.938	-0.239	(0)
UO2CO3	7.018e-11	7.018e-11	-10.154	-10.154	0.000	(0)
UO2H3SiO4+	8.054e-13	7.019e-13	-12.094	-12.154	-0.060	(0)
UO2OH+	5.950e-13	5.185e-13	-12.225	-12.285	-0.060	(0)
UO2F+	3.421e-14	2.981e-14	-13.466	-13.526	-0.060	(0)
UO2F2	8.677e-15	8.677e-15	-14.062	-14.062	0.000	(0)
UO2SO4	5.654e-15	5.654e-15	-14.248	-14.248	0.000	(0)
UO2+2	3.435e-15	2.140e-15	-14.464	-14.670	-0.205	(0)
UO2F3-	2.524e-16	2.199e-16	-15.598	-15.658	-0.060	(0)
UO2(SO4) 2-2	2.255e-16	1.301e-16	-15.647	-15.886	-0.239	(0)
UO2Cl+	8.873e-18	7.733e-18	-17.052	-17.112	-0.060	(0)
(UO2) 2(OH) 2+2	7.735e-19	4.463e-19	-18.112	-18.350	-0.239	(0)
(UO2) 3(OH) 5+	7.460e-19	6.501e-19	-18.127	-18.187	-0.060	(0)
UO2F4-2	3.056e-19	1.763e-19	-18.515	-18.754	-0.239	(0)
UO2NO3+	1.326e-23	1.156e-23	-22.877	-22.937	-0.060	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.738	-44.798	-0.060	(0)
V+2	0.000e+00	0.000e+00	-46.353	-46.592	-0.239	(0)
V(3)	9.298e-17					
V(OH) 3	9.298e-17	9.298e-17	-16.032	-16.032	0.000	(0)
V(OH) 2+	3.606e-28	3.143e-28	-27.443	-27.503	-0.060	(0)
VOH+2	2.703e-32	1.560e-32	-31.568	-31.807	-0.239	(0)
V+3	5.574e-38	1.617e-38	-37.254	-37.791	-0.537	(0)
VSO4+	1.529e-38	1.332e-38	-37.816	-37.875	-0.060	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-60.320	-60.858	-0.537	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-61.858	-62.814	-0.955	(0)
V(4)	1.634e-20					
V(OH) 3+	1.623e-20	1.415e-20	-19.790	-19.849	-0.060	(0)
VO+2	6.387e-23	3.685e-23	-22.195	-22.434	-0.239	(0)
VOF+	2.559e-23	2.230e-23	-22.592	-22.652	-0.060	(0)
VOSO4	1.771e-23	1.771e-23	-22.752	-22.752	0.000	(0)
VOF2	8.440e-25	8.440e-25	-24.074	-24.074	0.000	(0)
VOCl+	2.643e-25	2.303e-25	-24.578	-24.638	-0.060	(0)
VOF3-	3.467e-27	3.022e-27	-26.460	-26.520	-0.060	(0)
VOF4-2	2.134e-30	1.231e-30	-29.671	-29.910	-0.239	(0)
H2V2O4+2	1.739e-35	1.004e-35	-34.760	-34.998	-0.239	(0)
V(5)	1.890e-09					
H2VO4-	1.095e-09	9.546e-10	-8.960	-9.020	-0.060	(0)
HVO4-2	7.945e-10	4.584e-10	-9.100	-9.339	-0.239	(0)
H3VO4	4.993e-14	4.993e-14	-13.302	-13.302	0.000	(0)
VO4-3	1.514e-15	4.392e-16	-14.820	-15.357	-0.537	(0)
HV2O7-3	5.112e-16	1.483e-16	-15.291	-15.829	-0.537	(0)
H3V2O7-	3.532e-16	3.078e-16	-15.452	-15.512	-0.060	(0)
V2O7-4	6.888e-18	7.631e-19	-17.162	-18.117	-0.955	(0)
VO2+	5.869e-19	5.214e-19	-18.231	-18.283	-0.051	(0)
VO2F	9.228e-20	9.228e-20	-19.035	-19.035	0.000	(0)
VO2SO4-	2.493e-20	2.173e-20	-19.603	-19.663	-0.060	(0)
VO2F2-	3.880e-21	3.381e-21	-20.411	-20.471	-0.060	(0)
V3O9-3	3.142e-21	9.116e-22	-20.503	-21.040	-0.537	(0)
VO2F3-2	7.377e-24	4.256e-24	-23.132	-23.371	-0.239	(0)
V4O12-4	3.275e-27	3.628e-28	-26.485	-27.440	-0.955	(0)
VO2F4-3	7.285e-28	2.113e-28	-27.138	-27.675	-0.537	(0)
VO2NO3	7.138e-28	7.138e-28	-27.146	-27.146	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-72.271	-74.421	-2.150	(0)
HV10O28-5	0.000e+00	0.000e+00	-73.022	-74.515	-1.493	(0)
H2V10O28-4	0.000e+00	0.000e+00	-76.634	-77.589	-0.955	(0)
Zn	1.625e-06					
Zn+2	9.290e-07	5.788e-07	-6.032	-6.237	-0.205	(0)
ZnCO3	2.743e-07	2.743e-07	-6.562	-6.562	0.000	(0)
ZnSO4	2.210e-07	2.210e-07	-6.656	-6.656	0.000	(0)
ZnOH+	1.278e-07	1.114e-07	-6.893	-6.953	-0.060	(0)
Zn(OH) 2	3.398e-08	3.398e-08	-7.469	-7.469	0.000	(0)
ZnHCO3+	1.930e-08	1.682e-08	-7.714	-7.774	-0.060	(0)

ZnOHCl	8.161e-09	8.161e-09	-8.088	-8.088	0.000	(0)
Zn(SO4)2-2	5.824e-09	3.360e-09	-8.235	-8.474	-0.239	(0)
ZnCl+	3.649e-09	3.239e-09	-8.438	-8.490	-0.052	(0)
ZnF+	1.337e-09	1.165e-09	-8.874	-8.934	-0.060	(0)
Zn(OH)3-	3.760e-10	3.277e-10	-9.425	-9.484	-0.060	(0)
ZnCl2	1.144e-11	1.144e-11	-10.942	-10.942	0.000	(0)
Zn(OH)4-2	4.352e-14	2.511e-14	-13.361	-13.600	-0.239	(0)
ZnCl3-	2.280e-14	2.024e-14	-13.642	-13.694	-0.052	(0)
ZnNO3+	4.515e-15	3.935e-15	-14.345	-14.405	-0.060	(0)
ZnSeO4	4.227e-15	4.227e-15	-14.374	-14.374	0.000	(0)
ZnCl4-2	3.576e-17	2.255e-17	-16.447	-16.647	-0.200	(0)
Zn(NO3)2	2.125e-24	2.125e-24	-23.673	-23.673	0.000	(0)
Zn(SeO4)2-2	3.502e-25	2.020e-25	-24.456	-24.695	-0.239	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-150.203	-150.263	-0.060	(0)
Zn(HS)2	0.000e+00	0.000e+00	-152.534	-152.534	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-228.753	-228.812	-0.060	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-230.272	-230.511	-0.239	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-309.592	-309.831	-0.239	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-61.77	-55.48	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-48.16	-43.65	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-55.38	-43.65	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-79.28	-61.35	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-63.63	-43.60	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.54	-30.14	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.24	-26.79	0.45	(NH4)2SeO4
Acanthite	-53.08	-89.30	-36.22	Ag2S
Ag2CO3	-12.02	-23.11	-11.09	Ag2CO3
Ag2CrO4	-20.11	-31.70	-11.59	Ag2CrO4
Ag2HVO4	-12.94	-11.46	1.48	Ag2HVO4
Ag2MoO4	-13.08	-24.63	-11.55	Ag2MoO4
Ag2O	-14.03	-1.46	12.57	Ag2O
Ag2Se	-0.66	-49.36	-48.70	Ag2Se
Ag2SeO3	-10.44	-17.59	-7.15	Ag2SeO3
Ag2SeO4	-19.44	-28.35	-8.91	Ag2SeO4
Ag2SO4	-15.96	-20.78	-4.82	Ag2SO4
Ag3AsO3	-28.04	-25.89	2.16	Ag3AsO3
Ag3AsO4	-16.45	-19.24	-2.79	Ag3AsO4
Ag3H2VO5	-17.37	-12.19	5.18	Ag3H2VO5
AgF:4H2O	-14.06	-13.01	1.05	AgF:4H2O
Agmetal	0.00	-13.50	-13.51	Ag
AgVO3	-11.50	-10.73	0.77	AgVO3
Al(OH)3(am)	-2.69	8.11	10.80	Al(OH)3
Al2(MoO4)3	-55.65	-53.28	2.37	Al2(MoO4)3
Al2O3	-3.44	16.22	19.65	Al2O3
Al4(OH)10SO4	-9.59	13.11	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-13.74	-8.94	4.80	AlAsO4:2H2O
AlOHSO4	-7.98	-11.21	-3.23	AlOHSO4
AlSb	-154.88	-89.25	65.62	AlSb
Alunite	-7.76	-9.16	-1.40	KAl3(SO4)2(OH)6
Anglesite	-5.20	-12.99	-7.79	PbSO4
Anhydrite	-1.79	-6.15	-4.36	CaSO4
Anilite	-55.97	-87.85	-31.88	Cu0.25Cu1.5S
Antlerite	-2.20	6.59	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.03	-94.79	-2.76	As4O6
Artinite	-4.64	4.96	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-40.81	-34.10	6.71	As2O5
Atacamite	-1.05	6.34	7.39	Cu2(OH)3Cl
Azurite	-0.48	-17.39	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.00	8.40	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-19.08	-3.21	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-27.75	5.19	32.94	Ba3(VO4)2:4H2O

BaCrO4	-12.17	-21.84	-9.67	BaCrO4
BaF2	-10.34	-16.16	-5.82	BaF2
BaMoO4	-7.81	-14.77	-6.96	BaMoO4
Barite	-0.94	-10.92	-9.98	BaSO4
BaS	-95.62	-79.44	16.18	BaS
BaSeO3	-9.56	-7.73	1.83	BaSeO3
BaSeO4	-11.03	-18.49	-7.46	BaSeO4
Bianchite	-7.23	-9.00	-1.76	ZnSO4:6H2O
Birnessite	-6.52	11.57	18.09	MnO2
Bixbyite	-1.76	-2.40	-0.64	Mn2O3
BlaubleiI	-56.19	-80.36	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.54	-83.82	-27.28	Cu0.6Cu0.8S
Boehmite	-0.47	8.11	8.58	AlOOH
Breithauptite	-57.35	-75.87	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.54	13.30	16.84	Mg(OH)2
Bunsenite	-3.73	8.71	12.45	NiO
Ca(VO3)2	-12.50	-6.84	5.66	Ca(VO3)2
Ca2V2O7	-11.17	6.33	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.22	6.33	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.90	5.40	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.46	19.50	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.36	19.50	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.20	-155.22	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-10.24	-28.15	-17.91	Hg2Cl2
CaMoO4	-2.05	-10.00	-7.95	CaMoO4
Carnotite	-3.18	-2.95	0.23	KUO2VO4
CaSeO3:2H2O	-5.77	-2.96	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.70	-13.72	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.01	-2.17	9.84	Cd(BO2)2
Cd(OH)2	-6.02	7.62	13.64	Cd(OH)2
Cd(OH)2(am)	-6.11	7.62	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.49	-15.78	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-19.02	3.54	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.24	11.16	28.40	Cd4(OH)6SO4
CdCl2	-13.59	-14.25	-0.66	CdCl2
CdCl2:1H2O	-12.55	-14.25	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.33	-14.25	-1.91	CdCl2:2.5H2O
CdF2	-15.72	-16.93	-1.21	CdF2
Cdmetal(alpha)	-31.44	-17.92	13.51	Cd
Cdmetal(gamma)	-31.54	-17.92	13.62	Cd
CdMoO4	-1.40	-15.55	-14.15	CdMoO4
CdOHCl	-6.85	-3.31	3.54	CdOHCl
CdSb	-76.62	-76.97	-0.35	CdSb
CdSe	-20.08	-40.28	-20.20	CdSe
CdSeO4:2H2O	-17.42	-19.27	-1.85	CdSeO4:2H2O
CdSO4	-11.53	-11.70	-0.17	CdSO4
CdSO4:1H2O	-9.97	-11.70	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.83	-11.70	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.91	-11.66	-9.75	AgCl
Cerrusite	-2.19	-15.32	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-8.05	-10.69	-2.64	CuSO4:5H2O
Chalcedony	-0.30	-3.85	-3.55	SiO2
Chalcocite	-55.81	-90.73	-34.92	Cu2S
Chalcopyrite	-128.32	-163.59	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-54.11	-99.80	-45.69	HgS
Claudetite	-91.72	-94.79	-3.06	As4O6
Clausthalite	-14.47	-41.57	-27.10	PbSe
Co(BO2)2	-28.32	-1.25	27.07	Co(BO2)2
Co(OH)2	-4.56	8.53	13.09	Co(OH)2
Co(OH)3	-8.79	-11.09	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.53	-8.50	13.03	Co3(AsO4)2
Co3O4	-3.16	-13.65	-10.50	Co3O4

CoCl2	-21.60	-13.33	8.27	CoCl2
CoCl2:6H2O	-15.87	-13.33	2.54	CoCl2:6H2O
CoCO3	-3.13	-13.11	-9.98	CoCO3
CoF2	-14.42	-16.02	-1.60	CoF2
CoF3	-46.47	-47.93	-1.46	CoF3
CoFe2O4	18.44	14.92	-3.53	CoFe2O4
CoMoO4	-6.87	-14.63	-7.76	CoMoO4
CoO	-5.05	8.53	13.59	CoO
CoS (alpha)	-71.87	-79.31	-7.44	CoS
CoS (beta)	-68.24	-79.31	-11.07	CoS
CoSe	-23.17	-39.37	-16.20	CoSe
CoSeO3	-8.91	-7.59	1.32	CoSeO3
CoSeO4:6H2O	-16.83	-18.36	-1.53	CoSeO4:6H2O
CoSO4	-13.59	-10.79	2.80	CoSO4
CoSO4:6H2O	-8.32	-10.79	-2.47	CoSO4:6H2O
Cotunnite	-10.76	-15.54	-4.78	PbCl2
Covellite	-56.90	-79.20	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.96	-32.87	14.09	CrCl2
CrCl3	-49.09	-33.98	15.11	CrCl3
CrF3	-26.67	-38.01	-11.34	CrF3
Cristobalite	-0.50	-3.85	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-13.83	-47.67	-33.84	Na3AlF6
Cu (OH) 2	-0.04	8.64	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.94	18.27	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.83	0.42	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.29	-90.17	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.99	-50.79	-45.80	Cu2Se
Cu2SO4	-20.26	-22.21	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.29	-8.19	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.11	-101.70	-42.59	Cu3Sb
Cu3Se2	-26.57	-90.06	-63.49	Cu3Se2
CuCO3	-1.51	-13.01	-11.50	CuCO3
CuCrO4	-16.16	-21.60	-5.44	CuCrO4
CuF	-8.82	-13.72	-4.91	CuF
CuF2	-17.03	-15.92	1.12	CuF2
CuF2:2H2O	-11.37	-15.92	-4.55	CuF2:2H2O
Cumetal	-5.46	-14.22	-8.76	Cu
CuMoO4	-1.45	-14.53	-13.08	CuMoO4
CuOCuSO4	-12.35	-2.05	10.30	CuOCuSO4
Cupricferrite	9.03	15.02	5.99	CuFe2O4
Cuprite	-1.49	-2.89	-1.41	Cu2O
Cuprousferrite	10.66	1.74	-8.92	CuFeO2
CuSe	-6.16	-39.26	-33.10	CuSe
CuSe2	-28.25	-61.62	-33.37	CuSe2
CuSeO3:2H2O	-8.00	-7.49	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.81	-18.25	-2.44	CuSeO4:5H2O
CuSO4	-13.62	-10.69	2.94	CuSO4
Diaspore	1.23	8.11	6.87	AlOOH
Djurleite	-56.05	-89.97	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.28	-16.82	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.27	-16.82	-17.09	CaMg (CO3) 2
Epsomite	-3.89	-6.02	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	2.95	-0.09	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-12.83	-16.55	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-11.30	-9.74	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-21.37	-42.00	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-47.85	-51.58	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-14.26	-13.86	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-9.62	-19.72	-10.09	FeMoO4

Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-48.21	-66.80	-18.60	FeSe2
FeS (ppt)	-81.44	-84.39	-2.95	FeS
FeSe	-33.45	-44.45	-11.00	FeSe
Fix_pe	-4.49	-4.49	0.00	e-
Fluorite	-0.89	-11.39	-10.50	CaF2
Galena	-67.54	-81.51	-13.97	PbS
Gibbsite	-0.18	8.11	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.99	-9.00	-2.01	ZnSO4:7H2O
Greenalite	-18.17	2.64	20.81	Fe3Si2O5 (OH) 4
Greenockite	-65.86	-80.22	-14.36	CdS
Greigite	-296.49	-341.53	-45.03	Fe3S4
Gummite	-5.78	1.89	7.67	UO3
Gypsum	-1.54	-6.15	-4.61	CaSO4:2H2O
H-Jarosite	-16.97	-29.07	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-10.29	-23.17	-12.88	H2MoO4
H2S (g)	-79.83	-87.84	-8.01	H2S
H2Se (g)	-42.94	-47.90	-4.96	H2Se
Halite	-6.57	-4.97	1.60	NaCl
Halloysite	-1.07	8.51	9.57	Al2Si2O5 (OH) 4
Hausmannite	-1.36	59.67	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-3.23	19.67	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.91	-259.61	-73.71	Hg (CH3) 2
Hg (g)	-8.04	-15.91	-7.87	Hg
Hg (OH) 2	-8.46	-11.96	-3.50	Hg (OH) 2
Hg2 (g)	-16.87	-31.83	-14.96	Hg2
Hg2 (OH) 2	-11.54	-6.28	5.26	Hg2 (OH) 2
Hg2CO3	-11.88	-27.93	-16.05	Hg2CO3
Hg2CrO4	-27.82	-36.52	-8.70	Hg2CrO4
Hg2F2	-20.47	-30.84	-10.36	Hg2F2
Hg2S	-82.44	-94.12	-11.68	Hg2S
Hg2SeO3	-17.75	-22.41	-4.66	Hg2SeO3
Hg2SO4	-19.47	-25.60	-6.13	Hg2SO4
Hg3O2CO3	-27.85	-57.53	-29.68	Hg3O2CO3
HgCl (g)	-33.57	-14.07	19.50	HgCl
HgCl2	-12.57	-33.83	-21.26	HgCl2
HgF (g)	-48.09	-15.42	32.68	HgF
HgF2 (g)	-49.08	-36.52	12.57	HgF2
Hgmetal (l)	-2.46	-15.91	-13.45	Hg
HgSe	-4.17	-59.86	-55.69	HgSe
HgSeO3	-15.66	-28.09	-12.43	HgSeO3
HgSO4	-21.86	-31.28	-9.42	HgSO4
Huntite	-3.54	-33.51	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.54	-24.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.31	-20.07	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-20.21	-25.38	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-9.11	-23.91	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.92	-50.16	-17.24	K2Cr2O7
K2CrO4	-19.41	-19.92	-0.51	K2CrO4
K2MoO4	-16.11	-12.85	3.26	K2MoO4
K2SeO4	-15.85	-16.58	-0.73	K2SeO4
Kaolinite	1.07	8.51	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.23	-6.66	-0.43	PbO:PbSO4
Laurionite	-5.23	-4.60	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.37	6.33	12.69	PbO
Mackinawite	-80.79	-84.39	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.83	19.69	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.93	-4.38	-5.31	Cu2 (OH) 2CO3
Manganite	-1.19	24.15	25.34	MnOOH
Massicot	-6.57	6.33	12.89	PbO

Matlockite	-7.91	-16.88	-8.97	PbClF
Melanothallite	-19.49	-13.23	6.26	CuCl2
Melanterite	-13.66	-15.87	-2.21	FeSO4:7H2O
Metacinnabar	-54.71	-99.80	-45.09	HgS
Mg(OH)2 (active)	-5.49	13.30	18.79	Mg(OH)2
Mg(VO3)2	-17.98	-6.70	11.28	Mg(VO3)2
Mg2Sb3	-276.30	-201.62	74.68	Mg2Sb3
Mg2V2O7	-19.76	6.60	26.36	Mg2V2O7
MgCr2O4	-5.26	10.95	16.20	MgCr2O4
MgCrO4	-22.31	-16.93	5.38	MgCrO4
MgF2	-3.12	-11.25	-8.13	MgF2
MgMoO4	-8.01	-9.86	-1.85	MgMoO4
MgSeO3:6H2O	-5.88	-2.82	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-12.39	-13.59	-1.20	MgSeO4:6H2O
Minium	-28.99	44.53	73.52	Pb3O4
Mirabilite	-6.28	-7.40	-1.11	Na2SO4:10H2O
Mn(VO3)2	-13.53	-8.63	4.90	Mn(VO3)2
Mn2(SO4)3	-54.65	-60.36	-5.71	Mn2(SO4)3
Mn2Sb	-148.46	-87.38	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.47	0.03	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.21	-10.49	2.72	MnCl2:4H2O
MnS (grn)	-76.63	-76.46	0.17	MnS
MnS (pnk)	-79.80	-76.46	3.34	MnS
MnSb	-95.65	-98.56	-2.91	MnSb
MnSe	-40.02	-36.52	3.50	MnSe
MnSeO3	-5.88	-4.75	1.13	MnSeO3
MnSeO3:2H2O	-5.73	-4.75	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.46	-15.51	-2.05	MnSeO4:5H2O
MnSO4	-10.53	-7.94	2.58	MnSO4
Monteponite	-7.48	7.62	15.10	CdO
Montroydite	-8.32	-11.96	-3.64	HgO
MoO3	-15.17	-23.17	-8.00	MoO3
Morenosite	-8.46	-10.61	-2.14	NiSO4:7H2O
MoS2	-154.13	-224.39	-70.26	MoS2
Na-Jarosite	-11.91	-23.11	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.65	-48.55	-9.90	Na2Cr2O7
Na2CrO4	-21.24	-18.31	2.93	Na2CrO4
Na2Mo2O7	-17.81	-34.41	-16.60	Na2Mo2O7
Na2MoO4	-12.73	-11.24	1.49	Na2MoO4
Na2MoO4:2H2O	-12.46	-11.24	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.50	-4.20	10.30	Na2SeO3:5H2O
Na2SeO4	-16.24	-14.96	1.28	Na2SeO4
Na3Sb	-173.92	-79.47	94.45	Na3Sb
Na3VO4	-28.79	7.89	36.68	Na3VO4
Na4V2O7	-33.55	3.85	37.40	Na4V2O7
Nantokite	-5.65	-12.38	-6.73	CuCl
NaSb	-89.02	-65.85	23.17	NaSb
Natron	-8.41	-9.72	-1.31	Na2CO3:10H2O
NaVO3	-7.90	-4.04	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-4.08	8.71	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.66	-7.96	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.47	15.53	32.00	Ni4(OH)6SO4
NiCO3	-6.06	-12.93	-6.87	NiCO3
NiMoO4	-3.31	-14.45	-11.14	NiMoO4
NiS (alpha)	-73.53	-79.13	-5.60	NiS
NiS (beta)	-68.03	-79.13	-11.10	NiS
NiS (gamma)	-66.33	-79.13	-12.80	NiS
NiSe	-21.49	-39.19	-17.70	NiSe
NiSeO3:2H2O	-10.23	-7.41	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.66	-18.18	-1.52	NiSeO4:6H2O
Nsutite	-5.93	11.57	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-249.85	-310.91	-61.07	As2S3
Otavite	-2.03	-14.03	-12.00	CdCO3
Pb(BO2)2	-9.98	-3.46	6.52	Pb(BO2)2
Pb(OH)2	-1.82	6.33	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.83	-66.59	-8.76	Pb10(OH)60(CO3)6

Pb2 (OH) 3Cl	-7.07	1.72	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.53	12.66	26.19	Pb2O (OH) 2
Pb2O3	-22.84	38.20	61.04	Pb2O3
Pb2OCO3	-8.43	-8.99	-0.56	Pb2OCO3
Pb2V2O7	-5.45	-7.35	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.91	-15.11	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.16	-1.02	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.68	-2.66	11.02	Pb3O2CO3
Pb3O2SO4	-11.02	-0.33	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.11	5.99	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-15.88	5.99	21.88	Pb4O3SO4
PbCrO4	-11.31	-23.91	-12.60	PbCrO4
PbF2	-10.79	-18.23	-7.44	PbF2
Pbmetal	-23.46	-19.22	4.25	Pb
PbMoO4	-1.22	-16.84	-15.62	PbMoO4
PbO:0.3H2O	-6.65	6.33	12.98	PbO:0.33H2O
PbSeO4	-13.72	-20.56	-6.84	PbSeO4
Periclase	-8.28	13.30	21.58	MgO
Phosgenite	-11.05	-30.86	-19.81	PbCl2:PbCO3
Plattnerite	-17.73	31.87	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-128.18	-146.68	-18.51	FeS2
Pyrochroite	-3.82	11.38	15.19	Mn (OH) 2
Pyrolusite	-4.46	36.92	41.38	MnO2
Quartz	0.15	-3.85	-4.00	SiO2
Realgar	-104.56	-124.31	-19.75	AsS
Retgersite	-8.57	-10.61	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.25	-19.75	-14.50	UO2CO3
Sb (OH) 3	-13.62	-20.73	-7.11	Sb (OH) 3
Sb2O4	-19.31	-15.91	3.40	Sb2O4
Sb2O5	-29.32	-38.98	-9.67	Sb2O5
Sb2Se3	-117.40	-185.15	-67.76	Sb2Se3
Sb4O6(cubic)	-64.65	-82.91	-18.26	Sb4O6
Sb4O6(orth)	-65.01	-82.91	-17.90	Sb4O6
SbCl3	-54.10	-53.53	0.57	SbCl3
SbF3	-47.33	-57.56	-10.23	SbF3
Sbmetal	-47.36	-59.04	-11.69	Sb
SbO2	-4.44	-32.26	-27.82	SbO2
Schoepite	-4.10	1.89	5.99	UO2 (OH) 2:H2O
Semetal (am)	-15.25	-22.36	-7.11	Se
Semetal (hex)	-14.65	-22.36	-7.71	Se
Senarmontite	-29.09	-41.45	-12.37	Sb2O3
SeO2	-16.25	-16.13	0.12	SeO2
SeO3	-47.93	-26.89	21.04	SeO3
Sepiolite	-0.72	15.04	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.74	15.04	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2 (am-gel)	-1.14	-3.85	-2.71	SiO2
SiO2 (am-ppt)	-1.11	-3.85	-2.74	SiO2
Smithsonite	-1.32	-11.32	-10.00	ZnCO3
Sphalerite	-66.06	-77.51	-11.45	ZnS
Spinel	-7.33	29.52	36.85	MgAl2O4
Stibnite	-254.51	-304.97	-50.46	Sb2S3
Sulfur	-60.15	-62.29	-2.14	S
Tenorite	0.99	8.64	7.64	CuO
Thenardite	-7.72	-7.39	0.32	Na2SO4
Thermonatrite	-10.36	-9.72	0.64	Na2CO3:H2O
Tyuyamunite	-7.13	-3.05	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.30	7.78	21.08	U3O8
U3Sb4	-585.13	-432.75	152.38	U3Sb4
U4O9	-29.18	-32.20	-3.02	U4O9
UF4	-34.01	-63.55	-29.54	UF4
UF4:2.5H2O	-30.83	-63.55	-32.72	UF4:2.5H2O
UO2 (am)	-15.37	-14.44	0.93	UO2
UO2 (NO3) 2	-43.95	-31.80	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-36.66	-31.80	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-35.20	-31.81	3.39	UO2 (NO3) 2:3H2O

UO2(NO3)2:6H2O	-33.85	-31.81	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.72	1.89	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.75	-25.00	-2.25	UO2SeO4:4H2O
UO3	-5.81	1.89	7.70	UO3
Uraninite	-9.77	-14.44	-4.67	UO2
USb2	-222.41	-192.83	29.58	USb2
V(OH)3	-20.54	-12.95	7.59	V(OH)3
V2O5	-18.64	-20.00	-1.36	V2O5
V3O5	-44.99	-43.16	1.84	V3O5
V4O7	-56.21	-49.03	7.19	V4O7
V6O13	-50.24	-111.10	-60.86	V6O13
Valentinite	-32.97	-41.45	-8.48	Sb2O3
VC12	-66.46	-47.59	18.87	VC12
VC13	-69.18	-45.75	23.43	VC13
VF4	-69.91	-54.98	14.93	VF4
Vmetal	-95.29	-51.26	44.03	V
VO	-40.48	-25.72	14.76	VO
VO(OH)2	-11.02	-5.87	5.15	VO(OH)2
VO2Cl	-23.78	-20.93	2.84	VO2Cl
VOC1	-35.03	-23.88	11.15	VOC1
VOC12	-40.50	-27.74	12.76	VOC12
VOSO4	-28.80	-25.19	3.61	VOSO4
Witherite	-4.68	-13.25	-8.57	BaCO3
Wurtzite	-68.56	-77.51	-8.95	ZnS
Zincite	-1.01	10.33	11.33	ZnO
Zincosite	-12.93	-9.00	3.93	ZnSO4
Zn(BO2)2	-7.75	0.54	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-26.69	-23.37	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.87	10.33	12.20	Zn(OH)2
Zn(OH)2(am)	-2.15	10.33	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.43	10.33	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.21	10.33	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.41	10.33	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.17	1.33	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.47	9.72	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.78	-3.13	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.58	-7.67	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-6.42	21.98	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-8.74	29.76	38.50	Zn5(OH)8Cl2
ZnCl2	-18.59	-11.54	7.05	ZnCl2
ZnCO3:1H2O	-1.06	-11.32	-10.26	ZnCO3:1H2O
ZnF2	-13.70	-14.23	-0.53	ZnF2
Znmetal	-41.01	-15.22	25.79	Zn
ZnMoO4	-2.72	-12.84	-10.13	ZnMoO4
ZnO(active)	-0.86	10.33	11.19	ZnO
ZnS(am)	-68.46	-77.51	-9.05	ZnS
ZnSb	-85.28	-74.26	11.01	ZnSb
ZnSe	-23.17	-37.57	-14.40	ZnSe
ZnSeO4:6H2O	-15.04	-16.56	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.36	-9.00	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 99.

Title Use solution to allow model output
REACTION 506
H2O -0.0
0 moles
USE solution 515
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 515. Solution after simulation 98.
Using reaction 506.

Reaction 506.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	6.555e-09	6.556e-09
Al	5.669e-07	5.670e-07
As	3.675e-10	3.675e-10
B	1.441e-05	1.442e-05
Ba	1.105e-08	1.105e-08
C	1.081e-03	1.081e-03
Ca	8.194e-04	8.196e-04
Cd	2.867e-09	2.867e-09
Cl	2.508e-03	2.508e-03
Co	2.212e-08	2.212e-08
Cr	6.994e-10	6.996e-10
Cu	7.309e-07	7.310e-07
F	1.214e-04	1.214e-04
Fe	7.454e-10	7.455e-10
Hg	4.519e-10	4.520e-10
K	8.551e-04	8.552e-04
Mg	1.074e-03	1.074e-03
Mn	1.353e-05	1.353e-05
Mo	3.998e-07	3.999e-07
N	3.256e-06	3.256e-06
Na	5.462e-03	5.463e-03
Ni	3.444e-08	3.445e-08
Pb	2.041e-09	2.041e-09
S	3.200e-03	3.200e-03
Sb	6.043e-09	6.044e-09
Se	3.534e-08	3.535e-08
Si	1.437e-04	1.437e-04
U	6.304e-08	6.305e-08
V	1.890e-09	1.890e-09
Zn	1.625e-06	1.625e-06

-----Description of solution-----

pH = 8.281 Charge balance

```

equilibrium
pe = 4.491 Adjusted to redox
Activity of water = 1.000
Ionic strength (mol/kgw) = 1.371e-02
Mass of water (kg) = 1.000e+00
Total alkalinity (eq/kg) = 1.106e-03
Total CO2 (mol/kg) = 1.081e-03
Temperature (°C) = 25.00
Pressure (atm) = 1.00
Electrical balance (eq) = 3.853e-07
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 0
Total H = 1.110335e+02
Total O = 5.553258e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	2.172e-06	1.925e-06	-5.663	-5.716	-0.053	(0)
H+	5.887e-09	5.231e-09	-8.230	-8.281	-0.051	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	6.555e-09					
AgCl	4.430e-09	4.430e-09	-8.354	-8.354	0.000	(0)
Ag+	1.096e-09	9.739e-10	-8.960	-9.011	-0.051	(0)
AgCl2-	9.862e-10	8.595e-10	-9.006	-9.066	-0.060	(0)
AgSO4-	3.891e-11	3.391e-11	-10.410	-10.470	-0.060	(0)
AgCl3-2	2.958e-12	1.707e-12	-11.529	-11.768	-0.239	(0)
AgNO2	5.837e-13	5.837e-13	-12.234	-12.234	0.000	(0)
AgF	2.469e-13	2.469e-13	-12.608	-12.608	0.000	(0)
AgOH	1.874e-13	1.874e-13	-12.727	-12.727	0.000	(0)
AgCl4-3	2.676e-14	7.763e-15	-13.573	-14.110	-0.537	(0)
AgH2BO3	2.188e-14	2.188e-14	-13.660	-13.660	0.000	(0)
AgSeO3-	7.815e-15	6.811e-15	-14.107	-14.167	-0.060	(0)
Ag2Se	3.553e-15	3.553e-15	-14.449	-14.449	0.000	(0)
AgNH3+	1.456e-15	1.269e-15	-14.837	-14.896	-0.060	(0)
Ag (OH) 2-	4.044e-17	3.525e-17	-16.393	-16.453	-0.060	(0)
Ag (NO2) 2-	2.976e-18	2.594e-18	-17.526	-17.586	-0.060	(0)
AgNO3	2.094e-18	2.094e-18	-17.679	-17.679	0.000	(0)
Ag (NH3) 2+	7.557e-21	6.586e-21	-20.122	-20.181	-0.060	(0)
Ag (SeO3) 2-3	2.288e-21	6.637e-22	-20.641	-21.178	-0.537	(0)
Ag2MoO4	8.943e-26	8.943e-26	-25.049	-25.049	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.755	-74.755	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.958	-83.914	-0.955	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.264	-149.416	-0.151	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.154	-150.214	-0.060	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.283	-150.574	-0.291	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.606	-150.885	-0.279	(0)
Al	5.669e-07					
Al (OH) 4-	5.648e-07	5.023e-07	-6.248	-6.299	-0.051	(0)
Al (OH) 3	2.073e-09	2.073e-09	-8.683	-8.683	0.000	(0)
Al (OH) 2+	6.051e-11	5.399e-11	-10.218	-10.268	-0.049	(0)
AlF3	9.452e-13	9.452e-13	-12.024	-12.024	0.000	(0)
AlF2+	8.338e-13	7.440e-13	-12.079	-12.128	-0.049	(0)
AlOH+2	5.570e-14	3.532e-14	-13.254	-13.452	-0.198	(0)
AlF4-	5.375e-14	4.781e-14	-13.270	-13.321	-0.051	(0)
AlF+2	2.920e-14	1.852e-14	-13.535	-13.732	-0.198	(0)
AlSO4+	2.796e-16	2.487e-16	-15.553	-15.604	-0.051	(0)
Al+3	5.321e-17	1.835e-17	-16.274	-16.736	-0.462	(0)
Al (SO4) 2-	5.229e-18	4.650e-18	-17.282	-17.333	-0.051	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-50.516	-51.054	-0.537	(0)
As (3)	2.234e-24					
H3AsO3	2.008e-24	2.008e-24	-23.697	-23.697	0.000	(0)
H2AsO3-	2.259e-25	1.969e-25	-24.646	-24.706	-0.060	(0)
HAsO3-2	5.950e-29	3.433e-29	-28.225	-28.464	-0.239	(0)
H4AsO3+	5.972e-33	5.204e-33	-32.224	-32.284	-0.060	(0)
AsO3-3	8.721e-34	2.530e-34	-33.059	-33.597	-0.537	(0)

As (5)	3.675e-10					
HAsO4-2	3.558e-10	2.053e-10	-9.449	-9.688	-0.239	(0)
H2AsO4-	1.124e-11	9.793e-12	-10.949	-11.009	-0.060	(0)
AsO4-3	4.278e-13	1.241e-13	-12.369	-12.906	-0.537	(0)
H3AsO4	8.874e-18	8.902e-18	-17.052	-17.051	0.001	(0)
B	1.441e-05					
H3BO3	1.273e-05	1.277e-05	-4.895	-4.894	0.001	(0)
H2BO3-	1.607e-06	1.418e-06	-5.794	-5.848	-0.054	(0)
CaH2BO3+	3.718e-08	3.279e-08	-7.430	-7.484	-0.054	(0)
MgH2BO3+	3.063e-08	2.702e-08	-7.514	-7.568	-0.054	(0)
NaH2BO3	1.080e-08	1.080e-08	-7.967	-7.967	0.000	(0)
BF(OH) 3-	5.828e-10	5.141e-10	-9.234	-9.289	-0.054	(0)
H5(BO3) 2-	1.746e-11	1.541e-11	-10.758	-10.812	-0.054	(0)
BaH2BO3+	3.390e-13	2.990e-13	-12.470	-12.524	-0.054	(0)
BF2(OH) 2-	3.290e-14	2.902e-14	-13.483	-13.537	-0.054	(0)
H8(BO3) 3-	2.230e-14	1.967e-14	-13.652	-13.706	-0.054	(0)
AgH2BO3	2.188e-14	2.188e-14	-13.660	-13.660	0.000	(0)
BF3OH-	6.758e-21	5.961e-21	-20.170	-20.225	-0.054	(0)
BF4-	1.756e-26	1.549e-26	-25.756	-25.810	-0.054	(0)
Ba	1.105e-08					
Ba+2	1.095e-08	6.826e-09	-7.960	-8.166	-0.205	(0)
BaHCO3+	6.699e-11	5.990e-11	-10.174	-10.223	-0.049	(0)
BaCO3	2.883e-11	2.883e-11	-10.540	-10.540	0.000	(0)
BaH2BO3+	3.390e-13	2.990e-13	-12.470	-12.524	-0.054	(0)
BaOH+	6.435e-14	5.734e-14	-13.191	-13.242	-0.050	(0)
BaNO3+	1.062e-16	9.259e-17	-15.974	-16.033	-0.060	(0)
BaNH3+2	4.765e-18	2.749e-18	-17.322	-17.561	-0.239	(0)
C (4)	1.081e-03					
HCO3-	1.030e-03	9.190e-04	-2.987	-3.037	-0.049	(0)
CO3-2	1.322e-05	8.237e-06	-4.879	-5.084	-0.205	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CaHCO3+	7.693e-06	6.880e-06	-5.114	-5.162	-0.049	(0)
MgHCO3+	5.824e-06	5.170e-06	-5.235	-5.287	-0.052	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	3.766e-06	3.766e-06	-5.424	-5.424	0.000	(0)
NaHCO3	2.483e-06	2.483e-06	-5.605	-5.605	0.000	(0)
NaCO3-	8.259e-07	7.370e-07	-6.083	-6.133	-0.049	(0)
CuCO3	5.739e-07	5.739e-07	-6.241	-6.241	0.000	(0)
ZnCO3	2.743e-07	2.743e-07	-6.562	-6.562	0.000	(0)
MnHCO3+	1.340e-07	1.194e-07	-6.873	-6.923	-0.050	(0)
UO2(CO3) 3-4	4.297e-08	4.761e-09	-7.367	-8.322	-0.955	(0)
Cu(CO3) 2-2	2.205e-08	1.272e-08	-7.657	-7.895	-0.239	(0)
UO2(CO3) 2-2	1.999e-08	1.153e-08	-7.699	-7.938	-0.239	(0)
ZnHCO3+	1.930e-08	1.682e-08	-7.714	-7.774	-0.060	(0)
NiCO3	4.353e-09	4.353e-09	-8.361	-8.361	0.000	(0)
NiHCO3+	1.842e-09	1.605e-09	-8.735	-8.795	-0.060	(0)
PbCO3	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)
CoCO3	1.302e-09	1.302e-09	-8.885	-8.885	0.000	(0)
CuHCO3+	7.872e-10	6.861e-10	-9.104	-9.164	-0.060	(0)
CoHCO3+	7.670e-10	6.684e-10	-9.115	-9.175	-0.060	(0)
CdCO3	2.148e-10	2.148e-10	-9.668	-9.668	0.000	(0)
UO2CO3	7.018e-11	7.018e-11	-10.154	-10.154	0.000	(0)
BaHCO3+	6.699e-11	5.990e-11	-10.174	-10.223	-0.049	(0)
Pb(CO3) 2-2	5.948e-11	3.432e-11	-10.226	-10.464	-0.239	(0)
PbHCO3+	4.571e-11	3.984e-11	-10.340	-10.400	-0.060	(0)
BaCO3	2.883e-11	2.883e-11	-10.540	-10.540	0.000	(0)
CdHCO3+	2.747e-12	2.394e-12	-11.561	-11.621	-0.060	(0)
Cd(CO3) 2-2	2.274e-12	1.312e-12	-11.643	-11.882	-0.239	(0)
FeHCO3+	9.998e-16	8.941e-16	-15.000	-15.049	-0.049	(0)
HgCO3	4.615e-16	4.615e-16	-15.336	-15.336	0.000	(0)
Hg(CO3) 2-2	2.083e-17	1.202e-17	-16.681	-16.920	-0.239	(0)
HgHCO3+	5.158e-20	4.495e-20	-19.288	-19.347	-0.060	(0)
Ca	8.194e-04					
Ca+2	6.452e-04	4.020e-04	-3.190	-3.396	-0.205	(0)
CaSO4	1.607e-04	1.607e-04	-3.794	-3.794	0.000	(0)
CaHCO3+	7.693e-06	6.880e-06	-5.114	-5.162	-0.049	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	4.969e-07	4.428e-07	-6.304	-6.354	-0.050	(0)

	CaH ₂ BO ₃ +	3.718e-08	3.279e-08	-7.430	-7.484	-0.054	(0)
	CaOH+	1.726e-08	1.544e-08	-7.763	-7.811	-0.049	(0)
	CaNO ₃ +	3.948e-12	3.441e-12	-11.404	-11.463	-0.060	(0)
	CaNH ₃ +2	5.600e-13	3.231e-13	-12.252	-12.491	-0.239	(0)
	Ca (NH ₃) 2+2	1.423e-22	8.211e-23	-21.847	-22.086	-0.239	(0)
Cd	2.867e-09						
	Cd+2	1.836e-09	1.144e-09	-8.736	-8.941	-0.205	(0)
	CdSO ₄	4.682e-10	4.682e-10	-9.330	-9.330	0.000	(0)
	CdCl+	2.793e-10	2.435e-10	-9.554	-9.614	-0.060	(0)
	CdCO ₃	2.148e-10	2.148e-10	-9.668	-9.668	0.000	(0)
	CdOH+	2.007e-11	1.749e-11	-10.697	-10.757	-0.060	(0)
	CdOHC1	1.922e-11	1.922e-11	-10.716	-10.716	0.000	(0)
	Cd (SO ₄) 2-2	1.911e-11	1.102e-11	-10.719	-10.958	-0.239	(0)
	CdHCO ₃ +	2.747e-12	2.394e-12	-11.561	-11.621	-0.060	(0)
	Cd (CO ₃) 2-2	2.274e-12	1.312e-12	-11.643	-11.882	-0.239	(0)
	CdCl ₂	2.261e-12	2.261e-12	-11.646	-11.646	0.000	(0)
	CdF+	2.100e-12	1.830e-12	-11.678	-11.738	-0.060	(0)
	Cd (OH) 2	2.124e-13	2.124e-13	-12.673	-12.673	0.000	(0)
	CdCl ₃ -	3.647e-15	3.178e-15	-14.438	-14.498	-0.060	(0)
	CdF ₂	3.685e-16	3.685e-16	-15.434	-15.434	0.000	(0)
	Cd (OH) 3-	2.866e-17	2.497e-17	-16.543	-16.603	-0.060	(0)
	CdNO ₃ +	1.124e-17	9.794e-18	-16.949	-17.009	-0.060	(0)
	CdSeO ₄	1.005e-17	1.005e-17	-16.998	-16.998	0.000	(0)
	Cd2OH+3	3.458e-19	1.003e-19	-18.461	-18.999	-0.537	(0)
	Cd (SeO ₃) 2-2	1.936e-19	1.117e-19	-18.713	-18.952	-0.239	(0)
	Cd (OH) 4-2	1.364e-23	7.867e-24	-22.865	-23.104	-0.239	(0)
	Cd (NO ₃) 2	1.328e-26	1.328e-26	-25.877	-25.877	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-80.432	-80.492	-0.060	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-152.846	-152.846	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-230.445	-230.505	-0.060	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-307.628	-307.867	-0.239	(0)
Cl	2.508e-03						
	Cl-	2.507e-03	2.228e-03	-2.601	-2.652	-0.051	(0)
	MnCl+	2.050e-08	1.826e-08	-7.688	-7.738	-0.050	(0)
	ZnOHC1	8.161e-09	8.161e-09	-8.088	-8.088	0.000	(0)
	AgCl	4.430e-09	4.430e-09	-8.354	-8.354	0.000	(0)
	ZnCl+	3.649e-09	3.239e-09	-8.438	-8.490	-0.052	(0)
	AgCl ₂ -	9.862e-10	8.595e-10	-9.006	-9.066	-0.060	(0)
	CuCl	5.248e-10	5.248e-10	-9.280	-9.280	0.000	(0)
	CdCl+	2.793e-10	2.435e-10	-9.554	-9.614	-0.060	(0)
	CuCl ₂ -	2.752e-10	2.442e-10	-9.560	-9.612	-0.052	(0)
	NiCl+	9.265e-11	8.075e-11	-10.033	-10.093	-0.060	(0)
	CoCl+	8.269e-11	7.206e-11	-10.083	-10.142	-0.060	(0)
	MnCl ₂	5.748e-11	5.748e-11	-10.241	-10.241	0.000	(0)
	CuCl+	4.706e-11	4.178e-11	-10.327	-10.379	-0.052	(0)
	CdOHC1	1.922e-11	1.922e-11	-10.716	-10.716	0.000	(0)
	ZnCl ₂	1.144e-11	1.144e-11	-10.942	-10.942	0.000	(0)
	PbCl+	5.292e-12	4.612e-12	-11.276	-11.336	-0.060	(0)
	AgCl ₃ -2	2.958e-12	1.707e-12	-11.529	-11.768	-0.239	(0)
	CdCl ₂	2.261e-12	2.261e-12	-11.646	-11.646	0.000	(0)
	HgClOH	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
	CuCl ₃ -2	1.845e-13	1.163e-13	-12.734	-12.934	-0.200	(0)
	PbCl ₂	4.589e-14	4.589e-14	-13.338	-13.338	0.000	(0)
	MnCl ₃ -	3.958e-14	3.527e-14	-13.403	-13.453	-0.050	(0)
	CuCl ₂	3.227e-14	3.227e-14	-13.491	-13.491	0.000	(0)
	AgCl ₄ -3	2.676e-14	7.763e-15	-13.573	-14.110	-0.537	(0)
	HgCl ₂	2.324e-14	2.324e-14	-13.634	-13.634	0.000	(0)
	ZnCl ₃ -	2.280e-14	2.024e-14	-13.642	-13.694	-0.052	(0)
	CdCl ₃ -	3.647e-15	3.178e-15	-14.438	-14.498	-0.060	(0)
	NiCl ₂	9.058e-16	9.058e-16	-15.043	-15.043	0.000	(0)
	HgCl ₃ -	5.940e-16	5.177e-16	-15.226	-15.286	-0.060	(0)
	PbCl ₃ -	4.670e-17	4.070e-17	-16.331	-16.390	-0.060	(0)
	ZnCl ₄ -2	3.576e-17	2.255e-17	-16.447	-16.647	-0.200	(0)
	UO ₂ Cl+	8.873e-18	7.733e-18	-17.052	-17.112	-0.060	(0)
	HgCl ₄ -2	7.958e-18	4.591e-18	-17.099	-17.338	-0.239	(0)
	HgCl+	2.388e-18	2.081e-18	-17.622	-17.682	-0.060	(0)
	CuCl ₃ -	7.559e-19	6.709e-19	-18.122	-18.173	-0.052	(0)
	CrCl+2	1.756e-19	1.013e-19	-18.755	-18.994	-0.239	(0)

PbCl4-2	7.184e-20	4.145e-20	-19.144	-19.382	-0.239	(0)
CrOHC12	8.258e-21	8.258e-21	-20.083	-20.083	0.000	(0)
CrCl2+	2.458e-23	2.142e-23	-22.609	-22.669	-0.060	(0)
FeCl+2	2.373e-23	1.496e-23	-22.625	-22.825	-0.200	(0)
CuCl4-2	1.188e-23	7.492e-24	-22.925	-23.125	-0.200	(0)
VOCl+	2.643e-25	2.303e-25	-24.578	-24.638	-0.060	(0)
FeCl2+	1.671e-25	1.489e-25	-24.777	-24.827	-0.050	(0)
CrO3Cl-	3.009e-26	2.623e-26	-25.522	-25.581	-0.060	(0)
FeCl3	3.316e-29	3.316e-29	-28.479	-28.479	0.000	(0)
CoCl+2	9.058e-37	5.226e-37	-36.043	-36.282	-0.239	(0)
UCl+3	0.000e+00	0.000e+00	-47.976	-48.513	-0.537	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
Co (2)	2.212e-08					
Co+2	1.621e-08	9.350e-09	-7.790	-8.029	-0.239	(0)
CoSO4	3.256e-09	3.256e-09	-8.487	-8.487	0.000	(0)
CoCO3	1.302e-09	1.302e-09	-8.885	-8.885	0.000	(0)
CoHCO3+	7.670e-10	6.684e-10	-9.115	-9.175	-0.060	(0)
CoOH+	4.120e-10	3.590e-10	-9.385	-9.445	-0.060	(0)
CoCl+	8.269e-11	7.206e-11	-10.083	-10.142	-0.060	(0)
Co (OH) 2	5.489e-11	5.489e-11	-10.261	-10.261	0.000	(0)
CoF+	3.424e-11	2.984e-11	-10.466	-10.525	-0.060	(0)
CoNO2+	2.169e-13	1.890e-13	-12.664	-12.723	-0.060	(0)
Co (OH) 3-	2.418e-15	2.108e-15	-14.616	-14.676	-0.060	(0)
Co (NH3) +2	1.244e-15	7.176e-16	-14.905	-15.144	-0.239	(0)
CoOOH-	6.069e-16	5.289e-16	-15.217	-15.277	-0.060	(0)
CoSeO4	2.209e-16	2.209e-16	-15.656	-15.656	0.000	(0)
CoNO3+	4.602e-17	4.011e-17	-16.337	-16.397	-0.060	(0)
Co2OH+3	5.800e-19	1.683e-19	-18.237	-18.774	-0.537	(0)
Co (OH) 4-2	1.114e-21	6.429e-22	-20.953	-21.192	-0.239	(0)
Co (NH3) 2+2	3.387e-23	1.954e-23	-22.470	-22.709	-0.239	(0)
Co (NO3) 2	2.209e-25	2.209e-25	-24.656	-24.656	0.000	(0)
Co4 (OH) 4+4	2.993e-29	3.316e-30	-28.524	-29.479	-0.955	(0)
Co (NH3) 3+2	2.722e-31	1.571e-31	-30.565	-30.804	-0.239	(0)
Co (NH3) 4+2	9.120e-40	5.262e-40	-39.040	-39.279	-0.239	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-48.015	-48.254	-0.239	(0)
Co (3)	1.954e-29					
CoOH+2	1.954e-29	1.128e-29	-28.709	-28.948	-0.239	(0)
Co+3	3.342e-36	1.153e-36	-35.476	-35.938	-0.462	(0)
CoCl+2	9.058e-37	5.226e-37	-36.043	-36.282	-0.239	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-70.838	-71.077	-0.239	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
Cr (2)	4.699e-28					
Cr+2	4.699e-28	2.711e-28	-27.328	-27.567	-0.239	(0)
Cr (3)	6.994e-10					
Cr (OH) 2+	3.976e-10	3.465e-10	-9.401	-9.460	-0.060	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.610e-11	2.275e-11	-10.583	-10.643	-0.060	(0)
Cr (OH) 4-	2.202e-11	1.919e-11	-10.657	-10.717	-0.060	(0)
Cr (OH) +2	2.565e-12	1.480e-12	-11.591	-11.830	-0.239	(0)
CrOHSO4	6.129e-13	6.129e-13	-12.213	-12.213	0.000	(0)
CrF+2	9.743e-16	5.621e-16	-15.011	-15.250	-0.239	(0)
CrSO4+	1.644e-16	1.432e-16	-15.784	-15.844	-0.060	(0)
Cr+3	1.212e-16	3.515e-17	-15.917	-16.454	-0.537	(0)
CrCl+2	1.756e-19	1.013e-19	-18.755	-18.994	-0.239	(0)
CrOHC12	8.258e-21	8.258e-21	-20.083	-20.083	0.000	(0)
Cr2 (OH) 2SO4+2	1.421e-22	8.197e-23	-21.847	-22.086	-0.239	(0)
CrCl2+	2.458e-23	2.142e-23	-22.609	-22.669	-0.060	(0)
Cr2 (OH) 2 (SO4) 2	8.499e-24	8.499e-24	-23.071	-23.071	0.000	(0)
CrNO3+2	7.207e-27	4.158e-27	-26.142	-26.381	-0.239	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-47.533	-47.772	-0.239	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.086	-58.624	-0.537	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
Cr (6)	3.498e-14					
CrO4-2	3.392e-14	2.113e-14	-13.470	-13.675	-0.205	(0)

NaCrO4-	5.791e-16	5.047e-16	-15.237	-15.297	-0.060	(0)
HCrO4-	4.105e-16	3.577e-16	-15.387	-15.446	-0.060	(0)
KCrO4-	6.762e-17	5.893e-17	-16.170	-16.230	-0.060	(0)
CrO3SO4-2	1.725e-24	9.950e-25	-23.763	-24.002	-0.239	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	3.009e-26	2.623e-26	-25.522	-25.581	-0.060	(0)
Cr2O7-2	7.693e-30	4.439e-30	-29.114	-29.353	-0.239	(0)
Cu (1)	1.015e-09					
CuCl	5.248e-10	5.248e-10	-9.280	-9.280	0.000	(0)
CuCl2-	2.752e-10	2.442e-10	-9.560	-9.612	-0.052	(0)
Cu+	2.147e-10	1.871e-10	-9.668	-9.728	-0.060	(0)
CuCl3-2	1.845e-13	1.163e-13	-12.734	-12.934	-0.200	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.607	-148.892	-0.285	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.348	-149.622	-0.274	(0)
Cu (2)	7.299e-07					
CuCO3	5.739e-07	5.739e-07	-6.241	-6.241	0.000	(0)
CuOH+	8.112e-08	7.201e-08	-7.091	-7.143	-0.052	(0)
Cu (OH) 2	2.765e-08	2.765e-08	-7.558	-7.558	0.000	(0)
Cu (CO3) 2-2	2.205e-08	1.272e-08	-7.657	-7.895	-0.239	(0)
Cu+2	1.899e-08	1.183e-08	-7.722	-7.927	-0.205	(0)
CuSO4	4.731e-09	4.731e-09	-8.325	-8.325	0.000	(0)
CuHCO3+	7.872e-10	6.861e-10	-9.104	-9.164	-0.060	(0)
Cu2 (OH) 2+2	2.257e-10	1.302e-10	-9.646	-9.885	-0.239	(0)
Cu (OH) 3-	1.252e-10	1.091e-10	-9.902	-9.962	-0.060	(0)
CuF+	8.644e-11	7.533e-11	-10.063	-10.123	-0.060	(0)
CuCl+	4.706e-11	4.178e-11	-10.327	-10.379	-0.052	(0)
CuNO2+	4.078e-12	3.554e-12	-11.390	-11.449	-0.060	(0)
CuNH3+2	1.340e-13	7.729e-14	-12.873	-13.112	-0.239	(0)
CuCl2	3.227e-14	3.227e-14	-13.491	-13.491	0.000	(0)
Cu (OH) 4-2	2.865e-15	1.653e-15	-14.543	-14.782	-0.239	(0)
CuNO3+	1.162e-16	1.013e-16	-15.935	-15.995	-0.060	(0)
Cu (NO2) 2	1.043e-16	1.043e-16	-15.982	-15.982	0.000	(0)
CuCl3-	7.559e-19	6.709e-19	-18.122	-18.173	-0.052	(0)
CuCl4-2	1.188e-23	7.492e-24	-22.925	-23.125	-0.200	(0)
Cu (NO3) 2	3.450e-26	3.450e-26	-25.462	-25.462	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.643	-220.703	-0.060	(0)
F	1.214e-04					
F-	1.136e-04	1.009e-04	-3.945	-3.996	-0.051	(0)
MgF+	6.999e-06	6.225e-06	-5.155	-5.206	-0.051	(0)
CaF+	4.969e-07	4.428e-07	-6.304	-6.354	-0.050	(0)
NaF	3.059e-07	3.059e-07	-6.514	-6.514	0.000	(0)
MnF+	2.936e-08	2.616e-08	-7.532	-7.582	-0.050	(0)
ZnF+	1.337e-09	1.165e-09	-8.874	-8.934	-0.060	(0)
HF	7.808e-10	7.808e-10	-9.107	-9.107	0.000	(0)
BF (OH) 3-	5.828e-10	5.141e-10	-9.234	-9.289	-0.054	(0)
CuF+	8.644e-11	7.533e-11	-10.063	-10.123	-0.060	(0)
NiF+	4.120e-11	3.591e-11	-10.385	-10.445	-0.060	(0)
CoF+	3.424e-11	2.984e-11	-10.466	-10.525	-0.060	(0)
CdF+	2.100e-12	1.830e-12	-11.678	-11.738	-0.060	(0)
AlF3	9.452e-13	9.452e-13	-12.024	-12.024	0.000	(0)
AlF2+	8.338e-13	7.440e-13	-12.079	-12.128	-0.049	(0)
PbF+	4.761e-13	4.149e-13	-12.322	-12.382	-0.060	(0)
HF2-	3.381e-13	2.995e-13	-12.471	-12.524	-0.053	(0)
AgF	2.469e-13	2.469e-13	-12.608	-12.608	0.000	(0)
AlF4-	5.375e-14	4.781e-14	-13.270	-13.321	-0.051	(0)
UO2F+	3.421e-14	2.981e-14	-13.466	-13.526	-0.060	(0)
BF2 (OH) 2-	3.290e-14	2.902e-14	-13.483	-13.537	-0.054	(0)
AlF+2	2.920e-14	1.852e-14	-13.535	-13.732	-0.198	(0)
UO2F2	8.677e-15	8.677e-15	-14.062	-14.062	0.000	(0)
CrF+2	9.743e-16	5.621e-16	-15.011	-15.250	-0.239	(0)
PbF2	8.239e-16	8.239e-16	-15.084	-15.084	0.000	(0)
CdF2	3.685e-16	3.685e-16	-15.434	-15.434	0.000	(0)
UO2F3-	2.524e-16	2.199e-16	-15.598	-15.658	-0.060	(0)
H2F2	1.633e-18	1.633e-18	-17.787	-17.787	0.000	(0)
UO2F4-2	3.056e-19	1.763e-19	-18.515	-18.754	-0.239	(0)
PbF3-	1.809e-19	1.577e-19	-18.742	-18.802	-0.060	(0)
VO2F	9.228e-20	9.228e-20	-19.035	-19.035	0.000	(0)
FeF2+	7.456e-20	6.644e-20	-19.127	-19.178	-0.050	(0)

FeF+2	3.902e-20	2.460e-20	-19.409	-19.609	-0.200	(0)
FeF3	9.460e-21	9.460e-21	-20.024	-20.024	0.000	(0)
BF3OH-	6.758e-21	5.961e-21	-20.170	-20.225	-0.054	(0)
VO2F2-	3.880e-21	3.381e-21	-20.411	-20.471	-0.060	(0)
VOF+	2.559e-23	2.230e-23	-22.592	-22.652	-0.060	(0)
PbF4-2	1.320e-23	7.617e-24	-22.879	-23.118	-0.239	(0)
VO2F3-2	7.377e-24	4.256e-24	-23.132	-23.371	-0.239	(0)
VOF2	8.440e-25	8.440e-25	-24.074	-24.074	0.000	(0)
HgF+	2.009e-25	1.751e-25	-24.697	-24.757	-0.060	(0)
BF4-	1.756e-26	1.549e-26	-25.756	-25.810	-0.054	(0)
VOF3-	3.467e-27	3.022e-27	-26.460	-26.520	-0.060	(0)
Sb(OH) 2F	1.546e-27	1.546e-27	-26.811	-26.811	0.000	(0)
SbOF	1.521e-27	1.521e-27	-26.818	-26.818	0.000	(0)
VO2F4-3	7.285e-28	2.113e-28	-27.138	-27.675	-0.537	(0)
VOF4-2	2.134e-30	1.231e-30	-29.671	-29.910	-0.239	(0)
SiF6-2	2.656e-31	1.674e-31	-30.576	-30.776	-0.200	(0)
UF3+	1.290e-38	1.124e-38	-37.889	-37.949	-0.060	(0)
UF2+2	1.218e-39	7.029e-40	-38.914	-39.153	-0.239	(0)
UF4	1.244e-40	1.244e-40	-39.905	-39.905	0.000	(0)
UF+3	0.000e+00	0.000e+00	-41.720	-42.257	-0.537	(0)
UF5-	0.000e+00	0.000e+00	-42.244	-42.303	-0.060	(0)
UF6-2	0.000e+00	0.000e+00	-43.580	-43.819	-0.239	(0)
Fe (2)	1.747e-13					
Fe+2	1.339e-13	7.728e-14	-12.873	-13.112	-0.239	(0)
FeSO4	3.311e-14	3.311e-14	-13.480	-13.480	0.000	(0)
FeOH+	6.645e-15	5.921e-15	-14.178	-14.228	-0.050	(0)
FeHCO3+	9.998e-16	8.941e-16	-15.000	-15.049	-0.049	(0)
Fe (OH) 2	9.051e-18	9.051e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	6.182e-18	5.508e-18	-17.209	-17.259	-0.050	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.279	-163.279	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-240.740	-240.800	-0.060	(0)
Fe (3)	7.452e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.318e-10	2.069e-10	-9.635	-9.684	-0.049	(0)
Fe (OH) 4-	8.586e-11	7.662e-11	-10.066	-10.116	-0.049	(0)
FeOH+2	4.382e-16	2.763e-16	-15.358	-15.559	-0.200	(0)
FeF2+	7.456e-20	6.644e-20	-19.127	-19.178	-0.050	(0)
FeF+2	3.902e-20	2.460e-20	-19.409	-19.609	-0.200	(0)
FeF3	9.460e-21	9.460e-21	-20.024	-20.024	0.000	(0)
FeSO4+	4.887e-21	4.354e-21	-20.311	-20.361	-0.050	(0)
Fe+3	6.446e-22	2.224e-22	-21.191	-21.653	-0.462	(0)
Fe (SO4) 2-	1.864e-22	1.625e-22	-21.729	-21.789	-0.060	(0)
FeCl+2	2.373e-23	1.496e-23	-22.625	-22.825	-0.200	(0)
FeCl2+	1.671e-25	1.489e-25	-24.777	-24.827	-0.050	(0)
FeHSeO3+2	1.456e-26	8.401e-27	-25.837	-26.076	-0.239	(0)
FeCl3	3.316e-29	3.316e-29	-28.479	-28.479	0.000	(0)
Fe2 (OH) 2+4	2.281e-29	2.528e-30	-28.642	-29.597	-0.955	(0)
FeNO3+2	1.043e-29	6.018e-30	-28.982	-29.221	-0.239	(0)
Fe3 (OH) 4+5	2.351e-37	7.558e-39	-36.629	-38.122	-1.493	(0)
H (0)	4.026e-29					
H2	2.013e-29	2.019e-29	-28.696	-28.695	0.001	(0)
Hg (0)	4.505e-10					
Hg	4.505e-10	4.505e-10	-9.346	-9.346	0.000	(0)
Hg (1)	4.963e-23					
Hg2+2	2.482e-23	1.432e-23	-22.605	-22.844	-0.239	(0)
Hg (2)	1.469e-12					
Hg (OH) 2	1.091e-12	1.094e-12	-11.962	-11.961	0.001	(0)
HgClOH	3.545e-13	3.545e-13	-12.450	-12.450	0.000	(0)
HgCl2	2.324e-14	2.324e-14	-13.634	-13.634	0.000	(0)
HgCl3-	5.940e-16	5.177e-16	-15.226	-15.286	-0.060	(0)
HgCO3	4.615e-16	4.615e-16	-15.336	-15.336	0.000	(0)
Hg (CO3) 2-2	2.083e-17	1.202e-17	-16.681	-16.920	-0.239	(0)
HgCl4-2	7.958e-18	4.591e-18	-17.099	-17.338	-0.239	(0)
HgOH+	4.116e-18	3.587e-18	-17.386	-17.445	-0.060	(0)
HgCl+	2.388e-18	2.081e-18	-17.622	-17.682	-0.060	(0)
Hg (OH) 3-	3.042e-19	2.651e-19	-18.517	-18.577	-0.060	(0)
HgHCO3+	5.158e-20	4.495e-20	-19.288	-19.347	-0.060	(0)
Hg+2	8.115e-23	4.682e-23	-22.091	-22.330	-0.239	(0)

	HgNH3+2	3.269e-23	1.886e-23	-22.486	-22.725	-0.239	(0)
	HgSO4	2.139e-23	2.139e-23	-22.670	-22.670	0.000	(0)
	Hg (NH3) 2+2	2.087e-23	1.204e-23	-22.681	-22.919	-0.239	(0)
	HgF+	2.009e-25	1.751e-25	-24.697	-24.757	-0.060	(0)
	HgNO3+	5.368e-32	4.679e-32	-31.270	-31.330	-0.060	(0)
	Hg (NH3) 3+2	5.303e-32	3.059e-32	-31.276	-31.514	-0.239	(0)
	Hg (NH3) 4+2	2.689e-40	1.551e-40	-39.570	-39.809	-0.239	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.279	-40.279	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-141.177	-141.237	-0.060	(0)
	HgS2-2	0.000e+00	0.000e+00	-141.425	-141.663	-0.239	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-143.124	-143.124	0.000	(0)
K		8.551e-04					
	K+	8.447e-04	7.505e-04	-3.073	-3.125	-0.051	(0)
	KSO4-	1.039e-05	9.273e-06	-4.983	-5.033	-0.049	(0)
	KCrO4-	6.762e-17	5.893e-17	-16.170	-16.230	-0.060	(0)
Mg		1.074e-03					
	Mg+2	8.823e-04	5.498e-04	-3.054	-3.260	-0.205	(0)
	MgSO4	1.746e-04	1.746e-04	-3.758	-3.758	0.000	(0)
	MgF+	6.999e-06	6.225e-06	-5.155	-5.206	-0.051	(0)
	MgHCO3+	5.824e-06	5.170e-06	-5.235	-5.287	-0.052	(0)
	MgCO3	3.766e-06	3.766e-06	-5.424	-5.424	0.000	(0)
	MgOH+	4.702e-07	4.212e-07	-6.328	-6.376	-0.048	(0)
	MgH2BO3+	3.063e-08	2.702e-08	-7.514	-7.568	-0.054	(0)
Mn (2)		1.353e-05					
	Mn+2	1.129e-05	6.512e-06	-4.947	-5.186	-0.239	(0)
	MnSO4	2.021e-06	2.021e-06	-5.694	-5.694	0.000	(0)
	MnHCO3+	1.340e-07	1.194e-07	-6.873	-6.923	-0.050	(0)
	MnOH+	3.533e-08	3.148e-08	-7.452	-7.502	-0.050	(0)
	MnF+	2.936e-08	2.616e-08	-7.532	-7.582	-0.050	(0)
	MnCl+	2.050e-08	1.826e-08	-7.688	-7.738	-0.050	(0)
	MnCl2	5.748e-11	5.748e-11	-10.241	-10.241	0.000	(0)
	MnSeO4	8.264e-14	8.264e-14	-13.083	-13.083	0.000	(0)
	MnCl3-	3.958e-14	3.527e-14	-13.403	-13.453	-0.050	(0)
	MnNO3+	3.205e-14	2.793e-14	-13.494	-13.554	-0.060	(0)
	Mn (OH) 3-	8.087e-16	7.206e-16	-15.092	-15.142	-0.050	(0)
	Mn (OH) 4-2	7.102e-21	4.477e-21	-20.149	-20.349	-0.200	(0)
	Mn (NO3) 2	1.899e-22	1.899e-22	-21.721	-21.721	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.909	-41.909	0.000	(0)
Mn (3)		2.612e-26					
	Mn+3	2.612e-26	9.010e-27	-25.583	-26.045	-0.462	(0)
Mn (6)		6.412e-40					
	MnO4-2	6.412e-40	4.042e-40	-39.193	-39.393	-0.200	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.221	-44.274	-0.054	(0)
Mo		3.998e-07					
	MoO4-2	3.998e-07	2.491e-07	-6.398	-6.604	-0.205	(0)
	HMoO4-	2.975e-11	2.593e-11	-10.527	-10.586	-0.060	(0)
	H2MoO4	9.934e-16	9.934e-16	-15.003	-15.003	0.000	(0)
	Ag2MoO4	8.943e-26	8.943e-26	-25.049	-25.049	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-50.516	-51.054	-0.537	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-57.336	-59.486	-2.150	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-59.888	-61.381	-1.493	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-63.925	-64.880	-0.955	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-69.378	-69.916	-0.537	(0)
N (-3)		7.401e-09					
	NH4+	6.639e-09	5.857e-09	-8.178	-8.232	-0.054	(0)
	NH3	6.384e-10	6.384e-10	-9.195	-9.195	0.000	(0)
	NH4SO4-	1.229e-10	1.095e-10	-9.910	-9.960	-0.050	(0)
	CaNH3+2	5.600e-13	3.231e-13	-12.252	-12.491	-0.239	(0)
	CuNH3+2	1.340e-13	7.729e-14	-12.873	-13.112	-0.239	(0)
	NiNH3+2	8.418e-15	4.857e-15	-14.075	-14.314	-0.239	(0)
	AgNH3+	1.456e-15	1.269e-15	-14.837	-14.896	-0.060	(0)
	Co (NH3) +2	1.244e-15	7.176e-16	-14.905	-15.144	-0.239	(0)
	BaNH3+2	4.765e-18	2.749e-18	-17.322	-17.561	-0.239	(0)
	Ag (NH3) 2+	7.557e-21	6.586e-21	-20.122	-20.181	-0.060	(0)
	Ni (NH3) 2+2	7.767e-22	4.481e-22	-21.110	-21.349	-0.239	(0)
	Ca (NH3) 2+2	1.423e-22	8.211e-23	-21.847	-22.086	-0.239	(0)
	Co (NH3) 2+2	3.387e-23	1.954e-23	-22.470	-22.709	-0.239	(0)

HgNH3+2	3.269e-23	1.886e-23	-22.486	-22.725	-0.239	(0)
Hg (NH3) 2+2	2.087e-23	1.204e-23	-22.681	-22.919	-0.239	(0)
Co (NH3) 3+2	2.722e-31	1.571e-31	-30.565	-30.804	-0.239	(0)
Hg (NH3) 3+2	5.303e-32	3.059e-32	-31.276	-31.514	-0.239	(0)
Co (NH3) 4+2	9.120e-40	5.262e-40	-39.040	-39.279	-0.239	(0)
Hg (NH3) 4+2	2.689e-40	1.551e-40	-39.570	-39.809	-0.239	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-47.533	-47.772	-0.239	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-48.015	-48.254	-0.239	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-56.064	-56.303	-0.239	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-58.086	-58.624	-0.537	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-59.935	-60.174	-0.239	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-70.838	-71.077	-0.239	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-71.975	-72.214	-0.239	(0)
N (3)	3.245e-06					
NO2-	3.245e-06	2.869e-06	-5.489	-5.542	-0.054	(0)
CuNO2+	4.078e-12	3.554e-12	-11.390	-11.449	-0.060	(0)
AgNO2	5.837e-13	5.837e-13	-12.234	-12.234	0.000	(0)
CoNO2+	2.169e-13	1.890e-13	-12.664	-12.723	-0.060	(0)
Cu (NO2) 2	1.043e-16	1.043e-16	-15.982	-15.982	0.000	(0)
Ag (NO2) 2-	2.976e-18	2.594e-18	-17.526	-17.586	-0.060	(0)
N (5)	3.050e-09					
NO3-	3.046e-09	2.707e-09	-8.516	-8.568	-0.051	(0)
CaNO3+	3.948e-12	3.441e-12	-11.404	-11.463	-0.060	(0)
MnNO3+	3.205e-14	2.793e-14	-13.494	-13.554	-0.060	(0)
ZnNO3+	4.515e-15	3.935e-15	-14.345	-14.405	-0.060	(0)
CuNO3+	1.162e-16	1.013e-16	-15.935	-15.995	-0.060	(0)
NiNO3+	1.105e-16	9.631e-17	-15.957	-16.016	-0.060	(0)
BaNO3+	1.062e-16	9.259e-17	-15.974	-16.033	-0.060	(0)
CoNO3+	4.602e-17	4.011e-17	-16.337	-16.397	-0.060	(0)
CdNO3+	1.124e-17	9.794e-18	-16.949	-17.009	-0.060	(0)
PbNO3+	2.680e-18	2.336e-18	-17.572	-17.632	-0.060	(0)
AgNO3	2.094e-18	2.094e-18	-17.679	-17.679	0.000	(0)
Mn (NO3) 2	1.899e-22	1.899e-22	-21.721	-21.721	0.000	(0)
UO2NO3+	1.326e-23	1.156e-23	-22.877	-22.937	-0.060	(0)
Zn (NO3) 2	2.125e-24	2.125e-24	-23.673	-23.673	0.000	(0)
Co (NO3) 2	2.209e-25	2.209e-25	-24.656	-24.656	0.000	(0)
Cu (NO3) 2	3.450e-26	3.450e-26	-25.462	-25.462	0.000	(0)
Cd (NO3) 2	1.328e-26	1.328e-26	-25.877	-25.877	0.000	(0)
Pb (NO3) 2	1.074e-26	1.074e-26	-25.969	-25.969	0.000	(0)
CrNO3+2	7.207e-27	4.158e-27	-26.142	-26.381	-0.239	(0)
VO2NO3	7.138e-28	7.138e-28	-27.146	-27.146	0.000	(0)
FeNO3+2	1.043e-29	6.018e-30	-28.982	-29.221	-0.239	(0)
HgNO3+	5.368e-32	4.679e-32	-31.270	-31.330	-0.060	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.279	-40.279	0.000	(0)
Na	5.462e-03					
Na+	5.408e-03	4.805e-03	-2.267	-2.318	-0.051	(0)
NaSO4-	5.047e-05	4.504e-05	-4.297	-4.346	-0.049	(0)
NaHCO3	2.483e-06	2.483e-06	-5.605	-5.605	0.000	(0)
NaCO3-	8.259e-07	7.370e-07	-6.083	-6.133	-0.049	(0)
NaF	3.059e-07	3.059e-07	-6.514	-6.514	0.000	(0)
NaH2BO3	1.080e-08	1.080e-08	-7.967	-7.967	0.000	(0)
NaCrO4-	5.791e-16	5.047e-16	-15.237	-15.297	-0.060	(0)
Ni	3.444e-08					
Ni+2	2.274e-08	1.417e-08	-7.643	-7.849	-0.205	(0)
NiSO4	4.933e-09	4.933e-09	-8.307	-8.307	0.000	(0)
NiCO3	4.353e-09	4.353e-09	-8.361	-8.361	0.000	(0)
NiHCO3+	1.842e-09	1.605e-09	-8.735	-8.795	-0.060	(0)
NiOH+	3.938e-10	3.432e-10	-9.405	-9.464	-0.060	(0)
NiCl+	9.265e-11	8.075e-11	-10.033	-10.093	-0.060	(0)
Ni (OH) 2	5.247e-11	5.247e-11	-10.280	-10.280	0.000	(0)
NiF+	4.120e-11	3.591e-11	-10.385	-10.445	-0.060	(0)
Ni (SO4) 2-2	4.942e-13	2.851e-13	-12.306	-12.545	-0.239	(0)
Ni (OH) 3-	1.159e-13	1.010e-13	-12.936	-12.996	-0.060	(0)
NiNH3+2	8.418e-15	4.857e-15	-14.075	-14.314	-0.239	(0)
NiCl2	9.058e-16	9.058e-16	-15.043	-15.043	0.000	(0)
NiSeO4	3.124e-16	3.124e-16	-15.505	-15.505	0.000	(0)
NiNO3+	1.105e-16	9.631e-17	-15.957	-16.016	-0.060	(0)

Ni (NH3) 2+2	7.767e-22	4.481e-22	-21.110	-21.349	-0.239	(0)
O (0)	2.477e-35					
O2	1.239e-35	1.243e-35	-34.907	-34.906	0.001	(0)
Pb	2.041e-09					
PbCO3	1.445e-09	1.445e-09	-8.840	-8.840	0.000	(0)
PbOH+	3.236e-10	2.820e-10	-9.490	-9.550	-0.060	(0)
Pb+2	9.364e-11	5.834e-11	-10.029	-10.234	-0.205	(0)
Pb (CO3) 2-2	5.948e-11	3.432e-11	-10.226	-10.464	-0.239	(0)
PbSO4	4.988e-11	4.988e-11	-10.302	-10.302	0.000	(0)
PbHCO3+	4.571e-11	3.984e-11	-10.340	-10.400	-0.060	(0)
Pb (OH) 2	1.716e-11	1.716e-11	-10.765	-10.765	0.000	(0)
PbCl+	5.292e-12	4.612e-12	-11.276	-11.336	-0.060	(0)
Pb (SO4) 2-2	9.092e-13	5.245e-13	-12.041	-12.280	-0.239	(0)
PbF+	4.761e-13	4.149e-13	-12.322	-12.382	-0.060	(0)
PbCl2	4.589e-14	4.589e-14	-13.338	-13.338	0.000	(0)
Pb (OH) 3-	3.790e-14	3.303e-14	-13.421	-13.481	-0.060	(0)
PbF2	8.239e-16	8.239e-16	-15.084	-15.084	0.000	(0)
PbCl3-	4.670e-17	4.070e-17	-16.331	-16.390	-0.060	(0)
Pb (OH) 4-2	2.699e-17	1.557e-17	-16.569	-16.808	-0.239	(0)
PbNO3+	2.680e-18	2.336e-18	-17.572	-17.632	-0.060	(0)
Pb2OH+3	8.990e-19	2.608e-19	-18.046	-18.584	-0.537	(0)
PbF3-	1.809e-19	1.577e-19	-18.742	-18.802	-0.060	(0)
PbCl4-2	7.184e-20	4.145e-20	-19.144	-19.382	-0.239	(0)
Pb3 (OH) 4+2	5.945e-22	3.430e-22	-21.226	-21.465	-0.239	(0)
PbF4-2	1.320e-23	7.617e-24	-22.879	-23.118	-0.239	(0)
Pb (NO3) 2	1.074e-26	1.074e-26	-25.969	-25.969	0.000	(0)
Pb4 (OH) 4+4	1.435e-27	1.590e-28	-26.843	-27.799	-0.955	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.081	-154.081	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.279	-232.339	-0.060	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.755	-74.755	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.499	-79.558	-0.060	(0)
S5-2	0.000e+00	0.000e+00	-80.403	-80.642	-0.239	(0)
CdHS+	0.000e+00	0.000e+00	-80.432	-80.492	-0.060	(0)
H2S	0.000e+00	0.000e+00	-80.820	-80.820	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.919	-81.158	-0.239	(0)
S4-2	0.000e+00	0.000e+00	-80.999	-81.238	-0.239	(0)
S3-2	0.000e+00	0.000e+00	-81.805	-82.044	-0.239	(0)
S2-2	0.000e+00	0.000e+00	-82.821	-83.060	-0.239	(0)
S-2	0.000e+00	0.000e+00	-88.377	-88.577	-0.200	(0)
HgHS2-	0.000e+00	0.000e+00	-141.177	-141.237	-0.060	(0)
HgS2-2	0.000e+00	0.000e+00	-141.425	-141.663	-0.239	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-143.124	-143.124	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.607	-148.892	-0.285	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-149.264	-149.416	-0.151	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.348	-149.622	-0.274	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-150.154	-150.214	-0.060	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.203	-150.263	-0.060	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-150.283	-150.574	-0.291	(0)
AgS4S5-3	0.000e+00	0.000e+00	-150.606	-150.885	-0.279	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-152.534	-152.534	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-152.846	-152.846	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-154.081	-154.081	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-163.279	-163.279	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.643	-220.703	-0.060	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-228.753	-228.812	-0.060	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-230.272	-230.511	-0.239	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-230.445	-230.505	-0.060	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.279	-232.339	-0.060	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-240.740	-240.800	-0.060	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-307.628	-307.867	-0.239	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-309.592	-309.831	-0.239	(0)
Sb2S4-2	0.000e+00	0.000e+00	-326.622	-326.861	-0.239	(0)
S (6)	3.200e-03					
SO4-2	2.801e-03	1.745e-03	-2.553	-2.758	-0.205	(0)
MgSO4	1.746e-04	1.746e-04	-3.758	-3.758	0.000	(0)
CaSO4	1.607e-04	1.607e-04	-3.794	-3.794	0.000	(0)
NaSO4-	5.047e-05	4.504e-05	-4.297	-4.346	-0.049	(0)

KSO4-	1.039e-05	9.273e-06	-4.983	-5.033	-0.049	(0)
MnSO4	2.021e-06	2.021e-06	-5.694	-5.694	0.000	(0)
ZnSO4	2.210e-07	2.210e-07	-6.656	-6.656	0.000	(0)
Zn (SO4) 2-2	5.824e-09	3.360e-09	-8.235	-8.474	-0.239	(0)
NiSO4	4.933e-09	4.933e-09	-8.307	-8.307	0.000	(0)
CuSO4	4.731e-09	4.731e-09	-8.325	-8.325	0.000	(0)
CoSO4	3.256e-09	3.256e-09	-8.487	-8.487	0.000	(0)
HSO4-	1.003e-09	8.922e-10	-8.999	-9.050	-0.051	(0)
CdSO4	4.682e-10	4.682e-10	-9.330	-9.330	0.000	(0)
NH4SO4-	1.229e-10	1.095e-10	-9.910	-9.960	-0.050	(0)
PbSO4	4.988e-11	4.988e-11	-10.302	-10.302	0.000	(0)
AgSO4-	3.891e-11	3.391e-11	-10.410	-10.470	-0.060	(0)
Cd (SO4) 2-2	1.911e-11	1.102e-11	-10.719	-10.958	-0.239	(0)
Pb (SO4) 2-2	9.092e-13	5.245e-13	-12.041	-12.280	-0.239	(0)
CrOHSO4	6.129e-13	6.129e-13	-12.213	-12.213	0.000	(0)
Ni (SO4) 2-2	4.942e-13	2.851e-13	-12.306	-12.545	-0.239	(0)
FeSO4	3.311e-14	3.311e-14	-13.480	-13.480	0.000	(0)
UO2SO4	5.654e-15	5.654e-15	-14.248	-14.248	0.000	(0)
AlSO4+	2.796e-16	2.487e-16	-15.553	-15.604	-0.051	(0)
UO2 (SO4) 2-2	2.255e-16	1.301e-16	-15.647	-15.886	-0.239	(0)
CrSO4+	1.644e-16	1.432e-16	-15.784	-15.844	-0.060	(0)
Al (SO4) 2-	5.229e-18	4.650e-18	-17.282	-17.333	-0.051	(0)
VO2SO4-	2.493e-20	2.173e-20	-19.603	-19.663	-0.060	(0)
FeSO4+	4.887e-21	4.354e-21	-20.311	-20.361	-0.050	(0)
Fe (SO4) 2-	1.864e-22	1.625e-22	-21.729	-21.789	-0.060	(0)
Cr2 (OH) 2SO4+2	1.421e-22	8.197e-23	-21.847	-22.086	-0.239	(0)
HgSO4	2.139e-23	2.139e-23	-22.670	-22.670	0.000	(0)
VO4SO4	1.771e-23	1.771e-23	-22.752	-22.752	0.000	(0)
Cr2 (OH) 2 (SO4) 2	8.499e-24	8.499e-24	-23.071	-23.071	0.000	(0)
CrO3SO4-2	1.725e-24	9.950e-25	-23.763	-24.002	-0.239	(0)
VS4+	1.529e-38	1.332e-38	-37.816	-37.875	-0.060	(0)
U (SO4) 2	0.000e+00	0.000e+00	-42.577	-42.577	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-43.480	-43.719	-0.239	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-67.335	-67.394	-0.060	(0)
Sb (3)	3.706e-21					
Sb (OH) 3	1.874e-21	1.874e-21	-20.727	-20.727	0.000	(0)
HSbO2	1.830e-21	1.830e-21	-20.738	-20.738	0.000	(0)
SbO2-	6.502e-25	5.666e-25	-24.187	-24.247	-0.060	(0)
Sb (OH) 4-	3.724e-25	3.246e-25	-24.429	-24.489	-0.060	(0)
Sb (OH) 2F	1.546e-27	1.546e-27	-26.811	-26.811	0.000	(0)
SbOF	1.521e-27	1.521e-27	-26.818	-26.818	0.000	(0)
Sb (OH) 2+	2.733e-28	2.381e-28	-27.563	-27.623	-0.060	(0)
SbO+	9.423e-29	8.212e-29	-28.026	-28.086	-0.060	(0)
Sb2S4-2	0.000e+00	0.000e+00	-326.622	-326.861	-0.239	(0)
Sb (5)	6.043e-09					
SbO3-	6.036e-09	5.260e-09	-8.219	-8.279	-0.060	(0)
Sb (OH) 6-	6.921e-12	6.149e-12	-11.160	-11.211	-0.051	(0)
SbO2+	4.738e-26	4.129e-26	-25.324	-25.384	-0.060	(0)
Se (-2)	3.553e-15					
Ag2Se	3.553e-15	3.553e-15	-14.449	-14.449	0.000	(0)
HSe-	2.760e-40	2.405e-40	-39.559	-39.619	-0.060	(0)
MnSe	0.000e+00	0.000e+00	-41.909	-41.909	0.000	(0)
H2Se	0.000e+00	0.000e+00	-44.010	-44.010	0.000	(0)
Se-2	0.000e+00	0.000e+00	-46.098	-46.337	-0.239	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.958	-83.914	-0.955	(0)
Se (4)	3.527e-08					
SeO3-2	1.886e-08	1.088e-08	-7.724	-7.963	-0.239	(0)
HSeO3-	1.641e-08	1.430e-08	-7.785	-7.845	-0.060	(0)
H2SeO3	3.191e-14	3.191e-14	-13.496	-13.496	0.000	(0)
AgSeO3-	7.815e-15	6.811e-15	-14.107	-14.167	-0.060	(0)
Cd (SeO3) 2-2	1.936e-19	1.117e-19	-18.713	-18.952	-0.239	(0)
Ag (SeO3) 2-3	2.288e-21	6.637e-22	-20.641	-21.178	-0.537	(0)
FeHSeO3+2	1.456e-26	8.401e-27	-25.837	-26.076	-0.239	(0)
Se (6)	7.575e-11					
SeO4-2	7.566e-11	4.714e-11	-10.121	-10.327	-0.205	(0)
MnSeO4	8.264e-14	8.264e-14	-13.083	-13.083	0.000	(0)
ZnSeO4	4.227e-15	4.227e-15	-14.374	-14.374	0.000	(0)
NiSeO4	3.124e-16	3.124e-16	-15.505	-15.505	0.000	(0)

	CoSeO4	2.209e-16	2.209e-16	-15.656	-15.656	0.000	(0)
	HSeO4-	1.418e-17	1.236e-17	-16.848	-16.908	-0.060	(0)
	CdSeO4	1.005e-17	1.005e-17	-16.998	-16.998	0.000	(0)
	Zn (SeO4) 2-2	3.502e-25	2.020e-25	-24.456	-24.695	-0.239	(0)
Si	1.437e-04						
	H4SiO4	1.394e-04	1.398e-04	-3.856	-3.855	0.001	(0)
	H3SiO4-	4.352e-06	3.863e-06	-5.361	-5.413	-0.052	(0)
	H2SiO4-2	7.348e-11	4.660e-11	-10.134	-10.332	-0.198	(0)
	UO2H3SiO4+	8.054e-13	7.019e-13	-12.094	-12.154	-0.060	(0)
	SiF6-2	2.656e-31	1.674e-31	-30.576	-30.776	-0.200	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-60.311	-60.848	-0.537	(0)
U (4)	6.101e-20						
	U (OH) 5-	6.100e-20	5.316e-20	-19.215	-19.274	-0.060	(0)
	U (OH) 4	1.165e-23	1.165e-23	-22.934	-22.934	0.000	(0)
	U (OH) 3+	2.557e-28	2.228e-28	-27.592	-27.652	-0.060	(0)
	U (OH) 2+2	9.344e-34	5.391e-34	-33.029	-33.268	-0.239	(0)
	UF3+	1.290e-38	1.124e-38	-37.889	-37.949	-0.060	(0)
	UF2+2	1.218e-39	7.029e-40	-38.914	-39.153	-0.239	(0)
	UOH+3	4.579e-40	1.328e-40	-39.339	-39.877	-0.537	(0)
	UF4	1.244e-40	1.244e-40	-39.905	-39.905	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-41.720	-42.257	-0.537	(0)
	UF5-	0.000e+00	0.000e+00	-42.244	-42.303	-0.060	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-42.577	-42.577	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-43.480	-43.719	-0.239	(0)
	UF6-2	0.000e+00	0.000e+00	-43.580	-43.819	-0.239	(0)
	U+4	0.000e+00	0.000e+00	-46.606	-47.561	-0.955	(0)
	UCl+3	0.000e+00	0.000e+00	-47.976	-48.513	-0.537	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-173.464	-178.301	-4.837	(0)
U (5)	4.833e-17						
	UO2+	4.833e-17	4.212e-17	-16.316	-16.376	-0.060	(0)
U (6)	6.304e-08						
	UO2 (CO3) 3-4	4.297e-08	4.761e-09	-7.367	-8.322	-0.955	(0)
	UO2 (CO3) 2-2	1.999e-08	1.153e-08	-7.699	-7.938	-0.239	(0)
	UO2CO3	7.018e-11	7.018e-11	-10.154	-10.154	0.000	(0)
	UO2H3SiO4+	8.054e-13	7.019e-13	-12.094	-12.154	-0.060	(0)
	UO2OH+	5.950e-13	5.185e-13	-12.225	-12.285	-0.060	(0)
	UO2F+	3.421e-14	2.981e-14	-13.466	-13.526	-0.060	(0)
	UO2F2	8.677e-15	8.677e-15	-14.062	-14.062	0.000	(0)
	UO2SO4	5.654e-15	5.654e-15	-14.248	-14.248	0.000	(0)
	UO2+2	3.435e-15	2.140e-15	-14.464	-14.670	-0.205	(0)
	UO2F3-	2.524e-16	2.199e-16	-15.598	-15.658	-0.060	(0)
	UO2 (SO4) 2-2	2.255e-16	1.301e-16	-15.647	-15.886	-0.239	(0)
	UO2Cl+	8.873e-18	7.733e-18	-17.052	-17.112	-0.060	(0)
	(UO2) 2 (OH) 2+2	7.735e-19	4.463e-19	-18.112	-18.350	-0.239	(0)
	(UO2) 3 (OH) 5+	7.460e-19	6.501e-19	-18.127	-18.187	-0.060	(0)
	UO2F4-2	3.056e-19	1.763e-19	-18.515	-18.754	-0.239	(0)
	UO2NO3+	1.326e-23	1.156e-23	-22.877	-22.937	-0.060	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-44.738	-44.798	-0.060	(0)
	V+2	0.000e+00	0.000e+00	-46.353	-46.592	-0.239	(0)
V (3)	9.298e-17						
	V (OH) 3	9.298e-17	9.298e-17	-16.032	-16.032	0.000	(0)
	V (OH) 2+	3.606e-28	3.143e-28	-27.443	-27.503	-0.060	(0)
	VOH+2	2.703e-32	1.560e-32	-31.568	-31.807	-0.239	(0)
	V+3	5.574e-38	1.617e-38	-37.254	-37.791	-0.537	(0)
	VSO4+	1.529e-38	1.332e-38	-37.816	-37.875	-0.060	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-60.320	-60.858	-0.537	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-61.858	-62.814	-0.955	(0)
V (4)	1.634e-20						
	V (OH) 3+	1.623e-20	1.415e-20	-19.790	-19.849	-0.060	(0)
	VO+2	6.387e-23	3.685e-23	-22.195	-22.434	-0.239	(0)
	VOF+	2.559e-23	2.230e-23	-22.592	-22.652	-0.060	(0)
	VOSO4	1.771e-23	1.771e-23	-22.752	-22.752	0.000	(0)
	VOF2	8.440e-25	8.440e-25	-24.074	-24.074	0.000	(0)
	VOC1+	2.643e-25	2.303e-25	-24.578	-24.638	-0.060	(0)
	VOF3-	3.467e-27	3.022e-27	-26.460	-26.520	-0.060	(0)
	VOF4-2	2.134e-30	1.231e-30	-29.671	-29.910	-0.239	(0)

H2V2O4+2	1.739e-35	1.004e-35	-34.760	-34.998	-0.239	(0)
V(5)	1.890e-09					
H2VO4-	1.095e-09	9.546e-10	-8.960	-9.020	-0.060	(0)
HVO4-2	7.945e-10	4.584e-10	-9.100	-9.339	-0.239	(0)
H3VO4	4.993e-14	4.993e-14	-13.302	-13.302	0.000	(0)
VO4-3	1.514e-15	4.392e-16	-14.820	-15.357	-0.537	(0)
HV2O7-3	5.112e-16	1.483e-16	-15.291	-15.829	-0.537	(0)
H3V2O7-	3.532e-16	3.078e-16	-15.452	-15.512	-0.060	(0)
V2O7-4	6.888e-18	7.631e-19	-17.162	-18.117	-0.955	(0)
VO2+	5.869e-19	5.214e-19	-18.231	-18.283	-0.051	(0)
VO2F	9.228e-20	9.228e-20	-19.035	-19.035	0.000	(0)
VO2SO4-	2.493e-20	2.173e-20	-19.603	-19.663	-0.060	(0)
VO2F2-	3.880e-21	3.381e-21	-20.411	-20.471	-0.060	(0)
V3O9-3	3.142e-21	9.116e-22	-20.503	-21.040	-0.537	(0)
VO2F3-2	7.377e-24	4.256e-24	-23.132	-23.371	-0.239	(0)
V4O12-4	3.275e-27	3.628e-28	-26.485	-27.440	-0.955	(0)
VO2F4-3	7.285e-28	2.113e-28	-27.138	-27.675	-0.537	(0)
VO2NO3	7.138e-28	7.138e-28	-27.146	-27.146	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-72.271	-74.421	-2.150	(0)
HV10O28-5	0.000e+00	0.000e+00	-73.022	-74.515	-1.493	(0)
H2V10O28-4	0.000e+00	0.000e+00	-76.634	-77.589	-0.955	(0)
Zn	1.625e-06					
Zn+2	9.290e-07	5.788e-07	-6.032	-6.237	-0.205	(0)
ZnCO3	2.743e-07	2.743e-07	-6.562	-6.562	0.000	(0)
ZnSO4	2.210e-07	2.210e-07	-6.656	-6.656	0.000	(0)
ZnOH+	1.278e-07	1.114e-07	-6.893	-6.953	-0.060	(0)
Zn(OH)2	3.398e-08	3.398e-08	-7.469	-7.469	0.000	(0)
ZnHCO3+	1.930e-08	1.682e-08	-7.714	-7.774	-0.060	(0)
ZnOHC1	8.161e-09	8.161e-09	-8.088	-8.088	0.000	(0)
Zn(SO4)2-2	5.824e-09	3.360e-09	-8.235	-8.474	-0.239	(0)
ZnCl+	3.649e-09	3.239e-09	-8.438	-8.490	-0.052	(0)
ZnF+	1.337e-09	1.165e-09	-8.874	-8.934	-0.060	(0)
Zn(OH)3-	3.760e-10	3.277e-10	-9.425	-9.484	-0.060	(0)
ZnCl2	1.144e-11	1.144e-11	-10.942	-10.942	0.000	(0)
Zn(OH)4-2	4.352e-14	2.511e-14	-13.361	-13.600	-0.239	(0)
ZnCl3-	2.280e-14	2.024e-14	-13.642	-13.694	-0.052	(0)
ZnNO3+	4.515e-15	3.935e-15	-14.345	-14.405	-0.060	(0)
ZnSeO4	4.227e-15	4.227e-15	-14.374	-14.374	0.000	(0)
ZnCl4-2	3.576e-17	2.255e-17	-16.447	-16.647	-0.200	(0)
Zn(NO3)2	2.125e-24	2.125e-24	-23.673	-23.673	0.000	(0)
Zn(SeO4)2-2	3.502e-25	2.020e-25	-24.456	-24.695	-0.239	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-150.203	-150.263	-0.060	(0)
Zn(HS)2	0.000e+00	0.000e+00	-152.534	-152.534	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-228.753	-228.812	-0.060	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-230.272	-230.511	-0.239	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-309.592	-309.831	-0.239	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-61.77	-55.48	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-48.16	-43.65	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-55.38	-43.65	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-79.28	-61.35	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-63.63	-43.60	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.54	-30.14	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.24	-26.79	0.45	(NH4)2SeO4
Acanthite	-53.08	-89.30	-36.22	Ag2S
Ag2CO3	-12.02	-23.11	-11.09	Ag2CO3
Ag2CrO4	-20.11	-31.70	-11.59	Ag2CrO4
Ag2HVO4	-12.94	-11.46	1.48	Ag2HVO4
Ag2MoO4	-13.08	-24.63	-11.55	Ag2MoO4
Ag2O	-14.03	-1.46	12.57	Ag2O
Ag2Se	-0.66	-49.36	-48.70	Ag2Se
Ag2SeO3	-10.44	-17.59	-7.15	Ag2SeO3
Ag2SeO4	-19.44	-28.35	-8.91	Ag2SeO4
Ag2SO4	-15.96	-20.78	-4.82	Ag2SO4

Ag3AsO3	-28.04	-25.89	2.16	Ag3AsO3
Ag3AsO4	-16.45	-19.24	-2.79	Ag3AsO4
Ag3H2VO5	-17.37	-12.19	5.18	Ag3H2VO5
AgF·4H2O	-14.06	-13.01	1.05	AgF·4H2O
Agmetal	0.00	-13.50	-13.51	Ag
AgVO3	-11.50	-10.73	0.77	AgVO3
Al (OH) 3 (am)	-2.69	8.11	10.80	Al (OH) 3
Al2 (MoO4) 3	-55.65	-53.28	2.37	Al2 (MoO4) 3
Al2O3	-3.44	16.22	19.65	Al2O3
Al4 (OH) 10SO4	-9.59	13.11	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-13.74	-8.94	4.80	AlAsO4·2H2O
AlOHSO4	-7.98	-11.21	-3.23	AlOHSO4
AlSb	-154.88	-89.25	65.62	AlSb
Alunite	-7.76	-9.16	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-5.20	-12.99	-7.79	PbSO4
Anhydrite	-1.79	-6.15	-4.36	CaSO4
Anilite	-55.97	-87.85	-31.88	Cu0.25Cu1.5S
Antlerite	-2.20	6.59	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.03	-94.79	-2.76	As4O6
Artinite	-4.64	4.96	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.81	-34.10	6.71	As2O5
Atacamite	-1.05	6.34	7.39	Cu2 (OH) 3Cl
Azurite	-0.48	-17.39	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-16.00	8.40	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-19.08	-3.21	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-27.75	5.19	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-12.17	-21.84	-9.67	BaCrO4
BaF2	-10.34	-16.16	-5.82	BaF2
BaMoO4	-7.81	-14.77	-6.96	BaMoO4
Barite	-0.94	-10.92	-9.98	BaSO4
BaS	-95.62	-79.44	16.18	BaS
BaSeO3	-9.56	-7.73	1.83	BaSeO3
BaSeO4	-11.03	-18.49	-7.46	BaSeO4
Bianchite	-7.23	-9.00	-1.76	ZnSO4·6H2O
Birnessite	-6.52	11.57	18.09	MnO2
Bixbyite	-1.76	-2.40	-0.64	Mn2O3
BlaubleiI	-56.19	-80.36	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.54	-83.82	-27.28	Cu0.6Cu0.8S
Boehmite	-0.47	8.11	8.58	AlOOH
Breithauptite	-57.35	-75.87	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.54	13.30	16.84	Mg (OH) 2
Bunsenite	-3.73	8.71	12.45	NiO
Ca (VO3) 2	-12.50	-6.84	5.66	Ca (VO3) 2
Ca2V2O7	-11.17	6.33	17.50	Ca2V2O7
Ca2V2O7·2H2O	-15.22	6.33	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-16.90	5.40	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-19.46	19.50	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-20.36	19.50	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-298.20	-155.22	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-10.24	-28.15	-17.91	Hg2Cl2
CaMoO4	-2.05	-10.00	-7.95	CaMoO4
Carnotite	-3.18	-2.95	0.23	KUO2VO4
CaSeO3·2H2O	-5.77	-2.96	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-10.70	-13.72	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-12.01	-2.17	9.84	Cd (BO2) 2
Cd (OH) 2	-6.02	7.62	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.11	7.62	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-22.49	-15.78	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-19.02	3.54	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-17.24	11.16	28.40	Cd4 (OH) 6SO4
CdCl2	-13.59	-14.25	-0.66	CdCl2
CdCl2·1H2O	-12.55	-14.25	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.33	-14.25	-1.91	CdCl2·2.5H2O

CdF2	-15.72	-16.93	-1.21	CdF2
Cdmetal (alpha)	-31.44	-17.92	13.51	Cd
Cdmetal (gamma)	-31.54	-17.92	13.62	Cd
CdMoO4	-1.40	-15.55	-14.15	CdMoO4
CdOHCl	-6.85	-3.31	3.54	CdOHCl
CdSb	-76.62	-76.97	-0.35	CdSb
CdSe	-20.08	-40.28	-20.20	CdSe
CdSeO4:2H2O	-17.42	-19.27	-1.85	CdSeO4:2H2O
CdSO4	-11.53	-11.70	-0.17	CdSO4
CdSO4:1H2O	-9.97	-11.70	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.83	-11.70	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.91	-11.66	-9.75	AgCl
Cerrusite	-2.19	-15.32	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-8.05	-10.69	-2.64	CuSO4:5H2O
Chalcedony	-0.30	-3.85	-3.55	SiO2
Chalcocite	-55.81	-90.73	-34.92	Cu2S
Chalcopyrite	-128.32	-163.59	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-54.11	-99.80	-45.69	HgS
Claudetite	-91.72	-94.79	-3.06	As4O6
Clausthalite	-14.47	-41.57	-27.10	PbSe
Co (BO2) 2	-28.32	-1.25	27.07	Co (BO2) 2
Co (OH) 2	-4.56	8.53	13.09	Co (OH) 2
Co (OH) 3	-8.79	-11.09	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-21.53	-8.50	13.03	Co3 (AsO4) 2
Co3O4	-3.16	-13.65	-10.50	Co3O4
CoCl2	-21.60	-13.33	8.27	CoCl2
CoCl2:6H2O	-15.87	-13.33	2.54	CoCl2:6H2O
CoCO3	-3.13	-13.11	-9.98	CoCO3
CoF2	-14.42	-16.02	-1.60	CoF2
CoF3	-46.47	-47.93	-1.46	CoF3
CoFe2O4	18.44	14.92	-3.53	CoFe2O4
CoMoO4	-6.87	-14.63	-7.76	CoMoO4
CoO	-5.05	8.53	13.59	CoO
CoS (alpha)	-71.87	-79.31	-7.44	CoS
CoS (beta)	-68.24	-79.31	-11.07	CoS
CoSe	-23.17	-39.37	-16.20	CoSe
CoSeO3	-8.91	-7.59	1.32	CoSeO3
CoSeO4:6H2O	-16.83	-18.36	-1.53	CoSeO4:6H2O
CoSO4	-13.59	-10.79	2.80	CoSO4
CoSO4:6H2O	-8.32	-10.79	-2.47	CoSO4:6H2O
Cotunnite	-10.76	-15.54	-4.78	PbCl2
Covellite	-56.90	-79.20	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.96	-32.87	14.09	CrCl2
CrCl3	-49.09	-33.98	15.11	CrCl3
CrF3	-26.67	-38.01	-11.34	CrF3
Cristobalite	-0.50	-3.85	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-13.83	-47.67	-33.84	Na3AlF6
Cu (OH) 2	-0.04	8.64	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.94	18.27	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.83	0.42	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.29	-90.17	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.99	-50.79	-45.80	Cu2Se
Cu2SO4	-20.26	-22.21	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.29	-8.19	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.11	-101.70	-42.59	Cu3Sb
Cu3Se2	-26.57	-90.06	-63.49	Cu3Se2
CuCO3	-1.51	-13.01	-11.50	CuCO3
CuCrO4	-16.16	-21.60	-5.44	CuCrO4
CuF	-8.82	-13.72	-4.91	CuF

CuF2	-17.03	-15.92	1.12	CuF2
CuF2:2H2O	-11.37	-15.92	-4.55	CuF2:2H2O
Cumetal	-5.46	-14.22	-8.76	Cu
CuMoO4	-1.45	-14.53	-13.08	CuMoO4
CuOCuSO4	-12.35	-2.05	10.30	CuOCuSO4
Cupricferrite	9.03	15.02	5.99	CuFe2O4
Cuprite	-1.49	-2.89	-1.41	Cu2O
Cuprousferrite	10.66	1.74	-8.92	CuFeO2
CuSe	-6.16	-39.26	-33.10	CuSe
CuSe2	-28.25	-61.62	-33.37	CuSe2
CuSeO3:2H2O	-8.00	-7.49	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.81	-18.25	-2.44	CuSeO4:5H2O
CuSO4	-13.62	-10.69	2.94	CuSO4
Diaspore	1.23	8.11	6.87	AlOOH
Djurleite	-56.05	-89.97	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.28	-16.82	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.27	-16.82	-17.09	CaMg(CO3)2
Epsomite	-3.89	-6.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	2.95	-0.09	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-12.83	-16.55	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-11.30	-9.74	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-21.37	-42.00	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-47.85	-51.58	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.26	-13.86	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-9.62	-19.72	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-48.21	-66.80	-18.60	FeSe2
FeS(ppt)	-81.44	-84.39	-2.95	FeS
FeSe	-33.45	-44.45	-11.00	FeSe
Fix_pe	-4.49	-4.49	0.00	e-
Fluorite	-0.89	-11.39	-10.50	CaF2
Galena	-67.54	-81.51	-13.97	PbS
Gibbsite	-0.18	8.11	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.99	-9.00	-2.01	ZnSO4:7H2O
Greenalite	-18.17	2.64	20.81	Fe3Si2O5(OH)4
Greenockite	-65.86	-80.22	-14.36	CdS
Greigite	-296.49	-341.53	-45.03	Fe3S4
Gummite	-5.78	1.89	7.67	UO3
Gypsum	-1.54	-6.15	-4.61	CaSO4:2H2O
H-Jarosite	-16.97	-29.07	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-10.29	-23.17	-12.88	H2MoO4
H2S(g)	-79.83	-87.84	-8.01	H2S
H2Se(g)	-42.94	-47.90	-4.96	H2Se
Halite	-6.57	-4.97	1.60	NaCl
Halloysite	-1.07	8.51	9.57	Al2Si2O5(OH)4
Hausmannite	-1.36	59.67	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-3.23	19.67	22.89	FeAl2O4
Hg(CH3)2(g)	-185.91	-259.61	-73.71	Hg(CH3)2
Hg(g)	-8.04	-15.91	-7.87	Hg
Hg(OH)2	-8.46	-11.96	-3.50	Hg(OH)2
Hg2(g)	-16.87	-31.83	-14.96	Hg2
Hg2(OH)2	-11.54	-6.28	5.26	Hg2(OH)2
Hg2CO3	-11.88	-27.93	-16.05	Hg2CO3
Hg2CrO4	-27.82	-36.52	-8.70	Hg2CrO4
Hg2F2	-20.47	-30.84	-10.36	Hg2F2
Hg2S	-82.44	-94.12	-11.68	Hg2S
Hg2SeO3	-17.75	-22.41	-4.66	Hg2SeO3
Hg2SO4	-19.47	-25.60	-6.13	Hg2SO4
Hg3O2CO3	-27.85	-57.53	-29.68	Hg3O2CO3
HgCl(g)	-33.57	-14.07	19.50	HgCl
HgCl2	-12.57	-33.83	-21.26	HgCl2
HgF(g)	-48.09	-15.42	32.68	HgF
HgF2(g)	-49.08	-36.52	12.57	HgF2

Hgmetal (1)	-2.46	-15.91	-13.45	Hg
HgSe	-4.17	-59.86	-55.69	HgSe
HgSeO3	-15.66	-28.09	-12.43	HgSeO3
HgSO4	-21.86	-31.28	-9.42	HgSO4
Huntite	-3.54	-33.51	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.54	-24.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.31	-20.07	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-20.21	-25.38	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-9.11	-23.91	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.92	-50.16	-17.24	K2Cr2O7
K2CrO4	-19.41	-19.92	-0.51	K2CrO4
K2MoO4	-16.11	-12.85	3.26	K2MoO4
K2SeO4	-15.85	-16.58	-0.73	K2SeO4
Kaolinite	1.07	8.51	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.23	-6.66	-0.43	PbO : PbSO4
Laurionite	-5.23	-4.60	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.37	6.33	12.69	PbO
Mackinawite	-80.79	-84.39	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.83	19.69	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.93	-4.38	-5.31	Cu2 (OH) 2CO3
Manganite	-1.19	24.15	25.34	MnOOH
Massicot	-6.57	6.33	12.89	PbO
Matlockite	-7.91	-16.88	-8.97	PbClF
Melanothallite	-19.49	-13.23	6.26	CuCl2
Melanterite	-13.66	-15.87	-2.21	FeSO4 : 7H2O
Metacinnabar	-54.71	-99.80	-45.09	HgS
Mg (OH) 2 (active)	-5.49	13.30	18.79	Mg (OH) 2
Mg (VO3) 2	-17.98	-6.70	11.28	Mg (VO3) 2
Mg2Sb3	-276.30	-201.62	74.68	Mg2Sb3
Mg2V2O7	-19.76	6.60	26.36	Mg2V2O7
MgCr2O4	-5.26	10.95	16.20	MgCr2O4
MgCrO4	-22.31	-16.93	5.38	MgCrO4
MgF2	-3.12	-11.25	-8.13	MgF2
MgMoO4	-8.01	-9.86	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.88	-2.82	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.39	-13.59	-1.20	MgSeO4 : 6H2O
Minium	-28.99	44.53	73.52	Pb3O4
Mirabilite	-6.28	-7.40	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-13.53	-8.63	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-54.65	-60.36	-5.71	Mn2 (SO4) 3
Mn2Sb	-148.46	-87.38	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.47	0.03	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.21	-10.49	2.72	MnCl2 : 4H2O
MnS (grn)	-76.63	-76.46	0.17	MnS
MnS (pnk)	-79.80	-76.46	3.34	MnS
MnSb	-95.65	-98.56	-2.91	MnSb
MnSe	-40.02	-36.52	3.50	MnSe
MnSeO3	-5.88	-4.75	1.13	MnSeO3
MnSeO3 : 2H2O	-5.73	-4.75	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.46	-15.51	-2.05	MnSeO4 : 5H2O
MnSO4	-10.53	-7.94	2.58	MnSO4
Monteponite	-7.48	7.62	15.10	CdO
Montroydite	-8.32	-11.96	-3.64	HgO
MoO3	-15.17	-23.17	-8.00	MoO3
Morenosite	-8.46	-10.61	-2.14	NiSO4 : 7H2O
MoS2	-154.13	-224.39	-70.26	MoS2
Na-Jarosite	-11.91	-23.11	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.65	-48.55	-9.90	Na2Cr2O7
Na2CrO4	-21.24	-18.31	2.93	Na2CrO4
Na2Mo2O7	-17.81	-34.41	-16.60	Na2Mo2O7
Na2MoO4	-12.73	-11.24	1.49	Na2MoO4
Na2MoO4 : 2H2O	-12.46	-11.24	1.22	Na2MoO4 : 2H2O

Na2SeO3:5H2O	-14.50	-4.20	10.30	Na2SeO3:5H2O
Na2SeO4	-16.24	-14.96	1.28	Na2SeO4
Na3Sb	-173.92	-79.47	94.45	Na3Sb
Na3VO4	-28.79	7.89	36.68	Na3VO4
Na4V2O7	-33.55	3.85	37.40	Na4V2O7
Nantokite	-5.65	-12.38	-6.73	CuCl
NaSb	-89.02	-65.85	23.17	NaSb
Natron	-8.41	-9.72	-1.31	Na2CO3:10H2O
NaVO3	-7.90	-4.04	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-4.08	8.71	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.66	-7.96	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-16.47	15.53	32.00	Ni4(OH)6SO4
NiCO3	-6.06	-12.93	-6.87	NiCO3
NiMoO4	-3.31	-14.45	-11.14	NiMoO4
NiS(alpha)	-73.53	-79.13	-5.60	NiS
NiS(beta)	-68.03	-79.13	-11.10	NiS
NiS(gamma)	-66.33	-79.13	-12.80	NiS
NiSe	-21.49	-39.19	-17.70	NiSe
NiSeO3:2H2O	-10.23	-7.41	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.66	-18.18	-1.52	NiSeO4:6H2O
Nsutite	-5.93	11.57	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-249.85	-310.91	-61.07	As2S3
Otavite	-2.03	-14.03	-12.00	CdCO3
Pb(BO2)2	-9.98	-3.46	6.52	Pb(BO2)2
Pb(OH)2	-1.82	6.33	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.83	-66.59	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.07	1.72	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.53	12.66	26.19	Pb2O(OH)2
Pb2O3	-22.84	38.20	61.04	Pb2O3
Pb2OCO3	-8.43	-8.99	-0.56	Pb2OCO3
Pb2V2O7	-5.45	-7.35	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.91	-15.11	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.16	-1.02	6.14	Pb3(VO4)2
Pb3O2CO3	-13.68	-2.66	11.02	Pb3O2CO3
Pb3O2SO4	-11.02	-0.33	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.11	5.99	21.10	Pb4(OH)6SO4
Pb4O3SO4	-15.88	5.99	21.88	Pb4O3SO4
PbCrO4	-11.31	-23.91	-12.60	PbCrO4
PbF2	-10.79	-18.23	-7.44	PbF2
Pbmetal	-23.46	-19.22	4.25	Pb
PbMoO4	-1.22	-16.84	-15.62	PbMoO4
PbO:0.3H2O	-6.65	6.33	12.98	PbO:0.33H2O
PbSeO4	-13.72	-20.56	-6.84	PbSeO4
Periclase	-8.28	13.30	21.58	MgO
Phosgenite	-11.05	-30.86	-19.81	PbCl2:PbCO3
Plattnerite	-17.73	31.87	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-128.18	-146.68	-18.51	FeS2
Pyrochroite	-3.82	11.38	15.19	Mn(OH)2
Pyrolusite	-4.46	36.92	41.38	MnO2
Quartz	0.15	-3.85	-4.00	SiO2
Realgar	-104.56	-124.31	-19.75	AsS
Retgersite	-8.57	-10.61	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.25	-19.75	-14.50	UO2CO3
Sb(OH)3	-13.62	-20.73	-7.11	Sb(OH)3
Sb2O4	-19.31	-15.91	3.40	Sb2O4
Sb2O5	-29.32	-38.98	-9.67	Sb2O5
Sb2Se3	-117.40	-185.15	-67.76	Sb2Se3
Sb4O6(cubic)	-64.65	-82.91	-18.26	Sb4O6
Sb4O6(orth)	-65.01	-82.91	-17.90	Sb4O6
SbCl3	-54.10	-53.53	0.57	SbCl3
SbF3	-47.33	-57.56	-10.23	SbF3
Sbmetal	-47.36	-59.04	-11.69	Sb
SbO2	-4.44	-32.26	-27.82	SbO2
Schoepite	-4.10	1.89	5.99	UO2(OH)2:H2O

Semetal (am)	-15.25	-22.36	-7.11	Se
Semetal (hex)	-14.65	-22.36	-7.71	Se
Senarmontite	-29.09	-41.45	-12.37	Sb2O3
SeO2	-16.25	-16.13	0.12	SeO2
SeO3	-47.93	-26.89	21.04	SeO3
Sepiolite	-0.72	15.04	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-3.74	15.04	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2 (am-gel)	-1.14	-3.85	-2.71	SiO2
SiO2 (am-ppt)	-1.11	-3.85	-2.74	SiO2
Smithsonite	-1.32	-11.32	-10.00	ZnCO3
Sphalerite	-66.06	-77.51	-11.45	ZnS
Spinel	-7.33	29.52	36.85	MgAl2O4
Stibnite	-254.51	-304.97	-50.46	Sb2S3
Sulfur	-60.15	-62.29	-2.14	S
Tenorite	0.99	8.64	7.64	CuO
Thenardite	-7.72	-7.39	0.32	Na2SO4
Thermonatrite	-10.36	-9.72	0.64	Na2CO3:H2O
Tyuyamunite	-7.13	-3.05	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.30	7.78	21.08	U3O8
U3Sb4	-585.13	-432.75	152.38	U3Sb4
U4O9	-29.18	-32.20	-3.02	U4O9
UF4	-34.01	-63.55	-29.54	UF4
UF4:2.5H2O	-30.83	-63.55	-32.72	UF4:2.5H2O
UO2 (am)	-15.37	-14.44	0.93	UO2
UO2 (NO3) 2	-43.95	-31.80	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-36.66	-31.80	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-35.20	-31.81	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-33.85	-31.81	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.72	1.89	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.75	-25.00	-2.25	UO2SeO4:4H2O
UO3	-5.81	1.89	7.70	UO3
Uraninite	-9.77	-14.44	-4.67	UO2
USb2	-222.41	-192.83	29.58	USb2
V (OH) 3	-20.54	-12.95	7.59	V (OH) 3
V2O5	-18.64	-20.00	-1.36	V2O5
V3O5	-44.99	-43.16	1.84	V3O5
V4O7	-56.21	-49.03	7.19	V4O7
V6O13	-50.24	-111.10	-60.86	V6O13
Valentinite	-32.97	-41.45	-8.48	Sb2O3
VC12	-66.46	-47.59	18.87	VC12
VC13	-69.18	-45.75	23.43	VC13
VF4	-69.91	-54.98	14.93	VF4
Vmetal	-95.29	-51.26	44.03	V
VO	-40.48	-25.72	14.76	VO
VO (OH) 2	-11.02	-5.87	5.15	VO (OH) 2
VO2Cl	-23.78	-20.93	2.84	VO2Cl
VOC1	-35.03	-23.88	11.15	VOC1
VOC12	-40.50	-27.74	12.76	VOC12
VOSO4	-28.80	-25.19	3.61	VOSO4
Witherite	-4.68	-13.25	-8.57	BaCO3
Wurtzite	-68.56	-77.51	-8.95	ZnS
Zincite	-1.01	10.33	11.33	ZnO
Zincosite	-12.93	-9.00	3.93	ZnSO4
Zn (BO2) 2	-7.75	0.54	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-26.69	-23.37	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.87	10.33	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.15	10.33	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.43	10.33	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.21	10.33	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.41	10.33	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.17	1.33	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.47	9.72	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.78	-3.13	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-26.58	-7.67	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-6.42	21.98	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-8.74	29.76	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.59	-11.54	7.05	ZnCl2

ZnCO3:1H2O	-1.06	-11.32	-10.26	ZnCO3:1H2O
ZnF2	-13.70	-14.23	-0.53	ZnF2
Znmetal	-41.01	-15.22	25.79	Zn
ZnMoO4	-2.72	-12.84	-10.13	ZnMoO4
ZnO(active)	-0.86	10.33	11.19	ZnO
ZnS(am)	-68.46	-77.51	-9.05	ZnS
ZnSb	-85.28	-74.26	11.01	ZnSb
ZnSe	-23.17	-37.57	-14.40	ZnSe
ZnSeO4:6H2O	-15.04	-16.56	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.36	-9.00	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 100.

```

Title Stage 6 pit lake GW inflow
Title Stage 6 Groundwater mix
MIX 601
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.248204
11     2.013510
12     1.523472
13     3.581174
14     0
15     0
Save solution 601
end

```

TITLE

Stage 6 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 601.

Mixture 601.

```

1.000e+00 Solution 2      JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

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0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.482e-01 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
2.014e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.523e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.581e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	9.980e-09	8.350e-08
Al	5.513e-07	4.612e-06
As	4.863e-09	4.069e-08
B	1.908e-06	1.597e-05
Ba	1.769e-07	1.480e-06
C	1.470e-03	1.230e-02
Ca	6.583e-04	5.508e-03
Cd	1.402e-09	1.173e-08
Cl	2.051e-04	1.716e-03
Co	1.624e-08	1.359e-07
Cr	1.518e-08	1.270e-07
Cu	1.150e-06	9.620e-06
F	5.127e-05	4.290e-04
Fe	3.193e-06	2.671e-05
Hg	2.639e-11	2.208e-10
K	8.612e-05	7.205e-04
Mg	2.082e-04	1.742e-03
Mn	2.848e-06	2.383e-05
Mo	6.651e-08	5.565e-07
Na	5.950e-04	4.978e-03
Ni	2.548e-08	2.131e-07
Pb	3.133e-09	2.621e-08
S	4.314e-04	3.609e-03
Sb	1.573e-09	1.316e-08
Se	5.660e-09	4.736e-08
U	1.008e-08	8.430e-08
V	1.380e-08	1.155e-07
Zn	1.382e-07	1.157e-06

-----Description of solution-----

	pH	=	7.210	Charge balance
	pe	=	4.778	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	3.528e-03	
	Mass of water (kg)	=	8.366e+00	
	Total alkalinity (eq/kg)	=	1.309e-03	
	Total CO2 (mol/kg)	=	1.470e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.722e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	13	
	Total H	=	9.287941e+02	
	Total O	=	4.644416e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.743e-07	1.633e-07	-6.759	-6.787	-0.028	(0)
H+	6.578e-08	6.167e-08	-7.182	-7.210	-0.028	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	9.980e-09					
Ag+	6.905e-09	6.473e-09	-8.161	-8.189	-0.028	(0)
AgCl	2.542e-09	2.542e-09	-8.595	-8.595	0.000	(0)
Ag2Se	2.226e-10	2.226e-10	-9.652	-9.652	0.000	(0)
AgCl2-	4.564e-11	4.257e-11	-10.341	-10.371	-0.030	(0)
AgSO4-	4.162e-11	3.882e-11	-10.381	-10.411	-0.030	(0)
AgF	7.640e-13	7.640e-13	-12.117	-12.117	0.000	(0)
AgOH	1.057e-13	1.057e-13	-12.976	-12.976	0.000	(0)
AgCl3-2	9.643e-15	7.295e-15	-14.016	-14.137	-0.121	(0)
AgH2BO3	1.826e-15	1.826e-15	-14.738	-14.738	0.000	(0)
AgSeO3-	1.353e-15	1.262e-15	-14.869	-14.899	-0.030	(0)
AgCl4-3	5.366e-18	2.864e-18	-17.270	-17.543	-0.273	(0)
Ag (OH) 2-	1.808e-18	1.686e-18	-17.743	-17.773	-0.030	(0)
Ag (SeO3) 2-3	6.418e-24	3.426e-24	-23.193	-23.465	-0.273	(0)
Ag2MoO4	8.139e-25	8.139e-25	-24.089	-24.089	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.350	-67.350	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.375	-77.859	-0.485	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.195	-136.225	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.405	-136.499	-0.094	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.538	-138.729	-0.191	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.854	-139.040	-0.186	(0)
Al	5.513e-07					
Al (OH) 4-	5.148e-07	4.828e-07	-6.288	-6.316	-0.028	(0)
Al (OH) 3	2.349e-08	2.349e-08	-7.629	-7.629	0.000	(0)
Al (OH) 2+	7.680e-09	7.211e-09	-8.115	-8.142	-0.027	(0)
AlF2+	3.187e-09	2.993e-09	-8.497	-8.524	-0.027	(0)
AlF3	1.770e-09	1.770e-09	-8.752	-8.752	0.000	(0)
AlF+2	2.059e-10	1.600e-10	-9.686	-9.796	-0.110	(0)
AlOH+2	7.156e-11	5.560e-11	-10.145	-10.255	-0.110	(0)
AlF4-	4.444e-11	4.168e-11	-10.352	-10.380	-0.028	(0)
AlSO4+	8.470e-13	7.944e-13	-12.072	-12.100	-0.028	(0)
Al+3	6.090e-13	3.405e-13	-12.215	-12.468	-0.253	(0)
Al (SO4) 2-	2.728e-15	2.558e-15	-14.564	-14.592	-0.028	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.201	-44.474	-0.273	(0)
As (3)	1.284e-19					
H3AsO3	1.273e-19	1.273e-19	-18.895	-18.895	0.000	(0)
H2AsO3-	1.135e-21	1.059e-21	-20.945	-20.975	-0.030	(0)
HAsO3-2	2.069e-26	1.566e-26	-25.684	-25.805	-0.121	(0)
H4AsO3+	4.170e-27	3.889e-27	-26.380	-26.410	-0.030	(0)
AsO3-3	1.833e-32	9.786e-33	-31.737	-32.009	-0.273	(0)
As (5)	4.863e-09					
HAsO4-2	3.340e-09	2.526e-09	-8.476	-8.597	-0.121	(0)
H2AsO4-	1.524e-09	1.421e-09	-8.817	-8.847	-0.030	(0)
AsO4-3	2.427e-13	1.296e-13	-12.615	-12.888	-0.273	(0)
H3AsO4	1.522e-14	1.523e-14	-13.818	-13.817	0.000	(0)
B	1.908e-06					
H3BO3	1.889e-06	1.890e-06	-5.724	-5.723	0.000	(0)
H2BO3-	1.903e-08	1.780e-08	-7.721	-7.750	-0.029	(0)
CaH2BO3+	5.186e-10	4.853e-10	-9.285	-9.314	-0.029	(0)
MgH2BO3+	1.003e-10	9.387e-11	-9.999	-10.027	-0.029	(0)
BF (OH) 3-	3.787e-11	3.544e-11	-10.422	-10.451	-0.029	(0)
NaH2BO3	1.570e-11	1.570e-11	-10.804	-10.804	0.000	(0)
BaH2BO3+	7.956e-14	7.444e-14	-13.099	-13.128	-0.029	(0)
H5 (BO3) 2-	3.061e-14	2.864e-14	-13.514	-13.543	-0.029	(0)
BF2 (OH) 2-	1.173e-14	1.098e-14	-13.931	-13.960	-0.029	(0)
AgH2BO3	1.826e-15	1.826e-15	-14.738	-14.738	0.000	(0)
H8 (BO3) 3-	5.785e-18	5.413e-18	-17.238	-17.267	-0.029	(0)
BF3OH-	1.323e-20	1.237e-20	-19.879	-19.907	-0.029	(0)
BF4-	1.886e-25	1.764e-25	-24.725	-24.753	-0.029	(0)

Ba	1.769e-07					
Ba+2	1.752e-07	1.353e-07	-6.756	-6.869	-0.112	(0)
BaHCO3+	1.661e-09	1.561e-09	-8.780	-8.807	-0.027	(0)
BaCO3	6.371e-11	6.371e-11	-10.196	-10.196	0.000	(0)
BaOH+	1.028e-13	9.644e-14	-12.988	-13.016	-0.028	(0)
BaH2BO3+	7.956e-14	7.444e-14	-13.099	-13.128	-0.029	(0)
C (4)	1.470e-03					
HCO3-	1.286e-03	1.208e-03	-2.891	-2.918	-0.027	(0)
H2CO3	1.675e-04	1.675e-04	-3.776	-3.776	0.000	(0)
CaHCO3+	1.134e-05	1.065e-05	-4.945	-4.973	-0.027	(0)
MgHCO3+	2.005e-06	1.879e-06	-5.698	-5.726	-0.028	(0)
CO3-2	1.189e-06	9.180e-07	-5.925	-6.037	-0.112	(0)
CuCO3	8.339e-07	8.339e-07	-6.079	-6.079	0.000	(0)
CaCO3	6.893e-07	6.893e-07	-6.162	-6.162	0.000	(0)
NaHCO3	3.779e-07	3.779e-07	-6.423	-6.423	0.000	(0)
MgCO3	1.161e-07	1.161e-07	-6.935	-6.935	0.000	(0)
MnHCO3+	5.210e-08	4.889e-08	-7.283	-7.311	-0.028	(0)
CuHCO3+	1.260e-08	1.175e-08	-7.900	-7.930	-0.030	(0)
NaCO3-	1.013e-08	9.513e-09	-7.994	-8.022	-0.027	(0)
UO2 (CO3) 2-2	8.778e-09	6.641e-09	-8.057	-8.178	-0.121	(0)
ZnCO3	4.954e-09	4.954e-09	-8.305	-8.305	0.000	(0)
ZnHCO3+	3.839e-09	3.581e-09	-8.416	-8.446	-0.030	(0)
Cu (CO3) 2-2	2.724e-09	2.061e-09	-8.565	-8.686	-0.121	(0)
NiHCO3+	2.619e-09	2.443e-09	-8.582	-8.612	-0.030	(0)
BaHCO3+	1.661e-09	1.561e-09	-8.780	-8.807	-0.027	(0)
PbCO3	1.536e-09	1.536e-09	-8.813	-8.813	0.000	(0)
CoHCO3+	1.087e-09	1.014e-09	-8.964	-8.994	-0.030	(0)
FeHCO3+	1.081e-09	1.015e-09	-8.966	-8.993	-0.027	(0)
UO2 (CO3) 3-4	9.328e-10	3.055e-10	-9.030	-9.515	-0.485	(0)
NiCO3	5.620e-10	5.620e-10	-9.250	-9.250	0.000	(0)
PbHCO3+	5.356e-10	4.995e-10	-9.271	-9.301	-0.030	(0)
UO2CO3	3.625e-10	3.625e-10	-9.441	-9.441	0.000	(0)
CoCO3	1.676e-10	1.676e-10	-9.776	-9.776	0.000	(0)
BaCO3	6.371e-11	6.371e-11	-10.196	-10.196	0.000	(0)
CdCO3	2.078e-11	2.078e-11	-10.682	-10.682	0.000	(0)
Pb (CO3) 2-2	5.377e-12	4.068e-12	-11.269	-11.391	-0.121	(0)
CdHCO3+	2.928e-12	2.731e-12	-11.533	-11.564	-0.030	(0)
Cd (CO3) 2-2	1.870e-14	1.414e-14	-13.728	-13.849	-0.121	(0)
HgCO3	1.130e-17	1.130e-17	-16.947	-16.947	0.000	(0)
Hg (CO3) 2-2	4.336e-20	3.280e-20	-19.363	-19.484	-0.121	(0)
HgHCO3+	1.391e-20	1.297e-20	-19.857	-19.887	-0.030	(0)
Ca	6.583e-04					
Ca+2	6.134e-04	4.737e-04	-3.212	-3.324	-0.112	(0)
CaSO4	3.262e-05	3.262e-05	-4.487	-4.487	0.000	(0)
CaHCO3+	1.134e-05	1.065e-05	-4.945	-4.973	-0.027	(0)
CaCO3	6.893e-07	6.893e-07	-6.162	-6.162	0.000	(0)
CaF+	2.589e-07	2.429e-07	-6.587	-6.615	-0.028	(0)
CaOH+	1.643e-09	1.543e-09	-8.784	-8.812	-0.027	(0)
CaH2BO3+	5.186e-10	4.853e-10	-9.285	-9.314	-0.029	(0)
Cd	1.402e-09					
Cd+2	1.286e-09	9.933e-10	-8.891	-9.003	-0.112	(0)
CdSO4	6.998e-11	6.998e-11	-10.155	-10.155	0.000	(0)
CdCO3	2.078e-11	2.078e-11	-10.682	-10.682	0.000	(0)
CdCl+	1.956e-11	1.824e-11	-10.709	-10.739	-0.030	(0)
CdHCO3+	2.928e-12	2.731e-12	-11.533	-11.564	-0.030	(0)
CdOH+	1.381e-12	1.288e-12	-11.860	-11.890	-0.030	(0)
CdF+	7.931e-13	7.396e-13	-12.101	-12.131	-0.030	(0)
Cd (SO4) 2-2	3.750e-13	2.837e-13	-12.426	-12.547	-0.121	(0)
CdOHC1	1.222e-13	1.222e-13	-12.913	-12.913	0.000	(0)
Cd (CO3) 2-2	1.870e-14	1.414e-14	-13.728	-13.849	-0.121	(0)
CdCl2	1.462e-14	1.462e-14	-13.835	-13.835	0.000	(0)
Cd (OH) 2	1.327e-15	1.327e-15	-14.877	-14.877	0.000	(0)
CdF2	6.934e-17	6.934e-17	-16.159	-16.159	0.000	(0)
CdCl3-	1.902e-18	1.774e-18	-17.721	-17.751	-0.030	(0)
Cd (OH) 3-	1.419e-20	1.324e-20	-19.848	-19.878	-0.030	(0)
Cd2OH+3	1.201e-20	6.413e-21	-19.920	-20.193	-0.273	(0)
CdSeO4	6.557e-21	6.557e-21	-20.183	-20.183	0.000	(0)
Cd (SeO3) 2-2	9.950e-23	7.528e-23	-22.002	-22.123	-0.121	(0)

	Cd(OH) 4-2	4.676e-28	3.538e-28	-27.330	-27.451	-0.121	(0)
	CdHS+	0.000e+00	0.000e+00	-73.940	-73.970	-0.030	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-139.742	-139.742	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-210.787	-210.817	-0.030	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-281.475	-281.596	-0.121	(0)
C1		2.051e-04					
	Cl-	2.051e-04	1.923e-04	-3.688	-3.716	-0.028	(0)
	AgCl	2.542e-09	2.542e-09	-8.595	-8.595	0.000	(0)
	MnCl+	5.235e-10	4.912e-10	-9.281	-9.309	-0.028	(0)
	CuCl	3.050e-10	3.050e-10	-9.516	-9.516	0.000	(0)
	CuCl+	5.016e-11	4.702e-11	-10.300	-10.328	-0.028	(0)
	ZnCl+	4.832e-11	4.529e-11	-10.316	-10.344	-0.028	(0)
	AgCl2-	4.564e-11	4.257e-11	-10.341	-10.371	-0.030	(0)
	CdCl+	1.956e-11	1.824e-11	-10.709	-10.739	-0.030	(0)
	CuCl2-	1.307e-11	1.225e-11	-10.884	-10.912	-0.028	(0)
	ZnOHCl	9.682e-12	9.682e-12	-11.014	-11.014	0.000	(0)
	NiCl+	8.656e-12	8.073e-12	-11.063	-11.093	-0.030	(0)
	CoCl+	7.702e-12	7.183e-12	-11.113	-11.144	-0.030	(0)
	PbCl+	4.073e-12	3.799e-12	-11.390	-11.420	-0.030	(0)
	MnCl2	1.334e-13	1.334e-13	-12.875	-12.875	0.000	(0)
	CdOHCl	1.222e-13	1.222e-13	-12.913	-12.913	0.000	(0)
	CdCl2	1.462e-14	1.462e-14	-13.835	-13.835	0.000	(0)
	ZnCl2	1.380e-14	1.380e-14	-13.860	-13.860	0.000	(0)
	AgCl3-2	9.643e-15	7.295e-15	-14.016	-14.137	-0.121	(0)
	PbCl2	3.263e-15	3.263e-15	-14.486	-14.486	0.000	(0)
	CuCl2	3.135e-15	3.135e-15	-14.504	-14.504	0.000	(0)
	CuCl3-2	6.495e-16	5.037e-16	-15.187	-15.298	-0.110	(0)
	HgClOH	5.702e-16	5.702e-16	-15.244	-15.244	0.000	(0)
	CrCl+2	5.842e-17	4.420e-17	-16.233	-16.355	-0.121	(0)
	HgCl2	3.803e-17	3.803e-17	-16.420	-16.420	0.000	(0)
	UO2Cl+	3.317e-17	3.094e-17	-16.479	-16.510	-0.030	(0)
	NiCl2	7.816e-18	7.816e-18	-17.107	-17.107	0.000	(0)
	MnCl3-	7.530e-18	7.067e-18	-17.123	-17.151	-0.028	(0)
	AgCl4-3	5.366e-18	2.864e-18	-17.270	-17.543	-0.273	(0)
	FeCl+2	2.786e-18	2.161e-18	-17.555	-17.665	-0.110	(0)
	ZnCl3-	2.249e-18	2.108e-18	-17.648	-17.676	-0.028	(0)
	CdCl3-	1.902e-18	1.774e-18	-17.721	-17.751	-0.030	(0)
	PbCl3-	2.678e-19	2.498e-19	-18.572	-18.602	-0.030	(0)
	HgCl3-	7.841e-20	7.312e-20	-19.106	-19.136	-0.030	(0)
	HgCl+	4.231e-20	3.946e-20	-19.374	-19.404	-0.030	(0)
	CrOHCl2	2.637e-20	2.637e-20	-19.579	-19.579	0.000	(0)
	CuCl3-	6.002e-21	5.626e-21	-20.222	-20.250	-0.028	(0)
	VOCl+	2.727e-21	2.543e-21	-20.564	-20.595	-0.030	(0)
	FeCl2+	1.978e-21	1.856e-21	-20.704	-20.731	-0.028	(0)
	CrCl2+	8.647e-22	8.064e-22	-21.063	-21.093	-0.030	(0)
	ZnCl4-2	2.614e-22	2.027e-22	-21.583	-21.693	-0.110	(0)
	HgCl4-2	7.400e-23	5.598e-23	-22.131	-22.252	-0.121	(0)
	PbCl4-2	2.902e-23	2.195e-23	-22.537	-22.658	-0.121	(0)
	FeCl3	3.569e-26	3.569e-26	-25.447	-25.447	0.000	(0)
	CuCl4-2	6.991e-27	5.422e-27	-26.155	-26.266	-0.110	(0)
	CrO3Cl-	3.319e-29	3.096e-29	-28.479	-28.509	-0.030	(0)
	CoCl+2	1.333e-37	1.009e-37	-36.875	-36.996	-0.121	(0)
	UCl+3	0.000e+00	0.000e+00	-43.927	-44.199	-0.273	(0)
Co (2)		1.624e-08					
	Co+2	1.427e-08	1.080e-08	-7.846	-7.967	-0.121	(0)
	CoHCO3+	1.087e-09	1.014e-09	-8.964	-8.994	-0.030	(0)
	CoSO4	6.475e-10	6.475e-10	-9.189	-9.189	0.000	(0)
	CoCO3	1.676e-10	1.676e-10	-9.776	-9.776	0.000	(0)
	CoOH+	3.772e-11	3.517e-11	-10.423	-10.454	-0.030	(0)
	CoF+	1.720e-11	1.604e-11	-10.764	-10.795	-0.030	(0)
	CoCl+	7.702e-12	7.183e-12	-11.113	-11.144	-0.030	(0)
	Co (OH) 2	4.562e-13	4.562e-13	-12.341	-12.341	0.000	(0)
	Co (OH) 3-	1.594e-18	1.486e-18	-17.798	-17.828	-0.030	(0)
	CoOH-	3.998e-19	3.729e-19	-18.398	-18.428	-0.030	(0)
	CoSeO4	1.918e-19	1.918e-19	-18.717	-18.717	0.000	(0)
	Co2OH+3	3.566e-20	1.903e-20	-19.448	-19.720	-0.273	(0)
	Co (OH) 4-2	5.083e-26	3.846e-26	-25.294	-25.415	-0.121	(0)
	Co4 (OH) 4+4	9.325e-34	3.054e-34	-33.030	-33.515	-0.485	(0)

Co (3)	2.827e-30					
CoOH+2	2.827e-30	2.139e-30	-29.549	-29.670	-0.121	(0)
Co+3	4.611e-36	2.578e-36	-35.336	-35.589	-0.253	(0)
CoCl+2	1.333e-37	1.009e-37	-36.875	-36.996	-0.121	(0)
Cr (2)	9.350e-25					
Cr+2	9.350e-25	7.073e-25	-24.029	-24.150	-0.121	(0)
Cr (3)	1.518e-08					
Cr (OH) 2+	1.351e-08	1.260e-08	-7.869	-7.900	-0.030	(0)
Cr (OH) +2	8.385e-10	6.344e-10	-9.076	-9.198	-0.121	(0)
Cr (OH) 3	7.730e-10	7.730e-10	-9.112	-9.112	0.000	(0)
CrOHSO4	4.524e-11	4.524e-11	-10.344	-10.344	0.000	(0)
CrO2-	6.383e-12	5.953e-12	-11.195	-11.225	-0.030	(0)
Cr (OH) 4-	5.387e-12	5.024e-12	-11.269	-11.299	-0.030	(0)
CrF+2	1.748e-12	1.322e-12	-11.757	-11.879	-0.121	(0)
Cr+3	3.327e-13	1.776e-13	-12.478	-12.751	-0.273	(0)
CrSO4+	1.336e-13	1.246e-13	-12.874	-12.904	-0.030	(0)
CrCl+2	5.842e-17	4.420e-17	-16.233	-16.355	-0.121	(0)
Cr2 (OH) 2SO4+2	3.429e-18	2.594e-18	-17.465	-17.586	-0.121	(0)
Cr2 (OH) 2 (SO4) 2	4.631e-20	4.631e-20	-19.334	-19.334	0.000	(0)
CrOHC12	2.637e-20	2.637e-20	-19.579	-19.579	0.000	(0)
CrCl2+	8.647e-22	8.064e-22	-21.063	-21.093	-0.030	(0)
Cr (6)	3.145e-18					
CrO4-2	2.693e-18	2.080e-18	-17.570	-17.682	-0.112	(0)
HCrO4-	4.450e-19	4.150e-19	-18.352	-18.382	-0.030	(0)
NaCrO4-	6.167e-21	5.752e-21	-20.210	-20.240	-0.030	(0)
KCrO4-	6.675e-22	6.225e-22	-21.176	-21.206	-0.030	(0)
H2CrO4	2.075e-26	2.075e-26	-25.683	-25.683	0.000	(0)
CrO3SO4-2	3.097e-27	2.343e-27	-26.509	-26.630	-0.121	(0)
CrO3Cl-	3.319e-29	3.096e-29	-28.479	-28.509	-0.030	(0)
Cr2O7-2	7.895e-36	5.973e-36	-35.103	-35.224	-0.121	(0)
Cu (1)	1.669e-09					
Cu+	1.351e-09	1.260e-09	-8.869	-8.900	-0.030	(0)
CuCl	3.050e-10	3.050e-10	-9.516	-9.516	0.000	(0)
CuCl2-	1.307e-11	1.225e-11	-10.884	-10.912	-0.028	(0)
CuCl3-2	6.495e-16	5.037e-16	-15.187	-15.298	-0.110	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.852	-137.041	-0.188	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.587	-137.771	-0.183	(0)
Cu (2)	1.148e-06					
CuCO3	8.339e-07	8.339e-07	-6.079	-6.079	0.000	(0)
Cu+2	1.998e-07	1.543e-07	-6.699	-6.812	-0.112	(0)
CuOH+	8.498e-08	7.965e-08	-7.071	-7.099	-0.028	(0)
CuHCO3+	1.260e-08	1.175e-08	-7.900	-7.930	-0.030	(0)
CuSO4	1.062e-08	1.062e-08	-7.974	-7.974	0.000	(0)
Cu (CO3) 2-2	2.724e-09	2.061e-09	-8.565	-8.686	-0.121	(0)
Cu (OH) 2	2.595e-09	2.595e-09	-8.586	-8.586	0.000	(0)
CuF+	4.904e-10	4.573e-10	-9.309	-9.340	-0.030	(0)
Cu2 (OH) 2+2	2.107e-10	1.594e-10	-9.676	-9.798	-0.121	(0)
CuCl+	5.016e-11	4.702e-11	-10.300	-10.328	-0.028	(0)
Cu (OH) 3-	9.318e-13	8.690e-13	-12.031	-12.061	-0.030	(0)
CuCl2	3.135e-15	3.135e-15	-14.504	-14.504	0.000	(0)
Cu (OH) 4-2	1.476e-18	1.117e-18	-17.831	-17.952	-0.121	(0)
CuCl3-	6.002e-21	5.626e-21	-20.222	-20.250	-0.028	(0)
CuCl4-2	6.991e-27	5.422e-27	-26.155	-26.266	-0.110	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.809	-199.839	-0.030	(0)
F	5.127e-05					
F-	5.012e-05	4.698e-05	-4.300	-4.328	-0.028	(0)
MgF+	8.548e-07	8.017e-07	-6.068	-6.096	-0.028	(0)
CaF+	2.589e-07	2.429e-07	-6.587	-6.615	-0.028	(0)
NaF	1.650e-08	1.650e-08	-7.783	-7.783	0.000	(0)
HF	4.286e-09	4.286e-09	-8.368	-8.368	0.000	(0)
MnF+	4.045e-09	3.795e-09	-8.393	-8.421	-0.028	(0)
AlF2+	3.187e-09	2.993e-09	-8.497	-8.524	-0.027	(0)
AlF3	1.770e-09	1.770e-09	-8.752	-8.752	0.000	(0)
CuF+	4.904e-10	4.573e-10	-9.309	-9.340	-0.030	(0)
AlF+2	2.059e-10	1.600e-10	-9.686	-9.796	-0.110	(0)
ZnF+	9.426e-11	8.791e-11	-10.026	-10.056	-0.030	(0)
AlF4-	4.444e-11	4.168e-11	-10.352	-10.380	-0.028	(0)
BF (OH) 3-	3.787e-11	3.544e-11	-10.422	-10.451	-0.029	(0)

NiF+	2.076e-11	1.936e-11	-10.683	-10.713	-0.030	(0)
CoF+	1.720e-11	1.604e-11	-10.764	-10.795	-0.030	(0)
PbF+	1.977e-12	1.843e-12	-11.704	-11.734	-0.030	(0)
CrF+2	1.748e-12	1.322e-12	-11.757	-11.879	-0.121	(0)
HF2-	8.172e-13	7.655e-13	-12.088	-12.116	-0.028	(0)
CdF+	7.931e-13	7.396e-13	-12.101	-12.131	-0.030	(0)
AgF	7.640e-13	7.640e-13	-12.117	-12.117	0.000	(0)
UO2F+	6.898e-13	6.433e-13	-12.161	-12.192	-0.030	(0)
UO2F2	8.718e-14	8.718e-14	-13.060	-13.060	0.000	(0)
FeF2+	2.569e-14	2.410e-14	-13.590	-13.618	-0.028	(0)
FeF+2	2.472e-14	1.917e-14	-13.607	-13.717	-0.110	(0)
BF2(OH) 2-	1.173e-14	1.098e-14	-13.931	-13.960	-0.029	(0)
PbF2	1.704e-15	1.704e-15	-14.768	-14.768	0.000	(0)
FeF3	1.598e-15	1.598e-15	-14.796	-14.796	0.000	(0)
UO2F3-	1.103e-15	1.029e-15	-14.957	-14.988	-0.030	(0)
VO2F	7.659e-17	7.659e-17	-16.116	-16.116	0.000	(0)
CdF2	6.934e-17	6.934e-17	-16.159	-16.159	0.000	(0)
H2F2	4.921e-17	4.921e-17	-16.308	-16.308	0.000	(0)
VOF+	1.424e-18	1.328e-18	-17.846	-17.877	-0.030	(0)
VO2F2-	1.401e-18	1.306e-18	-17.854	-17.884	-0.030	(0)
UO2F4-2	5.076e-19	3.840e-19	-18.295	-18.416	-0.121	(0)
PbF3-	1.629e-19	1.519e-19	-18.788	-18.818	-0.030	(0)
VOF2	2.340e-20	2.340e-20	-19.631	-19.631	0.000	(0)
BF3OH-	1.323e-20	1.237e-20	-19.879	-19.907	-0.029	(0)
VO2F3-2	1.012e-21	7.657e-22	-20.995	-21.116	-0.121	(0)
VOF3-	4.183e-23	3.901e-23	-22.378	-22.409	-0.030	(0)
PbF4-2	4.515e-24	3.416e-24	-23.345	-23.467	-0.121	(0)
Sb(OH) 2F	1.032e-24	1.032e-24	-23.986	-23.986	0.000	(0)
SbOF	1.015e-24	1.015e-24	-23.993	-23.993	0.000	(0)
BF4-	1.886e-25	1.764e-25	-24.725	-24.753	-0.029	(0)
VO2F4-3	3.316e-26	1.770e-26	-25.479	-25.752	-0.273	(0)
HgF+	1.920e-26	1.791e-26	-25.717	-25.747	-0.030	(0)
VOF4-2	9.780e-27	7.399e-27	-26.010	-26.131	-0.121	(0)
UF3+	2.904e-34	2.708e-34	-33.537	-33.567	-0.030	(0)
UF2+2	4.807e-35	3.637e-35	-34.318	-34.439	-0.121	(0)
UF4	1.395e-36	1.395e-36	-35.855	-35.855	0.000	(0)
UF+3	1.152e-37	6.148e-38	-36.939	-37.211	-0.273	(0)
UF5-	2.785e-39	2.598e-39	-38.555	-38.585	-0.030	(0)
UF6-2	0.000e+00	0.000e+00	-40.312	-40.433	-0.121	(0)
Fe (2)	9.475e-08					
Fe+2	8.828e-08	6.679e-08	-7.054	-7.175	-0.121	(0)
FeSO4	4.927e-09	4.927e-09	-8.307	-8.307	0.000	(0)
FeHCO3+	1.081e-09	1.015e-09	-8.966	-8.993	-0.027	(0)
FeOH+	4.626e-10	4.341e-10	-9.335	-9.362	-0.028	(0)
Fe(OH) 2	5.630e-14	5.630e-14	-13.249	-13.249	0.000	(0)
Fe(OH) 3-	3.098e-15	2.907e-15	-14.509	-14.537	-0.028	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-144.176	-144.176	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-215.084	-215.114	-0.030	(0)
Fe (3)	3.098e-06					
Fe(OH) 2+	2.654e-06	2.492e-06	-5.576	-5.603	-0.027	(0)
Fe(OH) 3	4.369e-07	4.369e-07	-6.360	-6.360	0.000	(0)
Fe(OH) 4-	7.075e-09	6.643e-09	-8.150	-8.178	-0.027	(0)
FeOH+2	5.058e-11	3.923e-11	-10.296	-10.406	-0.110	(0)
FeF2+	2.569e-14	2.410e-14	-13.590	-13.618	-0.028	(0)
FeF+2	2.472e-14	1.917e-14	-13.607	-13.717	-0.110	(0)
FeF3	1.598e-15	1.598e-15	-14.796	-14.796	0.000	(0)
FeSO4+	1.337e-15	1.255e-15	-14.874	-14.901	-0.028	(0)
Fe+3	6.656e-16	3.721e-16	-15.177	-15.429	-0.253	(0)
Fe(SO4) 2-	8.646e-18	8.063e-18	-17.063	-17.093	-0.030	(0)
FeCl+2	2.786e-18	2.161e-18	-17.555	-17.665	-0.110	(0)
Fe2(OH) 2+4	1.556e-19	5.095e-20	-18.808	-19.293	-0.485	(0)
FeHSeO3+2	6.105e-21	4.619e-21	-20.214	-20.335	-0.121	(0)
FeCl2+	1.978e-21	1.856e-21	-20.704	-20.731	-0.028	(0)
Fe3(OH) 4+5	1.050e-23	1.835e-24	-22.979	-23.736	-0.757	(0)
FeCl3	3.569e-26	3.569e-26	-25.447	-25.447	0.000	(0)
H (0)	1.496e-27					
H2	7.478e-28	7.484e-28	-27.126	-27.126	0.000	(0)
Hg (0)	2.639e-11					

Hg	2.639e-11	2.639e-11	-10.579	-10.579	0.000	(0)
Hg (1)	4.870e-25					
Hg2+2	2.435e-25	1.842e-25	-24.613	-24.735	-0.121	(0)
Hg (2)	2.348e-15					
Hg (OH) 2	1.728e-15	1.730e-15	-14.762	-14.762	0.000	(0)
HgClOH	5.702e-16	5.702e-16	-15.244	-15.244	0.000	(0)
HgCl2	3.803e-17	3.803e-17	-16.420	-16.420	0.000	(0)
HgCO3	1.130e-17	1.130e-17	-16.947	-16.947	0.000	(0)
HgCl3-	7.841e-20	7.312e-20	-19.106	-19.136	-0.030	(0)
HgOH+	7.168e-20	6.685e-20	-19.145	-19.175	-0.030	(0)
Hg (CO3) 2-2	4.336e-20	3.280e-20	-19.363	-19.484	-0.121	(0)
HgCl+	4.231e-20	3.946e-20	-19.374	-19.404	-0.030	(0)
HgHCO3+	1.391e-20	1.297e-20	-19.857	-19.887	-0.030	(0)
HgCl4-2	7.400e-23	5.598e-23	-22.131	-22.252	-0.121	(0)
Hg (OH) 3-	3.812e-23	3.556e-23	-22.419	-22.449	-0.030	(0)
Hg+2	1.359e-23	1.028e-23	-22.867	-22.988	-0.121	(0)
HgSO4	8.092e-25	8.092e-25	-24.092	-24.092	0.000	(0)
HgF+	1.920e-26	1.791e-26	-25.717	-25.747	-0.030	(0)
HgHS2-	0.000e+00	0.000e+00	-129.770	-129.801	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.617	-130.617	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.178	-131.299	-0.121	(0)
K	8.612e-05					
K+	8.594e-05	8.056e-05	-4.066	-4.094	-0.028	(0)
KSO4-	1.826e-07	1.714e-07	-6.739	-6.766	-0.027	(0)
KCrO4-	6.675e-22	6.225e-22	-21.176	-21.206	-0.030	(0)
Mg	2.082e-04					
Mg+2	1.969e-04	1.521e-04	-3.706	-3.818	-0.112	(0)
MgSO4	8.317e-06	8.317e-06	-5.080	-5.080	0.000	(0)
MgHCO3+	2.005e-06	1.879e-06	-5.698	-5.726	-0.028	(0)
MgF+	8.548e-07	8.017e-07	-6.068	-6.096	-0.028	(0)
MgCO3	1.161e-07	1.161e-07	-6.935	-6.935	0.000	(0)
MgOH+	1.052e-08	9.885e-09	-7.978	-8.005	-0.027	(0)
MgH2BO3+	1.003e-10	9.387e-11	-9.999	-10.027	-0.029	(0)
Mn (2)	2.848e-06					
Mn+2	2.682e-06	2.029e-06	-5.572	-5.693	-0.121	(0)
MnSO4	1.084e-07	1.084e-07	-6.965	-6.965	0.000	(0)
MnHCO3+	5.210e-08	4.889e-08	-7.283	-7.311	-0.028	(0)
MnF+	4.045e-09	3.795e-09	-8.393	-8.421	-0.028	(0)
MnOH+	8.868e-10	8.322e-10	-9.052	-9.080	-0.028	(0)
MnCl+	5.235e-10	4.912e-10	-9.281	-9.309	-0.028	(0)
MnCl2	1.334e-13	1.334e-13	-12.875	-12.875	0.000	(0)
MnSeO4	1.936e-17	1.936e-17	-16.713	-16.713	0.000	(0)
MnCl3-	7.530e-18	7.067e-18	-17.123	-17.151	-0.028	(0)
Mn (OH) 3-	1.461e-19	1.371e-19	-18.835	-18.863	-0.028	(0)
Mn (OH) 4-2	9.319e-26	7.227e-26	-25.031	-25.141	-0.110	(0)
MnSe	5.453e-40	5.453e-40	-39.263	-39.263	0.000	(0)
Mn (3)	9.723e-27					
Mn+3	9.723e-27	5.436e-27	-26.012	-26.265	-0.253	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.213	-47.323	-0.110	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-51.889	-51.917	-0.029	(0)
Mo	6.651e-08					
MoO4-2	6.644e-08	5.131e-08	-7.178	-7.290	-0.112	(0)
HMoO4-	6.751e-11	6.296e-11	-10.171	-10.201	-0.030	(0)
H2MoO4	2.844e-14	2.844e-14	-13.546	-13.546	0.000	(0)
Ag2MoO4	8.139e-25	8.139e-25	-24.089	-24.089	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.201	-44.474	-0.273	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.627	-55.718	-1.091	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.784	-56.541	-0.757	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.484	-58.969	-0.485	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.660	-62.933	-0.273	(0)
Na	5.950e-04					
Na+	5.937e-04	5.565e-04	-3.226	-3.255	-0.028	(0)
NaSO4-	9.568e-07	8.982e-07	-6.019	-6.047	-0.027	(0)
NaHCO3	3.779e-07	3.779e-07	-6.423	-6.423	0.000	(0)
NaF	1.650e-08	1.650e-08	-7.783	-7.783	0.000	(0)
NaCO3-	1.013e-08	9.513e-09	-7.994	-8.022	-0.027	(0)

	NaH2BO3	1.570e-11	1.570e-11	-10.804	-10.804	0.000	(0)
	NaCrO4-	6.167e-21	5.752e-21	-20.210	-20.240	-0.030	(0)
Ni		2.548e-08					
	Ni+2	2.125e-08	1.641e-08	-7.673	-7.785	-0.112	(0)
	NiHCO3+	2.619e-09	2.443e-09	-8.582	-8.612	-0.030	(0)
	NiSO4	9.839e-10	9.839e-10	-9.007	-9.007	0.000	(0)
	NiCO3	5.620e-10	5.620e-10	-9.250	-9.250	0.000	(0)
	NiOH+	3.616e-11	3.373e-11	-10.442	-10.472	-0.030	(0)
	NiF+	2.076e-11	1.936e-11	-10.683	-10.713	-0.030	(0)
	NiCl+	8.656e-12	8.073e-12	-11.063	-11.093	-0.030	(0)
	Ni (OH) 2	4.374e-13	4.374e-13	-12.359	-12.359	0.000	(0)
	Ni (SO4) 2-2	1.294e-14	9.792e-15	-13.888	-14.009	-0.121	(0)
	Ni (OH) 3-	7.658e-17	7.142e-17	-16.116	-16.146	-0.030	(0)
	NiCl2	7.816e-18	7.816e-18	-17.107	-17.107	0.000	(0)
	NiSeO4	2.721e-19	2.721e-19	-18.565	-18.565	0.000	(0)
O (0)		1.808e-38					
	O2	9.042e-39	9.049e-39	-38.044	-38.043	0.000	(0)
Pb		3.133e-09					
	PbCO3	1.536e-09	1.536e-09	-8.813	-8.813	0.000	(0)
	Pb+2	7.209e-10	5.567e-10	-9.142	-9.254	-0.112	(0)
	PbHCO3+	5.356e-10	4.995e-10	-9.271	-9.301	-0.030	(0)
	PbOH+	2.448e-10	2.283e-10	-9.611	-9.641	-0.030	(0)
	PbSO4	8.195e-11	8.195e-11	-10.086	-10.086	0.000	(0)
	Pb (CO3) 2-2	5.377e-12	4.068e-12	-11.269	-11.391	-0.121	(0)
	PbCl+	4.073e-12	3.799e-12	-11.390	-11.420	-0.030	(0)
	PbF+	1.977e-12	1.843e-12	-11.704	-11.734	-0.030	(0)
	Pb (OH) 2	1.179e-12	1.179e-12	-11.929	-11.929	0.000	(0)
	Pb (SO4) 2-2	1.962e-13	1.484e-13	-12.707	-12.829	-0.121	(0)
	PbCl2	3.263e-15	3.263e-15	-14.486	-14.486	0.000	(0)
	PbF2	1.704e-15	1.704e-15	-14.768	-14.768	0.000	(0)
	Pb (OH) 3-	2.064e-16	1.925e-16	-15.685	-15.716	-0.030	(0)
	Pb2OH+3	3.775e-18	2.015e-18	-17.423	-17.696	-0.273	(0)
	PbCl3-	2.678e-19	2.498e-19	-18.572	-18.602	-0.030	(0)
	PbF3-	1.629e-19	1.519e-19	-18.788	-18.818	-0.030	(0)
	Pb (OH) 4-2	1.017e-20	7.697e-21	-19.992	-20.114	-0.121	(0)
	PbCl4-2	2.902e-23	2.195e-23	-22.537	-22.658	-0.121	(0)
	Pb3 (OH) 4+2	2.041e-23	1.544e-23	-22.690	-22.811	-0.121	(0)
	PbF4-2	4.515e-24	3.416e-24	-23.345	-23.467	-0.121	(0)
	Pb4 (OH) 4+4	2.085e-28	6.828e-29	-27.681	-28.166	-0.485	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-139.935	-139.935	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-211.580	-211.610	-0.030	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-67.350	-67.350	0.000	(0)
	HS-	0.000e+00	0.000e+00	-72.945	-72.975	-0.030	(0)
	H2S	0.000e+00	0.000e+00	-73.165	-73.165	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-73.940	-73.970	-0.030	(0)
	S5-2	0.000e+00	0.000e+00	-75.009	-75.131	-0.121	(0)
	S6-2	0.000e+00	0.000e+00	-75.525	-75.646	-0.121	(0)
	S4-2	0.000e+00	0.000e+00	-75.605	-75.726	-0.121	(0)
	S3-2	0.000e+00	0.000e+00	-76.411	-76.532	-0.121	(0)
	S2-2	0.000e+00	0.000e+00	-77.427	-77.548	-0.121	(0)
	S-2	0.000e+00	0.000e+00	-82.955	-83.065	-0.110	(0)
	HgHS2-	0.000e+00	0.000e+00	-129.770	-129.801	-0.030	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-130.617	-130.617	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-131.178	-131.299	-0.121	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-136.195	-136.225	-0.030	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-136.405	-136.499	-0.094	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-136.852	-137.041	-0.188	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-137.587	-137.771	-0.183	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-138.538	-138.729	-0.191	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-138.854	-139.040	-0.186	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-138.928	-138.959	-0.030	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-139.742	-139.742	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-139.935	-139.935	0.000	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-140.159	-140.159	0.000	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-144.176	-144.176	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-199.809	-199.839	-0.030	(0)
	Zn (HS) 3-	0.000e+00	0.000e+00	-209.824	-209.854	-0.030	(0)

Cd (HS) 3-	0.000e+00	0.000e+00	-210.787	-210.817	-0.030	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.580	-211.610	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.503	-212.624	-0.121	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.084	-215.114	-0.030	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-281.475	-281.596	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.168	-284.289	-0.121	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.095	-294.216	-0.121	(0)
S (6)	4.314e-04					
SO4-2	3.892e-04	3.005e-04	-3.410	-3.522	-0.112	(0)
CaSO4	3.262e-05	3.262e-05	-4.487	-4.487	0.000	(0)
MgSO4	8.317e-06	8.317e-06	-5.080	-5.080	0.000	(0)
NaSO4-	9.568e-07	8.982e-07	-6.019	-6.047	-0.027	(0)
KSO4-	1.826e-07	1.714e-07	-6.739	-6.766	-0.027	(0)
MnSO4	1.084e-07	1.084e-07	-6.965	-6.965	0.000	(0)
CuSO4	1.062e-08	1.062e-08	-7.974	-7.974	0.000	(0)
ZnSO4	6.166e-09	6.166e-09	-8.210	-8.210	0.000	(0)
FeSO4	4.927e-09	4.927e-09	-8.307	-8.307	0.000	(0)
HSO4-	1.931e-09	1.811e-09	-8.714	-8.742	-0.028	(0)
NiSO4	9.839e-10	9.839e-10	-9.007	-9.007	0.000	(0)
CoSO4	6.475e-10	6.475e-10	-9.189	-9.189	0.000	(0)
PbSO4	8.195e-11	8.195e-11	-10.086	-10.086	0.000	(0)
CdSO4	6.998e-11	6.998e-11	-10.155	-10.155	0.000	(0)
CrOHSO4	4.524e-11	4.524e-11	-10.344	-10.344	0.000	(0)
AgSO4-	4.162e-11	3.882e-11	-10.381	-10.411	-0.030	(0)
Zn (SO4) 2-2	2.133e-11	1.614e-11	-10.671	-10.792	-0.121	(0)
AlSO4+	8.470e-13	7.944e-13	-12.072	-12.100	-0.028	(0)
Cd (SO4) 2-2	3.750e-13	2.837e-13	-12.426	-12.547	-0.121	(0)
Pb (SO4) 2-2	1.962e-13	1.484e-13	-12.707	-12.829	-0.121	(0)
CrSO4+	1.336e-13	1.246e-13	-12.874	-12.904	-0.030	(0)
UO2SO4	4.512e-14	4.512e-14	-13.346	-13.346	0.000	(0)
Ni (SO4) 2-2	1.294e-14	9.792e-15	-13.888	-14.009	-0.121	(0)
Al (SO4) 2-	2.728e-15	2.558e-15	-14.564	-14.592	-0.028	(0)
FeSO4+	1.337e-15	1.255e-15	-14.874	-14.901	-0.028	(0)
UO2 (SO4) 2-2	2.363e-16	1.788e-16	-15.626	-15.748	-0.121	(0)
Fe (SO4) 2-	8.646e-18	8.063e-18	-17.063	-17.093	-0.030	(0)
VO2SO4-	7.152e-18	6.670e-18	-17.146	-17.176	-0.030	(0)
Cr2 (OH) 2SO4+2	3.429e-18	2.594e-18	-17.465	-17.586	-0.121	(0)
VOSO4	3.902e-19	3.902e-19	-18.409	-18.409	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.631e-20	4.631e-20	-19.334	-19.334	0.000	(0)
HgSO4	8.092e-25	8.092e-25	-24.092	-24.092	0.000	(0)
CrO3SO4-2	3.097e-27	2.343e-27	-26.509	-26.630	-0.121	(0)
VSO4+	2.258e-32	2.106e-32	-31.646	-31.677	-0.030	(0)
U (SO4) 2	1.873e-39	1.873e-39	-38.727	-38.727	0.000	(0)
USO4+2	1.037e-39	7.847e-40	-38.984	-39.105	-0.121	(0)
Sb (3)	4.508e-19					
Sb (OH) 3	2.281e-19	2.281e-19	-18.642	-18.642	0.000	(0)
HSbO2	2.227e-19	2.227e-19	-18.652	-18.652	0.000	(0)
SbO2-	6.270e-24	5.848e-24	-23.203	-23.233	-0.030	(0)
Sb (OH) 4-	3.593e-24	3.351e-24	-23.445	-23.475	-0.030	(0)
Sb (OH) 2F	1.032e-24	1.032e-24	-23.986	-23.986	0.000	(0)
SbOF	1.015e-24	1.015e-24	-23.993	-23.993	0.000	(0)
Sb (OH) 2+	3.663e-25	3.416e-25	-24.436	-24.466	-0.030	(0)
SbO+	1.263e-25	1.178e-25	-24.899	-24.929	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.095	-294.216	-0.121	(0)
Sb (5)	1.573e-09					
SbO3-	1.571e-09	1.465e-09	-8.804	-8.834	-0.030	(0)
Sb (OH) 6-	1.828e-12	1.713e-12	-11.738	-11.766	-0.028	(0)
SbO2+	1.713e-24	1.598e-24	-23.766	-23.796	-0.030	(0)
Se (-2)	2.226e-10					
Ag2Se	2.226e-10	2.226e-10	-9.652	-9.652	0.000	(0)
HSe-	4.312e-36	4.021e-36	-35.365	-35.396	-0.030	(0)
H2Se	1.925e-39	1.925e-39	-38.716	-38.716	0.000	(0)
MnSe	5.453e-40	5.453e-40	-39.263	-39.263	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.065	-43.186	-0.121	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.375	-77.859	-0.485	(0)
Se (4)	5.438e-09					
HSeO3-	5.037e-09	4.697e-09	-8.298	-8.328	-0.030	(0)
SeO3-2	4.008e-10	3.032e-10	-9.397	-9.518	-0.121	(0)

H2SeO3	1.236e-13	1.236e-13	-12.908	-12.908	0.000	(0)
AgSeO3-	1.353e-15	1.262e-15	-14.869	-14.899	-0.030	(0)
FeHSeO3+2	6.105e-21	4.619e-21	-20.214	-20.335	-0.121	(0)
Cd(SeO3) 2-2	9.950e-23	7.528e-23	-22.002	-22.123	-0.121	(0)
Ag(SeO3) 2-3	6.418e-24	3.426e-24	-23.193	-23.465	-0.273	(0)
Se(6)	4.593e-14					
SeO4-2	4.591e-14	3.545e-14	-13.338	-13.450	-0.112	(0)
MnSeO4	1.936e-17	1.936e-17	-16.713	-16.713	0.000	(0)
ZnSeO4	5.149e-19	5.149e-19	-18.288	-18.288	0.000	(0)
NiSeO4	2.721e-19	2.721e-19	-18.565	-18.565	0.000	(0)
CoSeO4	1.918e-19	1.918e-19	-18.717	-18.717	0.000	(0)
HSeO4-	1.175e-19	1.096e-19	-18.930	-18.960	-0.030	(0)
CdSeO4	6.557e-21	6.557e-21	-20.183	-20.183	0.000	(0)
Zn(SeO4) 2-2	2.446e-32	1.851e-32	-31.611	-31.733	-0.121	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.485	-55.757	-0.273	(0)
U(4)	5.994e-20					
U(OH) 5-	5.980e-20	5.577e-20	-19.223	-19.254	-0.030	(0)
U(OH) 4	1.440e-22	1.440e-22	-21.842	-21.842	0.000	(0)
U(OH) 3+	3.482e-26	3.247e-26	-25.458	-25.488	-0.030	(0)
U(OH) 2+2	1.224e-30	9.260e-31	-29.912	-30.033	-0.121	(0)
UF3+	2.904e-34	2.708e-34	-33.537	-33.567	-0.030	(0)
UF2+2	4.807e-35	3.637e-35	-34.318	-34.439	-0.121	(0)
UOH+3	5.039e-36	2.690e-36	-35.298	-35.570	-0.273	(0)
UF4	1.395e-36	1.395e-36	-35.855	-35.855	0.000	(0)
UF+3	1.152e-37	6.148e-38	-36.939	-37.211	-0.273	(0)
UF5-	2.785e-39	2.598e-39	-38.555	-38.585	-0.030	(0)
U(SO4) 2	1.873e-39	1.873e-39	-38.727	-38.727	0.000	(0)
USO4+2	1.037e-39	7.847e-40	-38.984	-39.105	-0.121	(0)
UF6-2	0.000e+00	0.000e+00	-40.312	-40.433	-0.121	(0)
U+4	0.000e+00	0.000e+00	-41.698	-42.183	-0.485	(0)
UCl+3	0.000e+00	0.000e+00	-43.927	-44.199	-0.273	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-159.652	-162.105	-2.454	(0)
U(5)	1.081e-15					
UO2+	1.081e-15	1.008e-15	-14.966	-14.996	-0.030	(0)
U(6)	1.008e-08					
UO2(CO3) 2-2	8.778e-09	6.641e-09	-8.057	-8.178	-0.121	(0)
UO2(CO3) 3-4	9.328e-10	3.055e-10	-9.030	-9.515	-0.485	(0)
UO2CO3	3.625e-10	3.625e-10	-9.441	-9.441	0.000	(0)
UO2OH+	2.186e-12	2.039e-12	-11.660	-11.691	-0.030	(0)
UO2F+	6.898e-13	6.433e-13	-12.161	-12.192	-0.030	(0)
UO2+2	1.284e-13	9.920e-14	-12.891	-13.004	-0.112	(0)
UO2F2	8.718e-14	8.718e-14	-13.060	-13.060	0.000	(0)
UO2SO4	4.512e-14	4.512e-14	-13.346	-13.346	0.000	(0)
UO2F3-	1.103e-15	1.029e-15	-14.957	-14.988	-0.030	(0)
UO2(SO4) 2-2	2.363e-16	1.788e-16	-15.626	-15.748	-0.121	(0)
UO2Cl+	3.317e-17	3.094e-17	-16.479	-16.510	-0.030	(0)
(UO2) 2(OH) 2+2	9.120e-18	6.899e-18	-17.040	-17.161	-0.121	(0)
UO2F4-2	5.076e-19	3.840e-19	-18.295	-18.416	-0.121	(0)
(UO2) 3(OH) 5+	3.050e-19	2.845e-19	-18.516	-18.546	-0.030	(0)
V(2)	8.469e-40					
VOH+	6.866e-40	6.404e-40	-39.163	-39.194	-0.030	(0)
V+2	1.602e-40	1.212e-40	-39.795	-39.916	-0.121	(0)
V(3)	5.211e-13					
V(OH) 3	5.211e-13	5.211e-13	-12.283	-12.283	0.000	(0)
V(OH) 2+	2.227e-23	2.077e-23	-22.652	-22.683	-0.030	(0)
VOH+2	1.605e-26	1.215e-26	-25.794	-25.916	-0.121	(0)
V+3	2.781e-31	1.484e-31	-30.556	-30.828	-0.273	(0)
VSO4+	2.258e-32	2.106e-32	-31.646	-31.677	-0.030	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-49.874	-50.146	-0.273	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-50.546	-51.031	-0.485	(0)
V(4)	1.727e-16					
V(OH) 3+	1.646e-16	1.535e-16	-15.783	-15.814	-0.030	(0)
VO+2	6.231e-18	4.714e-18	-17.205	-17.327	-0.121	(0)
VOF+	1.424e-18	1.328e-18	-17.846	-17.877	-0.030	(0)
VOSO4	3.902e-19	3.902e-19	-18.409	-18.409	0.000	(0)
VOF2	2.340e-20	2.340e-20	-19.631	-19.631	0.000	(0)
VOC1+	2.727e-21	2.543e-21	-20.564	-20.595	-0.030	(0)

VOF3-	4.183e-23	3.901e-23	-22.378	-22.409	-0.030	(0)
VOF4-2	9.780e-27	7.399e-27	-26.010	-26.131	-0.121	(0)
H2V2O4+2	1.562e-27	1.182e-27	-26.806	-26.927	-0.121	(0)
V(5)	1.380e-08					
H2VO4-	1.313e-08	1.225e-08	-7.882	-7.912	-0.030	(0)
HVO4-2	6.594e-10	4.989e-10	-9.181	-9.302	-0.121	(0)
H3VO4	7.552e-12	7.552e-12	-11.122	-11.122	0.000	(0)
H3V2O7-	6.404e-13	5.972e-13	-12.194	-12.224	-0.030	(0)
HV2O7-3	3.879e-15	2.070e-15	-14.411	-14.684	-0.273	(0)
VO2+	9.914e-16	9.294e-16	-15.004	-15.032	-0.028	(0)
VO2F	7.659e-17	7.659e-17	-16.116	-16.116	0.000	(0)
VO4-3	7.596e-17	4.054e-17	-16.119	-16.392	-0.273	(0)
VO2SO4-	7.152e-18	6.670e-18	-17.146	-17.176	-0.030	(0)
V3O9-3	3.604e-18	1.924e-18	-17.443	-17.716	-0.273	(0)
V2O7-4	2.759e-18	9.036e-19	-17.559	-18.044	-0.485	(0)
VO2F2-	1.401e-18	1.306e-18	-17.854	-17.884	-0.030	(0)
VO2F3-2	1.012e-21	7.657e-22	-20.995	-21.116	-0.121	(0)
V4O12-4	2.999e-23	9.823e-24	-22.523	-23.008	-0.485	(0)
VO2F4-3	3.316e-26	1.770e-26	-25.479	-25.752	-0.273	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.319	-58.077	-0.757	(0)
V10O28-6	0.000e+00	0.000e+00	-57.963	-59.053	-1.091	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.594	-60.079	-0.485	(0)
Zn	1.382e-07					
Zn+2	1.214e-07	9.377e-08	-6.916	-7.028	-0.112	(0)
ZnSO4	6.166e-09	6.166e-09	-8.210	-8.210	0.000	(0)
ZnCO3	4.954e-09	4.954e-09	-8.305	-8.305	0.000	(0)
ZnHCO3+	3.839e-09	3.581e-09	-8.416	-8.446	-0.030	(0)
ZnOH+	1.642e-09	1.531e-09	-8.785	-8.815	-0.030	(0)
ZnF+	9.426e-11	8.791e-11	-10.026	-10.056	-0.030	(0)
ZnCl+	4.832e-11	4.529e-11	-10.316	-10.344	-0.028	(0)
Zn(OH) 2	3.962e-11	3.962e-11	-10.402	-10.402	0.000	(0)
Zn(SO4) 2-2	2.133e-11	1.614e-11	-10.671	-10.792	-0.121	(0)
ZnOHCl	9.682e-12	9.682e-12	-11.014	-11.014	0.000	(0)
Zn(OH) 3-	3.476e-14	3.242e-14	-13.459	-13.489	-0.030	(0)
ZnCl2	1.380e-14	1.380e-14	-13.860	-13.860	0.000	(0)
ZnCl3-	2.249e-18	2.108e-18	-17.648	-17.676	-0.028	(0)
ZnSeO4	5.149e-19	5.149e-19	-18.288	-18.288	0.000	(0)
Zn(OH) 4-2	2.786e-19	2.107e-19	-18.555	-18.676	-0.121	(0)
ZnCl4-2	2.614e-22	2.027e-22	-21.583	-21.693	-0.110	(0)
Zn(SeO4) 2-2	2.446e-32	1.851e-32	-31.611	-31.733	-0.121	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-138.928	-138.959	-0.030	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-140.159	-140.159	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-209.824	-209.854	-0.030	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-212.503	-212.624	-0.121	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-284.168	-284.289	-0.121	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.92	-82.14	-36.22	Ag2S
Ag2CO3	-11.32	-22.41	-11.09	Ag2CO3
Ag2CrO4	-22.47	-34.06	-11.59	Ag2CrO4
Ag2HVO4	-11.26	-9.78	1.48	Ag2HVO4
Ag2MoO4	-12.12	-23.67	-11.55	Ag2MoO4
Ag2O	-14.53	-1.96	12.57	Ag2O
Ag2Se	4.14	-44.56	-48.70	Ag2Se
Ag2SeO3	-10.35	-17.50	-7.15	Ag2SeO3
Ag2SeO4	-20.92	-29.83	-8.91	Ag2SeO4
Ag2SO4	-15.08	-19.90	-4.82	Ag2SO4
Ag3AsO3	-23.99	-21.83	2.16	Ag3AsO3
Ag3AsO4	-13.97	-16.75	-2.79	Ag3AsO4
Ag3H2VO5	-15.94	-10.76	5.18	Ag3H2VO5
AgF:4H2O	-13.57	-12.52	1.05	AgF:4H2O
Agmetal	0.54	-12.97	-13.51	Ag
AgVO3	-9.57	-8.80	0.77	AgVO3
Al(OH) 3 (am)	-1.64	9.16	10.80	Al(OH) 3
Al2(MoO4) 3	-49.17	-46.81	2.37	Al2(MoO4) 3

Al2O3	-1.33	18.32	19.65	Al2O3
Al4(OH)10SO4	-3.99	18.71	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-9.46	-4.66	4.80	AlAsO4:2H2O
AlOHSO4	-5.55	-8.78	-3.23	AlOHSO4
AlSb	-147.03	-81.41	65.62	AlSb
Alunite	-3.88	-5.28	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.99	-12.78	-7.79	PbSO4
Anhydrite	-2.49	-6.85	-4.36	CaSO4
Anilite	-48.94	-80.82	-31.88	Cu0.25Cu1.5S
Antlerite	-3.91	4.88	8.79	Cu3(OH)4SO4
Aragonite	-1.06	-9.36	-8.30	CaCO3
Arsenolite	-72.82	-75.58	-2.76	As4O6
Artinite	-8.85	0.75	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-34.34	-27.63	6.71	As2O5
Atacamite	-3.10	4.29	7.39	Cu2(OH)3Cl
Azurite	-1.18	-18.09	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.84	7.55	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.41	-0.54	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	3.93	-4.98	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.93	7.01	32.94	Ba3(VO4)2:4H2O
BaCrO4	-14.88	-24.55	-9.67	BaCrO4
BaF2	-9.70	-15.52	-5.82	BaF2
BaMoO4	-7.20	-14.16	-6.96	BaMoO4
Barite	-0.41	-10.39	-9.98	BaSO4
BaS	-88.81	-72.63	16.18	BaS
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-12.86	-20.32	-7.46	BaSeO4
Bianchite	-8.79	-10.55	-1.76	ZnSO4:6H2O
Birnessite	-10.74	7.35	18.09	MnO2
Bixbyite	-8.63	-9.27	-0.64	Mn2O3
BlaubleiI	-49.51	-73.68	-24.16	Cu0.9Cu0.2S
BlaubleiII	-49.69	-76.97	-27.28	Cu0.6Cu0.8S
Boehmite	0.58	9.16	8.58	AlOOH
Breithauptite	-53.42	-71.95	-18.52	NiSb
Brochantite	-2.73	12.49	15.22	Cu4(OH)6SO4
Brucite	-6.24	10.60	16.84	Mg(OH)2
Bunsenite	-5.81	6.63	12.45	NiO
Ca(VO3)2	-10.21	-4.55	5.66	Ca(VO3)2
Ca2V2O7	-10.95	6.55	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.01	6.55	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.65	5.65	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.32	17.64	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.22	17.64	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-290.83	-147.85	142.97	Ca3Sb2
CaCrO4	-18.74	-21.01	-2.27	CaCrO4
Calcite	-0.88	-9.36	-8.48	CaCO3
Calomel	-14.26	-32.17	-17.91	Hg2Cl2
CaMoO4	-2.66	-10.61	-7.95	CaMoO4
Carnotite	-3.52	-3.29	0.23	KUO2VO4
CaSeO3:2H2O	-7.26	-4.44	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.75	-16.77	-3.02	CaSeO4:2H2O
Cd(BO2)2	-15.87	-6.03	9.84	Cd(BO2)2
Cd(OH)2	-8.23	5.42	13.64	Cd(OH)2
Cd(OH)2(am)	-8.31	5.42	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.34	-19.63	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.25	-1.69	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.67	3.73	28.40	Cd4(OH)6SO4
CdCl2	-15.78	-16.44	-0.66	CdCl2
CdCl2:1H2O	-14.74	-16.44	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-14.52	-16.44	-1.91	CdCl2:2.5H2O
CdF2	-16.45	-17.66	-1.21	CdF2
Cdmetal(alpha)	-32.07	-18.56	13.51	Cd
Cdmetal(gamma)	-32.18	-18.56	13.62	Cd
CdMoO4	-2.14	-16.29	-14.15	CdMoO4
CdOHCl	-9.05	-5.51	3.54	CdOHCl
CdSb	-72.81	-73.16	-0.35	CdSb
CdSe	-16.99	-37.19	-20.20	CdSe
CdSeO4:2H2O	-20.60	-22.45	-1.85	CdSeO4:2H2O

CdSO4	-12.35	-12.53	-0.17	CdSO4
CdSO4:1H2O	-10.80	-12.53	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.65	-12.53	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.15	-11.90	-9.75	AgCl
Cerrusite	-2.16	-15.29	-13.13	PbCO3
CH4 (g)	-75.32	-116.36	-41.05	CH4
Chalcanthite	-7.69	-10.33	-2.64	CuSO4:5H2O
Chalcocite	-48.64	-83.56	-34.92	Cu2S
Chalcopyrite	-110.25	-145.52	-35.27	CuFeS2
Cinnabar	-49.25	-94.95	-45.69	HgS
Claudetite	-72.52	-75.58	-3.06	As4O6
Clausthalite	-10.34	-37.44	-27.10	PbSe
Co (BO2) 2	-32.06	-4.99	27.07	Co (BO2) 2
Co (OH) 2	-6.64	6.45	13.09	Co (OH) 2
Co (OH) 3	-11.65	-13.96	-2.31	Co (OH) 3
CO2 (g)	-2.31	-20.46	-18.15	CO2
Co3 (AsO4) 2	-21.31	-8.28	13.03	Co3 (AsO4) 2
Co3O4	-10.97	-21.46	-10.50	Co3O4
CoCl2	-23.67	-15.40	8.27	CoCl2
CoCl2:6H2O	-17.94	-15.40	2.54	CoCl2:6H2O
CoCO3	-4.02	-14.00	-9.98	CoCO3
CoF2	-15.03	-16.62	-1.60	CoF2
CoF3	-47.11	-48.57	-1.46	CoF3
CoFe2O4	22.38	18.85	-3.53	CoFe2O4
CoMoO4	-7.50	-15.26	-7.76	CoMoO4
CoO	-7.13	6.45	13.59	CoO
CoS (alpha)	-66.29	-73.73	-7.44	CoS
CoS (beta)	-62.66	-73.73	-11.07	CoS
CoSe	-19.95	-36.15	-16.20	CoSe
CoSeO3	-10.40	-9.08	1.32	CoSeO3
CoSeO4:6H2O	-19.89	-21.42	-1.53	CoSeO4:6H2O
CoSO4	-14.29	-11.49	2.80	CoSO4
CoSO4:6H2O	-9.02	-11.49	-2.47	CoSO4:6H2O
Cotunnite	-11.91	-16.69	-4.78	PbCl2
Covellite	-50.28	-72.58	-22.30	CuS
Cr (OH) 2	-20.55	-9.73	10.82	Cr (OH) 2
Cr (OH) 3	-2.03	-0.69	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.06	-0.69	-0.75	Cr (OH) 3
Cr2O3	0.98	-1.38	-2.36	Cr2O3
CrCl2	-45.67	-31.58	14.09	CrCl2
CrCl3	-48.58	-33.47	15.11	CrCl3
CrF3	-23.97	-35.30	-11.34	CrF3
Crmetal	-64.19	-33.71	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	-14.36	-48.20	-33.84	Na3AlF6
Cu (OH) 2	-1.07	7.61	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.93	18.28	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.77	-84.65	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.19	-45.99	-45.80	Cu2Se
Cu2SO4	-19.37	-21.32	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.91	-4.81	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.04	-95.64	-42.59	Cu3Sb
Cu3Se2	-17.49	-80.98	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.05	-24.49	-5.44	CuCrO4
CuF	-8.32	-13.23	-4.91	CuF
CuF2	-16.58	-15.47	1.12	CuF2
CuF2:2H2O	-10.92	-15.47	-4.55	CuF2:2H2O
Cumetal	-4.92	-13.68	-8.76	Cu
CuMoO4	-1.03	-14.10	-13.08	CuMoO4
CuOCuSO4	-13.03	-2.73	10.30	CuOCuSO4
Cupricferrite	14.02	20.01	5.99	CuFe2O4
Cuprite	-1.97	-3.38	-1.41	Cu2O
Cuprousferrite	13.43	4.51	-8.92	CuFeO2
CuSe	-1.90	-35.00	-33.10	CuSe
CuSe2	-20.26	-53.63	-33.37	CuSe2
CuSeO3:2H2O	-8.44	-7.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.82	-20.26	-2.44	CuSeO4:5H2O

CuSO4	-13.27	-10.33	2.94	CuSO4
Diaspore	2.29	9.16	6.87	AlOOH
Djurleite	-48.92	-82.84	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-2.68	-19.22	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-2.13	-19.22	-17.09	CaMg (CO3) 2
Epsomite	-5.21	-7.34	-2.13	MgSO4:7H2O
Fe (OH) 2	-6.32	7.24	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	5.96	2.92	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-4.68	-8.40	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-4.69	-3.14	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-13.59	-34.21	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-37.69	-41.42	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-0.58	19.65	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-8.02	-7.62	0.40	FeAsO4:2H2O
FeCr2O4	-1.33	5.87	7.20	FeCr2O4
FeMoO4	-4.37	-14.47	-10.09	FeMoO4
Ferrihydrite	3.01	6.20	3.19	Fe (OH) 3
Ferroselite	-35.39	-53.99	-18.60	FeSe2
FeS (ppt)	-69.99	-72.94	-2.95	FeS
FeSe	-24.36	-35.36	-11.00	FeSe
Fix_pe	-4.78	-4.78	0.00	e-
Fluorite	-1.48	-11.98	-10.50	CaF2
Galena	-61.05	-75.02	-13.97	PbS
Gibbsite	0.87	9.16	8.29	Al (OH) 3
Goethite	5.71	6.20	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO4:7H2O
Greenockite	-60.41	-74.77	-14.36	CdS
Greigite	-256.06	-301.10	-45.03	Fe3S4
Gummite	-6.26	1.42	7.67	UO3
Gypsum	-2.24	-6.85	-4.61	CaSO4:2H2O
H-Jarosite	-5.18	-17.28	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.83	-21.71	-12.88	H2MoO4
H2S (g)	-72.18	-80.19	-8.01	H2S
H2Se (g)	-37.65	-42.61	-4.96	H2Se
Halite	-8.57	-6.97	1.60	NaCl
Hausmannite	-10.87	50.16	61.03	Mn3O4
Hematite	13.82	12.40	-1.42	Fe2O3
Hercynite	2.68	25.57	22.89	FeAl2O4
Hg (CH3) 2 (g)	-173.78	-247.48	-73.71	Hg (CH3) 2
Hg (g)	-9.27	-17.15	-7.87	Hg
Hg (OH) 2	-11.27	-14.76	-3.50	Hg (OH) 2
Hg2 (g)	-19.34	-34.29	-14.96	Hg2
Hg2 (OH) 2	-15.58	-10.31	5.26	Hg2 (OH) 2
Hg2CO3	-14.72	-30.77	-16.05	Hg2CO3
Hg2CrO4	-33.72	-42.42	-8.70	Hg2CrO4
Hg2F2	-23.03	-33.39	-10.36	Hg2F2
Hg2S	-78.82	-90.50	-11.68	Hg2S
Hg2SeO3	-21.20	-25.85	-4.66	Hg2SeO3
Hg2SO4	-22.13	-28.26	-6.13	Hg2SO4
Hg3O2CO3	-35.06	-64.74	-29.68	Hg3O2CO3
HgCl (g)	-35.58	-16.08	19.50	HgCl
HgCl2	-15.35	-36.61	-21.26	HgCl2
HgF (g)	-49.37	-16.70	32.68	HgF
HgF2 (g)	-50.40	-37.84	12.57	HgF2
Hgmetal (l)	-3.69	-17.15	-13.45	Hg
HgSe	-1.67	-57.37	-55.69	HgSe
HgSeO3	-17.87	-30.30	-12.43	HgSeO3
HgSO4	-23.29	-32.70	-9.42	HgSO4
Huntite	-8.96	-38.93	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.65	-25.42	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-20.05	-28.82	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-18.44	-23.61	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	0.63	-14.17	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-40.73	-57.97	-17.24	K2Cr2O7
K2CrO4	-25.36	-25.87	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.91	-21.64	-0.73	K2SeO4
Langite	-5.00	12.49	17.49	Cu4 (OH) 6SO4:H2O

Larnakite	-7.18	-7.61	-0.43	PbO:PbSO4
Laurionite	-6.38	-5.76	0.62	PbOHCl
Lepidocrocite	4.83	6.20	1.37	FeOOH
Lime	-21.60	11.10	32.70	CaO
Litharge	-7.53	5.17	12.69	PbO
Mackinawite	-69.34	-72.94	-3.60	FeS
Maghemite	6.01	12.40	6.39	Fe2O3
Magnesioferrite	6.14	23.00	16.86	Fe2MgO4
Magnesite	-2.40	-9.86	-7.46	MgCO3
Magnetite	16.24	19.65	3.40	Fe3O4
Malachite	0.07	-5.24	-5.31	Cu2 (OH) 2CO3
Manganite	-4.62	20.72	25.34	MnOOH
Massicot	-7.73	5.17	12.89	PbO
Matlockite	-8.33	-17.30	-8.97	PbClF
Melanothallite	-20.50	-14.24	6.26	CuCl2
Melanterite	-8.49	-10.70	-2.21	FeSO4:7H2O
Metacinnabar	-49.85	-94.95	-45.09	HgS
Mg (OH) 2 (active)	-8.19	10.60	18.79	Mg (OH) 2
Mg (VO3) 2	-16.32	-5.04	11.28	Mg (VO3) 2
Mg2Sb3	-265.25	-190.56	74.68	Mg2Sb3
Mg2V2O7	-20.80	5.56	26.36	Mg2V2O7
MgCr2O4	-6.98	9.22	16.20	MgCr2O4
MgCrO4	-26.88	-21.50	5.38	MgCrO4
MgF2	-4.34	-12.47	-8.13	MgF2
MgMoO4	-9.26	-11.11	-1.85	MgMoO4
MgSeO3:6H2O	-7.99	-4.94	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.07	-17.27	-1.20	MgSeO4:6H2O
Minium	-34.05	39.47	73.52	Pb3O4
Mirabilite	-8.92	-10.03	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.82	-6.92	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.38	-63.10	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.18	-85.10	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.95	-1.45	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-15.84	-13.12	2.72	MnCl2:4H2O
MnS (grn)	-71.63	-71.46	0.17	MnS
MnS (pnk)	-74.80	-71.46	3.34	MnS
MnSb	-92.29	-95.20	-2.91	MnSb
MnSe	-37.38	-33.88	3.50	MnSe
MnSeO3	-7.94	-6.81	1.13	MnSeO3
MnSeO3:2H2O	-7.79	-6.81	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.09	-19.14	-2.05	MnSeO4:5H2O
MnSO4	-11.80	-9.21	2.58	MnSO4
Monteponite	-9.69	5.42	15.10	CdO
Montroydite	-11.12	-14.76	-3.64	HgO
MoO3	-13.71	-21.71	-8.00	MoO3
Morenosite	-9.16	-11.31	-2.14	NiSO4:7H2O
MoS2	-135.80	-206.06	-70.26	MoS2
Na-Jarosite	-2.13	-13.33	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-46.40	-56.29	-9.90	Na2Cr2O7
Na2CrO4	-27.12	-24.19	2.93	Na2CrO4
Na2Mo2O7	-18.91	-35.51	-16.60	Na2Mo2O7
Na2MoO4	-15.29	-13.80	1.49	Na2MoO4
Na2MoO4:2H2O	-15.02	-13.80	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-17.93	-7.63	10.30	Na2SeO3:5H2O
Na2SeO4	-21.24	-19.96	1.28	Na2SeO4
Na3Sb	-173.15	-78.70	94.45	Na3Sb
Na3VO4	-32.64	4.04	36.68	Na3VO4
Na4V2O7	-37.22	0.18	37.40	Na4V2O7
Nantokite	-5.89	-12.62	-6.73	CuCl
NaSb	-85.80	-62.64	23.17	NaSb
Natron	-11.24	-12.55	-1.31	Na2CO3:10H2O
NaVO3	-7.72	-3.87	3.86	NaVO3
Nesquehonite	-5.19	-9.86	-4.67	MgCO3:3H2O
Ni (OH) 2	-6.16	6.63	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.43	-7.73	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-23.40	8.60	32.00	Ni4 (OH) 6SO4
NiCO3	-6.95	-13.82	-6.87	NiCO3
NiMoO4	-3.93	-15.07	-11.14	NiMoO4

NiS(alpha)	-67.95	-73.55	-5.60	NiS
NiS(beta)	-62.45	-73.55	-11.10	NiS
NiS(gamma)	-60.75	-73.55	-12.80	NiS
NiSe	-18.27	-35.97	-17.70	NiSe
NiSeO3:2H2O	-11.72	-8.90	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.72	-21.24	-1.52	NiSeO4:6H2O
Nsutite	-10.15	7.35	17.50	MnO2
O2(g)	-35.14	47.95	83.09	O2
Orpiment	-217.28	-278.35	-61.07	As2S3
Otavite	-3.04	-15.04	-12.00	CdCO3
Pb(BO2)2	-12.80	-6.28	6.52	Pb(BO2)2
Pb(OH)2	-2.98	5.17	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-62.33	-71.09	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-9.39	-0.59	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.86	10.33	26.19	Pb2O(OH)2
Pb2O3	-26.73	34.31	61.04	Pb2O3
Pb2OCO3	-9.57	-10.13	-0.56	Pb2OCO3
Pb2V2O7	-3.41	-5.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.94	-12.14	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.29	-0.15	6.14	Pb3(VO4)2
Pb3O2CO3	-15.98	-4.96	11.02	Pb3O2CO3
Pb3O2SO4	-13.13	-2.45	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.38	2.72	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.16	2.72	21.88	Pb4O3SO4
PbCrO4	-14.34	-26.94	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.06	-18.81	4.25	Pb
PbMoO4	-0.92	-16.54	-15.62	PbMoO4
PbO:0.3H2O	-7.81	5.17	12.98	PbO:0.3H2O
PbSeO4	-15.86	-22.70	-6.84	PbSeO4
Periclase	-10.98	10.60	21.58	MgO
Phosgenite	-12.17	-31.98	-19.81	PbCl2:PbCO3
Plattnerite	-20.46	29.14	49.60	PbO2
Portlandite	-11.71	11.10	22.80	Ca(OH)2
Pyrite	-110.64	-129.15	-18.51	FeS2
Pyrochroite	-6.47	8.73	15.19	Mn(OH)2
Pyrolusite	-8.68	32.70	41.38	MnO2
Realgar	-91.32	-111.07	-19.75	AsS
Retgersite	-9.27	-11.31	-2.04	NiSO4:6H2O
Rhodochrosite	-1.15	-11.73	-10.58	MnCO3
Rutherfordine	-4.54	-19.04	-14.50	UO2CO3
Sb(OH)3	-11.53	-18.64	-7.11	Sb(OH)3
Sb2O4	-16.71	-13.31	3.40	Sb2O4
Sb2O5	-28.28	-37.95	-9.67	Sb2O5
Sb2Se3	-97.34	-165.10	-67.76	Sb2Se3
Sb4O6(cubic)	-56.31	-74.57	-18.26	Sb4O6
Sb4O6(orth)	-56.67	-74.57	-17.90	Sb4O6
SbCl3	-51.99	-51.42	0.57	SbCl3
SbF3	-43.03	-53.26	-10.23	SbF3
Sbmetal	-42.92	-54.61	-11.69	Sb
SbO2	-3.14	-30.96	-27.82	SbO2
Schoepite	-4.58	1.42	5.99	UO2(OH)2:H2O
Semetal(am)	-11.52	-18.63	-7.11	Se
Semetal(hex)	-10.92	-18.63	-7.71	Se
Senarmontite	-24.92	-37.28	-12.37	Sb2O3
SeO2	-15.66	-15.54	0.12	SeO2
SeO3	-48.91	-27.87	21.04	SeO3
Siderite	-2.97	-13.21	-10.24	FeCO3
Smithsonite	-3.07	-13.07	-10.00	ZnCO3
Sphalerite	-61.34	-72.79	-11.45	ZnS
Spinel	-7.92	28.93	36.85	MgAl2O4
Stibnite	-227.38	-277.84	-50.46	Sb2S3
Sulfur	-54.06	-56.21	-2.14	S
Tenorite	-0.04	7.61	7.64	CuO
Thenardite	-10.35	-10.03	0.32	Na2SO4
Thermonatrite	-13.18	-12.55	0.64	Na2CO3:H2O
Tyuyamunite	-5.80	-1.72	4.08	Ca(UO2)2(VO4)2
U3O8	-13.16	7.92	21.08	U3O8

U3Sb4	-554.69	-402.31	152.38	U3Sb4
U4O9	-26.38	-29.40	-3.02	U4O9
UF4	-29.96	-59.50	-29.54	UF4
UF4:2.5H2O	-26.78	-59.50	-32.72	UF4:2.5H2O
UO2 (am)	-14.28	-13.34	0.93	UO2
UO2 (OH) 2 (beta)	-4.20	1.42	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.20	-26.45	-2.25	UO2SeO4:4H2O
UO3	-6.28	1.42	7.70	UO3
Uraninite	-8.67	-13.34	-4.67	UO2
USb2	-209.30	-179.72	29.58	USb2
V(OH) 3	-16.79	-9.20	7.59	V(OH) 3
V2O5	-14.28	-15.64	-1.36	V2O5
V3O5	-34.53	-32.70	1.84	V3O5
V4O7	-42.79	-35.60	7.19	V4O7
V6O13	-34.02	-94.88	-60.86	V6O13
Valentinite	-28.80	-37.28	-8.48	Sb2O3
VC12	-61.91	-43.04	18.87	VC12
VC13	-65.41	-41.98	23.43	VC13
VF4	-63.99	-49.06	14.93	VF4
Vmetal	-89.19	-45.16	44.03	V
VO	-35.94	-21.19	14.76	VO
VO(OH) 2	-8.06	-2.91	5.15	VO(OH) 2
VO2Cl	-21.59	-18.75	2.84	VO2Cl
VOC1	-31.28	-20.12	11.15	VOC1
VOC12	-37.52	-24.76	12.76	VOC12
VOSO4	-24.46	-20.85	3.61	VOSO4
Witherite	-4.34	-12.91	-8.57	BaCO3
Wurtzite	-63.84	-72.79	-8.95	ZnS
Zincite	-3.94	7.39	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO4
Zn(BO2) 2	-12.34	-4.05	8.29	Zn(BO2) 2
Zn(OH) 2	-4.81	7.39	12.20	Zn(OH) 2
Zn(OH) 2 (am)	-5.08	7.39	12.47	Zn(OH) 2
Zn(OH) 2 (beta)	-4.36	7.39	11.75	Zn(OH) 2
Zn(OH) 2 (epsilon)	-4.14	7.39	11.53	Zn(OH) 2
Zn(OH) 2 (gamma)	-4.34	7.39	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-10.66	-3.16	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-11.33	3.86	15.19	Zn2(OH) 3Cl
Zn3(AsO4) 2:2.5H2O	-19.11	-5.46	13.65	Zn3(AsO4) 2:2.5H2O
Zn3O(SO4) 2	-32.62	-13.71	18.91	Zn3O(SO4) 2
Zn4(OH) 6SO4	-16.77	11.63	28.40	Zn4(OH) 6SO4
Zn5(OH) 8Cl2	-23.39	15.11	38.50	Zn5(OH) 8Cl2
ZnCl2	-21.51	-14.46	7.05	ZnCl2
ZnCO3:1H2O	-2.81	-13.07	-10.26	ZnCO3:1H2O
ZnF2	-15.15	-15.68	-0.53	ZnF2
Znmetal	-42.37	-16.58	25.79	Zn
ZnMoO4	-4.19	-14.32	-10.13	ZnMoO4
ZnO(active)	-3.80	7.39	11.19	ZnO
ZnS(am)	-63.74	-72.79	-9.05	ZnS
ZnSb	-82.20	-71.19	11.01	ZnSb
ZnSe	-20.81	-35.21	-14.40	ZnSe
ZnSeO4:6H2O	-18.96	-20.48	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 101.

REACTION 601
H2O -1

408.8859 moles ### Addition step. Removes HTC water but solute mass remains
 USE solution 601
 SAVE Solution 602
 End

 Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 601. Solution after simulation 100.
 Using reaction 601.

Reaction 601.

4.089e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.350e-08	8.350e-08
Al	4.612e-06	4.612e-06
As	4.069e-08	4.069e-08
B	1.597e-05	1.597e-05
Ba	1.480e-06	1.480e-06
C	1.230e-02	1.230e-02
Ca	5.508e-03	5.508e-03
Cd	1.173e-08	1.173e-08
Cl	1.716e-03	1.716e-03
Co	1.359e-07	1.359e-07
Cr	1.270e-07	1.270e-07
Cu	9.621e-06	9.620e-06
F	4.290e-04	4.290e-04
Fe	2.671e-05	2.671e-05
Hg	2.208e-10	2.208e-10
K	7.205e-04	7.205e-04
Mg	1.742e-03	1.742e-03
Mn	2.383e-05	2.383e-05
Mo	5.565e-07	5.565e-07
Na	4.978e-03	4.978e-03
Ni	2.132e-07	2.131e-07
Pb	2.621e-08	2.621e-08
S	3.609e-03	3.609e-03
Sb	1.316e-08	1.316e-08
Se	4.736e-08	4.736e-08
U	8.431e-08	8.430e-08
V	1.155e-07	1.155e-07
Zn	1.157e-06	1.157e-06

-----Description of solution-----

	pH =	7.152	Charge balance
	pe =	5.125	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	2.606e-02	

Mass of water (kg) = 1.000e+00
 Total alkalinity (eq/kg) = 1.095e-02
 Total CO2 (mol/kg) = 1.230e-02
 Temperature (°C) = 25.00
 Electrical balance (eq) = 3.258e-16
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 15
 Total H = 1.110223e+02
 Total O = 5.555572e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.676e-07	1.428e-07	-6.776	-6.845	-0.069	(0)
H+	8.222e-08	7.048e-08	-7.085	-7.152	-0.067	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.350e-08					
AgCl	5.343e-08	5.343e-08	-7.272	-7.272	0.000	(0)
Ag+	2.075e-08	1.779e-08	-7.683	-7.750	-0.067	(0)
AgCl2-	8.275e-09	6.846e-09	-8.082	-8.165	-0.082	(0)
AgSO4-	6.059e-10	5.013e-10	-9.218	-9.300	-0.082	(0)
Ag2Se	2.061e-10	2.061e-10	-9.686	-9.686	0.000	(0)
AgCl3-2	1.916e-11	8.976e-12	-10.718	-11.047	-0.329	(0)
AgF	1.442e-11	1.442e-11	-10.841	-10.841	0.000	(0)
AgOH	2.540e-13	2.540e-13	-12.595	-12.595	0.000	(0)
AgCl4-3	1.485e-13	2.696e-14	-12.828	-13.569	-0.741	(0)
AgH2BO3	3.689e-14	3.689e-14	-13.433	-13.433	0.000	(0)
AgSeO3-	2.768e-14	2.290e-14	-13.558	-13.640	-0.082	(0)
Ag (OH) 2-	4.284e-18	3.544e-18	-17.368	-17.450	-0.082	(0)
Ag (SeO3) 2-3	2.263e-21	4.109e-22	-20.645	-21.386	-0.741	(0)
Ag2MoO4	3.595e-23	3.595e-23	-22.444	-22.444	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.489	-68.489	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.984	-79.301	-1.317	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.861	-138.943	-0.082	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.091	-139.275	-0.183	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.221	-141.563	-0.342	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.548	-141.874	-0.326	(0)
Al	4.612e-06					
AlF3	2.207e-06	2.207e-06	-5.656	-5.656	0.000	(0)
Al (OH) 4-	1.267e-06	1.087e-06	-5.897	-5.964	-0.066	(0)
AlF2+	6.295e-07	5.432e-07	-6.201	-6.265	-0.064	(0)
AlF4-	4.159e-07	3.569e-07	-6.381	-6.447	-0.066	(0)
Al (OH) 3	6.048e-08	6.048e-08	-7.218	-7.218	0.000	(0)
Al (OH) 2+	2.460e-08	2.123e-08	-7.609	-7.673	-0.064	(0)
AlF+2	7.625e-09	4.229e-09	-8.118	-8.374	-0.256	(0)
AlOH+2	3.374e-10	1.871e-10	-9.472	-9.728	-0.256	(0)
AlSO4+	1.675e-11	1.437e-11	-10.776	-10.843	-0.066	(0)
Al+3	5.242e-12	1.310e-12	-11.280	-11.883	-0.602	(0)
Al (SO4) 2-	2.534e-13	2.175e-13	-12.596	-12.663	-0.066	(0)
AlMo6O21-3	6.377e-39	1.158e-39	-38.195	-38.936	-0.741	(0)
As (3)	2.456e-19					
H3AsO3	2.435e-19	2.435e-19	-18.614	-18.614	0.000	(0)
H2AsO3-	2.142e-21	1.772e-21	-20.669	-20.752	-0.082	(0)
HAsO3-2	4.894e-26	2.293e-26	-25.310	-25.640	-0.329	(0)
H4AsO3+	1.028e-26	8.503e-27	-25.988	-26.070	-0.082	(0)
AsO3-3	6.907e-32	1.254e-32	-31.161	-31.902	-0.741	(0)
As (5)	4.069e-08					
HAsO4-2	2.983e-08	1.397e-08	-7.525	-7.855	-0.329	(0)
H2AsO4-	1.086e-08	8.983e-09	-7.964	-8.047	-0.082	(0)
AsO4-3	3.453e-12	6.270e-13	-11.462	-12.203	-0.741	(0)
H3AsO4	1.094e-13	1.100e-13	-12.961	-12.959	0.003	(0)
B	1.597e-05					
H3BO3	1.578e-05	1.588e-05	-4.802	-4.799	0.003	(0)
H2BO3-	1.547e-07	1.308e-07	-6.811	-6.883	-0.073	(0)
CaH2BO3+	2.060e-08	1.743e-08	-7.686	-7.759	-0.073	(0)
MgH2BO3+	4.130e-09	3.494e-09	-8.384	-8.457	-0.073	(0)

Ba	BF (OH) 3-	2.417e-09	2.045e-09	-8.617	-8.689	-0.073	(0)
	NaH2BO3	8.744e-10	8.744e-10	-9.058	-9.058	0.000	(0)
	BF2 (OH) 2-	5.879e-12	4.973e-12	-11.231	-11.303	-0.073	(0)
	BaH2BO3+	3.624e-12	3.065e-12	-11.441	-11.514	-0.073	(0)
	H5 (BO3) 2-	2.091e-12	1.768e-12	-11.680	-11.752	-0.073	(0)
	AgH2BO3	3.689e-14	3.689e-14	-13.433	-13.433	0.000	(0)
	H8 (BO3) 3-	3.320e-15	2.808e-15	-14.479	-14.552	-0.073	(0)
	BF3OH-	5.205e-17	4.402e-17	-16.284	-16.356	-0.073	(0)
	BF4-	5.827e-21	4.929e-21	-20.235	-20.307	-0.073	(0)
Ba	1.480e-06						
C (4)	Ba+2	1.404e-06	7.581e-07	-5.853	-6.120	-0.268	(0)
	BaHCO3+	7.430e-08	6.435e-08	-7.129	-7.191	-0.062	(0)
	BaCO3	2.299e-09	2.299e-09	-8.639	-8.639	0.000	(0)
	BaH2BO3+	3.624e-12	3.065e-12	-11.441	-11.514	-0.073	(0)
	BaOH+	5.489e-13	4.725e-13	-12.260	-12.326	-0.065	(0)
	C (4)	1.230e-02					
	HCO3-	1.030e-02	8.888e-03	-1.987	-2.051	-0.064	(0)
	H2CO3	1.409e-03	1.409e-03	-2.851	-2.851	0.000	(0)
	CaHCO3+	4.423e-04	3.830e-04	-3.354	-3.417	-0.062	(0)
Ca	MgHCO3+	8.189e-05	7.004e-05	-4.087	-4.155	-0.068	(0)
	CaCO3	2.169e-05	2.169e-05	-4.664	-4.664	0.000	(0)
	NaHCO3	2.108e-05	2.108e-05	-4.676	-4.676	0.000	(0)
	CO3-2	1.095e-05	5.912e-06	-4.961	-5.228	-0.268	(0)
	CuCO3	8.493e-06	8.493e-06	-5.071	-5.071	0.000	(0)
	MgCO3	3.787e-06	3.787e-06	-5.422	-5.422	0.000	(0)
	MnHCO3+	1.881e-06	1.620e-06	-5.726	-5.791	-0.065	(0)
	NaCO3-	5.379e-07	4.642e-07	-6.269	-6.333	-0.064	(0)
	Cu (CO3) 2-2	2.885e-07	1.351e-07	-6.540	-6.869	-0.329	(0)
	CuHCO3+	1.654e-07	1.368e-07	-6.782	-6.864	-0.082	(0)
	ZnCO3	1.367e-07	1.367e-07	-6.864	-6.864	0.000	(0)
	ZnHCO3+	1.365e-07	1.129e-07	-6.865	-6.947	-0.082	(0)
	NiHCO3+	7.640e-08	6.321e-08	-7.117	-7.199	-0.082	(0)
	BaHCO3+	7.430e-08	6.435e-08	-7.129	-7.191	-0.062	(0)
	UO2 (CO3) 3-4	6.252e-08	3.012e-09	-7.204	-8.521	-1.317	(0)
	FeHCO3+	4.015e-08	3.477e-08	-7.396	-7.459	-0.062	(0)
	CoHCO3+	3.365e-08	2.784e-08	-7.473	-7.555	-0.082	(0)
	UO2 (CO3) 2-2	2.169e-08	1.016e-08	-7.664	-7.993	-0.329	(0)
	PbCO3	1.580e-08	1.580e-08	-7.801	-7.801	0.000	(0)
	NiCO3	1.272e-08	1.272e-08	-7.895	-7.895	0.000	(0)
	PbHCO3+	7.096e-09	5.870e-09	-8.149	-8.231	-0.082	(0)
	CoCO3	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
	BaCO3	2.299e-09	2.299e-09	-8.639	-8.639	0.000	(0)
	CdCO3	6.234e-10	6.234e-10	-9.205	-9.205	0.000	(0)
	Pb (CO3) 2-2	5.750e-10	2.694e-10	-9.240	-9.570	-0.329	(0)
	CdHCO3+	1.131e-10	9.361e-11	-9.946	-10.029	-0.082	(0)
	UO2CO3	8.616e-11	8.616e-11	-10.065	-10.065	0.000	(0)
	Cd (CO3) 2-2	5.832e-12	2.732e-12	-11.234	-11.564	-0.329	(0)
HgCO3	3.001e-15	3.001e-15	-14.523	-14.523	0.000	(0)	
Hg (CO3) 2-2	1.198e-16	5.610e-17	-15.922	-16.251	-0.329	(0)	
HgHCO3+	4.760e-18	3.938e-18	-17.322	-17.405	-0.082	(0)	
Ca	5.508e-03						
Cd	Ca+2	4.286e-03	2.314e-03	-2.368	-2.636	-0.268	(0)
	CaSO4	7.489e-04	7.489e-04	-3.126	-3.126	0.000	(0)
	CaHCO3+	4.423e-04	3.830e-04	-3.354	-3.417	-0.062	(0)
	CaCO3	2.169e-05	2.169e-05	-4.664	-4.664	0.000	(0)
	CaF+	9.468e-06	8.151e-06	-5.024	-5.089	-0.065	(0)
	CaH2BO3+	2.060e-08	1.743e-08	-7.686	-7.759	-0.073	(0)
	CaOH+	7.614e-09	6.594e-09	-8.118	-8.181	-0.062	(0)
	Cd	1.173e-08					
	Cd+2	8.566e-09	4.626e-09	-8.067	-8.335	-0.268	(0)
Cd	CdSO4	1.532e-09	1.532e-09	-8.815	-8.815	0.000	(0)
	CdCl+	7.856e-10	6.499e-10	-9.105	-9.187	-0.082	(0)
	CdCO3	6.234e-10	6.234e-10	-9.205	-9.205	0.000	(0)
	CdHCO3+	1.131e-10	9.361e-11	-9.946	-10.029	-0.082	(0)
	Cd (SO4) 2-2	6.230e-11	2.919e-11	-10.206	-10.535	-0.329	(0)
	CdF+	2.860e-11	2.366e-11	-10.544	-10.626	-0.082	(0)
	CdOH+	6.342e-12	5.247e-12	-11.198	-11.280	-0.082	(0)
	Cd (CO3) 2-2	5.832e-12	2.732e-12	-11.234	-11.564	-0.329	(0)

CdCl ₂	3.986e-12	3.986e-12	-11.399	-11.399	0.000	(0)
CdOHC1	3.807e-12	3.807e-12	-11.419	-11.419	0.000	(0)
CdF ₂	1.523e-14	1.523e-14	-13.817	-13.817	0.000	(0)
Cd(OH) ₂	4.728e-15	4.728e-15	-14.325	-14.325	0.000	(0)
CdCl ₃ -	4.472e-15	3.700e-15	-14.349	-14.432	-0.082	(0)
CdSeO ₄	7.620e-19	7.620e-19	-18.118	-18.118	0.000	(0)
Cd ₂ OH+ ₃	6.700e-19	1.217e-19	-18.174	-18.915	-0.741	(0)
Cd(OH) ₃ -	4.985e-20	4.124e-20	-19.302	-19.385	-0.082	(0)
Cd(SeO ₃) ₂ - ₂	3.267e-20	1.530e-20	-19.486	-19.815	-0.329	(0)
Cd(OH) ₄ - ₂	2.058e-27	9.640e-28	-26.687	-27.016	-0.329	(0)
CdHS+	0.000e+00	0.000e+00	-74.798	-74.881	-0.082	(0)
Cd(HS) ₂	0.000e+00	0.000e+00	-142.230	-142.230	0.000	(0)
Cd(HS) ₃ -	0.000e+00	0.000e+00	-214.802	-214.884	-0.082	(0)
Cd(HS) ₄ - ₂	0.000e+00	0.000e+00	-286.913	-287.242	-0.329	(0)
Cl	1.716e-03					
Cl-	1.716e-03	1.471e-03	-2.765	-2.832	-0.067	(0)
AgCl	5.343e-08	5.343e-08	-7.272	-7.272	0.000	(0)
MnCl+	1.965e-08	1.692e-08	-7.707	-7.772	-0.065	(0)
AgCl ₂ -	8.275e-09	6.846e-09	-8.082	-8.165	-0.082	(0)
ZnCl+	1.736e-09	1.484e-09	-8.761	-8.828	-0.068	(0)
CuCl	1.661e-09	1.661e-09	-8.780	-8.780	0.000	(0)
CdCl+	7.856e-10	6.499e-10	-9.105	-9.187	-0.082	(0)
CuCl+	6.651e-10	5.688e-10	-9.177	-9.245	-0.068	(0)
CuCl ₂ -	5.969e-10	5.105e-10	-9.224	-9.292	-0.068	(0)
ZnOHC1	2.775e-10	2.775e-10	-9.557	-9.557	0.000	(0)
NiCl+	2.625e-10	2.171e-10	-9.581	-9.663	-0.082	(0)
CoCl+	2.477e-10	2.049e-10	-9.606	-9.688	-0.082	(0)
PbCl+	5.609e-11	4.640e-11	-10.251	-10.333	-0.082	(0)
MnCl ₂	3.515e-11	3.515e-11	-10.454	-10.454	0.000	(0)
AgCl ₃ - ₂	1.916e-11	8.976e-12	-10.718	-11.047	-0.329	(0)
CdCl ₂	3.986e-12	3.986e-12	-11.399	-11.399	0.000	(0)
CdOHC1	3.807e-12	3.807e-12	-11.419	-11.419	0.000	(0)
ZnCl ₂	3.461e-12	3.461e-12	-11.461	-11.461	0.000	(0)
PbCl ₂	3.049e-13	3.049e-13	-12.516	-12.516	0.000	(0)
CuCl ₃ - ₂	2.924e-13	1.606e-13	-12.534	-12.794	-0.260	(0)
CuCl ₂	2.902e-13	2.902e-13	-12.537	-12.537	0.000	(0)
HgClOH	1.573e-13	1.573e-13	-12.803	-12.803	0.000	(0)
AgCl ₄ - ₃	1.485e-13	2.696e-14	-12.828	-13.569	-0.741	(0)
HgCl ₂	9.179e-14	9.179e-14	-13.037	-13.037	0.000	(0)
MnCl ₃ -	1.655e-14	1.424e-14	-13.781	-13.846	-0.065	(0)
CrCl+ ₂	6.758e-15	3.166e-15	-14.170	-14.499	-0.329	(0)
ZnCl ₃ -	4.729e-15	4.045e-15	-14.325	-14.393	-0.068	(0)
CdCl ₃ -	4.472e-15	3.700e-15	-14.349	-14.432	-0.082	(0)
HgCl ₃ -	1.632e-15	1.350e-15	-14.787	-14.870	-0.082	(0)
NiCl ₂	1.608e-15	1.608e-15	-14.794	-14.794	0.000	(0)
FeCl+ ₂	3.112e-16	1.709e-16	-15.507	-15.767	-0.260	(0)
PbCl ₃ -	2.159e-16	1.786e-16	-15.666	-15.748	-0.082	(0)
HgCl ₄ - ₂	1.688e-17	7.909e-18	-16.773	-17.102	-0.329	(0)
HgCl+	1.505e-17	1.245e-17	-16.823	-16.905	-0.082	(0)
CrOHC1 ₂	1.264e-17	1.264e-17	-16.898	-16.898	0.000	(0)
UO ₂ Cl+	1.056e-17	8.734e-18	-16.976	-17.059	-0.082	(0)
ZnCl ₄ - ₂	5.418e-18	2.975e-18	-17.266	-17.526	-0.260	(0)
CuCl ₃ -	4.658e-18	3.984e-18	-17.332	-17.400	-0.068	(0)
FeCl ₂ +	1.305e-18	1.123e-18	-17.884	-17.950	-0.065	(0)
CrCl ₂ +	5.342e-19	4.419e-19	-18.272	-18.355	-0.082	(0)
PbCl ₄ - ₂	2.564e-19	1.201e-19	-18.591	-18.920	-0.329	(0)
VOC1+	1.325e-19	1.096e-19	-18.878	-18.960	-0.082	(0)
FeCl ₃	1.652e-22	1.652e-22	-21.782	-21.782	0.000	(0)
CuCl ₄ - ₂	5.349e-23	2.937e-23	-22.272	-22.532	-0.260	(0)
CrO ₃ Cl-	1.317e-26	1.090e-26	-25.880	-25.963	-0.082	(0)
CoCl+ ₂	1.365e-35	6.394e-36	-34.865	-35.194	-0.329	(0)
UCl+ ₃	0.000e+00	0.000e+00	-44.468	-45.209	-0.741	(0)
Co (2)	1.359e-07					
Co+ ₂	8.595e-08	4.027e-08	-7.066	-7.395	-0.329	(0)
CoHCO ₃ +	3.365e-08	2.784e-08	-7.473	-7.555	-0.082	(0)
CoSO ₄	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
CoCO ₃	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
CoF+	4.966e-10	4.109e-10	-9.304	-9.386	-0.082	(0)

CoCl+	2.477e-10	2.049e-10	-9.606	-9.688	-0.082	(0)
CoOH+	1.387e-10	1.147e-10	-9.858	-9.940	-0.082	(0)
Co (OH) 2	1.301e-12	1.301e-12	-11.886	-11.886	0.000	(0)
CoSeO4	1.785e-17	1.785e-17	-16.748	-16.748	0.000	(0)
Co (OH) 3-	4.482e-18	3.708e-18	-17.349	-17.431	-0.082	(0)
Co2OH+3	1.275e-18	2.315e-19	-17.894	-18.635	-0.741	(0)
CoOOH-	1.125e-18	9.307e-19	-17.949	-18.031	-0.082	(0)
Co (OH) 4-2	1.791e-25	8.391e-26	-24.747	-25.076	-0.329	(0)
Co4 (OH) 4+4	7.176e-31	3.457e-32	-30.144	-31.461	-1.317	(0)
Co (3)	3.308e-29					
CoOH+2	3.308e-29	1.550e-29	-28.480	-28.810	-0.329	(0)
Co+3	8.544e-35	2.136e-35	-34.068	-34.670	-0.602	(0)
CoCl+2	1.365e-35	6.394e-36	-34.865	-35.194	-0.329	(0)
Cr (2)	6.364e-24					
Cr+2	6.364e-24	2.981e-24	-23.196	-23.526	-0.329	(0)
Cr (3)	1.270e-07					
Cr (OH) 2+	1.091e-07	9.026e-08	-6.962	-7.045	-0.082	(0)
Cr (OH) +2	1.109e-08	5.195e-09	-7.955	-8.284	-0.329	(0)
Cr (OH) 3	4.842e-09	4.842e-09	-8.315	-8.315	0.000	(0)
CrOHSO4	1.741e-09	1.741e-09	-8.759	-8.759	0.000	(0)
CrF+2	1.815e-10	8.504e-11	-9.741	-10.070	-0.329	(0)
CrO2-	3.945e-11	3.264e-11	-10.404	-10.486	-0.082	(0)
Cr (OH) 4-	3.327e-11	2.752e-11	-10.478	-10.560	-0.082	(0)
Cr+3	9.158e-12	1.663e-12	-11.038	-11.779	-0.741	(0)
CrSO4+	6.629e-12	5.484e-12	-11.179	-11.261	-0.082	(0)
CrCl+2	6.758e-15	3.166e-15	-14.170	-14.499	-0.329	(0)
Cr2 (OH) 2SO4+2	1.745e-15	8.175e-16	-14.758	-15.088	-0.329	(0)
Cr2 (OH) 2 (SO4) 2	6.859e-17	6.859e-17	-16.164	-16.164	0.000	(0)
CrOHC12	1.264e-17	1.264e-17	-16.898	-16.898	0.000	(0)
CrCl2+	5.342e-19	4.419e-19	-18.272	-18.355	-0.082	(0)
Cr (6)	1.578e-16					
CrO4-2	1.356e-16	7.322e-17	-15.868	-16.135	-0.268	(0)
HCrO4-	2.018e-17	1.670e-17	-16.695	-16.777	-0.082	(0)
NaCrO4-	1.854e-18	1.534e-18	-17.732	-17.814	-0.082	(0)
KCrO4-	2.011e-19	1.664e-19	-18.697	-18.779	-0.082	(0)
CrO3SO4-2	1.081e-24	5.066e-25	-23.966	-24.295	-0.329	(0)
H2CrO4	9.540e-25	9.540e-25	-24.020	-24.020	0.000	(0)
CrO3Cl-	1.317e-26	1.090e-26	-25.880	-25.963	-0.082	(0)
Cr2O7-2	2.065e-32	9.674e-33	-31.685	-32.014	-0.329	(0)
Cu (1)	3.342e-09					
CuCl	1.661e-09	1.661e-09	-8.780	-8.780	0.000	(0)
Cu+	1.084e-09	8.967e-10	-8.965	-9.047	-0.082	(0)
CuCl2-	5.969e-10	5.105e-10	-9.224	-9.292	-0.068	(0)
CuCl3-2	2.924e-13	1.606e-13	-12.534	-12.794	-0.260	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.127	-140.461	-0.334	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.872	-141.191	-0.319	(0)
Cu (2)	9.617e-06					
CuCO3	8.493e-06	8.493e-06	-5.071	-5.071	0.000	(0)
Cu+2	4.517e-07	2.439e-07	-6.345	-6.613	-0.268	(0)
Cu (CO3) 2-2	2.885e-07	1.351e-07	-6.540	-6.869	-0.329	(0)
CuHCO3+	1.654e-07	1.368e-07	-6.782	-6.864	-0.082	(0)
CuOH+	1.288e-07	1.102e-07	-6.890	-6.958	-0.068	(0)
CuSO4	7.894e-08	7.894e-08	-7.103	-7.103	0.000	(0)
CuF+	6.003e-09	4.967e-09	-8.222	-8.304	-0.082	(0)
Cu (OH) 2	3.139e-09	3.139e-09	-8.503	-8.503	0.000	(0)
CuCl+	6.651e-10	5.688e-10	-9.177	-9.245	-0.068	(0)
Cu2 (OH) 2+2	6.507e-10	3.048e-10	-9.187	-9.516	-0.329	(0)
Cu (OH) 3-	1.111e-12	9.193e-13	-11.954	-12.037	-0.082	(0)
CuCl2	2.902e-13	2.902e-13	-12.537	-12.537	0.000	(0)
CuCl3-	4.658e-18	3.984e-18	-17.332	-17.400	-0.068	(0)
Cu (OH) 4-2	2.205e-18	1.033e-18	-17.656	-17.986	-0.329	(0)
CuCl4-2	5.349e-23	2.937e-23	-22.272	-22.532	-0.260	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.293	-204.375	-0.082	(0)
F	4.290e-04					
F-	3.764e-04	3.227e-04	-3.424	-3.491	-0.067	(0)
MgF+	3.249e-05	2.788e-05	-4.488	-4.555	-0.066	(0)
CaF+	9.468e-06	8.151e-06	-5.024	-5.089	-0.065	(0)
AlF3	2.207e-06	2.207e-06	-5.656	-5.656	0.000	(0)

NaF	8.585e-07	8.585e-07	-6.066	-6.066	0.000	(0)
AlF2+	6.295e-07	5.432e-07	-6.201	-6.265	-0.064	(0)
AlF4-	4.159e-07	3.569e-07	-6.381	-6.447	-0.066	(0)
MnF+	1.363e-07	1.173e-07	-6.866	-6.931	-0.065	(0)
HF	3.364e-08	3.364e-08	-7.473	-7.473	0.000	(0)
AlF+2	7.625e-09	4.229e-09	-8.118	-8.374	-0.256	(0)
CuF+	6.003e-09	4.967e-09	-8.222	-8.304	-0.082	(0)
ZnF+	3.126e-09	2.586e-09	-8.505	-8.587	-0.082	(0)
BF(OH) 3-	2.417e-09	2.045e-09	-8.617	-8.689	-0.073	(0)
NiF+	5.651e-10	4.676e-10	-9.248	-9.330	-0.082	(0)
CoF+	4.966e-10	4.109e-10	-9.304	-9.386	-0.082	(0)
CrF+2	1.815e-10	8.504e-11	-9.741	-10.070	-0.329	(0)
HF2-	4.842e-11	4.127e-11	-10.315	-10.384	-0.069	(0)
CdF+	2.860e-11	2.366e-11	-10.544	-10.626	-0.082	(0)
PbF+	2.443e-11	2.021e-11	-10.612	-10.694	-0.082	(0)
AgF	1.442e-11	1.442e-11	-10.841	-10.841	0.000	(0)
FeF2+	1.365e-11	1.175e-11	-10.865	-10.930	-0.065	(0)
BF2(OH) 2-	5.879e-12	4.973e-12	-11.231	-11.303	-0.073	(0)
FeF3	5.351e-12	5.351e-12	-11.272	-11.272	0.000	(0)
FeF+2	2.478e-12	1.361e-12	-11.606	-11.866	-0.260	(0)
UO2F+	1.971e-13	1.630e-13	-12.705	-12.788	-0.082	(0)
UO2F2	1.517e-13	1.517e-13	-12.819	-12.819	0.000	(0)
PbF2	1.284e-13	1.284e-13	-12.892	-12.892	0.000	(0)
CdF2	1.523e-14	1.523e-14	-13.817	-13.817	0.000	(0)
UO2F3-	1.487e-14	1.230e-14	-13.828	-13.910	-0.082	(0)
VO2F	5.039e-15	5.039e-15	-14.298	-14.298	0.000	(0)
H2F2	3.032e-15	3.032e-15	-14.518	-14.518	0.000	(0)
VO2F2-	7.136e-16	5.904e-16	-15.147	-15.229	-0.082	(0)
PbF3-	9.495e-17	7.856e-17	-16.022	-16.105	-0.082	(0)
UO2F4-2	6.729e-17	3.152e-17	-16.172	-16.501	-0.329	(0)
VOF+	6.214e-17	5.141e-17	-16.207	-16.289	-0.082	(0)
BF3OH-	5.205e-17	4.402e-17	-16.284	-16.356	-0.073	(0)
VOF2	6.221e-18	6.221e-18	-17.206	-17.206	0.000	(0)
VO2F3-2	5.073e-18	2.376e-18	-17.295	-17.624	-0.329	(0)
VOF3-	8.609e-20	7.122e-20	-19.065	-19.147	-0.082	(0)
PbF4-2	2.590e-20	1.213e-20	-19.587	-19.916	-0.329	(0)
BF4-	5.827e-21	4.929e-21	-20.235	-20.307	-0.073	(0)
VO2F4-3	2.078e-21	3.773e-22	-20.682	-21.423	-0.741	(0)
VOF4-2	1.980e-22	9.276e-23	-21.703	-22.033	-0.329	(0)
Sb(OH) 2F	1.820e-23	1.820e-23	-22.740	-22.740	0.000	(0)
SbOF	1.791e-23	1.791e-23	-22.747	-22.747	0.000	(0)
HgF+	6.132e-24	5.073e-24	-23.212	-23.295	-0.082	(0)
UF3+	1.354e-33	1.120e-33	-32.868	-32.951	-0.082	(0)
UF2+2	4.675e-35	2.190e-35	-34.330	-34.660	-0.329	(0)
UF4	3.963e-35	3.963e-35	-34.402	-34.402	0.000	(0)
UF5-	6.125e-37	5.067e-37	-36.213	-36.295	-0.082	(0)
UF6-2	1.054e-37	4.938e-38	-36.977	-37.306	-0.329	(0)
UF+3	2.969e-38	5.391e-39	-37.527	-38.268	-0.741	(0)
Fe(2)	8.133e-07					
Fe+2	6.634e-07	3.108e-07	-6.178	-6.508	-0.329	(0)
FeSO4	1.078e-07	1.078e-07	-6.968	-6.968	0.000	(0)
FeHCO3+	4.015e-08	3.477e-08	-7.396	-7.459	-0.062	(0)
FeOH+	2.052e-09	1.767e-09	-8.688	-8.753	-0.065	(0)
Fe(OH) 2	2.004e-13	2.004e-13	-12.698	-12.698	0.000	(0)
Fe(OH) 3-	1.051e-14	9.049e-15	-13.978	-14.043	-0.065	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-146.665	-146.665	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-219.100	-219.182	-0.082	(0)
Fe(3)	2.590e-05					
Fe(OH) 2+	2.283e-05	1.970e-05	-4.641	-4.705	-0.064	(0)
Fe(OH) 3	3.022e-06	3.022e-06	-5.520	-5.520	0.000	(0)
Fe(OH) 4-	4.656e-08	4.018e-08	-7.332	-7.396	-0.064	(0)
FeOH+2	6.458e-10	3.547e-10	-9.190	-9.450	-0.260	(0)
FeF2+	1.365e-11	1.175e-11	-10.865	-10.930	-0.065	(0)
FeF3	5.351e-12	5.351e-12	-11.272	-11.272	0.000	(0)
FeF+2	2.478e-12	1.361e-12	-11.606	-11.866	-0.260	(0)
FeSO4+	7.082e-14	6.096e-14	-13.150	-13.215	-0.065	(0)
Fe+3	1.539e-14	3.847e-15	-13.813	-14.415	-0.602	(0)
Fe(SO4) 2-	2.225e-15	1.841e-15	-14.653	-14.735	-0.082	(0)

	FeCl+2	3.112e-16	1.709e-16	-15.507	-15.767	-0.260	(0)
	Fe2 (OH) 2+4	8.648e-17	4.165e-18	-16.063	-17.380	-1.317	(0)
	FeCl2+	1.305e-18	1.123e-18	-17.884	-17.950	-0.065	(0)
	FeHSeO3+2	7.696e-19	3.605e-19	-18.114	-18.443	-0.329	(0)
	Fe3 (OH) 4+5	1.356e-19	1.186e-21	-18.868	-20.926	-2.058	(0)
	FeCl3	1.652e-22	1.652e-22	-21.782	-21.782	0.000	(0)
H (0)	3.938e-28						
	H2	1.969e-28	1.981e-28	-27.706	-27.703	0.003	(0)
Hg (0)	2.205e-10						
	Hg	2.205e-10	2.205e-10	-9.657	-9.657	0.000	(0)
Hg (1)	2.710e-22						
	Hg2+2	1.355e-22	6.348e-23	-21.868	-22.197	-0.329	(0)
Hg (2)	3.082e-13						
	HgClOH	1.573e-13	1.573e-13	-12.803	-12.803	0.000	(0)
	HgCl2	9.179e-14	9.179e-14	-13.037	-13.037	0.000	(0)
	Hg (OH) 2	5.424e-14	5.457e-14	-13.266	-13.263	0.003	(0)
	HgCO3	3.001e-15	3.001e-15	-14.523	-14.523	0.000	(0)
	HgCl3-	1.632e-15	1.350e-15	-14.787	-14.870	-0.082	(0)
	Hg (CO3) 2-2	1.198e-16	5.610e-17	-15.922	-16.251	-0.329	(0)
	HgCl4-2	1.688e-17	7.909e-18	-16.773	-17.102	-0.329	(0)
	HgCl+	1.505e-17	1.245e-17	-16.823	-16.905	-0.082	(0)
	HgHCO3+	4.760e-18	3.938e-18	-17.322	-17.405	-0.082	(0)
	HgOH+	2.914e-18	2.411e-18	-17.535	-17.618	-0.082	(0)
	Hg (OH) 3-	1.186e-21	9.809e-22	-20.926	-21.008	-0.082	(0)
	Hg+2	9.053e-22	4.241e-22	-21.043	-21.373	-0.329	(0)
	HgSO4	1.568e-22	1.568e-22	-21.805	-21.805	0.000	(0)
	HgF+	6.132e-24	5.073e-24	-23.212	-23.295	-0.082	(0)
	HgHS2-	0.000e+00	0.000e+00	-131.318	-131.400	-0.082	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-132.158	-132.158	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-132.627	-132.956	-0.329	(0)
K	7.205e-04						
	K+	7.134e-04	6.116e-04	-3.147	-3.214	-0.067	(0)
	KSO4-	7.087e-06	6.116e-06	-5.150	-5.214	-0.064	(0)
	KCrO4-	2.011e-19	1.664e-19	-18.697	-18.779	-0.082	(0)
Mg	1.742e-03						
	Mg+2	1.426e-03	7.701e-04	-2.846	-3.113	-0.268	(0)
	MgSO4	1.979e-04	1.979e-04	-3.703	-3.703	0.000	(0)
	MgHCO3+	8.189e-05	7.004e-05	-4.087	-4.155	-0.068	(0)
	MgF+	3.249e-05	2.788e-05	-4.488	-4.555	-0.066	(0)
	MgCO3	3.787e-06	3.787e-06	-5.422	-5.422	0.000	(0)
	MgOH+	5.040e-08	4.378e-08	-7.298	-7.359	-0.061	(0)
	MgH2BO3+	4.130e-09	3.494e-09	-8.384	-8.457	-0.073	(0)
Mn (2)	2.383e-05						
	Mn+2	1.950e-05	9.133e-06	-4.710	-5.039	-0.329	(0)
	MnSO4	2.294e-06	2.294e-06	-5.639	-5.639	0.000	(0)
	MnHCO3+	1.881e-06	1.620e-06	-5.726	-5.791	-0.065	(0)
	MnF+	1.363e-07	1.173e-07	-6.866	-6.931	-0.065	(0)
	MnCl+	1.965e-08	1.692e-08	-7.707	-7.772	-0.065	(0)
	MnOH+	3.805e-09	3.276e-09	-8.420	-8.485	-0.065	(0)
	MnCl2	3.515e-11	3.515e-11	-10.454	-10.454	0.000	(0)
	MnCl3-	1.655e-14	1.424e-14	-13.781	-13.846	-0.065	(0)
	MnSeO4	2.175e-15	2.175e-15	-14.663	-14.663	0.000	(0)
	Mn (OH) 3-	4.796e-19	4.128e-19	-18.319	-18.384	-0.065	(0)
	Mn (OH) 4-2	3.466e-25	1.903e-25	-24.460	-24.721	-0.260	(0)
	MnSe	3.010e-40	3.010e-40	-39.521	-39.521	0.000	(0)
Mn (3)	2.174e-25						
	Mn+3	2.174e-25	5.436e-26	-24.663	-25.265	-0.602	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-45.488	-45.748	-0.260	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-49.924	-49.995	-0.071	(0)
Mo	5.565e-07						
	MoO4-2	5.560e-07	3.002e-07	-6.255	-6.523	-0.268	(0)
	HMoO4-	5.089e-10	4.210e-10	-9.293	-9.376	-0.082	(0)
	H2MoO4	2.174e-13	2.174e-13	-12.663	-12.663	0.000	(0)
	Ag2MoO4	3.595e-23	3.595e-23	-22.444	-22.444	0.000	(0)
	AlMo6O21-3	6.377e-39	1.158e-39	-38.195	-38.936	-0.741	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-46.919	-49.882	-2.964	(0)

	HMo7O24-5	0.000e+00	0.000e+00	-48.589	-50.648	-2.058	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.700	-53.017	-1.317	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.182	-56.923	-0.741	(0)
Na	4.978e-03						
	Na+	4.919e-03	4.217e-03	-2.308	-2.375	-0.067	(0)
	NaSO4-	3.706e-05	3.198e-05	-4.431	-4.495	-0.064	(0)
	NaHCO3	2.108e-05	2.108e-05	-4.676	-4.676	0.000	(0)
	NaF	8.585e-07	8.585e-07	-6.066	-6.066	0.000	(0)
	NaCO3-	5.379e-07	4.642e-07	-6.269	-6.333	-0.064	(0)
	NaH2BO3	8.744e-10	8.744e-10	-9.058	-9.058	0.000	(0)
	NaCrO4-	1.854e-18	1.534e-18	-17.732	-17.814	-0.082	(0)
Ni	2.132e-07						
	Ni+2	1.068e-07	5.768e-08	-6.971	-7.239	-0.268	(0)
	NiHCO3+	7.640e-08	6.321e-08	-7.117	-7.199	-0.082	(0)
	NiSO4	1.626e-08	1.626e-08	-7.789	-7.789	0.000	(0)
	NiCO3	1.272e-08	1.272e-08	-7.895	-7.895	0.000	(0)
	NiF+	5.651e-10	4.676e-10	-9.248	-9.330	-0.082	(0)
	NiCl+	2.625e-10	2.171e-10	-9.581	-9.663	-0.082	(0)
	NiOH+	1.253e-10	1.037e-10	-9.902	-9.984	-0.082	(0)
	Ni (SO4) 2-2	1.623e-12	7.604e-13	-11.790	-12.119	-0.329	(0)
	Ni (OH) 2	1.176e-12	1.176e-12	-11.929	-11.929	0.000	(0)
	NiCl2	1.608e-15	1.608e-15	-14.794	-14.794	0.000	(0)
	Ni (OH) 3-	2.030e-16	1.680e-16	-15.692	-15.775	-0.082	(0)
	NiSeO4	2.387e-17	2.387e-17	-16.622	-16.622	0.000	(0)
O (0)	2.566e-37						
	O2	1.283e-37	1.291e-37	-36.892	-36.889	0.003	(0)
Pb	2.621e-08						
	PbCO3	1.580e-08	1.580e-08	-7.801	-7.801	0.000	(0)
	PbHCO3+	7.096e-09	5.870e-09	-8.149	-8.231	-0.082	(0)
	Pb+2	1.646e-09	8.889e-10	-8.784	-9.051	-0.268	(0)
	PbSO4	6.150e-10	6.150e-10	-9.211	-9.211	0.000	(0)
	Pb (CO3) 2-2	5.750e-10	2.694e-10	-9.240	-9.570	-0.329	(0)
	PbOH+	3.854e-10	3.189e-10	-9.414	-9.496	-0.082	(0)
	PbCl+	5.609e-11	4.640e-11	-10.251	-10.333	-0.082	(0)
	PbF+	2.443e-11	2.021e-11	-10.612	-10.694	-0.082	(0)
	Pb (SO4) 2-2	1.117e-11	5.234e-12	-10.952	-11.281	-0.329	(0)
	Pb (OH) 2	1.440e-12	1.440e-12	-11.842	-11.842	0.000	(0)
	PbCl2	3.049e-13	3.049e-13	-12.516	-12.516	0.000	(0)
	PbF2	1.284e-13	1.284e-13	-12.892	-12.892	0.000	(0)
	Pb (OH) 3-	2.485e-16	2.056e-16	-15.605	-15.687	-0.082	(0)
	PbCl3-	2.159e-16	1.786e-16	-15.666	-15.748	-0.082	(0)
	PbF3-	9.495e-17	7.856e-17	-16.022	-16.105	-0.082	(0)
	Pb2OH+3	2.474e-17	4.492e-18	-16.607	-17.348	-0.741	(0)
	PbCl4-2	2.564e-19	1.201e-19	-18.591	-18.920	-0.329	(0)
	PbF4-2	2.590e-20	1.213e-20	-19.587	-19.916	-0.329	(0)
	Pb (OH) 4-2	1.535e-20	7.190e-21	-19.814	-20.143	-0.329	(0)
	Pb3 (OH) 4+2	7.849e-23	3.677e-23	-22.105	-22.435	-0.329	(0)
	Pb4 (OH) 4+4	5.390e-27	2.596e-28	-26.268	-27.586	-1.317	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-142.889	-142.889	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-216.060	-216.143	-0.082	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-68.489	-68.489	0.000	(0)
	HS-	0.000e+00	0.000e+00	-74.471	-74.554	-0.082	(0)
	H2S	0.000e+00	0.000e+00	-74.686	-74.686	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-74.798	-74.881	-0.082	(0)
	S5-2	0.000e+00	0.000e+00	-76.438	-76.767	-0.329	(0)
	S6-2	0.000e+00	0.000e+00	-76.954	-77.283	-0.329	(0)
	S4-2	0.000e+00	0.000e+00	-77.033	-77.363	-0.329	(0)
	S3-2	0.000e+00	0.000e+00	-77.839	-78.169	-0.329	(0)
	S2-2	0.000e+00	0.000e+00	-78.855	-79.185	-0.329	(0)
	S-2	0.000e+00	0.000e+00	-84.442	-84.702	-0.260	(0)
	HgHS2-	0.000e+00	0.000e+00	-131.318	-131.400	-0.082	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-132.158	-132.158	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-132.627	-132.956	-0.329	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-138.861	-138.943	-0.082	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-139.091	-139.275	-0.183	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-140.127	-140.461	-0.334	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-140.872	-141.191	-0.319	(0)

Ag (S4) 2-3	0.000e+00	0.000e+00	-141.221	-141.563	-0.342	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.459	-141.542	-0.082	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.548	-141.874	-0.326	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.230	-142.230	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.684	-142.684	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.889	-142.889	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.665	-146.665	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.293	-204.375	-0.082	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.875	-213.958	-0.082	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.802	-214.884	-0.082	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.060	-216.143	-0.082	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.456	-216.786	-0.329	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.100	-219.182	-0.082	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.913	-287.242	-0.329	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.642	-289.971	-0.329	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.381	-299.711	-0.329	(0)
S (6)	3.609e-03					
SO4-2	2.616e-03	1.412e-03	-2.582	-2.850	-0.268	(0)
CaSO4	7.489e-04	7.489e-04	-3.126	-3.126	0.000	(0)
MgSO4	1.979e-04	1.979e-04	-3.703	-3.703	0.000	(0)
NaSO4-	3.706e-05	3.198e-05	-4.431	-4.495	-0.064	(0)
KSO4-	7.087e-06	6.116e-06	-5.150	-5.214	-0.064	(0)
MnSO4	2.294e-06	2.294e-06	-5.639	-5.639	0.000	(0)
ZnSO4	1.241e-07	1.241e-07	-6.906	-6.906	0.000	(0)
FeSO4	1.078e-07	1.078e-07	-6.968	-6.968	0.000	(0)
CuSO4	7.894e-08	7.894e-08	-7.103	-7.103	0.000	(0)
NiSO4	1.626e-08	1.626e-08	-7.789	-7.789	0.000	(0)
CoSO4	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
HSO4-	1.134e-08	9.728e-09	-7.945	-8.012	-0.066	(0)
Zn (SO4) 2-2	3.260e-09	1.527e-09	-8.487	-8.816	-0.329	(0)
CrOHSO4	1.741e-09	1.741e-09	-8.759	-8.759	0.000	(0)
CdSO4	1.532e-09	1.532e-09	-8.815	-8.815	0.000	(0)
PbSO4	6.150e-10	6.150e-10	-9.211	-9.211	0.000	(0)
AgSO4-	6.059e-10	5.013e-10	-9.218	-9.300	-0.082	(0)
Cd (SO4) 2-2	6.230e-11	2.919e-11	-10.206	-10.535	-0.329	(0)
AlSO4+	1.675e-11	1.437e-11	-10.776	-10.843	-0.066	(0)
Pb (SO4) 2-2	1.117e-11	5.234e-12	-10.952	-11.281	-0.329	(0)
CrSO4+	6.629e-12	5.484e-12	-11.179	-11.261	-0.082	(0)
Ni (SO4) 2-2	1.623e-12	7.604e-13	-11.790	-12.119	-0.329	(0)
Al (SO4) 2-	2.534e-13	2.175e-13	-12.596	-12.663	-0.066	(0)
FeSO4+	7.082e-14	6.096e-14	-13.150	-13.215	-0.065	(0)
UO2SO4	7.826e-15	7.826e-15	-14.106	-14.106	0.000	(0)
Fe (SO4) 2-	2.225e-15	1.841e-15	-14.653	-14.735	-0.082	(0)
Cr2 (OH) 2SO4+2	1.745e-15	8.175e-16	-14.758	-15.088	-0.329	(0)
VO2SO4-	3.630e-16	3.003e-16	-15.440	-15.522	-0.082	(0)
UO2 (SO4) 2-2	3.110e-16	1.457e-16	-15.507	-15.836	-0.329	(0)
Cr2 (OH) 2 (SO4) 2	6.859e-17	6.859e-17	-16.164	-16.164	0.000	(0)
VOSO4	1.033e-17	1.033e-17	-16.986	-16.986	0.000	(0)
HgSO4	1.568e-22	1.568e-22	-21.805	-21.805	0.000	(0)
CrO3SO4-2	1.081e-24	5.066e-25	-23.966	-24.295	-0.329	(0)
VSO4+	3.965e-31	3.281e-31	-30.402	-30.484	-0.082	(0)
U (SO4) 2	5.283e-40	5.283e-40	-39.277	-39.277	0.000	(0)
USO4+2	1.005e-40	0.000e+00	-39.998	-40.327	-0.329	(0)
Sb (3)	1.012e-18					
Sb (OH) 3	5.121e-19	5.121e-19	-18.291	-18.291	0.000	(0)
HSbO2	5.001e-19	5.001e-19	-18.301	-18.301	0.000	(0)
Sb (OH) 2F	1.820e-23	1.820e-23	-22.740	-22.740	0.000	(0)
SbOF	1.791e-23	1.791e-23	-22.747	-22.747	0.000	(0)
SbO2-	1.389e-23	1.149e-23	-22.857	-22.940	-0.082	(0)
Sb (OH) 4-	7.953e-24	6.579e-24	-23.099	-23.182	-0.082	(0)
Sb (OH) 2+	1.060e-24	8.769e-25	-23.975	-24.057	-0.082	(0)
SbO+	3.656e-25	3.024e-25	-24.437	-24.519	-0.082	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.381	-299.711	-0.329	(0)
Sb (5)	1.316e-08					
SbO3-	1.314e-08	1.087e-08	-7.881	-7.964	-0.082	(0)
Sb (OH) 6-	1.482e-11	1.270e-11	-10.829	-10.896	-0.067	(0)
SbO2+	1.873e-23	1.550e-23	-22.727	-22.810	-0.082	(0)
Se (-2)	2.061e-10					

Ag ₂ Se	2.061e-10	2.061e-10	-9.686	-9.686	0.000	(0)
HSe-	6.812e-37	5.636e-37	-36.167	-36.249	-0.082	(0)
H ₂ Se	3.083e-40	3.083e-40	-39.511	-39.511	0.000	(0)
MnSe	3.010e-40	3.010e-40	-39.521	-39.521	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.768	-44.097	-0.329	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.984	-79.301	-1.317	(0)
Se (4)	4.715e-08					
HSeO ₃ -	4.287e-08	3.547e-08	-7.368	-7.450	-0.082	(0)
SeO ₃ -2	4.277e-09	2.004e-09	-8.369	-8.698	-0.329	(0)
H ₂ SeO ₃	1.066e-12	1.066e-12	-11.972	-11.972	0.000	(0)
AgSeO ₃ -	2.768e-14	2.290e-14	-13.558	-13.640	-0.082	(0)
FeHSeO ₃ +2	7.696e-19	3.605e-19	-18.114	-18.443	-0.329	(0)
Cd (SeO ₃) 2-2	3.267e-20	1.530e-20	-19.486	-19.815	-0.329	(0)
Ag (SeO ₃) 2-3	2.263e-21	4.109e-22	-20.645	-21.386	-0.741	(0)
Se (6)	1.640e-12					
SeO ₄ -2	1.638e-12	8.846e-13	-11.786	-12.053	-0.268	(0)
MnSeO ₄	2.175e-15	2.175e-15	-14.663	-14.663	0.000	(0)
ZnSeO ₄	5.504e-17	5.504e-17	-16.259	-16.259	0.000	(0)
NiSeO ₄	2.387e-17	2.387e-17	-16.622	-16.622	0.000	(0)
CoSeO ₄	1.785e-17	1.785e-17	-16.748	-16.748	0.000	(0)
HSeO ₄ -	3.777e-18	3.125e-18	-17.423	-17.505	-0.082	(0)
CdSeO ₄	7.620e-19	7.620e-19	-18.118	-18.118	0.000	(0)
Zn (SeO ₄) 2-2	1.054e-28	4.936e-29	-27.977	-28.307	-0.329	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.257	-57.998	-0.741	(0)
U (4)	4.415e-22					
U (OH) 5-	4.404e-22	3.644e-22	-21.356	-21.438	-0.082	(0)
U (OH) 4	1.076e-24	1.076e-24	-23.968	-23.968	0.000	(0)
U (OH) 3+	3.353e-28	2.774e-28	-27.475	-27.557	-0.082	(0)
U (OH) 2+2	1.931e-32	9.044e-33	-31.714	-32.044	-0.329	(0)
UF ₃ +	1.354e-33	1.120e-33	-32.868	-32.951	-0.082	(0)
UF ₂ +2	4.675e-35	2.190e-35	-34.330	-34.660	-0.329	(0)
UF ₄	3.963e-35	3.963e-35	-34.402	-34.402	0.000	(0)
UF ₅ -	6.125e-37	5.067e-37	-36.213	-36.295	-0.082	(0)
UOH+3	1.654e-37	3.004e-38	-36.781	-37.522	-0.741	(0)
UF ₆ -2	1.054e-37	4.938e-38	-36.977	-37.306	-0.329	(0)
UF+3	2.969e-38	5.391e-39	-37.527	-38.268	-0.741	(0)
U (SO ₄) 2	5.283e-40	5.283e-40	-39.277	-39.277	0.000	(0)
USO ₄ +2	1.005e-40	0.000e+00	-39.998	-40.327	-0.329	(0)
U+4	0.000e+00	0.000e+00	-42.760	-44.077	-1.317	(0)
UCl+3	0.000e+00	0.000e+00	-44.468	-45.209	-0.741	(0)
U ₆ (OH) 15+9	0.000e+00	0.000e+00	-167.673	-174.342	-6.669	(0)
U (5)	2.024e-17					
UO ₂ +	2.024e-17	1.675e-17	-16.694	-16.776	-0.082	(0)
U (6)	8.431e-08					
UO ₂ (CO ₃) 3-4	6.252e-08	3.012e-09	-7.204	-8.521	-1.317	(0)
UO ₂ (CO ₃) 2-2	2.169e-08	1.016e-08	-7.664	-7.993	-0.329	(0)
UO ₂ CO ₃	8.616e-11	8.616e-11	-10.065	-10.065	0.000	(0)
UO ₂ F+	1.971e-13	1.630e-13	-12.705	-12.788	-0.082	(0)
UO ₂ F ₂	1.517e-13	1.517e-13	-12.819	-12.819	0.000	(0)
UO ₂ OH+	7.954e-14	6.581e-14	-13.099	-13.182	-0.082	(0)
UO ₂ F ₃ -	1.487e-14	1.230e-14	-13.828	-13.910	-0.082	(0)
UO ₂ SO ₄	7.826e-15	7.826e-15	-14.106	-14.106	0.000	(0)
UO ₂ +2	6.779e-15	3.661e-15	-14.169	-14.436	-0.268	(0)
UO ₂ (SO ₄) 2-2	3.110e-16	1.457e-16	-15.507	-15.836	-0.329	(0)
UO ₂ F ₄ -2	6.729e-17	3.152e-17	-16.172	-16.501	-0.329	(0)
UO ₂ Cl+	1.056e-17	8.734e-18	-16.976	-17.059	-0.082	(0)
(UO ₂) 2 (OH) 2+2	1.534e-20	7.187e-21	-19.814	-20.143	-0.329	(0)
(UO ₂) 3 (OH) 5+	8.842e-24	7.315e-24	-23.053	-23.136	-0.082	(0)
V (2)	1.396e-39					
VOH+	1.010e-39	8.357e-40	-38.996	-39.078	-0.082	(0)
V+2	3.860e-40	1.809e-40	-39.413	-39.743	-0.329	(0)
V (3)	1.156e-12					
V (OH) 3	1.156e-12	1.156e-12	-11.937	-11.937	0.000	(0)
V (OH) 2+	6.364e-23	5.265e-23	-22.196	-22.279	-0.082	(0)
VOH+2	7.516e-26	3.521e-26	-25.124	-25.453	-0.329	(0)
V+3	2.710e-30	4.920e-31	-29.567	-30.308	-0.741	(0)
VSO ₄ +	3.965e-31	3.281e-31	-30.402	-30.484	-0.082	(0)

V2 (OH) 3+3	0.000e+00	0.000e+00	-48.539	-49.280	-0.741	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.789	-50.107	-1.317	(0)
V (4)	1.050e-15					
V (OH) 3+	9.144e-16	7.565e-16	-15.039	-15.121	-0.082	(0)
VOF+	6.214e-17	5.141e-17	-16.207	-16.289	-0.082	(0)
VO+2	5.670e-17	2.656e-17	-16.246	-16.576	-0.329	(0)
VOSO4	1.033e-17	1.033e-17	-16.986	-16.986	0.000	(0)
VOF2	6.221e-18	6.221e-18	-17.206	-17.206	0.000	(0)
VOC1+	1.325e-19	1.096e-19	-18.878	-18.960	-0.082	(0)
VOF3-	8.609e-20	7.122e-20	-19.065	-19.147	-0.082	(0)
VOF4-2	1.980e-22	9.276e-23	-21.703	-22.033	-0.329	(0)
H2V2O4+2	6.128e-26	2.871e-26	-25.213	-25.542	-0.329	(0)
V (5)	1.155e-07					
H2VO4-	1.085e-07	8.975e-08	-6.965	-7.047	-0.082	(0)
HVO4-2	6.828e-09	3.199e-09	-8.166	-8.495	-0.329	(0)
H3VO4	6.326e-11	6.326e-11	-10.199	-10.199	0.000	(0)
H3V2O7-	4.433e-11	3.667e-11	-10.353	-10.436	-0.082	(0)
HV2O7-3	5.360e-13	9.733e-14	-12.271	-13.012	-0.741	(0)
VO2+	1.039e-14	8.904e-15	-13.984	-14.050	-0.067	(0)
VO2F	5.039e-15	5.039e-15	-14.298	-14.298	0.000	(0)
V3O9-3	4.176e-15	7.582e-16	-14.379	-15.120	-0.741	(0)
VO4-3	1.253e-15	2.275e-16	-14.902	-15.643	-0.741	(0)
V2O7-4	7.717e-16	3.717e-17	-15.113	-16.430	-1.317	(0)
VO2F2-	7.136e-16	5.904e-16	-15.147	-15.229	-0.082	(0)
VO2SO4-	3.630e-16	3.003e-16	-15.440	-15.522	-0.082	(0)
VO2F3-2	5.073e-18	2.376e-18	-17.295	-17.624	-0.329	(0)
V4O12-4	5.892e-19	2.838e-20	-18.230	-19.547	-1.317	(0)
VO2F4-3	2.078e-21	3.773e-22	-20.682	-21.423	-0.741	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.076	-49.134	-2.058	(0)
V10O28-6	0.000e+00	0.000e+00	-47.205	-50.169	-2.964	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.761	-51.079	-1.317	(0)
Zn	1.157e-06					
Zn+2	7.438e-07	4.017e-07	-6.129	-6.396	-0.268	(0)
ZnCO3	1.367e-07	1.367e-07	-6.864	-6.864	0.000	(0)
ZnHCO3+	1.365e-07	1.129e-07	-6.865	-6.947	-0.082	(0)
ZnSO4	1.241e-07	1.241e-07	-6.906	-6.906	0.000	(0)
ZnOH+	6.933e-09	5.736e-09	-8.159	-8.241	-0.082	(0)
Zn (SO4) 2-2	3.260e-09	1.527e-09	-8.487	-8.816	-0.329	(0)
ZnF+	3.126e-09	2.586e-09	-8.505	-8.587	-0.082	(0)
ZnCl+	1.736e-09	1.484e-09	-8.761	-8.828	-0.068	(0)
ZnOHCl	2.775e-10	2.775e-10	-9.557	-9.557	0.000	(0)
Zn (OH) 2	1.298e-10	1.298e-10	-9.887	-9.887	0.000	(0)
ZnCl2	3.461e-12	3.461e-12	-11.461	-11.461	0.000	(0)
Zn (OH) 3-	1.123e-13	9.291e-14	-12.950	-13.032	-0.082	(0)
ZnCl3-	4.729e-15	4.045e-15	-14.325	-14.393	-0.068	(0)
ZnSeO4	5.504e-17	5.504e-17	-16.259	-16.259	0.000	(0)
ZnCl4-2	5.418e-18	2.975e-18	-17.266	-17.526	-0.260	(0)
Zn (OH) 4-2	1.127e-18	5.282e-19	-17.948	-18.277	-0.329	(0)
Zn (SeO4) 2-2	1.054e-28	4.936e-29	-27.977	-28.307	-0.329	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.459	-141.542	-0.082	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.684	-142.684	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.875	-213.958	-0.082	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.456	-216.786	-0.329	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.642	-289.971	-0.329	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.68	-82.90	-36.22	Ag2S
Ag2CO3	-9.64	-20.73	-11.09	Ag2CO3
Ag2CrO4	-20.05	-31.64	-11.59	Ag2CrO4
Ag2HVO4	-9.57	-8.09	1.48	Ag2HVO4
Ag2MoO4	-10.47	-22.02	-11.55	Ag2MoO4
Ag2O	-13.77	-1.20	12.57	Ag2O
Ag2Se	4.10	-44.60	-48.70	Ag2Se
Ag2SeO3	-8.65	-15.80	-7.15	Ag2SeO3
Ag2SeO4	-18.64	-27.55	-8.91	Ag2SeO4

Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.56	-20.41	2.16	Ag3AsO3
Ag3AsO4	-11.97	-14.75	-2.79	Ag3AsO4
Ag3H2VO5	-13.87	-8.69	5.18	Ag3H2VO5
AgF·4H2O	-12.29	-11.24	1.05	AgF·4H2O
Agmetal	0.63	-12.87	-13.51	Ag
AgVO3	-8.27	-7.50	0.77	AgVO3
Al(OH)3(am)	-1.23	9.57	10.80	Al(OH)3
Al2(MoO4)3	-45.70	-43.33	2.37	Al2(MoO4)3
Al2O3	-0.51	19.15	19.65	Al2O3
Al4(OH)10SO4	-1.56	21.14	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-8.19	-3.39	4.80	AlAsO4·2H2O
AlOHSO4	-4.35	-7.58	-3.23	AlOHSO4
AlSb	-148.00	-82.38	65.62	AlSb
Alunite	-0.25	-1.65	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.11	-11.90	-7.79	PbSO4
Anhydrite	-1.13	-5.49	-4.36	CaSO4
Anilite	-50.75	-82.63	-31.88	Cu0.25Cu1.5S
Antlerite	-2.87	5.92	8.79	Cu3(OH)4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-71.69	-74.45	-2.76	As4O6
Artinite	-6.75	2.85	9.60	MgCO3:Mg(OH)2·3H2O
As2O5	-32.62	-25.92	6.71	As2O5
Atacamite	-1.99	5.40	7.39	Cu2(OH)3Cl
Azurite	0.91	-15.99	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-16.21	8.18	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-13.30	2.57	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	7.54	-1.37	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-22.19	10.75	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.59	-22.26	-9.67	BaCrO4
BaF2	-7.28	-13.10	-5.82	BaF2
BaMoO4	-5.68	-12.64	-6.96	BaMoO4
Barite	1.01	-8.97	-9.98	BaSO4
BaS	-89.70	-73.52	16.18	BaS
BaSeO3	-8.25	-6.42	1.83	BaSeO3
BaSeO4	-10.71	-18.17	-7.46	BaSeO4
Bianchite	-7.48	-9.25	-1.76	ZnSO4·6H2O
Birnessite	-9.62	8.47	18.09	MnO2
Bixbyite	-6.97	-7.62	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.33	-78.61	-27.28	Cu0.6Cu0.8S
Boehmite	0.99	9.57	8.58	AlOOH
Breithauptite	-54.09	-72.61	-18.52	NiSb
Brochantite	-1.61	13.61	15.22	Cu4(OH)6SO4
Brucite	-5.65	11.19	16.84	Mg(OH)2
Bunsenite	-5.38	7.06	12.45	NiO
Ca(VO3)2	-7.79	-2.13	5.66	Ca(VO3)2
Ca2V2O7	-7.96	9.54	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.01	9.54	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-13.21	9.09	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-17.75	21.21	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-18.65	21.21	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-291.87	-148.89	142.97	Ca3Sb2
CaCrO4	-16.51	-18.77	-2.27	CaCrO4
Calcite	0.62	-7.86	-8.48	CaCO3
Calomel	-9.95	-27.86	-17.91	Hg2Cl2
CaMoO4	-1.21	-9.16	-7.95	CaMoO4
Carnotite	-3.32	-3.09	0.23	KUO2VO4
CaSeO3·2H2O	-5.75	-2.93	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.67	-14.69	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.47	-3.63	9.84	Cd(BO2)2
Cd(OH)2	-7.68	5.97	13.64	Cd(OH)2
Cd(OH)2(am)	-7.76	5.97	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.11	-16.40	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.81	0.75	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.68	6.72	28.40	Cd4(OH)6SO4
CdCl2	-13.34	-14.00	-0.66	CdCl2
CdCl2·1H2O	-12.31	-14.00	-1.69	CdCl2·1H2O

CdCl2:2.5H2O	-12.09	-14.00	-1.91	CdCl2:2.5H2O
CdF2	-14.10	-15.32	-1.21	CdF2
Cdmetal (alpha)	-32.10	-18.58	13.51	Cd
Cdmetal (gamma)	-32.20	-18.58	13.62	Cd
CdMoO4	-0.71	-14.86	-14.15	CdMoO4
CdOHCl	-7.55	-4.02	3.54	CdOHCl
CdSb	-73.35	-73.70	-0.35	CdSb
CdSe	-17.23	-37.43	-20.20	CdSe
CdSeO4:2H2O	-18.54	-20.39	-1.85	CdSeO4:2H2O
CdSO4	-11.01	-11.18	-0.17	CdSO4
CdSO4:1H2O	-9.46	-11.19	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.31	-11.19	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.15	-14.28	-13.13	PbCO3
CH4 (g)	-76.70	-117.74	-41.05	CH4
Chalcanthite	-6.82	-9.46	-2.64	CuSO4:5H2O
Chalcocite	-50.58	-85.50	-34.92	Cu2S
Chalcopyrite	-112.65	-147.92	-35.27	CuFeS2
Cinnabar	-49.27	-94.97	-45.69	HgS
Claudetite	-71.39	-74.45	-3.06	As4O6
Clausthalite	-11.05	-38.15	-27.10	PbSe
Co (BO2) 2	-29.76	-2.69	27.07	Co (BO2) 2
Co (OH) 2	-6.19	6.91	13.09	Co (OH) 2
Co (OH) 3	-10.91	-13.22	-2.31	Co (OH) 3
CO2 (g)	-1.38	-19.53	-18.15	CO2
Co3 (AsO4) 2	-18.22	-5.19	13.03	Co3 (AsO4) 2
Co3O4	-9.03	-19.52	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-2.64	-12.62	-9.98	CoCO3
CoF2	-12.78	-14.38	-1.60	CoF2
CoF3	-43.69	-45.14	-1.46	CoF3
CoFe2O4	24.52	20.99	-3.53	CoFe2O4
CoMoO4	-6.16	-13.92	-7.76	CoMoO4
CoO	-6.68	6.91	13.59	CoO
CoS (alpha)	-67.36	-74.80	-7.44	CoS
CoS (beta)	-63.73	-74.80	-11.07	CoS
CoSe	-20.29	-36.49	-16.20	CoSe
CoSeO3	-9.01	-7.69	1.32	CoSeO3
CoSeO4:6H2O	-17.92	-19.45	-1.53	CoSeO4:6H2O
CoSO4	-13.05	-10.25	2.80	CoSO4
CoSO4:6H2O	-7.77	-10.25	-2.47	CoSO4:6H2O
Cotunnite	-9.94	-14.72	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr (OH) 2	-20.04	-9.22	10.82	Cr (OH) 2
Cr (OH) 3	-1.23	0.11	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.86	0.11	-0.75	Cr (OH) 3
Cr2O3	2.57	0.22	-2.36	Cr2O3
CrCl2	-43.28	-29.19	14.09	CrCl2
CrCl3	-44.96	-29.84	15.11	CrCl3
CrF3	-20.48	-31.82	-11.34	CrF3
Crmetal	-64.26	-33.77	30.48	Cr
CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.12	-39.96	-33.84	Na3AlF6
Cu (OH) 2	-0.98	7.69	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.99	20.22	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-51.27	-86.15	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.39	-47.19	-45.80	Cu2Se
Cu2SO4	-18.99	-20.94	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-8.94	-2.84	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-55.04	-97.64	-42.59	Cu3Sb
Cu3Se2	-19.41	-82.90	-63.49	Cu3Se2
CuCO3	-0.34	-11.84	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.63	-12.54	-4.91	CuF
CuF2	-14.71	-13.60	1.12	CuF2
CuF2:2H2O	-9.05	-13.60	-4.55	CuF2:2H2O
Cumetal	-5.42	-14.17	-8.76	Cu

CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-12.07	-1.77	10.30	CuOCuSO4
Cupricferrite	15.78	21.77	5.99	CuFe2O4
Cuprite	-2.39	-3.79	-1.41	Cu2O
Cuprousferrite	14.06	5.15	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.56	-33.37	CuSe2
CuSeO3:2H2O	-7.42	-6.91	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.23	-18.67	-2.44	CuSeO4:5H2O
CuSO4	-12.40	-9.46	2.94	CuSO4
Diaspore	2.70	9.57	6.87	AlOOH
Djurleite	-50.82	-84.74	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.33	-16.21	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.88	-16.21	-17.09	CaMg(CO3)2
Epsomite	-3.84	-5.97	-2.13	MgSO4:7H2O
Fe(OH)2	-5.77	7.80	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.09	4.05	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-2.28	-6.00	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.08	-0.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-9.10	-29.72	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.65	-37.38	-3.73	Fe2(SO4)3
Fe3(OH)8	1.65	21.88	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.32	-5.92	0.40	FeAsO4:2H2O
FeCr2O4	0.81	8.01	7.20	FeCr2O4
FeMoO4	-2.94	-13.03	-10.09	FeMoO4
Ferrihydrite	3.85	7.04	3.19	Fe(OH)3
Ferroselite	-35.86	-54.45	-18.60	FeSe2
FeS(ppt)	-70.96	-73.91	-2.95	FeS
FeSe	-24.60	-35.60	-11.00	FeSe
Fix_pe	-5.12	-5.12	0.00	e-
Fluorite	0.88	-9.62	-10.50	CaF2
Galena	-62.48	-76.45	-13.97	PbS
Gibbsite	1.28	9.57	8.29	Al(OH)3
Goethite	6.55	7.04	0.49	FeOOH
Goslarite	-7.24	-9.25	-2.01	ZnSO4:7H2O
Greenockite	-61.38	-75.74	-14.36	CdS
Greigite	-259.91	-304.94	-45.03	Fe3S4
Gummite	-7.80	-0.13	7.67	UO3
Gypsum	-0.88	-5.49	-4.61	CaSO4:2H2O
H-Jarosite	-1.09	-13.19	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.95	-20.83	-12.88	H2MoO4
H2S(g)	-73.70	-81.71	-8.01	H2S
H2Se(g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.81	-5.21	1.60	NaCl
Hausmannite	-8.68	52.35	61.03	Mn3O4
Hematite	15.50	14.08	-1.42	Fe2O3
Hercynite	4.05	26.94	22.89	FeAl2O4
Hg(CH3)2(g)	-175.04	-248.75	-73.71	Hg(CH3)2
Hg(g)	-8.35	-16.22	-7.87	Hg
Hg(OH)2	-9.77	-13.26	-3.50	Hg(OH)2
Hg2(g)	-17.49	-32.45	-14.96	Hg2
Hg2(OH)2	-13.15	-7.89	5.26	Hg2(OH)2
Hg2CO3	-11.38	-27.43	-16.05	Hg2CO3
Hg2CrO4	-29.63	-38.33	-8.70	Hg2CrO4
Hg2F2	-18.82	-29.18	-10.36	Hg2F2
Hg2S	-77.92	-89.60	-11.68	Hg2S
Hg2SeO3	-17.84	-22.50	-4.66	Hg2SeO3
Hg2SO4	-18.92	-25.05	-6.13	Hg2SO4
Hg3O2CO3	-29.64	-59.32	-29.68	Hg3O2CO3
HgCl(g)	-33.43	-13.93	19.50	HgCl
HgCl2	-11.97	-33.23	-21.26	HgCl2
HgF(g)	-47.27	-14.59	32.68	HgF
HgF2(g)	-47.11	-34.55	12.57	HgF2
Hgmetal(l)	-2.77	-16.22	-13.45	Hg
HgSe	-0.97	-56.66	-55.69	HgSe
HgSeO3	-15.43	-27.86	-12.43	HgSeO3
HgSO4	-21.00	-30.42	-9.42	HgSO4
Huntite	-2.92	-32.89	-29.97	CaMg3(CO3)4

Hydrocerrusite	-4.54	-23.31	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.41	-22.18	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-15.63	-20.80	-5.17	KAl(SO4)2·12H2O
K-Jarosite	5.55	-9.25	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.76	-53.00	-17.24	K2Cr2O7
K2CrO4	-22.05	-22.56	-0.51	K2CrO4
K2MoO4	-16.21	-12.95	3.26	K2MoO4
K2SeO4	-17.75	-18.48	-0.73	K2SeO4
Langite	-3.88	13.61	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.21	-6.65	-0.43	PbO:PbSO4
Laurionite	-5.35	-4.73	0.62	PbOHCl
Lepidocrocite	5.67	7.04	1.37	FeOOH
Lime	-21.03	11.67	32.70	CaO
Litharge	-7.44	5.25	12.69	PbO
Mackinawite	-70.31	-73.91	-3.60	FeS
Maghemite	7.70	14.08	6.39	Fe2O3
Magnesioferrite	8.41	25.27	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	18.47	21.88	3.40	Fe3O4
Malachite	1.16	-4.15	-5.31	Cu2(OH)2CO3
Manganite	-3.80	21.54	25.34	MnOOH
Massicot	-7.64	5.25	12.89	PbO
Matlockite	-6.40	-15.37	-8.97	PbClF
Melanothallite	-18.53	-12.28	6.26	CuCl2
Melanterite	-7.15	-9.36	-2.21	FeSO4·7H2O
Metacinnabar	-49.87	-94.97	-45.09	HgS
Mg(OH)2(active)	-7.60	11.19	18.79	Mg(OH)2
Mg(VO3)2	-13.89	-2.61	11.28	Mg(VO3)2
Mg2Sb3	-266.77	-192.08	74.68	Mg2Sb3
Mg2V2O7	-17.78	8.58	26.36	Mg2V2O7
MgCr2O4	-4.80	11.41	16.20	MgCr2O4
MgCrO4	-24.63	-19.25	5.38	MgCrO4
MgF2	-1.97	-10.10	-8.13	MgF2
MgMoO4	-7.79	-9.64	-1.85	MgMoO4
MgSeO3·6H2O	-6.47	-3.41	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-13.97	-15.17	-1.20	MgSeO4·6H2O
Minium	-33.21	40.31	73.52	Pb3O4
Mirabilite	-6.49	-7.60	-1.11	Na2SO4·10H2O
Mn(VO3)2	-9.43	-4.53	4.90	Mn(VO3)2
Mn2(SO4)3	-53.37	-59.08	-5.71	Mn2(SO4)3
Mn2Sb	-146.78	-85.70	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-10.63	1.87	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.42	-10.70	2.72	MnCl2·4H2O
MnS(grn)	-72.61	-72.44	0.17	MnS
MnS(pnk)	-75.78	-72.44	3.34	MnS
MnSb	-92.85	-95.76	-2.91	MnSb
MnSe	-37.64	-34.14	3.50	MnSe
MnSeO3	-6.47	-5.34	1.13	MnSeO3
MnSeO3·2H2O	-6.32	-5.34	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-15.04	-17.09	-2.05	MnSeO4·5H2O
MnSO4	-10.47	-7.89	2.58	MnSO4
Monteponite	-9.13	5.97	15.10	CdO
Montroydite	-9.62	-13.26	-3.64	HgO
MoO3	-12.83	-20.83	-8.00	MoO3
Morenosite	-7.95	-10.09	-2.14	NiSO4·7H2O
MoS2	-138.53	-208.79	-70.26	MoS2
Na-Jarosite	2.79	-8.41	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.43	-51.32	-9.90	Na2Cr2O7
Na2CrO4	-23.82	-20.89	2.93	Na2CrO4
Na2Mo2O7	-15.50	-32.10	-16.60	Na2Mo2O7
Na2MoO4	-12.76	-11.27	1.49	Na2MoO4
Na2MoO4·2H2O	-12.50	-11.27	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.35	-5.05	10.30	Na2SeO3·5H2O
Na2SeO4	-18.08	-16.80	1.28	Na2SeO4
Na3Sb	-172.07	-77.62	94.45	Na3Sb
Na3VO4	-29.25	7.43	36.68	Na3VO4
Na4V2O7	-32.09	5.31	37.40	Na4V2O7
Nantokite	-5.15	-11.88	-6.73	CuCl

NaSb	-85.79	-62.62	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-5.98	-2.12	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-5.73	7.06	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.42	-4.72	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.90	11.10	32.00	Ni4(OH)6SO4
NiCO3	-5.60	-12.47	-6.87	NiCO3
NiMoO4	-2.62	-13.76	-11.14	NiMoO4
NiS(alpha)	-69.04	-74.64	-5.60	NiS
NiS(beta)	-63.54	-74.64	-11.10	NiS
NiS(gamma)	-61.84	-74.64	-12.80	NiS
NiSe	-18.64	-36.34	-17.70	NiSe
NiSeO3:2H2O	-10.35	-7.54	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.77	-19.29	-1.52	NiSeO4:6H2O
Nsutite	-9.04	8.47	17.50	MnO2
O2(g)	-33.98	49.11	83.09	O2
Orpiment	-221.28	-282.34	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.86	-4.35	6.52	Pb(BO2)2
Pb(OH)2	-2.90	5.25	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.91	-64.67	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.27	0.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.68	10.50	26.19	Pb2O(OH)2
Pb2O3	-25.98	35.06	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	-1.39	-3.29	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.96	-10.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.18	1.96	6.14	Pb3(VO4)2
Pb3O2CO3	-14.79	-3.77	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.24	3.86	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.02	3.86	21.88	Pb4O3SO4
PbCrO4	-12.59	-25.19	-12.60	PbCrO4
PbF2	-8.59	-16.03	-7.44	PbF2
Pbmetal	-23.55	-19.30	4.25	Pb
PbMoO4	0.05	-15.57	-15.62	PbMoO4
PbO:0.3H2O	-7.73	5.25	12.98	PbO:0.33H2O
PbSeO4	-14.26	-21.10	-6.84	PbSeO4
Periclase	-10.39	11.19	21.58	MgO
Phosgenite	-9.19	-29.00	-19.81	PbCl2:PbCO3
Plattnerite	-19.79	29.81	49.60	PbO2
Portlandite	-11.14	11.67	22.80	Ca(OH)2
Pyrite	-112.55	-131.06	-18.51	FeS2
Pyrochroite	-5.93	9.26	15.19	Mn(OH)2
Pyrolusite	-7.56	33.82	41.38	MnO2
Realgar	-92.85	-112.60	-19.75	AsS
Retgersite	-8.05	-10.09	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.16	-19.66	-14.50	UO2CO3
Sb(OH)3	-11.18	-18.29	-7.11	Sb(OH)3
Sb2O4	-15.43	-12.03	3.40	Sb2O4
Sb2O5	-26.43	-36.09	-9.67	Sb2O5
Sb2Se3	-99.03	-166.78	-67.76	Sb2Se3
Sb4O6(cubic)	-54.90	-73.16	-18.26	Sb4O6
Sb4O6(orth)	-55.26	-73.16	-17.90	Sb4O6
SbCl3	-48.81	-48.24	0.57	SbCl3
SbF3	-39.99	-50.22	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.50	-30.32	-27.82	SbO2
Schoepite	-6.13	-0.13	5.99	UO2(OH)2:H2O
Semetal(am)	-11.74	-18.85	-7.11	Se
Semetal(hex)	-11.14	-18.85	-7.71	Se
Senarmontite	-24.22	-36.58	-12.37	Sb2O3
SeO2	-14.73	-14.60	0.12	SeO2
SeO3	-47.40	-26.36	21.04	SeO3
Siderite	-1.50	-11.74	-10.24	FeCO3
Smithsonite	-1.62	-11.62	-10.00	ZnCO3

Sphalerite	-62.35	-73.80	-11.45	ZnS
Spinel	-6.51	30.34	36.85	MgAl2O4
Stibnite	-231.24	-281.70	-50.46	Sb2S3
Sulfur	-55.01	-57.15	-2.14	S
Tenorite	0.05	7.69	7.64	CuO
Thenardite	-7.92	-7.60	0.32	Na2SO4
Thermonatrite	-10.62	-9.98	0.64	Na2CO3:H2O
Tyuyamunite	-6.47	-2.39	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-18.39	2.70	21.08	U3O8
U3Sb4	-566.59	-414.21	152.38	U3Sb4
U4O9	-34.31	-37.33	-3.02	U4O9
UF4	-28.50	-58.04	-29.54	UF4
UF4:2.5H2O	-25.32	-58.04	-32.72	UF4:2.5H2O
UO2 (am)	-16.40	-15.47	0.93	UO2
UO2 (OH) 2 (beta)	-5.74	-0.13	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.24	-26.49	-2.25	UO2SeO4:4H2O
UO3	-7.83	-0.13	7.70	UO3
Uraninite	-10.80	-15.47	-4.67	UO2
USb2	-213.61	-184.03	29.58	USb2
V (OH) 3	-16.44	-8.85	7.59	V (OH) 3
V2O5	-12.44	-13.80	-1.36	V2O5
V3O5	-33.21	-31.37	1.84	V3O5
V4O7	-40.83	-33.64	7.19	V4O7
V6O13	-29.64	-90.50	-60.86	V6O13
Valentinite	-28.10	-36.58	-8.48	Sb2O3
VC12	-59.97	-41.10	18.87	VC12
VC13	-62.24	-38.81	23.43	VC13
VF4	-59.77	-44.84	14.93	VF4
Vmetal	-89.71	-45.68	44.03	V
VO	-35.89	-21.13	14.76	VO
VO (OH) 2	-7.42	-2.27	5.15	VO (OH) 2
VO2Cl	-19.72	-16.88	2.84	VO2Cl
VOC1	-29.99	-18.84	11.15	VOC1
VOC12	-35.00	-22.24	12.76	VOC12
VOSO4	-23.04	-19.43	3.61	VOSO4
Witherite	-2.78	-11.35	-8.57	BaCO3
Wurtzite	-64.85	-73.80	-8.95	ZnS
Zincite	-3.43	7.91	11.33	ZnO
Zincosite	-13.18	-9.25	3.93	ZnSO4
Zn (BO2) 2	-9.98	-1.69	8.29	Zn (BO2) 2
Zn (OH) 2	-4.29	7.91	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.57	7.91	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.85	7.91	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.63	7.91	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.83	7.91	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.84	-1.34	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.36	5.83	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.84	-2.19	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.50	-10.58	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.92	14.48	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.93	19.57	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.11	-12.06	7.05	ZnCl2
ZnCO3:1H2O	-1.36	-11.62	-10.26	ZnCO3:1H2O
ZnF2	-12.84	-13.38	-0.53	ZnF2
Znmetal	-42.43	-16.65	25.79	Zn
ZnMoO4	-2.79	-12.92	-10.13	ZnMoO4
ZnO (active)	-3.28	7.91	11.19	ZnO
ZnS (am)	-64.75	-73.80	-9.05	ZnS
ZnSb	-82.78	-71.77	11.01	ZnSb
ZnSe	-21.09	-35.49	-14.40	ZnSe
ZnSeO4:6H2O	-16.93	-18.45	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.61	-9.25	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 102.

Title Precipitate oversaturated phases in groundwater
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 601

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -1.69 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 602

SAVE Solution 603 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 601

END

TITLE

Precipitate oversaturated phases in groundwater

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 602. Solution after simulation 101.
Using pure phase assemblage 601.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.525e-08	2.525e-08
Alunite	0.00	-1.40	-1.40	0.000e+00	8.850e-07	8.850e-07
Anhydrite	-1.36	-5.72	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.021e-08	2.021e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.308e-06	1.308e-06
Brochantite	-0.44	14.78	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.584e-03
CaMoO4	-1.73	-9.68	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.37	-3.55	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.868e-03	2.868e-03
Carnotite	-2.35	-2.12	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.90	-15.05	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	0.000e+00	6.030e-08	6.030e-08
Cu2Se(alpha)	-5.12	-50.92	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.405e-07	2.405e-07
Epsomite	-3.73	-5.86	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.671e-05	2.671e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.085e-04	1.085e-04
Gummite	-6.85	0.82	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.11	-5.72	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.27	-58.96	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.40	-7.51	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.73	-5.60	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-24.36	-8.66	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.72	-13.86	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.661e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	5.411e-09	5.411e-09
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.18	0.82	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.85	-0.77	4.08	0.000e+00	0	0.000e+00
U3O8	-16.52	4.56	21.08	0.000e+00	0	0.000e+00

UO2 (OH) 2 (beta)	-4.79	0.82	5.61	0.000e+00	0	0.000e+00
UO3	-6.88	0.82	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.94	-13.07	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.299e-08	3.299e-08
Al	1.957e-06	1.957e-06
As	2.663e-10	2.663e-10
B	1.597e-05	1.597e-05
Ba	1.113e-07	1.113e-07
C	5.849e-03	5.850e-03
Ca	2.531e-03	2.531e-03
Cd	1.173e-08	1.173e-08
Cl	1.716e-03	1.716e-03
Co	1.358e-07	1.359e-07
Cr	6.426e-09	6.427e-09
Cu	9.379e-06	9.380e-06
F	2.119e-04	2.119e-04
Fe	3.671e-09	3.671e-09
Hg	2.208e-10	2.208e-10
K	7.196e-04	7.196e-04
Mg	1.742e-03	1.742e-03
Mn	2.383e-05	2.383e-05
Mo	3.105e-07	3.105e-07
Na	4.978e-03	4.978e-03
Ni	2.131e-07	2.131e-07
Pb	2.080e-08	2.080e-08
S	3.606e-03	3.606e-03
Sb	1.316e-08	1.316e-08
Se	2.210e-08	2.210e-08
U	8.430e-08	8.430e-08
V	1.155e-07	1.155e-07
Zn	1.156e-06	1.157e-06

-----Description of solution-----

	pH =	7.148	Charge balance
	pe =	5.624	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.896e-02	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	5.178e-03	
	Total CO2 (mol/kg) =	5.849e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	3.259e-16	
Percent error, 100*(Cat- An)/(Cat+ An) =	0.00		
	Iterations =	10	
	Total H =	1.110222e+02	
	Total O =	5.553985e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.628e-07	1.416e-07	-6.788	-6.849	-0.061	(0)
H+	8.142e-08	7.111e-08	-7.089	-7.148	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.299e-08					
AgCl	2.141e-08	2.141e-08	-7.669	-7.669	0.000	(0)
Ag+	8.011e-09	6.997e-09	-8.096	-8.155	-0.059	(0)
AgCl2-	3.285e-09	2.795e-09	-8.483	-8.554	-0.070	(0)
AgSO4-	2.730e-10	2.323e-10	-9.564	-9.634	-0.070	(0)
AgCl3-2	7.128e-12	3.733e-12	-11.147	-11.428	-0.281	(0)

	AgF	2.913e-12	2.913e-12	-11.536	-11.536	0.000	(0)
	AgOH	9.904e-14	9.904e-14	-13.004	-13.004	0.000	(0)
	AgCl4-3	4.895e-14	1.142e-14	-13.310	-13.942	-0.632	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgH2BO3	1.437e-14	1.437e-14	-13.843	-13.843	0.000	(0)
	AgSeO3-	5.098e-15	4.337e-15	-14.293	-14.363	-0.070	(0)
	Ag (OH) 2-	1.610e-18	1.370e-18	-17.793	-17.863	-0.070	(0)
	Ag (SeO3) 2-3	1.605e-22	3.746e-23	-21.794	-22.426	-0.632	(0)
	Ag2MoO4	3.344e-24	3.344e-24	-23.476	-23.476	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.786	-72.786	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.172	-86.296	-1.124	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.062	-147.132	-0.070	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.300	-147.468	-0.167	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.443	-149.759	-0.317	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.767	-150.070	-0.303	(0)
Al		1.957e-06					
	Al (OH) 4-	1.321e-06	1.155e-06	-5.879	-5.937	-0.058	(0)
	AlF3	3.292e-07	3.292e-07	-6.482	-6.482	0.000	(0)
	AlF2+	1.797e-07	1.578e-07	-6.746	-6.802	-0.056	(0)
	Al (OH) 3	6.483e-08	6.483e-08	-7.188	-7.188	0.000	(0)
	AlF4-	3.129e-08	2.735e-08	-7.505	-7.563	-0.058	(0)
	Al (OH) 2+	2.614e-08	2.295e-08	-7.583	-7.639	-0.056	(0)
	AlF+2	4.020e-09	2.391e-09	-8.396	-8.621	-0.226	(0)
	AlOH+2	3.433e-10	2.041e-10	-9.464	-9.690	-0.226	(0)
	AlSO4+	2.130e-11	1.863e-11	-10.672	-10.730	-0.058	(0)
	Al+3	4.880e-12	1.442e-12	-11.312	-11.841	-0.529	(0)
	Al (SO4) 2-	3.798e-13	3.321e-13	-12.420	-12.479	-0.058	(0)
	AlMo6O21-3	2.715e-40	0.000e+00	-39.566	-40.198	-0.632	(0)
As (3)		1.817e-22					
	H3AsO3	1.802e-22	1.802e-22	-21.744	-21.744	0.000	(0)
	H2AsO3-	1.528e-24	1.300e-24	-23.816	-23.886	-0.070	(0)
	HAsO3-2	3.183e-29	1.667e-29	-28.497	-28.778	-0.281	(0)
	H4AsO3+	7.463e-30	6.349e-30	-29.127	-29.197	-0.070	(0)
	AsO3-3	3.872e-35	9.036e-36	-34.412	-35.044	-0.632	(0)
As (5)		2.663e-10					
	HAsO4-2	1.903e-10	9.968e-11	-9.721	-10.001	-0.281	(0)
	H2AsO4-	7.599e-11	6.464e-11	-10.119	-10.189	-0.070	(0)
	AsO4-3	1.900e-14	4.433e-15	-13.721	-14.353	-0.632	(0)
	H3AsO4	7.954e-16	7.988e-16	-15.099	-15.098	0.002	(0)
B		1.597e-05					
	H3BO3	1.580e-05	1.587e-05	-4.801	-4.799	0.002	(0)
	H2BO3-	1.499e-07	1.296e-07	-6.824	-6.887	-0.063	(0)
	CaH2BO3+	9.924e-09	8.583e-09	-8.003	-8.066	-0.063	(0)
	MgH2BO3+	4.317e-09	3.733e-09	-8.365	-8.428	-0.063	(0)
	BF (OH) 3-	1.214e-09	1.050e-09	-8.916	-8.979	-0.063	(0)
	NaH2BO3	8.831e-10	8.831e-10	-9.054	-9.054	0.000	(0)
	H5 (BO3) 2-	2.024e-12	1.750e-12	-11.694	-11.757	-0.063	(0)
	BF2 (OH) 2-	1.530e-12	1.323e-12	-11.815	-11.878	-0.063	(0)
	BaH2BO3+	2.915e-13	2.521e-13	-12.535	-12.599	-0.063	(0)
	AgH2BO3	1.437e-14	1.437e-14	-13.843	-13.843	0.000	(0)
	H8 (BO3) 3-	3.212e-15	2.778e-15	-14.493	-14.556	-0.063	(0)
	BF3OH-	7.019e-18	6.070e-18	-17.154	-17.217	-0.063	(0)
	BF4-	4.072e-22	3.522e-22	-21.390	-21.453	-0.063	(0)
Ba		1.113e-07					
	Ba+2	1.082e-07	6.293e-08	-6.966	-7.201	-0.235	(0)
	BaHCO3+	2.979e-09	2.623e-09	-8.526	-8.581	-0.055	(0)
	BaCO3	9.287e-11	9.287e-11	-10.032	-10.032	0.000	(0)
	BaH2BO3+	2.915e-13	2.521e-13	-12.535	-12.599	-0.063	(0)
	BaOH+	4.437e-14	3.889e-14	-13.353	-13.410	-0.057	(0)
C (4)		5.849e-03					
	HCO3-	4.970e-03	4.364e-03	-2.304	-2.360	-0.056	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.062e-04	9.353e-05	-3.974	-4.029	-0.055	(0)
	MgHCO3+	4.255e-05	3.710e-05	-4.371	-4.431	-0.059	(0)
	NaHCO3	1.055e-05	1.055e-05	-4.977	-4.977	0.000	(0)
	CuCO3	7.878e-06	7.878e-06	-5.104	-5.104	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.946e-06	2.877e-06	-5.306	-5.541	-0.235	(0)

	MgCO3	1.988e-06	1.988e-06	-5.702	-5.702	0.000	(0)
	MnHCO3+	1.023e-06	8.965e-07	-5.990	-6.047	-0.057	(0)
	NaCO3-	2.623e-07	2.304e-07	-6.581	-6.638	-0.056	(0)
	CuHCO3+	1.505e-07	1.280e-07	-6.822	-6.893	-0.070	(0)
	Cu (CO3) 2-2	1.165e-07	6.101e-08	-6.934	-7.215	-0.281	(0)
	ZnCO3	7.826e-08	7.826e-08	-7.106	-7.106	0.000	(0)
	ZnHCO3+	7.668e-08	6.523e-08	-7.115	-7.186	-0.070	(0)
	NiHCO3+	4.810e-08	4.092e-08	-7.318	-7.388	-0.070	(0)
	UO2 (CO3) 3-4	4.204e-08	3.163e-09	-7.376	-8.500	-1.124	(0)
	UO2 (CO3) 2-2	4.188e-08	2.193e-08	-7.378	-7.659	-0.281	(0)
	CoHCO3+	2.004e-08	1.705e-08	-7.698	-7.768	-0.070	(0)
	PbCO3	1.150e-08	1.150e-08	-7.939	-7.939	0.000	(0)
	NiCO3	8.165e-09	8.165e-09	-8.088	-8.088	0.000	(0)
	PbHCO3+	5.067e-09	4.311e-09	-8.295	-8.365	-0.070	(0)
	BaHCO3+	2.979e-09	2.623e-09	-8.526	-8.581	-0.055	(0)
	CoCO3	2.443e-09	2.443e-09	-8.612	-8.612	0.000	(0)
	UO2CO3	3.821e-10	3.821e-10	-9.418	-9.418	0.000	(0)
	CdCO3	3.235e-10	3.235e-10	-9.490	-9.490	0.000	(0)
	Pb (CO3) 2-2	1.822e-10	9.541e-11	-9.740	-10.020	-0.281	(0)
	BaCO3	9.287e-11	9.287e-11	-10.032	-10.032	0.000	(0)
	CdHCO3+	5.762e-11	4.902e-11	-10.239	-10.310	-0.070	(0)
	Cd (CO3) 2-2	1.318e-12	6.901e-13	-11.880	-12.161	-0.281	(0)
	FeHCO3+	8.913e-13	7.849e-13	-12.050	-12.105	-0.055	(0)
	HgCO3	1.440e-14	1.440e-14	-13.842	-13.842	0.000	(0)
	Hg (CO3) 2-2	2.502e-16	1.310e-16	-15.602	-15.883	-0.281	(0)
	HgHCO3+	2.241e-17	1.907e-17	-16.649	-16.720	-0.070	(0)
Ca		2.531e-03					
	Ca+2	1.978e-03	1.151e-03	-2.704	-2.939	-0.235	(0)
	CaSO4	4.387e-04	4.387e-04	-3.358	-3.358	0.000	(0)
	CaHCO3+	1.062e-04	9.353e-05	-3.974	-4.029	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.376e-06	2.082e-06	-5.624	-5.681	-0.057	(0)
	CaH2BO3+	9.924e-09	8.583e-09	-8.003	-8.066	-0.063	(0)
	CaOH+	3.691e-09	3.250e-09	-8.433	-8.488	-0.055	(0)
Cd		1.173e-08					
	Cd+2	8.481e-09	4.933e-09	-8.072	-8.307	-0.235	(0)
	CdSO4	1.924e-09	1.924e-09	-8.716	-8.716	0.000	(0)
	CdCl+	8.300e-10	7.061e-10	-9.081	-9.151	-0.070	(0)
	CdCO3	3.235e-10	3.235e-10	-9.490	-9.490	0.000	(0)
	Cd (SO4) 2-2	8.246e-11	4.319e-11	-10.084	-10.365	-0.281	(0)
	CdHCO3+	5.762e-11	4.902e-11	-10.239	-10.310	-0.070	(0)
	CdF+	1.524e-11	1.296e-11	-10.817	-10.887	-0.070	(0)
	CdOH+	6.521e-12	5.547e-12	-11.186	-11.256	-0.070	(0)
	CdCl2	4.412e-12	4.412e-12	-11.355	-11.355	0.000	(0)
	CdOHC1	4.100e-12	4.100e-12	-11.387	-11.387	0.000	(0)
	Cd (CO3) 2-2	1.318e-12	6.901e-13	-11.880	-12.161	-0.281	(0)
	Cd (OH) 2	4.954e-15	4.954e-15	-14.305	-14.305	0.000	(0)
	CdCl3-	4.904e-15	4.172e-15	-14.309	-14.380	-0.070	(0)
	CdF2	4.287e-15	4.287e-15	-14.368	-14.368	0.000	(0)
	CdSeO4	3.839e-18	3.839e-18	-17.416	-17.416	0.000	(0)
	Cd2OH+3	5.877e-19	1.372e-19	-18.231	-18.863	-0.632	(0)
	Cd (OH) 3-	5.036e-20	4.285e-20	-19.298	-19.368	-0.070	(0)
	Cd (SeO3) 2-2	7.222e-21	3.783e-21	-20.141	-20.422	-0.281	(0)
	Cd (OH) 4-2	1.895e-27	9.927e-28	-26.722	-27.003	-0.281	(0)
	CdHS+	0.000e+00	0.000e+00	-78.674	-78.745	-0.070	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.986	-149.986	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.462	-226.532	-0.070	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.501	-302.782	-0.281	(0)
Cl		1.716e-03					
	Cl-	1.716e-03	1.499e-03	-2.765	-2.824	-0.059	(0)
	MnCl+	2.216e-08	1.942e-08	-7.654	-7.712	-0.057	(0)
	AgCl	2.141e-08	2.141e-08	-7.669	-7.669	0.000	(0)
	AgCl2-	3.285e-09	2.795e-09	-8.483	-8.554	-0.070	(0)
	ZnCl+	2.040e-09	1.779e-09	-8.690	-8.750	-0.059	(0)
	CuCl+	1.267e-09	1.104e-09	-8.897	-8.957	-0.059	(0)
	CuCl	1.020e-09	1.020e-09	-8.991	-8.991	0.000	(0)
	CdCl+	8.300e-10	7.061e-10	-9.081	-9.151	-0.070	(0)
	CuCl2-	3.664e-10	3.195e-10	-9.436	-9.495	-0.059	(0)

NiCl+	3.428e-10	2.917e-10	-9.465	-9.535	-0.070	(0)
ZnOHCl	3.298e-10	3.298e-10	-9.482	-9.482	0.000	(0)
CoCl+	3.061e-10	2.604e-10	-9.514	-9.584	-0.070	(0)
PbCl+	8.310e-11	7.069e-11	-10.080	-10.151	-0.070	(0)
MnCl2	4.112e-11	4.112e-11	-10.386	-10.386	0.000	(0)
AgCl3-2	7.128e-12	3.733e-12	-11.147	-11.428	-0.281	(0)
CdCl2	4.412e-12	4.412e-12	-11.355	-11.355	0.000	(0)
ZnCl2	4.227e-12	4.227e-12	-11.374	-11.374	0.000	(0)
CdOHCl	4.100e-12	4.100e-12	-11.387	-11.387	0.000	(0)
HgClOH	1.567e-12	1.567e-12	-11.805	-11.805	0.000	(0)
HgCl2	9.394e-13	9.394e-13	-12.027	-12.027	0.000	(0)
CuCl2	5.740e-13	5.740e-13	-12.241	-12.241	0.000	(0)
PbCl2	4.732e-13	4.732e-13	-12.325	-12.325	0.000	(0)
CuCl3-2	1.735e-13	1.024e-13	-12.761	-12.990	-0.229	(0)
AgCl4-3	4.895e-14	1.142e-14	-13.310	-13.942	-0.632	(0)
MnCl3-	1.937e-14	1.697e-14	-13.713	-13.770	-0.057	(0)
HgCl3-	1.655e-14	1.408e-14	-13.781	-13.851	-0.070	(0)
ZnCl3-	5.770e-15	5.032e-15	-14.239	-14.298	-0.059	(0)
CdCl3-	4.904e-15	4.172e-15	-14.309	-14.380	-0.070	(0)
NiCl2	2.201e-15	2.201e-15	-14.657	-14.657	0.000	(0)
PbCl3-	3.319e-16	2.824e-16	-15.479	-15.549	-0.070	(0)
CrCl+2	3.271e-16	1.713e-16	-15.485	-15.766	-0.281	(0)
HgCl4-2	1.604e-16	8.400e-17	-15.795	-16.076	-0.281	(0)
HgCl+	1.470e-16	1.251e-16	-15.833	-15.903	-0.070	(0)
UO2Cl+	9.530e-17	8.107e-17	-16.021	-16.091	-0.070	(0)
CuCl3-	9.206e-18	8.028e-18	-17.036	-17.095	-0.059	(0)
ZnCl4-2	6.390e-18	3.771e-18	-17.194	-17.424	-0.229	(0)
CrOHCl2	6.907e-19	6.907e-19	-18.161	-18.161	0.000	(0)
PbCl4-2	3.693e-19	1.934e-19	-18.433	-18.713	-0.281	(0)
VOCl+	4.448e-20	3.784e-20	-19.352	-19.422	-0.070	(0)
FeCl+2	4.286e-20	2.529e-20	-19.368	-19.597	-0.229	(0)
CrCl2+	2.863e-20	2.436e-20	-19.543	-19.613	-0.070	(0)
FeCl2+	1.932e-22	1.693e-22	-21.714	-21.771	-0.057	(0)
CuCl4-2	1.022e-22	6.030e-23	-21.991	-22.220	-0.229	(0)
FeCl3	2.538e-26	2.538e-26	-25.596	-25.596	0.000	(0)
CrO3Cl-	2.074e-26	1.764e-26	-25.683	-25.753	-0.070	(0)
CoCl+2	4.902e-35	2.568e-35	-34.310	-34.590	-0.281	(0)
UCl+3	0.000e+00	0.000e+00	-44.594	-45.226	-0.632	(0)
Co (2)	1.358e-07					
Co+2	9.590e-08	5.023e-08	-7.018	-7.299	-0.281	(0)
CoHCO3+	2.004e-08	1.705e-08	-7.698	-7.768	-0.070	(0)
CoSO4	1.667e-08	1.667e-08	-7.778	-7.778	0.000	(0)
CoCO3	2.443e-09	2.443e-09	-8.612	-8.612	0.000	(0)
CoF+	3.095e-10	2.633e-10	-9.509	-9.580	-0.070	(0)
CoCl+	3.061e-10	2.604e-10	-9.514	-9.584	-0.070	(0)
CoOH+	1.668e-10	1.419e-10	-9.778	-9.848	-0.070	(0)
Co (OH) 2	1.595e-12	1.595e-12	-11.797	-11.797	0.000	(0)
CoSeO4	1.052e-16	1.052e-16	-15.978	-15.978	0.000	(0)
Co (OH) 3-	5.296e-18	4.505e-18	-17.276	-17.346	-0.070	(0)
Co2OH+3	1.530e-18	3.571e-19	-17.815	-18.447	-0.632	(0)
CoOOH-	1.329e-18	1.131e-18	-17.876	-17.947	-0.070	(0)
Co (OH) 4-2	1.930e-25	1.011e-25	-24.714	-24.995	-0.281	(0)
Co4 (OH) 4+4	1.074e-30	8.081e-32	-29.969	-31.093	-1.124	(0)
Co (3)	1.156e-28					
CoOH+2	1.156e-28	6.057e-29	-27.937	-28.218	-0.281	(0)
Co+3	2.849e-34	8.420e-35	-33.545	-34.075	-0.529	(0)
CoCl+2	4.902e-35	2.568e-35	-34.310	-34.590	-0.281	(0)
Cr (2)	9.566e-26					
Cr+2	9.566e-26	5.010e-26	-25.019	-25.300	-0.281	(0)
Cr (3)	6.426e-09					
Cr (OH) 2+	5.537e-09	4.710e-09	-8.257	-8.327	-0.070	(0)
Cr (OH) +2	5.222e-10	2.735e-10	-9.282	-9.563	-0.281	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.080e-10	1.080e-10	-9.967	-9.967	0.000	(0)
CrF+2	4.430e-12	2.320e-12	-11.354	-11.634	-0.281	(0)
CrO2-	1.967e-12	1.673e-12	-11.706	-11.776	-0.070	(0)
Cr (OH) 4-	1.659e-12	1.412e-12	-11.780	-11.850	-0.070	(0)
CrSO4+	4.033e-13	3.431e-13	-12.394	-12.465	-0.070	(0)

Cr+3	3.784e-13	8.831e-14	-12.422	-13.054	-0.632	(0)
CrCl+2	3.271e-16	1.713e-16	-15.485	-15.766	-0.281	(0)
Cr2 (OH) 2SO4+2	5.096e-18	2.669e-18	-17.293	-17.574	-0.281	(0)
CrOHC12	6.907e-19	6.907e-19	-18.161	-18.161	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.638e-19	2.638e-19	-18.579	-18.579	0.000	(0)
CrCl2+	2.863e-20	2.436e-20	-19.543	-19.613	-0.070	(0)
Cr (6)	2.307e-16					
CrO4-2	1.966e-16	1.144e-16	-15.706	-15.942	-0.235	(0)
HCrO4-	3.093e-17	2.631e-17	-16.510	-16.580	-0.070	(0)
NaCrO4-	2.872e-18	2.443e-18	-17.542	-17.612	-0.070	(0)
KCrO4-	3.102e-19	2.639e-19	-18.508	-18.579	-0.070	(0)
CrO3SO4-2	1.811e-24	9.485e-25	-23.742	-24.023	-0.281	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.074e-26	1.764e-26	-25.683	-25.753	-0.070	(0)
Cr2O7-2	4.585e-32	2.402e-32	-31.339	-31.620	-0.281	(0)
Cu (1)	2.023e-09					
CuCl	1.020e-09	1.020e-09	-8.991	-8.991	0.000	(0)
Cu+	6.358e-10	5.409e-10	-9.197	-9.267	-0.070	(0)
CuCl2-	3.664e-10	3.195e-10	-9.436	-9.495	-0.059	(0)
CuCl3-2	1.735e-13	1.024e-13	-12.761	-12.990	-0.229	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.163	-148.472	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.906	-149.202	-0.297	(0)
Cu (2)	9.377e-06					
CuCO3	7.878e-06	7.878e-06	-5.104	-5.104	0.000	(0)
Cu+2	7.993e-07	4.650e-07	-6.097	-6.333	-0.235	(0)
CuOH+	2.387e-07	2.081e-07	-6.622	-6.682	-0.059	(0)
CuSO4	1.772e-07	1.772e-07	-6.751	-6.751	0.000	(0)
CuHCO3+	1.505e-07	1.280e-07	-6.822	-6.893	-0.070	(0)
Cu (CO3) 2-2	1.165e-07	6.101e-08	-6.934	-7.215	-0.281	(0)
Cu (OH) 2	5.879e-09	5.879e-09	-8.231	-8.231	0.000	(0)
CuF+	5.717e-09	4.863e-09	-8.243	-8.313	-0.070	(0)
Cu2 (OH) 2+2	2.078e-09	1.088e-09	-8.682	-8.963	-0.281	(0)
CuCl+	1.267e-09	1.104e-09	-8.897	-8.957	-0.059	(0)
Cu (OH) 3-	2.006e-12	1.707e-12	-11.698	-11.768	-0.070	(0)
CuCl2	5.740e-13	5.740e-13	-12.241	-12.241	0.000	(0)
CuCl3-	9.206e-18	8.028e-18	-17.036	-17.095	-0.059	(0)
Cu (OH) 4-2	3.631e-18	1.902e-18	-17.440	-17.721	-0.281	(0)
CuCl4-2	1.022e-22	6.030e-23	-21.991	-22.220	-0.229	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.701	-215.771	-0.070	(0)
F	2.119e-04					
F-	1.898e-04	1.658e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.767e-05	1.545e-05	-4.753	-4.811	-0.058	(0)
CaF+	2.376e-06	2.082e-06	-5.624	-5.681	-0.057	(0)
NaF	4.497e-07	4.497e-07	-6.347	-6.347	0.000	(0)
AlF3	3.292e-07	3.292e-07	-6.482	-6.482	0.000	(0)
AlF2+	1.797e-07	1.578e-07	-6.746	-6.802	-0.056	(0)
MnF+	7.751e-08	6.794e-08	-7.111	-7.168	-0.057	(0)
AlF4-	3.129e-08	2.735e-08	-7.505	-7.563	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	5.717e-09	4.863e-09	-8.243	-8.313	-0.070	(0)
AlF+2	4.020e-09	2.391e-09	-8.396	-8.621	-0.226	(0)
ZnF+	1.838e-09	1.563e-09	-8.736	-8.806	-0.070	(0)
BF (OH) 3-	1.214e-09	1.050e-09	-8.916	-8.979	-0.063	(0)
NiF+	3.723e-10	3.167e-10	-9.429	-9.499	-0.070	(0)
CoF+	3.095e-10	2.633e-10	-9.509	-9.580	-0.070	(0)
PbF+	1.825e-11	1.553e-11	-10.739	-10.809	-0.070	(0)
CdF+	1.524e-11	1.296e-11	-10.817	-10.887	-0.070	(0)
HF2-	1.263e-11	1.099e-11	-10.898	-10.959	-0.061	(0)
CrF+2	4.430e-12	2.320e-12	-11.354	-11.634	-0.281	(0)
AgF	2.913e-12	2.913e-12	-11.536	-11.536	0.000	(0)
BF2 (OH) 2-	1.530e-12	1.323e-12	-11.815	-11.878	-0.063	(0)
UO2F+	8.971e-13	7.632e-13	-12.047	-12.117	-0.070	(0)
UO2F2	3.649e-13	3.649e-13	-12.438	-12.438	0.000	(0)
PbF2	5.066e-14	5.066e-14	-13.295	-13.295	0.000	(0)
UO2F3-	1.786e-14	1.519e-14	-13.748	-13.818	-0.070	(0)
CdF2	4.287e-15	4.287e-15	-14.368	-14.368	0.000	(0)
VO2F	2.723e-15	2.723e-15	-14.565	-14.565	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)

FeF2+	5.140e-16	4.505e-16	-15.289	-15.346	-0.057	(0)
VO2F2-	1.926e-16	1.639e-16	-15.715	-15.785	-0.070	(0)
FeF+2	1.721e-16	1.016e-16	-15.764	-15.993	-0.229	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	3.819e-17	2.000e-17	-16.418	-16.699	-0.281	(0)
PbF3-	1.872e-17	1.593e-17	-16.728	-16.798	-0.070	(0)
VOF+	1.052e-17	8.947e-18	-16.978	-17.048	-0.070	(0)
BF3OH-	7.019e-18	6.070e-18	-17.154	-17.217	-0.063	(0)
VO2F3-2	6.470e-19	3.389e-19	-18.189	-18.470	-0.281	(0)
VOF2	5.561e-19	5.561e-19	-18.255	-18.255	0.000	(0)
VOF3-	3.845e-21	3.271e-21	-20.415	-20.485	-0.070	(0)
PbF4-2	2.413e-21	1.264e-21	-20.618	-20.898	-0.281	(0)
BF4-	4.072e-22	3.522e-22	-21.390	-21.453	-0.063	(0)
VO2F4-3	1.184e-22	2.764e-23	-21.927	-22.558	-0.632	(0)
HgF+	3.021e-23	2.570e-23	-22.520	-22.590	-0.070	(0)
VOF4-2	4.179e-24	2.189e-24	-23.379	-23.660	-0.281	(0)
Sb(OH) 2F	9.975e-25	9.975e-25	-24.001	-24.001	0.000	(0)
SbOF	9.812e-25	9.812e-25	-24.008	-24.008	0.000	(0)
UF3+	1.687e-34	1.435e-34	-33.773	-33.843	-0.070	(0)
UF2+2	1.043e-35	5.463e-36	-34.982	-35.263	-0.281	(0)
UF4	2.609e-36	2.609e-36	-35.584	-35.584	0.000	(0)
UF5-	2.014e-38	1.714e-38	-37.696	-37.766	-0.070	(0)
UF+3	1.122e-38	2.618e-39	-37.950	-38.582	-0.632	(0)
UF6-2	1.638e-39	8.579e-40	-38.786	-39.067	-0.281	(0)
Fe (2)	3.409e-11					
Fe+2	2.728e-11	1.429e-11	-10.564	-10.845	-0.281	(0)
FeSO4	5.834e-12	5.834e-12	-11.234	-11.234	0.000	(0)
FeHCO3+	8.913e-13	7.849e-13	-12.050	-12.105	-0.055	(0)
FeOH+	9.185e-14	8.050e-14	-13.037	-13.094	-0.057	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.623e-19	4.052e-19	-18.335	-18.392	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.787	-158.787	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.125	-235.195	-0.070	(0)
Fe (3)	3.637e-09					
Fe (OH) 2+	3.203e-09	2.812e-09	-8.494	-8.551	-0.056	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.417e-12	5.635e-12	-11.193	-11.249	-0.056	(0)
FeOH+2	8.654e-14	5.107e-14	-13.063	-13.292	-0.229	(0)
FeF2+	5.140e-16	4.505e-16	-15.289	-15.346	-0.057	(0)
FeF+2	1.721e-16	1.016e-16	-15.764	-15.993	-0.229	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.190e-17	1.043e-17	-16.924	-16.982	-0.057	(0)
Fe+3	1.891e-18	5.588e-19	-17.723	-18.253	-0.529	(0)
Fe (SO4) 2-	4.362e-19	3.711e-19	-18.360	-18.431	-0.070	(0)
FeCl+2	4.286e-20	2.529e-20	-19.368	-19.597	-0.229	(0)
FeCl2+	1.932e-22	1.693e-22	-21.714	-21.771	-0.057	(0)
FeHSeO3+2	4.857e-23	2.544e-23	-22.314	-22.595	-0.281	(0)
Fe2 (OH) 2+4	1.148e-24	8.636e-26	-23.940	-25.064	-1.124	(0)
FeCl3	2.538e-26	2.538e-26	-25.596	-25.596	0.000	(0)
Fe3 (OH) 4+5	1.999e-31	3.511e-33	-30.699	-32.455	-1.755	(0)
H (0)	4.021e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.177e-10					
Hg	2.177e-10	2.177e-10	-9.662	-9.662	0.000	(0)
Hg (1)	2.360e-21					
Hg2+2	1.180e-21	6.181e-22	-20.928	-21.209	-0.281	(0)
Hg (2)	3.064e-12					
HgClOH	1.567e-12	1.567e-12	-11.805	-11.805	0.000	(0)
HgCl2	9.394e-13	9.394e-13	-12.027	-12.027	0.000	(0)
Hg (OH) 2	5.264e-13	5.287e-13	-12.279	-12.277	0.002	(0)
HgCl3-	1.655e-14	1.408e-14	-13.781	-13.851	-0.070	(0)
HgCO3	1.440e-14	1.440e-14	-13.842	-13.842	0.000	(0)
Hg (CO3) 2-2	2.502e-16	1.310e-16	-15.602	-15.883	-0.281	(0)
HgCl4-2	1.604e-16	8.400e-17	-15.795	-16.076	-0.281	(0)
HgCl+	1.470e-16	1.251e-16	-15.833	-15.903	-0.070	(0)
HgOH+	2.770e-17	2.357e-17	-16.557	-16.628	-0.070	(0)
HgHCO3+	2.241e-17	1.907e-17	-16.649	-16.720	-0.070	(0)
Hg (OH) 3-	1.108e-20	9.422e-21	-19.956	-20.026	-0.070	(0)

	Hg+2	7.985e-21	4.182e-21	-20.098	-20.379	-0.281	(0)
	HgSO4	1.822e-21	1.822e-21	-20.740	-20.740	0.000	(0)
	HgF+	3.021e-23	2.570e-23	-22.520	-22.590	-0.070	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.124	-138.194	-0.070	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.948	-138.948	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.473	-139.754	-0.281	(0)
K	7.196e-04						
	K+	7.113e-04	6.212e-04	-3.148	-3.207	-0.059	(0)
	KSO4-	8.332e-06	7.317e-06	-5.079	-5.136	-0.056	(0)
	KCrO4-	3.102e-19	2.639e-19	-18.508	-18.579	-0.070	(0)
Mg	1.742e-03						
	Mg+2	1.428e-03	8.308e-04	-2.845	-3.080	-0.235	(0)
	MgSO4	2.515e-04	2.515e-04	-3.599	-3.599	0.000	(0)
	MgHCO3+	4.255e-05	3.710e-05	-4.371	-4.431	-0.059	(0)
	MgF+	1.767e-05	1.545e-05	-4.753	-4.811	-0.058	(0)
	MgCO3	1.988e-06	1.988e-06	-5.702	-5.702	0.000	(0)
	MgOH+	5.305e-08	4.682e-08	-7.275	-7.330	-0.054	(0)
	MgH2BO3+	4.317e-09	3.733e-09	-8.365	-8.428	-0.063	(0)
Mn (2)	2.383e-05						
	Mn+2	1.966e-05	1.029e-05	-4.707	-4.987	-0.281	(0)
	MnSO4	3.046e-06	3.046e-06	-5.516	-5.516	0.000	(0)
	MnHCO3+	1.023e-06	8.965e-07	-5.990	-6.047	-0.057	(0)
	MnF+	7.751e-08	6.794e-08	-7.111	-7.168	-0.057	(0)
	MnCl+	2.216e-08	1.942e-08	-7.654	-7.712	-0.057	(0)
	MnOH+	4.176e-09	3.660e-09	-8.379	-8.436	-0.057	(0)
	MnCl2	4.112e-11	4.112e-11	-10.386	-10.386	0.000	(0)
	MnCl3-	1.937e-14	1.697e-14	-13.713	-13.770	-0.057	(0)
	MnSeO4	1.158e-14	1.158e-14	-13.936	-13.936	0.000	(0)
	Mn (OH) 3-	5.172e-19	4.533e-19	-18.286	-18.344	-0.057	(0)
	Mn (OH) 4-2	3.510e-25	2.072e-25	-24.455	-24.684	-0.229	(0)
	MnSe	0.000e+00	0.000e+00	-42.762	-42.762	0.000	(0)
Mn (3)	6.552e-25						
	Mn+3	6.552e-25	1.936e-25	-24.184	-24.713	-0.529	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-43.499	-43.728	-0.229	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.414	-47.476	-0.062	(0)
Mo	3.105e-07						
	MoO4-2	3.102e-07	1.805e-07	-6.508	-6.744	-0.235	(0)
	HMoO4-	3.001e-10	2.553e-10	-9.523	-9.593	-0.070	(0)
	H2MoO4	1.330e-13	1.330e-13	-12.876	-12.876	0.000	(0)
	Ag2MoO4	3.344e-24	3.344e-24	-23.476	-23.476	0.000	(0)
	AlMo6O21-3	2.715e-40	0.000e+00	-39.566	-40.198	-0.632	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-48.871	-51.399	-2.528	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.405	-52.161	-1.755	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.403	-54.527	-1.124	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-57.797	-58.429	-0.632	(0)
Na	4.978e-03						
	Na+	4.923e-03	4.299e-03	-2.308	-2.367	-0.059	(0)
	NaSO4-	4.375e-05	3.842e-05	-4.359	-4.415	-0.056	(0)
	NaHCO3	1.055e-05	1.055e-05	-4.977	-4.977	0.000	(0)
	NaF	4.497e-07	4.497e-07	-6.347	-6.347	0.000	(0)
	NaCO3-	2.623e-07	2.304e-07	-6.581	-6.638	-0.056	(0)
	NaH2BO3	8.831e-10	8.831e-10	-9.054	-9.054	0.000	(0)
	NaCrO4-	2.872e-18	2.443e-18	-17.542	-17.612	-0.070	(0)
Ni	2.131e-07						
	Ni+2	1.307e-07	7.606e-08	-6.884	-7.119	-0.235	(0)
	NiHCO3+	4.810e-08	4.092e-08	-7.318	-7.388	-0.070	(0)
	NiSO4	2.525e-08	2.525e-08	-7.598	-7.598	0.000	(0)
	NiCO3	8.165e-09	8.165e-09	-8.088	-8.088	0.000	(0)
	NiF+	3.723e-10	3.167e-10	-9.429	-9.499	-0.070	(0)
	NiCl+	3.428e-10	2.917e-10	-9.465	-9.535	-0.070	(0)
	NiOH+	1.593e-10	1.355e-10	-9.798	-9.868	-0.070	(0)
	Ni (SO4) 2-2	2.656e-12	1.391e-12	-11.576	-11.857	-0.281	(0)
	Ni (OH) 2	1.524e-12	1.524e-12	-11.817	-11.817	0.000	(0)
	NiCl2	2.201e-15	2.201e-15	-14.657	-14.657	0.000	(0)
	Ni (OH) 3-	2.536e-16	2.157e-16	-15.596	-15.666	-0.070	(0)
	NiSeO4	1.487e-16	1.487e-16	-15.828	-15.828	0.000	(0)

O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.080e-08					
PbCO3	1.150e-08	1.150e-08	-7.939	-7.939	0.000	(0)
PbHCO3+	5.067e-09	4.311e-09	-8.295	-8.365	-0.070	(0)
Pb+2	2.285e-09	1.329e-09	-8.641	-8.876	-0.235	(0)
PbSO4	1.083e-09	1.083e-09	-8.965	-8.965	0.000	(0)
PbOH+	5.556e-10	4.727e-10	-9.255	-9.325	-0.070	(0)
Pb (CO3) 2-2	1.822e-10	9.541e-11	-9.740	-10.020	-0.281	(0)
PbCl+	8.310e-11	7.069e-11	-10.080	-10.151	-0.070	(0)
Pb (SO4) 2-2	2.074e-11	1.086e-11	-10.683	-10.964	-0.281	(0)
PbF+	1.825e-11	1.553e-11	-10.739	-10.809	-0.070	(0)
Pb (OH) 2	2.116e-12	2.116e-12	-11.675	-11.675	0.000	(0)
PbCl2	4.732e-13	4.732e-13	-12.325	-12.325	0.000	(0)
PbF2	5.066e-14	5.066e-14	-13.295	-13.295	0.000	(0)
Pb (OH) 3-	3.521e-16	2.995e-16	-15.453	-15.524	-0.070	(0)
PbCl3-	3.319e-16	2.824e-16	-15.479	-15.549	-0.070	(0)
Pb2OH+3	4.267e-17	9.958e-18	-16.370	-17.002	-0.632	(0)
PbF3-	1.872e-17	1.593e-17	-16.728	-16.798	-0.070	(0)
PbCl4-2	3.693e-19	1.934e-19	-18.433	-18.713	-0.281	(0)
Pb (OH) 4-2	1.982e-20	1.038e-20	-19.703	-19.984	-0.281	(0)
PbF4-2	2.413e-21	1.264e-21	-20.618	-20.898	-0.281	(0)
Pb3 (OH) 4+2	2.267e-22	1.187e-22	-21.645	-21.925	-0.281	(0)
Pb4 (OH) 4+4	1.666e-26	1.254e-27	-25.778	-26.902	-1.124	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.498	-150.498	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.573	-227.644	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.786	-72.786	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.376	-78.446	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.574	-78.574	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.674	-78.745	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.382	-80.663	-0.281	(0)
S6-2	0.000e+00	0.000e+00	-80.898	-81.179	-0.281	(0)
S4-2	0.000e+00	0.000e+00	-80.978	-81.258	-0.281	(0)
S3-2	0.000e+00	0.000e+00	-81.784	-82.064	-0.281	(0)
S2-2	0.000e+00	0.000e+00	-82.800	-83.080	-0.281	(0)
S-2	0.000e+00	0.000e+00	-88.369	-88.598	-0.229	(0)
HgHS2-	0.000e+00	0.000e+00	-138.124	-138.194	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.948	-138.948	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.473	-139.754	-0.281	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.062	-147.132	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.300	-147.468	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.163	-148.472	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.906	-149.202	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.189	-149.259	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.443	-149.759	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.767	-150.070	-0.303	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.986	-149.986	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.397	-150.397	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.498	-150.498	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.787	-158.787	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.701	-215.771	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.493	-225.563	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.462	-226.532	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.573	-227.644	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.114	-228.395	-0.281	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.125	-235.195	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.501	-302.782	-0.281	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.188	-305.468	-0.281	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.942	-317.222	-0.281	(0)
S (6)	3.606e-03					
SO4-2	2.860e-03	1.664e-03	-2.544	-2.779	-0.235	(0)
CaSO4	4.387e-04	4.387e-04	-3.358	-3.358	0.000	(0)
MgSO4	2.515e-04	2.515e-04	-3.599	-3.599	0.000	(0)
NaSO4-	4.375e-05	3.842e-05	-4.359	-4.415	-0.056	(0)
KSO4-	8.332e-06	7.317e-06	-5.079	-5.136	-0.056	(0)
MnSO4	3.046e-06	3.046e-06	-5.516	-5.516	0.000	(0)
CuSO4	1.772e-07	1.772e-07	-6.751	-6.751	0.000	(0)

ZnSO4	1.721e-07	1.721e-07	-6.764	-6.764	0.000	(0)
NiSO4	2.525e-08	2.525e-08	-7.598	-7.598	0.000	(0)
CoSO4	1.667e-08	1.667e-08	-7.778	-7.778	0.000	(0)
HSO4-	1.322e-08	1.156e-08	-7.879	-7.937	-0.058	(0)
Zn(SO4) 2-2	4.760e-09	2.493e-09	-8.322	-8.603	-0.281	(0)
CdSO4	1.924e-09	1.924e-09	-8.716	-8.716	0.000	(0)
PbSO4	1.083e-09	1.083e-09	-8.965	-8.965	0.000	(0)
AgSO4-	2.730e-10	2.323e-10	-9.564	-9.634	-0.070	(0)
CrOHSO4	1.080e-10	1.080e-10	-9.967	-9.967	0.000	(0)
Cd(SO4) 2-2	8.246e-11	4.319e-11	-10.084	-10.365	-0.281	(0)
AlSO4+	2.130e-11	1.863e-11	-10.672	-10.730	-0.058	(0)
Pb(SO4) 2-2	2.074e-11	1.086e-11	-10.683	-10.964	-0.281	(0)
FeSO4	5.834e-12	5.834e-12	-11.234	-11.234	0.000	(0)
Ni(SO4) 2-2	2.656e-12	1.391e-12	-11.576	-11.857	-0.281	(0)
CrSO4+	4.033e-13	3.431e-13	-12.394	-12.465	-0.070	(0)
Al(SO4) 2-	3.798e-13	3.321e-13	-12.420	-12.479	-0.058	(0)
UO2SO4	8.399e-14	8.399e-14	-13.076	-13.076	0.000	(0)
UO2(SO4) 2-2	3.518e-15	1.842e-15	-14.454	-14.735	-0.281	(0)
VO2SO4-	4.374e-16	3.721e-16	-15.359	-15.429	-0.070	(0)
FeSO4+	1.190e-17	1.043e-17	-16.924	-16.982	-0.057	(0)
Cr2(OH) 2SO4+2	5.096e-18	2.669e-18	-17.293	-17.574	-0.281	(0)
VOSO4	4.124e-18	4.124e-18	-17.385	-17.385	0.000	(0)
Fe(SO4) 2-	4.362e-19	3.711e-19	-18.360	-18.431	-0.070	(0)
Cr2(OH) 2(SO4) 2	2.638e-19	2.638e-19	-18.579	-18.579	0.000	(0)
HgSO4	1.822e-21	1.822e-21	-20.740	-20.740	0.000	(0)
CrO3SO4-2	1.811e-24	9.485e-25	-23.742	-24.023	-0.281	(0)
VSO4+	4.957e-32	4.217e-32	-31.305	-31.375	-0.070	(0)
U(SO4) 2	6.929e-40	6.929e-40	-39.159	-39.159	0.000	(0)
USO4+2	1.001e-40	0.000e+00	-40.000	-40.280	-0.281	(0)
Sb(3)	1.070e-19					
Sb(OH) 3	5.415e-20	5.415e-20	-19.266	-19.266	0.000	(0)
HSbO2	5.288e-20	5.288e-20	-19.277	-19.277	0.000	(0)
SbO2-	1.416e-24	1.204e-24	-23.849	-23.919	-0.070	(0)
Sb(OH) 2F	9.975e-25	9.975e-25	-24.001	-24.001	0.000	(0)
SbOF	9.812e-25	9.812e-25	-24.008	-24.008	0.000	(0)
Sb(OH) 4-	8.107e-25	6.897e-25	-24.091	-24.161	-0.070	(0)
Sb(OH) 2+	1.100e-25	9.354e-26	-24.959	-25.029	-0.070	(0)
SbO+	3.792e-26	3.226e-26	-25.421	-25.491	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.942	-317.222	-0.281	(0)
Sb(5)	1.316e-08					
SbO3-	1.314e-08	1.118e-08	-7.881	-7.952	-0.070	(0)
Sb(OH) 6-	1.496e-11	1.306e-11	-10.825	-10.884	-0.059	(0)
SbO2+	1.907e-23	1.622e-23	-22.720	-22.790	-0.070	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.407e-40	2.898e-40	-39.468	-39.538	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.762	-42.762	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.796	-42.796	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.109	-47.390	-0.281	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-85.172	-86.296	-1.124	(0)
Se(4)	2.209e-08					
HSeO3-	2.025e-08	1.723e-08	-7.694	-7.764	-0.070	(0)
SeO3-2	1.842e-09	9.646e-10	-8.735	-9.016	-0.281	(0)
H2SeO3	5.226e-13	5.226e-13	-12.282	-12.282	0.000	(0)
AgSeO3-	5.098e-15	4.337e-15	-14.293	-14.363	-0.070	(0)
Cd(SeO3) 2-2	7.222e-21	3.783e-21	-20.141	-20.422	-0.281	(0)
Ag(SeO3) 2-3	1.605e-22	3.746e-23	-21.794	-22.426	-0.632	(0)
FeHSeO3+2	4.857e-23	2.544e-23	-22.314	-22.595	-0.281	(0)
Se(6)	7.195e-12					
SeO4-2	7.183e-12	4.179e-12	-11.144	-11.379	-0.235	(0)
MnSeO4	1.158e-14	1.158e-14	-13.936	-13.936	0.000	(0)
ZnSeO4	3.059e-16	3.059e-16	-15.514	-15.514	0.000	(0)
NiSeO4	1.487e-16	1.487e-16	-15.828	-15.828	0.000	(0)
CoSeO4	1.052e-16	1.052e-16	-15.978	-15.978	0.000	(0)
HSeO4-	1.751e-17	1.489e-17	-16.757	-16.827	-0.070	(0)
CdSeO4	3.839e-18	3.839e-18	-17.416	-17.416	0.000	(0)
Zn(SeO4) 2-2	2.474e-27	1.296e-27	-26.607	-26.887	-0.281	(0)
U(3)	0.000e+00					

U+3	0.000e+00	0.000e+00	-57.890	-58.522	-0.632	(0)
U (4)	3.885e-22					
U (OH) 5-	3.875e-22	3.296e-22	-21.412	-21.482	-0.070	(0)
U (OH) 4	9.820e-25	9.820e-25	-24.008	-24.008	0.000	(0)
U (OH) 3+	3.002e-28	2.554e-28	-27.523	-27.593	-0.070	(0)
U (OH) 2+2	1.604e-32	8.400e-33	-31.795	-32.076	-0.281	(0)
UF3+	1.687e-34	1.435e-34	-33.773	-33.843	-0.070	(0)
UF2+2	1.043e-35	5.463e-36	-34.982	-35.263	-0.281	(0)
UF4	2.609e-36	2.609e-36	-35.584	-35.584	0.000	(0)
UOH+3	1.206e-37	2.814e-38	-36.919	-37.551	-0.632	(0)
UF5-	2.014e-38	1.714e-38	-37.696	-37.766	-0.070	(0)
UF+3	1.122e-38	2.618e-39	-37.950	-38.582	-0.632	(0)
UF6-2	1.638e-39	8.579e-40	-38.786	-39.067	-0.281	(0)
U (SO4) 2	6.929e-40	6.929e-40	-39.159	-39.159	0.000	(0)
USO4+2	1.001e-40	0.000e+00	-40.000	-40.280	-0.281	(0)
U+4	0.000e+00	0.000e+00	-42.978	-44.102	-1.124	(0)
UC1+3	0.000e+00	0.000e+00	-44.594	-45.226	-0.632	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.858	-174.545	-5.688	(0)
U (5)	5.676e-17					
UO2+	5.676e-17	4.828e-17	-16.246	-16.316	-0.070	(0)
U (6)	8.430e-08					
UO2 (CO3) 3-4	4.204e-08	3.163e-09	-7.376	-8.500	-1.124	(0)
UO2 (CO3) 2-2	4.188e-08	2.193e-08	-7.378	-7.659	-0.281	(0)
UO2CO3	3.821e-10	3.821e-10	-9.418	-9.418	0.000	(0)
UO2F+	8.971e-13	7.632e-13	-12.047	-12.117	-0.070	(0)
UO2OH+	6.987e-13	5.944e-13	-12.156	-12.226	-0.070	(0)
UO2F2	3.649e-13	3.649e-13	-12.438	-12.438	0.000	(0)
UO2SO4	8.399e-14	8.399e-14	-13.076	-13.076	0.000	(0)
UO2+2	5.734e-14	3.335e-14	-13.242	-13.477	-0.235	(0)
UO2F3-	1.786e-14	1.519e-14	-13.748	-13.818	-0.070	(0)
UO2 (SO4) 2-2	3.518e-15	1.842e-15	-14.454	-14.735	-0.281	(0)
UO2Cl+	9.530e-17	8.107e-17	-16.021	-16.091	-0.070	(0)
UO2F4-2	3.819e-17	2.000e-17	-16.418	-16.699	-0.281	(0)
(UO2) 2 (OH) 2+2	1.119e-18	5.863e-19	-17.951	-18.232	-0.281	(0)
(UO2) 3 (OH) 5+	6.226e-21	5.297e-21	-20.206	-20.276	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.473	-40.544	-0.070	(0)
V+2	0.000e+00	0.000e+00	-40.924	-41.205	-0.281	(0)
V (3)	1.228e-13					
V (OH) 3	1.228e-13	1.228e-13	-12.911	-12.911	0.000	(0)
V (OH) 2+	6.636e-24	5.645e-24	-23.178	-23.248	-0.070	(0)
VOH+2	7.272e-27	3.809e-27	-26.138	-26.419	-0.281	(0)
V+3	2.301e-31	5.369e-32	-30.638	-31.270	-0.632	(0)
VSO4+	4.957e-32	4.217e-32	-31.305	-31.375	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.584	-51.216	-0.632	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.915	-52.038	-1.124	(0)
V (4)	3.311e-16					
V (OH) 3+	2.987e-16	2.541e-16	-15.525	-15.595	-0.070	(0)
VO+2	1.718e-17	8.999e-18	-16.765	-17.046	-0.281	(0)
VOF+	1.052e-17	8.947e-18	-16.978	-17.048	-0.070	(0)
VOSO4	4.124e-18	4.124e-18	-17.385	-17.385	0.000	(0)
VOF2	5.561e-19	5.561e-19	-18.255	-18.255	0.000	(0)
VOC1+	4.448e-20	3.784e-20	-19.352	-19.422	-0.070	(0)
VOF3-	3.845e-21	3.271e-21	-20.415	-20.485	-0.070	(0)
VOF4-2	4.179e-24	2.189e-24	-23.379	-23.660	-0.281	(0)
H2V2O4+2	6.182e-27	3.238e-27	-26.209	-26.490	-0.281	(0)
V (5)	1.155e-07					
H2VO4-	1.090e-07	9.276e-08	-6.962	-7.033	-0.070	(0)
HVO4-2	6.256e-09	3.277e-09	-8.204	-8.485	-0.281	(0)
H3VO4	6.596e-11	6.596e-11	-10.181	-10.181	0.000	(0)
H3V2O7-	4.646e-11	3.952e-11	-10.333	-10.403	-0.070	(0)
HV2O7-3	4.415e-13	1.030e-13	-12.355	-12.987	-0.632	(0)
VO2+	1.072e-14	9.366e-15	-13.970	-14.028	-0.059	(0)
V3O9-3	3.586e-15	8.367e-16	-14.445	-15.077	-0.632	(0)
VO2F	2.723e-15	2.723e-15	-14.565	-14.565	0.000	(0)
VO4-3	9.897e-16	2.310e-16	-15.005	-15.636	-0.632	(0)
V2O7-4	5.183e-16	3.900e-17	-15.285	-16.409	-1.124	(0)
VO2SO4-	4.374e-16	3.721e-16	-15.359	-15.429	-0.070	(0)

VO2F2-	1.926e-16	1.639e-16	-15.715	-15.785	-0.070	(0)
VO2F3-2	6.470e-19	3.389e-19	-18.189	-18.470	-0.281	(0)
V4O12-4	4.302e-19	3.237e-20	-18.366	-19.490	-1.124	(0)
VO2F4-3	1.184e-22	2.764e-23	-21.927	-22.558	-0.632	(0)
HV10028-5	0.000e+00	0.000e+00	-47.217	-48.972	-1.755	(0)
V10028-6	0.000e+00	0.000e+00	-47.483	-50.011	-2.528	(0)
H2V10028-4	0.000e+00	0.000e+00	-49.789	-50.913	-1.124	(0)
Zn	1.156e-06					
Zn+2	8.125e-07	4.727e-07	-6.090	-6.325	-0.235	(0)
ZnSO4	1.721e-07	1.721e-07	-6.764	-6.764	0.000	(0)
ZnCO3	7.826e-08	7.826e-08	-7.106	-7.106	0.000	(0)
ZnHCO3+	7.668e-08	6.523e-08	-7.115	-7.186	-0.070	(0)
ZnOH+	7.865e-09	6.691e-09	-8.104	-8.175	-0.070	(0)
Zn(SO4) 2-2	4.760e-09	2.493e-09	-8.322	-8.603	-0.281	(0)
ZnCl+	2.040e-09	1.779e-09	-8.690	-8.750	-0.059	(0)
ZnF+	1.838e-09	1.563e-09	-8.736	-8.806	-0.070	(0)
ZnOHCl	3.298e-10	3.298e-10	-9.482	-9.482	0.000	(0)
Zn(OH) 2	1.501e-10	1.501e-10	-9.824	-9.824	0.000	(0)
ZnCl2	4.227e-12	4.227e-12	-11.374	-11.374	0.000	(0)
Zn(OH) 3-	1.252e-13	1.065e-13	-12.902	-12.973	-0.070	(0)
ZnCl3-	5.770e-15	5.032e-15	-14.239	-14.298	-0.059	(0)
ZnSeO4	3.059e-16	3.059e-16	-15.514	-15.514	0.000	(0)
ZnCl4-2	6.390e-18	3.771e-18	-17.194	-17.424	-0.229	(0)
Zn(OH) 4-2	1.146e-18	6.001e-19	-17.941	-18.222	-0.281	(0)
Zn(SeO4) 2-2	2.474e-27	1.296e-27	-26.607	-26.887	-0.281	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.189	-149.259	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.397	-150.397	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.493	-225.563	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.114	-228.395	-0.281	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.188	-305.468	-0.281	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.39	-87.61	-36.22	Ag2S
Ag2CO3	-10.76	-21.85	-11.09	Ag2CO3
Ag2CrO4	-20.66	-32.25	-11.59	Ag2CrO4
Ag2HVO4	-10.37	-8.89	1.48	Ag2HVO4
Ag2MoO4	-11.50	-23.05	-11.55	Ag2MoO4
Ag2O	-14.59	-2.01	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-26.92	-24.77	2.16	Ag3AsO3
Ag3AsO4	-15.33	-18.12	-2.79	Ag3AsO4
Ag3H2VO5	-15.08	-9.90	5.18	Ag3H2VO5
AgF·4H2O	-12.99	-11.94	1.05	AgF·4H2O
Agmetal	-0.27	-13.78	-13.51	Ag
AgVO3	-8.66	-7.89	0.77	AgVO3
Al (OH) 3 (am)	-1.20	9.60	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.28	-43.91	2.37	Al2 (MoO4) 3
Al2O3	-0.45	19.21	19.65	Al2O3
Al4 (OH) 10SO4	-1.36	21.34	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.29	-5.49	4.80	AlAsO4·2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.87	-11.66	-7.79	PbSO4
Anhydrite	-1.36	-5.72	-4.36	CaSO4
Anilite	-54.90	-86.78	-31.88	Cu0.25Cu1.5S
Antlerite	-1.97	6.82	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-84.22	-86.98	-2.76	As4O6
Artinite	-7.01	2.59	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-36.90	-30.19	6.71	As2O5
Atacamite	-1.44	5.95	7.39	Cu2 (OH) 3Cl

Azurite	1.12	-15.78	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-17.30	7.09	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-15.44	0.43	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-25.42	7.52	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-13.47	-23.14	-9.67	BaCrO ₄
BaF ₂	-8.94	-14.76	-5.82	BaF ₂
BaMoO ₄	-6.98	-13.94	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.65	-7.82	1.83	BaSeO ₃
BaSeO ₄	-11.12	-18.58	-7.46	BaSeO ₄
Bianchite	-7.34	-9.11	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-8.59	9.50	18.09	MnO ₂
Bixbyite	-5.89	-6.54	-0.64	Mn ₂ O ₃
BlaubleiI	-54.69	-78.85	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiIII	-55.23	-82.51	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.44	14.78	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.63	11.22	16.84	Mg(OH) ₂
Bunsenite	-5.27	7.18	12.45	NiO
Ca(VO ₃) ₂	-8.06	-2.40	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-8.55	8.95	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-12.60	8.95	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-18.42	3.88	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-18.65	20.31	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-19.55	20.31	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-300.70	-157.73	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-8.95	-26.86	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.73	-9.68	-7.95	CaMoO ₄
Carnotite	-2.35	-2.12	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-6.37	-3.55	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-11.30	-14.32	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-13.45	-3.61	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.66	5.99	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.74	5.99	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.89	-16.18	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.67	0.89	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.52	6.88	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.30	-13.96	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.26	-13.96	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-12.04	-13.96	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-14.66	-15.87	-1.21	CdF ₂
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.17	-19.56	13.62	Cd
CdMoO ₄	-0.90	-15.05	-14.15	CdMoO ₄
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.79	-77.14	-0.35	CdSb
CdSe	-20.50	-40.70	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-17.84	-19.69	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.91	-11.09	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.36	-11.09	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-9.21	-11.09	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.23	-10.98	-9.75	AgCl
Cerrusite	-1.29	-14.42	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-6.47	-9.11	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-54.91	-89.83	-34.92	Cu ₂ S
Chalcopyrite	-124.50	-159.77	-35.27	CuFeS ₂
Cinnabar	-52.18	-97.87	-45.69	HgS
Claudetite	-83.91	-86.98	-3.06	As ₄ O ₆
Clausthalite	-14.17	-41.27	-27.10	PbSe
Co(BO ₂) ₂	-29.67	-2.60	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.10	7.00	13.09	Co(OH) ₂
Co(OH) ₃	-10.32	-12.63	-2.31	Co(OH) ₃

CO2(g)	-1.69	-19.84	-18.15	CO2
Co3(AsO4)2	-22.24	-9.20	13.03	Co3(AsO4)2
Co3O4	-7.77	-18.26	-10.50	Co3O4
CoCl2	-21.21	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.48	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.96	-45.42	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.28	-14.04	-7.76	CoMoO4
CoO	-6.59	7.00	13.59	CoO
CoS(alpha)	-71.16	-78.60	-7.44	CoS
CoS(beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.49	-39.69	-16.20	CoSe
CoSeO3	-9.23	-7.91	1.32	CoSeO3
CoSeO4:6H2O	-17.15	-18.68	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.08	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.74	-14.52	-4.78	PbCl2
Covellite	-55.33	-77.63	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.04	-30.95	14.09	CrCl2
CrCl3	-46.21	-31.10	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.78	-41.62	-33.84	Na3AlF6
Cu(OH)2	-0.71	7.96	8.67	Cu(OH)2
Cu(SbO3)2	-24.69	20.52	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-55.17	-90.06	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.12	-50.92	-45.80	Cu2Se
Cu2SO4	-19.36	-21.31	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.40	-6.30	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.66	-102.26	-42.59	Cu3Sb
Cu3Se2	-26.15	-89.65	-63.49	Cu3Se2
CuCO3	-0.37	-11.87	-11.50	CuCO3
CuCrO4	-16.83	-22.27	-5.44	CuCrO4
CuF	-8.14	-13.05	-4.91	CuF
CuF2	-15.01	-13.89	1.12	CuF2
CuF2:2H2O	-9.34	-13.89	-4.55	CuF2:2H2O
Cumetal	-6.14	-14.89	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.45	-1.15	10.30	CuOCuSO4
Cupricferrite	8.36	14.35	5.99	CuFe2O4
Cuprite	-2.83	-4.24	-1.41	Cu2O
Cuprousferrite	9.99	1.07	-8.92	CuFeO2
CuSe	-5.62	-38.72	-33.10	CuSe
CuSe2	-26.50	-59.86	-33.37	CuSe2
CuSeO3:2H2O	-7.46	-6.95	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.27	-17.71	-2.44	CuSeO4:5H2O
CuSO4	-12.05	-9.11	2.94	CuSO4
Diaspore	2.73	9.60	6.87	AlOOH
Djurleite	-55.11	-89.03	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.73	-5.86	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.59	-10.31	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.08	-8.53	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.73	-38.35	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.11	-44.84	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.31	-11.91	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4

FeMoO4	-7.50	-17.59	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.78	-64.38	-18.60	FeSe2
FeS(ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.23	-43.23	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.20	-80.17	-13.97	PbS
Gibbsite	1.31	9.60	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.09	-9.11	-2.01	ZnSO4·7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.51	-332.54	-45.03	Fe3S4
Gummite	-6.85	0.82	7.67	UO3
Gypsum	-1.11	-5.72	-4.61	CaSO4·2H2O
H-Jarosite	-12.48	-24.58	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.16	-21.04	-12.88	H2MoO4
H2S(g)	-77.58	-85.59	-8.01	H2S
H2Se(g)	-41.73	-46.69	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.24	22.66	22.89	FeAl2O4
Hg(CH3)2(g)	-182.60	-256.31	-73.71	Hg(CH3)2
Hg(g)	-8.36	-16.23	-7.87	Hg
Hg(OH)2	-8.78	-12.28	-3.50	Hg(OH)2
Hg2(g)	-17.50	-32.46	-14.96	Hg2
Hg2(OH)2	-12.17	-6.91	5.26	Hg2(OH)2
Hg2CO3	-10.70	-26.75	-16.05	Hg2CO3
Hg2CrO4	-28.45	-37.15	-8.70	Hg2CrO4
Hg2F2	-18.41	-28.77	-10.36	Hg2F2
Hg2S	-80.83	-92.51	-11.68	Hg2S
Hg2SeO3	-17.17	-21.82	-4.66	Hg2SeO3
Hg2SO4	-17.86	-23.99	-6.13	Hg2SO4
Hg3O2CO3	-26.98	-56.67	-29.68	Hg3O2CO3
HgCl(g)	-32.93	-13.43	19.50	HgCl
HgCl2	-10.96	-32.22	-21.26	HgCl2
HgF(g)	-47.06	-14.38	32.68	HgF
HgF2(g)	-46.70	-34.13	12.57	HgF2
Hgmetal(l)	-2.78	-16.23	-13.45	Hg
HgSe	-3.27	-58.96	-55.69	HgSe
HgSeO3	-14.76	-27.19	-12.43	HgSeO3
HgSO4	-19.93	-29.35	-9.42	HgSO4
Huntite	-4.38	-34.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.64	-23.42	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.51	-23.27	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-15.44	-20.61	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.84	-20.64	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.35	-52.59	-17.24	K2Cr2O7
K2CrO4	-21.84	-22.36	-0.51	K2CrO4
K2MoO4	-16.42	-13.16	3.26	K2MoO4
K2SeO4	-17.06	-17.79	-0.73	K2SeO4
Langite	-2.71	14.78	17.49	Cu4(OH)6SO4·H2O
Larnakite	-5.80	-6.24	-0.43	PbO·PbSO4
Laurionite	-5.18	-4.55	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.27	5.42	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.40	-3.91	-5.31	Cu2(OH)2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.47	5.42	12.89	PbO
Matlockite	-6.51	-15.48	-8.97	PbClF
Melanothallite	-18.24	-11.98	6.26	CuCl2

Melanterite	-11.42	-13.63	-2.21	FeSO4:7H2O
Metacinnabar	-52.78	-97.87	-45.09	HgS
Mg(OH)2(active)	-7.58	11.22	18.79	Mg(OH)2
Mg(VO3)2	-13.83	-2.55	11.28	Mg(VO3)2
Mg2Sb3	-276.09	-201.41	74.68	Mg2Sb3
Mg2V2O7	-17.69	8.67	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.97	-9.82	-1.85	MgMoO4
MgSeO3:6H2O	-6.75	-3.70	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.26	-14.46	-1.20	MgSeO4:6H2O
Minium	-31.72	41.80	73.52	Pb3O4
Mirabilite	-6.40	-7.51	-1.11	Na2SO4:10H2O
Mn(VO3)2	-9.35	-4.45	4.90	Mn(VO3)2
Mn2(SO4)3	-52.05	-57.76	-5.71	Mn2(SO4)3
Mn2Sb	-151.13	-90.06	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-14.77	-2.27	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.35	-10.64	2.72	MnCl2:4H2O
MnS(grn)	-76.46	-76.29	0.17	MnS
MnS(pnk)	-79.63	-76.29	3.34	MnS
MnSb	-96.26	-99.17	-2.91	MnSb
MnSe	-40.88	-37.38	3.50	MnSe
MnSeO3	-6.73	-5.60	1.13	MnSeO3
MnSeO3:2H2O	-6.59	-5.60	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.32	-16.37	-2.05	MnSeO4:5H2O
MnSO4	-10.35	-7.77	2.58	MnSO4
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.64	-12.28	-3.64	HgO
MoO3	-13.04	-21.04	-8.00	MoO3
Morenosite	-7.75	-9.90	-2.14	NiSO4:7H2O
MoS2	-147.51	-217.77	-70.26	MoS2
Na-Jarosite	-8.60	-19.80	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.67	2.93	Na2CrO4
Na2Mo2O7	-15.92	-32.52	-16.60	Na2Mo2O7
Na2MoO4	-12.97	-11.48	1.49	Na2MoO4
Na2MoO4:2H2O	-12.70	-11.48	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.65	-5.35	10.30	Na2SeO3:5H2O
Na2SeO4	-17.39	-16.11	1.28	Na2SeO4
Na3Sb	-176.01	-81.56	94.45	Na3Sb
Na3VO4	-29.22	7.46	36.68	Na3VO4
Na4V2O7	-32.04	5.36	37.40	Na4V2O7
Nantokite	-5.36	-12.09	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-5.96	-2.10	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.62	7.18	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.36	-8.66	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.72	-13.86	-11.14	NiMoO4
NiS(alpha)	-72.82	-78.42	-5.60	NiS
NiS(beta)	-67.32	-78.42	-11.10	NiS
NiS(gamma)	-65.62	-78.42	-12.80	NiS
NiSe	-21.81	-39.51	-17.70	NiSe
NiSeO3:2H2O	-10.55	-7.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.98	-18.50	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-239.20	-300.27	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.70	-4.18	6.52	Pb(BO2)2
Pb(OH)2	-2.73	5.42	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-56.07	-64.83	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.93	0.87	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.35	10.84	26.19	Pb2O(OH)2

Pb2O3	-24.66	36.38	61.04	Pb2O3
Pb2OCO3	-8.44	-9.00	-0.56	Pb2OCO3
Pb2V2O7	-1.02	-2.92	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.74	-13.94	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.64	2.50	6.14	Pb3(VO4)2
Pb3O2CO3	-14.60	-3.58	11.02	Pb3O2CO3
Pb3O2SO4	-11.50	-0.82	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.50	4.60	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.27	4.60	21.88	Pb4O3SO4
PbCrO4	-12.22	-24.82	-12.60	PbCrO4
PbF2	-9.00	-16.44	-7.44	PbF2
Pbmetal	-24.37	-20.13	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.56	5.42	12.98	PbO:0.33H2O
PbSeO4	-13.42	-20.26	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.13	-28.94	-19.81	PbCl2:PbCO3
Plattnerite	-18.64	30.96	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.68	-142.19	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.36	-120.11	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb(OH)3	-12.16	-19.27	-7.11	Sb(OH)3
Sb2O4	-16.39	-12.99	3.40	Sb2O4
Sb2O5	-26.40	-36.06	-9.67	Sb2O5
Sb2Se3	-110.83	-178.59	-67.76	Sb2Se3
Sb4O6(cubic)	-58.80	-77.06	-18.26	Sb4O6
Sb4O6(orth)	-59.16	-77.06	-17.90	Sb4O6
SbCl3	-49.75	-49.18	0.57	SbCl3
SbF3	-41.83	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-5.18	0.82	5.99	UO2(OH)2:H2O
Semetal(am)	-14.03	-21.14	-7.11	Se
Semetal(hex)	-13.43	-21.14	-7.71	Se
Senarmontite	-26.17	-38.53	-12.37	Sb2O3
SeO2	-15.04	-14.91	0.12	SeO2
SeO3	-46.72	-25.67	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.17	-77.62	-11.45	ZnS
Spinel	-6.43	30.42	36.85	MgAl2O4
Stibnite	-244.85	-295.31	-50.46	Sb2S3
Sulfur	-57.90	-60.05	-2.14	S
Tenorite	0.32	7.96	7.64	CuO
Thenardite	-7.83	-7.51	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-4.85	-0.77	4.08	Ca(UO2)2(VO4)2
U3O8	-16.52	4.56	21.08	U3O8
U3Sb4	-582.51	-430.13	152.38	U3Sb4
U4O9	-33.47	-36.49	-3.02	U4O9
UF4	-29.69	-59.22	-29.54	UF4
UF4:2.5H2O	-26.51	-59.22	-32.72	UF4:2.5H2O
UO2(am)	-16.44	-15.51	0.93	UO2
UO2(OH)2(beta)	-4.79	0.82	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.61	-24.86	-2.25	UO2SeO4:4H2O
UO3	-6.88	0.82	7.70	UO3
Uraninite	-10.84	-15.51	-4.67	UO2
USb2	-220.56	-190.98	29.58	USb2
V(OH)3	-17.42	-9.83	7.59	V(OH)3
V2O5	-12.40	-13.76	-1.36	V2O5
V3O5	-35.63	-33.79	1.84	V3O5
V4O7	-43.73	-36.54	7.19	V4O7
V6O13	-31.51	-92.37	-60.86	V6O13

Valentinite	-30.05	-38.53	-8.48	Sb2O3
VC12	-61.42	-42.54	18.87	VC12
VC13	-63.18	-39.74	23.43	VC13
VF4	-61.39	-46.46	14.93	VF4
Vmetal	-92.17	-48.14	44.03	V
VO	-37.35	-22.60	14.76	VO
VO(OH)2	-7.90	-2.75	5.15	VO(OH)2
VO2Cl	-19.69	-16.85	2.84	VO2Cl
VOC1	-30.95	-19.80	11.15	VOC1
VOC12	-35.45	-22.69	12.76	VOC12
VOSO4	-23.43	-19.82	3.61	VOSO4
Witherite	-4.17	-12.74	-8.57	BaCO3
Wurtzite	-68.67	-77.62	-8.95	ZnS
Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.03	-9.10	3.93	ZnSO4
Zn(BO2)2	-9.92	-1.63	8.29	Zn(BO2)2
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.50	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.78	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.56	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.76	7.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.63	-1.13	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.22	5.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.93	-6.28	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.15	-10.24	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.59	14.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.59	19.91	38.50	Zn5(OH)8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.35	-13.89	-0.53	ZnF2
Znmetal	-43.36	-17.57	25.79	Zn
ZnMoO4	-2.94	-13.07	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO
ZnS(am)	-68.57	-77.62	-9.05	ZnS
ZnSb	-86.17	-75.16	11.01	ZnSb
ZnSe	-24.32	-38.72	-14.40	ZnSe
ZnSeO4:6H2O	-16.19	-17.71	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.47	-9.10	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 103.

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 601
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 601
USE Surface 601
USE Solution 603
SAVE Solution 604 #Initial Stage 6 groundwater after Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 601.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.139e-15 Surface + diffuse layer charge, eq
7.817e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is
+1).

Element	Moles
C	4.3805e-11
Ca	5.4289e-13
Cl	8.7719e-10
H	1.2922e-10
K	8.6123e-13
Mg	8.4111e-14
N	3.5512e-09
Na	3.6489e-12
O	1.5828e-07
S	3.6882e-08

Hfo_s

1.335e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.927e-08	0.668	8.927e-08	-7.049
Hfo_sOH	4.378e-08	0.328	4.378e-08	-7.359
Hfo_sO-	4.919e-10	0.004	4.919e-10	-9.308
Hfo_sOHCa+2	1.630e-12	0.000	1.630e-12	-11.788

Hfo_w

5.342e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.468e-06	0.462	2.468e-06	-5.608
Hfo_wOH	1.211e-06	0.227	1.211e-06	-5.917
Hfo_wSO4-	8.337e-07	0.156	8.337e-07	-6.079
Hfo_wOHSO4-2	8.158e-07	0.153	8.158e-07	-6.088
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.866
Hfo_wOMg+	1.922e-14	0.000	1.922e-14	-13.716
Hfo_wOCa+	6.522e-15	0.000	6.522e-15	-14.186

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 603. Solution after simulation 102.
Using surface 601.
Using pure phase assemblage 601. Pure-phase assemblage after simulation 102.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.525e-08	2.161e-08	-3.647e-09
Alunite	-0.00	-1.40	-1.40	8.850e-07	8.852e-07	1.439e-10
Anhydrite	-1.36	-5.72	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.03	-9.94	-8.91	2.021e-08	0	-2.021e-08
Barite	0.00	-9.98	-9.98	1.308e-06	1.369e-06	6.065e-08
Brochantite	-0.99	14.23	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.264e-06
CaMoO4	-1.60	-9.55	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.54	-3.73	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.868e-03	2.868e-03	-6.462e-07
Carnotite	-4.12	-3.89	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.76	-14.91	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.030e-08	3.877e-08	-2.153e-08
Cu2Se(alpha)	-5.57	-51.37	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.405e-07	1.249e-07	-1.156e-07
Epsomite	-3.73	-5.86	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.671e-05	2.671e-05	-5.141e-13
Fluorite	0.00	-10.50	-10.50	1.085e-04	1.085e-04	9.590e-09
Gummite	-6.85	0.82	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.11	-5.72	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.44	-59.14	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.40	-7.51	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.91	-5.78	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-25.39	-9.69	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.58	-13.73	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.365e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.411e-09	0	-5.411e-09
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.18	0.82	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.39	-4.31	4.08	0.000e+00	0	0.000e+00
U3O8	-16.52	4.56	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.79	0.82	5.61	0.000e+00	0	0.000e+00
UO3	-6.88	0.82	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.81	-12.94	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.593e-19 Surface + diffuse layer charge, eq
 3.753e-07 Surface charge, eq
 2.112e-02 sigma, C/m²
 5.564e-02 psi, V
 -2.166e+00 -F*psi/RT
 1.147e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.330e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.958e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	6.7373e-13
Al	4.7803e-11
As	3.4969e-15
B	2.7542e-10
Ba	6.9054e-13
C	1.5720e-07
Ca	2.0770e-08
Cd	1.0351e-13
Cl	4.9388e-08
Co	1.1236e-12
Cr	6.6041e-14
Cu	1.1153e-10
F	5.6999e-09
Fe	4.0518e-14
H	1.6965e-07
Hg	3.7854e-15
K	7.5066e-09
Mg	1.3657e-08
Mn	1.8334e-10
Mo	2.0538e-11
N	8.4154e-14
Na	5.1753e-08
Ni	1.8650e-12
O	1.0789e-06
Pb	1.8086e-13
S	1.5156e-07
Sb	3.7864e-13
Se	4.5086e-13
U	7.7476e-12
V	5.8094e-14
Zn	1.0286e-11

Hfo_s

1.335e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.688e-08	0.576	7.688e-08	-7.114
Hfo_sOCrOH+	4.306e-08	0.322	4.306e-08	-7.366
Hfo_sOPb+	1.052e-08	0.079	1.052e-08	-7.978
Hfo_sOZn+	1.336e-09	0.010	1.336e-09	-8.874
Hfo_sOMn+	1.195e-09	0.009	1.195e-09	-8.922
Hfo_sOHCa+2	2.556e-10	0.002	2.556e-10	-9.592
Hfo_sOH	1.810e-10	0.001	1.810e-10	-9.742
Hfo_sONi+	5.190e-11	0.000	5.190e-11	-10.285
Hfo_sOH2+	2.878e-11	0.000	2.878e-11	-10.541
Hfo_sO-	2.608e-11	0.000	2.608e-11	-10.584
Hfo_sOCo+	5.078e-12	0.000	5.078e-12	-11.294

Hfo_sOCd+	4.242e-12	0.000	4.242e-12	-11.372
Hfo_sOAg	4.143e-13	0.000	4.143e-13	-12.383
Hfo_sOHBa+2	4.318e-14	0.000	4.318e-14	-13.365
Hfo_sOFe+	2.090e-14	0.000	2.090e-14	-13.680
Hfo_sOHg+	6.958e-17	0.000	6.958e-17	-16.157

Hfo_w

5.342e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.574e-06	0.482	2.574e-06	-5.589
Hfo_wOH	1.181e-06	0.221	1.181e-06	-5.928
Hfo_wOHSO4-2	9.221e-07	0.173	9.221e-07	-6.035
Hfo_wOH2+	1.878e-07	0.035	1.878e-07	-6.726
Hfo_wO-	1.702e-07	0.032	1.702e-07	-6.769
Hfo_wOHVO4-3	1.135e-07	0.021	1.135e-07	-6.945
Hfo_wSO4-	7.350e-08	0.014	7.350e-08	-7.134
Hfo_wOHAsO4-3	4.058e-08	0.008	4.058e-08	-7.392
Hfo_wOMg+	3.975e-08	0.007	3.975e-08	-7.401
Hfo_wOZn+	9.129e-09	0.002	9.129e-09	-8.040
Hfo_wOHSeO3-2	8.600e-09	0.002	8.600e-09	-8.066
Hfo_wOMn+	6.198e-09	0.001	6.198e-09	-8.208
Hfo_wOHMoO4-2	5.581e-09	0.001	5.581e-09	-8.253
Hfo_wOCa+	3.097e-09	0.001	3.097e-09	-8.509
Hfo_wOPb+	3.067e-09	0.001	3.067e-09	-8.513
Hfo_wSeO3-	2.323e-09	0.000	2.323e-09	-8.634
Hfo_wMoO4-	5.731e-10	0.000	5.731e-10	-9.242
Hfo_wONi+	4.570e-10	0.000	4.570e-10	-9.340
Hfo_wOCO+	9.342e-11	0.000	9.342e-11	-10.030
Hfo_wH2BO3	7.818e-11	0.000	7.818e-11	-10.107
Hfo_wHAsO4-	2.297e-11	0.000	2.297e-11	-10.639
Hfo_wOCd+	1.181e-11	0.000	1.181e-11	-10.928
Hfo_wOAg	7.113e-13	0.000	7.113e-13	-12.148
Hfo_wH2AsO4	1.182e-13	0.000	1.182e-13	-12.927
Hfo_wOFe+	8.606e-14	0.000	8.606e-14	-13.065
Hfo_wOHg+	2.225e-14	0.000	2.225e-14	-13.653
Hfo_wOBa+	7.562e-15	0.000	7.562e-15	-14.121
Hfo_wOHSbO(OH) 4-	2.687e-15	0.000	2.687e-15	-14.571
Hfo_wOHSeO4-2	1.589e-15	0.000	1.589e-15	-14.799
Hfo_wSbO(OH) 4	2.759e-16	0.000	2.759e-16	-15.559
Hfo_wSeO4-	1.103e-16	0.000	1.103e-16	-15.957
Hfo_wOHCrO4-2	8.162e-17	0.000	8.161e-17	-16.088
Hfo_wCrO4-	5.933e-18	0.000	5.933e-18	-17.227
Hfo_wH2AsO3	1.682e-23	0.000	1.682e-23	-22.774

-----Solution composition-----

Elements	Molality	Moles
Ag	4.028e-08	4.028e-08
Al	1.956e-06	1.957e-06
As	8.183e-11	8.183e-11
B	1.597e-05	1.597e-05
Ba	1.112e-07	1.112e-07
C	5.847e-03	5.847e-03
Ca	2.531e-03	2.531e-03
Cd	1.171e-08	1.171e-08
Cl	1.716e-03	1.716e-03
Co	1.357e-07	1.358e-07
Cr	6.427e-09	6.427e-09
Cu	6.844e-06	6.845e-06
F	2.119e-04	2.119e-04
Fe	3.671e-09	3.671e-09
Hg	2.207e-10	2.208e-10
K	7.196e-04	7.196e-04
Mg	1.742e-03	1.742e-03
Mn	2.382e-05	2.382e-05

Mo	4.254e-07	4.254e-07
N	3.551e-09	3.551e-09
Na	4.978e-03	4.978e-03
Ni	2.126e-07	2.126e-07
Pb	1.262e-08	1.262e-08
S	3.606e-03	3.606e-03
Sb	1.316e-08	1.316e-08
Se	1.483e-08	1.483e-08
U	8.429e-08	8.429e-08
V	1.947e-09	1.947e-09
Zn	1.146e-06	1.146e-06

-----Description of solution-----

equilibrium	pH	=	7.148	Charge balance
	pe	=	5.624	Adjusted to redox
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.896e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	5.173e-03	
	Total CO2 (mol/kg)	=	5.847e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.465e-15	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
Iterations = 1				
Total H = 1.110222e+02				
Total O = 5.553985e+01				

-----Distribution of species-----

Species	Molality	Activity	Log	Log	Log	mole V cm ³ /mol
			Molality	Activity	Gamma	
OH-	1.627e-07	1.415e-07	-6.789	-6.849	-0.061	(0)
H+	8.143e-08	7.112e-08	-7.089	-7.148	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.028e-08					
AgCl	2.614e-08	2.614e-08	-7.583	-7.583	0.000	(0)
Ag+	9.782e-09	8.543e-09	-8.010	-8.068	-0.059	(0)
AgCl2-	4.011e-09	3.412e-09	-8.397	-8.467	-0.070	(0)
AgSO4-	3.334e-10	2.836e-10	-9.477	-9.547	-0.070	(0)
AgCl3-2	8.702e-12	4.558e-12	-11.060	-11.341	-0.281	(0)
AgF	3.557e-12	3.557e-12	-11.449	-11.449	0.000	(0)
AgOH	1.209e-13	1.209e-13	-12.918	-12.918	0.000	(0)
AgCl4-3	5.977e-14	1.395e-14	-13.224	-13.856	-0.632	(0)
AgH2BO3	1.755e-14	1.755e-14	-13.756	-13.756	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	4.175e-15	3.552e-15	-14.379	-14.450	-0.070	(0)
AgNO2	3.959e-15	3.959e-15	-14.402	-14.402	0.000	(0)
AgNH3+	1.376e-16	1.170e-16	-15.862	-15.932	-0.070	(0)
Ag (OH) 2-	1.966e-18	1.672e-18	-17.706	-17.777	-0.070	(0)
AgNO3	1.420e-20	1.420e-20	-19.848	-19.848	0.000	(0)
Ag (SeO3) 2-3	8.817e-23	2.057e-23	-22.055	-22.687	-0.632	(0)
Ag (NO2) 2-	1.598e-23	1.360e-23	-22.796	-22.867	-0.070	(0)
Ag (NH3) 2+	7.501e-24	6.381e-24	-23.125	-23.195	-0.070	(0)
Ag2MoO4	6.830e-24	6.830e-24	-23.166	-23.166	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.700	-72.700	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.432	-86.556	-1.124	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.975	-147.045	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.213	-147.381	-0.167	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.356	-149.673	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.681	-149.984	-0.303	(0)
Al	1.956e-06					
Al (OH) 4-	1.321e-06	1.155e-06	-5.879	-5.937	-0.058	(0)
AlF3	3.292e-07	3.292e-07	-6.483	-6.483	0.000	(0)
AlF2+	1.796e-07	1.578e-07	-6.746	-6.802	-0.056	(0)
Al (OH) 3	6.482e-08	6.482e-08	-7.188	-7.188	0.000	(0)

AlF4-	3.128e-08	2.734e-08	-7.505	-7.563	-0.058	(0)
Al(OH) 2+	2.614e-08	2.295e-08	-7.583	-7.639	-0.056	(0)
AlF+2	4.021e-09	2.391e-09	-8.396	-8.621	-0.226	(0)
AlOH+2	3.433e-10	2.042e-10	-9.464	-9.690	-0.226	(0)
AlSO4+	2.131e-11	1.863e-11	-10.671	-10.730	-0.058	(0)
Al+3	4.881e-12	1.442e-12	-11.312	-11.841	-0.529	(0)
Al(SO4) 2-	3.800e-13	3.322e-13	-12.420	-12.479	-0.058	(0)
AlMo6O21-3	1.796e-39	4.191e-40	-38.746	-39.378	-0.632	(0)
As (3)	5.585e-23					
H3AsO3	5.538e-23	5.538e-23	-22.257	-22.257	0.000	(0)
H2AsO3-	4.695e-25	3.994e-25	-24.328	-24.399	-0.070	(0)
HAsO3-2	9.779e-30	5.121e-30	-29.010	-29.291	-0.281	(0)
H4AsO3+	2.294e-30	1.951e-30	-29.639	-29.710	-0.070	(0)
AsO3-3	1.190e-35	2.776e-36	-34.925	-35.557	-0.632	(0)
As (5)	8.183e-11					
HAsO4-2	5.848e-11	3.063e-11	-10.233	-10.514	-0.281	(0)
H2AsO4-	2.335e-11	1.986e-11	-10.632	-10.702	-0.070	(0)
AsO4-3	5.836e-15	1.362e-15	-14.234	-14.866	-0.632	(0)
H3AsO4	2.444e-16	2.455e-16	-15.612	-15.610	0.002	(0)
B	1.597e-05					
H3BO3	1.580e-05	1.587e-05	-4.801	-4.799	0.002	(0)
H2BO3-	1.498e-07	1.296e-07	-6.824	-6.887	-0.063	(0)
CaH2BO3+	9.925e-09	8.583e-09	-8.003	-8.066	-0.063	(0)
MgH2BO3+	4.316e-09	3.733e-09	-8.365	-8.428	-0.063	(0)
BF(OH) 3-	1.214e-09	1.049e-09	-8.916	-8.979	-0.063	(0)
NaH2BO3	8.830e-10	8.830e-10	-9.054	-9.054	0.000	(0)
H5(BO3) 2-	2.024e-12	1.750e-12	-11.694	-11.757	-0.063	(0)
BF2(OH) 2-	1.530e-12	1.323e-12	-11.815	-11.878	-0.063	(0)
BaH2BO3+	2.914e-13	2.520e-13	-12.536	-12.599	-0.063	(0)
AgH2BO3	1.755e-14	1.755e-14	-13.756	-13.756	0.000	(0)
H8(BO3) 3-	3.211e-15	2.777e-15	-14.493	-14.556	-0.063	(0)
BF3OH-	7.018e-18	6.069e-18	-17.154	-17.217	-0.063	(0)
BF4-	4.072e-22	3.521e-22	-21.390	-21.453	-0.063	(0)
Ba	1.112e-07					
Ba+2	1.082e-07	6.293e-08	-6.966	-7.201	-0.235	(0)
BaHCO3+	2.978e-09	2.622e-09	-8.526	-8.581	-0.055	(0)
BaCO3	9.284e-11	9.284e-11	-10.032	-10.032	0.000	(0)
BaH2BO3+	2.914e-13	2.520e-13	-12.536	-12.599	-0.063	(0)
BaOH+	4.436e-14	3.888e-14	-13.353	-13.410	-0.057	(0)
BaNO3+	7.757e-19	6.599e-19	-18.110	-18.181	-0.070	(0)
BaNH3+2	5.086e-19	2.664e-19	-18.294	-18.575	-0.281	(0)
C (4)	5.847e-03					
HCO3-	4.969e-03	4.364e-03	-2.304	-2.360	-0.056	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	1.062e-04	9.354e-05	-3.974	-4.029	-0.055	(0)
MgHCO3+	4.254e-05	3.710e-05	-4.371	-4.431	-0.059	(0)
NaHCO3	1.055e-05	1.055e-05	-4.977	-4.977	0.000	(0)
CuCO3	5.749e-06	5.749e-06	-5.240	-5.240	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	4.945e-06	2.877e-06	-5.306	-5.541	-0.235	(0)
MgCO3	1.988e-06	1.988e-06	-5.702	-5.702	0.000	(0)
MnHCO3+	1.022e-06	8.961e-07	-5.990	-6.048	-0.057	(0)
NaCO3-	2.623e-07	2.303e-07	-6.581	-6.638	-0.056	(0)
CuHCO3+	1.099e-07	9.346e-08	-6.959	-7.029	-0.070	(0)
Cu(CO3) 2-2	8.500e-08	4.452e-08	-7.071	-7.351	-0.281	(0)
ZnCO3	7.753e-08	7.753e-08	-7.111	-7.111	0.000	(0)
ZnHCO3+	7.598e-08	6.463e-08	-7.119	-7.190	-0.070	(0)
NiHCO3+	4.798e-08	4.082e-08	-7.319	-7.389	-0.070	(0)
UO2(CO3) 3-4	4.203e-08	3.162e-09	-7.376	-8.500	-1.124	(0)
UO2(CO3) 2-2	4.188e-08	2.193e-08	-7.378	-7.659	-0.281	(0)
CoHCO3+	2.003e-08	1.704e-08	-7.698	-7.769	-0.070	(0)
NiCO3	8.143e-09	8.143e-09	-8.089	-8.089	0.000	(0)
PbCO3	6.978e-09	6.978e-09	-8.156	-8.156	0.000	(0)
PbHCO3+	3.076e-09	2.617e-09	-8.512	-8.582	-0.070	(0)
BaHCO3+	2.978e-09	2.622e-09	-8.526	-8.581	-0.055	(0)
CoCO3	2.441e-09	2.441e-09	-8.612	-8.612	0.000	(0)
UO2CO3	3.821e-10	3.821e-10	-9.418	-9.418	0.000	(0)
CdCO3	3.230e-10	3.230e-10	-9.491	-9.491	0.000	(0)

	Pb(CO ₃) 2-2	1.105e-10	5.790e-11	-9.956	-10.237	-0.281	(0)
	BaCO ₃	9.284e-11	9.284e-11	-10.032	-10.032	0.000	(0)
	CdHCO ₃ +	5.754e-11	4.895e-11	-10.240	-10.310	-0.070	(0)
	Cd(CO ₃) 2-2	1.315e-12	6.889e-13	-11.881	-12.162	-0.281	(0)
	FeHCO ₃ +	8.914e-13	7.850e-13	-12.050	-12.105	-0.055	(0)
	HgCO ₃	1.440e-14	1.440e-14	-13.842	-13.842	0.000	(0)
	Hg(CO ₃) 2-2	2.501e-16	1.310e-16	-15.602	-15.883	-0.281	(0)
	HgHCO ₃ +	2.241e-17	1.907e-17	-16.649	-16.720	-0.070	(0)
Ca	2.531e-03						
	Ca+2	1.979e-03	1.151e-03	-2.704	-2.939	-0.235	(0)
	CaSO ₄	4.388e-04	4.388e-04	-3.358	-3.358	0.000	(0)
	CaHCO ₃ +	1.062e-04	9.354e-05	-3.974	-4.029	-0.055	(0)
	CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.376e-06	2.082e-06	-5.624	-5.681	-0.057	(0)
	CaH ₂ BO ₃ +	9.925e-09	8.583e-09	-8.003	-8.066	-0.063	(0)
	CaOH+	3.692e-09	3.251e-09	-8.433	-8.488	-0.055	(0)
	CaNH ₃ +2	1.856e-14	9.722e-15	-13.731	-14.012	-0.281	(0)
	CaNO ₃ +	8.953e-15	7.616e-15	-14.048	-14.118	-0.070	(0)
	Ca(NH ₃) 2+2	4.958e-26	2.597e-26	-25.305	-25.586	-0.281	(0)
Cd	1.171e-08						
	Cd+2	8.469e-09	4.927e-09	-8.072	-8.307	-0.235	(0)
	CdSO ₄	1.922e-09	1.922e-09	-8.716	-8.716	0.000	(0)
	CdCl+	8.288e-10	7.051e-10	-9.082	-9.152	-0.070	(0)
	CdCO ₃	3.230e-10	3.230e-10	-9.491	-9.491	0.000	(0)
	Cd(SO ₄) 2-2	8.237e-11	4.314e-11	-10.084	-10.365	-0.281	(0)
	CdHCO ₃ +	5.754e-11	4.895e-11	-10.240	-10.310	-0.070	(0)
	CdF+	1.521e-11	1.294e-11	-10.818	-10.888	-0.070	(0)
	CdOH+	6.511e-12	5.539e-12	-11.186	-11.257	-0.070	(0)
	CdCl ₂	4.405e-12	4.405e-12	-11.356	-11.356	0.000	(0)
	CdOHC1	4.094e-12	4.094e-12	-11.388	-11.388	0.000	(0)
	Cd(CO ₃) 2-2	1.315e-12	6.889e-13	-11.881	-12.162	-0.281	(0)
	Cd(OH) 2	4.946e-15	4.946e-15	-14.306	-14.306	0.000	(0)
	CdCl ₃ -	4.897e-15	4.166e-15	-14.310	-14.380	-0.070	(0)
	CdF ₂	4.280e-15	4.280e-15	-14.369	-14.369	0.000	(0)
	CdSeO ₄	2.571e-18	2.571e-18	-17.590	-17.590	0.000	(0)
	Cd ₂ OH+3	5.861e-19	1.368e-19	-18.232	-18.864	-0.632	(0)
	Cd(OH) 3-	5.028e-20	4.277e-20	-19.299	-19.369	-0.070	(0)
	CdNO ₃ +	3.832e-20	3.260e-20	-19.417	-19.487	-0.070	(0)
	Cd(SeO ₃) 2-2	3.244e-21	1.699e-21	-20.489	-20.770	-0.281	(0)
	Cd(OH) 4-2	1.892e-27	9.909e-28	-26.723	-27.004	-0.281	(0)
	Cd(NO ₃) 2	3.418e-32	3.418e-32	-31.466	-31.466	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.675	-78.745	-0.070	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-149.987	-149.987	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.462	-226.532	-0.070	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.501	-302.782	-0.281	(0)
Cl	1.716e-03						
	Cl-	1.716e-03	1.499e-03	-2.765	-2.824	-0.059	(0)
	AgCl	2.614e-08	2.614e-08	-7.583	-7.583	0.000	(0)
	MnCl+	2.215e-08	1.942e-08	-7.655	-7.712	-0.057	(0)
	AgCl ₂ -	4.011e-09	3.412e-09	-8.397	-8.467	-0.070	(0)
	ZnCl+	2.022e-09	1.763e-09	-8.694	-8.754	-0.059	(0)
	CuCl+	9.245e-10	8.062e-10	-9.034	-9.094	-0.059	(0)
	CdCl+	8.288e-10	7.051e-10	-9.082	-9.152	-0.070	(0)
	CuCl	7.448e-10	7.448e-10	-9.128	-9.128	0.000	(0)
	NiCl+	3.420e-10	2.910e-10	-9.466	-9.536	-0.070	(0)
	ZnOHC1	3.267e-10	3.267e-10	-9.486	-9.486	0.000	(0)
	CoCl+	3.059e-10	2.602e-10	-9.514	-9.585	-0.070	(0)
	CuCl ₂ -	2.674e-10	2.332e-10	-9.573	-9.632	-0.059	(0)
	PbCl+	5.044e-11	4.291e-11	-10.297	-10.367	-0.070	(0)
	MnCl ₂	4.110e-11	4.110e-11	-10.386	-10.386	0.000	(0)
	AgCl ₃ -2	8.702e-12	4.558e-12	-11.060	-11.341	-0.281	(0)
	CdCl ₂	4.405e-12	4.405e-12	-11.356	-11.356	0.000	(0)
	ZnCl ₂	4.188e-12	4.188e-12	-11.378	-11.378	0.000	(0)
	CdOHC1	4.094e-12	4.094e-12	-11.388	-11.388	0.000	(0)
	HgClOH	1.567e-12	1.567e-12	-11.805	-11.805	0.000	(0)
	HgCl ₂	9.394e-13	9.394e-13	-12.027	-12.027	0.000	(0)
	CuCl ₂	4.189e-13	4.189e-13	-12.378	-12.378	0.000	(0)
	PbCl ₂	2.873e-13	2.873e-13	-12.542	-12.542	0.000	(0)

CuCl3-2	1.266e-13	7.472e-14	-12.897	-13.127	-0.229	(0)
AgCl4-3	5.977e-14	1.395e-14	-13.224	-13.856	-0.632	(0)
MnCl3-	1.936e-14	1.697e-14	-13.713	-13.770	-0.057	(0)
HgCl3-	1.655e-14	1.408e-14	-13.781	-13.851	-0.070	(0)
ZnCl3-	5.717e-15	4.986e-15	-14.243	-14.302	-0.059	(0)
CdCl3-	4.897e-15	4.166e-15	-14.310	-14.380	-0.070	(0)
NiCl2	2.196e-15	2.196e-15	-14.658	-14.658	0.000	(0)
CrCl+2	3.272e-16	1.713e-16	-15.485	-15.766	-0.281	(0)
PbCl3-	2.015e-16	1.714e-16	-15.696	-15.766	-0.070	(0)
HgCl4-2	1.604e-16	8.400e-17	-15.795	-16.076	-0.281	(0)
HgCl+	1.470e-16	1.251e-16	-15.833	-15.903	-0.070	(0)
UO2Cl+	9.534e-17	8.110e-17	-16.021	-16.091	-0.070	(0)
CuCl3-	6.719e-18	5.860e-18	-17.173	-17.232	-0.059	(0)
ZnCl4-2	6.332e-18	3.736e-18	-17.198	-17.428	-0.229	(0)
CrOHC12	6.908e-19	6.908e-19	-18.161	-18.161	0.000	(0)
PbCl4-2	2.242e-19	1.174e-19	-18.649	-18.930	-0.281	(0)
FeCl+2	4.287e-20	2.530e-20	-19.368	-19.597	-0.229	(0)
CrCl2+	2.864e-20	2.437e-20	-19.543	-19.613	-0.070	(0)
VOCl+	7.510e-22	6.389e-22	-21.124	-21.195	-0.070	(0)
FeCl2+	1.932e-22	1.694e-22	-21.714	-21.771	-0.057	(0)
CuCl4-2	7.459e-23	4.401e-23	-22.127	-22.356	-0.229	(0)
FeCl3	2.538e-26	2.538e-26	-25.595	-25.595	0.000	(0)
CrO3Cl-	2.074e-26	1.764e-26	-25.683	-25.753	-0.070	(0)
CoCl+2	4.899e-35	2.566e-35	-34.310	-34.591	-0.281	(0)
UCl+3	0.000e+00	0.000e+00	-44.594	-45.226	-0.632	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.224	-64.504	-0.281	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.535	-68.816	-0.281	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.112	-82.393	-0.281	(0)
Co (2)	1.357e-07					
Co+2	9.583e-08	5.019e-08	-7.018	-7.299	-0.281	(0)
CoHCO3+	2.003e-08	1.704e-08	-7.698	-7.769	-0.070	(0)
CoSO4	1.666e-08	1.666e-08	-7.778	-7.778	0.000	(0)
CoCO3	2.441e-09	2.441e-09	-8.612	-8.612	0.000	(0)
CoF+	3.092e-10	2.631e-10	-9.510	-9.580	-0.070	(0)
CoCl+	3.059e-10	2.602e-10	-9.514	-9.585	-0.070	(0)
CoOH+	1.666e-10	1.417e-10	-9.778	-9.848	-0.070	(0)
Co (OH) 2	1.594e-12	1.594e-12	-11.798	-11.798	0.000	(0)
CoNO2+	9.221e-16	7.844e-16	-15.035	-15.105	-0.070	(0)
Co (NH3) +2	7.730e-17	4.048e-17	-16.112	-16.393	-0.281	(0)
CoSeO4	7.050e-17	7.050e-17	-16.152	-16.152	0.000	(0)
Co (OH) 3-	5.290e-18	4.500e-18	-17.277	-17.347	-0.070	(0)
Co2OH+3	1.528e-18	3.566e-19	-17.816	-18.448	-0.632	(0)
CoOOH-	1.328e-18	1.130e-18	-17.877	-17.947	-0.070	(0)
CoNO3+	1.956e-19	1.664e-19	-18.709	-18.779	-0.070	(0)
Co (OH) 4-2	1.928e-25	1.010e-25	-24.715	-24.996	-0.281	(0)
Co (NH3) 2+2	2.212e-26	1.159e-26	-25.655	-25.936	-0.281	(0)
Co4 (OH) 4+4	1.070e-30	8.054e-32	-29.970	-31.094	-1.124	(0)
Co (NO3) 2	7.086e-31	7.086e-31	-30.150	-30.150	0.000	(0)
Co (NH3) 3+2	1.868e-36	9.786e-37	-35.729	-36.009	-0.281	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.182	-46.463	-0.281	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.135	-57.416	-0.281	(0)
Co (3)	1.156e-28					
CoOH+2	1.156e-28	6.052e-29	-27.937	-28.218	-0.281	(0)
Co+3	2.847e-34	8.415e-35	-33.546	-34.075	-0.529	(0)
CoCl+2	4.899e-35	2.566e-35	-34.310	-34.591	-0.281	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.224	-64.504	-0.281	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.352	-77.422	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.937	-82.218	-0.281	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.112	-82.393	-0.281	(0)
Cr (2)	9.568e-26					
Cr+2	9.568e-26	5.011e-26	-25.019	-25.300	-0.281	(0)
Cr (3)	6.427e-09					
Cr (OH) 2+	5.538e-09	4.711e-09	-8.257	-8.327	-0.070	(0)
Cr (OH) +2	5.223e-10	2.735e-10	-9.282	-9.563	-0.281	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.080e-10	1.080e-10	-9.967	-9.967	0.000	(0)
CrF+2	4.431e-12	2.321e-12	-11.354	-11.634	-0.281	(0)
CrO2-	1.967e-12	1.673e-12	-11.706	-11.776	-0.070	(0)

Cr (OH) 4-	1.659e-12	1.411e-12	-11.780	-11.850	-0.070	(0)
CrSO4+	4.035e-13	3.433e-13	-12.394	-12.464	-0.070	(0)
Cr+3	3.786e-13	8.834e-14	-12.422	-13.054	-0.632	(0)
CrCl+2	3.272e-16	1.713e-16	-15.485	-15.766	-0.281	(0)
Cr2 (OH) 2SO4+2	5.099e-18	2.671e-18	-17.292	-17.573	-0.281	(0)
CrOHC12	6.908e-19	6.908e-19	-18.161	-18.161	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.640e-19	2.640e-19	-18.578	-18.578	0.000	(0)
CrCl2+	2.864e-20	2.437e-20	-19.543	-19.613	-0.070	(0)
CrNO3+2	1.543e-26	8.079e-27	-25.812	-26.093	-0.281	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.117	-55.397	-0.281	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.462	-67.094	-0.632	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.535	-68.816	-0.281	(0)
Cr (6)	2.306e-16					
CrO4-2	1.965e-16	1.143e-16	-15.707	-15.942	-0.235	(0)
HCrO4-	3.093e-17	2.631e-17	-16.510	-16.580	-0.070	(0)
NaCrO4-	2.871e-18	2.443e-18	-17.542	-17.612	-0.070	(0)
KCrO4-	3.101e-19	2.638e-19	-18.508	-18.579	-0.070	(0)
CrO3SO4-2	1.811e-24	9.487e-25	-23.742	-24.023	-0.281	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.074e-26	1.764e-26	-25.683	-25.753	-0.070	(0)
Cr2O7-2	4.584e-32	2.401e-32	-31.339	-31.620	-0.281	(0)
Cu (1)	1.476e-09					
CuCl	7.448e-10	7.448e-10	-9.128	-9.128	0.000	(0)
Cu+	4.640e-10	3.948e-10	-9.333	-9.404	-0.070	(0)
CuCl2-	2.674e-10	2.332e-10	-9.573	-9.632	-0.059	(0)
CuCl3-2	1.266e-13	7.472e-14	-12.897	-13.127	-0.229	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.299	-148.609	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.042	-149.339	-0.297	(0)
Cu (2)	6.843e-06					
CuCO3	5.749e-06	5.749e-06	-5.240	-5.240	0.000	(0)
Cu+2	5.835e-07	3.394e-07	-6.234	-6.469	-0.235	(0)
CuOH+	1.742e-07	1.519e-07	-6.759	-6.818	-0.059	(0)
CuSO4	1.294e-07	1.294e-07	-6.888	-6.888	0.000	(0)
CuHCO3+	1.099e-07	9.346e-08	-6.959	-7.029	-0.070	(0)
Cu (CO3) 2-2	8.500e-08	4.452e-08	-7.071	-7.351	-0.281	(0)
Cu (OH) 2	4.290e-09	4.290e-09	-8.368	-8.368	0.000	(0)
CuF+	4.173e-09	3.550e-09	-8.380	-8.450	-0.070	(0)
Cu2 (OH) 2+2	1.107e-09	5.797e-10	-8.956	-9.237	-0.281	(0)
CuCl+	9.245e-10	8.062e-10	-9.034	-9.094	-0.059	(0)
Cu (OH) 3-	1.464e-12	1.246e-12	-11.834	-11.905	-0.070	(0)
CuCl2	4.189e-13	4.189e-13	-12.378	-12.378	0.000	(0)
CuNO2+	9.266e-14	7.882e-14	-13.033	-13.103	-0.070	(0)
CuNH3+2	4.449e-14	2.330e-14	-13.352	-13.633	-0.281	(0)
CuCl3-	6.719e-18	5.860e-18	-17.173	-17.232	-0.059	(0)
Cu (OH) 4-2	2.649e-18	1.387e-18	-17.577	-17.858	-0.281	(0)
CuNO3+	2.640e-18	2.246e-18	-17.578	-17.649	-0.070	(0)
Cu (NO2) 2	1.789e-21	1.789e-21	-20.747	-20.747	0.000	(0)
CuCl4-2	7.459e-23	4.401e-23	-22.127	-22.356	-0.229	(0)
Cu (NO3) 2	5.915e-31	5.915e-31	-30.228	-30.228	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.837	-215.907	-0.070	(0)
F	2.119e-04					
F-	1.898e-04	1.657e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.767e-05	1.545e-05	-4.753	-4.811	-0.058	(0)
CaF+	2.376e-06	2.082e-06	-5.624	-5.681	-0.057	(0)
NaF	4.496e-07	4.496e-07	-6.347	-6.347	0.000	(0)
AlF3	3.292e-07	3.292e-07	-6.483	-6.483	0.000	(0)
AlF2+	1.796e-07	1.578e-07	-6.746	-6.802	-0.056	(0)
MnF+	7.748e-08	6.791e-08	-7.111	-7.168	-0.057	(0)
AlF4-	3.128e-08	2.734e-08	-7.505	-7.563	-0.058	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	4.173e-09	3.550e-09	-8.380	-8.450	-0.070	(0)
AlF+2	4.021e-09	2.391e-09	-8.396	-8.621	-0.226	(0)
ZnF+	1.821e-09	1.549e-09	-8.740	-8.810	-0.070	(0)
BF (OH) 3-	1.214e-09	1.049e-09	-8.916	-8.979	-0.063	(0)
NiF+	3.713e-10	3.159e-10	-9.430	-9.500	-0.070	(0)
CoF+	3.092e-10	2.631e-10	-9.510	-9.580	-0.070	(0)
CdF+	1.521e-11	1.294e-11	-10.818	-10.888	-0.070	(0)
HF2-	1.263e-11	1.099e-11	-10.899	-10.959	-0.061	(0)

PbF+	1.108e-11	9.426e-12	-10.955	-11.026	-0.070	(0)
CrF+2	4.431e-12	2.321e-12	-11.354	-11.634	-0.281	(0)
AgF	3.557e-12	3.557e-12	-11.449	-11.449	0.000	(0)
BF2 (OH) 2-	1.530e-12	1.323e-12	-11.815	-11.878	-0.063	(0)
UO2F+	8.974e-13	7.634e-13	-12.047	-12.117	-0.070	(0)
UO2F2	3.649e-13	3.649e-13	-12.438	-12.438	0.000	(0)
PbF2	3.074e-14	3.074e-14	-13.512	-13.512	0.000	(0)
UO2F3-	1.786e-14	1.519e-14	-13.748	-13.818	-0.070	(0)
CdF2	4.280e-15	4.280e-15	-14.369	-14.369	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.141e-16	4.506e-16	-15.289	-15.346	-0.057	(0)
FeF+2	1.722e-16	1.016e-16	-15.764	-15.993	-0.229	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
VO2F	4.597e-17	4.597e-17	-16.338	-16.338	0.000	(0)
UO2F4-2	3.819e-17	2.000e-17	-16.418	-16.699	-0.281	(0)
PbF3-	1.136e-17	9.665e-18	-16.945	-17.015	-0.070	(0)
BF3OH-	7.018e-18	6.069e-18	-17.154	-17.217	-0.063	(0)
VO2F2-	3.252e-18	2.766e-18	-17.488	-17.558	-0.070	(0)
VOF+	1.776e-19	1.511e-19	-18.751	-18.821	-0.070	(0)
VO2F3-2	1.092e-20	5.719e-21	-19.962	-20.243	-0.281	(0)
VOF2	9.389e-21	9.389e-21	-20.027	-20.027	0.000	(0)
PbF4-2	1.464e-21	7.667e-22	-20.834	-21.115	-0.281	(0)
BF4-	4.072e-22	3.521e-22	-21.390	-21.453	-0.063	(0)
VOF3-	6.491e-23	5.522e-23	-22.188	-22.258	-0.070	(0)
HgF+	3.021e-23	2.570e-23	-22.520	-22.590	-0.070	(0)
VO2F4-3	1.999e-24	4.664e-25	-23.699	-24.331	-0.632	(0)
Sb (OH) 2F	9.976e-25	9.976e-25	-24.001	-24.001	0.000	(0)
SbOF	9.813e-25	9.813e-25	-24.008	-24.008	0.000	(0)
VOF4-2	7.053e-26	3.694e-26	-25.152	-25.432	-0.281	(0)
UF3+	1.688e-34	1.436e-34	-33.773	-33.843	-0.070	(0)
UF2+2	1.044e-35	5.465e-36	-34.981	-35.262	-0.281	(0)
UF4	2.609e-36	2.609e-36	-35.583	-35.583	0.000	(0)
UF5-	2.015e-38	1.714e-38	-37.696	-37.766	-0.070	(0)
UF+3	1.122e-38	2.619e-39	-37.950	-38.582	-0.632	(0)
UF6-2	1.638e-39	8.579e-40	-38.786	-39.067	-0.281	(0)
Fe (2)	3.410e-11					
Fe+2	2.728e-11	1.429e-11	-10.564	-10.845	-0.281	(0)
FeSO4	5.836e-12	5.836e-12	-11.234	-11.234	0.000	(0)
FeHCO3+	8.914e-13	7.850e-13	-12.050	-12.105	-0.055	(0)
FeOH+	9.186e-14	8.051e-14	-13.037	-13.094	-0.057	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.622e-19	4.051e-19	-18.335	-18.392	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.786	-158.786	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.125	-235.195	-0.070	(0)
Fe (3)	3.637e-09					
Fe (OH) 2+	3.203e-09	2.813e-09	-8.494	-8.551	-0.056	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.417e-12	5.635e-12	-11.193	-11.249	-0.056	(0)
FeOH+2	8.656e-14	5.108e-14	-13.063	-13.292	-0.229	(0)
FeF2+	5.141e-16	4.506e-16	-15.289	-15.346	-0.057	(0)
FeF+2	1.722e-16	1.016e-16	-15.764	-15.993	-0.229	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.191e-17	1.044e-17	-16.924	-16.981	-0.057	(0)
Fe+3	1.891e-18	5.590e-19	-17.723	-18.253	-0.529	(0)
Fe (SO4) 2-	4.364e-19	3.713e-19	-18.360	-18.430	-0.070	(0)
FeCl+2	4.287e-20	2.530e-20	-19.368	-19.597	-0.229	(0)
FeCl2+	1.932e-22	1.694e-22	-21.714	-21.771	-0.057	(0)
FeHSeO3+2	3.259e-23	1.707e-23	-22.487	-22.768	-0.281	(0)
Fe2 (OH) 2+4	1.148e-24	8.640e-26	-23.940	-25.063	-1.124	(0)
FeCl3	2.538e-26	2.538e-26	-25.595	-25.595	0.000	(0)
FeNO3+2	2.233e-29	1.170e-29	-28.651	-28.932	-0.281	(0)
Fe3 (OH) 4+5	2.001e-31	3.513e-33	-30.699	-32.454	-1.756	(0)
H (0)	4.021e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.177e-10					
Hg	2.177e-10	2.177e-10	-9.662	-9.662	0.000	(0)
Hg (1)	2.360e-21					
Hg2+2	1.180e-21	6.181e-22	-20.928	-21.209	-0.281	(0)

Hg (2)	3.064e-12					
HgClOH	1.567e-12	1.567e-12	-11.805	-11.805	0.000	(0)
HgCl2	9.394e-13	9.394e-13	-12.027	-12.027	0.000	(0)
Hg (OH) 2	5.264e-13	5.287e-13	-12.279	-12.277	0.002	(0)
HgCl3-	1.655e-14	1.408e-14	-13.781	-13.851	-0.070	(0)
HgCO3	1.440e-14	1.440e-14	-13.842	-13.842	0.000	(0)
Hg (CO3) 2-2	2.501e-16	1.310e-16	-15.602	-15.883	-0.281	(0)
HgCl4-2	1.604e-16	8.400e-17	-15.795	-16.076	-0.281	(0)
HgCl+	1.470e-16	1.251e-16	-15.833	-15.903	-0.070	(0)
HgOH+	2.770e-17	2.357e-17	-16.557	-16.628	-0.070	(0)
HgHCO3+	2.241e-17	1.907e-17	-16.649	-16.720	-0.070	(0)
Hg (OH) 3-	1.107e-20	9.420e-21	-19.956	-20.026	-0.070	(0)
Hg+2	7.986e-21	4.182e-21	-20.098	-20.379	-0.281	(0)
HgSO4	1.822e-21	1.822e-21	-20.739	-20.739	0.000	(0)
HgNH3+2	3.380e-23	1.770e-23	-22.471	-22.752	-0.281	(0)
HgF+	3.021e-23	2.570e-23	-22.520	-22.590	-0.070	(0)
Hg (NH3) 2+2	2.268e-25	1.188e-25	-24.644	-24.925	-0.281	(0)
HgNO3+	3.798e-33	3.231e-33	-32.420	-32.491	-0.070	(0)
Hg (NH3) 3+2	6.057e-36	3.172e-36	-35.218	-35.499	-0.281	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.551	-44.551	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.491	-45.772	-0.281	(0)
HgHS2-	0.000e+00	0.000e+00	-138.124	-138.194	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.948	-138.948	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.473	-139.754	-0.281	(0)
K	7.196e-04					
K+	7.113e-04	6.212e-04	-3.148	-3.207	-0.059	(0)
KSO4-	8.333e-06	7.318e-06	-5.079	-5.136	-0.056	(0)
KCrO4-	3.101e-19	2.638e-19	-18.508	-18.579	-0.070	(0)
Mg	1.742e-03					
Mg+2	1.428e-03	8.308e-04	-2.845	-3.081	-0.235	(0)
MgSO4	2.516e-04	2.516e-04	-3.599	-3.599	0.000	(0)
MgHCO3+	4.254e-05	3.710e-05	-4.371	-4.431	-0.059	(0)
MgF+	1.767e-05	1.545e-05	-4.753	-4.811	-0.058	(0)
MgCO3	1.988e-06	1.988e-06	-5.702	-5.702	0.000	(0)
MgOH+	5.304e-08	4.681e-08	-7.275	-7.330	-0.054	(0)
MgH2BO3+	4.316e-09	3.733e-09	-8.365	-8.428	-0.063	(0)
Mn (2)	2.382e-05					
Mn+2	1.965e-05	1.029e-05	-4.707	-4.988	-0.281	(0)
MnSO4	3.045e-06	3.045e-06	-5.516	-5.516	0.000	(0)
MnHCO3+	1.022e-06	8.961e-07	-5.990	-6.048	-0.057	(0)
MnF+	7.748e-08	6.791e-08	-7.111	-7.168	-0.057	(0)
MnCl+	2.215e-08	1.942e-08	-7.655	-7.712	-0.057	(0)
MnOH+	4.175e-09	3.659e-09	-8.379	-8.437	-0.057	(0)
MnCl2	4.110e-11	4.110e-11	-10.386	-10.386	0.000	(0)
MnCl3-	1.936e-14	1.697e-14	-13.713	-13.770	-0.057	(0)
MnSeO4	7.763e-15	7.763e-15	-14.110	-14.110	0.000	(0)
MnNO3+	4.012e-17	3.413e-17	-16.397	-16.467	-0.070	(0)
Mn (OH) 3-	5.168e-19	4.530e-19	-18.287	-18.344	-0.057	(0)
Mn (OH) 4-2	3.508e-25	2.070e-25	-24.455	-24.684	-0.229	(0)
Mn (NO3) 2	1.794e-28	1.794e-28	-27.746	-27.746	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.936	-42.936	0.000	(0)
Mn (3)	6.551e-25					
Mn+3	6.551e-25	1.936e-25	-24.184	-24.713	-0.529	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.499	-43.728	-0.229	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.414	-47.476	-0.062	(0)
Mo	4.254e-07					
MoO4-2	4.250e-07	2.472e-07	-6.372	-6.607	-0.235	(0)
HMoO4-	4.112e-10	3.498e-10	-9.386	-9.456	-0.070	(0)
H2MoO4	1.822e-13	1.822e-13	-12.739	-12.739	0.000	(0)
Ag2MoO4	6.830e-24	6.830e-24	-23.166	-23.166	0.000	(0)
AlMo6O21-3	1.796e-39	4.191e-40	-38.746	-39.378	-0.632	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.914	-50.442	-2.528	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.448	-51.203	-1.756	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.446	-53.569	-1.124	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.839	-57.471	-0.632	(0)
N (-3)	9.914e-10					

NH4+	9.676e-10	8.368e-10	-9.014	-9.077	-0.063	(0)
NH4SO4-	1.702e-11	1.492e-11	-10.769	-10.826	-0.057	(0)
NH3	6.709e-12	6.709e-12	-11.173	-11.173	0.000	(0)
CuNH3+2	4.449e-14	2.330e-14	-13.352	-13.633	-0.281	(0)
CaNH3+2	1.856e-14	9.722e-15	-13.731	-14.012	-0.281	(0)
NiNH3+2	5.220e-16	2.734e-16	-15.282	-15.563	-0.281	(0)
AgNH3+	1.376e-16	1.170e-16	-15.862	-15.932	-0.070	(0)
Co (NH3) +2	7.730e-17	4.048e-17	-16.112	-16.393	-0.281	(0)
BaNH3+2	5.086e-19	2.664e-19	-18.294	-18.575	-0.281	(0)
HgNH3+2	3.380e-23	1.770e-23	-22.471	-22.752	-0.281	(0)
Ag (NH3) 2+	7.501e-24	6.381e-24	-23.125	-23.195	-0.070	(0)
Ni (NH3) 2+2	5.062e-25	2.651e-25	-24.296	-24.577	-0.281	(0)
Hg (NH3) 2+2	2.268e-25	1.188e-25	-24.644	-24.925	-0.281	(0)
Ca (NH3) 2+2	4.958e-26	2.597e-26	-25.305	-25.586	-0.281	(0)
Co (NH3) 2+2	2.212e-26	1.159e-26	-25.655	-25.936	-0.281	(0)
Hg (NH3) 3+2	6.057e-36	3.172e-36	-35.218	-35.499	-0.281	(0)
Co (NH3) 3+2	1.868e-36	9.786e-37	-35.729	-36.009	-0.281	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.491	-45.772	-0.281	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.182	-46.463	-0.281	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.117	-55.397	-0.281	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.135	-57.416	-0.281	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.224	-64.504	-0.281	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.462	-67.094	-0.632	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.535	-68.816	-0.281	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.352	-77.422	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.937	-82.218	-0.281	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.112	-82.393	-0.281	(0)
N (3)	2.557e-09					
NO2-	2.557e-09	2.218e-09	-8.592	-8.654	-0.062	(0)
CuNO2+	9.266e-14	7.882e-14	-13.033	-13.103	-0.070	(0)
AgNO2	3.959e-15	3.959e-15	-14.402	-14.402	0.000	(0)
CoNO2+	9.221e-16	7.844e-16	-15.035	-15.105	-0.070	(0)
Cu (NO2) 2	1.789e-21	1.789e-21	-20.747	-20.747	0.000	(0)
Ag (NO2) 2-	1.598e-23	1.360e-23	-22.796	-22.867	-0.070	(0)
N (5)	2.405e-12					
NO3-	2.396e-12	2.092e-12	-11.621	-11.679	-0.059	(0)
CaNO3+	8.953e-15	7.616e-15	-14.048	-14.118	-0.070	(0)
MnNO3+	4.012e-17	3.413e-17	-16.397	-16.467	-0.070	(0)
ZnNO3+	2.894e-18	2.462e-18	-17.539	-17.609	-0.070	(0)
CuNO3+	2.640e-18	2.246e-18	-17.578	-17.649	-0.070	(0)
BaNO3+	7.757e-19	6.599e-19	-18.110	-18.181	-0.070	(0)
NiNO3+	4.688e-19	3.988e-19	-18.329	-18.399	-0.070	(0)
CoNO3+	1.956e-19	1.664e-19	-18.709	-18.779	-0.070	(0)
CdNO3+	3.832e-20	3.260e-20	-19.417	-19.487	-0.070	(0)
PbNO3+	2.936e-20	2.497e-20	-19.532	-19.603	-0.070	(0)
AgNO3	1.420e-20	1.420e-20	-19.848	-19.848	0.000	(0)
UO2NO3+	1.637e-25	1.393e-25	-24.786	-24.856	-0.070	(0)
CrNO3+2	1.543e-26	8.079e-27	-25.812	-26.093	-0.281	(0)
Mn (NO3) 2	1.794e-28	1.794e-28	-27.746	-27.746	0.000	(0)
VO2NO3	1.674e-28	1.674e-28	-27.776	-27.776	0.000	(0)
FeNO3+2	2.233e-29	1.170e-29	-28.651	-28.932	-0.281	(0)
Zn (NO3) 2	1.028e-30	1.028e-30	-29.988	-29.988	0.000	(0)
Co (NO3) 2	7.086e-31	7.086e-31	-30.150	-30.150	0.000	(0)
Cu (NO3) 2	5.915e-31	5.915e-31	-30.228	-30.228	0.000	(0)
Pb (NO3) 2	8.874e-32	8.874e-32	-31.052	-31.052	0.000	(0)
Cd (NO3) 2	3.418e-32	3.418e-32	-31.466	-31.466	0.000	(0)
HgNO3+	3.798e-33	3.231e-33	-32.420	-32.491	-0.070	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.551	-44.551	0.000	(0)
Na	4.978e-03					
Na+	4.923e-03	4.299e-03	-2.308	-2.367	-0.059	(0)
NaSO4-	4.375e-05	3.842e-05	-4.359	-4.415	-0.056	(0)
NaHCO3	1.055e-05	1.055e-05	-4.977	-4.977	0.000	(0)
NaF	4.496e-07	4.496e-07	-6.347	-6.347	0.000	(0)
NaCO3-	2.623e-07	2.303e-07	-6.581	-6.638	-0.056	(0)
NaH2BO3	8.830e-10	8.830e-10	-9.054	-9.054	0.000	(0)
NaCrO4-	2.871e-18	2.443e-18	-17.542	-17.612	-0.070	(0)
Ni	2.126e-07					
Ni+2	1.304e-07	7.588e-08	-6.885	-7.120	-0.235	(0)

NiHCO3+	4.798e-08	4.082e-08	-7.319	-7.389	-0.070	(0)
NiSO4	2.519e-08	2.519e-08	-7.599	-7.599	0.000	(0)
NiCO3	8.143e-09	8.143e-09	-8.089	-8.089	0.000	(0)
NiF+	3.713e-10	3.159e-10	-9.430	-9.500	-0.070	(0)
NiCl+	3.420e-10	2.910e-10	-9.466	-9.536	-0.070	(0)
NiOH+	1.589e-10	1.352e-10	-9.799	-9.869	-0.070	(0)
Ni (SO4) 2-2	2.650e-12	1.388e-12	-11.577	-11.858	-0.281	(0)
Ni (OH) 2	1.520e-12	1.520e-12	-11.818	-11.818	0.000	(0)
NiCl2	2.196e-15	2.196e-15	-14.658	-14.658	0.000	(0)
NiNH3+2	5.220e-16	2.734e-16	-15.282	-15.563	-0.281	(0)
Ni (OH) 3-	2.529e-16	2.151e-16	-15.597	-15.667	-0.070	(0)
NiSeO4	9.946e-17	9.946e-17	-16.002	-16.002	0.000	(0)
NiNO3+	4.688e-19	3.988e-19	-18.329	-18.399	-0.070	(0)
Ni (NH3) 2+2	5.062e-25	2.651e-25	-24.296	-24.577	-0.281	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	1.262e-08					
PbCO3	6.978e-09	6.978e-09	-8.156	-8.156	0.000	(0)
PbHCO3+	3.076e-09	2.617e-09	-8.512	-8.582	-0.070	(0)
Pb+2	1.387e-09	8.070e-10	-8.858	-9.093	-0.235	(0)
PbSO4	6.577e-10	6.577e-10	-9.182	-9.182	0.000	(0)
PbOH+	3.373e-10	2.869e-10	-9.472	-9.542	-0.070	(0)
Pb (CO3) 2-2	1.105e-10	5.790e-11	-9.956	-10.237	-0.281	(0)
PbCl+	5.044e-11	4.291e-11	-10.297	-10.367	-0.070	(0)
Pb (SO4) 2-2	1.259e-11	6.595e-12	-10.900	-11.181	-0.281	(0)
PbF+	1.108e-11	9.426e-12	-10.955	-11.026	-0.070	(0)
Pb (OH) 2	1.284e-12	1.284e-12	-11.891	-11.891	0.000	(0)
PbCl2	2.873e-13	2.873e-13	-12.542	-12.542	0.000	(0)
PbF2	3.074e-14	3.074e-14	-13.512	-13.512	0.000	(0)
Pb (OH) 3-	2.136e-16	1.818e-16	-15.670	-15.741	-0.070	(0)
PbCl3-	2.015e-16	1.714e-16	-15.696	-15.766	-0.070	(0)
Pb2OH+3	1.572e-17	3.669e-18	-16.803	-17.435	-0.632	(0)
PbF3-	1.136e-17	9.665e-18	-16.945	-17.015	-0.070	(0)
PbCl4-2	2.242e-19	1.174e-19	-18.649	-18.930	-0.281	(0)
PbNO3+	2.936e-20	2.497e-20	-19.532	-19.603	-0.070	(0)
Pb (OH) 4-2	1.203e-20	6.300e-21	-19.920	-20.201	-0.281	(0)
PbF4-2	1.464e-21	7.667e-22	-20.834	-21.115	-0.281	(0)
Pb3 (OH) 4+2	5.069e-23	2.655e-23	-22.295	-22.576	-0.281	(0)
Pb4 (OH) 4+4	2.262e-27	1.702e-28	-26.646	-27.769	-1.124	(0)
Pb (NO3) 2	8.874e-32	8.874e-32	-31.052	-31.052	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.714	-150.714	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.790	-227.860	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.700	-72.700	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.375	-78.446	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.574	-78.574	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.675	-78.745	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.382	-80.663	-0.281	(0)
S6-2	0.000e+00	0.000e+00	-80.898	-81.179	-0.281	(0)
S4-2	0.000e+00	0.000e+00	-80.978	-81.258	-0.281	(0)
S3-2	0.000e+00	0.000e+00	-81.783	-82.064	-0.281	(0)
S2-2	0.000e+00	0.000e+00	-82.800	-83.080	-0.281	(0)
S-2	0.000e+00	0.000e+00	-88.369	-88.598	-0.229	(0)
HgHS2-	0.000e+00	0.000e+00	-138.124	-138.194	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.948	-138.948	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.473	-139.754	-0.281	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.975	-147.045	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.213	-147.381	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.299	-148.609	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.042	-149.339	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.192	-149.263	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.356	-149.673	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.681	-149.984	-0.303	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.987	-149.987	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.401	-150.401	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.714	-150.714	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.786	-158.786	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.837	-215.907	-0.070	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-225.496	-225.566	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.462	-226.532	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.790	-227.860	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.117	-228.398	-0.281	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.125	-235.195	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.501	-302.782	-0.281	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.191	-305.472	-0.281	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.941	-317.222	-0.281	(0)
S (6)	3.606e-03					
SO4-2	2.861e-03	1.664e-03	-2.544	-2.779	-0.235	(0)
CaSO4	4.388e-04	4.388e-04	-3.358	-3.358	0.000	(0)
MgSO4	2.516e-04	2.516e-04	-3.599	-3.599	0.000	(0)
NaSO4-	4.375e-05	3.842e-05	-4.359	-4.415	-0.056	(0)
KSO4-	8.333e-06	7.318e-06	-5.079	-5.136	-0.056	(0)
MnSO4	3.045e-06	3.045e-06	-5.516	-5.516	0.000	(0)
ZnSO4	1.705e-07	1.705e-07	-6.768	-6.768	0.000	(0)
CuSO4	1.294e-07	1.294e-07	-6.888	-6.888	0.000	(0)
NiSO4	2.519e-08	2.519e-08	-7.599	-7.599	0.000	(0)
CoSO4	1.666e-08	1.666e-08	-7.778	-7.778	0.000	(0)
HSO4-	1.323e-08	1.156e-08	-7.879	-7.937	-0.058	(0)
Zn (SO4) 2-2	4.718e-09	2.471e-09	-8.326	-8.607	-0.281	(0)
CdSO4	1.922e-09	1.922e-09	-8.716	-8.716	0.000	(0)
PbSO4	6.577e-10	6.577e-10	-9.182	-9.182	0.000	(0)
AgSO4-	3.334e-10	2.836e-10	-9.477	-9.547	-0.070	(0)
CrOHSO4	1.080e-10	1.080e-10	-9.967	-9.967	0.000	(0)
Cd (SO4) 2-2	8.237e-11	4.314e-11	-10.084	-10.365	-0.281	(0)
AlSO4+	2.131e-11	1.863e-11	-10.671	-10.730	-0.058	(0)
NH4SO4-	1.702e-11	1.492e-11	-10.769	-10.826	-0.057	(0)
Pb (SO4) 2-2	1.259e-11	6.595e-12	-10.900	-11.181	-0.281	(0)
FeSO4	5.836e-12	5.836e-12	-11.234	-11.234	0.000	(0)
Ni (SO4) 2-2	2.650e-12	1.388e-12	-11.577	-11.858	-0.281	(0)
CrSO4+	4.035e-13	3.433e-13	-12.394	-12.464	-0.070	(0)
Al (SO4) 2-	3.800e-13	3.322e-13	-12.420	-12.479	-0.058	(0)
UO2SO4	8.404e-14	8.404e-14	-13.076	-13.076	0.000	(0)
UO2 (SO4) 2-2	3.520e-15	1.844e-15	-14.453	-14.734	-0.281	(0)
FeSO4+	1.191e-17	1.044e-17	-16.924	-16.981	-0.057	(0)
VO2SO4-	7.386e-18	6.283e-18	-17.132	-17.202	-0.070	(0)
Cr2 (OH) 2SO4+2	5.099e-18	2.671e-18	-17.292	-17.573	-0.281	(0)
Fe (SO4) 2-	4.364e-19	3.713e-19	-18.360	-18.430	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.640e-19	2.640e-19	-18.578	-18.578	0.000	(0)
VOSO4	6.964e-20	6.964e-20	-19.157	-19.157	0.000	(0)
HgSO4	1.822e-21	1.822e-21	-20.739	-20.739	0.000	(0)
CrO3SO4-2	1.811e-24	9.487e-25	-23.742	-24.023	-0.281	(0)
VSO4+	8.372e-34	7.122e-34	-33.077	-33.147	-0.070	(0)
U (SO4) 2	6.935e-40	6.935e-40	-39.159	-39.159	0.000	(0)
USO4+2	1.002e-40	0.000e+00	-39.999	-40.280	-0.281	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.352	-77.422	-0.070	(0)
Sb (3)	1.070e-19					
Sb (OH) 3	5.416e-20	5.416e-20	-19.266	-19.266	0.000	(0)
HSbO2	5.288e-20	5.288e-20	-19.277	-19.277	0.000	(0)
SbO2-	1.416e-24	1.204e-24	-23.849	-23.919	-0.070	(0)
Sb (OH) 2F	9.976e-25	9.976e-25	-24.001	-24.001	0.000	(0)
SbOF	9.813e-25	9.813e-25	-24.008	-24.008	0.000	(0)
Sb (OH) 4-	8.107e-25	6.897e-25	-24.091	-24.161	-0.070	(0)
Sb (OH) 2+	1.100e-25	9.356e-26	-24.959	-25.029	-0.070	(0)
SbO+	3.793e-26	3.227e-26	-25.421	-25.491	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.941	-317.222	-0.281	(0)
Sb (5)	1.316e-08					
SbO3-	1.314e-08	1.118e-08	-7.881	-7.952	-0.070	(0)
Sb (OH) 6-	1.496e-11	1.306e-11	-10.825	-10.884	-0.059	(0)
SbO2+	1.907e-23	1.622e-23	-22.720	-22.790	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.285e-40	1.944e-40	-39.641	-39.711	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.936	-42.936	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.969	-42.969	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.282	-47.563	-0.281	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.432	-86.556	-1.124	(0)

Se (4)	1.482e-08					
HSeO3-	1.358e-08	1.156e-08	-7.867	-7.937	-0.070	(0)
SeO3-2	1.235e-09	6.469e-10	-8.908	-9.189	-0.281	(0)
H2SeO3	3.506e-13	3.506e-13	-12.455	-12.455	0.000	(0)
AgSeO3-	4.175e-15	3.552e-15	-14.379	-14.450	-0.070	(0)
Cd (SeO3) 2-2	3.244e-21	1.699e-21	-20.489	-20.770	-0.281	(0)
Ag (SeO3) 2-3	8.817e-23	2.057e-23	-22.055	-22.687	-0.632	(0)
FeHSeO3+2	3.259e-23	1.707e-23	-22.487	-22.768	-0.281	(0)
Se (6)	4.826e-12					
SeO4-2	4.818e-12	2.803e-12	-11.317	-11.552	-0.235	(0)
MnSeO4	7.763e-15	7.763e-15	-14.110	-14.110	0.000	(0)
ZnSeO4	2.033e-16	2.033e-16	-15.692	-15.692	0.000	(0)
NiSeO4	9.946e-17	9.946e-17	-16.002	-16.002	0.000	(0)
CoSeO4	7.050e-17	7.050e-17	-16.152	-16.152	0.000	(0)
HSeO4-	1.174e-17	9.989e-18	-16.930	-17.000	-0.070	(0)
CdSeO4	2.571e-18	2.571e-18	-17.590	-17.590	0.000	(0)
Zn (SeO4) 2-2	1.103e-27	5.777e-28	-26.957	-27.238	-0.281	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.890	-58.522	-0.632	(0)
U (4)	3.885e-22					
U (OH) 5-	3.875e-22	3.297e-22	-21.412	-21.482	-0.070	(0)
U (OH) 4	9.822e-25	9.822e-25	-24.008	-24.008	0.000	(0)
U (OH) 3+	3.003e-28	2.555e-28	-27.522	-27.593	-0.070	(0)
U (OH) 2+2	1.605e-32	8.404e-33	-31.795	-32.076	-0.281	(0)
UF3+	1.688e-34	1.436e-34	-33.773	-33.843	-0.070	(0)
UF2+2	1.044e-35	5.465e-36	-34.981	-35.262	-0.281	(0)
UF4	2.609e-36	2.609e-36	-35.583	-35.583	0.000	(0)
UOH+3	1.207e-37	2.816e-38	-36.918	-37.550	-0.632	(0)
UF5-	2.015e-38	1.714e-38	-37.696	-37.766	-0.070	(0)
UF+3	1.122e-38	2.619e-39	-37.950	-38.582	-0.632	(0)
UF6-2	1.638e-39	8.579e-40	-38.786	-39.067	-0.281	(0)
U (SO4) 2	6.935e-40	6.935e-40	-39.159	-39.159	0.000	(0)
USO4+2	1.002e-40	0.000e+00	-39.999	-40.280	-0.281	(0)
U+4	0.000e+00	0.000e+00	-42.978	-44.101	-1.124	(0)
UCl+3	0.000e+00	0.000e+00	-44.594	-45.226	-0.632	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.857	-174.545	-5.688	(0)
U (5)	5.677e-17					
UO2+	5.677e-17	4.830e-17	-16.246	-16.316	-0.070	(0)
U (6)	8.429e-08					
UO2 (CO3) 3-4	4.203e-08	3.162e-09	-7.376	-8.500	-1.124	(0)
UO2 (CO3) 2-2	4.188e-08	2.193e-08	-7.378	-7.659	-0.281	(0)
UO2CO3	3.821e-10	3.821e-10	-9.418	-9.418	0.000	(0)
UO2F+	8.974e-13	7.634e-13	-12.047	-12.117	-0.070	(0)
UO2OH+	6.989e-13	5.946e-13	-12.156	-12.226	-0.070	(0)
UO2F2	3.649e-13	3.649e-13	-12.438	-12.438	0.000	(0)
UO2SO4	8.404e-14	8.404e-14	-13.076	-13.076	0.000	(0)
UO2+2	5.736e-14	3.337e-14	-13.241	-13.477	-0.235	(0)
UO2F3-	1.786e-14	1.519e-14	-13.748	-13.818	-0.070	(0)
UO2 (SO4) 2-2	3.520e-15	1.844e-15	-14.453	-14.734	-0.281	(0)
UO2C1+	9.534e-17	8.110e-17	-16.021	-16.091	-0.070	(0)
UO2F4-2	3.819e-17	2.000e-17	-16.418	-16.699	-0.281	(0)
(UO2) 2 (OH) 2+2	1.120e-18	5.867e-19	-17.951	-18.232	-0.281	(0)
(UO2) 3 (OH) 5+	6.231e-21	5.301e-21	-20.205	-20.276	-0.070	(0)
UO2NO3+	1.637e-25	1.393e-25	-24.786	-24.856	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.246	-42.316	-0.070	(0)
V+2	0.000e+00	0.000e+00	-42.696	-42.977	-0.281	(0)
V (3)	2.074e-15					
V (OH) 3	2.074e-15	2.074e-15	-14.683	-14.683	0.000	(0)
V (OH) 2+	1.120e-25	9.532e-26	-24.951	-25.021	-0.070	(0)
VOH+2	1.228e-28	6.431e-29	-27.911	-28.192	-0.281	(0)
V+3	3.885e-33	9.066e-34	-32.411	-33.043	-0.632	(0)
VSO4+	8.372e-34	7.122e-34	-33.077	-33.147	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.129	-54.761	-0.632	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.460	-55.583	-1.124	(0)
V (4)	5.590e-18					
V (OH) 3+	5.043e-18	4.290e-18	-17.297	-17.368	-0.070	(0)
VO+2	2.901e-19	1.520e-19	-18.537	-18.818	-0.281	(0)

VOF+	1.776e-19	1.511e-19	-18.751	-18.821	-0.070	(0)
VOSO4	6.964e-20	6.964e-20	-19.157	-19.157	0.000	(0)
VOF2	9.389e-21	9.389e-21	-20.027	-20.027	0.000	(0)
VOC1+	7.510e-22	6.389e-22	-21.124	-21.195	-0.070	(0)
VOF3-	6.491e-23	5.522e-23	-22.188	-22.258	-0.070	(0)
VOF4-2	7.053e-26	3.694e-26	-25.152	-25.432	-0.281	(0)
H2V2O4+2	1.762e-30	9.230e-31	-29.754	-30.035	-0.281	(0)
V(5)	1.947e-09					
H2VO4-	1.841e-09	1.566e-09	-8.735	-8.805	-0.070	(0)
HVO4-2	1.056e-10	5.531e-11	-9.976	-10.257	-0.281	(0)
H3VO4	1.114e-12	1.114e-12	-11.953	-11.953	0.000	(0)
H3V2O7-	1.324e-14	1.126e-14	-13.878	-13.948	-0.070	(0)
VO2+	1.811e-16	1.581e-16	-15.742	-15.801	-0.059	(0)
HV2O7-3	1.258e-16	2.936e-17	-15.900	-16.532	-0.632	(0)
VO2F	4.597e-17	4.597e-17	-16.338	-16.338	0.000	(0)
VO4-3	1.670e-17	3.898e-18	-16.777	-17.409	-0.632	(0)
VO2SO4-	7.386e-18	6.283e-18	-17.132	-17.202	-0.070	(0)
VO2F2-	3.252e-18	2.766e-18	-17.488	-17.558	-0.070	(0)
V2O7-4	1.477e-19	1.111e-20	-18.831	-19.954	-1.124	(0)
V3O9-3	1.725e-20	4.025e-21	-19.763	-20.395	-0.632	(0)
VO2F3-2	1.092e-20	5.719e-21	-19.962	-20.243	-0.281	(0)
VO2F4-3	1.999e-24	4.664e-25	-23.699	-24.331	-0.632	(0)
V4O12-4	3.493e-26	2.628e-27	-25.457	-26.580	-1.124	(0)
VO2NO3	1.674e-28	1.674e-28	-27.776	-27.776	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-64.943	-66.698	-1.756	(0)
V10O28-6	0.000e+00	0.000e+00	-65.209	-67.737	-2.528	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.515	-68.639	-1.124	(0)
Zn	1.146e-06					
Zn+2	8.052e-07	4.684e-07	-6.094	-6.329	-0.235	(0)
ZnSO4	1.705e-07	1.705e-07	-6.768	-6.768	0.000	(0)
ZnCO3	7.753e-08	7.753e-08	-7.111	-7.111	0.000	(0)
ZnHCO3+	7.598e-08	6.463e-08	-7.119	-7.190	-0.070	(0)
ZnOH+	7.793e-09	6.629e-09	-8.108	-8.179	-0.070	(0)
Zn(SO4) 2-2	4.718e-09	2.471e-09	-8.326	-8.607	-0.281	(0)
ZnCl+	2.022e-09	1.763e-09	-8.694	-8.754	-0.059	(0)
ZnF+	1.821e-09	1.549e-09	-8.740	-8.810	-0.070	(0)
ZnOHCl	3.267e-10	3.267e-10	-9.486	-9.486	0.000	(0)
Zn(OH) 2	1.487e-10	1.487e-10	-9.828	-9.828	0.000	(0)
ZnCl2	4.188e-12	4.188e-12	-11.378	-11.378	0.000	(0)
Zn(OH) 3-	1.240e-13	1.055e-13	-12.907	-12.977	-0.070	(0)
ZnCl3-	5.717e-15	4.986e-15	-14.243	-14.302	-0.059	(0)
ZnSeO4	2.033e-16	2.033e-16	-15.692	-15.692	0.000	(0)
ZnCl4-2	6.332e-18	3.736e-18	-17.198	-17.428	-0.229	(0)
ZnNO3+	2.894e-18	2.462e-18	-17.539	-17.609	-0.070	(0)
Zn(OH) 4-2	1.135e-18	5.944e-19	-17.945	-18.226	-0.281	(0)
Zn(SeO4) 2-2	1.103e-27	5.777e-28	-26.957	-27.238	-0.281	(0)
Zn(NO3) 2	1.028e-30	1.028e-30	-29.988	-29.988	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.192	-149.263	-0.070	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.401	-150.401	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.496	-225.566	-0.070	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.117	-228.398	-0.281	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.191	-305.472	-0.281	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-76.19	-69.90	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-56.70	-52.19	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-63.93	-52.19	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-98.62	-80.69	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-74.16	-54.12	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.50	-34.10	0.40	(NH4)2CrO4
(NH4)2SeO4	-30.16	-29.71	0.45	(NH4)2SeO4
Acanthite	-51.21	-87.43	-36.22	Ag2S
Ag2CO3	-10.59	-21.68	-11.09	Ag2CO3
Ag2CrO4	-20.49	-32.08	-11.59	Ag2CrO4
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4

Ag2MoO4	-11.19	-22.74	-11.55	Ag2MoO4
Ag2O	-14.41	-1.84	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.10	-18.92	-4.82	Ag2SO4
Ag3AsO3	-27.18	-25.02	2.16	Ag3AsO3
Ag3AsO4	-15.58	-18.37	-2.79	Ag3AsO4
Ag3H2VO5	-16.59	-11.41	5.18	Ag3H2VO5
AgF:4H2O	-12.90	-11.85	1.05	AgF:4H2O
Agmetal	-0.19	-13.69	-13.51	Ag
AgVO3	-10.34	-9.57	0.77	AgVO3
Al (OH) 3 (am)	-1.20	9.60	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.87	-43.50	2.37	Al2 (MoO4) 3
Al2O3	-0.45	19.21	19.65	Al2O3
Al4 (OH) 10SO4	-1.36	21.34	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.81	-6.01	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.08	-11.87	-7.79	PbSO4
Anhydrite	-1.36	-5.72	-4.36	CaSO4
Anilite	-55.14	-87.02	-31.88	Cu0.25Cu1.5S
Antlerite	-2.38	6.40	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-86.27	-89.03	-2.76	As4O6
Artinite	-7.01	2.59	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.93	-31.22	6.71	As2O5
Atacamite	-1.71	5.68	7.39	Cu2 (OH) 3Cl
Azurite	0.71	-16.19	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.30	7.09	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.99	-3.12	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-1.03	-9.94	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.96	3.98	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.47	-23.14	-9.67	BaCrO4
BaF2	-8.94	-14.76	-5.82	BaF2
BaMoO4	-6.85	-13.81	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-11.29	-18.75	-7.46	BaSeO4
Bianchite	-7.34	-9.11	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.89	-6.54	-0.64	Mn2O3
BlaubleiI	-54.84	-79.00	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.42	-82.70	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.99	14.23	15.22	Cu4 (OH) 6SO4
Brucite	-5.63	11.22	16.84	Mg (OH) 2
Bunsenite	-5.27	7.18	12.45	NiO
Ca (VO3) 2	-11.61	-5.95	5.66	Ca (VO3) 2
Ca2V2O7	-12.09	5.41	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.14	5.41	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-19.45	2.85	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-22.20	16.76	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.10	16.76	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.70	-157.73	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.95	-26.86	-17.91	Hg2Cl2
CaMoO4	-1.60	-9.55	-7.95	CaMoO4
Carnotite	-4.12	-3.89	0.23	KUO2VO4
CaSeO3:2H2O	-6.54	-3.73	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.47	-14.49	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.45	-3.61	9.84	Cd (BO2) 2
Cd (OH) 2	-7.66	5.99	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.74	5.99	13.73	Cd (OH) 2

Cd3 (OH) 2 (SO4) 2	-22.89	-16.18	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.67	0.89	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-21.52	6.88	28.40	Cd4 (OH) 6SO4
CdCl2	-13.30	-13.96	-0.66	CdCl2
CdCl2:1H2O	-12.26	-13.96	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.04	-13.96	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal (alpha)	-33.07	-19.56	13.51	Cd
Cdmetal (gamma)	-33.17	-19.56	13.62	Cd
CdMoO4	-0.76	-14.91	-14.15	CdMoO4
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.79	-77.14	-0.35	CdSb
CdSe	-20.67	-40.87	-20.20	CdSe
CdSeO4:2H2O	-18.01	-19.86	-1.85	CdSeO4:2H2O
CdSO4	-10.91	-11.09	-0.17	CdSO4
CdSO4:1H2O	-9.36	-11.09	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.21	-11.09	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-1.50	-14.63	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.61	-9.25	-2.64	CuSO4:5H2O
Chalcocite	-55.18	-90.10	-34.92	Cu2S
Chalcopyrite	-124.64	-159.91	-35.27	CuFeS2
Cinnabar	-52.18	-97.87	-45.69	HgS
Claudetite	-85.96	-89.03	-3.06	As4O6
Clausthalite	-14.56	-41.66	-27.10	PbSe
Co (BO2) 2	-29.67	-2.60	27.07	Co (BO2) 2
Co (OH) 2	-6.10	7.00	13.09	Co (OH) 2
Co (OH) 3	-10.32	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-23.26	-10.23	13.03	Co3 (AsO4) 2
Co3O4	-7.77	-18.27	-10.50	Co3O4
CoCl2	-21.22	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.49	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.26	-14.86	-1.60	CoF2
CoF3	-43.96	-45.42	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.15	-13.91	-7.76	CoMoO4
CoO	-6.59	7.00	13.59	CoO
CoS (alpha)	-71.16	-78.60	-7.44	CoS
CoS (beta)	-67.53	-78.60	-11.07	CoS
CoSe	-23.66	-39.86	-16.20	CoSe
CoSeO3	-9.41	-8.09	1.32	CoSeO3
CoSeO4:6H2O	-17.32	-18.85	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.08	2.80	CoSO4
CoSO4:6H2O	-7.61	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.96	-14.74	-4.78	PbCl2
Covellite	-55.47	-77.77	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.04	-30.95	14.09	CrCl2
CrCl3	-46.21	-31.10	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.78	-41.62	-33.84	Na3AlF6
Cu (OH) 2	-0.85	7.83	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.83	20.38	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.43	-3.17	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.45	-90.33	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.57	-51.37	-45.80	Cu2Se
Cu2SO4	-19.64	-21.59	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.84	-7.74	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.07	-102.67	-42.59	Cu3Sb
Cu3Se2	-26.91	-90.40	-63.49	Cu3Se2

CuCO3	-0.51	-12.01	-11.50	CuCO3
CuCrO4	-16.97	-22.41	-5.44	CuCrO4
CuF	-8.28	-13.18	-4.91	CuF
CuF2	-15.15	-14.03	1.12	CuF2
CuF2:2H2O	-9.48	-14.03	-4.55	CuF2:2H2O
Cumetal	-6.27	-15.03	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.72	-1.42	10.30	CuOCuSO4
Cupricferrite	8.22	14.21	5.99	CuFe2O4
Cuprite	-3.11	-4.51	-1.41	Cu2O
Cuprousferrite	9.85	0.94	-8.92	CuFeO2
CuSe	-5.93	-39.03	-33.10	CuSe
CuSe2	-26.98	-60.35	-33.37	CuSe2
CuSeO3:2H2O	-7.77	-7.26	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.58	-18.02	-2.44	CuSeO4:5H2O
CuSO4	-12.19	-9.25	2.94	CuSO4
Diaspore	2.73	9.60	6.87	AlOOH
Djurleite	-55.37	-89.29	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.73	-5.86	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.14	-13.86	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.26	-8.70	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.25	-38.87	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.11	-44.84	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.82	-12.42	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.36	-17.45	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.13	-64.72	-18.60	FeSe2
FeS(ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.41	-43.41	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	1.31	9.60	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.10	-9.11	-2.01	ZnSO4:7H2O
Greenockite	-65.25	-79.61	-14.36	CdS
Greigite	-287.51	-332.54	-45.03	Fe3S4
Gummite	-6.85	0.82	7.67	UO3
Gypsum	-1.11	-5.72	-4.61	CaSO4:2H2O
H-Jarosite	-12.48	-24.58	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.03	-20.90	-12.88	H2MoO4
H2S(g)	-77.58	-85.59	-8.01	H2S
H2Se(g)	-41.90	-46.86	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.24	22.66	22.89	FeAl2O4
Hg(CH3)2(g)	-182.60	-256.31	-73.71	Hg(CH3)2
Hg(g)	-8.36	-16.23	-7.87	Hg
Hg(OH)2	-8.78	-12.28	-3.50	Hg(OH)2
Hg2(g)	-17.50	-32.46	-14.96	Hg2
Hg2(OH)2	-12.17	-6.91	5.26	Hg2(OH)2
Hg2CO3	-10.70	-26.75	-16.05	Hg2CO3
Hg2CrO4	-28.45	-37.15	-8.70	Hg2CrO4
Hg2F2	-18.41	-28.77	-10.36	Hg2F2
Hg2S	-80.83	-92.51	-11.68	Hg2S
Hg2SeO3	-17.34	-22.00	-4.66	Hg2SeO3
Hg2SO4	-17.86	-23.99	-6.13	Hg2SO4
Hg3O2CO3	-26.99	-56.67	-29.68	Hg3O2CO3
HgCl(g)	-32.93	-13.43	19.50	HgCl
HgCl2	-10.96	-32.22	-21.26	HgCl2
HgF(g)	-47.06	-14.39	32.68	HgF

HgF2(g)	-46.70	-34.13	12.57	HgF2
Hgmetal(l)	-2.78	-16.23	-13.45	Hg
HgSe	-3.44	-59.14	-55.69	HgSe
HgSeO3	-14.93	-27.36	-12.43	HgSeO3
HgSO4	-19.93	-29.35	-9.42	HgSO4
Huntite	-4.38	-34.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.30	-24.07	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.51	-23.27	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-15.44	-20.61	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.84	-20.64	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.35	-52.59	-17.24	K2Cr2O7
K2CrO4	-21.84	-22.36	-0.51	K2CrO4
K2MoO4	-16.28	-13.02	3.26	K2MoO4
K2SeO4	-17.24	-17.97	-0.73	K2SeO4
Langite	-3.26	14.23	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.23	-6.67	-0.43	PbO:PbSO4
Laurionite	-5.39	-4.77	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.49	5.20	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.12	-4.18	-5.31	Cu2(OH)2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.69	5.20	12.89	PbO
Matlockite	-6.72	-15.70	-8.97	PbClF
Melanothallite	-18.38	-12.12	6.26	CuCl2
Melanterite	-11.42	-13.62	-2.21	FeSO4·7H2O
Metacinnabar	-52.78	-97.87	-45.09	HgS
Mg(OH)2(active)	-7.58	11.22	18.79	Mg(OH)2
Mg(VO3)2	-17.37	-6.09	11.28	Mg(VO3)2
Mg2Sb3	-276.09	-201.41	74.68	Mg2Sb3
Mg2V2O7	-21.24	5.12	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.84	-9.69	-1.85	MgMoO4
MgSeO3·6H2O	-6.93	-3.87	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-13.43	-14.63	-1.20	MgSeO4·6H2O
Minium	-32.37	41.15	73.52	Pb3O4
Mirabilite	-6.40	-7.51	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.90	-8.00	4.90	Mn(VO3)2
Mn2(SO4)3	-52.05	-57.76	-5.71	Mn2(SO4)3
Mn2Sb	-151.14	-90.06	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-15.80	-3.30	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.35	-10.64	2.72	MnCl2·4H2O
MnS(grn)	-76.46	-76.29	0.17	MnS
MnS(pnk)	-79.63	-76.29	3.34	MnS
MnSb	-96.26	-99.17	-2.91	MnSb
MnSe	-41.05	-37.55	3.50	MnSe
MnSeO3	-6.91	-5.78	1.13	MnSeO3
MnSeO3·2H2O	-6.76	-5.78	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.49	-16.54	-2.05	MnSeO4·5H2O
MnSO4	-10.35	-7.77	2.58	MnSO4
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.64	-12.28	-3.64	HgO
MoO3	-12.90	-20.90	-8.00	MoO3
Morenosite	-7.75	-9.90	-2.14	NiSO4·7H2O
MoS2	-147.37	-217.63	-70.26	MoS2
Na-Jarosite	-8.59	-19.79	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.61	-20.68	2.93	Na2CrO4
Na2Mo2O7	-15.65	-32.24	-16.60	Na2Mo2O7
Na2MoO4	-12.83	-11.34	1.49	Na2MoO4
Na2MoO4·2H2O	-12.56	-11.34	1.22	Na2MoO4·2H2O

Na2SeO3:5H2O	-15.82	-5.52	10.30	Na2SeO3:5H2O
Na2SeO4	-17.57	-16.29	1.28	Na2SeO4
Na3Sb	-176.01	-81.56	94.45	Na3Sb
Na3VO4	-30.99	5.69	36.68	Na3VO4
Na4V2O7	-35.58	1.82	37.40	Na4V2O7
Nantokite	-5.50	-12.23	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.28	-1.31	Na2CO3:10H2O
NaVO3	-7.73	-3.87	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.62	7.18	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.39	-9.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.58	-13.73	-11.14	NiMoO4
NiS(alpha)	-72.82	-78.42	-5.60	NiS
NiS(beta)	-67.32	-78.42	-11.10	NiS
NiS(gamma)	-65.62	-78.42	-12.80	NiS
NiSe	-21.98	-39.68	-17.70	NiSe
NiSeO3:2H2O	-10.72	-7.91	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.15	-18.67	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-240.23	-301.29	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.91	-4.40	6.52	Pb(BO2)2
Pb(OH)2	-2.95	5.20	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.23	-66.99	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.36	0.43	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.78	10.41	26.19	Pb2O(OH)2
Pb2O3	-25.09	35.95	61.04	Pb2O3
Pb2OCO3	-8.87	-9.43	-0.56	Pb2OCO3
Pb2V2O7	-5.00	-6.90	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.41	-15.61	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.84	-1.70	6.14	Pb3(VO4)2
Pb3O2CO3	-15.25	-4.23	11.02	Pb3O2CO3
Pb3O2SO4	-12.15	-1.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.36	3.74	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.14	3.74	21.88	Pb4O3SO4
PbCrO4	-12.43	-25.03	-12.60	PbCrO4
PbF2	-9.21	-16.65	-7.44	PbF2
Pbmetal	-24.59	-20.34	4.25	Pb
PbMoO4	-0.08	-15.70	-15.62	PbMoO4
PbO:0.3H2O	-7.78	5.20	12.98	PbO:0.33H2O
PbSeO4	-13.81	-20.65	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.57	-29.38	-19.81	PbCl2:PbCO3
Plattnerite	-18.85	30.75	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.68	-142.19	-18.51	FeS2
Pyrochroite	-5.89	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.88	-120.62	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb(OH)3	-12.16	-19.27	-7.11	Sb(OH)3
Sb2O4	-16.39	-12.99	3.40	Sb2O4
Sb2O5	-26.40	-36.06	-9.67	Sb2O5
Sb2Se3	-111.35	-179.11	-67.76	Sb2Se3
Sb4O6(cubic)	-58.80	-77.06	-18.26	Sb4O6
Sb4O6(orth)	-59.16	-77.06	-17.90	Sb4O6
SbCl3	-49.75	-49.18	0.57	SbCl3
SbF3	-41.83	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-5.18	0.82	5.99	UO2(OH)2:H2O
Semetal(am)	-14.20	-21.31	-7.11	Se

Semetal(hex	-13.61	-21.31	-7.71	Se
Senarmontite	-26.17	-38.53	-12.37	Sb2O3
SeO2	-15.21	-15.09	0.12	SeO2
SeO3	-46.89	-25.85	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.18	-77.63	-11.45	ZnS
Spinel	-6.43	30.42	36.85	MgAl2O4
Stibnite	-244.85	-295.31	-50.46	Sb2S3
Sulfur	-57.90	-60.05	-2.14	S
Tenorite	0.18	7.83	7.64	CuO
Thenardite	-7.83	-7.51	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-8.39	-4.31	4.08	Ca(UO2)2(VO4)2
U3O8	-16.52	4.56	21.08	U3O8
U3Sb4	-582.51	-430.13	152.38	U3Sb4
U4O9	-33.47	-36.49	-3.02	U4O9
UF4	-29.69	-59.22	-29.54	UF4
UF4:2.5H2O	-26.51	-59.22	-32.72	UF4:2.5H2O
UO2(am)	-16.44	-15.51	0.93	UO2
UO2(NO3)2	-48.98	-36.84	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-41.69	-36.84	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.23	-36.84	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.88	-36.84	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.79	0.82	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.78	-25.03	-2.25	UO2SeO4:4H2O
UO3	-6.88	0.82	7.70	UO3
Uraninite	-10.84	-15.51	-4.67	UO2
USb2	-220.56	-190.98	29.58	USb2
V(OH)3	-19.19	-11.60	7.59	V(OH)3
V2O5	-15.95	-17.31	-1.36	V2O5
V3O5	-40.95	-39.11	1.84	V3O5
V4O7	-50.82	-43.63	7.19	V4O7
V6O13	-42.15	-103.01	-60.86	V6O13
Valentinite	-30.05	-38.53	-8.48	Sb2O3
VC12	-63.19	-44.32	18.87	VC12
VC13	-64.95	-41.52	23.43	VC13
VF4	-63.17	-48.24	14.93	VF4
Vmetal	-93.94	-49.92	44.03	V
VO	-39.13	-24.37	14.76	VO
VO(OH)2	-9.67	-4.52	5.15	VO(OH)2
VO2Cl	-21.47	-18.63	2.84	VO2Cl
VOC1	-32.72	-21.57	11.15	VOC1
VOC12	-37.23	-24.47	12.76	VOC12
VOSO4	-25.21	-21.60	3.61	VOSO4
Witherite	-4.17	-12.74	-8.57	BaCO3
Wurtzite	-68.68	-77.63	-8.95	ZnS
Zincite	-3.37	7.97	11.33	ZnO
Zincosite	-13.04	-9.11	3.93	ZnSO4
Zn(BO2)2	-9.92	-1.63	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.00	-29.69	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.51	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.79	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.57	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.77	7.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.64	-1.14	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.23	5.96	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-20.97	-7.32	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.16	-10.25	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.61	14.79	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.61	19.89	38.50	Zn5(OH)8Cl2
ZnCl2	-19.03	-11.98	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.36	-13.89	-0.53	ZnF2
Znmetal	-43.37	-17.58	25.79	Zn
ZnMoO4	-2.81	-12.94	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO

ZnS(am)	-68.58	-77.63	-9.05	ZnS
ZnSb	-86.18	-75.16	11.01	ZnSb
ZnSe	-24.49	-38.89	-14.40	ZnSe
ZnSeO4:6H2O	-16.36	-17.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.47	-9.11	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 104.

Title Stage 6 Run-off mix
Mix 602
1 1
3 0.001873
4 0.019678
5 0.010678
6 0.000000
7 0.035801
8 0.000000
9 5.390138
10 8.436524
11 16.282688
12 87.281163
13 67.068880
14 27.049432
15 13.693788
Save solution 605
end

TITLE

Stage 6 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 602.

Mixture 602.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
1.873e-03 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
1.968e-02 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
1.068e-02 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
3.580e-02 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
5.390e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)

8.437e+00 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.628e+01 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
8.728e+01 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
6.707e+01 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
2.705e+01 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
1.369e+01 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	9.838e-07	2.226e-04
As	4.524e-10	1.024e-07
B	4.446e-07	1.006e-04
Ba	1.334e-07	3.018e-05
C	7.225e-04	1.635e-01
Ca	3.123e-04	7.068e-02
Cd	1.168e-09	2.643e-07
Cl	3.743e-05	8.468e-03
Co	1.317e-11	2.979e-09
Cr	5.065e-12	1.146e-09
Cu	2.376e-06	5.377e-04
F	3.359e-05	7.601e-03
Fe	4.740e-08	1.072e-05
Hg	4.266e-11	9.652e-09
K	6.679e-05	1.511e-02
Mg	8.165e-05	1.848e-02
Mn	9.856e-07	2.230e-04
Mo	3.808e-08	8.616e-06
N	9.979e-08	2.258e-05
Na	1.198e-04	2.710e-02
Ni	2.144e-12	4.851e-10
Pb	3.331e-09	7.536e-07
S	2.506e-04	5.670e-02
Sb	4.002e-10	9.054e-08
Se	3.488e-09	7.893e-07
U	1.213e-08	2.745e-06
V	9.417e-09	2.131e-06
Zn	1.153e-07	2.609e-05

-----Description of solution-----

	pH	=	6.451	Charge balance
	pe	=	6.501	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.569e-03	
	Mass of water (kg)	=	2.263e+02	
	Total alkalinity (eq/kg)	=	4.125e-04	
	Total CO2 (mol/kg)	=	7.225e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	13	
	Total H	=	2.511937e+04	
	Total O	=	1.256028e+04	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
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	H+	3.700e-07	3.540e-07	-6.432	-6.451	-0.019	0.00
	OH-	2.974e-08	2.845e-08	-7.527	-7.546	-0.019	(0)
	H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al		9.838e-07					
	AlF2+	4.681e-07	4.482e-07	-6.330	-6.349	-0.019	(0)
	AlF3	1.714e-07	1.714e-07	-6.766	-6.766	0.000	(0)
	Al(OH) 4-	1.666e-07	1.594e-07	-6.778	-6.797	-0.019	(0)
	Al(OH) 2+	8.193e-08	7.845e-08	-7.087	-7.105	-0.019	(0)
	Al(OH) 3	4.452e-08	4.452e-08	-7.351	-7.351	0.000	(0)
	AlF+2	4.411e-08	3.707e-08	-7.356	-7.431	-0.075	(0)
	AlOH+2	4.131e-09	3.472e-09	-8.384	-8.459	-0.075	(0)
	AlF4-	2.725e-09	2.608e-09	-8.565	-8.584	-0.019	(0)
	AlSO4+	1.962e-10	1.878e-10	-9.707	-9.726	-0.019	(0)
	Al+3	1.817e-10	1.220e-10	-9.741	-9.913	-0.173	(0)
	Al(SO4) 2-	4.167e-13	3.988e-13	-12.380	-12.399	-0.019	(0)
	AlMo6O21-3	3.650e-39	2.401e-39	-38.438	-38.620	-0.182	(0)
As (3)		1.933e-21					
	H3AsO3	1.930e-21	1.930e-21	-20.715	-20.715	0.000	(0)
	H2AsO3-	2.929e-24	2.796e-24	-23.533	-23.553	-0.020	(0)
	H4AsO3+	3.545e-28	3.384e-28	-27.450	-27.471	-0.020	(0)
	HAsO3-2	8.677e-30	7.204e-30	-29.062	-29.142	-0.081	(0)
	AsO3-3	1.192e-36	7.845e-37	-35.924	-36.105	-0.182	(0)
As (5)		4.524e-10					
	H2AsO4-	3.336e-10	3.184e-10	-9.477	-9.497	-0.020	(0)
	HAsO4-2	1.188e-10	9.864e-11	-9.925	-10.006	-0.081	(0)
	H3AsO4	1.958e-14	1.959e-14	-13.708	-13.708	0.000	(0)
	AsO4-3	1.339e-15	8.812e-16	-14.873	-15.055	-0.182	(0)
B		4.446e-07					
	H3BO3	4.438e-07	4.439e-07	-6.353	-6.353	0.000	(0)
	H2BO3-	7.619e-10	7.284e-10	-9.118	-9.138	-0.020	(0)
	CaH2BO3+	1.098e-11	1.050e-11	-10.959	-10.979	-0.020	(0)
	BF(OH) 3-	5.628e-12	5.380e-12	-11.250	-11.269	-0.020	(0)
	MgH2BO3+	1.744e-12	1.667e-12	-11.759	-11.778	-0.020	(0)
	NaH2BO3	1.321e-13	1.321e-13	-12.879	-12.879	0.000	(0)
	BF2(OH) 2-	6.468e-15	6.183e-15	-14.189	-14.209	-0.020	(0)
	BaH2BO3+	2.623e-15	2.507e-15	-14.581	-14.601	-0.020	(0)
	H5(BO3) 2-	2.879e-16	2.752e-16	-15.541	-15.560	-0.020	(0)
	BF3OH-	2.705e-20	2.586e-20	-19.568	-19.587	-0.020	(0)
	H8(BO3) 3-	1.278e-20	1.222e-20	-19.893	-19.913	-0.020	(0)
	BF4-	1.431e-24	1.368e-24	-23.844	-23.864	-0.020	(0)
Ba		1.334e-07					
	Ba+2	1.329e-07	1.114e-07	-6.876	-6.953	-0.077	(0)
	BaHCO3+	4.343e-10	4.160e-10	-9.362	-9.381	-0.019	(0)
	BaCO3	2.959e-12	2.959e-12	-11.529	-11.529	0.000	(0)
	BaOH+	1.445e-14	1.383e-14	-13.840	-13.859	-0.019	(0)
	BaH2BO3+	2.623e-15	2.507e-15	-14.581	-14.601	-0.020	(0)
	BaNO3+	6.757e-17	6.450e-17	-16.170	-16.190	-0.020	(0)
	BaNH3+2	5.679e-18	4.715e-18	-17.246	-17.327	-0.081	(0)
C (4)		7.225e-04					
	HCO3-	4.084e-04	3.910e-04	-3.389	-3.408	-0.019	(0)
	H2CO3	3.113e-04	3.113e-04	-3.507	-3.507	0.000	(0)
	CaHCO3+	1.905e-06	1.824e-06	-5.720	-5.739	-0.019	(0)
	CuCO3	4.347e-07	4.347e-07	-6.362	-6.362	0.000	(0)
	MgHCO3+	2.760e-07	2.641e-07	-6.559	-6.578	-0.019	(0)
	CO3-2	6.180e-08	5.179e-08	-7.209	-7.286	-0.077	(0)
	CuHCO3+	3.685e-08	3.517e-08	-7.434	-7.454	-0.020	(0)
	NaHCO3	2.516e-08	2.516e-08	-7.599	-7.599	0.000	(0)
	CaCO3	2.056e-08	2.056e-08	-7.687	-7.687	0.000	(0)
	UO2(CO3) 2-2	6.568e-09	5.453e-09	-8.183	-8.263	-0.081	(0)
	MnHCO3+	6.431e-09	6.156e-09	-8.192	-8.211	-0.019	(0)
	UO2CO3	5.277e-09	5.277e-09	-8.278	-8.278	0.000	(0)
	MgCO3	2.843e-09	2.843e-09	-8.546	-8.546	0.000	(0)
	ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
	PbHCO3+	5.543e-10	5.291e-10	-9.256	-9.276	-0.020	(0)
	BaHCO3+	4.343e-10	4.160e-10	-9.362	-9.381	-0.019	(0)
	PbCO3	2.835e-10	2.835e-10	-9.547	-9.547	0.000	(0)
	ZnCO3	2.735e-10	2.735e-10	-9.563	-9.563	0.000	(0)

		NaCO3-	1.153e-10	1.104e-10	-9.938	-9.957	-0.019	(0)
		Cu (CO3) 2-2	7.299e-11	6.060e-11	-10.137	-10.218	-0.081	(0)
		UO2 (CO3) 3-4	2.979e-11	1.415e-11	-10.526	-10.849	-0.323	(0)
		FeHCO3+	3.712e-12	3.555e-12	-11.430	-11.449	-0.019	(0)
		BaCO3	2.959e-12	2.959e-12	-11.529	-11.529	0.000	(0)
		CdCO3	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
		CdHCO3+	8.739e-13	8.342e-13	-12.059	-12.079	-0.020	(0)
		CoHCO3+	3.282e-13	3.132e-13	-12.484	-12.504	-0.020	(0)
		NiHCO3+	8.416e-14	8.034e-14	-13.075	-13.095	-0.020	(0)
		Pb (CO3) 2-2	5.100e-14	4.234e-14	-13.292	-13.373	-0.081	(0)
		CoCO3	9.016e-15	9.016e-15	-14.045	-14.045	0.000	(0)
		NiCO3	3.220e-15	3.220e-15	-14.492	-14.492	0.000	(0)
		HgCO3	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
		Cd (CO3) 2-2	5.115e-17	4.247e-17	-16.291	-16.372	-0.081	(0)
		HgHCO3+	1.974e-17	1.884e-17	-16.705	-16.725	-0.020	(0)
		Hg (CO3) 2-2	5.639e-19	4.682e-19	-18.249	-18.330	-0.081	(0)
Ca	3.123e-04							
		Ca+2	2.990e-04	2.505e-04	-3.524	-3.601	-0.077	(0)
		CaSO4	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
		CaHCO3+	1.905e-06	1.824e-06	-5.720	-5.739	-0.019	(0)
		CaF+	8.675e-08	8.304e-08	-7.062	-7.081	-0.019	(0)
		CaCO3	2.056e-08	2.056e-08	-7.687	-7.687	0.000	(0)
		CaOH+	1.485e-10	1.422e-10	-9.828	-9.847	-0.019	(0)
		CaH2BO3+	1.098e-11	1.050e-11	-10.959	-10.979	-0.020	(0)
		CaNO3+	9.589e-14	9.153e-14	-13.018	-13.038	-0.020	(0)
		CaNH3+2	2.549e-14	2.116e-14	-13.594	-13.675	-0.081	(0)
		Ca (NH3) 2+2	6.807e-25	5.651e-25	-24.167	-24.248	-0.081	(0)
Cd	1.168e-09							
		Cd+2	1.118e-09	9.370e-10	-8.951	-9.028	-0.077	(0)
		CdSO4	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
		CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
		CdCO3	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
		CdHCO3+	8.739e-13	8.342e-13	-12.059	-12.079	-0.020	(0)
		CdF+	4.725e-13	4.510e-13	-12.326	-12.346	-0.020	(0)
		CdOH+	2.218e-13	2.117e-13	-12.654	-12.674	-0.020	(0)
		Cd (SO4) 2-2	1.402e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
		CdOHC1	3.739e-15	3.739e-15	-14.427	-14.427	0.000	(0)
		CdCl2	4.783e-16	4.783e-16	-15.320	-15.320	0.000	(0)
		Cd (CO3) 2-2	5.115e-17	4.247e-17	-16.291	-16.372	-0.081	(0)
		Cd (OH) 2	3.800e-17	3.800e-17	-16.420	-16.420	0.000	(0)
		CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
		CdNO3+	3.586e-19	3.423e-19	-18.445	-18.466	-0.020	(0)
		CdSeO4	6.397e-20	6.397e-20	-19.194	-19.194	0.000	(0)
		CdCl3-	1.132e-20	1.081e-20	-19.946	-19.966	-0.020	(0)
		Cd2OH+3	1.511e-21	9.943e-22	-20.821	-21.002	-0.182	(0)
		Cd (OH) 3-	6.918e-23	6.604e-23	-22.160	-22.180	-0.020	(0)
		Cd (SeO3) 2-2	1.271e-24	1.055e-24	-23.896	-23.977	-0.081	(0)
		Cd (NO3) 2	1.982e-29	1.982e-29	-28.703	-28.703	0.000	(0)
		Cd (OH) 4-2	3.703e-31	3.075e-31	-30.431	-30.512	-0.081	(0)
		CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-232.232	-232.252	-0.020	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-310.087	-310.168	-0.081	(0)
Cl	3.743e-05							
		Cl-	3.743e-05	3.581e-05	-4.427	-4.446	-0.019	(0)
		CuCl+	8.456e-11	8.090e-11	-10.073	-10.092	-0.019	(0)
		MnCl+	3.715e-11	3.557e-11	-10.430	-10.449	-0.019	(0)
		CuCl	9.925e-12	9.925e-12	-11.003	-11.003	0.000	(0)
		ZnCl+	8.627e-12	8.254e-12	-11.064	-11.083	-0.019	(0)
		CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
		PbCl+	2.424e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
		ZnOHC1	3.074e-13	3.074e-13	-12.512	-12.512	0.000	(0)
		HgClOH	8.297e-14	8.297e-14	-13.081	-13.081	0.000	(0)
		CuCl2-	7.761e-14	7.425e-14	-13.110	-13.129	-0.019	(0)
		HgCl2	5.914e-15	5.914e-15	-14.228	-14.228	0.000	(0)
		CdOHC1	3.739e-15	3.739e-15	-14.427	-14.427	0.000	(0)
		MnCl2	1.799e-15	1.799e-15	-14.745	-14.745	0.000	(0)
		UO2Cl+	1.557e-15	1.486e-15	-14.808	-14.828	-0.020	(0)

CoCl+	1.336e-15	1.276e-15	-14.874	-14.894	-0.020	(0)
CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)
CdCl2	4.783e-16	4.783e-16	-15.320	-15.320	0.000	(0)
ZnCl2	4.684e-16	4.684e-16	-15.329	-15.329	0.000	(0)
PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
NiCl+	1.599e-16	1.527e-16	-15.796	-15.816	-0.020	(0)
HgCl+	3.452e-17	3.295e-17	-16.462	-16.482	-0.020	(0)
HgCl3-	2.218e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
CuCl3-2	6.770e-19	5.685e-19	-18.169	-18.245	-0.076	(0)
FeCl+2	2.740e-19	2.300e-19	-18.562	-18.638	-0.076	(0)
CrCl+2	9.221e-20	7.655e-20	-19.035	-19.116	-0.081	(0)
MnCl3-	1.853e-20	1.774e-20	-19.732	-19.751	-0.019	(0)
ZnCl3-	1.393e-20	1.332e-20	-19.856	-19.875	-0.019	(0)
CdCl3-	1.132e-20	1.081e-20	-19.946	-19.966	-0.020	(0)
VOCl+	7.387e-21	7.051e-21	-20.132	-20.152	-0.020	(0)
PbCl3-	5.526e-21	5.275e-21	-20.258	-20.278	-0.020	(0)
HgCl4-2	3.636e-22	3.019e-22	-21.439	-21.520	-0.081	(0)
CuCl3-	3.509e-22	3.357e-22	-21.455	-21.474	-0.019	(0)
FeCl2+	3.844e-23	3.680e-23	-22.415	-22.434	-0.019	(0)
NiCl2	2.753e-23	2.753e-23	-22.560	-22.560	0.000	(0)
CrOHCl2	1.482e-24	1.482e-24	-23.829	-23.829	0.000	(0)
ZnCl4-2	2.841e-25	2.386e-25	-24.547	-24.622	-0.076	(0)
CrCl2+	2.725e-25	2.601e-25	-24.565	-24.585	-0.020	(0)
PbCl4-2	1.040e-25	8.634e-26	-24.983	-25.064	-0.081	(0)
FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)
CuCl4-2	7.174e-29	6.024e-29	-28.144	-28.220	-0.076	(0)
CrO3Cl-	2.322e-31	2.216e-31	-30.634	-30.654	-0.020	(0)
CoCl+2	1.141e-39	9.473e-40	-38.943	-39.024	-0.081	(0)
UCl+3	0.000e+00	0.000e+00	-42.747	-42.928	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.856	-63.937	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.085	-66.166	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.745	-80.826	-0.081	(0)
Co (2)	1.317e-11					
Co+2	1.240e-11	1.030e-11	-10.906	-10.987	-0.081	(0)
CoSO4	4.072e-13	4.072e-13	-12.390	-12.390	0.000	(0)
CoHCO3+	3.282e-13	3.132e-13	-12.484	-12.504	-0.020	(0)
CoF+	1.036e-14	9.890e-15	-13.985	-14.005	-0.020	(0)
CoCO3	9.016e-15	9.016e-15	-14.045	-14.045	0.000	(0)
CoOH+	6.123e-15	5.845e-15	-14.213	-14.233	-0.020	(0)
CoCl+	1.336e-15	1.276e-15	-14.874	-14.894	-0.020	(0)
Co (OH) 2	1.321e-17	1.321e-17	-16.879	-16.879	0.000	(0)
CoNO2+	4.066e-18	3.881e-18	-17.391	-17.411	-0.020	(0)
Co (NH3) +2	1.000e-19	8.306e-20	-19.000	-19.081	-0.081	(0)
CoNO3+	1.975e-21	1.886e-21	-20.704	-20.725	-0.020	(0)
CoSeO4	1.892e-21	1.892e-21	-20.723	-20.723	0.000	(0)
Co (OH) 3-	7.852e-24	7.496e-24	-23.105	-23.125	-0.020	(0)
CoOOH-	1.970e-24	1.881e-24	-23.705	-23.726	-0.020	(0)
Co2OH+3	4.585e-27	3.017e-27	-26.339	-26.520	-0.182	(0)
Co (NH3) 2+2	2.863e-28	2.377e-28	-27.543	-27.624	-0.081	(0)
Co (NO3) 2	4.433e-31	4.433e-31	-30.353	-30.353	0.000	(0)
Co (OH) 4-2	4.070e-32	3.379e-32	-31.390	-31.471	-0.081	(0)
Co (NH3) 3+2	2.418e-37	2.008e-37	-36.617	-36.697	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.070	-46.151	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.310	-48.633	-0.323	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.023	-56.104	-0.081	(0)
Co (3)	2.264e-32					
CoOH+2	2.264e-32	1.879e-32	-31.645	-31.726	-0.081	(0)
Co+3	1.935e-37	1.300e-37	-36.713	-36.886	-0.173	(0)
CoCl+2	1.141e-39	9.473e-40	-38.943	-39.024	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.856	-63.937	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.138	-75.158	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.645	-79.726	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.745	-80.826	-0.081	(0)
Cr (2)	1.499e-28					
Cr+2	1.499e-28	1.244e-28	-27.824	-27.905	-0.081	(0)
Cr (3)	5.065e-12					
Cr (OH) 2+	3.727e-12	3.558e-12	-11.429	-11.449	-0.020	(0)
Cr (OH) +2	1.238e-12	1.028e-12	-11.907	-11.988	-0.081	(0)

CrOHSO4	4.835e-14	4.835e-14	-13.316	-13.316	0.000	(0)
Cr(OH)3	3.802e-14	3.802e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.577e-15	7.951e-15	-14.019	-14.100	-0.081	(0)
Cr+3	2.511e-15	1.652e-15	-14.600	-14.782	-0.182	(0)
CrSO4+	8.009e-16	7.645e-16	-15.096	-15.117	-0.020	(0)
CrO2-	5.344e-17	5.101e-17	-16.272	-16.292	-0.020	(0)
Cr(OH)4-	4.511e-17	4.306e-17	-16.346	-16.366	-0.020	(0)
CrCl+2	9.221e-20	7.655e-20	-19.035	-19.116	-0.081	(0)
Cr2(OH)2SO4+2	5.411e-24	4.492e-24	-23.267	-23.348	-0.081	(0)
CrOHC12	1.482e-24	1.482e-24	-23.829	-23.829	0.000	(0)
CrCl2+	2.725e-25	2.601e-25	-24.565	-24.585	-0.020	(0)
Cr2(OH)2(SO4)2	5.289e-26	5.289e-26	-25.277	-25.277	0.000	(0)
CrNO3+2	1.005e-26	8.342e-27	-25.998	-26.079	-0.081	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-52.742	-52.823	-0.081	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-62.640	-62.822	-0.182	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-66.085	-66.166	-0.081	(0)
Cr(6)	5.810e-21					
HCrO4-	2.912e-21	2.780e-21	-20.536	-20.556	-0.020	(0)
CrO4-2	2.896e-21	2.427e-21	-20.538	-20.615	-0.077	(0)
NaCrO4-	1.446e-24	1.380e-24	-23.840	-23.860	-0.020	(0)
KCrO4-	6.028e-25	5.754e-25	-24.220	-24.240	-0.020	(0)
H2CrO4	7.976e-28	7.976e-28	-27.098	-27.098	0.000	(0)
CrO3SO4-2	7.155e-29	5.940e-29	-28.145	-28.226	-0.081	(0)
CrO3Cl-	2.322e-31	2.216e-31	-30.634	-30.654	-0.020	(0)
Cr2O7-2	3.227e-40	2.680e-40	-39.491	-39.572	-0.081	(0)
Cu(1)	2.406e-10					
Cu+	2.306e-10	2.202e-10	-9.637	-9.657	-0.020	(0)
CuCl	9.925e-12	9.925e-12	-11.003	-11.003	0.000	(0)
CuCl2-	7.761e-14	7.425e-14	-13.110	-13.129	-0.019	(0)
CuCl3-2	6.770e-19	5.685e-19	-18.169	-18.245	-0.076	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.182	-154.319	-0.137	(0)
Cu(2)	2.376e-06					
Cu+2	1.701e-06	1.426e-06	-5.769	-5.846	-0.077	(0)
CuCO3	4.347e-07	4.347e-07	-6.362	-6.362	0.000	(0)
CuOH+	1.340e-07	1.282e-07	-6.873	-6.892	-0.019	(0)
CuSO4	6.472e-08	6.472e-08	-7.189	-7.189	0.000	(0)
CuHCO3+	3.685e-08	3.517e-08	-7.434	-7.454	-0.020	(0)
CuF+	2.862e-09	2.732e-09	-8.543	-8.564	-0.020	(0)
Cu(OH)2	7.278e-10	7.278e-10	-9.138	-9.138	0.000	(0)
Cu2(OH)2+2	4.975e-10	4.130e-10	-9.303	-9.384	-0.081	(0)
CuCl+	8.456e-11	8.090e-11	-10.073	-10.092	-0.019	(0)
Cu(CO3)2-2	7.299e-11	6.060e-11	-10.137	-10.218	-0.081	(0)
CuNO2+	8.363e-12	7.983e-12	-11.078	-11.098	-0.020	(0)
CuNH3+2	1.179e-12	9.786e-13	-11.929	-12.009	-0.081	(0)
Cu(OH)3-	4.449e-14	4.246e-14	-13.352	-13.372	-0.020	(0)
CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)
CuNO3+	5.456e-16	5.208e-16	-15.263	-15.283	-0.020	(0)
Cu(NO2)2	4.369e-18	4.369e-18	-17.360	-17.360	0.000	(0)
Cu(OH)4-2	1.145e-20	9.507e-21	-19.941	-20.022	-0.081	(0)
CuCl3-	3.509e-22	3.357e-22	-21.455	-21.474	-0.019	(0)
Cu(NO3)2	7.575e-27	7.575e-27	-26.121	-26.121	0.000	(0)
CuCl4-2	7.174e-29	6.024e-29	-28.144	-28.220	-0.076	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-220.263	-220.283	-0.020	(0)
F	3.359e-05					
F-	3.174e-05	3.037e-05	-4.498	-4.518	-0.019	(0)
AlF2+	4.681e-07	4.482e-07	-6.330	-6.349	-0.019	(0)
MgF+	2.350e-07	2.249e-07	-6.629	-6.648	-0.019	(0)
AlF3	1.714e-07	1.714e-07	-6.766	-6.766	0.000	(0)
CaF+	8.675e-08	8.304e-08	-7.062	-7.081	-0.019	(0)
AlF+2	4.411e-08	3.707e-08	-7.356	-7.431	-0.075	(0)
HF	1.590e-08	1.590e-08	-7.799	-7.799	0.000	(0)
CuF+	2.862e-09	2.732e-09	-8.543	-8.564	-0.020	(0)
AlF4-	2.725e-09	2.608e-09	-8.565	-8.584	-0.019	(0)
NaF	2.193e-09	2.193e-09	-8.659	-8.659	0.000	(0)
MnF+	9.965e-10	9.539e-10	-9.002	-9.020	-0.019	(0)
UO2F+	1.124e-10	1.073e-10	-9.949	-9.969	-0.020	(0)
ZnF+	5.825e-11	5.561e-11	-10.235	-10.255	-0.020	(0)

UO2F2	9.398e-12	9.398e-12	-11.027	-11.027	0.000	(0)
BF(OH) 3-	5.628e-12	5.380e-12	-11.250	-11.269	-0.020	(0)
PbF+	4.083e-12	3.897e-12	-11.389	-11.409	-0.020	(0)
HF2-	1.920e-12	1.836e-12	-11.717	-11.736	-0.019	(0)
CdF+	4.725e-13	4.510e-13	-12.326	-12.346	-0.020	(0)
UO2F3-	7.511e-14	7.170e-14	-13.124	-13.145	-0.020	(0)
CoF+	1.036e-14	9.890e-15	-13.985	-14.005	-0.020	(0)
CrF+2	9.577e-15	7.951e-15	-14.019	-14.100	-0.081	(0)
FeF+2	8.436e-15	7.084e-15	-14.074	-14.150	-0.076	(0)
BF2(OH) 2-	6.468e-15	6.183e-15	-14.189	-14.209	-0.020	(0)
FeF2+	6.015e-15	5.758e-15	-14.221	-14.240	-0.019	(0)
PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
NiF+	1.332e-15	1.271e-15	-14.876	-14.896	-0.020	(0)
VO2F	1.183e-15	1.183e-15	-14.927	-14.927	0.000	(0)
H2F2	6.774e-16	6.774e-16	-15.169	-15.169	0.000	(0)
FeF3	2.467e-16	2.467e-16	-15.608	-15.608	0.000	(0)
CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
UO2F4-2	2.083e-17	1.730e-17	-16.681	-16.762	-0.081	(0)
VO2F2-	1.367e-17	1.304e-17	-16.864	-16.885	-0.020	(0)
VOF+	1.339e-17	1.279e-17	-16.873	-16.893	-0.020	(0)
VOF2	1.456e-19	1.456e-19	-18.837	-18.837	0.000	(0)
PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
BF3OH-	2.705e-20	2.586e-20	-19.568	-19.587	-0.020	(0)
VO2F3-2	5.952e-21	4.942e-21	-20.225	-20.306	-0.081	(0)
VOF3-	1.644e-22	1.569e-22	-21.784	-21.804	-0.020	(0)
HgF+	5.439e-23	5.192e-23	-22.264	-22.285	-0.020	(0)
PbF4-2	2.349e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
BF4-	1.431e-24	1.368e-24	-23.844	-23.864	-0.020	(0)
VO2F4-3	1.122e-25	7.385e-26	-24.950	-25.132	-0.182	(0)
Sb(OH) 2F	6.749e-26	6.749e-26	-25.171	-25.171	0.000	(0)
SbOF	6.636e-26	6.636e-26	-25.178	-25.178	0.000	(0)
VOF4-2	2.317e-26	1.923e-26	-25.635	-25.716	-0.081	(0)
UF3+	7.676e-33	7.327e-33	-32.115	-32.135	-0.020	(0)
UF2+2	1.834e-33	1.522e-33	-32.737	-32.818	-0.081	(0)
UF4	2.440e-35	2.440e-35	-34.613	-34.613	0.000	(0)
UF+3	6.051e-36	3.981e-36	-35.218	-35.400	-0.182	(0)
UF5-	3.076e-38	2.937e-38	-37.512	-37.532	-0.020	(0)
UF6-2	3.244e-40	2.693e-40	-39.489	-39.570	-0.081	(0)
Fe (2)	9.095e-10					
Fe+2	8.698e-10	7.221e-10	-9.061	-9.141	-0.081	(0)
FeSO4	3.513e-11	3.513e-11	-10.454	-10.454	0.000	(0)
FeHCO3+	3.712e-12	3.555e-12	-11.430	-11.449	-0.019	(0)
FeOH+	8.542e-13	8.177e-13	-12.068	-12.087	-0.019	(0)
Fe(OH) 2	1.848e-17	1.848e-17	-16.733	-16.733	0.000	(0)
Fe(OH) 3-	1.736e-19	1.662e-19	-18.760	-18.779	-0.019	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.470	-238.490	-0.020	(0)
Fe (3)	4.649e-08					
Fe(OH) 2+	4.516e-08	4.324e-08	-7.345	-7.364	-0.019	(0)
Fe(OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
FeOH+2	4.653e-12	3.907e-12	-11.332	-11.408	-0.076	(0)
Fe(OH) 4-	3.654e-12	3.499e-12	-11.437	-11.456	-0.019	(0)
FeF+2	8.436e-15	7.084e-15	-14.074	-14.150	-0.076	(0)
FeF2+	6.015e-15	5.758e-15	-14.221	-14.240	-0.019	(0)
FeSO4+	4.942e-16	4.731e-16	-15.306	-15.325	-0.019	(0)
Fe+3	3.166e-16	2.127e-16	-15.499	-15.672	-0.173	(0)
FeF3	2.467e-16	2.467e-16	-15.608	-15.608	0.000	(0)
Fe(SO4) 2-	2.100e-18	2.005e-18	-17.678	-17.698	-0.020	(0)
FeCl+2	2.740e-19	2.300e-19	-18.562	-18.638	-0.076	(0)
FeHSeO3+2	2.225e-21	1.847e-21	-20.653	-20.733	-0.081	(0)
Fe2(OH) 2+4	1.064e-21	5.055e-22	-20.973	-21.296	-0.323	(0)
FeCl2+	3.844e-23	3.680e-23	-22.415	-22.434	-0.019	(0)
FeNO3+2	2.960e-25	2.458e-25	-24.529	-24.609	-0.081	(0)
Fe3(OH) 4+5	1.011e-27	3.159e-28	-26.995	-27.500	-0.505	(0)
FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)
H (0)	1.763e-29					
H2	8.817e-30	8.820e-30	-29.055	-29.055	0.000	(0)
Hg (0)	4.233e-11					

Hg	4.233e-11	4.233e-11	-10.373	-10.373	0.000	(0)
Hg (1)	3.193e-21					
Hg2+2	1.596e-21	1.325e-21	-20.797	-20.878	-0.081	(0)
Hg (2)	3.272e-13					
Hg (OH) 2	2.354e-13	2.355e-13	-12.628	-12.628	0.000	(0)
HgClOH	8.297e-14	8.297e-14	-13.081	-13.081	0.000	(0)
HgCl2	5.914e-15	5.914e-15	-14.228	-14.228	0.000	(0)
HgCO3	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
HgOH+	5.472e-17	5.223e-17	-16.262	-16.282	-0.020	(0)
HgCl+	3.452e-17	3.295e-17	-16.462	-16.482	-0.020	(0)
HgHCO3+	1.974e-17	1.884e-17	-16.705	-16.725	-0.020	(0)
HgCl3-	2.218e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
Hg (CO3) 2-2	5.639e-19	4.682e-19	-18.249	-18.330	-0.081	(0)
Hg+2	5.555e-20	4.612e-20	-19.255	-19.336	-0.081	(0)
HgSO4	2.393e-21	2.393e-21	-20.621	-20.621	0.000	(0)
HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.709	-0.081	(0)
Hg (OH) 3-	8.834e-22	8.432e-22	-21.054	-21.074	-0.020	(0)
HgCl4-2	3.636e-22	3.019e-22	-21.439	-21.520	-0.081	(0)
Hg (NH3) 2+2	1.577e-22	1.310e-22	-21.802	-21.883	-0.081	(0)
HgF+	5.439e-23	5.192e-23	-22.264	-22.285	-0.020	(0)
HgNO3+	2.061e-30	1.967e-30	-29.686	-29.706	-0.020	(0)
Hg (NH3) 3+2	4.213e-32	3.498e-32	-31.375	-31.456	-0.081	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.025	-40.025	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.649	-40.730	-0.081	(0)
HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.357	-143.438	-0.081	(0)
K	6.679e-05					
K+	6.670e-05	6.381e-05	-4.176	-4.195	-0.019	(0)
KSO4-	9.352e-08	8.954e-08	-7.029	-7.048	-0.019	(0)
KCrO4-	6.028e-25	5.754e-25	-24.220	-24.240	-0.020	(0)
Mg	8.165e-05					
Mg+2	7.876e-05	6.600e-05	-4.104	-4.180	-0.077	(0)
MgSO4	2.380e-06	2.380e-06	-5.623	-5.623	0.000	(0)
MgHCO3+	2.760e-07	2.641e-07	-6.559	-6.578	-0.019	(0)
MgF+	2.350e-07	2.249e-07	-6.629	-6.648	-0.019	(0)
MgCO3	2.843e-09	2.843e-09	-8.546	-8.546	0.000	(0)
MgOH+	7.801e-10	7.474e-10	-9.108	-9.126	-0.019	(0)
MgH2BO3+	1.744e-12	1.667e-12	-11.759	-11.778	-0.020	(0)
Mn (2)	9.856e-07					
Mn+2	9.503e-07	7.890e-07	-6.022	-6.103	-0.081	(0)
MnSO4	2.781e-08	2.781e-08	-7.556	-7.556	0.000	(0)
MnHCO3+	6.431e-09	6.156e-09	-8.192	-8.211	-0.019	(0)
MnF+	9.965e-10	9.539e-10	-9.002	-9.020	-0.019	(0)
MnOH+	5.889e-11	5.637e-11	-10.230	-10.249	-0.019	(0)
MnCl+	3.715e-11	3.557e-11	-10.430	-10.449	-0.019	(0)
MnCl2	1.799e-15	1.799e-15	-14.745	-14.745	0.000	(0)
MnNO3+	1.513e-16	1.445e-16	-15.820	-15.840	-0.020	(0)
MnSeO4	7.786e-17	7.786e-17	-16.109	-16.109	0.000	(0)
MnCl3-	1.853e-20	1.774e-20	-19.732	-19.751	-0.019	(0)
Mn (OH) 3-	2.945e-22	2.819e-22	-21.531	-21.550	-0.019	(0)
Mn (NO3) 2	4.193e-26	4.193e-26	-25.378	-25.378	0.000	(0)
Mn (OH) 4-2	3.083e-29	2.589e-29	-28.511	-28.587	-0.076	(0)
MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Mn (3)	1.663e-25					
Mn+3	1.663e-25	1.118e-25	-24.779	-24.952	-0.173	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.836	-46.912	-0.076	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.763	-49.783	-0.019	(0)
Mo	3.808e-08					
MoO4-2	3.785e-08	3.171e-08	-7.422	-7.499	-0.077	(0)
HMoO4-	2.340e-10	2.234e-10	-9.631	-9.651	-0.020	(0)
H2MoO4	5.792e-13	5.792e-13	-12.237	-12.237	0.000	(0)
AlMo6O21-3	3.650e-39	2.401e-39	-38.438	-38.620	-0.182	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.382	-51.109	-0.727	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.669	-51.174	-0.505	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.519	-52.842	-0.323	(0)

H3Mo7O24-3	0.000e+00	0.000e+00	-55.866	-56.047	-0.182	(0)
N(-3)	4.373e-08					
NH4+	4.357e-08	4.165e-08	-7.361	-7.380	-0.020	(0)
NH4SO4-	9.240e-11	8.845e-11	-10.034	-10.053	-0.019	(0)
NH3	6.709e-11	6.709e-11	-10.173	-10.173	0.000	(0)
CuNH3+2	1.179e-12	9.786e-13	-11.929	-12.009	-0.081	(0)
CaNH3+2	2.549e-14	2.116e-14	-13.594	-13.675	-0.081	(0)
BaNH3+2	5.679e-18	4.715e-18	-17.246	-17.327	-0.081	(0)
Co(NH3)+2	1.000e-19	8.306e-20	-19.000	-19.081	-0.081	(0)
NiNH3+2	7.232e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.709	-0.081	(0)
Hg(NH3)2+2	1.577e-22	1.310e-22	-21.802	-21.883	-0.081	(0)
Ca(NH3)2+2	6.807e-25	5.651e-25	-24.167	-24.248	-0.081	(0)
Ni(NH3)2+2	7.012e-28	5.822e-28	-27.154	-27.235	-0.081	(0)
Co(NH3)2+2	2.863e-28	2.377e-28	-27.543	-27.624	-0.081	(0)
Hg(NH3)3+2	4.213e-32	3.498e-32	-31.375	-31.456	-0.081	(0)
Co(NH3)3+2	2.418e-37	2.008e-37	-36.617	-36.697	-0.081	(0)
Hg(NH3)4+2	0.000e+00	0.000e+00	-40.649	-40.730	-0.081	(0)
Co(NH3)4+2	0.000e+00	0.000e+00	-46.070	-46.151	-0.081	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-52.742	-52.823	-0.081	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-56.023	-56.104	-0.081	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-62.640	-62.822	-0.182	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-63.856	-63.937	-0.081	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-66.085	-66.166	-0.081	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-75.138	-75.158	-0.020	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-79.645	-79.726	-0.081	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-80.745	-80.826	-0.081	(0)
N(3)	5.594e-08					
NO2-	5.593e-08	5.348e-08	-7.252	-7.272	-0.019	(0)
CuNO2+	8.363e-12	7.983e-12	-11.078	-11.098	-0.020	(0)
Cu(NO2)2	4.369e-18	4.369e-18	-17.360	-17.360	0.000	(0)
CoNO2+	4.066e-18	3.881e-18	-17.391	-17.411	-0.020	(0)
N(5)	1.209e-10					
NO3-	1.208e-10	1.155e-10	-9.918	-9.937	-0.019	(0)
CaNO3+	9.589e-14	9.153e-14	-13.018	-13.038	-0.020	(0)
CuNO3+	5.456e-16	5.208e-16	-15.263	-15.283	-0.020	(0)
MnNO3+	1.513e-16	1.445e-16	-15.820	-15.840	-0.020	(0)
BaNO3+	6.757e-17	6.450e-17	-16.170	-16.190	-0.020	(0)
ZnNO3+	2.790e-17	2.663e-17	-16.554	-16.575	-0.020	(0)
PbNO3+	3.260e-18	3.112e-18	-17.487	-17.507	-0.020	(0)
CdNO3+	3.586e-19	3.423e-19	-18.445	-18.466	-0.020	(0)
UO2NO3+	6.181e-21	5.900e-21	-20.209	-20.229	-0.020	(0)
CoNO3+	1.975e-21	1.886e-21	-20.704	-20.725	-0.020	(0)
NiNO3+	5.067e-22	4.836e-22	-21.295	-21.315	-0.020	(0)
VO2NO3	1.298e-24	1.298e-24	-23.887	-23.887	0.000	(0)
FeNO3+2	2.960e-25	2.458e-25	-24.529	-24.609	-0.081	(0)
Mn(NO3)2	4.193e-26	4.193e-26	-25.378	-25.378	0.000	(0)
CrNO3+2	1.005e-26	8.342e-27	-25.998	-26.079	-0.081	(0)
Cu(NO3)2	7.575e-27	7.575e-27	-26.121	-26.121	0.000	(0)
Zn(NO3)2	6.139e-28	6.139e-28	-27.212	-27.212	0.000	(0)
Pb(NO3)2	6.105e-28	6.105e-28	-27.214	-27.214	0.000	(0)
Cd(NO3)2	1.982e-29	1.982e-29	-28.703	-28.703	0.000	(0)
HgNO3+	2.061e-30	1.967e-30	-29.686	-29.706	-0.020	(0)
Co(NO3)2	4.433e-31	4.433e-31	-30.353	-30.353	0.000	(0)
Hg(NO3)2	0.000e+00	0.000e+00	-40.025	-40.025	0.000	(0)
Na	1.198e-04					
Na+	1.196e-04	1.144e-04	-3.922	-3.941	-0.019	(0)
NaSO4-	1.272e-07	1.218e-07	-6.896	-6.914	-0.019	(0)
NaHCO3	2.516e-08	2.516e-08	-7.599	-7.599	0.000	(0)
NaF	2.193e-09	2.193e-09	-8.659	-8.659	0.000	(0)
NaCO3-	1.153e-10	1.104e-10	-9.938	-9.957	-0.019	(0)
NaH2BO3	1.321e-13	1.321e-13	-12.879	-12.879	0.000	(0)
NaCrO4-	1.446e-24	1.380e-24	-23.840	-23.860	-0.020	(0)
Ni	2.144e-12					
Ni+2	1.989e-12	1.666e-12	-11.701	-11.778	-0.077	(0)
NiHCO3+	8.416e-14	8.034e-14	-13.075	-13.095	-0.020	(0)
NiSO4	6.590e-14	6.590e-14	-13.181	-13.181	0.000	(0)
NiCO3	3.220e-15	3.220e-15	-14.492	-14.492	0.000	(0)

NiF+	1.332e-15	1.271e-15	-14.876	-14.896	-0.020	(0)
NiOH+	6.252e-16	5.968e-16	-15.204	-15.224	-0.020	(0)
NiCl+	1.599e-16	1.527e-16	-15.796	-15.816	-0.020	(0)
Ni(OH) 2	1.348e-18	1.348e-18	-17.870	-17.870	0.000	(0)
Ni(SO4) 2-2	5.209e-19	4.325e-19	-18.283	-18.364	-0.081	(0)
NiNH3+2	7.232e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
NiNO3+	5.067e-22	4.836e-22	-21.295	-21.315	-0.020	(0)
NiSeO4	2.858e-22	2.858e-22	-21.544	-21.544	0.000	(0)
Ni(OH) 3-	4.018e-23	3.836e-23	-22.396	-22.416	-0.020	(0)
NiCl2	2.753e-23	2.753e-23	-22.560	-22.560	0.000	(0)
Ni(NH3) 2+2	7.012e-28	5.822e-28	-27.154	-27.235	-0.081	(0)
O(0)	1.303e-34					
O2	6.513e-35	6.515e-35	-34.186	-34.186	0.000	(0)
Pb	3.331e-09					
Pb+2	2.173e-09	1.821e-09	-8.663	-8.740	-0.077	(0)
PbHCO3+	5.543e-10	5.291e-10	-9.256	-9.276	-0.020	(0)
PbCO3	2.835e-10	2.835e-10	-9.547	-9.547	0.000	(0)
PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
PbOH+	1.363e-10	1.301e-10	-9.866	-9.886	-0.020	(0)
PbF+	4.083e-12	3.897e-12	-11.389	-11.409	-0.020	(0)
PbCl+	2.424e-12	2.313e-12	-11.616	-11.636	-0.020	(0)
Pb(SO4) 2-2	2.542e-13	2.111e-13	-12.595	-12.676	-0.081	(0)
Pb(OH) 2	1.170e-13	1.170e-13	-12.932	-12.932	0.000	(0)
Pb(CO3) 2-2	5.100e-14	4.234e-14	-13.292	-13.373	-0.081	(0)
PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
Pb2OH+3	5.706e-18	3.755e-18	-17.244	-17.425	-0.182	(0)
Pb(OH) 3-	3.488e-18	3.329e-18	-17.457	-17.478	-0.020	(0)
PbNO3+	3.260e-18	3.112e-18	-17.487	-17.507	-0.020	(0)
PbF3-	1.406e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
PbCl3-	5.526e-21	5.275e-21	-20.258	-20.278	-0.020	(0)
Pb(OH) 4-2	2.793e-23	2.319e-23	-22.554	-22.635	-0.081	(0)
PbF4-2	2.349e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
Pb3(OH) 4+2	5.994e-25	4.976e-25	-24.222	-24.303	-0.081	(0)
PbCl4-2	1.040e-25	8.634e-26	-24.983	-25.064	-0.081	(0)
Pb(NO3) 2	6.105e-28	6.105e-28	-27.214	-27.214	0.000	(0)
Pb4(OH) 4+4	1.515e-29	7.197e-30	-28.820	-29.143	-0.323	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-153.694	-153.694	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-232.485	-232.506	-0.020	(0)
S(-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.543	-79.543	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.092	-80.112	-0.020	(0)
CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
S5-2	0.000e+00	0.000e+00	-82.945	-83.026	-0.081	(0)
S6-2	0.000e+00	0.000e+00	-83.461	-83.542	-0.081	(0)
S4-2	0.000e+00	0.000e+00	-83.541	-83.622	-0.081	(0)
S3-2	0.000e+00	0.000e+00	-84.347	-84.428	-0.081	(0)
S2-2	0.000e+00	0.000e+00	-85.363	-85.444	-0.081	(0)
S-2	0.000e+00	0.000e+00	-90.885	-90.961	-0.076	(0)
HgHS2-	0.000e+00	0.000e+00	-141.161	-141.181	-0.020	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-141.238	-141.238	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.357	-143.438	-0.081	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-153.694	-153.694	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.182	-154.319	-0.137	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-220.263	-220.283	-0.020	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.253	-231.273	-0.020	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-232.232	-232.252	-0.020	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-232.485	-232.506	-0.020	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.470	-238.490	-0.020	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-310.087	-310.168	-0.081	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.764	-312.845	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.672	-324.753	-0.081	(0)

S (6)	2.506e-04					
SO4-2	2.365e-04	1.982e-04	-3.626	-3.703	-0.077	(0)
CaSO4	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
MgSO4	2.380e-06	2.380e-06	-5.623	-5.623	0.000	(0)
NaSO4-	1.272e-07	1.218e-07	-6.896	-6.914	-0.019	(0)
KSO4-	9.352e-08	8.954e-08	-7.029	-7.048	-0.019	(0)
CuSO4	6.472e-08	6.472e-08	-7.189	-7.189	0.000	(0)
MnSO4	2.781e-08	2.781e-08	-7.556	-7.556	0.000	(0)
HSO4-	7.164e-09	6.856e-09	-8.145	-8.164	-0.019	(0)
ZnSO4	3.979e-09	3.979e-09	-8.400	-8.400	0.000	(0)
AlSO4+	1.962e-10	1.878e-10	-9.707	-9.726	-0.019	(0)
PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
NH4SO4-	9.240e-11	8.845e-11	-10.034	-10.053	-0.019	(0)
CdSO4	4.353e-11	4.353e-11	-10.361	-10.361	0.000	(0)
FeSO4	3.513e-11	3.513e-11	-10.454	-10.454	0.000	(0)
Zn (SO4) 2-2	8.273e-12	6.868e-12	-11.082	-11.163	-0.081	(0)
UO2SO4	7.677e-12	7.677e-12	-11.115	-11.115	0.000	(0)
Al (SO4) 2-	4.167e-13	3.988e-13	-12.380	-12.399	-0.019	(0)
CoSO4	4.072e-13	4.072e-13	-12.390	-12.390	0.000	(0)
Pb (SO4) 2-2	2.542e-13	2.111e-13	-12.595	-12.676	-0.081	(0)
Cd (SO4) 2-2	1.402e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
NiSO4	6.590e-14	6.590e-14	-13.181	-13.181	0.000	(0)
CrOHSO4	4.835e-14	4.835e-14	-13.316	-13.316	0.000	(0)
UO2 (SO4) 2-2	2.416e-14	2.006e-14	-13.617	-13.698	-0.081	(0)
CrSO4+	8.009e-16	7.645e-16	-15.096	-15.117	-0.020	(0)
FeSO4+	4.942e-16	4.731e-16	-15.306	-15.325	-0.019	(0)
VO2SO4-	1.101e-16	1.051e-16	-15.958	-15.978	-0.020	(0)
VOSO4	3.831e-18	3.831e-18	-17.417	-17.417	0.000	(0)
Fe (SO4) 2-	2.100e-18	2.005e-18	-17.678	-17.698	-0.020	(0)
Ni (SO4) 2-2	5.209e-19	4.325e-19	-18.283	-18.364	-0.081	(0)
HgSO4	2.393e-21	2.393e-21	-20.621	-20.621	0.000	(0)
Cr2 (OH) 2SO4+2	5.411e-24	4.492e-24	-23.267	-23.348	-0.081	(0)
Cr2 (OH) 2 (SO4) 2	5.289e-26	5.289e-26	-25.277	-25.277	0.000	(0)
CrO3SO4-2	7.155e-29	5.940e-29	-28.145	-28.226	-0.081	(0)
VSO4+	1.350e-31	1.288e-31	-30.870	-30.890	-0.020	(0)
U (SO4) 2	8.161e-38	8.161e-38	-37.088	-37.088	0.000	(0)
USO4+2	6.244e-38	5.184e-38	-37.205	-37.285	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.138	-75.158	-0.020	(0)
Sb (3)	7.942e-21					
Sb (OH) 3	4.019e-21	4.019e-21	-20.396	-20.396	0.000	(0)
HSbO2	3.923e-21	3.923e-21	-20.406	-20.406	0.000	(0)
Sb (OH) 2F	6.749e-26	6.749e-26	-25.171	-25.171	0.000	(0)
SbOF	6.636e-26	6.636e-26	-25.178	-25.178	0.000	(0)
Sb (OH) 2+	3.619e-26	3.454e-26	-25.441	-25.462	-0.020	(0)
SbO2-	1.880e-26	1.795e-26	-25.726	-25.746	-0.020	(0)
SbO+	1.248e-26	1.191e-26	-25.904	-25.924	-0.020	(0)
Sb (OH) 4-	1.077e-26	1.028e-26	-25.968	-25.988	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.672	-324.753	-0.081	(0)
Sb (5)	4.002e-10					
SbO3-	3.997e-10	3.815e-10	-9.398	-9.418	-0.020	(0)
Sb (OH) 6-	4.664e-13	4.463e-13	-12.331	-12.350	-0.019	(0)
SbO2+	1.436e-23	1.371e-23	-22.843	-22.863	-0.020	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.317	-41.337	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.898	-43.898	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.805	-49.886	-0.081	(0)
Se (4)	3.488e-09					
HSeO3-	3.443e-09	3.286e-09	-8.463	-8.483	-0.020	(0)
SeO3-2	4.452e-11	3.696e-11	-10.351	-10.432	-0.081	(0)
H2SeO3	4.962e-13	4.962e-13	-12.304	-12.304	0.000	(0)
FeHSeO3+2	2.225e-21	1.847e-21	-20.653	-20.733	-0.081	(0)
Cd (SeO3) 2-2	1.271e-24	1.055e-24	-23.896	-23.977	-0.081	(0)
Se (6)	4.376e-13					
SeO4-2	4.375e-13	3.666e-13	-12.359	-12.436	-0.077	(0)
MnSeO4	7.786e-17	7.786e-17	-16.109	-16.109	0.000	(0)
HSeO4-	6.814e-18	6.505e-18	-17.167	-17.187	-0.020	(0)
ZnSeO4	5.211e-18	5.211e-18	-17.283	-17.283	0.000	(0)

CdSeO4	6.397e-20	6.397e-20	-19.194	-19.194	0.000	(0)
CoSeO4	1.892e-21	1.892e-21	-20.723	-20.723	0.000	(0)
NiSeO4	2.858e-22	2.858e-22	-21.544	-21.544	0.000	(0)
Zn (SeO4) 2-2	2.333e-30	1.937e-30	-29.632	-29.713	-0.081	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.298	-55.480	-0.182	(0)
U (4)	9.527e-22					
U (OH) 5-	9.394e-22	8.967e-22	-21.027	-21.047	-0.020	(0)
U (OH) 4	1.329e-23	1.329e-23	-22.876	-22.876	0.000	(0)
U (OH) 3+	1.802e-26	1.720e-26	-25.744	-25.764	-0.020	(0)
U (OH) 2+2	3.392e-30	2.816e-30	-29.470	-29.550	-0.081	(0)
UF3+	7.676e-33	7.327e-33	-32.115	-32.135	-0.020	(0)
UF2+2	1.834e-33	1.522e-33	-32.737	-32.818	-0.081	(0)
UOH+3	7.135e-35	4.694e-35	-34.147	-34.328	-0.182	(0)
UF4	2.440e-35	2.440e-35	-34.613	-34.613	0.000	(0)
UF+3	6.051e-36	3.981e-36	-35.218	-35.400	-0.182	(0)
U (SO4) 2	8.161e-38	8.161e-38	-37.088	-37.088	0.000	(0)
USO4+2	6.244e-38	5.184e-38	-37.205	-37.285	-0.081	(0)
UF5-	3.076e-38	2.937e-38	-37.512	-37.532	-0.020	(0)
UF6-2	3.244e-40	2.693e-40	-39.489	-39.570	-0.081	(0)
U+4	1.383e-40	0.000e+00	-39.859	-40.182	-0.323	(0)
UCl+3	0.000e+00	0.000e+00	-42.747	-42.928	-0.182	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.848	-161.484	-1.636	(0)
U (5)	5.153e-15					
UO2+	5.153e-15	4.919e-15	-14.288	-14.308	-0.020	(0)
U (6)	1.213e-08					
UO2 (CO3) 2-2	6.568e-09	5.453e-09	-8.183	-8.263	-0.081	(0)
UO2CO3	5.277e-09	5.277e-09	-8.278	-8.278	0.000	(0)
UO2F+	1.124e-10	1.073e-10	-9.949	-9.969	-0.020	(0)
UO2OH+	9.602e-11	9.165e-11	-10.018	-10.038	-0.020	(0)
UO2+2	3.054e-11	2.559e-11	-10.515	-10.592	-0.077	(0)
UO2 (CO3) 3-4	2.979e-11	1.415e-11	-10.526	-10.849	-0.323	(0)
UO2F2	9.398e-12	9.398e-12	-11.027	-11.027	0.000	(0)
UO2SO4	7.677e-12	7.677e-12	-11.115	-11.115	0.000	(0)
UO2F3-	7.511e-14	7.170e-14	-13.124	-13.145	-0.020	(0)
UO2 (SO4) 2-2	2.416e-14	2.006e-14	-13.617	-13.698	-0.081	(0)
(UO2) 2 (OH) 2+2	1.679e-14	1.394e-14	-13.775	-13.856	-0.081	(0)
UO2Cl+	1.557e-15	1.486e-15	-14.808	-14.828	-0.020	(0)
(UO2) 3 (OH) 5+	8.216e-16	7.842e-16	-15.085	-15.106	-0.020	(0)
UO2F4-2	2.083e-17	1.730e-17	-16.681	-16.762	-0.081	(0)
UO2NO3+	6.181e-21	5.900e-21	-20.209	-20.229	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.591	-40.672	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.688	-40.708	-0.020	(0)
V (3)	2.557e-14					
V (OH) 3	2.557e-14	2.557e-14	-13.592	-13.592	0.000	(0)
V (OH) 2+	6.126e-24	5.848e-24	-23.213	-23.233	-0.020	(0)
VOH+2	2.365e-26	1.963e-26	-25.626	-25.707	-0.081	(0)
V+3	2.093e-30	1.377e-30	-29.679	-29.861	-0.182	(0)
VSO4+	1.350e-31	1.288e-31	-30.870	-30.890	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.291	-50.614	-0.323	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.306	-50.488	-0.182	(0)
V (4)	5.192e-16					
V (OH) 3+	4.173e-16	3.983e-16	-15.380	-15.400	-0.020	(0)
VO+2	8.454e-17	7.019e-17	-16.073	-16.154	-0.081	(0)
VOF+	1.339e-17	1.279e-17	-16.873	-16.893	-0.020	(0)
VOSO4	3.831e-18	3.831e-18	-17.417	-17.417	0.000	(0)
VOF2	1.456e-19	1.456e-19	-18.837	-18.837	0.000	(0)
VOC1+	7.387e-21	7.051e-21	-20.132	-20.152	-0.020	(0)
VOF3-	1.644e-22	1.569e-22	-21.784	-21.804	-0.020	(0)
VOF4-2	2.317e-26	1.923e-26	-25.635	-25.716	-0.081	(0)
H2V2O4+2	9.579e-27	7.953e-27	-26.019	-26.099	-0.081	(0)
V (5)	9.417e-09					
H2VO4-	9.306e-09	8.883e-09	-8.031	-8.051	-0.020	(0)
HVO4-2	7.593e-11	6.304e-11	-10.120	-10.200	-0.081	(0)
H3VO4	3.144e-11	3.144e-11	-10.502	-10.502	0.000	(0)
H3V2O7-	1.889e-12	1.803e-12	-11.724	-11.744	-0.020	(0)
VO2+	2.321e-14	2.221e-14	-13.634	-13.653	-0.019	(0)

VO2F	1.183e-15	1.183e-15	-14.927	-14.927	0.000	(0)
HV2O7-3	2.884e-16	1.897e-16	-15.540	-15.722	-0.182	(0)
VO2SO4-	1.101e-16	1.051e-16	-15.958	-15.978	-0.020	(0)
VO2F2-	1.367e-17	1.304e-17	-16.864	-16.885	-0.020	(0)
VO4-3	1.356e-18	8.925e-19	-17.868	-18.049	-0.182	(0)
V3O9-3	1.116e-18	7.340e-19	-17.952	-18.134	-0.182	(0)
V2O7-4	3.037e-20	1.443e-20	-19.518	-19.841	-0.323	(0)
VO2F3-2	5.952e-21	4.942e-21	-20.225	-20.306	-0.081	(0)
V4O12-4	5.721e-24	2.718e-24	-23.243	-23.566	-0.323	(0)
VO2NO3	1.298e-24	1.298e-24	-23.887	-23.887	0.000	(0)
VO2F4-3	1.122e-25	7.385e-26	-24.950	-25.132	-0.182	(0)
HV10028-5	0.000e+00	0.000e+00	-55.172	-55.677	-0.505	(0)
H2V10028-4	0.000e+00	0.000e+00	-56.597	-56.920	-0.323	(0)
V10028-6	0.000e+00	0.000e+00	-56.685	-57.413	-0.727	(0)
Zn	1.153e-07					
Zn+2	1.095e-07	9.176e-08	-6.961	-7.037	-0.077	(0)
ZnSO4	3.979e-09	3.979e-09	-8.400	-8.400	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
ZnCO3	2.735e-10	2.735e-10	-9.563	-9.563	0.000	(0)
ZnOH+	2.735e-10	2.610e-10	-9.563	-9.583	-0.020	(0)
ZnF+	5.825e-11	5.561e-11	-10.235	-10.255	-0.020	(0)
ZnCl+	8.627e-12	8.254e-12	-11.064	-11.083	-0.019	(0)
Zn (SO4) 2-2	8.273e-12	6.868e-12	-11.082	-11.163	-0.081	(0)
Zn (OH) 2	1.177e-12	1.177e-12	-11.929	-11.929	0.000	(0)
ZnOHCl	3.074e-13	3.074e-13	-12.512	-12.512	0.000	(0)
ZnCl2	4.684e-16	4.684e-16	-15.329	-15.329	0.000	(0)
Zn (OH) 3-	1.758e-16	1.678e-16	-15.755	-15.775	-0.020	(0)
ZnNO3+	2.790e-17	2.663e-17	-16.554	-16.575	-0.020	(0)
ZnSeO4	5.211e-18	5.211e-18	-17.283	-17.283	0.000	(0)
ZnCl3-	1.393e-20	1.332e-20	-19.856	-19.875	-0.019	(0)
Zn (OH) 4-2	2.288e-22	1.900e-22	-21.640	-21.721	-0.081	(0)
ZnCl4-2	2.841e-25	2.386e-25	-24.547	-24.622	-0.076	(0)
Zn (NO3) 2	6.139e-28	6.139e-28	-27.212	-27.212	0.000	(0)
Zn (SeO4) 2-2	2.333e-30	1.937e-30	-29.632	-29.713	-0.081	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.253	-231.273	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.764	-312.845	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-72.14	-65.85	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-59.38	-54.87	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-66.61	-54.87	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-90.21	-72.27	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-75.83	-55.80	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-35.78	-35.38	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-27.65	-27.20	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.36	9.44	10.80	Al (OH) 3
Al2 (MoO4) 3	-44.69	-42.32	2.37	Al2 (MoO4) 3
Al2O3	-0.77	18.88	19.65	Al2O3
Al4 (OH) 10SO4	-1.55	21.15	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-9.07	-4.27	4.80	AlAsO4:2H2O
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4
AlSb	-154.29	-88.67	65.62	AlSb
Alunite	-1.24	-2.64	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.65	-12.44	-7.79	PbSO4
Anhydrite	-2.94	-7.30	-4.36	CaSO4
Anilite	-57.73	-89.61	-31.88	Cu0.25Cu1.5S
Antlerite	-4.22	4.56	8.79	Cu3 (OH) 4SO4
Aragonite	-2.59	-10.89	-8.30	CaCO3
Arsenolite	-80.10	-82.86	-2.76	As4O6
Artinite	-12.34	-2.74	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-34.12	-27.42	6.71	As2O5
Atacamite	-4.18	3.21	7.39	Cu2 (OH) 3Cl

Azurite	-2.30	-19.21	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-18.45	5.95	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-18.38	-2.51	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.66	-9.57	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-29.50	3.44	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-17.90	-27.57	-9.67	BaCrO ₄
BaF ₂	-10.17	-15.99	-5.82	BaF ₂
BaMoO ₄	-7.49	-14.45	-6.96	BaMoO ₄
Barite	-0.68	-10.66	-9.98	BaSO ₄
BaS	-96.79	-80.61	16.18	BaS
BaSeO ₃	-10.82	-8.99	1.83	BaSeO ₃
BaSeO ₄	-11.93	-19.39	-7.46	BaSeO ₄
Bianchite	-8.98	-10.74	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-10.74	7.35	18.09	MnO ₂
Bixbyite	-10.55	-11.20	-0.64	Mn ₂ O ₃
BlaubleiI	-56.69	-80.85	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiIII	-57.62	-84.89	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.86	9.44	8.58	AlOOH
Breithauptite	-65.51	-84.03	-18.52	NiSb
Brochantite	-3.60	11.62	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-8.12	8.72	16.84	Mg(OH) ₂
Bunsenite	-11.32	1.12	12.45	NiO
Ca(VO ₃) ₂	-10.76	-5.10	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-13.30	4.20	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-17.36	4.20	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-21.81	0.49	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-25.46	13.50	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-26.36	13.50	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-311.29	-168.32	142.97	Ca ₃ Sb ₂
CaCrO ₄	-21.95	-24.22	-2.27	CaCrO ₄
Calcite	-2.41	-10.89	-8.48	CaCO ₃
Calomel	-11.86	-29.77	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.15	-11.10	-7.95	CaMoO ₄
Carnotite	-2.87	-2.64	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-8.45	-5.63	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-13.02	-16.04	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-18.67	-8.83	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-9.77	3.87	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-9.86	3.87	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-28.30	-21.59	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-27.54	-4.98	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-29.51	-1.11	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-17.26	-17.92	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-16.23	-17.92	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-16.01	-17.92	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-16.85	-18.06	-1.21	CdF ₂
Cdmetal(alpha)	-35.55	-22.03	13.51	Cd
Cdmetal(gamma)	-35.65	-22.03	13.62	Cd
CdMoO ₄	-2.38	-16.53	-14.15	CdMoO ₄
CdOHC1	-10.56	-7.02	3.54	CdOHC1
CdSb	-80.93	-81.28	-0.35	CdSb
CdSe	-23.71	-43.91	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-19.61	-21.46	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-12.56	-12.73	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-11.01	-12.73	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-10.86	-12.73	-1.87	CdSO ₄ ·2.67H ₂ O
Cerrusite	-2.90	-16.03	-13.13	PbCO ₃
CH ₄ (g)	-82.76	-123.81	-41.05	CH ₄
Chalcanthite	-6.91	-9.55	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-58.06	-92.98	-34.92	Cu ₂ S
Chalcopyrite	-127.04	-162.31	-35.27	CuFeS ₂
Cinnabar	-53.50	-99.19	-45.69	HgS
Claudetite	-79.79	-82.86	-3.06	As ₄ O ₆
Clausthalite	-16.53	-43.63	-27.10	PbSe
Co(BO ₂) ₂	-37.86	-10.79	27.07	Co(BO ₂) ₂
Co(OH) ₂	-11.18	1.91	13.09	Co(OH) ₂
Co(OH) ₃	-15.22	-17.53	-2.31	Co(OH) ₃
CO ₂ (g)	-2.04	-20.19	-18.15	CO ₂

Co3(AsO4)2	-34.71	-21.67	13.03	Co3(AsO4)2
Co3O4	-22.66	-33.15	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.43	-20.02	-1.60	CoF2
CoF3	-48.98	-50.44	-1.46	CoF3
CoFe2O4	12.80	9.28	-3.53	CoFe2O4
CoMoO4	-10.73	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS(alpha)	-77.21	-84.65	-7.44	CoS
CoS(beta)	-73.58	-84.65	-11.07	CoS
CoSe	-29.67	-45.87	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.89	-23.42	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.21	-79.51	-22.30	CuS
Cr(OH)2	-25.82	-15.00	10.82	Cr(OH)2
Cr(OH)3	-6.33	-5.00	1.34	Cr(OH)3
Cr(OH)3(am)	-4.25	-5.00	-0.75	Cr(OH)3
Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.89	-36.80	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.39	-40.91	30.48	Cr
CrO3	-30.31	-33.52	-3.21	CrO3
Cryolite	-15.00	-48.84	-33.84	Na3AlF6
Cu(OH)2	-1.62	7.06	8.67	Cu(OH)2
Cu(SbO3)2	-27.14	18.07	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-11.53	-2.28	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-59.38	-94.26	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-8.40	-54.20	-45.80	Cu2Se
Cu2SO4	-21.07	-23.02	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.35	-6.25	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-65.13	-107.73	-42.59	Cu3Sb
Cu3Se2	-31.44	-94.93	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.02	-26.46	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.40	-16.16	-8.76	Cu
CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-5.01	-6.41	-1.41	Cu2O
Cuprousferrite	9.39	0.47	-8.92	CuFeO2
CuSe	-7.63	-40.73	-33.10	CuSe
CuSe2	-29.25	-62.62	-33.37	CuSe2
CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.84	-18.28	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.17	-92.09	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.81	-22.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.26	-22.35	-17.09	CaMg(CO3)2
Epsomite	-5.76	-7.88	-2.13	MgSO4:7H2O
Fe(OH)2	-9.80	3.76	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.45	0.41	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.92	-10.64	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.13	-7.57	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.81	-37.44	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.72	-42.45	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.10	11.12	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.44	-6.23	7.20	FeCr2O4

FeMoO4	-6.55	-16.64	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe(OH)3
Ferroselite	-47.31	-65.91	-18.60	FeSe2
FeS(ppt)	-79.85	-82.80	-2.95	FeS
FeSe	-33.03	-44.03	-11.00	FeSe
Fix_pe	-6.50	-6.50	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF2
Galena	-68.43	-82.40	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al(OH)3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4·7H2O
Greenockite	-68.33	-82.69	-14.36	CdS
Greigite	-290.09	-335.13	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.69	-7.30	-4.61	CaSO4·2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.52	-20.40	-12.88	H2MoO4
H2S(g)	-78.55	-86.56	-8.01	H2S
H2Se(g)	-42.83	-47.79	-4.96	H2Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.73	46.30	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3)2(g)	-186.53	-260.24	-73.71	Hg(CH3)2
Hg(g)	-9.07	-16.94	-7.87	Hg
Hg(OH)2	-9.13	-12.63	-3.50	Hg(OH)2
Hg2(g)	-18.92	-33.88	-14.96	Hg2
Hg2(OH)2	-13.24	-7.98	5.26	Hg2(OH)2
Hg2CO3	-12.11	-28.16	-16.05	Hg2CO3
Hg2CrO4	-32.79	-41.49	-8.70	Hg2CrO4
Hg2F2	-19.55	-29.91	-10.36	Hg2F2
Hg2S	-82.86	-94.54	-11.68	Hg2S
Hg2SeO3	-18.25	-22.91	-4.66	Hg2SeO3
Hg2SO4	-18.45	-24.58	-6.13	Hg2SO4
Hg3O2CO3	-28.39	-58.07	-29.68	Hg3O2CO3
HgCl(g)	-34.38	-14.88	19.50	HgCl
HgCl2	-13.16	-34.42	-21.26	HgCl2
HgF(g)	-47.63	-14.96	32.68	HgF
HgF2(g)	-47.13	-34.57	12.57	HgF2
Hgmetal(l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.72	-60.42	-55.69	HgSe
HgSeO3	-15.13	-27.56	-12.43	HgSeO3
HgSO4	-19.81	-29.23	-9.42	HgSO4
Huntite	-15.32	-45.29	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.12	-27.89	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-28.38	-37.14	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-16.34	-21.51	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.11	-19.91	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-45.28	-62.52	-17.24	K2Cr2O7
K2CrO4	-28.49	-29.01	-0.51	K2CrO4
K2MoO4	-19.15	-15.89	3.26	K2MoO4
K2SeO4	-20.10	-20.83	-0.73	K2SeO4
Langite	-5.87	11.62	17.49	Cu4(OH)6SO4·H2O
Larnakite	-7.85	-8.28	-0.43	PbO·PbSO4
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.20	-82.80	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe2O3
Magnesioferrite	-0.78	16.08	16.86	Fe2MgO4
Magnesite	-4.01	-11.47	-7.46	MgCO3
Magnetite	7.72	11.12	3.40	Fe3O4
Malachite	-0.77	-6.08	-5.31	Cu2(OH)2CO3
Manganite	-5.59	19.75	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl2

Melanterite	-10.64	-12.84	-2.21	FeSO4:7H2O
Metacinnabar	-54.10	-99.19	-45.09	HgS
Mg(OH)2(active)	-10.07	8.72	18.79	Mg(OH)2
Mg(VO3)2	-16.96	-5.68	11.28	Mg(VO3)2
Mg2Sb3	-286.81	-212.12	74.68	Mg2Sb3
Mg2V2O7	-23.32	3.04	26.36	Mg2V2O7
MgCr2O4	-17.47	-1.27	16.20	MgCr2O4
MgCrO4	-30.18	-24.80	5.38	MgCrO4
MgF2	-5.09	-13.22	-8.13	MgF2
MgMoO4	-9.83	-11.68	-1.85	MgMoO4
MgSeO3:6H2O	-9.27	-6.21	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-15.42	-16.62	-1.20	MgSeO4:6H2O
Minium	-35.13	38.39	73.52	Pb3O4
Mirabilite	-10.47	-11.59	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.51	-7.61	4.90	Mn(VO3)2
Mn2(SO4)3	-55.30	-61.01	-5.71	Mn2(SO4)3
Mn2Sb	-158.54	-97.46	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-19.52	-7.02	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-17.71	-15.00	2.72	MnCl2:4H2O
MnS(grn)	-79.93	-79.76	0.17	MnS
MnS(pnk)	-83.10	-79.76	3.34	MnS
MnSb	-100.80	-103.71	-2.91	MnSb
MnSe	-44.49	-40.99	3.50	MnSe
MnSeO3	-9.27	-8.14	1.13	MnSeO3
MnSeO3:2H2O	-9.12	-8.14	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.49	-18.54	-2.05	MnSeO4:5H2O
MnSO4	-12.39	-9.81	2.58	MnSO4
Monteponite	-11.23	3.87	15.10	CdO
Montroydite	-8.99	-12.63	-3.64	HgO
MoO3	-12.40	-20.40	-8.00	MoO3
Morenosite	-13.34	-15.48	-2.14	NiSO4:7H2O
MoS2	-149.17	-219.43	-70.26	MoS2
Na-Jarosite	-8.46	-19.66	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-52.12	-62.01	-9.90	Na2Cr2O7
Na2CrO4	-31.43	-28.50	2.93	Na2CrO4
Na2Mo2O7	-19.19	-35.78	-16.60	Na2Mo2O7
Na2MoO4	-16.87	-15.38	1.49	Na2MoO4
Na2MoO4:2H2O	-16.61	-15.38	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.22	-9.92	10.30	Na2SeO3:5H2O
Na2SeO4	-21.60	-20.32	1.28	Na2SeO4
Na3Sb	-185.03	-90.58	94.45	Na3Sb
Na3VO4	-36.35	0.33	36.68	Na3VO4
Na4V2O7	-41.77	-4.37	37.40	Na4V2O7
Nantokite	-7.37	-14.10	-6.73	CuCl
NaSb	-92.86	-69.70	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na2CO3:10H2O
NaVO3	-8.55	-4.69	3.86	NaVO3
Nesquehonite	-6.80	-11.47	-4.67	MgCO3:3H2O
Ni(OH)2	-11.67	1.12	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-39.74	-24.04	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-44.11	-12.11	32.00	Ni4(OH)6SO4
NiCO3	-12.19	-19.06	-6.87	NiCO3
NiMoO4	-8.13	-19.28	-11.14	NiMoO4
NiS(alpha)	-79.84	-85.44	-5.60	NiS
NiS(beta)	-74.34	-85.44	-11.10	NiS
NiS(gamma)	-72.64	-85.44	-12.80	NiS
NiSe	-28.96	-46.66	-17.70	NiSe
NiSeO3:2H2O	-16.63	-13.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-22.69	-24.21	-1.52	NiSeO4:6H2O
Nsutite	-10.15	7.35	17.50	MnO2
O2(g)	-31.28	51.81	83.09	O2
Orpiment	-240.05	-301.12	-61.07	As2S3
Otavite	-4.31	-16.31	-12.00	CdCO3
Pb(BO2)2	-15.06	-8.54	6.52	Pb(BO2)2
Pb(OH)2	-3.99	4.16	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-70.74	-79.50	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-11.37	-2.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.86	8.32	26.19	Pb2O(OH)2

Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.31	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.73	-14.93	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.06	-1.92	6.14	Pb3(VO4)2
Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.06	0.04	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.04	21.88	Pb4O3SO4
PbCrO4	-16.75	-29.35	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.34	-21.18	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.53	30.07	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-124.95	-143.46	-18.51	FeS2
Pyrochroite	-8.39	6.80	15.19	Mn(OH)2
Pyrolusite	-8.68	32.70	41.38	MnO2
Realgar	-100.48	-120.23	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb(OH)3	-13.29	-20.40	-7.11	Sb(OH)3
Sb2O4	-18.29	-14.89	3.40	Sb2O4
Sb2O5	-27.94	-37.60	-9.67	Sb2O5
Sb2Se3	-116.40	-184.16	-67.76	Sb2Se3
Sb4O6(cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6(orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.66	-53.09	0.57	SbCl3
SbF3	-43.08	-53.30	-10.23	SbF3
Sbmetal	-47.56	-59.25	-11.69	Sb
SbO2	-3.93	-31.75	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2(OH)2:H2O
Semetal(am)	-14.77	-21.88	-7.11	Se
Semetal(hex)	-14.17	-21.88	-7.71	Se
Senarmontite	-28.43	-40.79	-12.37	Sb2O3
SeO2	-15.06	-14.93	0.12	SeO2
SeO3	-46.38	-25.34	21.04	SeO3
Siderite	-6.19	-16.43	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3
Sphalerite	-69.25	-80.70	-11.45	ZnS
Spinel	-9.25	27.60	36.85	MgAl2O4
Stibnite	-250.02	-300.48	-50.46	Sb2S3
Sulfur	-58.51	-60.66	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na2SO4
Thermonatrite	-15.81	-15.17	0.64	Na2CO3:H2O
Tyuyamunite	-4.56	-0.48	4.08	Ca(UO2)2(VO4)2
U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-587.96	-435.57	152.38	U3Sb4
U4O9	-28.59	-31.61	-3.02	U4O9
UF4	-28.72	-58.25	-29.54	UF4
UF4:2.5H2O	-25.53	-58.25	-32.72	UF4:2.5H2O
UO2(am)	-15.31	-14.38	0.93	UO2
UO2(NO3)2	-42.61	-30.47	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.32	-30.47	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.86	-30.47	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.51	-30.47	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.30	2.31	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.78	-23.03	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3
Uraninite	-9.71	-14.38	-4.67	UO2
USb2	-223.49	-193.91	29.58	USb2
V(OH)3	-18.10	-10.51	7.59	V(OH)3

V2O5	-13.04	-14.40	-1.36	V2O5
V3O5	-37.50	-35.66	1.84	V3O5
V4O7	-46.10	-38.91	7.19	V4O7
V6O13	-34.16	-95.02	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VC12	-64.13	-45.25	18.87	VC12
VC13	-66.63	-43.20	23.43	VC13
VF4	-62.06	-47.13	14.93	VF4
Vmetal	-93.39	-49.36	44.03	V
VO	-38.22	-23.46	14.76	VO
VO(OH)2	-8.40	-3.25	5.15	VO(OH)2
VO2Cl	-20.94	-18.10	2.84	VO2Cl
VOC1	-32.56	-21.40	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO4	-23.47	-19.86	3.61	VOSO4
Witherite	-5.67	-14.24	-8.57	BaCO3
Wurtzite	-71.75	-80.70	-8.95	ZnS
Zincite	-5.47	5.86	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO4
Zn(BO2)2	-15.13	-6.84	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-30.23	-26.91	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-6.34	5.86	12.20	Zn(OH)2
Zn(OH)2(am)	-6.61	5.86	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.89	5.86	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.67	5.86	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.87	5.86	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.38	-4.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.36	0.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.47	-9.82	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.53	-15.62	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.55	6.85	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.97	7.53	38.50	Zn5(OH)8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.83	-20.04	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO(active)	-5.32	5.86	11.19	ZnO
ZnS(am)	-71.65	-80.70	-9.05	ZnS
ZnSb	-90.31	-79.29	11.01	ZnSb
ZnSe	-27.52	-41.92	-14.40	ZnSe
ZnSeO4:6H2O	-17.95	-19.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 105.

```

REACTION 602
  H2O      -1
  12503.95 moles ### Addition step. Removes HTC water but solute mass
remains
  USE solution 605
  SAVE Solution 606
  End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 605. Solution after simulation 104.
Using reaction 602.

Reaction 602.

1.250e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.222e-04	2.226e-04
As	1.022e-07	1.024e-07
B	1.004e-04	1.006e-04
Ba	3.012e-05	3.018e-05
C	1.632e-01	1.635e-01
Ca	7.054e-02	7.068e-02
Cd	2.637e-07	2.643e-07
Cl	8.452e-03	8.468e-03
Co	2.973e-09	2.979e-09
Cr	1.144e-09	1.146e-09
Cu	5.366e-04	5.377e-04
F	7.586e-03	7.601e-03
Fe	1.070e-05	1.072e-05
Hg	9.632e-09	9.652e-09
K	1.508e-02	1.511e-02
Mg	1.844e-02	1.848e-02
Mn	2.226e-04	2.230e-04
Mo	8.599e-06	8.616e-06
N	2.253e-05	2.258e-05
Na	2.704e-02	2.710e-02
Ni	4.842e-10	4.851e-10
Pb	7.521e-07	7.536e-07
S	5.659e-02	5.670e-02
Sb	9.036e-08	9.054e-08
Se	7.877e-07	7.893e-07
U	2.739e-06	2.745e-06
V	2.127e-06	2.131e-06
Zn	2.604e-05	2.609e-05

-----Description of solution-----

	pH =	6.246	Charge balance
	pe =	6.786	Adjusted to redox

equilibrium

Activity of water	=	0.995
Ionic strength (mol/kgw)	=	2.209e-01
Mass of water (kg)	=	1.002e+00
Total alkalinity (eq/kg)	=	9.315e-02
Total CO2 (mol/kg)	=	1.632e-01
Temperature (°C)	=	25.00
Pressure (atm)	=	1.00
Electrical balance (eq)	=	2.673e-06
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00
Iterations	=	33
Total H	=	1.114686e+02
Total O	=	5.633496e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	7.647e-07	5.679e-07	-6.116	-6.246	-0.129	0.00
OH-	2.524e-08	1.764e-08	-7.598	-7.754	-0.156	(0)
H2O	5.551e+01	9.946e-01	1.744	-0.002	0.000	18.07
Al	2.222e-04					
AlF4-	1.548e-04	1.118e-04	-3.810	-3.952	-0.141	(0)
AlF3	6.528e-05	6.528e-05	-4.185	-4.185	0.000	(0)
AlF2+	2.050e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
AlF+2	3.718e-09	1.115e-09	-8.430	-8.953	-0.523	(0)
Al (OH) 2+	1.090e-11	8.064e-12	-10.963	-11.093	-0.131	(0)
Al (OH) 4-	8.726e-12	6.300e-12	-11.059	-11.201	-0.141	(0)
AlSO4+	3.065e-12	2.213e-12	-11.514	-11.655	-0.141	(0)
Al (OH) 3	2.838e-12	2.838e-12	-11.547	-11.547	0.000	(0)
AlOH+2	1.919e-12	5.756e-13	-11.717	-12.240	-0.523	(0)
Al+3	4.755e-13	3.264e-14	-12.323	-13.486	-1.163	(0)
Al (SO4) 2-	2.868e-13	2.071e-13	-12.542	-12.684	-0.141	(0)
AlMo6O21-3	4.840e-28	3.370e-30	-27.315	-29.472	-2.157	(0)
As (3)	1.985e-19					
H3AsO3	1.982e-19	1.982e-19	-18.703	-18.703	0.000	(0)
H2AsO3-	3.108e-22	1.790e-22	-21.507	-21.747	-0.240	(0)
H4AsO3+	9.683e-26	5.576e-26	-25.014	-25.254	-0.240	(0)
HAsO3-2	2.615e-27	2.875e-28	-26.583	-27.541	-0.959	(0)
AsO3-3	2.803e-33	1.951e-35	-32.552	-34.710	-2.157	(0)
As (5)	1.022e-07					
HAsO4-2	5.137e-08	5.648e-09	-7.289	-8.248	-0.959	(0)
H2AsO4-	5.080e-08	2.925e-08	-7.294	-7.534	-0.240	(0)
AsO4-3	4.518e-12	3.145e-14	-11.345	-13.502	-2.157	(0)
H3AsO4	2.743e-12	2.886e-12	-11.562	-11.540	0.022	(0)
B	1.004e-04					
H3BO3	9.986e-05	1.051e-04	-4.001	-3.979	0.022	(0)
BF (OH) 3-	2.133e-07	1.433e-07	-6.671	-6.844	-0.173	(0)
H2BO3-	1.600e-07	1.075e-07	-6.796	-6.969	-0.173	(0)
CaH2BO3+	9.668e-08	6.492e-08	-7.015	-7.188	-0.173	(0)
BF2 (OH) 2-	4.450e-08	2.988e-08	-7.352	-7.525	-0.173	(0)
MgH2BO3+	1.648e-08	1.107e-08	-7.783	-7.956	-0.173	(0)
NaH2BO3	3.191e-09	3.191e-09	-8.496	-8.496	0.000	(0)
BaH2BO3+	3.729e-11	2.504e-11	-10.428	-10.601	-0.173	(0)
BF3OH-	3.378e-11	2.268e-11	-10.471	-10.644	-0.173	(0)
H5 (BO3) 2-	1.431e-11	9.609e-12	-10.844	-11.017	-0.173	(0)
BF4-	3.243e-13	2.177e-13	-12.489	-12.662	-0.173	(0)
H8 (BO3) 3-	1.503e-13	1.010e-13	-12.823	-12.996	-0.173	(0)
Ba	3.012e-05					
Ba+2	2.480e-05	7.540e-06	-4.606	-5.123	-0.517	(0)
BaHCO3+	5.297e-06	3.978e-06	-5.276	-5.400	-0.124	(0)
BaCO3	1.764e-08	1.764e-08	-7.754	-7.754	0.000	(0)
BaH2BO3+	3.729e-11	2.504e-11	-10.428	-10.601	-0.173	(0)
BaNO3+	1.792e-12	1.032e-12	-11.747	-11.986	-0.240	(0)
BaOH+	7.926e-13	5.805e-13	-12.101	-12.236	-0.135	(0)
BaNH3+2	2.583e-13	2.840e-14	-12.588	-13.547	-0.959	(0)
C (4)	1.632e-01					
HCO3-	7.464e-02	5.524e-02	-1.127	-1.258	-0.131	(0)
H2CO3	7.054e-02	7.054e-02	-1.152	-1.152	0.000	(0)
CaHCO3+	1.438e-02	1.080e-02	-1.842	-1.967	-0.124	(0)
MgHCO3+	2.361e-03	1.679e-03	-2.627	-2.775	-0.148	(0)
NaHCO3	5.820e-04	5.820e-04	-3.235	-3.235	0.000	(0)
CuCO3	3.457e-04	3.457e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.792e-05	4.487e-05	-4.108	-4.348	-0.240	(0)
CaCO3	7.589e-05	7.589e-05	-4.120	-4.120	0.000	(0)
Cu (CO3) 2-2	3.859e-05	4.243e-06	-4.413	-5.372	-0.959	(0)
MnHCO3+	2.712e-05	1.986e-05	-4.567	-4.702	-0.135	(0)
CO3-2	1.500e-05	4.560e-06	-4.824	-5.341	-0.517	(0)
MgCO3	1.127e-05	1.127e-05	-4.948	-4.948	0.000	(0)
ZnHCO3+	7.928e-06	4.565e-06	-5.101	-5.341	-0.240	(0)
BaHCO3+	5.297e-06	3.978e-06	-5.276	-5.400	-0.124	(0)

	UO2 (CO3) 3-4	2.724e-06	3.981e-10	-5.565	-9.400	-3.835	(0)
	NaCO3-	2.150e-06	1.591e-06	-5.668	-5.798	-0.131	(0)
	ZnCO3	6.859e-07	6.859e-07	-6.164	-6.164	0.000	(0)
	PbHCO3+	5.518e-07	3.178e-07	-6.258	-6.498	-0.240	(0)
	FeHCO3+	1.337e-07	1.004e-07	-6.874	-6.998	-0.124	(0)
	PbCO3	1.061e-07	1.061e-07	-6.974	-6.974	0.000	(0)
	BaCO3	1.764e-08	1.764e-08	-7.754	-7.754	0.000	(0)
	UO2 (CO3) 2-2	1.584e-08	1.742e-09	-7.800	-8.759	-0.959	(0)
	Pb (CO3) 2-2	1.270e-08	1.396e-09	-7.896	-8.855	-0.959	(0)
	CdHCO3+	6.394e-09	3.682e-09	-8.194	-8.434	-0.240	(0)
	CdCO3	3.043e-09	3.043e-09	-8.517	-8.517	0.000	(0)
	CoHCO3+	1.193e-09	6.867e-10	-8.924	-9.163	-0.240	(0)
	NiHCO3+	3.327e-10	1.916e-10	-9.478	-9.718	-0.240	(0)
	Cd (CO3) 2-2	9.357e-11	1.029e-11	-10.029	-10.988	-0.959	(0)
	UO2CO3	1.914e-11	1.914e-11	-10.718	-10.718	0.000	(0)
	CoCO3	1.232e-11	1.232e-11	-10.909	-10.909	0.000	(0)
	HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
	NiCO3	4.787e-12	4.787e-12	-11.320	-11.320	0.000	(0)
	Hg (CO3) 2-2	1.414e-12	1.555e-13	-11.849	-12.808	-0.959	(0)
	HgHCO3+	1.980e-13	1.140e-13	-12.703	-12.943	-0.240	(0)
Ca	7.054e-02						
	Ca+2	3.453e-02	1.050e-02	-1.462	-1.979	-0.517	(0)
	CaSO4	2.101e-02	2.101e-02	-1.678	-1.678	0.000	(0)
	CaHCO3+	1.438e-02	1.080e-02	-1.842	-1.967	-0.124	(0)
	CaF+	5.347e-04	3.916e-04	-3.272	-3.407	-0.135	(0)
	CaCO3	7.589e-05	7.589e-05	-4.120	-4.120	0.000	(0)
	CaH2BO3+	9.668e-08	6.492e-08	-7.015	-7.188	-0.173	(0)
	CaOH+	4.921e-09	3.695e-09	-8.308	-8.432	-0.124	(0)
	CaNO3+	1.575e-09	9.067e-10	-8.803	-9.043	-0.240	(0)
	CaNH3+2	7.177e-10	7.892e-11	-9.144	-10.103	-0.959	(0)
	Ca (NH3) 2+2	1.706e-18	1.876e-19	-17.768	-18.727	-0.959	(0)
Cd	2.637e-07						
	Cd+2	9.630e-08	2.928e-08	-7.016	-7.533	-0.517	(0)
	Cd (SO4) 2-2	6.423e-08	7.062e-09	-7.192	-8.151	-0.959	(0)
	CdSO4	5.995e-08	5.995e-08	-7.222	-7.222	0.000	(0)
	CdCl+	3.047e-08	1.755e-08	-7.516	-7.756	-0.240	(0)
	CdHCO3+	6.394e-09	3.682e-09	-8.194	-8.434	-0.240	(0)
	CdCO3	3.043e-09	3.043e-09	-8.517	-8.517	0.000	(0)
	CdF+	2.754e-09	1.586e-09	-8.560	-8.800	-0.240	(0)
	CdCl2	4.591e-10	4.591e-10	-9.338	-9.338	0.000	(0)
	Cd (CO3) 2-2	9.357e-11	1.029e-11	-10.029	-10.988	-0.959	(0)
	CdOHCl	1.269e-11	1.269e-11	-10.896	-10.896	0.000	(0)
	CdF2	1.081e-11	1.081e-11	-10.966	-10.966	0.000	(0)
	CdOH+	7.123e-12	4.102e-12	-11.147	-11.387	-0.240	(0)
	CdCl3-	3.157e-12	1.818e-12	-11.501	-11.740	-0.240	(0)
	CdNO3+	4.391e-15	2.528e-15	-14.357	-14.597	-0.240	(0)
	Cd (OH) 2	4.564e-16	4.564e-16	-15.341	-15.341	0.000	(0)
	CdSeO4	2.380e-16	2.380e-16	-15.624	-15.624	0.000	(0)
	Cd2OH+3	8.646e-17	6.019e-19	-16.063	-18.220	-2.157	(0)
	Cd (SeO3) 2-2	2.064e-18	2.269e-19	-17.685	-18.644	-0.959	(0)
	Cd (OH) 3-	8.540e-22	4.918e-22	-21.069	-21.308	-0.240	(0)
	Cd (NO3) 2	3.460e-23	3.460e-23	-22.461	-22.461	0.000	(0)
	Cd (OH) 4-2	1.291e-29	1.420e-30	-28.889	-29.848	-0.959	(0)
	CdHS+	0.000e+00	0.000e+00	-78.175	-78.415	-0.240	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.101	-150.101	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.851	-227.091	-0.240	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.826	-303.784	-0.959	(0)
Cl	8.452e-03						
	Cl-	8.451e-03	6.275e-03	-2.073	-2.202	-0.129	(0)
	MnCl+	1.944e-07	1.424e-07	-6.711	-6.847	-0.135	(0)
	CuCl+	1.801e-07	1.281e-07	-6.744	-6.893	-0.148	(0)
	ZnCl+	5.795e-08	4.120e-08	-7.237	-7.385	-0.148	(0)
	CdCl+	3.047e-08	1.755e-08	-7.516	-7.756	-0.240	(0)
	CuCl2-	1.504e-08	1.069e-08	-7.823	-7.971	-0.148	(0)
	CuCl	8.153e-09	8.153e-09	-8.089	-8.089	0.000	(0)
	HgCl2	7.782e-09	7.782e-09	-8.109	-8.109	0.000	(0)
	PbCl+	2.994e-09	1.724e-09	-8.524	-8.763	-0.240	(0)
	MnCl2	1.262e-09	1.262e-09	-8.899	-8.899	0.000	(0)

ZnOHC1	9.513e-10	9.513e-10	-9.022	-9.022	0.000	(0)
HgCl3-	8.481e-10	4.884e-10	-9.072	-9.311	-0.240	(0)
CdCl2	4.591e-10	4.591e-10	-9.338	-9.338	0.000	(0)
ZnCl2	4.098e-10	4.098e-10	-9.387	-9.387	0.000	(0)
HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
CuCl2	2.786e-10	2.786e-10	-9.555	-9.555	0.000	(0)
HgCl4-2	1.110e-10	1.220e-11	-9.955	-10.914	-0.959	(0)
CuCl3-2	4.986e-11	1.434e-11	-10.302	-10.843	-0.541	(0)
PbCl2	4.833e-11	4.833e-11	-10.316	-10.316	0.000	(0)
CdOHC1	1.269e-11	1.269e-11	-10.896	-10.896	0.000	(0)
CoCl+	6.026e-12	3.470e-12	-11.220	-11.460	-0.240	(0)
CdCl3-	3.157e-12	1.818e-12	-11.501	-11.740	-0.240	(0)
MnCl3-	2.979e-12	2.182e-12	-11.526	-11.661	-0.135	(0)
ZnCl3-	2.873e-12	2.043e-12	-11.542	-11.690	-0.148	(0)
NiCl+	7.845e-13	4.517e-13	-12.105	-12.345	-0.240	(0)
HgCl+	4.297e-13	2.474e-13	-12.367	-12.607	-0.240	(0)
PbCl3-	2.097e-13	1.207e-13	-12.678	-12.918	-0.240	(0)
FeCl+2	5.397e-14	1.553e-14	-13.268	-13.809	-0.541	(0)
CuCl3-	2.295e-14	1.632e-14	-13.639	-13.787	-0.148	(0)
ZnCl4-2	2.228e-14	6.410e-15	-13.652	-14.193	-0.541	(0)
CrCl+2	7.782e-15	8.556e-16	-14.109	-15.068	-0.959	(0)
PbCl4-2	3.150e-15	3.463e-16	-14.502	-15.461	-0.959	(0)
VOCl+	9.323e-16	5.368e-16	-15.030	-15.270	-0.240	(0)
FeCl2+	5.942e-16	4.352e-16	-15.226	-15.361	-0.135	(0)
UO2Cl+	1.863e-17	1.073e-17	-16.730	-16.969	-0.240	(0)
NiCl2	1.427e-17	1.427e-17	-16.845	-16.845	0.000	(0)
CrOHC12	1.800e-18	1.800e-18	-17.745	-17.745	0.000	(0)
CuCl4-2	1.784e-18	5.132e-19	-17.749	-18.290	-0.541	(0)
CrCl2+	8.848e-19	5.095e-19	-18.053	-18.293	-0.240	(0)
FeCl3	2.731e-19	2.731e-19	-18.564	-18.564	0.000	(0)
CrO3Cl-	1.776e-27	1.023e-27	-26.751	-26.990	-0.240	(0)
CoCl+2	4.515e-35	4.964e-36	-34.345	-35.304	-0.959	(0)
UCl+3	0.000e+00	0.000e+00	-42.657	-44.814	-2.157	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.463	-50.422	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.512	-50.471	-0.959	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.452	-65.411	-0.959	(0)
Co (2)	2.973e-09					
Co+2	1.454e-09	1.598e-10	-8.838	-9.796	-0.959	(0)
CoHCO3+	1.193e-09	6.867e-10	-8.924	-9.163	-0.240	(0)
CoSO4	2.785e-10	2.785e-10	-9.555	-9.555	0.000	(0)
CoF+	2.999e-11	1.727e-11	-10.523	-10.763	-0.240	(0)
CoCO3	1.232e-11	1.232e-11	-10.909	-10.909	0.000	(0)
CoCl+	6.026e-12	3.470e-12	-11.220	-11.460	-0.240	(0)
CoOH+	9.767e-14	5.624e-14	-13.010	-13.250	-0.240	(0)
CoNO2+	1.723e-14	9.923e-15	-13.764	-14.003	-0.240	(0)
Co (NH3) +2	1.043e-15	1.147e-16	-14.982	-15.940	-0.959	(0)
Co (OH) 2	7.879e-17	7.879e-17	-16.104	-16.104	0.000	(0)
CoNO3+	1.201e-17	6.917e-18	-16.920	-17.160	-0.240	(0)
CoSeO4	3.496e-18	3.496e-18	-17.456	-17.456	0.000	(0)
Co (NH3) 2+2	2.657e-22	2.922e-23	-21.576	-22.534	-0.959	(0)
Co2OH+3	6.472e-23	4.505e-25	-22.189	-24.346	-2.157	(0)
Co (OH) 3-	4.815e-23	2.772e-23	-22.317	-22.557	-0.240	(0)
CoOOH-	1.215e-23	6.994e-24	-22.916	-23.155	-0.240	(0)
Co (NO3) 2	3.843e-25	3.843e-25	-24.415	-24.415	0.000	(0)
Co (NH3) 3+2	1.997e-29	2.196e-30	-28.700	-29.658	-0.959	(0)
Co (OH) 4-2	7.048e-31	7.749e-32	-30.152	-31.111	-0.959	(0)
Co (NH3) 4+2	6.257e-37	6.880e-38	-36.204	-37.162	-0.959	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.865	-44.700	-3.835	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-45.166	-0.959	(0)
Co (3)	3.169e-30					
CoOH+2	3.169e-30	3.484e-31	-29.499	-30.458	-0.959	(0)
Co+3	5.664e-35	3.888e-36	-34.247	-35.410	-1.163	(0)
CoCl+2	4.515e-35	4.964e-36	-34.345	-35.304	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.512	-50.471	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.102	-60.342	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.452	-65.411	-0.959	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.803	-66.762	-0.959	(0)
Cr (2)	3.746e-26					

Cr+2	3.746e-26	4.119e-27	-25.426	-26.385	-0.959	(0)
Cr (3)	1.144e-09					
CrF+2	5.189e-10	5.706e-11	-9.285	-10.244	-0.959	(0)
Cr (OH) +2	3.697e-10	4.065e-11	-9.432	-10.391	-0.959	(0)
Cr (OH) 2+	1.515e-10	8.722e-11	-9.820	-10.059	-0.240	(0)
CrOHSO4	8.424e-11	8.424e-11	-10.074	-10.074	0.000	(0)
Cr+3	1.513e-11	1.054e-13	-10.820	-12.977	-2.157	(0)
CrSO4+	3.731e-12	2.148e-12	-11.428	-11.668	-0.240	(0)
Cr (OH) 3	5.779e-13	5.779e-13	-12.238	-12.238	0.000	(0)
CrCl+2	7.782e-15	8.556e-16	-14.109	-15.068	-0.959	(0)
CrO2-	8.439e-16	4.859e-16	-15.074	-15.313	-0.240	(0)
Cr (OH) 4-	7.046e-16	4.057e-16	-15.152	-15.392	-0.240	(0)
Cr2 (OH) 2SO4+2	2.815e-18	3.095e-19	-17.551	-18.509	-0.959	(0)
CrOHC12	1.800e-18	1.800e-18	-17.745	-17.745	0.000	(0)
CrCl2+	8.848e-19	5.095e-19	-18.053	-18.293	-0.240	(0)
Cr2 (OH) 2 (SO4) 2	1.606e-19	1.606e-19	-18.794	-18.794	0.000	(0)
CrNO3+2	1.144e-21	1.258e-22	-20.942	-21.900	-0.959	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.520	-41.479	-0.959	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.164	-49.321	-2.157	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.463	-50.422	-0.959	(0)
Cr (6)	1.657e-19					
CrO4-2	8.124e-20	2.470e-20	-19.090	-19.607	-0.517	(0)
HCrO4-	7.882e-20	4.539e-20	-19.103	-19.343	-0.240	(0)
NaCrO4-	3.994e-21	2.300e-21	-20.399	-20.638	-0.240	(0)
KCrO4-	1.681e-21	9.678e-22	-20.775	-21.014	-0.240	(0)
CrO3SO4-2	6.269e-25	6.893e-26	-24.203	-25.162	-0.959	(0)
H2CrO4	2.089e-26	2.089e-26	-25.680	-25.680	0.000	(0)
CrO3Cl-	1.776e-27	1.023e-27	-26.751	-26.990	-0.240	(0)
Cr2O7-2	6.531e-37	7.181e-38	-36.185	-37.144	-0.959	(0)
Cu (1)	2.503e-08					
CuCl2-	1.504e-08	1.069e-08	-7.823	-7.971	-0.148	(0)
CuCl	8.153e-09	8.153e-09	-8.089	-8.089	0.000	(0)
Cu+	1.792e-09	1.032e-09	-8.747	-8.986	-0.240	(0)
CuCl3-2	4.986e-11	1.434e-11	-10.302	-10.843	-0.541	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Cu (2)	5.366e-04					
CuCO3	3.457e-04	3.457e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.792e-05	4.487e-05	-4.108	-4.348	-0.240	(0)
Cu+2	4.235e-05	1.287e-05	-4.373	-4.890	-0.517	(0)
Cu (CO3) 2-2	3.859e-05	4.243e-06	-4.413	-5.372	-0.959	(0)
CuSO4	2.576e-05	2.576e-05	-4.589	-4.589	0.000	(0)
CuF+	4.821e-06	2.776e-06	-5.317	-5.557	-0.240	(0)
CuOH+	1.010e-06	7.180e-07	-5.996	-6.144	-0.148	(0)
CuCl+	1.801e-07	1.281e-07	-6.744	-6.893	-0.148	(0)
Cu2 (OH) 2+2	1.178e-07	1.295e-08	-6.929	-7.888	-0.959	(0)
CuNO2+	2.063e-08	1.188e-08	-7.686	-7.925	-0.240	(0)
CuNH3+2	7.154e-09	7.865e-10	-8.145	-9.104	-0.959	(0)
Cu (OH) 2	2.527e-09	2.527e-09	-8.597	-8.597	0.000	(0)
CuCl2	2.786e-10	2.786e-10	-9.555	-9.555	0.000	(0)
CuNO3+	1.931e-12	1.112e-12	-11.714	-11.954	-0.240	(0)
Cu (NO2) 2	1.071e-12	1.071e-12	-11.970	-11.970	0.000	(0)
Cu (OH) 3-	1.587e-13	9.140e-14	-12.799	-13.039	-0.240	(0)
CuCl3-	2.295e-14	1.632e-14	-13.639	-13.787	-0.148	(0)
CuCl4-2	1.784e-18	5.132e-19	-17.749	-18.290	-0.541	(0)
Cu (OH) 4-2	1.154e-19	1.269e-20	-18.938	-19.897	-0.959	(0)
Cu (NO3) 2	3.822e-21	3.822e-21	-20.418	-20.418	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.421	-215.660	-0.240	(0)
F	7.586e-03					
F-	4.602e-03	3.417e-03	-2.337	-2.466	-0.129	(0)
MgF+	1.577e-03	1.139e-03	-2.802	-2.944	-0.141	(0)
CaF+	5.347e-04	3.916e-04	-3.272	-3.407	-0.135	(0)
AlF4-	1.548e-04	1.118e-04	-3.810	-3.952	-0.141	(0)
AlF3	6.528e-05	6.528e-05	-4.185	-4.185	0.000	(0)
NaF	4.040e-05	4.040e-05	-4.394	-4.394	0.000	(0)
CuF+	4.821e-06	2.776e-06	-5.317	-5.557	-0.240	(0)
MnF+	3.348e-06	2.452e-06	-5.475	-5.610	-0.135	(0)
HF	2.870e-06	2.870e-06	-5.542	-5.542	0.000	(0)

AlF2+	2.050e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
ZnF+	3.095e-07	1.782e-07	-6.509	-6.749	-0.240	(0)
BF(OH) 3-	2.133e-07	1.433e-07	-6.671	-6.844	-0.173	(0)
FeF3	1.353e-07	1.353e-07	-6.869	-6.869	0.000	(0)
HF2-	5.336e-08	3.729e-08	-7.273	-7.428	-0.156	(0)
BF2(OH) 2-	4.450e-08	2.988e-08	-7.352	-7.525	-0.173	(0)
FeF2+	3.833e-08	2.807e-08	-7.416	-7.552	-0.135	(0)
AlF+2	3.718e-09	1.115e-09	-8.430	-8.953	-0.523	(0)
PbF+	3.238e-09	1.865e-09	-8.490	-8.729	-0.240	(0)
CdF+	2.754e-09	1.586e-09	-8.560	-8.800	-0.240	(0)
FeF+2	1.067e-09	3.070e-10	-8.972	-9.513	-0.541	(0)
CrF+2	5.189e-10	5.706e-11	-9.285	-10.244	-0.959	(0)
PbF2	1.254e-10	1.254e-10	-9.902	-9.902	0.000	(0)
VO2F2-	9.278e-11	5.343e-11	-10.033	-10.272	-0.240	(0)
VO2F	4.306e-11	4.306e-11	-10.366	-10.366	0.000	(0)
BF3OH-	3.378e-11	2.268e-11	-10.471	-10.644	-0.173	(0)
CoF+	2.999e-11	1.727e-11	-10.523	-10.763	-0.240	(0)
H2F2	2.207e-11	2.207e-11	-10.656	-10.656	0.000	(0)
VO2F3-2	2.071e-11	2.277e-12	-10.684	-11.643	-0.959	(0)
CdF2	1.081e-11	1.081e-11	-10.966	-10.966	0.000	(0)
UO2F3-	7.306e-12	4.207e-12	-11.136	-11.376	-0.240	(0)
UO2F2	4.901e-12	4.901e-12	-11.310	-11.310	0.000	(0)
NiF+	4.194e-12	2.415e-12	-11.377	-11.617	-0.240	(0)
PbF3-	1.411e-12	8.127e-13	-11.850	-12.090	-0.240	(0)
VOF+	1.085e-12	6.250e-13	-11.964	-12.204	-0.240	(0)
UO2F4-2	1.039e-12	1.142e-13	-11.984	-12.942	-0.959	(0)
UO2F+	8.637e-13	4.973e-13	-12.064	-12.303	-0.240	(0)
VOF2	8.008e-13	8.008e-13	-12.096	-12.096	0.000	(0)
VO2F4-3	5.501e-13	3.829e-15	-12.260	-14.417	-2.157	(0)
BF4-	3.243e-13	2.177e-13	-12.489	-12.662	-0.173	(0)
VOF3-	1.686e-13	9.710e-14	-12.773	-13.013	-0.240	(0)
VOF4-2	1.218e-14	1.339e-15	-13.914	-14.873	-0.959	(0)
PbF4-2	1.209e-14	1.329e-15	-13.918	-14.876	-0.959	(0)
HgF+	4.347e-19	2.503e-19	-18.362	-18.602	-0.240	(0)
Sb(OH) 2F	1.856e-21	1.856e-21	-20.731	-20.731	0.000	(0)
SbOF	1.835e-21	1.835e-21	-20.736	-20.736	0.000	(0)
UF3+	1.347e-30	7.754e-31	-29.871	-30.110	-0.240	(0)
UF6-2	3.693e-31	4.060e-32	-30.433	-31.391	-0.959	(0)
UF4	2.905e-31	2.905e-31	-30.537	-30.537	0.000	(0)
UF5-	6.833e-32	3.934e-32	-31.165	-31.405	-0.240	(0)
UF2+2	1.302e-32	1.432e-33	-31.885	-32.844	-0.959	(0)
UF+3	4.781e-36	3.328e-38	-35.321	-37.478	-2.157	(0)
Fe (2)	1.756e-06					
Fe+2	1.313e-06	1.443e-07	-5.882	-6.841	-0.959	(0)
FeSO4	3.094e-07	3.094e-07	-6.509	-6.509	0.000	(0)
FeHCO3+	1.337e-07	1.004e-07	-6.874	-6.998	-0.124	(0)
FeOH+	1.384e-10	1.013e-10	-9.859	-9.994	-0.135	(0)
Fe(OH) 2	1.420e-15	1.420e-15	-14.848	-14.848	0.000	(0)
Fe(OH) 3-	1.081e-17	7.917e-18	-16.966	-17.101	-0.135	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-155.670	-155.670	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-232.283	-232.523	-0.240	(0)
Fe (3)	8.948e-06					
Fe(OH) 2+	8.648e-06	6.400e-06	-5.063	-5.194	-0.131	(0)
FeF3	1.353e-07	1.353e-07	-6.869	-6.869	0.000	(0)
Fe(OH) 3	1.212e-07	1.212e-07	-6.916	-6.916	0.000	(0)
FeF2+	3.833e-08	2.807e-08	-7.416	-7.552	-0.135	(0)
FeOH+2	3.243e-09	9.328e-10	-8.489	-9.030	-0.541	(0)
FeF+2	1.067e-09	3.070e-10	-8.972	-9.513	-0.541	(0)
Fe(OH) 4-	2.690e-10	1.991e-10	-9.570	-9.701	-0.131	(0)
FeSO4+	1.096e-11	8.028e-12	-10.960	-11.095	-0.135	(0)
Fe(SO4) 2-	2.603e-12	1.499e-12	-11.585	-11.824	-0.240	(0)
Fe+3	1.193e-12	8.192e-14	-11.923	-13.087	-1.163	(0)
Fe2(OH) 2+4	1.971e-13	2.881e-17	-12.705	-16.540	-3.835	(0)
FeCl+2	5.397e-14	1.553e-14	-13.268	-13.809	-0.541	(0)
Fe3(OH) 4+5	2.620e-15	2.666e-21	-14.582	-20.574	-5.992	(0)
FeHSeO3+2	8.611e-16	9.468e-17	-15.065	-16.024	-0.959	(0)
FeCl2+	5.942e-16	4.352e-16	-15.226	-15.361	-0.135	(0)
FeCl3	2.731e-19	2.731e-19	-18.564	-18.564	0.000	(0)

FeNO3+2	2.035e-19	2.237e-20	-18.692	-19.650	-0.959	(0)
H (0)	1.162e-29					
H2	5.811e-30	6.114e-30	-29.236	-29.214	0.022	(0)
Hg (0)	4.885e-10					
Hg	4.885e-10	4.885e-10	-9.311	-9.311	0.000	(0)
Hg (1)	1.192e-17					
Hg2+2	5.960e-18	6.554e-19	-17.225	-18.184	-0.959	(0)
Hg (2)	9.144e-09					
HgCl2	7.782e-09	7.782e-09	-8.109	-8.109	0.000	(0)
HgCl3-	8.481e-10	4.884e-10	-9.072	-9.311	-0.240	(0)
HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
HgCl4-2	1.110e-10	1.220e-11	-9.955	-10.914	-0.959	(0)
HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
Hg (OH) 2	3.686e-12	3.878e-12	-11.433	-11.411	0.022	(0)
Hg (CO3) 2-2	1.414e-12	1.555e-13	-11.849	-12.808	-0.959	(0)
HgCl+	4.297e-13	2.474e-13	-12.367	-12.607	-0.240	(0)
HgHCO3+	1.980e-13	1.140e-13	-12.703	-12.943	-0.240	(0)
HgOH+	2.409e-15	1.387e-15	-14.618	-14.858	-0.240	(0)
Hg (NH3) 2+2	4.042e-16	4.444e-17	-15.393	-16.352	-0.959	(0)
HgNH3+2	6.770e-17	7.444e-18	-16.169	-17.128	-0.959	(0)
Hg+2	1.797e-17	1.976e-18	-16.745	-17.704	-0.959	(0)
HgSO4	4.518e-18	4.518e-18	-17.345	-17.345	0.000	(0)
HgF+	4.347e-19	2.503e-19	-18.362	-18.602	-0.240	(0)
Hg (OH) 3-	1.495e-20	8.610e-21	-19.825	-20.065	-0.240	(0)
Hg (NH3) 3+2	9.606e-24	1.056e-24	-23.017	-23.976	-0.959	(0)
HgNO3+	3.460e-26	1.992e-26	-25.461	-25.701	-0.240	(0)
Hg (NH3) 4+2	4.556e-31	5.009e-32	-30.341	-31.300	-0.959	(0)
Hg (NO3) 2	2.261e-34	2.261e-34	-33.646	-33.646	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.959	(0)
K	1.508e-02					
K+	1.420e-02	1.055e-02	-1.848	-1.977	-0.129	(0)
KSO4-	8.810e-04	6.520e-04	-3.055	-3.186	-0.131	(0)
KCrO4-	1.681e-21	9.678e-22	-20.775	-21.014	-0.240	(0)
Mg	1.844e-02					
Mg+2	9.769e-03	2.970e-03	-2.010	-2.527	-0.517	(0)
MgSO4	4.720e-03	4.720e-03	-2.326	-2.326	0.000	(0)
MgHCO3+	2.361e-03	1.679e-03	-2.627	-2.775	-0.148	(0)
MgF+	1.577e-03	1.139e-03	-2.802	-2.944	-0.141	(0)
MgCO3	1.127e-05	1.127e-05	-4.948	-4.948	0.000	(0)
MgOH+	2.747e-08	2.085e-08	-7.561	-7.681	-0.120	(0)
MgH2BO3+	1.648e-08	1.107e-08	-7.783	-7.956	-0.173	(0)
Mn (2)	2.226e-04					
Mn+2	1.639e-04	1.802e-05	-3.785	-4.744	-0.959	(0)
MnSO4	2.799e-05	2.799e-05	-4.553	-4.553	0.000	(0)
MnHCO3+	2.712e-05	1.986e-05	-4.567	-4.702	-0.135	(0)
MnF+	3.348e-06	2.452e-06	-5.475	-5.610	-0.135	(0)
MnCl+	1.944e-07	1.424e-07	-6.711	-6.847	-0.135	(0)
MnCl2	1.262e-09	1.262e-09	-8.899	-8.899	0.000	(0)
MnOH+	1.090e-09	7.984e-10	-8.962	-9.098	-0.135	(0)
MnCl3-	2.979e-12	2.182e-12	-11.526	-11.661	-0.135	(0)
MnNO3+	1.355e-12	7.800e-13	-11.868	-12.108	-0.240	(0)
MnSeO4	2.117e-13	2.117e-13	-12.674	-12.674	0.000	(0)
Mn (NO3) 2	5.350e-20	5.350e-20	-19.272	-19.272	0.000	(0)
Mn (OH) 3-	2.096e-21	1.535e-21	-20.679	-20.814	-0.135	(0)
Mn (OH) 4-2	3.038e-28	8.739e-29	-27.517	-28.059	-0.541	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Mn (3)	7.166e-23					
Mn+3	7.166e-23	4.919e-24	-22.145	-23.308	-1.163	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.524	-46.065	-0.541	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.487	-48.651	-0.164	(0)
Mo	8.599e-06					
MoO4-2	8.548e-06	2.599e-06	-5.068	-5.585	-0.517	(0)
HMoO4-	5.100e-08	2.937e-08	-7.292	-7.532	-0.240	(0)
H2MoO4	1.221e-10	1.221e-10	-9.913	-9.913	0.000	(0)

AlMo6O21-3	4.840e-28	3.370e-30	-27.315	-29.472	-2.157	(0)
Mo7O24-6	3.682e-28	8.649e-37	-27.434	-36.063	-8.629	(0)
HMo7O24-5	1.176e-30	1.197e-36	-29.930	-35.922	-5.992	(0)
H2Mo7O24-4	2.816e-34	4.116e-38	-33.550	-37.386	-3.835	(0)
H3Mo7O24-3	5.915e-39	0.000e+00	-38.228	-40.385	-2.157	(0)
N (-3)	9.628e-06					
NH4+	8.855e-06	5.946e-06	-5.053	-5.226	-0.173	(0)
NH4SO4-	7.598e-07	5.564e-07	-6.119	-6.255	-0.135	(0)
CuNH3+2	7.154e-09	7.865e-10	-8.145	-9.104	-0.959	(0)
NH3	5.970e-09	5.970e-09	-8.224	-8.224	0.000	(0)
CaNH3+2	7.177e-10	7.892e-11	-9.144	-10.103	-0.959	(0)
BaNH3+2	2.583e-13	2.840e-14	-12.588	-13.547	-0.959	(0)
Co (NH3) +2	1.043e-15	1.147e-16	-14.982	-15.940	-0.959	(0)
NiNH3+2	8.204e-16	9.020e-17	-15.086	-16.045	-0.959	(0)
Hg (NH3) 2+2	4.042e-16	4.444e-17	-15.393	-16.352	-0.959	(0)
HgNH3+2	6.770e-17	7.444e-18	-16.169	-17.128	-0.959	(0)
Ca (NH3) 2+2	1.706e-18	1.876e-19	-17.768	-18.727	-0.959	(0)
Ni (NH3) 2+2	7.079e-22	7.784e-23	-21.150	-22.109	-0.959	(0)
Co (NH3) 2+2	2.657e-22	2.922e-23	-21.576	-22.534	-0.959	(0)
Hg (NH3) 3+2	9.606e-24	1.056e-24	-23.017	-23.976	-0.959	(0)
Co (NH3) 3+2	1.997e-29	2.196e-30	-28.700	-29.658	-0.959	(0)
Hg (NH3) 4+2	4.556e-31	5.009e-32	-30.341	-31.300	-0.959	(0)
Co (NH3) 4+2	6.257e-37	6.880e-38	-36.204	-37.162	-0.959	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.520	-41.479	-0.959	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.208	-45.166	-0.959	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.164	-49.321	-2.157	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.463	-50.422	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.512	-50.471	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.102	-60.342	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.452	-65.411	-0.959	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.803	-66.762	-0.959	(0)
N (3)	1.287e-05					
NO2-	1.285e-05	8.810e-06	-4.891	-5.055	-0.164	(0)
CuNO2+	2.063e-08	1.188e-08	-7.686	-7.925	-0.240	(0)
Cu (NO2) 2	1.071e-12	1.071e-12	-11.970	-11.970	0.000	(0)
CoNO2+	1.723e-14	9.923e-15	-13.764	-14.003	-0.240	(0)
N (5)	3.835e-08					
NO3-	3.677e-08	2.731e-08	-7.434	-7.564	-0.129	(0)
CaNO3+	1.575e-09	9.067e-10	-8.803	-9.043	-0.240	(0)
CuNO3+	1.931e-12	1.112e-12	-11.714	-11.954	-0.240	(0)
BaNO3+	1.792e-12	1.032e-12	-11.747	-11.986	-0.240	(0)
MnNO3+	1.355e-12	7.800e-13	-11.868	-12.108	-0.240	(0)
ZnNO3+	3.113e-13	1.793e-13	-12.507	-12.746	-0.240	(0)
PbNO3+	5.431e-15	3.127e-15	-14.265	-14.505	-0.240	(0)
CdNO3+	4.391e-15	2.528e-15	-14.357	-14.597	-0.240	(0)
CoNO3+	1.201e-17	6.917e-18	-16.920	-17.160	-0.240	(0)
NiNO3+	3.351e-18	1.930e-18	-17.475	-17.714	-0.240	(0)
FeNO3+2	2.035e-19	2.237e-20	-18.692	-19.650	-0.959	(0)
VO2NO3	9.924e-20	9.924e-20	-19.003	-19.003	0.000	(0)
Mn (NO3) 2	5.350e-20	5.350e-20	-19.272	-19.272	0.000	(0)
Cu (NO3) 2	3.822e-21	3.822e-21	-20.418	-20.418	0.000	(0)
CrNO3+2	1.144e-21	1.258e-22	-20.942	-21.900	-0.959	(0)
Zn (NO3) 2	9.768e-22	9.768e-22	-21.010	-21.010	0.000	(0)
Pb (NO3) 2	1.450e-22	1.450e-22	-21.839	-21.839	0.000	(0)
UO2NO3+	9.976e-23	5.744e-23	-22.001	-22.241	-0.240	(0)
Cd (NO3) 2	3.460e-23	3.460e-23	-22.461	-22.461	0.000	(0)
Co (NO3) 2	3.843e-25	3.843e-25	-24.415	-24.415	0.000	(0)
HgNO3+	3.460e-26	1.992e-26	-25.461	-25.701	-0.240	(0)
Hg (NO3) 2	2.261e-34	2.261e-34	-33.646	-33.646	0.000	(0)
Na	2.704e-02					
Na+	2.523e-02	1.874e-02	-1.598	-1.727	-0.129	(0)
NaSO4-	1.187e-03	8.787e-04	-2.925	-3.056	-0.131	(0)
NaHCO3	5.820e-04	5.820e-04	-3.235	-3.235	0.000	(0)
NaF	4.040e-05	4.040e-05	-4.394	-4.394	0.000	(0)
NaCO3-	2.150e-06	1.591e-06	-5.668	-5.798	-0.131	(0)
NaH2BO3	3.191e-09	3.191e-09	-8.496	-8.496	0.000	(0)
NaCrO4-	3.994e-21	2.300e-21	-20.399	-20.638	-0.240	(0)
Ni	4.842e-10					

NiHCO3+	3.327e-10	1.916e-10	-9.478	-9.718	-0.240	(0)
Ni+2	9.253e-11	2.813e-11	-10.034	-10.551	-0.517	(0)
NiSO4	4.903e-11	4.903e-11	-10.310	-10.310	0.000	(0)
NiCO3	4.787e-12	4.787e-12	-11.320	-11.320	0.000	(0)
NiF+	4.194e-12	2.415e-12	-11.377	-11.617	-0.240	(0)
NiCl+	7.845e-13	4.517e-13	-12.105	-12.345	-0.240	(0)
Ni (SO4) 2-2	1.289e-13	1.418e-14	-12.890	-13.848	-0.959	(0)
NiOH+	1.085e-14	6.246e-15	-13.965	-14.204	-0.240	(0)
NiNH3+2	8.204e-16	9.020e-17	-15.086	-16.045	-0.959	(0)
NiCl2	1.427e-17	1.427e-17	-16.845	-16.845	0.000	(0)
Ni (OH) 2	8.751e-18	8.751e-18	-17.058	-17.058	0.000	(0)
NiNO3+	3.351e-18	1.930e-18	-17.475	-17.714	-0.240	(0)
NiSeO4	5.743e-19	5.743e-19	-18.241	-18.241	0.000	(0)
Ni (NH3) 2+2	7.079e-22	7.784e-23	-21.150	-22.109	-0.959	(0)
Ni (OH) 3-	2.680e-22	1.543e-22	-21.572	-21.812	-0.240	(0)
O (0)	2.549e-34					
O2	1.275e-34	1.341e-34	-33.895	-33.872	0.022	(0)
Pb	7.521e-07					
PbHCO3+	5.518e-07	3.178e-07	-6.258	-6.498	-0.240	(0)
PbCO3	1.061e-07	1.061e-07	-6.974	-6.974	0.000	(0)
PbSO4	3.312e-08	3.312e-08	-7.480	-7.480	0.000	(0)
Pb+2	2.547e-08	7.743e-09	-7.594	-8.111	-0.517	(0)
Pb (SO4) 2-2	1.585e-08	1.743e-09	-7.800	-8.759	-0.959	(0)
Pb (CO3) 2-2	1.270e-08	1.396e-09	-7.896	-8.855	-0.959	(0)
PbF+	3.238e-09	1.865e-09	-8.490	-8.729	-0.240	(0)
PbCl+	2.994e-09	1.724e-09	-8.524	-8.763	-0.240	(0)
PbOH+	5.957e-10	3.430e-10	-9.225	-9.465	-0.240	(0)
PbF2	1.254e-10	1.254e-10	-9.902	-9.902	0.000	(0)
PbCl2	4.833e-11	4.833e-11	-10.316	-10.316	0.000	(0)
PbF3-	1.411e-12	8.127e-13	-11.850	-12.090	-0.240	(0)
PbCl3-	2.097e-13	1.207e-13	-12.678	-12.918	-0.240	(0)
Pb (OH) 2	1.913e-13	1.913e-13	-12.718	-12.718	0.000	(0)
PbF4-2	1.209e-14	1.329e-15	-13.918	-14.876	-0.959	(0)
Pb2OH+3	6.046e-15	4.209e-17	-14.219	-16.376	-2.157	(0)
PbNO3+	5.431e-15	3.127e-15	-14.265	-14.505	-0.240	(0)
PbCl4-2	3.150e-15	3.463e-16	-14.502	-15.461	-0.959	(0)
Pb (OH) 3-	5.859e-18	3.374e-18	-17.232	-17.472	-0.240	(0)
Pb (NO3) 2	1.450e-22	1.450e-22	-21.839	-21.839	0.000	(0)
Pb (OH) 4-2	1.325e-22	1.457e-23	-21.878	-22.836	-0.959	(0)
Pb3 (OH) 4+2	5.141e-23	5.653e-24	-22.289	-23.248	-0.959	(0)
Pb4 (OH) 4+4	2.379e-24	3.477e-28	-23.624	-27.459	-3.835	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.621	-150.621	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.971	-228.210	-0.240	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.116	-78.116	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.175	-78.415	-0.240	(0)
HS-	0.000e+00	0.000e+00	-78.650	-78.890	-0.240	(0)
S5-2	0.000e+00	0.000e+00	-81.050	-82.009	-0.959	(0)
S6-2	0.000e+00	0.000e+00	-81.566	-82.525	-0.959	(0)
S4-2	0.000e+00	0.000e+00	-81.646	-82.605	-0.959	(0)
S3-2	0.000e+00	0.000e+00	-82.452	-83.411	-0.959	(0)
S2-2	0.000e+00	0.000e+00	-83.468	-84.427	-0.959	(0)
S-2	0.000e+00	0.000e+00	-89.403	-89.944	-0.541	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.162	-137.162	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.959	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.067	-150.306	-0.240	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.101	-150.101	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.542	-150.542	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.621	-150.621	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.670	-155.670	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.421	-215.660	-0.240	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.912	-226.152	-0.240	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.851	-227.091	-0.240	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.971	-228.210	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.927	-229.886	-0.959	(0)

Fe (HS) 3-	0.000e+00	0.000e+00	-232.283	-232.523	-0.240	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.826	-303.784	-0.959	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.543	-306.502	-0.959	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.120	-315.079	-0.959	(0)
S (6)	5.659e-02					
SO4-2	2.872e-02	8.734e-03	-1.542	-2.059	-0.517	(0)
CaSO4	2.101e-02	2.101e-02	-1.678	-1.678	0.000	(0)
MgSO4	4.720e-03	4.720e-03	-2.326	-2.326	0.000	(0)
NaSO4-	1.187e-03	8.787e-04	-2.925	-3.056	-0.131	(0)
KSO4-	8.810e-04	6.520e-04	-3.055	-3.186	-0.131	(0)
MnSO4	2.799e-05	2.799e-05	-4.553	-4.553	0.000	(0)
CuSO4	2.576e-05	2.576e-05	-4.589	-4.589	0.000	(0)
ZnSO4	4.994e-06	4.994e-06	-5.302	-5.302	0.000	(0)
Zn (SO4) 2-2	3.455e-06	3.799e-07	-5.462	-6.420	-0.959	(0)
NH4SO4-	7.598e-07	5.564e-07	-6.119	-6.255	-0.135	(0)
HSO4-	6.712e-07	4.846e-07	-6.173	-6.315	-0.141	(0)
FeSO4	3.094e-07	3.094e-07	-6.509	-6.509	0.000	(0)
Cd (SO4) 2-2	6.423e-08	7.062e-09	-7.192	-8.151	-0.959	(0)
CdSO4	5.995e-08	5.995e-08	-7.222	-7.222	0.000	(0)
PbSO4	3.312e-08	3.312e-08	-7.480	-7.480	0.000	(0)
Pb (SO4) 2-2	1.585e-08	1.743e-09	-7.800	-8.759	-0.959	(0)
CoSO4	2.785e-10	2.785e-10	-9.555	-9.555	0.000	(0)
CrOHSO4	8.424e-11	8.424e-11	-10.074	-10.074	0.000	(0)
NiSO4	4.903e-11	4.903e-11	-10.310	-10.310	0.000	(0)
FeSO4+	1.096e-11	8.028e-12	-10.960	-11.095	-0.135	(0)
CrSO4+	3.731e-12	2.148e-12	-11.428	-11.668	-0.240	(0)
AlSO4+	3.065e-12	2.213e-12	-11.514	-11.655	-0.141	(0)
Fe (SO4) 2-	2.603e-12	1.499e-12	-11.585	-11.824	-0.240	(0)
VO2SO4-	2.602e-12	1.498e-12	-11.585	-11.824	-0.240	(0)
Al (SO4) 2-	2.868e-13	2.071e-13	-12.542	-12.684	-0.141	(0)
Ni (SO4) 2-2	1.289e-13	1.418e-14	-12.890	-13.848	-0.959	(0)
VOSO4	7.335e-14	7.335e-14	-13.135	-13.135	0.000	(0)
UO2 (SO4) 2-2	1.459e-14	1.605e-15	-13.836	-14.795	-0.959	(0)
UO2SO4	1.394e-14	1.394e-14	-13.856	-13.856	0.000	(0)
HgSO4	4.518e-18	4.518e-18	-17.345	-17.345	0.000	(0)
Cr2 (OH) 2SO4+2	2.815e-18	3.095e-19	-17.551	-18.509	-0.959	(0)
Cr2 (OH) 2 (SO4) 2	1.606e-19	1.606e-19	-18.794	-18.794	0.000	(0)
CrO3SO4-2	6.269e-25	6.893e-26	-24.203	-25.162	-0.959	(0)
VSO4+	5.752e-27	3.312e-27	-26.240	-26.480	-0.240	(0)
U (SO4) 2	1.177e-38	1.177e-38	-37.929	-37.929	0.000	(0)
USO4+2	1.543e-39	1.697e-40	-38.812	-39.770	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.102	-60.342	-0.240	(0)
Sb (3)	1.210e-18					
Sb (OH) 3	6.090e-19	6.090e-19	-18.215	-18.215	0.000	(0)
HSbO2	5.977e-19	5.977e-19	-18.224	-18.224	0.000	(0)
Sb (OH) 2F	1.856e-21	1.856e-21	-20.731	-20.731	0.000	(0)
SbOF	1.835e-21	1.835e-21	-20.736	-20.736	0.000	(0)
Sb (OH) 2+	1.466e-23	8.443e-24	-22.834	-23.074	-0.240	(0)
SbO+	5.082e-24	2.927e-24	-23.294	-23.534	-0.240	(0)
SbO2-	2.960e-24	1.705e-24	-23.529	-23.768	-0.240	(0)
Sb (OH) 4-	1.678e-24	9.663e-25	-23.775	-24.015	-0.240	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.120	-315.079	-0.959	(0)
Sb (5)	9.036e-08					
SbO3-	9.028e-08	5.199e-08	-7.044	-7.284	-0.240	(0)
Sb (OH) 6-	8.057e-11	5.983e-11	-10.094	-10.223	-0.129	(0)
SbO2+	8.395e-21	4.834e-21	-20.076	-20.316	-0.240	(0)
Se (-2)	3.603e-40					
HSe-	3.603e-40	2.075e-40	-39.443	-39.683	-0.240	(0)
H2Se	0.000e+00	0.000e+00	-42.039	-42.039	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.478	-48.437	-0.959	(0)
Se (4)	7.876e-07					
HSeO3-	7.596e-07	4.374e-07	-6.119	-6.359	-0.240	(0)
SeO3-2	2.789e-08	3.066e-09	-7.555	-8.513	-0.959	(0)
H2SeO3	1.060e-10	1.060e-10	-9.975	-9.975	0.000	(0)
FeHSeO3+2	8.611e-16	9.468e-17	-15.065	-16.024	-0.959	(0)
Cd (SeO3) 2-2	2.064e-18	2.269e-19	-17.685	-18.644	-0.959	(0)
Se (6)	1.438e-10					

SeO4-2	1.435e-10	4.364e-11	-9.843	-10.360	-0.517	(0)
MnSeO4	2.117e-13	2.117e-13	-12.674	-12.674	0.000	(0)
ZnSeO4	1.767e-14	1.767e-14	-13.753	-13.753	0.000	(0)
HSeO4-	2.157e-15	1.242e-15	-14.666	-14.906	-0.240	(0)
CdSeO4	2.380e-16	2.380e-16	-15.624	-15.624	0.000	(0)
CoSeO4	3.496e-18	3.496e-18	-17.456	-17.456	0.000	(0)
NiSeO4	5.743e-19	5.743e-19	-18.241	-18.241	0.000	(0)
Zn(SeO4) 2-2	7.111e-24	7.818e-25	-23.148	-24.107	-0.959	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.736	-59.894	-2.157	(0)
U (4)	1.075e-26					
U (OH) 5-	1.060e-26	6.103e-27	-25.975	-26.214	-0.240	(0)
U (OH) 4	1.459e-28	1.459e-28	-27.836	-27.836	0.000	(0)
UF3+	1.347e-30	7.754e-31	-29.871	-30.110	-0.240	(0)
U (OH) 3+	5.290e-31	3.046e-31	-30.277	-30.516	-0.240	(0)
UF6-2	3.693e-31	4.060e-32	-30.433	-31.391	-0.959	(0)
UF4	2.905e-31	2.905e-31	-30.537	-30.537	0.000	(0)
UF5-	6.833e-32	3.934e-32	-31.165	-31.405	-0.240	(0)
UF2+2	1.302e-32	1.432e-33	-31.885	-32.844	-0.959	(0)
U (OH) 2+2	7.313e-34	8.041e-35	-33.136	-34.095	-0.959	(0)
UF+3	4.781e-36	3.328e-38	-35.321	-37.478	-2.157	(0)
UOH+3	3.106e-37	2.162e-39	-36.508	-38.665	-2.157	(0)
U (SO4) 2	1.177e-38	1.177e-38	-37.929	-37.929	0.000	(0)
USO4+2	1.543e-39	1.697e-40	-38.812	-39.770	-0.959	(0)
U+4	0.000e+00	0.000e+00	-40.476	-44.311	-3.835	(0)
UCl+3	0.000e+00	0.000e+00	-42.657	-44.814	-2.157	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-169.957	-189.373	-19.416	(0)
U (5)	1.826e-19					
UO2+	1.826e-19	1.052e-19	-18.738	-18.978	-0.240	(0)
U (6)	2.739e-06					
UO2 (CO3) 3-4	2.724e-06	3.981e-10	-5.565	-9.400	-3.835	(0)
UO2 (CO3) 2-2	1.584e-08	1.742e-09	-7.800	-8.759	-0.959	(0)
UO2CO3	1.914e-11	1.914e-11	-10.718	-10.718	0.000	(0)
UO2F3-	7.306e-12	4.207e-12	-11.136	-11.376	-0.240	(0)
UO2F2	4.901e-12	4.901e-12	-11.310	-11.310	0.000	(0)
UO2F4-2	1.039e-12	1.142e-13	-11.984	-12.942	-0.959	(0)
UO2F+	8.637e-13	4.973e-13	-12.064	-12.303	-0.240	(0)
UO2 (SO4) 2-2	1.459e-14	1.605e-15	-13.836	-14.795	-0.959	(0)
UO2SO4	1.394e-14	1.394e-14	-13.856	-13.856	0.000	(0)
UO2OH+	4.065e-15	2.341e-15	-14.391	-14.631	-0.240	(0)
UO2+2	3.468e-15	1.054e-15	-14.460	-14.977	-0.517	(0)
UO2Cl+	1.863e-17	1.073e-17	-16.730	-16.969	-0.240	(0)
UO2NO3+	9.976e-23	5.744e-23	-22.001	-22.241	-0.240	(0)
(UO2) 2 (OH) 2+2	8.271e-23	9.094e-24	-22.082	-23.041	-0.959	(0)
(UO2) 3 (OH) 5+	8.722e-30	5.023e-30	-29.059	-29.299	-0.240	(0)
V (2)	6.495e-38					
V+2	5.857e-38	6.440e-39	-37.232	-38.191	-0.959	(0)
VOH+	6.383e-39	3.675e-39	-38.195	-38.435	-0.240	(0)
V (3)	3.555e-12					
V (OH) 3	3.555e-12	3.555e-12	-11.449	-11.449	0.000	(0)
V (OH) 2+	2.278e-21	1.311e-21	-20.643	-20.882	-0.240	(0)
VOH+2	6.459e-23	7.102e-24	-22.190	-23.149	-0.959	(0)
V+3	1.154e-25	8.034e-28	-24.938	-27.095	-2.157	(0)
VSO4+	5.752e-27	3.312e-27	-26.240	-26.480	-0.240	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-41.662	-45.497	-3.835	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-43.422	-45.579	-2.157	(0)
V (4)	2.604e-12					
VOF+	1.085e-12	6.250e-13	-11.964	-12.204	-0.240	(0)
VOF2	8.008e-13	8.008e-13	-12.096	-12.096	0.000	(0)
VO+2	2.773e-13	3.049e-14	-12.557	-13.516	-0.959	(0)
V (OH) 3+	1.853e-13	1.067e-13	-12.732	-12.972	-0.240	(0)
VOF3-	1.686e-13	9.710e-14	-12.773	-13.013	-0.240	(0)
VOSO4	7.335e-14	7.335e-14	-13.135	-13.135	0.000	(0)
VOF4-2	1.218e-14	1.339e-15	-13.914	-14.873	-0.959	(0)
VOC1+	9.323e-16	5.368e-16	-15.030	-15.270	-0.240	(0)
H2V2O4+2	5.248e-21	5.770e-22	-20.280	-21.239	-0.959	(0)
V (5)	2.127e-06					
H2VO4-	1.918e-06	1.105e-06	-5.717	-5.957	-0.240	(0)

H3V2O7-	7.812e-08	4.498e-08	-7.107	-7.347	-0.240	(0)
HVO4-2	4.444e-08	4.886e-09	-7.352	-8.311	-0.959	(0)
H3VO4	6.273e-09	6.273e-09	-8.203	-8.203	0.000	(0)
HV2O7-3	2.642e-10	1.839e-12	-9.578	-11.735	-2.157	(0)
V3O9-3	2.061e-10	1.435e-12	-9.686	-11.843	-2.157	(0)
VO2F2-	9.278e-11	5.343e-11	-10.033	-10.272	-0.240	(0)
VO2F	4.306e-11	4.306e-11	-10.366	-10.366	0.000	(0)
VO2F3-2	2.071e-11	2.277e-12	-10.684	-11.643	-0.959	(0)
VO2+	9.676e-12	7.185e-12	-11.014	-11.144	-0.129	(0)
V4O12-4	4.545e-12	6.643e-16	-11.342	-15.178	-3.835	(0)
VO2SO4-	2.602e-12	1.498e-12	-11.585	-11.824	-0.240	(0)
V2O7-4	5.964e-13	8.716e-17	-12.224	-16.060	-3.835	(0)
VO2F4-3	5.501e-13	3.829e-15	-12.260	-14.417	-2.157	(0)
VO4-3	6.195e-15	4.313e-17	-14.208	-16.365	-2.157	(0)
VO2NO3	9.924e-20	9.924e-20	-19.003	-19.003	0.000	(0)
V10O28-6	1.029e-27	2.417e-36	-26.988	-35.617	-8.629	(0)
HV10O28-5	2.073e-28	2.109e-34	-27.683	-33.676	-5.992	(0)
H2V10O28-4	1.322e-31	1.932e-35	-30.879	-34.714	-3.835	(0)
Zn	2.604e-05					
Zn+2	8.597e-06	2.614e-06	-5.066	-5.583	-0.517	(0)
ZnHCO3+	7.928e-06	4.565e-06	-5.101	-5.341	-0.240	(0)
ZnSO4	4.994e-06	4.994e-06	-5.302	-5.302	0.000	(0)
Zn (SO4) 2-2	3.455e-06	3.799e-07	-5.462	-6.420	-0.959	(0)
ZnCO3	6.859e-07	6.859e-07	-6.164	-6.164	0.000	(0)
ZnF+	3.095e-07	1.782e-07	-6.509	-6.749	-0.240	(0)
ZnCl+	5.795e-08	4.120e-08	-7.237	-7.385	-0.148	(0)
ZnOH+	8.005e-09	4.609e-09	-8.097	-8.336	-0.240	(0)
ZnOHCl	9.513e-10	9.513e-10	-9.022	-9.022	0.000	(0)
ZnCl2	4.098e-10	4.098e-10	-9.387	-9.387	0.000	(0)
Zn (OH) 2	1.288e-11	1.288e-11	-10.890	-10.890	0.000	(0)
ZnCl3-	2.873e-12	2.043e-12	-11.542	-11.690	-0.148	(0)
ZnNO3+	3.113e-13	1.793e-13	-12.507	-12.746	-0.240	(0)
ZnCl4-2	2.228e-14	6.410e-15	-13.652	-14.193	-0.541	(0)
ZnSeO4	1.767e-14	1.767e-14	-13.753	-13.753	0.000	(0)
Zn (OH) 3-	1.978e-15	1.139e-15	-14.704	-14.944	-0.240	(0)
Zn (OH) 4-2	7.272e-21	7.996e-22	-20.138	-21.097	-0.959	(0)
Zn (NO3) 2	9.768e-22	9.768e-22	-21.010	-21.010	0.000	(0)
Zn (SeO4) 2-2	7.111e-24	7.818e-25	-23.148	-24.107	-0.959	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.067	-150.306	-0.240	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.542	-150.542	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.912	-226.152	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.927	-229.886	-0.959	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.543	-306.502	-0.959	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-53.93	-47.64	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.43	-36.92	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.65	-36.92	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-69.92	-51.98	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-55.93	-35.90	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-30.46	-30.06	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-21.26	-20.81	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-5.56	5.24	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.10	-43.73	2.37	Al2 (MoO4) 3
Al2O3	-9.16	10.49	19.65	Al2O3
Al4 (OH) 10SO4	-16.27	6.43	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.09	-6.29	4.80	AlAsO4:2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-156.77	-91.15	65.62	AlSb
Alunite	-7.69	-9.09	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-2.38	-10.17	-7.79	PbSO4
Anhydrite	0.32	-4.04	-4.36	CaSO4
Anilite	-55.47	-87.35	-31.88	Cu0.25Cu1.5S
Antlerite	-0.54	8.24	8.79	Cu3 (OH) 4SO4
Aragonite	0.98	-7.32	-8.30	CaCO3

Arsenolite	-72.04	-74.80	-2.76	As4O6
Artinite	-7.52	2.08	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-29.78	-23.07	6.71	As2O5
Atacamite	-0.64	6.75	7.39	Cu2(OH)3Cl
Azurite	4.04	-12.87	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.05	7.35	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-10.94	4.93	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	7.94	-0.97	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-20.65	12.29	32.94	Ba3(VO4)2:4H2O
BaCrO4	-15.06	-24.73	-9.67	BaCrO4
BaF2	-4.24	-10.06	-5.82	BaF2
BaMoO4	-3.75	-10.71	-6.96	BaMoO4
Barite	2.80	-7.18	-9.98	BaSO4
BaS	-93.95	-77.77	16.18	BaS
BaSeO3	-7.07	-5.24	1.83	BaSeO3
BaSeO4	-8.02	-15.48	-7.46	BaSeO4
Bianchite	-5.89	-7.66	-1.76	ZnSO4:6H2O
Birnessite	-9.63	8.46	18.09	MnO2
Bixbyite	-8.50	-9.15	-0.64	Mn2O3
BlaubleiI	-54.68	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.49	-82.77	-27.28	Cu0.6Cu0.8S
Boehmite	-3.33	5.25	8.58	AlOOH
Breithauptite	-62.90	-81.43	-18.52	NiSb
Brochantite	0.62	15.84	15.22	Cu4(OH)6SO4
Brucite	-6.88	9.96	16.84	Mg(OH)2
Bunsenite	-10.51	1.94	12.45	NiO
Ca(VO3)2	-4.95	0.71	5.66	Ca(VO3)2
Ca2V2O7	-6.28	11.22	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.33	11.22	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.85	8.45	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.23	21.73	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.14	21.72	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-304.23	-161.26	142.97	Ca3Sb2
CaCrO4	-19.32	-21.59	-2.27	CaCrO4
Calcite	1.16	-7.32	-8.48	CaCO3
Calomel	-4.68	-22.59	-17.91	Hg2Cl2
CaMoO4	0.39	-7.56	-7.95	CaMoO4
Carnotite	-3.35	-3.12	0.23	KUO2VO4
CaSeO3:2H2O	-4.91	-2.10	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.32	-12.34	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.83	-2.99	9.84	Cd(BO2)2
Cd(OH)2	-8.69	4.95	13.64	Cd(OH)2
Cd(OH)2(am)	-8.78	4.95	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.94	-14.23	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-22.25	0.31	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-23.13	5.27	28.40	Cd4(OH)6SO4
CdCl2	-11.28	-11.94	-0.66	CdCl2
CdCl2:1H2O	-10.25	-11.94	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.03	-11.94	-1.91	CdCl2:2.5H2O
CdF2	-11.25	-12.47	-1.21	CdF2
Cdmetal(alpha)	-34.62	-21.11	13.51	Cd
Cdmetal(gamma)	-34.72	-21.11	13.62	Cd
CdMoO4	1.03	-13.12	-14.15	CdMoO4
CdOHCl	-7.03	-3.49	3.54	CdOHCl
CdSb	-78.06	-78.41	-0.35	CdSb
CdSe	-20.77	-40.97	-20.20	CdSe
CdSeO4:2H2O	-16.05	-17.90	-1.85	CdSeO4:2H2O
CdSO4	-9.42	-9.59	-0.17	CdSO4
CdSO4:1H2O	-7.87	-9.59	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.73	-9.60	-1.87	CdSO4:2.67H2O
Cerrusite	-0.32	-13.45	-13.13	PbCO3
CH4(g)	-81.03	-122.08	-41.05	CH4
Chalcanthite	-4.32	-6.96	-2.64	CuSO4:5H2O
Chalcocite	-55.70	-90.62	-34.92	Cu2S
Chalcopyrite	-121.75	-157.02	-35.27	CuFeS2
Cinnabar	-50.85	-96.54	-45.69	HgS
Claudetite	-71.73	-74.80	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe

Co (BO2) 2	-32.33	-5.26	27.07	Co (BO2) 2
Co (OH) 2	-10.40	2.69	13.09	Co (OH) 2
Co (OH) 3	-14.37	-16.68	-2.31	Co (OH) 3
CO2 (g)	0.32	-17.83	-18.15	CO2
Co3 (AsO4) 2	-28.03	-14.99	13.03	Co3 (AsO4) 2
Co3O4	-20.16	-30.66	-10.50	Co3O4
CoCl2	-22.47	-14.20	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.22	2.54	CoCl2:6H2O
CoCO3	-5.16	-15.14	-9.98	CoCO3
CoF2	-13.13	-14.73	-1.60	CoF2
CoF3	-41.35	-42.81	-1.46	CoF3
CoFe2O4	17.52	13.99	-3.53	CoFe2O4
CoMoO4	-7.62	-15.38	-7.76	CoMoO4
CoO	-10.89	2.69	13.59	CoO
CoS (alpha)	-75.00	-82.44	-7.44	CoS
CoS (beta)	-71.37	-82.44	-11.07	CoS
CoSe	-27.03	-43.23	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-18.64	-20.17	-1.53	CoSeO4:6H2O
CoSO4	-14.66	-11.86	2.80	CoSO4
CoSO4:6H2O	-9.40	-11.87	-2.47	CoSO4:6H2O
Cotunnite	-7.74	-12.52	-4.78	PbCl2
Covellite	-55.23	-77.53	-22.30	CuS
Cr (OH) 2	-24.72	-13.90	10.82	Cr (OH) 2
Cr (OH) 3	-5.15	-3.82	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-3.07	-3.82	-0.75	Cr (OH) 3
Cr2O3	-5.27	-7.62	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-44.27	-29.15	15.11	CrCl3
CrF3	-18.61	-29.95	-11.34	CrF3
Crmetal	-70.44	-39.96	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	0.37	-33.47	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.60	8.67	Cu (OH) 2
Cu (SbO3) 2	-21.91	23.30	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.87	1.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.66	-91.55	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.38	-0.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.03	-104.62	-42.59	Cu3Sb
Cu3Se2	-26.25	-89.74	-63.49	Cu3Se2
CuCO3	1.27	-10.23	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-6.55	-11.45	-4.91	CuF
CuF2	-10.94	-9.82	1.12	CuF2
CuF2:2H2O	-5.28	-9.83	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.60	-10.48	-13.08	CuMoO4
CuOCuSO4	-9.65	0.65	10.30	CuOCuSO4
Cupricferrite	12.90	18.89	5.99	CuFe2O4
Cuprite	-4.08	-5.48	-1.41	Cu2O
Cuprousferrite	11.82	2.91	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-24.83	-58.19	-33.37	CuSe2
CuSeO3:2H2O	-5.52	-5.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.82	-15.26	-2.44	CuSeO4:5H2O
CuSO4	-9.89	-6.95	2.94	CuSO4
Diaspore	-1.63	5.25	6.87	AlOOH
Djurleite	-55.83	-89.75	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	1.35	-15.19	-16.54	CaMg (CO3) 2
Dolomite (ordered)	1.90	-15.19	-17.09	CaMg (CO3) 2
Epsomite	-2.48	-4.60	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.92	5.65	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.15	3.11	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-0.43	-4.15	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-2.87	-1.31	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-5.89	-26.52	-20.63	Fe2 (SeO3) 3:2H2O

Fe2(SO4)3	-28.62	-32.35	-3.73	Fe2(SO4)3
Fe3(OH)8	-3.29	16.93	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.29	-5.89	0.40	FeAsO4:2H2O
FeCr2O4	-9.18	-1.98	7.20	FeCr2O4
FeMoO4	-2.33	-12.43	-10.09	FeMoO4
Ferrihydrite	2.45	5.64	3.19	Fe(OH)3
Ferroselite	-41.55	-60.14	-18.60	FeSe2
FeS (ppt)	-76.53	-79.48	-2.95	FeS
FeSe	-29.28	-40.28	-11.00	FeSe
Fix_pe	-6.79	-6.79	0.00	e-
Fluorite	3.59	-6.91	-10.50	CaF2
Galena	-66.79	-80.76	-13.97	PbS
Gibbsite	-3.05	5.24	8.29	Al(OH)3
Goethite	5.15	5.65	0.49	FeOOH
Goslarite	-5.65	-7.66	-2.01	ZnSO4:7H2O
Greenockite	-65.82	-80.18	-14.36	CdS
Greigite	-278.55	-323.59	-45.03	Fe3S4
Gummite	-10.16	-2.49	7.67	UO3
Gypsum	0.57	-4.04	-4.61	CaSO4:2H2O
H-Jarosite	-0.07	-12.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-5.20	-18.08	-12.88	H2MoO4
H2S (g)	-77.13	-85.14	-8.01	H2S
H2Se (g)	-40.97	-45.93	-4.96	H2Se
Halite	-5.53	-3.93	1.60	NaCl
Hausmannite	-11.73	49.30	61.03	Mn3O4
Hematite	12.71	11.29	-1.42	Fe2O3
Hercynite	-6.75	16.14	22.89	FeAl2O4
Hg(CH3)2 (g)	-181.86	-255.57	-73.71	Hg(CH3)2
Hg (g)	-8.00	-15.88	-7.87	Hg
Hg(OH)2	-7.92	-11.41	-3.50	Hg(OH)2
Hg2 (g)	-16.80	-31.76	-14.96	Hg2
Hg2(OH)2	-10.96	-5.70	5.26	Hg2(OH)2
Hg2CO3	-7.47	-23.52	-16.05	Hg2CO3
Hg2CrO4	-29.09	-37.79	-8.70	Hg2CrO4
Hg2F2	-12.75	-23.12	-10.36	Hg2F2
Hg2S	-79.15	-90.83	-11.68	Hg2S
Hg2SeO3	-13.64	-18.30	-4.66	Hg2SeO3
Hg2SO4	-14.11	-20.24	-6.13	Hg2SO4
Hg3O2CO3	-22.38	-52.06	-29.68	Hg3O2CO3
HgCl (g)	-30.79	-11.29	19.50	HgCl
HgCl2	-7.04	-28.30	-21.26	HgCl2
HgF (g)	-44.23	-11.56	32.68	HgF
HgF2 (g)	-41.40	-28.83	12.57	HgF2
Hgmetal (l)	-2.43	-15.88	-13.45	Hg
HgSe	-1.64	-57.34	-55.69	HgSe
HgSeO3	-11.58	-24.01	-12.43	HgSeO3
HgSO4	-16.54	-25.96	-9.42	HgSO4
Huntite	-0.96	-30.92	-29.97	CaMg3(CO3)4
Hydrocerrusite	-3.76	-22.53	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.76	-21.52	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-14.44	-19.61	-5.17	KAl(SO4)2:12H2O
K-Jarosite	6.91	-7.89	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-38.42	-55.66	-17.24	K2Cr2O7
K2CrO4	-23.05	-23.56	-0.51	K2CrO4
K2MoO4	-12.80	-9.54	3.26	K2MoO4
K2SeO4	-13.58	-14.31	-0.73	K2SeO4
Langite	-1.65	15.84	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.36	-5.79	-0.43	PbO:PbSO4
Laurionite	-4.69	-4.07	0.62	PbOHCl
Lepidocrocite	4.27	5.65	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.32	4.38	12.69	PbO
Mackinawite	-75.88	-79.48	-3.60	FeS
Maghemite	4.91	11.29	6.39	Fe2O3
Magnesioferrite	4.40	21.26	16.86	Fe2MgO4
Magnesite	-0.41	-7.87	-7.46	MgCO3
Magnetite	13.54	16.94	3.40	Fe3O4
Malachite	2.67	-2.63	-5.31	Cu2(OH)2CO3

Manganite	-4.57	20.77	25.34	MnOOH
Massicot	-8.52	4.38	12.89	PbO
Matlockite	-3.81	-12.78	-8.97	PbClF
Melanothallite	-15.55	-9.29	6.26	CuCl ₂
Melanterite	-6.71	-8.92	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.45	-96.54	-45.09	HgS
Mg(OH) ₂ (active)	-8.83	9.96	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-11.12	0.16	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-278.79	-204.11	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.23	10.13	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-13.86	2.34	16.20	MgCr ₂ O ₄
MgCrO ₄	-27.51	-22.13	5.38	MgCrO ₄
MgF ₂	0.67	-7.46	-8.13	MgF ₂
MgMoO ₄	-6.26	-8.11	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.71	-2.65	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.70	-12.90	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-34.33	39.20	73.52	Pb ₃ O ₄
Mirabilite	-4.42	-5.54	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-6.95	-2.05	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-47.08	-52.79	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-155.02	-93.94	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-12.36	0.14	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.87	-9.16	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-77.56	-77.39	0.17	MnS
MnS (pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.06	-100.97	-2.91	MnSb
MnSe	-41.68	-38.18	3.50	MnSe
MnSeO ₃	-5.99	-4.86	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.84	-4.86	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.07	-15.12	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.39	-6.80	2.58	MnSO ₄
Monteponite	-10.15	4.96	15.10	CdO
Montroydite	-7.77	-11.41	-3.64	HgO
MoO ₃	-10.07	-18.07	-8.00	MoO ₃
Morenosite	-10.48	-12.63	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-144.14	-214.40	-70.26	MoS ₂
Na-Jarosite	3.56	-7.64	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-45.26	-55.16	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-25.99	-23.06	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-10.52	-27.11	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.53	-9.04	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.27	-9.04	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-13.88	-3.58	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.09	-13.81	1.28	Na ₂ SeO ₄
Na ₃ Sb	-177.30	-82.84	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.03	8.65	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.13	8.27	37.40	Na ₄ V ₂ O ₇
Nantokite	-4.46	-11.19	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-4.24	-0.38	3.86	NaVO ₃
Nesquehonite	-3.21	-7.88	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-10.86	1.94	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-32.98	-17.28	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-38.80	-6.80	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-9.02	-15.89	-6.87	NiCO ₃
NiMoO ₄	-4.99	-16.14	-11.14	NiMoO ₄
NiS (alpha)	-77.59	-83.19	-5.60	NiS
NiS (beta)	-72.09	-83.19	-11.10	NiS
NiS (gamma)	-70.39	-83.19	-12.80	NiS
NiSe	-26.29	-43.99	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-13.48	-10.67	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-19.41	-20.93	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-9.05	8.46	17.50	MnO ₂
O ₂ (g)	-30.97	52.12	83.09	O ₂
Orpiment	-231.73	-292.80	-61.07	As ₂ S ₃
Otavite	-0.87	-12.87	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.09	-3.57	6.52	Pb(BO ₂) ₂

Pb(OH) 2	-3.77	4.38	8.15	Pb(OH) 2
Pb10(OH) 60(CO3) 6	-54.45	-63.21	-8.76	Pb10(OH) 60(CO3) 6
Pb2(OH) 3Cl	-8.49	0.31	8.79	Pb2(OH) 3Cl
Pb2O(OH) 2	-17.43	8.75	26.19	Pb2O(OH) 2
Pb2O3	-26.22	34.82	61.04	Pb2O3
Pb2OCO3	-8.52	-9.07	-0.56	Pb2OCO3
Pb2V2O7	0.86	-1.04	-1.90	Pb2V2O7
Pb3(AsO4) 2	-15.74	-9.94	5.80	Pb3(AsO4) 2
Pb3(VO4) 2	-2.80	3.34	6.14	Pb3(VO4) 2
Pb3O2CO3	-15.72	-4.70	11.02	Pb3O2CO3
Pb3O2SO4	-12.10	-1.41	10.69	Pb3O2SO4
Pb4(OH) 6SO4	-18.14	2.96	21.10	Pb4(OH) 6SO4
Pb4O3SO4	-18.91	2.96	21.88	Pb4O3SO4
PbCrO4	-15.12	-27.72	-12.60	PbCrO4
PbF2	-5.60	-13.04	-7.44	PbF2
Pbmetal	-25.93	-21.68	4.25	Pb
PbMoO4	1.92	-13.70	-15.62	PbMoO4
PbO:0.3H2O	-8.60	4.38	12.98	PbO:0.33H2O
PbSeO4	-11.63	-18.47	-6.84	PbSeO4
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-6.16	-25.97	-19.81	PbCl2:PbCO3
Plattnerite	-19.16	30.44	49.60	PbO2
Portlandite	-12.30	10.51	22.80	Ca(OH) 2
Pyrite	-120.05	-138.56	-18.51	FeS2
Pyrochroite	-7.45	7.74	15.19	Mn(OH) 2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-97.12	-116.86	-19.75	AsS
Retgersite	-10.58	-12.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.49	-10.09	-10.58	MnCO3
Rutherfordine	-5.82	-20.32	-14.50	UO2CO3
Sb(OH) 3	-11.11	-18.22	-7.11	Sb(OH) 3
Sb2O4	-13.76	-10.36	3.40	Sb2O4
Sb2O5	-23.25	-32.92	-9.67	Sb2O5
Sb2Se3	-106.45	-174.20	-67.76	Sb2Se3
Sb4O6(cubic)	-54.59	-72.85	-18.26	Sb4O6
Sb4O6(orth)	-54.95	-72.85	-17.90	Sb4O6
SbCl3	-44.12	-43.55	0.57	SbCl3
SbF3	-34.12	-44.34	-10.23	SbF3
Sbmetal	-45.61	-57.30	-11.69	Sb
SbO2	-1.67	-29.49	-27.82	SbO2
Schoepite	-8.49	-2.49	5.99	UO2(OH) 2:H2O
Semetal(am)	-12.76	-19.87	-7.11	Se
Semetal(hex)	-12.16	-19.87	-7.71	Se
Senarmontite	-24.06	-36.42	-12.37	Sb2O3
SeO2	-12.73	-12.60	0.12	SeO2
SeO3	-43.89	-22.85	21.04	SeO3
Siderite	-1.94	-12.18	-10.24	FeCO3
Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-66.78	-78.23	-11.45	ZnS
Spinel	-16.39	20.46	36.85	MgAl2O4
Stibnite	-241.36	-291.82	-50.46	Sb2S3
Sulfur	-56.93	-59.07	-2.14	S
Tenorite	-0.05	7.60	7.64	CuO
Thenardite	-5.84	-5.51	0.32	Na2SO4
Thermonatrite	-9.44	-8.80	0.64	Na2CO3:H2O
Tyuyamunite	-8.34	-4.26	4.08	Ca(UO2) 2(VO4) 2
U3O8	-26.96	-5.88	21.08	U3O8
U3Sb4	-595.97	-443.58	152.38	U3Sb4
U4O9	-48.25	-51.27	-3.02	U4O9
UF4	-24.64	-54.18	-29.54	UF4
UF4:2.5H2O	-21.46	-54.18	-32.72	UF4:2.5H2O
UO2(am)	-20.27	-19.33	0.93	UO2
UO2(NO3) 2	-42.25	-30.10	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-34.96	-30.11	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-33.50	-30.11	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-32.17	-30.12	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-8.10	-2.49	5.61	UO2(OH) 2
UO2SeO4:4H2O	-23.10	-25.35	-2.25	UO2SeO4:4H2O

UO3	-10.19	-2.49	7.70	UO3
Uraninite	-14.66	-19.33	-4.67	UO2
USb2	-224.86	-195.28	29.58	USb2
V(OH)3	-15.96	-8.36	7.59	V(OH)3
V2O5	-8.44	-9.80	-1.36	V2O5
V3O5	-30.98	-29.14	1.84	V3O5
V4O7	-37.35	-30.17	7.19	V4O7
V6O13	-20.66	-81.52	-60.86	V6O13
Valentinite	-27.94	-36.42	-8.48	Sb2O3
VC12	-57.16	-38.29	18.87	VC12
VC13	-57.13	-33.70	23.43	VC13
VF4	-50.80	-35.87	14.93	VF4
Vmetal	-91.48	-47.45	44.03	V
VO	-36.15	-21.39	14.76	VO
VO(OH)2	-6.18	-1.03	5.15	VO(OH)2
VO2Cl	-16.19	-13.35	2.84	VO2Cl
VOC1	-27.96	-16.81	11.15	VOC1
VOC12	-30.68	-17.92	12.76	VOC12
VOSO4	-19.18	-15.57	3.61	VOSO4
Witherite	-1.89	-10.46	-8.57	BaCO3
Wurtzite	-69.28	-78.23	-8.95	ZnS
Zincite	-4.43	6.91	11.33	ZnO
Zincosite	-11.57	-7.64	3.93	ZnSO4
Zn(BO2)2	-9.33	-1.04	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.04	-20.72	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.30	6.90	12.20	Zn(OH)2
Zn(OH)2(am)	-5.57	6.90	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.85	6.90	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.63	6.90	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.83	6.90	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.24	-0.74	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.83	5.36	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.01	-2.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.29	-8.38	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.33	13.07	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.87	17.63	38.50	Zn5(OH)8Cl2
ZnCl2	-17.04	-9.99	7.05	ZnCl2
ZnCO3:1H2O	-0.67	-10.93	-10.26	ZnCO3:1H2O
ZnF2	-9.98	-10.52	-0.53	ZnF2
Znmetal	-44.94	-19.15	25.79	Zn
ZnMoO4	-1.04	-11.17	-10.13	ZnMoO4
ZnO(active)	-4.28	6.91	11.19	ZnO
ZnS(am)	-69.17	-78.23	-9.05	ZnS
ZnSb	-87.47	-76.46	11.01	ZnSb
ZnSe	-24.62	-39.02	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.01	-7.64	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 106.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e-=e-
  log_k      0
EQUILIBRIUM_PHASES 602
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0

```

```

Alunite      0 0
Ba3(AsO4)2  0 0
Barite       0 0
Brochantite  0 0
Brucite      0 0
Calcite      0 0
CaMoO4       0 0
CaSeO3:2H2O  0 0
Carnotite    0 0
Cd(BO2)2     0 0
CdMoO4       0 0
Chrysotile   0 0
CO2(g)       -3.5 10
Cr2O3        0 0
CuMoO4       0 0
Cu2Se(alpha) 0 0
Epsomite     0 0
Ferrihydrite 0 0
Fluorite     0 0
Gummite      0 0
Gypsum       0 0
HgSe         0 0
Mg3(PO4)2    0 0
Mirabilite   0 0
MnSeO3       0 0
O2(g)        -32 10
Otavite      0 0
NiCO3        0 0
NiMoO4       0 0
Ni(OH)2      0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4       0 0
Rutherfordine 0 0
SbO2         0 0
Schoepite    0 0
Sepiolite    0 0
SiO2(am-ppt) 0 0
Tyuyamunite  0 0
U3O8         0 0
UO3          0 0
UO2(OH)2(beta) 0 0
ZnMoO4       0 0
USE solution 606
SAVE Solution 607 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 602
END

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TITLE
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```

Precipitate oversaturated phases

```

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Beginning of batch-reaction calculations.
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```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.

```

WARNING: Element in phase, Ag2Se, is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Ag2Se, is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 606. Solution after simulation 105.
 Using pure phase assemblage 602.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	7.235e-05	7.235e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	5.040e-08	5.040e-08
Barite	0.00	-9.98	-9.98	0.000e+00	3.000e-05	3.000e-05
Brochantite	0.00	15.22	15.22	0.000e+00	1.343e-04	1.343e-04
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.012e+01	1.172e-01
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	4.572e-02	4.572e-02
Carnotite	0.00	0.23	0.23	0.000e+00	2.083e-06	2.083e-06
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	2.418e-07	2.418e-07
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-0.28	-2.64	-2.36	0.000e+00	0	0.000e+00
Cu2Se (alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.072e-05	1.072e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	3.687e-03	3.687e-03
Gummite	-5.04	2.63	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	9.155e-03	9.155e-03
HgSe	-1.23	-56.92	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.34	-3.21	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-30.65	-14.95	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.99	-15.86	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.46	-15.61	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.446e-05
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	7.519e-07	7.519e-07
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.37	2.63	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2 (am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-11.09	9.99	21.08	0.000e+00	0	0.000e+00
UO2(OH)2 (beta)	-2.98	2.63	5.61	0.000e+00	0	0.000e+00
UO3	-5.07	2.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.554e-06	5.575e-06
As	1.573e-09	1.579e-09
B	1.002e-04	1.006e-04

Ba	2.721e-08	2.731e-08
C	5.741e-04	5.763e-04
Ca	1.207e-02	1.211e-02
Cd	2.234e-08	2.242e-08
Cl	8.437e-03	8.468e-03
Co	2.968e-09	2.979e-09
Cr	1.142e-09	1.146e-09
Cu	4.981e-07	5.000e-07
F	2.256e-04	2.265e-04
Fe	1.103e-09	1.108e-09
Hg	9.616e-09	9.652e-09
K	1.498e-02	1.504e-02
Mg	1.841e-02	1.848e-02
Mn	2.222e-04	2.230e-04
Mo	7.594e-06	7.623e-06
N	2.249e-05	2.258e-05
Na	2.700e-02	2.710e-02
Ni	4.833e-10	4.851e-10
Pb	1.666e-09	1.672e-09
S	4.706e-02	4.724e-02
Sb	9.021e-08	9.054e-08
Se	7.863e-07	7.893e-07
U	6.595e-07	6.620e-07
V	4.772e-08	4.790e-08
Zn	2.599e-05	2.609e-05

-----Description of solution-----

	pH	=	7.908	Charge balance
	pe	=	4.865	Adjusted to redox
equilibrium				
	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.227e-01	
	Mass of water (kg)	=	1.004e+00	
	Total alkalinity (eq/kg)	=	6.145e-04	
	Total CO2 (mol/kg)	=	5.741e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	22	
	Total H	=	1.114307e+02	
	Total O	=	5.590599e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.091e-06	8.136e-07	-5.962	-6.090	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.554e-06					
Al(OH)4-	5.509e-06	4.201e-06	-5.259	-5.377	-0.118	(0)
Al(OH)3	4.101e-08	4.101e-08	-7.387	-7.387	0.000	(0)
Al(OH)2+	3.256e-09	2.527e-09	-8.487	-8.597	-0.110	(0)
AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
AlOH+2	1.079e-11	3.910e-12	-10.967	-11.408	-0.441	(0)
AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
Al(SO4)2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.054e-14	4.806e-15	-13.296	-14.318	-1.022	(0)
AlMo6O21-3	2.472e-39	0.000e+00	-38.607	-40.215	-1.608	(0)
As(3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.002e-24	6.642e-25	-23.999	-24.178	-0.179	(0)

		HAsO3-2	2.542e-28	4.903e-29	-27.595	-28.309	-0.715	(0)
		H4AsO3+	1.477e-31	9.791e-32	-30.830	-31.009	-0.179	(0)
		AsO3-3	6.207e-33	1.530e-34	-32.207	-33.815	-1.608	(0)
As (5)	1.573e-09							
		HAsO4-2	1.520e-09	2.932e-10	-8.818	-9.533	-0.715	(0)
		H2AsO4-	4.985e-11	3.304e-11	-10.302	-10.481	-0.179	(0)
		AsO4-3	3.045e-12	7.506e-14	-11.516	-13.125	-1.608	(0)
		H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.002e-04							
		H3BO3	9.232e-05	9.497e-05	-4.035	-4.022	0.012	(0)
		H2BO3-	6.146e-06	4.465e-06	-5.211	-5.350	-0.139	(0)
		MgH2BO3+	8.059e-07	5.855e-07	-6.094	-6.232	-0.139	(0)
		CaH2BO3+	7.942e-07	5.770e-07	-6.100	-6.239	-0.139	(0)
		NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
		BF(OH) 3-	6.189e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
		H5 (BO3) 2-	4.968e-10	3.609e-10	-9.304	-9.443	-0.139	(0)
		H8 (BO3) 3-	4.718e-12	3.427e-12	-11.326	-11.465	-0.139	(0)
		BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
		BF2 (OH) 2-	9.718e-13	7.060e-13	-12.012	-12.151	-0.139	(0)
		BF3OH-	5.552e-19	4.034e-19	-18.256	-18.394	-0.139	(0)
		BF4-	4.012e-24	2.915e-24	-23.397	-23.535	-0.139	(0)
Ba	2.721e-08							
		Ba+2	2.716e-08	9.544e-09	-7.566	-8.020	-0.454	(0)
		BaHCO3+	4.516e-11	3.541e-11	-10.345	-10.451	-0.106	(0)
		BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
		BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
		BaOH+	4.401e-14	3.389e-14	-13.356	-13.470	-0.113	(0)
		BaNO3+	1.112e-15	7.372e-16	-14.954	-15.132	-0.179	(0)
		BaNH3+2	2.676e-16	5.161e-17	-15.573	-16.287	-0.715	(0)
C (4)	5.741e-04							
		HCO3-	5.007e-04	3.885e-04	-3.300	-3.411	-0.110	(0)
		CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)
		MgHCO3+	1.993e-05	1.504e-05	-4.701	-4.823	-0.122	(0)
		H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		MgCO3	4.638e-06	4.638e-06	-5.334	-5.334	0.000	(0)
		NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
		CO3-2	4.196e-06	1.474e-06	-5.377	-5.831	-0.454	(0)
		NaCO3-	6.947e-07	5.390e-07	-6.158	-6.268	-0.110	(0)
		UO2 (CO3) 3-4	6.008e-07	8.313e-10	-6.221	-9.080	-2.859	(0)
		ZnCO3	3.284e-07	3.284e-07	-6.484	-6.484	0.000	(0)
		MnHCO3+	3.121e-07	2.404e-07	-6.506	-6.619	-0.113	(0)
		CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
		ZnHCO3+	7.176e-08	4.755e-08	-7.144	-7.323	-0.179	(0)
		UO2 (CO3) 2-2	5.833e-08	1.125e-08	-7.234	-7.949	-0.715	(0)
		Cu (CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
		CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
		PbCO3	3.984e-10	3.984e-10	-9.400	-9.400	0.000	(0)
		UO2CO3	3.824e-10	3.824e-10	-9.417	-9.417	0.000	(0)
		CdCO3	8.922e-11	8.922e-11	-10.050	-10.050	0.000	(0)
		BaHCO3+	4.516e-11	3.541e-11	-10.345	-10.451	-0.106	(0)
		PbHCO3+	3.916e-11	2.595e-11	-10.407	-10.586	-0.179	(0)
		CoHCO3+	1.802e-11	1.194e-11	-10.744	-10.923	-0.179	(0)
		CoCO3	9.850e-12	9.850e-12	-11.007	-11.007	0.000	(0)
		Pb (CO3) 2-2	8.785e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
		BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
		NiHCO3+	6.702e-12	4.441e-12	-11.174	-11.352	-0.179	(0)
		NiCO3	5.101e-12	5.101e-12	-11.292	-11.292	0.000	(0)
		CdHCO3+	3.543e-12	2.348e-12	-11.451	-11.629	-0.179	(0)
		Cd (CO3) 2-2	5.056e-13	9.752e-14	-12.296	-13.011	-0.715	(0)
		HgCO3	9.749e-15	9.749e-15	-14.011	-14.011	0.000	(0)
		FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
		Hg (CO3) 2-2	2.357e-16	4.545e-17	-15.628	-16.342	-0.715	(0)
		HgHCO3+	3.384e-18	2.242e-18	-17.471	-17.649	-0.179	(0)
Ca	1.207e-02							
		Ca+2	6.391e-03	2.246e-03	-2.194	-2.649	-0.454	(0)
		CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
		CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)

	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
	CaH2BO3+	7.942e-07	5.770e-07	-6.100	-6.239	-0.139	(0)
	CaOH+	4.650e-08	3.646e-08	-7.333	-7.438	-0.106	(0)
	CaNO3+	1.652e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
	CaNH3+2	1.256e-10	2.423e-11	-9.901	-10.616	-0.715	(0)
	Ca (NH3) 2+2	4.287e-19	8.268e-20	-18.368	-19.083	-0.715	(0)
Cd		2.234e-08					
	Cd+2	7.555e-09	2.655e-09	-8.122	-8.576	-0.454	(0)
	CdSO4	6.829e-09	6.829e-09	-8.166	-8.166	0.000	(0)
	Cd (SO4) 2-2	5.240e-09	1.011e-09	-8.281	-8.995	-0.715	(0)
	CdCl+	2.485e-09	1.647e-09	-8.605	-8.783	-0.179	(0)
	CdCO3	8.922e-11	8.922e-11	-10.050	-10.050	0.000	(0)
	CdOHC1	5.496e-11	5.496e-11	-10.260	-10.260	0.000	(0)
	CdCl2	4.459e-11	4.459e-11	-10.351	-10.351	0.000	(0)
	CdOH+	2.589e-11	1.716e-11	-10.587	-10.766	-0.179	(0)
	CdF+	7.534e-12	4.993e-12	-11.123	-11.302	-0.179	(0)
	CdHCO3+	3.543e-12	2.348e-12	-11.451	-11.629	-0.179	(0)
	Cd (CO3) 2-2	5.056e-13	9.752e-14	-12.296	-13.011	-0.715	(0)
	CdCl3-	2.758e-13	1.828e-13	-12.559	-12.738	-0.179	(0)
	Cd (OH) 2	8.807e-14	8.807e-14	-13.055	-13.055	0.000	(0)
	CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
	CdNO3+	1.953e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
	CdSeO4	1.705e-16	1.705e-16	-15.768	-15.768	0.000	(0)
	Cd (SeO3) 2-2	7.187e-17	1.386e-17	-16.143	-16.858	-0.715	(0)
	Cd2OH+3	9.261e-18	2.283e-19	-17.033	-18.642	-1.608	(0)
	Cd (OH) 3-	6.606e-18	4.377e-18	-17.180	-17.359	-0.179	(0)
	Cd (OH) 4-2	3.022e-24	5.829e-25	-23.520	-24.234	-0.715	(0)
	Cd (NO3) 2	9.996e-25	9.996e-25	-24.000	-24.000	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Cl		8.437e-03					
	Cl-	8.436e-03	6.495e-03	-2.074	-2.187	-0.114	(0)
	MnCl+	3.292e-07	2.536e-07	-6.483	-6.596	-0.113	(0)
	ZnCl+	8.370e-08	6.315e-08	-7.077	-7.200	-0.122	(0)
	ZnOHC1	6.726e-08	6.726e-08	-7.172	-7.172	0.000	(0)
	CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
	CdCl+	2.485e-09	1.647e-09	-8.605	-8.783	-0.179	(0)
	MnCl2	2.326e-09	2.326e-09	-8.633	-8.633	0.000	(0)
	CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
	ZnCl2	6.501e-10	6.501e-10	-9.187	-9.187	0.000	(0)
	CuCl+	3.709e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
	CdOHC1	5.496e-11	5.496e-11	-10.260	-10.260	0.000	(0)
	HgClOH	5.156e-11	5.156e-11	-10.288	-10.288	0.000	(0)
	CdCl2	4.459e-11	4.459e-11	-10.351	-10.351	0.000	(0)
	PbCl+	3.126e-11	2.072e-11	-10.505	-10.684	-0.179	(0)
	HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
	CoCl+	1.340e-11	8.880e-12	-10.873	-11.052	-0.179	(0)
	CuCl3-2	7.967e-12	2.803e-12	-11.099	-11.552	-0.454	(0)
	MnCl3-	5.404e-12	4.162e-12	-11.267	-11.381	-0.113	(0)
	ZnCl3-	4.446e-12	3.354e-12	-11.352	-11.474	-0.122	(0)
	NiCl+	2.326e-12	1.541e-12	-11.633	-11.812	-0.179	(0)
	HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
	CuCl2	6.303e-13	6.303e-13	-12.200	-12.200	0.000	(0)
	PbCl2	6.011e-13	6.011e-13	-12.221	-12.221	0.000	(0)
	CdCl3-	2.758e-13	1.828e-13	-12.559	-12.738	-0.179	(0)
	HgCl4-2	2.030e-13	3.915e-14	-12.692	-13.407	-0.715	(0)
	ZnCl4-2	3.097e-14	1.089e-14	-13.509	-13.963	-0.454	(0)
	PbCl3-	2.346e-15	1.554e-15	-14.630	-14.808	-0.179	(0)
	HgCl+	1.080e-15	7.160e-16	-14.966	-15.145	-0.179	(0)
	UO2Cl+	1.036e-15	6.863e-16	-14.985	-15.163	-0.179	(0)
	CuCl3-	5.064e-17	3.821e-17	-16.295	-16.418	-0.122	(0)
	NiCl2	5.040e-17	5.040e-17	-16.298	-16.298	0.000	(0)
	PbCl4-2	2.393e-17	4.615e-18	-16.621	-17.336	-0.715	(0)
	CrCl+2	1.466e-17	2.828e-18	-16.834	-17.548	-0.715	(0)
	CrOHC12	2.841e-19	2.841e-19	-18.547	-18.547	0.000	(0)

CuCl4-2	3.536e-21	1.244e-21	-20.452	-20.905	-0.454	(0)
CrCl2+	2.630e-21	1.743e-21	-20.580	-20.759	-0.179	(0)
FeCl+2	1.641e-21	5.774e-22	-20.785	-21.239	-0.454	(0)
VOCl+	2.613e-22	1.732e-22	-21.583	-21.761	-0.179	(0)
FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
CrO3Cl-	8.365e-26	5.544e-26	-25.078	-25.256	-0.179	(0)
FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
CoCl+2	7.893e-37	1.522e-37	-36.103	-36.818	-0.715	(0)
UCl+3	0.000e+00	0.000e+00	-44.210	-45.818	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.485	-51.199	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.246	-51.960	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.267	-65.982	-0.715	(0)
Co (2)	2.968e-09					
Co+2	2.049e-09	3.952e-10	-8.688	-9.403	-0.715	(0)
CoSO4	8.652e-10	8.652e-10	-9.063	-9.063	0.000	(0)
CoHCO3+	1.802e-11	1.194e-11	-10.744	-10.923	-0.179	(0)
CoCl+	1.340e-11	8.880e-12	-10.873	-11.052	-0.179	(0)
CoCO3	9.850e-12	9.850e-12	-11.007	-11.007	0.000	(0)
CoOH+	9.681e-12	6.415e-12	-11.014	-11.193	-0.179	(0)
CoF+	2.238e-12	1.483e-12	-11.650	-11.829	-0.179	(0)
Co (OH) 2	4.146e-13	4.146e-13	-12.382	-12.382	0.000	(0)
CoNO2+	6.866e-14	4.550e-14	-13.163	-13.342	-0.179	(0)
Co (NH3) +2	2.111e-15	4.072e-16	-14.675	-15.390	-0.715	(0)
CoSeO4	6.830e-17	6.830e-17	-16.166	-16.166	0.000	(0)
CoNO3+	1.457e-17	9.654e-18	-16.837	-17.015	-0.179	(0)
Co (OH) 3-	1.015e-17	6.730e-18	-16.993	-17.172	-0.179	(0)
CoOOH-	2.553e-18	1.692e-18	-17.593	-17.772	-0.179	(0)
Co2OH+3	5.155e-21	1.271e-22	-20.288	-21.896	-1.608	(0)
Co (NH3) 2+2	7.720e-22	1.489e-22	-21.112	-21.827	-0.715	(0)
Co (OH) 4-2	4.499e-24	8.677e-25	-23.347	-24.062	-0.715	(0)
Co (NO3) 2	3.027e-25	3.027e-25	-24.519	-24.519	0.000	(0)
Co (NH3) 3+2	8.329e-29	1.606e-29	-28.079	-28.794	-0.715	(0)
Co4 (OH) 4+4	2.442e-34	3.380e-37	-33.612	-36.471	-2.859	(0)
Co (NH3) 4+2	3.746e-36	7.226e-37	-35.426	-36.141	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.273	-43.988	-0.715	(0)
Co (3)	2.469e-30					
CoOH+2	2.469e-30	4.762e-31	-29.608	-30.322	-0.715	(0)
Co+3	1.211e-36	1.152e-37	-35.917	-36.939	-1.022	(0)
CoCl+2	7.893e-37	1.522e-37	-36.103	-36.818	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.485	-51.199	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.267	-65.982	-0.715	(0)
Cr (2)	5.693e-27					
Cr+2	5.693e-27	1.098e-27	-26.245	-26.959	-0.715	(0)
Cr (3)	1.142e-09					
Cr (OH) 2+	8.945e-10	5.928e-10	-9.048	-9.227	-0.179	(0)
Cr (OH) 3	1.812e-10	1.812e-10	-9.742	-9.742	0.000	(0)
Cr (OH) +2	3.105e-11	5.988e-12	-10.508	-11.223	-0.715	(0)
CrOHSO4	1.559e-11	1.559e-11	-10.807	-10.807	0.000	(0)
CrO2-	1.053e-11	6.978e-12	-10.978	-11.156	-0.179	(0)
Cr (OH) 4-	8.855e-12	5.868e-12	-11.053	-11.232	-0.179	(0)
CrF+2	3.281e-14	6.327e-15	-13.484	-14.199	-0.715	(0)
Cr+3	1.365e-14	3.365e-16	-13.865	-15.473	-1.608	(0)
CrSO4+	1.301e-14	8.620e-15	-13.886	-14.064	-0.179	(0)
CrCl+2	1.466e-17	2.828e-18	-16.834	-17.548	-0.715	(0)
CrOHC12	2.841e-19	2.841e-19	-18.547	-18.547	0.000	(0)
Cr2 (OH) 2SO4+2	4.376e-20	8.439e-21	-19.359	-20.074	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	5.500e-21	5.500e-21	-20.260	-20.260	0.000	(0)
CrCl2+	2.630e-21	1.743e-21	-20.580	-20.759	-0.179	(0)
CrNO3+2	1.175e-24	2.267e-25	-23.930	-24.645	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.811	-41.525	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.267	-50.875	-1.608	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.246	-51.960	-0.715	(0)
Cr (6)	8.539e-15					
CrO4-2	7.805e-15	2.743e-15	-14.108	-14.562	-0.454	(0)
NaCrO4-	4.038e-16	2.676e-16	-15.394	-15.573	-0.179	(0)
HCrO4-	1.655e-16	1.096e-16	-15.781	-15.960	-0.179	(0)

KCrO4-	1.647e-16	1.091e-16	-15.783	-15.962	-0.179	(0)
CrO3SO4-2	2.351e-23	4.535e-24	-22.629	-23.343	-0.715	(0)
H2CrO4	1.098e-24	1.098e-24	-23.959	-23.959	0.000	(0)
CrO3Cl-	8.365e-26	5.544e-26	-25.078	-25.256	-0.179	(0)
Cr2O7-2	2.165e-30	4.176e-31	-29.664	-30.379	-0.715	(0)
Cu (1)	4.445e-09					
CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
Cu+	2.745e-10	1.819e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	7.967e-12	2.803e-12	-11.099	-11.552	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu (2)	4.937e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.270e-08	6.994e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.736e-08	2.719e-08	-7.111	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.371e-10	1.229e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.709e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
CuNO2+	7.018e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
Cu (OH) 3-	2.859e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
CuNH3+2	1.236e-11	2.384e-12	-10.908	-11.623	-0.715	(0)
CuCl2	6.303e-13	6.303e-13	-12.200	-12.200	0.000	(0)
Cu (NO2) 2	7.775e-15	7.775e-15	-14.109	-14.109	0.000	(0)
CuNO3+	1.999e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
Cu (OH) 4-2	6.290e-16	1.213e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.064e-17	3.821e-17	-16.295	-16.418	-0.122	(0)
CuCl4-2	3.536e-21	1.244e-21	-20.452	-20.905	-0.454	(0)
Cu (NO3) 2	2.571e-24	2.571e-24	-23.590	-23.590	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.256e-04					
F-	1.541e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.603e-05	5.035e-05	-4.180	-4.298	-0.118	(0)
CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
MnF+	1.902e-07	1.465e-07	-6.721	-6.834	-0.113	(0)
ZnF+	1.383e-08	9.164e-09	-7.859	-8.038	-0.179	(0)
BF (OH) 3-	6.189e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
CdF+	7.534e-12	4.993e-12	-11.123	-11.302	-0.179	(0)
CoF+	2.238e-12	1.483e-12	-11.650	-11.829	-0.179	(0)
UO2F+	1.610e-12	1.067e-12	-11.793	-11.972	-0.179	(0)
HF2-	1.311e-12	9.781e-13	-11.882	-12.010	-0.127	(0)
PbF+	1.134e-12	7.517e-13	-11.945	-12.124	-0.179	(0)
BF2 (OH) 2-	9.718e-13	7.060e-13	-12.012	-12.151	-0.139	(0)
NiF+	4.171e-13	2.764e-13	-12.380	-12.558	-0.179	(0)
UO2F2	3.652e-13	3.652e-13	-12.437	-12.437	0.000	(0)
CrF+2	3.281e-14	6.327e-15	-13.484	-14.199	-0.715	(0)
UO2F3-	1.643e-14	1.089e-14	-13.784	-13.963	-0.179	(0)
PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
UO2F4-2	5.320e-17	1.026e-17	-16.274	-16.989	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	1.184e-17	1.184e-17	-16.927	-16.927	0.000	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.829e-19	-17.963	-18.417	-0.454	(0)
VO2F2-	7.698e-19	5.101e-19	-18.114	-18.292	-0.179	(0)
PbF3-	5.962e-19	3.951e-19	-18.225	-18.403	-0.179	(0)
BF3OH-	5.552e-19	4.034e-19	-18.256	-18.394	-0.139	(0)

FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	1.021e-20	6.764e-21	-19.991	-20.170	-0.179	(0)
VO2F3-2	3.915e-21	7.551e-22	-20.407	-21.122	-0.715	(0)
VOF2	3.010e-22	3.010e-22	-21.521	-21.521	0.000	(0)
PbF4-2	1.163e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.667e-23	2.430e-23	-22.436	-22.614	-0.179	(0)
BF4-	4.012e-24	2.915e-24	-23.397	-23.535	-0.139	(0)
VOF3-	1.912e-24	1.267e-24	-23.718	-23.897	-0.179	(0)
VO2F4-3	1.788e-24	4.409e-26	-23.748	-25.356	-1.608	(0)
Sb(OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
VOF4-2	3.147e-27	6.069e-28	-26.502	-27.217	-0.715	(0)
UF3+	4.690e-36	3.108e-36	-35.329	-35.507	-0.179	(0)
UF2+2	8.569e-37	1.653e-37	-36.067	-36.782	-0.715	(0)
UF4	4.044e-38	4.044e-38	-37.393	-37.393	0.000	(0)
UF+3	4.488e-39	1.106e-40	-38.348	-39.956	-1.608	(0)
UF5-	2.870e-40	1.902e-40	-39.542	-39.721	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.452	-41.167	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.328e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.402e-14	-13.740	-13.853	-0.113	(0)
FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.026e-18	2.331e-18	-17.519	-17.633	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.307e-10	4.893e-10	-9.200	-9.310	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.174e-11	3.239e-11	-10.379	-10.490	-0.110	(0)
FeOH+2	4.394e-15	1.546e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.829e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.705e-19	3.623e-19	-18.327	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.283e-19	8.500e-20	-18.892	-19.071	-0.179	(0)
Fe+3	3.096e-20	2.943e-21	-19.509	-20.531	-1.022	(0)
FeCl+2	1.641e-21	5.774e-22	-20.785	-21.239	-0.454	(0)
FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
FeHSeO3+2	9.959e-24	1.921e-24	-23.002	-23.717	-0.715	(0)
Fe2 (OH) 2+4	5.720e-26	7.915e-29	-25.243	-28.102	-2.859	(0)
FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
FeNO3+2	2.352e-27	4.536e-28	-26.629	-27.343	-0.715	(0)
Fe3 (OH) 4+5	1.641e-32	5.598e-37	-31.785	-36.252	-4.467	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.516e-09					
Hg	9.516e-09	9.516e-09	-8.022	-8.022	0.000	(0)
Hg (1)	3.701e-19					
Hg2+2	1.851e-19	3.569e-20	-18.733	-19.447	-0.715	(0)
Hg (2)	9.980e-11					
HgClOH	5.156e-11	5.156e-11	-10.288	-10.288	0.000	(0)
HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
Hg (OH) 2	2.243e-11	2.307e-11	-10.649	-10.637	0.012	(0)
HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
HgCl4-2	2.030e-13	3.915e-14	-12.692	-13.407	-0.715	(0)
HgCO3	9.749e-15	9.749e-15	-14.011	-14.011	0.000	(0)
HgCl+	1.080e-15	7.160e-16	-14.966	-15.145	-0.179	(0)
HgOH+	2.700e-16	1.789e-16	-15.569	-15.747	-0.179	(0)
Hg (CO3) 2-2	2.357e-16	4.545e-17	-15.628	-16.342	-0.715	(0)
Hg (OH) 3-	3.566e-18	2.363e-18	-17.448	-17.627	-0.179	(0)
HgHCO3+	3.384e-18	2.242e-18	-17.471	-17.649	-0.179	(0)
Hg (NH3) 2+2	1.328e-18	2.561e-19	-17.877	-18.592	-0.715	(0)
HgNH3+2	1.549e-19	2.988e-20	-18.810	-19.525	-0.715	(0)
Hg+2	2.865e-20	5.525e-21	-19.543	-20.258	-0.715	(0)
HgSO4	1.587e-20	1.587e-20	-19.799	-19.799	0.000	(0)
HgF+	3.667e-23	2.430e-23	-22.436	-22.614	-0.179	(0)

	Hg (NH3) 3+2	4.530e-26	8.737e-27	-25.344	-26.059	-0.715	(0)
	HgNO3+	4.744e-29	3.144e-29	-28.324	-28.502	-0.179	(0)
	Hg (NH3) 4+2	3.084e-33	5.948e-34	-32.511	-33.226	-0.715	(0)
	Hg (NO3) 2	2.014e-37	2.014e-37	-36.696	-36.696	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K		1.498e-02					
	K+	1.391e-02	1.071e-02	-1.857	-1.970	-0.114	(0)
	KSO4-	1.072e-03	8.319e-04	-2.970	-3.080	-0.110	(0)
	KCrO4-	1.647e-16	1.091e-16	-15.783	-15.962	-0.179	(0)
Mg		1.841e-02					
	Mg+2	1.076e-02	3.782e-03	-1.968	-2.422	-0.454	(0)
	MgSO4	7.551e-03	7.551e-03	-2.122	-2.122	0.000	(0)
	MgF+	6.603e-05	5.035e-05	-4.180	-4.298	-0.118	(0)
	MgHCO3+	1.993e-05	1.504e-05	-4.701	-4.823	-0.122	(0)
	MgCO3	4.638e-06	4.638e-06	-5.334	-5.334	0.000	(0)
	MgOH+	1.550e-06	1.225e-06	-5.810	-5.912	-0.102	(0)
	MgH2BO3+	8.059e-07	5.855e-07	-6.094	-6.232	-0.139	(0)
Mn (2)		2.222e-04					
	Mn+2	1.608e-04	3.101e-05	-3.794	-4.509	-0.715	(0)
	MnSO4	6.050e-05	6.050e-05	-4.218	-4.218	0.000	(0)
	MnCl+	3.292e-07	2.536e-07	-6.483	-6.596	-0.113	(0)
	MnHCO3+	3.121e-07	2.404e-07	-6.506	-6.619	-0.113	(0)
	MnF+	1.902e-07	1.465e-07	-6.721	-6.834	-0.113	(0)
	MnOH+	8.228e-08	6.337e-08	-7.085	-7.198	-0.113	(0)
	MnCl2	2.326e-09	2.326e-09	-8.633	-8.633	0.000	(0)
	MnCl3-	5.404e-12	4.162e-12	-11.267	-11.381	-0.113	(0)
	MnSeO4	2.878e-12	2.878e-12	-11.541	-11.541	0.000	(0)
	MnNO3+	1.143e-12	7.574e-13	-11.942	-12.121	-0.179	(0)
	Mn (OH) 3-	3.366e-16	2.592e-16	-15.473	-15.586	-0.113	(0)
	Mn (NO3) 2	2.932e-20	2.932e-20	-19.533	-19.533	0.000	(0)
	Mn (OH) 4-2	1.935e-21	6.808e-22	-20.713	-21.167	-0.454	(0)
	MnSe	0.000e+00	0.000e+00	-40.367	-40.367	0.000	(0)
Mn (3)		1.066e-24					
	Mn+3	1.066e-24	1.014e-25	-23.972	-24.994	-1.022	(0)
Mn (6)		1.753e-40					
	MnO4-2	1.753e-40	0.000e+00	-39.756	-40.210	-0.454	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.585	-44.717	-0.133	(0)
Mo		7.594e-06					
	MoO4-2	7.593e-06	2.668e-06	-5.120	-5.574	-0.454	(0)
	HMoO4-	9.897e-10	6.559e-10	-9.004	-9.183	-0.179	(0)
	H2MoO4	5.935e-14	5.935e-14	-13.227	-13.227	0.000	(0)
	AlMo6O21-3	2.472e-39	0.000e+00	-38.607	-40.215	-1.608	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-42.856	-49.289	-6.433	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-46.343	-50.810	-4.467	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.077	-53.936	-2.859	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.990	-58.598	-1.608	(0)
N (-3)		2.926e-07					
	NH4+	2.556e-07	1.857e-07	-6.592	-6.731	-0.139	(0)
	NH4SO4-	2.835e-08	2.183e-08	-7.548	-7.661	-0.113	(0)
	NH3	8.571e-09	8.571e-09	-8.067	-8.067	0.000	(0)
	CaNH3+2	1.256e-10	2.423e-11	-9.901	-10.616	-0.715	(0)
	CuNH3+2	1.236e-11	2.384e-12	-10.908	-11.623	-0.715	(0)
	NiNH3+2	2.213e-15	4.268e-16	-14.655	-15.370	-0.715	(0)
	Co (NH3) +2	2.111e-15	4.072e-16	-14.675	-15.390	-0.715	(0)
	BaNH3+2	2.676e-16	5.161e-17	-15.573	-16.287	-0.715	(0)
	Hg (NH3) 2+2	1.328e-18	2.561e-19	-17.877	-18.592	-0.715	(0)
	Ca (NH3) 2+2	4.287e-19	8.268e-20	-18.368	-19.083	-0.715	(0)
	HgNH3+2	1.549e-19	2.988e-20	-18.810	-19.525	-0.715	(0)
	Ni (NH3) 2+2	2.742e-21	5.288e-22	-20.562	-21.277	-0.715	(0)
	Co (NH3) 2+2	7.720e-22	1.489e-22	-21.112	-21.827	-0.715	(0)
	Hg (NH3) 3+2	4.530e-26	8.737e-27	-25.344	-26.059	-0.715	(0)
	Co (NH3) 3+2	8.329e-29	1.606e-29	-28.079	-28.794	-0.715	(0)
	Hg (NH3) 4+2	3.084e-33	5.948e-34	-32.511	-33.226	-0.715	(0)
	Co (NH3) 4+2	3.746e-36	7.226e-37	-35.426	-36.141	-0.715	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.811	-41.525	-0.715	(0)

	Co (NH3) 5+2	0.000e+00	0.000e+00	-43.273	-43.988	-0.715	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.267	-50.875	-1.608	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.485	-51.199	-0.715	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.246	-51.960	-0.715	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.267	-65.982	-0.715	(0)
N (3)	2.218e-05						
	NO2-	2.218e-05	1.634e-05	-4.654	-4.787	-0.133	(0)
	CuNO2+	7.018e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
	CoNO2+	6.866e-14	4.550e-14	-13.163	-13.342	-0.179	(0)
	Cu (NO2) 2	7.775e-15	7.775e-15	-14.109	-14.109	0.000	(0)
N (5)	2.018e-08						
	NO3-	2.002e-08	1.541e-08	-7.699	-7.812	-0.114	(0)
	CaNO3+	1.652e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
	MnNO3+	1.143e-12	7.574e-13	-11.942	-12.121	-0.179	(0)
	ZnNO3+	2.261e-13	1.498e-13	-12.646	-12.824	-0.179	(0)
	CuNO3+	1.999e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
	BaNO3+	1.112e-15	7.372e-16	-14.954	-15.132	-0.179	(0)
	CdNO3+	1.953e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
	PbNO3+	3.093e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
	CoNO3+	1.457e-17	9.654e-18	-16.837	-17.015	-0.179	(0)
	NiNO3+	5.417e-18	3.590e-18	-17.266	-17.445	-0.179	(0)
	Mn (NO3) 2	2.932e-20	2.932e-20	-19.533	-19.533	0.000	(0)
	UO2NO3+	3.023e-21	2.003e-21	-20.520	-20.698	-0.179	(0)
	Zn (NO3) 2	4.608e-22	4.608e-22	-21.336	-21.336	0.000	(0)
	Cu (NO3) 2	2.571e-24	2.571e-24	-23.590	-23.590	0.000	(0)
	CrNO3+2	1.175e-24	2.267e-25	-23.930	-24.645	-0.715	(0)
	Cd (NO3) 2	9.996e-25	9.996e-25	-24.000	-24.000	0.000	(0)
	Pb (NO3) 2	5.364e-25	5.364e-25	-24.270	-24.270	0.000	(0)
	VO2NO3	4.436e-25	4.436e-25	-24.353	-24.353	0.000	(0)
	Co (NO3) 2	3.027e-25	3.027e-25	-24.519	-24.519	0.000	(0)
	FeNO3+2	2.352e-27	4.536e-28	-26.629	-27.343	-0.715	(0)
	HgNO3+	4.744e-29	3.144e-29	-28.324	-28.502	-0.179	(0)
	Hg (NO3) 2	2.014e-37	2.014e-37	-36.696	-36.696	0.000	(0)
Na	2.700e-02						
	Na+	2.550e-02	1.963e-02	-1.593	-1.707	-0.114	(0)
	NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
	NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
	NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
	NaCO3-	6.947e-07	5.390e-07	-6.158	-6.268	-0.110	(0)
	NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
	NaCrO4-	4.038e-16	2.676e-16	-15.394	-15.573	-0.179	(0)
Ni	4.833e-10						
	Ni+2	2.639e-10	9.273e-11	-9.579	-10.033	-0.454	(0)
	NiSO4	2.030e-10	2.030e-10	-9.692	-9.692	0.000	(0)
	NiHCO3+	6.702e-12	4.441e-12	-11.174	-11.352	-0.179	(0)
	NiCO3	5.101e-12	5.101e-12	-11.292	-11.292	0.000	(0)
	NiCl+	2.326e-12	1.541e-12	-11.633	-11.812	-0.179	(0)
	NiOH+	1.433e-12	9.498e-13	-11.844	-12.022	-0.179	(0)
	NiF+	4.171e-13	2.764e-13	-12.380	-12.558	-0.179	(0)
	Ni (SO4) 2-2	3.824e-13	7.376e-14	-12.417	-13.132	-0.715	(0)
	Ni (OH) 2	6.138e-14	6.138e-14	-13.212	-13.212	0.000	(0)
	NiNH3+2	2.213e-15	4.268e-16	-14.655	-15.370	-0.715	(0)
	Ni (OH) 3-	7.535e-17	4.993e-17	-16.123	-16.302	-0.179	(0)
	NiCl2	5.040e-17	5.040e-17	-16.298	-16.298	0.000	(0)
	NiSeO4	1.496e-17	1.496e-17	-16.825	-16.825	0.000	(0)
	NiNO3+	5.417e-18	3.590e-18	-17.266	-17.445	-0.179	(0)
	Ni (NH3) 2+2	2.742e-21	5.288e-22	-20.562	-21.277	-0.715	(0)
O (0)	2.416e-35						
	O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.666e-09						
	PbSO4	4.831e-10	4.831e-10	-9.316	-9.316	0.000	(0)
	PbCO3	3.984e-10	3.984e-10	-9.400	-9.400	0.000	(0)
	PbOH+	2.772e-10	1.837e-10	-9.557	-9.736	-0.179	(0)
	Pb+2	2.558e-10	8.990e-11	-9.592	-10.046	-0.454	(0)
	Pb (SO4) 2-2	1.656e-10	3.194e-11	-9.781	-10.496	-0.715	(0)
	PbHCO3+	3.916e-11	2.595e-11	-10.407	-10.586	-0.179	(0)

PbCl+	3.126e-11	2.072e-11	-10.505	-10.684	-0.179	(0)
Pb (CO3) 2-2	8.785e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
Pb (OH) 2	4.726e-12	4.726e-12	-11.325	-11.325	0.000	(0)
PbF+	1.134e-12	7.517e-13	-11.945	-12.124	-0.179	(0)
PbCl2	6.011e-13	6.011e-13	-12.221	-12.221	0.000	(0)
Pb (OH) 3-	5.802e-15	3.845e-15	-14.236	-14.415	-0.179	(0)
PbCl3-	2.346e-15	1.554e-15	-14.630	-14.808	-0.179	(0)
PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.093e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
PbCl4-2	2.393e-17	4.615e-18	-16.621	-17.336	-0.715	(0)
Pb2OH+3	1.062e-17	2.618e-19	-16.974	-18.582	-1.608	(0)
Pb (OH) 4-2	3.972e-18	7.661e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.962e-19	3.951e-19	-18.225	-18.403	-0.179	(0)
Pb3 (OH) 4+2	2.078e-22	4.007e-23	-21.682	-22.397	-0.715	(0)
PbF4-2	1.163e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
Pb (NO3) 2	5.364e-25	5.364e-25	-24.270	-24.270	0.000	(0)
Pb4 (OH) 4+4	2.068e-26	2.861e-29	-25.684	-28.543	-2.859	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.129	-79.844	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.645	-80.360	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.725	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.547	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.325	-87.779	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.289	-147.467	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.366	-149.366	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.294	-224.472	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.829	-226.544	-0.715	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.604	-304.319	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.715	(0)
S (6)	4.706e-02					
SO4-2	3.122e-02	1.097e-02	-1.506	-1.960	-0.454	(0)
MgSO4	7.551e-03	7.551e-03	-2.122	-2.122	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
KSO4-	1.072e-03	8.319e-04	-2.970	-3.080	-0.110	(0)
MnSO4	6.050e-05	6.050e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.291e-06	9.291e-06	-5.032	-5.032	0.000	(0)
Zn (SO4) 2-2	4.604e-06	8.879e-07	-5.337	-6.052	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.835e-08	2.183e-08	-7.548	-7.661	-0.113	(0)
HSO4-	1.737e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.829e-09	6.829e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.240e-09	1.011e-09	-8.281	-8.995	-0.715	(0)
CoSO4	8.652e-10	8.652e-10	-9.063	-9.063	0.000	(0)
PbSO4	4.831e-10	4.831e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.030e-10	2.030e-10	-9.692	-9.692	0.000	(0)
Pb (SO4) 2-2	1.656e-10	3.194e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	1.559e-11	1.559e-11	-10.807	-10.807	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)

UO2SO4	1.082e-12	1.082e-12	-11.966	-11.966	0.000	(0)
UO2 (SO4) 2-2	8.114e-13	1.565e-13	-12.091	-12.806	-0.715	(0)
AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.824e-13	7.376e-14	-12.417	-13.132	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	1.301e-14	8.620e-15	-13.886	-14.064	-0.179	(0)
VO2SO4-	2.249e-17	1.491e-17	-16.648	-16.827	-0.179	(0)
FeSO4+	4.705e-19	3.623e-19	-18.327	-18.441	-0.113	(0)
Fe (SO4) 2-	1.283e-19	8.500e-20	-18.892	-19.071	-0.179	(0)
Cr2 (OH) 2SO4+2	4.376e-20	8.439e-21	-19.359	-20.074	-0.715	(0)
VOSO4	2.872e-20	2.872e-20	-19.542	-19.542	0.000	(0)
HgSO4	1.587e-20	1.587e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.500e-21	5.500e-21	-20.260	-20.260	0.000	(0)
CrO3SO4-2	2.351e-23	4.535e-24	-22.629	-23.343	-0.715	(0)
VSO4+	7.704e-35	5.106e-35	-34.113	-34.292	-0.179	(0)
U (SO4) 2	1.779e-39	1.779e-39	-38.750	-38.750	0.000	(0)
USO4+2	1.058e-40	0.000e+00	-39.975	-40.690	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Sb (3)	9.925e-20					
Sb (OH) 3	5.017e-20	5.017e-20	-19.300	-19.300	0.000	(0)
HSbO2	4.907e-20	4.907e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.707e-24	6.433e-24	-23.013	-23.192	-0.179	(0)
Sb (OH) 4-	5.541e-24	3.672e-24	-23.256	-23.435	-0.179	(0)
Sb (OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.275e-26	1.508e-26	-25.643	-25.822	-0.179	(0)
SbO+	7.859e-27	5.208e-27	-26.105	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.715	(0)
Sb (5)	9.021e-08					
SbO3-	9.012e-08	5.972e-08	-7.045	-7.224	-0.179	(0)
Sb (OH) 6-	9.021e-11	6.946e-11	-10.045	-10.158	-0.114	(0)
SbO2+	3.952e-24	2.619e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.269e-39					
HSe-	6.269e-39	4.155e-39	-38.203	-38.381	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.367	-40.367	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.400	-42.400	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.758	-45.473	-0.715	(0)
Se (4)	7.854e-07					
SeO3-2	4.127e-07	7.959e-08	-6.384	-7.099	-0.715	(0)
HSeO3-	3.727e-07	2.470e-07	-6.429	-6.607	-0.179	(0)
H2SeO3	1.301e-12	1.301e-12	-11.886	-11.886	0.000	(0)
Cd (SeO3) 2-2	7.187e-17	1.386e-17	-16.143	-16.858	-0.715	(0)
FeHSeO3+2	9.959e-24	1.921e-24	-23.002	-23.717	-0.715	(0)
Se (6)	9.843e-10					
SeO4-2	9.812e-10	3.448e-10	-9.008	-9.462	-0.454	(0)
MnSeO4	2.878e-12	2.878e-12	-11.541	-11.541	0.000	(0)
ZnSeO4	2.067e-13	2.067e-13	-12.685	-12.685	0.000	(0)
HSeO4-	3.221e-16	2.135e-16	-15.492	-15.671	-0.179	(0)
CdSeO4	1.705e-16	1.705e-16	-15.768	-15.768	0.000	(0)
CoSeO4	6.830e-17	6.830e-17	-16.166	-16.166	0.000	(0)
NiSeO4	1.496e-17	1.496e-17	-16.825	-16.825	0.000	(0)
Zn (SeO4) 2-2	3.747e-22	7.226e-23	-21.426	-22.141	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.383	-58.991	-1.608	(0)
U (4)	1.842e-19					
U (OH) 5-	1.842e-19	1.221e-19	-18.735	-18.913	-0.179	(0)
U (OH) 4	6.326e-23	6.326e-23	-22.199	-22.199	0.000	(0)
U (OH) 3+	4.320e-27	2.863e-27	-26.365	-26.543	-0.179	(0)
U (OH) 2+2	8.494e-32	1.638e-32	-31.071	-31.786	-0.715	(0)
UF3+	4.690e-36	3.108e-36	-35.329	-35.507	-0.179	(0)
UF2+2	8.569e-37	1.653e-37	-36.067	-36.782	-0.715	(0)
UOH+3	3.874e-37	9.550e-39	-36.412	-38.020	-1.608	(0)
UF4	4.044e-38	4.044e-38	-37.393	-37.393	0.000	(0)
UF+3	4.488e-39	1.106e-40	-38.348	-39.956	-1.608	(0)
U (SO4) 2	1.779e-39	1.779e-39	-38.750	-38.750	0.000	(0)
UF5-	2.870e-40	1.902e-40	-39.542	-39.721	-0.179	(0)
USO4+2	1.058e-40	0.000e+00	-39.975	-40.690	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.452	-41.167	-0.715	(0)

U+4	0.000e+00	0.000e+00	-42.471	-45.330	-2.859	(0)
UC1+3	0.000e+00	0.000e+00	-44.210	-45.818	-1.608	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-156.053	-170.527	-14.473	(0)
U (5)	8.186e-16					
UO2+	8.186e-16	5.425e-16	-15.087	-15.266	-0.179	(0)
U (6)	6.595e-07					
UO2 (CO3) 3-4	6.008e-07	8.313e-10	-6.221	-9.080	-2.859	(0)
UO2 (CO3) 2-2	5.833e-08	1.125e-08	-7.234	-7.949	-0.715	(0)
UO2CO3	3.824e-10	3.824e-10	-9.417	-9.417	0.000	(0)
UO2OH+	1.007e-11	6.673e-12	-10.997	-11.176	-0.179	(0)
UO2F+	1.610e-12	1.067e-12	-11.793	-11.972	-0.179	(0)
UO2SO4	1.082e-12	1.082e-12	-11.966	-11.966	0.000	(0)
UO2 (SO4) 2-2	8.114e-13	1.565e-13	-12.091	-12.806	-0.715	(0)
UO2F2	3.652e-13	3.652e-13	-12.437	-12.437	0.000	(0)
UO2+2	1.854e-13	6.515e-14	-12.732	-13.186	-0.454	(0)
UO2F3-	1.643e-14	1.089e-14	-13.784	-13.963	-0.179	(0)
UO2Cl+	1.036e-15	6.863e-16	-14.985	-15.163	-0.179	(0)
(UO2) 2 (OH) 2+2	3.831e-16	7.389e-17	-15.417	-16.131	-0.715	(0)
(UO2) 3 (OH) 5+	3.736e-16	2.476e-16	-15.428	-15.606	-0.179	(0)
UO2F4-2	5.320e-17	1.026e-17	-16.274	-16.989	-0.715	(0)
UO2NO3+	3.023e-21	2.003e-21	-20.520	-20.698	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.582	-42.760	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.466	-44.181	-0.715	(0)
V (3)	4.282e-15					
V (OH) 3	4.282e-15	4.282e-15	-14.368	-14.368	0.000	(0)
V (OH) 2+	5.167e-26	3.424e-26	-25.287	-25.465	-0.179	(0)
VOH+2	2.084e-29	4.019e-30	-28.681	-29.396	-0.715	(0)
V+3	3.999e-34	9.857e-36	-33.398	-35.006	-1.608	(0)
VSO4+	7.704e-35	5.106e-35	-34.113	-34.292	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.801	-56.409	-1.608	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.133	-57.992	-2.859	(0)
V (4)	2.412e-18					
V (OH) 3+	2.324e-18	1.540e-18	-17.634	-17.813	-0.179	(0)
VO+2	4.928e-20	9.504e-21	-19.307	-20.022	-0.715	(0)
VOSO4	2.872e-20	2.872e-20	-19.542	-19.542	0.000	(0)
VOF+	1.021e-20	6.764e-21	-19.991	-20.170	-0.179	(0)
VOF2	3.010e-22	3.010e-22	-21.521	-21.521	0.000	(0)
VOC1+	2.613e-22	1.732e-22	-21.583	-21.761	-0.179	(0)
VOF3-	1.912e-24	1.267e-24	-23.718	-23.897	-0.179	(0)
VOF4-2	3.147e-27	6.069e-28	-26.502	-27.217	-0.715	(0)
H2V2O4+2	6.185e-31	1.193e-31	-30.209	-30.923	-0.715	(0)
V (5)	4.772e-08					
H2VO4-	2.809e-08	1.861e-08	-7.551	-7.730	-0.179	(0)
HVO4-2	1.963e-08	3.785e-09	-7.707	-8.422	-0.715	(0)
H3VO4	2.299e-12	2.299e-12	-11.638	-11.638	0.000	(0)
HV2O7-3	9.703e-13	2.392e-14	-12.013	-13.621	-1.608	(0)
H3V2O7-	4.178e-13	2.769e-13	-12.379	-12.558	-0.179	(0)
VO4-3	6.230e-14	1.536e-15	-13.206	-14.814	-1.608	(0)
V2O7-4	3.766e-14	5.212e-17	-13.424	-16.283	-2.859	(0)
V3O9-3	2.756e-16	6.793e-18	-15.560	-17.168	-1.608	(0)
VO2+	7.390e-17	5.690e-17	-16.131	-16.245	-0.114	(0)
VO2SO4-	2.249e-17	1.491e-17	-16.648	-16.827	-0.179	(0)
VO2F	1.184e-17	1.184e-17	-16.927	-16.927	0.000	(0)
VO2F2-	7.698e-19	5.101e-19	-18.114	-18.292	-0.179	(0)
V4O12-4	3.817e-20	5.281e-23	-19.418	-22.277	-2.859	(0)
VO2F3-2	3.915e-21	7.551e-22	-20.407	-21.122	-0.715	(0)
VO2F4-3	1.788e-24	4.409e-26	-23.748	-25.356	-1.608	(0)
VO2NO3	4.436e-25	4.436e-25	-24.353	-24.353	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.586	-60.019	-6.433	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.273	-59.740	-4.467	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.582	-62.441	-2.859	(0)
Zn	2.599e-05					
Zn+2	1.101e-05	3.871e-06	-4.958	-5.412	-0.454	(0)
ZnSO4	9.291e-06	9.291e-06	-5.032	-5.032	0.000	(0)
Zn (SO4) 2-2	4.604e-06	8.879e-07	-5.337	-6.052	-0.715	(0)
ZnOH+	4.752e-07	3.149e-07	-6.323	-6.502	-0.179	(0)
ZnCO3	3.284e-07	3.284e-07	-6.484	-6.484	0.000	(0)

ZnCl+	8.370e-08	6.315e-08	-7.077	-7.200	-0.122	(0)
ZnHCO3+	7.176e-08	4.755e-08	-7.144	-7.323	-0.179	(0)
ZnOHCl	6.726e-08	6.726e-08	-7.172	-7.172	0.000	(0)
Zn(OH)2	4.060e-08	4.060e-08	-7.391	-7.391	0.000	(0)
ZnF+	1.383e-08	9.164e-09	-7.859	-8.038	-0.179	(0)
ZnCl2	6.501e-10	6.501e-10	-9.187	-9.187	0.000	(0)
Zn(OH)3-	2.498e-10	1.656e-10	-9.602	-9.781	-0.179	(0)
ZnCl3-	4.446e-12	3.354e-12	-11.352	-11.474	-0.122	(0)
ZnNO3+	2.261e-13	1.498e-13	-12.646	-12.824	-0.179	(0)
ZnSeO4	2.067e-13	2.067e-13	-12.685	-12.685	0.000	(0)
ZnCl4-2	3.097e-14	1.089e-14	-13.509	-13.963	-0.454	(0)
Zn(OH)4-2	2.780e-14	5.362e-15	-13.556	-14.271	-0.715	(0)
Zn(NO3)2	4.608e-22	4.608e-22	-21.336	-21.336	0.000	(0)
Zn(SeO4)2-2	3.747e-22	7.226e-23	-21.426	-22.141	-0.715	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.289	-147.467	-0.179	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.366	-149.366	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.294	-224.472	-0.179	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.829	-226.544	-0.715	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.604	-304.319	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.15	-48.87	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-42.13	-37.62	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.35	-37.62	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.25	-53.31	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-56.47	-36.44	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.43	-28.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.37	-22.92	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3
Al2(MoO4)3	-47.73	-45.36	2.37	Al2(MoO4)3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.61	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.96	-1.09	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.23	6.71	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.55	-6.72	1.83	BaSeO3
BaSeO4	-10.02	-17.48	-7.46	BaSeO4
Bianchite	-5.61	-7.38	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.85	-77.38	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4

Brucite	-3.45	13.39	16.84	Mg (OH) 2
Bunsenite	-6.66	5.78	12.45	NiO
Ca (VO3) 2	-9.17	-3.51	5.66	Ca (VO3) 2
Ca2V2O7	-7.84	9.66	17.50	Ca2V2O7
Ca2V2O7:2H2O	-11.89	9.66	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-16.13	22.83	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-17.04	22.82	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-14.94	-17.21	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.16	-1.35	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.09	-12.11	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.64	-0.80	9.84	Cd (BO2) 2
Cd (OH) 2	-6.41	7.24	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-6.49	7.24	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.54	-13.83	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-18.62	3.94	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-17.22	11.18	28.40	Cd4 (OH) 6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.21	-16.43	-1.21	CdF2
Cdmetal (alpha)	-31.82	-18.31	13.51	Cd
Cdmetal (gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4:2H2O	-16.19	-18.04	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.66	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co (BO2) 2	-28.70	-1.63	27.07	Co (BO2) 2
Co (OH) 2	-6.68	6.41	13.09	Co (OH) 2
Co (OH) 3	-10.91	-13.22	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-26.09	-13.06	13.03	Co3 (AsO4) 2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.05	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.68	-39.88	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.34	-18.87	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.96	-11.14	10.82	Cr (OH) 2

Cr (OH) 3	-2.66	-1.32	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.57	-1.32	-0.75	Cr (OH) 3
Cr2O3	-0.28	-2.64	-2.36	Cr2O3
CrCl2	-45.43	-31.33	14.09	CrCl2
CrCl3	-46.72	-31.60	15.11	CrCl3
CrF3	-25.48	-36.82	-11.34	CrF3
Crmetal	-67.17	-36.69	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.50	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.69	-22.13	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.42	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.78	-6.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.50	-13.22	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.69	-8.13	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.54	-37.16	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.39	0.81	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-44.99	-63.58	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.84	-42.84	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.55	-80.52	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-5.04	2.63	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl

Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.58	-258.29	-73.71	Hg (CH3) 2
Hg (g)	-6.71	-14.59	-7.87	Hg
Hg (OH) 2	-7.14	-10.64	-3.50	Hg (OH) 2
Hg2 (g)	-14.22	-29.18	-14.96	Hg2
Hg2 (OH) 2	-8.89	-3.63	5.26	Hg2 (OH) 2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.31	-34.01	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.49	-18.15	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.56	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.83	-21.26	HgCl2
HgF (g)	-46.33	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.23	-56.92	-55.69	HgSe
HgSeO3	-12.72	-25.15	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.86	-19.63	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.64	-48.88	-17.24	K2Cr2O7
K2CrO4	-17.99	-18.50	-0.51	K2CrO4
K2MoO4	-12.78	-9.51	3.26	K2MoO4
K2SeO4	-12.67	-13.40	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.80	-6.24	-0.43	PbO : PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.56	-3.28	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.25	10.11	26.36	Mg2V2O7
MgCr2O4	-5.44	10.76	16.20	MgCr2O4
MgCrO4	-22.36	-16.98	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.15	-8.00	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.18	-1.13	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.69	-11.89	-1.20	MgSeO4 : 6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.27	-5.37	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.16	-55.87	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.88	1.62	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.60	-8.89	2.72	MnCl2 : 4H2O
MnS (grn)	-75.16	-74.99	0.17	MnS

MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.48	-34.98	3.50	MnSe
MnSeO3	-4.34	-3.21	1.13	MnSeO3
MnSeO3:2H2O	-4.19	-3.21	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.93	-13.98	-2.05	MnSeO4:5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.46	-48.35	-9.90	Na2Cr2O7
Na2CrO4	-20.91	-17.98	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.42	-2.12	10.30	Na2SeO3:5H2O
Na2SeO4	-14.16	-12.88	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.42	10.27	36.68	Na3VO4
Na4V2O7	-29.27	8.13	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-5.99	-2.14	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.01	5.78	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-30.65	-14.95	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-26.65	5.35	32.00	Ni4 (OH) 6SO4
NiCO3	-8.99	-15.86	-6.87	NiCO3
NiMoO4	-4.46	-15.61	-11.14	NiMoO4
NiS (alpha)	-74.91	-80.51	-5.60	NiS
NiS (beta)	-69.41	-80.51	-11.10	NiS
NiS (gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.81	-40.51	-17.70	NiSe
NiSeO3:2H2O	-11.55	-8.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.98	-19.50	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb (BO2) 2	-8.79	-2.27	6.52	Pb (BO2) 2
Pb (OH) 2	-2.38	5.77	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-63.43	-72.19	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-7.35	1.44	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.65	11.54	26.19	Pb2O (OH) 2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.24	-5.14	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.79	-14.99	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.51	0.63	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.80	5.30	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2

Pyrochroite	-3.89	11.31	15.19	Mn(OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb(OH) 3	-12.19	-19.30	-7.11	Sb(OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.71	-177.46	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.16	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.37	2.63	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.63	-20.74	-7.11	Se
Semetal(hex)	-13.04	-20.74	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.28	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.24	-11.24	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.70	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.25	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca(UO2) 2(VO4) 2
U3O8	-11.09	9.99	21.08	U3O8
U3Sb4	-577.21	-424.83	152.38	U3Sb4
U4O9	-26.23	-29.25	-3.02	U4O9
UF4	-31.50	-61.03	-29.54	UF4
UF4:2.5H2O	-28.32	-61.04	-32.72	UF4:2.5H2O
UO2(am)	-14.63	-13.70	0.93	UO2
UO2(NO3) 2	-40.96	-28.81	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-33.66	-28.81	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-32.20	-28.81	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-30.86	-28.82	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-2.98	2.63	5.61	UO2(OH) 2
UO2SeO4:4H2O	-20.40	-22.65	-2.25	UO2SeO4:4H2O
UO3	-5.07	2.63	7.70	UO3
Uraninite	-9.03	-13.70	-4.67	UO2
USb2	-218.81	-189.24	29.58	USb2
V(OH) 3	-18.88	-11.28	7.59	V(OH) 3
V2O5	-15.31	-16.67	-1.36	V2O5
V3O5	-40.00	-38.16	1.84	V3O5
V4O7	-49.56	-42.37	7.19	V4O7
V6O13	-40.25	-101.11	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VC12	-63.12	-44.25	18.87	VC12
VC13	-65.00	-41.57	23.43	VC13
VF4	-66.47	-51.54	14.93	VF4
Vmetal	-93.63	-49.60	44.03	V
VO	-38.81	-24.06	14.76	VO
VO(OH) 2	-9.36	-4.21	5.15	VO(OH) 2
VO2Cl	-21.27	-18.43	2.84	VO2Cl
VOC1	-32.53	-21.38	11.15	VOC1
VOC12	-37.16	-24.40	12.76	VOC12
VOSO4	-25.59	-21.98	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO4
Zn(BO2) 2	-5.93	2.36	8.29	Zn(BO2) 2

Zn(NO3)2:6H2O	-24.36	-21.04	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.80	10.40	12.20	Zn(OH)2
Zn(OH)2(am)	-2.07	10.40	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.35	10.40	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.13	10.40	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.33	10.40	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.47	3.03	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.48	10.71	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.74	-1.09	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.25	-4.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.56	23.84	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.68	31.82	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.98	-11.24	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.26	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.79	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.49	-35.89	-14.40	ZnSe
ZnSeO4:6H2O	-13.36	-14.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.73	-7.37	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 107.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 602
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 602
USE Surface 602
USE Solution 607
SAVE Solution 608 #Initial Stage 6 Run-off Water After Mineral
Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 602.

Diffuse Double Layer Surface-Complexation Model

Hfo

2.014e-19	Surface + diffuse layer charge, eq
3.138e-08	Surface charge, eq
4.399e-03	sigma, C/m ²
1.213e-01	psi, V
-4.722e+00	-F*psi/RT
8.900e-03	exp(-F*psi/RT)

6.420e+04 specific area, m²/mol Ferrihydrite
6.885e-01 m² for 1.072e-05 moles of Ferrihydrite

Water in diffuse layer: 6.885e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451\text{e-}02$ (= c_DL / c_free if z is +1).

Element	Moles
C	1.7587e-11
Ca	2.1796e-13
Cl	3.5219e-10
H	5.1881e-11
K	3.4578e-13
Mg	3.3770e-14
N	1.4258e-09
Na	1.4650e-12
O	6.3549e-08
S	1.4808e-08

Hfo_s

5.362e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.584e-08	0.668	3.584e-08	-7.446
Hfo_sOH	1.758e-08	0.328	1.758e-08	-7.755
Hfo_sO-	1.975e-10	0.004	1.975e-10	-9.704
Hfo_sOHCa+2	6.543e-13	0.000	6.543e-13	-12.184

Hfo_w

2.145e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	9.910e-07	0.462	9.910e-07	-6.004
Hfo_wOH	4.860e-07	0.227	4.860e-07	-6.313
Hfo_wSO4-	3.347e-07	0.156	3.347e-07	-6.475
Hfo_wOHSO4-2	3.275e-07	0.153	3.275e-07	-6.485
Hfo_wO-	5.461e-09	0.003	5.461e-09	-8.263
Hfo_wOMg+	7.718e-15	0.000	7.718e-15	-14.112
Hfo_wOCa+	2.618e-15	0.000	2.618e-15	-14.582

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.

WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 607. Solution after simulation 106.
Using surface 602.
Using pure phase assemblage 602. Pure-phase assemblage after simulation 106.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	7.235e-05	7.235e-05	6.105e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	5.040e-08	4.094e-08	-9.456e-09
Barite	0.00	-9.98	-9.98	3.000e-05	3.003e-05	2.837e-08
Brochantite	-0.00	15.22	15.22	1.343e-04	1.342e-04	-1.505e-07
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.012e+01	1.012e+01	9.805e-07
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.18	-1.36	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	4.572e-02	4.572e-02	-1.727e-06
Carnotite	0.00	0.23	0.23	2.083e-06	1.824e-06	-2.584e-07
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	2.418e-07	2.418e-07	-1.675e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-1.22	-3.58	-2.36	0.000e+00	0	0.000e+00
Cu2Se (alpha)	-4.17	-49.97	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.072e-05	1.072e-05	-2.208e-14
Fluorite	0.00	-10.50	-10.50	3.687e-03	3.687e-03	1.246e-09
Gummite	-4.90	2.77	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	9.155e-03	9.156e-03	1.505e-06
HgSe	-1.25	-56.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.35	-3.22	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.00	-15.87	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.47	-15.61	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	7.558e-10
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	7.519e-07	7.482e-07	-3.771e-09
Rutherfordine	-4.37	-18.87	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.22	2.77	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2 (am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-10.66	10.42	21.08	0.000e+00	0	0.000e+00
UO2(OH)2 (beta)	-2.84	2.77	5.61	0.000e+00	0	0.000e+00
UO3	-4.93	2.77	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

9.062e-21 Surface + diffuse layer charge, eq
1.778e-07 Surface charge, eq
2.492e-02 sigma, C/m²
2.951e-02 psi, V
-1.148e+00 -F*psi/RT
3.171e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.885e-01 m² for 1.072e-05 moles of Ferrihydrite

Water in diffuse layer: 6.885e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, $\psi_{DL} = 2.641e-03$ V.

Boltzmann factor, $\exp(-\psi_{DL} * F / RT) = 9.023e-01$ (= c_{DL} / c_{free} if z is +1).

Element	Moles
Al	4.2338e-11
As	1.3265e-14
B	6.9343e-10
Ba	1.5257e-13
C	4.3193e-09
Ca	7.4880e-08
Cd	1.5060e-13
Cl	6.4371e-08
Co	1.7769e-14
Cr	2.4394e-15
Cu	3.2748e-12
F	1.6210e-09
Fe	7.2006e-15
H	6.4792e-09
Hg	6.6199e-14
K	9.4591e-08
Mg	1.1289e-07
Mn	1.3230e-09
Mo	6.4234e-11
N	1.7127e-10
Na	1.6981e-07
Ni	2.9724e-15
O	1.5158e-06
Pb	1.1177e-14
S	3.7497e-07
Sb	6.8826e-13
Se	6.1244e-12
U	9.3651e-12
V	2.7350e-13
Zn	1.7007e-10

Hfo_s

5.362e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.613e-08	0.487	2.603e-08	-7.585
Hfo_sOCu+	1.471e-08	0.274	1.466e-08	-7.834
Hfo_sOMn+	8.603e-09	0.160	8.571e-09	-8.067
Hfo_sOPb+	2.799e-09	0.052	2.788e-09	-8.555
Hfo_sOCrOH+	7.596e-10	0.014	7.567e-10	-9.121
Hfo_sOHCa+2	5.724e-10	0.011	5.703e-10	-9.244
Hfo_sOH	2.716e-11	0.001	2.706e-11	-10.568
Hfo_sO-	8.145e-12	0.000	8.114e-12	-11.091
Hfo_sOCd+	5.461e-12	0.000	5.440e-12	-11.264
Hfo_sOH2+	2.074e-12	0.000	2.067e-12	-11.685
Hfo_sONi+	1.510e-13	0.000	1.504e-13	-12.823
Hfo_sOCu+	9.546e-14	0.000	9.511e-14	-13.022
Hfo_sOHCa+2	7.517e-15	0.000	7.489e-15	-14.126
Hfo_sOFe+	1.512e-15	0.000	1.507e-15	-14.822
Hfo_sOHg+	2.196e-16	0.000	2.188e-16	-15.660

Hfo_w

2.145e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	5.872e-07	0.274	5.850e-07	-6.233
Hfo_wOMg+	5.154e-07	0.240	5.135e-07	-6.289

Hfo_wOHVO4-3	2.719e-07	0.127	2.709e-07	-6.567
Hfo_wOZn+	2.129e-07	0.099	2.121e-07	-6.673
Hfo_wOH	2.113e-07	0.099	2.105e-07	-6.677
Hfo_wOHSO4-2	1.422e-07	0.066	1.416e-07	-6.849
Hfo_wO-	6.338e-08	0.030	6.314e-08	-7.200
Hfo_wOMn+	5.318e-08	0.025	5.298e-08	-7.276
Hfo_wOHSeO3-2	2.389e-08	0.011	2.380e-08	-7.623
Hfo_wOHAsO4-3	1.891e-08	0.009	1.884e-08	-7.725
Hfo_wOCa+	1.721e-08	0.008	1.715e-08	-7.766
Hfo_wOH2+	1.614e-08	0.008	1.608e-08	-7.794
Hfo_wSO4-	5.453e-09	0.003	5.433e-09	-8.265
Hfo_wSeO3-	3.105e-09	0.001	3.094e-09	-8.510
Hfo_wOHMoO4-2	1.409e-09	0.001	1.404e-09	-8.853
Hfo_wOPb+	9.728e-10	0.000	9.692e-10	-9.014
Hfo_wH2BO3	8.383e-11	0.000	8.351e-11	-10.078
Hfo_wMoO4-	6.962e-11	0.000	6.936e-11	-10.159
Hfo_wOCd+	1.813e-11	0.000	1.806e-11	-10.743
Hfo_wHAsO4-	2.475e-12	0.000	2.466e-12	-11.608
Hfo_wOCa+	2.094e-12	0.000	2.086e-12	-11.681
Hfo_wONi+	1.585e-12	0.000	1.579e-12	-11.802
Hfo_wOHg+	8.370e-14	0.000	8.339e-14	-13.079
Hfo_wOFe+	7.425e-15	0.000	7.398e-15	-14.131
Hfo_wH2AsO4	6.117e-15	0.000	6.094e-15	-14.215
Hfo_wOHSeO4-2	4.415e-15	0.000	4.399e-15	-14.357
Hfo_wOBa+	3.267e-15	0.000	3.255e-15	-14.487
Hfo_wOHSbO(OH) 4-	9.253e-16	0.000	9.218e-16	-15.035
Hfo_wSeO4-	1.475e-16	0.000	1.470e-16	-15.833
Hfo_wSbO(OH) 4	4.572e-17	0.000	4.555e-17	-16.342
Hfo_wOHCrO4-2	1.544e-17	0.000	1.538e-17	-16.813
Hfo_wCrO4-	5.401e-19	0.000	5.381e-19	-18.269
Hfo_wH2AsO3	8.707e-25	0.000	8.674e-25	-24.062

-----Solution composition-----

Elements	Molality	Moles
Al	5.554e-06	5.574e-06
As	1.573e-09	1.579e-09
B	1.002e-04	1.006e-04
Ba	2.721e-08	2.731e-08
C	5.748e-04	5.770e-04
Ca	1.207e-02	1.211e-02
Cd	2.233e-08	2.241e-08
Cl	8.437e-03	8.468e-03
Co	2.966e-09	2.977e-09
Cr	3.850e-10	3.865e-10
Cu	4.981e-07	5.000e-07
F	2.256e-04	2.265e-04
Fe	1.103e-09	1.108e-09
Hg	9.615e-09	9.651e-09
K	1.498e-02	1.504e-02
Mg	1.841e-02	1.847e-02
Mn	2.221e-04	2.230e-04
Mo	7.596e-06	7.625e-06
N	2.250e-05	2.258e-05
Na	2.700e-02	2.710e-02
Ni	4.816e-10	4.834e-10
Pb	1.665e-09	1.672e-09
S	4.706e-02	4.724e-02
Sb	9.021e-08	9.054e-08
Se	7.594e-07	7.623e-07
U	9.170e-07	9.204e-07
V	3.432e-08	3.445e-08
Zn	2.575e-05	2.585e-05

-----Description of solution-----

pH = 7.908 Charge balance

```

equilibrium
pe = 4.865 Adjusted to redox
Activity of water = 0.998
Ionic strength (mol/kgw) = 1.227e-01
Mass of water (kg) = 1.004e+00
Total alkalinity (eq/kg) = 6.160e-04
Total CO2 (mol/kg) = 5.748e-04
Temperature (°C) = 25.00
Pressure (atm) = 1.00
Electrical balance (eq) = 2.673e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 1
Total H = 1.114307e+02
Total O = 5.590599e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.091e-06	8.136e-07	-5.962	-6.090	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.554e-06					
Al(OH)4-	5.509e-06	4.201e-06	-5.259	-5.377	-0.118	(0)
Al(OH)3	4.101e-08	4.101e-08	-7.387	-7.387	0.000	(0)
Al(OH)2+	3.256e-09	2.527e-09	-8.487	-8.597	-0.110	(0)
AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
AlOH+2	1.079e-11	3.910e-12	-10.967	-11.408	-0.441	(0)
AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
Al(SO4)2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.055e-14	4.806e-15	-13.296	-14.318	-1.022	(0)
AlMo6O21-3	2.477e-39	0.000e+00	-38.606	-40.214	-1.608	(0)
As(3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.002e-24	6.642e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.542e-28	4.903e-29	-27.595	-28.310	-0.715	(0)
H4AsO3+	1.477e-31	9.791e-32	-30.830	-31.009	-0.179	(0)
AsO3-3	6.207e-33	1.530e-34	-32.207	-33.815	-1.608	(0)
As(5)	1.573e-09					
HAsO4-2	1.520e-09	2.932e-10	-8.818	-9.533	-0.715	(0)
H2AsO4-	4.985e-11	3.304e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.045e-12	7.506e-14	-11.516	-13.125	-1.608	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.002e-04					
H3BO3	9.232e-05	9.497e-05	-4.035	-4.022	0.012	(0)
H2BO3-	6.146e-06	4.465e-06	-5.211	-5.350	-0.139	(0)
MgH2BO3+	8.059e-07	5.855e-07	-6.094	-6.232	-0.139	(0)
CaH2BO3+	7.942e-07	5.770e-07	-6.100	-6.239	-0.139	(0)
NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
BF(OH)3-	6.189e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
H5(BO3)2-	4.967e-10	3.609e-10	-9.304	-9.443	-0.139	(0)
H8(BO3)3-	4.717e-12	3.427e-12	-11.326	-11.465	-0.139	(0)
BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
BF2(OH)2-	9.718e-13	7.060e-13	-12.012	-12.151	-0.139	(0)
BF3OH-	5.552e-19	4.034e-19	-18.256	-18.394	-0.139	(0)
BF4-	4.012e-24	2.915e-24	-23.397	-23.535	-0.139	(0)
Ba	2.721e-08					
Ba+2	2.716e-08	9.544e-09	-7.566	-8.020	-0.454	(0)
BaHCO3+	4.517e-11	3.541e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
BaOH+	4.401e-14	3.389e-14	-13.356	-13.470	-0.113	(0)
BaNO3+	1.113e-15	7.373e-16	-14.954	-15.132	-0.179	(0)
BaNH3+2	2.676e-16	5.161e-17	-15.573	-16.287	-0.715	(0)

C (4)	5.748e-04					
HCO3-	5.007e-04	3.885e-04	-3.300	-3.411	-0.110	(0)
CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)
MgHCO3+	1.993e-05	1.503e-05	-4.701	-4.823	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.638e-06	4.638e-06	-5.334	-5.334	0.000	(0)
NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
CO3-2	4.196e-06	1.474e-06	-5.377	-5.831	-0.454	(0)
UO2 (CO3) 3-4	8.353e-07	1.156e-09	-6.078	-8.937	-2.859	(0)
NaCO3-	6.946e-07	5.390e-07	-6.158	-6.268	-0.110	(0)
ZnCO3	3.254e-07	3.254e-07	-6.488	-6.488	0.000	(0)
MnHCO3+	3.120e-07	2.403e-07	-6.506	-6.619	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
UO2 (CO3) 2-2	8.110e-08	1.564e-08	-7.091	-7.806	-0.715	(0)
ZnHCO3+	7.110e-08	4.712e-08	-7.148	-7.327	-0.179	(0)
Cu (CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
UO2CO3	5.317e-10	5.317e-10	-9.274	-9.274	0.000	(0)
PbCO3	3.983e-10	3.983e-10	-9.400	-9.400	0.000	(0)
CdCO3	8.919e-11	8.919e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.517e-11	3.541e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.915e-11	2.594e-11	-10.407	-10.586	-0.179	(0)
CoHCO3+	1.801e-11	1.193e-11	-10.745	-10.923	-0.179	(0)
CoCO3	9.843e-12	9.843e-12	-11.007	-11.007	0.000	(0)
Pb (CO3) 2-2	8.782e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
NiHCO3+	6.678e-12	4.426e-12	-11.175	-11.354	-0.179	(0)
NiCO3	5.083e-12	5.083e-12	-11.294	-11.294	0.000	(0)
CdHCO3+	3.542e-12	2.348e-12	-11.451	-11.629	-0.179	(0)
Cd (CO3) 2-2	5.054e-13	9.749e-14	-12.296	-13.011	-0.715	(0)
HgCO3	9.748e-15	9.748e-15	-14.011	-14.011	0.000	(0)
FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
Hg (CO3) 2-2	2.357e-16	4.545e-17	-15.628	-16.342	-0.715	(0)
HgHCO3+	3.384e-18	2.242e-18	-17.471	-17.649	-0.179	(0)
Ca	1.207e-02					
Ca+2	6.391e-03	2.246e-03	-2.194	-2.649	-0.454	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
CaH2BO3+	7.942e-07	5.770e-07	-6.100	-6.239	-0.139	(0)
CaOH+	4.650e-08	3.646e-08	-7.333	-7.438	-0.106	(0)
CaNO3+	1.652e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
CaNH3+2	1.257e-10	2.423e-11	-9.901	-10.616	-0.715	(0)
Ca (NH3) 2+2	4.288e-19	8.270e-20	-18.368	-19.083	-0.715	(0)
Cd	2.233e-08					
Cd+2	7.553e-09	2.654e-09	-8.122	-8.576	-0.454	(0)
CdSO4	6.827e-09	6.827e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.239e-09	1.010e-09	-8.281	-8.996	-0.715	(0)
CdCl+	2.484e-09	1.646e-09	-8.605	-8.783	-0.179	(0)
CdCO3	8.919e-11	8.919e-11	-10.050	-10.050	0.000	(0)
CdOHC1	5.494e-11	5.494e-11	-10.260	-10.260	0.000	(0)
CdCl2	4.458e-11	4.458e-11	-10.351	-10.351	0.000	(0)
CdOH+	2.588e-11	1.715e-11	-10.587	-10.766	-0.179	(0)
CdF+	7.532e-12	4.991e-12	-11.123	-11.302	-0.179	(0)
CdHCO3+	3.542e-12	2.348e-12	-11.451	-11.629	-0.179	(0)
Cd (CO3) 2-2	5.054e-13	9.749e-14	-12.296	-13.011	-0.715	(0)
CdCl3-	2.757e-13	1.827e-13	-12.560	-12.738	-0.179	(0)
Cd (OH) 2	8.804e-14	8.804e-14	-13.055	-13.055	0.000	(0)
CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
CdNO3+	1.952e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
CdSeO4	1.646e-16	1.646e-16	-15.784	-15.784	0.000	(0)
Cd (SeO3) 2-2	6.701e-17	1.292e-17	-16.174	-16.889	-0.715	(0)
Cd2OH+3	9.255e-18	2.282e-19	-17.034	-18.642	-1.608	(0)
Cd (OH) 3-	6.603e-18	4.376e-18	-17.180	-17.359	-0.179	(0)
Cd (OH) 4-2	3.021e-24	5.827e-25	-23.520	-24.235	-0.715	(0)
Cd (NO3) 2	9.994e-25	9.994e-25	-24.000	-24.000	0.000	(0)

	CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.624	-0.179	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
C1	8.437e-03						
	Cl-	8.436e-03	6.495e-03	-2.074	-2.187	-0.114	(0)
	MnCl+	3.291e-07	2.535e-07	-6.483	-6.596	-0.113	(0)
	ZnCl+	8.294e-08	6.257e-08	-7.081	-7.204	-0.122	(0)
	ZnOHCl	6.665e-08	6.665e-08	-7.176	-7.176	0.000	(0)
	CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
	CdCl+	2.484e-09	1.646e-09	-8.605	-8.783	-0.179	(0)
	MnCl2	2.326e-09	2.326e-09	-8.633	-8.633	0.000	(0)
	CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
	ZnCl2	6.442e-10	6.442e-10	-9.191	-9.191	0.000	(0)
	CuCl+	3.710e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
	CdOHCl	5.494e-11	5.494e-11	-10.260	-10.260	0.000	(0)
	HgClOH	5.156e-11	5.156e-11	-10.288	-10.288	0.000	(0)
	CdCl2	4.458e-11	4.458e-11	-10.351	-10.351	0.000	(0)
	PbCl+	3.125e-11	2.071e-11	-10.505	-10.684	-0.179	(0)
	HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
	CoCl+	1.339e-11	8.874e-12	-10.873	-11.052	-0.179	(0)
	CuCl3-2	7.967e-12	2.803e-12	-11.099	-11.552	-0.454	(0)
	MnCl3-	5.402e-12	4.161e-12	-11.267	-11.381	-0.113	(0)
	ZnCl3-	4.405e-12	3.324e-12	-11.356	-11.478	-0.122	(0)
	NiCl+	2.317e-12	1.536e-12	-11.635	-11.814	-0.179	(0)
	HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
	CuCl2	6.303e-13	6.303e-13	-12.200	-12.200	0.000	(0)
	PbCl2	6.010e-13	6.010e-13	-12.221	-12.221	0.000	(0)
	CdCl3-	2.757e-13	1.827e-13	-12.560	-12.738	-0.179	(0)
	HgCl4-2	2.030e-13	3.915e-14	-12.693	-13.407	-0.715	(0)
	ZnCl4-2	3.068e-14	1.079e-14	-13.513	-13.967	-0.454	(0)
	PbCl3-	2.345e-15	1.554e-15	-14.630	-14.809	-0.179	(0)
	UO2Cl+	1.440e-15	9.543e-16	-14.842	-15.020	-0.179	(0)
	HgCl+	1.080e-15	7.160e-16	-14.966	-15.145	-0.179	(0)
	CuCl3-	5.064e-17	3.821e-17	-16.295	-16.418	-0.122	(0)
	NiCl2	5.022e-17	5.022e-17	-16.299	-16.299	0.000	(0)
	PbCl4-2	2.392e-17	4.614e-18	-16.621	-17.336	-0.715	(0)
	CrCl+2	4.945e-18	9.538e-19	-17.306	-18.021	-0.715	(0)
	CrOHCl2	9.580e-20	9.580e-20	-19.019	-19.019	0.000	(0)
	CuCl4-2	3.536e-21	1.244e-21	-20.452	-20.905	-0.454	(0)
	FeCl+2	1.641e-21	5.774e-22	-20.785	-21.239	-0.454	(0)
	CrCl2+	8.871e-22	5.879e-22	-21.052	-21.231	-0.179	(0)
	VOC1+	1.880e-22	1.246e-22	-21.726	-21.905	-0.179	(0)
	FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
	CrO3Cl-	2.821e-26	1.869e-26	-25.550	-25.728	-0.179	(0)
	FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
	CoCl+2	7.887e-37	1.521e-37	-36.103	-36.818	-0.715	(0)
	UCl+3	0.000e+00	0.000e+00	-44.066	-45.675	-1.608	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.485	-51.200	-0.715	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.718	-52.432	-0.715	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.267	-65.982	-0.715	(0)
Co (2)	2.966e-09						
	Co+2	2.048e-09	3.949e-10	-8.689	-9.403	-0.715	(0)
	CoSO4	8.645e-10	8.645e-10	-9.063	-9.063	0.000	(0)
	CoHCO3+	1.801e-11	1.193e-11	-10.745	-10.923	-0.179	(0)
	CoCl+	1.339e-11	8.874e-12	-10.873	-11.052	-0.179	(0)
	CoCO3	9.843e-12	9.843e-12	-11.007	-11.007	0.000	(0)
	CoOH+	9.673e-12	6.411e-12	-11.014	-11.193	-0.179	(0)
	CoF+	2.236e-12	1.482e-12	-11.651	-11.829	-0.179	(0)
	Co (OH) 2	4.143e-13	4.143e-13	-12.383	-12.383	0.000	(0)
	CoNO2+	6.861e-14	4.547e-14	-13.164	-13.342	-0.179	(0)
	Co (NH3) +2	2.110e-15	4.070e-16	-14.676	-15.390	-0.715	(0)
	CoSeO4	6.591e-17	6.591e-17	-16.181	-16.181	0.000	(0)
	CoNO3+	1.456e-17	9.647e-18	-16.837	-17.016	-0.179	(0)
	Co (OH) 3-	1.015e-17	6.725e-18	-16.994	-17.172	-0.179	(0)
	CoOOH-	2.551e-18	1.690e-18	-17.593	-17.772	-0.179	(0)
	Co2OH+3	5.147e-21	1.269e-22	-20.288	-21.897	-1.608	(0)
	Co (NH3) 2+2	7.715e-22	1.488e-22	-21.113	-21.827	-0.715	(0)

Co (OH) 4-2	4.496e-24	8.671e-25	-23.347	-24.062	-0.715	(0)
Co (NO3) 2	3.026e-25	3.026e-25	-24.519	-24.519	0.000	(0)
Co (NH3) 3+2	8.325e-29	1.606e-29	-28.080	-28.794	-0.715	(0)
Co4 (OH) 4+4	2.435e-34	3.370e-37	-33.613	-36.472	-2.859	(0)
Co (NH3) 4+2	3.745e-36	7.222e-37	-35.427	-36.141	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.274	-43.988	-0.715	(0)
Co (3)	2.467e-30					
CoOH+2	2.467e-30	4.758e-31	-29.608	-30.323	-0.715	(0)
Co+3	1.210e-36	1.151e-37	-35.917	-36.939	-1.022	(0)
CoCl+2	7.887e-37	1.521e-37	-36.103	-36.818	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.485	-51.200	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.267	-65.982	-0.715	(0)
Cr (2)	1.920e-27					
Cr+2	1.920e-27	3.703e-28	-26.717	-27.431	-0.715	(0)
Cr (3)	3.850e-10					
Cr (OH) 2+	3.017e-10	1.999e-10	-9.520	-9.699	-0.179	(0)
Cr (OH) 3	6.110e-11	6.110e-11	-10.214	-10.214	0.000	(0)
Cr (OH) +2	1.047e-11	2.019e-12	-10.980	-11.695	-0.715	(0)
CrOHSO4	5.258e-12	5.258e-12	-11.279	-11.279	0.000	(0)
CrO2-	3.551e-12	2.353e-12	-11.450	-11.628	-0.179	(0)
Cr (OH) 4-	2.986e-12	1.979e-12	-11.525	-11.704	-0.179	(0)
CrF+2	1.106e-14	2.134e-15	-13.956	-14.671	-0.715	(0)
Cr+3	4.603e-15	1.135e-16	-14.337	-15.945	-1.608	(0)
CrSO4+	4.387e-15	2.907e-15	-14.358	-14.537	-0.179	(0)
CrCl+2	4.945e-18	9.538e-19	-17.306	-18.021	-0.715	(0)
CrOHC12	9.580e-20	9.580e-20	-19.019	-19.019	0.000	(0)
Cr2 (OH) 2SO4+2	4.976e-21	9.598e-22	-20.303	-21.018	-0.715	(0)
CrCl2+	8.871e-22	5.879e-22	-21.052	-21.231	-0.179	(0)
Cr2 (OH) 2 (SO4) 2	6.255e-22	6.255e-22	-21.204	-21.204	0.000	(0)
CrNO3+2	3.964e-25	7.645e-26	-24.402	-25.117	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.283	-41.997	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.739	-51.347	-1.608	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.718	-52.432	-0.715	(0)
Cr (6)	2.880e-15					
CrO4-2	2.632e-15	9.250e-16	-14.580	-15.034	-0.454	(0)
NaCrO4-	1.362e-16	9.024e-17	-15.866	-16.045	-0.179	(0)
HCrO4-	5.579e-17	3.697e-17	-16.253	-16.432	-0.179	(0)
KCrO4-	5.554e-17	3.681e-17	-16.255	-16.434	-0.179	(0)
CrO3SO4-2	7.929e-24	1.529e-24	-23.101	-23.816	-0.715	(0)
H2CrO4	3.702e-25	3.702e-25	-24.432	-24.432	0.000	(0)
CrO3Cl-	2.821e-26	1.869e-26	-25.550	-25.728	-0.179	(0)
Cr2O7-2	2.463e-31	4.749e-32	-30.609	-31.323	-0.715	(0)
Cu (1)	4.445e-09					
CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
Cu+	2.745e-10	1.819e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	7.967e-12	2.803e-12	-11.099	-11.552	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu (2)	4.937e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.270e-08	6.994e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.736e-08	2.719e-08	-7.111	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.371e-10	1.229e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.710e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
CuNO2+	7.018e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
Cu (OH) 3-	2.859e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
CuNH3+2	1.236e-11	2.384e-12	-10.908	-11.623	-0.715	(0)
CuCl2	6.303e-13	6.303e-13	-12.200	-12.200	0.000	(0)
Cu (NO2) 2	7.776e-15	7.776e-15	-14.109	-14.109	0.000	(0)
CuNO3+	2.000e-15	1.325e-15	-14.699	-14.878	-0.179	(0)

	Cu (OH) 4-2	6.290e-16	1.213e-16	-15.201	-15.916	-0.715	(0)
	CuCl3-	5.064e-17	3.821e-17	-16.295	-16.418	-0.122	(0)
	CuCl4-2	3.536e-21	1.244e-21	-20.452	-20.905	-0.454	(0)
	Cu (NO3) 2	2.571e-24	2.571e-24	-23.590	-23.590	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.256e-04						
	F-	1.541e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
	MgF+	6.603e-05	5.035e-05	-4.180	-4.298	-0.118	(0)
	CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
	NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
	MnF+	1.901e-07	1.464e-07	-6.721	-6.834	-0.113	(0)
	ZnF+	1.370e-08	9.080e-09	-7.863	-8.042	-0.179	(0)
	BF (OH) 3-	6.189e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
	HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
	AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
	AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
	CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
	AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
	CdF+	7.532e-12	4.991e-12	-11.123	-11.302	-0.179	(0)
	UO2F+	2.239e-12	1.484e-12	-11.650	-11.829	-0.179	(0)
	CoF+	2.236e-12	1.482e-12	-11.651	-11.829	-0.179	(0)
	HF2-	1.311e-12	9.781e-13	-11.882	-12.010	-0.127	(0)
	PbF+	1.134e-12	7.515e-13	-11.945	-12.124	-0.179	(0)
	BF2 (OH) 2-	9.718e-13	7.060e-13	-12.012	-12.151	-0.139	(0)
	UO2F2	5.078e-13	5.078e-13	-12.294	-12.294	0.000	(0)
	NiF+	4.156e-13	2.754e-13	-12.381	-12.560	-0.179	(0)
	UO2F3-	2.284e-14	1.514e-14	-13.641	-13.820	-0.179	(0)
	CrF+2	1.106e-14	2.134e-15	-13.956	-14.671	-0.715	(0)
	PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
	CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
	UO2F4-2	7.397e-17	1.427e-17	-16.131	-16.846	-0.715	(0)
	H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
	VO2F	8.516e-18	8.516e-18	-17.070	-17.070	0.000	(0)
	FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
	FeF+2	1.088e-18	3.830e-19	-17.963	-18.417	-0.454	(0)
	PbF3-	5.960e-19	3.949e-19	-18.225	-18.403	-0.179	(0)
	BF3OH-	5.552e-19	4.034e-19	-18.256	-18.394	-0.139	(0)
	VO2F2-	5.536e-19	3.669e-19	-18.257	-18.435	-0.179	(0)
	FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
	VOF+	7.341e-21	4.865e-21	-20.134	-20.313	-0.179	(0)
	VO2F3-2	2.816e-21	5.430e-22	-20.550	-21.265	-0.715	(0)
	VOF2	2.165e-22	2.165e-22	-21.665	-21.665	0.000	(0)
	PbF4-2	1.163e-22	2.243e-23	-21.934	-22.649	-0.715	(0)
	HgF+	3.667e-23	2.430e-23	-22.436	-22.614	-0.179	(0)
	BF4-	4.012e-24	2.915e-24	-23.397	-23.535	-0.139	(0)
	VOF3-	1.375e-24	9.113e-25	-23.862	-24.040	-0.179	(0)
	VO2F4-3	1.286e-24	3.170e-26	-23.891	-25.499	-1.608	(0)
	Sb (OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
	SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
	VOF4-2	2.263e-27	4.365e-28	-26.645	-27.360	-0.715	(0)
	UF3+	6.522e-36	4.322e-36	-35.186	-35.364	-0.179	(0)
	UF2+2	1.192e-36	2.298e-37	-35.924	-36.639	-0.715	(0)
	UF4	5.623e-38	5.623e-38	-37.250	-37.250	0.000	(0)
	UF+3	6.241e-39	1.538e-40	-38.205	-39.813	-1.608	(0)
	UF5-	3.990e-40	2.644e-40	-39.399	-39.578	-0.179	(0)
	UF6-2	0.000e+00	0.000e+00	-40.309	-41.023	-0.715	(0)
Fe (2)	3.431e-12						
	Fe+2	2.244e-12	4.328e-13	-11.649	-12.364	-0.715	(0)
	FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
	FeOH+	1.820e-14	1.402e-14	-13.740	-13.853	-0.113	(0)
	FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
	Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	3.026e-18	2.331e-18	-17.519	-17.633	-0.113	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09						
	Fe (OH) 2+	6.307e-10	4.893e-10	-9.200	-9.310	-0.110	(0)

	Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
	Fe (OH) 4-	4.174e-11	3.239e-11	-10.379	-10.490	-0.110	(0)
	FeOH+2	4.394e-15	1.546e-15	-14.357	-14.811	-0.454	(0)
	FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
	FeF+2	1.088e-18	3.830e-19	-17.963	-18.417	-0.454	(0)
	FeSO4+	4.705e-19	3.623e-19	-18.327	-18.441	-0.113	(0)
	FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
	Fe (SO4) 2-	1.283e-19	8.500e-20	-18.892	-19.071	-0.179	(0)
	Fe+3	3.096e-20	2.943e-21	-19.509	-20.531	-1.022	(0)
	FeCl+2	1.641e-21	5.774e-22	-20.785	-21.239	-0.454	(0)
	FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
	FeHSeO3+2	9.619e-24	1.855e-24	-23.017	-23.732	-0.715	(0)
	Fe2 (OH) 2+4	5.720e-26	7.915e-29	-25.243	-28.102	-2.859	(0)
	FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
	FeNO3+2	2.352e-27	4.537e-28	-26.629	-27.343	-0.715	(0)
	Fe3 (OH) 4+5	1.641e-32	5.599e-37	-31.785	-36.252	-4.467	(0)
H (0)	3.919e-29						
	H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.516e-09						
	Hg	9.516e-09	9.516e-09	-8.022	-8.022	0.000	(0)
Hg (1)	3.701e-19						
	Hg2+2	1.851e-19	3.569e-20	-18.733	-19.447	-0.715	(0)
Hg (2)	9.980e-11						
	HgClOH	5.156e-11	5.156e-11	-10.288	-10.288	0.000	(0)
	HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
	Hg (OH) 2	2.243e-11	2.307e-11	-10.649	-10.637	0.012	(0)
	HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
	HgCl4-2	2.030e-13	3.915e-14	-12.693	-13.407	-0.715	(0)
	HgCO3	9.748e-15	9.748e-15	-14.011	-14.011	0.000	(0)
	HgCl+	1.080e-15	7.160e-16	-14.966	-15.145	-0.179	(0)
	HgOH+	2.700e-16	1.789e-16	-15.569	-15.747	-0.179	(0)
	Hg (CO3) 2-2	2.357e-16	4.545e-17	-15.628	-16.342	-0.715	(0)
	Hg (OH) 3-	3.566e-18	2.363e-18	-17.448	-17.627	-0.179	(0)
	HgHCO3+	3.384e-18	2.242e-18	-17.471	-17.649	-0.179	(0)
	Hg (NH3) 2+2	1.328e-18	2.561e-19	-17.877	-18.592	-0.715	(0)
	HgNH3+2	1.549e-19	2.988e-20	-18.810	-19.525	-0.715	(0)
	Hg+2	2.865e-20	5.525e-21	-19.543	-20.258	-0.715	(0)
	HgSO4	1.587e-20	1.587e-20	-19.799	-19.799	0.000	(0)
	HgF+	3.667e-23	2.430e-23	-22.436	-22.614	-0.179	(0)
	Hg (NH3) 3+2	4.531e-26	8.739e-27	-25.344	-26.059	-0.715	(0)
	HgNO3+	4.745e-29	3.144e-29	-28.324	-28.502	-0.179	(0)
	Hg (NH3) 4+2	3.085e-33	5.950e-34	-32.511	-33.225	-0.715	(0)
	Hg (NO3) 2	2.014e-37	2.014e-37	-36.696	-36.696	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K	1.498e-02						
	K+	1.391e-02	1.071e-02	-1.857	-1.970	-0.114	(0)
	KSO4-	1.072e-03	8.319e-04	-2.970	-3.080	-0.110	(0)
	KCrO4-	5.554e-17	3.681e-17	-16.255	-16.434	-0.179	(0)
Mg	1.841e-02						
	Mg+2	1.076e-02	3.782e-03	-1.968	-2.422	-0.454	(0)
	MgSO4	7.551e-03	7.551e-03	-2.122	-2.122	0.000	(0)
	MgF+	6.603e-05	5.035e-05	-4.180	-4.298	-0.118	(0)
	MgHCO3+	1.993e-05	1.503e-05	-4.701	-4.823	-0.122	(0)
	MgCO3	4.638e-06	4.638e-06	-5.334	-5.334	0.000	(0)
	MgOH+	1.550e-06	1.225e-06	-5.810	-5.912	-0.102	(0)
	MgH2BO3+	8.059e-07	5.855e-07	-6.094	-6.232	-0.139	(0)
Mn (2)	2.221e-04						
	Mn+2	1.607e-04	3.100e-05	-3.794	-4.509	-0.715	(0)
	MnSO4	6.048e-05	6.048e-05	-4.218	-4.218	0.000	(0)
	MnCl+	3.291e-07	2.535e-07	-6.483	-6.596	-0.113	(0)
	MnHCO3+	3.120e-07	2.403e-07	-6.506	-6.619	-0.113	(0)
	MnF+	1.901e-07	1.464e-07	-6.721	-6.834	-0.113	(0)
	MnOH+	8.225e-08	6.335e-08	-7.085	-7.198	-0.113	(0)
	MnCl2	2.326e-09	2.326e-09	-8.633	-8.633	0.000	(0)
	MnCl3-	5.402e-12	4.161e-12	-11.267	-11.381	-0.113	(0)
	MnSeO4	2.778e-12	2.778e-12	-11.556	-11.556	0.000	(0)

MnNO3+	1.143e-12	7.573e-13	-11.942	-12.121	-0.179	(0)
Mn (OH) 3-	3.365e-16	2.591e-16	-15.473	-15.586	-0.113	(0)
Mn (NO3) 2	2.932e-20	2.932e-20	-19.533	-19.533	0.000	(0)
Mn (OH) 4-2	1.934e-21	6.806e-22	-20.713	-21.167	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
Mn (3)	1.066e-24					
Mn+3	1.066e-24	1.014e-25	-23.972	-24.994	-1.022	(0)
Mn (6)	1.752e-40					
MnO4-2	1.752e-40	0.000e+00	-39.756	-40.210	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.585	-44.717	-0.133	(0)
Mo	7.596e-06					
MoO4-2	7.595e-06	2.669e-06	-5.119	-5.574	-0.454	(0)
HMoO4-	9.900e-10	6.561e-10	-9.004	-9.183	-0.179	(0)
H2MoO4	5.937e-14	5.937e-14	-13.226	-13.226	0.000	(0)
AlMo6O21-3	2.477e-39	0.000e+00	-38.606	-40.214	-1.608	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.855	-49.288	-6.433	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.342	-50.809	-4.467	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.076	-53.935	-2.859	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.989	-58.597	-1.608	(0)
N (-3)	2.927e-07					
NH4+	2.556e-07	1.857e-07	-6.592	-6.731	-0.139	(0)
NH4SO4-	2.835e-08	2.183e-08	-7.547	-7.661	-0.113	(0)
NH3	8.571e-09	8.571e-09	-8.067	-8.067	0.000	(0)
CaNH3+2	1.257e-10	2.423e-11	-9.901	-10.616	-0.715	(0)
CuNH3+2	1.236e-11	2.384e-12	-10.908	-11.623	-0.715	(0)
NiNH3+2	2.205e-15	4.253e-16	-14.657	-15.371	-0.715	(0)
Co (NH3) +2	2.110e-15	4.070e-16	-14.676	-15.390	-0.715	(0)
BaNH3+2	2.676e-16	5.161e-17	-15.573	-16.287	-0.715	(0)
Hg (NH3) 2+2	1.328e-18	2.561e-19	-17.877	-18.592	-0.715	(0)
Ca (NH3) 2+2	4.288e-19	8.270e-20	-18.368	-19.083	-0.715	(0)
HgNH3+2	1.549e-19	2.988e-20	-18.810	-19.525	-0.715	(0)
Ni (NH3) 2+2	2.732e-21	5.269e-22	-20.563	-21.278	-0.715	(0)
Co (NH3) 2+2	7.715e-22	1.488e-22	-21.113	-21.827	-0.715	(0)
Hg (NH3) 3+2	4.531e-26	8.739e-27	-25.344	-26.059	-0.715	(0)
Co (NH3) 3+2	8.325e-29	1.606e-29	-28.080	-28.794	-0.715	(0)
Hg (NH3) 4+2	3.085e-33	5.950e-34	-32.511	-33.225	-0.715	(0)
Co (NH3) 4+2	3.745e-36	7.222e-37	-35.427	-36.141	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.283	-41.997	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.274	-43.988	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.739	-51.347	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.485	-51.200	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.718	-52.432	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.267	-65.982	-0.715	(0)
N (3)	2.218e-05					
NO2-	2.218e-05	1.634e-05	-4.654	-4.787	-0.133	(0)
CuNO2+	7.018e-11	4.651e-11	-10.154	-10.332	-0.179	(0)
CoNO2+	6.861e-14	4.547e-14	-13.164	-13.342	-0.179	(0)
Cu (NO2) 2	7.776e-15	7.776e-15	-14.109	-14.109	0.000	(0)
N (5)	2.019e-08					
NO3-	2.002e-08	1.541e-08	-7.699	-7.812	-0.114	(0)
CaNO3+	1.652e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
MnNO3+	1.143e-12	7.573e-13	-11.942	-12.121	-0.179	(0)
ZnNO3+	2.241e-13	1.485e-13	-12.650	-12.828	-0.179	(0)
CuNO3+	2.000e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
BaNO3+	1.113e-15	7.373e-16	-14.954	-15.132	-0.179	(0)
CdNO3+	1.952e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
PbNO3+	3.092e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
CoNO3+	1.456e-17	9.647e-18	-16.837	-17.016	-0.179	(0)
NiNO3+	5.398e-18	3.578e-18	-17.268	-17.446	-0.179	(0)
Mn (NO3) 2	2.932e-20	2.932e-20	-19.533	-19.533	0.000	(0)
UO2NO3+	4.204e-21	2.786e-21	-20.376	-20.555	-0.179	(0)
Zn (NO3) 2	4.567e-22	4.567e-22	-21.340	-21.340	0.000	(0)
Cu (NO3) 2	2.571e-24	2.571e-24	-23.590	-23.590	0.000	(0)
Cd (NO3) 2	9.994e-25	9.994e-25	-24.000	-24.000	0.000	(0)
Pb (NO3) 2	5.363e-25	5.363e-25	-24.271	-24.271	0.000	(0)

	CrNO3+2	3.964e-25	7.645e-26	-24.402	-25.117	-0.715	(0)
	VO2NO3	3.190e-25	3.190e-25	-24.496	-24.496	0.000	(0)
	Co (NO3) 2	3.026e-25	3.026e-25	-24.519	-24.519	0.000	(0)
	FeNO3+2	2.352e-27	4.537e-28	-26.629	-27.343	-0.715	(0)
	HgNO3+	4.745e-29	3.144e-29	-28.324	-28.502	-0.179	(0)
	Hg (NO3) 2	2.014e-37	2.014e-37	-36.696	-36.696	0.000	(0)
Na	2.700e-02						
	Na+	2.550e-02	1.963e-02	-1.593	-1.707	-0.114	(0)
	NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
	NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
	NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
	NaCO3-	6.946e-07	5.390e-07	-6.158	-6.268	-0.110	(0)
	NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
	NaCrO4-	1.362e-16	9.024e-17	-15.866	-16.045	-0.179	(0)
Ni	4.816e-10						
	Ni+2	2.629e-10	9.240e-11	-9.580	-10.034	-0.454	(0)
	NiSO4	2.023e-10	2.023e-10	-9.694	-9.694	0.000	(0)
	NiHCO3+	6.678e-12	4.426e-12	-11.175	-11.354	-0.179	(0)
	NiCO3	5.083e-12	5.083e-12	-11.294	-11.294	0.000	(0)
	NiCl+	2.317e-12	1.536e-12	-11.635	-11.814	-0.179	(0)
	NiOH+	1.428e-12	9.464e-13	-11.845	-12.024	-0.179	(0)
	NiF+	4.156e-13	2.754e-13	-12.381	-12.560	-0.179	(0)
	Ni (SO4) 2-2	3.810e-13	7.349e-14	-12.419	-13.134	-0.715	(0)
	Ni (OH) 2	6.116e-14	6.116e-14	-13.214	-13.214	0.000	(0)
	NiNH3+2	2.205e-15	4.253e-16	-14.657	-15.371	-0.715	(0)
	Ni (OH) 3-	7.508e-17	4.975e-17	-16.124	-16.303	-0.179	(0)
	NiCl2	5.022e-17	5.022e-17	-16.299	-16.299	0.000	(0)
	NiSeO4	1.439e-17	1.439e-17	-16.842	-16.842	0.000	(0)
	NiNO3+	5.398e-18	3.578e-18	-17.268	-17.446	-0.179	(0)
	Ni (NH3) 2+2	2.732e-21	5.269e-22	-20.563	-21.278	-0.715	(0)
O (0)	2.416e-35						
	O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.665e-09						
	PbSO4	4.830e-10	4.830e-10	-9.316	-9.316	0.000	(0)
	PbCO3	3.983e-10	3.983e-10	-9.400	-9.400	0.000	(0)
	PbOH+	2.771e-10	1.837e-10	-9.557	-9.736	-0.179	(0)
	Pb+2	2.557e-10	8.987e-11	-9.592	-10.046	-0.454	(0)
	Pb (SO4) 2-2	1.655e-10	3.193e-11	-9.781	-10.496	-0.715	(0)
	PbHCO3+	3.915e-11	2.594e-11	-10.407	-10.586	-0.179	(0)
	PbCl+	3.125e-11	2.071e-11	-10.505	-10.684	-0.179	(0)
	Pb (CO3) 2-2	8.782e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
	Pb (OH) 2	4.725e-12	4.725e-12	-11.326	-11.326	0.000	(0)
	PbF+	1.134e-12	7.515e-13	-11.945	-12.124	-0.179	(0)
	PbCl2	6.010e-13	6.010e-13	-12.221	-12.221	0.000	(0)
	Pb (OH) 3-	5.800e-15	3.844e-15	-14.237	-14.415	-0.179	(0)
	PbCl3-	2.345e-15	1.554e-15	-14.630	-14.809	-0.179	(0)
	PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
	PbNO3+	3.092e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
	PbCl4-2	2.392e-17	4.614e-18	-16.621	-17.336	-0.715	(0)
	Pb2OH+3	1.061e-17	2.616e-19	-16.974	-18.582	-1.608	(0)
	Pb (OH) 4-2	3.971e-18	7.659e-19	-17.401	-18.116	-0.715	(0)
	PbF3-	5.960e-19	3.949e-19	-18.225	-18.403	-0.179	(0)
	Pb3 (OH) 4+2	2.076e-22	4.003e-23	-21.683	-22.398	-0.715	(0)
	PbF4-2	1.163e-22	2.243e-23	-21.934	-22.649	-0.715	(0)
	Pb (NO3) 2	5.363e-25	5.363e-25	-24.271	-24.271	0.000	(0)
	Pb4 (OH) 4+4	2.065e-26	2.858e-29	-25.685	-28.544	-2.859	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
S (-2)	0.000e+00						
	HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
	CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
	S5-2	0.000e+00	0.000e+00	-79.129	-79.844	-0.715	(0)
	H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-79.645	-80.360	-0.715	(0)
	S4-2	0.000e+00	0.000e+00	-79.725	-80.439	-0.715	(0)
	S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
	S2-2	0.000e+00	0.000e+00	-81.547	-82.261	-0.715	(0)
	S-2	0.000e+00	0.000e+00	-87.325	-87.779	-0.454	(0)

HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.293	-147.471	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.370	-149.370	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.298	-224.476	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.833	-226.548	-0.715	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.446	-226.624	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.608	-304.323	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.715	(0)
S (6)	4.706e-02					
SO4-2	3.122e-02	1.097e-02	-1.506	-1.960	-0.454	(0)
MgSO4	7.551e-03	7.551e-03	-2.122	-2.122	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
KSO4-	1.072e-03	8.319e-04	-2.970	-3.080	-0.110	(0)
MnSO4	6.048e-05	6.048e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.206e-06	9.206e-06	-5.036	-5.036	0.000	(0)
Zn (SO4) 2-2	4.561e-06	8.797e-07	-5.341	-6.056	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.835e-08	2.183e-08	-7.547	-7.661	-0.113	(0)
HSO4-	1.737e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.827e-09	6.827e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.239e-09	1.010e-09	-8.281	-8.996	-0.715	(0)
CoSO4	8.645e-10	8.645e-10	-9.063	-9.063	0.000	(0)
PbSO4	4.830e-10	4.830e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.023e-10	2.023e-10	-9.694	-9.694	0.000	(0)
Pb (SO4) 2-2	1.655e-10	3.193e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	5.258e-12	5.258e-12	-11.279	-11.279	0.000	(0)
UO2SO4	1.504e-12	1.504e-12	-11.823	-11.823	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2 (SO4) 2-2	1.128e-12	2.176e-13	-11.948	-12.662	-0.715	(0)
AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.810e-13	7.349e-14	-12.419	-13.134	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	4.387e-15	2.907e-15	-14.358	-14.537	-0.179	(0)
VO2SO4-	1.618e-17	1.072e-17	-16.791	-16.970	-0.179	(0)
FeSO4+	4.705e-19	3.623e-19	-18.327	-18.441	-0.113	(0)
Fe (SO4) 2-	1.283e-19	8.500e-20	-18.892	-19.071	-0.179	(0)
VOSO4	2.066e-20	2.066e-20	-19.685	-19.685	0.000	(0)
HgSO4	1.587e-20	1.587e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2SO4+2	4.976e-21	9.598e-22	-20.303	-21.018	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	6.255e-22	6.255e-22	-21.204	-21.204	0.000	(0)
CrO3SO4-2	7.929e-24	1.529e-24	-23.101	-23.816	-0.715	(0)
VSO4+	5.541e-35	3.672e-35	-34.256	-34.435	-0.179	(0)
U (SO4) 2	2.474e-39	2.474e-39	-38.607	-38.607	0.000	(0)
USO4+2	1.472e-40	0.000e+00	-39.832	-40.547	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Sb (3)	9.925e-20					
Sb (OH) 3	5.017e-20	5.017e-20	-19.300	-19.300	0.000	(0)
HSbO2	4.907e-20	4.907e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.707e-24	6.433e-24	-23.013	-23.192	-0.179	(0)
Sb (OH) 4-	5.541e-24	3.672e-24	-23.256	-23.435	-0.179	(0)
Sb (OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.275e-26	1.508e-26	-25.643	-25.822	-0.179	(0)
SbO+	7.859e-27	5.208e-27	-26.105	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.854	-318.569	-0.715	(0)
Sb (5)	9.021e-08					

SbO3-	9.011e-08	5.972e-08	-7.045	-7.224	-0.179	(0)
Sb(OH) 6-	9.021e-11	6.946e-11	-10.045	-10.158	-0.114	(0)
SbO2+	3.952e-24	2.619e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.055e-39					
HSe-	6.055e-39	4.013e-39	-38.218	-38.397	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.415	-42.415	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.774	-45.488	-0.715	(0)
Se (4)	7.585e-07					
SeO3-2	3.986e-07	7.687e-08	-6.400	-7.114	-0.715	(0)
HSeO3-	3.599e-07	2.385e-07	-6.444	-6.622	-0.179	(0)
H2SeO3	1.257e-12	1.257e-12	-11.901	-11.901	0.000	(0)
Cd(SeO3) 2-2	6.701e-17	1.292e-17	-16.174	-16.889	-0.715	(0)
FeHSeO3+2	9.619e-24	1.855e-24	-23.017	-23.732	-0.715	(0)
Se (6)	9.506e-10					
SeO4-2	9.476e-10	3.330e-10	-9.023	-9.478	-0.454	(0)
MnSeO4	2.778e-12	2.778e-12	-11.556	-11.556	0.000	(0)
ZnSeO4	1.978e-13	1.978e-13	-12.704	-12.704	0.000	(0)
HSeO4-	3.111e-16	2.062e-16	-15.507	-15.686	-0.179	(0)
CdSeO4	1.646e-16	1.646e-16	-15.784	-15.784	0.000	(0)
CoSeO4	6.591e-17	6.591e-17	-16.181	-16.181	0.000	(0)
NiSeO4	1.439e-17	1.439e-17	-16.842	-16.842	0.000	(0)
Zn(SeO4) 2-2	3.463e-22	6.679e-23	-21.461	-22.175	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.240	-58.848	-1.608	(0)
U (4)	2.562e-19					
U(OH) 5-	2.561e-19	1.697e-19	-18.592	-18.770	-0.179	(0)
U(OH) 4	8.797e-23	8.797e-23	-22.056	-22.056	0.000	(0)
U(OH) 3+	6.006e-27	3.980e-27	-26.221	-26.400	-0.179	(0)
U(OH) 2+2	1.181e-31	2.278e-32	-30.928	-31.642	-0.715	(0)
UF3+	6.522e-36	4.322e-36	-35.186	-35.364	-0.179	(0)
UF2+2	1.192e-36	2.298e-37	-35.924	-36.639	-0.715	(0)
UOH+3	5.387e-37	1.328e-38	-36.269	-37.877	-1.608	(0)
UF4	5.623e-38	5.623e-38	-37.250	-37.250	0.000	(0)
UF+3	6.241e-39	1.538e-40	-38.205	-39.813	-1.608	(0)
U(SO4) 2	2.474e-39	2.474e-39	-38.607	-38.607	0.000	(0)
UF5-	3.990e-40	2.644e-40	-39.399	-39.578	-0.179	(0)
USO4+2	1.472e-40	0.000e+00	-39.832	-40.547	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.309	-41.023	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.328	-45.187	-2.859	(0)
UCl+3	0.000e+00	0.000e+00	-44.066	-45.675	-1.608	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-155.194	-169.668	-14.473	(0)
U (5)	1.138e-15					
UO2+	1.138e-15	7.543e-16	-14.944	-15.122	-0.179	(0)
U (6)	9.170e-07					
UO2(CO3) 3-4	8.353e-07	1.156e-09	-6.078	-8.937	-2.859	(0)
UO2(CO3) 2-2	8.110e-08	1.564e-08	-7.091	-7.806	-0.715	(0)
UO2CO3	5.317e-10	5.317e-10	-9.274	-9.274	0.000	(0)
UO2OH+	1.400e-11	9.278e-12	-10.854	-11.033	-0.179	(0)
UO2F+	2.239e-12	1.484e-12	-11.650	-11.829	-0.179	(0)
UO2SO4	1.504e-12	1.504e-12	-11.823	-11.823	0.000	(0)
UO2(SO4) 2-2	1.128e-12	2.176e-13	-11.948	-12.662	-0.715	(0)
UO2F2	5.078e-13	5.078e-13	-12.294	-12.294	0.000	(0)
UO2+2	2.578e-13	9.059e-14	-12.589	-13.043	-0.454	(0)
UO2F3-	2.284e-14	1.514e-14	-13.641	-13.820	-0.179	(0)
UO2Cl+	1.440e-15	9.543e-16	-14.842	-15.020	-0.179	(0)
(UO2) 3(OH) 5+	1.004e-15	6.655e-16	-14.998	-15.177	-0.179	(0)
(UO2) 2(OH) 2+2	7.407e-16	1.429e-16	-15.130	-15.845	-0.715	(0)
UO2F4-2	7.397e-17	1.427e-17	-16.131	-16.846	-0.715	(0)
UO2NO3+	4.204e-21	2.786e-21	-20.376	-20.555	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.725	-42.904	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.609	-44.324	-0.715	(0)
V (3)	3.079e-15					
V(OH) 3	3.079e-15	3.079e-15	-14.512	-14.512	0.000	(0)
V(OH) 2+	3.716e-26	2.463e-26	-25.430	-25.609	-0.179	(0)
VOH+2	1.499e-29	2.891e-30	-28.824	-29.539	-0.715	(0)
V+3	2.876e-34	7.089e-36	-33.541	-35.149	-1.608	(0)

VSO4+	5.541e-35	3.672e-35	-34.256	-34.435	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.088	-56.696	-1.608	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.419	-58.278	-2.859	(0)
V (4)	1.735e-18					
V (OH) 3+	1.671e-18	1.107e-18	-17.777	-17.956	-0.179	(0)
VO+2	3.544e-20	6.835e-21	-19.451	-20.165	-0.715	(0)
VOSO4	2.066e-20	2.066e-20	-19.685	-19.685	0.000	(0)
VOF+	7.341e-21	4.865e-21	-20.134	-20.313	-0.179	(0)
VOF2	2.165e-22	2.165e-22	-21.665	-21.665	0.000	(0)
VOC1+	1.880e-22	1.246e-22	-21.726	-21.905	-0.179	(0)
VOF3-	1.375e-24	9.113e-25	-23.862	-24.040	-0.179	(0)
VOF4-2	2.263e-27	4.365e-28	-26.645	-27.360	-0.715	(0)
H2V2O4+2	3.199e-31	6.170e-32	-30.495	-31.210	-0.715	(0)
V (5)	3.432e-08					
H2VO4-	2.020e-08	1.339e-08	-7.695	-7.873	-0.179	(0)
HVO4-2	1.411e-08	2.722e-09	-7.850	-8.565	-0.715	(0)
H3VO4	1.654e-12	1.654e-12	-11.782	-11.782	0.000	(0)
HV2O7-3	5.019e-13	1.237e-14	-12.299	-13.908	-1.608	(0)
H3V2O7-	2.161e-13	1.432e-13	-12.665	-12.844	-0.179	(0)
VO4-3	4.480e-14	1.104e-15	-13.349	-14.957	-1.608	(0)
V2O7-4	1.948e-14	2.696e-17	-13.710	-16.569	-2.859	(0)
V3O9-3	1.025e-16	2.527e-18	-15.989	-17.597	-1.608	(0)
VO2+	5.314e-17	4.092e-17	-16.275	-16.388	-0.114	(0)
VO2SO4-	1.618e-17	1.072e-17	-16.791	-16.970	-0.179	(0)
VO2F	8.516e-18	8.516e-18	-17.070	-17.070	0.000	(0)
VO2F2-	5.536e-19	3.669e-19	-18.257	-18.435	-0.179	(0)
V4O12-4	1.021e-20	1.413e-23	-19.991	-22.850	-2.859	(0)
VO2F3-2	2.816e-21	5.430e-22	-20.550	-21.265	-0.715	(0)
VO2F4-3	1.286e-24	3.170e-26	-23.891	-25.499	-1.608	(0)
VO2NO3	3.190e-25	3.190e-25	-24.496	-24.496	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.018	-61.450	-6.433	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.705	-61.172	-4.467	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.013	-63.872	-2.859	(0)
Zn	2.575e-05					
Zn+2	1.091e-05	3.835e-06	-4.962	-5.416	-0.454	(0)
ZnSO4	9.206e-06	9.206e-06	-5.036	-5.036	0.000	(0)
Zn (SO4) 2-2	4.561e-06	8.797e-07	-5.341	-6.056	-0.715	(0)
ZnOH+	4.708e-07	3.120e-07	-6.327	-6.506	-0.179	(0)
ZnCO3	3.254e-07	3.254e-07	-6.488	-6.488	0.000	(0)
ZnCl+	8.294e-08	6.257e-08	-7.081	-7.204	-0.122	(0)
ZnHCO3+	7.110e-08	4.712e-08	-7.148	-7.327	-0.179	(0)
ZnOHCl	6.665e-08	6.665e-08	-7.176	-7.176	0.000	(0)
Zn (OH) 2	4.023e-08	4.023e-08	-7.395	-7.395	0.000	(0)
ZnF+	1.370e-08	9.080e-09	-7.863	-8.042	-0.179	(0)
ZnCl2	6.442e-10	6.442e-10	-9.191	-9.191	0.000	(0)
Zn (OH) 3-	2.475e-10	1.640e-10	-9.606	-9.785	-0.179	(0)
ZnCl3-	4.405e-12	3.324e-12	-11.356	-11.478	-0.122	(0)
ZnNO3+	2.241e-13	1.485e-13	-12.650	-12.828	-0.179	(0)
ZnSeO4	1.978e-13	1.978e-13	-12.704	-12.704	0.000	(0)
ZnCl4-2	3.068e-14	1.079e-14	-13.513	-13.967	-0.454	(0)
Zn (OH) 4-2	2.755e-14	5.313e-15	-13.560	-14.275	-0.715	(0)
Zn (NO3) 2	4.567e-22	4.567e-22	-21.340	-21.340	0.000	(0)
Zn (SeO4) 2-2	3.463e-22	6.679e-23	-21.461	-22.175	-0.715	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.293	-147.471	-0.179	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.370	-149.370	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.298	-224.476	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.833	-226.548	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.608	-304.323	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.15	-48.87	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-42.13	-37.62	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-49.35	-37.62	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-71.25	-53.31	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-56.47	-36.44	20.03	(Co (NH3) 6) Cl3	

(NH4)2CrO4	-28.90	-28.50	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.39	-22.94	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3
Al2(MoO4)3	-47.72	-45.36	2.37	Al2(MoO4)3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.61	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.24	-1.37	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.52	6.42	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.38	-23.05	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.56	-6.73	1.83	BaSeO3
BaSeO4	-10.04	-17.50	-7.46	BaSeO4
Bianchite	-5.62	-7.38	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.86	-77.38	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.45	13.39	16.84	Mg(OH)2
Bunsenite	-6.66	5.78	12.45	NiO
Ca(VO3)2	-9.45	-3.79	5.66	Ca(VO3)2
Ca2V2O7	-8.13	9.37	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.18	9.37	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.42	22.54	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.32	22.54	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-15.42	-17.68	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.18	-1.36	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.11	-12.13	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.41	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal(alpha)	-31.82	-18.31	13.51	Cd
Cdmetal(gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4

CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO4:2H2O	-16.21	-18.06	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.43	-40.53	-27.10	PbSe
Co (BO2) 2	-28.70	-1.63	27.07	Co (BO2) 2
Co (OH) 2	-6.68	6.41	13.09	Co (OH) 2
Co (OH) 3	-10.91	-13.22	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-26.09	-13.06	13.03	Co3 (AsO4) 2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.05	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.32	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.69	-39.89	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.36	-18.89	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-22.44	-11.62	10.82	Cr (OH) 2
Cr (OH) 3	-3.13	-1.79	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-1.04	-1.79	-0.75	Cr (OH) 3
Cr2O3	-1.22	-3.58	-2.36	Cr2O3
CrCl2	-45.90	-31.81	14.09	CrCl2
CrCl3	-47.19	-32.08	15.11	CrCl3
CrF3	-25.95	-37.29	-11.34	CrF3
Crmetal	-67.64	-37.16	30.48	Cr
CrO3	-27.64	-30.85	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.17	-49.97	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.53	-88.02	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-17.16	-22.60	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2

CuSe	-4.95	-38.05	-33.10	CuSe
CuSe2	-25.45	-58.81	-33.37	CuSe2
CuSeO3:2H2O	-6.79	-6.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.61	-17.05	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg(CO3)2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.20	0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.79	-13.51	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.70	-8.15	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.58	-37.21	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-7.33	-0.13	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.02	-63.61	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.85	-42.85	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.55	-80.52	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.90	2.77	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.34	-46.30	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg(CH3)2(g)	-184.58	-258.29	-73.71	Hg(CH3)2
Hg(g)	-6.71	-14.59	-7.87	Hg
Hg(OH)2	-7.14	-10.64	-3.50	Hg(OH)2
Hg2(g)	-14.22	-29.18	-14.96	Hg2
Hg2(OH)2	-8.89	-3.63	5.26	Hg2(OH)2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.78	-34.48	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.50	-18.16	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.56	-29.68	Hg3O2CO3
HgCl(g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.83	-21.26	HgCl2
HgF(g)	-46.33	-13.65	32.68	HgF
HgF2(g)	-46.87	-34.30	12.57	HgF2
Hgmetal(l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.25	-56.94	-55.69	HgSe
HgSeO3	-12.74	-25.17	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.86	-19.63	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.05	-20.22	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.58	-49.82	-17.24	K2Cr2O7

K2CrO4	-18.46	-18.97	-0.51	K2CrO4
K2MoO4	-12.78	-9.51	3.26	K2MoO4
K2SeO4	-12.69	-13.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.85	-3.57	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.53	9.83	26.36	Mg2V2O7
MgCr2O4	-6.39	9.81	16.20	MgCr2O4
MgCrO4	-22.84	-17.46	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.15	-8.00	-1.85	MgMoO4
MgSeO3:6H2O	-4.20	-1.14	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.70	-11.90	-1.20	MgSeO4:6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-10.55	-5.65	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.16	-55.87	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.88	1.62	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-11.60	-8.89	2.72	MnCl2:4H2O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.50	-35.00	3.50	MnSe
MnSeO3	-4.35	-3.22	1.13	MnSeO3
MnSeO3:2H2O	-4.21	-3.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.94	-13.99	-2.05	MnSeO4:5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.40	-49.30	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.45	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.43	-2.13	10.30	Na2SeO3:5H2O
Na2SeO4	-14.17	-12.89	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.56	10.12	36.68	Na3VO4
Na4V2O7	-29.56	7.84	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-6.14	-2.28	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.01	5.78	12.79	Ni (OH) 2

Ni3(AsO4)2·8H2O	-30.66	-14.96	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-26.65	5.35	32.00	Ni4(OH)6SO4
NiCO3	-9.00	-15.87	-6.87	NiCO3
NiMoO4	-4.47	-15.61	-11.14	NiMoO4
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.82	-40.52	-17.70	NiSe
NiSeO3·2H2O	-11.56	-8.75	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-18.00	-19.52	-1.52	NiSeO4·6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb(BO2)2	-8.79	-2.27	6.52	Pb(BO2)2
Pb(OH)2	-2.38	5.77	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-63.43	-72.19	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.65	11.54	26.19	Pb2O(OH)2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.52	-5.42	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.79	0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.80	5.30	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.48	-25.08	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO·0.3H2O	-7.21	5.77	12.98	PbO·0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4·6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.37	-18.87	-14.50	UO2CO3
Sb(OH)3	-12.19	-19.30	-7.11	Sb(OH)3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.75	-177.51	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.16	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.22	2.77	5.99	UO2(OH)2·H2O
Semetal(am)	-13.65	-20.76	-7.11	Se
Semetal(hex)	-13.05	-20.76	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.25	-11.25	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO

Thenardite	-5.70	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.25	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.66	10.42	21.08	U3O8
U3Sb4	-576.78	-424.40	152.38	U3Sb4
U4O9	-25.66	-28.68	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.17	-60.89	-32.72	UF4:2.5H2O
UO2 (am)	-14.49	-13.56	0.93	UO2
UO2 (NO3) 2	-40.81	-28.67	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.52	-28.67	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.06	-28.67	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.72	-28.67	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.84	2.77	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.27	-22.52	-2.25	UO2SeO4:4H2O
UO3	-4.93	2.77	7.70	UO3
Uraninite	-8.89	-13.56	-4.67	UO2
USb2	-218.67	-189.09	29.58	USb2
V (OH) 3	-19.02	-11.43	7.59	V (OH) 3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-40.43	-38.59	1.84	V3O5
V4O7	-50.13	-42.94	7.19	V4O7
V6O13	-41.11	-101.97	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VC12	-63.26	-44.39	18.87	VC12
VC13	-65.14	-41.71	23.43	VC13
VF4	-66.61	-51.68	14.93	VF4
Vmetal	-93.77	-49.74	44.03	V
VO	-38.95	-24.20	14.76	VO
VO (OH) 2	-9.50	-4.35	5.15	VO (OH) 2
VO2Cl	-21.42	-18.58	2.84	VO2Cl
VOC1	-32.67	-21.52	11.15	VOC1
VOC12	-37.30	-24.54	12.76	VOC12
VOSO4	-25.73	-22.12	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.31	-7.38	3.93	ZnSO4
Zn (BO2) 2	-5.93	2.36	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.36	-21.05	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.80	10.40	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.08	10.40	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.36	10.40	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.14	10.40	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.34	10.40	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.48	3.02	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.49	10.70	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.75	-1.10	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.27	-4.35	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.58	23.82	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.70	31.80	38.50	Zn5 (OH) 8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.27	-0.53	ZnF2
Znmetal	-40.93	-15.15	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO (active)	-0.79	10.40	11.19	ZnO
ZnS (am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.50	-35.90	-14.40	ZnSe
ZnSeO4:6H2O	-13.38	-14.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 108.

Title Stage 6 Pit lake Mix
Mix 603
604 0.149812
608 0.039730
1 0.094917
17 0.100825
16 0.000000
515 0.614716
Save solution 609
end

TITLE

Stage 6 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 603.

Mixture 603.

9.492e-02 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)
1.008e-01 Solution 17 Average water quality for Background Surface Water
SWQ-1 (representative of haul road and watershed run-off)
6.147e-01 Solution 515 Solution after simulation 98.
1.498e-01 Solution 604 Solution after simulation 103.
3.973e-02 Solution 608 Solution after simulation 107.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.006e-08	1.006e-08
Al	8.629e-07	8.631e-07
As	3.009e-10	3.009e-10
B	1.543e-05	1.544e-05
Ba	2.454e-08	2.455e-08
C	2.257e-03	2.258e-03
Ca	1.639e-03	1.639e-03
Cd	4.407e-09	4.408e-09
Cl	2.196e-03	2.197e-03
Co	3.404e-08	3.405e-08
Cr	1.408e-09	1.408e-09
Cu	1.494e-06	1.495e-06
F	1.169e-04	1.170e-04
Fe	1.052e-09	1.052e-09
Hg	6.942e-10	6.944e-10
K	1.235e-03	1.236e-03
Mg	1.804e-03	1.805e-03
Mn	2.074e-05	2.074e-05
Mo	6.123e-07	6.125e-07
N	5.041e-06	5.042e-06
Na	5.649e-03	5.651e-03

Ni	5.304e-08	5.305e-08
Pb	3.211e-09	3.212e-09
S	4.658e-03	4.659e-03
Sb	9.281e-09	9.283e-09
Se	5.422e-08	5.424e-08
Si	8.833e-05	8.835e-05
U	8.793e-08	8.795e-08
V	2.822e-09	2.822e-09
Zn	2.197e-06	2.198e-06

-----Description of solution-----

	pH	=	7.660	Charge balance
	pe	=	5.039	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.877e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.188e-03	
	Total CO2 (mol/kg)	=	2.257e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	5.967e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	11	
	Total H	=	1.110444e+02	
	Total O	=	5.554665e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.288e-07	4.602e-07	-6.277	-6.337	-0.060	(0)
H+	2.503e-08	2.187e-08	-7.601	-7.660	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	1.006e-08					
AgCl	6.696e-09	6.696e-09	-8.174	-8.174	0.000	(0)
Ag+	1.956e-09	1.709e-09	-8.709	-8.767	-0.059	(0)
AgCl2-	1.315e-09	1.119e-09	-8.881	-8.951	-0.070	(0)
AgSO4-	9.003e-11	7.665e-11	-10.046	-10.115	-0.070	(0)
AgCl3-2	3.643e-12	1.914e-12	-11.439	-11.718	-0.279	(0)
AgNO2	1.414e-12	1.414e-12	-11.849	-11.849	0.000	(0)
AgF	3.972e-13	3.972e-13	-12.401	-12.401	0.000	(0)
AgOH	7.865e-14	7.865e-14	-13.104	-13.104	0.000	(0)
AgNH3+	4.185e-14	3.563e-14	-13.378	-13.448	-0.070	(0)
AgCl4-3	3.191e-14	7.499e-15	-13.496	-14.125	-0.629	(0)
Ag2Se	1.806e-14	1.806e-14	-13.743	-13.743	0.000	(0)
AgH2BO3	1.079e-14	1.079e-14	-13.967	-13.967	0.000	(0)
AgSeO3-	8.366e-15	7.123e-15	-14.077	-14.147	-0.070	(0)
Ag (NO2) 2-	1.019e-17	8.678e-18	-16.992	-17.062	-0.070	(0)
Ag (OH) 2-	4.154e-18	3.537e-18	-17.381	-17.451	-0.070	(0)
AgNO3	3.612e-18	3.612e-18	-17.442	-17.442	0.000	(0)
Ag (NH3) 2+	3.473e-18	2.956e-18	-17.459	-17.529	-0.070	(0)
Ag (SeO3) 2-3	1.759e-21	4.135e-22	-20.755	-21.384	-0.629	(0)
Ag2MoO4	3.946e-25	3.946e-25	-24.404	-24.404	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.190	-73.190	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.738	-83.856	-1.118	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.984	-147.150	-0.167	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.257	-147.327	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.614	-148.930	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.939	-149.241	-0.302	(0)
Al	8.629e-07					
Al (OH) 4-	8.479e-07	7.417e-07	-6.072	-6.130	-0.058	(0)
Al (OH) 3	1.280e-08	1.280e-08	-7.893	-7.893	0.000	(0)
Al (OH) 2+	1.587e-09	1.394e-09	-8.799	-8.856	-0.056	(0)
AlF3	3.290e-10	3.290e-10	-9.483	-9.483	0.000	(0)
AlF2+	3.215e-10	2.825e-10	-9.493	-9.549	-0.056	(0)

AlF4-	1.744e-11	1.526e-11	-10.758	-10.817	-0.058	(0)
AlF+2	1.287e-11	7.669e-12	-10.890	-11.115	-0.225	(0)
AlOH+2	6.401e-12	3.814e-12	-11.194	-11.419	-0.225	(0)
AlSO4+	1.653e-13	1.446e-13	-12.782	-12.840	-0.058	(0)
Al+3	2.791e-14	8.289e-15	-13.554	-14.082	-0.527	(0)
Al (SO4) 2-	3.982e-15	3.483e-15	-14.400	-14.458	-0.058	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.105	-43.734	-0.629	(0)
As (3)	3.473e-23					
H3AsO3	3.380e-23	3.380e-23	-22.471	-22.471	0.000	(0)
H2AsO3-	9.309e-25	7.926e-25	-24.031	-24.101	-0.070	(0)
HAsO3-2	6.289e-29	3.305e-29	-28.201	-28.481	-0.279	(0)
H4AsO3+	4.303e-31	3.663e-31	-30.366	-30.436	-0.070	(0)
AsO3-3	2.478e-34	5.823e-35	-33.606	-34.235	-0.629	(0)
As (5)	3.009e-10					
HAsO4-2	2.678e-10	1.407e-10	-9.572	-9.852	-0.279	(0)
H2AsO4-	3.297e-11	2.807e-11	-10.482	-10.552	-0.070	(0)
AsO4-3	8.655e-14	2.034e-14	-13.063	-13.692	-0.629	(0)
H3AsO4	1.062e-16	1.067e-16	-15.974	-15.972	0.002	(0)
B	1.543e-05					
H3BO3	1.494e-05	1.500e-05	-4.826	-4.824	0.002	(0)
H2BO3-	4.603e-07	3.983e-07	-6.337	-6.400	-0.063	(0)
CaH2BO3+	1.907e-08	1.650e-08	-7.720	-7.783	-0.063	(0)
MgH2BO3+	1.332e-08	1.153e-08	-7.875	-7.938	-0.063	(0)
NaH2BO3	3.076e-09	3.076e-09	-8.512	-8.512	0.000	(0)
BF (OH) 3-	6.400e-10	5.538e-10	-9.194	-9.257	-0.063	(0)
H5 (BO3) 2-	5.877e-12	5.086e-12	-11.231	-11.294	-0.063	(0)
BaH2BO3+	2.009e-13	1.739e-13	-12.697	-12.760	-0.063	(0)
BF2 (OH) 2-	1.385e-13	1.199e-13	-12.859	-12.921	-0.063	(0)
AgH2BO3	1.079e-14	1.079e-14	-13.967	-13.967	0.000	(0)
H8 (BO3) 3-	8.816e-15	7.629e-15	-14.055	-14.118	-0.063	(0)
BF3OH-	1.091e-19	9.441e-20	-18.962	-19.025	-0.063	(0)
BF4-	1.087e-24	9.404e-25	-23.964	-24.027	-0.063	(0)
Ba	2.454e-08					
Ba+2	2.423e-08	1.413e-08	-7.616	-7.850	-0.234	(0)
BaHCO3+	2.823e-10	2.487e-10	-9.549	-9.604	-0.055	(0)
BaCO3	2.863e-11	2.863e-11	-10.543	-10.543	0.000	(0)
BaH2BO3+	2.009e-13	1.739e-13	-12.697	-12.760	-0.063	(0)
BaOH+	3.236e-14	2.837e-14	-13.490	-13.547	-0.057	(0)
BaNO3+	2.213e-16	1.884e-16	-15.655	-15.725	-0.070	(0)
BaNH3+2	1.732e-16	9.099e-17	-15.762	-16.041	-0.279	(0)
C (4)	2.257e-03					
HCO3-	2.099e-03	1.844e-03	-2.678	-2.734	-0.056	(0)
H2CO3	9.071e-05	9.071e-05	-4.042	-4.042	0.000	(0)
CaHCO3+	2.805e-05	2.472e-05	-4.552	-4.607	-0.055	(0)
MgHCO3+	1.805e-05	1.575e-05	-4.743	-4.803	-0.059	(0)
CO3-2	6.779e-06	3.952e-06	-5.169	-5.403	-0.234	(0)
NaHCO3	5.053e-06	5.053e-06	-5.296	-5.296	0.000	(0)
CaCO3	4.509e-06	4.509e-06	-5.346	-5.346	0.000	(0)
MgCO3	2.744e-06	2.744e-06	-5.562	-5.562	0.000	(0)
CuCO3	1.244e-06	1.244e-06	-5.905	-5.905	0.000	(0)
NaCO3-	4.081e-07	3.586e-07	-6.389	-6.445	-0.056	(0)
MnHCO3+	3.697e-07	3.242e-07	-6.432	-6.489	-0.057	(0)
ZnCO3	1.930e-07	1.930e-07	-6.715	-6.715	0.000	(0)
ZnHCO3+	5.811e-08	4.948e-08	-7.236	-7.306	-0.070	(0)
UO2 (CO3) 3-4	5.061e-08	3.857e-09	-7.296	-8.414	-1.118	(0)
UO2 (CO3) 2-2	3.707e-08	1.947e-08	-7.431	-7.711	-0.279	(0)
Cu (CO3) 2-2	2.518e-08	1.323e-08	-7.599	-7.878	-0.279	(0)
CuHCO3+	7.305e-09	6.219e-09	-8.136	-8.206	-0.070	(0)
NiHCO3+	5.460e-09	4.648e-09	-8.263	-8.333	-0.070	(0)
NiCO3	3.015e-09	3.015e-09	-8.521	-8.521	0.000	(0)
CoHCO3+	2.198e-09	1.871e-09	-8.658	-8.728	-0.070	(0)
PbCO3	2.113e-09	2.113e-09	-8.675	-8.675	0.000	(0)
CoCO3	8.716e-10	8.716e-10	-9.060	-9.060	0.000	(0)
PbHCO3+	2.862e-10	2.437e-10	-9.543	-9.613	-0.070	(0)
BaHCO3+	2.823e-10	2.487e-10	-9.549	-9.604	-0.055	(0)
UO2CO3	2.470e-10	2.470e-10	-9.607	-9.607	0.000	(0)
CdCO3	1.530e-10	1.530e-10	-9.815	-9.815	0.000	(0)
Pb (CO3) 2-2	4.584e-11	2.408e-11	-10.339	-10.618	-0.279	(0)

		BaCO3	2.863e-11	2.863e-11	-10.543	-10.543	0.000	(0)
		CdHCO3+	8.375e-12	7.131e-12	-11.077	-11.147	-0.070	(0)
		Cd (CO3) 2-2	8.531e-13	4.482e-13	-12.069	-12.348	-0.279	(0)
		FeHCO3+	3.090e-14	2.722e-14	-13.510	-13.565	-0.055	(0)
		HgCO3	4.231e-15	4.231e-15	-14.374	-14.374	0.000	(0)
		Hg (CO3) 2-2	1.006e-16	5.288e-17	-15.997	-16.277	-0.279	(0)
		HgHCO3+	2.024e-18	1.723e-18	-17.694	-17.764	-0.070	(0)
Ca	1.639e-03							
		Ca+2	1.235e-03	7.198e-04	-2.908	-3.143	-0.234	(0)
		CaSO4	3.707e-04	3.707e-04	-3.431	-3.431	0.000	(0)
		CaHCO3+	2.805e-05	2.472e-05	-4.552	-4.607	-0.055	(0)
		CaCO3	4.509e-06	4.509e-06	-5.346	-5.346	0.000	(0)
		CaF+	8.289e-07	7.269e-07	-6.081	-6.139	-0.057	(0)
		CaH2BO3+	1.907e-08	1.650e-08	-7.720	-7.783	-0.063	(0)
		CaOH+	7.502e-09	6.610e-09	-8.125	-8.180	-0.055	(0)
		CaNH3+2	1.761e-11	9.252e-12	-10.754	-11.034	-0.279	(0)
		CaNO3+	7.115e-12	6.057e-12	-11.148	-11.218	-0.070	(0)
		Ca (NH3) 2+2	7.157e-20	3.760e-20	-19.145	-19.425	-0.279	(0)
Cd	4.407e-09							
		Cd+2	2.914e-09	1.699e-09	-8.536	-8.770	-0.234	(0)
		CdSO4	8.951e-10	8.951e-10	-9.048	-9.048	0.000	(0)
		CdCl+	3.656e-10	3.113e-10	-9.437	-9.507	-0.070	(0)
		CdCO3	1.530e-10	1.530e-10	-9.815	-9.815	0.000	(0)
		Cd (SO4) 2-2	5.166e-11	2.714e-11	-10.287	-10.566	-0.279	(0)
		CdHCO3+	8.375e-12	7.131e-12	-11.077	-11.147	-0.070	(0)
		CdOH+	7.293e-12	6.209e-12	-11.137	-11.207	-0.070	(0)
		CdOHC1	5.876e-12	5.876e-12	-11.231	-11.231	0.000	(0)
		CdF+	2.926e-12	2.491e-12	-11.534	-11.604	-0.070	(0)
		CdCl2	2.490e-12	2.490e-12	-11.604	-11.604	0.000	(0)
		Cd (CO3) 2-2	8.531e-13	4.482e-13	-12.069	-12.348	-0.279	(0)
		Cd (OH) 2	1.803e-14	1.803e-14	-13.744	-13.744	0.000	(0)
		CdCl3-	3.541e-15	3.015e-15	-14.451	-14.521	-0.070	(0)
		CdF2	4.598e-16	4.598e-16	-15.337	-15.337	0.000	(0)
		CdNO3+	1.679e-17	1.429e-17	-16.775	-16.845	-0.070	(0)
		CdSeO4	6.327e-18	6.327e-18	-17.199	-17.199	0.000	(0)
		Cd (OH) 3-	5.954e-19	5.069e-19	-18.225	-18.295	-0.070	(0)
		Cd2OH+3	2.249e-19	5.286e-20	-18.648	-19.277	-0.629	(0)
		Cd (SeO3) 2-2	1.120e-19	5.886e-20	-18.951	-19.230	-0.279	(0)
		Cd (OH) 4-2	7.267e-26	3.818e-26	-25.139	-25.418	-0.279	(0)
		Cd (NO3) 2	1.906e-26	1.906e-26	-25.720	-25.720	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.929	-78.999	-0.070	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.032	-150.032	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.299	-226.369	-0.070	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.131	-302.410	-0.279	(0)
Cl	2.196e-03							
		Cl-	2.196e-03	1.919e-03	-2.658	-2.717	-0.059	(0)
		MnCl+	2.428e-08	2.129e-08	-7.615	-7.672	-0.057	(0)
		AgCl	6.696e-09	6.696e-09	-8.174	-8.174	0.000	(0)
		ZnCl+	4.687e-09	4.090e-09	-8.329	-8.388	-0.059	(0)
		ZnOHC1	2.464e-09	2.464e-09	-8.608	-8.608	0.000	(0)
		AgCl2-	1.315e-09	1.119e-09	-8.881	-8.951	-0.070	(0)
		CuCl	5.787e-10	5.787e-10	-9.238	-9.238	0.000	(0)
		CdCl+	3.656e-10	3.113e-10	-9.437	-9.507	-0.070	(0)
		CuCl2-	2.659e-10	2.320e-10	-9.575	-9.634	-0.059	(0)
		CuCl+	1.863e-10	1.626e-10	-9.730	-9.789	-0.059	(0)
		NiCl+	1.179e-10	1.004e-10	-9.928	-9.998	-0.070	(0)
		CoCl+	1.017e-10	8.661e-11	-9.993	-10.062	-0.070	(0)
		MnCl2	5.771e-11	5.771e-11	-10.239	-10.239	0.000	(0)
		PbCl+	1.423e-11	1.211e-11	-10.847	-10.917	-0.070	(0)
		ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
		CdOHC1	5.876e-12	5.876e-12	-11.231	-11.231	0.000	(0)
		AgCl3-2	3.643e-12	1.914e-12	-11.439	-11.718	-0.279	(0)
		CdCl2	2.490e-12	2.490e-12	-11.604	-11.604	0.000	(0)
		HgClOH	1.395e-12	1.395e-12	-11.855	-11.855	0.000	(0)
		HgCl2	3.294e-13	3.294e-13	-12.482	-12.482	0.000	(0)
		CuCl3-2	1.610e-13	9.519e-14	-12.793	-13.021	-0.228	(0)
		CuCl2	1.082e-13	1.082e-13	-12.966	-12.966	0.000	(0)
		PbCl2	1.038e-13	1.038e-13	-12.984	-12.984	0.000	(0)

MnCl3-	3.478e-14	3.050e-14	-13.459	-13.516	-0.057	(0)
AgCl4-3	3.191e-14	7.499e-15	-13.496	-14.125	-0.629	(0)
ZnCl3-	2.173e-14	1.896e-14	-13.663	-13.722	-0.059	(0)
HgCl3-	7.425e-15	6.322e-15	-14.129	-14.199	-0.070	(0)
CdCl3-	3.541e-15	3.015e-15	-14.451	-14.521	-0.070	(0)
NiCl2	9.700e-16	9.700e-16	-15.013	-15.013	0.000	(0)
PbCl3-	9.315e-17	7.931e-17	-16.031	-16.101	-0.070	(0)
HgCl4-2	9.192e-17	4.829e-17	-16.037	-16.316	-0.279	(0)
UO2Cl+	5.739e-17	4.886e-17	-16.241	-16.311	-0.070	(0)
HgCl+	4.023e-17	3.425e-17	-16.395	-16.465	-0.070	(0)
ZnCl4-2	3.076e-17	1.819e-17	-16.512	-16.740	-0.228	(0)
CrCl+2	8.437e-18	4.433e-18	-17.074	-17.353	-0.279	(0)
CuCl3-	2.220e-18	1.937e-18	-17.654	-17.713	-0.059	(0)
PbCl4-2	1.324e-19	6.956e-20	-18.878	-19.158	-0.279	(0)
CrOHC12	7.441e-20	7.441e-20	-19.128	-19.128	0.000	(0)
FeCl+2	1.167e-21	6.899e-22	-20.933	-21.161	-0.228	(0)
CrCl2+	9.481e-22	8.072e-22	-21.023	-21.093	-0.070	(0)
VOC1+	4.284e-23	3.648e-23	-22.368	-22.438	-0.070	(0)
CuCl4-2	3.151e-23	1.863e-23	-22.502	-22.730	-0.228	(0)
FeCl2+	6.744e-24	5.914e-24	-23.171	-23.228	-0.057	(0)
CrO3Cl-	1.107e-26	9.426e-27	-25.956	-26.026	-0.070	(0)
FeCl3	1.135e-27	1.135e-27	-26.945	-26.945	0.000	(0)
CoCl+2	4.219e-36	2.216e-36	-35.375	-35.654	-0.279	(0)
UCl+3	0.000e+00	0.000e+00	-45.693	-46.322	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.377	-49.656	-0.279	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.030	-51.309	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.083	-64.363	-0.279	(0)
Co (2)	3.404e-08					
Co+2	2.483e-08	1.305e-08	-7.605	-7.884	-0.279	(0)
CoSO4	5.851e-09	5.851e-09	-8.233	-8.233	0.000	(0)
CoHCO3+	2.198e-09	1.871e-09	-8.658	-8.728	-0.070	(0)
CoCO3	8.716e-10	8.716e-10	-9.060	-9.060	0.000	(0)
CoOH+	1.407e-10	1.198e-10	-9.852	-9.922	-0.070	(0)
CoCl+	1.017e-10	8.661e-11	-9.993	-10.062	-0.070	(0)
CoF+	4.484e-11	3.817e-11	-10.348	-10.418	-0.070	(0)
Co (OH) 2	4.379e-12	4.379e-12	-11.359	-11.359	0.000	(0)
CoNO2+	4.278e-13	3.642e-13	-12.369	-12.439	-0.070	(0)
Co (NH3) +2	3.048e-14	1.601e-14	-13.516	-13.795	-0.279	(0)
CoSeO4	1.308e-16	1.308e-16	-15.883	-15.883	0.000	(0)
CoNO3+	6.463e-17	5.502e-17	-16.190	-16.259	-0.070	(0)
Co (OH) 3-	4.723e-17	4.021e-17	-16.326	-16.396	-0.070	(0)
CoOOH-	1.185e-17	1.009e-17	-16.926	-16.996	-0.070	(0)
Co2OH+3	3.333e-19	7.833e-20	-18.477	-19.106	-0.629	(0)
Co (NH3) 2+2	1.327e-20	6.974e-21	-19.877	-20.156	-0.279	(0)
Co (OH) 4-2	5.581e-24	2.932e-24	-23.253	-23.533	-0.279	(0)
Co (NO3) 2	2.979e-25	2.979e-25	-24.526	-24.526	0.000	(0)
Co (NH3) 3+2	1.706e-27	8.964e-28	-26.768	-27.047	-0.279	(0)
Co4 (OH) 4+4	5.392e-31	4.109e-32	-30.268	-31.386	-1.118	(0)
Co (NH3) 4+2	9.141e-35	4.803e-35	-34.039	-34.318	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.810	-42.089	-0.279	(0)
Co (3)	2.527e-29					
CoOH+2	2.527e-29	1.328e-29	-28.597	-28.877	-0.279	(0)
Co+3	1.911e-35	5.677e-36	-34.719	-35.246	-0.527	(0)
CoCl+2	4.219e-36	2.216e-36	-35.375	-35.654	-0.279	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.377	-49.656	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.299	-59.369	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.503	-63.783	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.083	-64.363	-0.279	(0)
Cr (2)	7.426e-27					
Cr+2	7.426e-27	3.902e-27	-26.129	-26.409	-0.279	(0)
Cr (3)	1.408e-09					
Cr (OH) 2+	1.182e-09	1.006e-09	-8.927	-8.997	-0.070	(0)
Cr (OH) 3	1.740e-10	1.740e-10	-9.760	-9.760	0.000	(0)
Cr (OH) +2	3.420e-11	1.797e-11	-10.466	-10.745	-0.279	(0)
CrOHSO4	9.586e-12	9.586e-12	-11.018	-11.018	0.000	(0)
CrO2-	4.437e-12	3.778e-12	-11.353	-11.423	-0.070	(0)
Cr (OH) 4-	3.743e-12	3.187e-12	-11.427	-11.497	-0.070	(0)
CrF+2	4.982e-14	2.618e-14	-13.303	-13.582	-0.279	(0)

CrSO4+	1.100e-14	9.369e-15	-13.958	-14.028	-0.070	(0)
Cr+3	7.595e-15	1.785e-15	-14.119	-14.748	-0.629	(0)
CrCl+2	8.437e-18	4.433e-18	-17.074	-17.353	-0.279	(0)
CrOHC12	7.441e-20	7.441e-20	-19.128	-19.128	0.000	(0)
Cr2 (OH) 2SO4+2	2.964e-20	1.557e-20	-19.528	-19.808	-0.279	(0)
Cr2 (OH) 2 (SO4) 2	2.079e-21	2.079e-21	-20.682	-20.682	0.000	(0)
CrCl2+	9.481e-22	8.072e-22	-21.023	-21.093	-0.070	(0)
CrNO3+2	3.952e-25	2.076e-25	-24.403	-24.683	-0.279	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.389	-40.668	-0.279	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.065	-49.694	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.030	-51.309	-0.279	(0)
Cr (6)	9.236e-16					
CrO4-2	8.650e-16	5.043e-16	-15.063	-15.297	-0.234	(0)
HCrO4-	4.192e-17	3.569e-17	-16.378	-16.447	-0.070	(0)
NaCrO4-	1.434e-17	1.221e-17	-16.843	-16.913	-0.070	(0)
KCrO4-	2.339e-18	1.991e-18	-17.631	-17.701	-0.070	(0)
CrO3SO4-2	1.018e-24	5.347e-25	-23.992	-24.272	-0.279	(0)
H2CrO4	6.329e-25	6.329e-25	-24.199	-24.199	0.000	(0)
CrO3Cl-	1.107e-26	9.426e-27	-25.956	-26.026	-0.070	(0)
Cr2O7-2	8.411e-32	4.419e-32	-31.075	-31.355	-0.279	(0)
Cu (1)	1.126e-09					
CuCl	5.787e-10	5.787e-10	-9.238	-9.238	0.000	(0)
Cu+	2.814e-10	2.396e-10	-9.551	-9.621	-0.070	(0)
CuCl2-	2.659e-10	2.320e-10	-9.575	-9.634	-0.059	(0)
CuCl3-2	1.610e-13	9.519e-14	-12.793	-13.021	-0.228	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.076	-147.385	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.819	-148.115	-0.296	(0)
Cu (2)	1.493e-06					
CuCO3	1.244e-06	1.244e-06	-5.905	-5.905	0.000	(0)
Cu+2	9.169e-08	5.346e-08	-7.038	-7.272	-0.234	(0)
CuOH+	8.916e-08	7.779e-08	-7.050	-7.109	-0.059	(0)
CuSO4	2.753e-08	2.753e-08	-7.560	-7.560	0.000	(0)
Cu (CO3) 2-2	2.518e-08	1.323e-08	-7.599	-7.878	-0.279	(0)
CuHCO3+	7.305e-09	6.219e-09	-8.136	-8.206	-0.070	(0)
Cu (OH) 2	7.143e-09	7.143e-09	-8.146	-8.146	0.000	(0)
CuF+	3.665e-10	3.121e-10	-9.436	-9.506	-0.070	(0)
Cu2 (OH) 2+2	2.893e-10	1.520e-10	-9.539	-9.818	-0.279	(0)
CuCl+	1.863e-10	1.626e-10	-9.730	-9.789	-0.059	(0)
CuNO2+	2.604e-11	2.217e-11	-10.584	-10.654	-0.070	(0)
CuNH3+2	1.063e-11	5.585e-12	-10.973	-11.253	-0.279	(0)
Cu (OH) 3-	7.919e-12	6.742e-12	-11.101	-11.171	-0.070	(0)
CuCl2	1.082e-13	1.082e-13	-12.966	-12.966	0.000	(0)
Cu (NO2) 2	8.988e-16	8.988e-16	-15.046	-15.046	0.000	(0)
CuNO3+	5.283e-16	4.498e-16	-15.277	-15.347	-0.070	(0)
Cu (OH) 4-2	4.648e-17	2.442e-17	-16.333	-16.612	-0.279	(0)
CuCl3-	2.220e-18	1.937e-18	-17.654	-17.713	-0.059	(0)
CuCl4-2	3.151e-23	1.863e-23	-22.502	-22.730	-0.228	(0)
Cu (NO3) 2	1.507e-25	1.507e-25	-24.822	-24.822	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.015	-216.084	-0.070	(0)
F	1.169e-04					
F-	1.059e-04	9.252e-05	-3.975	-4.034	-0.059	(0)
MgF+	9.908e-06	8.667e-06	-5.004	-5.062	-0.058	(0)
CaF+	8.289e-07	7.269e-07	-6.081	-6.139	-0.057	(0)
NaF	2.845e-07	2.845e-07	-6.546	-6.546	0.000	(0)
MnF+	3.702e-08	3.246e-08	-7.432	-7.489	-0.057	(0)
HF	2.993e-09	2.993e-09	-8.524	-8.524	0.000	(0)
ZnF+	1.840e-09	1.566e-09	-8.735	-8.805	-0.070	(0)
BF (OH) 3-	6.400e-10	5.538e-10	-9.194	-9.257	-0.063	(0)
CuF+	3.665e-10	3.121e-10	-9.436	-9.506	-0.070	(0)
AlF3	3.290e-10	3.290e-10	-9.483	-9.483	0.000	(0)
AlF2+	3.215e-10	2.825e-10	-9.493	-9.549	-0.056	(0)
NiF+	5.582e-11	4.752e-11	-10.253	-10.323	-0.070	(0)
CoF+	4.484e-11	3.817e-11	-10.348	-10.418	-0.070	(0)
AlF4-	1.744e-11	1.526e-11	-10.758	-10.817	-0.058	(0)
AlF+2	1.287e-11	7.669e-12	-10.890	-11.115	-0.225	(0)
CdF+	2.926e-12	2.491e-12	-11.534	-11.604	-0.070	(0)
PbF+	1.362e-12	1.160e-12	-11.866	-11.936	-0.070	(0)
HF2-	1.210e-12	1.053e-12	-11.917	-11.978	-0.060	(0)

AgF	3.972e-13	3.972e-13	-12.401	-12.401	0.000	(0)
UO2F+	2.355e-13	2.005e-13	-12.628	-12.698	-0.070	(0)
BF2 (OH) 2-	1.385e-13	1.199e-13	-12.859	-12.921	-0.063	(0)
UO2F2	5.350e-14	5.350e-14	-13.272	-13.272	0.000	(0)
CrF+2	4.982e-14	2.618e-14	-13.303	-13.582	-0.279	(0)
PbF2	2.112e-15	2.112e-15	-14.675	-14.675	0.000	(0)
UO2F3-	1.460e-15	1.243e-15	-14.836	-14.905	-0.070	(0)
CdF2	4.598e-16	4.598e-16	-15.337	-15.337	0.000	(0)
H2F2	2.401e-17	2.401e-17	-16.620	-16.620	0.000	(0)
FeF2+	3.410e-18	2.990e-18	-17.467	-17.524	-0.057	(0)
VO2F	3.139e-18	3.139e-18	-17.503	-17.503	0.000	(0)
FeF+2	2.042e-18	1.208e-18	-17.690	-17.918	-0.228	(0)
UO2F4-2	1.739e-18	9.138e-19	-17.760	-18.039	-0.279	(0)
PbF3-	4.352e-19	3.706e-19	-18.361	-18.431	-0.070	(0)
FeF3	3.904e-19	3.904e-19	-18.409	-18.409	0.000	(0)
VO2F2-	1.239e-19	1.055e-19	-18.907	-18.977	-0.070	(0)
BF3OH-	1.091e-19	9.441e-20	-18.962	-19.025	-0.063	(0)
VOF+	4.416e-21	3.760e-21	-20.355	-20.425	-0.070	(0)
VO2F3-2	2.316e-22	1.217e-22	-21.635	-21.915	-0.279	(0)
VOF2	1.305e-22	1.305e-22	-21.885	-21.885	0.000	(0)
PbF4-2	3.123e-23	1.641e-23	-22.505	-22.785	-0.279	(0)
HgF+	3.604e-24	3.068e-24	-23.443	-23.513	-0.070	(0)
BF4-	1.087e-24	9.404e-25	-23.964	-24.027	-0.063	(0)
VOF3-	5.030e-25	4.282e-25	-24.298	-24.368	-0.070	(0)
Sb (OH) 2F	5.223e-26	5.223e-26	-25.282	-25.282	0.000	(0)
SbOF	5.138e-26	5.138e-26	-25.289	-25.289	0.000	(0)
VO2F4-3	2.357e-26	5.540e-27	-25.628	-26.256	-0.629	(0)
VOF4-2	3.044e-28	1.599e-28	-27.517	-27.796	-0.279	(0)
SiF6-2	3.240e-29	1.916e-29	-28.489	-28.718	-0.228	(0)
UF3+	1.833e-36	1.561e-36	-35.737	-35.807	-0.070	(0)
UF2+2	2.026e-37	1.065e-37	-36.693	-36.973	-0.279	(0)
UF4	1.584e-38	1.584e-38	-37.800	-37.800	0.000	(0)
UF+3	3.888e-40	0.000e+00	-39.410	-40.039	-0.629	(0)
UF5-	0.000e+00	0.000e+00	-40.166	-40.236	-0.070	(0)
UF6-2	0.000e+00	0.000e+00	-41.510	-41.790	-0.279	(0)
Fe (2)	2.934e-12					
Fe+2	2.232e-12	1.173e-12	-11.651	-11.931	-0.279	(0)
FeSO4	6.470e-13	6.470e-13	-12.189	-12.189	0.000	(0)
FeHCO3+	3.090e-14	2.722e-14	-13.510	-13.565	-0.055	(0)
FeOH+	2.450e-14	2.148e-14	-13.611	-13.668	-0.057	(0)
Fe (OH) 2	7.853e-18	7.853e-18	-17.105	-17.105	0.000	(0)
Fe (OH) 3-	1.303e-18	1.143e-18	-17.885	-17.942	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.455	-159.455	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.585	-235.655	-0.070	(0)
Fe (3)	1.049e-09					
Fe (OH) 2+	7.208e-10	6.333e-10	-9.142	-9.198	-0.056	(0)
Fe (OH) 3	3.130e-10	3.130e-10	-9.504	-9.504	0.000	(0)
Fe (OH) 4-	1.526e-11	1.341e-11	-10.816	-10.873	-0.056	(0)
FeOH+2	5.982e-15	3.537e-15	-14.223	-14.451	-0.228	(0)
FeF2+	3.410e-18	2.990e-18	-17.467	-17.524	-0.057	(0)
FeF+2	2.042e-18	1.208e-18	-17.690	-17.918	-0.228	(0)
FeF3	3.904e-19	3.904e-19	-18.409	-18.409	0.000	(0)
FeSO4+	3.424e-19	3.003e-19	-18.465	-18.522	-0.057	(0)
Fe+3	4.009e-20	1.191e-20	-19.397	-19.924	-0.527	(0)
Fe (SO4) 2-	1.695e-20	1.443e-20	-19.771	-19.841	-0.070	(0)
FeCl+2	1.167e-21	6.899e-22	-20.933	-21.161	-0.228	(0)
FeCl2+	6.744e-24	5.914e-24	-23.171	-23.228	-0.057	(0)
FeHSeO3+2	2.133e-24	1.121e-24	-23.671	-23.950	-0.279	(0)
Fe2 (OH) 2+4	5.437e-27	4.143e-28	-26.265	-27.383	-1.118	(0)
FeCl3	1.135e-27	1.135e-27	-26.945	-26.945	0.000	(0)
FeNO3+2	6.030e-28	3.168e-28	-27.220	-27.499	-0.279	(0)
Fe3 (OH) 4+5	2.118e-34	3.793e-36	-33.674	-35.421	-1.747	(0)
H (0)	5.647e-29					
H2	2.823e-29	2.836e-29	-28.549	-28.547	0.002	(0)
Hg (0)	6.913e-10					
Hg	6.913e-10	6.913e-10	-9.160	-9.160	0.000	(0)
Hg (1)	1.598e-21					
Hg2+2	7.991e-22	4.199e-22	-21.097	-21.377	-0.279	(0)

Hg (2)	2.927e-12					
HgClOH	1.395e-12	1.395e-12	-11.855	-11.855	0.000	(0)
Hg (OH) 2	1.190e-12	1.195e-12	-11.924	-11.922	0.002	(0)
HgCl2	3.294e-13	3.294e-13	-12.482	-12.482	0.000	(0)
HgCl3-	7.425e-15	6.322e-15	-14.129	-14.199	-0.070	(0)
HgCO3	4.231e-15	4.231e-15	-14.374	-14.374	0.000	(0)
Hg (CO3) 2-2	1.006e-16	5.288e-17	-15.997	-16.277	-0.279	(0)
HgCl4-2	9.192e-17	4.829e-17	-16.037	-16.316	-0.279	(0)
HgCl+	4.023e-17	3.425e-17	-16.395	-16.465	-0.070	(0)
HgOH+	1.925e-17	1.639e-17	-16.716	-16.785	-0.070	(0)
HgHCO3+	2.024e-18	1.723e-18	-17.694	-17.764	-0.070	(0)
Hg (NH3) 2+2	1.120e-19	5.884e-20	-18.951	-19.230	-0.279	(0)
Hg (OH) 3-	8.134e-20	6.926e-20	-19.090	-19.160	-0.070	(0)
HgNH3+2	1.097e-20	5.763e-21	-19.960	-20.239	-0.279	(0)
Hg+2	1.703e-21	8.947e-22	-20.769	-21.048	-0.279	(0)
HgSO4	5.265e-22	5.265e-22	-21.279	-21.279	0.000	(0)
HgF+	3.604e-24	3.068e-24	-23.443	-23.513	-0.070	(0)
Hg (NH3) 3+2	4.552e-27	2.391e-27	-26.342	-26.621	-0.279	(0)
HgNO3+	1.032e-30	8.790e-31	-29.986	-30.056	-0.070	(0)
Hg (NH3) 4+2	3.691e-34	1.939e-34	-33.433	-33.712	-0.279	(0)
Hg (NO3) 2	9.721e-40	9.721e-40	-39.012	-39.012	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.865	-137.935	-0.070	(0)
HgS2-2	0.000e+00	0.000e+00	-138.703	-138.982	-0.279	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.201	-139.201	0.000	(0)
K	1.235e-03					
K+	1.216e-03	1.063e-03	-2.915	-2.974	-0.059	(0)
KSO4-	1.925e-05	1.691e-05	-4.716	-4.772	-0.056	(0)
KCrO4-	2.339e-18	1.991e-18	-17.631	-17.701	-0.070	(0)
Mg	1.804e-03					
Mg+2	1.432e-03	8.349e-04	-2.844	-3.078	-0.234	(0)
MgSO4	3.415e-04	3.415e-04	-3.467	-3.467	0.000	(0)
MgHCO3+	1.805e-05	1.575e-05	-4.743	-4.803	-0.059	(0)
MgF+	9.908e-06	8.667e-06	-5.004	-5.062	-0.058	(0)
MgCO3	2.744e-06	2.744e-06	-5.562	-5.562	0.000	(0)
MgOH+	1.732e-07	1.530e-07	-6.761	-6.815	-0.054	(0)
MgH2BO3+	1.332e-08	1.153e-08	-7.875	-7.938	-0.063	(0)
Mn (2)	2.074e-05					
Mn+2	1.677e-05	8.813e-06	-4.775	-5.055	-0.279	(0)
MnSO4	3.523e-06	3.523e-06	-5.453	-5.453	0.000	(0)
MnHCO3+	3.697e-07	3.242e-07	-6.432	-6.489	-0.057	(0)
MnF+	3.702e-08	3.246e-08	-7.432	-7.489	-0.057	(0)
MnCl+	2.428e-08	2.129e-08	-7.615	-7.672	-0.057	(0)
MnOH+	1.162e-08	1.019e-08	-7.935	-7.992	-0.057	(0)
MnCl2	5.771e-11	5.771e-11	-10.239	-10.239	0.000	(0)
MnSeO4	4.745e-14	4.745e-14	-13.324	-13.324	0.000	(0)
MnNO3+	4.366e-14	3.717e-14	-13.360	-13.430	-0.070	(0)
MnCl3-	3.478e-14	3.050e-14	-13.459	-13.516	-0.057	(0)
Mn (OH) 3-	1.520e-17	1.333e-17	-16.818	-16.875	-0.057	(0)
Mn (NO3) 2	2.484e-22	2.484e-22	-21.605	-21.605	0.000	(0)
Mn (OH) 4-2	3.350e-23	1.981e-23	-22.475	-22.703	-0.228	(0)
MnSe	0.000e+00	0.000e+00	-41.560	-41.560	0.000	(0)
Mn (3)	1.449e-25					
Mn+3	1.449e-25	4.303e-26	-24.839	-25.366	-0.527	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.814	-42.042	-0.228	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.314	-46.376	-0.062	(0)
Mo	6.123e-07					
MoO4-2	6.121e-07	3.569e-07	-6.213	-6.447	-0.234	(0)
HMoO4-	1.824e-10	1.553e-10	-9.739	-9.809	-0.070	(0)
H2MoO4	2.489e-14	2.489e-14	-13.604	-13.604	0.000	(0)
Ag2MoO4	3.946e-25	3.946e-25	-24.404	-24.404	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.105	-43.734	-0.629	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.907	-53.422	-2.515	(0)
HMo7O24-5	0.000e+00	0.000e+00	-52.949	-54.696	-1.747	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.456	-57.574	-1.118	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-61.359	-61.988	-0.629	(0)
N (-3)	4.736e-07					

NH4+	4.526e-07	3.917e-07	-6.344	-6.407	-0.063	(0)
NH4SO4-	1.076e-08	9.434e-09	-7.968	-8.025	-0.057	(0)
NH3	1.021e-08	1.021e-08	-7.991	-7.991	0.000	(0)
CaNH3+2	1.761e-11	9.252e-12	-10.754	-11.034	-0.279	(0)
CuNH3+2	1.063e-11	5.585e-12	-10.973	-11.253	-0.279	(0)
NiNH3+2	2.134e-13	1.121e-13	-12.671	-12.950	-0.279	(0)
AgNH3+	4.185e-14	3.563e-14	-13.378	-13.448	-0.070	(0)
Co (NH3) +2	3.048e-14	1.601e-14	-13.516	-13.795	-0.279	(0)
BaNH3+2	1.732e-16	9.099e-17	-15.762	-16.041	-0.279	(0)
Ag (NH3) 2+	3.473e-18	2.956e-18	-17.459	-17.529	-0.070	(0)
Ni (NH3) 2+2	3.149e-19	1.654e-19	-18.502	-18.781	-0.279	(0)
Hg (NH3) 2+2	1.120e-19	5.884e-20	-18.951	-19.230	-0.279	(0)
Ca (NH3) 2+2	7.157e-20	3.760e-20	-19.145	-19.425	-0.279	(0)
Co (NH3) 2+2	1.327e-20	6.974e-21	-19.877	-20.156	-0.279	(0)
HgNH3+2	1.097e-20	5.763e-21	-19.960	-20.239	-0.279	(0)
Hg (NH3) 3+2	4.552e-27	2.391e-27	-26.342	-26.621	-0.279	(0)
Co (NH3) 3+2	1.706e-27	8.964e-28	-26.768	-27.047	-0.279	(0)
Hg (NH3) 4+2	3.691e-34	1.939e-34	-33.433	-33.712	-0.279	(0)
Co (NH3) 4+2	9.141e-35	4.803e-35	-34.039	-34.318	-0.279	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.389	-40.668	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.810	-42.089	-0.279	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.065	-49.694	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.377	-49.656	-0.279	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.030	-51.309	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.299	-59.369	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.503	-63.783	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.083	-64.363	-0.279	(0)
N (3)	4.565e-06					
NO2-	4.565e-06	3.961e-06	-5.341	-5.402	-0.062	(0)
CuNO2+	2.604e-11	2.217e-11	-10.584	-10.654	-0.070	(0)
AgNO2	1.414e-12	1.414e-12	-11.849	-11.849	0.000	(0)
CoNO2+	4.278e-13	3.642e-13	-12.369	-12.439	-0.070	(0)
Cu (NO2) 2	8.988e-16	8.988e-16	-15.046	-15.046	0.000	(0)
Ag (NO2) 2-	1.019e-17	8.678e-18	-16.992	-17.062	-0.070	(0)
N (5)	3.052e-09					
NO3-	3.045e-09	2.661e-09	-8.516	-8.575	-0.059	(0)
CaNO3+	7.115e-12	6.057e-12	-11.148	-11.218	-0.070	(0)
MnNO3+	4.366e-14	3.717e-14	-13.360	-13.430	-0.070	(0)
ZnNO3+	6.661e-15	5.671e-15	-14.176	-14.246	-0.070	(0)
CuNO3+	5.283e-16	4.498e-16	-15.277	-15.347	-0.070	(0)
BaNO3+	2.213e-16	1.884e-16	-15.655	-15.725	-0.070	(0)
NiNO3+	1.605e-16	1.367e-16	-15.794	-15.864	-0.070	(0)
CoNO3+	6.463e-17	5.502e-17	-16.190	-16.259	-0.070	(0)
CdNO3+	1.679e-17	1.429e-17	-16.775	-16.845	-0.070	(0)
PbNO3+	8.223e-18	7.001e-18	-17.085	-17.155	-0.070	(0)
AgNO3	3.612e-18	3.612e-18	-17.442	-17.442	0.000	(0)
Mn (NO3) 2	2.484e-22	2.484e-22	-21.605	-21.605	0.000	(0)
UO2NO3+	9.790e-23	8.335e-23	-22.009	-22.079	-0.070	(0)
Zn (NO3) 2	3.011e-24	3.011e-24	-23.521	-23.521	0.000	(0)
CrNO3+2	3.952e-25	2.076e-25	-24.403	-24.683	-0.279	(0)
Co (NO3) 2	2.979e-25	2.979e-25	-24.526	-24.526	0.000	(0)
Cu (NO3) 2	1.507e-25	1.507e-25	-24.822	-24.822	0.000	(0)
Pb (NO3) 2	3.164e-26	3.164e-26	-25.500	-25.500	0.000	(0)
VO2NO3	2.604e-26	2.604e-26	-25.584	-25.584	0.000	(0)
Cd (NO3) 2	1.906e-26	1.906e-26	-25.720	-25.720	0.000	(0)
FeNO3+2	6.030e-28	3.168e-28	-27.220	-27.499	-0.279	(0)
HgNO3+	1.032e-30	8.790e-31	-29.986	-30.056	-0.070	(0)
Hg (NO3) 2	9.721e-40	9.721e-40	-39.012	-39.012	0.000	(0)
Na	5.649e-03					
Na+	5.577e-03	4.873e-03	-2.254	-2.312	-0.059	(0)
NaSO4-	6.695e-05	5.882e-05	-4.174	-4.230	-0.056	(0)
NaHCO3	5.053e-06	5.053e-06	-5.296	-5.296	0.000	(0)
NaCO3-	4.081e-07	3.586e-07	-6.389	-6.445	-0.056	(0)
NaF	2.845e-07	2.845e-07	-6.546	-6.546	0.000	(0)
NaH2BO3	3.076e-09	3.076e-09	-8.512	-8.512	0.000	(0)
NaCrO4-	1.434e-17	1.221e-17	-16.843	-16.913	-0.070	(0)
Ni	5.304e-08					
Ni+2	3.507e-08	2.045e-08	-7.455	-7.689	-0.234	(0)

NiSO4	9.171e-09	9.171e-09	-8.038	-8.038	0.000	(0)
NiHCO3+	5.460e-09	4.648e-09	-8.263	-8.333	-0.070	(0)
NiCO3	3.015e-09	3.015e-09	-8.521	-8.521	0.000	(0)
NiOH+	1.391e-10	1.185e-10	-9.857	-9.926	-0.070	(0)
NiCl+	1.179e-10	1.004e-10	-9.928	-9.998	-0.070	(0)
NiF+	5.582e-11	4.752e-11	-10.253	-10.323	-0.070	(0)
Ni (OH) 2	4.330e-12	4.330e-12	-11.363	-11.363	0.000	(0)
Ni (SO4) 2-2	1.299e-12	6.826e-13	-11.886	-12.166	-0.279	(0)
NiNH3+2	2.134e-13	1.121e-13	-12.671	-12.950	-0.279	(0)
Ni (OH) 3-	2.341e-15	1.993e-15	-14.631	-14.701	-0.070	(0)
NiCl2	9.700e-16	9.700e-16	-15.013	-15.013	0.000	(0)
NiSeO4	1.913e-16	1.913e-16	-15.718	-15.718	0.000	(0)
NiNO3+	1.605e-16	1.367e-16	-15.794	-15.864	-0.070	(0)
Ni (NH3) 2+2	3.149e-19	1.654e-19	-18.502	-18.781	-0.279	(0)
O (0)	1.255e-35					
O2	6.273e-36	6.300e-36	-35.203	-35.201	0.002	(0)
Pb	3.211e-09					
PbCO3	2.113e-09	2.113e-09	-8.675	-8.675	0.000	(0)
Pb+2	3.051e-10	1.779e-10	-9.516	-9.750	-0.234	(0)
PbHCO3+	2.862e-10	2.437e-10	-9.543	-9.613	-0.070	(0)
PbOH+	2.415e-10	2.056e-10	-9.617	-9.687	-0.070	(0)
PbSO4	1.958e-10	1.958e-10	-9.708	-9.708	0.000	(0)
Pb (CO3) 2-2	4.584e-11	2.408e-11	-10.339	-10.618	-0.279	(0)
PbCl+	1.423e-11	1.211e-11	-10.847	-10.917	-0.070	(0)
Pb (SO4) 2-2	5.048e-12	2.652e-12	-11.297	-11.576	-0.279	(0)
Pb (OH) 2	2.992e-12	2.992e-12	-11.524	-11.524	0.000	(0)
PbF+	1.362e-12	1.160e-12	-11.866	-11.936	-0.070	(0)
PbCl2	1.038e-13	1.038e-13	-12.984	-12.984	0.000	(0)
PbF2	2.112e-15	2.112e-15	-14.675	-14.675	0.000	(0)
Pb (OH) 3-	1.617e-15	1.377e-15	-14.791	-14.861	-0.070	(0)
PbCl3-	9.315e-17	7.931e-17	-16.031	-16.101	-0.070	(0)
PbNO3+	8.223e-18	7.001e-18	-17.085	-17.155	-0.070	(0)
Pb2OH+3	2.466e-18	5.797e-19	-17.608	-18.237	-0.629	(0)
PbF3-	4.352e-19	3.706e-19	-18.361	-18.431	-0.070	(0)
Pb (OH) 4-2	2.954e-19	1.552e-19	-18.530	-18.809	-0.279	(0)
PbCl4-2	1.324e-19	6.956e-20	-18.878	-19.158	-0.279	(0)
Pb3 (OH) 4+2	6.048e-23	3.178e-23	-22.218	-22.498	-0.279	(0)
PbF4-2	3.123e-23	1.641e-23	-22.505	-22.785	-0.279	(0)
Pb (NO3) 2	3.164e-26	3.164e-26	-25.500	-25.500	0.000	(0)
Pb4 (OH) 4+4	5.892e-28	4.490e-29	-27.230	-28.348	-1.118	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.954	-150.954	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.821	-227.891	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.190	-73.190	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.167	-78.237	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.877	-78.877	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.929	-78.999	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-79.663	-79.942	-0.279	(0)
S6-2	0.000e+00	0.000e+00	-80.179	-80.458	-0.279	(0)
S4-2	0.000e+00	0.000e+00	-80.258	-80.538	-0.279	(0)
S3-2	0.000e+00	0.000e+00	-81.064	-81.344	-0.279	(0)
S2-2	0.000e+00	0.000e+00	-82.080	-82.360	-0.279	(0)
S-2	0.000e+00	0.000e+00	-87.649	-87.877	-0.228	(0)
HgHS2-	0.000e+00	0.000e+00	-137.865	-137.935	-0.070	(0)
HgS2-2	0.000e+00	0.000e+00	-138.703	-138.982	-0.279	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.201	-139.201	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.984	-147.150	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.076	-147.385	-0.309	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.257	-147.327	-0.070	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.819	-148.115	-0.296	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.006	-148.076	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.614	-148.930	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.939	-149.241	-0.302	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.726	-149.726	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.032	-150.032	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.954	-150.954	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.455	-159.455	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.015	-216.084	-0.070	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-224.613	-224.683	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.299	-226.369	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.723	-227.003	-0.279	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.821	-227.891	-0.070	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.585	-235.655	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.131	-302.410	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.100	-304.380	-0.279	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.164	-318.443	-0.279	(0)
S (6)	4.658e-03					
SO4-2	3.856e-03	2.248e-03	-2.414	-2.648	-0.234	(0)
CaSO4	3.707e-04	3.707e-04	-3.431	-3.431	0.000	(0)
MgSO4	3.415e-04	3.415e-04	-3.467	-3.467	0.000	(0)
NaSO4-	6.695e-05	5.882e-05	-4.174	-4.230	-0.056	(0)
KSO4-	1.925e-05	1.691e-05	-4.716	-4.772	-0.056	(0)
MnSO4	3.523e-06	3.523e-06	-5.453	-5.453	0.000	(0)
ZnSO4	4.173e-07	4.173e-07	-6.380	-6.380	0.000	(0)
CuSO4	2.753e-08	2.753e-08	-7.560	-7.560	0.000	(0)
Zn (SO4) 2-2	1.555e-08	8.169e-09	-7.808	-8.088	-0.279	(0)
NH4SO4-	1.076e-08	9.434e-09	-7.968	-8.025	-0.057	(0)
NiSO4	9.171e-09	9.171e-09	-8.038	-8.038	0.000	(0)
CoSO4	5.851e-09	5.851e-09	-8.233	-8.233	0.000	(0)
HSO4-	5.493e-09	4.805e-09	-8.260	-8.318	-0.058	(0)
CdSO4	8.951e-10	8.951e-10	-9.048	-9.048	0.000	(0)
PbSO4	1.958e-10	1.958e-10	-9.708	-9.708	0.000	(0)
AgSO4-	9.003e-11	7.665e-11	-10.046	-10.115	-0.070	(0)
Cd (SO4) 2-2	5.166e-11	2.714e-11	-10.287	-10.566	-0.279	(0)
CrOHSO4	9.586e-12	9.586e-12	-11.018	-11.018	0.000	(0)
Pb (SO4) 2-2	5.048e-12	2.652e-12	-11.297	-11.576	-0.279	(0)
Ni (SO4) 2-2	1.299e-12	6.826e-13	-11.886	-12.166	-0.279	(0)
FeSO4	6.470e-13	6.470e-13	-12.189	-12.189	0.000	(0)
AlSO4+	1.653e-13	1.446e-13	-12.782	-12.840	-0.058	(0)
UO2SO4	5.341e-14	5.341e-14	-13.272	-13.272	0.000	(0)
CrSO4+	1.100e-14	9.369e-15	-13.958	-14.028	-0.070	(0)
Al (SO4) 2-	3.982e-15	3.483e-15	-14.400	-14.458	-0.058	(0)
UO2 (SO4) 2-2	3.012e-15	1.583e-15	-14.521	-14.801	-0.279	(0)
VO2SO4-	1.220e-18	1.038e-18	-17.914	-17.984	-0.070	(0)
FeSO4+	3.424e-19	3.003e-19	-18.465	-18.522	-0.057	(0)
Cr2 (OH) 2SO4+2	2.964e-20	1.557e-20	-19.528	-19.808	-0.279	(0)
Fe (SO4) 2-	1.695e-20	1.443e-20	-19.771	-19.841	-0.070	(0)
VOSO4	4.195e-21	4.195e-21	-20.377	-20.377	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.079e-21	2.079e-21	-20.682	-20.682	0.000	(0)
HgSO4	5.265e-22	5.265e-22	-21.279	-21.279	0.000	(0)
CrO3SO4-2	1.018e-24	5.347e-25	-23.992	-24.272	-0.279	(0)
VSO4+	1.836e-35	1.564e-35	-34.736	-34.806	-0.070	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.102	-40.102	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.074	-41.354	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.299	-59.369	-0.070	(0)
Sb (3)	3.265e-20					
Sb (OH) 3	1.652e-20	1.652e-20	-19.782	-19.782	0.000	(0)
HSbO2	1.613e-20	1.613e-20	-19.792	-19.792	0.000	(0)
SbO2-	1.402e-24	1.194e-24	-23.853	-23.923	-0.070	(0)
Sb (OH) 4-	8.032e-25	6.838e-25	-24.095	-24.165	-0.070	(0)
Sb (OH) 2F	5.223e-26	5.223e-26	-25.282	-25.282	0.000	(0)
SbOF	5.138e-26	5.138e-26	-25.289	-25.289	0.000	(0)
Sb (OH) 2+	1.031e-26	8.776e-27	-25.987	-26.057	-0.070	(0)
SbO+	3.555e-27	3.026e-27	-26.449	-26.519	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.164	-318.443	-0.279	(0)
Sb (5)	9.281e-09					
SbO3-	9.271e-09	7.893e-09	-8.033	-8.103	-0.070	(0)
Sb (OH) 6-	1.056e-11	9.224e-12	-10.977	-11.035	-0.059	(0)
SbO2+	1.273e-24	1.083e-24	-23.895	-23.965	-0.070	(0)
Se (-2)	1.806e-14					
Ag2Se	1.806e-14	1.806e-14	-13.743	-13.743	0.000	(0)
HSe-	1.950e-39	1.660e-39	-38.710	-38.780	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-41.560	-41.560	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.550	-42.550	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.840	-46.120	-0.279	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.738	-83.856	-1.118	(0)

Se (4)	5.419e-08					
HSeO3-	4.185e-08	3.563e-08	-7.378	-7.448	-0.070	(0)
SeO3-2	1.234e-08	6.484e-09	-7.909	-8.188	-0.279	(0)
H2SeO3	3.324e-13	3.324e-13	-12.478	-12.478	0.000	(0)
AgSeO3-	8.366e-15	7.123e-15	-14.077	-14.147	-0.070	(0)
Cd (SeO3) 2-2	1.120e-19	5.886e-20	-18.951	-19.230	-0.279	(0)
Ag (SeO3) 2-3	1.759e-21	4.135e-22	-20.755	-21.384	-0.629	(0)
FeHSeO3+2	2.133e-24	1.121e-24	-23.671	-23.950	-0.279	(0)
Se (6)	3.436e-11					
SeO4-2	3.431e-11	2.000e-11	-10.465	-10.699	-0.234	(0)
MnSeO4	4.745e-14	4.745e-14	-13.324	-13.324	0.000	(0)
ZnSeO4	2.629e-15	2.629e-15	-14.580	-14.580	0.000	(0)
NiSeO4	1.913e-16	1.913e-16	-15.718	-15.718	0.000	(0)
CoSeO4	1.308e-16	1.308e-16	-15.883	-15.883	0.000	(0)
HSeO4-	2.576e-17	2.193e-17	-16.589	-16.659	-0.070	(0)
CdSeO4	6.327e-18	6.327e-18	-17.199	-17.199	0.000	(0)
Zn (SeO4) 2-2	1.015e-25	5.331e-26	-24.994	-25.273	-0.279	(0)
Si	8.833e-05					
H4SiO4	8.767e-05	8.804e-05	-4.057	-4.055	0.002	(0)
H3SiO4-	6.668e-07	5.818e-07	-6.176	-6.235	-0.059	(0)
H2SiO4-2	2.816e-12	1.678e-12	-11.550	-11.775	-0.225	(0)
UO2H3SiO4+	9.108e-13	7.754e-13	-12.041	-12.110	-0.070	(0)
SiF6-2	3.240e-29	1.916e-29	-28.489	-28.718	-0.228	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.511	-59.140	-0.629	(0)
U (4)	8.801e-21					
U (OH) 5-	8.794e-21	7.487e-21	-20.056	-20.126	-0.070	(0)
U (OH) 4	6.861e-24	6.861e-24	-23.164	-23.164	0.000	(0)
U (OH) 3+	6.447e-28	5.489e-28	-27.191	-27.261	-0.070	(0)
U (OH) 2+2	1.057e-32	5.553e-33	-31.976	-32.255	-0.279	(0)
UF3+	1.833e-36	1.561e-36	-35.737	-35.807	-0.070	(0)
UF2+2	2.026e-37	1.065e-37	-36.693	-36.973	-0.279	(0)
UOH+3	2.435e-38	5.723e-39	-37.614	-38.242	-0.629	(0)
UF4	1.584e-38	1.584e-38	-37.800	-37.800	0.000	(0)
UF+3	3.888e-40	0.000e+00	-39.410	-40.039	-0.629	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.102	-40.102	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.166	-40.236	-0.070	(0)
USO4+2	0.000e+00	0.000e+00	-41.074	-41.354	-0.279	(0)
UF6-2	0.000e+00	0.000e+00	-41.510	-41.790	-0.279	(0)
U+4	0.000e+00	0.000e+00	-44.187	-45.305	-1.118	(0)
UCl+3	0.000e+00	0.000e+00	-45.693	-46.322	-0.629	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.428	-174.088	-5.660	(0)
U (5)	1.028e-16					
UO2+	1.028e-16	8.755e-17	-15.988	-16.058	-0.070	(0)
U (6)	8.793e-08					
UO2 (CO3) 3-4	5.061e-08	3.857e-09	-7.296	-8.414	-1.118	(0)
UO2 (CO3) 2-2	3.707e-08	1.947e-08	-7.431	-7.711	-0.279	(0)
UO2CO3	2.470e-10	2.470e-10	-9.607	-9.607	0.000	(0)
UO2OH+	1.068e-12	9.095e-13	-11.971	-12.041	-0.070	(0)
UO2H3SiO4+	9.108e-13	7.754e-13	-12.041	-12.110	-0.070	(0)
UO2F+	2.355e-13	2.005e-13	-12.628	-12.698	-0.070	(0)
UO2F2	5.350e-14	5.350e-14	-13.272	-13.272	0.000	(0)
UO2SO4	5.341e-14	5.341e-14	-13.272	-13.272	0.000	(0)
UO2+2	2.693e-14	1.570e-14	-13.570	-13.804	-0.234	(0)
UO2 (SO4) 2-2	3.012e-15	1.583e-15	-14.521	-14.801	-0.279	(0)
UO2F3-	1.460e-15	1.243e-15	-14.836	-14.905	-0.070	(0)
UO2Cl+	5.739e-17	4.886e-17	-16.241	-16.311	-0.070	(0)
(UO2) 2 (OH) 2+2	2.613e-18	1.373e-18	-17.583	-17.862	-0.279	(0)
UO2F4-2	1.739e-18	9.138e-19	-17.760	-18.039	-0.279	(0)
(UO2) 3 (OH) 5+	2.356e-19	2.006e-19	-18.628	-18.698	-0.070	(0)
UO2NO3+	9.790e-23	8.335e-23	-22.009	-22.079	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.937	-43.007	-0.070	(0)
V+2	0.000e+00	0.000e+00	-43.901	-44.180	-0.279	(0)
V (3)	1.158e-15					
V (OH) 3	1.158e-15	1.158e-15	-14.936	-14.936	0.000	(0)
V (OH) 2+	1.923e-26	1.638e-26	-25.716	-25.786	-0.070	(0)
VOH+2	6.468e-30	3.398e-30	-29.189	-29.469	-0.279	(0)

V+3	6.269e-35	1.474e-35	-34.203	-34.832	-0.629	(0)
VSO4+	1.836e-35	1.564e-35	-34.736	-34.806	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-56.174	-56.803	-0.629	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-57.019	-58.137	-1.118	(0)
V (4)	7.522e-19					
V (OH) 3+	7.305e-19	6.219e-19	-18.136	-18.206	-0.070	(0)
VO+2	1.290e-20	6.776e-21	-19.890	-20.169	-0.279	(0)
VOF+	4.416e-21	3.760e-21	-20.355	-20.425	-0.070	(0)
VOSO4	4.195e-21	4.195e-21	-20.377	-20.377	0.000	(0)
VOF2	1.305e-22	1.305e-22	-21.885	-21.885	0.000	(0)
VOC1+	4.284e-23	3.648e-23	-22.368	-22.438	-0.070	(0)
VOF3-	5.030e-25	4.282e-25	-24.298	-24.368	-0.070	(0)
VOF4-2	3.044e-28	1.599e-28	-27.517	-27.796	-0.279	(0)
H2V2O4+2	3.692e-32	1.940e-32	-31.433	-31.712	-0.279	(0)
V (5)	2.822e-09					
H2VO4-	2.378e-09	2.025e-09	-8.624	-8.694	-0.070	(0)
HVO4-2	4.426e-10	2.325e-10	-9.354	-9.634	-0.279	(0)
H3VO4	4.430e-13	4.430e-13	-12.354	-12.354	0.000	(0)
H3V2O7-	6.805e-15	5.793e-15	-14.167	-14.237	-0.070	(0)
HV2O7-3	6.791e-16	1.596e-16	-15.168	-15.797	-0.629	(0)
VO4-3	2.267e-16	5.328e-17	-15.645	-16.273	-0.629	(0)
VO2+	2.214e-17	1.934e-17	-16.655	-16.713	-0.059	(0)
VO2F	3.139e-18	3.139e-18	-17.503	-17.503	0.000	(0)
V2O7-4	2.577e-18	1.964e-19	-17.589	-18.707	-1.118	(0)
VO2SO4-	1.220e-18	1.038e-18	-17.914	-17.984	-0.070	(0)
VO2F2-	1.239e-19	1.055e-19	-18.907	-18.977	-0.070	(0)
V3O9-3	3.703e-20	8.704e-21	-19.431	-20.060	-0.629	(0)
VO2F3-2	2.316e-22	1.217e-22	-21.635	-21.915	-0.279	(0)
V4O12-4	9.644e-26	7.350e-27	-25.016	-26.134	-1.118	(0)
VO2NO3	2.604e-26	2.604e-26	-25.584	-25.584	0.000	(0)
VO2F4-3	2.357e-26	5.540e-27	-25.628	-26.256	-0.629	(0)
V10O28-6	0.000e+00	0.000e+00	-66.153	-68.669	-2.515	(0)
HV10O28-5	0.000e+00	0.000e+00	-66.395	-68.142	-1.747	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.476	-70.594	-1.118	(0)
Zn	2.197e-06					
Zn+2	1.455e-06	8.485e-07	-5.837	-6.071	-0.234	(0)
ZnSO4	4.173e-07	4.173e-07	-6.380	-6.380	0.000	(0)
ZnCO3	1.930e-07	1.930e-07	-6.715	-6.715	0.000	(0)
ZnHCO3+	5.811e-08	4.948e-08	-7.236	-7.306	-0.070	(0)
ZnOH+	4.586e-08	3.905e-08	-7.339	-7.408	-0.070	(0)
Zn (SO4) 2-2	1.555e-08	8.169e-09	-7.808	-8.088	-0.279	(0)
ZnCl+	4.687e-09	4.090e-09	-8.329	-8.388	-0.059	(0)
Zn (OH) 2	2.848e-09	2.848e-09	-8.545	-8.545	0.000	(0)
ZnOHCl	2.464e-09	2.464e-09	-8.608	-8.608	0.000	(0)
ZnF+	1.840e-09	1.566e-09	-8.735	-8.805	-0.070	(0)
ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
Zn (OH) 3-	7.715e-12	6.568e-12	-11.113	-11.183	-0.070	(0)
ZnCl3-	2.173e-14	1.896e-14	-13.663	-13.722	-0.059	(0)
ZnNO3+	6.661e-15	5.671e-15	-14.176	-14.246	-0.070	(0)
ZnSeO4	2.629e-15	2.629e-15	-14.580	-14.580	0.000	(0)
Zn (OH) 4-2	2.290e-16	1.203e-16	-15.640	-15.920	-0.279	(0)
ZnCl4-2	3.076e-17	1.819e-17	-16.512	-16.740	-0.228	(0)
Zn (NO3) 2	3.011e-24	3.011e-24	-23.521	-23.521	0.000	(0)
Zn (SeO4) 2-2	1.015e-25	5.331e-26	-24.994	-25.273	-0.279	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.006	-148.076	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.726	-149.726	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.613	-224.683	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.723	-227.003	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.100	-304.380	-0.279	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.14	-48.85	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.64	-37.13	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.87	-37.13	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.39	-53.45	17.93	(Co (NH3) 6) (NO3) 3

(Co (NH3) 6) Cl3	-55.91	-35.88	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.52	-28.11	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.96	-23.51	0.45	(NH4) 2SeO4
Acanthite	-51.89	-88.11	-36.22	Ag2S
Ag2CO3	-11.85	-22.94	-11.09	Ag2CO3
Ag2CrO4	-21.24	-32.83	-11.59	Ag2CrO4
Ag2HVO4	-12.75	-11.27	1.48	Ag2HVO4
Ag2MoO4	-12.43	-23.98	-11.55	Ag2MoO4
Ag2O	-14.79	-2.21	12.57	Ag2O
Ag2Se	0.05	-48.65	-48.70	Ag2Se
Ag2SeO3	-10.17	-17.32	-7.15	Ag2SeO3
Ag2SeO4	-19.32	-28.23	-8.91	Ag2SeO4
Ag2SO4	-15.36	-20.18	-4.82	Ag2SO4
Ag3AsO3	-27.95	-25.79	2.16	Ag3AsO3
Ag3AsO4	-16.51	-19.29	-2.79	Ag3AsO4
Ag3H2VO5	-17.56	-12.38	5.18	Ag3H2VO5
AgF·4H2O	-13.85	-12.80	1.05	AgF·4H2O
Agmetal	-0.30	-13.81	-13.51	Ag
AgVO3	-10.93	-10.16	0.77	AgVO3
Al (OH) 3 (am)	-1.90	8.90	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.87	-47.51	2.37	Al2 (MoO4) 3
Al2O3	-1.86	17.80	19.65	Al2O3
Al4 (OH) 10SO4	-5.07	17.63	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-11.87	-7.07	4.80	AlAsO4·2H2O
AlOHSO4	-5.84	-9.07	-3.23	AlOHSO4
AlSb	-152.70	-87.08	65.62	AlSb
Alunite	-3.16	-4.56	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.61	-12.40	-7.79	PbSO4
Anhydrite	-1.43	-5.79	-4.36	CaSO4
Anilite	-54.95	-86.83	-31.88	Cu0.25Cu1.5S
Antlerite	-2.61	6.18	8.79	Cu3 (OH) 4SO4
Aragonite	-0.25	-8.55	-8.30	CaCO3
Arsenolite	-87.12	-89.88	-2.76	As4O6
Artinite	-5.84	3.76	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.65	-31.94	6.71	As2O5
Atacamite	-1.67	5.72	7.39	Cu2 (OH) 3Cl
Azurite	-0.40	-17.30	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-16.93	7.47	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-19.04	-3.17	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-0.62	-9.53	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-28.64	4.30	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-10.10	-15.92	-5.82	BaF2
BaMoO4	-7.34	-14.30	-6.96	BaMoO4
Barite	-0.52	-10.50	-9.98	BaSO4
BaS	-94.61	-78.43	16.18	BaS
BaSeO3	-9.47	-7.64	1.83	BaSeO3
BaSeO4	-11.09	-18.55	-7.46	BaSeO4
Bianchite	-6.96	-8.72	-1.76	ZnSO4·6H2O
Birnessite	-7.78	10.31	18.09	MnO2
Bixbyite	-4.13	-4.77	-0.64	Mn2O3
BlaubleiI	-54.88	-79.05	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.36	-82.64	-27.28	Cu0.6Cu0.8S
Boehmite	0.32	8.90	8.58	AlOOH
Breithauptite	-57.12	-75.64	-18.52	NiSb
Brochantite	-1.00	14.22	15.22	Cu4 (OH) 6SO4
Brucite	-4.60	12.24	16.84	Mg (OH) 2
Bunsenite	-4.81	7.63	12.45	NiO
Ca (VO3) 2	-11.59	-5.93	5.66	Ca (VO3) 2
Ca2V2O7	-11.25	6.25	17.50	Ca2V2O7
Ca2V2O7·2H2O	-15.30	6.25	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-17.71	4.59	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-20.54	18.42	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-21.44	18.42	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-298.39	-155.42	142.97	Ca3Sb2
CaCrO4	-16.17	-18.44	-2.27	CaCrO4
Calcite	-0.07	-8.55	-8.48	CaCO3
Calomel	-8.90	-26.81	-17.91	Hg2Cl2

CaMoO4	-1.64	-9.59	-7.95	CaMoO4
Carnotite	-3.08	-2.85	0.23	KUO2VO4
CaSeO3:2H2O	-5.75	-2.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.82	-13.84	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.94	-3.10	9.84	Cd(BO2)2
Cd(OH)2	-7.09	6.55	13.64	Cd(OH)2
Cd(OH)2(am)	-7.18	6.55	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.00	-16.29	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.88	1.68	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.17	8.23	28.40	Cd4(OH)6SO4
CdCl2	-13.54	-14.20	-0.66	CdCl2
CdCl2:1H2O	-12.51	-14.20	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.29	-14.20	-1.91	CdCl2:2.5H2O
CdF2	-15.63	-16.84	-1.21	CdF2
Cdmetal(alpha)	-32.36	-18.85	13.51	Cd
Cdmetal(gamma)	-32.47	-18.85	13.62	Cd
CdMoO4	-1.07	-15.22	-14.15	CdMoO4
CdOHCl	-7.36	-3.83	3.54	CdOHCl
CdSb	-76.37	-76.72	-0.35	CdSb
CdSe	-19.69	-39.89	-20.20	CdSe
CdSeO4:2H2O	-17.62	-19.47	-1.85	CdSeO4:2H2O
CdSO4	-11.25	-11.42	-0.17	CdSO4
CdSO4:1H2O	-9.69	-11.42	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.55	-11.42	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.73	-11.48	-9.75	AgCl
Cerrusite	-2.02	-15.15	-13.13	PbCO3
CH4(g)	-81.27	-122.31	-41.05	CH4
Chalcanthite	-7.28	-9.92	-2.64	CuSO4:5H2O
Chalcedony	-0.51	-4.06	-3.55	SiO2
Chalcocite	-54.90	-89.82	-34.92	Cu2S
Chalcopyrite	-125.09	-160.36	-35.27	CuFeS2
Chrysotile	-3.59	28.61	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.13	-97.82	-45.69	HgS
Claudetite	-86.82	-89.88	-3.06	As4O6
Clausthalite	-13.77	-40.87	-27.10	PbSe
Co(BO2)2	-29.28	-2.21	27.07	Co(BO2)2
Co(OH)2	-5.66	7.44	13.09	Co(OH)2
Co(OH)3	-9.96	-12.27	-2.31	Co(OH)3
CO2(g)	-2.58	-20.72	-18.15	CO2
Co3(AsO4)2	-22.67	-9.64	13.03	Co3(AsO4)2
Co3O4	-6.60	-17.10	-10.50	Co3O4
CoCl2	-21.59	-13.32	8.27	CoCl2
CoCl2:6H2O	-15.86	-13.32	2.54	CoCl2:6H2O
CoCO3	-3.31	-13.29	-9.98	CoCO3
CoF2	-14.36	-15.95	-1.60	CoF2
CoF3	-45.89	-47.35	-1.46	CoF3
CoFe2O4	17.08	13.55	-3.53	CoFe2O4
CoMoO4	-6.57	-14.33	-7.76	CoMoO4
CoO	-6.15	7.44	13.59	CoO
CoS(alpha)	-71.02	-78.46	-7.44	CoS
CoS(beta)	-67.39	-78.46	-11.07	CoS
CoSe	-22.80	-39.00	-16.20	CoSe
CoSeO3	-8.99	-7.67	1.32	CoSeO3
CoSeO4:6H2O	-17.05	-18.58	-1.53	CoSeO4:6H2O
CoSO4	-13.34	-10.53	2.80	CoSO4
CoSO4:6H2O	-8.06	-10.53	-2.47	CoSO4:6H2O
Cotunnite	-10.40	-15.18	-4.78	PbCl2
Covellite	-55.55	-77.85	-22.30	CuS
Cr(OH)2	-21.91	-11.09	10.82	Cr(OH)2
Cr(OH)3	-2.67	-1.34	1.34	Cr(OH)3
Cr(OH)3(am)	-0.59	-1.34	-0.75	Cr(OH)3
Cr2O3	-0.32	-2.67	-2.36	Cr2O3
CrCl2	-45.93	-31.84	14.09	CrCl2
CrCl3	-47.58	-32.47	15.11	CrCl3
CrF3	-25.08	-36.42	-11.34	CrF3
Cristobalite	-0.71	-4.06	-3.35	SiO2
Crmetal	-66.97	-36.49	30.48	Cr
CrO3	-27.41	-30.62	-3.21	CrO3

Cryolite	-11.38	-45.22	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.63	8.05	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-25.93	19.28	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-9.39	-0.14	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb·3H ₂ O	-55.00	-89.89	-34.88	Cu ₂ Sb·3H ₂ O
Cu ₂ Se(alpha)	-4.56	-50.36	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.94	-21.89	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-13.90	-7.80	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-59.26	-101.86	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-25.26	-88.75	-63.49	Cu ₃ Se ₂
CuCO ₃	-1.18	-12.68	-11.50	CuCO ₃
CuCrO ₄	-17.13	-22.57	-5.44	CuCrO ₄
CuF	-8.75	-13.65	-4.91	CuF
CuF ₂	-16.45	-15.34	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-10.79	-15.34	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-5.90	-14.66	-8.76	Cu
CuMoO ₄	-0.64	-13.72	-13.08	CuMoO ₄
CuOCuSO ₄	-12.18	-1.87	10.30	CuOCuSO ₄
Cupricferrite	8.17	14.16	5.99	CuFe ₂ O ₄
Cuprite	-2.52	-3.92	-1.41	Cu ₂ O
Cuprousferrite	10.01	1.10	-8.92	CuFeO ₂
CuSe	-5.29	-38.39	-33.10	CuSe
CuSe ₂	-26.07	-59.43	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-7.57	-7.06	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-15.53	-17.97	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.86	-9.92	2.94	CuSO ₄
Diaspore	2.03	8.90	6.87	AlOOH
Djurleite	-55.11	-89.03	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.49	-17.03	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	0.06	-17.03	-17.09	CaMg(CO ₃) ₂
Epsomite	-3.60	-5.73	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.17	3.39	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	2.98	-0.06	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-11.00	-14.72	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-10.55	-9.00	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-18.59	-39.21	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-44.06	-47.79	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.72	9.50	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-13.32	-12.92	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.49	0.71	7.20	FeCr ₂ O ₄
FeMoO ₄	-8.29	-18.38	-10.09	FeMoO ₄
Ferrihydrite	-0.14	3.06	3.19	Fe(OH) ₃
Ferroselite	-45.50	-64.09	-18.60	FeSe ₂
FeS(ppt)	-79.56	-82.51	-2.95	FeS
FeSe	-32.05	-43.05	-11.00	FeSe
Fix_pe	-5.04	-5.04	0.00	e-
Fluorite	-0.71	-11.21	-10.50	CaF ₂
Galena	-66.36	-80.33	-13.97	PbS
Gibbsite	0.61	8.90	8.29	Al(OH) ₃
Goethite	2.56	3.06	0.49	FeOOH
Goslarite	-6.71	-8.72	-2.01	ZnSO ₄ ·7H ₂ O
Greenalite	-18.75	2.06	20.81	Fe ₃ Si ₂ O ₅ (OH) ₄
Greenockite	-64.99	-79.35	-14.36	CdS
Greigite	-289.05	-334.09	-45.03	Fe ₃ S ₄
Gummite	-6.16	1.52	7.67	UO ₃
Gypsum	-1.18	-5.79	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-14.67	-26.77	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.89	-21.77	-12.88	H ₂ MoO ₄
H ₂ S(g)	-77.89	-85.90	-8.01	H ₂ S
H ₂ Se(g)	-41.48	-46.44	-4.96	H ₂ Se
Halite	-6.63	-5.03	1.60	NaCl
Halloysite	0.11	9.69	9.57	Al ₂ Si ₂ O ₅ (OH) ₄
Hausmannite	-4.84	56.19	61.03	Mn ₃ O ₄
Hematite	7.53	6.11	-1.42	Fe ₂ O ₃
Hercynite	-1.71	21.19	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-182.84	-256.55	-73.71	Hg(CH ₃) ₂
Hg(g)	-7.85	-15.73	-7.87	Hg
Hg(OH) ₂	-8.43	-11.92	-3.50	Hg(OH) ₂

Hg2 (g)	-16.50	-31.45	-14.96	Hg2
Hg2 (OH) 2	-11.32	-6.06	5.26	Hg2 (OH) 2
Hg2CO3	-10.73	-26.78	-16.05	Hg2CO3
Hg2CrO4	-27.97	-36.67	-8.70	Hg2CrO4
Hg2F2	-19.08	-29.44	-10.36	Hg2F2
Hg2S	-80.28	-91.95	-11.68	Hg2S
Hg2SeO3	-16.51	-21.17	-4.66	Hg2SeO3
Hg2SO4	-17.90	-24.03	-6.13	Hg2SO4
Hg3O2CO3	-26.81	-56.49	-29.68	Hg3O2CO3
HgCl (g)	-32.90	-13.41	19.50	HgCl
HgCl2	-11.41	-32.68	-21.26	HgCl2
HgF (g)	-47.40	-14.72	32.68	HgF
HgF2 (g)	-47.88	-35.31	12.57	HgF2
Hgmetal (l)	-2.28	-15.73	-13.45	Hg
HgSe	-2.67	-58.36	-55.69	HgSe
HgSeO3	-14.60	-27.03	-12.43	HgSeO3
HgSO4	-20.47	-29.89	-9.42	HgSO4
Huntite	-4.02	-33.99	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.97	-24.74	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.92	-21.69	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.18	-22.35	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.28	-22.08	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.62	-51.86	-17.24	K2Cr2O7
K2CrO4	-20.73	-21.24	-0.51	K2CrO4
K2MoO4	-15.66	-12.39	3.26	K2MoO4
K2SeO4	-15.92	-16.65	-0.73	K2SeO4
Kaolinite	2.25	9.69	7.43	Al2Si2O5 (OH) 4
Langite	-3.27	14.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.39	-6.83	-0.43	PbO : PbSO4
Laurionite	-5.43	-4.81	0.62	PbOHCl
Lepidocrocite	1.68	3.06	1.37	FeOOH
Lime	-20.52	12.18	32.70	CaO
Litharge	-7.12	5.57	12.69	PbO
Mackinawite	-78.91	-82.51	-3.60	FeS
Maghemite	-0.27	6.11	6.39	Fe2O3
Magnesioferrite	1.49	18.35	16.86	Fe2MgO4
Magnesite	-1.02	-8.48	-7.46	MgCO3
Magnetite	6.10	9.50	3.40	Fe3O4
Malachite	0.68	-4.63	-5.31	Cu2 (OH) 2CO3
Manganite	-2.38	22.96	25.34	MnOOH
Massicot	-7.32	5.57	12.89	PbO
Matlockite	-7.53	-16.50	-8.97	PbClF
Melanothallite	-18.96	-12.71	6.26	CuCl2
Melanterite	-12.37	-14.58	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.73	-97.82	-45.09	HgS
Mg (OH) 2 (active)	-6.55	12.24	18.79	Mg (OH) 2
Mg (VO3) 2	-17.15	-5.87	11.28	Mg (VO3) 2
Mg2Sb3	-274.63	-199.94	74.68	Mg2Sb3
Mg2V2O7	-19.98	6.38	26.36	Mg2V2O7
MgCr2O4	-6.63	9.57	16.20	MgCr2O4
MgCrO4	-23.76	-18.38	5.38	MgCrO4
MgF2	-3.02	-11.15	-8.13	MgF2
MgMoO4	-7.68	-9.53	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.92	-2.87	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.58	-13.78	-1.20	MgSeO4 : 6H2O
Minium	-31.41	42.11	73.52	Pb3O4
Mirabilite	-6.16	-7.27	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-12.74	-7.84	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.97	-58.68	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.22	-88.14	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.65	-1.15	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.20	-10.49	2.72	MnCl2 : 4H2O
MnS (grn)	-75.80	-75.63	0.17	MnS
MnS (pnk)	-78.97	-75.63	3.34	MnS
MnSb	-95.45	-98.36	-2.91	MnSb
MnSe	-39.67	-36.17	3.50	MnSe
MnSeO3	-5.97	-4.84	1.13	MnSeO3
MnSeO3 : 2H2O	-5.83	-4.84	0.98	MnSeO3 : 2H2O

MnSeO4:5H2O	-13.70	-15.75	-2.05	MnSeO4:5H2O
MnSO4	-10.29	-7.70	2.58	MnSO4
Monteponite	-8.55	6.55	15.10	CdO
Montroydite	-8.28	-11.92	-3.64	HgO
MoO3	-13.77	-21.77	-8.00	MoO3
Morenosite	-8.19	-10.34	-2.14	NiSO4:7H2O
MoS2	-148.70	-218.96	-70.26	MoS2
Na-Jarosite	-10.22	-21.42	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.64	-50.54	-9.90	Na2Cr2O7
Na2CrO4	-22.85	-19.92	2.93	Na2CrO4
Na2Mo2O7	-16.24	-32.84	-16.60	Na2Mo2O7
Na2MoO4	-12.56	-11.07	1.49	Na2MoO4
Na2MoO4:2H2O	-12.30	-11.07	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.71	-4.41	10.30	Na2SeO3:5H2O
Na2SeO4	-16.60	-15.32	1.28	Na2SeO4
Na3Sb	-174.38	-79.93	94.45	Na3Sb
Na3VO4	-29.69	6.99	36.68	Na3VO4
Na4V2O7	-34.12	3.28	37.40	Na4V2O7
Nantokite	-5.61	-12.34	-6.73	CuCl
NaSb	-88.39	-65.23	23.17	NaSb
Natron	-8.72	-10.03	-1.31	Na2CO3:10H2O
NaVO3	-7.56	-3.71	3.86	NaVO3
Nesquehonite	-3.81	-8.48	-4.67	MgCO3:3H2O
Ni(OH)2	-5.16	7.63	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.75	-9.05	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.45	12.55	32.00	Ni4(OH)6SO4
NiCO3	-6.22	-13.09	-6.87	NiCO3
NiMoO4	-2.99	-14.14	-11.14	NiMoO4
NiS(alpha)	-72.67	-78.27	-5.60	NiS
NiS(beta)	-67.17	-78.27	-11.10	NiS
NiS(gamma)	-65.47	-78.27	-12.80	NiS
NiSe	-21.11	-38.81	-17.70	NiSe
NiSeO3:2H2O	-10.29	-7.48	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.87	-18.39	-1.52	NiSeO4:6H2O
Nsutite	-7.19	10.31	17.50	MnO2
O2(g)	-32.29	50.79	83.09	O2
Orpiment	-241.57	-302.63	-61.07	As2S3
Otavite	-2.17	-14.17	-12.00	CdCO3
Pb(BO2)2	-10.60	-4.08	6.52	Pb(BO2)2
Pb(OH)2	-2.58	5.57	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-59.88	-68.64	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.03	0.76	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.05	11.14	26.19	Pb2O(OH)2
Pb2O3	-24.50	36.54	61.04	Pb2O3
Pb2OCO3	-9.03	-9.58	-0.56	Pb2OCO3
Pb2V2O7	-5.07	-6.97	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.03	-15.23	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.54	-1.40	6.14	Pb3(VO4)2
Pb3O2CO3	-15.03	-4.01	11.02	Pb3O2CO3
Pb3O2SO4	-11.94	-1.26	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.79	4.31	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.56	4.31	21.88	Pb4O3SO4
PbCrO4	-12.45	-25.05	-12.60	PbCrO4
PbF2	-10.38	-17.82	-7.44	PbF2
Pbmetal	-24.07	-19.83	4.25	Pb
PbMoO4	-0.58	-16.20	-15.62	PbMoO4
PbO:0.3H2O	-7.41	5.57	12.98	PbO:0.33H2O
PbSeO4	-13.61	-20.45	-6.84	PbSeO4
Periclase	-9.34	12.24	21.58	MgO
Phosgenite	-10.53	-30.34	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-10.63	12.18	22.80	Ca(OH)2
Pyrite	-124.50	-143.01	-18.51	FeS2
Pyrochroite	-4.93	10.26	15.19	Mn(OH)2
Pyrolusite	-5.72	35.66	41.38	MnO2
Quartz	-0.06	-4.06	-4.00	SiO2
Realgar	-101.32	-121.07	-19.75	AsS
Retgersite	-8.30	-10.34	-2.04	NiSO4:6H2O

Rhodochrosite	0.12	-10.46	-10.58	MnCO3
Rutherfordine	-4.71	-19.21	-14.50	UO2CO3
Sb(OH)3	-12.67	-19.78	-7.11	Sb(OH)3
Sb2O4	-17.57	-14.17	3.40	Sb2O4
Sb2O5	-27.72	-37.39	-9.67	Sb2O5
Sb2Se3	-111.13	-178.88	-67.76	Sb2Se3
Sb4O6(cubic)	-60.87	-79.13	-18.26	Sb4O6
Sb4O6(orth)	-61.23	-79.13	-17.90	Sb4O6
SbCl3	-51.48	-50.91	0.57	SbCl3
SbF3	-44.64	-54.86	-10.23	SbF3
Sbmetal	-46.19	-57.88	-11.69	Sb
SbO2	-3.57	-31.39	-27.82	SbO2
Schoepite	-4.48	1.52	5.99	UO2(OH)2·H2O
Semetal(am)	-13.93	-21.04	-7.11	Se
Semetal(hex)	-13.33	-21.04	-7.71	Se
Senarmontite	-27.20	-39.56	-12.37	Sb2O3
SeO2	-15.23	-15.11	0.12	SeO2
SeO3	-47.06	-26.02	21.04	SeO3
Sepiolite	-3.44	12.32	15.76	Mg2Si3O7·5OH·3H2O
Sepiolite(A)	-6.46	12.32	18.78	Mg2Si3O7·5OH·3H2O
Siderite	-7.09	-17.33	-10.24	FeCO3
SiO2(am-gel)	-1.35	-4.06	-2.71	SiO2
SiO2(am-ppt)	-1.32	-4.06	-2.74	SiO2
Smithsonite	-1.47	-11.47	-10.00	ZnCO3
Sphalerite	-65.20	-76.65	-11.45	ZnS
Spinel	-6.81	30.04	36.85	MgAl2O4
Stibnite	-246.79	-297.25	-50.46	Sb2S3
Sulfur	-58.35	-60.50	-2.14	S
Tenorite	0.40	8.05	7.64	CuO
Thenardite	-7.59	-7.27	0.32	Na2SO4
Thermonatrite	-10.66	-10.03	0.64	Na2CO3·H2O
Tyuyamunite	-6.98	-2.90	4.08	Ca(UO2)2(VO4)2
U3O8	-14.28	6.80	21.08	U3O8
U3Sb4	-580.27	-427.89	152.38	U3Sb4
U4O9	-30.24	-33.26	-3.02	U4O9
UF4	-31.90	-61.44	-29.54	UF4
UF4·2.5H2O	-28.72	-61.44	-32.72	UF4·2.5H2O
UO2(am)	-15.60	-14.67	0.93	UO2
UO2(NO3)2	-43.10	-30.95	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-35.81	-30.95	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-34.34	-30.95	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-33.00	-30.95	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-4.10	1.52	5.61	UO2(OH)2
UO2SeO4·4H2O	-22.25	-24.50	-2.25	UO2SeO4·4H2O
UO3	-6.18	1.52	7.70	UO3
Uraninite	-10.00	-14.67	-4.67	UO2
USb2	-220.01	-190.43	29.58	USb2
V(OH)3	-19.44	-11.85	7.59	V(OH)3
V2O5	-16.75	-18.11	-1.36	V2O5
V3O5	-41.78	-39.94	1.84	V3O5
V4O7	-51.98	-44.79	7.19	V4O7
V6O13	-44.26	-105.12	-60.86	V6O13
Valentinite	-31.08	-39.56	-8.48	Sb2O3
VC12	-64.18	-45.30	18.87	VC12
VC13	-66.42	-42.98	23.43	VC13
VF4	-66.55	-51.62	14.93	VF4
Vmetal	-93.97	-49.95	44.03	V
VO	-39.31	-24.55	14.76	VO
VO(OH)2	-10.00	-4.85	5.15	VO(OH)2
VO2Cl	-22.27	-19.43	2.84	VO2Cl
VOC1	-33.38	-22.23	11.15	VOC1
VOC12	-38.36	-25.60	12.76	VOC12
VOSO4	-26.43	-22.82	3.61	VOSO4
Witherite	-4.68	-13.25	-8.57	BaCO3
Wurtzite	-67.70	-76.65	-8.95	ZnS
Zincite	-2.09	9.25	11.33	ZnO
Zincosite	-12.65	-8.72	3.93	ZnSO4
Zn(BO2)2	-8.69	-0.40	8.29	Zn(BO2)2

Zn(NO3)2:6H2O	-26.54	-23.22	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.95	9.25	12.20	Zn(OH)2
Zn(OH)2(am)	-3.23	9.25	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.51	9.25	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.29	9.25	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.49	9.25	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.97	0.53	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.07	8.12	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.85	-4.20	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.10	-8.19	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.37	19.03	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.01	25.49	38.50	Zn5(OH)8Cl2
ZnCl2	-18.56	-11.51	7.05	ZnCl2
ZnCO3:1H2O	-1.21	-11.47	-10.26	ZnCO3:1H2O
ZnF2	-13.60	-14.14	-0.53	ZnF2
Znmetal	-41.94	-16.15	25.79	Zn
ZnMoO4	-2.39	-12.52	-10.13	ZnMoO4
ZnO(active)	-1.94	9.25	11.19	ZnO
ZnS(am)	-67.60	-76.65	-9.05	ZnS
ZnSb	-85.04	-74.03	11.01	ZnSb
ZnSe	-22.79	-37.19	-14.40	ZnSe
ZnSeO4:6H2O	-15.25	-16.77	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.08	-8.72	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 109.

```

Title Stage 6 Pit wall interaction mix calculator
MIX 604
609 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000077
11 0.000622
12 0.000471
13 0.001106
14 0
15 0
Save solution 610
end

```

TITLE

Stage 6 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 604.

Mixture 604.

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
7.700e-05 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
6.220e-04 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
4.710e-04 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
1.106e-03 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 609 Solution after simulation 108.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.004e-08	1.006e-08
Al	8.621e-07	8.642e-07
As	3.032e-10	3.040e-10
B	1.540e-05	1.544e-05
Ba	2.474e-08	2.480e-08
C	2.254e-03	2.259e-03
Ca	1.636e-03	1.640e-03
Cd	4.398e-09	4.409e-09
Cl	2.191e-03	2.197e-03
Co	3.397e-08	3.405e-08
Cr	1.405e-09	1.408e-09
Cu	1.494e-06	1.498e-06
F	1.168e-04	1.171e-04
Fe	1.109e-09	1.111e-09
Hg	6.927e-10	6.944e-10
K	1.233e-03	1.236e-03
Mg	1.801e-03	1.805e-03
Mn	2.070e-05	2.075e-05
Mo	6.111e-07	6.126e-07
N	5.030e-06	5.042e-06
Na	5.637e-03	5.651e-03
Ni	5.292e-08	5.305e-08
Pb	3.208e-09	3.217e-09
S	4.648e-03	4.660e-03
Sb	9.262e-09	9.285e-09
Se	5.411e-08	5.425e-08
Si	8.813e-05	8.835e-05
U	8.775e-08	8.797e-08
V	2.845e-09	2.852e-09
Zn	2.192e-06	2.198e-06

-----Description of solution-----

pH = 7.659 Charge balance

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equilibrium
pe = 5.040 Adjusted to redox
Activity of water = 1.000
Ionic strength (mol/kgw) = 1.873e-02
Mass of water (kg) = 1.003e+00
Total alkalinity (eq/kg) = 2.184e-03
Total CO2 (mol/kg) = 2.254e-03
Temperature (°C) = 25.00
Pressure (atm) = 1.00
Electrical balance (eq) = 5.967e-07
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 4
Total H = 1.112971e+02
Total O = 5.567300e+01

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-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.271e-07	4.588e-07	-6.278	-6.338	-0.060	(0)
H+	2.511e-08	2.194e-08	-7.600	-7.659	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	1.004e-08					
AgCl	6.680e-09	6.680e-09	-8.175	-8.175	0.000	(0)
Ag+	1.955e-09	1.709e-09	-8.709	-8.767	-0.059	(0)
AgCl2-	1.308e-09	1.114e-09	-8.883	-8.953	-0.070	(0)
AgSO4-	8.986e-11	7.652e-11	-10.046	-10.116	-0.070	(0)
AgCl3-2	3.617e-12	1.901e-12	-11.442	-11.721	-0.279	(0)
AgNO2	1.411e-12	1.411e-12	-11.850	-11.850	0.000	(0)
AgF	3.966e-13	3.966e-13	-12.402	-12.402	0.000	(0)
AgOH	7.839e-14	7.839e-14	-13.106	-13.106	0.000	(0)
AgNH3+	4.162e-14	3.544e-14	-13.381	-13.451	-0.070	(0)
AgCl4-3	3.159e-14	7.434e-15	-13.501	-14.129	-0.628	(0)
Ag2Se	1.787e-14	1.787e-14	-13.748	-13.748	0.000	(0)
AgH2BO3	1.073e-14	1.073e-14	-13.969	-13.969	0.000	(0)
AgSeO3-	8.327e-15	7.091e-15	-14.079	-14.149	-0.070	(0)
Ag (NO2) 2-	1.015e-17	8.639e-18	-16.994	-17.064	-0.070	(0)
Ag (OH) 2-	4.128e-18	3.515e-18	-17.384	-17.454	-0.070	(0)
AgNO3	3.611e-18	3.611e-18	-17.442	-17.442	0.000	(0)
Ag (NH3) 2+	3.436e-18	2.926e-18	-17.464	-17.534	-0.070	(0)
Ag (SeO3) 2-3	1.742e-21	4.100e-22	-20.759	-21.387	-0.628	(0)
Ag2MoO4	3.938e-25	3.938e-25	-24.405	-24.405	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.193	-73.193	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.749	-83.866	-1.117	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.991	-147.157	-0.167	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.263	-147.333	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.623	-148.939	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.947	-149.250	-0.302	(0)
Al	8.621e-07					
Al (OH) 4-	8.469e-07	7.410e-07	-6.072	-6.130	-0.058	(0)
Al (OH) 3	1.283e-08	1.283e-08	-7.892	-7.892	0.000	(0)
Al (OH) 2+	1.595e-09	1.401e-09	-8.797	-8.853	-0.056	(0)
AlF3	3.315e-10	3.315e-10	-9.479	-9.479	0.000	(0)
AlF2+	3.243e-10	2.850e-10	-9.489	-9.545	-0.056	(0)
AlF4-	1.755e-11	1.536e-11	-10.756	-10.814	-0.058	(0)
AlF+2	1.299e-11	7.746e-12	-10.886	-11.111	-0.225	(0)
AlOH+2	6.451e-12	3.846e-12	-11.190	-11.415	-0.225	(0)
AlSO4+	1.669e-13	1.460e-13	-12.777	-12.836	-0.058	(0)
Al+3	2.820e-14	8.382e-15	-13.550	-14.077	-0.527	(0)
Al (SO4) 2-	4.014e-15	3.512e-15	-14.396	-14.454	-0.058	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.097	-43.725	-0.628	(0)
As (3)	3.516e-23					
H3AsO3	3.422e-23	3.422e-23	-22.466	-22.466	0.000	(0)
H2AsO3-	9.394e-25	7.999e-25	-24.027	-24.097	-0.070	(0)
HAsO3-2	6.324e-29	3.325e-29	-28.199	-28.478	-0.279	(0)
H4AsO3+	4.369e-31	3.720e-31	-30.360	-30.429	-0.070	(0)
AsO3-3	2.482e-34	5.842e-35	-33.605	-34.233	-0.628	(0)

As (5)	3.032e-10					
HAsO4-2	2.698e-10	1.419e-10	-9.569	-9.848	-0.279	(0)
H2AsO4-	3.334e-11	2.839e-11	-10.477	-10.547	-0.070	(0)
AsO4-3	8.687e-14	2.045e-14	-13.061	-13.689	-0.628	(0)
H3AsO4	1.078e-16	1.082e-16	-15.968	-15.966	0.002	(0)
B	1.540e-05					
H3BO3	1.491e-05	1.497e-05	-4.827	-4.825	0.002	(0)
H2BO3-	4.578e-07	3.962e-07	-6.339	-6.402	-0.063	(0)
CaH2BO3+	1.895e-08	1.640e-08	-7.722	-7.785	-0.063	(0)
MgH2BO3+	1.323e-08	1.145e-08	-7.878	-7.941	-0.063	(0)
NaH2BO3	3.054e-09	3.054e-09	-8.515	-8.515	0.000	(0)
BF(OH) 3-	6.378e-10	5.520e-10	-9.195	-9.258	-0.063	(0)
H5(BO3) 2-	5.834e-12	5.049e-12	-11.234	-11.297	-0.063	(0)
BaH2BO3+	2.016e-13	1.745e-13	-12.696	-12.758	-0.063	(0)
BF2(OH) 2-	1.383e-13	1.197e-13	-12.859	-12.922	-0.063	(0)
AgH2BO3	1.073e-14	1.073e-14	-13.969	-13.969	0.000	(0)
H8(BO3) 3-	8.733e-15	7.558e-15	-14.059	-14.122	-0.063	(0)
BF3OH-	1.091e-19	9.444e-20	-18.962	-19.025	-0.063	(0)
BF4-	1.089e-24	9.425e-25	-23.963	-24.026	-0.063	(0)
Ba	2.474e-08					
Ba+2	2.443e-08	1.425e-08	-7.612	-7.846	-0.234	(0)
BaHCO3+	2.843e-10	2.505e-10	-9.546	-9.601	-0.055	(0)
BaCO3	2.874e-11	2.874e-11	-10.541	-10.541	0.000	(0)
BaH2BO3+	2.016e-13	1.745e-13	-12.696	-12.758	-0.063	(0)
BaOH+	3.253e-14	2.853e-14	-13.488	-13.545	-0.057	(0)
BaNO3+	2.231e-16	1.900e-16	-15.652	-15.721	-0.070	(0)
BaNH3+2	1.737e-16	9.131e-17	-15.760	-16.039	-0.279	(0)
C (4)	2.254e-03					
HCO3-	2.095e-03	1.841e-03	-2.679	-2.735	-0.056	(0)
H2CO3	9.085e-05	9.085e-05	-4.042	-4.042	0.000	(0)
CaHCO3+	2.798e-05	2.466e-05	-4.553	-4.608	-0.055	(0)
MgHCO3+	1.800e-05	1.571e-05	-4.745	-4.804	-0.059	(0)
CO3-2	6.745e-06	3.934e-06	-5.171	-5.405	-0.234	(0)
NaHCO3	5.035e-06	5.035e-06	-5.298	-5.298	0.000	(0)
CaCO3	4.484e-06	4.484e-06	-5.348	-5.348	0.000	(0)
MgCO3	2.728e-06	2.728e-06	-5.564	-5.564	0.000	(0)
CuCO3	1.243e-06	1.243e-06	-5.905	-5.905	0.000	(0)
NaCO3-	4.054e-07	3.562e-07	-6.392	-6.448	-0.056	(0)
MnHCO3+	3.687e-07	3.233e-07	-6.433	-6.490	-0.057	(0)
ZnCO3	1.919e-07	1.919e-07	-6.717	-6.717	0.000	(0)
ZnHCO3+	5.796e-08	4.935e-08	-7.237	-7.307	-0.070	(0)
UO2(CO3) 3-4	5.038e-08	3.848e-09	-7.298	-8.415	-1.117	(0)
UO2(CO3) 2-2	3.713e-08	1.952e-08	-7.430	-7.710	-0.279	(0)
Cu(CO3) 2-2	2.504e-08	1.316e-08	-7.601	-7.881	-0.279	(0)
CuHCO3+	7.321e-09	6.234e-09	-8.135	-8.205	-0.070	(0)
NiHCO3+	5.444e-09	4.635e-09	-8.264	-8.334	-0.070	(0)
NiCO3	2.997e-09	2.997e-09	-8.523	-8.523	0.000	(0)
CoHCO3+	2.191e-09	1.866e-09	-8.659	-8.729	-0.070	(0)
PbCO3	2.109e-09	2.109e-09	-8.676	-8.676	0.000	(0)
CoCO3	8.665e-10	8.665e-10	-9.062	-9.062	0.000	(0)
PbHCO3+	2.866e-10	2.440e-10	-9.543	-9.613	-0.070	(0)
BaHCO3+	2.843e-10	2.505e-10	-9.546	-9.601	-0.055	(0)
UO2CO3	2.487e-10	2.487e-10	-9.604	-9.604	0.000	(0)
CdCO3	1.522e-10	1.522e-10	-9.818	-9.818	0.000	(0)
Pb(CO3) 2-2	4.552e-11	2.393e-11	-10.342	-10.621	-0.279	(0)
BaCO3	2.874e-11	2.874e-11	-10.541	-10.541	0.000	(0)
CdHCO3+	8.354e-12	7.113e-12	-11.078	-11.148	-0.070	(0)
Cd(CO3) 2-2	8.441e-13	4.438e-13	-12.074	-12.353	-0.279	(0)
FeHCO3+	3.261e-14	2.873e-14	-13.487	-13.542	-0.055	(0)
HgCO3	4.237e-15	4.237e-15	-14.373	-14.373	0.000	(0)
Hg(CO3) 2-2	1.003e-16	5.271e-17	-15.999	-16.278	-0.279	(0)
HgHCO3+	2.033e-18	1.731e-18	-17.692	-17.762	-0.070	(0)
Ca	1.636e-03					
Ca+2	1.233e-03	7.192e-04	-2.909	-3.143	-0.234	(0)
CaSO4	3.698e-04	3.698e-04	-3.432	-3.432	0.000	(0)
CaHCO3+	2.798e-05	2.466e-05	-4.553	-4.608	-0.055	(0)
CaCO3	4.484e-06	4.484e-06	-5.348	-5.348	0.000	(0)
CaF+	8.271e-07	7.254e-07	-6.082	-6.139	-0.057	(0)

	CaH ₂ BO ₃ +	1.895e-08	1.640e-08	-7.722	-7.785	-0.063	(0)
	CaOH+	7.472e-09	6.583e-09	-8.127	-8.182	-0.055	(0)
	CaNH ₃ +2	1.749e-11	9.197e-12	-10.757	-11.036	-0.279	(0)
	CaNO ₃ +	7.105e-12	6.050e-12	-11.148	-11.218	-0.070	(0)
	Ca (NH ₃) 2+2	7.075e-20	3.719e-20	-19.150	-19.430	-0.279	(0)
Cd		4.398e-09					
	Cd+2	2.910e-09	1.697e-09	-8.536	-8.770	-0.234	(0)
	CdSO ₄	8.929e-10	8.929e-10	-9.049	-9.049	0.000	(0)
	CdCl+	3.644e-10	3.103e-10	-9.438	-9.508	-0.070	(0)
	CdCO ₃	1.522e-10	1.522e-10	-9.818	-9.818	0.000	(0)
	Cd (SO ₄) 2-2	5.142e-11	2.703e-11	-10.289	-10.568	-0.279	(0)
	CdHCO ₃ +	8.354e-12	7.113e-12	-11.078	-11.148	-0.070	(0)
	CdOH+	7.263e-12	6.184e-12	-11.139	-11.209	-0.070	(0)
	CdOHC1	5.840e-12	5.840e-12	-11.234	-11.234	0.000	(0)
	CdF+	2.919e-12	2.485e-12	-11.535	-11.605	-0.070	(0)
	CdCl ₂	2.477e-12	2.477e-12	-11.606	-11.606	0.000	(0)
	Cd (CO ₃) 2-2	8.441e-13	4.438e-13	-12.074	-12.353	-0.279	(0)
	Cd (OH) 2	1.790e-14	1.790e-14	-13.747	-13.747	0.000	(0)
	CdCl ₃ -	3.515e-15	2.993e-15	-14.454	-14.524	-0.070	(0)
	CdF ₂	4.583e-16	4.583e-16	-15.339	-15.339	0.000	(0)
	CdNO ₃ +	1.677e-17	1.428e-17	-16.776	-16.845	-0.070	(0)
	CdSeO ₄	6.306e-18	6.306e-18	-17.200	-17.200	0.000	(0)
	Cd (OH) 3-	5.893e-19	5.018e-19	-18.230	-18.299	-0.070	(0)
	Cd ₂ OH+3	2.235e-19	5.260e-20	-18.651	-19.279	-0.628	(0)
	Cd (SeO ₃) 2-2	1.109e-19	5.831e-20	-18.955	-19.234	-0.279	(0)
	Cd (OH) 4-2	7.168e-26	3.768e-26	-25.145	-25.424	-0.279	(0)
	Cd (NO ₃) 2	1.904e-26	1.904e-26	-25.720	-25.720	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.932	-79.002	-0.070	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.038	-150.038	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.308	-226.378	-0.070	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.143	-302.422	-0.279	(0)
Cl		2.191e-03					
	Cl-	2.191e-03	1.915e-03	-2.659	-2.718	-0.059	(0)
	MnCl+	2.419e-08	2.122e-08	-7.616	-7.673	-0.057	(0)
	AgCl	6.680e-09	6.680e-09	-8.175	-8.175	0.000	(0)
	ZnCl+	4.672e-09	4.077e-09	-8.330	-8.390	-0.059	(0)
	ZnOHC1	2.449e-09	2.449e-09	-8.611	-8.611	0.000	(0)
	AgCl ₂ -	1.308e-09	1.114e-09	-8.883	-8.953	-0.070	(0)
	CuCl	5.774e-10	5.774e-10	-9.239	-9.239	0.000	(0)
	CdCl+	3.644e-10	3.103e-10	-9.438	-9.508	-0.070	(0)
	CuCl ₂ -	2.647e-10	2.310e-10	-9.577	-9.636	-0.059	(0)
	CuCl+	1.866e-10	1.629e-10	-9.729	-9.788	-0.059	(0)
	NiCl+	1.175e-10	1.001e-10	-9.930	-10.000	-0.070	(0)
	CoCl+	1.014e-10	8.631e-11	-9.994	-10.064	-0.070	(0)
	MnCl ₂	5.739e-11	5.739e-11	-10.241	-10.241	0.000	(0)
	PbCl+	1.423e-11	1.212e-11	-10.847	-10.917	-0.070	(0)
	ZnCl ₂	1.237e-11	1.237e-11	-10.908	-10.908	0.000	(0)
	CdOHC1	5.840e-12	5.840e-12	-11.234	-11.234	0.000	(0)
	AgCl ₃ -2	3.617e-12	1.901e-12	-11.442	-11.721	-0.279	(0)
	CdCl ₂	2.477e-12	2.477e-12	-11.606	-11.606	0.000	(0)
	HgClOH	1.396e-12	1.396e-12	-11.855	-11.855	0.000	(0)
	HgCl ₂	3.300e-13	3.300e-13	-12.482	-12.482	0.000	(0)
	CuCl ₃ -2	1.599e-13	9.457e-14	-12.796	-13.024	-0.228	(0)
	CuCl ₂	1.081e-13	1.081e-13	-12.966	-12.966	0.000	(0)
	PbCl ₂	1.037e-13	1.037e-13	-12.984	-12.984	0.000	(0)
	MnCl ₃ -	3.451e-14	3.027e-14	-13.462	-13.519	-0.057	(0)
	AgCl ₄ -3	3.159e-14	7.434e-15	-13.501	-14.129	-0.628	(0)
	ZnCl ₃ -	2.157e-14	1.882e-14	-13.666	-13.725	-0.059	(0)
	HgCl ₃ -	7.420e-15	6.319e-15	-14.130	-14.199	-0.070	(0)
	CdCl ₃ -	3.515e-15	2.993e-15	-14.454	-14.524	-0.070	(0)
	NiCl ₂	9.647e-16	9.647e-16	-15.016	-15.016	0.000	(0)
	PbCl ₃ -	9.280e-17	7.902e-17	-16.032	-16.102	-0.070	(0)
	HgCl ₄ -2	9.162e-17	4.817e-17	-16.038	-16.317	-0.279	(0)
	UO ₂ Cl+	5.791e-17	4.931e-17	-16.237	-16.307	-0.070	(0)
	HgCl+	4.038e-17	3.438e-17	-16.394	-16.464	-0.070	(0)
	ZnCl ₄ -2	3.046e-17	1.802e-17	-16.516	-16.744	-0.228	(0)
	CrCl+2	8.450e-18	4.443e-18	-17.073	-17.352	-0.279	(0)
	CuCl ₃ -	2.215e-18	1.933e-18	-17.655	-17.714	-0.059	(0)

PbCl4-2	1.316e-19	6.916e-20	-18.881	-19.160	-0.279	(0)
CrOHC12	7.418e-20	7.418e-20	-19.130	-19.130	0.000	(0)
FeCl+2	1.235e-21	7.307e-22	-20.908	-21.136	-0.228	(0)
CrCl2+	9.480e-22	8.072e-22	-21.023	-21.093	-0.070	(0)
VOCl+	4.349e-23	3.703e-23	-22.362	-22.431	-0.070	(0)
CuCl4-2	3.135e-23	1.855e-23	-22.504	-22.732	-0.228	(0)
FeCl2+	7.127e-24	6.250e-24	-23.147	-23.204	-0.057	(0)
CrO3Cl-	1.103e-26	9.388e-27	-25.958	-26.027	-0.070	(0)
FeCl3	1.197e-27	1.197e-27	-26.922	-26.922	0.000	(0)
CoCl+2	4.218e-36	2.218e-36	-35.375	-35.654	-0.279	(0)
UCl+3	0.000e+00	0.000e+00	-45.688	-46.316	-0.628	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.388	-49.667	-0.279	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.042	-51.321	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.096	-64.376	-0.279	(0)
Co (2)	3.397e-08					
Co+2	2.478e-08	1.303e-08	-7.606	-7.885	-0.279	(0)
CoSO4	5.835e-09	5.835e-09	-8.234	-8.234	0.000	(0)
CoHCO3+	2.191e-09	1.866e-09	-8.659	-8.729	-0.070	(0)
CoCO3	8.665e-10	8.665e-10	-9.062	-9.062	0.000	(0)
CoOH+	1.401e-10	1.193e-10	-9.854	-9.923	-0.070	(0)
CoCl+	1.014e-10	8.631e-11	-9.994	-10.064	-0.070	(0)
CoF+	4.472e-11	3.808e-11	-10.350	-10.419	-0.070	(0)
Co (OH) 2	4.347e-12	4.347e-12	-11.362	-11.362	0.000	(0)
CoNO2+	4.262e-13	3.629e-13	-12.370	-12.440	-0.070	(0)
Co (NH3) +2	3.027e-14	1.591e-14	-13.519	-13.798	-0.279	(0)
CoSeO4	1.303e-16	1.303e-16	-15.885	-15.885	0.000	(0)
CoNO3+	6.452e-17	5.494e-17	-16.190	-16.260	-0.070	(0)
Co (OH) 3-	4.673e-17	3.979e-17	-16.330	-16.400	-0.070	(0)
CoOOH-	1.173e-17	9.986e-18	-16.931	-17.001	-0.070	(0)
Co2OH+3	3.309e-19	7.789e-20	-18.480	-19.109	-0.628	(0)
Co (NH3) 2+2	1.312e-20	6.895e-21	-19.882	-20.161	-0.279	(0)
Co (OH) 4-2	5.503e-24	2.893e-24	-23.259	-23.539	-0.279	(0)
Co (NO3) 2	2.974e-25	2.974e-25	-24.527	-24.527	0.000	(0)
Co (NH3) 3+2	1.677e-27	8.818e-28	-26.775	-27.055	-0.279	(0)
Co4 (OH) 4+4	5.286e-31	4.038e-32	-30.277	-31.394	-1.117	(0)
Co (NH3) 4+2	8.942e-35	4.701e-35	-34.049	-34.328	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.822	-42.101	-0.279	(0)
Co (3)	2.524e-29					
CoOH+2	2.524e-29	1.327e-29	-28.598	-28.877	-0.279	(0)
Co+3	1.915e-35	5.692e-36	-34.718	-35.245	-0.527	(0)
CoCl+2	4.218e-36	2.218e-36	-35.375	-35.654	-0.279	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.388	-49.667	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.312	-59.381	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.517	-63.796	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.096	-64.376	-0.279	(0)
Cr (2)	7.423e-27					
Cr+2	7.423e-27	3.903e-27	-26.129	-26.409	-0.279	(0)
Cr (3)	1.405e-09					
Cr (OH) 2+	1.180e-09	1.004e-09	-8.928	-8.998	-0.070	(0)
Cr (OH) 3	1.731e-10	1.731e-10	-9.762	-9.762	0.000	(0)
Cr (OH) +2	3.423e-11	1.799e-11	-10.466	-10.745	-0.279	(0)
CrOHSO4	9.583e-12	9.583e-12	-11.018	-11.018	0.000	(0)
CrO2-	4.402e-12	3.748e-12	-11.356	-11.426	-0.070	(0)
Cr (OH) 4-	3.713e-12	3.162e-12	-11.430	-11.500	-0.070	(0)
CrF+2	4.994e-14	2.626e-14	-13.302	-13.581	-0.279	(0)
CrSO4+	1.103e-14	9.395e-15	-13.957	-14.027	-0.070	(0)
Cr+3	7.617e-15	1.793e-15	-14.118	-14.746	-0.628	(0)
CrCl+2	8.450e-18	4.443e-18	-17.073	-17.352	-0.279	(0)
CrOHC12	7.418e-20	7.418e-20	-19.130	-19.130	0.000	(0)
Cr2 (OH) 2SO4+2	2.965e-20	1.559e-20	-19.528	-19.807	-0.279	(0)
Cr2 (OH) 2 (SO4) 2	2.078e-21	2.078e-21	-20.682	-20.682	0.000	(0)
CrCl2+	9.480e-22	8.072e-22	-21.023	-21.093	-0.070	(0)
CrNO3+2	3.965e-25	2.085e-25	-24.402	-24.681	-0.279	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.399	-40.678	-0.279	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.077	-49.706	-0.628	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.042	-51.321	-0.279	(0)
Cr (6)	9.160e-16					
CrO4-2	8.577e-16	5.003e-16	-15.067	-15.301	-0.234	(0)

HCrO4-	4.171e-17	3.552e-17	-16.380	-16.450	-0.070	(0)
NaCrO4-	1.420e-17	1.209e-17	-16.848	-16.918	-0.070	(0)
KCrO4-	2.315e-18	1.971e-18	-17.635	-17.705	-0.070	(0)
CrO3SO4-2	1.014e-24	5.329e-25	-23.994	-24.273	-0.279	(0)
H2CrO4	6.317e-25	6.317e-25	-24.199	-24.199	0.000	(0)
CrO3Cl-	1.103e-26	9.388e-27	-25.958	-26.027	-0.070	(0)
Cr2O7-2	8.323e-32	4.376e-32	-31.080	-31.359	-0.279	(0)
Cu (1)	1.124e-09					
CuCl	5.774e-10	5.774e-10	-9.239	-9.239	0.000	(0)
Cu+	2.813e-10	2.395e-10	-9.551	-9.621	-0.070	(0)
CuCl2-	2.647e-10	2.310e-10	-9.577	-9.636	-0.059	(0)
CuCl3-2	1.599e-13	9.457e-14	-12.796	-13.024	-0.228	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.084	-147.393	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.827	-148.123	-0.296	(0)
Cu (2)	1.493e-06					
CuCO3	1.243e-06	1.243e-06	-5.905	-5.905	0.000	(0)
Cu+2	9.201e-08	5.367e-08	-7.036	-7.270	-0.234	(0)
CuOH+	8.922e-08	7.786e-08	-7.050	-7.109	-0.059	(0)
CuSO4	2.759e-08	2.759e-08	-7.559	-7.559	0.000	(0)
Cu (CO3) 2-2	2.504e-08	1.316e-08	-7.601	-7.881	-0.279	(0)
CuHCO3+	7.321e-09	6.234e-09	-8.135	-8.205	-0.070	(0)
Cu (OH) 2	7.127e-09	7.127e-09	-8.147	-8.147	0.000	(0)
CuF+	3.675e-10	3.129e-10	-9.435	-9.505	-0.070	(0)
Cu2 (OH) 2+2	2.896e-10	1.523e-10	-9.538	-9.817	-0.279	(0)
CuCl+	1.866e-10	1.629e-10	-9.729	-9.788	-0.059	(0)
CuNO2+	2.609e-11	2.221e-11	-10.584	-10.653	-0.070	(0)
CuNH3+2	1.061e-11	5.579e-12	-10.974	-11.253	-0.279	(0)
Cu (OH) 3-	7.877e-12	6.707e-12	-11.104	-11.173	-0.070	(0)
CuCl2	1.081e-13	1.081e-13	-12.966	-12.966	0.000	(0)
Cu (NO2) 2	8.984e-16	8.984e-16	-15.047	-15.047	0.000	(0)
CuNO3+	5.302e-16	4.515e-16	-15.276	-15.345	-0.070	(0)
Cu (OH) 4-2	4.607e-17	2.422e-17	-16.337	-16.616	-0.279	(0)
CuCl3-	2.215e-18	1.933e-18	-17.655	-17.714	-0.059	(0)
CuCl4-2	3.135e-23	1.855e-23	-22.504	-22.732	-0.228	(0)
Cu (NO3) 2	1.512e-25	1.512e-25	-24.820	-24.820	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.021	-216.091	-0.070	(0)
F	1.168e-04					
F-	1.057e-04	9.241e-05	-3.976	-4.034	-0.059	(0)
MgF+	9.880e-06	8.644e-06	-5.005	-5.063	-0.058	(0)
CaF+	8.271e-07	7.254e-07	-6.082	-6.139	-0.057	(0)
NaF	2.835e-07	2.835e-07	-6.547	-6.547	0.000	(0)
MnF+	3.692e-08	3.238e-08	-7.433	-7.490	-0.057	(0)
HF	2.999e-09	2.999e-09	-8.523	-8.523	0.000	(0)
ZnF+	1.835e-09	1.563e-09	-8.736	-8.806	-0.070	(0)
BF (OH) 3-	6.378e-10	5.520e-10	-9.195	-9.258	-0.063	(0)
CuF+	3.675e-10	3.129e-10	-9.435	-9.505	-0.070	(0)
AlF3	3.315e-10	3.315e-10	-9.479	-9.479	0.000	(0)
AlF2+	3.243e-10	2.850e-10	-9.489	-9.545	-0.056	(0)
NiF+	5.567e-11	4.740e-11	-10.254	-10.324	-0.070	(0)
CoF+	4.472e-11	3.808e-11	-10.350	-10.419	-0.070	(0)
AlF4-	1.755e-11	1.536e-11	-10.756	-10.814	-0.058	(0)
AlF+2	1.299e-11	7.746e-12	-10.886	-11.111	-0.225	(0)
CdF+	2.919e-12	2.485e-12	-11.535	-11.605	-0.070	(0)
PbF+	1.364e-12	1.162e-12	-11.865	-11.935	-0.070	(0)
HF2-	1.211e-12	1.054e-12	-11.917	-11.977	-0.060	(0)
AgF	3.966e-13	3.966e-13	-12.402	-12.402	0.000	(0)
UO2F+	2.379e-13	2.025e-13	-12.624	-12.693	-0.070	(0)
BF2 (OH) 2-	1.383e-13	1.197e-13	-12.859	-12.922	-0.063	(0)
UO2F2	5.398e-14	5.398e-14	-13.268	-13.268	0.000	(0)
CrF+2	4.994e-14	2.626e-14	-13.302	-13.581	-0.279	(0)
PbF2	2.112e-15	2.112e-15	-14.675	-14.675	0.000	(0)
UO2F3-	1.472e-15	1.253e-15	-14.832	-14.902	-0.070	(0)
CdF2	4.583e-16	4.583e-16	-15.339	-15.339	0.000	(0)
H2F2	2.410e-17	2.410e-17	-16.618	-16.618	0.000	(0)
FeF2+	3.611e-18	3.166e-18	-17.442	-17.499	-0.057	(0)
VO2F	3.183e-18	3.183e-18	-17.497	-17.497	0.000	(0)
FeF+2	2.164e-18	1.280e-18	-17.665	-17.893	-0.228	(0)
UO2F4-2	1.750e-18	9.198e-19	-17.757	-18.036	-0.279	(0)

PbF3-	4.348e-19	3.703e-19	-18.362	-18.431	-0.070	(0)
FeF3	4.129e-19	4.129e-19	-18.384	-18.384	0.000	(0)
VO2F2-	1.254e-19	1.068e-19	-18.902	-18.971	-0.070	(0)
BF3OH-	1.091e-19	9.444e-20	-18.962	-19.025	-0.063	(0)
VOF+	4.487e-21	3.821e-21	-20.348	-20.418	-0.070	(0)
VO2F3-2	2.342e-22	1.231e-22	-21.630	-21.910	-0.279	(0)
VOF2	1.324e-22	1.324e-22	-21.878	-21.878	0.000	(0)
PbF4-2	3.115e-23	1.638e-23	-22.507	-22.786	-0.279	(0)
HgF+	3.620e-24	3.083e-24	-23.441	-23.511	-0.070	(0)
BF4-	1.089e-24	9.425e-25	-23.963	-24.026	-0.063	(0)
VOF3-	5.098e-25	4.341e-25	-24.293	-24.362	-0.070	(0)
Sb(OH) 2F	5.228e-26	5.228e-26	-25.282	-25.282	0.000	(0)
SbOF	5.143e-26	5.143e-26	-25.289	-25.289	0.000	(0)
VO2F4-3	2.379e-26	5.598e-27	-25.624	-26.252	-0.628	(0)
VOF4-2	3.080e-28	1.619e-28	-27.511	-27.791	-0.279	(0)
SiF6-2	3.248e-29	1.921e-29	-28.488	-28.716	-0.228	(0)
UF3+	1.855e-36	1.580e-36	-35.732	-35.801	-0.070	(0)
UF2+2	2.051e-37	1.078e-37	-36.688	-36.967	-0.279	(0)
UF4	1.601e-38	1.601e-38	-37.796	-37.796	0.000	(0)
UF+3	3.939e-40	0.000e+00	-39.405	-40.033	-0.628	(0)
UF5-	0.000e+00	0.000e+00	-40.162	-40.232	-0.070	(0)
UF6-2	0.000e+00	0.000e+00	-41.507	-41.786	-0.279	(0)
Fe (2)	3.099e-12					
Fe+2	2.358e-12	1.240e-12	-11.627	-11.907	-0.279	(0)
FeSO4	6.829e-13	6.829e-13	-12.166	-12.166	0.000	(0)
FeHCO3+	3.261e-14	2.873e-14	-13.487	-13.542	-0.055	(0)
FeOH+	2.582e-14	2.264e-14	-13.588	-13.645	-0.057	(0)
Fe (OH) 2	8.251e-18	8.251e-18	-17.084	-17.084	0.000	(0)
Fe (OH) 3-	1.365e-18	1.197e-18	-17.865	-17.922	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.437	-159.437	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.570	-235.639	-0.070	(0)
Fe (3)	1.106e-09					
Fe (OH) 2+	7.604e-10	6.681e-10	-9.119	-9.175	-0.056	(0)
Fe (OH) 3	3.292e-10	3.292e-10	-9.483	-9.483	0.000	(0)
Fe (OH) 4-	1.600e-11	1.406e-11	-10.796	-10.852	-0.056	(0)
FeOH+2	6.327e-15	3.743e-15	-14.199	-14.427	-0.228	(0)
FeF2+	3.611e-18	3.166e-18	-17.442	-17.499	-0.057	(0)
FeF+2	2.164e-18	1.280e-18	-17.665	-17.893	-0.228	(0)
FeF3	4.129e-19	4.129e-19	-18.384	-18.384	0.000	(0)
FeSO4+	3.628e-19	3.182e-19	-18.440	-18.497	-0.057	(0)
Fe+3	4.251e-20	1.264e-20	-19.372	-19.898	-0.527	(0)
Fe (SO4) 2-	1.793e-20	1.527e-20	-19.746	-19.816	-0.070	(0)
FeCl+2	1.235e-21	7.307e-22	-20.908	-21.136	-0.228	(0)
FeCl2+	7.127e-24	6.250e-24	-23.147	-23.204	-0.057	(0)
FeHSeO3+2	2.260e-24	1.188e-24	-23.646	-23.925	-0.279	(0)
Fe2 (OH) 2+4	6.073e-27	4.639e-28	-26.217	-27.334	-1.117	(0)
FeCl3	1.197e-27	1.197e-27	-26.922	-26.922	0.000	(0)
FeNO3+2	6.394e-28	3.362e-28	-27.194	-27.473	-0.279	(0)
Fe3 (OH) 4+5	2.492e-34	4.480e-36	-33.603	-35.349	-1.745	(0)
H (0)	5.636e-29					
H2	2.818e-29	2.830e-29	-28.550	-28.548	0.002	(0)
Hg (0)	6.898e-10					
Hg	6.898e-10	6.898e-10	-9.161	-9.161	0.000	(0)
Hg (1)	1.603e-21					
Hg2+2	8.016e-22	4.214e-22	-21.096	-21.375	-0.279	(0)
Hg (2)	2.928e-12					
HgClOH	1.396e-12	1.396e-12	-11.855	-11.855	0.000	(0)
Hg (OH) 2	1.190e-12	1.195e-12	-11.924	-11.923	0.002	(0)
HgCl2	3.300e-13	3.300e-13	-12.482	-12.482	0.000	(0)
HgCl3-	7.420e-15	6.319e-15	-14.130	-14.199	-0.070	(0)
HgCO3	4.237e-15	4.237e-15	-14.373	-14.373	0.000	(0)
Hg (CO3) 2-2	1.003e-16	5.271e-17	-15.999	-16.278	-0.279	(0)
HgCl4-2	9.162e-17	4.817e-17	-16.038	-16.317	-0.279	(0)
HgCl+	4.038e-17	3.438e-17	-16.394	-16.464	-0.070	(0)
HgOH+	1.930e-17	1.644e-17	-16.714	-16.784	-0.070	(0)
HgHCO3+	2.033e-18	1.731e-18	-17.692	-17.762	-0.070	(0)
Hg (NH3) 2+2	1.114e-19	5.859e-20	-18.953	-19.232	-0.279	(0)
Hg (OH) 3-	8.107e-20	6.903e-20	-19.091	-19.161	-0.070	(0)

	HgNH3+2	1.097e-20	5.768e-21	-19.960	-20.239	-0.279	(0)
	Hg+2	1.712e-21	8.999e-22	-20.767	-21.046	-0.279	(0)
	HgSO4	5.288e-22	5.288e-22	-21.277	-21.277	0.000	(0)
	HgF+	3.620e-24	3.083e-24	-23.441	-23.511	-0.070	(0)
	Hg (NH3) 3+2	4.507e-27	2.369e-27	-26.346	-26.625	-0.279	(0)
	HgNO3+	1.038e-30	8.840e-31	-29.984	-30.054	-0.070	(0)
	Hg (NH3) 4+2	3.637e-34	1.912e-34	-33.439	-33.719	-0.279	(0)
	Hg (NO3) 2	9.775e-40	9.775e-40	-39.010	-39.010	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.869	-137.939	-0.070	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.709	-138.988	-0.279	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.204	-139.204	0.000	(0)
K	1.233e-03						
	K+	1.214e-03	1.061e-03	-2.916	-2.974	-0.059	(0)
	KSO4-	1.918e-05	1.685e-05	-4.717	-4.773	-0.056	(0)
	KCrO4-	2.315e-18	1.971e-18	-17.635	-17.705	-0.070	(0)
Mg	1.801e-03						
	Mg+2	1.429e-03	8.337e-04	-2.845	-3.079	-0.234	(0)
	MgSO4	3.405e-04	3.405e-04	-3.468	-3.468	0.000	(0)
	MgHCO3+	1.800e-05	1.571e-05	-4.745	-4.804	-0.059	(0)
	MgF+	9.880e-06	8.644e-06	-5.005	-5.063	-0.058	(0)
	MgCO3	2.728e-06	2.728e-06	-5.564	-5.564	0.000	(0)
	MgOH+	1.724e-07	1.523e-07	-6.763	-6.817	-0.054	(0)
	MgH2BO3+	1.323e-08	1.145e-08	-7.878	-7.941	-0.063	(0)
Mn (2)	2.070e-05						
	Mn+2	1.674e-05	8.801e-06	-4.776	-5.055	-0.279	(0)
	MnSO4	3.513e-06	3.513e-06	-5.454	-5.454	0.000	(0)
	MnHCO3+	3.687e-07	3.233e-07	-6.433	-6.490	-0.057	(0)
	MnF+	3.692e-08	3.238e-08	-7.433	-7.490	-0.057	(0)
	MnCl+	2.419e-08	2.122e-08	-7.616	-7.673	-0.057	(0)
	MnOH+	1.157e-08	1.014e-08	-7.937	-7.994	-0.057	(0)
	MnCl2	5.739e-11	5.739e-11	-10.241	-10.241	0.000	(0)
	MnSeO4	4.728e-14	4.728e-14	-13.325	-13.325	0.000	(0)
	MnNO3+	4.358e-14	3.711e-14	-13.361	-13.430	-0.070	(0)
	MnCl3-	3.451e-14	3.027e-14	-13.462	-13.519	-0.057	(0)
	Mn (OH) 3-	1.504e-17	1.319e-17	-16.823	-16.880	-0.057	(0)
	Mn (NO3) 2	2.480e-22	2.480e-22	-21.606	-21.606	0.000	(0)
	Mn (OH) 4-2	3.304e-23	1.954e-23	-22.481	-22.709	-0.228	(0)
	MnSe	0.000e+00	0.000e+00	-41.565	-41.565	0.000	(0)
Mn (3)	1.451e-25						
	Mn+3	1.451e-25	4.314e-26	-24.838	-25.365	-0.527	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.819	-42.047	-0.228	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-46.317	-46.378	-0.062	(0)
Mo	6.111e-07						
	MoO4-2	6.109e-07	3.563e-07	-6.214	-6.448	-0.234	(0)
	HMoO4-	1.827e-10	1.555e-10	-9.738	-9.808	-0.070	(0)
	H2MoO4	2.500e-14	2.500e-14	-13.602	-13.602	0.000	(0)
	Ag2MoO4	3.938e-25	3.938e-25	-24.405	-24.405	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.097	-43.725	-0.628	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.904	-53.417	-2.513	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-52.944	-54.689	-1.745	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-56.448	-57.565	-1.117	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-61.350	-61.978	-0.628	(0)
N (-3)	4.726e-07						
	NH4+	4.517e-07	3.909e-07	-6.345	-6.408	-0.063	(0)
	NH4SO4-	1.072e-08	9.401e-09	-7.970	-8.027	-0.057	(0)
	NH3	1.016e-08	1.016e-08	-7.993	-7.993	0.000	(0)
	CaNH3+2	1.749e-11	9.197e-12	-10.757	-11.036	-0.279	(0)
	CuNH3+2	1.061e-11	5.579e-12	-10.974	-11.253	-0.279	(0)
	NiNH3+2	2.119e-13	1.114e-13	-12.674	-12.953	-0.279	(0)
	AgNH3+	4.162e-14	3.544e-14	-13.381	-13.451	-0.070	(0)
	Co (NH3) +2	3.027e-14	1.591e-14	-13.519	-13.798	-0.279	(0)
	BaNH3+2	1.737e-16	9.131e-17	-15.760	-16.039	-0.279	(0)
	Ag (NH3) 2+	3.436e-18	2.926e-18	-17.464	-17.534	-0.070	(0)
	Ni (NH3) 2+2	3.111e-19	1.636e-19	-18.507	-18.786	-0.279	(0)
	Hg (NH3) 2+2	1.114e-19	5.859e-20	-18.953	-19.232	-0.279	(0)
	Ca (NH3) 2+2	7.075e-20	3.719e-20	-19.150	-19.430	-0.279	(0)

Co (NH3) 2+2	1.312e-20	6.895e-21	-19.882	-20.161	-0.279	(0)
HgNH3+2	1.097e-20	5.768e-21	-19.960	-20.239	-0.279	(0)
Hg (NH3) 3+2	4.507e-27	2.369e-27	-26.346	-26.625	-0.279	(0)
Co (NH3) 3+2	1.677e-27	8.818e-28	-26.775	-27.055	-0.279	(0)
Hg (NH3) 4+2	3.637e-34	1.912e-34	-33.439	-33.719	-0.279	(0)
Co (NH3) 4+2	8.942e-35	4.701e-35	-34.049	-34.328	-0.279	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.399	-40.678	-0.279	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.822	-42.101	-0.279	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.077	-49.706	-0.628	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.388	-49.667	-0.279	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.042	-51.321	-0.279	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.312	-59.381	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.517	-63.796	-0.279	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.096	-64.376	-0.279	(0)
N (3)	4.554e-06					
NO2-	4.554e-06	3.953e-06	-5.342	-5.403	-0.062	(0)
CuNO2+	2.609e-11	2.221e-11	-10.584	-10.653	-0.070	(0)
AgNO2	1.411e-12	1.411e-12	-11.850	-11.850	0.000	(0)
CoNO2+	4.262e-13	3.629e-13	-12.370	-12.440	-0.070	(0)
Cu (NO2) 2	8.984e-16	8.984e-16	-15.047	-15.047	0.000	(0)
Ag (NO2) 2-	1.015e-17	8.639e-18	-16.994	-17.064	-0.070	(0)
N (5)	3.051e-09					
NO3-	3.044e-09	2.660e-09	-8.517	-8.575	-0.059	(0)
CaNO3+	7.105e-12	6.050e-12	-11.148	-11.218	-0.070	(0)
MnNO3+	4.358e-14	3.711e-14	-13.361	-13.430	-0.070	(0)
ZnNO3+	6.652e-15	5.664e-15	-14.177	-14.247	-0.070	(0)
CuNO3+	5.302e-16	4.515e-16	-15.276	-15.345	-0.070	(0)
BaNO3+	2.231e-16	1.900e-16	-15.652	-15.721	-0.070	(0)
NiNO3+	1.603e-16	1.365e-16	-15.795	-15.865	-0.070	(0)
CoNO3+	6.452e-17	5.494e-17	-16.190	-16.260	-0.070	(0)
CdNO3+	1.677e-17	1.428e-17	-16.776	-16.845	-0.070	(0)
PbNO3+	8.243e-18	7.019e-18	-17.084	-17.154	-0.070	(0)
AgNO3	3.611e-18	3.611e-18	-17.442	-17.442	0.000	(0)
Mn (NO3) 2	2.480e-22	2.480e-22	-21.606	-21.606	0.000	(0)
UO2NO3+	9.898e-23	8.428e-23	-22.004	-22.074	-0.070	(0)
Zn (NO3) 2	3.007e-24	3.007e-24	-23.522	-23.522	0.000	(0)
CrNO3+2	3.965e-25	2.085e-25	-24.402	-24.681	-0.279	(0)
Co (NO3) 2	2.974e-25	2.974e-25	-24.527	-24.527	0.000	(0)
Cu (NO3) 2	1.512e-25	1.512e-25	-24.820	-24.820	0.000	(0)
Pb (NO3) 2	3.171e-26	3.171e-26	-25.499	-25.499	0.000	(0)
VO2NO3	2.643e-26	2.643e-26	-25.578	-25.578	0.000	(0)
Cd (NO3) 2	1.904e-26	1.904e-26	-25.720	-25.720	0.000	(0)
FeNO3+2	6.394e-28	3.362e-28	-27.194	-27.473	-0.279	(0)
HgNO3+	1.038e-30	8.840e-31	-29.984	-30.054	-0.070	(0)
Hg (NO3) 2	9.775e-40	9.775e-40	-39.010	-39.010	0.000	(0)
Na	5.637e-03					
Na+	5.564e-03	4.863e-03	-2.255	-2.313	-0.059	(0)
NaSO4-	6.670e-05	5.861e-05	-4.176	-4.232	-0.056	(0)
NaHCO3	5.035e-06	5.035e-06	-5.298	-5.298	0.000	(0)
NaCO3-	4.054e-07	3.562e-07	-6.392	-6.448	-0.056	(0)
NaF	2.835e-07	2.835e-07	-6.547	-6.547	0.000	(0)
NaH2BO3	3.054e-09	3.054e-09	-8.515	-8.515	0.000	(0)
NaCrO4-	1.420e-17	1.209e-17	-16.848	-16.918	-0.070	(0)
Ni	5.292e-08					
Ni+2	3.501e-08	2.042e-08	-7.456	-7.690	-0.234	(0)
NiSO4	9.145e-09	9.145e-09	-8.039	-8.039	0.000	(0)
NiHCO3+	5.444e-09	4.635e-09	-8.264	-8.334	-0.070	(0)
NiCO3	2.997e-09	2.997e-09	-8.523	-8.523	0.000	(0)
NiOH+	1.385e-10	1.180e-10	-9.858	-9.928	-0.070	(0)
NiCl+	1.175e-10	1.001e-10	-9.930	-10.000	-0.070	(0)
NiF+	5.567e-11	4.740e-11	-10.254	-10.324	-0.070	(0)
Ni (OH) 2	4.299e-12	4.299e-12	-11.367	-11.367	0.000	(0)
Ni (SO4) 2-2	1.293e-12	6.797e-13	-11.888	-12.168	-0.279	(0)
NiNH3+2	2.119e-13	1.114e-13	-12.674	-12.953	-0.279	(0)
Ni (OH) 3-	2.316e-15	1.972e-15	-14.635	-14.705	-0.070	(0)
NiCl2	9.647e-16	9.647e-16	-15.016	-15.016	0.000	(0)
NiSeO4	1.906e-16	1.906e-16	-15.720	-15.720	0.000	(0)
NiNO3+	1.603e-16	1.365e-16	-15.795	-15.865	-0.070	(0)

Ni (NH3) 2+2	3.111e-19	1.636e-19	-18.507	-18.786	-0.279	(0)
O (0)	1.260e-35					
O2	6.298e-36	6.325e-36	-35.201	-35.199	0.002	(0)
Pb	3.208e-09					
PbCO3	2.109e-09	2.109e-09	-8.676	-8.676	0.000	(0)
Pb+2	3.058e-10	1.784e-10	-9.515	-9.749	-0.234	(0)
PbHCO3+	2.866e-10	2.440e-10	-9.543	-9.613	-0.070	(0)
PbOH+	2.414e-10	2.056e-10	-9.617	-9.687	-0.070	(0)
PbSO4	1.961e-10	1.961e-10	-9.708	-9.708	0.000	(0)
Pb (CO3) 2-2	4.552e-11	2.393e-11	-10.342	-10.621	-0.279	(0)
PbCl+	1.423e-11	1.212e-11	-10.847	-10.917	-0.070	(0)
Pb (SO4) 2-2	5.044e-12	2.652e-12	-11.297	-11.576	-0.279	(0)
Pb (OH) 2	2.982e-12	2.982e-12	-11.525	-11.525	0.000	(0)
PbF+	1.364e-12	1.162e-12	-11.865	-11.935	-0.070	(0)
PbCl2	1.037e-13	1.037e-13	-12.984	-12.984	0.000	(0)
PbF2	2.112e-15	2.112e-15	-14.675	-14.675	0.000	(0)
Pb (OH) 3-	1.607e-15	1.368e-15	-14.794	-14.864	-0.070	(0)
PbCl3-	9.280e-17	7.902e-17	-16.032	-16.102	-0.070	(0)
PbNO3+	8.243e-18	7.019e-18	-17.084	-17.154	-0.070	(0)
Pb2OH+3	2.469e-18	5.811e-19	-17.607	-18.236	-0.628	(0)
PbF3-	4.348e-19	3.703e-19	-18.362	-18.431	-0.070	(0)
Pb (OH) 4-2	2.924e-19	1.537e-19	-18.534	-18.813	-0.279	(0)
PbCl4-2	1.316e-19	6.916e-20	-18.881	-19.160	-0.279	(0)
Pb3 (OH) 4+2	6.021e-23	3.165e-23	-22.220	-22.500	-0.279	(0)
PbF4-2	3.115e-23	1.638e-23	-22.507	-22.786	-0.279	(0)
Pb (NO3) 2	3.171e-26	3.171e-26	-25.499	-25.499	0.000	(0)
Pb4 (OH) 4+4	5.870e-28	4.485e-29	-27.231	-28.348	-1.117	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.958	-150.958	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.829	-227.898	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.193	-73.193	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.170	-78.240	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.879	-78.879	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.932	-79.002	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-79.667	-79.946	-0.279	(0)
S6-2	0.000e+00	0.000e+00	-80.183	-80.462	-0.279	(0)
S4-2	0.000e+00	0.000e+00	-80.263	-80.542	-0.279	(0)
S3-2	0.000e+00	0.000e+00	-81.069	-81.348	-0.279	(0)
S2-2	0.000e+00	0.000e+00	-82.085	-82.364	-0.279	(0)
S-2	0.000e+00	0.000e+00	-87.653	-87.881	-0.228	(0)
HgHS2-	0.000e+00	0.000e+00	-137.869	-137.939	-0.070	(0)
HgS2-2	0.000e+00	0.000e+00	-138.709	-138.988	-0.279	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-139.204	-139.204	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.991	-147.157	-0.167	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.084	-147.393	-0.309	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.263	-147.333	-0.070	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.827	-148.123	-0.296	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.013	-148.083	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.623	-148.939	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.947	-149.250	-0.302	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.732	-149.732	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.038	-150.038	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.958	-150.958	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.437	-159.437	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.021	-216.091	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.622	-224.691	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.308	-226.378	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.734	-227.013	-0.279	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.829	-227.898	-0.070	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.570	-235.639	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.143	-302.422	-0.279	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.112	-304.391	-0.279	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.173	-318.453	-0.279	(0)
S (6)	4.648e-03					
SO4-2	3.848e-03	2.244e-03	-2.415	-2.649	-0.234	(0)
CaSO4	3.698e-04	3.698e-04	-3.432	-3.432	0.000	(0)
MgSO4	3.405e-04	3.405e-04	-3.468	-3.468	0.000	(0)
NaSO4-	6.670e-05	5.861e-05	-4.176	-4.232	-0.056	(0)

KSO4-	1.918e-05	1.685e-05	-4.717	-4.773	-0.056	(0)
MnSO4	3.513e-06	3.513e-06	-5.454	-5.454	0.000	(0)
ZnSO4	4.162e-07	4.162e-07	-6.381	-6.381	0.000	(0)
CuSO4	2.759e-08	2.759e-08	-7.559	-7.559	0.000	(0)
Zn(SO4) 2-2	1.548e-08	8.136e-09	-7.810	-8.090	-0.279	(0)
NH4SO4-	1.072e-08	9.401e-09	-7.970	-8.027	-0.057	(0)
NiSO4	9.145e-09	9.145e-09	-8.039	-8.039	0.000	(0)
CoSO4	5.835e-09	5.835e-09	-8.234	-8.234	0.000	(0)
HSO4-	5.501e-09	4.812e-09	-8.260	-8.318	-0.058	(0)
CdSO4	8.929e-10	8.929e-10	-9.049	-9.049	0.000	(0)
PbSO4	1.961e-10	1.961e-10	-9.708	-9.708	0.000	(0)
AgSO4-	8.986e-11	7.652e-11	-10.046	-10.116	-0.070	(0)
Cd(SO4) 2-2	5.142e-11	2.703e-11	-10.289	-10.568	-0.279	(0)
CrOHSO4	9.583e-12	9.583e-12	-11.018	-11.018	0.000	(0)
Pb(SO4) 2-2	5.044e-12	2.652e-12	-11.297	-11.576	-0.279	(0)
Ni(SO4) 2-2	1.293e-12	6.797e-13	-11.888	-12.168	-0.279	(0)
FeSO4	6.829e-13	6.829e-13	-12.166	-12.166	0.000	(0)
AlSO4+	1.669e-13	1.460e-13	-12.777	-12.836	-0.058	(0)
UO2SO4	5.394e-14	5.394e-14	-13.268	-13.268	0.000	(0)
CrSO4+	1.103e-14	9.395e-15	-13.957	-14.027	-0.070	(0)
Al(SO4) 2-	4.014e-15	3.512e-15	-14.396	-14.454	-0.058	(0)
UO2(SO4) 2-2	3.035e-15	1.596e-15	-14.518	-14.797	-0.279	(0)
VO2SO4-	1.236e-18	1.053e-18	-17.908	-17.978	-0.070	(0)
FeSO4+	3.628e-19	3.182e-19	-18.440	-18.497	-0.057	(0)
Cr2(OH) 2SO4+2	2.965e-20	1.559e-20	-19.528	-19.807	-0.279	(0)
Fe(SO4) 2-	1.793e-20	1.527e-20	-19.746	-19.816	-0.070	(0)
VOSO4	4.261e-21	4.261e-21	-20.370	-20.370	0.000	(0)
Cr2(OH) 2(SO4) 2	2.078e-21	2.078e-21	-20.682	-20.682	0.000	(0)
HgSO4	5.288e-22	5.288e-22	-21.277	-21.277	0.000	(0)
CrO3SO4-2	1.014e-24	5.329e-25	-23.994	-24.273	-0.279	(0)
VSO4+	1.869e-35	1.592e-35	-34.728	-34.798	-0.070	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.096	-40.096	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.068	-41.348	-0.279	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-59.312	-59.381	-0.070	(0)
Sb(3)	3.262e-20					
Sb(OH) 3	1.650e-20	1.650e-20	-19.782	-19.782	0.000	(0)
HSbO2	1.611e-20	1.611e-20	-19.793	-19.793	0.000	(0)
SbO2-	1.397e-24	1.189e-24	-23.855	-23.925	-0.070	(0)
Sb(OH) 4-	8.000e-25	6.812e-25	-24.097	-24.167	-0.070	(0)
Sb(OH) 2F	5.228e-26	5.228e-26	-25.282	-25.282	0.000	(0)
SbOF	5.143e-26	5.143e-26	-25.289	-25.289	0.000	(0)
Sb(OH) 2+	1.033e-26	8.795e-27	-25.986	-26.056	-0.070	(0)
SbO+	3.562e-27	3.033e-27	-26.448	-26.518	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.173	-318.453	-0.279	(0)
Sb(5)	9.262e-09					
SbO3-	9.251e-09	7.878e-09	-8.034	-8.104	-0.070	(0)
Sb(OH) 6-	1.053e-11	9.206e-12	-10.977	-11.036	-0.059	(0)
SbO2+	1.278e-24	1.088e-24	-23.894	-23.963	-0.070	(0)
Se(-2)	1.787e-14					
Ag2Se	1.787e-14	1.787e-14	-13.748	-13.748	0.000	(0)
HSe-	1.936e-39	1.649e-39	-38.713	-38.783	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-41.565	-41.565	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.552	-42.552	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.845	-46.124	-0.279	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.749	-83.866	-1.117	(0)
Se(4)	5.407e-08					
HSeO3-	4.179e-08	3.559e-08	-7.379	-7.449	-0.070	(0)
SeO3-2	1.228e-08	6.457e-09	-7.911	-8.190	-0.279	(0)
H2SeO3	3.331e-13	3.331e-13	-12.477	-12.477	0.000	(0)
AgSeO3-	8.327e-15	7.091e-15	-14.079	-14.149	-0.070	(0)
Cd(SeO3) 2-2	1.109e-19	5.831e-20	-18.955	-19.234	-0.279	(0)
Ag(SeO3) 2-3	1.742e-21	4.100e-22	-20.759	-21.387	-0.628	(0)
FeHSeO3+2	2.260e-24	1.188e-24	-23.646	-23.925	-0.279	(0)
Se(6)	3.427e-11					
SeO4-2	3.422e-11	1.996e-11	-10.466	-10.700	-0.234	(0)
MnSeO4	4.728e-14	4.728e-14	-13.325	-13.325	0.000	(0)
ZnSeO4	2.620e-15	2.620e-15	-14.582	-14.582	0.000	(0)
NiSeO4	1.906e-16	1.906e-16	-15.720	-15.720	0.000	(0)

	CoSeO4	1.303e-16	1.303e-16	-15.885	-15.885	0.000	(0)
	HSeO4-	2.577e-17	2.195e-17	-16.589	-16.659	-0.070	(0)
	CdSeO4	6.306e-18	6.306e-18	-17.200	-17.200	0.000	(0)
	Zn (SeO4) 2-2	1.008e-25	5.302e-26	-24.996	-25.276	-0.279	(0)
Si	8.813e-05						
	H4SiO4	8.747e-05	8.785e-05	-4.058	-4.056	0.002	(0)
	H3SiO4-	6.632e-07	5.787e-07	-6.178	-6.238	-0.059	(0)
	H2SiO4-2	2.792e-12	1.664e-12	-11.554	-11.779	-0.225	(0)
	UO2H3SiO4+	9.162e-13	7.801e-13	-12.038	-12.108	-0.070	(0)
	SiF6-2	3.248e-29	1.921e-29	-28.488	-28.716	-0.228	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-58.507	-59.135	-0.628	(0)
U (4)	8.802e-21						
	U (OH) 5-	8.795e-21	7.489e-21	-20.056	-20.126	-0.070	(0)
	U (OH) 4	6.884e-24	6.884e-24	-23.162	-23.162	0.000	(0)
	U (OH) 3+	6.486e-28	5.523e-28	-27.188	-27.258	-0.070	(0)
	U (OH) 2+2	1.066e-32	5.605e-33	-31.972	-32.251	-0.279	(0)
	UF3+	1.855e-36	1.580e-36	-35.732	-35.801	-0.070	(0)
	UF2+2	2.051e-37	1.078e-37	-36.688	-36.967	-0.279	(0)
	UOH+3	2.462e-38	5.794e-39	-37.609	-38.237	-0.628	(0)
	UF4	1.601e-38	1.601e-38	-37.796	-37.796	0.000	(0)
	UF+3	3.939e-40	0.000e+00	-39.405	-40.033	-0.628	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-40.096	-40.096	0.000	(0)
	UF5-	0.000e+00	0.000e+00	-40.162	-40.232	-0.070	(0)
	USO4+2	0.000e+00	0.000e+00	-41.068	-41.348	-0.279	(0)
	UF6-2	0.000e+00	0.000e+00	-41.507	-41.786	-0.279	(0)
	U+4	0.000e+00	0.000e+00	-44.182	-45.299	-1.117	(0)
	UCl+3	0.000e+00	0.000e+00	-45.688	-46.316	-0.628	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-168.413	-174.068	-5.654	(0)
U (5)	1.036e-16						
	UO2+	1.036e-16	8.819e-17	-15.985	-16.055	-0.070	(0)
U (6)	8.775e-08						
	UO2 (CO3) 3-4	5.038e-08	3.848e-09	-7.298	-8.415	-1.117	(0)
	UO2 (CO3) 2-2	3.713e-08	1.952e-08	-7.430	-7.710	-0.279	(0)
	UO2CO3	2.487e-10	2.487e-10	-9.604	-9.604	0.000	(0)
	UO2OH+	1.077e-12	9.171e-13	-11.968	-12.038	-0.070	(0)
	UO2H3SiO4+	9.162e-13	7.801e-13	-12.038	-12.108	-0.070	(0)
	UO2F+	2.379e-13	2.025e-13	-12.624	-12.693	-0.070	(0)
	UO2F2	5.398e-14	5.398e-14	-13.268	-13.268	0.000	(0)
	UO2SO4	5.394e-14	5.394e-14	-13.268	-13.268	0.000	(0)
	UO2+2	2.722e-14	1.588e-14	-13.565	-13.799	-0.234	(0)
	UO2 (SO4) 2-2	3.035e-15	1.596e-15	-14.518	-14.797	-0.279	(0)
	UO2F3-	1.472e-15	1.253e-15	-14.832	-14.902	-0.070	(0)
	UO2Cl+	5.791e-17	4.931e-17	-16.237	-16.307	-0.070	(0)
	(UO2) 2 (OH) 2+2	2.655e-18	1.396e-18	-17.576	-17.855	-0.279	(0)
	UO2F4-2	1.750e-18	9.198e-19	-17.757	-18.036	-0.279	(0)
	(UO2) 3 (OH) 5+	2.400e-19	2.044e-19	-18.620	-18.690	-0.070	(0)
	UO2NO3+	9.898e-23	8.428e-23	-22.004	-22.074	-0.070	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-42.932	-43.002	-0.070	(0)
	V+2	0.000e+00	0.000e+00	-43.894	-44.174	-0.279	(0)
V (3)	1.170e-15						
	V (OH) 3	1.170e-15	1.170e-15	-14.932	-14.932	0.000	(0)
	V (OH) 2+	1.949e-26	1.659e-26	-25.710	-25.780	-0.070	(0)
	VOH+2	6.570e-30	3.454e-30	-29.182	-29.462	-0.279	(0)
	V+3	6.383e-35	1.502e-35	-34.195	-34.823	-0.628	(0)
	VSO4+	1.869e-35	1.592e-35	-34.728	-34.798	-0.070	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-56.162	-56.790	-0.628	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-57.006	-58.123	-1.117	(0)
V (4)	7.629e-19						
	V (OH) 3+	7.408e-19	6.308e-19	-18.130	-18.200	-0.070	(0)
	VO+2	1.311e-20	6.893e-21	-19.882	-20.162	-0.279	(0)
	VOF+	4.487e-21	3.821e-21	-20.348	-20.418	-0.070	(0)
	VOSO4	4.261e-21	4.261e-21	-20.370	-20.370	0.000	(0)
	VOF2	1.324e-22	1.324e-22	-21.878	-21.878	0.000	(0)
	VOC1+	4.349e-23	3.703e-23	-22.362	-22.431	-0.070	(0)
	VOF3-	5.098e-25	4.341e-25	-24.293	-24.362	-0.070	(0)
	VOF4-2	3.080e-28	1.619e-28	-27.511	-27.791	-0.279	(0)

H2V2O4+2	3.796e-32	1.996e-32	-31.421	-31.700	-0.279	(0)
V(5)	2.845e-09					
H2VO4-	2.400e-09	2.043e-09	-8.620	-8.690	-0.070	(0)
HVO4-2	4.450e-10	2.339e-10	-9.352	-9.631	-0.279	(0)
H3VO4	4.484e-13	4.484e-13	-12.348	-12.348	0.000	(0)
H3V2O7-	6.949e-15	5.917e-15	-14.158	-14.228	-0.070	(0)
HV2O7-3	6.885e-16	1.620e-16	-15.162	-15.790	-0.628	(0)
VO4-3	2.271e-16	5.344e-17	-15.644	-16.272	-0.628	(0)
VO2+	2.247e-17	1.964e-17	-16.648	-16.707	-0.059	(0)
VO2F	3.183e-18	3.183e-18	-17.497	-17.497	0.000	(0)
V2O7-4	2.602e-18	1.988e-19	-17.585	-18.702	-1.117	(0)
VO2SO4-	1.236e-18	1.053e-18	-17.908	-17.978	-0.070	(0)
VO2F2-	1.254e-19	1.068e-19	-18.902	-18.971	-0.070	(0)
V3O9-3	3.800e-20	8.944e-21	-19.420	-20.048	-0.628	(0)
VO2F3-2	2.342e-22	1.231e-22	-21.630	-21.910	-0.279	(0)
V4O12-4	9.976e-26	7.621e-27	-25.001	-26.118	-1.117	(0)
VO2NO3	2.643e-26	2.643e-26	-25.578	-25.578	0.000	(0)
VO2F4-3	2.379e-26	5.598e-27	-25.624	-26.252	-0.628	(0)
V10O28-6	0.000e+00	0.000e+00	-66.111	-68.624	-2.513	(0)
HV10O28-5	0.000e+00	0.000e+00	-66.351	-68.096	-1.745	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.430	-70.547	-1.117	(0)
Zn	2.192e-06					
Zn+2	1.453e-06	8.476e-07	-5.838	-6.072	-0.234	(0)
ZnSO4	4.162e-07	4.162e-07	-6.381	-6.381	0.000	(0)
ZnCO3	1.919e-07	1.919e-07	-6.717	-6.717	0.000	(0)
ZnHCO3+	5.796e-08	4.935e-08	-7.237	-7.307	-0.070	(0)
ZnOH+	4.567e-08	3.889e-08	-7.340	-7.410	-0.070	(0)
Zn(SO4) 2-2	1.548e-08	8.136e-09	-7.810	-8.090	-0.279	(0)
ZnCl+	4.672e-09	4.077e-09	-8.330	-8.390	-0.059	(0)
Zn(OH) 2	2.828e-09	2.828e-09	-8.549	-8.549	0.000	(0)
ZnOHCl	2.449e-09	2.449e-09	-8.611	-8.611	0.000	(0)
ZnF+	1.835e-09	1.563e-09	-8.736	-8.806	-0.070	(0)
ZnCl2	1.237e-11	1.237e-11	-10.908	-10.908	0.000	(0)
Zn(OH) 3-	7.636e-12	6.502e-12	-11.117	-11.187	-0.070	(0)
ZnCl3-	2.157e-14	1.882e-14	-13.666	-13.725	-0.059	(0)
ZnNO3+	6.652e-15	5.664e-15	-14.177	-14.247	-0.070	(0)
ZnSeO4	2.620e-15	2.620e-15	-14.582	-14.582	0.000	(0)
Zn(OH) 4-2	2.259e-16	1.188e-16	-15.646	-15.925	-0.279	(0)
ZnCl4-2	3.046e-17	1.802e-17	-16.516	-16.744	-0.228	(0)
Zn(NO3) 2	3.007e-24	3.007e-24	-23.522	-23.522	0.000	(0)
Zn(SeO4) 2-2	1.008e-25	5.302e-26	-24.996	-25.276	-0.279	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.013	-148.083	-0.070	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.732	-149.732	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.622	-224.691	-0.070	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.734	-227.013	-0.279	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.112	-304.391	-0.279	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.15	-48.86	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.65	-37.14	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.88	-37.14	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.40	-53.46	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.93	-35.89	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.52	-28.12	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.97	-23.52	0.45	(NH4)2SeO4
Acanthite	-51.90	-88.12	-36.22	Ag2S
Ag2CO3	-11.85	-22.94	-11.09	Ag2CO3
Ag2CrO4	-21.25	-32.84	-11.59	Ag2CrO4
Ag2HVO4	-12.75	-11.27	1.48	Ag2HVO4
Ag2MoO4	-12.43	-23.98	-11.55	Ag2MoO4
Ag2O	-14.79	-2.22	12.57	Ag2O
Ag2Se	0.04	-48.66	-48.70	Ag2Se
Ag2SeO3	-10.17	-17.32	-7.15	Ag2SeO3
Ag2SeO4	-19.32	-28.23	-8.91	Ag2SeO4
Ag2SO4	-15.36	-20.18	-4.82	Ag2SO4

Ag3AsO3	-27.95	-25.79	2.16	Ag3AsO3
Ag3AsO4	-16.50	-19.29	-2.79	Ag3AsO4
Ag3H2VO5	-17.55	-12.37	5.18	Ag3H2VO5
AgF:4H2O	-13.85	-12.80	1.05	AgF:4H2O
Agmetal	-0.30	-13.81	-13.51	Ag
AgVO3	-10.93	-10.16	0.77	AgVO3
Al (OH) 3 (am)	-1.90	8.90	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.87	-47.50	2.37	Al2 (MoO4) 3
Al2O3	-1.85	17.80	19.65	Al2O3
Al4 (OH) 10SO4	-5.07	17.63	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.87	-7.07	4.80	AlAsO4:2H2O
AlOHSO4	-5.84	-9.07	-3.23	AlOHSO4
AlSb	-152.70	-87.08	65.62	AlSb
Alunite	-3.15	-4.55	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.61	-12.40	-7.79	PbSO4
Anhydrite	-1.43	-5.79	-4.36	CaSO4
Anilite	-54.95	-86.83	-31.88	Cu0.25Cu1.5S
Antlerite	-2.61	6.17	8.79	Cu3 (OH) 4SO4
Aragonite	-0.25	-8.55	-8.30	CaCO3
Arsenolite	-87.10	-89.86	-2.76	As4O6
Artinite	-5.85	3.75	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.64	-31.93	6.71	As2O5
Atacamite	-1.67	5.72	7.39	Cu2 (OH) 3Cl
Azurite	-0.40	-17.30	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.92	7.47	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.03	-3.15	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.61	-9.52	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.62	4.32	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-10.09	-15.91	-5.82	BaF2
BaMoO4	-7.33	-14.29	-6.96	BaMoO4
Barite	-0.52	-10.50	-9.98	BaSO4
BaS	-94.61	-78.43	16.18	BaS
BaSeO3	-9.47	-7.64	1.83	BaSeO3
BaSeO4	-11.09	-18.55	-7.46	BaSeO4
Bianchite	-6.96	-8.72	-1.76	ZnSO4:6H2O
Birnessite	-7.78	10.31	18.09	MnO2
Bixbyite	-4.13	-4.78	-0.64	Mn2O3
BlaubleiI	-54.89	-79.05	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.36	-82.64	-27.28	Cu0.6Cu0.8S
Boehmite	0.32	8.90	8.58	AlOOH
Breithauptite	-57.13	-75.65	-18.52	NiSb
Brochantite	-1.00	14.22	15.22	Cu4 (OH) 6SO4
Brucite	-4.61	12.24	16.84	Mg (OH) 2
Bunsenite	-4.82	7.63	12.45	NiO
Ca (VO3) 2	-11.58	-5.92	5.66	Ca (VO3) 2
Ca2V2O7	-11.25	6.25	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.30	6.25	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.71	4.59	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-20.53	18.43	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.43	18.43	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-298.40	-155.43	142.97	Ca3Sb2
CaCrO4	-16.18	-18.44	-2.27	CaCrO4
Calcite	-0.07	-8.55	-8.48	CaCO3
Calomel	-8.90	-26.81	-17.91	Hg2Cl2
CaMoO4	-1.64	-9.59	-7.95	CaMoO4
Carnotite	-3.08	-2.85	0.23	KUO2VO4
CaSeO3:2H2O	-5.75	-2.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.82	-13.84	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-12.94	-3.10	9.84	Cd (BO2) 2
Cd (OH) 2	-7.10	6.55	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.18	6.55	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.00	-16.29	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.89	1.67	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-20.18	8.22	28.40	Cd4 (OH) 6SO4
CdCl2	-13.55	-14.21	-0.66	CdCl2
CdCl2:1H2O	-12.51	-14.21	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.29	-14.21	-1.91	CdCl2:2.5H2O

CdF2	-15.63	-16.84	-1.21	CdF2
Cdmetal (alpha)	-32.37	-18.85	13.51	Cd
Cdmetal (gamma)	-32.47	-18.85	13.62	Cd
CdMoO4	-1.07	-15.22	-14.15	CdMoO4
CdOHCl	-7.37	-3.83	3.54	CdOHCl
CdSb	-76.38	-76.73	-0.35	CdSb
CdSe	-19.69	-39.89	-20.20	CdSe
CdSeO4:2H2O	-17.62	-19.47	-1.85	CdSeO4:2H2O
CdSO4	-11.25	-11.42	-0.17	CdSO4
CdSO4:1H2O	-9.69	-11.42	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.55	-11.42	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.74	-11.49	-9.75	AgCl
Cerrusite	-2.02	-15.15	-13.13	PbCO3
CH4 (g)	-81.27	-122.32	-41.05	CH4
Chalcanthite	-7.28	-9.92	-2.64	CuSO4:5H2O
Chalcedony	-0.51	-4.06	-3.55	SiO2
Chalcocite	-54.90	-89.82	-34.92	Cu2S
Chalcopyrite	-125.07	-160.34	-35.27	CuFeS2
Chrysotile	-3.60	28.60	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-52.13	-97.82	-45.69	HgS
Claudetite	-86.80	-89.86	-3.06	As4O6
Clausthalite	-13.77	-40.87	-27.10	PbSe
Co (BO2) 2	-29.29	-2.22	27.07	Co (BO2) 2
Co (OH) 2	-5.66	7.43	13.09	Co (OH) 2
Co (OH) 3	-9.96	-12.27	-2.31	Co (OH) 3
CO2 (g)	-2.58	-20.72	-18.15	CO2
Co3 (AsO4) 2	-22.67	-9.63	13.03	Co3 (AsO4) 2
Co3O4	-6.61	-17.11	-10.50	Co3O4
CoCl2	-21.59	-13.32	8.27	CoCl2
CoCl2:6H2O	-15.86	-13.32	2.54	CoCl2:6H2O
CoCO3	-3.31	-13.29	-9.98	CoCO3
CoF2	-14.36	-15.95	-1.60	CoF2
CoF3	-45.89	-47.35	-1.46	CoF3
CoFe2O4	17.12	13.59	-3.53	CoFe2O4
CoMoO4	-6.57	-14.33	-7.76	CoMoO4
CoO	-6.15	7.43	13.59	CoO
CoS (alpha)	-71.03	-78.47	-7.44	CoS
CoS (beta)	-67.40	-78.47	-11.07	CoS
CoSe	-22.81	-39.01	-16.20	CoSe
CoSeO3	-9.00	-7.68	1.32	CoSeO3
CoSeO4:6H2O	-17.06	-18.59	-1.53	CoSeO4:6H2O
CoSO4	-13.34	-10.53	2.80	CoSO4
CoSO4:6H2O	-8.06	-10.53	-2.47	CoSO4:6H2O
Cotunnite	-10.40	-15.18	-4.78	PbCl2
Covellite	-55.55	-77.85	-22.30	CuS
Cr (OH) 2	-21.91	-11.09	10.82	Cr (OH) 2
Cr (OH) 3	-2.67	-1.34	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.59	-1.34	-0.75	Cr (OH) 3
Cr2O3	-0.32	-2.68	-2.36	Cr2O3
CrCl2	-45.94	-31.84	14.09	CrCl2
CrCl3	-47.58	-32.47	15.11	CrCl3
CrF3	-25.08	-36.42	-11.34	CrF3
Cristobalite	-0.71	-4.06	-3.35	SiO2
Crmetal	-66.97	-36.49	30.48	Cr
CrO3	-27.41	-30.62	-3.21	CrO3
Cryolite	-11.38	-45.22	-33.84	Na3AlF6
Cu (OH) 2	-0.63	8.05	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.93	19.28	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.39	-0.14	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.01	-89.89	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.57	-50.37	-45.80	Cu2Se
Cu2SO4	-19.94	-21.89	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.89	-7.79	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.27	-101.86	-42.59	Cu3Sb
Cu3Se2	-25.27	-88.76	-63.49	Cu3Se2
CuCO3	-1.18	-12.68	-11.50	CuCO3
CuCrO4	-17.13	-22.57	-5.44	CuCrO4
CuF	-8.75	-13.65	-4.91	CuF

CuF2	-16.45	-15.34	1.12	CuF2
CuF2:2H2O	-10.79	-15.34	-4.55	CuF2:2H2O
Cumetal	-5.90	-14.66	-8.76	Cu
CuMoO4	-0.64	-13.72	-13.08	CuMoO4
CuOCuSO4	-12.18	-1.87	10.30	CuOCuSO4
Cupricferrite	8.21	14.20	5.99	CuFe2O4
Cuprite	-2.52	-3.92	-1.41	Cu2O
Cuprousferrite	10.03	1.12	-8.92	CuFeO2
CuSe	-5.29	-38.39	-33.10	CuSe
CuSe2	-26.07	-59.44	-33.37	CuSe2
CuSeO3:2H2O	-7.57	-7.06	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.53	-17.97	-2.44	CuSeO4:5H2O
CuSO4	-12.86	-9.92	2.94	CuSO4
Diaspore	2.03	8.90	6.87	AlOOH
Djurleite	-55.11	-89.03	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.49	-17.03	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.06	-17.03	-17.09	CaMg(CO3)2
Epsomite	-3.60	-5.73	-2.13	MgSO4:7H2O
Fe(OH)2	-10.15	3.41	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.00	-0.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.97	-14.69	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.51	-8.95	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.54	-39.17	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-44.01	-47.74	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.66	9.57	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.29	-12.89	0.40	FeAsO4:2H2O
FeCr2O4	-6.47	0.73	7.20	FeCr2O4
FeMoO4	-8.26	-18.35	-10.09	FeMoO4
Ferrihydrite	-0.11	3.08	3.19	Fe(OH)3
Ferroselite	-45.48	-64.07	-18.60	FeSe2
FeS(ppt)	-79.54	-82.49	-2.95	FeS
FeSe	-32.03	-43.03	-11.00	FeSe
Fix_pe	-5.04	-5.04	0.00	e-
Fluorite	-0.71	-11.21	-10.50	CaF2
Galena	-66.36	-80.33	-13.97	PbS
Gibbsite	0.61	8.90	8.29	Al(OH)3
Goethite	2.59	3.08	0.49	FeOOH
Goslarite	-6.71	-8.72	-2.01	ZnSO4:7H2O
Greenalite	-18.69	2.12	20.81	Fe3Si2O5(OH)4
Greenockite	-64.99	-79.35	-14.36	CdS
Greigite	-288.99	-334.03	-45.03	Fe3S4
Gummite	-6.15	1.52	7.67	UO3
Gypsum	-1.18	-5.79	-4.61	CaSO4:2H2O
H-Jarosite	-14.60	-26.70	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.89	-21.77	-12.88	H2MoO4
H2S(g)	-77.89	-85.90	-8.01	H2S
H2Se(g)	-41.48	-46.44	-4.96	H2Se
Halite	-6.63	-5.03	1.60	NaCl
Halloysite	0.11	9.69	9.57	Al2Si2O5(OH)4
Hausmannite	-4.85	56.18	61.03	Mn3O4
Hematite	7.57	6.16	-1.42	Fe2O3
Hercynite	-1.68	21.21	22.89	FeAl2O4
Hg(CH3)2(g)	-182.85	-256.55	-73.71	Hg(CH3)2
Hg(g)	-7.85	-15.73	-7.87	Hg
Hg(OH)2	-8.43	-11.92	-3.50	Hg(OH)2
Hg2(g)	-16.50	-31.46	-14.96	Hg2
Hg2(OH)2	-11.32	-6.06	5.26	Hg2(OH)2
Hg2CO3	-10.73	-26.78	-16.05	Hg2CO3
Hg2CrO4	-27.98	-36.68	-8.70	Hg2CrO4
Hg2F2	-19.08	-29.44	-10.36	Hg2F2
Hg2S	-80.28	-91.96	-11.68	Hg2S
Hg2SeO3	-16.51	-21.17	-4.66	Hg2SeO3
Hg2SO4	-17.89	-24.02	-6.13	Hg2SO4
Hg3O2CO3	-26.81	-56.49	-29.68	Hg3O2CO3
HgCl(g)	-32.90	-13.41	19.50	HgCl
HgCl2	-11.41	-32.68	-21.26	HgCl2
HgF(g)	-47.40	-14.72	32.68	HgF
HgF2(g)	-47.87	-35.31	12.57	HgF2

Hgmetal (1)	-2.28	-15.73	-13.45	Hg
HgSe	-2.67	-58.36	-55.69	HgSe
HgSeO3	-14.60	-27.03	-12.43	HgSeO3
HgSO4	-20.47	-29.89	-9.42	HgSO4
Huntite	-4.03	-34.00	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.97	-24.74	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.93	-21.70	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.18	-22.35	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.22	-22.02	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.63	-51.87	-17.24	K2Cr2O7
K2CrO4	-20.74	-21.25	-0.51	K2CrO4
K2MoO4	-15.66	-12.40	3.26	K2MoO4
K2SeO4	-15.92	-16.65	-0.73	K2SeO4
Kaolinite	2.25	9.69	7.43	Al2Si2O5 (OH) 4
Langite	-3.27	14.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.39	-6.83	-0.43	PbO : PbSO4
Laurionite	-5.43	-4.81	0.62	PbOHCl
Lepidocrocite	1.71	3.08	1.37	FeOOH
Lime	-20.53	12.17	32.70	CaO
Litharge	-7.13	5.57	12.69	PbO
Mackinawite	-78.89	-82.49	-3.60	FeS
Maghemite	-0.23	6.16	6.39	Fe2O3
Magnesioferrite	1.53	18.39	16.86	Fe2MgO4
Magnesite	-1.02	-8.48	-7.46	MgCO3
Magnetite	6.16	9.57	3.40	Fe3O4
Malachite	0.68	-4.63	-5.31	Cu2 (OH) 2CO3
Manganite	-2.38	22.96	25.34	MnOOH
Massicot	-7.33	5.57	12.89	PbO
Matlockite	-7.53	-16.50	-8.97	PbClF
Melanothallite	-18.96	-12.71	6.26	CuCl2
Melanterite	-12.35	-14.56	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.73	-97.82	-45.09	HgS
Mg (OH) 2 (active)	-6.56	12.24	18.79	Mg (OH) 2
Mg (VO3) 2	-17.14	-5.86	11.28	Mg (VO3) 2
Mg2Sb3	-274.64	-199.96	74.68	Mg2Sb3
Mg2V2O7	-19.98	6.38	26.36	Mg2V2O7
MgCr2O4	-6.64	9.56	16.20	MgCr2O4
MgCrO4	-23.76	-18.38	5.38	MgCrO4
MgF2	-3.02	-11.15	-8.13	MgF2
MgMoO4	-7.68	-9.53	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.93	-2.87	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.58	-13.78	-1.20	MgSeO4 : 6H2O
Minium	-31.42	42.10	73.52	Pb3O4
Mirabilite	-6.16	-7.28	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-12.73	-7.83	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.97	-58.68	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.23	-88.15	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.65	-1.15	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.21	-10.49	2.72	MnCl2 : 4H2O
MnS (grn)	-75.81	-75.64	0.17	MnS
MnS (pnk)	-78.98	-75.64	3.34	MnS
MnSb	-95.46	-98.37	-2.91	MnSb
MnSe	-39.68	-36.18	3.50	MnSe
MnSeO3	-5.98	-4.85	1.13	MnSeO3
MnSeO3 : 2H2O	-5.83	-4.85	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.71	-15.76	-2.05	MnSeO4 : 5H2O
MnSO4	-10.29	-7.70	2.58	MnSO4
Monteponite	-8.56	6.55	15.10	CdO
Montroydite	-8.28	-11.92	-3.64	HgO
MoO3	-13.77	-21.77	-8.00	MoO3
Morenosite	-8.19	-10.34	-2.14	NiSO4 : 7H2O
MoS2	-148.70	-218.96	-70.26	MoS2
Na-Jarosite	-10.15	-21.35	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.65	-50.55	-9.90	Na2Cr2O7
Na2CrO4	-22.86	-19.93	2.93	Na2CrO4
Na2Mo2O7	-16.24	-32.84	-16.60	Na2Mo2O7
Na2MoO4	-12.56	-11.07	1.49	Na2MoO4
Na2MoO4 : 2H2O	-12.30	-11.07	1.22	Na2MoO4 : 2H2O

Na2SeO3:5H2O	-14.72	-4.42	10.30	Na2SeO3:5H2O
Na2SeO4	-16.61	-15.33	1.28	Na2SeO4
Na3Sb	-174.39	-79.94	94.45	Na3Sb
Na3VO4	-29.69	6.99	36.68	Na3VO4
Na4V2O7	-34.11	3.29	37.40	Na4V2O7
Nantokite	-5.61	-12.34	-6.73	CuCl
NaSb	-88.40	-65.23	23.17	NaSb
Natron	-8.72	-10.03	-1.31	Na2CO3:10H2O
NaVO3	-7.56	-3.70	3.86	NaVO3
Nesquehonite	-3.81	-8.48	-4.67	MgCO3:3H2O
Ni(OH)2	-5.17	7.63	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.75	-9.05	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.46	12.54	32.00	Ni4(OH)6SO4
NiCO3	-6.23	-13.10	-6.87	NiCO3
NiMoO4	-3.00	-14.14	-11.14	NiMoO4
NiS(alpha)	-72.67	-78.27	-5.60	NiS
NiS(beta)	-67.17	-78.27	-11.10	NiS
NiS(gamma)	-65.47	-78.27	-12.80	NiS
NiSe	-21.11	-38.81	-17.70	NiSe
NiSeO3:2H2O	-10.29	-7.48	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.87	-18.39	-1.52	NiSeO4:6H2O
Nsutite	-7.19	10.31	17.50	MnO2
O2(g)	-32.29	50.80	83.09	O2
Orpiment	-241.56	-302.63	-61.07	As2S3
Otavite	-2.18	-14.18	-12.00	CdCO3
Pb(BO2)2	-10.60	-4.08	6.52	Pb(BO2)2
Pb(OH)2	-2.58	5.57	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-59.89	-68.65	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.03	0.76	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.05	11.14	26.19	Pb2O(OH)2
Pb2O3	-24.50	36.54	61.04	Pb2O3
Pb2OCO3	-9.03	-9.59	-0.56	Pb2OCO3
Pb2V2O7	-5.06	-6.96	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.02	-15.22	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.53	-1.39	6.14	Pb3(VO4)2
Pb3O2CO3	-15.04	-4.02	11.02	Pb3O2CO3
Pb3O2SO4	-11.95	-1.26	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.79	4.31	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.57	4.31	21.88	Pb4O3SO4
PbCrO4	-12.45	-25.05	-12.60	PbCrO4
PbF2	-10.38	-17.82	-7.44	PbF2
Pbmetal	-24.08	-19.83	4.25	Pb
PbMoO4	-0.58	-16.20	-15.62	PbMoO4
PbO:0.3H2O	-7.41	5.57	12.98	PbO:0.33H2O
PbSeO4	-13.61	-20.45	-6.84	PbSeO4
Periclase	-9.35	12.24	21.58	MgO
Phosgenite	-10.53	-30.34	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-10.63	12.17	22.80	Ca(OH)2
Pyrite	-124.48	-142.99	-18.51	FeS2
Pyrochroite	-4.93	10.26	15.19	Mn(OH)2
Pyrolusite	-5.72	35.66	41.38	MnO2
Quartz	-0.06	-4.06	-4.00	SiO2
Realgar	-101.32	-121.06	-19.75	AsS
Retgersite	-8.30	-10.34	-2.04	NiSO4:6H2O
Rhodochrosite	0.12	-10.46	-10.58	MnCO3
Rutherfordine	-4.70	-19.20	-14.50	UO2CO3
Sb(OH)3	-12.67	-19.78	-7.11	Sb(OH)3
Sb2O4	-17.57	-14.17	3.40	Sb2O4
Sb2O5	-27.72	-37.39	-9.67	Sb2O5
Sb2Se3	-111.13	-178.89	-67.76	Sb2Se3
Sb4O6(cubic)	-60.87	-79.13	-18.26	Sb4O6
Sb4O6(orth)	-61.23	-79.13	-17.90	Sb4O6
SbCl3	-51.48	-50.91	0.57	SbCl3
SbF3	-44.64	-54.86	-10.23	SbF3
Sbmetal	-46.19	-57.88	-11.69	Sb
SbO2	-3.57	-31.39	-27.82	SbO2
Schoepite	-4.48	1.52	5.99	UO2(OH)2:H2O

Semetal (am)	-13.93	-21.04	-7.11	Se
Semetal (hex)	-13.34	-21.04	-7.71	Se
Senarmontite	-27.20	-39.56	-12.37	Sb2O3
SeO2	-15.23	-15.11	0.12	SeO2
SeO3	-47.06	-26.02	21.04	SeO3
Sepiolite	-3.45	12.31	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-6.47	12.31	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.07	-17.31	-10.24	FeCO3
SiO2 (am-gel)	-1.35	-4.06	-2.71	SiO2
SiO2 (am-ppt)	-1.32	-4.06	-2.74	SiO2
Smithsonite	-1.48	-11.48	-10.00	ZnCO3
Sphalerite	-65.20	-76.65	-11.45	ZnS
Spinel	-6.81	30.04	36.85	MgAl2O4
Stibnite	-246.80	-297.26	-50.46	Sb2S3
Sulfur	-58.36	-60.50	-2.14	S
Tenorite	0.40	8.05	7.64	CuO
Thenardite	-7.60	-7.28	0.32	Na2SO4
Thermonatrite	-10.67	-10.03	0.64	Na2CO3:H2O
Tyuyamunite	-6.97	-2.89	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.28	6.80	21.08	U3O8
U3Sb4	-580.28	-427.90	152.38	U3Sb4
U4O9	-30.24	-33.26	-3.02	U4O9
UF4	-31.90	-61.44	-29.54	UF4
UF4:2.5H2O	-28.72	-61.44	-32.72	UF4:2.5H2O
UO2 (am)	-15.60	-14.66	0.93	UO2
UO2 (NO3) 2	-43.10	-30.95	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.80	-30.95	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-34.34	-30.95	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-33.00	-30.95	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.09	1.52	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.25	-24.50	-2.25	UO2SeO4:4H2O
UO3	-6.18	1.52	7.70	UO3
Uraninite	-9.99	-14.66	-4.67	UO2
USb2	-220.01	-190.43	29.58	USb2
V (OH) 3	-19.44	-11.85	7.59	V (OH) 3
V2O5	-16.74	-18.10	-1.36	V2O5
V3O5	-41.77	-39.93	1.84	V3O5
V4O7	-51.96	-44.77	7.19	V4O7
V6O13	-44.23	-105.09	-60.86	V6O13
Valentinite	-31.08	-39.56	-8.48	Sb2O3
VC12	-64.17	-45.30	18.87	VC12
VC13	-66.41	-42.98	23.43	VC13
VF4	-66.55	-51.62	14.93	VF4
Vmetal	-93.97	-49.94	44.03	V
VO	-39.30	-24.55	14.76	VO
VO (OH) 2	-9.99	-4.84	5.15	VO (OH) 2
VO2Cl	-22.27	-19.42	2.84	VO2Cl
VOC1	-33.38	-22.22	11.15	VOC1
VOC12	-38.36	-25.60	12.76	VOC12
VOSO4	-26.42	-22.81	3.61	VOSO4
Witherite	-4.68	-13.25	-8.57	BaCO3
Wurtzite	-67.70	-76.65	-8.95	ZnS
Zincite	-2.09	9.25	11.33	ZnO
Zincosite	-12.65	-8.72	3.93	ZnSO4
Zn (BO2) 2	-8.69	-0.40	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-26.54	-23.22	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.95	9.25	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.23	9.25	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.51	9.25	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.29	9.25	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.49	9.25	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.98	0.52	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-7.08	8.11	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.84	-4.19	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-27.11	-8.20	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-9.38	19.02	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-13.03	25.47	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.56	-11.51	7.05	ZnCl2

ZnCO3:1H2O	-1.22	-11.48	-10.26	ZnCO3:1H2O
ZnF2	-13.61	-14.14	-0.53	ZnF2
Znmetal	-41.94	-16.15	25.79	Zn
ZnMoO4	-2.39	-12.52	-10.13	ZnMoO4
ZnO(active)	-1.94	9.25	11.19	ZnO
ZnS(am)	-67.60	-76.65	-9.05	ZnS
ZnSb	-85.05	-74.03	11.01	ZnSb
ZnSe	-22.80	-37.20	-14.40	ZnSe
ZnSeO4:6H2O	-15.25	-16.77	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.08	-8.72	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 110.

REACTION 604
H2O -1
0.126425 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 610
SAVE Solution 611
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 610. Solution after simulation 109.
Using reaction 604.

Reaction 604.

1.264e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.006e-08	1.006e-08
Al	8.640e-07	8.642e-07
As	3.039e-10	3.040e-10
B	1.543e-05	1.544e-05
Ba	2.480e-08	2.480e-08
C	2.259e-03	2.259e-03
Ca	1.640e-03	1.640e-03
Cd	4.408e-09	4.409e-09
Cl	2.196e-03	2.197e-03
Co	3.404e-08	3.405e-08
Cr	1.408e-09	1.408e-09
Cu	1.497e-06	1.498e-06

F	1.170e-04	1.171e-04
Fe	1.111e-09	1.111e-09
Hg	6.943e-10	6.944e-10
K	1.236e-03	1.236e-03
Mg	1.805e-03	1.805e-03
Mn	2.074e-05	2.075e-05
Mo	6.125e-07	6.126e-07
N	5.041e-06	5.042e-06
Na	5.650e-03	5.651e-03
Ni	5.304e-08	5.305e-08
Pb	3.216e-09	3.217e-09
S	4.659e-03	4.660e-03
Sb	9.283e-09	9.285e-09
Se	5.423e-08	5.425e-08
Si	8.833e-05	8.835e-05
U	8.795e-08	8.797e-08
V	2.852e-09	2.852e-09
Zn	2.197e-06	2.198e-06

-----Description of solution-----

	pH	=	7.659	Charge balance
	pe	=	5.040	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.877e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.189e-03	
	Total CO2 (mol/kg)	=	2.259e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	5.967e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	3	
	Total H	=	1.110442e+02	
	Total O	=	5.554657e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.271e-07	4.587e-07	-6.278	-6.338	-0.060	(0)
H+	2.512e-08	2.195e-08	-7.600	-7.659	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	1.006e-08					
AgCl	6.696e-09	6.696e-09	-8.174	-8.174	0.000	(0)
Ag+	1.956e-09	1.709e-09	-8.709	-8.767	-0.059	(0)
AgCl2-	1.315e-09	1.119e-09	-8.881	-8.951	-0.070	(0)
AgSO4-	9.004e-11	7.666e-11	-10.046	-10.115	-0.070	(0)
AgCl3-2	3.643e-12	1.914e-12	-11.438	-11.718	-0.280	(0)
AgNO2	1.414e-12	1.414e-12	-11.849	-11.849	0.000	(0)
AgF	3.975e-13	3.975e-13	-12.401	-12.401	0.000	(0)
AgOH	7.839e-14	7.839e-14	-13.106	-13.106	0.000	(0)
AgNH3+	4.171e-14	3.551e-14	-13.380	-13.450	-0.070	(0)
AgCl4-3	3.191e-14	7.500e-15	-13.496	-14.125	-0.629	(0)
Ag2Se	1.790e-14	1.790e-14	-13.747	-13.747	0.000	(0)
AgH2BO3	1.075e-14	1.075e-14	-13.968	-13.968	0.000	(0)
AgSeO3-	8.346e-15	7.105e-15	-14.079	-14.148	-0.070	(0)
Ag(NO2)2-	1.019e-17	8.678e-18	-16.992	-17.062	-0.070	(0)
Ag(OH)2-	4.127e-18	3.514e-18	-17.384	-17.454	-0.070	(0)
AgNO3	3.620e-18	3.620e-18	-17.441	-17.441	0.000	(0)
Ag(NH3)2+	3.451e-18	2.938e-18	-17.462	-17.532	-0.070	(0)
Ag(SeO3)2-3	1.751e-21	4.115e-22	-20.757	-21.386	-0.629	(0)
Ag2MoO4	3.946e-25	3.946e-25	-24.404	-24.404	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.192	-73.192	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.747	-83.865	-1.118	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-146.990	-147.156	-0.167	(0)

	Ag (HS) 2-	0.000e+00	0.000e+00	-147.262	-147.332	-0.070	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.622	-148.938	-0.316	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.946	-149.249	-0.302	(0)
Al	8.640e-07						
	Al (OH) 4-	8.489e-07	7.426e-07	-6.071	-6.129	-0.058	(0)
	Al (OH) 3	1.286e-08	1.286e-08	-7.891	-7.891	0.000	(0)
	Al (OH) 2+	1.599e-09	1.405e-09	-8.796	-8.852	-0.056	(0)
	AlF3	3.346e-10	3.346e-10	-9.475	-9.475	0.000	(0)
	AlF2+	3.267e-10	2.870e-10	-9.486	-9.542	-0.056	(0)
	AlF4-	1.775e-11	1.553e-11	-10.751	-10.809	-0.058	(0)
	AlF+2	1.307e-11	7.786e-12	-10.884	-11.109	-0.225	(0)
	AlOH+2	6.473e-12	3.857e-12	-11.189	-11.414	-0.225	(0)
	AlSO4+	1.677e-13	1.467e-13	-12.775	-12.833	-0.058	(0)
	Al+3	2.831e-14	8.408e-15	-13.548	-14.075	-0.527	(0)
	Al (SO4) 2-	4.040e-15	3.534e-15	-14.394	-14.452	-0.058	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.090	-43.719	-0.629	(0)
As (3)	3.523e-23						
	H3AsO3	3.429e-23	3.429e-23	-22.465	-22.465	0.000	(0)
	H2AsO3-	9.411e-25	8.013e-25	-24.026	-24.096	-0.070	(0)
	HAsO3-2	6.338e-29	3.330e-29	-28.198	-28.478	-0.280	(0)
	H4AsO3+	4.379e-31	3.728e-31	-30.359	-30.429	-0.070	(0)
	AsO3-3	2.489e-34	5.849e-35	-33.604	-34.233	-0.629	(0)
As (5)	3.039e-10						
	HAsO4-2	2.704e-10	1.421e-10	-9.568	-9.847	-0.280	(0)
	H2AsO4-	3.340e-11	2.844e-11	-10.476	-10.546	-0.070	(0)
	AsO4-3	8.712e-14	2.047e-14	-13.060	-13.689	-0.629	(0)
	H3AsO4	1.080e-16	1.085e-16	-15.967	-15.965	0.002	(0)
B	1.543e-05						
	H3BO3	1.494e-05	1.500e-05	-4.826	-4.824	0.002	(0)
	H2BO3-	4.588e-07	3.971e-07	-6.338	-6.401	-0.063	(0)
	CaH2BO3+	1.902e-08	1.646e-08	-7.721	-7.784	-0.063	(0)
	MgH2BO3+	1.328e-08	1.150e-08	-7.877	-7.939	-0.063	(0)
	NaH2BO3	3.067e-09	3.067e-09	-8.513	-8.513	0.000	(0)
	BF (OH) 3-	6.407e-10	5.544e-10	-9.193	-9.256	-0.063	(0)
	H5 (BO3) 2-	5.860e-12	5.071e-12	-11.232	-11.295	-0.063	(0)
	BaH2BO3+	2.024e-13	1.751e-13	-12.694	-12.757	-0.063	(0)
	BF2 (OH) 2-	1.392e-13	1.205e-13	-12.856	-12.919	-0.063	(0)
	AgH2BO3	1.075e-14	1.075e-14	-13.968	-13.968	0.000	(0)
	H8 (BO3) 3-	8.792e-15	7.608e-15	-14.056	-14.119	-0.063	(0)
	BF3OH-	1.101e-19	9.528e-20	-18.958	-19.021	-0.063	(0)
	BF4-	1.101e-24	9.530e-25	-23.958	-24.021	-0.063	(0)
Ba	2.480e-08						
	Ba+2	2.448e-08	1.427e-08	-7.611	-7.846	-0.234	(0)
	BaHCO3+	2.854e-10	2.515e-10	-9.544	-9.600	-0.055	(0)
	BaCO3	2.885e-11	2.885e-11	-10.540	-10.540	0.000	(0)
	BaH2BO3+	2.024e-13	1.751e-13	-12.694	-12.757	-0.063	(0)
	BaOH+	3.259e-14	2.858e-14	-13.487	-13.544	-0.057	(0)
	BaNO3+	2.240e-16	1.907e-16	-15.650	-15.720	-0.070	(0)
	BaNH3+2	1.744e-16	9.165e-17	-15.758	-16.038	-0.280	(0)
C (4)	2.259e-03						
	HCO3-	2.100e-03	1.845e-03	-2.678	-2.734	-0.056	(0)
	H2CO3	9.107e-05	9.107e-05	-4.041	-4.041	0.000	(0)
	CaHCO3+	2.809e-05	2.475e-05	-4.551	-4.607	-0.055	(0)
	MgHCO3+	1.807e-05	1.576e-05	-4.743	-4.802	-0.059	(0)
	CO3-2	6.761e-06	3.941e-06	-5.170	-5.404	-0.234	(0)
	NaHCO3	5.056e-06	5.056e-06	-5.296	-5.296	0.000	(0)
	CaCO3	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
	MgCO3	2.737e-06	2.737e-06	-5.563	-5.563	0.000	(0)
	CuCO3	1.246e-06	1.246e-06	-5.904	-5.904	0.000	(0)
	NaCO3-	4.071e-07	3.576e-07	-6.390	-6.447	-0.056	(0)
	MnHCO3+	3.700e-07	3.245e-07	-6.432	-6.489	-0.057	(0)
	ZnCO3	1.925e-07	1.925e-07	-6.716	-6.716	0.000	(0)
	ZnHCO3+	5.817e-08	4.952e-08	-7.235	-7.305	-0.070	(0)
	UO2 (CO3) 3-4	5.057e-08	3.853e-09	-7.296	-8.414	-1.118	(0)
	UO2 (CO3) 2-2	3.713e-08	1.951e-08	-7.430	-7.710	-0.280	(0)
	Cu (CO3) 2-2	2.516e-08	1.322e-08	-7.599	-7.879	-0.280	(0)
	CuHCO3+	7.342e-09	6.251e-09	-8.134	-8.204	-0.070	(0)
	NiHCO3+	5.463e-09	4.651e-09	-8.263	-8.332	-0.070	(0)

		NiCO3	3.007e-09	3.007e-09	-8.522	-8.522	0.000	(0)
		CoHCO3+	2.199e-09	1.872e-09	-8.658	-8.728	-0.070	(0)
		PbCO3	2.115e-09	2.115e-09	-8.675	-8.675	0.000	(0)
		CoCO3	8.692e-10	8.692e-10	-9.061	-9.061	0.000	(0)
		PbHCO3+	2.874e-10	2.447e-10	-9.542	-9.611	-0.070	(0)
		BaHCO3+	2.854e-10	2.515e-10	-9.544	-9.600	-0.055	(0)
		UO2CO3	2.480e-10	2.480e-10	-9.605	-9.605	0.000	(0)
		CdCO3	1.527e-10	1.527e-10	-9.816	-9.816	0.000	(0)
		Pb (CO3) 2-2	4.575e-11	2.404e-11	-10.340	-10.619	-0.280	(0)
		BaCO3	2.885e-11	2.885e-11	-10.540	-10.540	0.000	(0)
		CdHCO3+	8.384e-12	7.138e-12	-11.077	-11.146	-0.070	(0)
		Cd (CO3) 2-2	8.489e-13	4.460e-13	-12.071	-12.351	-0.280	(0)
		FeHCO3+	3.276e-14	2.886e-14	-13.485	-13.540	-0.055	(0)
		HgCO3	4.257e-15	4.257e-15	-14.371	-14.371	0.000	(0)
		Hg (CO3) 2-2	1.010e-16	5.306e-17	-15.996	-16.275	-0.280	(0)
		HgHCO3+	2.043e-18	1.740e-18	-17.690	-17.760	-0.070	(0)
Ca	1.640e-03							
		Ca+2	1.235e-03	7.203e-04	-2.908	-3.143	-0.234	(0)
		CaSO4	3.709e-04	3.709e-04	-3.431	-3.431	0.000	(0)
		CaHCO3+	2.809e-05	2.475e-05	-4.551	-4.607	-0.055	(0)
		CaCO3	4.499e-06	4.499e-06	-5.347	-5.347	0.000	(0)
		CaF+	8.301e-07	7.279e-07	-6.081	-6.138	-0.057	(0)
		CaH2BO3+	1.902e-08	1.646e-08	-7.721	-7.784	-0.063	(0)
		CaOH+	7.482e-09	6.592e-09	-8.126	-8.181	-0.055	(0)
		CaNH3+2	1.756e-11	9.228e-12	-10.755	-11.035	-0.280	(0)
		CaNO3+	7.134e-12	6.074e-12	-11.147	-11.217	-0.070	(0)
		Ca (NH3) 2+2	7.117e-20	3.739e-20	-19.148	-19.427	-0.280	(0)
Cd	4.408e-09							
		Cd+2	2.915e-09	1.699e-09	-8.535	-8.770	-0.234	(0)
		CdSO4	8.955e-10	8.955e-10	-9.048	-9.048	0.000	(0)
		CdCl+	3.658e-10	3.114e-10	-9.437	-9.507	-0.070	(0)
		CdCO3	1.527e-10	1.527e-10	-9.816	-9.816	0.000	(0)
		Cd (SO4) 2-2	5.169e-11	2.716e-11	-10.287	-10.566	-0.280	(0)
		CdHCO3+	8.384e-12	7.138e-12	-11.077	-11.146	-0.070	(0)
		CdOH+	7.272e-12	6.191e-12	-11.138	-11.208	-0.070	(0)
		CdOHC1	5.859e-12	5.859e-12	-11.232	-11.232	0.000	(0)
		CdF+	2.929e-12	2.494e-12	-11.533	-11.603	-0.070	(0)
		CdCl2	2.491e-12	2.491e-12	-11.604	-11.604	0.000	(0)
		Cd (CO3) 2-2	8.489e-13	4.460e-13	-12.071	-12.351	-0.280	(0)
		Cd (OH) 2	1.792e-14	1.792e-14	-13.747	-13.747	0.000	(0)
		CdCl3-	3.543e-15	3.016e-15	-14.451	-14.521	-0.070	(0)
		CdF2	4.607e-16	4.607e-16	-15.337	-15.337	0.000	(0)
		CdNO3+	1.683e-17	1.433e-17	-16.774	-16.844	-0.070	(0)
		CdSeO4	6.327e-18	6.327e-18	-17.199	-17.199	0.000	(0)
		Cd (OH) 3-	5.897e-19	5.021e-19	-18.229	-18.299	-0.070	(0)
		Cd2OH+3	2.244e-19	5.273e-20	-18.649	-19.278	-0.629	(0)
		Cd (SeO3) 2-2	1.115e-19	5.860e-20	-18.953	-19.232	-0.280	(0)
		Cd (OH) 4-2	7.175e-26	3.769e-26	-25.144	-25.424	-0.280	(0)
		Cd (NO3) 2	1.915e-26	1.915e-26	-25.718	-25.718	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.931	-79.001	-0.070	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.037	-150.037	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.306	-226.376	-0.070	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.140	-302.419	-0.280	(0)
Cl	2.196e-03							
		Cl-	2.196e-03	1.919e-03	-2.658	-2.717	-0.059	(0)
		MnCl+	2.428e-08	2.129e-08	-7.615	-7.672	-0.057	(0)
		AgCl	6.696e-09	6.696e-09	-8.174	-8.174	0.000	(0)
		ZnCl+	4.689e-09	4.092e-09	-8.329	-8.388	-0.059	(0)
		ZnOHC1	2.457e-09	2.457e-09	-8.610	-8.610	0.000	(0)
		AgCl2-	1.315e-09	1.119e-09	-8.881	-8.951	-0.070	(0)
		CuCl	5.788e-10	5.788e-10	-9.237	-9.237	0.000	(0)
		CdCl+	3.658e-10	3.114e-10	-9.437	-9.507	-0.070	(0)
		CuCl2-	2.660e-10	2.321e-10	-9.575	-9.634	-0.059	(0)
		CuCl+	1.872e-10	1.633e-10	-9.728	-9.787	-0.059	(0)
		NiCl+	1.179e-10	1.004e-10	-9.928	-9.998	-0.070	(0)
		CoCl+	1.017e-10	8.661e-11	-9.993	-10.062	-0.070	(0)
		MnCl2	5.772e-11	5.772e-11	-10.239	-10.239	0.000	(0)
		PbCl+	1.427e-11	1.215e-11	-10.845	-10.915	-0.070	(0)

ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
CdOHCl	5.859e-12	5.859e-12	-11.232	-11.232	0.000	(0)
AgCl3-2	3.643e-12	1.914e-12	-11.438	-11.718	-0.280	(0)
CdCl2	2.491e-12	2.491e-12	-11.604	-11.604	0.000	(0)
HgClOH	1.403e-12	1.403e-12	-11.853	-11.853	0.000	(0)
HgCl2	3.324e-13	3.324e-13	-12.478	-12.478	0.000	(0)
CuCl3-2	1.610e-13	9.521e-14	-12.793	-13.021	-0.228	(0)
CuCl2	1.087e-13	1.087e-13	-12.964	-12.964	0.000	(0)
PbCl2	1.042e-13	1.042e-13	-12.982	-12.982	0.000	(0)
MnCl3-	3.479e-14	3.051e-14	-13.459	-13.516	-0.057	(0)
AgCl4-3	3.191e-14	7.500e-15	-13.496	-14.125	-0.629	(0)
ZnCl3-	2.174e-14	1.897e-14	-13.663	-13.722	-0.059	(0)
HgCl3-	7.492e-15	6.378e-15	-14.125	-14.195	-0.070	(0)
CdCl3-	3.543e-15	3.016e-15	-14.451	-14.521	-0.070	(0)
NiCl2	9.701e-16	9.701e-16	-15.013	-15.013	0.000	(0)
PbCl3-	9.348e-17	7.958e-17	-16.029	-16.099	-0.070	(0)
HgCl4-2	9.275e-17	4.873e-17	-16.033	-16.312	-0.280	(0)
UO2Cl+	5.779e-17	4.920e-17	-16.238	-16.308	-0.070	(0)
HgCl+	4.059e-17	3.456e-17	-16.392	-16.461	-0.070	(0)
ZnCl4-2	3.078e-17	1.820e-17	-16.512	-16.740	-0.228	(0)
CrCl+2	8.497e-18	4.464e-18	-17.071	-17.350	-0.280	(0)
CuCl3-	2.231e-18	1.946e-18	-17.652	-17.711	-0.059	(0)
PbCl4-2	1.329e-19	6.981e-20	-18.877	-19.156	-0.280	(0)
CrOHCl2	7.468e-20	7.468e-20	-19.127	-19.127	0.000	(0)
FeCl+2	1.242e-21	7.343e-22	-20.906	-21.134	-0.228	(0)
CrCl2+	9.547e-22	8.128e-22	-21.020	-21.090	-0.070	(0)
VOCl+	4.371e-23	3.721e-23	-22.359	-22.429	-0.070	(0)
CuCl4-2	3.165e-23	1.872e-23	-22.500	-22.728	-0.228	(0)
FeCl2+	7.178e-24	6.295e-24	-23.144	-23.201	-0.057	(0)
CrO3Cl-	1.107e-26	9.429e-27	-25.956	-26.026	-0.070	(0)
FeCl3	1.208e-27	1.208e-27	-26.918	-26.918	0.000	(0)
CoCl+2	4.237e-36	2.226e-36	-35.373	-35.652	-0.280	(0)
UCl+3	0.000e+00	0.000e+00	-45.688	-46.317	-0.629	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.382	-49.661	-0.280	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.035	-51.315	-0.280	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.090	-64.369	-0.280	(0)
Co (2)	3.404e-08					
Co+2	2.483e-08	1.305e-08	-7.605	-7.885	-0.280	(0)
CoSO4	5.852e-09	5.852e-09	-8.233	-8.233	0.000	(0)
CoHCO3+	2.199e-09	1.872e-09	-8.658	-8.728	-0.070	(0)
CoCO3	8.692e-10	8.692e-10	-9.061	-9.061	0.000	(0)
CoOH+	1.402e-10	1.194e-10	-9.853	-9.923	-0.070	(0)
CoCl+	1.017e-10	8.661e-11	-9.993	-10.062	-0.070	(0)
CoF+	4.487e-11	3.820e-11	-10.348	-10.418	-0.070	(0)
Co (OH) 2	4.350e-12	4.350e-12	-11.361	-11.361	0.000	(0)
CoNO2+	4.278e-13	3.642e-13	-12.369	-12.439	-0.070	(0)
Co (NH3) +2	3.038e-14	1.596e-14	-13.517	-13.797	-0.280	(0)
CoSeO4	1.308e-16	1.308e-16	-15.884	-15.884	0.000	(0)
CoNO3+	6.476e-17	5.514e-17	-16.189	-16.259	-0.070	(0)
Co (OH) 3-	4.676e-17	3.981e-17	-16.330	-16.400	-0.070	(0)
CoOOH-	1.174e-17	9.992e-18	-16.930	-17.000	-0.070	(0)
Co2OH+3	3.322e-19	7.807e-20	-18.479	-19.108	-0.629	(0)
Co (NH3) 2+2	1.319e-20	6.930e-21	-19.880	-20.159	-0.280	(0)
Co (OH) 4-2	5.509e-24	2.894e-24	-23.259	-23.538	-0.280	(0)
Co (NO3) 2	2.992e-25	2.992e-25	-24.524	-24.524	0.000	(0)
Co (NH3) 3+2	1.690e-27	8.879e-28	-26.772	-27.052	-0.280	(0)
Co4 (OH) 4+4	5.322e-31	4.055e-32	-30.274	-31.392	-1.118	(0)
Co (NH3) 4+2	9.027e-35	4.742e-35	-34.044	-34.324	-0.280	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.817	-42.096	-0.280	(0)
Co (3)	2.529e-29					
CoOH+2	2.529e-29	1.329e-29	-28.597	-28.877	-0.280	(0)
Co+3	1.920e-35	5.701e-36	-34.717	-35.244	-0.527	(0)
CoCl+2	4.237e-36	2.226e-36	-35.373	-35.652	-0.280	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.382	-49.661	-0.280	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.305	-59.375	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.511	-63.791	-0.280	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.090	-64.369	-0.280	(0)
Cr (2)	7.445e-27					

Cr+2	7.445e-27	3.912e-27	-26.128	-26.408	-0.280	(0)
Cr (3)	1.408e-09					
Cr (OH) 2+	1.182e-09	1.007e-09	-8.927	-8.997	-0.070	(0)
Cr (OH) 3	1.734e-10	1.734e-10	-9.761	-9.761	0.000	(0)
Cr (OH) +2	3.433e-11	1.804e-11	-10.464	-10.744	-0.280	(0)
CrOHSO4	9.622e-12	9.622e-12	-11.017	-11.017	0.000	(0)
CrO2-	4.410e-12	3.754e-12	-11.356	-11.425	-0.070	(0)
Cr (OH) 4-	3.720e-12	3.167e-12	-11.429	-11.499	-0.070	(0)
CrF+2	5.021e-14	2.638e-14	-13.299	-13.579	-0.280	(0)
CrSO4+	1.108e-14	9.435e-15	-13.955	-14.025	-0.070	(0)
Cr+3	7.649e-15	1.797e-15	-14.116	-14.745	-0.629	(0)
CrCl+2	8.497e-18	4.464e-18	-17.071	-17.350	-0.280	(0)
CrOHC12	7.468e-20	7.468e-20	-19.127	-19.127	0.000	(0)
Cr2 (OH) 2SO4+2	2.986e-20	1.569e-20	-19.525	-19.804	-0.280	(0)
Cr2 (OH) 2 (SO4) 2	2.095e-21	2.095e-21	-20.679	-20.679	0.000	(0)
CrCl2+	9.547e-22	8.128e-22	-21.020	-21.090	-0.070	(0)
CrNO3+2	3.988e-25	2.095e-25	-24.399	-24.679	-0.280	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.394	-40.673	-0.280	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.071	-49.700	-0.629	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.035	-51.315	-0.280	(0)
Cr (6)	9.179e-16					
CrO4-2	8.596e-16	5.011e-16	-15.066	-15.300	-0.234	(0)
HCrO4-	4.180e-17	3.559e-17	-16.379	-16.449	-0.070	(0)
NaCrO4-	1.425e-17	1.213e-17	-16.846	-16.916	-0.070	(0)
KCrO4-	2.324e-18	1.979e-18	-17.634	-17.704	-0.070	(0)
CrO3SO4-2	1.018e-24	5.349e-25	-23.992	-24.272	-0.280	(0)
H2CrO4	6.331e-25	6.331e-25	-24.199	-24.199	0.000	(0)
CrO3Cl-	1.107e-26	9.429e-27	-25.956	-26.026	-0.070	(0)
Cr2O7-2	8.360e-32	4.392e-32	-31.078	-31.357	-0.280	(0)
Cu (1)	1.126e-09					
CuCl	5.788e-10	5.788e-10	-9.237	-9.237	0.000	(0)
Cu+	2.814e-10	2.396e-10	-9.551	-9.621	-0.070	(0)
CuCl2-	2.660e-10	2.321e-10	-9.575	-9.634	-0.059	(0)
CuCl3-2	1.610e-13	9.521e-14	-12.793	-13.021	-0.228	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.083	-147.392	-0.309	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.826	-148.122	-0.296	(0)
Cu (2)	1.496e-06					
CuCO3	1.246e-06	1.246e-06	-5.904	-5.904	0.000	(0)
Cu+2	9.211e-08	5.370e-08	-7.036	-7.270	-0.234	(0)
CuOH+	8.926e-08	7.789e-08	-7.049	-7.109	-0.059	(0)
CuSO4	2.765e-08	2.765e-08	-7.558	-7.558	0.000	(0)
Cu (CO3) 2-2	2.516e-08	1.322e-08	-7.599	-7.879	-0.280	(0)
CuHCO3+	7.342e-09	6.251e-09	-8.134	-8.204	-0.070	(0)
Cu (OH) 2	7.128e-09	7.128e-09	-8.147	-8.147	0.000	(0)
CuF+	3.685e-10	3.137e-10	-9.434	-9.503	-0.070	(0)
Cu2 (OH) 2+2	2.900e-10	1.524e-10	-9.538	-9.817	-0.280	(0)
CuCl+	1.872e-10	1.633e-10	-9.728	-9.787	-0.059	(0)
CuNO2+	2.616e-11	2.227e-11	-10.582	-10.652	-0.070	(0)
CuNH3+2	1.064e-11	5.592e-12	-10.973	-11.252	-0.280	(0)
Cu (OH) 3-	7.877e-12	6.706e-12	-11.104	-11.174	-0.070	(0)
CuCl2	1.087e-13	1.087e-13	-12.964	-12.964	0.000	(0)
Cu (NO2) 2	9.028e-16	9.028e-16	-15.044	-15.044	0.000	(0)
CuNO3+	5.319e-16	4.528e-16	-15.274	-15.344	-0.070	(0)
Cu (OH) 4-2	4.608e-17	2.421e-17	-16.336	-16.616	-0.280	(0)
CuCl3-	2.231e-18	1.946e-18	-17.652	-17.711	-0.059	(0)
CuCl4-2	3.165e-23	1.872e-23	-22.500	-22.728	-0.228	(0)
Cu (NO3) 2	1.520e-25	1.520e-25	-24.818	-24.818	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.019	-216.089	-0.070	(0)
F	1.170e-04					
F-	1.060e-04	9.260e-05	-3.975	-4.033	-0.059	(0)
MgF+	9.917e-06	8.675e-06	-5.004	-5.062	-0.058	(0)
CaF+	8.301e-07	7.279e-07	-6.081	-6.138	-0.057	(0)
NaF	2.847e-07	2.847e-07	-6.546	-6.546	0.000	(0)
MnF+	3.705e-08	3.249e-08	-7.431	-7.488	-0.057	(0)
HF	3.006e-09	3.006e-09	-8.522	-8.522	0.000	(0)
ZnF+	1.842e-09	1.568e-09	-8.735	-8.805	-0.070	(0)
BF (OH) 3-	6.407e-10	5.544e-10	-9.193	-9.256	-0.063	(0)
CuF+	3.685e-10	3.137e-10	-9.434	-9.503	-0.070	(0)

AlF3	3.346e-10	3.346e-10	-9.475	-9.475	0.000	(0)
AlF2+	3.267e-10	2.870e-10	-9.486	-9.542	-0.056	(0)
NiF+	5.587e-11	4.756e-11	-10.253	-10.323	-0.070	(0)
CoF+	4.487e-11	3.820e-11	-10.348	-10.418	-0.070	(0)
AlF4-	1.775e-11	1.553e-11	-10.751	-10.809	-0.058	(0)
AlF+2	1.307e-11	7.786e-12	-10.884	-11.109	-0.225	(0)
CdF+	2.929e-12	2.494e-12	-11.533	-11.603	-0.070	(0)
PbF+	1.368e-12	1.165e-12	-11.864	-11.934	-0.070	(0)
HF2-	1.216e-12	1.058e-12	-11.915	-11.975	-0.060	(0)
AgF	3.975e-13	3.975e-13	-12.401	-12.401	0.000	(0)
UO2F+	2.373e-13	2.021e-13	-12.625	-12.695	-0.070	(0)
BF2 (OH) 2-	1.392e-13	1.205e-13	-12.856	-12.919	-0.063	(0)
UO2F2	5.396e-14	5.396e-14	-13.268	-13.268	0.000	(0)
CrF+2	5.021e-14	2.638e-14	-13.299	-13.579	-0.280	(0)
PbF2	2.122e-15	2.122e-15	-14.673	-14.673	0.000	(0)
UO2F3-	1.474e-15	1.255e-15	-14.831	-14.901	-0.070	(0)
CdF2	4.607e-16	4.607e-16	-15.337	-15.337	0.000	(0)
H2F2	2.421e-17	2.421e-17	-16.616	-16.616	0.000	(0)
FeF2+	3.636e-18	3.188e-18	-17.439	-17.496	-0.057	(0)
VO2F	3.198e-18	3.198e-18	-17.495	-17.495	0.000	(0)
FeF+2	2.176e-18	1.287e-18	-17.662	-17.891	-0.228	(0)
UO2F4-2	1.757e-18	9.232e-19	-17.755	-18.035	-0.280	(0)
PbF3-	4.378e-19	3.727e-19	-18.359	-18.429	-0.070	(0)
FeF3	4.165e-19	4.165e-19	-18.380	-18.380	0.000	(0)
VO2F2-	1.263e-19	1.075e-19	-18.899	-18.969	-0.070	(0)
BF3OH-	1.101e-19	9.528e-20	-18.958	-19.021	-0.063	(0)
VOF+	4.509e-21	3.839e-21	-20.346	-20.416	-0.070	(0)
VO2F3-2	2.364e-22	1.242e-22	-21.626	-21.906	-0.280	(0)
VOF2	1.333e-22	1.333e-22	-21.875	-21.875	0.000	(0)
PbF4-2	3.144e-23	1.652e-23	-22.502	-22.782	-0.280	(0)
HgF+	3.639e-24	3.098e-24	-23.439	-23.509	-0.070	(0)
BF4-	1.101e-24	9.530e-25	-23.958	-24.021	-0.063	(0)
VOF3-	5.144e-25	4.379e-25	-24.289	-24.359	-0.070	(0)
Sb (OH) 2F	5.251e-26	5.251e-26	-25.280	-25.280	0.000	(0)
SbOF	5.166e-26	5.166e-26	-25.287	-25.287	0.000	(0)
VO2F4-3	2.408e-26	5.658e-27	-25.618	-26.247	-0.629	(0)
VOF4-2	3.116e-28	1.637e-28	-27.506	-27.786	-0.280	(0)
SiF6-2	3.300e-29	1.951e-29	-28.482	-28.710	-0.228	(0)
UF3+	1.859e-36	1.583e-36	-35.731	-35.801	-0.070	(0)
UF2+2	2.053e-37	1.078e-37	-36.688	-36.967	-0.280	(0)
UF4	1.607e-38	1.607e-38	-37.794	-37.794	0.000	(0)
UF+3	3.937e-40	0.000e+00	-39.405	-40.034	-0.629	(0)
UF5-	0.000e+00	0.000e+00	-40.160	-40.229	-0.070	(0)
UF6-2	0.000e+00	0.000e+00	-41.503	-41.783	-0.280	(0)
Fe (2)	3.109e-12					
Fe+2	2.365e-12	1.243e-12	-11.626	-11.906	-0.280	(0)
FeSO4	6.857e-13	6.857e-13	-12.164	-12.164	0.000	(0)
FeHCO3+	3.276e-14	2.886e-14	-13.485	-13.540	-0.055	(0)
FeOH+	2.587e-14	2.269e-14	-13.587	-13.644	-0.057	(0)
Fe (OH) 2	8.267e-18	8.267e-18	-17.083	-17.083	0.000	(0)
Fe (OH) 3-	1.367e-18	1.199e-18	-17.864	-17.921	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.434	-159.434	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.567	-235.637	-0.070	(0)
Fe (3)	1.108e-09					
Fe (OH) 2+	7.622e-10	6.696e-10	-9.118	-9.174	-0.056	(0)
Fe (OH) 3	3.299e-10	3.299e-10	-9.482	-9.482	0.000	(0)
Fe (OH) 4-	1.603e-11	1.409e-11	-10.795	-10.851	-0.056	(0)
FeOH+2	6.346e-15	3.753e-15	-14.197	-14.426	-0.228	(0)
FeF2+	3.636e-18	3.188e-18	-17.439	-17.496	-0.057	(0)
FeF+2	2.176e-18	1.287e-18	-17.662	-17.891	-0.228	(0)
FeF3	4.165e-19	4.165e-19	-18.380	-18.380	0.000	(0)
FeSO4+	3.645e-19	3.196e-19	-18.438	-18.495	-0.057	(0)
Fe+3	4.267e-20	1.267e-20	-19.370	-19.897	-0.527	(0)
Fe (SO4) 2-	1.804e-20	1.536e-20	-19.744	-19.814	-0.070	(0)
FeCl+2	1.242e-21	7.343e-22	-20.906	-21.134	-0.228	(0)
FeCl2+	7.178e-24	6.295e-24	-23.144	-23.201	-0.057	(0)
FeHSeO3+2	2.273e-24	1.194e-24	-23.643	-23.923	-0.280	(0)
Fe2 (OH) 2+4	6.120e-27	4.663e-28	-26.213	-27.331	-1.118	(0)

	FeCl3	1.208e-27	1.208e-27	-26.918	-26.918	0.000	(0)
	FeNO3+2	6.431e-28	3.379e-28	-27.192	-27.471	-0.280	(0)
	Fe3 (OH) 4+5	2.521e-34	4.513e-36	-33.598	-35.346	-1.747	(0)
H (0)	5.635e-29						
	H2	2.817e-29	2.830e-29	-28.550	-28.548	0.002	(0)
Hg (0)	6.913e-10						
	Hg	6.913e-10	6.913e-10	-9.160	-9.160	0.000	(0)
Hg (1)	1.613e-21						
	Hg2+2	8.063e-22	4.236e-22	-21.094	-21.373	-0.280	(0)
Hg (2)	2.940e-12						
	HgClOH	1.403e-12	1.403e-12	-11.853	-11.853	0.000	(0)
	Hg (OH) 2	1.193e-12	1.198e-12	-11.923	-11.922	0.002	(0)
	HgCl2	3.324e-13	3.324e-13	-12.478	-12.478	0.000	(0)
	HgCl3-	7.492e-15	6.378e-15	-14.125	-14.195	-0.070	(0)
	HgCO3	4.257e-15	4.257e-15	-14.371	-14.371	0.000	(0)
	Hg (CO3) 2-2	1.010e-16	5.306e-17	-15.996	-16.275	-0.280	(0)
	HgCl4-2	9.275e-17	4.873e-17	-16.033	-16.312	-0.280	(0)
	HgCl+	4.059e-17	3.456e-17	-16.392	-16.461	-0.070	(0)
	HgOH+	1.936e-17	1.648e-17	-16.713	-16.783	-0.070	(0)
	HgHCO3+	2.043e-18	1.740e-18	-17.690	-17.760	-0.070	(0)
	Hg (NH3) 2+2	1.123e-19	5.898e-20	-18.950	-19.229	-0.280	(0)
	Hg (OH) 3-	8.126e-20	6.918e-20	-19.090	-19.160	-0.070	(0)
	HgNH3+2	1.103e-20	5.796e-21	-19.957	-20.237	-0.280	(0)
	Hg+2	1.718e-21	9.026e-22	-20.765	-21.045	-0.280	(0)
	HgSO4	5.312e-22	5.312e-22	-21.275	-21.275	0.000	(0)
	HgF+	3.639e-24	3.098e-24	-23.439	-23.509	-0.070	(0)
	Hg (NH3) 3+2	4.549e-27	2.390e-27	-26.342	-26.622	-0.280	(0)
	HgNO3+	1.044e-30	8.887e-31	-29.981	-30.051	-0.070	(0)
	Hg (NH3) 4+2	3.677e-34	1.932e-34	-33.434	-33.714	-0.280	(0)
	Hg (NO3) 2	9.849e-40	9.849e-40	-39.007	-39.007	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.867	-137.937	-0.070	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.707	-138.986	-0.280	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.201	-139.201	0.000	(0)
K	1.236e-03						
	K+	1.216e-03	1.063e-03	-2.915	-2.974	-0.059	(0)
	KSO4-	1.925e-05	1.692e-05	-4.716	-4.772	-0.056	(0)
	KCrO4-	2.324e-18	1.979e-18	-17.634	-17.704	-0.070	(0)
Mg	1.805e-03						
	Mg+2	1.432e-03	8.350e-04	-2.844	-3.078	-0.234	(0)
	MgSO4	3.416e-04	3.416e-04	-3.467	-3.467	0.000	(0)
	MgHCO3+	1.807e-05	1.576e-05	-4.743	-4.802	-0.059	(0)
	MgF+	9.917e-06	8.675e-06	-5.004	-5.062	-0.058	(0)
	MgCO3	2.737e-06	2.737e-06	-5.563	-5.563	0.000	(0)
	MgOH+	1.727e-07	1.525e-07	-6.763	-6.817	-0.054	(0)
	MgH2BO3+	1.328e-08	1.150e-08	-7.877	-7.939	-0.063	(0)
Mn (2)	2.074e-05						
	Mn+2	1.678e-05	8.814e-06	-4.775	-5.055	-0.280	(0)
	MnSO4	3.523e-06	3.523e-06	-5.453	-5.453	0.000	(0)
	MnHCO3+	3.700e-07	3.245e-07	-6.432	-6.489	-0.057	(0)
	MnF+	3.705e-08	3.249e-08	-7.431	-7.488	-0.057	(0)
	MnCl+	2.428e-08	2.129e-08	-7.615	-7.672	-0.057	(0)
	MnOH+	1.158e-08	1.015e-08	-7.936	-7.993	-0.057	(0)
	MnCl2	5.772e-11	5.772e-11	-10.239	-10.239	0.000	(0)
	MnSeO4	4.744e-14	4.744e-14	-13.324	-13.324	0.000	(0)
	MnNO3+	4.375e-14	3.725e-14	-13.359	-13.429	-0.070	(0)
	MnCl3-	3.479e-14	3.051e-14	-13.459	-13.516	-0.057	(0)
	Mn (OH) 3-	1.506e-17	1.320e-17	-16.822	-16.879	-0.057	(0)
	Mn (NO3) 2	2.495e-22	2.495e-22	-21.603	-21.603	0.000	(0)
	Mn (OH) 4-2	3.306e-23	1.955e-23	-22.481	-22.709	-0.228	(0)
	MnSe	0.000e+00	0.000e+00	-41.563	-41.563	0.000	(0)
Mn (3)	1.455e-25						
	Mn+3	1.455e-25	4.322e-26	-24.837	-25.364	-0.527	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.818	-42.046	-0.228	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-46.316	-46.378	-0.062	(0)
Mo	6.125e-07						
	MoO4-2	6.123e-07	3.569e-07	-6.213	-6.447	-0.234	(0)

HM04-	1.831e-10	1.559e-10	-9.737	-9.807	-0.070	(0)
H2MoO4	2.506e-14	2.506e-14	-13.601	-13.601	0.000	(0)
Ag2MoO4	3.946e-25	3.946e-25	-24.404	-24.404	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.090	-43.719	-0.629	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.895	-53.410	-2.516	(0)
HM7O24-5	0.000e+00	0.000e+00	-52.935	-54.682	-1.747	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.441	-57.559	-1.118	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-61.342	-61.971	-0.629	(0)
N(-3)	4.737e-07					
NH4+	4.527e-07	3.917e-07	-6.344	-6.407	-0.063	(0)
NH4SO4-	1.076e-08	9.436e-09	-7.968	-8.025	-0.057	(0)
NH3	1.018e-08	1.018e-08	-7.992	-7.992	0.000	(0)
CaNH3+2	1.756e-11	9.228e-12	-10.755	-11.035	-0.280	(0)
CuNH3+2	1.064e-11	5.592e-12	-10.973	-11.252	-0.280	(0)
NiNH3+2	2.127e-13	1.118e-13	-12.672	-12.952	-0.280	(0)
AgNH3+	4.171e-14	3.551e-14	-13.380	-13.450	-0.070	(0)
Co(NH3)+2	3.038e-14	1.596e-14	-13.517	-13.797	-0.280	(0)
BaNH3+2	1.744e-16	9.165e-17	-15.758	-16.038	-0.280	(0)
Ag(NH3)2+	3.451e-18	2.938e-18	-17.462	-17.532	-0.070	(0)
Ni(NH3)2+2	3.129e-19	1.644e-19	-18.505	-18.784	-0.280	(0)
Hg(NH3)2+2	1.123e-19	5.898e-20	-18.950	-19.229	-0.280	(0)
Ca(NH3)2+2	7.117e-20	3.739e-20	-19.148	-19.427	-0.280	(0)
Co(NH3)2+2	1.319e-20	6.930e-21	-19.880	-20.159	-0.280	(0)
HgNH3+2	1.103e-20	5.796e-21	-19.957	-20.237	-0.280	(0)
Hg(NH3)3+2	4.549e-27	2.390e-27	-26.342	-26.622	-0.280	(0)
Co(NH3)3+2	1.690e-27	8.879e-28	-26.772	-27.052	-0.280	(0)
Hg(NH3)4+2	3.677e-34	1.932e-34	-33.434	-33.714	-0.280	(0)
Co(NH3)4+2	9.027e-35	4.742e-35	-34.044	-34.324	-0.280	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-40.394	-40.673	-0.280	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-41.817	-42.096	-0.280	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-49.071	-49.700	-0.629	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-49.382	-49.661	-0.280	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-51.035	-51.315	-0.280	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-59.305	-59.375	-0.070	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-63.511	-63.791	-0.280	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-64.090	-64.369	-0.280	(0)
N(3)	4.565e-06					
NO2-	4.564e-06	3.961e-06	-5.341	-5.402	-0.062	(0)
CuNO2+	2.616e-11	2.227e-11	-10.582	-10.652	-0.070	(0)
AgNO2	1.414e-12	1.414e-12	-11.849	-11.849	0.000	(0)
CoNO2+	4.278e-13	3.642e-13	-12.369	-12.439	-0.070	(0)
Cu(NO2)2	9.028e-16	9.028e-16	-15.044	-15.044	0.000	(0)
Ag(NO2)2-	1.019e-17	8.678e-18	-16.992	-17.062	-0.070	(0)
N(5)	3.059e-09					
NO3-	3.052e-09	2.667e-09	-8.515	-8.574	-0.059	(0)
CaNO3+	7.134e-12	6.074e-12	-11.147	-11.217	-0.070	(0)
MnNO3+	4.375e-14	3.725e-14	-13.359	-13.429	-0.070	(0)
ZnNO3+	6.678e-15	5.686e-15	-14.175	-14.245	-0.070	(0)
CuNO3+	5.319e-16	4.528e-16	-15.274	-15.344	-0.070	(0)
BaNO3+	2.240e-16	1.907e-16	-15.650	-15.720	-0.070	(0)
NiNO3+	1.609e-16	1.370e-16	-15.793	-15.863	-0.070	(0)
CoNO3+	6.476e-17	5.514e-17	-16.189	-16.259	-0.070	(0)
CdNO3+	1.683e-17	1.433e-17	-16.774	-16.844	-0.070	(0)
PbNO3+	8.269e-18	7.040e-18	-17.083	-17.152	-0.070	(0)
AgNO3	3.620e-18	3.620e-18	-17.441	-17.441	0.000	(0)
Mn(NO3)2	2.495e-22	2.495e-22	-21.603	-21.603	0.000	(0)
UO2NO3+	9.879e-23	8.411e-23	-22.005	-22.075	-0.070	(0)
Zn(NO3)2	3.025e-24	3.025e-24	-23.519	-23.519	0.000	(0)
CrNO3+2	3.988e-25	2.095e-25	-24.399	-24.679	-0.280	(0)
Co(NO3)2	2.992e-25	2.992e-25	-24.524	-24.524	0.000	(0)
Cu(NO3)2	1.520e-25	1.520e-25	-24.818	-24.818	0.000	(0)
Pb(NO3)2	3.188e-26	3.188e-26	-25.496	-25.496	0.000	(0)
VO2NO3	2.656e-26	2.656e-26	-25.576	-25.576	0.000	(0)
Cd(NO3)2	1.915e-26	1.915e-26	-25.718	-25.718	0.000	(0)
FeNO3+2	6.431e-28	3.379e-28	-27.192	-27.471	-0.280	(0)
HgNO3+	1.044e-30	8.887e-31	-29.981	-30.051	-0.070	(0)
Hg(NO3)2	9.849e-40	9.849e-40	-39.007	-39.007	0.000	(0)
Na	5.650e-03					

	Na+	5.577e-03	4.873e-03	-2.254	-2.312	-0.059	(0)
	NaSO4-	6.696e-05	5.883e-05	-4.174	-4.230	-0.056	(0)
	NaHCO3	5.056e-06	5.056e-06	-5.296	-5.296	0.000	(0)
	NaCO3-	4.071e-07	3.576e-07	-6.390	-6.447	-0.056	(0)
	NaF	2.847e-07	2.847e-07	-6.546	-6.546	0.000	(0)
	NaH2BO3	3.067e-09	3.067e-09	-8.513	-8.513	0.000	(0)
	NaCrO4-	1.425e-17	1.213e-17	-16.846	-16.916	-0.070	(0)
Ni		5.304e-08					
	Ni+2	3.508e-08	2.045e-08	-7.455	-7.689	-0.234	(0)
	NiSO4	9.172e-09	9.172e-09	-8.038	-8.038	0.000	(0)
	NiHCO3+	5.463e-09	4.651e-09	-8.263	-8.332	-0.070	(0)
	NiCO3	3.007e-09	3.007e-09	-8.522	-8.522	0.000	(0)
	NiOH+	1.387e-10	1.181e-10	-9.858	-9.928	-0.070	(0)
	NiCl+	1.179e-10	1.004e-10	-9.928	-9.998	-0.070	(0)
	NiF+	5.587e-11	4.756e-11	-10.253	-10.323	-0.070	(0)
	Ni (OH) 2	4.302e-12	4.302e-12	-11.366	-11.366	0.000	(0)
	Ni (SO4) 2-2	1.300e-12	6.828e-13	-11.886	-12.166	-0.280	(0)
	NiNH3+2	2.127e-13	1.118e-13	-12.672	-12.952	-0.280	(0)
	Ni (OH) 3-	2.318e-15	1.973e-15	-14.635	-14.705	-0.070	(0)
	NiCl2	9.701e-16	9.701e-16	-15.013	-15.013	0.000	(0)
	NiSeO4	1.913e-16	1.913e-16	-15.718	-15.718	0.000	(0)
	NiNO3+	1.609e-16	1.370e-16	-15.793	-15.863	-0.070	(0)
	Ni (NH3) 2+2	3.129e-19	1.644e-19	-18.505	-18.784	-0.280	(0)
O (0)		1.260e-35					
	O2	6.300e-36	6.327e-36	-35.201	-35.199	0.002	(0)
Pb		3.216e-09					
	PbCO3	2.115e-09	2.115e-09	-8.675	-8.675	0.000	(0)
	Pb+2	3.062e-10	1.785e-10	-9.514	-9.748	-0.234	(0)
	PbHCO3+	2.874e-10	2.447e-10	-9.542	-9.611	-0.070	(0)
	PbOH+	2.415e-10	2.056e-10	-9.617	-9.687	-0.070	(0)
	PbSO4	1.965e-10	1.965e-10	-9.707	-9.707	0.000	(0)
	Pb (CO3) 2-2	4.575e-11	2.404e-11	-10.340	-10.619	-0.280	(0)
	PbCl+	1.427e-11	1.215e-11	-10.845	-10.915	-0.070	(0)
	Pb (SO4) 2-2	5.067e-12	2.662e-12	-11.295	-11.575	-0.280	(0)
	Pb (OH) 2	2.983e-12	2.983e-12	-11.525	-11.525	0.000	(0)
	PbF+	1.368e-12	1.165e-12	-11.864	-11.934	-0.070	(0)
	PbCl2	1.042e-13	1.042e-13	-12.982	-12.982	0.000	(0)
	PbF2	2.122e-15	2.122e-15	-14.673	-14.673	0.000	(0)
	Pb (OH) 3-	1.607e-15	1.368e-15	-14.794	-14.864	-0.070	(0)
	PbCl3-	9.348e-17	7.958e-17	-16.029	-16.099	-0.070	(0)
	PbNO3+	8.269e-18	7.040e-18	-17.083	-17.152	-0.070	(0)
	Pb2OH+3	2.475e-18	5.817e-19	-17.606	-18.235	-0.629	(0)
	PbF3-	4.378e-19	3.727e-19	-18.359	-18.429	-0.070	(0)
	Pb (OH) 4-2	2.925e-19	1.537e-19	-18.534	-18.813	-0.280	(0)
	PbCl4-2	1.329e-19	6.981e-20	-18.877	-19.156	-0.280	(0)
	Pb3 (OH) 4+2	6.030e-23	3.168e-23	-22.220	-22.499	-0.280	(0)
	PbF4-2	3.144e-23	1.652e-23	-22.502	-22.782	-0.280	(0)
	Pb (NO3) 2	3.188e-26	3.188e-26	-25.496	-25.496	0.000	(0)
	Pb4 (OH) 4+4	5.895e-28	4.491e-29	-27.229	-28.348	-1.118	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.957	-150.957	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.827	-227.897	-0.070	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.192	-73.192	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.170	-78.239	-0.070	(0)
	H2S	0.000e+00	0.000e+00	-78.878	-78.878	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.931	-79.001	-0.070	(0)
	S5-2	0.000e+00	0.000e+00	-79.666	-79.946	-0.280	(0)
	S6-2	0.000e+00	0.000e+00	-80.182	-80.462	-0.280	(0)
	S4-2	0.000e+00	0.000e+00	-80.262	-80.542	-0.280	(0)
	S3-2	0.000e+00	0.000e+00	-81.068	-81.347	-0.280	(0)
	S2-2	0.000e+00	0.000e+00	-82.084	-82.364	-0.280	(0)
	S-2	0.000e+00	0.000e+00	-87.653	-87.881	-0.228	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.867	-137.937	-0.070	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.707	-138.986	-0.280	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-139.201	-139.201	0.000	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.990	-147.156	-0.167	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.083	-147.392	-0.309	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.262	-147.332	-0.070	(0)

CuS4S5-3	0.000e+00	0.000e+00	-147.826	-148.122	-0.296	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.011	-148.081	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.622	-148.938	-0.316	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.946	-149.249	-0.302	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.730	-149.730	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.037	-150.037	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.957	-150.957	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.434	-159.434	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.019	-216.089	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.619	-224.689	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.306	-226.376	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.731	-227.011	-0.280	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.827	-227.897	-0.070	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.567	-235.637	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.140	-302.419	-0.280	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.109	-304.389	-0.280	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.169	-318.448	-0.280	(0)
S (6)	4.659e-03					
SO4-2	3.856e-03	2.248e-03	-2.414	-2.648	-0.234	(0)
CaSO4	3.709e-04	3.709e-04	-3.431	-3.431	0.000	(0)
MgSO4	3.416e-04	3.416e-04	-3.467	-3.467	0.000	(0)
NaSO4-	6.696e-05	5.883e-05	-4.174	-4.230	-0.056	(0)
KSO4-	1.925e-05	1.692e-05	-4.716	-4.772	-0.056	(0)
MnSO4	3.523e-06	3.523e-06	-5.453	-5.453	0.000	(0)
ZnSO4	4.175e-07	4.175e-07	-6.379	-6.379	0.000	(0)
CuSO4	2.765e-08	2.765e-08	-7.558	-7.558	0.000	(0)
Zn (SO4) 2-2	1.556e-08	8.173e-09	-7.808	-8.088	-0.280	(0)
NH4SO4-	1.076e-08	9.436e-09	-7.968	-8.025	-0.057	(0)
NiSO4	9.172e-09	9.172e-09	-8.038	-8.038	0.000	(0)
CoSO4	5.852e-09	5.852e-09	-8.233	-8.233	0.000	(0)
HSO4-	5.511e-09	4.821e-09	-8.259	-8.317	-0.058	(0)
CdSO4	8.955e-10	8.955e-10	-9.048	-9.048	0.000	(0)
PbSO4	1.965e-10	1.965e-10	-9.707	-9.707	0.000	(0)
AgSO4-	9.004e-11	7.666e-11	-10.046	-10.115	-0.070	(0)
Cd (SO4) 2-2	5.169e-11	2.716e-11	-10.287	-10.566	-0.280	(0)
CrOHSO4	9.622e-12	9.622e-12	-11.017	-11.017	0.000	(0)
Pb (SO4) 2-2	5.067e-12	2.662e-12	-11.295	-11.575	-0.280	(0)
Ni (SO4) 2-2	1.300e-12	6.828e-13	-11.886	-12.166	-0.280	(0)
FeSO4	6.857e-13	6.857e-13	-12.164	-12.164	0.000	(0)
AlSO4+	1.677e-13	1.467e-13	-12.775	-12.833	-0.058	(0)
UO2SO4	5.379e-14	5.379e-14	-13.269	-13.269	0.000	(0)
CrSO4+	1.108e-14	9.435e-15	-13.955	-14.025	-0.070	(0)
Al (SO4) 2-	4.040e-15	3.534e-15	-14.394	-14.452	-0.058	(0)
UO2 (SO4) 2-2	3.034e-15	1.594e-15	-14.518	-14.798	-0.280	(0)
VO2SO4-	1.241e-18	1.057e-18	-17.906	-17.976	-0.070	(0)
FeSO4+	3.645e-19	3.196e-19	-18.438	-18.495	-0.057	(0)
Cr2 (OH) 2SO4+2	2.986e-20	1.569e-20	-19.525	-19.804	-0.280	(0)
Fe (SO4) 2-	1.804e-20	1.536e-20	-19.744	-19.814	-0.070	(0)
VOSO4	4.280e-21	4.280e-21	-20.369	-20.369	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.095e-21	2.095e-21	-20.679	-20.679	0.000	(0)
HgSO4	5.312e-22	5.312e-22	-21.275	-21.275	0.000	(0)
CrO3SO4-2	1.018e-24	5.349e-25	-23.992	-24.272	-0.280	(0)
VSO4+	1.878e-35	1.599e-35	-34.726	-34.796	-0.070	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.097	-40.097	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.069	-41.349	-0.280	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.305	-59.375	-0.070	(0)
Sb (3)	3.269e-20					
Sb (OH) 3	1.654e-20	1.654e-20	-19.782	-19.782	0.000	(0)
HSbO2	1.615e-20	1.615e-20	-19.792	-19.792	0.000	(0)
SbO2-	1.400e-24	1.192e-24	-23.854	-23.924	-0.070	(0)
Sb (OH) 4-	8.016e-25	6.825e-25	-24.096	-24.166	-0.070	(0)
Sb (OH) 2F	5.251e-26	5.251e-26	-25.280	-25.280	0.000	(0)
SbOF	5.166e-26	5.166e-26	-25.287	-25.287	0.000	(0)
Sb (OH) 2+	1.036e-26	8.816e-27	-25.985	-26.055	-0.070	(0)
SbO+	3.571e-27	3.040e-27	-26.447	-26.517	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.169	-318.448	-0.280	(0)
Sb (5)	9.283e-09					
SbO3-	9.272e-09	7.894e-09	-8.033	-8.103	-0.070	(0)

Sb(OH) 6-	1.056e-11	9.226e-12	-10.976	-11.035	-0.059	(0)
SbO2+	1.281e-24	1.091e-24	-23.892	-23.962	-0.070	(0)
Se (-2)	1.790e-14					
Ag2Se	1.790e-14	1.790e-14	-13.747	-13.747	0.000	(0)
HSe-	1.939e-39	1.651e-39	-38.712	-38.782	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-41.563	-41.563	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.551	-42.551	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.844	-46.124	-0.280	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.747	-83.865	-1.118	(0)
Se (4)	5.420e-08					
HSeO3-	4.188e-08	3.566e-08	-7.378	-7.448	-0.070	(0)
SeO3-2	1.231e-08	6.469e-09	-7.910	-8.189	-0.280	(0)
H2SeO3	3.338e-13	3.338e-13	-12.476	-12.476	0.000	(0)
AgSeO3-	8.346e-15	7.105e-15	-14.079	-14.148	-0.070	(0)
Cd (SeO3) 2-2	1.115e-19	5.860e-20	-18.953	-19.232	-0.280	(0)
Ag (SeO3) 2-3	1.751e-21	4.115e-22	-20.757	-21.386	-0.629	(0)
FeHSeO3+2	2.273e-24	1.194e-24	-23.643	-23.923	-0.280	(0)
Se (6)	3.435e-11					
SeO4-2	3.430e-11	2.000e-11	-10.465	-10.699	-0.234	(0)
MnSeO4	4.744e-14	4.744e-14	-13.324	-13.324	0.000	(0)
ZnSeO4	2.629e-15	2.629e-15	-14.580	-14.580	0.000	(0)
NiSeO4	1.913e-16	1.913e-16	-15.718	-15.718	0.000	(0)
CoSeO4	1.308e-16	1.308e-16	-15.884	-15.884	0.000	(0)
HSeO4-	2.583e-17	2.199e-17	-16.588	-16.658	-0.070	(0)
CdSeO4	6.327e-18	6.327e-18	-17.199	-17.199	0.000	(0)
Zn (SeO4) 2-2	1.015e-25	5.330e-26	-24.994	-25.273	-0.280	(0)
Si	8.833e-05					
H4SiO4	8.767e-05	8.805e-05	-4.057	-4.055	0.002	(0)
H3SiO4-	6.646e-07	5.799e-07	-6.177	-6.237	-0.059	(0)
H2SiO4-2	2.798e-12	1.667e-12	-11.553	-11.778	-0.225	(0)
UO2H3SiO4+	9.142e-13	7.783e-13	-12.039	-12.109	-0.070	(0)
SiF6-2	3.300e-29	1.951e-29	-28.482	-28.710	-0.228	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.508	-59.137	-0.629	(0)
U (4)	8.757e-21					
U (OH) 5-	8.750e-21	7.449e-21	-20.058	-20.128	-0.070	(0)
U (OH) 4	6.849e-24	6.849e-24	-23.164	-23.164	0.000	(0)
U (OH) 3+	6.456e-28	5.497e-28	-27.190	-27.260	-0.070	(0)
U (OH) 2+2	1.062e-32	5.580e-33	-31.974	-32.253	-0.280	(0)
UF3+	1.859e-36	1.583e-36	-35.731	-35.801	-0.070	(0)
UF2+2	2.053e-37	1.078e-37	-36.688	-36.967	-0.280	(0)
UOH+3	2.455e-38	5.769e-39	-37.610	-38.239	-0.629	(0)
UF4	1.607e-38	1.607e-38	-37.794	-37.794	0.000	(0)
UF+3	3.937e-40	0.000e+00	-39.405	-40.034	-0.629	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.097	-40.097	0.000	(0)
UF5-	0.000e+00	0.000e+00	-40.160	-40.229	-0.070	(0)
USO4+2	0.000e+00	0.000e+00	-41.069	-41.349	-0.280	(0)
UF6-2	0.000e+00	0.000e+00	-41.503	-41.783	-0.280	(0)
U+4	0.000e+00	0.000e+00	-44.182	-45.300	-1.118	(0)
UC1+3	0.000e+00	0.000e+00	-45.688	-46.317	-0.629	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.419	-174.080	-5.660	(0)
U (5)	1.031e-16					
UO2+	1.031e-16	8.778e-17	-15.987	-16.057	-0.070	(0)
U (6)	8.795e-08					
UO2 (CO3) 3-4	5.057e-08	3.853e-09	-7.296	-8.414	-1.118	(0)
UO2 (CO3) 2-2	3.713e-08	1.951e-08	-7.430	-7.710	-0.280	(0)
UO2CO3	2.480e-10	2.480e-10	-9.605	-9.605	0.000	(0)
UO2OH+	1.072e-12	9.128e-13	-11.970	-12.040	-0.070	(0)
UO2H3SiO4+	9.142e-13	7.783e-13	-12.039	-12.109	-0.070	(0)
UO2F+	2.373e-13	2.021e-13	-12.625	-12.695	-0.070	(0)
UO2F2	5.396e-14	5.396e-14	-13.268	-13.268	0.000	(0)
UO2SO4	5.379e-14	5.379e-14	-13.269	-13.269	0.000	(0)
UO2+2	2.712e-14	1.581e-14	-13.567	-13.801	-0.234	(0)
UO2 (SO4) 2-2	3.034e-15	1.594e-15	-14.518	-14.798	-0.280	(0)
UO2F3-	1.474e-15	1.255e-15	-14.831	-14.901	-0.070	(0)
UO2C1+	5.779e-17	4.920e-17	-16.238	-16.308	-0.070	(0)
(UO2) 2 (OH) 2+2	2.632e-18	1.383e-18	-17.580	-17.859	-0.280	(0)
UO2F4-2	1.757e-18	9.232e-19	-17.755	-18.035	-0.280	(0)

(UO2) 3 (OH) 5+	2.366e-19	2.015e-19	-18.626	-18.696	-0.070	(0)
UO2NO3+	9.879e-23	8.411e-23	-22.005	-22.075	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.931	-43.001	-0.070	(0)
V+2	0.000e+00	0.000e+00	-43.893	-44.173	-0.280	(0)
V (3)	1.173e-15					
V (OH) 3	1.173e-15	1.173e-15	-14.931	-14.931	0.000	(0)
V (OH) 2+	1.954e-26	1.663e-26	-25.709	-25.779	-0.070	(0)
VOH+2	6.592e-30	3.463e-30	-29.181	-29.461	-0.280	(0)
V+3	6.411e-35	1.507e-35	-34.193	-34.822	-0.629	(0)
VSO4+	1.878e-35	1.599e-35	-34.726	-34.796	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-56.159	-56.788	-0.629	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-57.003	-58.121	-1.118	(0)
V (4)	7.649e-19					
V (OH) 3+	7.428e-19	6.324e-19	-18.129	-18.199	-0.070	(0)
VO+2	1.316e-20	6.912e-21	-19.881	-20.160	-0.280	(0)
VOF+	4.509e-21	3.839e-21	-20.346	-20.416	-0.070	(0)
VOSO4	4.280e-21	4.280e-21	-20.369	-20.369	0.000	(0)
VOF2	1.333e-22	1.333e-22	-21.875	-21.875	0.000	(0)
VOC1+	4.371e-23	3.721e-23	-22.359	-22.429	-0.070	(0)
VOF3-	5.144e-25	4.379e-25	-24.289	-24.359	-0.070	(0)
VOF4-2	3.116e-28	1.637e-28	-27.506	-27.786	-0.280	(0)
H2V2O4+2	3.817e-32	2.006e-32	-31.418	-31.698	-0.280	(0)
V (5)	2.852e-09					
H2VO4-	2.405e-09	2.048e-09	-8.619	-8.689	-0.070	(0)
HVO4-2	4.461e-10	2.344e-10	-9.351	-9.630	-0.280	(0)
H3VO4	4.494e-13	4.494e-13	-12.347	-12.347	0.000	(0)
H3V2O7-	6.981e-15	5.943e-15	-14.156	-14.226	-0.070	(0)
HV2O7-3	6.922e-16	1.627e-16	-15.160	-15.789	-0.629	(0)
VO4-3	2.278e-16	5.352e-17	-15.643	-16.271	-0.629	(0)
VO2+	2.253e-17	1.969e-17	-16.647	-16.706	-0.059	(0)
VO2F	3.198e-18	3.198e-18	-17.495	-17.495	0.000	(0)
V2O7-4	2.619e-18	1.995e-19	-17.582	-18.700	-1.118	(0)
VO2SO4-	1.241e-18	1.057e-18	-17.906	-17.976	-0.070	(0)
VO2F2-	1.263e-19	1.075e-19	-18.899	-18.969	-0.070	(0)
V3O9-3	3.830e-20	8.999e-21	-19.417	-20.046	-0.629	(0)
VO2F3-2	2.364e-22	1.242e-22	-21.626	-21.906	-0.280	(0)
V4O12-4	1.009e-25	7.685e-27	-24.996	-26.114	-1.118	(0)
VO2NO3	2.656e-26	2.656e-26	-25.576	-25.576	0.000	(0)
VO2F4-3	2.408e-26	5.658e-27	-25.618	-26.247	-0.629	(0)
V10O28-6	0.000e+00	0.000e+00	-66.099	-68.615	-2.516	(0)
HV10O28-5	0.000e+00	0.000e+00	-66.339	-68.086	-1.747	(0)
H2V10O28-4	0.000e+00	0.000e+00	-69.419	-70.538	-1.118	(0)
Zn	2.197e-06					
Zn+2	1.456e-06	8.488e-07	-5.837	-6.071	-0.234	(0)
ZnSO4	4.175e-07	4.175e-07	-6.379	-6.379	0.000	(0)
ZnCO3	1.925e-07	1.925e-07	-6.716	-6.716	0.000	(0)
ZnHCO3+	5.817e-08	4.952e-08	-7.235	-7.305	-0.070	(0)
ZnOH+	4.573e-08	3.893e-08	-7.340	-7.410	-0.070	(0)
Zn (SO4) 2-2	1.556e-08	8.173e-09	-7.808	-8.088	-0.280	(0)
ZnCl+	4.689e-09	4.092e-09	-8.329	-8.388	-0.059	(0)
Zn (OH) 2	2.830e-09	2.830e-09	-8.548	-8.548	0.000	(0)
ZnOHCl	2.457e-09	2.457e-09	-8.610	-8.610	0.000	(0)
ZnF+	1.842e-09	1.568e-09	-8.735	-8.805	-0.070	(0)
ZnCl2	1.244e-11	1.244e-11	-10.905	-10.905	0.000	(0)
Zn (OH) 3-	7.642e-12	6.506e-12	-11.117	-11.187	-0.070	(0)
ZnCl3-	2.174e-14	1.897e-14	-13.663	-13.722	-0.059	(0)
ZnNO3+	6.678e-15	5.686e-15	-14.175	-14.245	-0.070	(0)
ZnSeO4	2.629e-15	2.629e-15	-14.580	-14.580	0.000	(0)
Zn (OH) 4-2	2.261e-16	1.188e-16	-15.646	-15.925	-0.280	(0)
ZnCl4-2	3.078e-17	1.820e-17	-16.512	-16.740	-0.228	(0)
Zn (NO3) 2	3.025e-24	3.025e-24	-23.519	-23.519	0.000	(0)
Zn (SeO4) 2-2	1.015e-25	5.330e-26	-24.994	-25.273	-0.280	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.011	-148.081	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.730	-149.730	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.619	-224.689	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.731	-227.011	-0.280	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.109	-304.389	-0.280	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.14	-48.85	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.65	-37.14	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.87	-37.14	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.39	-53.46	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-55.92	-35.89	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.52	-28.11	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.96	-23.51	0.45	(NH4) 2SeO4
Acanthite	-51.90	-88.12	-36.22	Ag2S
Ag2CO3	-11.85	-22.94	-11.09	Ag2CO3
Ag2CrO4	-21.24	-32.83	-11.59	Ag2CrO4
Ag2HVO4	-12.74	-11.26	1.48	Ag2HVO4
Ag2MoO4	-12.43	-23.98	-11.55	Ag2MoO4
Ag2O	-14.79	-2.22	12.57	Ag2O
Ag2Se	0.04	-48.66	-48.70	Ag2Se
Ag2SeO3	-10.17	-17.32	-7.15	Ag2SeO3
Ag2SeO4	-19.32	-28.23	-8.91	Ag2SeO4
Ag2SO4	-15.36	-20.18	-4.82	Ag2SO4
Ag3AsO3	-27.95	-25.79	2.16	Ag3AsO3
Ag3AsO4	-16.50	-19.29	-2.79	Ag3AsO4
Ag3H2VO5	-17.55	-12.37	5.18	Ag3H2VO5
AgF:4H2O	-13.85	-12.80	1.05	AgF:4H2O
Agmetal	-0.30	-13.81	-13.51	Ag
AgVO3	-10.93	-10.16	0.77	AgVO3
Al (OH) 3 (am)	-1.90	8.90	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.86	-47.49	2.37	Al2 (MoO4) 3
Al2O3	-1.85	17.80	19.65	Al2O3
Al4 (OH) 10SO4	-5.06	17.64	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.86	-7.06	4.80	AlAsO4:2H2O
AlOHSO4	-5.83	-9.06	-3.23	AlOHSO4
AlSb	-152.70	-87.08	65.62	AlSb
Alunite	-3.14	-4.54	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.61	-12.40	-7.79	PbSO4
Anhydrite	-1.43	-5.79	-4.36	CaSO4
Anilite	-54.95	-86.83	-31.88	Cu0.25Cu1.5S
Antlerite	-2.61	6.18	8.79	Cu3 (OH) 4SO4
Aragonite	-0.25	-8.55	-8.30	CaCO3
Arsenolite	-87.10	-89.86	-2.76	As4O6
Artinite	-5.84	3.76	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.64	-31.93	6.71	As2O5
Atacamite	-1.67	5.72	7.39	Cu2 (OH) 3Cl
Azurite	-0.40	-17.30	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.92	7.47	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-19.02	-3.15	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.60	-9.51	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.62	4.32	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-10.09	-15.91	-5.82	BaF2
BaMoO4	-7.33	-14.29	-6.96	BaMoO4
Barite	-0.51	-10.49	-9.98	BaSO4
BaS	-94.61	-78.43	16.18	BaS
BaSeO3	-9.46	-7.63	1.83	BaSeO3
BaSeO4	-11.08	-18.54	-7.46	BaSeO4
Bianchite	-6.96	-8.72	-1.76	ZnSO4:6H2O
Birnessite	-7.78	10.31	18.09	MnO2
Bixbyite	-4.13	-4.78	-0.64	Mn2O3
BlaubleiI	-54.89	-79.05	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.36	-82.64	-27.28	Cu0.6Cu0.8S
Boehmite	0.32	8.90	8.58	AlOOH
Breithauptite	-57.13	-75.65	-18.52	NiSb
Brochantite	-1.00	14.22	15.22	Cu4 (OH) 6SO4
Brucite	-4.61	12.24	16.84	Mg (OH) 2
Bunsenite	-4.82	7.63	12.45	NiO
Ca (VO3) 2	-11.58	-5.92	5.66	Ca (VO3) 2

Ca2V2O7	-11.25	6.25	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.30	6.25	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.71	4.59	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-20.53	18.43	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-21.43	18.43	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.40	-155.43	142.97	Ca3Sb2
CaCrO4	-16.18	-18.44	-2.27	CaCrO4
Calcite	-0.07	-8.55	-8.48	CaCO3
Calomel	-8.90	-26.81	-17.91	Hg2Cl2
CaMoO4	-1.64	-9.59	-7.95	CaMoO4
Carnotite	-3.08	-2.85	0.23	KUO2VO4
CaSeO3:2H2O	-5.75	-2.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.82	-13.84	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.94	-3.10	9.84	Cd(BO2)2
Cd(OH)2	-7.10	6.55	13.64	Cd(OH)2
Cd(OH)2(am)	-7.18	6.55	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.00	-16.29	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.88	1.68	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.18	8.22	28.40	Cd4(OH)6SO4
CdCl2	-13.54	-14.20	-0.66	CdCl2
CdCl2:1H2O	-12.51	-14.20	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.29	-14.20	-1.91	CdCl2:2.5H2O
CdF2	-15.62	-16.84	-1.21	CdF2
Cdmetal(alpha)	-32.37	-18.85	13.51	Cd
Cdmetal(gamma)	-32.47	-18.85	13.62	Cd
CdMoO4	-1.07	-15.22	-14.15	CdMoO4
CdOHCl	-7.37	-3.83	3.54	CdOHCl
CdSb	-76.38	-76.73	-0.35	CdSb
CdSe	-19.69	-39.89	-20.20	CdSe
CdSeO4:2H2O	-17.62	-19.47	-1.85	CdSeO4:2H2O
CdSO4	-11.25	-11.42	-0.17	CdSO4
CdSO4:1H2O	-9.69	-11.42	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.55	-11.42	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.73	-11.48	-9.75	AgCl
Cerrusite	-2.02	-15.15	-13.13	PbCO3
CH4(g)	-81.27	-122.31	-41.05	CH4
Chalcanthite	-7.28	-9.92	-2.64	CuSO4:5H2O
Chalcedony	-0.51	-4.06	-3.55	SiO2
Chalcocite	-54.90	-89.82	-34.92	Cu2S
Chalcopyrite	-125.07	-160.34	-35.27	CuFeS2
Chrysotile	-3.59	28.61	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.13	-97.82	-45.69	HgS
Claudetite	-86.79	-89.86	-3.06	As4O6
Clausthalite	-13.77	-40.87	-27.10	PbSe
Co(BO2)2	-29.28	-2.21	27.07	Co(BO2)2
Co(OH)2	-5.66	7.43	13.09	Co(OH)2
Co(OH)3	-9.96	-12.27	-2.31	Co(OH)3
CO2(g)	-2.57	-20.72	-18.15	CO2
Co3(AsO4)2	-22.67	-9.63	13.03	Co3(AsO4)2
Co3O4	-6.61	-17.10	-10.50	Co3O4
CoCl2	-21.59	-13.32	8.27	CoCl2
CoCl2:6H2O	-15.86	-13.32	2.54	CoCl2:6H2O
CoCO3	-3.31	-13.29	-9.98	CoCO3
CoF2	-14.35	-15.95	-1.60	CoF2
CoF3	-45.89	-47.34	-1.46	CoF3
CoFe2O4	17.12	13.59	-3.53	CoFe2O4
CoMoO4	-6.57	-14.33	-7.76	CoMoO4
CoO	-6.15	7.43	13.59	CoO
CoS(alpha)	-71.03	-78.47	-7.44	CoS
CoS(beta)	-67.40	-78.47	-11.07	CoS
CoSe	-22.81	-39.01	-16.20	CoSe
CoSeO3	-8.99	-7.67	1.32	CoSeO3
CoSeO4:6H2O	-17.05	-18.58	-1.53	CoSeO4:6H2O
CoSO4	-13.34	-10.53	2.80	CoSO4
CoSO4:6H2O	-8.06	-10.53	-2.47	CoSO4:6H2O
Cotunnite	-10.40	-15.18	-4.78	PbCl2
Covellite	-55.55	-77.85	-22.30	CuS
Cr(OH)2	-21.91	-11.09	10.82	Cr(OH)2

Cr(OH)3	-2.67	-1.34	1.34	Cr(OH)3
Cr(OH)3(am)	-0.59	-1.34	-0.75	Cr(OH)3
Cr2O3	-0.32	-2.68	-2.36	Cr2O3
CrCl2	-45.93	-31.84	14.09	CrCl2
CrCl3	-47.58	-32.46	15.11	CrCl3
CrF3	-25.08	-36.41	-11.34	CrF3
Cristobalite	-0.71	-4.06	-3.35	SiO2
Crmetal	-66.97	-36.49	30.48	Cr
CrO3	-27.41	-30.62	-3.21	CrO3
Cryolite	-11.37	-45.21	-33.84	Na3AlF6
Cu(OH)2	-0.63	8.05	8.67	Cu(OH)2
Cu(SbO3)2	-25.93	19.28	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.39	-0.14	9.25	Cu2(OH)3NO3
Cu2Sb·3H2O	-55.01	-89.89	-34.88	Cu2Sb·3H2O
Cu2Se(alpha)	-4.56	-50.36	-45.80	Cu2Se
Cu2SO4	-19.94	-21.89	-1.95	Cu2SO4
Cu3(AsO4)2·2H2O	-13.89	-7.79	6.10	Cu3(AsO4)2·2H2O
Cu3Sb	-59.27	-101.86	-42.59	Cu3Sb
Cu3Se2	-25.27	-88.76	-63.49	Cu3Se2
CuCO3	-1.17	-12.67	-11.50	CuCO3
CuCrO4	-17.13	-22.57	-5.44	CuCrO4
CuF	-8.75	-13.65	-4.91	CuF
CuF2	-16.45	-15.34	1.12	CuF2
CuF2·2H2O	-10.79	-15.34	-4.55	CuF2·2H2O
Cumetal	-5.91	-14.66	-8.76	Cu
CuMoO4	-0.64	-13.72	-13.08	CuMoO4
CuOCuSO4	-12.17	-1.87	10.30	CuOCuSO4
Cupricferrite	8.22	14.20	5.99	CuFe2O4
Cuprite	-2.52	-3.92	-1.41	Cu2O
Cuprousferrite	10.03	1.12	-8.92	CuFeO2
CuSe	-5.29	-38.39	-33.10	CuSe
CuSe2	-26.07	-59.44	-33.37	CuSe2
CuSeO3·2H2O	-7.57	-7.06	0.51	CuSeO3·2H2O
CuSeO4·5H2O	-15.53	-17.97	-2.44	CuSeO4·5H2O
CuSO4	-12.86	-9.92	2.94	CuSO4
Diaspore	2.03	8.90	6.87	AlOOH
Djurleite	-55.11	-89.03	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.49	-17.03	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.06	-17.03	-17.09	CaMg(CO3)2
Epsomite	-3.60	-5.73	-2.13	MgSO4·7H2O
Fe(OH)2	-10.15	3.41	13.56	Fe(OH)2
Fe(OH)2·7Cl.3	3.01	-0.03	-3.04	Fe(OH)2·7Cl.3
Fe(VO3)2	-10.96	-14.68	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.50	-8.95	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3·2H2O	-18.54	-39.16	-20.63	Fe2(SeO3)3·2H2O
Fe2(SO4)3	-44.00	-47.74	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.65	9.57	20.22	Fe3(OH)8
FeAsO4·2H2O	-13.29	-12.89	0.40	FeAsO4·2H2O
FeCr2O4	-6.47	0.73	7.20	FeCr2O4
FeMoO4	-8.26	-18.35	-10.09	FeMoO4
Ferrihydrite	-0.11	3.08	3.19	Fe(OH)3
Ferroselite	-45.48	-64.07	-18.60	FeSe2
FeS(ppt)	-79.54	-82.49	-2.95	FeS
FeSe	-32.03	-43.03	-11.00	FeSe
Fix_pe	-5.04	-5.04	0.00	e-
Fluorite	-0.71	-11.21	-10.50	CaF2
Galena	-66.36	-80.33	-13.97	PbS
Gibbsite	0.61	8.90	8.29	Al(OH)3
Goethite	2.59	3.08	0.49	FeOOH
Goslarite	-6.71	-8.72	-2.01	ZnSO4·7H2O
Greenalite	-18.69	2.12	20.81	Fe3Si2O5(OH)4
Greenockite	-64.99	-79.35	-14.36	CdS
Greigite	-288.99	-334.02	-45.03	Fe3S4
Gummite	-6.16	1.52	7.67	UO3
Gypsum	-1.18	-5.79	-4.61	CaSO4·2H2O
H-Jarosite	-14.60	-26.70	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.89	-21.76	-12.88	H2MoO4
H2S(g)	-77.89	-85.90	-8.01	H2S

H2Se(g)	-41.48	-46.44	-4.96	H2Se
Halite	-6.63	-5.03	1.60	NaCl
Halloysite	0.12	9.69	9.57	Al2Si2O5(OH)4
Hausmannite	-4.84	56.19	61.03	Mn3O4
Hematite	7.58	6.16	-1.42	Fe2O3
Hercynite	-1.68	21.21	22.89	FeAl2O4
Hg(CH3)2(g)	-182.84	-256.55	-73.71	Hg(CH3)2
Hg(g)	-7.85	-15.73	-7.87	Hg
Hg(OH)2	-8.43	-11.92	-3.50	Hg(OH)2
Hg2(g)	-16.50	-31.45	-14.96	Hg2
Hg2(OH)2	-11.32	-6.06	5.26	Hg2(OH)2
Hg2CO3	-10.73	-26.78	-16.05	Hg2CO3
Hg2CrO4	-27.97	-36.67	-8.70	Hg2CrO4
Hg2F2	-19.08	-29.44	-10.36	Hg2F2
Hg2S	-80.28	-91.95	-11.68	Hg2S
Hg2SeO3	-16.51	-21.16	-4.66	Hg2SeO3
Hg2SO4	-17.89	-24.02	-6.13	Hg2SO4
Hg3O2CO3	-26.80	-56.49	-29.68	Hg3O2CO3
HgCl(g)	-32.90	-13.40	19.50	HgCl
HgCl2	-11.41	-32.67	-21.26	HgCl2
HgF(g)	-47.40	-14.72	32.68	HgF
HgF2(g)	-47.87	-35.31	12.57	HgF2
Hgmetal(l)	-2.28	-15.73	-13.45	Hg
HgSe	-2.67	-58.36	-55.69	HgSe
HgSeO3	-14.60	-27.03	-12.43	HgSeO3
HgSO4	-20.47	-29.89	-9.42	HgSO4
Huntite	-4.03	-33.99	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.97	-24.74	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.93	-21.69	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-17.18	-22.35	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-7.21	-22.01	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-34.62	-51.86	-17.24	K2Cr2O7
K2CrO4	-20.73	-21.25	-0.51	K2CrO4
K2MoO4	-15.66	-12.39	3.26	K2MoO4
K2SeO4	-15.92	-16.65	-0.73	K2SeO4
Kaolinite	2.26	9.69	7.43	Al2Si2O5(OH)4
Langite	-3.27	14.22	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.39	-6.83	-0.43	PbO:PbSO4
Laurionite	-5.43	-4.81	0.62	PbOHCl
Lepidocrocite	1.71	3.08	1.37	FeOOH
Lime	-20.52	12.17	32.70	CaO
Litharge	-7.13	5.57	12.69	PbO
Mackinawite	-78.89	-82.49	-3.60	FeS
Maghemite	-0.23	6.16	6.39	Fe2O3
Magnesioferrite	1.54	18.40	16.86	Fe2MgO4
Magnesite	-1.02	-8.48	-7.46	MgCO3
Magnetite	6.17	9.57	3.40	Fe3O4
Malachite	0.68	-4.63	-5.31	Cu2(OH)2CO3
Manganite	-2.38	22.96	25.34	MnOOH
Massicot	-7.33	5.57	12.89	PbO
Matlockite	-7.53	-16.50	-8.97	PbClF
Melanothallite	-18.96	-12.70	6.26	CuCl2
Melanterite	-12.35	-14.55	-2.21	FeSO4·7H2O
Metacinnabar	-52.73	-97.82	-45.09	HgS
Mg(OH)2(active)	-6.56	12.24	18.79	Mg(OH)2
Mg(VO3)2	-17.14	-5.86	11.28	Mg(VO3)2
Mg2Sb3	-274.64	-199.95	74.68	Mg2Sb3
Mg2V2O7	-19.98	6.38	26.36	Mg2V2O7
MgCr2O4	-6.64	9.56	16.20	MgCr2O4
MgCrO4	-23.76	-18.38	5.38	MgCrO4
MgF2	-3.02	-11.15	-8.13	MgF2
MgMoO4	-7.68	-9.53	-1.85	MgMoO4
MgSeO3·6H2O	-5.92	-2.87	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-12.58	-13.78	-1.20	MgSeO4·6H2O
Minium	-31.42	42.10	73.52	Pb3O4
Mirabilite	-6.16	-7.27	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.73	-7.83	4.90	Mn(VO3)2
Mn2(SO4)3	-52.96	-58.67	-5.71	Mn2(SO4)3

Mn2Sb	-149.23	-88.15	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.64	-1.14	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-13.20	-10.49	2.72	MnCl2:4H2O
MnS (grn)	-75.81	-75.64	0.17	MnS
MnS (pnk)	-78.98	-75.64	3.34	MnS
MnSb	-95.45	-98.36	-2.91	MnSb
MnSe	-39.68	-36.18	3.50	MnSe
MnSeO3	-5.97	-4.84	1.13	MnSeO3
MnSeO3:2H2O	-5.83	-4.84	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.70	-15.75	-2.05	MnSeO4:5H2O
MnSO4	-10.29	-7.70	2.58	MnSO4
Monteponite	-8.56	6.55	15.10	CdO
Montroydite	-8.28	-11.92	-3.64	HgO
MoO3	-13.76	-21.76	-8.00	MoO3
Morenosite	-8.19	-10.34	-2.14	NiSO4:7H2O
MoS2	-148.70	-218.96	-70.26	MoS2
Na-Jarosite	-10.15	-21.35	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-40.65	-50.54	-9.90	Na2Cr2O7
Na2CrO4	-22.85	-19.92	2.93	Na2CrO4
Na2Mo2O7	-16.24	-32.84	-16.60	Na2Mo2O7
Na2MoO4	-12.56	-11.07	1.49	Na2MoO4
Na2MoO4:2H2O	-12.30	-11.07	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.71	-4.41	10.30	Na2SeO3:5H2O
Na2SeO4	-16.60	-15.32	1.28	Na2SeO4
Na3Sb	-174.39	-79.94	94.45	Na3Sb
Na3VO4	-29.69	6.99	36.68	Na3VO4
Na4V2O7	-34.11	3.29	37.40	Na4V2O7
Nantokite	-5.61	-12.34	-6.73	CuCl
NaSb	-88.40	-65.23	23.17	NaSb
Natron	-8.72	-10.03	-1.31	Na2CO3:10H2O
NaVO3	-7.56	-3.70	3.86	NaVO3
Nesquehonite	-3.81	-8.48	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.17	7.63	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-24.75	-9.05	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-19.45	12.55	32.00	Ni4 (OH) 6SO4
NiCO3	-6.22	-13.09	-6.87	NiCO3
NiMoO4	-2.99	-14.14	-11.14	NiMoO4
NiS (alpha)	-72.67	-78.27	-5.60	NiS
NiS (beta)	-67.17	-78.27	-11.10	NiS
NiS (gamma)	-65.47	-78.27	-12.80	NiS
NiSe	-21.11	-38.81	-17.70	NiSe
NiSeO3:2H2O	-10.29	-7.48	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.87	-18.39	-1.52	NiSeO4:6H2O
Nsutite	-7.19	10.31	17.50	MnO2
O2 (g)	-32.29	50.80	83.09	O2
Orpiment	-241.56	-302.62	-61.07	As2S3
Otavite	-2.17	-14.17	-12.00	CdCO3
Pb (BO2) 2	-10.60	-4.08	6.52	Pb (BO2) 2
Pb (OH) 2	-2.58	5.57	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-59.88	-68.64	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-8.03	0.76	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.05	11.14	26.19	Pb2O (OH) 2
Pb2O3	-24.50	36.54	61.04	Pb2O3
Pb2OCO3	-9.03	-9.58	-0.56	Pb2OCO3
Pb2V2O7	-5.06	-6.96	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-21.02	-15.22	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.53	-1.39	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.04	-4.02	11.02	Pb3O2CO3
Pb3O2SO4	-11.95	-1.26	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.79	4.31	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.57	4.31	21.88	Pb4O3SO4
PbCrO4	-12.45	-25.05	-12.60	PbCrO4
PbF2	-10.38	-17.82	-7.44	PbF2
Pbmetal	-24.08	-19.83	4.25	Pb
PbMoO4	-0.58	-16.20	-15.62	PbMoO4
PbO:0.3H2O	-7.41	5.57	12.98	PbO:0.33H2O
PbSeO4	-13.61	-20.45	-6.84	PbSeO4
Periclase	-9.35	12.24	21.58	MgO

Phosgenite	-10.53	-30.34	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-10.63	12.17	22.80	Ca(OH)2
Pyrite	-124.48	-142.99	-18.51	FeS2
Pyrochroite	-4.93	10.26	15.19	Mn(OH)2
Pyrolusite	-5.72	35.66	41.38	MnO2
Quartz	-0.06	-4.06	-4.00	SiO2
Realgar	-101.31	-121.06	-19.75	AsS
Retgersite	-8.30	-10.34	-2.04	NiSO4:6H2O
Rhodochrosite	0.12	-10.46	-10.58	MnCO3
Rutherfordine	-4.71	-19.21	-14.50	UO2CO3
Sb(OH)3	-12.67	-19.78	-7.11	Sb(OH)3
Sb2O4	-17.57	-14.16	3.40	Sb2O4
Sb2O5	-27.72	-37.39	-9.67	Sb2O5
Sb2Se3	-111.13	-178.88	-67.76	Sb2Se3
Sb4O6(cubic)	-60.86	-79.13	-18.26	Sb4O6
Sb4O6(orth)	-61.22	-79.13	-17.90	Sb4O6
SbCl3	-51.48	-50.91	0.57	SbCl3
SbF3	-44.63	-54.86	-10.23	SbF3
Sbmetal	-46.19	-57.88	-11.69	Sb
SbO2	-3.57	-31.39	-27.82	SbO2
Schoepite	-4.48	1.52	5.99	UO2(OH)2:H2O
Semetal(am)	-13.93	-21.04	-7.11	Se
Semetal(hex)	-13.33	-21.04	-7.71	Se
Senarmontite	-27.20	-39.56	-12.37	Sb2O3
SeO2	-15.23	-15.11	0.12	SeO2
SeO3	-47.06	-26.02	21.04	SeO3
Sepiolite	-3.45	12.31	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-6.47	12.31	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.07	-17.31	-10.24	FeCO3
SiO2(am-gel)	-1.35	-4.06	-2.71	SiO2
SiO2(am-ppt)	-1.32	-4.06	-2.74	SiO2
Smithsonite	-1.48	-11.48	-10.00	ZnCO3
Sphalerite	-65.20	-76.65	-11.45	ZnS
Spinel	-6.81	30.04	36.85	MgAl2O4
Stibnite	-246.80	-297.26	-50.46	Sb2S3
Sulfur	-58.35	-60.50	-2.14	S
Tenorite	0.40	8.05	7.64	CuO
Thenardite	-7.59	-7.27	0.32	Na2SO4
Thermonatrite	-10.67	-10.03	0.64	Na2CO3:H2O
Tyuyamunite	-6.97	-2.89	4.08	Ca(UO2)2(VO4)2
U3O8	-14.29	6.80	21.08	U3O8
U3Sb4	-580.28	-427.90	152.38	U3Sb4
U4O9	-30.25	-33.27	-3.02	U4O9
UF4	-31.90	-61.43	-29.54	UF4
UF4:2.5H2O	-28.72	-61.43	-32.72	UF4:2.5H2O
UO2(am)	-15.60	-14.67	0.93	UO2
UO2(NO3)2	-43.10	-30.95	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.80	-30.95	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-34.34	-30.95	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-33.00	-30.95	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.10	1.52	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.25	-24.50	-2.25	UO2SeO4:4H2O
UO3	-6.18	1.52	7.70	UO3
Uraninite	-10.00	-14.67	-4.67	UO2
USb2	-220.01	-190.44	29.58	USb2
V(OH)3	-19.44	-11.85	7.59	V(OH)3
V2O5	-16.73	-18.09	-1.36	V2O5
V3O5	-41.76	-39.93	1.84	V3O5
V4O7	-51.96	-44.77	7.19	V4O7
V6O13	-44.22	-105.08	-60.86	V6O13
Valentinite	-31.08	-39.56	-8.48	Sb2O3
VC12	-64.17	-45.30	18.87	VC12
VC13	-66.41	-42.97	23.43	VC13
VF4	-66.54	-51.61	14.93	VF4
Vmetal	-93.97	-49.94	44.03	V
VO	-39.30	-24.55	14.76	VO
VO(OH)2	-9.99	-4.84	5.15	VO(OH)2

VO2Cl	-22.26	-19.42	2.84	VO2Cl
VOC1	-33.37	-22.22	11.15	VOC1
VOC12	-38.35	-25.59	12.76	VOC12
VOSO4	-26.42	-22.81	3.61	VOSO4
Witherite	-4.68	-13.25	-8.57	BaCO3
Wurtzite	-67.70	-76.65	-8.95	ZnS
Zincite	-2.09	9.25	11.33	ZnO
Zincosite	-12.65	-8.72	3.93	ZnSO4
Zn(BO2)2	-8.69	-0.40	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-26.54	-23.22	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.95	9.25	12.20	Zn(OH)2
Zn(OH)2(am)	-3.23	9.25	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.51	9.25	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.29	9.25	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.49	9.25	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.97	0.53	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.07	8.12	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.84	-4.19	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.11	-8.19	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.38	19.02	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-13.02	25.48	38.50	Zn5(OH)8Cl2
ZnCl2	-18.56	-11.51	7.05	ZnCl2
ZnCO3:1H2O	-1.22	-11.48	-10.26	ZnCO3:1H2O
ZnF2	-13.60	-14.14	-0.53	ZnF2
Znmetal	-41.94	-16.15	25.79	Zn
ZnMoO4	-2.39	-12.52	-10.13	ZnMoO4
ZnO(active)	-1.94	9.25	11.19	ZnO
ZnS(am)	-67.60	-76.65	-9.05	ZnS
ZnSb	-85.04	-74.03	11.01	ZnSb
ZnSe	-22.79	-37.19	-14.40	ZnSe
ZnSeO4:6H2O	-15.25	-16.77	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.08	-8.72	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 111.

```

Title Evaporate Stage 6 lake water to produce initial Stage 7 Lake water
REACTION 605
      H2O      -1
      21.01 moles      ## Removes x m3 water, but solute mass remains the
same
      USE solution 611
      Save Solution 612
      END

```

TITLE

Evaporate Stage 6 lake water to produce initial Stage 7 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 611. Solution after simulation 110.
Using reaction 605.

Reaction 605.

2.101e+01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.619e-08	1.006e-08
Al	1.390e-06	8.642e-07
As	4.890e-10	3.040e-10
B	2.483e-05	1.544e-05
Ba	3.989e-08	2.480e-08
C	3.634e-03	2.259e-03
Ca	2.638e-03	1.640e-03
Cd	7.092e-09	4.409e-09
Cl	3.533e-03	2.197e-03
Co	5.477e-08	3.405e-08
Cr	2.265e-09	1.408e-09
Cu	2.409e-06	1.498e-06
F	1.883e-04	1.171e-04
Fe	1.788e-09	1.111e-09
Hg	1.117e-09	6.944e-10
K	1.988e-03	1.236e-03
Mg	2.903e-03	1.805e-03
Mn	3.337e-05	2.075e-05
Mo	9.853e-07	6.126e-07
N	8.110e-06	5.042e-06
Na	9.089e-03	5.651e-03
Ni	8.533e-08	5.305e-08
Pb	5.174e-09	3.217e-09
S	7.495e-03	4.660e-03
Sb	1.493e-08	9.285e-09
Se	8.725e-08	5.425e-08
Si	1.421e-04	8.835e-05
U	1.415e-07	8.797e-08
V	4.588e-09	2.852e-09
Zn	3.535e-06	2.198e-06

-----Description of solution-----

	pH	=	7.634	Charge balance
	pe	=	5.074	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	2.919e-02	
	Mass of water (kg)	=	6.217e-01	
	Total alkalinity (eq/kg)	=	3.522e-03	
	Total CO2 (mol/kg)	=	3.634e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	5.967e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	6	
	Total H	=	6.902421e+01	
	Total O	=	3.453657e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.128e-07	4.336e-07	-6.290	-6.363	-0.073	(0)
H+	2.727e-08	2.321e-08	-7.564	-7.634	-0.070	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	1.619e-08					
AgCl	1.061e-08	1.061e-08	-7.974	-7.974	0.000	(0)
AgCl2-	3.397e-09	2.779e-09	-8.469	-8.556	-0.087	(0)
Ag+	2.030e-09	1.728e-09	-8.693	-8.762	-0.070	(0)
AgSO4-	1.315e-10	1.076e-10	-9.881	-9.968	-0.087	(0)
AgCl3-2	1.662e-11	7.449e-12	-10.779	-11.128	-0.349	(0)
AgNO2	2.233e-12	2.233e-12	-11.651	-11.651	0.000	(0)
AgF	6.082e-13	6.082e-13	-12.216	-12.216	0.000	(0)
AgCl4-3	2.784e-13	4.574e-14	-12.555	-13.340	-0.784	(0)
AgOH	7.492e-14	7.492e-14	-13.125	-13.125	0.000	(0)
AgNH3+	6.426e-14	5.257e-14	-13.192	-13.279	-0.087	(0)
Ag2Se	2.338e-14	2.338e-14	-13.631	-13.631	0.000	(0)
AgH2BO3	1.658e-14	1.658e-14	-13.780	-13.780	0.000	(0)
AgSeO3-	1.265e-14	1.035e-14	-13.898	-13.985	-0.087	(0)
Ag (NO2) 2-	2.614e-17	2.138e-17	-16.583	-16.670	-0.087	(0)
Ag (NH3) 2+	7.783e-18	6.368e-18	-17.109	-17.196	-0.087	(0)
AgNO3	5.947e-18	5.947e-18	-17.226	-17.226	0.000	(0)
Ag (OH) 2-	3.880e-18	3.175e-18	-17.411	-17.498	-0.087	(0)
Ag (SeO3) 2-3	5.254e-21	8.633e-22	-20.280	-21.064	-0.784	(0)
Ag2MoO4	5.844e-25	5.844e-25	-24.233	-24.233	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.277	-83.672	-1.394	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.792	-146.981	-0.189	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.045	-147.132	-0.087	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.436	-148.787	-0.351	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.764	-149.098	-0.334	(0)
Al	1.390e-06					
Al (OH) 4-	1.362e-06	1.160e-06	-5.866	-5.935	-0.070	(0)
Al (OH) 3	2.126e-08	2.126e-08	-7.673	-7.673	0.000	(0)
Al (OH) 2+	2.866e-09	2.457e-09	-8.543	-8.610	-0.067	(0)
AlF3	2.268e-09	2.268e-09	-8.644	-8.644	0.000	(0)
AlF2+	1.500e-09	1.286e-09	-8.824	-8.891	-0.067	(0)
AlF4-	1.870e-10	1.593e-10	-9.728	-9.798	-0.070	(0)
AlF+2	4.268e-11	2.305e-11	-10.370	-10.637	-0.268	(0)
AlOH+2	1.321e-11	7.133e-12	-10.879	-11.147	-0.268	(0)
AlSO4+	4.678e-13	3.985e-13	-12.330	-12.400	-0.070	(0)
Al+3	7.012e-14	1.645e-14	-13.154	-13.784	-0.630	(0)
Al (SO4) 2-	1.564e-14	1.333e-14	-13.806	-13.875	-0.070	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.531	-42.315	-0.784	(0)
As (3)	5.228e-23					
H3AsO3	5.091e-23	5.091e-23	-22.293	-22.293	0.000	(0)
H2AsO3-	1.375e-24	1.125e-24	-23.862	-23.949	-0.087	(0)
HAsO3-2	9.863e-29	4.420e-29	-28.006	-28.355	-0.349	(0)
H4AsO3+	7.155e-31	5.854e-31	-30.145	-30.233	-0.087	(0)
AsO3-3	4.467e-34	7.341e-35	-33.350	-34.134	-0.784	(0)
As (5)	4.890e-10					
HAsO4-2	4.380e-10	1.963e-10	-9.359	-9.707	-0.349	(0)
H2AsO4-	5.079e-11	4.155e-11	-10.294	-10.381	-0.087	(0)
AsO4-3	1.628e-13	2.674e-14	-12.788	-13.573	-0.784	(0)
H3AsO4	1.665e-16	1.676e-16	-15.779	-15.776	0.003	(0)
B	2.483e-05					
H3BO3	2.403e-05	2.419e-05	-4.619	-4.616	0.003	(0)
H2BO3-	7.218e-07	6.053e-07	-6.142	-6.218	-0.076	(0)
CaH2BO3+	4.069e-08	3.413e-08	-7.390	-7.467	-0.076	(0)
MgH2BO3+	2.871e-08	2.408e-08	-7.542	-7.618	-0.076	(0)
NaH2BO3	7.290e-09	7.290e-09	-8.137	-8.137	0.000	(0)
BF (OH) 3-	1.613e-09	1.353e-09	-8.792	-8.869	-0.076	(0)
H5 (BO3) 2-	1.486e-11	1.246e-11	-10.828	-10.904	-0.076	(0)
BF2 (OH) 2-	5.611e-13	4.705e-13	-12.251	-12.327	-0.076	(0)
BaH2BO3+	4.588e-13	3.848e-13	-12.338	-12.415	-0.076	(0)
H8 (BO3) 3-	3.596e-14	3.015e-14	-13.444	-13.521	-0.076	(0)
AgH2BO3	1.658e-14	1.658e-14	-13.780	-13.780	0.000	(0)

	BF3OH-	7.103e-19	5.957e-19	-18.149	-18.225	-0.076	(0)
	BF4-	1.137e-23	9.537e-24	-22.944	-23.021	-0.076	(0)
Ba		3.989e-08					
	Ba+2	3.918e-08	2.057e-08	-7.407	-7.687	-0.280	(0)
	BaHCO3+	6.538e-10	5.627e-10	-9.185	-9.250	-0.065	(0)
	BaCO3	6.103e-11	6.103e-11	-10.214	-10.214	0.000	(0)
	BaH2BO3+	4.588e-13	3.848e-13	-12.338	-12.415	-0.076	(0)
	BaOH+	4.553e-14	3.893e-14	-13.342	-13.410	-0.068	(0)
	BaNO3+	5.459e-16	4.467e-16	-15.263	-15.350	-0.087	(0)
	BaNH3+2	4.315e-16	1.934e-16	-15.365	-15.714	-0.349	(0)
C (4)		3.634e-03					
	HCO3-	3.342e-03	2.865e-03	-2.476	-2.543	-0.067	(0)
	H2CO3	1.495e-04	1.495e-04	-3.825	-3.825	0.000	(0)
	CaHCO3+	6.073e-05	5.226e-05	-4.217	-4.282	-0.065	(0)
	MgHCO3+	3.962e-05	3.363e-05	-4.402	-4.473	-0.071	(0)
	NaHCO3	1.224e-05	1.224e-05	-4.912	-4.912	0.000	(0)
	CO3-2	1.102e-05	5.786e-06	-4.958	-5.238	-0.280	(0)
	CaCO3	8.985e-06	8.985e-06	-5.047	-5.047	0.000	(0)
	MgCO3	5.521e-06	5.521e-06	-5.258	-5.258	0.000	(0)
	CuCO3	2.057e-06	2.057e-06	-5.687	-5.687	0.000	(0)
	NaCO3-	9.550e-07	8.187e-07	-6.020	-6.087	-0.067	(0)
	MnHCO3+	7.785e-07	6.656e-07	-6.109	-6.177	-0.068	(0)
	ZnCO3	3.742e-07	3.742e-07	-6.427	-6.427	0.000	(0)
	ZnHCO3+	1.244e-07	1.018e-07	-6.905	-6.992	-0.087	(0)
	UO2 (CO3) 3-4	1.079e-07	4.352e-09	-6.967	-8.361	-1.394	(0)
	Cu (CO3) 2-2	7.149e-08	3.204e-08	-7.146	-7.494	-0.349	(0)
	UO2 (CO3) 2-2	3.348e-08	1.501e-08	-7.475	-7.824	-0.349	(0)
	CuHCO3+	1.334e-08	1.091e-08	-7.875	-7.962	-0.087	(0)
	NiHCO3+	1.152e-08	9.430e-09	-7.938	-8.026	-0.087	(0)
	NiCO3	5.764e-09	5.764e-09	-8.239	-8.239	0.000	(0)
	CoHCO3+	4.585e-09	3.751e-09	-8.339	-8.426	-0.087	(0)
	PbCO3	3.511e-09	3.511e-09	-8.455	-8.455	0.000	(0)
	CoCO3	1.647e-09	1.647e-09	-8.783	-8.783	0.000	(0)
	BaHCO3+	6.538e-10	5.627e-10	-9.185	-9.250	-0.065	(0)
	PbHCO3+	5.251e-10	4.296e-10	-9.280	-9.367	-0.087	(0)
	CdCO3	2.911e-10	2.911e-10	-9.536	-9.536	0.000	(0)
	Pb (CO3) 2-2	1.307e-10	5.859e-11	-9.884	-10.232	-0.349	(0)
	UO2CO3	1.300e-10	1.300e-10	-9.886	-9.886	0.000	(0)
	BaCO3	6.103e-11	6.103e-11	-10.214	-10.214	0.000	(0)
	CdHCO3+	1.759e-11	1.440e-11	-10.755	-10.842	-0.087	(0)
	Cd (CO3) 2-2	2.786e-12	1.249e-12	-11.555	-11.904	-0.349	(0)
	FeHCO3+	8.684e-14	7.473e-14	-13.061	-13.126	-0.065	(0)
	HgCO3	1.168e-14	1.168e-14	-13.933	-13.933	0.000	(0)
	Hg (CO3) 2-2	4.768e-16	2.137e-16	-15.322	-15.670	-0.349	(0)
	HgHCO3+	6.169e-18	5.048e-18	-17.210	-17.297	-0.087	(0)
Ca		2.638e-03					
	Ca+2	1.866e-03	9.798e-04	-2.729	-3.009	-0.280	(0)
	CaSO4	7.005e-04	7.005e-04	-3.155	-3.155	0.000	(0)
	CaHCO3+	6.073e-05	5.226e-05	-4.217	-4.282	-0.065	(0)
	CaCO3	8.985e-06	8.985e-06	-5.047	-5.047	0.000	(0)
	CaF+	1.753e-06	1.498e-06	-5.756	-5.824	-0.068	(0)
	CaH2BO3+	4.069e-08	3.413e-08	-7.390	-7.467	-0.076	(0)
	CaOH+	9.849e-09	8.476e-09	-8.007	-8.072	-0.065	(0)
	CaNH3+2	4.101e-11	1.838e-11	-10.387	-10.736	-0.349	(0)
	CaNO3+	1.641e-11	1.343e-11	-10.785	-10.872	-0.087	(0)
	Ca (NH3) 2+2	2.433e-19	1.090e-19	-18.614	-18.962	-0.349	(0)
Cd		7.092e-09					
	Cd+2	4.204e-09	2.207e-09	-8.376	-8.656	-0.280	(0)
	CdSO4	1.615e-09	1.615e-09	-8.792	-8.792	0.000	(0)
	CdCl+	7.748e-10	6.340e-10	-9.111	-9.198	-0.087	(0)
	CdCO3	2.911e-10	2.911e-10	-9.536	-9.536	0.000	(0)
	Cd (SO4) 2-2	1.517e-10	6.799e-11	-9.819	-10.168	-0.349	(0)
	CdHCO3+	1.759e-11	1.440e-11	-10.755	-10.842	-0.087	(0)
	CdOHC1	1.128e-11	1.128e-11	-10.948	-10.948	0.000	(0)
	CdOH+	9.292e-12	7.603e-12	-11.032	-11.119	-0.087	(0)
	CdCl2	7.948e-12	7.948e-12	-11.100	-11.100	0.000	(0)
	CdF+	5.991e-12	4.902e-12	-11.222	-11.310	-0.087	(0)
	Cd (CO3) 2-2	2.786e-12	1.249e-12	-11.555	-11.904	-0.349	(0)

Cd(OH) 2	2.080e-14	2.080e-14	-13.682	-13.682	0.000	(0)
CdCl3-	1.843e-14	1.508e-14	-13.734	-13.822	-0.087	(0)
CdF2	1.370e-15	1.370e-15	-14.863	-14.863	0.000	(0)
CdNO3+	3.697e-17	3.025e-17	-16.432	-16.519	-0.087	(0)
CdSeO4	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
Cd(OH) 3-	6.734e-19	5.510e-19	-18.172	-18.259	-0.087	(0)
Cd2OH+3	5.118e-19	8.411e-20	-18.291	-19.075	-0.784	(0)
Cd(SeO3) 2-2	3.525e-19	1.580e-19	-18.453	-18.801	-0.349	(0)
Cd(OH) 4-2	8.726e-26	3.911e-26	-25.059	-25.408	-0.349	(0)
Cd(NO3) 2	6.569e-26	6.569e-26	-25.183	-25.183	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.703	-78.790	-0.087	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-149.728	-149.728	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.883	-225.970	-0.087	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.568	-301.916	-0.349	(0)
Cl	3.533e-03					
Cl-	3.533e-03	3.007e-03	-2.452	-2.522	-0.070	(0)
MnCl+	5.157e-08	4.409e-08	-7.288	-7.356	-0.068	(0)
AgCl	1.061e-08	1.061e-08	-7.974	-7.974	0.000	(0)
ZnCl+	1.000e-08	8.490e-09	-8.000	-8.071	-0.071	(0)
ZnOHCl	4.820e-09	4.820e-09	-8.317	-8.317	0.000	(0)
AgCl2-	3.397e-09	2.779e-09	-8.469	-8.556	-0.087	(0)
CuCl	9.453e-10	9.453e-10	-9.024	-9.024	0.000	(0)
CdCl+	7.748e-10	6.340e-10	-9.111	-9.198	-0.087	(0)
CuCl2-	6.997e-10	5.940e-10	-9.155	-9.226	-0.071	(0)
CuCl+	3.391e-10	2.878e-10	-9.470	-9.541	-0.071	(0)
NiCl+	2.511e-10	2.055e-10	-9.600	-9.687	-0.087	(0)
CoCl+	2.141e-10	1.752e-10	-9.669	-9.757	-0.087	(0)
MnCl2	1.873e-10	1.873e-10	-9.727	-9.727	0.000	(0)
ZnCl2	4.047e-11	4.047e-11	-10.393	-10.393	0.000	(0)
PbCl+	2.633e-11	2.154e-11	-10.580	-10.667	-0.087	(0)
AgCl3-2	1.662e-11	7.449e-12	-10.779	-11.128	-0.349	(0)
CdOHCl	1.128e-11	1.128e-11	-10.948	-10.948	0.000	(0)
CdCl2	7.948e-12	7.948e-12	-11.100	-11.100	0.000	(0)
HgClOH	3.884e-12	3.884e-12	-11.411	-11.411	0.000	(0)
HgCl2	1.526e-12	1.526e-12	-11.817	-11.817	0.000	(0)
CuCl3-2	7.147e-13	3.819e-13	-12.146	-12.418	-0.272	(0)
CuCl2	3.001e-13	3.001e-13	-12.523	-12.523	0.000	(0)
PbCl2	2.894e-13	2.894e-13	-12.539	-12.539	0.000	(0)
AgCl4-3	2.784e-13	4.574e-14	-12.555	-13.340	-0.784	(0)
MnCl3-	1.815e-13	1.552e-13	-12.741	-12.809	-0.068	(0)
ZnCl3-	1.139e-13	9.668e-14	-12.943	-13.015	-0.071	(0)
HgCl3-	5.607e-14	4.588e-14	-13.251	-13.338	-0.087	(0)
CdCl3-	1.843e-14	1.508e-14	-13.734	-13.822	-0.087	(0)
NiCl2	3.111e-15	3.111e-15	-14.507	-14.507	0.000	(0)
HgCl4-2	1.226e-15	5.493e-16	-14.912	-15.260	-0.349	(0)
PbCl3-	4.234e-16	3.465e-16	-15.373	-15.460	-0.087	(0)
ZnCl4-2	2.721e-16	1.454e-16	-15.565	-15.837	-0.272	(0)
HgCl+	1.237e-16	1.012e-16	-15.908	-15.995	-0.087	(0)
UO2Cl+	3.364e-17	2.752e-17	-16.473	-16.560	-0.087	(0)
CrCl+2	2.713e-17	1.216e-17	-16.567	-16.915	-0.349	(0)
CuCl3-	9.924e-18	8.424e-18	-17.003	-17.074	-0.071	(0)
PbCl4-2	1.063e-18	4.763e-19	-17.974	-18.322	-0.349	(0)
CrOHC12	3.013e-19	3.013e-19	-18.521	-18.521	0.000	(0)
CrCl2+	4.240e-21	3.469e-21	-20.373	-20.460	-0.087	(0)
FeCl+2	3.876e-21	2.071e-21	-20.412	-20.684	-0.272	(0)
CuCl4-2	2.376e-22	1.270e-22	-21.624	-21.896	-0.272	(0)
VOC1+	1.266e-22	1.036e-22	-21.898	-21.985	-0.087	(0)
FeCl2+	3.254e-23	2.782e-23	-22.488	-22.556	-0.068	(0)
CrO3Cl-	2.816e-26	2.304e-26	-25.550	-25.638	-0.087	(0)
FeCl3	8.368e-27	8.368e-27	-26.077	-26.077	0.000	(0)
CoCl+2	1.084e-35	4.858e-36	-34.965	-35.314	-0.349	(0)
UCl+3	0.000e+00	0.000e+00	-45.754	-46.538	-0.784	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-48.146	-48.494	-0.349	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-49.537	-49.886	-0.349	(0)
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-62.688	-63.036	-0.349	(0)
Co(2)	5.477e-08					
Co+2	3.757e-08	1.684e-08	-7.425	-7.774	-0.349	(0)
CoSO4	1.048e-08	1.048e-08	-7.980	-7.980	0.000	(0)

CoHCO3+	4.585e-09	3.751e-09	-8.339	-8.426	-0.087	(0)
CoCO3	1.647e-09	1.647e-09	-8.783	-8.783	0.000	(0)
CoCl+	2.141e-10	1.752e-10	-9.669	-9.757	-0.087	(0)
CoOH+	1.780e-10	1.457e-10	-9.750	-9.837	-0.087	(0)
CoF+	9.117e-11	7.460e-11	-10.040	-10.127	-0.087	(0)
Co (OH) 2	5.017e-12	5.017e-12	-11.300	-11.300	0.000	(0)
CoNO2+	8.967e-13	7.337e-13	-12.047	-12.134	-0.087	(0)
Co (NH3) +2	6.730e-14	3.016e-14	-13.172	-13.521	-0.349	(0)
CoSeO4	2.530e-16	2.530e-16	-15.597	-15.597	0.000	(0)
CoNO3+	1.413e-16	1.156e-16	-15.850	-15.937	-0.087	(0)
Co (OH) 3-	5.304e-17	4.340e-17	-16.275	-16.363	-0.087	(0)
CoOOH-	1.332e-17	1.089e-17	-16.876	-16.963	-0.087	(0)
Co2OH+3	7.479e-19	1.229e-19	-18.126	-18.910	-0.784	(0)
Co (NH3) 2+2	4.278e-20	1.917e-20	-19.369	-19.717	-0.349	(0)
Co (OH) 4-2	6.655e-24	2.983e-24	-23.177	-23.525	-0.349	(0)
Co (NO3) 2	1.019e-24	1.019e-24	-23.992	-23.992	0.000	(0)
Co (NH3) 3+2	8.027e-27	3.597e-27	-26.095	-26.444	-0.349	(0)
Co4 (OH) 4+4	2.226e-30	8.980e-32	-29.652	-31.047	-1.394	(0)
Co (NH3) 4+2	6.277e-34	2.813e-34	-33.202	-33.551	-0.349	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-40.809	-41.158	-0.349	(0)
Co (3)	3.903e-29					
CoOH+2	3.903e-29	1.749e-29	-28.409	-28.757	-0.349	(0)
Co+3	3.384e-35	7.939e-36	-34.471	-35.100	-0.630	(0)
CoCl+2	1.084e-35	4.858e-36	-34.965	-35.314	-0.349	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.146	-48.494	-0.349	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.008	-58.095	-0.087	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.329	-62.677	-0.349	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.688	-63.036	-0.349	(0)
Cr (2)	1.406e-26					
Cr+2	1.406e-26	6.299e-27	-25.852	-26.201	-0.349	(0)
Cr (3)	2.265e-09					
Cr (OH) 2+	1.910e-09	1.563e-09	-8.719	-8.806	-0.087	(0)
Cr (OH) 3	2.546e-10	2.546e-10	-9.594	-9.594	0.000	(0)
Cr (OH) +2	6.611e-11	2.963e-11	-10.180	-10.528	-0.349	(0)
CrOHSO4	2.194e-11	2.194e-11	-10.659	-10.659	0.000	(0)
CrO2-	6.370e-12	5.212e-12	-11.196	-11.283	-0.087	(0)
Cr (OH) 4-	5.372e-12	4.395e-12	-11.270	-11.357	-0.087	(0)
CrF+2	1.548e-13	6.936e-14	-12.810	-13.159	-0.349	(0)
CrSO4+	2.782e-14	2.276e-14	-13.556	-13.643	-0.087	(0)
Cr+3	1.901e-14	3.123e-15	-13.721	-14.505	-0.784	(0)
CrCl+2	2.713e-17	1.216e-17	-16.567	-16.915	-0.349	(0)
CrOHC12	3.013e-19	3.013e-19	-18.521	-18.521	0.000	(0)
Cr2 (OH) 2SO4+2	1.311e-19	5.876e-20	-18.882	-19.231	-0.349	(0)
Cr2 (OH) 2 (SO4) 2	1.089e-20	1.089e-20	-19.963	-19.963	0.000	(0)
CrCl2+	4.240e-21	3.469e-21	-20.373	-20.460	-0.087	(0)
CrNO3+2	1.320e-24	5.916e-25	-23.879	-24.228	-0.349	(0)
Cr (NH3) 5OH+2	5.234e-40	2.345e-40	-39.281	-39.630	-0.349	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.682	-48.466	-0.784	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.537	-49.886	-0.349	(0)
Cr (6)	1.432e-15					
CrO4-2	1.330e-15	6.984e-16	-14.876	-15.156	-0.280	(0)
HCrO4-	6.411e-17	5.245e-17	-16.193	-16.280	-0.087	(0)
NaCrO4-	3.223e-17	2.637e-17	-16.492	-16.579	-0.087	(0)
KCrO4-	5.251e-18	4.296e-18	-17.280	-17.367	-0.087	(0)
CrO3SO4-2	2.584e-24	1.158e-24	-23.588	-23.936	-0.349	(0)
H2CrO4	9.869e-25	9.869e-25	-24.006	-24.006	0.000	(0)
CrO3Cl-	2.816e-26	2.304e-26	-25.550	-25.638	-0.087	(0)
Cr2O7-2	2.130e-31	9.544e-32	-30.672	-31.020	-0.349	(0)
Cu (1)	1.951e-09					
CuCl	9.453e-10	9.453e-10	-9.024	-9.024	0.000	(0)
CuCl2-	6.997e-10	5.940e-10	-9.155	-9.226	-0.071	(0)
Cu+	3.051e-10	2.497e-10	-9.516	-9.603	-0.087	(0)
CuCl3-2	7.147e-13	3.819e-13	-12.146	-12.418	-0.272	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.886	-147.228	-0.342	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.632	-147.958	-0.326	(0)
Cu (2)	2.407e-06					
CuCO3	2.057e-06	2.057e-06	-5.687	-5.687	0.000	(0)
Cu+2	1.150e-07	6.038e-08	-6.939	-7.219	-0.280	(0)

	CuOH+	9.753e-08	8.279e-08	-7.011	-7.082	-0.071	(0)
	Cu (CO3) 2-2	7.149e-08	3.204e-08	-7.146	-7.494	-0.349	(0)
	CuSO4	4.317e-08	4.317e-08	-7.365	-7.365	0.000	(0)
	CuHCO3+	1.334e-08	1.091e-08	-7.875	-7.962	-0.087	(0)
	Cu (OH) 2	7.163e-09	7.163e-09	-8.145	-8.145	0.000	(0)
	CuF+	6.524e-10	5.338e-10	-9.185	-9.273	-0.087	(0)
	Cu2 (OH) 2+2	3.842e-10	1.722e-10	-9.415	-9.764	-0.349	(0)
	CuCl+	3.391e-10	2.878e-10	-9.470	-9.541	-0.071	(0)
	CuNO2+	4.779e-11	3.910e-11	-10.321	-10.408	-0.087	(0)
	CuNH3+2	2.055e-11	9.208e-12	-10.687	-11.036	-0.349	(0)
	Cu (OH) 3-	7.786e-12	6.370e-12	-11.109	-11.196	-0.087	(0)
	CuCl2	3.001e-13	3.001e-13	-12.523	-12.523	0.000	(0)
	Cu (NO2) 2	2.474e-15	2.474e-15	-14.607	-14.607	0.000	(0)
	CuNO3+	1.011e-15	8.274e-16	-14.995	-15.082	-0.087	(0)
	Cu (OH) 4-2	4.851e-17	2.174e-17	-16.314	-16.663	-0.349	(0)
	CuCl3-	9.924e-18	8.424e-18	-17.003	-17.074	-0.071	(0)
	CuCl4-2	2.376e-22	1.270e-22	-21.624	-21.896	-0.272	(0)
	Cu (NO3) 2	4.513e-25	4.513e-25	-24.346	-24.346	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.659	-215.746	-0.087	(0)
F		1.883e-04					
	F-	1.646e-04	1.401e-04	-3.784	-3.853	-0.070	(0)
	MgF+	2.117e-05	1.804e-05	-4.674	-4.744	-0.070	(0)
	CaF+	1.753e-06	1.498e-06	-5.756	-5.824	-0.068	(0)
	NaF	6.718e-07	6.718e-07	-6.173	-6.173	0.000	(0)
	MnF+	7.598e-08	6.496e-08	-7.119	-7.187	-0.068	(0)
	HF	4.810e-09	4.810e-09	-8.318	-8.318	0.000	(0)
	ZnF+	3.840e-09	3.142e-09	-8.416	-8.503	-0.087	(0)
	AlF3	2.268e-09	2.268e-09	-8.644	-8.644	0.000	(0)
	BF (OH) 3-	1.613e-09	1.353e-09	-8.792	-8.869	-0.076	(0)
	AlF2+	1.500e-09	1.286e-09	-8.824	-8.891	-0.067	(0)
	CuF+	6.524e-10	5.338e-10	-9.185	-9.273	-0.087	(0)
	AlF4-	1.870e-10	1.593e-10	-9.728	-9.798	-0.070	(0)
	NiF+	1.149e-10	9.398e-11	-9.940	-10.027	-0.087	(0)
	CoF+	9.117e-11	7.460e-11	-10.040	-10.127	-0.087	(0)
	AlF+2	4.268e-11	2.305e-11	-10.370	-10.637	-0.268	(0)
	CdF+	5.991e-12	4.902e-12	-11.222	-11.310	-0.087	(0)
	HF2-	3.031e-12	2.563e-12	-11.518	-11.591	-0.073	(0)
	PbF+	2.436e-12	1.993e-12	-11.613	-11.700	-0.087	(0)
	AgF	6.082e-13	6.082e-13	-12.216	-12.216	0.000	(0)
	BF2 (OH) 2-	5.611e-13	4.705e-13	-12.251	-12.327	-0.076	(0)
	CrF+2	1.548e-13	6.936e-14	-12.810	-13.159	-0.349	(0)
	UO2F+	1.334e-13	1.091e-13	-12.875	-12.962	-0.087	(0)
	UO2F2	4.411e-14	4.411e-14	-13.355	-13.355	0.000	(0)
	PbF2	5.496e-15	5.496e-15	-14.260	-14.260	0.000	(0)
	UO2F3-	1.897e-15	1.552e-15	-14.722	-14.809	-0.087	(0)
	CdF2	1.370e-15	1.370e-15	-14.863	-14.863	0.000	(0)
	H2F2	6.200e-17	6.200e-17	-16.208	-16.208	0.000	(0)
	FeF2+	1.537e-17	1.314e-17	-16.813	-16.881	-0.068	(0)
	VO2F	8.287e-18	8.287e-18	-17.082	-17.082	0.000	(0)
	FeF+2	6.557e-18	3.503e-18	-17.183	-17.455	-0.272	(0)
	UO2F4-2	3.856e-18	1.728e-18	-17.414	-17.762	-0.349	(0)
	FeF3	2.597e-18	2.597e-18	-17.585	-17.585	0.000	(0)
	PbF3-	1.785e-18	1.461e-18	-17.748	-17.835	-0.087	(0)
	BF3OH-	7.103e-19	5.957e-19	-18.149	-18.225	-0.076	(0)
	VO2F2-	5.153e-19	4.216e-19	-18.288	-18.375	-0.087	(0)
	VOF+	1.261e-20	1.031e-20	-19.899	-19.987	-0.087	(0)
	VO2F3-2	1.644e-21	7.369e-22	-20.784	-21.133	-0.349	(0)
	VOF2	5.420e-22	5.420e-22	-21.266	-21.266	0.000	(0)
	PbF4-2	2.186e-22	9.796e-23	-21.660	-22.009	-0.349	(0)
	BF4-	1.137e-23	9.537e-24	-22.944	-23.021	-0.076	(0)
	HgF+	1.071e-23	8.760e-24	-22.970	-23.057	-0.087	(0)
	VOF3-	3.293e-24	2.694e-24	-23.482	-23.570	-0.087	(0)
	VO2F4-3	3.092e-25	5.081e-26	-24.510	-25.294	-0.784	(0)
	Sb (OH) 2F	1.320e-25	1.320e-25	-24.879	-24.879	0.000	(0)
	SbOF	1.299e-25	1.299e-25	-24.886	-24.886	0.000	(0)
	VOF4-2	3.400e-27	1.524e-27	-26.468	-26.817	-0.349	(0)
	SiF6-2	8.855e-28	4.731e-28	-27.053	-27.325	-0.272	(0)
	UF3+	2.572e-36	2.104e-36	-35.590	-35.677	-0.087	(0)

UF2+2	2.114e-37	9.476e-38	-36.675	-37.023	-0.349	(0)
UF4	3.233e-38	3.233e-38	-37.490	-37.490	0.000	(0)
UF+3	3.269e-40	0.000e+00	-39.486	-40.270	-0.784	(0)
UF5-	2.194e-40	1.795e-40	-39.659	-39.746	-0.087	(0)
UF6-2	0.000e+00	0.000e+00	-40.771	-41.119	-0.349	(0)
Fe (2)	6.340e-12					
Fe+2	4.624e-12	2.072e-12	-11.335	-11.684	-0.349	(0)
FeSO4	1.588e-12	1.588e-12	-11.799	-11.799	0.000	(0)
FeHCO3+	8.684e-14	7.473e-14	-13.061	-13.126	-0.065	(0)
FeOH+	4.184e-14	3.577e-14	-13.378	-13.446	-0.068	(0)
Fe (OH) 2	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
Fe (OH) 3-	1.976e-18	1.689e-18	-17.704	-17.772	-0.068	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.018	-159.018	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.036	-235.123	-0.087	(0)
Fe (3)	1.781e-09					
Fe (OH) 2+	1.256e-09	1.077e-09	-8.901	-8.968	-0.067	(0)
Fe (OH) 3	5.015e-10	5.015e-10	-9.300	-9.300	0.000	(0)
Fe (OH) 4-	2.362e-11	2.025e-11	-10.627	-10.694	-0.067	(0)
FeOH+2	1.195e-14	6.384e-15	-13.923	-14.195	-0.272	(0)
FeF2+	1.537e-17	1.314e-17	-16.813	-16.881	-0.068	(0)
FeF+2	6.557e-18	3.503e-18	-17.183	-17.455	-0.272	(0)
FeF3	2.597e-18	2.597e-18	-17.585	-17.585	0.000	(0)
FeSO4+	9.339e-19	7.985e-19	-18.030	-18.098	-0.068	(0)
Fe+3	9.719e-20	2.280e-20	-19.012	-19.642	-0.630	(0)
Fe (SO4) 2-	6.512e-20	5.328e-20	-19.186	-19.273	-0.087	(0)
FeCl+2	3.876e-21	2.071e-21	-20.412	-20.684	-0.272	(0)
FeCl2+	3.254e-23	2.782e-23	-22.488	-22.556	-0.068	(0)
FeHSeO3+2	7.304e-24	3.274e-24	-23.136	-23.485	-0.349	(0)
Fe2 (OH) 2+4	3.346e-26	1.350e-27	-25.476	-26.870	-1.394	(0)
FeCl3	8.368e-27	8.368e-27	-26.077	-26.077	0.000	(0)
FeNO3+2	2.205e-27	9.881e-28	-26.657	-27.005	-0.349	(0)
Fe3 (OH) 4+5	3.169e-33	2.101e-35	-32.499	-34.678	-2.179	(0)
H (0)	5.400e-29					
H2	2.700e-29	2.718e-29	-28.569	-28.566	0.003	(0)
Hg (0)	1.109e-09					
Hg	1.109e-09	1.109e-09	-8.955	-8.955	0.000	(0)
Hg (1)	5.669e-21					
Hg2+2	2.835e-21	1.270e-21	-20.547	-20.896	-0.349	(0)
Hg (2)	7.467e-12					
HgClOH	3.884e-12	3.884e-12	-11.411	-11.411	0.000	(0)
Hg (OH) 2	1.987e-12	2.001e-12	-11.702	-11.699	0.003	(0)
HgCl2	1.526e-12	1.526e-12	-11.817	-11.817	0.000	(0)
HgCl3-	5.607e-14	4.588e-14	-13.251	-13.338	-0.087	(0)
HgCO3	1.168e-14	1.168e-14	-13.933	-13.933	0.000	(0)
HgCl4-2	1.226e-15	5.493e-16	-14.912	-15.260	-0.349	(0)
Hg (CO3) 2-2	4.768e-16	2.137e-16	-15.322	-15.670	-0.349	(0)
HgCl+	1.237e-16	1.012e-16	-15.908	-15.995	-0.087	(0)
HgOH+	3.558e-17	2.911e-17	-16.449	-16.536	-0.087	(0)
HgHCO3+	6.169e-18	5.048e-18	-17.210	-17.297	-0.087	(0)
Hg (NH3) 2+2	5.273e-19	2.363e-19	-18.278	-18.626	-0.349	(0)
Hg (OH) 3-	1.335e-19	1.092e-19	-18.875	-18.962	-0.087	(0)
HgNH3+2	3.539e-20	1.586e-20	-19.451	-19.800	-0.349	(0)
Hg+2	3.764e-21	1.687e-21	-20.424	-20.773	-0.349	(0)
HgSO4	1.378e-21	1.378e-21	-20.861	-20.861	0.000	(0)
HgF+	1.071e-23	8.760e-24	-22.970	-23.057	-0.087	(0)
Hg (NH3) 3+2	3.128e-26	1.402e-26	-25.505	-25.853	-0.349	(0)
HgNO3+	3.298e-30	2.698e-30	-29.482	-29.569	-0.087	(0)
Hg (NH3) 4+2	3.703e-33	1.660e-33	-32.431	-32.780	-0.349	(0)
Hg (NO3) 2	4.860e-39	4.860e-39	-38.313	-38.313	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.408	-137.495	-0.087	(0)
HgS2-2	0.000e+00	0.000e+00	-138.220	-138.568	-0.349	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.735	-138.735	0.000	(0)
K	1.988e-03					
K+	1.945e-03	1.656e-03	-2.711	-2.781	-0.070	(0)
KSO4-	4.267e-05	3.658e-05	-4.370	-4.437	-0.067	(0)
KCrO4-	5.251e-18	4.296e-18	-17.280	-17.367	-0.087	(0)
Mg	2.903e-03					
Mg+2	2.185e-03	1.147e-03	-2.660	-2.940	-0.280	(0)

MgSO4	6.515e-04	6.515e-04	-3.186	-3.186	0.000	(0)
MgHCO3+	3.962e-05	3.363e-05	-4.402	-4.473	-0.071	(0)
MgF+	2.117e-05	1.804e-05	-4.674	-4.744	-0.070	(0)
MgCO3	5.521e-06	5.521e-06	-5.258	-5.258	0.000	(0)
MgOH+	2.294e-07	1.980e-07	-6.639	-6.703	-0.064	(0)
MgH2BO3+	2.871e-08	2.408e-08	-7.542	-7.618	-0.076	(0)
Mn (2)	3.337e-05					
Mn+2	2.599e-05	1.165e-05	-4.585	-4.934	-0.349	(0)
MnSO4	6.463e-06	6.463e-06	-5.190	-5.190	0.000	(0)
MnHCO3+	7.785e-07	6.656e-07	-6.109	-6.177	-0.068	(0)
MnF+	7.598e-08	6.496e-08	-7.119	-7.187	-0.068	(0)
MnCl+	5.157e-08	4.409e-08	-7.288	-7.356	-0.068	(0)
MnOH+	1.484e-08	1.268e-08	-7.829	-7.897	-0.068	(0)
MnCl2	1.873e-10	1.873e-10	-9.727	-9.727	0.000	(0)
MnCl3-	1.815e-13	1.552e-13	-12.741	-12.809	-0.068	(0)
MnNO3+	9.775e-14	7.998e-14	-13.010	-13.097	-0.087	(0)
MnSeO4	9.397e-14	9.397e-14	-13.027	-13.027	0.000	(0)
Mn (OH) 3-	1.724e-17	1.474e-17	-16.764	-16.832	-0.068	(0)
Mn (NO3) 2	8.705e-22	8.705e-22	-21.060	-21.060	0.000	(0)
Mn (OH) 4-2	3.861e-23	2.063e-23	-22.413	-22.685	-0.272	(0)
MnSe	0.000e+00	0.000e+00	-41.336	-41.336	0.000	(0)
Mn (3)	2.626e-25					
Mn+3	2.626e-25	6.162e-26	-24.581	-25.210	-0.630	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.716	-41.988	-0.272	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.212	-46.286	-0.075	(0)
Mo	9.853e-07					
MoO4-2	9.850e-07	5.171e-07	-6.007	-6.286	-0.280	(0)
HMoO4-	2.919e-10	2.388e-10	-9.535	-9.622	-0.087	(0)
H2MoO4	4.061e-14	4.061e-14	-13.391	-13.391	0.000	(0)
Ag2MoO4	5.844e-25	5.844e-25	-24.233	-24.233	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.531	-42.315	-0.784	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.951	-52.088	-3.137	(0)
HMo7O24-5	0.000e+00	0.000e+00	-51.157	-53.336	-2.179	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-54.794	-56.188	-1.394	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-59.792	-60.576	-0.784	(0)
N (-3)	7.620e-07					
NH4+	7.234e-07	6.066e-07	-6.141	-6.217	-0.076	(0)
NH4SO4-	2.373e-08	2.029e-08	-7.625	-7.693	-0.068	(0)
NH3	1.490e-08	1.490e-08	-7.827	-7.827	0.000	(0)
CaNH3+2	4.101e-11	1.838e-11	-10.387	-10.736	-0.349	(0)
CuNH3+2	2.055e-11	9.208e-12	-10.687	-11.036	-0.349	(0)
NiNH3+2	4.768e-13	2.137e-13	-12.322	-12.670	-0.349	(0)
Co (NH3) +2	6.730e-14	3.016e-14	-13.172	-13.521	-0.349	(0)
AgNH3+	6.426e-14	5.257e-14	-13.192	-13.279	-0.087	(0)
BaNH3+2	4.315e-16	1.934e-16	-15.365	-15.714	-0.349	(0)
Ag (NH3) 2+	7.783e-18	6.368e-18	-17.109	-17.196	-0.087	(0)
Ni (NH3) 2+2	1.027e-18	4.603e-19	-17.988	-18.337	-0.349	(0)
Hg (NH3) 2+2	5.273e-19	2.363e-19	-18.278	-18.626	-0.349	(0)
Ca (NH3) 2+2	2.433e-19	1.090e-19	-18.614	-18.962	-0.349	(0)
Co (NH3) 2+2	4.278e-20	1.917e-20	-19.369	-19.717	-0.349	(0)
HgNH3+2	3.539e-20	1.586e-20	-19.451	-19.800	-0.349	(0)
Hg (NH3) 3+2	3.128e-26	1.402e-26	-25.505	-25.853	-0.349	(0)
Co (NH3) 3+2	8.027e-27	3.597e-27	-26.095	-26.444	-0.349	(0)
Hg (NH3) 4+2	3.703e-33	1.660e-33	-32.431	-32.780	-0.349	(0)
Co (NH3) 4+2	6.277e-34	2.813e-34	-33.202	-33.551	-0.349	(0)
Cr (NH3) 5OH+2	5.234e-40	2.345e-40	-39.281	-39.630	-0.349	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-40.809	-41.158	-0.349	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.682	-48.466	-0.784	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.146	-48.494	-0.349	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.537	-49.886	-0.349	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.008	-58.095	-0.087	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.329	-62.677	-0.349	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.688	-63.036	-0.349	(0)
N (3)	7.343e-06					
NO2-	7.343e-06	6.184e-06	-5.134	-5.209	-0.075	(0)
CuNO2+	4.779e-11	3.910e-11	-10.321	-10.408	-0.087	(0)

AgNO2	2.233e-12	2.233e-12	-11.651	-11.651	0.000	(0)
CoNO2+	8.967e-13	7.337e-13	-12.047	-12.134	-0.087	(0)
Cu (NO2) 2	2.474e-15	2.474e-15	-14.607	-14.607	0.000	(0)
Ag (NO2) 2-	2.614e-17	2.138e-17	-16.583	-16.670	-0.087	(0)
N (5)	5.107e-09					
NO3-	5.090e-09	4.333e-09	-8.293	-8.363	-0.070	(0)
CaNO3+	1.641e-11	1.343e-11	-10.785	-10.872	-0.087	(0)
MnNO3+	9.775e-14	7.998e-14	-13.010	-13.097	-0.087	(0)
ZnNO3+	1.495e-14	1.223e-14	-13.825	-13.912	-0.087	(0)
CuNO3+	1.011e-15	8.274e-16	-14.995	-15.082	-0.087	(0)
BaNO3+	5.459e-16	4.467e-16	-15.263	-15.350	-0.087	(0)
NiNO3+	3.552e-16	2.906e-16	-15.450	-15.537	-0.087	(0)
CoNO3+	1.413e-16	1.156e-16	-15.850	-15.937	-0.087	(0)
CdNO3+	3.697e-17	3.025e-17	-16.432	-16.519	-0.087	(0)
PbNO3+	1.581e-17	1.294e-17	-16.801	-16.888	-0.087	(0)
AgNO3	5.947e-18	5.947e-18	-17.226	-17.226	0.000	(0)
Mn (NO3) 2	8.705e-22	8.705e-22	-21.060	-21.060	0.000	(0)
UO2NO3+	5.963e-23	4.879e-23	-22.225	-22.312	-0.087	(0)
Zn (NO3) 2	1.058e-23	1.058e-23	-22.976	-22.976	0.000	(0)
CrNO3+2	1.320e-24	5.916e-25	-23.879	-24.228	-0.349	(0)
Co (NO3) 2	1.019e-24	1.019e-24	-23.992	-23.992	0.000	(0)
Cu (NO3) 2	4.513e-25	4.513e-25	-24.346	-24.346	0.000	(0)
Pb (NO3) 2	9.520e-26	9.520e-26	-25.021	-25.021	0.000	(0)
VO2NO3	7.391e-26	7.391e-26	-25.131	-25.131	0.000	(0)
Cd (NO3) 2	6.569e-26	6.569e-26	-25.183	-25.183	0.000	(0)
FeNO3+2	2.205e-27	9.881e-28	-26.657	-27.005	-0.349	(0)
HgNO3+	3.298e-30	2.698e-30	-29.482	-29.569	-0.087	(0)
Hg (NO3) 2	4.860e-39	4.860e-39	-38.313	-38.313	0.000	(0)
Na	9.089e-03					
Na+	8.927e-03	7.599e-03	-2.049	-2.119	-0.070	(0)
NaSO4-	1.486e-04	1.274e-04	-3.828	-3.895	-0.067	(0)
NaHCO3	1.224e-05	1.224e-05	-4.912	-4.912	0.000	(0)
NaCO3-	9.550e-07	8.187e-07	-6.020	-6.087	-0.067	(0)
NaF	6.718e-07	6.718e-07	-6.173	-6.173	0.000	(0)
NaH2BO3	7.290e-09	7.290e-09	-8.137	-8.137	0.000	(0)
NaCrO4-	3.223e-17	2.637e-17	-16.492	-16.579	-0.087	(0)
Ni	8.533e-08					
Ni+2	5.086e-08	2.670e-08	-7.294	-7.573	-0.280	(0)
NiSO4	1.663e-08	1.663e-08	-7.779	-7.779	0.000	(0)
NiHCO3+	1.152e-08	9.430e-09	-7.938	-8.026	-0.087	(0)
NiCO3	5.764e-09	5.764e-09	-8.239	-8.239	0.000	(0)
NiCl+	2.511e-10	2.055e-10	-9.600	-9.687	-0.087	(0)
NiOH+	1.781e-10	1.458e-10	-9.749	-9.836	-0.087	(0)
NiF+	1.149e-10	9.398e-11	-9.940	-10.027	-0.087	(0)
Ni (OH) 2	5.020e-12	5.020e-12	-11.299	-11.299	0.000	(0)
Ni (SO4) 2-2	3.834e-12	1.718e-12	-11.416	-11.765	-0.349	(0)
NiNH3+2	4.768e-13	2.137e-13	-12.322	-12.670	-0.349	(0)
NiCl2	3.111e-15	3.111e-15	-14.507	-14.507	0.000	(0)
Ni (OH) 3-	2.660e-15	2.177e-15	-14.575	-14.662	-0.087	(0)
NiSeO4	3.744e-16	3.744e-16	-15.427	-15.427	0.000	(0)
NiNO3+	3.552e-16	2.906e-16	-15.450	-15.537	-0.087	(0)
Ni (NH3) 2+2	1.027e-18	4.603e-19	-17.988	-18.337	-0.349	(0)
O (0)	1.362e-35					
O2	6.808e-36	6.854e-36	-35.167	-35.164	0.003	(0)
Pb	5.174e-09					
PbCO3	3.511e-09	3.511e-09	-8.455	-8.455	0.000	(0)
PbHCO3+	5.251e-10	4.296e-10	-9.280	-9.367	-0.087	(0)
Pb+2	3.845e-10	2.019e-10	-9.415	-9.695	-0.280	(0)
PbSO4	3.085e-10	3.085e-10	-9.511	-9.511	0.000	(0)
PbOH+	2.687e-10	2.199e-10	-9.571	-9.658	-0.087	(0)
Pb (CO3) 2-2	1.307e-10	5.859e-11	-9.884	-10.232	-0.349	(0)
PbCl+	2.633e-11	2.154e-11	-10.580	-10.667	-0.087	(0)
Pb (SO4) 2-2	1.295e-11	5.802e-12	-10.888	-11.236	-0.349	(0)
Pb (OH) 2	3.015e-12	3.015e-12	-11.521	-11.521	0.000	(0)
PbF+	2.436e-12	1.993e-12	-11.613	-11.700	-0.087	(0)
PbCl2	2.894e-13	2.894e-13	-12.539	-12.539	0.000	(0)
PbF2	5.496e-15	5.496e-15	-14.260	-14.260	0.000	(0)
Pb (OH) 3-	1.598e-15	1.307e-15	-14.797	-14.884	-0.087	(0)

PbCl3-	4.234e-16	3.465e-16	-15.373	-15.460	-0.087	(0)
PbNO3+	1.581e-17	1.294e-17	-16.801	-16.888	-0.087	(0)
Pb2OH+3	4.280e-18	7.034e-19	-17.369	-18.153	-0.784	(0)
PbF3-	1.785e-18	1.461e-18	-17.748	-17.835	-0.087	(0)
PbCl4-2	1.063e-18	4.763e-19	-17.974	-18.322	-0.349	(0)
Pb(OH) 4-2	3.097e-19	1.388e-19	-18.509	-18.858	-0.349	(0)
PbF4-2	2.186e-22	9.796e-23	-21.660	-22.009	-0.349	(0)
Pb3(OH) 4+2	8.167e-23	3.660e-23	-22.088	-22.437	-0.349	(0)
Pb(NO3) 2	9.520e-26	9.520e-26	-25.021	-25.021	0.000	(0)
Pb4(OH) 4+4	1.455e-27	5.869e-29	-26.837	-28.231	-1.394	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.709	-150.709	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.464	-227.551	-0.087	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.055	-78.142	-0.087	(0)
CdHS+	0.000e+00	0.000e+00	-78.703	-78.790	-0.087	(0)
H2S	0.000e+00	0.000e+00	-78.756	-78.756	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.524	-79.873	-0.349	(0)
S6-2	0.000e+00	0.000e+00	-80.040	-80.389	-0.349	(0)
S4-2	0.000e+00	0.000e+00	-80.120	-80.469	-0.349	(0)
S3-2	0.000e+00	0.000e+00	-80.926	-81.274	-0.349	(0)
S2-2	0.000e+00	0.000e+00	-81.942	-82.291	-0.349	(0)
S-2	0.000e+00	0.000e+00	-87.536	-87.808	-0.272	(0)
HgHS2-	0.000e+00	0.000e+00	-137.408	-137.495	-0.087	(0)
HgS2-2	0.000e+00	0.000e+00	-138.220	-138.568	-0.349	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.735	-138.735	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-146.792	-146.981	-0.189	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.886	-147.228	-0.342	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.045	-147.132	-0.087	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.632	-147.958	-0.326	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.702	-147.789	-0.087	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-148.436	-148.787	-0.351	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.764	-149.098	-0.334	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.413	-149.413	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-149.728	-149.728	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.709	-150.709	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.018	-159.018	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.659	-215.746	-0.087	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.188	-224.275	-0.087	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-225.883	-225.970	-0.087	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.273	-226.621	-0.349	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.464	-227.551	-0.087	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.036	-235.123	-0.087	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-301.568	-301.916	-0.349	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.529	-303.878	-0.349	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.269	-317.618	-0.349	(0)
S(6)	7.495e-03					
SO4-2	5.944e-03	3.121e-03	-2.226	-2.506	-0.280	(0)
CaSO4	7.005e-04	7.005e-04	-3.155	-3.155	0.000	(0)
MgSO4	6.515e-04	6.515e-04	-3.186	-3.186	0.000	(0)
NaSO4-	1.486e-04	1.274e-04	-3.828	-3.895	-0.067	(0)
KSO4-	4.267e-05	3.658e-05	-4.370	-4.437	-0.067	(0)
MnSO4	6.463e-06	6.463e-06	-5.190	-5.190	0.000	(0)
ZnSO4	7.674e-07	7.674e-07	-6.115	-6.115	0.000	(0)
Zn(SO4) 2-2	4.654e-08	2.086e-08	-7.332	-7.681	-0.349	(0)
CuSO4	4.317e-08	4.317e-08	-7.365	-7.365	0.000	(0)
NH4SO4-	2.373e-08	2.029e-08	-7.625	-7.693	-0.068	(0)
NiSO4	1.663e-08	1.663e-08	-7.779	-7.779	0.000	(0)
CoSO4	1.048e-08	1.048e-08	-7.980	-7.980	0.000	(0)
HSO4-	8.309e-09	7.079e-09	-8.080	-8.150	-0.070	(0)
CdSO4	1.615e-09	1.615e-09	-8.792	-8.792	0.000	(0)
PbSO4	3.085e-10	3.085e-10	-9.511	-9.511	0.000	(0)
Cd(SO4) 2-2	1.517e-10	6.799e-11	-9.819	-10.168	-0.349	(0)
AgSO4-	1.315e-10	1.076e-10	-9.881	-9.968	-0.087	(0)
CrOHSO4	2.194e-11	2.194e-11	-10.659	-10.659	0.000	(0)
Pb(SO4) 2-2	1.295e-11	5.802e-12	-10.888	-11.236	-0.349	(0)
Ni(SO4) 2-2	3.834e-12	1.718e-12	-11.416	-11.765	-0.349	(0)
FeSO4	1.588e-12	1.588e-12	-11.799	-11.799	0.000	(0)

AlSO4+	4.678e-13	3.985e-13	-12.330	-12.400	-0.070	(0)
CrSO4+	2.782e-14	2.276e-14	-13.556	-13.643	-0.087	(0)
UO2SO4	2.665e-14	2.665e-14	-13.574	-13.574	0.000	(0)
Al (SO4) 2-	1.564e-14	1.333e-14	-13.806	-13.875	-0.070	(0)
UO2 (SO4) 2-2	2.447e-15	1.097e-15	-14.611	-14.960	-0.349	(0)
VO2SO4-	3.071e-18	2.513e-18	-17.513	-17.600	-0.087	(0)
FeSO4+	9.339e-19	7.985e-19	-18.030	-18.098	-0.068	(0)
Cr2 (OH) 2SO4+2	1.311e-19	5.876e-20	-18.882	-19.231	-0.349	(0)
Fe (SO4) 2-	6.512e-20	5.328e-20	-19.186	-19.273	-0.087	(0)
Cr2 (OH) 2 (SO4) 2	1.089e-20	1.089e-20	-19.963	-19.963	0.000	(0)
VOSO4	1.055e-20	1.055e-20	-19.977	-19.977	0.000	(0)
HgSO4	1.378e-21	1.378e-21	-20.861	-20.861	0.000	(0)
CrO3SO4-2	2.584e-24	1.158e-24	-23.588	-23.936	-0.349	(0)
VSO4+	4.994e-35	4.086e-35	-34.302	-34.389	-0.087	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.228	-40.228	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.274	-41.622	-0.349	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.008	-58.095	-0.087	(0)
Sb (3)	5.135e-20					
Sb (OH) 3	2.598e-20	2.598e-20	-19.585	-19.585	0.000	(0)
HSbO2	2.537e-20	2.537e-20	-19.596	-19.596	0.000	(0)
SbO2-	2.164e-24	1.770e-24	-23.665	-23.752	-0.087	(0)
Sb (OH) 4-	1.239e-24	1.013e-24	-23.907	-23.994	-0.087	(0)
Sb (OH) 2F	1.320e-25	1.320e-25	-24.879	-24.879	0.000	(0)
SbOF	1.299e-25	1.299e-25	-24.886	-24.886	0.000	(0)
Sb (OH) 2+	1.790e-26	1.465e-26	-25.747	-25.834	-0.087	(0)
SbO+	6.176e-27	5.053e-27	-26.209	-26.296	-0.087	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.269	-317.618	-0.349	(0)
Sb (5)	1.493e-08					
SbO3-	1.492e-08	1.221e-08	-7.826	-7.913	-0.087	(0)
Sb (OH) 6-	1.675e-11	1.426e-11	-10.776	-10.846	-0.070	(0)
SbO2+	2.306e-24	1.887e-24	-23.637	-23.724	-0.087	(0)
Se (-2)	2.338e-14					
Ag2Se	2.338e-14	2.338e-14	-13.631	-13.631	0.000	(0)
HSe-	2.727e-39	2.231e-39	-38.564	-38.651	-0.087	(0)
MnSe	0.000e+00	0.000e+00	-41.336	-41.336	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.396	-42.396	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.669	-46.017	-0.349	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.277	-83.672	-1.394	(0)
Se (4)	8.719e-08					
HSeO3-	6.640e-08	5.433e-08	-7.178	-7.265	-0.087	(0)
SeO3-2	2.079e-08	9.318e-09	-7.682	-8.031	-0.349	(0)
H2SeO3	5.379e-13	5.379e-13	-12.269	-12.269	0.000	(0)
AgSeO3-	1.265e-14	1.035e-14	-13.898	-13.985	-0.087	(0)
Cd (SeO3) 2-2	3.525e-19	1.580e-19	-18.453	-18.801	-0.349	(0)
Ag (SeO3) 2-3	5.254e-21	8.633e-22	-20.280	-21.064	-0.784	(0)
FeHSeO3+2	7.304e-24	3.274e-24	-23.136	-23.485	-0.349	(0)
Se (6)	5.720e-11					
SeO4-2	5.710e-11	2.998e-11	-10.243	-10.523	-0.280	(0)
MnSeO4	9.397e-14	9.397e-14	-13.027	-13.027	0.000	(0)
ZnSeO4	5.219e-15	5.219e-15	-14.282	-14.282	0.000	(0)
NiSeO4	3.744e-16	3.744e-16	-15.427	-15.427	0.000	(0)
CoSeO4	2.530e-16	2.530e-16	-15.597	-15.597	0.000	(0)
HSeO4-	4.262e-17	3.488e-17	-16.370	-16.457	-0.087	(0)
CdSeO4	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
Zn (SeO4) 2-2	3.540e-25	1.586e-25	-24.451	-24.800	-0.349	(0)
Si	1.421e-04					
H4SiO4	1.411e-04	1.420e-04	-3.851	-3.848	0.003	(0)
H3SiO4-	1.042e-06	8.844e-07	-5.982	-6.053	-0.071	(0)
H2SiO4-2	4.451e-12	2.404e-12	-11.352	-11.619	-0.268	(0)
UO2H3SiO4+	5.179e-13	4.237e-13	-12.286	-12.373	-0.087	(0)
SiF6-2	8.855e-28	4.731e-28	-27.053	-27.325	-0.272	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.802	-59.586	-0.784	(0)
U (4)	2.640e-21					
U (OH) 5-	2.638e-21	2.158e-21	-20.579	-20.666	-0.087	(0)
U (OH) 4	2.099e-24	2.099e-24	-23.678	-23.678	0.000	(0)
U (OH) 3+	2.178e-28	1.782e-28	-27.662	-27.749	-0.087	(0)
U (OH) 2+2	4.269e-33	1.913e-33	-32.370	-32.718	-0.349	(0)

UF3+	2.572e-36	2.104e-36	-35.590	-35.677	-0.087	(0)
UF2+2	2.114e-37	9.476e-38	-36.675	-37.023	-0.349	(0)
UF4	3.233e-38	3.233e-38	-37.490	-37.490	0.000	(0)
UOH+3	1.273e-38	2.093e-39	-37.895	-38.679	-0.784	(0)
UF+3	3.269e-40	0.000e+00	-39.486	-40.270	-0.784	(0)
UF5-	2.194e-40	1.795e-40	-39.659	-39.746	-0.087	(0)
U(SO4)2	0.000e+00	0.000e+00	-40.228	-40.228	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.771	-41.119	-0.349	(0)
USO4+2	0.000e+00	0.000e+00	-41.274	-41.622	-0.349	(0)
U+4	0.000e+00	0.000e+00	-44.322	-45.716	-1.394	(0)
UC1+3	0.000e+00	0.000e+00	-45.754	-46.538	-0.784	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-169.883	-176.942	-7.059	(0)
U(5)	3.549e-17					
UO2+	3.549e-17	2.904e-17	-16.450	-16.537	-0.087	(0)
U(6)	1.415e-07					
UO2(CO3)3-4	1.079e-07	4.352e-09	-6.967	-8.361	-1.394	(0)
UO2(CO3)2-2	3.348e-08	1.501e-08	-7.475	-7.824	-0.349	(0)
UO2CO3	1.300e-10	1.300e-10	-9.886	-9.886	0.000	(0)
UO2H3SiO4+	5.179e-13	4.237e-13	-12.286	-12.373	-0.087	(0)
UO2OH+	3.765e-13	3.080e-13	-12.424	-12.511	-0.087	(0)
UO2F+	1.334e-13	1.091e-13	-12.875	-12.962	-0.087	(0)
UO2F2	4.411e-14	4.411e-14	-13.355	-13.355	0.000	(0)
UO2SO4	2.665e-14	2.665e-14	-13.574	-13.574	0.000	(0)
UO2+2	1.075e-14	5.643e-15	-13.969	-14.248	-0.280	(0)
UO2(SO4)2-2	2.447e-15	1.097e-15	-14.611	-14.960	-0.349	(0)
UO2F3-	1.897e-15	1.552e-15	-14.722	-14.809	-0.087	(0)
UO2Cl+	3.364e-17	2.752e-17	-16.473	-16.560	-0.087	(0)
UO2F4-2	3.856e-18	1.728e-18	-17.414	-17.762	-0.349	(0)
(UO2)2(OH)2+2	3.514e-19	1.575e-19	-18.454	-18.803	-0.349	(0)
(UO2)3(OH)5+	8.455e-21	6.918e-21	-20.073	-20.160	-0.087	(0)
UO2NO3+	5.963e-23	4.879e-23	-22.225	-22.312	-0.087	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.706	-42.793	-0.087	(0)
V+2	0.000e+00	0.000e+00	-43.592	-43.941	-0.349	(0)
V(3)	1.824e-15					
V(OH)3	1.824e-15	1.824e-15	-14.739	-14.739	0.000	(0)
V(OH)2+	3.344e-26	2.736e-26	-25.476	-25.563	-0.087	(0)
VOH+2	1.345e-29	6.027e-30	-28.871	-29.220	-0.349	(0)
V+3	1.688e-34	2.773e-35	-33.773	-34.557	-0.784	(0)
VSO4+	4.994e-35	4.086e-35	-34.302	-34.389	-0.087	(0)
V2(OH)3+3	0.000e+00	0.000e+00	-55.547	-56.331	-0.784	(0)
V2(OH)2+4	0.000e+00	0.000e+00	-56.246	-57.640	-1.394	(0)
V(4)	1.348e-18					
V(OH)3+	1.297e-18	1.061e-18	-17.887	-17.974	-0.087	(0)
VO+2	2.739e-20	1.227e-20	-19.562	-19.911	-0.349	(0)
VOF+	1.261e-20	1.031e-20	-19.899	-19.987	-0.087	(0)
VOSO4	1.055e-20	1.055e-20	-19.977	-19.977	0.000	(0)
VOF2	5.420e-22	5.420e-22	-21.266	-21.266	0.000	(0)
VOC1+	1.266e-22	1.036e-22	-21.898	-21.985	-0.087	(0)
VOF3-	3.293e-24	2.694e-24	-23.482	-23.570	-0.087	(0)
VOF4-2	3.400e-27	1.524e-27	-26.468	-26.817	-0.349	(0)
H2V2O4+2	1.261e-31	5.651e-32	-30.899	-31.248	-0.349	(0)
V(5)	4.588e-09					
H2VO4-	3.830e-09	3.134e-09	-8.417	-8.504	-0.087	(0)
HVO4-2	7.568e-10	3.392e-10	-9.121	-9.470	-0.349	(0)
H3VO4	7.274e-13	7.274e-13	-12.138	-12.138	0.000	(0)
H3V2O7-	1.800e-14	1.473e-14	-13.745	-13.832	-0.087	(0)
HV2O7-3	2.193e-15	3.603e-16	-14.659	-15.443	-0.784	(0)
VO4-3	4.457e-16	7.323e-17	-15.351	-16.135	-0.784	(0)
VO2+	3.962e-17	3.372e-17	-16.402	-16.472	-0.070	(0)
V2O7-4	1.036e-17	4.179e-19	-16.985	-18.379	-1.394	(0)
VO2F	8.287e-18	8.287e-18	-17.082	-17.082	0.000	(0)
VO2SO4-	3.071e-18	2.513e-18	-17.513	-17.600	-0.087	(0)
VO2F2-	5.153e-19	4.216e-19	-18.288	-18.375	-0.087	(0)
V3O9-3	1.964e-19	3.228e-20	-18.707	-19.491	-0.784	(0)
VO2F3-2	1.644e-21	7.369e-22	-20.784	-21.133	-0.349	(0)
V4O12-4	1.046e-24	4.219e-26	-23.980	-25.375	-1.394	(0)
VO2F4-3	3.092e-25	5.081e-26	-24.510	-25.294	-0.784	(0)

VO2NO3	7.391e-26	7.391e-26	-25.131	-25.131	0.000	(0)
V10028-6	0.000e+00	0.000e+00	-63.531	-66.668	-3.137	(0)
HV10028-5	0.000e+00	0.000e+00	-63.937	-66.116	-2.179	(0)
H2V10028-4	0.000e+00	0.000e+00	-67.148	-68.542	-1.394	(0)
Zn	3.535e-06					
Zn+2	2.141e-06	1.124e-06	-5.669	-5.949	-0.280	(0)
ZnSO4	7.674e-07	7.674e-07	-6.115	-6.115	0.000	(0)
ZnCO3	3.742e-07	3.742e-07	-6.427	-6.427	0.000	(0)
ZnHCO3+	1.244e-07	1.018e-07	-6.905	-6.992	-0.087	(0)
ZnOH+	5.956e-08	4.873e-08	-7.225	-7.312	-0.087	(0)
Zn(SO4) 2-2	4.654e-08	2.086e-08	-7.332	-7.681	-0.349	(0)
ZnCl+	1.000e-08	8.490e-09	-8.000	-8.071	-0.071	(0)
ZnOHCl	4.820e-09	4.820e-09	-8.317	-8.317	0.000	(0)
ZnF+	3.840e-09	3.142e-09	-8.416	-8.503	-0.087	(0)
Zn(OH) 2	3.349e-09	3.349e-09	-8.475	-8.475	0.000	(0)
ZnCl2	4.047e-11	4.047e-11	-10.393	-10.393	0.000	(0)
Zn(OH) 3-	8.895e-12	7.278e-12	-11.051	-11.138	-0.087	(0)
ZnCl3-	1.139e-13	9.668e-14	-12.943	-13.015	-0.071	(0)
ZnNO3+	1.495e-14	1.223e-14	-13.825	-13.912	-0.087	(0)
ZnSeO4	5.219e-15	5.219e-15	-14.282	-14.282	0.000	(0)
Zn(OH) 4-2	2.803e-16	1.256e-16	-15.552	-15.901	-0.349	(0)
ZnCl4-2	2.721e-16	1.454e-16	-15.565	-15.837	-0.272	(0)
Zn(NO3) 2	1.058e-23	1.058e-23	-22.976	-22.976	0.000	(0)
Zn(SeO4) 2-2	3.540e-25	1.586e-25	-24.451	-24.800	-0.349	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.702	-147.789	-0.087	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.413	-149.413	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.188	-224.275	-0.087	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.273	-226.621	-0.349	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.529	-303.878	-0.349	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-53.55	-47.26	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-40.09	-35.58	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-47.31	-35.58	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.62	-51.69	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-54.19	-34.16	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-27.99	-27.59	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.41	-22.96	0.45	(NH4)2SeO4
Acanthite	-51.81	-88.03	-36.22	Ag2S
Ag2CO3	-11.67	-22.76	-11.09	Ag2CO3
Ag2CrO4	-21.09	-32.68	-11.59	Ag2CrO4
Ag2HVO4	-12.57	-11.09	1.48	Ag2HVO4
Ag2MoO4	-12.26	-23.81	-11.55	Ag2MoO4
Ag2O	-14.83	-2.26	12.57	Ag2O
Ag2Se	0.16	-48.54	-48.70	Ag2Se
Ag2SeO3	-10.01	-17.16	-7.15	Ag2SeO3
Ag2SeO4	-19.14	-28.05	-8.91	Ag2SeO4
Ag2SO4	-15.21	-20.03	-4.82	Ag2SO4
Ag3AsO3	-27.84	-25.68	2.16	Ag3AsO3
Ag3AsO4	-16.37	-19.16	-2.79	Ag3AsO4
Ag3H2VO5	-17.40	-12.22	5.18	Ag3H2VO5
AgF:4H2O	-13.67	-12.62	1.05	AgF:4H2O
Agmetal	-0.33	-13.84	-13.51	Ag
AgVO3	-10.74	-9.97	0.77	AgVO3
Al(OH)3(am)	-1.68	9.12	10.80	Al(OH)3
Al2(MoO4)3	-48.79	-46.43	2.37	Al2(MoO4)3
Al2O3	-1.41	18.24	19.65	Al2O3
Al4(OH)10SO4	-4.00	18.70	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.46	-6.66	4.80	AlAsO4:2H2O
AlOHSO4	-5.43	-8.66	-3.23	AlOHSO4
AlSb	-152.34	-86.71	65.62	AlSb
Alunite	-1.94	-3.34	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.41	-12.20	-7.79	PbSO4
Anhydrite	-1.15	-5.51	-4.36	CaSO4
Anilite	-54.84	-86.72	-31.88	Cu0.25Cu1.5S

Antlerite	-2.41	6.37	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	0.05	-8.25	-8.30	CaCO ₃
Arsenolite	-86.41	-89.17	-2.76	As ₄ O ₆
Artinite	-5.45	4.15	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-38.26	-31.55	6.71	As ₂ O ₅
Atacamite	-1.45	5.94	7.39	Cu ₂ (OH) ₃ Cl
Azurite	0.04	-16.86	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.81	7.58	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-18.39	-2.51	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	0.10	-8.81	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-27.87	5.07	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.17	-22.84	-9.67	BaCrO ₄
BaF ₂	-9.57	-15.39	-5.82	BaF ₂
BaMoO ₄	-7.01	-13.97	-6.96	BaMoO ₄
Barite	-0.21	-10.19	-9.98	BaSO ₄
BaS	-94.37	-78.19	16.18	BaS
BaSeO ₃	-9.15	-7.32	1.83	BaSeO ₃
BaSeO ₄	-10.75	-18.21	-7.46	BaSeO ₄
Bianchite	-6.69	-8.46	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.69	10.40	18.09	MnO ₂
Bixbyite	-3.97	-4.62	-0.64	Mn ₂ O ₃
BlaubleiI	-54.76	-78.93	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.24	-82.52	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.54	9.12	8.58	AlOOH
Breithauptite	-56.91	-75.43	-18.52	NiSb
Brochantite	-0.80	14.42	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.52	12.33	16.84	Mg(OH) ₂
Bunsenite	-4.75	7.69	12.45	NiO
Ca(VO ₃) ₂	-11.08	-5.42	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.66	6.84	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.71	6.84	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-17.07	5.23	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-19.86	19.10	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-20.76	19.10	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-297.86	-154.88	142.97	Ca ₃ Sb ₂
CaCrO ₄	-15.90	-18.16	-2.27	CaCrO ₄
Calcite	0.23	-8.25	-8.48	CaCO ₃
Calomel	-8.03	-25.94	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.35	-9.30	-7.95	CaMoO ₄
Carnotite	-3.19	-2.96	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.45	-2.64	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-10.51	-13.53	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.46	-2.62	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.03	6.61	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.12	6.61	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.42	-15.71	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.50	2.06	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-19.73	8.67	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.04	-13.70	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.01	-13.70	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.79	-13.70	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.15	-16.36	-1.21	CdF ₂
Cdmetal(alpha)	-32.32	-18.80	13.51	Cd
Cdmetal(gamma)	-32.42	-18.80	13.62	Cd
CdMoO ₄	-0.79	-14.94	-14.15	CdMoO ₄
CdOHCl	-7.08	-3.54	3.54	CdOHCl
CdSb	-76.16	-76.51	-0.35	CdSb
CdSe	-19.47	-39.67	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-17.33	-19.18	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.99	-11.16	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.44	-11.16	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.29	-11.16	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.80	-14.93	-13.13	PbCO ₃
CH ₄ (g)	-81.12	-122.17	-41.05	CH ₄
Chalcanthite	-7.09	-9.73	-2.64	CuSO ₄ :5H ₂ O
Chalcedony	-0.30	-3.85	-3.55	SiO ₂
Chalcocite	-54.79	-89.71	-34.92	Cu ₂ S

Chalcopyrite	-124.65	-159.92	-35.27	CuFeS2
Chrysotile	-2.91	29.29	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-51.78	-97.47	-45.69	HgS
Claudetite	-86.11	-89.17	-3.06	As4O6
Clausthalite	-13.61	-40.71	-27.10	PbSe
Co (BO2) 2	-28.81	-1.74	27.07	Co (BO2) 2
Co (OH) 2	-5.60	7.49	13.09	Co (OH) 2
Co (OH) 3	-9.89	-12.20	-2.31	Co (OH) 3
CO2 (g)	-2.36	-20.51	-18.15	CO2
Co3 (AsO4) 2	-22.10	-9.07	13.03	Co3 (AsO4) 2
Co3O4	-6.41	-16.90	-10.50	Co3O4
CoCl2	-21.08	-12.82	8.27	CoCl2
CoCl2:6H2O	-15.36	-12.82	2.54	CoCl2:6H2O
CoCO3	-3.03	-13.01	-9.98	CoCO3
CoF2	-13.88	-15.48	-1.60	CoF2
CoF3	-45.20	-46.66	-1.46	CoF3
CoFe2O4	17.54	14.02	-3.53	CoFe2O4
CoMoO4	-6.30	-14.06	-7.76	CoMoO4
CoO	-6.09	7.49	13.59	CoO
CoS (alpha)	-70.84	-78.28	-7.44	CoS
CoS (beta)	-67.21	-78.28	-11.07	CoS
CoSe	-22.59	-38.79	-16.20	CoSe
CoSeO3	-8.72	-7.40	1.32	CoSeO3
CoSeO4:6H2O	-16.77	-18.30	-1.53	CoSeO4:6H2O
CoSO4	-13.08	-10.28	2.80	CoSO4
CoSO4:6H2O	-7.81	-10.28	-2.47	CoSO4:6H2O
Cotunnite	-9.96	-14.74	-4.78	PbCl2
Covellite	-55.43	-77.73	-22.30	CuS
Cr (OH) 2	-21.75	-10.93	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.17	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.42	-1.17	-0.75	Cr (OH) 3
Cr2O3	0.01	-2.34	-2.36	Cr2O3
CrCl2	-45.34	-31.24	14.09	CrCl2
CrCl3	-46.75	-31.64	15.11	CrCl3
CrF3	-24.30	-35.63	-11.34	CrF3
Cristobalite	-0.50	-3.85	-3.35	SiO2
Crmetal	-66.83	-36.35	30.48	Cr
CrO3	-27.21	-30.42	-3.21	CrO3
Cryolite	-9.42	-43.26	-33.84	Na3AlF6
Cu (OH) 2	-0.62	8.05	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.50	19.71	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.15	0.10	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.87	-89.75	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.42	-50.22	-45.80	Cu2Se
Cu2SO4	-19.76	-21.71	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.50	-7.40	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.14	-101.74	-42.59	Cu3Sb
Cu3Se2	-24.97	-88.46	-63.49	Cu3Se2
CuCO3	-0.96	-12.46	-11.50	CuCO3
CuCrO4	-16.94	-22.38	-5.44	CuCrO4
CuF	-8.55	-13.46	-4.91	CuF
CuF2	-16.04	-14.93	1.12	CuF2
CuF2:2H2O	-10.38	-14.93	-4.55	CuF2:2H2O
Cumetal	-5.92	-14.68	-8.76	Cu
CuMoO4	-0.43	-13.51	-13.08	CuMoO4
CuOCuSO4	-11.98	-1.68	10.30	CuOCuSO4
Cupricferrite	8.58	14.57	5.99	CuFe2O4
Cuprite	-2.53	-3.94	-1.41	Cu2O
Cuprousferrite	10.21	1.29	-8.92	CuFeO2
CuSe	-5.14	-38.24	-33.10	CuSe
CuSe2	-25.74	-59.11	-33.37	CuSe2
CuSeO3:2H2O	-7.36	-6.85	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.30	-17.74	-2.44	CuSeO4:5H2O
CuSO4	-12.66	-9.72	2.94	CuSO4
Diaspore	2.25	9.12	6.87	AlOOH
Djurleite	-55.00	-88.92	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.12	-16.42	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.67	-16.42	-17.09	CaMg (CO3) 2

Epsomite	-3.32	-5.45	-2.13	MgSO4:7H2O
Fe(OH)2	-9.98	3.58	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.25	0.21	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.37	-14.09	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.93	-8.38	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.55	-38.18	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.07	-46.80	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.12	10.11	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.92	-12.52	0.40	FeAsO4:2H2O
FeCr2O4	-5.96	1.24	7.20	FeCr2O4
FeMoO4	-7.88	-17.97	-10.09	FeMoO4
Ferrihydrite	0.07	3.26	3.19	Fe(OH)3
Ferroselite	-44.97	-63.57	-18.60	FeSe2
FeS(ppt)	-79.24	-82.19	-2.95	FeS
FeSe	-31.70	-42.70	-11.00	FeSe
Fix_pe	-5.07	-5.07	0.00	e-
Fluorite	-0.22	-10.72	-10.50	CaF2
Galena	-66.23	-80.20	-13.97	PbS
Gibbsite	0.83	9.12	8.29	Al(OH)3
Goethite	2.77	3.26	0.49	FeOOH
Goslarite	-6.45	-8.46	-2.01	ZnSO4:7H2O
Greenalite	-17.75	3.06	20.81	Fe3Si2O5(OH)4
Greenockite	-64.80	-79.16	-14.36	CdS
Greigite	-287.96	-333.00	-45.03	Fe3S4
Gummite	-6.65	1.02	7.67	UO3
Gypsum	-0.91	-5.52	-4.61	CaSO4:2H2O
H-Jarosite	-13.67	-25.77	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.68	-21.56	-12.88	H2MoO4
H2S(g)	-77.77	-85.78	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-6.24	-4.64	1.60	NaCl
Halloysite	0.97	10.54	9.57	Al2Si2O5(OH)4
Hausmannite	-4.61	56.42	61.03	Mn3O4
Hematite	7.94	6.52	-1.42	Fe2O3
Hercynite	-1.07	21.82	22.89	FeAl2O4
Hg(CH3)2(g)	-182.33	-256.04	-73.71	Hg(CH3)2
Hg(g)	-7.65	-15.52	-7.87	Hg
Hg(OH)2	-8.20	-11.70	-3.50	Hg(OH)2
Hg2(g)	-16.09	-31.04	-14.96	Hg2
Hg2(OH)2	-10.89	-5.63	5.26	Hg2(OH)2
Hg2CO3	-10.08	-26.13	-16.05	Hg2CO3
Hg2CrO4	-27.35	-36.05	-8.70	Hg2CrO4
Hg2F2	-18.24	-28.60	-10.36	Hg2F2
Hg2S	-79.73	-91.40	-11.68	Hg2S
Hg2SeO3	-15.87	-20.53	-4.66	Hg2SeO3
Hg2SO4	-17.27	-23.40	-6.13	Hg2SO4
Hg3O2CO3	-25.92	-55.60	-29.68	Hg3O2CO3
HgCl(g)	-32.47	-12.97	19.50	HgCl
HgCl2	-10.75	-32.01	-21.26	HgCl2
HgF(g)	-46.98	-14.30	32.68	HgF
HgF2(g)	-47.24	-34.67	12.57	HgF2
Hgmetal(l)	-2.07	-15.52	-13.45	Hg
HgSe	-2.29	-57.98	-55.69	HgSe
HgSeO3	-14.17	-26.60	-12.43	HgSeO3
HgSO4	-20.05	-29.47	-9.42	HgSO4
Huntite	-2.81	-32.78	-29.97	CaMg3(CO3)4
Hydrocerrussite	-5.52	-24.29	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.62	-20.38	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.41	-21.58	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.11	-20.91	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-33.90	-51.14	-17.24	K2Cr2O7
K2CrO4	-20.20	-20.72	-0.51	K2CrO4
K2MoO4	-15.11	-11.85	3.26	K2MoO4
K2SeO4	-15.36	-16.09	-0.73	K2SeO4
Kaolinite	3.11	10.54	7.43	Al2Si2O5(OH)4
Langite	-3.07	14.42	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.19	-6.63	-0.43	PbO:PbSO4
Laurionite	-5.21	-4.58	0.62	PbOHCl

Lepidocrocite	1.89	3.26	1.37	FeOOH
Lime	-20.44	12.26	32.70	CaO
Litharge	-7.12	5.57	12.69	PbO
Mackinawite	-78.59	-82.19	-3.60	FeS
Maghemite	0.14	6.52	6.39	Fe ₂ O ₃
Magnesioferrite	1.99	18.85	16.86	Fe ₂ MgO ₄
Magnesite	-0.72	-8.18	-7.46	MgCO ₃
Magnetite	6.70	10.11	3.40	Fe ₃ O ₄
Malachite	0.90	-4.41	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.30	23.04	25.34	MnOOH
Massicot	-7.32	5.57	12.89	PbO
Matlockite	-7.10	-16.07	-8.97	PbClF
Melanothallite	-18.52	-12.26	6.26	CuCl ₂
Melanterite	-11.98	-14.19	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.38	-97.47	-45.09	HgS
Mg(OH) ₂ (active)	-6.47	12.33	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.63	-5.35	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-273.98	-199.30	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-19.38	6.98	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.22	9.98	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.48	-18.10	5.38	MgCrO ₄
MgF ₂	-2.52	-10.65	-8.13	MgF ₂
MgMoO ₄	-7.38	-9.23	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.63	-2.57	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-12.26	-13.46	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.39	42.14	73.52	Pb ₃ O ₄
Mirabilite	-5.63	-6.75	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.24	-7.34	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.23	-57.94	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-148.95	-87.87	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.05	-0.55	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.69	-9.98	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-75.61	-75.44	0.17	MnS
MnS(pnk)	-78.78	-75.44	3.34	MnS
MnSb	-95.23	-98.14	-2.91	MnSb
MnSe	-39.45	-35.95	3.50	MnSe
MnSeO ₃	-5.69	-4.56	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.55	-4.56	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.41	-15.46	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.02	-7.44	2.58	MnSO ₄
Monteponite	-8.49	6.61	15.10	CdO
Montroydite	-8.06	-11.70	-3.64	HgO
MoO ₃	-13.55	-21.55	-8.00	MoO ₃
Morenosite	-7.94	-10.08	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-148.26	-218.52	-70.26	MoS ₂
Na-Jarosite	-9.05	-20.25	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.92	-49.82	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.32	-19.39	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.48	-32.08	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.02	-10.52	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.75	-10.53	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.17	-3.87	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-16.04	-14.76	1.28	Na ₂ SeO ₄
Na ₃ Sb	-173.74	-79.29	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.97	7.71	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-33.02	4.38	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.39	-12.12	-6.73	CuCl
NaSb	-88.07	-64.90	23.17	NaSb
Natron	-8.17	-9.48	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.18	-3.32	3.86	NaVO ₃
Nesquehonite	-3.51	-8.18	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.10	7.69	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-24.17	-8.47	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-19.00	13.00	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.94	-12.81	-6.87	NiCO ₃
NiMoO ₄	-2.72	-13.86	-11.14	NiMoO ₄
NiS(alpha)	-72.48	-78.08	-5.60	NiS
NiS(beta)	-66.98	-78.08	-11.10	NiS

NiS (gamma)	-65.28	-78.08	-12.80	NiS
NiSe	-20.89	-38.59	-17.70	NiSe
NiSeO3:2H2O	-10.02	-7.20	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.58	-18.10	-1.52	NiSeO4:6H2O
Nsutite	-7.10	10.40	17.50	MnO2
O2 (g)	-32.26	50.83	83.09	O2
Orpiment	-240.85	-301.91	-61.07	As2S3
Otavite	-1.89	-13.89	-12.00	CdCO3
Pb (BO2) 2	-10.18	-3.66	6.52	Pb (BO2) 2
Pb (OH) 2	-2.58	5.57	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-58.54	-67.30	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-7.80	0.99	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.04	11.15	26.19	Pb2O (OH) 2
Pb2O3	-24.48	36.56	61.04	Pb2O3
Pb2OCO3	-8.80	-9.36	-0.56	Pb2OCO3
Pb2V2O7	-4.63	-6.53	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.63	-14.83	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-7.10	-0.96	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.81	-3.79	11.02	Pb3O2CO3
Pb3O2SO4	-11.74	-1.05	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.58	4.52	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.36	4.52	21.88	Pb4O3SO4
PbCrO4	-12.25	-24.85	-12.60	PbCrO4
PbF2	-9.96	-17.40	-7.44	PbF2
Pbmetal	-24.09	-19.84	4.25	Pb
PbMoO4	-0.36	-15.98	-15.62	PbMoO4
PbO:0.3H2O	-7.41	5.57	12.98	PbO:0.33H2O
PbSeO4	-13.38	-20.22	-6.84	PbSeO4
Periclase	-9.26	12.33	21.58	MgO
Phosgenite	-9.86	-29.67	-19.81	PbCl2:PbCO3
Plattnerite	-18.61	30.99	49.60	PbO2
Portlandite	-10.54	12.26	22.80	Ca (OH) 2
Pyrite	-124.04	-142.55	-18.51	FeS2
Pyrochroite	-4.86	10.33	15.19	Mn (OH) 2
Pyrolusite	-5.63	35.75	41.38	MnO2
Quartz	0.15	-3.85	-4.00	SiO2
Realgar	-101.03	-120.78	-19.75	AsS
Retgersite	-8.04	-10.08	-2.04	NiSO4:6H2O
Rhodochrosite	0.41	-10.17	-10.58	MnCO3
Rutherfordine	-4.99	-19.49	-14.50	UO2CO3
Sb (OH) 3	-12.48	-19.59	-7.11	Sb (OH) 3
Sb2O4	-17.16	-13.75	3.40	Sb2O4
Sb2O5	-27.29	-36.96	-9.67	Sb2O5
Sb2Se3	-110.27	-178.03	-67.76	Sb2Se3
Sb4O6 (cubic)	-60.08	-78.34	-18.26	Sb4O6
Sb4O6 (orth)	-60.44	-78.34	-17.90	Sb4O6
SbCl3	-50.62	-50.05	0.57	SbCl3
SbF3	-43.82	-54.05	-10.23	SbF3
Sbmetal	-46.02	-57.71	-11.69	Sb
SbO2	-3.36	-31.19	-27.82	SbO2
Schoepite	-4.97	1.02	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.76	-20.87	-7.11	Se
Semetal (hex)	-13.16	-20.87	-7.71	Se
Senarmontite	-26.80	-39.17	-12.37	Sb2O3
SeO2	-15.02	-14.90	0.12	SeO2
SeO3	-46.84	-25.79	21.04	SeO3
Sepiolite	-2.65	13.11	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-5.67	13.11	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.68	-16.92	-10.24	FeCO3
SiO2 (am-gel)	-1.14	-3.85	-2.71	SiO2
SiO2 (am-ppt)	-1.11	-3.85	-2.74	SiO2
Smithsonite	-1.19	-11.19	-10.00	ZnCO3
Sphalerite	-65.01	-76.46	-11.45	ZnS
Spinel	-6.28	30.57	36.85	MgAl2O4
Stibnite	-246.04	-296.50	-50.46	Sb2S3
Sulfur	-58.22	-60.36	-2.14	S
Tenorite	0.41	8.05	7.64	CuO
Thenardite	-7.07	-6.74	0.32	Na2SO4

Thermonatrite	-10.11	-9.48	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-7.46	-3.38	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-15.79	5.29	21.08	U ₃ O ₈
U ₃ Sb ₄	-581.25	-428.87	152.38	U ₃ Sb ₄
U ₄ O ₉	-32.28	-35.30	-3.02	U ₄ O ₉
UF ₄	-31.59	-61.13	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.41	-61.13	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-16.11	-15.18	0.93	UO ₂
UO ₂ (NO ₃) ₂	-43.12	-30.97	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-35.83	-30.98	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-34.37	-30.98	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-33.02	-30.98	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.59	1.02	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-22.52	-24.77	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-6.68	1.02	7.70	UO ₃
Uraninite	-10.51	-15.18	-4.67	UO ₂
USb ₂	-220.22	-190.64	29.58	USb ₂
V(OH) ₃	-19.25	-11.65	7.59	V(OH) ₃
V ₂ O ₅	-16.32	-17.68	-1.36	V ₂ O ₅
V ₃ O ₅	-41.18	-39.34	1.84	V ₃ O ₅
V ₄ O ₇	-51.17	-43.99	7.19	V ₄ O ₇
V ₆ O ₁₃	-43.00	-103.86	-60.86	V ₆ O ₁₃
Valentinite	-30.69	-39.17	-8.48	Sb ₂ O ₃
VC ₁₂	-63.55	-44.67	18.87	VC ₁₂
VC ₁₃	-65.55	-42.12	23.43	VC ₁₃
VF ₄	-65.52	-50.59	14.93	VF ₄
Vmetal	-93.80	-49.78	44.03	V
VO	-39.12	-24.36	14.76	VO
VO(OH) ₂	-9.79	-4.64	5.15	VO(OH) ₂
VO ₂ Cl	-21.84	-18.99	2.84	VO ₂ Cl
VOC ₁	-32.96	-21.81	11.15	VOC ₁
VOC ₁₂	-37.71	-24.95	12.76	VOC ₁₂
VOSO ₄	-26.03	-22.42	3.61	VOSO ₄
Witherite	-4.35	-12.92	-8.57	BaCO ₃
Wurtzite	-67.51	-76.46	-8.95	ZnS
Zincite	-2.01	9.32	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO ₄
Zn(BO ₂) ₂	-8.20	0.09	8.29	Zn(BO ₂) ₂
Zn(NO ₃) ₂ :6H ₂ O	-25.99	-22.68	3.32	Zn(NO ₃) ₂ :6H ₂ O
Zn(OH) ₂	-2.88	9.32	12.20	Zn(OH) ₂
Zn(OH) ₂ (am)	-3.16	9.32	12.47	Zn(OH) ₂
Zn(OH) ₂ (beta)	-2.44	9.32	11.75	Zn(OH) ₂
Zn(OH) ₂ (epsilon)	-2.22	9.32	11.53	Zn(OH) ₂
Zn(OH) ₂ (gamma)	-2.42	9.32	11.73	Zn(OH) ₂
Zn ₂ (OH) ₂ SO ₄	-6.64	0.86	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-6.71	8.48	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-17.24	-3.59	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O(SO ₄) ₂	-26.50	-7.59	18.91	Zn ₃ O(SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-8.90	19.50	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-12.22	26.28	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-18.04	-10.99	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-0.93	-11.19	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-13.12	-13.66	-0.53	ZnF ₂
Znmetal	-41.88	-16.10	25.79	Zn
ZnMoO ₄	-2.11	-12.24	-10.13	ZnMoO ₄
ZnO(active)	-1.87	9.32	11.19	ZnO
ZnS(am)	-67.41	-76.46	-9.05	ZnS
ZnSb	-84.82	-73.80	11.01	ZnSb
ZnSe	-22.57	-36.97	-14.40	ZnSe
ZnSeO ₄ :6H ₂ O	-14.95	-16.47	-1.52	ZnSeO ₄ :6H ₂ O
ZnSO ₄ :1H ₂ O	-7.82	-8.46	-0.64	ZnSO ₄ :1H ₂ O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 112.

Title Return solution back to 1L
Mix 605
612 1.6083
save solution 613
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 605.

Mixture 605.

1.608e+00 Solution 612 Solution after simulation 111.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.619e-08	1.619e-08
Al	1.390e-06	1.390e-06
As	4.890e-10	4.889e-10
B	2.483e-05	2.483e-05
Ba	3.989e-08	3.989e-08
C	3.634e-03	3.634e-03
Ca	2.638e-03	2.638e-03
Cd	7.092e-09	7.092e-09
Cl	3.533e-03	3.533e-03
Co	5.477e-08	5.477e-08
Cr	2.265e-09	2.265e-09
Cu	2.409e-06	2.409e-06
F	1.883e-04	1.883e-04
Fe	1.788e-09	1.788e-09
Hg	1.117e-09	1.117e-09
K	1.988e-03	1.988e-03
Mg	2.903e-03	2.903e-03
Mn	3.337e-05	3.337e-05
Mo	9.853e-07	9.853e-07
N	8.110e-06	8.110e-06
Na	9.089e-03	9.089e-03
Ni	8.533e-08	8.532e-08
Pb	5.174e-09	5.173e-09
S	7.495e-03	7.495e-03
Sb	1.493e-08	1.493e-08
Se	8.725e-08	8.724e-08
Si	1.421e-04	1.421e-04
U	1.415e-07	1.415e-07
V	4.588e-09	4.588e-09
Zn	3.535e-06	3.535e-06

-----Description of solution-----

	pH = 7.634	Charge balance
equilibrium	pe = 5.074	Adjusted to redox

Activity of water = 0.999
 Ionic strength (mol/kgw) = 2.919e-02
 Mass of water (kg) = 9.999e-01
 Total alkalinity (eq/kg) = 3.522e-03
 Total CO2 (mol/kg) = 3.634e-03
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 9.597e-07
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 0
 Total H = 1.110116e+02
 Total O = 5.554517e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	5.128e-07	4.336e-07	-6.290	-6.363	-0.073	(0)
H+	2.727e-08	2.321e-08	-7.564	-7.634	-0.070	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	1.619e-08					
AgCl	1.061e-08	1.061e-08	-7.974	-7.974	0.000	(0)
AgCl2-	3.397e-09	2.779e-09	-8.469	-8.556	-0.087	(0)
Ag+	2.030e-09	1.728e-09	-8.693	-8.762	-0.070	(0)
AgSO4-	1.315e-10	1.076e-10	-9.881	-9.968	-0.087	(0)
AgCl3-2	1.662e-11	7.449e-12	-10.779	-11.128	-0.349	(0)
AgNO2	2.233e-12	2.233e-12	-11.651	-11.651	0.000	(0)
AgF	6.082e-13	6.082e-13	-12.216	-12.216	0.000	(0)
AgCl4-3	2.784e-13	4.574e-14	-12.555	-13.340	-0.784	(0)
AgOH	7.492e-14	7.492e-14	-13.125	-13.125	0.000	(0)
AgNH3+	6.426e-14	5.257e-14	-13.192	-13.279	-0.087	(0)
Ag2Se	2.338e-14	2.338e-14	-13.631	-13.631	0.000	(0)
AgH2BO3	1.658e-14	1.658e-14	-13.780	-13.780	0.000	(0)
AgSeO3-	1.265e-14	1.035e-14	-13.898	-13.985	-0.087	(0)
Ag (NO2) 2-	2.614e-17	2.138e-17	-16.583	-16.670	-0.087	(0)
Ag (NH3) 2+	7.783e-18	6.368e-18	-17.109	-17.196	-0.087	(0)
AgNO3	5.947e-18	5.947e-18	-17.226	-17.226	0.000	(0)
Ag (OH) 2-	3.880e-18	3.175e-18	-17.411	-17.498	-0.087	(0)
Ag (SeO3) 2-3	5.254e-21	8.633e-22	-20.280	-21.064	-0.784	(0)
Ag2MoO4	5.844e-25	5.844e-25	-24.233	-24.233	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.277	-83.672	-1.394	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.792	-146.981	-0.189	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.045	-147.132	-0.087	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.436	-148.787	-0.351	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.764	-149.098	-0.334	(0)
Al	1.390e-06					
Al (OH) 4-	1.362e-06	1.160e-06	-5.866	-5.935	-0.070	(0)
Al (OH) 3	2.126e-08	2.126e-08	-7.673	-7.673	0.000	(0)
Al (OH) 2+	2.866e-09	2.457e-09	-8.543	-8.610	-0.067	(0)
AlF3	2.268e-09	2.268e-09	-8.644	-8.644	0.000	(0)
AlF2+	1.500e-09	1.286e-09	-8.824	-8.891	-0.067	(0)
AlF4-	1.870e-10	1.593e-10	-9.728	-9.798	-0.070	(0)
AlF+2	4.268e-11	2.305e-11	-10.370	-10.637	-0.268	(0)
AlOH+2	1.321e-11	7.133e-12	-10.879	-11.147	-0.268	(0)
AlSO4+	4.678e-13	3.985e-13	-12.330	-12.400	-0.070	(0)
Al+3	7.012e-14	1.645e-14	-13.154	-13.784	-0.630	(0)
Al (SO4) 2-	1.564e-14	1.333e-14	-13.806	-13.875	-0.070	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-41.531	-42.315	-0.784	(0)
As (3)	5.228e-23					
H3AsO3	5.091e-23	5.091e-23	-22.293	-22.293	0.000	(0)
H2AsO3-	1.375e-24	1.125e-24	-23.862	-23.949	-0.087	(0)
HAsO3-2	9.863e-29	4.420e-29	-28.006	-28.355	-0.349	(0)
H4AsO3+	7.155e-31	5.854e-31	-30.145	-30.233	-0.087	(0)
AsO3-3	4.467e-34	7.341e-35	-33.350	-34.134	-0.784	(0)
As (5)	4.890e-10					
HAsO4-2	4.380e-10	1.963e-10	-9.359	-9.707	-0.349	(0)

		H2AsO4-	5.079e-11	4.155e-11	-10.294	-10.381	-0.087	(0)
		AsO4-3	1.628e-13	2.674e-14	-12.788	-13.573	-0.784	(0)
		H3AsO4	1.665e-16	1.676e-16	-15.779	-15.776	0.003	(0)
B	2.483e-05							
		H3BO3	2.403e-05	2.419e-05	-4.619	-4.616	0.003	(0)
		H2BO3-	7.218e-07	6.053e-07	-6.142	-6.218	-0.076	(0)
		CaH2BO3+	4.069e-08	3.413e-08	-7.390	-7.467	-0.076	(0)
		MgH2BO3+	2.871e-08	2.408e-08	-7.542	-7.618	-0.076	(0)
		NaH2BO3	7.290e-09	7.290e-09	-8.137	-8.137	0.000	(0)
		BF(OH) 3-	1.613e-09	1.353e-09	-8.792	-8.869	-0.076	(0)
		H5(BO3) 2-	1.486e-11	1.246e-11	-10.828	-10.904	-0.076	(0)
		BF2(OH) 2-	5.611e-13	4.705e-13	-12.251	-12.327	-0.076	(0)
		BaH2BO3+	4.588e-13	3.848e-13	-12.338	-12.415	-0.076	(0)
		H8(BO3) 3-	3.596e-14	3.015e-14	-13.444	-13.521	-0.076	(0)
		AgH2BO3	1.658e-14	1.658e-14	-13.780	-13.780	0.000	(0)
		BF3OH-	7.103e-19	5.957e-19	-18.149	-18.225	-0.076	(0)
		BF4-	1.137e-23	9.537e-24	-22.944	-23.021	-0.076	(0)
Ba	3.989e-08							
		Ba+2	3.918e-08	2.057e-08	-7.407	-7.687	-0.280	(0)
		BaHCO3+	6.538e-10	5.627e-10	-9.185	-9.250	-0.065	(0)
		BaCO3	6.103e-11	6.103e-11	-10.214	-10.214	0.000	(0)
		BaH2BO3+	4.588e-13	3.848e-13	-12.338	-12.415	-0.076	(0)
		BaOH+	4.553e-14	3.893e-14	-13.342	-13.410	-0.068	(0)
		BaNO3+	5.459e-16	4.467e-16	-15.263	-15.350	-0.087	(0)
		BaNH3+2	4.315e-16	1.934e-16	-15.365	-15.714	-0.349	(0)
C(4)	3.634e-03							
		HCO3-	3.342e-03	2.865e-03	-2.476	-2.543	-0.067	(0)
		H2CO3	1.495e-04	1.495e-04	-3.825	-3.825	0.000	(0)
		CaHCO3+	6.073e-05	5.226e-05	-4.217	-4.282	-0.065	(0)
		MgHCO3+	3.962e-05	3.363e-05	-4.402	-4.473	-0.071	(0)
		NaHCO3	1.224e-05	1.224e-05	-4.912	-4.912	0.000	(0)
		CO3-2	1.102e-05	5.786e-06	-4.958	-5.238	-0.280	(0)
		CaCO3	8.985e-06	8.985e-06	-5.047	-5.047	0.000	(0)
		MgCO3	5.521e-06	5.521e-06	-5.258	-5.258	0.000	(0)
		CuCO3	2.057e-06	2.057e-06	-5.687	-5.687	0.000	(0)
		NaCO3-	9.550e-07	8.187e-07	-6.020	-6.087	-0.067	(0)
		MnHCO3+	7.785e-07	6.656e-07	-6.109	-6.177	-0.068	(0)
		ZnCO3	3.742e-07	3.742e-07	-6.427	-6.427	0.000	(0)
		ZnHCO3+	1.244e-07	1.018e-07	-6.905	-6.992	-0.087	(0)
		UO2(CO3) 3-4	1.079e-07	4.352e-09	-6.967	-8.361	-1.394	(0)
		Cu(CO3) 2-2	7.149e-08	3.204e-08	-7.146	-7.494	-0.349	(0)
		UO2(CO3) 2-2	3.348e-08	1.501e-08	-7.475	-7.824	-0.349	(0)
		CuHCO3+	1.334e-08	1.091e-08	-7.875	-7.962	-0.087	(0)
		NiHCO3+	1.152e-08	9.430e-09	-7.938	-8.026	-0.087	(0)
		NiCO3	5.764e-09	5.764e-09	-8.239	-8.239	0.000	(0)
		CoHCO3+	4.585e-09	3.751e-09	-8.339	-8.426	-0.087	(0)
		PbCO3	3.511e-09	3.511e-09	-8.455	-8.455	0.000	(0)
		CoCO3	1.647e-09	1.647e-09	-8.783	-8.783	0.000	(0)
		BaHCO3+	6.538e-10	5.627e-10	-9.185	-9.250	-0.065	(0)
		PbHCO3+	5.251e-10	4.296e-10	-9.280	-9.367	-0.087	(0)
		CdCO3	2.911e-10	2.911e-10	-9.536	-9.536	0.000	(0)
		Pb(CO3) 2-2	1.307e-10	5.859e-11	-9.884	-10.232	-0.349	(0)
		UO2CO3	1.300e-10	1.300e-10	-9.886	-9.886	0.000	(0)
		BaCO3	6.103e-11	6.103e-11	-10.214	-10.214	0.000	(0)
		CdHCO3+	1.759e-11	1.440e-11	-10.755	-10.842	-0.087	(0)
		Cd(CO3) 2-2	2.786e-12	1.249e-12	-11.555	-11.904	-0.349	(0)
		FeHCO3+	8.684e-14	7.473e-14	-13.061	-13.126	-0.065	(0)
		HgCO3	1.168e-14	1.168e-14	-13.933	-13.933	0.000	(0)
		Hg(CO3) 2-2	4.768e-16	2.137e-16	-15.322	-15.670	-0.349	(0)
		HgHCO3+	6.169e-18	5.048e-18	-17.210	-17.297	-0.087	(0)
Ca	2.638e-03							
		Ca+2	1.866e-03	9.798e-04	-2.729	-3.009	-0.280	(0)
		CaSO4	7.005e-04	7.005e-04	-3.155	-3.155	0.000	(0)
		CaHCO3+	6.073e-05	5.226e-05	-4.217	-4.282	-0.065	(0)
		CaCO3	8.985e-06	8.985e-06	-5.047	-5.047	0.000	(0)
		CaF+	1.753e-06	1.498e-06	-5.756	-5.824	-0.068	(0)
		CaH2BO3+	4.069e-08	3.413e-08	-7.390	-7.467	-0.076	(0)
		CaOH+	9.849e-09	8.476e-09	-8.007	-8.072	-0.065	(0)

		CaNH3+2	4.101e-11	1.838e-11	-10.387	-10.736	-0.349	(0)
		CaNO3+	1.641e-11	1.343e-11	-10.785	-10.872	-0.087	(0)
		Ca (NH3) 2+2	2.433e-19	1.090e-19	-18.614	-18.962	-0.349	(0)
Cd	7.092e-09							
		Cd+2	4.204e-09	2.207e-09	-8.376	-8.656	-0.280	(0)
		CdSO4	1.615e-09	1.615e-09	-8.792	-8.792	0.000	(0)
		CdCl+	7.748e-10	6.340e-10	-9.111	-9.198	-0.087	(0)
		CdCO3	2.911e-10	2.911e-10	-9.536	-9.536	0.000	(0)
		Cd (SO4) 2-2	1.517e-10	6.799e-11	-9.819	-10.168	-0.349	(0)
		CdHCO3+	1.759e-11	1.440e-11	-10.755	-10.842	-0.087	(0)
		CdOHC1	1.128e-11	1.128e-11	-10.948	-10.948	0.000	(0)
		CdOH+	9.292e-12	7.603e-12	-11.032	-11.119	-0.087	(0)
		CdCl2	7.948e-12	7.948e-12	-11.100	-11.100	0.000	(0)
		CdF+	5.991e-12	4.902e-12	-11.222	-11.310	-0.087	(0)
		Cd (CO3) 2-2	2.786e-12	1.249e-12	-11.555	-11.904	-0.349	(0)
		Cd (OH) 2	2.080e-14	2.080e-14	-13.682	-13.682	0.000	(0)
		CdCl3-	1.843e-14	1.508e-14	-13.734	-13.822	-0.087	(0)
		CdF2	1.370e-15	1.370e-15	-14.863	-14.863	0.000	(0)
		CdNO3+	3.697e-17	3.025e-17	-16.432	-16.519	-0.087	(0)
		CdSeO4	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
		Cd (OH) 3-	6.734e-19	5.510e-19	-18.172	-18.259	-0.087	(0)
		Cd2OH+3	5.118e-19	8.411e-20	-18.291	-19.075	-0.784	(0)
		Cd (SeO3) 2-2	3.525e-19	1.580e-19	-18.453	-18.801	-0.349	(0)
		Cd (OH) 4-2	8.726e-26	3.911e-26	-25.059	-25.408	-0.349	(0)
		Cd (NO3) 2	6.569e-26	6.569e-26	-25.183	-25.183	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.703	-78.790	-0.087	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-149.728	-149.728	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-225.883	-225.970	-0.087	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-301.568	-301.916	-0.349	(0)
Cl	3.533e-03							
		Cl-	3.533e-03	3.007e-03	-2.452	-2.522	-0.070	(0)
		MnCl+	5.157e-08	4.409e-08	-7.288	-7.356	-0.068	(0)
		AgCl	1.061e-08	1.061e-08	-7.974	-7.974	0.000	(0)
		ZnCl+	1.000e-08	8.490e-09	-8.000	-8.071	-0.071	(0)
		ZnOHC1	4.820e-09	4.820e-09	-8.317	-8.317	0.000	(0)
		AgCl2-	3.397e-09	2.779e-09	-8.469	-8.556	-0.087	(0)
		CuCl	9.453e-10	9.453e-10	-9.024	-9.024	0.000	(0)
		CdCl+	7.748e-10	6.340e-10	-9.111	-9.198	-0.087	(0)
		CuCl2-	6.997e-10	5.940e-10	-9.155	-9.226	-0.071	(0)
		CuCl+	3.391e-10	2.878e-10	-9.470	-9.541	-0.071	(0)
		NiCl+	2.511e-10	2.055e-10	-9.600	-9.687	-0.087	(0)
		CoCl+	2.141e-10	1.752e-10	-9.669	-9.757	-0.087	(0)
		MnCl2	1.873e-10	1.873e-10	-9.727	-9.727	0.000	(0)
		ZnCl2	4.047e-11	4.047e-11	-10.393	-10.393	0.000	(0)
		PbCl+	2.633e-11	2.154e-11	-10.580	-10.667	-0.087	(0)
		AgCl3-2	1.662e-11	7.449e-12	-10.779	-11.128	-0.349	(0)
		CdOHC1	1.128e-11	1.128e-11	-10.948	-10.948	0.000	(0)
		CdCl2	7.948e-12	7.948e-12	-11.100	-11.100	0.000	(0)
		HgClOH	3.884e-12	3.884e-12	-11.411	-11.411	0.000	(0)
		HgCl2	1.526e-12	1.526e-12	-11.817	-11.817	0.000	(0)
		CuCl3-2	7.147e-13	3.819e-13	-12.146	-12.418	-0.272	(0)
		CuCl2	3.001e-13	3.001e-13	-12.523	-12.523	0.000	(0)
		PbCl2	2.894e-13	2.894e-13	-12.539	-12.539	0.000	(0)
		AgCl4-3	2.784e-13	4.574e-14	-12.555	-13.340	-0.784	(0)
		MnCl3-	1.815e-13	1.552e-13	-12.741	-12.809	-0.068	(0)
		ZnCl3-	1.139e-13	9.668e-14	-12.943	-13.015	-0.071	(0)
		HgCl3-	5.607e-14	4.588e-14	-13.251	-13.338	-0.087	(0)
		CdCl3-	1.843e-14	1.508e-14	-13.734	-13.822	-0.087	(0)
		NiCl2	3.111e-15	3.111e-15	-14.507	-14.507	0.000	(0)
		HgCl4-2	1.226e-15	5.493e-16	-14.912	-15.260	-0.349	(0)
		PbCl3-	4.234e-16	3.465e-16	-15.373	-15.460	-0.087	(0)
		ZnCl4-2	2.721e-16	1.454e-16	-15.565	-15.837	-0.272	(0)
		HgCl+	1.237e-16	1.012e-16	-15.908	-15.995	-0.087	(0)
		UO2Cl+	3.364e-17	2.752e-17	-16.473	-16.560	-0.087	(0)
		CrCl+2	2.713e-17	1.216e-17	-16.567	-16.915	-0.349	(0)
		CuCl3-	9.924e-18	8.424e-18	-17.003	-17.074	-0.071	(0)
		PbCl4-2	1.063e-18	4.763e-19	-17.974	-18.322	-0.349	(0)
		CrOHC12	3.013e-19	3.013e-19	-18.521	-18.521	0.000	(0)

CrCl2+	4.240e-21	3.469e-21	-20.373	-20.460	-0.087	(0)
FeCl+2	3.876e-21	2.071e-21	-20.412	-20.684	-0.272	(0)
CuCl4-2	2.376e-22	1.270e-22	-21.624	-21.896	-0.272	(0)
VOCl+	1.266e-22	1.036e-22	-21.898	-21.985	-0.087	(0)
FeCl2+	3.254e-23	2.782e-23	-22.488	-22.556	-0.068	(0)
CrO3Cl-	2.816e-26	2.304e-26	-25.550	-25.638	-0.087	(0)
FeCl3	8.368e-27	8.368e-27	-26.077	-26.077	0.000	(0)
CoCl+2	1.084e-35	4.858e-36	-34.965	-35.314	-0.349	(0)
UCl+3	0.000e+00	0.000e+00	-45.754	-46.538	-0.784	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.146	-48.494	-0.349	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.537	-49.886	-0.349	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.688	-63.036	-0.349	(0)
Co (2)	5.477e-08					
Co+2	3.757e-08	1.684e-08	-7.425	-7.774	-0.349	(0)
CoSO4	1.048e-08	1.048e-08	-7.980	-7.980	0.000	(0)
CoHCO3+	4.585e-09	3.751e-09	-8.339	-8.426	-0.087	(0)
CoCO3	1.647e-09	1.647e-09	-8.783	-8.783	0.000	(0)
CoCl+	2.141e-10	1.752e-10	-9.669	-9.757	-0.087	(0)
CoOH+	1.780e-10	1.457e-10	-9.750	-9.837	-0.087	(0)
CoF+	9.117e-11	7.460e-11	-10.040	-10.127	-0.087	(0)
Co (OH) 2	5.017e-12	5.017e-12	-11.300	-11.300	0.000	(0)
CoNO2+	8.967e-13	7.337e-13	-12.047	-12.134	-0.087	(0)
Co (NH3) +2	6.730e-14	3.016e-14	-13.172	-13.521	-0.349	(0)
CoSeO4	2.530e-16	2.530e-16	-15.597	-15.597	0.000	(0)
CoNO3+	1.413e-16	1.156e-16	-15.850	-15.937	-0.087	(0)
Co (OH) 3-	5.304e-17	4.340e-17	-16.275	-16.363	-0.087	(0)
CoOOH-	1.332e-17	1.089e-17	-16.876	-16.963	-0.087	(0)
Co2OH+3	7.479e-19	1.229e-19	-18.126	-18.910	-0.784	(0)
Co (NH3) 2+2	4.278e-20	1.917e-20	-19.369	-19.717	-0.349	(0)
Co (OH) 4-2	6.655e-24	2.983e-24	-23.177	-23.525	-0.349	(0)
Co (NO3) 2	1.019e-24	1.019e-24	-23.992	-23.992	0.000	(0)
Co (NH3) 3+2	8.027e-27	3.597e-27	-26.095	-26.444	-0.349	(0)
Co4 (OH) 4+4	2.226e-30	8.980e-32	-29.652	-31.047	-1.394	(0)
Co (NH3) 4+2	6.277e-34	2.813e-34	-33.202	-33.551	-0.349	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-40.809	-41.158	-0.349	(0)
Co (3)	3.903e-29					
CoOH+2	3.903e-29	1.749e-29	-28.409	-28.757	-0.349	(0)
Co+3	3.384e-35	7.939e-36	-34.471	-35.100	-0.630	(0)
CoCl+2	1.084e-35	4.858e-36	-34.965	-35.314	-0.349	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.146	-48.494	-0.349	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.008	-58.095	-0.087	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.329	-62.677	-0.349	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.688	-63.036	-0.349	(0)
Cr (2)	1.406e-26					
Cr+2	1.406e-26	6.299e-27	-25.852	-26.201	-0.349	(0)
Cr (3)	2.265e-09					
Cr (OH) 2+	1.910e-09	1.563e-09	-8.719	-8.806	-0.087	(0)
Cr (OH) 3	2.546e-10	2.546e-10	-9.594	-9.594	0.000	(0)
Cr (OH) +2	6.611e-11	2.963e-11	-10.180	-10.528	-0.349	(0)
CrOHSO4	2.194e-11	2.194e-11	-10.659	-10.659	0.000	(0)
CrO2-	6.370e-12	5.212e-12	-11.196	-11.283	-0.087	(0)
Cr (OH) 4-	5.372e-12	4.395e-12	-11.270	-11.357	-0.087	(0)
CrF+2	1.548e-13	6.936e-14	-12.810	-13.159	-0.349	(0)
CrSO4+	2.782e-14	2.276e-14	-13.556	-13.643	-0.087	(0)
Cr+3	1.901e-14	3.123e-15	-13.721	-14.505	-0.784	(0)
CrCl+2	2.713e-17	1.216e-17	-16.567	-16.915	-0.349	(0)
CrOHC12	3.013e-19	3.013e-19	-18.521	-18.521	0.000	(0)
Cr2 (OH) 2SO4+2	1.311e-19	5.876e-20	-18.882	-19.231	-0.349	(0)
Cr2 (OH) 2 (SO4) 2	1.089e-20	1.089e-20	-19.963	-19.963	0.000	(0)
CrCl2+	4.240e-21	3.469e-21	-20.373	-20.460	-0.087	(0)
CrNO3+2	1.320e-24	5.916e-25	-23.879	-24.228	-0.349	(0)
Cr (NH3) 5OH+2	5.234e-40	2.345e-40	-39.281	-39.630	-0.349	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.682	-48.466	-0.784	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.537	-49.886	-0.349	(0)
Cr (6)	1.432e-15					
CrO4-2	1.330e-15	6.984e-16	-14.876	-15.156	-0.280	(0)
HCrO4-	6.411e-17	5.245e-17	-16.193	-16.280	-0.087	(0)
NaCrO4-	3.223e-17	2.637e-17	-16.492	-16.579	-0.087	(0)

KCrO4-	5.251e-18	4.296e-18	-17.280	-17.367	-0.087	(0)
CrO3SO4-2	2.584e-24	1.158e-24	-23.588	-23.936	-0.349	(0)
H2CrO4	9.869e-25	9.869e-25	-24.006	-24.006	0.000	(0)
CrO3Cl-	2.816e-26	2.304e-26	-25.550	-25.638	-0.087	(0)
Cr2O7-2	2.130e-31	9.544e-32	-30.672	-31.020	-0.349	(0)
Cu (1)	1.951e-09					
CuCl	9.453e-10	9.453e-10	-9.024	-9.024	0.000	(0)
CuCl2-	6.997e-10	5.940e-10	-9.155	-9.226	-0.071	(0)
Cu+	3.051e-10	2.497e-10	-9.516	-9.603	-0.087	(0)
CuCl3-2	7.147e-13	3.819e-13	-12.146	-12.418	-0.272	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.886	-147.228	-0.342	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.632	-147.958	-0.326	(0)
Cu (2)	2.407e-06					
CuCO3	2.057e-06	2.057e-06	-5.687	-5.687	0.000	(0)
Cu+2	1.150e-07	6.038e-08	-6.939	-7.219	-0.280	(0)
CuOH+	9.753e-08	8.279e-08	-7.011	-7.082	-0.071	(0)
Cu (CO3) 2-2	7.149e-08	3.204e-08	-7.146	-7.494	-0.349	(0)
CuSO4	4.317e-08	4.317e-08	-7.365	-7.365	0.000	(0)
CuHCO3+	1.334e-08	1.091e-08	-7.875	-7.962	-0.087	(0)
Cu (OH) 2	7.163e-09	7.163e-09	-8.145	-8.145	0.000	(0)
CuF+	6.524e-10	5.338e-10	-9.185	-9.273	-0.087	(0)
Cu2 (OH) 2+2	3.842e-10	1.722e-10	-9.415	-9.764	-0.349	(0)
CuCl+	3.391e-10	2.878e-10	-9.470	-9.541	-0.071	(0)
CuNO2+	4.779e-11	3.910e-11	-10.321	-10.408	-0.087	(0)
CuNH3+2	2.055e-11	9.208e-12	-10.687	-11.036	-0.349	(0)
Cu (OH) 3-	7.786e-12	6.370e-12	-11.109	-11.196	-0.087	(0)
CuCl2	3.001e-13	3.001e-13	-12.523	-12.523	0.000	(0)
Cu (NO2) 2	2.474e-15	2.474e-15	-14.607	-14.607	0.000	(0)
CuNO3+	1.011e-15	8.274e-16	-14.995	-15.082	-0.087	(0)
Cu (OH) 4-2	4.851e-17	2.174e-17	-16.314	-16.663	-0.349	(0)
CuCl3-	9.924e-18	8.424e-18	-17.003	-17.074	-0.071	(0)
CuCl4-2	2.376e-22	1.270e-22	-21.624	-21.896	-0.272	(0)
Cu (NO3) 2	4.513e-25	4.513e-25	-24.346	-24.346	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.659	-215.746	-0.087	(0)
F	1.883e-04					
F-	1.646e-04	1.401e-04	-3.784	-3.853	-0.070	(0)
MgF+	2.117e-05	1.804e-05	-4.674	-4.744	-0.070	(0)
CaF+	1.753e-06	1.498e-06	-5.756	-5.824	-0.068	(0)
NaF	6.718e-07	6.718e-07	-6.173	-6.173	0.000	(0)
MnF+	7.598e-08	6.496e-08	-7.119	-7.187	-0.068	(0)
HF	4.810e-09	4.810e-09	-8.318	-8.318	0.000	(0)
ZnF+	3.840e-09	3.142e-09	-8.416	-8.503	-0.087	(0)
AlF3	2.268e-09	2.268e-09	-8.644	-8.644	0.000	(0)
BF (OH) 3-	1.613e-09	1.353e-09	-8.792	-8.869	-0.076	(0)
AlF2+	1.500e-09	1.286e-09	-8.824	-8.891	-0.067	(0)
CuF+	6.524e-10	5.338e-10	-9.185	-9.273	-0.087	(0)
AlF4-	1.870e-10	1.593e-10	-9.728	-9.798	-0.070	(0)
NiF+	1.149e-10	9.398e-11	-9.940	-10.027	-0.087	(0)
CoF+	9.117e-11	7.460e-11	-10.040	-10.127	-0.087	(0)
AlF+2	4.268e-11	2.305e-11	-10.370	-10.637	-0.268	(0)
CdF+	5.991e-12	4.902e-12	-11.222	-11.310	-0.087	(0)
HF2-	3.031e-12	2.563e-12	-11.518	-11.591	-0.073	(0)
PbF+	2.436e-12	1.993e-12	-11.613	-11.700	-0.087	(0)
AgF	6.082e-13	6.082e-13	-12.216	-12.216	0.000	(0)
BF2 (OH) 2-	5.611e-13	4.705e-13	-12.251	-12.327	-0.076	(0)
CrF+2	1.548e-13	6.936e-14	-12.810	-13.159	-0.349	(0)
UO2F+	1.334e-13	1.091e-13	-12.875	-12.962	-0.087	(0)
UO2F2	4.411e-14	4.411e-14	-13.355	-13.355	0.000	(0)
PbF2	5.496e-15	5.496e-15	-14.260	-14.260	0.000	(0)
UO2F3-	1.897e-15	1.552e-15	-14.722	-14.809	-0.087	(0)
CdF2	1.370e-15	1.370e-15	-14.863	-14.863	0.000	(0)
H2F2	6.200e-17	6.200e-17	-16.208	-16.208	0.000	(0)
FeF2+	1.537e-17	1.314e-17	-16.813	-16.881	-0.068	(0)
VO2F	8.287e-18	8.287e-18	-17.082	-17.082	0.000	(0)
FeF+2	6.557e-18	3.503e-18	-17.183	-17.455	-0.272	(0)
UO2F4-2	3.856e-18	1.728e-18	-17.414	-17.762	-0.349	(0)
FeF3	2.597e-18	2.597e-18	-17.585	-17.585	0.000	(0)
PbF3-	1.785e-18	1.461e-18	-17.748	-17.835	-0.087	(0)

BF3OH-	7.103e-19	5.957e-19	-18.149	-18.225	-0.076	(0)
VO2F2-	5.153e-19	4.216e-19	-18.288	-18.375	-0.087	(0)
VOF+	1.261e-20	1.031e-20	-19.899	-19.987	-0.087	(0)
VO2F3-2	1.644e-21	7.369e-22	-20.784	-21.133	-0.349	(0)
VOF2	5.420e-22	5.420e-22	-21.266	-21.266	0.000	(0)
PbF4-2	2.186e-22	9.796e-23	-21.660	-22.009	-0.349	(0)
BF4-	1.137e-23	9.537e-24	-22.944	-23.021	-0.076	(0)
HgF+	1.071e-23	8.760e-24	-22.970	-23.057	-0.087	(0)
VOF3-	3.293e-24	2.694e-24	-23.482	-23.570	-0.087	(0)
VO2F4-3	3.092e-25	5.081e-26	-24.510	-25.294	-0.784	(0)
Sb(OH) 2F	1.320e-25	1.320e-25	-24.879	-24.879	0.000	(0)
SbOF	1.299e-25	1.299e-25	-24.886	-24.886	0.000	(0)
VOF4-2	3.400e-27	1.524e-27	-26.468	-26.817	-0.349	(0)
SiF6-2	8.855e-28	4.731e-28	-27.053	-27.325	-0.272	(0)
UF3+	2.572e-36	2.104e-36	-35.590	-35.677	-0.087	(0)
UF2+2	2.114e-37	9.476e-38	-36.675	-37.023	-0.349	(0)
UF4	3.233e-38	3.233e-38	-37.490	-37.490	0.000	(0)
UF+3	3.269e-40	0.000e+00	-39.486	-40.270	-0.784	(0)
UF5-	2.194e-40	1.795e-40	-39.659	-39.746	-0.087	(0)
UF6-2	0.000e+00	0.000e+00	-40.771	-41.119	-0.349	(0)
Fe (2)	6.340e-12					
Fe+2	4.624e-12	2.072e-12	-11.335	-11.684	-0.349	(0)
FeSO4	1.588e-12	1.588e-12	-11.799	-11.799	0.000	(0)
FeHCO3+	8.684e-14	7.473e-14	-13.061	-13.126	-0.065	(0)
FeOH+	4.184e-14	3.577e-14	-13.378	-13.446	-0.068	(0)
Fe (OH) 2	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
Fe (OH) 3-	1.976e-18	1.689e-18	-17.704	-17.772	-0.068	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.018	-159.018	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.036	-235.123	-0.087	(0)
Fe (3)	1.781e-09					
Fe (OH) 2+	1.256e-09	1.077e-09	-8.901	-8.968	-0.067	(0)
Fe (OH) 3	5.015e-10	5.015e-10	-9.300	-9.300	0.000	(0)
Fe (OH) 4-	2.362e-11	2.025e-11	-10.627	-10.694	-0.067	(0)
FeOH+2	1.195e-14	6.384e-15	-13.923	-14.195	-0.272	(0)
FeF2+	1.537e-17	1.314e-17	-16.813	-16.881	-0.068	(0)
FeF+2	6.557e-18	3.503e-18	-17.183	-17.455	-0.272	(0)
FeF3	2.597e-18	2.597e-18	-17.585	-17.585	0.000	(0)
FeSO4+	9.339e-19	7.985e-19	-18.030	-18.098	-0.068	(0)
Fe+3	9.719e-20	2.280e-20	-19.012	-19.642	-0.630	(0)
Fe (SO4) 2-	6.512e-20	5.328e-20	-19.186	-19.273	-0.087	(0)
FeCl+2	3.876e-21	2.071e-21	-20.412	-20.684	-0.272	(0)
FeCl2+	3.254e-23	2.782e-23	-22.488	-22.556	-0.068	(0)
FeHSeO3+2	7.304e-24	3.274e-24	-23.136	-23.485	-0.349	(0)
Fe2 (OH) 2+4	3.346e-26	1.350e-27	-25.476	-26.870	-1.394	(0)
FeCl3	8.368e-27	8.368e-27	-26.077	-26.077	0.000	(0)
FeNO3+2	2.205e-27	9.881e-28	-26.657	-27.005	-0.349	(0)
Fe3 (OH) 4+5	3.169e-33	2.101e-35	-32.499	-34.678	-2.179	(0)
H (0)	5.400e-29					
H2	2.700e-29	2.718e-29	-28.569	-28.566	0.003	(0)
Hg (0)	1.109e-09					
Hg	1.109e-09	1.109e-09	-8.955	-8.955	0.000	(0)
Hg (1)	5.669e-21					
Hg2+2	2.835e-21	1.270e-21	-20.547	-20.896	-0.349	(0)
Hg (2)	7.467e-12					
HgClOH	3.884e-12	3.884e-12	-11.411	-11.411	0.000	(0)
Hg (OH) 2	1.987e-12	2.001e-12	-11.702	-11.699	0.003	(0)
HgCl2	1.526e-12	1.526e-12	-11.817	-11.817	0.000	(0)
HgCl3-	5.607e-14	4.588e-14	-13.251	-13.338	-0.087	(0)
HgCO3	1.168e-14	1.168e-14	-13.933	-13.933	0.000	(0)
HgCl4-2	1.226e-15	5.493e-16	-14.912	-15.260	-0.349	(0)
Hg (CO3) 2-2	4.768e-16	2.137e-16	-15.322	-15.670	-0.349	(0)
HgCl+	1.237e-16	1.012e-16	-15.908	-15.995	-0.087	(0)
HgOH+	3.558e-17	2.911e-17	-16.449	-16.536	-0.087	(0)
HgHCO3+	6.169e-18	5.048e-18	-17.210	-17.297	-0.087	(0)
Hg (NH3) 2+2	5.273e-19	2.363e-19	-18.278	-18.626	-0.349	(0)
Hg (OH) 3-	1.335e-19	1.092e-19	-18.875	-18.962	-0.087	(0)
HgNH3+2	3.539e-20	1.586e-20	-19.451	-19.800	-0.349	(0)
Hg+2	3.764e-21	1.687e-21	-20.424	-20.773	-0.349	(0)

		HgSO4	1.378e-21	1.378e-21	-20.861	-20.861	0.000	(0)
		HgF+	1.071e-23	8.760e-24	-22.970	-23.057	-0.087	(0)
		Hg (NH3) 3+2	3.128e-26	1.402e-26	-25.505	-25.853	-0.349	(0)
		HgNO3+	3.298e-30	2.698e-30	-29.482	-29.569	-0.087	(0)
		Hg (NH3) 4+2	3.703e-33	1.660e-33	-32.431	-32.780	-0.349	(0)
		Hg (NO3) 2	4.860e-39	4.860e-39	-38.313	-38.313	0.000	(0)
		HgHS2-	0.000e+00	0.000e+00	-137.408	-137.495	-0.087	(0)
		HgS2-2	0.000e+00	0.000e+00	-138.220	-138.568	-0.349	(0)
		Hg (HS) 2	0.000e+00	0.000e+00	-138.735	-138.735	0.000	(0)
K	1.988e-03							
		K+	1.945e-03	1.656e-03	-2.711	-2.781	-0.070	(0)
		KSO4-	4.267e-05	3.658e-05	-4.370	-4.437	-0.067	(0)
		KCrO4-	5.251e-18	4.296e-18	-17.280	-17.367	-0.087	(0)
Mg	2.903e-03							
		Mg+2	2.185e-03	1.147e-03	-2.660	-2.940	-0.280	(0)
		MgSO4	6.515e-04	6.515e-04	-3.186	-3.186	0.000	(0)
		MgHCO3+	3.962e-05	3.363e-05	-4.402	-4.473	-0.071	(0)
		MgF+	2.117e-05	1.804e-05	-4.674	-4.744	-0.070	(0)
		MgCO3	5.521e-06	5.521e-06	-5.258	-5.258	0.000	(0)
		MgOH+	2.294e-07	1.980e-07	-6.639	-6.703	-0.064	(0)
		MgH2BO3+	2.871e-08	2.408e-08	-7.542	-7.618	-0.076	(0)
Mn (2)	3.337e-05							
		Mn+2	2.599e-05	1.165e-05	-4.585	-4.934	-0.349	(0)
		MnSO4	6.463e-06	6.463e-06	-5.190	-5.190	0.000	(0)
		MnHCO3+	7.785e-07	6.656e-07	-6.109	-6.177	-0.068	(0)
		MnF+	7.598e-08	6.496e-08	-7.119	-7.187	-0.068	(0)
		MnCl+	5.157e-08	4.409e-08	-7.288	-7.356	-0.068	(0)
		MnOH+	1.484e-08	1.268e-08	-7.829	-7.897	-0.068	(0)
		MnCl2	1.873e-10	1.873e-10	-9.727	-9.727	0.000	(0)
		MnCl3-	1.815e-13	1.552e-13	-12.741	-12.809	-0.068	(0)
		MnNO3+	9.775e-14	7.998e-14	-13.010	-13.097	-0.087	(0)
		MnSeO4	9.397e-14	9.397e-14	-13.027	-13.027	0.000	(0)
		Mn (OH) 3-	1.724e-17	1.474e-17	-16.764	-16.832	-0.068	(0)
		Mn (NO3) 2	8.705e-22	8.705e-22	-21.060	-21.060	0.000	(0)
		Mn (OH) 4-2	3.861e-23	2.063e-23	-22.413	-22.685	-0.272	(0)
		MnSe	0.000e+00	0.000e+00	-41.336	-41.336	0.000	(0)
Mn (3)	2.626e-25							
		Mn+3	2.626e-25	6.162e-26	-24.581	-25.210	-0.630	(0)
Mn (6)	0.000e+00							
		MnO4-2	0.000e+00	0.000e+00	-41.716	-41.988	-0.272	(0)
Mn (7)	0.000e+00							
		MnO4-	0.000e+00	0.000e+00	-46.212	-46.286	-0.075	(0)
Mo	9.853e-07							
		MoO4-2	9.850e-07	5.171e-07	-6.007	-6.286	-0.280	(0)
		HMoO4-	2.919e-10	2.388e-10	-9.535	-9.622	-0.087	(0)
		H2MoO4	4.061e-14	4.061e-14	-13.391	-13.391	0.000	(0)
		Ag2MoO4	5.844e-25	5.844e-25	-24.233	-24.233	0.000	(0)
		AlMo6O21-3	0.000e+00	0.000e+00	-41.531	-42.315	-0.784	(0)
		Mo7O24-6	0.000e+00	0.000e+00	-48.951	-52.088	-3.137	(0)
		HMo7O24-5	0.000e+00	0.000e+00	-51.157	-53.336	-2.179	(0)
		H2Mo7O24-4	0.000e+00	0.000e+00	-54.794	-56.188	-1.394	(0)
		H3Mo7O24-3	0.000e+00	0.000e+00	-59.792	-60.576	-0.784	(0)
N (-3)	7.620e-07							
		NH4+	7.234e-07	6.066e-07	-6.141	-6.217	-0.076	(0)
		NH4SO4-	2.373e-08	2.029e-08	-7.625	-7.693	-0.068	(0)
		NH3	1.490e-08	1.490e-08	-7.827	-7.827	0.000	(0)
		CaNH3+2	4.101e-11	1.838e-11	-10.387	-10.736	-0.349	(0)
		CuNH3+2	2.055e-11	9.208e-12	-10.687	-11.036	-0.349	(0)
		NiNH3+2	4.768e-13	2.137e-13	-12.322	-12.670	-0.349	(0)
		Co (NH3) +2	6.730e-14	3.016e-14	-13.172	-13.521	-0.349	(0)
		AgNH3+	6.426e-14	5.257e-14	-13.192	-13.279	-0.087	(0)
		BaNH3+2	4.315e-16	1.934e-16	-15.365	-15.714	-0.349	(0)
		Ag (NH3) 2+	7.783e-18	6.368e-18	-17.109	-17.196	-0.087	(0)
		Ni (NH3) 2+2	1.027e-18	4.603e-19	-17.988	-18.337	-0.349	(0)
		Hg (NH3) 2+2	5.273e-19	2.363e-19	-18.278	-18.626	-0.349	(0)
		Ca (NH3) 2+2	2.433e-19	1.090e-19	-18.614	-18.962	-0.349	(0)
		Co (NH3) 2+2	4.278e-20	1.917e-20	-19.369	-19.717	-0.349	(0)
		HgNH3+2	3.539e-20	1.586e-20	-19.451	-19.800	-0.349	(0)

Hg (NH3) 3+2	3.128e-26	1.402e-26	-25.505	-25.853	-0.349	(0)
Co (NH3) 3+2	8.027e-27	3.597e-27	-26.095	-26.444	-0.349	(0)
Hg (NH3) 4+2	3.703e-33	1.660e-33	-32.431	-32.780	-0.349	(0)
Co (NH3) 4+2	6.277e-34	2.813e-34	-33.202	-33.551	-0.349	(0)
Cr (NH3) 5OH+2	5.234e-40	2.345e-40	-39.281	-39.630	-0.349	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-40.809	-41.158	-0.349	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.682	-48.466	-0.784	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.146	-48.494	-0.349	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.537	-49.886	-0.349	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.008	-58.095	-0.087	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.329	-62.677	-0.349	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-62.688	-63.036	-0.349	(0)
N (3)	7.343e-06					
NO2-	7.343e-06	6.184e-06	-5.134	-5.209	-0.075	(0)
CuNO2+	4.779e-11	3.910e-11	-10.321	-10.408	-0.087	(0)
AgNO2	2.233e-12	2.233e-12	-11.651	-11.651	0.000	(0)
CoNO2+	8.967e-13	7.337e-13	-12.047	-12.134	-0.087	(0)
Cu (NO2) 2	2.474e-15	2.474e-15	-14.607	-14.607	0.000	(0)
Ag (NO2) 2-	2.614e-17	2.138e-17	-16.583	-16.670	-0.087	(0)
N (5)	5.107e-09					
NO3-	5.090e-09	4.333e-09	-8.293	-8.363	-0.070	(0)
CaNO3+	1.641e-11	1.343e-11	-10.785	-10.872	-0.087	(0)
MnNO3+	9.775e-14	7.998e-14	-13.010	-13.097	-0.087	(0)
ZnNO3+	1.495e-14	1.223e-14	-13.825	-13.912	-0.087	(0)
CuNO3+	1.011e-15	8.274e-16	-14.995	-15.082	-0.087	(0)
BaNO3+	5.459e-16	4.467e-16	-15.263	-15.350	-0.087	(0)
NiNO3+	3.552e-16	2.906e-16	-15.450	-15.537	-0.087	(0)
CoNO3+	1.413e-16	1.156e-16	-15.850	-15.937	-0.087	(0)
CdNO3+	3.697e-17	3.025e-17	-16.432	-16.519	-0.087	(0)
PbNO3+	1.581e-17	1.294e-17	-16.801	-16.888	-0.087	(0)
AgNO3	5.947e-18	5.947e-18	-17.226	-17.226	0.000	(0)
Mn (NO3) 2	8.705e-22	8.705e-22	-21.060	-21.060	0.000	(0)
UO2NO3+	5.963e-23	4.879e-23	-22.225	-22.312	-0.087	(0)
Zn (NO3) 2	1.058e-23	1.058e-23	-22.976	-22.976	0.000	(0)
CrNO3+2	1.320e-24	5.916e-25	-23.879	-24.228	-0.349	(0)
Co (NO3) 2	1.019e-24	1.019e-24	-23.992	-23.992	0.000	(0)
Cu (NO3) 2	4.513e-25	4.513e-25	-24.346	-24.346	0.000	(0)
Pb (NO3) 2	9.520e-26	9.520e-26	-25.021	-25.021	0.000	(0)
VO2NO3	7.391e-26	7.391e-26	-25.131	-25.131	0.000	(0)
Cd (NO3) 2	6.569e-26	6.569e-26	-25.183	-25.183	0.000	(0)
FeNO3+2	2.205e-27	9.881e-28	-26.657	-27.005	-0.349	(0)
HgNO3+	3.298e-30	2.698e-30	-29.482	-29.569	-0.087	(0)
Hg (NO3) 2	4.860e-39	4.860e-39	-38.313	-38.313	0.000	(0)
Na	9.089e-03					
Na+	8.927e-03	7.599e-03	-2.049	-2.119	-0.070	(0)
NaSO4-	1.486e-04	1.274e-04	-3.828	-3.895	-0.067	(0)
NaHCO3	1.224e-05	1.224e-05	-4.912	-4.912	0.000	(0)
NaCO3-	9.550e-07	8.187e-07	-6.020	-6.087	-0.067	(0)
NaF	6.718e-07	6.718e-07	-6.173	-6.173	0.000	(0)
NaH2BO3	7.290e-09	7.290e-09	-8.137	-8.137	0.000	(0)
NaCrO4-	3.223e-17	2.637e-17	-16.492	-16.579	-0.087	(0)
Ni	8.533e-08					
Ni+2	5.086e-08	2.670e-08	-7.294	-7.573	-0.280	(0)
NiSO4	1.663e-08	1.663e-08	-7.779	-7.779	0.000	(0)
NiHCO3+	1.152e-08	9.430e-09	-7.938	-8.026	-0.087	(0)
NiCO3	5.764e-09	5.764e-09	-8.239	-8.239	0.000	(0)
NiCl+	2.511e-10	2.055e-10	-9.600	-9.687	-0.087	(0)
NiOH+	1.781e-10	1.458e-10	-9.749	-9.836	-0.087	(0)
NiF+	1.149e-10	9.398e-11	-9.940	-10.027	-0.087	(0)
Ni (OH) 2	5.020e-12	5.020e-12	-11.299	-11.299	0.000	(0)
Ni (SO4) 2-2	3.834e-12	1.718e-12	-11.416	-11.765	-0.349	(0)
NiNH3+2	4.768e-13	2.137e-13	-12.322	-12.670	-0.349	(0)
NiCl2	3.111e-15	3.111e-15	-14.507	-14.507	0.000	(0)
Ni (OH) 3-	2.660e-15	2.177e-15	-14.575	-14.662	-0.087	(0)
NiSeO4	3.744e-16	3.744e-16	-15.427	-15.427	0.000	(0)
NiNO3+	3.552e-16	2.906e-16	-15.450	-15.537	-0.087	(0)
Ni (NH3) 2+2	1.027e-18	4.603e-19	-17.988	-18.337	-0.349	(0)
O (0)	1.362e-35					

O2	6.808e-36	6.854e-36	-35.167	-35.164	0.003	(0)
Pb	5.174e-09					
PbCO3	3.511e-09	3.511e-09	-8.455	-8.455	0.000	(0)
PbHCO3+	5.251e-10	4.296e-10	-9.280	-9.367	-0.087	(0)
Pb+2	3.845e-10	2.019e-10	-9.415	-9.695	-0.280	(0)
PbSO4	3.085e-10	3.085e-10	-9.511	-9.511	0.000	(0)
PbOH+	2.687e-10	2.199e-10	-9.571	-9.658	-0.087	(0)
Pb (CO3) 2-2	1.307e-10	5.859e-11	-9.884	-10.232	-0.349	(0)
PbCl+	2.633e-11	2.154e-11	-10.580	-10.667	-0.087	(0)
Pb (SO4) 2-2	1.295e-11	5.802e-12	-10.888	-11.236	-0.349	(0)
Pb (OH) 2	3.015e-12	3.015e-12	-11.521	-11.521	0.000	(0)
PbF+	2.436e-12	1.993e-12	-11.613	-11.700	-0.087	(0)
PbCl2	2.894e-13	2.894e-13	-12.539	-12.539	0.000	(0)
PbF2	5.496e-15	5.496e-15	-14.260	-14.260	0.000	(0)
Pb (OH) 3-	1.598e-15	1.307e-15	-14.797	-14.884	-0.087	(0)
PbCl3-	4.234e-16	3.465e-16	-15.373	-15.460	-0.087	(0)
PbNO3+	1.581e-17	1.294e-17	-16.801	-16.888	-0.087	(0)
Pb2OH+3	4.280e-18	7.034e-19	-17.369	-18.153	-0.784	(0)
PbF3-	1.785e-18	1.461e-18	-17.748	-17.835	-0.087	(0)
PbCl4-2	1.063e-18	4.763e-19	-17.974	-18.322	-0.349	(0)
Pb (OH) 4-2	3.097e-19	1.388e-19	-18.509	-18.858	-0.349	(0)
PbF4-2	2.186e-22	9.796e-23	-21.660	-22.009	-0.349	(0)
Pb3 (OH) 4+2	8.167e-23	3.660e-23	-22.088	-22.437	-0.349	(0)
Pb (NO3) 2	9.520e-26	9.520e-26	-25.021	-25.021	0.000	(0)
Pb4 (OH) 4+4	1.455e-27	5.869e-29	-26.837	-28.231	-1.394	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.709	-150.709	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.464	-227.551	-0.087	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.055	-78.142	-0.087	(0)
CdHS+	0.000e+00	0.000e+00	-78.703	-78.790	-0.087	(0)
H2S	0.000e+00	0.000e+00	-78.756	-78.756	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.524	-79.873	-0.349	(0)
S6-2	0.000e+00	0.000e+00	-80.040	-80.389	-0.349	(0)
S4-2	0.000e+00	0.000e+00	-80.120	-80.469	-0.349	(0)
S3-2	0.000e+00	0.000e+00	-80.926	-81.274	-0.349	(0)
S2-2	0.000e+00	0.000e+00	-81.942	-82.291	-0.349	(0)
S-2	0.000e+00	0.000e+00	-87.536	-87.808	-0.272	(0)
HgHS2-	0.000e+00	0.000e+00	-137.408	-137.495	-0.087	(0)
HgS2-2	0.000e+00	0.000e+00	-138.220	-138.568	-0.349	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.735	-138.735	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.792	-146.981	-0.189	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.886	-147.228	-0.342	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.045	-147.132	-0.087	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.632	-147.958	-0.326	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.702	-147.789	-0.087	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.436	-148.787	-0.351	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.764	-149.098	-0.334	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.413	-149.413	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.728	-149.728	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.709	-150.709	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.018	-159.018	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.659	-215.746	-0.087	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.188	-224.275	-0.087	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.883	-225.970	-0.087	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.273	-226.621	-0.349	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.464	-227.551	-0.087	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.036	-235.123	-0.087	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.568	-301.916	-0.349	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.529	-303.878	-0.349	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.269	-317.618	-0.349	(0)
S (6)	7.495e-03					
SO4-2	5.944e-03	3.121e-03	-2.226	-2.506	-0.280	(0)
CaSO4	7.005e-04	7.005e-04	-3.155	-3.155	0.000	(0)
MgSO4	6.515e-04	6.515e-04	-3.186	-3.186	0.000	(0)
NaSO4-	1.486e-04	1.274e-04	-3.828	-3.895	-0.067	(0)
KSO4-	4.267e-05	3.658e-05	-4.370	-4.437	-0.067	(0)
MnSO4	6.463e-06	6.463e-06	-5.190	-5.190	0.000	(0)

ZnSO4	7.674e-07	7.674e-07	-6.115	-6.115	0.000	(0)
Zn (SO4) 2-2	4.654e-08	2.086e-08	-7.332	-7.681	-0.349	(0)
CuSO4	4.317e-08	4.317e-08	-7.365	-7.365	0.000	(0)
NH4SO4-	2.373e-08	2.029e-08	-7.625	-7.693	-0.068	(0)
NiSO4	1.663e-08	1.663e-08	-7.779	-7.779	0.000	(0)
CoSO4	1.048e-08	1.048e-08	-7.980	-7.980	0.000	(0)
HSO4-	8.309e-09	7.079e-09	-8.080	-8.150	-0.070	(0)
CdSO4	1.615e-09	1.615e-09	-8.792	-8.792	0.000	(0)
PbSO4	3.085e-10	3.085e-10	-9.511	-9.511	0.000	(0)
Cd (SO4) 2-2	1.517e-10	6.799e-11	-9.819	-10.168	-0.349	(0)
AgSO4-	1.315e-10	1.076e-10	-9.881	-9.968	-0.087	(0)
CrOHSO4	2.194e-11	2.194e-11	-10.659	-10.659	0.000	(0)
Pb (SO4) 2-2	1.295e-11	5.802e-12	-10.888	-11.236	-0.349	(0)
Ni (SO4) 2-2	3.834e-12	1.718e-12	-11.416	-11.765	-0.349	(0)
FeSO4	1.588e-12	1.588e-12	-11.799	-11.799	0.000	(0)
AlSO4+	4.678e-13	3.985e-13	-12.330	-12.400	-0.070	(0)
CrSO4+	2.782e-14	2.276e-14	-13.556	-13.643	-0.087	(0)
UO2SO4	2.665e-14	2.665e-14	-13.574	-13.574	0.000	(0)
Al (SO4) 2-	1.564e-14	1.333e-14	-13.806	-13.875	-0.070	(0)
UO2 (SO4) 2-2	2.447e-15	1.097e-15	-14.611	-14.960	-0.349	(0)
VO2SO4-	3.071e-18	2.513e-18	-17.513	-17.600	-0.087	(0)
FeSO4+	9.339e-19	7.985e-19	-18.030	-18.098	-0.068	(0)
Cr2 (OH) 2SO4+2	1.311e-19	5.876e-20	-18.882	-19.231	-0.349	(0)
Fe (SO4) 2-	6.512e-20	5.328e-20	-19.186	-19.273	-0.087	(0)
Cr2 (OH) 2 (SO4) 2	1.089e-20	1.089e-20	-19.963	-19.963	0.000	(0)
VOSO4	1.055e-20	1.055e-20	-19.977	-19.977	0.000	(0)
HgSO4	1.378e-21	1.378e-21	-20.861	-20.861	0.000	(0)
CrO3SO4-2	2.584e-24	1.158e-24	-23.588	-23.936	-0.349	(0)
VSO4+	4.994e-35	4.086e-35	-34.302	-34.389	-0.087	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.228	-40.228	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.274	-41.622	-0.349	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.008	-58.095	-0.087	(0)
Sb (3)	5.135e-20					
Sb (OH) 3	2.598e-20	2.598e-20	-19.585	-19.585	0.000	(0)
HSbo2	2.537e-20	2.537e-20	-19.596	-19.596	0.000	(0)
Sbo2-	2.164e-24	1.770e-24	-23.665	-23.752	-0.087	(0)
Sb (OH) 4-	1.239e-24	1.013e-24	-23.907	-23.994	-0.087	(0)
Sb (OH) 2F	1.320e-25	1.320e-25	-24.879	-24.879	0.000	(0)
SbOF	1.299e-25	1.299e-25	-24.886	-24.886	0.000	(0)
Sb (OH) 2+	1.790e-26	1.465e-26	-25.747	-25.834	-0.087	(0)
Sbo+	6.176e-27	5.053e-27	-26.209	-26.296	-0.087	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.269	-317.618	-0.349	(0)
Sb (5)	1.493e-08					
Sbo3-	1.492e-08	1.221e-08	-7.826	-7.913	-0.087	(0)
Sb (OH) 6-	1.675e-11	1.426e-11	-10.776	-10.846	-0.070	(0)
Sbo2+	2.306e-24	1.887e-24	-23.637	-23.724	-0.087	(0)
Se (-2)	2.338e-14					
Ag2Se	2.338e-14	2.338e-14	-13.631	-13.631	0.000	(0)
HSe-	2.727e-39	2.231e-39	-38.564	-38.651	-0.087	(0)
MnSe	0.000e+00	0.000e+00	-41.336	-41.336	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.396	-42.396	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.669	-46.017	-0.349	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.277	-83.672	-1.394	(0)
Se (4)	8.719e-08					
HSeO3-	6.640e-08	5.433e-08	-7.178	-7.265	-0.087	(0)
SeO3-2	2.079e-08	9.318e-09	-7.682	-8.031	-0.349	(0)
H2SeO3	5.379e-13	5.379e-13	-12.269	-12.269	0.000	(0)
AgSeO3-	1.265e-14	1.035e-14	-13.898	-13.985	-0.087	(0)
Cd (SeO3) 2-2	3.525e-19	1.580e-19	-18.453	-18.801	-0.349	(0)
Ag (SeO3) 2-3	5.254e-21	8.633e-22	-20.280	-21.064	-0.784	(0)
FeHSeO3+2	7.304e-24	3.274e-24	-23.136	-23.485	-0.349	(0)
Se (6)	5.720e-11					
SeO4-2	5.710e-11	2.998e-11	-10.243	-10.523	-0.280	(0)
MnSeO4	9.397e-14	9.397e-14	-13.027	-13.027	0.000	(0)
ZnSeO4	5.219e-15	5.219e-15	-14.282	-14.282	0.000	(0)
NiSeO4	3.744e-16	3.744e-16	-15.427	-15.427	0.000	(0)
CoSeO4	2.530e-16	2.530e-16	-15.597	-15.597	0.000	(0)
HSeO4-	4.262e-17	3.488e-17	-16.370	-16.457	-0.087	(0)

	CdSeO4	1.232e-17	1.232e-17	-16.909	-16.909	0.000	(0)
	Zn (SeO4) 2-2	3.540e-25	1.586e-25	-24.451	-24.800	-0.349	(0)
Si	1.421e-04						
	H4SiO4	1.411e-04	1.420e-04	-3.851	-3.848	0.003	(0)
	H3SiO4-	1.042e-06	8.844e-07	-5.982	-6.053	-0.071	(0)
	H2SiO4-2	4.451e-12	2.404e-12	-11.352	-11.619	-0.268	(0)
	UO2H3SiO4+	5.179e-13	4.237e-13	-12.286	-12.373	-0.087	(0)
	SiF6-2	8.855e-28	4.731e-28	-27.053	-27.325	-0.272	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-58.802	-59.586	-0.784	(0)
U (4)	2.640e-21						
	U (OH) 5-	2.638e-21	2.158e-21	-20.579	-20.666	-0.087	(0)
	U (OH) 4	2.099e-24	2.099e-24	-23.678	-23.678	0.000	(0)
	U (OH) 3+	2.178e-28	1.782e-28	-27.662	-27.749	-0.087	(0)
	U (OH) 2+2	4.269e-33	1.913e-33	-32.370	-32.718	-0.349	(0)
	UF3+	2.572e-36	2.104e-36	-35.590	-35.677	-0.087	(0)
	UF2+2	2.114e-37	9.476e-38	-36.675	-37.023	-0.349	(0)
	UF4	3.233e-38	3.233e-38	-37.490	-37.490	0.000	(0)
	UOH+3	1.273e-38	2.093e-39	-37.895	-38.679	-0.784	(0)
	UF+3	3.269e-40	0.000e+00	-39.486	-40.270	-0.784	(0)
	UF5-	2.194e-40	1.795e-40	-39.659	-39.746	-0.087	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-40.228	-40.228	0.000	(0)
	UF6-2	0.000e+00	0.000e+00	-40.771	-41.119	-0.349	(0)
	USO4+2	0.000e+00	0.000e+00	-41.274	-41.622	-0.349	(0)
	U+4	0.000e+00	0.000e+00	-44.322	-45.716	-1.394	(0)
	UCl+3	0.000e+00	0.000e+00	-45.754	-46.538	-0.784	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-169.883	-176.942	-7.059	(0)
U (5)	3.549e-17						
	UO2+	3.549e-17	2.904e-17	-16.450	-16.537	-0.087	(0)
U (6)	1.415e-07						
	UO2 (CO3) 3-4	1.079e-07	4.352e-09	-6.967	-8.361	-1.394	(0)
	UO2 (CO3) 2-2	3.348e-08	1.501e-08	-7.475	-7.824	-0.349	(0)
	UO2CO3	1.300e-10	1.300e-10	-9.886	-9.886	0.000	(0)
	UO2H3SiO4+	5.179e-13	4.237e-13	-12.286	-12.373	-0.087	(0)
	UO2OH+	3.765e-13	3.080e-13	-12.424	-12.511	-0.087	(0)
	UO2F+	1.334e-13	1.091e-13	-12.875	-12.962	-0.087	(0)
	UO2F2	4.411e-14	4.411e-14	-13.355	-13.355	0.000	(0)
	UO2SO4	2.665e-14	2.665e-14	-13.574	-13.574	0.000	(0)
	UO2+2	1.075e-14	5.643e-15	-13.969	-14.248	-0.280	(0)
	UO2 (SO4) 2-2	2.447e-15	1.097e-15	-14.611	-14.960	-0.349	(0)
	UO2F3-	1.897e-15	1.552e-15	-14.722	-14.809	-0.087	(0)
	UO2Cl+	3.364e-17	2.752e-17	-16.473	-16.560	-0.087	(0)
	UO2F4-2	3.856e-18	1.728e-18	-17.414	-17.762	-0.349	(0)
	(UO2) 2 (OH) 2+2	3.514e-19	1.575e-19	-18.454	-18.803	-0.349	(0)
	(UO2) 3 (OH) 5+	8.455e-21	6.918e-21	-20.073	-20.160	-0.087	(0)
	UO2NO3+	5.963e-23	4.879e-23	-22.225	-22.312	-0.087	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-42.706	-42.793	-0.087	(0)
	V+2	0.000e+00	0.000e+00	-43.592	-43.941	-0.349	(0)
V (3)	1.824e-15						
	V (OH) 3	1.824e-15	1.824e-15	-14.739	-14.739	0.000	(0)
	V (OH) 2+	3.344e-26	2.736e-26	-25.476	-25.563	-0.087	(0)
	VOH+2	1.345e-29	6.027e-30	-28.871	-29.220	-0.349	(0)
	V+3	1.688e-34	2.773e-35	-33.773	-34.557	-0.784	(0)
	VSO4+	4.994e-35	4.086e-35	-34.302	-34.389	-0.087	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-55.547	-56.331	-0.784	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-56.246	-57.640	-1.394	(0)
V (4)	1.348e-18						
	V (OH) 3+	1.297e-18	1.061e-18	-17.887	-17.974	-0.087	(0)
	VO+2	2.739e-20	1.227e-20	-19.562	-19.911	-0.349	(0)
	VOF+	1.261e-20	1.031e-20	-19.899	-19.987	-0.087	(0)
	VOSO4	1.055e-20	1.055e-20	-19.977	-19.977	0.000	(0)
	VOF2	5.420e-22	5.420e-22	-21.266	-21.266	0.000	(0)
	VOC1+	1.266e-22	1.036e-22	-21.898	-21.985	-0.087	(0)
	VOF3-	3.293e-24	2.694e-24	-23.482	-23.570	-0.087	(0)
	VOF4-2	3.400e-27	1.524e-27	-26.468	-26.817	-0.349	(0)
	H2V2O4+2	1.261e-31	5.651e-32	-30.899	-31.248	-0.349	(0)
V (5)	4.588e-09						

H2VO4-	3.830e-09	3.134e-09	-8.417	-8.504	-0.087	(0)
HVO4-2	7.568e-10	3.392e-10	-9.121	-9.470	-0.349	(0)
H3VO4	7.274e-13	7.274e-13	-12.138	-12.138	0.000	(0)
H3V2O7-	1.800e-14	1.473e-14	-13.745	-13.832	-0.087	(0)
HV2O7-3	2.193e-15	3.603e-16	-14.659	-15.443	-0.784	(0)
VO4-3	4.457e-16	7.323e-17	-15.351	-16.135	-0.784	(0)
VO2+	3.962e-17	3.372e-17	-16.402	-16.472	-0.070	(0)
V2O7-4	1.036e-17	4.179e-19	-16.985	-18.379	-1.394	(0)
VO2F	8.287e-18	8.287e-18	-17.082	-17.082	0.000	(0)
VO2SO4-	3.071e-18	2.513e-18	-17.513	-17.600	-0.087	(0)
VO2F2-	5.153e-19	4.216e-19	-18.288	-18.375	-0.087	(0)
V3O9-3	1.964e-19	3.228e-20	-18.707	-19.491	-0.784	(0)
VO2F3-2	1.644e-21	7.369e-22	-20.784	-21.133	-0.349	(0)
V4O12-4	1.046e-24	4.219e-26	-23.980	-25.375	-1.394	(0)
VO2F4-3	3.092e-25	5.081e-26	-24.510	-25.294	-0.784	(0)
VO2NO3	7.391e-26	7.391e-26	-25.131	-25.131	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-63.531	-66.668	-3.137	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.937	-66.116	-2.179	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.148	-68.542	-1.394	(0)
Zn	3.535e-06					
Zn+2	2.141e-06	1.124e-06	-5.669	-5.949	-0.280	(0)
ZnSO4	7.674e-07	7.674e-07	-6.115	-6.115	0.000	(0)
ZnCO3	3.742e-07	3.742e-07	-6.427	-6.427	0.000	(0)
ZnHCO3+	1.244e-07	1.018e-07	-6.905	-6.992	-0.087	(0)
ZnOH+	5.956e-08	4.873e-08	-7.225	-7.312	-0.087	(0)
Zn (SO4) 2-2	4.654e-08	2.086e-08	-7.332	-7.681	-0.349	(0)
ZnCl+	1.000e-08	8.490e-09	-8.000	-8.071	-0.071	(0)
ZnOHC1	4.820e-09	4.820e-09	-8.317	-8.317	0.000	(0)
ZnF+	3.840e-09	3.142e-09	-8.416	-8.503	-0.087	(0)
Zn (OH) 2	3.349e-09	3.349e-09	-8.475	-8.475	0.000	(0)
ZnCl2	4.047e-11	4.047e-11	-10.393	-10.393	0.000	(0)
Zn (OH) 3-	8.895e-12	7.278e-12	-11.051	-11.138	-0.087	(0)
ZnCl3-	1.139e-13	9.668e-14	-12.943	-13.015	-0.071	(0)
ZnNO3+	1.495e-14	1.223e-14	-13.825	-13.912	-0.087	(0)
ZnSeO4	5.219e-15	5.219e-15	-14.282	-14.282	0.000	(0)
Zn (OH) 4-2	2.803e-16	1.256e-16	-15.552	-15.901	-0.349	(0)
ZnCl4-2	2.721e-16	1.454e-16	-15.565	-15.837	-0.272	(0)
Zn (NO3) 2	1.058e-23	1.058e-23	-22.976	-22.976	0.000	(0)
Zn (SeO4) 2-2	3.540e-25	1.586e-25	-24.451	-24.800	-0.349	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.702	-147.789	-0.087	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.413	-149.413	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.188	-224.275	-0.087	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.273	-226.621	-0.349	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.529	-303.878	-0.349	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-53.55	-47.26	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-40.09	-35.58	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-47.31	-35.58	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-69.62	-51.69	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-54.19	-34.16	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-27.99	-27.59	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-23.41	-22.96	0.45	(NH4) 2SeO4	
Acanthite	-51.81	-88.03	-36.22	Ag2S	
Ag2CO3	-11.67	-22.76	-11.09	Ag2CO3	
Ag2CrO4	-21.09	-32.68	-11.59	Ag2CrO4	
Ag2HVO4	-12.57	-11.09	1.48	Ag2HVO4	
Ag2MoO4	-12.26	-23.81	-11.55	Ag2MoO4	
Ag2O	-14.83	-2.26	12.57	Ag2O	
Ag2Se	0.16	-48.54	-48.70	Ag2Se	
Ag2SeO3	-10.01	-17.16	-7.15	Ag2SeO3	
Ag2SeO4	-19.14	-28.05	-8.91	Ag2SeO4	
Ag2SO4	-15.21	-20.03	-4.82	Ag2SO4	
Ag3AsO3	-27.84	-25.68	2.16	Ag3AsO3	
Ag3AsO4	-16.37	-19.16	-2.79	Ag3AsO4	

Ag3H2VO5	-17.40	-12.22	5.18	Ag3H2VO5
AgF:4H2O	-13.67	-12.62	1.05	AgF:4H2O
Agmetal	-0.33	-13.84	-13.51	Ag
AgVO3	-10.74	-9.97	0.77	AgVO3
Al(OH)3(am)	-1.68	9.12	10.80	Al(OH)3
Al2(MoO4)3	-48.79	-46.43	2.37	Al2(MoO4)3
Al2O3	-1.41	18.24	19.65	Al2O3
Al4(OH)10SO4	-4.00	18.70	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.46	-6.66	4.80	AlAsO4:2H2O
AlOHSO4	-5.43	-8.66	-3.23	AlOHSO4
AlSb	-152.34	-86.71	65.62	AlSb
Alunite	-1.94	-3.34	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.41	-12.20	-7.79	PbSO4
Anhydrite	-1.15	-5.51	-4.36	CaSO4
Anilite	-54.84	-86.72	-31.88	Cu0.25Cu1.5S
Antlerite	-2.41	6.37	8.79	Cu3(OH)4SO4
Aragonite	0.05	-8.25	-8.30	CaCO3
Arsenolite	-86.41	-89.17	-2.76	As4O6
Artinite	-5.45	4.15	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.26	-31.55	6.71	As2O5
Atacamite	-1.45	5.94	7.39	Cu2(OH)3Cl
Azurite	0.04	-16.86	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.81	7.58	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.39	-2.51	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.10	-8.81	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-27.87	5.07	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.17	-22.84	-9.67	BaCrO4
BaF2	-9.57	-15.39	-5.82	BaF2
BaMoO4	-7.01	-13.97	-6.96	BaMoO4
Barite	-0.21	-10.19	-9.98	BaSO4
BaS	-94.37	-78.19	16.18	BaS
BaSeO3	-9.15	-7.32	1.83	BaSeO3
BaSeO4	-10.75	-18.21	-7.46	BaSeO4
Bianchite	-6.69	-8.46	-1.76	ZnSO4:6H2O
Birnessite	-7.69	10.40	18.09	MnO2
Bixbyite	-3.97	-4.62	-0.64	Mn2O3
BlaubleiI	-54.76	-78.93	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.24	-82.52	-27.28	Cu0.6Cu0.8S
Boehmite	0.54	9.12	8.58	AlOOH
Breithauptite	-56.91	-75.43	-18.52	NiSb
Brochantite	-0.80	14.42	15.22	Cu4(OH)6SO4
Brucite	-4.52	12.33	16.84	Mg(OH)2
Bunsenite	-4.75	7.69	12.45	NiO
Ca(VO3)2	-11.08	-5.42	5.66	Ca(VO3)2
Ca2V2O7	-10.66	6.84	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.71	6.84	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.07	5.23	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.86	19.10	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.76	19.10	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-297.86	-154.88	142.97	Ca3Sb2
CaCrO4	-15.90	-18.16	-2.27	CaCrO4
Calcite	0.23	-8.25	-8.48	CaCO3
Calomel	-8.03	-25.94	-17.91	Hg2Cl2
CaMoO4	-1.35	-9.30	-7.95	CaMoO4
Carnotite	-3.19	-2.96	0.23	KUO2VO4
CaSeO3:2H2O	-5.45	-2.64	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.51	-13.53	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.46	-2.62	9.84	Cd(BO2)2
Cd(OH)2	-7.03	6.61	13.64	Cd(OH)2
Cd(OH)2(am)	-7.12	6.61	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.42	-15.71	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.50	2.06	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.73	8.67	28.40	Cd4(OH)6SO4
CdCl2	-13.04	-13.70	-0.66	CdCl2
CdCl2:1H2O	-12.01	-13.70	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.79	-13.70	-1.91	CdCl2:2.5H2O
CdF2	-15.15	-16.36	-1.21	CdF2
Cdmetal(alpha)	-32.32	-18.80	13.51	Cd

Cdmetal (gamma)	-32.42	-18.80	13.62	Cd
CdMoO4	-0.79	-14.94	-14.15	CdMoO4
CdOHCl	-7.08	-3.54	3.54	CdOHCl
CdSb	-76.16	-76.51	-0.35	CdSb
CdSe	-19.47	-39.67	-20.20	CdSe
CdSeO4:2H2O	-17.33	-19.18	-1.85	CdSeO4:2H2O
CdSO4	-10.99	-11.16	-0.17	CdSO4
CdSO4:1H2O	-9.44	-11.16	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.29	-11.16	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.80	-14.93	-13.13	PbCO3
CH4 (g)	-81.12	-122.17	-41.05	CH4
Chalcanthite	-7.09	-9.73	-2.64	CuSO4:5H2O
Chalcedony	-0.30	-3.85	-3.55	SiO2
Chalcocite	-54.79	-89.71	-34.92	Cu2S
Chalcopyrite	-124.65	-159.92	-35.27	CuFeS2
Chrysotile	-2.91	29.29	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-51.78	-97.47	-45.69	HgS
Claudetite	-86.11	-89.17	-3.06	As4O6
Clausthalite	-13.61	-40.71	-27.10	PbSe
Co (BO2) 2	-28.81	-1.74	27.07	Co (BO2) 2
Co (OH) 2	-5.60	7.49	13.09	Co (OH) 2
Co (OH) 3	-9.89	-12.20	-2.31	Co (OH) 3
CO2 (g)	-2.36	-20.51	-18.15	CO2
Co3 (AsO4) 2	-22.10	-9.07	13.03	Co3 (AsO4) 2
Co3O4	-6.41	-16.90	-10.50	Co3O4
CoCl2	-21.08	-12.82	8.27	CoCl2
CoCl2:6H2O	-15.36	-12.82	2.54	CoCl2:6H2O
CoCO3	-3.03	-13.01	-9.98	CoCO3
CoF2	-13.88	-15.48	-1.60	CoF2
CoF3	-45.20	-46.66	-1.46	CoF3
CoFe2O4	17.54	14.02	-3.53	CoFe2O4
CoMoO4	-6.30	-14.06	-7.76	CoMoO4
CoO	-6.09	7.49	13.59	CoO
CoS (alpha)	-70.84	-78.28	-7.44	CoS
CoS (beta)	-67.21	-78.28	-11.07	CoS
CoSe	-22.59	-38.79	-16.20	CoSe
CoSeO3	-8.72	-7.40	1.32	CoSeO3
CoSeO4:6H2O	-16.77	-18.30	-1.53	CoSeO4:6H2O
CoSO4	-13.08	-10.28	2.80	CoSO4
CoSO4:6H2O	-7.81	-10.28	-2.47	CoSO4:6H2O
Cotunnite	-9.96	-14.74	-4.78	PbCl2
Covellite	-55.43	-77.73	-22.30	CuS
Cr (OH) 2	-21.75	-10.93	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.17	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.42	-1.17	-0.75	Cr (OH) 3
Cr2O3	0.01	-2.34	-2.36	Cr2O3
CrCl2	-45.34	-31.24	14.09	CrCl2
CrCl3	-46.75	-31.64	15.11	CrCl3
CrF3	-24.30	-35.63	-11.34	CrF3
Cristobalite	-0.50	-3.85	-3.35	SiO2
Crmetal	-66.83	-36.35	30.48	Cr
CrO3	-27.21	-30.42	-3.21	CrO3
Cryolite	-9.42	-43.26	-33.84	Na3AlF6
Cu (OH) 2	-0.62	8.05	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.50	19.71	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.15	0.10	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.87	-89.75	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.42	-50.22	-45.80	Cu2Se
Cu2SO4	-19.76	-21.71	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.50	-7.40	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.14	-101.74	-42.59	Cu3Sb
Cu3Se2	-24.97	-88.46	-63.49	Cu3Se2
CuCO3	-0.96	-12.46	-11.50	CuCO3
CuCrO4	-16.94	-22.38	-5.44	CuCrO4
CuF	-8.55	-13.46	-4.91	CuF
CuF2	-16.04	-14.93	1.12	CuF2
CuF2:2H2O	-10.38	-14.93	-4.55	CuF2:2H2O

Cumetal	-5.92	-14.68	-8.76	Cu
CuMoO4	-0.43	-13.51	-13.08	CuMoO4
CuOCuSO4	-11.98	-1.68	10.30	CuOCuSO4
Cupricferrite	8.58	14.57	5.99	CuFe2O4
Cuprite	-2.53	-3.94	-1.41	Cu2O
Cuprousferrite	10.21	1.29	-8.92	CuFeO2
CuSe	-5.14	-38.24	-33.10	CuSe
CuSe2	-25.74	-59.11	-33.37	CuSe2
CuSeO3:2H2O	-7.36	-6.85	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.30	-17.74	-2.44	CuSeO4:5H2O
CuSO4	-12.66	-9.72	2.94	CuSO4
Diaspore	2.25	9.12	6.87	AlOOH
Djurleite	-55.00	-88.92	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.12	-16.42	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.67	-16.42	-17.09	CaMg(CO3)2
Epsomite	-3.32	-5.45	-2.13	MgSO4:7H2O
Fe(OH)2	-9.98	3.58	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.25	0.21	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.37	-14.09	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.93	-8.38	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.55	-38.18	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.07	-46.80	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.12	10.11	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.92	-12.52	0.40	FeAsO4:2H2O
FeCr2O4	-5.96	1.24	7.20	FeCr2O4
FeMoO4	-7.88	-17.97	-10.09	FeMoO4
Ferrihydrite	0.07	3.26	3.19	Fe(OH)3
Ferroselite	-44.97	-63.57	-18.60	FeSe2
FeS(ppt)	-79.24	-82.19	-2.95	FeS
FeSe	-31.70	-42.70	-11.00	FeSe
Fix_pe	-5.07	-5.07	0.00	e-
Fluorite	-0.22	-10.72	-10.50	CaF2
Galena	-66.23	-80.20	-13.97	PbS
Gibbsite	0.83	9.12	8.29	Al(OH)3
Goethite	2.77	3.26	0.49	FeOOH
Goslarite	-6.45	-8.46	-2.01	ZnSO4:7H2O
Greenalite	-17.75	3.06	20.81	Fe3Si2O5(OH)4
Greenockite	-64.80	-79.16	-14.36	CdS
Greigite	-287.96	-333.00	-45.03	Fe3S4
Gummite	-6.65	1.02	7.67	UO3
Gypsum	-0.91	-5.52	-4.61	CaSO4:2H2O
H-Jarosite	-13.67	-25.77	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.68	-21.56	-12.88	H2MoO4
H2S(g)	-77.77	-85.78	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-6.24	-4.64	1.60	NaCl
Halloysite	0.97	10.54	9.57	Al2Si2O5(OH)4
Hausmannite	-4.61	56.42	61.03	Mn3O4
Hematite	7.94	6.52	-1.42	Fe2O3
Hercynite	-1.07	21.82	22.89	FeAl2O4
Hg(CH3)2(g)	-182.33	-256.04	-73.71	Hg(CH3)2
Hg(g)	-7.65	-15.52	-7.87	Hg
Hg(OH)2	-8.20	-11.70	-3.50	Hg(OH)2
Hg2(g)	-16.09	-31.04	-14.96	Hg2
Hg2(OH)2	-10.89	-5.63	5.26	Hg2(OH)2
Hg2CO3	-10.08	-26.13	-16.05	Hg2CO3
Hg2CrO4	-27.35	-36.05	-8.70	Hg2CrO4
Hg2F2	-18.24	-28.60	-10.36	Hg2F2
Hg2S	-79.73	-91.40	-11.68	Hg2S
Hg2SeO3	-15.87	-20.53	-4.66	Hg2SeO3
Hg2SO4	-17.27	-23.40	-6.13	Hg2SO4
Hg3O2CO3	-25.92	-55.60	-29.68	Hg3O2CO3
HgCl(g)	-32.47	-12.97	19.50	HgCl
HgCl2	-10.75	-32.01	-21.26	HgCl2
HgF(g)	-46.98	-14.30	32.68	HgF
HgF2(g)	-47.24	-34.67	12.57	HgF2
Hgmetal(1)	-2.07	-15.52	-13.45	Hg
HgSe	-2.29	-57.98	-55.69	HgSe

HgSeO3	-14.17	-26.60	-12.43	HgSeO3
HgSO4	-20.05	-29.47	-9.42	HgSO4
Huntite	-2.81	-32.78	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-5.52	-24.29	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.62	-20.38	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.41	-21.58	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-6.11	-20.91	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.90	-51.14	-17.24	K2Cr2O7
K2CrO4	-20.20	-20.72	-0.51	K2CrO4
K2MoO4	-15.11	-11.85	3.26	K2MoO4
K2SeO4	-15.36	-16.09	-0.73	K2SeO4
Kaolinite	3.11	10.54	7.43	Al2Si2O5 (OH) 4
Langite	-3.07	14.42	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.19	-6.63	-0.43	PbO : PbSO4
Laurionite	-5.21	-4.58	0.62	PbOHCl
Lepidocrocite	1.89	3.26	1.37	FeOOH
Lime	-20.44	12.26	32.70	CaO
Litharge	-7.12	5.57	12.69	PbO
Mackinawite	-78.59	-82.19	-3.60	FeS
Maghemite	0.14	6.52	6.39	Fe2O3
Magnesioferrite	1.99	18.85	16.86	Fe2MgO4
Magnesite	-0.72	-8.18	-7.46	MgCO3
Magnetite	6.70	10.11	3.40	Fe3O4
Malachite	0.90	-4.41	-5.31	Cu2 (OH) 2CO3
Manganite	-2.30	23.04	25.34	MnOOH
Massicot	-7.32	5.57	12.89	PbO
Matlockite	-7.10	-16.07	-8.97	PbClF
Melanothallite	-18.52	-12.26	6.26	CuCl2
Melanterite	-11.98	-14.19	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.38	-97.47	-45.09	HgS
Mg (OH) 2 (active)	-6.47	12.33	18.79	Mg (OH) 2
Mg (VO3) 2	-16.63	-5.35	11.28	Mg (VO3) 2
Mg2Sb3	-273.98	-199.30	74.68	Mg2Sb3
Mg2V2O7	-19.38	6.98	26.36	Mg2V2O7
MgCr2O4	-6.22	9.98	16.20	MgCr2O4
MgCrO4	-23.48	-18.10	5.38	MgCrO4
MgF2	-2.52	-10.65	-8.13	MgF2
MgMoO4	-7.38	-9.23	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.63	-2.57	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-12.26	-13.46	-1.20	MgSeO4 : 6H2O
Minium	-31.39	42.14	73.52	Pb3O4
Mirabilite	-5.63	-6.75	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-12.24	-7.34	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.23	-57.94	-5.71	Mn2 (SO4) 3
Mn2Sb	-148.95	-87.87	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.05	-0.55	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.69	-9.98	2.72	MnCl2 : 4H2O
MnS (grn)	-75.61	-75.44	0.17	MnS
MnS (pnk)	-78.78	-75.44	3.34	MnS
MnSb	-95.23	-98.14	-2.91	MnSb
MnSe	-39.45	-35.95	3.50	MnSe
MnSeO3	-5.69	-4.56	1.13	MnSeO3
MnSeO3 : 2H2O	-5.55	-4.56	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-13.41	-15.46	-2.05	MnSeO4 : 5H2O
MnSO4	-10.02	-7.44	2.58	MnSO4
Monteponite	-8.49	6.61	15.10	CdO
Montroydite	-8.06	-11.70	-3.64	HgO
MoO3	-13.55	-21.55	-8.00	MoO3
Morenosite	-7.94	-10.08	-2.14	NiSO4 : 7H2O
MoS2	-148.26	-218.52	-70.26	MoS2
Na-Jarosite	-9.05	-20.25	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.92	-49.82	-9.90	Na2Cr2O7
Na2CrO4	-22.32	-19.39	2.93	Na2CrO4
Na2Mo2O7	-15.48	-32.08	-16.60	Na2Mo2O7
Na2MoO4	-12.02	-10.52	1.49	Na2MoO4
Na2MoO4 : 2H2O	-11.75	-10.53	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-14.17	-3.87	10.30	Na2SeO3 : 5H2O
Na2SeO4	-16.04	-14.76	1.28	Na2SeO4

Na3Sb	-173.74	-79.29	94.45	Na3Sb
Na3VO4	-28.97	7.71	36.68	Na3VO4
Na4V2O7	-33.02	4.38	37.40	Na4V2O7
Nantokite	-5.39	-12.12	-6.73	CuCl
NaSb	-88.07	-64.90	23.17	NaSb
Natron	-8.17	-9.48	-1.31	Na2CO3:10H2O
NaVO3	-7.18	-3.32	3.86	NaVO3
Nesquehonite	-3.51	-8.18	-4.67	MgCO3:3H2O
Ni(OH)2	-5.10	7.69	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.17	-8.47	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.00	13.00	32.00	Ni4(OH)6SO4
NiCO3	-5.94	-12.81	-6.87	NiCO3
NiMoO4	-2.72	-13.86	-11.14	NiMoO4
NiS(alpha)	-72.48	-78.08	-5.60	NiS
NiS(beta)	-66.98	-78.08	-11.10	NiS
NiS(gamma)	-65.28	-78.08	-12.80	NiS
NiSe	-20.89	-38.59	-17.70	NiSe
NiSeO3:2H2O	-10.02	-7.20	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.58	-18.10	-1.52	NiSeO4:6H2O
Nsutite	-7.10	10.40	17.50	MnO2
O2(g)	-32.26	50.83	83.09	O2
Orpiment	-240.85	-301.91	-61.07	As2S3
Otavite	-1.89	-13.89	-12.00	CdCO3
Pb(BO2)2	-10.18	-3.66	6.52	Pb(BO2)2
Pb(OH)2	-2.58	5.57	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-58.54	-67.30	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.80	0.99	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.04	11.15	26.19	Pb2O(OH)2
Pb2O3	-24.48	36.56	61.04	Pb2O3
Pb2OCO3	-8.80	-9.36	-0.56	Pb2OCO3
Pb2V2O7	-4.63	-6.53	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.63	-14.83	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.10	-0.96	6.14	Pb3(VO4)2
Pb3O2CO3	-14.81	-3.79	11.02	Pb3O2CO3
Pb3O2SO4	-11.74	-1.05	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.58	4.52	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.36	4.52	21.88	Pb4O3SO4
PbCrO4	-12.25	-24.85	-12.60	PbCrO4
PbF2	-9.96	-17.40	-7.44	PbF2
Pbmetal	-24.09	-19.84	4.25	Pb
PbMoO4	-0.36	-15.98	-15.62	PbMoO4
PbO:0.3H2O	-7.41	5.57	12.98	PbO:0.3H2O
PbSeO4	-13.38	-20.22	-6.84	PbSeO4
Periclase	-9.26	12.33	21.58	MgO
Phosgenite	-9.86	-29.67	-19.81	PbCl2:PbCO3
Plattnerite	-18.61	30.99	49.60	PbO2
Portlandite	-10.54	12.26	22.80	Ca(OH)2
Pyrite	-124.04	-142.55	-18.51	FeS2
Pyrochroite	-4.86	10.33	15.19	Mn(OH)2
Pyrolusite	-5.63	35.75	41.38	MnO2
Quartz	0.15	-3.85	-4.00	SiO2
Realgar	-101.03	-120.78	-19.75	AsS
Retgersite	-8.04	-10.08	-2.04	NiSO4:6H2O
Rhodochrosite	0.41	-10.17	-10.58	MnCO3
Rutherfordine	-4.99	-19.49	-14.50	UO2CO3
Sb(OH)3	-12.48	-19.59	-7.11	Sb(OH)3
Sb2O4	-17.16	-13.75	3.40	Sb2O4
Sb2O5	-27.29	-36.96	-9.67	Sb2O5
Sb2Se3	-110.27	-178.03	-67.76	Sb2Se3
Sb4O6(cubic)	-60.08	-78.34	-18.26	Sb4O6
Sb4O6(orth)	-60.44	-78.34	-17.90	Sb4O6
SbCl3	-50.62	-50.05	0.57	SbCl3
SbF3	-43.82	-54.05	-10.23	SbF3
Sbmetal	-46.02	-57.71	-11.69	Sb
SbO2	-3.36	-31.19	-27.82	SbO2
Schoepite	-4.97	1.02	5.99	UO2(OH)2:H2O
Semetal(am)	-13.76	-20.87	-7.11	Se
Semetal(hex)	-13.16	-20.87	-7.71	Se

Senarmontite	-26.80	-39.17	-12.37	Sb2O3
SeO2	-15.02	-14.90	0.12	SeO2
SeO3	-46.84	-25.79	21.04	SeO3
Sepiolite	-2.65	13.11	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-5.67	13.11	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.68	-16.92	-10.24	FeCO3
SiO2(am-gel)	-1.14	-3.85	-2.71	SiO2
SiO2(am-ppt)	-1.11	-3.85	-2.74	SiO2
Smithsonite	-1.19	-11.19	-10.00	ZnCO3
Sphalerite	-65.01	-76.46	-11.45	ZnS
Spinel	-6.28	30.57	36.85	MgAl2O4
Stibnite	-246.04	-296.50	-50.46	Sb2S3
Sulfur	-58.22	-60.36	-2.14	S
Tenorite	0.41	8.05	7.64	CuO
Thenardite	-7.07	-6.74	0.32	Na2SO4
Thermonatrite	-10.11	-9.48	0.64	Na2CO3:H2O
Tyuyamunite	-7.46	-3.38	4.08	Ca(UO2)2(VO4)2
U3O8	-15.79	5.29	21.08	U3O8
U3Sb4	-581.25	-428.87	152.38	U3Sb4
U4O9	-32.28	-35.30	-3.02	U4O9
UF4	-31.59	-61.13	-29.54	UF4
UF4:2.5H2O	-28.41	-61.13	-32.72	UF4:2.5H2O
UO2(am)	-16.11	-15.18	0.93	UO2
UO2(NO3)2	-43.12	-30.97	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.83	-30.98	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-34.37	-30.98	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-33.02	-30.98	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.59	1.02	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.52	-24.77	-2.25	UO2SeO4:4H2O
UO3	-6.68	1.02	7.70	UO3
Uraninite	-10.51	-15.18	-4.67	UO2
USb2	-220.22	-190.64	29.58	USb2
V(OH)3	-19.25	-11.65	7.59	V(OH)3
V2O5	-16.32	-17.68	-1.36	V2O5
V3O5	-41.18	-39.34	1.84	V3O5
V4O7	-51.17	-43.99	7.19	V4O7
V6O13	-43.00	-103.86	-60.86	V6O13
Valentinite	-30.69	-39.17	-8.48	Sb2O3
VC12	-63.55	-44.67	18.87	VC12
VC13	-65.55	-42.12	23.43	VC13
VF4	-65.52	-50.59	14.93	VF4
Vmetal	-93.80	-49.78	44.03	V
VO	-39.12	-24.36	14.76	VO
VO(OH)2	-9.79	-4.64	5.15	VO(OH)2
VO2Cl	-21.84	-18.99	2.84	VO2Cl
VOC1	-32.96	-21.81	11.15	VOC1
VOC12	-37.71	-24.95	12.76	VOC12
VOSO4	-26.03	-22.42	3.61	VOSO4
Witherite	-4.35	-12.92	-8.57	BaCO3
Wurtzite	-67.51	-76.46	-8.95	ZnS
Zincite	-2.01	9.32	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO4
Zn(BO2)2	-8.20	0.09	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.99	-22.68	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.88	9.32	12.20	Zn(OH)2
Zn(OH)2(am)	-3.16	9.32	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.44	9.32	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.22	9.32	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.42	9.32	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.64	0.86	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.71	8.48	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.24	-3.59	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.50	-7.59	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.90	19.50	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.22	26.28	38.50	Zn5(OH)8Cl2
ZnCl2	-18.04	-10.99	7.05	ZnCl2
ZnCO3:1H2O	-0.93	-11.19	-10.26	ZnCO3:1H2O
ZnF2	-13.12	-13.66	-0.53	ZnF2

Znmetal	-41.88	-16.10	25.79	Zn
ZnMoO4	-2.11	-12.24	-10.13	ZnMoO4
ZnO(active)	-1.87	9.32	11.19	ZnO
ZnS(am)	-67.41	-76.46	-9.05	ZnS
ZnSb	-84.82	-73.80	11.01	ZnSb
ZnSe	-22.57	-36.97	-14.40	ZnSe
ZnSeO4:6H2O	-14.95	-16.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.82	-8.46	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 113.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 605

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

```

      UO3 0 0
      UO2(OH)2(beta) 0 0
      ZnMoO4 0 0
USE solution 613
SAVE Solution 614 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 605
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 613. Solution after simulation 112.
Using pure phase assemblage 605.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	1.106e-09	1.106e-09
Alunite	-5.32	-6.72	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	1.948e-10	1.948e-10
Barite	-0.18	-10.16	-9.98	0.000e+00	0	0.000e+00
Brochantite	-0.00	15.22	15.22	0.000e+00	4.515e-07	4.515e-07
Brucite	-3.37	13.47	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.500e-03
CaMoO4	-1.58	-9.53	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-5.34	-2.53	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.168e-03	1.168e-03
Carnotite	-2.18	-1.95	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.38	-1.54	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.79	-14.94	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	0.000e+00	3.147e-05	3.147e-05
Cr2O3	0.00	-2.36	-2.36	0.000e+00	7.362e-10	7.362e-10
Cu2Se(alpha)	-4.77	-50.57	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.09	-14.17	-13.08	0.000e+00	0	0.000e+00
Epsomite	-3.30	-5.43	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.002e-09	1.002e-09
Fluorite	-0.45	-10.95	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.48	2.19	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.34	-59.03	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.60	-6.71	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.32	-4.19	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.90	8.89	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-24.17	-8.47	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.89	-12.76	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.67	-13.81	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.105e-06
Otavite	-1.88	-13.88	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.39	-16.01	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.96	-19.46	-14.50	0.000e+00	0	0.000e+00
SbO2	-4.00	-31.83	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.80	2.19	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.14	14.62	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.37	-4.11	-2.74	0.000e+00	0	0.000e+00

Tyuyamunite	-5.67	-1.59	4.08	0.000e+00	0	0.000e+00
U3O8	-12.41	8.67	21.08	0.000e+00	0	0.000e+00
UO2 (OH) 2 (beta)	-3.42	2.19	5.61	0.000e+00	0	0.000e+00
UO3	-5.51	2.19	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.12	-12.24	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	1.398e-08	1.398e-08
Al	1.390e-06	1.390e-06
As	9.928e-11	9.928e-11
B	2.483e-05	2.483e-05
Ba	3.931e-08	3.931e-08
C	9.659e-04	9.659e-04
Ca	1.470e-03	1.470e-03
Cd	7.092e-09	7.092e-09
Cl	3.533e-03	3.533e-03
Co	5.477e-08	5.477e-08
Cr	7.925e-10	7.925e-10
Cu	6.024e-07	6.024e-07
F	1.883e-04	1.883e-04
Fe	7.855e-10	7.854e-10
Hg	1.117e-09	1.117e-09
K	1.988e-03	1.988e-03
Mg	2.809e-03	2.809e-03
Mn	3.337e-05	3.337e-05
Mo	9.853e-07	9.853e-07
N	8.110e-06	8.110e-06
Na	9.089e-03	9.089e-03
Ni	8.533e-08	8.532e-08
Pb	5.173e-09	5.173e-09
S	7.495e-03	7.494e-03
Sb	1.493e-08	1.493e-08
Se	8.614e-08	8.614e-08
Si	7.916e-05	7.915e-05
U	1.415e-07	1.415e-07
V	4.588e-09	4.588e-09
Zn	3.535e-06	3.535e-06

-----Description of solution-----

	pH	=	8.212	Charge balance
	pe	=	4.561	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	2.656e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	9.930e-04	
	Total CO2 (mol/kg)	=	9.659e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	9.597e-07	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	23	
	Total H	=	1.110115e+02	
	Total O	=	5.553838e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.925e-06	1.638e-06	-5.716	-5.786	-0.070	(0)
H+	7.176e-09	6.144e-09	-8.144	-8.212	-0.067	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	1.398e-08					

AgCl	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
AgCl2-	2.928e-09	2.418e-09	-8.533	-8.617	-0.083	(0)
Ag+	1.735e-09	1.486e-09	-8.761	-8.828	-0.067	(0)
AgSO4-	1.193e-10	9.849e-11	-9.924	-10.007	-0.083	(0)
AgCl3-2	1.402e-11	6.519e-12	-10.853	-11.186	-0.332	(0)
AgNO2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
AgF	5.294e-13	5.294e-13	-12.276	-12.276	0.000	(0)
AgOH	2.434e-13	2.434e-13	-12.614	-12.614	0.000	(0)
AgCl4-3	2.254e-13	4.026e-14	-12.647	-13.395	-0.748	(0)
AgH2BO3	4.957e-14	4.957e-14	-13.305	-13.305	0.000	(0)
AgSeO3-	2.473e-14	2.042e-14	-13.607	-13.690	-0.083	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	6.575e-15	5.429e-15	-14.182	-14.265	-0.083	(0)
Ag (OH) 2-	4.718e-17	3.896e-17	-16.326	-16.409	-0.083	(0)
Ag (NO2) 2-	2.731e-17	2.255e-17	-16.564	-16.647	-0.083	(0)
AgNO3	7.626e-18	7.626e-18	-17.118	-17.118	0.000	(0)
Ag (NH3) 2+	9.565e-20	7.899e-20	-19.019	-19.102	-0.083	(0)
Ag (SeO3) 2-3	2.190e-20	3.912e-21	-19.660	-20.408	-0.748	(0)
Ag2MoO4	4.425e-25	4.425e-25	-24.354	-24.354	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.222	-74.222	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.884	-83.213	-1.330	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.419	-148.603	-0.184	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.248	-149.331	-0.083	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.488	-149.832	-0.344	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.815	-150.143	-0.327	(0)
Al	1.390e-06					
Al (OH) 4-	1.384e-06	1.186e-06	-5.859	-5.926	-0.067	(0)
Al (OH) 3	5.752e-09	5.752e-09	-8.240	-8.240	0.000	(0)
Al (OH) 2+	2.041e-10	1.760e-10	-9.690	-9.755	-0.064	(0)
AlF3	1.181e-11	1.181e-11	-10.928	-10.928	0.000	(0)
AlF2+	7.671e-12	6.613e-12	-11.115	-11.180	-0.064	(0)
AlF4-	9.795e-13	8.395e-13	-12.009	-12.076	-0.067	(0)
AlOH+2	2.449e-13	1.352e-13	-12.611	-12.869	-0.258	(0)
AlF+2	2.121e-13	1.171e-13	-12.673	-12.931	-0.258	(0)
AlSO4+	2.484e-15	2.129e-15	-14.605	-14.672	-0.067	(0)
Al+3	3.338e-16	8.256e-17	-15.477	-16.083	-0.607	(0)
Al (SO4) 2-	8.844e-17	7.580e-17	-16.053	-16.120	-0.067	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.268	-48.016	-0.748	(0)
As (3)	6.643e-25					
H3AsO3	6.033e-25	6.033e-25	-24.219	-24.219	0.000	(0)
H2AsO3-	6.098e-26	5.036e-26	-25.215	-25.298	-0.083	(0)
HAsO3-2	1.607e-29	7.475e-30	-28.794	-29.126	-0.332	(0)
H4AsO3+	2.224e-33	1.837e-33	-32.653	-32.736	-0.083	(0)
AsO3-3	2.626e-34	4.690e-35	-33.581	-34.329	-0.748	(0)
As (5)	9.928e-11					
HAsO4-2	9.612e-11	4.470e-11	-10.017	-10.350	-0.332	(0)
H2AsO4-	3.033e-12	2.505e-12	-11.518	-11.601	-0.083	(0)
AsO4-3	1.288e-13	2.301e-14	-12.890	-13.638	-0.748	(0)
H3AsO4	2.658e-18	2.674e-18	-17.575	-17.573	0.003	(0)
B	2.483e-05					
H3BO3	2.213e-05	2.227e-05	-4.655	-4.652	0.003	(0)
H2BO3-	2.492e-06	2.105e-06	-5.603	-5.677	-0.073	(0)
MgH2BO3+	9.713e-08	8.205e-08	-7.013	-7.086	-0.073	(0)
CaH2BO3+	7.956e-08	6.720e-08	-7.099	-7.173	-0.073	(0)
NaH2BO3	2.550e-08	2.550e-08	-7.594	-7.594	0.000	(0)
BF (OH) 3-	1.492e-09	1.260e-09	-8.826	-8.899	-0.073	(0)
H5 (BO3) 2-	4.724e-11	3.990e-11	-10.326	-10.399	-0.073	(0)
BaH2BO3+	1.617e-12	1.366e-12	-11.791	-11.865	-0.073	(0)
BF2 (OH) 2-	1.391e-13	1.175e-13	-12.857	-12.930	-0.073	(0)
H8 (BO3) 3-	1.052e-13	8.886e-14	-12.978	-13.051	-0.073	(0)
AgH2BO3	4.957e-14	4.957e-14	-13.305	-13.305	0.000	(0)
BF3OH-	4.718e-20	3.985e-20	-19.326	-19.400	-0.073	(0)
BF4-	2.024e-25	1.710e-25	-24.694	-24.767	-0.073	(0)
Ba	3.931e-08					
Ba+2	3.906e-08	2.099e-08	-7.408	-7.678	-0.270	(0)
BaHCO3+	1.813e-10	1.568e-10	-9.742	-9.805	-0.063	(0)
BaCO3	6.427e-11	6.427e-11	-10.192	-10.192	0.000	(0)
BaH2BO3+	1.617e-12	1.366e-12	-11.791	-11.865	-0.073	(0)

BaOH+	1.746e-13	1.501e-13	-12.758	-12.824	-0.066	(0)
BaNO3+	8.233e-16	6.799e-16	-15.084	-15.168	-0.083	(0)
BaNH3+2	5.098e-17	2.371e-17	-16.293	-16.625	-0.332	(0)
C (4)	9.659e-04					
HCO3-	9.075e-04	7.823e-04	-3.042	-3.107	-0.064	(0)
CO3-2	1.110e-05	5.969e-06	-4.954	-5.224	-0.270	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
MgHCO3+	1.053e-05	8.998e-06	-4.977	-5.046	-0.068	(0)
CaHCO3+	9.341e-06	8.081e-06	-5.030	-5.093	-0.063	(0)
MgCO3	5.581e-06	5.581e-06	-5.253	-5.253	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	3.362e-06	3.362e-06	-5.473	-5.473	0.000	(0)
NaCO3-	9.854e-07	8.494e-07	-6.006	-6.071	-0.064	(0)
CuCO3	4.508e-07	4.508e-07	-6.346	-6.346	0.000	(0)
ZnCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
MnHCO3+	2.183e-07	1.877e-07	-6.661	-6.727	-0.066	(0)
UO2 (CO3) 3-4	1.058e-07	4.949e-09	-6.976	-8.306	-1.330	(0)
UO2 (CO3) 2-2	3.557e-08	1.654e-08	-7.449	-7.781	-0.332	(0)
ZnHCO3+	3.232e-08	2.669e-08	-7.491	-7.574	-0.083	(0)
Cu (CO3) 2-2	1.557e-08	7.243e-09	-7.808	-8.140	-0.332	(0)
NiCO3	6.542e-09	6.542e-09	-8.184	-8.184	0.000	(0)
NiHCO3+	3.431e-09	2.833e-09	-8.465	-8.548	-0.083	(0)
PbCO3	3.291e-09	3.291e-09	-8.483	-8.483	0.000	(0)
CoCO3	1.812e-09	1.812e-09	-8.742	-8.742	0.000	(0)
CoHCO3+	1.323e-09	1.093e-09	-8.878	-8.961	-0.083	(0)
CuHCO3+	7.666e-10	6.331e-10	-9.115	-9.199	-0.083	(0)
CdCO3	2.973e-10	2.973e-10	-9.527	-9.527	0.000	(0)
BaHCO3+	1.813e-10	1.568e-10	-9.742	-9.805	-0.063	(0)
UO2CO3	1.389e-10	1.389e-10	-9.857	-9.857	0.000	(0)
PbHCO3+	1.291e-10	1.066e-10	-9.889	-9.972	-0.083	(0)
Pb (CO3) 2-2	1.218e-10	5.665e-11	-9.914	-10.247	-0.332	(0)
BaCO3	6.427e-11	6.427e-11	-10.192	-10.192	0.000	(0)
CdHCO3+	4.713e-12	3.892e-12	-11.327	-11.410	-0.083	(0)
Cd (CO3) 2-2	2.828e-12	1.315e-12	-11.548	-11.881	-0.332	(0)
FeHCO3+	1.214e-15	1.051e-15	-14.916	-14.979	-0.063	(0)
HgCO3	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
Hg (CO3) 2-2	4.626e-17	2.152e-17	-16.335	-16.667	-0.332	(0)
HgHCO3+	1.579e-19	1.304e-19	-18.802	-18.885	-0.083	(0)
Ca	1.470e-03					
Ca+2	1.032e-03	5.548e-04	-2.986	-3.256	-0.270	(0)
CaSO4	4.222e-04	4.222e-04	-3.374	-3.374	0.000	(0)
CaHCO3+	9.341e-06	8.081e-06	-5.030	-5.093	-0.063	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	9.988e-07	8.589e-07	-6.001	-6.066	-0.066	(0)
CaH2BO3+	7.956e-08	6.720e-08	-7.099	-7.173	-0.073	(0)
CaOH+	2.096e-08	1.813e-08	-7.679	-7.742	-0.063	(0)
CaNO3+	1.373e-11	1.134e-11	-10.862	-10.946	-0.083	(0)
CaNH3+2	2.688e-12	1.250e-12	-11.571	-11.903	-0.332	(0)
Ca (NH3) 2+2	1.915e-21	8.907e-22	-20.718	-21.050	-0.332	(0)
Cd	7.092e-09					
Cd+2	4.066e-09	2.185e-09	-8.391	-8.661	-0.270	(0)
CdSO4	1.702e-09	1.702e-09	-8.769	-8.769	0.000	(0)
CdCl+	7.645e-10	6.313e-10	-9.117	-9.200	-0.083	(0)
CdCO3	2.973e-10	2.973e-10	-9.527	-9.527	0.000	(0)
Cd (SO4) 2-2	1.640e-10	7.627e-11	-9.785	-10.118	-0.332	(0)
CdOHC1	4.242e-11	4.242e-11	-10.372	-10.372	0.000	(0)
CdOH+	3.443e-11	2.843e-11	-10.463	-10.546	-0.083	(0)
CdC12	7.961e-12	7.961e-12	-11.099	-11.099	0.000	(0)
CdF+	5.949e-12	4.912e-12	-11.226	-11.309	-0.083	(0)
CdHCO3+	4.713e-12	3.892e-12	-11.327	-11.410	-0.083	(0)
Cd (CO3) 2-2	2.828e-12	1.315e-12	-11.548	-11.881	-0.332	(0)
Cd (OH) 2	2.939e-13	2.939e-13	-12.532	-12.532	0.000	(0)
CdCl3-	1.840e-14	1.520e-14	-13.735	-13.818	-0.083	(0)
CdF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000	(0)
CdNO3+	5.407e-17	4.465e-17	-16.267	-16.350	-0.083	(0)
CdSeO4	3.770e-17	3.770e-17	-16.424	-16.424	0.000	(0)
Cd (OH) 3-	3.562e-17	2.941e-17	-16.448	-16.531	-0.083	(0)
Cd (SeO3) 2-2	1.772e-18	8.240e-19	-17.752	-18.084	-0.332	(0)

Cd2OH+3	1.743e-18	3.114e-19	-17.759	-18.507	-0.748	(0)
Cd(OH) 4-2	1.696e-23	7.886e-24	-22.771	-23.103	-0.332	(0)
Cd(NO3) 2	1.446e-25	1.446e-25	-24.840	-24.840	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.778	-79.861	-0.083	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.866	-151.866	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-229.092	-229.175	-0.083	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-305.856	-306.188	-0.332	(0)
C1	3.533e-03					
C1-	3.533e-03	3.025e-03	-2.452	-2.519	-0.067	(0)
MnCl+	5.326e-08	4.580e-08	-7.274	-7.339	-0.066	(0)
ZnOHC1	1.758e-08	1.758e-08	-7.755	-7.755	0.000	(0)
ZnCl+	9.599e-09	8.199e-09	-8.018	-8.086	-0.068	(0)
AgCl	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
AgCl2-	2.928e-09	2.418e-09	-8.533	-8.617	-0.083	(0)
CdCl+	7.645e-10	6.313e-10	-9.117	-9.200	-0.083	(0)
CuCl	6.576e-10	6.576e-10	-9.182	-9.182	0.000	(0)
CuCl2-	4.866e-10	4.156e-10	-9.313	-9.381	-0.068	(0)
NiCl+	2.754e-10	2.274e-10	-9.560	-9.643	-0.083	(0)
CoCl+	2.276e-10	1.879e-10	-9.643	-9.726	-0.083	(0)
MnCl2	1.957e-10	1.957e-10	-9.708	-9.708	0.000	(0)
CuCl+	7.200e-11	6.150e-11	-10.143	-10.211	-0.068	(0)
CdOHC1	4.242e-11	4.242e-11	-10.372	-10.372	0.000	(0)
ZnCl2	3.931e-11	3.931e-11	-10.405	-10.405	0.000	(0)
PbCl+	2.384e-11	1.969e-11	-10.623	-10.706	-0.083	(0)
AgCl3-2	1.402e-11	6.519e-12	-10.853	-11.186	-0.332	(0)
CdCl2	7.961e-12	7.961e-12	-11.099	-11.099	0.000	(0)
HgClOH	1.397e-12	1.397e-12	-11.855	-11.855	0.000	(0)
CuCl3-2	4.917e-13	2.688e-13	-12.308	-12.571	-0.262	(0)
PbCl2	2.660e-13	2.660e-13	-12.575	-12.575	0.000	(0)
AgCl4-3	2.254e-13	4.026e-14	-12.647	-13.395	-0.748	(0)
MnCl3-	1.896e-13	1.631e-13	-12.722	-12.788	-0.066	(0)
HgCl2	1.460e-13	1.460e-13	-12.836	-12.836	0.000	(0)
ZnCl3-	1.106e-13	9.446e-14	-12.956	-13.025	-0.068	(0)
CuCl2	6.451e-14	6.451e-14	-13.190	-13.190	0.000	(0)
CdCl3-	1.840e-14	1.520e-14	-13.735	-13.818	-0.083	(0)
HgCl3-	5.350e-15	4.418e-15	-14.272	-14.355	-0.083	(0)
NiCl2	3.463e-15	3.463e-15	-14.460	-14.460	0.000	(0)
PbCl3-	3.879e-16	3.204e-16	-15.411	-15.494	-0.083	(0)
ZnCl4-2	2.614e-16	1.429e-16	-15.583	-15.845	-0.262	(0)
HgCl4-2	1.144e-16	5.320e-17	-15.942	-16.274	-0.332	(0)
UO2Cl+	3.473e-17	2.868e-17	-16.459	-16.542	-0.083	(0)
HgCl+	1.166e-17	9.632e-18	-16.933	-17.016	-0.083	(0)
CuCl3-	2.132e-18	1.821e-18	-17.671	-17.740	-0.068	(0)
PbCl4-2	9.525e-19	4.430e-19	-18.021	-18.354	-0.332	(0)
CrCl+2	4.796e-19	2.231e-19	-18.319	-18.652	-0.332	(0)
CrOHC12	2.101e-20	2.101e-20	-19.678	-19.678	0.000	(0)
CrCl2+	7.753e-23	6.403e-23	-22.111	-22.194	-0.083	(0)
FeCl+2	6.025e-23	3.294e-23	-22.220	-22.482	-0.262	(0)
CuCl4-2	5.051e-23	2.761e-23	-22.297	-22.559	-0.262	(0)
VOC1+	1.412e-24	1.166e-24	-23.850	-23.933	-0.083	(0)
FeCl2+	5.176e-25	4.451e-25	-24.286	-24.352	-0.066	(0)
CrO3Cl-	4.312e-26	3.561e-26	-25.365	-25.448	-0.083	(0)
FeCl3	1.346e-28	1.346e-28	-27.871	-27.871	0.000	(0)
CoCl+2	3.443e-36	1.601e-36	-35.463	-35.796	-0.332	(0)
UCl+3	0.000e+00	0.000e+00	-47.056	-47.804	-0.748	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
Co (2)	5.477e-08					
Co+2	3.862e-08	1.796e-08	-7.413	-7.746	-0.332	(0)
CoSO4	1.190e-08	1.190e-08	-7.924	-7.924	0.000	(0)
CoCO3	1.812e-09	1.812e-09	-8.742	-8.742	0.000	(0)
CoHCO3+	1.323e-09	1.093e-09	-8.878	-8.961	-0.083	(0)
CoOH+	7.108e-10	5.870e-10	-9.148	-9.231	-0.083	(0)
CoCl+	2.276e-10	1.879e-10	-9.643	-9.726	-0.083	(0)
CoF+	9.755e-11	8.055e-11	-10.011	-10.094	-0.083	(0)
Co (OH) 2	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
CoNO2+	1.050e-12	8.668e-13	-11.979	-12.062	-0.083	(0)

Co (NH3) +2	8.309e-15	3.864e-15	-14.080	-14.413	-0.332	(0)
Co (OH) 3-	3.023e-15	2.496e-15	-14.520	-14.603	-0.083	(0)
CoSeO4	8.341e-16	8.341e-16	-15.079	-15.079	0.000	(0)
CoOOH-	7.588e-16	6.266e-16	-15.120	-15.203	-0.083	(0)
CoNO3+	2.227e-16	1.839e-16	-15.652	-15.735	-0.083	(0)
Co2OH+3	2.958e-18	5.283e-19	-17.529	-18.277	-0.748	(0)
Co (OH) 4-2	1.394e-21	6.481e-22	-20.856	-21.188	-0.332	(0)
Co (NH3) 2+2	6.344e-22	2.950e-22	-21.198	-21.530	-0.332	(0)
Co (NO3) 2	2.418e-24	2.418e-24	-23.617	-23.617	0.000	(0)
Co4 (OH) 4+4	5.063e-28	2.369e-29	-27.296	-28.625	-1.330	(0)
Co (NH3) 3+2	1.429e-29	6.648e-30	-28.845	-29.177	-0.332	(0)
Co (NH3) 4+2	1.343e-37	6.244e-38	-36.872	-37.205	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.399	-45.732	-0.332	(0)
Co (3)	4.656e-29					
CoOH+2	4.656e-29	2.165e-29	-28.332	-28.664	-0.332	(0)
Co+3	1.052e-35	2.601e-36	-34.978	-35.585	-0.607	(0)
CoCl+2	3.443e-36	1.601e-36	-35.463	-35.796	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.775	-68.107	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
Cr (2)	8.043e-28					
Cr+2	8.043e-28	3.741e-28	-27.095	-27.427	-0.332	(0)
Cr (3)	7.925e-10					
Cr (OH) 2+	4.928e-10	4.070e-10	-9.307	-9.390	-0.083	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.345e-11	1.937e-11	-10.630	-10.713	-0.083	(0)
Cr (OH) 4-	1.978e-11	1.633e-11	-10.704	-10.787	-0.083	(0)
Cr (OH) +2	4.390e-12	2.042e-12	-11.358	-11.690	-0.332	(0)
CrOHSO4	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
CrF+2	2.754e-15	1.281e-15	-14.560	-14.893	-0.332	(0)
CrSO4+	5.352e-16	4.420e-16	-15.271	-15.355	-0.083	(0)
Cr+3	3.190e-16	5.697e-17	-15.496	-16.244	-0.748	(0)
CrCl+2	4.796e-19	2.231e-19	-18.319	-18.652	-0.332	(0)
CrOHC12	2.101e-20	2.101e-20	-19.678	-19.678	0.000	(0)
Cr2 (OH) 2SO4+2	6.388e-22	2.971e-22	-21.195	-21.527	-0.332	(0)
CrCl2+	7.753e-23	6.403e-23	-22.111	-22.194	-0.083	(0)
Cr2 (OH) 2 (SO4) 2	5.863e-23	5.863e-23	-22.232	-22.232	0.000	(0)
CrNO3+2	3.460e-26	1.609e-26	-25.461	-25.793	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.061	-45.394	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-54.979	-55.728	-0.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Cr (6)	2.968e-14					
CrO4-2	2.849e-14	1.532e-14	-13.545	-13.815	-0.270	(0)
NaCrO4-	7.044e-16	5.817e-16	-15.152	-15.235	-0.083	(0)
HCrO4-	3.687e-16	3.045e-16	-15.433	-15.516	-0.083	(0)
KCrO4-	1.146e-16	9.464e-17	-15.941	-16.024	-0.083	(0)
CrO3SO4-2	4.073e-24	1.894e-24	-23.390	-23.723	-0.332	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	4.312e-26	3.561e-26	-25.365	-25.448	-0.083	(0)
Cr2O7-2	6.916e-30	3.217e-30	-29.160	-29.493	-0.332	(0)
Cu (1)	1.354e-09					
CuCl	6.576e-10	6.576e-10	-9.182	-9.182	0.000	(0)
CuCl2-	4.866e-10	4.156e-10	-9.313	-9.381	-0.068	(0)
Cu+	2.091e-10	1.727e-10	-9.680	-9.763	-0.083	(0)
CuCl3-2	4.917e-13	2.688e-13	-12.308	-12.571	-0.262	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.032	-148.368	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.778	-149.098	-0.320	(0)
Cu (2)	6.011e-07					
CuCO3	4.508e-07	4.508e-07	-6.346	-6.346	0.000	(0)
CuOH+	7.779e-08	6.645e-08	-7.109	-7.178	-0.068	(0)
Cu+2	2.386e-08	1.283e-08	-7.622	-7.892	-0.270	(0)
Cu (OH) 2	2.172e-08	2.172e-08	-7.663	-7.663	0.000	(0)
Cu (CO3) 2-2	1.557e-08	7.243e-09	-7.808	-8.140	-0.332	(0)
CuSO4	9.762e-09	9.762e-09	-8.010	-8.010	0.000	(0)
CuHCO3+	7.666e-10	6.331e-10	-9.115	-9.199	-0.083	(0)
Cu2 (OH) 2+2	2.385e-10	1.109e-10	-9.623	-9.955	-0.332	(0)
CuF+	1.390e-10	1.148e-10	-9.857	-9.940	-0.083	(0)

	Cu (OH) 3-	8.836e-11	7.297e-11	-10.054	-10.137	-0.083	(0)
	CuCl+	7.200e-11	6.150e-11	-10.143	-10.211	-0.068	(0)
	CuNO2+	1.114e-11	9.199e-12	-10.953	-11.036	-0.083	(0)
	CuNH3+2	5.051e-13	2.349e-13	-12.297	-12.629	-0.332	(0)
	CuCl2	6.451e-14	6.451e-14	-13.190	-13.190	0.000	(0)
	Cu (OH) 4-2	2.023e-15	9.408e-16	-14.694	-15.026	-0.332	(0)
	Cu (NO2) 2	6.448e-16	6.448e-16	-15.191	-15.191	0.000	(0)
	CuNO3+	3.174e-16	2.621e-16	-15.498	-15.582	-0.083	(0)
	CuCl3-	2.132e-18	1.821e-18	-17.671	-17.740	-0.068	(0)
	CuCl4-2	5.051e-23	2.761e-23	-22.297	-22.559	-0.262	(0)
	Cu (NO3) 2	2.132e-25	2.132e-25	-24.671	-24.671	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-219.536	-219.620	-0.083	(0)
F		1.883e-04					
	F-	1.657e-04	1.418e-04	-3.781	-3.848	-0.067	(0)
	MgF+	2.087e-05	1.789e-05	-4.680	-4.747	-0.067	(0)
	CaF+	9.988e-07	8.589e-07	-6.001	-6.066	-0.066	(0)
	NaF	6.840e-07	6.840e-07	-6.165	-6.165	0.000	(0)
	MnF+	7.897e-08	6.791e-08	-7.103	-7.168	-0.066	(0)
	ZnF+	3.698e-09	3.054e-09	-8.432	-8.515	-0.083	(0)
	BF (OH) 3-	1.492e-09	1.260e-09	-8.826	-8.899	-0.073	(0)
	HF	1.289e-09	1.289e-09	-8.890	-8.890	0.000	(0)
	CuF+	1.390e-10	1.148e-10	-9.857	-9.940	-0.083	(0)
	NiF+	1.268e-10	1.047e-10	-9.897	-9.980	-0.083	(0)
	CoF+	9.755e-11	8.055e-11	-10.011	-10.094	-0.083	(0)
	AlF3	1.181e-11	1.181e-11	-10.928	-10.928	0.000	(0)
	AlF2+	7.671e-12	6.613e-12	-11.115	-11.180	-0.064	(0)
	CdF+	5.949e-12	4.912e-12	-11.226	-11.309	-0.083	(0)
	PbF+	2.220e-12	1.833e-12	-11.654	-11.737	-0.083	(0)
	AlF4-	9.795e-13	8.395e-13	-12.009	-12.076	-0.067	(0)
	HF2-	8.167e-13	6.951e-13	-12.088	-12.158	-0.070	(0)
	AgF	5.294e-13	5.294e-13	-12.276	-12.276	0.000	(0)
	AlF+2	2.121e-13	1.171e-13	-12.673	-12.931	-0.258	(0)
	BF2 (OH) 2-	1.391e-13	1.175e-13	-12.857	-12.930	-0.073	(0)
	UO2F+	1.386e-13	1.145e-13	-12.858	-12.941	-0.083	(0)
	UO2F2	4.682e-14	4.682e-14	-13.330	-13.330	0.000	(0)
	PbF2	5.117e-15	5.117e-15	-14.291	-14.291	0.000	(0)
	CrF+2	2.754e-15	1.281e-15	-14.560	-14.893	-0.332	(0)
	UO2F3-	2.020e-15	1.668e-15	-14.695	-14.778	-0.083	(0)
	CdF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000	(0)
	H2F2	4.452e-18	4.452e-18	-17.351	-17.351	0.000	(0)
	UO2F4-2	4.042e-18	1.880e-18	-17.393	-17.726	-0.332	(0)
	PbF3-	1.667e-18	1.377e-18	-17.778	-17.861	-0.083	(0)
	VO2F	4.117e-19	4.117e-19	-18.385	-18.385	0.000	(0)
	FeF2+	2.475e-19	2.129e-19	-18.606	-18.672	-0.066	(0)
	FeF+2	1.026e-19	5.607e-20	-18.989	-19.251	-0.262	(0)
	BF3OH-	4.718e-20	3.985e-20	-19.326	-19.400	-0.073	(0)
	FeF3	4.260e-20	4.260e-20	-19.371	-19.371	0.000	(0)
	VO2F2-	2.567e-20	2.120e-20	-19.591	-19.674	-0.083	(0)
	PbF4-2	2.010e-22	9.346e-23	-21.697	-22.029	-0.332	(0)
	VOF+	1.415e-22	1.169e-22	-21.849	-21.932	-0.083	(0)
	VO2F3-2	8.066e-23	3.751e-23	-22.093	-22.426	-0.332	(0)
	VOF2	6.217e-24	6.217e-24	-23.206	-23.206	0.000	(0)
	HgF+	1.016e-24	8.391e-25	-23.993	-24.076	-0.083	(0)
	BF4-	2.024e-25	1.710e-25	-24.694	-24.767	-0.073	(0)
	VOF3-	3.789e-26	3.129e-26	-25.422	-25.505	-0.083	(0)
	VO2F4-3	1.466e-26	2.618e-27	-25.834	-26.582	-0.748	(0)
	Sb (OH) 2F	7.021e-27	7.021e-27	-26.154	-26.154	0.000	(0)
	SbOF	6.907e-27	6.907e-27	-26.161	-26.161	0.000	(0)
	VOF4-2	3.852e-29	1.791e-29	-28.414	-28.747	-0.332	(0)
	SiF6-2	2.495e-30	1.364e-30	-29.603	-29.865	-0.262	(0)
	UF3+	1.425e-37	1.177e-37	-36.846	-36.929	-0.083	(0)
	UF2+2	1.125e-38	5.234e-39	-37.949	-38.281	-0.332	(0)
	UF4	1.830e-39	1.830e-39	-38.738	-38.738	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.785	-41.533	-0.748	(0)
	UF5-	0.000e+00	0.000e+00	-40.905	-40.988	-0.083	(0)
	UF6-2	0.000e+00	0.000e+00	-42.023	-42.356	-0.332	(0)
Fe (2)		3.257e-13					
	Fe+2	2.294e-13	1.067e-13	-12.639	-12.972	-0.332	(0)

FeSO4	8.699e-14	8.699e-14	-13.061	-13.061	0.000	(0)
FeOH+	8.090e-15	6.957e-15	-14.092	-14.158	-0.066	(0)
FeHCO3+	1.214e-15	1.051e-15	-14.916	-14.979	-0.063	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	5.453e-18	4.689e-18	-17.263	-17.329	-0.066	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-162.440	-162.440	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-239.529	-239.612	-0.083	(0)
Fe (3)	7.851e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.819e-10	2.430e-10	-9.550	-9.614	-0.064	(0)
Fe (OH) 4-	7.565e-11	6.521e-11	-10.121	-10.186	-0.064	(0)
FeOH+2	6.976e-16	3.813e-16	-15.156	-15.419	-0.262	(0)
FeF2+	2.475e-19	2.129e-19	-18.606	-18.672	-0.066	(0)
FeF+2	1.026e-19	5.607e-20	-18.989	-19.251	-0.262	(0)
FeF3	4.260e-20	4.260e-20	-19.371	-19.371	0.000	(0)
FeSO4+	1.563e-20	1.344e-20	-19.806	-19.872	-0.066	(0)
Fe+3	1.458e-21	3.605e-22	-20.836	-21.443	-0.607	(0)
Fe (SO4) 2-	1.156e-21	9.546e-22	-20.937	-21.020	-0.083	(0)
FeCl+2	6.025e-23	3.294e-23	-22.220	-22.482	-0.262	(0)
FeCl2+	5.176e-25	4.451e-25	-24.286	-24.352	-0.066	(0)
FeHSeO3+2	6.763e-26	3.145e-26	-25.170	-25.502	-0.332	(0)
FeCl3	1.346e-28	1.346e-28	-27.871	-27.871	0.000	(0)
Fe2 (OH) 2+4	1.029e-28	4.815e-30	-27.987	-29.317	-1.330	(0)
FeNO3+2	5.009e-29	2.330e-29	-28.300	-28.633	-0.332	(0)
Fe3 (OH) 4+5	2.024e-36	1.691e-38	-35.694	-37.772	-2.078	(0)
H (0)	4.013e-29					
H2	2.007e-29	2.019e-29	-28.698	-28.695	0.003	(0)
Hg (0)	1.113e-09					
Hg	1.113e-09	1.113e-09	-8.954	-8.954	0.000	(0)
Hg (1)	5.184e-22					
Hg2+2	2.592e-22	1.205e-22	-21.586	-21.919	-0.332	(0)
Hg (2)	4.235e-12					
Hg (OH) 2	2.685e-12	2.702e-12	-11.571	-11.568	0.003	(0)
HgClOH	1.397e-12	1.397e-12	-11.855	-11.855	0.000	(0)
HgCl2	1.460e-13	1.460e-13	-12.836	-12.836	0.000	(0)
HgCl3-	5.350e-15	4.418e-15	-14.272	-14.355	-0.083	(0)
HgCO3	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
HgCl4-2	1.144e-16	5.320e-17	-15.942	-16.274	-0.332	(0)
Hg (CO3) 2-2	4.626e-17	2.152e-17	-16.335	-16.667	-0.332	(0)
HgOH+	1.260e-17	1.041e-17	-16.900	-16.983	-0.083	(0)
HgCl+	1.166e-17	9.632e-18	-16.933	-17.016	-0.083	(0)
Hg (OH) 3-	6.747e-19	5.572e-19	-18.171	-18.254	-0.083	(0)
HgHCO3+	1.579e-19	1.304e-19	-18.802	-18.885	-0.083	(0)
Hg (NH3) 2+2	6.935e-22	3.225e-22	-21.159	-21.491	-0.332	(0)
HgNH3+2	3.875e-22	1.802e-22	-21.412	-21.744	-0.332	(0)
Hg+2	3.431e-22	1.596e-22	-21.465	-21.797	-0.332	(0)
HgSO4	1.388e-22	1.388e-22	-21.858	-21.858	0.000	(0)
HgF+	1.016e-24	8.391e-25	-23.993	-24.076	-0.083	(0)
Hg (NH3) 3+2	4.942e-30	2.298e-30	-29.306	-29.639	-0.332	(0)
HgNO3+	4.610e-31	3.807e-31	-30.336	-30.419	-0.083	(0)
Hg (NH3) 4+2	7.025e-38	3.267e-38	-37.153	-37.486	-0.332	(0)
Hg (NO3) 2	1.022e-39	1.022e-39	-38.990	-38.990	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.992	-140.075	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-140.239	-140.572	-0.332	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.893	-141.893	0.000	(0)
K	1.988e-03					
K+	1.942e-03	1.663e-03	-2.712	-2.779	-0.067	(0)
KSO4-	4.538e-05	3.912e-05	-4.343	-4.408	-0.064	(0)
KCrO4-	1.146e-16	9.464e-17	-15.941	-16.024	-0.083	(0)
Mg	2.809e-03					
Mg+2	2.091e-03	1.124e-03	-2.680	-2.949	-0.270	(0)
MgSO4	6.796e-04	6.796e-04	-3.168	-3.168	0.000	(0)
MgF+	2.087e-05	1.789e-05	-4.680	-4.747	-0.067	(0)
MgHCO3+	1.053e-05	8.998e-06	-4.977	-5.046	-0.068	(0)
MgCO3	5.581e-06	5.581e-06	-5.253	-5.253	0.000	(0)
MgOH+	8.449e-07	7.331e-07	-6.073	-6.135	-0.062	(0)
MgH2BO3+	9.713e-08	8.205e-08	-7.013	-7.086	-0.073	(0)
Mn (2)	3.337e-05					

Mn+2	2.586e-05	1.203e-05	-4.587	-4.920	-0.332	(0)
MnSO4	7.104e-06	7.104e-06	-5.148	-5.148	0.000	(0)
MnHCO3+	2.183e-07	1.877e-07	-6.661	-6.727	-0.066	(0)
MnF+	7.897e-08	6.791e-08	-7.103	-7.168	-0.066	(0)
MnOH+	5.755e-08	4.948e-08	-7.240	-7.306	-0.066	(0)
MnCl+	5.326e-08	4.580e-08	-7.274	-7.339	-0.066	(0)
MnCl2	1.957e-10	1.957e-10	-9.708	-9.708	0.000	(0)
MnSeO4	2.999e-13	2.999e-13	-12.523	-12.523	0.000	(0)
MnCl3-	1.896e-13	1.631e-13	-12.722	-12.788	-0.066	(0)
MnNO3+	1.491e-13	1.231e-13	-12.826	-12.910	-0.083	(0)
Mn (OH) 3-	9.543e-16	8.206e-16	-15.020	-15.086	-0.066	(0)
Mn (OH) 4-2	7.939e-21	4.340e-21	-20.100	-20.363	-0.262	(0)
Mn (NO3) 2	1.999e-21	1.999e-21	-20.699	-20.699	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.349	-41.349	0.000	(0)
Mn (3)	7.901e-26					
Mn+3	7.901e-26	1.954e-26	-25.102	-25.709	-0.607	(0)
Mn (6)	7.170e-40					
MnO4-2	7.170e-40	3.920e-40	-39.144	-39.407	-0.262	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.146	-44.218	-0.072	(0)
Mo	9.853e-07					
MoO4-2	9.852e-07	5.295e-07	-6.006	-6.276	-0.270	(0)
HMoO4-	7.839e-11	6.474e-11	-10.106	-10.189	-0.083	(0)
H2MoO4	2.914e-15	2.914e-15	-14.536	-14.536	0.000	(0)
Ag2MoO4	4.425e-25	4.425e-25	-24.354	-24.354	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.268	-48.016	-0.748	(0)
Mo7O24-6	0.000e+00	0.000e+00	-53.642	-56.634	-2.992	(0)
HMo7O24-5	0.000e+00	0.000e+00	-56.381	-58.459	-2.078	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-60.558	-61.888	-1.330	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-66.106	-66.854	-0.748	(0)
N (-3)	2.542e-08					
NH4+	2.283e-08	1.929e-08	-7.641	-7.715	-0.073	(0)
NH3	1.790e-09	1.790e-09	-8.747	-8.747	0.000	(0)
NH4SO4-	7.985e-10	6.866e-10	-9.098	-9.163	-0.066	(0)
CaNH3+2	2.688e-12	1.250e-12	-11.571	-11.903	-0.332	(0)
CuNH3+2	5.051e-13	2.349e-13	-12.297	-12.629	-0.332	(0)
NiNH3+2	6.072e-14	2.824e-14	-13.217	-13.549	-0.332	(0)
Co (NH3) +2	8.309e-15	3.864e-15	-14.080	-14.413	-0.332	(0)
AgNH3+	6.575e-15	5.429e-15	-14.182	-14.265	-0.083	(0)
BaNH3+2	5.098e-17	2.371e-17	-16.293	-16.625	-0.332	(0)
Ag (NH3) 2+	9.565e-20	7.899e-20	-19.019	-19.102	-0.083	(0)
Ni (NH3) 2+2	1.571e-20	7.305e-21	-19.804	-20.136	-0.332	(0)
Ca (NH3) 2+2	1.915e-21	8.907e-22	-20.718	-21.050	-0.332	(0)
Hg (NH3) 2+2	6.935e-22	3.225e-22	-21.159	-21.491	-0.332	(0)
Co (NH3) 2+2	6.344e-22	2.950e-22	-21.198	-21.530	-0.332	(0)
HgNH3+2	3.875e-22	1.802e-22	-21.412	-21.744	-0.332	(0)
Co (NH3) 3+2	1.429e-29	6.648e-30	-28.845	-29.177	-0.332	(0)
Hg (NH3) 3+2	4.942e-30	2.298e-30	-29.306	-29.639	-0.332	(0)
Co (NH3) 4+2	1.343e-37	6.244e-38	-36.872	-37.205	-0.332	(0)
Hg (NH3) 4+2	7.025e-38	3.267e-38	-37.153	-37.486	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.061	-45.394	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.399	-45.732	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-54.979	-55.728	-0.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.775	-68.107	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
N (3)	8.077e-06					
NO2-	8.077e-06	6.849e-06	-5.093	-5.164	-0.072	(0)
CuNO2+	1.114e-11	9.199e-12	-10.953	-11.036	-0.083	(0)
AgNO2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
CoNO2+	1.050e-12	8.668e-13	-11.979	-12.062	-0.083	(0)
Cu (NO2) 2	6.448e-16	6.448e-16	-15.191	-15.191	0.000	(0)
Ag (NO2) 2-	2.731e-17	2.255e-17	-16.564	-16.647	-0.083	(0)
N (5)	7.560e-09					
NO3-	7.546e-09	6.462e-09	-8.122	-8.190	-0.067	(0)
CaNO3+	1.373e-11	1.134e-11	-10.862	-10.946	-0.083	(0)

MnNO3+	1.491e-13	1.231e-13	-12.826	-12.910	-0.083	(0)
ZnNO3+	2.121e-14	1.751e-14	-13.674	-13.757	-0.083	(0)
BaNO3+	8.233e-16	6.799e-16	-15.084	-15.168	-0.083	(0)
NiNO3+	5.774e-16	4.768e-16	-15.239	-15.322	-0.083	(0)
CuNO3+	3.174e-16	2.621e-16	-15.498	-15.582	-0.083	(0)
CoNO3+	2.227e-16	1.839e-16	-15.652	-15.735	-0.083	(0)
CdNO3+	5.407e-17	4.465e-17	-16.267	-16.350	-0.083	(0)
PbNO3+	2.123e-17	1.753e-17	-16.673	-16.756	-0.083	(0)
AgNO3	7.626e-18	7.626e-18	-17.118	-17.118	0.000	(0)
Mn (NO3) 2	1.999e-21	1.999e-21	-20.699	-20.699	0.000	(0)
UO2NO3+	9.126e-23	7.537e-23	-22.040	-22.123	-0.083	(0)
Zn (NO3) 2	2.258e-23	2.258e-23	-22.646	-22.646	0.000	(0)
Co (NO3) 2	2.418e-24	2.418e-24	-23.617	-23.617	0.000	(0)
Cu (NO3) 2	2.132e-25	2.132e-25	-24.671	-24.671	0.000	(0)
Pb (NO3) 2	1.923e-25	1.923e-25	-24.716	-24.716	0.000	(0)
Cd (NO3) 2	1.446e-25	1.446e-25	-24.840	-24.840	0.000	(0)
CrNO3+2	3.460e-26	1.609e-26	-25.461	-25.793	-0.332	(0)
VO2NO3	5.409e-27	5.409e-27	-26.267	-26.267	0.000	(0)
FeNO3+2	5.009e-29	2.330e-29	-28.300	-28.633	-0.332	(0)
HgNO3+	4.610e-31	3.807e-31	-30.336	-30.419	-0.083	(0)
Hg (NO3) 2	1.022e-39	1.022e-39	-38.990	-38.990	0.000	(0)
Na	9.089e-03					
Na+	8.926e-03	7.642e-03	-2.049	-2.117	-0.067	(0)
NaSO4-	1.582e-04	1.364e-04	-3.801	-3.865	-0.064	(0)
NaHCO3	3.362e-06	3.362e-06	-5.473	-5.473	0.000	(0)
NaCO3-	9.854e-07	8.494e-07	-6.006	-6.071	-0.064	(0)
NaF	6.840e-07	6.840e-07	-6.165	-6.165	0.000	(0)
NaH2BO3	2.550e-08	2.550e-08	-7.594	-7.594	0.000	(0)
NaCrO4-	7.044e-16	5.817e-16	-15.152	-15.235	-0.083	(0)
Ni	8.533e-08					
Ni+2	5.466e-08	2.938e-08	-7.262	-7.532	-0.270	(0)
NiSO4	1.947e-08	1.947e-08	-7.711	-7.711	0.000	(0)
NiCO3	6.542e-09	6.542e-09	-8.184	-8.184	0.000	(0)
NiHCO3+	3.431e-09	2.833e-09	-8.465	-8.548	-0.083	(0)
NiOH+	7.337e-10	6.059e-10	-9.135	-9.218	-0.083	(0)
NiCl+	2.754e-10	2.274e-10	-9.560	-9.643	-0.083	(0)
NiF+	1.268e-10	1.047e-10	-9.897	-9.980	-0.083	(0)
Ni (OH) 2	7.884e-11	7.884e-11	-10.103	-10.103	0.000	(0)
Ni (SO4) 2-2	4.607e-12	2.142e-12	-11.337	-11.669	-0.332	(0)
Ni (OH) 3-	1.564e-13	1.291e-13	-12.806	-12.889	-0.083	(0)
NiNH3+2	6.072e-14	2.824e-14	-13.217	-13.549	-0.332	(0)
NiCl2	3.463e-15	3.463e-15	-14.460	-14.460	0.000	(0)
NiSeO4	1.273e-15	1.273e-15	-14.895	-14.895	0.000	(0)
NiNO3+	5.774e-16	4.768e-16	-15.239	-15.322	-0.083	(0)
Ni (NH3) 2+2	1.571e-20	7.305e-21	-19.804	-20.136	-0.332	(0)
O (0)	2.470e-35					
O2	1.235e-35	1.243e-35	-34.908	-34.906	0.003	(0)
Pb	5.173e-09					
PbCO3	3.291e-09	3.291e-09	-8.483	-8.483	0.000	(0)
PbOH+	9.138e-10	7.547e-10	-9.039	-9.122	-0.083	(0)
Pb+2	3.412e-10	1.834e-10	-9.467	-9.737	-0.270	(0)
PbSO4	2.984e-10	2.984e-10	-9.525	-9.525	0.000	(0)
PbHCO3+	1.291e-10	1.066e-10	-9.889	-9.972	-0.083	(0)
Pb (CO3) 2-2	1.218e-10	5.665e-11	-9.914	-10.247	-0.332	(0)
Pb (OH) 2	3.909e-11	3.909e-11	-10.408	-10.408	0.000	(0)
PbCl+	2.384e-11	1.969e-11	-10.623	-10.706	-0.083	(0)
Pb (SO4) 2-2	1.285e-11	5.974e-12	-10.891	-11.224	-0.332	(0)
PbF+	2.220e-12	1.833e-12	-11.654	-11.737	-0.083	(0)
PbCl2	2.660e-13	2.660e-13	-12.575	-12.575	0.000	(0)
Pb (OH) 3-	7.755e-14	6.404e-14	-13.110	-13.194	-0.083	(0)
PbF2	5.117e-15	5.117e-15	-14.291	-14.291	0.000	(0)
PbCl3-	3.879e-16	3.204e-16	-15.411	-15.494	-0.083	(0)
Pb (OH) 4-2	5.524e-17	2.569e-17	-16.258	-16.590	-0.332	(0)
PbNO3+	2.123e-17	1.753e-17	-16.673	-16.756	-0.083	(0)
Pb2OH+3	1.228e-17	2.194e-18	-16.911	-17.659	-0.748	(0)
PbF3-	1.667e-18	1.377e-18	-17.778	-17.861	-0.083	(0)
PbCl4-2	9.525e-19	4.430e-19	-18.021	-18.354	-0.332	(0)
Pb3 (OH) 4+2	1.202e-20	5.592e-21	-19.920	-20.252	-0.332	(0)

PbF4-2	2.010e-22	9.346e-23	-21.697	-22.029	-0.332	(0)
Pb(NO3)2	1.923e-25	1.923e-25	-24.716	-24.716	0.000	(0)
Pb4(OH)4+4	1.741e-25	8.147e-27	-24.759	-26.089	-1.330	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.884	-152.884	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-230.710	-230.793	-0.083	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.222	-74.222	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.126	-79.209	-0.083	(0)
CdHS+	0.000e+00	0.000e+00	-79.778	-79.861	-0.083	(0)
S5-2	0.000e+00	0.000e+00	-80.030	-80.362	-0.332	(0)
H2S	0.000e+00	0.000e+00	-80.400	-80.400	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.546	-80.878	-0.332	(0)
S4-2	0.000e+00	0.000e+00	-80.626	-80.958	-0.332	(0)
S3-2	0.000e+00	0.000e+00	-81.432	-81.764	-0.332	(0)
S2-2	0.000e+00	0.000e+00	-82.448	-82.780	-0.332	(0)
S-2	0.000e+00	0.000e+00	-88.035	-88.297	-0.262	(0)
HgHS2-	0.000e+00	0.000e+00	-139.992	-140.075	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-140.239	-140.572	-0.332	(0)
Hg(HS)2	0.000e+00	0.000e+00	-141.893	-141.893	0.000	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-148.032	-148.368	-0.335	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.419	-148.603	-0.184	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.778	-149.098	-0.320	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-149.248	-149.331	-0.083	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-149.280	-149.363	-0.083	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-149.488	-149.832	-0.344	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.815	-150.143	-0.327	(0)
Zn(HS)2	0.000e+00	0.000e+00	-151.565	-151.565	0.000	(0)
Cd(HS)2	0.000e+00	0.000e+00	-151.866	-151.866	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.884	-152.884	0.000	(0)
Fe(HS)2	0.000e+00	0.000e+00	-162.440	-162.440	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-219.536	-219.620	-0.083	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-227.411	-227.494	-0.083	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-228.930	-229.262	-0.332	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-229.092	-229.175	-0.083	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-230.710	-230.793	-0.083	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-239.529	-239.612	-0.083	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-305.856	-306.188	-0.332	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-307.830	-308.163	-0.332	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.112	-324.444	-0.332	(0)
S(6)	7.495e-03					
SO4-2	6.181e-03	3.322e-03	-2.209	-2.479	-0.270	(0)
MgSO4	6.796e-04	6.796e-04	-3.168	-3.168	0.000	(0)
CaSO4	4.222e-04	4.222e-04	-3.374	-3.374	0.000	(0)
NaSO4-	1.582e-04	1.364e-04	-3.801	-3.865	-0.064	(0)
KSO4-	4.538e-05	3.912e-05	-4.343	-4.408	-0.064	(0)
MnSO4	7.104e-06	7.104e-06	-5.148	-5.148	0.000	(0)
ZnSO4	7.843e-07	7.843e-07	-6.106	-6.106	0.000	(0)
Zn(SO4)2-2	4.880e-08	2.269e-08	-7.312	-7.644	-0.332	(0)
NiSO4	1.947e-08	1.947e-08	-7.711	-7.711	0.000	(0)
CoSO4	1.190e-08	1.190e-08	-7.924	-7.924	0.000	(0)
CuSO4	9.762e-09	9.762e-09	-8.010	-8.010	0.000	(0)
HSO4-	2.327e-09	1.995e-09	-8.633	-8.700	-0.067	(0)
CdSO4	1.702e-09	1.702e-09	-8.769	-8.769	0.000	(0)
NH4SO4-	7.985e-10	6.866e-10	-9.098	-9.163	-0.066	(0)
PbSO4	2.984e-10	2.984e-10	-9.525	-9.525	0.000	(0)
Cd(SO4)2-2	1.640e-10	7.627e-11	-9.785	-10.118	-0.332	(0)
AgSO4-	1.193e-10	9.849e-11	-9.924	-10.007	-0.083	(0)
Pb(SO4)2-2	1.285e-11	5.974e-12	-10.891	-11.224	-0.332	(0)
Ni(SO4)2-2	4.607e-12	2.142e-12	-11.337	-11.669	-0.332	(0)
CrOHSO4	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
FeSO4	8.699e-14	8.699e-14	-13.061	-13.061	0.000	(0)
UO2SO4	2.939e-14	2.939e-14	-13.532	-13.532	0.000	(0)
UO2(SO4)2-2	2.768e-15	1.287e-15	-14.558	-14.890	-0.332	(0)
AlSO4+	2.484e-15	2.129e-15	-14.605	-14.672	-0.067	(0)
CrSO4+	5.352e-16	4.420e-16	-15.271	-15.355	-0.083	(0)
Al(SO4)2-	8.844e-17	7.580e-17	-16.053	-16.120	-0.067	(0)
VO2SO4-	1.590e-19	1.313e-19	-18.799	-18.882	-0.083	(0)
FeSO4+	1.563e-20	1.344e-20	-19.806	-19.872	-0.066	(0)

Fe (SO4) 2-	1.156e-21	9.546e-22	-20.937	-21.020	-0.083	(0)
Cr2 (OH) 2SO4+2	6.388e-22	2.971e-22	-21.195	-21.527	-0.332	(0)
HgSO4	1.388e-22	1.388e-22	-21.858	-21.858	0.000	(0)
VOSO4	1.257e-22	1.257e-22	-21.901	-21.901	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.863e-23	5.863e-23	-22.232	-22.232	0.000	(0)
CrO3SO4-2	4.073e-24	1.894e-24	-23.390	-23.723	-0.332	(0)
VSO4+	1.345e-37	1.111e-37	-36.871	-36.954	-0.083	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.442	-41.442	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.531	-42.863	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Sb (3)	1.019e-20					
Sb (OH) 3	5.155e-21	5.155e-21	-20.288	-20.288	0.000	(0)
HSbO2	5.034e-21	5.034e-21	-20.298	-20.298	0.000	(0)
SbO2-	1.607e-24	1.327e-24	-23.794	-23.877	-0.083	(0)
Sb (OH) 4-	9.200e-25	7.598e-25	-24.036	-24.119	-0.083	(0)
Sb (OH) 2F	7.021e-27	7.021e-27	-26.154	-26.154	0.000	(0)
SbOF	6.907e-27	6.907e-27	-26.161	-26.161	0.000	(0)
Sb (OH) 2+	9.318e-28	7.695e-28	-27.031	-27.114	-0.083	(0)
SbO+	3.214e-28	2.654e-28	-27.493	-27.576	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.112	-324.444	-0.332	(0)
Sb (5)	1.493e-08					
SbO3-	1.492e-08	1.232e-08	-7.826	-7.909	-0.083	(0)
Sb (OH) 6-	1.681e-11	1.439e-11	-10.775	-10.842	-0.067	(0)
SbO2+	1.616e-25	1.334e-25	-24.792	-24.875	-0.083	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	6.725e-40	5.554e-40	-39.172	-39.255	-0.083	(0)
MnSe	0.000e+00	0.000e+00	-41.349	-41.349	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.577	-43.577	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.711	-46.044	-0.332	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.884	-83.213	-1.330	(0)
Se (4)	8.597e-08					
SeO3-2	4.599e-08	2.139e-08	-7.337	-7.670	-0.332	(0)
HSeO3-	3.998e-08	3.301e-08	-7.398	-7.481	-0.083	(0)
H2SeO3	8.652e-14	8.652e-14	-13.063	-13.063	0.000	(0)
AgSeO3-	2.473e-14	2.042e-14	-13.607	-13.690	-0.083	(0)
Cd (SeO3) 2-2	1.772e-18	8.240e-19	-17.752	-18.084	-0.332	(0)
Ag (SeO3) 2-3	2.190e-20	3.912e-21	-19.660	-20.408	-0.748	(0)
FeHSeO3+2	6.763e-26	3.145e-26	-25.170	-25.502	-0.332	(0)
Se (6)	1.727e-10					
SeO4-2	1.724e-10	9.266e-11	-9.763	-10.033	-0.270	(0)
MnSeO4	2.999e-13	2.999e-13	-12.523	-12.523	0.000	(0)
ZnSeO4	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
NiSeO4	1.273e-15	1.273e-15	-14.895	-14.895	0.000	(0)
CoSeO4	8.341e-16	8.341e-16	-15.079	-15.079	0.000	(0)
CdSeO4	3.770e-17	3.770e-17	-16.424	-16.424	0.000	(0)
HSeO4-	3.455e-17	2.853e-17	-16.462	-16.545	-0.083	(0)
Zn (SeO4) 2-2	3.128e-24	1.455e-24	-23.505	-23.837	-0.332	(0)
Si	7.916e-05					
H4SiO4	7.702e-05	7.749e-05	-4.113	-4.111	0.003	(0)
H3SiO4-	2.134e-06	1.823e-06	-5.671	-5.739	-0.068	(0)
H2SiO4-2	3.391e-11	1.872e-11	-10.470	-10.728	-0.258	(0)
UO2H3SiO4+	1.096e-12	9.048e-13	-11.960	-12.043	-0.083	(0)
SiF6-2	2.495e-30	1.364e-30	-29.603	-29.865	-0.262	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.594	-60.342	-0.748	(0)
U (4)	1.084e-19					
U (OH) 5-	1.084e-19	8.953e-20	-18.965	-19.048	-0.083	(0)
U (OH) 4	2.305e-23	2.305e-23	-22.637	-22.637	0.000	(0)
U (OH) 3+	6.272e-28	5.180e-28	-27.203	-27.286	-0.083	(0)
U (OH) 2+2	3.165e-33	1.472e-33	-32.500	-32.832	-0.332	(0)
UF3+	1.425e-37	1.177e-37	-36.846	-36.929	-0.083	(0)
UF2+2	1.125e-38	5.234e-39	-37.949	-38.281	-0.332	(0)
UOH+3	2.386e-39	4.262e-40	-38.622	-39.370	-0.748	(0)
UF4	1.830e-39	1.830e-39	-38.738	-38.738	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.785	-41.533	-0.748	(0)
UF5-	0.000e+00	0.000e+00	-40.905	-40.988	-0.083	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.442	-41.442	0.000	(0)

UF6-2	0.000e+00	0.000e+00	-42.023	-42.356	-0.332	(0)
USO4+2	0.000e+00	0.000e+00	-42.531	-42.863	-0.332	(0)
U+4	0.000e+00	0.000e+00	-45.655	-46.985	-1.330	(0)
UC1+3	0.000e+00	0.000e+00	-47.056	-47.804	-0.748	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-169.161	-175.893	-6.733	(0)
U(5)	1.186e-16					
UO2+	1.186e-16	9.793e-17	-15.926	-16.009	-0.083	(0)
U(6)	1.415e-07					
UO2(CO3)3-4	1.058e-07	4.949e-09	-6.976	-8.306	-1.330	(0)
UO2(CO3)2-2	3.557e-08	1.654e-08	-7.449	-7.781	-0.332	(0)
UO2CO3	1.389e-10	1.389e-10	-9.857	-9.857	0.000	(0)
UO2OH+	1.460e-12	1.206e-12	-11.836	-11.919	-0.083	(0)
UO2H3SiO4+	1.096e-12	9.048e-13	-11.960	-12.043	-0.083	(0)
UO2F+	1.386e-13	1.145e-13	-12.858	-12.941	-0.083	(0)
UO2F2	4.682e-14	4.682e-14	-13.330	-13.330	0.000	(0)
UO2SO4	2.939e-14	2.939e-14	-13.532	-13.532	0.000	(0)
UO2+2	1.088e-14	5.846e-15	-13.964	-14.233	-0.270	(0)
UO2(SO4)2-2	2.768e-15	1.287e-15	-14.558	-14.890	-0.332	(0)
UO2F3-	2.020e-15	1.668e-15	-14.695	-14.778	-0.083	(0)
UO2Cl+	3.473e-17	2.868e-17	-16.459	-16.542	-0.083	(0)
(UO2)3(OH)5+	7.167e-18	5.919e-18	-17.145	-17.228	-0.083	(0)
(UO2)2(OH)2+2	5.186e-18	2.412e-18	-17.285	-17.618	-0.332	(0)
UO2F4-2	4.042e-18	1.880e-18	-17.393	-17.726	-0.332	(0)
UO2NO3+	9.126e-23	7.537e-23	-22.040	-22.123	-0.083	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.213	-44.296	-0.083	(0)
V+2	0.000e+00	0.000e+00	-45.688	-46.021	-0.332	(0)
V(3)	2.511e-16					
V(OH)3	2.511e-16	2.511e-16	-15.600	-15.600	0.000	(0)
V(OH)2+	1.208e-27	9.974e-28	-26.918	-27.001	-0.083	(0)
VOH+2	1.250e-31	5.814e-32	-30.903	-31.235	-0.332	(0)
V+3	3.965e-37	7.082e-38	-36.402	-37.150	-0.748	(0)
VSO4+	1.345e-37	1.111e-37	-36.871	-36.954	-0.083	(0)
V2(OH)3+3	0.000e+00	0.000e+00	-59.037	-59.785	-0.748	(0)
V2(OH)2+4	0.000e+00	0.000e+00	-60.341	-61.671	-1.330	(0)
V(4)	5.492e-20					
V(OH)3+	5.435e-20	4.489e-20	-19.265	-19.348	-0.083	(0)
VO+2	2.954e-22	1.374e-22	-21.530	-21.862	-0.332	(0)
VOF+	1.415e-22	1.169e-22	-21.849	-21.932	-0.083	(0)
VOSO4	1.257e-22	1.257e-22	-21.901	-21.901	0.000	(0)
VOF2	6.217e-24	6.217e-24	-23.206	-23.206	0.000	(0)
VOC1+	1.412e-24	1.166e-24	-23.850	-23.933	-0.083	(0)
VOF3-	3.789e-26	3.129e-26	-25.422	-25.505	-0.083	(0)
VOF4-2	3.852e-29	1.791e-29	-28.414	-28.747	-0.332	(0)
H2V2O4+2	2.173e-34	1.011e-34	-33.663	-33.995	-0.332	(0)
V(5)	4.588e-09					
H2VO4-	2.658e-09	2.195e-09	-8.575	-8.659	-0.083	(0)
HVO4-2	1.930e-09	8.974e-10	-8.715	-9.047	-0.332	(0)
H3VO4	1.349e-13	1.349e-13	-12.870	-12.870	0.000	(0)
VO4-3	4.098e-15	7.320e-16	-14.387	-15.135	-0.748	(0)
HV2O7-3	3.738e-15	6.678e-16	-14.427	-15.175	-0.748	(0)
H3V2O7-	2.316e-15	1.912e-15	-14.635	-14.718	-0.083	(0)
V2O7-4	6.253e-17	2.925e-18	-16.204	-17.534	-1.330	(0)
VO2+	1.933e-18	1.655e-18	-17.714	-17.781	-0.067	(0)
VO2F	4.117e-19	4.117e-19	-18.385	-18.385	0.000	(0)
VO2SO4-	1.590e-19	1.313e-19	-18.799	-18.882	-0.083	(0)
V3O9-3	6.209e-20	1.109e-20	-19.207	-19.955	-0.748	(0)
VO2F2-	2.567e-20	2.120e-20	-19.591	-19.674	-0.083	(0)
VO2F3-2	8.066e-23	3.751e-23	-22.093	-22.426	-0.332	(0)
V4O12-4	2.170e-25	1.015e-26	-24.664	-25.993	-1.330	(0)
VO2F4-3	1.466e-26	2.618e-27	-25.834	-26.582	-0.748	(0)
VO2NO3	5.409e-27	5.409e-27	-26.267	-26.267	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-67.531	-70.524	-2.992	(0)
HV10O28-5	0.000e+00	0.000e+00	-68.471	-70.549	-2.078	(0)
H2V10O28-4	0.000e+00	0.000e+00	-72.223	-73.552	-1.330	(0)
Zn	3.535e-06					
Zn+2	2.008e-06	1.079e-06	-5.697	-5.967	-0.270	(0)
ZnSO4	7.843e-07	7.843e-07	-6.106	-6.106	0.000	(0)

ZnCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
ZnOH+	2.140e-07	1.768e-07	-6.670	-6.753	-0.083	(0)
Zn (SO4) 2-2	4.880e-08	2.269e-08	-7.312	-7.644	-0.332	(0)
Zn (OH) 2	4.589e-08	4.589e-08	-7.338	-7.338	0.000	(0)
ZnHCO3+	3.232e-08	2.669e-08	-7.491	-7.574	-0.083	(0)
ZnOHCl	1.758e-08	1.758e-08	-7.755	-7.755	0.000	(0)
ZnCl+	9.599e-09	8.199e-09	-8.018	-8.086	-0.068	(0)
ZnF+	3.698e-09	3.054e-09	-8.432	-8.515	-0.083	(0)
Zn (OH) 3-	4.562e-10	3.768e-10	-9.341	-9.424	-0.083	(0)
ZnCl2	3.931e-11	3.931e-11	-10.405	-10.405	0.000	(0)
ZnCl3-	1.106e-13	9.446e-14	-12.956	-13.025	-0.068	(0)
Zn (OH) 4-2	5.283e-14	2.457e-14	-13.277	-13.610	-0.332	(0)
ZnNO3+	2.121e-14	1.751e-14	-13.674	-13.757	-0.083	(0)
ZnSeO4	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
ZnCl4-2	2.614e-16	1.429e-16	-15.583	-15.845	-0.262	(0)
Zn (NO3) 2	2.258e-23	2.258e-23	-22.646	-22.646	0.000	(0)
Zn (SeO4) 2-2	3.128e-24	1.455e-24	-23.505	-23.837	-0.332	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.280	-149.363	-0.083	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.565	-151.565	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.411	-227.494	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.930	-229.262	-0.332	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.830	-308.163	-0.332	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-58.29	-52.00	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-45.17	-40.66	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-52.39	-40.66	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-75.11	-57.17	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-60.19	-40.16	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-29.65	-29.24	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-25.91	-25.46	0.45	(NH4) 2SeO4	
Acanthite	-52.43	-88.65	-36.22	Ag2S	
Ag2CO3	-11.79	-22.88	-11.09	Ag2CO3	
Ag2CrO4	-19.88	-31.47	-11.59	Ag2CrO4	
Ag2HVO4	-12.28	-10.80	1.48	Ag2HVO4	
Ag2MoO4	-12.38	-23.93	-11.55	Ag2MoO4	
Ag2O	-13.81	-1.23	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-15.31	-20.13	-4.82	Ag2SO4	
Ag3AsO3	-28.23	-26.07	2.16	Ag3AsO3	
Ag3AsO4	-16.64	-19.42	-2.79	Ag3AsO4	
Ag3H2VO5	-16.60	-11.42	5.18	Ag3H2VO5	
AgF:4H2O	-13.73	-12.68	1.05	AgF:4H2O	
Agmetal	0.12	-13.39	-13.51	Ag	
AgVO3	-10.96	-10.19	0.77	AgVO3	
Al (OH) 3 (am)	-2.25	8.55	10.80	Al (OH) 3	
Al2 (MoO4) 3	-53.36	-50.99	2.37	Al2 (MoO4) 3	
Al2O3	-2.55	17.10	19.65	Al2O3	
Al4 (OH) 10SO4	-7.40	15.30	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-13.82	-9.02	4.80	AlAsO4:2H2O	
AlOHSO4	-7.12	-10.35	-3.23	AlOHSO4	
AlSb	-153.99	-88.37	65.62	AlSb	
Alunite	-5.32	-6.72	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-4.43	-12.22	-7.79	PbSO4	
Anhydrite	-1.37	-5.73	-4.36	CaSO4	
Anilite	-55.74	-87.61	-31.88	Cu0.25Cu1.5S	
Antlerite	-2.10	6.69	8.79	Cu3 (OH) 4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-94.12	-96.88	-2.76	As4O6	
Artinite	-4.30	5.30	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-41.85	-35.14	6.71	As2O5	
Atacamite	-1.06	6.33	7.39	Cu2 (OH) 3Cl	
Azurite	-0.80	-17.70	-16.91	Cu3 (OH) 2 (CO3) 2	

Ba(OH)2:8H2O	-15.65	8.74	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.52	-1.65	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.85	7.09	32.94	Ba3(VO4)2:4H2O
BaCrO4	-11.82	-21.49	-9.67	BaCrO4
BaF2	-9.55	-15.37	-5.82	BaF2
BaMoO4	-6.99	-13.95	-6.96	BaMoO4
Barite	-0.18	-10.16	-9.98	BaSO4
BaS	-94.86	-78.68	16.18	BaS
BaSeO3	-8.78	-6.95	1.83	BaSeO3
BaSeO4	-10.25	-17.71	-7.46	BaSeO4
Bianchite	-6.68	-8.45	-1.76	ZnSO4:6H2O
Birnessite	-6.39	11.70	18.09	MnO2
Bixbyite	-1.50	-2.15	-0.64	Mn2O3
BlaubleiI	-55.89	-80.05	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.26	-83.54	-27.28	Cu0.6Cu0.8S
Boehmite	-0.03	8.55	8.58	AlOOH
Breithauptite	-56.74	-75.26	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.37	13.47	16.84	Mg(OH)2
Bunsenite	-3.55	8.89	12.45	NiO
Ca(VO3)2	-11.63	-5.97	5.66	Ca(VO3)2
Ca2V2O7	-10.31	7.19	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.36	7.19	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.94	4.36	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.60	20.36	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-19.50	20.36	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-297.32	-154.34	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-9.05	-26.96	-17.91	Hg2Cl2
CaMoO4	-1.58	-9.53	-7.95	CaMoO4
Carnotite	-2.18	-1.95	0.23	KUO2VO4
CaSeO3:2H2O	-5.34	-2.53	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.27	-13.29	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.38	-1.54	9.84	Cd(BO2)2
Cd(OH)2	-5.88	7.76	13.64	Cd(OH)2
Cd(OH)2(am)	-5.97	7.76	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.23	-14.52	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.17	4.39	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-16.25	12.15	28.40	Cd4(OH)6SO4
CdCl2	-13.04	-13.70	-0.66	CdCl2
CdCl2:1H2O	-12.01	-13.70	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.79	-13.70	-1.91	CdCl2:2.5H2O
CdF2	-15.14	-16.36	-1.21	CdF2
Cdmetal(alpha)	-31.30	-17.78	13.51	Cd
Cdmetal(gamma)	-31.40	-17.78	13.62	Cd
CdMoO4	-0.79	-14.94	-14.15	CdMoO4
CdOHCl	-6.51	-2.97	3.54	CdOHCl
CdSb	-76.04	-76.39	-0.35	CdSb
CdSe	-19.50	-39.70	-20.20	CdSe
CdSeO4:2H2O	-16.84	-18.69	-1.85	CdSeO4:2H2O
CdSO4	-10.97	-11.14	-0.17	CdSO4
CdSO4:1H2O	-9.41	-11.14	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.27	-11.14	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.60	-11.35	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.73	-10.37	-2.64	CuSO4:5H2O
Chalcedony	-0.56	-4.11	-3.55	SiO2
Chalcocite	-55.60	-90.52	-34.92	Cu2S
Chalcopyrite	-127.59	-162.86	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-53.29	-98.99	-45.69	HgS
Claudetite	-93.81	-96.88	-3.06	As4O6
Clausthalite	-13.68	-40.78	-27.10	PbSe
Co(BO2)2	-27.70	-0.63	27.07	Co(BO2)2
Co(OH)2	-4.42	8.68	13.09	Co(OH)2

Co(OH) 3	-8.64	-10.95	-2.31	Co(OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-22.15	-9.11	13.03	Co3 (AsO4) 2
Co3O4	-2.73	-13.22	-10.50	Co3O4
CoCl2	-21.05	-12.78	8.27	CoCl2
CoCl2:6H2O	-15.32	-12.79	2.54	CoCl2:6H2O
CoCO3	-2.99	-12.97	-9.98	CoCO3
CoF2	-13.85	-15.44	-1.60	CoF2
CoF3	-45.67	-47.13	-1.46	CoF3
CoFe2O4	18.59	15.06	-3.53	CoFe2O4
CoMoO4	-6.26	-14.02	-7.76	CoMoO4
CoO	-4.91	8.68	13.59	CoO
CoS (alpha)	-71.30	-78.74	-7.44	CoS
CoS (beta)	-67.67	-78.74	-11.07	CoS
CoSe	-22.59	-38.79	-16.20	CoSe
CoSeO3	-8.34	-7.02	1.32	CoSeO3
CoSeO4:6H2O	-16.25	-17.78	-1.53	CoSeO4:6H2O
CoSO4	-13.03	-10.22	2.80	CoSO4
CoSO4:6H2O	-7.75	-10.23	-2.47	CoSO4:6H2O
Cotunnite	-10.00	-14.78	-4.78	PbCl2
Covellite	-56.59	-78.89	-22.30	CuS
Cr(OH) 2	-21.82	-11.00	10.82	Cr(OH) 2
Cr(OH) 3	-2.51	-1.18	1.34	Cr(OH) 3
Cr(OH) 3 (am)	-0.43	-1.18	-0.75	Cr(OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.56	-32.47	14.09	CrCl2
CrCl3	-48.49	-33.37	15.11	CrCl3
CrF3	-26.02	-37.36	-11.34	CrF3
Cristobalite	-0.76	-4.11	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.68	-45.52	-33.84	Na3AlF6
Cu(OH) 2	-0.14	8.53	8.67	Cu(OH) 2
Cu(SbO3) 2	-26.17	19.05	45.21	Cu(SbO3) 2
Cu2(OH) 3NO3	-8.59	0.66	9.25	Cu2(OH) 3NO3
Cu2Sb:3H2O	-55.06	-89.94	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.77	-50.57	-45.80	Cu2Se
Cu2SO4	-20.05	-22.00	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.65	-9.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.98	-101.58	-42.59	Cu3Sb
Cu3Se2	-26.01	-89.51	-63.49	Cu3Se2
CuCO3	-1.62	-13.12	-11.50	CuCO3
CuCrO4	-16.27	-21.71	-5.44	CuCrO4
CuF	-8.71	-13.61	-4.91	CuF
CuF2	-16.70	-15.59	1.12	CuF2
CuF2:2H2O	-11.04	-15.59	-4.55	CuF2:2H2O
Cumetal	-5.57	-14.32	-8.76	Cu
CuMoO4	-1.09	-14.17	-13.08	CuMoO4
CuOCuSO4	-12.14	-1.84	10.30	CuOCuSO4
Cupricferrite	8.93	14.91	5.99	CuFe2O4
Cuprite	-1.70	-3.10	-1.41	Cu2O
Cuprousferrite	10.56	1.64	-8.92	CuFeO2
CuSe	-5.84	-38.94	-33.10	CuSe
CuSe2	-27.49	-60.86	-33.37	CuSe2
CuSeO3:2H2O	-7.67	-7.16	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.49	-17.93	-2.44	CuSeO4:5H2O
CuSO4	-13.31	-10.37	2.94	CuSO4
Diaspore	1.68	8.55	6.87	AlOOH
Djurleite	-55.84	-89.76	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.11	-16.65	-16.54	CaMg (CO3) 2
Dolomite(ordered)	0.44	-16.65	-17.09	CaMg (CO3) 2
Epsomite	-3.30	-5.43	-2.13	MgSO4:7H2O
Fe(OH) 2	-10.11	3.45	13.56	Fe(OH) 2
Fe(OH) 2.7Cl.3	3.01	-0.03	-3.04	Fe(OH) 2.7Cl.3
Fe(VO3) 2	-11.97	-15.69	-3.72	Fe(VO3) 2
Fe2(OH) 4SeO3	-10.86	-9.31	1.55	Fe2(OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-20.07	-40.70	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-46.59	-50.32	-3.73	Fe2 (SO4) 3

Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.78	-14.38	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-9.16	-19.25	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-47.34	-65.94	-18.60	FeSe2
FeS (ppt)	-81.02	-83.97	-2.95	FeS
FeSe	-33.02	-44.02	-11.00	FeSe
Fix_pe	-4.56	-4.56	0.00	e-
Fluorite	-0.45	-10.95	-10.50	CaF2
Galena	-66.76	-80.73	-13.97	PbS
Gibbsite	0.26	8.55	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.44	-8.45	-2.01	ZnSO4:7H2O
Greenalite	-18.68	2.13	20.81	Fe3Si2O5(OH)4
Greenockite	-65.30	-79.66	-14.36	CdS
Greigite	-294.81	-339.85	-45.03	Fe3S4
Gummite	-5.48	2.19	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-16.13	-28.23	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.82	-22.70	-12.88	H2MoO4
H2S (g)	-79.41	-87.42	-8.01	H2S
H2Se (g)	-42.51	-47.47	-4.96	H2Se
Halite	-6.24	-4.64	1.60	NaCl
Halloysite	-0.69	8.88	9.57	Al2Si2O5(OH)4
Hausmannite	-0.98	60.05	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-2.34	20.55	22.89	FeAl2O4
Hg(CH3)2(g)	-185.51	-259.22	-73.71	Hg(CH3)2
Hg(g)	-7.65	-15.52	-7.87	Hg
Hg(OH)2	-8.07	-11.57	-3.50	Hg(OH)2
Hg2(g)	-16.09	-31.04	-14.96	Hg2
Hg2(OH)2	-10.76	-5.50	5.26	Hg2(OH)2
Hg2CO3	-11.09	-27.14	-16.05	Hg2CO3
Hg2CrO4	-27.03	-35.73	-8.70	Hg2CrO4
Hg2F2	-19.25	-29.62	-10.36	Hg2F2
Hg2S	-81.24	-92.92	-11.68	Hg2S
Hg2SeO3	-16.53	-21.19	-4.66	Hg2SeO3
Hg2SO4	-18.27	-24.40	-6.13	Hg2SO4
Hg3O2CO3	-26.67	-56.35	-29.68	Hg3O2CO3
HgCl(g)	-32.98	-13.48	19.50	HgCl
HgCl2	-11.77	-33.03	-21.26	HgCl2
HgF(g)	-47.48	-14.81	32.68	HgF
HgF2(g)	-48.25	-35.69	12.57	HgF2
Hgmetal(l)	-2.07	-15.52	-13.45	Hg
HgSe	-3.34	-59.03	-55.69	HgSe
HgSeO3	-14.83	-27.26	-12.43	HgSeO3
HgSO4	-21.05	-30.47	-9.42	HgSO4
Huntite	-3.03	-33.00	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.46	-23.24	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.45	-19.22	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-18.65	-23.82	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-8.00	-22.80	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.37	-49.61	-17.24	K2Cr2O7
K2CrO4	-18.86	-19.37	-0.51	K2CrO4
K2MoO4	-15.10	-11.83	3.26	K2MoO4
K2SeO4	-14.86	-15.59	-0.73	K2SeO4
Kaolinite	1.45	8.88	7.43	Al2Si2O5(OH)4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.09	-5.53	-0.43	PbO:PbSO4
Laurionite	-4.67	-4.04	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.01	6.69	12.69	PbO
Mackinawite	-80.37	-83.97	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.00	19.86	16.86	Fe2MgO4
Magnesite	-0.71	-8.17	-7.46	MgCO3

Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.72	-4.59	-5.31	Cu2(OH)2CO3
Manganite	-1.06	24.28	25.34	MnOOH
Massicot	-6.21	6.69	12.89	PbO
Matlockite	-7.13	-16.10	-8.97	PbClF
Melanothallite	-19.19	-12.93	6.26	CuCl2
Melanterite	-13.24	-15.45	-2.21	FeSO4·7H2O
Metacinnabar	-53.89	-98.99	-45.09	HgS
Mg(OH)2(active)	-5.32	13.47	18.79	Mg(OH)2
Mg(VO3)2	-16.95	-5.67	11.28	Mg(VO3)2
Mg2Sb3	-274.64	-199.96	74.68	Mg2Sb3
Mg2V2O7	-18.55	7.81	26.36	Mg2V2O7
MgCr2O4	-5.08	11.12	16.20	MgCr2O4
MgCrO4	-22.14	-16.76	5.38	MgCrO4
MgF2	-2.52	-10.65	-8.13	MgF2
MgMoO4	-7.38	-9.23	-1.85	MgMoO4
MgSeO3·6H2O	-5.28	-2.22	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.78	-12.98	-1.20	MgSeO4·6H2O
Minium	-27.92	45.60	73.52	Pb3O4
Mirabilite	-5.60	-6.71	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.54	-7.64	4.90	Mn(VO3)2
Mn2(SO4)3	-53.14	-58.85	-5.71	Mn2(SO4)3
Mn2Sb	-147.77	-86.69	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-13.14	-0.64	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.67	-9.96	2.72	MnCl2·4H2O
MnS(grn)	-76.09	-75.92	0.17	MnS
MnS(pnk)	-79.26	-75.92	3.34	MnS
MnSb	-95.09	-98.00	-2.91	MnSb
MnSe	-39.46	-35.96	3.50	MnSe
MnSeO3	-5.32	-4.19	1.13	MnSeO3
MnSeO3·2H2O	-5.17	-4.19	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.90	-14.95	-2.05	MnSeO4·5H2O
MnSO4	-9.98	-7.40	2.58	MnSO4
Monteponite	-7.34	7.76	15.10	CdO
Montroydite	-7.93	-11.57	-3.64	HgO
MoO3	-14.70	-22.70	-8.00	MoO3
Morenosite	-7.87	-10.01	-2.14	NiSO4·7H2O
MoS2	-152.82	-223.08	-70.26	MoS2
Na-Jarosite	-10.93	-22.13	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.39	-48.29	-9.90	Na2Cr2O7
Na2CrO4	-20.98	-18.05	2.93	Na2CrO4
Na2Mo2O7	-16.61	-33.21	-16.60	Na2Mo2O7
Na2MoO4	-12.00	-10.51	1.49	Na2MoO4
Na2MoO4·2H2O	-11.73	-10.51	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.80	-3.50	10.30	Na2SeO3·5H2O
Na2SeO4	-15.55	-14.27	1.28	Na2SeO4
Na3Sb	-173.09	-78.64	94.45	Na3Sb
Na3VO4	-27.97	8.71	36.68	Na3VO4
Na4V2O7	-32.16	5.24	37.40	Na4V2O7
Nantokite	-5.55	-12.28	-6.73	CuCl
NaSb	-88.45	-65.28	23.17	NaSb
Natron	-8.15	-9.46	-1.31	Na2CO3·10H2O
NaVO3	-7.33	-3.48	3.86	NaVO3
Nesquehonite	-3.50	-8.17	-4.67	MgCO3·3H2O
Ni(OH)2	-3.90	8.89	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-24.17	-8.47	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-15.34	16.66	32.00	Ni4(OH)6SO4
NiCO3	-5.89	-12.76	-6.87	NiCO3
NiMoO4	-2.67	-13.81	-11.14	NiMoO4
NiS(alpha)	-72.93	-78.53	-5.60	NiS
NiS(beta)	-67.43	-78.53	-11.10	NiS
NiS(gamma)	-65.73	-78.53	-12.80	NiS
NiSe	-20.88	-38.58	-17.70	NiSe
NiSeO3·2H2O	-9.62	-6.80	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-16.05	-17.57	-1.52	NiSeO4·6H2O
Nsutite	-5.81	11.70	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-249.63	-310.70	-61.07	As2S3

Otavite	-1.88	-13.88	-12.00	CdCO3
Pb(BO2)2	-9.14	-2.62	6.52	Pb(BO2)2
Pb(OH)2	-1.46	6.69	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-54.26	-63.02	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.15	2.64	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.82	13.37	26.19	Pb2O(OH)2
Pb2O3	-22.12	38.92	61.04	Pb2O3
Pb2OC03	-7.72	-8.27	-0.56	Pb2OC03
Pb2V2O7	-3.87	-5.77	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.89	-15.09	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.22	0.92	6.14	Pb3(VO4)2
Pb3O2CO3	-12.61	-1.59	11.02	Pb3O2CO3
Pb3O2SO4	-9.53	1.16	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.26	7.84	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.03	7.84	21.88	Pb4O3SO4
PbCrO4	-10.95	-23.55	-12.60	PbCrO4
PbF2	-9.99	-17.43	-7.44	PbF2
Pbmetal	-23.10	-18.86	4.25	Pb
PbMoO4	-0.39	-16.01	-15.62	PbMoO4
PbO:0.3H2O	-6.29	6.69	12.98	PbO:0.33H2O
PbSeO4	-12.93	-19.77	-6.84	PbSeO4
Periclase	-8.11	13.47	21.58	MgO
Phosgenite	-9.93	-29.74	-19.81	PbCl2:PbCO3
Plattnerite	-17.37	32.23	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-127.34	-145.84	-18.51	FeS2
Pyrochroite	-3.69	11.50	15.19	Mn(OH)2
Pyrolusite	-4.33	37.05	41.38	MnO2
Quartz	-0.11	-4.11	-4.00	SiO2
Realgar	-104.66	-124.41	-19.75	AsS
Retgersite	-7.97	-10.01	-2.04	NiSO4:6H2O
Rhodochrosite	0.44	-10.14	-10.58	MnCO3
Rutherfordine	-4.96	-19.46	-14.50	UO2CO3
Sb(OH)3	-13.18	-20.29	-7.11	Sb(OH)3
Sb2O4	-18.43	-15.03	3.40	Sb2O4
Sb2O5	-28.44	-38.11	-9.67	Sb2O5
Sb2Se3	-115.22	-182.98	-67.76	Sb2Se3
Sb4O6(cubic)	-62.89	-81.15	-18.26	Sb4O6
Sb4O6(orth)	-63.25	-81.15	-17.90	Sb4O6
SbCl3	-53.05	-52.48	0.57	SbCl3
SbF3	-46.24	-56.47	-10.23	SbF3
Sbmetal	-46.92	-58.60	-11.69	Sb
SbO2	-4.00	-31.83	-27.82	SbO2
Schoepite	-3.80	2.19	5.99	UO2(OH)2:H2O
Semetal(am)	-14.81	-21.92	-7.11	Se
Semetal(hex)	-14.21	-21.92	-7.71	Se
Senarmontite	-28.21	-40.57	-12.37	Sb2O3
SeO2	-15.82	-15.69	0.12	SeO2
SeO3	-47.50	-26.46	21.04	SeO3
Sepiolite	-1.14	14.62	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.16	14.62	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-1.40	-4.11	-2.71	SiO2
SiO2(am-ppt)	-1.37	-4.11	-2.74	SiO2
Smithsonite	-1.19	-11.19	-10.00	ZnCO3
Sphalerite	-65.51	-76.96	-11.45	ZnS
Spinel	-6.27	30.58	36.85	MgAl2O4
Stibnite	-252.38	-302.84	-50.46	Sb2S3
Sulfur	-59.73	-61.88	-2.14	S
Tenorite	0.89	8.53	7.64	CuO
Thenardite	-7.03	-6.71	0.32	Na2SO4
Thermonatrite	-10.09	-9.46	0.64	Na2CO3:H2O
Tyuyamunite	-5.67	-1.59	4.08	Ca(UO2)2(VO4)2
U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-582.49	-430.10	152.38	U3Sb4
U4O9	-27.99	-31.01	-3.02	U4O9
UF4	-32.84	-62.38	-29.54	UF4
UF4:2.5H2O	-29.66	-62.38	-32.72	UF4:2.5H2O

UO2 (am)	-15.07	-14.14	0.93	UO2
UO2 (NO3) 2	-42.76	-30.61	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.46	-30.61	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-34.00	-30.61	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.66	-30.61	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.42	2.19	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.02	-24.27	-2.25	UO2SeO4:4H2O
UO3	-5.51	2.19	7.70	UO3
Uraninite	-9.47	-14.14	-4.67	UO2
USb2	-221.23	-191.65	29.58	USb2
V (OH) 3	-20.11	-12.52	7.59	V (OH) 3
V2O5	-17.78	-19.14	-1.36	V2O5
V3O5	-43.70	-41.86	1.84	V3O5
V4O7	-54.49	-47.30	7.19	V4O7
V6O13	-47.65	-108.51	-60.86	V6O13
Valentinite	-32.09	-40.57	-8.48	Sb2O3
VC12	-65.62	-46.75	18.87	VC12
VC13	-68.14	-44.71	23.43	VC13
VF4	-68.61	-53.68	14.93	VF4
Vmetal	-94.86	-50.83	44.03	V
VO	-40.04	-25.29	14.76	VO
VO (OH) 2	-10.59	-5.44	5.15	VO (OH) 2
VO2Cl	-23.14	-20.30	2.84	VO2Cl
VOC1	-34.40	-23.25	11.15	VOC1
VOC12	-39.66	-26.90	12.76	VOC12
VOSO4	-27.95	-24.34	3.61	VOSO4
Witherite	-4.33	-12.90	-8.57	BaCO3
Wurtzite	-68.01	-76.96	-8.95	ZnS
Zincite	-0.88	10.46	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO4
Zn (BO2) 2	-7.14	1.15	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.66	-22.35	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.74	10.46	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.02	10.46	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.30	10.46	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.08	10.46	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.28	10.46	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-5.49	2.01	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.01	10.18	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.43	-3.78	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-25.35	-6.44	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-5.48	22.92	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-7.68	30.82	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.06	-11.01	7.05	ZnCl2
ZnCO3:1H2O	-0.93	-11.19	-10.26	ZnCO3:1H2O
ZnF2	-13.13	-13.66	-0.53	ZnF2
Znmetal	-40.88	-15.09	25.79	Zn
ZnMoO4	-2.12	-12.24	-10.13	ZnMoO4
ZnO (active)	-0.73	10.46	11.19	ZnO
ZnS (am)	-67.91	-76.96	-9.05	ZnS
ZnSb	-84.71	-73.69	11.01	ZnSb
ZnSe	-22.61	-37.01	-14.40	ZnSe
ZnSeO4:6H2O	-14.48	-16.00	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.81	-8.45	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 114.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 605


```

        equilibrate with solution 1
        Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
        Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
        donnan 1e-008
    USE EQUILIBRIUM_PHASES 605
    USE Surface 605
    USE Solution 614
    SAVE Solution 615  #Initial Stage 7 Pit Water After Mineral Precipitation
and Sorption Loss
    END

```

```

-----
TITLE
-----

```

Determine loss of metals due to HFO sorption and sedimentation

```

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Beginning of initial surface-composition calculations.
-----

```

Surface 605.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

    3.249e-20  Surface + diffuse layer charge, eq
    2.933e-12  Surface charge, eq
    4.399e-03  sigma, C/m²
    1.213e-01  psi, V
    -4.722e+00 -F*psi/RT
    8.900e-03  exp(-F*psi/RT)
    6.420e+04  specific area, m²/mol Ferrihydrite
    6.434e-05  m² for 1.002e-09 moles of Ferrihydrite

```

Water in diffuse layer: 6.434e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, $\psi_{DL} = 7.042e-02$ V.

Boltzmann factor, $\exp(-\psi_{DL} * F / RT) = 6.451e-02$ (= c_{DL} / c_{free} if z is +1).

Element	Moles
C	1.6435e-15
Ca	2.0369e-17
Cl	3.2912e-14
H	4.8483e-15
K	3.2313e-17
Mg	3.1558e-18
N	1.3324e-13
Na	1.3691e-16
O	5.9387e-12
S	1.3838e-12

Hfo_s

```

    5.011e-12  moles  [0.005 mol/(mol Ferrihydrite)]

```

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.349e-12	0.668	3.349e-12	-11.475
Hfo_sOH	1.643e-12	0.328	1.643e-12	-11.784
Hfo_sO-	1.846e-14	0.004	1.846e-14	-13.734
Hfo_sOHCa+2	6.114e-17	0.000	6.114e-17	-16.214

Hfo_w

```

    2.004e-10  moles  [0.2 mol/(mol Ferrihydrite)]

```

Species	Moles	Mole Fraction	Molality	Log Molality
---------	-------	---------------	----------	--------------

Hfo_wOH2+	9.261e-11	0.462	9.261e-11	-10.033
Hfo_wOH	4.542e-11	0.227	4.542e-11	-10.343
Hfo_wSO4-	3.128e-11	0.156	3.128e-11	-10.505
Hfo_wOHSO4-2	3.061e-11	0.153	3.061e-11	-10.514
Hfo_wO-	5.103e-13	0.003	5.103e-13	-12.292
Hfo_wOMg+	7.212e-19	0.000	7.212e-19	-18.142
Hfo_wOCa+	2.447e-19	0.000	2.447e-19	-18.611

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 614. Solution after simulation 113.
Using surface 605.
Using pure phase assemblage 605. Pure-phase assemblage after simulation 113.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	1.106e-09	1.106e-09	-3.966e-14
Alunite	-5.32	-6.72	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.37	-5.73	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	1.948e-10	1.944e-10	-4.473e-13
Barite	-0.18	-10.16	-9.98	0.000e+00	0	0.000e+00
Brochantite	0.00	15.22	15.22	4.515e-07	4.515e-07	-1.643e-11
Brucite	-3.37	13.47	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.060e-10
CaMoO4	-1.58	-9.53	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-5.34	-2.53	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.168e-03	1.168e-03	-7.970e-11
Carnotite	-2.18	-1.95	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-11.38	-1.54	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.79	-14.94	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	3.147e-05	3.147e-05	-3.685e-12
Cr2O3	0.00	-2.36	-2.36	7.362e-10	7.361e-10	-7.933e-14
Cu2Se(alpha)	-4.77	-50.57	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-1.09	-14.17	-13.08	0.000e+00	0	0.000e+00
Epsomite	-3.30	-5.43	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	1.002e-09	1.002e-09	-6.309e-18
Fluorite	-0.45	-10.95	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.48	2.19	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.12	-5.73	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.34	-59.03	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.60	-6.71	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-5.32	-4.19	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.90	8.89	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-24.17	-8.47	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.89	-12.76	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.67	-13.81	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	7.105e-15
Otavite	-1.88	-13.88	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.39	-16.01	-15.62	0.000e+00	0	0.000e+00
Rutherfordine	-4.96	-19.46	-14.50	0.000e+00	0	0.000e+00
SbO2	-4.00	-31.83	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.80	2.19	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.14	14.62	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.37	-4.11	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-5.68	-1.60	4.08	0.000e+00	0	0.000e+00
U3O8	-12.41	8.67	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.42	2.19	5.61	0.000e+00	0	0.000e+00
UO3	-5.51	2.19	7.70	0.000e+00	0	0.000e+00

ZnMoO4 -2.12 -12.24 -10.13 0.000e+00 0 0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.165e-23 Surface + diffuse layer charge, eq
 8.287e-12 Surface charge, eq
 1.243e-02 sigma, C/m²
 3.141e-02 psi, V
 -1.223e+00 -F*psi/RT
 2.945e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 6.434e-05 m² for 1.002e-09 moles of Ferrihydrite

Water in diffuse layer: 6.434e-10 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 5.839e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 7.967e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	9.2705e-18
Al	1.1215e-15
As	1.0003e-19
B	1.6361e-14
Ba	1.6086e-17
C	7.7242e-13
Ca	7.0185e-13
Cd	3.5630e-18
Cl	2.8532e-12
Co	2.5852e-17
Cr	4.5149e-19
Cu	3.7740e-16
F	1.4547e-13
Fe	4.8083e-19
H	1.0164e-12
Hg	7.1858e-19
K	1.0323e-12
Mg	1.3114e-12
Mn	1.5339e-14
Mo	9.9871e-16
N	6.5422e-15
Na	4.7061e-12
Ni	4.1454e-17
O	3.1171e-11
Pb	3.1572e-18
S	7.1438e-12
Sb	1.2060e-17
Se	7.9076e-17
Si	5.1277e-14
U	2.0508e-16
V	4.0776e-18
Zn	1.7866e-15

Hfo_s

5.011e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	1.519e-12	0.303	1.519e-12	-11.819
Hfo_sOCu+	1.434e-12	0.286	1.434e-12	-11.843
Hfo_sOPb+	1.179e-12	0.235	1.180e-12	-11.928
Hfo_sOMn+	6.895e-13	0.138	6.895e-13	-12.161
Hfo_sOCrOH+	1.587e-13	0.032	1.587e-13	-12.800
Hfo_sOHCa+2	1.349e-14	0.003	1.349e-14	-13.870

Hfo_sONi+	9.919e-15	0.002	9.919e-15	-14.004
Hfo_sOH	3.005e-15	0.001	3.005e-15	-14.522
Hfo_sO-	1.951e-15	0.000	1.952e-15	-14.710
Hfo_sOCd+	9.288e-16	0.000	9.288e-16	-15.032
Hfo_sOCo+	8.968e-16	0.000	8.969e-16	-15.047
Hfo_sOH2+	1.060e-16	0.000	1.060e-16	-15.975
Hfo_sOAg	1.385e-17	0.000	1.385e-17	-16.859
Hfo_sOHBa+2	1.578e-18	0.000	1.578e-18	-17.802
Hfo_sOFe+	7.700e-20	0.000	7.700e-20	-19.114
Hfo_sOHg+	1.310e-21	0.000	1.310e-21	-20.883

Hfo_w

2.004e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	6.428e-11	0.321	6.428e-11	-10.192
Hfo_wOMg+	3.554e-11	0.177	3.554e-11	-10.449
Hfo_wOHVO4-3	2.781e-11	0.139	2.781e-11	-10.556
Hfo_wOH	2.626e-11	0.131	2.627e-11	-10.581
Hfo_wO-	1.706e-11	0.085	1.706e-11	-10.768
Hfo_wOZn+	1.390e-11	0.069	1.390e-11	-10.857
Hfo_wOHSO4-2	6.205e-12	0.031	6.205e-12	-11.207
Hfo_wOMn+	4.787e-12	0.024	4.787e-12	-11.320
Hfo_wOCa+	9.864e-13	0.005	9.864e-13	-12.006
Hfo_wOHSeO3-2	9.583e-13	0.005	9.584e-13	-12.018
Hfo_wOH2+	9.265e-13	0.005	9.266e-13	-12.033
Hfo_wOHAsO4-3	8.997e-13	0.004	8.998e-13	-12.046
Hfo_wOPb+	4.605e-13	0.002	4.605e-13	-12.337
Hfo_wONi+	1.169e-13	0.001	1.169e-13	-12.932
Hfo_wSO4-	1.098e-13	0.001	1.098e-13	-12.960
Hfo_wSeO3-	5.744e-14	0.000	5.744e-14	-13.241
Hfo_wOHMoO4-2	4.029e-14	0.000	4.029e-14	-13.395
Hfo_wOCo+	2.209e-14	0.000	2.209e-14	-13.656
Hfo_wOCd+	3.463e-15	0.000	3.463e-15	-14.461
Hfo_wH2BO3	2.439e-15	0.000	2.439e-15	-14.613
Hfo_wMoO4-	9.181e-16	0.000	9.181e-16	-15.037
Hfo_wOAg	3.183e-17	0.000	3.183e-17	-16.497
Hfo_wHAsO4-	2.508e-17	0.000	2.508e-17	-16.601
Hfo_wOBa+	1.667e-18	0.000	1.668e-18	-17.778
Hfo_wOHg+	5.610e-19	0.000	5.610e-19	-18.251
Hfo_wOFe+	4.246e-19	0.000	4.246e-19	-18.372
Hfo_wOHSeO4-2	1.771e-19	0.000	1.771e-19	-18.752
Hfo_wOHCrO4-2	3.685e-20	0.000	3.685e-20	-19.434
Hfo_wH2AsO4	2.863e-20	0.000	2.863e-20	-19.543
Hfo_wOHSbO(OH) 4-	2.562e-20	0.000	2.562e-20	-19.591
Hfo_wSeO4-	2.728e-21	0.000	2.728e-21	-20.564
Hfo_wCrO4-	5.945e-22	0.000	5.945e-22	-21.226
Hfo_wSbO(OH) 4	5.839e-22	0.000	5.839e-22	-21.234
Hfo_wH2AsO3	4.075e-30	0.000	4.075e-30	-29.390

-----Solution composition-----

Elements	Molality	Moles
Ag	1.398e-08	1.398e-08
Al	1.390e-06	1.390e-06
As	9.927e-11	9.927e-11
B	2.483e-05	2.483e-05
Ba	3.931e-08	3.931e-08
C	9.659e-04	9.659e-04
Ca	1.470e-03	1.470e-03
Cd	7.092e-09	7.092e-09
Cl	3.533e-03	3.533e-03
Co	5.477e-08	5.477e-08
Cr	7.925e-10	7.925e-10
Cu	6.024e-07	6.024e-07
F	1.883e-04	1.883e-04

Fe	7.855e-10	7.854e-10
Hg	1.117e-09	1.117e-09
K	1.988e-03	1.988e-03
Mg	2.809e-03	2.809e-03
Mn	3.337e-05	3.337e-05
Mo	9.853e-07	9.853e-07
N	8.110e-06	8.110e-06
Na	9.089e-03	9.089e-03
Ni	8.533e-08	8.532e-08
Pb	5.172e-09	5.172e-09
S	7.495e-03	7.494e-03
Sb	1.493e-08	1.493e-08
Se	8.614e-08	8.614e-08
Si	7.916e-05	7.915e-05
U	1.415e-07	1.415e-07
V	4.560e-09	4.560e-09
Zn	3.535e-06	3.535e-06

-----Description of solution-----

equilibrium	pH	=	8.212	Charge balance
	pe	=	4.561	Adjusted to redox
Activity of water = 1.000				
Ionic strength (mol/kgw) = 2.656e-02				
Mass of water (kg) = 1.000e+00				
Total alkalinity (eq/kg) = 9.930e-04				
Total CO2 (mol/kg) = 9.659e-04				
Temperature (°C) = 25.00				
Pressure (atm) = 1.00				
Electrical balance (eq) = 9.597e-07				
Percent error, 100*(Cat- An)/(Cat+ An) = 0.00				
Iterations = 1				
Total H = 1.110115e+02				
Total O = 5.553838e+01				

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.925e-06	1.638e-06	-5.716	-5.786	-0.070	(0)
H+	7.176e-09	6.144e-09	-8.144	-8.212	-0.067	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	1.398e-08					
AgCl	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
AgCl2-	2.928e-09	2.418e-09	-8.533	-8.617	-0.083	(0)
Ag+	1.735e-09	1.486e-09	-8.761	-8.828	-0.067	(0)
AgSO4-	1.193e-10	9.849e-11	-9.923	-10.007	-0.083	(0)
AgCl3-2	1.402e-11	6.519e-12	-10.853	-11.186	-0.332	(0)
AgNO2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
AgF	5.294e-13	5.294e-13	-12.276	-12.276	0.000	(0)
AgOH	2.434e-13	2.434e-13	-12.614	-12.614	0.000	(0)
AgCl4-3	2.254e-13	4.026e-14	-12.647	-13.395	-0.748	(0)
AgH2BO3	4.957e-14	4.957e-14	-13.305	-13.305	0.000	(0)
AgSeO3-	2.473e-14	2.042e-14	-13.607	-13.690	-0.083	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	6.575e-15	5.429e-15	-14.182	-14.265	-0.083	(0)
Ag (OH) 2-	4.718e-17	3.896e-17	-16.326	-16.409	-0.083	(0)
Ag (NO2) 2-	2.731e-17	2.255e-17	-16.564	-16.647	-0.083	(0)
AgNO3	7.626e-18	7.626e-18	-17.118	-17.118	0.000	(0)
Ag (NH3) 2+	9.565e-20	7.899e-20	-19.019	-19.102	-0.083	(0)
Ag (SeO3) 2-3	2.190e-20	3.912e-21	-19.660	-20.408	-0.748	(0)
Ag2MoO4	4.425e-25	4.425e-25	-24.354	-24.354	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.222	-74.222	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.884	-83.213	-1.330	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.419	-148.603	-0.184	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-149.248	-149.331	-0.083	(0)

	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.488	-149.832	-0.344	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.815	-150.143	-0.327	(0)
Al	1.390e-06						
	Al (OH) 4-	1.384e-06	1.186e-06	-5.859	-5.926	-0.067	(0)
	Al (OH) 3	5.752e-09	5.752e-09	-8.240	-8.240	0.000	(0)
	Al (OH) 2+	2.041e-10	1.760e-10	-9.690	-9.755	-0.064	(0)
	AlF3	1.181e-11	1.181e-11	-10.928	-10.928	0.000	(0)
	AlF2+	7.671e-12	6.613e-12	-11.115	-11.180	-0.064	(0)
	AlF4-	9.795e-13	8.395e-13	-12.009	-12.076	-0.067	(0)
	AlOH+2	2.449e-13	1.352e-13	-12.611	-12.869	-0.258	(0)
	AlF+2	2.121e-13	1.171e-13	-12.673	-12.931	-0.258	(0)
	AlSO4+	2.484e-15	2.129e-15	-14.605	-14.672	-0.067	(0)
	Al+3	3.338e-16	8.256e-17	-15.477	-16.083	-0.607	(0)
	Al (SO4) 2-	8.844e-17	7.580e-17	-16.053	-16.120	-0.067	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-47.268	-48.016	-0.748	(0)
As (3)	6.643e-25						
	H3AsO3	6.033e-25	6.033e-25	-24.219	-24.219	0.000	(0)
	H2AsO3-	6.098e-26	5.036e-26	-25.215	-25.298	-0.083	(0)
	HAsO3-2	1.607e-29	7.475e-30	-28.794	-29.126	-0.332	(0)
	H4AsO3+	2.224e-33	1.836e-33	-32.653	-32.736	-0.083	(0)
	AsO3-3	2.626e-34	4.690e-35	-33.581	-34.329	-0.748	(0)
As (5)	9.927e-11						
	HAsO4-2	9.611e-11	4.470e-11	-10.017	-10.350	-0.332	(0)
	H2AsO4-	3.033e-12	2.505e-12	-11.518	-11.601	-0.083	(0)
	AsO4-3	1.288e-13	2.301e-14	-12.890	-13.638	-0.748	(0)
	H3AsO4	2.658e-18	2.674e-18	-17.575	-17.573	0.003	(0)
B	2.483e-05						
	H3BO3	2.213e-05	2.227e-05	-4.655	-4.652	0.003	(0)
	H2BO3-	2.492e-06	2.105e-06	-5.603	-5.677	-0.073	(0)
	MgH2BO3+	9.713e-08	8.205e-08	-7.013	-7.086	-0.073	(0)
	CaH2BO3+	7.956e-08	6.720e-08	-7.099	-7.173	-0.073	(0)
	NaH2BO3	2.550e-08	2.550e-08	-7.594	-7.594	0.000	(0)
	BF (OH) 3-	1.492e-09	1.260e-09	-8.826	-8.899	-0.073	(0)
	H5 (BO3) 2-	4.724e-11	3.990e-11	-10.326	-10.399	-0.073	(0)
	BaH2BO3+	1.617e-12	1.366e-12	-11.791	-11.865	-0.073	(0)
	BF2 (OH) 2-	1.391e-13	1.175e-13	-12.857	-12.930	-0.073	(0)
	H8 (BO3) 3-	1.052e-13	8.886e-14	-12.978	-13.051	-0.073	(0)
	AgH2BO3	4.957e-14	4.957e-14	-13.305	-13.305	0.000	(0)
	BF3OH-	4.718e-20	3.985e-20	-19.326	-19.400	-0.073	(0)
	BF4-	2.024e-25	1.710e-25	-24.694	-24.767	-0.073	(0)
Ba	3.931e-08						
	Ba+2	3.906e-08	2.099e-08	-7.408	-7.678	-0.270	(0)
	BaHCO3+	1.813e-10	1.568e-10	-9.742	-9.805	-0.063	(0)
	BaCO3	6.427e-11	6.427e-11	-10.192	-10.192	0.000	(0)
	BaH2BO3+	1.617e-12	1.366e-12	-11.791	-11.865	-0.073	(0)
	BaOH+	1.746e-13	1.501e-13	-12.758	-12.824	-0.066	(0)
	BaNO3+	8.233e-16	6.799e-16	-15.084	-15.168	-0.083	(0)
	BaNH3+2	5.098e-17	2.371e-17	-16.293	-16.625	-0.332	(0)
C (4)	9.659e-04						
	HCO3-	9.075e-04	7.823e-04	-3.042	-3.107	-0.064	(0)
	CO3-2	1.110e-05	5.969e-06	-4.954	-5.224	-0.270	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	MgHCO3+	1.053e-05	8.998e-06	-4.977	-5.046	-0.068	(0)
	CaHCO3+	9.341e-06	8.081e-06	-5.030	-5.093	-0.063	(0)
	MgCO3	5.581e-06	5.581e-06	-5.253	-5.253	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	NaHCO3	3.362e-06	3.362e-06	-5.473	-5.473	0.000	(0)
	NaCO3-	9.854e-07	8.494e-07	-6.006	-6.071	-0.064	(0)
	CuCO3	4.508e-07	4.508e-07	-6.346	-6.346	0.000	(0)
	ZnCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
	MnHCO3+	2.183e-07	1.877e-07	-6.661	-6.727	-0.066	(0)
	UO2 (CO3) 3-4	1.058e-07	4.949e-09	-6.976	-8.306	-1.330	(0)
	UO2 (CO3) 2-2	3.557e-08	1.654e-08	-7.449	-7.781	-0.332	(0)
	ZnHCO3+	3.232e-08	2.669e-08	-7.491	-7.574	-0.083	(0)
	Cu (CO3) 2-2	1.557e-08	7.243e-09	-7.808	-8.140	-0.332	(0)
	NiCO3	6.542e-09	6.542e-09	-8.184	-8.184	0.000	(0)
	NiHCO3+	3.431e-09	2.833e-09	-8.465	-8.548	-0.083	(0)
	PbCO3	3.290e-09	3.290e-09	-8.483	-8.483	0.000	(0)

		CoCO3	1.812e-09	1.812e-09	-8.742	-8.742	0.000	(0)
		CoHCO3+	1.323e-09	1.093e-09	-8.878	-8.961	-0.083	(0)
		CuHCO3+	7.666e-10	6.331e-10	-9.115	-9.199	-0.083	(0)
		CdCO3	2.973e-10	2.973e-10	-9.527	-9.527	0.000	(0)
		BaHCO3+	1.813e-10	1.568e-10	-9.742	-9.805	-0.063	(0)
		UO2CO3	1.389e-10	1.389e-10	-9.857	-9.857	0.000	(0)
		PbHCO3+	1.290e-10	1.066e-10	-9.889	-9.972	-0.083	(0)
		Pb (CO3) 2-2	1.218e-10	5.663e-11	-9.914	-10.247	-0.332	(0)
		BaCO3	6.427e-11	6.427e-11	-10.192	-10.192	0.000	(0)
		CdHCO3+	4.713e-12	3.892e-12	-11.327	-11.410	-0.083	(0)
		Cd (CO3) 2-2	2.828e-12	1.315e-12	-11.548	-11.881	-0.332	(0)
		FeHCO3+	1.214e-15	1.051e-15	-14.916	-14.979	-0.063	(0)
		HgCO3	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
		Hg (CO3) 2-2	4.626e-17	2.152e-17	-16.335	-16.667	-0.332	(0)
		HgHCO3+	1.579e-19	1.304e-19	-18.802	-18.885	-0.083	(0)
Ca	1.470e-03							
		Ca+2	1.032e-03	5.548e-04	-2.986	-3.256	-0.270	(0)
		CaSO4	4.222e-04	4.222e-04	-3.374	-3.374	0.000	(0)
		CaHCO3+	9.341e-06	8.081e-06	-5.030	-5.093	-0.063	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	9.988e-07	8.589e-07	-6.001	-6.066	-0.066	(0)
		CaH2BO3+	7.956e-08	6.720e-08	-7.099	-7.173	-0.073	(0)
		CaOH+	2.096e-08	1.813e-08	-7.679	-7.742	-0.063	(0)
		CaNO3+	1.373e-11	1.134e-11	-10.862	-10.946	-0.083	(0)
		CaNH3+2	2.688e-12	1.250e-12	-11.571	-11.903	-0.332	(0)
		Ca (NH3) 2+2	1.915e-21	8.907e-22	-20.718	-21.050	-0.332	(0)
Cd	7.092e-09							
		Cd+2	4.066e-09	2.185e-09	-8.391	-8.661	-0.270	(0)
		CdSO4	1.702e-09	1.702e-09	-8.769	-8.769	0.000	(0)
		CdCl+	7.645e-10	6.313e-10	-9.117	-9.200	-0.083	(0)
		CdCO3	2.973e-10	2.973e-10	-9.527	-9.527	0.000	(0)
		Cd (SO4) 2-2	1.640e-10	7.627e-11	-9.785	-10.118	-0.332	(0)
		CdOHC1	4.242e-11	4.242e-11	-10.372	-10.372	0.000	(0)
		CdOH+	3.443e-11	2.843e-11	-10.463	-10.546	-0.083	(0)
		CdCl2	7.961e-12	7.961e-12	-11.099	-11.099	0.000	(0)
		CdF+	5.949e-12	4.912e-12	-11.226	-11.309	-0.083	(0)
		CdHCO3+	4.713e-12	3.892e-12	-11.327	-11.410	-0.083	(0)
		Cd (CO3) 2-2	2.828e-12	1.315e-12	-11.548	-11.881	-0.332	(0)
		Cd (OH) 2	2.939e-13	2.939e-13	-12.532	-12.532	0.000	(0)
		CdCl3-	1.840e-14	1.520e-14	-13.735	-13.818	-0.083	(0)
		CdF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000	(0)
		CdNO3+	5.407e-17	4.465e-17	-16.267	-16.350	-0.083	(0)
		CdSeO4	3.770e-17	3.770e-17	-16.424	-16.424	0.000	(0)
		Cd (OH) 3-	3.562e-17	2.941e-17	-16.448	-16.531	-0.083	(0)
		Cd (SeO3) 2-2	1.772e-18	8.239e-19	-17.752	-18.084	-0.332	(0)
		Cd2OH+3	1.743e-18	3.114e-19	-17.759	-18.507	-0.748	(0)
		Cd (OH) 4-2	1.696e-23	7.886e-24	-22.771	-23.103	-0.332	(0)
		Cd (NO3) 2	1.446e-25	1.446e-25	-24.840	-24.840	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-79.778	-79.861	-0.083	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.866	-151.866	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-229.092	-229.175	-0.083	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-305.856	-306.188	-0.332	(0)
Cl	3.533e-03							
		Cl-	3.533e-03	3.025e-03	-2.452	-2.519	-0.067	(0)
		MnCl+	5.326e-08	4.580e-08	-7.274	-7.339	-0.066	(0)
		ZnOHC1	1.758e-08	1.758e-08	-7.755	-7.755	0.000	(0)
		ZnCl+	9.599e-09	8.199e-09	-8.018	-8.086	-0.068	(0)
		AgCl	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
		AgCl2-	2.928e-09	2.418e-09	-8.533	-8.617	-0.083	(0)
		CdCl+	7.645e-10	6.313e-10	-9.117	-9.200	-0.083	(0)
		CuCl	6.576e-10	6.576e-10	-9.182	-9.182	0.000	(0)
		CuCl2-	4.866e-10	4.156e-10	-9.313	-9.381	-0.068	(0)
		NiCl+	2.754e-10	2.274e-10	-9.560	-9.643	-0.083	(0)
		CoCl+	2.276e-10	1.879e-10	-9.643	-9.726	-0.083	(0)
		MnCl2	1.957e-10	1.957e-10	-9.708	-9.708	0.000	(0)
		CuCl+	7.200e-11	6.150e-11	-10.143	-10.211	-0.068	(0)
		CdOHC1	4.242e-11	4.242e-11	-10.372	-10.372	0.000	(0)
		ZnCl2	3.931e-11	3.931e-11	-10.405	-10.405	0.000	(0)

PbCl+	2.383e-11	1.968e-11	-10.623	-10.706	-0.083	(0)
AgCl3-2	1.402e-11	6.519e-12	-10.853	-11.186	-0.332	(0)
CdCl2	7.961e-12	7.961e-12	-11.099	-11.099	0.000	(0)
HgClOH	1.397e-12	1.397e-12	-11.855	-11.855	0.000	(0)
CuCl3-2	4.917e-13	2.688e-13	-12.308	-12.571	-0.262	(0)
PbCl2	2.659e-13	2.659e-13	-12.575	-12.575	0.000	(0)
AgCl4-3	2.254e-13	4.026e-14	-12.647	-13.395	-0.748	(0)
MnCl3-	1.896e-13	1.631e-13	-12.722	-12.788	-0.066	(0)
HgCl2	1.460e-13	1.460e-13	-12.836	-12.836	0.000	(0)
ZnCl3-	1.106e-13	9.446e-14	-12.956	-13.025	-0.068	(0)
CuCl2	6.451e-14	6.451e-14	-13.190	-13.190	0.000	(0)
CdCl3-	1.840e-14	1.520e-14	-13.735	-13.818	-0.083	(0)
HgCl3-	5.350e-15	4.418e-15	-14.272	-14.355	-0.083	(0)
NiCl2	3.463e-15	3.463e-15	-14.460	-14.460	0.000	(0)
PbCl3-	3.878e-16	3.203e-16	-15.411	-15.495	-0.083	(0)
ZnCl4-2	2.614e-16	1.429e-16	-15.583	-15.845	-0.262	(0)
HgCl4-2	1.144e-16	5.320e-17	-15.942	-16.274	-0.332	(0)
UO2Cl+	3.473e-17	2.868e-17	-16.459	-16.542	-0.083	(0)
HgCl+	1.166e-17	9.632e-18	-16.933	-17.016	-0.083	(0)
CuCl3-	2.132e-18	1.821e-18	-17.671	-17.740	-0.068	(0)
PbCl4-2	9.522e-19	4.428e-19	-18.021	-18.354	-0.332	(0)
CrCl+2	4.796e-19	2.231e-19	-18.319	-18.652	-0.332	(0)
CrOHC12	2.101e-20	2.101e-20	-19.678	-19.678	0.000	(0)
CrCl2+	7.753e-23	6.403e-23	-22.111	-22.194	-0.083	(0)
FeCl+2	6.025e-23	3.294e-23	-22.220	-22.482	-0.262	(0)
CuCl4-2	5.051e-23	2.761e-23	-22.297	-22.559	-0.262	(0)
VOCl+	1.403e-24	1.159e-24	-23.853	-23.936	-0.083	(0)
FeCl2+	5.176e-25	4.451e-25	-24.286	-24.352	-0.066	(0)
CrO3Cl-	4.312e-26	3.561e-26	-25.365	-25.448	-0.083	(0)
FeCl3	1.346e-28	1.346e-28	-27.871	-27.871	0.000	(0)
CoCl+2	3.443e-36	1.601e-36	-35.463	-35.796	-0.332	(0)
UCl+3	0.000e+00	0.000e+00	-47.056	-47.804	-0.748	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
Co (2)	5.477e-08					
Co+2	3.862e-08	1.796e-08	-7.413	-7.746	-0.332	(0)
CoSO4	1.190e-08	1.190e-08	-7.924	-7.924	0.000	(0)
CoCO3	1.812e-09	1.812e-09	-8.742	-8.742	0.000	(0)
CoHCO3+	1.323e-09	1.093e-09	-8.878	-8.961	-0.083	(0)
CoOH+	7.108e-10	5.870e-10	-9.148	-9.231	-0.083	(0)
CoCl+	2.276e-10	1.879e-10	-9.643	-9.726	-0.083	(0)
CoF+	9.755e-11	8.055e-11	-10.011	-10.094	-0.083	(0)
Co (OH) 2	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
CoNO2+	1.050e-12	8.668e-13	-11.979	-12.062	-0.083	(0)
Co (NH3) +2	8.309e-15	3.864e-15	-14.080	-14.413	-0.332	(0)
Co (OH) 3-	3.023e-15	2.496e-15	-14.520	-14.603	-0.083	(0)
CoSeO4	8.340e-16	8.340e-16	-15.079	-15.079	0.000	(0)
CoOOH-	7.588e-16	6.266e-16	-15.120	-15.203	-0.083	(0)
CoNO3+	2.227e-16	1.839e-16	-15.652	-15.735	-0.083	(0)
Co2OH+3	2.958e-18	5.283e-19	-17.529	-18.277	-0.748	(0)
Co (OH) 4-2	1.394e-21	6.481e-22	-20.856	-21.188	-0.332	(0)
Co (NH3) 2+2	6.344e-22	2.950e-22	-21.198	-21.530	-0.332	(0)
Co (NO3) 2	2.418e-24	2.418e-24	-23.617	-23.617	0.000	(0)
Co4 (OH) 4+4	5.063e-28	2.369e-29	-27.296	-28.625	-1.330	(0)
Co (NH3) 3+2	1.429e-29	6.648e-30	-28.845	-29.177	-0.332	(0)
Co (NH3) 4+2	1.343e-37	6.244e-38	-36.872	-37.205	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.399	-45.732	-0.332	(0)
Co (3)	4.656e-29					
CoOH+2	4.656e-29	2.165e-29	-28.332	-28.664	-0.332	(0)
Co+3	1.052e-35	2.601e-36	-34.978	-35.585	-0.607	(0)
CoCl+2	3.443e-36	1.601e-36	-35.463	-35.796	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.775	-68.107	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
Cr (2)	8.043e-28					
Cr+2	8.043e-28	3.741e-28	-27.095	-27.427	-0.332	(0)

Cr (3)	7.925e-10					
Cr (OH) 2+	4.928e-10	4.070e-10	-9.307	-9.390	-0.083	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.345e-11	1.937e-11	-10.630	-10.713	-0.083	(0)
Cr (OH) 4-	1.978e-11	1.633e-11	-10.704	-10.787	-0.083	(0)
Cr (OH) +2	4.390e-12	2.042e-12	-11.358	-11.690	-0.332	(0)
CrOHSO4	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
CrF+2	2.754e-15	1.281e-15	-14.560	-14.893	-0.332	(0)
CrSO4+	5.352e-16	4.420e-16	-15.271	-15.355	-0.083	(0)
Cr+3	3.190e-16	5.697e-17	-15.496	-16.244	-0.748	(0)
CrCl+2	4.796e-19	2.231e-19	-18.319	-18.652	-0.332	(0)
CrOHCl2	2.101e-20	2.101e-20	-19.678	-19.678	0.000	(0)
Cr2 (OH) 2SO4+2	6.388e-22	2.971e-22	-21.195	-21.527	-0.332	(0)
CrCl2+	7.753e-23	6.403e-23	-22.111	-22.194	-0.083	(0)
Cr2 (OH) 2 (SO4) 2	5.863e-23	5.863e-23	-22.232	-22.232	0.000	(0)
CrNO3+2	3.460e-26	1.609e-26	-25.461	-25.793	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.061	-45.394	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-54.979	-55.728	-0.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Cr (6)	2.968e-14					
CrO4-2	2.849e-14	1.532e-14	-13.545	-13.815	-0.270	(0)
NaCrO4-	7.044e-16	5.817e-16	-15.152	-15.235	-0.083	(0)
HCrO4-	3.687e-16	3.045e-16	-15.433	-15.516	-0.083	(0)
KCrO4-	1.146e-16	9.464e-17	-15.941	-16.024	-0.083	(0)
CrO3SO4-2	4.073e-24	1.894e-24	-23.390	-23.723	-0.332	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	4.312e-26	3.561e-26	-25.365	-25.448	-0.083	(0)
Cr2O7-2	6.916e-30	3.217e-30	-29.160	-29.493	-0.332	(0)
Cu (1)	1.354e-09					
CuCl	6.576e-10	6.576e-10	-9.182	-9.182	0.000	(0)
CuCl2-	4.866e-10	4.156e-10	-9.313	-9.381	-0.068	(0)
Cu+	2.091e-10	1.727e-10	-9.680	-9.763	-0.083	(0)
CuCl3-2	4.917e-13	2.688e-13	-12.308	-12.571	-0.262	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.032	-148.368	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.778	-149.098	-0.320	(0)
Cu (2)	6.011e-07					
CuCO3	4.508e-07	4.508e-07	-6.346	-6.346	0.000	(0)
CuOH+	7.779e-08	6.645e-08	-7.109	-7.178	-0.068	(0)
Cu+2	2.386e-08	1.283e-08	-7.622	-7.892	-0.270	(0)
Cu (OH) 2	2.172e-08	2.172e-08	-7.663	-7.663	0.000	(0)
Cu (CO3) 2-2	1.557e-08	7.243e-09	-7.808	-8.140	-0.332	(0)
CuSO4	9.762e-09	9.762e-09	-8.010	-8.010	0.000	(0)
CuHCO3+	7.666e-10	6.331e-10	-9.115	-9.199	-0.083	(0)
Cu2 (OH) 2+2	2.385e-10	1.109e-10	-9.623	-9.955	-0.332	(0)
CuF+	1.390e-10	1.148e-10	-9.857	-9.940	-0.083	(0)
Cu (OH) 3-	8.836e-11	7.297e-11	-10.054	-10.137	-0.083	(0)
CuCl+	7.200e-11	6.150e-11	-10.143	-10.211	-0.068	(0)
CuNO2+	1.114e-11	9.199e-12	-10.953	-11.036	-0.083	(0)
CuNH3+2	5.051e-13	2.349e-13	-12.297	-12.629	-0.332	(0)
CuCl2	6.451e-14	6.451e-14	-13.190	-13.190	0.000	(0)
Cu (OH) 4-2	2.023e-15	9.408e-16	-14.694	-15.026	-0.332	(0)
Cu (NO2) 2	6.448e-16	6.448e-16	-15.191	-15.191	0.000	(0)
CuNO3+	3.174e-16	2.621e-16	-15.498	-15.582	-0.083	(0)
CuCl3-	2.132e-18	1.821e-18	-17.671	-17.740	-0.068	(0)
CuCl4-2	5.051e-23	2.761e-23	-22.297	-22.559	-0.262	(0)
Cu (NO3) 2	2.132e-25	2.132e-25	-24.671	-24.671	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.536	-219.620	-0.083	(0)
F	1.883e-04					
F-	1.657e-04	1.418e-04	-3.781	-3.848	-0.067	(0)
MgF+	2.087e-05	1.789e-05	-4.680	-4.747	-0.067	(0)
CaF+	9.988e-07	8.589e-07	-6.001	-6.066	-0.066	(0)
NaF	6.840e-07	6.840e-07	-6.165	-6.165	0.000	(0)
MnF+	7.897e-08	6.791e-08	-7.103	-7.168	-0.066	(0)
ZnF+	3.698e-09	3.054e-09	-8.432	-8.515	-0.083	(0)
BF (OH) 3-	1.492e-09	1.260e-09	-8.826	-8.899	-0.073	(0)
HF	1.289e-09	1.289e-09	-8.890	-8.890	0.000	(0)
CuF+	1.390e-10	1.148e-10	-9.857	-9.940	-0.083	(0)
NiF+	1.268e-10	1.047e-10	-9.897	-9.980	-0.083	(0)

CoF+	9.755e-11	8.055e-11	-10.011	-10.094	-0.083	(0)
AlF3	1.181e-11	1.181e-11	-10.928	-10.928	0.000	(0)
AlF2+	7.671e-12	6.613e-12	-11.115	-11.180	-0.064	(0)
CdF+	5.949e-12	4.912e-12	-11.226	-11.309	-0.083	(0)
PbF+	2.219e-12	1.833e-12	-11.654	-11.737	-0.083	(0)
AlF4-	9.795e-13	8.395e-13	-12.009	-12.076	-0.067	(0)
HF2-	8.167e-13	6.951e-13	-12.088	-12.158	-0.070	(0)
AgF	5.294e-13	5.294e-13	-12.276	-12.276	0.000	(0)
AlF+2	2.121e-13	1.171e-13	-12.673	-12.931	-0.258	(0)
BF2 (OH) 2-	1.391e-13	1.175e-13	-12.857	-12.930	-0.073	(0)
UO2F+	1.386e-13	1.145e-13	-12.858	-12.941	-0.083	(0)
UO2F2	4.682e-14	4.682e-14	-13.330	-13.330	0.000	(0)
PbF2	5.115e-15	5.115e-15	-14.291	-14.291	0.000	(0)
CrF+2	2.754e-15	1.281e-15	-14.560	-14.893	-0.332	(0)
UO2F3-	2.020e-15	1.668e-15	-14.695	-14.778	-0.083	(0)
CdF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000	(0)
H2F2	4.452e-18	4.452e-18	-17.351	-17.351	0.000	(0)
UO2F4-2	4.042e-18	1.880e-18	-17.393	-17.726	-0.332	(0)
PbF3-	1.666e-18	1.376e-18	-17.778	-17.861	-0.083	(0)
VO2F	4.092e-19	4.092e-19	-18.388	-18.388	0.000	(0)
FeF2+	2.475e-19	2.129e-19	-18.606	-18.672	-0.066	(0)
FeF+2	1.026e-19	5.607e-20	-18.989	-19.251	-0.262	(0)
BF3OH-	4.718e-20	3.985e-20	-19.326	-19.400	-0.073	(0)
FeF3	4.260e-20	4.260e-20	-19.371	-19.371	0.000	(0)
VO2F2-	2.552e-20	2.107e-20	-19.593	-19.676	-0.083	(0)
PbF4-2	2.009e-22	9.343e-23	-21.697	-22.030	-0.332	(0)
VOF+	1.407e-22	1.162e-22	-21.852	-21.935	-0.083	(0)
VO2F3-2	8.017e-23	3.728e-23	-22.096	-22.428	-0.332	(0)
VOF2	6.179e-24	6.179e-24	-23.209	-23.209	0.000	(0)
HgF+	1.016e-24	8.391e-25	-23.993	-24.076	-0.083	(0)
BF4-	2.024e-25	1.710e-25	-24.694	-24.767	-0.073	(0)
VOF3-	3.766e-26	3.110e-26	-25.424	-25.507	-0.083	(0)
VO2F4-3	1.457e-26	2.602e-27	-25.837	-26.585	-0.748	(0)
Sb (OH) 2F	7.021e-27	7.021e-27	-26.154	-26.154	0.000	(0)
SbOF	6.907e-27	6.907e-27	-26.161	-26.161	0.000	(0)
VOF4-2	3.828e-29	1.781e-29	-28.417	-28.749	-0.332	(0)
SiF6-2	2.495e-30	1.364e-30	-29.603	-29.865	-0.262	(0)
UF3+	1.425e-37	1.177e-37	-36.846	-36.929	-0.083	(0)
UF2+2	1.125e-38	5.234e-39	-37.949	-38.281	-0.332	(0)
UF4	1.830e-39	1.830e-39	-38.738	-38.738	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.785	-41.533	-0.748	(0)
UF5-	0.000e+00	0.000e+00	-40.905	-40.988	-0.083	(0)
UF6-2	0.000e+00	0.000e+00	-42.023	-42.356	-0.332	(0)
Fe (2)	3.257e-13					
Fe+2	2.294e-13	1.067e-13	-12.639	-12.972	-0.332	(0)
FeSO4	8.699e-14	8.699e-14	-13.061	-13.061	0.000	(0)
FeOH+	8.090e-15	6.957e-15	-14.092	-14.158	-0.066	(0)
FeHCO3+	1.214e-15	1.051e-15	-14.916	-14.979	-0.063	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	5.453e-18	4.689e-18	-17.263	-17.329	-0.066	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-162.440	-162.440	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-239.529	-239.612	-0.083	(0)
Fe (3)	7.851e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.819e-10	2.430e-10	-9.550	-9.614	-0.064	(0)
Fe (OH) 4-	7.565e-11	6.521e-11	-10.121	-10.186	-0.064	(0)
FeOH+2	6.976e-16	3.813e-16	-15.156	-15.419	-0.262	(0)
FeF2+	2.475e-19	2.129e-19	-18.606	-18.672	-0.066	(0)
FeF+2	1.026e-19	5.607e-20	-18.989	-19.251	-0.262	(0)
FeF3	4.260e-20	4.260e-20	-19.371	-19.371	0.000	(0)
FeSO4+	1.563e-20	1.344e-20	-19.806	-19.872	-0.066	(0)
Fe+3	1.458e-21	3.605e-22	-20.836	-21.443	-0.607	(0)
Fe (SO4) 2-	1.156e-21	9.546e-22	-20.937	-21.020	-0.083	(0)
FeCl+2	6.025e-23	3.294e-23	-22.220	-22.482	-0.262	(0)
FeCl2+	5.176e-25	4.451e-25	-24.286	-24.352	-0.066	(0)
FeHSeO3+2	6.762e-26	3.145e-26	-25.170	-25.502	-0.332	(0)
FeCl3	1.346e-28	1.346e-28	-27.871	-27.871	0.000	(0)
Fe2 (OH) 2+4	1.029e-28	4.815e-30	-27.987	-29.317	-1.330	(0)

	FeNO3+2	5.009e-29	2.330e-29	-28.300	-28.633	-0.332	(0)
	Fe3 (OH) 4+5	2.024e-36	1.691e-38	-35.694	-37.772	-2.078	(0)
H (0)	4.013e-29						
	H2	2.007e-29	2.019e-29	-28.698	-28.695	0.003	(0)
Hg (0)	1.113e-09						
	Hg	1.113e-09	1.113e-09	-8.954	-8.954	0.000	(0)
Hg (1)	5.184e-22						
	Hg2+2	2.592e-22	1.205e-22	-21.586	-21.919	-0.332	(0)
Hg (2)	4.235e-12						
	Hg (OH) 2	2.685e-12	2.702e-12	-11.571	-11.568	0.003	(0)
	HgClOH	1.397e-12	1.397e-12	-11.855	-11.855	0.000	(0)
	HgCl2	1.460e-13	1.460e-13	-12.836	-12.836	0.000	(0)
	HgCl3-	5.350e-15	4.418e-15	-14.272	-14.355	-0.083	(0)
	HgCO3	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
	HgCl4-2	1.144e-16	5.320e-17	-15.942	-16.274	-0.332	(0)
	Hg (CO3) 2-2	4.626e-17	2.152e-17	-16.335	-16.667	-0.332	(0)
	HgOH+	1.260e-17	1.041e-17	-16.900	-16.983	-0.083	(0)
	HgCl+	1.166e-17	9.632e-18	-16.933	-17.016	-0.083	(0)
	Hg (OH) 3-	6.747e-19	5.572e-19	-18.171	-18.254	-0.083	(0)
	HgHCO3+	1.579e-19	1.304e-19	-18.802	-18.885	-0.083	(0)
	Hg (NH3) 2+2	6.935e-22	3.225e-22	-21.159	-21.491	-0.332	(0)
	HgNH3+2	3.875e-22	1.802e-22	-21.412	-21.744	-0.332	(0)
	Hg+2	3.431e-22	1.596e-22	-21.465	-21.797	-0.332	(0)
	HgSO4	1.388e-22	1.388e-22	-21.858	-21.858	0.000	(0)
	HgF+	1.016e-24	8.391e-25	-23.993	-24.076	-0.083	(0)
	Hg (NH3) 3+2	4.942e-30	2.298e-30	-29.306	-29.639	-0.332	(0)
	HgNO3+	4.610e-31	3.807e-31	-30.336	-30.419	-0.083	(0)
	Hg (NH3) 4+2	7.025e-38	3.267e-38	-37.153	-37.486	-0.332	(0)
	Hg (NO3) 2	1.022e-39	1.022e-39	-38.990	-38.990	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.992	-140.075	-0.083	(0)
	HgS2-2	0.000e+00	0.000e+00	-140.239	-140.572	-0.332	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.893	-141.893	0.000	(0)
K	1.988e-03						
	K+	1.942e-03	1.663e-03	-2.712	-2.779	-0.067	(0)
	KSO4-	4.538e-05	3.912e-05	-4.343	-4.408	-0.064	(0)
	KCrO4-	1.146e-16	9.464e-17	-15.941	-16.024	-0.083	(0)
Mg	2.809e-03						
	Mg+2	2.091e-03	1.124e-03	-2.680	-2.949	-0.270	(0)
	MgSO4	6.796e-04	6.796e-04	-3.168	-3.168	0.000	(0)
	MgF+	2.087e-05	1.789e-05	-4.680	-4.747	-0.067	(0)
	MgHCO3+	1.053e-05	8.998e-06	-4.977	-5.046	-0.068	(0)
	MgCO3	5.581e-06	5.581e-06	-5.253	-5.253	0.000	(0)
	MgOH+	8.449e-07	7.331e-07	-6.073	-6.135	-0.062	(0)
	MgH2BO3+	9.713e-08	8.205e-08	-7.013	-7.086	-0.073	(0)
Mn (2)	3.337e-05						
	Mn+2	2.586e-05	1.203e-05	-4.587	-4.920	-0.332	(0)
	MnSO4	7.104e-06	7.104e-06	-5.148	-5.148	0.000	(0)
	MnHCO3+	2.183e-07	1.877e-07	-6.661	-6.727	-0.066	(0)
	MnF+	7.897e-08	6.791e-08	-7.103	-7.168	-0.066	(0)
	MnOH+	5.755e-08	4.948e-08	-7.240	-7.306	-0.066	(0)
	MnCl+	5.326e-08	4.580e-08	-7.274	-7.339	-0.066	(0)
	MnCl2	1.957e-10	1.957e-10	-9.708	-9.708	0.000	(0)
	MnSeO4	2.999e-13	2.999e-13	-12.523	-12.523	0.000	(0)
	MnCl3-	1.896e-13	1.631e-13	-12.722	-12.788	-0.066	(0)
	MnNO3+	1.491e-13	1.231e-13	-12.826	-12.910	-0.083	(0)
	Mn (OH) 3-	9.543e-16	8.206e-16	-15.020	-15.086	-0.066	(0)
	Mn (OH) 4-2	7.939e-21	4.340e-21	-20.100	-20.363	-0.262	(0)
	Mn (NO3) 2	1.999e-21	1.999e-21	-20.699	-20.699	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-41.349	-41.349	0.000	(0)
Mn (3)	7.901e-26						
	Mn+3	7.901e-26	1.954e-26	-25.102	-25.709	-0.607	(0)
Mn (6)	7.170e-40						
	MnO4-2	7.170e-40	3.920e-40	-39.144	-39.407	-0.262	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.146	-44.218	-0.072	(0)
Mo	9.853e-07						
	MoO4-2	9.852e-07	5.295e-07	-6.006	-6.276	-0.270	(0)
	HMoO4-	7.839e-11	6.474e-11	-10.106	-10.189	-0.083	(0)

H2MoO4	2.914e-15	2.914e-15	-14.536	-14.536	0.000	(0)
Ag2MoO4	4.425e-25	4.425e-25	-24.354	-24.354	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.268	-48.016	-0.748	(0)
Mo7O24-6	0.000e+00	0.000e+00	-53.642	-56.634	-2.992	(0)
HMo7O24-5	0.000e+00	0.000e+00	-56.381	-58.459	-2.078	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-60.558	-61.888	-1.330	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-66.106	-66.854	-0.748	(0)
N (-3)	2.542e-08					
NH4+	2.283e-08	1.929e-08	-7.641	-7.715	-0.073	(0)
NH3	1.790e-09	1.790e-09	-8.747	-8.747	0.000	(0)
NH4SO4-	7.985e-10	6.866e-10	-9.098	-9.163	-0.066	(0)
CaNH3+2	2.688e-12	1.250e-12	-11.571	-11.903	-0.332	(0)
CuNH3+2	5.051e-13	2.349e-13	-12.297	-12.629	-0.332	(0)
NiNH3+2	6.072e-14	2.824e-14	-13.217	-13.549	-0.332	(0)
Co (NH3) +2	8.309e-15	3.864e-15	-14.080	-14.413	-0.332	(0)
AgNH3+	6.575e-15	5.429e-15	-14.182	-14.265	-0.083	(0)
BaNH3+2	5.098e-17	2.371e-17	-16.293	-16.625	-0.332	(0)
Ag (NH3) 2+	9.565e-20	7.899e-20	-19.019	-19.102	-0.083	(0)
Ni (NH3) 2+2	1.571e-20	7.305e-21	-19.804	-20.136	-0.332	(0)
Ca (NH3) 2+2	1.915e-21	8.907e-22	-20.718	-21.050	-0.332	(0)
Hg (NH3) 2+2	6.935e-22	3.225e-22	-21.159	-21.491	-0.332	(0)
Co (NH3) 2+2	6.344e-22	2.950e-22	-21.198	-21.530	-0.332	(0)
HgNH3+2	3.875e-22	1.802e-22	-21.412	-21.744	-0.332	(0)
Co (NH3) 3+2	1.429e-29	6.648e-30	-28.845	-29.177	-0.332	(0)
Hg (NH3) 3+2	4.942e-30	2.298e-30	-29.306	-29.639	-0.332	(0)
Co (NH3) 4+2	1.343e-37	6.244e-38	-36.872	-37.205	-0.332	(0)
Hg (NH3) 4+2	7.025e-38	3.267e-38	-37.153	-37.486	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.061	-45.394	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.399	-45.732	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-54.979	-55.728	-0.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.775	-68.107	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
N (3)	8.077e-06					
NO2-	8.077e-06	6.849e-06	-5.093	-5.164	-0.072	(0)
CuNO2+	1.114e-11	9.199e-12	-10.953	-11.036	-0.083	(0)
AgNO2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
CoNO2+	1.050e-12	8.668e-13	-11.979	-12.062	-0.083	(0)
Cu (NO2) 2	6.448e-16	6.448e-16	-15.191	-15.191	0.000	(0)
Ag (NO2) 2-	2.731e-17	2.255e-17	-16.564	-16.647	-0.083	(0)
N (5)	7.560e-09					
NO3-	7.546e-09	6.462e-09	-8.122	-8.190	-0.067	(0)
CaNO3+	1.373e-11	1.134e-11	-10.862	-10.946	-0.083	(0)
MnNO3+	1.491e-13	1.231e-13	-12.826	-12.910	-0.083	(0)
ZnNO3+	2.121e-14	1.751e-14	-13.674	-13.757	-0.083	(0)
BaNO3+	8.233e-16	6.799e-16	-15.084	-15.168	-0.083	(0)
NiNO3+	5.774e-16	4.768e-16	-15.239	-15.322	-0.083	(0)
CuNO3+	3.174e-16	2.621e-16	-15.498	-15.582	-0.083	(0)
CoNO3+	2.227e-16	1.839e-16	-15.652	-15.735	-0.083	(0)
CdNO3+	5.407e-17	4.465e-17	-16.267	-16.350	-0.083	(0)
PbNO3+	2.122e-17	1.752e-17	-16.673	-16.756	-0.083	(0)
AgNO3	7.626e-18	7.626e-18	-17.118	-17.118	0.000	(0)
Mn (NO3) 2	1.999e-21	1.999e-21	-20.699	-20.699	0.000	(0)
UO2NO3+	9.126e-23	7.537e-23	-22.040	-22.123	-0.083	(0)
Zn (NO3) 2	2.258e-23	2.258e-23	-22.646	-22.646	0.000	(0)
Co (NO3) 2	2.418e-24	2.418e-24	-23.617	-23.617	0.000	(0)
Cu (NO3) 2	2.132e-25	2.132e-25	-24.671	-24.671	0.000	(0)
Pb (NO3) 2	1.923e-25	1.923e-25	-24.716	-24.716	0.000	(0)
Cd (NO3) 2	1.446e-25	1.446e-25	-24.840	-24.840	0.000	(0)
CrNO3+2	3.460e-26	1.609e-26	-25.461	-25.793	-0.332	(0)
VO2NO3	5.376e-27	5.376e-27	-26.270	-26.270	0.000	(0)
FeNO3+2	5.009e-29	2.330e-29	-28.300	-28.633	-0.332	(0)
HgNO3+	4.610e-31	3.807e-31	-30.336	-30.419	-0.083	(0)
Hg (NO3) 2	1.022e-39	1.022e-39	-38.990	-38.990	0.000	(0)
Na	9.089e-03					
Na+	8.926e-03	7.642e-03	-2.049	-2.117	-0.067	(0)

	NaSO4-	1.582e-04	1.364e-04	-3.801	-3.865	-0.064	(0)
	NaHCO3	3.362e-06	3.362e-06	-5.473	-5.473	0.000	(0)
	NaCO3-	9.854e-07	8.494e-07	-6.006	-6.071	-0.064	(0)
	NaF	6.840e-07	6.840e-07	-6.165	-6.165	0.000	(0)
	NaH2BO3	2.550e-08	2.550e-08	-7.594	-7.594	0.000	(0)
	NaCrO4-	7.044e-16	5.817e-16	-15.152	-15.235	-0.083	(0)
Ni		8.533e-08					
	Ni+2	5.466e-08	2.938e-08	-7.262	-7.532	-0.270	(0)
	NiSO4	1.947e-08	1.947e-08	-7.711	-7.711	0.000	(0)
	NiCO3	6.542e-09	6.542e-09	-8.184	-8.184	0.000	(0)
	NiHCO3+	3.431e-09	2.833e-09	-8.465	-8.548	-0.083	(0)
	NiOH+	7.337e-10	6.059e-10	-9.135	-9.218	-0.083	(0)
	NiCl+	2.754e-10	2.274e-10	-9.560	-9.643	-0.083	(0)
	NiF+	1.268e-10	1.047e-10	-9.897	-9.980	-0.083	(0)
	Ni(OH)2	7.884e-11	7.884e-11	-10.103	-10.103	0.000	(0)
	Ni(SO4)2-2	4.607e-12	2.142e-12	-11.337	-11.669	-0.332	(0)
	Ni(OH)3-	1.564e-13	1.291e-13	-12.806	-12.889	-0.083	(0)
	NiNH3+2	6.072e-14	2.824e-14	-13.217	-13.549	-0.332	(0)
	NiCl2	3.463e-15	3.463e-15	-14.460	-14.460	0.000	(0)
	NiSeO4	1.273e-15	1.273e-15	-14.895	-14.895	0.000	(0)
	NiNO3+	5.774e-16	4.768e-16	-15.239	-15.322	-0.083	(0)
	Ni(NH3)2+2	1.571e-20	7.305e-21	-19.804	-20.136	-0.332	(0)
O(0)		2.470e-35					
	O2	1.235e-35	1.243e-35	-34.908	-34.906	0.003	(0)
Pb		5.172e-09					
	PbCO3	3.290e-09	3.290e-09	-8.483	-8.483	0.000	(0)
	PbOH+	9.135e-10	7.544e-10	-9.039	-9.122	-0.083	(0)
	Pb+2	3.411e-10	1.833e-10	-9.467	-9.737	-0.270	(0)
	PbSO4	2.983e-10	2.983e-10	-9.525	-9.525	0.000	(0)
	PbHCO3+	1.290e-10	1.066e-10	-9.889	-9.972	-0.083	(0)
	Pb(CO3)2-2	1.218e-10	5.663e-11	-9.914	-10.247	-0.332	(0)
	Pb(OH)2	3.908e-11	3.908e-11	-10.408	-10.408	0.000	(0)
	PbCl+	2.383e-11	1.968e-11	-10.623	-10.706	-0.083	(0)
	Pb(SO4)2-2	1.284e-11	5.972e-12	-10.891	-11.224	-0.332	(0)
	PbF+	2.219e-12	1.833e-12	-11.654	-11.737	-0.083	(0)
	PbCl2	2.659e-13	2.659e-13	-12.575	-12.575	0.000	(0)
	Pb(OH)3-	7.752e-14	6.402e-14	-13.111	-13.194	-0.083	(0)
	PbF2	5.115e-15	5.115e-15	-14.291	-14.291	0.000	(0)
	PbCl3-	3.878e-16	3.203e-16	-15.411	-15.495	-0.083	(0)
	Pb(OH)4-2	5.522e-17	2.568e-17	-16.258	-16.590	-0.332	(0)
	PbNO3+	2.122e-17	1.752e-17	-16.673	-16.756	-0.083	(0)
	Pb2OH+3	1.227e-17	2.192e-18	-16.911	-17.659	-0.748	(0)
	PbF3-	1.666e-18	1.376e-18	-17.778	-17.861	-0.083	(0)
	PbCl4-2	9.522e-19	4.428e-19	-18.021	-18.354	-0.332	(0)
	Pb3(OH)4+2	1.201e-20	5.587e-21	-19.920	-20.253	-0.332	(0)
	PbF4-2	2.009e-22	9.343e-23	-21.697	-22.030	-0.332	(0)
	Pb(NO3)2	1.923e-25	1.923e-25	-24.716	-24.716	0.000	(0)
	Pb4(OH)4+4	1.739e-25	8.137e-27	-24.760	-26.090	-1.330	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-152.885	-152.885	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-230.710	-230.793	-0.083	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-74.222	-74.222	0.000	(0)
	HS-	0.000e+00	0.000e+00	-79.126	-79.209	-0.083	(0)
	CdHS+	0.000e+00	0.000e+00	-79.778	-79.861	-0.083	(0)
	S5-2	0.000e+00	0.000e+00	-80.030	-80.362	-0.332	(0)
	H2S	0.000e+00	0.000e+00	-80.400	-80.400	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-80.546	-80.878	-0.332	(0)
	S4-2	0.000e+00	0.000e+00	-80.626	-80.958	-0.332	(0)
	S3-2	0.000e+00	0.000e+00	-81.432	-81.764	-0.332	(0)
	S2-2	0.000e+00	0.000e+00	-82.448	-82.780	-0.332	(0)
	S-2	0.000e+00	0.000e+00	-88.035	-88.297	-0.262	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.992	-140.075	-0.083	(0)
	HgS2-2	0.000e+00	0.000e+00	-140.239	-140.572	-0.332	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-141.893	-141.893	0.000	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-148.032	-148.368	-0.335	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-148.419	-148.603	-0.184	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.778	-149.098	-0.320	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-149.248	-149.331	-0.083	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-149.280	-149.363	-0.083	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.488	-149.832	-0.344	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.815	-150.143	-0.327	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.565	-151.565	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.866	-151.866	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.885	-152.885	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-162.440	-162.440	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-219.536	-219.620	-0.083	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.411	-227.494	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.930	-229.262	-0.332	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-229.092	-229.175	-0.083	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-230.710	-230.793	-0.083	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-239.529	-239.612	-0.083	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-305.856	-306.188	-0.332	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.830	-308.163	-0.332	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.112	-324.444	-0.332	(0)
S (6)	7.495e-03					
SO4-2	6.181e-03	3.322e-03	-2.209	-2.479	-0.270	(0)
MgSO4	6.796e-04	6.796e-04	-3.168	-3.168	0.000	(0)
CaSO4	4.222e-04	4.222e-04	-3.374	-3.374	0.000	(0)
NaSO4-	1.582e-04	1.364e-04	-3.801	-3.865	-0.064	(0)
KSO4-	4.538e-05	3.912e-05	-4.343	-4.408	-0.064	(0)
MnSO4	7.104e-06	7.104e-06	-5.148	-5.148	0.000	(0)
ZnSO4	7.843e-07	7.843e-07	-6.106	-6.106	0.000	(0)
Zn (SO4) 2-2	4.880e-08	2.269e-08	-7.312	-7.644	-0.332	(0)
NiSO4	1.947e-08	1.947e-08	-7.711	-7.711	0.000	(0)
CoSO4	1.190e-08	1.190e-08	-7.924	-7.924	0.000	(0)
CuSO4	9.762e-09	9.762e-09	-8.010	-8.010	0.000	(0)
HSO4-	2.327e-09	1.995e-09	-8.633	-8.700	-0.067	(0)
CdSO4	1.702e-09	1.702e-09	-8.769	-8.769	0.000	(0)
NH4SO4-	7.985e-10	6.866e-10	-9.098	-9.163	-0.066	(0)
PbSO4	2.983e-10	2.983e-10	-9.525	-9.525	0.000	(0)
Cd (SO4) 2-2	1.640e-10	7.627e-11	-9.785	-10.118	-0.332	(0)
AgSO4-	1.193e-10	9.849e-11	-9.923	-10.007	-0.083	(0)
Pb (SO4) 2-2	1.284e-11	5.972e-12	-10.891	-11.224	-0.332	(0)
Ni (SO4) 2-2	4.607e-12	2.142e-12	-11.337	-11.669	-0.332	(0)
CrOHSO4	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
FeSO4	8.699e-14	8.699e-14	-13.061	-13.061	0.000	(0)
UO2SO4	2.939e-14	2.939e-14	-13.532	-13.532	0.000	(0)
UO2 (SO4) 2-2	2.768e-15	1.287e-15	-14.558	-14.890	-0.332	(0)
AlSO4+	2.484e-15	2.129e-15	-14.605	-14.672	-0.067	(0)
CrSO4+	5.352e-16	4.420e-16	-15.271	-15.355	-0.083	(0)
Al (SO4) 2-	8.844e-17	7.580e-17	-16.053	-16.120	-0.067	(0)
VO2SO4-	1.580e-19	1.305e-19	-18.801	-18.884	-0.083	(0)
FeSO4+	1.563e-20	1.344e-20	-19.806	-19.872	-0.066	(0)
Fe (SO4) 2-	1.156e-21	9.546e-22	-20.937	-21.020	-0.083	(0)
Cr2 (OH) 2SO4+2	6.388e-22	2.971e-22	-21.195	-21.527	-0.332	(0)
HgSO4	1.388e-22	1.388e-22	-21.858	-21.858	0.000	(0)
VOSO4	1.250e-22	1.250e-22	-21.903	-21.903	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.863e-23	5.863e-23	-22.232	-22.232	0.000	(0)
CrO3SO4-2	4.073e-24	1.894e-24	-23.390	-23.723	-0.332	(0)
VSO4+	1.337e-37	1.104e-37	-36.874	-36.957	-0.083	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.442	-41.442	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.531	-42.863	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Sb (3)	1.019e-20					
Sb (OH) 3	5.155e-21	5.155e-21	-20.288	-20.288	0.000	(0)
HSbO2	5.034e-21	5.034e-21	-20.298	-20.298	0.000	(0)
SbO2-	1.607e-24	1.327e-24	-23.794	-23.877	-0.083	(0)
Sb (OH) 4-	9.200e-25	7.598e-25	-24.036	-24.119	-0.083	(0)
Sb (OH) 2F	7.021e-27	7.021e-27	-26.154	-26.154	0.000	(0)
SbOF	6.907e-27	6.907e-27	-26.161	-26.161	0.000	(0)
Sb (OH) 2+	9.318e-28	7.695e-28	-27.031	-27.114	-0.083	(0)
SbO+	3.214e-28	2.654e-28	-27.493	-27.576	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.112	-324.444	-0.332	(0)
Sb (5)	1.493e-08					
SbO3-	1.492e-08	1.232e-08	-7.826	-7.909	-0.083	(0)
Sb (OH) 6-	1.681e-11	1.439e-11	-10.775	-10.842	-0.067	(0)

SbO2+	1.616e-25	1.334e-25	-24.792	-24.875	-0.083	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	6.725e-40	5.553e-40	-39.172	-39.255	-0.083	(0)
MnSe	0.000e+00	0.000e+00	-41.349	-41.349	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.577	-43.577	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.711	-46.044	-0.332	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.884	-83.213	-1.330	(0)
Se (4)	8.597e-08					
SeO3-2	4.599e-08	2.139e-08	-7.337	-7.670	-0.332	(0)
HSeO3-	3.997e-08	3.301e-08	-7.398	-7.481	-0.083	(0)
H2SeO3	8.652e-14	8.652e-14	-13.063	-13.063	0.000	(0)
AgSeO3-	2.473e-14	2.042e-14	-13.607	-13.690	-0.083	(0)
Cd (SeO3) 2-2	1.772e-18	8.239e-19	-17.752	-18.084	-0.332	(0)
Ag (SeO3) 2-3	2.190e-20	3.912e-21	-19.660	-20.408	-0.748	(0)
FeHSeO3+2	6.762e-26	3.145e-26	-25.170	-25.502	-0.332	(0)
Se (6)	1.727e-10					
SeO4-2	1.724e-10	9.266e-11	-9.763	-10.033	-0.270	(0)
MnSeO4	2.999e-13	2.999e-13	-12.523	-12.523	0.000	(0)
ZnSeO4	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
NiSeO4	1.273e-15	1.273e-15	-14.895	-14.895	0.000	(0)
CoSeO4	8.340e-16	8.340e-16	-15.079	-15.079	0.000	(0)
CdSeO4	3.770e-17	3.770e-17	-16.424	-16.424	0.000	(0)
HSeO4-	3.455e-17	2.853e-17	-16.462	-16.545	-0.083	(0)
Zn (SeO4) 2-2	3.128e-24	1.455e-24	-23.505	-23.837	-0.332	(0)
Si	7.916e-05					
H4SiO4	7.702e-05	7.749e-05	-4.113	-4.111	0.003	(0)
H3SiO4-	2.134e-06	1.823e-06	-5.671	-5.739	-0.068	(0)
H2SiO4-2	3.391e-11	1.872e-11	-10.470	-10.728	-0.258	(0)
UO2H3SiO4+	1.096e-12	9.048e-13	-11.960	-12.043	-0.083	(0)
SiF6-2	2.495e-30	1.364e-30	-29.603	-29.865	-0.262	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.594	-60.342	-0.748	(0)
U (4)	1.084e-19					
U (OH) 5-	1.084e-19	8.953e-20	-18.965	-19.048	-0.083	(0)
U (OH) 4	2.305e-23	2.305e-23	-22.637	-22.637	0.000	(0)
U (OH) 3+	6.272e-28	5.180e-28	-27.203	-27.286	-0.083	(0)
U (OH) 2+2	3.165e-33	1.472e-33	-32.500	-32.832	-0.332	(0)
UF3+	1.425e-37	1.177e-37	-36.846	-36.929	-0.083	(0)
UF2+2	1.125e-38	5.234e-39	-37.949	-38.281	-0.332	(0)
UOH+3	2.386e-39	4.262e-40	-38.622	-39.370	-0.748	(0)
UF4	1.830e-39	1.830e-39	-38.738	-38.738	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.785	-41.533	-0.748	(0)
UF5-	0.000e+00	0.000e+00	-40.905	-40.988	-0.083	(0)
U (SO4) 2	0.000e+00	0.000e+00	-41.442	-41.442	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.023	-42.356	-0.332	(0)
USO4+2	0.000e+00	0.000e+00	-42.531	-42.863	-0.332	(0)
U+4	0.000e+00	0.000e+00	-45.655	-46.985	-1.330	(0)
UCl+3	0.000e+00	0.000e+00	-47.056	-47.804	-0.748	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-169.161	-175.893	-6.733	(0)
U (5)	1.186e-16					
UO2+	1.186e-16	9.793e-17	-15.926	-16.009	-0.083	(0)
U (6)	1.415e-07					
UO2 (CO3) 3-4	1.058e-07	4.949e-09	-6.976	-8.306	-1.330	(0)
UO2 (CO3) 2-2	3.557e-08	1.654e-08	-7.449	-7.781	-0.332	(0)
UO2CO3	1.389e-10	1.389e-10	-9.857	-9.857	0.000	(0)
UO2OH+	1.460e-12	1.206e-12	-11.836	-11.919	-0.083	(0)
UO2H3SiO4+	1.096e-12	9.048e-13	-11.960	-12.043	-0.083	(0)
UO2F+	1.386e-13	1.145e-13	-12.858	-12.941	-0.083	(0)
UO2F2	4.682e-14	4.682e-14	-13.330	-13.330	0.000	(0)
UO2SO4	2.939e-14	2.939e-14	-13.532	-13.532	0.000	(0)
UO2+2	1.088e-14	5.846e-15	-13.964	-14.233	-0.270	(0)
UO2 (SO4) 2-2	2.768e-15	1.287e-15	-14.558	-14.890	-0.332	(0)
UO2F3-	2.020e-15	1.668e-15	-14.695	-14.778	-0.083	(0)
UO2Cl+	3.473e-17	2.868e-17	-16.459	-16.542	-0.083	(0)
(UO2) 3 (OH) 5+	7.167e-18	5.919e-18	-17.145	-17.228	-0.083	(0)
(UO2) 2 (OH) 2+2	5.186e-18	2.412e-18	-17.285	-17.618	-0.332	(0)
UO2F4-2	4.042e-18	1.880e-18	-17.393	-17.726	-0.332	(0)

UO2NO3+	9.126e-23	7.537e-23	-22.040	-22.123	-0.083	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.216	-44.299	-0.083	(0)
V+2	0.000e+00	0.000e+00	-45.691	-46.023	-0.332	(0)
V(3)	2.496e-16					
V(OH) 3	2.496e-16	2.496e-16	-15.603	-15.603	0.000	(0)
V(OH) 2+	1.200e-27	9.913e-28	-26.921	-27.004	-0.083	(0)
VOH+2	1.243e-31	5.779e-32	-30.906	-31.238	-0.332	(0)
V+3	3.941e-37	7.039e-38	-36.404	-37.152	-0.748	(0)
VSO4+	1.337e-37	1.104e-37	-36.874	-36.957	-0.083	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-59.042	-59.790	-0.748	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-60.346	-61.676	-1.330	(0)
V(4)	5.459e-20					
V(OH) 3+	5.402e-20	4.461e-20	-19.267	-19.351	-0.083	(0)
VO+2	2.936e-22	1.366e-22	-21.532	-21.865	-0.332	(0)
VOF+	1.407e-22	1.162e-22	-21.852	-21.935	-0.083	(0)
VOSO4	1.250e-22	1.250e-22	-21.903	-21.903	0.000	(0)
VOF2	6.179e-24	6.179e-24	-23.209	-23.209	0.000	(0)
VOC1+	1.403e-24	1.159e-24	-23.853	-23.936	-0.083	(0)
VOF3-	3.766e-26	3.110e-26	-25.424	-25.507	-0.083	(0)
VOF4-2	3.828e-29	1.781e-29	-28.417	-28.749	-0.332	(0)
H2V2O4+2	2.147e-34	9.984e-35	-33.668	-34.001	-0.332	(0)
V(5)	4.560e-09					
H2VO4-	2.642e-09	2.182e-09	-8.578	-8.661	-0.083	(0)
HVO4-2	1.918e-09	8.920e-10	-8.717	-9.050	-0.332	(0)
H3VO4	1.340e-13	1.340e-13	-12.873	-12.873	0.000	(0)
VO4-3	4.073e-15	7.276e-16	-14.390	-15.138	-0.748	(0)
HV2O7-3	3.693e-15	6.597e-16	-14.433	-15.181	-0.748	(0)
H3V2O7-	2.288e-15	1.889e-15	-14.641	-14.724	-0.083	(0)
V2O7-4	6.177e-17	2.890e-18	-16.209	-17.539	-1.330	(0)
VO2+	1.921e-18	1.645e-18	-17.716	-17.784	-0.067	(0)
VO2F	4.092e-19	4.092e-19	-18.388	-18.388	0.000	(0)
VO2SO4-	1.580e-19	1.305e-19	-18.801	-18.884	-0.083	(0)
V3O9-3	6.096e-20	1.089e-20	-19.215	-19.963	-0.748	(0)
VO2F2-	2.552e-20	2.107e-20	-19.593	-19.676	-0.083	(0)
VO2F3-2	8.017e-23	3.728e-23	-22.096	-22.428	-0.332	(0)
V4O12-4	2.118e-25	9.908e-27	-24.674	-26.004	-1.330	(0)
VO2F4-3	1.457e-26	2.602e-27	-25.837	-26.585	-0.748	(0)
VO2NO3	5.376e-27	5.376e-27	-26.270	-26.270	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-67.558	-70.550	-2.992	(0)
HV10O28-5	0.000e+00	0.000e+00	-68.497	-70.575	-2.078	(0)
H2V10O28-4	0.000e+00	0.000e+00	-72.249	-73.579	-1.330	(0)
Zn	3.535e-06					
Zn+2	2.008e-06	1.079e-06	-5.697	-5.967	-0.270	(0)
ZnSO4	7.843e-07	7.843e-07	-6.106	-6.106	0.000	(0)
ZnCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
ZnOH+	2.140e-07	1.768e-07	-6.670	-6.753	-0.083	(0)
Zn(SO4) 2-2	4.880e-08	2.269e-08	-7.312	-7.644	-0.332	(0)
Zn(OH) 2	4.589e-08	4.589e-08	-7.338	-7.338	0.000	(0)
ZnHCO3+	3.232e-08	2.669e-08	-7.491	-7.574	-0.083	(0)
ZnOHC1	1.758e-08	1.758e-08	-7.755	-7.755	0.000	(0)
ZnCl+	9.599e-09	8.199e-09	-8.018	-8.086	-0.068	(0)
ZnF+	3.698e-09	3.054e-09	-8.432	-8.515	-0.083	(0)
Zn(OH) 3-	4.562e-10	3.768e-10	-9.341	-9.424	-0.083	(0)
ZnCl2	3.931e-11	3.931e-11	-10.405	-10.405	0.000	(0)
ZnCl3-	1.106e-13	9.446e-14	-12.956	-13.025	-0.068	(0)
Zn(OH) 4-2	5.283e-14	2.457e-14	-13.277	-13.610	-0.332	(0)
ZnNO3+	2.121e-14	1.751e-14	-13.674	-13.757	-0.083	(0)
ZnSeO4	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
ZnCl4-2	2.614e-16	1.429e-16	-15.583	-15.845	-0.262	(0)
Zn(NO3) 2	2.258e-23	2.258e-23	-22.646	-22.646	0.000	(0)
Zn(SeO4) 2-2	3.128e-24	1.455e-24	-23.505	-23.837	-0.332	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.280	-149.363	-0.083	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.565	-151.565	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.411	-227.494	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.930	-229.262	-0.332	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.830	-308.163	-0.332	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-58.29	-52.00	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-45.17	-40.66	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-52.39	-40.66	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-75.11	-57.17	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-60.19	-40.16	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-29.65	-29.24	0.40	(NH4)2CrO4
(NH4)2SeO4	-25.91	-25.46	0.45	(NH4)2SeO4
Acanthite	-52.43	-88.65	-36.22	Ag2S
Ag2CO3	-11.79	-22.88	-11.09	Ag2CO3
Ag2CrO4	-19.88	-31.47	-11.59	Ag2CrO4
Ag2HVO4	-12.29	-10.81	1.48	Ag2HVO4
Ag2MoO4	-12.38	-23.93	-11.55	Ag2MoO4
Ag2O	-13.81	-1.23	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.31	-20.13	-4.82	Ag2SO4
Ag3AsO3	-28.23	-26.07	2.16	Ag3AsO3
Ag3AsO4	-16.64	-19.42	-2.79	Ag3AsO4
Ag3H2VO5	-16.60	-11.42	5.18	Ag3H2VO5
AgF:4H2O	-13.73	-12.68	1.05	AgF:4H2O
Agmetal	0.12	-13.39	-13.51	Ag
AgVO3	-10.96	-10.19	0.77	AgVO3
Al(OH)3(am)	-2.25	8.55	10.80	Al(OH)3
Al2(MoO4)3	-53.36	-50.99	2.37	Al2(MoO4)3
Al2O3	-2.55	17.10	19.65	Al2O3
Al4(OH)10SO4	-7.40	15.30	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-13.82	-9.02	4.80	AlAsO4:2H2O
AlOHSO4	-7.12	-10.35	-3.23	AlOHSO4
AlSb	-153.99	-88.37	65.62	AlSb
Alunite	-5.32	-6.72	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.43	-12.22	-7.79	PbSO4
Anhydrite	-1.37	-5.73	-4.36	CaSO4
Anilite	-55.74	-87.61	-31.88	Cu0.25Cu1.5S
Antlerite	-2.10	6.69	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-94.12	-96.88	-2.76	As4O6
Artinite	-4.30	5.30	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-41.85	-35.14	6.71	As2O5
Atacamite	-1.06	6.33	7.39	Cu2(OH)3Cl
Azurite	-0.80	-17.70	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-15.65	8.74	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.53	-1.66	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.85	7.09	32.94	Ba3(VO4)2:4H2O
BaCrO4	-11.82	-21.49	-9.67	BaCrO4
BaF2	-9.55	-15.37	-5.82	BaF2
BaMoO4	-6.99	-13.95	-6.96	BaMoO4
Barite	-0.18	-10.16	-9.98	BaSO4
BaS	-94.86	-78.68	16.18	BaS
BaSeO3	-8.78	-6.95	1.83	BaSeO3
BaSeO4	-10.25	-17.71	-7.46	BaSeO4
Bianchite	-6.68	-8.45	-1.76	ZnSO4:6H2O
Birnessite	-6.39	11.70	18.09	MnO2
Bixbyite	-1.50	-2.15	-0.64	Mn2O3
BlaubleiI	-55.89	-80.05	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.26	-83.54	-27.28	Cu0.6Cu0.8S
Boehmite	-0.03	8.55	8.58	AlOOH
Breithauptite	-56.74	-75.26	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.37	13.47	16.84	Mg(OH)2
Bunsenite	-3.55	8.89	12.45	NiO
Ca(VO3)2	-11.64	-5.98	5.66	Ca(VO3)2
Ca2V2O7	-10.31	7.19	17.50	Ca2V2O7

Ca ₂ V ₂ O ₇ ·2H ₂ O	-14.36	7.19	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-17.94	4.36	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-18.60	20.36	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-19.50	20.36	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-297.32	-154.34	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.81	-17.07	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-9.05	-26.96	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.58	-9.53	-7.95	CaMoO ₄
Carnotite	-2.18	-1.95	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-5.34	-2.53	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-10.27	-13.29	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-11.38	-1.54	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-5.88	7.76	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-5.97	7.76	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-21.23	-14.52	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.17	4.39	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-16.25	12.15	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.04	-13.70	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-12.01	-13.70	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.79	-13.70	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.14	-16.36	-1.21	CdF ₂
Cdmetal(alpha)	-31.30	-17.78	13.51	Cd
Cdmetal(gamma)	-31.40	-17.78	13.62	Cd
CdMoO ₄	-0.79	-14.94	-14.15	CdMoO ₄
CdOHCl	-6.51	-2.97	3.54	CdOHCl
CdSb	-76.04	-76.39	-0.35	CdSb
CdSe	-19.50	-39.70	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.84	-18.69	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.97	-11.14	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.41	-11.14	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-9.27	-11.14	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.60	-11.35	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-7.73	-10.37	-2.64	CuSO ₄ ·5H ₂ O
Chalcedony	-0.56	-4.11	-3.55	SiO ₂
Chalcocite	-55.60	-90.52	-34.92	Cu ₂ S
Chalcopyrite	-127.59	-162.86	-35.27	CuFeS ₂
Chrysotile	0.00	32.20	32.20	Mg ₃ Si ₂ O ₅ (OH) ₄
Cinnabar	-53.29	-98.99	-45.69	HgS
Claudetite	-93.81	-96.88	-3.06	As ₄ O ₆
Clausthalite	-13.68	-40.78	-27.10	PbSe
Co(BO ₂) ₂	-27.70	-0.63	27.07	Co(BO ₂) ₂
Co(OH) ₂	-4.42	8.68	13.09	Co(OH) ₂
Co(OH) ₃	-8.64	-10.95	-2.31	Co(OH) ₃
CO ₂ (g)	-3.50	-21.65	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.15	-9.11	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-2.73	-13.22	-10.50	Co ₃ O ₄
CoCl ₂	-21.05	-12.78	8.27	CoCl ₂
CoCl ₂ ·6H ₂ O	-15.32	-12.79	2.54	CoCl ₂ ·6H ₂ O
CoCO ₃	-2.99	-12.97	-9.98	CoCO ₃
CoF ₂	-13.85	-15.44	-1.60	CoF ₂
CoF ₃	-45.67	-47.13	-1.46	CoF ₃
CoFe ₂ O ₄	18.59	15.06	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.26	-14.02	-7.76	CoMoO ₄
CoO	-4.91	8.68	13.59	CoO
CoS(alpha)	-71.30	-78.74	-7.44	CoS
CoS(beta)	-67.67	-78.74	-11.07	CoS
CoSe	-22.59	-38.79	-16.20	CoSe
CoSeO ₃	-8.34	-7.02	1.32	CoSeO ₃
CoSeO ₄ ·6H ₂ O	-16.25	-17.78	-1.53	CoSeO ₄ ·6H ₂ O
CoSO ₄	-13.03	-10.22	2.80	CoSO ₄
CoSO ₄ ·6H ₂ O	-7.75	-10.23	-2.47	CoSO ₄ ·6H ₂ O
Cotunnite	-10.00	-14.78	-4.78	PbCl ₂
Covellite	-56.59	-78.89	-22.30	CuS
Cr(OH) ₂	-21.82	-11.00	10.82	Cr(OH) ₂
Cr(OH) ₃	-2.51	-1.18	1.34	Cr(OH) ₃

Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.56	-32.47	14.09	CrCl2
CrCl3	-48.49	-33.37	15.11	CrCl3
CrF3	-26.02	-37.36	-11.34	CrF3
Cristobalite	-0.76	-4.11	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.68	-45.52	-33.84	Na3AlF6
Cu(OH)2	-0.14	8.53	8.67	Cu(OH)2
Cu(SbO3)2	-26.17	19.05	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.59	0.66	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.06	-89.94	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.77	-50.57	-45.80	Cu2Se
Cu2SO4	-20.05	-22.00	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.65	-9.55	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.98	-101.58	-42.59	Cu3Sb
Cu3Se2	-26.01	-89.51	-63.49	Cu3Se2
CuCO3	-1.62	-13.12	-11.50	CuCO3
CuCrO4	-16.27	-21.71	-5.44	CuCrO4
CuF	-8.71	-13.61	-4.91	CuF
CuF2	-16.70	-15.59	1.12	CuF2
CuF2:2H2O	-11.04	-15.59	-4.55	CuF2:2H2O
Cumetal	-5.57	-14.32	-8.76	Cu
CuMoO4	-1.09	-14.17	-13.08	CuMoO4
CuOCuSO4	-12.14	-1.84	10.30	CuOCuSO4
Cupricferrite	8.93	14.91	5.99	CuFe2O4
Cuprite	-1.70	-3.10	-1.41	Cu2O
Cuprousferrite	10.56	1.64	-8.92	CuFeO2
CuSe	-5.84	-38.94	-33.10	CuSe
CuSe2	-27.49	-60.86	-33.37	CuSe2
CuSeO3:2H2O	-7.67	-7.16	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.49	-17.93	-2.44	CuSeO4:5H2O
CuSO4	-13.31	-10.37	2.94	CuSO4
Diaspore	1.68	8.55	6.87	AlOOH
Djurleite	-55.84	-89.76	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.11	-16.65	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.44	-16.65	-17.09	CaMg(CO3)2
Epsomite	-3.30	-5.43	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.01	-0.03	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.97	-15.69	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.86	-9.31	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.07	-40.70	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-46.59	-50.32	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.78	-14.38	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-9.16	-19.25	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-47.34	-65.94	-18.60	FeSe2
FeS(ppt)	-81.02	-83.97	-2.95	FeS
FeSe	-33.02	-44.02	-11.00	FeSe
Fix_pe	-4.56	-4.56	0.00	e-
Fluorite	-0.45	-10.95	-10.50	CaF2
Galena	-66.76	-80.73	-13.97	PbS
Gibbsite	0.26	8.55	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.44	-8.45	-2.01	ZnSO4:7H2O
Greenalite	-18.68	2.13	20.81	Fe3Si2O5(OH)4
Greenockite	-65.30	-79.66	-14.36	CdS
Greigite	-294.81	-339.85	-45.03	Fe3S4
Gummite	-5.48	2.19	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-16.13	-28.23	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.82	-22.70	-12.88	H2MoO4
H2S(g)	-79.41	-87.42	-8.01	H2S
H2Se(g)	-42.51	-47.47	-4.96	H2Se

Halite	-6.24	-4.64	1.60	NaCl
Halloysite	-0.69	8.88	9.57	Al ₂ Si ₂ O ₅ (OH) ₄
Hausmannite	-0.98	60.05	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-2.34	20.55	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-185.51	-259.22	-73.71	Hg(CH ₃) ₂
Hg(g)	-7.65	-15.52	-7.87	Hg
Hg(OH) ₂	-8.07	-11.57	-3.50	Hg(OH) ₂
Hg ₂ (g)	-16.09	-31.04	-14.96	Hg ₂
Hg ₂ (OH) ₂	-10.76	-5.50	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-11.09	-27.14	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-27.03	-35.73	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-19.25	-29.62	-10.36	Hg ₂ F ₂
Hg ₂ S	-81.24	-92.92	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-16.53	-21.19	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-18.27	-24.40	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-26.67	-56.35	-29.68	Hg ₃ O ₂ CO ₃
HgCl(g)	-32.98	-13.48	19.50	HgCl
HgCl ₂	-11.77	-33.03	-21.26	HgCl ₂
HgF(g)	-47.48	-14.81	32.68	HgF
HgF ₂ (g)	-48.25	-35.69	12.57	HgF ₂
Hgmetal(l)	-2.07	-15.52	-13.45	Hg
HgSe	-3.34	-59.03	-55.69	HgSe
HgSeO ₃	-14.83	-27.26	-12.43	HgSeO ₃
HgSO ₄	-21.05	-30.47	-9.42	HgSO ₄
Huntite	-3.03	-33.00	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-4.47	-23.24	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-10.45	-19.22	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ :4H ₂ O
K-Alum	-18.65	-23.82	-5.17	KAl(SO ₄) ₂ :12H ₂ O
K-Jarosite	-8.00	-22.80	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-32.37	-49.61	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-18.86	-19.37	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-15.10	-11.83	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-14.86	-15.59	-0.73	K ₂ SeO ₄
Kaolinite	1.45	8.88	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-2.27	15.22	17.49	Cu ₄ (OH) ₆ SO ₄ :H ₂ O
Larnakite	-5.09	-5.53	-0.43	PbO:PbSO ₄
Laurionite	-4.67	-4.04	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.01	6.69	12.69	PbO
Mackinawite	-80.37	-83.97	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	3.00	19.86	16.86	Fe ₂ MgO ₄
Magnesite	-0.71	-8.17	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	0.72	-4.59	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-1.06	24.28	25.34	MnOOH
Massicot	-6.21	6.69	12.89	PbO
Matlockite	-7.13	-16.10	-8.97	PbClF
Melanothallite	-19.19	-12.93	6.26	CuCl ₂
Melanterite	-13.24	-15.45	-2.21	FeSO ₄ :7H ₂ O
Metacinnabar	-53.89	-98.99	-45.09	HgS
Mg(OH) ₂ (active)	-5.32	13.47	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.95	-5.67	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-274.64	-199.96	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.56	7.80	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.08	11.12	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.14	-16.76	5.38	MgCrO ₄
MgF ₂	-2.52	-10.65	-8.13	MgF ₂
MgMoO ₄	-7.38	-9.23	-1.85	MgMoO ₄
MgSeO ₃ :6H ₂ O	-5.28	-2.22	3.06	MgSeO ₃ :6H ₂ O
MgSeO ₄ :6H ₂ O	-11.78	-12.98	-1.20	MgSeO ₄ :6H ₂ O
Minium	-27.92	45.60	73.52	Pb ₃ O ₄
Mirabilite	-5.60	-6.71	-1.11	Na ₂ SO ₄ :10H ₂ O
Mn(VO ₃) ₂	-12.54	-7.64	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-53.14	-58.85	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.77	-86.69	61.08	Mn ₂ Sb

Mn3(AsO4)2·8H2O	-13.14	-0.64	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.67	-9.96	2.72	MnCl2·4H2O
MnS (grn)	-76.09	-75.92	0.17	MnS
MnS (pnk)	-79.26	-75.92	3.34	MnS
MnSb	-95.09	-98.00	-2.91	MnSb
MnSe	-39.46	-35.96	3.50	MnSe
MnSeO3	-5.32	-4.19	1.13	MnSeO3
MnSeO3·2H2O	-5.17	-4.19	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.90	-14.95	-2.05	MnSeO4·5H2O
MnSO4	-9.98	-7.40	2.58	MnSO4
Monteponite	-7.34	7.76	15.10	CdO
Montroydite	-7.93	-11.57	-3.64	HgO
MoO3	-14.70	-22.70	-8.00	MoO3
Morenosite	-7.87	-10.01	-2.14	NiSO4·7H2O
MoS2	-152.82	-223.08	-70.26	MoS2
Na-Jarosite	-10.93	-22.13	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.39	-48.29	-9.90	Na2Cr2O7
Na2CrO4	-20.98	-18.05	2.93	Na2CrO4
Na2Mo2O7	-16.61	-33.21	-16.60	Na2Mo2O7
Na2MoO4	-12.00	-10.51	1.49	Na2MoO4
Na2MoO4·2H2O	-11.73	-10.51	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.80	-3.50	10.30	Na2SeO3·5H2O
Na2SeO4	-15.55	-14.27	1.28	Na2SeO4
Na3Sb	-173.09	-78.64	94.45	Na3Sb
Na3VO4	-27.97	8.71	36.68	Na3VO4
Na4V2O7	-32.17	5.23	37.40	Na4V2O7
Nantokite	-5.55	-12.28	-6.73	CuCl
NaSb	-88.45	-65.28	23.17	NaSb
Natron	-8.15	-9.46	-1.31	Na2CO3·10H2O
NaVO3	-7.34	-3.48	3.86	NaVO3
Nesquehonite	-3.50	-8.17	-4.67	MgCO3·3H2O
Ni(OH)2	-3.90	8.89	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-24.17	-8.47	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-15.34	16.66	32.00	Ni4(OH)6SO4
NiCO3	-5.89	-12.76	-6.87	NiCO3
NiMoO4	-2.67	-13.81	-11.14	NiMoO4
NiS (alpha)	-72.93	-78.53	-5.60	NiS
NiS (beta)	-67.43	-78.53	-11.10	NiS
NiS (gamma)	-65.73	-78.53	-12.80	NiS
NiSe	-20.88	-38.58	-17.70	NiSe
NiSeO3·2H2O	-9.62	-6.80	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-16.05	-17.57	-1.52	NiSeO4·6H2O
Nsutite	-5.81	11.70	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-249.63	-310.70	-61.07	As2S3
Otavite	-1.88	-13.88	-12.00	CdCO3
Pb(BO2)2	-9.14	-2.62	6.52	Pb(BO2)2
Pb(OH)2	-1.46	6.69	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-54.26	-63.02	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.15	2.64	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.82	13.37	26.19	Pb2O(OH)2
Pb2O3	-22.12	38.92	61.04	Pb2O3
Pb2OCO3	-7.72	-8.27	-0.56	Pb2OCO3
Pb2V2O7	-3.87	-5.77	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.89	-15.09	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.23	0.91	6.14	Pb3(VO4)2
Pb3O2CO3	-12.61	-1.59	11.02	Pb3O2CO3
Pb3O2SO4	-9.53	1.16	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.26	7.84	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.03	7.84	21.88	Pb4O3SO4
PbCrO4	-10.95	-23.55	-12.60	PbCrO4
PbF2	-9.99	-17.43	-7.44	PbF2
Pbmetal	-23.10	-18.86	4.25	Pb
PbMoO4	-0.39	-16.01	-15.62	PbMoO4
PbO·0.3H2O	-6.29	6.69	12.98	PbO·0.33H2O
PbSeO4	-12.93	-19.77	-6.84	PbSeO4
Periclase	-8.11	13.47	21.58	MgO
Phosgenite	-9.93	-29.74	-19.81	PbCl2·PbCO3

Plattnerite	-17.37	32.23	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-127.34	-145.84	-18.51	FeS2
Pyrochroite	-3.69	11.50	15.19	Mn(OH)2
Pyrolusite	-4.33	37.05	41.38	MnO2
Quartz	-0.11	-4.11	-4.00	SiO2
Realgar	-104.66	-124.41	-19.75	AsS
Retgersite	-7.97	-10.01	-2.04	NiSO4·6H2O
Rhodochrosite	0.44	-10.14	-10.58	MnCO3
Rutherfordine	-4.96	-19.46	-14.50	UO2CO3
Sb(OH)3	-13.18	-20.29	-7.11	Sb(OH)3
Sb2O4	-18.43	-15.03	3.40	Sb2O4
Sb2O5	-28.44	-38.11	-9.67	Sb2O5
Sb2Se3	-115.22	-182.98	-67.76	Sb2Se3
Sb4O6(cubic)	-62.89	-81.15	-18.26	Sb4O6
Sb4O6(orth)	-63.25	-81.15	-17.90	Sb4O6
SbCl3	-53.05	-52.48	0.57	SbCl3
SbF3	-46.24	-56.47	-10.23	SbF3
Sbmetal	-46.92	-58.60	-11.69	Sb
SbO2	-4.00	-31.83	-27.82	SbO2
Schoepite	-3.80	2.19	5.99	UO2(OH)2·H2O
Semetal(am)	-14.81	-21.92	-7.11	Se
Semetal(hex)	-14.21	-21.92	-7.71	Se
Senarmontite	-28.21	-40.57	-12.37	Sb2O3
SeO2	-15.82	-15.69	0.12	SeO2
SeO3	-47.50	-26.46	21.04	SeO3
Sepiolite	-1.14	14.62	15.76	Mg2Si3O7·5OH·3H2O
Sepiolite(A)	-4.16	14.62	18.78	Mg2Si3O7·5OH·3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-1.40	-4.11	-2.71	SiO2
SiO2(am-ppt)	-1.37	-4.11	-2.74	SiO2
Smithsonite	-1.19	-11.19	-10.00	ZnCO3
Sphalerite	-65.51	-76.96	-11.45	ZnS
Spinel	-6.27	30.58	36.85	MgAl2O4
Stibnite	-252.38	-302.84	-50.46	Sb2S3
Sulfur	-59.73	-61.88	-2.14	S
Tenorite	0.89	8.53	7.64	CuO
Thenardite	-7.03	-6.71	0.32	Na2SO4
Thermonatrite	-10.09	-9.46	0.64	Na2CO3·H2O
Tyuyamunite	-5.68	-1.60	4.08	Ca(UO2)2(VO4)2
U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-582.49	-430.10	152.38	U3Sb4
U4O9	-27.99	-31.01	-3.02	U4O9
UF4	-32.84	-62.38	-29.54	UF4
UF4·2.5H2O	-29.66	-62.38	-32.72	UF4·2.5H2O
UO2(am)	-15.07	-14.14	0.93	UO2
UO2(NO3)2	-42.76	-30.61	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-35.46	-30.61	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-34.00	-30.61	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-32.66	-30.61	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-3.42	2.19	5.61	UO2(OH)2
UO2SeO4·4H2O	-22.02	-24.27	-2.25	UO2SeO4·4H2O
UO3	-5.51	2.19	7.70	UO3
Uraninite	-9.47	-14.14	-4.67	UO2
USb2	-221.23	-191.65	29.58	USb2
V(OH)3	-20.11	-12.52	7.59	V(OH)3
V2O5	-17.78	-19.14	-1.36	V2O5
V3O5	-43.71	-41.87	1.84	V3O5
V4O7	-54.50	-47.31	7.19	V4O7
V6O13	-47.66	-108.52	-60.86	V6O13
Valentinite	-32.09	-40.57	-8.48	Sb2O3
VC12	-65.63	-46.75	18.87	VC12
VC13	-68.14	-44.71	23.43	VC13
VF4	-68.61	-53.68	14.93	VF4
Vmetal	-94.86	-50.84	44.03	V
VO	-40.05	-25.29	14.76	VO
VO(OH)2	-10.59	-5.44	5.15	VO(OH)2
VO2Cl	-23.14	-20.30	2.84	VO2Cl

VOC1	-34.40	-23.25	11.15	VOC1
VOC12	-39.66	-26.90	12.76	VOC12
VOSO4	-27.95	-24.34	3.61	VOSO4
Witherite	-4.33	-12.90	-8.57	BaCO3
Wurtzite	-68.01	-76.96	-8.95	ZnS
Zincite	-0.88	10.46	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO4
Zn(BO2)2	-7.14	1.15	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.66	-22.35	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.74	10.46	12.20	Zn(OH)2
Zn(OH)2(am)	-2.02	10.46	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.30	10.46	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.08	10.46	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.28	10.46	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.49	2.01	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-5.01	10.18	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.43	-3.78	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.35	-6.44	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-5.48	22.92	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-7.68	30.82	38.50	Zn5(OH)8Cl2
ZnCl2	-18.06	-11.01	7.05	ZnCl2
ZnCO3:1H2O	-0.93	-11.19	-10.26	ZnCO3:1H2O
ZnF2	-13.13	-13.66	-0.53	ZnF2
Znmetal	-40.88	-15.09	25.79	Zn
ZnMoO4	-2.12	-12.24	-10.13	ZnMoO4
ZnO(active)	-0.73	10.46	11.19	ZnO
ZnS(am)	-67.91	-76.96	-9.05	ZnS
ZnSb	-84.71	-73.69	11.01	ZnSb
ZnSe	-22.61	-37.01	-14.40	ZnSe
ZnSeO4:6H2O	-14.48	-16.00	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.81	-8.45	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 115.

```

Title Use solution to allow model output
REACTION 606
      H2O      -0.0
      0 moles
USE solution 615
End

```

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 615. Solution after simulation 114.
Using reaction 606.

Reaction 606.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.398e-08	1.398e-08
Al	1.390e-06	1.390e-06
As	9.927e-11	9.927e-11
B	2.483e-05	2.483e-05
Ba	3.931e-08	3.931e-08
C	9.659e-04	9.659e-04
Ca	1.470e-03	1.470e-03
Cd	7.092e-09	7.092e-09
Cl	3.533e-03	3.533e-03
Co	5.477e-08	5.477e-08
Cr	7.925e-10	7.925e-10
Cu	6.024e-07	6.024e-07
F	1.883e-04	1.883e-04
Fe	7.855e-10	7.854e-10
Hg	1.117e-09	1.117e-09
K	1.988e-03	1.988e-03
Mg	2.809e-03	2.809e-03
Mn	3.337e-05	3.337e-05
Mo	9.853e-07	9.853e-07
N	8.110e-06	8.110e-06
Na	9.089e-03	9.089e-03
Ni	8.533e-08	8.532e-08
Pb	5.172e-09	5.172e-09
S	7.495e-03	7.494e-03
Sb	1.493e-08	1.493e-08
Se	8.614e-08	8.614e-08
Si	7.916e-05	7.915e-05
U	1.415e-07	1.415e-07
V	4.560e-09	4.560e-09
Zn	3.535e-06	3.535e-06

-----Description of solution-----

	pH =	8.212	Charge balance
	pe =	4.561	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	2.656e-02	
	Mass of water (kg) =	1.000e+00	
	Total alkalinity (eq/kg) =	9.930e-04	
	Total CO2 (mol/kg) =	9.659e-04	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	9.597e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	0	
	Total H =	1.110115e+02	
	Total O =	5.553838e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm³/mol
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	OH-	1.925e-06	1.638e-06	-5.716	-5.786	-0.070	(0)
	H+	7.176e-09	6.144e-09	-8.144	-8.212	-0.067	0.00
	H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag		1.398e-08					
	AgCl	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
	AgCl2-	2.928e-09	2.418e-09	-8.533	-8.617	-0.083	(0)
	Ag+	1.735e-09	1.486e-09	-8.761	-8.828	-0.067	(0)
	AgSO4-	1.193e-10	9.849e-11	-9.923	-10.007	-0.083	(0)
	AgCl3-2	1.402e-11	6.519e-12	-10.853	-11.186	-0.332	(0)
	AgNO2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
	AgF	5.294e-13	5.294e-13	-12.276	-12.276	0.000	(0)
	AgOH	2.434e-13	2.434e-13	-12.614	-12.614	0.000	(0)
	AgCl4-3	2.254e-13	4.026e-14	-12.647	-13.395	-0.748	(0)
	AgH2BO3	4.957e-14	4.957e-14	-13.305	-13.305	0.000	(0)
	AgSeO3-	2.473e-14	2.042e-14	-13.607	-13.690	-0.083	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgNH3+	6.575e-15	5.429e-15	-14.182	-14.265	-0.083	(0)
	Ag (OH) 2-	4.718e-17	3.896e-17	-16.326	-16.409	-0.083	(0)
	Ag (NO2) 2-	2.731e-17	2.255e-17	-16.564	-16.647	-0.083	(0)
	AgNO3	7.626e-18	7.626e-18	-17.118	-17.118	0.000	(0)
	Ag (NH3) 2+	9.565e-20	7.899e-20	-19.019	-19.102	-0.083	(0)
	Ag (SeO3) 2-3	2.190e-20	3.912e-21	-19.660	-20.408	-0.748	(0)
	Ag2MoO4	4.425e-25	4.425e-25	-24.354	-24.354	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-74.222	-74.222	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.884	-83.213	-1.330	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.419	-148.603	-0.184	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-149.248	-149.331	-0.083	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.488	-149.832	-0.344	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.815	-150.143	-0.327	(0)
Al		1.390e-06					
	Al (OH) 4-	1.384e-06	1.186e-06	-5.859	-5.926	-0.067	(0)
	Al (OH) 3	5.752e-09	5.752e-09	-8.240	-8.240	0.000	(0)
	Al (OH) 2+	2.041e-10	1.760e-10	-9.690	-9.755	-0.064	(0)
	AlF3	1.181e-11	1.181e-11	-10.928	-10.928	0.000	(0)
	AlF2+	7.671e-12	6.613e-12	-11.115	-11.180	-0.064	(0)
	AlF4-	9.795e-13	8.395e-13	-12.009	-12.076	-0.067	(0)
	AlOH+2	2.449e-13	1.352e-13	-12.611	-12.869	-0.258	(0)
	AlF+2	2.121e-13	1.171e-13	-12.673	-12.931	-0.258	(0)
	AlSO4+	2.484e-15	2.129e-15	-14.605	-14.672	-0.067	(0)
	Al+3	3.338e-16	8.256e-17	-15.477	-16.083	-0.607	(0)
	Al (SO4) 2-	8.844e-17	7.580e-17	-16.053	-16.120	-0.067	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-47.268	-48.016	-0.748	(0)
As (3)		6.643e-25					
	H3AsO3	6.033e-25	6.033e-25	-24.219	-24.219	0.000	(0)
	H2AsO3-	6.098e-26	5.036e-26	-25.215	-25.298	-0.083	(0)
	HAsO3-2	1.607e-29	7.475e-30	-28.794	-29.126	-0.332	(0)
	H4AsO3+	2.224e-33	1.836e-33	-32.653	-32.736	-0.083	(0)
	AsO3-3	2.626e-34	4.690e-35	-33.581	-34.329	-0.748	(0)
As (5)		9.927e-11					
	HAsO4-2	9.611e-11	4.470e-11	-10.017	-10.350	-0.332	(0)
	H2AsO4-	3.033e-12	2.505e-12	-11.518	-11.601	-0.083	(0)
	AsO4-3	1.288e-13	2.301e-14	-12.890	-13.638	-0.748	(0)
	H3AsO4	2.658e-18	2.674e-18	-17.575	-17.573	0.003	(0)
B		2.483e-05					
	H3BO3	2.213e-05	2.227e-05	-4.655	-4.652	0.003	(0)
	H2BO3-	2.492e-06	2.105e-06	-5.603	-5.677	-0.073	(0)
	MgH2BO3+	9.713e-08	8.205e-08	-7.013	-7.086	-0.073	(0)
	CaH2BO3+	7.956e-08	6.720e-08	-7.099	-7.173	-0.073	(0)
	NaH2BO3	2.550e-08	2.550e-08	-7.594	-7.594	0.000	(0)
	BF (OH) 3-	1.492e-09	1.260e-09	-8.826	-8.899	-0.073	(0)
	H5 (BO3) 2-	4.724e-11	3.990e-11	-10.326	-10.399	-0.073	(0)
	BaH2BO3+	1.617e-12	1.366e-12	-11.791	-11.865	-0.073	(0)
	BF2 (OH) 2-	1.391e-13	1.175e-13	-12.857	-12.930	-0.073	(0)
	H8 (BO3) 3-	1.052e-13	8.886e-14	-12.978	-13.051	-0.073	(0)
	AgH2BO3	4.957e-14	4.957e-14	-13.305	-13.305	0.000	(0)
	BF3OH-	4.718e-20	3.985e-20	-19.326	-19.400	-0.073	(0)
	BF4-	2.024e-25	1.710e-25	-24.694	-24.767	-0.073	(0)
Ba		3.931e-08					

Ba+2	3.906e-08	2.099e-08	-7.408	-7.678	-0.270	(0)
BaHCO3+	1.813e-10	1.568e-10	-9.742	-9.805	-0.063	(0)
BaCO3	6.427e-11	6.427e-11	-10.192	-10.192	0.000	(0)
BaH2BO3+	1.617e-12	1.366e-12	-11.791	-11.865	-0.073	(0)
BaOH+	1.746e-13	1.501e-13	-12.758	-12.824	-0.066	(0)
BaNO3+	8.233e-16	6.799e-16	-15.084	-15.168	-0.083	(0)
BaNH3+2	5.098e-17	2.371e-17	-16.293	-16.625	-0.332	(0)
C (4)	9.659e-04					
HCO3-	9.075e-04	7.823e-04	-3.042	-3.107	-0.064	(0)
CO3-2	1.110e-05	5.969e-06	-4.954	-5.224	-0.270	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
MgHCO3+	1.053e-05	8.998e-06	-4.977	-5.046	-0.068	(0)
CaHCO3+	9.341e-06	8.081e-06	-5.030	-5.093	-0.063	(0)
MgCO3	5.581e-06	5.581e-06	-5.253	-5.253	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	3.362e-06	3.362e-06	-5.473	-5.473	0.000	(0)
NaCO3-	9.854e-07	8.494e-07	-6.006	-6.071	-0.064	(0)
CuCO3	4.508e-07	4.508e-07	-6.346	-6.346	0.000	(0)
ZnCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
MnHCO3+	2.183e-07	1.877e-07	-6.661	-6.727	-0.066	(0)
UO2 (CO3) 3-4	1.058e-07	4.949e-09	-6.976	-8.306	-1.330	(0)
UO2 (CO3) 2-2	3.557e-08	1.654e-08	-7.449	-7.781	-0.332	(0)
ZnHCO3+	3.232e-08	2.669e-08	-7.491	-7.574	-0.083	(0)
Cu (CO3) 2-2	1.557e-08	7.243e-09	-7.808	-8.140	-0.332	(0)
NiCO3	6.542e-09	6.542e-09	-8.184	-8.184	0.000	(0)
NiHCO3+	3.431e-09	2.833e-09	-8.465	-8.548	-0.083	(0)
PbCO3	3.290e-09	3.290e-09	-8.483	-8.483	0.000	(0)
CoCO3	1.812e-09	1.812e-09	-8.742	-8.742	0.000	(0)
CoHCO3+	1.323e-09	1.093e-09	-8.878	-8.961	-0.083	(0)
CuHCO3+	7.666e-10	6.331e-10	-9.115	-9.199	-0.083	(0)
CdCO3	2.973e-10	2.973e-10	-9.527	-9.527	0.000	(0)
BaHCO3+	1.813e-10	1.568e-10	-9.742	-9.805	-0.063	(0)
UO2CO3	1.389e-10	1.389e-10	-9.857	-9.857	0.000	(0)
PbHCO3+	1.290e-10	1.066e-10	-9.889	-9.972	-0.083	(0)
Pb (CO3) 2-2	1.218e-10	5.663e-11	-9.914	-10.247	-0.332	(0)
BaCO3	6.427e-11	6.427e-11	-10.192	-10.192	0.000	(0)
CdHCO3+	4.713e-12	3.892e-12	-11.327	-11.410	-0.083	(0)
Cd (CO3) 2-2	2.828e-12	1.315e-12	-11.548	-11.881	-0.332	(0)
FeHCO3+	1.214e-15	1.051e-15	-14.916	-14.979	-0.063	(0)
HgCO3	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
Hg (CO3) 2-2	4.626e-17	2.152e-17	-16.335	-16.667	-0.332	(0)
HgHCO3+	1.579e-19	1.304e-19	-18.802	-18.885	-0.083	(0)
Ca	1.470e-03					
Ca+2	1.032e-03	5.548e-04	-2.986	-3.256	-0.270	(0)
CaSO4	4.222e-04	4.222e-04	-3.374	-3.374	0.000	(0)
CaHCO3+	9.341e-06	8.081e-06	-5.030	-5.093	-0.063	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	9.988e-07	8.589e-07	-6.001	-6.066	-0.066	(0)
CaH2BO3+	7.956e-08	6.720e-08	-7.099	-7.173	-0.073	(0)
CaOH+	2.096e-08	1.813e-08	-7.679	-7.742	-0.063	(0)
CaNO3+	1.373e-11	1.134e-11	-10.862	-10.946	-0.083	(0)
CaNH3+2	2.688e-12	1.250e-12	-11.571	-11.903	-0.332	(0)
Ca (NH3) 2+2	1.915e-21	8.907e-22	-20.718	-21.050	-0.332	(0)
Cd	7.092e-09					
Cd+2	4.066e-09	2.185e-09	-8.391	-8.661	-0.270	(0)
CdSO4	1.702e-09	1.702e-09	-8.769	-8.769	0.000	(0)
CdCl+	7.645e-10	6.313e-10	-9.117	-9.200	-0.083	(0)
CdCO3	2.973e-10	2.973e-10	-9.527	-9.527	0.000	(0)
Cd (SO4) 2-2	1.640e-10	7.627e-11	-9.785	-10.118	-0.332	(0)
CdOHC1	4.242e-11	4.242e-11	-10.372	-10.372	0.000	(0)
CdOH+	3.443e-11	2.843e-11	-10.463	-10.546	-0.083	(0)
CdCl2	7.961e-12	7.961e-12	-11.099	-11.099	0.000	(0)
CdF+	5.949e-12	4.912e-12	-11.226	-11.309	-0.083	(0)
CdHCO3+	4.713e-12	3.892e-12	-11.327	-11.410	-0.083	(0)
Cd (CO3) 2-2	2.828e-12	1.315e-12	-11.548	-11.881	-0.332	(0)
Cd (OH) 2	2.939e-13	2.939e-13	-12.532	-12.532	0.000	(0)
CdCl3-	1.840e-14	1.520e-14	-13.735	-13.818	-0.083	(0)
CdF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000	(0)

	CdNO3+	5.407e-17	4.465e-17	-16.267	-16.350	-0.083	(0)
	CdSeO4	3.770e-17	3.770e-17	-16.424	-16.424	0.000	(0)
	Cd (OH) 3-	3.562e-17	2.941e-17	-16.448	-16.531	-0.083	(0)
	Cd (SeO3) 2-2	1.772e-18	8.239e-19	-17.752	-18.084	-0.332	(0)
	Cd2OH+3	1.743e-18	3.114e-19	-17.759	-18.507	-0.748	(0)
	Cd (OH) 4-2	1.696e-23	7.886e-24	-22.771	-23.103	-0.332	(0)
	Cd (NO3) 2	1.446e-25	1.446e-25	-24.840	-24.840	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.778	-79.861	-0.083	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.866	-151.866	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-229.092	-229.175	-0.083	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-305.856	-306.188	-0.332	(0)
Cl		3.533e-03					
	Cl-	3.533e-03	3.025e-03	-2.452	-2.519	-0.067	(0)
	MnCl+	5.326e-08	4.580e-08	-7.274	-7.339	-0.066	(0)
	ZnOHCl	1.758e-08	1.758e-08	-7.755	-7.755	0.000	(0)
	ZnCl+	9.599e-09	8.199e-09	-8.018	-8.086	-0.068	(0)
	AgCl	9.177e-09	9.177e-09	-8.037	-8.037	0.000	(0)
	AgCl2-	2.928e-09	2.418e-09	-8.533	-8.617	-0.083	(0)
	CdCl+	7.645e-10	6.313e-10	-9.117	-9.200	-0.083	(0)
	CuCl	6.576e-10	6.576e-10	-9.182	-9.182	0.000	(0)
	CuCl2-	4.866e-10	4.156e-10	-9.313	-9.381	-0.068	(0)
	NiCl+	2.754e-10	2.274e-10	-9.560	-9.643	-0.083	(0)
	CoCl+	2.276e-10	1.879e-10	-9.643	-9.726	-0.083	(0)
	MnCl2	1.957e-10	1.957e-10	-9.708	-9.708	0.000	(0)
	CuCl+	7.200e-11	6.150e-11	-10.143	-10.211	-0.068	(0)
	CdOHCl	4.242e-11	4.242e-11	-10.372	-10.372	0.000	(0)
	ZnCl2	3.931e-11	3.931e-11	-10.405	-10.405	0.000	(0)
	PbCl+	2.383e-11	1.968e-11	-10.623	-10.706	-0.083	(0)
	AgCl3-2	1.402e-11	6.519e-12	-10.853	-11.186	-0.332	(0)
	CdCl2	7.961e-12	7.961e-12	-11.099	-11.099	0.000	(0)
	HgClOH	1.397e-12	1.397e-12	-11.855	-11.855	0.000	(0)
	CuCl3-2	4.917e-13	2.688e-13	-12.308	-12.571	-0.262	(0)
	PbCl2	2.659e-13	2.659e-13	-12.575	-12.575	0.000	(0)
	AgCl4-3	2.254e-13	4.026e-14	-12.647	-13.395	-0.748	(0)
	MnCl3-	1.896e-13	1.631e-13	-12.722	-12.788	-0.066	(0)
	HgCl2	1.460e-13	1.460e-13	-12.836	-12.836	0.000	(0)
	ZnCl3-	1.106e-13	9.446e-14	-12.956	-13.025	-0.068	(0)
	CuCl2	6.451e-14	6.451e-14	-13.190	-13.190	0.000	(0)
	CdCl3-	1.840e-14	1.520e-14	-13.735	-13.818	-0.083	(0)
	HgCl3-	5.350e-15	4.418e-15	-14.272	-14.355	-0.083	(0)
	NiCl2	3.463e-15	3.463e-15	-14.460	-14.460	0.000	(0)
	PbCl3-	3.878e-16	3.203e-16	-15.411	-15.495	-0.083	(0)
	ZnCl4-2	2.614e-16	1.429e-16	-15.583	-15.845	-0.262	(0)
	HgCl4-2	1.144e-16	5.320e-17	-15.942	-16.274	-0.332	(0)
	UO2Cl+	3.473e-17	2.868e-17	-16.459	-16.542	-0.083	(0)
	HgCl+	1.166e-17	9.632e-18	-16.933	-17.016	-0.083	(0)
	CuCl3-	2.132e-18	1.821e-18	-17.671	-17.740	-0.068	(0)
	PbCl4-2	9.522e-19	4.428e-19	-18.021	-18.354	-0.332	(0)
	CrCl+2	4.796e-19	2.231e-19	-18.319	-18.652	-0.332	(0)
	CrOHC12	2.101e-20	2.101e-20	-19.678	-19.678	0.000	(0)
	CrCl2+	7.753e-23	6.403e-23	-22.111	-22.194	-0.083	(0)
	FeCl+2	6.025e-23	3.294e-23	-22.220	-22.482	-0.262	(0)
	CuCl4-2	5.051e-23	2.761e-23	-22.297	-22.559	-0.262	(0)
	VOCl+	1.403e-24	1.159e-24	-23.853	-23.936	-0.083	(0)
	FeCl2+	5.176e-25	4.451e-25	-24.286	-24.352	-0.066	(0)
	CrO3Cl-	4.312e-26	3.561e-26	-25.365	-25.448	-0.083	(0)
	FeCl3	1.346e-28	1.346e-28	-27.871	-27.871	0.000	(0)
	CoCl+2	3.443e-36	1.601e-36	-35.463	-35.796	-0.332	(0)
	UCl+3	0.000e+00	0.000e+00	-47.056	-47.804	-0.748	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
Co (2)		5.477e-08					
	Co+2	3.862e-08	1.796e-08	-7.413	-7.746	-0.332	(0)
	CoSO4	1.190e-08	1.190e-08	-7.924	-7.924	0.000	(0)
	CoCO3	1.812e-09	1.812e-09	-8.742	-8.742	0.000	(0)
	CoHCO3+	1.323e-09	1.093e-09	-8.878	-8.961	-0.083	(0)
	CoOH+	7.108e-10	5.870e-10	-9.148	-9.231	-0.083	(0)

CoCl+	2.276e-10	1.879e-10	-9.643	-9.726	-0.083	(0)
CoF+	9.755e-11	8.055e-11	-10.011	-10.094	-0.083	(0)
Co (OH) 2	7.638e-11	7.638e-11	-10.117	-10.117	0.000	(0)
CoNO2+	1.050e-12	8.668e-13	-11.979	-12.062	-0.083	(0)
Co (NH3) +2	8.309e-15	3.864e-15	-14.080	-14.413	-0.332	(0)
Co (OH) 3-	3.023e-15	2.496e-15	-14.520	-14.603	-0.083	(0)
CoSeO4	8.340e-16	8.340e-16	-15.079	-15.079	0.000	(0)
CoOOH-	7.588e-16	6.266e-16	-15.120	-15.203	-0.083	(0)
CoNO3+	2.227e-16	1.839e-16	-15.652	-15.735	-0.083	(0)
Co2OH+3	2.958e-18	5.283e-19	-17.529	-18.277	-0.748	(0)
Co (OH) 4-2	1.394e-21	6.481e-22	-20.856	-21.188	-0.332	(0)
Co (NH3) 2+2	6.344e-22	2.950e-22	-21.198	-21.530	-0.332	(0)
Co (NO3) 2	2.418e-24	2.418e-24	-23.617	-23.617	0.000	(0)
Co4 (OH) 4+4	5.063e-28	2.369e-29	-27.296	-28.625	-1.330	(0)
Co (NH3) 3+2	1.429e-29	6.648e-30	-28.845	-29.177	-0.332	(0)
Co (NH3) 4+2	1.343e-37	6.244e-38	-36.872	-37.205	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.399	-45.732	-0.332	(0)
Co (3)	4.656e-29					
CoOH+2	4.656e-29	2.165e-29	-28.332	-28.664	-0.332	(0)
Co+3	1.052e-35	2.601e-36	-34.978	-35.585	-0.607	(0)
CoCl+2	3.443e-36	1.601e-36	-35.463	-35.796	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.775	-68.107	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
Cr (2)	8.043e-28					
Cr+2	8.043e-28	3.741e-28	-27.095	-27.427	-0.332	(0)
Cr (3)	7.925e-10					
Cr (OH) 2+	4.928e-10	4.070e-10	-9.307	-9.390	-0.083	(0)
Cr (OH) 3	2.504e-10	2.504e-10	-9.601	-9.601	0.000	(0)
CrO2-	2.345e-11	1.937e-11	-10.630	-10.713	-0.083	(0)
Cr (OH) 4-	1.978e-11	1.633e-11	-10.704	-10.787	-0.083	(0)
Cr (OH) +2	4.390e-12	2.042e-12	-11.358	-11.690	-0.332	(0)
CrOHSO4	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
CrF+2	2.754e-15	1.281e-15	-14.560	-14.893	-0.332	(0)
CrSO4+	5.352e-16	4.420e-16	-15.271	-15.355	-0.083	(0)
Cr+3	3.190e-16	5.697e-17	-15.496	-16.244	-0.748	(0)
CrCl+2	4.796e-19	2.231e-19	-18.319	-18.652	-0.332	(0)
CrOHC12	2.101e-20	2.101e-20	-19.678	-19.678	0.000	(0)
Cr2 (OH) 2SO4+2	6.388e-22	2.971e-22	-21.195	-21.527	-0.332	(0)
CrCl2+	7.753e-23	6.403e-23	-22.111	-22.194	-0.083	(0)
Cr2 (OH) 2 (SO4) 2	5.863e-23	5.863e-23	-22.232	-22.232	0.000	(0)
CrNO3+2	3.460e-26	1.609e-26	-25.461	-25.793	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.061	-45.394	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-54.979	-55.728	-0.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Cr (6)	2.968e-14					
CrO4-2	2.849e-14	1.532e-14	-13.545	-13.815	-0.270	(0)
NaCrO4-	7.044e-16	5.817e-16	-15.152	-15.235	-0.083	(0)
HCrO4-	3.687e-16	3.045e-16	-15.433	-15.516	-0.083	(0)
KCrO4-	1.146e-16	9.464e-17	-15.941	-16.024	-0.083	(0)
CrO3SO4-2	4.073e-24	1.894e-24	-23.390	-23.723	-0.332	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	4.312e-26	3.561e-26	-25.365	-25.448	-0.083	(0)
Cr2O7-2	6.916e-30	3.217e-30	-29.160	-29.493	-0.332	(0)
Cu (1)	1.354e-09					
CuCl	6.576e-10	6.576e-10	-9.182	-9.182	0.000	(0)
CuCl2-	4.866e-10	4.156e-10	-9.313	-9.381	-0.068	(0)
Cu+	2.091e-10	1.727e-10	-9.680	-9.763	-0.083	(0)
CuCl3-2	4.917e-13	2.688e-13	-12.308	-12.571	-0.262	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.032	-148.368	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.778	-149.098	-0.320	(0)
Cu (2)	6.011e-07					
CuCO3	4.508e-07	4.508e-07	-6.346	-6.346	0.000	(0)
CuOH+	7.779e-08	6.645e-08	-7.109	-7.178	-0.068	(0)
Cu+2	2.386e-08	1.283e-08	-7.622	-7.892	-0.270	(0)
Cu (OH) 2	2.172e-08	2.172e-08	-7.663	-7.663	0.000	(0)
Cu (CO3) 2-2	1.557e-08	7.243e-09	-7.808	-8.140	-0.332	(0)

	CuSO4	9.762e-09	9.762e-09	-8.010	-8.010	0.000	(0)
	CuHCO3+	7.666e-10	6.331e-10	-9.115	-9.199	-0.083	(0)
	Cu2 (OH) 2+2	2.385e-10	1.109e-10	-9.623	-9.955	-0.332	(0)
	CuF+	1.390e-10	1.148e-10	-9.857	-9.940	-0.083	(0)
	Cu (OH) 3-	8.836e-11	7.297e-11	-10.054	-10.137	-0.083	(0)
	CuCl+	7.200e-11	6.150e-11	-10.143	-10.211	-0.068	(0)
	CuNO2+	1.114e-11	9.199e-12	-10.953	-11.036	-0.083	(0)
	CuNH3+2	5.051e-13	2.349e-13	-12.297	-12.629	-0.332	(0)
	CuCl2	6.451e-14	6.451e-14	-13.190	-13.190	0.000	(0)
	Cu (OH) 4-2	2.023e-15	9.408e-16	-14.694	-15.026	-0.332	(0)
	Cu (NO2) 2	6.448e-16	6.448e-16	-15.191	-15.191	0.000	(0)
	CuNO3+	3.174e-16	2.621e-16	-15.498	-15.582	-0.083	(0)
	CuCl3-	2.132e-18	1.821e-18	-17.671	-17.740	-0.068	(0)
	CuCl4-2	5.051e-23	2.761e-23	-22.297	-22.559	-0.262	(0)
	Cu (NO3) 2	2.132e-25	2.132e-25	-24.671	-24.671	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-219.536	-219.620	-0.083	(0)
F	1.883e-04						
	F-	1.657e-04	1.418e-04	-3.781	-3.848	-0.067	(0)
	MgF+	2.087e-05	1.789e-05	-4.680	-4.747	-0.067	(0)
	CaF+	9.988e-07	8.589e-07	-6.001	-6.066	-0.066	(0)
	NaF	6.840e-07	6.840e-07	-6.165	-6.165	0.000	(0)
	MnF+	7.897e-08	6.791e-08	-7.103	-7.168	-0.066	(0)
	ZnF+	3.698e-09	3.054e-09	-8.432	-8.515	-0.083	(0)
	BF (OH) 3-	1.492e-09	1.260e-09	-8.826	-8.899	-0.073	(0)
	HF	1.289e-09	1.289e-09	-8.890	-8.890	0.000	(0)
	CuF+	1.390e-10	1.148e-10	-9.857	-9.940	-0.083	(0)
	NiF+	1.268e-10	1.047e-10	-9.897	-9.980	-0.083	(0)
	CoF+	9.755e-11	8.055e-11	-10.011	-10.094	-0.083	(0)
	AlF3	1.181e-11	1.181e-11	-10.928	-10.928	0.000	(0)
	AlF2+	7.671e-12	6.613e-12	-11.115	-11.180	-0.064	(0)
	CdF+	5.949e-12	4.912e-12	-11.226	-11.309	-0.083	(0)
	PbF+	2.219e-12	1.833e-12	-11.654	-11.737	-0.083	(0)
	AlF4-	9.795e-13	8.395e-13	-12.009	-12.076	-0.067	(0)
	HF2-	8.167e-13	6.951e-13	-12.088	-12.158	-0.070	(0)
	AgF	5.294e-13	5.294e-13	-12.276	-12.276	0.000	(0)
	AlF+2	2.121e-13	1.171e-13	-12.673	-12.931	-0.258	(0)
	BF2 (OH) 2-	1.391e-13	1.175e-13	-12.857	-12.930	-0.073	(0)
	UO2F+	1.386e-13	1.145e-13	-12.858	-12.941	-0.083	(0)
	UO2F2	4.682e-14	4.682e-14	-13.330	-13.330	0.000	(0)
	PbF2	5.115e-15	5.115e-15	-14.291	-14.291	0.000	(0)
	CrF+2	2.754e-15	1.281e-15	-14.560	-14.893	-0.332	(0)
	UO2F3-	2.020e-15	1.668e-15	-14.695	-14.778	-0.083	(0)
	CdF2	1.390e-15	1.390e-15	-14.857	-14.857	0.000	(0)
	H2F2	4.452e-18	4.452e-18	-17.351	-17.351	0.000	(0)
	UO2F4-2	4.042e-18	1.880e-18	-17.393	-17.726	-0.332	(0)
	PbF3-	1.666e-18	1.376e-18	-17.778	-17.861	-0.083	(0)
	VO2F	4.092e-19	4.092e-19	-18.388	-18.388	0.000	(0)
	FeF2+	2.475e-19	2.129e-19	-18.606	-18.672	-0.066	(0)
	FeF+2	1.026e-19	5.607e-20	-18.989	-19.251	-0.262	(0)
	BF3OH-	4.718e-20	3.985e-20	-19.326	-19.400	-0.073	(0)
	FeF3	4.260e-20	4.260e-20	-19.371	-19.371	0.000	(0)
	VO2F2-	2.552e-20	2.107e-20	-19.593	-19.676	-0.083	(0)
	PbF4-2	2.009e-22	9.343e-23	-21.697	-22.030	-0.332	(0)
	VOF+	1.407e-22	1.162e-22	-21.852	-21.935	-0.083	(0)
	VO2F3-2	8.017e-23	3.728e-23	-22.096	-22.428	-0.332	(0)
	VOF2	6.179e-24	6.179e-24	-23.209	-23.209	0.000	(0)
	HgF+	1.016e-24	8.391e-25	-23.993	-24.076	-0.083	(0)
	BF4-	2.024e-25	1.710e-25	-24.694	-24.767	-0.073	(0)
	VOF3-	3.766e-26	3.110e-26	-25.424	-25.507	-0.083	(0)
	VO2F4-3	1.457e-26	2.602e-27	-25.837	-26.585	-0.748	(0)
	Sb (OH) 2F	7.021e-27	7.021e-27	-26.154	-26.154	0.000	(0)
	SbOF	6.907e-27	6.907e-27	-26.161	-26.161	0.000	(0)
	VOF4-2	3.828e-29	1.781e-29	-28.417	-28.749	-0.332	(0)
	SiF6-2	2.495e-30	1.364e-30	-29.603	-29.865	-0.262	(0)
	UF3+	1.425e-37	1.177e-37	-36.846	-36.929	-0.083	(0)
	UF2+2	1.125e-38	5.234e-39	-37.949	-38.281	-0.332	(0)
	UF4	1.830e-39	1.830e-39	-38.738	-38.738	0.000	(0)
	UF+3	0.000e+00	0.000e+00	-40.785	-41.533	-0.748	(0)

UF5-	0.000e+00	0.000e+00	-40.905	-40.988	-0.083	(0)
UF6-2	0.000e+00	0.000e+00	-42.023	-42.356	-0.332	(0)
Fe (2)	3.257e-13					
Fe+2	2.294e-13	1.067e-13	-12.639	-12.972	-0.332	(0)
FeSO4	8.699e-14	8.699e-14	-13.061	-13.061	0.000	(0)
FeOH+	8.090e-15	6.957e-15	-14.092	-14.158	-0.066	(0)
FeHCO3+	1.214e-15	1.051e-15	-14.916	-14.979	-0.063	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	5.453e-18	4.689e-18	-17.263	-17.329	-0.066	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-162.440	-162.440	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-239.529	-239.612	-0.083	(0)
Fe (3)	7.851e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	2.819e-10	2.430e-10	-9.550	-9.614	-0.064	(0)
Fe (OH) 4-	7.565e-11	6.521e-11	-10.121	-10.186	-0.064	(0)
FeOH+2	6.976e-16	3.813e-16	-15.156	-15.419	-0.262	(0)
FeF2+	2.475e-19	2.129e-19	-18.606	-18.672	-0.066	(0)
FeF+2	1.026e-19	5.607e-20	-18.989	-19.251	-0.262	(0)
FeF3	4.260e-20	4.260e-20	-19.371	-19.371	0.000	(0)
FeSO4+	1.563e-20	1.344e-20	-19.806	-19.872	-0.066	(0)
Fe+3	1.458e-21	3.605e-22	-20.836	-21.443	-0.607	(0)
Fe (SO4) 2-	1.156e-21	9.546e-22	-20.937	-21.020	-0.083	(0)
FeCl+2	6.025e-23	3.294e-23	-22.220	-22.482	-0.262	(0)
FeCl2+	5.176e-25	4.451e-25	-24.286	-24.352	-0.066	(0)
FeHSeO3+2	6.762e-26	3.145e-26	-25.170	-25.502	-0.332	(0)
FeCl3	1.346e-28	1.346e-28	-27.871	-27.871	0.000	(0)
Fe2 (OH) 2+4	1.029e-28	4.815e-30	-27.987	-29.317	-1.330	(0)
FeNO3+2	5.009e-29	2.330e-29	-28.300	-28.633	-0.332	(0)
Fe3 (OH) 4+5	2.024e-36	1.691e-38	-35.694	-37.772	-2.078	(0)
H (0)	4.013e-29					
H2	2.007e-29	2.019e-29	-28.698	-28.695	0.003	(0)
Hg (0)	1.113e-09					
Hg	1.113e-09	1.113e-09	-8.954	-8.954	0.000	(0)
Hg (1)	5.184e-22					
Hg2+2	2.592e-22	1.205e-22	-21.586	-21.919	-0.332	(0)
Hg (2)	4.235e-12					
Hg (OH) 2	2.685e-12	2.702e-12	-11.571	-11.568	0.003	(0)
HgClOH	1.397e-12	1.397e-12	-11.855	-11.855	0.000	(0)
HgCl2	1.460e-13	1.460e-13	-12.836	-12.836	0.000	(0)
HgCl3-	5.350e-15	4.418e-15	-14.272	-14.355	-0.083	(0)
HgCO3	1.140e-15	1.140e-15	-14.943	-14.943	0.000	(0)
HgCl4-2	1.144e-16	5.320e-17	-15.942	-16.274	-0.332	(0)
Hg (CO3) 2-2	4.626e-17	2.152e-17	-16.335	-16.667	-0.332	(0)
HgOH+	1.260e-17	1.041e-17	-16.900	-16.983	-0.083	(0)
HgCl+	1.166e-17	9.632e-18	-16.933	-17.016	-0.083	(0)
Hg (OH) 3-	6.747e-19	5.572e-19	-18.171	-18.254	-0.083	(0)
HgHCO3+	1.579e-19	1.304e-19	-18.802	-18.885	-0.083	(0)
Hg (NH3) 2+2	6.935e-22	3.225e-22	-21.159	-21.491	-0.332	(0)
HgNH3+2	3.875e-22	1.802e-22	-21.412	-21.744	-0.332	(0)
Hg+2	3.431e-22	1.596e-22	-21.465	-21.797	-0.332	(0)
HgSO4	1.388e-22	1.388e-22	-21.858	-21.858	0.000	(0)
HgF+	1.016e-24	8.391e-25	-23.993	-24.076	-0.083	(0)
Hg (NH3) 3+2	4.942e-30	2.298e-30	-29.306	-29.639	-0.332	(0)
HgNO3+	4.610e-31	3.807e-31	-30.336	-30.419	-0.083	(0)
Hg (NH3) 4+2	7.025e-38	3.267e-38	-37.153	-37.486	-0.332	(0)
Hg (NO3) 2	1.022e-39	1.022e-39	-38.990	-38.990	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.992	-140.075	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-140.239	-140.572	-0.332	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.893	-141.893	0.000	(0)
K	1.988e-03					
K+	1.942e-03	1.663e-03	-2.712	-2.779	-0.067	(0)
KSO4-	4.538e-05	3.912e-05	-4.343	-4.408	-0.064	(0)
KCrO4-	1.146e-16	9.464e-17	-15.941	-16.024	-0.083	(0)
Mg	2.809e-03					
Mg+2	2.091e-03	1.124e-03	-2.680	-2.949	-0.270	(0)
MgSO4	6.796e-04	6.796e-04	-3.168	-3.168	0.000	(0)
MgF+	2.087e-05	1.789e-05	-4.680	-4.747	-0.067	(0)
MgHCO3+	1.053e-05	8.998e-06	-4.977	-5.046	-0.068	(0)

MgCO3	5.581e-06	5.581e-06	-5.253	-5.253	0.000	(0)
MgOH+	8.449e-07	7.331e-07	-6.073	-6.135	-0.062	(0)
MgH2BO3+	9.713e-08	8.205e-08	-7.013	-7.086	-0.073	(0)
Mn (2)	3.337e-05					
Mn+2	2.586e-05	1.203e-05	-4.587	-4.920	-0.332	(0)
MnSO4	7.104e-06	7.104e-06	-5.148	-5.148	0.000	(0)
MnHCO3+	2.183e-07	1.877e-07	-6.661	-6.727	-0.066	(0)
MnF+	7.897e-08	6.791e-08	-7.103	-7.168	-0.066	(0)
MnOH+	5.755e-08	4.948e-08	-7.240	-7.306	-0.066	(0)
MnCl+	5.326e-08	4.580e-08	-7.274	-7.339	-0.066	(0)
MnCl2	1.957e-10	1.957e-10	-9.708	-9.708	0.000	(0)
MnSeO4	2.999e-13	2.999e-13	-12.523	-12.523	0.000	(0)
MnCl3-	1.896e-13	1.631e-13	-12.722	-12.788	-0.066	(0)
MnNO3+	1.491e-13	1.231e-13	-12.826	-12.910	-0.083	(0)
Mn (OH) 3-	9.543e-16	8.206e-16	-15.020	-15.086	-0.066	(0)
Mn (OH) 4-2	7.939e-21	4.340e-21	-20.100	-20.363	-0.262	(0)
Mn (NO3) 2	1.999e-21	1.999e-21	-20.699	-20.699	0.000	(0)
MnSe	0.000e+00	0.000e+00	-41.349	-41.349	0.000	(0)
Mn (3)	7.901e-26					
Mn+3	7.901e-26	1.954e-26	-25.102	-25.709	-0.607	(0)
Mn (6)	7.170e-40					
MnO4-2	7.170e-40	3.920e-40	-39.144	-39.407	-0.262	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.146	-44.218	-0.072	(0)
Mo	9.853e-07					
MoO4-2	9.852e-07	5.295e-07	-6.006	-6.276	-0.270	(0)
HMoO4-	7.839e-11	6.474e-11	-10.106	-10.189	-0.083	(0)
H2MoO4	2.914e-15	2.914e-15	-14.536	-14.536	0.000	(0)
Ag2MoO4	4.425e-25	4.425e-25	-24.354	-24.354	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-47.268	-48.016	-0.748	(0)
Mo7O24-6	0.000e+00	0.000e+00	-53.642	-56.634	-2.992	(0)
HMo7O24-5	0.000e+00	0.000e+00	-56.381	-58.459	-2.078	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-60.558	-61.888	-1.330	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-66.106	-66.854	-0.748	(0)
N (-3)	2.542e-08					
NH4+	2.283e-08	1.929e-08	-7.641	-7.715	-0.073	(0)
NH3	1.790e-09	1.790e-09	-8.747	-8.747	0.000	(0)
NH4SO4-	7.985e-10	6.866e-10	-9.098	-9.163	-0.066	(0)
CaNH3+2	2.688e-12	1.250e-12	-11.571	-11.903	-0.332	(0)
CuNH3+2	5.051e-13	2.349e-13	-12.297	-12.629	-0.332	(0)
NiNH3+2	6.072e-14	2.824e-14	-13.217	-13.549	-0.332	(0)
Co (NH3) +2	8.309e-15	3.864e-15	-14.080	-14.413	-0.332	(0)
AgNH3+	6.575e-15	5.429e-15	-14.182	-14.265	-0.083	(0)
BaNH3+2	5.098e-17	2.371e-17	-16.293	-16.625	-0.332	(0)
Ag (NH3) 2+	9.565e-20	7.899e-20	-19.019	-19.102	-0.083	(0)
Ni (NH3) 2+2	1.571e-20	7.305e-21	-19.804	-20.136	-0.332	(0)
Ca (NH3) 2+2	1.915e-21	8.907e-22	-20.718	-21.050	-0.332	(0)
Hg (NH3) 2+2	6.935e-22	3.225e-22	-21.159	-21.491	-0.332	(0)
Co (NH3) 2+2	6.344e-22	2.950e-22	-21.198	-21.530	-0.332	(0)
HgNH3+2	3.875e-22	1.802e-22	-21.412	-21.744	-0.332	(0)
Co (NH3) 3+2	1.429e-29	6.648e-30	-28.845	-29.177	-0.332	(0)
Hg (NH3) 3+2	4.942e-30	2.298e-30	-29.306	-29.639	-0.332	(0)
Co (NH3) 4+2	1.343e-37	6.244e-38	-36.872	-37.205	-0.332	(0)
Hg (NH3) 4+2	7.025e-38	3.267e-38	-37.153	-37.486	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-45.061	-45.394	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-45.399	-45.732	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-53.246	-53.578	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-54.979	-55.728	-0.748	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-56.812	-57.145	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-67.775	-68.107	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.709	-69.041	-0.332	(0)
N (3)	8.077e-06					
NO2-	8.077e-06	6.849e-06	-5.093	-5.164	-0.072	(0)
CuNO2+	1.114e-11	9.199e-12	-10.953	-11.036	-0.083	(0)
AgNO2	2.126e-12	2.126e-12	-11.672	-11.672	0.000	(0)
CoNO2+	1.050e-12	8.668e-13	-11.979	-12.062	-0.083	(0)
Cu (NO2) 2	6.448e-16	6.448e-16	-15.191	-15.191	0.000	(0)

Ag (NO ₂) ₂ -	2.731e-17	2.255e-17	-16.564	-16.647	-0.083	(0)
N (5)	7.560e-09					
NO ₃ -	7.546e-09	6.462e-09	-8.122	-8.190	-0.067	(0)
CaNO ₃ +	1.373e-11	1.134e-11	-10.862	-10.946	-0.083	(0)
MnNO ₃ +	1.491e-13	1.231e-13	-12.826	-12.910	-0.083	(0)
ZnNO ₃ +	2.121e-14	1.751e-14	-13.674	-13.757	-0.083	(0)
BaNO ₃ +	8.233e-16	6.799e-16	-15.084	-15.168	-0.083	(0)
NiNO ₃ +	5.774e-16	4.768e-16	-15.239	-15.322	-0.083	(0)
CuNO ₃ +	3.174e-16	2.621e-16	-15.498	-15.582	-0.083	(0)
CoNO ₃ +	2.227e-16	1.839e-16	-15.652	-15.735	-0.083	(0)
CdNO ₃ +	5.407e-17	4.465e-17	-16.267	-16.350	-0.083	(0)
PbNO ₃ +	2.122e-17	1.752e-17	-16.673	-16.756	-0.083	(0)
AgNO ₃	7.626e-18	7.626e-18	-17.118	-17.118	0.000	(0)
Mn (NO ₃) ₂	1.999e-21	1.999e-21	-20.699	-20.699	0.000	(0)
UO ₂ NO ₃ +	9.126e-23	7.537e-23	-22.040	-22.123	-0.083	(0)
Zn (NO ₃) ₂	2.258e-23	2.258e-23	-22.646	-22.646	0.000	(0)
Co (NO ₃) ₂	2.418e-24	2.418e-24	-23.617	-23.617	0.000	(0)
Cu (NO ₃) ₂	2.132e-25	2.132e-25	-24.671	-24.671	0.000	(0)
Pb (NO ₃) ₂	1.923e-25	1.923e-25	-24.716	-24.716	0.000	(0)
Cd (NO ₃) ₂	1.446e-25	1.446e-25	-24.840	-24.840	0.000	(0)
CrNO ₃ +2	3.460e-26	1.609e-26	-25.461	-25.793	-0.332	(0)
VO ₂ NO ₃	5.376e-27	5.376e-27	-26.270	-26.270	0.000	(0)
FeNO ₃ +2	5.009e-29	2.330e-29	-28.300	-28.633	-0.332	(0)
HgNO ₃ +	4.610e-31	3.807e-31	-30.336	-30.419	-0.083	(0)
Hg (NO ₃) ₂	1.022e-39	1.022e-39	-38.990	-38.990	0.000	(0)
Na	9.089e-03					
Na+	8.926e-03	7.642e-03	-2.049	-2.117	-0.067	(0)
NaSO ₄ -	1.582e-04	1.364e-04	-3.801	-3.865	-0.064	(0)
NaHCO ₃	3.362e-06	3.362e-06	-5.473	-5.473	0.000	(0)
NaCO ₃ -	9.854e-07	8.494e-07	-6.006	-6.071	-0.064	(0)
NaF	6.840e-07	6.840e-07	-6.165	-6.165	0.000	(0)
NaH ₂ BO ₃	2.550e-08	2.550e-08	-7.594	-7.594	0.000	(0)
NaCrO ₄ -	7.044e-16	5.817e-16	-15.152	-15.235	-0.083	(0)
Ni	8.533e-08					
Ni+2	5.466e-08	2.938e-08	-7.262	-7.532	-0.270	(0)
NiSO ₄	1.947e-08	1.947e-08	-7.711	-7.711	0.000	(0)
NiCO ₃	6.542e-09	6.542e-09	-8.184	-8.184	0.000	(0)
NiHCO ₃ +	3.431e-09	2.833e-09	-8.465	-8.548	-0.083	(0)
NiOH+	7.337e-10	6.059e-10	-9.135	-9.218	-0.083	(0)
NiCl+	2.754e-10	2.274e-10	-9.560	-9.643	-0.083	(0)
NiF+	1.268e-10	1.047e-10	-9.897	-9.980	-0.083	(0)
Ni (OH) ₂	7.884e-11	7.884e-11	-10.103	-10.103	0.000	(0)
Ni (SO ₄) ₂ -2	4.607e-12	2.142e-12	-11.337	-11.669	-0.332	(0)
Ni (OH) ₃ -	1.564e-13	1.291e-13	-12.806	-12.889	-0.083	(0)
NiNH ₃ +2	6.072e-14	2.824e-14	-13.217	-13.549	-0.332	(0)
NiCl ₂	3.463e-15	3.463e-15	-14.460	-14.460	0.000	(0)
NiSeO ₄	1.273e-15	1.273e-15	-14.895	-14.895	0.000	(0)
NiNO ₃ +	5.774e-16	4.768e-16	-15.239	-15.322	-0.083	(0)
Ni (NH ₃) ₂ +2	1.571e-20	7.305e-21	-19.804	-20.136	-0.332	(0)
O (0)	2.470e-35					
O ₂	1.235e-35	1.243e-35	-34.908	-34.906	0.003	(0)
Pb	5.172e-09					
PbCO ₃	3.290e-09	3.290e-09	-8.483	-8.483	0.000	(0)
PbOH+	9.135e-10	7.544e-10	-9.039	-9.122	-0.083	(0)
Pb+2	3.411e-10	1.833e-10	-9.467	-9.737	-0.270	(0)
PbSO ₄	2.983e-10	2.983e-10	-9.525	-9.525	0.000	(0)
PbHCO ₃ +	1.290e-10	1.066e-10	-9.889	-9.972	-0.083	(0)
Pb (CO ₃) ₂ -2	1.218e-10	5.663e-11	-9.914	-10.247	-0.332	(0)
Pb (OH) ₂	3.908e-11	3.908e-11	-10.408	-10.408	0.000	(0)
PbCl+	2.383e-11	1.968e-11	-10.623	-10.706	-0.083	(0)
Pb (SO ₄) ₂ -2	1.284e-11	5.972e-12	-10.891	-11.224	-0.332	(0)
PbF+	2.219e-12	1.833e-12	-11.654	-11.737	-0.083	(0)
PbCl ₂	2.659e-13	2.659e-13	-12.575	-12.575	0.000	(0)
Pb (OH) ₃ -	7.752e-14	6.402e-14	-13.111	-13.194	-0.083	(0)
PbF ₂	5.115e-15	5.115e-15	-14.291	-14.291	0.000	(0)
PbCl ₃ -	3.878e-16	3.203e-16	-15.411	-15.495	-0.083	(0)
Pb (OH) ₄ -2	5.522e-17	2.568e-17	-16.258	-16.590	-0.332	(0)
PbNO ₃ +	2.122e-17	1.752e-17	-16.673	-16.756	-0.083	(0)

Pb2OH+3	1.227e-17	2.192e-18	-16.911	-17.659	-0.748	(0)
PbF3-	1.666e-18	1.376e-18	-17.778	-17.861	-0.083	(0)
PbCl4-2	9.522e-19	4.428e-19	-18.021	-18.354	-0.332	(0)
Pb3(OH) 4+2	1.201e-20	5.587e-21	-19.920	-20.253	-0.332	(0)
PbF4-2	2.009e-22	9.343e-23	-21.697	-22.030	-0.332	(0)
Pb(NO3) 2	1.923e-25	1.923e-25	-24.716	-24.716	0.000	(0)
Pb4(OH) 4+4	1.739e-25	8.137e-27	-24.760	-26.090	-1.330	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.885	-152.885	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.710	-230.793	-0.083	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.222	-74.222	0.000	(0)
HS-	0.000e+00	0.000e+00	-79.126	-79.209	-0.083	(0)
CdHS+	0.000e+00	0.000e+00	-79.778	-79.861	-0.083	(0)
S5-2	0.000e+00	0.000e+00	-80.030	-80.362	-0.332	(0)
H2S	0.000e+00	0.000e+00	-80.400	-80.400	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.546	-80.878	-0.332	(0)
S4-2	0.000e+00	0.000e+00	-80.626	-80.958	-0.332	(0)
S3-2	0.000e+00	0.000e+00	-81.432	-81.764	-0.332	(0)
S2-2	0.000e+00	0.000e+00	-82.448	-82.780	-0.332	(0)
S-2	0.000e+00	0.000e+00	-88.035	-88.297	-0.262	(0)
HgHS2-	0.000e+00	0.000e+00	-139.992	-140.075	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-140.239	-140.572	-0.332	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-141.893	-141.893	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-148.032	-148.368	-0.335	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-148.419	-148.603	-0.184	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.778	-149.098	-0.320	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-149.248	-149.331	-0.083	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.280	-149.363	-0.083	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-149.488	-149.832	-0.344	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.815	-150.143	-0.327	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-151.565	-151.565	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.866	-151.866	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-152.885	-152.885	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-162.440	-162.440	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-219.536	-219.620	-0.083	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-227.411	-227.494	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.930	-229.262	-0.332	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-229.092	-229.175	-0.083	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-230.710	-230.793	-0.083	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-239.529	-239.612	-0.083	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-305.856	-306.188	-0.332	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-307.830	-308.163	-0.332	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.112	-324.444	-0.332	(0)
S(6)	7.495e-03					
SO4-2	6.181e-03	3.322e-03	-2.209	-2.479	-0.270	(0)
MgSO4	6.796e-04	6.796e-04	-3.168	-3.168	0.000	(0)
CaSO4	4.222e-04	4.222e-04	-3.374	-3.374	0.000	(0)
NaSO4-	1.582e-04	1.364e-04	-3.801	-3.865	-0.064	(0)
KSO4-	4.538e-05	3.912e-05	-4.343	-4.408	-0.064	(0)
MnSO4	7.104e-06	7.104e-06	-5.148	-5.148	0.000	(0)
ZnSO4	7.843e-07	7.843e-07	-6.106	-6.106	0.000	(0)
Zn(SO4) 2-2	4.880e-08	2.269e-08	-7.312	-7.644	-0.332	(0)
NiSO4	1.947e-08	1.947e-08	-7.711	-7.711	0.000	(0)
CoSO4	1.190e-08	1.190e-08	-7.924	-7.924	0.000	(0)
CuSO4	9.762e-09	9.762e-09	-8.010	-8.010	0.000	(0)
HSO4-	2.327e-09	1.995e-09	-8.633	-8.700	-0.067	(0)
CdSO4	1.702e-09	1.702e-09	-8.769	-8.769	0.000	(0)
NH4SO4-	7.985e-10	6.866e-10	-9.098	-9.163	-0.066	(0)
PbSO4	2.983e-10	2.983e-10	-9.525	-9.525	0.000	(0)
Cd(SO4) 2-2	1.640e-10	7.627e-11	-9.785	-10.118	-0.332	(0)
AgSO4-	1.193e-10	9.849e-11	-9.923	-10.007	-0.083	(0)
Pb(SO4) 2-2	1.284e-11	5.972e-12	-10.891	-11.224	-0.332	(0)
Ni(SO4) 2-2	4.607e-12	2.142e-12	-11.337	-11.669	-0.332	(0)
CrOHSO4	1.610e-12	1.610e-12	-11.793	-11.793	0.000	(0)
FeSO4	8.699e-14	8.699e-14	-13.061	-13.061	0.000	(0)
UO2SO4	2.939e-14	2.939e-14	-13.532	-13.532	0.000	(0)
UO2(SO4) 2-2	2.768e-15	1.287e-15	-14.558	-14.890	-0.332	(0)
AlSO4+	2.484e-15	2.129e-15	-14.605	-14.672	-0.067	(0)

CrSO4+	5.352e-16	4.420e-16	-15.271	-15.355	-0.083	(0)
Al(SO4)2-	8.844e-17	7.580e-17	-16.053	-16.120	-0.067	(0)
VO2SO4-	1.580e-19	1.305e-19	-18.801	-18.884	-0.083	(0)
FeSO4+	1.563e-20	1.344e-20	-19.806	-19.872	-0.066	(0)
Fe(SO4)2-	1.156e-21	9.546e-22	-20.937	-21.020	-0.083	(0)
Cr2(OH)2SO4+2	6.388e-22	2.971e-22	-21.195	-21.527	-0.332	(0)
HgSO4	1.388e-22	1.388e-22	-21.858	-21.858	0.000	(0)
VOSO4	1.250e-22	1.250e-22	-21.903	-21.903	0.000	(0)
Cr2(OH)2(SO4)2	5.863e-23	5.863e-23	-22.232	-22.232	0.000	(0)
CrO3SO4-2	4.073e-24	1.894e-24	-23.390	-23.723	-0.332	(0)
VSO4+	1.337e-37	1.104e-37	-36.874	-36.957	-0.083	(0)
U(SO4)2	0.000e+00	0.000e+00	-41.442	-41.442	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-42.531	-42.863	-0.332	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-63.992	-64.075	-0.083	(0)
Sb(3)	1.019e-20					
Sb(OH)3	5.155e-21	5.155e-21	-20.288	-20.288	0.000	(0)
HSbO2	5.034e-21	5.034e-21	-20.298	-20.298	0.000	(0)
SbO2-	1.607e-24	1.327e-24	-23.794	-23.877	-0.083	(0)
Sb(OH)4-	9.200e-25	7.598e-25	-24.036	-24.119	-0.083	(0)
Sb(OH)2F	7.021e-27	7.021e-27	-26.154	-26.154	0.000	(0)
SbOF	6.907e-27	6.907e-27	-26.161	-26.161	0.000	(0)
Sb(OH)2+	9.318e-28	7.695e-28	-27.031	-27.114	-0.083	(0)
SbO+	3.214e-28	2.654e-28	-27.493	-27.576	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.112	-324.444	-0.332	(0)
Sb(5)	1.493e-08					
SbO3-	1.492e-08	1.232e-08	-7.826	-7.909	-0.083	(0)
Sb(OH)6-	1.681e-11	1.439e-11	-10.775	-10.842	-0.067	(0)
SbO2+	1.616e-25	1.334e-25	-24.792	-24.875	-0.083	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	6.725e-40	5.553e-40	-39.172	-39.255	-0.083	(0)
MnSe	0.000e+00	0.000e+00	-41.349	-41.349	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.577	-43.577	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.711	-46.044	-0.332	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-81.884	-83.213	-1.330	(0)
Se(4)	8.597e-08					
SeO3-2	4.599e-08	2.139e-08	-7.337	-7.670	-0.332	(0)
HSeO3-	3.997e-08	3.301e-08	-7.398	-7.481	-0.083	(0)
H2SeO3	8.652e-14	8.652e-14	-13.063	-13.063	0.000	(0)
AgSeO3-	2.473e-14	2.042e-14	-13.607	-13.690	-0.083	(0)
Cd(SeO3)2-2	1.772e-18	8.239e-19	-17.752	-18.084	-0.332	(0)
Ag(SeO3)2-3	2.190e-20	3.912e-21	-19.660	-20.408	-0.748	(0)
FeHSeO3+2	6.762e-26	3.145e-26	-25.170	-25.502	-0.332	(0)
Se(6)	1.727e-10					
SeO4-2	1.724e-10	9.266e-11	-9.763	-10.033	-0.270	(0)
MnSeO4	2.999e-13	2.999e-13	-12.523	-12.523	0.000	(0)
ZnSeO4	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
NiSeO4	1.273e-15	1.273e-15	-14.895	-14.895	0.000	(0)
CoSeO4	8.340e-16	8.340e-16	-15.079	-15.079	0.000	(0)
CdSeO4	3.770e-17	3.770e-17	-16.424	-16.424	0.000	(0)
HSeO4-	3.455e-17	2.853e-17	-16.462	-16.545	-0.083	(0)
Zn(SeO4)2-2	3.128e-24	1.455e-24	-23.505	-23.837	-0.332	(0)
Si	7.916e-05					
H4SiO4	7.702e-05	7.749e-05	-4.113	-4.111	0.003	(0)
H3SiO4-	2.134e-06	1.823e-06	-5.671	-5.739	-0.068	(0)
H2SiO4-2	3.391e-11	1.872e-11	-10.470	-10.728	-0.258	(0)
UO2H3SiO4+	1.096e-12	9.048e-13	-11.960	-12.043	-0.083	(0)
SiF6-2	2.495e-30	1.364e-30	-29.603	-29.865	-0.262	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.594	-60.342	-0.748	(0)
U(4)	1.084e-19					
U(OH)5-	1.084e-19	8.953e-20	-18.965	-19.048	-0.083	(0)
U(OH)4	2.305e-23	2.305e-23	-22.637	-22.637	0.000	(0)
U(OH)3+	6.272e-28	5.180e-28	-27.203	-27.286	-0.083	(0)
U(OH)2+2	3.165e-33	1.472e-33	-32.500	-32.832	-0.332	(0)
UF3+	1.425e-37	1.177e-37	-36.846	-36.929	-0.083	(0)
UF2+2	1.125e-38	5.234e-39	-37.949	-38.281	-0.332	(0)
UOH+3	2.386e-39	4.262e-40	-38.622	-39.370	-0.748	(0)

UF4	1.830e-39	1.830e-39	-38.738	-38.738	0.000	(0)
UF+3	0.000e+00	0.000e+00	-40.785	-41.533	-0.748	(0)
UF5-	0.000e+00	0.000e+00	-40.905	-40.988	-0.083	(0)
U(SO4) 2	0.000e+00	0.000e+00	-41.442	-41.442	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-42.023	-42.356	-0.332	(0)
USO4+2	0.000e+00	0.000e+00	-42.531	-42.863	-0.332	(0)
U+4	0.000e+00	0.000e+00	-45.655	-46.985	-1.330	(0)
UC1+3	0.000e+00	0.000e+00	-47.056	-47.804	-0.748	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-169.161	-175.893	-6.733	(0)
U(5)	1.186e-16					
UO2+	1.186e-16	9.793e-17	-15.926	-16.009	-0.083	(0)
U(6)	1.415e-07					
UO2(CO3) 3-4	1.058e-07	4.949e-09	-6.976	-8.306	-1.330	(0)
UO2(CO3) 2-2	3.557e-08	1.654e-08	-7.449	-7.781	-0.332	(0)
UO2CO3	1.389e-10	1.389e-10	-9.857	-9.857	0.000	(0)
UO2OH+	1.460e-12	1.206e-12	-11.836	-11.919	-0.083	(0)
UO2H3SiO4+	1.096e-12	9.048e-13	-11.960	-12.043	-0.083	(0)
UO2F+	1.386e-13	1.145e-13	-12.858	-12.941	-0.083	(0)
UO2F2	4.682e-14	4.682e-14	-13.330	-13.330	0.000	(0)
UO2SO4	2.939e-14	2.939e-14	-13.532	-13.532	0.000	(0)
UO2+2	1.088e-14	5.846e-15	-13.964	-14.233	-0.270	(0)
UO2(SO4) 2-2	2.768e-15	1.287e-15	-14.558	-14.890	-0.332	(0)
UO2F3-	2.020e-15	1.668e-15	-14.695	-14.778	-0.083	(0)
UO2Cl+	3.473e-17	2.868e-17	-16.459	-16.542	-0.083	(0)
(UO2) 3(OH) 5+	7.167e-18	5.919e-18	-17.145	-17.228	-0.083	(0)
(UO2) 2(OH) 2+2	5.186e-18	2.412e-18	-17.285	-17.618	-0.332	(0)
UO2F4-2	4.042e-18	1.880e-18	-17.393	-17.726	-0.332	(0)
UO2NO3+	9.126e-23	7.537e-23	-22.040	-22.123	-0.083	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-44.216	-44.299	-0.083	(0)
V+2	0.000e+00	0.000e+00	-45.691	-46.023	-0.332	(0)
V(3)	2.496e-16					
V(OH) 3	2.496e-16	2.496e-16	-15.603	-15.603	0.000	(0)
V(OH) 2+	1.200e-27	9.913e-28	-26.921	-27.004	-0.083	(0)
VOH+2	1.243e-31	5.779e-32	-30.906	-31.238	-0.332	(0)
V+3	3.941e-37	7.039e-38	-36.404	-37.152	-0.748	(0)
VSO4+	1.337e-37	1.104e-37	-36.874	-36.957	-0.083	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-59.042	-59.790	-0.748	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-60.346	-61.676	-1.330	(0)
V(4)	5.459e-20					
V(OH) 3+	5.402e-20	4.461e-20	-19.267	-19.351	-0.083	(0)
VO+2	2.936e-22	1.366e-22	-21.532	-21.865	-0.332	(0)
VOF+	1.407e-22	1.162e-22	-21.852	-21.935	-0.083	(0)
VOSO4	1.250e-22	1.250e-22	-21.903	-21.903	0.000	(0)
VOF2	6.179e-24	6.179e-24	-23.209	-23.209	0.000	(0)
VOC1+	1.403e-24	1.159e-24	-23.853	-23.936	-0.083	(0)
VOF3-	3.766e-26	3.110e-26	-25.424	-25.507	-0.083	(0)
VOF4-2	3.828e-29	1.781e-29	-28.417	-28.749	-0.332	(0)
H2V2O4+2	2.147e-34	9.984e-35	-33.668	-34.001	-0.332	(0)
V(5)	4.560e-09					
H2VO4-	2.642e-09	2.182e-09	-8.578	-8.661	-0.083	(0)
HVO4-2	1.918e-09	8.920e-10	-8.717	-9.050	-0.332	(0)
H3VO4	1.340e-13	1.340e-13	-12.873	-12.873	0.000	(0)
VO4-3	4.073e-15	7.276e-16	-14.390	-15.138	-0.748	(0)
HV2O7-3	3.693e-15	6.597e-16	-14.433	-15.181	-0.748	(0)
H3V2O7-	2.288e-15	1.889e-15	-14.641	-14.724	-0.083	(0)
V2O7-4	6.177e-17	2.890e-18	-16.209	-17.539	-1.330	(0)
VO2+	1.921e-18	1.645e-18	-17.716	-17.784	-0.067	(0)
VO2F	4.092e-19	4.092e-19	-18.388	-18.388	0.000	(0)
VO2SO4-	1.580e-19	1.305e-19	-18.801	-18.884	-0.083	(0)
V3O9-3	6.096e-20	1.089e-20	-19.215	-19.963	-0.748	(0)
VO2F2-	2.552e-20	2.107e-20	-19.593	-19.676	-0.083	(0)
VO2F3-2	8.017e-23	3.728e-23	-22.096	-22.428	-0.332	(0)
V4O12-4	2.118e-25	9.908e-27	-24.674	-26.004	-1.330	(0)
VO2F4-3	1.457e-26	2.602e-27	-25.837	-26.585	-0.748	(0)
VO2NO3	5.376e-27	5.376e-27	-26.270	-26.270	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-67.558	-70.550	-2.992	(0)
HV10O28-5	0.000e+00	0.000e+00	-68.497	-70.575	-2.078	(0)

H2V10O28-4	0.000e+00	0.000e+00	-72.249	-73.579	-1.330	(0)
Zn	3.535e-06					
Zn+2	2.008e-06	1.079e-06	-5.697	-5.967	-0.270	(0)
ZnSO4	7.843e-07	7.843e-07	-6.106	-6.106	0.000	(0)
ZnCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
ZnOH+	2.140e-07	1.768e-07	-6.670	-6.753	-0.083	(0)
Zn (SO4) 2-2	4.880e-08	2.269e-08	-7.312	-7.644	-0.332	(0)
Zn (OH) 2	4.589e-08	4.589e-08	-7.338	-7.338	0.000	(0)
ZnHCO3+	3.232e-08	2.669e-08	-7.491	-7.574	-0.083	(0)
ZnOHCl	1.758e-08	1.758e-08	-7.755	-7.755	0.000	(0)
ZnCl+	9.599e-09	8.199e-09	-8.018	-8.086	-0.068	(0)
ZnF+	3.698e-09	3.054e-09	-8.432	-8.515	-0.083	(0)
Zn (OH) 3-	4.562e-10	3.768e-10	-9.341	-9.424	-0.083	(0)
ZnCl2	3.931e-11	3.931e-11	-10.405	-10.405	0.000	(0)
ZnCl3-	1.106e-13	9.446e-14	-12.956	-13.025	-0.068	(0)
Zn (OH) 4-2	5.283e-14	2.457e-14	-13.277	-13.610	-0.332	(0)
ZnNO3+	2.121e-14	1.751e-14	-13.674	-13.757	-0.083	(0)
ZnSeO4	1.549e-14	1.549e-14	-13.810	-13.810	0.000	(0)
ZnCl4-2	2.614e-16	1.429e-16	-15.583	-15.845	-0.262	(0)
Zn (NO3) 2	2.258e-23	2.258e-23	-22.646	-22.646	0.000	(0)
Zn (SeO4) 2-2	3.128e-24	1.455e-24	-23.505	-23.837	-0.332	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.280	-149.363	-0.083	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-151.565	-151.565	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-227.411	-227.494	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.930	-229.262	-0.332	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-307.830	-308.163	-0.332	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-58.29	-52.00	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-45.17	-40.66	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-52.39	-40.66	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-75.11	-57.17	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-60.19	-40.16	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-29.65	-29.24	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-25.91	-25.46	0.45	(NH4) 2SeO4
Acanthite	-52.43	-88.65	-36.22	Ag2S
Ag2CO3	-11.79	-22.88	-11.09	Ag2CO3
Ag2CrO4	-19.88	-31.47	-11.59	Ag2CrO4
Ag2HVO4	-12.29	-10.81	1.48	Ag2HVO4
Ag2MoO4	-12.38	-23.93	-11.55	Ag2MoO4
Ag2O	-13.81	-1.23	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.31	-20.13	-4.82	Ag2SO4
Ag3AsO3	-28.23	-26.07	2.16	Ag3AsO3
Ag3AsO4	-16.64	-19.42	-2.79	Ag3AsO4
Ag3H2VO5	-16.60	-11.42	5.18	Ag3H2VO5
AgF:4H2O	-13.73	-12.68	1.05	AgF:4H2O
Agmetal	0.12	-13.39	-13.51	Ag
AgVO3	-10.96	-10.19	0.77	AgVO3
Al (OH) 3 (am)	-2.25	8.55	10.80	Al (OH) 3
Al2 (MoO4) 3	-53.36	-50.99	2.37	Al2 (MoO4) 3
Al2O3	-2.55	17.10	19.65	Al2O3
Al4 (OH) 10SO4	-7.40	15.30	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.82	-9.02	4.80	AlAsO4:2H2O
AlOHSO4	-7.12	-10.35	-3.23	AlOHSO4
AlSb	-153.99	-88.37	65.62	AlSb
Alunite	-5.32	-6.72	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.43	-12.22	-7.79	PbSO4
Anhydrite	-1.37	-5.73	-4.36	CaSO4
Anilite	-55.74	-87.61	-31.88	Cu0.25Cu1.5S
Antlerite	-2.10	6.69	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-94.12	-96.88	-2.76	As4O6

Artinite	-4.30	5.30	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-41.85	-35.14	6.71	As2O5
Atacamite	-1.06	6.33	7.39	Cu2 (OH) 3Cl
Azurite	-0.80	-17.70	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.65	8.74	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.53	-1.66	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.85	7.09	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-11.82	-21.49	-9.67	BaCrO4
BaF2	-9.55	-15.37	-5.82	BaF2
BaMoO4	-6.99	-13.95	-6.96	BaMoO4
Barite	-0.18	-10.16	-9.98	BaSO4
BaS	-94.86	-78.68	16.18	BaS
BaSeO3	-8.78	-6.95	1.83	BaSeO3
BaSeO4	-10.25	-17.71	-7.46	BaSeO4
Bianchite	-6.68	-8.45	-1.76	ZnSO4:6H2O
Birnessite	-6.39	11.70	18.09	MnO2
Bixbyite	-1.50	-2.15	-0.64	Mn2O3
BlaubleiI	-55.89	-80.05	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.26	-83.54	-27.28	Cu0.6Cu0.8S
Boehmite	-0.03	8.55	8.58	AlOOH
Breithauptite	-56.74	-75.26	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.37	13.47	16.84	Mg (OH) 2
Bunsenite	-3.55	8.89	12.45	NiO
Ca (VO3) 2	-11.64	-5.98	5.66	Ca (VO3) 2
Ca2V2O7	-10.31	7.19	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.36	7.19	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.94	4.36	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-18.60	20.36	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-19.50	20.36	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-297.32	-154.34	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-9.05	-26.96	-17.91	Hg2Cl2
CaMoO4	-1.58	-9.53	-7.95	CaMoO4
Carnotite	-2.18	-1.95	0.23	KUO2VO4
CaSeO3:2H2O	-5.34	-2.53	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.27	-13.29	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-11.38	-1.54	9.84	Cd (BO2) 2
Cd (OH) 2	-5.88	7.76	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-5.97	7.76	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-21.23	-14.52	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-18.17	4.39	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-16.25	12.15	28.40	Cd4 (OH) 6SO4
CdCl2	-13.04	-13.70	-0.66	CdCl2
CdCl2:1H2O	-12.01	-13.70	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.79	-13.70	-1.91	CdCl2:2.5H2O
CdF2	-15.14	-16.36	-1.21	CdF2
Cdmetal (alpha)	-31.30	-17.78	13.51	Cd
Cdmetal (gamma)	-31.40	-17.78	13.62	Cd
CdMoO4	-0.79	-14.94	-14.15	CdMoO4
CdOHCl	-6.51	-2.97	3.54	CdOHCl
CdSb	-76.04	-76.39	-0.35	CdSb
CdSe	-19.50	-39.70	-20.20	CdSe
CdSeO4:2H2O	-16.84	-18.69	-1.85	CdSeO4:2H2O
CdSO4	-10.97	-11.14	-0.17	CdSO4
CdSO4:1H2O	-9.41	-11.14	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.27	-11.14	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.60	-11.35	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.73	-10.37	-2.64	CuSO4:5H2O
Chalcedony	-0.56	-4.11	-3.55	SiO2
Chalcocite	-55.60	-90.52	-34.92	Cu2S
Chalcopyrite	-127.59	-162.86	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-53.29	-98.99	-45.69	HgS

Claudetite	-93.81	-96.88	-3.06	As4O6
Clausthalite	-13.68	-40.78	-27.10	PbSe
Co (BO2) 2	-27.70	-0.63	27.07	Co (BO2) 2
Co (OH) 2	-4.42	8.68	13.09	Co (OH) 2
Co (OH) 3	-8.64	-10.95	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-22.15	-9.11	13.03	Co3 (AsO4) 2
Co3O4	-2.73	-13.22	-10.50	Co3O4
CoCl2	-21.05	-12.78	8.27	CoCl2
CoCl2:6H2O	-15.32	-12.79	2.54	CoCl2:6H2O
CoCO3	-2.99	-12.97	-9.98	CoCO3
CoF2	-13.85	-15.44	-1.60	CoF2
CoF3	-45.67	-47.13	-1.46	CoF3
CoFe2O4	18.59	15.06	-3.53	CoFe2O4
CoMoO4	-6.26	-14.02	-7.76	CoMoO4
CoO	-4.91	8.68	13.59	CoO
CoS (alpha)	-71.30	-78.74	-7.44	CoS
CoS (beta)	-67.67	-78.74	-11.07	CoS
CoSe	-22.59	-38.79	-16.20	CoSe
CoSeO3	-8.34	-7.02	1.32	CoSeO3
CoSeO4:6H2O	-16.25	-17.78	-1.53	CoSeO4:6H2O
CoSO4	-13.03	-10.22	2.80	CoSO4
CoSO4:6H2O	-7.75	-10.23	-2.47	CoSO4:6H2O
Cotunnite	-10.00	-14.78	-4.78	PbCl2
Covellite	-56.59	-78.89	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.56	-32.47	14.09	CrCl2
CrCl3	-48.49	-33.37	15.11	CrCl3
CrF3	-26.02	-37.36	-11.34	CrF3
Cristobalite	-0.76	-4.11	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-11.68	-45.52	-33.84	Na3AlF6
Cu (OH) 2	-0.14	8.53	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.17	19.05	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.59	0.66	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.06	-89.94	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.77	-50.57	-45.80	Cu2Se
Cu2SO4	-20.05	-22.00	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.65	-9.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.98	-101.58	-42.59	Cu3Sb
Cu3Se2	-26.01	-89.51	-63.49	Cu3Se2
CuCO3	-1.62	-13.12	-11.50	CuCO3
CuCrO4	-16.27	-21.71	-5.44	CuCrO4
CuF	-8.71	-13.61	-4.91	CuF
CuF2	-16.70	-15.59	1.12	CuF2
CuF2:2H2O	-11.04	-15.59	-4.55	CuF2:2H2O
Cumetal	-5.57	-14.32	-8.76	Cu
CuMoO4	-1.09	-14.17	-13.08	CuMoO4
CuOCuSO4	-12.14	-1.84	10.30	CuOCuSO4
Cupricferrite	8.93	14.91	5.99	CuFe2O4
Cuprite	-1.70	-3.10	-1.41	Cu2O
Cuprousferrite	10.56	1.64	-8.92	CuFeO2
CuSe	-5.84	-38.94	-33.10	CuSe
CuSe2	-27.49	-60.86	-33.37	CuSe2
CuSeO3:2H2O	-7.67	-7.16	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.49	-17.93	-2.44	CuSeO4:5H2O
CuSO4	-13.31	-10.37	2.94	CuSO4
Diaspore	1.68	8.55	6.87	AlOOH
Djurleite	-55.84	-89.76	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.11	-16.65	-16.54	CaMg (CO3) 2
Dolomite(ordered)	0.44	-16.65	-17.09	CaMg (CO3) 2
Epsomite	-3.30	-5.43	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.01	-0.03	-3.04	Fe (OH) 2.7Cl.3

Fe(VO3)2	-11.97	-15.69	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.86	-9.31	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-20.07	-40.70	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-46.59	-50.32	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.78	-14.38	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-9.16	-19.25	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-47.34	-65.94	-18.60	FeSe2
FeS(ppt)	-81.02	-83.97	-2.95	FeS
FeSe	-33.02	-44.02	-11.00	FeSe
Fix_pe	-4.56	-4.56	0.00	e-
Fluorite	-0.45	-10.95	-10.50	CaF2
Galena	-66.76	-80.73	-13.97	PbS
Gibbsite	0.26	8.55	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.44	-8.45	-2.01	ZnSO4:7H2O
Greenalite	-18.68	2.13	20.81	Fe3Si2O5(OH)4
Greenockite	-65.30	-79.66	-14.36	CdS
Greigite	-294.81	-339.85	-45.03	Fe3S4
Gummite	-5.48	2.19	7.67	UO3
Gypsum	-1.12	-5.73	-4.61	CaSO4:2H2O
H-Jarosite	-16.13	-28.23	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.82	-22.70	-12.88	H2MoO4
H2S(g)	-79.41	-87.42	-8.01	H2S
H2Se(g)	-42.51	-47.47	-4.96	H2Se
Halite	-6.24	-4.64	1.60	NaCl
Halloysite	-0.69	8.88	9.57	Al2Si2O5(OH)4
Hausmannite	-0.98	60.05	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-2.34	20.55	22.89	FeAl2O4
Hg(CH3)2(g)	-185.51	-259.22	-73.71	Hg(CH3)2
Hg(g)	-7.65	-15.52	-7.87	Hg
Hg(OH)2	-8.07	-11.57	-3.50	Hg(OH)2
Hg2(g)	-16.09	-31.04	-14.96	Hg2
Hg2(OH)2	-10.76	-5.50	5.26	Hg2(OH)2
Hg2CO3	-11.09	-27.14	-16.05	Hg2CO3
Hg2CrO4	-27.03	-35.73	-8.70	Hg2CrO4
Hg2F2	-19.25	-29.62	-10.36	Hg2F2
Hg2S	-81.24	-92.92	-11.68	Hg2S
Hg2SeO3	-16.53	-21.19	-4.66	Hg2SeO3
Hg2SO4	-18.27	-24.40	-6.13	Hg2SO4
Hg3O2CO3	-26.67	-56.35	-29.68	Hg3O2CO3
HgCl(g)	-32.98	-13.48	19.50	HgCl
HgCl2	-11.77	-33.03	-21.26	HgCl2
HgF(g)	-47.48	-14.81	32.68	HgF
HgF2(g)	-48.25	-35.69	12.57	HgF2
Hgmetal(l)	-2.07	-15.52	-13.45	Hg
HgSe	-3.34	-59.03	-55.69	HgSe
HgSeO3	-14.83	-27.26	-12.43	HgSeO3
HgSO4	-21.05	-30.47	-9.42	HgSO4
Huntite	-3.03	-33.00	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.47	-23.24	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.45	-19.22	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-18.65	-23.82	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-8.00	-22.80	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.37	-49.61	-17.24	K2Cr2O7
K2CrO4	-18.86	-19.37	-0.51	K2CrO4
K2MoO4	-15.10	-11.83	3.26	K2MoO4
K2SeO4	-14.86	-15.59	-0.73	K2SeO4
Kaolinite	1.45	8.88	7.43	Al2Si2O5(OH)4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.09	-5.53	-0.43	PbO:PbSO4
Laurionite	-4.67	-4.04	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.01	6.69	12.69	PbO

Mackinawite	-80.37	-83.97	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.00	19.86	16.86	Fe2MgO4
Magnesite	-0.71	-8.17	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.72	-4.59	-5.31	Cu2(OH)2CO3
Manganite	-1.06	24.28	25.34	MnOOH
Massicot	-6.21	6.69	12.89	PbO
Matlockite	-7.13	-16.10	-8.97	PbClF
Melanothallite	-19.19	-12.93	6.26	CuCl2
Melanterite	-13.24	-15.45	-2.21	FeSO4·7H2O
Metacinnabar	-53.89	-98.99	-45.09	HgS
Mg(OH)2(active)	-5.32	13.47	18.79	Mg(OH)2
Mg(VO3)2	-16.95	-5.67	11.28	Mg(VO3)2
Mg2Sb3	-274.64	-199.96	74.68	Mg2Sb3
Mg2V2O7	-18.56	7.80	26.36	Mg2V2O7
MgCr2O4	-5.08	11.12	16.20	MgCr2O4
MgCrO4	-22.14	-16.76	5.38	MgCrO4
MgF2	-2.52	-10.65	-8.13	MgF2
MgMoO4	-7.38	-9.23	-1.85	MgMoO4
MgSeO3·6H2O	-5.28	-2.22	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.78	-12.98	-1.20	MgSeO4·6H2O
Minium	-27.92	45.60	73.52	Pb3O4
Mirabilite	-5.60	-6.71	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.54	-7.64	4.90	Mn(VO3)2
Mn2(SO4)3	-53.14	-58.85	-5.71	Mn2(SO4)3
Mn2Sb	-147.77	-86.69	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-13.14	-0.64	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.67	-9.96	2.72	MnCl2·4H2O
MnS(grn)	-76.09	-75.92	0.17	MnS
MnS(pnk)	-79.26	-75.92	3.34	MnS
MnSb	-95.09	-98.00	-2.91	MnSb
MnSe	-39.46	-35.96	3.50	MnSe
MnSeO3	-5.32	-4.19	1.13	MnSeO3
MnSeO3·2H2O	-5.17	-4.19	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.90	-14.95	-2.05	MnSeO4·5H2O
MnSO4	-9.98	-7.40	2.58	MnSO4
Monteponite	-7.34	7.76	15.10	CdO
Montroydite	-7.93	-11.57	-3.64	HgO
MoO3	-14.70	-22.70	-8.00	MoO3
Morenosite	-7.87	-10.01	-2.14	NiSO4·7H2O
MoS2	-152.82	-223.08	-70.26	MoS2
Na-Jarosite	-10.93	-22.13	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.39	-48.29	-9.90	Na2Cr2O7
Na2CrO4	-20.98	-18.05	2.93	Na2CrO4
Na2Mo2O7	-16.61	-33.21	-16.60	Na2Mo2O7
Na2MoO4	-12.00	-10.51	1.49	Na2MoO4
Na2MoO4·2H2O	-11.73	-10.51	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-13.80	-3.50	10.30	Na2SeO3·5H2O
Na2SeO4	-15.55	-14.27	1.28	Na2SeO4
Na3Sb	-173.09	-78.64	94.45	Na3Sb
Na3VO4	-27.97	8.71	36.68	Na3VO4
Na4V2O7	-32.17	5.23	37.40	Na4V2O7
Nantokite	-5.55	-12.28	-6.73	CuCl
NaSb	-88.45	-65.28	23.17	NaSb
Natron	-8.15	-9.46	-1.31	Na2CO3·10H2O
NaVO3	-7.34	-3.48	3.86	NaVO3
Nesquehonite	-3.50	-8.17	-4.67	MgCO3·3H2O
Ni(OH)2	-3.90	8.89	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-24.17	-8.47	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-15.34	16.66	32.00	Ni4(OH)6SO4
NiCO3	-5.89	-12.76	-6.87	NiCO3
NiMoO4	-2.67	-13.81	-11.14	NiMoO4
NiS(alpha)	-72.93	-78.53	-5.60	NiS
NiS(beta)	-67.43	-78.53	-11.10	NiS
NiS(gamma)	-65.73	-78.53	-12.80	NiS
NiSe	-20.88	-38.58	-17.70	NiSe
NiSeO3·2H2O	-9.62	-6.80	2.81	NiSeO3·2H2O

NiSeO4:6H2O	-16.05	-17.57	-1.52	NiSeO4:6H2O
Nsutite	-5.81	11.70	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-249.63	-310.70	-61.07	As2S3
Otavite	-1.88	-13.88	-12.00	CdCO3
Pb(BO2)2	-9.14	-2.62	6.52	Pb(BO2)2
Pb(OH)2	-1.46	6.69	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-54.26	-63.02	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-6.15	2.64	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-12.82	13.37	26.19	Pb2O(OH)2
Pb2O3	-22.12	38.92	61.04	Pb2O3
Pb2OCO3	-7.72	-8.27	-0.56	Pb2OCO3
Pb2V2O7	-3.87	-5.77	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.89	-15.09	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.23	0.91	6.14	Pb3(VO4)2
Pb3O2CO3	-12.61	-1.59	11.02	Pb3O2CO3
Pb3O2SO4	-9.53	1.16	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.26	7.84	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.03	7.84	21.88	Pb4O3SO4
PbCrO4	-10.95	-23.55	-12.60	PbCrO4
PbF2	-9.99	-17.43	-7.44	PbF2
Pbmetal	-23.10	-18.86	4.25	Pb
PbMoO4	-0.39	-16.01	-15.62	PbMoO4
PbO:0.3H2O	-6.29	6.69	12.98	PbO:0.33H2O
PbSeO4	-12.93	-19.77	-6.84	PbSeO4
Periclase	-8.11	13.47	21.58	MgO
Phosgenite	-9.93	-29.74	-19.81	PbCl2:PbCO3
Plattnerite	-17.37	32.23	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-127.34	-145.84	-18.51	FeS2
Pyrochroite	-3.69	11.50	15.19	Mn(OH)2
Pyrolusite	-4.33	37.05	41.38	MnO2
Quartz	-0.11	-4.11	-4.00	SiO2
Realgar	-104.66	-124.41	-19.75	AsS
Retgersite	-7.97	-10.01	-2.04	NiSO4:6H2O
Rhodochrosite	0.44	-10.14	-10.58	MnCO3
Rutherfordine	-4.96	-19.46	-14.50	UO2CO3
Sb(OH)3	-13.18	-20.29	-7.11	Sb(OH)3
Sb2O4	-18.43	-15.03	3.40	Sb2O4
Sb2O5	-28.44	-38.11	-9.67	Sb2O5
Sb2Se3	-115.22	-182.98	-67.76	Sb2Se3
Sb4O6(cubic)	-62.89	-81.15	-18.26	Sb4O6
Sb4O6(orth)	-63.25	-81.15	-17.90	Sb4O6
SbCl3	-53.05	-52.48	0.57	SbCl3
SbF3	-46.24	-56.47	-10.23	SbF3
Sbmetal	-46.92	-58.60	-11.69	Sb
SbO2	-4.00	-31.83	-27.82	SbO2
Schoepite	-3.80	2.19	5.99	UO2(OH)2:H2O
Semetal(am)	-14.81	-21.92	-7.11	Se
Semetal(hex)	-14.21	-21.92	-7.71	Se
Senarmontite	-28.21	-40.57	-12.37	Sb2O3
SeO2	-15.82	-15.69	0.12	SeO2
SeO3	-47.50	-26.46	21.04	SeO3
Sepiolite	-1.14	14.62	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.16	14.62	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-1.40	-4.11	-2.71	SiO2
SiO2(am-ppt)	-1.37	-4.11	-2.74	SiO2
Smithsonite	-1.19	-11.19	-10.00	ZnCO3
Sphalerite	-65.51	-76.96	-11.45	ZnS
Spinel	-6.27	30.58	36.85	MgAl2O4
Stibnite	-252.38	-302.84	-50.46	Sb2S3
Sulfur	-59.73	-61.88	-2.14	S
Tenorite	0.89	8.53	7.64	CuO
Thenardite	-7.03	-6.71	0.32	Na2SO4
Thermonatrite	-10.09	-9.46	0.64	Na2CO3:H2O
Tyuyamunite	-5.68	-1.60	4.08	Ca(UO2)2(VO4)2
U3O8	-12.41	8.67	21.08	U3O8

U3Sb4	-582.49	-430.10	152.38	U3Sb4
U4O9	-27.99	-31.01	-3.02	U4O9
UF4	-32.84	-62.38	-29.54	UF4
UF4:2.5H2O	-29.66	-62.38	-32.72	UF4:2.5H2O
UO2 (am)	-15.07	-14.14	0.93	UO2
UO2 (NO3) 2	-42.76	-30.61	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.46	-30.61	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-34.00	-30.61	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.66	-30.61	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.42	2.19	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.02	-24.27	-2.25	UO2SeO4:4H2O
UO3	-5.51	2.19	7.70	UO3
Uraninite	-9.47	-14.14	-4.67	UO2
USb2	-221.23	-191.65	29.58	USb2
V (OH) 3	-20.11	-12.52	7.59	V (OH) 3
V2O5	-17.78	-19.14	-1.36	V2O5
V3O5	-43.71	-41.87	1.84	V3O5
V4O7	-54.50	-47.31	7.19	V4O7
V6O13	-47.66	-108.52	-60.86	V6O13
Valentinite	-32.09	-40.57	-8.48	Sb2O3
VC12	-65.63	-46.75	18.87	VC12
VC13	-68.14	-44.71	23.43	VC13
VF4	-68.61	-53.68	14.93	VF4
Vmetal	-94.86	-50.84	44.03	V
VO	-40.05	-25.29	14.76	VO
VO (OH) 2	-10.59	-5.44	5.15	VO (OH) 2
VO2Cl	-23.14	-20.30	2.84	VO2Cl
VOC1	-34.40	-23.25	11.15	VOC1
VOC12	-39.66	-26.90	12.76	VOC12
VOSO4	-27.95	-24.34	3.61	VOSO4
Witherite	-4.33	-12.90	-8.57	BaCO3
Wurtzite	-68.01	-76.96	-8.95	ZnS
Zincite	-0.88	10.46	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO4
Zn (BO2) 2	-7.14	1.15	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-25.66	-22.35	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.74	10.46	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.02	10.46	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.30	10.46	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.08	10.46	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.28	10.46	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-5.49	2.01	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-5.01	10.18	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.43	-3.78	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-25.35	-6.44	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-5.48	22.92	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-7.68	30.82	38.50	Zn5 (OH) 8Cl2
ZnCl2	-18.06	-11.01	7.05	ZnCl2
ZnCO3:1H2O	-0.93	-11.19	-10.26	ZnCO3:1H2O
ZnF2	-13.13	-13.66	-0.53	ZnF2
Znmetal	-40.88	-15.09	25.79	Zn
ZnMoO4	-2.12	-12.24	-10.13	ZnMoO4
ZnO (active)	-0.73	10.46	11.19	ZnO
ZnS (am)	-67.91	-76.96	-9.05	ZnS
ZnSb	-84.71	-73.69	11.01	ZnSb
ZnSe	-22.61	-37.01	-14.40	ZnSe
ZnSeO4:6H2O	-14.48	-16.00	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.81	-8.45	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 116.

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-----
Title Stage 7 pit lake GW inflow
Title Stage 7 Groundwater mix
MIX 701
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.251123
11     2.037716
12     1.552630
13     3.651462
14     0
15     0
Save solution 701
end

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TITLE
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Stage 7 Groundwater mix

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Beginning of batch-reaction calculations.
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Reaction step 1.

Using mix 701.

Mixture 701.

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1.000e+00 Solution 2      JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.511e-01 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
2.038e+00 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.553e+00 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.651e+00 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

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-----Solution composition-----

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Elements	Molality	Moles
Ag	9.832e-09	8.350e-08
Al	5.507e-07	4.677e-06
As	4.805e-09	4.081e-08
B	1.887e-06	1.602e-05
Ba	1.761e-07	1.495e-06
C	1.460e-03	1.240e-02
Ca	6.550e-04	5.563e-03
Cd	1.392e-09	1.182e-08
Cl	2.028e-04	1.722e-03
Co	1.600e-08	1.359e-07
Cr	1.496e-08	1.270e-07
Cu	1.154e-06	9.800e-06
F	5.112e-05	4.342e-04
Fe	3.146e-06	2.672e-05
Hg	2.648e-11	2.249e-10
K	8.612e-05	7.314e-04
Mg	2.070e-04	1.758e-03
Mn	2.830e-06	2.404e-05
Mo	6.640e-08	5.640e-07
Na	5.883e-04	4.996e-03
Ni	2.510e-08	2.131e-07
Pb	3.118e-09	2.648e-08
S	4.303e-04	3.655e-03
Sb	1.561e-09	1.325e-08
Se	5.633e-09	4.784e-08
U	1.008e-08	8.559e-08
V	1.378e-08	1.170e-07
Zn	1.377e-07	1.169e-06

-----Description of solution-----

	pH	=	7.205	Charge balance
	pe	=	4.782	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	3.508e-03	
	Mass of water (kg)	=	8.493e+00	
	Total alkalinity (eq/kg)	=	1.297e-03	
	Total CO2 (mol/kg)	=	1.460e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.277e-17	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	13	
	Total H	=	9.428453e+02	
	Total O	=	4.714676e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.724e-07	1.616e-07	-6.763	-6.792	-0.028	(0)
H+	6.647e-08	6.232e-08	-7.177	-7.205	-0.028	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	9.832e-09					
Ag+	6.828e-09	6.402e-09	-8.166	-8.194	-0.028	(0)
AgCl	2.485e-09	2.485e-09	-8.605	-8.605	0.000	(0)
Ag2Se	2.162e-10	2.162e-10	-9.665	-9.665	0.000	(0)
AgCl2-	4.411e-11	4.115e-11	-10.355	-10.386	-0.030	(0)
AgSO4-	4.110e-11	3.834e-11	-10.386	-10.416	-0.030	(0)
AgF	7.536e-13	7.536e-13	-12.123	-12.123	0.000	(0)
AgOH	1.034e-13	1.034e-13	-12.985	-12.985	0.000	(0)
AgCl3-2	9.208e-15	6.972e-15	-14.036	-14.157	-0.121	(0)
AgH2BO3	1.767e-15	1.767e-15	-14.753	-14.753	0.000	(0)
AgSeO3-	1.320e-15	1.231e-15	-14.879	-14.910	-0.030	(0)

	AgCl4-3	5.061e-18	2.706e-18	-17.296	-17.568	-0.272	(0)
	Ag (OH) 2-	1.751e-18	1.633e-18	-17.757	-17.787	-0.030	(0)
	Ag (SeO3) 2-3	6.169e-24	3.299e-24	-23.210	-23.482	-0.272	(0)
	Ag2MoO4	7.953e-25	7.953e-25	-24.099	-24.099	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-67.347	-67.347	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.391	-77.875	-0.483	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-136.185	-136.215	-0.030	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-136.399	-136.493	-0.094	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.727	-0.190	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.038	-0.185	(0)
Al	5.507e-07						
	Al (OH) 4-	5.138e-07	4.819e-07	-6.289	-6.317	-0.028	(0)
	Al (OH) 3	2.369e-08	2.369e-08	-7.625	-7.625	0.000	(0)
	Al (OH) 2+	7.827e-09	7.350e-09	-8.106	-8.134	-0.027	(0)
	AlF2+	3.300e-09	3.099e-09	-8.482	-8.509	-0.027	(0)
	AlF3	1.828e-09	1.828e-09	-8.738	-8.738	0.000	(0)
	AlF+2	2.136e-10	1.661e-10	-9.670	-9.780	-0.109	(0)
	AlOH+2	7.366e-11	5.727e-11	-10.133	-10.242	-0.109	(0)
	AlF4-	4.577e-11	4.293e-11	-10.339	-10.367	-0.028	(0)
	AlSO4+	8.802e-13	8.257e-13	-12.055	-12.083	-0.028	(0)
	Al+3	6.330e-13	3.544e-13	-12.199	-12.450	-0.252	(0)
	Al (SO4) 2-	2.831e-15	2.655e-15	-14.548	-14.576	-0.028	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-44.159	-44.431	-0.272	(0)
As (3)	1.295e-19						
	H3AsO3	1.284e-19	1.284e-19	-18.892	-18.892	0.000	(0)
	H2AsO3-	1.132e-21	1.056e-21	-20.946	-20.976	-0.030	(0)
	HAsO3-2	2.042e-26	1.546e-26	-25.690	-25.811	-0.121	(0)
	H4AsO3+	4.248e-27	3.963e-27	-26.372	-26.402	-0.030	(0)
	AsO3-3	1.788e-32	9.563e-33	-31.748	-32.019	-0.272	(0)
As (5)	4.805e-09						
	HAsO4-2	3.288e-09	2.489e-09	-8.483	-8.604	-0.121	(0)
	H2AsO4-	1.517e-09	1.415e-09	-8.819	-8.849	-0.030	(0)
	AsO4-3	2.362e-13	1.263e-13	-12.627	-12.899	-0.272	(0)
	H3AsO4	1.531e-14	1.532e-14	-13.815	-13.815	0.000	(0)
B	1.887e-06						
	H3BO3	1.867e-06	1.869e-06	-5.729	-5.728	0.000	(0)
	H2BO3-	1.861e-08	1.742e-08	-7.730	-7.759	-0.029	(0)
	CaH2BO3+	5.053e-10	4.728e-10	-9.296	-9.325	-0.029	(0)
	MgH2BO3+	9.763e-11	9.137e-11	-10.010	-10.039	-0.029	(0)
	BF (OH) 3-	3.734e-11	3.495e-11	-10.428	-10.457	-0.029	(0)
	NaH2BO3	1.519e-11	1.519e-11	-10.818	-10.818	0.000	(0)
	BaH2BO3+	7.751e-14	7.253e-14	-13.111	-13.139	-0.029	(0)
	H5 (BO3) 2-	2.961e-14	2.771e-14	-13.529	-13.557	-0.029	(0)
	BF2 (OH) 2-	1.166e-14	1.091e-14	-13.933	-13.962	-0.029	(0)
	AgH2BO3	1.767e-15	1.767e-15	-14.753	-14.753	0.000	(0)
	H8 (BO3) 3-	5.534e-18	5.178e-18	-17.257	-17.286	-0.029	(0)
	BF3OH-	1.325e-20	1.240e-20	-19.878	-19.907	-0.029	(0)
	BF4-	1.904e-25	1.781e-25	-24.720	-24.749	-0.029	(0)
Ba	1.761e-07						
	Ba+2	1.744e-07	1.348e-07	-6.759	-6.870	-0.112	(0)
	BaHCO3+	1.640e-09	1.541e-09	-8.785	-8.812	-0.027	(0)
	BaCO3	6.226e-11	6.226e-11	-10.206	-10.206	0.000	(0)
	BaOH+	1.013e-13	9.504e-14	-12.995	-13.022	-0.028	(0)
	BaH2BO3+	7.751e-14	7.253e-14	-13.111	-13.139	-0.029	(0)
C (4)	1.460e-03						
	HCO3-	1.275e-03	1.197e-03	-2.894	-2.922	-0.027	(0)
	H2CO3	1.678e-04	1.678e-04	-3.775	-3.775	0.000	(0)
	CaHCO3+	1.120e-05	1.052e-05	-4.951	-4.978	-0.027	(0)
	MgHCO3+	1.977e-06	1.854e-06	-5.704	-5.732	-0.028	(0)
	CO3-2	1.166e-06	9.009e-07	-5.933	-6.045	-0.112	(0)
	CuCO3	8.335e-07	8.335e-07	-6.079	-6.079	0.000	(0)
	CaCO3	6.736e-07	6.736e-07	-6.172	-6.172	0.000	(0)
	NaHCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
	MgCO3	1.134e-07	1.134e-07	-6.946	-6.946	0.000	(0)
	MnHCO3+	5.138e-08	4.823e-08	-7.289	-7.317	-0.028	(0)
	CuHCO3+	1.273e-08	1.187e-08	-7.895	-7.925	-0.030	(0)
	NaCO3-	9.832e-09	9.232e-09	-8.007	-8.035	-0.027	(0)
	UO2 (CO3) 2-2	8.790e-09	6.655e-09	-8.056	-8.177	-0.121	(0)

	ZnCO3	4.850e-09	4.850e-09	-8.314	-8.314	0.000	(0)
	ZnHCO3+	3.798e-09	3.543e-09	-8.420	-8.451	-0.030	(0)
	Cu (CO3) 2-2	2.669e-09	2.021e-09	-8.574	-8.694	-0.121	(0)
	NiHCO3+	2.563e-09	2.391e-09	-8.591	-8.621	-0.030	(0)
	BaHCO3+	1.640e-09	1.541e-09	-8.785	-8.812	-0.027	(0)
	PbCO3	1.518e-09	1.518e-09	-8.819	-8.819	0.000	(0)
	FeHCO3+	1.069e-09	1.005e-09	-8.971	-8.998	-0.027	(0)
	CoHCO3+	1.064e-09	9.923e-10	-8.973	-9.003	-0.030	(0)
	UO2 (CO3) 3-4	9.144e-10	3.005e-10	-9.039	-9.522	-0.483	(0)
	NiCO3	5.443e-10	5.443e-10	-9.264	-9.264	0.000	(0)
	PbHCO3+	5.348e-10	4.989e-10	-9.272	-9.302	-0.030	(0)
	UO2CO3	3.702e-10	3.702e-10	-9.432	-9.432	0.000	(0)
	CoCO3	1.622e-10	1.622e-10	-9.790	-9.790	0.000	(0)
	BaCO3	6.226e-11	6.226e-11	-10.206	-10.206	0.000	(0)
	CdCO3	2.027e-11	2.027e-11	-10.693	-10.693	0.000	(0)
	Pb (CO3) 2-2	5.211e-12	3.945e-12	-11.283	-11.404	-0.121	(0)
	CdHCO3+	2.885e-12	2.691e-12	-11.540	-11.570	-0.030	(0)
	Cd (CO3) 2-2	1.788e-14	1.353e-14	-13.748	-13.869	-0.121	(0)
	HgCO3	1.134e-17	1.134e-17	-16.946	-16.946	0.000	(0)
	Hg (CO3) 2-2	4.265e-20	3.229e-20	-19.370	-19.491	-0.121	(0)
	HgHCO3+	1.410e-20	1.315e-20	-19.851	-19.881	-0.030	(0)
Ca	6.550e-04						
	Ca+2	6.105e-04	4.718e-04	-3.214	-3.326	-0.112	(0)
	CaSO4	3.244e-05	3.244e-05	-4.489	-4.489	0.000	(0)
	CaHCO3+	1.120e-05	1.052e-05	-4.951	-4.978	-0.027	(0)
	CaCO3	6.736e-07	6.736e-07	-6.172	-6.172	0.000	(0)
	CaF+	2.571e-07	2.413e-07	-6.590	-6.617	-0.028	(0)
	CaOH+	1.619e-09	1.521e-09	-8.791	-8.818	-0.027	(0)
	CaH2BO3+	5.053e-10	4.728e-10	-9.296	-9.325	-0.029	(0)
Cd	1.392e-09						
	Cd+2	1.277e-09	9.870e-10	-8.894	-9.006	-0.112	(0)
	CdSO4	6.944e-11	6.944e-11	-10.158	-10.158	0.000	(0)
	CdCO3	2.027e-11	2.027e-11	-10.693	-10.693	0.000	(0)
	CdCl+	1.921e-11	1.792e-11	-10.716	-10.747	-0.030	(0)
	CdHCO3+	2.885e-12	2.691e-12	-11.540	-11.570	-0.030	(0)
	CdOH+	1.358e-12	1.267e-12	-11.867	-11.897	-0.030	(0)
	CdF+	7.858e-13	7.330e-13	-12.105	-12.135	-0.030	(0)
	Cd (SO4) 2-2	3.713e-13	2.811e-13	-12.430	-12.551	-0.121	(0)
	CdOHCl	1.188e-13	1.188e-13	-12.925	-12.925	0.000	(0)
	Cd (CO3) 2-2	1.788e-14	1.353e-14	-13.748	-13.869	-0.121	(0)
	CdCl2	1.420e-14	1.420e-14	-13.848	-13.848	0.000	(0)
	Cd (OH) 2	1.291e-15	1.291e-15	-14.889	-14.889	0.000	(0)
	CdF2	6.854e-17	6.854e-17	-16.164	-16.164	0.000	(0)
	CdCl3-	1.826e-18	1.703e-18	-17.738	-17.769	-0.030	(0)
	Cd (OH) 3-	1.366e-20	1.275e-20	-19.864	-19.895	-0.030	(0)
	Cd2OH+3	1.172e-20	6.266e-21	-19.931	-20.203	-0.272	(0)
	CdSeO4	6.416e-21	6.416e-21	-20.193	-20.193	0.000	(0)
	Cd (SeO3) 2-2	9.620e-23	7.283e-23	-22.017	-22.138	-0.121	(0)
	Cd (OH) 4-2	4.452e-28	3.371e-28	-27.351	-27.472	-0.121	(0)
	CdHS+	0.000e+00	0.000e+00	-73.935	-73.965	-0.030	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-139.729	-139.729	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-210.767	-210.797	-0.030	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-281.448	-281.569	-0.121	(0)
Cl	2.028e-04						
	Cl-	2.028e-04	1.901e-04	-3.693	-3.721	-0.028	(0)
	AgCl	2.485e-09	2.485e-09	-8.605	-8.605	0.000	(0)
	MnCl+	5.147e-10	4.831e-10	-9.288	-9.316	-0.028	(0)
	CuCl	3.042e-10	3.042e-10	-9.517	-9.517	0.000	(0)
	CuCl+	5.050e-11	4.734e-11	-10.297	-10.325	-0.028	(0)
	ZnCl+	4.766e-11	4.468e-11	-10.322	-10.350	-0.028	(0)
	AgCl2-	4.411e-11	4.115e-11	-10.355	-10.386	-0.030	(0)
	CdCl+	1.921e-11	1.792e-11	-10.716	-10.747	-0.030	(0)
	CuCl2-	1.289e-11	1.208e-11	-10.890	-10.918	-0.028	(0)
	ZnOHCl	9.450e-12	9.450e-12	-11.025	-11.025	0.000	(0)
	NiCl+	8.445e-12	7.877e-12	-11.073	-11.104	-0.030	(0)
	CoCl+	7.511e-12	7.006e-12	-11.124	-11.155	-0.030	(0)
	PbCl+	4.055e-12	3.782e-12	-11.392	-11.422	-0.030	(0)
	MnCl2	1.297e-13	1.297e-13	-12.887	-12.887	0.000	(0)

CdOHC1	1.188e-13	1.188e-13	-12.925	-12.925	0.000	(0)
CdCl2	1.420e-14	1.420e-14	-13.848	-13.848	0.000	(0)
ZnCl2	1.346e-14	1.346e-14	-13.871	-13.871	0.000	(0)
AgCl3-2	9.208e-15	6.972e-15	-14.036	-14.157	-0.121	(0)
PbCl2	3.212e-15	3.212e-15	-14.493	-14.493	0.000	(0)
CuCl2	3.121e-15	3.121e-15	-14.506	-14.506	0.000	(0)
CuCl3-2	6.329e-16	4.911e-16	-15.199	-15.309	-0.110	(0)
HgClOH	5.704e-16	5.704e-16	-15.244	-15.244	0.000	(0)
CrCl+2	5.807e-17	4.396e-17	-16.236	-16.357	-0.121	(0)
HgCl2	3.800e-17	3.800e-17	-16.420	-16.420	0.000	(0)
UO2Cl+	3.412e-17	3.183e-17	-16.467	-16.497	-0.030	(0)
NiCl2	7.540e-18	7.540e-18	-17.123	-17.123	0.000	(0)
MnCl3-	7.237e-18	6.793e-18	-17.140	-17.168	-0.028	(0)
AgCl4-3	5.061e-18	2.706e-18	-17.296	-17.568	-0.272	(0)
FeCl+2	2.773e-18	2.152e-18	-17.557	-17.667	-0.110	(0)
ZnCl3-	2.168e-18	2.033e-18	-17.664	-17.692	-0.028	(0)
CdCl3-	1.826e-18	1.703e-18	-17.738	-17.769	-0.030	(0)
PbCl3-	2.606e-19	2.431e-19	-18.584	-18.614	-0.030	(0)
HgCl3-	7.745e-20	7.224e-20	-19.111	-19.141	-0.030	(0)
HgCl+	4.276e-20	3.988e-20	-19.369	-19.399	-0.030	(0)
CrOHC12	2.567e-20	2.567e-20	-19.591	-19.591	0.000	(0)
CuCl3-	5.906e-21	5.537e-21	-20.229	-20.257	-0.028	(0)
VOCl+	2.781e-21	2.594e-21	-20.556	-20.586	-0.030	(0)
FeCl2+	1.947e-21	1.828e-21	-20.711	-20.738	-0.028	(0)
CrCl2+	8.502e-22	7.930e-22	-21.071	-21.101	-0.030	(0)
ZnCl4-2	2.490e-22	1.932e-22	-21.604	-21.714	-0.110	(0)
HgCl4-2	7.222e-23	5.468e-23	-22.141	-22.262	-0.121	(0)
PbCl4-2	2.790e-23	2.112e-23	-22.554	-22.675	-0.121	(0)
FeCl3	3.475e-26	3.475e-26	-25.459	-25.459	0.000	(0)
CuCl4-2	6.798e-27	5.276e-27	-26.168	-26.278	-0.110	(0)
CrO3Cl-	3.189e-29	2.974e-29	-28.496	-28.527	-0.030	(0)
CoCl+2	1.312e-37	9.932e-38	-36.882	-37.003	-0.121	(0)
UCl+3	0.000e+00	0.000e+00	-43.905	-44.177	-0.272	(0)
Co (2)	1.600e-08					
Co+2	1.407e-08	1.065e-08	-7.852	-7.973	-0.121	(0)
CoHCO3+	1.064e-09	9.923e-10	-8.973	-9.003	-0.030	(0)
CoSO4	6.379e-10	6.379e-10	-9.195	-9.195	0.000	(0)
CoCO3	1.622e-10	1.622e-10	-9.790	-9.790	0.000	(0)
CoOH+	3.682e-11	3.434e-11	-10.434	-10.464	-0.030	(0)
CoF+	1.692e-11	1.579e-11	-10.772	-10.802	-0.030	(0)
CoCl+	7.511e-12	7.006e-12	-11.124	-11.155	-0.030	(0)
Co (OH) 2	4.408e-13	4.408e-13	-12.356	-12.356	0.000	(0)
Co (OH) 3-	1.523e-18	1.421e-18	-17.817	-17.847	-0.030	(0)
CoOOH-	3.822e-19	3.565e-19	-18.418	-18.448	-0.030	(0)
CoSeO4	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
Co2OH+3	3.429e-20	1.834e-20	-19.465	-19.737	-0.272	(0)
Co (OH) 4-2	4.806e-26	3.638e-26	-25.318	-25.439	-0.121	(0)
Co4 (OH) 4+4	8.446e-34	2.775e-34	-33.073	-33.557	-0.483	(0)
Co (3)	2.785e-30					
CoOH+2	2.785e-30	2.108e-30	-29.555	-29.676	-0.121	(0)
Co+3	4.586e-36	2.568e-36	-35.339	-35.590	-0.252	(0)
CoCl+2	1.312e-37	9.932e-38	-36.882	-37.003	-0.121	(0)
Cr (2)	9.312e-25					
Cr+2	9.312e-25	7.050e-25	-24.031	-24.152	-0.121	(0)
Cr (3)	1.496e-08					
Cr (OH) 2+	1.331e-08	1.242e-08	-7.876	-7.906	-0.030	(0)
Cr (OH) +2	8.342e-10	6.316e-10	-9.079	-9.200	-0.121	(0)
Cr (OH) 3	7.536e-10	7.536e-10	-9.123	-9.123	0.000	(0)
CrOHSO4	4.498e-11	4.498e-11	-10.347	-10.347	0.000	(0)
CrO2-	6.157e-12	5.744e-12	-11.211	-11.241	-0.030	(0)
Cr (OH) 4-	5.197e-12	4.848e-12	-11.284	-11.314	-0.030	(0)
CrF+2	1.753e-12	1.327e-12	-11.756	-11.877	-0.121	(0)
Cr+3	3.342e-13	1.787e-13	-12.476	-12.748	-0.272	(0)
CrSO4+	1.342e-13	1.252e-13	-12.872	-12.902	-0.030	(0)
CrCl+2	5.807e-17	4.396e-17	-16.236	-16.357	-0.121	(0)
Cr2 (OH) 2SO4+2	3.392e-18	2.568e-18	-17.470	-17.590	-0.121	(0)
Cr2 (OH) 2 (SO4) 2	4.578e-20	4.578e-20	-19.339	-19.339	0.000	(0)
CrOHC12	2.567e-20	2.567e-20	-19.591	-19.591	0.000	(0)

CrCl ₂ +2	8.502e-22	7.930e-22	-21.071	-21.101	-0.030	(0)
Cr (6)	2.996e-18					
CrO ₄ -2	2.561e-18	1.979e-18	-17.592	-17.703	-0.112	(0)
HCrO ₄ -	4.279e-19	3.992e-19	-18.369	-18.399	-0.030	(0)
NaCrO ₄ -	5.803e-21	5.413e-21	-20.236	-20.267	-0.030	(0)
KCrO ₄ -	6.353e-22	5.926e-22	-21.197	-21.227	-0.030	(0)
H ₂ CrO ₄	2.016e-26	2.016e-26	-25.695	-25.695	0.000	(0)
CrO ₃ SO ₄ -2	3.003e-27	2.274e-27	-26.522	-26.643	-0.121	(0)
CrO ₃ Cl-	3.189e-29	2.974e-29	-28.496	-28.527	-0.030	(0)
Cr ₂ O ₇ -2	7.297e-36	5.525e-36	-35.137	-35.258	-0.121	(0)
Cu (1)	1.680e-09					
Cu+	1.363e-09	1.271e-09	-8.866	-8.896	-0.030	(0)
CuCl	3.042e-10	3.042e-10	-9.517	-9.517	0.000	(0)
CuCl ₂ -	1.289e-11	1.208e-11	-10.890	-10.918	-0.028	(0)
CuCl ₃ -2	6.329e-16	4.911e-16	-15.199	-15.309	-0.110	(0)
Cu (S ₄) ₂ -3	0.000e+00	0.000e+00	-136.843	-137.031	-0.188	(0)
CuS ₄ S ₅ -3	0.000e+00	0.000e+00	-137.578	-137.761	-0.183	(0)
Cu (2)	1.152e-06					
CuCO ₃	8.335e-07	8.335e-07	-6.079	-6.079	0.000	(0)
Cu+2	2.033e-07	1.571e-07	-6.692	-6.804	-0.112	(0)
CuOH+	8.563e-08	8.028e-08	-7.067	-7.095	-0.028	(0)
CuHCO ₃ +	1.273e-08	1.187e-08	-7.895	-7.925	-0.030	(0)
CuSO ₄	1.080e-08	1.080e-08	-7.966	-7.966	0.000	(0)
Cu (CO ₃) ₂ -2	2.669e-09	2.021e-09	-8.574	-8.694	-0.121	(0)
Cu (OH) ₂	2.588e-09	2.588e-09	-8.587	-8.587	0.000	(0)
CuF+	4.980e-10	4.646e-10	-9.303	-9.333	-0.030	(0)
Cu ₂ (OH) ₂ +2	2.138e-10	1.619e-10	-9.670	-9.791	-0.121	(0)
CuCl+	5.050e-11	4.734e-11	-10.297	-10.325	-0.028	(0)
Cu (OH) ₃ -	9.195e-13	8.577e-13	-12.036	-12.067	-0.030	(0)
CuCl ₂	3.121e-15	3.121e-15	-14.506	-14.506	0.000	(0)
Cu (OH) ₄ -2	1.441e-18	1.091e-18	-17.841	-17.962	-0.121	(0)
CuCl ₃ -	5.906e-21	5.537e-21	-20.229	-20.257	-0.028	(0)
CuCl ₄ -2	6.798e-27	5.276e-27	-26.168	-26.278	-0.110	(0)
Cu (HS) ₃ -	0.000e+00	0.000e+00	-199.778	-199.808	-0.030	(0)
F	5.112e-05					
F-	4.998e-05	4.686e-05	-4.301	-4.329	-0.028	(0)
MgF+	8.480e-07	7.954e-07	-6.072	-6.099	-0.028	(0)
CaF+	2.571e-07	2.413e-07	-6.590	-6.617	-0.028	(0)
NaF	1.627e-08	1.627e-08	-7.789	-7.789	0.000	(0)
HF	4.319e-09	4.319e-09	-8.365	-8.365	0.000	(0)
MnF+	4.012e-09	3.766e-09	-8.397	-8.424	-0.028	(0)
AlF ₂ +	3.300e-09	3.099e-09	-8.482	-8.509	-0.027	(0)
AlF ₃	1.828e-09	1.828e-09	-8.738	-8.738	0.000	(0)
CuF+	4.980e-10	4.646e-10	-9.303	-9.333	-0.030	(0)
AlF+2	2.136e-10	1.661e-10	-9.670	-9.780	-0.109	(0)
ZnF+	9.378e-11	8.748e-11	-10.028	-10.058	-0.030	(0)
AlF ₄ -	4.577e-11	4.293e-11	-10.339	-10.367	-0.028	(0)
BF (OH) ₃ -	3.734e-11	3.495e-11	-10.428	-10.457	-0.029	(0)
NiF+	2.044e-11	1.906e-11	-10.690	-10.720	-0.030	(0)
CoF+	1.692e-11	1.579e-11	-10.772	-10.802	-0.030	(0)
PbF+	1.985e-12	1.852e-12	-11.702	-11.732	-0.030	(0)
CrF+2	1.753e-12	1.327e-12	-11.756	-11.877	-0.121	(0)
HF ₂ -	8.213e-13	7.695e-13	-12.085	-12.114	-0.028	(0)
CdF+	7.858e-13	7.330e-13	-12.105	-12.135	-0.030	(0)
AgF	7.536e-13	7.536e-13	-12.123	-12.123	0.000	(0)
UO ₂ F+	7.159e-13	6.678e-13	-12.145	-12.175	-0.030	(0)
UO ₂ F ₂	9.025e-14	9.025e-14	-13.045	-13.045	0.000	(0)
FeF ₂ +	2.574e-14	2.415e-14	-13.589	-13.617	-0.028	(0)
FeF+2	2.482e-14	1.926e-14	-13.605	-13.715	-0.110	(0)
BF ₂ (OH) ₂ -	1.166e-14	1.091e-14	-13.933	-13.962	-0.029	(0)
PbF ₂	1.707e-15	1.707e-15	-14.768	-14.768	0.000	(0)
FeF ₃	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
UO ₂ F ₃ -	1.139e-15	1.062e-15	-14.944	-14.974	-0.030	(0)
VO ₂ F	7.792e-17	7.792e-17	-16.108	-16.108	0.000	(0)
CdF ₂	6.854e-17	6.854e-17	-16.164	-16.164	0.000	(0)
H ₂ F ₂	4.998e-17	4.998e-17	-16.301	-16.301	0.000	(0)
VOF+	1.466e-18	1.367e-18	-17.834	-17.864	-0.030	(0)
VO ₂ F ₂ -	1.421e-18	1.326e-18	-17.847	-17.878	-0.030	(0)

UO2F4-2	5.223e-19	3.954e-19	-18.282	-18.403	-0.121	(0)
PbF3-	1.627e-19	1.518e-19	-18.789	-18.819	-0.030	(0)
VOF2	2.402e-20	2.402e-20	-19.619	-19.619	0.000	(0)
BF3OH-	1.325e-20	1.240e-20	-19.878	-19.907	-0.029	(0)
VO2F3-2	1.024e-21	7.750e-22	-20.990	-21.111	-0.121	(0)
VOF3-	4.282e-23	3.994e-23	-22.368	-22.399	-0.030	(0)
PbF4-2	4.496e-24	3.404e-24	-23.347	-23.468	-0.121	(0)
Sb(OH) 2F	1.046e-24	1.046e-24	-23.981	-23.981	0.000	(0)
SbOF	1.028e-24	1.028e-24	-23.988	-23.988	0.000	(0)
BF4-	1.904e-25	1.781e-25	-24.720	-24.749	-0.029	(0)
VO2F4-3	3.342e-26	1.787e-26	-25.476	-25.748	-0.272	(0)
HgF+	1.958e-26	1.826e-26	-25.708	-25.738	-0.030	(0)
VOF4-2	9.979e-27	7.556e-27	-26.001	-26.122	-0.121	(0)
UF3+	3.068e-34	2.861e-34	-33.513	-33.543	-0.030	(0)
UF2+2	5.089e-35	3.853e-35	-34.293	-34.414	-0.121	(0)
UF4	1.470e-36	1.470e-36	-35.833	-35.833	0.000	(0)
UF+3	1.221e-37	6.531e-38	-36.913	-37.185	-0.272	(0)
UF5-	2.927e-39	2.730e-39	-38.534	-38.564	-0.030	(0)
UF6-2	0.000e+00	0.000e+00	-40.292	-40.413	-0.121	(0)
Fe (2)	9.447e-08					
Fe+2	8.803e-08	6.665e-08	-7.055	-7.176	-0.121	(0)
FeSO4	4.910e-09	4.910e-09	-8.309	-8.309	0.000	(0)
FeHCO3+	1.069e-09	1.005e-09	-8.971	-8.998	-0.027	(0)
FeOH+	4.568e-10	4.287e-10	-9.340	-9.368	-0.028	(0)
Fe (OH) 2	5.502e-14	5.502e-14	-13.259	-13.259	0.000	(0)
Fe (OH) 3-	2.995e-15	2.811e-15	-14.524	-14.551	-0.028	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.162	-144.162	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.062	-215.093	-0.030	(0)
Fe (3)	3.051e-06					
Fe (OH) 2+	2.618e-06	2.458e-06	-5.582	-5.609	-0.027	(0)
Fe (OH) 3	4.265e-07	4.265e-07	-6.370	-6.370	0.000	(0)
Fe (OH) 4-	6.834e-09	6.417e-09	-8.165	-8.193	-0.027	(0)
FeOH+2	5.039e-11	3.911e-11	-10.298	-10.408	-0.110	(0)
FeF2+	2.574e-14	2.415e-14	-13.589	-13.617	-0.028	(0)
FeF+2	2.482e-14	1.926e-14	-13.605	-13.715	-0.110	(0)
FeF3	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
FeSO4+	1.345e-15	1.262e-15	-14.871	-14.899	-0.028	(0)
Fe+3	6.695e-16	3.749e-16	-15.174	-15.426	-0.252	(0)
Fe (SO4) 2-	8.683e-18	8.100e-18	-17.061	-17.092	-0.030	(0)
FeCl+2	2.773e-18	2.152e-18	-17.557	-17.667	-0.110	(0)
Fe2 (OH) 2+4	1.541e-19	5.064e-20	-18.812	-19.296	-0.483	(0)
FeHSeO3+2	6.128e-21	4.640e-21	-20.213	-20.333	-0.121	(0)
FeCl2+	1.947e-21	1.828e-21	-20.711	-20.738	-0.028	(0)
Fe3 (OH) 4+5	1.024e-23	1.799e-24	-22.990	-23.745	-0.755	(0)
FeCl3	3.475e-26	3.475e-26	-25.459	-25.459	0.000	(0)
H (0)	1.499e-27					
H2	7.494e-28	7.500e-28	-27.125	-27.125	0.000	(0)
Hg (0)	2.647e-11					
Hg	2.647e-11	2.647e-11	-10.577	-10.577	0.000	(0)
Hg (1)	4.992e-25					
Hg2+2	2.496e-25	1.890e-25	-24.603	-24.724	-0.121	(0)
Hg (2)	2.350e-15					
Hg (OH) 2	1.730e-15	1.732e-15	-14.762	-14.762	0.000	(0)
HgClOH	5.704e-16	5.704e-16	-15.244	-15.244	0.000	(0)
HgCl2	3.800e-17	3.800e-17	-16.420	-16.420	0.000	(0)
HgCO3	1.134e-17	1.134e-17	-16.946	-16.946	0.000	(0)
HgCl3-	7.745e-20	7.224e-20	-19.111	-19.141	-0.030	(0)
HgOH+	7.250e-20	6.763e-20	-19.140	-19.170	-0.030	(0)
HgCl+	4.276e-20	3.988e-20	-19.369	-19.399	-0.030	(0)
Hg (CO3) 2-2	4.265e-20	3.229e-20	-19.370	-19.491	-0.121	(0)
HgHCO3+	1.410e-20	1.315e-20	-19.851	-19.881	-0.030	(0)
HgCl4-2	7.222e-23	5.468e-23	-22.141	-22.262	-0.121	(0)
Hg (OH) 3-	3.776e-23	3.523e-23	-22.423	-22.453	-0.030	(0)
Hg+2	1.389e-23	1.051e-23	-22.857	-22.978	-0.121	(0)
HgSO4	8.262e-25	8.262e-25	-24.083	-24.083	0.000	(0)
HgF+	1.958e-26	1.826e-26	-25.708	-25.738	-0.030	(0)
HgHS2-	0.000e+00	0.000e+00	-129.750	-129.780	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.592	-130.592	0.000	(0)

	HgS2-2	0.000e+00	0.000e+00	-131.162	-131.283	-0.121	(0)
K		8.612e-05					
	K+	8.594e-05	8.058e-05	-4.066	-4.094	-0.028	(0)
	KSO4-	1.823e-07	1.712e-07	-6.739	-6.767	-0.027	(0)
	KCrO4-	6.353e-22	5.926e-22	-21.197	-21.227	-0.030	(0)
Mg		2.070e-04					
	Mg+2	1.958e-04	1.513e-04	-3.708	-3.820	-0.112	(0)
	MgSO4	8.262e-06	8.262e-06	-5.083	-5.083	0.000	(0)
	MgHCO3+	1.977e-06	1.854e-06	-5.704	-5.732	-0.028	(0)
	MgF+	8.480e-07	7.954e-07	-6.072	-6.099	-0.028	(0)
	MgCO3	1.134e-07	1.134e-07	-6.946	-6.946	0.000	(0)
	MgOH+	1.035e-08	9.731e-09	-7.985	-8.012	-0.027	(0)
	MgH2BO3+	9.763e-11	9.137e-11	-10.010	-10.039	-0.029	(0)
Mn (2)		2.830e-06					
	Mn+2	2.666e-06	2.018e-06	-5.574	-5.695	-0.121	(0)
	MnSO4	1.077e-07	1.077e-07	-6.968	-6.968	0.000	(0)
	MnHCO3+	5.138e-08	4.823e-08	-7.289	-7.317	-0.028	(0)
	MnF+	4.012e-09	3.766e-09	-8.397	-8.424	-0.028	(0)
	MnOH+	8.728e-10	8.192e-10	-9.059	-9.087	-0.028	(0)
	MnCl+	5.147e-10	4.831e-10	-9.288	-9.316	-0.028	(0)
	MnCl2	1.297e-13	1.297e-13	-12.887	-12.887	0.000	(0)
	MnSeO4	1.896e-17	1.896e-17	-16.722	-16.722	0.000	(0)
	MnCl3-	7.237e-18	6.793e-18	-17.140	-17.168	-0.028	(0)
	Mn (OH) 3-	1.408e-19	1.322e-19	-18.851	-18.879	-0.028	(0)
	Mn (OH) 4-2	8.884e-26	6.894e-26	-25.051	-25.162	-0.110	(0)
	MnSe	5.386e-40	5.386e-40	-39.269	-39.269	0.000	(0)
Mn (3)		9.749e-27					
	Mn+3	9.749e-27	5.459e-27	-26.011	-26.263	-0.252	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-47.236	-47.346	-0.110	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-51.907	-51.936	-0.029	(0)
Mo		6.640e-08					
	MoO4-2	6.633e-08	5.126e-08	-7.178	-7.290	-0.112	(0)
	HMoO4-	6.814e-11	6.357e-11	-10.167	-10.197	-0.030	(0)
	H2MoO4	2.902e-14	2.902e-14	-13.537	-13.537	0.000	(0)
	Ag2MoO4	7.953e-25	7.953e-25	-24.099	-24.099	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-44.159	-44.431	-0.272	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-54.597	-55.684	-1.088	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-55.748	-56.503	-0.755	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-58.443	-58.926	-0.483	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-62.614	-62.886	-0.272	(0)
Na		5.883e-04					
	Na+	5.870e-04	5.503e-04	-3.231	-3.259	-0.028	(0)
	NaSO4-	9.446e-07	8.870e-07	-6.025	-6.052	-0.027	(0)
	NaHCO3	3.706e-07	3.706e-07	-6.431	-6.431	0.000	(0)
	NaF	1.627e-08	1.627e-08	-7.789	-7.789	0.000	(0)
	NaCO3-	9.832e-09	9.232e-09	-8.007	-8.035	-0.027	(0)
	NaH2BO3	1.519e-11	1.519e-11	-10.818	-10.818	0.000	(0)
	NaCrO4-	5.803e-21	5.413e-21	-20.236	-20.267	-0.030	(0)
Ni		2.510e-08					
	Ni+2	2.096e-08	1.619e-08	-7.679	-7.791	-0.112	(0)
	NiHCO3+	2.563e-09	2.391e-09	-8.591	-8.621	-0.030	(0)
	NiSO4	9.697e-10	9.697e-10	-9.013	-9.013	0.000	(0)
	NiCO3	5.443e-10	5.443e-10	-9.264	-9.264	0.000	(0)
	NiOH+	3.531e-11	3.294e-11	-10.452	-10.482	-0.030	(0)
	NiF+	2.044e-11	1.906e-11	-10.690	-10.720	-0.030	(0)
	NiCl+	8.445e-12	7.877e-12	-11.073	-11.104	-0.030	(0)
	Ni (OH) 2	4.228e-13	4.228e-13	-12.374	-12.374	0.000	(0)
	Ni (SO4) 2-2	1.273e-14	9.637e-15	-13.895	-14.016	-0.121	(0)
	Ni (OH) 3-	7.323e-17	6.831e-17	-16.135	-16.166	-0.030	(0)
	NiCl2	7.540e-18	7.540e-18	-17.123	-17.123	0.000	(0)
	NiSeO4	2.644e-19	2.644e-19	-18.578	-18.578	0.000	(0)
O (0)		1.801e-38					
	O2	9.003e-39	9.011e-39	-38.046	-38.045	0.000	(0)
Pb		3.118e-09					
	PbCO3	1.518e-09	1.518e-09	-8.819	-8.819	0.000	(0)
	Pb+2	7.256e-10	5.607e-10	-9.139	-9.251	-0.112	(0)

PbHCO3+	5.348e-10	4.989e-10	-9.272	-9.302	-0.030	(0)
PbOH+	2.440e-10	2.276e-10	-9.613	-9.643	-0.030	(0)
PbSO4	8.242e-11	8.242e-11	-10.084	-10.084	0.000	(0)
Pb (CO3) 2-2	5.211e-12	3.945e-12	-11.283	-11.404	-0.121	(0)
PbCl+	4.055e-12	3.782e-12	-11.392	-11.422	-0.030	(0)
PbF+	1.985e-12	1.852e-12	-11.702	-11.732	-0.030	(0)
Pb (OH) 2	1.163e-12	1.163e-12	-11.935	-11.935	0.000	(0)
Pb (SO4) 2-2	1.969e-13	1.490e-13	-12.706	-12.827	-0.121	(0)
PbCl2	3.212e-15	3.212e-15	-14.493	-14.493	0.000	(0)
PbF2	1.707e-15	1.707e-15	-14.768	-14.768	0.000	(0)
Pb (OH) 3-	2.014e-16	1.879e-16	-15.696	-15.726	-0.030	(0)
Pb2OH+3	3.782e-18	2.022e-18	-17.422	-17.694	-0.272	(0)
PbCl3-	2.606e-19	2.431e-19	-18.584	-18.614	-0.030	(0)
PbF3-	1.627e-19	1.518e-19	-18.789	-18.819	-0.030	(0)
Pb (OH) 4-2	9.818e-21	7.433e-21	-20.008	-20.129	-0.121	(0)
PbCl4-2	2.790e-23	2.112e-23	-22.554	-22.675	-0.121	(0)
Pb3 (OH) 4+2	1.998e-23	1.512e-23	-22.699	-22.820	-0.121	(0)
PbF4-2	4.496e-24	3.404e-24	-23.347	-23.468	-0.121	(0)
Pb4 (OH) 4+4	2.050e-28	6.736e-29	-27.688	-28.172	-0.483	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.917	-139.917	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.554	-211.585	-0.030	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.347	-67.347	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.938	-72.968	-0.030	(0)
H2S	0.000e+00	0.000e+00	-73.153	-73.153	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.935	-73.965	-0.030	(0)
S5-2	0.000e+00	0.000e+00	-75.007	-75.127	-0.121	(0)
S6-2	0.000e+00	0.000e+00	-75.523	-75.643	-0.121	(0)
S4-2	0.000e+00	0.000e+00	-75.602	-75.723	-0.121	(0)
S3-2	0.000e+00	0.000e+00	-76.408	-76.529	-0.121	(0)
S2-2	0.000e+00	0.000e+00	-77.424	-77.545	-0.121	(0)
S-2	0.000e+00	0.000e+00	-82.952	-83.062	-0.110	(0)
HgHS2-	0.000e+00	0.000e+00	-129.750	-129.780	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.592	-130.592	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.162	-131.283	-0.121	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.185	-136.215	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.399	-136.493	-0.094	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.843	-137.031	-0.188	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.578	-137.761	-0.183	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.727	-0.190	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.038	-0.185	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.919	-138.949	-0.030	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.729	-139.729	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.917	-139.917	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.144	-140.144	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.162	-144.162	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.778	-199.808	-0.030	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.802	-209.832	-0.030	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.767	-210.797	-0.030	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.554	-211.585	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.486	-212.607	-0.121	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.062	-215.093	-0.030	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-281.448	-281.569	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.139	-284.260	-0.121	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.052	-294.172	-0.121	(0)
S (6)	4.303e-04					
SO4-2	3.884e-04	3.001e-04	-3.411	-3.523	-0.112	(0)
CaSO4	3.244e-05	3.244e-05	-4.489	-4.489	0.000	(0)
MgSO4	8.262e-06	8.262e-06	-5.083	-5.083	0.000	(0)
NaSO4-	9.446e-07	8.870e-07	-6.025	-6.052	-0.027	(0)
KSO4-	1.823e-07	1.712e-07	-6.739	-6.767	-0.027	(0)
MnSO4	1.077e-07	1.077e-07	-6.968	-6.968	0.000	(0)
CuSO4	1.080e-08	1.080e-08	-7.966	-7.966	0.000	(0)
ZnSO4	6.143e-09	6.143e-09	-8.212	-8.212	0.000	(0)
FeSO4	4.910e-09	4.910e-09	-8.309	-8.309	0.000	(0)
HSO4-	1.948e-09	1.828e-09	-8.710	-8.738	-0.028	(0)
NiSO4	9.697e-10	9.697e-10	-9.013	-9.013	0.000	(0)
CoSO4	6.379e-10	6.379e-10	-9.195	-9.195	0.000	(0)

PbSO4	8.242e-11	8.242e-11	-10.084	-10.084	0.000	(0)
CdSO4	6.944e-11	6.944e-11	-10.158	-10.158	0.000	(0)
CrOHSO4	4.498e-11	4.498e-11	-10.347	-10.347	0.000	(0)
AgSO4-	4.110e-11	3.834e-11	-10.386	-10.416	-0.030	(0)
Zn(SO4) 2-2	2.121e-11	1.606e-11	-10.674	-10.794	-0.121	(0)
AlSO4+	8.802e-13	8.257e-13	-12.055	-12.083	-0.028	(0)
Cd(SO4) 2-2	3.713e-13	2.811e-13	-12.430	-12.551	-0.121	(0)
Pb(SO4) 2-2	1.969e-13	1.490e-13	-12.706	-12.827	-0.121	(0)
CrSO4+	1.342e-13	1.252e-13	-12.872	-12.902	-0.030	(0)
UO2SO4	4.689e-14	4.689e-14	-13.329	-13.329	0.000	(0)
Ni(SO4) 2-2	1.273e-14	9.637e-15	-13.895	-14.016	-0.121	(0)
Al(SO4) 2-	2.831e-15	2.655e-15	-14.548	-14.576	-0.028	(0)
FeSO4+	1.345e-15	1.262e-15	-14.871	-14.899	-0.028	(0)
UO2(SO4) 2-2	2.450e-16	1.855e-16	-15.611	-15.732	-0.121	(0)
Fe(SO4) 2-	8.683e-18	8.100e-18	-17.061	-17.092	-0.030	(0)
VO2SO4-	7.284e-18	6.794e-18	-17.138	-17.168	-0.030	(0)
Cr2(OH) 2SO4+2	3.392e-18	2.568e-18	-17.470	-17.590	-0.121	(0)
VOSO4	4.021e-19	4.021e-19	-18.396	-18.396	0.000	(0)
Cr2(OH) 2(SO4) 2	4.578e-20	4.578e-20	-19.339	-19.339	0.000	(0)
HgSO4	8.262e-25	8.262e-25	-24.083	-24.083	0.000	(0)
CrO3SO4-2	3.003e-27	2.274e-27	-26.522	-26.643	-0.121	(0)
VS04+	2.353e-32	2.195e-32	-31.628	-31.659	-0.030	(0)
U(SO4) 2	1.989e-39	1.989e-39	-38.701	-38.701	0.000	(0)
USO4+2	1.102e-39	8.345e-40	-38.958	-39.079	-0.121	(0)
Sb(3)	4.531e-19					
Sb(OH) 3	2.293e-19	2.293e-19	-18.640	-18.640	0.000	(0)
HSbO2	2.238e-19	2.238e-19	-18.650	-18.650	0.000	(0)
SbO2-	6.235e-24	5.816e-24	-23.205	-23.235	-0.030	(0)
Sb(OH) 4-	3.573e-24	3.333e-24	-23.447	-23.477	-0.030	(0)
Sb(OH) 2F	1.046e-24	1.046e-24	-23.981	-23.981	0.000	(0)
SbOF	1.028e-24	1.028e-24	-23.988	-23.988	0.000	(0)
Sb(OH) 2+	3.719e-25	3.469e-25	-24.430	-24.460	-0.030	(0)
SbO+	1.282e-25	1.196e-25	-24.892	-24.922	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.052	-294.172	-0.121	(0)
Sb(5)	1.561e-09					
SbO3-	1.559e-09	1.454e-09	-8.807	-8.837	-0.030	(0)
Sb(OH) 6-	1.814e-12	1.701e-12	-11.741	-11.769	-0.028	(0)
SbO2+	1.736e-24	1.620e-24	-23.760	-23.791	-0.030	(0)
Se(-2)	2.162e-10					
Ag2Se	2.162e-10	2.162e-10	-9.665	-9.665	0.000	(0)
HSe-	4.326e-36	4.035e-36	-35.364	-35.394	-0.030	(0)
H2Se	1.952e-39	1.952e-39	-38.710	-38.710	0.000	(0)
MnSe	5.386e-40	5.386e-40	-39.269	-39.269	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.068	-43.189	-0.121	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.391	-77.875	-0.483	(0)
Se(4)	5.417e-09					
HSeO3-	5.022e-09	4.684e-09	-8.299	-8.329	-0.030	(0)
SeO3-2	3.952e-10	2.992e-10	-9.403	-9.524	-0.121	(0)
H2SeO3	1.245e-13	1.245e-13	-12.905	-12.905	0.000	(0)
AgSeO3-	1.320e-15	1.231e-15	-14.879	-14.910	-0.030	(0)
FeHSeO3+2	6.128e-21	4.640e-21	-20.213	-20.333	-0.121	(0)
Cd(SeO3) 2-2	9.620e-23	7.283e-23	-22.017	-22.138	-0.121	(0)
Ag(SeO3) 2-3	6.169e-24	3.299e-24	-23.210	-23.482	-0.272	(0)
Se(6)	4.519e-14					
SeO4-2	4.517e-14	3.491e-14	-13.345	-13.457	-0.112	(0)
MnSeO4	1.896e-17	1.896e-17	-16.722	-16.722	0.000	(0)
ZnSeO4	5.058e-19	5.058e-19	-18.296	-18.296	0.000	(0)
NiSeO4	2.644e-19	2.644e-19	-18.578	-18.578	0.000	(0)
CoSeO4	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
HSeO4-	1.169e-19	1.090e-19	-18.932	-18.962	-0.030	(0)
CdSeO4	6.416e-21	6.416e-21	-20.193	-20.193	0.000	(0)
Zn(SeO4) 2-2	2.365e-32	1.790e-32	-31.626	-31.747	-0.121	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.462	-55.734	-0.272	(0)
U(4)	6.057e-20					
U(OH) 5-	6.042e-20	5.636e-20	-19.219	-19.249	-0.030	(0)
U(OH) 4	1.471e-22	1.471e-22	-21.832	-21.832	0.000	(0)
U(OH) 3+	3.593e-26	3.352e-26	-25.445	-25.475	-0.030	(0)

U (OH) 2+2	1.276e-30	9.658e-31	-29.894	-30.015	-0.121	(0)
UF3+	3.068e-34	2.861e-34	-33.513	-33.543	-0.030	(0)
UF2+2	5.089e-35	3.853e-35	-34.293	-34.414	-0.121	(0)
UOH+3	5.301e-36	2.835e-36	-35.276	-35.547	-0.272	(0)
UF4	1.470e-36	1.470e-36	-35.833	-35.833	0.000	(0)
UF+3	1.221e-37	6.531e-38	-36.913	-37.185	-0.272	(0)
UF5-	2.927e-39	2.730e-39	-38.534	-38.564	-0.030	(0)
U (SO4) 2	1.989e-39	1.989e-39	-38.701	-38.701	0.000	(0)
USO4+2	1.102e-39	8.345e-40	-38.958	-39.079	-0.121	(0)
UF6-2	0.000e+00	0.000e+00	-40.292	-40.413	-0.121	(0)
U+4	0.000e+00	0.000e+00	-41.673	-42.156	-0.483	(0)
UC1+3	0.000e+00	0.000e+00	-43.905	-44.177	-0.272	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.563	-162.010	-2.447	(0)
U (5)	1.114e-15					
UO2+	1.114e-15	1.039e-15	-14.953	-14.983	-0.030	(0)
U (6)	1.008e-08					
UO2 (CO3) 2-2	8.790e-09	6.655e-09	-8.056	-8.177	-0.121	(0)
UO2 (CO3) 3-4	9.144e-10	3.005e-10	-9.039	-9.522	-0.483	(0)
UO2CO3	3.702e-10	3.702e-10	-9.432	-9.432	0.000	(0)
UO2OH+	2.251e-12	2.100e-12	-11.648	-11.678	-0.030	(0)
UO2F+	7.159e-13	6.678e-13	-12.145	-12.175	-0.030	(0)
UO2+2	1.336e-13	1.032e-13	-12.874	-12.986	-0.112	(0)
UO2F2	9.025e-14	9.025e-14	-13.045	-13.045	0.000	(0)
UO2SO4	4.689e-14	4.689e-14	-13.329	-13.329	0.000	(0)
UO2F3-	1.139e-15	1.062e-15	-14.944	-14.974	-0.030	(0)
UO2 (SO4) 2-2	2.450e-16	1.855e-16	-15.611	-15.732	-0.121	(0)
UO2C1+	3.412e-17	3.183e-17	-16.467	-16.497	-0.030	(0)
(UO2) 2 (OH) 2+2	9.665e-18	7.318e-18	-17.015	-17.136	-0.121	(0)
UO2F4-2	5.223e-19	3.954e-19	-18.282	-18.403	-0.121	(0)
(UO2) 3 (OH) 5+	3.262e-19	3.043e-19	-18.487	-18.517	-0.030	(0)
V (2)	8.681e-40					
VOH+	7.026e-40	6.553e-40	-39.153	-39.184	-0.030	(0)
V+2	1.656e-40	1.253e-40	-39.781	-39.902	-0.121	(0)
V (3)	5.272e-13					
V (OH) 3	5.272e-13	5.272e-13	-12.278	-12.278	0.000	(0)
V (OH) 2+	2.276e-23	2.123e-23	-22.643	-22.673	-0.030	(0)
VOH+2	1.657e-26	1.255e-26	-25.781	-25.901	-0.121	(0)
V+3	2.898e-31	1.549e-31	-30.538	-30.810	-0.272	(0)
VSO4+	2.353e-32	2.195e-32	-31.628	-31.659	-0.030	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.851	-50.123	-0.272	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.520	-51.003	-0.483	(0)
V (4)	1.764e-16					
V (OH) 3+	1.681e-16	1.568e-16	-15.774	-15.805	-0.030	(0)
VO+2	6.425e-18	4.864e-18	-17.192	-17.313	-0.121	(0)
VOF+	1.466e-18	1.367e-18	-17.834	-17.864	-0.030	(0)
VOSO4	4.021e-19	4.021e-19	-18.396	-18.396	0.000	(0)
VOF2	2.402e-20	2.402e-20	-19.619	-19.619	0.000	(0)
VOC1+	2.781e-21	2.594e-21	-20.556	-20.586	-0.030	(0)
VOF3-	4.282e-23	3.994e-23	-22.368	-22.399	-0.030	(0)
VOF4-2	9.979e-27	7.556e-27	-26.001	-26.122	-0.121	(0)
H2V2O4+2	1.628e-27	1.232e-27	-26.788	-26.909	-0.121	(0)
V (5)	1.378e-08					
H2VO4-	1.312e-08	1.223e-08	-7.882	-7.912	-0.030	(0)
HVO4-2	6.513e-10	4.931e-10	-9.186	-9.307	-0.121	(0)
H3VO4	7.624e-12	7.624e-12	-11.118	-11.118	0.000	(0)
H3V2O7-	6.457e-13	6.023e-13	-12.190	-12.220	-0.030	(0)
HV2O7-3	3.824e-15	2.045e-15	-14.418	-14.689	-0.272	(0)
VO2+	1.011e-15	9.481e-16	-14.995	-15.023	-0.028	(0)
VO2F	7.792e-17	7.792e-17	-16.108	-16.108	0.000	(0)
VO4-3	7.417e-17	3.966e-17	-16.130	-16.402	-0.272	(0)
VO2SO4-	7.284e-18	6.794e-18	-17.138	-17.168	-0.030	(0)
V3O9-3	3.587e-18	1.918e-18	-17.445	-17.717	-0.272	(0)
V2O7-4	2.687e-18	8.830e-19	-17.571	-18.054	-0.483	(0)
VO2F2-	1.421e-18	1.326e-18	-17.847	-17.878	-0.030	(0)
VO2F3-2	1.024e-21	7.750e-22	-20.990	-21.111	-0.121	(0)
V4O12-4	2.977e-23	9.783e-24	-22.526	-23.010	-0.483	(0)
VO2F4-3	3.342e-26	1.787e-26	-25.476	-25.748	-0.272	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.303	-58.058	-0.755	(0)

V10028-6	0.000e+00	0.000e+00	-57.952	-59.040	-1.088	(0)
H2V10028-4	0.000e+00	0.000e+00	-59.573	-60.056	-0.483	(0)
Zn	1.377e-07					
Zn+2	1.211e-07	9.356e-08	-6.917	-7.029	-0.112	(0)
ZnSO4	6.143e-09	6.143e-09	-8.212	-8.212	0.000	(0)
ZnCO3	4.850e-09	4.850e-09	-8.314	-8.314	0.000	(0)
ZnHCO3+	3.798e-09	3.543e-09	-8.420	-8.451	-0.030	(0)
ZnOH+	1.621e-09	1.512e-09	-8.790	-8.821	-0.030	(0)
ZnF+	9.378e-11	8.748e-11	-10.028	-10.058	-0.030	(0)
ZnCl+	4.766e-11	4.468e-11	-10.322	-10.350	-0.028	(0)
Zn(OH) 2	3.871e-11	3.871e-11	-10.412	-10.412	0.000	(0)
Zn(SO4) 2-2	2.121e-11	1.606e-11	-10.674	-10.794	-0.121	(0)
ZnOHCl	9.450e-12	9.450e-12	-11.025	-11.025	0.000	(0)
Zn(OH) 3-	3.360e-14	3.134e-14	-13.474	-13.504	-0.030	(0)
ZnCl2	1.346e-14	1.346e-14	-13.871	-13.871	0.000	(0)
ZnCl3-	2.168e-18	2.033e-18	-17.664	-17.692	-0.028	(0)
ZnSeO4	5.058e-19	5.058e-19	-18.296	-18.296	0.000	(0)
Zn(OH) 4-2	2.663e-19	2.016e-19	-18.575	-18.695	-0.121	(0)
ZnCl4-2	2.490e-22	1.932e-22	-21.604	-21.714	-0.110	(0)
Zn(SeO4) 2-2	2.365e-32	1.790e-32	-31.626	-31.747	-0.121	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-138.919	-138.949	-0.030	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-140.144	-140.144	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-209.802	-209.832	-0.030	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-212.486	-212.607	-0.121	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-284.139	-284.260	-0.121	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.93	-82.15	-36.22	Ag2S
Ag2CO3	-11.34	-22.43	-11.09	Ag2CO3
Ag2CrO4	-22.50	-34.09	-11.59	Ag2CrO4
Ag2HVO4	-11.27	-9.79	1.48	Ag2HVO4
Ag2MoO4	-12.13	-23.68	-11.55	Ag2MoO4
Ag2O	-14.55	-1.98	12.57	Ag2O
Ag2Se	4.12	-44.58	-48.70	Ag2Se
Ag2SeO3	-10.36	-17.51	-7.15	Ag2SeO3
Ag2SeO4	-20.93	-29.84	-8.91	Ag2SeO4
Ag2SO4	-15.09	-19.91	-4.82	Ag2SO4
Ag3AsO3	-24.01	-21.86	2.16	Ag3AsO3
Ag3AsO4	-13.99	-16.78	-2.79	Ag3AsO4
Ag3H2VO5	-15.96	-10.78	5.18	Ag3H2VO5
AgF:4H2O	-13.57	-12.52	1.05	AgF:4H2O
Agmetal	0.53	-12.98	-13.51	Ag
AgVO3	-9.58	-8.81	0.77	AgVO3
Al(OH) 3 (am)	-1.63	9.17	10.80	Al(OH) 3
Al2(MoO4) 3	-49.14	-46.77	2.37	Al2(MoO4) 3
Al2O3	-1.32	18.33	19.65	Al2O3
Al4(OH) 10SO4	-3.97	18.73	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-9.45	-4.65	4.80	AlAsO4:2H2O
AlOHSO4	-5.54	-8.77	-3.23	AlOHSO4
AlSb	-147.02	-81.40	65.62	AlSb
Alunite	-3.86	-5.26	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-4.98	-12.77	-7.79	PbSO4
Anhydrite	-2.49	-6.85	-4.36	CaSO4
Anilite	-48.93	-80.81	-31.88	Cu0.25Cu1.5S
Antlerite	-3.90	4.89	8.79	Cu3(OH) 4SO4
Aragonite	-1.07	-9.37	-8.30	CaCO3
Arsenolite	-72.81	-75.57	-2.76	As4O6
Artinite	-8.88	0.72	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-34.34	-27.63	6.71	As2O5
Atacamite	-3.10	4.29	7.39	Cu2(OH) 3Cl
Azurite	-1.19	-18.09	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-16.85	7.54	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-16.43	-0.55	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	3.90	-5.01	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-25.95	6.99	32.94	Ba3(VO4) 2:4H2O

BaCrO4	-14.90	-24.57	-9.67	BaCrO4
BaF2	-9.71	-15.53	-5.82	BaF2
BaMoO4	-7.20	-14.16	-6.96	BaMoO4
Barite	-0.41	-10.39	-9.98	BaSO4
BaS	-88.81	-72.63	16.18	BaS
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-12.87	-20.33	-7.46	BaSeO4
Bianchite	-8.79	-10.55	-1.76	ZnSO4:6H2O
Birnessite	-10.75	7.34	18.09	MnO2
Bixbyite	-8.65	-9.29	-0.64	Mn2O3
BlaubleiI	-49.50	-73.66	-24.16	Cu0.9Cu0.2S
BlaubleiII	-49.68	-76.96	-27.28	Cu0.6Cu0.8S
Boehmite	0.59	9.17	8.58	AlOOH
Breithauptite	-53.43	-71.96	-18.52	NiSb
Brochantite	-2.73	12.49	15.22	Cu4(OH)6SO4
Brucite	-6.25	10.59	16.84	Mg(OH)2
Bunsenite	-5.83	6.62	12.45	NiO
Ca(VO3)2	-10.21	-4.55	5.66	Ca(VO3)2
Ca2V2O7	-10.97	6.53	17.50	Ca2V2O7
Ca2V2O7:2H2O	-15.02	6.53	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.68	5.62	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-21.34	17.62	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-22.24	17.62	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-290.85	-147.88	142.97	Ca3Sb2
CaCrO4	-18.76	-21.03	-2.27	CaCrO4
Calcite	-0.89	-9.37	-8.48	CaCO3
Calomel	-14.26	-32.17	-17.91	Hg2Cl2
CaMoO4	-2.67	-10.62	-7.95	CaMoO4
Carnotite	-3.51	-3.28	0.23	KUO2VO4
CaSeO3:2H2O	-7.26	-4.45	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.76	-16.78	-3.02	CaSeO4:2H2O
Cd(BO2)2	-15.89	-6.05	9.84	Cd(BO2)2
Cd(OH)2	-8.24	5.41	13.64	Cd(OH)2
Cd(OH)2(am)	-8.32	5.41	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.36	-19.65	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.28	-1.72	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.71	3.69	28.40	Cd4(OH)6SO4
CdCl2	-15.79	-16.45	-0.66	CdCl2
CdCl2:1H2O	-14.75	-16.45	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-14.53	-16.45	-1.91	CdCl2:2.5H2O
CdF2	-16.45	-17.66	-1.21	CdF2
Cdmetal(alpha)	-32.08	-18.57	13.51	Cd
Cdmetal(gamma)	-32.19	-18.57	13.62	Cd
CdMoO4	-2.15	-16.30	-14.15	CdMoO4
CdOHCl	-9.06	-5.52	3.54	CdOHCl
CdSb	-72.82	-73.17	-0.35	CdSb
CdSe	-16.99	-37.19	-20.20	CdSe
CdSeO4:2H2O	-20.61	-22.46	-1.85	CdSeO4:2H2O
CdSO4	-12.36	-12.53	-0.17	CdSO4
CdSO4:1H2O	-10.80	-12.53	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.66	-12.53	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.16	-11.91	-9.75	AgCl
Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4(g)	-75.31	-116.36	-41.05	CH4
Chalcanthite	-7.69	-10.33	-2.64	CuSO4:5H2O
Chalcocite	-48.63	-83.55	-34.92	Cu2S
Chalcopyrite	-110.23	-145.50	-35.27	CuFeS2
Cinnabar	-49.24	-94.93	-45.69	HgS
Claudetite	-72.50	-75.57	-3.06	As4O6
Clausthalite	-10.34	-37.44	-27.10	PbSe
Co(BO2)2	-32.09	-5.02	27.07	Co(BO2)2
Co(OH)2	-6.66	6.44	13.09	Co(OH)2
Co(OH)3	-11.67	-13.97	-2.31	Co(OH)3
CO2(g)	-2.31	-20.46	-18.15	CO2
Co3(AsO4)2	-21.35	-8.31	13.03	Co3(AsO4)2
Co3O4	-11.01	-21.51	-10.50	Co3O4
CoCl2	-23.68	-15.41	8.27	CoCl2
CoCl2:6H2O	-17.95	-15.41	2.54	CoCl2:6H2O

CoCO3	-4.04	-14.02	-9.98	CoCO3
CoF2	-15.03	-16.63	-1.60	CoF2
CoF3	-47.12	-48.58	-1.46	CoF3
CoFe2O4	22.35	18.82	-3.53	CoFe2O4
CoMoO4	-7.50	-15.26	-7.76	CoMoO4
CoO	-7.15	6.44	13.59	CoO
CoS (alpha)	-66.29	-73.73	-7.44	CoS
CoS (beta)	-62.66	-73.73	-11.07	CoS
CoSe	-19.96	-36.16	-16.20	CoSe
CoSeO3	-10.42	-9.10	1.32	CoSeO3
CoSeO4:6H2O	-19.90	-21.43	-1.53	CoSeO4:6H2O
CoSO4	-14.30	-11.50	2.80	CoSO4
CoSO4:6H2O	-9.02	-11.50	-2.47	CoSO4:6H2O
Cotunnite	-11.91	-16.69	-4.78	PbCl2
Covellite	-50.27	-72.57	-22.30	CuS
Cr (OH) 2	-20.56	-9.74	10.82	Cr (OH) 2
Cr (OH) 3	-2.04	-0.70	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.05	-0.70	-0.75	Cr (OH) 3
Cr2O3	0.96	-1.40	-2.36	Cr2O3
CrCl2	-45.69	-31.59	14.09	CrCl2
CrCl3	-48.59	-33.48	15.11	CrCl3
CrF3	-23.97	-35.30	-11.34	CrF3
Crmetal	-64.20	-33.72	30.48	Cr
CrO3	-28.90	-32.11	-3.21	CrO3
Cryolite	-14.36	-48.20	-33.84	Na3AlF6
Cu (OH) 2	-1.07	7.61	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.93	18.28	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.77	-84.65	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.18	-45.98	-45.80	Cu2Se
Cu2SO4	-19.36	-21.31	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.91	-4.81	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.04	-95.64	-42.59	Cu3Sb
Cu3Se2	-17.48	-80.97	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.07	-24.51	-5.44	CuCrO4
CuF	-8.32	-13.23	-4.91	CuF
CuF2	-16.58	-15.46	1.12	CuF2
CuF2:2H2O	-10.91	-15.46	-4.55	CuF2:2H2O
Cumetal	-4.92	-13.68	-8.76	Cu
CuMoO4	-1.02	-14.09	-13.08	CuMoO4
CuOCuSO4	-13.02	-2.72	10.30	CuOCuSO4
Cupricferrite	14.00	19.99	5.99	CuFe2O4
Cuprite	-1.97	-3.38	-1.41	Cu2O
Cuprousferrite	13.42	4.50	-8.92	CuFeO2
CuSe	-1.89	-34.99	-33.10	CuSe
CuSe2	-20.25	-53.62	-33.37	CuSe2
CuSeO3:2H2O	-8.44	-7.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.82	-20.26	-2.44	CuSeO4:5H2O
CuSO4	-13.27	-10.33	2.94	CuSO4
Diaspore	2.29	9.17	6.87	AlOOH
Djurleite	-48.91	-82.83	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-2.70	-19.24	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-2.15	-19.24	-17.09	CaMg (CO3) 2
Epsomite	-5.22	-7.34	-2.13	MgSO4:7H2O
Fe (OH) 2	-6.33	7.23	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	5.95	2.91	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-4.68	-8.40	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-4.71	-3.15	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-13.60	-34.22	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-37.69	-41.42	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-0.61	19.61	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-8.02	-7.62	0.40	FeAsO4:2H2O
FeCr2O4	-1.37	5.83	7.20	FeCr2O4
FeMoO4	-4.38	-14.47	-10.09	FeMoO4
Ferrihydrite	3.00	6.19	3.19	Fe (OH) 3
Ferroselite	-35.39	-53.99	-18.60	FeSe2
FeS (ppt)	-69.99	-72.94	-2.95	FeS
FeSe	-24.36	-35.36	-11.00	FeSe

Fix_pe	-4.78	-4.78	0.00	e-
Fluorite	-1.48	-11.98	-10.50	CaF2
Galena	-61.04	-75.01	-13.97	PbS
Gibbsite	0.87	9.17	8.29	Al (OH) 3
Goethite	5.70	6.19	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO4:7H2O
Greenockite	-60.41	-74.77	-14.36	CdS
Greigite	-256.04	-301.08	-45.03	Fe3S4
Gummite	-6.25	1.42	7.67	UO3
Gypsum	-2.24	-6.85	-4.61	CaSO4:2H2O
H-Jarosite	-5.20	-17.30	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.82	-21.70	-12.88	H2MoO4
H2S (g)	-72.16	-80.17	-8.01	H2S
H2Se (g)	-37.64	-42.60	-4.96	H2Se
Halite	-8.58	-6.98	1.60	NaCl
Hausmannite	-10.91	50.12	61.03	Mn3O4
Hematite	13.80	12.38	-1.42	Fe2O3
Hercynite	2.67	25.57	22.89	FeAl2O4
Hg (CH3) 2 (g)	-173.77	-247.47	-73.71	Hg (CH3) 2
Hg (g)	-9.27	-17.14	-7.87	Hg
Hg (OH) 2	-11.27	-14.76	-3.50	Hg (OH) 2
Hg2 (g)	-19.33	-34.29	-14.96	Hg2
Hg2 (OH) 2	-15.57	-10.31	5.26	Hg2 (OH) 2
Hg2CO3	-14.72	-30.77	-16.05	Hg2CO3
Hg2CrO4	-33.73	-42.43	-8.70	Hg2CrO4
Hg2F2	-23.02	-33.38	-10.36	Hg2F2
Hg2S	-78.81	-90.49	-11.68	Hg2S
Hg2SeO3	-21.19	-25.85	-4.66	Hg2SeO3
Hg2SO4	-22.12	-28.25	-6.13	Hg2SO4
Hg3O2CO3	-35.06	-64.74	-29.68	Hg3O2CO3
HgCl (g)	-35.58	-16.08	19.50	HgCl
HgCl2	-15.35	-36.61	-21.26	HgCl2
HgF (g)	-49.37	-16.69	32.68	HgF
HgF2 (g)	-50.40	-37.83	12.57	HgF2
Hgmetal (l)	-3.69	-17.14	-13.45	Hg
HgSe	-1.67	-57.36	-55.69	HgSe
HgSeO3	-17.87	-30.30	-12.43	HgSeO3
HgSO4	-23.28	-32.69	-9.42	HgSO4
Huntite	-9.00	-38.97	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.66	-25.43	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-20.11	-28.87	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-18.42	-23.59	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	0.61	-14.19	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-40.76	-58.01	-17.24	K2Cr2O7
K2CrO4	-25.38	-25.89	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.91	-21.64	-0.73	K2SeO4
Langite	-4.99	12.49	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-7.18	-7.61	-0.43	PbO:PbSO4
Laurionite	-6.39	-5.77	0.62	PbOHCl
Lepidocrocite	4.82	6.19	1.37	FeOOH
Lime	-21.61	11.08	32.70	CaO
Litharge	-7.53	5.16	12.69	PbO
Mackinawite	-69.34	-72.94	-3.60	FeS
Maghemite	5.99	12.38	6.39	Fe2O3
Magnesioferrite	6.11	22.97	16.86	Fe2MgO4
Magnesite	-2.41	-9.87	-7.46	MgCO3
Magnetite	16.21	19.61	3.40	Fe3O4
Malachite	0.06	-5.24	-5.31	Cu2 (OH) 2CO3
Manganite	-4.64	20.70	25.34	MnOOH
Massicot	-7.73	5.16	12.89	PbO
Matlockite	-8.33	-17.30	-8.97	PbClF
Melanothallite	-20.50	-14.25	6.26	CuCl2
Melanterite	-8.49	-10.70	-2.21	FeSO4:7H2O
Metacinnabar	-49.84	-94.93	-45.09	HgS
Mg (OH) 2 (active)	-8.20	10.59	18.79	Mg (OH) 2
Mg (VO3) 2	-16.32	-5.04	11.28	Mg (VO3) 2
Mg2Sb3	-265.26	-190.57	74.68	Mg2Sb3

Mg2V2O7	-20.81	5.55	26.36	Mg2V2O7
MgCr2O4	-7.01	9.19	16.20	MgCr2O4
MgCrO4	-26.90	-21.52	5.38	MgCrO4
MgF2	-4.35	-12.48	-8.13	MgF2
MgMoO4	-9.26	-11.11	-1.85	MgMoO4
MgSeO3:6H2O	-8.00	-4.94	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-16.08	-17.28	-1.20	MgSeO4:6H2O
Minium	-34.07	39.45	73.52	Pb3O4
Mirabilite	-8.93	-10.04	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.82	-6.92	4.90	Mn(VO3)2
Mn2(SO4)3	-57.38	-63.09	-5.71	Mn2(SO4)3
Mn2Sb	-146.20	-85.12	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.98	-1.48	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-15.85	-13.14	2.72	MnCl2:4H2O
MnS (grn)	-71.63	-71.46	0.17	MnS
MnS (pnk)	-74.80	-71.46	3.34	MnS
MnSb	-92.30	-95.21	-2.91	MnSb
MnSe	-37.38	-33.88	3.50	MnSe
MnSeO3	-7.95	-6.82	1.13	MnSeO3
MnSeO3:2H2O	-7.80	-6.82	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-17.10	-19.15	-2.05	MnSeO4:5H2O
MnSO4	-11.80	-9.22	2.58	MnSO4
Monteponite	-9.70	5.41	15.10	CdO
Montroydite	-11.12	-14.76	-3.64	HgO
MoO3	-13.70	-21.70	-8.00	MoO3
Morenosite	-9.17	-11.31	-2.14	NiSO4:7H2O
MoS2	-135.76	-206.02	-70.26	MoS2
Na-Jarosite	-2.15	-13.35	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-46.44	-56.34	-9.90	Na2Cr2O7
Na2CrO4	-27.15	-24.22	2.93	Na2CrO4
Na2Mo2O7	-18.91	-35.51	-16.60	Na2Mo2O7
Na2MoO4	-15.30	-13.81	1.49	Na2MoO4
Na2MoO4:2H2O	-15.03	-13.81	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-17.94	-7.64	10.30	Na2SeO3:5H2O
Na2SeO4	-21.26	-19.98	1.28	Na2SeO4
Na3Sb	-173.18	-78.73	94.45	Na3Sb
Na3VO4	-32.66	4.02	36.68	Na3VO4
Na4V2O7	-37.25	0.15	37.40	Na4V2O7
Nantokite	-5.89	-12.62	-6.73	CuCl
NaSb	-85.81	-62.64	23.17	NaSb
Natron	-11.25	-12.56	-1.31	Na2CO3:10H2O
NaVO3	-7.73	-3.87	3.86	NaVO3
Nesquehonite	-5.20	-9.87	-4.67	MgCO3:3H2O
Ni(OH)2	-6.17	6.62	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.47	-7.77	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-23.45	8.55	32.00	Ni4(OH)6SO4
NiCO3	-6.97	-13.84	-6.87	NiCO3
NiMoO4	-3.94	-15.08	-11.14	NiMoO4
NiS (alpha)	-67.95	-73.55	-5.60	NiS
NiS (beta)	-62.45	-73.55	-11.10	NiS
NiS (gamma)	-60.75	-73.55	-12.80	NiS
NiSe	-18.28	-35.98	-17.70	NiSe
NiSeO3:2H2O	-11.73	-8.91	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.73	-21.25	-1.52	NiSeO4:6H2O
Nsutite	-10.16	7.34	17.50	MnO2
O2 (g)	-35.14	47.95	83.09	O2
Orpiment	-217.24	-278.30	-61.07	As2S3
Otavite	-3.05	-15.05	-12.00	CdCO3
Pb(BO2)2	-12.82	-6.30	6.52	Pb(BO2)2
Pb(OH)2	-2.99	5.16	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.38	-71.14	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.40	-0.61	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.87	10.32	26.19	Pb2O(OH)2
Pb2O3	-26.75	34.29	61.04	Pb2O3
Pb2OCO3	-9.58	-10.14	-0.56	Pb2OCO3
Pb2V2O7	-3.42	-5.32	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.95	-12.15	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.30	-0.16	6.14	Pb3(VO4)2

Pb3O2CO3	-16.00	-4.98	11.02	Pb3O2CO3
Pb3O2SO4	-13.14	-2.45	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.40	2.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.17	2.70	21.88	Pb4O3SO4
PbCrO4	-14.35	-26.95	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.06	-18.82	4.25	Pb
PbMoO4	-0.92	-16.54	-15.62	PbMoO4
PbO:0.3H2O	-7.82	5.16	12.98	PbO:0.33H2O
PbSeO4	-15.87	-22.71	-6.84	PbSeO4
Periclase	-10.99	10.59	21.58	MgO
Phosgenite	-12.18	-31.99	-19.81	PbCl2:PbCO3
Plattnerite	-20.47	29.13	49.60	PbO2
Portlandite	-11.72	11.08	22.80	Ca(OH)2
Pyrite	-110.63	-129.14	-18.51	FeS2
Pyrochroite	-6.48	8.72	15.19	Mn(OH)2
Pyrolusite	-8.69	32.69	41.38	MnO2
Realgar	-91.31	-111.05	-19.75	AsS
Retgersite	-9.27	-11.31	-2.04	NiSO4:6H2O
Rhodochrosite	-1.16	-11.74	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-11.53	-18.64	-7.11	Sb(OH)3
Sb2O4	-16.71	-13.30	3.40	Sb2O4
Sb2O5	-28.28	-37.95	-9.67	Sb2O5
Sb2Se3	-97.32	-165.08	-67.76	Sb2Se3
Sb4O6(cubic)	-56.30	-74.56	-18.26	Sb4O6
Sb4O6(orth)	-56.66	-74.56	-17.90	Sb4O6
SbCl3	-51.99	-51.42	0.57	SbCl3
SbF3	-43.02	-53.24	-10.23	SbF3
Sbmetal	-42.91	-54.60	-11.69	Sb
SbO2	-3.14	-30.96	-27.82	SbO2
Schoepite	-4.57	1.42	5.99	UO2(OH)2:H2O
Semetal(am)	-11.51	-18.62	-7.11	Se
Semetal(hex)	-10.92	-18.62	-7.71	Se
Senarmontite	-24.91	-37.28	-12.37	Sb2O3
SeO2	-15.66	-15.53	0.12	SeO2
SeO3	-48.91	-27.87	21.04	SeO3
Siderite	-2.98	-13.22	-10.24	FeCO3
Smithsonite	-3.07	-13.07	-10.00	ZnCO3
Sphalerite	-61.34	-72.79	-11.45	ZnS
Spinel	-7.93	28.92	36.85	MgAl2O4
Stibnite	-227.34	-277.80	-50.46	Sb2S3
Sulfur	-54.05	-56.20	-2.14	S
Tenorite	-0.04	7.61	7.64	CuO
Thenardite	-10.36	-10.04	0.32	Na2SO4
Thermonatrite	-13.20	-12.56	0.64	Na2CO3:H2O
Tyuyamunite	-5.78	-1.70	4.08	Ca(UO2)2(VO4)2
U3O8	-13.14	7.95	21.08	U3O8
U3Sb4	-554.64	-402.26	152.38	U3Sb4
U4O9	-26.34	-29.36	-3.02	U4O9
UF4	-29.94	-59.47	-29.54	UF4
UF4:2.5H2O	-26.75	-59.47	-32.72	UF4:2.5H2O
UO2(am)	-14.27	-13.33	0.93	UO2
UO2(OH)2(beta)	-4.19	1.42	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.19	-26.44	-2.25	UO2SeO4:4H2O
UO3	-6.28	1.42	7.70	UO3
Uraninite	-8.67	-13.33	-4.67	UO2
USb2	-209.28	-179.70	29.58	USb2
V(OH)3	-16.78	-9.19	7.59	V(OH)3
V2O5	-14.28	-15.64	-1.36	V2O5
V3O5	-34.52	-32.68	1.84	V3O5
V4O7	-42.77	-35.58	7.19	V4O7
V6O13	-34.00	-94.86	-60.86	V6O13
Valentinite	-28.80	-37.28	-8.48	Sb2O3
VC12	-61.91	-43.03	18.87	VC12
VC13	-65.41	-41.97	23.43	VC13
VF4	-63.97	-49.04	14.93	VF4
Vmetal	-89.18	-45.16	44.03	V

VO	-35.94	-21.18	14.76	VO
VO(OH)2	-8.05	-2.90	5.15	VO(OH)2
VO2Cl	-21.59	-18.74	2.84	VO2Cl
VOC1	-31.27	-20.12	11.15	VOC1
VOC12	-37.52	-24.75	12.76	VOC12
VOSO4	-24.45	-20.84	3.61	VOSO4
Witherite	-4.35	-12.92	-8.57	BaCO3
Wurtzite	-63.84	-72.79	-8.95	ZnS
Zincite	-3.95	7.38	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO4
Zn(BO2)2	-12.36	-4.07	8.29	Zn(BO2)2
Zn(OH)2	-4.82	7.38	12.20	Zn(OH)2
Zn(OH)2(am)	-5.09	7.38	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.37	7.38	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.15	7.38	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.35	7.38	11.73	Zn(OH)2
Zn2(OH)2SO4	-10.67	-3.17	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-11.35	3.84	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.13	-5.48	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-32.63	-13.72	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-16.81	11.59	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-23.44	15.06	38.50	Zn5(OH)8Cl2
ZnCl2	-21.52	-14.47	7.05	ZnCl2
ZnCO3:1H2O	-2.81	-13.07	-10.26	ZnCO3:1H2O
ZnF2	-15.15	-15.69	-0.53	ZnF2
Znmetal	-42.38	-16.59	25.79	Zn
ZnMoO4	-4.19	-14.32	-10.13	ZnMoO4
ZnO(active)	-3.81	7.38	11.19	ZnO
ZnS(am)	-63.74	-72.79	-9.05	ZnS
ZnSb	-82.21	-71.20	11.01	ZnSb
ZnSe	-20.82	-35.22	-14.40	ZnSe
ZnSeO4:6H2O	-18.97	-20.49	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 117.

```

      REACTION 701
      H2O      -1
      415.9357 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 701
      SAVE Solution 702
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 701. Solution after simulation 116.
Using reaction 701.

Reaction 701.

4.159e+02 moles of the following reaction have been added:

Reactant	Relative moles
----------	-------------------

H2O -1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.354e-08	8.350e-08
Al	4.680e-06	4.677e-06
As	4.083e-08	4.081e-08
B	1.603e-05	1.602e-05
Ba	1.496e-06	1.495e-06
C	1.240e-02	1.240e-02
Ca	5.566e-03	5.563e-03
Cd	1.182e-08	1.182e-08
Cl	1.723e-03	1.722e-03
Co	1.359e-07	1.359e-07
Cr	1.271e-07	1.270e-07
Cu	9.805e-06	9.800e-06
F	4.344e-04	4.342e-04
Fe	2.673e-05	2.672e-05
Hg	2.250e-10	2.249e-10
K	7.318e-04	7.314e-04
Mg	1.759e-03	1.758e-03
Mn	2.405e-05	2.404e-05
Mo	5.642e-07	5.640e-07
Na	4.999e-03	4.996e-03
Ni	2.133e-07	2.131e-07
Pb	2.649e-08	2.648e-08
S	3.656e-03	3.655e-03
Sb	1.326e-08	1.325e-08
Se	4.787e-08	4.784e-08
U	8.563e-08	8.559e-08
V	1.171e-07	1.170e-07
Zn	1.170e-06	1.169e-06

-----Description of solution-----

	pH =	7.147	Charge balance
	pe =	5.131	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	2.628e-02	
	Mass of water (kg) =	9.995e-01	
	Total alkalinity (eq/kg) =	1.102e-02	
	Total CO2 (mol/kg) =	1.240e-02	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	8.605e-16	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	15	
	Total H =	1.109739e+02	
	Total O =	5.553194e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.658e-07	1.412e-07	-6.780	-6.850	-0.070	(0)
H+	8.318e-08	7.127e-08	-7.080	-7.147	-0.067	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.354e-08					
AgCl	5.347e-08	5.347e-08	-7.272	-7.272	0.000	(0)
Ag+	2.071e-08	1.774e-08	-7.684	-7.751	-0.067	(0)

	AgCl2-	8.316e-09	6.874e-09	-8.080	-8.163	-0.083	(0)
	AgSO4-	6.107e-10	5.048e-10	-9.214	-9.297	-0.083	(0)
	Ag2Se	1.999e-10	1.999e-10	-9.699	-9.699	0.000	(0)
	AgCl3-2	1.937e-11	9.044e-12	-10.713	-11.044	-0.331	(0)
	AgF	1.454e-11	1.454e-11	-10.838	-10.838	0.000	(0)
	AgOH	2.505e-13	2.505e-13	-12.601	-12.601	0.000	(0)
	AgCl4-3	1.512e-13	2.726e-14	-12.820	-13.565	-0.744	(0)
	AgH2BO3	3.654e-14	3.654e-14	-13.437	-13.437	0.000	(0)
	AgSeO3-	2.763e-14	2.284e-14	-13.559	-13.641	-0.083	(0)
	Ag (OH) 2-	4.182e-18	3.457e-18	-17.379	-17.461	-0.083	(0)
	Ag (SeO3) 2-3	2.272e-21	4.095e-22	-20.644	-21.388	-0.744	(0)
	Ag2MoO4	3.620e-23	3.620e-23	-22.441	-22.441	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-68.496	-68.496	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-78.007	-79.329	-1.323	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-138.872	-138.955	-0.083	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-139.108	-139.292	-0.184	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-141.242	-141.584	-0.343	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-141.569	-141.895	-0.327	(0)
Al		4.680e-06					
	AlF3	2.289e-06	2.289e-06	-5.640	-5.640	0.000	(0)
	Al (OH) 4-	1.217e-06	1.044e-06	-5.915	-5.981	-0.067	(0)
	AlF2+	6.462e-07	5.574e-07	-6.190	-6.254	-0.064	(0)
	AlF4-	4.363e-07	3.742e-07	-6.360	-6.427	-0.067	(0)
	Al (OH) 3	5.872e-08	5.872e-08	-7.231	-7.231	0.000	(0)
	Al (OH) 2+	2.416e-08	2.084e-08	-7.617	-7.681	-0.064	(0)
	AlF+2	7.754e-09	4.292e-09	-8.110	-8.367	-0.257	(0)
	AlOH+2	3.357e-10	1.858e-10	-9.474	-9.731	-0.257	(0)
	AlSO4+	1.699e-11	1.457e-11	-10.770	-10.837	-0.067	(0)
	Al+3	5.289e-12	1.316e-12	-11.277	-11.881	-0.604	(0)
	Al (SO4) 2-	2.595e-13	2.226e-13	-12.586	-12.652	-0.067	(0)
	AlMo6O21-3	7.402e-39	1.334e-39	-38.131	-38.875	-0.744	(0)
As (3)		2.485e-19					
	H3AsO3	2.464e-19	2.464e-19	-18.608	-18.608	0.000	(0)
	H2AsO3-	2.145e-21	1.773e-21	-20.669	-20.751	-0.083	(0)
	HAsO3-2	4.859e-26	2.269e-26	-25.313	-25.644	-0.331	(0)
	H4AsO3+	1.053e-26	8.701e-27	-25.978	-26.060	-0.083	(0)
	AsO3-3	6.807e-32	1.227e-32	-31.167	-31.911	-0.744	(0)
As (5)		4.083e-08					
	HAsO4-2	2.986e-08	1.394e-08	-7.525	-7.856	-0.331	(0)
	H2AsO4-	1.096e-08	9.064e-09	-7.960	-8.043	-0.083	(0)
	AsO4-3	3.432e-12	6.187e-13	-11.464	-12.209	-0.744	(0)
	H3AsO4	1.116e-13	1.123e-13	-12.952	-12.950	0.003	(0)
B		1.603e-05					
	H3BO3	1.585e-05	1.595e-05	-4.800	-4.797	0.003	(0)
	H2BO3-	1.537e-07	1.299e-07	-6.813	-6.886	-0.073	(0)
	CaH2BO3+	2.061e-08	1.743e-08	-7.686	-7.759	-0.073	(0)
	MgH2BO3+	4.129e-09	3.491e-09	-8.384	-8.457	-0.073	(0)
	BF (OH) 3-	2.455e-09	2.076e-09	-8.610	-8.683	-0.073	(0)
	NaH2BO3	8.714e-10	8.714e-10	-9.060	-9.060	0.000	(0)
	BF2 (OH) 2-	6.105e-12	5.161e-12	-11.214	-11.287	-0.073	(0)
	BaH2BO3+	3.631e-12	3.069e-12	-11.440	-11.513	-0.073	(0)
	H5 (BO3) 2-	2.086e-12	1.764e-12	-11.681	-11.754	-0.073	(0)
	AgH2BO3	3.654e-14	3.654e-14	-13.437	-13.437	0.000	(0)
	H8 (BO3) 3-	3.327e-15	2.812e-15	-14.478	-14.551	-0.073	(0)
	BF3OH-	5.525e-17	4.670e-17	-16.258	-16.331	-0.073	(0)
	BF4-	6.323e-21	5.345e-21	-20.199	-20.272	-0.073	(0)
Ba		1.496e-06					
	Ba+2	1.418e-06	7.644e-07	-5.848	-6.117	-0.269	(0)
	BaHCO3+	7.541e-08	6.528e-08	-7.123	-7.185	-0.063	(0)
	BaCO3	2.306e-09	2.306e-09	-8.637	-8.637	0.000	(0)
	BaH2BO3+	3.631e-12	3.069e-12	-11.440	-11.513	-0.073	(0)
	BaOH+	5.476e-13	4.712e-13	-12.262	-12.327	-0.065	(0)
C (4)		1.240e-02					
	HCO3-	1.037e-02	8.942e-03	-1.984	-2.049	-0.064	(0)
	H2CO3	1.433e-03	1.433e-03	-2.844	-2.844	0.000	(0)
	CaHCO3+	4.483e-04	3.881e-04	-3.348	-3.411	-0.063	(0)
	MgHCO3+	8.294e-05	7.090e-05	-4.081	-4.149	-0.068	(0)
	CaCO3	2.173e-05	2.173e-05	-4.663	-4.663	0.000	(0)

	NaHCO ₃	2.128e-05	2.128e-05	-4.672	-4.672	0.000	(0)
	CO ₃ -2	1.092e-05	5.882e-06	-4.962	-5.230	-0.269	(0)
	CuCO ₃	8.651e-06	8.651e-06	-5.063	-5.063	0.000	(0)
	MgCO ₃	3.791e-06	3.791e-06	-5.421	-5.421	0.000	(0)
	MnHCO ₃ +	1.903e-06	1.638e-06	-5.720	-5.786	-0.065	(0)
	NaCO ₃ -	5.373e-07	4.634e-07	-6.270	-6.334	-0.064	(0)
	Cu (CO ₃) 2-2	2.933e-07	1.370e-07	-6.533	-6.863	-0.331	(0)
	CuHCO ₃ +	1.705e-07	1.409e-07	-6.768	-6.851	-0.083	(0)
	ZnHCO ₃ +	1.386e-07	1.146e-07	-6.858	-6.941	-0.083	(0)
	ZnCO ₃	1.372e-07	1.372e-07	-6.863	-6.863	0.000	(0)
	NiHCO ₃ +	7.666e-08	6.337e-08	-7.115	-7.198	-0.083	(0)
	BaHCO ₃ +	7.541e-08	6.528e-08	-7.123	-7.185	-0.063	(0)
	UO ₂ (CO ₃) 3-4	6.358e-08	3.023e-09	-7.197	-8.520	-1.323	(0)
	FeHCO ₃ +	4.074e-08	3.527e-08	-7.390	-7.453	-0.063	(0)
	CoHCO ₃ +	3.375e-08	2.790e-08	-7.472	-7.554	-0.083	(0)
	UO ₂ (CO ₃) 2-2	2.196e-08	1.026e-08	-7.658	-7.989	-0.331	(0)
	PbCO ₃	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
	NiCO ₃	1.261e-08	1.261e-08	-7.899	-7.899	0.000	(0)
	PbHCO ₃ +	7.230e-09	5.977e-09	-8.141	-8.224	-0.083	(0)
	CoCO ₃	3.988e-09	3.988e-09	-8.399	-8.399	0.000	(0)
	BaCO ₃	2.306e-09	2.306e-09	-8.637	-8.637	0.000	(0)
	CdCO ₃	6.233e-10	6.233e-10	-9.205	-9.205	0.000	(0)
	Pb (CO ₃) 2-2	5.778e-10	2.698e-10	-9.238	-9.569	-0.331	(0)
	CdHCO ₃ +	1.145e-10	9.464e-11	-9.941	-10.024	-0.083	(0)
	UO ₂ CO ₃	8.738e-11	8.738e-11	-10.059	-10.059	0.000	(0)
	Cd (CO ₃) 2-2	5.820e-12	2.718e-12	-11.235	-11.566	-0.331	(0)
	HgCO ₃	3.137e-15	3.137e-15	-14.504	-14.504	0.000	(0)
	Hg (CO ₃) 2-2	1.249e-16	5.834e-17	-15.903	-16.234	-0.331	(0)
	HgHCO ₃ +	5.036e-18	4.163e-18	-17.298	-17.381	-0.083	(0)
Ca	5.566e-03						
	Ca+2	4.325e-03	2.331e-03	-2.364	-2.633	-0.269	(0)
	CaSO ₄	7.614e-04	7.614e-04	-3.118	-3.118	0.000	(0)
	CaHCO ₃ +	4.483e-04	3.881e-04	-3.348	-3.411	-0.063	(0)
	CaCO ₃	2.173e-05	2.173e-05	-4.663	-4.663	0.000	(0)
	CaF+	9.643e-06	8.297e-06	-5.016	-5.081	-0.065	(0)
	CaH ₂ BO ₃ +	2.061e-08	1.743e-08	-7.686	-7.759	-0.073	(0)
	CaOH+	7.585e-09	6.566e-09	-8.120	-8.183	-0.063	(0)
Cd	1.182e-08						
	Cd+2	8.627e-09	4.649e-09	-8.064	-8.333	-0.269	(0)
	CdSO ₄	1.554e-09	1.554e-09	-8.809	-8.809	0.000	(0)
	CdCl+	7.928e-10	6.553e-10	-9.101	-9.184	-0.083	(0)
	CdCO ₃	6.233e-10	6.233e-10	-9.205	-9.205	0.000	(0)
	CdHCO ₃ +	1.145e-10	9.464e-11	-9.941	-10.024	-0.083	(0)
	Cd (SO ₄) 2-2	6.403e-11	2.990e-11	-10.194	-10.524	-0.331	(0)
	CdF+	2.907e-11	2.403e-11	-10.537	-10.619	-0.083	(0)
	CdOH+	6.308e-12	5.214e-12	-11.200	-11.283	-0.083	(0)
	Cd (CO ₃) 2-2	5.820e-12	2.718e-12	-11.235	-11.566	-0.331	(0)
	CdCl ₂	4.033e-12	4.033e-12	-11.394	-11.394	0.000	(0)
	CdOHC1	3.796e-12	3.796e-12	-11.421	-11.421	0.000	(0)
	CdF ₂	1.564e-14	1.564e-14	-13.806	-13.806	0.000	(0)
	Cd (OH) 2	4.646e-15	4.646e-15	-14.333	-14.333	0.000	(0)
	CdCl ₃ -	4.543e-15	3.756e-15	-14.343	-14.425	-0.083	(0)
	CdSeO ₄	7.719e-19	7.719e-19	-18.112	-18.112	0.000	(0)
	Cd ₂ OH+3	6.740e-19	1.215e-19	-18.171	-18.915	-0.744	(0)
	Cd (OH) 3-	4.848e-20	4.008e-20	-19.314	-19.397	-0.083	(0)
	Cd (SeO ₃) 2-2	3.291e-20	1.537e-20	-19.483	-19.813	-0.331	(0)
	Cd (OH) 4-2	1.984e-27	9.264e-28	-26.702	-27.033	-0.331	(0)
	CdHS+	0.000e+00	0.000e+00	-74.801	-74.884	-0.083	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-142.239	-142.239	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-214.816	-214.899	-0.083	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-286.931	-287.262	-0.331	(0)
Cl	1.723e-03						
	Cl-	1.723e-03	1.476e-03	-2.764	-2.831	-0.067	(0)
	AgCl	5.347e-08	5.347e-08	-7.272	-7.272	0.000	(0)
	MnCl+	1.983e-08	1.706e-08	-7.703	-7.768	-0.065	(0)
	AgCl ₂ -	8.316e-09	6.874e-09	-8.080	-8.163	-0.083	(0)
	ZnCl+	1.758e-09	1.503e-09	-8.755	-8.823	-0.068	(0)
	CuCl	1.680e-09	1.680e-09	-8.775	-8.775	0.000	(0)

CdCl+	7.928e-10	6.553e-10	-9.101	-9.184	-0.083	(0)
CuCl+	6.836e-10	5.843e-10	-9.165	-9.233	-0.068	(0)
CuCl2-	6.062e-10	5.181e-10	-9.217	-9.286	-0.068	(0)
ZnOHC1	2.778e-10	2.778e-10	-9.556	-9.556	0.000	(0)
NiCl+	2.626e-10	2.171e-10	-9.581	-9.663	-0.083	(0)
CoCl+	2.477e-10	2.048e-10	-9.606	-9.689	-0.083	(0)
PbCl+	5.699e-11	4.711e-11	-10.244	-10.327	-0.083	(0)
MnCl2	3.557e-11	3.557e-11	-10.449	-10.449	0.000	(0)
AgCl3-2	1.937e-11	9.044e-12	-10.713	-11.044	-0.331	(0)
CdCl2	4.033e-12	4.033e-12	-11.394	-11.394	0.000	(0)
CdOHC1	3.796e-12	3.796e-12	-11.421	-11.421	0.000	(0)
ZnCl2	3.515e-12	3.515e-12	-11.454	-11.454	0.000	(0)
PbCl2	3.106e-13	3.106e-13	-12.508	-12.508	0.000	(0)
CuCl2	2.991e-13	2.991e-13	-12.524	-12.524	0.000	(0)
CuCl3-2	2.984e-13	1.635e-13	-12.525	-12.786	-0.261	(0)
HgClOH	1.640e-13	1.640e-13	-12.785	-12.785	0.000	(0)
AgCl4-3	1.512e-13	2.726e-14	-12.820	-13.565	-0.744	(0)
HgCl2	9.709e-14	9.709e-14	-13.013	-13.013	0.000	(0)
MnCl3-	1.681e-14	1.446e-14	-13.775	-13.840	-0.065	(0)
CrCl+2	6.947e-15	3.244e-15	-14.158	-14.489	-0.331	(0)
ZnCl3-	4.822e-15	4.122e-15	-14.317	-14.385	-0.068	(0)
CdCl3-	4.543e-15	3.756e-15	-14.343	-14.425	-0.083	(0)
HgCl3-	1.734e-15	1.433e-15	-14.761	-14.844	-0.083	(0)
NiCl2	1.613e-15	1.613e-15	-14.792	-14.792	0.000	(0)
FeCl+2	3.203e-16	1.756e-16	-15.494	-15.756	-0.261	(0)
PbCl3-	2.208e-16	1.825e-16	-15.656	-15.739	-0.083	(0)
HgCl4-2	1.804e-17	8.422e-18	-16.744	-17.075	-0.331	(0)
HgCl+	1.588e-17	1.312e-17	-16.799	-16.882	-0.083	(0)
CrOHC12	1.285e-17	1.285e-17	-16.891	-16.891	0.000	(0)
UO2Cl+	1.081e-17	8.933e-18	-16.966	-17.049	-0.083	(0)
ZnCl4-2	5.551e-18	3.042e-18	-17.256	-17.517	-0.261	(0)
CuCl3-	4.820e-18	4.120e-18	-17.317	-17.385	-0.068	(0)
FeCl2+	1.345e-18	1.158e-18	-17.871	-17.936	-0.065	(0)
CrCl2+	5.496e-19	4.543e-19	-18.260	-18.343	-0.083	(0)
PbCl4-2	2.638e-19	1.232e-19	-18.579	-18.910	-0.331	(0)
VOCl+	1.389e-19	1.148e-19	-18.857	-18.940	-0.083	(0)
FeCl3	1.709e-22	1.709e-22	-21.767	-21.767	0.000	(0)
CuCl4-2	5.561e-23	3.048e-23	-22.255	-22.516	-0.261	(0)
CrO3Cl-	1.322e-26	1.093e-26	-25.879	-25.961	-0.083	(0)
CoCl+2	1.390e-35	6.489e-36	-34.857	-35.188	-0.331	(0)
UCl+3	0.000e+00	0.000e+00	-44.449	-45.194	-0.744	(0)
Co (2)	1.359e-07					
Co+2	8.589e-08	4.011e-08	-7.066	-7.397	-0.331	(0)
CoHCO3+	3.375e-08	2.790e-08	-7.472	-7.554	-0.083	(0)
CoSO4	1.141e-08	1.141e-08	-7.943	-7.943	0.000	(0)
CoCO3	3.988e-09	3.988e-09	-8.399	-8.399	0.000	(0)
CoF+	5.004e-10	4.137e-10	-9.301	-9.383	-0.083	(0)
CoCl+	2.477e-10	2.048e-10	-9.606	-9.689	-0.083	(0)
CoOH+	1.367e-10	1.130e-10	-9.864	-9.947	-0.083	(0)
Co (OH) 2	1.267e-12	1.267e-12	-11.897	-11.897	0.000	(0)
CoSeO4	1.792e-17	1.792e-17	-16.747	-16.747	0.000	(0)
Co (OH) 3-	4.320e-18	3.571e-18	-17.365	-17.447	-0.083	(0)
Co2OH+3	1.260e-18	2.271e-19	-17.900	-18.644	-0.744	(0)
CoOOH-	1.084e-18	8.964e-19	-17.965	-18.047	-0.083	(0)
Co (OH) 4-2	1.711e-25	7.992e-26	-24.767	-25.097	-0.331	(0)
Co4 (OH) 4+4	6.841e-31	3.253e-32	-30.165	-31.488	-1.323	(0)
Co (3)	3.320e-29					
CoOH+2	3.320e-29	1.550e-29	-28.479	-28.810	-0.331	(0)
Co+3	8.683e-35	2.160e-35	-34.061	-34.665	-0.604	(0)
CoCl+2	1.390e-35	6.489e-36	-34.857	-35.188	-0.331	(0)
Cr (2)	6.420e-24					
Cr+2	6.420e-24	2.998e-24	-23.192	-23.523	-0.331	(0)
Cr (3)	1.271e-07					
Cr (OH) 2+	1.090e-07	9.013e-08	-6.962	-7.045	-0.083	(0)
Cr (OH) +2	1.123e-08	5.246e-09	-7.949	-8.280	-0.331	(0)
Cr (OH) 3	4.781e-09	4.781e-09	-8.320	-8.320	0.000	(0)
CrOHSO4	1.775e-09	1.775e-09	-8.751	-8.751	0.000	(0)
CrF+2	1.880e-10	8.778e-11	-9.726	-10.057	-0.331	(0)

CrO2-	3.856e-11	3.187e-11	-10.414	-10.497	-0.083	(0)
Cr(OH) 4-	3.251e-11	2.688e-11	-10.488	-10.571	-0.083	(0)
Cr+3	9.420e-12	1.698e-12	-11.026	-11.770	-0.744	(0)
CrSO4+	6.840e-12	5.654e-12	-11.165	-11.248	-0.083	(0)
CrCl+2	6.947e-15	3.244e-15	-14.158	-14.489	-0.331	(0)
Cr2(OH) 2SO4+2	1.802e-15	8.417e-16	-14.744	-15.075	-0.331	(0)
Cr2(OH) 2(SO4) 2	7.130e-17	7.130e-17	-16.147	-16.147	0.000	(0)
CrOHC12	1.285e-17	1.285e-17	-16.891	-16.891	0.000	(0)
CrCl2+	5.496e-19	4.543e-19	-18.260	-18.343	-0.083	(0)
Cr (6)	1.549e-16					
CrO4-2	1.329e-16	7.160e-17	-15.877	-16.145	-0.269	(0)
HCrO4-	1.997e-17	1.651e-17	-16.700	-16.782	-0.083	(0)
NaCrO4-	1.821e-18	1.505e-18	-17.740	-17.822	-0.083	(0)
KCrO4-	1.997e-19	1.651e-19	-18.700	-18.782	-0.083	(0)
CrO3SO4-2	1.095e-24	5.114e-25	-23.960	-24.291	-0.331	(0)
H2CrO4	9.539e-25	9.539e-25	-24.020	-24.020	0.000	(0)
CrO3Cl-	1.322e-26	1.093e-26	-25.879	-25.961	-0.083	(0)
Cr2O7-2	2.026e-32	9.459e-33	-31.693	-32.024	-0.331	(0)
Cu (1)	3.380e-09					
CuCl	1.680e-09	1.680e-09	-8.775	-8.775	0.000	(0)
Cu+	1.094e-09	9.041e-10	-8.961	-9.044	-0.083	(0)
CuCl2-	6.062e-10	5.181e-10	-9.217	-9.286	-0.068	(0)
CuCl3-2	2.984e-13	1.635e-13	-12.525	-12.786	-0.261	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-140.144	-140.478	-0.334	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.889	-141.208	-0.319	(0)
Cu (2)	9.801e-06					
CuCO3	8.651e-06	8.651e-06	-5.063	-5.063	0.000	(0)
Cu+2	4.635e-07	2.498e-07	-6.334	-6.602	-0.269	(0)
Cu(CO3) 2-2	2.933e-07	1.370e-07	-6.533	-6.863	-0.331	(0)
CuHCO3+	1.705e-07	1.409e-07	-6.768	-6.851	-0.083	(0)
CuOH+	1.305e-07	1.115e-07	-6.884	-6.953	-0.068	(0)
CuSO4	8.160e-08	8.160e-08	-7.088	-7.088	0.000	(0)
CuF+	6.218e-09	5.140e-09	-8.206	-8.289	-0.083	(0)
Cu(OH) 2	3.142e-09	3.142e-09	-8.503	-8.503	0.000	(0)
CuCl+	6.836e-10	5.843e-10	-9.165	-9.233	-0.068	(0)
Cu2(OH) 2+2	6.691e-10	3.125e-10	-9.175	-9.505	-0.331	(0)
Cu(OH) 3-	1.101e-12	9.101e-13	-11.958	-12.041	-0.083	(0)
CuCl2	2.991e-13	2.991e-13	-12.524	-12.524	0.000	(0)
CuCl3-	4.820e-18	4.120e-18	-17.317	-17.385	-0.068	(0)
Cu(OH) 4-2	2.166e-18	1.012e-18	-17.664	-17.995	-0.331	(0)
CuCl4-2	5.561e-23	3.048e-23	-22.255	-22.516	-0.261	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-204.299	-204.381	-0.083	(0)
F	4.344e-04					
F-	3.807e-04	3.262e-04	-3.419	-3.487	-0.067	(0)
MgF+	3.306e-05	2.836e-05	-4.481	-4.547	-0.067	(0)
CaF+	9.643e-06	8.297e-06	-5.016	-5.081	-0.065	(0)
AlF3	2.289e-06	2.289e-06	-5.640	-5.640	0.000	(0)
NaF	8.709e-07	8.709e-07	-6.060	-6.060	0.000	(0)
AlF2+	6.462e-07	5.574e-07	-6.190	-6.254	-0.064	(0)
AlF4-	4.363e-07	3.742e-07	-6.360	-6.427	-0.067	(0)
MnF+	1.385e-07	1.192e-07	-6.858	-6.924	-0.065	(0)
HF	3.439e-08	3.439e-08	-7.464	-7.464	0.000	(0)
AlF+2	7.754e-09	4.292e-09	-8.110	-8.367	-0.257	(0)
CuF+	6.218e-09	5.140e-09	-8.206	-8.289	-0.083	(0)
ZnF+	3.191e-09	2.638e-09	-8.496	-8.579	-0.083	(0)
BF(OH) 3-	2.455e-09	2.076e-09	-8.610	-8.683	-0.073	(0)
NiF+	5.697e-10	4.710e-10	-9.244	-9.327	-0.083	(0)
CoF+	5.004e-10	4.137e-10	-9.301	-9.383	-0.083	(0)
CrF+2	1.880e-10	8.778e-11	-9.726	-10.057	-0.331	(0)
HF2-	5.007e-11	4.264e-11	-10.300	-10.370	-0.070	(0)
CdF+	2.907e-11	2.403e-11	-10.537	-10.619	-0.083	(0)
PbF+	2.501e-11	2.068e-11	-10.602	-10.685	-0.083	(0)
AgF	1.454e-11	1.454e-11	-10.838	-10.838	0.000	(0)
FeF2+	1.429e-11	1.230e-11	-10.845	-10.910	-0.065	(0)
BF2(OH) 2-	6.105e-12	5.161e-12	-11.214	-11.287	-0.073	(0)
FeF3	5.659e-12	5.659e-12	-11.247	-11.247	0.000	(0)
FeF+2	2.570e-12	1.409e-12	-11.590	-11.851	-0.261	(0)
UO2F+	2.033e-13	1.680e-13	-12.692	-12.775	-0.083	(0)

UO2F2	1.581e-13	1.581e-13	-12.801	-12.801	0.000	(0)
PbF2	1.327e-13	1.327e-13	-12.877	-12.877	0.000	(0)
UO2F3-	1.567e-14	1.295e-14	-13.805	-13.888	-0.083	(0)
CdF2	1.564e-14	1.564e-14	-13.806	-13.806	0.000	(0)
VO2F	5.280e-15	5.280e-15	-14.277	-14.277	0.000	(0)
H2F2	3.168e-15	3.168e-15	-14.499	-14.499	0.000	(0)
VO2F2-	7.564e-16	6.253e-16	-15.121	-15.204	-0.083	(0)
PbF3-	9.934e-17	8.212e-17	-16.003	-16.086	-0.083	(0)
UO2F4-2	7.186e-17	3.356e-17	-16.143	-16.474	-0.331	(0)
VOF+	6.562e-17	5.424e-17	-16.183	-16.266	-0.083	(0)
BF3OH-	5.525e-17	4.670e-17	-16.258	-16.331	-0.073	(0)
VOF2	6.635e-18	6.635e-18	-17.178	-17.178	0.000	(0)
VO2F3-2	5.448e-18	2.544e-18	-17.264	-17.594	-0.331	(0)
VOF3-	9.289e-20	7.679e-20	-19.032	-19.115	-0.083	(0)
PbF4-2	2.746e-20	1.282e-20	-19.561	-19.892	-0.331	(0)
BF4-	6.323e-21	5.345e-21	-20.199	-20.272	-0.073	(0)
VO2F4-3	2.265e-21	4.083e-22	-20.645	-21.389	-0.744	(0)
VOF4-2	2.165e-22	1.011e-22	-21.665	-21.995	-0.331	(0)
Sb(OH) 2F	1.879e-23	1.879e-23	-22.726	-22.726	0.000	(0)
SbOF	1.848e-23	1.848e-23	-22.733	-22.733	0.000	(0)
HgF+	6.518e-24	5.388e-24	-23.186	-23.269	-0.083	(0)
UF3+	1.447e-33	1.196e-33	-32.840	-32.922	-0.083	(0)
UF2+2	4.955e-35	2.314e-35	-34.305	-34.636	-0.331	(0)
UF4	4.278e-35	4.278e-35	-34.369	-34.369	0.000	(0)
UF5-	6.690e-37	5.530e-37	-36.175	-36.257	-0.083	(0)
UF6-2	1.167e-37	5.447e-38	-36.933	-37.264	-0.331	(0)
UF+3	3.126e-38	5.634e-39	-37.505	-38.249	-0.744	(0)
Fe (2)	8.234e-07					
Fe+2	6.709e-07	3.133e-07	-6.173	-6.504	-0.331	(0)
FeSO4	1.097e-07	1.097e-07	-6.960	-6.960	0.000	(0)
FeHCO3+	4.074e-08	3.527e-08	-7.390	-7.453	-0.063	(0)
FeOH+	2.047e-09	1.761e-09	-8.689	-8.754	-0.065	(0)
Fe(OH) 2	1.976e-13	1.976e-13	-12.704	-12.704	0.000	(0)
Fe(OH) 3-	1.025e-14	8.822e-15	-13.989	-14.054	-0.065	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-146.673	-146.673	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-219.112	-219.195	-0.083	(0)
Fe (3)	2.591e-05					
Fe(OH) 2+	2.287e-05	1.973e-05	-4.641	-4.705	-0.064	(0)
Fe(OH) 3	2.991e-06	2.991e-06	-5.524	-5.524	0.000	(0)
Fe(OH) 4-	4.560e-08	3.933e-08	-7.341	-7.405	-0.064	(0)
FeOH+2	6.551e-10	3.591e-10	-9.184	-9.445	-0.261	(0)
FeF2+	1.429e-11	1.230e-11	-10.845	-10.910	-0.065	(0)
FeF3	5.659e-12	5.659e-12	-11.247	-11.247	0.000	(0)
FeF+2	2.570e-12	1.409e-12	-11.590	-11.851	-0.261	(0)
FeSO4+	7.324e-14	6.302e-14	-13.135	-13.201	-0.065	(0)
Fe+3	1.583e-14	3.938e-15	-13.801	-14.405	-0.604	(0)
Fe(SO4) 2-	2.324e-15	1.921e-15	-14.634	-14.716	-0.083	(0)
FeCl+2	3.203e-16	1.756e-16	-15.494	-15.756	-0.261	(0)
Fe2(OH) 2+4	8.978e-17	4.269e-18	-16.047	-17.370	-1.323	(0)
FeCl2+	1.345e-18	1.158e-18	-17.871	-17.936	-0.065	(0)
FeHSeO3+2	7.990e-19	3.731e-19	-18.097	-18.428	-0.331	(0)
Fe3(OH) 4+5	1.420e-19	1.217e-21	-18.848	-20.915	-2.067	(0)
FeCl3	1.709e-22	1.709e-22	-21.767	-21.767	0.000	(0)
H (0)	3.905e-28					
H2	1.952e-28	1.964e-28	-27.709	-27.707	0.003	(0)
Hg (0)	2.246e-10					
Hg	2.246e-10	2.246e-10	-9.649	-9.649	0.000	(0)
Hg (1)	2.911e-22					
Hg2+2	1.455e-22	6.796e-23	-21.837	-22.168	-0.331	(0)
Hg (2)	3.219e-13					
HgClOH	1.640e-13	1.640e-13	-12.785	-12.785	0.000	(0)
HgCl2	9.709e-14	9.709e-14	-13.013	-13.013	0.000	(0)
Hg(OH) 2	5.572e-14	5.606e-14	-13.254	-13.251	0.003	(0)
HgCO3	3.137e-15	3.137e-15	-14.504	-14.504	0.000	(0)
HgCl3-	1.734e-15	1.433e-15	-14.761	-14.844	-0.083	(0)
Hg(CO3) 2-2	1.249e-16	5.834e-17	-15.903	-16.234	-0.331	(0)
HgCl4-2	1.804e-17	8.422e-18	-16.744	-17.075	-0.331	(0)
HgCl+	1.588e-17	1.312e-17	-16.799	-16.882	-0.083	(0)

		HgHCO3+	5.036e-18	4.163e-18	-17.298	-17.381	-0.083	(0)
		HgOH+	3.030e-18	2.505e-18	-17.519	-17.601	-0.083	(0)
		Hg (OH) 3-	1.206e-21	9.966e-22	-20.919	-21.001	-0.083	(0)
		Hg+2	9.543e-22	4.456e-22	-21.020	-21.351	-0.331	(0)
		HgSO4	1.664e-22	1.664e-22	-21.779	-21.779	0.000	(0)
		HgF+	6.518e-24	5.388e-24	-23.186	-23.269	-0.083	(0)
		HgHS2-	0.000e+00	0.000e+00	-131.312	-131.395	-0.083	(0)
		Hg (HS) 2	0.000e+00	0.000e+00	-132.148	-132.148	0.000	(0)
		HgS2-2	0.000e+00	0.000e+00	-132.625	-132.956	-0.331	(0)
K	7.318e-04							
		K+	7.245e-04	6.208e-04	-3.140	-3.207	-0.067	(0)
		KSO4-	7.266e-06	6.267e-06	-5.139	-5.203	-0.064	(0)
		KCrO4-	1.997e-19	1.651e-19	-18.700	-18.782	-0.083	(0)
Mg	1.759e-03							
		Mg+2	1.438e-03	7.748e-04	-2.842	-3.111	-0.269	(0)
		MgSO4	2.011e-04	2.011e-04	-3.697	-3.697	0.000	(0)
		MgHCO3+	8.294e-05	7.090e-05	-4.081	-4.149	-0.068	(0)
		MgF+	3.306e-05	2.836e-05	-4.481	-4.547	-0.067	(0)
		MgCO3	3.791e-06	3.791e-06	-5.421	-5.421	0.000	(0)
		MgOH+	5.017e-08	4.356e-08	-7.300	-7.361	-0.061	(0)
		MgH2BO3+	4.129e-09	3.491e-09	-8.384	-8.457	-0.073	(0)
Mn (2)	2.405e-05							
		Mn+2	1.966e-05	9.179e-06	-4.706	-5.037	-0.331	(0)
		MnSO4	2.328e-06	2.328e-06	-5.633	-5.633	0.000	(0)
		MnHCO3+	1.903e-06	1.638e-06	-5.720	-5.786	-0.065	(0)
		MnF+	1.385e-07	1.192e-07	-6.858	-6.924	-0.065	(0)
		MnCl+	1.983e-08	1.706e-08	-7.703	-7.768	-0.065	(0)
		MnOH+	3.784e-09	3.256e-09	-8.422	-8.487	-0.065	(0)
		MnCl2	3.557e-11	3.557e-11	-10.449	-10.449	0.000	(0)
		MnCl3-	1.681e-14	1.446e-14	-13.775	-13.840	-0.065	(0)
		MnSeO4	2.203e-15	2.203e-15	-14.657	-14.657	0.000	(0)
		Mn (OH) 3-	4.663e-19	4.012e-19	-18.331	-18.397	-0.065	(0)
		Mn (OH) 4-2	3.338e-25	1.829e-25	-24.477	-24.738	-0.261	(0)
		MnSe	2.949e-40	2.949e-40	-39.530	-39.530	0.000	(0)
Mn (3)	2.230e-25							
		Mn+3	2.230e-25	5.548e-26	-24.652	-25.256	-0.604	(0)
Mn (6)	0.000e+00							
		MnO4-2	0.000e+00	0.000e+00	-45.497	-45.758	-0.261	(0)
Mn (7)	0.000e+00							
		MnO4-	0.000e+00	0.000e+00	-49.928	-49.999	-0.071	(0)
Mo	5.642e-07							
		MoO4-2	5.637e-07	3.038e-07	-6.249	-6.517	-0.269	(0)
		HMoO4-	5.211e-10	4.308e-10	-9.283	-9.366	-0.083	(0)
		H2MoO4	2.249e-13	2.249e-13	-12.648	-12.648	0.000	(0)
		Ag2MoO4	3.620e-23	3.620e-23	-22.441	-22.441	0.000	(0)
		AlMo6O21-3	7.402e-39	1.334e-39	-38.131	-38.875	-0.744	(0)
		Mo7O24-6	0.000e+00	0.000e+00	-46.831	-49.808	-2.976	(0)
		HMo7O24-5	0.000e+00	0.000e+00	-48.501	-50.568	-2.067	(0)
		H2Mo7O24-4	0.000e+00	0.000e+00	-51.610	-52.933	-1.323	(0)
		H3Mo7O24-3	0.000e+00	0.000e+00	-56.090	-56.834	-0.744	(0)
Na	4.999e-03							
		Na+	4.939e-03	4.231e-03	-2.306	-2.374	-0.067	(0)
		NaSO4-	3.757e-05	3.241e-05	-4.425	-4.489	-0.064	(0)
		NaHCO3	2.128e-05	2.128e-05	-4.672	-4.672	0.000	(0)
		NaF	8.709e-07	8.709e-07	-6.060	-6.060	0.000	(0)
		NaCO3-	5.373e-07	4.634e-07	-6.270	-6.334	-0.064	(0)
		NaH2BO3	8.714e-10	8.714e-10	-9.060	-9.060	0.000	(0)
		NaCrO4-	1.821e-18	1.505e-18	-17.740	-17.822	-0.083	(0)
Ni	2.133e-07							
		Ni+2	1.067e-07	5.748e-08	-6.972	-7.240	-0.269	(0)
		NiHCO3+	7.666e-08	6.337e-08	-7.115	-7.198	-0.083	(0)
		NiSO4	1.636e-08	1.636e-08	-7.786	-7.786	0.000	(0)
		NiCO3	1.261e-08	1.261e-08	-7.899	-7.899	0.000	(0)
		NiF+	5.697e-10	4.710e-10	-9.244	-9.327	-0.083	(0)
		NiCl+	2.626e-10	2.171e-10	-9.581	-9.663	-0.083	(0)
		NiOH+	1.236e-10	1.022e-10	-9.908	-9.991	-0.083	(0)
		Ni (SO4) 2-2	1.654e-12	7.724e-13	-11.781	-12.112	-0.331	(0)
		Ni (OH) 2	1.146e-12	1.146e-12	-11.941	-11.941	0.000	(0)

NiCl2	1.613e-15	1.613e-15	-14.792	-14.792	0.000	(0)
Ni(OH) 3-	1.958e-16	1.618e-16	-15.708	-15.791	-0.083	(0)
NiSeO4	2.397e-17	2.397e-17	-16.620	-16.620	0.000	(0)
O(0)	2.609e-37					
O2	1.305e-37	1.313e-37	-36.885	-36.882	0.003	(0)
Pb	2.649e-08					
PbCO3	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
PbHCO3+	7.230e-09	5.977e-09	-8.141	-8.224	-0.083	(0)
Pb+2	1.669e-09	8.995e-10	-8.777	-9.046	-0.269	(0)
PbSO4	6.283e-10	6.283e-10	-9.202	-9.202	0.000	(0)
Pb(CO3) 2-2	5.778e-10	2.698e-10	-9.238	-9.569	-0.331	(0)
PbOH+	3.860e-10	3.191e-10	-9.413	-9.496	-0.083	(0)
PbCl+	5.699e-11	4.711e-11	-10.244	-10.327	-0.083	(0)
PbF+	2.501e-11	2.068e-11	-10.602	-10.685	-0.083	(0)
Pb(SO4) 2-2	1.156e-11	5.399e-12	-10.937	-11.268	-0.331	(0)
Pb(OH) 2	1.425e-12	1.425e-12	-11.846	-11.846	0.000	(0)
PbCl2	3.106e-13	3.106e-13	-12.508	-12.508	0.000	(0)
PbF2	1.327e-13	1.327e-13	-12.877	-12.877	0.000	(0)
Pb(OH) 3-	2.434e-16	2.012e-16	-15.614	-15.696	-0.083	(0)
PbCl3-	2.208e-16	1.825e-16	-15.656	-15.739	-0.083	(0)
PbF3-	9.934e-17	8.212e-17	-16.003	-16.086	-0.083	(0)
Pb2OH+3	2.524e-17	4.549e-18	-16.598	-17.342	-0.744	(0)
PbCl4-2	2.638e-19	1.232e-19	-18.579	-18.910	-0.331	(0)
PbF4-2	2.746e-20	1.282e-20	-19.561	-19.892	-0.331	(0)
Pb(OH) 4-2	1.490e-20	6.958e-21	-19.827	-20.158	-0.331	(0)
Pb3(OH) 4+2	7.802e-23	3.643e-23	-22.108	-22.438	-0.331	(0)
Pb4(OH) 4+4	5.475e-27	2.603e-28	-26.262	-27.584	-1.323	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-142.895	-142.895	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-216.071	-216.154	-0.083	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-68.496	-68.496	0.000	(0)
HS-	0.000e+00	0.000e+00	-74.477	-74.559	-0.083	(0)
H2S	0.000e+00	0.000e+00	-74.686	-74.686	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.801	-74.884	-0.083	(0)
S5-2	0.000e+00	0.000e+00	-76.447	-76.777	-0.331	(0)
S6-2	0.000e+00	0.000e+00	-76.963	-77.293	-0.331	(0)
S4-2	0.000e+00	0.000e+00	-77.042	-77.373	-0.331	(0)
S3-2	0.000e+00	0.000e+00	-77.848	-78.179	-0.331	(0)
S2-2	0.000e+00	0.000e+00	-78.864	-79.195	-0.331	(0)
S-2	0.000e+00	0.000e+00	-84.451	-84.712	-0.261	(0)
HgHS2-	0.000e+00	0.000e+00	-131.312	-131.395	-0.083	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-132.148	-132.148	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.625	-132.956	-0.331	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-138.872	-138.955	-0.083	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-139.108	-139.292	-0.184	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-140.144	-140.478	-0.334	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.889	-141.208	-0.319	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-141.242	-141.584	-0.343	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-141.471	-141.554	-0.083	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.569	-141.895	-0.327	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-142.239	-142.239	0.000	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-142.691	-142.691	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-142.895	-142.895	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-146.673	-146.673	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-204.299	-204.381	-0.083	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-213.888	-213.970	-0.083	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-214.816	-214.899	-0.083	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-216.071	-216.154	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-216.472	-216.803	-0.331	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-219.112	-219.195	-0.083	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-286.931	-287.262	-0.331	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-289.659	-289.990	-0.331	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.384	-299.714	-0.331	(0)
S(6)	3.656e-03					
SO4-2	2.646e-03	1.426e-03	-2.577	-2.846	-0.269	(0)
CaSO4	7.614e-04	7.614e-04	-3.118	-3.118	0.000	(0)
MgSO4	2.011e-04	2.011e-04	-3.697	-3.697	0.000	(0)
NaSO4-	3.757e-05	3.241e-05	-4.425	-4.489	-0.064	(0)

KSO4-	7.266e-06	6.267e-06	-5.139	-5.203	-0.064	(0)
MnSO4	2.328e-06	2.328e-06	-5.633	-5.633	0.000	(0)
ZnSO4	1.264e-07	1.264e-07	-6.898	-6.898	0.000	(0)
FeSO4	1.097e-07	1.097e-07	-6.960	-6.960	0.000	(0)
CuSO4	8.160e-08	8.160e-08	-7.088	-7.088	0.000	(0)
NiSO4	1.636e-08	1.636e-08	-7.786	-7.786	0.000	(0)
HSO4-	1.158e-08	9.933e-09	-7.936	-8.003	-0.067	(0)
CoSO4	1.141e-08	1.141e-08	-7.943	-7.943	0.000	(0)
Zn(SO4) 2-2	3.363e-09	1.570e-09	-8.473	-8.804	-0.331	(0)
CrOHSO4	1.775e-09	1.775e-09	-8.751	-8.751	0.000	(0)
CdSO4	1.554e-09	1.554e-09	-8.809	-8.809	0.000	(0)
PbSO4	6.283e-10	6.283e-10	-9.202	-9.202	0.000	(0)
AgSO4-	6.107e-10	5.048e-10	-9.214	-9.297	-0.083	(0)
Cd(SO4) 2-2	6.403e-11	2.990e-11	-10.194	-10.524	-0.331	(0)
AlSO4+	1.699e-11	1.457e-11	-10.770	-10.837	-0.067	(0)
Pb(SO4) 2-2	1.156e-11	5.399e-12	-10.937	-11.268	-0.331	(0)
CrSO4+	6.840e-12	5.654e-12	-11.165	-11.248	-0.083	(0)
Ni(SO4) 2-2	1.654e-12	7.724e-13	-11.781	-12.112	-0.331	(0)
Al(SO4) 2-	2.595e-13	2.226e-13	-12.586	-12.652	-0.067	(0)
FeSO4+	7.324e-14	6.302e-14	-13.135	-13.201	-0.065	(0)
UO2SO4	8.055e-15	8.055e-15	-14.094	-14.094	0.000	(0)
Fe(SO4) 2-	2.324e-15	1.921e-15	-14.634	-14.716	-0.083	(0)
Cr2(OH) 2SO4+2	1.802e-15	8.417e-16	-14.744	-15.075	-0.331	(0)
VO2SO4-	3.802e-16	3.143e-16	-15.420	-15.503	-0.083	(0)
UO2(SO4) 2-2	3.243e-16	1.514e-16	-15.489	-15.820	-0.331	(0)
Cr2(OH) 2(SO4) 2	7.130e-17	7.130e-17	-16.147	-16.147	0.000	(0)
VOSO4	1.089e-17	1.089e-17	-16.963	-16.963	0.000	(0)
HgSO4	1.664e-22	1.664e-22	-21.779	-21.779	0.000	(0)
CrO3SO4-2	1.095e-24	5.114e-25	-23.960	-24.291	-0.331	(0)
VSO4+	4.211e-31	3.481e-31	-30.376	-30.458	-0.083	(0)
U(SO4) 2	5.567e-40	5.567e-40	-39.254	-39.254	0.000	(0)
USO4+2	1.053e-40	0.000e+00	-39.978	-40.308	-0.331	(0)
Sb(3)	1.022e-18					
Sb(OH) 3	5.171e-19	5.171e-19	-18.286	-18.286	0.000	(0)
HSbO2	5.050e-19	5.050e-19	-18.297	-18.297	0.000	(0)
Sb(OH) 2F	1.879e-23	1.879e-23	-22.726	-22.726	0.000	(0)
SbOF	1.848e-23	1.848e-23	-22.733	-22.733	0.000	(0)
SbO2-	1.388e-23	1.148e-23	-22.858	-22.940	-0.083	(0)
Sb(OH) 4-	7.947e-24	6.570e-24	-23.100	-23.182	-0.083	(0)
Sb(OH) 2+	1.083e-24	8.954e-25	-23.965	-24.048	-0.083	(0)
SbO+	3.736e-25	3.088e-25	-24.428	-24.510	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.384	-299.714	-0.331	(0)
Sb(5)	1.326e-08					
SbO3-	1.324e-08	1.095e-08	-7.878	-7.961	-0.083	(0)
Sb(OH) 6-	1.493e-11	1.279e-11	-10.826	-10.893	-0.067	(0)
SbO2+	1.931e-23	1.596e-23	-22.714	-22.797	-0.083	(0)
Se(-2)	1.999e-10					
Ag2Se	1.999e-10	1.999e-10	-9.699	-9.699	0.000	(0)
HSe-	6.721e-37	5.556e-37	-36.173	-36.255	-0.083	(0)
H2Se	3.074e-40	3.074e-40	-39.512	-39.512	0.000	(0)
MnSe	2.949e-40	2.949e-40	-39.530	-39.530	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.777	-44.108	-0.331	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-78.007	-79.329	-1.323	(0)
Se(4)	4.766e-08					
HSeO3-	4.337e-08	3.585e-08	-7.363	-7.445	-0.083	(0)
SeO3-2	4.289e-09	2.003e-09	-8.368	-8.698	-0.331	(0)
H2SeO3	1.090e-12	1.090e-12	-11.963	-11.963	0.000	(0)
AgSeO3-	2.763e-14	2.284e-14	-13.559	-13.641	-0.083	(0)
FeHSeO3+2	7.990e-19	3.731e-19	-18.097	-18.428	-0.331	(0)
Cd(SeO3) 2-2	3.291e-20	1.537e-20	-19.483	-19.813	-0.331	(0)
Ag(SeO3) 2-3	2.272e-21	4.095e-22	-20.644	-21.388	-0.744	(0)
Se(6)	1.657e-12					
SeO4-2	1.655e-12	8.917e-13	-11.781	-12.050	-0.269	(0)
MnSeO4	2.203e-15	2.203e-15	-14.657	-14.657	0.000	(0)
ZnSeO4	5.597e-17	5.597e-17	-16.252	-16.252	0.000	(0)
NiSeO4	2.397e-17	2.397e-17	-16.620	-16.620	0.000	(0)
CoSeO4	1.792e-17	1.792e-17	-16.747	-16.747	0.000	(0)
HSeO4-	3.853e-18	3.185e-18	-17.414	-17.497	-0.083	(0)

CdSeO4	7.719e-19	7.719e-19	-18.112	-18.112	0.000	(0)
Zn (SeO4) 2-2	1.084e-28	5.060e-29	-27.965	-28.296	-0.331	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.246	-57.990	-0.744	(0)
U (4)	4.319e-22					
U (OH) 5-	4.309e-22	3.562e-22	-21.366	-21.448	-0.083	(0)
U (OH) 4	1.064e-24	1.064e-24	-23.973	-23.973	0.000	(0)
U (OH) 3+	3.354e-28	2.773e-28	-27.474	-27.557	-0.083	(0)
U (OH) 2+2	1.958e-32	9.143e-33	-31.708	-32.039	-0.331	(0)
UF3+	1.447e-33	1.196e-33	-32.840	-32.922	-0.083	(0)
UF2+2	4.955e-35	2.314e-35	-34.305	-34.636	-0.331	(0)
UF4	4.278e-35	4.278e-35	-34.369	-34.369	0.000	(0)
UF5-	6.690e-37	5.530e-37	-36.175	-36.257	-0.083	(0)
UOH+3	1.703e-37	3.071e-38	-36.769	-37.513	-0.744	(0)
UF6-2	1.167e-37	5.447e-38	-36.933	-37.264	-0.331	(0)
UF+3	3.126e-38	5.634e-39	-37.505	-38.249	-0.744	(0)
U (SO4) 2	5.567e-40	5.567e-40	-39.254	-39.254	0.000	(0)
USO4+2	1.053e-40	0.000e+00	-39.978	-40.308	-0.331	(0)
U+4	0.000e+00	0.000e+00	-42.740	-44.063	-1.323	(0)
UC1+3	0.000e+00	0.000e+00	-44.449	-45.194	-0.744	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.631	-174.328	-6.697	(0)
U (5)	2.034e-17					
UO2+	2.034e-17	1.681e-17	-16.692	-16.774	-0.083	(0)
U (6)	8.563e-08					
UO2 (CO3) 3-4	6.358e-08	3.023e-09	-7.197	-8.520	-1.323	(0)
UO2 (CO3) 2-2	2.196e-08	1.026e-08	-7.658	-7.989	-0.331	(0)
UO2CO3	8.738e-11	8.738e-11	-10.059	-10.059	0.000	(0)
UO2F+	2.033e-13	1.680e-13	-12.692	-12.775	-0.083	(0)
UO2F2	1.581e-13	1.581e-13	-12.801	-12.801	0.000	(0)
UO2OH+	8.025e-14	6.634e-14	-13.096	-13.178	-0.083	(0)
UO2F3-	1.567e-14	1.295e-14	-13.805	-13.888	-0.083	(0)
UO2SO4	8.055e-15	8.055e-15	-14.094	-14.094	0.000	(0)
UO2+2	6.925e-15	3.732e-15	-14.160	-14.428	-0.269	(0)
UO2 (SO4) 2-2	3.243e-16	1.514e-16	-15.489	-15.820	-0.331	(0)
UO2F4-2	7.186e-17	3.356e-17	-16.143	-16.474	-0.331	(0)
UO2C1+	1.081e-17	8.933e-18	-16.966	-17.049	-0.083	(0)
(UO2) 2 (OH) 2+2	1.564e-20	7.303e-21	-19.806	-20.136	-0.331	(0)
(UO2) 3 (OH) 5+	8.865e-24	7.328e-24	-23.052	-23.135	-0.083	(0)
V (2)	1.436e-39					
VOH+	1.035e-39	8.553e-40	-38.985	-39.068	-0.083	(0)
V+2	4.009e-40	1.872e-40	-39.397	-39.728	-0.331	(0)
V (3)	1.175e-12					
V (OH) 3	1.175e-12	1.175e-12	-11.930	-11.930	0.000	(0)
V (OH) 2+	6.546e-23	5.411e-23	-22.184	-22.267	-0.083	(0)
VOH+2	7.837e-26	3.660e-26	-25.106	-25.437	-0.331	(0)
V+3	2.869e-30	5.171e-31	-29.542	-30.286	-0.744	(0)
VSO4+	4.211e-31	3.481e-31	-30.376	-30.458	-0.083	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.507	-49.251	-0.744	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.750	-50.073	-1.323	(0)
V (4)	1.087e-15					
V (OH) 3+	9.445e-16	7.807e-16	-15.025	-15.107	-0.083	(0)
VOF+	6.562e-17	5.424e-17	-16.183	-16.266	-0.083	(0)
VO+2	5.937e-17	2.772e-17	-16.226	-16.557	-0.331	(0)
VOSO4	1.089e-17	1.089e-17	-16.963	-16.963	0.000	(0)
VOF2	6.635e-18	6.635e-18	-17.178	-17.178	0.000	(0)
VOC1+	1.389e-19	1.148e-19	-18.857	-18.940	-0.083	(0)
VOF3-	9.289e-20	7.679e-20	-19.032	-19.115	-0.083	(0)
VOF4-2	2.165e-22	1.011e-22	-21.665	-21.995	-0.331	(0)
H2V2O4+2	6.549e-26	3.058e-26	-25.184	-25.515	-0.331	(0)
V (5)	1.171e-07					
H2VO4-	1.100e-07	9.096e-08	-6.958	-7.041	-0.083	(0)
HVO4-2	6.865e-09	3.206e-09	-8.163	-8.494	-0.331	(0)
H3VO4	6.483e-11	6.483e-11	-10.188	-10.188	0.000	(0)
H3V2O7-	4.608e-11	3.809e-11	-10.336	-10.419	-0.083	(0)
HV2O7-3	5.484e-13	9.886e-14	-12.261	-13.005	-0.744	(0)
VO2+	1.077e-14	9.229e-15	-13.968	-14.035	-0.067	(0)
VO2F	5.280e-15	5.280e-15	-14.277	-14.277	0.000	(0)
V3O9-3	4.379e-15	7.893e-16	-14.359	-15.103	-0.744	(0)

VO4-3	1.251e-15	2.254e-16	-14.903	-15.647	-0.744	(0)
V2O7-4	7.852e-16	3.733e-17	-15.105	-16.428	-1.323	(0)
VO2F2-	7.564e-16	6.253e-16	-15.121	-15.204	-0.083	(0)
VO2SO4-	3.802e-16	3.143e-16	-15.420	-15.503	-0.083	(0)
VO2F3-2	5.448e-18	2.544e-18	-17.264	-17.594	-0.331	(0)
V4O12-4	6.297e-19	2.994e-20	-18.201	-19.524	-1.323	(0)
VO2F4-3	2.265e-21	4.083e-22	-20.645	-21.389	-0.744	(0)
HV10028-5	0.000e+00	0.000e+00	-46.985	-49.052	-2.067	(0)
V10028-6	0.000e+00	0.000e+00	-47.115	-50.091	-2.976	(0)
H2V10028-4	0.000e+00	0.000e+00	-49.668	-50.991	-1.323	(0)
Zn	1.170e-06					
Zn+2	7.520e-07	4.053e-07	-6.124	-6.392	-0.269	(0)
ZnHCO3+	1.386e-07	1.146e-07	-6.858	-6.941	-0.083	(0)
ZnCO3	1.372e-07	1.372e-07	-6.863	-6.863	0.000	(0)
ZnSO4	1.264e-07	1.264e-07	-6.898	-6.898	0.000	(0)
ZnOH+	6.923e-09	5.723e-09	-8.160	-8.242	-0.083	(0)
Zn(SO4) 2-2	3.363e-09	1.570e-09	-8.473	-8.804	-0.331	(0)
ZnF+	3.191e-09	2.638e-09	-8.496	-8.579	-0.083	(0)
ZnCl+	1.758e-09	1.503e-09	-8.755	-8.823	-0.068	(0)
ZnOHCl	2.778e-10	2.778e-10	-9.556	-9.556	0.000	(0)
Zn(OH) 2	1.281e-10	1.281e-10	-9.893	-9.893	0.000	(0)
ZnCl2	3.515e-12	3.515e-12	-11.454	-11.454	0.000	(0)
Zn(OH) 3-	1.096e-13	9.064e-14	-12.960	-13.043	-0.083	(0)
ZnCl3-	4.822e-15	4.122e-15	-14.317	-14.385	-0.068	(0)
ZnSeO4	5.597e-17	5.597e-17	-16.252	-16.252	0.000	(0)
ZnCl4-2	5.551e-18	3.042e-18	-17.256	-17.517	-0.261	(0)
Zn(OH) 4-2	1.091e-18	5.095e-19	-17.962	-18.293	-0.331	(0)
Zn(SeO4) 2-2	1.084e-28	5.060e-29	-27.965	-28.296	-0.331	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-141.471	-141.554	-0.083	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-142.691	-142.691	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-213.888	-213.970	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-216.472	-216.803	-0.331	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-289.659	-289.990	-0.331	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Acanthite	-46.69	-82.91	-36.22	Ag2S
Ag2CO3	-9.64	-20.73	-11.09	Ag2CO3
Ag2CrO4	-20.06	-31.65	-11.59	Ag2CrO4
Ag2HVO4	-9.58	-8.10	1.48	Ag2HVO4
Ag2MoO4	-10.47	-22.02	-11.55	Ag2MoO4
Ag2O	-13.78	-1.21	12.57	Ag2O
Ag2Se	4.09	-44.61	-48.70	Ag2Se
Ag2SeO3	-8.65	-15.80	-7.15	Ag2SeO3
Ag2SeO4	-18.64	-27.55	-8.91	Ag2SeO4
Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.58	-20.42	2.16	Ag3AsO3
Ag3AsO4	-11.97	-14.76	-2.79	Ag3AsO4
Ag3H2VO5	-13.88	-8.70	5.18	Ag3H2VO5
AgF:4H2O	-12.29	-11.24	1.05	AgF:4H2O
Agmetal	0.62	-12.88	-13.51	Ag
AgVO3	-8.26	-7.49	0.77	AgVO3
Al(OH) 3 (am)	-1.24	9.56	10.80	Al(OH) 3
Al2(MoO4) 3	-45.68	-43.31	2.37	Al2(MoO4) 3
Al2O3	-0.53	19.12	19.65	Al2O3
Al4(OH) 10SO4	-1.60	21.10	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-8.19	-3.39	4.80	AlAsO4:2H2O
AlOHSO4	-4.35	-7.58	-3.23	AlOHSO4
AlSb	-148.02	-82.40	65.62	AlSb
Alunite	-0.26	-1.66	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-4.10	-11.89	-7.79	PbSO4
Anhydrite	-1.12	-5.48	-4.36	CaSO4
Anilite	-50.75	-82.63	-31.88	Cu0.25Cu1.5S
Antlerite	-2.85	5.93	8.79	Cu3(OH) 4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-71.67	-74.43	-2.76	As4O6

Artinite	-6.76	2.84	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-32.60	-25.90	6.71	As2O5
Atacamite	-1.99	5.40	7.39	Cu2 (OH) 3Cl
Azurite	0.93	-15.97	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.22	8.18	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-13.29	2.58	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.54	-1.37	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-22.18	10.76	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.59	-22.26	-9.67	BaCrO4
BaF2	-7.27	-13.09	-5.82	BaF2
BaMoO4	-5.67	-12.63	-6.96	BaMoO4
Barite	1.02	-8.96	-9.98	BaSO4
BaS	-89.71	-73.53	16.18	BaS
BaSeO3	-8.25	-6.42	1.83	BaSeO3
BaSeO4	-10.71	-18.17	-7.46	BaSeO4
Bianchite	-7.47	-9.24	-1.76	ZnSO4:6H2O
Birnessite	-9.63	8.46	18.09	MnO2
Bixbyite	-6.99	-7.63	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.33	-78.61	-27.28	Cu0.6Cu0.8S
Boehmite	0.98	9.56	8.58	AlOOH
Breithauptite	-54.10	-72.62	-18.52	NiSb
Brochantite	-1.60	13.63	15.22	Cu4 (OH) 6SO4
Brucite	-5.66	11.18	16.84	Mg (OH) 2
Bunsenite	-5.39	7.05	12.45	NiO
Ca (VO3) 2	-7.77	-2.11	5.66	Ca (VO3) 2
Ca2V2O7	-7.95	9.55	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.01	9.55	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-13.22	9.08	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.75	21.21	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.65	21.21	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-291.90	-148.93	142.97	Ca3Sb2
CaCrO4	-16.51	-18.78	-2.27	CaCrO4
Calcite	0.62	-7.86	-8.48	CaCO3
Calomel	-9.92	-27.83	-17.91	Hg2Cl2
CaMoO4	-1.20	-9.15	-7.95	CaMoO4
Carnotite	-3.31	-3.08	0.23	KUO2VO4
CaSeO3:2H2O	-5.75	-2.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.66	-14.68	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.47	-3.63	9.84	Cd (BO2) 2
Cd (OH) 2	-7.68	5.96	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.77	5.96	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-23.11	-16.40	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.82	0.74	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-21.70	6.70	28.40	Cd4 (OH) 6SO4
CdCl2	-13.34	-13.99	-0.66	CdCl2
CdCl2:1H2O	-12.30	-13.99	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.08	-13.99	-1.91	CdCl2:2.5H2O
CdF2	-14.09	-15.31	-1.21	CdF2
Cdmetal (alpha)	-32.11	-18.60	13.51	Cd
Cdmetal (gamma)	-32.21	-18.60	13.62	Cd
CdMoO4	-0.70	-14.85	-14.15	CdMoO4
CdOHCl	-7.55	-4.02	3.54	CdOHCl
CdSb	-73.37	-73.72	-0.35	CdSb
CdSe	-17.24	-37.44	-20.20	CdSe
CdSeO4:2H2O	-18.53	-20.38	-1.85	CdSeO4:2H2O
CdSO4	-11.01	-11.18	-0.17	CdSO4
CdSO4:1H2O	-9.45	-11.18	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.31	-11.18	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.15	-14.28	-13.13	PbCO3
CH4 (g)	-76.71	-117.75	-41.05	CH4
Chalcanthite	-6.81	-9.45	-2.64	CuSO4:5H2O
Chalcocite	-50.58	-85.50	-34.92	Cu2S
Chalcopyrite	-112.66	-147.93	-35.27	CuFeS2
Cinnabar	-49.26	-94.96	-45.69	HgS
Claudetite	-71.37	-74.43	-3.06	As4O6
Clausthalite	-11.05	-38.15	-27.10	PbSe

Co(BO2)2	-29.77	-2.70	27.07	Co(BO2)2
Co(OH)2	-6.20	6.90	13.09	Co(OH)2
Co(OH)3	-10.92	-13.22	-2.31	Co(OH)3
CO2(g)	-1.38	-19.52	-18.15	CO2
Co3(AsO4)2	-18.24	-5.21	13.03	Co3(AsO4)2
Co3O4	-9.06	-19.55	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-2.65	-12.63	-9.98	CoCO3
CoF2	-12.77	-14.37	-1.60	CoF2
CoF3	-43.67	-45.13	-1.46	CoF3
CoFe2O4	24.50	20.97	-3.53	CoFe2O4
CoMoO4	-6.15	-13.91	-7.76	CoMoO4
CoO	-6.69	6.90	13.59	CoO
CoS(alpha)	-67.37	-74.81	-7.44	CoS
CoS(beta)	-63.74	-74.81	-11.07	CoS
CoSe	-20.30	-36.50	-16.20	CoSe
CoSeO3	-9.02	-7.70	1.32	CoSeO3
CoSeO4:6H2O	-17.92	-19.45	-1.53	CoSeO4:6H2O
CoSO4	-13.05	-10.24	2.80	CoSO4
CoSO4:6H2O	-7.77	-10.24	-2.47	CoSO4:6H2O
Cotunnite	-9.93	-14.71	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr(OH)2	-20.05	-9.23	10.82	Cr(OH)2
Cr(OH)3	-1.23	0.10	1.34	Cr(OH)3
Cr(OH)3(am)	0.85	0.10	-0.75	Cr(OH)3
Cr2O3	2.56	0.20	-2.36	Cr2O3
CrCl2	-43.28	-29.18	14.09	CrCl2
CrCl3	-44.95	-29.83	15.11	CrCl3
CrF3	-20.46	-31.80	-11.34	CrF3
Crmetal	-64.27	-33.79	30.48	Cr
CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.08	-39.92	-33.84	Na3AlF6
Cu(OH)2	-0.98	7.69	8.67	Cu(OH)2
Cu(SbO3)2	-24.98	20.23	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-51.28	-86.16	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-1.40	-47.20	-45.80	Cu2Se
Cu2SO4	-18.98	-20.93	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-8.92	-2.82	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-55.05	-97.65	-42.59	Cu3Sb
Cu3Se2	-19.42	-82.91	-63.49	Cu3Se2
CuCO3	-0.33	-11.83	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.62	-12.53	-4.91	CuF
CuF2	-14.69	-13.58	1.12	CuF2
CuF2:2H2O	-9.03	-13.58	-4.55	CuF2:2H2O
Cumetal	-5.42	-14.18	-8.76	Cu
CuMoO4	-0.04	-13.12	-13.08	CuMoO4
CuOCuSO4	-12.06	-1.76	10.30	CuOCuSO4
Cupricferrite	15.78	21.76	5.99	CuFe2O4
Cuprite	-2.39	-3.79	-1.41	Cu2O
Cuprousferrite	14.06	5.14	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.56	-33.37	CuSe2
CuSeO3:2H2O	-7.41	-6.90	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.21	-18.65	-2.44	CuSeO4:5H2O
CuSO4	-12.39	-9.45	2.94	CuSO4
Diaspore	2.69	9.56	6.87	AlOOH
Djurleite	-50.82	-84.74	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.34	-16.20	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.89	-16.20	-17.09	CaMg(CO3)2
Epsomite	-3.83	-5.96	-2.13	MgSO4:7H2O
Fe(OH)2	-5.77	7.79	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.08	4.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-2.27	-5.99	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.07	-0.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-9.08	-29.70	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.61	-37.35	-3.73	Fe2(SO4)3

Fe3(OH)8	1.64	21.86	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.31	-5.91	0.40	FeAsO4:2H2O
FeCr2O4	0.79	7.99	7.20	FeCr2O4
FeMoO4	-2.93	-13.02	-10.09	FeMoO4
Ferrihydrite	3.84	7.04	3.19	Fe(OH)3
Ferroselite	-35.86	-54.46	-18.60	FeSe2
FeS(ppt)	-70.97	-73.92	-2.95	FeS
FeSe	-24.61	-35.61	-11.00	FeSe
Fix_pe	-5.13	-5.13	0.00	e-
Fluorite	0.89	-9.61	-10.50	CaF2
Galena	-62.49	-76.46	-13.97	PbS
Gibbsite	1.27	9.56	8.29	Al(OH)3
Goethite	6.55	7.04	0.49	FeOOH
Goslarite	-7.23	-9.24	-2.01	ZnSO4:7H2O
Greenockite	-61.38	-75.74	-14.36	CdS
Greigite	-259.93	-304.96	-45.03	Fe3S4
Gummite	-7.81	-0.13	7.67	UO3
Gypsum	-0.87	-5.48	-4.61	CaSO4:2H2O
H-Jarosite	-1.07	-13.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.94	-20.81	-12.88	H2MoO4
H2S(g)	-73.70	-81.71	-8.01	H2S
H2Se(g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.81	-5.20	1.60	NaCl
Hausmannite	-8.70	52.33	61.03	Mn3O4
Hematite	15.49	14.07	-1.42	Fe2O3
Hercynite	4.02	26.91	22.89	FeAl2O4
Hg(CH3)2(g)	-175.05	-248.75	-73.71	Hg(CH3)2
Hg(g)	-8.34	-16.22	-7.87	Hg
Hg(OH)2	-9.76	-13.25	-3.50	Hg(OH)2
Hg2(g)	-17.48	-32.43	-14.96	Hg2
Hg2(OH)2	-13.13	-7.87	5.26	Hg2(OH)2
Hg2CO3	-11.35	-27.40	-16.05	Hg2CO3
Hg2CrO4	-29.61	-38.31	-8.70	Hg2CrO4
Hg2F2	-18.78	-29.14	-10.36	Hg2F2
Hg2S	-77.90	-89.58	-11.68	Hg2S
Hg2SeO3	-17.81	-22.47	-4.66	Hg2SeO3
Hg2SO4	-18.88	-25.01	-6.13	Hg2SO4
Hg3O2CO3	-29.60	-59.28	-29.68	Hg3O2CO3
HgCl(g)	-33.41	-13.91	19.50	HgCl
HgCl2	-11.94	-33.21	-21.26	HgCl2
HgF(g)	-47.25	-14.57	32.68	HgF
HgF2(g)	-47.08	-34.52	12.57	HgF2
Hgmetal(1)	-2.76	-16.22	-13.45	Hg
HgSe	-0.96	-56.65	-55.69	HgSe
HgSeO3	-15.41	-27.84	-12.43	HgSeO3
HgSO4	-20.97	-30.39	-9.42	HgSO4
Huntite	-2.92	-32.89	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.53	-23.31	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-13.42	-22.18	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.61	-20.78	-5.17	KAl(SO4)2:12H2O
K-Jarosite	5.57	-9.23	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.76	-53.00	-17.24	K2Cr2O7
K2CrO4	-22.05	-22.56	-0.51	K2CrO4
K2MoO4	-16.19	-12.93	3.26	K2MoO4
K2SeO4	-17.73	-18.46	-0.73	K2SeO4
Langite	-3.86	13.63	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.21	-6.64	-0.43	PbO:PbSO4
Laurionite	-5.35	-4.73	0.62	PbOHCl
Lepidocrocite	5.67	7.04	1.37	FeOOH
Lime	-21.04	11.66	32.70	CaO
Litharge	-7.45	5.25	12.69	PbO
Mackinawite	-70.32	-73.92	-3.60	FeS
Maghemite	7.69	14.07	6.39	Fe2O3
Magnesianoferrite	8.40	25.26	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	18.46	21.86	3.40	Fe3O4
Malachite	1.16	-4.14	-5.31	Cu2(OH)2CO3
Manganite	-3.81	21.53	25.34	MnOOH

Massicot	-7.65	5.25	12.89	PbO
Matlockite	-6.39	-15.36	-8.97	PbClF
Melanothallite	-18.52	-12.26	6.26	CuCl ₂
Melanterite	-7.14	-9.35	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-49.86	-94.96	-45.09	HgS
Mg(OH) ₂ (active)	-7.61	11.18	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-13.87	-2.59	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-266.79	-192.11	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-17.77	8.59	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-4.81	11.39	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.64	-19.26	5.38	MgCrO ₄
MgF ₂	-1.95	-10.08	-8.13	MgF ₂
MgMoO ₄	-7.78	-9.63	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.47	-3.41	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-13.96	-15.16	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-33.22	40.30	73.52	Pb ₃ O ₄
Mirabilite	-6.48	-7.60	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-9.42	-4.52	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-53.34	-59.05	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.80	-85.72	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.63	1.87	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.41	-10.70	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-72.62	-72.45	0.17	MnS
MnS (pnk)	-75.79	-72.45	3.34	MnS
MnSb	-92.86	-95.77	-2.91	MnSb
MnSe	-37.65	-34.15	3.50	MnSe
MnSeO ₃	-6.47	-5.34	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.32	-5.34	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-15.04	-17.09	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.47	-7.88	2.58	MnSO ₄
Montepontite	-9.14	5.96	15.10	CdO
Montroydite	-9.61	-13.25	-3.64	HgO
MoO ₃	-12.81	-20.81	-8.00	MoO ₃
Morenosite	-7.94	-10.09	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-138.52	-208.78	-70.26	MoS ₂
Na-Jarosite	2.80	-8.40	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.44	-51.33	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.82	-20.89	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.48	-32.08	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.75	-11.26	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.49	-11.26	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.35	-5.05	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-18.08	-16.80	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.09	-77.64	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.25	7.43	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.08	5.32	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.14	-11.87	-6.73	CuCl
NaSb	-85.79	-62.63	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-5.97	-2.11	3.86	NaVO ₃
Nesquehonite	-3.67	-8.34	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.74	7.05	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-20.44	-4.74	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.93	11.07	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.60	-12.47	-6.87	NiCO ₃
NiMoO ₄	-2.62	-13.76	-11.14	NiMoO ₄
NiS (alpha)	-69.05	-74.65	-5.60	NiS
NiS (beta)	-63.55	-74.65	-11.10	NiS
NiS (gamma)	-61.85	-74.65	-12.80	NiS
NiSe	-18.65	-36.35	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.35	-7.54	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.77	-19.29	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-9.04	8.46	17.50	MnO ₂
O ₂ (g)	-33.98	49.11	83.09	O ₂
Orpiment	-221.27	-282.33	-61.07	As ₂ S ₃
Otavite	-1.56	-13.56	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.87	-4.35	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.90	5.25	8.15	Pb(OH) ₂

Pb10(OH)6O(CO3)6	-55.91	-64.67	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.28	0.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.69	10.50	26.19	Pb2O(OH)2
Pb2O3	-25.99	35.05	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	-1.38	-3.28	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.96	-10.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.17	1.97	6.14	Pb3(VO4)2
Pb3O2CO3	-14.80	-3.78	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.25	3.85	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.03	3.85	21.88	Pb4O3SO4
PbCrO4	-12.59	-25.19	-12.60	PbCrO4
PbF2	-8.58	-16.02	-7.44	PbF2
Pbmetal	-23.55	-19.31	4.25	Pb
PbMoO4	0.06	-15.56	-15.62	PbMoO4
PbO:0.3H2O	-7.73	5.25	12.98	PbO:0.33H2O
PbSeO4	-14.26	-21.10	-6.84	PbSeO4
Periclase	-10.40	11.18	21.58	MgO
Phosgenite	-9.17	-28.98	-19.81	PbCl2:PbCO3
Plattnerite	-19.80	29.80	49.60	PbO2
Portlandite	-11.14	11.66	22.80	Ca(OH)2
Pyrite	-112.56	-131.07	-18.51	FeS2
Pyrochroite	-5.94	9.26	15.19	Mn(OH)2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-92.85	-112.59	-19.75	AsS
Retgersite	-8.05	-10.09	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.16	-19.66	-14.50	UO2CO3
Sb(OH)3	-11.18	-18.29	-7.11	Sb(OH)3
Sb2O4	-15.42	-12.02	3.40	Sb2O4
Sb2O5	-26.41	-36.08	-9.67	Sb2O5
Sb2Se3	-99.02	-166.78	-67.76	Sb2Se3
Sb4O6(cubic)	-54.88	-73.14	-18.26	Sb4O6
Sb4O6(orth)	-55.24	-73.14	-17.90	Sb4O6
SbCl3	-48.79	-48.22	0.57	SbCl3
SbF3	-39.96	-50.19	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.49	-30.32	-27.82	SbO2
Schoepite	-6.13	-0.13	5.99	UO2(OH)2:H2O
Semetal(am)	-11.74	-18.85	-7.11	Se
Semetal(hex)	-11.14	-18.85	-7.71	Se
Senarmontite	-24.21	-36.57	-12.37	Sb2O3
SeO2	-14.72	-14.59	0.12	SeO2
SeO3	-47.39	-26.34	21.04	SeO3
Siderite	-1.49	-11.73	-10.24	FeCO3
Smithsonite	-1.62	-11.62	-10.00	ZnCO3
Sphalerite	-62.35	-73.80	-11.45	ZnS
Spinel	-6.54	30.30	36.85	MgAl2O4
Stibnite	-231.23	-281.69	-50.46	Sb2S3
Sulfur	-55.00	-57.15	-2.14	S
Tenorite	0.05	7.69	7.64	CuO
Thenardite	-7.91	-7.59	0.32	Na2SO4
Thermonatrite	-10.61	-9.98	0.64	Na2CO3:H2O
Tyuyamunite	-6.46	-2.38	4.08	Ca(UO2)2(VO4)2
U3O8	-18.39	2.69	21.08	U3O8
U3Sb4	-566.63	-414.25	152.38	U3Sb4
U4O9	-34.32	-37.34	-3.02	U4O9
UF4	-28.47	-58.01	-29.54	UF4
UF4:2.5H2O	-25.29	-58.01	-32.72	UF4:2.5H2O
UO2(am)	-16.41	-15.47	0.93	UO2
UO2(OH)2(beta)	-5.75	-0.13	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.23	-26.48	-2.25	UO2SeO4:4H2O
UO3	-7.83	-0.13	7.70	UO3
Uraninite	-10.81	-15.47	-4.67	UO2
USb2	-213.62	-184.05	29.58	USb2
V(OH)3	-16.44	-8.85	7.59	V(OH)3
V2O5	-12.42	-13.78	-1.36	V2O5

V3O5	-33.18	-31.35	1.84	V3O5
V4O7	-40.80	-33.61	7.19	V4O7
V6O13	-29.58	-90.44	-60.86	V6O13
Valentinite	-28.09	-36.57	-8.48	Sb2O3
VC12	-59.95	-41.08	18.87	VC12
VC13	-62.21	-38.78	23.43	VC13
VF4	-59.73	-44.80	14.93	VF4
Vmetal	-89.71	-45.68	44.03	V
VO	-35.88	-21.12	14.76	VO
VO(OH)2	-7.41	-2.26	5.15	VO(OH)2
VO2Cl	-19.71	-16.87	2.84	VO2Cl
VOC1	-29.98	-18.82	11.15	VOC1
VOC12	-34.98	-22.22	12.76	VOC12
VOSO4	-23.01	-19.40	3.61	VOSO4
Witherite	-2.78	-11.35	-8.57	BaCO3
Wurtzite	-64.85	-73.80	-8.95	ZnS
Zincite	-3.43	7.90	11.33	ZnO
Zincosite	-13.17	-9.24	3.93	ZnSO4
Zn(BO2)2	-9.98	-1.69	8.29	Zn(BO2)2
Zn(OH)2	-4.30	7.90	12.20	Zn(OH)2
Zn(OH)2(am)	-4.57	7.90	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.85	7.90	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.63	7.90	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.83	7.90	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.84	-1.34	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.37	5.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.84	-2.19	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.49	-10.57	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.93	14.47	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.95	19.55	38.50	Zn5(OH)8Cl2
ZnCl2	-19.10	-12.05	7.05	ZnCl2
ZnCO3:1H2O	-1.36	-11.62	-10.26	ZnCO3:1H2O
ZnF2	-12.83	-13.37	-0.53	ZnF2
Znmetal	-42.44	-16.65	25.79	Zn
ZnMoO4	-2.78	-12.91	-10.13	ZnMoO4
ZnO(active)	-3.29	7.90	11.19	ZnO
ZnS(am)	-64.75	-73.80	-9.05	ZnS
ZnSb	-82.79	-71.78	11.01	ZnSb
ZnSe	-21.10	-35.50	-14.40	ZnSe
ZnSeO4:6H2O	-16.92	-18.44	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.60	-9.24	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 118.

```

Title Precipitate oversaturated phases in groundwater
PHASES
Fix_pe
e-=e-
log_k      0
EQUILIBRIUM_PHASES 701
Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0

```

```

CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -1.69 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 702
SAVE Solution 703 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 701
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases in groundwater

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 702. Solution after simulation 117.
Using pure phase assemblage 701.

```

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.534e-08	2.534e-08
Alunite	0.00	-1.40	-1.40	0.000e+00	9.163e-07	9.163e-07
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.027e-08	2.027e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.324e-06	1.324e-06
Brochantite	-0.41	14.81	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.647e-03
CaMoO4	-1.74	-9.69	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.36	-3.55	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.907e-03	2.907e-03
Carnotite	-2.33	-2.10	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.91	-15.06	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.030e-08	6.030e-08
Cu2Se(alpha)	-5.10	-50.90	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.540e-07	2.540e-07
Epsomite	-3.73	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	2.671e-05	2.671e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.112e-04	1.112e-04
Gummite	-6.85	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.25	-58.95	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.51	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.72	-5.59	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.18	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-24.35	-8.65	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.73	-13.87	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.684e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	5.291e-09	5.291e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.82	-0.74	4.08	0.000e+00	0	0.000e+00
U3O8	-16.50	4.58	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.79	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.95	-13.07	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.283e-08	3.281e-08
Al	1.929e-06	1.928e-06
As	2.717e-10	2.716e-10
B	1.603e-05	1.602e-05
Ba	1.102e-07	1.102e-07
C	5.845e-03	5.842e-03
Ca	2.546e-03	2.545e-03
Cd	1.182e-08	1.182e-08
Cl	1.723e-03	1.722e-03
Co	1.359e-07	1.359e-07
Cr	6.442e-09	6.439e-09
Cu	9.550e-06	9.546e-06
F	2.118e-04	2.117e-04

Fe	3.677e-09	3.675e-09
Hg	2.250e-10	2.249e-10
K	7.308e-04	7.305e-04
Mg	1.759e-03	1.758e-03
Mn	2.405e-05	2.404e-05
Mo	3.047e-07	3.046e-07
Na	4.999e-03	4.996e-03
Ni	2.132e-07	2.131e-07
Pb	2.120e-08	2.119e-08
S	3.653e-03	3.651e-03
Sb	1.326e-08	1.325e-08
Se	2.251e-08	2.250e-08
U	8.563e-08	8.559e-08
V	1.171e-07	1.170e-07
Zn	1.170e-06	1.169e-06

-----Description of solution-----

	pH	=	7.147	Charge balance
	pe	=	5.625	Adjusted to redox
equilibrium	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.908e-02	
	Mass of water (kg)	=	9.996e-01	
	Total alkalinity (eq/kg)	=	5.174e-03	
	Total CO2 (mol/kg)	=	5.845e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	8.630e-16	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	10	
	Total H	=	1.109739e+02	
	Total O	=	5.551583e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.626e-07	1.413e-07	-6.789	-6.850	-0.061	(0)
H+	8.157e-08	7.121e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.283e-08					
AgCl	2.131e-08	2.131e-08	-7.671	-7.671	0.000	(0)
Ag+	7.950e-09	6.940e-09	-8.100	-8.159	-0.059	(0)
AgCl2-	3.283e-09	2.792e-09	-8.484	-8.554	-0.070	(0)
AgSO4-	2.739e-10	2.329e-10	-9.562	-9.633	-0.070	(0)
AgCl3-2	7.160e-12	3.742e-12	-11.145	-11.427	-0.282	(0)
AgF	2.886e-12	2.886e-12	-11.540	-11.540	0.000	(0)
AgOH	9.809e-14	9.809e-14	-13.008	-13.008	0.000	(0)
AgCl4-3	4.948e-14	1.149e-14	-13.306	-13.940	-0.634	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgH2BO3	1.429e-14	1.429e-14	-13.845	-13.845	0.000	(0)
AgSeO3-	5.143e-15	4.373e-15	-14.289	-14.359	-0.070	(0)
Ag (OH) 2-	1.594e-18	1.355e-18	-17.798	-17.868	-0.070	(0)
Ag (SeO3) 2-3	1.653e-22	3.838e-23	-21.782	-22.416	-0.634	(0)
Ag2MoO4	3.224e-24	3.224e-24	-23.492	-23.492	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.785	-72.785	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.158	-86.286	-1.127	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.055	-147.125	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.293	-147.461	-0.168	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.436	-149.754	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.761	-150.065	-0.304	(0)
Al	1.929e-06					
Al (OH) 4-	1.302e-06	1.138e-06	-5.885	-5.944	-0.059	(0)
AlF3	3.248e-07	3.248e-07	-6.488	-6.488	0.000	(0)
AlF2+	1.775e-07	1.558e-07	-6.751	-6.807	-0.057	(0)
Al (OH) 3	6.395e-08	6.395e-08	-7.194	-7.194	0.000	(0)
AlF4-	3.083e-08	2.694e-08	-7.511	-7.570	-0.059	(0)

Al (OH) 2+	2.583e-08	2.268e-08	-7.588	-7.644	-0.057	(0)
AlF+2	3.983e-09	2.365e-09	-8.400	-8.626	-0.226	(0)
AlOH+2	3.401e-10	2.020e-10	-9.468	-9.695	-0.226	(0)
AlSO4+	2.135e-11	1.866e-11	-10.671	-10.729	-0.059	(0)
Al+3	4.851e-12	1.429e-12	-11.314	-11.845	-0.531	(0)
Al (SO4) 2-	3.847e-13	3.362e-13	-12.415	-12.473	-0.059	(0)
AlMo6O21-3	2.415e-40	0.000e+00	-39.617	-40.251	-0.634	(0)
As (3)	1.855e-22					
H3AsO3	1.840e-22	1.840e-22	-21.735	-21.735	0.000	(0)
H2AsO3-	1.558e-24	1.325e-24	-23.807	-23.878	-0.070	(0)
HAsO3-2	3.247e-29	1.697e-29	-28.489	-28.770	-0.282	(0)
H4AsO3+	7.634e-30	6.491e-30	-29.117	-29.188	-0.070	(0)
AsO3-3	3.955e-35	9.184e-36	-34.403	-35.037	-0.634	(0)
As (5)	2.717e-10					
HAsO4-2	1.941e-10	1.015e-10	-9.712	-9.994	-0.282	(0)
H2AsO4-	7.750e-11	6.590e-11	-10.111	-10.181	-0.070	(0)
AsO4-3	1.940e-14	4.505e-15	-13.712	-14.346	-0.634	(0)
H3AsO4	8.119e-16	8.155e-16	-15.090	-15.089	0.002	(0)
B	1.603e-05					
H3BO3	1.586e-05	1.593e-05	-4.800	-4.798	0.002	(0)
H2BO3-	1.503e-07	1.299e-07	-6.823	-6.886	-0.063	(0)
CaH2BO3+	9.984e-09	8.630e-09	-8.001	-8.064	-0.063	(0)
MgH2BO3+	4.359e-09	3.768e-09	-8.361	-8.424	-0.063	(0)
BF (OH) 3-	1.217e-09	1.052e-09	-8.915	-8.978	-0.063	(0)
NaH2BO3	8.887e-10	8.887e-10	-9.051	-9.051	0.000	(0)
H5 (BO3) 2-	2.039e-12	1.762e-12	-11.691	-11.754	-0.063	(0)
BF2 (OH) 2-	1.535e-12	1.327e-12	-11.814	-11.877	-0.063	(0)
BaH2BO3+	2.892e-13	2.500e-13	-12.539	-12.602	-0.063	(0)
AgH2BO3	1.429e-14	1.429e-14	-13.845	-13.845	0.000	(0)
H8 (BO3) 3-	3.248e-15	2.808e-15	-14.488	-14.552	-0.063	(0)
BF3OH-	7.040e-18	6.086e-18	-17.152	-17.216	-0.063	(0)
BF4-	4.085e-22	3.531e-22	-21.389	-21.452	-0.063	(0)
Ba	1.102e-07					
Ba+2	1.072e-07	6.226e-08	-6.970	-7.206	-0.236	(0)
BaHCO3+	2.943e-09	2.591e-09	-8.531	-8.587	-0.055	(0)
BaCO3	9.160e-11	9.160e-11	-10.038	-10.038	0.000	(0)
BaH2BO3+	2.892e-13	2.500e-13	-12.539	-12.602	-0.063	(0)
BaOH+	4.384e-14	3.841e-14	-13.358	-13.416	-0.057	(0)
C (4)	5.845e-03					
HCO3-	4.964e-03	4.358e-03	-2.304	-2.361	-0.057	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	1.064e-04	9.366e-05	-3.973	-4.028	-0.055	(0)
MgHCO3+	4.279e-05	3.730e-05	-4.369	-4.428	-0.060	(0)
NaHCO3	1.057e-05	1.057e-05	-4.976	-4.976	0.000	(0)
CuCO3	8.016e-06	8.016e-06	-5.096	-5.096	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	4.939e-06	2.869e-06	-5.306	-5.542	-0.236	(0)
MgCO3	1.996e-06	1.996e-06	-5.700	-5.700	0.000	(0)
MnHCO3+	1.028e-06	9.006e-07	-5.988	-6.045	-0.057	(0)
NaCO3-	2.626e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
CuHCO3+	1.534e-07	1.305e-07	-6.814	-6.884	-0.070	(0)
Cu (CO3) 2-2	1.184e-07	6.189e-08	-6.927	-7.208	-0.282	(0)
ZnCO3	7.873e-08	7.873e-08	-7.104	-7.104	0.000	(0)
ZnHCO3+	7.730e-08	6.572e-08	-7.112	-7.182	-0.070	(0)
NiHCO3+	4.799e-08	4.080e-08	-7.319	-7.389	-0.070	(0)
UO2 (CO3) 3-4	4.278e-08	3.191e-09	-7.369	-8.496	-1.127	(0)
UO2 (CO3) 2-2	4.246e-08	2.219e-08	-7.372	-7.654	-0.282	(0)
CoHCO3+	1.998e-08	1.699e-08	-7.699	-7.770	-0.070	(0)
PbCO3	1.170e-08	1.170e-08	-7.932	-7.932	0.000	(0)
NiCO3	8.129e-09	8.129e-09	-8.090	-8.090	0.000	(0)
PbHCO3+	5.166e-09	4.392e-09	-8.287	-8.357	-0.070	(0)
BaHCO3+	2.943e-09	2.591e-09	-8.531	-8.587	-0.055	(0)
CoCO3	2.430e-09	2.430e-09	-8.614	-8.614	0.000	(0)
UO2CO3	3.876e-10	3.876e-10	-9.412	-9.412	0.000	(0)
CdCO3	3.241e-10	3.241e-10	-9.489	-9.489	0.000	(0)
Pb (CO3) 2-2	1.852e-10	9.679e-11	-9.732	-10.014	-0.282	(0)
BaCO3	9.160e-11	9.160e-11	-10.038	-10.038	0.000	(0)
CdHCO3+	5.784e-11	4.918e-11	-10.238	-10.308	-0.070	(0)

	Cd(CO ₃) ₂₋₂	1.319e-12	6.893e-13	-11.880	-12.162	-0.282	(0)
	FeHCO ₃ +	8.929e-13	7.860e-13	-12.049	-12.105	-0.055	(0)
	HgCO ₃	1.467e-14	1.467e-14	-13.834	-13.834	0.000	(0)
	Hg(CO ₃) ₂₋₂	2.547e-16	1.331e-16	-15.594	-15.876	-0.282	(0)
	HgHCO ₃ +	2.288e-17	1.946e-17	-16.640	-16.711	-0.070	(0)
Ca	2.546e-03						
	Ca+2	1.987e-03	1.154e-03	-2.702	-2.938	-0.236	(0)
	CaSO ₄	4.447e-04	4.447e-04	-3.352	-3.352	0.000	(0)
	CaHCO ₃ +	1.064e-04	9.366e-05	-3.973	-4.028	-0.055	(0)
	CaCO ₃	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.380e-06	2.085e-06	-5.623	-5.681	-0.057	(0)
	CaH ₂ BO ₃ +	9.984e-09	8.630e-09	-8.001	-8.064	-0.063	(0)
	CaOH+	3.698e-09	3.255e-09	-8.432	-8.487	-0.055	(0)
Cd	1.182e-08						
	Cd+2	8.533e-09	4.957e-09	-8.069	-8.305	-0.236	(0)
	CdSO ₄	1.954e-09	1.954e-09	-8.709	-8.709	0.000	(0)
	CdCl+	8.373e-10	7.119e-10	-9.077	-9.148	-0.070	(0)
	CdCO ₃	3.241e-10	3.241e-10	-9.489	-9.489	0.000	(0)
	Cd(SO ₄) ₂₋₂	8.485e-11	4.434e-11	-10.071	-10.353	-0.282	(0)
	CdHCO ₃ +	5.784e-11	4.918e-11	-10.238	-10.308	-0.070	(0)
	CdF+	1.529e-11	1.300e-11	-10.816	-10.886	-0.070	(0)
	CdOH+	6.545e-12	5.565e-12	-11.184	-11.255	-0.070	(0)
	CdCl ₂	4.463e-12	4.463e-12	-11.350	-11.350	0.000	(0)
	CdOHC1	4.128e-12	4.128e-12	-11.384	-11.384	0.000	(0)
	Cd(CO ₃) ₂₋₂	1.319e-12	6.893e-13	-11.880	-12.162	-0.282	(0)
	CdCl ₃ -	4.981e-15	4.235e-15	-14.303	-14.373	-0.070	(0)
	Cd(OH) ₂	4.963e-15	4.963e-15	-14.304	-14.304	0.000	(0)
	CdF ₂	4.294e-15	4.294e-15	-14.367	-14.367	0.000	(0)
	CdSeO ₄	3.920e-18	3.920e-18	-17.407	-17.407	0.000	(0)
	Cd ₂ OH+3	5.953e-19	1.382e-19	-18.225	-18.859	-0.634	(0)
	Cd(OH) ₃ -	5.041e-20	4.286e-20	-19.298	-19.368	-0.070	(0)
	Cd(SeO ₃) ₂₋₂	7.512e-21	3.926e-21	-20.124	-20.406	-0.282	(0)
	Cd(OH) ₄ -2	1.897e-27	9.915e-28	-26.722	-27.004	-0.282	(0)
	CdHS+	0.000e+00	0.000e+00	-78.667	-78.737	-0.070	(0)
	Cd(HS) ₂	0.000e+00	0.000e+00	-149.974	-149.974	0.000	(0)
	Cd(HS) ₃ -	0.000e+00	0.000e+00	-226.444	-226.514	-0.070	(0)
	Cd(HS) ₄ -2	0.000e+00	0.000e+00	-302.477	-302.758	-0.282	(0)
Cl	1.723e-03						
	Cl-	1.723e-03	1.504e-03	-2.764	-2.823	-0.059	(0)
	MnCl+	2.238e-08	1.961e-08	-7.650	-7.708	-0.057	(0)
	AgCl	2.131e-08	2.131e-08	-7.671	-7.671	0.000	(0)
	AgCl ₂ -	3.283e-09	2.792e-09	-8.484	-8.554	-0.070	(0)
	ZnCl+	2.067e-09	1.802e-09	-8.685	-8.744	-0.060	(0)
	CuCl+	1.297e-09	1.131e-09	-8.887	-8.947	-0.060	(0)
	CuCl	1.043e-09	1.043e-09	-8.982	-8.982	0.000	(0)
	CdCl+	8.373e-10	7.119e-10	-9.077	-9.148	-0.070	(0)
	CuCl ₂ -	3.761e-10	3.279e-10	-9.425	-9.484	-0.060	(0)
	NiCl+	3.437e-10	2.922e-10	-9.464	-9.534	-0.070	(0)
	ZnOHC1	3.334e-10	3.334e-10	-9.477	-9.477	0.000	(0)
	CoCl+	3.067e-10	2.607e-10	-9.513	-9.584	-0.070	(0)
	PbCl+	8.514e-11	7.239e-11	-10.070	-10.140	-0.070	(0)
	MnCl ₂	4.166e-11	4.166e-11	-10.380	-10.380	0.000	(0)
	AgCl ₃ -2	7.160e-12	3.742e-12	-11.145	-11.427	-0.282	(0)
	CdCl ₂	4.463e-12	4.463e-12	-11.350	-11.350	0.000	(0)
	ZnCl ₂	4.294e-12	4.294e-12	-11.367	-11.367	0.000	(0)
	CdOHC1	4.128e-12	4.128e-12	-11.384	-11.384	0.000	(0)
	HgClOH	1.604e-12	1.604e-12	-11.795	-11.795	0.000	(0)
	HgCl ₂	9.666e-13	9.666e-13	-12.015	-12.015	0.000	(0)
	CuCl ₂	5.898e-13	5.898e-13	-12.229	-12.229	0.000	(0)
	PbCl ₂	4.863e-13	4.863e-13	-12.313	-12.313	0.000	(0)
	CuCl ₃ -2	1.789e-13	1.054e-13	-12.747	-12.977	-0.230	(0)
	AgCl ₄ -3	4.948e-14	1.149e-14	-13.306	-13.940	-0.634	(0)
	MnCl ₃ -	1.970e-14	1.726e-14	-13.706	-13.763	-0.057	(0)
	HgCl ₃ -	1.710e-14	1.454e-14	-13.767	-13.838	-0.070	(0)
	ZnCl ₃ -	5.885e-15	5.130e-15	-14.230	-14.290	-0.060	(0)
	CdCl ₃ -	4.981e-15	4.235e-15	-14.303	-14.373	-0.070	(0)
	NiCl ₂	2.213e-15	2.213e-15	-14.655	-14.655	0.000	(0)
	PbCl ₃ -	3.425e-16	2.912e-16	-15.465	-15.536	-0.070	(0)

CrCl+2	3.304e-16	1.727e-16	-15.481	-15.763	-0.282	(0)
HgCl4-2	1.666e-16	8.704e-17	-15.778	-16.060	-0.282	(0)
HgCl+	1.508e-16	1.282e-16	-15.822	-15.892	-0.070	(0)
UO2Cl+	9.737e-17	8.279e-17	-16.012	-16.082	-0.070	(0)
CuCl3-	9.497e-18	8.278e-18	-17.022	-17.082	-0.060	(0)
ZnCl4-2	6.548e-18	3.858e-18	-17.184	-17.414	-0.230	(0)
CrOHC12	6.976e-19	6.976e-19	-18.156	-18.156	0.000	(0)
PbCl4-2	3.830e-19	2.002e-19	-18.417	-18.699	-0.282	(0)
VOCl+	4.545e-20	3.864e-20	-19.342	-19.413	-0.070	(0)
FeCl+2	4.326e-20	2.549e-20	-19.364	-19.594	-0.230	(0)
CrCl2+	2.898e-20	2.464e-20	-19.538	-19.608	-0.070	(0)
FeCl2+	1.955e-22	1.713e-22	-21.709	-21.766	-0.057	(0)
CuCl4-2	1.059e-22	6.240e-23	-21.975	-22.205	-0.230	(0)
FeCl3	2.576e-26	2.576e-26	-25.589	-25.589	0.000	(0)
CrO3Cl-	2.082e-26	1.770e-26	-25.681	-25.752	-0.070	(0)
CoCl+2	4.926e-35	2.575e-35	-34.307	-34.589	-0.282	(0)
UCl+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
Co (2)	1.359e-07					
Co+2	9.590e-08	5.012e-08	-7.018	-7.300	-0.282	(0)
CoHCO3+	1.998e-08	1.699e-08	-7.699	-7.770	-0.070	(0)
CoSO4	1.682e-08	1.682e-08	-7.774	-7.774	0.000	(0)
CoCO3	2.430e-09	2.430e-09	-8.614	-8.614	0.000	(0)
CoF+	3.085e-10	2.623e-10	-9.511	-9.581	-0.070	(0)
CoCl+	3.067e-10	2.607e-10	-9.513	-9.584	-0.070	(0)
CoOH+	1.662e-10	1.413e-10	-9.779	-9.850	-0.070	(0)
Co (OH) 2	1.587e-12	1.587e-12	-11.799	-11.799	0.000	(0)
CoSeO4	1.067e-16	1.067e-16	-15.972	-15.972	0.000	(0)
Co (OH) 3-	5.263e-18	4.475e-18	-17.279	-17.349	-0.070	(0)
Co2OH+3	1.529e-18	3.550e-19	-17.816	-18.450	-0.634	(0)
CoOOH-	1.321e-18	1.123e-18	-17.879	-17.950	-0.070	(0)
Co (OH) 4-2	1.918e-25	1.003e-25	-24.717	-24.999	-0.282	(0)
Co4 (OH) 4+4	1.067e-30	7.961e-32	-29.972	-31.099	-1.127	(0)
Co (3)	1.156e-28					
CoOH+2	1.156e-28	6.043e-29	-27.937	-28.219	-0.282	(0)
Co+3	2.857e-34	8.413e-35	-33.544	-34.075	-0.531	(0)
CoCl+2	4.926e-35	2.575e-35	-34.307	-34.589	-0.282	(0)
Cr (2)	9.615e-26					
Cr+2	9.615e-26	5.025e-26	-25.017	-25.299	-0.282	(0)
Cr (3)	6.442e-09					
Cr (OH) 2+	5.548e-09	4.717e-09	-8.256	-8.326	-0.070	(0)
Cr (OH) +2	5.249e-10	2.743e-10	-9.280	-9.562	-0.282	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
CrF+2	4.453e-12	2.327e-12	-11.351	-11.633	-0.282	(0)
CrO2-	1.965e-12	1.671e-12	-11.707	-11.777	-0.070	(0)
Cr (OH) 4-	1.658e-12	1.409e-12	-11.780	-11.851	-0.070	(0)
CrSO4+	4.097e-13	3.484e-13	-12.387	-12.458	-0.070	(0)
Cr+3	3.820e-13	8.870e-14	-12.418	-13.052	-0.634	(0)
CrCl+2	3.304e-16	1.727e-16	-15.481	-15.763	-0.282	(0)
Cr2 (OH) 2SO4+2	5.194e-18	2.714e-18	-17.285	-17.566	-0.282	(0)
CrOHC12	6.976e-19	6.976e-19	-18.156	-18.156	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.712e-19	2.712e-19	-18.567	-18.567	0.000	(0)
CrCl2+	2.898e-20	2.464e-20	-19.538	-19.608	-0.070	(0)
Cr (6)	2.304e-16					
CrO4-2	1.963e-16	1.140e-16	-15.707	-15.943	-0.236	(0)
HCrO4-	3.090e-17	2.627e-17	-16.510	-16.580	-0.070	(0)
NaCrO4-	2.875e-18	2.445e-18	-17.541	-17.612	-0.070	(0)
KCrO4-	3.141e-19	2.671e-19	-18.503	-18.573	-0.070	(0)
CrO3SO4-2	1.835e-24	9.589e-25	-23.736	-24.018	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.082e-26	1.770e-26	-25.681	-25.752	-0.070	(0)
Cr2O7-2	4.582e-32	2.394e-32	-31.339	-31.621	-0.282	(0)
Cu (1)	2.068e-09					
CuCl	1.043e-09	1.043e-09	-8.982	-8.982	0.000	(0)
Cu+	6.482e-10	5.511e-10	-9.188	-9.259	-0.070	(0)
CuCl2-	3.761e-10	3.279e-10	-9.425	-9.484	-0.060	(0)
CuCl3-2	1.789e-13	1.054e-13	-12.747	-12.977	-0.230	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.144	-148.455	-0.310	(0)

CuS4S5-3	0.000e+00	0.000e+00	-148.888	-149.185	-0.297	(0)
Cu (2)	9.548e-06					
CuCO3	8.016e-06	8.016e-06	-5.096	-5.096	0.000	(0)
Cu+2	8.169e-07	4.745e-07	-6.088	-6.324	-0.236	(0)
CuOH+	2.433e-07	2.121e-07	-6.614	-6.673	-0.060	(0)
CuSO4	1.828e-07	1.828e-07	-6.738	-6.738	0.000	(0)
CuHCO3+	1.534e-07	1.305e-07	-6.814	-6.884	-0.070	(0)
Cu (CO3) 2-2	1.184e-07	6.189e-08	-6.927	-7.208	-0.282	(0)
Cu (OH) 2	5.981e-09	5.981e-09	-8.223	-8.223	0.000	(0)
CuF+	5.828e-09	4.955e-09	-8.234	-8.305	-0.070	(0)
Cu2 (OH) 2+2	2.162e-09	1.130e-09	-8.665	-8.947	-0.282	(0)
CuCl+	1.297e-09	1.131e-09	-8.887	-8.947	-0.060	(0)
Cu (OH) 3-	2.040e-12	1.734e-12	-11.690	-11.761	-0.070	(0)
CuCl2	5.898e-13	5.898e-13	-12.229	-12.229	0.000	(0)
CuCl3-	9.497e-18	8.278e-18	-17.022	-17.082	-0.060	(0)
Cu (OH) 4-2	3.691e-18	1.929e-18	-17.433	-17.715	-0.282	(0)
CuCl4-2	1.059e-22	6.240e-23	-21.975	-22.205	-0.230	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.676	-215.746	-0.070	(0)
F	2.118e-04					
F-	1.896e-04	1.655e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.777e-05	1.553e-05	-4.750	-4.809	-0.059	(0)
CaF+	2.380e-06	2.085e-06	-5.623	-5.681	-0.057	(0)
NaF	4.507e-07	4.507e-07	-6.346	-6.346	0.000	(0)
AlF3	3.248e-07	3.248e-07	-6.488	-6.488	0.000	(0)
AlF2+	1.775e-07	1.558e-07	-6.751	-6.807	-0.057	(0)
MnF+	7.790e-08	6.825e-08	-7.108	-7.166	-0.057	(0)
AlF4-	3.083e-08	2.694e-08	-7.511	-7.570	-0.059	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	5.828e-09	4.955e-09	-8.234	-8.305	-0.070	(0)
AlF+2	3.983e-09	2.365e-09	-8.400	-8.626	-0.226	(0)
ZnF+	1.852e-09	1.575e-09	-8.732	-8.803	-0.070	(0)
BF (OH) 3-	1.217e-09	1.052e-09	-8.915	-8.978	-0.063	(0)
NiF+	3.714e-10	3.158e-10	-9.430	-9.501	-0.070	(0)
CoF+	3.085e-10	2.623e-10	-9.511	-9.581	-0.070	(0)
PbF+	1.861e-11	1.582e-11	-10.730	-10.801	-0.070	(0)
CdF+	1.529e-11	1.300e-11	-10.816	-10.886	-0.070	(0)
HF2-	1.262e-11	1.097e-11	-10.899	-10.960	-0.061	(0)
CrF+2	4.453e-12	2.327e-12	-11.351	-11.633	-0.282	(0)
AgF	2.886e-12	2.886e-12	-11.540	-11.540	0.000	(0)
BF2 (OH) 2-	1.535e-12	1.327e-12	-11.814	-11.877	-0.063	(0)
UO2F+	9.121e-13	7.755e-13	-12.040	-12.110	-0.070	(0)
UO2F2	3.702e-13	3.702e-13	-12.432	-12.432	0.000	(0)
PbF2	5.154e-14	5.154e-14	-13.288	-13.288	0.000	(0)
UO2F3-	1.810e-14	1.539e-14	-13.742	-13.813	-0.070	(0)
CdF2	4.294e-15	4.294e-15	-14.367	-14.367	0.000	(0)
VO2F	2.763e-15	2.763e-15	-14.559	-14.559	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.150e-16	4.512e-16	-15.288	-15.346	-0.057	(0)
VO2F2-	1.953e-16	1.660e-16	-15.709	-15.780	-0.070	(0)
FeF+2	1.729e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	3.872e-17	2.024e-17	-16.412	-16.694	-0.282	(0)
PbF3-	1.903e-17	1.618e-17	-16.721	-16.791	-0.070	(0)
VOF+	1.069e-17	9.092e-18	-16.971	-17.041	-0.070	(0)
BF3OH-	7.040e-18	6.086e-18	-17.152	-17.216	-0.063	(0)
VO2F3-2	6.560e-19	3.428e-19	-18.183	-18.465	-0.282	(0)
VOF2	5.643e-19	5.643e-19	-18.248	-18.248	0.000	(0)
VOF3-	3.898e-21	3.314e-21	-20.409	-20.480	-0.070	(0)
PbF4-2	2.453e-21	1.282e-21	-20.610	-20.892	-0.282	(0)
BF4-	4.085e-22	3.531e-22	-21.389	-21.452	-0.063	(0)
VO2F4-3	1.202e-22	2.792e-23	-21.920	-22.554	-0.634	(0)
HgF+	3.084e-23	2.622e-23	-22.511	-22.581	-0.070	(0)
VOF4-2	4.237e-24	2.214e-24	-23.373	-23.655	-0.282	(0)
Sb (OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.897e-25	9.897e-25	-24.004	-24.004	0.000	(0)
UF3+	1.715e-34	1.458e-34	-33.766	-33.836	-0.070	(0)
UF2+2	1.064e-35	5.559e-36	-34.973	-35.255	-0.282	(0)
UF4	2.647e-36	2.647e-36	-35.577	-35.577	0.000	(0)

UF5-	2.042e-38	1.736e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.149e-38	2.668e-39	-37.940	-38.574	-0.634	(0)
UF6-2	1.661e-39	8.679e-40	-38.780	-39.062	-0.282	(0)
Fe (2)	3.432e-11					
Fe+2	2.742e-11	1.433e-11	-10.562	-10.844	-0.282	(0)
FeSO4	5.915e-12	5.915e-12	-11.228	-11.228	0.000	(0)
FeHCO3+	8.929e-13	7.860e-13	-12.049	-12.105	-0.055	(0)
FeOH+	9.202e-14	8.062e-14	-13.036	-13.094	-0.057	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.618e-19	4.046e-19	-18.336	-18.393	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.775	-158.775	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.108	-235.178	-0.070	(0)
Fe (3)	3.643e-09					
Fe (OH) 2+	3.209e-09	2.817e-09	-8.494	-8.550	-0.057	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.410e-12	5.627e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.693e-14	5.122e-14	-13.061	-13.291	-0.230	(0)
FeF2+	5.150e-16	4.512e-16	-15.288	-15.346	-0.057	(0)
FeF+2	1.729e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.209e-17	1.059e-17	-16.918	-16.975	-0.057	(0)
Fe+3	1.906e-18	5.613e-19	-17.720	-18.251	-0.531	(0)
Fe (SO4) 2-	4.480e-19	3.809e-19	-18.349	-18.419	-0.070	(0)
FeCl+2	4.326e-20	2.549e-20	-19.364	-19.594	-0.230	(0)
FeCl2+	1.955e-22	1.713e-22	-21.709	-21.766	-0.057	(0)
FeHSeO3+2	4.977e-23	2.601e-23	-22.303	-22.585	-0.282	(0)
Fe2 (OH) 2+4	1.165e-24	8.687e-26	-23.934	-25.061	-1.127	(0)
FeCl3	2.576e-26	2.576e-26	-25.589	-25.589	0.000	(0)
Fe3 (OH) 4+5	2.042e-31	3.537e-33	-30.690	-32.451	-1.761	(0)
H (0)	4.020e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.218e-10					
Hg	2.218e-10	2.218e-10	-9.654	-9.654	0.000	(0)
Hg (1)	2.463e-21					
Hg2+2	1.231e-21	6.435e-22	-20.910	-21.191	-0.282	(0)
Hg (2)	3.140e-12					
HgClOH	1.604e-12	1.604e-12	-11.795	-11.795	0.000	(0)
HgCl2	9.666e-13	9.666e-13	-12.015	-12.015	0.000	(0)
Hg (OH) 2	5.363e-13	5.387e-13	-12.271	-12.269	0.002	(0)
HgCl3-	1.710e-14	1.454e-14	-13.767	-13.838	-0.070	(0)
HgCO3	1.467e-14	1.467e-14	-13.834	-13.834	0.000	(0)
Hg (CO3) 2-2	2.547e-16	1.331e-16	-15.594	-15.876	-0.282	(0)
HgCl4-2	1.666e-16	8.704e-17	-15.778	-16.060	-0.282	(0)
HgCl+	1.508e-16	1.282e-16	-15.822	-15.892	-0.070	(0)
HgOH+	2.828e-17	2.405e-17	-16.548	-16.619	-0.070	(0)
HgHCO3+	2.288e-17	1.946e-17	-16.640	-16.711	-0.070	(0)
Hg (OH) 3-	1.127e-20	9.585e-21	-19.948	-20.018	-0.070	(0)
Hg+2	8.177e-21	4.273e-21	-20.087	-20.369	-0.282	(0)
HgSO4	1.882e-21	1.882e-21	-20.725	-20.725	0.000	(0)
HgF+	3.084e-23	2.622e-23	-22.511	-22.581	-0.070	(0)
HgHS2-	0.000e+00	0.000e+00	-138.104	-138.175	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.928	-138.928	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.453	-139.735	-0.282	(0)
K	7.308e-04					
K+	7.223e-04	6.305e-04	-3.141	-3.200	-0.059	(0)
KSO4-	8.553e-06	7.508e-06	-5.068	-5.124	-0.057	(0)
KCrO4-	3.141e-19	2.671e-19	-18.503	-18.573	-0.070	(0)
Mg	1.759e-03					
Mg+2	1.440e-03	8.364e-04	-2.842	-3.078	-0.236	(0)
MgSO4	2.560e-04	2.560e-04	-3.592	-3.592	0.000	(0)
MgHCO3+	4.279e-05	3.730e-05	-4.369	-4.428	-0.060	(0)
MgF+	1.777e-05	1.553e-05	-4.750	-4.809	-0.059	(0)
MgCO3	1.996e-06	1.996e-06	-5.700	-5.700	0.000	(0)
MgOH+	5.334e-08	4.706e-08	-7.273	-7.327	-0.054	(0)
MgH2BO3+	4.359e-09	3.768e-09	-8.361	-8.424	-0.063	(0)
Mn (2)	2.405e-05					
Mn+2	1.982e-05	1.036e-05	-4.703	-4.985	-0.282	(0)
MnSO4	3.098e-06	3.098e-06	-5.509	-5.509	0.000	(0)

MnHCO3+	1.028e-06	9.006e-07	-5.988	-6.045	-0.057	(0)
MnF+	7.790e-08	6.825e-08	-7.108	-7.166	-0.057	(0)
MnCl+	2.238e-08	1.961e-08	-7.650	-7.708	-0.057	(0)
MnOH+	4.197e-09	3.677e-09	-8.377	-8.434	-0.057	(0)
MnCl2	4.166e-11	4.166e-11	-10.380	-10.380	0.000	(0)
MnCl3-	1.970e-14	1.726e-14	-13.706	-13.763	-0.057	(0)
MnSeO4	1.184e-14	1.184e-14	-13.927	-13.927	0.000	(0)
Mn (OH) 3-	5.182e-19	4.540e-19	-18.285	-18.343	-0.057	(0)
Mn (OH) 4-2	3.516e-25	2.072e-25	-24.454	-24.684	-0.230	(0)
MnSe	0.000e+00	0.000e+00	-42.752	-42.752	0.000	(0)
Mn (3)	6.624e-25					
Mn+3	6.624e-25	1.951e-25	-24.179	-24.710	-0.531	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.498	-43.728	-0.230	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.413	-47.475	-0.062	(0)
Mo	3.047e-07					
MoO4-2	3.045e-07	1.768e-07	-6.516	-6.752	-0.236	(0)
HMoO4-	2.947e-10	2.506e-10	-9.531	-9.601	-0.070	(0)
H2MoO4	1.307e-13	1.307e-13	-12.884	-12.884	0.000	(0)
Ag2MoO4	3.224e-24	3.224e-24	-23.492	-23.492	0.000	(0)
AlMo6O21-3	2.415e-40	0.000e+00	-39.617	-40.251	-0.634	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.919	-51.456	-2.537	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.455	-52.216	-1.761	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-53.454	-54.582	-1.127	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.849	-58.483	-0.634	(0)
Na	4.999e-03					
Na+	4.943e-03	4.315e-03	-2.306	-2.365	-0.059	(0)
NaSO4-	4.440e-05	3.898e-05	-4.353	-4.409	-0.057	(0)
NaHCO3	1.057e-05	1.057e-05	-4.976	-4.976	0.000	(0)
NaF	4.507e-07	4.507e-07	-6.346	-6.346	0.000	(0)
NaCO3-	2.626e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
NaH2BO3	8.887e-10	8.887e-10	-9.051	-9.051	0.000	(0)
NaCrO4-	2.875e-18	2.445e-18	-17.541	-17.612	-0.070	(0)
Ni	2.132e-07					
Ni+2	1.308e-07	7.595e-08	-6.884	-7.119	-0.236	(0)
NiHCO3+	4.799e-08	4.080e-08	-7.319	-7.389	-0.070	(0)
NiSO4	2.549e-08	2.549e-08	-7.594	-7.594	0.000	(0)
NiCO3	8.129e-09	8.129e-09	-8.090	-8.090	0.000	(0)
NiF+	3.714e-10	3.158e-10	-9.430	-9.501	-0.070	(0)
NiCl+	3.437e-10	2.922e-10	-9.464	-9.534	-0.070	(0)
NiOH+	1.589e-10	1.351e-10	-9.799	-9.869	-0.070	(0)
Ni (SO4) 2-2	2.716e-12	1.420e-12	-11.566	-11.848	-0.282	(0)
Ni (OH) 2	1.517e-12	1.517e-12	-11.819	-11.819	0.000	(0)
NiCl2	2.213e-15	2.213e-15	-14.655	-14.655	0.000	(0)
Ni (OH) 3-	2.522e-16	2.145e-16	-15.598	-15.669	-0.070	(0)
NiSeO4	1.509e-16	1.509e-16	-15.821	-15.821	0.000	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.120e-08					
PbCO3	1.170e-08	1.170e-08	-7.932	-7.932	0.000	(0)
PbHCO3+	5.166e-09	4.392e-09	-8.287	-8.357	-0.070	(0)
Pb+2	2.335e-09	1.357e-09	-8.632	-8.868	-0.236	(0)
PbSO4	1.117e-09	1.117e-09	-8.952	-8.952	0.000	(0)
PbOH+	5.665e-10	4.816e-10	-9.247	-9.317	-0.070	(0)
Pb (CO3) 2-2	1.852e-10	9.679e-11	-9.732	-10.014	-0.282	(0)
PbCl+	8.514e-11	7.239e-11	-10.070	-10.140	-0.070	(0)
Pb (SO4) 2-2	2.167e-11	1.133e-11	-10.664	-10.946	-0.282	(0)
PbF+	1.861e-11	1.582e-11	-10.730	-10.801	-0.070	(0)
Pb (OH) 2	2.153e-12	2.153e-12	-11.667	-11.667	0.000	(0)
PbCl2	4.863e-13	4.863e-13	-12.313	-12.313	0.000	(0)
PbF2	5.154e-14	5.154e-14	-13.288	-13.288	0.000	(0)
Pb (OH) 3-	3.579e-16	3.043e-16	-15.446	-15.517	-0.070	(0)
PbCl3-	3.425e-16	2.912e-16	-15.465	-15.536	-0.070	(0)
Pb2OH+3	4.459e-17	1.035e-17	-16.351	-16.985	-0.634	(0)
PbF3-	1.903e-17	1.618e-17	-16.721	-16.791	-0.070	(0)
PbCl4-2	3.830e-19	2.002e-19	-18.417	-18.699	-0.282	(0)
Pb (OH) 4-2	2.015e-20	1.053e-20	-19.696	-19.977	-0.282	(0)

PbF4-2	2.453e-21	1.282e-21	-20.610	-20.892	-0.282	(0)
Pb3 (OH) 4+2	2.400e-22	1.254e-22	-21.620	-21.902	-0.282	(0)
Pb4 (OH) 4+4	1.812e-26	1.352e-27	-25.742	-26.869	-1.127	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.478	-150.478	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.548	-227.619	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.785	-72.785	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.370	-78.440	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.568	-78.568	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.667	-78.737	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.376	-80.658	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.892	-81.174	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.972	-81.254	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.778	-82.060	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.794	-83.076	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.363	-88.593	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.104	-138.175	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.928	-138.928	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.453	-139.735	-0.282	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.055	-147.125	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.293	-147.461	-0.168	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.144	-148.455	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.888	-149.185	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.175	-149.245	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.436	-149.754	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.761	-150.065	-0.304	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.974	-149.974	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.382	-150.382	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.478	-150.478	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.775	-158.775	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.676	-215.746	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.472	-225.543	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.444	-226.514	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.548	-227.619	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.094	-228.375	-0.282	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.108	-235.178	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.477	-302.758	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.161	-305.443	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.910	-317.192	-0.282	(0)
S (6)	3.653e-03					
SO4-2	2.896e-03	1.682e-03	-2.538	-2.774	-0.236	(0)
CaSO4	4.447e-04	4.447e-04	-3.352	-3.352	0.000	(0)
MgSO4	2.560e-04	2.560e-04	-3.592	-3.592	0.000	(0)
NaSO4-	4.440e-05	3.898e-05	-4.353	-4.409	-0.057	(0)
KSO4-	8.553e-06	7.508e-06	-5.068	-5.124	-0.057	(0)
MnSO4	3.098e-06	3.098e-06	-5.509	-5.509	0.000	(0)
CuSO4	1.828e-07	1.828e-07	-6.738	-6.738	0.000	(0)
ZnSO4	1.755e-07	1.755e-07	-6.756	-6.756	0.000	(0)
NiSO4	2.549e-08	2.549e-08	-7.594	-7.594	0.000	(0)
CoSO4	1.682e-08	1.682e-08	-7.774	-7.774	0.000	(0)
HSO4-	1.339e-08	1.171e-08	-7.873	-7.932	-0.059	(0)
Zn (SO4) 2-2	4.919e-09	2.571e-09	-8.308	-8.590	-0.282	(0)
CdSO4	1.954e-09	1.954e-09	-8.709	-8.709	0.000	(0)
PbSO4	1.117e-09	1.117e-09	-8.952	-8.952	0.000	(0)
AgSO4-	2.739e-10	2.329e-10	-9.562	-9.633	-0.070	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
Cd (SO4) 2-2	8.485e-11	4.434e-11	-10.071	-10.353	-0.282	(0)
Pb (SO4) 2-2	2.167e-11	1.133e-11	-10.664	-10.946	-0.282	(0)
AlSO4+	2.135e-11	1.866e-11	-10.671	-10.729	-0.059	(0)
FeSO4	5.915e-12	5.915e-12	-11.228	-11.228	0.000	(0)
Ni (SO4) 2-2	2.716e-12	1.420e-12	-11.566	-11.848	-0.282	(0)
CrSO4+	4.097e-13	3.484e-13	-12.387	-12.458	-0.070	(0)
Al (SO4) 2-	3.847e-13	3.362e-13	-12.415	-12.473	-0.059	(0)
UO2SO4	8.641e-14	8.641e-14	-13.063	-13.063	0.000	(0)
UO2 (SO4) 2-2	3.666e-15	1.916e-15	-14.436	-14.718	-0.282	(0)
VO2SO4-	4.496e-16	3.822e-16	-15.347	-15.418	-0.070	(0)
FeSO4+	1.209e-17	1.059e-17	-16.918	-16.975	-0.057	(0)
Cr2 (OH) 2SO4+2	5.194e-18	2.714e-18	-17.285	-17.566	-0.282	(0)

VOSO4	4.243e-18	4.243e-18	-17.372	-17.372	0.000	(0)
Fe (SO4) 2-	4.480e-19	3.809e-19	-18.349	-18.419	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.712e-19	2.712e-19	-18.567	-18.567	0.000	(0)
HgSO4	1.882e-21	1.882e-21	-20.725	-20.725	0.000	(0)
CrO3SO4-2	1.835e-24	9.589e-25	-23.736	-24.018	-0.282	(0)
VSO4+	5.110e-32	4.344e-32	-31.292	-31.362	-0.070	(0)
U (SO4) 2	7.227e-40	7.227e-40	-39.141	-39.141	0.000	(0)
USO4+2	1.035e-40	0.000e+00	-39.985	-40.267	-0.282	(0)
Sb (3)	1.080e-19					
Sb (OH) 3	5.462e-20	5.462e-20	-19.263	-19.263	0.000	(0)
HSbO2	5.334e-20	5.334e-20	-19.273	-19.273	0.000	(0)
SbO2-	1.427e-24	1.213e-24	-23.846	-23.916	-0.070	(0)
Sb (OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.897e-25	9.897e-25	-24.004	-24.004	0.000	(0)
Sb (OH) 4-	8.170e-25	6.946e-25	-24.088	-24.158	-0.070	(0)
Sb (OH) 2+	1.111e-25	9.449e-26	-24.954	-25.025	-0.070	(0)
SbO+	3.833e-26	3.259e-26	-25.416	-25.487	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.910	-317.192	-0.282	(0)
Sb (5)	1.326e-08					
SbO3-	1.324e-08	1.126e-08	-7.878	-7.948	-0.070	(0)
Sb (OH) 6-	1.507e-11	1.316e-11	-10.822	-10.881	-0.059	(0)
SbO2+	1.927e-23	1.639e-23	-22.715	-22.786	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.470e-40	2.950e-40	-39.460	-39.530	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.752	-42.752	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.788	-42.788	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.101	-47.383	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.158	-86.286	-1.127	(0)
Se (4)	2.250e-08					
HSeO3-	2.063e-08	1.754e-08	-7.686	-7.756	-0.070	(0)
SeO3-2	1.876e-09	9.803e-10	-8.727	-9.009	-0.282	(0)
H2SeO3	5.327e-13	5.327e-13	-12.273	-12.273	0.000	(0)
AgSeO3-	5.143e-15	4.373e-15	-14.289	-14.359	-0.070	(0)
Cd (SeO3) 2-2	7.512e-21	3.926e-21	-20.124	-20.406	-0.282	(0)
Ag (SeO3) 2-3	1.653e-22	3.838e-23	-21.782	-22.416	-0.634	(0)
FeHSeO3+2	4.977e-23	2.601e-23	-22.303	-22.585	-0.282	(0)
Se (6)	7.324e-12					
SeO4-2	7.312e-12	4.247e-12	-11.136	-11.372	-0.236	(0)
MnSeO4	1.184e-14	1.184e-14	-13.927	-13.927	0.000	(0)
ZnSeO4	3.137e-16	3.137e-16	-15.504	-15.504	0.000	(0)
NiSeO4	1.509e-16	1.509e-16	-15.821	-15.821	0.000	(0)
CoSeO4	1.067e-16	1.067e-16	-15.972	-15.972	0.000	(0)
HSeO4-	1.783e-17	1.516e-17	-16.749	-16.819	-0.070	(0)
CdSeO4	3.920e-18	3.920e-18	-17.407	-17.407	0.000	(0)
Zn (SeO4) 2-2	2.585e-27	1.351e-27	-26.588	-26.869	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.880	-58.514	-0.634	(0)
U (4)	3.938e-22					
U (OH) 5-	3.928e-22	3.340e-22	-21.406	-21.476	-0.070	(0)
U (OH) 4	9.964e-25	9.964e-25	-24.002	-24.002	0.000	(0)
U (OH) 3+	3.052e-28	2.595e-28	-27.515	-27.586	-0.070	(0)
U (OH) 2+2	1.636e-32	8.548e-33	-31.786	-32.068	-0.282	(0)
UF3+	1.715e-34	1.458e-34	-33.766	-33.836	-0.070	(0)
UF2+2	1.064e-35	5.559e-36	-34.973	-35.255	-0.282	(0)
UF4	2.647e-36	2.647e-36	-35.577	-35.577	0.000	(0)
UOH+3	1.235e-37	2.868e-38	-36.908	-37.542	-0.634	(0)
UF5-	2.042e-38	1.736e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.149e-38	2.668e-39	-37.940	-38.574	-0.634	(0)
UF6-2	1.661e-39	8.679e-40	-38.780	-39.062	-0.282	(0)
U (SO4) 2	7.227e-40	7.227e-40	-39.141	-39.141	0.000	(0)
USO4+2	1.035e-40	0.000e+00	-39.985	-40.267	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.965	-44.093	-1.127	(0)
UCl+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.795	-174.502	-5.707	(0)
U (5)	5.770e-17					
UO2+	5.770e-17	4.906e-17	-16.239	-16.309	-0.070	(0)
U (6)	8.563e-08					

UO2 (CO3) 3-4	4.278e-08	3.191e-09	-7.369	-8.496	-1.127	(0)
UO2 (CO3) 2-2	4.246e-08	2.219e-08	-7.372	-7.654	-0.282	(0)
UO2CO3	3.876e-10	3.876e-10	-9.412	-9.412	0.000	(0)
UO2F+	9.121e-13	7.755e-13	-12.040	-12.110	-0.070	(0)
UO2OH+	7.103e-13	6.040e-13	-12.149	-12.219	-0.070	(0)
UO2F2	3.702e-13	3.702e-13	-12.432	-12.432	0.000	(0)
UO2SO4	8.641e-14	8.641e-14	-13.063	-13.063	0.000	(0)
UO2+2	5.843e-14	3.394e-14	-13.233	-13.469	-0.236	(0)
UO2F3-	1.810e-14	1.539e-14	-13.742	-13.813	-0.070	(0)
UO2 (SO4) 2-2	3.666e-15	1.916e-15	-14.436	-14.718	-0.282	(0)
UO2Cl+	9.737e-17	8.279e-17	-16.012	-16.082	-0.070	(0)
UO2F4-2	3.872e-17	2.024e-17	-16.412	-16.694	-0.282	(0)
(UO2) 2 (OH) 2+2	1.158e-18	6.054e-19	-17.936	-18.218	-0.282	(0)
(UO2) 3 (OH) 5+	6.517e-21	5.541e-21	-20.186	-20.256	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.466	-40.537	-0.070	(0)
V+2	0.000e+00	0.000e+00	-40.915	-41.197	-0.282	(0)
V (3)	1.246e-13					
V (OH) 3	1.246e-13	1.246e-13	-12.904	-12.904	0.000	(0)
V (OH) 2+	6.747e-24	5.737e-24	-23.171	-23.241	-0.070	(0)
VOH+2	7.417e-27	3.876e-27	-26.130	-26.412	-0.282	(0)
V+3	2.356e-31	5.472e-32	-30.628	-31.262	-0.634	(0)
VSO4+	5.110e-32	4.344e-32	-31.292	-31.362	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.567	-51.201	-0.634	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.896	-52.023	-1.127	(0)
V (4)	3.367e-16					
V (OH) 3+	3.037e-16	2.582e-16	-15.518	-15.588	-0.070	(0)
VO+2	1.752e-17	9.158e-18	-16.756	-17.038	-0.282	(0)
VOF+	1.069e-17	9.092e-18	-16.971	-17.041	-0.070	(0)
VOSO4	4.243e-18	4.243e-18	-17.372	-17.372	0.000	(0)
VOF2	5.643e-19	5.643e-19	-18.248	-18.248	0.000	(0)
VOC1+	4.545e-20	3.864e-20	-19.342	-19.413	-0.070	(0)
VOF3-	3.898e-21	3.314e-21	-20.409	-20.480	-0.070	(0)
VOF4-2	4.237e-24	2.214e-24	-23.373	-23.655	-0.282	(0)
H2V2O4+2	6.398e-27	3.343e-27	-26.194	-26.476	-0.282	(0)
V (5)	1.171e-07					
H2VO4-	1.105e-07	9.399e-08	-6.956	-7.027	-0.070	(0)
HVO4-2	6.344e-09	3.315e-09	-8.198	-8.479	-0.282	(0)
H3VO4	6.693e-11	6.693e-11	-10.174	-10.174	0.000	(0)
H3V2O7-	4.779e-11	4.063e-11	-10.321	-10.391	-0.070	(0)
HV2O7-3	4.549e-13	1.056e-13	-12.342	-12.976	-0.634	(0)
VO2+	1.090e-14	9.517e-15	-13.962	-14.021	-0.059	(0)
V3O9-3	3.748e-15	8.704e-16	-14.426	-15.060	-0.634	(0)
VO2F	2.763e-15	2.763e-15	-14.559	-14.559	0.000	(0)
VO4-3	1.005e-15	2.333e-16	-14.998	-15.632	-0.634	(0)
V2O7-4	5.352e-16	3.992e-17	-15.271	-16.399	-1.127	(0)
VO2SO4-	4.496e-16	3.822e-16	-15.347	-15.418	-0.070	(0)
VO2F2-	1.953e-16	1.660e-16	-15.709	-15.780	-0.070	(0)
VO2F3-2	6.560e-19	3.428e-19	-18.183	-18.465	-0.282	(0)
V4O12-4	4.574e-19	3.411e-20	-18.340	-19.467	-1.127	(0)
VO2F4-3	1.202e-22	2.792e-23	-21.920	-22.554	-0.634	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.151	-48.912	-1.761	(0)
V10O28-6	0.000e+00	0.000e+00	-47.415	-49.951	-2.537	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.725	-50.852	-1.127	(0)
Zn	1.170e-06					
Zn+2	8.211e-07	4.769e-07	-6.086	-6.322	-0.236	(0)
ZnSO4	1.755e-07	1.755e-07	-6.756	-6.756	0.000	(0)
ZnCO3	7.873e-08	7.873e-08	-7.104	-7.104	0.000	(0)
ZnHCO3+	7.730e-08	6.572e-08	-7.112	-7.182	-0.070	(0)
ZnOH+	7.928e-09	6.741e-09	-8.101	-8.171	-0.070	(0)
Zn (SO4) 2-2	4.919e-09	2.571e-09	-8.308	-8.590	-0.282	(0)
ZnCl+	2.067e-09	1.802e-09	-8.685	-8.744	-0.060	(0)
ZnF+	1.852e-09	1.575e-09	-8.732	-8.803	-0.070	(0)
ZnOHC1	3.334e-10	3.334e-10	-9.477	-9.477	0.000	(0)
Zn (OH) 2	1.510e-10	1.510e-10	-9.821	-9.821	0.000	(0)
ZnCl2	4.294e-12	4.294e-12	-11.367	-11.367	0.000	(0)
Zn (OH) 3-	1.258e-13	1.070e-13	-12.900	-12.971	-0.070	(0)
ZnCl3-	5.885e-15	5.130e-15	-14.230	-14.290	-0.060	(0)

ZnSeO4	3.137e-16	3.137e-16	-15.504	-15.504	0.000	(0)
ZnCl4-2	6.548e-18	3.858e-18	-17.184	-17.414	-0.230	(0)
Zn (OH) 4-2	1.152e-18	6.019e-19	-17.939	-18.220	-0.282	(0)
Zn (SeO4) 2-2	2.585e-27	1.351e-27	-26.588	-26.869	-0.282	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.175	-149.245	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.382	-150.382	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.472	-225.543	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.094	-228.375	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.161	-305.443	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Acanthite	-51.39	-87.61	-36.22	Ag2S
Ag2CO3	-10.77	-21.86	-11.09	Ag2CO3
Ag2CrO4	-20.67	-32.26	-11.59	Ag2CrO4
Ag2HVO4	-10.38	-8.90	1.48	Ag2HVO4
Ag2MoO4	-11.52	-23.07	-11.55	Ag2MoO4
Ag2O	-14.60	-2.02	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-26.93	-24.77	2.16	Ag3AsO3
Ag3AsO4	-15.34	-18.12	-2.79	Ag3AsO4
Ag3H2VO5	-15.09	-9.91	5.18	Ag3H2VO5
AgF:4H2O	-12.99	-11.94	1.05	AgF:4H2O
Agmetal	-0.28	-13.78	-13.51	Ag
AgVO3	-8.66	-7.89	0.77	AgVO3
Al (OH) 3 (am)	-1.20	9.60	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.31	-43.95	2.37	Al2 (MoO4) 3
Al2O3	-0.46	19.19	19.65	Al2O3
Al4 (OH) 10SO4	-1.38	21.32	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.29	-5.49	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.85	-11.64	-7.79	PbSO4
Anhydrite	-1.35	-5.71	-4.36	CaSO4
Anilite	-54.88	-86.76	-31.88	Cu0.25Cu1.5S
Antlerite	-1.94	6.84	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-84.18	-86.94	-2.76	As4O6
Artinite	-7.00	2.60	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-36.88	-30.18	6.71	As2O5
Atacamite	-1.42	5.97	7.39	Cu2 (OH) 3Cl
Azurite	1.14	-15.76	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.31	7.09	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-15.44	0.43	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.42	7.52	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-8.95	-14.77	-5.82	BaF2
BaMoO4	-7.00	-13.96	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.64	-7.81	1.83	BaSeO3
BaSeO4	-11.12	-18.58	-7.46	BaSeO4
Bianchite	-7.33	-9.10	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.89	-6.54	-0.64	Mn2O3
BlaubleiI	-54.67	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.22	-82.49	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.41	14.81	15.22	Cu4 (OH) 6SO4
Brucite	-5.63	11.22	16.84	Mg (OH) 2

Bunsenite	-5.27	7.18	12.45	NiO
Ca (VO3) 2	-8.05	-2.39	5.66	Ca (VO3) 2
Ca2V2O7	-8.53	8.97	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.59	8.97	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-18.41	3.89	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-18.64	20.32	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-19.54	20.32	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.70	-157.72	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.93	-26.84	-17.91	Hg2Cl2
CaMoO4	-1.74	-9.69	-7.95	CaMoO4
Carnotite	-2.33	-2.10	0.23	KUO2VO4
CaSeO3:2H2O	-6.36	-3.55	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.29	-14.31	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-13.45	-3.61	9.84	Cd (BO2) 2
Cd (OH) 2	-7.65	5.99	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.74	5.99	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-22.88	-16.17	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-21.66	0.90	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-21.51	6.89	28.40	Cd4 (OH) 6SO4
CdCl2	-13.29	-13.95	-0.66	CdCl2
CdCl2:1H2O	-12.26	-13.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.04	-13.95	-1.91	CdCl2:2.5H2O
CdF2	-14.65	-15.87	-1.21	CdF2
Cdmetal (alpha)	-33.07	-19.55	13.51	Cd
Cdmetal (gamma)	-33.17	-19.55	13.62	Cd
CdMoO4	-0.91	-15.06	-14.15	CdMoO4
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.78	-77.13	-0.35	CdSb
CdSe	-20.49	-40.69	-20.20	CdSe
CdSeO4:2H2O	-17.83	-19.68	-1.85	CdSeO4:2H2O
CdSO4	-10.91	-11.08	-0.17	CdSO4
CdSO4:1H2O	-9.35	-11.08	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.21	-11.08	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.23	-10.98	-9.75	AgCl
Cerrusite	-1.28	-14.41	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.46	-9.10	-2.64	CuSO4:5H2O
Chalcocite	-54.89	-89.81	-34.92	Cu2S
Chalcopyrite	-124.48	-159.75	-35.27	CuFeS2
Cinnabar	-52.16	-97.86	-45.69	HgS
Claudetite	-83.88	-86.94	-3.06	As4O6
Clausthalite	-14.15	-41.25	-27.10	PbSe
Co (BO2) 2	-29.67	-2.60	27.07	Co (BO2) 2
Co (OH) 2	-6.10	6.99	13.09	Co (OH) 2
Co (OH) 3	-10.32	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-22.23	-9.19	13.03	Co3 (AsO4) 2
Co3O4	-7.78	-18.27	-10.50	Co3O4
CoCl2	-21.21	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.48	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.27	-14.86	-1.60	CoF2
CoF3	-43.96	-45.42	-1.46	CoF3
CoFe2O4	16.91	13.38	-3.53	CoFe2O4
CoMoO4	-6.29	-14.05	-7.76	CoMoO4
CoO	-6.59	6.99	13.59	CoO
CoS (alpha)	-71.15	-78.59	-7.44	CoS
CoS (beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.48	-39.68	-16.20	CoSe
CoSeO3	-9.23	-7.91	1.32	CoSeO3
CoSeO4:6H2O	-17.14	-18.67	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.07	2.80	CoSO4
CoSO4:6H2O	-7.60	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.73	-14.51	-4.78	PbCl2
Covellite	-55.32	-77.62	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2

Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.04	-30.94	14.09	CrCl2
CrCl3	-46.20	-31.09	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu(OH)2	-0.70	7.97	8.67	Cu(OH)2
Cu(SbO3)2	-24.67	20.54	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-55.15	-90.04	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.10	-50.90	-45.80	Cu2Se
Cu2SO4	-19.34	-21.29	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.36	-6.26	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.64	-102.23	-42.59	Cu3Sb
Cu3Se2	-26.12	-89.61	-63.49	Cu3Se2
CuCO3	-0.37	-11.87	-11.50	CuCO3
CuCrO4	-16.83	-22.27	-5.44	CuCrO4
CuF	-8.13	-13.04	-4.91	CuF
CuF2	-15.00	-13.89	1.12	CuF2
CuF2:2H2O	-9.34	-13.89	-4.55	CuF2:2H2O
Cumetal	-6.13	-14.88	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.43	-1.13	10.30	CuOCuSO4
Cupricferrite	8.37	14.35	5.99	CuFe2O4
Cuprite	-2.82	-4.22	-1.41	Cu2O
Cuprousferrite	10.00	1.08	-8.92	CuFeO2
CuSe	-5.61	-38.71	-33.10	CuSe
CuSe2	-26.47	-59.84	-33.37	CuSe2
CuSeO3:2H2O	-7.44	-6.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.26	-17.70	-2.44	CuSeO4:5H2O
CuSO4	-12.04	-9.10	2.94	CuSO4
Diaspore	2.72	9.60	6.87	AlOOH
Djurleite	-55.09	-89.01	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.73	-5.85	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.24	0.20	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.58	-10.30	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.08	-8.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.70	-38.33	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.09	-44.82	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.30	-11.90	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.51	-17.60	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.76	-64.36	-18.60	FeSe2
FeS(ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.23	-43.23	-11.00	FeSe
Fix_pe	-5.62	-5.62	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.19	-80.16	-13.97	PbS
Gibbsite	1.31	9.60	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.09	-9.10	-2.01	ZnSO4:7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.48	-332.52	-45.03	Fe3S4
Gummite	-6.85	0.83	7.67	UO3
Gypsum	-1.10	-5.71	-4.61	CaSO4:2H2O
H-Jarosite	-12.46	-24.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.17	-21.05	-12.88	H2MoO4
H2S(g)	-77.58	-85.59	-8.01	H2S
H2Se(g)	-41.72	-46.68	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4

Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.25	22.65	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.59	-256.30	-73.71	Hg (CH3) 2
Hg (g)	-8.35	-16.22	-7.87	Hg
Hg (OH) 2	-8.77	-12.27	-3.50	Hg (OH) 2
Hg2 (g)	-17.49	-32.44	-14.96	Hg2
Hg2 (OH) 2	-12.16	-6.90	5.26	Hg2 (OH) 2
Hg2CO3	-10.68	-26.73	-16.05	Hg2CO3
Hg2CrO4	-28.43	-37.13	-8.70	Hg2CrO4
Hg2F2	-18.39	-28.75	-10.36	Hg2F2
Hg2S	-80.81	-92.48	-11.68	Hg2S
Hg2SeO3	-17.14	-21.80	-4.66	Hg2SeO3
Hg2SO4	-17.84	-23.97	-6.13	Hg2SO4
Hg3O2CO3	-26.96	-56.64	-29.68	Hg3O2CO3
HgCl (g)	-32.92	-13.42	19.50	HgCl
HgCl2	-10.95	-32.21	-21.26	HgCl2
HgF (g)	-47.05	-14.38	32.68	HgF
HgF2 (g)	-46.69	-34.13	12.57	HgF2
Hgmetal (l)	-2.77	-16.22	-13.45	Hg
HgSe	-3.25	-58.95	-55.69	HgSe
HgSeO3	-14.74	-27.17	-12.43	HgSeO3
HgSO4	-19.92	-29.34	-9.42	HgSO4
Huntite	-4.37	-34.34	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-4.62	-23.39	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.50	-23.26	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.43	-20.60	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.82	-20.62	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.34	-52.58	-17.24	K2Cr2O7
K2CrO4	-21.83	-22.34	-0.51	K2CrO4
K2MoO4	-16.41	-13.15	3.26	K2MoO4
K2SeO4	-17.04	-17.77	-0.73	K2SeO4
Langite	-2.67	14.81	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.78	-6.21	-0.43	PbO : PbSO4
Laurionite	-5.17	-4.54	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.27	5.43	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.41	-3.90	-5.31	Cu2 (OH) 2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.47	5.43	12.89	PbO
Matlockite	-6.50	-15.47	-8.97	PbClF
Melanothallite	-18.23	-11.97	6.26	CuCl2
Melanterite	-11.41	-13.62	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.76	-97.86	-45.09	HgS
Mg (OH) 2 (active)	-7.58	11.22	18.79	Mg (OH) 2
Mg (VO3) 2	-13.81	-2.53	11.28	Mg (VO3) 2
Mg2Sb3	-276.08	-201.39	74.68	Mg2Sb3
Mg2V2O7	-17.67	8.69	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.98	-9.83	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.74	-3.69	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.25	-14.45	-1.20	MgSeO4 : 6H2O
Minium	-31.70	41.83	73.52	Pb3O4
Mirabilite	-6.39	-7.51	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.34	-4.44	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.03	-57.74	-5.71	Mn2 (SO4) 3
Mn2Sb	-151.13	-90.05	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-14.75	-2.25	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.35	-10.63	2.72	MnCl2 : 4H2O
MnS (grn)	-76.45	-76.28	0.17	MnS
MnS (pnk)	-79.62	-76.28	3.34	MnS

MnSb	-96.25	-99.16	-2.91	MnSb
MnSe	-40.87	-37.37	3.50	MnSe
MnSeO3	-6.72	-5.59	1.13	MnSeO3
MnSeO3:2H2O	-6.58	-5.59	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.31	-16.36	-2.05	MnSeO4:5H2O
MnSO4	-10.34	-7.76	2.58	MnSO4
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO3	-13.05	-21.05	-8.00	MoO3
Morenosite	-7.75	-9.89	-2.14	NiSO4:7H2O
MoS2	-147.51	-217.77	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.60	-20.67	2.93	Na2CrO4
Na2Mo2O7	-15.93	-32.53	-16.60	Na2Mo2O7
Na2MoO4	-12.97	-11.48	1.49	Na2MoO4
Na2MoO4:2H2O	-12.71	-11.48	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.64	-5.34	10.30	Na2SeO3:5H2O
Na2SeO4	-17.38	-16.10	1.28	Na2SeO4
Na3Sb	-176.00	-81.55	94.45	Na3Sb
Na3VO4	-29.21	7.47	36.68	Na3VO4
Na4V2O7	-32.02	5.38	37.40	Na4V2O7
Nantokite	-5.35	-12.08	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.27	-1.31	Na2CO3:10H2O
NaVO3	-5.95	-2.09	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.62	7.18	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.35	-8.65	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.73	-13.87	-11.14	NiMoO4
NiS(alpha)	-72.81	-78.41	-5.60	NiS
NiS(beta)	-67.31	-78.41	-11.10	NiS
NiS(gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.80	-39.50	-17.70	NiSe
NiSeO3:2H2O	-10.54	-7.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.97	-18.49	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-239.17	-300.23	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.69	-4.17	6.52	Pb(BO2)2
Pb(OH)2	-2.72	5.43	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.99	-64.75	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.91	0.88	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.33	10.85	26.19	Pb2O(OH)2
Pb2O3	-24.64	36.40	61.04	Pb2O3
Pb2OCO3	-8.42	-8.98	-0.56	Pb2OCO3
Pb2V2O7	-0.99	-2.89	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.70	-13.90	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.61	2.53	6.14	Pb3(VO4)2
Pb3O2CO3	-14.58	-3.56	11.02	Pb3O2CO3
Pb3O2SO4	-11.47	-0.79	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.46	4.64	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.24	4.64	21.88	Pb4O3SO4
PbCrO4	-12.21	-24.81	-12.60	PbCrO4
PbF2	-8.99	-16.43	-7.44	PbF2
Pbmetal	-24.36	-20.12	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.55	5.43	12.98	PbO:0.33H2O
PbSeO4	-13.40	-20.24	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.11	-28.92	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.67	-142.18	-18.51	FeS2
Pyrochroite	-5.88	9.31	15.19	Mn(OH)2

Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.35	-120.10	-19.75	AsS
Retgersite	-7.85	-9.89	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.51	-19.01	-14.50	UO2CO3
Sb(OH)3	-12.15	-19.26	-7.11	Sb(OH)3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-26.39	-36.06	-9.67	Sb2O5
Sb2Se3	-110.80	-178.56	-67.76	Sb2Se3
Sb4O6(cubic)	-58.79	-77.05	-18.26	Sb4O6
Sb4O6(orth)	-59.15	-77.05	-17.90	Sb4O6
SbCl3	-49.74	-49.17	0.57	SbCl3
SbF3	-41.82	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-5.17	0.83	5.99	UO2(OH)2:H2O
Semetal(am)	-14.02	-21.13	-7.11	Se
Semetal(hex)	-13.42	-21.13	-7.71	Se
Senarmontite	-26.16	-38.52	-12.37	Sb2O3
SeO2	-15.03	-14.90	0.12	SeO2
SeO3	-46.71	-25.67	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.86	-11.86	-10.00	ZnCO3
Sphalerite	-66.16	-77.61	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.83	-295.29	-50.46	Sb2S3
Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.33	7.97	7.64	CuO
Thenardite	-7.83	-7.50	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-4.82	-0.74	4.08	Ca(UO2)2(VO4)2
U3O8	-16.50	4.58	21.08	U3O8
U3Sb4	-582.48	-430.10	152.38	U3Sb4
U4O9	-33.45	-36.47	-3.02	U4O9
UF4	-29.68	-59.22	-29.54	UF4
UF4:2.5H2O	-26.50	-59.22	-32.72	UF4:2.5H2O
UO2(am)	-16.44	-15.50	0.93	UO2
UO2(OH)2(beta)	-4.79	0.83	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.59	-24.84	-2.25	UO2SeO4:4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.97	29.58	USb2
V(OH)3	-17.41	-9.82	7.59	V(OH)3
V2O5	-12.39	-13.75	-1.36	V2O5
V3O5	-35.61	-33.78	1.84	V3O5
V4O7	-43.71	-36.52	7.19	V4O7
V6O13	-31.47	-92.33	-60.86	V6O13
Valentinite	-30.04	-38.52	-8.48	Sb2O3
VC12	-61.41	-42.53	18.87	VC12
VC13	-63.16	-39.73	23.43	VC13
VF4	-61.39	-46.46	14.93	VF4
Vmetal	-92.16	-48.14	44.03	V
VO	-37.35	-22.59	14.76	VO
VO(OH)2	-7.89	-2.74	5.15	VO(OH)2
VO2Cl	-19.69	-16.84	2.84	VO2Cl
VOC1	-30.94	-19.79	11.15	VOC1
VOC12	-35.44	-22.68	12.76	VOC12
VOSO4	-23.42	-19.81	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.66	-77.61	-8.95	ZnS
Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.03	-9.10	3.93	ZnSO4
Zn(BO2)2	-9.91	-1.62	8.29	Zn(BO2)2
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.50	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.78	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.56	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.76	7.97	11.73	Zn(OH)2

Zn2(OH)2SO4	-8.62	-1.12	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.22	5.98	15.19	Zn2(OH)3Cl
Zn3(AsO4)2·2.5H2O	-19.91	-6.26	13.65	Zn3(AsO4)2·2.5H2O
Zn3O(SO4)2	-29.13	-10.22	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.58	14.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.58	19.92	38.50	Zn5(OH)8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3·1H2O	-1.60	-11.86	-10.26	ZnCO3·1H2O
ZnF2	-13.35	-13.88	-0.53	ZnF2
Znmetal	-43.36	-17.57	25.79	Zn
ZnMoO4	-2.95	-13.07	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO
ZnS(am)	-68.56	-77.61	-9.05	ZnS
ZnSb	-86.16	-75.15	11.01	ZnSb
ZnSe	-24.30	-38.70	-14.40	ZnSe
ZnSeO4·6H2O	-16.17	-17.69	-1.52	ZnSeO4·6H2O
ZnSO4·1H2O	-8.46	-9.10	-0.64	ZnSO4·1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 119.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 701
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 701
USE Surface 701
USE Solution 703
SAVE Solution 704  #Initial Stage 7 groundwater after Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 701.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

1.136e-15  Surface + diffuse layer charge, eq
7.818e-08  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
1.715e+00  m² for 2.671e-05 moles of Ferrihydrite

```

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, $\psi_{DL} = 7.042e-02$ V.
 Boltzmann factor, $\exp(-\psi_{DL} * F / RT) = 6.451e-02$ (= c_{DL} / c_{free} if z is +1).

Element	Moles
C	4.3810e-11
Ca	5.4296e-13
Cl	8.7731e-10
H	1.2924e-10
K	8.6134e-13
Mg	8.4122e-14
N	3.5517e-09
Na	3.6494e-12
O	1.5830e-07
S	3.6887e-08

Hfo_s
 1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.928e-08	0.668	8.928e-08	-7.049
Hfo_sOH	4.379e-08	0.328	4.379e-08	-7.359
Hfo_sO-	4.920e-10	0.004	4.920e-10	-9.308
Hfo_sOHCa+2	1.630e-12	0.000	1.630e-12	-11.788

Hfo_w
 5.343e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.469e-06	0.462	2.469e-06	-5.608
Hfo_wOH	1.211e-06	0.227	1.211e-06	-5.917
Hfo_wSO4-	8.338e-07	0.156	8.338e-07	-6.079
Hfo_wOHSO4-2	8.159e-07	0.153	8.159e-07	-6.088
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.866
Hfo_wOMg+	1.923e-14	0.000	1.923e-14	-13.716
Hfo_wOCa+	6.522e-15	0.000	6.522e-15	-14.186

 Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in Sepiolite (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass), but is not in solution or other phases.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 WARNING: Element in phase, Chrysotile, is not in model.
 WARNING: Element in phase, Sepiolite, is not in model.
 WARNING: Element in phase, SiO2(am-ppt), is not in model.
 Using solution 703. Solution after simulation 118.
 Using surface 701.
 Using pure phase assemblage 701. Pure-phase assemblage after simulation 118.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta

Ag2Se	0.00	-48.70	-48.70	2.534e-08	2.172e-08	-3.624e-09
Alunite	0.00	-1.40	-1.40	9.163e-07	9.165e-07	1.397e-10
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.03	-9.94	-8.91	2.027e-08	0	-2.027e-08
Barite	0.00	-9.98	-9.98	1.324e-06	1.385e-06	6.082e-08
Brochantite	-0.95	14.27	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.271e-06
CaMoO4	-1.60	-9.55	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.53	-3.72	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.907e-03	2.906e-03	-6.428e-07
Carnotite	-4.10	-3.87	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.77	-14.92	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.030e-08	3.905e-08	-2.125e-08
Cu2Se(alpha)	-5.54	-51.34	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.540e-07	1.421e-07	-1.119e-07
Epsomite	-3.73	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.671e-05	2.671e-05	-5.094e-13
Fluorite	0.00	-10.50	-10.50	1.112e-04	1.113e-04	9.480e-09
Gummite	-6.85	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.43	-59.12	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.51	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.90	-5.77	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.17	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.39	-9.69	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.60	-13.74	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.329e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.291e-09	0	-5.291e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.36	-4.28	4.08	0.000e+00	0	0.000e+00
U3O8	-16.50	4.58	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.79	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.82	-12.94	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

2.801e-21 Surface + diffuse layer charge, eq
3.773e-07 Surface charge, eq
2.123e-02 sigma, C/m²
5.572e-02 psi, V
-2.169e+00 -F*psi/RT
1.143e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.328e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.964e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	6.7080e-13

Al	4.7086e-11
As	3.5269e-15
B	2.7657e-10
Ba	6.8546e-13
C	1.5693e-07
Ca	2.0957e-08
Cd	1.0467e-13
Cl	4.9536e-08
Co	1.1267e-12
Cr	6.6268e-14
Cu	1.1395e-10
F	5.6903e-09
Fe	4.0618e-14
H	1.6938e-07
Hg	3.8576e-15
K	7.6333e-09
Mg	1.3828e-08
Mn	1.8555e-10
Mo	2.0049e-11
N	8.4112e-14
Na	5.2030e-08
Ni	1.8697e-12
O	1.0848e-06
Pb	1.8425e-13
S	1.5323e-07
Sb	3.8125e-13
Se	4.5887e-13
U	7.8505e-12
V	5.9229e-14
Zn	1.0432e-11

Hfo_s

1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.746e-08	0.580	7.749e-08	-7.111
Hfo_sOCrOH+	4.249e-08	0.318	4.251e-08	-7.371
Hfo_sOPb+	1.055e-08	0.079	1.056e-08	-7.976
Hfo_sOZn+	1.326e-09	0.010	1.327e-09	-8.877
Hfo_sOMn+	1.183e-09	0.009	1.184e-09	-8.927
Hfo_sOHCa+2	2.518e-10	0.002	2.519e-10	-9.599
Hfo_sOH	1.789e-10	0.001	1.790e-10	-9.747
Hfo_sONi+	5.099e-11	0.000	5.101e-11	-10.292
Hfo_sOH2+	2.840e-11	0.000	2.841e-11	-10.547
Hfo_sO-	2.582e-11	0.000	2.583e-11	-10.588
Hfo_sOCu+	4.985e-12	0.000	4.987e-12	-11.302
Hfo_sOCd+	4.194e-12	0.000	4.195e-12	-11.377
Hfo_sOAg	4.055e-13	0.000	4.057e-13	-12.392
Hfo_sOHBa+2	4.196e-14	0.000	4.197e-14	-13.377
Hfo_sOFe+	2.062e-14	0.000	2.063e-14	-13.686
Hfo_sOHg+	6.996e-17	0.000	6.999e-17	-16.155

Hfo_w

5.343e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.590e-06	0.485	2.591e-06	-5.587
Hfo_wOH	1.166e-06	0.218	1.167e-06	-5.933
Hfo_wOHSO4-2	9.259e-07	0.173	9.263e-07	-6.033
Hfo_wOH2+	1.851e-07	0.035	1.852e-07	-6.732
Hfo_wO-	1.683e-07	0.032	1.684e-07	-6.774
Hfo_wOHVO4-3	1.150e-07	0.022	1.151e-07	-6.939
Hfo_wSO4-	7.368e-08	0.014	7.371e-08	-7.132
Hfo_wOHasO4-3	4.070e-08	0.008	4.072e-08	-7.390
Hfo_wOMg+	3.931e-08	0.007	3.933e-08	-7.405
Hfo_wOZn+	9.051e-09	0.002	9.055e-09	-8.043

Hfo_wOHSeO3-2	8.684e-09	0.002	8.688e-09	-8.061
Hfo_wOMn+	6.127e-09	0.001	6.130e-09	-8.213
Hfo_wOHMoO4-2	5.413e-09	0.001	5.415e-09	-8.266
Hfo_wOPb+	3.073e-09	0.001	3.074e-09	-8.512
Hfo_wOCa+	3.052e-09	0.001	3.053e-09	-8.515
Hfo_wSeO3-	2.342e-09	0.000	2.343e-09	-8.630
Hfo_wMoO4-	5.549e-10	0.000	5.551e-10	-9.256
Hfo_wONi+	4.484e-10	0.000	4.486e-10	-9.348
Hfo_wOCo+	9.158e-11	0.000	9.162e-11	-10.038
Hfo_wH2BO3	7.748e-11	0.000	7.751e-11	-10.111
Hfo_wHAsO4-	2.296e-11	0.000	2.297e-11	-10.639
Hfo_wOCd+	1.166e-11	0.000	1.167e-11	-10.933
Hfo_wOAg	6.953e-13	0.000	6.956e-13	-12.158
Hfo_wH2AsO4	1.180e-13	0.000	1.180e-13	-12.928
Hfo_wOFe+	8.480e-14	0.000	8.484e-14	-13.071
Hfo_wOHg+	2.233e-14	0.000	2.234e-14	-13.651
Hfo_wOBa+	7.350e-15	0.000	7.353e-15	-14.134
Hfo_wOHSbO(OH) 4-	2.680e-15	0.000	2.681e-15	-14.572
Hfo_wOHSeO4-2	1.605e-15	0.000	1.606e-15	-14.794
Hfo_wSbO(OH) 4	2.747e-16	0.000	2.748e-16	-15.561
Hfo_wSeO4-	1.112e-16	0.000	1.113e-16	-15.954
Hfo_wOHCrO4-2	8.083e-17	0.000	8.086e-17	-16.092
Hfo_wCrO4-	5.866e-18	0.000	5.869e-18	-17.231
Hfo_wH2AsO3	1.679e-23	0.000	1.680e-23	-22.775

-----Solution composition-----

Elements	Molality	Moles
Ag	4.008e-08	4.006e-08
Al	1.929e-06	1.928e-06
As	8.267e-11	8.264e-11
B	1.603e-05	1.602e-05
Ba	1.102e-07	1.102e-07
C	5.842e-03	5.839e-03
Ca	2.547e-03	2.545e-03
Cd	1.181e-08	1.180e-08
Cl	1.723e-03	1.722e-03
Co	1.358e-07	1.358e-07
Cr	6.443e-09	6.440e-09
Cu	6.994e-06	6.991e-06
F	2.117e-04	2.117e-04
Fe	3.677e-09	3.676e-09
Hg	2.249e-10	2.248e-10
K	7.308e-04	7.305e-04
Mg	1.758e-03	1.758e-03
Mn	2.404e-05	2.403e-05
Mo	4.160e-07	4.158e-07
N	3.553e-09	3.552e-09
Na	4.998e-03	4.996e-03
Ni	2.127e-07	2.126e-07
Pb	1.286e-08	1.285e-08
S	3.653e-03	3.652e-03
Sb	1.326e-08	1.325e-08
Se	1.510e-08	1.510e-08
U	8.562e-08	8.558e-08
V	1.987e-09	1.987e-09
Zn	1.159e-06	1.159e-06

-----Description of solution-----

equilibrium	pH	=	7.147	Charge balance
	pe	=	5.625	Adjusted to redox
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.909e-02	
	Mass of water (kg)	=	9.996e-01	
	Total alkalinity (eq/kg)	=	5.168e-03	

Total CO2 (mol/kg) = 5.842e-03
 Temperature (°C) = 25.00
 Electrical balance (eq) = 1.979e-15
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 1
 Total H = 1.109739e+02
 Total O = 5.551582e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.626e-07	1.413e-07	-6.789	-6.850	-0.061	(0)
H+	8.158e-08	7.122e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	4.008e-08					
AgCl	2.602e-08	2.602e-08	-7.585	-7.585	0.000	(0)
Ag+	9.705e-09	8.473e-09	-8.013	-8.072	-0.059	(0)
AgCl2-	4.008e-09	3.408e-09	-8.397	-8.468	-0.070	(0)
AgSO4-	3.345e-10	2.844e-10	-9.476	-9.546	-0.070	(0)
AgCl3-2	8.741e-12	4.568e-12	-11.058	-11.340	-0.282	(0)
AgF	3.522e-12	3.522e-12	-11.453	-11.453	0.000	(0)
AgOH	1.197e-13	1.197e-13	-12.922	-12.922	0.000	(0)
AgCl4-3	6.040e-14	1.403e-14	-13.219	-13.853	-0.634	(0)
AgH2BO3	1.745e-14	1.745e-14	-13.758	-13.758	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	4.212e-15	3.582e-15	-14.375	-14.446	-0.070	(0)
AgNO2	3.923e-15	3.923e-15	-14.406	-14.406	0.000	(0)
AgNH3+	1.366e-16	1.161e-16	-15.865	-15.935	-0.070	(0)
Ag (OH) 2-	1.945e-18	1.654e-18	-17.711	-17.782	-0.070	(0)
AgNO3	1.407e-20	1.407e-20	-19.852	-19.852	0.000	(0)
Ag (SeO3) 2-3	9.083e-23	2.109e-23	-22.042	-22.676	-0.634	(0)
Ag (NO2) 2-	1.584e-23	1.347e-23	-22.800	-22.871	-0.070	(0)
Ag (NH3) 2+	7.455e-24	6.338e-24	-23.128	-23.198	-0.070	(0)
Ag2MoO4	6.560e-24	6.560e-24	-23.183	-23.183	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.698	-72.698	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.418	-86.546	-1.127	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.968	-147.038	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.207	-147.374	-0.168	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.350	-149.667	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.674	-149.978	-0.304	(0)
Al	1.929e-06					
Al (OH) 4-	1.302e-06	1.138e-06	-5.885	-5.944	-0.059	(0)
AlF3	3.247e-07	3.247e-07	-6.489	-6.489	0.000	(0)
AlF2+	1.775e-07	1.558e-07	-6.751	-6.807	-0.057	(0)
Al (OH) 3	6.394e-08	6.394e-08	-7.194	-7.194	0.000	(0)
AlF4-	3.082e-08	2.693e-08	-7.511	-7.570	-0.059	(0)
Al (OH) 2+	2.583e-08	2.267e-08	-7.588	-7.644	-0.057	(0)
AlF+2	3.983e-09	2.365e-09	-8.400	-8.626	-0.226	(0)
AlOH+2	3.401e-10	2.020e-10	-9.468	-9.695	-0.226	(0)
AlSO4+	2.135e-11	1.866e-11	-10.671	-10.729	-0.059	(0)
Al+3	4.852e-12	1.429e-12	-11.314	-11.845	-0.531	(0)
Al (SO4) 2-	3.849e-13	3.363e-13	-12.415	-12.473	-0.059	(0)
AlMo6O21-3	1.564e-39	3.632e-40	-38.806	-39.440	-0.634	(0)
As (3)	5.646e-23					
H3AsO3	5.599e-23	5.599e-23	-22.252	-22.252	0.000	(0)
H2AsO3-	4.742e-25	4.032e-25	-24.324	-24.395	-0.070	(0)
HAsO3-2	9.879e-30	5.163e-30	-29.005	-29.287	-0.282	(0)
H4AsO3+	2.324e-30	1.976e-30	-29.634	-29.704	-0.070	(0)
AsO3-3	1.203e-35	2.794e-36	-34.920	-35.554	-0.634	(0)
As (5)	8.267e-11					
HAsO4-2	5.908e-11	3.087e-11	-10.229	-10.510	-0.282	(0)
H2AsO4-	2.359e-11	2.005e-11	-10.627	-10.698	-0.070	(0)
AsO4-3	5.903e-15	1.371e-15	-14.229	-14.863	-0.634	(0)
H3AsO4	2.471e-16	2.482e-16	-15.607	-15.605	0.002	(0)
B	1.603e-05					
H3BO3	1.586e-05	1.593e-05	-4.800	-4.798	0.002	(0)

	H2BO3-	1.503e-07	1.299e-07	-6.823	-6.886	-0.063	(0)
	CaH2BO3+	9.985e-09	8.631e-09	-8.001	-8.064	-0.063	(0)
	MgH2BO3+	4.359e-09	3.768e-09	-8.361	-8.424	-0.063	(0)
	BF(OH) 3-	1.217e-09	1.052e-09	-8.915	-8.978	-0.063	(0)
	NaH2BO3	8.885e-10	8.885e-10	-9.051	-9.051	0.000	(0)
	H5(BO3) 2-	2.038e-12	1.762e-12	-11.691	-11.754	-0.063	(0)
	BF2(OH) 2-	1.535e-12	1.326e-12	-11.814	-11.877	-0.063	(0)
	BaH2BO3+	2.891e-13	2.499e-13	-12.539	-12.602	-0.063	(0)
	AgH2BO3	1.745e-14	1.745e-14	-13.758	-13.758	0.000	(0)
	H8(BO3) 3-	3.248e-15	2.807e-15	-14.488	-14.552	-0.063	(0)
	BF3OH-	7.040e-18	6.085e-18	-17.152	-17.216	-0.063	(0)
	BF4-	4.084e-22	3.531e-22	-21.389	-21.452	-0.063	(0)
Ba		1.102e-07					
	Ba+2	1.072e-07	6.225e-08	-6.970	-7.206	-0.236	(0)
	BaHCO3+	2.943e-09	2.590e-09	-8.531	-8.587	-0.055	(0)
	BaCO3	9.157e-11	9.157e-11	-10.038	-10.038	0.000	(0)
	BaH2BO3+	2.891e-13	2.499e-13	-12.539	-12.602	-0.063	(0)
	BaOH+	4.383e-14	3.840e-14	-13.358	-13.416	-0.057	(0)
	BaNO3+	7.672e-19	6.523e-19	-18.115	-18.186	-0.070	(0)
	BaNH3+2	5.046e-19	2.637e-19	-18.297	-18.579	-0.282	(0)
C(4)		5.842e-03					
	HCO3-	4.964e-03	4.357e-03	-2.304	-2.361	-0.057	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.064e-04	9.367e-05	-3.973	-4.028	-0.055	(0)
	MgHCO3+	4.278e-05	3.729e-05	-4.369	-4.428	-0.060	(0)
	NaHCO3	1.057e-05	1.057e-05	-4.976	-4.976	0.000	(0)
	CuCO3	5.871e-06	5.871e-06	-5.231	-5.231	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.938e-06	2.868e-06	-5.306	-5.542	-0.236	(0)
	MgCO3	1.995e-06	1.995e-06	-5.700	-5.700	0.000	(0)
	MnHCO3+	1.027e-06	9.002e-07	-5.988	-6.046	-0.057	(0)
	NaCO3-	2.625e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
	CuHCO3+	1.124e-07	9.557e-08	-6.949	-7.020	-0.070	(0)
	Cu(CO3) 2-2	8.672e-08	4.532e-08	-7.062	-7.344	-0.282	(0)
	ZnCO3	7.801e-08	7.801e-08	-7.108	-7.108	0.000	(0)
	ZnHCO3+	7.660e-08	6.513e-08	-7.116	-7.186	-0.070	(0)
	NiHCO3+	4.787e-08	4.070e-08	-7.320	-7.390	-0.070	(0)
	UO2(CO3) 3-4	4.277e-08	3.190e-09	-7.369	-8.496	-1.127	(0)
	UO2(CO3) 2-2	4.246e-08	2.219e-08	-7.372	-7.654	-0.282	(0)
	CoHCO3+	1.996e-08	1.697e-08	-7.700	-7.770	-0.070	(0)
	NiCO3	8.108e-09	8.108e-09	-8.091	-8.091	0.000	(0)
	PbCO3	7.096e-09	7.096e-09	-8.149	-8.149	0.000	(0)
	PbHCO3+	3.134e-09	2.665e-09	-8.504	-8.574	-0.070	(0)
	BaHCO3+	2.943e-09	2.590e-09	-8.531	-8.587	-0.055	(0)
	CoCO3	2.428e-09	2.428e-09	-8.615	-8.615	0.000	(0)
	UO2CO3	3.877e-10	3.877e-10	-9.411	-9.411	0.000	(0)
	CdCO3	3.236e-10	3.236e-10	-9.490	-9.490	0.000	(0)
	Pb(CO3) 2-2	1.123e-10	5.870e-11	-9.950	-10.231	-0.282	(0)
	BaCO3	9.157e-11	9.157e-11	-10.038	-10.038	0.000	(0)
	CdHCO3+	5.775e-11	4.910e-11	-10.238	-10.309	-0.070	(0)
	Cd(CO3) 2-2	1.317e-12	6.880e-13	-11.881	-12.162	-0.282	(0)
	FeHCO3+	8.930e-13	7.861e-13	-12.049	-12.105	-0.055	(0)
	HgCO3	1.467e-14	1.467e-14	-13.834	-13.834	0.000	(0)
	Hg(CO3) 2-2	2.546e-16	1.331e-16	-15.594	-15.876	-0.282	(0)
	HgHCO3+	2.288e-17	1.946e-17	-16.640	-16.711	-0.070	(0)
Ca		2.547e-03					
	Ca+2	1.988e-03	1.154e-03	-2.702	-2.938	-0.236	(0)
	CaSO4	4.449e-04	4.449e-04	-3.352	-3.352	0.000	(0)
	CaHCO3+	1.064e-04	9.367e-05	-3.973	-4.028	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.380e-06	2.085e-06	-5.623	-5.681	-0.057	(0)
	CaH2BO3+	9.985e-09	8.631e-09	-8.001	-8.064	-0.063	(0)
	CaOH+	3.698e-09	3.255e-09	-8.432	-8.487	-0.055	(0)
	CaNH3+2	1.867e-14	9.758e-15	-13.729	-14.011	-0.282	(0)
	CaNO3+	8.977e-15	7.633e-15	-14.047	-14.117	-0.070	(0)
	Ca(NH3) 2+2	4.991e-26	2.608e-26	-25.302	-25.584	-0.282	(0)
Cd		1.181e-08					
	Cd+2	8.522e-09	4.950e-09	-8.069	-8.305	-0.236	(0)

CdSO4	1.952e-09	1.952e-09	-8.710	-8.710	0.000	(0)
CdCl+	8.361e-10	7.109e-10	-9.078	-9.148	-0.070	(0)
CdCO3	3.236e-10	3.236e-10	-9.490	-9.490	0.000	(0)
Cd (SO4) 2-2	8.475e-11	4.429e-11	-10.072	-10.354	-0.282	(0)
CdHCO3+	5.775e-11	4.910e-11	-10.238	-10.309	-0.070	(0)
CdF+	1.527e-11	1.298e-11	-10.816	-10.887	-0.070	(0)
CdOH+	6.535e-12	5.557e-12	-11.185	-11.255	-0.070	(0)
CdCl2	4.457e-12	4.457e-12	-11.351	-11.351	0.000	(0)
CdOHC1	4.121e-12	4.121e-12	-11.385	-11.385	0.000	(0)
Cd (CO3) 2-2	1.317e-12	6.880e-13	-11.881	-12.162	-0.282	(0)
CdCl3-	4.974e-15	4.229e-15	-14.303	-14.374	-0.070	(0)
Cd (OH) 2	4.955e-15	4.955e-15	-14.305	-14.305	0.000	(0)
CdF2	4.287e-15	4.287e-15	-14.368	-14.368	0.000	(0)
CdSeO4	2.626e-18	2.626e-18	-17.581	-17.581	0.000	(0)
Cd2OH+3	5.937e-19	1.378e-19	-18.226	-18.861	-0.634	(0)
Cd (OH) 3-	5.032e-20	4.278e-20	-19.298	-19.369	-0.070	(0)
CdNO3+	3.849e-20	3.273e-20	-19.415	-19.485	-0.070	(0)
Cd (SeO3) 2-2	3.377e-21	1.765e-21	-20.471	-20.753	-0.282	(0)
Cd (OH) 4-2	1.894e-27	9.897e-28	-26.723	-27.004	-0.282	(0)
Cd (NO3) 2	3.429e-32	3.429e-32	-31.465	-31.465	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.667	-78.738	-0.070	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.974	-149.974	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.444	-226.514	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.477	-302.759	-0.282	(0)
C1	1.723e-03					
Cl-	1.723e-03	1.504e-03	-2.764	-2.823	-0.059	(0)
AgCl	2.602e-08	2.602e-08	-7.585	-7.585	0.000	(0)
MnCl+	2.237e-08	1.960e-08	-7.650	-7.708	-0.057	(0)
AgCl2-	4.008e-09	3.408e-09	-8.397	-8.468	-0.070	(0)
ZnCl+	2.048e-09	1.786e-09	-8.689	-8.748	-0.060	(0)
CuCl+	9.504e-10	8.285e-10	-9.022	-9.082	-0.060	(0)
CdCl+	8.361e-10	7.109e-10	-9.078	-9.148	-0.070	(0)
CuCl	7.643e-10	7.643e-10	-9.117	-9.117	0.000	(0)
NiCl+	3.429e-10	2.916e-10	-9.465	-9.535	-0.070	(0)
ZnOHC1	3.304e-10	3.304e-10	-9.481	-9.481	0.000	(0)
CoCl+	3.064e-10	2.605e-10	-9.514	-9.584	-0.070	(0)
CuCl2-	2.755e-10	2.401e-10	-9.560	-9.620	-0.060	(0)
PbCl+	5.165e-11	4.391e-11	-10.287	-10.357	-0.070	(0)
MnCl2	4.164e-11	4.164e-11	-10.380	-10.380	0.000	(0)
AgCl3-2	8.741e-12	4.568e-12	-11.058	-11.340	-0.282	(0)
CdCl2	4.457e-12	4.457e-12	-11.351	-11.351	0.000	(0)
ZnCl2	4.256e-12	4.256e-12	-11.371	-11.371	0.000	(0)
CdOHC1	4.121e-12	4.121e-12	-11.385	-11.385	0.000	(0)
HgClOH	1.604e-12	1.604e-12	-11.795	-11.795	0.000	(0)
HgCl2	9.666e-13	9.666e-13	-12.015	-12.015	0.000	(0)
CuCl2	4.320e-13	4.320e-13	-12.364	-12.364	0.000	(0)
PbCl2	2.950e-13	2.950e-13	-12.530	-12.530	0.000	(0)
CuCl3-2	1.310e-13	7.721e-14	-12.883	-13.112	-0.230	(0)
AgCl4-3	6.040e-14	1.403e-14	-13.219	-13.853	-0.634	(0)
MnCl3-	1.969e-14	1.725e-14	-13.706	-13.763	-0.057	(0)
HgCl3-	1.710e-14	1.454e-14	-13.767	-13.838	-0.070	(0)
ZnCl3-	5.833e-15	5.084e-15	-14.234	-14.294	-0.060	(0)
CdCl3-	4.974e-15	4.229e-15	-14.303	-14.374	-0.070	(0)
NiCl2	2.208e-15	2.208e-15	-14.656	-14.656	0.000	(0)
CrCl+2	3.305e-16	1.727e-16	-15.481	-15.763	-0.282	(0)
PbCl3-	2.077e-16	1.766e-16	-15.682	-15.753	-0.070	(0)
HgCl4-2	1.666e-16	8.704e-17	-15.778	-16.060	-0.282	(0)
HgCl+	1.508e-16	1.282e-16	-15.822	-15.892	-0.070	(0)
UO2Cl+	9.741e-17	8.282e-17	-16.011	-16.082	-0.070	(0)
CuCl3-	6.956e-18	6.064e-18	-17.158	-17.217	-0.060	(0)
ZnCl4-2	6.489e-18	3.823e-18	-17.188	-17.418	-0.230	(0)
CrOHC12	6.977e-19	6.977e-19	-18.156	-18.156	0.000	(0)
PbCl4-2	2.323e-19	1.214e-19	-18.634	-18.916	-0.282	(0)
FeCl+2	4.328e-20	2.550e-20	-19.364	-19.593	-0.230	(0)
CrCl2+	2.899e-20	2.464e-20	-19.538	-19.608	-0.070	(0)
VOC1+	7.725e-22	6.568e-22	-21.112	-21.183	-0.070	(0)
FeCl2+	1.955e-22	1.713e-22	-21.709	-21.766	-0.057	(0)
CuCl4-2	7.757e-23	4.570e-23	-22.110	-22.340	-0.230	(0)

FeCl3	2.576e-26	2.576e-26	-25.589	-25.589	0.000	(0)
CrO3Cl-	2.082e-26	1.770e-26	-25.681	-25.752	-0.070	(0)
CoCl+2	4.923e-35	2.573e-35	-34.308	-34.590	-0.282	(0)
UCl+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.220	-64.502	-0.282	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.529	-68.811	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.108	-82.390	-0.282	(0)
Co (2)	1.358e-07					
Co+2	9.583e-08	5.008e-08	-7.019	-7.300	-0.282	(0)
CoHCO3+	1.996e-08	1.697e-08	-7.700	-7.770	-0.070	(0)
CoSO4	1.681e-08	1.681e-08	-7.774	-7.774	0.000	(0)
CoCO3	2.428e-09	2.428e-09	-8.615	-8.615	0.000	(0)
CoF+	3.083e-10	2.621e-10	-9.511	-9.582	-0.070	(0)
CoCl+	3.064e-10	2.605e-10	-9.514	-9.584	-0.070	(0)
CoOH+	1.661e-10	1.412e-10	-9.780	-9.850	-0.070	(0)
Co (OH) 2	1.585e-12	1.585e-12	-11.800	-11.800	0.000	(0)
CoNO2+	9.199e-16	7.821e-16	-15.036	-15.107	-0.070	(0)
Co (NH3) +2	7.735e-17	4.042e-17	-16.112	-16.393	-0.282	(0)
CoSeO4	7.151e-17	7.151e-17	-16.146	-16.146	0.000	(0)
Co (OH) 3-	5.258e-18	4.470e-18	-17.279	-17.350	-0.070	(0)
Co2OH+3	1.526e-18	3.544e-19	-17.816	-18.450	-0.634	(0)
CoOH-	1.320e-18	1.122e-18	-17.880	-17.950	-0.070	(0)
CoNO3+	1.952e-19	1.659e-19	-18.710	-18.780	-0.070	(0)
Co (OH) 4-2	1.916e-25	1.001e-25	-24.718	-24.999	-0.282	(0)
Co (NH3) 2+2	2.215e-26	1.158e-26	-25.655	-25.936	-0.282	(0)
Co4 (OH) 4+4	1.064e-30	7.935e-32	-29.973	-31.100	-1.127	(0)
Co (NO3) 2	7.059e-31	7.059e-31	-30.151	-30.151	0.000	(0)
Co (NH3) 3+2	1.872e-36	9.785e-37	-35.728	-36.009	-0.282	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.181	-46.462	-0.282	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.134	-57.416	-0.282	(0)
Co (3)	1.155e-28					
CoOH+2	1.155e-28	6.038e-29	-27.937	-28.219	-0.282	(0)
Co+3	2.855e-34	8.408e-35	-33.544	-34.075	-0.531	(0)
CoCl+2	4.923e-35	2.573e-35	-34.308	-34.590	-0.282	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.220	-64.502	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.346	-77.416	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.935	-82.217	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.108	-82.390	-0.282	(0)
Cr (2)	9.618e-26					
Cr+2	9.618e-26	5.026e-26	-25.017	-25.299	-0.282	(0)
Cr (3)	6.443e-09					
Cr (OH) 2+	5.549e-09	4.718e-09	-8.256	-8.326	-0.070	(0)
Cr (OH) +2	5.250e-10	2.744e-10	-9.280	-9.562	-0.282	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
CrF+2	4.454e-12	2.327e-12	-11.351	-11.633	-0.282	(0)
CrO2-	1.965e-12	1.671e-12	-11.707	-11.777	-0.070	(0)
Cr (OH) 4-	1.658e-12	1.409e-12	-11.781	-11.851	-0.070	(0)
CrSO4+	4.099e-13	3.485e-13	-12.387	-12.458	-0.070	(0)
Cr+3	3.821e-13	8.873e-14	-12.418	-13.052	-0.634	(0)
CrCl+2	3.305e-16	1.727e-16	-15.481	-15.763	-0.282	(0)
Cr2 (OH) 2SO4+2	5.197e-18	2.716e-18	-17.284	-17.566	-0.282	(0)
CrOHC12	6.977e-19	6.977e-19	-18.156	-18.156	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.714e-19	2.714e-19	-18.566	-18.566	0.000	(0)
CrCl2+	2.899e-20	2.464e-20	-19.538	-19.608	-0.070	(0)
CrNO3+2	1.552e-26	8.109e-27	-25.809	-26.091	-0.282	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.113	-55.395	-0.282	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.456	-67.090	-0.634	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.529	-68.811	-0.282	(0)
Cr (6)	2.303e-16					
CrO4-2	1.963e-16	1.140e-16	-15.707	-15.943	-0.236	(0)
HCrO4-	3.090e-17	2.627e-17	-16.510	-16.581	-0.070	(0)
NaCrO4-	2.875e-18	2.444e-18	-17.541	-17.612	-0.070	(0)
KCrO4-	3.141e-19	2.670e-19	-18.503	-18.573	-0.070	(0)
CrO3SO4-2	1.835e-24	9.590e-25	-23.736	-24.018	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.082e-26	1.770e-26	-25.681	-25.752	-0.070	(0)
Cr2O7-2	4.581e-32	2.394e-32	-31.339	-31.621	-0.282	(0)

Cu (1)	1.515e-09					
CuCl	7.643e-10	7.643e-10	-9.117	-9.117	0.000	(0)
Cu+	4.748e-10	4.037e-10	-9.324	-9.394	-0.070	(0)
CuCl2-	2.755e-10	2.401e-10	-9.560	-9.620	-0.060	(0)
CuCl3-2	1.310e-13	7.721e-14	-12.883	-13.112	-0.230	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.280	-148.590	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.023	-149.320	-0.297	(0)
Cu (2)	6.992e-06					
CuCO3	5.871e-06	5.871e-06	-5.231	-5.231	0.000	(0)
Cu+2	5.984e-07	3.476e-07	-6.223	-6.459	-0.236	(0)
CuOH+	1.782e-07	1.553e-07	-6.749	-6.809	-0.060	(0)
CuSO4	1.339e-07	1.339e-07	-6.873	-6.873	0.000	(0)
CuHCO3+	1.124e-07	9.557e-08	-6.949	-7.020	-0.070	(0)
Cu (CO3) 2-2	8.672e-08	4.532e-08	-7.062	-7.344	-0.282	(0)
Cu (OH) 2	4.381e-09	4.381e-09	-8.358	-8.358	0.000	(0)
CuF+	4.269e-09	3.630e-09	-8.370	-8.440	-0.070	(0)
Cu2 (OH) 2+2	1.160e-09	6.062e-10	-8.936	-9.217	-0.282	(0)
CuCl+	9.504e-10	8.285e-10	-9.022	-9.082	-0.060	(0)
Cu (OH) 3-	1.494e-12	1.270e-12	-11.826	-11.896	-0.070	(0)
CuCl2	4.320e-13	4.320e-13	-12.364	-12.364	0.000	(0)
CuNO2+	9.487e-14	8.066e-14	-13.023	-13.093	-0.070	(0)
CuNH3+2	4.570e-14	2.388e-14	-13.340	-13.622	-0.282	(0)
CuCl3-	6.956e-18	6.064e-18	-17.158	-17.217	-0.060	(0)
Cu (OH) 4-2	2.703e-18	1.413e-18	-17.568	-17.850	-0.282	(0)
CuNO3+	2.703e-18	2.298e-18	-17.568	-17.639	-0.070	(0)
Cu (NO2) 2	1.829e-21	1.829e-21	-20.738	-20.738	0.000	(0)
CuCl4-2	7.757e-23	4.570e-23	-22.110	-22.340	-0.230	(0)
Cu (NO3) 2	6.049e-31	6.049e-31	-30.218	-30.218	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.810	-215.881	-0.070	(0)
F	2.117e-04					
F-	1.896e-04	1.655e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.777e-05	1.553e-05	-4.750	-4.809	-0.059	(0)
CaF+	2.380e-06	2.085e-06	-5.623	-5.681	-0.057	(0)
NaF	4.506e-07	4.506e-07	-6.346	-6.346	0.000	(0)
AlF3	3.247e-07	3.247e-07	-6.489	-6.489	0.000	(0)
AlF2+	1.775e-07	1.558e-07	-6.751	-6.807	-0.057	(0)
MnF+	7.786e-08	6.822e-08	-7.109	-7.166	-0.057	(0)
AlF4-	3.082e-08	2.693e-08	-7.511	-7.570	-0.059	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	4.269e-09	3.630e-09	-8.370	-8.440	-0.070	(0)
AlF+2	3.983e-09	2.365e-09	-8.400	-8.626	-0.226	(0)
ZnF+	1.836e-09	1.561e-09	-8.736	-8.807	-0.070	(0)
BF (OH) 3-	1.217e-09	1.052e-09	-8.915	-8.978	-0.063	(0)
NiF+	3.705e-10	3.150e-10	-9.431	-9.502	-0.070	(0)
CoF+	3.083e-10	2.621e-10	-9.511	-9.582	-0.070	(0)
CdF+	1.527e-11	1.298e-11	-10.816	-10.887	-0.070	(0)
HF2-	1.262e-11	1.097e-11	-10.899	-10.960	-0.061	(0)
PbF+	1.129e-11	9.598e-12	-10.947	-11.018	-0.070	(0)
CrF+2	4.454e-12	2.327e-12	-11.351	-11.633	-0.282	(0)
AgF	3.522e-12	3.522e-12	-11.453	-11.453	0.000	(0)
BF2 (OH) 2-	1.535e-12	1.326e-12	-11.814	-11.877	-0.063	(0)
UO2F+	9.124e-13	7.757e-13	-12.040	-12.110	-0.070	(0)
UO2F2	3.703e-13	3.703e-13	-12.431	-12.431	0.000	(0)
PbF2	3.126e-14	3.126e-14	-13.505	-13.505	0.000	(0)
UO2F3-	1.810e-14	1.539e-14	-13.742	-13.813	-0.070	(0)
CdF2	4.287e-15	4.287e-15	-14.368	-14.368	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.150e-16	4.513e-16	-15.288	-15.346	-0.057	(0)
FeF+2	1.729e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
VO2F	4.695e-17	4.695e-17	-16.328	-16.328	0.000	(0)
UO2F4-2	3.872e-17	2.024e-17	-16.412	-16.694	-0.282	(0)
PbF3-	1.154e-17	9.813e-18	-16.938	-17.008	-0.070	(0)
BF3OH-	7.040e-18	6.085e-18	-17.152	-17.216	-0.063	(0)
VO2F2-	3.318e-18	2.822e-18	-17.479	-17.550	-0.070	(0)
VOF+	1.817e-19	1.545e-19	-18.741	-18.811	-0.070	(0)
VO2F3-2	1.115e-20	5.825e-21	-19.953	-20.235	-0.282	(0)
VOF2	9.590e-21	9.590e-21	-20.018	-20.018	0.000	(0)

PbF4-2	1.488e-21	7.774e-22	-20.828	-21.109	-0.282	(0)
BF4-	4.084e-22	3.531e-22	-21.389	-21.452	-0.063	(0)
VOF3-	6.624e-23	5.632e-23	-22.179	-22.249	-0.070	(0)
HgF+	3.084e-23	2.622e-23	-22.511	-22.581	-0.070	(0)
VO2F4-3	2.043e-24	4.744e-25	-23.690	-24.324	-0.634	(0)
Sb(OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.898e-25	9.898e-25	-24.004	-24.004	0.000	(0)
VOF4-2	7.199e-26	3.762e-26	-25.143	-25.425	-0.282	(0)
UF3+	1.716e-34	1.459e-34	-33.766	-33.836	-0.070	(0)
UF2+2	1.064e-35	5.562e-36	-34.973	-35.255	-0.282	(0)
UF4	2.647e-36	2.647e-36	-35.577	-35.577	0.000	(0)
UF5-	2.042e-38	1.736e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.150e-38	2.669e-39	-37.939	-38.574	-0.634	(0)
UF6-2	1.661e-39	8.679e-40	-38.780	-39.062	-0.282	(0)
Fe (2)	3.432e-11					
Fe+2	2.742e-11	1.433e-11	-10.562	-10.844	-0.282	(0)
FeSO4	5.917e-12	5.917e-12	-11.228	-11.228	0.000	(0)
FeHCO3+	8.930e-13	7.861e-13	-12.049	-12.105	-0.055	(0)
FeOH+	9.203e-14	8.063e-14	-13.036	-13.094	-0.057	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.617e-19	4.045e-19	-18.336	-18.393	-0.057	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.774	-158.774	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.107	-235.178	-0.070	(0)
Fe (3)	3.643e-09					
Fe(OH) 2+	3.209e-09	2.817e-09	-8.494	-8.550	-0.057	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.410e-12	5.626e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.695e-14	5.123e-14	-13.061	-13.290	-0.230	(0)
FeF2+	5.150e-16	4.513e-16	-15.288	-15.346	-0.057	(0)
FeF+2	1.729e-16	1.019e-16	-15.762	-15.992	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.209e-17	1.060e-17	-16.917	-16.975	-0.057	(0)
Fe+3	1.906e-18	5.614e-19	-17.720	-18.251	-0.531	(0)
Fe(SO4) 2-	4.482e-19	3.811e-19	-18.349	-18.419	-0.070	(0)
FeCl+2	4.328e-20	2.550e-20	-19.364	-19.593	-0.230	(0)
FeCl2+	1.955e-22	1.713e-22	-21.709	-21.766	-0.057	(0)
FeHSeO3+2	3.340e-23	1.746e-23	-22.476	-22.758	-0.282	(0)
Fe2(OH) 2+4	1.165e-24	8.691e-26	-23.934	-25.061	-1.127	(0)
FeCl3	2.576e-26	2.576e-26	-25.589	-25.589	0.000	(0)
FeNO3+2	2.246e-29	1.174e-29	-28.649	-28.930	-0.282	(0)
Fe3(OH) 4+5	2.043e-31	3.539e-33	-30.690	-32.451	-1.761	(0)
H (0)	4.020e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.218e-10					
Hg	2.218e-10	2.218e-10	-9.654	-9.654	0.000	(0)
Hg (1)	2.463e-21					
Hg2+2	1.231e-21	6.435e-22	-20.910	-21.191	-0.282	(0)
Hg (2)	3.140e-12					
HgClOH	1.604e-12	1.604e-12	-11.795	-11.795	0.000	(0)
HgCl2	9.666e-13	9.666e-13	-12.015	-12.015	0.000	(0)
Hg(OH) 2	5.363e-13	5.386e-13	-12.271	-12.269	0.002	(0)
HgCl3-	1.710e-14	1.454e-14	-13.767	-13.838	-0.070	(0)
HgCO3	1.467e-14	1.467e-14	-13.834	-13.834	0.000	(0)
Hg(CO3) 2-2	2.546e-16	1.331e-16	-15.594	-15.876	-0.282	(0)
HgCl4-2	1.666e-16	8.704e-17	-15.778	-16.060	-0.282	(0)
HgCl+	1.508e-16	1.282e-16	-15.822	-15.892	-0.070	(0)
HgOH+	2.828e-17	2.405e-17	-16.548	-16.619	-0.070	(0)
HgHCO3+	2.288e-17	1.946e-17	-16.640	-16.711	-0.070	(0)
Hg(OH) 3-	1.127e-20	9.583e-21	-19.948	-20.018	-0.070	(0)
Hg+2	8.178e-21	4.274e-21	-20.087	-20.369	-0.282	(0)
HgSO4	1.882e-21	1.882e-21	-20.725	-20.725	0.000	(0)
HgNH3+2	3.464e-23	1.810e-23	-22.460	-22.742	-0.282	(0)
HgF+	3.084e-23	2.622e-23	-22.511	-22.581	-0.070	(0)
Hg(NH3) 2+2	2.326e-25	1.215e-25	-24.633	-24.915	-0.282	(0)
HgNO3+	3.880e-33	3.299e-33	-32.411	-32.482	-0.070	(0)
Hg(NH3) 3+2	6.217e-36	3.249e-36	-35.206	-35.488	-0.282	(0)
Hg(NO3) 2	0.000e+00	0.000e+00	-44.543	-44.543	0.000	(0)
Hg(NH3) 4+2	0.000e+00	0.000e+00	-45.479	-45.761	-0.282	(0)

	HgHS2-	0.000e+00	0.000e+00	-138.104	-138.174	-0.070	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.928	-138.928	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.453	-139.735	-0.282	(0)
K	7.308e-04						
	K+	7.223e-04	6.305e-04	-3.141	-3.200	-0.059	(0)
	KSO4-	8.554e-06	7.509e-06	-5.068	-5.124	-0.057	(0)
	KCrO4-	3.141e-19	2.670e-19	-18.503	-18.573	-0.070	(0)
Mg	1.758e-03						
	Mg+2	1.440e-03	8.363e-04	-2.842	-3.078	-0.236	(0)
	MgSO4	2.560e-04	2.560e-04	-3.592	-3.592	0.000	(0)
	MgHCO3+	4.278e-05	3.729e-05	-4.369	-4.428	-0.060	(0)
	MgF+	1.777e-05	1.553e-05	-4.750	-4.809	-0.059	(0)
	MgCO3	1.995e-06	1.995e-06	-5.700	-5.700	0.000	(0)
	MgOH+	5.334e-08	4.706e-08	-7.273	-7.327	-0.054	(0)
	MgH2BO3+	4.359e-09	3.768e-09	-8.361	-8.424	-0.063	(0)
Mn (2)	2.404e-05						
	Mn+2	1.981e-05	1.035e-05	-4.703	-4.985	-0.282	(0)
	MnSO4	3.097e-06	3.097e-06	-5.509	-5.509	0.000	(0)
	MnHCO3+	1.027e-06	9.002e-07	-5.988	-6.046	-0.057	(0)
	MnF+	7.786e-08	6.822e-08	-7.109	-7.166	-0.057	(0)
	MnCl+	2.237e-08	1.960e-08	-7.650	-7.708	-0.057	(0)
	MnOH+	4.195e-09	3.676e-09	-8.377	-8.435	-0.057	(0)
	MnCl2	4.164e-11	4.164e-11	-10.380	-10.380	0.000	(0)
	MnCl3-	1.969e-14	1.725e-14	-13.706	-13.763	-0.057	(0)
	MnSeO4	7.940e-15	7.940e-15	-14.100	-14.100	0.000	(0)
	MnNO3+	4.035e-17	3.431e-17	-16.394	-16.465	-0.070	(0)
	Mn (OH) 3-	5.179e-19	4.537e-19	-18.286	-18.343	-0.057	(0)
	Mn (OH) 4-2	3.514e-25	2.070e-25	-24.454	-24.684	-0.230	(0)
	Mn (NO3) 2	1.802e-28	1.802e-28	-27.744	-27.744	0.000	(0)
	MnSe	0.000e+00	0.000e+00	-42.926	-42.926	0.000	(0)
Mn (3)	6.623e-25						
	Mn+3	6.623e-25	1.950e-25	-24.179	-24.710	-0.531	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-43.499	-43.728	-0.230	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.413	-47.475	-0.062	(0)
Mo	4.160e-07						
	MoO4-2	4.156e-07	2.414e-07	-6.381	-6.617	-0.236	(0)
	HMoO4-	4.024e-10	3.421e-10	-9.395	-9.466	-0.070	(0)
	H2MoO4	1.785e-13	1.785e-13	-12.748	-12.748	0.000	(0)
	Ag2MoO4	6.560e-24	6.560e-24	-23.183	-23.183	0.000	(0)
	AlMo6O21-3	1.564e-39	3.632e-40	-38.806	-39.440	-0.634	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-47.973	-50.509	-2.537	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-49.508	-51.270	-1.761	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.508	-53.635	-1.127	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.902	-57.537	-0.634	(0)
N (-3)	9.942e-10						
	NH4+	9.702e-10	8.387e-10	-9.013	-9.076	-0.063	(0)
	NH4SO4-	1.725e-11	1.512e-11	-10.763	-10.821	-0.057	(0)
	NH3	6.714e-12	6.714e-12	-11.173	-11.173	0.000	(0)
	CuNH3+2	4.570e-14	2.388e-14	-13.340	-13.622	-0.282	(0)
	CaNH3+2	1.867e-14	9.758e-15	-13.729	-14.011	-0.282	(0)
	NiNH3+2	5.228e-16	2.732e-16	-15.282	-15.564	-0.282	(0)
	AgNH3+	1.366e-16	1.161e-16	-15.865	-15.935	-0.070	(0)
	Co (NH3) +2	7.735e-17	4.042e-17	-16.112	-16.393	-0.282	(0)
	BaNH3+2	5.046e-19	2.637e-19	-18.297	-18.579	-0.282	(0)
	HgNH3+2	3.464e-23	1.810e-23	-22.460	-22.742	-0.282	(0)
	Ag (NH3) 2+	7.455e-24	6.338e-24	-23.128	-23.198	-0.070	(0)
	Ni (NH3) 2+2	5.073e-25	2.651e-25	-24.295	-24.577	-0.282	(0)
	Hg (NH3) 2+2	2.326e-25	1.215e-25	-24.633	-24.915	-0.282	(0)
	Ca (NH3) 2+2	4.991e-26	2.608e-26	-25.302	-25.584	-0.282	(0)
	Co (NH3) 2+2	2.215e-26	1.158e-26	-25.655	-25.936	-0.282	(0)
	Hg (NH3) 3+2	6.217e-36	3.249e-36	-35.206	-35.488	-0.282	(0)
	Co (NH3) 3+2	1.872e-36	9.785e-37	-35.728	-36.009	-0.282	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.479	-45.761	-0.282	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-46.181	-46.462	-0.282	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.113	-55.395	-0.282	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-57.134	-57.416	-0.282	(0)

Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.220	-64.502	-0.282	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.456	-67.090	-0.634	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.529	-68.811	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.346	-77.416	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.935	-82.217	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.108	-82.390	-0.282	(0)
N (3)	2.556e-09					
NO2-	2.556e-09	2.216e-09	-8.592	-8.654	-0.062	(0)
CuNO2+	9.487e-14	8.066e-14	-13.023	-13.093	-0.070	(0)
AgNO2	3.923e-15	3.923e-15	-14.406	-14.406	0.000	(0)
CoNO2+	9.199e-16	7.821e-16	-15.036	-15.107	-0.070	(0)
Cu (NO2) 2	1.829e-21	1.829e-21	-20.738	-20.738	0.000	(0)
Ag (NO2) 2-	1.584e-23	1.347e-23	-22.800	-22.871	-0.070	(0)
N (5)	2.404e-12					
NO3-	2.395e-12	2.091e-12	-11.621	-11.680	-0.059	(0)
CaNO3+	8.977e-15	7.633e-15	-14.047	-14.117	-0.070	(0)
MnNO3+	4.035e-17	3.431e-17	-16.394	-16.465	-0.070	(0)
ZnNO3+	2.920e-18	2.482e-18	-17.535	-17.605	-0.070	(0)
CuNO3+	2.703e-18	2.298e-18	-17.568	-17.639	-0.070	(0)
BaNO3+	7.672e-19	6.523e-19	-18.115	-18.186	-0.070	(0)
NiNO3+	4.680e-19	3.979e-19	-18.330	-18.400	-0.070	(0)
CoNO3+	1.952e-19	1.659e-19	-18.710	-18.780	-0.070	(0)
CdNO3+	3.849e-20	3.273e-20	-19.415	-19.485	-0.070	(0)
PbNO3+	2.993e-20	2.545e-20	-19.524	-19.594	-0.070	(0)
AgNO3	1.407e-20	1.407e-20	-19.852	-19.852	0.000	(0)
UO2NO3+	1.666e-25	1.416e-25	-24.778	-24.849	-0.070	(0)
CrNO3+2	1.552e-26	8.109e-27	-25.809	-26.091	-0.282	(0)
Mn (NO3) 2	1.802e-28	1.802e-28	-27.744	-27.744	0.000	(0)
VO2NO3	1.711e-28	1.711e-28	-27.767	-27.767	0.000	(0)
FeNO3+2	2.246e-29	1.174e-29	-28.649	-28.930	-0.282	(0)
Zn (NO3) 2	1.036e-30	1.036e-30	-29.985	-29.985	0.000	(0)
Co (NO3) 2	7.059e-31	7.059e-31	-30.151	-30.151	0.000	(0)
Cu (NO3) 2	6.049e-31	6.049e-31	-30.218	-30.218	0.000	(0)
Pb (NO3) 2	9.036e-32	9.036e-32	-31.044	-31.044	0.000	(0)
Cd (NO3) 2	3.429e-32	3.429e-32	-31.465	-31.465	0.000	(0)
HgNO3+	3.880e-33	3.299e-33	-32.411	-32.482	-0.070	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.543	-44.543	0.000	(0)
Na	4.998e-03					
Na+	4.943e-03	4.315e-03	-2.306	-2.365	-0.059	(0)
NaSO4-	4.441e-05	3.898e-05	-4.353	-4.409	-0.057	(0)
NaHCO3	1.057e-05	1.057e-05	-4.976	-4.976	0.000	(0)
NaF	4.506e-07	4.506e-07	-6.346	-6.346	0.000	(0)
NaCO3-	2.625e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
NaH2BO3	8.885e-10	8.885e-10	-9.051	-9.051	0.000	(0)
NaCrO4-	2.875e-18	2.444e-18	-17.541	-17.612	-0.070	(0)
Ni	2.127e-07					
Ni+2	1.304e-07	7.577e-08	-6.885	-7.121	-0.236	(0)
NiHCO3+	4.787e-08	4.070e-08	-7.320	-7.390	-0.070	(0)
NiSO4	2.543e-08	2.543e-08	-7.595	-7.595	0.000	(0)
NiCO3	8.108e-09	8.108e-09	-8.091	-8.091	0.000	(0)
NiF+	3.705e-10	3.150e-10	-9.431	-9.502	-0.070	(0)
NiCl+	3.429e-10	2.916e-10	-9.465	-9.535	-0.070	(0)
NiOH+	1.586e-10	1.348e-10	-9.800	-9.870	-0.070	(0)
Ni (SO4) 2-2	2.711e-12	1.417e-12	-11.567	-11.849	-0.282	(0)
Ni (OH) 2	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
NiCl2	2.208e-15	2.208e-15	-14.656	-14.656	0.000	(0)
NiNH3+2	5.228e-16	2.732e-16	-15.282	-15.564	-0.282	(0)
Ni (OH) 3-	2.516e-16	2.139e-16	-15.599	-15.670	-0.070	(0)
NiSeO4	1.010e-16	1.010e-16	-15.996	-15.996	0.000	(0)
NiNO3+	4.680e-19	3.979e-19	-18.330	-18.400	-0.070	(0)
Ni (NH3) 2+2	5.073e-25	2.651e-25	-24.295	-24.577	-0.282	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	1.286e-08					
PbCO3	7.096e-09	7.096e-09	-8.149	-8.149	0.000	(0)
PbHCO3+	3.134e-09	2.665e-09	-8.504	-8.574	-0.070	(0)
Pb+2	1.417e-09	8.230e-10	-8.849	-9.085	-0.236	(0)
PbSO4	6.780e-10	6.780e-10	-9.169	-9.169	0.000	(0)

PbOH+	3.436e-10	2.922e-10	-9.464	-9.534	-0.070	(0)
Pb (CO3) 2-2	1.123e-10	5.870e-11	-9.950	-10.231	-0.282	(0)
PbCl+	5.165e-11	4.391e-11	-10.287	-10.357	-0.070	(0)
Pb (SO4) 2-2	1.315e-11	6.873e-12	-10.881	-11.163	-0.282	(0)
PbF+	1.129e-11	9.598e-12	-10.947	-11.018	-0.070	(0)
Pb (OH) 2	1.306e-12	1.306e-12	-11.884	-11.884	0.000	(0)
PbCl2	2.950e-13	2.950e-13	-12.530	-12.530	0.000	(0)
PbF2	3.126e-14	3.126e-14	-13.505	-13.505	0.000	(0)
Pb (OH) 3-	2.170e-16	1.845e-16	-15.663	-15.734	-0.070	(0)
PbCl3-	2.077e-16	1.766e-16	-15.682	-15.753	-0.070	(0)
Pb2OH+3	1.641e-17	3.811e-18	-16.785	-17.419	-0.634	(0)
PbF3-	1.154e-17	9.813e-18	-16.938	-17.008	-0.070	(0)
PbCl4-2	2.323e-19	1.214e-19	-18.634	-18.916	-0.282	(0)
PbNO3+	2.993e-20	2.545e-20	-19.524	-19.594	-0.070	(0)
Pb (OH) 4-2	1.222e-20	6.387e-21	-19.913	-20.195	-0.282	(0)
PbF4-2	1.488e-21	7.774e-22	-20.828	-21.109	-0.282	(0)
Pb3 (OH) 4+2	5.357e-23	2.800e-23	-22.271	-22.553	-0.282	(0)
Pb4 (OH) 4+4	2.454e-27	1.830e-28	-26.610	-27.738	-1.127	(0)
Pb (NO3) 2	9.036e-32	9.036e-32	-31.044	-31.044	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.695	-150.695	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.765	-227.836	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.698	-72.698	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.370	-78.440	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.568	-78.568	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.667	-78.738	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.376	-80.658	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.892	-81.174	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.972	-81.254	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.778	-82.060	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.794	-83.076	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.363	-88.593	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.104	-138.174	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.928	-138.928	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.453	-139.735	-0.282	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.968	-147.038	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.207	-147.374	-0.168	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.280	-148.590	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.023	-149.320	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.178	-149.249	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.350	-149.667	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.674	-149.978	-0.304	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.974	-149.974	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.386	-150.386	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.695	-150.695	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.774	-158.774	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.810	-215.881	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.476	-225.546	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.444	-226.514	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.765	-227.836	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.097	-228.379	-0.282	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.107	-235.178	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.477	-302.759	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.165	-305.447	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.910	-317.192	-0.282	(0)
S (6)	3.653e-03					
SO4-2	2.896e-03	1.682e-03	-2.538	-2.774	-0.236	(0)
CaSO4	4.449e-04	4.449e-04	-3.352	-3.352	0.000	(0)
MgSO4	2.560e-04	2.560e-04	-3.592	-3.592	0.000	(0)
NaSO4-	4.441e-05	3.898e-05	-4.353	-4.409	-0.057	(0)
KSO4-	8.554e-06	7.509e-06	-5.068	-5.124	-0.057	(0)
MnSO4	3.097e-06	3.097e-06	-5.509	-5.509	0.000	(0)
ZnSO4	1.739e-07	1.739e-07	-6.760	-6.760	0.000	(0)
CuSO4	1.339e-07	1.339e-07	-6.873	-6.873	0.000	(0)
NiSO4	2.543e-08	2.543e-08	-7.595	-7.595	0.000	(0)
CoSO4	1.681e-08	1.681e-08	-7.774	-7.774	0.000	(0)
HSO4-	1.340e-08	1.171e-08	-7.873	-7.932	-0.059	(0)
Zn (SO4) 2-2	4.877e-09	2.549e-09	-8.312	-8.594	-0.282	(0)

CdSO4	1.952e-09	1.952e-09	-8.710	-8.710	0.000	(0)
PbSO4	6.780e-10	6.780e-10	-9.169	-9.169	0.000	(0)
AgSO4-	3.345e-10	2.844e-10	-9.476	-9.546	-0.070	(0)
CrOHSO4	1.095e-10	1.095e-10	-9.961	-9.961	0.000	(0)
Cd (SO4) 2-2	8.475e-11	4.429e-11	-10.072	-10.354	-0.282	(0)
AlSO4+	2.135e-11	1.866e-11	-10.671	-10.729	-0.059	(0)
NH4SO4-	1.725e-11	1.512e-11	-10.763	-10.821	-0.057	(0)
Pb (SO4) 2-2	1.315e-11	6.873e-12	-10.881	-11.163	-0.282	(0)
FeSO4	5.917e-12	5.917e-12	-11.228	-11.228	0.000	(0)
Ni (SO4) 2-2	2.711e-12	1.417e-12	-11.567	-11.849	-0.282	(0)
CrSO4+	4.099e-13	3.485e-13	-12.387	-12.458	-0.070	(0)
Al (SO4) 2-	3.849e-13	3.363e-13	-12.415	-12.473	-0.059	(0)
UO2SO4	8.645e-14	8.645e-14	-13.063	-13.063	0.000	(0)
UO2 (SO4) 2-2	3.668e-15	1.917e-15	-14.436	-14.717	-0.282	(0)
FeSO4+	1.209e-17	1.060e-17	-16.917	-16.975	-0.057	(0)
VO2SO4-	7.642e-18	6.497e-18	-17.117	-17.187	-0.070	(0)
Cr2 (OH) 2SO4+2	5.197e-18	2.716e-18	-17.284	-17.566	-0.282	(0)
Fe (SO4) 2-	4.482e-19	3.811e-19	-18.349	-18.419	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.714e-19	2.714e-19	-18.566	-18.566	0.000	(0)
VOSO4	7.212e-20	7.212e-20	-19.142	-19.142	0.000	(0)
HgSO4	1.882e-21	1.882e-21	-20.725	-20.725	0.000	(0)
CrO3SO4-2	1.835e-24	9.590e-25	-23.736	-24.018	-0.282	(0)
VSO4+	8.687e-34	7.386e-34	-33.061	-33.132	-0.070	(0)
U (SO4) 2	7.233e-40	7.233e-40	-39.141	-39.141	0.000	(0)
USO4+2	1.036e-40	0.000e+00	-39.985	-40.267	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.346	-77.416	-0.070	(0)
Sb (3)	1.080e-19					
Sb (OH) 3	5.463e-20	5.463e-20	-19.263	-19.263	0.000	(0)
HSbO2	5.334e-20	5.334e-20	-19.273	-19.273	0.000	(0)
SbO2-	1.427e-24	1.213e-24	-23.846	-23.916	-0.070	(0)
Sb (OH) 2F	1.006e-24	1.006e-24	-23.997	-23.997	0.000	(0)
SbOF	9.898e-25	9.898e-25	-24.004	-24.004	0.000	(0)
Sb (OH) 4-	8.170e-25	6.946e-25	-24.088	-24.158	-0.070	(0)
Sb (OH) 2+	1.112e-25	9.451e-26	-24.954	-25.025	-0.070	(0)
SbO+	3.833e-26	3.259e-26	-25.416	-25.487	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.910	-317.192	-0.282	(0)
Sb (5)	1.326e-08					
SbO3-	1.324e-08	1.126e-08	-7.878	-7.948	-0.070	(0)
Sb (OH) 6-	1.507e-11	1.316e-11	-10.822	-10.881	-0.059	(0)
SbO2+	1.927e-23	1.639e-23	-22.715	-22.785	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.328e-40	1.980e-40	-39.633	-39.703	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.926	-42.926	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.961	-42.961	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.274	-47.556	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.418	-86.546	-1.127	(0)
Se (4)	1.510e-08					
HSeO3-	1.384e-08	1.177e-08	-7.859	-7.929	-0.070	(0)
SeO3-2	1.259e-09	6.577e-10	-8.900	-9.182	-0.282	(0)
H2SeO3	3.575e-13	3.575e-13	-12.447	-12.447	0.000	(0)
AgSeO3-	4.212e-15	3.582e-15	-14.375	-14.446	-0.070	(0)
Cd (SeO3) 2-2	3.377e-21	1.765e-21	-20.471	-20.753	-0.282	(0)
Ag (SeO3) 2-3	9.083e-23	2.109e-23	-22.042	-22.676	-0.634	(0)
FeHSeO3+2	3.340e-23	1.746e-23	-22.476	-22.758	-0.282	(0)
Se (6)	4.914e-12					
SeO4-2	4.906e-12	2.849e-12	-11.309	-11.545	-0.236	(0)
MnSeO4	7.940e-15	7.940e-15	-14.100	-14.100	0.000	(0)
ZnSeO4	2.086e-16	2.086e-16	-15.681	-15.681	0.000	(0)
NiSeO4	1.010e-16	1.010e-16	-15.996	-15.996	0.000	(0)
CoSeO4	7.151e-17	7.151e-17	-16.146	-16.146	0.000	(0)
HSeO4-	1.196e-17	1.017e-17	-16.922	-16.993	-0.070	(0)
CdSeO4	2.626e-18	2.626e-18	-17.581	-17.581	0.000	(0)
Zn (SeO4) 2-2	1.153e-27	6.026e-28	-26.938	-27.220	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.879	-58.513	-0.634	(0)
U (4)	3.938e-22					
U (OH) 5-	3.928e-22	3.340e-22	-21.406	-21.476	-0.070	(0)

U (OH) 4	9.966e-25	9.966e-25	-24.001	-24.001	0.000	(0)
U (OH) 3+	3.053e-28	2.596e-28	-27.515	-27.586	-0.070	(0)
U (OH) 2+2	1.636e-32	8.552e-33	-31.786	-32.068	-0.282	(0)
UF3+	1.716e-34	1.459e-34	-33.766	-33.836	-0.070	(0)
UF2+2	1.064e-35	5.562e-36	-34.973	-35.255	-0.282	(0)
UF4	2.647e-36	2.647e-36	-35.577	-35.577	0.000	(0)
UOH+3	1.236e-37	2.870e-38	-36.908	-37.542	-0.634	(0)
UF5-	2.042e-38	1.736e-38	-37.690	-37.760	-0.070	(0)
UF+3	1.150e-38	2.669e-39	-37.939	-38.574	-0.634	(0)
UF6-2	1.661e-39	8.679e-40	-38.780	-39.062	-0.282	(0)
U (SO4) 2	7.233e-40	7.233e-40	-39.141	-39.141	0.000	(0)
USO4+2	1.036e-40	0.000e+00	-39.985	-40.267	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.965	-44.092	-1.127	(0)
UC1+3	0.000e+00	0.000e+00	-44.581	-45.215	-0.634	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.794	-174.501	-5.707	(0)
U (5)	5.772e-17					
UO2+	5.772e-17	4.908e-17	-16.239	-16.309	-0.070	(0)
U (6)	8.562e-08					
UO2 (CO3) 3-4	4.277e-08	3.190e-09	-7.369	-8.496	-1.127	(0)
UO2 (CO3) 2-2	4.246e-08	2.219e-08	-7.372	-7.654	-0.282	(0)
UO2CO3	3.877e-10	3.877e-10	-9.411	-9.411	0.000	(0)
UO2F+	9.124e-13	7.757e-13	-12.040	-12.110	-0.070	(0)
UO2OH+	7.106e-13	6.041e-13	-12.148	-12.219	-0.070	(0)
UO2F2	3.703e-13	3.703e-13	-12.431	-12.431	0.000	(0)
UO2SO4	8.645e-14	8.645e-14	-13.063	-13.063	0.000	(0)
UO2+2	5.846e-14	3.396e-14	-13.233	-13.469	-0.236	(0)
UO2F3-	1.810e-14	1.539e-14	-13.742	-13.813	-0.070	(0)
UO2 (SO4) 2-2	3.668e-15	1.917e-15	-14.436	-14.717	-0.282	(0)
UO2Cl+	9.741e-17	8.282e-17	-16.011	-16.082	-0.070	(0)
UO2F4-2	3.872e-17	2.024e-17	-16.412	-16.694	-0.282	(0)
(UO2) 2 (OH) 2+2	1.159e-18	6.057e-19	-17.936	-18.218	-0.282	(0)
(UO2) 3 (OH) 5+	6.522e-21	5.545e-21	-20.186	-20.256	-0.070	(0)
UO2NO3+	1.666e-25	1.416e-25	-24.778	-24.849	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.236	-42.306	-0.070	(0)
V+2	0.000e+00	0.000e+00	-42.685	-42.966	-0.282	(0)
V (3)	2.118e-15					
V (OH) 3	2.118e-15	2.118e-15	-14.674	-14.674	0.000	(0)
V (OH) 2+	1.147e-25	9.750e-26	-24.941	-25.011	-0.070	(0)
VOH+2	1.261e-28	6.588e-29	-27.899	-28.181	-0.282	(0)
V+3	4.006e-33	9.301e-34	-32.397	-33.031	-0.634	(0)
VSO4+	8.687e-34	7.386e-34	-33.061	-33.132	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.106	-54.740	-0.634	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.435	-55.562	-1.127	(0)
V (4)	5.723e-18					
V (OH) 3+	5.161e-18	4.388e-18	-17.287	-17.358	-0.070	(0)
VO+2	2.979e-19	1.557e-19	-18.526	-18.808	-0.282	(0)
VOF+	1.817e-19	1.545e-19	-18.741	-18.811	-0.070	(0)
VOSO4	7.212e-20	7.212e-20	-19.142	-19.142	0.000	(0)
VOF2	9.590e-21	9.590e-21	-20.018	-20.018	0.000	(0)
VOC1+	7.725e-22	6.568e-22	-21.112	-21.183	-0.070	(0)
VOF3-	6.624e-23	5.632e-23	-22.179	-22.249	-0.070	(0)
VOF4-2	7.199e-26	3.762e-26	-25.143	-25.425	-0.282	(0)
H2V2O4+2	1.848e-30	9.658e-31	-29.733	-30.015	-0.282	(0)
V (5)	1.987e-09					
H2VO4-	1.878e-09	1.597e-09	-8.726	-8.797	-0.070	(0)
HVO4-2	1.078e-10	5.633e-11	-9.967	-10.249	-0.282	(0)
H3VO4	1.137e-12	1.137e-12	-11.944	-11.944	0.000	(0)
H3V2O7-	1.380e-14	1.173e-14	-13.860	-13.931	-0.070	(0)
VO2+	1.853e-16	1.618e-16	-15.732	-15.791	-0.059	(0)
HV2O7-3	1.313e-16	3.049e-17	-15.882	-16.516	-0.634	(0)
VO2F	4.695e-17	4.695e-17	-16.328	-16.328	0.000	(0)
VO4-3	1.707e-17	3.964e-18	-16.768	-17.402	-0.634	(0)
VO2SO4-	7.642e-18	6.497e-18	-17.117	-17.187	-0.070	(0)
VO2F2-	3.318e-18	2.822e-18	-17.479	-17.550	-0.070	(0)
V2O7-4	1.545e-19	1.152e-20	-18.811	-19.938	-1.127	(0)
V3O9-3	1.839e-20	4.270e-21	-19.735	-20.370	-0.634	(0)
VO2F3-2	1.115e-20	5.825e-21	-19.953	-20.235	-0.282	(0)

VO2F4-3	2.043e-24	4.744e-25	-23.690	-24.324	-0.634	(0)
V4O12-4	3.813e-26	2.844e-27	-25.419	-26.546	-1.127	(0)
VO2NO3	1.711e-28	1.711e-28	-27.767	-27.767	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-64.848	-66.609	-1.761	(0)
V10O28-6	0.000e+00	0.000e+00	-65.112	-67.649	-2.537	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.422	-68.549	-1.127	(0)
Zn	1.159e-06					
Zn+2	8.138e-07	4.727e-07	-6.089	-6.325	-0.236	(0)
ZnSO4	1.739e-07	1.739e-07	-6.760	-6.760	0.000	(0)
ZnCO3	7.801e-08	7.801e-08	-7.108	-7.108	0.000	(0)
ZnHCO3+	7.660e-08	6.513e-08	-7.116	-7.186	-0.070	(0)
ZnOH+	7.857e-09	6.680e-09	-8.105	-8.175	-0.070	(0)
Zn(SO4) 2-2	4.877e-09	2.549e-09	-8.312	-8.594	-0.282	(0)
ZnCl+	2.048e-09	1.786e-09	-8.689	-8.748	-0.060	(0)
ZnF+	1.836e-09	1.561e-09	-8.736	-8.807	-0.070	(0)
ZnOHCl	3.304e-10	3.304e-10	-9.481	-9.481	0.000	(0)
Zn(OH) 2	1.496e-10	1.496e-10	-9.825	-9.825	0.000	(0)
ZnCl2	4.256e-12	4.256e-12	-11.371	-11.371	0.000	(0)
Zn(OH) 3-	1.247e-13	1.060e-13	-12.904	-12.975	-0.070	(0)
ZnCl3-	5.833e-15	5.084e-15	-14.234	-14.294	-0.060	(0)
ZnSeO4	2.086e-16	2.086e-16	-15.681	-15.681	0.000	(0)
ZnCl4-2	6.489e-18	3.823e-18	-17.188	-17.418	-0.230	(0)
ZnNO3+	2.920e-18	2.482e-18	-17.535	-17.605	-0.070	(0)
Zn(OH) 4-2	1.141e-18	5.963e-19	-17.943	-18.225	-0.282	(0)
Zn(SeO4) 2-2	1.153e-27	6.026e-28	-26.938	-27.220	-0.282	(0)
Zn(NO3) 2	1.036e-30	1.036e-30	-29.985	-29.985	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.178	-149.249	-0.070	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.386	-150.386	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.476	-225.546	-0.070	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.097	-228.379	-0.282	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.165	-305.447	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3) 2	-76.19	-69.90	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2	-56.70	-52.19	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-63.92	-52.19	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3	-98.62	-80.69	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3	-74.15	-54.12	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-34.50	-34.10	0.40	(NH4)2CrO4	
(NH4)2SeO4	-30.15	-29.70	0.45	(NH4)2SeO4	
Acanthite	-51.22	-87.44	-36.22	Ag2S	
Ag2CO3	-10.60	-21.69	-11.09	Ag2CO3	
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4	
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4	
Ag2MoO4	-11.21	-22.76	-11.55	Ag2MoO4	
Ag2O	-14.42	-1.85	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-14.10	-18.92	-4.82	Ag2SO4	
Ag3AsO3	-27.18	-25.03	2.16	Ag3AsO3	
Ag3AsO4	-15.59	-18.38	-2.79	Ag3AsO4	
Ag3H2VO5	-16.60	-11.42	5.18	Ag3H2VO5	
AgF:4H2O	-12.90	-11.85	1.05	AgF:4H2O	
Agmetal	-0.19	-13.70	-13.51	Ag	
AgVO3	-10.34	-9.57	0.77	AgVO3	
Al(OH) 3 (am)	-1.20	9.60	10.80	Al(OH) 3	
Al2(MoO4) 3	-45.91	-43.54	2.37	Al2(MoO4) 3	
Al2O3	-0.46	19.19	19.65	Al2O3	
Al4(OH) 10SO4	-1.38	21.32	22.70	Al4(OH) 10SO4	
AlAsO4:2H2O	-10.81	-6.01	4.80	AlAsO4:2H2O	
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4	
AlSb	-151.92	-86.30	65.62	AlSb	
Alunite	0.00	-1.40	-1.40	KAl3(SO4) 2 (OH) 6	
Anglesite	-4.07	-11.86	-7.79	PbSO4	

Anhydrite	-1.35	-5.71	-4.36	CaSO ₄
Anilite	-55.12	-87.00	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-2.35	6.44	8.79	Cu ₃ (OH) 4SO ₄
Aragonite	-0.18	-8.48	-8.30	CaCO ₃
Arsenolite	-86.25	-89.01	-2.76	As ₄ O ₆
Artinite	-7.00	2.60	9.60	MgCO ₃ :Mg(OH) 2:3H ₂ O
As ₂ O ₅	-37.92	-31.21	6.71	As ₂ O ₅
Atacamite	-1.69	5.70	7.39	Cu ₂ (OH) 3Cl
Azurite	0.74	-16.17	-16.91	Cu ₃ (OH) 2 (CO ₃) 2
Ba(OH) 2:8H ₂ O	-17.31	7.09	24.39	Ba(OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-18.98	-3.11	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	-1.03	-9.94	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-28.96	3.98	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-13.48	-23.15	-9.67	BaCrO ₄
BaF ₂	-8.95	-14.77	-5.82	BaF ₂
BaMoO ₄	-6.86	-13.82	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-9.82	-7.99	1.83	BaSeO ₃
BaSeO ₄	-11.29	-18.75	-7.46	BaSeO ₄
Bianchite	-7.34	-9.10	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-8.59	9.50	18.09	MnO ₂
Bixbyite	-5.89	-6.54	-0.64	Mn ₂ O ₃
BlaubleiI	-54.82	-78.98	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.40	-82.68	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.95	14.27	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-5.63	11.22	16.84	Mg(OH) 2
Bunsenite	-5.27	7.17	12.45	NiO
Ca(VO ₃) 2	-11.59	-5.93	5.66	Ca(VO ₃) 2
Ca ₂ V ₂ O ₇	-12.07	5.43	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-16.13	5.43	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-19.44	2.86	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-22.18	16.78	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-23.08	16.78	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-300.70	-157.72	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-8.93	-26.84	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.60	-9.55	-7.95	CaMoO ₄
Carnotite	-4.10	-3.87	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.53	-3.72	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.46	-14.48	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) 2	-13.45	-3.61	9.84	Cd(BO ₂) 2
Cd(OH) 2	-7.65	5.99	13.64	Cd(OH) 2
Cd(OH) 2 (am)	-7.74	5.99	13.73	Cd(OH) 2
Cd ₃ (OH) 2 (SO ₄) 2	-22.88	-16.17	6.71	Cd ₃ (OH) 2 (SO ₄) 2
Cd ₃ (OH) 4SO ₄	-21.66	0.90	22.56	Cd ₃ (OH) 4SO ₄
Cd ₄ (OH) 6SO ₄	-21.51	6.89	28.40	Cd ₄ (OH) 6SO ₄
CdCl ₂	-13.29	-13.95	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.26	-13.95	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.04	-13.95	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.66	-15.87	-1.21	CdF ₂
Cdmetal (alpha)	-33.07	-19.56	13.51	Cd
Cdmetal (gamma)	-33.17	-19.56	13.62	Cd
CdMoO ₄	-0.77	-14.92	-14.15	CdMoO ₄
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.78	-77.13	-0.35	CdSb
CdSe	-20.66	-40.86	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.00	-19.85	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.91	-11.08	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.35	-11.08	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.21	-11.08	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.14	-10.89	-9.75	AgCl
Cerrusite	-1.50	-14.63	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-6.59	-9.23	-2.64	CuSO ₄ :5H ₂ O

Chalcocite	-55.16	-90.08	-34.92	Cu ₂ S
Chalcopyrite	-124.62	-159.89	-35.27	CuFeS ₂
Cinnabar	-52.16	-97.86	-45.69	HgS
Claudetite	-85.94	-89.01	-3.06	As ₄ O ₆
Clausthalite	-14.54	-41.64	-27.10	PbSe
Co(BO ₂) ₂	-29.67	-2.60	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.10	6.99	13.09	Co(OH) ₂
Co(OH) ₃	-10.32	-12.63	-2.31	Co(OH) ₃
CO ₂ (g)	-1.69	-19.84	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-23.26	-10.23	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.78	-18.27	-10.50	Co ₃ O ₄
CoCl ₂	-21.21	-12.95	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.48	-12.95	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.86	-12.84	-9.98	CoCO ₃
CoF ₂	-13.27	-14.86	-1.60	CoF ₂
CoF ₃	-43.96	-45.42	-1.46	CoF ₃
CoFe ₂ O ₄	16.90	13.38	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.16	-13.92	-7.76	CoMoO ₄
CoO	-6.59	6.99	13.59	CoO
CoS(alpha)	-71.15	-78.59	-7.44	CoS
CoS(beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.66	-39.86	-16.20	CoSe
CoSeO ₃	-9.40	-8.08	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-17.32	-18.85	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.88	-10.07	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.60	-10.08	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-9.95	-14.73	-4.78	PbCl ₂
Covellite	-55.45	-77.75	-22.30	CuS
Cr(OH) ₂	-21.82	-11.00	10.82	Cr(OH) ₂
Cr(OH) ₃	-2.51	-1.18	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	-0.43	-1.18	-0.75	Cr(OH) ₃
Cr ₂ O ₃	0.00	-2.36	-2.36	Cr ₂ O ₃
CrCl ₂	-45.04	-30.94	14.09	CrCl ₂
CrCl ₃	-46.20	-31.09	15.11	CrCl ₃
CrF ₃	-22.63	-33.96	-11.34	CrF ₃
Crmetal	-67.03	-36.55	30.48	Cr
CrO ₃	-27.03	-30.24	-3.21	CrO ₃
Cryolite	-7.79	-41.63	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.84	7.84	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-24.81	20.40	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-12.41	-3.16	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb:3H ₂ O	-55.43	-90.31	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se(alpha)	-5.54	-51.34	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.61	-21.56	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ :2H ₂ O	-13.80	-7.70	6.10	Cu ₃ (AsO ₄) ₂ :2H ₂ O
Cu ₃ Sb	-60.04	-102.64	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-26.87	-90.36	-63.49	Cu ₃ Se ₂
CuCO ₃	-0.50	-12.00	-11.50	CuCO ₃
CuCrO ₄	-16.96	-22.40	-5.44	CuCrO ₄
CuF	-8.27	-13.18	-4.91	CuF
CuF ₂	-15.14	-14.02	1.12	CuF ₂
CuF ₂ :2H ₂ O	-9.47	-14.02	-4.55	CuF ₂ :2H ₂ O
Cumetal	-6.26	-15.02	-8.76	Cu
CuMoO ₄	0.00	-13.08	-13.08	CuMoO ₄
CuOCuSO ₄	-11.70	-1.40	10.30	CuOCuSO ₄
Cupricferrite	8.23	14.22	5.99	CuFe ₂ O ₄
Cuprite	-3.09	-4.49	-1.41	Cu ₂ O
Cuprousferrite	9.86	0.94	-8.92	CuFeO ₂
CuSe	-5.91	-39.01	-33.10	CuSe
CuSe ₂	-26.96	-60.32	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-7.75	-7.24	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-15.56	-18.00	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-12.17	-9.23	2.94	CuSO ₄
Diaspore	2.72	9.60	6.87	AlOOH
Djurleite	-55.35	-89.27	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO ₃) ₂
Epsomite	-3.73	-5.85	-2.13	MgSO ₄ :7H ₂ O

Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.24	0.20	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.12	-13.84	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.25	-8.69	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.22	-38.85	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.09	-44.82	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.81	-12.41	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.37	-17.46	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.11	-64.71	-18.60	FeSe2
FeS (ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.40	-43.40	-11.00	FeSe
Fix_pe	-5.63	-5.63	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.41	-80.38	-13.97	PbS
Gibbsite	1.31	9.60	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.09	-9.10	-2.01	ZnSO4:7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.48	-332.52	-45.03	Fe3S4
Gummite	-6.85	0.83	7.67	UO3
Gypsum	-1.10	-5.71	-4.61	CaSO4:2H2O
H-Jarosite	-12.46	-24.56	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.04	-20.91	-12.88	H2MoO4
H2S (g)	-77.58	-85.59	-8.01	H2S
H2Se (g)	-41.89	-46.85	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.59	-256.30	-73.71	Hg (CH3) 2
Hg (g)	-8.35	-16.22	-7.87	Hg
Hg (OH) 2	-8.77	-12.27	-3.50	Hg (OH) 2
Hg2 (g)	-17.49	-32.44	-14.96	Hg2
Hg2 (OH) 2	-12.16	-6.90	5.26	Hg2 (OH) 2
Hg2CO3	-10.68	-26.73	-16.05	Hg2CO3
Hg2CrO4	-28.43	-37.13	-8.70	Hg2CrO4
Hg2F2	-18.39	-28.75	-10.36	Hg2F2
Hg2S	-80.81	-92.48	-11.68	Hg2S
Hg2SeO3	-17.32	-21.97	-4.66	Hg2SeO3
Hg2SO4	-17.84	-23.97	-6.13	Hg2SO4
Hg3O2CO3	-26.96	-56.64	-29.68	Hg3O2CO3
HgCl (g)	-32.92	-13.42	19.50	HgCl
HgCl2	-10.95	-32.21	-21.26	HgCl2
HgF (g)	-47.05	-14.38	32.68	HgF
HgF2 (g)	-46.69	-34.13	12.57	HgF2
Hgmetal (l)	-2.77	-16.22	-13.45	Hg
HgSe	-3.43	-59.12	-55.69	HgSe
HgSeO3	-14.92	-27.35	-12.43	HgSeO3
HgSO4	-19.92	-29.34	-9.42	HgSO4
Huntite	-4.37	-34.34	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.27	-24.04	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-14.50	-23.26	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.43	-20.60	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.82	-20.62	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.34	-52.58	-17.24	K2Cr2O7
K2CrO4	-21.83	-22.34	-0.51	K2CrO4
K2MoO4	-16.28	-13.02	3.26	K2MoO4
K2SeO4	-17.22	-17.95	-0.73	K2SeO4
Langite	-3.22	14.27	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-6.21	-6.65	-0.43	PbO:PbSO4
Laurionite	-5.38	-4.76	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.48	5.21	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS

Maghemite	-0.00	6.38	6.39	Fe ₂ O ₃
Magnesioferrite	0.74	17.60	16.86	Fe ₂ MgO ₄
Magnesite	-1.16	-8.62	-7.46	MgCO ₃
Magnetite	6.43	9.83	3.40	Fe ₃ O ₄
Malachite	1.14	-4.17	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.68	5.21	12.89	PbO
Matlockite	-6.72	-15.69	-8.97	PbClF
Melanothallite	-18.36	-12.10	6.26	CuCl ₂
Melanterite	-11.41	-13.62	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.76	-97.86	-45.09	HgS
Mg(OH) ₂ (active)	-7.58	11.22	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-17.35	-6.07	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.08	-201.39	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-21.21	5.15	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.34	8.86	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.40	-19.02	5.38	MgCrO ₄
MgF ₂	-2.51	-10.64	-8.13	MgF ₂
MgMoO ₄	-7.84	-9.69	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.92	-3.86	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-13.42	-14.62	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-32.35	41.17	73.52	Pb ₃ O ₄
Mirabilite	-6.39	-7.51	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.88	-7.98	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.03	-57.74	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.13	-90.05	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-15.78	-3.28	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.35	-10.63	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.45	-76.28	0.17	MnS
MnS (pnk)	-79.62	-76.28	3.34	MnS
MnSb	-96.25	-99.16	-2.91	MnSb
MnSe	-41.04	-37.54	3.50	MnSe
MnSeO ₃	-6.90	-5.77	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.75	-5.77	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-14.48	-16.53	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.34	-7.76	2.58	MnSO ₄
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO ₃	-12.91	-20.91	-8.00	MoO ₃
Morenosite	-7.75	-9.90	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-147.37	-217.63	-70.26	MoS ₂
Na-Jarosite	-8.58	-19.78	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.02	-50.91	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.60	-20.67	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.66	-32.26	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.84	-11.35	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.57	-11.35	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.81	-5.51	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-17.56	-16.28	1.28	Na ₂ SeO ₄
Na ₃ Sb	-176.00	-81.55	94.45	Na ₃ Sb
Na ₃ VO ₄	-30.98	5.70	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-35.56	1.84	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.49	-12.22	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.27	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.72	-3.86	3.86	NaVO ₃
Nesquehonite	-3.95	-8.62	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.62	7.17	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-25.39	-9.69	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.37	11.63	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.79	-12.66	-6.87	NiCO ₃
NiMoO ₄	-2.60	-13.74	-11.14	NiMoO ₄
NiS (alpha)	-72.81	-78.41	-5.60	NiS
NiS (beta)	-67.31	-78.41	-11.10	NiS
NiS (gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.98	-39.68	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.72	-7.90	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.15	-18.67	-1.52	NiSeO ₄ ·6H ₂ O

Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-240.20	-301.27	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.90	-4.38	6.52	Pb(BO2)2
Pb(OH)2	-2.94	5.21	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-58.16	-66.92	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.34	0.45	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.77	10.42	26.19	Pb2O(OH)2
Pb2O3	-25.08	35.96	61.04	Pb2O3
Pb2OCO3	-8.86	-9.42	-0.56	Pb2OCO3
Pb2V2O7	-4.97	-6.87	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.38	-15.58	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.80	-1.66	6.14	Pb3(VO4)2
Pb3O2CO3	-15.23	-4.21	11.02	Pb3O2CO3
Pb3O2SO4	-12.13	-1.44	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.33	3.77	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.11	3.77	21.88	Pb4O3SO4
PbCrO4	-12.43	-25.03	-12.60	PbCrO4
PbF2	-9.21	-16.65	-7.44	PbF2
Pbmetal	-24.58	-20.33	4.25	Pb
PbMoO4	-0.08	-15.70	-15.62	PbMoO4
PbO:0.3H2O	-7.77	5.21	12.98	PbO:0.33H2O
PbSeO4	-13.79	-20.63	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.55	-29.36	-19.81	PbCl2:PbCO3
Plattnerite	-18.85	30.75	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.67	-142.18	-18.51	FeS2
Pyrochroite	-5.88	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.51	-19.01	-14.50	UO2CO3
Sb(OH)3	-12.15	-19.26	-7.11	Sb(OH)3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-26.39	-36.06	-9.67	Sb2O5
Sb2Se3	-111.32	-179.08	-67.76	Sb2Se3
Sb4O6(cubic)	-58.79	-77.05	-18.26	Sb4O6
Sb4O6(orth)	-59.15	-77.05	-17.90	Sb4O6
SbCl3	-49.74	-49.17	0.57	SbCl3
SbF3	-41.82	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-5.17	0.83	5.99	UO2(OH)2:H2O
Semetal(am)	-14.20	-21.31	-7.11	Se
Semetal(hex)	-13.60	-21.31	-7.71	Se
Senarmontite	-26.16	-38.52	-12.37	Sb2O3
SeO2	-15.20	-15.08	0.12	SeO2
SeO3	-46.88	-25.84	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.17	-77.62	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.83	-295.29	-50.46	Sb2S3
Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.19	7.84	7.64	CuO
Thenardite	-7.83	-7.50	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-8.36	-4.28	4.08	Ca(UO2)2(VO4)2
U3O8	-16.50	4.58	21.08	U3O8
U3Sb4	-582.48	-430.10	152.38	U3Sb4
U4O9	-33.45	-36.47	-3.02	U4O9
UF4	-29.68	-59.22	-29.54	UF4
UF4:2.5H2O	-26.50	-59.22	-32.72	UF4:2.5H2O
UO2(am)	-16.44	-15.50	0.93	UO2
UO2(NO3)2	-48.98	-36.83	12.15	UO2(NO3)2

UO2(NO3)2:2H2O	-41.68	-36.83	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-40.22	-36.83	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-38.88	-36.83	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.79	0.83	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.76	-25.01	-2.25	UO2SeO4:4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.97	29.58	USb2
V(OH)3	-19.18	-11.59	7.59	V(OH)3
V2O5	-15.93	-17.29	-1.36	V2O5
V3O5	-40.92	-39.08	1.84	V3O5
V4O7	-50.78	-43.60	7.19	V4O7
V6O13	-42.09	-102.95	-60.86	V6O13
Valentinite	-30.04	-38.52	-8.48	Sb2O3
VC12	-63.18	-44.30	18.87	VC12
VC13	-64.93	-41.50	23.43	VC13
VF4	-63.16	-48.23	14.93	VF4
Vmetal	-93.93	-49.91	44.03	V
VO	-39.12	-24.36	14.76	VO
VO(OH)2	-9.66	-4.51	5.15	VO(OH)2
VO2Cl	-21.46	-18.61	2.84	VO2Cl
VOC1	-32.71	-21.56	11.15	VOC1
VOC12	-37.21	-24.45	12.76	VOC12
VOSO4	-25.19	-21.58	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.67	-77.62	-8.95	ZnS
Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.03	-9.10	3.93	ZnSO4
Zn(BO2)2	-9.92	-1.63	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.00	-29.69	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.50	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.78	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.56	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.76	7.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.63	-1.13	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.22	5.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-20.95	-7.30	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.14	-10.23	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.59	14.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.59	19.91	38.50	Zn5(OH)8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.35	-13.89	-0.53	ZnF2
Znmetal	-43.36	-17.58	25.79	Zn
ZnMoO4	-2.82	-12.94	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO
ZnS(am)	-68.57	-77.62	-9.05	ZnS
ZnSb	-86.17	-75.15	11.01	ZnSb
ZnSe	-24.48	-38.88	-14.40	ZnSe
ZnSeO4:6H2O	-16.35	-17.87	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.46	-9.10	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 120.

Title Stage 7 Run-off mix
Mix 702
1 1
3 0.001877

```

4      0.019712
5      0.010697
6      0.000000
7      0.035864
8      0.000000
9      5.399655
10     8.450607
11     16.302900
12     87.388282
13     67.070334
14     27.097188
15     13.717965
Save solution 705
end

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TITLE
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Stage 7 Run-off mix

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Beginning of batch-reaction calculations.
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Reaction step 1.

Using mix 702.

Mixture 702.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

1.877e-03 Solution 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

1.971e-02 Solution 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

1.070e-02 Solution 5 Average HCT data for quartz monzonite - oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

3.586e-02 Solution 7 Average HCT data for coarse crystalline porphyry - oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry - oxide/transitional (ore) (cell CF-11-02, 0-27)

5.400e+00 Solution 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

8.451e+00 Solution 10 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

1.630e+01 Solution 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

8.739e+01 Solution 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

6.707e+01 Solution 13 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

2.710e+01 Solution 14 Average HCT data for coarse crystalline porphyry - sulfide (waste) (cell CF-11-02, 367-408)

1.372e+01 Solution 15 Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell CF-11-02, 367-408)

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-----Solution composition-----

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Elements	Molality	Moles
Al	9.842e-07	2.229e-04
As	4.526e-10	1.025e-07
B	4.445e-07	1.007e-04
Ba	1.334e-07	3.021e-05

C	7.225e-04	1.636e-01
Ca	3.123e-04	7.073e-02
Cd	1.168e-09	2.646e-07
Cl	3.742e-05	8.475e-03
Co	1.318e-11	2.984e-09
Cr	5.069e-12	1.148e-09
Cu	2.377e-06	5.384e-04
F	3.359e-05	7.608e-03
Fe	4.741e-08	1.074e-05
Hg	4.266e-11	9.662e-09
K	6.678e-05	1.512e-02
Mg	8.163e-05	1.849e-02
Mn	9.851e-07	2.231e-04
Mo	3.806e-08	8.621e-06
N	9.969e-08	2.258e-05
Na	1.197e-04	2.712e-02
Ni	2.146e-12	4.860e-10
Pb	3.331e-09	7.545e-07
S	2.505e-04	5.674e-02
Sb	3.999e-10	9.058e-08
Se	3.488e-09	7.900e-07
U	1.213e-08	2.748e-06
V	9.417e-09	2.133e-06
Zn	1.153e-07	2.611e-05

-----Description of solution-----

	pH =	6.451	Charge balance
	pe =	6.501	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.568e-03	
	Mass of water (kg) =	2.265e+02	
	Total alkalinity (eq/kg) =	4.124e-04	
	Total CO2 (mol/kg) =	7.225e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	13	
	Total H =	2.514428e+04	
	Total O =	1.257274e+04	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.701e-07	3.541e-07	-6.432	-6.451	-0.019	0.00
OH-	2.973e-08	2.843e-08	-7.527	-7.546	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.842e-07					
AlF2+	4.684e-07	4.485e-07	-6.329	-6.348	-0.019	(0)
AlF3	1.715e-07	1.715e-07	-6.766	-6.766	0.000	(0)
Al(OH)4-	1.665e-07	1.593e-07	-6.779	-6.798	-0.019	(0)
Al(OH)2+	8.194e-08	7.845e-08	-7.087	-7.105	-0.019	(0)
Al(OH)3	4.451e-08	4.451e-08	-7.352	-7.352	0.000	(0)
AlF+2	4.414e-08	3.710e-08	-7.355	-7.431	-0.075	(0)
AlOH+2	4.133e-09	3.474e-09	-8.384	-8.459	-0.075	(0)
AlF4-	2.727e-09	2.609e-09	-8.564	-8.583	-0.019	(0)
AlSO4+	1.963e-10	1.879e-10	-9.707	-9.726	-0.019	(0)
Al+3	1.818e-10	1.222e-10	-9.740	-9.913	-0.173	(0)
Al(SO4)2-	4.169e-13	3.989e-13	-12.380	-12.399	-0.019	(0)
AlMo6O21-3	3.652e-39	2.403e-39	-38.437	-38.619	-0.182	(0)
As(3)	1.935e-21					
H3AsO3	1.932e-21	1.932e-21	-20.714	-20.714	0.000	(0)
H2AsO3-	2.931e-24	2.798e-24	-23.533	-23.553	-0.020	(0)
H4AsO3+	3.550e-28	3.389e-28	-27.450	-27.470	-0.020	(0)
HAsO3-2	8.678e-30	7.205e-30	-29.062	-29.142	-0.081	(0)

AsO3-3	1.192e-36	7.843e-37	-35.924	-36.106	-0.182	(0)
As (5)	4.526e-10					
H2AsO4-	3.338e-10	3.186e-10	-9.477	-9.497	-0.020	(0)
HAsO4-2	1.188e-10	9.865e-11	-9.925	-10.006	-0.081	(0)
H3AsO4	1.960e-14	1.961e-14	-13.708	-13.708	0.000	(0)
AsO4-3	1.339e-15	8.809e-16	-14.873	-15.055	-0.182	(0)
B	4.445e-07					
H3BO3	4.438e-07	4.439e-07	-6.353	-6.353	0.000	(0)
H2BO3-	7.616e-10	7.281e-10	-9.118	-9.138	-0.020	(0)
CaH2BO3+	1.098e-11	1.049e-11	-10.959	-10.979	-0.020	(0)
BF (OH) 3-	5.627e-12	5.379e-12	-11.250	-11.269	-0.020	(0)
MgH2BO3+	1.742e-12	1.666e-12	-11.759	-11.778	-0.020	(0)
NaH2BO3	1.320e-13	1.320e-13	-12.879	-12.879	0.000	(0)
BF2 (OH) 2-	6.469e-15	6.184e-15	-14.189	-14.209	-0.020	(0)
BaH2BO3+	2.622e-15	2.506e-15	-14.581	-14.601	-0.020	(0)
H5 (BO3) 2-	2.878e-16	2.751e-16	-15.541	-15.561	-0.020	(0)
BF3OH-	2.707e-20	2.587e-20	-19.568	-19.587	-0.020	(0)
H8 (BO3) 3-	1.277e-20	1.221e-20	-19.894	-19.913	-0.020	(0)
BF4-	1.432e-24	1.369e-24	-23.844	-23.864	-0.020	(0)
Ba	1.334e-07					
Ba+2	1.329e-07	1.114e-07	-6.876	-6.953	-0.077	(0)
BaHCO3+	4.343e-10	4.159e-10	-9.362	-9.381	-0.019	(0)
BaCO3	2.957e-12	2.957e-12	-11.529	-11.529	0.000	(0)
BaOH+	1.444e-14	1.383e-14	-13.840	-13.859	-0.019	(0)
BaH2BO3+	2.622e-15	2.506e-15	-14.581	-14.601	-0.020	(0)
BaNO3+	6.747e-17	6.440e-17	-16.171	-16.191	-0.020	(0)
BaNH3+2	5.675e-18	4.712e-18	-17.246	-17.327	-0.081	(0)
C (4)	7.225e-04					
HCO3-	4.083e-04	3.910e-04	-3.389	-3.408	-0.019	(0)
H2CO3	3.114e-04	3.114e-04	-3.507	-3.507	0.000	(0)
CaHCO3+	1.904e-06	1.824e-06	-5.720	-5.739	-0.019	(0)
CuCO3	4.347e-07	4.347e-07	-6.362	-6.362	0.000	(0)
MgHCO3+	2.759e-07	2.640e-07	-6.559	-6.578	-0.019	(0)
CO3-2	6.177e-08	5.176e-08	-7.209	-7.286	-0.077	(0)
CuHCO3+	3.685e-08	3.518e-08	-7.434	-7.454	-0.020	(0)
NaHCO3	2.515e-08	2.515e-08	-7.599	-7.599	0.000	(0)
CaCO3	2.055e-08	2.055e-08	-7.687	-7.687	0.000	(0)
UO2 (CO3) 2-2	6.567e-09	5.453e-09	-8.183	-8.263	-0.081	(0)
MnHCO3+	6.426e-09	6.151e-09	-8.192	-8.211	-0.019	(0)
UO2CO3	5.280e-09	5.280e-09	-8.277	-8.277	0.000	(0)
MgCO3	2.841e-09	2.841e-09	-8.547	-8.547	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
PbHCO3+	5.543e-10	5.291e-10	-9.256	-9.276	-0.020	(0)
BaHCO3+	4.343e-10	4.159e-10	-9.362	-9.381	-0.019	(0)
PbCO3	2.834e-10	2.834e-10	-9.548	-9.548	0.000	(0)
ZnCO3	2.733e-10	2.733e-10	-9.563	-9.563	0.000	(0)
NaCO3-	1.152e-10	1.103e-10	-9.939	-9.958	-0.019	(0)
Cu (CO3) 2-2	7.294e-11	6.055e-11	-10.137	-10.218	-0.081	(0)
UO2 (CO3) 3-4	2.977e-11	1.415e-11	-10.526	-10.849	-0.323	(0)
FeHCO3+	3.714e-12	3.557e-12	-11.430	-11.449	-0.019	(0)
BaCO3	2.957e-12	2.957e-12	-11.529	-11.529	0.000	(0)
CdCO3	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
CdHCO3+	8.740e-13	8.343e-13	-12.058	-12.079	-0.020	(0)
CoHCO3+	3.284e-13	3.134e-13	-12.484	-12.504	-0.020	(0)
NiHCO3+	8.422e-14	8.039e-14	-13.075	-13.095	-0.020	(0)
Pb (CO3) 2-2	5.096e-14	4.231e-14	-13.293	-13.374	-0.081	(0)
CoCO3	9.018e-15	9.018e-15	-14.045	-14.045	0.000	(0)
NiCO3	3.221e-15	3.221e-15	-14.492	-14.492	0.000	(0)
HgCO3	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
Cd (CO3) 2-2	5.110e-17	4.243e-17	-16.292	-16.372	-0.081	(0)
HgHCO3+	1.975e-17	1.885e-17	-16.704	-16.725	-0.020	(0)
Hg (CO3) 2-2	5.637e-19	4.680e-19	-18.249	-18.330	-0.081	(0)
Ca	3.123e-04					
Ca+2	2.989e-04	2.505e-04	-3.524	-3.601	-0.077	(0)
CaSO4	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
CaHCO3+	1.904e-06	1.824e-06	-5.720	-5.739	-0.019	(0)
CaF+	8.672e-08	8.302e-08	-7.062	-7.081	-0.019	(0)
CaCO3	2.055e-08	2.055e-08	-7.687	-7.687	0.000	(0)

	CaOH+	1.484e-10	1.421e-10	-9.829	-9.847	-0.019	(0)
	CaH2BO3+	1.098e-11	1.049e-11	-10.959	-10.979	-0.020	(0)
	CaNO3+	9.572e-14	9.137e-14	-13.019	-13.039	-0.020	(0)
	CaNH3+2	2.546e-14	2.114e-14	-13.594	-13.675	-0.081	(0)
	Ca (NH3) 2+2	6.795e-25	5.642e-25	-24.168	-24.249	-0.081	(0)
Cd		1.168e-09					
	Cd+2	1.118e-09	9.373e-10	-8.951	-9.028	-0.077	(0)
	CdSO4	4.354e-11	4.354e-11	-10.361	-10.361	0.000	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	CdCO3	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
	CdHCO3+	8.740e-13	8.343e-13	-12.058	-12.079	-0.020	(0)
	CdF+	4.726e-13	4.511e-13	-12.326	-12.346	-0.020	(0)
	CdOH+	2.218e-13	2.117e-13	-12.654	-12.674	-0.020	(0)
	Cd (SO4) 2-2	1.402e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
	CdOHC1	3.738e-15	3.738e-15	-14.427	-14.427	0.000	(0)
	CdCl2	4.782e-16	4.782e-16	-15.320	-15.320	0.000	(0)
	Cd (CO3) 2-2	5.110e-17	4.243e-17	-16.292	-16.372	-0.081	(0)
	Cd (OH) 2	3.798e-17	3.798e-17	-16.420	-16.420	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	CdNO3+	3.582e-19	3.419e-19	-18.446	-18.466	-0.020	(0)
	CdSeO4	6.395e-20	6.395e-20	-19.194	-19.194	0.000	(0)
	CdCl3-	1.132e-20	1.080e-20	-19.946	-19.966	-0.020	(0)
	Cd2OH+3	1.511e-21	9.944e-22	-20.821	-21.002	-0.182	(0)
	Cd (OH) 3-	6.912e-23	6.597e-23	-22.160	-22.181	-0.020	(0)
	Cd (SeO3) 2-2	1.270e-24	1.054e-24	-23.896	-23.977	-0.081	(0)
	Cd (NO3) 2	1.977e-29	1.977e-29	-28.704	-28.704	0.000	(0)
	Cd (OH) 4-2	3.698e-31	3.071e-31	-30.432	-30.513	-0.081	(0)
	CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-232.231	-232.251	-0.020	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-310.086	-310.167	-0.081	(0)
Cl		3.742e-05					
	Cl-	3.742e-05	3.580e-05	-4.427	-4.446	-0.019	(0)
	CuCl+	8.457e-11	8.092e-11	-10.073	-10.092	-0.019	(0)
	MnCl+	3.713e-11	3.554e-11	-10.430	-10.449	-0.019	(0)
	CuCl	9.923e-12	9.923e-12	-11.003	-11.003	0.000	(0)
	ZnCl+	8.625e-12	8.252e-12	-11.064	-11.083	-0.019	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	PbCl+	2.424e-12	2.314e-12	-11.615	-11.636	-0.020	(0)
	ZnOHC1	3.072e-13	3.072e-13	-12.513	-12.513	0.000	(0)
	HgClOH	8.298e-14	8.298e-14	-13.081	-13.081	0.000	(0)
	CuCl2-	7.758e-14	7.422e-14	-13.110	-13.129	-0.019	(0)
	HgCl2	5.916e-15	5.916e-15	-14.228	-14.228	0.000	(0)
	CdOHC1	3.738e-15	3.738e-15	-14.427	-14.427	0.000	(0)
	MnCl2	1.797e-15	1.797e-15	-14.745	-14.745	0.000	(0)
	UO2Cl+	1.558e-15	1.488e-15	-14.807	-14.828	-0.020	(0)
	CoCl+	1.337e-15	1.276e-15	-14.874	-14.894	-0.020	(0)
	CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)
	CdCl2	4.782e-16	4.782e-16	-15.320	-15.320	0.000	(0)
	ZnCl2	4.682e-16	4.682e-16	-15.330	-15.330	0.000	(0)
	PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
	NiCl+	1.600e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
	HgCl+	3.454e-17	3.297e-17	-16.462	-16.482	-0.020	(0)
	HgCl3-	2.219e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
	CuCl3-2	6.765e-19	5.681e-19	-18.170	-18.246	-0.076	(0)
	FeCl+2	2.742e-19	2.303e-19	-18.562	-18.638	-0.076	(0)
	CrCl+2	9.232e-20	7.665e-20	-19.035	-19.115	-0.081	(0)
	MnCl3-	1.851e-20	1.772e-20	-19.733	-19.752	-0.019	(0)
	ZnCl3-	1.392e-20	1.332e-20	-19.856	-19.876	-0.019	(0)
	CdCl3-	1.132e-20	1.080e-20	-19.946	-19.966	-0.020	(0)
	VOCl+	7.394e-21	7.058e-21	-20.131	-20.151	-0.020	(0)
	PbCl3-	5.524e-21	5.273e-21	-20.258	-20.278	-0.020	(0)
	HgCl4-2	3.636e-22	3.019e-22	-21.439	-21.520	-0.081	(0)
	CuCl3-	3.508e-22	3.356e-22	-21.455	-21.474	-0.019	(0)
	FeCl2+	3.846e-23	3.682e-23	-22.415	-22.434	-0.019	(0)
	NiCl2	2.754e-23	2.754e-23	-22.560	-22.560	0.000	(0)
	CrOHC12	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
	ZnCl4-2	2.839e-25	2.384e-25	-24.547	-24.623	-0.076	(0)

CrCl2+	2.728e-25	2.604e-25	-24.564	-24.584	-0.020	(0)
PbCl4-2	1.039e-25	8.629e-26	-24.983	-25.064	-0.081	(0)
FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)
CuCl4-2	7.171e-29	6.021e-29	-28.144	-28.220	-0.076	(0)
CrO3Cl-	2.321e-31	2.216e-31	-30.634	-30.654	-0.020	(0)
CoCl+2	1.142e-39	9.482e-40	-38.942	-39.023	-0.081	(0)
UCl+3	0.000e+00	0.000e+00	-42.746	-42.928	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.858	-63.938	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.087	-66.168	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.747	-80.828	-0.081	(0)
Co (2)	1.318e-11					
Co+2	1.241e-11	1.031e-11	-10.906	-10.987	-0.081	(0)
CoSO4	4.075e-13	4.075e-13	-12.390	-12.390	0.000	(0)
CoHCO3+	3.284e-13	3.134e-13	-12.484	-12.504	-0.020	(0)
CoF+	1.037e-14	9.897e-15	-13.984	-14.004	-0.020	(0)
CoCO3	9.018e-15	9.018e-15	-14.045	-14.045	0.000	(0)
CoOH+	6.126e-15	5.847e-15	-14.213	-14.233	-0.020	(0)
CoCl+	1.337e-15	1.276e-15	-14.874	-14.894	-0.020	(0)
Co (OH) 2	1.321e-17	1.321e-17	-16.879	-16.879	0.000	(0)
CoNO2+	4.063e-18	3.879e-18	-17.391	-17.411	-0.020	(0)
Co (NH3) +2	1.000e-19	8.307e-20	-19.000	-19.081	-0.081	(0)
CoNO3+	1.974e-21	1.884e-21	-20.705	-20.725	-0.020	(0)
CoSeO4	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
Co (OH) 3-	7.849e-24	7.493e-24	-23.105	-23.125	-0.020	(0)
CoOOH-	1.969e-24	1.880e-24	-23.706	-23.726	-0.020	(0)
Co2OH+3	4.590e-27	3.020e-27	-26.338	-26.520	-0.182	(0)
Co (NH3) 2+2	2.861e-28	2.375e-28	-27.543	-27.624	-0.081	(0)
Co (NO3) 2	4.422e-31	4.422e-31	-30.354	-30.354	0.000	(0)
Co (OH) 4-2	4.067e-32	3.377e-32	-31.391	-31.472	-0.081	(0)
Co (NH3) 3+2	2.415e-37	2.005e-37	-36.617	-36.698	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.071	-46.152	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.309	-48.632	-0.323	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.025	-56.105	-0.081	(0)
Co (3)	2.265e-32					
CoOH+2	2.265e-32	1.881e-32	-31.645	-31.726	-0.081	(0)
Co+3	1.937e-37	1.302e-37	-36.713	-36.886	-0.173	(0)
CoCl+2	1.142e-39	9.482e-40	-38.942	-39.023	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.858	-63.938	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.139	-75.159	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.647	-79.728	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.747	-80.828	-0.081	(0)
Cr (2)	1.501e-28					
Cr+2	1.501e-28	1.246e-28	-27.824	-27.905	-0.081	(0)
Cr (3)	5.069e-12					
Cr (OH) 2+	3.730e-12	3.561e-12	-11.428	-11.448	-0.020	(0)
Cr (OH) +2	1.240e-12	1.029e-12	-11.907	-11.988	-0.081	(0)
CrOHSO4	4.839e-14	4.839e-14	-13.315	-13.315	0.000	(0)
Cr (OH) 3	3.803e-14	3.803e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.590e-15	7.962e-15	-14.018	-14.099	-0.081	(0)
Cr+3	2.514e-15	1.654e-15	-14.600	-14.781	-0.182	(0)
CrSO4+	8.019e-16	7.655e-16	-15.096	-15.116	-0.020	(0)
CrO2-	5.343e-17	5.101e-17	-16.272	-16.292	-0.020	(0)
Cr (OH) 4-	4.510e-17	4.305e-17	-16.346	-16.366	-0.020	(0)
CrCl+2	9.232e-20	7.665e-20	-19.035	-19.115	-0.081	(0)
Cr2 (OH) 2SO4+2	5.421e-24	4.501e-24	-23.266	-23.347	-0.081	(0)
CrOHC12	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
CrCl2+	2.728e-25	2.604e-25	-24.564	-24.584	-0.020	(0)
Cr2 (OH) 2 (SO4) 2	5.298e-26	5.298e-26	-25.276	-25.276	0.000	(0)
CrNO3+2	1.005e-26	8.342e-27	-25.998	-26.079	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.743	-52.824	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.642	-62.824	-0.182	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.087	-66.168	-0.081	(0)
Cr (6)	5.807e-21					
HCrO4-	2.911e-21	2.779e-21	-20.536	-20.556	-0.020	(0)
CrO4-2	2.894e-21	2.425e-21	-20.538	-20.615	-0.077	(0)
NaCrO4-	1.444e-24	1.379e-24	-23.840	-23.860	-0.020	(0)
KCrO4-	6.023e-25	5.749e-25	-24.220	-24.240	-0.020	(0)
H2CrO4	7.977e-28	7.977e-28	-27.098	-27.098	0.000	(0)

	CrO3SO4-2	7.154e-29	5.939e-29	-28.145	-28.226	-0.081	(0)
	CrO3Cl-	2.321e-31	2.216e-31	-30.634	-30.654	-0.020	(0)
	Cr2O7-2	3.226e-40	2.678e-40	-39.491	-39.572	-0.081	(0)
Cu (1)	2.407e-10						
	Cu+	2.307e-10	2.202e-10	-9.637	-9.657	-0.020	(0)
	CuCl	9.923e-12	9.923e-12	-11.003	-11.003	0.000	(0)
	CuCl2-	7.758e-14	7.422e-14	-13.110	-13.129	-0.019	(0)
	CuCl3-2	6.765e-19	5.681e-19	-18.170	-18.246	-0.076	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-154.182	-154.319	-0.137	(0)
Cu (2)	2.377e-06						
	Cu+2	1.702e-06	1.426e-06	-5.769	-5.846	-0.077	(0)
	CuCO3	4.347e-07	4.347e-07	-6.362	-6.362	0.000	(0)
	CuOH+	1.340e-07	1.282e-07	-6.873	-6.892	-0.019	(0)
	CuSO4	6.473e-08	6.473e-08	-7.189	-7.189	0.000	(0)
	CuHCO3+	3.685e-08	3.518e-08	-7.434	-7.454	-0.020	(0)
	CuF+	2.862e-09	2.732e-09	-8.543	-8.563	-0.020	(0)
	Cu (OH) 2	7.275e-10	7.275e-10	-9.138	-9.138	0.000	(0)
	Cu2 (OH) 2+2	4.975e-10	4.130e-10	-9.303	-9.384	-0.081	(0)
	CuCl+	8.457e-11	8.092e-11	-10.073	-10.092	-0.019	(0)
	Cu (CO3) 2-2	7.294e-11	6.055e-11	-10.137	-10.218	-0.081	(0)
	CuNO2+	8.354e-12	7.974e-12	-11.078	-11.098	-0.020	(0)
	CuNH3+2	1.178e-12	9.783e-13	-11.929	-12.010	-0.081	(0)
	Cu (OH) 3-	4.445e-14	4.243e-14	-13.352	-13.372	-0.020	(0)
	CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)
	CuNO3+	5.450e-16	5.202e-16	-15.264	-15.284	-0.020	(0)
	Cu (NO2) 2	4.358e-18	4.358e-18	-17.361	-17.361	0.000	(0)
	Cu (OH) 4-2	1.144e-20	9.495e-21	-19.942	-20.022	-0.081	(0)
	CuCl3-	3.508e-22	3.356e-22	-21.455	-21.474	-0.019	(0)
	Cu (NO3) 2	7.554e-27	7.554e-27	-26.122	-26.122	0.000	(0)
	CuCl4-2	7.171e-29	6.021e-29	-28.144	-28.220	-0.076	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.262	-220.282	-0.020	(0)
F	3.359e-05						
	F-	3.174e-05	3.037e-05	-4.498	-4.518	-0.019	(0)
	AlF2+	4.684e-07	4.485e-07	-6.329	-6.348	-0.019	(0)
	MgF+	2.349e-07	2.248e-07	-6.629	-6.648	-0.019	(0)
	AlF3	1.715e-07	1.715e-07	-6.766	-6.766	0.000	(0)
	CaF+	8.672e-08	8.302e-08	-7.062	-7.081	-0.019	(0)
	AlF+2	4.414e-08	3.710e-08	-7.355	-7.431	-0.075	(0)
	HF	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
	CuF+	2.862e-09	2.732e-09	-8.543	-8.563	-0.020	(0)
	AlF4-	2.727e-09	2.609e-09	-8.564	-8.583	-0.019	(0)
	NaF	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
	MnF+	9.958e-10	9.533e-10	-9.002	-9.021	-0.019	(0)
	UO2F+	1.125e-10	1.074e-10	-9.949	-9.969	-0.020	(0)
	ZnF+	5.825e-11	5.560e-11	-10.235	-10.255	-0.020	(0)
	UO2F2	9.406e-12	9.406e-12	-11.027	-11.027	0.000	(0)
	BF (OH) 3-	5.627e-12	5.379e-12	-11.250	-11.269	-0.020	(0)
	PbF+	4.083e-12	3.898e-12	-11.389	-11.409	-0.020	(0)
	HF2-	1.920e-12	1.836e-12	-11.717	-11.736	-0.019	(0)
	CdF+	4.726e-13	4.511e-13	-12.326	-12.346	-0.020	(0)
	UO2F3-	7.516e-14	7.175e-14	-13.124	-13.144	-0.020	(0)
	CoF+	1.037e-14	9.897e-15	-13.984	-14.004	-0.020	(0)
	CrF+2	9.590e-15	7.962e-15	-14.018	-14.099	-0.081	(0)
	FeF+2	8.445e-15	7.091e-15	-14.073	-14.149	-0.076	(0)
	BF2 (OH) 2-	6.469e-15	6.184e-15	-14.189	-14.209	-0.020	(0)
	FeF2+	6.020e-15	5.763e-15	-14.220	-14.239	-0.019	(0)
	PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
	NiF+	1.333e-15	1.272e-15	-14.875	-14.895	-0.020	(0)
	VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
	H2F2	6.778e-16	6.778e-16	-15.169	-15.169	0.000	(0)
	FeF3	2.469e-16	2.469e-16	-15.607	-15.607	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	UO2F4-2	2.085e-17	1.731e-17	-16.681	-16.762	-0.081	(0)
	VO2F2-	1.367e-17	1.305e-17	-16.864	-16.884	-0.020	(0)
	VOF+	1.341e-17	1.280e-17	-16.873	-16.893	-0.020	(0)
	VOF2	1.457e-19	1.457e-19	-18.836	-18.836	0.000	(0)
	PbF3-	1.405e-19	1.342e-19	-18.852	-18.872	-0.020	(0)

BF3OH-	2.707e-20	2.587e-20	-19.568	-19.587	-0.020	(0)
VO2F3-2	5.955e-21	4.944e-21	-20.225	-20.306	-0.081	(0)
VOF3-	1.645e-22	1.570e-22	-21.784	-21.804	-0.020	(0)
HgF+	5.443e-23	5.196e-23	-22.264	-22.284	-0.020	(0)
PbF4-2	2.349e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
BF4-	1.432e-24	1.369e-24	-23.844	-23.864	-0.020	(0)
VO2F4-3	1.123e-25	7.387e-26	-24.950	-25.132	-0.182	(0)
Sb(OH) 2F	6.750e-26	6.750e-26	-25.171	-25.171	0.000	(0)
SbOF	6.638e-26	6.638e-26	-25.178	-25.178	0.000	(0)
VOF4-2	2.318e-26	1.925e-26	-25.635	-25.716	-0.081	(0)
UF3+	7.689e-33	7.339e-33	-32.114	-32.134	-0.020	(0)
UF2+2	1.837e-33	1.525e-33	-32.736	-32.817	-0.081	(0)
UF4	2.444e-35	2.444e-35	-34.612	-34.612	0.000	(0)
UF+3	6.062e-36	3.989e-36	-35.217	-35.399	-0.182	(0)
UF5-	3.081e-38	2.941e-38	-37.511	-37.532	-0.020	(0)
UF6-2	3.248e-40	2.697e-40	-39.488	-39.569	-0.081	(0)
Fe (2)	9.101e-10					
Fe+2	8.704e-10	7.227e-10	-9.060	-9.141	-0.081	(0)
FeSO4	3.515e-11	3.515e-11	-10.454	-10.454	0.000	(0)
FeHCO3+	3.714e-12	3.557e-12	-11.430	-11.449	-0.019	(0)
FeOH+	8.545e-13	8.180e-13	-12.068	-12.087	-0.019	(0)
Fe(OH) 2	1.848e-17	1.848e-17	-16.733	-16.733	0.000	(0)
Fe(OH) 3-	1.735e-19	1.661e-19	-18.761	-18.780	-0.019	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.469	-238.489	-0.020	(0)
Fe (3)	4.650e-08					
Fe(OH) 2+	4.517e-08	4.325e-08	-7.345	-7.364	-0.019	(0)
Fe(OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
FeOH+2	4.656e-12	3.910e-12	-11.332	-11.408	-0.076	(0)
Fe(OH) 4-	3.652e-12	3.497e-12	-11.437	-11.456	-0.019	(0)
FeF+2	8.445e-15	7.091e-15	-14.073	-14.149	-0.076	(0)
FeF2+	6.020e-15	5.763e-15	-14.220	-14.239	-0.019	(0)
FeSO4+	4.946e-16	4.735e-16	-15.306	-15.325	-0.019	(0)
Fe+3	3.170e-16	2.130e-16	-15.499	-15.672	-0.173	(0)
FeF3	2.469e-16	2.469e-16	-15.607	-15.607	0.000	(0)
Fe(SO4) 2-	2.101e-18	2.006e-18	-17.678	-17.698	-0.020	(0)
FeCl+2	2.742e-19	2.303e-19	-18.562	-18.638	-0.076	(0)
FeHSeO3+2	2.227e-21	1.849e-21	-20.652	-20.733	-0.081	(0)
Fe2(OH) 2+4	1.065e-21	5.062e-22	-20.973	-21.296	-0.323	(0)
FeCl2+	3.846e-23	3.682e-23	-22.415	-22.434	-0.019	(0)
FeNO3+2	2.959e-25	2.457e-25	-24.529	-24.610	-0.081	(0)
Fe3(OH) 4+5	1.012e-27	3.164e-28	-26.995	-27.500	-0.505	(0)
FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)
H (0)	1.764e-29					
H2	8.818e-30	8.821e-30	-29.055	-29.054	0.000	(0)
Hg (0)	4.233e-11					
Hg	4.233e-11	4.233e-11	-10.373	-10.373	0.000	(0)
Hg (1)	3.195e-21					
Hg2+2	1.598e-21	1.326e-21	-20.797	-20.877	-0.081	(0)
Hg (2)	3.272e-13					
Hg(OH) 2	2.354e-13	2.355e-13	-12.628	-12.628	0.000	(0)
HgClOH	8.298e-14	8.298e-14	-13.081	-13.081	0.000	(0)
HgCl2	5.916e-15	5.916e-15	-14.228	-14.228	0.000	(0)
HgCO3	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
HgOH+	5.474e-17	5.225e-17	-16.262	-16.282	-0.020	(0)
HgCl+	3.454e-17	3.297e-17	-16.462	-16.482	-0.020	(0)
HgHCO3+	1.975e-17	1.885e-17	-16.704	-16.725	-0.020	(0)
HgCl3-	2.219e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
Hg(CO3) 2-2	5.637e-19	4.680e-19	-18.249	-18.330	-0.081	(0)
Hg+2	5.559e-20	4.616e-20	-19.255	-19.336	-0.081	(0)
HgSO4	2.395e-21	2.395e-21	-20.621	-20.621	0.000	(0)
HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.709	-0.081	(0)
Hg(OH) 3-	8.830e-22	8.429e-22	-21.054	-21.074	-0.020	(0)
HgCl4-2	3.636e-22	3.019e-22	-21.439	-21.520	-0.081	(0)
Hg(NH3) 2+2	1.576e-22	1.309e-22	-21.802	-21.883	-0.081	(0)
HgF+	5.443e-23	5.196e-23	-22.264	-22.284	-0.020	(0)
HgNO3+	2.059e-30	1.966e-30	-29.686	-29.706	-0.020	(0)
Hg(NH3) 3+2	4.207e-32	3.493e-32	-31.376	-31.457	-0.081	(0)

	Hg (NO3) 2	0.000e+00	0.000e+00	-40.026	-40.026	0.000	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.650	-40.731	-0.081	(0)
	HgHS2-	0.000e+00	0.000e+00	-141.160	-141.180	-0.020	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-143.357	-143.437	-0.081	(0)
K	6.678e-05						
	K+	6.668e-05	6.380e-05	-4.176	-4.195	-0.019	(0)
	KSO4-	9.348e-08	8.950e-08	-7.029	-7.048	-0.019	(0)
	KCrO4-	6.023e-25	5.749e-25	-24.220	-24.240	-0.020	(0)
Mg	8.163e-05						
	Mg+2	7.873e-05	6.598e-05	-4.104	-4.181	-0.077	(0)
	MgSO4	2.379e-06	2.379e-06	-5.624	-5.624	0.000	(0)
	MgHCO3+	2.759e-07	2.640e-07	-6.559	-6.578	-0.019	(0)
	MgF+	2.349e-07	2.248e-07	-6.629	-6.648	-0.019	(0)
	MgCO3	2.841e-09	2.841e-09	-8.547	-8.547	0.000	(0)
	MgOH+	7.796e-10	7.469e-10	-9.108	-9.127	-0.019	(0)
	MgH2BO3+	1.742e-12	1.666e-12	-11.759	-11.778	-0.020	(0)
Mn (2)	9.851e-07						
	Mn+2	9.497e-07	7.885e-07	-6.022	-6.103	-0.081	(0)
	MnSO4	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
	MnHCO3+	6.426e-09	6.151e-09	-8.192	-8.211	-0.019	(0)
	MnF+	9.958e-10	9.533e-10	-9.002	-9.021	-0.019	(0)
	MnOH+	5.883e-11	5.632e-11	-10.230	-10.249	-0.019	(0)
	MnCl+	3.713e-11	3.554e-11	-10.430	-10.449	-0.019	(0)
	MnCl2	1.797e-15	1.797e-15	-14.745	-14.745	0.000	(0)
	MnNO3+	1.510e-16	1.442e-16	-15.821	-15.841	-0.020	(0)
	MnSeO4	7.777e-17	7.777e-17	-16.109	-16.109	0.000	(0)
	MnCl3-	1.851e-20	1.772e-20	-19.733	-19.752	-0.019	(0)
	Mn (OH) 3-	2.940e-22	2.814e-22	-21.532	-21.551	-0.019	(0)
	Mn (NO3) 2	4.177e-26	4.177e-26	-25.379	-25.379	0.000	(0)
	Mn (OH) 4-2	3.076e-29	2.583e-29	-28.512	-28.588	-0.076	(0)
	MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Mn (3)	1.663e-25						
	Mn+3	1.663e-25	1.117e-25	-24.779	-24.952	-0.173	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-46.837	-46.913	-0.076	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-49.764	-49.783	-0.019	(0)
Mo	3.806e-08						
	MoO4-2	3.783e-08	3.170e-08	-7.422	-7.499	-0.077	(0)
	HMoO4-	2.340e-10	2.234e-10	-9.631	-9.651	-0.020	(0)
	H2MoO4	5.794e-13	5.794e-13	-12.237	-12.237	0.000	(0)
	AlMo6O21-3	3.652e-39	2.403e-39	-38.437	-38.619	-0.182	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.382	-51.109	-0.727	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.668	-51.173	-0.505	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-52.519	-52.842	-0.323	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-55.865	-56.047	-0.182	(0)
N (-3)	4.371e-08						
	NH4+	4.355e-08	4.164e-08	-7.361	-7.381	-0.020	(0)
	NH4SO4-	9.234e-11	8.840e-11	-10.035	-10.054	-0.019	(0)
	NH3	6.704e-11	6.704e-11	-10.174	-10.174	0.000	(0)
	CuNH3+2	1.178e-12	9.783e-13	-11.929	-12.010	-0.081	(0)
	CaNH3+2	2.546e-14	2.114e-14	-13.594	-13.675	-0.081	(0)
	BaNH3+2	5.675e-18	4.712e-18	-17.246	-17.327	-0.081	(0)
	Co (NH3) +2	1.000e-19	8.307e-20	-19.000	-19.081	-0.081	(0)
	NiNH3+2	7.232e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
	HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.709	-0.081	(0)
	Hg (NH3) 2+2	1.576e-22	1.309e-22	-21.802	-21.883	-0.081	(0)
	Ca (NH3) 2+2	6.795e-25	5.642e-25	-24.168	-24.249	-0.081	(0)
	Ni (NH3) 2+2	7.007e-28	5.818e-28	-27.154	-27.235	-0.081	(0)
	Co (NH3) 2+2	2.861e-28	2.375e-28	-27.543	-27.624	-0.081	(0)
	Hg (NH3) 3+2	4.207e-32	3.493e-32	-31.376	-31.457	-0.081	(0)
	Co (NH3) 3+2	2.415e-37	2.005e-37	-36.617	-36.698	-0.081	(0)
	Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.650	-40.731	-0.081	(0)
	Co (NH3) 4+2	0.000e+00	0.000e+00	-46.071	-46.152	-0.081	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.743	-52.824	-0.081	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-56.025	-56.105	-0.081	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.642	-62.824	-0.182	(0)

	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.858	-63.938	-0.081	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.087	-66.168	-0.081	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.139	-75.159	-0.020	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.647	-79.728	-0.081	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.747	-80.828	-0.081	(0)
N (3)	5.586e-08						
	NO2-	5.585e-08	5.340e-08	-7.253	-7.272	-0.019	(0)
	CuNO2+	8.354e-12	7.974e-12	-11.078	-11.098	-0.020	(0)
	Cu (NO2) 2	4.358e-18	4.358e-18	-17.361	-17.361	0.000	(0)
	CoNO2+	4.063e-18	3.879e-18	-17.391	-17.411	-0.020	(0)
N (5)	1.207e-10						
	NO3-	1.206e-10	1.154e-10	-9.919	-9.938	-0.019	(0)
	CaNO3+	9.572e-14	9.137e-14	-13.019	-13.039	-0.020	(0)
	CuNO3+	5.450e-16	5.202e-16	-15.264	-15.284	-0.020	(0)
	MnNO3+	1.510e-16	1.442e-16	-15.821	-15.841	-0.020	(0)
	BaNO3+	6.747e-17	6.440e-17	-16.171	-16.191	-0.020	(0)
	ZnNO3+	2.786e-17	2.659e-17	-16.555	-16.575	-0.020	(0)
	PbNO3+	3.256e-18	3.108e-18	-17.487	-17.508	-0.020	(0)
	CdNO3+	3.582e-19	3.419e-19	-18.446	-18.466	-0.020	(0)
	UO2NO3+	6.178e-21	5.897e-21	-20.209	-20.229	-0.020	(0)
	CoNO3+	1.974e-21	1.884e-21	-20.705	-20.725	-0.020	(0)
	NiNO3+	5.063e-22	4.832e-22	-21.296	-21.316	-0.020	(0)
	VO2NO3	1.297e-24	1.297e-24	-23.887	-23.887	0.000	(0)
	FeNO3+2	2.959e-25	2.457e-25	-24.529	-24.610	-0.081	(0)
	Mn (NO3) 2	4.177e-26	4.177e-26	-25.379	-25.379	0.000	(0)
	CrNO3+2	1.005e-26	8.342e-27	-25.998	-26.079	-0.081	(0)
	Cu (NO3) 2	7.554e-27	7.554e-27	-26.122	-26.122	0.000	(0)
	Zn (NO3) 2	6.120e-28	6.120e-28	-27.213	-27.213	0.000	(0)
	Pb (NO3) 2	6.088e-28	6.088e-28	-27.216	-27.216	0.000	(0)
	Cd (NO3) 2	1.977e-29	1.977e-29	-28.704	-28.704	0.000	(0)
	HgNO3+	2.059e-30	1.966e-30	-29.686	-29.706	-0.020	(0)
	Co (NO3) 2	4.422e-31	4.422e-31	-30.354	-30.354	0.000	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.026	-40.026	0.000	(0)
Na	1.197e-04						
	Na+	1.196e-04	1.144e-04	-3.922	-3.942	-0.019	(0)
	NaSO4-	1.272e-07	1.217e-07	-6.896	-6.915	-0.019	(0)
	NaHCO3	2.515e-08	2.515e-08	-7.599	-7.599	0.000	(0)
	NaF	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
	NaCO3-	1.152e-10	1.103e-10	-9.939	-9.958	-0.019	(0)
	NaH2BO3	1.320e-13	1.320e-13	-12.879	-12.879	0.000	(0)
	NaCrO4-	1.444e-24	1.379e-24	-23.840	-23.860	-0.020	(0)
Ni	2.146e-12						
	Ni+2	1.990e-12	1.668e-12	-11.701	-11.778	-0.077	(0)
	NiHCO3+	8.422e-14	8.039e-14	-13.075	-13.095	-0.020	(0)
	NiSO4	6.594e-14	6.594e-14	-13.181	-13.181	0.000	(0)
	NiCO3	3.221e-15	3.221e-15	-14.492	-14.492	0.000	(0)
	NiF+	1.333e-15	1.272e-15	-14.875	-14.895	-0.020	(0)
	NiOH+	6.254e-16	5.970e-16	-15.204	-15.224	-0.020	(0)
	NiCl+	1.600e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
	Ni (OH) 2	1.348e-18	1.348e-18	-17.870	-17.870	0.000	(0)
	Ni (SO4) 2-2	5.211e-19	4.326e-19	-18.283	-18.364	-0.081	(0)
	NiNH3+2	7.232e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
	NiNO3+	5.063e-22	4.832e-22	-21.296	-21.316	-0.020	(0)
	NiSeO4	2.859e-22	2.859e-22	-21.544	-21.544	0.000	(0)
	Ni (OH) 3-	4.017e-23	3.834e-23	-22.396	-22.416	-0.020	(0)
	NiCl2	2.754e-23	2.754e-23	-22.560	-22.560	0.000	(0)
	Ni (NH3) 2+2	7.007e-28	5.818e-28	-27.154	-27.235	-0.081	(0)
O (0)	1.302e-34						
	O2	6.512e-35	6.514e-35	-34.186	-34.186	0.000	(0)
Pb	3.331e-09						
	Pb+2	2.174e-09	1.821e-09	-8.663	-8.740	-0.077	(0)
	PbHCO3+	5.543e-10	5.291e-10	-9.256	-9.276	-0.020	(0)
	PbCO3	2.834e-10	2.834e-10	-9.548	-9.548	0.000	(0)
	PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
	PbOH+	1.363e-10	1.301e-10	-9.866	-9.886	-0.020	(0)
	PbF+	4.083e-12	3.898e-12	-11.389	-11.409	-0.020	(0)
	PbCl+	2.424e-12	2.314e-12	-11.615	-11.636	-0.020	(0)
	Pb (SO4) 2-2	2.542e-13	2.110e-13	-12.595	-12.676	-0.081	(0)

Pb(OH) 2	1.170e-13	1.170e-13	-12.932	-12.932	0.000	(0)
Pb(CO3) 2-2	5.096e-14	4.231e-14	-13.293	-13.374	-0.081	(0)
PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
Pb2OH+3	5.707e-18	3.755e-18	-17.244	-17.425	-0.182	(0)
Pb(OH) 3-	3.484e-18	3.326e-18	-17.458	-17.478	-0.020	(0)
PbNO3+	3.256e-18	3.108e-18	-17.487	-17.508	-0.020	(0)
PbF3-	1.405e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
PbCl3-	5.524e-21	5.273e-21	-20.258	-20.278	-0.020	(0)
Pb(OH) 4-2	2.790e-23	2.316e-23	-22.554	-22.635	-0.081	(0)
PbF4-2	2.349e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
Pb3(OH) 4+2	5.989e-25	4.973e-25	-24.223	-24.303	-0.081	(0)
PbCl4-2	1.039e-25	8.629e-26	-24.983	-25.064	-0.081	(0)
Pb(NO3) 2	6.088e-28	6.088e-28	-27.216	-27.216	0.000	(0)
Pb4(OH) 4+4	1.514e-29	7.195e-30	-28.820	-29.143	-0.323	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-153.693	-153.693	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-232.485	-232.505	-0.020	(0)
S(-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.543	-79.543	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.092	-80.112	-0.020	(0)
CdHS+	0.000e+00	0.000e+00	-81.112	-81.132	-0.020	(0)
S5-2	0.000e+00	0.000e+00	-82.945	-83.026	-0.081	(0)
S6-2	0.000e+00	0.000e+00	-83.461	-83.542	-0.081	(0)
S4-2	0.000e+00	0.000e+00	-83.541	-83.622	-0.081	(0)
S3-2	0.000e+00	0.000e+00	-84.347	-84.428	-0.081	(0)
S2-2	0.000e+00	0.000e+00	-85.363	-85.444	-0.081	(0)
S-2	0.000e+00	0.000e+00	-90.885	-90.961	-0.076	(0)
HgHS2-	0.000e+00	0.000e+00	-141.160	-141.180	-0.020	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.357	-143.437	-0.081	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-153.693	-153.693	0.000	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-154.040	-154.040	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.182	-154.319	-0.137	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.415	-160.415	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-220.262	-220.282	-0.020	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-231.252	-231.272	-0.020	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-232.231	-232.251	-0.020	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-232.485	-232.505	-0.020	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.469	-238.489	-0.020	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-310.086	-310.167	-0.081	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-312.763	-312.844	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.671	-324.752	-0.081	(0)
S(6)	2.505e-04					
SO4-2	2.364e-04	1.981e-04	-3.626	-3.703	-0.077	(0)
CaSO4	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
MgSO4	2.379e-06	2.379e-06	-5.624	-5.624	0.000	(0)
NaSO4-	1.272e-07	1.217e-07	-6.896	-6.915	-0.019	(0)
KSO4-	9.348e-08	8.950e-08	-7.029	-7.048	-0.019	(0)
CuSO4	6.473e-08	6.473e-08	-7.189	-7.189	0.000	(0)
MnSO4	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
HSO4-	7.165e-09	6.857e-09	-8.145	-8.164	-0.019	(0)
ZnSO4	3.978e-09	3.978e-09	-8.400	-8.400	0.000	(0)
AlSO4+	1.963e-10	1.879e-10	-9.707	-9.726	-0.019	(0)
PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
NH4SO4-	9.234e-11	8.840e-11	-10.035	-10.054	-0.019	(0)
CdSO4	4.354e-11	4.354e-11	-10.361	-10.361	0.000	(0)
FeSO4	3.515e-11	3.515e-11	-10.454	-10.454	0.000	(0)
Zn(SO4) 2-2	8.269e-12	6.865e-12	-11.083	-11.163	-0.081	(0)
UO2SO4	7.684e-12	7.684e-12	-11.114	-11.114	0.000	(0)
Al(SO4) 2-	4.169e-13	3.989e-13	-12.380	-12.399	-0.019	(0)
CoSO4	4.075e-13	4.075e-13	-12.390	-12.390	0.000	(0)
Pb(SO4) 2-2	2.542e-13	2.110e-13	-12.595	-12.676	-0.081	(0)
Cd(SO4) 2-2	1.402e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
NiSO4	6.594e-14	6.594e-14	-13.181	-13.181	0.000	(0)

CrOHSO4	4.839e-14	4.839e-14	-13.315	-13.315	0.000	(0)
UO2(SO4) 2-2	2.417e-14	2.007e-14	-13.617	-13.697	-0.081	(0)
CrSO4+	8.019e-16	7.655e-16	-15.096	-15.116	-0.020	(0)
FeSO4+	4.946e-16	4.735e-16	-15.306	-15.325	-0.019	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VOSO4	3.835e-18	3.835e-18	-17.416	-17.416	0.000	(0)
Fe(SO4) 2-	2.101e-18	2.006e-18	-17.678	-17.698	-0.020	(0)
Ni(SO4) 2-2	5.211e-19	4.326e-19	-18.283	-18.364	-0.081	(0)
HgSO4	2.395e-21	2.395e-21	-20.621	-20.621	0.000	(0)
Cr2(OH) 2SO4+2	5.421e-24	4.501e-24	-23.266	-23.347	-0.081	(0)
Cr2(OH) 2(SO4) 2	5.298e-26	5.298e-26	-25.276	-25.276	0.000	(0)
CrO3SO4-2	7.154e-29	5.939e-29	-28.145	-28.226	-0.081	(0)
VSO4+	1.352e-31	1.290e-31	-30.869	-30.889	-0.020	(0)
U(SO4) 2	8.174e-38	8.174e-38	-37.088	-37.088	0.000	(0)
USO4+2	6.255e-38	5.193e-38	-37.204	-37.285	-0.081	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-75.139	-75.159	-0.020	(0)
Sb(3)	7.941e-21					
Sb(OH) 3	4.018e-21	4.018e-21	-20.396	-20.396	0.000	(0)
HSbO2	3.922e-21	3.922e-21	-20.406	-20.406	0.000	(0)
Sb(OH) 2F	6.750e-26	6.750e-26	-25.171	-25.171	0.000	(0)
SbOF	6.638e-26	6.638e-26	-25.178	-25.178	0.000	(0)
Sb(OH) 2+	3.620e-26	3.455e-26	-25.441	-25.462	-0.020	(0)
SbO2-	1.879e-26	1.794e-26	-25.726	-25.746	-0.020	(0)
SbO+	1.248e-26	1.191e-26	-25.904	-25.924	-0.020	(0)
Sb(OH) 4-	1.077e-26	1.028e-26	-25.968	-25.988	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.671	-324.752	-0.081	(0)
Sb(5)	3.999e-10					
SbO3-	3.995e-10	3.813e-10	-9.399	-9.419	-0.020	(0)
Sb(OH) 6-	4.661e-13	4.460e-13	-12.331	-12.351	-0.019	(0)
SbO2+	1.437e-23	1.371e-23	-22.843	-22.863	-0.020	(0)
Se(-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.317	-41.337	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.898	-43.898	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.805	-49.886	-0.081	(0)
Se(4)	3.488e-09					
HSeO3-	3.443e-09	3.286e-09	-8.463	-8.483	-0.020	(0)
SeO3-2	4.450e-11	3.694e-11	-10.352	-10.432	-0.081	(0)
H2SeO3	4.964e-13	4.964e-13	-12.304	-12.304	0.000	(0)
FeHSeO3+2	2.227e-21	1.849e-21	-20.652	-20.733	-0.081	(0)
Cd(SeO3) 2-2	1.270e-24	1.054e-24	-23.896	-23.977	-0.081	(0)
Se(6)	4.374e-13					
SeO4-2	4.373e-13	3.664e-13	-12.359	-12.436	-0.077	(0)
MnSeO4	7.777e-17	7.777e-17	-16.109	-16.109	0.000	(0)
HSeO4-	6.813e-18	6.504e-18	-17.167	-17.187	-0.020	(0)
ZnSeO4	5.208e-18	5.208e-18	-17.283	-17.283	0.000	(0)
CdSeO4	6.395e-20	6.395e-20	-19.194	-19.194	0.000	(0)
CoSeO4	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
NiSeO4	2.859e-22	2.859e-22	-21.544	-21.544	0.000	(0)
Zn(SeO4) 2-2	2.331e-30	1.935e-30	-29.633	-29.713	-0.081	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.297	-55.479	-0.182	(0)
U(4)	9.527e-22					
U(OH) 5-	9.394e-22	8.967e-22	-21.027	-21.047	-0.020	(0)
U(OH) 4	1.330e-23	1.330e-23	-22.876	-22.876	0.000	(0)
U(OH) 3+	1.804e-26	1.722e-26	-25.744	-25.764	-0.020	(0)
U(OH) 2+2	3.396e-30	2.819e-30	-29.469	-29.550	-0.081	(0)
UF3+	7.689e-33	7.339e-33	-32.114	-32.134	-0.020	(0)
UF2+2	1.837e-33	1.525e-33	-32.736	-32.817	-0.081	(0)
UOH+3	7.146e-35	4.702e-35	-34.146	-34.328	-0.182	(0)
UF4	2.444e-35	2.444e-35	-34.612	-34.612	0.000	(0)
UF+3	6.062e-36	3.989e-36	-35.217	-35.399	-0.182	(0)
U(SO4) 2	8.174e-38	8.174e-38	-37.088	-37.088	0.000	(0)
USO4+2	6.255e-38	5.193e-38	-37.204	-37.285	-0.081	(0)
UF5-	3.081e-38	2.941e-38	-37.511	-37.532	-0.020	(0)
UF6-2	3.248e-40	2.697e-40	-39.488	-39.569	-0.081	(0)
U+4	1.385e-40	0.000e+00	-39.858	-40.182	-0.323	(0)
UCl+3	0.000e+00	0.000e+00	-42.746	-42.928	-0.182	(0)

U6 (OH) 15+9	0.000e+00	0.000e+00	-159.846	-161.482	-1.636	(0)
U (5)	5.157e-15					
UO2+	5.157e-15	4.923e-15	-14.288	-14.308	-0.020	(0)
U (6)	1.213e-08					
UO2 (CO3) 2-2	6.567e-09	5.453e-09	-8.183	-8.263	-0.081	(0)
UO2CO3	5.280e-09	5.280e-09	-8.277	-8.277	0.000	(0)
UO2F+	1.125e-10	1.074e-10	-9.949	-9.969	-0.020	(0)
UO2OH+	9.608e-11	9.171e-11	-10.017	-10.038	-0.020	(0)
UO2+2	3.057e-11	2.562e-11	-10.515	-10.591	-0.077	(0)
UO2 (CO3) 3-4	2.977e-11	1.415e-11	-10.526	-10.849	-0.323	(0)
UO2F2	9.406e-12	9.406e-12	-11.027	-11.027	0.000	(0)
UO2SO4	7.684e-12	7.684e-12	-11.114	-11.114	0.000	(0)
UO2F3-	7.516e-14	7.175e-14	-13.124	-13.144	-0.020	(0)
UO2 (SO4) 2-2	2.417e-14	2.007e-14	-13.617	-13.697	-0.081	(0)
(UO2) 2 (OH) 2+2	1.681e-14	1.396e-14	-13.774	-13.855	-0.081	(0)
UO2Cl+	1.558e-15	1.488e-15	-14.807	-14.828	-0.020	(0)
(UO2) 3 (OH) 5+	8.226e-16	7.852e-16	-15.085	-15.105	-0.020	(0)
UO2F4-2	2.085e-17	1.731e-17	-16.681	-16.762	-0.081	(0)
UO2NO3+	6.178e-21	5.897e-21	-20.209	-20.229	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.591	-40.672	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.688	-40.708	-0.020	(0)
V (3)	2.558e-14					
V (OH) 3	2.558e-14	2.558e-14	-13.592	-13.592	0.000	(0)
V (OH) 2+	6.132e-24	5.853e-24	-23.212	-23.233	-0.020	(0)
VOH+2	2.368e-26	1.966e-26	-25.626	-25.706	-0.081	(0)
V+3	2.096e-30	1.379e-30	-29.679	-29.860	-0.182	(0)
VSO4+	1.352e-31	1.290e-31	-30.869	-30.889	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.290	-50.613	-0.323	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.305	-50.487	-0.182	(0)
V (4)	5.197e-16					
V (OH) 3+	4.176e-16	3.987e-16	-15.379	-15.399	-0.020	(0)
VO+2	8.464e-17	7.027e-17	-16.072	-16.153	-0.081	(0)
VOF+	1.341e-17	1.280e-17	-16.873	-16.893	-0.020	(0)
VOSO4	3.835e-18	3.835e-18	-17.416	-17.416	0.000	(0)
VOF2	1.457e-19	1.457e-19	-18.836	-18.836	0.000	(0)
VOC1+	7.394e-21	7.058e-21	-20.131	-20.151	-0.020	(0)
VOF3-	1.645e-22	1.570e-22	-21.784	-21.804	-0.020	(0)
VOF4-2	2.318e-26	1.925e-26	-25.635	-25.716	-0.081	(0)
H2V2O4+2	9.595e-27	7.966e-27	-26.018	-26.099	-0.081	(0)
V (5)	9.417e-09					
H2VO4-	9.305e-09	8.883e-09	-8.031	-8.051	-0.020	(0)
HVO4-2	7.589e-11	6.301e-11	-10.120	-10.201	-0.081	(0)
H3VO4	3.145e-11	3.145e-11	-10.502	-10.502	0.000	(0)
H3V2O7-	1.890e-12	1.804e-12	-11.724	-11.744	-0.020	(0)
VO2+	2.323e-14	2.223e-14	-13.634	-13.653	-0.019	(0)
VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
HV2O7-3	2.882e-16	1.896e-16	-15.540	-15.722	-0.182	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VO2F2-	1.367e-17	1.305e-17	-16.864	-16.884	-0.020	(0)
VO4-3	1.355e-18	8.917e-19	-17.868	-18.050	-0.182	(0)
V3O9-3	1.115e-18	7.339e-19	-17.953	-18.134	-0.182	(0)
V2O7-4	3.034e-20	1.441e-20	-19.518	-19.841	-0.323	(0)
VO2F3-2	5.955e-21	4.944e-21	-20.225	-20.306	-0.081	(0)
V4O12-4	5.720e-24	2.718e-24	-23.243	-23.566	-0.323	(0)
VO2NO3	1.297e-24	1.297e-24	-23.887	-23.887	0.000	(0)
VO2F4-3	1.123e-25	7.387e-26	-24.950	-25.132	-0.182	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.171	-55.676	-0.505	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.596	-56.920	-0.323	(0)
V10O28-6	0.000e+00	0.000e+00	-56.685	-57.412	-0.727	(0)
Zn	1.153e-07					
Zn+2	1.095e-07	9.177e-08	-6.961	-7.037	-0.077	(0)
ZnSO4	3.978e-09	3.978e-09	-8.400	-8.400	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
ZnOH+	2.734e-10	2.609e-10	-9.563	-9.583	-0.020	(0)
ZnCO3	2.733e-10	2.733e-10	-9.563	-9.563	0.000	(0)
ZnF+	5.825e-11	5.560e-11	-10.235	-10.255	-0.020	(0)
ZnCl+	8.625e-12	8.252e-12	-11.064	-11.083	-0.019	(0)

Zn(SO4)2-2	8.269e-12	6.865e-12	-11.083	-11.163	-0.081	(0)
Zn(OH)2	1.176e-12	1.176e-12	-11.930	-11.930	0.000	(0)
ZnOHCl	3.072e-13	3.072e-13	-12.513	-12.513	0.000	(0)
ZnCl2	4.682e-16	4.682e-16	-15.330	-15.330	0.000	(0)
Zn(OH)3-	1.756e-16	1.676e-16	-15.756	-15.776	-0.020	(0)
ZnNO3+	2.786e-17	2.659e-17	-16.555	-16.575	-0.020	(0)
ZnSeO4	5.208e-18	5.208e-18	-17.283	-17.283	0.000	(0)
ZnCl3-	1.392e-20	1.332e-20	-19.856	-19.876	-0.019	(0)
Zn(OH)4-2	2.285e-22	1.897e-22	-21.641	-21.722	-0.081	(0)
ZnCl4-2	2.839e-25	2.384e-25	-24.547	-24.623	-0.076	(0)
Zn(NO3)2	6.120e-28	6.120e-28	-27.213	-27.213	0.000	(0)
Zn(SeO4)2-2	2.331e-30	1.935e-30	-29.633	-29.713	-0.081	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-153.980	-154.000	-0.020	(0)
Zn(HS)2	0.000e+00	0.000e+00	-154.441	-154.441	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-231.252	-231.272	-0.020	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-234.721	-234.802	-0.081	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-312.763	-312.844	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-72.14	-65.86	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-59.38	-54.87	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-66.61	-54.87	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-90.21	-72.28	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-75.83	-55.80	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-35.78	-35.38	0.40	(NH4)2CrO4	
(NH4)2SeO4	-27.65	-27.20	0.45	(NH4)2SeO4	
Al(OH)3(am)	-1.36	9.44	10.80	Al(OH)3	
Al2(MoO4)3	-44.69	-42.32	2.37	Al2(MoO4)3	
Al2O3	-0.77	18.88	19.65	Al2O3	
Al4(OH)10SO4	-1.55	21.15	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-9.07	-4.27	4.80	AlAsO4:2H2O	
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4	
AlSb	-154.29	-88.67	65.62	AlSb	
Alunite	-1.24	-2.64	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.65	-12.44	-7.79	PbSO4	
Anhydrite	-2.94	-7.30	-4.36	CaSO4	
Anilite	-57.73	-89.61	-31.88	Cu0.25Cu1.5S	
Antlerite	-4.23	4.56	8.79	Cu3(OH)4SO4	
Aragonite	-2.59	-10.89	-8.30	CaCO3	
Arsenolite	-80.10	-82.86	-2.76	As4O6	
Artinite	-12.35	-2.75	9.60	MgCO3:Mg(OH)2:3H2O	
As2O5	-34.12	-27.42	6.71	As2O5	
Atacamite	-4.18	3.21	7.39	Cu2(OH)3Cl	
Azurite	-2.30	-19.21	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2:8H2O	-18.45	5.95	24.39	Ba(OH)2:8H2O	
Ba2V2O7:2H2O	-18.38	-2.51	15.87	Ba2V2O7:2H2O	
Ba3(AsO4)2	-0.66	-9.57	-8.91	Ba3(AsO4)2	
Ba3(VO4)2:4H2O	-29.50	3.44	32.94	Ba3(VO4)2:4H2O	
BaCrO4	-17.90	-27.57	-9.67	BaCrO4	
BaF2	-10.17	-15.99	-5.82	BaF2	
BaMoO4	-7.49	-14.45	-6.96	BaMoO4	
Barite	-0.68	-10.66	-9.98	BaSO4	
BaS	-96.79	-80.61	16.18	BaS	
BaSeO3	-10.82	-8.99	1.83	BaSeO3	
BaSeO4	-11.93	-19.39	-7.46	BaSeO4	
Bianchite	-8.98	-10.74	-1.76	ZnSO4:6H2O	
Birnessite	-10.74	7.35	18.09	MnO2	
Bixbyite	-10.55	-11.20	-0.64	Mn2O3	
BlaubleiI	-56.69	-80.85	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-57.62	-84.89	-27.28	Cu0.6Cu0.8S	
Boehmite	0.86	9.44	8.58	AlOOH	
Breithauptite	-65.51	-84.03	-18.52	NiSb	
Brochantite	-3.60	11.62	15.22	Cu4(OH)6SO4	
Brucite	-8.12	8.72	16.84	Mg(OH)2	
Bunsenite	-11.32	1.12	12.45	NiO	

Ca (VO3) 2	-10.76	-5.10	5.66	Ca (VO3) 2
Ca2V2O7	-13.30	4.20	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.36	4.20	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-21.81	0.49	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-25.46	13.50	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-26.36	13.50	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-311.29	-168.32	142.97	Ca3Sb2
CaCrO4	-21.95	-24.22	-2.27	CaCrO4
Calcite	-2.41	-10.89	-8.48	CaCO3
Calomel	-11.86	-29.77	-17.91	Hg2Cl2
CaMoO4	-3.15	-11.10	-7.95	CaMoO4
Carnotite	-2.87	-2.64	0.23	KUO2VO4
CaSeO3:2H2O	-8.45	-5.63	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.02	-16.04	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-18.67	-8.83	9.84	Cd (BO2) 2
Cd (OH) 2	-9.77	3.87	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-9.86	3.87	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-28.30	-21.59	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-27.54	-4.98	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-29.51	-1.11	28.40	Cd4 (OH) 6SO4
CdCl2	-17.26	-17.92	-0.66	CdCl2
CdCl2:1H2O	-16.23	-17.92	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.01	-17.92	-1.91	CdCl2:2.5H2O
CdF2	-16.85	-18.06	-1.21	CdF2
Cdmetal (alpha)	-35.55	-22.03	13.51	Cd
Cdmetal (gamma)	-35.65	-22.03	13.62	Cd
CdMoO4	-2.38	-16.53	-14.15	CdMoO4
CdOHC1	-10.56	-7.02	3.54	CdOHC1
CdSb	-80.93	-81.28	-0.35	CdSb
CdSe	-23.71	-43.91	-20.20	CdSe
CdSeO4:2H2O	-19.61	-21.46	-1.85	CdSeO4:2H2O
CdSO4	-12.56	-12.73	-0.17	CdSO4
CdSO4:1H2O	-11.01	-12.73	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.86	-12.73	-1.87	CdSO4:2.67H2O
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4 (g)	-82.76	-123.81	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-58.06	-92.98	-34.92	Cu2S
Chalcopyrite	-127.04	-162.31	-35.27	CuFeS2
Cinnabar	-53.50	-99.19	-45.69	HgS
Claudetite	-79.79	-82.86	-3.06	As4O6
Clausthalite	-16.53	-43.63	-27.10	PbSe
Co (BO2) 2	-37.86	-10.79	27.07	Co (BO2) 2
Co (OH) 2	-11.18	1.91	13.09	Co (OH) 2
Co (OH) 3	-15.22	-17.53	-2.31	Co (OH) 3
CO2 (g)	-2.04	-20.19	-18.15	CO2
Co3 (AsO4) 2	-34.70	-21.67	13.03	Co3 (AsO4) 2
Co3O4	-22.66	-33.15	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.43	-20.02	-1.60	CoF2
CoF3	-48.98	-50.44	-1.46	CoF3
CoFe2O4	12.80	9.28	-3.53	CoFe2O4
CoMoO4	-10.72	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS (alpha)	-77.21	-84.65	-7.44	CoS
CoS (beta)	-73.58	-84.65	-11.07	CoS
CoSe	-29.67	-45.87	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.89	-23.42	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.21	-79.51	-22.30	CuS
Cr (OH) 2	-25.82	-15.00	10.82	Cr (OH) 2
Cr (OH) 3	-6.33	-5.00	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-4.25	-5.00	-0.75	Cr (OH) 3

Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.89	-36.80	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.39	-40.91	30.48	Cr
CrO3	-30.31	-33.52	-3.21	CrO3
Cryolite	-15.00	-48.84	-33.84	Na3AlF6
Cu(OH)2	-1.62	7.06	8.67	Cu(OH)2
Cu(SbO3)2	-27.14	18.07	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-11.53	-2.28	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-59.38	-94.26	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-8.40	-54.20	-45.80	Cu2Se
Cu2SO4	-21.07	-23.02	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-12.35	-6.25	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-65.13	-107.73	-42.59	Cu3Sb
Cu3Se2	-31.44	-94.93	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.02	-26.46	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.40	-16.16	-8.76	Cu
CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-5.01	-6.41	-1.41	Cu2O
Cuprousferrite	9.39	0.47	-8.92	CuFeO2
CuSe	-7.63	-40.73	-33.10	CuSe
CuSe2	-29.25	-62.61	-33.37	CuSe2
CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.84	-18.28	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.17	-92.09	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-5.81	-22.35	-16.54	CaMg(CO3)2
Dolomite(ordered)	-5.26	-22.35	-17.09	CaMg(CO3)2
Epsomite	-5.76	-7.88	-2.13	MgSO4:7H2O
Fe(OH)2	-9.80	3.76	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.45	0.41	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-6.92	-10.64	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.13	-7.57	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.81	-37.44	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-38.72	-42.45	-3.73	Fe2(SO4)3
Fe3(OH)8	-9.10	11.12	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.43	-6.23	7.20	FeCr2O4
FeMoO4	-6.55	-16.64	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe(OH)3
Ferroselite	-47.31	-65.91	-18.60	FeSe2
FeS(ppt)	-79.85	-82.80	-2.95	FeS
FeSe	-33.03	-44.03	-11.00	FeSe
Fix_pe	-6.50	-6.50	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF2
Galena	-68.43	-82.40	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al(OH)3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4:7H2O
Greenockite	-68.33	-82.69	-14.36	CdS
Greigite	-290.09	-335.13	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.69	-7.30	-4.61	CaSO4:2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.52	-20.40	-12.88	H2MoO4
H2S(g)	-78.55	-86.56	-8.01	H2S
H2Se(g)	-42.83	-47.79	-4.96	H2Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.73	46.30	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3

Hercynite	-0.25	22.64	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-186.53	-260.24	-73.71	Hg (CH ₃) ₂
Hg (g)	-9.07	-16.94	-7.87	Hg
Hg (OH) ₂	-9.13	-12.63	-3.50	Hg (OH) ₂
Hg ₂ (g)	-18.92	-33.88	-14.96	Hg ₂
Hg ₂ (OH) ₂	-13.24	-7.98	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-12.11	-28.16	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-32.79	-41.49	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-19.55	-29.91	-10.36	Hg ₂ F ₂
Hg ₂ S	-82.86	-94.54	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-18.25	-22.91	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-18.45	-24.58	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-28.39	-58.07	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-34.38	-14.88	19.50	HgCl
HgCl ₂	-13.16	-34.42	-21.26	HgCl ₂
HgF (g)	-47.63	-14.96	32.68	HgF
HgF ₂ (g)	-47.13	-34.56	12.57	HgF ₂
Hgmetal (l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.72	-60.42	-55.69	HgSe
HgSeO ₃	-15.13	-27.56	-12.43	HgSeO ₃
HgSO ₄	-19.81	-29.23	-9.42	HgSO ₄
Huntite	-15.32	-45.29	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-9.12	-27.89	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-28.38	-37.15	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-16.34	-21.51	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-5.11	-19.91	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-45.28	-62.52	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-28.49	-29.01	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-19.15	-15.89	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-20.10	-20.83	-0.73	K ₂ SeO ₄
Langite	-5.87	11.62	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-7.85	-8.28	-0.43	PbO : PbSO ₄
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.20	-82.80	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe ₂ O ₃
Magnesioferrite	-0.78	16.08	16.86	Fe ₂ MgO ₄
Magnesite	-4.01	-11.47	-7.46	MgCO ₃
Magnetite	7.72	11.12	3.40	Fe ₃ O ₄
Malachite	-0.77	-6.08	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-5.59	19.75	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl ₂
Melanterite	-10.64	-12.84	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-54.10	-99.19	-45.09	HgS
Mg (OH) ₂ (active)	-10.07	8.72	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-16.96	-5.68	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-286.81	-212.12	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.32	3.04	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-17.47	-1.27	16.20	MgCr ₂ O ₄
MgCrO ₄	-30.18	-24.80	5.38	MgCrO ₄
MgF ₂	-5.09	-13.22	-8.13	MgF ₂
MgMoO ₄	-9.83	-11.68	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-9.27	-6.21	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-15.42	-16.62	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-35.13	38.39	73.52	Pb ₃ O ₄
Mirabilite	-10.47	-11.59	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-12.51	-7.61	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.30	-61.01	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-158.54	-97.46	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-19.52	-7.02	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O
MnCl ₂ : 4H ₂ O	-17.71	-15.00	2.72	MnCl ₂ : 4H ₂ O
MnS (grn)	-79.93	-79.76	0.17	MnS
MnS (pnk)	-83.10	-79.76	3.34	MnS
MnSb	-100.80	-103.71	-2.91	MnSb

MnSe	-44.49	-40.99	3.50	MnSe
MnSeO3	-9.27	-8.14	1.13	MnSeO3
MnSeO3:2H2O	-9.12	-8.14	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-16.49	-18.54	-2.05	MnSeO4:5H2O
MnSO4	-12.39	-9.81	2.58	MnSO4
Monteponite	-11.23	3.87	15.10	CdO
Montroydite	-8.99	-12.63	-3.64	HgO
MoO3	-12.40	-20.40	-8.00	MoO3
Morenosite	-13.34	-15.48	-2.14	NiSO4:7H2O
MoS2	-149.17	-219.43	-70.26	MoS2
Na-Jarosite	-8.46	-19.66	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-52.12	-62.02	-9.90	Na2Cr2O7
Na2CrO4	-31.43	-28.50	2.93	Na2CrO4
Na2Mo2O7	-19.19	-35.78	-16.60	Na2Mo2O7
Na2MoO4	-16.87	-15.38	1.49	Na2MoO4
Na2MoO4:2H2O	-16.61	-15.38	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-20.22	-9.92	10.30	Na2SeO3:5H2O
Na2SeO4	-21.60	-20.32	1.28	Na2SeO4
Na3Sb	-185.03	-90.58	94.45	Na3Sb
Na3VO4	-36.36	0.33	36.68	Na3VO4
Na4V2O7	-41.77	-4.37	37.40	Na4V2O7
Nantokite	-7.37	-14.10	-6.73	CuCl
NaSb	-92.86	-69.70	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na2CO3:10H2O
NaVO3	-8.55	-4.69	3.86	NaVO3
Nesquehonite	-6.80	-11.47	-4.67	MgCO3:3H2O
Ni(OH)2	-11.67	1.12	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-39.74	-24.04	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-44.11	-12.11	32.00	Ni4(OH)6SO4
NiCO3	-12.19	-19.06	-6.87	NiCO3
NiMoO4	-8.13	-19.28	-11.14	NiMoO4
NiS(alpha)	-79.84	-85.44	-5.60	NiS
NiS(beta)	-74.34	-85.44	-11.10	NiS
NiS(gamma)	-72.64	-85.44	-12.80	NiS
NiSe	-28.96	-46.66	-17.70	NiSe
NiSeO3:2H2O	-16.63	-13.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-22.69	-24.21	-1.52	NiSeO4:6H2O
Nsutite	-10.15	7.35	17.50	MnO2
O2(g)	-31.28	51.81	83.09	O2
Orpiment	-240.05	-301.12	-61.07	As2S3
Otavite	-4.31	-16.31	-12.00	CdCO3
Pb(BO2)2	-15.06	-8.54	6.52	Pb(BO2)2
Pb(OH)2	-3.99	4.16	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-70.75	-79.51	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-11.37	-2.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.86	8.32	26.19	Pb2O(OH)2
Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.31	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.73	-14.93	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.06	-1.92	6.14	Pb3(VO4)2
Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.06	0.04	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.04	21.88	Pb4O3SO4
PbCrO4	-16.75	-29.35	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.34	-21.18	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.53	30.07	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-124.95	-143.46	-18.51	FeS2
Pyrochroite	-8.40	6.80	15.19	Mn(OH)2
Pyrolusite	-8.68	32.70	41.38	MnO2

Realgar	-100.48	-120.23	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO ₄ ·6H ₂ O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO ₃
Rutherfordine	-3.38	-17.88	-14.50	UO ₂ CO ₃
Sb(OH)3	-13.29	-20.40	-7.11	Sb(OH)3
Sb ₂ O ₄	-18.29	-14.89	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-27.94	-37.60	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-116.40	-184.15	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-63.32	-81.58	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-63.68	-81.58	-17.90	Sb ₄ O ₆
SbCl ₃	-53.66	-53.09	0.57	SbCl ₃
SbF ₃	-43.08	-53.30	-10.23	SbF ₃
Sbmetal	-47.56	-59.25	-11.69	Sb
SbO ₂	-3.93	-31.75	-27.82	SbO ₂
Schoepite	-3.68	2.31	5.99	UO ₂ (OH)2·H ₂ O
Semetal(am)	-14.77	-21.88	-7.11	Se
Semetal(hex)	-14.17	-21.88	-7.71	Se
Senarmontite	-28.43	-40.79	-12.37	Sb ₂ O ₃
SeO ₂	-15.06	-14.93	0.12	SeO ₂
SeO ₃	-46.38	-25.34	21.04	SeO ₃
Siderite	-6.19	-16.43	-10.24	FeCO ₃
Smithsonite	-4.32	-14.32	-10.00	ZnCO ₃
Sphalerite	-69.25	-80.70	-11.45	ZnS
Spinel	-9.25	27.60	36.85	MgAl ₂ O ₄
Stibnite	-250.02	-300.48	-50.46	Sb ₂ S ₃
Sulfur	-58.51	-60.66	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na ₂ SO ₄
Thermonatrite	-15.81	-15.17	0.64	Na ₂ CO ₃ ·H ₂ O
Tyuyamunite	-4.56	-0.48	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-12.41	8.67	21.08	U ₃ O ₈
U ₃ Sb ₄	-587.95	-435.57	152.38	U ₃ Sb ₄
U ₄ O ₉	-28.59	-31.61	-3.02	U ₄ O ₉
UF ₄	-28.71	-58.25	-29.54	UF ₄
UF ₄ ·2.5H ₂ O	-25.53	-58.25	-32.72	UF ₄ ·2.5H ₂ O
UO ₂ (am)	-15.31	-14.38	0.93	UO ₂
UO ₂ (NO ₃) ₂	-42.61	-30.47	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ ·2H ₂ O	-35.32	-30.47	4.85	UO ₂ (NO ₃) ₂ ·2H ₂ O
UO ₂ (NO ₃) ₂ ·3H ₂ O	-33.86	-30.47	3.39	UO ₂ (NO ₃) ₂ ·3H ₂ O
UO ₂ (NO ₃) ₂ ·6H ₂ O	-32.51	-30.47	2.05	UO ₂ (NO ₃) ₂ ·6H ₂ O
UO ₂ (OH)2(beta)	-3.30	2.31	5.61	UO ₂ (OH)2
UO ₂ SeO ₄ ·4H ₂ O	-20.78	-23.03	-2.25	UO ₂ SeO ₄ ·4H ₂ O
UO ₃	-5.39	2.31	7.70	UO ₃
Uraninite	-9.71	-14.38	-4.67	UO ₂
USb ₂	-223.49	-193.91	29.58	USb ₂
V(OH)3	-18.10	-10.51	7.59	V(OH)3
V ₂ O ₅	-13.04	-14.40	-1.36	V ₂ O ₅
V ₃ O ₅	-37.50	-35.66	1.84	V ₃ O ₅
V ₄ O ₇	-46.10	-38.91	7.19	V ₄ O ₇
V ₆ O ₁₃	-34.16	-95.02	-60.86	V ₆ O ₁₃
Valentinite	-32.31	-40.79	-8.48	Sb ₂ O ₃
VC12	-64.13	-45.25	18.87	VC12
VC13	-66.63	-43.20	23.43	VC13
VF ₄	-62.06	-47.13	14.93	VF ₄
Vmetal	-93.39	-49.36	44.03	V
VO	-38.22	-23.46	14.76	VO
VO(OH)2	-8.40	-3.25	5.15	VO(OH)2
VO ₂ Cl	-20.94	-18.10	2.84	VO ₂ Cl
VOC1	-32.56	-21.40	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO ₄	-23.47	-19.86	3.61	VOSO ₄
Witherite	-5.67	-14.24	-8.57	BaCO ₃
Wurtzite	-71.75	-80.70	-8.95	ZnS
Zincite	-5.47	5.86	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO ₄
Zn(BO ₂) ₂	-15.13	-6.84	8.29	Zn(BO ₂) ₂
Zn(NO ₃) ₂ ·6H ₂ O	-30.23	-26.91	3.32	Zn(NO ₃) ₂ ·6H ₂ O
Zn(OH)2	-6.34	5.86	12.20	Zn(OH)2

Zn(OH)2(am)	-6.61	5.86	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.89	5.86	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.67	5.86	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.87	5.86	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.38	-4.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.36	0.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.47	-9.82	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.53	-15.62	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.55	6.85	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.97	7.53	38.50	Zn5(OH)8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.83	-20.04	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO(active)	-5.32	5.86	11.19	ZnO
ZnS(am)	-71.65	-80.70	-9.05	ZnS
ZnSb	-90.31	-79.29	11.01	ZnSb
ZnSe	-27.52	-41.92	-14.40	ZnSe
ZnSeO4:6H2O	-17.95	-19.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 121.

REACTION 702
H2O -1
12516.4855 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 705
SAVE Solution 706
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 705. Solution after simulation 120.
Using reaction 702.

Reaction 702.

1.252e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.228e-04	2.229e-04

As	1.025e-07	1.025e-07
B	1.006e-04	1.007e-04
Ba	3.019e-05	3.021e-05
C	1.636e-01	1.636e-01
Ca	7.069e-02	7.073e-02
Cd	2.644e-07	2.646e-07
Cl	8.470e-03	8.475e-03
Co	2.983e-09	2.984e-09
Cr	1.147e-09	1.148e-09
Cu	5.381e-04	5.384e-04
F	7.603e-03	7.608e-03
Fe	1.073e-05	1.074e-05
Hg	9.656e-09	9.662e-09
K	1.512e-02	1.512e-02
Mg	1.848e-02	1.849e-02
Mn	2.230e-04	2.231e-04
Mo	8.616e-06	8.621e-06
N	2.257e-05	2.258e-05
Na	2.710e-02	2.712e-02
Ni	4.857e-10	4.860e-10
Pb	7.541e-07	7.545e-07
S	5.671e-02	5.674e-02
Sb	9.053e-08	9.058e-08
Se	7.896e-07	7.900e-07
U	2.746e-06	2.748e-06
V	2.132e-06	2.133e-06
Zn	2.610e-05	2.611e-05

-----Description of solution-----

equilibrium	pH	=	6.245	Charge balance
	pe	=	6.786	Adjusted to redox
	Activity of water	=	0.995	
	Ionic strength (mol/kgw)	=	2.213e-01	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	9.336e-02	
	Total CO2 (mol/kg)	=	1.636e-01	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	33	
	Total H	=	1.113135e+02	
	Total O	=	5.625795e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	7.654e-07	5.683e-07	-6.116	-6.245	-0.129	0.00
OH-	2.522e-08	1.762e-08	-7.598	-7.754	-0.156	(0)
H2O	5.551e+01	9.946e-01	1.744	-0.002	0.000	18.07
Al	2.228e-04					
AlF4-	1.554e-04	1.122e-04	-3.809	-3.950	-0.142	(0)
AlF3	6.537e-05	6.537e-05	-4.185	-4.185	0.000	(0)
AlF2+	2.050e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
AlF+2	3.712e-09	1.113e-09	-8.430	-8.953	-0.523	(0)
Al(OH)2+	1.084e-11	8.020e-12	-10.965	-11.096	-0.131	(0)
Al(OH)4-	8.665e-12	6.256e-12	-11.062	-11.204	-0.142	(0)
AlSO4+	3.057e-12	2.207e-12	-11.515	-11.656	-0.142	(0)
Al(OH)3	2.820e-12	2.820e-12	-11.550	-11.550	0.000	(0)
AlOH+2	1.911e-12	5.730e-13	-11.719	-12.242	-0.523	(0)
Al+3	4.740e-13	3.251e-14	-12.324	-13.488	-1.164	(0)
Al(SO4)2-	2.865e-13	2.068e-13	-12.543	-12.684	-0.142	(0)
AlMo6O21-3	4.913e-28	3.405e-30	-27.309	-29.468	-2.159	(0)
As(3)	1.990e-19					
H3AsO3	1.987e-19	1.987e-19	-18.702	-18.702	0.000	(0)

	H2AsO3-	3.115e-22	1.793e-22	-21.507	-21.746	-0.240	(0)
	H4AsO3+	9.719e-26	5.594e-26	-25.012	-25.252	-0.240	(0)
	HAsO3-2	2.622e-27	2.877e-28	-26.581	-27.541	-0.960	(0)
	AsO3-3	2.816e-33	1.952e-35	-32.550	-34.710	-2.159	(0)
As (5)	1.025e-07						
	HAsO4-2	5.153e-08	5.654e-09	-7.288	-8.248	-0.960	(0)
	H2AsO4-	5.092e-08	2.931e-08	-7.293	-7.533	-0.240	(0)
	AsO4-3	4.540e-12	3.146e-14	-11.343	-13.502	-2.159	(0)
	H3AsO4	2.750e-12	2.894e-12	-11.561	-11.538	0.022	(0)
B	1.006e-04						
	H3BO3	1.001e-04	1.053e-04	-4.000	-3.977	0.022	(0)
	BF(OH) 3-	2.143e-07	1.439e-07	-6.669	-6.842	-0.173	(0)
	H2BO3-	1.603e-07	1.076e-07	-6.795	-6.968	-0.173	(0)
	CaH2BO3+	9.699e-08	6.511e-08	-7.013	-7.186	-0.173	(0)
	BF2(OH) 2-	4.481e-08	3.008e-08	-7.349	-7.522	-0.173	(0)
	MgH2BO3+	1.653e-08	1.110e-08	-7.782	-7.955	-0.173	(0)
	NaH2BO3	3.203e-09	3.203e-09	-8.495	-8.495	0.000	(0)
	BaH2BO3+	3.743e-11	2.513e-11	-10.427	-10.600	-0.173	(0)
	BF3OH-	3.410e-11	2.289e-11	-10.467	-10.640	-0.173	(0)
	H5(BO3) 2-	1.437e-11	9.649e-12	-10.842	-11.016	-0.173	(0)
	BF4-	3.282e-13	2.203e-13	-12.484	-12.657	-0.173	(0)
	H8(BO3) 3-	1.514e-13	1.016e-13	-12.820	-12.993	-0.173	(0)
Ba	3.019e-05						
	Ba+2	2.485e-05	7.554e-06	-4.605	-5.122	-0.517	(0)
	BaHCO3+	5.317e-06	3.992e-06	-5.274	-5.399	-0.124	(0)
	BaCO3	1.768e-08	1.768e-08	-7.752	-7.752	0.000	(0)
	BaH2BO3+	3.743e-11	2.513e-11	-10.427	-10.600	-0.173	(0)
	BaNO3+	1.798e-12	1.035e-12	-11.745	-11.985	-0.240	(0)
	BaOH+	7.935e-13	5.811e-13	-12.100	-12.236	-0.135	(0)
	BaNH3+2	2.595e-13	2.848e-14	-12.586	-13.545	-0.960	(0)
C (4)	1.636e-01						
	HCO3-	7.478e-02	5.534e-02	-1.126	-1.257	-0.131	(0)
	H2CO3	7.073e-02	7.073e-02	-1.150	-1.150	0.000	(0)
	CaHCO3+	1.443e-02	1.083e-02	-1.841	-1.965	-0.124	(0)
	MgHCO3+	2.369e-03	1.684e-03	-2.625	-2.774	-0.148	(0)
	NaHCO3	5.842e-04	5.842e-04	-3.233	-3.233	0.000	(0)
	CuCO3	3.465e-04	3.465e-04	-3.460	-3.460	0.000	(0)
	CuHCO3+	7.820e-05	4.501e-05	-4.107	-4.347	-0.240	(0)
	CaCO3	7.606e-05	7.606e-05	-4.119	-4.119	0.000	(0)
	Cu(CO3) 2-2	3.880e-05	4.257e-06	-4.411	-5.371	-0.960	(0)
	MnHCO3+	2.717e-05	1.990e-05	-4.566	-4.701	-0.135	(0)
	CO3-2	1.502e-05	4.565e-06	-4.823	-5.341	-0.517	(0)
	MgCO3	1.129e-05	1.129e-05	-4.947	-4.947	0.000	(0)
	ZnHCO3+	7.952e-06	4.577e-06	-5.100	-5.339	-0.240	(0)
	BaHCO3+	5.317e-06	3.992e-06	-5.274	-5.399	-0.124	(0)
	UO2(CO3) 3-4	2.731e-06	3.959e-10	-5.564	-9.402	-3.839	(0)
	NaCO3-	2.157e-06	1.596e-06	-5.666	-5.797	-0.131	(0)
	ZnCO3	6.870e-07	6.870e-07	-6.163	-6.163	0.000	(0)
	PbHCO3+	5.534e-07	3.185e-07	-6.257	-6.497	-0.240	(0)
	FeHCO3+	1.343e-07	1.008e-07	-6.872	-6.996	-0.124	(0)
	PbCO3	1.063e-07	1.063e-07	-6.973	-6.973	0.000	(0)
	BaCO3	1.768e-08	1.768e-08	-7.752	-7.752	0.000	(0)
	UO2(CO3) 2-2	1.577e-08	1.731e-09	-7.802	-8.762	-0.960	(0)
	Pb(CO3) 2-2	1.275e-08	1.400e-09	-7.894	-8.854	-0.960	(0)
	CdHCO3+	6.413e-09	3.691e-09	-8.193	-8.433	-0.240	(0)
	CdCO3	3.049e-09	3.049e-09	-8.516	-8.516	0.000	(0)
	CoHCO3+	1.197e-09	6.887e-10	-8.922	-9.162	-0.240	(0)
	NiHCO3+	3.339e-10	1.922e-10	-9.476	-9.716	-0.240	(0)
	Cd(CO3) 2-2	9.401e-11	1.032e-11	-10.027	-10.986	-0.960	(0)
	UO2CO3	1.900e-11	1.900e-11	-10.721	-10.721	0.000	(0)
	CoCO3	1.235e-11	1.235e-11	-10.908	-10.908	0.000	(0)
	HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
	NiCO3	4.798e-12	4.798e-12	-11.319	-11.319	0.000	(0)
	Hg(CO3) 2-2	1.418e-12	1.556e-13	-11.848	-12.808	-0.960	(0)
	HgHCO3+	1.982e-13	1.141e-13	-12.703	-12.943	-0.240	(0)
Ca	7.069e-02						
	Ca+2	3.459e-02	1.051e-02	-1.461	-1.978	-0.517	(0)
	CaSO4	2.106e-02	2.106e-02	-1.677	-1.677	0.000	(0)

	CaHCO3+	1.443e-02	1.083e-02	-1.841	-1.965	-0.124	(0)
	CaF+	5.364e-04	3.928e-04	-3.271	-3.406	-0.135	(0)
	CaCO3	7.606e-05	7.606e-05	-4.119	-4.119	0.000	(0)
	CaH2BO3+	9.699e-08	6.511e-08	-7.013	-7.186	-0.173	(0)
	CaOH+	4.923e-09	3.696e-09	-8.308	-8.432	-0.124	(0)
	CaNO3+	1.579e-09	9.087e-10	-8.802	-9.042	-0.240	(0)
	CaNH3+2	7.206e-10	7.907e-11	-9.142	-10.102	-0.960	(0)
	Ca (NH3) 2+2	1.714e-18	1.881e-19	-17.766	-18.726	-0.960	(0)
Cd	2.644e-07						
	Cd+2	9.640e-08	2.930e-08	-7.016	-7.533	-0.517	(0)
	Cd (SO4) 2-2	6.457e-08	7.086e-09	-7.190	-8.150	-0.960	(0)
	CdSO4	6.007e-08	6.007e-08	-7.221	-7.221	0.000	(0)
	CdCl+	3.057e-08	1.760e-08	-7.515	-7.755	-0.240	(0)
	CdHCO3+	6.413e-09	3.691e-09	-8.193	-8.433	-0.240	(0)
	CdCO3	3.049e-09	3.049e-09	-8.516	-8.516	0.000	(0)
	CdF+	2.762e-09	1.590e-09	-8.559	-8.799	-0.240	(0)
	CdCl2	4.613e-10	4.613e-10	-9.336	-9.336	0.000	(0)
	Cd (CO3) 2-2	9.401e-11	1.032e-11	-10.027	-10.986	-0.960	(0)
	CdOHC1	1.272e-11	1.272e-11	-10.896	-10.896	0.000	(0)
	CdF2	1.086e-11	1.086e-11	-10.964	-10.964	0.000	(0)
	CdOH+	7.126e-12	4.101e-12	-11.147	-11.387	-0.240	(0)
	CdCl3-	3.180e-12	1.830e-12	-11.498	-11.737	-0.240	(0)
	CdNO3+	4.400e-15	2.533e-15	-14.357	-14.596	-0.240	(0)
	Cd (OH) 2	4.560e-16	4.560e-16	-15.341	-15.341	0.000	(0)
	CdSeO4	2.384e-16	2.384e-16	-15.623	-15.623	0.000	(0)
	Cd2OH+3	8.690e-17	6.022e-19	-16.061	-18.220	-2.159	(0)
	Cd (SeO3) 2-2	2.073e-18	2.275e-19	-17.683	-18.643	-0.960	(0)
	Cd (OH) 3-	8.530e-22	4.909e-22	-21.069	-21.309	-0.240	(0)
	Cd (NO3) 2	3.469e-23	3.469e-23	-22.460	-22.460	0.000	(0)
Cd (OH) 4-2	1.290e-29	1.416e-30	-28.889	-29.849	-0.960	(0)	
CdHS+	0.000e+00	0.000e+00	-78.174	-78.414	-0.240	(0)	
Cd (HS) 2	0.000e+00	0.000e+00	-150.100	-150.100	0.000	(0)	
Cd (HS) 3-	0.000e+00	0.000e+00	-226.849	-227.089	-0.240	(0)	
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.822	-303.782	-0.960	(0)	
Cl	8.470e-03						
	Cl-	8.469e-03	6.289e-03	-2.072	-2.201	-0.129	(0)
	MnCl+	1.948e-07	1.427e-07	-6.710	-6.846	-0.135	(0)
	CuCl+	1.808e-07	1.285e-07	-6.743	-6.891	-0.148	(0)
	ZnCl+	5.812e-08	4.131e-08	-7.236	-7.384	-0.148	(0)
	CdCl+	3.057e-08	1.760e-08	-7.515	-7.755	-0.240	(0)
	CuCl2-	1.511e-08	1.074e-08	-7.821	-7.969	-0.148	(0)
	CuCl	8.173e-09	8.173e-09	-8.088	-8.088	0.000	(0)
	HgCl2	7.802e-09	7.802e-09	-8.108	-8.108	0.000	(0)
	PbCl+	3.003e-09	1.728e-09	-8.522	-8.762	-0.240	(0)
	MnCl2	1.267e-09	1.267e-09	-8.897	-8.897	0.000	(0)
	ZnOHC1	9.531e-10	9.531e-10	-9.021	-9.021	0.000	(0)
	HgCl3-	8.525e-10	4.907e-10	-9.069	-9.309	-0.240	(0)
	CdCl2	4.613e-10	4.613e-10	-9.336	-9.336	0.000	(0)
	ZnCl2	4.118e-10	4.118e-10	-9.385	-9.385	0.000	(0)
	HgClOH	3.861e-10	3.861e-10	-9.413	-9.413	0.000	(0)
	CuCl2	2.801e-10	2.801e-10	-9.553	-9.553	0.000	(0)
	HgCl4-2	1.119e-10	1.228e-11	-9.951	-10.911	-0.960	(0)
	CuCl3-2	5.022e-11	1.444e-11	-10.299	-10.841	-0.541	(0)
	PbCl2	4.855e-11	4.855e-11	-10.314	-10.314	0.000	(0)
	CdOHC1	1.272e-11	1.272e-11	-10.896	-10.896	0.000	(0)
	CoCl+	6.048e-12	3.481e-12	-11.218	-11.458	-0.240	(0)
	CdCl3-	3.180e-12	1.830e-12	-11.498	-11.737	-0.240	(0)
	MnCl3-	2.998e-12	2.195e-12	-11.523	-11.659	-0.135	(0)
	ZnCl3-	2.894e-12	2.057e-12	-11.539	-11.687	-0.148	(0)
	NiCl+	7.875e-13	4.533e-13	-12.104	-12.344	-0.240	(0)
	HgCl+	4.301e-13	2.476e-13	-12.366	-12.606	-0.240	(0)
	PbCl3-	2.112e-13	1.215e-13	-12.675	-12.915	-0.240	(0)
	FeCl+2	5.431e-14	1.561e-14	-13.265	-13.806	-0.541	(0)
	CuCl3-	2.313e-14	1.644e-14	-13.636	-13.784	-0.148	(0)
	ZnCl4-2	2.250e-14	6.467e-15	-13.648	-14.189	-0.541	(0)
	CrCl+2	7.822e-15	8.584e-16	-14.107	-15.066	-0.960	(0)
	PbCl4-2	3.184e-15	3.494e-16	-14.497	-15.457	-0.960	(0)
VOC1+	9.383e-16	5.401e-16	-15.028	-15.268	-0.240	(0)	

FeCl2+	5.990e-16	4.386e-16	-15.223	-15.358	-0.135	(0)
UO2Cl+	1.853e-17	1.066e-17	-16.732	-16.972	-0.240	(0)
NiCl2	1.435e-17	1.435e-17	-16.843	-16.843	0.000	(0)
CrOHC12	1.808e-18	1.808e-18	-17.743	-17.743	0.000	(0)
CuCl4-2	1.802e-18	5.182e-19	-17.744	-18.286	-0.541	(0)
CrCl2+	8.899e-19	5.122e-19	-18.051	-18.291	-0.240	(0)
FeCl3	2.758e-19	2.758e-19	-18.559	-18.559	0.000	(0)
CrO3Cl-	1.779e-27	1.024e-27	-26.750	-26.990	-0.240	(0)
CoCl+2	4.543e-35	4.985e-36	-34.343	-35.302	-0.960	(0)
UCl+3	0.000e+00	0.000e+00	-42.657	-44.816	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.508	-50.468	-0.960	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.447	-65.407	-0.960	(0)
Co (2)	2.983e-09					
Co+2	1.458e-09	1.600e-10	-8.836	-9.796	-0.960	(0)
CoHCO3+	1.197e-09	6.887e-10	-8.922	-9.162	-0.240	(0)
CoSO4	2.792e-10	2.792e-10	-9.554	-9.554	0.000	(0)
CoF+	3.009e-11	1.732e-11	-10.522	-10.761	-0.240	(0)
CoCO3	1.235e-11	1.235e-11	-10.908	-10.908	0.000	(0)
CoCl+	6.048e-12	3.481e-12	-11.218	-11.458	-0.240	(0)
CoOH+	9.775e-14	5.626e-14	-13.010	-13.250	-0.240	(0)
CoNO2+	1.727e-14	9.941e-15	-13.763	-14.003	-0.240	(0)
Co (NH3) +2	1.047e-15	1.149e-16	-14.980	-15.940	-0.960	(0)
Co (OH) 2	7.875e-17	7.875e-17	-16.104	-16.104	0.000	(0)
CoNO3+	1.204e-17	6.932e-18	-16.919	-17.159	-0.240	(0)
CoSeO4	3.504e-18	3.504e-18	-17.455	-17.455	0.000	(0)
Co (NH3) 2+2	2.670e-22	2.930e-23	-21.574	-22.533	-0.960	(0)
Co2OH+3	6.510e-23	4.512e-25	-22.186	-24.346	-2.159	(0)
Co (OH) 3-	4.811e-23	2.769e-23	-22.318	-22.558	-0.240	(0)
CoOOH-	1.214e-23	6.985e-24	-22.916	-23.156	-0.240	(0)
Co (NO3) 2	3.855e-25	3.855e-25	-24.414	-24.414	0.000	(0)
Co (NH3) 3+2	2.008e-29	2.204e-30	-28.697	-29.657	-0.960	(0)
Co (OH) 4-2	7.047e-31	7.733e-32	-30.152	-31.112	-0.960	(0)
Co (NH3) 4+2	6.297e-37	6.910e-38	-36.201	-37.161	-0.960	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.861	-44.699	-3.839	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.205	-45.164	-0.960	(0)
Co (3)	3.179e-30					
CoOH+2	3.179e-30	3.489e-31	-29.498	-30.457	-0.960	(0)
Co+3	5.680e-35	3.896e-36	-34.246	-35.409	-1.164	(0)
CoCl+2	4.543e-35	4.985e-36	-34.343	-35.302	-0.960	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.508	-50.468	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.098	-60.338	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.447	-65.407	-0.960	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.799	-66.759	-0.960	(0)
Cr (2)	3.754e-26					
Cr+2	3.754e-26	4.120e-27	-25.425	-26.385	-0.960	(0)
Cr (3)	1.147e-09					
CrF+2	5.215e-10	5.722e-11	-9.283	-10.242	-0.960	(0)
Cr (OH) +2	3.705e-10	4.066e-11	-9.431	-10.391	-0.960	(0)
Cr (OH) 2+	1.515e-10	8.718e-11	-9.820	-10.060	-0.240	(0)
CrOHSO4	8.438e-11	8.438e-11	-10.074	-10.074	0.000	(0)
Cr+3	1.522e-11	1.055e-13	-10.818	-12.977	-2.159	(0)
CrSO4+	3.742e-12	2.154e-12	-11.427	-11.667	-0.240	(0)
Cr (OH) 3	5.772e-13	5.772e-13	-12.239	-12.239	0.000	(0)
CrCl+2	7.822e-15	8.584e-16	-14.107	-15.066	-0.960	(0)
CrO2-	8.425e-16	4.849e-16	-15.074	-15.314	-0.240	(0)
Cr (OH) 4-	7.035e-16	4.049e-16	-15.153	-15.393	-0.240	(0)
Cr2 (OH) 2SO4+2	2.826e-18	3.101e-19	-17.549	-18.508	-0.960	(0)
CrOHC12	1.808e-18	1.808e-18	-17.743	-17.743	0.000	(0)
CrCl2+	8.899e-19	5.122e-19	-18.051	-18.291	-0.240	(0)
Cr2 (OH) 2 (SO4) 2	1.611e-19	1.611e-19	-18.793	-18.793	0.000	(0)
CrNO3+2	1.148e-21	1.260e-22	-20.940	-21.900	-0.960	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.517	-41.477	-0.960	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.160	-49.319	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
Cr (6)	1.655e-19					
CrO4-2	8.106e-20	2.464e-20	-19.091	-19.608	-0.517	(0)
HCrO4-	7.872e-20	4.531e-20	-19.104	-19.344	-0.240	(0)

NaCrO4-	3.994e-21	2.299e-21	-20.399	-20.639	-0.240	(0)
KCrO4-	1.681e-21	9.673e-22	-20.775	-21.014	-0.240	(0)
CrO3SO4-2	6.284e-25	6.896e-26	-24.202	-25.161	-0.960	(0)
H2CrO4	2.087e-26	2.087e-26	-25.680	-25.680	0.000	(0)
CrO3Cl-	1.779e-27	1.024e-27	-26.750	-26.990	-0.240	(0)
Cr2O7-2	6.522e-37	7.157e-38	-36.186	-37.145	-0.960	(0)
Cu (1)	2.512e-08					
CuCl2-	1.511e-08	1.074e-08	-7.821	-7.969	-0.148	(0)
CuCl	8.173e-09	8.173e-09	-8.088	-8.088	0.000	(0)
Cu+	1.794e-09	1.032e-09	-8.746	-8.986	-0.240	(0)
CuCl3-2	5.022e-11	1.444e-11	-10.299	-10.841	-0.541	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Cu (2)	5.380e-04					
CuCO3	3.465e-04	3.465e-04	-3.460	-3.460	0.000	(0)
CuHCO3+	7.820e-05	4.501e-05	-4.107	-4.347	-0.240	(0)
Cu+2	4.241e-05	1.289e-05	-4.373	-4.890	-0.517	(0)
Cu (CO3) 2-2	3.880e-05	4.257e-06	-4.411	-5.371	-0.960	(0)
CuSO4	2.582e-05	2.582e-05	-4.588	-4.588	0.000	(0)
CuF+	4.837e-06	2.784e-06	-5.315	-5.555	-0.240	(0)
CuOH+	1.011e-06	7.183e-07	-5.995	-6.144	-0.148	(0)
CuCl+	1.808e-07	1.285e-07	-6.743	-6.891	-0.148	(0)
Cu2 (OH) 2+2	1.181e-07	1.296e-08	-6.928	-7.887	-0.960	(0)
CuNO2+	2.068e-08	1.190e-08	-7.685	-7.924	-0.240	(0)
CuNH3+2	7.182e-09	7.882e-10	-8.144	-9.103	-0.960	(0)
Cu (OH) 2	2.526e-09	2.526e-09	-8.598	-8.598	0.000	(0)
CuCl2	2.801e-10	2.801e-10	-9.553	-9.553	0.000	(0)
CuNO3+	1.936e-12	1.114e-12	-11.713	-11.953	-0.240	(0)
Cu (NO2) 2	1.074e-12	1.074e-12	-11.969	-11.969	0.000	(0)
Cu (OH) 3-	1.586e-13	9.129e-14	-12.800	-13.040	-0.240	(0)
CuCl3-	2.313e-14	1.644e-14	-13.636	-13.784	-0.148	(0)
CuCl4-2	1.802e-18	5.182e-19	-17.744	-18.286	-0.541	(0)
Cu (OH) 4-2	1.154e-19	1.266e-20	-18.938	-19.898	-0.960	(0)
Cu (NO3) 2	3.834e-21	3.834e-21	-20.416	-20.416	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.419	-215.658	-0.240	(0)
F	7.603e-03					
F-	4.610e-03	3.423e-03	-2.336	-2.466	-0.129	(0)
MgF+	1.582e-03	1.142e-03	-2.801	-2.942	-0.142	(0)
CaF+	5.364e-04	3.928e-04	-3.271	-3.406	-0.135	(0)
AlF4-	1.554e-04	1.122e-04	-3.809	-3.950	-0.142	(0)
AlF3	6.537e-05	6.537e-05	-4.185	-4.185	0.000	(0)
NaF	4.055e-05	4.055e-05	-4.392	-4.392	0.000	(0)
CuF+	4.837e-06	2.784e-06	-5.315	-5.555	-0.240	(0)
MnF+	3.354e-06	2.456e-06	-5.474	-5.610	-0.135	(0)
HF	2.877e-06	2.877e-06	-5.541	-5.541	0.000	(0)
AlF2+	2.050e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
ZnF+	3.104e-07	1.786e-07	-6.508	-6.748	-0.240	(0)
BF (OH) 3-	2.143e-07	1.439e-07	-6.669	-6.842	-0.173	(0)
FeF3	1.365e-07	1.365e-07	-6.865	-6.865	0.000	(0)
HF2-	5.360e-08	3.745e-08	-7.271	-7.427	-0.156	(0)
BF2 (OH) 2-	4.481e-08	3.008e-08	-7.349	-7.522	-0.173	(0)
FeF2+	3.861e-08	2.827e-08	-7.413	-7.549	-0.135	(0)
AlF+2	3.712e-09	1.113e-09	-8.430	-8.953	-0.523	(0)
PbF+	3.247e-09	1.869e-09	-8.489	-8.728	-0.240	(0)
CdF+	2.762e-09	1.590e-09	-8.559	-8.799	-0.240	(0)
FeF+2	1.073e-09	3.086e-10	-8.969	-9.511	-0.541	(0)
CrF+2	5.215e-10	5.722e-11	-9.283	-10.242	-0.960	(0)
PbF2	1.259e-10	1.259e-10	-9.900	-9.900	0.000	(0)
VO2F2-	9.346e-11	5.379e-11	-10.029	-10.269	-0.240	(0)
VO2F	4.328e-11	4.328e-11	-10.364	-10.364	0.000	(0)
BF3OH-	3.410e-11	2.289e-11	-10.467	-10.640	-0.173	(0)
CoF+	3.009e-11	1.732e-11	-10.522	-10.761	-0.240	(0)
H2F2	2.218e-11	2.218e-11	-10.654	-10.654	0.000	(0)
VO2F3-2	2.093e-11	2.297e-12	-10.679	-11.639	-0.960	(0)
CdF2	1.086e-11	1.086e-11	-10.964	-10.964	0.000	(0)
UO2F3-	7.287e-12	4.194e-12	-11.137	-11.377	-0.240	(0)
UO2F2	4.877e-12	4.877e-12	-11.312	-11.312	0.000	(0)
NiF+	4.209e-12	2.422e-12	-11.376	-11.616	-0.240	(0)

PbF3-	1.420e-12	8.173e-13	-11.848	-12.088	-0.240	(0)
VOF+	1.092e-12	6.285e-13	-11.962	-12.202	-0.240	(0)
UO2F4-2	1.039e-12	1.140e-13	-11.983	-12.943	-0.960	(0)
UO2F+	8.584e-13	4.940e-13	-12.066	-12.306	-0.240	(0)
VOF2	8.068e-13	8.068e-13	-12.093	-12.093	0.000	(0)
VO2F4-3	5.582e-13	3.869e-15	-12.253	-14.412	-2.159	(0)
BF4-	3.282e-13	2.203e-13	-12.484	-12.657	-0.173	(0)
VOF3-	1.703e-13	9.799e-14	-12.769	-13.009	-0.240	(0)
VOF4-2	1.234e-14	1.354e-15	-13.909	-14.868	-0.960	(0)
PbF4-2	1.220e-14	1.339e-15	-13.914	-14.873	-0.960	(0)
HgF+	4.350e-19	2.504e-19	-18.362	-18.601	-0.240	(0)
Sb(OH) 2F	1.864e-21	1.864e-21	-20.730	-20.730	0.000	(0)
SbOF	1.843e-21	1.843e-21	-20.734	-20.734	0.000	(0)
UF3+	1.345e-30	7.740e-31	-29.871	-30.111	-0.240	(0)
UF6-2	3.713e-31	4.074e-32	-30.430	-31.390	-0.960	(0)
UF4	2.905e-31	2.905e-31	-30.537	-30.537	0.000	(0)
UF5-	6.848e-32	3.941e-32	-31.164	-31.404	-0.240	(0)
UF2+2	1.300e-32	1.427e-33	-31.886	-32.846	-0.960	(0)
UF+3	4.777e-36	3.310e-38	-35.321	-37.480	-2.159	(0)
Fe (2)	1.764e-06					
Fe+2	1.319e-06	1.447e-07	-5.880	-6.839	-0.960	(0)
FeSO4	3.107e-07	3.107e-07	-6.508	-6.508	0.000	(0)
FeHCO3+	1.343e-07	1.008e-07	-6.872	-6.996	-0.124	(0)
FeOH+	1.386e-10	1.015e-10	-9.858	-9.993	-0.135	(0)
Fe (OH) 2	1.421e-15	1.421e-15	-14.847	-14.847	0.000	(0)
Fe (OH) 3-	1.081e-17	7.919e-18	-16.966	-17.101	-0.135	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.668	-155.668	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.280	-232.520	-0.240	(0)
Fe (3)	8.968e-06					
Fe (OH) 2+	8.667e-06	6.413e-06	-5.062	-5.193	-0.131	(0)
FeF3	1.365e-07	1.365e-07	-6.865	-6.865	0.000	(0)
Fe (OH) 3	1.214e-07	1.214e-07	-6.916	-6.916	0.000	(0)
FeF2+	3.861e-08	2.827e-08	-7.413	-7.549	-0.135	(0)
FeOH+2	3.254e-09	9.355e-10	-8.488	-9.029	-0.541	(0)
FeF+2	1.073e-09	3.086e-10	-8.969	-9.511	-0.541	(0)
Fe (OH) 4-	2.691e-10	1.992e-10	-9.570	-9.701	-0.131	(0)
FeSO4+	1.102e-11	8.068e-12	-10.958	-11.093	-0.135	(0)
Fe (SO4) 2-	2.621e-12	1.508e-12	-11.582	-11.821	-0.240	(0)
Fe+3	1.199e-12	8.222e-14	-11.921	-13.085	-1.164	(0)
Fe2 (OH) 2+4	1.998e-13	2.898e-17	-12.699	-16.538	-3.839	(0)
FeCl+2	5.431e-14	1.561e-14	-13.265	-13.806	-0.541	(0)
Fe3 (OH) 4+5	2.673e-15	2.686e-21	-14.573	-20.571	-5.998	(0)
FeHSeO3+2	8.675e-16	9.520e-17	-15.062	-16.021	-0.960	(0)
FeCl2+	5.990e-16	4.386e-16	-15.223	-15.358	-0.135	(0)
FeCl3	2.758e-19	2.758e-19	-18.559	-18.559	0.000	(0)
FeNO3+2	2.048e-19	2.247e-20	-18.689	-19.648	-0.960	(0)
H (0)	1.162e-29					
H2	5.809e-30	6.113e-30	-29.236	-29.214	0.022	(0)
Hg (0)	4.869e-10					
Hg	4.869e-10	4.869e-10	-9.313	-9.313	0.000	(0)
Hg (1)	1.189e-17					
Hg2+2	5.943e-18	6.521e-19	-17.226	-18.186	-0.960	(0)
Hg (2)	9.169e-09					
HgCl2	7.802e-09	7.802e-09	-8.108	-8.108	0.000	(0)
HgCl3-	8.525e-10	4.907e-10	-9.069	-9.309	-0.240	(0)
HgClOH	3.861e-10	3.861e-10	-9.413	-9.413	0.000	(0)
HgCl4-2	1.119e-10	1.228e-11	-9.951	-10.911	-0.960	(0)
HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
Hg (OH) 2	3.674e-12	3.866e-12	-11.435	-11.413	0.022	(0)
Hg (CO3) 2-2	1.418e-12	1.556e-13	-11.848	-12.808	-0.960	(0)
HgCl+	4.301e-13	2.476e-13	-12.366	-12.606	-0.240	(0)
HgHCO3+	1.982e-13	1.141e-13	-12.703	-12.943	-0.240	(0)
HgOH+	2.405e-15	1.384e-15	-14.619	-14.859	-0.240	(0)
Hg (NH3) 2+2	4.050e-16	4.444e-17	-15.393	-16.352	-0.960	(0)
HgNH3+2	6.778e-17	7.438e-18	-16.169	-17.129	-0.960	(0)
Hg+2	1.798e-17	1.973e-18	-16.745	-17.705	-0.960	(0)
HgSO4	4.517e-18	4.517e-18	-17.345	-17.345	0.000	(0)
HgF+	4.350e-19	2.504e-19	-18.362	-18.601	-0.240	(0)

		Hg (OH) 3-	1.490e-20	8.576e-21	-19.827	-20.067	-0.240	(0)
		Hg (NH3) 3+2	9.634e-24	1.057e-24	-23.016	-23.976	-0.960	(0)
		HgNO3+	3.460e-26	1.991e-26	-25.461	-25.701	-0.240	(0)
		Hg (NH3) 4+2	4.572e-31	5.017e-32	-30.340	-31.300	-0.960	(0)
		Hg (NO3) 2	2.262e-34	2.262e-34	-33.645	-33.645	0.000	(0)
		HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
		Hg (HS) 2	0.000e+00	0.000e+00	-137.161	-137.161	0.000	(0)
		HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.960	(0)
K	1.512e-02							
		K+	1.423e-02	1.057e-02	-1.847	-1.976	-0.129	(0)
		KSO4-	8.841e-04	6.542e-04	-3.053	-3.184	-0.131	(0)
		KCrO4-	1.681e-21	9.673e-22	-20.775	-21.014	-0.240	(0)
Mg	1.848e-02							
		Mg+2	9.783e-03	2.973e-03	-2.010	-2.527	-0.517	(0)
		MgSO4	4.732e-03	4.732e-03	-2.325	-2.325	0.000	(0)
		MgHCO3+	2.369e-03	1.684e-03	-2.625	-2.774	-0.148	(0)
		MgF+	1.582e-03	1.142e-03	-2.801	-2.942	-0.142	(0)
		MgCO3	1.129e-05	1.129e-05	-4.947	-4.947	0.000	(0)
		MgOH+	2.748e-08	2.086e-08	-7.561	-7.681	-0.120	(0)
		MgH2BO3+	1.653e-08	1.110e-08	-7.782	-7.955	-0.173	(0)
Mn (2)	2.230e-04							
		Mn+2	1.642e-04	1.802e-05	-3.785	-4.744	-0.960	(0)
		MnSO4	2.803e-05	2.803e-05	-4.552	-4.552	0.000	(0)
		MnHCO3+	2.717e-05	1.990e-05	-4.566	-4.701	-0.135	(0)
		MnF+	3.354e-06	2.456e-06	-5.474	-5.610	-0.135	(0)
		MnCl+	1.948e-07	1.427e-07	-6.710	-6.846	-0.135	(0)
		MnCl2	1.267e-09	1.267e-09	-8.897	-8.897	0.000	(0)
		MnOH+	1.089e-09	7.977e-10	-8.963	-9.098	-0.135	(0)
		MnCl3-	2.998e-12	2.195e-12	-11.523	-11.659	-0.135	(0)
		MnNO3+	1.356e-12	7.807e-13	-11.868	-12.108	-0.240	(0)
		MnSeO4	2.120e-13	2.120e-13	-12.674	-12.674	0.000	(0)
		Mn (NO3) 2	5.360e-20	5.360e-20	-19.271	-19.271	0.000	(0)
		Mn (OH) 3-	2.091e-21	1.531e-21	-20.680	-20.815	-0.135	(0)
		Mn (OH) 4-2	3.030e-28	8.710e-29	-27.519	-28.060	-0.541	(0)
		MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Mn (3)	7.178e-23							
		Mn+3	7.178e-23	4.923e-24	-22.144	-23.308	-1.164	(0)
Mn (6)	0.000e+00							
		MnO4-2	0.000e+00	0.000e+00	-45.525	-46.066	-0.541	(0)
Mn (7)	0.000e+00							
		MnO4-	0.000e+00	0.000e+00	-48.488	-48.652	-0.164	(0)
Mo	8.616e-06							
		MoO4-2	8.565e-06	2.603e-06	-5.067	-5.585	-0.517	(0)
		HMoO4-	5.114e-08	2.944e-08	-7.291	-7.531	-0.240	(0)
		H2MoO4	1.225e-10	1.225e-10	-9.912	-9.912	0.000	(0)
		AlMo6O21-3	4.913e-28	3.405e-30	-27.309	-29.468	-2.159	(0)
		Mo7O24-6	3.815e-28	8.801e-37	-27.419	-36.055	-8.637	(0)
		HMo7O24-5	1.213e-30	1.219e-36	-29.916	-35.914	-5.998	(0)
		H2Mo7O24-4	2.893e-34	4.195e-38	-33.539	-37.377	-3.839	(0)
		H3Mo7O24-3	6.061e-39	0.000e+00	-38.217	-40.377	-2.159	(0)
N (-3)	9.647e-06							
		NH4+	8.871e-06	5.955e-06	-5.052	-5.225	-0.173	(0)
		NH4SO4-	7.621e-07	5.581e-07	-6.118	-6.253	-0.135	(0)
		CuNH3+2	7.182e-09	7.882e-10	-8.144	-9.103	-0.960	(0)
		NH3	5.975e-09	5.975e-09	-8.224	-8.224	0.000	(0)
		CaNH3+2	7.206e-10	7.907e-11	-9.142	-10.102	-0.960	(0)
		BaNH3+2	2.595e-13	2.848e-14	-12.586	-13.545	-0.960	(0)
		Co (NH3) +2	1.047e-15	1.149e-16	-14.980	-15.940	-0.960	(0)
		NiNH3+2	8.238e-16	9.040e-17	-15.084	-16.044	-0.960	(0)
		Hg (NH3) 2+2	4.050e-16	4.444e-17	-15.393	-16.352	-0.960	(0)
		HgNH3+2	6.778e-17	7.438e-18	-16.169	-17.129	-0.960	(0)
		Ca (NH3) 2+2	1.714e-18	1.881e-19	-17.766	-18.726	-0.960	(0)
		Ni (NH3) 2+2	7.114e-22	7.807e-23	-21.148	-22.108	-0.960	(0)
		Co (NH3) 2+2	2.670e-22	2.930e-23	-21.574	-22.533	-0.960	(0)
		Hg (NH3) 3+2	9.634e-24	1.057e-24	-23.016	-23.976	-0.960	(0)
		Co (NH3) 3+2	2.008e-29	2.204e-30	-28.697	-29.657	-0.960	(0)
		Hg (NH3) 4+2	4.572e-31	5.017e-32	-30.340	-31.300	-0.960	(0)
		Co (NH3) 4+2	6.297e-37	6.910e-38	-36.201	-37.161	-0.960	(0)

Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.517	-41.477	-0.960	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.205	-45.164	-0.960	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.160	-49.319	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.459	-50.418	-0.960	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.508	-50.468	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.098	-60.338	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.447	-65.407	-0.960	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.799	-66.759	-0.960	(0)
N (3)	1.288e-05					
NO2-	1.286e-05	8.817e-06	-4.891	-5.055	-0.164	(0)
CuNO2+	2.068e-08	1.190e-08	-7.685	-7.924	-0.240	(0)
Cu (NO2) 2	1.074e-12	1.074e-12	-11.969	-11.969	0.000	(0)
CoNO2+	1.727e-14	9.941e-15	-13.763	-14.003	-0.240	(0)
N (5)	3.840e-08					
NO3-	3.681e-08	2.733e-08	-7.434	-7.563	-0.129	(0)
CaNO3+	1.579e-09	9.087e-10	-8.802	-9.042	-0.240	(0)
CuNO3+	1.936e-12	1.114e-12	-11.713	-11.953	-0.240	(0)
BaNO3+	1.798e-12	1.035e-12	-11.745	-11.985	-0.240	(0)
MnNO3+	1.356e-12	7.807e-13	-11.868	-12.108	-0.240	(0)
ZnNO3+	3.120e-13	1.796e-13	-12.506	-12.746	-0.240	(0)
PbNO3+	5.441e-15	3.132e-15	-14.264	-14.504	-0.240	(0)
CdNO3+	4.400e-15	2.533e-15	-14.357	-14.596	-0.240	(0)
CoNO3+	1.204e-17	6.932e-18	-16.919	-17.159	-0.240	(0)
NiNO3+	3.361e-18	1.934e-18	-17.474	-17.713	-0.240	(0)
FeNO3+2	2.048e-19	2.247e-20	-18.689	-19.648	-0.960	(0)
VO2NO3	9.966e-20	9.966e-20	-19.001	-19.001	0.000	(0)
Mn (NO3) 2	5.360e-20	5.360e-20	-19.271	-19.271	0.000	(0)
Cu (NO3) 2	3.834e-21	3.834e-21	-20.416	-20.416	0.000	(0)
CrNO3+2	1.148e-21	1.260e-22	-20.940	-21.900	-0.960	(0)
Zn (NO3) 2	9.794e-22	9.794e-22	-21.009	-21.009	0.000	(0)
Pb (NO3) 2	1.454e-22	1.454e-22	-21.837	-21.837	0.000	(0)
UO2NO3+	9.907e-23	5.702e-23	-22.004	-22.244	-0.240	(0)
Cd (NO3) 2	3.469e-23	3.469e-23	-22.460	-22.460	0.000	(0)
Co (NO3) 2	3.855e-25	3.855e-25	-24.414	-24.414	0.000	(0)
HgNO3+	3.460e-26	1.991e-26	-25.461	-25.701	-0.240	(0)
Hg (NO3) 2	2.262e-34	2.262e-34	-33.645	-33.645	0.000	(0)
Na	2.710e-02					
Na+	2.528e-02	1.877e-02	-1.597	-1.726	-0.129	(0)
NaSO4-	1.192e-03	8.817e-04	-2.924	-3.055	-0.131	(0)
NaHCO3	5.842e-04	5.842e-04	-3.233	-3.233	0.000	(0)
NaF	4.055e-05	4.055e-05	-4.392	-4.392	0.000	(0)
NaCO3-	2.157e-06	1.596e-06	-5.666	-5.797	-0.131	(0)
NaH2BO3	3.203e-09	3.203e-09	-8.495	-8.495	0.000	(0)
NaCrO4-	3.994e-21	2.299e-21	-20.399	-20.639	-0.240	(0)
Ni	4.857e-10					
NiHCO3+	3.339e-10	1.922e-10	-9.476	-9.716	-0.240	(0)
Ni+2	9.269e-11	2.817e-11	-10.033	-10.550	-0.517	(0)
NiSO4	4.916e-11	4.916e-11	-10.308	-10.308	0.000	(0)
NiCO3	4.798e-12	4.798e-12	-11.319	-11.319	0.000	(0)
NiF+	4.209e-12	2.422e-12	-11.376	-11.616	-0.240	(0)
NiCl+	7.875e-13	4.533e-13	-12.104	-12.344	-0.240	(0)
Ni (SO4) 2-2	1.297e-13	1.423e-14	-12.887	-13.847	-0.960	(0)
NiOH+	1.086e-14	6.250e-15	-13.964	-14.204	-0.240	(0)
NiNH3+2	8.238e-16	9.040e-17	-15.084	-16.044	-0.960	(0)
NiCl2	1.435e-17	1.435e-17	-16.843	-16.843	0.000	(0)
Ni (OH) 2	8.748e-18	8.748e-18	-17.058	-17.058	0.000	(0)
NiNO3+	3.361e-18	1.934e-18	-17.474	-17.713	-0.240	(0)
NiSeO4	5.758e-19	5.758e-19	-18.240	-18.240	0.000	(0)
Ni (NH3) 2+2	7.114e-22	7.807e-23	-21.148	-22.108	-0.960	(0)
Ni (OH) 3-	2.678e-22	1.542e-22	-21.572	-21.812	-0.240	(0)
O (0)	2.550e-34					
O2	1.275e-34	1.342e-34	-33.894	-33.872	0.022	(0)
Pb	7.541e-07					
PbHCO3+	5.534e-07	3.185e-07	-6.257	-6.497	-0.240	(0)
PbCO3	1.063e-07	1.063e-07	-6.973	-6.973	0.000	(0)
PbSO4	3.318e-08	3.318e-08	-7.479	-7.479	0.000	(0)
Pb+2	2.549e-08	7.746e-09	-7.594	-8.111	-0.517	(0)
Pb (SO4) 2-2	1.593e-08	1.748e-09	-7.798	-8.757	-0.960	(0)

Pb(CO3) 2-2	1.275e-08	1.400e-09	-7.894	-8.854	-0.960	(0)
PbF+	3.247e-09	1.869e-09	-8.489	-8.728	-0.240	(0)
PbCl+	3.003e-09	1.728e-09	-8.522	-8.762	-0.240	(0)
PbOH+	5.958e-10	3.429e-10	-9.225	-9.465	-0.240	(0)
PbF2	1.259e-10	1.259e-10	-9.900	-9.900	0.000	(0)
PbCl2	4.855e-11	4.855e-11	-10.314	-10.314	0.000	(0)
PbF3-	1.420e-12	8.173e-13	-11.848	-12.088	-0.240	(0)
PbCl3-	2.112e-13	1.215e-13	-12.675	-12.915	-0.240	(0)
Pb(OH) 2	1.911e-13	1.911e-13	-12.719	-12.719	0.000	(0)
PbF4-2	1.220e-14	1.339e-15	-13.914	-14.873	-0.960	(0)
Pb2OH+3	6.074e-15	4.210e-17	-14.217	-16.376	-2.159	(0)
PbNO3+	5.441e-15	3.132e-15	-14.264	-14.504	-0.240	(0)
PbCl4-2	3.184e-15	3.494e-16	-14.497	-15.457	-0.960	(0)
Pb(OH) 3-	5.850e-18	3.367e-18	-17.233	-17.473	-0.240	(0)
Pb(NO3) 2	1.454e-22	1.454e-22	-21.837	-21.837	0.000	(0)
Pb(OH) 4-2	1.324e-22	1.453e-23	-21.878	-22.838	-0.960	(0)
Pb3(OH) 4+2	5.142e-23	5.643e-24	-22.289	-23.248	-0.960	(0)
Pb4(OH) 4+4	2.395e-24	3.472e-28	-23.621	-27.459	-3.839	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.969	-228.209	-0.240	(0)
S(-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.115	-78.115	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.174	-78.414	-0.240	(0)
HS-	0.000e+00	0.000e+00	-78.649	-78.889	-0.240	(0)
S5-2	0.000e+00	0.000e+00	-81.049	-82.009	-0.960	(0)
S6-2	0.000e+00	0.000e+00	-81.565	-82.525	-0.960	(0)
S4-2	0.000e+00	0.000e+00	-81.645	-82.605	-0.960	(0)
S3-2	0.000e+00	0.000e+00	-82.451	-83.411	-0.960	(0)
S2-2	0.000e+00	0.000e+00	-83.467	-84.427	-0.960	(0)
S-2	0.000e+00	0.000e+00	-89.402	-89.944	-0.541	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.310	-0.240	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-137.161	-137.161	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.960	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.066	-150.306	-0.240	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.100	-150.100	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-150.410	-150.884	-0.474	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.541	-150.541	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-155.668	-155.668	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.419	-215.658	-0.240	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.910	-226.150	-0.240	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.849	-227.089	-0.240	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.969	-228.209	-0.240	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.925	-229.885	-0.960	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-232.280	-232.520	-0.240	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.822	-303.782	-0.960	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.540	-306.499	-0.960	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.115	-315.074	-0.960	(0)
S(6)	5.671e-02					
SO4-2	2.877e-02	8.745e-03	-1.541	-2.058	-0.517	(0)
CaSO4	2.106e-02	2.106e-02	-1.677	-1.677	0.000	(0)
MgSO4	4.732e-03	4.732e-03	-2.325	-2.325	0.000	(0)
NaSO4-	1.192e-03	8.817e-04	-2.924	-3.055	-0.131	(0)
KSO4-	8.841e-04	6.542e-04	-3.053	-3.184	-0.131	(0)
MnSO4	2.803e-05	2.803e-05	-4.552	-4.552	0.000	(0)
CuSO4	2.582e-05	2.582e-05	-4.588	-4.588	0.000	(0)
ZnSO4	5.004e-06	5.004e-06	-5.301	-5.301	0.000	(0)
Zn(SO4) 2-2	3.473e-06	3.811e-07	-5.459	-6.419	-0.960	(0)
NH4SO4-	7.621e-07	5.581e-07	-6.118	-6.253	-0.135	(0)
HSO4-	6.728e-07	4.857e-07	-6.172	-6.314	-0.142	(0)
FeSO4	3.107e-07	3.107e-07	-6.508	-6.508	0.000	(0)
Cd(SO4) 2-2	6.457e-08	7.086e-09	-7.190	-8.150	-0.960	(0)
CdSO4	6.007e-08	6.007e-08	-7.221	-7.221	0.000	(0)
PbSO4	3.318e-08	3.318e-08	-7.479	-7.479	0.000	(0)
Pb(SO4) 2-2	1.593e-08	1.748e-09	-7.798	-8.757	-0.960	(0)
CoSO4	2.792e-10	2.792e-10	-9.554	-9.554	0.000	(0)
CrOHSO4	8.438e-11	8.438e-11	-10.074	-10.074	0.000	(0)

NiSO4	4.916e-11	4.916e-11	-10.308	-10.308	0.000	(0)
FeSO4+	1.102e-11	8.068e-12	-10.958	-11.093	-0.135	(0)
CrSO4+	3.742e-12	2.154e-12	-11.427	-11.667	-0.240	(0)
AlSO4+	3.057e-12	2.207e-12	-11.515	-11.656	-0.142	(0)
Fe (SO4) 2-	2.621e-12	1.508e-12	-11.582	-11.821	-0.240	(0)
VO2SO4-	2.615e-12	1.505e-12	-11.582	-11.822	-0.240	(0)
Al (SO4) 2-	2.865e-13	2.068e-13	-12.543	-12.684	-0.142	(0)
Ni (SO4) 2-2	1.297e-13	1.423e-14	-12.887	-13.847	-0.960	(0)
VOSO4	7.373e-14	7.373e-14	-13.132	-13.132	0.000	(0)
UO2 (SO4) 2-2	1.454e-14	1.595e-15	-13.837	-14.797	-0.960	(0)
UO2SO4	1.384e-14	1.384e-14	-13.859	-13.859	0.000	(0)
HgSO4	4.517e-18	4.517e-18	-17.345	-17.345	0.000	(0)
Cr2 (OH) 2SO4+2	2.826e-18	3.101e-19	-17.549	-18.508	-0.960	(0)
Cr2 (OH) 2 (SO4) 2	1.611e-19	1.611e-19	-18.793	-18.793	0.000	(0)
CrO3SO4-2	6.284e-25	6.896e-26	-24.202	-25.161	-0.960	(0)
VSO4+	5.789e-27	3.332e-27	-26.237	-26.477	-0.240	(0)
U (SO4) 2	1.172e-38	1.172e-38	-37.931	-37.931	0.000	(0)
USO4+2	1.538e-39	1.687e-40	-38.813	-39.773	-0.960	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.098	-60.338	-0.240	(0)
Sb (3)	1.213e-18					
Sb (OH) 3	6.101e-19	6.101e-19	-18.215	-18.215	0.000	(0)
HSbO2	5.988e-19	5.988e-19	-18.223	-18.223	0.000	(0)
Sb (OH) 2F	1.864e-21	1.864e-21	-20.730	-20.730	0.000	(0)
SbOF	1.843e-21	1.843e-21	-20.734	-20.734	0.000	(0)
Sb (OH) 2+	1.471e-23	8.465e-24	-22.832	-23.072	-0.240	(0)
SbO+	5.098e-24	2.934e-24	-23.293	-23.532	-0.240	(0)
SbO2-	2.965e-24	1.706e-24	-23.528	-23.768	-0.240	(0)
Sb (OH) 4-	1.681e-24	9.673e-25	-23.775	-24.014	-0.240	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.115	-315.074	-0.960	(0)
Sb (5)	9.053e-08					
SbO3-	9.045e-08	5.206e-08	-7.044	-7.284	-0.240	(0)
Sb (OH) 6-	8.068e-11	5.991e-11	-10.093	-10.223	-0.129	(0)
SbO2+	8.424e-21	4.848e-21	-20.074	-20.314	-0.240	(0)
Se (-2)	3.609e-40					
HSe-	3.609e-40	2.077e-40	-39.443	-39.683	-0.240	(0)
H2Se	0.000e+00	0.000e+00	-42.038	-42.038	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.477	-48.437	-0.960	(0)
Se (4)	7.894e-07					
HSeO3-	7.613e-07	4.382e-07	-6.118	-6.358	-0.240	(0)
SeO3-2	2.797e-08	3.070e-09	-7.553	-8.513	-0.960	(0)
H2SeO3	1.062e-10	1.062e-10	-9.974	-9.974	0.000	(0)
FeHSeO3+2	8.675e-16	9.520e-17	-15.062	-16.021	-0.960	(0)
Cd (SeO3) 2-2	2.073e-18	2.275e-19	-17.683	-18.643	-0.960	(0)
Se (6)	1.440e-10					
SeO4-2	1.438e-10	4.370e-11	-9.842	-10.360	-0.517	(0)
MnSeO4	2.120e-13	2.120e-13	-12.674	-12.674	0.000	(0)
ZnSeO4	1.770e-14	1.770e-14	-13.752	-13.752	0.000	(0)
HSeO4-	2.163e-15	1.245e-15	-14.665	-14.905	-0.240	(0)
CdSeO4	2.384e-16	2.384e-16	-15.623	-15.623	0.000	(0)
CoSeO4	3.504e-18	3.504e-18	-17.455	-17.455	0.000	(0)
NiSeO4	5.758e-19	5.758e-19	-18.240	-18.240	0.000	(0)
Zn (SeO4) 2-2	7.147e-24	7.843e-25	-23.146	-24.106	-0.960	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.738	-59.897	-2.159	(0)
U (4)	1.063e-26					
U (OH) 5-	1.049e-26	6.036e-27	-25.979	-26.219	-0.240	(0)
U (OH) 4	1.444e-28	1.444e-28	-27.840	-27.840	0.000	(0)
UF3+	1.345e-30	7.740e-31	-29.871	-30.111	-0.240	(0)
U (OH) 3+	5.242e-31	3.017e-31	-30.280	-30.520	-0.240	(0)
UF6-2	3.713e-31	4.074e-32	-30.430	-31.390	-0.960	(0)
UF4	2.905e-31	2.905e-31	-30.537	-30.537	0.000	(0)
UF5-	6.848e-32	3.941e-32	-31.164	-31.404	-0.240	(0)
UF2+2	1.300e-32	1.427e-33	-31.886	-32.846	-0.960	(0)
U (OH) 2+2	7.265e-34	7.972e-35	-33.139	-34.098	-0.960	(0)
UF+3	4.777e-36	3.310e-38	-35.321	-37.480	-2.159	(0)
UOH+3	3.096e-37	2.145e-39	-36.509	-38.668	-2.159	(0)
U (SO4) 2	1.172e-38	1.172e-38	-37.931	-37.931	0.000	(0)

USO4+2	1.538e-39	1.687e-40	-38.813	-39.773	-0.960	(0)
U+4	0.000e+00	0.000e+00	-40.476	-44.315	-3.839	(0)
UCl+3	0.000e+00	0.000e+00	-42.657	-44.816	-2.159	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-169.963	-189.396	-19.433	(0)
U (5)	1.810e-19					
UO2+	1.810e-19	1.042e-19	-18.742	-18.982	-0.240	(0)
U (6)	2.746e-06					
UO2 (CO3) 3-4	2.731e-06	3.959e-10	-5.564	-9.402	-3.839	(0)
UO2 (CO3) 2-2	1.577e-08	1.731e-09	-7.802	-8.762	-0.960	(0)
UO2CO3	1.900e-11	1.900e-11	-10.721	-10.721	0.000	(0)
UO2F3-	7.287e-12	4.194e-12	-11.137	-11.377	-0.240	(0)
UO2F2	4.877e-12	4.877e-12	-11.312	-11.312	0.000	(0)
UO2F4-2	1.039e-12	1.140e-13	-11.983	-12.943	-0.960	(0)
UO2F+	8.584e-13	4.940e-13	-12.066	-12.306	-0.240	(0)
UO2 (SO4) 2-2	1.454e-14	1.595e-15	-13.837	-14.797	-0.960	(0)
UO2SO4	1.384e-14	1.384e-14	-13.859	-13.859	0.000	(0)
UO2OH+	4.030e-15	2.319e-15	-14.395	-14.635	-0.240	(0)
UO2+2	3.440e-15	1.045e-15	-14.463	-14.981	-0.517	(0)
UO2Cl+	1.853e-17	1.066e-17	-16.732	-16.972	-0.240	(0)
UO2NO3+	9.907e-23	5.702e-23	-22.004	-22.244	-0.240	(0)
(UO2) 2 (OH) 2+2	8.136e-23	8.928e-24	-22.090	-23.049	-0.960	(0)
(UO2) 3 (OH) 5+	8.475e-30	4.878e-30	-29.072	-29.312	-0.240	(0)
V (2)	6.531e-38					
V+2	5.891e-38	6.464e-39	-37.230	-38.190	-0.960	(0)
VOH+	6.404e-39	3.686e-39	-38.194	-38.433	-0.240	(0)
V (3)	3.563e-12					
V (OH) 3	3.563e-12	3.563e-12	-11.448	-11.448	0.000	(0)
V (OH) 2+	2.285e-21	1.315e-21	-20.641	-20.881	-0.240	(0)
VOH+2	6.496e-23	7.129e-24	-22.187	-23.147	-0.960	(0)
V+3	1.165e-25	8.072e-28	-24.934	-27.093	-2.159	(0)
VSO4+	5.789e-27	3.332e-27	-26.237	-26.477	-0.240	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-41.655	-45.494	-3.839	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-43.417	-45.576	-2.159	(0)
V (4)	2.621e-12					
VOF+	1.092e-12	6.285e-13	-11.962	-12.202	-0.240	(0)
VOF2	8.068e-13	8.068e-13	-12.093	-12.093	0.000	(0)
VO+2	2.790e-13	3.061e-14	-12.554	-13.514	-0.960	(0)
V (OH) 3+	1.860e-13	1.070e-13	-12.731	-12.970	-0.240	(0)
VOF3-	1.703e-13	9.799e-14	-12.769	-13.009	-0.240	(0)
VOSO4	7.373e-14	7.373e-14	-13.132	-13.132	0.000	(0)
VOF4-2	1.234e-14	1.354e-15	-13.909	-14.868	-0.960	(0)
VOC1+	9.383e-16	5.401e-16	-15.028	-15.268	-0.240	(0)
H2V2O4+2	5.291e-21	5.806e-22	-20.276	-21.236	-0.960	(0)
V (5)	2.132e-06					
H2VO4-	1.922e-06	1.106e-06	-5.716	-5.956	-0.240	(0)
H3V2O7-	7.847e-08	4.517e-08	-7.105	-7.345	-0.240	(0)
HVO4-2	4.457e-08	4.890e-09	-7.351	-8.311	-0.960	(0)
H3VO4	6.288e-09	6.288e-09	-8.201	-8.201	0.000	(0)
HV2O7-3	2.660e-10	1.844e-12	-9.575	-11.734	-2.159	(0)
V3O9-3	2.080e-10	1.442e-12	-9.682	-11.841	-2.159	(0)
VO2F2-	9.346e-11	5.379e-11	-10.029	-10.269	-0.240	(0)
VO2F	4.328e-11	4.328e-11	-10.364	-10.364	0.000	(0)
VO2F3-2	2.093e-11	2.297e-12	-10.679	-11.639	-0.960	(0)
VO2+	9.708e-12	7.208e-12	-11.013	-11.142	-0.129	(0)
V4O12-4	4.611e-12	6.686e-16	-11.336	-15.175	-3.839	(0)
VO2SO4-	2.615e-12	1.505e-12	-11.582	-11.822	-0.240	(0)
V2O7-4	6.021e-13	8.731e-17	-12.220	-16.059	-3.839	(0)
VO2F4-3	5.582e-13	3.869e-15	-12.253	-14.412	-2.159	(0)
VO4-3	6.223e-15	4.313e-17	-14.206	-16.365	-2.159	(0)
VO2NO3	9.966e-20	9.966e-20	-19.001	-19.001	0.000	(0)
V10O28-6	1.068e-27	2.464e-36	-26.971	-35.608	-8.637	(0)
HV10O28-5	2.142e-28	2.153e-34	-27.669	-33.667	-5.998	(0)
H2V10O28-4	1.361e-31	1.973e-35	-30.866	-34.705	-3.839	(0)
Zn	2.610e-05					
Zn+2	8.605e-06	2.615e-06	-5.065	-5.582	-0.517	(0)
ZnHCO3+	7.952e-06	4.577e-06	-5.100	-5.339	-0.240	(0)
ZnSO4	5.004e-06	5.004e-06	-5.301	-5.301	0.000	(0)
Zn (SO4) 2-2	3.473e-06	3.811e-07	-5.459	-6.419	-0.960	(0)

ZnCO3	6.870e-07	6.870e-07	-6.163	-6.163	0.000	(0)
ZnF+	3.104e-07	1.786e-07	-6.508	-6.748	-0.240	(0)
ZnCl+	5.812e-08	4.131e-08	-7.236	-7.384	-0.148	(0)
ZnOH+	8.008e-09	4.609e-09	-8.096	-8.336	-0.240	(0)
ZnOHCl	9.531e-10	9.531e-10	-9.021	-9.021	0.000	(0)
ZnCl2	4.118e-10	4.118e-10	-9.385	-9.385	0.000	(0)
Zn (OH) 2	1.287e-11	1.287e-11	-10.890	-10.890	0.000	(0)
ZnCl3-	2.894e-12	2.057e-12	-11.539	-11.687	-0.148	(0)
ZnNO3+	3.120e-13	1.796e-13	-12.506	-12.746	-0.240	(0)
ZnCl4-2	2.250e-14	6.467e-15	-13.648	-14.189	-0.541	(0)
ZnSeO4	1.770e-14	1.770e-14	-13.752	-13.752	0.000	(0)
Zn (OH) 3-	1.975e-15	1.137e-15	-14.704	-14.944	-0.240	(0)
Zn (OH) 4-2	7.268e-21	7.975e-22	-20.139	-21.098	-0.960	(0)
Zn (NO3) 2	9.794e-22	9.794e-22	-21.009	-21.009	0.000	(0)
Zn (SeO4) 2-2	7.147e-24	7.843e-25	-23.146	-24.106	-0.960	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.066	-150.306	-0.240	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.541	-150.541	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.910	-226.150	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.925	-229.885	-0.960	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.540	-306.499	-0.960	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-53.92	-47.64	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.42	-36.91	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.65	-36.91	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-69.91	-51.98	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-55.92	-35.89	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-30.46	-30.06	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-21.26	-20.81	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-5.56	5.24	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.10	-43.73	2.37	Al2 (MoO4) 3
Al2O3	-9.16	10.49	19.65	Al2O3
Al4 (OH) 10SO4	-16.28	6.42	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.09	-6.29	4.80	AlAsO4:2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-156.77	-91.15	65.62	AlSb
Alunite	-7.70	-9.10	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-2.38	-10.17	-7.79	PbSO4
Anhydrite	0.32	-4.04	-4.36	CaSO4
Anilite	-55.47	-87.35	-31.88	Cu0.25Cu1.5S
Antlerite	-0.54	8.24	8.79	Cu3 (OH) 4SO4
Aragonite	0.98	-7.32	-8.30	CaCO3
Arsenolite	-72.03	-74.79	-2.76	As4O6
Artinite	-7.52	2.08	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-29.78	-23.07	6.71	As2O5
Atacamite	-0.64	6.75	7.39	Cu2 (OH) 3Cl
Azurite	4.04	-12.86	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.05	7.35	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-10.94	4.93	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.94	-0.97	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-20.65	12.29	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-15.06	-24.73	-9.67	BaCrO4
BaF2	-4.23	-10.05	-5.82	BaF2
BaMoO4	-3.75	-10.71	-6.96	BaMoO4
Barite	2.80	-7.18	-9.98	BaSO4
BaS	-93.95	-77.77	16.18	BaS
BaSeO3	-7.06	-5.23	1.83	BaSeO3
BaSeO4	-8.02	-15.48	-7.46	BaSeO4
Bianchite	-5.89	-7.65	-1.76	ZnSO4:6H2O
Birnessite	-9.64	8.46	18.09	MnO2
Bixbyite	-8.51	-9.15	-0.64	Mn2O3
BlaubleiI	-54.68	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.49	-82.77	-27.28	Cu0.6Cu0.8S
Boehmite	-3.33	5.24	8.58	AlOOH
Breithauptite	-62.90	-81.43	-18.52	NiSb

Brochantite	0.62	15.84	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.88	9.96	16.84	Mg(OH) ₂
Bunsenite	-10.51	1.94	12.45	NiO
Ca(VO ₃) ₂	-4.95	0.71	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-6.28	11.22	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-10.33	11.22	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-13.85	8.45	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-17.23	21.73	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-18.13	21.73	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-304.23	-161.26	142.97	Ca ₃ Sb ₂
CaCrO ₄	-19.32	-21.59	-2.27	CaCrO ₄
Calcite	1.16	-7.32	-8.48	CaCO ₃
Calomel	-4.68	-22.59	-17.91	Hg ₂ Cl ₂
CaMoO ₄	0.39	-7.56	-7.95	CaMoO ₄
Carnotite	-3.35	-3.12	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.91	-2.10	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.32	-12.34	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.83	-2.99	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.69	4.95	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.78	4.95	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.94	-14.23	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.25	0.31	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-23.13	5.27	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-11.28	-11.94	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-10.25	-11.94	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-10.03	-11.94	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-11.25	-12.46	-1.21	CdF ₂
Cdmetal(alpha)	-34.62	-21.11	13.51	Cd
Cdmetal(gamma)	-34.72	-21.11	13.62	Cd
CdMoO ₄	1.03	-13.12	-14.15	CdMoO ₄
CdOHCl	-7.03	-3.49	3.54	CdOHCl
CdSb	-78.06	-78.41	-0.35	CdSb
CdSe	-20.77	-40.97	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.05	-17.90	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-9.42	-9.59	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-7.87	-9.59	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-7.72	-9.60	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-0.32	-13.45	-13.13	PbCO ₃
CH ₄ (g)	-81.03	-122.08	-41.05	CH ₄
Chalcanthite	-4.32	-6.96	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.70	-90.62	-34.92	Cu ₂ S
Chalcopyrite	-121.75	-157.02	-35.27	CuFeS ₂
Cinnabar	-50.85	-96.54	-45.69	HgS
Claudetite	-71.73	-74.79	-3.06	As ₄ O ₆
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co(BO ₂) ₂	-32.33	-5.26	27.07	Co(BO ₂) ₂
Co(OH) ₂	-10.40	2.69	13.09	Co(OH) ₂
Co(OH) ₃	-14.37	-16.68	-2.31	Co(OH) ₃
CO ₂ (g)	0.32	-17.83	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-28.03	-14.99	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-20.17	-30.66	-10.50	Co ₃ O ₄
CoCl ₂	-22.47	-14.20	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-16.75	-14.21	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-5.16	-15.14	-9.98	CoCO ₃
CoF ₂	-13.13	-14.73	-1.60	CoF ₂
CoF ₃	-41.35	-42.81	-1.46	CoF ₃
CoFe ₂ O ₄	17.52	13.99	-3.53	CoFe ₂ O ₄
CoMoO ₄	-7.62	-15.38	-7.76	CoMoO ₄
CoO	-10.89	2.69	13.59	CoO
CoS(alpha)	-75.00	-82.44	-7.44	CoS
CoS(beta)	-71.37	-82.44	-11.07	CoS
CoSe	-27.03	-43.23	-16.20	CoSe
CoSeO ₃	-11.23	-9.91	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-18.64	-20.17	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-14.66	-11.85	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-9.40	-11.87	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-7.73	-12.51	-4.78	PbCl ₂
Covellite	-55.23	-77.53	-22.30	CuS

Cr (OH) 2	-24.72	-13.90	10.82	Cr (OH) 2
Cr (OH) 3	-5.15	-3.82	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-3.07	-3.82	-0.75	Cr (OH) 3
Cr2O3	-5.27	-7.63	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-44.26	-29.15	15.11	CrCl3
CrF3	-18.61	-29.94	-11.34	CrF3
Crmetal	-70.44	-39.96	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	0.38	-33.46	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.60	8.67	Cu (OH) 2
Cu (SbO3) 2	-21.91	23.30	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.86	1.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.66	-91.55	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.38	-0.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.03	-104.62	-42.59	Cu3Sb
Cu3Se2	-26.25	-89.74	-63.49	Cu3Se2
CuCO3	1.27	-10.23	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-6.55	-11.45	-4.91	CuF
CuF2	-10.94	-9.82	1.12	CuF2
CuF2:2H2O	-5.28	-9.83	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.60	-10.47	-13.08	CuMoO4
CuOCuSO4	-9.65	0.65	10.30	CuOCuSO4
Cupricferrite	12.91	18.89	5.99	CuFe2O4
Cuprite	-4.08	-5.48	-1.41	Cu2O
Cuprousferrite	11.82	2.91	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-24.83	-58.19	-33.37	CuSe2
CuSeO3:2H2O	-5.52	-5.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.82	-15.26	-2.44	CuSeO4:5H2O
CuSO4	-9.89	-6.95	2.94	CuSO4
Diaspore	-1.63	5.24	6.87	AlOOH
Djurleite	-55.83	-89.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	1.35	-15.19	-16.54	CaMg (CO3) 2
Dolomite(ordered)	1.90	-15.19	-17.09	CaMg (CO3) 2
Epsomite	-2.48	-4.60	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.92	5.65	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.15	3.11	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-0.43	-4.15	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-2.86	-1.31	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-5.89	-26.51	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-28.61	-32.34	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-3.29	16.93	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.29	-5.89	0.40	FeAsO4:2H2O
FeCr2O4	-9.18	-1.98	7.20	FeCr2O4
FeMoO4	-2.33	-12.42	-10.09	FeMoO4
Ferrihydrite	2.45	5.64	3.19	Fe (OH) 3
Ferroselite	-41.54	-60.14	-18.60	FeSe2
FeS (ppt)	-76.53	-79.48	-2.95	FeS
FeSe	-29.28	-40.28	-11.00	FeSe
Fix_pe	-6.79	-6.79	0.00	e-
Fluorite	3.59	-6.91	-10.50	CaF2
Galena	-66.78	-80.75	-13.97	PbS
Gibbsite	-3.05	5.24	8.29	Al (OH) 3
Goethite	5.16	5.65	0.49	FeOOH
Goslarite	-5.65	-7.66	-2.01	ZnSO4:7H2O
Greenockite	-65.82	-80.18	-14.36	CdS
Greigite	-278.55	-323.58	-45.03	Fe3S4
Gummite	-10.16	-2.49	7.67	UO3
Gypsum	0.57	-4.04	-4.61	CaSO4:2H2O
H-Jarosite	-0.06	-12.16	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-5.20	-18.08	-12.88	H2MoO4
H2S (g)	-77.12	-85.13	-8.01	H2S
H2Se (g)	-40.97	-45.93	-4.96	H2Se

Halite	-5.53	-3.93	1.60	NaCl
Hausmannite	-11.74	49.29	61.03	Mn3O4
Hematite	12.71	11.30	-1.42	Fe2O3
Hercynite	-6.75	16.14	22.89	FeAl2O4
Hg (CH3) 2 (g)	-181.86	-255.57	-73.71	Hg (CH3) 2
Hg (g)	-8.01	-15.88	-7.87	Hg
Hg (OH) 2	-7.92	-11.41	-3.50	Hg (OH) 2
Hg2 (g)	-16.80	-31.76	-14.96	Hg2
Hg2 (OH) 2	-10.96	-5.70	5.26	Hg2 (OH) 2
Hg2CO3	-7.48	-23.53	-16.05	Hg2CO3
Hg2CrO4	-29.09	-37.79	-8.70	Hg2CrO4
Hg2F2	-12.75	-23.12	-10.36	Hg2F2
Hg2S	-79.15	-90.83	-11.68	Hg2S
Hg2SeO3	-13.64	-18.30	-4.66	Hg2SeO3
Hg2SO4	-14.11	-20.24	-6.13	Hg2SO4
Hg3O2CO3	-22.38	-52.06	-29.68	Hg3O2CO3
HgCl (g)	-30.79	-11.29	19.50	HgCl
HgCl2	-7.04	-28.30	-21.26	HgCl2
HgF (g)	-44.23	-11.56	32.68	HgF
HgF2 (g)	-41.40	-28.83	12.57	HgF2
Hgmetal (l)	-2.43	-15.88	-13.45	Hg
HgSe	-1.64	-57.34	-55.69	HgSe
HgSeO3	-11.58	-24.01	-12.43	HgSeO3
HgSO4	-16.54	-25.96	-9.42	HgSO4
Huntite	-0.95	-30.92	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-3.76	-22.53	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.75	-21.52	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.44	-19.61	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	6.91	-7.89	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-38.41	-55.66	-17.24	K2Cr2O7
K2CrO4	-23.05	-23.56	-0.51	K2CrO4
K2MoO4	-12.80	-9.54	3.26	K2MoO4
K2SeO4	-13.58	-14.31	-0.73	K2SeO4
Langite	-1.65	15.84	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.36	-5.79	-0.43	PbO : PbSO4
Laurionite	-4.69	-4.07	0.62	PbOHCl
Lepidocrocite	4.28	5.65	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.32	4.38	12.69	PbO
Mackinawite	-75.88	-79.48	-3.60	FeS
Maghemite	4.91	11.30	6.39	Fe2O3
Magnesioferrite	4.40	21.26	16.86	Fe2MgO4
Magnesite	-0.41	-7.87	-7.46	MgCO3
Magnetite	13.54	16.94	3.40	Fe3O4
Malachite	2.67	-2.63	-5.31	Cu2 (OH) 2CO3
Manganite	-4.57	20.77	25.34	MnOOH
Massicot	-8.52	4.38	12.89	PbO
Matlockite	-3.80	-12.78	-8.97	PbClF
Melanothallite	-15.55	-9.29	6.26	CuCl2
Melanterite	-6.71	-8.91	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.45	-96.54	-45.09	HgS
Mg (OH) 2 (active)	-8.83	9.96	18.79	Mg (OH) 2
Mg (VO3) 2	-11.11	0.17	11.28	Mg (VO3) 2
Mg2Sb3	-278.79	-204.11	74.68	Mg2Sb3
Mg2V2O7	-16.23	10.13	26.36	Mg2V2O7
MgCr2O4	-13.86	2.34	16.20	MgCr2O4
MgCrO4	-27.52	-22.14	5.38	MgCrO4
MgF2	0.67	-7.46	-8.13	MgF2
MgMoO4	-6.26	-8.11	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.71	-2.65	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.70	-12.90	-1.20	MgSeO4 : 6H2O
Minium	-34.33	39.19	73.52	Pb3O4
Mirabilite	-4.42	-5.53	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-6.95	-2.05	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-47.08	-52.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-155.02	-93.94	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.36	0.14	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.87	-9.16	2.72	MnCl2 : 4H2O

MnS (grn)	-77.56	-77.39	0.17	MnS
MnS (pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.06	-100.97	-2.91	MnSb
MnSe	-41.68	-38.18	3.50	MnSe
MnSeO3	-5.99	-4.86	1.13	MnSeO3
MnSeO3:2H2O	-5.84	-4.86	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.07	-15.12	-2.05	MnSeO4:5H2O
MnSO4	-9.39	-6.80	2.58	MnSO4
Monteponite	-10.15	4.96	15.10	CdO
Montroydite	-7.77	-11.41	-3.64	HgO
MoO3	-10.07	-18.07	-8.00	MoO3
Morenosite	-10.48	-12.63	-2.14	NiSO4:7H2O
MoS2	-144.14	-214.40	-70.26	MoS2
Na-Jarosite	3.56	-7.64	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-45.26	-55.16	-9.90	Na2Cr2O7
Na2CrO4	-25.99	-23.06	2.93	Na2CrO4
Na2Mo2O7	-10.51	-27.11	-16.60	Na2Mo2O7
Na2MoO4	-10.53	-9.04	1.49	Na2MoO4
Na2MoO4:2H2O	-10.27	-9.04	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.88	-3.58	10.30	Na2SeO3:5H2O
Na2SeO4	-15.09	-13.81	1.28	Na2SeO4
Na3Sb	-177.29	-82.84	94.45	Na3Sb
Na3VO4	-28.03	8.66	36.68	Na3VO4
Na4V2O7	-29.12	8.28	37.40	Na4V2O7
Nantokite	-4.46	-11.19	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-4.24	-0.38	3.86	NaVO3
Nesquehonite	-3.20	-7.87	-4.67	MgCO3:3H2O
Ni(OH)2	-10.86	1.94	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-32.97	-17.27	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-38.80	-6.80	32.00	Ni4(OH)6SO4
NiCO3	-9.02	-15.89	-6.87	NiCO3
NiMoO4	-4.99	-16.13	-11.14	NiMoO4
NiS(alpha)	-77.59	-83.19	-5.60	NiS
NiS(beta)	-72.09	-83.19	-11.10	NiS
NiS(gamma)	-70.39	-83.19	-12.80	NiS
NiSe	-26.29	-43.99	-17.70	NiSe
NiSeO3:2H2O	-13.48	-10.67	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.40	-20.92	-1.52	NiSeO4:6H2O
Nsutite	-9.05	8.46	17.50	MnO2
O2(g)	-30.97	52.12	83.09	O2
Orpiment	-231.73	-292.79	-61.07	As2S3
Otavite	-0.87	-12.87	-12.00	CdCO3
Pb(BO2)2	-10.09	-3.57	6.52	Pb(BO2)2
Pb(OH)2	-3.77	4.38	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-54.45	-63.21	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.49	0.31	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.44	8.75	26.19	Pb2O(OH)2
Pb2O3	-26.22	34.82	61.04	Pb2O3
Pb2OCO3	-8.52	-9.07	-0.56	Pb2OCO3
Pb2V2O7	0.86	-1.04	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.74	-9.94	5.80	Pb3(AsO4)2
Pb3(VO4)2	-2.80	3.34	6.14	Pb3(VO4)2
Pb3O2CO3	-15.72	-4.70	11.02	Pb3O2CO3
Pb3O2SO4	-12.10	-1.41	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.14	2.96	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.91	2.96	21.88	Pb4O3SO4
PbCrO4	-15.12	-27.72	-12.60	PbCrO4
PbF2	-5.60	-13.04	-7.44	PbF2
Pbmetal	-25.93	-21.68	4.25	Pb
PbMoO4	1.92	-13.70	-15.62	PbMoO4
PbO:0.3H2O	-8.60	4.38	12.98	PbO:0.33H2O
PbSeO4	-11.63	-18.47	-6.84	PbSeO4
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-6.16	-25.97	-19.81	PbCl2:PbCO3
Plattnerite	-19.16	30.44	49.60	PbO2
Portlandite	-12.30	10.51	22.80	Ca(OH)2

Pyrite	-120.05	-138.55	-18.51	FeS2
Pyrochroite	-7.45	7.74	15.19	Mn(OH)2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-97.11	-116.86	-19.75	AsS
Retgersite	-10.58	-12.62	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-5.82	-20.32	-14.50	UO2CO3
Sb(OH)3	-11.10	-18.21	-7.11	Sb(OH)3
Sb2O4	-13.76	-10.36	3.40	Sb2O4
Sb2O5	-23.25	-32.92	-9.67	Sb2O5
Sb2Se3	-106.44	-174.20	-67.76	Sb2Se3
Sb4O6(cubic)	-54.58	-72.84	-18.26	Sb4O6
Sb4O6(orth)	-54.94	-72.84	-17.90	Sb4O6
SbCl3	-44.12	-43.55	0.57	SbCl3
SbF3	-34.12	-44.34	-10.23	SbF3
Sbmetal	-45.61	-57.30	-11.69	Sb
SbO2	-1.67	-29.49	-27.82	SbO2
Schoepite	-8.49	-2.50	5.99	UO2(OH)2:H2O
Semetal(am)	-12.75	-19.86	-7.11	Se
Semetal(hex)	-12.16	-19.86	-7.71	Se
Senarmontite	-24.06	-36.42	-12.37	Sb2O3
SeO2	-12.73	-12.60	0.12	SeO2
SeO3	-43.89	-22.85	21.04	SeO3
Siderite	-1.94	-12.18	-10.24	FeCO3
Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-66.78	-78.23	-11.45	ZnS
Spinel	-16.40	20.45	36.85	MgAl2O4
Stibnite	-241.36	-291.82	-50.46	Sb2S3
Sulfur	-56.93	-59.07	-2.14	S
Tenorite	-0.05	7.60	7.64	CuO
Thenardite	-5.83	-5.51	0.32	Na2SO4
Thermonatrite	-9.43	-8.80	0.64	Na2CO3:H2O
Tyuyamunite	-8.35	-4.27	4.08	Ca(UO2)2(VO4)2
U3O8	-26.97	-5.89	21.08	U3O8
U3Sb4	-595.98	-443.59	152.38	U3Sb4
U4O9	-48.27	-51.29	-3.02	U4O9
UF4	-24.64	-54.18	-29.54	UF4
UF4:2.5H2O	-21.46	-54.18	-32.72	UF4:2.5H2O
UO2(am)	-20.27	-19.34	0.93	UO2
UO2(NO3)2	-42.25	-30.11	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.96	-30.11	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.50	-30.11	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.17	-30.12	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-8.11	-2.49	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.10	-25.35	-2.25	UO2SeO4:4H2O
UO3	-10.19	-2.49	7.70	UO3
Uraninite	-14.67	-19.34	-4.67	UO2
USb2	-224.86	-195.28	29.58	USb2
V(OH)3	-15.95	-8.36	7.59	V(OH)3
V2O5	-8.44	-9.80	-1.36	V2O5
V3O5	-30.97	-29.14	1.84	V3O5
V4O7	-37.35	-30.16	7.19	V4O7
V6O13	-20.65	-81.51	-60.86	V6O13
Valentinite	-27.94	-36.42	-8.48	Sb2O3
VCl2	-57.16	-38.28	18.87	VCl2
VCl3	-57.13	-33.70	23.43	VCl3
VF4	-50.79	-35.86	14.93	VF4
Vmetal	-91.48	-47.45	44.03	V
VO	-36.15	-21.39	14.76	VO
VO(OH)2	-6.18	-1.03	5.15	VO(OH)2
VO2Cl	-16.18	-13.34	2.84	VO2Cl
VOC1	-27.96	-16.81	11.15	VOC1
VOC12	-30.68	-17.92	12.76	VOC12
VOSO4	-19.18	-15.57	3.61	VOSO4
Witherite	-1.89	-10.46	-8.57	BaCO3
Wurtzite	-69.28	-78.23	-8.95	ZnS
Zincite	-4.43	6.91	11.33	ZnO
Zincosite	-11.57	-7.64	3.93	ZnSO4

Zn(BO2)2	-9.33	-1.04	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.04	-20.72	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.30	6.90	12.20	Zn(OH)2
Zn(OH)2(am)	-5.57	6.90	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.85	6.90	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.63	6.90	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.83	6.90	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.24	-0.74	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.83	5.36	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.01	-2.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.29	-8.38	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.33	13.07	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.87	17.63	38.50	Zn5(OH)8Cl2
ZnCl2	-17.04	-9.99	7.05	ZnCl2
ZnCO3:1H2O	-0.67	-10.93	-10.26	ZnCO3:1H2O
ZnF2	-9.98	-10.51	-0.53	ZnF2
Znmetal	-44.94	-19.16	25.79	Zn
ZnMoO4	-1.04	-11.17	-10.13	ZnMoO4
ZnO(active)	-4.28	6.91	11.19	ZnO
ZnS(am)	-69.17	-78.23	-9.05	ZnS
ZnSb	-87.47	-76.46	11.01	ZnSb
ZnSe	-24.62	-39.02	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.01	-7.64	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 122.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e-=e-

log_k 0

EQUILIBRIUM_PHASES 702

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

```

Mirabilite 0 0
MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 706
SAVE Solution 707 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 702
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 706. Solution after simulation 121.
Using pure phase assemblage 702.

```

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	7.245e-05	7.245e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	5.047e-08	5.047e-08
Barite	0.00	-9.98	-9.98	0.000e+00	3.003e-05	3.003e-05
Brochantite	0.00	15.22	15.22	0.000e+00	1.345e-04	1.345e-04
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00

CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.012e+01	1.173e-01
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	4.576e-02	4.576e-02
Carnotite	-0.00	0.23	0.23	0.000e+00	2.085e-06	2.085e-06
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	2.422e-07	2.422e-07
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.28	-2.63	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.074e-05	1.074e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	3.691e-03	3.691e-03
Gummite	-5.04	2.63	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.00	-4.61	-4.61	0.000e+00	9.190e-03	9.190e-03
HgSe	-1.23	-56.92	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.34	-3.21	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-30.65	-14.95	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.99	-15.86	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.46	-15.60	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.447e-05
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	7.528e-07	7.528e-07
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.37	2.63	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-11.10	9.99	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.98	2.63	5.61	0.000e+00	0	0.000e+00
UO3	-5.07	2.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.98	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.553e-06	5.566e-06
As	1.577e-09	1.580e-09
B	1.005e-04	1.007e-04
Ba	2.719e-08	2.726e-08
C	5.745e-04	5.758e-04
Ca	1.206e-02	1.209e-02
Cd	2.234e-08	2.239e-08
Cl	8.455e-03	8.475e-03
Co	2.977e-09	2.984e-09
Cr	1.145e-09	1.148e-09
Cu	4.981e-07	4.993e-07
F	2.258e-04	2.264e-04
Fe	1.103e-09	1.106e-09
Hg	9.639e-09	9.662e-09
K	1.502e-02	1.505e-02
Mg	1.844e-02	1.849e-02
Mn	2.226e-04	2.231e-04
Mo	7.608e-06	7.626e-06
N	2.253e-05	2.258e-05
Na	2.706e-02	2.712e-02
Ni	4.848e-10	4.860e-10
Pb	1.665e-09	1.669e-09
S	4.713e-02	4.724e-02
Sb	9.037e-08	9.058e-08
Se	7.882e-07	7.900e-07
U	6.616e-07	6.632e-07

V	4.781e-08	4.792e-08
Zn	2.605e-05	2.611e-05

-----Description of solution-----

	pH =	7.908	Charge balance
	pe =	4.864	Adjusted to redox
equilibrium	Activity of water	=	0.998
	Ionic strength (mol/kgw)	=	1.229e-01
	Mass of water (kg)	=	1.002e+00
	Total alkalinity (eq/kg)	=	6.150e-04
	Total CO2 (mol/kg)	=	5.745e-04
	Temperature (°C)	=	25.00
	Electrical balance (eq)	=	2.673e-06
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	22
	Total H	=	1.112755e+02
	Total O	=	5.582841e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.092e-06	8.140e-07	-5.962	-6.089	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.553e-06					
Al (OH) 4-	5.507e-06	4.199e-06	-5.259	-5.377	-0.118	(0)
Al (OH) 3	4.098e-08	4.098e-08	-7.387	-7.387	0.000	(0)
Al (OH) 2+	3.252e-09	2.523e-09	-8.488	-8.598	-0.110	(0)
AlF3	4.021e-10	4.021e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.468e-10	2.690e-10	-9.460	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.571e-11	5.692e-12	-10.804	-11.245	-0.441	(0)
AlOH+2	1.077e-11	3.903e-12	-10.968	-11.409	-0.441	(0)
AlSO4+	5.361e-13	4.088e-13	-12.271	-12.389	-0.118	(0)
Al (SO4) 2-	6.309e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.047e-14	4.794e-15	-13.297	-14.319	-1.022	(0)
AlMo6O21-3	2.487e-39	0.000e+00	-38.604	-40.214	-1.609	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.003e-24	6.645e-25	-23.999	-24.177	-0.179	(0)
HAsO3-2	2.548e-28	4.909e-29	-27.594	-28.309	-0.715	(0)
H4AsO3+	1.477e-31	9.786e-32	-30.831	-31.009	-0.179	(0)
AsO3-3	6.233e-33	1.532e-34	-32.205	-33.815	-1.609	(0)
As (5)	1.577e-09					
HAsO4-2	1.524e-09	2.935e-10	-8.817	-9.532	-0.715	(0)
H2AsO4-	4.989e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.058e-12	7.518e-14	-11.515	-13.124	-1.609	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.005e-04					
H3BO3	9.254e-05	9.519e-05	-4.034	-4.021	0.012	(0)
H2BO3-	6.164e-06	4.478e-06	-5.210	-5.349	-0.139	(0)
MgH2BO3+	8.095e-07	5.880e-07	-6.092	-6.231	-0.139	(0)
CaH2BO3+	7.958e-07	5.781e-07	-6.099	-6.238	-0.139	(0)
NaH2BO3	1.396e-07	1.396e-07	-6.855	-6.855	0.000	(0)
BF (OH) 3-	6.208e-09	4.509e-09	-8.207	-8.346	-0.139	(0)
H5 (BO3) 2-	4.994e-10	3.628e-10	-9.302	-9.440	-0.139	(0)
H8 (BO3) 3-	4.754e-12	3.453e-12	-11.323	-11.462	-0.139	(0)
BaH2BO3+	1.816e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
BF2 (OH) 2-	9.747e-13	7.080e-13	-12.011	-12.150	-0.139	(0)
BF3OH-	5.569e-19	4.045e-19	-18.254	-18.393	-0.139	(0)
BF4-	4.025e-24	2.923e-24	-23.395	-23.534	-0.139	(0)
Ba	2.719e-08					
Ba+2	2.714e-08	9.534e-09	-7.566	-8.021	-0.454	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)

BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.816e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
BaOH+	4.399e-14	3.387e-14	-13.357	-13.470	-0.113	(0)
BaNO3+	1.113e-15	7.374e-16	-14.954	-15.132	-0.179	(0)
BaNH3+2	2.678e-16	5.159e-17	-15.572	-16.287	-0.715	(0)
C (4)	5.745e-04					
HCO3-	5.010e-04	3.887e-04	-3.300	-3.410	-0.110	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
NaHCO3	4.300e-06	4.300e-06	-5.367	-5.367	0.000	(0)
CO3-2	4.202e-06	1.476e-06	-5.377	-5.831	-0.454	(0)
NaCO3-	6.969e-07	5.406e-07	-6.157	-6.267	-0.110	(0)
UO2 (CO3) 3-4	6.030e-07	8.304e-10	-6.220	-9.081	-2.861	(0)
ZnCO3	3.291e-07	3.291e-07	-6.483	-6.483	0.000	(0)
MnHCO3+	3.125e-07	2.406e-07	-6.505	-6.619	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
ZnHCO3+	7.190e-08	4.764e-08	-7.143	-7.322	-0.179	(0)
UO2 (CO3) 2-2	5.828e-08	1.123e-08	-7.235	-7.950	-0.715	(0)
Cu (CO3) 2-2	4.867e-09	9.376e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
PbCO3	3.983e-10	3.983e-10	-9.400	-9.400	0.000	(0)
UO2CO3	3.812e-10	3.812e-10	-9.419	-9.419	0.000	(0)
CdCO3	8.918e-11	8.918e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.913e-11	2.593e-11	-10.407	-10.586	-0.179	(0)
CoHCO3+	1.807e-11	1.197e-11	-10.743	-10.922	-0.179	(0)
CoCO3	9.880e-12	9.880e-12	-11.005	-11.005	0.000	(0)
Pb (CO3) 2-2	8.800e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
NiHCO3+	6.724e-12	4.455e-12	-11.172	-11.351	-0.179	(0)
NiCO3	5.119e-12	5.119e-12	-11.291	-11.291	0.000	(0)
CdHCO3+	3.541e-12	2.346e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.065e-13	9.758e-14	-12.295	-13.011	-0.715	(0)
HgCO3	9.773e-15	9.773e-15	-14.010	-14.010	0.000	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
Hg (CO3) 2-2	2.368e-16	4.561e-17	-15.626	-16.341	-0.715	(0)
HgHCO3+	3.391e-18	2.247e-18	-17.470	-17.648	-0.179	(0)
Ca	1.206e-02					
Ca+2	6.387e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	3.775e-06	2.907e-06	-5.423	-5.537	-0.113	(0)
CaH2BO3+	7.958e-07	5.781e-07	-6.099	-6.238	-0.139	(0)
CaOH+	4.648e-08	3.644e-08	-7.333	-7.438	-0.106	(0)
CaNO3+	1.653e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
CaNH3+2	1.258e-10	2.423e-11	-9.900	-10.616	-0.715	(0)
Ca (NH3) 2+2	4.294e-19	8.272e-20	-18.367	-19.082	-0.715	(0)
Cd	2.234e-08					
Cd+2	7.547e-09	2.651e-09	-8.122	-8.577	-0.454	(0)
CdSO4	6.826e-09	6.826e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.250e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CdCl+	2.487e-09	1.648e-09	-8.604	-8.783	-0.179	(0)
CdCO3	8.918e-11	8.918e-11	-10.050	-10.050	0.000	(0)
CdOHCl	5.502e-11	5.502e-11	-10.259	-10.259	0.000	(0)
CdCl2	4.471e-11	4.471e-11	-10.350	-10.350	0.000	(0)
CdOH+	2.587e-11	1.714e-11	-10.587	-10.766	-0.179	(0)
CdF+	7.530e-12	4.988e-12	-11.123	-11.302	-0.179	(0)
CdHCO3+	3.541e-12	2.346e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.065e-13	9.758e-14	-12.295	-13.011	-0.715	(0)
CdCl3-	2.772e-13	1.836e-13	-12.557	-12.736	-0.179	(0)
Cd (OH) 2	8.803e-14	8.803e-14	-13.055	-13.055	0.000	(0)
CdF2	1.182e-15	1.182e-15	-14.928	-14.928	0.000	(0)
CdNO3+	1.953e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
CdSeO4	1.705e-16	1.705e-16	-15.768	-15.768	0.000	(0)

	Cd(SeO3) 2-2	7.211e-17	1.389e-17	-16.142	-16.857	-0.715	(0)
	Cd2OH+3	9.263e-18	2.278e-19	-17.033	-18.643	-1.609	(0)
	Cd(OH) 3-	6.608e-18	4.378e-18	-17.180	-17.359	-0.179	(0)
	Cd(OH) 4-2	3.028e-24	5.833e-25	-23.519	-24.234	-0.715	(0)
	Cd(NO3) 2	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.099	-302.815	-0.715	(0)
C1		8.455e-03					
	Cl-	8.455e-03	6.509e-03	-2.073	-2.186	-0.114	(0)
	MnCl+	3.302e-07	2.542e-07	-6.481	-6.595	-0.113	(0)
	ZnCl+	8.399e-08	6.336e-08	-7.076	-7.198	-0.122	(0)
	ZnOHCl	6.752e-08	6.752e-08	-7.171	-7.171	0.000	(0)
	CuCl2-	2.685e-09	2.026e-09	-8.571	-8.693	-0.122	(0)
	CdCl+	2.487e-09	1.648e-09	-8.604	-8.783	-0.179	(0)
	MnCl2	2.338e-09	2.338e-09	-8.631	-8.631	0.000	(0)
	CuCl	1.490e-09	1.490e-09	-8.827	-8.827	0.000	(0)
	ZnCl2	6.536e-10	6.536e-10	-9.185	-9.185	0.000	(0)
	CuCl+	3.714e-10	2.802e-10	-9.430	-9.553	-0.122	(0)
	CdOHCl	5.502e-11	5.502e-11	-10.259	-10.259	0.000	(0)
	HgClOH	5.177e-11	5.177e-11	-10.286	-10.286	0.000	(0)
	CdCl2	4.471e-11	4.471e-11	-10.350	-10.350	0.000	(0)
	PbCl+	3.129e-11	2.073e-11	-10.505	-10.683	-0.179	(0)
	HgCl2	2.344e-11	2.344e-11	-10.630	-10.630	0.000	(0)
	CoCl+	1.346e-11	8.917e-12	-10.871	-11.050	-0.179	(0)
	CuCl3-2	8.016e-12	2.819e-12	-11.096	-11.550	-0.454	(0)
	MnCl3-	5.442e-12	4.191e-12	-11.264	-11.378	-0.113	(0)
	ZnCl3-	4.480e-12	3.379e-12	-11.349	-11.471	-0.122	(0)
	NiCl+	2.337e-12	1.548e-12	-11.631	-11.810	-0.179	(0)
	HgCl3-	2.303e-12	1.526e-12	-11.638	-11.817	-0.179	(0)
	CuCl2	6.323e-13	6.323e-13	-12.199	-12.199	0.000	(0)
	PbCl2	6.027e-13	6.027e-13	-12.220	-12.220	0.000	(0)
	CdCl3-	2.772e-13	1.836e-13	-12.557	-12.736	-0.179	(0)
	HgCl4-2	2.052e-13	3.953e-14	-12.688	-13.403	-0.715	(0)
	ZnCl4-2	3.128e-14	1.100e-14	-13.505	-13.959	-0.454	(0)
	PbCl3-	2.358e-15	1.562e-15	-14.628	-14.806	-0.179	(0)
	HgCl+	1.085e-15	7.185e-16	-14.965	-15.144	-0.179	(0)
	UO2Cl+	1.034e-15	6.849e-16	-14.986	-15.164	-0.179	(0)
	CuCl3-	5.091e-17	3.841e-17	-16.293	-16.416	-0.122	(0)
	NiCl2	5.074e-17	5.074e-17	-16.295	-16.295	0.000	(0)
	PbCl4-2	2.412e-17	4.647e-18	-16.618	-17.333	-0.715	(0)
	CrCl+2	1.474e-17	2.839e-18	-16.832	-17.547	-0.715	(0)
	CrOHCl2	2.859e-19	2.859e-19	-18.544	-18.544	0.000	(0)
	CuCl4-2	3.563e-21	1.253e-21	-20.448	-20.902	-0.454	(0)
	CrCl2+	2.647e-21	1.754e-21	-20.577	-20.756	-0.179	(0)
	FeCl+2	1.643e-21	5.777e-22	-20.784	-21.238	-0.454	(0)
	VOCl+	2.618e-22	1.735e-22	-21.582	-21.761	-0.179	(0)
	FeCl2+	2.181e-23	1.680e-23	-22.661	-22.775	-0.113	(0)
	CrO3Cl-	8.413e-26	5.574e-26	-25.075	-25.254	-0.179	(0)
	FeCl3	1.093e-26	1.093e-26	-25.961	-25.961	0.000	(0)
	CoCl+2	7.930e-37	1.528e-37	-36.101	-36.816	-0.715	(0)
	UCl+3	0.000e+00	0.000e+00	-44.210	-45.819	-1.609	(0)
	Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
	Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-51.242	-51.957	-0.715	(0)
	Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
Co(2)		2.977e-09					
	Co+2	2.056e-09	3.960e-10	-8.687	-9.402	-0.715	(0)
	CoSO4	8.678e-10	8.678e-10	-9.062	-9.062	0.000	(0)
	CoHCO3+	1.807e-11	1.197e-11	-10.743	-10.922	-0.179	(0)
	CoCl+	1.346e-11	8.917e-12	-10.871	-11.050	-0.179	(0)
	CoCO3	9.880e-12	9.880e-12	-11.005	-11.005	0.000	(0)
	CoOH+	9.708e-12	6.432e-12	-11.013	-11.192	-0.179	(0)
	CoF+	2.244e-12	1.487e-12	-11.649	-11.828	-0.179	(0)
	Co(OH) 2	4.158e-13	4.158e-13	-12.381	-12.381	0.000	(0)
	CoNO2+	6.890e-14	4.565e-14	-13.162	-13.341	-0.179	(0)
	Co(NH3) +2	2.120e-15	4.084e-16	-14.674	-15.389	-0.715	(0)
	CoSeO4	6.856e-17	6.856e-17	-16.164	-16.164	0.000	(0)

CoNO3+	1.462e-17	9.686e-18	-16.835	-17.014	-0.179	(0)
Co(OH) 3-	1.019e-17	6.754e-18	-16.992	-17.170	-0.179	(0)
CoOOH-	2.563e-18	1.698e-18	-17.591	-17.770	-0.179	(0)
Co2OH+3	5.192e-21	1.277e-22	-20.285	-21.894	-1.609	(0)
Co(NH3) 2+2	7.756e-22	1.494e-22	-21.110	-21.826	-0.715	(0)
Co(OH) 4-2	4.523e-24	8.713e-25	-23.345	-24.060	-0.715	(0)
Co(NO3) 2	3.041e-25	3.041e-25	-24.517	-24.517	0.000	(0)
Co(NH3) 3+2	8.374e-29	1.613e-29	-28.077	-28.792	-0.715	(0)
Co4(OH) 4+4	2.479e-34	3.414e-37	-33.606	-36.467	-2.861	(0)
Co(NH3) 4+2	3.769e-36	7.262e-37	-35.424	-36.139	-0.715	(0)
Co(NH3) 5+2	0.000e+00	0.000e+00	-43.270	-43.986	-0.715	(0)
Co(3)	2.477e-30					
CoOH+2	2.477e-30	4.771e-31	-29.606	-30.321	-0.715	(0)
Co+3	1.214e-36	1.154e-37	-35.916	-36.938	-1.022	(0)
CoCl+2	7.930e-37	1.528e-37	-36.101	-36.816	-0.715	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Co(NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
Cr(2)	5.713e-27					
Cr+2	5.713e-27	1.100e-27	-26.243	-26.958	-0.715	(0)
Cr(3)	1.145e-09					
Cr(OH) 2+	8.973e-10	5.945e-10	-9.047	-9.226	-0.179	(0)
Cr(OH) 3	1.818e-10	1.818e-10	-9.740	-9.740	0.000	(0)
Cr(OH) +2	3.116e-11	6.002e-12	-10.506	-11.222	-0.715	(0)
CrOHSO4	1.564e-11	1.564e-11	-10.806	-10.806	0.000	(0)
CrO2-	1.057e-11	7.005e-12	-10.976	-11.155	-0.179	(0)
Cr(OH) 4-	8.891e-12	5.890e-12	-11.051	-11.230	-0.179	(0)
CrF+2	3.292e-14	6.342e-15	-13.483	-14.198	-0.715	(0)
Cr+3	1.371e-14	3.371e-16	-13.863	-15.472	-1.609	(0)
CrSO4+	1.305e-14	8.644e-15	-13.884	-14.063	-0.179	(0)
CrCl+2	1.474e-17	2.839e-18	-16.832	-17.547	-0.715	(0)
CrOHC12	2.859e-19	2.859e-19	-18.544	-18.544	0.000	(0)
Cr2(OH) 2SO4+2	4.406e-20	8.487e-21	-19.356	-20.071	-0.715	(0)
Cr2(OH) 2(SO4) 2	5.537e-21	5.537e-21	-20.257	-20.257	0.000	(0)
CrCl2+	2.647e-21	1.754e-21	-20.577	-20.756	-0.179	(0)
CrNO3+2	1.180e-24	2.274e-25	-23.928	-24.643	-0.715	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.807	-41.523	-0.715	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-49.263	-50.872	-1.609	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-51.242	-51.957	-0.715	(0)
Cr(6)	8.581e-15					
CrO4-2	7.842e-15	2.755e-15	-14.106	-14.560	-0.454	(0)
NaCrO4-	4.065e-16	2.693e-16	-15.391	-15.570	-0.179	(0)
HCrO4-	1.661e-16	1.101e-16	-15.780	-15.958	-0.179	(0)
KCrO4-	1.658e-16	1.098e-16	-15.780	-15.959	-0.179	(0)
CrO3SO4-2	2.364e-23	4.555e-24	-22.626	-23.342	-0.715	(0)
H2CrO4	1.102e-24	1.102e-24	-23.958	-23.958	0.000	(0)
CrO3Cl-	8.413e-26	5.574e-26	-25.075	-25.254	-0.179	(0)
Cr2O7-2	2.185e-30	4.209e-31	-29.661	-30.376	-0.715	(0)
Cu(1)	4.457e-09					
CuCl2-	2.685e-09	2.026e-09	-8.571	-8.693	-0.122	(0)
CuCl	1.490e-09	1.490e-09	-8.827	-8.827	0.000	(0)
Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	8.016e-12	2.819e-12	-11.096	-11.550	-0.454	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu(2)	4.936e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.267e-08	6.991e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.731e-08	2.716e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu(OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu(CO3) 2-2	4.867e-09	9.376e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
Cu2(OH) 2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.714e-10	2.802e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.034e-10	-9.513	-9.692	-0.179	(0)
CuNO2+	7.021e-11	4.652e-11	-10.154	-10.332	-0.179	(0)

	Cu (OH) 3-	2.861e-11	1.896e-11	-10.543	-10.722	-0.179	(0)
	CuNH3+2	1.237e-11	2.384e-12	-10.908	-11.623	-0.715	(0)
	CuCl2	6.323e-13	6.323e-13	-12.199	-12.199	0.000	(0)
	Cu (NO2) 2	7.786e-15	7.786e-15	-14.109	-14.109	0.000	(0)
	CuNO3+	2.000e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
	Cu (OH) 4-2	6.304e-16	1.214e-16	-15.200	-15.916	-0.715	(0)
	CuCl3-	5.091e-17	3.841e-17	-16.293	-16.416	-0.122	(0)
	CuCl4-2	3.563e-21	1.253e-21	-20.448	-20.902	-0.454	(0)
	Cu (NO3) 2	2.575e-24	2.575e-24	-23.589	-23.589	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F		2.258e-04					
	F-	1.542e-04	1.187e-04	-3.812	-3.925	-0.114	(0)
	MgF+	6.617e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
	CaF+	3.775e-06	2.907e-06	-5.423	-5.537	-0.113	(0)
	NaF	1.474e-06	1.474e-06	-5.832	-5.832	0.000	(0)
	MnF+	1.904e-07	1.467e-07	-6.720	-6.834	-0.113	(0)
	ZnF+	1.386e-08	9.180e-09	-7.858	-8.037	-0.179	(0)
	BF (OH) 3-	6.208e-09	4.509e-09	-8.207	-8.346	-0.139	(0)
	HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
	AlF3	4.021e-10	4.021e-10	-9.396	-9.396	0.000	(0)
	AlF2+	3.468e-10	2.690e-10	-9.460	-9.570	-0.110	(0)
	CuF+	3.071e-10	2.034e-10	-9.513	-9.692	-0.179	(0)
	AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.571e-11	5.692e-12	-10.804	-11.245	-0.441	(0)
	CdF+	7.530e-12	4.988e-12	-11.123	-11.302	-0.179	(0)
	CoF+	2.244e-12	1.487e-12	-11.649	-11.828	-0.179	(0)
	UO2F+	1.605e-12	1.063e-12	-11.795	-11.973	-0.179	(0)
	HF2-	1.312e-12	9.786e-13	-11.882	-12.009	-0.127	(0)
	PbF+	1.134e-12	7.510e-13	-11.946	-12.124	-0.179	(0)
	BF2 (OH) 2-	9.747e-13	7.080e-13	-12.011	-12.150	-0.139	(0)
	NiF+	4.185e-13	2.772e-13	-12.378	-12.557	-0.179	(0)
	UO2F2	3.641e-13	3.641e-13	-12.439	-12.439	0.000	(0)
	CrF+2	3.292e-14	6.342e-15	-13.483	-14.198	-0.715	(0)
	UO2F3-	1.639e-14	1.086e-14	-13.785	-13.964	-0.179	(0)
	PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
	CdF2	1.182e-15	1.182e-15	-14.928	-14.928	0.000	(0)
	UO2F4-2	5.315e-17	1.024e-17	-16.275	-16.990	-0.715	(0)
	H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
	VO2F	1.185e-17	1.185e-17	-16.926	-16.926	0.000	(0)
	FeF2+	1.578e-18	1.215e-18	-17.802	-17.915	-0.113	(0)
	FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
	VO2F2-	7.708e-19	5.107e-19	-18.113	-18.292	-0.179	(0)
	PbF3-	5.964e-19	3.951e-19	-18.224	-18.403	-0.179	(0)
	BF3OH-	5.569e-19	4.045e-19	-18.254	-18.393	-0.139	(0)
	FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
	VOF+	1.021e-20	6.765e-21	-19.991	-20.170	-0.179	(0)
	VO2F3-2	3.926e-21	7.563e-22	-20.406	-21.121	-0.715	(0)
	VOF2	3.011e-22	3.011e-22	-21.521	-21.521	0.000	(0)
	PbF4-2	1.165e-22	2.245e-23	-21.934	-22.649	-0.715	(0)
	HgF+	3.675e-23	2.435e-23	-22.435	-22.614	-0.179	(0)
	BF4-	4.025e-24	2.923e-24	-23.395	-23.534	-0.139	(0)
	VOF3-	1.915e-24	1.269e-24	-23.718	-23.897	-0.179	(0)
	VO2F4-3	1.797e-24	4.418e-26	-23.745	-25.355	-1.609	(0)
	Sb (OH) 2F	1.152e-25	1.152e-25	-24.939	-24.939	0.000	(0)
	SbOF	1.135e-25	1.135e-25	-24.945	-24.945	0.000	(0)
	VOF4-2	3.156e-27	6.079e-28	-26.501	-27.216	-0.715	(0)
	UF3+	4.675e-36	3.097e-36	-35.330	-35.509	-0.179	(0)
	UF2+2	8.544e-37	1.646e-37	-36.068	-36.784	-0.715	(0)
	UF4	4.032e-38	4.032e-38	-37.395	-37.395	0.000	(0)
	UF+3	4.479e-39	1.101e-40	-38.349	-39.958	-1.609	(0)
	UF5-	2.863e-40	1.897e-40	-39.543	-39.722	-0.179	(0)
	UF6-2	0.000e+00	0.000e+00	-40.452	-41.167	-0.715	(0)
Fe (2)		3.431e-12					
	Fe+2	2.244e-12	4.324e-13	-11.649	-12.364	-0.715	(0)
	FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
	FeOH+	1.819e-14	1.401e-14	-13.740	-13.854	-0.113	(0)
	FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
	Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)

Fe (OH) 3-	3.028e-18	2.332e-18	-17.519	-17.632	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.304e-10	4.891e-10	-9.200	-9.311	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.177e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
FeOH+2	4.392e-15	1.544e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.578e-18	1.215e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
Fe+3	3.094e-20	2.939e-21	-19.510	-20.532	-1.022	(0)
FeCl+2	1.643e-21	5.777e-22	-20.784	-21.238	-0.454	(0)
FeCl2+	2.181e-23	1.680e-23	-22.661	-22.775	-0.113	(0)
FeHSeO3+2	9.968e-24	1.920e-24	-23.001	-23.717	-0.715	(0)
Fe2 (OH) 2+4	5.735e-26	7.899e-29	-25.241	-28.102	-2.861	(0)
FeCl3	1.093e-26	1.093e-26	-25.961	-25.961	0.000	(0)
FeNO3+2	2.354e-27	4.535e-28	-26.628	-27.343	-0.715	(0)
Fe3 (OH) 4+5	1.649e-32	5.584e-37	-31.783	-36.253	-4.470	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.539e-09					
Hg	9.539e-09	9.539e-09	-8.020	-8.020	0.000	(0)
Hg (1)	3.720e-19					
Hg2+2	1.860e-19	3.583e-20	-18.730	-19.446	-0.715	(0)
Hg (2)	1.002e-10					
HgClOH	5.177e-11	5.177e-11	-10.286	-10.286	0.000	(0)
HgCl2	2.344e-11	2.344e-11	-10.630	-10.630	0.000	(0)
Hg (OH) 2	2.248e-11	2.313e-11	-10.648	-10.636	0.012	(0)
HgCl3-	2.303e-12	1.526e-12	-11.638	-11.817	-0.179	(0)
HgCl4-2	2.052e-13	3.953e-14	-12.688	-13.403	-0.715	(0)
HgCO3	9.773e-15	9.773e-15	-14.010	-14.010	0.000	(0)
HgCl+	1.085e-15	7.185e-16	-14.965	-15.144	-0.179	(0)
HgOH+	2.706e-16	1.793e-16	-15.568	-15.746	-0.179	(0)
Hg (CO3) 2-2	2.368e-16	4.561e-17	-15.626	-16.341	-0.715	(0)
Hg (OH) 3-	3.578e-18	2.370e-18	-17.446	-17.625	-0.179	(0)
HgHCO3+	3.391e-18	2.247e-18	-17.470	-17.648	-0.179	(0)
Hg (NH3) 2+2	1.333e-18	2.568e-19	-17.875	-18.590	-0.715	(0)
HgNH3+2	1.554e-19	2.994e-20	-18.808	-19.524	-0.715	(0)
Hg+2	2.872e-20	5.533e-21	-19.542	-20.257	-0.715	(0)
HgSO4	1.591e-20	1.591e-20	-19.798	-19.798	0.000	(0)
HgF+	3.675e-23	2.435e-23	-22.435	-22.614	-0.179	(0)
Hg (NH3) 3+2	4.552e-26	8.769e-27	-25.342	-26.057	-0.715	(0)
HgNO3+	4.759e-29	3.153e-29	-28.323	-28.501	-0.179	(0)
Hg (NH3) 4+2	3.101e-33	5.974e-34	-32.508	-33.224	-0.715	(0)
Hg (NO3) 2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.278	-137.993	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
K	1.502e-02					
K+	1.394e-02	1.073e-02	-1.856	-1.969	-0.114	(0)
KSO4-	1.076e-03	8.344e-04	-2.968	-3.079	-0.110	(0)
KCrO4-	1.658e-16	1.098e-16	-15.780	-15.959	-0.179	(0)
Mg	1.844e-02					
Mg+2	1.078e-02	3.787e-03	-1.967	-2.422	-0.454	(0)
MgSO4	7.570e-03	7.570e-03	-2.121	-2.121	0.000	(0)
MgF+	6.617e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
MgCO3	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
MgOH+	1.553e-06	1.227e-06	-5.809	-5.911	-0.102	(0)
MgH2BO3+	8.095e-07	5.880e-07	-6.092	-6.231	-0.139	(0)
Mn (2)	2.226e-04					
Mn+2	1.611e-04	3.103e-05	-3.793	-4.508	-0.715	(0)
MnSO4	6.060e-05	6.060e-05	-4.218	-4.218	0.000	(0)
MnCl+	3.302e-07	2.542e-07	-6.481	-6.595	-0.113	(0)
MnHCO3+	3.125e-07	2.406e-07	-6.505	-6.619	-0.113	(0)

MnF+	1.904e-07	1.467e-07	-6.720	-6.834	-0.113	(0)
MnOH+	8.238e-08	6.344e-08	-7.084	-7.198	-0.113	(0)
MnCl2	2.338e-09	2.338e-09	-8.631	-8.631	0.000	(0)
MnCl3-	5.442e-12	4.191e-12	-11.264	-11.378	-0.113	(0)
MnSeO4	2.885e-12	2.885e-12	-11.540	-11.540	0.000	(0)
MnNO3+	1.145e-12	7.589e-13	-11.941	-12.120	-0.179	(0)
Mn (OH) 3-	3.373e-16	2.598e-16	-15.472	-15.585	-0.113	(0)
Mn (NO3) 2	2.942e-20	2.942e-20	-19.531	-19.531	0.000	(0)
Mn (OH) 4-2	1.941e-21	6.826e-22	-20.712	-21.166	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
Mn (3)	1.067e-24					
Mn+3	1.067e-24	1.014e-25	-23.972	-24.994	-1.022	(0)
Mn (6)	1.759e-40					
MnO4-2	1.759e-40	0.000e+00	-39.755	-40.209	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.584	-44.716	-0.133	(0)
Mo	7.608e-06					
MoO4-2	7.607e-06	2.672e-06	-5.119	-5.573	-0.454	(0)
HMoO4-	9.909e-10	6.565e-10	-9.004	-9.183	-0.179	(0)
H2MoO4	5.937e-14	5.937e-14	-13.226	-13.226	0.000	(0)
AlMo6O21-3	2.487e-39	0.000e+00	-38.604	-40.214	-1.609	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.849	-49.286	-6.437	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.337	-50.808	-4.470	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.073	-53.934	-2.861	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.987	-58.596	-1.609	(0)
N (-3)	2.928e-07					
NH4+	2.557e-07	1.857e-07	-6.592	-6.731	-0.139	(0)
NH4SO4-	2.838e-08	2.186e-08	-7.547	-7.660	-0.113	(0)
NH3	8.577e-09	8.577e-09	-8.067	-8.067	0.000	(0)
CaNH3+2	1.258e-10	2.423e-11	-9.900	-10.616	-0.715	(0)
CuNH3+2	1.237e-11	2.384e-12	-10.908	-11.623	-0.715	(0)
NiNH3+2	2.223e-15	4.282e-16	-14.653	-15.368	-0.715	(0)
Co (NH3) +2	2.120e-15	4.084e-16	-14.674	-15.389	-0.715	(0)
BaNH3+2	2.678e-16	5.159e-17	-15.572	-16.287	-0.715	(0)
Hg (NH3) 2+2	1.333e-18	2.568e-19	-17.875	-18.590	-0.715	(0)
Ca (NH3) 2+2	4.294e-19	8.272e-20	-18.367	-19.082	-0.715	(0)
HgNH3+2	1.554e-19	2.994e-20	-18.808	-19.524	-0.715	(0)
Ni (NH3) 2+2	2.756e-21	5.308e-22	-20.560	-21.275	-0.715	(0)
Co (NH3) 2+2	7.756e-22	1.494e-22	-21.110	-21.826	-0.715	(0)
Hg (NH3) 3+2	4.552e-26	8.769e-27	-25.342	-26.057	-0.715	(0)
Co (NH3) 3+2	8.374e-29	1.613e-29	-28.077	-28.792	-0.715	(0)
Hg (NH3) 4+2	3.101e-33	5.974e-34	-32.508	-33.224	-0.715	(0)
Co (NH3) 4+2	3.769e-36	7.262e-37	-35.424	-36.139	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.807	-41.523	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.270	-43.986	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.263	-50.872	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.242	-51.957	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.978	-0.715	(0)
N (3)	2.221e-05					
NO2-	2.221e-05	1.636e-05	-4.653	-4.786	-0.133	(0)
CuNO2+	7.021e-11	4.652e-11	-10.154	-10.332	-0.179	(0)
CoNO2+	6.890e-14	4.565e-14	-13.162	-13.341	-0.179	(0)
Cu (NO2) 2	7.786e-15	7.786e-15	-14.109	-14.109	0.000	(0)
N (5)	2.021e-08					
NO3-	2.004e-08	1.543e-08	-7.698	-7.812	-0.114	(0)
CaNO3+	1.653e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
MnNO3+	1.145e-12	7.589e-13	-11.941	-12.120	-0.179	(0)
ZnNO3+	2.268e-13	1.502e-13	-12.644	-12.823	-0.179	(0)
CuNO3+	2.000e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
BaNO3+	1.113e-15	7.374e-16	-14.954	-15.132	-0.179	(0)
CdNO3+	1.953e-16	1.294e-16	-15.709	-15.888	-0.179	(0)
PbNO3+	3.093e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
CoNO3+	1.462e-17	9.686e-18	-16.835	-17.014	-0.179	(0)
NiNO3+	5.439e-18	3.603e-18	-17.264	-17.443	-0.179	(0)
Mn (NO3) 2	2.942e-20	2.942e-20	-19.531	-19.531	0.000	(0)

UO2NO3+	3.015e-21	1.998e-21	-20.521	-20.699	-0.179	(0)
Zn(NO3)2	4.625e-22	4.625e-22	-21.335	-21.335	0.000	(0)
Cu(NO3)2	2.575e-24	2.575e-24	-23.589	-23.589	0.000	(0)
CrNO3+2	1.180e-24	2.274e-25	-23.928	-24.643	-0.715	(0)
Cd(NO3)2	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
Pb(NO3)2	5.370e-25	5.370e-25	-24.270	-24.270	0.000	(0)
VO2NO3	4.441e-25	4.441e-25	-24.352	-24.352	0.000	(0)
Co(NO3)2	3.041e-25	3.041e-25	-24.517	-24.517	0.000	(0)
FeNO3+2	2.354e-27	4.535e-28	-26.628	-27.343	-0.715	(0)
HgNO3+	4.759e-29	3.153e-29	-28.323	-28.501	-0.179	(0)
Hg(NO3)2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
Na	2.706e-02					
Na+	2.555e-02	1.967e-02	-1.593	-1.706	-0.114	(0)
NaSO4-	1.496e-03	1.160e-03	-2.825	-2.935	-0.110	(0)
NaHCO3	4.300e-06	4.300e-06	-5.367	-5.367	0.000	(0)
NaF	1.474e-06	1.474e-06	-5.832	-5.832	0.000	(0)
NaCO3-	6.969e-07	5.406e-07	-6.157	-6.267	-0.110	(0)
NaH2BO3	1.396e-07	1.396e-07	-6.855	-6.855	0.000	(0)
NaCrO4-	4.065e-16	2.693e-16	-15.391	-15.570	-0.179	(0)
Ni	4.848e-10					
Ni+2	2.646e-10	9.296e-11	-9.577	-10.032	-0.454	(0)
NiSO4	2.037e-10	2.037e-10	-9.691	-9.691	0.000	(0)
NiHCO3+	6.724e-12	4.455e-12	-11.172	-11.351	-0.179	(0)
NiCO3	5.119e-12	5.119e-12	-11.291	-11.291	0.000	(0)
NiCl+	2.337e-12	1.548e-12	-11.631	-11.810	-0.179	(0)
NiOH+	1.438e-12	9.526e-13	-11.842	-12.021	-0.179	(0)
NiF+	4.185e-13	2.772e-13	-12.378	-12.557	-0.179	(0)
Ni(SO4)2-2	3.846e-13	7.409e-14	-12.415	-13.130	-0.715	(0)
Ni(OH)2	6.159e-14	6.159e-14	-13.210	-13.210	0.000	(0)
NiNH3+2	2.223e-15	4.282e-16	-14.653	-15.368	-0.715	(0)
Ni(OH)3-	7.567e-17	5.013e-17	-16.121	-16.300	-0.179	(0)
NiCl2	5.074e-17	5.074e-17	-16.295	-16.295	0.000	(0)
NiSeO4	1.502e-17	1.502e-17	-16.823	-16.823	0.000	(0)
NiNO3+	5.439e-18	3.603e-18	-17.264	-17.443	-0.179	(0)
Ni(NH3)2+2	2.756e-21	5.308e-22	-20.560	-21.275	-0.715	(0)
O(0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.665e-09					
PbSO4	4.829e-10	4.829e-10	-9.316	-9.316	0.000	(0)
PbCO3	3.983e-10	3.983e-10	-9.400	-9.400	0.000	(0)
PbOH+	2.770e-10	1.835e-10	-9.557	-9.736	-0.179	(0)
Pb+2	2.556e-10	8.977e-11	-9.593	-10.047	-0.454	(0)
Pb(SO4)2-2	1.659e-10	3.196e-11	-9.780	-10.495	-0.715	(0)
PbHCO3+	3.913e-11	2.593e-11	-10.407	-10.586	-0.179	(0)
PbCl+	3.129e-11	2.073e-11	-10.505	-10.683	-0.179	(0)
Pb(CO3)2-2	8.800e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
Pb(OH)2	4.724e-12	4.724e-12	-11.326	-11.326	0.000	(0)
PbF+	1.134e-12	7.510e-13	-11.946	-12.124	-0.179	(0)
PbCl2	6.027e-13	6.027e-13	-12.220	-12.220	0.000	(0)
Pb(OH)3-	5.805e-15	3.846e-15	-14.236	-14.415	-0.179	(0)
PbCl3-	2.358e-15	1.562e-15	-14.628	-14.806	-0.179	(0)
PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.093e-17	2.049e-17	-16.510	-16.688	-0.179	(0)
PbCl4-2	2.412e-17	4.647e-18	-16.618	-17.333	-0.715	(0)
Pb2OH+3	1.062e-17	2.611e-19	-16.974	-18.583	-1.609	(0)
Pb(OH)4-2	3.979e-18	7.666e-19	-17.400	-18.115	-0.715	(0)
PbF3-	5.964e-19	3.951e-19	-18.224	-18.403	-0.179	(0)
Pb3(OH)4+2	2.075e-22	3.998e-23	-21.683	-22.398	-0.715	(0)
PbF4-2	1.165e-22	2.245e-23	-21.934	-22.649	-0.715	(0)
Pb(NO3)2	5.370e-25	5.370e-25	-24.270	-24.270	0.000	(0)
Pb4(OH)4+4	2.070e-26	2.851e-29	-25.684	-28.545	-2.861	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)

S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.278	-137.993	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.287	-147.466	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.292	-224.471	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.099	-302.815	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.602	-304.318	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.568	-0.715	(0)
S (6)	4.713e-02					
SO4-2	3.127e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.570e-03	7.570e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.496e-03	1.160e-03	-2.825	-2.935	-0.110	(0)
KSO4-	1.076e-03	8.344e-04	-2.968	-3.079	-0.110	(0)
MnSO4	6.060e-05	6.060e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.312e-06	9.312e-06	-5.031	-5.031	0.000	(0)
Zn (SO4) 2-2	4.624e-06	8.908e-07	-5.335	-6.050	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.838e-08	2.186e-08	-7.547	-7.660	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.826e-09	6.826e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.250e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CoSO4	8.678e-10	8.678e-10	-9.062	-9.062	0.000	(0)
PbSO4	4.829e-10	4.829e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.037e-10	2.037e-10	-9.691	-9.691	0.000	(0)
Pb (SO4) 2-2	1.659e-10	3.196e-11	-9.780	-10.495	-0.715	(0)
CrOHSO4	1.564e-11	1.564e-11	-10.806	-10.806	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2SO4	1.079e-12	1.079e-12	-11.967	-11.967	0.000	(0)
UO2 (SO4) 2-2	8.107e-13	1.562e-13	-12.091	-12.806	-0.715	(0)
AlSO4+	5.361e-13	4.088e-13	-12.271	-12.389	-0.118	(0)
Ni (SO4) 2-2	3.846e-13	7.409e-14	-12.415	-13.130	-0.715	(0)
Al (SO4) 2-	6.309e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	1.305e-14	8.644e-15	-13.884	-14.063	-0.179	(0)
VO2SO4-	2.252e-17	1.492e-17	-16.647	-16.826	-0.179	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
Cr2 (OH) 2SO4+2	4.406e-20	8.487e-21	-19.356	-20.071	-0.715	(0)
VOSO4	2.874e-20	2.874e-20	-19.542	-19.542	0.000	(0)
HgSO4	1.591e-20	1.591e-20	-19.798	-19.798	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.537e-21	5.537e-21	-20.257	-20.257	0.000	(0)
CrO3SO4-2	2.364e-23	4.555e-24	-22.626	-23.342	-0.715	(0)
VSO4+	7.707e-35	5.106e-35	-34.113	-34.292	-0.179	(0)
U (SO4) 2	1.774e-39	1.774e-39	-38.751	-38.751	0.000	(0)
USO4+2	1.055e-40	0.000e+00	-39.977	-40.692	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Sb (3)	9.935e-20					
Sb (OH) 3	5.022e-20	5.022e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.912e-20	4.912e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.725e-24	6.443e-24	-23.012	-23.191	-0.179	(0)
Sb (OH) 4-	5.551e-24	3.678e-24	-23.256	-23.434	-0.179	(0)
Sb (OH) 2F	1.152e-25	1.152e-25	-24.939	-24.939	0.000	(0)

SbOF	1.135e-25	1.135e-25	-24.945	-24.945	0.000	(0)
Sb(OH) 2+	2.277e-26	1.509e-26	-25.643	-25.821	-0.179	(0)
SbO+	7.865e-27	5.211e-27	-26.104	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.568	-0.715	(0)
Sb (5)	9.037e-08					
SbO3-	9.028e-08	5.981e-08	-7.044	-7.223	-0.179	(0)
Sb(OH) 6-	9.035e-11	6.956e-11	-10.044	-10.158	-0.114	(0)
SbO2+	3.955e-24	2.620e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.279e-39					
HSe-	6.279e-39	4.160e-39	-38.202	-38.381	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.399	-42.399	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.757	-45.472	-0.715	(0)
Se (4)	7.872e-07					
SeO3-2	4.139e-07	7.974e-08	-6.383	-7.098	-0.715	(0)
HSeO3-	3.733e-07	2.473e-07	-6.428	-6.607	-0.179	(0)
H2SeO3	1.302e-12	1.302e-12	-11.885	-11.885	0.000	(0)
Cd(SeO3) 2-2	7.211e-17	1.389e-17	-16.142	-16.857	-0.715	(0)
FeHSeO3+2	9.968e-24	1.920e-24	-23.001	-23.717	-0.715	(0)
Se (6)	9.864e-10					
SeO4-2	9.833e-10	3.454e-10	-9.007	-9.462	-0.454	(0)
MnSeO4	2.885e-12	2.885e-12	-11.540	-11.540	0.000	(0)
ZnSeO4	2.073e-13	2.073e-13	-12.683	-12.683	0.000	(0)
HSeO4-	3.226e-16	2.138e-16	-15.491	-15.670	-0.179	(0)
CdSeO4	1.705e-16	1.705e-16	-15.768	-15.768	0.000	(0)
CoSeO4	6.856e-17	6.856e-17	-16.164	-16.164	0.000	(0)
NiSeO4	1.502e-17	1.502e-17	-16.823	-16.823	0.000	(0)
Zn(SeO4) 2-2	3.769e-22	7.262e-23	-21.424	-22.139	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.384	-58.993	-1.609	(0)
U (4)	1.838e-19					
U(OH) 5-	1.838e-19	1.217e-19	-18.736	-18.915	-0.179	(0)
U(OH) 4	6.307e-23	6.307e-23	-22.200	-22.200	0.000	(0)
U(OH) 3+	4.305e-27	2.852e-27	-26.366	-26.545	-0.179	(0)
U(OH) 2+2	8.469e-32	1.632e-32	-31.072	-31.787	-0.715	(0)
UF3+	4.675e-36	3.097e-36	-35.330	-35.509	-0.179	(0)
UF2+2	8.544e-37	1.646e-37	-36.068	-36.784	-0.715	(0)
UOH+3	3.866e-37	9.506e-39	-36.413	-38.022	-1.609	(0)
UF4	4.032e-38	4.032e-38	-37.395	-37.395	0.000	(0)
UF+3	4.479e-39	1.101e-40	-38.349	-39.958	-1.609	(0)
U(SO4) 2	1.774e-39	1.774e-39	-38.751	-38.751	0.000	(0)
UF5-	2.863e-40	1.897e-40	-39.543	-39.722	-0.179	(0)
USO4+2	1.055e-40	0.000e+00	-39.977	-40.692	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.452	-41.167	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.472	-45.333	-2.861	(0)
UCl+3	0.000e+00	0.000e+00	-44.210	-45.819	-1.609	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-156.053	-170.537	-14.484	(0)
U (5)	8.159e-16					
UO2+	8.159e-16	5.405e-16	-15.088	-15.267	-0.179	(0)
U (6)	6.616e-07					
UO2(CO3) 3-4	6.030e-07	8.304e-10	-6.220	-9.081	-2.861	(0)
UO2(CO3) 2-2	5.828e-08	1.123e-08	-7.235	-7.950	-0.715	(0)
UO2CO3	3.812e-10	3.812e-10	-9.419	-9.419	0.000	(0)
UO2OH+	1.004e-11	6.649e-12	-10.998	-11.177	-0.179	(0)
UO2F+	1.605e-12	1.063e-12	-11.795	-11.973	-0.179	(0)
UO2SO4	1.079e-12	1.079e-12	-11.967	-11.967	0.000	(0)
UO2(SO4) 2-2	8.107e-13	1.562e-13	-12.091	-12.806	-0.715	(0)
UO2F2	3.641e-13	3.641e-13	-12.439	-12.439	0.000	(0)
UO2+2	1.847e-13	6.488e-14	-12.734	-13.188	-0.454	(0)
UO2F3-	1.639e-14	1.086e-14	-13.785	-13.964	-0.179	(0)
UO2Cl+	1.034e-15	6.849e-16	-14.986	-15.164	-0.179	(0)
(UO2) 2(OH) 2+2	3.808e-16	7.336e-17	-15.419	-16.135	-0.715	(0)
(UO2) 3(OH) 5+	3.700e-16	2.451e-16	-15.432	-15.611	-0.179	(0)
UO2F4-2	5.315e-17	1.024e-17	-16.275	-16.990	-0.715	(0)
UO2NO3+	3.015e-21	1.998e-21	-20.521	-20.699	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.582	-42.760	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.466	-44.181	-0.715	(0)

V (3)	4.284e-15					
V (OH) 3	4.284e-15	4.284e-15	-14.368	-14.368	0.000	(0)
V (OH) 2+	5.169e-26	3.424e-26	-25.287	-25.465	-0.179	(0)
VOH+2	2.085e-29	4.017e-30	-28.681	-29.396	-0.715	(0)
V+3	4.005e-34	9.848e-36	-33.397	-35.007	-1.609	(0)
VSO4+	7.707e-35	5.106e-35	-34.113	-34.292	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.800	-56.410	-1.609	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.131	-57.992	-2.861	(0)
V (4)	2.413e-18					
V (OH) 3+	2.324e-18	1.540e-18	-17.634	-17.813	-0.179	(0)
VO+2	4.931e-20	9.500e-21	-19.307	-20.022	-0.715	(0)
VOSO4	2.874e-20	2.874e-20	-19.542	-19.542	0.000	(0)
VOF+	1.021e-20	6.765e-21	-19.991	-20.170	-0.179	(0)
VOF2	3.011e-22	3.011e-22	-21.521	-21.521	0.000	(0)
VOC1+	2.618e-22	1.735e-22	-21.582	-21.761	-0.179	(0)
VOF3-	1.915e-24	1.269e-24	-23.718	-23.897	-0.179	(0)
VOF4-2	3.156e-27	6.079e-28	-26.501	-27.216	-0.715	(0)
H2V2O4+2	6.193e-31	1.193e-31	-30.208	-30.923	-0.715	(0)
V (5)	4.781e-08					
H2VO4-	2.813e-08	1.863e-08	-7.551	-7.730	-0.179	(0)
HVO4-2	1.968e-08	3.791e-09	-7.706	-8.421	-0.715	(0)
H3VO4	2.301e-12	2.301e-12	-11.638	-11.638	0.000	(0)
HV2O7-3	9.755e-13	2.398e-14	-12.011	-13.620	-1.609	(0)
H3V2O7-	4.186e-13	2.773e-13	-12.378	-12.557	-0.179	(0)
VO4-3	6.259e-14	1.539e-15	-13.203	-14.813	-1.609	(0)
V2O7-4	3.796e-14	5.228e-17	-13.421	-16.282	-2.861	(0)
V3O9-3	2.772e-16	6.815e-18	-15.557	-17.167	-1.609	(0)
VO2+	7.391e-17	5.690e-17	-16.131	-16.245	-0.114	(0)
VO2SO4-	2.252e-17	1.492e-17	-16.647	-16.826	-0.179	(0)
VO2F	1.185e-17	1.185e-17	-16.926	-16.926	0.000	(0)
VO2F2-	7.708e-19	5.107e-19	-18.113	-18.292	-0.179	(0)
V4O12-4	3.851e-20	5.304e-23	-19.414	-22.275	-2.861	(0)
VO2F3-2	3.926e-21	7.563e-22	-20.406	-21.121	-0.715	(0)
VO2F4-3	1.797e-24	4.418e-26	-23.745	-25.355	-1.609	(0)
VO2NO3	4.441e-25	4.441e-25	-24.352	-24.352	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.578	-60.015	-6.437	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.266	-59.737	-4.470	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.576	-62.437	-2.861	(0)
Zn	2.605e-05					
Zn+2	1.103e-05	3.875e-06	-4.957	-5.412	-0.454	(0)
ZnSO4	9.312e-06	9.312e-06	-5.031	-5.031	0.000	(0)
Zn (SO4) 2-2	4.624e-06	8.908e-07	-5.335	-6.050	-0.715	(0)
ZnOH+	4.762e-07	3.155e-07	-6.322	-6.501	-0.179	(0)
ZnCO3	3.291e-07	3.291e-07	-6.483	-6.483	0.000	(0)
ZnCl+	8.399e-08	6.336e-08	-7.076	-7.198	-0.122	(0)
ZnHCO3+	7.190e-08	4.764e-08	-7.143	-7.322	-0.179	(0)
ZnOHCl	6.752e-08	6.752e-08	-7.171	-7.171	0.000	(0)
Zn (OH) 2	4.070e-08	4.070e-08	-7.390	-7.390	0.000	(0)
ZnF+	1.386e-08	9.180e-09	-7.858	-8.037	-0.179	(0)
ZnCl2	6.536e-10	6.536e-10	-9.185	-9.185	0.000	(0)
Zn (OH) 3-	2.506e-10	1.660e-10	-9.601	-9.780	-0.179	(0)
ZnCl3-	4.480e-12	3.379e-12	-11.349	-11.471	-0.122	(0)
ZnNO3+	2.268e-13	1.502e-13	-12.644	-12.823	-0.179	(0)
ZnSeO4	2.073e-13	2.073e-13	-12.683	-12.683	0.000	(0)
ZnCl4-2	3.128e-14	1.100e-14	-13.505	-13.959	-0.454	(0)
Zn (OH) 4-2	2.793e-14	5.380e-15	-13.554	-14.269	-0.715	(0)
Zn (NO3) 2	4.625e-22	4.625e-22	-21.335	-21.335	0.000	(0)
Zn (SeO4) 2-2	3.769e-22	7.262e-23	-21.424	-22.139	-0.715	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.287	-147.466	-0.179	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.292	-224.471	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.602	-304.318	-0.715	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co(NH3)5Cl)(NO3)2	-55.15	-48.86	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-42.12	-37.61	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.35	-37.61	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.24	-53.31	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-56.47	-36.43	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.43	-28.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.37	-22.92	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3
Al2(MoO4)3	-47.73	-45.36	2.37	Al2(MoO4)3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4
AlAsO4·2H2O	-11.54	-6.74	4.80	AlAsO4·2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3·Mg(OH)2·3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-16.61	7.79	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-16.96	-1.08	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	-0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-26.23	6.71	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.55	-6.72	1.83	BaSeO3
BaSeO4	-10.02	-17.48	-7.46	BaSeO4
Bianchite	-5.61	-7.38	-1.76	ZnSO4·6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.85	-77.38	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.45	13.39	16.84	Mg(OH)2
Bunsenite	-6.66	5.78	12.45	NiO
Ca(VO3)2	-9.17	-3.51	5.66	Ca(VO3)2
Ca2V2O7	-7.84	9.66	17.50	Ca2V2O7
Ca2V2O7·2H2O	-11.89	9.66	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-15.10	7.20	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-16.13	22.83	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-17.04	22.82	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-14.94	-17.21	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	-0.00	0.23	0.23	KUO2VO4
CaSeO3·2H2O	-4.16	-1.35	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.09	-12.11	-3.02	CaSeO4·2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.41	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2·1H2O	-11.26	-12.95	-1.69	CdCl2·1H2O

CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal (alpha)	-31.82	-18.31	13.51	Cd
Cdmetal (gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4:2H2O	-16.19	-18.04	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcocopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co (BO2) 2	-28.70	-1.63	27.07	Co (BO2) 2
Co (OH) 2	-6.68	6.41	13.09	Co (OH) 2
Co (OH) 3	-10.91	-13.22	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-26.09	-13.05	13.03	Co3 (AsO4) 2
Co3O4	-9.52	-20.01	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.71	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.21	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.34	-18.87	-1.53	CoSeO4:6H2O
CoSO4	-14.16	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.89	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.96	-11.14	10.82	Cr (OH) 2
Cr (OH) 3	-2.65	-1.32	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.57	-1.32	-0.75	Cr (OH) 3
Cr2O3	-0.28	-2.63	-2.36	Cr2O3
CrCl2	-45.42	-31.33	14.09	CrCl2
CrCl3	-46.72	-31.60	15.11	CrCl3
CrF3	-25.48	-36.82	-11.34	CrF3
Crmetal	-67.17	-36.69	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.50	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.69	-22.13	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu

CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.42	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.78	-6.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg(CO3)2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.20	0.16	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.50	-13.22	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.69	-8.13	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.53	-37.16	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.21	-46.94	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.38	0.82	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.98	-63.58	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.84	-42.84	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.55	-80.52	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-5.04	2.63	7.67	UO3
Gypsum	-0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg(CH3)2(g)	-184.58	-258.29	-73.71	Hg(CH3)2
Hg(g)	-6.71	-14.59	-7.87	Hg
Hg(OH)2	-7.14	-10.64	-3.50	Hg(OH)2
Hg2(g)	-14.22	-29.17	-14.96	Hg2
Hg2(OH)2	-8.89	-3.63	5.26	Hg2(OH)2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.31	-34.01	-8.70	Hg2CrO4
Hg2F2	-16.93	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.92	-11.68	Hg2S
Hg2SeO3	-13.49	-18.14	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl(g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF(g)	-46.32	-13.65	32.68	HgF
HgF2(g)	-46.87	-34.30	12.57	HgF2
Hgmetal(l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.23	-56.92	-55.69	HgSe
HgSeO3	-12.72	-25.15	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3(CO3)4

Hydrocerrusite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.85	-19.62	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.63	-48.87	-17.24	K2Cr2O7
K2CrO4	-17.99	-18.50	-0.51	K2CrO4
K2MoO4	-12.77	-9.51	3.26	K2MoO4
K2SeO4	-12.67	-13.40	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.80	-6.24	-0.43	PbO : PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.56	-3.28	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.24	10.12	26.36	Mg2V2O7
MgCr2O4	-5.44	10.76	16.20	MgCr2O4
MgCrO4	-22.36	-16.98	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.14	-7.99	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.18	-1.13	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.69	-11.89	-1.20	MgSeO4 : 6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.27	-5.37	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.15	-55.87	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.88	1.62	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.60	-8.88	2.72	MnCl2 : 4H2O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.48	-34.98	3.50	MnSe
MnSeO3	-4.34	-3.21	1.13	MnSeO3
MnSeO3 : 2H2O	-4.19	-3.21	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-11.92	-13.97	-2.05	MnSeO4 : 5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-6.99	-10.63	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4 : 7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.57	-19.77	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.45	-48.35	-9.90	Na2Cr2O7
Na2CrO4	-20.90	-17.97	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.37	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4 : 2H2O	-10.21	-8.99	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-12.41	-2.11	10.30	Na2SeO3 : 5H2O
Na2SeO4	-14.15	-12.87	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.41	10.27	36.68	Na3VO4
Na4V2O7	-29.27	8.13	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl

NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-5.99	-2.13	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni(OH)2	-7.01	5.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-30.65	-14.95	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-26.64	5.36	32.00	Ni4(OH)6SO4
NiCO3	-8.99	-15.86	-6.87	NiCO3
NiMoO4	-4.46	-15.60	-11.14	NiMoO4
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.80	-40.50	-17.70	NiSe
NiSeO3:2H2O	-11.55	-8.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.98	-19.50	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb(BO2)2	-8.79	-2.27	6.52	Pb(BO2)2
Pb(OH)2	-2.38	5.77	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-63.43	-72.19	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.65	11.54	26.19	Pb2O(OH)2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.24	-5.14	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.51	0.63	6.14	Pb3(VO4)2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.80	5.30	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb(OH)3	-12.19	-19.30	-7.11	Sb(OH)3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.70	-177.46	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.61	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.37	2.63	5.99	UO2(OH)2:H2O
Semetal(am)	-13.63	-20.74	-7.11	Se
Semetal(hex)	-13.04	-20.74	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.28	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.24	-11.24	-10.00	ZnCO3

Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl ₂ O ₄
Stibnite	-247.02	-297.48	-50.46	Sb ₂ S ₃
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na ₂ SO ₄
Thermonatrite	-9.88	-9.24	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-2.33	1.75	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-11.10	9.99	21.08	U ₃ O ₈
U ₃ Sb ₄	-577.21	-424.83	152.38	U ₃ Sb ₄
U ₄ O ₉	-26.24	-29.26	-3.02	U ₄ O ₉
UF ₄	-31.50	-61.03	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.32	-61.04	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.63	-13.70	0.93	UO ₂
UO ₂ (NO ₃) ₂	-40.96	-28.81	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-33.66	-28.81	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.20	-28.81	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-30.86	-28.82	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-2.98	2.63	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-20.40	-22.65	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-5.07	2.63	7.70	UO ₃
Uraninite	-9.03	-13.70	-4.67	UO ₂
USb ₂	-218.81	-189.24	29.58	USb ₂
V (OH) ₃	-18.87	-11.28	7.59	V (OH) ₃
V ₂ O ₅	-15.31	-16.67	-1.36	V ₂ O ₅
V ₃ O ₅	-40.00	-38.16	1.84	V ₃ O ₅
V ₄ O ₇	-49.56	-42.37	7.19	V ₄ O ₇
V ₆ O ₁₃	-40.25	-101.11	-60.86	V ₆ O ₁₃
Valentinite	-30.12	-38.60	-8.48	Sb ₂ O ₃
VC ₁₂	-63.12	-44.24	18.87	VC ₁₂
VC ₁₃	-65.00	-41.57	23.43	VC ₁₃
VF ₄	-66.47	-51.54	14.93	VF ₄
Vmetal	-93.62	-49.60	44.03	V
VO	-38.81	-24.05	14.76	VO
VO (OH) ₂	-9.36	-4.21	5.15	VO (OH) ₂
VO ₂ Cl	-21.27	-18.43	2.84	VO ₂ Cl
VOC ₁	-32.53	-21.38	11.15	VOC ₁
VOC ₁₂	-37.16	-24.40	12.76	VOC ₁₂
VOSO ₄	-25.59	-21.98	3.61	VOSO ₄
Witherite	-5.28	-13.85	-8.57	BaCO ₃
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO ₄
Zn (BO ₂) ₂	-5.93	2.36	8.29	Zn (BO ₂) ₂
Zn (NO ₃) ₂ :6H ₂ O	-24.36	-21.04	3.32	Zn (NO ₃) ₂ :6H ₂ O
Zn (OH) ₂	-1.80	10.40	12.20	Zn (OH) ₂
Zn (OH) ₂ (am)	-2.07	10.40	12.47	Zn (OH) ₂
Zn (OH) ₂ (beta)	-1.35	10.40	11.75	Zn (OH) ₂
Zn (OH) ₂ (epsilon)	-1.13	10.40	11.53	Zn (OH) ₂
Zn (OH) ₂ (gamma)	-1.33	10.40	11.73	Zn (OH) ₂
Zn ₂ (OH) ₂ SO ₄	-4.47	3.03	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-4.48	10.71	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-14.73	-1.08	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O (SO ₄) ₂	-23.25	-4.34	18.91	Zn ₃ O (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-4.56	23.84	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-6.67	31.83	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-16.83	-9.78	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-0.98	-11.24	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-12.73	-13.26	-0.53	ZnF ₂
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO ₄	-0.86	-10.98	-10.13	ZnMoO ₄
ZnO (active)	-0.78	10.40	11.19	ZnO
ZnS (am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.48	-35.88	-14.40	ZnSe
ZnSeO ₄ :6H ₂ O	-13.36	-14.88	-1.52	ZnSeO ₄ :6H ₂ O
ZnSO ₄ :1H ₂ O	-6.73	-7.37	-0.64	ZnSO ₄ :1H ₂ O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 123.

```
Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 702
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 702
USE Surface 702
USE Solution 707
SAVE Solution 708 #Initial Stage 7 Run-off Water After Mineral
Precipitation and Sorption Loss
END
```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 702.

Diffuse Double Layer Surface-Complexation Model

Hfo

```
2.146e-19  Surface + diffuse layer charge, eq
3.142e-08  Surface charge, eq
4.399e-03  sigma, C/m2
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m2/mol Ferrihydrite
6.893e-01  m2 for 1.074e-05 moles of Ferrihydrite
```

Water in diffuse layer: 6.893e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is
+1).

Element	Moles
C	1.7610e-11
Ca	2.1824e-13
Cl	3.5264e-10
H	5.1947e-11
K	3.4622e-13
Mg	3.3813e-14
N	1.4276e-09
Na	1.4669e-12
O	6.3630e-08
S	1.4827e-08

Hfo_s

5.369e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.589e-08	0.668	3.589e-08	-7.445
Hfo_sOH	1.760e-08	0.328	1.760e-08	-7.754
Hfo_sO-	1.978e-10	0.004	1.978e-10	-9.704
Hfo_sOHCa+2	6.551e-13	0.000	6.551e-13	-12.184

Hfo_w

2.147e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	9.922e-07	0.462	9.922e-07	-6.003
Hfo_wOH	4.866e-07	0.227	4.866e-07	-6.313
Hfo_wSO4-	3.351e-07	0.156	3.351e-07	-6.475
Hfo_wOHSO4-2	3.280e-07	0.153	3.280e-07	-6.484
Hfo_wO-	5.468e-09	0.003	5.468e-09	-8.262
Hfo_wOMg+	7.728e-15	0.000	7.728e-15	-14.112
Hfo_wOCa+	2.622e-15	0.000	2.622e-15	-14.581

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 707. Solution after simulation 122.
Using surface 702.
Using pure phase assemblage 702. Pure-phase assemblage after simulation 122.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Initial	Moles in assemblage Final	Delta
Ag2Se			Element not present.	0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	7.245e-05	7.245e-05	6.090e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	5.047e-08	4.100e-08	-9.466e-09
Barite	0.00	-9.98	-9.98	3.003e-05	3.006e-05	2.840e-08
Brochantite	0.00	15.22	15.22	1.345e-04	1.343e-04	-1.505e-07
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.012e+01	1.012e+01	9.824e-07
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-4.18	-1.36	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	4.576e-02	4.576e-02	-1.730e-06
Carnotite	0.00	0.23	0.23	2.085e-06	1.826e-06	-2.589e-07
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	2.422e-07	2.422e-07	-1.676e-11

Chrysotile	Element not present.	0.000e+00	0	0.000e+00
Cr2O3	-1.22 -3.58 -2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.17 -49.97 -45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06 -13.14 -13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26 -4.39 -2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00 3.19 3.19	1.074e-05	1.074e-05	-2.209e-14
Fluorite	0.00 -10.50 -10.50	3.691e-03	3.691e-03	1.249e-09
Gummite	-4.90 2.77 7.67	0.000e+00	0	0.000e+00
Gypsum	0.00 -4.61 -4.61	9.190e-03	9.191e-03	1.509e-06
HgSe	-1.24 -56.94 -55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.	0.000e+00	0	0.000e+00
Mirabilite	-4.27 -5.38 -1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.35 -3.22 1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01 5.78 12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-30.65 -14.95 15.70	0.000e+00	0	0.000e+00
NiCO3	-8.99 -15.86 -6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.46 -15.61 -11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00 51.09 83.09	1.000e+01	1.000e+01	7.568e-10
Otavite	-2.41 -14.41 -12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00 -15.62 -15.62	7.528e-07	7.491e-07	-3.769e-09
Rutherfordine	-4.38 -18.88 -14.50	0.000e+00	0	0.000e+00
SbO2	-3.01 -30.84 -27.82	0.000e+00	0	0.000e+00
Schoepite	-3.22 2.77 5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.	0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.	0.000e+00	0	0.000e+00
Tyuyamunite	-2.33 1.75 4.08	0.000e+00	0	0.000e+00
U3O8	-10.67 10.42 21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.84 2.77 5.61	0.000e+00	0	0.000e+00
UO3	-4.93 2.77 7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86 -10.99 -10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.994e-21	Surface + diffuse layer charge, eq
1.781e-07	Surface charge, eq
2.493e-02	sigma, C/m ²
2.950e-02	psi, V
-1.148e+00	-F*psi/RT
3.172e-01	exp(-F*psi/RT)
6.420e+04	specific area, m ² /mol Ferrihydrite
6.893e-01	m ² for 1.074e-05 moles of Ferrihydrite

Water in diffuse layer: 6.893e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 2.638e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.024e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Al	4.2378e-11
As	1.3308e-14
B	6.9596e-10
Ba	1.5270e-13
C	4.3273e-09
Ca	7.4961e-08
Cd	1.5082e-13
Cl	6.4586e-08
Co	1.7850e-14
Cr	2.4481e-15
Cu	3.2789e-12
F	1.6246e-09
Fe	7.2088e-15
H	6.4945e-09
Hg	6.6448e-14

K	9.4928e-08
Mg	1.1328e-07
Mn	1.3272e-09
Mo	6.4422e-11
N	1.7172e-10
Na	1.7042e-07
Ni	2.9860e-15
O	1.5198e-06
Pb	1.1189e-14
S	3.7596e-07
Sb	6.9030e-13
Se	6.1456e-12
U	9.4044e-12
V	2.7437e-13
Zn	1.7072e-10

Hfo_s

5.369e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole		Log
		Fraction	Molality	
Hfo_sOZn+	2.618e-08	0.488	2.612e-08	-7.583
Hfo_sOCu+	1.471e-08	0.274	1.468e-08	-7.833
Hfo_sOMn+	8.617e-09	0.161	8.597e-09	-8.066
Hfo_sOPb+	2.797e-09	0.052	2.791e-09	-8.554
Hfo_sOCrOH+	7.613e-10	0.014	7.595e-10	-9.119
Hfo_sOHCa+2	5.722e-10	0.011	5.709e-10	-9.243
Hfo_sOH	2.716e-11	0.001	2.710e-11	-10.567
Hfo_sO-	8.147e-12	0.000	8.128e-12	-11.090
Hfo_sOCd+	5.458e-12	0.000	5.445e-12	-11.264
Hfo_sOH2+	2.074e-12	0.000	2.069e-12	-11.684
Hfo_sONi+	1.515e-13	0.000	1.512e-13	-12.821
Hfo_sOCu+	9.574e-14	0.000	9.552e-14	-13.020
Hfo_sOHBa+2	7.515e-15	0.000	7.497e-15	-14.125
Hfo_sOFe+	1.512e-15	0.000	1.509e-15	-14.821
Hfo_sOHg+	2.201e-16	0.000	2.196e-16	-15.658

Hfo_w

2.147e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole		Log
		Fraction	Molality	
Hfo_wOCu+	5.873e-07	0.273	5.859e-07	-6.232
Hfo_wOMg+	5.167e-07	0.241	5.155e-07	-6.288
Hfo_wOHVO4-3	2.723e-07	0.127	2.717e-07	-6.566
Hfo_wOZn+	2.134e-07	0.099	2.129e-07	-6.672
Hfo_wOH	2.114e-07	0.098	2.109e-07	-6.676
Hfo_wOHSeO4-2	1.423e-07	0.066	1.419e-07	-6.848
Hfo_wO-	6.342e-08	0.030	6.327e-08	-7.199
Hfo_wOMn+	5.328e-08	0.025	5.315e-08	-7.274
Hfo_wOHSeO3-2	2.393e-08	0.011	2.387e-08	-7.622
Hfo_wOHAsO4-3	1.893e-08	0.009	1.889e-08	-7.724
Hfo_wOCa+	1.721e-08	0.008	1.717e-08	-7.765
Hfo_wOH2+	1.614e-08	0.008	1.611e-08	-7.793
Hfo_wSO4-	5.456e-09	0.003	5.443e-09	-8.264
Hfo_wSeO3-	3.109e-09	0.001	3.102e-09	-8.508
Hfo_wOHMoO4-2	1.411e-09	0.001	1.407e-09	-8.852
Hfo_wOPb+	9.725e-10	0.000	9.703e-10	-9.013
Hfo_wH2BO3	8.405e-11	0.000	8.386e-11	-10.076
Hfo_wMoO4-	6.969e-11	0.000	6.953e-11	-10.158
Hfo_wOCd+	1.812e-11	0.000	1.808e-11	-10.743
Hfo_wHAsO4-	2.476e-12	0.000	2.470e-12	-11.607
Hfo_wOCu+	2.100e-12	0.000	2.095e-12	-11.679
Hfo_wONi+	1.591e-12	0.000	1.587e-12	-11.799
Hfo_wOHg+	8.392e-14	0.000	8.372e-14	-13.077
Hfo_wOFe+	7.426e-15	0.000	7.409e-15	-14.130
Hfo_wH2AsO4	6.119e-15	0.000	6.105e-15	-14.214
Hfo_wOHSeO4-2	4.422e-15	0.000	4.412e-15	-14.355

Hfo_wOBa+	3.267e-15	0.000	3.260e-15	-14.487
Hfo_wOHSbO(OH) 4-	9.267e-16	0.000	9.245e-16	-15.034
Hfo_wSeO4-	1.477e-16	0.000	1.474e-16	-15.832
Hfo_wSbO(OH) 4	4.578e-17	0.000	4.567e-17	-16.340
Hfo_wOHCrO4-2	1.549e-17	0.000	1.545e-17	-16.811
Hfo_wCrO4-	5.417e-19	0.000	5.404e-19	-18.267
Hfo_wH2AsO3	8.710e-25	0.000	8.689e-25	-24.061

-----Solution composition-----

Elements	Molality	Moles
Al	5.552e-06	5.566e-06
As	1.577e-09	1.580e-09
B	1.005e-04	1.007e-04
Ba	2.720e-08	2.726e-08
C	5.752e-04	5.766e-04
Ca	1.206e-02	1.209e-02
Cd	2.233e-08	2.238e-08
Cl	8.455e-03	8.475e-03
Co	2.975e-09	2.982e-09
Cr	3.859e-10	3.868e-10
Cu	4.981e-07	4.993e-07
F	2.258e-04	2.264e-04
Fe	1.103e-09	1.106e-09
Hg	9.639e-09	9.662e-09
K	1.502e-02	1.505e-02
Mg	1.844e-02	1.849e-02
Mn	2.225e-04	2.230e-04
Mo	7.610e-06	7.628e-06
N	2.253e-05	2.258e-05
Na	2.706e-02	2.712e-02
Ni	4.831e-10	4.842e-10
Pb	1.665e-09	1.669e-09
S	4.713e-02	4.724e-02
Sb	9.037e-08	9.058e-08
Se	7.612e-07	7.630e-07
U	9.199e-07	9.221e-07
V	3.439e-08	3.447e-08
Zn	2.581e-05	2.587e-05

-----Description of solution-----

	pH	=	7.908	Charge balance
	pe	=	4.864	Adjusted to redox
equilibrium	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.229e-01	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	6.164e-04	
	Total CO2 (mol/kg)	=	5.752e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.112755e+02	
	Total O	=	5.582841e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.092e-06	8.140e-07	-5.962	-6.089	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.552e-06					
Al(OH) 4-	5.507e-06	4.199e-06	-5.259	-5.377	-0.118	(0)

Al (OH) 3	4.098e-08	4.098e-08	-7.387	-7.387	0.000	(0)
Al (OH) 2+	3.252e-09	2.523e-09	-8.488	-8.598	-0.110	(0)
AlF3	4.021e-10	4.021e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.468e-10	2.690e-10	-9.460	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.392e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.571e-11	5.692e-12	-10.804	-11.245	-0.441	(0)
AlOH+2	1.077e-11	3.903e-12	-10.968	-11.409	-0.441	(0)
AlSO4+	5.361e-13	4.088e-13	-12.271	-12.389	-0.118	(0)
Al (SO4) 2-	6.309e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.047e-14	4.795e-15	-13.297	-14.319	-1.022	(0)
AlMo6O21-3	2.491e-39	0.000e+00	-38.604	-40.213	-1.609	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.003e-24	6.645e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.548e-28	4.908e-29	-27.594	-28.309	-0.715	(0)
H4AsO3+	1.477e-31	9.786e-32	-30.831	-31.009	-0.179	(0)
AsO3-3	6.233e-33	1.532e-34	-32.205	-33.815	-1.609	(0)
As (5)	1.577e-09					
HAsO4-2	1.524e-09	2.935e-10	-8.817	-9.532	-0.715	(0)
H2AsO4-	4.989e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.058e-12	7.518e-14	-11.515	-13.124	-1.609	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.005e-04					
H3BO3	9.253e-05	9.519e-05	-4.034	-4.021	0.012	(0)
H2BO3-	6.164e-06	4.478e-06	-5.210	-5.349	-0.139	(0)
MgH2BO3+	8.095e-07	5.880e-07	-6.092	-6.231	-0.139	(0)
CaH2BO3+	7.958e-07	5.781e-07	-6.099	-6.238	-0.139	(0)
NaH2BO3	1.396e-07	1.396e-07	-6.855	-6.855	0.000	(0)
BF (OH) 3-	6.208e-09	4.509e-09	-8.207	-8.346	-0.139	(0)
H5 (BO3) 2-	4.994e-10	3.628e-10	-9.302	-9.440	-0.139	(0)
H8 (BO3) 3-	4.754e-12	3.453e-12	-11.323	-11.462	-0.139	(0)
BaH2BO3+	1.816e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
BF2 (OH) 2-	9.747e-13	7.080e-13	-12.011	-12.150	-0.139	(0)
BF3OH-	5.569e-19	4.045e-19	-18.254	-18.393	-0.139	(0)
BF4-	4.025e-24	2.923e-24	-23.395	-23.534	-0.139	(0)
Ba	2.720e-08					
Ba+2	2.714e-08	9.534e-09	-7.566	-8.021	-0.454	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.816e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
BaOH+	4.399e-14	3.388e-14	-13.357	-13.470	-0.113	(0)
BaNO3+	1.113e-15	7.374e-16	-14.953	-15.132	-0.179	(0)
BaNH3+2	2.678e-16	5.160e-17	-15.572	-16.287	-0.715	(0)
C (4)	5.752e-04					
HCO3-	5.010e-04	3.887e-04	-3.300	-3.410	-0.110	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
NaHCO3	4.300e-06	4.300e-06	-5.367	-5.367	0.000	(0)
CO3-2	4.201e-06	1.476e-06	-5.377	-5.831	-0.454	(0)
UO2 (CO3) 3-4	8.383e-07	1.155e-09	-6.077	-8.938	-2.861	(0)
NaCO3-	6.969e-07	5.406e-07	-6.157	-6.267	-0.110	(0)
ZnCO3	3.261e-07	3.261e-07	-6.487	-6.487	0.000	(0)
MnHCO3+	3.124e-07	2.406e-07	-6.505	-6.619	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
UO2 (CO3) 2-2	8.103e-08	1.561e-08	-7.091	-7.807	-0.715	(0)
ZnHCO3+	7.124e-08	4.720e-08	-7.147	-7.326	-0.179	(0)
Cu (CO3) 2-2	4.867e-09	9.376e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
UO2CO3	5.301e-10	5.301e-10	-9.276	-9.276	0.000	(0)
PbCO3	3.981e-10	3.981e-10	-9.400	-9.400	0.000	(0)
CdCO3	8.916e-11	8.916e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.515e-11	3.539e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.912e-11	2.592e-11	-10.408	-10.586	-0.179	(0)
CoHCO3+	1.806e-11	1.196e-11	-10.743	-10.922	-0.179	(0)
CoCO3	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)

	Pb(CO3) 2-2	8.797e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
	BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
	NiHCO3+	6.700e-12	4.439e-12	-11.174	-11.353	-0.179	(0)
	NiCO3	5.100e-12	5.100e-12	-11.292	-11.292	0.000	(0)
	CdHCO3+	3.540e-12	2.345e-12	-11.451	-11.630	-0.179	(0)
	Cd(CO3) 2-2	5.063e-13	9.754e-14	-12.296	-13.011	-0.715	(0)
	HgCO3	9.772e-15	9.772e-15	-14.010	-14.010	0.000	(0)
	FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
	Hg(CO3) 2-2	2.368e-16	4.561e-17	-15.626	-16.341	-0.715	(0)
	HgHCO3+	3.391e-18	2.247e-18	-17.470	-17.648	-0.179	(0)
Ca	1.206e-02						
	Ca+2	6.387e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
	CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
	CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.775e-06	2.907e-06	-5.423	-5.537	-0.113	(0)
	CaH2BO3+	7.958e-07	5.781e-07	-6.099	-6.238	-0.139	(0)
	CaOH+	4.648e-08	3.644e-08	-7.333	-7.438	-0.106	(0)
	CaNO3+	1.653e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
	CaNH3+2	1.258e-10	2.423e-11	-9.900	-10.616	-0.715	(0)
	Ca(NH3) 2+2	4.295e-19	8.273e-20	-18.367	-19.082	-0.715	(0)
Cd	2.233e-08						
	Cd+2	7.545e-09	2.650e-09	-8.122	-8.577	-0.454	(0)
	CdSO4	6.824e-09	6.824e-09	-8.166	-8.166	0.000	(0)
	Cd(SO4) 2-2	5.248e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
	CdCl+	2.487e-09	1.647e-09	-8.604	-8.783	-0.179	(0)
	CdCO3	8.916e-11	8.916e-11	-10.050	-10.050	0.000	(0)
	CdOHC1	5.501e-11	5.501e-11	-10.260	-10.260	0.000	(0)
	CdCl2	4.470e-11	4.470e-11	-10.350	-10.350	0.000	(0)
	CdOH+	2.587e-11	1.714e-11	-10.587	-10.766	-0.179	(0)
	CdF+	7.527e-12	4.987e-12	-11.123	-11.302	-0.179	(0)
	CdHCO3+	3.540e-12	2.345e-12	-11.451	-11.630	-0.179	(0)
	Cd(CO3) 2-2	5.063e-13	9.754e-14	-12.296	-13.011	-0.715	(0)
	CdCl3-	2.771e-13	1.836e-13	-12.557	-12.736	-0.179	(0)
	Cd(OH) 2	8.801e-14	8.801e-14	-13.055	-13.055	0.000	(0)
	CdF2	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
	CdNO3+	1.952e-16	1.293e-16	-15.709	-15.888	-0.179	(0)
	CdSeO4	1.646e-16	1.646e-16	-15.783	-15.783	0.000	(0)
	Cd(SeO3) 2-2	6.724e-17	1.295e-17	-16.172	-16.888	-0.715	(0)
	Cd2OH+3	9.258e-18	2.276e-19	-17.033	-18.643	-1.609	(0)
	Cd(OH) 3-	6.606e-18	4.376e-18	-17.180	-17.359	-0.179	(0)
	Cd(OH) 4-2	3.027e-24	5.831e-25	-23.519	-24.234	-0.715	(0)
	Cd(NO3) 2	1.000e-24	1.000e-24	-24.000	-24.000	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Cl	8.455e-03						
	Cl-	8.455e-03	6.509e-03	-2.073	-2.186	-0.114	(0)
	MnCl+	3.301e-07	2.542e-07	-6.481	-6.595	-0.113	(0)
	ZnCl+	8.322e-08	6.278e-08	-7.080	-7.202	-0.122	(0)
	ZnOHC1	6.690e-08	6.690e-08	-7.175	-7.175	0.000	(0)
	CuCl2-	2.685e-09	2.026e-09	-8.571	-8.693	-0.122	(0)
	CdCl+	2.487e-09	1.647e-09	-8.604	-8.783	-0.179	(0)
	MnCl2	2.337e-09	2.337e-09	-8.631	-8.631	0.000	(0)
	CuCl	1.490e-09	1.490e-09	-8.827	-8.827	0.000	(0)
	ZnCl2	6.476e-10	6.476e-10	-9.189	-9.189	0.000	(0)
	CuCl+	3.714e-10	2.802e-10	-9.430	-9.553	-0.122	(0)
	CdOHC1	5.501e-11	5.501e-11	-10.260	-10.260	0.000	(0)
	HgClOH	5.177e-11	5.177e-11	-10.286	-10.286	0.000	(0)
	CdCl2	4.470e-11	4.470e-11	-10.350	-10.350	0.000	(0)
	PbCl+	3.128e-11	2.073e-11	-10.505	-10.684	-0.179	(0)
	HgCl2	2.344e-11	2.344e-11	-10.630	-10.630	0.000	(0)
	CoCl+	1.345e-11	8.910e-12	-10.871	-11.050	-0.179	(0)
	CuCl3-2	8.016e-12	2.819e-12	-11.096	-11.550	-0.454	(0)
	MnCl3-	5.440e-12	4.189e-12	-11.264	-11.378	-0.113	(0)
	ZnCl3-	4.439e-12	3.348e-12	-11.353	-11.475	-0.122	(0)
	NiCl+	2.328e-12	1.543e-12	-11.633	-11.812	-0.179	(0)

HgCl3-	2.303e-12	1.526e-12	-11.638	-11.817	-0.179	(0)
CuCl2	6.323e-13	6.323e-13	-12.199	-12.199	0.000	(0)
PbCl2	6.026e-13	6.026e-13	-12.220	-12.220	0.000	(0)
CdCl3-	2.771e-13	1.836e-13	-12.557	-12.736	-0.179	(0)
HgCl4-2	2.052e-13	3.953e-14	-12.688	-13.403	-0.715	(0)
ZnCl4-2	3.099e-14	1.090e-14	-13.509	-13.963	-0.454	(0)
PbCl3-	2.357e-15	1.561e-15	-14.628	-14.806	-0.179	(0)
UO2Cl+	1.437e-15	9.523e-16	-14.842	-15.021	-0.179	(0)
HgCl+	1.085e-15	7.185e-16	-14.965	-15.144	-0.179	(0)
CuCl3-	5.091e-17	3.841e-17	-16.293	-16.416	-0.122	(0)
NiCl2	5.055e-17	5.055e-17	-16.296	-16.296	0.000	(0)
PbCl4-2	2.411e-17	4.645e-18	-16.618	-17.333	-0.715	(0)
CrCl+2	4.966e-18	9.566e-19	-17.304	-18.019	-0.715	(0)
CrOHC12	9.632e-20	9.632e-20	-19.016	-19.016	0.000	(0)
CuCl4-2	3.563e-21	1.253e-21	-20.448	-20.902	-0.454	(0)
FeCl+2	1.643e-21	5.777e-22	-20.784	-21.238	-0.454	(0)
CrCl2+	8.917e-22	5.908e-22	-21.050	-21.229	-0.179	(0)
VOC1+	1.883e-22	1.248e-22	-21.725	-21.904	-0.179	(0)
FeCl2+	2.181e-23	1.680e-23	-22.661	-22.775	-0.113	(0)
CrO3Cl-	2.834e-26	1.878e-26	-25.548	-25.726	-0.179	(0)
FeCl3	1.093e-26	1.093e-26	-25.961	-25.961	0.000	(0)
CoCl+2	7.924e-37	1.527e-37	-36.101	-36.816	-0.715	(0)
UCl+3	0.000e+00	0.000e+00	-44.067	-45.676	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.714	-52.429	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.979	-0.715	(0)
Co (2)	2.975e-09					
Co+2	2.054e-09	3.957e-10	-8.687	-9.403	-0.715	(0)
CoSO4	8.672e-10	8.672e-10	-9.062	-9.062	0.000	(0)
CoHCO3+	1.806e-11	1.196e-11	-10.743	-10.922	-0.179	(0)
CoCl+	1.345e-11	8.910e-12	-10.871	-11.050	-0.179	(0)
CoCO3	9.873e-12	9.873e-12	-11.006	-11.006	0.000	(0)
CoOH+	9.701e-12	6.427e-12	-11.013	-11.192	-0.179	(0)
CoF+	2.242e-12	1.486e-12	-11.649	-11.828	-0.179	(0)
Co (OH) 2	4.155e-13	4.155e-13	-12.381	-12.381	0.000	(0)
CoNO2+	6.886e-14	4.562e-14	-13.162	-13.341	-0.179	(0)
Co (NH3) +2	2.118e-15	4.081e-16	-14.674	-15.389	-0.715	(0)
CoSeO4	6.616e-17	6.616e-17	-16.179	-16.179	0.000	(0)
CoNO3+	1.461e-17	9.679e-18	-16.835	-17.014	-0.179	(0)
Co (OH) 3-	1.019e-17	6.748e-18	-16.992	-17.171	-0.179	(0)
CoOOH-	2.561e-18	1.696e-18	-17.592	-17.770	-0.179	(0)
Co2OH+3	5.184e-21	1.275e-22	-20.285	-21.895	-1.609	(0)
Co (NH3) 2+2	7.751e-22	1.493e-22	-21.111	-21.826	-0.715	(0)
Co (OH) 4-2	4.519e-24	8.706e-25	-23.345	-24.060	-0.715	(0)
Co (NO3) 2	3.039e-25	3.039e-25	-24.517	-24.517	0.000	(0)
Co (NH3) 3+2	8.370e-29	1.612e-29	-28.077	-28.793	-0.715	(0)
Co4 (OH) 4+4	2.472e-34	3.404e-37	-33.607	-36.468	-2.861	(0)
Co (NH3) 4+2	3.768e-36	7.258e-37	-35.424	-36.139	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.271	-43.986	-0.715	(0)
Co (3)	2.475e-30					
CoOH+2	2.475e-30	4.768e-31	-29.606	-30.322	-0.715	(0)
Co+3	1.213e-36	1.153e-37	-35.916	-36.938	-1.022	(0)
CoCl+2	7.924e-37	1.527e-37	-36.101	-36.816	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.979	-0.715	(0)
Cr (2)	1.925e-27					
Cr+2	1.925e-27	3.708e-28	-26.716	-27.431	-0.715	(0)
Cr (3)	3.859e-10					
Cr (OH) 2+	3.023e-10	2.003e-10	-9.520	-9.698	-0.179	(0)
Cr (OH) 3	6.124e-11	6.124e-11	-10.213	-10.213	0.000	(0)
Cr (OH) +2	1.050e-11	2.022e-12	-10.979	-11.694	-0.715	(0)
CrOHSO4	5.271e-12	5.271e-12	-11.278	-11.278	0.000	(0)
CrO2-	3.562e-12	2.360e-12	-11.448	-11.627	-0.179	(0)
Cr (OH) 4-	2.995e-12	1.984e-12	-11.524	-11.702	-0.179	(0)
CrF+2	1.109e-14	2.137e-15	-13.955	-14.670	-0.715	(0)
Cr+3	4.619e-15	1.136e-16	-14.335	-15.945	-1.609	(0)

CrSO4+	4.396e-15	2.912e-15	-14.357	-14.536	-0.179	(0)
CrCl+2	4.966e-18	9.566e-19	-17.304	-18.019	-0.715	(0)
CrOHC12	9.632e-20	9.632e-20	-19.016	-19.016	0.000	(0)
Cr2(OH)2SO4+2	5.001e-21	9.633e-22	-20.301	-21.016	-0.715	(0)
CrCl2+	8.917e-22	5.908e-22	-21.050	-21.229	-0.179	(0)
Cr2(OH)2(SO4)2	6.285e-22	6.285e-22	-21.202	-21.202	0.000	(0)
CrNO3+2	3.977e-25	7.661e-26	-24.400	-25.116	-0.715	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-41.280	-41.995	-0.715	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-49.735	-51.345	-1.609	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-51.714	-52.429	-0.715	(0)
Cr(6)	2.891e-15					
CrO4-2	2.642e-15	9.281e-16	-14.578	-15.032	-0.454	(0)
NaCrO4-	1.369e-16	9.073e-17	-15.863	-16.042	-0.179	(0)
HCrO4-	5.597e-17	3.708e-17	-16.252	-16.431	-0.179	(0)
KCrO4-	5.586e-17	3.701e-17	-16.253	-16.432	-0.179	(0)
CrO3SO4-2	7.966e-24	1.535e-24	-23.099	-23.814	-0.715	(0)
H2CrO4	3.711e-25	3.711e-25	-24.430	-24.430	0.000	(0)
CrO3Cl-	2.834e-26	1.878e-26	-25.548	-25.726	-0.179	(0)
Cr2O7-2	2.480e-31	4.777e-32	-30.606	-31.321	-0.715	(0)
Cu(1)	4.457e-09					
CuCl2-	2.685e-09	2.026e-09	-8.571	-8.693	-0.122	(0)
CuCl	1.490e-09	1.490e-09	-8.827	-8.827	0.000	(0)
Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	8.016e-12	2.819e-12	-11.096	-11.550	-0.454	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu(2)	4.936e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.267e-08	6.991e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.731e-08	2.716e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu(OH)2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu(CO3)2-2	4.867e-09	9.376e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.661e-10	-8.998	-9.176	-0.179	(0)
Cu2(OH)2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.714e-10	2.802e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.034e-10	-9.513	-9.692	-0.179	(0)
CuNO2+	7.022e-11	4.652e-11	-10.154	-10.332	-0.179	(0)
Cu(OH)3-	2.861e-11	1.896e-11	-10.543	-10.722	-0.179	(0)
CuNH3+2	1.237e-11	2.384e-12	-10.907	-11.623	-0.715	(0)
CuCl2	6.323e-13	6.323e-13	-12.199	-12.199	0.000	(0)
Cu(NO2)2	7.787e-15	7.787e-15	-14.109	-14.109	0.000	(0)
CuNO3+	2.001e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
Cu(OH)4-2	6.304e-16	1.214e-16	-15.200	-15.916	-0.715	(0)
CuCl3-	5.091e-17	3.841e-17	-16.293	-16.416	-0.122	(0)
CuCl4-2	3.563e-21	1.253e-21	-20.448	-20.902	-0.454	(0)
Cu(NO3)2	2.575e-24	2.575e-24	-23.589	-23.589	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.258e-04					
F-	1.542e-04	1.187e-04	-3.812	-3.925	-0.114	(0)
MgF+	6.616e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
CaF+	3.775e-06	2.907e-06	-5.423	-5.537	-0.113	(0)
NaF	1.474e-06	1.474e-06	-5.832	-5.832	0.000	(0)
MnF+	1.904e-07	1.466e-07	-6.720	-6.834	-0.113	(0)
ZnF+	1.373e-08	9.096e-09	-7.862	-8.041	-0.179	(0)
BF(OH)3-	6.208e-09	4.509e-09	-8.207	-8.346	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.021e-10	4.021e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.468e-10	2.690e-10	-9.460	-9.570	-0.110	(0)
CuF+	3.071e-10	2.034e-10	-9.513	-9.692	-0.179	(0)
AlF4-	3.138e-11	2.392e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.571e-11	5.692e-12	-10.804	-11.245	-0.441	(0)
CdF+	7.527e-12	4.987e-12	-11.123	-11.302	-0.179	(0)
CoF+	2.242e-12	1.486e-12	-11.649	-11.828	-0.179	(0)
UO2F+	2.232e-12	1.478e-12	-11.651	-11.830	-0.179	(0)
HF2-	1.312e-12	9.786e-13	-11.882	-12.009	-0.127	(0)
PbF+	1.133e-12	7.508e-13	-11.946	-12.124	-0.179	(0)
BF2(OH)2-	9.747e-13	7.080e-13	-12.011	-12.150	-0.139	(0)

UO2F2	5.062e-13	5.062e-13	-12.296	-12.296	0.000	(0)
NiF+	4.170e-13	2.762e-13	-12.380	-12.559	-0.179	(0)
UO2F3-	2.279e-14	1.510e-14	-13.642	-13.821	-0.179	(0)
CrF+2	1.109e-14	2.137e-15	-13.955	-14.670	-0.715	(0)
PbF2	1.754e-15	1.754e-15	-14.756	-14.756	0.000	(0)
CdF2	1.181e-15	1.181e-15	-14.928	-14.928	0.000	(0)
UO2F4-2	7.390e-17	1.424e-17	-16.131	-16.847	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	8.521e-18	8.521e-18	-17.070	-17.070	0.000	(0)
FeF2+	1.578e-18	1.215e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
PbF3-	5.962e-19	3.950e-19	-18.225	-18.403	-0.179	(0)
BF3OH-	5.569e-19	4.045e-19	-18.254	-18.393	-0.139	(0)
VO2F2-	5.544e-19	3.673e-19	-18.256	-18.435	-0.179	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	7.344e-21	4.865e-21	-20.134	-20.313	-0.179	(0)
VO2F3-2	2.823e-21	5.439e-22	-20.549	-21.264	-0.715	(0)
VOF2	2.166e-22	2.166e-22	-21.664	-21.664	0.000	(0)
PbF4-2	1.165e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.675e-23	2.435e-23	-22.435	-22.614	-0.179	(0)
BF4-	4.025e-24	2.923e-24	-23.395	-23.534	-0.139	(0)
VOF3-	1.377e-24	9.123e-25	-23.861	-24.040	-0.179	(0)
VO2F4-3	1.292e-24	3.177e-26	-23.889	-25.498	-1.609	(0)
Sb(OH) 2F	1.152e-25	1.152e-25	-24.939	-24.939	0.000	(0)
SbOF	1.135e-25	1.135e-25	-24.945	-24.945	0.000	(0)
VOF4-2	2.270e-27	4.372e-28	-26.644	-27.359	-0.715	(0)
UF3+	6.500e-36	4.306e-36	-35.187	-35.366	-0.179	(0)
UF2+2	1.188e-36	2.289e-37	-35.925	-36.640	-0.715	(0)
UF4	5.606e-38	5.606e-38	-37.251	-37.251	0.000	(0)
UF+3	6.228e-39	1.531e-40	-38.206	-39.815	-1.609	(0)
UF5-	3.981e-40	2.637e-40	-39.400	-39.579	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.309	-41.024	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.324e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.819e-14	1.401e-14	-13.740	-13.854	-0.113	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.675	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.028e-18	2.332e-18	-17.519	-17.632	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.304e-10	4.891e-10	-9.200	-9.311	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.177e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
FeOH+2	4.392e-15	1.545e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.578e-18	1.215e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.826e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
Fe+3	3.094e-20	2.939e-21	-19.510	-20.532	-1.022	(0)
FeCl+2	1.643e-21	5.777e-22	-20.784	-21.238	-0.454	(0)
FeCl2+	2.181e-23	1.680e-23	-22.661	-22.775	-0.113	(0)
FeHSeO3+2	9.628e-24	1.855e-24	-23.016	-23.732	-0.715	(0)
Fe2 (OH) 2+4	5.736e-26	7.899e-29	-25.241	-28.102	-2.861	(0)
FeCl3	1.093e-26	1.093e-26	-25.961	-25.961	0.000	(0)
FeNO3+2	2.354e-27	4.535e-28	-26.628	-27.343	-0.715	(0)
Fe3 (OH) 4+5	1.649e-32	5.584e-37	-31.783	-36.253	-4.470	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.539e-09					
Hg	9.539e-09	9.539e-09	-8.020	-8.020	0.000	(0)
Hg (1)	3.720e-19					
Hg2+2	1.860e-19	3.583e-20	-18.730	-19.446	-0.715	(0)
Hg (2)	1.002e-10					
HgClOH	5.177e-11	5.177e-11	-10.286	-10.286	0.000	(0)
HgCl2	2.344e-11	2.344e-11	-10.630	-10.630	0.000	(0)

	Hg (OH) 2	2.248e-11	2.313e-11	-10.648	-10.636	0.012	(0)
	HgCl3-	2.303e-12	1.526e-12	-11.638	-11.817	-0.179	(0)
	HgCl4-2	2.052e-13	3.953e-14	-12.688	-13.403	-0.715	(0)
	HgCO3	9.772e-15	9.772e-15	-14.010	-14.010	0.000	(0)
	HgCl+	1.085e-15	7.185e-16	-14.965	-15.144	-0.179	(0)
	HgOH+	2.706e-16	1.793e-16	-15.568	-15.746	-0.179	(0)
	Hg (CO3) 2-2	2.368e-16	4.561e-17	-15.626	-16.341	-0.715	(0)
	Hg (OH) 3-	3.578e-18	2.370e-18	-17.446	-17.625	-0.179	(0)
	HgHCO3+	3.391e-18	2.247e-18	-17.470	-17.648	-0.179	(0)
	Hg (NH3) 2+2	1.333e-18	2.568e-19	-17.875	-18.590	-0.715	(0)
	HgNH3+2	1.554e-19	2.994e-20	-18.808	-19.524	-0.715	(0)
	Hg+2	2.872e-20	5.533e-21	-19.542	-20.257	-0.715	(0)
	HgSO4	1.591e-20	1.591e-20	-19.798	-19.798	0.000	(0)
	HgF+	3.675e-23	2.435e-23	-22.435	-22.614	-0.179	(0)
	Hg (NH3) 3+2	4.553e-26	8.771e-27	-25.342	-26.057	-0.715	(0)
	HgNO3+	4.759e-29	3.153e-29	-28.322	-28.501	-0.179	(0)
	Hg (NH3) 4+2	3.102e-33	5.976e-34	-32.508	-33.224	-0.715	(0)
	Hg (NO3) 2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.278	-137.993	-0.715	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
K		1.502e-02					
	K+	1.394e-02	1.073e-02	-1.856	-1.969	-0.114	(0)
	KSO4-	1.076e-03	8.344e-04	-2.968	-3.079	-0.110	(0)
	KCrO4-	5.586e-17	3.701e-17	-16.253	-16.432	-0.179	(0)
Mg		1.844e-02					
	Mg+2	1.078e-02	3.787e-03	-1.967	-2.422	-0.454	(0)
	MgSO4	7.569e-03	7.569e-03	-2.121	-2.121	0.000	(0)
	MgF+	6.616e-05	5.045e-05	-4.179	-4.297	-0.118	(0)
	MgHCO3+	1.997e-05	1.506e-05	-4.700	-4.822	-0.122	(0)
	MgCO3	4.649e-06	4.649e-06	-5.333	-5.333	0.000	(0)
	MgOH+	1.553e-06	1.227e-06	-5.809	-5.911	-0.102	(0)
	MgH2BO3+	8.095e-07	5.880e-07	-6.092	-6.231	-0.139	(0)
Mn (2)		2.225e-04					
	Mn+2	1.610e-04	3.102e-05	-3.793	-4.508	-0.715	(0)
	MnSO4	6.058e-05	6.058e-05	-4.218	-4.218	0.000	(0)
	MnCl+	3.301e-07	2.542e-07	-6.481	-6.595	-0.113	(0)
	MnHCO3+	3.124e-07	2.406e-07	-6.505	-6.619	-0.113	(0)
	MnF+	1.904e-07	1.466e-07	-6.720	-6.834	-0.113	(0)
	MnOH+	8.236e-08	6.342e-08	-7.084	-7.198	-0.113	(0)
	MnCl2	2.337e-09	2.337e-09	-8.631	-8.631	0.000	(0)
	MnCl3-	5.440e-12	4.189e-12	-11.264	-11.378	-0.113	(0)
	MnSeO4	2.785e-12	2.785e-12	-11.555	-11.555	0.000	(0)
	MnNO3+	1.145e-12	7.587e-13	-11.941	-12.120	-0.179	(0)
	Mn (OH) 3-	3.372e-16	2.597e-16	-15.472	-15.586	-0.113	(0)
	Mn (NO3) 2	2.941e-20	2.941e-20	-19.531	-19.531	0.000	(0)
	Mn (OH) 4-2	1.941e-21	6.824e-22	-20.712	-21.166	-0.454	(0)
	MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
Mn (3)		1.067e-24					
	Mn+3	1.067e-24	1.014e-25	-23.972	-24.994	-1.022	(0)
Mn (6)		1.758e-40					
	MnO4-2	1.758e-40	0.000e+00	-39.755	-40.209	-0.454	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.584	-44.717	-0.133	(0)
Mo		7.610e-06					
	MoO4-2	7.609e-06	2.673e-06	-5.119	-5.573	-0.454	(0)
	HMoO4-	9.912e-10	6.567e-10	-9.004	-9.183	-0.179	(0)
	H2MoO4	5.939e-14	5.939e-14	-13.226	-13.226	0.000	(0)
	AlMo6O21-3	2.491e-39	0.000e+00	-38.604	-40.213	-1.609	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-42.848	-49.285	-6.437	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-46.337	-50.807	-4.470	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.072	-53.933	-2.861	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.986	-58.596	-1.609	(0)
N (-3)		2.928e-07					
	NH4+	2.557e-07	1.857e-07	-6.592	-6.731	-0.139	(0)
	NH4SO4-	2.839e-08	2.186e-08	-7.547	-7.660	-0.113	(0)
	NH3	8.577e-09	8.577e-09	-8.067	-8.067	0.000	(0)
	CaNH3+2	1.258e-10	2.423e-11	-9.900	-10.616	-0.715	(0)

	CuNH3+2	1.237e-11	2.384e-12	-10.907	-11.623	-0.715	(0)
	NiNH3+2	2.215e-15	4.267e-16	-14.655	-15.370	-0.715	(0)
	Co (NH3) +2	2.118e-15	4.081e-16	-14.674	-15.389	-0.715	(0)
	BaNH3+2	2.678e-16	5.160e-17	-15.572	-16.287	-0.715	(0)
	Hg (NH3) 2+2	1.333e-18	2.568e-19	-17.875	-18.590	-0.715	(0)
	Ca (NH3) 2+2	4.295e-19	8.273e-20	-18.367	-19.082	-0.715	(0)
	HgNH3+2	1.554e-19	2.994e-20	-18.808	-19.524	-0.715	(0)
	Ni (NH3) 2+2	2.746e-21	5.290e-22	-20.561	-21.277	-0.715	(0)
	Co (NH3) 2+2	7.751e-22	1.493e-22	-21.111	-21.826	-0.715	(0)
	Hg (NH3) 3+2	4.553e-26	8.771e-27	-25.342	-26.057	-0.715	(0)
	Co (NH3) 3+2	8.370e-29	1.612e-29	-28.077	-28.793	-0.715	(0)
	Hg (NH3) 4+2	3.102e-33	5.976e-34	-32.508	-33.224	-0.715	(0)
	Co (NH3) 4+2	3.768e-36	7.258e-37	-35.424	-36.139	-0.715	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.280	-41.995	-0.715	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-43.271	-43.986	-0.715	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.735	-51.345	-1.609	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.481	-51.196	-0.715	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.714	-52.429	-0.715	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.966	-65.681	-0.715	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.263	-65.979	-0.715	(0)
N (3)	2.221e-05						
	NO2-	2.221e-05	1.636e-05	-4.653	-4.786	-0.133	(0)
	CuNO2+	7.022e-11	4.652e-11	-10.154	-10.332	-0.179	(0)
	CoNO2+	6.886e-14	4.562e-14	-13.162	-13.341	-0.179	(0)
	Cu (NO2) 2	7.787e-15	7.787e-15	-14.109	-14.109	0.000	(0)
N (5)	2.021e-08						
	NO3-	2.005e-08	1.543e-08	-7.698	-7.812	-0.114	(0)
	CaNO3+	1.653e-10	1.095e-10	-9.782	-9.961	-0.179	(0)
	MnNO3+	1.145e-12	7.587e-13	-11.941	-12.120	-0.179	(0)
	ZnNO3+	2.247e-13	1.489e-13	-12.648	-12.827	-0.179	(0)
	CuNO3+	2.001e-15	1.325e-15	-14.699	-14.878	-0.179	(0)
	BaNO3+	1.113e-15	7.374e-16	-14.953	-15.132	-0.179	(0)
	CdNO3+	1.952e-16	1.293e-16	-15.709	-15.888	-0.179	(0)
	PbNO3+	3.092e-17	2.049e-17	-16.510	-16.689	-0.179	(0)
	CoNO3+	1.461e-17	9.679e-18	-16.835	-17.014	-0.179	(0)
	NiNO3+	5.420e-18	3.591e-18	-17.266	-17.445	-0.179	(0)
	Mn (NO3) 2	2.941e-20	2.941e-20	-19.531	-19.531	0.000	(0)
	UO2NO3+	4.193e-21	2.778e-21	-20.377	-20.556	-0.179	(0)
	Zn (NO3) 2	4.584e-22	4.584e-22	-21.339	-21.339	0.000	(0)
	Cu (NO3) 2	2.575e-24	2.575e-24	-23.589	-23.589	0.000	(0)
	Cd (NO3) 2	1.000e-24	1.000e-24	-24.000	-24.000	0.000	(0)
	Pb (NO3) 2	5.369e-25	5.369e-25	-24.270	-24.270	0.000	(0)
	CrNO3+2	3.977e-25	7.661e-26	-24.400	-25.116	-0.715	(0)
	VO2NO3	3.194e-25	3.194e-25	-24.496	-24.496	0.000	(0)
	Co (NO3) 2	3.039e-25	3.039e-25	-24.517	-24.517	0.000	(0)
	FeNO3+2	2.354e-27	4.535e-28	-26.628	-27.343	-0.715	(0)
	HgNO3+	4.759e-29	3.153e-29	-28.322	-28.501	-0.179	(0)
	Hg (NO3) 2	2.022e-37	2.022e-37	-36.694	-36.694	0.000	(0)
Na	2.706e-02						
	Na+	2.555e-02	1.967e-02	-1.593	-1.706	-0.114	(0)
	NaSO4-	1.496e-03	1.160e-03	-2.825	-2.935	-0.110	(0)
	NaHCO3	4.300e-06	4.300e-06	-5.367	-5.367	0.000	(0)
	NaF	1.474e-06	1.474e-06	-5.832	-5.832	0.000	(0)
	NaCO3-	6.969e-07	5.406e-07	-6.157	-6.267	-0.110	(0)
	NaH2BO3	1.396e-07	1.396e-07	-6.855	-6.855	0.000	(0)
	NaCrO4-	1.369e-16	9.073e-17	-15.863	-16.042	-0.179	(0)
Ni	4.831e-10						
	Ni+2	2.637e-10	9.263e-11	-9.579	-10.033	-0.454	(0)
	NiSO4	2.030e-10	2.030e-10	-9.693	-9.693	0.000	(0)
	NiHCO3+	6.700e-12	4.439e-12	-11.174	-11.353	-0.179	(0)
	NiCO3	5.100e-12	5.100e-12	-11.292	-11.292	0.000	(0)
	NiCl+	2.328e-12	1.543e-12	-11.633	-11.812	-0.179	(0)
	NiOH+	1.433e-12	9.492e-13	-11.844	-12.023	-0.179	(0)
	NiF+	4.170e-13	2.762e-13	-12.380	-12.559	-0.179	(0)
	Ni (SO4) 2-2	3.832e-13	7.382e-14	-12.417	-13.132	-0.715	(0)
	Ni (OH) 2	6.137e-14	6.137e-14	-13.212	-13.212	0.000	(0)
	NiNH3+2	2.215e-15	4.267e-16	-14.655	-15.370	-0.715	(0)

Ni (OH) 3-	7.540e-17	4.995e-17	-16.123	-16.301	-0.179	(0)
NiCl2	5.055e-17	5.055e-17	-16.296	-16.296	0.000	(0)
NiSeO4	1.445e-17	1.445e-17	-16.840	-16.840	0.000	(0)
NiNO3+	5.420e-18	3.591e-18	-17.266	-17.445	-0.179	(0)
Ni (NH3) 2+2	2.746e-21	5.290e-22	-20.561	-21.277	-0.715	(0)
O (0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.665e-09					
PbSO4	4.827e-10	4.827e-10	-9.316	-9.316	0.000	(0)
PbCO3	3.981e-10	3.981e-10	-9.400	-9.400	0.000	(0)
PbOH+	2.770e-10	1.835e-10	-9.558	-9.736	-0.179	(0)
Pb+2	2.555e-10	8.974e-11	-9.593	-10.047	-0.454	(0)
Pb (SO4) 2-2	1.658e-10	3.195e-11	-9.780	-10.496	-0.715	(0)
PbHCO3+	3.912e-11	2.592e-11	-10.408	-10.586	-0.179	(0)
PbCl+	3.128e-11	2.073e-11	-10.505	-10.684	-0.179	(0)
Pb (CO3) 2-2	8.797e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
Pb (OH) 2	4.723e-12	4.723e-12	-11.326	-11.326	0.000	(0)
PbF+	1.133e-12	7.508e-13	-11.946	-12.124	-0.179	(0)
PbCl2	6.026e-13	6.026e-13	-12.220	-12.220	0.000	(0)
Pb (OH) 3-	5.803e-15	3.844e-15	-14.236	-14.415	-0.179	(0)
PbCl3-	2.357e-15	1.561e-15	-14.628	-14.806	-0.179	(0)
PbF2	1.754e-15	1.754e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.092e-17	2.049e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.411e-17	4.645e-18	-16.618	-17.333	-0.715	(0)
Pb2OH+3	1.061e-17	2.610e-19	-16.974	-18.583	-1.609	(0)
Pb (OH) 4-2	3.978e-18	7.663e-19	-17.400	-18.116	-0.715	(0)
PbF3-	5.962e-19	3.950e-19	-18.225	-18.403	-0.179	(0)
Pb3 (OH) 4+2	2.073e-22	3.994e-23	-21.683	-22.399	-0.715	(0)
PbF4-2	1.165e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
Pb (NO3) 2	5.369e-25	5.369e-25	-24.270	-24.270	0.000	(0)
Pb4 (OH) 4+4	2.067e-26	2.847e-29	-25.685	-28.546	-2.861	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.278	-137.993	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.291	-147.470	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.296	-224.475	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.637	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.568	-0.715	(0)
S (6)	4.713e-02					
SO4-2	3.127e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.569e-03	7.569e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.496e-03	1.160e-03	-2.825	-2.935	-0.110	(0)
KSO4-	1.076e-03	8.344e-04	-2.968	-3.079	-0.110	(0)

MnSO4	6.058e-05	6.058e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.227e-06	9.227e-06	-5.035	-5.035	0.000	(0)
Zn (SO4) 2-2	4.582e-06	8.826e-07	-5.339	-6.054	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.839e-08	2.186e-08	-7.547	-7.660	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.824e-09	6.824e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.248e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CoSO4	8.672e-10	8.672e-10	-9.062	-9.062	0.000	(0)
PbSO4	4.827e-10	4.827e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.030e-10	2.030e-10	-9.693	-9.693	0.000	(0)
Pb (SO4) 2-2	1.658e-10	3.195e-11	-9.780	-10.496	-0.715	(0)
CrOHSO4	5.271e-12	5.271e-12	-11.278	-11.278	0.000	(0)
UO2SO4	1.500e-12	1.500e-12	-11.824	-11.824	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2 (SO4) 2-2	1.127e-12	2.171e-13	-11.948	-12.663	-0.715	(0)
AlSO4+	5.361e-13	4.088e-13	-12.271	-12.389	-0.118	(0)
Ni (SO4) 2-2	3.832e-13	7.382e-14	-12.417	-13.132	-0.715	(0)
Al (SO4) 2-	6.309e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	4.396e-15	2.912e-15	-14.357	-14.536	-0.179	(0)
VO2SO4-	1.620e-17	1.073e-17	-16.791	-16.969	-0.179	(0)
FeSO4+	4.703e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
Fe (SO4) 2-	1.284e-19	8.504e-20	-18.892	-19.070	-0.179	(0)
VOSO4	2.067e-20	2.067e-20	-19.685	-19.685	0.000	(0)
HgSO4	1.591e-20	1.591e-20	-19.798	-19.798	0.000	(0)
Cr2 (OH) 2SO4+2	5.001e-21	9.633e-22	-20.301	-21.016	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	6.285e-22	6.285e-22	-21.202	-21.202	0.000	(0)
CrO3SO4-2	7.966e-24	1.535e-24	-23.099	-23.814	-0.715	(0)
VSO4+	5.543e-35	3.672e-35	-34.256	-34.435	-0.179	(0)
U (SO4) 2	2.466e-39	2.466e-39	-38.608	-38.608	0.000	(0)
USO4+2	1.467e-40	0.000e+00	-39.833	-40.549	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.647	-60.826	-0.179	(0)
Sb (3)	9.935e-20					
Sb (OH) 3	5.022e-20	5.022e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.912e-20	4.912e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.725e-24	6.443e-24	-23.012	-23.191	-0.179	(0)
Sb (OH) 4-	5.551e-24	3.678e-24	-23.256	-23.434	-0.179	(0)
Sb (OH) 2F	1.152e-25	1.152e-25	-24.939	-24.939	0.000	(0)
SbOF	1.135e-25	1.135e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.277e-26	1.509e-26	-25.643	-25.821	-0.179	(0)
SbO+	7.865e-27	5.211e-27	-26.104	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.852	-318.568	-0.715	(0)
Sb (5)	9.037e-08					
SbO3-	9.028e-08	5.981e-08	-7.044	-7.223	-0.179	(0)
Sb (OH) 6-	9.035e-11	6.956e-11	-10.044	-10.158	-0.114	(0)
SbO2+	3.955e-24	2.620e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.064e-39					
HSe-	6.064e-39	4.018e-39	-38.217	-38.396	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.414	-42.414	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.772	-45.488	-0.715	(0)
Se (4)	7.602e-07					
SeO3-2	3.997e-07	7.701e-08	-6.398	-7.113	-0.715	(0)
HSeO3-	3.605e-07	2.388e-07	-6.443	-6.622	-0.179	(0)
H2SeO3	1.258e-12	1.258e-12	-11.900	-11.900	0.000	(0)
Cd (SeO3) 2-2	6.724e-17	1.295e-17	-16.172	-16.888	-0.715	(0)
FeHSeO3+2	9.628e-24	1.855e-24	-23.016	-23.732	-0.715	(0)
Se (6)	9.527e-10					
SeO4-2	9.497e-10	3.336e-10	-9.022	-9.477	-0.454	(0)
MnSeO4	2.785e-12	2.785e-12	-11.555	-11.555	0.000	(0)
ZnSeO4	1.984e-13	1.984e-13	-12.702	-12.702	0.000	(0)
HSeO4-	3.116e-16	2.064e-16	-15.506	-15.685	-0.179	(0)
CdSeO4	1.646e-16	1.646e-16	-15.783	-15.783	0.000	(0)
CoSeO4	6.616e-17	6.616e-17	-16.179	-16.179	0.000	(0)
NiSeO4	1.445e-17	1.445e-17	-16.840	-16.840	0.000	(0)
Zn (SeO4) 2-2	3.484e-22	6.711e-23	-21.458	-22.173	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.240	-58.850	-1.609	(0)

U (4)	2.556e-19					
U (OH) 5-	2.555e-19	1.693e-19	-18.593	-18.771	-0.179	(0)
U (OH) 4	8.769e-23	8.769e-23	-22.057	-22.057	0.000	(0)
U (OH) 3+	5.986e-27	3.966e-27	-26.223	-26.402	-0.179	(0)
U (OH) 2+2	1.178e-31	2.268e-32	-30.929	-31.644	-0.715	(0)
UF3+	6.500e-36	4.306e-36	-35.187	-35.366	-0.179	(0)
UF2+2	1.188e-36	2.289e-37	-35.925	-36.640	-0.715	(0)
UOH+3	5.376e-37	1.322e-38	-36.270	-37.879	-1.609	(0)
UF4	5.606e-38	5.606e-38	-37.251	-37.251	0.000	(0)
UF+3	6.228e-39	1.531e-40	-38.206	-39.815	-1.609	(0)
U (SO4) 2	2.466e-39	2.466e-39	-38.608	-38.608	0.000	(0)
UF5-	3.981e-40	2.637e-40	-39.400	-39.579	-0.179	(0)
USO4+2	1.467e-40	0.000e+00	-39.833	-40.549	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.309	-41.024	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.328	-45.189	-2.861	(0)
UCl+3	0.000e+00	0.000e+00	-44.067	-45.676	-1.609	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.194	-169.678	-14.484	(0)
U (5)	1.134e-15					
UO2+	1.134e-15	7.515e-16	-14.945	-15.124	-0.179	(0)
U (6)	9.199e-07					
UO2 (CO3) 3-4	8.383e-07	1.155e-09	-6.077	-8.938	-2.861	(0)
UO2 (CO3) 2-2	8.103e-08	1.561e-08	-7.091	-7.807	-0.715	(0)
UO2CO3	5.301e-10	5.301e-10	-9.276	-9.276	0.000	(0)
UO2OH+	1.395e-11	9.244e-12	-10.855	-11.034	-0.179	(0)
UO2F+	2.232e-12	1.478e-12	-11.651	-11.830	-0.179	(0)
UO2SO4	1.500e-12	1.500e-12	-11.824	-11.824	0.000	(0)
UO2 (SO4) 2-2	1.127e-12	2.171e-13	-11.948	-12.663	-0.715	(0)
UO2F2	5.062e-13	5.062e-13	-12.296	-12.296	0.000	(0)
UO2+2	2.568e-13	9.021e-14	-12.590	-13.045	-0.454	(0)
UO2F3-	2.279e-14	1.510e-14	-13.642	-13.821	-0.179	(0)
UO2Cl+	1.437e-15	9.523e-16	-14.842	-15.021	-0.179	(0)
(UO2) 3 (OH) 5+	9.946e-16	6.590e-16	-15.002	-15.181	-0.179	(0)
(UO2) 2 (OH) 2+2	7.362e-16	1.418e-16	-15.133	-15.848	-0.715	(0)
UO2F4-2	7.390e-17	1.424e-17	-16.131	-16.847	-0.715	(0)
UO2NO3+	4.193e-21	2.778e-21	-20.377	-20.556	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.725	-42.904	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.609	-44.324	-0.715	(0)
V (3)	3.081e-15					
V (OH) 3	3.081e-15	3.081e-15	-14.511	-14.511	0.000	(0)
V (OH) 2+	3.717e-26	2.463e-26	-25.430	-25.609	-0.179	(0)
VOH+2	1.500e-29	2.889e-30	-28.824	-29.539	-0.715	(0)
V+3	2.881e-34	7.083e-36	-33.540	-35.150	-1.609	(0)
VSO4+	5.543e-35	3.672e-35	-34.256	-34.435	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.087	-56.696	-1.609	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.417	-58.278	-2.861	(0)
V (4)	1.736e-18					
V (OH) 3+	1.672e-18	1.108e-18	-17.777	-17.956	-0.179	(0)
VO+2	3.547e-20	6.833e-21	-19.450	-20.165	-0.715	(0)
VOSO4	2.067e-20	2.067e-20	-19.685	-19.685	0.000	(0)
VOF+	7.344e-21	4.865e-21	-20.134	-20.313	-0.179	(0)
VOF2	2.166e-22	2.166e-22	-21.664	-21.664	0.000	(0)
VOC1+	1.883e-22	1.248e-22	-21.725	-21.904	-0.179	(0)
VOF3-	1.377e-24	9.123e-25	-23.861	-24.040	-0.179	(0)
VOF4-2	2.270e-27	4.372e-28	-26.644	-27.359	-0.715	(0)
H2V2O4+2	3.204e-31	6.171e-32	-30.494	-31.210	-0.715	(0)
V (5)	3.439e-08					
H2VO4-	2.023e-08	1.340e-08	-7.694	-7.873	-0.179	(0)
HVO4-2	1.415e-08	2.727e-09	-7.849	-8.564	-0.715	(0)
H3VO4	1.655e-12	1.655e-12	-11.781	-11.781	0.000	(0)
HV2O7-3	5.046e-13	1.241e-14	-12.297	-13.906	-1.609	(0)
H3V2O7-	2.165e-13	1.435e-13	-12.664	-12.843	-0.179	(0)
VO4-3	4.502e-14	1.107e-15	-13.347	-14.956	-1.609	(0)
V2O7-4	1.964e-14	2.704e-17	-13.707	-16.568	-2.861	(0)
V3O9-3	1.031e-16	2.535e-18	-15.987	-17.596	-1.609	(0)
VO2+	5.316e-17	4.092e-17	-16.274	-16.388	-0.114	(0)
VO2SO4-	1.620e-17	1.073e-17	-16.791	-16.969	-0.179	(0)
VO2F	8.521e-18	8.521e-18	-17.070	-17.070	0.000	(0)

VO2F2-	5.544e-19	3.673e-19	-18.256	-18.435	-0.179	(0)
V4O12-4	1.030e-20	1.419e-23	-19.987	-22.848	-2.861	(0)
VO2F3-2	2.823e-21	5.439e-22	-20.549	-21.264	-0.715	(0)
VO2F4-3	1.292e-24	3.177e-26	-23.889	-25.498	-1.609	(0)
VO2NO3	3.194e-25	3.194e-25	-24.496	-24.496	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.009	-61.446	-6.437	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.698	-61.168	-4.470	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.008	-63.869	-2.861	(0)
Zn	2.581e-05					
Zn+2	1.093e-05	3.840e-06	-4.961	-5.416	-0.454	(0)
ZnSO4	9.227e-06	9.227e-06	-5.035	-5.035	0.000	(0)
Zn(SO4) 2-2	4.582e-06	8.826e-07	-5.339	-6.054	-0.715	(0)
ZnOH+	4.718e-07	3.126e-07	-6.326	-6.505	-0.179	(0)
ZnCO3	3.261e-07	3.261e-07	-6.487	-6.487	0.000	(0)
ZnCl+	8.322e-08	6.278e-08	-7.080	-7.202	-0.122	(0)
ZnHCO3+	7.124e-08	4.720e-08	-7.147	-7.326	-0.179	(0)
ZnOHC1	6.690e-08	6.690e-08	-7.175	-7.175	0.000	(0)
Zn(OH) 2	4.032e-08	4.032e-08	-7.394	-7.394	0.000	(0)
ZnF+	1.373e-08	9.096e-09	-7.862	-8.041	-0.179	(0)
ZnCl2	6.476e-10	6.476e-10	-9.189	-9.189	0.000	(0)
Zn(OH) 3-	2.483e-10	1.645e-10	-9.605	-9.784	-0.179	(0)
ZnCl3-	4.439e-12	3.348e-12	-11.353	-11.475	-0.122	(0)
ZnNO3+	2.247e-13	1.489e-13	-12.648	-12.827	-0.179	(0)
ZnSeO4	1.984e-13	1.984e-13	-12.702	-12.702	0.000	(0)
ZnCl4-2	3.099e-14	1.090e-14	-13.509	-13.963	-0.454	(0)
Zn(OH) 4-2	2.767e-14	5.330e-15	-13.558	-14.273	-0.715	(0)
Zn(NO3) 2	4.584e-22	4.584e-22	-21.339	-21.339	0.000	(0)
Zn(SeO4) 2-2	3.484e-22	6.711e-23	-21.458	-22.173	-0.715	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.291	-147.470	-0.179	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.296	-224.475	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.15	-48.86	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.12	-37.61	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.35	-37.61	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.24	-53.31	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-56.47	-36.43	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.90	-28.49	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.39	-22.94	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-1.40	9.40	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.72	-45.36	2.37	Al2 (MoO4) 3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4 (OH) 10SO4	-2.86	19.84	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2 (OH) 3Cl
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.24	-1.37	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.52	6.42	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.38	-23.05	-9.67	BaCrO4

BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.56	-6.73	1.83	BaSeO3
BaSeO4	-10.04	-17.50	-7.46	BaSeO4
Bianchite	-5.61	-7.38	-1.76	ZnSO4:6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.85	-77.38	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.45	13.39	16.84	Mg(OH)2
Bunsenite	-6.66	5.78	12.45	NiO
Ca(VO3)2	-9.45	-3.79	5.66	Ca(VO3)2
Ca2V2O7	-8.13	9.37	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.18	9.37	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-16.42	22.54	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-17.32	22.54	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-15.42	-17.68	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.18	-1.36	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.11	-12.13	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.41	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal(alpha)	-31.82	-18.31	13.51	Cd
Cdmetal(gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO4:2H2O	-16.21	-18.06	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.43	-40.53	-27.10	PbSe
Co(BO2)2	-28.70	-1.63	27.07	Co(BO2)2
Co(OH)2	-6.68	6.41	13.09	Co(OH)2
Co(OH)3	-10.91	-13.22	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-26.09	-13.06	13.03	Co3(AsO4)2
Co3O4	-9.52	-20.01	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2

CoF3	-47.26	-48.71	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.21	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.69	-39.89	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.35	-18.88	-1.53	CoSeO4:6H2O
CoSO4	-14.16	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.89	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-22.43	-11.62	10.82	Cr (OH) 2
Cr (OH) 3	-3.13	-1.79	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-1.04	-1.79	-0.75	Cr (OH) 3
Cr2O3	-1.22	-3.58	-2.36	Cr2O3
CrCl2	-45.90	-31.80	14.09	CrCl2
CrCl3	-47.19	-32.07	15.11	CrCl3
CrF3	-25.95	-37.29	-11.34	CrF3
Crmetal	-67.64	-37.16	30.48	Cr
CrO3	-27.64	-30.85	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.17	-49.97	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.53	-88.02	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-17.16	-22.60	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.95	-38.05	-33.10	CuSe
CuSe2	-25.45	-58.81	-33.37	CuSe2
CuSeO3:2H2O	-6.79	-6.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.61	-17.05	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.79	-13.51	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.70	-8.15	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.58	-37.21	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-7.33	-0.13	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.01	-63.61	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.85	-42.85	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-

Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.56	-80.53	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.90	2.77	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.34	-46.30	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.58	-258.29	-73.71	Hg (CH3) 2
Hg (g)	-6.71	-14.59	-7.87	Hg
Hg (OH) 2	-7.14	-10.64	-3.50	Hg (OH) 2
Hg2 (g)	-14.22	-29.17	-14.96	Hg2
Hg2 (OH) 2	-8.89	-3.63	5.26	Hg2 (OH) 2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.78	-34.48	-8.70	Hg2CrO4
Hg2F2	-16.93	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.92	-11.68	Hg2S
Hg2SeO3	-13.50	-18.16	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF (g)	-46.32	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.24	-56.94	-55.69	HgSe
HgSeO3	-12.73	-25.16	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.85	-19.62	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.58	-49.82	-17.24	K2Cr2O7
K2CrO4	-18.46	-18.97	-0.51	K2CrO4
K2MoO4	-12.77	-9.51	3.26	K2MoO4
K2SeO4	-12.69	-13.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.85	-3.57	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.53	9.83	26.36	Mg2V2O7

MgCr2O4	-6.39	9.82	16.20	MgCr2O4
MgCrO4	-22.83	-17.45	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.14	-7.99	-1.85	MgMoO4
MgSeO3:6H2O	-4.20	-1.14	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.70	-11.90	-1.20	MgSeO4:6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4:10H2O
Mn(VO3)2	-10.55	-5.65	4.90	Mn(VO3)2
Mn2(SO4)3	-50.15	-55.87	-5.71	Mn2(SO4)3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-10.88	1.62	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.60	-8.88	2.72	MnCl2:4H2O
MnS(grn)	-75.16	-74.99	0.17	MnS
MnS(pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.50	-35.00	3.50	MnSe
MnSeO3	-4.35	-3.22	1.13	MnSeO3
MnSeO3:2H2O	-4.21	-3.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.94	-13.99	-2.05	MnSeO4:5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-6.99	-10.63	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.57	-19.77	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.40	-49.29	-9.90	Na2Cr2O7
Na2CrO4	-21.37	-18.44	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.37	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.43	-2.13	10.30	Na2SeO3:5H2O
Na2SeO4	-14.17	-12.89	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.56	10.13	36.68	Na3VO4
Na4V2O7	-29.55	7.85	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-6.14	-2.28	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni(OH)2	-7.01	5.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-30.65	-14.95	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-26.65	5.35	32.00	Ni4(OH)6SO4
NiCO3	-8.99	-15.86	-6.87	NiCO3
NiMoO4	-4.46	-15.61	-11.14	NiMoO4
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.82	-40.52	-17.70	NiSe
NiSeO3:2H2O	-11.56	-8.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.00	-19.52	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb(BO2)2	-8.79	-2.27	6.52	Pb(BO2)2
Pb(OH)2	-2.38	5.77	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-63.43	-72.19	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.65	11.54	26.19	Pb2O(OH)2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.52	-5.42	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.79	0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3

Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.80	5.30	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.48	-25.08	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn (OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.38	-18.88	-14.50	UO2CO3
Sb (OH) 3	-12.19	-19.30	-7.11	Sb (OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.75	-177.51	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6 (orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.61	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.22	2.77	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.65	-20.76	-7.11	Se
Semetal (hex)	-13.05	-20.76	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.25	-11.25	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.67	10.42	21.08	U3O8
U3Sb4	-576.78	-424.40	152.38	U3Sb4
U4O9	-25.66	-28.68	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.18	-60.89	-32.72	UF4:2.5H2O
UO2 (am)	-14.49	-13.56	0.93	UO2
UO2 (NO3) 2	-40.82	-28.67	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.52	-28.67	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.06	-28.67	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.72	-28.67	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.84	2.77	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.27	-22.52	-2.25	UO2SeO4:4H2O
UO3	-4.93	2.77	7.70	UO3
Uraninite	-8.89	-13.56	-4.67	UO2
USb2	-218.67	-189.09	29.58	USb2
V (OH) 3	-19.02	-11.43	7.59	V (OH) 3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-40.43	-38.59	1.84	V3O5
V4O7	-50.13	-42.94	7.19	V4O7
V6O13	-41.11	-101.97	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VCl2	-63.26	-44.39	18.87	VCl2

VC13	-65.14	-41.71	23.43	VC13
VF4	-66.61	-51.68	14.93	VF4
Vmetal	-93.77	-49.74	44.03	V
VO	-38.95	-24.20	14.76	VO
VO(OH)2	-9.50	-4.35	5.15	VO(OH)2
VO2Cl	-21.42	-18.57	2.84	VO2Cl
VOC1	-32.67	-21.52	11.15	VOC1
VOC12	-37.30	-24.54	12.76	VOC12
VOSO4	-25.73	-22.12	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO4
Zn(BO2)2	-5.93	2.36	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.36	-21.04	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.80	10.40	12.20	Zn(OH)2
Zn(OH)2(am)	-2.07	10.40	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.35	10.40	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.13	10.40	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.33	10.40	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.48	3.02	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.49	10.70	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.75	-1.10	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.26	-4.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.69	31.81	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.27	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.79	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.50	-35.90	-14.40	ZnSe
ZnSeO4:6H2O	-13.38	-14.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 124.

```

Title Stage 7 Pit lake Mix
Mix 703
704 0.195667
708 0.052364
1 0.126410
17 0.132998
16 0.000000
615 0.492561
Save solution 709
end

```

TITLE

Stage 7 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 703.

Mixture 703.

1.264e-01 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1 and PW-3 (representative of water used to rapidly re-fill pit)

1.330e-01 Solution 17 Average water quality for Background Surface Water SWQ-1 (representative of haul road and watershed run-off)

4.926e-01 Solution 615 Solution after simulation 114.

1.957e-01 Solution 704 Solution after simulation 119.

5.236e-02 Solution 708 Solution after simulation 123.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.472e-08	1.472e-08
Al	1.353e-06	1.353e-06
As	1.478e-10	1.478e-10
B	2.088e-05	2.088e-05
Ba	4.234e-08	4.234e-08
C	2.564e-03	2.564e-03
Ca	2.218e-03	2.218e-03
Cd	6.974e-09	6.974e-09
Cl	2.602e-03	2.602e-03
Co	5.369e-08	5.369e-08
Cr	1.671e-09	1.671e-09
Cu	1.691e-06	1.691e-06
F	1.481e-04	1.481e-04
Fe	1.164e-09	1.164e-09
Hg	1.100e-09	1.100e-09
K	1.916e-03	1.916e-03
Mg	2.893e-03	2.893e-03
Mn	3.282e-05	3.282e-05
Mo	9.661e-07	9.661e-07
N	8.032e-06	8.032e-06
Na	7.494e-03	7.494e-03
Ni	8.366e-08	8.366e-08
Pb	5.149e-09	5.150e-09
S	7.242e-03	7.243e-03
Sb	1.469e-08	1.469e-08
Se	8.533e-08	8.533e-08
Si	3.899e-05	3.899e-05
U	1.347e-07	1.347e-07
V	4.439e-09	4.440e-09
Zn	3.323e-06	3.323e-06

-----Description of solution-----

	pH	=	7.576	Charge balance
	pe	=	5.164	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	2.646e-02	
	Mass of water (kg)	=	1.000e+00	
	Total alkalinity (eq/kg)	=	2.468e-03	
	Total CO2 (mol/kg)	=	2.564e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	9.505e-07	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	11	

Total H = 1.110194e+02
Total O = 5.554517e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.458e-07	3.795e-07	-6.351	-6.421	-0.070	(0)
H+	3.096e-08	2.652e-08	-7.509	-7.576	-0.067	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	1.472e-08					
AgCl	9.754e-09	9.754e-09	-8.011	-8.011	0.000	(0)
Ag+	2.503e-09	2.144e-09	-8.601	-8.669	-0.067	(0)
AgCl2-	2.292e-09	1.893e-09	-8.640	-8.723	-0.083	(0)
AgSO4-	1.616e-10	1.335e-10	-9.792	-9.875	-0.083	(0)
AgCl3-2	8.072e-12	3.759e-12	-11.093	-11.425	-0.332	(0)
AgNO2	2.807e-12	2.807e-12	-11.552	-11.552	0.000	(0)
AgF	5.968e-13	5.968e-13	-12.224	-12.224	0.000	(0)
AgCl4-3	9.546e-14	1.710e-14	-13.020	-13.767	-0.747	(0)
AgOH	8.137e-14	8.137e-14	-13.090	-13.090	0.000	(0)
AgNH3+	5.838e-14	4.822e-14	-13.234	-13.317	-0.083	(0)
Ag2Se	2.060e-14	2.060e-14	-13.686	-13.686	0.000	(0)
AgH2BO3	1.520e-14	1.520e-14	-13.818	-13.818	0.000	(0)
AgSeO3-	1.393e-14	1.151e-14	-13.856	-13.939	-0.083	(0)
Ag (NO2) 2-	3.298e-17	2.724e-17	-16.482	-16.565	-0.083	(0)
AgNO3	8.683e-18	8.683e-18	-17.061	-17.061	0.000	(0)
Ag (NH3) 2+	5.228e-18	4.319e-18	-17.282	-17.365	-0.083	(0)
Ag (OH) 2-	3.653e-18	3.018e-18	-17.437	-17.520	-0.083	(0)
Ag (SeO3) 2-3	4.802e-21	8.605e-22	-20.319	-21.065	-0.747	(0)
Ag2MoO4	9.039e-25	9.039e-25	-24.044	-24.044	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.198	-73.198	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.793	-84.121	-1.328	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.165	-147.349	-0.184	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.359	-147.442	-0.083	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.870	-149.213	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.197	-149.524	-0.327	(0)
Al	1.353e-06					
Al (OH) 4-	1.322e-06	1.134e-06	-5.879	-5.946	-0.067	(0)
Al (OH) 3	2.372e-08	2.372e-08	-7.625	-7.625	0.000	(0)
Al (OH) 2+	3.633e-09	3.133e-09	-8.440	-8.504	-0.064	(0)
AlF3	1.868e-09	1.868e-09	-8.729	-8.729	0.000	(0)
AlF2+	1.553e-09	1.339e-09	-8.809	-8.873	-0.064	(0)
AlF4-	1.210e-10	1.037e-10	-9.917	-9.984	-0.067	(0)
AlF+2	5.490e-11	3.034e-11	-10.260	-10.518	-0.258	(0)
AlOH+2	1.880e-11	1.039e-11	-10.726	-10.983	-0.258	(0)
AlSO4+	7.737e-13	6.633e-13	-12.111	-12.178	-0.067	(0)
Al+3	1.105e-13	2.738e-14	-12.957	-13.563	-0.606	(0)
Al (SO4) 2-	2.587e-14	2.218e-14	-13.587	-13.654	-0.067	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.988	-41.735	-0.747	(0)
As (3)	1.807e-23					
H3AsO3	1.765e-23	1.765e-23	-22.753	-22.753	0.000	(0)
H2AsO3-	4.133e-25	3.414e-25	-24.384	-24.467	-0.083	(0)
HAsO3-2	2.521e-29	1.174e-29	-28.598	-28.930	-0.332	(0)
H4AsO3+	2.808e-31	2.320e-31	-30.552	-30.635	-0.083	(0)
AsO3-3	9.527e-35	1.707e-35	-34.021	-34.768	-0.747	(0)
As (5)	1.478e-10					
HAsO4-2	1.300e-10	6.056e-11	-9.886	-10.218	-0.332	(0)
H2AsO4-	1.773e-11	1.465e-11	-10.751	-10.834	-0.083	(0)
AsO4-3	4.031e-14	7.222e-15	-13.395	-14.141	-0.747	(0)
H3AsO4	6.709e-17	6.750e-17	-16.173	-16.171	0.003	(0)
B	2.088e-05					
H3BO3	2.030e-05	2.043e-05	-4.692	-4.690	0.003	(0)
H2BO3-	5.294e-07	4.473e-07	-6.276	-6.349	-0.073	(0)
CaH2BO3+	2.575e-08	2.175e-08	-7.589	-7.662	-0.073	(0)
MgH2BO3+	2.151e-08	1.817e-08	-7.667	-7.741	-0.073	(0)
NaH2BO3	4.471e-09	4.471e-09	-8.350	-8.350	0.000	(0)
BF (OH) 3-	1.069e-09	9.033e-10	-8.971	-9.044	-0.073	(0)

	H5 (BO3) 2-	9.204e-12	7.776e-12	-11.036	-11.109	-0.073	(0)
	BaH2BO3+	3.679e-13	3.108e-13	-12.434	-12.507	-0.073	(0)
	BF2 (OH) 2-	3.360e-13	2.839e-13	-12.474	-12.547	-0.073	(0)
	H8 (BO3) 3-	1.880e-14	1.588e-14	-13.726	-13.799	-0.073	(0)
	AgH2BO3	1.520e-14	1.520e-14	-13.818	-13.818	0.000	(0)
	BF3OH-	3.844e-19	3.248e-19	-18.415	-18.488	-0.073	(0)
	BF4-	5.561e-24	4.698e-24	-23.255	-23.328	-0.073	(0)
Ba		4.234e-08					
	Ba+2	4.180e-08	2.249e-08	-7.379	-7.648	-0.269	(0)
	BaHCO3+	5.034e-10	4.356e-10	-9.298	-9.361	-0.063	(0)
	BaCO3	4.135e-11	4.135e-11	-10.383	-10.383	0.000	(0)
	BaH2BO3+	3.679e-13	3.108e-13	-12.434	-12.507	-0.073	(0)
	BaOH+	4.332e-14	3.725e-14	-13.363	-13.429	-0.065	(0)
	BaNO3+	6.956e-16	5.746e-16	-15.158	-15.241	-0.083	(0)
	BaNH3+2	3.356e-16	1.563e-16	-15.474	-15.806	-0.332	(0)
C (4)		2.564e-03					
	HCO3-	2.353e-03	2.028e-03	-2.628	-2.693	-0.064	(0)
	H2CO3	1.210e-04	1.210e-04	-3.917	-3.917	0.000	(0)
	CaHCO3+	3.689e-05	3.192e-05	-4.433	-4.496	-0.063	(0)
	MgHCO3+	2.847e-05	2.432e-05	-4.546	-4.614	-0.068	(0)
	NaHCO3	7.193e-06	7.193e-06	-5.143	-5.143	0.000	(0)
	CO3-2	6.666e-06	3.586e-06	-5.176	-5.445	-0.269	(0)
	CaCO3	4.803e-06	4.803e-06	-5.318	-5.318	0.000	(0)
	MgCO3	3.495e-06	3.495e-06	-5.457	-5.457	0.000	(0)
	CuCO3	1.383e-06	1.383e-06	-5.859	-5.859	0.000	(0)
	MnHCO3+	5.598e-07	4.814e-07	-6.252	-6.317	-0.065	(0)
	NaCO3-	4.884e-07	4.211e-07	-6.311	-6.376	-0.064	(0)
	ZnCO3	2.343e-07	2.343e-07	-6.630	-6.630	0.000	(0)
	ZnHCO3+	8.818e-08	7.285e-08	-7.055	-7.138	-0.083	(0)
	UO2 (CO3) 3-4	8.604e-08	4.048e-09	-7.065	-8.393	-1.328	(0)
	UO2 (CO3) 2-2	4.836e-08	2.252e-08	-7.316	-7.647	-0.332	(0)
	Cu (CO3) 2-2	2.866e-08	1.335e-08	-7.543	-7.875	-0.332	(0)
	CuHCO3+	1.014e-08	8.380e-09	-7.994	-8.077	-0.083	(0)
	NiHCO3+	8.630e-09	7.129e-09	-8.064	-8.147	-0.083	(0)
	NiCO3	3.814e-09	3.814e-09	-8.419	-8.419	0.000	(0)
	CoHCO3+	3.368e-09	2.783e-09	-8.473	-8.556	-0.083	(0)
	PbCO3	3.160e-09	3.160e-09	-8.500	-8.500	0.000	(0)
	CoCO3	1.069e-09	1.069e-09	-8.971	-8.971	0.000	(0)
	PbHCO3+	5.349e-10	4.419e-10	-9.272	-9.355	-0.083	(0)
	BaHCO3+	5.034e-10	4.356e-10	-9.298	-9.361	-0.063	(0)
	UO2CO3	3.148e-10	3.148e-10	-9.502	-9.502	0.000	(0)
	CdCO3	1.892e-10	1.892e-10	-9.723	-9.723	0.000	(0)
	Pb (CO3) 2-2	7.018e-11	3.269e-11	-10.154	-10.486	-0.332	(0)
	BaCO3	4.135e-11	4.135e-11	-10.383	-10.383	0.000	(0)
	CdHCO3+	1.294e-11	1.069e-11	-10.888	-10.971	-0.083	(0)
	Cd (CO3) 2-2	1.080e-12	5.029e-13	-11.967	-12.298	-0.332	(0)
	FeHCO3+	4.406e-14	3.813e-14	-13.356	-13.419	-0.063	(0)
	HgCO3	1.081e-14	1.081e-14	-13.966	-13.966	0.000	(0)
	Hg (CO3) 2-2	2.631e-16	1.225e-16	-15.580	-15.912	-0.332	(0)
	HgHCO3+	6.459e-18	5.336e-18	-17.190	-17.273	-0.083	(0)
Ca		2.218e-03					
	Ca+2	1.571e-03	8.451e-04	-2.804	-3.073	-0.269	(0)
	CaSO4	6.042e-04	6.042e-04	-3.219	-3.219	0.000	(0)
	CaHCO3+	3.689e-05	3.192e-05	-4.433	-4.496	-0.063	(0)
	CaCO3	4.803e-06	4.803e-06	-5.318	-5.318	0.000	(0)
	CaF+	1.189e-06	1.022e-06	-5.925	-5.990	-0.065	(0)
	CaH2BO3+	2.575e-08	2.175e-08	-7.589	-7.662	-0.073	(0)
	CaOH+	7.396e-09	6.400e-09	-8.131	-8.194	-0.063	(0)
	CaNH3+2	2.517e-11	1.172e-11	-10.599	-10.931	-0.332	(0)
	CaNO3+	1.649e-11	1.363e-11	-10.783	-10.866	-0.083	(0)
	Ca (NH3) 2+2	1.104e-19	5.141e-20	-18.957	-19.289	-0.332	(0)
Cd		6.974e-09					
	Cd+2	4.303e-09	2.315e-09	-8.366	-8.636	-0.269	(0)
	CdSO4	1.693e-09	1.693e-09	-8.771	-8.771	0.000	(0)
	CdCl+	5.963e-10	4.926e-10	-9.225	-9.308	-0.083	(0)
	CdCO3	1.892e-10	1.892e-10	-9.723	-9.723	0.000	(0)
	Cd (SO4) 2-2	1.531e-10	7.130e-11	-9.815	-10.147	-0.332	(0)
	CdHCO3+	1.294e-11	1.069e-11	-10.888	-10.971	-0.083	(0)

	CdOH+	8.447e-12	6.978e-12	-11.073	-11.156	-0.083	(0)
	CdOHCl	7.669e-12	7.669e-12	-11.115	-11.115	0.000	(0)
	CdF+	4.922e-12	4.066e-12	-11.308	-11.391	-0.083	(0)
	CdCl2	4.575e-12	4.575e-12	-11.340	-11.340	0.000	(0)
	Cd(CO3) 2-2	1.080e-12	5.029e-13	-11.967	-12.298	-0.332	(0)
	Cd(OH) 2	1.671e-14	1.671e-14	-13.777	-13.777	0.000	(0)
	CdCl3-	7.787e-15	6.433e-15	-14.109	-14.192	-0.083	(0)
	CdF2	8.990e-16	8.990e-16	-15.046	-15.046	0.000	(0)
	CdNO3+	4.518e-17	3.732e-17	-16.345	-16.428	-0.083	(0)
	CdSeO4	1.345e-17	1.345e-17	-16.871	-16.871	0.000	(0)
	Cd(OH) 3-	4.691e-19	3.875e-19	-18.329	-18.412	-0.083	(0)
	Cd2OH+3	4.518e-19	8.095e-20	-18.345	-19.092	-0.747	(0)
	Cd(SeO3) 2-2	2.857e-19	1.330e-19	-18.544	-18.876	-0.332	(0)
	Cd(NO3) 2	9.538e-26	9.538e-26	-25.021	-25.021	0.000	(0)
	Cd(OH) 4-2	5.169e-26	2.407e-26	-25.287	-25.618	-0.332	(0)
	CdHS+	0.000e+00	0.000e+00	-78.888	-78.971	-0.083	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.111	-150.111	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.472	-226.555	-0.083	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.371	-302.703	-0.332	(0)
C1		2.602e-03					
	Cl-	2.602e-03	2.228e-03	-2.585	-2.652	-0.067	(0)
	MnCl+	3.880e-08	3.337e-08	-7.411	-7.477	-0.065	(0)
	AgCl	9.754e-09	9.754e-09	-8.011	-8.011	0.000	(0)
	ZnCl+	7.440e-09	6.357e-09	-8.128	-8.197	-0.068	(0)
	ZnOHCl	3.159e-09	3.159e-09	-8.501	-8.501	0.000	(0)
	AgCl2-	2.292e-09	1.893e-09	-8.640	-8.723	-0.083	(0)
	CuCl	6.169e-10	6.169e-10	-9.210	-9.210	0.000	(0)
	CdCl+	5.963e-10	4.926e-10	-9.225	-9.308	-0.083	(0)
	CuCl2-	3.362e-10	2.872e-10	-9.473	-9.542	-0.068	(0)
	CuCl+	2.707e-10	2.312e-10	-9.568	-9.636	-0.068	(0)
	NiCl+	1.968e-10	1.625e-10	-9.706	-9.789	-0.083	(0)
	CoCl+	1.646e-10	1.359e-10	-9.784	-9.867	-0.083	(0)
	MnCl2	1.050e-10	1.050e-10	-9.979	-9.979	0.000	(0)
	PbCl+	2.806e-11	2.318e-11	-10.552	-10.635	-0.083	(0)
	ZnCl2	2.245e-11	2.245e-11	-10.649	-10.649	0.000	(0)
	AgCl3-2	8.072e-12	3.759e-12	-11.093	-11.425	-0.332	(0)
	CdOHCl	7.669e-12	7.669e-12	-11.115	-11.115	0.000	(0)
	CdCl2	4.575e-12	4.575e-12	-11.340	-11.340	0.000	(0)
	HgClOH	3.761e-12	3.761e-12	-11.425	-11.425	0.000	(0)
	HgCl2	1.250e-12	1.250e-12	-11.903	-11.903	0.000	(0)
	CuCl3-2	2.501e-13	1.368e-13	-12.602	-12.864	-0.262	(0)
	PbCl2	2.307e-13	2.307e-13	-12.637	-12.637	0.000	(0)
	CuCl2	1.787e-13	1.787e-13	-12.748	-12.748	0.000	(0)
	AgCl4-3	9.546e-14	1.710e-14	-13.020	-13.767	-0.747	(0)
	MnCl3-	7.495e-14	6.446e-14	-13.125	-13.191	-0.065	(0)
	ZnCl3-	4.651e-14	3.973e-14	-13.332	-13.401	-0.068	(0)
	HgCl3-	3.372e-14	2.786e-14	-13.472	-13.555	-0.083	(0)
	CdCl3-	7.787e-15	6.433e-15	-14.109	-14.192	-0.083	(0)
	NiCl2	1.824e-15	1.824e-15	-14.739	-14.739	0.000	(0)
	HgCl4-2	5.306e-16	2.471e-16	-15.275	-15.607	-0.332	(0)
	PbCl3-	2.478e-16	2.047e-16	-15.606	-15.689	-0.083	(0)
	HgCl+	1.355e-16	1.119e-16	-15.868	-15.951	-0.083	(0)
	UO2Cl+	9.645e-17	7.968e-17	-16.016	-16.099	-0.083	(0)
	ZnCl4-2	8.092e-17	4.427e-17	-16.092	-16.354	-0.262	(0)
	CrCl+2	1.898e-17	8.839e-18	-16.722	-17.054	-0.332	(0)
	CuCl3-	4.349e-18	3.716e-18	-17.362	-17.430	-0.068	(0)
	PbCl4-2	4.476e-19	2.085e-19	-18.349	-18.681	-0.332	(0)
	CrOHCl2	1.421e-19	1.421e-19	-18.847	-18.847	0.000	(0)
	FeCl+2	2.488e-21	1.361e-21	-20.604	-20.866	-0.262	(0)
	CrCl2+	2.262e-21	1.869e-21	-20.645	-20.728	-0.083	(0)
	VOCl+	1.287e-22	1.063e-22	-21.890	-21.973	-0.083	(0)
	CuCl4-2	7.584e-23	4.149e-23	-22.120	-22.382	-0.262	(0)
	FeCl2+	1.575e-23	1.355e-23	-22.803	-22.868	-0.065	(0)
	CrO3Cl-	1.702e-26	1.406e-26	-25.769	-25.852	-0.083	(0)
	FeCl3	3.019e-27	3.019e-27	-26.520	-26.520	0.000	(0)
	CoCl+2	9.968e-36	4.642e-36	-35.001	-35.333	-0.332	(0)
	UCl+3	0.000e+00	0.000e+00	-45.279	-46.026	-0.747	(0)
	Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-48.838	-49.170	-0.332	(0)

Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.479	-50.811	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.511	-63.843	-0.332	(0)
Co (2)	5.369e-08					
Co+2	3.787e-08	1.764e-08	-7.422	-7.754	-0.332	(0)
CoSO4	1.098e-08	1.098e-08	-7.959	-7.959	0.000	(0)
CoHCO3+	3.368e-09	2.783e-09	-8.473	-8.556	-0.083	(0)
CoCO3	1.069e-09	1.069e-09	-8.971	-8.971	0.000	(0)
CoCl+	1.646e-10	1.359e-10	-9.784	-9.867	-0.083	(0)
CoOH+	1.617e-10	1.336e-10	-9.791	-9.874	-0.083	(0)
CoF+	7.482e-11	6.181e-11	-10.126	-10.209	-0.083	(0)
Co (OH) 2	4.026e-12	4.026e-12	-11.395	-11.395	0.000	(0)
CoNO2+	9.428e-13	7.788e-13	-12.026	-12.109	-0.083	(0)
Co (NH3) +2	5.016e-14	2.336e-14	-13.300	-13.632	-0.332	(0)
CoSeO4	2.758e-16	2.758e-16	-15.559	-15.559	0.000	(0)
CoNO3+	1.725e-16	1.425e-16	-15.763	-15.846	-0.083	(0)
Co (OH) 3-	3.691e-17	3.049e-17	-16.433	-16.516	-0.083	(0)
CoOOH-	9.265e-18	7.654e-18	-17.033	-17.116	-0.083	(0)
Co2OH+3	6.588e-19	1.180e-19	-18.181	-18.928	-0.747	(0)
Co (NH3) 2+2	2.357e-20	1.098e-20	-19.628	-19.959	-0.332	(0)
Co (OH) 4-2	3.938e-24	1.834e-24	-23.405	-23.737	-0.332	(0)
Co (NO3) 2	1.479e-24	1.479e-24	-23.830	-23.830	0.000	(0)
Co (NH3) 3+2	3.269e-27	1.523e-27	-26.486	-26.817	-0.332	(0)
Co4 (OH) 4+4	1.349e-30	6.348e-32	-29.870	-31.197	-1.328	(0)
Co (NH3) 4+2	1.890e-34	8.803e-35	-33.723	-34.055	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.461	-41.793	-0.332	(0)
Co (3)	4.240e-29					
CoOH+2	4.240e-29	1.975e-29	-28.373	-28.704	-0.332	(0)
Co+3	4.131e-35	1.024e-35	-34.384	-34.990	-0.606	(0)
CoCl+2	9.968e-36	4.642e-36	-35.001	-35.333	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.838	-49.170	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.689	-58.772	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.080	-63.412	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.511	-63.843	-0.332	(0)
Cr (2)	1.078e-26					
Cr+2	1.078e-26	5.021e-27	-25.967	-26.299	-0.332	(0)
Cr (3)	1.671e-09					
Cr (OH) 2+	1.423e-09	1.175e-09	-8.847	-8.930	-0.083	(0)
Cr (OH) 3	1.676e-10	1.676e-10	-9.776	-9.776	0.000	(0)
Cr (OH) +2	5.465e-11	2.545e-11	-10.262	-10.594	-0.332	(0)
CrOHSO4	1.885e-11	1.885e-11	-10.725	-10.725	0.000	(0)
CrO2-	3.634e-12	3.002e-12	-11.440	-11.523	-0.083	(0)
Cr (OH) 4-	3.065e-12	2.532e-12	-11.514	-11.597	-0.083	(0)
CrF+2	1.156e-13	5.384e-14	-12.937	-13.269	-0.332	(0)
CrSO4+	2.704e-14	2.234e-14	-13.568	-13.651	-0.083	(0)
Cr+3	1.711e-14	3.065e-15	-13.767	-14.514	-0.747	(0)
CrCl+2	1.898e-17	8.839e-18	-16.722	-17.054	-0.332	(0)
CrOHCl2	1.421e-19	1.421e-19	-18.847	-18.847	0.000	(0)
Cr2 (OH) 2SO4+2	9.310e-20	4.336e-20	-19.031	-19.363	-0.332	(0)
Cr2 (OH) 2 (SO4) 2	8.038e-21	8.038e-21	-20.095	-20.095	0.000	(0)
CrCl2+	2.262e-21	1.869e-21	-20.645	-20.728	-0.083	(0)
CrNO3+2	1.467e-24	6.831e-25	-23.834	-24.165	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.020	-40.352	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.514	-49.261	-0.747	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.479	-50.811	-0.332	(0)
Cr (6)	8.847e-16					
CrO4-2	8.191e-16	4.406e-16	-15.087	-15.356	-0.269	(0)
HCrO4-	4.577e-17	3.781e-17	-16.339	-16.422	-0.083	(0)
NaCrO4-	1.672e-17	1.381e-17	-16.777	-16.860	-0.083	(0)
KCrO4-	3.183e-18	2.629e-18	-17.497	-17.580	-0.083	(0)
CrO3SO4-2	2.048e-24	9.536e-25	-23.689	-24.021	-0.332	(0)
H2CrO4	8.128e-25	8.128e-25	-24.090	-24.090	0.000	(0)
CrO3Cl-	1.702e-26	1.406e-26	-25.769	-25.852	-0.083	(0)
Cr2O7-2	1.065e-31	4.960e-32	-30.973	-31.305	-0.332	(0)
Cu (1)	1.220e-09					
CuCl	6.169e-10	6.169e-10	-9.210	-9.210	0.000	(0)
CuCl2-	3.362e-10	2.872e-10	-9.473	-9.542	-0.068	(0)
Cu+	2.662e-10	2.199e-10	-9.575	-9.658	-0.083	(0)
CuCl3-2	2.501e-13	1.368e-13	-12.602	-12.864	-0.262	(0)

Cu (S4) 2-3	0.000e+00	0.000e+00	-147.468	-147.803	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.213	-148.533	-0.320	(0)
Cu (2)	1.689e-06					
CuCO3	1.383e-06	1.383e-06	-5.859	-5.859	0.000	(0)
Cu+2	1.217e-07	6.548e-08	-6.915	-7.184	-0.269	(0)
CuOH+	9.199e-08	7.859e-08	-7.036	-7.105	-0.068	(0)
CuSO4	4.682e-08	4.682e-08	-7.330	-7.330	0.000	(0)
Cu (CO3) 2-2	2.866e-08	1.335e-08	-7.543	-7.875	-0.332	(0)
CuHCO3+	1.014e-08	8.380e-09	-7.994	-8.077	-0.083	(0)
Cu (OH) 2	5.952e-09	5.952e-09	-8.225	-8.225	0.000	(0)
CuF+	5.543e-10	4.579e-10	-9.256	-9.339	-0.083	(0)
Cu2 (OH) 2+2	3.331e-10	1.551e-10	-9.477	-9.809	-0.332	(0)
CuCl+	2.707e-10	2.312e-10	-9.568	-9.636	-0.068	(0)
CuNO2+	5.201e-11	4.297e-11	-10.284	-10.367	-0.083	(0)
CuNH3+2	1.585e-11	7.382e-12	-10.800	-11.132	-0.332	(0)
Cu (OH) 3-	5.609e-12	4.633e-12	-11.251	-11.334	-0.083	(0)
CuCl2	1.787e-13	1.787e-13	-12.748	-12.748	0.000	(0)
Cu (NO2) 2	2.755e-15	2.755e-15	-14.560	-14.560	0.000	(0)
CuNO3+	1.278e-15	1.056e-15	-14.893	-14.976	-0.083	(0)
Cu (OH) 4-2	2.972e-17	1.384e-17	-16.527	-16.859	-0.332	(0)
CuCl3-	4.349e-18	3.716e-18	-17.362	-17.430	-0.068	(0)
CuCl4-2	7.584e-23	4.149e-23	-22.120	-22.382	-0.262	(0)
Cu (NO3) 2	6.777e-25	6.777e-25	-24.169	-24.169	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.234	-216.317	-0.083	(0)
F	1.481e-04					
F-	1.294e-04	1.108e-04	-3.888	-3.955	-0.067	(0)
MgF+	1.700e-05	1.457e-05	-4.770	-4.837	-0.067	(0)
CaF+	1.189e-06	1.022e-06	-5.925	-5.990	-0.065	(0)
NaF	4.410e-07	4.410e-07	-6.356	-6.356	0.000	(0)
MnF+	6.102e-08	5.248e-08	-7.214	-7.280	-0.065	(0)
HF	4.347e-09	4.347e-09	-8.362	-8.362	0.000	(0)
ZnF+	3.040e-09	2.511e-09	-8.517	-8.600	-0.083	(0)
AlF3	1.868e-09	1.868e-09	-8.729	-8.729	0.000	(0)
AlF2+	1.553e-09	1.339e-09	-8.809	-8.873	-0.064	(0)
BF (OH) 3-	1.069e-09	9.033e-10	-8.971	-9.044	-0.073	(0)
CuF+	5.543e-10	4.579e-10	-9.256	-9.339	-0.083	(0)
AlF4-	1.210e-10	1.037e-10	-9.917	-9.984	-0.067	(0)
NiF+	9.607e-11	7.937e-11	-10.017	-10.100	-0.083	(0)
CoF+	7.482e-11	6.181e-11	-10.126	-10.209	-0.083	(0)
AlF+2	5.490e-11	3.034e-11	-10.260	-10.518	-0.258	(0)
CdF+	4.922e-12	4.066e-12	-11.308	-11.391	-0.083	(0)
PbF+	2.772e-12	2.290e-12	-11.557	-11.640	-0.083	(0)
HF2-	2.151e-12	1.832e-12	-11.667	-11.737	-0.070	(0)
AgF	5.968e-13	5.968e-13	-12.224	-12.224	0.000	(0)
UO2F+	4.083e-13	3.373e-13	-12.389	-12.472	-0.083	(0)
BF2 (OH) 2-	3.360e-13	2.839e-13	-12.474	-12.547	-0.073	(0)
CrF+2	1.156e-13	5.384e-14	-12.937	-13.269	-0.332	(0)
UO2F2	1.078e-13	1.078e-13	-12.967	-12.967	0.000	(0)
PbF2	4.994e-15	4.994e-15	-14.302	-14.302	0.000	(0)
UO2F3-	3.633e-15	3.001e-15	-14.440	-14.523	-0.083	(0)
CdF2	8.990e-16	8.990e-16	-15.046	-15.046	0.000	(0)
H2F2	5.063e-17	5.063e-17	-16.296	-16.296	0.000	(0)
VO2F	8.569e-18	8.569e-18	-17.067	-17.067	0.000	(0)
FeF2+	8.477e-18	7.290e-18	-17.072	-17.137	-0.065	(0)
UO2F4-2	5.673e-18	2.642e-18	-17.246	-17.578	-0.332	(0)
FeF+2	4.493e-18	2.458e-18	-17.347	-17.609	-0.262	(0)
PbF3-	1.271e-18	1.050e-18	-17.896	-17.979	-0.083	(0)
FeF3	1.140e-18	1.140e-18	-17.943	-17.943	0.000	(0)
VO2F2-	4.174e-19	3.448e-19	-18.379	-18.462	-0.083	(0)
BF3OH-	3.844e-19	3.248e-19	-18.415	-18.488	-0.073	(0)
VOF+	1.369e-20	1.131e-20	-19.864	-19.947	-0.083	(0)
VO2F3-2	1.024e-21	4.767e-22	-20.990	-21.322	-0.332	(0)
VOF2	4.699e-22	4.699e-22	-21.328	-21.328	0.000	(0)
PbF4-2	1.196e-22	5.568e-23	-21.922	-22.254	-0.332	(0)
HgF+	1.252e-23	1.034e-23	-22.902	-22.985	-0.083	(0)
BF4-	5.561e-24	4.698e-24	-23.255	-23.328	-0.073	(0)
VOF3-	2.237e-24	1.848e-24	-23.650	-23.733	-0.083	(0)
VO2F4-3	1.451e-25	2.599e-26	-24.838	-25.585	-0.747	(0)

Sb(OH) 2F	1.166e-25	1.166e-25	-24.933	-24.933	0.000	(0)
SbOF	1.147e-25	1.147e-25	-24.940	-24.940	0.000	(0)
VOF4-2	1.775e-27	8.266e-28	-26.751	-27.083	-0.332	(0)
SiF6-2	9.897e-29	5.415e-29	-28.004	-28.266	-0.262	(0)
UF3+	5.535e-36	4.572e-36	-35.257	-35.340	-0.083	(0)
UF2+2	5.590e-37	2.603e-37	-36.253	-36.584	-0.332	(0)
UF4	5.556e-38	5.556e-38	-37.255	-37.255	0.000	(0)
UF+3	1.041e-39	1.866e-40	-38.982	-39.729	-0.747	(0)
UF5-	2.954e-40	2.440e-40	-39.530	-39.613	-0.083	(0)
UF6-2	0.000e+00	0.000e+00	-40.756	-41.088	-0.332	(0)
Fe (2)	4.420e-12					
Fe+2	3.206e-12	1.493e-12	-11.494	-11.826	-0.332	(0)
FeSO4	1.144e-12	1.144e-12	-11.942	-11.942	0.000	(0)
FeHCO3+	4.406e-14	3.813e-14	-13.356	-13.419	-0.063	(0)
FeOH+	2.623e-14	2.256e-14	-13.581	-13.647	-0.065	(0)
Fe (OH) 2	6.802e-18	6.802e-18	-17.167	-17.167	0.000	(0)
Fe (OH) 3-	9.492e-19	8.164e-19	-18.023	-18.088	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.564	-159.564	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.788	-235.871	-0.083	(0)
Fe (3)	1.160e-09					
Fe (OH) 2+	8.489e-10	7.320e-10	-9.071	-9.136	-0.064	(0)
Fe (OH) 3	2.984e-10	2.984e-10	-9.525	-9.525	0.000	(0)
Fe (OH) 4-	1.223e-11	1.054e-11	-10.913	-10.977	-0.064	(0)
FeOH+2	9.060e-15	4.957e-15	-14.043	-14.305	-0.262	(0)
FeF2+	8.477e-18	7.290e-18	-17.072	-17.137	-0.065	(0)
FeF+2	4.493e-18	2.458e-18	-17.347	-17.609	-0.262	(0)
FeF3	1.140e-18	1.140e-18	-17.943	-17.943	0.000	(0)
FeSO4+	8.236e-19	7.084e-19	-18.084	-18.150	-0.065	(0)
Fe+3	8.161e-20	2.023e-20	-19.088	-19.694	-0.606	(0)
Fe (SO4) 2-	5.721e-20	4.726e-20	-19.242	-19.325	-0.083	(0)
FeCl+2	2.488e-21	1.361e-21	-20.604	-20.866	-0.262	(0)
FeCl2+	1.575e-23	1.355e-23	-22.803	-22.868	-0.065	(0)
FeHSeO3+2	6.385e-24	2.974e-24	-23.195	-23.527	-0.332	(0)
Fe2 (OH) 2+4	1.730e-26	8.137e-28	-25.762	-27.090	-1.328	(0)
FeCl3	3.019e-27	3.019e-27	-26.520	-26.520	0.000	(0)
FeNO3+2	2.215e-27	1.031e-27	-26.655	-26.987	-0.332	(0)
Fe3 (OH) 4+5	1.021e-33	8.609e-36	-32.991	-35.065	-2.074	(0)
H (0)	4.653e-29					
H2	2.327e-29	2.341e-29	-28.633	-28.631	0.003	(0)
Hg (0)	1.093e-09					
Hg	1.093e-09	1.093e-09	-8.962	-8.962	0.000	(0)
Hg (1)	8.021e-21					
Hg2+2	4.011e-21	1.868e-21	-20.397	-20.729	-0.332	(0)
Hg (2)	7.331e-12					
HgClOH	3.761e-12	3.761e-12	-11.425	-11.425	0.000	(0)
Hg (OH) 2	2.275e-12	2.289e-12	-11.643	-11.640	0.003	(0)
HgCl2	1.250e-12	1.250e-12	-11.903	-11.903	0.000	(0)
HgCl3-	3.372e-14	2.786e-14	-13.472	-13.555	-0.083	(0)
HgCO3	1.081e-14	1.081e-14	-13.966	-13.966	0.000	(0)
HgCl4-2	5.306e-16	2.471e-16	-15.275	-15.607	-0.332	(0)
Hg (CO3) 2-2	2.631e-16	1.225e-16	-15.580	-15.912	-0.332	(0)
HgCl+	1.355e-16	1.119e-16	-15.868	-15.951	-0.083	(0)
HgOH+	4.605e-17	3.804e-17	-16.337	-16.420	-0.083	(0)
HgHCO3+	6.459e-18	5.336e-18	-17.190	-17.273	-0.083	(0)
Hg (NH3) 2+2	4.140e-19	1.928e-19	-18.383	-18.715	-0.332	(0)
Hg (OH) 3-	1.324e-19	1.093e-19	-18.878	-18.961	-0.083	(0)
HgNH3+2	3.758e-20	1.750e-20	-19.425	-19.757	-0.332	(0)
Hg+2	5.406e-21	2.518e-21	-20.267	-20.599	-0.332	(0)
HgSO4	2.057e-21	2.057e-21	-20.687	-20.687	0.000	(0)
HgF+	1.252e-23	1.034e-23	-22.902	-22.985	-0.083	(0)
Hg (NH3) 3+2	1.816e-26	8.457e-27	-25.741	-26.073	-0.332	(0)
HgNO3+	5.738e-30	4.740e-30	-29.241	-29.324	-0.083	(0)
Hg (NH3) 4+2	1.589e-33	7.401e-34	-32.799	-33.131	-0.332	(0)
Hg (NO3) 2	1.005e-38	1.005e-38	-37.998	-37.998	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.699	-137.782	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-138.582	-138.914	-0.332	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.965	-138.965	0.000	(0)
K	1.916e-03					

K+	1.875e-03	1.606e-03	-2.727	-2.794	-0.067	(0)
KSO4-	4.115e-05	3.548e-05	-4.386	-4.450	-0.064	(0)
KCrO4-	3.183e-18	2.629e-18	-17.497	-17.580	-0.083	(0)
Mg	2.893e-03					
Mg+2	2.178e-03	1.172e-03	-2.662	-2.931	-0.269	(0)
MgSO4	6.655e-04	6.655e-04	-3.177	-3.177	0.000	(0)
MgHCO3+	2.847e-05	2.432e-05	-4.546	-4.614	-0.068	(0)
MgF+	1.700e-05	1.457e-05	-4.770	-4.837	-0.067	(0)
MgCO3	3.495e-06	3.495e-06	-5.457	-5.457	0.000	(0)
MgOH+	2.040e-07	1.770e-07	-6.690	-6.752	-0.062	(0)
MgH2BO3+	2.151e-08	1.817e-08	-7.667	-7.741	-0.073	(0)
Mn (2)	3.282e-05					
Mn+2	2.554e-05	1.190e-05	-4.593	-4.925	-0.332	(0)
MnSO4	6.602e-06	6.602e-06	-5.180	-5.180	0.000	(0)
MnHCO3+	5.598e-07	4.814e-07	-6.252	-6.317	-0.065	(0)
MnF+	6.102e-08	5.248e-08	-7.214	-7.280	-0.065	(0)
MnCl+	3.880e-08	3.337e-08	-7.411	-7.477	-0.065	(0)
MnOH+	1.319e-08	1.134e-08	-7.880	-7.945	-0.065	(0)
MnCl2	1.050e-10	1.050e-10	-9.979	-9.979	0.000	(0)
MnNO3+	1.164e-13	9.613e-14	-12.934	-13.017	-0.083	(0)
MnSeO4	9.990e-14	9.990e-14	-13.000	-13.000	0.000	(0)
MnCl3-	7.495e-14	6.446e-14	-13.125	-13.191	-0.065	(0)
Mn (OH) 3-	1.174e-17	1.010e-17	-16.930	-16.996	-0.065	(0)
Mn (NO3) 2	1.231e-21	1.231e-21	-20.910	-20.910	0.000	(0)
Mn (OH) 4-2	2.261e-23	1.237e-23	-22.646	-22.908	-0.262	(0)
MnSe	0.000e+00	0.000e+00	-41.569	-41.569	0.000	(0)
Mn (3)	3.126e-25					
Mn+3	3.126e-25	7.749e-26	-24.505	-25.111	-0.606	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.818	-42.080	-0.262	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.217	-46.288	-0.072	(0)
Mo	9.661e-07					
MoO4-2	9.658e-07	5.195e-07	-6.015	-6.284	-0.269	(0)
HMoO4-	3.318e-10	2.741e-10	-9.479	-9.562	-0.083	(0)
H2MoO4	5.325e-14	5.325e-14	-13.274	-13.274	0.000	(0)
Ag2MoO4	9.039e-25	9.039e-25	-24.044	-24.044	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.988	-41.735	-0.747	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.625	-51.611	-2.987	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.727	-52.801	-2.074	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-54.268	-55.595	-1.328	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-59.179	-59.926	-0.747	(0)
N (-3)	6.374e-07					
NH4+	6.065e-07	5.124e-07	-6.217	-6.290	-0.073	(0)
NH4SO4-	1.992e-08	1.714e-08	-7.701	-7.766	-0.065	(0)
NH3	1.102e-08	1.102e-08	-7.958	-7.958	0.000	(0)
CaNH3+2	2.517e-11	1.172e-11	-10.599	-10.931	-0.332	(0)
CuNH3+2	1.585e-11	7.382e-12	-10.800	-11.132	-0.332	(0)
NiNH3+2	3.622e-13	1.687e-13	-12.441	-12.773	-0.332	(0)
AgNH3+	5.838e-14	4.822e-14	-13.234	-13.317	-0.083	(0)
Co (NH3) +2	5.016e-14	2.336e-14	-13.300	-13.632	-0.332	(0)
BaNH3+2	3.356e-16	1.563e-16	-15.474	-15.806	-0.332	(0)
Ag (NH3) 2+	5.228e-18	4.319e-18	-17.282	-17.365	-0.083	(0)
Ni (NH3) 2+2	5.768e-19	2.686e-19	-18.239	-18.571	-0.332	(0)
Hg (NH3) 2+2	4.140e-19	1.928e-19	-18.383	-18.715	-0.332	(0)
Ca (NH3) 2+2	1.104e-19	5.141e-20	-18.957	-19.289	-0.332	(0)
HgNH3+2	3.758e-20	1.750e-20	-19.425	-19.757	-0.332	(0)
Co (NH3) 2+2	2.357e-20	1.098e-20	-19.628	-19.959	-0.332	(0)
Hg (NH3) 3+2	1.816e-26	8.457e-27	-25.741	-26.073	-0.332	(0)
Co (NH3) 3+2	3.269e-27	1.523e-27	-26.486	-26.817	-0.332	(0)
Hg (NH3) 4+2	1.589e-33	7.401e-34	-32.799	-33.131	-0.332	(0)
Co (NH3) 4+2	1.890e-34	8.803e-35	-33.723	-34.055	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.020	-40.352	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.461	-41.793	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.514	-49.261	-0.747	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.838	-49.170	-0.332	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.479	-50.811	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.689	-58.772	-0.083	(0)

	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.080	-63.412	-0.332	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.511	-63.843	-0.332	(0)
N (3)	7.388e-06						
	NO2-	7.388e-06	6.267e-06	-5.131	-5.203	-0.072	(0)
	CuNO2+	5.201e-11	4.297e-11	-10.284	-10.367	-0.083	(0)
	AgNO2	2.807e-12	2.807e-12	-11.552	-11.552	0.000	(0)
	CoNO2+	9.428e-13	7.788e-13	-12.026	-12.109	-0.083	(0)
	Cu (NO2) 2	2.755e-15	2.755e-15	-14.560	-14.560	0.000	(0)
	Ag (NO2) 2-	3.298e-17	2.724e-17	-16.482	-16.565	-0.083	(0)
N (5)	5.970e-09						
	NO3-	5.954e-09	5.099e-09	-8.225	-8.293	-0.067	(0)
	CaNO3+	1.649e-11	1.363e-11	-10.783	-10.866	-0.083	(0)
	MnNO3+	1.164e-13	9.613e-14	-12.934	-13.017	-0.083	(0)
	ZnNO3+	1.761e-14	1.455e-14	-13.754	-13.837	-0.083	(0)
	CuNO3+	1.278e-15	1.056e-15	-14.893	-14.976	-0.083	(0)
	BaNO3+	6.956e-16	5.746e-16	-15.158	-15.241	-0.083	(0)
	NiNO3+	4.420e-16	3.651e-16	-15.355	-15.438	-0.083	(0)
	CoNO3+	1.725e-16	1.425e-16	-15.763	-15.846	-0.083	(0)
	CdNO3+	4.518e-17	3.732e-17	-16.345	-16.428	-0.083	(0)
	PbNO3+	2.677e-17	2.211e-17	-16.572	-16.655	-0.083	(0)
	AgNO3	8.683e-18	8.683e-18	-17.061	-17.061	0.000	(0)
	Mn (NO3) 2	1.231e-21	1.231e-21	-20.910	-20.910	0.000	(0)
	UO2NO3+	2.715e-22	2.243e-22	-21.566	-21.649	-0.083	(0)
	Zn (NO3) 2	1.480e-23	1.480e-23	-22.830	-22.830	0.000	(0)
	Co (NO3) 2	1.479e-24	1.479e-24	-23.830	-23.830	0.000	(0)
	CrNO3+2	1.467e-24	6.831e-25	-23.834	-24.165	-0.332	(0)
	Cu (NO3) 2	6.777e-25	6.777e-25	-24.169	-24.169	0.000	(0)
	Pb (NO3) 2	1.915e-25	1.915e-25	-24.718	-24.718	0.000	(0)
	VO2NO3	1.137e-25	1.137e-25	-24.944	-24.944	0.000	(0)
	Cd (NO3) 2	9.538e-26	9.538e-26	-25.021	-25.021	0.000	(0)
	FeNO3+2	2.215e-27	1.031e-27	-26.655	-26.987	-0.332	(0)
	HgNO3+	5.738e-30	4.740e-30	-29.241	-29.324	-0.083	(0)
	Hg (NO3) 2	1.005e-38	1.005e-38	-37.998	-37.998	0.000	(0)
Na	7.494e-03						
	Na+	7.363e-03	6.306e-03	-2.133	-2.200	-0.067	(0)
	NaSO4-	1.226e-04	1.057e-04	-3.912	-3.976	-0.064	(0)
	NaHCO3	7.193e-06	7.193e-06	-5.143	-5.143	0.000	(0)
	NaCO3-	4.884e-07	4.211e-07	-6.311	-6.376	-0.064	(0)
	NaF	4.410e-07	4.410e-07	-6.356	-6.356	0.000	(0)
	NaH2BO3	4.471e-09	4.471e-09	-8.350	-8.350	0.000	(0)
	NaCrO4-	1.672e-17	1.381e-17	-16.777	-16.860	-0.083	(0)
Ni	8.366e-08						
	Ni+2	5.299e-08	2.851e-08	-7.276	-7.545	-0.269	(0)
	NiSO4	1.775e-08	1.775e-08	-7.751	-7.751	0.000	(0)
	NiHCO3+	8.630e-09	7.129e-09	-8.064	-8.147	-0.083	(0)
	NiCO3	3.814e-09	3.814e-09	-8.419	-8.419	0.000	(0)
	NiCl+	1.968e-10	1.625e-10	-9.706	-9.789	-0.083	(0)
	NiOH+	1.649e-10	1.362e-10	-9.783	-9.866	-0.083	(0)
	NiF+	9.607e-11	7.937e-11	-10.017	-10.100	-0.083	(0)
	Ni (OH) 2	4.107e-12	4.107e-12	-11.386	-11.386	0.000	(0)
	Ni (SO4) 2-2	3.939e-12	1.835e-12	-11.405	-11.736	-0.332	(0)
	NiNH3+2	3.622e-13	1.687e-13	-12.441	-12.773	-0.332	(0)
	Ni (OH) 3-	1.887e-15	1.559e-15	-14.724	-14.807	-0.083	(0)
	NiCl2	1.824e-15	1.824e-15	-14.739	-14.739	0.000	(0)
	NiNO3+	4.420e-16	3.651e-16	-15.355	-15.438	-0.083	(0)
	NiSeO4	4.161e-16	4.161e-16	-15.381	-15.381	0.000	(0)
	Ni (NH3) 2+2	5.768e-19	2.686e-19	-18.239	-18.571	-0.332	(0)
O (0)	1.837e-35						
	O2	9.187e-36	9.243e-36	-35.037	-35.034	0.003	(0)
Pb	5.149e-09						
	PbCO3	3.160e-09	3.160e-09	-8.500	-8.500	0.000	(0)
	Pb+2	5.450e-10	2.932e-10	-9.264	-9.533	-0.269	(0)
	PbHCO3+	5.349e-10	4.419e-10	-9.272	-9.355	-0.083	(0)
	PbSO4	4.481e-10	4.481e-10	-9.349	-9.349	0.000	(0)
	PbOH+	3.383e-10	2.795e-10	-9.471	-9.554	-0.083	(0)
	Pb (CO3) 2-2	7.018e-11	3.269e-11	-10.154	-10.486	-0.332	(0)
	PbCl+	2.806e-11	2.318e-11	-10.552	-10.635	-0.083	(0)
	Pb (SO4) 2-2	1.810e-11	8.428e-12	-10.742	-11.074	-0.332	(0)

Pb(OH) 2	3.355e-12	3.355e-12	-11.474	-11.474	0.000	(0)
PbF+	2.772e-12	2.290e-12	-11.557	-11.640	-0.083	(0)
PbCl2	2.307e-13	2.307e-13	-12.637	-12.637	0.000	(0)
PbF2	4.994e-15	4.994e-15	-14.302	-14.302	0.000	(0)
Pb(OH) 3-	1.541e-15	1.273e-15	-14.812	-14.895	-0.083	(0)
PbCl3-	2.478e-16	2.047e-16	-15.606	-15.689	-0.083	(0)
PbNO3+	2.677e-17	2.211e-17	-16.572	-16.655	-0.083	(0)
Pb2OH+3	7.249e-18	1.299e-18	-17.140	-17.886	-0.747	(0)
PbF3-	1.271e-18	1.050e-18	-17.896	-17.979	-0.083	(0)
PbCl4-2	4.476e-19	2.085e-19	-18.349	-18.681	-0.332	(0)
Pb(OH) 4-2	2.541e-19	1.184e-19	-18.595	-18.927	-0.332	(0)
Pb3(OH) 4+2	1.414e-22	6.583e-23	-21.850	-22.182	-0.332	(0)
PbF4-2	1.196e-22	5.568e-23	-21.922	-22.254	-0.332	(0)
Pb(NO3) 2	1.915e-25	1.915e-25	-24.718	-24.718	0.000	(0)
Pb4(OH) 4+4	3.259e-27	1.533e-28	-26.487	-27.814	-1.328	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.951	-150.951	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.912	-227.995	-0.083	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.198	-73.198	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.261	-78.344	-0.083	(0)
CdHS+	0.000e+00	0.000e+00	-78.888	-78.971	-0.083	(0)
H2S	0.000e+00	0.000e+00	-78.900	-78.900	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.801	-80.133	-0.332	(0)
S6-2	0.000e+00	0.000e+00	-80.317	-80.648	-0.332	(0)
S4-2	0.000e+00	0.000e+00	-80.396	-80.728	-0.332	(0)
S3-2	0.000e+00	0.000e+00	-81.202	-81.534	-0.332	(0)
S2-2	0.000e+00	0.000e+00	-82.218	-82.550	-0.332	(0)
S-2	0.000e+00	0.000e+00	-87.806	-88.067	-0.262	(0)
HgHS2-	0.000e+00	0.000e+00	-137.699	-137.782	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-138.582	-138.914	-0.332	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.965	-138.965	0.000	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-147.165	-147.349	-0.184	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-147.359	-147.442	-0.083	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-147.468	-147.803	-0.335	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.163	-148.246	-0.083	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.213	-148.533	-0.320	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-148.870	-149.213	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.197	-149.524	-0.327	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.813	-149.813	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.111	-150.111	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-150.951	-150.951	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.564	-159.564	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.234	-216.317	-0.083	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.794	-224.877	-0.083	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.472	-226.555	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.948	-227.280	-0.332	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-227.912	-227.995	-0.083	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.788	-235.871	-0.083	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.371	-302.703	-0.332	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.349	-304.681	-0.332	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.998	-318.330	-0.332	(0)
S(6)	7.242e-03					
SO4-2	5.801e-03	3.121e-03	-2.236	-2.506	-0.269	(0)
MgSO4	6.655e-04	6.655e-04	-3.177	-3.177	0.000	(0)
CaSO4	6.042e-04	6.042e-04	-3.219	-3.219	0.000	(0)
NaSO4-	1.226e-04	1.057e-04	-3.912	-3.976	-0.064	(0)
KSO4-	4.115e-05	3.548e-05	-4.386	-4.450	-0.064	(0)
MnSO4	6.602e-06	6.602e-06	-5.180	-5.180	0.000	(0)
ZnSO4	7.754e-07	7.754e-07	-6.110	-6.110	0.000	(0)
CuSO4	4.682e-08	4.682e-08	-7.330	-7.330	0.000	(0)
Zn(SO4) 2-2	4.526e-08	2.108e-08	-7.344	-7.676	-0.332	(0)
NH4SO4-	1.992e-08	1.714e-08	-7.701	-7.766	-0.065	(0)
NiSO4	1.775e-08	1.775e-08	-7.751	-7.751	0.000	(0)
CoSO4	1.098e-08	1.098e-08	-7.959	-7.959	0.000	(0)
HSO4-	9.434e-09	8.088e-09	-8.025	-8.092	-0.067	(0)
CdSO4	1.693e-09	1.693e-09	-8.771	-8.771	0.000	(0)
PbSO4	4.481e-10	4.481e-10	-9.349	-9.349	0.000	(0)
AgSO4-	1.616e-10	1.335e-10	-9.792	-9.875	-0.083	(0)

Cd(SO4) 2-2	1.531e-10	7.130e-11	-9.815	-10.147	-0.332	(0)
CrOHSO4	1.885e-11	1.885e-11	-10.725	-10.725	0.000	(0)
Pb(SO4) 2-2	1.810e-11	8.428e-12	-10.742	-11.074	-0.332	(0)
Ni(SO4) 2-2	3.939e-12	1.835e-12	-11.405	-11.736	-0.332	(0)
FeSO4	1.144e-12	1.144e-12	-11.942	-11.942	0.000	(0)
AlSO4+	7.737e-13	6.633e-13	-12.111	-12.178	-0.067	(0)
UO2SO4	1.041e-13	1.041e-13	-12.982	-12.982	0.000	(0)
CrSO4+	2.704e-14	2.234e-14	-13.568	-13.651	-0.083	(0)
Al(SO4) 2-	2.587e-14	2.218e-14	-13.587	-13.654	-0.067	(0)
UO2(SO4) 2-2	9.201e-15	4.285e-15	-14.036	-14.368	-0.332	(0)
VO2SO4-	3.977e-18	3.285e-18	-17.400	-17.483	-0.083	(0)
FeSO4+	8.236e-19	7.084e-19	-18.084	-18.150	-0.065	(0)
Cr2(OH) 2SO4+2	9.310e-20	4.336e-20	-19.031	-19.363	-0.332	(0)
Fe(SO4) 2-	5.721e-20	4.726e-20	-19.242	-19.325	-0.083	(0)
VOSO4	1.462e-20	1.462e-20	-19.835	-19.835	0.000	(0)
Cr2(OH) 2(SO4) 2	8.038e-21	8.038e-21	-20.095	-20.095	0.000	(0)
HgSO4	2.057e-21	2.057e-21	-20.687	-20.687	0.000	(0)
CrO3SO4-2	2.048e-24	9.536e-25	-23.689	-24.021	-0.332	(0)
VSO4+	7.267e-35	6.004e-35	-34.139	-34.222	-0.083	(0)
U(SO4) 2	2.599e-40	2.599e-40	-39.585	-39.585	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.648	-40.980	-0.332	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-58.689	-58.772	-0.083	(0)
Sb(3)	5.018e-20					
Sb(OH) 3	2.539e-20	2.539e-20	-19.595	-19.595	0.000	(0)
HSbO2	2.479e-20	2.479e-20	-19.606	-19.606	0.000	(0)
SbO2-	1.833e-24	1.514e-24	-23.737	-23.820	-0.083	(0)
Sb(OH) 4-	1.049e-24	8.669e-25	-23.979	-24.062	-0.083	(0)
Sb(OH) 2F	1.166e-25	1.166e-25	-24.933	-24.933	0.000	(0)
SbOF	1.147e-25	1.147e-25	-24.940	-24.940	0.000	(0)
Sb(OH) 2+	1.980e-26	1.636e-26	-25.703	-25.786	-0.083	(0)
SbO+	6.828e-27	5.641e-27	-26.166	-26.249	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.998	-318.330	-0.332	(0)
Sb(5)	1.469e-08					
SbO3-	1.467e-08	1.212e-08	-7.833	-7.916	-0.083	(0)
Sb(OH) 6-	1.654e-11	1.416e-11	-10.782	-10.849	-0.067	(0)
SbO2+	2.961e-24	2.446e-24	-23.529	-23.612	-0.083	(0)
Se(-2)	2.060e-14					
Ag2Se	2.060e-14	2.060e-14	-13.686	-13.686	0.000	(0)
HSe-	1.766e-39	1.459e-39	-38.753	-38.836	-0.083	(0)
MnSe	0.000e+00	0.000e+00	-41.569	-41.569	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.522	-42.522	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.928	-46.260	-0.332	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.793	-84.121	-1.328	(0)
Se(4)	8.527e-08					
HSeO3-	6.734e-08	5.563e-08	-7.172	-7.255	-0.083	(0)
SeO3-2	1.793e-08	8.351e-09	-7.746	-8.078	-0.332	(0)
H2SeO3	6.293e-13	6.293e-13	-12.201	-12.201	0.000	(0)
AgSeO3-	1.393e-14	1.151e-14	-13.856	-13.939	-0.083	(0)
Cd(SeO3) 2-2	2.857e-19	1.330e-19	-18.544	-18.876	-0.332	(0)
Ag(SeO3) 2-3	4.802e-21	8.605e-22	-20.319	-21.065	-0.747	(0)
FeHSeO3+2	6.385e-24	2.974e-24	-23.195	-23.527	-0.332	(0)
Se(6)	5.811e-11					
SeO4-2	5.800e-11	3.120e-11	-10.237	-10.506	-0.269	(0)
MnSeO4	9.990e-14	9.990e-14	-13.000	-13.000	0.000	(0)
ZnSeO4	5.488e-15	5.488e-15	-14.261	-14.261	0.000	(0)
NiSeO4	4.161e-16	4.161e-16	-15.381	-15.381	0.000	(0)
CoSeO4	2.758e-16	2.758e-16	-15.559	-15.559	0.000	(0)
HSeO4-	5.020e-17	4.147e-17	-16.299	-16.382	-0.083	(0)
CdSeO4	1.345e-17	1.345e-17	-16.871	-16.871	0.000	(0)
Zn(SeO4) 2-2	3.728e-25	1.736e-25	-24.428	-24.760	-0.332	(0)
Si	3.899e-05					
H4SiO4	3.874e-05	3.898e-05	-4.412	-4.409	0.003	(0)
H3SiO4-	2.487e-07	2.124e-07	-6.604	-6.673	-0.068	(0)
H2SiO4-2	9.146e-13	5.055e-13	-12.039	-12.296	-0.258	(0)
UO2H3SiO4+	4.814e-13	3.977e-13	-12.318	-12.400	-0.083	(0)
SiF6-2	9.897e-29	5.415e-29	-28.004	-28.266	-0.262	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.287	-59.034	-0.747	(0)

U (4)	5.901e-21					
U (OH) 5-	5.895e-21	4.870e-21	-20.230	-20.312	-0.083	(0)
U (OH) 4	5.411e-24	5.411e-24	-23.267	-23.267	0.000	(0)
U (OH) 3+	6.353e-28	5.248e-28	-27.197	-27.280	-0.083	(0)
U (OH) 2+2	1.382e-32	6.438e-33	-31.859	-32.191	-0.332	(0)
UF3+	5.535e-36	4.572e-36	-35.257	-35.340	-0.083	(0)
UF2+2	5.590e-37	2.603e-37	-36.253	-36.584	-0.332	(0)
UF4	5.556e-38	5.556e-38	-37.255	-37.255	0.000	(0)
UOH+3	4.489e-38	8.044e-39	-37.348	-38.095	-0.747	(0)
UF+3	1.041e-39	1.866e-40	-38.982	-39.729	-0.747	(0)
UF5-	2.954e-40	2.440e-40	-39.530	-39.613	-0.083	(0)
U (SO4) 2	2.599e-40	2.599e-40	-39.585	-39.585	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.648	-40.980	-0.332	(0)
UF6-2	0.000e+00	0.000e+00	-40.756	-41.088	-0.332	(0)
U+4	0.000e+00	0.000e+00	-43.746	-45.074	-1.328	(0)
UC1+3	0.000e+00	0.000e+00	-45.279	-46.026	-0.747	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.233	-173.954	-6.721	(0)
U (5)	1.116e-16					
UO2+	1.116e-16	9.215e-17	-15.953	-16.035	-0.083	(0)
U (6)	1.347e-07					
UO2 (CO3) 3-4	8.604e-08	4.048e-09	-7.065	-8.393	-1.328	(0)
UO2 (CO3) 2-2	4.836e-08	2.252e-08	-7.316	-7.647	-0.332	(0)
UO2CO3	3.148e-10	3.148e-10	-9.502	-9.502	0.000	(0)
UO2OH+	1.275e-12	1.053e-12	-11.894	-11.977	-0.083	(0)
UO2H3SiO4+	4.814e-13	3.977e-13	-12.318	-12.400	-0.083	(0)
UO2F+	4.083e-13	3.373e-13	-12.389	-12.472	-0.083	(0)
UO2F2	1.078e-13	1.078e-13	-12.967	-12.967	0.000	(0)
UO2SO4	1.041e-13	1.041e-13	-12.982	-12.982	0.000	(0)
UO2+2	4.098e-14	2.205e-14	-13.387	-13.657	-0.269	(0)
UO2 (SO4) 2-2	9.201e-15	4.285e-15	-14.036	-14.368	-0.332	(0)
UO2F3-	3.633e-15	3.001e-15	-14.440	-14.523	-0.083	(0)
UO2Cl+	9.645e-17	7.968e-17	-16.016	-16.099	-0.083	(0)
UO2F4-2	5.673e-18	2.642e-18	-17.246	-17.578	-0.332	(0)
(UO2) 2 (OH) 2+2	3.955e-18	1.842e-18	-17.403	-17.735	-0.332	(0)
(UO2) 3 (OH) 5+	2.567e-19	2.120e-19	-18.591	-18.674	-0.083	(0)
UO2NO3+	2.715e-22	2.243e-22	-21.566	-21.649	-0.083	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.692	-42.774	-0.083	(0)
V+2	0.000e+00	0.000e+00	-43.532	-43.864	-0.332	(0)
V (3)	1.797e-15					
V (OH) 3	1.797e-15	1.797e-15	-14.745	-14.745	0.000	(0)
V (OH) 2+	3.729e-26	3.081e-26	-25.428	-25.511	-0.083	(0)
VOH+2	1.664e-29	7.752e-30	-28.779	-29.111	-0.332	(0)
V+3	2.274e-34	4.075e-35	-33.643	-34.390	-0.747	(0)
VSO4+	7.267e-35	6.004e-35	-34.139	-34.222	-0.083	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.423	-56.170	-0.747	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-56.094	-57.421	-1.328	(0)
V (4)	1.624e-18					
V (OH) 3+	1.559e-18	1.288e-18	-17.807	-17.890	-0.083	(0)
VO+2	3.652e-20	1.701e-20	-19.437	-19.769	-0.332	(0)
VOSO4	1.462e-20	1.462e-20	-19.835	-19.835	0.000	(0)
VOF+	1.369e-20	1.131e-20	-19.864	-19.947	-0.083	(0)
VOF2	4.699e-22	4.699e-22	-21.328	-21.328	0.000	(0)
VOC1+	1.287e-22	1.063e-22	-21.890	-21.973	-0.083	(0)
VOF3-	2.237e-24	1.848e-24	-23.650	-23.733	-0.083	(0)
VOF4-2	1.775e-27	8.266e-28	-26.751	-27.083	-0.332	(0)
H2V2O4+2	1.786e-31	8.317e-32	-30.748	-31.080	-0.332	(0)
V (5)	4.439e-09					
H2VO4-	3.800e-09	3.139e-09	-8.420	-8.503	-0.083	(0)
HVO4-2	6.385e-10	2.974e-10	-9.195	-9.527	-0.332	(0)
H3VO4	8.325e-13	8.325e-13	-12.080	-12.080	0.000	(0)
H3V2O7-	2.043e-14	1.688e-14	-13.690	-13.773	-0.083	(0)
HV2O7-3	1.766e-15	3.164e-16	-14.753	-15.500	-0.747	(0)
VO4-3	3.137e-16	5.620e-17	-15.504	-16.250	-0.747	(0)
VO2+	5.148e-17	4.408e-17	-16.288	-16.356	-0.067	(0)
VO2F	8.569e-18	8.569e-18	-17.067	-17.067	0.000	(0)
V2O7-4	6.827e-18	3.212e-19	-17.166	-18.493	-1.328	(0)
VO2SO4-	3.977e-18	3.285e-18	-17.400	-17.483	-0.083	(0)

VO2F2-	4.174e-19	3.448e-19	-18.379	-18.462	-0.083	(0)
V3O9-3	1.810e-19	3.244e-20	-18.742	-19.489	-0.747	(0)
VO2F3-2	1.024e-21	4.767e-22	-20.990	-21.322	-0.332	(0)
V4O12-4	9.027e-25	4.246e-26	-24.044	-25.372	-1.328	(0)
VO2F4-3	1.451e-25	2.599e-26	-24.838	-25.585	-0.747	(0)
VO2NO3	1.137e-25	1.137e-25	-24.944	-24.944	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-63.443	-66.430	-2.987	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.745	-65.819	-2.074	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.861	-68.188	-1.328	(0)
Zn	3.323e-06					
Zn+2	2.111e-06	1.136e-06	-5.676	-5.945	-0.269	(0)
ZnSO4	7.754e-07	7.754e-07	-6.110	-6.110	0.000	(0)
ZnCO3	2.343e-07	2.343e-07	-6.630	-6.630	0.000	(0)
ZnHCO3+	8.818e-08	7.285e-08	-7.055	-7.138	-0.083	(0)
ZnOH+	5.218e-08	4.310e-08	-7.283	-7.365	-0.083	(0)
Zn(SO4) 2-2	4.526e-08	2.108e-08	-7.344	-7.676	-0.332	(0)
ZnCl+	7.440e-09	6.357e-09	-8.128	-8.197	-0.068	(0)
ZnOHCl	3.159e-09	3.159e-09	-8.501	-8.501	0.000	(0)
ZnF+	3.040e-09	2.511e-09	-8.517	-8.600	-0.083	(0)
Zn(OH) 2	2.593e-09	2.593e-09	-8.586	-8.586	0.000	(0)
ZnCl2	2.245e-11	2.245e-11	-10.649	-10.649	0.000	(0)
Zn(OH) 3-	5.970e-12	4.932e-12	-11.224	-11.307	-0.083	(0)
ZnCl3-	4.651e-14	3.973e-14	-13.332	-13.401	-0.068	(0)
ZnNO3+	1.761e-14	1.455e-14	-13.754	-13.837	-0.083	(0)
ZnSeO4	5.488e-15	5.488e-15	-14.261	-14.261	0.000	(0)
Zn(OH) 4-2	1.600e-16	7.453e-17	-15.796	-16.128	-0.332	(0)
ZnCl4-2	8.092e-17	4.427e-17	-16.092	-16.354	-0.262	(0)
Zn(NO3) 2	1.480e-23	1.480e-23	-22.830	-22.830	0.000	(0)
Zn(SeO4) 2-2	3.728e-25	1.736e-25	-24.428	-24.760	-0.332	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.163	-148.246	-0.083	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.813	-149.813	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.794	-224.877	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.948	-227.280	-0.332	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.349	-304.681	-0.332	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3) 2	-54.09	-47.80	6.29	(Co(NH3)5Cl)(NO3) 2
(Co(NH3)5Cl)Cl2	-41.03	-36.52	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.25	-36.52	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3) 3	-70.09	-52.15	17.93	(Co(NH3)6)(NO3) 3
(Co(NH3)6)Cl3	-55.26	-35.23	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.34	-27.94	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.54	-23.09	0.45	(NH4)2SeO4
Acanthite	-51.89	-88.11	-36.22	Ag2S
Ag2CO3	-11.69	-22.78	-11.09	Ag2CO3
Ag2CrO4	-21.10	-32.69	-11.59	Ag2CrO4
Ag2HVO4	-12.44	-10.96	1.48	Ag2HVO4
Ag2MoO4	-12.07	-23.62	-11.55	Ag2MoO4
Ag2O	-14.76	-2.18	12.57	Ag2O
Ag2Se	0.10	-48.60	-48.70	Ag2Se
Ag2SeO3	-9.87	-17.02	-7.15	Ag2SeO3
Ag2SeO4	-18.93	-27.84	-8.91	Ag2SeO4
Ag2SO4	-15.02	-19.84	-4.82	Ag2SO4
Ag3AsO3	-28.19	-26.03	2.16	Ag3AsO3
Ag3AsO4	-16.66	-19.45	-2.79	Ag3AsO4
Ag3H2VO5	-17.24	-12.06	5.18	Ag3H2VO5
AgF:4H2O	-13.67	-12.62	1.05	AgF:4H2O
Agmetal	-0.33	-13.83	-13.51	Ag
AgVO3	-10.64	-9.87	0.77	AgVO3
Al(OH) 3 (am)	-1.63	9.17	10.80	Al(OH) 3
Al2(MoO4) 3	-48.35	-45.98	2.37	Al2(MoO4) 3
Al2O3	-1.32	18.33	19.65	Al2O3
Al4(OH)10SO4	-3.69	19.01	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.80	-7.00	4.80	AlAsO4:2H2O
AlOHSO4	-5.26	-8.49	-3.23	AlOHSO4

AlSb	-152.49	-86.87	65.62	AlSb
Alunite	-1.64	-3.04	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-4.25	-12.04	-7.79	PbSO ₄
Anhydrite	-1.22	-5.58	-4.36	CaSO ₄
Anilite	-55.17	-87.05	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-2.54	6.25	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-0.22	-8.52	-8.30	CaCO ₃
Arsenolite	-88.25	-91.01	-2.76	As ₄ O ₆
Artinite	-5.76	3.84	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-39.05	-32.34	6.71	As ₂ O ₅
Atacamite	-1.68	5.71	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-0.38	-17.29	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.89	7.50	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-18.42	-2.55	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.92	-9.83	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-27.99	4.95	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-13.33	-23.00	-9.67	BaCrO ₄
BaF ₂	-9.74	-15.56	-5.82	BaF ₂
BaMoO ₄	-6.97	-13.93	-6.96	BaMoO ₄
Barite	-0.17	-10.15	-9.98	BaSO ₄
BaS	-94.60	-78.42	16.18	BaS
BaSeO ₃	-9.16	-7.33	1.83	BaSeO ₃
BaSeO ₄	-10.69	-18.15	-7.46	BaSeO ₄
Bianchite	-6.69	-8.45	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.73	10.36	18.09	MnO ₂
Bixbyite	-4.12	-4.76	-0.64	Mn ₂ O ₃
BlaubleiI	-55.00	-79.16	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.53	-82.80	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.59	9.17	8.58	AlOOH
Breithauptite	-57.17	-75.69	-18.52	NiSb
Brochantite	-1.01	14.22	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.62	12.22	16.84	Mg(OH) ₂
Bunsenite	-4.84	7.61	12.45	NiO
Ca(VO ₃) ₂	-11.14	-5.48	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.90	6.60	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.95	6.60	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-18.40	3.90	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-20.28	18.68	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-21.18	18.68	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-298.81	-155.83	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.16	-18.43	-2.27	CaCrO ₄
Calcite	-0.04	-8.52	-8.48	CaCO ₃
Calomel	-8.12	-26.03	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.41	-9.36	-7.95	CaMoO ₄
Carnotite	-2.73	-2.50	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.57	-2.75	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-10.56	-13.58	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.70	-2.86	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.13	6.52	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.21	6.52	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.48	-15.77	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.67	1.89	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-19.99	8.41	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.28	-13.94	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.25	-13.94	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.03	-13.94	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-15.33	-16.55	-1.21	CdF ₂
Cdmetal(alpha)	-32.48	-18.96	13.51	Cd
Cdmetal(gamma)	-32.58	-18.96	13.62	Cd
CdMoO ₄	-0.77	-14.92	-14.15	CdMoO ₄
CdOHC1	-7.25	-3.71	3.54	CdOHC1
CdSb	-76.43	-76.78	-0.35	CdSb
CdSe	-19.70	-39.90	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-17.29	-19.14	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.97	-11.14	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.42	-11.14	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.27	-11.14	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.57	-11.32	-9.75	AgCl

Cerrusite	-1.85	-14.98	-13.13	PbCO3
CH4 (g)	-81.48	-122.52	-41.05	CH4
Chalcanthite	-7.05	-9.69	-2.64	CuSO4:5H2O
Chalcedony	-0.86	-4.41	-3.55	SiO2
Chalcocite	-55.16	-90.08	-34.92	Cu2S
Chalcopyrite	-125.27	-160.54	-35.27	CuFeS2
Chrysotile	-4.35	27.85	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-51.87	-97.56	-45.69	HgS
Claudetite	-87.95	-91.01	-3.06	As4O6
Clausthalite	-13.69	-40.79	-27.10	PbSe
Co (BO2) 2	-29.05	-1.98	27.07	Co (BO2) 2
Co (OH) 2	-5.70	7.40	13.09	Co (OH) 2
Co (OH) 3	-9.95	-12.26	-2.31	Co (OH) 3
CO2 (g)	-2.45	-20.60	-18.15	CO2
Co3 (AsO4) 2	-23.18	-10.14	13.03	Co3 (AsO4) 2
Co3O4	-6.63	-17.12	-10.50	Co3O4
CoCl2	-21.32	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-3.22	-13.20	-9.98	CoCO3
CoF2	-14.07	-15.66	-1.60	CoF2
CoF3	-45.40	-46.86	-1.46	CoF3
CoFe2O4	17.00	13.47	-3.53	CoFe2O4
CoMoO4	-6.28	-14.04	-7.76	CoMoO4
CoO	-6.19	7.40	13.59	CoO
CoS (alpha)	-71.08	-78.52	-7.44	CoS
CoS (beta)	-67.45	-78.52	-11.07	CoS
CoSe	-22.81	-39.01	-16.20	CoSe
CoSeO3	-8.75	-7.43	1.32	CoSeO3
CoSeO4:6H2O	-16.73	-18.26	-1.53	CoSeO4:6H2O
CoSO4	-13.06	-10.26	2.80	CoSO4
CoSO4:6H2O	-7.79	-10.26	-2.47	CoSO4:6H2O
Cotunnite	-10.06	-14.84	-4.78	PbCl2
Covellite	-55.65	-77.95	-22.30	CuS
Cr (OH) 2	-21.97	-11.15	10.82	Cr (OH) 2
Cr (OH) 3	-2.69	-1.35	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.60	-1.35	-0.75	Cr (OH) 3
Cr2O3	-0.35	-2.71	-2.36	Cr2O3
CrCl2	-45.69	-31.60	14.09	CrCl2
CrCl3	-47.15	-32.04	15.11	CrCl3
CrF3	-24.61	-35.95	-11.34	CrF3
Cristobalite	-1.06	-4.41	-3.35	SiO2
Crmetal	-67.11	-36.63	30.48	Cr
CrO3	-27.30	-30.51	-3.21	CrO3
Cryolite	-10.06	-43.90	-33.84	Na3AlF6
Cu (OH) 2	-0.71	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.47	19.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.18	0.07	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.27	-90.15	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.78	-50.58	-45.80	Cu2Se
Cu2SO4	-19.87	-21.82	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.53	-8.43	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.69	-102.28	-42.59	Cu3Sb
Cu3Se2	-25.53	-89.02	-63.49	Cu3Se2
CuCO3	-1.13	-12.63	-11.50	CuCO3
CuCrO4	-17.10	-22.54	-5.44	CuCrO4
CuF	-8.71	-13.61	-4.91	CuF
CuF2	-16.21	-15.09	1.12	CuF2
CuF2:2H2O	-10.54	-15.09	-4.55	CuF2:2H2O
Cumetal	-6.07	-14.82	-8.76	Cu
CuMoO4	-0.39	-13.47	-13.08	CuMoO4
CuOCuSO4	-12.02	-1.72	10.30	CuOCuSO4
Cupricferrite	8.05	14.04	5.99	CuFe2O4
Cuprite	-2.76	-4.16	-1.41	Cu2O
Cuprousferrite	9.87	0.95	-8.92	CuFeO2
CuSe	-5.34	-38.44	-33.10	CuSe
CuSe2	-26.01	-59.38	-33.37	CuSe2
CuSeO3:2H2O	-7.37	-6.86	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.25	-17.69	-2.44	CuSeO4:5H2O

CuSO4	-12.63	-9.69	2.94	CuSO4
Diaspore	2.29	9.17	6.87	AlOOH
Djurleite	-55.36	-89.28	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.36	-16.90	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.19	-16.90	-17.09	CaMg (CO3) 2
Epsomite	-3.31	-5.44	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.24	3.33	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.01	-0.03	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.51	-14.23	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.32	-8.76	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.80	-38.42	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.17	-46.91	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.83	9.40	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.54	-13.14	0.40	FeAsO4:2H2O
FeCr2O4	-6.58	0.62	7.20	FeCr2O4
FeMoO4	-8.02	-18.11	-10.09	FeMoO4
Ferrihydrite	-0.16	3.03	3.19	Fe (OH) 3
Ferroselite	-45.42	-64.02	-18.60	FeSe2
FeS (ppt)	-79.64	-82.59	-2.95	FeS
FeSe	-32.09	-43.09	-11.00	FeSe
Fix_pe	-5.16	-5.16	0.00	e-
Fluorite	-0.48	-10.98	-10.50	CaF2
Galena	-66.33	-80.30	-13.97	PbS
Gibbsite	0.88	9.17	8.29	Al (OH) 3
Goethite	2.54	3.03	0.49	FeOOH
Goslarite	-6.44	-8.45	-2.01	ZnSO4:7H2O
Greenalite	-19.65	1.16	20.81	Fe3Si2O5 (OH) 4
Greenockite	-65.04	-79.40	-14.36	CdS
Greigite	-289.25	-334.28	-45.03	Fe3S4
Gummite	-6.18	1.50	7.67	UO3
Gypsum	-0.97	-5.58	-4.61	CaSO4:2H2O
H-Jarosite	-14.11	-26.21	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.56	-21.44	-12.88	H2MoO4
H2S (g)	-77.91	-85.92	-8.01	H2S
H2Se (g)	-41.45	-46.41	-4.96	H2Se
Halite	-6.45	-4.85	1.60	NaCl
Halloysite	-0.06	9.51	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.87	56.16	61.03	Mn3O4
Hematite	7.49	6.07	-1.42	Fe2O3
Hercynite	-1.23	21.66	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.97	-256.68	-73.71	Hg (CH3) 2
Hg (g)	-7.65	-15.53	-7.87	Hg
Hg (OH) 2	-8.14	-11.64	-3.50	Hg (OH) 2
Hg2 (g)	-16.10	-31.06	-14.96	Hg2
Hg2 (OH) 2	-10.84	-5.58	5.26	Hg2 (OH) 2
Hg2CO3	-10.12	-26.17	-16.05	Hg2CO3
Hg2CrO4	-27.38	-36.08	-8.70	Hg2CrO4
Hg2F2	-18.28	-28.64	-10.36	Hg2F2
Hg2S	-79.82	-91.50	-11.68	Hg2S
Hg2SeO3	-15.75	-20.41	-4.66	Hg2SeO3
Hg2SO4	-17.10	-23.23	-6.13	Hg2SO4
Hg3O2CO3	-25.84	-55.52	-29.68	Hg3O2CO3
HgCl (g)	-32.51	-13.02	19.50	HgCl
HgCl2	-10.83	-32.10	-21.26	HgCl2
HgF (g)	-47.00	-14.32	32.68	HgF
HgF2 (g)	-47.27	-34.70	12.57	HgF2
Hgmetal (l)	-2.08	-15.53	-13.45	Hg
HgSe	-2.36	-58.05	-55.69	HgSe
HgSeO3	-14.04	-26.47	-12.43	HgSeO3
HgSO4	-19.88	-29.30	-9.42	HgSO4
Huntite	-3.68	-33.65	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.57	-24.34	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.52	-21.29	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.20	-21.37	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.63	-21.43	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-34.21	-51.45	-17.24	K2Cr2O7
K2CrO4	-20.43	-20.94	-0.51	K2CrO4
K2MoO4	-15.13	-11.87	3.26	K2MoO4

K2SeO4	-15.36	-16.09	-0.73	K2SeO4
Kaolinite	2.08	9.51	7.43	Al2Si2O5(OH)4
Langite	-3.27	14.22	17.49	Cu4(OH)6SO4·H2O
Larnakite	-5.98	-6.42	-0.43	PbO:PbSO4
Laurionite	-5.23	-4.61	0.62	PbOHCl
Lepidocrocite	1.66	3.03	1.37	FeOOH
Lime	-20.62	12.08	32.70	CaO
Litharge	-7.07	5.62	12.69	PbO
Mackinawite	-78.99	-82.59	-3.60	FeS
Maghemite	-0.32	6.07	6.39	Fe2O3
Magnesianoferrite	1.43	18.29	16.86	Fe2MgO4
Magnesite	-0.92	-8.38	-7.46	MgCO3
Magnetite	5.99	9.40	3.40	Fe3O4
Malachite	0.65	-4.66	-5.31	Cu2(OH)2CO3
Manganite	-2.37	22.97	25.34	MnOOH
Massicot	-7.27	5.62	12.89	PbO
Matlockite	-7.17	-16.14	-8.97	PbClF
Melanothallite	-18.75	-12.49	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4·7H2O
Metacinnabar	-52.47	-97.56	-45.09	HgS
Mg(OH)2(active)	-6.57	12.22	18.79	Mg(OH)2
Mg(VO3)2	-16.62	-5.34	11.28	Mg(VO3)2
Mg2Sb3	-274.65	-199.97	74.68	Mg2Sb3
Mg2V2O7	-19.48	6.88	26.36	Mg2V2O7
MgCr2O4	-6.69	9.51	16.20	MgCr2O4
MgCrO4	-23.67	-18.29	5.38	MgCrO4
MgF2	-2.71	-10.84	-8.13	MgF2
MgMoO4	-7.37	-9.22	-1.85	MgMoO4
MgSeO3·6H2O	-5.67	-2.61	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-12.24	-13.44	-1.20	MgSeO4·6H2O
Minium	-31.18	42.34	73.52	Pb3O4
Mirabilite	-5.79	-6.91	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.23	-7.33	4.90	Mn(VO3)2
Mn2(SO4)3	-52.03	-57.74	-5.71	Mn2(SO4)3
Mn2Sb	-149.40	-88.32	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-14.16	-1.66	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-12.94	-10.23	2.72	MnCl2·4H2O
MnS(grn)	-75.86	-75.69	0.17	MnS
MnS(pnk)	-79.03	-75.69	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.68	-36.18	3.50	MnSe
MnSeO3	-5.73	-4.60	1.13	MnSeO3
MnSeO3·2H2O	-5.59	-4.60	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-13.38	-15.43	-2.05	MnSeO4·5H2O
MnSO4	-10.01	-7.43	2.58	MnSO4
Monteponite	-8.59	6.52	15.10	CdO
Montroydite	-8.00	-11.64	-3.64	HgO
MoO3	-13.44	-21.44	-8.00	MoO3
Morenosite	-7.91	-10.05	-2.14	NiSO4·7H2O
MoS2	-148.50	-218.76	-70.26	MoS2
Na-Jarosite	-9.64	-20.84	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.37	-50.27	-9.90	Na2Cr2O7
Na2CrO4	-22.69	-19.76	2.93	Na2CrO4
Na2Mo2O7	-15.53	-32.12	-16.60	Na2Mo2O7
Na2MoO4	-12.17	-10.68	1.49	Na2MoO4
Na2MoO4·2H2O	-11.91	-10.69	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-14.38	-4.08	10.30	Na2SeO3·5H2O
Na2SeO4	-16.19	-14.91	1.28	Na2SeO4
Na3Sb	-174.36	-79.91	94.45	Na3Sb
Na3VO4	-29.33	7.35	36.68	Na3VO4
Na4V2O7	-33.45	3.95	37.40	Na4V2O7
Nantokite	-5.58	-12.31	-6.73	CuCl
NaSb	-88.35	-65.18	23.17	NaSb
Natron	-8.54	-9.85	-1.31	Na2CO3·10H2O
NaVO3	-7.26	-3.40	3.86	NaVO3
Nesquehonite	-3.71	-8.38	-4.67	MgCO3·3H2O
Ni(OH)2	-5.19	7.61	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-25.22	-9.52	15.70	Ni3(AsO4)2·8H2O

Ni4(OH)6SO4	-19.23	12.77	32.00	Ni4(OH)6SO4
NiCO3	-6.12	-12.99	-6.87	NiCO3
NiMoO4	-2.69	-13.83	-11.14	NiMoO4
NiS(alpha)	-72.71	-78.31	-5.60	NiS
NiS(beta)	-67.21	-78.31	-11.10	NiS
NiS(gamma)	-65.51	-78.31	-12.80	NiS
NiSe	-21.10	-38.80	-17.70	NiSe
NiSeO3:2H2O	-10.04	-7.22	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.53	-18.05	-1.52	NiSeO4:6H2O
Nsutite	-7.15	10.36	17.50	MnO2
O2(g)	-32.13	50.96	83.09	O2
Orpiment	-242.20	-303.27	-61.07	As2S3
Otavite	-2.08	-14.08	-12.00	CdCO3
Pb(BO2)2	-10.28	-3.76	6.52	Pb(BO2)2
Pb(OH)2	-2.53	5.62	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.63	-67.39	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.78	1.01	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.95	11.24	26.19	Pb2O(OH)2
Pb2O3	-24.32	36.72	61.04	Pb2O3
Pb2OCO3	-8.80	-9.36	-0.56	Pb2OCO3
Pb2V2O7	-4.42	-6.32	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.28	-15.48	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.84	-0.70	6.14	Pb3(VO4)2
Pb3O2CO3	-14.76	-3.74	11.02	Pb3O2CO3
Pb3O2SO4	-11.49	-0.80	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.28	4.82	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.06	4.82	21.88	Pb4O3SO4
PbCrO4	-12.29	-24.89	-12.60	PbCrO4
PbF2	-10.00	-17.44	-7.44	PbF2
Pbmetal	-24.11	-19.86	4.25	Pb
PbMoO4	-0.20	-15.82	-15.62	PbMoO4
PbO:0.3H2O	-7.36	5.62	12.98	PbO:0.33H2O
PbSeO4	-13.20	-20.04	-6.84	PbSeO4
Periclase	-9.36	12.22	21.58	MgO
Phosgenite	-10.01	-29.82	-19.81	PbCl2:PbCO3
Plattnerite	-18.50	31.10	49.60	PbO2
Portlandite	-10.72	12.08	22.80	Ca(OH)2
Pyrite	-124.52	-143.03	-18.51	FeS2
Pyrochroite	-4.97	10.23	15.19	Mn(OH)2
Pyrolusite	-5.67	35.71	41.38	MnO2
Quartz	-0.41	-4.41	-4.00	SiO2
Realgar	-101.67	-121.41	-19.75	AsS
Retgersite	-8.01	-10.05	-2.04	NiSO4:6H2O
Rhodochrosite	0.21	-10.37	-10.58	MnCO3
Rutherfordine	-4.60	-19.10	-14.50	UO2CO3
Sb(OH)3	-12.49	-19.60	-7.11	Sb(OH)3
Sb2O4	-17.11	-13.71	3.40	Sb2O4
Sb2O5	-27.18	-36.85	-9.67	Sb2O5
Sb2Se3	-110.67	-178.43	-67.76	Sb2Se3
Sb4O6(cubic)	-60.12	-78.38	-18.26	Sb4O6
Sb4O6(orth)	-60.48	-78.38	-17.90	Sb4O6
SbCl3	-50.85	-50.28	0.57	SbCl3
SbF3	-43.97	-54.19	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.34	-31.16	-27.82	SbO2
Schoepite	-4.50	1.50	5.99	UO2(OH)2:2H2O
Semetal(am)	-13.82	-20.93	-7.11	Se
Semetal(hex)	-13.22	-20.93	-7.71	Se
Senarmontite	-26.82	-39.19	-12.37	Sb2O3
SeO2	-14.96	-14.83	0.12	SeO2
SeO3	-46.70	-25.66	21.04	SeO3
Sepiolite	-4.54	11.22	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-7.56	11.22	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.03	-17.27	-10.24	FeCO3
SiO2(am-gel)	-1.70	-4.41	-2.71	SiO2
SiO2(am-ppt)	-1.67	-4.41	-2.74	SiO2
Smithsonite	-1.39	-11.39	-10.00	ZnCO3
Sphalerite	-65.26	-76.71	-11.45	ZnS

Spinel	-6.29	30.55	36.85	MgAl ₂ O ₄
Stibnite	-246.49	-296.95	-50.46	Sb ₂ S ₃
Sulfur	-58.29	-60.44	-2.14	S
Tenorite	0.32	7.97	7.64	CuO
Thenardite	-7.23	-6.91	0.32	Na ₂ SO ₄
Thermonatrite	-10.48	-9.85	0.64	Na ₂ CO ₃ ·H ₂ O
Tyuyamunite	-6.57	-2.49	4.08	Ca (UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-14.43	6.66	21.08	U ₃ O ₈
U ₃ Sb ₄	-580.83	-428.45	152.38	U ₃ Sb ₄
U ₄ O ₉	-30.57	-33.59	-3.02	U ₄ O ₉
UF ₄	-31.36	-60.90	-29.54	UF ₄
UF ₄ ·2.5H ₂ O	-28.18	-60.90	-32.72	UF ₄ ·2.5H ₂ O
UO ₂ (am)	-15.70	-14.77	0.93	UO ₂
UO ₂ (NO ₃) ₂	-42.39	-30.24	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ ·2H ₂ O	-35.09	-30.24	4.85	UO ₂ (NO ₃) ₂ ·2H ₂ O
UO ₂ (NO ₃) ₂ ·3H ₂ O	-33.63	-30.24	3.39	UO ₂ (NO ₃) ₂ ·3H ₂ O
UO ₂ (NO ₃) ₂ ·6H ₂ O	-32.29	-30.24	2.05	UO ₂ (NO ₃) ₂ ·6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.12	1.50	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ ·4H ₂ O	-21.91	-24.16	-2.25	UO ₂ SeO ₄ ·4H ₂ O
UO ₃	-6.20	1.50	7.70	UO ₃
Uraninite	-10.10	-14.77	-4.67	UO ₂
USb ₂	-220.15	-190.58	29.58	USb ₂
V (OH) ₃	-19.25	-11.66	7.59	V (OH) ₃
V ₂ O ₅	-16.20	-17.56	-1.36	V ₂ O ₅
V ₃ O ₅	-41.17	-39.33	1.84	V ₃ O ₅
V ₄ O ₇	-51.13	-43.95	7.19	V ₄ O ₇
V ₆ O ₁₃	-42.78	-103.64	-60.86	V ₆ O ₁₃
Valentinite	-30.71	-39.19	-8.48	Sb ₂ O ₃
VC ₁₂	-63.73	-44.86	18.87	VC ₁₂
VC ₁₃	-65.78	-42.35	23.43	VC ₁₃
VF ₄	-65.67	-50.74	14.93	VF ₄
Vmetal	-93.91	-49.88	44.03	V
VO	-39.16	-24.40	14.76	VO
VO (OH) ₂	-9.77	-4.62	5.15	VO (OH) ₂
VO ₂ Cl	-21.85	-19.01	2.84	VO ₂ Cl
VOC ₁	-33.04	-21.89	11.15	VOC ₁
VOC ₁₂	-37.83	-25.07	12.76	VOC ₁₂
VOSO ₄	-25.88	-22.28	3.61	VOSO ₄
Witherite	-4.52	-13.09	-8.57	BaCO ₃
Wurtzite	-67.76	-76.71	-8.95	ZnS
Zincite	-2.13	9.21	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO ₄
Zn (BO ₂) ₂	-8.46	-0.17	8.29	Zn (BO ₂) ₂
Zn (NO ₃) ₂ ·6H ₂ O	-25.85	-22.53	3.32	Zn (NO ₃) ₂ ·6H ₂ O
Zn (OH) ₂	-2.99	9.21	12.20	Zn (OH) ₂
Zn (OH) ₂ (am)	-3.27	9.21	12.47	Zn (OH) ₂
Zn (OH) ₂ (beta)	-2.55	9.21	11.75	Zn (OH) ₂
Zn (OH) ₂ (epsilon)	-2.33	9.21	11.53	Zn (OH) ₂
Zn (OH) ₂ (gamma)	-2.53	9.21	11.73	Zn (OH) ₂
Zn ₂ (OH) ₂ SO ₄	-6.74	0.76	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₂ 3Cl	-7.00	8.19	15.19	Zn ₂ (OH) ₂ 3Cl
Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O	-18.37	-4.72	13.65	Zn ₃ (AsO ₄) ₂ ·2.5H ₂ O
Zn ₃ O (SO ₄) ₂	-26.61	-7.69	18.91	Zn ₃ O (SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-9.23	19.17	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-12.92	25.58	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-18.30	-11.25	7.05	ZnCl ₂
ZnCO ₃ ·1H ₂ O	-1.13	-11.39	-10.26	ZnCO ₃ ·1H ₂ O
ZnF ₂	-13.32	-13.86	-0.53	ZnF ₂
Znmetal	-42.06	-16.27	25.79	Zn
ZnMoO ₄	-2.10	-12.23	-10.13	ZnMoO ₄
ZnO (active)	-1.98	9.21	11.19	ZnO
ZnS (am)	-67.66	-76.71	-9.05	ZnS
ZnSb	-85.10	-74.09	11.01	ZnSb
ZnSe	-22.80	-37.20	-14.40	ZnSe
ZnSeO ₄ ·6H ₂ O	-14.93	-16.45	-1.52	ZnSeO ₄ ·6H ₂ O
ZnSO ₄ ·1H ₂ O	-7.81	-8.45	-0.64	ZnSO ₄ ·1H ₂ O

**For a gas, SI = log₁₀(fugacity). Fugacity = pressure * phi / 1 atm.

For ideal gases, $\phi = 1$.

End of simulation.

Reading input data for simulation 125.

```
Title Stage 7 Pit wall interaction mix calculator
MIX 704
709    1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.000076
11     0.000618
12     0.000471
13     0.001107
14     0
15     0
Save solution 710
end
```

TITLE

Stage 7 Pit wall interaction mix calculator

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 704.

Mixture 704.

```
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
7.600e-05 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
6.180e-04 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
4.710e-04 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
1.107e-03 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
```


0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 709 Solution after simulation 124.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.469e-08	1.472e-08
Al	1.351e-06	1.354e-06
As	1.505e-10	1.509e-10
B	2.084e-05	2.088e-05
Ba	4.250e-08	4.260e-08
C	2.560e-03	2.566e-03
Ca	2.214e-03	2.219e-03
Cd	6.960e-09	6.976e-09
Cl	2.596e-03	2.602e-03
Co	5.357e-08	5.369e-08
Cr	1.667e-09	1.671e-09
Cu	1.690e-06	1.694e-06
F	1.479e-04	1.482e-04
Fe	1.220e-09	1.223e-09
Hg	1.098e-09	1.100e-09
K	1.912e-03	1.917e-03
Mg	2.886e-03	2.893e-03
Mn	3.275e-05	3.282e-05
Mo	9.640e-07	9.663e-07
N	8.014e-06	8.032e-06
Na	7.478e-03	7.495e-03
Ni	8.347e-08	8.366e-08
Pb	5.142e-09	5.154e-09
S	7.227e-03	7.243e-03
Sb	1.466e-08	1.469e-08
Se	8.515e-08	8.534e-08
Si	3.890e-05	3.899e-05
U	1.344e-07	1.347e-07
V	4.459e-09	4.470e-09
Zn	3.315e-06	3.323e-06

-----Description of solution-----

	pH =	7.575	Charge balance
	pe =	5.165	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	2.641e-02	
	Mass of water (kg) =	1.002e+00	
	Total alkalinity (eq/kg) =	2.464e-03	
	Total CO2 (mol/kg) =	2.560e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	9.505e-07	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	4	
	Total H =	1.112717e+02	
	Total O =	5.567129e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.448e-07	3.787e-07	-6.352	-6.422	-0.070	(0)
H+	3.103e-08	2.658e-08	-7.508	-7.575	-0.067	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	1.469e-08					
AgCl	9.732e-09	9.732e-09	-8.012	-8.012	0.000	(0)
Ag+	2.503e-09	2.144e-09	-8.602	-8.669	-0.067	(0)

	AgCl2-	2.281e-09	1.885e-09	-8.642	-8.725	-0.083	(0)
	AgSO4-	1.613e-10	1.333e-10	-9.792	-9.875	-0.083	(0)
	AgCl3-2	8.014e-12	3.735e-12	-11.096	-11.428	-0.332	(0)
	AgNO2	2.801e-12	2.801e-12	-11.553	-11.553	0.000	(0)
	AgF	5.960e-13	5.960e-13	-12.225	-12.225	0.000	(0)
	AgCl4-3	9.448e-14	1.696e-14	-13.025	-13.771	-0.746	(0)
	AgOH	8.118e-14	8.118e-14	-13.091	-13.091	0.000	(0)
	AgNH3+	5.811e-14	4.802e-14	-13.236	-13.319	-0.083	(0)
	Ag2Se	2.043e-14	2.043e-14	-13.690	-13.690	0.000	(0)
	AgH2BO3	1.513e-14	1.513e-14	-13.820	-13.820	0.000	(0)
	AgSeO3-	1.387e-14	1.146e-14	-13.858	-13.941	-0.083	(0)
	Ag (NO2) 2-	3.283e-17	2.712e-17	-16.484	-16.567	-0.083	(0)
	AgNO3	8.676e-18	8.676e-18	-17.062	-17.062	0.000	(0)
	Ag (NH3) 2+	5.182e-18	4.282e-18	-17.286	-17.368	-0.083	(0)
	Ag (OH) 2-	3.636e-18	3.004e-18	-17.439	-17.522	-0.083	(0)
	Ag (SeO3) 2-3	4.759e-21	8.541e-22	-20.322	-21.068	-0.746	(0)
	Ag2MoO4	9.022e-25	9.022e-25	-24.045	-24.045	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.200	-73.200	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.802	-84.129	-1.326	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.170	-147.355	-0.184	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.364	-147.447	-0.083	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.876	-149.219	-0.343	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.203	-149.530	-0.327	(0)
Al		1.351e-06					
	Al (OH) 4-	1.320e-06	1.132e-06	-5.879	-5.946	-0.067	(0)
	Al (OH) 3	2.374e-08	2.374e-08	-7.624	-7.624	0.000	(0)
	Al (OH) 2+	3.644e-09	3.142e-09	-8.438	-8.503	-0.064	(0)
	AlF3	1.874e-09	1.874e-09	-8.727	-8.727	0.000	(0)
	AlF2+	1.560e-09	1.345e-09	-8.807	-8.871	-0.064	(0)
	AlF4-	1.213e-10	1.040e-10	-9.916	-9.983	-0.067	(0)
	AlF+2	5.522e-11	3.053e-11	-10.258	-10.515	-0.257	(0)
	AlOH+2	1.889e-11	1.045e-11	-10.724	-10.981	-0.257	(0)
	AlSO4+	7.782e-13	6.672e-13	-12.109	-12.176	-0.067	(0)
	Al+3	1.112e-13	2.758e-14	-12.954	-13.559	-0.605	(0)
	Al (SO4) 2-	2.599e-14	2.228e-14	-13.585	-13.652	-0.067	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-40.984	-41.730	-0.746	(0)
As (3)		1.846e-23					
	H3AsO3	1.804e-23	1.804e-23	-22.744	-22.744	0.000	(0)
	H2AsO3-	4.213e-25	3.481e-25	-24.375	-24.458	-0.083	(0)
	HAsO3-2	2.563e-29	1.195e-29	-28.591	-28.923	-0.332	(0)
	H4AsO3+	2.875e-31	2.376e-31	-30.541	-30.624	-0.083	(0)
	AsO3-3	9.654e-35	1.733e-35	-34.015	-34.761	-0.746	(0)
As (5)		1.505e-10					
	HAsO4-2	1.324e-10	6.170e-11	-9.878	-10.210	-0.332	(0)
	H2AsO4-	1.810e-11	1.496e-11	-10.742	-10.825	-0.083	(0)
	AsO4-3	4.091e-14	7.342e-15	-13.388	-14.134	-0.746	(0)
	H3AsO4	6.866e-17	6.907e-17	-16.163	-16.161	0.003	(0)
B		2.084e-05					
	H3BO3	2.026e-05	2.038e-05	-4.693	-4.691	0.003	(0)
	H2BO3-	5.270e-07	4.454e-07	-6.278	-6.351	-0.073	(0)
	CaH2BO3+	2.560e-08	2.164e-08	-7.592	-7.665	-0.073	(0)
	MgH2BO3+	2.138e-08	1.807e-08	-7.670	-7.743	-0.073	(0)
	NaH2BO3	4.442e-09	4.442e-09	-8.352	-8.352	0.000	(0)
	BF (OH) 3-	1.065e-09	9.001e-10	-8.973	-9.046	-0.073	(0)
	H5 (BO3) 2-	9.143e-12	7.726e-12	-11.039	-11.112	-0.073	(0)
	BaH2BO3+	3.678e-13	3.108e-13	-12.434	-12.508	-0.073	(0)
	BF2 (OH) 2-	3.351e-13	2.832e-13	-12.475	-12.548	-0.073	(0)
	H8 (BO3) 3-	1.863e-14	1.575e-14	-13.730	-13.803	-0.073	(0)
	AgH2BO3	1.513e-14	1.513e-14	-13.820	-13.820	0.000	(0)
	BF3OH-	3.837e-19	3.242e-19	-18.416	-18.489	-0.073	(0)
	BF4-	5.556e-24	4.695e-24	-23.255	-23.328	-0.073	(0)
Ba		4.250e-08					
	Ba+2	4.196e-08	2.258e-08	-7.377	-7.646	-0.269	(0)
	BaHCO3+	5.047e-10	4.368e-10	-9.297	-9.360	-0.063	(0)
	BaCO3	4.137e-11	4.137e-11	-10.383	-10.383	0.000	(0)
	BaH2BO3+	3.678e-13	3.108e-13	-12.434	-12.508	-0.073	(0)
	BaOH+	4.340e-14	3.733e-14	-13.363	-13.428	-0.065	(0)
	BaNO3+	6.979e-16	5.767e-16	-15.156	-15.239	-0.083	(0)

BaNH3+2	3.354e-16	1.563e-16	-15.474	-15.806	-0.332	(0)
C(4)	2.560e-03					
HCO3-	2.349e-03	2.025e-03	-2.629	-2.694	-0.064	(0)
H2CO3	1.211e-04	1.211e-04	-3.917	-3.917	0.000	(0)
CaHCO3+	3.679e-05	3.184e-05	-4.434	-4.497	-0.063	(0)
MgHCO3+	2.838e-05	2.425e-05	-4.547	-4.615	-0.068	(0)
NaHCO3	7.167e-06	7.167e-06	-5.145	-5.145	0.000	(0)
CO3-2	6.638e-06	3.573e-06	-5.178	-5.447	-0.269	(0)
CaCO3	4.780e-06	4.780e-06	-5.321	-5.321	0.000	(0)
MgCO3	3.477e-06	3.477e-06	-5.459	-5.459	0.000	(0)
CuCO3	1.381e-06	1.381e-06	-5.860	-5.860	0.000	(0)
MnHCO3+	5.582e-07	4.801e-07	-6.253	-6.319	-0.065	(0)
NaCO3-	4.855e-07	4.186e-07	-6.314	-6.378	-0.064	(0)
ZnCO3	2.332e-07	2.332e-07	-6.632	-6.632	0.000	(0)
ZnHCO3+	8.793e-08	7.265e-08	-7.056	-7.139	-0.083	(0)
UO2 (CO3) 3-4	8.568e-08	4.042e-09	-7.067	-8.393	-1.326	(0)
UO2 (CO3) 2-2	4.844e-08	2.258e-08	-7.315	-7.646	-0.332	(0)
Cu (CO3) 2-2	2.850e-08	1.328e-08	-7.545	-7.877	-0.332	(0)
CuHCO3+	1.016e-08	8.392e-09	-7.993	-8.076	-0.083	(0)
NiHCO3+	8.604e-09	7.109e-09	-8.065	-8.148	-0.083	(0)
NiCO3	3.795e-09	3.795e-09	-8.421	-8.421	0.000	(0)
CoHCO3+	3.358e-09	2.775e-09	-8.474	-8.557	-0.083	(0)
PbCO3	3.153e-09	3.153e-09	-8.501	-8.501	0.000	(0)
CoCO3	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
PbHCO3+	5.348e-10	4.419e-10	-9.272	-9.355	-0.083	(0)
BaHCO3+	5.047e-10	4.368e-10	-9.297	-9.360	-0.063	(0)
UO2CO3	3.167e-10	3.167e-10	-9.499	-9.499	0.000	(0)
CdCO3	1.883e-10	1.883e-10	-9.725	-9.725	0.000	(0)
Pb (CO3) 2-2	6.971e-11	3.249e-11	-10.157	-10.488	-0.332	(0)
BaCO3	4.137e-11	4.137e-11	-10.383	-10.383	0.000	(0)
CdHCO3+	1.290e-11	1.066e-11	-10.889	-10.972	-0.083	(0)
Cd (CO3) 2-2	1.070e-12	4.987e-13	-11.971	-12.302	-0.332	(0)
FeHCO3+	4.622e-14	4.000e-14	-13.335	-13.398	-0.063	(0)
HgCO3	1.080e-14	1.080e-14	-13.966	-13.966	0.000	(0)
Hg (CO3) 2-2	2.619e-16	1.221e-16	-15.582	-15.913	-0.332	(0)
HgHCO3+	6.471e-18	5.347e-18	-17.189	-17.272	-0.083	(0)
Ca	2.214e-03					
Ca+2	1.569e-03	8.442e-04	-2.805	-3.074	-0.269	(0)
CaSO4	6.027e-04	6.027e-04	-3.220	-3.220	0.000	(0)
CaHCO3+	3.679e-05	3.184e-05	-4.434	-4.497	-0.063	(0)
CaCO3	4.780e-06	4.780e-06	-5.321	-5.321	0.000	(0)
CaF+	1.186e-06	1.020e-06	-5.926	-5.991	-0.065	(0)
CaH2BO3+	2.560e-08	2.164e-08	-7.592	-7.665	-0.073	(0)
CaOH+	7.371e-09	6.379e-09	-8.132	-8.195	-0.063	(0)
CaNH3+2	2.502e-11	1.166e-11	-10.602	-10.933	-0.332	(0)
CaNO3+	1.646e-11	1.360e-11	-10.783	-10.866	-0.083	(0)
Ca (NH3) 2+2	1.093e-19	5.092e-20	-18.962	-19.293	-0.332	(0)
Cd	6.960e-09					
Cd+2	4.296e-09	2.312e-09	-8.367	-8.636	-0.269	(0)
CdSO4	1.689e-09	1.689e-09	-8.772	-8.772	0.000	(0)
CdCl+	5.943e-10	4.910e-10	-9.226	-9.309	-0.083	(0)
CdCO3	1.883e-10	1.883e-10	-9.725	-9.725	0.000	(0)
Cd (SO4) 2-2	1.524e-10	7.101e-11	-9.817	-10.149	-0.332	(0)
CdHCO3+	1.290e-11	1.066e-11	-10.889	-10.972	-0.083	(0)
CdOH+	8.419e-12	6.956e-12	-11.075	-11.158	-0.083	(0)
CdOHC1	7.628e-12	7.628e-12	-11.118	-11.118	0.000	(0)
CdF+	4.909e-12	4.056e-12	-11.309	-11.392	-0.083	(0)
CdCl2	4.552e-12	4.552e-12	-11.342	-11.342	0.000	(0)
Cd (CO3) 2-2	1.070e-12	4.987e-13	-11.971	-12.302	-0.332	(0)
Cd (OH) 2	1.662e-14	1.662e-14	-13.779	-13.779	0.000	(0)
CdCl3-	7.729e-15	6.386e-15	-14.112	-14.195	-0.083	(0)
CdF2	8.958e-16	8.958e-16	-15.048	-15.048	0.000	(0)
CdNO3+	4.509e-17	3.726e-17	-16.346	-16.429	-0.083	(0)
CdSeO4	1.341e-17	1.341e-17	-16.873	-16.873	0.000	(0)
Cd (OH) 3-	4.654e-19	3.845e-19	-18.332	-18.415	-0.083	(0)
Cd2OH+3	4.492e-19	8.061e-20	-18.348	-19.094	-0.746	(0)
Cd (SeO3) 2-2	2.831e-19	1.320e-19	-18.548	-18.880	-0.332	(0)
Cd (NO3) 2	9.515e-26	9.515e-26	-25.022	-25.022	0.000	(0)

	Cd(OH) 4-2	5.114e-26	2.384e-26	-25.291	-25.623	-0.332	(0)
	CdHS+	0.000e+00	0.000e+00	-78.891	-78.974	-0.083	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.116	-150.116	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.479	-226.562	-0.083	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.381	-302.712	-0.332	(0)
C1	2.596e-03						
	Cl-	2.596e-03	2.224e-03	-2.586	-2.653	-0.067	(0)
	MnCl+	3.867e-08	3.326e-08	-7.413	-7.478	-0.065	(0)
	AgCl	9.732e-09	9.732e-09	-8.012	-8.012	0.000	(0)
	ZnCl+	7.415e-09	6.336e-09	-8.130	-8.198	-0.068	(0)
	ZnOHC1	3.141e-09	3.141e-09	-8.503	-8.503	0.000	(0)
	AgCl2-	2.281e-09	1.885e-09	-8.642	-8.725	-0.083	(0)
	CuCl	6.156e-10	6.156e-10	-9.211	-9.211	0.000	(0)
	CdCl+	5.943e-10	4.910e-10	-9.226	-9.309	-0.083	(0)
	CuCl2-	3.347e-10	2.860e-10	-9.475	-9.544	-0.068	(0)
	CuCl+	2.709e-10	2.314e-10	-9.567	-9.636	-0.068	(0)
	NiCl+	1.961e-10	1.620e-10	-9.708	-9.791	-0.083	(0)
	CoCl+	1.640e-10	1.355e-10	-9.785	-9.868	-0.083	(0)
	MnCl2	1.045e-10	1.045e-10	-9.981	-9.981	0.000	(0)
	PbCl+	2.804e-11	2.317e-11	-10.552	-10.635	-0.083	(0)
	ZnCl2	2.233e-11	2.233e-11	-10.651	-10.651	0.000	(0)
	AgCl3-2	8.014e-12	3.735e-12	-11.096	-11.428	-0.332	(0)
	CdOHC1	7.628e-12	7.628e-12	-11.118	-11.118	0.000	(0)
	CdCl2	4.552e-12	4.552e-12	-11.342	-11.342	0.000	(0)
	HgClOH	3.758e-12	3.758e-12	-11.425	-11.425	0.000	(0)
	HgCl2	1.249e-12	1.249e-12	-11.903	-11.903	0.000	(0)
	CuCl3-2	2.484e-13	1.360e-13	-12.605	-12.867	-0.262	(0)
	PbCl2	2.301e-13	2.301e-13	-12.638	-12.638	0.000	(0)
	CuCl2	1.784e-13	1.784e-13	-12.749	-12.749	0.000	(0)
	AgCl4-3	9.448e-14	1.696e-14	-13.025	-13.771	-0.746	(0)
	MnCl3-	7.438e-14	6.397e-14	-13.129	-13.194	-0.065	(0)
	ZnCl3-	4.616e-14	3.944e-14	-13.336	-13.404	-0.068	(0)
	HgCl3-	3.363e-14	2.778e-14	-13.473	-13.556	-0.083	(0)
	CdCl3-	7.729e-15	6.386e-15	-14.112	-14.195	-0.083	(0)
	NiCl2	1.814e-15	1.814e-15	-14.741	-14.741	0.000	(0)
	HgCl4-2	5.277e-16	2.459e-16	-15.278	-15.609	-0.332	(0)
	PbCl3-	2.465e-16	2.037e-16	-15.608	-15.691	-0.083	(0)
	HgCl+	1.357e-16	1.121e-16	-15.867	-15.950	-0.083	(0)
	UO2Cl+	9.720e-17	8.031e-17	-16.012	-16.095	-0.083	(0)
	ZnCl4-2	8.011e-17	4.385e-17	-16.096	-16.358	-0.262	(0)
	CrCl+2	1.897e-17	8.842e-18	-16.722	-17.053	-0.332	(0)
	CuCl3-	4.334e-18	3.703e-18	-17.363	-17.431	-0.068	(0)
	PbCl4-2	4.442e-19	2.070e-19	-18.352	-18.684	-0.332	(0)
	CrOHC12	1.415e-19	1.415e-19	-18.849	-18.849	0.000	(0)
	FeCl+2	2.615e-21	1.431e-21	-20.583	-20.844	-0.262	(0)
	CrCl2+	2.258e-21	1.866e-21	-20.646	-20.729	-0.083	(0)
	VOCl+	1.298e-22	1.073e-22	-21.887	-21.969	-0.083	(0)
	CuCl4-2	7.539e-23	4.127e-23	-22.123	-22.384	-0.262	(0)
	FeCl2+	1.653e-23	1.422e-23	-22.782	-22.847	-0.065	(0)
	CrO3Cl-	1.694e-26	1.400e-26	-25.771	-25.854	-0.083	(0)
	FeCl3	3.161e-27	3.161e-27	-26.500	-26.500	0.000	(0)
	CoCl+2	9.957e-36	4.640e-36	-35.002	-35.333	-0.332	(0)
	UCl+3	0.000e+00	0.000e+00	-45.275	-46.021	-0.746	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.848	-49.179	-0.332	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.490	-50.822	-0.332	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.523	-63.854	-0.332	(0)
Co (2)	5.357e-08						
	Co+2	3.779e-08	1.761e-08	-7.423	-7.754	-0.332	(0)
	CoSO4	1.095e-08	1.095e-08	-7.961	-7.961	0.000	(0)
	CoHCO3+	3.358e-09	2.775e-09	-8.474	-8.557	-0.083	(0)
	CoCO3	1.064e-09	1.064e-09	-8.973	-8.973	0.000	(0)
	CoCl+	1.640e-10	1.355e-10	-9.785	-9.868	-0.083	(0)
	CoOH+	1.611e-10	1.331e-10	-9.793	-9.876	-0.083	(0)
	CoF+	7.461e-11	6.165e-11	-10.127	-10.210	-0.083	(0)
	Co (OH) 2	4.004e-12	4.004e-12	-11.398	-11.398	0.000	(0)
	CoNO2+	9.394e-13	7.762e-13	-12.027	-12.110	-0.083	(0)
	Co (NH3) +2	4.985e-14	2.323e-14	-13.302	-13.634	-0.332	(0)
	CoSeO4	2.749e-16	2.749e-16	-15.561	-15.561	0.000	(0)

CoNO3+	1.722e-16	1.422e-16	-15.764	-15.847	-0.083	(0)
Co(OH) 3-	3.661e-17	3.025e-17	-16.436	-16.519	-0.083	(0)
CoOOH-	9.190e-18	7.594e-18	-17.037	-17.120	-0.083	(0)
Co2OH+3	6.547e-19	1.175e-19	-18.184	-18.930	-0.746	(0)
Co(NH3) 2+2	2.333e-20	1.087e-20	-19.632	-19.964	-0.332	(0)
Co(OH) 4-2	3.896e-24	1.816e-24	-23.409	-23.741	-0.332	(0)
Co(NO3) 2	1.475e-24	1.475e-24	-23.831	-23.831	0.000	(0)
Co(NH3) 3+2	3.222e-27	1.502e-27	-26.492	-26.823	-0.332	(0)
Co4(OH) 4+4	1.327e-30	6.261e-32	-29.877	-31.203	-1.326	(0)
Co(NH3) 4+2	1.855e-34	8.645e-35	-33.732	-34.063	-0.332	(0)
Co(NH3) 5+2	0.000e+00	0.000e+00	-41.471	-41.803	-0.332	(0)
Co(3)	4.235e-29					
CoOH+2	4.235e-29	1.974e-29	-28.373	-28.705	-0.332	(0)
Co+3	4.134e-35	1.026e-35	-34.384	-34.989	-0.605	(0)
CoCl+2	9.957e-36	4.640e-36	-35.002	-35.333	-0.332	(0)
Co(NH3) 5Cl+2	0.000e+00	0.000e+00	-48.848	-49.179	-0.332	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-58.700	-58.783	-0.083	(0)
Co(NH3) 6OH+2	0.000e+00	0.000e+00	-63.092	-63.423	-0.332	(0)
Co(NH3) 6Cl+2	0.000e+00	0.000e+00	-63.523	-63.854	-0.332	(0)
Cr(2)	1.077e-26					
Cr+2	1.077e-26	5.019e-27	-25.968	-26.299	-0.332	(0)
Cr(3)	1.667e-09					
Cr(OH) 2+	1.420e-09	1.173e-09	-8.848	-8.931	-0.083	(0)
Cr(OH) 3	1.669e-10	1.669e-10	-9.778	-9.778	0.000	(0)
Cr(OH) +2	5.462e-11	2.546e-11	-10.263	-10.594	-0.332	(0)
CrOHSO4	1.883e-11	1.883e-11	-10.725	-10.725	0.000	(0)
CrO2-	3.611e-12	2.983e-12	-11.442	-11.525	-0.083	(0)
Cr(OH) 4-	3.045e-12	2.516e-12	-11.516	-11.599	-0.083	(0)
CrF+2	1.156e-13	5.390e-14	-12.937	-13.268	-0.332	(0)
CrSO4+	2.706e-14	2.236e-14	-13.568	-13.651	-0.083	(0)
Cr+3	1.712e-14	3.073e-15	-13.766	-14.512	-0.746	(0)
CrCl+2	1.897e-17	8.842e-18	-16.722	-17.053	-0.332	(0)
CrOHC12	1.415e-19	1.415e-19	-18.849	-18.849	0.000	(0)
Cr2(OH) 2SO4+2	9.294e-20	4.332e-20	-19.032	-19.363	-0.332	(0)
Cr2(OH) 2(SO4) 2	8.019e-21	8.019e-21	-20.096	-20.096	0.000	(0)
CrCl2+	2.258e-21	1.866e-21	-20.646	-20.729	-0.083	(0)
CrNO3+2	1.468e-24	6.844e-25	-23.833	-24.165	-0.332	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.029	-40.361	-0.332	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-48.525	-49.271	-0.746	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-50.490	-50.822	-0.332	(0)
Cr(6)	8.787e-16					
CrO4-2	8.134e-16	4.378e-16	-15.090	-15.359	-0.269	(0)
HCrO4-	4.557e-17	3.765e-17	-16.341	-16.424	-0.083	(0)
NaCrO4-	1.657e-17	1.369e-17	-16.781	-16.864	-0.083	(0)
KCrO4-	3.155e-18	2.607e-18	-17.501	-17.584	-0.083	(0)
CrO3SO4-2	2.039e-24	9.502e-25	-23.691	-24.022	-0.332	(0)
H2CrO4	8.112e-25	8.112e-25	-24.091	-24.091	0.000	(0)
CrO3Cl-	1.694e-26	1.400e-26	-25.771	-25.854	-0.083	(0)
Cr2O7-2	1.055e-31	4.918e-32	-30.977	-31.308	-0.332	(0)
Cu(1)	1.217e-09					
CuCl	6.156e-10	6.156e-10	-9.211	-9.211	0.000	(0)
CuCl2-	3.347e-10	2.860e-10	-9.475	-9.544	-0.068	(0)
Cu+	2.661e-10	2.199e-10	-9.575	-9.658	-0.083	(0)
CuCl3-2	2.484e-13	1.360e-13	-12.605	-12.867	-0.262	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-147.474	-147.809	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.219	-148.539	-0.320	(0)
Cu(2)	1.689e-06					
CuCO3	1.381e-06	1.381e-06	-5.860	-5.860	0.000	(0)
Cu+2	1.220e-07	6.567e-08	-6.914	-7.183	-0.269	(0)
CuOH+	9.204e-08	7.865e-08	-7.036	-7.104	-0.068	(0)
CuSO4	4.688e-08	4.688e-08	-7.329	-7.329	0.000	(0)
Cu(CO3) 2-2	2.850e-08	1.328e-08	-7.545	-7.877	-0.332	(0)
CuHCO3+	1.016e-08	8.392e-09	-7.993	-8.076	-0.083	(0)
Cu(OH) 2	5.943e-09	5.943e-09	-8.226	-8.226	0.000	(0)
CuF+	5.551e-10	4.586e-10	-9.256	-9.339	-0.083	(0)
Cu2(OH) 2+2	3.334e-10	1.554e-10	-9.477	-9.809	-0.332	(0)
CuCl+	2.709e-10	2.314e-10	-9.567	-9.636	-0.068	(0)
CuNO2+	5.204e-11	4.300e-11	-10.284	-10.367	-0.083	(0)

	CuNH3+2	1.582e-11	7.372e-12	-10.801	-11.132	-0.332	(0)
	Cu (OH) 3-	5.587e-12	4.616e-12	-11.253	-11.336	-0.083	(0)
	CuCl2	1.784e-13	1.784e-13	-12.749	-12.749	0.000	(0)
	Cu (NO2) 2	2.752e-15	2.752e-15	-14.560	-14.560	0.000	(0)
	CuNO3+	1.281e-15	1.058e-15	-14.893	-14.975	-0.083	(0)
	Cu (OH) 4-2	2.952e-17	1.376e-17	-16.530	-16.861	-0.332	(0)
	CuCl3-	4.334e-18	3.703e-18	-17.363	-17.431	-0.068	(0)
	CuCl4-2	7.539e-23	4.127e-23	-22.123	-22.384	-0.262	(0)
	Cu (NO3) 2	6.788e-25	6.788e-25	-24.168	-24.168	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.239	-216.322	-0.083	(0)
F	1.479e-04						
	F-	1.292e-04	1.107e-04	-3.889	-3.956	-0.067	(0)
	MgF+	1.695e-05	1.453e-05	-4.771	-4.838	-0.067	(0)
	CaF+	1.186e-06	1.020e-06	-5.926	-5.991	-0.065	(0)
	NaF	4.395e-07	4.395e-07	-6.357	-6.357	0.000	(0)
	MnF+	6.086e-08	5.235e-08	-7.216	-7.281	-0.065	(0)
	HF	4.351e-09	4.351e-09	-8.361	-8.361	0.000	(0)
	ZnF+	3.032e-09	2.505e-09	-8.518	-8.601	-0.083	(0)
	AlF3	1.874e-09	1.874e-09	-8.727	-8.727	0.000	(0)
	AlF2+	1.560e-09	1.345e-09	-8.807	-8.871	-0.064	(0)
	BF (OH) 3-	1.065e-09	9.001e-10	-8.973	-9.046	-0.073	(0)
	CuF+	5.551e-10	4.586e-10	-9.256	-9.339	-0.083	(0)
	AlF4-	1.213e-10	1.040e-10	-9.916	-9.983	-0.067	(0)
	NiF+	9.581e-11	7.916e-11	-10.019	-10.101	-0.083	(0)
	CoF+	7.461e-11	6.165e-11	-10.127	-10.210	-0.083	(0)
	AlF+2	5.522e-11	3.053e-11	-10.258	-10.515	-0.257	(0)
	CdF+	4.909e-12	4.056e-12	-11.309	-11.392	-0.083	(0)
	PbF+	2.772e-12	2.290e-12	-11.557	-11.640	-0.083	(0)
	HF2-	2.150e-12	1.831e-12	-11.667	-11.737	-0.070	(0)
	AgF	5.960e-13	5.960e-13	-12.225	-12.225	0.000	(0)
	UO2F+	4.118e-13	3.403e-13	-12.385	-12.468	-0.083	(0)
	BF2 (OH) 2-	3.351e-13	2.832e-13	-12.475	-12.548	-0.073	(0)
	CrF+2	1.156e-13	5.390e-14	-12.937	-13.268	-0.332	(0)
	UO2F2	1.086e-13	1.086e-13	-12.964	-12.964	0.000	(0)
	PbF2	4.988e-15	4.988e-15	-14.302	-14.302	0.000	(0)
	UO2F3-	3.655e-15	3.020e-15	-14.437	-14.520	-0.083	(0)
	CdF2	8.958e-16	8.958e-16	-15.048	-15.048	0.000	(0)
	H2F2	5.072e-17	5.072e-17	-16.295	-16.295	0.000	(0)
	FeF2+	8.909e-18	7.663e-18	-17.050	-17.116	-0.065	(0)
	VO2F	8.640e-18	8.640e-18	-17.063	-17.063	0.000	(0)
	UO2F4-2	5.696e-18	2.655e-18	-17.244	-17.576	-0.332	(0)
	FeF+2	4.726e-18	2.587e-18	-17.325	-17.587	-0.262	(0)
	PbF3-	1.267e-18	1.047e-18	-17.897	-17.980	-0.083	(0)
	FeF3	1.197e-18	1.197e-18	-17.922	-17.922	0.000	(0)
	VO2F2-	4.202e-19	3.472e-19	-18.377	-18.459	-0.083	(0)
	BF3OH-	3.837e-19	3.242e-19	-18.416	-18.489	-0.073	(0)
	VOF+	1.382e-20	1.142e-20	-19.860	-19.942	-0.083	(0)
	VO2F3-2	1.029e-21	4.794e-22	-20.988	-21.319	-0.332	(0)
	VOF2	4.739e-22	4.739e-22	-21.324	-21.324	0.000	(0)
	PbF4-2	1.190e-22	5.548e-23	-21.924	-22.256	-0.332	(0)
	HgF+	1.255e-23	1.037e-23	-22.901	-22.984	-0.083	(0)
	BF4-	5.556e-24	4.695e-24	-23.255	-23.328	-0.073	(0)
	VOF3-	2.252e-24	1.861e-24	-23.647	-23.730	-0.083	(0)
	VO2F4-3	1.455e-25	2.611e-26	-24.837	-25.583	-0.746	(0)
	Sb (OH) 2F	1.166e-25	1.166e-25	-24.933	-24.933	0.000	(0)
	SbOF	1.147e-25	1.147e-25	-24.941	-24.941	0.000	(0)
	VOF4-2	1.784e-27	8.314e-28	-26.749	-27.080	-0.332	(0)
	SiF6-2	9.880e-29	5.408e-29	-28.005	-28.267	-0.262	(0)
	UF3+	5.585e-36	4.614e-36	-35.253	-35.336	-0.083	(0)
	UF2+2	5.644e-37	2.630e-37	-36.248	-36.580	-0.332	(0)
	UF4	5.600e-38	5.600e-38	-37.252	-37.252	0.000	(0)
	UF+3	1.052e-39	1.888e-40	-38.978	-39.724	-0.746	(0)
	UF5-	2.973e-40	2.456e-40	-39.527	-39.610	-0.083	(0)
	UF6-2	0.000e+00	0.000e+00	-40.754	-41.086	-0.332	(0)
Fe (2)	4.640e-12						
	Fe+2	3.366e-12	1.569e-12	-11.473	-11.804	-0.332	(0)
	FeSO4	1.200e-12	1.200e-12	-11.921	-11.921	0.000	(0)
	FeHCO3+	4.622e-14	4.000e-14	-13.335	-13.398	-0.063	(0)

FeOH+	2.750e-14	2.365e-14	-13.561	-13.626	-0.065	(0)
Fe (OH) 2	7.115e-18	7.115e-18	-17.148	-17.148	0.000	(0)
Fe (OH) 3-	9.906e-19	8.521e-19	-18.004	-18.070	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.547	-159.547	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.773	-235.856	-0.083	(0)
Fe (3)	1.216e-09					
Fe (OH) 2+	8.906e-10	7.679e-10	-9.050	-9.115	-0.064	(0)
Fe (OH) 3	3.123e-10	3.123e-10	-9.505	-9.505	0.000	(0)
Fe (OH) 4-	1.277e-11	1.101e-11	-10.894	-10.958	-0.064	(0)
FeOH+2	9.522e-15	5.212e-15	-14.021	-14.283	-0.262	(0)
FeF2+	8.909e-18	7.663e-18	-17.050	-17.116	-0.065	(0)
FeF+2	4.726e-18	2.587e-18	-17.325	-17.587	-0.262	(0)
FeF3	1.197e-18	1.197e-18	-17.922	-17.922	0.000	(0)
FeSO4+	8.665e-19	7.453e-19	-18.062	-18.128	-0.065	(0)
Fe+3	8.591e-20	2.132e-20	-19.066	-19.671	-0.605	(0)
Fe (SO4) 2-	6.010e-20	4.966e-20	-19.221	-19.304	-0.083	(0)
FeCl+2	2.615e-21	1.431e-21	-20.583	-20.844	-0.262	(0)
FeCl2+	1.653e-23	1.422e-23	-22.782	-22.847	-0.065	(0)
FeHSeO3+2	6.714e-24	3.129e-24	-23.173	-23.505	-0.332	(0)
Fe2 (OH) 2+4	1.907e-26	8.996e-28	-25.720	-27.046	-1.326	(0)
FeCl3	3.161e-27	3.161e-27	-26.500	-26.500	0.000	(0)
FeNO3+2	2.331e-27	1.086e-27	-26.633	-26.964	-0.332	(0)
Fe3 (OH) 4+5	1.179e-33	9.986e-36	-32.928	-35.001	-2.072	(0)
H (0)	4.647e-29					
H2	2.323e-29	2.337e-29	-28.634	-28.631	0.003	(0)
Hg (0)	1.090e-09					
Hg	1.090e-09	1.090e-09	-8.962	-8.962	0.000	(0)
Hg (1)	8.027e-21					
Hg2+2	4.013e-21	1.870e-21	-20.396	-20.728	-0.332	(0)
Hg (2)	7.326e-12					
HgClOH	3.758e-12	3.758e-12	-11.425	-11.425	0.000	(0)
Hg (OH) 2	2.273e-12	2.287e-12	-11.643	-11.641	0.003	(0)
HgCl2	1.249e-12	1.249e-12	-11.903	-11.903	0.000	(0)
HgCl3-	3.363e-14	2.778e-14	-13.473	-13.556	-0.083	(0)
HgCO3	1.080e-14	1.080e-14	-13.966	-13.966	0.000	(0)
HgCl4-2	5.277e-16	2.459e-16	-15.278	-15.609	-0.332	(0)
Hg (CO3) 2-2	2.619e-16	1.221e-16	-15.582	-15.913	-0.332	(0)
HgCl+	1.357e-16	1.121e-16	-15.867	-15.950	-0.083	(0)
HgOH+	4.611e-17	3.810e-17	-16.336	-16.419	-0.083	(0)
HgHCO3+	6.471e-18	5.347e-18	-17.189	-17.272	-0.083	(0)
Hg (NH3) 2+2	4.117e-19	1.919e-19	-18.385	-18.717	-0.332	(0)
Hg (OH) 3-	1.319e-19	1.090e-19	-18.880	-18.962	-0.083	(0)
HgNH3+2	3.753e-20	1.749e-20	-19.426	-19.757	-0.332	(0)
Hg+2	5.422e-21	2.527e-21	-20.266	-20.597	-0.332	(0)
HgSO4	2.062e-21	2.062e-21	-20.686	-20.686	0.000	(0)
HgF+	1.255e-23	1.037e-23	-22.901	-22.984	-0.083	(0)
Hg (NH3) 3+2	1.798e-26	8.381e-27	-25.745	-26.077	-0.332	(0)
HgNO3+	5.754e-30	4.754e-30	-29.240	-29.323	-0.083	(0)
Hg (NH3) 4+2	1.567e-33	7.304e-34	-32.805	-33.136	-0.332	(0)
Hg (NO3) 2	1.007e-38	1.007e-38	-37.997	-37.997	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.703	-137.786	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-138.587	-138.919	-0.332	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.968	-138.968	0.000	(0)
K	1.912e-03					
K+	1.871e-03	1.603e-03	-2.728	-2.795	-0.067	(0)
KSO4-	4.100e-05	3.536e-05	-4.387	-4.452	-0.064	(0)
KCrO4-	3.155e-18	2.607e-18	-17.501	-17.584	-0.083	(0)
Mg	2.886e-03					
Mg+2	2.174e-03	1.170e-03	-2.663	-2.932	-0.269	(0)
MgSO4	6.635e-04	6.635e-04	-3.178	-3.178	0.000	(0)
MgHCO3+	2.838e-05	2.425e-05	-4.547	-4.615	-0.068	(0)
MgF+	1.695e-05	1.453e-05	-4.771	-4.838	-0.067	(0)
MgCO3	3.477e-06	3.477e-06	-5.459	-5.459	0.000	(0)
MgOH+	2.033e-07	1.764e-07	-6.692	-6.753	-0.062	(0)
MgH2BO3+	2.138e-08	1.807e-08	-7.670	-7.743	-0.073	(0)
Mn (2)	3.275e-05					
Mn+2	2.549e-05	1.188e-05	-4.594	-4.925	-0.332	(0)
MnSO4	6.584e-06	6.584e-06	-5.182	-5.182	0.000	(0)

MnHCO3+	5.582e-07	4.801e-07	-6.253	-6.319	-0.065	(0)
MnF+	6.086e-08	5.235e-08	-7.216	-7.281	-0.065	(0)
MnCl+	3.867e-08	3.326e-08	-7.413	-7.478	-0.065	(0)
MnOH+	1.314e-08	1.130e-08	-7.881	-7.947	-0.065	(0)
MnCl2	1.045e-10	1.045e-10	-9.981	-9.981	0.000	(0)
MnNO3+	1.161e-13	9.594e-14	-12.935	-13.018	-0.083	(0)
MnSeO4	9.956e-14	9.956e-14	-13.002	-13.002	0.000	(0)
MnCl3-	7.438e-14	6.397e-14	-13.129	-13.194	-0.065	(0)
Mn (OH) 3-	1.165e-17	1.002e-17	-16.934	-16.999	-0.065	(0)
Mn (NO3) 2	1.228e-21	1.228e-21	-20.911	-20.911	0.000	(0)
Mn (OH) 4-2	2.237e-23	1.225e-23	-22.650	-22.912	-0.262	(0)
MnSe	0.000e+00	0.000e+00	-41.573	-41.573	0.000	(0)
Mn (3)	3.128e-25					
Mn+3	3.128e-25	7.762e-26	-24.505	-25.110	-0.605	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.822	-42.083	-0.262	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.219	-46.290	-0.071	(0)
Mo	9.640e-07					
MoO4-2	9.637e-07	5.187e-07	-6.016	-6.285	-0.269	(0)
HMoO4-	3.320e-10	2.743e-10	-9.479	-9.562	-0.083	(0)
H2MoO4	5.340e-14	5.340e-14	-13.272	-13.272	0.000	(0)
Ag2MoO4	9.022e-25	9.022e-25	-24.045	-24.045	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.984	-41.730	-0.746	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.625	-51.609	-2.984	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.725	-52.797	-2.072	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-54.265	-55.591	-1.326	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-59.174	-59.920	-0.746	(0)
N (-3)	6.360e-07					
NH4+	6.052e-07	5.114e-07	-6.218	-6.291	-0.073	(0)
NH4SO4-	1.985e-08	1.708e-08	-7.702	-7.768	-0.065	(0)
NH3	1.097e-08	1.097e-08	-7.960	-7.960	0.000	(0)
CaNH3+2	2.502e-11	1.166e-11	-10.602	-10.933	-0.332	(0)
CuNH3+2	1.582e-11	7.372e-12	-10.801	-11.132	-0.332	(0)
NiNH3+2	3.599e-13	1.677e-13	-12.444	-12.775	-0.332	(0)
AgNH3+	5.811e-14	4.802e-14	-13.236	-13.319	-0.083	(0)
Co (NH3) +2	4.985e-14	2.323e-14	-13.302	-13.634	-0.332	(0)
BaNH3+2	3.354e-16	1.563e-16	-15.474	-15.806	-0.332	(0)
Ag (NH3) 2+	5.182e-18	4.282e-18	-17.286	-17.368	-0.083	(0)
Ni (NH3) 2+2	5.707e-19	2.660e-19	-18.244	-18.575	-0.332	(0)
Hg (NH3) 2+2	4.117e-19	1.919e-19	-18.385	-18.717	-0.332	(0)
Ca (NH3) 2+2	1.093e-19	5.092e-20	-18.962	-19.293	-0.332	(0)
HgNH3+2	3.753e-20	1.749e-20	-19.426	-19.757	-0.332	(0)
Co (NH3) 2+2	2.333e-20	1.087e-20	-19.632	-19.964	-0.332	(0)
Hg (NH3) 3+2	1.798e-26	8.381e-27	-25.745	-26.077	-0.332	(0)
Co (NH3) 3+2	3.222e-27	1.502e-27	-26.492	-26.823	-0.332	(0)
Hg (NH3) 4+2	1.567e-33	7.304e-34	-32.805	-33.136	-0.332	(0)
Co (NH3) 4+2	1.855e-34	8.645e-35	-33.732	-34.063	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.029	-40.361	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.471	-41.803	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.525	-49.271	-0.746	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.848	-49.179	-0.332	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.490	-50.822	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.700	-58.783	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.092	-63.423	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.523	-63.854	-0.332	(0)
N (3)	7.372e-06					
NO2-	7.371e-06	6.253e-06	-5.132	-5.204	-0.071	(0)
CuNO2+	5.204e-11	4.300e-11	-10.284	-10.367	-0.083	(0)
AgNO2	2.801e-12	2.801e-12	-11.553	-11.553	0.000	(0)
CoNO2+	9.394e-13	7.762e-13	-12.027	-12.110	-0.083	(0)
Cu (NO2) 2	2.752e-15	2.752e-15	-14.560	-14.560	0.000	(0)
Ag (NO2) 2-	3.283e-17	2.712e-17	-16.484	-16.567	-0.083	(0)
N (5)	5.965e-09					
NO3-	5.949e-09	5.095e-09	-8.226	-8.293	-0.067	(0)
CaNO3+	1.646e-11	1.360e-11	-10.783	-10.866	-0.083	(0)
MnNO3+	1.161e-13	9.594e-14	-12.935	-13.018	-0.083	(0)
ZnNO3+	1.757e-14	1.452e-14	-13.755	-13.838	-0.083	(0)

CuNO3+	1.281e-15	1.058e-15	-14.893	-14.975	-0.083	(0)
BaNO3+	6.979e-16	5.767e-16	-15.156	-15.239	-0.083	(0)
NiNO3+	4.411e-16	3.644e-16	-15.356	-15.438	-0.083	(0)
CoNO3+	1.722e-16	1.422e-16	-15.764	-15.847	-0.083	(0)
CdNO3+	4.509e-17	3.726e-17	-16.346	-16.429	-0.083	(0)
PbNO3+	2.678e-17	2.213e-17	-16.572	-16.655	-0.083	(0)
AgNO3	8.676e-18	8.676e-18	-17.062	-17.062	0.000	(0)
Mn(NO3)2	1.228e-21	1.228e-21	-20.911	-20.911	0.000	(0)
UO2NO3+	2.740e-22	2.264e-22	-21.562	-21.645	-0.083	(0)
Zn(NO3)2	1.476e-23	1.476e-23	-22.831	-22.831	0.000	(0)
Co(NO3)2	1.475e-24	1.475e-24	-23.831	-23.831	0.000	(0)
CrNO3+2	1.468e-24	6.844e-25	-23.833	-24.165	-0.332	(0)
Cu(NO3)2	6.788e-25	6.788e-25	-24.168	-24.168	0.000	(0)
Pb(NO3)2	1.915e-25	1.915e-25	-24.718	-24.718	0.000	(0)
VO2NO3	1.147e-25	1.147e-25	-24.940	-24.940	0.000	(0)
Cd(NO3)2	9.515e-26	9.515e-26	-25.022	-25.022	0.000	(0)
FeNO3+2	2.331e-27	1.086e-27	-26.633	-26.964	-0.332	(0)
HgNO3+	5.754e-30	4.754e-30	-29.240	-29.323	-0.083	(0)
Hg(NO3)2	1.007e-38	1.007e-38	-37.997	-37.997	0.000	(0)
Na	7.478e-03					
Na+	7.347e-03	6.293e-03	-2.134	-2.201	-0.067	(0)
NaSO4-	1.221e-04	1.053e-04	-3.913	-3.977	-0.064	(0)
NaHCO3	7.167e-06	7.167e-06	-5.145	-5.145	0.000	(0)
NaCO3-	4.855e-07	4.186e-07	-6.314	-6.378	-0.064	(0)
NaF	4.395e-07	4.395e-07	-6.357	-6.357	0.000	(0)
NaH2BO3	4.442e-09	4.442e-09	-8.352	-8.352	0.000	(0)
NaCrO4-	1.657e-17	1.369e-17	-16.781	-16.864	-0.083	(0)
Ni	8.347e-08					
Ni+2	5.290e-08	2.847e-08	-7.277	-7.546	-0.269	(0)
NiSO4	1.770e-08	1.770e-08	-7.752	-7.752	0.000	(0)
NiHCO3+	8.604e-09	7.109e-09	-8.065	-8.148	-0.083	(0)
NiCO3	3.795e-09	3.795e-09	-8.421	-8.421	0.000	(0)
NiCl+	1.961e-10	1.620e-10	-9.708	-9.791	-0.083	(0)
NiOH+	1.643e-10	1.357e-10	-9.784	-9.867	-0.083	(0)
NiF+	9.581e-11	7.916e-11	-10.019	-10.101	-0.083	(0)
Ni(OH)2	4.083e-12	4.083e-12	-11.389	-11.389	0.000	(0)
Ni(SO4)2-2	3.920e-12	1.827e-12	-11.407	-11.738	-0.332	(0)
NiNH3+2	3.599e-13	1.677e-13	-12.444	-12.775	-0.332	(0)
Ni(OH)3-	1.872e-15	1.546e-15	-14.728	-14.811	-0.083	(0)
NiCl2	1.814e-15	1.814e-15	-14.741	-14.741	0.000	(0)
NiNO3+	4.411e-16	3.644e-16	-15.356	-15.438	-0.083	(0)
NiSeO4	4.147e-16	4.147e-16	-15.382	-15.382	0.000	(0)
Ni(NH3)2+2	5.707e-19	2.660e-19	-18.244	-18.575	-0.332	(0)
O(0)	1.843e-35					
O2	9.213e-36	9.270e-36	-35.036	-35.033	0.003	(0)
Pb	5.142e-09					
PbCO3	3.153e-09	3.153e-09	-8.501	-8.501	0.000	(0)
Pb+2	5.456e-10	2.936e-10	-9.263	-9.532	-0.269	(0)
PbHCO3+	5.348e-10	4.419e-10	-9.272	-9.355	-0.083	(0)
PbSO4	4.482e-10	4.482e-10	-9.349	-9.349	0.000	(0)
PbOH+	3.381e-10	2.793e-10	-9.471	-9.554	-0.083	(0)
Pb(CO3)2-2	6.971e-11	3.249e-11	-10.157	-10.488	-0.332	(0)
PbCl+	2.804e-11	2.317e-11	-10.552	-10.635	-0.083	(0)
Pb(SO4)2-2	1.806e-11	8.415e-12	-10.743	-11.075	-0.332	(0)
Pb(OH)2	3.345e-12	3.345e-12	-11.476	-11.476	0.000	(0)
PbF+	2.772e-12	2.290e-12	-11.557	-11.640	-0.083	(0)
PbCl2	2.301e-13	2.301e-13	-12.638	-12.638	0.000	(0)
PbF2	4.988e-15	4.988e-15	-14.302	-14.302	0.000	(0)
Pb(OH)3-	1.533e-15	1.267e-15	-14.814	-14.897	-0.083	(0)
PbCl3-	2.465e-16	2.037e-16	-15.608	-15.691	-0.083	(0)
PbNO3+	2.678e-17	2.213e-17	-16.572	-16.655	-0.083	(0)
Pb2OH+3	7.243e-18	1.300e-18	-17.140	-17.886	-0.746	(0)
PbF3-	1.267e-18	1.047e-18	-17.897	-17.980	-0.083	(0)
PbCl4-2	4.442e-19	2.070e-19	-18.352	-18.684	-0.332	(0)
Pb(OH)4-2	2.521e-19	1.175e-19	-18.598	-18.930	-0.332	(0)
Pb3(OH)4+2	1.407e-22	6.556e-23	-21.852	-22.183	-0.332	(0)
PbF4-2	1.190e-22	5.548e-23	-21.924	-22.256	-0.332	(0)
Pb(NO3)2	1.915e-25	1.915e-25	-24.718	-24.718	0.000	(0)

Pb4 (OH) 4+4	3.241e-27	1.529e-28	-26.489	-27.816	-1.326	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.954	-150.954	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.918	-228.001	-0.083	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.200	-73.200	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.263	-78.346	-0.083	(0)
CdHS+	0.000e+00	0.000e+00	-78.891	-78.974	-0.083	(0)
H2S	0.000e+00	0.000e+00	-78.902	-78.902	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.804	-80.136	-0.332	(0)
S6-2	0.000e+00	0.000e+00	-80.320	-80.652	-0.332	(0)
S4-2	0.000e+00	0.000e+00	-80.400	-80.731	-0.332	(0)
S3-2	0.000e+00	0.000e+00	-81.206	-81.537	-0.332	(0)
S2-2	0.000e+00	0.000e+00	-82.222	-82.553	-0.332	(0)
S-2	0.000e+00	0.000e+00	-87.809	-88.071	-0.262	(0)
HgHS2-	0.000e+00	0.000e+00	-137.703	-137.786	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-138.587	-138.919	-0.332	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.968	-138.968	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.170	-147.355	-0.184	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.364	-147.447	-0.083	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.474	-147.809	-0.335	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.169	-148.252	-0.083	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.219	-148.539	-0.320	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.876	-149.219	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.203	-149.530	-0.327	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.817	-149.817	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.116	-150.116	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.954	-150.954	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.547	-159.547	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.239	-216.322	-0.083	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.801	-224.884	-0.083	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.479	-226.562	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.957	-227.288	-0.332	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.918	-228.001	-0.083	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.773	-235.856	-0.083	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.381	-302.712	-0.332	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.358	-304.690	-0.332	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.006	-318.338	-0.332	(0)
S (6)	7.227e-03					
SO4-2	5.790e-03	3.116e-03	-2.237	-2.506	-0.269	(0)
MgSO4	6.635e-04	6.635e-04	-3.178	-3.178	0.000	(0)
CaSO4	6.027e-04	6.027e-04	-3.220	-3.220	0.000	(0)
NaSO4-	1.221e-04	1.053e-04	-3.913	-3.977	-0.064	(0)
KSO4-	4.100e-05	3.536e-05	-4.387	-4.452	-0.064	(0)
MnSO4	6.584e-06	6.584e-06	-5.182	-5.182	0.000	(0)
ZnSO4	7.734e-07	7.734e-07	-6.112	-6.112	0.000	(0)
CuSO4	4.688e-08	4.688e-08	-7.329	-7.329	0.000	(0)
Zn (SO4) 2-2	4.504e-08	2.099e-08	-7.346	-7.678	-0.332	(0)
NH4SO4-	1.985e-08	1.708e-08	-7.702	-7.768	-0.065	(0)
NiSO4	1.770e-08	1.770e-08	-7.752	-7.752	0.000	(0)
CoSO4	1.095e-08	1.095e-08	-7.961	-7.961	0.000	(0)
HSO4-	9.440e-09	8.094e-09	-8.025	-8.092	-0.067	(0)
CdSO4	1.689e-09	1.689e-09	-8.772	-8.772	0.000	(0)
PbSO4	4.482e-10	4.482e-10	-9.349	-9.349	0.000	(0)
AgSO4-	1.613e-10	1.333e-10	-9.792	-9.875	-0.083	(0)
Cd (SO4) 2-2	1.524e-10	7.101e-11	-9.817	-10.149	-0.332	(0)
CrOHSO4	1.883e-11	1.883e-11	-10.725	-10.725	0.000	(0)
Pb (SO4) 2-2	1.806e-11	8.415e-12	-10.743	-11.075	-0.332	(0)
Ni (SO4) 2-2	3.920e-12	1.827e-12	-11.407	-11.738	-0.332	(0)
FeSO4	1.200e-12	1.200e-12	-11.921	-11.921	0.000	(0)
AlSO4+	7.782e-13	6.672e-13	-12.109	-12.176	-0.067	(0)
UO2SO4	1.050e-13	1.050e-13	-12.979	-12.979	0.000	(0)
CrSO4+	2.706e-14	2.236e-14	-13.568	-13.651	-0.083	(0)
Al (SO4) 2-	2.599e-14	2.228e-14	-13.585	-13.652	-0.067	(0)
UO2 (SO4) 2-2	9.259e-15	4.315e-15	-14.033	-14.365	-0.332	(0)
VO2SO4-	4.008e-18	3.312e-18	-17.397	-17.480	-0.083	(0)
FeSO4+	8.665e-19	7.453e-19	-18.062	-18.128	-0.065	(0)
Cr2 (OH) 2SO4+2	9.294e-20	4.332e-20	-19.032	-19.363	-0.332	(0)
Fe (SO4) 2-	6.010e-20	4.966e-20	-19.221	-19.304	-0.083	(0)

VOSO4	1.476e-20	1.476e-20	-19.831	-19.831	0.000	(0)
Cr2(OH)2(SO4)2	8.019e-21	8.019e-21	-20.096	-20.096	0.000	(0)
HgSO4	2.062e-21	2.062e-21	-20.686	-20.686	0.000	(0)
CrO3SO4-2	2.039e-24	9.502e-25	-23.691	-24.022	-0.332	(0)
VSO4+	7.347e-35	6.070e-35	-34.134	-34.217	-0.083	(0)
U(SO4)2	2.625e-40	2.625e-40	-39.581	-39.581	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.643	-40.975	-0.332	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-58.700	-58.783	-0.083	(0)
Sb(3)	5.012e-20					
Sb(OH)3	2.536e-20	2.536e-20	-19.596	-19.596	0.000	(0)
HSbO2	2.476e-20	2.476e-20	-19.606	-19.606	0.000	(0)
SbO2-	1.826e-24	1.509e-24	-23.738	-23.821	-0.083	(0)
Sb(OH)4-	1.046e-24	8.640e-25	-23.981	-24.063	-0.083	(0)
Sb(OH)2F	1.166e-25	1.166e-25	-24.933	-24.933	0.000	(0)
SbOF	1.147e-25	1.147e-25	-24.941	-24.941	0.000	(0)
Sb(OH)2+	1.982e-26	1.637e-26	-25.703	-25.786	-0.083	(0)
SbO+	6.834e-27	5.647e-27	-26.165	-26.248	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.006	-318.338	-0.332	(0)
Sb(5)	1.466e-08					
SbO3-	1.464e-08	1.210e-08	-7.834	-7.917	-0.083	(0)
Sb(OH)6-	1.650e-11	1.413e-11	-10.782	-10.850	-0.067	(0)
SbO2+	2.968e-24	2.452e-24	-23.528	-23.610	-0.083	(0)
Se(-2)	2.043e-14					
Ag2Se	2.043e-14	2.043e-14	-13.690	-13.690	0.000	(0)
HSe-	1.755e-39	1.450e-39	-38.756	-38.838	-0.083	(0)
MnSe	0.000e+00	0.000e+00	-41.573	-41.573	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.524	-42.524	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.931	-46.263	-0.332	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.802	-84.129	-1.326	(0)
Se(4)	8.509e-08					
HSeO3-	6.723e-08	5.555e-08	-7.172	-7.255	-0.083	(0)
SeO3-2	1.785e-08	8.321e-09	-7.748	-8.080	-0.332	(0)
H2SeO3	6.298e-13	6.298e-13	-12.201	-12.201	0.000	(0)
AgSeO3-	1.387e-14	1.146e-14	-13.858	-13.941	-0.083	(0)
Cd(SeO3)2-2	2.831e-19	1.320e-19	-18.548	-18.880	-0.332	(0)
Ag(SeO3)2-3	4.759e-21	8.541e-22	-20.322	-21.068	-0.746	(0)
FeHSeO3+2	6.714e-24	3.129e-24	-23.173	-23.505	-0.332	(0)
Se(6)	5.795e-11					
SeO4-2	5.785e-11	3.114e-11	-10.238	-10.507	-0.269	(0)
MnSeO4	9.956e-14	9.956e-14	-13.002	-13.002	0.000	(0)
ZnSeO4	5.470e-15	5.470e-15	-14.262	-14.262	0.000	(0)
NiSeO4	4.147e-16	4.147e-16	-15.382	-15.382	0.000	(0)
CoSeO4	2.749e-16	2.749e-16	-15.561	-15.561	0.000	(0)
HSeO4-	5.019e-17	4.147e-17	-16.299	-16.382	-0.083	(0)
CdSeO4	1.341e-17	1.341e-17	-16.873	-16.873	0.000	(0)
Zn(SeO4)2-2	3.705e-25	1.727e-25	-24.431	-24.763	-0.332	(0)
Si	3.890e-05					
H4SiO4	3.865e-05	3.889e-05	-4.413	-4.410	0.003	(0)
H3SiO4-	2.475e-07	2.115e-07	-6.606	-6.675	-0.068	(0)
H2SiO4-2	9.081e-13	5.021e-13	-12.042	-12.299	-0.257	(0)
UO2H3SiO4+	4.840e-13	3.999e-13	-12.315	-12.398	-0.083	(0)
SiF6-2	9.880e-29	5.408e-29	-28.005	-28.267	-0.262	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.283	-59.029	-0.746	(0)
U(4)	5.911e-21					
U(OH)5-	5.905e-21	4.879e-21	-20.229	-20.312	-0.083	(0)
U(OH)4	5.433e-24	5.433e-24	-23.265	-23.265	0.000	(0)
U(OH)3+	6.392e-28	5.282e-28	-27.194	-27.277	-0.083	(0)
U(OH)2+2	1.393e-32	6.493e-33	-31.856	-32.188	-0.332	(0)
UF3+	5.585e-36	4.614e-36	-35.253	-35.336	-0.083	(0)
UF2+2	5.644e-37	2.630e-37	-36.248	-36.580	-0.332	(0)
UF4	5.600e-38	5.600e-38	-37.252	-37.252	0.000	(0)
UOH+3	4.531e-38	8.131e-39	-37.344	-38.090	-0.746	(0)
UF+3	1.052e-39	1.888e-40	-38.978	-39.724	-0.746	(0)
UF5-	2.973e-40	2.456e-40	-39.527	-39.610	-0.083	(0)
U(SO4)2	2.625e-40	2.625e-40	-39.581	-39.581	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.643	-40.975	-0.332	(0)
UF6-2	0.000e+00	0.000e+00	-40.754	-41.086	-0.332	(0)

U+4	0.000e+00	0.000e+00	-43.742	-45.068	-1.326	(0)
UC1+3	0.000e+00	0.000e+00	-45.275	-46.021	-0.746	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.220	-173.934	-6.714	(0)
U (5)	1.123e-16					
UO2+	1.123e-16	9.281e-17	-15.950	-16.032	-0.083	(0)
U (6)	1.344e-07					
UO2 (CO3) 3-4	8.568e-08	4.042e-09	-7.067	-8.393	-1.326	(0)
UO2 (CO3) 2-2	4.844e-08	2.258e-08	-7.315	-7.646	-0.332	(0)
UO2CO3	3.167e-10	3.167e-10	-9.499	-9.499	0.000	(0)
UO2OH+	1.285e-12	1.062e-12	-11.891	-11.974	-0.083	(0)
UO2H3SiO4+	4.840e-13	3.999e-13	-12.315	-12.398	-0.083	(0)
UO2F+	4.118e-13	3.403e-13	-12.385	-12.468	-0.083	(0)
UO2F2	1.086e-13	1.086e-13	-12.964	-12.964	0.000	(0)
UO2SO4	1.050e-13	1.050e-13	-12.979	-12.979	0.000	(0)
UO2+2	4.138e-14	2.227e-14	-13.383	-13.652	-0.269	(0)
UO2 (SO4) 2-2	9.259e-15	4.315e-15	-14.033	-14.365	-0.332	(0)
UO2F3-	3.655e-15	3.020e-15	-14.437	-14.520	-0.083	(0)
UO2Cl+	9.720e-17	8.031e-17	-16.012	-16.095	-0.083	(0)
UO2F4-2	5.696e-18	2.655e-18	-17.244	-17.576	-0.332	(0)
(UO2) 2 (OH) 2+2	4.014e-18	1.871e-18	-17.396	-17.728	-0.332	(0)
(UO2) 3 (OH) 5+	2.615e-19	2.161e-19	-18.582	-18.665	-0.083	(0)
UO2NO3+	2.740e-22	2.264e-22	-21.562	-21.645	-0.083	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.688	-42.771	-0.083	(0)
V+2	0.000e+00	0.000e+00	-43.528	-43.860	-0.332	(0)
V (3)	1.808e-15					
V (OH) 3	1.808e-15	1.808e-15	-14.743	-14.743	0.000	(0)
V (OH) 2+	3.759e-26	3.106e-26	-25.425	-25.508	-0.083	(0)
VOH+2	1.680e-29	7.832e-30	-28.775	-29.106	-0.332	(0)
V+3	2.299e-34	4.126e-35	-33.638	-34.384	-0.746	(0)
VSO4+	7.347e-35	6.070e-35	-34.134	-34.217	-0.083	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.416	-56.162	-0.746	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-56.086	-57.412	-1.326	(0)
V (4)	1.638e-18					
V (OH) 3+	1.572e-18	1.299e-18	-17.804	-17.886	-0.083	(0)
VO+2	3.690e-20	1.720e-20	-19.433	-19.765	-0.332	(0)
VOSO4	1.476e-20	1.476e-20	-19.831	-19.831	0.000	(0)
VOF+	1.382e-20	1.142e-20	-19.860	-19.942	-0.083	(0)
VOF2	4.739e-22	4.739e-22	-21.324	-21.324	0.000	(0)
VOC1+	1.298e-22	1.073e-22	-21.887	-21.969	-0.083	(0)
VOF3-	2.252e-24	1.861e-24	-23.647	-23.730	-0.083	(0)
VOF4-2	1.784e-27	8.314e-28	-26.749	-27.080	-0.332	(0)
H2V2O4+2	1.816e-31	8.464e-32	-30.741	-31.072	-0.332	(0)
V (5)	4.459e-09					
H2VO4-	3.819e-09	3.155e-09	-8.418	-8.501	-0.083	(0)
HVO4-2	6.398e-10	2.982e-10	-9.194	-9.525	-0.332	(0)
H3VO4	8.386e-13	8.386e-13	-12.076	-12.076	0.000	(0)
H3V2O7-	2.068e-14	1.709e-14	-13.684	-13.767	-0.083	(0)
HV2O7-3	1.777e-15	3.190e-16	-14.750	-15.496	-0.746	(0)
VO4-3	3.133e-16	5.623e-17	-15.504	-16.250	-0.746	(0)
VO2+	5.196e-17	4.451e-17	-16.284	-16.352	-0.067	(0)
VO2F	8.640e-18	8.640e-18	-17.063	-17.063	0.000	(0)
V2O7-4	6.846e-18	3.230e-19	-17.165	-18.491	-1.326	(0)
VO2SO4-	4.008e-18	3.312e-18	-17.397	-17.480	-0.083	(0)
VO2F2-	4.202e-19	3.472e-19	-18.377	-18.459	-0.083	(0)
V3O9-3	1.835e-19	3.293e-20	-18.736	-19.482	-0.746	(0)
VO2F3-2	1.029e-21	4.794e-22	-20.988	-21.319	-0.332	(0)
V4O12-4	9.185e-25	4.334e-26	-24.037	-25.363	-1.326	(0)
VO2F4-3	1.455e-25	2.611e-26	-24.837	-25.583	-0.746	(0)
VO2NO3	1.147e-25	1.147e-25	-24.940	-24.940	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-63.420	-66.404	-2.984	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.720	-65.793	-2.072	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.834	-68.160	-1.326	(0)
Zn	3.315e-06					
Zn+2	2.108e-06	1.134e-06	-5.676	-5.945	-0.269	(0)
ZnSO4	7.734e-07	7.734e-07	-6.112	-6.112	0.000	(0)
ZnCO3	2.332e-07	2.332e-07	-6.632	-6.632	0.000	(0)
ZnHCO3+	8.793e-08	7.265e-08	-7.056	-7.139	-0.083	(0)

ZnOH+	5.199e-08	4.296e-08	-7.284	-7.367	-0.083	(0)
Zn(SO4)2-2	4.504e-08	2.099e-08	-7.346	-7.678	-0.332	(0)
ZnCl+	7.415e-09	6.336e-09	-8.130	-8.198	-0.068	(0)
ZnOHC1	3.141e-09	3.141e-09	-8.503	-8.503	0.000	(0)
ZnF+	3.032e-09	2.505e-09	-8.518	-8.601	-0.083	(0)
Zn(OH)2	2.578e-09	2.578e-09	-8.589	-8.589	0.000	(0)
ZnCl2	2.233e-11	2.233e-11	-10.651	-10.651	0.000	(0)
Zn(OH)3-	5.923e-12	4.894e-12	-11.227	-11.310	-0.083	(0)
ZnCl3-	4.616e-14	3.944e-14	-13.336	-13.404	-0.068	(0)
ZnNO3+	1.757e-14	1.452e-14	-13.755	-13.838	-0.083	(0)
ZnSeO4	5.470e-15	5.470e-15	-14.262	-14.262	0.000	(0)
Zn(OH)4-2	1.583e-16	7.378e-17	-15.800	-16.132	-0.332	(0)
ZnCl4-2	8.011e-17	4.385e-17	-16.096	-16.358	-0.262	(0)
Zn(NO3)2	1.476e-23	1.476e-23	-22.831	-22.831	0.000	(0)
Zn(SeO4)2-2	3.705e-25	1.727e-25	-24.431	-24.763	-0.332	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-148.169	-148.252	-0.083	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.817	-149.817	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.801	-224.884	-0.083	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-226.957	-227.288	-0.332	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-304.358	-304.690	-0.332	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-54.10	-47.81	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.04	-36.53	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.26	-36.53	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-70.10	-52.16	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.27	-35.24	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.35	-27.94	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.54	-23.09	0.45	(NH4)2SeO4
Acanthite	-51.89	-88.11	-36.22	Ag2S
Ag2CO3	-11.69	-22.78	-11.09	Ag2CO3
Ag2CrO4	-21.11	-32.70	-11.59	Ag2CrO4
Ag2HVO4	-12.44	-10.96	1.48	Ag2HVO4
Ag2MoO4	-12.07	-23.62	-11.55	Ag2MoO4
Ag2O	-14.76	-2.19	12.57	Ag2O
Ag2Se	0.10	-48.60	-48.70	Ag2Se
Ag2SeO3	-9.87	-17.02	-7.15	Ag2SeO3
Ag2SeO4	-18.93	-27.84	-8.91	Ag2SeO4
Ag2SO4	-15.02	-19.84	-4.82	Ag2SO4
Ag3AsO3	-28.18	-26.02	2.16	Ag3AsO3
Ag3AsO4	-16.65	-19.44	-2.79	Ag3AsO4
Ag3H2VO5	-17.24	-12.06	5.18	Ag3H2VO5
AgF:4H2O	-13.67	-12.63	1.05	AgF:4H2O
Agmetal	-0.33	-13.83	-13.51	Ag
AgVO3	-10.64	-9.87	0.77	AgVO3
Al(OH)3(am)	-1.63	9.17	10.80	Al(OH)3
Al2(MoO4)3	-48.34	-45.97	2.37	Al2(MoO4)3
Al2O3	-1.32	18.33	19.65	Al2O3
Al4(OH)10SO4	-3.69	19.01	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.79	-6.99	4.80	AlAsO4:2H2O
AlOHSO4	-5.26	-8.49	-3.23	AlOHSO4
AlSb	-152.50	-86.87	65.62	AlSb
Alunite	-1.63	-3.03	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.25	-12.04	-7.79	PbSO4
Anhydrite	-1.22	-5.58	-4.36	CaSO4
Anilite	-55.17	-87.05	-31.88	Cu0.25Cu1.5S
Antlerite	-2.54	6.25	8.79	Cu3(OH)4SO4
Aragonite	-0.22	-8.52	-8.30	CaCO3
Arsenolite	-88.21	-90.97	-2.76	As4O6
Artinite	-5.76	3.84	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.03	-32.32	6.71	As2O5
Atacamite	-1.68	5.71	7.39	Cu2(OH)3Cl
Azurite	-0.39	-17.29	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.89	7.50	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.42	-2.54	15.87	Ba2V2O7:2H2O

Ba3(AsO4)2	-0.90	-9.81	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-27.98	4.96	32.94	Ba3(VO4)2·4H2O
BaCrO4	-13.33	-23.00	-9.67	BaCrO4
BaF2	-9.74	-15.56	-5.82	BaF2
BaMoO4	-6.97	-13.93	-6.96	BaMoO4
Barite	-0.17	-10.15	-9.98	BaSO4
BaS	-94.60	-78.42	16.18	BaS
BaSeO3	-9.16	-7.33	1.83	BaSeO3
BaSeO4	-10.69	-18.15	-7.46	BaSeO4
Bianchite	-6.69	-8.45	-1.76	ZnSO4·6H2O
Birnessite	-7.73	10.36	18.09	MnO2
Bixbyite	-4.12	-4.77	-0.64	Mn2O3
BlaubleiI	-55.00	-79.17	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.59	9.17	8.58	AlOOH
Breithauptite	-57.17	-75.69	-18.52	NiSb
Brochantite	-1.01	14.21	15.22	Cu4(OH)6SO4
Brucite	-4.63	12.22	16.84	Mg(OH)2
Bunsenite	-4.84	7.61	12.45	NiO
Ca(VO3)2	-11.14	-5.48	5.66	Ca(VO3)2
Ca2V2O7	-10.90	6.60	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.95	6.60	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-18.39	3.91	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-20.28	18.68	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-21.18	18.68	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-298.82	-155.85	142.97	Ca3Sb2
CaCrO4	-16.17	-18.43	-2.27	CaCrO4
Calcite	-0.04	-8.52	-8.48	CaCO3
Calomel	-8.12	-26.03	-17.91	Hg2Cl2
CaMoO4	-1.41	-9.36	-7.95	CaMoO4
Carnotite	-2.73	-2.50	0.23	KUO2VO4
CaSeO3·2H2O	-5.57	-2.75	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-10.56	-13.58	-3.02	CaSeO4·2H2O
Cd(BO2)2	-12.71	-2.87	9.84	Cd(BO2)2
Cd(OH)2	-7.13	6.51	13.64	Cd(OH)2
Cd(OH)2(am)	-7.22	6.51	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.48	-15.77	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.67	1.89	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-20.00	8.40	28.40	Cd4(OH)6SO4
CdCl2	-13.28	-13.94	-0.66	CdCl2
CdCl2·1H2O	-12.25	-13.94	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.03	-13.94	-1.91	CdCl2·2.5H2O
CdF2	-15.34	-16.55	-1.21	CdF2
Cdmetal(alpha)	-32.48	-18.97	13.51	Cd
Cdmetal(gamma)	-32.58	-18.97	13.62	Cd
CdMoO4	-0.77	-14.92	-14.15	CdMoO4
CdOHCl	-7.25	-3.71	3.54	CdOHCl
CdSb	-76.43	-76.78	-0.35	CdSb
CdSe	-19.70	-39.90	-20.20	CdSe
CdSeO4·2H2O	-17.29	-19.14	-1.85	CdSeO4·2H2O
CdSO4	-10.97	-11.14	-0.17	CdSO4
CdSO4·1H2O	-9.42	-11.14	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-9.27	-11.14	-1.87	CdSO4·2.67H2O
Cerargyrite	-1.57	-11.32	-9.75	AgCl
Cerrusite	-1.85	-14.98	-13.13	PbCO3
CH4(g)	-81.48	-122.52	-41.05	CH4
Chalcanthite	-7.05	-9.69	-2.64	CuSO4·5H2O
Chalcedony	-0.86	-4.41	-3.55	SiO2
Chalcocite	-55.17	-90.09	-34.92	Cu2S
Chalcopyrite	-125.26	-160.53	-35.27	CuFeS2
Chrysotile	-4.36	27.84	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.87	-97.56	-45.69	HgS
Claudetite	-87.91	-90.97	-3.06	As4O6
Clausthalite	-13.70	-40.80	-27.10	PbSe
Co(BO2)2	-29.05	-1.98	27.07	Co(BO2)2
Co(OH)2	-5.70	7.40	13.09	Co(OH)2
Co(OH)3	-9.95	-12.26	-2.31	Co(OH)3
CO2(g)	-2.45	-20.60	-18.15	CO2

Co3(AsO4)2	-23.16	-10.13	13.03	Co3(AsO4)2
Co3O4	-6.63	-17.13	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-3.22	-13.20	-9.98	CoCO3
CoF2	-14.07	-15.67	-1.60	CoF2
CoF3	-45.40	-46.86	-1.46	CoF3
CoFe2O4	17.03	13.51	-3.53	CoFe2O4
CoMoO4	-6.28	-14.04	-7.76	CoMoO4
CoO	-6.19	7.40	13.59	CoO
CoS(alpha)	-71.08	-78.52	-7.44	CoS
CoS(beta)	-67.45	-78.52	-11.07	CoS
CoSe	-22.82	-39.02	-16.20	CoSe
CoSeO3	-8.75	-7.43	1.32	CoSeO3
CoSeO4:6H2O	-16.73	-18.26	-1.53	CoSeO4:6H2O
CoSO4	-13.06	-10.26	2.80	CoSO4
CoSO4:6H2O	-7.79	-10.26	-2.47	CoSO4:6H2O
Cotunnite	-10.06	-14.84	-4.78	PbCl2
Covellite	-55.65	-77.95	-22.30	CuS
Cr(OH)2	-21.97	-11.15	10.82	Cr(OH)2
Cr(OH)3	-2.69	-1.36	1.34	Cr(OH)3
Cr(OH)3(am)	-0.61	-1.36	-0.75	Cr(OH)3
Cr2O3	-0.35	-2.71	-2.36	Cr2O3
CrCl2	-45.70	-31.61	14.09	CrCl2
CrCl3	-47.15	-32.04	15.11	CrCl3
CrF3	-24.61	-35.95	-11.34	CrF3
Cristobalite	-1.06	-4.41	-3.35	SiO2
Crmetal	-67.11	-36.63	30.48	Cr
CrO3	-27.30	-30.51	-3.21	CrO3
Cryolite	-10.06	-43.90	-33.84	Na3AlF6
Cu(OH)2	-0.71	7.97	8.67	Cu(OH)2
Cu(SbO3)2	-25.47	19.74	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-9.18	0.07	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.27	-90.15	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.78	-50.58	-45.80	Cu2Se
Cu2SO4	-19.87	-21.82	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.52	-8.42	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.69	-102.29	-42.59	Cu3Sb
Cu3Se2	-25.53	-89.02	-63.49	Cu3Se2
CuCO3	-1.13	-12.63	-11.50	CuCO3
CuCrO4	-17.10	-22.54	-5.44	CuCrO4
CuF	-8.71	-13.61	-4.91	CuF
CuF2	-16.21	-15.09	1.12	CuF2
CuF2:2H2O	-10.54	-15.09	-4.55	CuF2:2H2O
Cumetal	-6.07	-14.82	-8.76	Cu
CuMoO4	-0.39	-13.47	-13.08	CuMoO4
CuOCuSO4	-12.02	-1.72	10.30	CuOCuSO4
Cupricferrite	8.09	14.08	5.99	CuFe2O4
Cuprite	-2.76	-4.16	-1.41	Cu2O
Cuprousferrite	9.89	0.97	-8.92	CuFeO2
CuSe	-5.35	-38.45	-33.10	CuSe
CuSe2	-26.01	-59.38	-33.37	CuSe2
CuSeO3:2H2O	-7.37	-6.86	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.25	-17.69	-2.44	CuSeO4:5H2O
CuSO4	-12.63	-9.69	2.94	CuSO4
Diaspore	2.29	9.17	6.87	AlOOH
Djurleite	-55.37	-89.29	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.36	-16.90	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.19	-16.90	-17.09	CaMg(CO3)2
Epsomite	-3.31	-5.44	-2.13	MgSO4:7H2O
Fe(OH)2	-10.22	3.35	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.03	-0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.49	-14.21	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.28	-8.72	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.76	-38.38	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.13	-46.86	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.77	9.46	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.51	-13.11	0.40	FeAsO4:2H2O

FeCr2O4	-6.56	0.64	7.20	FeCr2O4
FeMoO4	-8.00	-18.09	-10.09	FeMoO4
Ferrihydrite	-0.14	3.05	3.19	Fe(OH)3
Ferroselite	-45.40	-64.00	-18.60	FeSe2
FeS(ppt)	-79.63	-82.58	-2.95	FeS
FeSe	-32.07	-43.07	-11.00	FeSe
Fix_pe	-5.17	-5.17	0.00	e-
Fluorite	-0.49	-10.99	-10.50	CaF2
Galena	-66.33	-80.30	-13.97	PbS
Gibbsite	0.88	9.17	8.29	Al(OH)3
Goethite	2.56	3.05	0.49	FeOOH
Goslarite	-6.44	-8.45	-2.01	ZnSO4:7H2O
Greenalite	-19.59	1.22	20.81	Fe3Si2O5(OH)4
Greenockite	-65.05	-79.41	-14.36	CdS
Greigite	-289.19	-334.23	-45.03	Fe3S4
Gummite	-6.17	1.50	7.67	UO3
Gypsum	-0.97	-5.58	-4.61	CaSO4:2H2O
H-Jarosite	-14.05	-26.15	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.56	-21.44	-12.88	H2MoO4
H2S(g)	-77.91	-85.92	-8.01	H2S
H2Se(g)	-41.45	-46.41	-4.96	H2Se
Halite	-6.46	-4.85	1.60	NaCl
Halloysite	-0.06	9.51	9.57	Al2Si2O5(OH)4
Hausmannite	-4.87	56.16	61.03	Mn3O4
Hematite	7.53	6.11	-1.42	Fe2O3
Hercynite	-1.21	21.68	22.89	FeAl2O4
Hg(CH3)2(g)	-182.98	-256.69	-73.71	Hg(CH3)2
Hg(g)	-7.66	-15.53	-7.87	Hg
Hg(OH)2	-8.14	-11.64	-3.50	Hg(OH)2
Hg2(g)	-16.10	-31.06	-14.96	Hg2
Hg2(OH)2	-10.84	-5.58	5.26	Hg2(OH)2
Hg2CO3	-10.13	-26.18	-16.05	Hg2CO3
Hg2CrO4	-27.39	-36.09	-8.70	Hg2CrO4
Hg2F2	-18.28	-28.64	-10.36	Hg2F2
Hg2S	-79.82	-91.50	-11.68	Hg2S
Hg2SeO3	-15.75	-20.41	-4.66	Hg2SeO3
Hg2SO4	-17.10	-23.23	-6.13	Hg2SO4
Hg3O2CO3	-25.84	-55.52	-29.68	Hg3O2CO3
HgCl(g)	-32.51	-13.02	19.50	HgCl
HgCl2	-10.84	-32.10	-21.26	HgCl2
HgF(g)	-47.00	-14.32	32.68	HgF
HgF2(g)	-47.27	-34.70	12.57	HgF2
Hgmetal(l)	-2.08	-15.53	-13.45	Hg
HgSe	-2.36	-58.05	-55.69	HgSe
HgSeO3	-14.04	-26.47	-12.43	HgSeO3
HgSO4	-19.88	-29.30	-9.42	HgSO4
Huntite	-3.69	-33.66	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.57	-24.34	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-12.53	-21.30	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.20	-21.37	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.57	-21.37	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-34.22	-51.46	-17.24	K2Cr2O7
K2CrO4	-20.44	-20.95	-0.51	K2CrO4
K2MoO4	-15.14	-11.88	3.26	K2MoO4
K2SeO4	-15.37	-16.10	-0.73	K2SeO4
Kaolinite	2.08	9.51	7.43	Al2Si2O5(OH)4
Langite	-3.27	14.21	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.99	-6.42	-0.43	PbO:PbSO4
Laurionite	-5.23	-4.61	0.62	PbOHCl
Lepidocrocite	1.68	3.05	1.37	FeOOH
Lime	-20.62	12.08	32.70	CaO
Litharge	-7.08	5.62	12.69	PbO
Mackinawite	-78.98	-82.58	-3.60	FeS
Maghemite	-0.28	6.11	6.39	Fe2O3
Magnesioferrite	1.47	18.33	16.86	Fe2MgO4
Magnesite	-0.92	-8.38	-7.46	MgCO3
Magnetite	6.05	9.46	3.40	Fe3O4
Malachite	0.64	-4.66	-5.31	Cu2(OH)2CO3

Manganite	-2.37	22.97	25.34	MnOOH
Massicot	-7.28	5.62	12.89	PbO
Matlockite	-7.17	-16.14	-8.97	PbClF
Melanothallite	-18.75	-12.49	6.26	CuCl2
Melanterite	-12.10	-14.31	-2.21	FeSO4:7H2O
Metacinnabar	-52.47	-97.56	-45.09	HgS
Mg(OH)2 (active)	-6.58	12.22	18.79	Mg(OH)2
Mg(VO3)2	-16.61	-5.33	11.28	Mg(VO3)2
Mg2Sb3	-274.66	-199.98	74.68	Mg2Sb3
Mg2V2O7	-19.47	6.89	26.36	Mg2V2O7
MgCr2O4	-6.69	9.51	16.20	MgCr2O4
MgCrO4	-23.67	-18.29	5.38	MgCrO4
MgF2	-2.71	-10.84	-8.13	MgF2
MgMoO4	-7.37	-9.22	-1.85	MgMoO4
MgSeO3:6H2O	-5.67	-2.61	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-12.24	-13.44	-1.20	MgSeO4:6H2O
Minium	-31.19	42.34	73.52	Pb3O4
Mirabilite	-5.80	-6.91	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.23	-7.33	4.90	Mn(VO3)2
Mn2(SO4)3	-52.03	-57.74	-5.71	Mn2(SO4)3
Mn2Sb	-149.41	-88.33	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-14.15	-1.65	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.95	-10.23	2.72	MnCl2:4H2O
MnS (grn)	-75.87	-75.70	0.17	MnS
MnS (pnk)	-79.04	-75.70	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.69	-36.19	3.50	MnSe
MnSeO3	-5.73	-4.60	1.13	MnSeO3
MnSeO3:2H2O	-5.59	-4.61	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.38	-15.43	-2.05	MnSeO4:5H2O
MnSO4	-10.01	-7.43	2.58	MnSO4
Monteponite	-8.59	6.51	15.10	CdO
Montroydite	-8.00	-11.64	-3.64	HgO
MoO3	-13.44	-21.44	-8.00	MoO3
Morenosite	-7.91	-10.05	-2.14	NiSO4:7H2O
MoS2	-148.50	-218.76	-70.26	MoS2
Na-Jarosite	-9.58	-20.78	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-40.38	-50.27	-9.90	Na2Cr2O7
Na2CrO4	-22.69	-19.76	2.93	Na2CrO4
Na2Mo2O7	-15.53	-32.12	-16.60	Na2Mo2O7
Na2MoO4	-12.18	-10.69	1.49	Na2MoO4
Na2MoO4:2H2O	-11.91	-10.69	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-14.38	-4.08	10.30	Na2SeO3:5H2O
Na2SeO4	-16.19	-14.91	1.28	Na2SeO4
Na3Sb	-174.37	-79.92	94.45	Na3Sb
Na3VO4	-29.33	7.35	36.68	Na3VO4
Na4V2O7	-33.46	3.94	37.40	Na4V2O7
Nantokite	-5.58	-12.31	-6.73	CuCl
NaSb	-88.35	-65.18	23.17	NaSb
Natron	-8.54	-9.85	-1.31	Na2CO3:10H2O
NaVO3	-7.26	-3.40	3.86	NaVO3
Nesquehonite	-3.71	-8.38	-4.67	MgCO3:3H2O
Ni(OH)2	-5.19	7.61	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.21	-9.51	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.24	12.76	32.00	Ni4(OH)6SO4
NiCO3	-6.12	-12.99	-6.87	NiCO3
NiMoO4	-2.69	-13.83	-11.14	NiMoO4
NiS (alpha)	-72.72	-78.32	-5.60	NiS
NiS (beta)	-67.22	-78.32	-11.10	NiS
NiS (gamma)	-65.52	-78.32	-12.80	NiS
NiSe	-21.11	-38.81	-17.70	NiSe
NiSeO3:2H2O	-10.04	-7.23	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.53	-18.05	-1.52	NiSeO4:6H2O
Nsutite	-7.15	10.36	17.50	MnO2
O2 (g)	-32.13	50.96	83.09	O2
Orpiment	-242.18	-303.25	-61.07	As2S3
Otavite	-2.08	-14.08	-12.00	CdCO3
Pb(BO2)2	-10.28	-3.76	6.52	Pb(BO2)2

Pb(OH) 2	-2.53	5.62	8.15	Pb(OH) 2
Pb10(OH) 60(CO3) 6	-58.64	-67.40	-8.76	Pb10(OH) 60(CO3) 6
Pb2(OH) 3Cl	-7.78	1.01	8.79	Pb2(OH) 3Cl
Pb2O(OH) 2	-14.95	11.24	26.19	Pb2O(OH) 2
Pb2O3	-24.32	36.72	61.04	Pb2O3
Pb2OCO3	-8.80	-9.36	-0.56	Pb2OCO3
Pb2V2O7	-4.42	-6.32	-1.90	Pb2V2O7
Pb3(AsO4) 2	-21.27	-15.47	5.80	Pb3(AsO4) 2
Pb3(VO4) 2	-6.84	-0.70	6.14	Pb3(VO4) 2
Pb3O2CO3	-14.76	-3.74	11.02	Pb3O2CO3
Pb3O2SO4	-11.49	-0.80	10.69	Pb3O2SO4
Pb4(OH) 6SO4	-16.28	4.82	21.10	Pb4(OH) 6SO4
Pb4O3SO4	-17.06	4.82	21.88	Pb4O3SO4
PbCrO4	-12.29	-24.89	-12.60	PbCrO4
PbF2	-10.00	-17.44	-7.44	PbF2
Pbmetal	-24.11	-19.86	4.25	Pb
PbMoO4	-0.20	-15.82	-15.62	PbMoO4
PbO:0.3H2O	-7.36	5.62	12.98	PbO:0.33H2O
PbSeO4	-13.20	-20.04	-6.84	PbSeO4
Periclase	-9.37	12.22	21.58	MgO
Phosgenite	-10.01	-29.82	-19.81	PbCl2:PbCO3
Plattnerite	-18.50	31.10	49.60	PbO2
Portlandite	-10.73	12.08	22.80	Ca(OH) 2
Pyrite	-124.51	-143.02	-18.51	FeS2
Pyrochroite	-4.97	10.23	15.19	Mn(OH) 2
Pyrolusite	-5.67	35.71	41.38	MnO2
Quartz	-0.41	-4.41	-4.00	SiO2
Realgar	-101.66	-121.41	-19.75	AsS
Retgersite	-8.01	-10.05	-2.04	NiSO4:6H2O
Rhodochrosite	0.21	-10.37	-10.58	MnCO3
Rutherfordine	-4.60	-19.10	-14.50	UO2CO3
Sb(OH) 3	-12.49	-19.60	-7.11	Sb(OH) 3
Sb2O4	-17.11	-13.71	3.40	Sb2O4
Sb2O5	-27.18	-36.85	-9.67	Sb2O5
Sb2Se3	-110.68	-178.43	-67.76	Sb2Se3
Sb4O6(cubic)	-60.12	-78.38	-18.26	Sb4O6
Sb4O6(orth)	-60.48	-78.38	-17.90	Sb4O6
SbCl3	-50.85	-50.28	0.57	SbCl3
SbF3	-43.96	-54.19	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.34	-31.17	-27.82	SbO2
Schoepite	-4.50	1.50	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.82	-20.93	-7.11	Se
Semetal(hex)	-13.22	-20.93	-7.71	Se
Senarmontite	-26.83	-39.19	-12.37	Sb2O3
SeO2	-14.96	-14.83	0.12	SeO2
SeO3	-46.70	-25.66	21.04	SeO3
Sepiolite	-4.55	11.21	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-7.57	11.21	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.01	-17.25	-10.24	FeCO3
SiO2(am-gel)	-1.70	-4.41	-2.71	SiO2
SiO2(am-ppt)	-1.67	-4.41	-2.74	SiO2
Smithsonite	-1.39	-11.39	-10.00	ZnCO3
Sphalerite	-65.27	-76.72	-11.45	ZnS
Spinel	-6.29	30.55	36.85	MgAl2O4
Stibnite	-246.50	-296.96	-50.46	Sb2S3
Sulfur	-58.30	-60.44	-2.14	S
Tenorite	0.32	7.97	7.64	CuO
Thenardite	-7.23	-6.91	0.32	Na2SO4
Thermonatrite	-10.49	-9.85	0.64	Na2CO3:H2O
Tyuyamunite	-6.56	-2.48	4.08	Ca(UO2) 2(VO4) 2
U3O8	-14.42	6.66	21.08	U3O8
U3Sb4	-580.84	-428.45	152.38	U3Sb4
U4O9	-30.57	-33.59	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.17	-60.89	-32.72	UF4:2.5H2O
UO2(am)	-15.70	-14.77	0.93	UO2
UO2(NO3) 2	-42.39	-30.24	12.15	UO2(NO3) 2

UO2(NO3)2:2H2O	-35.09	-30.24	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.63	-30.24	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.29	-30.24	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.11	1.50	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.91	-24.16	-2.25	UO2SeO4:4H2O
UO3	-6.20	1.50	7.70	UO3
Uraninite	-10.10	-14.77	-4.67	UO2
USb2	-220.16	-190.58	29.58	USb2
V(OH)3	-19.25	-11.66	7.59	V(OH)3
V2O5	-16.19	-17.55	-1.36	V2O5
V3O5	-41.16	-39.32	1.84	V3O5
V4O7	-51.12	-43.94	7.19	V4O7
V6O13	-42.76	-103.62	-60.86	V6O13
Valentinite	-30.71	-39.19	-8.48	Sb2O3
VC12	-63.73	-44.86	18.87	VC12
VC13	-65.78	-42.34	23.43	VC13
VF4	-65.67	-50.74	14.93	VF4
Vmetal	-93.91	-49.88	44.03	V
VO	-39.16	-24.40	14.76	VO
VO(OH)2	-9.76	-4.61	5.15	VO(OH)2
VO2Cl	-21.85	-19.00	2.84	VO2Cl
VOC1	-33.04	-21.89	11.15	VOC1
VOC12	-37.83	-25.07	12.76	VOC12
VOSO4	-25.88	-22.27	3.61	VOSO4
Witherite	-4.52	-13.09	-8.57	BaCO3
Wurtzite	-67.77	-76.72	-8.95	ZnS
Zincite	-2.13	9.21	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO4
Zn(BO2)2	-8.47	-0.18	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.85	-22.53	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.99	9.21	12.20	Zn(OH)2
Zn(OH)2(am)	-3.27	9.21	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.55	9.21	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.33	9.21	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.53	9.21	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.75	0.75	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.01	8.18	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.35	-4.70	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.61	-7.70	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.24	19.16	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.93	25.57	38.50	Zn5(OH)8Cl2
ZnCl2	-18.30	-11.25	7.05	ZnCl2
ZnCO3:1H2O	-1.13	-11.39	-10.26	ZnCO3:1H2O
ZnF2	-13.32	-13.86	-0.53	ZnF2
Znmetal	-42.06	-16.28	25.79	Zn
ZnMoO4	-2.10	-12.23	-10.13	ZnMoO4
ZnO(active)	-1.98	9.21	11.19	ZnO
ZnS(am)	-67.66	-76.72	-9.05	ZnS
ZnSb	-85.11	-74.09	11.01	ZnSb
ZnSe	-22.81	-37.21	-14.40	ZnSe
ZnSeO4:6H2O	-14.93	-16.45	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.81	-8.45	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 126.

REACTION 704
H2O -1
0.126267 moles ### Addition step. Removes HTC water but solute mass
remains

USE solution 710
SAVE Solution 711
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 710. Solution after simulation 125.
Using reaction 704.

Reaction 704.

1.263e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.472e-08	1.472e-08
Al	1.354e-06	1.354e-06
As	1.509e-10	1.509e-10
B	2.088e-05	2.088e-05
Ba	4.260e-08	4.260e-08
C	2.566e-03	2.566e-03
Ca	2.219e-03	2.219e-03
Cd	6.976e-09	6.976e-09
Cl	2.602e-03	2.602e-03
Co	5.369e-08	5.369e-08
Cr	1.671e-09	1.671e-09
Cu	1.694e-06	1.694e-06
F	1.482e-04	1.482e-04
Fe	1.223e-09	1.223e-09
Hg	1.100e-09	1.100e-09
K	1.917e-03	1.917e-03
Mg	2.893e-03	2.893e-03
Mn	3.282e-05	3.282e-05
Mo	9.662e-07	9.663e-07
N	8.032e-06	8.032e-06
Na	7.495e-03	7.495e-03
Ni	8.366e-08	8.366e-08
Pb	5.154e-09	5.154e-09
S	7.243e-03	7.243e-03
Sb	1.469e-08	1.469e-08
Se	8.534e-08	8.534e-08
Si	3.899e-05	3.899e-05
U	1.347e-07	1.347e-07
V	4.470e-09	4.470e-09
Zn	3.323e-06	3.323e-06

-----Description of solution-----

	pH =	7.575	Charge balance
	pe =	5.165	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	2.647e-02	

Mass of water (kg) = 1.000e+00
 Total alkalinity (eq/kg) = 2.469e-03
 Total CO2 (mol/kg) = 2.566e-03
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 9.505e-07
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 3
 Total H = 1.110191e+02
 Total O = 5.554503e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.447e-07	3.786e-07	-6.352	-6.422	-0.070	(0)
H+	3.104e-08	2.658e-08	-7.508	-7.575	-0.067	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	1.472e-08					
AgCl	9.754e-09	9.754e-09	-8.011	-8.011	0.000	(0)
Ag+	2.503e-09	2.144e-09	-8.601	-8.669	-0.067	(0)
AgCl2-	2.292e-09	1.893e-09	-8.640	-8.723	-0.083	(0)
AgSO4-	1.616e-10	1.335e-10	-9.792	-9.875	-0.083	(0)
AgCl3-2	8.073e-12	3.760e-12	-11.093	-11.425	-0.332	(0)
AgNO2	2.807e-12	2.807e-12	-11.552	-11.552	0.000	(0)
AgF	5.972e-13	5.972e-13	-12.224	-12.224	0.000	(0)
AgCl4-3	9.548e-14	1.711e-14	-13.020	-13.767	-0.747	(0)
AgOH	8.117e-14	8.117e-14	-13.091	-13.091	0.000	(0)
AgNH3+	5.824e-14	4.811e-14	-13.235	-13.318	-0.083	(0)
Ag2Se	2.046e-14	2.046e-14	-13.689	-13.689	0.000	(0)
AgH2BO3	1.516e-14	1.516e-14	-13.819	-13.819	0.000	(0)
AgSeO3-	1.390e-14	1.149e-14	-13.857	-13.940	-0.083	(0)
Ag (NO2) 2-	3.298e-17	2.724e-17	-16.482	-16.565	-0.083	(0)
AgNO3	8.697e-18	8.697e-18	-17.061	-17.061	0.000	(0)
Ag (NH3) 2+	5.203e-18	4.298e-18	-17.284	-17.367	-0.083	(0)
Ag (OH) 2-	3.635e-18	3.003e-18	-17.439	-17.522	-0.083	(0)
Ag (SeO3) 2-3	4.785e-21	8.572e-22	-20.320	-21.067	-0.747	(0)
Ag2MoO4	9.040e-25	9.040e-25	-24.044	-24.044	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.200	-73.200	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.800	-84.128	-1.328	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.170	-147.354	-0.184	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.363	-147.446	-0.083	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.875	-149.218	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.202	-149.529	-0.327	(0)
Al	1.354e-06					
Al (OH) 4-	1.323e-06	1.134e-06	-5.878	-5.945	-0.067	(0)
Al (OH) 3	2.380e-08	2.380e-08	-7.623	-7.623	0.000	(0)
Al (OH) 2+	3.654e-09	3.150e-09	-8.437	-8.502	-0.064	(0)
AlF3	1.891e-09	1.891e-09	-8.723	-8.723	0.000	(0)
AlF2+	1.571e-09	1.355e-09	-8.804	-8.868	-0.064	(0)
AlF4-	1.226e-10	1.051e-10	-9.911	-9.978	-0.067	(0)
AlF+2	5.553e-11	3.068e-11	-10.256	-10.513	-0.258	(0)
AlOH+2	1.896e-11	1.048e-11	-10.722	-10.980	-0.258	(0)
AlSO4+	7.820e-13	6.704e-13	-12.107	-12.174	-0.067	(0)
Al+3	1.116e-13	2.767e-14	-12.952	-13.558	-0.606	(0)
Al (SO4) 2-	2.615e-14	2.242e-14	-13.582	-13.649	-0.067	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-40.976	-41.723	-0.747	(0)
As (3)	1.850e-23					
H3AsO3	1.807e-23	1.807e-23	-22.743	-22.743	0.000	(0)
H2AsO3-	4.221e-25	3.487e-25	-24.375	-24.458	-0.083	(0)
HAsO3-2	2.569e-29	1.196e-29	-28.590	-28.922	-0.332	(0)
H4AsO3+	2.882e-31	2.381e-31	-30.540	-30.623	-0.083	(0)
AsO3-3	9.682e-35	1.735e-35	-34.014	-34.761	-0.747	(0)
As (5)	1.509e-10					
HAsO4-2	1.327e-10	6.180e-11	-9.877	-10.209	-0.332	(0)
H2AsO4-	1.814e-11	1.498e-11	-10.741	-10.824	-0.083	(0)
AsO4-3	4.103e-14	7.351e-15	-13.387	-14.134	-0.747	(0)

	H3AsO4	6.879e-17	6.921e-17	-16.162	-16.160	0.003	(0)
B	2.088e-05						
	H3BO3	2.030e-05	2.043e-05	-4.692	-4.690	0.003	(0)
	H2BO3-	5.282e-07	4.463e-07	-6.277	-6.350	-0.073	(0)
	CaH2BO3+	2.570e-08	2.171e-08	-7.590	-7.663	-0.073	(0)
	MgH2BO3+	2.146e-08	1.813e-08	-7.668	-7.742	-0.073	(0)
	NaH2BO3	4.460e-09	4.460e-09	-8.351	-8.351	0.000	(0)
	BF(OH) 3-	1.070e-09	9.039e-10	-8.971	-9.044	-0.073	(0)
	H5(BO3) 2-	9.183e-12	7.759e-12	-11.037	-11.110	-0.073	(0)
	BaH2BO3+	3.692e-13	3.120e-13	-12.433	-12.506	-0.073	(0)
	BF2(OH) 2-	3.373e-13	2.850e-13	-12.472	-12.545	-0.073	(0)
	H8(BO3) 3-	1.876e-14	1.585e-14	-13.727	-13.800	-0.073	(0)
	AgH2BO3	1.516e-14	1.516e-14	-13.819	-13.819	0.000	(0)
	BF3OH-	3.871e-19	3.271e-19	-18.412	-18.485	-0.073	(0)
	BF4-	5.618e-24	4.746e-24	-23.250	-23.324	-0.073	(0)
Ba	4.260e-08						
	Ba+2	4.205e-08	2.262e-08	-7.376	-7.645	-0.269	(0)
	BaHCO3+	5.067e-10	4.384e-10	-9.295	-9.358	-0.063	(0)
	BaCO3	4.152e-11	4.152e-11	-10.382	-10.382	0.000	(0)
	BaH2BO3+	3.692e-13	3.120e-13	-12.433	-12.506	-0.073	(0)
	BaOH+	4.347e-14	3.739e-14	-13.362	-13.427	-0.065	(0)
	BaNO3+	7.009e-16	5.790e-16	-15.154	-15.237	-0.083	(0)
	BaNH3+2	3.369e-16	1.569e-16	-15.473	-15.804	-0.332	(0)
C(4)	2.566e-03						
	HCO3-	2.354e-03	2.030e-03	-2.628	-2.693	-0.064	(0)
	H2CO3	1.213e-04	1.213e-04	-3.916	-3.916	0.000	(0)
	CaHCO3+	3.692e-05	3.195e-05	-4.433	-4.496	-0.063	(0)
	MgHCO3+	2.848e-05	2.434e-05	-4.545	-4.614	-0.068	(0)
	NaHCO3	7.198e-06	7.198e-06	-5.143	-5.143	0.000	(0)
	CO3-2	6.653e-06	3.579e-06	-5.177	-5.446	-0.269	(0)
	CaCO3	4.796e-06	4.796e-06	-5.319	-5.319	0.000	(0)
	MgCO3	3.488e-06	3.488e-06	-5.457	-5.457	0.000	(0)
	CuCO3	1.385e-06	1.385e-06	-5.859	-5.859	0.000	(0)
	MnHCO3+	5.601e-07	4.817e-07	-6.252	-6.317	-0.065	(0)
	NaCO3-	4.875e-07	4.203e-07	-6.312	-6.376	-0.064	(0)
	ZnCO3	2.339e-07	2.339e-07	-6.631	-6.631	0.000	(0)
	ZnHCO3+	8.825e-08	7.290e-08	-7.054	-7.137	-0.083	(0)
	UO2(CO3) 3-4	8.600e-08	4.045e-09	-7.065	-8.393	-1.328	(0)
	UO2(CO3) 2-2	4.842e-08	2.255e-08	-7.315	-7.647	-0.332	(0)
	Cu(CO3) 2-2	2.865e-08	1.334e-08	-7.543	-7.875	-0.332	(0)
	CuHCO3+	1.019e-08	8.415e-09	-7.992	-8.075	-0.083	(0)
	NiHCO3+	8.635e-09	7.133e-09	-8.064	-8.147	-0.083	(0)
	NiCO3	3.807e-09	3.807e-09	-8.419	-8.419	0.000	(0)
	CoHCO3+	3.370e-09	2.784e-09	-8.472	-8.555	-0.083	(0)
	PbCO3	3.161e-09	3.161e-09	-8.500	-8.500	0.000	(0)
	CoCO3	1.067e-09	1.067e-09	-8.972	-8.972	0.000	(0)
	PbHCO3+	5.364e-10	4.431e-10	-9.271	-9.354	-0.083	(0)
	BaHCO3+	5.067e-10	4.384e-10	-9.295	-9.358	-0.063	(0)
	UO2CO3	3.158e-10	3.158e-10	-9.501	-9.501	0.000	(0)
	CdCO3	1.889e-10	1.889e-10	-9.724	-9.724	0.000	(0)
	Pb(CO3) 2-2	7.007e-11	3.263e-11	-10.154	-10.486	-0.332	(0)
	BaCO3	4.152e-11	4.152e-11	-10.382	-10.382	0.000	(0)
	CdHCO3+	1.295e-11	1.070e-11	-10.888	-10.971	-0.083	(0)
	Cd(CO3) 2-2	1.076e-12	5.011e-13	-11.968	-12.300	-0.332	(0)
	FeHCO3+	4.644e-14	4.018e-14	-13.333	-13.396	-0.063	(0)
	HgCO3	1.086e-14	1.086e-14	-13.964	-13.964	0.000	(0)
	Hg(CO3) 2-2	2.638e-16	1.229e-16	-15.579	-15.911	-0.332	(0)
	HgHCO3+	6.505e-18	5.374e-18	-17.187	-17.270	-0.083	(0)
Ca	2.219e-03						
	Ca+2	1.572e-03	8.454e-04	-2.804	-3.073	-0.269	(0)
	CaSO4	6.045e-04	6.045e-04	-3.219	-3.219	0.000	(0)
	CaHCO3+	3.692e-05	3.195e-05	-4.433	-4.496	-0.063	(0)
	CaCO3	4.796e-06	4.796e-06	-5.319	-5.319	0.000	(0)
	CaF+	1.190e-06	1.023e-06	-5.925	-5.990	-0.065	(0)
	CaH2BO3+	2.570e-08	2.171e-08	-7.590	-7.663	-0.073	(0)
	CaOH+	7.381e-09	6.387e-09	-8.132	-8.195	-0.063	(0)
	CaNH3+2	2.512e-11	1.170e-11	-10.600	-10.932	-0.332	(0)
	CaNO3+	1.653e-11	1.365e-11	-10.782	-10.865	-0.083	(0)

Ca (NH3) 2+2	1.099e-19	5.118e-20	-18.959	-19.291	-0.332	(0)
Cd	6.976e-09					
Cd+2	4.304e-09	2.315e-09	-8.366	-8.635	-0.269	(0)
CdSO4	1.694e-09	1.694e-09	-8.771	-8.771	0.000	(0)
CdCl+	5.964e-10	4.927e-10	-9.224	-9.307	-0.083	(0)
CdCO3	1.889e-10	1.889e-10	-9.724	-9.724	0.000	(0)
Cd (SO4) 2-2	1.531e-10	7.132e-11	-9.815	-10.147	-0.332	(0)
CdHCO3+	1.295e-11	1.070e-11	-10.888	-10.971	-0.083	(0)
CdOH+	8.428e-12	6.963e-12	-11.074	-11.157	-0.083	(0)
CdOHC1	7.652e-12	7.652e-12	-11.116	-11.116	0.000	(0)
CdF+	4.926e-12	4.069e-12	-11.308	-11.390	-0.083	(0)
CdCl2	4.577e-12	4.577e-12	-11.339	-11.339	0.000	(0)
Cd (CO3) 2-2	1.076e-12	5.011e-13	-11.968	-12.300	-0.332	(0)
Cd (OH) 2	1.663e-14	1.663e-14	-13.779	-13.779	0.000	(0)
CdCl3-	7.790e-15	6.435e-15	-14.108	-14.191	-0.083	(0)
CdF2	9.004e-16	9.004e-16	-15.046	-15.046	0.000	(0)
CdNO3+	4.526e-17	3.739e-17	-16.344	-16.427	-0.083	(0)
CdSeO4	1.345e-17	1.345e-17	-16.871	-16.871	0.000	(0)
Cd (OH) 3-	4.657e-19	3.847e-19	-18.332	-18.415	-0.083	(0)
Cd2OH+3	4.510e-19	8.079e-20	-18.346	-19.093	-0.747	(0)
Cd (SeO3) 2-2	2.847e-19	1.326e-19	-18.546	-18.878	-0.332	(0)
Cd (NO3) 2	9.571e-26	9.571e-26	-25.019	-25.019	0.000	(0)
Cd (OH) 4-2	5.120e-26	2.384e-26	-25.291	-25.623	-0.332	(0)
CdHS+	0.000e+00	0.000e+00	-78.890	-78.973	-0.083	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.115	-150.115	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.477	-226.560	-0.083	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.378	-302.710	-0.332	(0)
Cl	2.602e-03					
Cl-	2.602e-03	2.228e-03	-2.585	-2.652	-0.067	(0)
MnCl+	3.880e-08	3.337e-08	-7.411	-7.477	-0.065	(0)
AgCl	9.754e-09	9.754e-09	-8.011	-8.011	0.000	(0)
ZnCl+	7.442e-09	6.358e-09	-8.128	-8.197	-0.068	(0)
ZnOHC1	3.151e-09	3.151e-09	-8.501	-8.501	0.000	(0)
AgCl2-	2.292e-09	1.893e-09	-8.640	-8.723	-0.083	(0)
CuCl	6.171e-10	6.171e-10	-9.210	-9.210	0.000	(0)
CdCl+	5.964e-10	4.927e-10	-9.224	-9.307	-0.083	(0)
CuCl2-	3.363e-10	2.873e-10	-9.473	-9.542	-0.068	(0)
CuCl+	2.716e-10	2.321e-10	-9.566	-9.634	-0.068	(0)
NiCl+	1.968e-10	1.625e-10	-9.706	-9.789	-0.083	(0)
CoCl+	1.646e-10	1.359e-10	-9.784	-9.867	-0.083	(0)
MnCl2	1.050e-10	1.050e-10	-9.979	-9.979	0.000	(0)
PbCl+	2.812e-11	2.323e-11	-10.551	-10.634	-0.083	(0)
ZnCl2	2.245e-11	2.245e-11	-10.649	-10.649	0.000	(0)
AgCl3-2	8.073e-12	3.760e-12	-11.093	-11.425	-0.332	(0)
CdOHC1	7.652e-12	7.652e-12	-11.116	-11.116	0.000	(0)
CdCl2	4.577e-12	4.577e-12	-11.339	-11.339	0.000	(0)
HgClOH	3.776e-12	3.776e-12	-11.423	-11.423	0.000	(0)
HgCl2	1.259e-12	1.259e-12	-11.900	-11.900	0.000	(0)
CuCl3-2	2.502e-13	1.369e-13	-12.602	-12.864	-0.262	(0)
PbCl2	2.312e-13	2.312e-13	-12.636	-12.636	0.000	(0)
CuCl2	1.793e-13	1.793e-13	-12.746	-12.746	0.000	(0)
AgCl4-3	9.548e-14	1.711e-14	-13.020	-13.767	-0.747	(0)
MnCl3-	7.496e-14	6.447e-14	-13.125	-13.191	-0.065	(0)
ZnCl3-	4.652e-14	3.975e-14	-13.332	-13.401	-0.068	(0)
HgCl3-	3.395e-14	2.804e-14	-13.469	-13.552	-0.083	(0)
CdCl3-	7.790e-15	6.435e-15	-14.108	-14.191	-0.083	(0)
NiCl2	1.824e-15	1.824e-15	-14.739	-14.739	0.000	(0)
HgCl4-2	5.342e-16	2.488e-16	-15.272	-15.604	-0.332	(0)
PbCl3-	2.483e-16	2.051e-16	-15.605	-15.688	-0.083	(0)
HgCl+	1.364e-16	1.127e-16	-15.865	-15.948	-0.083	(0)
UO2Cl+	9.695e-17	8.009e-17	-16.013	-16.096	-0.083	(0)
ZnCl4-2	8.095e-17	4.429e-17	-16.092	-16.354	-0.262	(0)
CrCl+2	1.908e-17	8.884e-18	-16.719	-17.051	-0.332	(0)
CuCl3-	4.365e-18	3.729e-18	-17.360	-17.428	-0.068	(0)
PbCl4-2	4.487e-19	2.089e-19	-18.348	-18.680	-0.332	(0)
CrOHC12	1.425e-19	1.425e-19	-18.846	-18.846	0.000	(0)
FeCl+2	2.629e-21	1.438e-21	-20.580	-20.842	-0.262	(0)
CrCl2+	2.274e-21	1.878e-21	-20.643	-20.726	-0.083	(0)

VOC1+	1.305e-22	1.078e-22	-21.884	-21.967	-0.083	(0)
CuCl4-2	7.612e-23	4.165e-23	-22.119	-22.380	-0.262	(0)
FeCl2+	1.665e-23	1.432e-23	-22.779	-22.844	-0.065	(0)
CrO3Cl-	1.702e-26	1.406e-26	-25.769	-25.852	-0.083	(0)
FeCl3	3.191e-27	3.191e-27	-26.496	-26.496	0.000	(0)
CoCl+2	1.000e-35	4.658e-36	-35.000	-35.332	-0.332	(0)
UCl+3	0.000e+00	0.000e+00	-45.275	-46.022	-0.747	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.842	-49.174	-0.332	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.483	-50.815	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.516	-63.848	-0.332	(0)
Co (2)	5.369e-08					
Co+2	3.787e-08	1.764e-08	-7.422	-7.754	-0.332	(0)
CoSO4	1.098e-08	1.098e-08	-7.959	-7.959	0.000	(0)
CoHCO3+	3.370e-09	2.784e-09	-8.472	-8.555	-0.083	(0)
CoCO3	1.067e-09	1.067e-09	-8.972	-8.972	0.000	(0)
CoCl+	1.646e-10	1.359e-10	-9.784	-9.867	-0.083	(0)
CoOH+	1.613e-10	1.332e-10	-9.792	-9.875	-0.083	(0)
CoF+	7.487e-11	6.185e-11	-10.126	-10.209	-0.083	(0)
Co (OH) 2	4.006e-12	4.006e-12	-11.397	-11.397	0.000	(0)
CoNO2+	9.427e-13	7.788e-13	-12.026	-12.109	-0.083	(0)
Co (NH3) +2	5.004e-14	2.330e-14	-13.301	-13.633	-0.332	(0)
CoSeO4	2.757e-16	2.757e-16	-15.560	-15.560	0.000	(0)
CoNO3+	1.728e-16	1.427e-16	-15.762	-15.845	-0.083	(0)
Co (OH) 3-	3.664e-17	3.027e-17	-16.436	-16.519	-0.083	(0)
CoOOH-	9.196e-18	7.597e-18	-17.036	-17.119	-0.083	(0)
Co2OH+3	6.572e-19	1.177e-19	-18.182	-18.929	-0.747	(0)
Co (NH3) 2+2	2.346e-20	1.093e-20	-19.630	-19.962	-0.332	(0)
Co (OH) 4-2	3.900e-24	1.816e-24	-23.409	-23.741	-0.332	(0)
Co (NO3) 2	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
Co (NH3) 3+2	3.246e-27	1.512e-27	-26.489	-26.821	-0.332	(0)
Co4 (OH) 4+4	1.336e-30	6.285e-32	-29.874	-31.202	-1.328	(0)
Co (NH3) 4+2	1.872e-34	8.719e-35	-33.728	-34.060	-0.332	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.467	-41.798	-0.332	(0)
Co (3)	4.244e-29					
CoOH+2	4.244e-29	1.976e-29	-28.372	-28.704	-0.332	(0)
Co+3	4.145e-35	1.027e-35	-34.382	-34.988	-0.606	(0)
CoCl+2	1.000e-35	4.658e-36	-35.000	-35.332	-0.332	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.842	-49.174	-0.332	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.694	-58.776	-0.083	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.086	-63.418	-0.332	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.516	-63.848	-0.332	(0)
Cr (2)	1.080e-26					
Cr+2	1.080e-26	5.030e-27	-25.967	-26.298	-0.332	(0)
Cr (3)	1.671e-09					
Cr (OH) 2+	1.423e-09	1.175e-09	-8.847	-8.930	-0.083	(0)
Cr (OH) 3	1.672e-10	1.672e-10	-9.777	-9.777	0.000	(0)
Cr (OH) +2	5.479e-11	2.552e-11	-10.261	-10.593	-0.332	(0)
CrOHSO4	1.890e-11	1.890e-11	-10.724	-10.724	0.000	(0)
CrO2-	3.617e-12	2.988e-12	-11.442	-11.525	-0.083	(0)
Cr (OH) 4-	3.050e-12	2.520e-12	-11.516	-11.599	-0.083	(0)
CrF+2	1.163e-13	5.415e-14	-12.935	-13.266	-0.332	(0)
CrSO4+	2.718e-14	2.245e-14	-13.566	-13.649	-0.083	(0)
Cr+3	1.720e-14	3.081e-15	-13.765	-14.511	-0.747	(0)
CrCl+2	1.908e-17	8.884e-18	-16.719	-17.051	-0.332	(0)
CrOHC12	1.425e-19	1.425e-19	-18.846	-18.846	0.000	(0)
Cr2 (OH) 2SO4+2	9.360e-20	4.359e-20	-19.029	-19.361	-0.332	(0)
Cr2 (OH) 2 (SO4) 2	8.081e-21	8.081e-21	-20.093	-20.093	0.000	(0)
CrCl2+	2.274e-21	1.878e-21	-20.643	-20.726	-0.083	(0)
CrNO3+2	1.477e-24	6.877e-25	-23.831	-24.163	-0.332	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.024	-40.356	-0.332	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.518	-49.265	-0.747	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.483	-50.815	-0.332	(0)
Cr (6)	8.806e-16					
CrO4-2	8.151e-16	4.385e-16	-15.089	-15.358	-0.269	(0)
HCrO4-	4.566e-17	3.772e-17	-16.340	-16.423	-0.083	(0)
NaCrO4-	1.664e-17	1.374e-17	-16.779	-16.862	-0.083	(0)
KCrO4-	3.168e-18	2.617e-18	-17.499	-17.582	-0.083	(0)
CrO3SO4-2	2.048e-24	9.537e-25	-23.689	-24.021	-0.332	(0)

H2CrO4	8.129e-25	8.129e-25	-24.090	-24.090	0.000	(0)
CrO3Cl-	1.702e-26	1.406e-26	-25.769	-25.852	-0.083	(0)
Cr2O7-2	1.060e-31	4.936e-32	-30.975	-31.307	-0.332	(0)
Cu (1)	1.220e-09					
CuCl	6.171e-10	6.171e-10	-9.210	-9.210	0.000	(0)
CuCl2-	3.363e-10	2.873e-10	-9.473	-9.542	-0.068	(0)
Cu+	2.663e-10	2.200e-10	-9.575	-9.658	-0.083	(0)
CuCl3-2	2.502e-13	1.369e-13	-12.602	-12.864	-0.262	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.473	-147.808	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.219	-148.538	-0.320	(0)
Cu (2)	1.692e-06					
CuCO3	1.385e-06	1.385e-06	-5.859	-5.859	0.000	(0)
Cu+2	1.222e-07	6.571e-08	-6.913	-7.182	-0.269	(0)
CuOH+	9.208e-08	7.867e-08	-7.036	-7.104	-0.068	(0)
CuSO4	4.698e-08	4.698e-08	-7.328	-7.328	0.000	(0)
Cu (CO3) 2-2	2.865e-08	1.334e-08	-7.543	-7.875	-0.332	(0)
CuHCO3+	1.019e-08	8.415e-09	-7.992	-8.075	-0.083	(0)
Cu (OH) 2	5.943e-09	5.943e-09	-8.226	-8.226	0.000	(0)
CuF+	5.566e-10	4.598e-10	-9.254	-9.337	-0.083	(0)
Cu2 (OH) 2+2	3.339e-10	1.555e-10	-9.476	-9.808	-0.332	(0)
CuCl+	2.716e-10	2.321e-10	-9.566	-9.634	-0.068	(0)
CuNO2+	5.220e-11	4.312e-11	-10.282	-10.365	-0.083	(0)
CuNH3+2	1.587e-11	7.390e-12	-10.799	-11.131	-0.332	(0)
Cu (OH) 3-	5.587e-12	4.615e-12	-11.253	-11.336	-0.083	(0)
CuCl2	1.793e-13	1.793e-13	-12.746	-12.746	0.000	(0)
Cu (NO2) 2	2.765e-15	2.765e-15	-14.558	-14.558	0.000	(0)
CuNO3+	1.285e-15	1.061e-15	-14.891	-14.974	-0.083	(0)
Cu (OH) 4-2	2.953e-17	1.375e-17	-16.530	-16.862	-0.332	(0)
CuCl3-	4.365e-18	3.729e-18	-17.360	-17.428	-0.068	(0)
CuCl4-2	7.612e-23	4.165e-23	-22.119	-22.380	-0.262	(0)
Cu (NO3) 2	6.823e-25	6.823e-25	-24.166	-24.166	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.237	-216.320	-0.083	(0)
F	1.482e-04					
F-	1.295e-04	1.109e-04	-3.888	-3.955	-0.067	(0)
MgF+	1.701e-05	1.458e-05	-4.769	-4.836	-0.067	(0)
CaF+	1.190e-06	1.023e-06	-5.925	-5.990	-0.065	(0)
NaF	4.413e-07	4.413e-07	-6.355	-6.355	0.000	(0)
MnF+	6.107e-08	5.252e-08	-7.214	-7.280	-0.065	(0)
HF	4.361e-09	4.361e-09	-8.360	-8.360	0.000	(0)
ZnF+	3.043e-09	2.513e-09	-8.517	-8.600	-0.083	(0)
AlF3	1.891e-09	1.891e-09	-8.723	-8.723	0.000	(0)
AlF2+	1.571e-09	1.355e-09	-8.804	-8.868	-0.064	(0)
BF (OH) 3-	1.070e-09	9.039e-10	-8.971	-9.044	-0.073	(0)
CuF+	5.566e-10	4.598e-10	-9.254	-9.337	-0.083	(0)
AlF4-	1.226e-10	1.051e-10	-9.911	-9.978	-0.067	(0)
NiF+	9.614e-11	7.942e-11	-10.017	-10.100	-0.083	(0)
CoF+	7.487e-11	6.185e-11	-10.126	-10.209	-0.083	(0)
AlF+2	5.553e-11	3.068e-11	-10.256	-10.513	-0.258	(0)
CdF+	4.926e-12	4.069e-12	-11.308	-11.390	-0.083	(0)
PbF+	2.780e-12	2.296e-12	-11.556	-11.639	-0.083	(0)
HF2-	2.160e-12	1.839e-12	-11.666	-11.736	-0.070	(0)
AgF	5.972e-13	5.972e-13	-12.224	-12.224	0.000	(0)
UO2F+	4.107e-13	3.392e-13	-12.387	-12.469	-0.083	(0)
BF2 (OH) 2-	3.373e-13	2.850e-13	-12.472	-12.545	-0.073	(0)
CrF+2	1.163e-13	5.415e-14	-12.935	-13.266	-0.332	(0)
UO2F2	1.085e-13	1.085e-13	-12.965	-12.965	0.000	(0)
PbF2	5.011e-15	5.011e-15	-14.300	-14.300	0.000	(0)
UO2F3-	3.659e-15	3.022e-15	-14.437	-14.520	-0.083	(0)
CdF2	9.004e-16	9.004e-16	-15.046	-15.046	0.000	(0)
H2F2	5.094e-17	5.094e-17	-16.293	-16.293	0.000	(0)
FeF2+	8.969e-18	7.714e-18	-17.047	-17.113	-0.065	(0)
VO2F	8.679e-18	8.679e-18	-17.062	-17.062	0.000	(0)
UO2F4-2	5.717e-18	2.662e-18	-17.243	-17.575	-0.332	(0)
FeF+2	4.751e-18	2.599e-18	-17.323	-17.585	-0.262	(0)
PbF3-	1.276e-18	1.054e-18	-17.894	-17.977	-0.083	(0)
FeF3	1.207e-18	1.207e-18	-17.918	-17.918	0.000	(0)
VO2F2-	4.230e-19	3.494e-19	-18.374	-18.457	-0.083	(0)
BF3OH-	3.871e-19	3.271e-19	-18.412	-18.485	-0.073	(0)

VOF+	1.389e-20	1.147e-20	-19.857	-19.940	-0.083	(0)
VO2F3-2	1.038e-21	4.834e-22	-20.984	-21.316	-0.332	(0)
VOF2	4.770e-22	4.770e-22	-21.321	-21.321	0.000	(0)
PbF4-2	1.201e-22	5.595e-23	-21.920	-22.252	-0.332	(0)
HgF+	1.261e-23	1.042e-23	-22.899	-22.982	-0.083	(0)
BF4-	5.618e-24	4.746e-24	-23.250	-23.324	-0.073	(0)
VOF3-	2.272e-24	1.877e-24	-23.644	-23.727	-0.083	(0)
VO2F4-3	1.472e-25	2.638e-26	-24.832	-25.579	-0.747	(0)
Sb(OH) 2F	1.171e-25	1.171e-25	-24.932	-24.932	0.000	(0)
SbOF	1.152e-25	1.152e-25	-24.939	-24.939	0.000	(0)
VOF4-2	1.804e-27	8.402e-28	-26.744	-27.076	-0.332	(0)
SiF6-2	1.003e-28	5.490e-29	-27.998	-28.260	-0.262	(0)
UF3+	5.593e-36	4.620e-36	-35.252	-35.335	-0.083	(0)
UF2+2	5.644e-37	2.629e-37	-36.248	-36.580	-0.332	(0)
UF4	5.618e-38	5.618e-38	-37.250	-37.250	0.000	(0)
UF+3	1.051e-39	1.883e-40	-38.978	-39.725	-0.747	(0)
UF5-	2.989e-40	2.469e-40	-39.525	-39.608	-0.083	(0)
UF6-2	0.000e+00	0.000e+00	-40.751	-41.083	-0.332	(0)
Fe (2)	4.656e-12					
Fe+2	3.377e-12	1.573e-12	-11.471	-11.803	-0.332	(0)
FeSO4	1.205e-12	1.205e-12	-11.919	-11.919	0.000	(0)
FeHCO3+	4.644e-14	4.018e-14	-13.333	-13.396	-0.063	(0)
FeOH+	2.756e-14	2.370e-14	-13.560	-13.625	-0.065	(0)
Fe (OH) 2	7.129e-18	7.129e-18	-17.147	-17.147	0.000	(0)
Fe (OH) 3-	9.924e-19	8.535e-19	-18.003	-18.069	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.545	-159.545	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.770	-235.853	-0.083	(0)
Fe (3)	1.218e-09					
Fe (OH) 2+	8.927e-10	7.697e-10	-9.049	-9.114	-0.064	(0)
Fe (OH) 3	3.130e-10	3.130e-10	-9.505	-9.505	0.000	(0)
Fe (OH) 4-	1.280e-11	1.103e-11	-10.893	-10.957	-0.064	(0)
FeOH+2	9.551e-15	5.225e-15	-14.020	-14.282	-0.262	(0)
FeF2+	8.969e-18	7.714e-18	-17.047	-17.113	-0.065	(0)
FeF+2	4.751e-18	2.599e-18	-17.323	-17.585	-0.262	(0)
FeF3	1.207e-18	1.207e-18	-17.918	-17.918	0.000	(0)
FeSO4+	8.704e-19	7.486e-19	-18.060	-18.126	-0.065	(0)
Fe+3	8.625e-20	2.138e-20	-19.064	-19.670	-0.606	(0)
Fe (SO4) 2-	6.047e-20	4.995e-20	-19.218	-19.301	-0.083	(0)
FeCl+2	2.629e-21	1.438e-21	-20.580	-20.842	-0.262	(0)
FeCl2+	1.665e-23	1.432e-23	-22.779	-22.844	-0.065	(0)
FeHSeO3+2	6.751e-24	3.144e-24	-23.171	-23.503	-0.332	(0)
Fe2 (OH) 2+4	1.922e-26	9.041e-28	-25.716	-27.044	-1.328	(0)
FeCl3	3.191e-27	3.191e-27	-26.496	-26.496	0.000	(0)
FeNO3+2	2.344e-27	1.092e-27	-26.630	-26.962	-0.332	(0)
Fe3 (OH) 4+5	1.194e-33	1.006e-35	-32.923	-34.997	-2.074	(0)
H (0)	4.646e-29					
H2	2.323e-29	2.337e-29	-28.634	-28.631	0.003	(0)
Hg (0)	1.093e-09					
Hg	1.093e-09	1.093e-09	-8.961	-8.961	0.000	(0)
Hg (1)	8.075e-21					
Hg2+2	4.037e-21	1.880e-21	-20.394	-20.726	-0.332	(0)
Hg (2)	7.359e-12					
HgClOH	3.776e-12	3.776e-12	-11.423	-11.423	0.000	(0)
Hg (OH) 2	2.278e-12	2.292e-12	-11.642	-11.640	0.003	(0)
HgCl2	1.259e-12	1.259e-12	-11.900	-11.900	0.000	(0)
HgCl3-	3.395e-14	2.804e-14	-13.469	-13.552	-0.083	(0)
HgCO3	1.086e-14	1.086e-14	-13.964	-13.964	0.000	(0)
HgCl4-2	5.342e-16	2.488e-16	-15.272	-15.604	-0.332	(0)
Hg (CO3) 2-2	2.638e-16	1.229e-16	-15.579	-15.911	-0.332	(0)
HgCl+	1.364e-16	1.127e-16	-15.865	-15.948	-0.083	(0)
HgOH+	4.624e-17	3.820e-17	-16.335	-16.418	-0.083	(0)
HgHCO3+	6.505e-18	5.374e-18	-17.187	-17.270	-0.083	(0)
Hg (NH3) 2+2	4.148e-19	1.932e-19	-18.382	-18.714	-0.332	(0)
Hg (OH) 3-	1.323e-19	1.093e-19	-18.879	-18.962	-0.083	(0)
HgNH3+2	3.774e-20	1.758e-20	-19.423	-19.755	-0.332	(0)
Hg+2	5.442e-21	2.534e-21	-20.264	-20.596	-0.332	(0)
HgSO4	2.071e-21	2.071e-21	-20.684	-20.684	0.000	(0)
HgF+	1.261e-23	1.042e-23	-22.899	-22.982	-0.083	(0)

	Hg (NH3) 3+2	1.815e-26	8.452e-27	-25.741	-26.073	-0.332	(0)
	HgNO3+	5.786e-30	4.779e-30	-29.238	-29.321	-0.083	(0)
	Hg (NH3) 4+2	1.584e-33	7.379e-34	-32.800	-33.132	-0.332	(0)
	Hg (NO3) 2	1.014e-38	1.014e-38	-37.994	-37.994	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.701	-137.784	-0.083	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.585	-138.917	-0.332	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.965	-138.965	0.000	(0)
K		1.917e-03					
	K+	1.875e-03	1.606e-03	-2.727	-2.794	-0.067	(0)
	KSO4-	4.116e-05	3.549e-05	-4.386	-4.450	-0.064	(0)
	KCrO4-	3.168e-18	2.617e-18	-17.499	-17.582	-0.083	(0)
Mg		2.893e-03					
	Mg+2	2.178e-03	1.172e-03	-2.662	-2.931	-0.269	(0)
	MgSO4	6.655e-04	6.655e-04	-3.177	-3.177	0.000	(0)
	MgHCO3+	2.848e-05	2.434e-05	-4.545	-4.614	-0.068	(0)
	MgF+	1.701e-05	1.458e-05	-4.769	-4.836	-0.067	(0)
	MgCO3	3.488e-06	3.488e-06	-5.457	-5.457	0.000	(0)
	MgOH+	2.035e-07	1.766e-07	-6.691	-6.753	-0.062	(0)
	MgH2BO3+	2.146e-08	1.813e-08	-7.668	-7.742	-0.073	(0)
Mn (2)		3.282e-05					
	Mn+2	2.554e-05	1.190e-05	-4.593	-4.925	-0.332	(0)
	MnSO4	6.603e-06	6.603e-06	-5.180	-5.180	0.000	(0)
	MnHCO3+	5.601e-07	4.817e-07	-6.252	-6.317	-0.065	(0)
	MnF+	6.107e-08	5.252e-08	-7.214	-7.280	-0.065	(0)
	MnCl+	3.880e-08	3.337e-08	-7.411	-7.477	-0.065	(0)
	MnOH+	1.315e-08	1.131e-08	-7.881	-7.946	-0.065	(0)
	MnCl2	1.050e-10	1.050e-10	-9.979	-9.979	0.000	(0)
	MnNO3+	1.166e-13	9.629e-14	-12.933	-13.016	-0.083	(0)
	MnSeO4	9.988e-14	9.988e-14	-13.001	-13.001	0.000	(0)
	MnCl3-	7.496e-14	6.447e-14	-13.125	-13.191	-0.065	(0)
	Mn (OH) 3-	1.165e-17	1.002e-17	-16.934	-16.999	-0.065	(0)
	Mn (NO3) 2	1.235e-21	1.235e-21	-20.908	-20.908	0.000	(0)
	Mn (OH) 4-2	2.239e-23	1.225e-23	-22.650	-22.912	-0.262	(0)
	MnSe	0.000e+00	0.000e+00	-41.572	-41.572	0.000	(0)
Mn (3)		3.137e-25					
	Mn+3	3.137e-25	7.775e-26	-24.503	-25.109	-0.606	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-41.821	-42.083	-0.262	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-46.218	-46.290	-0.072	(0)
Mo		9.662e-07					
	MoO4-2	9.659e-07	5.196e-07	-6.015	-6.284	-0.269	(0)
	HMoO4-	3.327e-10	2.748e-10	-9.478	-9.561	-0.083	(0)
	H2MoO4	5.352e-14	5.352e-14	-13.271	-13.271	0.000	(0)
	Ag2MoO4	9.040e-25	9.040e-25	-24.044	-24.044	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-40.976	-41.723	-0.747	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-48.615	-51.603	-2.987	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.717	-52.791	-2.074	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-54.257	-55.584	-1.328	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-59.167	-59.914	-0.747	(0)
N (-3)		6.375e-07					
	NH4+	6.065e-07	5.124e-07	-6.217	-6.290	-0.073	(0)
	NH4SO4-	1.993e-08	1.714e-08	-7.701	-7.766	-0.065	(0)
	NH3	1.099e-08	1.099e-08	-7.959	-7.959	0.000	(0)
	CaNH3+2	2.512e-11	1.170e-11	-10.600	-10.932	-0.332	(0)
	CuNH3+2	1.587e-11	7.390e-12	-10.799	-11.131	-0.332	(0)
	NiNH3+2	3.613e-13	1.683e-13	-12.442	-12.774	-0.332	(0)
	AgNH3+	5.824e-14	4.811e-14	-13.235	-13.318	-0.083	(0)
	Co (NH3) +2	5.004e-14	2.330e-14	-13.301	-13.633	-0.332	(0)
	BaNH3+2	3.369e-16	1.569e-16	-15.473	-15.804	-0.332	(0)
	Ag (NH3) 2+	5.203e-18	4.298e-18	-17.284	-17.367	-0.083	(0)
	Ni (NH3) 2+2	5.740e-19	2.673e-19	-18.241	-18.573	-0.332	(0)
	Hg (NH3) 2+2	4.148e-19	1.932e-19	-18.382	-18.714	-0.332	(0)
	Ca (NH3) 2+2	1.099e-19	5.118e-20	-18.959	-19.291	-0.332	(0)
	HgNH3+2	3.774e-20	1.758e-20	-19.423	-19.755	-0.332	(0)
	Co (NH3) 2+2	2.346e-20	1.093e-20	-19.630	-19.962	-0.332	(0)
	Hg (NH3) 3+2	1.815e-26	8.452e-27	-25.741	-26.073	-0.332	(0)
	Co (NH3) 3+2	3.246e-27	1.512e-27	-26.489	-26.821	-0.332	(0)

	Hg (NH3) 4+2	1.584e-33	7.379e-34	-32.800	-33.132	-0.332	(0)
	Co (NH3) 4+2	1.872e-34	8.719e-35	-33.728	-34.060	-0.332	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.024	-40.356	-0.332	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-41.467	-41.798	-0.332	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.518	-49.265	-0.747	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.842	-49.174	-0.332	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.483	-50.815	-0.332	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.694	-58.776	-0.083	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.086	-63.418	-0.332	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.516	-63.848	-0.332	(0)
N (3)	7.388e-06						
	NO2-	7.388e-06	6.267e-06	-5.131	-5.203	-0.072	(0)
	CuNO2+	5.220e-11	4.312e-11	-10.282	-10.365	-0.083	(0)
	AgNO2	2.807e-12	2.807e-12	-11.552	-11.552	0.000	(0)
	CoNO2+	9.427e-13	7.788e-13	-12.026	-12.109	-0.083	(0)
	Cu (NO2) 2	2.765e-15	2.765e-15	-14.558	-14.558	0.000	(0)
	Ag (NO2) 2-	3.298e-17	2.724e-17	-16.482	-16.565	-0.083	(0)
N (5)	5.980e-09						
	NO3-	5.963e-09	5.107e-09	-8.225	-8.292	-0.067	(0)
	CaNO3+	1.653e-11	1.365e-11	-10.782	-10.865	-0.083	(0)
	MnNO3+	1.166e-13	9.629e-14	-12.933	-13.016	-0.083	(0)
	ZnNO3+	1.764e-14	1.457e-14	-13.754	-13.836	-0.083	(0)
	CuNO3+	1.285e-15	1.061e-15	-14.891	-14.974	-0.083	(0)
	BaNO3+	7.009e-16	5.790e-16	-15.154	-15.237	-0.083	(0)
	NiNO3+	4.427e-16	3.657e-16	-15.354	-15.437	-0.083	(0)
	CoNO3+	1.728e-16	1.427e-16	-15.762	-15.845	-0.083	(0)
	CdNO3+	4.526e-17	3.739e-17	-16.344	-16.427	-0.083	(0)
	PbNO3+	2.687e-17	2.220e-17	-16.571	-16.654	-0.083	(0)
	AgNO3	8.697e-18	8.697e-18	-17.061	-17.061	0.000	(0)
	Mn (NO3) 2	1.235e-21	1.235e-21	-20.908	-20.908	0.000	(0)
	UO2NO3+	2.734e-22	2.258e-22	-21.563	-21.646	-0.083	(0)
	Zn (NO3) 2	1.485e-23	1.485e-23	-22.828	-22.828	0.000	(0)
	Co (NO3) 2	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
	CrNO3+2	1.477e-24	6.877e-25	-23.831	-24.163	-0.332	(0)
	Cu (NO3) 2	6.823e-25	6.823e-25	-24.166	-24.166	0.000	(0)
	Pb (NO3) 2	1.925e-25	1.925e-25	-24.716	-24.716	0.000	(0)
	VO2NO3	1.153e-25	1.153e-25	-24.938	-24.938	0.000	(0)
	Cd (NO3) 2	9.571e-26	9.571e-26	-25.019	-25.019	0.000	(0)
	FeNO3+2	2.344e-27	1.092e-27	-26.630	-26.962	-0.332	(0)
	HgNO3+	5.786e-30	4.779e-30	-29.238	-29.321	-0.083	(0)
	Hg (NO3) 2	1.014e-38	1.014e-38	-37.994	-37.994	0.000	(0)
Na	7.495e-03						
	Na+	7.364e-03	6.306e-03	-2.133	-2.200	-0.067	(0)
	NaSO4-	1.226e-04	1.057e-04	-3.912	-3.976	-0.064	(0)
	NaHCO3	7.198e-06	7.198e-06	-5.143	-5.143	0.000	(0)
	NaCO3-	4.875e-07	4.203e-07	-6.312	-6.376	-0.064	(0)
	NaF	4.413e-07	4.413e-07	-6.355	-6.355	0.000	(0)
	NaH2BO3	4.460e-09	4.460e-09	-8.351	-8.351	0.000	(0)
	NaCrO4-	1.664e-17	1.374e-17	-16.779	-16.862	-0.083	(0)
Ni	8.366e-08						
	Ni+2	5.300e-08	2.851e-08	-7.276	-7.545	-0.269	(0)
	NiSO4	1.775e-08	1.775e-08	-7.751	-7.751	0.000	(0)
	NiHCO3+	8.635e-09	7.133e-09	-8.064	-8.147	-0.083	(0)
	NiCO3	3.807e-09	3.807e-09	-8.419	-8.419	0.000	(0)
	NiCl+	1.968e-10	1.625e-10	-9.706	-9.789	-0.083	(0)
	NiOH+	1.645e-10	1.359e-10	-9.784	-9.867	-0.083	(0)
	NiF+	9.614e-11	7.942e-11	-10.017	-10.100	-0.083	(0)
	Ni (OH) 2	4.087e-12	4.087e-12	-11.389	-11.389	0.000	(0)
	Ni (SO4) 2-2	3.940e-12	1.835e-12	-11.404	-11.736	-0.332	(0)
	NiNH3+2	3.613e-13	1.683e-13	-12.442	-12.774	-0.332	(0)
	Ni (OH) 3-	1.873e-15	1.547e-15	-14.727	-14.810	-0.083	(0)
	NiCl2	1.824e-15	1.824e-15	-14.739	-14.739	0.000	(0)
	NiNO3+	4.427e-16	3.657e-16	-15.354	-15.437	-0.083	(0)
	NiSeO4	4.160e-16	4.160e-16	-15.381	-15.381	0.000	(0)
	Ni (NH3) 2+2	5.740e-19	2.673e-19	-18.241	-18.573	-0.332	(0)
O (0)	1.843e-35						
	O2	9.217e-36	9.273e-36	-35.035	-35.033	0.003	(0)
Pb	5.154e-09						

PbCO3	3.161e-09	3.161e-09	-8.500	-8.500	0.000	(0)
Pb+2	5.462e-10	2.938e-10	-9.263	-9.532	-0.269	(0)
PbHCO3+	5.364e-10	4.431e-10	-9.271	-9.354	-0.083	(0)
PbSO4	4.491e-10	4.491e-10	-9.348	-9.348	0.000	(0)
PbOH+	3.383e-10	2.794e-10	-9.471	-9.554	-0.083	(0)
Pb (CO3) 2-2	7.007e-11	3.263e-11	-10.154	-10.486	-0.332	(0)
PbCl+	2.812e-11	2.323e-11	-10.551	-10.634	-0.083	(0)
Pb (SO4) 2-2	1.814e-11	8.447e-12	-10.741	-11.073	-0.332	(0)
Pb (OH) 2	3.345e-12	3.345e-12	-11.476	-11.476	0.000	(0)
PbF+	2.780e-12	2.296e-12	-11.556	-11.639	-0.083	(0)
PbCl2	2.312e-13	2.312e-13	-12.636	-12.636	0.000	(0)
PbF2	5.011e-15	5.011e-15	-14.300	-14.300	0.000	(0)
Pb (OH) 3-	1.533e-15	1.267e-15	-14.814	-14.897	-0.083	(0)
PbCl3-	2.483e-16	2.051e-16	-15.605	-15.688	-0.083	(0)
PbNO3+	2.687e-17	2.220e-17	-16.571	-16.654	-0.083	(0)
Pb2OH+3	7.263e-18	1.301e-18	-17.139	-17.886	-0.747	(0)
PbF3-	1.276e-18	1.054e-18	-17.894	-17.977	-0.083	(0)
PbCl4-2	4.487e-19	2.089e-19	-18.348	-18.680	-0.332	(0)
Pb (OH) 4-2	2.522e-19	1.174e-19	-18.598	-18.930	-0.332	(0)
Pb3 (OH) 4+2	1.409e-22	6.561e-23	-21.851	-22.183	-0.332	(0)
PbF4-2	1.201e-22	5.595e-23	-21.920	-22.252	-0.332	(0)
Pb (NO3) 2	1.925e-25	1.925e-25	-24.716	-24.716	0.000	(0)
Pb4 (OH) 4+4	3.256e-27	1.531e-28	-26.487	-27.815	-1.328	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.953	-150.953	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.916	-227.999	-0.083	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.200	-73.200	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.263	-78.346	-0.083	(0)
CdHS+	0.000e+00	0.000e+00	-78.890	-78.973	-0.083	(0)
H2S	0.000e+00	0.000e+00	-78.901	-78.901	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.803	-80.135	-0.332	(0)
S6-2	0.000e+00	0.000e+00	-80.319	-80.651	-0.332	(0)
S4-2	0.000e+00	0.000e+00	-80.399	-80.731	-0.332	(0)
S3-2	0.000e+00	0.000e+00	-81.205	-81.537	-0.332	(0)
S2-2	0.000e+00	0.000e+00	-82.221	-82.553	-0.332	(0)
S-2	0.000e+00	0.000e+00	-87.808	-88.070	-0.262	(0)
HgHS2-	0.000e+00	0.000e+00	-137.701	-137.784	-0.083	(0)
HgS2-2	0.000e+00	0.000e+00	-138.585	-138.917	-0.332	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.965	-138.965	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.170	-147.354	-0.184	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.363	-147.446	-0.083	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.473	-147.808	-0.335	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.168	-148.251	-0.083	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.219	-148.538	-0.320	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.875	-149.218	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.202	-149.529	-0.327	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.816	-149.816	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.115	-150.115	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.953	-150.953	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.545	-159.545	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.237	-216.320	-0.083	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.799	-224.882	-0.083	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.477	-226.560	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.954	-227.286	-0.332	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.916	-227.999	-0.083	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.770	-235.853	-0.083	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.378	-302.710	-0.332	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.355	-304.687	-0.332	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.002	-318.334	-0.332	(0)
S (6)	7.243e-03					
SO4-2	5.802e-03	3.121e-03	-2.236	-2.506	-0.269	(0)
MgSO4	6.655e-04	6.655e-04	-3.177	-3.177	0.000	(0)
CaSO4	6.045e-04	6.045e-04	-3.219	-3.219	0.000	(0)
NaSO4-	1.226e-04	1.057e-04	-3.912	-3.976	-0.064	(0)
KSO4-	4.116e-05	3.549e-05	-4.386	-4.450	-0.064	(0)
MnSO4	6.603e-06	6.603e-06	-5.180	-5.180	0.000	(0)
ZnSO4	7.756e-07	7.756e-07	-6.110	-6.110	0.000	(0)
CuSO4	4.698e-08	4.698e-08	-7.328	-7.328	0.000	(0)

Zn(SO4) 2-2	4.527e-08	2.108e-08	-7.344	-7.676	-0.332	(0)
NH4SO4-	1.993e-08	1.714e-08	-7.701	-7.766	-0.065	(0)
NiSO4	1.775e-08	1.775e-08	-7.751	-7.751	0.000	(0)
CoSO4	1.098e-08	1.098e-08	-7.959	-7.959	0.000	(0)
HSO4-	9.458e-09	8.108e-09	-8.024	-8.091	-0.067	(0)
CdSO4	1.694e-09	1.694e-09	-8.771	-8.771	0.000	(0)
PbSO4	4.491e-10	4.491e-10	-9.348	-9.348	0.000	(0)
AgSO4-	1.616e-10	1.335e-10	-9.792	-9.875	-0.083	(0)
Cd(SO4) 2-2	1.531e-10	7.132e-11	-9.815	-10.147	-0.332	(0)
CrOHSO4	1.890e-11	1.890e-11	-10.724	-10.724	0.000	(0)
Pb(SO4) 2-2	1.814e-11	8.447e-12	-10.741	-11.073	-0.332	(0)
Ni(SO4) 2-2	3.940e-12	1.835e-12	-11.404	-11.736	-0.332	(0)
FeSO4	1.205e-12	1.205e-12	-11.919	-11.919	0.000	(0)
AlSO4+	7.820e-13	6.704e-13	-12.107	-12.174	-0.067	(0)
UO2SO4	1.047e-13	1.047e-13	-12.980	-12.980	0.000	(0)
CrSO4+	2.718e-14	2.245e-14	-13.566	-13.649	-0.083	(0)
Al(SO4) 2-	2.615e-14	2.242e-14	-13.582	-13.649	-0.067	(0)
UO2(SO4) 2-2	9.249e-15	4.307e-15	-14.034	-14.366	-0.332	(0)
VO2SO4-	4.025e-18	3.325e-18	-17.395	-17.478	-0.083	(0)
FeSO4+	8.704e-19	7.486e-19	-18.060	-18.126	-0.065	(0)
Cr2(OH) 2SO4+2	9.360e-20	4.359e-20	-19.029	-19.361	-0.332	(0)
Fe(SO4) 2-	6.047e-20	4.995e-20	-19.218	-19.301	-0.083	(0)
VOSO4	1.482e-20	1.482e-20	-19.829	-19.829	0.000	(0)
Cr2(OH) 2(SO4) 2	8.081e-21	8.081e-21	-20.093	-20.093	0.000	(0)
HgSO4	2.071e-21	2.071e-21	-20.684	-20.684	0.000	(0)
CrO3SO4-2	2.048e-24	9.537e-25	-23.689	-24.021	-0.332	(0)
VSO4+	7.381e-35	6.097e-35	-34.132	-34.215	-0.083	(0)
U(SO4) 2	2.621e-40	2.621e-40	-39.582	-39.582	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.644	-40.976	-0.332	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-58.694	-58.776	-0.083	(0)
Sb(3)	5.023e-20					
Sb(OH) 3	2.541e-20	2.541e-20	-19.595	-19.595	0.000	(0)
HSbO2	2.482e-20	2.482e-20	-19.605	-19.605	0.000	(0)
SbO2-	1.830e-24	1.512e-24	-23.738	-23.820	-0.083	(0)
Sb(OH) 4-	1.048e-24	8.656e-25	-23.980	-24.063	-0.083	(0)
Sb(OH) 2F	1.171e-25	1.171e-25	-24.932	-24.932	0.000	(0)
SbOF	1.152e-25	1.152e-25	-24.939	-24.939	0.000	(0)
Sb(OH) 2+	1.987e-26	1.641e-26	-25.702	-25.785	-0.083	(0)
SbO+	6.852e-27	5.660e-27	-26.164	-26.247	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.002	-318.334	-0.332	(0)
Sb(5)	1.469e-08					
SbO3-	1.468e-08	1.212e-08	-7.833	-7.916	-0.083	(0)
Sb(OH) 6-	1.654e-11	1.416e-11	-10.781	-10.849	-0.067	(0)
SbO2+	2.976e-24	2.459e-24	-23.526	-23.609	-0.083	(0)
Se(-2)	2.046e-14					
Ag2Se	2.046e-14	2.046e-14	-13.689	-13.689	0.000	(0)
HSe-	1.758e-39	1.453e-39	-38.755	-38.838	-0.083	(0)
MnSe	0.000e+00	0.000e+00	-41.572	-41.572	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.523	-42.523	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.931	-46.262	-0.332	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.800	-84.128	-1.328	(0)
Se(4)	8.528e-08					
HSeO3-	6.738e-08	5.566e-08	-7.171	-7.254	-0.083	(0)
SeO3-2	1.790e-08	8.336e-09	-7.747	-8.079	-0.332	(0)
H2SeO3	6.312e-13	6.312e-13	-12.200	-12.200	0.000	(0)
AgSeO3-	1.390e-14	1.149e-14	-13.857	-13.940	-0.083	(0)
Cd(SeO3) 2-2	2.847e-19	1.326e-19	-18.546	-18.878	-0.332	(0)
Ag(SeO3) 2-3	4.785e-21	8.572e-22	-20.320	-21.067	-0.747	(0)
FeHSeO3+2	6.751e-24	3.144e-24	-23.171	-23.503	-0.332	(0)
Se(6)	5.810e-11					
SeO4-2	5.799e-11	3.120e-11	-10.237	-10.506	-0.269	(0)
MnSeO4	9.988e-14	9.988e-14	-13.001	-13.001	0.000	(0)
ZnSeO4	5.488e-15	5.488e-15	-14.261	-14.261	0.000	(0)
NiSeO4	4.160e-16	4.160e-16	-15.381	-15.381	0.000	(0)
CoSeO4	2.757e-16	2.757e-16	-15.560	-15.560	0.000	(0)
HSeO4-	5.031e-17	4.156e-17	-16.298	-16.381	-0.083	(0)
CdSeO4	1.345e-17	1.345e-17	-16.871	-16.871	0.000	(0)
Zn(SeO4) 2-2	3.728e-25	1.736e-25	-24.429	-24.760	-0.332	(0)

Si	3.899e-05					
H4SiO4	3.874e-05	3.898e-05	-4.412	-4.409	0.003	(0)
H3SiO4-	2.480e-07	2.119e-07	-6.605	-6.674	-0.068	(0)
H2SiO4-2	9.102e-13	5.030e-13	-12.041	-12.298	-0.258	(0)
UO2H3SiO4+	4.827e-13	3.987e-13	-12.316	-12.399	-0.083	(0)
SiF6-2	1.003e-28	5.490e-29	-27.998	-28.260	-0.262	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.285	-59.031	-0.747	(0)
U (4)	5.877e-21					
U (OH) 5-	5.872e-21	4.851e-21	-20.231	-20.314	-0.083	(0)
U (OH) 4	5.403e-24	5.403e-24	-23.267	-23.267	0.000	(0)
U (OH) 3+	6.359e-28	5.253e-28	-27.197	-27.280	-0.083	(0)
U (OH) 2+2	1.387e-32	6.460e-33	-31.858	-32.190	-0.332	(0)
UF3+	5.593e-36	4.620e-36	-35.252	-35.335	-0.083	(0)
UF2+2	5.644e-37	2.629e-37	-36.248	-36.580	-0.332	(0)
UF4	5.618e-38	5.618e-38	-37.250	-37.250	0.000	(0)
UOH+3	4.517e-38	8.092e-39	-37.345	-38.092	-0.747	(0)
UF+3	1.051e-39	1.883e-40	-38.978	-39.725	-0.747	(0)
UF5-	2.989e-40	2.469e-40	-39.525	-39.608	-0.083	(0)
U (SO4) 2	2.621e-40	2.621e-40	-39.582	-39.582	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.644	-40.976	-0.332	(0)
UF6-2	0.000e+00	0.000e+00	-40.751	-41.083	-0.332	(0)
U+4	0.000e+00	0.000e+00	-43.743	-45.070	-1.328	(0)
UC1+3	0.000e+00	0.000e+00	-45.275	-46.022	-0.747	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.227	-173.948	-6.721	(0)
U (5)	1.118e-16					
UO2+	1.118e-16	9.232e-17	-15.952	-16.035	-0.083	(0)
U (6)	1.347e-07					
UO2 (CO3) 3-4	8.600e-08	4.045e-09	-7.065	-8.393	-1.328	(0)
UO2 (CO3) 2-2	4.842e-08	2.255e-08	-7.315	-7.647	-0.332	(0)
UO2CO3	3.158e-10	3.158e-10	-9.501	-9.501	0.000	(0)
UO2OH+	1.279e-12	1.056e-12	-11.893	-11.976	-0.083	(0)
UO2H3SiO4+	4.827e-13	3.987e-13	-12.316	-12.399	-0.083	(0)
UO2F+	4.107e-13	3.392e-13	-12.387	-12.469	-0.083	(0)
UO2F2	1.085e-13	1.085e-13	-12.965	-12.965	0.000	(0)
UO2SO4	1.047e-13	1.047e-13	-12.980	-12.980	0.000	(0)
UO2+2	4.119e-14	2.216e-14	-13.385	-13.654	-0.269	(0)
UO2 (SO4) 2-2	9.249e-15	4.307e-15	-14.034	-14.366	-0.332	(0)
UO2F3-	3.659e-15	3.022e-15	-14.437	-14.520	-0.083	(0)
UO2Cl+	9.695e-17	8.009e-17	-16.013	-16.096	-0.083	(0)
UO2F4-2	5.717e-18	2.662e-18	-17.243	-17.575	-0.332	(0)
(UO2) 2 (OH) 2+2	3.976e-18	1.852e-18	-17.401	-17.732	-0.332	(0)
(UO2) 3 (OH) 5+	2.574e-19	2.127e-19	-18.589	-18.672	-0.083	(0)
UO2NO3+	2.734e-22	2.258e-22	-21.563	-21.646	-0.083	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.687	-42.770	-0.083	(0)
V+2	0.000e+00	0.000e+00	-43.527	-43.858	-0.332	(0)
V (3)	1.812e-15					
V (OH) 3	1.812e-15	1.812e-15	-14.742	-14.742	0.000	(0)
V (OH) 2+	3.768e-26	3.113e-26	-25.424	-25.507	-0.083	(0)
VOH+2	1.686e-29	7.852e-30	-28.773	-29.105	-0.332	(0)
V+3	2.310e-34	4.138e-35	-33.636	-34.383	-0.747	(0)
VSO4+	7.381e-35	6.097e-35	-34.132	-34.215	-0.083	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.413	-56.160	-0.747	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-56.082	-57.410	-1.328	(0)
V (4)	1.643e-18					
V (OH) 3+	1.576e-18	1.302e-18	-17.802	-17.885	-0.083	(0)
VO+2	3.703e-20	1.725e-20	-19.431	-19.763	-0.332	(0)
VOSO4	1.482e-20	1.482e-20	-19.829	-19.829	0.000	(0)
VOF+	1.389e-20	1.147e-20	-19.857	-19.940	-0.083	(0)
VOF2	4.770e-22	4.770e-22	-21.321	-21.321	0.000	(0)
VOC1+	1.305e-22	1.078e-22	-21.884	-21.967	-0.083	(0)
VOF3-	2.272e-24	1.877e-24	-23.644	-23.727	-0.083	(0)
VOF4-2	1.804e-27	8.402e-28	-26.744	-27.076	-0.332	(0)
H2V2O4+2	1.826e-31	8.506e-32	-30.738	-31.070	-0.332	(0)
V (5)	4.470e-09					
H2VO4-	3.827e-09	3.162e-09	-8.417	-8.500	-0.083	(0)
HVO4-2	6.415e-10	2.987e-10	-9.193	-9.525	-0.332	(0)

H3VO4	8.405e-13	8.405e-13	-12.075	-12.075	0.000	(0)
H3V2O7-	2.078e-14	1.716e-14	-13.682	-13.765	-0.083	(0)
HV2O7-3	1.787e-15	3.202e-16	-14.748	-15.495	-0.747	(0)
VO4-3	3.144e-16	5.632e-17	-15.503	-16.249	-0.747	(0)
VO2+	5.210e-17	4.462e-17	-16.283	-16.350	-0.067	(0)
VO2F	8.679e-18	8.679e-18	-17.062	-17.062	0.000	(0)
V2O7-4	6.892e-18	3.242e-19	-17.162	-18.489	-1.328	(0)
VO2SO4-	4.025e-18	3.325e-18	-17.395	-17.478	-0.083	(0)
VO2F2-	4.230e-19	3.494e-19	-18.374	-18.457	-0.083	(0)
V3O9-3	1.849e-19	3.313e-20	-18.733	-19.480	-0.747	(0)
VO2F3-2	1.038e-21	4.834e-22	-20.984	-21.316	-0.332	(0)
V4O12-4	9.289e-25	4.369e-26	-24.032	-25.360	-1.328	(0)
VO2F4-3	1.472e-25	2.638e-26	-24.832	-25.579	-0.747	(0)
VO2NO3	1.153e-25	1.153e-25	-24.938	-24.938	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-63.407	-66.395	-2.987	(0)
HV10O28-5	0.000e+00	0.000e+00	-63.709	-65.783	-2.074	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.823	-68.151	-1.328	(0)
Zn	3.323e-06					
Zn+2	2.112e-06	1.136e-06	-5.675	-5.945	-0.269	(0)
ZnSO4	7.756e-07	7.756e-07	-6.110	-6.110	0.000	(0)
ZnCO3	2.339e-07	2.339e-07	-6.631	-6.631	0.000	(0)
ZnHCO3+	8.825e-08	7.290e-08	-7.054	-7.137	-0.083	(0)
ZnOH+	5.206e-08	4.301e-08	-7.284	-7.366	-0.083	(0)
Zn(SO4) 2-2	4.527e-08	2.108e-08	-7.344	-7.676	-0.332	(0)
ZnCl+	7.442e-09	6.358e-09	-8.128	-8.197	-0.068	(0)
ZnOHCl	3.151e-09	3.151e-09	-8.501	-8.501	0.000	(0)
ZnF+	3.043e-09	2.513e-09	-8.517	-8.600	-0.083	(0)
Zn(OH) 2	2.581e-09	2.581e-09	-8.588	-8.588	0.000	(0)
ZnCl2	2.245e-11	2.245e-11	-10.649	-10.649	0.000	(0)
Zn(OH) 3-	5.928e-12	4.897e-12	-11.227	-11.310	-0.083	(0)
ZnCl3-	4.652e-14	3.975e-14	-13.332	-13.401	-0.068	(0)
ZnNO3+	1.764e-14	1.457e-14	-13.754	-13.836	-0.083	(0)
ZnSeO4	5.488e-15	5.488e-15	-14.261	-14.261	0.000	(0)
Zn(OH) 4-2	1.585e-16	7.381e-17	-15.800	-16.132	-0.332	(0)
ZnCl4-2	8.095e-17	4.429e-17	-16.092	-16.354	-0.262	(0)
Zn(NO3) 2	1.485e-23	1.485e-23	-22.828	-22.828	0.000	(0)
Zn(SeO4) 2-2	3.728e-25	1.736e-25	-24.429	-24.760	-0.332	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.168	-148.251	-0.083	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.816	-149.816	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.799	-224.882	-0.083	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.954	-227.286	-0.332	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.355	-304.687	-0.332	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-54.09	-47.80	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.03	-36.52	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.25	-36.52	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-70.09	-52.15	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.27	-35.23	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.34	-27.94	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.54	-23.09	0.45	(NH4)2SeO4
Acanthite	-51.89	-88.11	-36.22	Ag2S
Ag2CO3	-11.69	-22.78	-11.09	Ag2CO3
Ag2CrO4	-21.11	-32.70	-11.59	Ag2CrO4
Ag2HVO4	-12.44	-10.96	1.48	Ag2HVO4
Ag2MoO4	-12.07	-23.62	-11.55	Ag2MoO4
Ag2O	-14.76	-2.19	12.57	Ag2O
Ag2Se	0.10	-48.60	-48.70	Ag2Se
Ag2SeO3	-9.87	-17.02	-7.15	Ag2SeO3
Ag2SeO4	-18.93	-27.84	-8.91	Ag2SeO4
Ag2SO4	-15.02	-19.84	-4.82	Ag2SO4
Ag3AsO3	-28.18	-26.02	2.16	Ag3AsO3
Ag3AsO4	-16.65	-19.44	-2.79	Ag3AsO4
Ag3H2VO5	-17.24	-12.06	5.18	Ag3H2VO5
AgF:4H2O	-13.67	-12.62	1.05	AgF:4H2O

Agmetal	-0.33	-13.83	-13.51	Ag
AgVO3	-10.64	-9.87	0.77	AgVO3
Al (OH) 3 (am)	-1.63	9.17	10.80	Al (OH) 3
Al2 (MoO4) 3	-48.34	-45.97	2.37	Al2 (MoO4) 3
Al2O3	-1.32	18.34	19.65	Al2O3
Al4 (OH) 10SO4	-3.69	19.01	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.79	-6.99	4.80	AlAsO4:2H2O
AlOHSO4	-5.26	-8.49	-3.23	AlOHSO4
AlSb	-152.49	-86.87	65.62	AlSb
Alunite	-1.63	-3.03	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.25	-12.04	-7.79	PbSO4
Anhydrite	-1.22	-5.58	-4.36	CaSO4
Anilite	-55.17	-87.05	-31.88	Cu0.25Cu1.5S
Antlerite	-2.54	6.25	8.79	Cu3 (OH) 4SO4
Aragonite	-0.22	-8.52	-8.30	CaCO3
Arsenolite	-88.21	-90.97	-2.76	As4O6
Artinite	-5.76	3.84	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-39.03	-32.32	6.71	As2O5
Atacamite	-1.68	5.71	7.39	Cu2 (OH) 3Cl
Azurite	-0.38	-17.29	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.89	7.50	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.41	-2.54	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.89	-9.80	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.98	4.96	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.33	-23.00	-9.67	BaCrO4
BaF2	-9.74	-15.56	-5.82	BaF2
BaMoO4	-6.97	-13.93	-6.96	BaMoO4
Barite	-0.17	-10.15	-9.98	BaSO4
BaS	-94.60	-78.42	16.18	BaS
BaSeO3	-9.15	-7.32	1.83	BaSeO3
BaSeO4	-10.69	-18.15	-7.46	BaSeO4
Bianchite	-6.69	-8.45	-1.76	ZnSO4:6H2O
Birnessite	-7.73	10.36	18.09	MnO2
Bixbyite	-4.12	-4.77	-0.64	Mn2O3
BlaubleiI	-55.00	-79.17	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.59	9.17	8.58	AlOOH
Breithauptite	-57.17	-75.69	-18.52	NiSb
Brochantite	-1.01	14.22	15.22	Cu4 (OH) 6SO4
Brucite	-4.62	12.22	16.84	Mg (OH) 2
Bunsenite	-4.84	7.61	12.45	NiO
Ca (VO3) 2	-11.13	-5.47	5.66	Ca (VO3) 2
Ca2V2O7	-10.90	6.60	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.95	6.60	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-18.39	3.91	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-20.28	18.68	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-21.18	18.68	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-298.82	-155.84	142.97	Ca3Sb2
CaCrO4	-16.17	-18.43	-2.27	CaCrO4
Calcite	-0.04	-8.52	-8.48	CaCO3
Calomel	-8.12	-26.03	-17.91	Hg2Cl2
CaMoO4	-1.41	-9.36	-7.95	CaMoO4
Carnotite	-2.73	-2.50	0.23	KUO2VO4
CaSeO3:2H2O	-5.57	-2.75	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.56	-13.58	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-12.70	-2.86	9.84	Cd (BO2) 2
Cd (OH) 2	-7.13	6.51	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.22	6.51	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-22.48	-15.77	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-20.67	1.89	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-20.00	8.40	28.40	Cd4 (OH) 6SO4
CdCl2	-13.28	-13.94	-0.66	CdCl2
CdCl2:1H2O	-12.25	-13.94	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.03	-13.94	-1.91	CdCl2:2.5H2O
CdF2	-15.33	-16.55	-1.21	CdF2
Cdmetal (alpha)	-32.48	-18.97	13.51	Cd
Cdmetal (gamma)	-32.58	-18.97	13.62	Cd
CdMoO4	-0.77	-14.92	-14.15	CdMoO4

CdOHCl	-7.25	-3.71	3.54	CdOHCl
CdSb	-76.43	-76.78	-0.35	CdSb
CdSe	-19.70	-39.90	-20.20	CdSe
CdSeO4:2H2O	-17.29	-19.14	-1.85	CdSeO4:2H2O
CdSO4	-10.97	-11.14	-0.17	CdSO4
CdSO4:1H2O	-9.42	-11.14	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.27	-11.14	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.57	-11.32	-9.75	AgCl
Cerrusite	-1.85	-14.98	-13.13	PbCO3
CH4 (g)	-81.48	-122.52	-41.05	CH4
Chalcanthite	-7.05	-9.69	-2.64	CuSO4:5H2O
Chalcedony	-0.86	-4.41	-3.55	SiO2
Chalcocite	-55.17	-90.09	-34.92	Cu2S
Chalcopyrite	-125.26	-160.53	-35.27	CuFeS2
Chrysotile	-4.36	27.84	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-51.87	-97.56	-45.69	HgS
Claudetite	-87.91	-90.97	-3.06	As4O6
Clausthalite	-13.69	-40.79	-27.10	PbSe
Co (BO2) 2	-29.05	-1.98	27.07	Co (BO2) 2
Co (OH) 2	-5.70	7.40	13.09	Co (OH) 2
Co (OH) 3	-9.95	-12.26	-2.31	Co (OH) 3
CO2 (g)	-2.45	-20.60	-18.15	CO2
Co3 (AsO4) 2	-23.16	-10.13	13.03	Co3 (AsO4) 2
Co3O4	-6.63	-17.13	-10.50	Co3O4
CoCl2	-21.32	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-3.22	-13.20	-9.98	CoCO3
CoF2	-14.07	-15.66	-1.60	CoF2
CoF3	-45.40	-46.85	-1.46	CoF3
CoFe2O4	17.04	13.51	-3.53	CoFe2O4
CoMoO4	-6.28	-14.04	-7.76	CoMoO4
CoO	-6.19	7.40	13.59	CoO
CoS (alpha)	-71.08	-78.52	-7.44	CoS
CoS (beta)	-67.45	-78.52	-11.07	CoS
CoSe	-22.82	-39.02	-16.20	CoSe
CoSeO3	-8.75	-7.43	1.32	CoSeO3
CoSeO4:6H2O	-16.73	-18.26	-1.53	CoSeO4:6H2O
CoSO4	-13.06	-10.26	2.80	CoSO4
CoSO4:6H2O	-7.79	-10.26	-2.47	CoSO4:6H2O
Cotunnite	-10.06	-14.84	-4.78	PbCl2
Covellite	-55.65	-77.95	-22.30	CuS
Cr (OH) 2	-21.97	-11.15	10.82	Cr (OH) 2
Cr (OH) 3	-2.69	-1.35	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.60	-1.35	-0.75	Cr (OH) 3
Cr2O3	-0.35	-2.71	-2.36	Cr2O3
CrCl2	-45.69	-31.60	14.09	CrCl2
CrCl3	-47.15	-32.04	15.11	CrCl3
CrF3	-24.61	-35.95	-11.34	CrF3
Cristobalite	-1.06	-4.41	-3.35	SiO2
Crmetal	-67.11	-36.63	30.48	Cr
CrO3	-27.30	-30.51	-3.21	CrO3
Cryolite	-10.05	-43.89	-33.84	Na3AlF6
Cu (OH) 2	-0.71	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.47	19.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-9.18	0.07	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.27	-90.15	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.78	-50.58	-45.80	Cu2Se
Cu2SO4	-19.87	-21.82	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.51	-8.41	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.69	-102.29	-42.59	Cu3Sb
Cu3Se2	-25.53	-89.02	-63.49	Cu3Se2
CuCO3	-1.13	-12.63	-11.50	CuCO3
CuCrO4	-17.10	-22.54	-5.44	CuCrO4
CuF	-8.71	-13.61	-4.91	CuF
CuF2	-16.21	-15.09	1.12	CuF2
CuF2:2H2O	-10.54	-15.09	-4.55	CuF2:2H2O
Cumetal	-6.07	-14.82	-8.76	Cu
CuMoO4	-0.39	-13.47	-13.08	CuMoO4

CuOCuSO4	-12.02	-1.72	10.30	CuOCuSO4
Cupricferrite	8.09	14.08	5.99	CuFe2O4
Cuprite	-2.76	-4.16	-1.41	Cu2O
Cuprousferrite	9.89	0.97	-8.92	CuFeO2
CuSe	-5.34	-38.44	-33.10	CuSe
CuSe2	-26.01	-59.38	-33.37	CuSe2
CuSeO3:2H2O	-7.37	-6.86	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.25	-17.69	-2.44	CuSeO4:5H2O
CuSO4	-12.63	-9.69	2.94	CuSO4
Diaspore	2.29	9.17	6.87	AlOOH
Djurleite	-55.36	-89.28	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.36	-16.90	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.19	-16.90	-17.09	CaMg(CO3)2
Epsomite	-3.31	-5.44	-2.13	MgSO4:7H2O
Fe(OH)2	-10.22	3.35	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.03	-0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.48	-14.20	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.27	-8.72	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.75	-38.38	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-43.12	-46.86	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.76	9.46	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.50	-13.10	0.40	FeAsO4:2H2O
FeCr2O4	-6.56	0.64	7.20	FeCr2O4
FeMoO4	-8.00	-18.09	-10.09	FeMoO4
Ferrihydrite	-0.14	3.06	3.19	Fe(OH)3
Ferroselite	-45.40	-64.00	-18.60	FeSe2
FeS(ppt)	-79.62	-82.57	-2.95	FeS
FeSe	-32.07	-43.07	-11.00	FeSe
Fix_pe	-5.17	-5.17	0.00	e-
Fluorite	-0.48	-10.98	-10.50	CaF2
Galena	-66.33	-80.30	-13.97	PbS
Gibbsite	0.88	9.17	8.29	Al(OH)3
Goethite	2.56	3.06	0.49	FeOOH
Goslarite	-6.44	-8.45	-2.01	ZnSO4:7H2O
Greenalite	-19.59	1.22	20.81	Fe3Si2O5(OH)4
Greenockite	-65.05	-79.41	-14.36	CdS
Greigite	-289.19	-334.22	-45.03	Fe3S4
Gummite	-6.18	1.50	7.67	UO3
Gypsum	-0.97	-5.58	-4.61	CaSO4:2H2O
H-Jarosite	-14.05	-26.15	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.56	-21.44	-12.88	H2MoO4
H2S(g)	-77.91	-85.92	-8.01	H2S
H2Se(g)	-41.45	-46.41	-4.96	H2Se
Halite	-6.45	-4.85	1.60	NaCl
Halloysite	-0.06	9.52	9.57	Al2Si2O5(OH)4
Hausmannite	-4.87	56.16	61.03	Mn3O4
Hematite	7.53	6.11	-1.42	Fe2O3
Hercynite	-1.21	21.68	22.89	FeAl2O4
Hg(CH3)2(g)	-182.98	-256.68	-73.71	Hg(CH3)2
Hg(g)	-7.65	-15.53	-7.87	Hg
Hg(OH)2	-8.14	-11.64	-3.50	Hg(OH)2
Hg2(g)	-16.10	-31.06	-14.96	Hg2
Hg2(OH)2	-10.84	-5.58	5.26	Hg2(OH)2
Hg2CO3	-10.12	-26.17	-16.05	Hg2CO3
Hg2CrO4	-27.38	-36.08	-8.70	Hg2CrO4
Hg2F2	-18.27	-28.64	-10.36	Hg2F2
Hg2S	-79.82	-91.50	-11.68	Hg2S
Hg2SeO3	-15.75	-20.40	-4.66	Hg2SeO3
Hg2SO4	-17.10	-23.23	-6.13	Hg2SO4
Hg3O2CO3	-25.83	-55.52	-29.68	Hg3O2CO3
HgCl(g)	-32.51	-13.01	19.50	HgCl
HgCl2	-10.83	-32.09	-21.26	HgCl2
HgF(g)	-46.99	-14.32	32.68	HgF
HgF2(g)	-47.27	-34.70	12.57	HgF2
Hgmetal(l)	-2.08	-15.53	-13.45	Hg
HgSe	-2.36	-58.05	-55.69	HgSe
HgSeO3	-14.04	-26.47	-12.43	HgSeO3
HgSO4	-19.88	-29.30	-9.42	HgSO4

Huntite	-3.68	-33.65	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-5.57	-24.34	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.52	-21.29	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-16.20	-21.37	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	-6.56	-21.36	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-34.21	-51.46	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-20.43	-20.95	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-15.13	-11.87	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-15.36	-16.09	-0.73	K ₂ SeO ₄
Kaolinite	2.08	9.52	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-3.27	14.22	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.98	-6.42	-0.43	PbO:PbSO ₄
Laurionite	-5.23	-4.61	0.62	PbOHCl
Lepidocrocite	1.68	3.06	1.37	FeOOH
Lime	-20.62	12.08	32.70	CaO
Litharge	-7.08	5.62	12.69	PbO
Mackinawite	-78.97	-82.57	-3.60	FeS
Maghemite	-0.27	6.11	6.39	Fe ₂ O ₃
Magnesioferrite	1.47	18.33	16.86	Fe ₂ MgO ₄
Magnesite	-0.92	-8.38	-7.46	MgCO ₃
Magnetite	6.06	9.46	3.40	Fe ₃ O ₄
Malachite	0.65	-4.66	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.37	22.97	25.34	MnOOH
Massicot	-7.28	5.62	12.89	PbO
Matlockite	-7.17	-16.14	-8.97	PbClF
Melanothallite	-18.74	-12.49	6.26	CuCl ₂
Melanterite	-12.10	-14.31	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.47	-97.56	-45.09	HgS
Mg(OH) ₂ (active)	-6.57	12.22	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.61	-5.33	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-274.66	-199.97	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-19.47	6.89	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.69	9.51	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.67	-18.29	5.38	MgCrO ₄
MgF ₂	-2.71	-10.84	-8.13	MgF ₂
MgMoO ₄	-7.37	-9.22	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.67	-2.61	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-12.24	-13.44	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.18	42.34	73.52	Pb ₃ O ₄
Mirabilite	-5.79	-6.91	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.22	-7.32	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.02	-57.74	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-149.41	-88.33	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-14.14	-1.64	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.94	-10.23	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.86	-75.69	0.17	MnS
MnS (pnk)	-79.03	-75.69	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.69	-36.19	3.50	MnSe
MnSeO ₃	-5.73	-4.60	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.59	-4.60	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.38	-15.43	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.01	-7.43	2.58	MnSO ₄
Monteponite	-8.59	6.52	15.10	CdO
Montroydite	-8.00	-11.64	-3.64	HgO
MoO ₃	-13.43	-21.43	-8.00	MoO ₃
Morenosite	-7.91	-10.05	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-148.50	-218.76	-70.26	MoS ₂
Na-Jarosite	-9.57	-20.77	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-40.37	-50.27	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.69	-19.76	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.52	-32.12	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.17	-10.68	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.91	-10.69	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-14.38	-4.08	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-16.19	-14.91	1.28	Na ₂ SeO ₄
Na ₃ Sb	-174.36	-79.91	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.33	7.35	36.68	Na ₃ VO ₄

Na4V2O7	-33.45	3.95	37.40	Na4V2O7
Nantokite	-5.58	-12.31	-6.73	CuCl
NaSb	-88.35	-65.18	23.17	NaSb
Natron	-8.54	-9.85	-1.31	Na2CO3:10H2O
NaVO3	-7.26	-3.40	3.86	NaVO3
Nesquehonite	-3.71	-8.38	-4.67	MgCO3:3H2O
Ni(OH)2	-5.19	7.61	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.20	-9.50	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-19.23	12.77	32.00	Ni4(OH)6SO4
NiCO3	-6.12	-12.99	-6.87	NiCO3
NiMoO4	-2.69	-13.83	-11.14	NiMoO4
NiS(alpha)	-72.72	-78.32	-5.60	NiS
NiS(beta)	-67.22	-78.32	-11.10	NiS
NiS(gamma)	-65.52	-78.32	-12.80	NiS
NiSe	-21.11	-38.81	-17.70	NiSe
NiSeO3:2H2O	-10.04	-7.22	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.53	-18.05	-1.52	NiSeO4:6H2O
Nsutite	-7.15	10.36	17.50	MnO2
O2(g)	-32.13	50.96	83.09	O2
Orpiment	-242.18	-303.25	-61.07	As2S3
Otavite	-2.08	-14.08	-12.00	CdCO3
Pb(BO2)2	-10.28	-3.76	6.52	Pb(BO2)2
Pb(OH)2	-2.53	5.62	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-58.63	-67.39	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.78	1.01	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.95	11.24	26.19	Pb2O(OH)2
Pb2O3	-24.32	36.72	61.04	Pb2O3
Pb2OCO3	-8.80	-9.36	-0.56	Pb2OCO3
Pb2V2O7	-4.41	-6.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.26	-15.46	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.83	-0.69	6.14	Pb3(VO4)2
Pb3O2CO3	-14.76	-3.74	11.02	Pb3O2CO3
Pb3O2SO4	-11.49	-0.80	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.28	4.82	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.06	4.82	21.88	Pb4O3SO4
PbCrO4	-12.29	-24.89	-12.60	PbCrO4
PbF2	-10.00	-17.44	-7.44	PbF2
Pbmetal	-24.11	-19.86	4.25	Pb
PbMoO4	-0.20	-15.82	-15.62	PbMoO4
PbO:0.3H2O	-7.36	5.62	12.98	PbO:0.33H2O
PbSeO4	-13.20	-20.04	-6.84	PbSeO4
Periclase	-9.36	12.22	21.58	MgO
Phosgenite	-10.00	-29.81	-19.81	PbCl2:PbCO3
Plattnerite	-18.50	31.10	49.60	PbO2
Portlandite	-10.73	12.08	22.80	Ca(OH)2
Pyrite	-124.51	-143.01	-18.51	FeS2
Pyrochroite	-4.97	10.23	15.19	Mn(OH)2
Pyrolusite	-5.67	35.71	41.38	MnO2
Quartz	-0.41	-4.41	-4.00	SiO2
Realgar	-101.66	-121.40	-19.75	AsS
Retgersite	-8.01	-10.05	-2.04	NiSO4:6H2O
Rhodochrosite	0.21	-10.37	-10.58	MnCO3
Rutherfordine	-4.60	-19.10	-14.50	UO2CO3
Sb(OH)3	-12.49	-19.59	-7.11	Sb(OH)3
Sb2O4	-17.11	-13.71	3.40	Sb2O4
Sb2O5	-27.18	-36.85	-9.67	Sb2O5
Sb2Se3	-110.67	-178.43	-67.76	Sb2Se3
Sb4O6(cubic)	-60.12	-78.38	-18.26	Sb4O6
Sb4O6(orth)	-60.48	-78.38	-17.90	Sb4O6
SbCl3	-50.85	-50.28	0.57	SbCl3
SbF3	-43.96	-54.19	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.34	-31.16	-27.82	SbO2
Schoepite	-4.50	1.50	5.99	UO2(OH)2:H2O
Semetal(am)	-13.82	-20.93	-7.11	Se
Semetal(hex)	-13.22	-20.93	-7.71	Se
Senarmontite	-26.82	-39.19	-12.37	Sb2O3
SeO2	-14.95	-14.83	0.12	SeO2

SeO3	-46.70	-25.66	21.04	SeO3
Sepiolite	-4.55	11.21	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-7.57	11.21	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.01	-17.25	-10.24	FeCO3
SiO2(am-gel)	-1.70	-4.41	-2.71	SiO2
SiO2(am-ppt)	-1.67	-4.41	-2.74	SiO2
Smithsonite	-1.39	-11.39	-10.00	ZnCO3
Sphalerite	-65.26	-76.71	-11.45	ZnS
Spinel	-6.29	30.56	36.85	MgAl2O4
Stibnite	-246.49	-296.95	-50.46	Sb2S3
Sulfur	-58.29	-60.44	-2.14	S
Tenorite	0.32	7.97	7.64	CuO
Thenardite	-7.23	-6.91	0.32	Na2SO4
Thermonatrite	-10.48	-9.85	0.64	Na2CO3:H2O
Tyuyamunite	-6.56	-2.48	4.08	Ca(UO2)2(VO4)2
U3O8	-14.43	6.66	21.08	U3O8
U3Sb4	-580.84	-428.46	152.38	U3Sb4
U4O9	-30.58	-33.59	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.17	-60.89	-32.72	UF4:2.5H2O
UO2(am)	-15.70	-14.77	0.93	UO2
UO2(NO3)2	-42.39	-30.24	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.09	-30.24	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.63	-30.24	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.29	-30.24	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.12	1.50	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.91	-24.16	-2.25	UO2SeO4:4H2O
UO3	-6.20	1.50	7.70	UO3
Uraninite	-10.10	-14.77	-4.67	UO2
USb2	-220.16	-190.58	29.58	USb2
V(OH)3	-19.25	-11.66	7.59	V(OH)3
V2O5	-16.19	-17.55	-1.36	V2O5
V3O5	-41.16	-39.32	1.84	V3O5
V4O7	-51.12	-43.93	7.19	V4O7
V6O13	-42.75	-103.61	-60.86	V6O13
Valentinite	-30.71	-39.19	-8.48	Sb2O3
VC12	-63.73	-44.85	18.87	VC12
VC13	-65.77	-42.34	23.43	VC13
VF4	-65.66	-50.73	14.93	VF4
Vmetal	-93.90	-49.88	44.03	V
VO	-39.15	-24.40	14.76	VO
VO(OH)2	-9.76	-4.61	5.15	VO(OH)2
VO2Cl	-21.84	-19.00	2.84	VO2Cl
VOC1	-33.04	-21.88	11.15	VOC1
VOC12	-37.83	-25.07	12.76	VOC12
VOSO4	-25.88	-22.27	3.61	VOSO4
Witherite	-4.52	-13.09	-8.57	BaCO3
Wurtzite	-67.76	-76.71	-8.95	ZnS
Zincite	-2.13	9.21	11.33	ZnO
Zincosite	-12.38	-8.45	3.93	ZnSO4
Zn(BO2)2	-8.46	-0.17	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.84	-22.53	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.99	9.21	12.20	Zn(OH)2
Zn(OH)2(am)	-3.27	9.21	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.55	9.21	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.33	9.21	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.53	9.21	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.74	0.76	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-7.01	8.18	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.35	-4.70	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.61	-7.69	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-9.23	19.17	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.93	25.57	38.50	Zn5(OH)8Cl2
ZnCl2	-18.30	-11.25	7.05	ZnCl2
ZnCO3:1H2O	-1.13	-11.39	-10.26	ZnCO3:1H2O
ZnF2	-13.32	-13.85	-0.53	ZnF2
Znmetal	-42.06	-16.28	25.79	Zn
ZnMoO4	-2.10	-12.23	-10.13	ZnMoO4

ZnO(active)	-1.98	9.21	11.19	ZnO
ZnS(am)	-67.66	-76.71	-9.05	ZnS
ZnSb	-85.11	-74.09	11.01	ZnSb
ZnSe	-22.81	-37.21	-14.40	ZnSe
ZnSeO4:6H2O	-14.93	-16.45	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.81	-8.45	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 127.

Title Evaporate Stage 7 lake water to produce initial Stage 8 Lake water
REACTION 705
H2O -1
27.99 moles ## Removes x m3 water, but solute mass remains the
same
USE solution 711
Save Solution 712
END

TITLE

Evaporate Stage 7 lake water to produce initial Stage 8 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 711. Solution after simulation 126.
Using reaction 705.

Reaction 705.

2.799e+01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.970e-08	1.472e-08
Al	2.732e-06	1.354e-06
As	3.043e-10	1.509e-10
B	4.213e-05	2.088e-05
Ba	8.593e-08	4.260e-08
C	5.176e-03	2.566e-03
Ca	4.476e-03	2.219e-03
Cd	1.407e-08	6.976e-09
Cl	5.249e-03	2.602e-03

Co	1.083e-07	5.369e-08
Cr	3.370e-09	1.671e-09
Cu	3.416e-06	1.694e-06
F	2.990e-04	1.482e-04
Fe	2.467e-09	1.223e-09
Hg	2.219e-09	1.100e-09
K	3.866e-03	1.917e-03
Mg	5.836e-03	2.893e-03
Mn	6.620e-05	3.282e-05
Mo	1.949e-06	9.663e-07
N	1.620e-05	8.032e-06
Na	1.512e-02	7.495e-03
Ni	1.688e-07	8.366e-08
Pb	1.040e-08	5.154e-09
S	1.461e-02	7.243e-03
Sb	2.964e-08	1.469e-08
Se	1.721e-07	8.534e-08
Si	7.864e-05	3.899e-05
U	2.718e-07	1.347e-07
V	9.016e-09	4.470e-09
Zn	6.703e-06	3.323e-06

-----Description of solution-----

equilibrium	pH	=	7.538	Charge balance
	pe	=	5.216	Adjusted to redox
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	5.053e-02	
	Mass of water (kg)	=	4.958e-01	
	Total alkalinity (eq/kg)	=	4.981e-03	
	Total CO2 (mol/kg)	=	5.176e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	9.505e-07	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	7	
	Total H	=	5.503912e+01	
	Total O	=	2.755503e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.284e-07	3.473e-07	-6.368	-6.459	-0.091	(0)
H+	3.530e-08	2.897e-08	-7.452	-7.538	-0.086	0.00
H2O	5.551e+01	9.991e-01	1.744	-0.000	0.000	18.07
Ag	2.970e-08					
AgCl	1.804e-08	1.804e-08	-7.744	-7.744	0.000	(0)
AgCl2-	8.811e-09	6.766e-09	-8.055	-8.170	-0.115	(0)
Ag+	2.500e-09	2.051e-09	-8.602	-8.688	-0.086	(0)
AgSO4-	2.645e-10	2.031e-10	-9.578	-9.692	-0.115	(0)
AgCl3-2	7.466e-11	2.597e-11	-10.127	-10.585	-0.459	(0)
AgNO2	5.146e-12	5.146e-12	-11.289	-11.289	0.000	(0)
AgCl4-3	2.457e-12	2.284e-13	-11.610	-12.641	-1.032	(0)
AgF	1.030e-12	1.030e-12	-11.987	-11.987	0.000	(0)
AgNH3+	1.035e-13	7.948e-14	-12.985	-13.100	-0.115	(0)
AgOH	7.125e-14	7.125e-14	-13.147	-13.147	0.000	(0)
AgH2BO3	2.699e-14	2.699e-14	-13.569	-13.569	0.000	(0)
Ag2Se	2.590e-14	2.590e-14	-13.587	-13.587	0.000	(0)
AgSeO3-	2.391e-14	1.837e-14	-13.621	-13.736	-0.115	(0)
Ag(NO2)2-	1.246e-16	9.568e-17	-15.905	-16.019	-0.115	(0)
AgNO3	1.698e-17	1.698e-17	-16.770	-16.770	0.000	(0)
Ag(NH3)2+	1.596e-17	1.226e-17	-16.797	-16.912	-0.115	(0)
Ag(OH)2-	3.149e-18	2.418e-18	-17.502	-17.617	-0.115	(0)
Ag(SeO3)2-3	2.465e-20	2.291e-21	-19.608	-20.640	-1.032	(0)
Ag2MoO4	1.407e-24	1.407e-24	-23.852	-23.852	0.000	(0)

	AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.068	-83.903	-1.834	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.935	-147.152	-0.218	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.092	-147.207	-0.115	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.661	-149.054	-0.393	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.993	-149.365	-0.372	(0)
Al	2.732e-06						
	Al (OH) 4-	2.626e-06	2.154e-06	-5.581	-5.667	-0.086	(0)
	Al (OH) 3	4.927e-08	4.927e-08	-7.307	-7.307	0.000	(0)
	AlF3	2.972e-08	2.972e-08	-7.527	-7.527	0.000	(0)
	AlF2+	1.426e-08	1.181e-08	-7.846	-7.928	-0.082	(0)
	Al (OH) 2+	8.586e-09	7.109e-09	-8.066	-8.148	-0.082	(0)
	AlF4-	3.630e-09	2.978e-09	-8.440	-8.526	-0.086	(0)
	AlF+2	3.156e-10	1.483e-10	-9.501	-9.829	-0.328	(0)
	AlOH+2	5.482e-11	2.577e-11	-10.261	-10.589	-0.328	(0)
	AlSO4+	3.484e-12	2.858e-12	-11.458	-11.544	-0.086	(0)
	Al+3	4.398e-13	7.419e-14	-12.357	-13.130	-0.773	(0)
	Al (SO4) 2-	1.853e-13	1.520e-13	-12.732	-12.818	-0.086	(0)
	AlMo6O21-3	2.209e-39	2.053e-40	-38.656	-39.688	-1.032	(0)
As (3)	3.153e-23						
	H3AsO3	3.081e-23	3.081e-23	-22.511	-22.511	0.000	(0)
	H2AsO3-	7.104e-25	5.456e-25	-24.148	-24.263	-0.115	(0)
	HAsO3-2	4.938e-29	1.718e-29	-28.306	-28.765	-0.459	(0)
	H4AsO3+	5.758e-31	4.422e-31	-30.240	-30.354	-0.115	(0)
	AsO3-3	2.460e-34	2.286e-35	-33.609	-34.641	-1.032	(0)
As (5)	3.043e-10						
	HAsO4-2	2.717e-10	9.452e-11	-9.566	-10.024	-0.459	(0)
	H2AsO4-	3.251e-11	2.497e-11	-10.488	-10.603	-0.115	(0)
	AsO4-3	1.110e-13	1.032e-14	-12.955	-13.986	-1.032	(0)
	H3AsO4	1.242e-16	1.257e-16	-15.906	-15.901	0.005	(0)
B	4.213e-05						
	H3BO3	4.093e-05	4.140e-05	-4.388	-4.383	0.005	(0)
	H2BO3-	1.037e-06	8.301e-07	-5.984	-6.081	-0.097	(0)
	CaH2BO3+	7.765e-08	6.214e-08	-7.110	-7.207	-0.097	(0)
	MgH2BO3+	6.581e-08	5.267e-08	-7.182	-7.278	-0.097	(0)
	NaH2BO3	1.587e-08	1.587e-08	-7.799	-7.799	0.000	(0)
	BF (OH) 3-	4.128e-09	3.303e-09	-8.384	-8.481	-0.097	(0)
	H5 (BO3) 2-	3.656e-11	2.926e-11	-10.437	-10.534	-0.097	(0)
	BF2 (OH) 2-	2.558e-12	2.047e-12	-11.592	-11.689	-0.097	(0)
	BaH2BO3+	1.223e-12	9.785e-13	-11.913	-12.009	-0.097	(0)
	H8 (BO3) 3-	1.514e-13	1.211e-13	-12.820	-12.917	-0.097	(0)
	AgH2BO3	2.699e-14	2.699e-14	-13.569	-13.569	0.000	(0)
	BF3OH-	5.768e-18	4.616e-18	-17.239	-17.336	-0.097	(0)
	BF4-	1.645e-22	1.316e-22	-21.784	-21.881	-0.097	(0)
Ba	8.593e-08						
	Ba+2	8.412e-08	3.814e-08	-7.075	-7.419	-0.343	(0)
	BaHCO3+	1.685e-09	1.404e-09	-8.773	-8.853	-0.079	(0)
	BaCO3	1.220e-10	1.220e-10	-9.914	-9.914	0.000	(0)
	BaH2BO3+	1.223e-12	9.785e-13	-11.913	-12.009	-0.097	(0)
	BaOH+	7.012e-14	5.783e-14	-13.154	-13.238	-0.084	(0)
	BaNO3+	2.594e-15	1.992e-15	-14.586	-14.701	-0.115	(0)
	BaNH3+2	1.313e-15	4.567e-16	-14.882	-15.340	-0.459	(0)
C (4)	5.176e-03						
	HCO3-	4.654e-03	3.854e-03	-2.332	-2.414	-0.082	(0)
	H2CO3	2.511e-04	2.511e-04	-3.600	-3.600	0.000	(0)
	CaHCO3+	1.121e-04	9.334e-05	-3.950	-4.030	-0.079	(0)
	MgHCO3+	8.846e-05	7.215e-05	-4.053	-4.142	-0.089	(0)
	NaHCO3	2.614e-05	2.614e-05	-4.583	-4.583	0.000	(0)
	CO3-2	1.375e-05	6.237e-06	-4.862	-5.205	-0.343	(0)
	CaCO3	1.286e-05	1.286e-05	-4.891	-4.891	0.000	(0)
	MgCO3	9.492e-06	9.492e-06	-5.023	-5.023	0.000	(0)
	CuCO3	2.874e-06	2.874e-06	-5.542	-5.542	0.000	(0)
	NaCO3-	1.692e-06	1.401e-06	-5.772	-5.854	-0.082	(0)
	MnHCO3+	1.596e-06	1.316e-06	-5.797	-5.881	-0.084	(0)
	ZnCO3	5.993e-07	5.993e-07	-6.222	-6.222	0.000	(0)
	ZnHCO3+	2.650e-07	2.035e-07	-6.577	-6.691	-0.115	(0)
	UO2 (CO3) 3-4	2.395e-07	3.507e-09	-6.621	-8.455	-1.834	(0)
	Cu (CO3) 2-2	1.387e-07	4.824e-08	-6.858	-7.317	-0.459	(0)

	UO2 (CO3) 2-2	3.225e-08	1.122e-08	-7.491	-7.950	-0.459	(0)
	NiHCO3+	2.562e-08	1.968e-08	-7.591	-7.706	-0.115	(0)
	CuHCO3+	2.478e-08	1.903e-08	-7.606	-7.721	-0.115	(0)
	NiCO3	9.638e-09	9.638e-09	-8.016	-8.016	0.000	(0)
	CoHCO3+	9.613e-09	7.383e-09	-8.017	-8.132	-0.115	(0)
	PbCO3	6.572e-09	6.572e-09	-8.182	-8.182	0.000	(0)
	CoCO3	2.597e-09	2.597e-09	-8.586	-8.586	0.000	(0)
	BaHCO3+	1.685e-09	1.404e-09	-8.773	-8.853	-0.079	(0)
	PbHCO3+	1.307e-09	1.004e-09	-8.884	-8.998	-0.115	(0)
	CdCO3	4.647e-10	4.647e-10	-9.333	-9.333	0.000	(0)
	Pb (CO3) 2-2	3.398e-10	1.182e-10	-9.469	-9.927	-0.459	(0)
	BaCO3	1.220e-10	1.220e-10	-9.914	-9.914	0.000	(0)
	UO2CO3	9.016e-11	9.016e-11	-10.045	-10.045	0.000	(0)
	CdHCO3+	3.734e-11	2.868e-11	-10.428	-10.542	-0.115	(0)
	Cd (CO3) 2-2	6.176e-12	2.148e-12	-11.209	-11.668	-0.459	(0)
	FeHCO3+	1.934e-13	1.610e-13	-12.714	-12.793	-0.079	(0)
	HgCO3	4.785e-14	4.785e-14	-13.320	-13.320	0.000	(0)
	Hg (CO3) 2-2	2.713e-15	9.437e-16	-14.567	-15.025	-0.459	(0)
	HgHCO3+	3.361e-17	2.581e-17	-16.474	-16.588	-0.115	(0)
Ca	4.476e-03						
	Ca+2	2.869e-03	1.301e-03	-2.542	-2.886	-0.343	(0)
	CaSO4	1.479e-03	1.479e-03	-2.830	-2.830	0.000	(0)
	CaHCO3+	1.121e-04	9.334e-05	-3.950	-4.030	-0.079	(0)
	CaCO3	1.286e-05	1.286e-05	-4.891	-4.891	0.000	(0)
	CaF+	3.442e-06	2.839e-06	-5.463	-5.547	-0.084	(0)
	CaH2BO3+	7.765e-08	6.214e-08	-7.110	-7.207	-0.097	(0)
	CaOH+	1.082e-08	9.014e-09	-7.966	-8.045	-0.079	(0)
	CaNH3+2	8.933e-11	3.108e-11	-10.049	-10.508	-0.459	(0)
	CaNO3+	5.582e-11	4.287e-11	-10.253	-10.368	-0.115	(0)
	Ca (NH3) 2+2	6.749e-19	2.348e-19	-18.171	-18.629	-0.459	(0)
Cd	1.407e-08						
	Cd+2	7.209e-09	3.269e-09	-8.142	-8.486	-0.343	(0)
	CdSO4	3.803e-09	3.803e-09	-8.420	-8.420	0.000	(0)
	CdCl+	1.751e-09	1.345e-09	-8.757	-8.871	-0.115	(0)
	Cd (SO4) 2-2	7.317e-10	2.545e-10	-9.136	-9.594	-0.459	(0)
	CdCO3	4.647e-10	4.647e-10	-9.333	-9.333	0.000	(0)
	CdHCO3+	3.734e-11	2.868e-11	-10.428	-10.542	-0.115	(0)
	CdCl2	2.414e-11	2.414e-11	-10.617	-10.617	0.000	(0)
	CdOHC1	1.916e-11	1.916e-11	-10.718	-10.718	0.000	(0)
	CdF+	1.349e-11	1.036e-11	-10.870	-10.985	-0.115	(0)
	CdOH+	1.174e-11	9.018e-12	-10.930	-11.045	-0.115	(0)
	Cd (CO3) 2-2	6.176e-12	2.148e-12	-11.209	-11.668	-0.459	(0)
	CdCl3-	8.541e-14	6.560e-14	-13.068	-13.183	-0.115	(0)
	Cd (OH) 2	1.976e-14	1.976e-14	-13.704	-13.704	0.000	(0)
	CdF2	4.132e-15	4.132e-15	-14.384	-14.384	0.000	(0)
	CdNO3+	1.403e-16	1.077e-16	-15.853	-15.968	-0.115	(0)
	CdSeO4	3.380e-17	3.380e-17	-16.471	-16.471	0.000	(0)
	Cd2OH+3	1.590e-18	1.477e-19	-17.799	-18.830	-1.032	(0)
	Cd (SeO3) 2-2	1.503e-18	5.228e-19	-17.823	-18.282	-0.459	(0)
	Cd (OH) 3-	5.460e-19	4.194e-19	-18.263	-18.377	-0.115	(0)
	Cd (NO3) 2	5.628e-25	5.628e-25	-24.250	-24.250	0.000	(0)
	Cd (OH) 4-2	6.853e-26	2.384e-26	-25.164	-25.623	-0.459	(0)
	CdHS+	0.000e+00	0.000e+00	-78.580	-78.694	-0.115	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.707	-149.707	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.909	-226.024	-0.115	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.586	-302.044	-0.459	(0)
Cl	5.249e-03						
	Cl-	5.248e-03	4.307e-03	-2.280	-2.366	-0.086	(0)
	MnCl+	1.125e-07	9.281e-08	-6.949	-7.032	-0.084	(0)
	ZnCl+	2.215e-08	1.806e-08	-7.655	-7.743	-0.089	(0)
	AgCl	1.804e-08	1.804e-08	-7.744	-7.744	0.000	(0)
	AgCl2-	8.811e-09	6.766e-09	-8.055	-8.170	-0.115	(0)
	ZnOHC1	8.214e-09	8.214e-09	-8.085	-8.085	0.000	(0)
	CdCl+	1.751e-09	1.345e-09	-8.757	-8.871	-0.115	(0)
	CuCl2-	1.393e-09	1.136e-09	-8.856	-8.945	-0.089	(0)
	CuCl	1.263e-09	1.263e-09	-8.899	-8.899	0.000	(0)
	CuCl+	6.549e-10	5.342e-10	-9.184	-9.272	-0.089	(0)
	NiCl+	5.943e-10	4.564e-10	-9.226	-9.341	-0.115	(0)

MnCl2	5.646e-10	5.646e-10	-9.248	-9.248	0.000	(0)
CoCl+	4.778e-10	3.670e-10	-9.321	-9.435	-0.115	(0)
ZnCl2	1.233e-10	1.233e-10	-9.909	-9.909	0.000	(0)
AgCl3-2	7.466e-11	2.597e-11	-10.127	-10.585	-0.459	(0)
PbCl+	6.975e-11	5.357e-11	-10.156	-10.271	-0.115	(0)
CdCl2	2.414e-11	2.414e-11	-10.617	-10.617	0.000	(0)
CdOHC1	1.916e-11	1.916e-11	-10.718	-10.718	0.000	(0)
HgClOH	1.694e-11	1.694e-11	-10.771	-10.771	0.000	(0)
HgCl2	1.189e-11	1.189e-11	-10.925	-10.925	0.000	(0)
AgCl4-3	2.457e-12	2.284e-13	-11.610	-12.641	-1.032	(0)
CuCl3-2	2.262e-12	1.046e-12	-11.645	-11.980	-0.335	(0)
PbCl2	1.031e-12	1.031e-12	-11.987	-11.987	0.000	(0)
MnCl3-	8.122e-13	6.698e-13	-12.090	-12.174	-0.084	(0)
CuCl2	7.977e-13	7.977e-13	-12.098	-12.098	0.000	(0)
HgCl3-	6.669e-13	5.122e-13	-12.176	-12.291	-0.115	(0)
ZnCl3-	5.172e-13	4.218e-13	-12.286	-12.375	-0.089	(0)
CdCl3-	8.541e-14	6.560e-14	-13.068	-13.183	-0.115	(0)
HgCl4-2	2.524e-14	8.782e-15	-13.598	-14.056	-0.459	(0)
NiCl2	9.898e-15	9.898e-15	-14.004	-14.004	0.000	(0)
PbCl3-	2.301e-15	1.767e-15	-14.638	-14.753	-0.115	(0)
ZnCl4-2	1.964e-15	9.085e-16	-14.707	-15.042	-0.335	(0)
HgCl+	7.173e-16	5.509e-16	-15.144	-15.259	-0.115	(0)
CrCl+2	1.096e-16	3.813e-17	-15.960	-16.419	-0.459	(0)
CuCl3-	3.931e-17	3.206e-17	-16.406	-16.494	-0.089	(0)
UO2Cl+	3.302e-17	2.536e-17	-16.481	-16.596	-0.115	(0)
PbCl4-2	9.999e-18	3.479e-18	-17.000	-17.459	-0.459	(0)
CrOHC12	1.084e-18	1.084e-18	-17.965	-17.965	0.000	(0)
CrCl2+	2.029e-20	1.558e-20	-19.693	-19.807	-0.115	(0)
FeCl+2	1.427e-20	6.601e-21	-19.845	-20.180	-0.335	(0)
CuCl4-2	1.497e-21	6.921e-22	-20.825	-21.160	-0.335	(0)
VOCl+	6.257e-22	4.805e-22	-21.204	-21.318	-0.115	(0)
FeCl2+	1.540e-22	1.270e-22	-21.812	-21.896	-0.084	(0)
CrO3Cl-	6.674e-26	5.125e-26	-25.176	-25.290	-0.115	(0)
FeCl3	5.470e-26	5.470e-26	-25.262	-25.262	0.000	(0)
CoCl+2	4.065e-35	1.414e-35	-34.391	-34.850	-0.459	(0)
UCl+3	0.000e+00	0.000e+00	-45.442	-46.474	-1.032	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.047	-47.505	-0.459	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.301	-48.759	-0.459	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.484	-61.943	-0.459	(0)
Co (2)	1.083e-07					
Co+2	7.080e-08	2.463e-08	-7.150	-7.609	-0.459	(0)
CoSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
CoHCO3+	9.613e-09	7.383e-09	-8.017	-8.132	-0.115	(0)
CoCO3	2.597e-09	2.597e-09	-8.586	-8.586	0.000	(0)
CoCl+	4.778e-10	3.670e-10	-9.321	-9.435	-0.115	(0)
CoOH+	2.222e-10	1.707e-10	-9.653	-9.768	-0.115	(0)
CoF+	2.028e-10	1.557e-10	-9.693	-9.808	-0.115	(0)
Co (OH) 2	4.709e-12	4.709e-12	-11.327	-11.327	0.000	(0)
CoNO2+	2.713e-12	2.084e-12	-11.566	-11.681	-0.115	(0)
Co (NH3) +2	1.615e-13	5.619e-14	-12.792	-13.250	-0.459	(0)
CoSeO4	6.855e-16	6.855e-16	-15.164	-15.164	0.000	(0)
CoNO3+	5.298e-16	4.068e-16	-15.276	-15.391	-0.115	(0)
Co (OH) 3-	4.249e-17	3.263e-17	-16.372	-16.486	-0.115	(0)
CoOOH-	1.067e-17	8.194e-18	-16.972	-17.086	-0.115	(0)
Co2OH+3	2.267e-18	2.107e-19	-17.645	-18.676	-1.032	(0)
Co (NH3) 2+2	1.308e-19	4.549e-20	-18.884	-19.342	-0.459	(0)
Co (NO3) 2	8.628e-24	8.628e-24	-23.064	-23.064	0.000	(0)
Co (OH) 4-2	5.164e-24	1.796e-24	-23.287	-23.746	-0.459	(0)
Co (NH3) 3+2	3.124e-26	1.087e-26	-25.505	-25.964	-0.459	(0)
Co4 (OH) 4+4	1.156e-29	1.693e-31	-28.937	-30.771	-1.834	(0)
Co (NH3) 4+2	3.111e-33	1.082e-33	-32.507	-32.966	-0.459	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-40.009	-40.467	-0.459	(0)
Co (3)	8.187e-29					
CoOH+2	8.187e-29	2.848e-29	-28.087	-28.545	-0.459	(0)
Co+3	9.565e-35	1.614e-35	-34.019	-34.792	-0.773	(0)
CoCl+2	4.065e-35	1.414e-35	-34.391	-34.850	-0.459	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.047	-47.505	-0.459	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.841	-56.956	-0.115	(0)

	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.377	-61.836	-0.459	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.484	-61.943	-0.459	(0)
Cr (2)	2.855e-26						
	Cr+2	2.855e-26	9.931e-27	-25.544	-26.003	-0.459	(0)
Cr (3)	3.370e-09						
	Cr (OH) 2+	2.861e-09	2.197e-09	-8.544	-8.658	-0.115	(0)
	Cr (OH) 3	2.866e-10	2.866e-10	-9.543	-9.543	0.000	(0)
	Cr (OH) +2	1.494e-10	5.199e-11	-9.826	-10.284	-0.459	(0)
	CrOHSO4	6.122e-11	6.122e-11	-10.213	-10.213	0.000	(0)
	CrO2-	6.124e-12	4.703e-12	-11.213	-11.328	-0.115	(0)
	Cr (OH) 4-	5.161e-12	3.963e-12	-11.287	-11.402	-0.115	(0)
	CrF+2	6.232e-13	2.168e-13	-12.205	-12.664	-0.459	(0)
	CrSO4+	1.032e-13	7.928e-14	-12.986	-13.101	-0.115	(0)
	Cr+3	7.361e-14	6.842e-15	-13.133	-14.165	-1.032	(0)
	CrCl+2	1.096e-16	3.813e-17	-15.960	-16.419	-0.459	(0)
	CrOHC12	1.084e-18	1.084e-18	-17.965	-17.965	0.000	(0)
	Cr2 (OH) 2SO4+2	8.268e-19	2.876e-19	-18.083	-18.541	-0.459	(0)
	Cr2 (OH) 2 (SO4) 2	8.479e-20	8.479e-20	-19.072	-19.072	0.000	(0)
	CrCl2+	2.029e-20	1.558e-20	-19.693	-19.807	-0.115	(0)
	CrNO3+2	8.960e-24	3.117e-24	-23.048	-23.506	-0.459	(0)
	Cr (NH3) 5OH+2	3.962e-39	1.378e-39	-38.402	-38.861	-0.459	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.464	-47.496	-1.032	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.301	-48.759	-0.459	(0)
Cr (6)	1.685e-15						
	CrO4-2	1.536e-15	6.963e-16	-14.814	-15.157	-0.343	(0)
	HCrO4-	8.498e-17	6.526e-17	-16.071	-16.185	-0.115	(0)
	NaCrO4-	5.435e-17	4.174e-17	-16.265	-16.379	-0.115	(0)
	KCrO4-	1.033e-17	7.930e-18	-16.986	-17.101	-0.115	(0)
	CrO3SO4-2	8.221e-24	2.860e-24	-23.085	-23.544	-0.459	(0)
	H2CrO4	1.532e-24	1.532e-24	-23.815	-23.815	0.000	(0)
	CrO3Cl-	6.674e-26	5.125e-26	-25.176	-25.290	-0.115	(0)
	Cr2O7-2	4.249e-31	1.478e-31	-30.372	-30.830	-0.459	(0)
Cu (1)	2.961e-09						
	CuCl2-	1.393e-09	1.136e-09	-8.856	-8.945	-0.089	(0)
	CuCl	1.263e-09	1.263e-09	-8.899	-8.899	0.000	(0)
	Cu+	3.032e-10	2.329e-10	-9.518	-9.633	-0.115	(0)
	CuCl3-2	2.262e-12	1.046e-12	-11.645	-11.980	-0.335	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.218	-147.600	-0.382	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-147.967	-148.330	-0.363	(0)
Cu (2)	3.413e-06						
	CuCO3	2.874e-06	2.874e-06	-5.542	-5.542	0.000	(0)
	Cu+2	1.726e-07	7.825e-08	-6.763	-7.106	-0.343	(0)
	Cu (CO3) 2-2	1.387e-07	4.824e-08	-6.858	-7.317	-0.459	(0)
	CuOH+	1.054e-07	8.595e-08	-6.977	-7.066	-0.089	(0)
	CuSO4	8.896e-08	8.896e-08	-7.051	-7.051	0.000	(0)
	CuHCO3+	2.478e-08	1.903e-08	-7.606	-7.721	-0.115	(0)
	Cu (OH) 2	5.956e-09	5.956e-09	-8.225	-8.225	0.000	(0)
	CuF+	1.285e-09	9.872e-10	-8.891	-9.006	-0.115	(0)
	CuCl+	6.549e-10	5.342e-10	-9.184	-9.272	-0.089	(0)
	Cu2 (OH) 2+2	5.334e-10	1.856e-10	-9.273	-9.732	-0.459	(0)
	CuNO2+	1.281e-10	9.838e-11	-9.892	-10.007	-0.115	(0)
	CuNH3+2	4.368e-11	1.520e-11	-10.360	-10.818	-0.459	(0)
	Cu (OH) 3-	5.525e-12	4.243e-12	-11.258	-11.372	-0.115	(0)
	CuCl2	7.977e-13	7.977e-13	-12.098	-12.098	0.000	(0)
	Cu (NO2) 2	1.209e-14	1.209e-14	-13.918	-13.918	0.000	(0)
	CuNO3+	3.358e-15	2.579e-15	-14.474	-14.589	-0.115	(0)
	CuCl3-	3.931e-17	3.206e-17	-16.406	-16.494	-0.089	(0)
	Cu (OH) 4-2	3.334e-17	1.160e-17	-16.477	-16.936	-0.459	(0)
	CuCl4-2	1.497e-21	6.921e-22	-20.825	-21.160	-0.335	(0)
	Cu (NO3) 2	3.384e-24	3.384e-24	-23.471	-23.471	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.743	-215.858	-0.115	(0)
F	2.990e-04						
	F-	2.436e-04	1.999e-04	-3.613	-3.699	-0.086	(0)
	MgF+	5.004e-05	4.104e-05	-4.301	-4.387	-0.086	(0)
	CaF+	3.442e-06	2.839e-06	-5.463	-5.547	-0.084	(0)
	NaF	1.522e-06	1.522e-06	-5.818	-5.818	0.000	(0)
	MnF+	1.652e-07	1.362e-07	-6.782	-6.866	-0.084	(0)
	AlF3	2.972e-08	2.972e-08	-7.527	-7.527	0.000	(0)

AlF2+	1.426e-08	1.181e-08	-7.846	-7.928	-0.082	(0)
ZnF+	8.673e-09	6.661e-09	-8.062	-8.176	-0.115	(0)
HF	8.566e-09	8.566e-09	-8.067	-8.067	0.000	(0)
BF (OH) 3-	4.128e-09	3.303e-09	-8.384	-8.481	-0.097	(0)
AlF4-	3.630e-09	2.978e-09	-8.440	-8.526	-0.086	(0)
CuF+	1.285e-09	9.872e-10	-8.891	-9.006	-0.115	(0)
AlF+2	3.156e-10	1.483e-10	-9.501	-9.829	-0.328	(0)
NiF+	2.709e-10	2.080e-10	-9.567	-9.682	-0.115	(0)
CoF+	2.028e-10	1.557e-10	-9.693	-9.808	-0.115	(0)
CdF+	1.349e-11	1.036e-11	-10.870	-10.985	-0.115	(0)
HF2-	8.031e-12	6.511e-12	-11.095	-11.186	-0.091	(0)
PbF+	6.431e-12	4.939e-12	-11.192	-11.306	-0.115	(0)
BF2 (OH) 2-	2.558e-12	2.047e-12	-11.592	-11.689	-0.097	(0)
AgF	1.030e-12	1.030e-12	-11.987	-11.987	0.000	(0)
CrF+2	6.232e-13	2.168e-13	-12.205	-12.664	-0.459	(0)
UO2F+	1.305e-13	1.002e-13	-12.884	-12.999	-0.115	(0)
UO2F2	5.778e-14	5.778e-14	-13.238	-13.238	0.000	(0)
PbF2	1.943e-14	1.943e-14	-13.711	-13.711	0.000	(0)
CdF2	4.132e-15	4.132e-15	-14.384	-14.384	0.000	(0)
UO2F3-	3.778e-15	2.902e-15	-14.423	-14.537	-0.115	(0)
H2F2	1.966e-16	1.966e-16	-15.706	-15.706	0.000	(0)
FeF2+	7.219e-17	5.953e-17	-16.142	-16.225	-0.084	(0)
VO2F	3.417e-17	3.417e-17	-16.466	-16.466	0.000	(0)
FeF+2	2.406e-17	1.113e-17	-16.619	-16.954	-0.335	(0)
FeF3	1.679e-17	1.679e-17	-16.775	-16.775	0.000	(0)
UO2F4-2	1.325e-17	4.608e-18	-16.878	-17.336	-0.459	(0)
PbF3-	9.595e-18	7.369e-18	-17.018	-17.133	-0.115	(0)
BF3OH-	5.768e-18	4.616e-18	-17.239	-17.336	-0.097	(0)
VO2F2-	3.230e-18	2.480e-18	-17.491	-17.606	-0.115	(0)
VOF+	6.210e-20	4.769e-20	-19.207	-19.322	-0.115	(0)
VO2F3-2	1.778e-20	6.185e-21	-19.750	-20.209	-0.459	(0)
VOF2	3.575e-21	3.575e-21	-20.447	-20.447	0.000	(0)
PbF4-2	2.027e-21	7.051e-22	-20.693	-21.152	-0.459	(0)
BF4-	1.645e-22	1.316e-22	-21.784	-21.881	-0.097	(0)
HgF+	6.186e-23	4.751e-23	-22.209	-22.323	-0.115	(0)
VOF3-	3.302e-23	2.536e-23	-22.481	-22.596	-0.115	(0)
VO2F4-3	6.547e-24	6.085e-25	-23.184	-24.216	-1.032	(0)
Sb (OH) 2F	4.412e-25	4.412e-25	-24.355	-24.355	0.000	(0)
SbOF	4.342e-25	4.342e-25	-24.362	-24.362	0.000	(0)
VOF4-2	5.883e-26	2.047e-26	-25.230	-25.689	-0.459	(0)
SiF6-2	1.168e-26	5.400e-27	-25.933	-26.268	-0.335	(0)
UF3+	6.440e-36	4.946e-36	-35.191	-35.306	-0.115	(0)
UF2+2	4.487e-37	1.561e-37	-36.348	-36.807	-0.459	(0)
UF4	1.084e-37	1.084e-37	-36.965	-36.965	0.000	(0)
UF5-	1.119e-39	8.591e-40	-38.951	-39.066	-0.115	(0)
UF+3	6.673e-40	0.000e+00	-39.176	-40.207	-1.032	(0)
UF6-2	1.491e-40	0.000e+00	-39.827	-40.285	-0.459	(0)
Fe (2)	1.384e-11					
Fe+2	9.543e-12	3.320e-12	-11.020	-11.479	-0.459	(0)
FeSO4	4.044e-12	4.044e-12	-11.393	-11.393	0.000	(0)
FeHCO3+	1.934e-13	1.610e-13	-12.714	-12.793	-0.079	(0)
FeOH+	5.566e-14	4.590e-14	-13.254	-13.338	-0.084	(0)
Fe (OH) 2	1.266e-17	1.266e-17	-16.897	-16.897	0.000	(0)
Fe (OH) 3-	1.687e-18	1.391e-18	-17.773	-17.857	-0.084	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.962	-158.962	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.027	-235.142	-0.115	(0)
Fe (3)	2.453e-09					
Fe (OH) 2+	1.857e-09	1.538e-09	-8.731	-8.813	-0.082	(0)
Fe (OH) 3	5.736e-10	5.736e-10	-9.241	-9.241	0.000	(0)
Fe (OH) 4-	2.240e-11	1.855e-11	-10.650	-10.732	-0.082	(0)
FeOH+2	2.461e-14	1.138e-14	-13.609	-13.944	-0.335	(0)
FeF2+	7.219e-17	5.953e-17	-16.142	-16.225	-0.084	(0)
FeF+2	2.406e-17	1.113e-17	-16.619	-16.954	-0.335	(0)
FeF3	1.679e-17	1.679e-17	-16.775	-16.775	0.000	(0)
FeSO4+	3.427e-18	2.826e-18	-17.465	-17.549	-0.084	(0)
Fe (SO4) 2-	3.904e-19	2.998e-19	-18.409	-18.523	-0.115	(0)
Fe+3	3.008e-19	5.075e-20	-18.522	-19.295	-0.773	(0)
FeCl+2	1.427e-20	6.601e-21	-19.845	-20.180	-0.335	(0)

	FeCl2+	1.540e-22	1.270e-22	-21.812	-21.896	-0.084	(0)
	FeHSeO3+2	3.907e-23	1.359e-23	-22.408	-22.867	-0.459	(0)
	Fe2 (OH) 2+4	2.929e-25	4.289e-27	-24.533	-26.368	-1.834	(0)
	FeCl3	5.470e-26	5.470e-26	-25.262	-25.262	0.000	(0)
	FeNO3+2	1.521e-26	5.290e-27	-25.818	-26.277	-0.459	(0)
	Fe3 (OH) 4+5	7.005e-32	9.534e-35	-31.155	-34.021	-2.866	(0)
H (0)	4.335e-29						
	H2	2.168e-29	2.193e-29	-28.664	-28.659	0.005	(0)
Hg (0)	2.185e-09						
	Hg	2.185e-09	2.185e-09	-8.661	-8.661	0.000	(0)
Hg (1)	5.467e-20						
	Hg2+2	2.733e-20	9.508e-21	-19.563	-20.022	-0.459	(0)
Hg (2)	3.439e-11						
	HgClOH	1.694e-11	1.694e-11	-10.771	-10.771	0.000	(0)
	HgCl2	1.189e-11	1.189e-11	-10.925	-10.925	0.000	(0)
	Hg (OH) 2	4.823e-12	4.879e-12	-11.317	-11.312	0.005	(0)
	HgCl3-	6.669e-13	5.122e-13	-12.176	-12.291	-0.115	(0)
	HgCO3	4.785e-14	4.785e-14	-13.320	-13.320	0.000	(0)
	HgCl4-2	2.524e-14	8.782e-15	-13.598	-14.056	-0.459	(0)
	Hg (CO3) 2-2	2.713e-15	9.437e-16	-14.567	-15.025	-0.459	(0)
	HgCl+	7.173e-16	5.509e-16	-15.144	-15.259	-0.115	(0)
	HgOH+	1.154e-16	8.864e-17	-15.938	-16.052	-0.115	(0)
	HgHCO3+	3.361e-17	2.581e-17	-16.474	-16.588	-0.115	(0)
	Hg (NH3) 2+2	4.187e-18	1.457e-18	-17.378	-17.837	-0.459	(0)
	Hg (OH) 3-	2.778e-19	2.134e-19	-18.556	-18.671	-0.115	(0)
	HgNH3+2	2.207e-19	7.676e-20	-18.656	-19.115	-0.459	(0)
	Hg+2	1.843e-20	6.411e-21	-19.735	-20.193	-0.459	(0)
	HgSO4	8.329e-21	8.329e-21	-20.079	-20.079	0.000	(0)
	HgF+	6.186e-23	4.751e-23	-22.209	-22.323	-0.115	(0)
	Hg (NH3) 3+2	3.163e-25	1.101e-25	-24.500	-24.958	-0.459	(0)
	HgNO3+	3.212e-29	2.467e-29	-28.493	-28.608	-0.115	(0)
	Hg (NH3) 4+2	4.769e-32	1.659e-32	-31.322	-31.780	-0.459	(0)
	Hg (NO3) 2	1.069e-37	1.069e-37	-36.971	-36.971	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.046	-137.160	-0.115	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.872	-138.330	-0.459	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.304	-138.304	0.000	(0)
K	3.866e-03						
	K+	3.736e-03	3.066e-03	-2.428	-2.513	-0.086	(0)
	KSO4-	1.301e-04	1.077e-04	-3.886	-3.968	-0.082	(0)
	KCrO4-	1.033e-17	7.930e-18	-16.986	-17.101	-0.115	(0)
Mg	5.836e-03						
	Mg+2	4.035e-03	1.830e-03	-2.394	-2.738	-0.343	(0)
	MgSO4	1.652e-03	1.652e-03	-2.782	-2.782	0.000	(0)
	MgHCO3+	8.846e-05	7.215e-05	-4.053	-4.142	-0.089	(0)
	MgF+	5.004e-05	4.104e-05	-4.301	-4.387	-0.086	(0)
	MgCO3	9.492e-06	9.492e-06	-5.023	-5.023	0.000	(0)
	MgOH+	3.024e-07	2.530e-07	-6.519	-6.597	-0.077	(0)
	MgH2BO3+	6.581e-08	5.267e-08	-7.182	-7.278	-0.097	(0)
Mn (2)	6.620e-05						
	Mn+2	4.921e-05	1.712e-05	-4.308	-4.767	-0.459	(0)
	MnSO4	1.511e-05	1.511e-05	-4.821	-4.821	0.000	(0)
	MnHCO3+	1.596e-06	1.316e-06	-5.797	-5.881	-0.084	(0)
	MnF+	1.652e-07	1.362e-07	-6.782	-6.866	-0.084	(0)
	MnCl+	1.125e-07	9.281e-08	-6.949	-7.032	-0.084	(0)
	MnOH+	1.811e-08	1.493e-08	-7.742	-7.826	-0.084	(0)
	MnCl2	5.646e-10	5.646e-10	-9.248	-9.248	0.000	(0)
	MnCl3-	8.122e-13	6.698e-13	-12.090	-12.174	-0.084	(0)
	MnNO3+	3.682e-13	2.828e-13	-12.434	-12.549	-0.115	(0)
	MnSeO4	2.558e-13	2.558e-13	-12.592	-12.592	0.000	(0)
	Mn (OH) 3-	1.350e-17	1.113e-17	-16.870	-16.953	-0.084	(0)
	Mn (NO3) 2	7.403e-21	7.403e-21	-20.131	-20.131	0.000	(0)
	Mn (OH) 4-2	2.699e-23	1.248e-23	-22.569	-22.904	-0.335	(0)
	MnSe	0.000e+00	0.000e+00	-41.273	-41.273	0.000	(0)
Mn (3)	7.459e-25						
	Mn+3	7.459e-25	1.258e-25	-24.127	-24.900	-0.773	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.685	-42.020	-0.335	(0)
Mn (7)	0.000e+00						

MnO4-	0.000e+00	0.000e+00	-46.082	-46.175	-0.094	(0)
Mo	1.949e-06					
MoO4-2	1.948e-06	8.834e-07	-5.710	-6.054	-0.343	(0)
HMoO4-	6.630e-10	5.092e-10	-9.178	-9.293	-0.115	(0)
H2MoO4	1.080e-13	1.080e-13	-12.966	-12.966	0.000	(0)
Ag2MoO4	1.407e-24	1.407e-24	-23.852	-23.852	0.000	(0)
AlMo6O21-3	2.209e-39	2.053e-40	-38.656	-39.688	-1.032	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.563	-49.690	-4.127	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.975	-50.841	-2.866	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.763	-53.597	-1.834	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.858	-57.889	-1.032	(0)
N(-3)	1.286e-06					
NH4+	1.205e-06	9.641e-07	-5.919	-6.016	-0.097	(0)
NH4SO4-	6.216e-08	5.126e-08	-7.206	-7.290	-0.084	(0)
NH3	1.898e-08	1.898e-08	-7.722	-7.722	0.000	(0)
CaNH3+2	8.933e-11	3.108e-11	-10.049	-10.508	-0.459	(0)
CuNH3+2	4.368e-11	1.520e-11	-10.360	-10.818	-0.459	(0)
NiNH3+2	1.213e-12	4.221e-13	-11.916	-12.375	-0.459	(0)
Co(NH3)+2	1.615e-13	5.619e-14	-12.792	-13.250	-0.459	(0)
AgNH3+	1.035e-13	7.948e-14	-12.985	-13.100	-0.115	(0)
BaNH3+2	1.313e-15	4.567e-16	-14.882	-15.340	-0.459	(0)
Ag(NH3)2+	1.596e-17	1.226e-17	-16.797	-16.912	-0.115	(0)
Hg(NH3)2+2	4.187e-18	1.457e-18	-17.378	-17.837	-0.459	(0)
Ni(NH3)2+2	3.328e-18	1.158e-18	-17.478	-17.936	-0.459	(0)
Ca(NH3)2+2	6.749e-19	2.348e-19	-18.171	-18.629	-0.459	(0)
HgNH3+2	2.207e-19	7.676e-20	-18.656	-19.115	-0.459	(0)
Co(NH3)2+2	1.308e-19	4.549e-20	-18.884	-19.342	-0.459	(0)
Hg(NH3)3+2	3.163e-25	1.101e-25	-24.500	-24.958	-0.459	(0)
Co(NH3)3+2	3.124e-26	1.087e-26	-25.505	-25.964	-0.459	(0)
Hg(NH3)4+2	4.769e-32	1.659e-32	-31.322	-31.780	-0.459	(0)
Co(NH3)4+2	3.111e-33	1.082e-33	-32.507	-32.966	-0.459	(0)
Cr(NH3)5OH+2	3.962e-39	1.378e-39	-38.402	-38.861	-0.459	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-40.009	-40.467	-0.459	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-46.464	-47.496	-1.032	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-47.047	-47.505	-0.459	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-48.301	-48.759	-0.459	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-56.841	-56.956	-0.115	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-61.377	-61.836	-0.459	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-61.484	-61.943	-0.459	(0)
N(3)	1.490e-05					
NO2-	1.490e-05	1.201e-05	-4.827	-4.921	-0.094	(0)
CuNO2+	1.281e-10	9.838e-11	-9.892	-10.007	-0.115	(0)
AgNO2	5.146e-12	5.146e-12	-11.289	-11.289	0.000	(0)
CoNO2+	2.713e-12	2.084e-12	-11.566	-11.681	-0.115	(0)
Cu(NO2)2	1.209e-14	1.209e-14	-13.918	-13.918	0.000	(0)
Ag(NO2)2-	1.246e-16	9.568e-17	-15.905	-16.019	-0.115	(0)
N(5)	1.276e-08					
NO3-	1.270e-08	1.042e-08	-7.896	-7.982	-0.086	(0)
CaNO3+	5.582e-11	4.287e-11	-10.253	-10.368	-0.115	(0)
MnNO3+	3.682e-13	2.828e-13	-12.434	-12.549	-0.115	(0)
ZnNO3+	5.692e-14	4.372e-14	-13.245	-13.359	-0.115	(0)
CuNO3+	3.358e-15	2.579e-15	-14.474	-14.589	-0.115	(0)
BaNO3+	2.594e-15	1.992e-15	-14.586	-14.701	-0.115	(0)
NiNO3+	1.412e-15	1.084e-15	-14.850	-14.965	-0.115	(0)
CoNO3+	5.298e-16	4.068e-16	-15.276	-15.391	-0.115	(0)
CdNO3+	1.403e-16	1.077e-16	-15.853	-15.968	-0.115	(0)
PbNO3+	7.037e-17	5.404e-17	-16.153	-16.267	-0.115	(0)
AgNO3	1.698e-17	1.698e-17	-16.770	-16.770	0.000	(0)
Mn(NO3)2	7.403e-21	7.403e-21	-20.131	-20.131	0.000	(0)
UO2NO3+	9.832e-23	7.551e-23	-22.007	-22.122	-0.115	(0)
Zn(NO3)2	9.091e-23	9.091e-23	-22.041	-22.041	0.000	(0)
CrNO3+2	8.960e-24	3.117e-24	-23.048	-23.506	-0.459	(0)
Co(NO3)2	8.628e-24	8.628e-24	-23.064	-23.064	0.000	(0)
Cu(NO3)2	3.384e-24	3.384e-24	-23.471	-23.471	0.000	(0)
Pb(NO3)2	9.565e-25	9.565e-25	-24.019	-24.019	0.000	(0)
Cd(NO3)2	5.628e-25	5.628e-25	-24.250	-24.250	0.000	(0)
VO2NO3	5.137e-25	5.137e-25	-24.289	-24.289	0.000	(0)
FeNO3+2	1.521e-26	5.290e-27	-25.818	-26.277	-0.459	(0)

	HgNO3+	3.212e-29	2.467e-29	-28.493	-28.608	-0.115	(0)
	Hg (NO3) 2	1.069e-37	1.069e-37	-36.971	-36.971	0.000	(0)
Na		1.512e-02					
	Na+	1.470e-02	1.206e-02	-1.833	-1.919	-0.086	(0)
	NaSO4-	3.882e-04	3.215e-04	-3.411	-3.493	-0.082	(0)
	NaHCO3	2.614e-05	2.614e-05	-4.583	-4.583	0.000	(0)
	NaCO3-	1.692e-06	1.401e-06	-5.772	-5.854	-0.082	(0)
	NaF	1.522e-06	1.522e-06	-5.818	-5.818	0.000	(0)
	NaH2BO3	1.587e-08	1.587e-08	-7.799	-7.799	0.000	(0)
	NaCrO4-	5.435e-17	4.174e-17	-16.265	-16.379	-0.115	(0)
Ni		1.688e-07					
	Ni+2	9.135e-08	4.142e-08	-7.039	-7.383	-0.343	(0)
	NiSO4	4.101e-08	4.101e-08	-7.387	-7.387	0.000	(0)
	NiHCO3+	2.562e-08	1.968e-08	-7.591	-7.706	-0.115	(0)
	NiCO3	9.638e-09	9.638e-09	-8.016	-8.016	0.000	(0)
	NiCl+	5.943e-10	4.564e-10	-9.226	-9.341	-0.115	(0)
	NiF+	2.709e-10	2.080e-10	-9.567	-9.682	-0.115	(0)
	NiOH+	2.358e-10	1.811e-10	-9.627	-9.742	-0.115	(0)
	Ni (SO4) 2-2	1.937e-11	6.739e-12	-10.713	-11.171	-0.459	(0)
	Ni (OH) 2	4.997e-12	4.997e-12	-11.301	-11.301	0.000	(0)
	NiNH3+2	1.213e-12	4.221e-13	-11.916	-12.375	-0.459	(0)
	NiCl2	9.898e-15	9.898e-15	-14.004	-14.004	0.000	(0)
	Ni (OH) 3-	2.260e-15	1.735e-15	-14.646	-14.761	-0.115	(0)
	NiNO3+	1.412e-15	1.084e-15	-14.850	-14.965	-0.115	(0)
	NiSeO4	1.076e-15	1.076e-15	-14.968	-14.968	0.000	(0)
	Ni (NH3) 2+2	3.328e-18	1.158e-18	-17.478	-17.936	-0.459	(0)
O (0)		2.080e-35					
	O2	1.040e-35	1.052e-35	-34.983	-34.978	0.005	(0)
Pb		1.040e-08					
	PbCO3	6.572e-09	6.572e-09	-8.182	-8.182	0.000	(0)
	PbHCO3+	1.307e-09	1.004e-09	-8.884	-8.998	-0.115	(0)
	PbSO4	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
	Pb+2	7.731e-10	3.505e-10	-9.112	-9.455	-0.343	(0)
	PbOH+	3.982e-10	3.058e-10	-9.400	-9.515	-0.115	(0)
	Pb (CO3) 2-2	3.398e-10	1.182e-10	-9.469	-9.927	-0.459	(0)
	Pb (SO4) 2-2	7.323e-11	2.547e-11	-10.135	-10.594	-0.459	(0)
	PbCl+	6.975e-11	5.357e-11	-10.156	-10.271	-0.115	(0)
	PbF+	6.431e-12	4.939e-12	-11.192	-11.306	-0.115	(0)
	Pb (OH) 2	3.359e-12	3.359e-12	-11.474	-11.474	0.000	(0)
	PbCl2	1.031e-12	1.031e-12	-11.987	-11.987	0.000	(0)
	PbF2	1.943e-14	1.943e-14	-13.711	-13.711	0.000	(0)
	PbCl3-	2.301e-15	1.767e-15	-14.638	-14.753	-0.115	(0)
	Pb (OH) 3-	1.519e-15	1.167e-15	-14.818	-14.933	-0.115	(0)
	PbNO3+	7.037e-17	5.404e-17	-16.153	-16.267	-0.115	(0)
	Pb2OH+3	1.828e-17	1.699e-18	-16.738	-17.770	-1.032	(0)
	PbCl4-2	9.999e-18	3.479e-18	-17.000	-17.459	-0.459	(0)
	PbF3-	9.595e-18	7.369e-18	-17.018	-17.133	-0.115	(0)
	Pb (OH) 4-2	2.853e-19	9.923e-20	-18.545	-19.003	-0.459	(0)
	PbF4-2	2.027e-21	7.051e-22	-20.693	-21.152	-0.459	(0)
	Pb3 (OH) 4+2	2.268e-22	7.891e-23	-21.644	-22.103	-0.459	(0)
	Pb (NO3) 2	9.565e-25	9.565e-25	-24.019	-24.019	0.000	(0)
	Pb4 (OH) 4+4	1.500e-26	2.197e-28	-25.824	-27.658	-1.834	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.421	-227.535	-0.115	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.102	-78.217	-0.115	(0)
	CdHS+	0.000e+00	0.000e+00	-78.580	-78.694	-0.115	(0)
	H2S	0.000e+00	0.000e+00	-78.735	-78.735	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.585	-80.044	-0.459	(0)
	S6-2	0.000e+00	0.000e+00	-80.101	-80.560	-0.459	(0)
	S4-2	0.000e+00	0.000e+00	-80.181	-80.639	-0.459	(0)
	S3-2	0.000e+00	0.000e+00	-80.987	-81.445	-0.459	(0)
	S2-2	0.000e+00	0.000e+00	-82.003	-82.461	-0.459	(0)
	S-2	0.000e+00	0.000e+00	-87.644	-87.979	-0.335	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.046	-137.160	-0.115	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.872	-138.330	-0.459	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.304	-138.304	0.000	(0)

Ag (HS) S4-2	0.000e+00	0.000e+00	-146.935	-147.152	-0.218	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.092	-147.207	-0.115	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.218	-147.600	-0.382	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.748	-147.863	-0.115	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.967	-148.330	-0.363	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.661	-149.054	-0.393	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.993	-149.365	-0.372	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.391	-149.391	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.707	-149.707	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.962	-158.962	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.743	-215.858	-0.115	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.213	-224.327	-0.115	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.909	-226.024	-0.115	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.311	-226.769	-0.459	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.421	-227.535	-0.115	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.027	-235.142	-0.115	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.586	-302.044	-0.459	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.546	-304.004	-0.459	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.718	-317.177	-0.459	(0)
S (6)	1.461e-02					
SO4-2	1.094e-02	4.962e-03	-1.961	-2.304	-0.343	(0)
MgSO4	1.652e-03	1.652e-03	-2.782	-2.782	0.000	(0)
CaSO4	1.479e-03	1.479e-03	-2.830	-2.830	0.000	(0)
NaSO4-	3.882e-04	3.215e-04	-3.411	-3.493	-0.082	(0)
KSO4-	1.301e-04	1.077e-04	-3.886	-3.968	-0.082	(0)
MnSO4	1.511e-05	1.511e-05	-4.821	-4.821	0.000	(0)
ZnSO4	1.813e-06	1.813e-06	-5.742	-5.742	0.000	(0)
Zn (SO4) 2-2	2.252e-07	7.835e-08	-6.647	-7.106	-0.459	(0)
CuSO4	8.896e-08	8.896e-08	-7.051	-7.051	0.000	(0)
NH4SO4-	6.216e-08	5.126e-08	-7.206	-7.290	-0.084	(0)
NiSO4	4.101e-08	4.101e-08	-7.387	-7.387	0.000	(0)
CoSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
HSO4-	1.712e-08	1.405e-08	-7.766	-7.852	-0.086	(0)
CdSO4	3.803e-09	3.803e-09	-8.420	-8.420	0.000	(0)
PbSO4	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
Cd (SO4) 2-2	7.317e-10	2.545e-10	-9.136	-9.594	-0.459	(0)
AgSO4-	2.645e-10	2.031e-10	-9.578	-9.692	-0.115	(0)
Pb (SO4) 2-2	7.323e-11	2.547e-11	-10.135	-10.594	-0.459	(0)
CrOHSO4	6.122e-11	6.122e-11	-10.213	-10.213	0.000	(0)
Ni (SO4) 2-2	1.937e-11	6.739e-12	-10.713	-11.171	-0.459	(0)
FeSO4	4.044e-12	4.044e-12	-11.393	-11.393	0.000	(0)
AlSO4+	3.484e-12	2.858e-12	-11.458	-11.544	-0.086	(0)
Al (SO4) 2-	1.853e-13	1.520e-13	-12.732	-12.818	-0.086	(0)
CrSO4+	1.032e-13	7.928e-14	-12.986	-13.101	-0.115	(0)
UO2SO4	2.727e-14	2.727e-14	-13.564	-13.564	0.000	(0)
UO2 (SO4) 2-2	5.128e-15	1.784e-15	-14.290	-14.749	-0.459	(0)
VO2SO4-	1.503e-17	1.155e-17	-16.823	-16.938	-0.115	(0)
FeSO4+	3.427e-18	2.826e-18	-17.465	-17.549	-0.084	(0)
Cr2 (OH) 2SO4+2	8.268e-19	2.876e-19	-18.083	-18.541	-0.459	(0)
Fe (SO4) 2-	3.904e-19	2.998e-19	-18.409	-18.523	-0.115	(0)
Cr2 (OH) 2 (SO4) 2	8.479e-20	8.479e-20	-19.072	-19.072	0.000	(0)
VOSO4	5.435e-20	5.435e-20	-19.265	-19.265	0.000	(0)
HgSO4	8.329e-21	8.329e-21	-20.079	-20.079	0.000	(0)
CrO3SO4-2	8.221e-24	2.860e-24	-23.085	-23.544	-0.459	(0)
VSO4+	3.074e-34	2.361e-34	-33.512	-33.627	-0.115	(0)
U (SO4) 2	1.211e-40	1.211e-40	-39.917	-39.917	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.054	-41.513	-0.459	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.841	-56.956	-0.115	(0)
Sb (3)	9.634e-20					
Sb (OH) 3	4.873e-20	4.873e-20	-19.312	-19.312	0.000	(0)
HSbO2	4.761e-20	4.761e-20	-19.322	-19.322	0.000	(0)
SbO2-	3.466e-24	2.662e-24	-23.460	-23.575	-0.115	(0)
Sb (OH) 4-	1.983e-24	1.523e-24	-23.703	-23.817	-0.115	(0)
Sb (OH) 2F	4.412e-25	4.412e-25	-24.355	-24.355	0.000	(0)
SbOF	4.342e-25	4.342e-25	-24.362	-24.362	0.000	(0)
Sb (OH) 2+	4.467e-26	3.431e-26	-25.350	-25.465	-0.115	(0)
SbO+	1.541e-26	1.184e-26	-25.812	-25.927	-0.115	(0)

Sb2S4-2	0.000e+00	0.000e+00	-316.718	-317.177	-0.459	(0)
Sb (5)	2.964e-08					
SbO3-	2.961e-08	2.274e-08	-7.529	-7.643	-0.115	(0)
Sb (OH) 6-	3.233e-11	2.653e-11	-10.490	-10.576	-0.086	(0)
SbO2+	7.131e-24	5.477e-24	-23.147	-23.261	-0.115	(0)
Se (-2)	2.590e-14					
Ag2Se	2.590e-14	2.590e-14	-13.587	-13.587	0.000	(0)
HSe-	2.850e-39	2.189e-39	-38.545	-38.660	-0.115	(0)
MnSe	0.000e+00	0.000e+00	-41.273	-41.273	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.308	-42.308	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.663	-46.122	-0.459	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.068	-83.903	-1.834	(0)
Se (4)	1.720e-07					
HSeO3-	1.320e-07	1.014e-07	-6.880	-6.994	-0.115	(0)
SeO3-2	4.004e-08	1.393e-08	-7.397	-7.856	-0.459	(0)
H2SeO3	1.252e-12	1.252e-12	-11.902	-11.902	0.000	(0)
AgSeO3-	2.391e-14	1.837e-14	-13.621	-13.736	-0.115	(0)
Cd (SeO3) 2-2	1.503e-18	5.228e-19	-17.823	-18.282	-0.459	(0)
Ag (SeO3) 2-3	2.465e-20	2.291e-21	-19.608	-20.640	-1.032	(0)
FeHSeO3+2	3.907e-23	1.359e-23	-22.408	-22.867	-0.459	(0)
Se (6)	1.227e-10					
SeO4-2	1.225e-10	5.553e-11	-9.912	-10.255	-0.343	(0)
MnSeO4	2.558e-13	2.558e-13	-12.592	-12.592	0.000	(0)
ZnSeO4	1.436e-14	1.436e-14	-13.843	-13.843	0.000	(0)
NiSeO4	1.076e-15	1.076e-15	-14.968	-14.968	0.000	(0)
CoSeO4	6.855e-16	6.855e-16	-15.164	-15.164	0.000	(0)
HSeO4-	1.050e-16	8.062e-17	-15.979	-16.094	-0.115	(0)
CdSeO4	3.380e-17	3.380e-17	-16.471	-16.471	0.000	(0)
Zn (SeO4) 2-2	2.324e-24	8.086e-25	-23.634	-24.092	-0.459	(0)
Si	7.864e-05					
H4SiO4	7.816e-05	7.907e-05	-4.107	-4.102	0.005	(0)
H3SiO4-	4.838e-07	3.946e-07	-6.315	-6.404	-0.089	(0)
H2SiO4-2	1.828e-12	8.595e-13	-11.738	-12.066	-0.328	(0)
UO2H3SiO4+	1.584e-13	1.216e-13	-12.800	-12.915	-0.115	(0)
SiF6-2	1.168e-26	5.400e-27	-25.933	-26.268	-0.335	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.789	-59.821	-1.032	(0)
U (4)	7.504e-22					
U (OH) 5-	7.497e-22	5.758e-22	-21.125	-21.240	-0.115	(0)
U (OH) 4	6.991e-25	6.991e-25	-24.155	-24.155	0.000	(0)
U (OH) 3+	9.648e-29	7.410e-29	-28.016	-28.130	-0.115	(0)
U (OH) 2+2	2.855e-33	9.933e-34	-32.544	-33.003	-0.459	(0)
UF3+	6.440e-36	4.946e-36	-35.191	-35.306	-0.115	(0)
UF2+2	4.487e-37	1.561e-37	-36.348	-36.807	-0.459	(0)
UF4	1.084e-37	1.084e-37	-36.965	-36.965	0.000	(0)
UOH+3	1.459e-38	1.356e-39	-37.836	-38.868	-1.032	(0)
UF5-	1.119e-39	8.591e-40	-38.951	-39.066	-0.115	(0)
UF+3	6.673e-40	0.000e+00	-39.176	-40.207	-1.032	(0)
UF6-2	1.491e-40	0.000e+00	-39.827	-40.285	-0.459	(0)
U (SO4) 2	1.211e-40	1.211e-40	-39.917	-39.917	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.054	-41.513	-0.459	(0)
U+4	0.000e+00	0.000e+00	-43.974	-45.808	-1.834	(0)
UC1+3	0.000e+00	0.000e+00	-45.442	-46.474	-1.032	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-169.653	-178.939	-9.286	(0)
U (5)	1.751e-17					
UO2+	1.751e-17	1.345e-17	-16.757	-16.871	-0.115	(0)
U (6)	2.718e-07					
UO2 (CO3) 3-4	2.395e-07	3.507e-09	-6.621	-8.455	-1.834	(0)
UO2 (CO3) 2-2	3.225e-08	1.122e-08	-7.491	-7.950	-0.459	(0)
UO2CO3	9.016e-11	9.016e-11	-10.045	-10.045	0.000	(0)
UO2OH+	2.067e-13	1.588e-13	-12.685	-12.799	-0.115	(0)
UO2H3SiO4+	1.584e-13	1.216e-13	-12.800	-12.915	-0.115	(0)
UO2F+	1.305e-13	1.002e-13	-12.884	-12.999	-0.115	(0)
UO2F2	5.778e-14	5.778e-14	-13.238	-13.238	0.000	(0)
UO2SO4	2.727e-14	2.727e-14	-13.564	-13.564	0.000	(0)
UO2+2	8.008e-15	3.631e-15	-14.096	-14.440	-0.343	(0)
UO2 (SO4) 2-2	5.128e-15	1.784e-15	-14.290	-14.749	-0.459	(0)
UO2F3-	3.778e-15	2.902e-15	-14.423	-14.537	-0.115	(0)

UO2Cl+	3.302e-17	2.536e-17	-16.481	-16.596	-0.115	(0)
UO2F4-2	1.325e-17	4.608e-18	-16.878	-17.336	-0.459	(0)
(UO2) 2 (OH) 2+2	1.203e-19	4.183e-20	-18.920	-19.378	-0.459	(0)
(UO2) 3 (OH) 5+	7.913e-22	6.077e-22	-21.102	-21.216	-0.115	(0)
UO2NO3+	9.832e-23	7.551e-23	-22.007	-22.122	-0.115	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.358	-42.472	-0.115	(0)
V+2	0.000e+00	0.000e+00	-43.064	-43.523	-0.459	(0)
V (3)	3.406e-15					
V (OH) 3	3.406e-15	3.406e-15	-14.468	-14.468	0.000	(0)
V (OH) 2+	8.307e-26	6.380e-26	-25.081	-25.195	-0.115	(0)
VOH+2	5.043e-29	1.754e-29	-28.297	-28.756	-0.459	(0)
V+3	1.084e-33	1.008e-34	-32.965	-33.997	-1.032	(0)
VSO4+	3.074e-34	2.361e-34	-33.512	-33.627	-0.115	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.467	-55.499	-1.032	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.878	-56.712	-1.834	(0)
V (4)	3.820e-18					
V (OH) 3+	3.585e-18	2.754e-18	-17.445	-17.560	-0.115	(0)
VO+2	1.143e-19	3.977e-20	-18.942	-19.400	-0.459	(0)
VOF+	6.210e-20	4.769e-20	-19.207	-19.322	-0.115	(0)
VOSO4	5.435e-20	5.435e-20	-19.265	-19.265	0.000	(0)
VOF2	3.575e-21	3.575e-21	-20.447	-20.447	0.000	(0)
VOC1+	6.257e-22	4.805e-22	-21.204	-21.318	-0.115	(0)
VOF3-	3.302e-23	2.536e-23	-22.481	-22.596	-0.115	(0)
VOF4-2	5.883e-26	2.047e-26	-25.230	-25.689	-0.459	(0)
H2V2O4+2	1.094e-30	3.807e-31	-29.961	-30.419	-0.459	(0)
V (5)	9.016e-09					
H2VO4-	7.565e-09	5.810e-09	-8.121	-8.236	-0.115	(0)
HVO4-2	1.448e-09	5.038e-10	-8.839	-9.298	-0.459	(0)
H3VO4	1.683e-12	1.683e-12	-11.774	-11.774	0.000	(0)
H3V2O7-	8.228e-14	6.319e-14	-13.085	-13.199	-0.115	(0)
HV2O7-3	1.068e-14	9.928e-16	-13.971	-15.003	-1.032	(0)
VO4-3	9.380e-16	8.718e-17	-15.028	-16.060	-1.032	(0)
VO2+	1.187e-16	9.744e-17	-15.925	-16.011	-0.086	(0)
V2O7-4	6.299e-17	9.225e-19	-16.201	-18.035	-1.834	(0)
VO2F	3.417e-17	3.417e-17	-16.466	-16.466	0.000	(0)
VO2SO4-	1.503e-17	1.155e-17	-16.823	-16.938	-0.115	(0)
VO2F2-	3.230e-18	2.480e-18	-17.491	-17.606	-0.115	(0)
V3O9-3	2.216e-18	2.059e-19	-17.655	-18.686	-1.032	(0)
VO2F3-2	1.778e-20	6.185e-21	-19.750	-20.209	-0.459	(0)
V4O12-4	3.409e-23	4.992e-25	-22.467	-24.302	-1.834	(0)
VO2F4-3	6.547e-24	6.085e-25	-23.184	-24.216	-1.032	(0)
VO2NO3	5.137e-25	5.137e-25	-24.289	-24.289	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.473	-63.600	-4.127	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.086	-62.952	-2.866	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.448	-65.282	-1.834	(0)
Zn	6.703e-06					
Zn+2	3.683e-06	1.670e-06	-5.434	-5.777	-0.343	(0)
ZnSO4	1.813e-06	1.813e-06	-5.742	-5.742	0.000	(0)
ZnCO3	5.993e-07	5.993e-07	-6.222	-6.222	0.000	(0)
ZnHCO3+	2.650e-07	2.035e-07	-6.577	-6.691	-0.115	(0)
Zn (SO4) 2-2	2.252e-07	7.835e-08	-6.647	-7.106	-0.459	(0)
ZnOH+	7.552e-08	5.800e-08	-7.122	-7.237	-0.115	(0)
ZnCl+	2.215e-08	1.806e-08	-7.655	-7.743	-0.089	(0)
ZnF+	8.673e-09	6.661e-09	-8.062	-8.176	-0.115	(0)
ZnOHC1	8.214e-09	8.214e-09	-8.085	-8.085	0.000	(0)
Zn (OH) 2	3.192e-09	3.192e-09	-8.496	-8.496	0.000	(0)
ZnCl2	1.233e-10	1.233e-10	-9.909	-9.909	0.000	(0)
Zn (OH) 3-	7.236e-12	5.557e-12	-11.141	-11.255	-0.115	(0)
ZnCl3-	5.172e-13	4.218e-13	-12.286	-12.375	-0.089	(0)
ZnNO3+	5.692e-14	4.372e-14	-13.245	-13.359	-0.115	(0)
ZnSeO4	1.436e-14	1.436e-14	-13.843	-13.843	0.000	(0)
ZnCl4-2	1.964e-15	9.085e-16	-14.707	-15.042	-0.335	(0)
Zn (OH) 4-2	2.209e-16	7.684e-17	-15.656	-16.114	-0.459	(0)
Zn (NO3) 2	9.091e-23	9.091e-23	-22.041	-22.041	0.000	(0)
Zn (SeO4) 2-2	2.324e-24	8.086e-25	-23.634	-24.092	-0.459	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.748	-147.863	-0.115	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.391	-149.391	0.000	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-224.213	-224.327	-0.115	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.311	-226.769	-0.459	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.546	-304.004	-0.459	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-51.80	-45.51	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-38.79	-34.28	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-46.01	-34.28	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-67.54	-49.60	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-52.79	-32.76	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-27.59	-27.19	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-22.74	-22.29	0.45	(NH4) 2SeO4	
Acanthite	-51.83	-88.05	-36.22	Ag2S	
Ag2CO3	-11.49	-22.58	-11.09	Ag2CO3	
Ag2CrO4	-20.94	-32.53	-11.59	Ag2CrO4	
Ag2HVO4	-12.25	-10.77	1.48	Ag2HVO4	
Ag2MoO4	-11.88	-23.43	-11.55	Ag2MoO4	
Ag2O	-14.87	-2.30	12.57	Ag2O	
Ag2Se	0.20	-48.50	-48.70	Ag2Se	
Ag2SeO3	-9.68	-16.83	-7.15	Ag2SeO3	
Ag2SeO4	-18.72	-27.63	-8.91	Ag2SeO4	
Ag2SO4	-14.86	-19.68	-4.82	Ag2SO4	
Ag3AsO3	-28.12	-25.96	2.16	Ag3AsO3	
Ag3AsO4	-16.56	-19.35	-2.79	Ag3AsO4	
Ag3H2VO5	-17.10	-11.92	5.18	Ag3H2VO5	
AgF:4H2O	-13.44	-12.39	1.05	AgF:4H2O	
Agmetal	-0.40	-13.90	-13.51	Ag	
AgVO3	-10.39	-9.62	0.77	AgVO3	
Al (OH) 3 (am)	-1.32	9.48	10.80	Al (OH) 3	
Al2 (MoO4) 3	-46.79	-44.42	2.37	Al2 (MoO4) 3	
Al2O3	-0.68	18.97	19.65	Al2O3	
Al4 (OH) 10SO4	-2.15	20.55	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-11.22	-6.42	4.80	AlAsO4:2H2O	
AlOHSO4	-4.67	-7.90	-3.23	AlOHSO4	
AlSb	-151.98	-86.35	65.62	AlSb	
Alunite	0.12	-1.28	-1.40	KA13 (SO4) 2 (OH) 6	
Anglesite	-3.97	-11.76	-7.79	PbSO4	
Anhydrite	-0.83	-5.19	-4.36	CaSO4	
Anilite	-55.03	-86.90	-31.88	Cu0.25Cu1.5S	
Antlerite	-2.26	6.53	8.79	Cu3 (OH) 4SO4	
Aragonite	0.21	-8.09	-8.30	CaCO3	
Arsenolite	-87.28	-90.04	-2.76	As4O6	
Artinite	-5.21	4.39	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-38.51	-31.80	6.71	As2O5	
Atacamite	-1.36	6.03	7.39	Cu2 (OH) 3Cl	
Azurite	0.25	-16.65	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-16.74	7.65	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-17.50	-1.63	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	0.08	-8.83	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-26.92	6.02	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-12.91	-22.58	-9.67	BaCrO4	
BaF2	-9.00	-14.82	-5.82	BaF2	
BaMoO4	-6.51	-13.47	-6.96	BaMoO4	
Barite	0.26	-9.72	-9.98	BaSO4	
BaS	-94.28	-78.10	16.18	BaS	
BaSeO3	-8.70	-6.87	1.83	BaSeO3	
BaSeO4	-10.21	-17.67	-7.46	BaSeO4	
Bianchite	-6.32	-8.08	-1.76	ZnSO4:6H2O	
Birnessite	-7.62	10.47	18.09	MnO2	
Bixbyite	-3.93	-4.57	-0.64	Mn2O3	
BlaubleiI	-54.84	-79.00	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-55.37	-82.65	-27.28	Cu0.6Cu0.8S	
Boehmite	0.91	9.48	8.58	AlOOH	
Breithauptite	-56.87	-75.39	-18.52	NiSb	
Brochantite	-0.73	14.50	15.22	Cu4 (OH) 6SO4	

Brucite	-4.51	12.34	16.84	Mg(OH)2
Bunsenite	-4.75	7.69	12.45	NiO
Ca(VO3)2	-10.42	-4.76	5.66	Ca(VO3)2
Ca2V2O7	-10.07	7.43	17.50	Ca2V2O7
Ca2V2O7·2H2O	-14.12	7.43	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-17.53	4.77	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-19.34	19.62	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-20.24	19.62	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-298.08	-155.10	142.97	Ca3Sb2
CaCrO4	-15.78	-18.04	-2.27	CaCrO4
Calcite	0.39	-8.09	-8.48	CaCO3
Calomel	-6.84	-24.75	-17.91	Hg2Cl2
CaMoO4	-0.99	-8.94	-7.95	CaMoO4
Carnotite	-3.04	-2.81	0.23	KUO2VO4
CaSeO3·2H2O	-5.16	-2.34	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-10.12	-13.14	-3.02	CaSeO4·2H2O
Cd(BO2)2	-12.01	-2.17	9.84	Cd(BO2)2
Cd(OH)2	-7.05	6.59	13.64	Cd(OH)2
Cd(OH)2(am)	-7.14	6.59	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.70	-14.99	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.17	2.39	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.42	8.98	28.40	Cd4(OH)6SO4
CdCl2	-12.56	-13.22	-0.66	CdCl2
CdCl2·1H2O	-11.52	-13.22	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.31	-13.22	-1.91	CdCl2·2.5H2O
CdF2	-14.67	-15.88	-1.21	CdF2
Cdmetal(alpha)	-32.43	-18.92	13.51	Cd
Cdmetal(gamma)	-32.54	-18.92	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-6.85	-3.31	3.54	CdOHCl
CdSb	-76.14	-76.49	-0.35	CdSb
CdSe	-19.41	-39.61	-20.20	CdSe
CdSeO4·2H2O	-16.89	-18.74	-1.85	CdSeO4·2H2O
CdSO4	-10.62	-10.79	-0.17	CdSO4
CdSO4·1H2O	-9.06	-10.79	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-8.92	-10.79	-1.87	CdSO4·2.67H2O
Cerargyrite	-1.30	-11.05	-9.75	AgCl
Cerrusite	-1.53	-14.66	-13.13	PbCO3
CH4(g)	-81.27	-122.32	-41.05	CH4
Chalcanthite	-6.77	-9.41	-2.64	CuSO4·5H2O
Chalcedony	-0.55	-4.10	-3.55	SiO2
Chalcocite	-55.02	-89.94	-34.92	Cu2S
Chalcopyrite	-124.67	-159.94	-35.27	CuFeS2
Chrysotile	-3.39	28.81	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.37	-97.07	-45.69	HgS
Claudetite	-86.98	-90.04	-3.06	As4O6
Clausthalite	-13.48	-40.58	-27.10	PbSe
Co(BO2)2	-28.37	-1.30	27.07	Co(BO2)2
Co(OH)2	-5.63	7.47	13.09	Co(OH)2
Co(OH)3	-9.87	-12.18	-2.31	Co(OH)3
CO2(g)	-2.13	-20.28	-18.15	CO2
Co3(AsO4)2	-22.43	-9.40	13.03	Co3(AsO4)2
Co3O4	-6.39	-16.89	-10.50	Co3O4
CoCl2	-20.61	-12.34	8.27	CoCl2
CoCl2·6H2O	-14.88	-12.34	2.54	CoCl2·6H2O
CoCO3	-2.83	-12.81	-9.98	CoCO3
CoF2	-13.41	-15.01	-1.60	CoF2
CoF3	-44.43	-45.89	-1.46	CoF3
CoFe2O4	17.63	14.11	-3.53	CoFe2O4
CoMoO4	-5.90	-13.66	-7.76	CoMoO4
CoO	-6.12	7.47	13.59	CoO
CoS(alpha)	-70.85	-78.29	-7.44	CoS
CoS(beta)	-67.22	-78.29	-11.07	CoS
CoSe	-22.53	-38.73	-16.20	CoSe
CoSeO3	-8.38	-7.06	1.32	CoSeO3
CoSeO4·6H2O	-16.34	-17.87	-1.53	CoSeO4·6H2O
CoSO4	-12.72	-9.91	2.80	CoSO4
CoSO4·6H2O	-7.44	-9.92	-2.47	CoSO4·6H2O

Cotunnite	-9.41	-14.19	-4.78	PbCl2
Covellite	-55.49	-77.79	-22.30	CuS
Cr (OH) 2	-21.75	-10.93	10.82	Cr (OH) 2
Cr (OH) 3	-2.46	-1.12	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.37	-1.12	-0.75	Cr (OH) 3
Cr2O3	0.12	-2.24	-2.36	Cr2O3
CrCl2	-44.83	-30.73	14.09	CrCl2
CrCl3	-45.95	-30.83	15.11	CrCl3
CrF3	-23.49	-34.83	-11.34	CrF3
Cristobalite	-0.75	-4.10	-3.35	SiO2
Crmetal	-66.92	-36.44	30.48	Cr
CrO3	-27.02	-30.23	-3.21	CrO3
Cryolite	-7.24	-41.08	-33.84	Na3AlF6
Cu (OH) 2	-0.71	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.85	20.36	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.83	0.42	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.08	-89.96	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.59	-50.39	-45.80	Cu2Se
Cu2SO4	-19.62	-21.57	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.99	-7.89	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.53	-102.12	-42.59	Cu3Sb
Cu3Se2	-25.12	-88.62	-63.49	Cu3Se2
CuCO3	-0.81	-12.31	-11.50	CuCO3
CuCrO4	-16.82	-22.26	-5.44	CuCrO4
CuF	-8.43	-13.33	-4.91	CuF
CuF2	-15.62	-14.50	1.12	CuF2
CuF2:2H2O	-9.96	-14.51	-4.55	CuF2:2H2O
Cumetal	-6.09	-14.85	-8.76	Cu
CuMoO4	-0.08	-13.16	-13.08	CuMoO4
CuOCuSO4	-11.74	-1.44	10.30	CuOCuSO4
Cupricferrite	8.62	14.61	5.99	CuFe2O4
Cuprite	-2.78	-4.19	-1.41	Cu2O
Cuprousferrite	10.14	1.22	-8.92	CuFeO2
CuSe	-5.13	-38.23	-33.10	CuSe
CuSe2	-25.55	-58.92	-33.37	CuSe2
CuSeO3:2H2O	-7.07	-6.56	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.92	-17.36	-2.44	CuSeO4:5H2O
CuSO4	-12.35	-9.41	2.94	CuSO4
Diaspore	2.61	9.48	6.87	AlOOH
Djurleite	-55.22	-89.14	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.51	-16.03	-16.54	CaMg (CO3) 2
Dolomite (ordered)	1.06	-16.03	-17.09	CaMg (CO3) 2
Epsomite	-2.92	-5.04	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.97	3.60	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.39	0.35	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.63	-13.35	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.45	-7.89	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.33	-36.96	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.77	-45.50	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.99	10.23	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.98	-12.58	0.40	FeAsO4:2H2O
FeCr2O4	-5.84	1.36	7.20	FeCr2O4
FeMoO4	-7.44	-17.53	-10.09	FeMoO4
Ferrihydrite	0.13	3.32	3.19	Fe (OH) 3
Ferroselite	-44.69	-63.29	-18.60	FeSe2
FeS (ppt)	-79.21	-82.16	-2.95	FeS
FeSe	-31.60	-42.60	-11.00	FeSe
Fix_pe	-5.22	-5.22	0.00	e-
Fluorite	0.22	-10.28	-10.50	CaF2
Galena	-66.16	-80.13	-13.97	PbS
Gibbsite	1.19	9.48	8.29	Al (OH) 3
Goethite	2.83	3.32	0.49	FeOOH
Goslarite	-6.07	-8.08	-2.01	ZnSO4:7H2O
Greenalite	-18.22	2.59	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.80	-79.16	-14.36	CdS
Greigite	-287.75	-332.78	-45.03	Fe3S4
Gummite	-7.04	0.64	7.67	UO3
Gypsum	-0.58	-5.19	-4.61	CaSO4:2H2O

H-Jarosite	-12.70	-24.80	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.25	-21.13	-12.88	H2MoO4
H2S (g)	-77.74	-85.75	-8.01	H2S
H2Se (g)	-41.24	-46.20	-4.96	H2Se
Halite	-5.89	-4.28	1.60	NaCl
Halloysite	1.19	10.77	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.59	56.44	61.03	Mn3O4
Hematite	8.06	6.64	-1.42	Fe2O3
Hercynite	-0.33	22.57	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.24	-255.94	-73.71	Hg (CH3) 2
Hg (g)	-7.35	-15.23	-7.87	Hg
Hg (OH) 2	-7.82	-11.31	-3.50	Hg (OH) 2
Hg2 (g)	-15.50	-30.45	-14.96	Hg2
Hg2 (OH) 2	-10.21	-4.95	5.26	Hg2 (OH) 2
Hg2CO3	-9.18	-25.23	-16.05	Hg2CO3
Hg2CrO4	-26.48	-35.18	-8.70	Hg2CrO4
Hg2F2	-17.06	-27.42	-10.36	Hg2F2
Hg2S	-79.02	-90.70	-11.68	Hg2S
Hg2SeO3	-14.82	-19.48	-4.66	Hg2SeO3
Hg2SO4	-16.20	-22.33	-6.13	Hg2SO4
Hg3O2CO3	-24.53	-54.21	-29.68	Hg3O2CO3
HgCl (g)	-31.87	-12.38	19.50	HgCl
HgCl2	-9.86	-31.12	-21.26	HgCl2
HgF (g)	-46.39	-13.71	32.68	HgF
HgF2 (g)	-46.35	-33.79	12.57	HgF2
Hgmetal (l)	-1.78	-15.23	-13.45	Hg
HgSe	-1.81	-57.51	-55.69	HgSe
HgSeO3	-13.41	-25.84	-12.43	HgSeO3
HgSO4	-19.27	-28.69	-9.42	HgSO4
Huntite	-1.95	-31.92	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.93	-23.70	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.67	-19.43	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.09	-20.26	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.98	-19.78	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.17	-50.42	-17.24	K2Cr2O7
K2CrO4	-19.67	-20.18	-0.51	K2CrO4
K2MoO4	-14.34	-11.08	3.26	K2MoO4
K2SeO4	-14.55	-15.28	-0.73	K2SeO4
Kaolinite	3.33	10.77	7.43	Al2Si2O5 (OH) 4
Langite	-2.99	14.50	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.70	-6.14	-0.43	PbO : PbSO4
Laurionite	-4.91	-4.28	0.62	PbOHCl
Lepidocrocite	1.95	3.32	1.37	FeOOH
Lime	-20.51	12.19	32.70	CaO
Litharge	-7.07	5.62	12.69	PbO
Mackinawite	-78.56	-82.16	-3.60	FeS
Maghemite	0.25	6.64	6.39	Fe2O3
Magnesioferrite	2.12	18.98	16.86	Fe2MgO4
Magnesite	-0.48	-7.94	-7.46	MgCO3
Magnetite	6.83	10.24	3.40	Fe3O4
Malachite	0.96	-4.34	-5.31	Cu2 (OH) 2CO3
Manganite	-2.28	23.06	25.34	MnOOH
Massicot	-7.27	5.62	12.89	PbO
Matlockite	-6.55	-15.52	-8.97	PbClF
Melanothallite	-18.10	-11.84	6.26	CuCl2
Melanterite	-11.58	-13.79	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.97	-97.07	-45.09	HgS
Mg (OH) 2 (active)	-6.46	12.34	18.79	Mg (OH) 2
Mg (VO3) 2	-15.89	-4.61	11.28	Mg (VO3) 2
Mg2Sb3	-273.75	-199.06	74.68	Mg2Sb3
Mg2V2O7	-18.63	7.73	26.36	Mg2V2O7
MgCr2O4	-6.10	10.10	16.20	MgCr2O4
MgCrO4	-23.27	-17.89	5.38	MgCrO4
MgF2	-2.01	-10.14	-8.13	MgF2
MgMoO4	-6.94	-8.79	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.25	-2.20	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.80	-13.00	-1.20	MgSeO4 : 6H2O
Minium	-31.15	42.37	73.52	Pb3O4

Mirabilite	-5.03	-6.15	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-11.54	-6.64	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-51.00	-56.71	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.05	-87.97	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-13.38	-0.88	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.21	-9.50	2.72	MnCl2:4H2O
MnS (grn)	-75.62	-75.45	0.17	MnS
MnS (pnk)	-78.79	-75.45	3.34	MnS
MnSb	-95.21	-98.12	-2.91	MnSb
MnSe	-39.39	-35.89	3.50	MnSe
MnSeO3	-5.35	-4.22	1.13	MnSeO3
MnSeO3:2H2O	-5.21	-4.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.97	-15.02	-2.05	MnSeO4:5H2O
MnSO4	-9.65	-7.07	2.58	MnSO4
Monteponite	-8.51	6.59	15.10	CdO
Montroydite	-7.67	-11.31	-3.64	HgO
MoO3	-13.13	-21.13	-8.00	MoO3
Morenosite	-7.54	-9.69	-2.14	NiSO4:7H2O
MoS2	-147.89	-218.15	-70.26	MoS2
Na-Jarosite	-7.98	-19.18	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-39.33	-49.23	-9.90	Na2Cr2O7
Na2CrO4	-21.92	-18.99	2.93	Na2CrO4
Na2Mo2O7	-14.42	-31.02	-16.60	Na2Mo2O7
Na2MoO4	-11.38	-9.89	1.49	Na2MoO4
Na2MoO4:2H2O	-11.12	-9.89	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.60	-3.30	10.30	Na2SeO3:5H2O
Na2SeO4	-15.37	-14.09	1.28	Na2SeO4
Na3Sb	-173.43	-78.98	94.45	Na3Sb
Na3VO4	-28.30	8.38	36.68	Na3VO4
Na4V2O7	-31.87	5.53	37.40	Na4V2O7
Nantokite	-5.27	-12.00	-6.73	CuCl
NaSb	-87.88	-64.71	23.17	NaSb
Natron	-7.73	-9.05	-1.31	Na2CO3:10H2O
NaVO3	-6.71	-2.85	3.86	NaVO3
Nesquehonite	-3.27	-7.94	-4.67	MgCO3:3H2O
Ni (OH) 2	-5.10	7.69	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-24.42	-8.72	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-18.61	13.39	32.00	Ni4 (OH) 6SO4
NiCO3	-5.72	-12.59	-6.87	NiCO3
NiMoO4	-2.29	-13.44	-11.14	NiMoO4
NiS (alpha)	-72.46	-78.06	-5.60	NiS
NiS (beta)	-66.96	-78.06	-11.10	NiS
NiS (gamma)	-65.26	-78.06	-12.80	NiS
NiSe	-20.80	-38.50	-17.70	NiSe
NiSeO3:2H2O	-9.65	-6.84	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.12	-17.64	-1.52	NiSeO4:6H2O
Nsutite	-7.04	10.47	17.50	MnO2
O2 (g)	-32.07	51.02	83.09	O2
Orpiment	-241.22	-302.28	-61.07	As2S3
Otavite	-1.69	-13.69	-12.00	CdCO3
Pb (BO2) 2	-9.66	-3.14	6.52	Pb (BO2) 2
Pb (OH) 2	-2.53	5.62	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-56.72	-65.48	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-7.46	1.34	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.95	11.24	26.19	Pb2O (OH) 2
Pb2O3	-24.29	36.75	61.04	Pb2O3
Pb2OCO3	-8.48	-9.04	-0.56	Pb2OCO3
Pb2V2O7	-3.81	-5.71	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.74	-14.94	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-6.22	-0.08	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.44	-3.42	11.02	Pb3O2CO3
Pb3O2SO4	-11.20	-0.52	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.00	5.10	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.78	5.10	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-9.41	-16.85	-7.44	PbF2
Pbmetal	-24.13	-19.89	4.25	Pb
PbMoO4	0.11	-15.51	-15.62	PbMoO4

PbO:0.3H2O	-7.36	5.62	12.98	PbO:0.33H2O
PbSeO4	-12.87	-19.71	-6.84	PbSeO4
Periclase	-9.25	12.34	21.58	MgO
Phosgenite	-9.04	-28.85	-19.81	PbCl2:PbCO3
Plattnerite	-18.47	31.13	49.60	PbO2
Portlandite	-10.61	12.19	22.80	Ca(OH)2
Pyrite	-123.90	-142.40	-18.51	FeS2
Pyrochroite	-4.89	10.31	15.19	Mn(OH)2
Pyrolusite	-5.56	35.82	41.38	MnO2
Quartz	-0.10	-4.10	-4.00	SiO2
Realgar	-101.27	-121.02	-19.75	AsS
Retgersite	-7.65	-9.69	-2.04	NiSO4:6H2O
Rhodochrosite	0.61	-9.97	-10.58	MnCO3
Rutherfordine	-5.15	-19.65	-14.50	UO2CO3
Sb(OH)3	-12.20	-19.31	-7.11	Sb(OH)3
Sb2O4	-16.52	-13.11	3.40	Sb2O4
Sb2O5	-26.56	-36.23	-9.67	Sb2O5
Sb2Se3	-109.46	-177.22	-67.76	Sb2Se3
Sb4O6(cubic)	-58.99	-77.25	-18.26	Sb4O6
Sb4O6(orth)	-59.35	-77.25	-17.90	Sb4O6
SbCl3	-49.59	-49.02	0.57	SbCl3
SbF3	-42.80	-53.02	-10.23	SbF3
Sbmetal	-45.89	-57.57	-11.69	Sb
SbO2	-3.04	-30.87	-27.82	SbO2
Schoepite	-5.36	0.64	5.99	UO2(OH)2:H2O
Semetal(am)	-13.58	-20.69	-7.11	Se
Semetal(hex)	-12.98	-20.69	-7.71	Se
Senarmontite	-26.26	-38.62	-12.37	Sb2O3
SeO2	-14.66	-14.53	0.12	SeO2
SeO3	-46.38	-25.33	21.04	SeO3
Sepiolite	-3.39	12.37	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-6.41	12.37	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.44	-16.68	-10.24	FeCO3
SiO2(am-gel)	-1.39	-4.10	-2.71	SiO2
SiO2(am-ppt)	-1.36	-4.10	-2.74	SiO2
Smithsonite	-0.98	-10.98	-10.00	ZnCO3
Sphalerite	-65.01	-76.46	-11.45	ZnS
Spinel	-5.54	31.31	36.85	MgAl2O4
Stibnite	-245.43	-295.89	-50.46	Sb2S3
Sulfur	-58.10	-60.25	-2.14	S
Tenorite	0.33	7.97	7.64	CuO
Thenardite	-6.46	-6.14	0.32	Na2SO4
Thermonatrite	-9.68	-9.04	0.64	Na2CO3:H2O
Tyuyamunite	-7.56	-3.48	4.08	Ca(UO2)2(VO4)2
U3O8	-17.04	4.05	21.08	U3O8
U3Sb4	-582.70	-430.32	152.38	U3Sb4
U4O9	-34.10	-37.12	-3.02	U4O9
UF4	-31.07	-60.60	-29.54	UF4
UF4:2.5H2O	-27.89	-60.61	-32.72	UF4:2.5H2O
UO2(am)	-16.59	-15.66	0.93	UO2
UO2(NO3)2	-42.55	-30.40	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.26	-30.40	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.80	-30.41	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.45	-30.41	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.98	0.64	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.45	-24.70	-2.25	UO2SeO4:4H2O
UO3	-7.06	0.64	7.70	UO3
Uraninite	-10.99	-15.66	-4.67	UO2
USb2	-220.62	-191.04	29.58	USb2
V(OH)3	-18.97	-11.38	7.59	V(OH)3
V2O5	-15.59	-16.95	-1.36	V2O5
V3O5	-40.32	-38.48	1.84	V3O5
V4O7	-49.99	-42.81	7.19	V4O7
V6O13	-41.00	-101.86	-60.86	V6O13
Valentinite	-30.14	-38.62	-8.48	Sb2O3
VC12	-62.82	-43.94	18.87	VC12
VC13	-64.53	-41.09	23.43	VC13
VF4	-64.20	-49.27	14.93	VF4

Vmetal	-93.67	-49.65	44.03	V
VO	-38.89	-24.14	14.76	VO
VO(OH)2	-9.48	-4.33	5.15	VO(OH)2
VO2Cl	-21.22	-18.38	2.84	VO2Cl
VOC1	-32.44	-21.29	11.15	VOC1
VOC12	-36.89	-24.13	12.76	VOC12
VOSO4	-25.31	-21.70	3.61	VOSO4
Witherite	-4.05	-12.62	-8.57	BaCO3
Wurtzite	-67.51	-76.46	-8.95	ZnS
Zincite	-2.04	9.30	11.33	ZnO
Zincosite	-12.01	-8.08	3.93	ZnSO4
Zn(BO2)2	-7.76	0.53	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.06	-21.74	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.90	9.30	12.20	Zn(OH)2
Zn(OH)2(am)	-3.18	9.30	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.46	9.30	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.24	9.30	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.44	9.30	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.28	1.22	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.50	8.69	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.56	-3.91	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.78	-6.86	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.59	19.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.82	26.68	38.50	Zn5(OH)8Cl2
ZnCl2	-17.56	-10.51	7.05	ZnCl2
ZnCO3:1H2O	-0.72	-10.98	-10.26	ZnCO3:1H2O
ZnF2	-12.64	-13.18	-0.53	ZnF2
Znmetal	-42.00	-16.21	25.79	Zn
ZnMoO4	-1.71	-11.83	-10.13	ZnMoO4
ZnO(active)	-1.89	9.30	11.19	ZnO
ZnS(am)	-67.40	-76.46	-9.05	ZnS
ZnSb	-84.80	-73.78	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-14.52	-16.04	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.44	-8.08	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 128.

```

Title Return solution back to 1L
Mix 705
      712  2.0151
save solution 713
end

```

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 705.

Mixture 705.

2.015e+00 Solution 712 Solution after simulation 127.

-----Solution composition-----

Elements	Molality	Moles
Ag	2.970e-08	2.967e-08
Al	2.732e-06	2.729e-06
As	3.043e-10	3.040e-10
B	4.213e-05	4.208e-05
Ba	8.593e-08	8.584e-08
C	5.176e-03	5.171e-03
Ca	4.476e-03	4.472e-03
Cd	1.407e-08	1.406e-08
Cl	5.249e-03	5.243e-03
Co	1.083e-07	1.082e-07
Cr	3.370e-09	3.367e-09
Cu	3.416e-06	3.413e-06
F	2.990e-04	2.987e-04
Fe	2.467e-09	2.465e-09
Hg	2.219e-09	2.217e-09
K	3.866e-03	3.862e-03
Mg	5.836e-03	5.830e-03
Mn	6.620e-05	6.614e-05
Mo	1.949e-06	1.947e-06
N	1.620e-05	1.619e-05
Na	1.512e-02	1.510e-02
Ni	1.688e-07	1.686e-07
Pb	1.040e-08	1.039e-08
S	1.461e-02	1.460e-02
Sb	2.964e-08	2.961e-08
Se	1.721e-07	1.720e-07
Si	7.864e-05	7.856e-05
U	2.718e-07	2.715e-07
V	9.016e-09	9.007e-09
Zn	6.703e-06	6.696e-06

-----Description of solution-----

	pH =	7.538	Charge balance
	pe =	5.216	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	5.053e-02	
	Mass of water (kg) =	9.990e-01	
	Total alkalinity (eq/kg) =	4.981e-03	
	Total CO2 (mol/kg) =	5.176e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	1.915e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	0	
	Total H =	1.109093e+02	
	Total O =	5.552614e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.284e-07	3.473e-07	-6.368	-6.459	-0.091	(0)
H+	3.530e-08	2.897e-08	-7.452	-7.538	-0.086	0.00
H2O	5.551e+01	9.991e-01	1.744	-0.000	0.000	18.07
Ag	2.970e-08					
AgCl	1.804e-08	1.804e-08	-7.744	-7.744	0.000	(0)
AgCl2-	8.811e-09	6.766e-09	-8.055	-8.170	-0.115	(0)
Ag+	2.500e-09	2.051e-09	-8.602	-8.688	-0.086	(0)
AgSO4-	2.645e-10	2.031e-10	-9.578	-9.692	-0.115	(0)

	AgCl3-2	7.466e-11	2.597e-11	-10.127	-10.585	-0.459	(0)
	AgNO2	5.146e-12	5.146e-12	-11.289	-11.289	0.000	(0)
	AgCl4-3	2.457e-12	2.284e-13	-11.610	-12.641	-1.032	(0)
	AgF	1.030e-12	1.030e-12	-11.987	-11.987	0.000	(0)
	AgNH3+	1.035e-13	7.948e-14	-12.985	-13.100	-0.115	(0)
	AgOH	7.125e-14	7.125e-14	-13.147	-13.147	0.000	(0)
	AgH2BO3	2.699e-14	2.699e-14	-13.569	-13.569	0.000	(0)
	Ag2Se	2.590e-14	2.590e-14	-13.587	-13.587	0.000	(0)
	AgSeO3-	2.391e-14	1.837e-14	-13.621	-13.736	-0.115	(0)
	Ag (NO2) 2-	1.246e-16	9.568e-17	-15.905	-16.019	-0.115	(0)
	AgNO3	1.698e-17	1.698e-17	-16.770	-16.770	0.000	(0)
	Ag (NH3) 2+	1.596e-17	1.226e-17	-16.797	-16.912	-0.115	(0)
	Ag (OH) 2-	3.149e-18	2.418e-18	-17.502	-17.617	-0.115	(0)
	Ag (SeO3) 2-3	2.465e-20	2.291e-21	-19.608	-20.640	-1.032	(0)
	Ag2MoO4	1.407e-24	1.407e-24	-23.852	-23.852	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.068	-83.903	-1.834	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-146.935	-147.152	-0.218	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.092	-147.207	-0.115	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.661	-149.054	-0.393	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-148.993	-149.365	-0.372	(0)
Al		2.732e-06					
	Al (OH) 4-	2.626e-06	2.154e-06	-5.581	-5.667	-0.086	(0)
	Al (OH) 3	4.927e-08	4.927e-08	-7.307	-7.307	0.000	(0)
	AlF3	2.972e-08	2.972e-08	-7.527	-7.527	0.000	(0)
	AlF2+	1.426e-08	1.181e-08	-7.846	-7.928	-0.082	(0)
	Al (OH) 2+	8.586e-09	7.109e-09	-8.066	-8.148	-0.082	(0)
	AlF4-	3.630e-09	2.978e-09	-8.440	-8.526	-0.086	(0)
	AlF+2	3.156e-10	1.483e-10	-9.501	-9.829	-0.328	(0)
	AlOH+2	5.482e-11	2.577e-11	-10.261	-10.589	-0.328	(0)
	AlSO4+	3.484e-12	2.858e-12	-11.458	-11.544	-0.086	(0)
	Al+3	4.398e-13	7.419e-14	-12.357	-13.130	-0.773	(0)
	Al (SO4) 2-	1.853e-13	1.520e-13	-12.732	-12.818	-0.086	(0)
	AlMo6O21-3	2.209e-39	2.053e-40	-38.656	-39.688	-1.032	(0)
As (3)		3.153e-23					
	H3AsO3	3.081e-23	3.081e-23	-22.511	-22.511	0.000	(0)
	H2AsO3-	7.104e-25	5.456e-25	-24.148	-24.263	-0.115	(0)
	HAsO3-2	4.938e-29	1.718e-29	-28.306	-28.765	-0.459	(0)
	H4AsO3+	5.758e-31	4.422e-31	-30.240	-30.354	-0.115	(0)
	AsO3-3	2.460e-34	2.286e-35	-33.609	-34.641	-1.032	(0)
As (5)		3.043e-10					
	HAsO4-2	2.717e-10	9.452e-11	-9.566	-10.024	-0.459	(0)
	H2AsO4-	3.251e-11	2.497e-11	-10.488	-10.603	-0.115	(0)
	AsO4-3	1.110e-13	1.032e-14	-12.955	-13.986	-1.032	(0)
	H3AsO4	1.242e-16	1.257e-16	-15.906	-15.901	0.005	(0)
B		4.213e-05					
	H3BO3	4.093e-05	4.140e-05	-4.388	-4.383	0.005	(0)
	H2BO3-	1.037e-06	8.301e-07	-5.984	-6.081	-0.097	(0)
	CaH2BO3+	7.765e-08	6.214e-08	-7.110	-7.207	-0.097	(0)
	MgH2BO3+	6.581e-08	5.267e-08	-7.182	-7.278	-0.097	(0)
	NaH2BO3	1.587e-08	1.587e-08	-7.799	-7.799	0.000	(0)
	BF (OH) 3-	4.128e-09	3.303e-09	-8.384	-8.481	-0.097	(0)
	H5 (BO3) 2-	3.656e-11	2.926e-11	-10.437	-10.534	-0.097	(0)
	BF2 (OH) 2-	2.558e-12	2.047e-12	-11.592	-11.689	-0.097	(0)
	BaH2BO3+	1.223e-12	9.785e-13	-11.913	-12.009	-0.097	(0)
	H8 (BO3) 3-	1.514e-13	1.211e-13	-12.820	-12.917	-0.097	(0)
	AgH2BO3	2.699e-14	2.699e-14	-13.569	-13.569	0.000	(0)
	BF3OH-	5.768e-18	4.616e-18	-17.239	-17.336	-0.097	(0)
	BF4-	1.645e-22	1.316e-22	-21.784	-21.881	-0.097	(0)
Ba		8.593e-08					
	Ba+2	8.412e-08	3.814e-08	-7.075	-7.419	-0.343	(0)
	BaHCO3+	1.685e-09	1.404e-09	-8.773	-8.853	-0.079	(0)
	BaCO3	1.220e-10	1.220e-10	-9.914	-9.914	0.000	(0)
	BaH2BO3+	1.223e-12	9.785e-13	-11.913	-12.009	-0.097	(0)
	BaOH+	7.012e-14	5.783e-14	-13.154	-13.238	-0.084	(0)
	BaNO3+	2.594e-15	1.992e-15	-14.586	-14.701	-0.115	(0)
	BaNH3+2	1.313e-15	4.567e-16	-14.882	-15.340	-0.459	(0)
C (4)		5.176e-03					

HCO3-	4.654e-03	3.854e-03	-2.332	-2.414	-0.082	(0)
H2CO3	2.511e-04	2.511e-04	-3.600	-3.600	0.000	(0)
CaHCO3+	1.121e-04	9.334e-05	-3.950	-4.030	-0.079	(0)
MgHCO3+	8.846e-05	7.215e-05	-4.053	-4.142	-0.089	(0)
NaHCO3	2.614e-05	2.614e-05	-4.583	-4.583	0.000	(0)
CO3-2	1.375e-05	6.237e-06	-4.862	-5.205	-0.343	(0)
CaCO3	1.286e-05	1.286e-05	-4.891	-4.891	0.000	(0)
MgCO3	9.492e-06	9.492e-06	-5.023	-5.023	0.000	(0)
CuCO3	2.874e-06	2.874e-06	-5.542	-5.542	0.000	(0)
NaCO3-	1.692e-06	1.401e-06	-5.772	-5.854	-0.082	(0)
MnHCO3+	1.596e-06	1.316e-06	-5.797	-5.881	-0.084	(0)
ZnCO3	5.993e-07	5.993e-07	-6.222	-6.222	0.000	(0)
ZnHCO3+	2.650e-07	2.035e-07	-6.577	-6.691	-0.115	(0)
UO2 (CO3) 3-4	2.395e-07	3.507e-09	-6.621	-8.455	-1.834	(0)
Cu (CO3) 2-2	1.387e-07	4.824e-08	-6.858	-7.317	-0.459	(0)
UO2 (CO3) 2-2	3.225e-08	1.122e-08	-7.491	-7.950	-0.459	(0)
NiHCO3+	2.562e-08	1.968e-08	-7.591	-7.706	-0.115	(0)
CuHCO3+	2.478e-08	1.903e-08	-7.606	-7.721	-0.115	(0)
NiCO3	9.638e-09	9.638e-09	-8.016	-8.016	0.000	(0)
CoHCO3+	9.613e-09	7.383e-09	-8.017	-8.132	-0.115	(0)
PbCO3	6.572e-09	6.572e-09	-8.182	-8.182	0.000	(0)
CoCO3	2.597e-09	2.597e-09	-8.586	-8.586	0.000	(0)
BaHCO3+	1.685e-09	1.404e-09	-8.773	-8.853	-0.079	(0)
PbHCO3+	1.307e-09	1.004e-09	-8.884	-8.998	-0.115	(0)
CdCO3	4.647e-10	4.647e-10	-9.333	-9.333	0.000	(0)
Pb (CO3) 2-2	3.398e-10	1.182e-10	-9.469	-9.927	-0.459	(0)
BaCO3	1.220e-10	1.220e-10	-9.914	-9.914	0.000	(0)
UO2CO3	9.016e-11	9.016e-11	-10.045	-10.045	0.000	(0)
CdHCO3+	3.734e-11	2.868e-11	-10.428	-10.542	-0.115	(0)
Cd (CO3) 2-2	6.176e-12	2.148e-12	-11.209	-11.668	-0.459	(0)
FeHCO3+	1.934e-13	1.610e-13	-12.714	-12.793	-0.079	(0)
HgCO3	4.785e-14	4.785e-14	-13.320	-13.320	0.000	(0)
Hg (CO3) 2-2	2.713e-15	9.437e-16	-14.567	-15.025	-0.459	(0)
HgHCO3+	3.361e-17	2.581e-17	-16.474	-16.588	-0.115	(0)
Ca	4.476e-03					
Ca+2	2.869e-03	1.301e-03	-2.542	-2.886	-0.343	(0)
CaSO4	1.479e-03	1.479e-03	-2.830	-2.830	0.000	(0)
CaHCO3+	1.121e-04	9.334e-05	-3.950	-4.030	-0.079	(0)
CaCO3	1.286e-05	1.286e-05	-4.891	-4.891	0.000	(0)
CaF+	3.442e-06	2.839e-06	-5.463	-5.547	-0.084	(0)
CaH2BO3+	7.765e-08	6.214e-08	-7.110	-7.207	-0.097	(0)
CaOH+	1.082e-08	9.014e-09	-7.966	-8.045	-0.079	(0)
CaNH3+2	8.933e-11	3.108e-11	-10.049	-10.508	-0.459	(0)
CaNO3+	5.582e-11	4.287e-11	-10.253	-10.368	-0.115	(0)
Ca (NH3) 2+2	6.749e-19	2.348e-19	-18.171	-18.629	-0.459	(0)
Cd	1.407e-08					
Cd+2	7.209e-09	3.269e-09	-8.142	-8.486	-0.343	(0)
CdSO4	3.803e-09	3.803e-09	-8.420	-8.420	0.000	(0)
CdCl+	1.751e-09	1.345e-09	-8.757	-8.871	-0.115	(0)
Cd (SO4) 2-2	7.317e-10	2.545e-10	-9.136	-9.594	-0.459	(0)
CdCO3	4.647e-10	4.647e-10	-9.333	-9.333	0.000	(0)
CdHCO3+	3.734e-11	2.868e-11	-10.428	-10.542	-0.115	(0)
CdCl2	2.414e-11	2.414e-11	-10.617	-10.617	0.000	(0)
CdOHC1	1.916e-11	1.916e-11	-10.718	-10.718	0.000	(0)
CdF+	1.349e-11	1.036e-11	-10.870	-10.985	-0.115	(0)
CdOH+	1.174e-11	9.018e-12	-10.930	-11.045	-0.115	(0)
Cd (CO3) 2-2	6.176e-12	2.148e-12	-11.209	-11.668	-0.459	(0)
CdCl3-	8.541e-14	6.560e-14	-13.068	-13.183	-0.115	(0)
Cd (OH) 2	1.976e-14	1.976e-14	-13.704	-13.704	0.000	(0)
CdF2	4.132e-15	4.132e-15	-14.384	-14.384	0.000	(0)
CdNO3+	1.403e-16	1.077e-16	-15.853	-15.968	-0.115	(0)
CdSeO4	3.380e-17	3.380e-17	-16.471	-16.471	0.000	(0)
Cd2OH+3	1.590e-18	1.477e-19	-17.799	-18.830	-1.032	(0)
Cd (SeO3) 2-2	1.503e-18	5.228e-19	-17.823	-18.282	-0.459	(0)
Cd (OH) 3-	5.460e-19	4.194e-19	-18.263	-18.377	-0.115	(0)
Cd (NO3) 2	5.628e-25	5.628e-25	-24.250	-24.250	0.000	(0)
Cd (OH) 4-2	6.853e-26	2.384e-26	-25.164	-25.623	-0.459	(0)
CdHS+	0.000e+00	0.000e+00	-78.580	-78.694	-0.115	(0)

	Cd (HS) 2	0.000e+00	0.000e+00	-149.707	-149.707	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-225.909	-226.024	-0.115	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-301.586	-302.044	-0.459	(0)
C1	5.249e-03						
	Cl-	5.248e-03	4.307e-03	-2.280	-2.366	-0.086	(0)
	MnCl+	1.125e-07	9.281e-08	-6.949	-7.032	-0.084	(0)
	ZnCl+	2.215e-08	1.806e-08	-7.655	-7.743	-0.089	(0)
	AgCl	1.804e-08	1.804e-08	-7.744	-7.744	0.000	(0)
	AgCl2-	8.811e-09	6.766e-09	-8.055	-8.170	-0.115	(0)
	ZnOHC1	8.214e-09	8.214e-09	-8.085	-8.085	0.000	(0)
	CdCl+	1.751e-09	1.345e-09	-8.757	-8.871	-0.115	(0)
	CuCl2-	1.393e-09	1.136e-09	-8.856	-8.945	-0.089	(0)
	CuCl	1.263e-09	1.263e-09	-8.899	-8.899	0.000	(0)
	CuCl+	6.549e-10	5.342e-10	-9.184	-9.272	-0.089	(0)
	NiCl+	5.943e-10	4.564e-10	-9.226	-9.341	-0.115	(0)
	MnCl2	5.646e-10	5.646e-10	-9.248	-9.248	0.000	(0)
	CoCl+	4.778e-10	3.670e-10	-9.321	-9.435	-0.115	(0)
	ZnCl2	1.233e-10	1.233e-10	-9.909	-9.909	0.000	(0)
	AgCl3-2	7.466e-11	2.597e-11	-10.127	-10.585	-0.459	(0)
	PbCl+	6.975e-11	5.357e-11	-10.156	-10.271	-0.115	(0)
	CdCl2	2.414e-11	2.414e-11	-10.617	-10.617	0.000	(0)
	CdOHC1	1.916e-11	1.916e-11	-10.718	-10.718	0.000	(0)
	HgClOH	1.694e-11	1.694e-11	-10.771	-10.771	0.000	(0)
	HgCl2	1.189e-11	1.189e-11	-10.925	-10.925	0.000	(0)
	AgCl4-3	2.457e-12	2.284e-13	-11.610	-12.641	-1.032	(0)
	CuCl3-2	2.262e-12	1.046e-12	-11.645	-11.980	-0.335	(0)
	PbCl2	1.031e-12	1.031e-12	-11.987	-11.987	0.000	(0)
	MnCl3-	8.122e-13	6.698e-13	-12.090	-12.174	-0.084	(0)
	CuCl2	7.977e-13	7.977e-13	-12.098	-12.098	0.000	(0)
	HgCl3-	6.669e-13	5.122e-13	-12.176	-12.291	-0.115	(0)
	ZnCl3-	5.172e-13	4.218e-13	-12.286	-12.375	-0.089	(0)
	CdCl3-	8.541e-14	6.560e-14	-13.068	-13.183	-0.115	(0)
	HgCl4-2	2.524e-14	8.782e-15	-13.598	-14.056	-0.459	(0)
	NiCl2	9.898e-15	9.898e-15	-14.004	-14.004	0.000	(0)
	PbCl3-	2.301e-15	1.767e-15	-14.638	-14.753	-0.115	(0)
	ZnCl4-2	1.964e-15	9.085e-16	-14.707	-15.042	-0.335	(0)
	HgCl+	7.173e-16	5.509e-16	-15.144	-15.259	-0.115	(0)
	CrCl+2	1.096e-16	3.813e-17	-15.960	-16.419	-0.459	(0)
	CuCl3-	3.931e-17	3.206e-17	-16.406	-16.494	-0.089	(0)
	UO2Cl+	3.302e-17	2.536e-17	-16.481	-16.596	-0.115	(0)
	PbCl4-2	9.999e-18	3.479e-18	-17.000	-17.459	-0.459	(0)
	CrOHC12	1.084e-18	1.084e-18	-17.965	-17.965	0.000	(0)
	CrCl2+	2.029e-20	1.558e-20	-19.693	-19.807	-0.115	(0)
	FeCl+2	1.427e-20	6.601e-21	-19.845	-20.180	-0.335	(0)
	CuCl4-2	1.497e-21	6.921e-22	-20.825	-21.160	-0.335	(0)
	VOCl+	6.257e-22	4.805e-22	-21.204	-21.318	-0.115	(0)
	FeCl2+	1.540e-22	1.270e-22	-21.812	-21.896	-0.084	(0)
	CrO3Cl-	6.674e-26	5.125e-26	-25.176	-25.290	-0.115	(0)
	FeCl3	5.470e-26	5.470e-26	-25.262	-25.262	0.000	(0)
	CoCl+2	4.065e-35	1.414e-35	-34.391	-34.850	-0.459	(0)
	UCl+3	0.000e+00	0.000e+00	-45.442	-46.474	-1.032	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.047	-47.505	-0.459	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.301	-48.759	-0.459	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.484	-61.943	-0.459	(0)
Co (2)	1.083e-07						
	Co+2	7.080e-08	2.463e-08	-7.150	-7.609	-0.459	(0)
	CoSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
	CoHCO3+	9.613e-09	7.383e-09	-8.017	-8.132	-0.115	(0)
	CoCO3	2.597e-09	2.597e-09	-8.586	-8.586	0.000	(0)
	CoCl+	4.778e-10	3.670e-10	-9.321	-9.435	-0.115	(0)
	CoOH+	2.222e-10	1.707e-10	-9.653	-9.768	-0.115	(0)
	CoF+	2.028e-10	1.557e-10	-9.693	-9.808	-0.115	(0)
	Co (OH) 2	4.709e-12	4.709e-12	-11.327	-11.327	0.000	(0)
	CoNO2+	2.713e-12	2.084e-12	-11.566	-11.681	-0.115	(0)
	Co (NH3) +2	1.615e-13	5.619e-14	-12.792	-13.250	-0.459	(0)
	CoSeO4	6.855e-16	6.855e-16	-15.164	-15.164	0.000	(0)
	CoNO3+	5.298e-16	4.068e-16	-15.276	-15.391	-0.115	(0)
	Co (OH) 3-	4.249e-17	3.263e-17	-16.372	-16.486	-0.115	(0)

CoOOH-	1.067e-17	8.194e-18	-16.972	-17.086	-0.115	(0)
Co2OH+3	2.267e-18	2.107e-19	-17.645	-18.676	-1.032	(0)
Co (NH3) 2+2	1.308e-19	4.549e-20	-18.884	-19.342	-0.459	(0)
Co (NO3) 2	8.628e-24	8.628e-24	-23.064	-23.064	0.000	(0)
Co (OH) 4-2	5.164e-24	1.796e-24	-23.287	-23.746	-0.459	(0)
Co (NH3) 3+2	3.124e-26	1.087e-26	-25.505	-25.964	-0.459	(0)
Co4 (OH) 4+4	1.156e-29	1.693e-31	-28.937	-30.771	-1.834	(0)
Co (NH3) 4+2	3.111e-33	1.082e-33	-32.507	-32.966	-0.459	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-40.009	-40.467	-0.459	(0)
Co (3)	8.187e-29					
CoOH+2	8.187e-29	2.848e-29	-28.087	-28.545	-0.459	(0)
Co+3	9.565e-35	1.614e-35	-34.019	-34.792	-0.773	(0)
CoCl+2	4.065e-35	1.414e-35	-34.391	-34.850	-0.459	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.047	-47.505	-0.459	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.841	-56.956	-0.115	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.377	-61.836	-0.459	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.484	-61.943	-0.459	(0)
Cr (2)	2.855e-26					
Cr+2	2.855e-26	9.931e-27	-25.544	-26.003	-0.459	(0)
Cr (3)	3.370e-09					
Cr (OH) 2+	2.861e-09	2.197e-09	-8.544	-8.658	-0.115	(0)
Cr (OH) 3	2.866e-10	2.866e-10	-9.543	-9.543	0.000	(0)
Cr (OH) +2	1.494e-10	5.199e-11	-9.826	-10.284	-0.459	(0)
CrOHSO4	6.122e-11	6.122e-11	-10.213	-10.213	0.000	(0)
CrO2-	6.124e-12	4.703e-12	-11.213	-11.328	-0.115	(0)
Cr (OH) 4-	5.161e-12	3.963e-12	-11.287	-11.402	-0.115	(0)
CrF+2	6.232e-13	2.168e-13	-12.205	-12.664	-0.459	(0)
CrSO4+	1.032e-13	7.928e-14	-12.986	-13.101	-0.115	(0)
Cr+3	7.361e-14	6.842e-15	-13.133	-14.165	-1.032	(0)
CrCl+2	1.096e-16	3.813e-17	-15.960	-16.419	-0.459	(0)
CrOHC12	1.084e-18	1.084e-18	-17.965	-17.965	0.000	(0)
Cr2 (OH) 2SO4+2	8.268e-19	2.876e-19	-18.083	-18.541	-0.459	(0)
Cr2 (OH) 2 (SO4) 2	8.479e-20	8.479e-20	-19.072	-19.072	0.000	(0)
CrCl2+	2.029e-20	1.558e-20	-19.693	-19.807	-0.115	(0)
CrNO3+2	8.960e-24	3.117e-24	-23.048	-23.506	-0.459	(0)
Cr (NH3) 5OH+2	3.962e-39	1.378e-39	-38.402	-38.861	-0.459	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.464	-47.496	-1.032	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.301	-48.759	-0.459	(0)
Cr (6)	1.685e-15					
CrO4-2	1.536e-15	6.963e-16	-14.814	-15.157	-0.343	(0)
HCrO4-	8.498e-17	6.526e-17	-16.071	-16.185	-0.115	(0)
NaCrO4-	5.435e-17	4.174e-17	-16.265	-16.379	-0.115	(0)
KCrO4-	1.033e-17	7.930e-18	-16.986	-17.101	-0.115	(0)
CrO3SO4-2	8.221e-24	2.860e-24	-23.085	-23.544	-0.459	(0)
H2CrO4	1.532e-24	1.532e-24	-23.815	-23.815	0.000	(0)
CrO3Cl-	6.674e-26	5.125e-26	-25.176	-25.290	-0.115	(0)
Cr2O7-2	4.249e-31	1.478e-31	-30.372	-30.830	-0.459	(0)
Cu (1)	2.961e-09					
CuCl2-	1.393e-09	1.136e-09	-8.856	-8.945	-0.089	(0)
CuCl	1.263e-09	1.263e-09	-8.899	-8.899	0.000	(0)
Cu+	3.032e-10	2.329e-10	-9.518	-9.633	-0.115	(0)
CuCl3-2	2.262e-12	1.046e-12	-11.645	-11.980	-0.335	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.218	-147.600	-0.382	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.967	-148.330	-0.363	(0)
Cu (2)	3.413e-06					
CuCO3	2.874e-06	2.874e-06	-5.542	-5.542	0.000	(0)
Cu+2	1.726e-07	7.825e-08	-6.763	-7.106	-0.343	(0)
Cu (CO3) 2-2	1.387e-07	4.824e-08	-6.858	-7.317	-0.459	(0)
CuOH+	1.054e-07	8.595e-08	-6.977	-7.066	-0.089	(0)
CuSO4	8.896e-08	8.896e-08	-7.051	-7.051	0.000	(0)
CuHCO3+	2.478e-08	1.903e-08	-7.606	-7.721	-0.115	(0)
Cu (OH) 2	5.956e-09	5.956e-09	-8.225	-8.225	0.000	(0)
CuF+	1.285e-09	9.872e-10	-8.891	-9.006	-0.115	(0)
CuCl+	6.549e-10	5.342e-10	-9.184	-9.272	-0.089	(0)
Cu2 (OH) 2+2	5.334e-10	1.856e-10	-9.273	-9.732	-0.459	(0)
CuNO2+	1.281e-10	9.838e-11	-9.892	-10.007	-0.115	(0)
CuNH3+2	4.368e-11	1.520e-11	-10.360	-10.818	-0.459	(0)
Cu (OH) 3-	5.525e-12	4.243e-12	-11.258	-11.372	-0.115	(0)

	CuCl2	7.977e-13	7.977e-13	-12.098	-12.098	0.000	(0)
	Cu(NO2)2	1.209e-14	1.209e-14	-13.918	-13.918	0.000	(0)
	CuNO3+	3.358e-15	2.579e-15	-14.474	-14.589	-0.115	(0)
	CuCl3-	3.931e-17	3.206e-17	-16.406	-16.494	-0.089	(0)
	Cu(OH)4-2	3.334e-17	1.160e-17	-16.477	-16.936	-0.459	(0)
	CuCl4-2	1.497e-21	6.921e-22	-20.825	-21.160	-0.335	(0)
	Cu(NO3)2	3.384e-24	3.384e-24	-23.471	-23.471	0.000	(0)
	Cu(HS)3-	0.000e+00	0.000e+00	-215.743	-215.858	-0.115	(0)
F		2.990e-04					
	F-	2.436e-04	1.999e-04	-3.613	-3.699	-0.086	(0)
	MgF+	5.004e-05	4.104e-05	-4.301	-4.387	-0.086	(0)
	CaF+	3.442e-06	2.839e-06	-5.463	-5.547	-0.084	(0)
	NaF	1.522e-06	1.522e-06	-5.818	-5.818	0.000	(0)
	MnF+	1.652e-07	1.362e-07	-6.782	-6.866	-0.084	(0)
	AlF3	2.972e-08	2.972e-08	-7.527	-7.527	0.000	(0)
	AlF2+	1.426e-08	1.181e-08	-7.846	-7.928	-0.082	(0)
	ZnF+	8.673e-09	6.661e-09	-8.062	-8.176	-0.115	(0)
	HF	8.566e-09	8.566e-09	-8.067	-8.067	0.000	(0)
	BF(OH)3-	4.128e-09	3.303e-09	-8.384	-8.481	-0.097	(0)
	AlF4-	3.630e-09	2.978e-09	-8.440	-8.526	-0.086	(0)
	CuF+	1.285e-09	9.872e-10	-8.891	-9.006	-0.115	(0)
	AlF+2	3.156e-10	1.483e-10	-9.501	-9.829	-0.328	(0)
	NiF+	2.709e-10	2.080e-10	-9.567	-9.682	-0.115	(0)
	CoF+	2.028e-10	1.557e-10	-9.693	-9.808	-0.115	(0)
	CdF+	1.349e-11	1.036e-11	-10.870	-10.985	-0.115	(0)
	HF2-	8.031e-12	6.511e-12	-11.095	-11.186	-0.091	(0)
	PbF+	6.431e-12	4.939e-12	-11.192	-11.306	-0.115	(0)
	BF2(OH)2-	2.558e-12	2.047e-12	-11.592	-11.689	-0.097	(0)
	AgF	1.030e-12	1.030e-12	-11.987	-11.987	0.000	(0)
	CrF+2	6.232e-13	2.168e-13	-12.205	-12.664	-0.459	(0)
	UO2F+	1.305e-13	1.002e-13	-12.884	-12.999	-0.115	(0)
	UO2F2	5.778e-14	5.778e-14	-13.238	-13.238	0.000	(0)
	PbF2	1.943e-14	1.943e-14	-13.711	-13.711	0.000	(0)
	CdF2	4.132e-15	4.132e-15	-14.384	-14.384	0.000	(0)
	UO2F3-	3.778e-15	2.902e-15	-14.423	-14.537	-0.115	(0)
	H2F2	1.966e-16	1.966e-16	-15.706	-15.706	0.000	(0)
	FeF2+	7.219e-17	5.953e-17	-16.142	-16.225	-0.084	(0)
	VO2F	3.417e-17	3.417e-17	-16.466	-16.466	0.000	(0)
	FeF+2	2.406e-17	1.113e-17	-16.619	-16.954	-0.335	(0)
	FeF3	1.679e-17	1.679e-17	-16.775	-16.775	0.000	(0)
	UO2F4-2	1.325e-17	4.608e-18	-16.878	-17.336	-0.459	(0)
	PbF3-	9.595e-18	7.369e-18	-17.018	-17.133	-0.115	(0)
	BF3OH-	5.768e-18	4.616e-18	-17.239	-17.336	-0.097	(0)
	VO2F2-	3.230e-18	2.480e-18	-17.491	-17.606	-0.115	(0)
	VOF+	6.210e-20	4.769e-20	-19.207	-19.322	-0.115	(0)
	VO2F3-2	1.778e-20	6.185e-21	-19.750	-20.209	-0.459	(0)
	VOF2	3.575e-21	3.575e-21	-20.447	-20.447	0.000	(0)
	PbF4-2	2.027e-21	7.051e-22	-20.693	-21.152	-0.459	(0)
	BF4-	1.645e-22	1.316e-22	-21.784	-21.881	-0.097	(0)
	HgF+	6.186e-23	4.751e-23	-22.209	-22.323	-0.115	(0)
	VOF3-	3.302e-23	2.536e-23	-22.481	-22.596	-0.115	(0)
	VO2F4-3	6.547e-24	6.085e-25	-23.184	-24.216	-1.032	(0)
	Sb(OH)2F	4.412e-25	4.412e-25	-24.355	-24.355	0.000	(0)
	SbOF	4.342e-25	4.342e-25	-24.362	-24.362	0.000	(0)
	VOF4-2	5.883e-26	2.047e-26	-25.230	-25.689	-0.459	(0)
	SiF6-2	1.168e-26	5.400e-27	-25.933	-26.268	-0.335	(0)
	UF3+	6.440e-36	4.946e-36	-35.191	-35.306	-0.115	(0)
	UF2+2	4.487e-37	1.561e-37	-36.348	-36.807	-0.459	(0)
	UF4	1.084e-37	1.084e-37	-36.965	-36.965	0.000	(0)
	UF5-	1.119e-39	8.591e-40	-38.951	-39.066	-0.115	(0)
	UF+3	6.673e-40	0.000e+00	-39.176	-40.207	-1.032	(0)
	UF6-2	1.491e-40	0.000e+00	-39.827	-40.285	-0.459	(0)
Fe(2)		1.384e-11					
	Fe+2	9.543e-12	3.320e-12	-11.020	-11.479	-0.459	(0)
	FeSO4	4.044e-12	4.044e-12	-11.393	-11.393	0.000	(0)
	FeHCO3+	1.934e-13	1.610e-13	-12.714	-12.793	-0.079	(0)
	FeOH+	5.566e-14	4.590e-14	-13.254	-13.338	-0.084	(0)
	Fe(OH)2	1.266e-17	1.266e-17	-16.897	-16.897	0.000	(0)

Fe (OH) 3-	1.687e-18	1.391e-18	-17.773	-17.857	-0.084	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.962	-158.962	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.027	-235.142	-0.115	(0)
Fe (3)	2.453e-09					
Fe (OH) 2+	1.857e-09	1.538e-09	-8.731	-8.813	-0.082	(0)
Fe (OH) 3	5.736e-10	5.736e-10	-9.241	-9.241	0.000	(0)
Fe (OH) 4-	2.240e-11	1.855e-11	-10.650	-10.732	-0.082	(0)
FeOH+2	2.461e-14	1.138e-14	-13.609	-13.944	-0.335	(0)
FeF2+	7.219e-17	5.953e-17	-16.142	-16.225	-0.084	(0)
FeF+2	2.406e-17	1.113e-17	-16.619	-16.954	-0.335	(0)
FeF3	1.679e-17	1.679e-17	-16.775	-16.775	0.000	(0)
FeSO4+	3.427e-18	2.826e-18	-17.465	-17.549	-0.084	(0)
Fe (SO4) 2-	3.904e-19	2.998e-19	-18.409	-18.523	-0.115	(0)
Fe+3	3.008e-19	5.075e-20	-18.522	-19.295	-0.773	(0)
FeCl+2	1.427e-20	6.601e-21	-19.845	-20.180	-0.335	(0)
FeCl2+	1.540e-22	1.270e-22	-21.812	-21.896	-0.084	(0)
FeHSeO3+2	3.907e-23	1.359e-23	-22.408	-22.867	-0.459	(0)
Fe2 (OH) 2+4	2.929e-25	4.289e-27	-24.533	-26.368	-1.834	(0)
FeCl3	5.470e-26	5.470e-26	-25.262	-25.262	0.000	(0)
FeNO3+2	1.521e-26	5.290e-27	-25.818	-26.277	-0.459	(0)
Fe3 (OH) 4+5	7.005e-32	9.534e-35	-31.155	-34.021	-2.866	(0)
H (0)	4.335e-29					
H2	2.168e-29	2.193e-29	-28.664	-28.659	0.005	(0)
Hg (0)	2.185e-09					
Hg	2.185e-09	2.185e-09	-8.661	-8.661	0.000	(0)
Hg (1)	5.467e-20					
Hg2+2	2.733e-20	9.508e-21	-19.563	-20.022	-0.459	(0)
Hg (2)	3.439e-11					
HgClOH	1.694e-11	1.694e-11	-10.771	-10.771	0.000	(0)
HgCl2	1.189e-11	1.189e-11	-10.925	-10.925	0.000	(0)
Hg (OH) 2	4.823e-12	4.879e-12	-11.317	-11.312	0.005	(0)
HgCl3-	6.669e-13	5.122e-13	-12.176	-12.291	-0.115	(0)
HgCO3	4.785e-14	4.785e-14	-13.320	-13.320	0.000	(0)
HgCl4-2	2.524e-14	8.782e-15	-13.598	-14.056	-0.459	(0)
Hg (CO3) 2-2	2.713e-15	9.437e-16	-14.567	-15.025	-0.459	(0)
HgCl+	7.173e-16	5.509e-16	-15.144	-15.259	-0.115	(0)
HgOH+	1.154e-16	8.864e-17	-15.938	-16.052	-0.115	(0)
HgHCO3+	3.361e-17	2.581e-17	-16.474	-16.588	-0.115	(0)
Hg (NH3) 2+2	4.187e-18	1.457e-18	-17.378	-17.837	-0.459	(0)
Hg (OH) 3-	2.778e-19	2.134e-19	-18.556	-18.671	-0.115	(0)
HgNH3+2	2.207e-19	7.676e-20	-18.656	-19.115	-0.459	(0)
Hg+2	1.843e-20	6.411e-21	-19.735	-20.193	-0.459	(0)
HgSO4	8.329e-21	8.329e-21	-20.079	-20.079	0.000	(0)
HgF+	6.186e-23	4.751e-23	-22.209	-22.323	-0.115	(0)
Hg (NH3) 3+2	3.163e-25	1.101e-25	-24.500	-24.958	-0.459	(0)
HgNO3+	3.212e-29	2.467e-29	-28.493	-28.608	-0.115	(0)
Hg (NH3) 4+2	4.769e-32	1.659e-32	-31.322	-31.780	-0.459	(0)
Hg (NO3) 2	1.069e-37	1.069e-37	-36.971	-36.971	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.046	-137.160	-0.115	(0)
HgS2-2	0.000e+00	0.000e+00	-137.872	-138.330	-0.459	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.304	-138.304	0.000	(0)
K	3.866e-03					
K+	3.736e-03	3.066e-03	-2.428	-2.513	-0.086	(0)
KSO4-	1.301e-04	1.077e-04	-3.886	-3.968	-0.082	(0)
KCrO4-	1.033e-17	7.930e-18	-16.986	-17.101	-0.115	(0)
Mg	5.836e-03					
Mg+2	4.035e-03	1.830e-03	-2.394	-2.738	-0.343	(0)
MgSO4	1.652e-03	1.652e-03	-2.782	-2.782	0.000	(0)
MgHCO3+	8.846e-05	7.215e-05	-4.053	-4.142	-0.089	(0)
MgF+	5.004e-05	4.104e-05	-4.301	-4.387	-0.086	(0)
MgCO3	9.492e-06	9.492e-06	-5.023	-5.023	0.000	(0)
MgOH+	3.024e-07	2.530e-07	-6.519	-6.597	-0.077	(0)
MgH2BO3+	6.581e-08	5.267e-08	-7.182	-7.278	-0.097	(0)
Mn (2)	6.620e-05					
Mn+2	4.921e-05	1.712e-05	-4.308	-4.767	-0.459	(0)
MnSO4	1.511e-05	1.511e-05	-4.821	-4.821	0.000	(0)
MnHCO3+	1.596e-06	1.316e-06	-5.797	-5.881	-0.084	(0)
MnF+	1.652e-07	1.362e-07	-6.782	-6.866	-0.084	(0)

MnCl+	1.125e-07	9.281e-08	-6.949	-7.032	-0.084	(0)
MnOH+	1.811e-08	1.493e-08	-7.742	-7.826	-0.084	(0)
MnCl2	5.646e-10	5.646e-10	-9.248	-9.248	0.000	(0)
MnCl3-	8.122e-13	6.698e-13	-12.090	-12.174	-0.084	(0)
MnNO3+	3.682e-13	2.828e-13	-12.434	-12.549	-0.115	(0)
MnSeO4	2.558e-13	2.558e-13	-12.592	-12.592	0.000	(0)
Mn (OH) 3-	1.350e-17	1.113e-17	-16.870	-16.953	-0.084	(0)
Mn (NO3) 2	7.403e-21	7.403e-21	-20.131	-20.131	0.000	(0)
Mn (OH) 4-2	2.699e-23	1.248e-23	-22.569	-22.904	-0.335	(0)
MnSe	0.000e+00	0.000e+00	-41.273	-41.273	0.000	(0)
Mn (3)	7.459e-25					
Mn+3	7.459e-25	1.258e-25	-24.127	-24.900	-0.773	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.685	-42.020	-0.335	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-46.082	-46.175	-0.094	(0)
Mo	1.949e-06					
MoO4-2	1.948e-06	8.834e-07	-5.710	-6.054	-0.343	(0)
HMoO4-	6.630e-10	5.092e-10	-9.178	-9.293	-0.115	(0)
H2MoO4	1.080e-13	1.080e-13	-12.966	-12.966	0.000	(0)
Ag2MoO4	1.407e-24	1.407e-24	-23.852	-23.852	0.000	(0)
AlMo6O21-3	2.209e-39	2.053e-40	-38.656	-39.688	-1.032	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.563	-49.690	-4.127	(0)
HMo7O24-5	0.000e+00	0.000e+00	-47.975	-50.841	-2.866	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.763	-53.597	-1.834	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.858	-57.889	-1.032	(0)
N (-3)	1.286e-06					
NH4+	1.205e-06	9.641e-07	-5.919	-6.016	-0.097	(0)
NH4SO4-	6.216e-08	5.126e-08	-7.206	-7.290	-0.084	(0)
NH3	1.898e-08	1.898e-08	-7.722	-7.722	0.000	(0)
CaNH3+2	8.933e-11	3.108e-11	-10.049	-10.508	-0.459	(0)
CuNH3+2	4.368e-11	1.520e-11	-10.360	-10.818	-0.459	(0)
NiNH3+2	1.213e-12	4.221e-13	-11.916	-12.375	-0.459	(0)
Co (NH3) +2	1.615e-13	5.619e-14	-12.792	-13.250	-0.459	(0)
AgNH3+	1.035e-13	7.948e-14	-12.985	-13.100	-0.115	(0)
BaNH3+2	1.313e-15	4.567e-16	-14.882	-15.340	-0.459	(0)
Ag (NH3) 2+	1.596e-17	1.226e-17	-16.797	-16.912	-0.115	(0)
Hg (NH3) 2+2	4.187e-18	1.457e-18	-17.378	-17.837	-0.459	(0)
Ni (NH3) 2+2	3.328e-18	1.158e-18	-17.478	-17.936	-0.459	(0)
Ca (NH3) 2+2	6.749e-19	2.348e-19	-18.171	-18.629	-0.459	(0)
HgNH3+2	2.207e-19	7.676e-20	-18.656	-19.115	-0.459	(0)
Co (NH3) 2+2	1.308e-19	4.549e-20	-18.884	-19.342	-0.459	(0)
Hg (NH3) 3+2	3.163e-25	1.101e-25	-24.500	-24.958	-0.459	(0)
Co (NH3) 3+2	3.124e-26	1.087e-26	-25.505	-25.964	-0.459	(0)
Hg (NH3) 4+2	4.769e-32	1.659e-32	-31.322	-31.780	-0.459	(0)
Co (NH3) 4+2	3.111e-33	1.082e-33	-32.507	-32.966	-0.459	(0)
Cr (NH3) 5OH+2	3.962e-39	1.378e-39	-38.402	-38.861	-0.459	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-40.009	-40.467	-0.459	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.464	-47.496	-1.032	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-47.047	-47.505	-0.459	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.301	-48.759	-0.459	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.841	-56.956	-0.115	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.377	-61.836	-0.459	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.484	-61.943	-0.459	(0)
N (3)	1.490e-05					
NO2-	1.490e-05	1.201e-05	-4.827	-4.921	-0.094	(0)
CuNO2+	1.281e-10	9.838e-11	-9.892	-10.007	-0.115	(0)
AgNO2	5.146e-12	5.146e-12	-11.289	-11.289	0.000	(0)
CoNO2+	2.713e-12	2.084e-12	-11.566	-11.681	-0.115	(0)
Cu (NO2) 2	1.209e-14	1.209e-14	-13.918	-13.918	0.000	(0)
Ag (NO2) 2-	1.246e-16	9.568e-17	-15.905	-16.019	-0.115	(0)
N (5)	1.276e-08					
NO3-	1.270e-08	1.042e-08	-7.896	-7.982	-0.086	(0)
CaNO3+	5.582e-11	4.287e-11	-10.253	-10.368	-0.115	(0)
MnNO3+	3.682e-13	2.828e-13	-12.434	-12.549	-0.115	(0)
ZnNO3+	5.692e-14	4.372e-14	-13.245	-13.359	-0.115	(0)
CuNO3+	3.358e-15	2.579e-15	-14.474	-14.589	-0.115	(0)
BaNO3+	2.594e-15	1.992e-15	-14.586	-14.701	-0.115	(0)

NiNO3+	1.412e-15	1.084e-15	-14.850	-14.965	-0.115	(0)
CoNO3+	5.298e-16	4.068e-16	-15.276	-15.391	-0.115	(0)
CdNO3+	1.403e-16	1.077e-16	-15.853	-15.968	-0.115	(0)
PbNO3+	7.037e-17	5.404e-17	-16.153	-16.267	-0.115	(0)
AgNO3	1.698e-17	1.698e-17	-16.770	-16.770	0.000	(0)
Mn(NO3)2	7.403e-21	7.403e-21	-20.131	-20.131	0.000	(0)
UO2NO3+	9.832e-23	7.551e-23	-22.007	-22.122	-0.115	(0)
Zn(NO3)2	9.091e-23	9.091e-23	-22.041	-22.041	0.000	(0)
CrNO3+2	8.960e-24	3.117e-24	-23.048	-23.506	-0.459	(0)
Co(NO3)2	8.628e-24	8.628e-24	-23.064	-23.064	0.000	(0)
Cu(NO3)2	3.384e-24	3.384e-24	-23.471	-23.471	0.000	(0)
Pb(NO3)2	9.565e-25	9.565e-25	-24.019	-24.019	0.000	(0)
Cd(NO3)2	5.628e-25	5.628e-25	-24.250	-24.250	0.000	(0)
VO2NO3	5.137e-25	5.137e-25	-24.289	-24.289	0.000	(0)
FeNO3+2	1.521e-26	5.290e-27	-25.818	-26.277	-0.459	(0)
HgNO3+	3.212e-29	2.467e-29	-28.493	-28.608	-0.115	(0)
Hg(NO3)2	1.069e-37	1.069e-37	-36.971	-36.971	0.000	(0)
Na	1.512e-02					
Na+	1.470e-02	1.206e-02	-1.833	-1.919	-0.086	(0)
NaSO4-	3.882e-04	3.215e-04	-3.411	-3.493	-0.082	(0)
NaHCO3	2.614e-05	2.614e-05	-4.583	-4.583	0.000	(0)
NaCO3-	1.692e-06	1.401e-06	-5.772	-5.854	-0.082	(0)
NaF	1.522e-06	1.522e-06	-5.818	-5.818	0.000	(0)
NaH2BO3	1.587e-08	1.587e-08	-7.799	-7.799	0.000	(0)
NaCrO4-	5.435e-17	4.174e-17	-16.265	-16.379	-0.115	(0)
Ni	1.688e-07					
Ni+2	9.135e-08	4.142e-08	-7.039	-7.383	-0.343	(0)
NiSO4	4.101e-08	4.101e-08	-7.387	-7.387	0.000	(0)
NiHCO3+	2.562e-08	1.968e-08	-7.591	-7.706	-0.115	(0)
NiCO3	9.638e-09	9.638e-09	-8.016	-8.016	0.000	(0)
NiCl+	5.943e-10	4.564e-10	-9.226	-9.341	-0.115	(0)
NiF+	2.709e-10	2.080e-10	-9.567	-9.682	-0.115	(0)
NiOH+	2.358e-10	1.811e-10	-9.627	-9.742	-0.115	(0)
Ni(SO4)2-2	1.937e-11	6.739e-12	-10.713	-11.171	-0.459	(0)
Ni(OH)2	4.997e-12	4.997e-12	-11.301	-11.301	0.000	(0)
NiNH3+2	1.213e-12	4.221e-13	-11.916	-12.375	-0.459	(0)
NiCl2	9.898e-15	9.898e-15	-14.004	-14.004	0.000	(0)
Ni(OH)3-	2.260e-15	1.735e-15	-14.646	-14.761	-0.115	(0)
NiNO3+	1.412e-15	1.084e-15	-14.850	-14.965	-0.115	(0)
NiSeO4	1.076e-15	1.076e-15	-14.968	-14.968	0.000	(0)
Ni(NH3)2+2	3.328e-18	1.158e-18	-17.478	-17.936	-0.459	(0)
O(0)	2.080e-35					
O2	1.040e-35	1.052e-35	-34.983	-34.978	0.005	(0)
Pb	1.040e-08					
PbCO3	6.572e-09	6.572e-09	-8.182	-8.182	0.000	(0)
PbHCO3+	1.307e-09	1.004e-09	-8.884	-8.998	-0.115	(0)
PbSO4	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
Pb+2	7.731e-10	3.505e-10	-9.112	-9.455	-0.343	(0)
PbOH+	3.982e-10	3.058e-10	-9.400	-9.515	-0.115	(0)
Pb(CO3)2-2	3.398e-10	1.182e-10	-9.469	-9.927	-0.459	(0)
Pb(SO4)2-2	7.323e-11	2.547e-11	-10.135	-10.594	-0.459	(0)
PbCl+	6.975e-11	5.357e-11	-10.156	-10.271	-0.115	(0)
PbF+	6.431e-12	4.939e-12	-11.192	-11.306	-0.115	(0)
Pb(OH)2	3.359e-12	3.359e-12	-11.474	-11.474	0.000	(0)
PbCl2	1.031e-12	1.031e-12	-11.987	-11.987	0.000	(0)
PbF2	1.943e-14	1.943e-14	-13.711	-13.711	0.000	(0)
PbCl3-	2.301e-15	1.767e-15	-14.638	-14.753	-0.115	(0)
Pb(OH)3-	1.519e-15	1.167e-15	-14.818	-14.933	-0.115	(0)
PbNO3+	7.037e-17	5.404e-17	-16.153	-16.267	-0.115	(0)
Pb2OH+3	1.828e-17	1.699e-18	-16.738	-17.770	-1.032	(0)
PbCl4-2	9.999e-18	3.479e-18	-17.000	-17.459	-0.459	(0)
PbF3-	9.595e-18	7.369e-18	-17.018	-17.133	-0.115	(0)
Pb(OH)4-2	2.853e-19	9.923e-20	-18.545	-19.003	-0.459	(0)
PbF4-2	2.027e-21	7.051e-22	-20.693	-21.152	-0.459	(0)
Pb3(OH)4+2	2.268e-22	7.891e-23	-21.644	-22.103	-0.459	(0)
Pb(NO3)2	9.565e-25	9.565e-25	-24.019	-24.019	0.000	(0)
Pb4(OH)4+4	1.500e-26	2.197e-28	-25.824	-27.658	-1.834	(0)
Pb(HS)2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-227.421	-227.535	-0.115	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.090	-73.090	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.102	-78.217	-0.115	(0)
CdHS+	0.000e+00	0.000e+00	-78.580	-78.694	-0.115	(0)
H2S	0.000e+00	0.000e+00	-78.735	-78.735	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.585	-80.044	-0.459	(0)
S6-2	0.000e+00	0.000e+00	-80.101	-80.560	-0.459	(0)
S4-2	0.000e+00	0.000e+00	-80.181	-80.639	-0.459	(0)
S3-2	0.000e+00	0.000e+00	-80.987	-81.445	-0.459	(0)
S2-2	0.000e+00	0.000e+00	-82.003	-82.461	-0.459	(0)
S-2	0.000e+00	0.000e+00	-87.644	-87.979	-0.335	(0)
HgHS2-	0.000e+00	0.000e+00	-137.046	-137.160	-0.115	(0)
HgS2-2	0.000e+00	0.000e+00	-137.872	-138.330	-0.459	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.304	-138.304	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-146.935	-147.152	-0.218	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.092	-147.207	-0.115	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.218	-147.600	-0.382	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.748	-147.863	-0.115	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.967	-148.330	-0.363	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.661	-149.054	-0.393	(0)
AgS4S5-3	0.000e+00	0.000e+00	-148.993	-149.365	-0.372	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.391	-149.391	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.707	-149.707	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.962	-158.962	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.743	-215.858	-0.115	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.213	-224.327	-0.115	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-225.909	-226.024	-0.115	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.311	-226.769	-0.459	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.421	-227.535	-0.115	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.027	-235.142	-0.115	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-301.586	-302.044	-0.459	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.546	-304.004	-0.459	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.718	-317.177	-0.459	(0)
S (6)	1.461e-02					
SO4-2	1.094e-02	4.962e-03	-1.961	-2.304	-0.343	(0)
MgSO4	1.652e-03	1.652e-03	-2.782	-2.782	0.000	(0)
CaSO4	1.479e-03	1.479e-03	-2.830	-2.830	0.000	(0)
NaSO4-	3.882e-04	3.215e-04	-3.411	-3.493	-0.082	(0)
KSO4-	1.301e-04	1.077e-04	-3.886	-3.968	-0.082	(0)
MnSO4	1.511e-05	1.511e-05	-4.821	-4.821	0.000	(0)
ZnSO4	1.813e-06	1.813e-06	-5.742	-5.742	0.000	(0)
Zn (SO4) 2-2	2.252e-07	7.835e-08	-6.647	-7.106	-0.459	(0)
CuSO4	8.896e-08	8.896e-08	-7.051	-7.051	0.000	(0)
NH4SO4-	6.216e-08	5.126e-08	-7.206	-7.290	-0.084	(0)
NiSO4	4.101e-08	4.101e-08	-7.387	-7.387	0.000	(0)
CoSO4	2.439e-08	2.439e-08	-7.613	-7.613	0.000	(0)
HSO4-	1.712e-08	1.405e-08	-7.766	-7.852	-0.086	(0)
CdSO4	3.803e-09	3.803e-09	-8.420	-8.420	0.000	(0)
PbSO4	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
Cd (SO4) 2-2	7.317e-10	2.545e-10	-9.136	-9.594	-0.459	(0)
AgSO4-	2.645e-10	2.031e-10	-9.578	-9.692	-0.115	(0)
Pb (SO4) 2-2	7.323e-11	2.547e-11	-10.135	-10.594	-0.459	(0)
CrOHSO4	6.122e-11	6.122e-11	-10.213	-10.213	0.000	(0)
Ni (SO4) 2-2	1.937e-11	6.739e-12	-10.713	-11.171	-0.459	(0)
FeSO4	4.044e-12	4.044e-12	-11.393	-11.393	0.000	(0)
AlSO4+	3.484e-12	2.858e-12	-11.458	-11.544	-0.086	(0)
Al (SO4) 2-	1.853e-13	1.520e-13	-12.732	-12.818	-0.086	(0)
CrSO4+	1.032e-13	7.928e-14	-12.986	-13.101	-0.115	(0)
UO2SO4	2.727e-14	2.727e-14	-13.564	-13.564	0.000	(0)
UO2 (SO4) 2-2	5.128e-15	1.784e-15	-14.290	-14.749	-0.459	(0)
VO2SO4-	1.503e-17	1.155e-17	-16.823	-16.938	-0.115	(0)
FeSO4+	3.427e-18	2.826e-18	-17.465	-17.549	-0.084	(0)
Cr2 (OH) 2SO4+2	8.268e-19	2.876e-19	-18.083	-18.541	-0.459	(0)
Fe (SO4) 2-	3.904e-19	2.998e-19	-18.409	-18.523	-0.115	(0)
Cr2 (OH) 2 (SO4) 2	8.479e-20	8.479e-20	-19.072	-19.072	0.000	(0)
VOSO4	5.435e-20	5.435e-20	-19.265	-19.265	0.000	(0)

HgSO4	8.329e-21	8.329e-21	-20.079	-20.079	0.000	(0)
CrO3SO4-2	8.221e-24	2.860e-24	-23.085	-23.544	-0.459	(0)
VSO4+	3.074e-34	2.361e-34	-33.512	-33.627	-0.115	(0)
U(SO4) 2	1.211e-40	1.211e-40	-39.917	-39.917	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.054	-41.513	-0.459	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-56.841	-56.956	-0.115	(0)
Sb (3)	9.634e-20					
Sb(OH) 3	4.873e-20	4.873e-20	-19.312	-19.312	0.000	(0)
HSbO2	4.761e-20	4.761e-20	-19.322	-19.322	0.000	(0)
SbO2-	3.466e-24	2.662e-24	-23.460	-23.575	-0.115	(0)
Sb(OH) 4-	1.983e-24	1.523e-24	-23.703	-23.817	-0.115	(0)
Sb(OH) 2F	4.412e-25	4.412e-25	-24.355	-24.355	0.000	(0)
SbOF	4.342e-25	4.342e-25	-24.362	-24.362	0.000	(0)
Sb(OH) 2+	4.467e-26	3.431e-26	-25.350	-25.465	-0.115	(0)
SbO+	1.541e-26	1.184e-26	-25.812	-25.927	-0.115	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.718	-317.177	-0.459	(0)
Sb (5)	2.964e-08					
SbO3-	2.961e-08	2.274e-08	-7.529	-7.643	-0.115	(0)
Sb(OH) 6-	3.233e-11	2.653e-11	-10.490	-10.576	-0.086	(0)
SbO2+	7.131e-24	5.477e-24	-23.147	-23.261	-0.115	(0)
Se (-2)	2.590e-14					
Ag2Se	2.590e-14	2.590e-14	-13.587	-13.587	0.000	(0)
HSe-	2.850e-39	2.189e-39	-38.545	-38.660	-0.115	(0)
MnSe	0.000e+00	0.000e+00	-41.273	-41.273	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.308	-42.308	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.663	-46.122	-0.459	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.068	-83.903	-1.834	(0)
Se (4)	1.720e-07					
HSeO3-	1.320e-07	1.014e-07	-6.880	-6.994	-0.115	(0)
SeO3-2	4.004e-08	1.393e-08	-7.397	-7.856	-0.459	(0)
H2SeO3	1.252e-12	1.252e-12	-11.902	-11.902	0.000	(0)
AgSeO3-	2.391e-14	1.837e-14	-13.621	-13.736	-0.115	(0)
Cd(SeO3) 2-2	1.503e-18	5.228e-19	-17.823	-18.282	-0.459	(0)
Ag(SeO3) 2-3	2.465e-20	2.291e-21	-19.608	-20.640	-1.032	(0)
FeHSeO3+2	3.907e-23	1.359e-23	-22.408	-22.867	-0.459	(0)
Se (6)	1.227e-10					
SeO4-2	1.225e-10	5.553e-11	-9.912	-10.255	-0.343	(0)
MnSeO4	2.558e-13	2.558e-13	-12.592	-12.592	0.000	(0)
ZnSeO4	1.436e-14	1.436e-14	-13.843	-13.843	0.000	(0)
NiSeO4	1.076e-15	1.076e-15	-14.968	-14.968	0.000	(0)
CoSeO4	6.855e-16	6.855e-16	-15.164	-15.164	0.000	(0)
HSeO4-	1.050e-16	8.062e-17	-15.979	-16.094	-0.115	(0)
CdSeO4	3.380e-17	3.380e-17	-16.471	-16.471	0.000	(0)
Zn(SeO4) 2-2	2.324e-24	8.086e-25	-23.634	-24.092	-0.459	(0)
Si	7.864e-05					
H4SiO4	7.816e-05	7.907e-05	-4.107	-4.102	0.005	(0)
H3SiO4-	4.838e-07	3.946e-07	-6.315	-6.404	-0.089	(0)
H2SiO4-2	1.828e-12	8.595e-13	-11.738	-12.066	-0.328	(0)
UO2H3SiO4+	1.584e-13	1.216e-13	-12.800	-12.915	-0.115	(0)
SiF6-2	1.168e-26	5.400e-27	-25.933	-26.268	-0.335	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.789	-59.821	-1.032	(0)
U (4)	7.504e-22					
U(OH) 5-	7.497e-22	5.758e-22	-21.125	-21.240	-0.115	(0)
U(OH) 4	6.991e-25	6.991e-25	-24.155	-24.155	0.000	(0)
U(OH) 3+	9.648e-29	7.410e-29	-28.016	-28.130	-0.115	(0)
U(OH) 2+2	2.855e-33	9.933e-34	-32.544	-33.003	-0.459	(0)
UF3+	6.440e-36	4.946e-36	-35.191	-35.306	-0.115	(0)
UF2+2	4.487e-37	1.561e-37	-36.348	-36.807	-0.459	(0)
UF4	1.084e-37	1.084e-37	-36.965	-36.965	0.000	(0)
UOH+3	1.459e-38	1.356e-39	-37.836	-38.868	-1.032	(0)
UF5-	1.119e-39	8.591e-40	-38.951	-39.066	-0.115	(0)
UF+3	6.673e-40	0.000e+00	-39.176	-40.207	-1.032	(0)
UF6-2	1.491e-40	0.000e+00	-39.827	-40.285	-0.459	(0)
U(SO4) 2	1.211e-40	1.211e-40	-39.917	-39.917	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.054	-41.513	-0.459	(0)
U+4	0.000e+00	0.000e+00	-43.974	-45.808	-1.834	(0)
UCl+3	0.000e+00	0.000e+00	-45.442	-46.474	-1.032	(0)

U6(OH) 15+9	0.000e+00	0.000e+00	-169.653	-178.939	-9.286	(0)
U(5)	1.751e-17					
UO2+	1.751e-17	1.345e-17	-16.757	-16.871	-0.115	(0)
U(6)	2.718e-07					
UO2(CO3) 3-4	2.395e-07	3.507e-09	-6.621	-8.455	-1.834	(0)
UO2(CO3) 2-2	3.225e-08	1.122e-08	-7.491	-7.950	-0.459	(0)
UO2CO3	9.016e-11	9.016e-11	-10.045	-10.045	0.000	(0)
UO2OH+	2.067e-13	1.588e-13	-12.685	-12.799	-0.115	(0)
UO2H3SiO4+	1.584e-13	1.216e-13	-12.800	-12.915	-0.115	(0)
UO2F+	1.305e-13	1.002e-13	-12.884	-12.999	-0.115	(0)
UO2F2	5.778e-14	5.778e-14	-13.238	-13.238	0.000	(0)
UO2SO4	2.727e-14	2.727e-14	-13.564	-13.564	0.000	(0)
UO2+2	8.008e-15	3.631e-15	-14.096	-14.440	-0.343	(0)
UO2(SO4) 2-2	5.128e-15	1.784e-15	-14.290	-14.749	-0.459	(0)
UO2F3-	3.778e-15	2.902e-15	-14.423	-14.537	-0.115	(0)
UO2Cl+	3.302e-17	2.536e-17	-16.481	-16.596	-0.115	(0)
UO2F4-2	1.325e-17	4.608e-18	-16.878	-17.336	-0.459	(0)
(UO2) 2 (OH) 2+2	1.203e-19	4.183e-20	-18.920	-19.378	-0.459	(0)
(UO2) 3 (OH) 5+	7.913e-22	6.077e-22	-21.102	-21.216	-0.115	(0)
UO2NO3+	9.832e-23	7.551e-23	-22.007	-22.122	-0.115	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.358	-42.472	-0.115	(0)
V+2	0.000e+00	0.000e+00	-43.064	-43.523	-0.459	(0)
V(3)	3.406e-15					
V(OH) 3	3.406e-15	3.406e-15	-14.468	-14.468	0.000	(0)
V(OH) 2+	8.307e-26	6.380e-26	-25.081	-25.195	-0.115	(0)
VOH+2	5.043e-29	1.754e-29	-28.297	-28.756	-0.459	(0)
V+3	1.084e-33	1.008e-34	-32.965	-33.997	-1.032	(0)
VSO4+	3.074e-34	2.361e-34	-33.512	-33.627	-0.115	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.467	-55.499	-1.032	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-54.878	-56.712	-1.834	(0)
V(4)	3.820e-18					
V(OH) 3+	3.585e-18	2.754e-18	-17.445	-17.560	-0.115	(0)
VO+2	1.143e-19	3.977e-20	-18.942	-19.400	-0.459	(0)
VOF+	6.210e-20	4.769e-20	-19.207	-19.322	-0.115	(0)
VOSO4	5.435e-20	5.435e-20	-19.265	-19.265	0.000	(0)
VOF2	3.575e-21	3.575e-21	-20.447	-20.447	0.000	(0)
VOCl+	6.257e-22	4.805e-22	-21.204	-21.318	-0.115	(0)
VOF3-	3.302e-23	2.536e-23	-22.481	-22.596	-0.115	(0)
VOF4-2	5.883e-26	2.047e-26	-25.230	-25.689	-0.459	(0)
H2V2O4+2	1.094e-30	3.807e-31	-29.961	-30.419	-0.459	(0)
V(5)	9.016e-09					
H2VO4-	7.565e-09	5.810e-09	-8.121	-8.236	-0.115	(0)
HVO4-2	1.448e-09	5.038e-10	-8.839	-9.298	-0.459	(0)
H3VO4	1.683e-12	1.683e-12	-11.774	-11.774	0.000	(0)
H3V2O7-	8.228e-14	6.319e-14	-13.085	-13.199	-0.115	(0)
HV2O7-3	1.068e-14	9.928e-16	-13.971	-15.003	-1.032	(0)
VO4-3	9.380e-16	8.718e-17	-15.028	-16.060	-1.032	(0)
VO2+	1.187e-16	9.744e-17	-15.925	-16.011	-0.086	(0)
V2O7-4	6.299e-17	9.225e-19	-16.201	-18.035	-1.834	(0)
VO2F	3.417e-17	3.417e-17	-16.466	-16.466	0.000	(0)
VO2SO4-	1.503e-17	1.155e-17	-16.823	-16.938	-0.115	(0)
VO2F2-	3.230e-18	2.480e-18	-17.491	-17.606	-0.115	(0)
V3O9-3	2.216e-18	2.059e-19	-17.655	-18.686	-1.032	(0)
VO2F3-2	1.778e-20	6.185e-21	-19.750	-20.209	-0.459	(0)
V4O12-4	3.409e-23	4.992e-25	-22.467	-24.302	-1.834	(0)
VO2F4-3	6.547e-24	6.085e-25	-23.184	-24.216	-1.032	(0)
VO2NO3	5.137e-25	5.137e-25	-24.289	-24.289	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.473	-63.600	-4.127	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.086	-62.952	-2.866	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.448	-65.282	-1.834	(0)
Zn	6.703e-06					
Zn+2	3.683e-06	1.670e-06	-5.434	-5.777	-0.343	(0)
ZnSO4	1.813e-06	1.813e-06	-5.742	-5.742	0.000	(0)
ZnCO3	5.993e-07	5.993e-07	-6.222	-6.222	0.000	(0)
ZnHCO3+	2.650e-07	2.035e-07	-6.577	-6.691	-0.115	(0)
Zn(SO4) 2-2	2.252e-07	7.835e-08	-6.647	-7.106	-0.459	(0)
ZnOH+	7.552e-08	5.800e-08	-7.122	-7.237	-0.115	(0)

ZnCl+	2.215e-08	1.806e-08	-7.655	-7.743	-0.089	(0)
ZnF+	8.673e-09	6.661e-09	-8.062	-8.176	-0.115	(0)
ZnOHCl	8.214e-09	8.214e-09	-8.085	-8.085	0.000	(0)
Zn(OH) 2	3.192e-09	3.192e-09	-8.496	-8.496	0.000	(0)
ZnCl2	1.233e-10	1.233e-10	-9.909	-9.909	0.000	(0)
Zn(OH) 3-	7.236e-12	5.557e-12	-11.141	-11.255	-0.115	(0)
ZnCl3-	5.172e-13	4.218e-13	-12.286	-12.375	-0.089	(0)
ZnNO3+	5.692e-14	4.372e-14	-13.245	-13.359	-0.115	(0)
ZnSeO4	1.436e-14	1.436e-14	-13.843	-13.843	0.000	(0)
ZnCl4-2	1.964e-15	9.085e-16	-14.707	-15.042	-0.335	(0)
Zn(OH) 4-2	2.209e-16	7.684e-17	-15.656	-16.114	-0.459	(0)
Zn(NO3) 2	9.091e-23	9.091e-23	-22.041	-22.041	0.000	(0)
Zn(SeO4) 2-2	2.324e-24	8.086e-25	-23.634	-24.092	-0.459	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.748	-147.863	-0.115	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.391	-149.391	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.213	-224.327	-0.115	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.311	-226.769	-0.459	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.546	-304.004	-0.459	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-51.80	-45.51	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-38.79	-34.28	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-46.01	-34.28	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-67.54	-49.60	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-52.79	-32.76	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-27.59	-27.19	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-22.74	-22.29	0.45	(NH4) 2SeO4
Acanthite	-51.83	-88.05	-36.22	Ag2S
Ag2CO3	-11.49	-22.58	-11.09	Ag2CO3
Ag2CrO4	-20.94	-32.53	-11.59	Ag2CrO4
Ag2HVO4	-12.25	-10.77	1.48	Ag2HVO4
Ag2MoO4	-11.88	-23.43	-11.55	Ag2MoO4
Ag2O	-14.87	-2.30	12.57	Ag2O
Ag2Se	0.20	-48.50	-48.70	Ag2Se
Ag2SeO3	-9.68	-16.83	-7.15	Ag2SeO3
Ag2SeO4	-18.72	-27.63	-8.91	Ag2SeO4
Ag2SO4	-14.86	-19.68	-4.82	Ag2SO4
Ag3AsO3	-28.12	-25.96	2.16	Ag3AsO3
Ag3AsO4	-16.56	-19.35	-2.79	Ag3AsO4
Ag3H2VO5	-17.10	-11.92	5.18	Ag3H2VO5
AgF:4H2O	-13.44	-12.39	1.05	AgF:4H2O
Agmetal	-0.40	-13.90	-13.51	Ag
AgVO3	-10.39	-9.62	0.77	AgVO3
Al(OH) 3 (am)	-1.32	9.48	10.80	Al(OH) 3
Al2(MoO4) 3	-46.79	-44.42	2.37	Al2(MoO4) 3
Al2O3	-0.68	18.97	19.65	Al2O3
Al4(OH) 10SO4	-2.15	20.55	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-11.22	-6.42	4.80	AlAsO4:2H2O
AlOHSO4	-4.67	-7.90	-3.23	AlOHSO4
AlSb	-151.98	-86.35	65.62	AlSb
Alunite	0.12	-1.28	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-3.97	-11.76	-7.79	PbSO4
Anhydrite	-0.83	-5.19	-4.36	CaSO4
Anilite	-55.03	-86.90	-31.88	Cu0.25Cu1.5S
Antlerite	-2.26	6.53	8.79	Cu3(OH) 4SO4
Aragonite	0.21	-8.09	-8.30	CaCO3
Arsenolite	-87.28	-90.04	-2.76	As4O6
Artinite	-5.21	4.39	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-38.51	-31.80	6.71	As2O5
Atacamite	-1.36	6.03	7.39	Cu2(OH) 3Cl
Azurite	0.25	-16.65	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-16.74	7.65	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-17.50	-1.63	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	0.08	-8.83	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-26.92	6.02	32.94	Ba3(VO4) 2:4H2O

BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-9.00	-14.82	-5.82	BaF2
BaMoO4	-6.51	-13.47	-6.96	BaMoO4
Barite	0.26	-9.72	-9.98	BaSO4
BaS	-94.28	-78.10	16.18	BaS
BaSeO3	-8.70	-6.87	1.83	BaSeO3
BaSeO4	-10.21	-17.67	-7.46	BaSeO4
Bianchite	-6.32	-8.08	-1.76	ZnSO4:6H2O
Birnessite	-7.62	10.47	18.09	MnO2
Bixbyite	-3.93	-4.57	-0.64	Mn2O3
BlaubleiI	-54.84	-79.00	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.37	-82.65	-27.28	Cu0.6Cu0.8S
Boehmite	0.91	9.48	8.58	AlOOH
Breithauptite	-56.87	-75.39	-18.52	NiSb
Brochantite	-0.73	14.50	15.22	Cu4(OH)6SO4
Brucite	-4.51	12.34	16.84	Mg(OH)2
Bunsenite	-4.75	7.69	12.45	NiO
Ca(VO3)2	-10.42	-4.76	5.66	Ca(VO3)2
Ca2V2O7	-10.07	7.43	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.12	7.43	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.53	4.77	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.34	19.62	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.24	19.62	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.08	-155.10	142.97	Ca3Sb2
CaCrO4	-15.78	-18.04	-2.27	CaCrO4
Calcite	0.39	-8.09	-8.48	CaCO3
Calomel	-6.84	-24.75	-17.91	Hg2Cl2
CaMoO4	-0.99	-8.94	-7.95	CaMoO4
Carnotite	-3.04	-2.81	0.23	KUO2VO4
CaSeO3:2H2O	-5.16	-2.34	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.12	-13.14	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.01	-2.17	9.84	Cd(BO2)2
Cd(OH)2	-7.05	6.59	13.64	Cd(OH)2
Cd(OH)2(am)	-7.14	6.59	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.70	-14.99	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.17	2.39	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.42	8.98	28.40	Cd4(OH)6SO4
CdCl2	-12.56	-13.22	-0.66	CdCl2
CdCl2:1H2O	-11.52	-13.22	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.31	-13.22	-1.91	CdCl2:2.5H2O
CdF2	-14.67	-15.88	-1.21	CdF2
Cdmetal(alpha)	-32.43	-18.92	13.51	Cd
Cdmetal(gamma)	-32.54	-18.92	13.62	Cd
CdMoO4	-0.39	-14.54	-14.15	CdMoO4
CdOHCl	-6.85	-3.31	3.54	CdOHCl
CdSb	-76.14	-76.49	-0.35	CdSb
CdSe	-19.41	-39.61	-20.20	CdSe
CdSeO4:2H2O	-16.89	-18.74	-1.85	CdSeO4:2H2O
CdSO4	-10.62	-10.79	-0.17	CdSO4
CdSO4:1H2O	-9.06	-10.79	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.92	-10.79	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.30	-11.05	-9.75	AgCl
Cerrusite	-1.53	-14.66	-13.13	PbCO3
CH4(g)	-81.27	-122.32	-41.05	CH4
Chalcanthite	-6.77	-9.41	-2.64	CuSO4:5H2O
Chalcedony	-0.55	-4.10	-3.55	SiO2
Chalcocite	-55.02	-89.94	-34.92	Cu2S
Chalcopyrite	-124.67	-159.94	-35.27	CuFeS2
Chrysotile	-3.39	28.81	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.37	-97.07	-45.69	HgS
Claudetite	-86.98	-90.04	-3.06	As4O6
Clausthalite	-13.48	-40.58	-27.10	PbSe
Co(BO2)2	-28.37	-1.30	27.07	Co(BO2)2
Co(OH)2	-5.63	7.47	13.09	Co(OH)2
Co(OH)3	-9.87	-12.18	-2.31	Co(OH)3
CO2(g)	-2.13	-20.28	-18.15	CO2
Co3(AsO4)2	-22.43	-9.40	13.03	Co3(AsO4)2
Co3O4	-6.39	-16.89	-10.50	Co3O4

CoCl2	-20.61	-12.34	8.27	CoCl2
CoCl2:6H2O	-14.88	-12.34	2.54	CoCl2:6H2O
CoCO3	-2.83	-12.81	-9.98	CoCO3
CoF2	-13.41	-15.01	-1.60	CoF2
CoF3	-44.43	-45.89	-1.46	CoF3
CoFe2O4	17.63	14.11	-3.53	CoFe2O4
CoMoO4	-5.90	-13.66	-7.76	CoMoO4
CoO	-6.12	7.47	13.59	CoO
CoS (alpha)	-70.85	-78.29	-7.44	CoS
CoS (beta)	-67.22	-78.29	-11.07	CoS
CoSe	-22.53	-38.73	-16.20	CoSe
CoSeO3	-8.38	-7.06	1.32	CoSeO3
CoSeO4:6H2O	-16.34	-17.87	-1.53	CoSeO4:6H2O
CoSO4	-12.72	-9.91	2.80	CoSO4
CoSO4:6H2O	-7.44	-9.92	-2.47	CoSO4:6H2O
Cotunnite	-9.41	-14.19	-4.78	PbCl2
Covellite	-55.49	-77.79	-22.30	CuS
Cr (OH) 2	-21.75	-10.93	10.82	Cr (OH) 2
Cr (OH) 3	-2.46	-1.12	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.37	-1.12	-0.75	Cr (OH) 3
Cr2O3	0.12	-2.24	-2.36	Cr2O3
CrCl2	-44.83	-30.73	14.09	CrCl2
CrCl3	-45.95	-30.83	15.11	CrCl3
CrF3	-23.49	-34.83	-11.34	CrF3
Cristobalite	-0.75	-4.10	-3.35	SiO2
Crmetal	-66.92	-36.44	30.48	Cr
CrO3	-27.02	-30.23	-3.21	CrO3
Cryolite	-7.24	-41.08	-33.84	Na3AlF6
Cu (OH) 2	-0.71	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.85	20.36	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.83	0.42	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.08	-89.96	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.59	-50.39	-45.80	Cu2Se
Cu2SO4	-19.62	-21.57	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.99	-7.89	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.53	-102.12	-42.59	Cu3Sb
Cu3Se2	-25.12	-88.62	-63.49	Cu3Se2
CuCO3	-0.81	-12.31	-11.50	CuCO3
CuCrO4	-16.82	-22.26	-5.44	CuCrO4
CuF	-8.43	-13.33	-4.91	CuF
CuF2	-15.62	-14.50	1.12	CuF2
CuF2:2H2O	-9.96	-14.51	-4.55	CuF2:2H2O
Cumetal	-6.09	-14.85	-8.76	Cu
CuMoO4	-0.08	-13.16	-13.08	CuMoO4
CuOCuSO4	-11.74	-1.44	10.30	CuOCuSO4
Cupricferrite	8.62	14.61	5.99	CuFe2O4
Cuprite	-2.78	-4.19	-1.41	Cu2O
Cuprousferrite	10.14	1.22	-8.92	CuFeO2
CuSe	-5.13	-38.23	-33.10	CuSe
CuSe2	-25.55	-58.92	-33.37	CuSe2
CuSeO3:2H2O	-7.07	-6.56	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.92	-17.36	-2.44	CuSeO4:5H2O
CuSO4	-12.35	-9.41	2.94	CuSO4
Diaspore	2.61	9.48	6.87	AlOOH
Djurleite	-55.22	-89.14	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.51	-16.03	-16.54	CaMg (CO3) 2
Dolomite (ordered)	1.06	-16.03	-17.09	CaMg (CO3) 2
Epsomite	-2.92	-5.04	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.97	3.60	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.39	0.35	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.63	-13.35	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.45	-7.89	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.33	-36.96	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.77	-45.50	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-9.99	10.23	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.98	-12.58	0.40	FeAsO4:2H2O
FeCr2O4	-5.84	1.36	7.20	FeCr2O4
FeMoO4	-7.44	-17.53	-10.09	FeMoO4

Ferrihydrite	0.13	3.32	3.19	Fe (OH) 3
Ferroselite	-44.69	-63.29	-18.60	FeSe2
FeS (ppt)	-79.21	-82.16	-2.95	FeS
FeSe	-31.60	-42.60	-11.00	FeSe
Fix_pe	-5.22	-5.22	0.00	e-
Fluorite	0.22	-10.28	-10.50	CaF2
Galena	-66.16	-80.13	-13.97	PbS
Gibbsite	1.19	9.48	8.29	Al (OH) 3
Goethite	2.83	3.32	0.49	FeOOH
Goslarite	-6.07	-8.08	-2.01	ZnSO4:7H2O
Greenalite	-18.22	2.59	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.80	-79.16	-14.36	CdS
Greigite	-287.75	-332.78	-45.03	Fe3S4
Gummite	-7.04	0.64	7.67	UO3
Gypsum	-0.58	-5.19	-4.61	CaSO4:2H2O
H-Jarosite	-12.70	-24.80	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.25	-21.13	-12.88	H2MoO4
H2S (g)	-77.74	-85.75	-8.01	H2S
H2Se (g)	-41.24	-46.20	-4.96	H2Se
Halite	-5.89	-4.28	1.60	NaCl
Halloysite	1.19	10.77	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.59	56.44	61.03	Mn3O4
Hematite	8.06	6.64	-1.42	Fe2O3
Hercynite	-0.33	22.57	22.89	FeAl2O4
Hg (CH3) 2 (g)	-182.24	-255.94	-73.71	Hg (CH3) 2
Hg (g)	-7.35	-15.23	-7.87	Hg
Hg (OH) 2	-7.82	-11.31	-3.50	Hg (OH) 2
Hg2 (g)	-15.50	-30.45	-14.96	Hg2
Hg2 (OH) 2	-10.21	-4.95	5.26	Hg2 (OH) 2
Hg2CO3	-9.18	-25.23	-16.05	Hg2CO3
Hg2CrO4	-26.48	-35.18	-8.70	Hg2CrO4
Hg2F2	-17.06	-27.42	-10.36	Hg2F2
Hg2S	-79.02	-90.70	-11.68	Hg2S
Hg2SeO3	-14.82	-19.48	-4.66	Hg2SeO3
Hg2SO4	-16.20	-22.33	-6.13	Hg2SO4
Hg3O2CO3	-24.53	-54.21	-29.68	Hg3O2CO3
HgCl (g)	-31.87	-12.38	19.50	HgCl
HgCl2	-9.86	-31.12	-21.26	HgCl2
HgF (g)	-46.39	-13.71	32.68	HgF
HgF2 (g)	-46.35	-33.79	12.57	HgF2
Hgmetal (l)	-1.78	-15.23	-13.45	Hg
HgSe	-1.81	-57.51	-55.69	HgSe
HgSeO3	-13.41	-25.84	-12.43	HgSeO3
HgSO4	-19.27	-28.69	-9.42	HgSO4
Huntite	-1.95	-31.92	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.93	-23.70	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.67	-19.43	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.09	-20.26	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-4.98	-19.78	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.17	-50.42	-17.24	K2Cr2O7
K2CrO4	-19.67	-20.18	-0.51	K2CrO4
K2MoO4	-14.34	-11.08	3.26	K2MoO4
K2SeO4	-14.55	-15.28	-0.73	K2SeO4
Kaolinite	3.33	10.77	7.43	Al2Si2O5 (OH) 4
Langite	-2.99	14.50	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.70	-6.14	-0.43	PbO:PbSO4
Laurionite	-4.91	-4.28	0.62	PbOHCl
Lepidocrocite	1.95	3.32	1.37	FeOOH
Lime	-20.51	12.19	32.70	CaO
Litharge	-7.07	5.62	12.69	PbO
Mackinawite	-78.56	-82.16	-3.60	FeS
Maghemite	0.25	6.64	6.39	Fe2O3
Magnesioferrite	2.12	18.98	16.86	Fe2MgO4
Magnesite	-0.48	-7.94	-7.46	MgCO3
Magnetite	6.83	10.24	3.40	Fe3O4
Malachite	0.96	-4.34	-5.31	Cu2 (OH) 2CO3
Manganite	-2.28	23.06	25.34	MnOOH
Massicot	-7.27	5.62	12.89	PbO

Matlockite	-6.55	-15.52	-8.97	PbClF
Melanothallite	-18.10	-11.84	6.26	CuCl2
Melanterite	-11.58	-13.79	-2.21	FeSO4:7H2O
Metacinnabar	-51.97	-97.07	-45.09	HgS
Mg(OH)2 (active)	-6.46	12.34	18.79	Mg(OH)2
Mg(VO3)2	-15.89	-4.61	11.28	Mg(VO3)2
Mg2Sb3	-273.75	-199.06	74.68	Mg2Sb3
Mg2V2O7	-18.63	7.73	26.36	Mg2V2O7
MgCr2O4	-6.10	10.10	16.20	MgCr2O4
MgCrO4	-23.27	-17.89	5.38	MgCrO4
MgF2	-2.01	-10.14	-8.13	MgF2
MgMoO4	-6.94	-8.79	-1.85	MgMoO4
MgSeO3:6H2O	-5.25	-2.20	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.80	-13.00	-1.20	MgSeO4:6H2O
Minium	-31.15	42.37	73.52	Pb3O4
Mirabilite	-5.03	-6.15	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.54	-6.64	4.90	Mn(VO3)2
Mn2(SO4)3	-51.00	-56.71	-5.71	Mn2(SO4)3
Mn2Sb	-149.05	-87.97	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.38	-0.88	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.21	-9.50	2.72	MnCl2:4H2O
MnS (grn)	-75.62	-75.45	0.17	MnS
MnS (pnk)	-78.79	-75.45	3.34	MnS
MnSb	-95.21	-98.12	-2.91	MnSb
MnSe	-39.39	-35.89	3.50	MnSe
MnSeO3	-5.35	-4.22	1.13	MnSeO3
MnSeO3:2H2O	-5.21	-4.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.97	-15.02	-2.05	MnSeO4:5H2O
MnSO4	-9.65	-7.07	2.58	MnSO4
Monteponite	-8.51	6.59	15.10	CdO
Montroydite	-7.67	-11.31	-3.64	HgO
MoO3	-13.13	-21.13	-8.00	MoO3
Morenosite	-7.54	-9.69	-2.14	NiSO4:7H2O
MoS2	-147.89	-218.15	-70.26	MoS2
Na-Jarosite	-7.98	-19.18	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.33	-49.23	-9.90	Na2Cr2O7
Na2CrO4	-21.92	-18.99	2.93	Na2CrO4
Na2Mo2O7	-14.42	-31.02	-16.60	Na2Mo2O7
Na2MoO4	-11.38	-9.89	1.49	Na2MoO4
Na2MoO4:2H2O	-11.12	-9.89	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.60	-3.30	10.30	Na2SeO3:5H2O
Na2SeO4	-15.37	-14.09	1.28	Na2SeO4
Na3Sb	-173.43	-78.98	94.45	Na3Sb
Na3VO4	-28.30	8.38	36.68	Na3VO4
Na4V2O7	-31.87	5.53	37.40	Na4V2O7
Nantokite	-5.27	-12.00	-6.73	CuCl
NaSb	-87.88	-64.71	23.17	NaSb
Natron	-7.73	-9.05	-1.31	Na2CO3:10H2O
NaVO3	-6.71	-2.85	3.86	NaVO3
Nesquehonite	-3.27	-7.94	-4.67	MgCO3:3H2O
Ni(OH)2	-5.10	7.69	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.42	-8.72	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.61	13.39	32.00	Ni4(OH)6SO4
NiCO3	-5.72	-12.59	-6.87	NiCO3
NiMoO4	-2.29	-13.44	-11.14	NiMoO4
NiS (alpha)	-72.46	-78.06	-5.60	NiS
NiS (beta)	-66.96	-78.06	-11.10	NiS
NiS (gamma)	-65.26	-78.06	-12.80	NiS
NiSe	-20.80	-38.50	-17.70	NiSe
NiSeO3:2H2O	-9.65	-6.84	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.12	-17.64	-1.52	NiSeO4:6H2O
Nsutite	-7.04	10.47	17.50	MnO2
O2 (g)	-32.07	51.02	83.09	O2
Orpiment	-241.22	-302.28	-61.07	As2S3
Otavite	-1.69	-13.69	-12.00	CdCO3
Pb(BO2)2	-9.66	-3.14	6.52	Pb(BO2)2
Pb(OH)2	-2.53	5.62	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-56.72	-65.48	-8.76	Pb10(OH)60(CO3)6

Pb2 (OH) 3Cl	-7.46	1.34	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.95	11.24	26.19	Pb2O (OH) 2
Pb2O3	-24.29	36.75	61.04	Pb2O3
Pb2OCO3	-8.48	-9.04	-0.56	Pb2OCO3
Pb2V2O7	-3.81	-5.71	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.74	-14.94	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-6.22	-0.08	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.44	-3.42	11.02	Pb3O2CO3
Pb3O2SO4	-11.20	-0.52	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.00	5.10	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.78	5.10	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-9.41	-16.85	-7.44	PbF2
Pbmetal	-24.13	-19.89	4.25	Pb
PbMoO4	0.11	-15.51	-15.62	PbMoO4
PbO:0.3H2O	-7.36	5.62	12.98	PbO:0.33H2O
PbSeO4	-12.87	-19.71	-6.84	PbSeO4
Periclase	-9.25	12.34	21.58	MgO
Phosgenite	-9.04	-28.85	-19.81	PbCl2:PbCO3
Plattnerite	-18.47	31.13	49.60	PbO2
Portlandite	-10.61	12.19	22.80	Ca (OH) 2
Pyrite	-123.90	-142.40	-18.51	FeS2
Pyrochroite	-4.89	10.31	15.19	Mn (OH) 2
Pyrolusite	-5.56	35.82	41.38	MnO2
Quartz	-0.10	-4.10	-4.00	SiO2
Realgar	-101.27	-121.02	-19.75	AsS
Retgersite	-7.65	-9.69	-2.04	NiSO4:6H2O
Rhodochrosite	0.61	-9.97	-10.58	MnCO3
Rutherfordine	-5.15	-19.65	-14.50	UO2CO3
Sb (OH) 3	-12.20	-19.31	-7.11	Sb (OH) 3
Sb2O4	-16.52	-13.11	3.40	Sb2O4
Sb2O5	-26.56	-36.23	-9.67	Sb2O5
Sb2Se3	-109.46	-177.22	-67.76	Sb2Se3
Sb4O6(cubic)	-58.99	-77.25	-18.26	Sb4O6
Sb4O6(orth)	-59.35	-77.25	-17.90	Sb4O6
SbCl3	-49.59	-49.02	0.57	SbCl3
SbF3	-42.80	-53.02	-10.23	SbF3
Sbmetal	-45.89	-57.57	-11.69	Sb
SbO2	-3.04	-30.87	-27.82	SbO2
Schoepite	-5.36	0.64	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.58	-20.69	-7.11	Se
Semetal (hex)	-12.98	-20.69	-7.71	Se
Senarmontite	-26.26	-38.62	-12.37	Sb2O3
SeO2	-14.66	-14.53	0.12	SeO2
SeO3	-46.38	-25.33	21.04	SeO3
Sepiolite	-3.39	12.37	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-6.41	12.37	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.44	-16.68	-10.24	FeCO3
SiO2 (am-gel)	-1.39	-4.10	-2.71	SiO2
SiO2 (am-ppt)	-1.36	-4.10	-2.74	SiO2
Smithsonite	-0.98	-10.98	-10.00	ZnCO3
Sphalerite	-65.01	-76.46	-11.45	ZnS
Spinel	-5.54	31.31	36.85	MgAl2O4
Stibnite	-245.43	-295.89	-50.46	Sb2S3
Sulfur	-58.10	-60.25	-2.14	S
Tenorite	0.33	7.97	7.64	CuO
Thenardite	-6.46	-6.14	0.32	Na2SO4
Thermonatrite	-9.68	-9.04	0.64	Na2CO3:H2O
Tyuyamunite	-7.56	-3.48	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-17.04	4.05	21.08	U3O8
U3Sb4	-582.70	-430.32	152.38	U3Sb4
U4O9	-34.10	-37.12	-3.02	U4O9
UF4	-31.07	-60.60	-29.54	UF4
UF4:2.5H2O	-27.89	-60.61	-32.72	UF4:2.5H2O
UO2 (am)	-16.59	-15.66	0.93	UO2
UO2 (NO3) 2	-42.55	-30.40	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.26	-30.40	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.80	-30.41	3.39	UO2 (NO3) 2:3H2O

UO2(NO3)2:6H2O	-32.45	-30.41	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.98	0.64	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.45	-24.70	-2.25	UO2SeO4:4H2O
UO3	-7.06	0.64	7.70	UO3
Uraninite	-10.99	-15.66	-4.67	UO2
USb2	-220.62	-191.04	29.58	USb2
V(OH)3	-18.97	-11.38	7.59	V(OH)3
V2O5	-15.59	-16.95	-1.36	V2O5
V3O5	-40.32	-38.48	1.84	V3O5
V4O7	-49.99	-42.81	7.19	V4O7
V6O13	-41.00	-101.86	-60.86	V6O13
Valentinite	-30.14	-38.62	-8.48	Sb2O3
VC12	-62.82	-43.94	18.87	VC12
VC13	-64.53	-41.09	23.43	VC13
VF4	-64.20	-49.27	14.93	VF4
Vmetal	-93.67	-49.65	44.03	V
VO	-38.89	-24.14	14.76	VO
VO(OH)2	-9.48	-4.33	5.15	VO(OH)2
VO2Cl	-21.22	-18.38	2.84	VO2Cl
VOC1	-32.44	-21.29	11.15	VOC1
VOC12	-36.89	-24.13	12.76	VOC12
VOSO4	-25.31	-21.70	3.61	VOSO4
Witherite	-4.05	-12.62	-8.57	BaCO3
Wurtzite	-67.51	-76.46	-8.95	ZnS
Zincite	-2.04	9.30	11.33	ZnO
Zincosite	-12.01	-8.08	3.93	ZnSO4
Zn(BO2)2	-7.76	0.53	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.06	-21.74	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.90	9.30	12.20	Zn(OH)2
Zn(OH)2(am)	-3.18	9.30	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.46	9.30	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.24	9.30	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.44	9.30	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.28	1.22	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.50	8.69	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.56	-3.91	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.78	-6.86	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.59	19.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.82	26.68	38.50	Zn5(OH)8Cl2
ZnCl2	-17.56	-10.51	7.05	ZnCl2
ZnCO3:1H2O	-0.72	-10.98	-10.26	ZnCO3:1H2O
ZnF2	-12.64	-13.18	-0.53	ZnF2
Znmetal	-42.00	-16.21	25.79	Zn
ZnMoO4	-1.71	-11.83	-10.13	ZnMoO4
ZnO(active)	-1.89	9.30	11.19	ZnO
ZnS(am)	-67.40	-76.46	-9.05	ZnS
ZnSb	-84.80	-73.78	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-14.52	-16.04	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.44	-8.08	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 129.

Title Precipitate oversaturated phases
PHASES
Fix_pe
e--e-
log_k 0
EQUILIBRIUM_PHASES 705

```

Ag2Se 0 0
Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3·2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2·8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 713
SAVE Solution 714 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 705
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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```

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 713. Solution after simulation 128.
Using pure phase assemblage 705.

```

-----Phase assemblage-----

```

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-0.00	-48.70	-48.70	0.000e+00	6.134e-09	6.134e-09
Alunite	-3.46	-4.86	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.05	-5.41	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	7.254e-11	7.254e-11
Barite	0.00	-9.98	-9.98	0.000e+00	4.267e-08	4.267e-08
Brochantite	0.00	15.22	15.22	0.000e+00	7.199e-07	7.199e-07
Brucite	-3.28	13.57	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	2.294e-03
CaMoO4	-1.23	-9.18	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-5.03	-2.22	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.992e-03	1.992e-03
Carnotite	-1.52	-1.29	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-10.86	-1.02	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.38	-14.53	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	0.000e+00	1.084e-05	1.084e-05
Cr2O3	0.00	-2.36	-2.36	0.000e+00	1.232e-09	1.232e-09
Cu2Se(alpha)	-4.62	-50.42	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.82	-13.90	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.89	-5.02	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	0.000e+00	1.634e-09	1.634e-09
Fluorite	-0.03	-10.53	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.35	2.32	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.80	-5.41	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.74	-58.43	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.00	-6.11	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.96	-3.83	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.81	8.98	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-23.47	-7.77	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.80	-12.67	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.22	-13.37	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.818e-06
Otavite	-1.83	-13.83	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	3.815e-09	3.815e-09
Rutherfordine	-4.82	-19.32	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.67	-31.49	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.67	2.32	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.38	14.38	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.51	-4.25	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-4.77	-0.69	4.08	0.000e+00	0	0.000e+00
U3O8	-12.01	9.07	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.29	2.32	5.61	0.000e+00	0	0.000e+00
UO3	-5.38	2.32	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.70	-11.82	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	1.742e-08	1.740e-08
Al	2.732e-06	2.729e-06
As	1.591e-10	1.590e-10
B	4.213e-05	4.208e-05
Ba	4.299e-08	4.295e-08
C	8.855e-04	8.846e-04
Ca	2.482e-03	2.479e-03
Cd	1.407e-08	1.406e-08
Cl	5.248e-03	5.243e-03
Co	1.083e-07	1.082e-07
Cr	9.034e-10	9.025e-10
Cu	5.340e-07	5.334e-07
F	2.990e-04	2.987e-04
Fe	8.317e-10	8.309e-10
Hg	2.219e-09	2.217e-09
K	3.866e-03	3.862e-03

Mg	5.803e-03	5.797e-03
Mn	6.620e-05	6.614e-05
Mo	1.945e-06	1.943e-06
N	1.620e-05	1.619e-05
Na	1.512e-02	1.510e-02
Ni	1.687e-07	1.686e-07
Pb	6.577e-09	6.571e-09
S	1.461e-02	1.460e-02
Sb	2.964e-08	2.961e-08
Se	1.660e-07	1.658e-07
Si	5.695e-05	5.689e-05
U	2.718e-07	2.715e-07
V	9.015e-09	9.007e-09
Zn	6.702e-06	6.696e-06

-----Description of solution-----

	pH	=	8.152	Charge balance
	pe	=	4.621	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.669e-02	
	Mass of water (kg)	=	9.990e-01	
	Total alkalinity (eq/kg)	=	9.199e-04	
	Total CO2 (mol/kg)	=	8.855e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.915e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	8	
	Total H	=	1.109093e+02	
	Total O	=	5.551547e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.748e-06	1.426e-06	-5.758	-5.846	-0.088	(0)
H+	8.550e-09	7.054e-09	-8.068	-8.152	-0.083	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	1.742e-08					
AgCl	1.060e-08	1.060e-08	-7.975	-7.975	0.000	(0)
AgCl2-	5.153e-09	3.998e-09	-8.288	-8.398	-0.110	(0)
Ag+	1.453e-09	1.199e-09	-8.838	-8.921	-0.083	(0)
AgSO4-	1.628e-10	1.263e-10	-9.788	-9.899	-0.110	(0)
AgCl3-2	4.258e-11	1.543e-11	-10.371	-10.812	-0.441	(0)
AgNO2	3.275e-12	3.275e-12	-11.485	-11.485	0.000	(0)
AgCl4-3	1.339e-12	1.364e-13	-11.873	-12.865	-0.992	(0)
AgF	6.083e-13	6.083e-13	-12.216	-12.216	0.000	(0)
AgOH	1.710e-13	1.710e-13	-12.767	-12.767	0.000	(0)
AgH2BO3	5.969e-14	5.969e-14	-13.224	-13.224	0.000	(0)
AgSeO3-	3.262e-14	2.531e-14	-13.486	-13.597	-0.110	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	1.237e-14	9.599e-15	-13.908	-14.018	-0.110	(0)
Ag(NO2)2-	8.548e-17	6.632e-17	-16.068	-16.178	-0.110	(0)
Ag(OH)2-	3.072e-17	2.383e-17	-16.513	-16.623	-0.110	(0)
AgNO3	1.175e-17	1.175e-17	-16.930	-16.930	0.000	(0)
Ag(NH3)2+	3.944e-19	3.060e-19	-18.404	-18.514	-0.110	(0)
Ag(SeO3)2-3	7.308e-20	7.446e-21	-19.136	-20.128	-0.992	(0)
Ag2MoO4	4.905e-25	4.905e-25	-24.309	-24.309	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.055	-74.055	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-81.231	-82.994	-1.763	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.021	-148.234	-0.214	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-148.792	-148.902	-0.110	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-149.135	-149.523	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.467	-149.834	-0.367	(0)
Al	2.732e-06					

Al (OH) 4-	2.719e-06	2.243e-06	-5.566	-5.649	-0.084	(0)
Al (OH) 3	1.249e-08	1.249e-08	-7.903	-7.903	0.000	(0)
Al (OH) 2+	5.273e-10	4.390e-10	-9.278	-9.358	-0.080	(0)
AlF3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
AlF2+	5.301e-11	4.413e-11	-10.276	-10.355	-0.080	(0)
AlF4-	1.377e-11	1.136e-11	-10.861	-10.945	-0.084	(0)
AlF+2	1.143e-12	5.487e-13	-11.942	-12.261	-0.319	(0)
AlOH+2	8.071e-13	3.875e-13	-12.093	-12.412	-0.319	(0)
AlSO4+	1.349e-14	1.113e-14	-13.870	-13.953	-0.084	(0)
Al+3	1.532e-15	2.717e-16	-14.815	-15.566	-0.751	(0)
Al (SO4) 2-	7.633e-16	6.297e-16	-15.117	-15.201	-0.084	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.760	-45.752	-0.992	(0)
As (3)	1.088e-24					
H3AsO3	9.944e-25	9.944e-25	-24.002	-24.002	0.000	(0)
H2AsO3-	9.317e-26	7.229e-26	-25.031	-25.141	-0.110	(0)
HAsO3-2	2.579e-29	9.346e-30	-28.589	-29.029	-0.441	(0)
H4AsO3+	4.479e-33	3.475e-33	-32.349	-32.459	-0.110	(0)
AsO3-3	5.012e-34	5.107e-35	-33.300	-34.292	-0.992	(0)
As (5)	1.591e-10					
HAsO4-2	1.542e-10	5.589e-11	-9.812	-10.253	-0.441	(0)
H2AsO4-	4.634e-12	3.596e-12	-11.334	-11.444	-0.110	(0)
AsO4-3	2.459e-13	2.505e-14	-12.609	-13.601	-0.992	(0)
H3AsO4	4.361e-18	4.408e-18	-17.360	-17.356	0.005	(0)
B	4.213e-05					
H3BO3	3.775e-05	3.816e-05	-4.423	-4.418	0.005	(0)
H2BO3-	3.897e-06	3.141e-06	-5.409	-5.503	-0.094	(0)
MgH2BO3+	2.483e-07	2.001e-07	-6.605	-6.699	-0.094	(0)
CaH2BO3+	1.641e-07	1.323e-07	-6.785	-6.879	-0.094	(0)
NaH2BO3	6.038e-08	6.038e-08	-7.219	-7.219	0.000	(0)
BF (OH) 3-	3.815e-09	3.076e-09	-8.418	-8.512	-0.094	(0)
H5 (BO3) 2-	1.266e-10	1.020e-10	-9.898	-9.991	-0.094	(0)
BaH2BO3+	2.389e-12	1.926e-12	-11.622	-11.715	-0.094	(0)
BF2 (OH) 2-	5.817e-13	4.689e-13	-12.235	-12.329	-0.094	(0)
H8 (BO3) 3-	4.830e-13	3.893e-13	-12.316	-12.410	-0.094	(0)
AgH2BO3	5.969e-14	5.969e-14	-13.224	-13.224	0.000	(0)
BF3OH-	3.227e-19	2.601e-19	-18.491	-18.585	-0.094	(0)
BF4-	2.264e-24	1.825e-24	-23.645	-23.739	-0.094	(0)
Ba	4.299e-08					
Ba+2	4.279e-08	1.983e-08	-7.369	-7.703	-0.334	(0)
BaHCO3+	1.541e-10	1.290e-10	-9.812	-9.889	-0.077	(0)
BaCO3	4.604e-11	4.604e-11	-10.337	-10.337	0.000	(0)
BaH2BO3+	2.389e-12	1.926e-12	-11.622	-11.715	-0.094	(0)
BaOH+	1.489e-13	1.235e-13	-12.827	-12.908	-0.081	(0)
BaNO3+	1.580e-15	1.226e-15	-14.801	-14.911	-0.110	(0)
BaNH3+2	1.354e-16	4.908e-17	-15.868	-16.309	-0.441	(0)
C (4)	8.855e-04					
HCO3-	8.182e-04	6.811e-04	-3.087	-3.167	-0.080	(0)
MgHCO3+	1.560e-05	1.280e-05	-4.807	-4.893	-0.086	(0)
CaHCO3+	1.109e-05	9.278e-06	-4.955	-5.033	-0.077	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.765e-06	4.526e-06	-5.010	-5.344	-0.334	(0)
MgCO3	6.917e-06	6.917e-06	-5.160	-5.160	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	4.644e-06	4.644e-06	-5.333	-5.333	0.000	(0)
NaCO3-	1.228e-06	1.022e-06	-5.911	-5.991	-0.080	(0)
ZnCO3	4.362e-07	4.362e-07	-6.360	-6.360	0.000	(0)
CuCO3	3.748e-07	3.748e-07	-6.426	-6.426	0.000	(0)
MnHCO3+	2.905e-07	2.408e-07	-6.537	-6.618	-0.081	(0)
UO2 (CO3) 3-4	2.245e-07	3.872e-09	-6.649	-8.412	-1.763	(0)
UO2 (CO3) 2-2	4.710e-08	1.707e-08	-7.327	-7.768	-0.441	(0)
ZnHCO3+	4.649e-08	3.607e-08	-7.333	-7.443	-0.110	(0)
Cu (CO3) 2-2	1.260e-08	4.566e-09	-7.900	-8.340	-0.441	(0)
NiCO3	8.062e-09	8.062e-09	-8.094	-8.094	0.000	(0)
NiHCO3+	5.167e-09	4.009e-09	-8.287	-8.397	-0.110	(0)
PbCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)
CoCO3	2.059e-09	2.059e-09	-8.686	-8.686	0.000	(0)
CoHCO3+	1.837e-09	1.425e-09	-8.736	-8.846	-0.110	(0)
CuHCO3+	7.789e-10	6.043e-10	-9.109	-9.219	-0.110	(0)

		CdCO3	3.354e-10	3.354e-10	-9.474	-9.474	0.000	(0)
		UO2CO3	1.890e-10	1.890e-10	-9.724	-9.724	0.000	(0)
		PbHCO3+	1.735e-10	1.347e-10	-9.761	-9.871	-0.110	(0)
		BaHCO3+	1.541e-10	1.290e-10	-9.812	-9.889	-0.077	(0)
		Pb (CO3) 2-2	1.304e-10	4.726e-11	-9.885	-10.326	-0.441	(0)
		BaCO3	4.604e-11	4.604e-11	-10.337	-10.337	0.000	(0)
		CdHCO3+	6.498e-12	5.041e-12	-11.187	-11.297	-0.110	(0)
		Cd (CO3) 2-2	3.106e-12	1.125e-12	-11.508	-11.949	-0.441	(0)
		HgCO3	2.262e-15	2.262e-15	-14.645	-14.645	0.000	(0)
		FeHCO3+	1.442e-15	1.207e-15	-14.841	-14.918	-0.077	(0)
		Hg (CO3) 2-2	8.936e-17	3.238e-17	-16.049	-16.490	-0.441	(0)
		HgHCO3+	3.830e-19	2.972e-19	-18.417	-18.527	-0.110	(0)
Ca	2.482e-03							
		Ca+2	1.578e-03	7.316e-04	-2.802	-3.136	-0.334	(0)
		CaSO4	8.848e-04	8.848e-04	-3.053	-3.053	0.000	(0)
		CaHCO3+	1.109e-05	9.278e-06	-4.955	-5.033	-0.077	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	1.945e-06	1.613e-06	-5.711	-5.792	-0.081	(0)
		CaH2BO3+	1.641e-07	1.323e-07	-6.785	-6.879	-0.094	(0)
		CaOH+	2.487e-08	2.082e-08	-7.604	-7.682	-0.077	(0)
		CaNO3+	3.678e-11	2.854e-11	-10.434	-10.545	-0.110	(0)
		CaNH3+2	9.967e-12	3.612e-12	-11.001	-11.442	-0.441	(0)
		Ca (NH3) 2+2	1.556e-20	5.639e-21	-19.808	-20.249	-0.441	(0)
Cd	1.407e-08							
		Cd+2	7.014e-09	3.251e-09	-8.154	-8.488	-0.334	(0)
		CdSO4	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
		CdCl+	1.733e-09	1.345e-09	-8.761	-8.871	-0.110	(0)
		Cd (SO4) 2-2	7.907e-10	2.865e-10	-9.102	-9.543	-0.441	(0)
		CdCO3	3.354e-10	3.354e-10	-9.474	-9.474	0.000	(0)
		CdOHC1	7.866e-11	7.866e-11	-10.104	-10.104	0.000	(0)
		CdOH+	4.747e-11	3.683e-11	-10.324	-10.434	-0.110	(0)
		CdCl2	2.427e-11	2.427e-11	-10.615	-10.615	0.000	(0)
		CdF+	1.341e-11	1.041e-11	-10.872	-10.983	-0.110	(0)
		CdHCO3+	6.498e-12	5.041e-12	-11.187	-11.297	-0.110	(0)
		Cd (CO3) 2-2	3.106e-12	1.125e-12	-11.508	-11.949	-0.441	(0)
		Cd (OH) 2	3.315e-13	3.315e-13	-12.480	-12.480	0.000	(0)
		CdCl3-	8.548e-14	6.632e-14	-13.068	-13.178	-0.110	(0)
		CdF2	4.195e-15	4.195e-15	-14.377	-14.377	0.000	(0)
		CdNO3+	1.635e-16	1.268e-16	-15.787	-15.897	-0.110	(0)
		CdSeO4	8.616e-17	8.616e-17	-16.065	-16.065	0.000	(0)
		Cd (OH) 3-	3.723e-17	2.888e-17	-16.429	-16.539	-0.110	(0)
		Cd (SeO3) 2-2	7.980e-18	2.892e-18	-17.098	-17.539	-0.441	(0)
		Cd2OH+3	5.890e-18	6.002e-19	-17.230	-18.222	-0.992	(0)
		Cd (OH) 4-2	1.861e-23	6.743e-24	-22.730	-23.171	-0.441	(0)
		Cd (NO3) 2	7.841e-25	7.841e-25	-24.106	-24.106	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-79.318	-79.428	-0.110	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-151.171	-151.171	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-228.109	-228.219	-0.110	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-304.530	-304.971	-0.441	(0)
Cl	5.248e-03							
		Cl-	5.248e-03	4.330e-03	-2.280	-2.363	-0.083	(0)
		MnCl+	1.165e-07	9.662e-08	-6.934	-7.015	-0.081	(0)
		ZnOHC1	3.401e-08	3.401e-08	-7.468	-7.468	0.000	(0)
		ZnCl+	2.220e-08	1.822e-08	-7.654	-7.740	-0.086	(0)
		AgCl	1.060e-08	1.060e-08	-7.975	-7.975	0.000	(0)
		AgCl2-	5.153e-09	3.998e-09	-8.288	-8.398	-0.110	(0)
		CdCl+	1.733e-09	1.345e-09	-8.761	-8.871	-0.110	(0)
		CuCl2-	9.908e-10	8.131e-10	-9.004	-9.090	-0.086	(0)
		CuCl	8.987e-10	8.987e-10	-9.046	-9.046	0.000	(0)
		NiCl+	6.818e-10	5.290e-10	-9.166	-9.277	-0.110	(0)
		MnCl2	5.910e-10	5.910e-10	-9.228	-9.228	0.000	(0)
		CoCl+	5.195e-10	4.031e-10	-9.284	-9.395	-0.110	(0)
		ZnCl2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
		CuCl+	1.176e-10	9.651e-11	-9.930	-10.015	-0.086	(0)
		CdOHC1	7.866e-11	7.866e-11	-10.104	-10.104	0.000	(0)
		PbCl+	5.269e-11	4.088e-11	-10.278	-10.388	-0.110	(0)
		AgCl3-2	4.258e-11	1.543e-11	-10.371	-10.812	-0.441	(0)
		CdCl2	2.427e-11	2.427e-11	-10.615	-10.615	0.000	(0)

HgClOH	4.556e-12	4.556e-12	-11.341	-11.341	0.000	(0)
CuCl3-2	1.592e-12	7.528e-13	-11.798	-12.123	-0.325	(0)
AgCl4-3	1.339e-12	1.364e-13	-11.873	-12.865	-0.992	(0)
MnCl3-	8.501e-13	7.049e-13	-12.071	-12.152	-0.081	(0)
PbCl2	7.908e-13	7.908e-13	-12.102	-12.102	0.000	(0)
HgCl2	7.832e-13	7.832e-13	-12.106	-12.106	0.000	(0)
ZnCl3-	5.240e-13	4.301e-13	-12.281	-12.366	-0.086	(0)
CuCl2	1.449e-13	1.449e-13	-12.839	-12.839	0.000	(0)
CdCl3-	8.548e-14	6.632e-14	-13.068	-13.178	-0.110	(0)
HgCl3-	4.371e-14	3.392e-14	-13.359	-13.470	-0.110	(0)
NiCl2	1.153e-14	1.153e-14	-13.938	-13.938	0.000	(0)
ZnCl4-2	1.970e-15	9.312e-16	-14.706	-15.031	-0.325	(0)
PbCl3-	1.757e-15	1.363e-15	-14.755	-14.865	-0.110	(0)
HgCl4-2	1.614e-15	5.847e-16	-14.792	-15.233	-0.441	(0)
UO2Cl+	9.493e-17	7.366e-17	-16.023	-16.133	-0.110	(0)
HgCl+	4.651e-17	3.609e-17	-16.332	-16.443	-0.110	(0)
PbCl4-2	7.447e-18	2.699e-18	-17.128	-17.569	-0.441	(0)
CuCl3-	7.137e-18	5.857e-18	-17.147	-17.232	-0.086	(0)
CrCl+2	1.334e-18	4.835e-19	-17.875	-18.316	-0.441	(0)
CrOHCl2	5.676e-20	5.676e-20	-19.246	-19.246	0.000	(0)
CuCl4-2	2.689e-22	1.271e-22	-21.570	-21.896	-0.325	(0)
CrCl2+	2.561e-22	1.987e-22	-21.592	-21.702	-0.110	(0)
FeCl+2	1.511e-22	7.144e-23	-21.821	-22.146	-0.325	(0)
VOCl+	5.892e-24	4.572e-24	-23.230	-23.340	-0.110	(0)
FeCl2+	1.666e-24	1.382e-24	-23.778	-23.860	-0.081	(0)
CrO3Cl-	6.570e-26	5.098e-26	-25.182	-25.293	-0.110	(0)
FeCl3	5.984e-28	5.984e-28	-27.223	-27.223	0.000	(0)
CoCl+2	1.088e-35	3.943e-36	-34.963	-35.404	-0.441	(0)
UCl+3	0.000e+00	0.000e+00	-46.282	-47.274	-0.992	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
Co (2)	1.083e-07					
Co+2	7.425e-08	2.691e-08	-7.129	-7.570	-0.441	(0)
CoSO4	2.834e-08	2.834e-08	-7.548	-7.548	0.000	(0)
CoCO3	2.059e-09	2.059e-09	-8.686	-8.686	0.000	(0)
CoHCO3+	1.837e-09	1.425e-09	-8.736	-8.846	-0.110	(0)
CoOH+	9.869e-10	7.657e-10	-9.006	-9.116	-0.110	(0)
CoCl+	5.195e-10	4.031e-10	-9.284	-9.395	-0.110	(0)
CoF+	2.215e-10	1.719e-10	-9.655	-9.765	-0.110	(0)
Co (OH) 2	8.675e-11	8.675e-11	-10.062	-10.062	0.000	(0)
CoNO2+	3.195e-12	2.479e-12	-11.495	-11.606	-0.110	(0)
Co (NH3) +2	3.501e-14	1.269e-14	-13.456	-13.897	-0.441	(0)
Co (OH) 3-	3.182e-15	2.469e-15	-14.497	-14.608	-0.110	(0)
CoSeO4	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
CoOOH-	7.989e-16	6.199e-16	-15.097	-15.208	-0.110	(0)
CoNO3+	6.780e-16	5.260e-16	-15.169	-15.279	-0.110	(0)
Co2OH+3	1.013e-17	1.033e-18	-16.994	-17.986	-0.992	(0)
Co (NH3) 2+2	5.857e-21	2.122e-21	-20.232	-20.673	-0.441	(0)
Co (OH) 4-2	1.540e-21	5.580e-22	-20.813	-21.253	-0.441	(0)
Co (NO3) 2	1.320e-23	1.320e-23	-22.879	-22.879	0.000	(0)
Co4 (OH) 4+4	3.977e-27	6.859e-29	-26.400	-28.164	-1.763	(0)
Co (NH3) 3+2	2.892e-28	1.048e-28	-27.539	-27.980	-0.441	(0)
Co (NH3) 4+2	5.951e-36	2.157e-36	-35.225	-35.666	-0.441	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.412	-43.853	-0.441	(0)
Co (3)	8.951e-29					
CoOH+2	8.951e-29	3.244e-29	-28.048	-28.489	-0.441	(0)
Co+3	2.524e-35	4.475e-36	-34.598	-35.349	-0.751	(0)
CoCl+2	1.088e-35	3.943e-36	-34.963	-35.404	-0.441	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.447	-65.888	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
Cr (2)	1.361e-27					
Cr+2	1.361e-27	4.933e-28	-26.866	-27.307	-0.441	(0)
Cr (3)	9.033e-10					
Cr (OH) 2+	6.021e-10	4.672e-10	-9.220	-9.331	-0.110	(0)
Cr (OH) 3	2.503e-10	2.503e-10	-9.602	-9.602	0.000	(0)

CrO2-	2.174e-11	1.686e-11	-10.663	-10.773	-0.110	(0)
Cr (OH) 4-	1.832e-11	1.421e-11	-10.737	-10.847	-0.110	(0)
Cr (OH) +2	7.429e-12	2.692e-12	-11.129	-11.570	-0.441	(0)
CrOHSO4	3.373e-12	3.373e-12	-11.472	-11.472	0.000	(0)
CrF+2	7.622e-15	2.762e-15	-14.118	-14.559	-0.441	(0)
CrSO4+	1.371e-15	1.064e-15	-14.863	-14.973	-0.110	(0)
Cr+3	8.468e-16	8.628e-17	-15.072	-16.064	-0.992	(0)
CrCl+2	1.334e-18	4.835e-19	-17.875	-18.316	-0.441	(0)
CrOHC12	5.676e-20	5.676e-20	-19.246	-19.246	0.000	(0)
Cr2 (OH) 2SO4+2	2.265e-21	8.207e-22	-20.645	-21.086	-0.441	(0)
Cr2 (OH) 2 (SO4) 2	2.574e-22	2.574e-22	-21.589	-21.589	0.000	(0)
CrCl2+	2.561e-22	1.987e-22	-21.592	-21.702	-0.110	(0)
CrNO3+2	1.284e-25	4.652e-26	-24.892	-25.332	-0.441	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.129	-43.570	-0.441	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.511	-53.503	-0.992	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Cr (6)	2.647e-14					
CrO4-2	2.506e-14	1.161e-14	-13.601	-13.935	-0.334	(0)
NaCrO4-	9.020e-16	6.999e-16	-15.045	-15.155	-0.110	(0)
HCrO4-	3.417e-16	2.651e-16	-15.466	-15.577	-0.110	(0)
KCrO4-	1.711e-16	1.327e-16	-15.767	-15.877	-0.110	(0)
CrO3SO4-2	8.305e-24	3.010e-24	-23.081	-23.521	-0.441	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	6.570e-26	5.098e-26	-25.182	-25.293	-0.110	(0)
Cr2O7-2	6.731e-30	2.439e-30	-29.172	-29.613	-0.441	(0)
Cu (1)	2.104e-09					
CuCl2-	9.908e-10	8.131e-10	-9.004	-9.090	-0.086	(0)
CuCl	8.987e-10	8.987e-10	-9.046	-9.046	0.000	(0)
Cu+	2.125e-10	1.648e-10	-9.673	-9.783	-0.110	(0)
CuCl3-2	1.592e-12	7.528e-13	-11.798	-12.123	-0.325	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.609	-147.985	-0.377	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.358	-148.715	-0.357	(0)
Cu (2)	5.319e-07					
CuCO3	3.748e-07	3.748e-07	-6.426	-6.426	0.000	(0)
CuOH+	7.728e-08	6.342e-08	-7.112	-7.198	-0.086	(0)
Cu+2	3.034e-08	1.406e-08	-7.518	-7.852	-0.334	(0)
Cu (OH) 2	1.805e-08	1.805e-08	-7.744	-7.744	0.000	(0)
CuSO4	1.701e-08	1.701e-08	-7.769	-7.769	0.000	(0)
Cu (CO3) 2-2	1.260e-08	4.566e-09	-7.900	-8.340	-0.441	(0)
CuHCO3+	7.789e-10	6.043e-10	-9.109	-9.219	-0.110	(0)
Cu2 (OH) 2+2	2.788e-10	1.010e-10	-9.555	-9.995	-0.441	(0)
CuF+	2.310e-10	1.792e-10	-9.636	-9.747	-0.110	(0)
CuCl+	1.176e-10	9.651e-11	-9.930	-10.015	-0.086	(0)
Cu (OH) 3-	6.806e-11	5.280e-11	-10.167	-10.277	-0.110	(0)
CuNO2+	2.482e-11	1.925e-11	-10.605	-10.715	-0.110	(0)
CuNH3+2	1.557e-12	5.643e-13	-11.808	-12.248	-0.441	(0)
CuCl2	1.449e-13	1.449e-13	-12.839	-12.839	0.000	(0)
Cu (NO2) 2	2.576e-15	2.576e-15	-14.589	-14.589	0.000	(0)
Cu (OH) 4-2	1.636e-15	5.927e-16	-14.786	-15.227	-0.441	(0)
CuNO3+	7.070e-16	5.485e-16	-15.151	-15.261	-0.110	(0)
CuCl3-	7.137e-18	5.857e-18	-17.147	-17.232	-0.086	(0)
CuCl4-2	2.689e-22	1.271e-22	-21.570	-21.896	-0.325	(0)
Cu (NO3) 2	8.518e-25	8.518e-25	-24.070	-24.070	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.686	-218.796	-0.110	(0)
F	2.990e-04					
F-	2.448e-04	2.020e-04	-3.611	-3.695	-0.083	(0)
MgF+	5.047e-05	4.164e-05	-4.297	-4.381	-0.084	(0)
CaF+	1.945e-06	1.613e-06	-5.711	-5.792	-0.081	(0)
NaF	1.546e-06	1.546e-06	-5.811	-5.811	0.000	(0)
MnF+	1.719e-07	1.425e-07	-6.765	-6.846	-0.081	(0)
ZnF+	8.699e-09	6.749e-09	-8.061	-8.171	-0.110	(0)
BF (OH) 3-	3.815e-09	3.076e-09	-8.418	-8.512	-0.094	(0)
HF	2.108e-09	2.108e-09	-8.676	-8.676	0.000	(0)
NiF+	3.122e-10	2.422e-10	-9.506	-9.616	-0.110	(0)
CuF+	2.310e-10	1.792e-10	-9.636	-9.747	-0.110	(0)
CoF+	2.215e-10	1.719e-10	-9.655	-9.765	-0.110	(0)
AlF3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
AlF2+	5.301e-11	4.413e-11	-10.276	-10.355	-0.080	(0)

AlF4-	1.377e-11	1.136e-11	-10.861	-10.945	-0.084	(0)
CdF+	1.341e-11	1.041e-11	-10.872	-10.983	-0.110	(0)
PbF+	4.882e-12	3.787e-12	-11.311	-11.422	-0.110	(0)
HF2-	1.983e-12	1.619e-12	-11.703	-11.791	-0.088	(0)
AlF+2	1.143e-12	5.487e-13	-11.942	-12.261	-0.319	(0)
AgF	6.083e-13	6.083e-13	-12.216	-12.216	0.000	(0)
BF2(OH) 2-	5.817e-13	4.689e-13	-12.235	-12.329	-0.094	(0)
UO2F+	3.769e-13	2.924e-13	-12.424	-12.534	-0.110	(0)
UO2F2	1.704e-13	1.704e-13	-12.769	-12.769	0.000	(0)
PbF2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
UO2F3-	1.114e-14	8.644e-15	-13.953	-14.063	-0.110	(0)
CrF+2	7.622e-15	2.762e-15	-14.118	-14.559	-0.441	(0)
CdF2	4.195e-15	4.195e-15	-14.377	-14.377	0.000	(0)
UO2F4-2	3.827e-17	1.387e-17	-16.417	-16.858	-0.441	(0)
H2F2	1.190e-17	1.190e-17	-16.924	-16.924	0.000	(0)
PbF3-	7.434e-18	5.768e-18	-17.129	-17.239	-0.110	(0)
VO2F	1.398e-18	1.398e-18	-17.854	-17.854	0.000	(0)
FeF2+	7.887e-19	6.540e-19	-18.103	-18.184	-0.081	(0)
BF3OH-	3.227e-19	2.601e-19	-18.491	-18.585	-0.094	(0)
FeF+2	2.559e-19	1.210e-19	-18.592	-18.917	-0.325	(0)
FeF3	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
VO2F2-	1.322e-19	1.026e-19	-18.879	-18.989	-0.110	(0)
PbF4-2	1.539e-21	5.577e-22	-20.813	-21.254	-0.441	(0)
VO2F3-2	7.130e-22	2.584e-22	-21.147	-21.588	-0.441	(0)
VOF+	5.876e-22	4.559e-22	-21.231	-21.341	-0.110	(0)
VOF2	3.453e-23	3.453e-23	-22.462	-22.462	0.000	(0)
HgF+	4.031e-24	3.127e-24	-23.395	-23.505	-0.110	(0)
BF4-	2.264e-24	1.825e-24	-23.645	-23.739	-0.094	(0)
VOF3-	3.190e-25	2.475e-25	-24.496	-24.606	-0.110	(0)
VO2F4-3	2.520e-25	2.568e-26	-24.599	-25.590	-0.992	(0)
Sb(OH) 2F	2.458e-26	2.458e-26	-25.609	-25.609	0.000	(0)
SbOF	2.419e-26	2.419e-26	-25.616	-25.616	0.000	(0)
VOF4-2	5.568e-28	2.018e-28	-27.254	-27.695	-0.441	(0)
SiF6-2	3.033e-29	1.434e-29	-28.518	-28.843	-0.325	(0)
UF3+	1.036e-36	8.040e-37	-35.985	-36.095	-0.110	(0)
UF2+2	6.930e-38	2.511e-38	-37.159	-37.600	-0.441	(0)
UF4	1.781e-38	1.781e-38	-37.749	-37.749	0.000	(0)
UF5-	1.837e-40	1.425e-40	-39.736	-39.846	-0.110	(0)
UF+3	0.000e+00	0.000e+00	-40.014	-41.005	-0.992	(0)
UF6-2	0.000e+00	0.000e+00	-40.620	-41.061	-0.441	(0)
Fe (2)	5.818e-13					
Fe+2	3.884e-13	1.407e-13	-12.411	-12.852	-0.441	(0)
FeSO4	1.824e-13	1.824e-13	-12.739	-12.739	0.000	(0)
FeOH+	9.637e-15	7.991e-15	-14.016	-14.097	-0.081	(0)
FeHCO3+	1.442e-15	1.207e-15	-14.841	-14.918	-0.077	(0)
Fe(OH) 2	9.054e-18	9.054e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.924e-18	4.083e-18	-17.308	-17.389	-0.081	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-161.797	-161.797	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.598	-238.708	-0.110	(0)
Fe (3)	8.311e-10					
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 2+	3.353e-10	2.791e-10	-9.475	-9.554	-0.080	(0)
Fe(OH) 4-	6.821e-11	5.678e-11	-10.166	-10.246	-0.080	(0)
FeOH+2	1.064e-15	5.030e-16	-14.973	-15.298	-0.325	(0)
FeF2+	7.887e-19	6.540e-19	-18.103	-18.184	-0.081	(0)
FeF+2	2.559e-19	1.210e-19	-18.592	-18.917	-0.325	(0)
FeF3	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
FeSO4+	3.902e-20	3.236e-20	-19.409	-19.490	-0.081	(0)
Fe(SO4) 2-	4.707e-21	3.652e-21	-20.327	-20.437	-0.110	(0)
Fe+3	3.081e-21	5.463e-22	-20.511	-21.263	-0.751	(0)
FeCl+2	1.511e-22	7.144e-23	-21.821	-22.146	-0.325	(0)
FeCl2+	1.666e-24	1.382e-24	-23.778	-23.860	-0.081	(0)
FeHSeO3+2	2.319e-25	8.403e-26	-24.635	-25.076	-0.441	(0)
FeCl3	5.984e-28	5.984e-28	-27.223	-27.223	0.000	(0)
Fe2(OH) 2+4	4.859e-28	8.379e-30	-27.313	-29.077	-1.763	(0)
FeNO3+2	1.859e-28	6.738e-29	-27.731	-28.171	-0.441	(0)
Fe3(OH) 4+5	1.924e-35	3.381e-38	-34.716	-37.471	-2.755	(0)
H (0)	3.993e-29					

H2	1.997e-29	2.018e-29	-28.700	-28.695	0.005	(0)
Hg (0)	2.208e-09					
Hg	2.208e-09	2.208e-09	-8.656	-8.656	0.000	(0)
Hg (1)	3.456e-21					
Hg2+2	1.728e-21	6.261e-22	-20.763	-21.203	-0.441	(0)
Hg (2)	1.069e-11					
Hg (OH) 2	5.303e-12	5.361e-12	-11.275	-11.271	0.005	(0)
HgClOH	4.556e-12	4.556e-12	-11.341	-11.341	0.000	(0)
HgCl2	7.832e-13	7.832e-13	-12.106	-12.106	0.000	(0)
HgCl3-	4.371e-14	3.392e-14	-13.359	-13.470	-0.110	(0)
HgCO3	2.262e-15	2.262e-15	-14.645	-14.645	0.000	(0)
HgCl4-2	1.614e-15	5.847e-16	-14.792	-15.233	-0.441	(0)
Hg (CO3) 2-2	8.936e-17	3.238e-17	-16.049	-16.490	-0.441	(0)
HgCl+	4.651e-17	3.609e-17	-16.332	-16.443	-0.110	(0)
HgOH+	3.056e-17	2.371e-17	-16.515	-16.625	-0.110	(0)
Hg (OH) 3-	1.241e-18	9.625e-19	-17.906	-18.017	-0.110	(0)
HgHCO3+	3.830e-19	2.972e-19	-18.417	-18.527	-0.110	(0)
Hg (NH3) 2+2	1.118e-20	4.053e-21	-19.951	-20.392	-0.441	(0)
HgNH3+2	2.852e-21	1.033e-21	-20.545	-20.986	-0.441	(0)
Hg+2	1.153e-21	4.177e-22	-20.938	-21.379	-0.441	(0)
HgSO4	5.773e-22	5.773e-22	-21.239	-21.239	0.000	(0)
HgF+	4.031e-24	3.127e-24	-23.395	-23.505	-0.110	(0)
Hg (NH3) 3+2	1.746e-28	6.328e-29	-27.758	-28.199	-0.441	(0)
HgNO3+	2.452e-30	1.902e-30	-29.611	-29.721	-0.110	(0)
Hg (NH3) 4+2	5.440e-36	1.971e-36	-35.264	-35.705	-0.441	(0)
Hg (NO3) 2	9.753e-39	9.753e-39	-38.011	-38.011	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-139.085	-139.195	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-139.311	-139.752	-0.441	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.953	-140.953	0.000	(0)
K	3.866e-03					
K+	3.728e-03	3.076e-03	-2.429	-2.512	-0.083	(0)
KSO4-	1.381e-04	1.150e-04	-3.860	-3.939	-0.080	(0)
KCrO4-	1.711e-16	1.327e-16	-15.767	-15.877	-0.110	(0)
Mg	5.803e-03					
Mg+2	3.963e-03	1.837e-03	-2.402	-2.736	-0.334	(0)
MgSO4	1.765e-03	1.765e-03	-2.753	-2.753	0.000	(0)
MgF+	5.047e-05	4.164e-05	-4.297	-4.381	-0.084	(0)
MgHCO3+	1.560e-05	1.280e-05	-4.807	-4.893	-0.086	(0)
MgCO3	6.917e-06	6.917e-06	-5.160	-5.160	0.000	(0)
MgOH+	1.241e-06	1.043e-06	-5.906	-5.982	-0.075	(0)
MgH2BO3+	2.483e-07	2.001e-07	-6.605	-6.699	-0.094	(0)
Mn (2)	6.620e-05					
Mn+2	4.891e-05	1.772e-05	-4.311	-4.751	-0.441	(0)
MnSO4	1.664e-05	1.664e-05	-4.779	-4.779	0.000	(0)
MnHCO3+	2.905e-07	2.408e-07	-6.537	-6.618	-0.081	(0)
MnF+	1.719e-07	1.425e-07	-6.765	-6.846	-0.081	(0)
MnCl+	1.165e-07	9.662e-08	-6.934	-7.015	-0.081	(0)
MnOH+	7.657e-08	6.350e-08	-7.116	-7.197	-0.081	(0)
MnCl2	5.910e-10	5.910e-10	-9.228	-9.228	0.000	(0)
MnCl3-	8.501e-13	7.049e-13	-12.071	-12.152	-0.081	(0)
MnSeO4	6.789e-13	6.789e-13	-12.168	-12.168	0.000	(0)
MnNO3+	4.466e-13	3.465e-13	-12.350	-12.460	-0.110	(0)
Mn (OH) 3-	9.627e-16	7.983e-16	-15.017	-15.098	-0.081	(0)
Mn (NO3) 2	1.074e-20	1.074e-20	-19.969	-19.969	0.000	(0)
Mn (OH) 4-2	7.775e-21	3.676e-21	-20.109	-20.435	-0.325	(0)
MnSe	0.000e+00	0.000e+00	-40.994	-40.994	0.000	(0)
Mn (3)	1.866e-25					
Mn+3	1.866e-25	3.308e-26	-24.729	-25.480	-0.751	(0)
Mn (6)	7.027e-40					
MnO4-2	7.027e-40	3.322e-40	-39.153	-39.479	-0.325	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.139	-44.230	-0.091	(0)
Mo	1.945e-06					
MoO4-2	1.945e-06	9.015e-07	-5.711	-6.045	-0.334	(0)
HMoO4-	1.631e-10	1.265e-10	-9.788	-9.898	-0.110	(0)
H2MoO4	6.539e-15	6.539e-15	-14.184	-14.184	0.000	(0)
Ag2MoO4	4.905e-25	4.905e-25	-24.309	-24.309	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.760	-45.752	-0.992	(0)

Mo7O24-6	0.000e+00	0.000e+00	-50.569	-54.536	-3.967	(0)
HMo7O24-5	0.000e+00	0.000e+00	-53.546	-56.301	-2.755	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-57.907	-59.670	-1.763	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-63.584	-64.576	-0.992	(0)
N (-3)	6.744e-08					
NH4+	6.019e-08	4.852e-08	-7.220	-7.314	-0.094	(0)
NH3	3.922e-09	3.922e-09	-8.407	-8.407	0.000	(0)
NH4SO4-	3.310e-09	2.745e-09	-8.480	-8.561	-0.081	(0)
CaNH3+2	9.967e-12	3.612e-12	-11.001	-11.442	-0.441	(0)
CuNH3+2	1.557e-12	5.643e-13	-11.808	-12.248	-0.441	(0)
NiNH3+2	2.775e-13	1.006e-13	-12.557	-12.998	-0.441	(0)
Co (NH3) +2	3.501e-14	1.269e-14	-13.456	-13.897	-0.441	(0)
AgNH3+	1.237e-14	9.599e-15	-13.908	-14.018	-0.110	(0)
BaNH3+2	1.354e-16	4.908e-17	-15.868	-16.309	-0.441	(0)
Ag (NH3) 2+	3.944e-19	3.060e-19	-18.404	-18.514	-0.110	(0)
Ni (NH3) 2+2	1.573e-19	5.700e-20	-18.803	-19.244	-0.441	(0)
Ca (NH3) 2+2	1.556e-20	5.639e-21	-19.808	-20.249	-0.441	(0)
Hg (NH3) 2+2	1.118e-20	4.053e-21	-19.951	-20.392	-0.441	(0)
Co (NH3) 2+2	5.857e-21	2.122e-21	-20.232	-20.673	-0.441	(0)
HgNH3+2	2.852e-21	1.033e-21	-20.545	-20.986	-0.441	(0)
Co (NH3) 3+2	2.892e-28	1.048e-28	-27.539	-27.980	-0.441	(0)
Hg (NH3) 3+2	1.746e-28	6.328e-29	-27.758	-28.199	-0.441	(0)
Co (NH3) 4+2	5.951e-36	2.157e-36	-35.225	-35.666	-0.441	(0)
Hg (NH3) 4+2	5.440e-36	1.971e-36	-35.264	-35.705	-0.441	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.129	-43.570	-0.441	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.412	-43.853	-0.441	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.511	-53.503	-0.992	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.447	-65.888	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
N (3)	1.612e-05					
NO2-	1.612e-05	1.308e-05	-4.793	-4.884	-0.091	(0)
CuNO2+	2.482e-11	1.925e-11	-10.605	-10.715	-0.110	(0)
AgNO2	3.275e-12	3.275e-12	-11.485	-11.485	0.000	(0)
CoNO2+	3.195e-12	2.479e-12	-11.495	-11.606	-0.110	(0)
Cu (NO2) 2	2.576e-15	2.576e-15	-14.589	-14.589	0.000	(0)
Ag (NO2) 2-	8.548e-17	6.632e-17	-16.068	-16.178	-0.110	(0)
N (5)	1.499e-08					
NO3-	1.495e-08	1.234e-08	-7.825	-7.909	-0.083	(0)
CaNO3+	3.678e-11	2.854e-11	-10.434	-10.545	-0.110	(0)
MnNO3+	4.466e-13	3.465e-13	-12.350	-12.460	-0.110	(0)
ZnNO3+	6.688e-14	5.189e-14	-13.175	-13.285	-0.110	(0)
NiNO3+	1.907e-15	1.479e-15	-14.720	-14.830	-0.110	(0)
BaNO3+	1.580e-15	1.226e-15	-14.801	-14.911	-0.110	(0)
CuNO3+	7.070e-16	5.485e-16	-15.151	-15.261	-0.110	(0)
CoNO3+	6.780e-16	5.260e-16	-15.169	-15.279	-0.110	(0)
CdNO3+	1.635e-16	1.268e-16	-15.787	-15.897	-0.110	(0)
PbNO3+	6.257e-17	4.855e-17	-16.204	-16.314	-0.110	(0)
AgNO3	1.175e-17	1.175e-17	-16.930	-16.930	0.000	(0)
Mn (NO3) 2	1.074e-20	1.074e-20	-19.969	-19.969	0.000	(0)
UO2NO3+	3.327e-22	2.581e-22	-21.478	-21.588	-0.110	(0)
Zn (NO3) 2	1.277e-22	1.277e-22	-21.894	-21.894	0.000	(0)
Co (NO3) 2	1.320e-23	1.320e-23	-22.879	-22.879	0.000	(0)
Pb (NO3) 2	1.017e-24	1.017e-24	-23.993	-23.993	0.000	(0)
Cu (NO3) 2	8.518e-25	8.518e-25	-24.070	-24.070	0.000	(0)
Cd (NO3) 2	7.841e-25	7.841e-25	-24.106	-24.106	0.000	(0)
CrNO3+2	1.284e-25	4.652e-26	-24.892	-25.332	-0.441	(0)
VO2NO3	2.463e-26	2.463e-26	-25.609	-25.609	0.000	(0)
FeNO3+2	1.859e-28	6.738e-29	-27.731	-28.171	-0.441	(0)
HgNO3+	2.452e-30	1.902e-30	-29.611	-29.721	-0.110	(0)
Hg (NO3) 2	9.753e-39	9.753e-39	-38.011	-38.011	0.000	(0)
Na	1.512e-02					
Na+	1.470e-02	1.213e-02	-1.833	-1.916	-0.083	(0)
NaSO4-	4.130e-04	3.438e-04	-3.384	-3.464	-0.080	(0)
NaHCO3	4.644e-06	4.644e-06	-5.333	-5.333	0.000	(0)
NaF	1.546e-06	1.546e-06	-5.811	-5.811	0.000	(0)

	NaCO3-	1.228e-06	1.022e-06	-5.911	-5.991	-0.080	(0)
	NaH2BO3	6.038e-08	6.038e-08	-7.219	-7.219	0.000	(0)
	NaCrO4-	9.020e-16	6.999e-16	-15.045	-15.155	-0.110	(0)
Ni	1.687e-07						
	Ni+2	1.030e-07	4.774e-08	-6.987	-7.321	-0.334	(0)
	NiSO4	5.029e-08	5.029e-08	-7.299	-7.299	0.000	(0)
	NiCO3	8.062e-09	8.062e-09	-8.094	-8.094	0.000	(0)
	NiHCO3+	5.167e-09	4.009e-09	-8.287	-8.397	-0.110	(0)
	NiOH+	1.105e-09	8.573e-10	-8.957	-9.067	-0.110	(0)
	NiCl+	6.818e-10	5.290e-10	-9.166	-9.277	-0.110	(0)
	NiF+	3.122e-10	2.422e-10	-9.506	-9.616	-0.110	(0)
	Ni(OH)2	9.712e-11	9.712e-11	-10.013	-10.013	0.000	(0)
	Ni(SO4)2-2	2.426e-11	8.792e-12	-10.615	-11.056	-0.441	(0)
	NiNH3+2	2.775e-13	1.006e-13	-12.557	-12.998	-0.441	(0)
	Ni(OH)3-	1.785e-13	1.385e-13	-12.748	-12.858	-0.110	(0)
	NiCl2	1.153e-14	1.153e-14	-13.938	-13.938	0.000	(0)
	NiSeO4	3.178e-15	3.178e-15	-14.498	-14.498	0.000	(0)
	NiNO3+	1.907e-15	1.479e-15	-14.720	-14.830	-0.110	(0)
	Ni(NH3)2+2	1.573e-19	5.700e-20	-18.803	-19.244	-0.441	(0)
O(0)	2.459e-35						
	O2	1.229e-35	1.243e-35	-34.910	-34.906	0.005	(0)
Pb	6.577e-09						
	PbCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)
	PbOH+	1.229e-09	9.533e-10	-8.911	-9.021	-0.110	(0)
	PbSO4	6.880e-10	6.880e-10	-9.162	-9.162	0.000	(0)
	Pb+2	5.740e-10	2.661e-10	-9.241	-9.575	-0.334	(0)
	PbHCO3+	1.735e-10	1.347e-10	-9.761	-9.871	-0.110	(0)
	Pb(CO3)2-2	1.304e-10	4.726e-11	-9.885	-10.326	-0.441	(0)
	Pb(SO4)2-2	6.039e-11	2.189e-11	-10.219	-10.660	-0.441	(0)
	PbCl+	5.269e-11	4.088e-11	-10.278	-10.388	-0.110	(0)
	Pb(OH)2	4.299e-11	4.299e-11	-10.367	-10.367	0.000	(0)
	PbF+	4.882e-12	3.787e-12	-11.311	-11.422	-0.110	(0)
	PbCl2	7.908e-13	7.908e-13	-12.102	-12.102	0.000	(0)
	Pb(OH)3-	7.904e-14	6.132e-14	-13.102	-13.212	-0.110	(0)
	PbF2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
	PbCl3-	1.757e-15	1.363e-15	-14.755	-14.865	-0.110	(0)
	PbNO3+	6.257e-17	4.855e-17	-16.204	-16.314	-0.110	(0)
	Pb(OH)4-2	5.911e-17	2.142e-17	-16.228	-16.669	-0.441	(0)
	Pb2OH+3	3.945e-17	4.020e-18	-16.404	-17.396	-0.992	(0)
	PbCl4-2	7.447e-18	2.699e-18	-17.128	-17.569	-0.441	(0)
	PbF3-	7.434e-18	5.768e-18	-17.129	-17.239	-0.110	(0)
	Pb3(OH)4+2	2.708e-20	9.814e-21	-19.567	-20.008	-0.441	(0)
	PbF4-2	1.539e-21	5.577e-22	-20.813	-21.254	-0.441	(0)
	Pb4(OH)4+4	1.203e-24	2.074e-26	-23.920	-25.683	-1.763	(0)
	Pb(NO3)2	1.017e-24	1.017e-24	-23.993	-23.993	0.000	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-152.201	-152.201	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-229.738	-229.848	-0.110	(0)
S(-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-74.055	-74.055	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.838	-78.948	-0.110	(0)
	CdHS+	0.000e+00	0.000e+00	-79.318	-79.428	-0.110	(0)
	S5-2	0.000e+00	0.000e+00	-79.720	-80.161	-0.441	(0)
	H2S	0.000e+00	0.000e+00	-80.079	-80.079	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-80.236	-80.677	-0.441	(0)
	S4-2	0.000e+00	0.000e+00	-80.316	-80.757	-0.441	(0)
	S3-2	0.000e+00	0.000e+00	-81.122	-81.563	-0.441	(0)
	S2-2	0.000e+00	0.000e+00	-82.138	-82.579	-0.441	(0)
	S-2	0.000e+00	0.000e+00	-87.771	-88.096	-0.325	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.085	-139.195	-0.110	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.311	-139.752	-0.441	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-140.953	-140.953	0.000	(0)
	Cu(S4)2-3	0.000e+00	0.000e+00	-147.609	-147.985	-0.377	(0)
	Ag(HS)S4-2	0.000e+00	0.000e+00	-148.021	-148.234	-0.214	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.358	-148.715	-0.357	(0)
	ZnS(HS)-	0.000e+00	0.000e+00	-148.600	-148.710	-0.110	(0)
	Ag(HS)2-	0.000e+00	0.000e+00	-148.792	-148.902	-0.110	(0)
	Ag(S4)2-3	0.000e+00	0.000e+00	-149.135	-149.523	-0.387	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.467	-149.834	-0.367	(0)

Zn (HS) 2	0.000e+00	0.000e+00	-150.852	-150.852	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.171	-151.171	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.201	-152.201	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.797	-161.797	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.686	-218.796	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.409	-226.519	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.907	-228.348	-0.441	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.109	-228.219	-0.110	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.738	-229.848	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.598	-238.708	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.530	-304.971	-0.441	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.486	-306.927	-0.441	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.177	-322.618	-0.441	(0)
S (6)	1.461e-02					
SO4-2	1.139e-02	5.279e-03	-1.944	-2.277	-0.334	(0)
MgSO4	1.765e-03	1.765e-03	-2.753	-2.753	0.000	(0)
CaSO4	8.848e-04	8.848e-04	-3.053	-3.053	0.000	(0)
NaSO4-	4.130e-04	3.438e-04	-3.384	-3.464	-0.080	(0)
KSO4-	1.381e-04	1.150e-04	-3.860	-3.939	-0.080	(0)
MnSO4	1.664e-05	1.664e-05	-4.779	-4.779	0.000	(0)
ZnSO4	1.934e-06	1.934e-06	-5.714	-5.714	0.000	(0)
Zn (SO4) 2-2	2.454e-07	8.893e-08	-6.610	-7.051	-0.441	(0)
NiSO4	5.029e-08	5.029e-08	-7.299	-7.299	0.000	(0)
CoSO4	2.834e-08	2.834e-08	-7.548	-7.548	0.000	(0)
CuSO4	1.701e-08	1.701e-08	-7.769	-7.769	0.000	(0)
HSO4-	4.411e-09	3.639e-09	-8.355	-8.439	-0.084	(0)
CdSO4	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
NH4SO4-	3.310e-09	2.745e-09	-8.480	-8.561	-0.081	(0)
Cd (SO4) 2-2	7.907e-10	2.865e-10	-9.102	-9.543	-0.441	(0)
PbSO4	6.880e-10	6.880e-10	-9.162	-9.162	0.000	(0)
AgSO4-	1.628e-10	1.263e-10	-9.788	-9.899	-0.110	(0)
Pb (SO4) 2-2	6.039e-11	2.189e-11	-10.219	-10.660	-0.441	(0)
Ni (SO4) 2-2	2.426e-11	8.792e-12	-10.615	-11.056	-0.441	(0)
CrOHSO4	3.373e-12	3.373e-12	-11.472	-11.472	0.000	(0)
FeSO4	1.824e-13	1.824e-13	-12.739	-12.739	0.000	(0)
UO2SO4	8.380e-14	8.380e-14	-13.077	-13.077	0.000	(0)
UO2 (SO4) 2-2	1.609e-14	5.832e-15	-13.793	-14.234	-0.441	(0)
AlSO4+	1.349e-14	1.113e-14	-13.870	-13.953	-0.084	(0)
CrSO4+	1.371e-15	1.064e-15	-14.863	-14.973	-0.110	(0)
Al (SO4) 2-	7.633e-16	6.297e-16	-15.117	-15.201	-0.084	(0)
VO2SO4-	6.413e-19	4.975e-19	-18.193	-18.303	-0.110	(0)
FeSO4+	3.902e-20	3.236e-20	-19.409	-19.490	-0.081	(0)
Fe (SO4) 2-	4.707e-21	3.652e-21	-20.327	-20.437	-0.110	(0)
Cr2 (OH) 2SO4+2	2.265e-21	8.207e-22	-20.645	-21.086	-0.441	(0)
HgSO4	5.773e-22	5.773e-22	-21.239	-21.239	0.000	(0)
VOSO4	5.472e-22	5.472e-22	-21.262	-21.262	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.574e-22	2.574e-22	-21.589	-21.589	0.000	(0)
CrO3SO4-2	8.305e-24	3.010e-24	-23.081	-23.521	-0.441	(0)
VSO4+	7.155e-37	5.551e-37	-36.145	-36.256	-0.110	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.666	-40.666	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.847	-42.288	-0.441	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Sb (3)	2.182e-20					
Sb (OH) 3	1.103e-20	1.103e-20	-19.957	-19.957	0.000	(0)
HSbO2	1.078e-20	1.078e-20	-19.967	-19.967	0.000	(0)
SbO2-	3.189e-24	2.474e-24	-23.496	-23.607	-0.110	(0)
Sb (OH) 4-	1.825e-24	1.416e-24	-23.739	-23.849	-0.110	(0)
Sb (OH) 2F	2.458e-26	2.458e-26	-25.609	-25.609	0.000	(0)
SbOF	2.419e-26	2.419e-26	-25.616	-25.616	0.000	(0)
Sb (OH) 2+	2.438e-27	1.891e-27	-26.613	-26.723	-0.110	(0)
SbO+	8.411e-28	6.526e-28	-27.075	-27.185	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.177	-322.618	-0.441	(0)
Sb (5)	2.964e-08					
SbO3-	2.960e-08	2.297e-08	-7.529	-7.639	-0.110	(0)
Sb (OH) 6-	3.249e-11	2.681e-11	-10.488	-10.572	-0.083	(0)
SbO2+	4.229e-25	3.281e-25	-24.374	-24.484	-0.110	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)

HSe-	1.262e-39	9.794e-40	-38.899	-39.009	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-40.994	-40.994	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.271	-43.271	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.417	-45.858	-0.441	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.231	-82.994	-1.763	(0)
Se (4)	1.657e-07					
SeO3-2	9.066e-08	3.285e-08	-7.043	-7.483	-0.441	(0)
HSeO3-	7.503e-08	5.822e-08	-7.125	-7.235	-0.110	(0)
H2SeO3	1.752e-13	1.752e-13	-12.756	-12.756	0.000	(0)
AgSeO3-	3.262e-14	2.531e-14	-13.486	-13.597	-0.110	(0)
Cd (SeO3) 2-2	7.980e-18	2.892e-18	-17.098	-17.539	-0.441	(0)
Ag (SeO3) 2-3	7.308e-20	7.446e-21	-19.136	-20.128	-0.992	(0)
FeHSeO3+2	2.319e-25	8.403e-26	-24.635	-25.076	-0.441	(0)
Se (6)	3.078e-10					
SeO4-2	3.070e-10	1.423e-10	-9.513	-9.847	-0.334	(0)
MnSeO4	6.789e-13	6.789e-13	-12.168	-12.168	0.000	(0)
ZnSeO4	3.691e-14	3.691e-14	-13.433	-13.433	0.000	(0)
NiSeO4	3.178e-15	3.178e-15	-14.498	-14.498	0.000	(0)
CoSeO4	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
CdSeO4	8.616e-17	8.616e-17	-16.065	-16.065	0.000	(0)
HSeO4-	6.486e-17	5.032e-17	-16.188	-16.298	-0.110	(0)
Zn (SeO4) 2-2	1.470e-23	5.327e-24	-22.833	-23.274	-0.441	(0)
Si	5.695e-05					
H4SiO4	5.555e-05	5.615e-05	-4.255	-4.251	0.005	(0)
H3SiO4-	1.402e-06	1.150e-06	-5.853	-5.939	-0.086	(0)
H2SiO4-2	2.143e-11	1.029e-11	-10.669	-10.988	-0.319	(0)
UO2H3SiO4+	1.320e-12	1.024e-12	-11.879	-11.990	-0.110	(0)
SiF6-2	3.033e-29	1.434e-29	-28.518	-28.843	-0.325	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.036	-60.028	-0.992	(0)
U (4)	1.366e-19					
U (OH) 5-	1.366e-19	1.060e-19	-18.865	-18.975	-0.110	(0)
U (OH) 4	3.134e-23	3.134e-23	-22.504	-22.504	0.000	(0)
U (OH) 3+	1.042e-27	8.088e-28	-26.982	-27.092	-0.110	(0)
U (OH) 2+2	7.286e-33	2.640e-33	-32.138	-32.578	-0.441	(0)
UF3+	1.036e-36	8.040e-37	-35.985	-36.095	-0.110	(0)
UF2+2	6.930e-38	2.511e-38	-37.159	-37.600	-0.441	(0)
UF4	1.781e-38	1.781e-38	-37.749	-37.749	0.000	(0)
UOH+3	8.616e-39	8.779e-40	-38.065	-39.057	-0.992	(0)
UF5-	1.837e-40	1.425e-40	-39.736	-39.846	-0.110	(0)
UF+3	0.000e+00	0.000e+00	-40.014	-41.005	-0.992	(0)
UF6-2	0.000e+00	0.000e+00	-40.620	-41.061	-0.441	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.666	-40.666	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.847	-42.288	-0.441	(0)
U+4	0.000e+00	0.000e+00	-44.847	-46.611	-1.763	(0)
UCl+3	0.000e+00	0.000e+00	-46.282	-47.274	-0.992	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.625	-174.552	-8.927	(0)
U (5)	1.972e-16					
UO2+	1.972e-16	1.530e-16	-15.705	-15.815	-0.110	(0)
U (6)	2.718e-07					
UO2 (CO3) 3-4	2.245e-07	3.872e-09	-6.649	-8.412	-1.763	(0)
UO2 (CO3) 2-2	4.710e-08	1.707e-08	-7.327	-7.768	-0.441	(0)
UO2CO3	1.890e-10	1.890e-10	-9.724	-9.724	0.000	(0)
UO2OH+	2.427e-12	1.883e-12	-11.615	-11.725	-0.110	(0)
UO2H3SiO4+	1.320e-12	1.024e-12	-11.879	-11.990	-0.110	(0)
UO2F+	3.769e-13	2.924e-13	-12.424	-12.534	-0.110	(0)
UO2F2	1.704e-13	1.704e-13	-12.769	-12.769	0.000	(0)
UO2SO4	8.380e-14	8.380e-14	-13.077	-13.077	0.000	(0)
UO2+2	2.263e-14	1.049e-14	-13.645	-13.979	-0.334	(0)
UO2 (SO4) 2-2	1.609e-14	5.832e-15	-13.793	-14.234	-0.441	(0)
UO2F3-	1.114e-14	8.644e-15	-13.953	-14.063	-0.110	(0)
UO2Cl+	9.493e-17	7.366e-17	-16.023	-16.133	-0.110	(0)
UO2F4-2	3.827e-17	1.387e-17	-16.417	-16.858	-0.441	(0)
(UO2) 3 (OH) 5+	2.204e-17	1.710e-17	-16.657	-16.767	-0.110	(0)
(UO2) 2 (OH) 2+2	1.624e-17	5.885e-18	-16.789	-17.230	-0.441	(0)
UO2NO3+	3.327e-22	2.581e-22	-21.478	-21.588	-0.110	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.809	-43.919	-0.110	(0)

V+2	0.000e+00	0.000e+00	-45.142	-45.583	-0.441	(0)
V(3)	5.213e-16					
V(OH) 3	5.213e-16	5.213e-16	-15.283	-15.283	0.000	(0)
V(OH) 2+	3.065e-27	2.378e-27	-26.514	-26.624	-0.110	(0)
VOH+2	4.394e-31	1.592e-31	-30.357	-30.798	-0.441	(0)
V+3	2.186e-36	2.228e-37	-35.660	-36.652	-0.992	(0)
VSO4+	7.155e-37	5.551e-37	-36.145	-36.256	-0.110	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-57.978	-58.970	-0.992	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-59.033	-60.796	-1.763	(0)
V(4)	1.401e-19					
V(OH) 3+	1.379e-19	1.070e-19	-18.860	-18.971	-0.110	(0)
VO+2	1.038e-21	3.763e-22	-20.984	-21.424	-0.441	(0)
VOF+	5.876e-22	4.559e-22	-21.231	-21.341	-0.110	(0)
VOSO4	5.472e-22	5.472e-22	-21.262	-21.262	0.000	(0)
VOF2	3.453e-23	3.453e-23	-22.462	-22.462	0.000	(0)
VOC1+	5.892e-24	4.572e-24	-23.230	-23.340	-0.110	(0)
VOF3-	3.190e-25	2.475e-25	-24.496	-24.606	-0.110	(0)
VOF4-2	5.568e-28	2.018e-28	-27.254	-27.695	-0.441	(0)
H2V2O4+2	1.586e-33	5.748e-34	-32.800	-33.241	-0.441	(0)
V(5)	9.015e-09					
H2VO4-	5.115e-09	3.969e-09	-8.291	-8.401	-0.110	(0)
HVO4-2	3.900e-09	1.413e-09	-8.409	-8.850	-0.441	(0)
H3VO4	2.800e-13	2.800e-13	-12.553	-12.553	0.000	(0)
HV2O7-3	1.867e-14	1.902e-15	-13.729	-14.721	-0.992	(0)
VO4-3	9.854e-15	1.004e-15	-14.006	-14.998	-0.992	(0)
H3V2O7-	9.254e-15	7.180e-15	-14.034	-14.144	-0.110	(0)
V2O7-4	4.208e-16	7.257e-18	-15.376	-17.139	-1.763	(0)
VO2+	4.783e-18	3.947e-18	-17.320	-17.404	-0.083	(0)
VO2F	1.398e-18	1.398e-18	-17.854	-17.854	0.000	(0)
V3O9-3	6.440e-19	6.561e-20	-18.191	-19.183	-0.992	(0)
VO2SO4-	6.413e-19	4.975e-19	-18.193	-18.303	-0.110	(0)
VO2F2-	1.322e-19	1.026e-19	-18.879	-18.989	-0.110	(0)
VO2F3-2	7.130e-22	2.584e-22	-21.147	-21.588	-0.441	(0)
V4O12-4	6.299e-24	1.086e-25	-23.201	-24.964	-1.763	(0)
VO2F4-3	2.520e-25	2.568e-26	-24.599	-25.590	-0.992	(0)
VO2NO3	2.463e-26	2.463e-26	-25.609	-25.609	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-63.742	-67.710	-3.967	(0)
HV10O28-5	0.000e+00	0.000e+00	-64.919	-67.675	-2.755	(0)
H2V10O28-4	0.000e+00	0.000e+00	-68.855	-70.619	-1.763	(0)
Zn	6.702e-06					
Zn+2	3.613e-06	1.675e-06	-5.442	-5.776	-0.334	(0)
ZnSO4	1.934e-06	1.934e-06	-5.714	-5.714	0.000	(0)
ZnCO3	4.362e-07	4.362e-07	-6.360	-6.360	0.000	(0)
ZnOH+	3.078e-07	2.389e-07	-6.512	-6.622	-0.110	(0)
Zn(SO4) 2-2	2.454e-07	8.893e-08	-6.610	-7.051	-0.441	(0)
Zn(OH) 2	5.399e-08	5.399e-08	-7.268	-7.268	0.000	(0)
ZnHCO3+	4.649e-08	3.607e-08	-7.333	-7.443	-0.110	(0)
ZnOHCl	3.401e-08	3.401e-08	-7.468	-7.468	0.000	(0)
ZnCl+	2.220e-08	1.822e-08	-7.654	-7.740	-0.086	(0)
ZnF+	8.699e-09	6.749e-09	-8.061	-8.171	-0.110	(0)
Zn(OH) 3-	4.974e-10	3.860e-10	-9.303	-9.413	-0.110	(0)
ZnCl2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
ZnCl3-	5.240e-13	4.301e-13	-12.281	-12.366	-0.086	(0)
ZnNO3+	6.688e-14	5.189e-14	-13.175	-13.285	-0.110	(0)
Zn(OH) 4-2	6.047e-14	2.191e-14	-13.218	-13.659	-0.441	(0)
ZnSeO4	3.691e-14	3.691e-14	-13.433	-13.433	0.000	(0)
ZnCl4-2	1.970e-15	9.312e-16	-14.706	-15.031	-0.325	(0)
Zn(NO3) 2	1.277e-22	1.277e-22	-21.894	-21.894	0.000	(0)
Zn(SeO4) 2-2	1.470e-23	5.327e-24	-22.833	-23.274	-0.441	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.600	-148.710	-0.110	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.852	-150.852	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-226.409	-226.519	-0.110	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.907	-228.348	-0.441	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-306.486	-306.927	-0.441	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-55.63	-49.34	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.76	-38.25	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.99	-38.25	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.99	-54.05	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-57.45	-37.41	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.97	-28.56	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.92	-24.47	0.45	(NH4) 2SeO4
Acanthite	-52.42	-88.64	-36.22	Ag2S
Ag2CO3	-12.10	-23.19	-11.09	Ag2CO3
Ag2CrO4	-20.19	-31.78	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.11	-1.54	12.57	Ag2O
Ag2Se	-0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.30	-20.12	-4.82	Ag2SO4
Ag3AsO3	-28.47	-26.31	2.16	Ag3AsO3
Ag3AsO4	-16.88	-19.66	-2.79	Ag3AsO4
Ag3H2VO5	-16.74	-11.56	5.18	Ag3H2VO5
AgF:4H2O	-13.67	-12.62	1.05	AgF:4H2O
Agmetal	-0.04	-13.54	-13.51	Ag
AgVO3	-10.79	-10.02	0.77	AgVO3
Al (OH) 3 (am)	-1.91	8.89	10.80	Al (OH) 3
Al2 (MoO4) 3	-51.63	-49.27	2.37	Al2 (MoO4) 3
Al2O3	-1.88	17.78	19.65	Al2O3
Al4 (OH) 10SO4	-5.73	16.97	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.27	-8.47	4.80	AlAsO4:2H2O
AlOHSO4	-6.46	-9.69	-3.23	AlOHSO4
AlSb	-153.33	-87.70	65.62	AlSb
Alunite	-3.46	-4.86	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.06	-11.85	-7.79	PbSO4
Anhydrite	-1.05	-5.41	-4.36	CaSO4
Anilite	-55.56	-87.43	-31.88	Cu0.25Cu1.5S
Antlerite	-2.02	6.77	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-93.25	-96.01	-2.76	As4O6
Artinite	-4.11	5.49	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-41.42	-34.71	6.71	As2O5
Atacamite	-1.00	6.39	7.39	Cu2 (OH) 3Cl
Azurite	-1.04	-17.94	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.80	8.60	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.18	-1.31	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.65	7.29	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-11.97	-21.64	-9.67	BaCrO4
BaF2	-9.27	-15.09	-5.82	BaF2
BaMoO4	-6.79	-13.75	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.62	-6.79	1.83	BaSeO3
BaSeO4	-10.09	-17.55	-7.46	BaSeO4
Bianchite	-6.29	-8.06	-1.76	ZnSO4:6H2O
Birnessite	-6.35	11.75	18.09	MnO2
Bixbyite	-1.41	-2.05	-0.64	Mn2O3
BlaubleiI	-55.66	-79.82	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.05	-83.33	-27.28	Cu0.6Cu0.8S
Boehmite	0.31	8.89	8.58	AlOOH
Breithauptite	-56.31	-74.84	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.28	13.57	16.84	Mg (OH) 2
Bunsenite	-3.46	8.98	12.45	NiO
Ca (VO3) 2	-11.00	-5.34	5.66	Ca (VO3) 2
Ca2V2O7	-9.67	7.83	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.72	7.83	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.51	4.79	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.96	21.00	38.96	Ca3 (VO4) 2

Ca3(VO4)2·4H2O	-18.87	20.99	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-296.65	-153.68	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.02	-25.93	-17.91	Hg2Cl2
CaMoO4	-1.23	-9.18	-7.95	CaMoO4
Carnotite	-1.52	-1.29	0.23	KUO2VO4
CaSeO3·2H2O	-5.03	-2.22	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.96	-12.98	-3.02	CaSeO4·2H2O
Cd(BO2)2	-10.86	-1.02	9.84	Cd(BO2)2
Cd(OH)2	-5.83	7.81	13.64	Cd(OH)2
Cd(OH)2(am)	-5.92	7.81	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.43	-13.72	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.70	4.86	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.72	12.68	28.40	Cd4(OH)6SO4
CdCl2	-12.56	-13.21	-0.66	CdCl2
CdCl2·1H2O	-11.52	-13.22	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.30	-13.22	-1.91	CdCl2·2.5H2O
CdF2	-14.66	-15.88	-1.21	CdF2
Cdmetal(alpha)	-31.24	-17.73	13.51	Cd
Cdmetal(gamma)	-31.35	-17.73	13.62	Cd
CdMoO4	-0.38	-14.53	-14.15	CdMoO4
CdOHCl	-6.24	-2.70	3.54	CdOHCl
CdSb	-75.65	-76.00	-0.35	CdSb
CdSe	-19.15	-39.35	-20.20	CdSe
CdSeO4·2H2O	-16.49	-18.34	-1.85	CdSeO4·2H2O
CdSO4	-10.59	-10.77	-0.17	CdSO4
CdSO4·1H2O	-9.04	-10.77	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-8.89	-10.77	-1.87	CdSO4·2.67H2O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.79	-14.92	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.49	-10.13	-2.64	CuSO4·5H2O
Chalcedony	-0.70	-4.25	-3.55	SiO2
Chalcocite	-55.44	-90.36	-34.92	Cu2S
Chalcopyrite	-127.03	-162.30	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.68	-98.37	-45.69	HgS
Claudetite	-92.94	-96.01	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe
Co(BO2)2	-27.17	-0.10	27.07	Co(BO2)2
Co(OH)2	-4.36	8.73	13.09	Co(OH)2
Co(OH)3	-8.59	-10.90	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.55	-8.51	13.03	Co3(AsO4)2
Co3O4	-2.56	-13.06	-10.50	Co3O4
CoCl2	-20.56	-12.30	8.27	CoCl2
CoCl2·6H2O	-14.84	-12.30	2.54	CoCl2·6H2O
CoCO3	-2.93	-12.91	-9.98	CoCO3
CoF2	-13.36	-14.96	-1.60	CoF2
CoF3	-44.98	-46.43	-1.46	CoF3
CoFe2O4	18.64	15.12	-3.53	CoFe2O4
CoMoO4	-5.85	-13.62	-7.76	CoMoO4
CoO	-4.85	8.73	13.59	CoO
CoS(alpha)	-70.93	-78.37	-7.44	CoS
CoS(beta)	-67.30	-78.37	-11.07	CoS
CoSe	-22.23	-38.43	-16.20	CoSe
CoSeO3	-7.97	-6.65	1.32	CoSeO3
CoSeO4·6H2O	-15.89	-17.42	-1.53	CoSeO4·6H2O
CoSO4	-12.65	-9.85	2.80	CoSO4
CoSO4·6H2O	-7.38	-9.85	-2.47	CoSO4·6H2O
Cotunnite	-9.52	-14.30	-4.78	PbCl2
Covellite	-56.35	-78.65	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.13	-32.03	14.09	CrCl2

CrCl3	-47.84	-32.72	15.11	CrCl3
CrF3	-25.38	-36.72	-11.34	CrF3
Cristobalite	-0.90	-4.25	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.64	-43.48	-33.84	Na3AlF6
Cu(OH)2	-0.22	8.45	8.67	Cu(OH)2
Cu(SbO3)2	-25.58	19.63	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.41	0.84	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.89	-89.77	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.62	-50.42	-45.80	Cu2Se
Cu2SO4	-19.89	-21.84	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.46	-9.36	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.89	-101.49	-42.59	Cu3Sb
Cu3Se2	-25.64	-89.13	-63.49	Cu3Se2
CuCO3	-1.70	-13.20	-11.50	CuCO3
CuCrO4	-16.35	-21.79	-5.44	CuCrO4
CuF	-8.57	-13.48	-4.91	CuF
CuF2	-16.36	-15.24	1.12	CuF2
CuF2:2H2O	-10.69	-15.24	-4.55	CuF2:2H2O
Cumetal	-5.65	-14.40	-8.76	Cu
CuMoO4	-0.82	-13.90	-13.08	CuMoO4
CuOCuSO4	-11.98	-1.68	10.30	CuOCuSO4
Cupricferrite	8.85	14.83	5.99	CuFe2O4
Cuprite	-1.86	-3.26	-1.41	Cu2O
Cuprousferrite	10.48	1.56	-8.92	CuFeO2
CuSe	-5.61	-38.71	-33.10	CuSe
CuSe2	-26.96	-60.33	-33.37	CuSe2
CuSeO3:2H2O	-7.45	-6.94	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.26	-17.70	-2.44	CuSeO4:5H2O
CuSO4	-13.07	-10.13	2.94	CuSO4
Diaspore	2.01	8.89	6.87	AlOOH
Djurleite	-55.67	-89.59	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.02	-16.56	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.53	-16.56	-17.09	CaMg(CO3)2
Epsomite	-2.89	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.08	0.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.33	-15.05	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.56	-9.00	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.15	-39.78	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.62	-49.36	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.56	-14.16	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.81	-18.90	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.73	-65.32	-18.60	FeSe2
FeS(ppt)	-80.70	-83.65	-2.95	FeS
FeSe	-32.71	-43.71	-11.00	FeSe
Fix_pe	-4.62	-4.62	0.00	e-
Fluorite	-0.03	-10.53	-10.50	CaF2
Galena	-66.40	-80.37	-13.97	PbS
Gibbsite	0.60	8.89	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.04	-8.06	-2.01	ZnSO4:7H2O
Greenalite	-18.96	1.85	20.81	Fe3Si2O5(OH)4
Greenockite	-64.92	-79.28	-14.36	CdS
Greigite	-293.53	-338.56	-45.03	Fe3S4
Gummite	-5.35	2.32	7.67	UO3
Gypsum	-0.80	-5.41	-4.61	CaSO4:2H2O
H-Jarosite	-15.49	-27.59	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.47	-22.35	-12.88	H2MoO4
H2S(g)	-79.09	-87.10	-8.01	H2S
H2Se(g)	-42.20	-47.16	-4.96	H2Se
Halite	-5.88	-4.28	1.60	NaCl
Halloysite	-0.30	9.28	9.57	Al2Si2O5(OH)4
Hausmannite	-0.83	60.20	61.03	Mn3O4

Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.67	21.23	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.22	-258.92	-73.71	Hg (CH3) 2
Hg (g)	-7.35	-15.22	-7.87	Hg
Hg (OH) 2	-7.77	-11.27	-3.50	Hg (OH) 2
Hg2 (g)	-15.49	-30.45	-14.96	Hg2
Hg2 (OH) 2	-10.16	-4.90	5.26	Hg2 (OH) 2
Hg2CO3	-10.50	-26.55	-16.05	Hg2CO3
Hg2CrO4	-26.44	-35.14	-8.70	Hg2CrO4
Hg2F2	-18.23	-28.59	-10.36	Hg2F2
Hg2S	-80.32	-92.00	-11.68	Hg2S
Hg2SeO3	-15.63	-20.29	-4.66	Hg2SeO3
Hg2SO4	-17.35	-23.48	-6.13	Hg2SO4
Hg3O2CO3	-25.78	-55.46	-29.68	Hg3O2CO3
HgCl (g)	-32.46	-12.97	19.50	HgCl
HgCl2	-11.04	-32.30	-21.26	HgCl2
HgF (g)	-46.97	-14.30	32.68	HgF
HgF2 (g)	-47.53	-34.96	12.57	HgF2
Hgmetal (l)	-1.77	-15.22	-13.45	Hg
HgSe	-2.74	-58.43	-55.69	HgSe
HgSeO3	-14.23	-26.66	-12.43	HgSeO3
HgSO4	-20.43	-29.85	-9.42	HgSO4
Huntite	-2.75	-32.72	-29.97	CaMg3 (CO3) 4
Hydrocerrussite	-4.34	-23.11	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.99	-18.76	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.47	-22.64	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.15	-21.95	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.95	-49.20	-17.24	K2Cr2O7
K2CrO4	-18.45	-18.96	-0.51	K2CrO4
K2MoO4	-14.33	-11.07	3.26	K2MoO4
K2SeO4	-14.14	-14.87	-0.73	K2SeO4
Kaolinite	1.84	9.28	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-4.69	-5.12	-0.43	PbO : PbSO4
Laurionite	-4.41	-3.79	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-5.97	6.73	12.69	PbO
Mackinawite	-80.05	-83.65	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.09	19.95	16.86	Fe2MgO4
Magnesite	-0.62	-8.08	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.56	-4.75	-5.31	Cu2 (OH) 2CO3
Manganite	-1.02	24.32	25.34	MnOOH
Massicot	-6.17	6.73	12.89	PbO
Matlockite	-6.66	-15.63	-8.97	PbClF
Melanothallite	-18.84	-12.58	6.26	CuCl2
Melanterite	-12.92	-15.13	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.28	-98.37	-45.09	HgS
Mg (OH) 2 (active)	-5.23	13.57	18.79	Mg (OH) 2
Mg (VO3) 2	-16.22	-4.94	11.28	Mg (VO3) 2
Mg2Sb3	-273.46	-198.78	74.68	Mg2Sb3
Mg2V2O7	-17.73	8.63	26.36	Mg2V2O7
MgCr2O4	-4.99	11.21	16.20	MgCr2O4
MgCrO4	-22.05	-16.67	5.38	MgCrO4
MgF2	-2.00	-10.13	-8.13	MgF2
MgMoO4	-6.93	-8.78	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.88	-1.82	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.38	-12.58	-1.20	MgSeO4 : 6H2O
Minium	-27.79	45.73	73.52	Pb3O4
Mirabilite	-5.00	-6.11	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.85	-6.95	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.08	-57.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.34	-86.26	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.56	-0.06	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.19	-9.48	2.72	MnCl2 : 4H2O
MnS (grn)	-75.72	-75.55	0.17	MnS

MnS (pnk)	-78.89	-75.55	3.34	MnS
MnSb	-94.71	-97.62	-2.91	MnSb
MnSe	-39.11	-35.61	3.50	MnSe
MnSeO3	-4.96	-3.83	1.13	MnSeO3
MnSeO3:2H2O	-4.82	-3.84	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.55	-14.60	-2.05	MnSeO4:5H2O
MnSO4	-9.61	-7.03	2.58	MnSO4
Monteponite	-7.29	7.81	15.10	CdO
Montroydite	-7.63	-11.27	-3.64	HgO
MoO3	-14.35	-22.35	-8.00	MoO3
Morenosite	-7.46	-9.60	-2.14	NiSO4:7H2O
MoS2	-151.83	-222.09	-70.26	MoS2
Na-Jarosite	-10.15	-21.35	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.11	-48.01	-9.90	Na2Cr2O7
Na2CrO4	-20.70	-17.77	2.93	Na2CrO4
Na2Mo2O7	-15.63	-32.23	-16.60	Na2Mo2O7
Na2MoO4	-11.37	-9.88	1.49	Na2MoO4
Na2MoO4:2H2O	-11.10	-9.88	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.22	-2.92	10.30	Na2SeO3:5H2O
Na2SeO4	-14.96	-13.68	1.28	Na2SeO4
Na3Sb	-172.34	-77.89	94.45	Na3Sb
Na3VO4	-27.23	9.45	36.68	Na3VO4
Na4V2O7	-30.96	6.44	37.40	Na4V2O7
Nantokite	-5.42	-12.15	-6.73	CuCl
NaSb	-87.98	-64.81	23.17	NaSb
Natron	-7.87	-9.18	-1.31	Na2CO3:10H2O
NaVO3	-6.88	-3.02	3.86	NaVO3
Nesquehonite	-3.41	-8.08	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.81	8.98	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.47	-7.77	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.65	17.35	32.00	Ni4 (OH) 6SO4
NiCO3	-5.80	-12.67	-6.87	NiCO3
NiMoO4	-2.22	-13.37	-11.14	NiMoO4
NiS (alpha)	-72.52	-78.12	-5.60	NiS
NiS (beta)	-67.02	-78.12	-11.10	NiS
NiS (gamma)	-65.32	-78.12	-12.80	NiS
NiSe	-20.48	-38.18	-17.70	NiSe
NiSeO3:2H2O	-9.22	-6.41	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.65	-17.17	-1.52	NiSeO4:6H2O
Nsutite	-5.76	11.75	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-248.23	-309.30	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb (BO2) 2	-8.63	-2.11	6.52	Pb (BO2) 2
Pb (OH) 2	-1.42	6.73	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-53.85	-62.61	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-5.85	2.94	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-12.73	13.46	26.19	Pb2O (OH) 2
Pb2O3	-22.04	39.00	61.04	Pb2O3
Pb2OCO3	-7.63	-8.19	-0.56	Pb2OCO3
Pb2V2O7	-3.15	-5.05	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.33	-14.53	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.46	1.68	6.14	Pb3 (VO4) 2
Pb3O2CO3	-12.48	-1.46	11.02	Pb3O2CO3
Pb3O2SO4	-9.08	1.60	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-12.77	8.33	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-13.55	8.33	21.88	Pb4O3SO4
PbCrO4	-10.91	-23.51	-12.60	PbCrO4
PbF2	-9.52	-16.96	-7.44	PbF2
Pbmetal	-23.06	-18.82	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.25	6.73	12.98	PbO:0.33H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.02	13.57	21.58	MgO
Phosgenite	-9.41	-29.22	-19.81	PbCl2:PbCO3
Plattnerite	-17.33	32.27	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.69	-145.20	-18.51	FeS2

Pyrochroite	-3.64	11.55	15.19	Mn(OH)2
Pyrolusite	-4.28	37.10	41.38	MnO2
Quartz	-0.25	-4.25	-4.00	SiO2
Realgar	-104.13	-123.87	-19.75	AsS
Retgersite	-7.56	-9.60	-2.04	NiSO4:6H2O
Rhodochrosite	0.48	-10.10	-10.58	MnCO3
Rutherfordine	-4.82	-19.32	-14.50	UO2CO3
Sb(OH)3	-12.85	-19.96	-7.11	Sb(OH)3
Sb2O4	-17.77	-14.37	3.40	Sb2O4
Sb2O5	-27.78	-37.44	-9.67	Sb2O5
Sb2Se3	-113.64	-181.39	-67.76	Sb2Se3
Sb4O6(cubic)	-61.57	-79.83	-18.26	Sb4O6
Sb4O6(orth)	-61.93	-79.83	-17.90	Sb4O6
SbCl3	-52.07	-51.50	0.57	SbCl3
SbF3	-45.27	-55.49	-10.23	SbF3
Sbmetal	-46.58	-58.27	-11.69	Sb
SbO2	-3.67	-31.49	-27.82	SbO2
Schoepite	-3.67	2.32	5.99	UO2(OH)2:H2O
Semetal(am)	-14.51	-21.62	-7.11	Se
Semetal(hex)	-13.91	-21.62	-7.71	Se
Senarmontite	-27.55	-39.91	-12.37	Sb2O3
SeO2	-15.51	-15.39	0.12	SeO2
SeO3	-47.19	-26.15	21.04	SeO3
Sepiolite	-1.38	14.38	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.40	14.38	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-1.54	-4.25	-2.71	SiO2
SiO2(am-ppt)	-1.51	-4.25	-2.74	SiO2
Smithsonite	-1.12	-11.12	-10.00	ZnCO3
Sphalerite	-65.12	-76.57	-11.45	ZnS
Spinel	-5.50	31.34	36.85	MgAl2O4
Stibnite	-250.75	-301.21	-50.46	Sb2S3
Sulfur	-59.41	-61.55	-2.14	S
Tenorite	0.81	8.45	7.64	CuO
Thenardite	-6.43	-6.11	0.32	Na2SO4
Thermonatrite	-9.81	-9.18	0.64	Na2CO3:H2O
Tyuyamunite	-4.77	-0.69	4.08	Ca(UO2)2(VO4)2
U3O8	-12.01	9.07	21.08	U3O8
U3Sb4	-580.76	-428.38	152.38	U3Sb4
U4O9	-27.46	-30.48	-3.02	U4O9
UF4	-31.85	-61.39	-29.54	UF4
UF4:2.5H2O	-28.67	-61.39	-32.72	UF4:2.5H2O
UO2(am)	-14.94	-14.01	0.93	UO2
UO2(NO3)2	-41.94	-29.80	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.65	-29.80	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.19	-29.80	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.85	-29.80	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.29	2.32	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.58	-23.83	-2.25	UO2SeO4:4H2O
UO3	-5.38	2.32	7.70	UO3
Uraninite	-9.34	-14.01	-4.67	UO2
USb2	-220.44	-190.86	29.58	USb2
V(OH)3	-19.79	-12.20	7.59	V(OH)3
V2O5	-17.14	-18.50	-1.36	V2O5
V3O5	-42.75	-40.91	1.84	V3O5
V4O7	-53.22	-46.03	7.19	V4O7
V6O13	-45.74	-106.60	-60.86	V6O13
Valentinite	-31.43	-39.91	-8.48	Sb2O3
VC12	-64.87	-46.00	18.87	VC12
VC13	-67.18	-43.74	23.43	VC13
VF4	-67.44	-52.51	14.93	VF4
Vmetal	-94.54	-50.52	44.03	V
VO	-39.73	-24.97	14.76	VO
VO(OH)2	-10.27	-5.12	5.15	VO(OH)2
VO2Cl	-22.61	-19.77	2.84	VO2Cl
VOC1	-33.87	-22.71	11.15	VOC1
VOC12	-38.91	-26.15	12.76	VOC12
VOSO4	-27.31	-23.70	3.61	VOSO4

Witherite	-4.48	-13.05	-8.57	BaCO3
Wurtzite	-67.62	-76.57	-8.95	ZnS
Zincite	-0.81	10.53	11.33	ZnO
Zincosite	-11.98	-8.05	3.93	ZnSO4
Zn(BO2)2	-6.60	1.69	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.91	-21.60	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.67	10.53	12.20	Zn(OH)2
Zn(OH)2(am)	-1.95	10.53	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.23	10.53	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.01	10.53	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.21	10.53	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.03	2.47	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.65	10.54	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.78	-3.13	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.49	-5.58	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.87	23.53	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.90	31.60	38.50	Zn5(OH)8Cl2
ZnCl2	-17.55	-10.50	7.05	ZnCl2
ZnCO3:1H2O	-0.86	-11.12	-10.26	ZnCO3:1H2O
ZnF2	-12.63	-13.17	-0.53	ZnF2
Znmetal	-40.81	-15.02	25.79	Zn
ZnMoO4	-1.70	-11.82	-10.13	ZnMoO4
ZnO(active)	-0.66	10.53	11.19	ZnO
ZnS(am)	-67.52	-76.57	-9.05	ZnS
ZnSb	-84.31	-73.29	11.01	ZnSb
ZnSe	-22.23	-36.63	-14.40	ZnSe
ZnSeO4:6H2O	-14.10	-15.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.42	-8.05	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 130.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 705
  equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 705
USE Surface 705
USE Solution 714
SAVE Solution 715  #Initial Stage 8 Pit Water After Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 705.

Diffuse Double Layer Surface-Complexation Model

Hfo

8.580e-20 Surface + diffuse layer charge, eq

4.782e-12 Surface charge, eq
 4.399e-03 sigma, C/m²
 1.213e-01 psi, V
 -4.722e+00 -F*psi/RT
 8.900e-03 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.049e-04 m² for 1.634e-09 moles of Ferrihydrite

Water in diffuse layer: 1.049e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is +1).

Element	Moles
C	2.6796e-15
Ca	3.3209e-17
Cl	5.3659e-14
H	7.9046e-15
K	5.2682e-17
Mg	5.1452e-18
N	2.1723e-13
Na	2.2321e-16
O	9.6823e-12
S	2.2561e-12

Hfo_s 8.169e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	5.461e-12	0.668	5.461e-12	-11.263
Hfo_sOH	2.678e-12	0.328	2.678e-12	-11.572
Hfo_sO-	3.009e-14	0.004	3.009e-14	-13.522
Hfo_sOHCa+2	9.968e-17	0.000	9.968e-17	-16.001

Hfo_w 3.268e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.510e-10	0.462	1.510e-10	-9.821
Hfo_wOH	7.405e-11	0.227	7.405e-11	-10.130
Hfo_wSO4-	5.100e-11	0.156	5.100e-11	-10.292
Hfo_wOHSO4-2	4.990e-11	0.153	4.990e-11	-10.302
Hfo_wO-	8.320e-13	0.003	8.320e-13	-12.080
Hfo_wOMg+	1.176e-18	0.000	1.176e-18	-17.930
Hfo_wOCa+	3.989e-19	0.000	3.989e-19	-18.399

 Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
 but is not in solution or other phases.
 Using solution 714. Solution after simulation 129.
 Using surface 705.
 Using pure phase assemblage 705. Pure-phase assemblage after simulation 129.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	6.134e-09	6.134e-09	-5.246e-14

Alunite	-3.46	-4.86	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-1.05	-5.41	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	7.254e-11	7.193e-11	-6.107e-13
Barite	0.00	-9.98	-9.98	4.267e-08	4.268e-08	1.832e-12
Brochantite	-0.00	15.22	15.22	7.199e-07	7.199e-07	-2.302e-11
Brucite	-3.28	13.57	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.885e-10
CaMoO4	-1.23	-9.18	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-5.03	-2.22	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.992e-03	1.992e-03	-1.606e-10
Carnotite	-1.52	-1.29	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-10.86	-1.02	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.38	-14.53	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	1.084e-05	1.084e-05	-3.214e-12
Cr2O3	0.00	-2.36	-2.36	1.232e-09	1.232e-09	-1.236e-13
Cu2Se(alpha)	-4.62	-50.42	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.82	-13.90	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.89	-5.02	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.634e-09	1.634e-09	-9.960e-18
Fluorite	-0.03	-10.53	-10.50	0.000e+00	0	0.000e+00
Gummite	-5.35	2.32	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.80	-5.41	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.74	-58.43	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-5.00	-6.11	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.96	-3.83	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.81	8.98	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-23.47	-7.77	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.80	-12.67	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.22	-13.37	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	2.487e-14
Otavite	-1.83	-13.83	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	3.815e-09	3.812e-09	-2.869e-12
Rutherfordine	-4.82	-19.32	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.67	-31.49	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.67	2.32	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.38	14.38	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.51	-4.25	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-4.78	-0.70	4.08	0.000e+00	0	0.000e+00
U3O8	-12.01	9.07	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.29	2.32	5.61	0.000e+00	0	0.000e+00
UO3	-5.38	2.32	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.70	-11.82	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-5.450e-23 Surface + diffuse layer charge, eq
1.724e-11 Surface charge, eq
1.586e-02 sigma, C/m²
3.035e-02 psi, V
-1.181e+00 -F*psi/RT
3.068e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.049e-04 m² for 1.634e-09 moles of Ferrihydrite

Water in diffuse layer: 1.049e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 4.320e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.452e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	1.9072e-17
Al	3.3877e-15

As	2.3262e-19
B	4.4868e-14
Ba	3.2252e-17
C	1.0866e-12
Ca	2.1280e-12
Cd	1.2698e-17
Cl	6.5133e-12
Co	9.0779e-17
Cr	8.5527e-19
Cu	5.4354e-16
F	3.5206e-13
Fe	8.3092e-19
H	1.4523e-12
Hg	2.3275e-18
K	3.4762e-12
Mg	4.8884e-12
Mn	5.4682e-14
Mo	2.8560e-15
N	2.0083e-14
Na	1.3550e-11
Ni	1.4497e-16
O	8.4530e-11
Pb	6.5696e-18
S	2.0206e-11
Sb	3.6780e-17
Se	2.2668e-16
Si	6.0004e-14
U	5.3076e-16
V	1.2011e-17
Zn	5.9885e-15

Hfo_s

8.169e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.786e-12	0.341	2.788e-12	-11.555
Hfo_sOPb+	2.023e-12	0.248	2.025e-12	-11.694
Hfo_sOCu+	1.858e-12	0.227	1.860e-12	-11.731
Hfo_sOMn+	1.201e-12	0.147	1.202e-12	-11.920
Hfo_sOCrOH+	2.472e-13	0.030	2.475e-13	-12.606
Hfo_sOHCa+2	2.516e-14	0.003	2.518e-14	-13.599
Hfo_sONi+	1.905e-14	0.002	1.907e-14	-13.720
Hfo_sOH	3.914e-15	0.000	3.917e-15	-14.407
Hfo_sO-	2.124e-15	0.000	2.126e-15	-14.672
Hfo_sOCd+	1.633e-15	0.000	1.635e-15	-14.787
Hfo_sOCo+	1.588e-15	0.000	1.590e-15	-14.799
Hfo_sOH2+	1.652e-16	0.000	1.653e-16	-15.782
Hfo_sOAg	1.267e-17	0.000	1.268e-17	-16.897
Hfo_sOHBa+2	2.108e-18	0.000	2.110e-18	-17.676
Hfo_sOFe+	1.201e-19	0.000	1.202e-19	-18.920
Hfo_sOHg+	4.054e-21	0.000	4.058e-21	-20.392

Hfo_w

3.268e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	9.021e-11	0.276	9.029e-11	-10.044
Hfo_wOMg+	7.436e-11	0.228	7.443e-11	-10.128
Hfo_wOHVO4-3	4.758e-11	0.146	4.762e-11	-10.322
Hfo_wOH	3.705e-11	0.113	3.708e-11	-10.431
Hfo_wOZn+	2.761e-11	0.085	2.764e-11	-10.558
Hfo_wO-	2.011e-11	0.062	2.013e-11	-10.696
Hfo_wOHSO4-2	1.281e-11	0.039	1.282e-11	-10.892
Hfo_wOMn+	9.031e-12	0.028	9.040e-12	-11.044
Hfo_wOHSeO3-2	1.912e-12	0.006	1.914e-12	-11.718
Hfo_wOCa+	1.665e-12	0.005	1.667e-12	-11.778

Hfo_wOH2+	1.564e-12	0.005	1.565e-12	-11.805
Hfo_wOHAsO4-3	1.221e-12	0.004	1.222e-12	-11.913
Hfo_wOPb+	8.555e-13	0.003	8.563e-13	-12.067
Hfo_wSO4-	2.711e-13	0.001	2.714e-13	-12.566
Hfo_wONi+	2.433e-13	0.001	2.435e-13	-12.613
Hfo_wSeO3-	1.371e-13	0.000	1.373e-13	-12.862
Hfo_wOHMoO4-2	8.910e-14	0.000	8.919e-14	-13.050
Hfo_wOCu+	4.237e-14	0.000	4.241e-14	-13.373
Hfo_wOCd+	6.595e-15	0.000	6.602e-15	-14.180
Hfo_wH2BO3	5.898e-15	0.000	5.903e-15	-14.229
Hfo_wMoO4-	2.430e-15	0.000	2.432e-15	-14.614
Hfo_wHAsO4-	4.875e-17	0.000	4.879e-17	-16.312
Hfo_wOAg	3.155e-17	0.000	3.158e-17	-16.501
Hfo_wOBa+	2.017e-18	0.000	2.019e-18	-17.695
Hfo_wOHg+	1.879e-18	0.000	1.881e-18	-17.726
Hfo_wOFe+	7.171e-19	0.000	7.178e-19	-18.144
Hfo_wOHSeO4-2	3.533e-19	0.000	3.537e-19	-18.451
Hfo_wH2AsO4	6.658e-20	0.000	6.664e-20	-19.176
Hfo_wOHSbO(OH) 4-	6.463e-20	0.000	6.469e-20	-19.189
Hfo_wOHCrO4-2	3.630e-20	0.000	3.633e-20	-19.440
Hfo_wSeO4-	6.515e-21	0.000	6.521e-21	-20.186
Hfo_wSbO(OH) 4	1.762e-21	0.000	1.764e-21	-20.753
Hfo_wCrO4-	7.008e-22	0.000	7.015e-22	-21.154
Hfo_wH2AsO3	9.476e-30	0.000	9.485e-30	-29.023

-----Solution composition-----

Elements	Molality	Moles
Ag	1.742e-08	1.740e-08
Al	2.732e-06	2.729e-06
As	1.591e-10	1.590e-10
B	4.213e-05	4.208e-05
Ba	4.299e-08	4.295e-08
C	8.855e-04	8.846e-04
Ca	2.482e-03	2.479e-03
Cd	1.407e-08	1.406e-08
Cl	5.248e-03	5.243e-03
Co	1.083e-07	1.082e-07
Cr	9.034e-10	9.025e-10
Cu	5.340e-07	5.334e-07
F	2.990e-04	2.987e-04
Fe	8.317e-10	8.309e-10
Hg	2.219e-09	2.217e-09
K	3.866e-03	3.862e-03
Mg	5.803e-03	5.797e-03
Mn	6.620e-05	6.614e-05
Mo	1.945e-06	1.943e-06
N	1.620e-05	1.619e-05
Na	1.512e-02	1.510e-02
Ni	1.687e-07	1.686e-07
Pb	6.577e-09	6.571e-09
S	1.461e-02	1.460e-02
Sb	2.964e-08	2.961e-08
Se	1.660e-07	1.658e-07
Si	5.695e-05	5.689e-05
U	2.718e-07	2.715e-07
V	8.968e-09	8.959e-09
Zn	6.702e-06	6.696e-06

-----Description of solution-----

equilibrium	pH	=	8.152	Charge balance
	pe	=	4.621	Adjusted to redox
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.669e-02	
	Mass of water (kg)	=	9.990e-01	

Total alkalinity (eq/kg) = 9.199e-04
 Total CO2 (mol/kg) = 8.855e-04
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 1.915e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 1
 Total H = 1.109093e+02
 Total O = 5.551547e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.748e-06	1.426e-06	-5.758	-5.846	-0.088	(0)
H+	8.550e-09	7.054e-09	-8.068	-8.152	-0.083	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	1.742e-08					
AgCl	1.060e-08	1.060e-08	-7.975	-7.975	0.000	(0)
AgCl2-	5.153e-09	3.998e-09	-8.288	-8.398	-0.110	(0)
Ag+	1.453e-09	1.199e-09	-8.838	-8.921	-0.083	(0)
AgSO4-	1.628e-10	1.263e-10	-9.788	-9.899	-0.110	(0)
AgCl3-2	4.258e-11	1.543e-11	-10.371	-10.812	-0.441	(0)
AgNO2	3.275e-12	3.275e-12	-11.485	-11.485	0.000	(0)
AgCl4-3	1.339e-12	1.364e-13	-11.873	-12.865	-0.992	(0)
AgF	6.083e-13	6.083e-13	-12.216	-12.216	0.000	(0)
AgOH	1.710e-13	1.710e-13	-12.767	-12.767	0.000	(0)
AgH2BO3	5.969e-14	5.969e-14	-13.224	-13.224	0.000	(0)
AgSeO3-	3.262e-14	2.531e-14	-13.486	-13.597	-0.110	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	1.237e-14	9.600e-15	-13.908	-14.018	-0.110	(0)
Ag (NO2) 2-	8.548e-17	6.632e-17	-16.068	-16.178	-0.110	(0)
Ag (OH) 2-	3.072e-17	2.383e-17	-16.513	-16.623	-0.110	(0)
AgNO3	1.175e-17	1.175e-17	-16.930	-16.930	0.000	(0)
Ag (NH3) 2+	3.944e-19	3.060e-19	-18.404	-18.514	-0.110	(0)
Ag (SeO3) 2-3	7.308e-20	7.446e-21	-19.136	-20.128	-0.992	(0)
Ag2MoO4	4.905e-25	4.905e-25	-24.309	-24.309	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.054	-74.054	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.231	-82.994	-1.763	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.021	-148.234	-0.214	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.792	-148.902	-0.110	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.135	-149.523	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.467	-149.834	-0.367	(0)
Al	2.732e-06					
Al (OH) 4-	2.719e-06	2.243e-06	-5.566	-5.649	-0.084	(0)
Al (OH) 3	1.249e-08	1.249e-08	-7.903	-7.903	0.000	(0)
Al (OH) 2+	5.273e-10	4.390e-10	-9.278	-9.358	-0.080	(0)
AlF3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
AlF2+	5.301e-11	4.413e-11	-10.276	-10.355	-0.080	(0)
AlF4-	1.377e-11	1.136e-11	-10.861	-10.945	-0.084	(0)
AlF+2	1.143e-12	5.487e-13	-11.942	-12.261	-0.319	(0)
AlOH+2	8.071e-13	3.875e-13	-12.093	-12.412	-0.319	(0)
AlSO4+	1.349e-14	1.113e-14	-13.870	-13.953	-0.084	(0)
Al+3	1.532e-15	2.717e-16	-14.815	-15.566	-0.751	(0)
Al (SO4) 2-	7.633e-16	6.297e-16	-15.117	-15.201	-0.084	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.760	-45.752	-0.992	(0)
As (3)	1.088e-24					
H3AsO3	9.944e-25	9.944e-25	-24.002	-24.002	0.000	(0)
H2AsO3-	9.317e-26	7.229e-26	-25.031	-25.141	-0.110	(0)
HAsO3-2	2.579e-29	9.346e-30	-28.589	-29.029	-0.441	(0)
H4AsO3+	4.479e-33	3.475e-33	-32.349	-32.459	-0.110	(0)
AsO3-3	5.012e-34	5.107e-35	-33.300	-34.292	-0.992	(0)
As (5)	1.591e-10					
HAsO4-2	1.542e-10	5.589e-11	-9.812	-10.253	-0.441	(0)
H2AsO4-	4.634e-12	3.596e-12	-11.334	-11.444	-0.110	(0)
AsO4-3	2.459e-13	2.505e-14	-12.609	-13.601	-0.992	(0)
H3AsO4	4.361e-18	4.408e-18	-17.360	-17.356	0.005	(0)

B	4.213e-05					
H3BO3	3.775e-05	3.816e-05	-4.423	-4.418	0.005	(0)
H2BO3-	3.897e-06	3.141e-06	-5.409	-5.503	-0.094	(0)
MgH2BO3+	2.483e-07	2.001e-07	-6.605	-6.699	-0.094	(0)
CaH2BO3+	1.641e-07	1.323e-07	-6.785	-6.879	-0.094	(0)
NaH2BO3	6.038e-08	6.038e-08	-7.219	-7.219	0.000	(0)
BF(OH) 3-	3.815e-09	3.076e-09	-8.418	-8.512	-0.094	(0)
H5(BO3) 2-	1.266e-10	1.020e-10	-9.898	-9.991	-0.094	(0)
BaH2BO3+	2.389e-12	1.926e-12	-11.622	-11.715	-0.094	(0)
BF2(OH) 2-	5.817e-13	4.689e-13	-12.235	-12.329	-0.094	(0)
H8(BO3) 3-	4.830e-13	3.893e-13	-12.316	-12.410	-0.094	(0)
AgH2BO3	5.969e-14	5.969e-14	-13.224	-13.224	0.000	(0)
BF3OH-	3.227e-19	2.601e-19	-18.491	-18.585	-0.094	(0)
BF4-	2.264e-24	1.825e-24	-23.645	-23.739	-0.094	(0)
Ba	4.299e-08					
Ba+2	4.279e-08	1.983e-08	-7.369	-7.703	-0.334	(0)
BaHCO3+	1.541e-10	1.290e-10	-9.812	-9.889	-0.077	(0)
BaCO3	4.604e-11	4.604e-11	-10.337	-10.337	0.000	(0)
BaH2BO3+	2.389e-12	1.926e-12	-11.622	-11.715	-0.094	(0)
BaOH+	1.489e-13	1.235e-13	-12.827	-12.908	-0.081	(0)
BaNO3+	1.580e-15	1.226e-15	-14.801	-14.911	-0.110	(0)
BaNH3+2	1.354e-16	4.908e-17	-15.868	-16.309	-0.441	(0)
C (4)	8.855e-04					
HCO3-	8.182e-04	6.811e-04	-3.087	-3.167	-0.080	(0)
MgHCO3+	1.560e-05	1.280e-05	-4.807	-4.893	-0.086	(0)
CaHCO3+	1.109e-05	9.278e-06	-4.955	-5.033	-0.077	(0)
H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.765e-06	4.526e-06	-5.010	-5.344	-0.334	(0)
MgCO3	6.917e-06	6.917e-06	-5.160	-5.160	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaHCO3	4.644e-06	4.644e-06	-5.333	-5.333	0.000	(0)
NaCO3-	1.228e-06	1.022e-06	-5.911	-5.991	-0.080	(0)
ZnCO3	4.362e-07	4.362e-07	-6.360	-6.360	0.000	(0)
CuCO3	3.748e-07	3.748e-07	-6.426	-6.426	0.000	(0)
MnHCO3+	2.905e-07	2.408e-07	-6.537	-6.618	-0.081	(0)
UO2(CO3) 3-4	2.245e-07	3.872e-09	-6.649	-8.412	-1.763	(0)
UO2(CO3) 2-2	4.710e-08	1.707e-08	-7.327	-7.768	-0.441	(0)
ZnHCO3+	4.649e-08	3.607e-08	-7.333	-7.443	-0.110	(0)
Cu(CO3) 2-2	1.260e-08	4.566e-09	-7.900	-8.340	-0.441	(0)
NiCO3	8.062e-09	8.062e-09	-8.094	-8.094	0.000	(0)
NiHCO3+	5.167e-09	4.009e-09	-8.287	-8.397	-0.110	(0)
PbCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)
CoCO3	2.059e-09	2.059e-09	-8.686	-8.686	0.000	(0)
CoHCO3+	1.837e-09	1.425e-09	-8.736	-8.846	-0.110	(0)
CuHCO3+	7.789e-10	6.043e-10	-9.109	-9.219	-0.110	(0)
CdCO3	3.354e-10	3.354e-10	-9.474	-9.474	0.000	(0)
UO2CO3	1.890e-10	1.890e-10	-9.724	-9.724	0.000	(0)
PbHCO3+	1.735e-10	1.347e-10	-9.761	-9.871	-0.110	(0)
BaHCO3+	1.541e-10	1.290e-10	-9.812	-9.889	-0.077	(0)
Pb(CO3) 2-2	1.304e-10	4.726e-11	-9.885	-10.326	-0.441	(0)
BaCO3	4.604e-11	4.604e-11	-10.337	-10.337	0.000	(0)
CdHCO3+	6.498e-12	5.041e-12	-11.187	-11.297	-0.110	(0)
Cd(CO3) 2-2	3.106e-12	1.125e-12	-11.508	-11.949	-0.441	(0)
HgCO3	2.262e-15	2.262e-15	-14.645	-14.645	0.000	(0)
FeHCO3+	1.442e-15	1.207e-15	-14.841	-14.918	-0.077	(0)
Hg(CO3) 2-2	8.936e-17	3.238e-17	-16.049	-16.490	-0.441	(0)
HgHCO3+	3.830e-19	2.972e-19	-18.417	-18.527	-0.110	(0)
Ca	2.482e-03					
Ca+2	1.578e-03	7.316e-04	-2.802	-3.136	-0.334	(0)
CaSO4	8.848e-04	8.848e-04	-3.053	-3.053	0.000	(0)
CaHCO3+	1.109e-05	9.278e-06	-4.955	-5.033	-0.077	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	1.945e-06	1.613e-06	-5.711	-5.792	-0.081	(0)
CaH2BO3+	1.641e-07	1.323e-07	-6.785	-6.879	-0.094	(0)
CaOH+	2.487e-08	2.082e-08	-7.604	-7.682	-0.077	(0)
CaNO3+	3.678e-11	2.854e-11	-10.434	-10.545	-0.110	(0)
CaNH3+2	9.967e-12	3.612e-12	-11.001	-11.442	-0.441	(0)
Ca(NH3) 2+2	1.556e-20	5.639e-21	-19.808	-20.249	-0.441	(0)

Cd	1.407e-08					
Cd+2	7.014e-09	3.251e-09	-8.154	-8.488	-0.334	(0)
CdSO4	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
CdCl+	1.733e-09	1.345e-09	-8.761	-8.871	-0.110	(0)
Cd(SO4) 2-2	7.907e-10	2.865e-10	-9.102	-9.543	-0.441	(0)
CdCO3	3.354e-10	3.354e-10	-9.474	-9.474	0.000	(0)
CdOHC1	7.866e-11	7.866e-11	-10.104	-10.104	0.000	(0)
CdOH+	4.747e-11	3.683e-11	-10.324	-10.434	-0.110	(0)
CdCl2	2.427e-11	2.427e-11	-10.615	-10.615	0.000	(0)
CdF+	1.341e-11	1.041e-11	-10.872	-10.983	-0.110	(0)
CdHCO3+	6.498e-12	5.041e-12	-11.187	-11.297	-0.110	(0)
Cd(CO3) 2-2	3.106e-12	1.125e-12	-11.508	-11.949	-0.441	(0)
Cd(OH) 2	3.315e-13	3.315e-13	-12.480	-12.480	0.000	(0)
CdCl3-	8.548e-14	6.632e-14	-13.068	-13.178	-0.110	(0)
CdF2	4.195e-15	4.195e-15	-14.377	-14.377	0.000	(0)
CdNO3+	1.635e-16	1.268e-16	-15.787	-15.897	-0.110	(0)
CdSeO4	8.616e-17	8.616e-17	-16.065	-16.065	0.000	(0)
Cd(OH) 3-	3.723e-17	2.888e-17	-16.429	-16.539	-0.110	(0)
Cd(SeO3) 2-2	7.980e-18	2.892e-18	-17.098	-17.539	-0.441	(0)
Cd2OH+3	5.890e-18	6.002e-19	-17.230	-18.222	-0.992	(0)
Cd(OH) 4-2	1.861e-23	6.743e-24	-22.730	-23.171	-0.441	(0)
Cd(NO3) 2	7.841e-25	7.841e-25	-24.106	-24.106	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.318	-79.428	-0.110	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-151.171	-151.171	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-228.109	-228.219	-0.110	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-304.530	-304.971	-0.441	(0)
Cl	5.248e-03					
Cl-	5.248e-03	4.330e-03	-2.280	-2.363	-0.083	(0)
MnCl+	1.165e-07	9.662e-08	-6.934	-7.015	-0.081	(0)
ZnOHC1	3.401e-08	3.401e-08	-7.468	-7.468	0.000	(0)
ZnCl+	2.220e-08	1.822e-08	-7.654	-7.740	-0.086	(0)
AgCl	1.060e-08	1.060e-08	-7.975	-7.975	0.000	(0)
AgCl2-	5.153e-09	3.998e-09	-8.288	-8.398	-0.110	(0)
CdCl+	1.733e-09	1.345e-09	-8.761	-8.871	-0.110	(0)
CuCl2-	9.908e-10	8.131e-10	-9.004	-9.090	-0.086	(0)
CuCl	8.987e-10	8.987e-10	-9.046	-9.046	0.000	(0)
NiCl+	6.818e-10	5.290e-10	-9.166	-9.277	-0.110	(0)
MnCl2	5.910e-10	5.910e-10	-9.228	-9.228	0.000	(0)
CoCl+	5.195e-10	4.031e-10	-9.284	-9.395	-0.110	(0)
ZnCl2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
CuCl+	1.176e-10	9.651e-11	-9.930	-10.015	-0.086	(0)
CdOHC1	7.866e-11	7.866e-11	-10.104	-10.104	0.000	(0)
PbCl+	5.269e-11	4.088e-11	-10.278	-10.388	-0.110	(0)
AgCl3-2	4.258e-11	1.543e-11	-10.371	-10.812	-0.441	(0)
CdCl2	2.427e-11	2.427e-11	-10.615	-10.615	0.000	(0)
HgClOH	4.556e-12	4.556e-12	-11.341	-11.341	0.000	(0)
CuCl3-2	1.592e-12	7.528e-13	-11.798	-12.123	-0.325	(0)
AgCl4-3	1.339e-12	1.364e-13	-11.873	-12.865	-0.992	(0)
MnCl3-	8.501e-13	7.049e-13	-12.071	-12.152	-0.081	(0)
PbCl2	7.908e-13	7.908e-13	-12.102	-12.102	0.000	(0)
HgCl2	7.832e-13	7.832e-13	-12.106	-12.106	0.000	(0)
ZnCl3-	5.240e-13	4.301e-13	-12.281	-12.366	-0.086	(0)
CuCl2	1.449e-13	1.449e-13	-12.839	-12.839	0.000	(0)
CdCl3-	8.548e-14	6.632e-14	-13.068	-13.178	-0.110	(0)
HgCl3-	4.371e-14	3.392e-14	-13.359	-13.470	-0.110	(0)
NiCl2	1.153e-14	1.153e-14	-13.938	-13.938	0.000	(0)
ZnCl4-2	1.970e-15	9.312e-16	-14.706	-15.031	-0.325	(0)
PbCl3-	1.757e-15	1.363e-15	-14.755	-14.865	-0.110	(0)
HgCl4-2	1.614e-15	5.847e-16	-14.792	-15.233	-0.441	(0)
UO2Cl+	9.493e-17	7.366e-17	-16.023	-16.133	-0.110	(0)
HgCl+	4.651e-17	3.609e-17	-16.332	-16.443	-0.110	(0)
PbCl4-2	7.447e-18	2.699e-18	-17.128	-17.569	-0.441	(0)
CuCl3-	7.137e-18	5.857e-18	-17.147	-17.232	-0.086	(0)
CrCl+2	1.334e-18	4.835e-19	-17.875	-18.316	-0.441	(0)
CrOHC12	5.676e-20	5.676e-20	-19.246	-19.246	0.000	(0)
CuCl4-2	2.689e-22	1.271e-22	-21.570	-21.896	-0.325	(0)
CrCl2+	2.561e-22	1.987e-22	-21.592	-21.702	-0.110	(0)
FeCl+2	1.511e-22	7.144e-23	-21.821	-22.146	-0.325	(0)

VOC1+	5.861e-24	4.548e-24	-23.232	-23.342	-0.110	(0)
FeCl2+	1.666e-24	1.382e-24	-23.778	-23.860	-0.081	(0)
CrO3Cl-	6.570e-26	5.098e-26	-25.182	-25.293	-0.110	(0)
FeCl3	5.984e-28	5.984e-28	-27.223	-27.223	0.000	(0)
CoCl+2	1.088e-35	3.943e-36	-34.963	-35.404	-0.441	(0)
UCl+3	0.000e+00	0.000e+00	-46.282	-47.274	-0.992	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
Co (2)	1.083e-07					
Co+2	7.425e-08	2.691e-08	-7.129	-7.570	-0.441	(0)
CoSO4	2.834e-08	2.834e-08	-7.548	-7.548	0.000	(0)
CoCO3	2.059e-09	2.059e-09	-8.686	-8.686	0.000	(0)
CoHCO3+	1.837e-09	1.425e-09	-8.736	-8.846	-0.110	(0)
CoOH+	9.869e-10	7.657e-10	-9.006	-9.116	-0.110	(0)
CoCl+	5.195e-10	4.031e-10	-9.284	-9.395	-0.110	(0)
CoF+	2.215e-10	1.719e-10	-9.655	-9.765	-0.110	(0)
Co (OH) 2	8.675e-11	8.675e-11	-10.062	-10.062	0.000	(0)
CoNO2+	3.195e-12	2.479e-12	-11.495	-11.606	-0.110	(0)
Co (NH3) +2	3.501e-14	1.269e-14	-13.456	-13.897	-0.441	(0)
Co (OH) 3-	3.182e-15	2.469e-15	-14.497	-14.608	-0.110	(0)
CoSeO4	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
CoOOH-	7.989e-16	6.199e-16	-15.097	-15.208	-0.110	(0)
CoNO3+	6.780e-16	5.260e-16	-15.169	-15.279	-0.110	(0)
Co2OH+3	1.013e-17	1.033e-18	-16.994	-17.986	-0.992	(0)
Co (NH3) 2+2	5.857e-21	2.122e-21	-20.232	-20.673	-0.441	(0)
Co (OH) 4-2	1.540e-21	5.580e-22	-20.813	-21.253	-0.441	(0)
Co (NO3) 2	1.320e-23	1.320e-23	-22.879	-22.879	0.000	(0)
Co4 (OH) 4+4	3.977e-27	6.859e-29	-26.400	-28.164	-1.763	(0)
Co (NH3) 3+2	2.892e-28	1.048e-28	-27.539	-27.980	-0.441	(0)
Co (NH3) 4+2	5.951e-36	2.157e-36	-35.225	-35.666	-0.441	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.412	-43.853	-0.441	(0)
Co (3)	8.951e-29					
CoOH+2	8.951e-29	3.244e-29	-28.048	-28.489	-0.441	(0)
Co+3	2.524e-35	4.475e-36	-34.598	-35.349	-0.751	(0)
CoCl+2	1.088e-35	3.943e-36	-34.963	-35.404	-0.441	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.447	-65.888	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
Cr (2)	1.361e-27					
Cr+2	1.361e-27	4.933e-28	-26.866	-27.307	-0.441	(0)
Cr (3)	9.033e-10					
Cr (OH) 2+	6.021e-10	4.672e-10	-9.220	-9.331	-0.110	(0)
Cr (OH) 3	2.503e-10	2.503e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.174e-11	1.686e-11	-10.663	-10.773	-0.110	(0)
Cr (OH) 4-	1.832e-11	1.421e-11	-10.737	-10.847	-0.110	(0)
Cr (OH) +2	7.429e-12	2.692e-12	-11.129	-11.570	-0.441	(0)
CrOHSO4	3.373e-12	3.373e-12	-11.472	-11.472	0.000	(0)
CrF+2	7.622e-15	2.762e-15	-14.118	-14.559	-0.441	(0)
CrSO4+	1.371e-15	1.064e-15	-14.863	-14.973	-0.110	(0)
Cr+3	8.468e-16	8.628e-17	-15.072	-16.064	-0.992	(0)
CrCl+2	1.334e-18	4.835e-19	-17.875	-18.316	-0.441	(0)
CrOHC12	5.676e-20	5.676e-20	-19.246	-19.246	0.000	(0)
Cr2 (OH) 2SO4+2	2.265e-21	8.207e-22	-20.645	-21.086	-0.441	(0)
Cr2 (OH) 2 (SO4) 2	2.574e-22	2.574e-22	-21.589	-21.589	0.000	(0)
CrCl2+	2.561e-22	1.987e-22	-21.592	-21.702	-0.110	(0)
CrNO3+2	1.284e-25	4.652e-26	-24.892	-25.332	-0.441	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.129	-43.570	-0.441	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.511	-53.503	-0.992	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Cr (6)	2.647e-14					
CrO4-2	2.506e-14	1.161e-14	-13.601	-13.935	-0.334	(0)
NaCrO4-	9.020e-16	6.999e-16	-15.045	-15.155	-0.110	(0)
HCrO4-	3.417e-16	2.651e-16	-15.466	-15.577	-0.110	(0)
KCrO4-	1.711e-16	1.327e-16	-15.767	-15.877	-0.110	(0)
CrO3SO4-2	8.305e-24	3.010e-24	-23.081	-23.521	-0.441	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)

CrO3Cl-	6.570e-26	5.098e-26	-25.182	-25.293	-0.110	(0)
Cr2O7-2	6.731e-30	2.439e-30	-29.172	-29.613	-0.441	(0)
Cu (1)	2.104e-09					
CuCl2-	9.908e-10	8.131e-10	-9.004	-9.090	-0.086	(0)
CuCl	8.987e-10	8.987e-10	-9.046	-9.046	0.000	(0)
Cu+	2.125e-10	1.648e-10	-9.673	-9.783	-0.110	(0)
CuCl3-2	1.592e-12	7.528e-13	-11.798	-12.123	-0.325	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.609	-147.985	-0.377	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.358	-148.715	-0.357	(0)
Cu (2)	5.319e-07					
CuCO3	3.748e-07	3.748e-07	-6.426	-6.426	0.000	(0)
CuOH+	7.728e-08	6.342e-08	-7.112	-7.198	-0.086	(0)
Cu+2	3.034e-08	1.406e-08	-7.518	-7.852	-0.334	(0)
Cu (OH) 2	1.805e-08	1.805e-08	-7.744	-7.744	0.000	(0)
CuSO4	1.701e-08	1.701e-08	-7.769	-7.769	0.000	(0)
Cu (CO3) 2-2	1.260e-08	4.566e-09	-7.900	-8.340	-0.441	(0)
CuHCO3+	7.789e-10	6.043e-10	-9.109	-9.219	-0.110	(0)
Cu2 (OH) 2+2	2.788e-10	1.010e-10	-9.555	-9.995	-0.441	(0)
CuF+	2.310e-10	1.792e-10	-9.636	-9.747	-0.110	(0)
CuCl+	1.176e-10	9.651e-11	-9.930	-10.015	-0.086	(0)
Cu (OH) 3-	6.806e-11	5.280e-11	-10.167	-10.277	-0.110	(0)
CuNO2+	2.482e-11	1.925e-11	-10.605	-10.715	-0.110	(0)
CuNH3+2	1.557e-12	5.643e-13	-11.808	-12.248	-0.441	(0)
CuCl2	1.449e-13	1.449e-13	-12.839	-12.839	0.000	(0)
Cu (NO2) 2	2.576e-15	2.576e-15	-14.589	-14.589	0.000	(0)
Cu (OH) 4-2	1.636e-15	5.927e-16	-14.786	-15.227	-0.441	(0)
CuNO3+	7.070e-16	5.485e-16	-15.151	-15.261	-0.110	(0)
CuCl3-	7.137e-18	5.857e-18	-17.147	-17.232	-0.086	(0)
CuCl4-2	2.689e-22	1.271e-22	-21.570	-21.896	-0.325	(0)
Cu (NO3) 2	8.518e-25	8.518e-25	-24.070	-24.070	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.686	-218.796	-0.110	(0)
F	2.990e-04					
F-	2.448e-04	2.020e-04	-3.611	-3.695	-0.083	(0)
MgF+	5.047e-05	4.164e-05	-4.297	-4.381	-0.084	(0)
CaF+	1.945e-06	1.613e-06	-5.711	-5.792	-0.081	(0)
NaF	1.546e-06	1.546e-06	-5.811	-5.811	0.000	(0)
MnF+	1.719e-07	1.425e-07	-6.765	-6.846	-0.081	(0)
ZnF+	8.699e-09	6.749e-09	-8.061	-8.171	-0.110	(0)
BF (OH) 3-	3.815e-09	3.076e-09	-8.418	-8.512	-0.094	(0)
HF	2.108e-09	2.108e-09	-8.676	-8.676	0.000	(0)
NiF+	3.122e-10	2.422e-10	-9.506	-9.616	-0.110	(0)
CuF+	2.310e-10	1.792e-10	-9.636	-9.747	-0.110	(0)
CoF+	2.215e-10	1.719e-10	-9.655	-9.765	-0.110	(0)
AlF3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
AlF2+	5.301e-11	4.413e-11	-10.276	-10.355	-0.080	(0)
AlF4-	1.377e-11	1.136e-11	-10.861	-10.945	-0.084	(0)
CdF+	1.341e-11	1.041e-11	-10.872	-10.983	-0.110	(0)
PbF+	4.882e-12	3.787e-12	-11.311	-11.422	-0.110	(0)
HF2-	1.983e-12	1.619e-12	-11.703	-11.791	-0.088	(0)
AlF+2	1.143e-12	5.487e-13	-11.942	-12.261	-0.319	(0)
AgF	6.083e-13	6.083e-13	-12.216	-12.216	0.000	(0)
BF2 (OH) 2-	5.817e-13	4.689e-13	-12.235	-12.329	-0.094	(0)
UO2F+	3.769e-13	2.924e-13	-12.424	-12.534	-0.110	(0)
UO2F2	1.704e-13	1.704e-13	-12.769	-12.769	0.000	(0)
PbF2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
UO2F3-	1.114e-14	8.644e-15	-13.953	-14.063	-0.110	(0)
CrF+2	7.622e-15	2.762e-15	-14.118	-14.559	-0.441	(0)
CdF2	4.195e-15	4.195e-15	-14.377	-14.377	0.000	(0)
UO2F4-2	3.827e-17	1.387e-17	-16.417	-16.858	-0.441	(0)
H2F2	1.190e-17	1.190e-17	-16.924	-16.924	0.000	(0)
PbF3-	7.434e-18	5.768e-18	-17.129	-17.239	-0.110	(0)
VO2F	1.391e-18	1.391e-18	-17.857	-17.857	0.000	(0)
FeF2+	7.887e-19	6.540e-19	-18.103	-18.184	-0.081	(0)
BF3OH-	3.227e-19	2.601e-19	-18.491	-18.585	-0.094	(0)
FeF+2	2.559e-19	1.210e-19	-18.592	-18.917	-0.325	(0)
FeF3	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
VO2F2-	1.315e-19	1.020e-19	-18.881	-18.991	-0.110	(0)
PbF4-2	1.539e-21	5.577e-22	-20.813	-21.254	-0.441	(0)

VO2F3-2	7.093e-22	2.570e-22	-21.149	-21.590	-0.441	(0)
VOF+	5.845e-22	4.535e-22	-21.233	-21.343	-0.110	(0)
VOF2	3.435e-23	3.435e-23	-22.464	-22.464	0.000	(0)
HgF+	4.031e-24	3.127e-24	-23.395	-23.505	-0.110	(0)
BF4-	2.264e-24	1.825e-24	-23.645	-23.739	-0.094	(0)
VOF3-	3.173e-25	2.462e-25	-24.499	-24.609	-0.110	(0)
VO2F4-3	2.507e-25	2.555e-26	-24.601	-25.593	-0.992	(0)
Sb(OH) 2F	2.458e-26	2.458e-26	-25.609	-25.609	0.000	(0)
SbOF	2.419e-26	2.419e-26	-25.616	-25.616	0.000	(0)
VOF4-2	5.539e-28	2.007e-28	-27.257	-27.697	-0.441	(0)
SiF6-2	3.033e-29	1.434e-29	-28.518	-28.843	-0.325	(0)
UF3+	1.036e-36	8.040e-37	-35.985	-36.095	-0.110	(0)
UF2+2	6.930e-38	2.511e-38	-37.159	-37.600	-0.441	(0)
UF4	1.781e-38	1.781e-38	-37.749	-37.749	0.000	(0)
UF5-	1.837e-40	1.425e-40	-39.736	-39.846	-0.110	(0)
UF+3	0.000e+00	0.000e+00	-40.014	-41.005	-0.992	(0)
UF6-2	0.000e+00	0.000e+00	-40.620	-41.061	-0.441	(0)
Fe (2)	5.818e-13					
Fe+2	3.884e-13	1.407e-13	-12.411	-12.852	-0.441	(0)
FeSO4	1.824e-13	1.824e-13	-12.739	-12.739	0.000	(0)
FeOH+	9.637e-15	7.991e-15	-14.016	-14.097	-0.081	(0)
FeHCO3+	1.442e-15	1.207e-15	-14.841	-14.918	-0.077	(0)
Fe (OH) 2	9.054e-18	9.054e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.924e-18	4.083e-18	-17.308	-17.389	-0.081	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.797	-161.797	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.598	-238.708	-0.110	(0)
Fe (3)	8.311e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	3.353e-10	2.791e-10	-9.475	-9.554	-0.080	(0)
Fe (OH) 4-	6.821e-11	5.678e-11	-10.166	-10.246	-0.080	(0)
FeOH+2	1.064e-15	5.030e-16	-14.973	-15.298	-0.325	(0)
FeF2+	7.887e-19	6.540e-19	-18.103	-18.184	-0.081	(0)
FeF+2	2.559e-19	1.210e-19	-18.592	-18.917	-0.325	(0)
FeF3	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
FeSO4+	3.902e-20	3.236e-20	-19.409	-19.490	-0.081	(0)
Fe (SO4) 2-	4.707e-21	3.652e-21	-20.327	-20.437	-0.110	(0)
Fe+3	3.081e-21	5.463e-22	-20.511	-21.263	-0.751	(0)
FeCl+2	1.511e-22	7.144e-23	-21.821	-22.146	-0.325	(0)
FeCl2+	1.666e-24	1.382e-24	-23.778	-23.860	-0.081	(0)
FeHSeO3+2	2.319e-25	8.403e-26	-24.635	-25.076	-0.441	(0)
FeCl3	5.984e-28	5.984e-28	-27.223	-27.223	0.000	(0)
Fe2 (OH) 2+4	4.859e-28	8.379e-30	-27.313	-29.077	-1.763	(0)
FeNO3+2	1.859e-28	6.738e-29	-27.731	-28.171	-0.441	(0)
Fe3 (OH) 4+5	1.924e-35	3.381e-38	-34.716	-37.471	-2.755	(0)
H (0)	3.993e-29					
H2	1.997e-29	2.018e-29	-28.700	-28.695	0.005	(0)
Hg (0)	2.208e-09					
Hg	2.208e-09	2.208e-09	-8.656	-8.656	0.000	(0)
Hg (1)	3.456e-21					
Hg2+2	1.728e-21	6.261e-22	-20.763	-21.203	-0.441	(0)
Hg (2)	1.069e-11					
Hg (OH) 2	5.303e-12	5.361e-12	-11.275	-11.271	0.005	(0)
HgClOH	4.556e-12	4.556e-12	-11.341	-11.341	0.000	(0)
HgCl2	7.832e-13	7.832e-13	-12.106	-12.106	0.000	(0)
HgCl3-	4.371e-14	3.392e-14	-13.359	-13.470	-0.110	(0)
HgCO3	2.262e-15	2.262e-15	-14.645	-14.645	0.000	(0)
HgCl4-2	1.614e-15	5.847e-16	-14.792	-15.233	-0.441	(0)
Hg (CO3) 2-2	8.936e-17	3.238e-17	-16.049	-16.490	-0.441	(0)
HgCl+	4.651e-17	3.609e-17	-16.332	-16.443	-0.110	(0)
HgOH+	3.056e-17	2.371e-17	-16.515	-16.625	-0.110	(0)
Hg (OH) 3-	1.241e-18	9.625e-19	-17.906	-18.017	-0.110	(0)
HgHCO3+	3.830e-19	2.972e-19	-18.417	-18.527	-0.110	(0)
Hg (NH3) 2+2	1.118e-20	4.053e-21	-19.951	-20.392	-0.441	(0)
HgNH3+2	2.852e-21	1.033e-21	-20.545	-20.986	-0.441	(0)
Hg+2	1.153e-21	4.177e-22	-20.938	-21.379	-0.441	(0)
HgSO4	5.773e-22	5.773e-22	-21.239	-21.239	0.000	(0)
HgF+	4.031e-24	3.127e-24	-23.395	-23.505	-0.110	(0)
Hg (NH3) 3+2	1.746e-28	6.328e-29	-27.758	-28.199	-0.441	(0)

	HgNO3+	2.452e-30	1.902e-30	-29.611	-29.721	-0.110	(0)
	Hg (NH3) 4+2	5.440e-36	1.971e-36	-35.264	-35.705	-0.441	(0)
	Hg (NO3) 2	9.753e-39	9.753e-39	-38.011	-38.011	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.085	-139.195	-0.110	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.311	-139.752	-0.441	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.953	-140.953	0.000	(0)
K	3.866e-03						
	K+	3.728e-03	3.076e-03	-2.429	-2.512	-0.083	(0)
	KSO4-	1.381e-04	1.150e-04	-3.860	-3.939	-0.080	(0)
	KCrO4-	1.711e-16	1.327e-16	-15.767	-15.877	-0.110	(0)
Mg	5.803e-03						
	Mg+2	3.963e-03	1.837e-03	-2.402	-2.736	-0.334	(0)
	MgSO4	1.765e-03	1.765e-03	-2.753	-2.753	0.000	(0)
	MgF+	5.047e-05	4.164e-05	-4.297	-4.381	-0.084	(0)
	MgHCO3+	1.560e-05	1.280e-05	-4.807	-4.893	-0.086	(0)
	MgCO3	6.917e-06	6.917e-06	-5.160	-5.160	0.000	(0)
	MgOH+	1.241e-06	1.043e-06	-5.906	-5.982	-0.075	(0)
	MgH2BO3+	2.483e-07	2.001e-07	-6.605	-6.699	-0.094	(0)
Mn (2)	6.620e-05						
	Mn+2	4.891e-05	1.772e-05	-4.311	-4.751	-0.441	(0)
	MnSO4	1.664e-05	1.664e-05	-4.779	-4.779	0.000	(0)
	MnHCO3+	2.905e-07	2.408e-07	-6.537	-6.618	-0.081	(0)
	MnF+	1.719e-07	1.425e-07	-6.765	-6.846	-0.081	(0)
	MnCl+	1.165e-07	9.662e-08	-6.934	-7.015	-0.081	(0)
	MnOH+	7.657e-08	6.350e-08	-7.116	-7.197	-0.081	(0)
	MnCl2	5.910e-10	5.910e-10	-9.228	-9.228	0.000	(0)
	MnCl3-	8.501e-13	7.049e-13	-12.071	-12.152	-0.081	(0)
	MnSeO4	6.789e-13	6.789e-13	-12.168	-12.168	0.000	(0)
	MnNO3+	4.466e-13	3.465e-13	-12.350	-12.460	-0.110	(0)
	Mn (OH) 3-	9.627e-16	7.983e-16	-15.017	-15.098	-0.081	(0)
	Mn (NO3) 2	1.074e-20	1.074e-20	-19.969	-19.969	0.000	(0)
	Mn (OH) 4-2	7.775e-21	3.676e-21	-20.109	-20.435	-0.325	(0)
	MnSe	0.000e+00	0.000e+00	-40.994	-40.994	0.000	(0)
Mn (3)	1.866e-25						
	Mn+3	1.866e-25	3.308e-26	-24.729	-25.480	-0.751	(0)
Mn (6)	7.027e-40						
	MnO4-2	7.027e-40	3.322e-40	-39.153	-39.479	-0.325	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.139	-44.230	-0.091	(0)
Mo	1.945e-06						
	MoO4-2	1.945e-06	9.016e-07	-5.711	-6.045	-0.334	(0)
	HMoO4-	1.631e-10	1.265e-10	-9.788	-9.898	-0.110	(0)
	H2MoO4	6.539e-15	6.539e-15	-14.184	-14.184	0.000	(0)
	Ag2MoO4	4.905e-25	4.905e-25	-24.309	-24.309	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-44.760	-45.752	-0.992	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-50.569	-54.536	-3.967	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-53.546	-56.301	-2.755	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-57.907	-59.670	-1.763	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-63.584	-64.576	-0.992	(0)
N (-3)	6.744e-08						
	NH4+	6.019e-08	4.852e-08	-7.220	-7.314	-0.094	(0)
	NH3	3.922e-09	3.922e-09	-8.407	-8.407	0.000	(0)
	NH4SO4-	3.310e-09	2.745e-09	-8.480	-8.561	-0.081	(0)
	CaNH3+2	9.967e-12	3.612e-12	-11.001	-11.442	-0.441	(0)
	CuNH3+2	1.557e-12	5.643e-13	-11.808	-12.248	-0.441	(0)
	NiNH3+2	2.775e-13	1.006e-13	-12.557	-12.998	-0.441	(0)
	Co (NH3) +2	3.501e-14	1.269e-14	-13.456	-13.897	-0.441	(0)
	AgNH3+	1.237e-14	9.600e-15	-13.908	-14.018	-0.110	(0)
	BaNH3+2	1.354e-16	4.908e-17	-15.868	-16.309	-0.441	(0)
	Ag (NH3) 2+	3.944e-19	3.060e-19	-18.404	-18.514	-0.110	(0)
	Ni (NH3) 2+2	1.573e-19	5.700e-20	-18.803	-19.244	-0.441	(0)
	Ca (NH3) 2+2	1.556e-20	5.639e-21	-19.808	-20.249	-0.441	(0)
	Hg (NH3) 2+2	1.118e-20	4.053e-21	-19.951	-20.392	-0.441	(0)
	Co (NH3) 2+2	5.857e-21	2.122e-21	-20.232	-20.673	-0.441	(0)
	HgNH3+2	2.852e-21	1.033e-21	-20.545	-20.986	-0.441	(0)
	Co (NH3) 3+2	2.892e-28	1.048e-28	-27.539	-27.980	-0.441	(0)
	Hg (NH3) 3+2	1.746e-28	6.328e-29	-27.758	-28.199	-0.441	(0)
	Co (NH3) 4+2	5.951e-36	2.157e-36	-35.225	-35.666	-0.441	(0)

	Hg (NH3) 4+2	5.440e-36	1.971e-36	-35.264	-35.705	-0.441	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.129	-43.570	-0.441	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-43.412	-43.853	-0.441	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.511	-53.503	-0.992	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.447	-65.888	-0.441	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
N (3)	1.612e-05						
	NO2-	1.612e-05	1.308e-05	-4.793	-4.884	-0.091	(0)
	CuNO2+	2.482e-11	1.925e-11	-10.605	-10.715	-0.110	(0)
	AgNO2	3.275e-12	3.275e-12	-11.485	-11.485	0.000	(0)
	CoNO2+	3.195e-12	2.479e-12	-11.495	-11.606	-0.110	(0)
	Cu (NO2) 2	2.576e-15	2.576e-15	-14.589	-14.589	0.000	(0)
	Ag (NO2) 2-	8.548e-17	6.632e-17	-16.068	-16.178	-0.110	(0)
N (5)	1.499e-08						
	NO3-	1.495e-08	1.234e-08	-7.825	-7.909	-0.083	(0)
	CaNO3+	3.678e-11	2.854e-11	-10.434	-10.545	-0.110	(0)
	MnNO3+	4.466e-13	3.465e-13	-12.350	-12.460	-0.110	(0)
	ZnNO3+	6.688e-14	5.189e-14	-13.175	-13.285	-0.110	(0)
	NiNO3+	1.907e-15	1.479e-15	-14.720	-14.830	-0.110	(0)
	BaNO3+	1.580e-15	1.226e-15	-14.801	-14.911	-0.110	(0)
	CuNO3+	7.070e-16	5.485e-16	-15.151	-15.261	-0.110	(0)
	CoNO3+	6.780e-16	5.260e-16	-15.169	-15.279	-0.110	(0)
	CdNO3+	1.635e-16	1.268e-16	-15.787	-15.897	-0.110	(0)
	PbNO3+	6.257e-17	4.855e-17	-16.204	-16.314	-0.110	(0)
	AgNO3	1.175e-17	1.175e-17	-16.930	-16.930	0.000	(0)
	Mn (NO3) 2	1.074e-20	1.074e-20	-19.969	-19.969	0.000	(0)
	UO2NO3+	3.327e-22	2.581e-22	-21.478	-21.588	-0.110	(0)
	Zn (NO3) 2	1.277e-22	1.277e-22	-21.894	-21.894	0.000	(0)
	Co (NO3) 2	1.320e-23	1.320e-23	-22.879	-22.879	0.000	(0)
	Pb (NO3) 2	1.017e-24	1.017e-24	-23.993	-23.993	0.000	(0)
	Cu (NO3) 2	8.518e-25	8.518e-25	-24.070	-24.070	0.000	(0)
	Cd (NO3) 2	7.841e-25	7.841e-25	-24.106	-24.106	0.000	(0)
	CrNO3+2	1.284e-25	4.652e-26	-24.892	-25.332	-0.441	(0)
	VO2NO3	2.450e-26	2.450e-26	-25.611	-25.611	0.000	(0)
	FeNO3+2	1.859e-28	6.738e-29	-27.731	-28.171	-0.441	(0)
	HgNO3+	2.452e-30	1.902e-30	-29.611	-29.721	-0.110	(0)
	Hg (NO3) 2	9.753e-39	9.753e-39	-38.011	-38.011	0.000	(0)
Na	1.512e-02						
	Na+	1.470e-02	1.213e-02	-1.833	-1.916	-0.083	(0)
	NaSO4-	4.130e-04	3.438e-04	-3.384	-3.464	-0.080	(0)
	NaHCO3	4.644e-06	4.644e-06	-5.333	-5.333	0.000	(0)
	NaF	1.546e-06	1.546e-06	-5.811	-5.811	0.000	(0)
	NaCO3-	1.228e-06	1.022e-06	-5.911	-5.991	-0.080	(0)
	NaH2BO3	6.038e-08	6.038e-08	-7.219	-7.219	0.000	(0)
	NaCrO4-	9.020e-16	6.999e-16	-15.045	-15.155	-0.110	(0)
Ni	1.687e-07						
	Ni+2	1.030e-07	4.774e-08	-6.987	-7.321	-0.334	(0)
	NiSO4	5.029e-08	5.029e-08	-7.299	-7.299	0.000	(0)
	NiCO3	8.062e-09	8.062e-09	-8.094	-8.094	0.000	(0)
	NiHCO3+	5.167e-09	4.009e-09	-8.287	-8.397	-0.110	(0)
	NiOH+	1.105e-09	8.573e-10	-8.957	-9.067	-0.110	(0)
	NiCl+	6.818e-10	5.290e-10	-9.166	-9.277	-0.110	(0)
	NiF+	3.122e-10	2.422e-10	-9.506	-9.616	-0.110	(0)
	Ni (OH) 2	9.712e-11	9.712e-11	-10.013	-10.013	0.000	(0)
	Ni (SO4) 2-2	2.426e-11	8.792e-12	-10.615	-11.056	-0.441	(0)
	NiNH3+2	2.775e-13	1.006e-13	-12.557	-12.998	-0.441	(0)
	Ni (OH) 3-	1.785e-13	1.385e-13	-12.748	-12.858	-0.110	(0)
	NiCl2	1.153e-14	1.153e-14	-13.938	-13.938	0.000	(0)
	NiSeO4	3.178e-15	3.178e-15	-14.498	-14.498	0.000	(0)
	NiNO3+	1.907e-15	1.479e-15	-14.720	-14.830	-0.110	(0)
	Ni (NH3) 2+2	1.573e-19	5.700e-20	-18.803	-19.244	-0.441	(0)
O (0)	2.459e-35						
	O2	1.229e-35	1.243e-35	-34.910	-34.906	0.005	(0)
Pb	6.577e-09						
	PbCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)

PbOH+	1.229e-09	9.533e-10	-8.911	-9.021	-0.110	(0)
PbSO4	6.880e-10	6.880e-10	-9.162	-9.162	0.000	(0)
Pb+2	5.740e-10	2.661e-10	-9.241	-9.575	-0.334	(0)
PbHCO3+	1.735e-10	1.347e-10	-9.761	-9.871	-0.110	(0)
Pb (CO3) 2-2	1.304e-10	4.726e-11	-9.885	-10.326	-0.441	(0)
Pb (SO4) 2-2	6.039e-11	2.189e-11	-10.219	-10.660	-0.441	(0)
PbCl+	5.269e-11	4.088e-11	-10.278	-10.388	-0.110	(0)
Pb (OH) 2	4.299e-11	4.299e-11	-10.367	-10.367	0.000	(0)
PbF+	4.882e-12	3.787e-12	-11.311	-11.422	-0.110	(0)
PbCl2	7.908e-13	7.908e-13	-12.102	-12.102	0.000	(0)
Pb (OH) 3-	7.904e-14	6.132e-14	-13.102	-13.212	-0.110	(0)
PbF2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
PbCl3-	1.757e-15	1.363e-15	-14.755	-14.865	-0.110	(0)
PbNO3+	6.257e-17	4.855e-17	-16.204	-16.314	-0.110	(0)
Pb (OH) 4-2	5.911e-17	2.142e-17	-16.228	-16.669	-0.441	(0)
Pb2OH+3	3.945e-17	4.020e-18	-16.404	-17.396	-0.992	(0)
PbCl4-2	7.447e-18	2.699e-18	-17.128	-17.569	-0.441	(0)
PbF3-	7.434e-18	5.768e-18	-17.129	-17.239	-0.110	(0)
Pb3 (OH) 4+2	2.708e-20	9.814e-21	-19.567	-20.008	-0.441	(0)
PbF4-2	1.539e-21	5.577e-22	-20.813	-21.254	-0.441	(0)
Pb4 (OH) 4+4	1.203e-24	2.074e-26	-23.920	-25.683	-1.763	(0)
Pb (NO3) 2	1.017e-24	1.017e-24	-23.993	-23.993	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.201	-152.201	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.738	-229.848	-0.110	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-74.054	-74.054	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.838	-78.948	-0.110	(0)
CdHS+	0.000e+00	0.000e+00	-79.318	-79.428	-0.110	(0)
S5-2	0.000e+00	0.000e+00	-79.720	-80.161	-0.441	(0)
H2S	0.000e+00	0.000e+00	-80.079	-80.079	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.236	-80.677	-0.441	(0)
S4-2	0.000e+00	0.000e+00	-80.316	-80.757	-0.441	(0)
S3-2	0.000e+00	0.000e+00	-81.122	-81.563	-0.441	(0)
S2-2	0.000e+00	0.000e+00	-82.138	-82.579	-0.441	(0)
S-2	0.000e+00	0.000e+00	-87.771	-88.096	-0.325	(0)
HgHS2-	0.000e+00	0.000e+00	-139.085	-139.195	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-139.311	-139.752	-0.441	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.953	-140.953	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.609	-147.985	-0.377	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-148.021	-148.234	-0.214	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.358	-148.715	-0.357	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.600	-148.710	-0.110	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.792	-148.902	-0.110	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.135	-149.523	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.467	-149.834	-0.367	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.852	-150.852	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.171	-151.171	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.201	-152.201	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.797	-161.797	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.686	-218.796	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.409	-226.519	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.907	-228.348	-0.441	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.109	-228.219	-0.110	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.738	-229.848	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.598	-238.708	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.530	-304.971	-0.441	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.486	-306.927	-0.441	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.177	-322.618	-0.441	(0)
S (6)	1.461e-02					
SO4-2	1.139e-02	5.279e-03	-1.944	-2.277	-0.334	(0)
MgSO4	1.765e-03	1.765e-03	-2.753	-2.753	0.000	(0)
CaSO4	8.848e-04	8.848e-04	-3.053	-3.053	0.000	(0)
NaSO4-	4.130e-04	3.438e-04	-3.384	-3.464	-0.080	(0)
KSO4-	1.381e-04	1.150e-04	-3.860	-3.939	-0.080	(0)
MnSO4	1.664e-05	1.664e-05	-4.779	-4.779	0.000	(0)
ZnSO4	1.934e-06	1.934e-06	-5.714	-5.714	0.000	(0)
Zn (SO4) 2-2	2.454e-07	8.893e-08	-6.610	-7.051	-0.441	(0)
NiSO4	5.029e-08	5.029e-08	-7.299	-7.299	0.000	(0)

CoSO4	2.834e-08	2.834e-08	-7.548	-7.548	0.000	(0)
CuSO4	1.701e-08	1.701e-08	-7.769	-7.769	0.000	(0)
HSO4-	4.411e-09	3.639e-09	-8.355	-8.439	-0.084	(0)
CdSO4	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
NH4SO4-	3.310e-09	2.745e-09	-8.480	-8.561	-0.081	(0)
Cd(SO4) 2-2	7.907e-10	2.865e-10	-9.102	-9.543	-0.441	(0)
PbSO4	6.880e-10	6.880e-10	-9.162	-9.162	0.000	(0)
AgSO4-	1.628e-10	1.263e-10	-9.788	-9.899	-0.110	(0)
Pb(SO4) 2-2	6.039e-11	2.189e-11	-10.219	-10.660	-0.441	(0)
Ni(SO4) 2-2	2.426e-11	8.792e-12	-10.615	-11.056	-0.441	(0)
CrOHSO4	3.373e-12	3.373e-12	-11.472	-11.472	0.000	(0)
FeSO4	1.824e-13	1.824e-13	-12.739	-12.739	0.000	(0)
UO2SO4	8.380e-14	8.380e-14	-13.077	-13.077	0.000	(0)
UO2(SO4) 2-2	1.609e-14	5.832e-15	-13.793	-14.234	-0.441	(0)
AlSO4+	1.349e-14	1.113e-14	-13.870	-13.953	-0.084	(0)
CrSO4+	1.371e-15	1.064e-15	-14.863	-14.973	-0.110	(0)
Al(SO4) 2-	7.633e-16	6.297e-16	-15.117	-15.201	-0.084	(0)
VO2SO4-	6.379e-19	4.949e-19	-18.195	-18.305	-0.110	(0)
FeSO4+	3.902e-20	3.236e-20	-19.409	-19.490	-0.081	(0)
Fe(SO4) 2-	4.707e-21	3.652e-21	-20.327	-20.437	-0.110	(0)
Cr2(OH) 2SO4+2	2.265e-21	8.207e-22	-20.645	-21.086	-0.441	(0)
HgSO4	5.773e-22	5.773e-22	-21.239	-21.239	0.000	(0)
VOSO4	5.443e-22	5.443e-22	-21.264	-21.264	0.000	(0)
Cr2(OH) 2(SO4) 2	2.574e-22	2.574e-22	-21.589	-21.589	0.000	(0)
CrO3SO4-2	8.305e-24	3.010e-24	-23.081	-23.521	-0.441	(0)
VSO4+	7.117e-37	5.522e-37	-36.148	-36.258	-0.110	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.666	-40.666	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.847	-42.288	-0.441	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Sb(3)	2.182e-20					
Sb(OH) 3	1.103e-20	1.103e-20	-19.957	-19.957	0.000	(0)
HSbO2	1.078e-20	1.078e-20	-19.967	-19.967	0.000	(0)
SbO2-	3.189e-24	2.474e-24	-23.496	-23.607	-0.110	(0)
Sb(OH) 4-	1.825e-24	1.416e-24	-23.739	-23.849	-0.110	(0)
Sb(OH) 2F	2.458e-26	2.458e-26	-25.609	-25.609	0.000	(0)
SbOF	2.419e-26	2.419e-26	-25.616	-25.616	0.000	(0)
Sb(OH) 2+	2.438e-27	1.891e-27	-26.613	-26.723	-0.110	(0)
SbO+	8.411e-28	6.526e-28	-27.075	-27.185	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.177	-322.618	-0.441	(0)
Sb(5)	2.964e-08					
SbO3-	2.960e-08	2.297e-08	-7.529	-7.639	-0.110	(0)
Sb(OH) 6-	3.249e-11	2.681e-11	-10.488	-10.572	-0.083	(0)
SbO2+	4.229e-25	3.281e-25	-24.374	-24.484	-0.110	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.262e-39	9.793e-40	-38.899	-39.009	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-40.994	-40.994	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.271	-43.271	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.417	-45.858	-0.441	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-81.231	-82.994	-1.763	(0)
Se(4)	1.657e-07					
SeO3-2	9.066e-08	3.285e-08	-7.043	-7.483	-0.441	(0)
HSeO3-	7.503e-08	5.822e-08	-7.125	-7.235	-0.110	(0)
H2SeO3	1.752e-13	1.752e-13	-12.757	-12.757	0.000	(0)
AgSeO3-	3.262e-14	2.531e-14	-13.486	-13.597	-0.110	(0)
Cd(SeO3) 2-2	7.980e-18	2.892e-18	-17.098	-17.539	-0.441	(0)
Ag(SeO3) 2-3	7.308e-20	7.446e-21	-19.136	-20.128	-0.992	(0)
FeHSeO3+2	2.319e-25	8.403e-26	-24.635	-25.076	-0.441	(0)
Se(6)	3.078e-10					
SeO4-2	3.070e-10	1.423e-10	-9.513	-9.847	-0.334	(0)
MnSeO4	6.789e-13	6.789e-13	-12.168	-12.168	0.000	(0)
ZnSeO4	3.691e-14	3.691e-14	-13.433	-13.433	0.000	(0)
NiSeO4	3.178e-15	3.178e-15	-14.498	-14.498	0.000	(0)
CoSeO4	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
CdSeO4	8.616e-17	8.616e-17	-16.065	-16.065	0.000	(0)
HSeO4-	6.485e-17	5.032e-17	-16.188	-16.298	-0.110	(0)
Zn(SeO4) 2-2	1.470e-23	5.327e-24	-22.833	-23.274	-0.441	(0)
Si	5.695e-05					

H4SiO4	5.555e-05	5.615e-05	-4.255	-4.251	0.005	(0)
H3SiO4-	1.402e-06	1.150e-06	-5.853	-5.939	-0.086	(0)
H2SiO4-2	2.143e-11	1.029e-11	-10.669	-10.988	-0.319	(0)
UO2H3SiO4+	1.320e-12	1.024e-12	-11.879	-11.990	-0.110	(0)
SiF6-2	3.033e-29	1.434e-29	-28.518	-28.843	-0.325	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.036	-60.028	-0.992	(0)
U (4)	1.366e-19					
U (OH) 5-	1.366e-19	1.060e-19	-18.865	-18.975	-0.110	(0)
U (OH) 4	3.134e-23	3.134e-23	-22.504	-22.504	0.000	(0)
U (OH) 3+	1.042e-27	8.088e-28	-26.982	-27.092	-0.110	(0)
U (OH) 2+2	7.286e-33	2.640e-33	-32.138	-32.578	-0.441	(0)
UF3+	1.036e-36	8.040e-37	-35.985	-36.095	-0.110	(0)
UF2+2	6.930e-38	2.511e-38	-37.159	-37.600	-0.441	(0)
UF4	1.781e-38	1.781e-38	-37.749	-37.749	0.000	(0)
UOH+3	8.616e-39	8.779e-40	-38.065	-39.057	-0.992	(0)
UF5-	1.837e-40	1.425e-40	-39.736	-39.846	-0.110	(0)
UF+3	0.000e+00	0.000e+00	-40.014	-41.005	-0.992	(0)
UF6-2	0.000e+00	0.000e+00	-40.620	-41.061	-0.441	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.666	-40.666	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.847	-42.288	-0.441	(0)
U+4	0.000e+00	0.000e+00	-44.847	-46.611	-1.763	(0)
UCl+3	0.000e+00	0.000e+00	-46.282	-47.274	-0.992	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.625	-174.552	-8.927	(0)
U (5)	1.972e-16					
UO2+	1.972e-16	1.530e-16	-15.705	-15.815	-0.110	(0)
U (6)	2.718e-07					
UO2 (CO3) 3-4	2.245e-07	3.872e-09	-6.649	-8.412	-1.763	(0)
UO2 (CO3) 2-2	4.710e-08	1.707e-08	-7.327	-7.768	-0.441	(0)
UO2CO3	1.890e-10	1.890e-10	-9.724	-9.724	0.000	(0)
UO2OH+	2.427e-12	1.883e-12	-11.615	-11.725	-0.110	(0)
UO2H3SiO4+	1.320e-12	1.024e-12	-11.879	-11.990	-0.110	(0)
UO2F+	3.769e-13	2.924e-13	-12.424	-12.534	-0.110	(0)
UO2F2	1.704e-13	1.704e-13	-12.769	-12.769	0.000	(0)
UO2SO4	8.380e-14	8.380e-14	-13.077	-13.077	0.000	(0)
UO2+2	2.263e-14	1.049e-14	-13.645	-13.979	-0.334	(0)
UO2 (SO4) 2-2	1.609e-14	5.832e-15	-13.793	-14.234	-0.441	(0)
UO2F3-	1.114e-14	8.644e-15	-13.953	-14.063	-0.110	(0)
UO2Cl+	9.493e-17	7.366e-17	-16.023	-16.133	-0.110	(0)
UO2F4-2	3.827e-17	1.387e-17	-16.417	-16.858	-0.441	(0)
(UO2) 3 (OH) 5+	2.204e-17	1.710e-17	-16.657	-16.767	-0.110	(0)
(UO2) 2 (OH) 2+2	1.624e-17	5.885e-18	-16.789	-17.230	-0.441	(0)
UO2NO3+	3.327e-22	2.581e-22	-21.478	-21.588	-0.110	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.811	-43.921	-0.110	(0)
V+2	0.000e+00	0.000e+00	-45.145	-45.585	-0.441	(0)
V (3)	5.186e-16					
V (OH) 3	5.186e-16	5.186e-16	-15.285	-15.285	0.000	(0)
V (OH) 2+	3.049e-27	2.366e-27	-26.516	-26.626	-0.110	(0)
VOH+2	4.371e-31	1.584e-31	-30.359	-30.800	-0.441	(0)
V+3	2.175e-36	2.216e-37	-35.663	-36.654	-0.992	(0)
VSO4+	7.117e-37	5.522e-37	-36.148	-36.258	-0.110	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.983	-58.974	-0.992	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-59.037	-60.801	-1.763	(0)
V (4)	1.394e-19					
V (OH) 3+	1.372e-19	1.064e-19	-18.863	-18.973	-0.110	(0)
VO+2	1.033e-21	3.743e-22	-20.986	-21.427	-0.441	(0)
VOF+	5.845e-22	4.535e-22	-21.233	-21.343	-0.110	(0)
VOSO4	5.443e-22	5.443e-22	-21.264	-21.264	0.000	(0)
VOF2	3.435e-23	3.435e-23	-22.464	-22.464	0.000	(0)
VOC1+	5.861e-24	4.548e-24	-23.232	-23.342	-0.110	(0)
VOF3-	3.173e-25	2.462e-25	-24.499	-24.609	-0.110	(0)
VOF4-2	5.539e-28	2.007e-28	-27.257	-27.697	-0.441	(0)
H2V2O4+2	1.569e-33	5.687e-34	-32.804	-33.245	-0.441	(0)
V (5)	8.968e-09					
H2VO4-	5.088e-09	3.948e-09	-8.293	-8.404	-0.110	(0)
HVO4-2	3.879e-09	1.406e-09	-8.411	-8.852	-0.441	(0)
H3VO4	2.785e-13	2.785e-13	-12.555	-12.555	0.000	(0)

HV2O7-3	1.847e-14	1.882e-15	-13.734	-14.725	-0.992	(0)
VO4-3	9.802e-15	9.987e-16	-14.009	-15.001	-0.992	(0)
H3V2O7-	9.157e-15	7.104e-15	-14.038	-14.148	-0.110	(0)
V2O7-4	4.163e-16	7.180e-18	-15.381	-17.144	-1.763	(0)
VO2+	4.758e-18	3.926e-18	-17.323	-17.406	-0.083	(0)
VO2F	1.391e-18	1.391e-18	-17.857	-17.857	0.000	(0)
VO2SO4-	6.379e-19	4.949e-19	-18.195	-18.305	-0.110	(0)
V3O9-3	6.338e-19	6.458e-20	-18.198	-19.190	-0.992	(0)
VO2F2-	1.315e-19	1.020e-19	-18.881	-18.991	-0.110	(0)
VO2F3-2	7.093e-22	2.570e-22	-21.149	-21.590	-0.441	(0)
V4O12-4	6.167e-24	1.064e-25	-23.210	-24.973	-1.763	(0)
VO2F4-3	2.507e-25	2.555e-26	-24.601	-25.593	-0.992	(0)
VO2NO3	2.450e-26	2.450e-26	-25.611	-25.611	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-63.765	-67.733	-3.967	(0)
HV10O28-5	0.000e+00	0.000e+00	-64.942	-67.698	-2.755	(0)
H2V10O28-4	0.000e+00	0.000e+00	-68.878	-70.642	-1.763	(0)
Zn	6.702e-06					
Zn+2	3.613e-06	1.675e-06	-5.442	-5.776	-0.334	(0)
ZnSO4	1.934e-06	1.934e-06	-5.714	-5.714	0.000	(0)
ZnCO3	4.362e-07	4.362e-07	-6.360	-6.360	0.000	(0)
ZnOH+	3.078e-07	2.389e-07	-6.512	-6.622	-0.110	(0)
Zn(SO4)2-2	2.454e-07	8.893e-08	-6.610	-7.051	-0.441	(0)
Zn(OH)2	5.399e-08	5.399e-08	-7.268	-7.268	0.000	(0)
ZnHCO3+	4.649e-08	3.607e-08	-7.333	-7.443	-0.110	(0)
ZnOHCl	3.401e-08	3.401e-08	-7.468	-7.468	0.000	(0)
ZnCl+	2.220e-08	1.822e-08	-7.654	-7.740	-0.086	(0)
ZnF+	8.699e-09	6.749e-09	-8.061	-8.171	-0.110	(0)
Zn(OH)3-	4.974e-10	3.859e-10	-9.303	-9.413	-0.110	(0)
ZnCl2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
ZnCl3-	5.240e-13	4.301e-13	-12.281	-12.366	-0.086	(0)
ZnNO3+	6.688e-14	5.189e-14	-13.175	-13.285	-0.110	(0)
Zn(OH)4-2	6.047e-14	2.191e-14	-13.218	-13.659	-0.441	(0)
ZnSeO4	3.691e-14	3.691e-14	-13.433	-13.433	0.000	(0)
ZnCl4-2	1.970e-15	9.312e-16	-14.706	-15.031	-0.325	(0)
Zn(NO3)2	1.277e-22	1.277e-22	-21.894	-21.894	0.000	(0)
Zn(SeO4)2-2	1.470e-23	5.327e-24	-22.833	-23.274	-0.441	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-148.600	-148.710	-0.110	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.852	-150.852	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-226.409	-226.519	-0.110	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-227.907	-228.348	-0.441	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-306.486	-306.927	-0.441	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.63	-49.34	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-42.76	-38.25	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.99	-38.25	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.99	-54.05	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-57.45	-37.41	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.97	-28.56	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.92	-24.47	0.45	(NH4)2SeO4
Acanthite	-52.42	-88.64	-36.22	Ag2S
Ag2CO3	-12.10	-23.19	-11.09	Ag2CO3
Ag2CrO4	-20.19	-31.78	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.11	-1.54	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.30	-20.12	-4.82	Ag2SO4
Ag3AsO3	-28.47	-26.31	2.16	Ag3AsO3
Ag3AsO4	-16.88	-19.66	-2.79	Ag3AsO4
Ag3H2VO5	-16.74	-11.56	5.18	Ag3H2VO5
AgF·4H2O	-13.67	-12.62	1.05	AgF·4H2O
Agmetal	-0.04	-13.54	-13.51	Ag

AgVO3	-10.79	-10.02	0.77	AgVO3
Al (OH) 3 (am)	-1.91	8.89	10.80	Al (OH) 3
Al2 (MoO4) 3	-51.63	-49.27	2.37	Al2 (MoO4) 3
Al2O3	-1.88	17.78	19.65	Al2O3
Al4 (OH) 10SO4	-5.73	16.97	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.27	-8.47	4.80	AlAsO4:2H2O
AlOHSO4	-6.46	-9.69	-3.23	AlOHSO4
AlSb	-153.33	-87.70	65.62	AlSb
Alunite	-3.46	-4.86	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.06	-11.85	-7.79	PbSO4
Anhydrite	-1.05	-5.41	-4.36	CaSO4
Anilite	-55.56	-87.43	-31.88	Cu0.25Cu1.5S
Antlerite	-2.02	6.77	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-93.25	-96.01	-2.76	As4O6
Artinite	-4.11	5.49	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-41.42	-34.71	6.71	As2O5
Atacamite	-1.00	6.39	7.39	Cu2 (OH) 3Cl
Azurite	-1.04	-17.94	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.80	8.60	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.18	-1.31	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.65	7.29	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-11.97	-21.64	-9.67	BaCrO4
BaF2	-9.27	-15.09	-5.82	BaF2
BaMoO4	-6.79	-13.75	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.62	-6.79	1.83	BaSeO3
BaSeO4	-10.09	-17.55	-7.46	BaSeO4
Bianchite	-6.29	-8.06	-1.76	ZnSO4:6H2O
Birnessite	-6.35	11.75	18.09	MnO2
Bixbyite	-1.41	-2.05	-0.64	Mn2O3
BlaubleiI	-55.66	-79.82	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.05	-83.33	-27.28	Cu0.6Cu0.8S
Boehmite	0.31	8.89	8.58	AlOOH
Breithauptite	-56.31	-74.84	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.28	13.57	16.84	Mg (OH) 2
Bunsenite	-3.46	8.98	12.45	NiO
Ca (VO3) 2	-11.00	-5.34	5.66	Ca (VO3) 2
Ca2V2O7	-9.68	7.82	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.73	7.82	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.51	4.79	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.97	20.99	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.87	20.99	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-296.65	-153.68	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.02	-25.93	-17.91	Hg2Cl2
CaMoO4	-1.23	-9.18	-7.95	CaMoO4
Carnotite	-1.52	-1.29	0.23	KUO2VO4
CaSeO3:2H2O	-5.03	-2.22	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.96	-12.98	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.86	-1.02	9.84	Cd (BO2) 2
Cd (OH) 2	-5.83	7.81	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-5.92	7.81	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.43	-13.72	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-17.70	4.86	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-15.72	12.68	28.40	Cd4 (OH) 6SO4
CdCl2	-12.56	-13.21	-0.66	CdCl2
CdCl2:1H2O	-11.52	-13.22	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.30	-13.22	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.88	-1.21	CdF2
Cdmetal (alpha)	-31.24	-17.73	13.51	Cd
Cdmetal (gamma)	-31.35	-17.73	13.62	Cd
CdMoO4	-0.38	-14.53	-14.15	CdMoO4
CdOHCl	-6.24	-2.70	3.54	CdOHCl

CdSb	-75.65	-76.00	-0.35	CdSb
CdSe	-19.15	-39.35	-20.20	CdSe
CdSeO4:2H2O	-16.49	-18.34	-1.85	CdSeO4:2H2O
CdSO4	-10.59	-10.77	-0.17	CdSO4
CdSO4:1H2O	-9.04	-10.77	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.89	-10.77	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.79	-14.92	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.49	-10.13	-2.64	CuSO4:5H2O
Chalcedony	-0.70	-4.25	-3.55	SiO2
Chalcocite	-55.44	-90.36	-34.92	Cu2S
Chalcopyrite	-127.03	-162.30	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-52.68	-98.37	-45.69	HgS
Claudetite	-92.94	-96.01	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe
Co (BO2) 2	-27.17	-0.10	27.07	Co (BO2) 2
Co (OH) 2	-4.36	8.73	13.09	Co (OH) 2
Co (OH) 3	-8.59	-10.90	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-21.55	-8.51	13.03	Co3 (AsO4) 2
Co3O4	-2.56	-13.06	-10.50	Co3O4
CoCl2	-20.56	-12.30	8.27	CoCl2
CoCl2:6H2O	-14.84	-12.30	2.54	CoCl2:6H2O
CoCO3	-2.93	-12.91	-9.98	CoCO3
CoF2	-13.36	-14.96	-1.60	CoF2
CoF3	-44.98	-46.43	-1.46	CoF3
CoFe2O4	18.64	15.12	-3.53	CoFe2O4
CoMoO4	-5.85	-13.62	-7.76	CoMoO4
CoO	-4.85	8.73	13.59	CoO
CoS (alpha)	-70.93	-78.37	-7.44	CoS
CoS (beta)	-67.30	-78.37	-11.07	CoS
CoSe	-22.23	-38.43	-16.20	CoSe
CoSeO3	-7.97	-6.65	1.32	CoSeO3
CoSeO4:6H2O	-15.89	-17.42	-1.53	CoSeO4:6H2O
CoSO4	-12.65	-9.85	2.80	CoSO4
CoSO4:6H2O	-7.38	-9.85	-2.47	CoSO4:6H2O
Cotunnite	-9.52	-14.30	-4.78	PbCl2
Covellite	-56.35	-78.65	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.13	-32.03	14.09	CrCl2
CrCl3	-47.84	-32.72	15.11	CrCl3
CrF3	-25.38	-36.72	-11.34	CrF3
Cristobalite	-0.90	-4.25	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.64	-43.48	-33.84	Na3AlF6
Cu (OH) 2	-0.22	8.45	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.58	19.63	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.41	0.84	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.89	-89.77	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.62	-50.42	-45.80	Cu2Se
Cu2SO4	-19.89	-21.84	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.46	-9.36	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.89	-101.49	-42.59	Cu3Sb
Cu3Se2	-25.64	-89.13	-63.49	Cu3Se2
CuCO3	-1.70	-13.20	-11.50	CuCO3
CuCrO4	-16.35	-21.79	-5.44	CuCrO4
CuF	-8.57	-13.48	-4.91	CuF
CuF2	-16.36	-15.24	1.12	CuF2
CuF2:2H2O	-10.69	-15.24	-4.55	CuF2:2H2O
Cumetal	-5.65	-14.40	-8.76	Cu
CuMoO4	-0.82	-13.90	-13.08	CuMoO4
CuOCuSO4	-11.98	-1.68	10.30	CuOCuSO4

Cupricferrite	8.85	14.83	5.99	CuFe2O4
Cuprite	-1.86	-3.26	-1.41	Cu2O
Cuprousferrite	10.48	1.56	-8.92	CuFeO2
CuSe	-5.61	-38.71	-33.10	CuSe
CuSe2	-26.96	-60.33	-33.37	CuSe2
CuSeO3:2H2O	-7.45	-6.94	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.26	-17.70	-2.44	CuSeO4:5H2O
CuSO4	-13.07	-10.13	2.94	CuSO4
Diaspore	2.01	8.89	6.87	AlOOH
Djurleite	-55.67	-89.59	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.02	-16.56	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.53	-16.56	-17.09	CaMg(CO3)2
Epsomite	-2.89	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.08	0.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-11.34	-15.06	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.56	-9.00	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.15	-39.78	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.62	-49.36	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.56	-14.16	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.81	-18.90	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.73	-65.32	-18.60	FeSe2
FeS(ppt)	-80.70	-83.65	-2.95	FeS
FeSe	-32.71	-43.71	-11.00	FeSe
Fix_pe	-4.62	-4.62	0.00	e-
Fluorite	-0.03	-10.53	-10.50	CaF2
Galena	-66.40	-80.37	-13.97	PbS
Gibbsite	0.60	8.89	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.04	-8.06	-2.01	ZnSO4:7H2O
Greenalite	-18.96	1.85	20.81	Fe3Si2O5(OH)4
Greenockite	-64.92	-79.28	-14.36	CdS
Greigite	-293.53	-338.56	-45.03	Fe3S4
Gummite	-5.35	2.32	7.67	UO3
Gypsum	-0.80	-5.41	-4.61	CaSO4:2H2O
H-Jarosite	-15.49	-27.59	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.47	-22.35	-12.88	H2MoO4
H2S(g)	-79.09	-87.10	-8.01	H2S
H2Se(g)	-42.20	-47.16	-4.96	H2Se
Halite	-5.88	-4.28	1.60	NaCl
Halloysite	-0.30	9.28	9.57	Al2Si2O5(OH)4
Hausmannite	-0.83	60.20	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.67	21.23	22.89	FeAl2O4
Hg(CH3)2(g)	-185.22	-258.92	-73.71	Hg(CH3)2
Hg(g)	-7.35	-15.22	-7.87	Hg
Hg(OH)2	-7.77	-11.27	-3.50	Hg(OH)2
Hg2(g)	-15.49	-30.45	-14.96	Hg2
Hg2(OH)2	-10.16	-4.90	5.26	Hg2(OH)2
Hg2CO3	-10.50	-26.55	-16.05	Hg2CO3
Hg2CrO4	-26.44	-35.14	-8.70	Hg2CrO4
Hg2F2	-18.23	-28.59	-10.36	Hg2F2
Hg2S	-80.32	-92.00	-11.68	Hg2S
Hg2SeO3	-15.63	-20.29	-4.66	Hg2SeO3
Hg2SO4	-17.35	-23.48	-6.13	Hg2SO4
Hg3O2CO3	-25.78	-55.46	-29.68	Hg3O2CO3
HgCl(g)	-32.46	-12.97	19.50	HgCl
HgCl2	-11.04	-32.30	-21.26	HgCl2
HgF(g)	-46.97	-14.30	32.68	HgF
HgF2(g)	-47.53	-34.96	12.57	HgF2
Hgmetal(l)	-1.77	-15.22	-13.45	Hg
HgSe	-2.74	-58.43	-55.69	HgSe
HgSeO3	-14.23	-26.66	-12.43	HgSeO3
HgSO4	-20.43	-29.85	-9.42	HgSO4
Huntite	-2.75	-32.72	-29.97	CaMg3(CO3)4

Hydrocerrusite	-4.34	-23.11	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.99	-18.76	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-17.47	-22.64	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-7.15	-21.95	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.95	-49.20	-17.24	K2Cr2O7
K2CrO4	-18.45	-18.96	-0.51	K2CrO4
K2MoO4	-14.33	-11.07	3.26	K2MoO4
K2SeO4	-14.14	-14.87	-0.73	K2SeO4
Kaolinite	1.84	9.28	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-4.69	-5.12	-0.43	PbO : PbSO4
Laurionite	-4.41	-3.79	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-5.97	6.73	12.69	PbO
Mackinawite	-80.05	-83.65	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.09	19.95	16.86	Fe2MgO4
Magnesite	-0.62	-8.08	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.56	-4.75	-5.31	Cu2 (OH) 2CO3
Manganite	-1.02	24.32	25.34	MnOOH
Massicot	-6.17	6.73	12.89	PbO
Matlockite	-6.66	-15.63	-8.97	PbClF
Melanothallite	-18.84	-12.58	6.26	CuCl2
Melanterite	-12.92	-15.13	-2.21	FeSO4 : 7H2O
Metacinnabar	-53.28	-98.37	-45.09	HgS
Mg (OH) 2 (active)	-5.23	13.57	18.79	Mg (OH) 2
Mg (VO3) 2	-16.22	-4.94	11.28	Mg (VO3) 2
Mg2Sb3	-273.46	-198.78	74.68	Mg2Sb3
Mg2V2O7	-17.74	8.62	26.36	Mg2V2O7
MgCr2O4	-4.99	11.21	16.20	MgCr2O4
MgCrO4	-22.05	-16.67	5.38	MgCrO4
MgF2	-2.00	-10.13	-8.13	MgF2
MgMoO4	-6.93	-8.78	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.88	-1.82	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.38	-12.58	-1.20	MgSeO4 : 6H2O
Minium	-27.79	45.73	73.52	Pb3O4
Mirabilite	-5.00	-6.11	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.86	-6.96	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-52.08	-57.79	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.34	-86.26	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.56	-0.06	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.19	-9.48	2.72	MnCl2 : 4H2O
MnS (grn)	-75.72	-75.55	0.17	MnS
MnS (pnk)	-78.89	-75.55	3.34	MnS
MnSb	-94.71	-97.62	-2.91	MnSb
MnSe	-39.11	-35.61	3.50	MnSe
MnSeO3	-4.96	-3.83	1.13	MnSeO3
MnSeO3 : 2H2O	-4.82	-3.84	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.55	-14.60	-2.05	MnSeO4 : 5H2O
MnSO4	-9.61	-7.03	2.58	MnSO4
Monteponite	-7.29	7.81	15.10	CdO
Montroydite	-7.63	-11.27	-3.64	HgO
MoO3	-14.35	-22.35	-8.00	MoO3
Morenosite	-7.46	-9.60	-2.14	NiSO4 : 7H2O
MoS2	-151.83	-222.09	-70.26	MoS2
Na-Jarosite	-10.15	-21.35	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.11	-48.01	-9.90	Na2Cr2O7
Na2CrO4	-20.70	-17.77	2.93	Na2CrO4
Na2Mo2O7	-15.63	-32.23	-16.60	Na2Mo2O7
Na2MoO4	-11.37	-9.88	1.49	Na2MoO4
Na2MoO4 : 2H2O	-11.10	-9.88	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-13.22	-2.92	10.30	Na2SeO3 : 5H2O
Na2SeO4	-14.96	-13.68	1.28	Na2SeO4
Na3Sb	-172.34	-77.89	94.45	Na3Sb
Na3VO4	-27.23	9.45	36.68	Na3VO4
Na4V2O7	-30.97	6.43	37.40	Na4V2O7

Nantokite	-5.42	-12.15	-6.73	CuCl
NaSb	-87.98	-64.81	23.17	NaSb
Natron	-7.87	-9.18	-1.31	Na2CO3:10H2O
NaVO3	-6.88	-3.02	3.86	NaVO3
Nesquehonite	-3.41	-8.08	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.81	8.98	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.47	-7.77	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.65	17.35	32.00	Ni4 (OH) 6SO4
NiCO3	-5.80	-12.67	-6.87	NiCO3
NiMoO4	-2.22	-13.37	-11.14	NiMoO4
NiS (alpha)	-72.52	-78.12	-5.60	NiS
NiS (beta)	-67.02	-78.12	-11.10	NiS
NiS (gamma)	-65.32	-78.12	-12.80	NiS
NiSe	-20.48	-38.18	-17.70	NiSe
NiSeO3:2H2O	-9.22	-6.41	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.65	-17.17	-1.52	NiSeO4:6H2O
Nsutite	-5.76	11.75	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-248.23	-309.30	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb (BO2) 2	-8.63	-2.11	6.52	Pb (BO2) 2
Pb (OH) 2	-1.42	6.73	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-53.85	-62.61	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-5.85	2.94	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-12.73	13.46	26.19	Pb2O (OH) 2
Pb2O3	-22.04	39.00	61.04	Pb2O3
Pb2OCO3	-7.63	-8.19	-0.56	Pb2OCO3
Pb2V2O7	-3.15	-5.05	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.33	-14.53	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.47	1.67	6.14	Pb3 (VO4) 2
Pb3O2CO3	-12.48	-1.46	11.02	Pb3O2CO3
Pb3O2SO4	-9.08	1.60	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-12.77	8.33	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-13.55	8.33	21.88	Pb4O3SO4
PbCrO4	-10.91	-23.51	-12.60	PbCrO4
PbF2	-9.52	-16.96	-7.44	PbF2
Pbmetal	-23.06	-18.82	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.25	6.73	12.98	PbO:0.33H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.02	13.57	21.58	MgO
Phosgenite	-9.41	-29.22	-19.81	PbCl2:PbCO3
Plattnerite	-17.33	32.27	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.69	-145.20	-18.51	FeS2
Pyrochroite	-3.64	11.55	15.19	Mn (OH) 2
Pyrolusite	-4.28	37.10	41.38	MnO2
Quartz	-0.25	-4.25	-4.00	SiO2
Realgar	-104.13	-123.87	-19.75	AsS
Retgersite	-7.56	-9.60	-2.04	NiSO4:6H2O
Rhodochrosite	0.48	-10.10	-10.58	MnCO3
Rutherfordine	-4.82	-19.32	-14.50	UO2CO3
Sb (OH) 3	-12.85	-19.96	-7.11	Sb (OH) 3
Sb2O4	-17.77	-14.37	3.40	Sb2O4
Sb2O5	-27.78	-37.44	-9.67	Sb2O5
Sb2Se3	-113.64	-181.39	-67.76	Sb2Se3
Sb4O6 (cubic)	-61.57	-79.83	-18.26	Sb4O6
Sb4O6 (orth)	-61.93	-79.83	-17.90	Sb4O6
SbCl3	-52.07	-51.50	0.57	SbCl3
SbF3	-45.27	-55.49	-10.23	SbF3
Sbmetal	-46.58	-58.27	-11.69	Sb
SbO2	-3.67	-31.49	-27.82	SbO2
Schoepite	-3.67	2.32	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.51	-21.62	-7.11	Se
Semetal (hex)	-13.91	-21.62	-7.71	Se
Senarmontite	-27.55	-39.91	-12.37	Sb2O3
SeO2	-15.51	-15.39	0.12	SeO2
SeO3	-47.19	-26.15	21.04	SeO3

Sepiolite	-1.38	14.38	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-4.40	14.38	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.96	-18.20	-10.24	FeCO ₃
SiO ₂ (am-gel)	-1.54	-4.25	-2.71	SiO ₂
SiO ₂ (am-ppt)	-1.51	-4.25	-2.74	SiO ₂
Smithsonite	-1.12	-11.12	-10.00	ZnCO ₃
Sphalerite	-65.12	-76.57	-11.45	ZnS
Spinel	-5.50	31.34	36.85	MgAl ₂ O ₄
Stibnite	-250.75	-301.21	-50.46	Sb ₂ S ₃
Sulfur	-59.41	-61.55	-2.14	S
Tenorite	0.81	8.45	7.64	CuO
Thenardite	-6.43	-6.11	0.32	Na ₂ SO ₄
Thermonatrite	-9.81	-9.18	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-4.78	-0.70	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-12.01	9.07	21.08	U ₃ O ₈
U ₃ Sb ₄	-580.76	-428.38	152.38	U ₃ Sb ₄
U ₄ O ₉	-27.46	-30.48	-3.02	U ₄ O ₉
UF ₄	-31.85	-61.39	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.67	-61.39	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.94	-14.01	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.94	-29.80	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.65	-29.80	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-33.19	-29.80	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.85	-29.80	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.29	2.32	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-21.58	-23.83	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-5.38	2.32	7.70	UO ₃
Uraninite	-9.34	-14.01	-4.67	UO ₂
USb ₂	-220.44	-190.86	29.58	USb ₂
V(OH) ₃	-19.79	-12.20	7.59	V(OH) ₃
V ₂ O ₅	-17.15	-18.51	-1.36	V ₂ O ₅
V ₃ O ₅	-42.75	-40.92	1.84	V ₃ O ₅
V ₄ O ₇	-53.23	-46.04	7.19	V ₄ O ₇
V ₆ O ₁₃	-45.76	-106.62	-60.86	V ₆ O ₁₃
Valentinite	-31.43	-39.91	-8.48	Sb ₂ O ₃
VC ₁₂	-64.88	-46.00	18.87	VC ₁₂
VC ₁₃	-67.18	-43.74	23.43	VC ₁₃
VF ₄	-67.44	-52.51	14.93	VF ₄
Vmetal	-94.54	-50.52	44.03	V
VO	-39.73	-24.97	14.76	VO
VO(OH) ₂	-10.27	-5.12	5.15	VO(OH) ₂
VO ₂ Cl	-22.61	-19.77	2.84	VO ₂ Cl
VOC ₁	-33.87	-22.72	11.15	VOC ₁
VOC ₁₂	-38.91	-26.15	12.76	VOC ₁₂
VOSO ₄	-27.31	-23.70	3.61	VOSO ₄
Witherite	-4.48	-13.05	-8.57	BaCO ₃
Wurtzite	-67.62	-76.57	-8.95	ZnS
Zincite	-0.81	10.53	11.33	ZnO
Zincosite	-11.98	-8.05	3.93	ZnSO ₄
Zn(BO ₂) ₂	-6.60	1.69	8.29	Zn(BO ₂) ₂
Zn(NO ₃) ₂ :6H ₂ O	-24.91	-21.60	3.32	Zn(NO ₃) ₂ :6H ₂ O
Zn(OH) ₂	-1.67	10.53	12.20	Zn(OH) ₂
Zn(OH) ₂ (am)	-1.95	10.53	12.47	Zn(OH) ₂
Zn(OH) ₂ (beta)	-1.23	10.53	11.75	Zn(OH) ₂
Zn(OH) ₂ (epsilon)	-1.01	10.53	11.53	Zn(OH) ₂
Zn(OH) ₂ (gamma)	-1.21	10.53	11.73	Zn(OH) ₂
Zn ₂ (OH) ₂ SO ₄	-5.03	2.47	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-4.65	10.54	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-16.78	-3.13	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O(SO ₄) ₂	-24.49	-5.58	18.91	Zn ₃ O(SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-4.87	23.53	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-6.90	31.60	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-17.55	-10.50	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-0.86	-11.12	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-12.63	-13.17	-0.53	ZnF ₂
Znmetal	-40.81	-15.02	25.79	Zn
ZnMoO ₄	-1.70	-11.82	-10.13	ZnMoO ₄
ZnO(active)	-0.66	10.53	11.19	ZnO

ZnS(am)	-67.52	-76.57	-9.05	ZnS
ZnSb	-84.31	-73.29	11.01	ZnSb
ZnSe	-22.23	-36.63	-14.40	ZnSe
ZnSeO4:6H2O	-14.10	-15.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.42	-8.05	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 131.

Title Use solution to allow model output
REACTION 706
H2O -0.0
0 moles
USE solution 715
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 715. Solution after simulation 130.
Using reaction 706.

Reaction 706.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.742e-08	1.740e-08
Al	2.732e-06	2.729e-06
As	1.591e-10	1.590e-10
B	4.213e-05	4.208e-05
Ba	4.299e-08	4.295e-08
C	8.855e-04	8.846e-04
Ca	2.482e-03	2.479e-03
Cd	1.407e-08	1.406e-08
Cl	5.248e-03	5.243e-03
Co	1.083e-07	1.082e-07
Cr	9.034e-10	9.025e-10
Cu	5.340e-07	5.334e-07

F	2.990e-04	2.987e-04
Fe	8.317e-10	8.309e-10
Hg	2.219e-09	2.217e-09
K	3.866e-03	3.862e-03
Mg	5.803e-03	5.797e-03
Mn	6.620e-05	6.614e-05
Mo	1.945e-06	1.943e-06
N	1.620e-05	1.619e-05
Na	1.512e-02	1.510e-02
Ni	1.687e-07	1.686e-07
Pb	6.577e-09	6.571e-09
S	1.461e-02	1.460e-02
Sb	2.964e-08	2.961e-08
Se	1.660e-07	1.658e-07
Si	5.695e-05	5.689e-05
U	2.718e-07	2.715e-07
V	8.968e-09	8.959e-09
Zn	6.702e-06	6.696e-06

-----Description of solution-----

	pH	=	8.152	Charge balance
	pe	=	4.621	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.669e-02	
	Mass of water (kg)	=	9.990e-01	
	Total alkalinity (eq/kg)	=	9.199e-04	
	Total CO2 (mol/kg)	=	8.855e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.915e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.109093e+02	
	Total O	=	5.551547e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.748e-06	1.426e-06	-5.758	-5.846	-0.088	(0)
H+	8.550e-09	7.054e-09	-8.068	-8.152	-0.083	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	1.742e-08					
AgCl	1.060e-08	1.060e-08	-7.975	-7.975	0.000	(0)
AgCl2-	5.153e-09	3.998e-09	-8.288	-8.398	-0.110	(0)
Ag+	1.453e-09	1.199e-09	-8.838	-8.921	-0.083	(0)
AgSO4-	1.628e-10	1.263e-10	-9.788	-9.899	-0.110	(0)
AgCl3-2	4.258e-11	1.543e-11	-10.371	-10.812	-0.441	(0)
AgNO2	3.275e-12	3.275e-12	-11.485	-11.485	0.000	(0)
AgCl4-3	1.339e-12	1.364e-13	-11.873	-12.865	-0.992	(0)
AgF	6.083e-13	6.083e-13	-12.216	-12.216	0.000	(0)
AgOH	1.710e-13	1.710e-13	-12.767	-12.767	0.000	(0)
AgH2BO3	5.969e-14	5.969e-14	-13.224	-13.224	0.000	(0)
AgSeO3-	3.262e-14	2.531e-14	-13.486	-13.597	-0.110	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgNH3+	1.237e-14	9.600e-15	-13.908	-14.018	-0.110	(0)
Ag(NO2)2-	8.548e-17	6.632e-17	-16.068	-16.178	-0.110	(0)
Ag(OH)2-	3.072e-17	2.383e-17	-16.513	-16.623	-0.110	(0)
AgNO3	1.175e-17	1.175e-17	-16.930	-16.930	0.000	(0)
Ag(NH3)2+	3.944e-19	3.060e-19	-18.404	-18.514	-0.110	(0)
Ag(SeO3)2-3	7.308e-20	7.446e-21	-19.136	-20.128	-0.992	(0)
Ag2MoO4	4.905e-25	4.905e-25	-24.309	-24.309	0.000	(0)
AgHS	0.000e+00	0.000e+00	-74.054	-74.054	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-81.231	-82.994	-1.763	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-148.021	-148.234	-0.214	(0)

	Ag (HS) 2-	0.000e+00	0.000e+00	-148.792	-148.902	-0.110	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.135	-149.523	-0.387	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.467	-149.834	-0.367	(0)
Al	2.732e-06						
	Al (OH) 4-	2.719e-06	2.243e-06	-5.566	-5.649	-0.084	(0)
	Al (OH) 3	1.249e-08	1.249e-08	-7.903	-7.903	0.000	(0)
	Al (OH) 2+	5.273e-10	4.390e-10	-9.278	-9.358	-0.080	(0)
	AlF3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
	AlF2+	5.301e-11	4.413e-11	-10.276	-10.355	-0.080	(0)
	AlF4-	1.377e-11	1.136e-11	-10.861	-10.945	-0.084	(0)
	AlF+2	1.143e-12	5.487e-13	-11.942	-12.261	-0.319	(0)
	AlOH+2	8.071e-13	3.875e-13	-12.093	-12.412	-0.319	(0)
	AlSO4+	1.349e-14	1.113e-14	-13.870	-13.953	-0.084	(0)
	Al+3	1.532e-15	2.717e-16	-14.815	-15.566	-0.751	(0)
	Al (SO4) 2-	7.633e-16	6.297e-16	-15.117	-15.201	-0.084	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-44.760	-45.752	-0.992	(0)
As (3)	1.088e-24						
	H3AsO3	9.944e-25	9.944e-25	-24.002	-24.002	0.000	(0)
	H2AsO3-	9.317e-26	7.229e-26	-25.031	-25.141	-0.110	(0)
	HAsO3-2	2.579e-29	9.346e-30	-28.589	-29.029	-0.441	(0)
	H4AsO3+	4.479e-33	3.475e-33	-32.349	-32.459	-0.110	(0)
	AsO3-3	5.012e-34	5.107e-35	-33.300	-34.292	-0.992	(0)
As (5)	1.591e-10						
	HAsO4-2	1.542e-10	5.589e-11	-9.812	-10.253	-0.441	(0)
	H2AsO4-	4.634e-12	3.596e-12	-11.334	-11.444	-0.110	(0)
	AsO4-3	2.459e-13	2.505e-14	-12.609	-13.601	-0.992	(0)
	H3AsO4	4.361e-18	4.408e-18	-17.360	-17.356	0.005	(0)
B	4.213e-05						
	H3BO3	3.775e-05	3.816e-05	-4.423	-4.418	0.005	(0)
	H2BO3-	3.897e-06	3.141e-06	-5.409	-5.503	-0.094	(0)
	MgH2BO3+	2.483e-07	2.001e-07	-6.605	-6.699	-0.094	(0)
	CaH2BO3+	1.641e-07	1.323e-07	-6.785	-6.879	-0.094	(0)
	NaH2BO3	6.038e-08	6.038e-08	-7.219	-7.219	0.000	(0)
	BF (OH) 3-	3.815e-09	3.076e-09	-8.418	-8.512	-0.094	(0)
	H5 (BO3) 2-	1.266e-10	1.020e-10	-9.898	-9.991	-0.094	(0)
	BaH2BO3+	2.389e-12	1.926e-12	-11.622	-11.715	-0.094	(0)
	BF2 (OH) 2-	5.817e-13	4.689e-13	-12.235	-12.329	-0.094	(0)
	H8 (BO3) 3-	4.830e-13	3.893e-13	-12.316	-12.410	-0.094	(0)
	AgH2BO3	5.969e-14	5.969e-14	-13.224	-13.224	0.000	(0)
	BF3OH-	3.227e-19	2.601e-19	-18.491	-18.585	-0.094	(0)
	BF4-	2.264e-24	1.825e-24	-23.645	-23.739	-0.094	(0)
Ba	4.299e-08						
	Ba+2	4.279e-08	1.983e-08	-7.369	-7.703	-0.334	(0)
	BaHCO3+	1.541e-10	1.290e-10	-9.812	-9.889	-0.077	(0)
	BaCO3	4.604e-11	4.604e-11	-10.337	-10.337	0.000	(0)
	BaH2BO3+	2.389e-12	1.926e-12	-11.622	-11.715	-0.094	(0)
	BaOH+	1.489e-13	1.235e-13	-12.827	-12.908	-0.081	(0)
	BaNO3+	1.580e-15	1.226e-15	-14.801	-14.911	-0.110	(0)
	BaNH3+2	1.354e-16	4.908e-17	-15.868	-16.309	-0.441	(0)
C (4)	8.855e-04						
	HCO3-	8.182e-04	6.811e-04	-3.087	-3.167	-0.080	(0)
	MgHCO3+	1.560e-05	1.280e-05	-4.807	-4.893	-0.086	(0)
	CaHCO3+	1.109e-05	9.278e-06	-4.955	-5.033	-0.077	(0)
	H2CO3	1.081e-05	1.081e-05	-4.966	-4.966	0.000	(0)
	CO3-2	9.765e-06	4.526e-06	-5.010	-5.344	-0.334	(0)
	MgCO3	6.917e-06	6.917e-06	-5.160	-5.160	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	NaHCO3	4.644e-06	4.644e-06	-5.333	-5.333	0.000	(0)
	NaCO3-	1.228e-06	1.022e-06	-5.911	-5.991	-0.080	(0)
	ZnCO3	4.362e-07	4.362e-07	-6.360	-6.360	0.000	(0)
	CuCO3	3.748e-07	3.748e-07	-6.426	-6.426	0.000	(0)
	MnHCO3+	2.905e-07	2.408e-07	-6.537	-6.618	-0.081	(0)
	UO2 (CO3) 3-4	2.245e-07	3.872e-09	-6.649	-8.412	-1.763	(0)
	UO2 (CO3) 2-2	4.710e-08	1.707e-08	-7.327	-7.768	-0.441	(0)
	ZnHCO3+	4.649e-08	3.607e-08	-7.333	-7.443	-0.110	(0)
	Cu (CO3) 2-2	1.260e-08	4.566e-09	-7.900	-8.340	-0.441	(0)
	NiCO3	8.062e-09	8.062e-09	-8.094	-8.094	0.000	(0)
	NiHCO3+	5.167e-09	4.009e-09	-8.287	-8.397	-0.110	(0)

	PbCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)
	CoCO3	2.059e-09	2.059e-09	-8.686	-8.686	0.000	(0)
	CoHCO3+	1.837e-09	1.425e-09	-8.736	-8.846	-0.110	(0)
	CuHCO3+	7.789e-10	6.043e-10	-9.109	-9.219	-0.110	(0)
	CdCO3	3.354e-10	3.354e-10	-9.474	-9.474	0.000	(0)
	UO2CO3	1.890e-10	1.890e-10	-9.724	-9.724	0.000	(0)
	PbHCO3+	1.735e-10	1.347e-10	-9.761	-9.871	-0.110	(0)
	BaHCO3+	1.541e-10	1.290e-10	-9.812	-9.889	-0.077	(0)
	Pb (CO3) 2-2	1.304e-10	4.726e-11	-9.885	-10.326	-0.441	(0)
	BaCO3	4.604e-11	4.604e-11	-10.337	-10.337	0.000	(0)
	CdHCO3+	6.498e-12	5.041e-12	-11.187	-11.297	-0.110	(0)
	Cd (CO3) 2-2	3.106e-12	1.125e-12	-11.508	-11.949	-0.441	(0)
	HgCO3	2.262e-15	2.262e-15	-14.645	-14.645	0.000	(0)
	FeHCO3+	1.442e-15	1.207e-15	-14.841	-14.918	-0.077	(0)
	Hg (CO3) 2-2	8.936e-17	3.238e-17	-16.049	-16.490	-0.441	(0)
	HgHCO3+	3.830e-19	2.972e-19	-18.417	-18.527	-0.110	(0)
Ca		2.482e-03					
	Ca+2	1.578e-03	7.316e-04	-2.802	-3.136	-0.334	(0)
	CaSO4	8.848e-04	8.848e-04	-3.053	-3.053	0.000	(0)
	CaHCO3+	1.109e-05	9.278e-06	-4.955	-5.033	-0.077	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	1.945e-06	1.613e-06	-5.711	-5.792	-0.081	(0)
	CaH2BO3+	1.641e-07	1.323e-07	-6.785	-6.879	-0.094	(0)
	CaOH+	2.487e-08	2.082e-08	-7.604	-7.682	-0.077	(0)
	CaNO3+	3.678e-11	2.854e-11	-10.434	-10.545	-0.110	(0)
	CaNH3+2	9.967e-12	3.612e-12	-11.001	-11.442	-0.441	(0)
	Ca (NH3) 2+2	1.556e-20	5.639e-21	-19.808	-20.249	-0.441	(0)
Cd		1.407e-08					
	Cd+2	7.014e-09	3.251e-09	-8.154	-8.488	-0.334	(0)
	CdSO4	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
	CdCl+	1.733e-09	1.345e-09	-8.761	-8.871	-0.110	(0)
	Cd (SO4) 2-2	7.907e-10	2.865e-10	-9.102	-9.543	-0.441	(0)
	CdCO3	3.354e-10	3.354e-10	-9.474	-9.474	0.000	(0)
	CdOHCl	7.866e-11	7.866e-11	-10.104	-10.104	0.000	(0)
	CdOH+	4.747e-11	3.683e-11	-10.324	-10.434	-0.110	(0)
	CdCl2	2.427e-11	2.427e-11	-10.615	-10.615	0.000	(0)
	CdF+	1.341e-11	1.041e-11	-10.872	-10.983	-0.110	(0)
	CdHCO3+	6.498e-12	5.041e-12	-11.187	-11.297	-0.110	(0)
	Cd (CO3) 2-2	3.106e-12	1.125e-12	-11.508	-11.949	-0.441	(0)
	Cd (OH) 2	3.315e-13	3.315e-13	-12.480	-12.480	0.000	(0)
	CdCl3-	8.548e-14	6.632e-14	-13.068	-13.178	-0.110	(0)
	CdF2	4.195e-15	4.195e-15	-14.377	-14.377	0.000	(0)
	CdNO3+	1.635e-16	1.268e-16	-15.787	-15.897	-0.110	(0)
	CdSeO4	8.616e-17	8.616e-17	-16.065	-16.065	0.000	(0)
	Cd (OH) 3-	3.723e-17	2.888e-17	-16.429	-16.539	-0.110	(0)
	Cd (SeO3) 2-2	7.980e-18	2.892e-18	-17.098	-17.539	-0.441	(0)
	Cd2OH+3	5.890e-18	6.002e-19	-17.230	-18.222	-0.992	(0)
	Cd (OH) 4-2	1.861e-23	6.743e-24	-22.730	-23.171	-0.441	(0)
	Cd (NO3) 2	7.841e-25	7.841e-25	-24.106	-24.106	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.318	-79.428	-0.110	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-151.171	-151.171	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-228.109	-228.219	-0.110	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-304.530	-304.971	-0.441	(0)
Cl		5.248e-03					
	Cl-	5.248e-03	4.330e-03	-2.280	-2.363	-0.083	(0)
	MnCl+	1.165e-07	9.662e-08	-6.934	-7.015	-0.081	(0)
	ZnOHCl	3.401e-08	3.401e-08	-7.468	-7.468	0.000	(0)
	ZnCl+	2.220e-08	1.822e-08	-7.654	-7.740	-0.086	(0)
	AgCl	1.060e-08	1.060e-08	-7.975	-7.975	0.000	(0)
	AgCl2-	5.153e-09	3.998e-09	-8.288	-8.398	-0.110	(0)
	CdCl+	1.733e-09	1.345e-09	-8.761	-8.871	-0.110	(0)
	CuCl2-	9.908e-10	8.131e-10	-9.004	-9.090	-0.086	(0)
	CuCl	8.987e-10	8.987e-10	-9.046	-9.046	0.000	(0)
	NiCl+	6.818e-10	5.290e-10	-9.166	-9.277	-0.110	(0)
	MnCl2	5.910e-10	5.910e-10	-9.228	-9.228	0.000	(0)
	CoCl+	5.195e-10	4.031e-10	-9.284	-9.395	-0.110	(0)
	ZnCl2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
	CuCl+	1.176e-10	9.651e-11	-9.930	-10.015	-0.086	(0)

CdOHC1	7.866e-11	7.866e-11	-10.104	-10.104	0.000	(0)
PbCl+	5.269e-11	4.088e-11	-10.278	-10.388	-0.110	(0)
AgCl3-2	4.258e-11	1.543e-11	-10.371	-10.812	-0.441	(0)
CdCl2	2.427e-11	2.427e-11	-10.615	-10.615	0.000	(0)
HgClOH	4.556e-12	4.556e-12	-11.341	-11.341	0.000	(0)
CuCl3-2	1.592e-12	7.528e-13	-11.798	-12.123	-0.325	(0)
AgCl4-3	1.339e-12	1.364e-13	-11.873	-12.865	-0.992	(0)
MnCl3-	8.501e-13	7.049e-13	-12.071	-12.152	-0.081	(0)
PbCl2	7.908e-13	7.908e-13	-12.102	-12.102	0.000	(0)
HgCl2	7.832e-13	7.832e-13	-12.106	-12.106	0.000	(0)
ZnCl3-	5.240e-13	4.301e-13	-12.281	-12.366	-0.086	(0)
CuCl2	1.449e-13	1.449e-13	-12.839	-12.839	0.000	(0)
CdCl3-	8.548e-14	6.632e-14	-13.068	-13.178	-0.110	(0)
HgCl3-	4.371e-14	3.392e-14	-13.359	-13.470	-0.110	(0)
NiCl2	1.153e-14	1.153e-14	-13.938	-13.938	0.000	(0)
ZnCl4-2	1.970e-15	9.312e-16	-14.706	-15.031	-0.325	(0)
PbCl3-	1.757e-15	1.363e-15	-14.755	-14.865	-0.110	(0)
HgCl4-2	1.614e-15	5.847e-16	-14.792	-15.233	-0.441	(0)
UO2Cl+	9.493e-17	7.366e-17	-16.023	-16.133	-0.110	(0)
HgCl+	4.651e-17	3.609e-17	-16.332	-16.443	-0.110	(0)
PbCl4-2	7.447e-18	2.699e-18	-17.128	-17.569	-0.441	(0)
CuCl3-	7.137e-18	5.857e-18	-17.147	-17.232	-0.086	(0)
CrCl+2	1.334e-18	4.835e-19	-17.875	-18.316	-0.441	(0)
CrOHC12	5.676e-20	5.676e-20	-19.246	-19.246	0.000	(0)
CuCl4-2	2.689e-22	1.271e-22	-21.570	-21.896	-0.325	(0)
CrCl2+	2.561e-22	1.987e-22	-21.592	-21.702	-0.110	(0)
FeCl+2	1.511e-22	7.144e-23	-21.821	-22.146	-0.325	(0)
VOCl+	5.861e-24	4.548e-24	-23.232	-23.342	-0.110	(0)
FeCl2+	1.666e-24	1.382e-24	-23.778	-23.860	-0.081	(0)
CrO3Cl-	6.570e-26	5.098e-26	-25.182	-25.293	-0.110	(0)
FeCl3	5.984e-28	5.984e-28	-27.223	-27.223	0.000	(0)
CoCl+2	1.088e-35	3.943e-36	-34.963	-35.404	-0.441	(0)
UCl+3	0.000e+00	0.000e+00	-46.282	-47.274	-0.992	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
Co (2)	1.083e-07					
Co+2	7.425e-08	2.691e-08	-7.129	-7.570	-0.441	(0)
CoSO4	2.834e-08	2.834e-08	-7.548	-7.548	0.000	(0)
CoCO3	2.059e-09	2.059e-09	-8.686	-8.686	0.000	(0)
CoHCO3+	1.837e-09	1.425e-09	-8.736	-8.846	-0.110	(0)
CoOH+	9.869e-10	7.657e-10	-9.006	-9.116	-0.110	(0)
CoCl+	5.195e-10	4.031e-10	-9.284	-9.395	-0.110	(0)
CoF+	2.215e-10	1.719e-10	-9.655	-9.765	-0.110	(0)
Co (OH) 2	8.675e-11	8.675e-11	-10.062	-10.062	0.000	(0)
CoNO2+	3.195e-12	2.479e-12	-11.495	-11.606	-0.110	(0)
Co (NH3) +2	3.501e-14	1.269e-14	-13.456	-13.897	-0.441	(0)
Co (OH) 3-	3.182e-15	2.469e-15	-14.497	-14.608	-0.110	(0)
CoSeO4	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
CoOOH-	7.989e-16	6.199e-16	-15.097	-15.208	-0.110	(0)
CoNO3+	6.780e-16	5.260e-16	-15.169	-15.279	-0.110	(0)
Co2OH+3	1.013e-17	1.033e-18	-16.994	-17.986	-0.992	(0)
Co (NH3) 2+2	5.857e-21	2.122e-21	-20.232	-20.673	-0.441	(0)
Co (OH) 4-2	1.540e-21	5.580e-22	-20.813	-21.253	-0.441	(0)
Co (NO3) 2	1.320e-23	1.320e-23	-22.879	-22.879	0.000	(0)
Co4 (OH) 4+4	3.977e-27	6.859e-29	-26.400	-28.164	-1.763	(0)
Co (NH3) 3+2	2.892e-28	1.048e-28	-27.539	-27.980	-0.441	(0)
Co (NH3) 4+2	5.951e-36	2.157e-36	-35.225	-35.666	-0.441	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.412	-43.853	-0.441	(0)
Co (3)	8.951e-29					
CoOH+2	8.951e-29	3.244e-29	-28.048	-28.489	-0.441	(0)
Co+3	2.524e-35	4.475e-36	-34.598	-35.349	-0.751	(0)
CoCl+2	1.088e-35	3.943e-36	-34.963	-35.404	-0.441	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.447	-65.888	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
Cr (2)	1.361e-27					

Cr+2	1.361e-27	4.933e-28	-26.866	-27.307	-0.441	(0)
Cr (3)	9.033e-10					
Cr (OH) 2+	6.021e-10	4.672e-10	-9.220	-9.331	-0.110	(0)
Cr (OH) 3	2.503e-10	2.503e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.174e-11	1.686e-11	-10.663	-10.773	-0.110	(0)
Cr (OH) 4-	1.832e-11	1.421e-11	-10.737	-10.847	-0.110	(0)
Cr (OH) +2	7.429e-12	2.692e-12	-11.129	-11.570	-0.441	(0)
CrOHSO4	3.373e-12	3.373e-12	-11.472	-11.472	0.000	(0)
CrF+2	7.622e-15	2.762e-15	-14.118	-14.559	-0.441	(0)
CrSO4+	1.371e-15	1.064e-15	-14.863	-14.973	-0.110	(0)
Cr+3	8.468e-16	8.628e-17	-15.072	-16.064	-0.992	(0)
CrCl+2	1.334e-18	4.835e-19	-17.875	-18.316	-0.441	(0)
CrOHC12	5.676e-20	5.676e-20	-19.246	-19.246	0.000	(0)
Cr2 (OH) 2SO4+2	2.265e-21	8.207e-22	-20.645	-21.086	-0.441	(0)
Cr2 (OH) 2 (SO4) 2	2.574e-22	2.574e-22	-21.589	-21.589	0.000	(0)
CrCl2+	2.561e-22	1.987e-22	-21.592	-21.702	-0.110	(0)
CrNO3+2	1.284e-25	4.652e-26	-24.892	-25.332	-0.441	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.129	-43.570	-0.441	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.511	-53.503	-0.992	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Cr (6)	2.647e-14					
CrO4-2	2.506e-14	1.161e-14	-13.601	-13.935	-0.334	(0)
NaCrO4-	9.020e-16	6.999e-16	-15.045	-15.155	-0.110	(0)
HCrO4-	3.417e-16	2.651e-16	-15.466	-15.577	-0.110	(0)
KCrO4-	1.711e-16	1.327e-16	-15.767	-15.877	-0.110	(0)
CrO3SO4-2	8.305e-24	3.010e-24	-23.081	-23.521	-0.441	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	6.570e-26	5.098e-26	-25.182	-25.293	-0.110	(0)
Cr2O7-2	6.731e-30	2.439e-30	-29.172	-29.613	-0.441	(0)
Cu (1)	2.104e-09					
CuCl2-	9.908e-10	8.131e-10	-9.004	-9.090	-0.086	(0)
CuCl	8.987e-10	8.987e-10	-9.046	-9.046	0.000	(0)
Cu+	2.125e-10	1.648e-10	-9.673	-9.783	-0.110	(0)
CuCl3-2	1.592e-12	7.528e-13	-11.798	-12.123	-0.325	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.609	-147.985	-0.377	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.358	-148.715	-0.357	(0)
Cu (2)	5.319e-07					
CuCO3	3.748e-07	3.748e-07	-6.426	-6.426	0.000	(0)
CuOH+	7.728e-08	6.342e-08	-7.112	-7.198	-0.086	(0)
Cu+2	3.034e-08	1.406e-08	-7.518	-7.852	-0.334	(0)
Cu (OH) 2	1.805e-08	1.805e-08	-7.744	-7.744	0.000	(0)
CuSO4	1.701e-08	1.701e-08	-7.769	-7.769	0.000	(0)
Cu (CO3) 2-2	1.260e-08	4.566e-09	-7.900	-8.340	-0.441	(0)
CuHCO3+	7.789e-10	6.043e-10	-9.109	-9.219	-0.110	(0)
Cu2 (OH) 2+2	2.788e-10	1.010e-10	-9.555	-9.995	-0.441	(0)
CuF+	2.310e-10	1.792e-10	-9.636	-9.747	-0.110	(0)
CuCl+	1.176e-10	9.651e-11	-9.930	-10.015	-0.086	(0)
Cu (OH) 3-	6.806e-11	5.280e-11	-10.167	-10.277	-0.110	(0)
CuNO2+	2.482e-11	1.925e-11	-10.605	-10.715	-0.110	(0)
CuNH3+2	1.557e-12	5.643e-13	-11.808	-12.248	-0.441	(0)
CuCl2	1.449e-13	1.449e-13	-12.839	-12.839	0.000	(0)
Cu (NO2) 2	2.576e-15	2.576e-15	-14.589	-14.589	0.000	(0)
Cu (OH) 4-2	1.636e-15	5.927e-16	-14.786	-15.227	-0.441	(0)
CuNO3+	7.070e-16	5.485e-16	-15.151	-15.261	-0.110	(0)
CuCl3-	7.137e-18	5.857e-18	-17.147	-17.232	-0.086	(0)
CuCl4-2	2.689e-22	1.271e-22	-21.570	-21.896	-0.325	(0)
Cu (NO3) 2	8.518e-25	8.518e-25	-24.070	-24.070	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.686	-218.796	-0.110	(0)
F	2.990e-04					
F-	2.448e-04	2.020e-04	-3.611	-3.695	-0.083	(0)
MgF+	5.047e-05	4.164e-05	-4.297	-4.381	-0.084	(0)
CaF+	1.945e-06	1.613e-06	-5.711	-5.792	-0.081	(0)
NaF	1.546e-06	1.546e-06	-5.811	-5.811	0.000	(0)
MnF+	1.719e-07	1.425e-07	-6.765	-6.846	-0.081	(0)
ZnF+	8.699e-09	6.749e-09	-8.061	-8.171	-0.110	(0)
BF (OH) 3-	3.815e-09	3.076e-09	-8.418	-8.512	-0.094	(0)
HF	2.108e-09	2.108e-09	-8.676	-8.676	0.000	(0)
NiF+	3.122e-10	2.422e-10	-9.506	-9.616	-0.110	(0)

CuF+	2.310e-10	1.792e-10	-9.636	-9.747	-0.110	(0)
CoF+	2.215e-10	1.719e-10	-9.655	-9.765	-0.110	(0)
AlF3	1.122e-10	1.122e-10	-9.950	-9.950	0.000	(0)
AlF2+	5.301e-11	4.413e-11	-10.276	-10.355	-0.080	(0)
AlF4-	1.377e-11	1.136e-11	-10.861	-10.945	-0.084	(0)
CdF+	1.341e-11	1.041e-11	-10.872	-10.983	-0.110	(0)
PbF+	4.882e-12	3.787e-12	-11.311	-11.422	-0.110	(0)
HF2-	1.983e-12	1.619e-12	-11.703	-11.791	-0.088	(0)
AlF+2	1.143e-12	5.487e-13	-11.942	-12.261	-0.319	(0)
AgF	6.083e-13	6.083e-13	-12.216	-12.216	0.000	(0)
BF2 (OH) 2-	5.817e-13	4.689e-13	-12.235	-12.329	-0.094	(0)
UO2F+	3.769e-13	2.924e-13	-12.424	-12.534	-0.110	(0)
UO2F2	1.704e-13	1.704e-13	-12.769	-12.769	0.000	(0)
PbF2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
UO2F3-	1.114e-14	8.644e-15	-13.953	-14.063	-0.110	(0)
CrF+2	7.622e-15	2.762e-15	-14.118	-14.559	-0.441	(0)
CdF2	4.195e-15	4.195e-15	-14.377	-14.377	0.000	(0)
UO2F4-2	3.827e-17	1.387e-17	-16.417	-16.858	-0.441	(0)
H2F2	1.190e-17	1.190e-17	-16.924	-16.924	0.000	(0)
PbF3-	7.434e-18	5.768e-18	-17.129	-17.239	-0.110	(0)
VO2F	1.391e-18	1.391e-18	-17.857	-17.857	0.000	(0)
FeF2+	7.887e-19	6.540e-19	-18.103	-18.184	-0.081	(0)
BF3OH-	3.227e-19	2.601e-19	-18.491	-18.585	-0.094	(0)
FeF+2	2.559e-19	1.210e-19	-18.592	-18.917	-0.325	(0)
FeF3	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
VO2F2-	1.315e-19	1.020e-19	-18.881	-18.991	-0.110	(0)
PbF4-2	1.539e-21	5.577e-22	-20.813	-21.254	-0.441	(0)
VO2F3-2	7.093e-22	2.570e-22	-21.149	-21.590	-0.441	(0)
VOF+	5.845e-22	4.535e-22	-21.233	-21.343	-0.110	(0)
VOF2	3.435e-23	3.435e-23	-22.464	-22.464	0.000	(0)
HgF+	4.031e-24	3.127e-24	-23.395	-23.505	-0.110	(0)
BF4-	2.264e-24	1.825e-24	-23.645	-23.739	-0.094	(0)
VOF3-	3.173e-25	2.462e-25	-24.499	-24.609	-0.110	(0)
VO2F4-3	2.507e-25	2.555e-26	-24.601	-25.593	-0.992	(0)
Sb (OH) 2F	2.458e-26	2.458e-26	-25.609	-25.609	0.000	(0)
SbOF	2.419e-26	2.419e-26	-25.616	-25.616	0.000	(0)
VOF4-2	5.539e-28	2.007e-28	-27.257	-27.697	-0.441	(0)
SiF6-2	3.033e-29	1.434e-29	-28.518	-28.843	-0.325	(0)
UF3+	1.036e-36	8.040e-37	-35.985	-36.095	-0.110	(0)
UF2+2	6.930e-38	2.511e-38	-37.159	-37.600	-0.441	(0)
UF4	1.781e-38	1.781e-38	-37.749	-37.749	0.000	(0)
UF5-	1.837e-40	1.425e-40	-39.736	-39.846	-0.110	(0)
UF+3	0.000e+00	0.000e+00	-40.014	-41.005	-0.992	(0)
UF6-2	0.000e+00	0.000e+00	-40.620	-41.061	-0.441	(0)
Fe (2)	5.818e-13					
Fe+2	3.884e-13	1.407e-13	-12.411	-12.852	-0.441	(0)
FeSO4	1.824e-13	1.824e-13	-12.739	-12.739	0.000	(0)
FeOH+	9.637e-15	7.991e-15	-14.016	-14.097	-0.081	(0)
FeHCO3+	1.442e-15	1.207e-15	-14.841	-14.918	-0.077	(0)
Fe (OH) 2	9.054e-18	9.054e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.924e-18	4.083e-18	-17.308	-17.389	-0.081	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.797	-161.797	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.598	-238.708	-0.110	(0)
Fe (3)	8.311e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	3.353e-10	2.791e-10	-9.475	-9.554	-0.080	(0)
Fe (OH) 4-	6.821e-11	5.678e-11	-10.166	-10.246	-0.080	(0)
FeOH+2	1.064e-15	5.030e-16	-14.973	-15.298	-0.325	(0)
FeF2+	7.887e-19	6.540e-19	-18.103	-18.184	-0.081	(0)
FeF+2	2.559e-19	1.210e-19	-18.592	-18.917	-0.325	(0)
FeF3	1.864e-19	1.864e-19	-18.730	-18.730	0.000	(0)
FeSO4+	3.902e-20	3.236e-20	-19.409	-19.490	-0.081	(0)
Fe (SO4) 2-	4.707e-21	3.652e-21	-20.327	-20.437	-0.110	(0)
Fe+3	3.081e-21	5.463e-22	-20.511	-21.263	-0.751	(0)
FeCl+2	1.511e-22	7.144e-23	-21.821	-22.146	-0.325	(0)
FeCl2+	1.666e-24	1.382e-24	-23.778	-23.860	-0.081	(0)
FeHSeO3+2	2.319e-25	8.403e-26	-24.635	-25.076	-0.441	(0)
FeCl3	5.984e-28	5.984e-28	-27.223	-27.223	0.000	(0)

	Fe2 (OH) 2+4	4.859e-28	8.379e-30	-27.313	-29.077	-1.763	(0)
	FeNO3+2	1.859e-28	6.738e-29	-27.731	-28.171	-0.441	(0)
	Fe3 (OH) 4+5	1.924e-35	3.381e-38	-34.716	-37.471	-2.755	(0)
H (0)	3.993e-29						
	H2	1.997e-29	2.018e-29	-28.700	-28.695	0.005	(0)
Hg (0)	2.208e-09						
	Hg	2.208e-09	2.208e-09	-8.656	-8.656	0.000	(0)
Hg (1)	3.456e-21						
	Hg2+2	1.728e-21	6.261e-22	-20.763	-21.203	-0.441	(0)
Hg (2)	1.069e-11						
	Hg (OH) 2	5.303e-12	5.361e-12	-11.275	-11.271	0.005	(0)
	HgClOH	4.556e-12	4.556e-12	-11.341	-11.341	0.000	(0)
	HgCl2	7.832e-13	7.832e-13	-12.106	-12.106	0.000	(0)
	HgCl3-	4.371e-14	3.392e-14	-13.359	-13.470	-0.110	(0)
	HgCO3	2.262e-15	2.262e-15	-14.645	-14.645	0.000	(0)
	HgCl4-2	1.614e-15	5.847e-16	-14.792	-15.233	-0.441	(0)
	Hg (CO3) 2-2	8.936e-17	3.238e-17	-16.049	-16.490	-0.441	(0)
	HgCl+	4.651e-17	3.609e-17	-16.332	-16.443	-0.110	(0)
	HgOH+	3.056e-17	2.371e-17	-16.515	-16.625	-0.110	(0)
	Hg (OH) 3-	1.241e-18	9.625e-19	-17.906	-18.017	-0.110	(0)
	HgHCO3+	3.830e-19	2.972e-19	-18.417	-18.527	-0.110	(0)
	Hg (NH3) 2+2	1.118e-20	4.053e-21	-19.951	-20.392	-0.441	(0)
	HgNH3+2	2.852e-21	1.033e-21	-20.545	-20.986	-0.441	(0)
	Hg+2	1.153e-21	4.177e-22	-20.938	-21.379	-0.441	(0)
	HgSO4	5.773e-22	5.773e-22	-21.239	-21.239	0.000	(0)
	HgF+	4.031e-24	3.127e-24	-23.395	-23.505	-0.110	(0)
	Hg (NH3) 3+2	1.746e-28	6.328e-29	-27.758	-28.199	-0.441	(0)
	HgNO3+	2.452e-30	1.902e-30	-29.611	-29.721	-0.110	(0)
	Hg (NH3) 4+2	5.440e-36	1.971e-36	-35.264	-35.705	-0.441	(0)
	Hg (NO3) 2	9.753e-39	9.753e-39	-38.011	-38.011	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.085	-139.195	-0.110	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.311	-139.752	-0.441	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.953	-140.953	0.000	(0)
K	3.866e-03						
	K+	3.728e-03	3.076e-03	-2.429	-2.512	-0.083	(0)
	KSO4-	1.381e-04	1.150e-04	-3.860	-3.939	-0.080	(0)
	KCrO4-	1.711e-16	1.327e-16	-15.767	-15.877	-0.110	(0)
Mg	5.803e-03						
	Mg+2	3.963e-03	1.837e-03	-2.402	-2.736	-0.334	(0)
	MgSO4	1.765e-03	1.765e-03	-2.753	-2.753	0.000	(0)
	MgF+	5.047e-05	4.164e-05	-4.297	-4.381	-0.084	(0)
	MgHCO3+	1.560e-05	1.280e-05	-4.807	-4.893	-0.086	(0)
	MgCO3	6.917e-06	6.917e-06	-5.160	-5.160	0.000	(0)
	MgOH+	1.241e-06	1.043e-06	-5.906	-5.982	-0.075	(0)
	MgH2BO3+	2.483e-07	2.001e-07	-6.605	-6.699	-0.094	(0)
Mn (2)	6.620e-05						
	Mn+2	4.891e-05	1.772e-05	-4.311	-4.751	-0.441	(0)
	MnSO4	1.664e-05	1.664e-05	-4.779	-4.779	0.000	(0)
	MnHCO3+	2.905e-07	2.408e-07	-6.537	-6.618	-0.081	(0)
	MnF+	1.719e-07	1.425e-07	-6.765	-6.846	-0.081	(0)
	MnCl+	1.165e-07	9.662e-08	-6.934	-7.015	-0.081	(0)
	MnOH+	7.657e-08	6.350e-08	-7.116	-7.197	-0.081	(0)
	MnCl2	5.910e-10	5.910e-10	-9.228	-9.228	0.000	(0)
	MnCl3-	8.501e-13	7.049e-13	-12.071	-12.152	-0.081	(0)
	MnSeO4	6.789e-13	6.789e-13	-12.168	-12.168	0.000	(0)
	MnNO3+	4.466e-13	3.465e-13	-12.350	-12.460	-0.110	(0)
	Mn (OH) 3-	9.627e-16	7.983e-16	-15.017	-15.098	-0.081	(0)
	Mn (NO3) 2	1.074e-20	1.074e-20	-19.969	-19.969	0.000	(0)
	Mn (OH) 4-2	7.775e-21	3.676e-21	-20.109	-20.435	-0.325	(0)
	MnSe	0.000e+00	0.000e+00	-40.994	-40.994	0.000	(0)
Mn (3)	1.866e-25						
	Mn+3	1.866e-25	3.308e-26	-24.729	-25.480	-0.751	(0)
Mn (6)	7.027e-40						
	MnO4-2	7.027e-40	3.322e-40	-39.153	-39.479	-0.325	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.139	-44.230	-0.091	(0)
Mo	1.945e-06						
	MoO4-2	1.945e-06	9.016e-07	-5.711	-6.045	-0.334	(0)

HM04-	1.631e-10	1.265e-10	-9.788	-9.898	-0.110	(0)
H2MoO4	6.539e-15	6.539e-15	-14.184	-14.184	0.000	(0)
Ag2MoO4	4.905e-25	4.905e-25	-24.309	-24.309	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.760	-45.752	-0.992	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.569	-54.536	-3.967	(0)
HM7O24-5	0.000e+00	0.000e+00	-53.546	-56.301	-2.755	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-57.907	-59.670	-1.763	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-63.584	-64.576	-0.992	(0)
N (-3)	6.744e-08					
NH4+	6.019e-08	4.852e-08	-7.220	-7.314	-0.094	(0)
NH3	3.922e-09	3.922e-09	-8.407	-8.407	0.000	(0)
NH4SO4-	3.310e-09	2.745e-09	-8.480	-8.561	-0.081	(0)
CaNH3+2	9.967e-12	3.612e-12	-11.001	-11.442	-0.441	(0)
CuNH3+2	1.557e-12	5.643e-13	-11.808	-12.248	-0.441	(0)
NiNH3+2	2.775e-13	1.006e-13	-12.557	-12.998	-0.441	(0)
Co (NH3) +2	3.501e-14	1.269e-14	-13.456	-13.897	-0.441	(0)
AgNH3+	1.237e-14	9.600e-15	-13.908	-14.018	-0.110	(0)
BaNH3+2	1.354e-16	4.908e-17	-15.868	-16.309	-0.441	(0)
Ag (NH3) 2+	3.944e-19	3.060e-19	-18.404	-18.514	-0.110	(0)
Ni (NH3) 2+2	1.573e-19	5.700e-20	-18.803	-19.244	-0.441	(0)
Ca (NH3) 2+2	1.556e-20	5.639e-21	-19.808	-20.249	-0.441	(0)
Hg (NH3) 2+2	1.118e-20	4.053e-21	-19.951	-20.392	-0.441	(0)
Co (NH3) 2+2	5.857e-21	2.122e-21	-20.232	-20.673	-0.441	(0)
HgNH3+2	2.852e-21	1.033e-21	-20.545	-20.986	-0.441	(0)
Co (NH3) 3+2	2.892e-28	1.048e-28	-27.539	-27.980	-0.441	(0)
Hg (NH3) 3+2	1.746e-28	6.328e-29	-27.758	-28.199	-0.441	(0)
Co (NH3) 4+2	5.951e-36	2.157e-36	-35.225	-35.666	-0.441	(0)
Hg (NH3) 4+2	5.440e-36	1.971e-36	-35.264	-35.705	-0.441	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-43.129	-43.570	-0.441	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.412	-43.853	-0.441	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-51.043	-51.484	-0.441	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-52.511	-53.503	-0.992	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-54.324	-54.765	-0.441	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.447	-65.888	-0.441	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.165	-66.606	-0.441	(0)
N (3)	1.612e-05					
NO2-	1.612e-05	1.308e-05	-4.793	-4.884	-0.091	(0)
CuNO2+	2.482e-11	1.925e-11	-10.605	-10.715	-0.110	(0)
AgNO2	3.275e-12	3.275e-12	-11.485	-11.485	0.000	(0)
CoNO2+	3.195e-12	2.479e-12	-11.495	-11.606	-0.110	(0)
Cu (NO2) 2	2.576e-15	2.576e-15	-14.589	-14.589	0.000	(0)
Ag (NO2) 2-	8.548e-17	6.632e-17	-16.068	-16.178	-0.110	(0)
N (5)	1.499e-08					
NO3-	1.495e-08	1.234e-08	-7.825	-7.909	-0.083	(0)
CaNO3+	3.678e-11	2.854e-11	-10.434	-10.545	-0.110	(0)
MnNO3+	4.466e-13	3.465e-13	-12.350	-12.460	-0.110	(0)
ZnNO3+	6.688e-14	5.189e-14	-13.175	-13.285	-0.110	(0)
NiNO3+	1.907e-15	1.479e-15	-14.720	-14.830	-0.110	(0)
BaNO3+	1.580e-15	1.226e-15	-14.801	-14.911	-0.110	(0)
CuNO3+	7.070e-16	5.485e-16	-15.151	-15.261	-0.110	(0)
CoNO3+	6.780e-16	5.260e-16	-15.169	-15.279	-0.110	(0)
CdNO3+	1.635e-16	1.268e-16	-15.787	-15.897	-0.110	(0)
PbNO3+	6.257e-17	4.855e-17	-16.204	-16.314	-0.110	(0)
AgNO3	1.175e-17	1.175e-17	-16.930	-16.930	0.000	(0)
Mn (NO3) 2	1.074e-20	1.074e-20	-19.969	-19.969	0.000	(0)
UO2NO3+	3.327e-22	2.581e-22	-21.478	-21.588	-0.110	(0)
Zn (NO3) 2	1.277e-22	1.277e-22	-21.894	-21.894	0.000	(0)
Co (NO3) 2	1.320e-23	1.320e-23	-22.879	-22.879	0.000	(0)
Pb (NO3) 2	1.017e-24	1.017e-24	-23.993	-23.993	0.000	(0)
Cu (NO3) 2	8.518e-25	8.518e-25	-24.070	-24.070	0.000	(0)
Cd (NO3) 2	7.841e-25	7.841e-25	-24.106	-24.106	0.000	(0)
CrNO3+2	1.284e-25	4.652e-26	-24.892	-25.332	-0.441	(0)
VO2NO3	2.450e-26	2.450e-26	-25.611	-25.611	0.000	(0)
FeNO3+2	1.859e-28	6.738e-29	-27.731	-28.171	-0.441	(0)
HgNO3+	2.452e-30	1.902e-30	-29.611	-29.721	-0.110	(0)
Hg (NO3) 2	9.753e-39	9.753e-39	-38.011	-38.011	0.000	(0)
Na	1.512e-02					

	Na+	1.470e-02	1.213e-02	-1.833	-1.916	-0.083	(0)
	NaSO4-	4.130e-04	3.438e-04	-3.384	-3.464	-0.080	(0)
	NaHCO3	4.644e-06	4.644e-06	-5.333	-5.333	0.000	(0)
	NaF	1.546e-06	1.546e-06	-5.811	-5.811	0.000	(0)
	NaCO3-	1.228e-06	1.022e-06	-5.911	-5.991	-0.080	(0)
	NaH2BO3	6.038e-08	6.038e-08	-7.219	-7.219	0.000	(0)
	NaCrO4-	9.020e-16	6.999e-16	-15.045	-15.155	-0.110	(0)
Ni		1.687e-07					
	Ni+2	1.030e-07	4.774e-08	-6.987	-7.321	-0.334	(0)
	NiSO4	5.029e-08	5.029e-08	-7.299	-7.299	0.000	(0)
	NiCO3	8.062e-09	8.062e-09	-8.094	-8.094	0.000	(0)
	NiHCO3+	5.167e-09	4.009e-09	-8.287	-8.397	-0.110	(0)
	NiOH+	1.105e-09	8.573e-10	-8.957	-9.067	-0.110	(0)
	NiCl+	6.818e-10	5.290e-10	-9.166	-9.277	-0.110	(0)
	NiF+	3.122e-10	2.422e-10	-9.506	-9.616	-0.110	(0)
	Ni (OH) 2	9.712e-11	9.712e-11	-10.013	-10.013	0.000	(0)
	Ni (SO4) 2-2	2.426e-11	8.792e-12	-10.615	-11.056	-0.441	(0)
	NiNH3+2	2.775e-13	1.006e-13	-12.557	-12.998	-0.441	(0)
	Ni (OH) 3-	1.785e-13	1.385e-13	-12.748	-12.858	-0.110	(0)
	NiCl2	1.153e-14	1.153e-14	-13.938	-13.938	0.000	(0)
	NiSeO4	3.178e-15	3.178e-15	-14.498	-14.498	0.000	(0)
	NiNO3+	1.907e-15	1.479e-15	-14.720	-14.830	-0.110	(0)
	Ni (NH3) 2+2	1.573e-19	5.700e-20	-18.803	-19.244	-0.441	(0)
O (0)		2.459e-35					
	O2	1.229e-35	1.243e-35	-34.910	-34.906	0.005	(0)
Pb		6.577e-09					
	PbCO3	3.620e-09	3.620e-09	-8.441	-8.441	0.000	(0)
	PbOH+	1.229e-09	9.533e-10	-8.911	-9.021	-0.110	(0)
	PbSO4	6.880e-10	6.880e-10	-9.162	-9.162	0.000	(0)
	Pb+2	5.740e-10	2.661e-10	-9.241	-9.575	-0.334	(0)
	PbHCO3+	1.735e-10	1.347e-10	-9.761	-9.871	-0.110	(0)
	Pb (CO3) 2-2	1.304e-10	4.726e-11	-9.885	-10.326	-0.441	(0)
	Pb (SO4) 2-2	6.039e-11	2.189e-11	-10.219	-10.660	-0.441	(0)
	PbCl+	5.269e-11	4.088e-11	-10.278	-10.388	-0.110	(0)
	Pb (OH) 2	4.299e-11	4.299e-11	-10.367	-10.367	0.000	(0)
	PbF+	4.882e-12	3.787e-12	-11.311	-11.422	-0.110	(0)
	PbCl2	7.908e-13	7.908e-13	-12.102	-12.102	0.000	(0)
	Pb (OH) 3-	7.904e-14	6.132e-14	-13.102	-13.212	-0.110	(0)
	PbF2	1.506e-14	1.506e-14	-13.822	-13.822	0.000	(0)
	PbCl3-	1.757e-15	1.363e-15	-14.755	-14.865	-0.110	(0)
	PbNO3+	6.257e-17	4.855e-17	-16.204	-16.314	-0.110	(0)
	Pb (OH) 4-2	5.911e-17	2.142e-17	-16.228	-16.669	-0.441	(0)
	Pb2OH+3	3.945e-17	4.020e-18	-16.404	-17.396	-0.992	(0)
	PbCl4-2	7.447e-18	2.699e-18	-17.128	-17.569	-0.441	(0)
	PbF3-	7.434e-18	5.768e-18	-17.129	-17.239	-0.110	(0)
	Pb3 (OH) 4+2	2.708e-20	9.814e-21	-19.567	-20.008	-0.441	(0)
	PbF4-2	1.539e-21	5.577e-22	-20.813	-21.254	-0.441	(0)
	Pb4 (OH) 4+4	1.203e-24	2.074e-26	-23.920	-25.683	-1.763	(0)
	Pb (NO3) 2	1.017e-24	1.017e-24	-23.993	-23.993	0.000	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-152.201	-152.201	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-229.738	-229.848	-0.110	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-74.054	-74.054	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.838	-78.948	-0.110	(0)
	CdHS+	0.000e+00	0.000e+00	-79.318	-79.428	-0.110	(0)
	S5-2	0.000e+00	0.000e+00	-79.720	-80.161	-0.441	(0)
	H2S	0.000e+00	0.000e+00	-80.079	-80.079	0.000	(0)
	S6-2	0.000e+00	0.000e+00	-80.236	-80.677	-0.441	(0)
	S4-2	0.000e+00	0.000e+00	-80.316	-80.757	-0.441	(0)
	S3-2	0.000e+00	0.000e+00	-81.122	-81.563	-0.441	(0)
	S2-2	0.000e+00	0.000e+00	-82.138	-82.579	-0.441	(0)
	S-2	0.000e+00	0.000e+00	-87.771	-88.096	-0.325	(0)
	HgHS2-	0.000e+00	0.000e+00	-139.085	-139.195	-0.110	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.311	-139.752	-0.441	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.953	-140.953	0.000	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.609	-147.985	-0.377	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-148.021	-148.234	-0.214	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.358	-148.715	-0.357	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-148.600	-148.710	-0.110	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.792	-148.902	-0.110	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.135	-149.523	-0.387	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.467	-149.834	-0.367	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.852	-150.852	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-151.171	-151.171	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.201	-152.201	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.797	-161.797	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.686	-218.796	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-226.409	-226.519	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.907	-228.348	-0.441	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-228.109	-228.219	-0.110	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.738	-229.848	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.598	-238.708	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-304.530	-304.971	-0.441	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-306.486	-306.927	-0.441	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.177	-322.618	-0.441	(0)
S (6)	1.461e-02					
SO4-2	1.139e-02	5.279e-03	-1.944	-2.277	-0.334	(0)
MgSO4	1.765e-03	1.765e-03	-2.753	-2.753	0.000	(0)
CaSO4	8.848e-04	8.848e-04	-3.053	-3.053	0.000	(0)
NaSO4-	4.130e-04	3.438e-04	-3.384	-3.464	-0.080	(0)
KSO4-	1.381e-04	1.150e-04	-3.860	-3.939	-0.080	(0)
MnSO4	1.664e-05	1.664e-05	-4.779	-4.779	0.000	(0)
ZnSO4	1.934e-06	1.934e-06	-5.714	-5.714	0.000	(0)
Zn (SO4) 2-2	2.454e-07	8.893e-08	-6.610	-7.051	-0.441	(0)
NiSO4	5.029e-08	5.029e-08	-7.299	-7.299	0.000	(0)
CoSO4	2.834e-08	2.834e-08	-7.548	-7.548	0.000	(0)
CuSO4	1.701e-08	1.701e-08	-7.769	-7.769	0.000	(0)
HSO4-	4.411e-09	3.639e-09	-8.355	-8.439	-0.084	(0)
CdSO4	4.024e-09	4.024e-09	-8.395	-8.395	0.000	(0)
NH4SO4-	3.310e-09	2.745e-09	-8.480	-8.561	-0.081	(0)
Cd (SO4) 2-2	7.907e-10	2.865e-10	-9.102	-9.543	-0.441	(0)
PbSO4	6.880e-10	6.880e-10	-9.162	-9.162	0.000	(0)
AgSO4-	1.628e-10	1.263e-10	-9.788	-9.899	-0.110	(0)
Pb (SO4) 2-2	6.039e-11	2.189e-11	-10.219	-10.660	-0.441	(0)
Ni (SO4) 2-2	2.426e-11	8.792e-12	-10.615	-11.056	-0.441	(0)
CrOHSO4	3.373e-12	3.373e-12	-11.472	-11.472	0.000	(0)
FeSO4	1.824e-13	1.824e-13	-12.739	-12.739	0.000	(0)
UO2SO4	8.380e-14	8.380e-14	-13.077	-13.077	0.000	(0)
UO2 (SO4) 2-2	1.609e-14	5.832e-15	-13.793	-14.234	-0.441	(0)
AlSO4+	1.349e-14	1.113e-14	-13.870	-13.953	-0.084	(0)
CrSO4+	1.371e-15	1.064e-15	-14.863	-14.973	-0.110	(0)
Al (SO4) 2-	7.633e-16	6.297e-16	-15.117	-15.201	-0.084	(0)
VO2SO4-	6.379e-19	4.949e-19	-18.195	-18.305	-0.110	(0)
FeSO4+	3.902e-20	3.236e-20	-19.409	-19.490	-0.081	(0)
Fe (SO4) 2-	4.707e-21	3.652e-21	-20.327	-20.437	-0.110	(0)
Cr2 (OH) 2SO4+2	2.265e-21	8.207e-22	-20.645	-21.086	-0.441	(0)
HgSO4	5.773e-22	5.773e-22	-21.239	-21.239	0.000	(0)
VOSO4	5.443e-22	5.443e-22	-21.264	-21.264	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.574e-22	2.574e-22	-21.589	-21.589	0.000	(0)
CrO3SO4-2	8.305e-24	3.010e-24	-23.081	-23.521	-0.441	(0)
VSO4+	7.117e-37	5.522e-37	-36.148	-36.258	-0.110	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.666	-40.666	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.847	-42.288	-0.441	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-61.484	-61.594	-0.110	(0)
Sb (3)	2.182e-20					
Sb (OH) 3	1.103e-20	1.103e-20	-19.957	-19.957	0.000	(0)
HSbO2	1.078e-20	1.078e-20	-19.967	-19.967	0.000	(0)
SbO2-	3.189e-24	2.474e-24	-23.496	-23.607	-0.110	(0)
Sb (OH) 4-	1.825e-24	1.416e-24	-23.739	-23.849	-0.110	(0)
Sb (OH) 2F	2.458e-26	2.458e-26	-25.609	-25.609	0.000	(0)
SbOF	2.419e-26	2.419e-26	-25.616	-25.616	0.000	(0)
Sb (OH) 2+	2.438e-27	1.891e-27	-26.613	-26.723	-0.110	(0)
SbO+	8.411e-28	6.526e-28	-27.075	-27.185	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-322.177	-322.618	-0.441	(0)
Sb (5)	2.964e-08					
SbO3-	2.960e-08	2.297e-08	-7.529	-7.639	-0.110	(0)

Sb(OH) 6-	3.249e-11	2.681e-11	-10.488	-10.572	-0.083	(0)
SbO2+	4.229e-25	3.281e-25	-24.374	-24.484	-0.110	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.262e-39	9.793e-40	-38.899	-39.009	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-40.994	-40.994	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.271	-43.271	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.417	-45.858	-0.441	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-81.231	-82.994	-1.763	(0)
Se (4)	1.657e-07					
SeO3-2	9.066e-08	3.285e-08	-7.043	-7.483	-0.441	(0)
HSeO3-	7.503e-08	5.822e-08	-7.125	-7.235	-0.110	(0)
H2SeO3	1.752e-13	1.752e-13	-12.757	-12.757	0.000	(0)
AgSeO3-	3.262e-14	2.531e-14	-13.486	-13.597	-0.110	(0)
Cd (SeO3) 2-2	7.980e-18	2.892e-18	-17.098	-17.539	-0.441	(0)
Ag (SeO3) 2-3	7.308e-20	7.446e-21	-19.136	-20.128	-0.992	(0)
FeHSeO3+2	2.319e-25	8.403e-26	-24.635	-25.076	-0.441	(0)
Se (6)	3.078e-10					
SeO4-2	3.070e-10	1.423e-10	-9.513	-9.847	-0.334	(0)
MnSeO4	6.789e-13	6.789e-13	-12.168	-12.168	0.000	(0)
ZnSeO4	3.691e-14	3.691e-14	-13.433	-13.433	0.000	(0)
NiSeO4	3.178e-15	3.178e-15	-14.498	-14.498	0.000	(0)
CoSeO4	1.919e-15	1.919e-15	-14.717	-14.717	0.000	(0)
CdSeO4	8.616e-17	8.616e-17	-16.065	-16.065	0.000	(0)
HSeO4-	6.485e-17	5.032e-17	-16.188	-16.298	-0.110	(0)
Zn (SeO4) 2-2	1.470e-23	5.327e-24	-22.833	-23.274	-0.441	(0)
Si	5.695e-05					
H4SiO4	5.555e-05	5.615e-05	-4.255	-4.251	0.005	(0)
H3SiO4-	1.402e-06	1.150e-06	-5.853	-5.939	-0.086	(0)
H2SiO4-2	2.143e-11	1.029e-11	-10.669	-10.988	-0.319	(0)
UO2H3SiO4+	1.320e-12	1.024e-12	-11.879	-11.990	-0.110	(0)
SiF6-2	3.033e-29	1.434e-29	-28.518	-28.843	-0.325	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-59.036	-60.028	-0.992	(0)
U (4)	1.366e-19					
U (OH) 5-	1.366e-19	1.060e-19	-18.865	-18.975	-0.110	(0)
U (OH) 4	3.134e-23	3.134e-23	-22.504	-22.504	0.000	(0)
U (OH) 3+	1.042e-27	8.088e-28	-26.982	-27.092	-0.110	(0)
U (OH) 2+2	7.286e-33	2.640e-33	-32.138	-32.578	-0.441	(0)
UF3+	1.036e-36	8.040e-37	-35.985	-36.095	-0.110	(0)
UF2+2	6.930e-38	2.511e-38	-37.159	-37.600	-0.441	(0)
UF4	1.781e-38	1.781e-38	-37.749	-37.749	0.000	(0)
UOH+3	8.616e-39	8.779e-40	-38.065	-39.057	-0.992	(0)
UF5-	1.837e-40	1.425e-40	-39.736	-39.846	-0.110	(0)
UF+3	0.000e+00	0.000e+00	-40.014	-41.005	-0.992	(0)
UF6-2	0.000e+00	0.000e+00	-40.620	-41.061	-0.441	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.666	-40.666	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.847	-42.288	-0.441	(0)
U+4	0.000e+00	0.000e+00	-44.847	-46.611	-1.763	(0)
UC1+3	0.000e+00	0.000e+00	-46.282	-47.274	-0.992	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.625	-174.552	-8.927	(0)
U (5)	1.972e-16					
UO2+	1.972e-16	1.530e-16	-15.705	-15.815	-0.110	(0)
U (6)	2.718e-07					
UO2 (CO3) 3-4	2.245e-07	3.872e-09	-6.649	-8.412	-1.763	(0)
UO2 (CO3) 2-2	4.710e-08	1.707e-08	-7.327	-7.768	-0.441	(0)
UO2CO3	1.890e-10	1.890e-10	-9.724	-9.724	0.000	(0)
UO2OH+	2.427e-12	1.883e-12	-11.615	-11.725	-0.110	(0)
UO2H3SiO4+	1.320e-12	1.024e-12	-11.879	-11.990	-0.110	(0)
UO2F+	3.769e-13	2.924e-13	-12.424	-12.534	-0.110	(0)
UO2F2	1.704e-13	1.704e-13	-12.769	-12.769	0.000	(0)
UO2SO4	8.380e-14	8.380e-14	-13.077	-13.077	0.000	(0)
UO2+2	2.263e-14	1.049e-14	-13.645	-13.979	-0.334	(0)
UO2 (SO4) 2-2	1.609e-14	5.832e-15	-13.793	-14.234	-0.441	(0)
UO2F3-	1.114e-14	8.644e-15	-13.953	-14.063	-0.110	(0)
UO2Cl+	9.493e-17	7.366e-17	-16.023	-16.133	-0.110	(0)
UO2F4-2	3.827e-17	1.387e-17	-16.417	-16.858	-0.441	(0)
(UO2) 3 (OH) 5+	2.204e-17	1.710e-17	-16.657	-16.767	-0.110	(0)

	(UO2) 2 (OH) 2+2	1.624e-17	5.885e-18	-16.789	-17.230	-0.441	(0)
	UO2NO3+	3.327e-22	2.581e-22	-21.478	-21.588	-0.110	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-43.811	-43.921	-0.110	(0)
	V+2	0.000e+00	0.000e+00	-45.145	-45.585	-0.441	(0)
V (3)	5.186e-16						
	V (OH) 3	5.186e-16	5.186e-16	-15.285	-15.285	0.000	(0)
	V (OH) 2+	3.049e-27	2.366e-27	-26.516	-26.626	-0.110	(0)
	VOH+2	4.371e-31	1.584e-31	-30.359	-30.800	-0.441	(0)
	V+3	2.175e-36	2.216e-37	-35.663	-36.654	-0.992	(0)
	VSO4+	7.117e-37	5.522e-37	-36.148	-36.258	-0.110	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-57.983	-58.974	-0.992	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-59.037	-60.801	-1.763	(0)
V (4)	1.394e-19						
	V (OH) 3+	1.372e-19	1.064e-19	-18.863	-18.973	-0.110	(0)
	VO+2	1.033e-21	3.743e-22	-20.986	-21.427	-0.441	(0)
	VOF+	5.845e-22	4.535e-22	-21.233	-21.343	-0.110	(0)
	VOSO4	5.443e-22	5.443e-22	-21.264	-21.264	0.000	(0)
	VOF2	3.435e-23	3.435e-23	-22.464	-22.464	0.000	(0)
	VOC1+	5.861e-24	4.548e-24	-23.232	-23.342	-0.110	(0)
	VOF3-	3.173e-25	2.462e-25	-24.499	-24.609	-0.110	(0)
	VOF4-2	5.539e-28	2.007e-28	-27.257	-27.697	-0.441	(0)
	H2V2O4+2	1.569e-33	5.687e-34	-32.804	-33.245	-0.441	(0)
V (5)	8.968e-09						
	H2VO4-	5.088e-09	3.948e-09	-8.293	-8.404	-0.110	(0)
	HVO4-2	3.879e-09	1.406e-09	-8.411	-8.852	-0.441	(0)
	H3VO4	2.785e-13	2.785e-13	-12.555	-12.555	0.000	(0)
	HV2O7-3	1.847e-14	1.882e-15	-13.734	-14.725	-0.992	(0)
	VO4-3	9.802e-15	9.987e-16	-14.009	-15.001	-0.992	(0)
	H3V2O7-	9.157e-15	7.104e-15	-14.038	-14.148	-0.110	(0)
	V2O7-4	4.163e-16	7.180e-18	-15.381	-17.144	-1.763	(0)
	VO2+	4.758e-18	3.926e-18	-17.323	-17.406	-0.083	(0)
	VO2F	1.391e-18	1.391e-18	-17.857	-17.857	0.000	(0)
	VO2SO4-	6.379e-19	4.949e-19	-18.195	-18.305	-0.110	(0)
	V3O9-3	6.338e-19	6.458e-20	-18.198	-19.190	-0.992	(0)
	VO2F2-	1.315e-19	1.020e-19	-18.881	-18.991	-0.110	(0)
	VO2F3-2	7.093e-22	2.570e-22	-21.149	-21.590	-0.441	(0)
	V4O12-4	6.167e-24	1.064e-25	-23.210	-24.973	-1.763	(0)
	VO2F4-3	2.507e-25	2.555e-26	-24.601	-25.593	-0.992	(0)
	VO2NO3	2.450e-26	2.450e-26	-25.611	-25.611	0.000	(0)
	V10O28-6	0.000e+00	0.000e+00	-63.765	-67.733	-3.967	(0)
	HV10O28-5	0.000e+00	0.000e+00	-64.942	-67.698	-2.755	(0)
	H2V10O28-4	0.000e+00	0.000e+00	-68.878	-70.642	-1.763	(0)
Zn	6.702e-06						
	Zn+2	3.613e-06	1.675e-06	-5.442	-5.776	-0.334	(0)
	ZnSO4	1.934e-06	1.934e-06	-5.714	-5.714	0.000	(0)
	ZnCO3	4.362e-07	4.362e-07	-6.360	-6.360	0.000	(0)
	ZnOH+	3.078e-07	2.389e-07	-6.512	-6.622	-0.110	(0)
	Zn (SO4) 2-2	2.454e-07	8.893e-08	-6.610	-7.051	-0.441	(0)
	Zn (OH) 2	5.399e-08	5.399e-08	-7.268	-7.268	0.000	(0)
	ZnHCO3+	4.649e-08	3.607e-08	-7.333	-7.443	-0.110	(0)
	ZnOHC1	3.401e-08	3.401e-08	-7.468	-7.468	0.000	(0)
	ZnCl+	2.220e-08	1.822e-08	-7.654	-7.740	-0.086	(0)
	ZnF+	8.699e-09	6.749e-09	-8.061	-8.171	-0.110	(0)
	Zn (OH) 3-	4.974e-10	3.859e-10	-9.303	-9.413	-0.110	(0)
	ZnCl2	1.250e-10	1.250e-10	-9.903	-9.903	0.000	(0)
	ZnCl3-	5.240e-13	4.301e-13	-12.281	-12.366	-0.086	(0)
	ZnNO3+	6.688e-14	5.189e-14	-13.175	-13.285	-0.110	(0)
	Zn (OH) 4-2	6.047e-14	2.191e-14	-13.218	-13.659	-0.441	(0)
	ZnSeO4	3.691e-14	3.691e-14	-13.433	-13.433	0.000	(0)
	ZnCl4-2	1.970e-15	9.312e-16	-14.706	-15.031	-0.325	(0)
	Zn (NO3) 2	1.277e-22	1.277e-22	-21.894	-21.894	0.000	(0)
	Zn (SeO4) 2-2	1.470e-23	5.327e-24	-22.833	-23.274	-0.441	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-148.600	-148.710	-0.110	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-150.852	-150.852	0.000	(0)
	Zn (HS) 3-	0.000e+00	0.000e+00	-226.409	-226.519	-0.110	(0)
	ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.907	-228.348	-0.441	(0)
	Zn (HS) 4-2	0.000e+00	0.000e+00	-306.486	-306.927	-0.441	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.63	-49.34	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-42.76	-38.25	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-49.99	-38.25	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-71.99	-54.05	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-57.45	-37.41	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.97	-28.56	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.92	-24.47	0.45	(NH4) 2SeO4
Acanthite	-52.42	-88.64	-36.22	Ag2S
Ag2CO3	-12.10	-23.19	-11.09	Ag2CO3
Ag2CrO4	-20.19	-31.78	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.34	-23.89	-11.55	Ag2MoO4
Ag2O	-14.11	-1.54	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.30	-20.12	-4.82	Ag2SO4
Ag3AsO3	-28.47	-26.31	2.16	Ag3AsO3
Ag3AsO4	-16.88	-19.66	-2.79	Ag3AsO4
Ag3H2VO5	-16.74	-11.56	5.18	Ag3H2VO5
AgF:4H2O	-13.67	-12.62	1.05	AgF:4H2O
Agmetal	-0.04	-13.54	-13.51	Ag
AgVO3	-10.79	-10.02	0.77	AgVO3
Al (OH) 3 (am)	-1.91	8.89	10.80	Al (OH) 3
Al2 (MoO4) 3	-51.63	-49.27	2.37	Al2 (MoO4) 3
Al2O3	-1.88	17.78	19.65	Al2O3
Al4 (OH) 10SO4	-5.73	16.97	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-13.27	-8.47	4.80	AlAsO4:2H2O
AlOHSO4	-6.46	-9.69	-3.23	AlOHSO4
AlSb	-153.33	-87.70	65.62	AlSb
Alunite	-3.46	-4.86	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.06	-11.85	-7.79	PbSO4
Anhydrite	-1.05	-5.41	-4.36	CaSO4
Anilite	-55.56	-87.43	-31.88	Cu0.25Cu1.5S
Antlerite	-2.02	6.77	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-93.25	-96.01	-2.76	As4O6
Artinite	-4.11	5.49	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-41.42	-34.71	6.71	As2O5
Atacamite	-1.00	6.39	7.39	Cu2 (OH) 3Cl
Azurite	-1.04	-17.94	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.80	8.60	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.18	-1.31	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.65	7.29	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-11.97	-21.64	-9.67	BaCrO4
BaF2	-9.27	-15.09	-5.82	BaF2
BaMoO4	-6.79	-13.75	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.62	-6.79	1.83	BaSeO3
BaSeO4	-10.09	-17.55	-7.46	BaSeO4
Bianchite	-6.29	-8.06	-1.76	ZnSO4:6H2O
Birnessite	-6.35	11.75	18.09	MnO2
Bixbyite	-1.41	-2.05	-0.64	Mn2O3
BlaubleiI	-55.66	-79.82	-24.16	Cu0.9Cu0.2S
BlaubleiII	-56.05	-83.33	-27.28	Cu0.6Cu0.8S
Boehmite	0.31	8.89	8.58	AlOOH
Breithauptite	-56.31	-74.84	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.28	13.57	16.84	Mg (OH) 2
Bunsenite	-3.46	8.98	12.45	NiO
Ca (VO3) 2	-11.00	-5.34	5.66	Ca (VO3) 2

Ca2V2O7	-9.68	7.82	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.73	7.82	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.51	4.79	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.97	20.99	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.87	20.99	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.65	-153.68	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.02	-25.93	-17.91	Hg2Cl2
CaMoO4	-1.23	-9.18	-7.95	CaMoO4
Carnotite	-1.52	-1.29	0.23	KUO2VO4
CaSeO3:2H2O	-5.03	-2.22	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.96	-12.98	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.86	-1.02	9.84	Cd(BO2)2
Cd(OH)2	-5.83	7.81	13.64	Cd(OH)2
Cd(OH)2(am)	-5.92	7.81	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.43	-13.72	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.70	4.86	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.72	12.68	28.40	Cd4(OH)6SO4
CdCl2	-12.56	-13.21	-0.66	CdCl2
CdCl2:1H2O	-11.52	-13.22	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.30	-13.22	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.88	-1.21	CdF2
Cdmetal(alpha)	-31.24	-17.73	13.51	Cd
Cdmetal(gamma)	-31.35	-17.73	13.62	Cd
CdMoO4	-0.38	-14.53	-14.15	CdMoO4
CdOHCl	-6.24	-2.70	3.54	CdOHCl
CdSb	-75.65	-76.00	-0.35	CdSb
CdSe	-19.15	-39.35	-20.20	CdSe
CdSeO4:2H2O	-16.49	-18.34	-1.85	CdSeO4:2H2O
CdSO4	-10.59	-10.77	-0.17	CdSO4
CdSO4:1H2O	-9.04	-10.77	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.89	-10.77	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.79	-14.92	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.49	-10.13	-2.64	CuSO4:5H2O
Chalcedony	-0.70	-4.25	-3.55	SiO2
Chalcocite	-55.44	-90.36	-34.92	Cu2S
Chalcopyrite	-127.03	-162.30	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.68	-98.37	-45.69	HgS
Claudetite	-92.94	-96.01	-3.06	As4O6
Clausthalite	-13.33	-40.43	-27.10	PbSe
Co(BO2)2	-27.17	-0.10	27.07	Co(BO2)2
Co(OH)2	-4.36	8.73	13.09	Co(OH)2
Co(OH)3	-8.59	-10.90	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-21.55	-8.51	13.03	Co3(AsO4)2
Co3O4	-2.56	-13.06	-10.50	Co3O4
CoCl2	-20.56	-12.30	8.27	CoCl2
CoCl2:6H2O	-14.84	-12.30	2.54	CoCl2:6H2O
CoCO3	-2.93	-12.91	-9.98	CoCO3
CoF2	-13.36	-14.96	-1.60	CoF2
CoF3	-44.98	-46.43	-1.46	CoF3
CoFe2O4	18.64	15.12	-3.53	CoFe2O4
CoMoO4	-5.85	-13.62	-7.76	CoMoO4
CoO	-4.85	8.73	13.59	CoO
CoS(alpha)	-70.93	-78.37	-7.44	CoS
CoS(beta)	-67.30	-78.37	-11.07	CoS
CoSe	-22.23	-38.43	-16.20	CoSe
CoSeO3	-7.97	-6.65	1.32	CoSeO3
CoSeO4:6H2O	-15.89	-17.42	-1.53	CoSeO4:6H2O
CoSO4	-12.65	-9.85	2.80	CoSO4
CoSO4:6H2O	-7.38	-9.85	-2.47	CoSO4:6H2O
Cotunnite	-9.52	-14.30	-4.78	PbCl2
Covellite	-56.35	-78.65	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2

Cr(OH)3	-2.51	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-46.13	-32.03	14.09	CrCl2
CrCl3	-47.84	-32.72	15.11	CrCl3
CrF3	-25.38	-36.72	-11.34	CrF3
Cristobalite	-0.90	-4.25	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.64	-43.48	-33.84	Na3AlF6
Cu(OH)2	-0.22	8.45	8.67	Cu(OH)2
Cu(SbO3)2	-25.58	19.63	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.41	0.84	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.89	-89.77	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.62	-50.42	-45.80	Cu2Se
Cu2SO4	-19.89	-21.84	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.46	-9.36	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.89	-101.49	-42.59	Cu3Sb
Cu3Se2	-25.64	-89.13	-63.49	Cu3Se2
CuCO3	-1.70	-13.20	-11.50	CuCO3
CuCrO4	-16.35	-21.79	-5.44	CuCrO4
CuF	-8.57	-13.48	-4.91	CuF
CuF2	-16.36	-15.24	1.12	CuF2
CuF2:2H2O	-10.69	-15.24	-4.55	CuF2:2H2O
Cumetal	-5.65	-14.40	-8.76	Cu
CuMoO4	-0.82	-13.90	-13.08	CuMoO4
CuOCuSO4	-11.98	-1.68	10.30	CuOCuSO4
Cupricferrite	8.85	14.83	5.99	CuFe2O4
Cuprite	-1.86	-3.26	-1.41	Cu2O
Cuprousferrite	10.48	1.56	-8.92	CuFeO2
CuSe	-5.61	-38.71	-33.10	CuSe
CuSe2	-26.96	-60.33	-33.37	CuSe2
CuSeO3:2H2O	-7.45	-6.94	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.26	-17.70	-2.44	CuSeO4:5H2O
CuSO4	-13.07	-10.13	2.94	CuSO4
Diaspore	2.01	8.89	6.87	AlOOH
Djurleite	-55.67	-89.59	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.02	-16.56	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.53	-16.56	-17.09	CaMg(CO3)2
Epsomite	-2.89	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2:7Cl.3	3.08	0.04	-3.04	Fe(OH)2:7Cl.3
Fe(VO3)2	-11.34	-15.06	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.56	-9.00	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-19.15	-39.78	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.62	-49.36	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.56	-14.16	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.81	-18.90	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.73	-65.32	-18.60	FeSe2
FeS(ppt)	-80.70	-83.65	-2.95	FeS
FeSe	-32.71	-43.71	-11.00	FeSe
Fix_pe	-4.62	-4.62	0.00	e-
Fluorite	-0.03	-10.53	-10.50	CaF2
Galena	-66.40	-80.37	-13.97	PbS
Gibbsite	0.60	8.89	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-6.04	-8.06	-2.01	ZnSO4:7H2O
Greenalite	-18.96	1.85	20.81	Fe3Si2O5(OH)4
Greenockite	-64.92	-79.28	-14.36	CdS
Greigite	-293.53	-338.56	-45.03	Fe3S4
Gummite	-5.35	2.32	7.67	UO3
Gypsum	-0.80	-5.41	-4.61	CaSO4:2H2O
H-Jarosite	-15.49	-27.59	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.47	-22.35	-12.88	H2MoO4
H2S(g)	-79.09	-87.10	-8.01	H2S

H2Se(g)	-42.20	-47.16	-4.96	H2Se
Halite	-5.88	-4.28	1.60	NaCl
Halloysite	-0.30	9.28	9.57	Al2Si2O5(OH)4
Hausmannite	-0.83	60.20	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.67	21.23	22.89	FeAl2O4
Hg(CH3)2(g)	-185.22	-258.92	-73.71	Hg(CH3)2
Hg(g)	-7.35	-15.22	-7.87	Hg
Hg(OH)2	-7.77	-11.27	-3.50	Hg(OH)2
Hg2(g)	-15.49	-30.45	-14.96	Hg2
Hg2(OH)2	-10.16	-4.90	5.26	Hg2(OH)2
Hg2CO3	-10.50	-26.55	-16.05	Hg2CO3
Hg2CrO4	-26.44	-35.14	-8.70	Hg2CrO4
Hg2F2	-18.23	-28.59	-10.36	Hg2F2
Hg2S	-80.32	-92.00	-11.68	Hg2S
Hg2SeO3	-15.63	-20.29	-4.66	Hg2SeO3
Hg2SO4	-17.35	-23.48	-6.13	Hg2SO4
Hg3O2CO3	-25.78	-55.46	-29.68	Hg3O2CO3
HgCl(g)	-32.46	-12.97	19.50	HgCl
HgCl2	-11.04	-32.30	-21.26	HgCl2
HgF(g)	-46.97	-14.30	32.68	HgF
HgF2(g)	-47.53	-34.96	12.57	HgF2
Hgmetal(l)	-1.77	-15.22	-13.45	Hg
HgSe	-2.74	-58.43	-55.69	HgSe
HgSeO3	-14.23	-26.66	-12.43	HgSeO3
HgSO4	-20.43	-29.85	-9.42	HgSO4
Huntite	-2.75	-32.72	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.34	-23.11	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-9.99	-18.76	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-17.47	-22.64	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-7.15	-21.95	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-31.95	-49.20	-17.24	K2Cr2O7
K2CrO4	-18.45	-18.96	-0.51	K2CrO4
K2MoO4	-14.33	-11.07	3.26	K2MoO4
K2SeO4	-14.14	-14.87	-0.73	K2SeO4
Kaolinite	1.84	9.28	7.43	Al2Si2O5(OH)4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4·H2O
Larnakite	-4.69	-5.12	-0.43	PbO:PbSO4
Laurionite	-4.41	-3.79	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-5.97	6.73	12.69	PbO
Mackinawite	-80.05	-83.65	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.09	19.95	16.86	Fe2MgO4
Magnesite	-0.62	-8.08	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.56	-4.75	-5.31	Cu2(OH)2CO3
Manganite	-1.02	24.32	25.34	MnOOH
Massicot	-6.17	6.73	12.89	PbO
Matlockite	-6.66	-15.63	-8.97	PbClF
Melanothallite	-18.84	-12.58	6.26	CuCl2
Melanterite	-12.92	-15.13	-2.21	FeSO4·7H2O
Metacinnabar	-53.28	-98.37	-45.09	HgS
Mg(OH)2(active)	-5.23	13.57	18.79	Mg(OH)2
Mg(VO3)2	-16.22	-4.94	11.28	Mg(VO3)2
Mg2Sb3	-273.46	-198.78	74.68	Mg2Sb3
Mg2V2O7	-17.74	8.62	26.36	Mg2V2O7
MgCr2O4	-4.99	11.21	16.20	MgCr2O4
MgCrO4	-22.05	-16.67	5.38	MgCrO4
MgF2	-2.00	-10.13	-8.13	MgF2
MgMoO4	-6.93	-8.78	-1.85	MgMoO4
MgSeO3·6H2O	-4.88	-1.82	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.38	-12.58	-1.20	MgSeO4·6H2O
Minium	-27.79	45.73	73.52	Pb3O4
Mirabilite	-5.00	-6.11	-1.11	Na2SO4·10H2O
Mn(VO3)2	-11.86	-6.96	4.90	Mn(VO3)2
Mn2(SO4)3	-52.08	-57.79	-5.71	Mn2(SO4)3

Mn2Sb	-147.34	-86.26	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-12.56	-0.06	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-12.19	-9.48	2.72	MnCl2:4H2O
MnS (grn)	-75.72	-75.55	0.17	MnS
MnS (pnk)	-78.89	-75.55	3.34	MnS
MnSb	-94.71	-97.62	-2.91	MnSb
MnSe	-39.11	-35.61	3.50	MnSe
MnSeO3	-4.96	-3.83	1.13	MnSeO3
MnSeO3:2H2O	-4.82	-3.84	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.55	-14.60	-2.05	MnSeO4:5H2O
MnSO4	-9.61	-7.03	2.58	MnSO4
Monteponite	-7.29	7.81	15.10	CdO
Montroydite	-7.63	-11.27	-3.64	HgO
MoO3	-14.35	-22.35	-8.00	MoO3
Morenosite	-7.46	-9.60	-2.14	NiSO4:7H2O
MoS2	-151.83	-222.09	-70.26	MoS2
Na-Jarosite	-10.15	-21.35	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.11	-48.01	-9.90	Na2Cr2O7
Na2CrO4	-20.70	-17.77	2.93	Na2CrO4
Na2Mo2O7	-15.63	-32.23	-16.60	Na2Mo2O7
Na2MoO4	-11.37	-9.88	1.49	Na2MoO4
Na2MoO4:2H2O	-11.10	-9.88	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.22	-2.92	10.30	Na2SeO3:5H2O
Na2SeO4	-14.96	-13.68	1.28	Na2SeO4
Na3Sb	-172.34	-77.89	94.45	Na3Sb
Na3VO4	-27.23	9.45	36.68	Na3VO4
Na4V2O7	-30.97	6.43	37.40	Na4V2O7
Nantokite	-5.42	-12.15	-6.73	CuCl
NaSb	-87.98	-64.81	23.17	NaSb
Natron	-7.87	-9.18	-1.31	Na2CO3:10H2O
NaVO3	-6.88	-3.02	3.86	NaVO3
Nesquehonite	-3.41	-8.08	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.81	8.98	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-23.47	-7.77	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.65	17.35	32.00	Ni4 (OH) 6SO4
NiCO3	-5.80	-12.67	-6.87	NiCO3
NiMoO4	-2.22	-13.37	-11.14	NiMoO4
NiS (alpha)	-72.52	-78.12	-5.60	NiS
NiS (beta)	-67.02	-78.12	-11.10	NiS
NiS (gamma)	-65.32	-78.12	-12.80	NiS
NiSe	-20.48	-38.18	-17.70	NiSe
NiSeO3:2H2O	-9.22	-6.41	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.65	-17.17	-1.52	NiSeO4:6H2O
Nsutite	-5.76	11.75	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-248.23	-309.30	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb (BO2) 2	-8.63	-2.11	6.52	Pb (BO2) 2
Pb (OH) 2	-1.42	6.73	8.15	Pb (OH) 2
Pb10 (OH) 60 (CO3) 6	-53.85	-62.61	-8.76	Pb10 (OH) 60 (CO3) 6
Pb2 (OH) 3Cl	-5.85	2.94	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-12.73	13.46	26.19	Pb2O (OH) 2
Pb2O3	-22.04	39.00	61.04	Pb2O3
Pb2OCO3	-7.63	-8.19	-0.56	Pb2OCO3
Pb2V2O7	-3.15	-5.05	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.33	-14.53	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.47	1.67	6.14	Pb3 (VO4) 2
Pb3O2CO3	-12.48	-1.46	11.02	Pb3O2CO3
Pb3O2SO4	-9.08	1.60	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-12.77	8.33	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-13.55	8.33	21.88	Pb4O3SO4
PbCrO4	-10.91	-23.51	-12.60	PbCrO4
PbF2	-9.52	-16.96	-7.44	PbF2
Pbmetal	-23.06	-18.82	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.25	6.73	12.98	PbO:0.33H2O
PbSeO4	-12.58	-19.42	-6.84	PbSeO4
Periclase	-8.02	13.57	21.58	MgO

Phosgenite	-9.41	-29.22	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-17.33	32.27	49.60	PbO ₂
Portlandite	-9.64	13.17	22.80	Ca(OH) ₂
Pyrite	-126.69	-145.20	-18.51	FeS ₂
Pyrochroite	-3.64	11.55	15.19	Mn(OH) ₂
Pyrolusite	-4.28	37.10	41.38	MnO ₂
Quartz	-0.25	-4.25	-4.00	SiO ₂
Realgar	-104.13	-123.87	-19.75	AsS
Retgersite	-7.56	-9.60	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.48	-10.10	-10.58	MnCO ₃
Rutherfordine	-4.82	-19.32	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-12.85	-19.96	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-17.77	-14.37	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-27.78	-37.44	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-113.64	-181.39	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-61.57	-79.83	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-61.93	-79.83	-17.90	Sb ₄ O ₆
SbCl ₃	-52.07	-51.50	0.57	SbCl ₃
SbF ₃	-45.27	-55.49	-10.23	SbF ₃
Sbmetal	-46.58	-58.27	-11.69	Sb
SbO ₂	-3.67	-31.49	-27.82	SbO ₂
Schoepite	-3.67	2.32	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-14.51	-21.62	-7.11	Se
Semetal(hex)	-13.91	-21.62	-7.71	Se
Senarmontite	-27.55	-39.91	-12.37	Sb ₂ O ₃
SeO ₂	-15.51	-15.39	0.12	SeO ₂
SeO ₃	-47.19	-26.15	21.04	SeO ₃
Sepiolite	-1.38	14.38	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-4.40	14.38	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.96	-18.20	-10.24	FeCO ₃
SiO ₂ (am-gel)	-1.54	-4.25	-2.71	SiO ₂
SiO ₂ (am-ppt)	-1.51	-4.25	-2.74	SiO ₂
Smithsonite	-1.12	-11.12	-10.00	ZnCO ₃
Sphalerite	-65.12	-76.57	-11.45	ZnS
Spinel	-5.50	31.34	36.85	MgAl ₂ O ₄
Stibnite	-250.75	-301.21	-50.46	Sb ₂ S ₃
Sulfur	-59.41	-61.55	-2.14	S
Tenorite	0.81	8.45	7.64	CuO
Thenardite	-6.43	-6.11	0.32	Na ₂ SO ₄
Thermonatrite	-9.81	-9.18	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-4.78	-0.70	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-12.01	9.07	21.08	U ₃ O ₈
U ₃ Sb ₄	-580.76	-428.38	152.38	U ₃ Sb ₄
U ₄ O ₉	-27.46	-30.48	-3.02	U ₄ O ₉
UF ₄	-31.85	-61.39	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.67	-61.39	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.94	-14.01	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.94	-29.80	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.65	-29.80	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-33.19	-29.80	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.85	-29.80	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.29	2.32	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-21.58	-23.83	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-5.38	2.32	7.70	UO ₃
Uraninite	-9.34	-14.01	-4.67	UO ₂
USb ₂	-220.44	-190.86	29.58	USb ₂
V(OH) ₃	-19.79	-12.20	7.59	V(OH) ₃
V ₂ O ₅	-17.15	-18.51	-1.36	V ₂ O ₅
V ₃ O ₅	-42.75	-40.92	1.84	V ₃ O ₅
V ₄ O ₇	-53.23	-46.04	7.19	V ₄ O ₇
V ₆ O ₁₃	-45.76	-106.62	-60.86	V ₆ O ₁₃
Valentinite	-31.43	-39.91	-8.48	Sb ₂ O ₃
VC ₁₂	-64.88	-46.00	18.87	VC ₁₂
VC ₁₃	-67.18	-43.74	23.43	VC ₁₃
VF ₄	-67.44	-52.51	14.93	VF ₄
Vmetal	-94.54	-50.52	44.03	V
VO	-39.73	-24.97	14.76	VO
VO(OH) ₂	-10.27	-5.12	5.15	VO(OH) ₂

VO2Cl	-22.61	-19.77	2.84	VO2Cl
VOC1	-33.87	-22.72	11.15	VOC1
VOC12	-38.91	-26.15	12.76	VOC12
VOSO4	-27.31	-23.70	3.61	VOSO4
Witherite	-4.48	-13.05	-8.57	BaCO3
Wurtzite	-67.62	-76.57	-8.95	ZnS
Zincite	-0.81	10.53	11.33	ZnO
Zincosite	-11.98	-8.05	3.93	ZnSO4
Zn(BO2)2	-6.60	1.69	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.91	-21.60	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.67	10.53	12.20	Zn(OH)2
Zn(OH)2(am)	-1.95	10.53	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.23	10.53	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.01	10.53	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.21	10.53	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.03	2.47	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.65	10.54	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.78	-3.13	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.49	-5.58	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.87	23.53	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.90	31.60	38.50	Zn5(OH)8Cl2
ZnCl2	-17.55	-10.50	7.05	ZnCl2
ZnCO3:1H2O	-0.86	-11.12	-10.26	ZnCO3:1H2O
ZnF2	-12.63	-13.17	-0.53	ZnF2
Znmetal	-40.81	-15.02	25.79	Zn
ZnMoO4	-1.70	-11.82	-10.13	ZnMoO4
ZnO(active)	-0.66	10.53	11.19	ZnO
ZnS(am)	-67.52	-76.57	-9.05	ZnS
ZnSb	-84.31	-73.29	11.01	ZnSb
ZnSe	-22.23	-36.63	-14.40	ZnSe
ZnSeO4:6H2O	-14.10	-15.62	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.42	-8.05	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 132.

```

Title Stage 8 pit lake GW inflow
Title Stage 8 Groundwater mix
MIX 801
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.252012
11     2.045062
12     1.562094
13     3.674360
14     0
15     0
Save solution 801
end

```

TITLE

Stage 8 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 801.

Mixture 801.

1.000e+00 Solution 2 JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013

0.000e+00 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)

0.000e+00 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)

0.000e+00 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)

0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)

2.520e-01 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)

2.045e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

1.562e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)

3.674e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)

0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)

0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	9.785e-09	8.350e-08
Al	5.506e-07	4.699e-06
As	4.786e-09	4.085e-08
B	1.880e-06	1.604e-05
Ba	1.758e-07	1.500e-06
C	1.456e-03	1.243e-02
Ca	6.540e-04	5.581e-03
Cd	1.388e-09	1.185e-08
Cl	2.020e-04	1.724e-03
Co	1.592e-08	1.359e-07
Cr	1.489e-08	1.270e-07
Cu	1.155e-06	9.858e-06
F	5.107e-05	4.358e-04
Fe	3.131e-06	2.672e-05
Hg	2.651e-11	2.262e-10
K	8.612e-05	7.349e-04
Mg	2.066e-04	1.763e-03
Mn	2.825e-06	2.411e-05
Mo	6.637e-08	5.664e-07
Na	5.862e-04	5.002e-03
Ni	2.498e-08	2.131e-07
Pb	3.113e-09	2.657e-08
S	4.300e-04	3.669e-03

Sb	1.557e-09	1.328e-08
Se	5.625e-09	4.800e-08
U	1.008e-08	8.600e-08
V	1.377e-08	1.175e-07
Zn	1.375e-07	1.173e-06

-----Description of solution-----

	pH =	7.204	Charge balance
	pe =	4.783	Adjusted to redox
equilibrium			
	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	3.502e-03	
	Mass of water (kg) =	8.534e+00	
	Total alkalinity (eq/kg) =	1.294e-03	
	Total CO2 (mol/kg) =	1.456e-03	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	1.260e-17	
	Percent error, 100*(Cat- An)/(Cat+ An) =	0.00	
	Iterations =	13	
	Total H =	9.473522e+02	
	Total O =	4.737212e+02	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.719e-07	1.610e-07	-6.765	-6.793	-0.028	(0)
H+	6.669e-08	6.253e-08	-7.176	-7.204	-0.028	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	9.785e-09					
Ag+	6.804e-09	6.380e-09	-8.167	-8.195	-0.028	(0)
AgCl	2.467e-09	2.467e-09	-8.608	-8.608	0.000	(0)
Ag2Se	2.142e-10	2.142e-10	-9.669	-9.669	0.000	(0)
AgCl2-	4.364e-11	4.071e-11	-10.360	-10.390	-0.030	(0)
AgSO4-	4.093e-11	3.818e-11	-10.388	-10.418	-0.030	(0)
AgF	7.503e-13	7.503e-13	-12.125	-12.125	0.000	(0)
AgOH	1.027e-13	1.027e-13	-12.988	-12.988	0.000	(0)
AgCl3-2	9.075e-15	6.872e-15	-14.042	-14.163	-0.121	(0)
AgH2BO3	1.749e-15	1.749e-15	-14.757	-14.757	0.000	(0)
AgSeO3-	1.310e-15	1.222e-15	-14.883	-14.913	-0.030	(0)
AgCl4-3	4.968e-18	2.658e-18	-17.304	-17.575	-0.272	(0)
Ag(OH) 2-	1.733e-18	1.617e-18	-17.761	-17.791	-0.030	(0)
Ag(SeO3) 2-3	6.092e-24	3.259e-24	-23.215	-23.487	-0.272	(0)
Ag2MoO4	7.895e-25	7.895e-25	-24.103	-24.103	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.346	-67.346	0.000	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-77.397	-77.880	-0.483	(0)
Ag(HS) 2-	0.000e+00	0.000e+00	-136.181	-136.211	-0.030	(0)
Ag(HS) S4-2	0.000e+00	0.000e+00	-136.397	-136.491	-0.093	(0)
Ag(S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.727	-0.190	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.038	-0.185	(0)
Al	5.506e-07					
Al(OH) 4-	5.134e-07	4.817e-07	-6.290	-6.317	-0.028	(0)
Al(OH) 3	2.376e-08	2.376e-08	-7.624	-7.624	0.000	(0)
Al(OH) 2+	7.875e-09	7.395e-09	-8.104	-8.131	-0.027	(0)
AlF2+	3.337e-09	3.134e-09	-8.477	-8.504	-0.027	(0)
AlF3	1.847e-09	1.847e-09	-8.734	-8.734	0.000	(0)
AlF+2	2.162e-10	1.681e-10	-9.665	-9.774	-0.109	(0)
AlOH+2	7.436e-11	5.782e-11	-10.129	-10.238	-0.109	(0)
AlF4-	4.620e-11	4.334e-11	-10.335	-10.363	-0.028	(0)
AlSO4+	8.913e-13	8.361e-13	-12.050	-12.078	-0.028	(0)
Al+3	6.409e-13	3.591e-13	-12.193	-12.445	-0.252	(0)
Al(SO4) 2-	2.865e-15	2.687e-15	-14.543	-14.571	-0.028	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.146	-44.418	-0.272	(0)
As(3)	1.298e-19					
H3AsO3	1.287e-19	1.287e-19	-18.890	-18.890	0.000	(0)
H2AsO3-	1.132e-21	1.056e-21	-20.946	-20.977	-0.030	(0)

	HAsO3-2	2.033e-26	1.540e-26	-25.692	-25.813	-0.121	(0)
	H4AsO3+	4.274e-27	3.987e-27	-26.369	-26.399	-0.030	(0)
	AsO3-3	1.774e-32	9.491e-33	-31.751	-32.023	-0.272	(0)
As (5)	4.786e-09						
	HAsO4-2	3.272e-09	2.478e-09	-8.485	-8.606	-0.121	(0)
	H2AsO4-	1.515e-09	1.413e-09	-8.820	-8.850	-0.030	(0)
	AsO4-3	2.342e-13	1.253e-13	-12.630	-12.902	-0.272	(0)
	H3AsO4	1.534e-14	1.535e-14	-13.814	-13.814	0.000	(0)
B	1.880e-06						
	H3BO3	1.861e-06	1.862e-06	-5.730	-5.730	0.000	(0)
	H2BO3-	1.848e-08	1.730e-08	-7.733	-7.762	-0.029	(0)
	CaH2BO3+	5.011e-10	4.689e-10	-9.300	-9.329	-0.029	(0)
	MgH2BO3+	9.679e-11	9.058e-11	-10.014	-10.043	-0.029	(0)
	BF(OH) 3-	3.718e-11	3.479e-11	-10.430	-10.459	-0.029	(0)
	NaH2BO3	1.503e-11	1.503e-11	-10.823	-10.823	0.000	(0)
	BaH2BO3+	7.687e-14	7.194e-14	-13.114	-13.143	-0.029	(0)
	H5(BO3) 2-	2.930e-14	2.742e-14	-13.533	-13.562	-0.029	(0)
	BF2(OH) 2-	1.164e-14	1.089e-14	-13.934	-13.963	-0.029	(0)
	AgH2BO3	1.749e-15	1.749e-15	-14.757	-14.757	0.000	(0)
	H8(BO3) 3-	5.456e-18	5.106e-18	-17.263	-17.292	-0.029	(0)
	BF3OH-	1.325e-20	1.240e-20	-19.878	-19.906	-0.029	(0)
	BF4-	1.909e-25	1.787e-25	-24.719	-24.748	-0.029	(0)
Ba	1.758e-07						
	Ba+2	1.741e-07	1.346e-07	-6.759	-6.871	-0.112	(0)
	BaHCO3+	1.634e-09	1.535e-09	-8.787	-8.814	-0.027	(0)
	BaCO3	6.181e-11	6.181e-11	-10.209	-10.209	0.000	(0)
	BaOH+	1.008e-13	9.460e-14	-12.997	-13.024	-0.028	(0)
	BaH2BO3+	7.687e-14	7.194e-14	-13.114	-13.143	-0.029	(0)
C (4)	1.456e-03						
	HCO3-	1.272e-03	1.194e-03	-2.896	-2.923	-0.027	(0)
	H2CO3	1.680e-04	1.680e-04	-3.775	-3.775	0.000	(0)
	CaHCO3+	1.115e-05	1.048e-05	-4.953	-4.980	-0.027	(0)
	MgHCO3+	1.969e-06	1.846e-06	-5.706	-5.734	-0.028	(0)
	CO3-2	1.158e-06	8.954e-07	-5.936	-6.048	-0.112	(0)
	CuCO3	8.334e-07	8.334e-07	-6.079	-6.079	0.000	(0)
	CaCO3	6.686e-07	6.686e-07	-6.175	-6.175	0.000	(0)
	NaHCO3	3.683e-07	3.683e-07	-6.434	-6.434	0.000	(0)
	MgCO3	1.125e-07	1.125e-07	-6.949	-6.949	0.000	(0)
	MnHCO3+	5.116e-08	4.802e-08	-7.291	-7.319	-0.028	(0)
	CuHCO3+	1.277e-08	1.191e-08	-7.894	-7.924	-0.030	(0)
	NaCO3-	9.738e-09	9.144e-09	-8.012	-8.039	-0.027	(0)
	UO2(CO3) 2-2	8.794e-09	6.659e-09	-8.056	-8.177	-0.121	(0)
	ZnCO3	4.817e-09	4.817e-09	-8.317	-8.317	0.000	(0)
	ZnHCO3+	3.785e-09	3.531e-09	-8.422	-8.452	-0.030	(0)
	Cu(CO3) 2-2	2.652e-09	2.009e-09	-8.576	-8.697	-0.121	(0)
	NiHCO3+	2.545e-09	2.375e-09	-8.594	-8.624	-0.030	(0)
	BaHCO3+	1.634e-09	1.535e-09	-8.787	-8.814	-0.027	(0)
	PbCO3	1.513e-09	1.513e-09	-8.820	-8.820	0.000	(0)
	FeHCO3+	1.066e-09	1.002e-09	-8.972	-8.999	-0.027	(0)
	CoHCO3+	1.056e-09	9.854e-10	-8.976	-9.006	-0.030	(0)
	UO2(CO3) 3-4	9.086e-10	2.989e-10	-9.042	-9.525	-0.483	(0)
	NiCO3	5.388e-10	5.388e-10	-9.269	-9.269	0.000	(0)
	PbHCO3+	5.346e-10	4.987e-10	-9.272	-9.302	-0.030	(0)
	UO2CO3	3.727e-10	3.727e-10	-9.429	-9.429	0.000	(0)
	CoCO3	1.606e-10	1.606e-10	-9.794	-9.794	0.000	(0)
	BaCO3	6.181e-11	6.181e-11	-10.209	-10.209	0.000	(0)
	CdCO3	2.010e-11	2.010e-11	-10.697	-10.697	0.000	(0)
	Pb(CO3) 2-2	5.159e-12	3.907e-12	-11.287	-11.408	-0.121	(0)
	CdHCO3+	2.871e-12	2.678e-12	-11.542	-11.572	-0.030	(0)
	Cd(CO3) 2-2	1.762e-14	1.335e-14	-13.754	-13.875	-0.121	(0)
	HgCO3	1.135e-17	1.135e-17	-16.945	-16.945	0.000	(0)
	Hg(CO3) 2-2	4.243e-20	3.214e-20	-19.372	-19.493	-0.121	(0)
	HgHCO3+	1.416e-20	1.321e-20	-19.849	-19.879	-0.030	(0)
Ca	6.540e-04						
	Ca+2	6.095e-04	4.711e-04	-3.215	-3.327	-0.112	(0)
	CaSO4	3.238e-05	3.238e-05	-4.490	-4.490	0.000	(0)
	CaHCO3+	1.115e-05	1.048e-05	-4.953	-4.980	-0.027	(0)
	CaCO3	6.686e-07	6.686e-07	-6.175	-6.175	0.000	(0)

		CaF+	2.565e-07	2.408e-07	-6.591	-6.618	-0.028	(0)
		CaOH+	1.611e-09	1.514e-09	-8.793	-8.820	-0.027	(0)
		CaH2BO3+	5.011e-10	4.689e-10	-9.300	-9.329	-0.029	(0)
Cd	1.388e-09							
		Cd+2	1.274e-09	9.850e-10	-8.895	-9.007	-0.112	(0)
		CdSO4	6.927e-11	6.927e-11	-10.159	-10.159	0.000	(0)
		CdCO3	2.010e-11	2.010e-11	-10.697	-10.697	0.000	(0)
		CdCl+	1.910e-11	1.782e-11	-10.719	-10.749	-0.030	(0)
		CdHCO3+	2.871e-12	2.678e-12	-11.542	-11.572	-0.030	(0)
		CdOH+	1.351e-12	1.260e-12	-11.869	-11.900	-0.030	(0)
		CdF+	7.835e-13	7.309e-13	-12.106	-12.136	-0.030	(0)
		Cd(SO4) 2-2	3.701e-13	2.803e-13	-12.432	-12.552	-0.121	(0)
		CdOHC1	1.177e-13	1.177e-13	-12.929	-12.929	0.000	(0)
		Cd(CO3) 2-2	1.762e-14	1.335e-14	-13.754	-13.875	-0.121	(0)
		CdCl2	1.407e-14	1.407e-14	-13.852	-13.852	0.000	(0)
		Cd(OH) 2	1.280e-15	1.280e-15	-14.893	-14.893	0.000	(0)
		CdF2	6.828e-17	6.828e-17	-16.166	-16.166	0.000	(0)
		CdCl3-	1.803e-18	1.682e-18	-17.744	-17.774	-0.030	(0)
		Cd(OH) 3-	1.350e-20	1.259e-20	-19.870	-19.900	-0.030	(0)
		Cd2OH+3	1.163e-20	6.220e-21	-19.935	-20.206	-0.272	(0)
		CdSeO4	6.371e-21	6.371e-21	-20.196	-20.196	0.000	(0)
		Cd(SeO3) 2-2	9.517e-23	7.207e-23	-22.022	-22.142	-0.121	(0)
		Cd(OH) 4-2	4.383e-28	3.319e-28	-27.358	-27.479	-0.121	(0)
		CdHS+	0.000e+00	0.000e+00	-73.934	-73.964	-0.030	(0)
		Cd(HS) 2	0.000e+00	0.000e+00	-139.725	-139.725	0.000	(0)
		Cd(HS) 3-	0.000e+00	0.000e+00	-210.760	-210.791	-0.030	(0)
		Cd(HS) 4-2	0.000e+00	0.000e+00	-281.439	-281.560	-0.121	(0)
Cl	2.020e-04							
		Cl-	2.020e-04	1.894e-04	-3.695	-3.723	-0.028	(0)
		AgCl	2.467e-09	2.467e-09	-8.608	-8.608	0.000	(0)
		MnCl+	5.120e-10	4.806e-10	-9.291	-9.318	-0.028	(0)
		CuCl	3.040e-10	3.040e-10	-9.517	-9.517	0.000	(0)
		CuCl+	5.061e-11	4.745e-11	-10.296	-10.324	-0.028	(0)
		ZnCl+	4.745e-11	4.449e-11	-10.324	-10.352	-0.028	(0)
		AgCl2-	4.364e-11	4.071e-11	-10.360	-10.390	-0.030	(0)
		CdCl+	1.910e-11	1.782e-11	-10.719	-10.749	-0.030	(0)
		CuCl2-	1.283e-11	1.203e-11	-10.892	-10.920	-0.028	(0)
		ZnOHC1	9.378e-12	9.378e-12	-11.028	-11.028	0.000	(0)
		NiCl+	8.379e-12	7.816e-12	-11.077	-11.107	-0.030	(0)
		CoCl+	7.451e-12	6.951e-12	-11.128	-11.158	-0.030	(0)
		PbCl+	4.049e-12	3.777e-12	-11.393	-11.423	-0.030	(0)
		MnCl2	1.286e-13	1.286e-13	-12.891	-12.891	0.000	(0)
		CdOHC1	1.177e-13	1.177e-13	-12.929	-12.929	0.000	(0)
		CdCl2	1.407e-14	1.407e-14	-13.852	-13.852	0.000	(0)
		ZnCl2	1.336e-14	1.336e-14	-13.874	-13.874	0.000	(0)
		AgCl3-2	9.075e-15	6.872e-15	-14.042	-14.163	-0.121	(0)
		PbCl2	3.196e-15	3.196e-15	-14.495	-14.495	0.000	(0)
		CuCl2	3.117e-15	3.117e-15	-14.506	-14.506	0.000	(0)
		CuCl3-2	6.277e-16	4.872e-16	-15.202	-15.312	-0.110	(0)
		HgClOH	5.705e-16	5.705e-16	-15.244	-15.244	0.000	(0)
		CrCl+2	5.796e-17	4.389e-17	-16.237	-16.358	-0.121	(0)
		HgCl2	3.800e-17	3.800e-17	-16.420	-16.420	0.000	(0)
		UO2Cl+	3.443e-17	3.212e-17	-16.463	-16.493	-0.030	(0)
		NiCl2	7.455e-18	7.455e-18	-17.128	-17.128	0.000	(0)
		MnCl3-	7.147e-18	6.708e-18	-17.146	-17.173	-0.028	(0)
		AgCl4-3	4.968e-18	2.658e-18	-17.304	-17.575	-0.272	(0)
		FeCl+2	2.770e-18	2.150e-18	-17.558	-17.668	-0.110	(0)
		ZnCl3-	2.143e-18	2.010e-18	-17.669	-17.697	-0.028	(0)
		CdCl3-	1.803e-18	1.682e-18	-17.744	-17.774	-0.030	(0)
		PbCl3-	2.584e-19	2.410e-19	-18.588	-18.618	-0.030	(0)
		HgCl3-	7.716e-20	7.198e-20	-19.113	-19.143	-0.030	(0)
		HgCl+	4.291e-20	4.003e-20	-19.367	-19.398	-0.030	(0)
		CrOHC12	2.545e-20	2.545e-20	-19.594	-19.594	0.000	(0)
		CuCl3-	5.877e-21	5.510e-21	-20.231	-20.259	-0.028	(0)
		VOCl+	2.799e-21	2.611e-21	-20.553	-20.583	-0.030	(0)
		FeCl2+	1.938e-21	1.819e-21	-20.713	-20.740	-0.028	(0)
		CrCl2+	8.457e-22	7.889e-22	-21.073	-21.103	-0.030	(0)
		ZnCl4-2	2.452e-22	1.903e-22	-21.610	-21.720	-0.110	(0)

HgCl4-2	7.168e-23	5.428e-23	-22.145	-22.265	-0.121	(0)
PbCl4-2	2.756e-23	2.087e-23	-22.560	-22.680	-0.121	(0)
FeCl3	3.446e-26	3.446e-26	-25.463	-25.463	0.000	(0)
CuCl4-2	6.739e-27	5.231e-27	-26.171	-26.281	-0.110	(0)
CrO3Cl-	3.148e-29	2.937e-29	-28.502	-28.532	-0.030	(0)
CoCl+2	1.305e-37	9.884e-38	-36.884	-37.005	-0.121	(0)
UCl+3	0.000e+00	0.000e+00	-43.898	-44.170	-0.272	(0)
Co (2)	1.592e-08					
Co+2	1.401e-08	1.061e-08	-7.854	-7.974	-0.121	(0)
CoHCO3+	1.056e-09	9.854e-10	-8.976	-9.006	-0.030	(0)
CoSO4	6.349e-10	6.349e-10	-9.197	-9.197	0.000	(0)
CoCO3	1.606e-10	1.606e-10	-9.794	-9.794	0.000	(0)
CoOH+	3.653e-11	3.408e-11	-10.437	-10.467	-0.030	(0)
CoF+	1.684e-11	1.571e-11	-10.774	-10.804	-0.030	(0)
CoCl+	7.451e-12	6.951e-12	-11.128	-11.158	-0.030	(0)
Co (OH) 2	4.359e-13	4.359e-13	-12.361	-12.361	0.000	(0)
Co (OH) 3-	1.501e-18	1.401e-18	-17.824	-17.854	-0.030	(0)
CoOOH-	3.767e-19	3.514e-19	-18.424	-18.454	-0.030	(0)
CoSeO4	1.847e-19	1.847e-19	-18.734	-18.734	0.000	(0)
Co2OH+3	3.386e-20	1.812e-20	-19.470	-19.742	-0.272	(0)
Co (OH) 4-2	4.720e-26	3.574e-26	-25.326	-25.447	-0.121	(0)
Co4 (OH) 4+4	8.183e-34	2.692e-34	-33.087	-33.570	-0.483	(0)
Co (3)	2.771e-30					
CoOH+2	2.771e-30	2.099e-30	-29.557	-29.678	-0.121	(0)
Co+3	4.578e-36	2.565e-36	-35.339	-35.591	-0.252	(0)
CoCl+2	1.305e-37	9.884e-38	-36.884	-37.005	-0.121	(0)
Cr (2)	9.300e-25					
Cr+2	9.300e-25	7.043e-25	-24.032	-24.152	-0.121	(0)
Cr (3)	1.489e-08					
Cr (OH) 2+	1.325e-08	1.236e-08	-7.878	-7.908	-0.030	(0)
Cr (OH) +2	8.329e-10	6.307e-10	-9.079	-9.200	-0.121	(0)
Cr (OH) 3	7.476e-10	7.476e-10	-9.126	-9.126	0.000	(0)
CrOHSO4	4.490e-11	4.490e-11	-10.348	-10.348	0.000	(0)
CrO2-	6.087e-12	5.678e-12	-11.216	-11.246	-0.030	(0)
Cr (OH) 4-	5.137e-12	4.792e-12	-11.289	-11.319	-0.030	(0)
CrF+2	1.754e-12	1.329e-12	-11.756	-11.877	-0.121	(0)
Cr+3	3.346e-13	1.790e-13	-12.475	-12.747	-0.272	(0)
CrSO4+	1.344e-13	1.254e-13	-12.871	-12.902	-0.030	(0)
CrCl+2	5.796e-17	4.389e-17	-16.237	-16.358	-0.121	(0)
Cr2 (OH) 2SO4+2	3.380e-18	2.560e-18	-17.471	-17.592	-0.121	(0)
Cr2 (OH) 2 (SO4) 2	4.561e-20	4.561e-20	-19.341	-19.341	0.000	(0)
CrOHC12	2.545e-20	2.545e-20	-19.594	-19.594	0.000	(0)
CrCl2+	8.457e-22	7.889e-22	-21.073	-21.103	-0.030	(0)
Cr (6)	2.949e-18					
CrO4-2	2.520e-18	1.948e-18	-17.599	-17.710	-0.112	(0)
HCrO4-	4.226e-19	3.942e-19	-18.374	-18.404	-0.030	(0)
NaCrO4-	5.691e-21	5.309e-21	-20.245	-20.275	-0.030	(0)
KCrO4-	6.252e-22	5.833e-22	-21.204	-21.234	-0.030	(0)
H2CrO4	1.998e-26	1.998e-26	-25.699	-25.699	0.000	(0)
CrO3SO4-2	2.974e-27	2.252e-27	-26.527	-26.647	-0.121	(0)
CrO3Cl-	3.148e-29	2.937e-29	-28.502	-28.532	-0.030	(0)
Cr2O7-2	7.115e-36	5.388e-36	-35.148	-35.269	-0.121	(0)
Cu (1)	1.683e-09					
Cu+	1.366e-09	1.275e-09	-8.864	-8.895	-0.030	(0)
CuCl	3.040e-10	3.040e-10	-9.517	-9.517	0.000	(0)
CuCl2-	1.283e-11	1.203e-11	-10.892	-10.920	-0.028	(0)
CuCl3-2	6.277e-16	4.872e-16	-15.202	-15.312	-0.110	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.840	-137.027	-0.188	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.575	-137.757	-0.183	(0)
Cu (2)	1.154e-06					
CuCO3	8.334e-07	8.334e-07	-6.079	-6.079	0.000	(0)
Cu+2	2.045e-07	1.581e-07	-6.689	-6.801	-0.112	(0)
CuOH+	8.584e-08	8.048e-08	-7.066	-7.094	-0.028	(0)
CuHCO3+	1.277e-08	1.191e-08	-7.894	-7.924	-0.030	(0)
CuSO4	1.086e-08	1.086e-08	-7.964	-7.964	0.000	(0)
Cu (CO3) 2-2	2.652e-09	2.009e-09	-8.576	-8.697	-0.121	(0)
Cu (OH) 2	2.586e-09	2.586e-09	-8.587	-8.587	0.000	(0)
CuF+	5.005e-10	4.669e-10	-9.301	-9.331	-0.030	(0)

	Cu ₂ (OH) 2+2	2.149e-10	1.627e-10	-9.668	-9.789	-0.121	(0)
	CuCl+	5.061e-11	4.745e-11	-10.296	-10.324	-0.028	(0)
	Cu(OH) 3-	9.155e-13	8.541e-13	-12.038	-12.069	-0.030	(0)
	CuCl ₂	3.117e-15	3.117e-15	-14.506	-14.506	0.000	(0)
	Cu(OH) 4-2	1.429e-18	1.082e-18	-17.845	-17.966	-0.121	(0)
	CuCl ₃ -	5.877e-21	5.510e-21	-20.231	-20.259	-0.028	(0)
	CuCl ₄ -2	6.739e-27	5.231e-27	-26.171	-26.281	-0.110	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-199.768	-199.798	-0.030	(0)
F	5.107e-05						
	F-	4.993e-05	4.682e-05	-4.302	-4.330	-0.028	(0)
	MgF+	8.458e-07	7.934e-07	-6.073	-6.100	-0.028	(0)
	CaF+	2.565e-07	2.408e-07	-6.591	-6.618	-0.028	(0)
	NaF	1.620e-08	1.620e-08	-7.790	-7.790	0.000	(0)
	HF	4.330e-09	4.330e-09	-8.363	-8.363	0.000	(0)
	MnF+	4.002e-09	3.756e-09	-8.398	-8.425	-0.028	(0)
	AlF ₂ +	3.337e-09	3.134e-09	-8.477	-8.504	-0.027	(0)
	AlF ₃	1.847e-09	1.847e-09	-8.734	-8.734	0.000	(0)
	CuF+	5.005e-10	4.669e-10	-9.301	-9.331	-0.030	(0)
	AlF+2	2.162e-10	1.681e-10	-9.665	-9.774	-0.109	(0)
	ZnF+	9.363e-11	8.734e-11	-10.029	-10.059	-0.030	(0)
	AlF ₄ -	4.620e-11	4.334e-11	-10.335	-10.363	-0.028	(0)
	BF(OH) 3-	3.718e-11	3.479e-11	-10.430	-10.459	-0.029	(0)
	NiF+	2.033e-11	1.897e-11	-10.692	-10.722	-0.030	(0)
	CoF+	1.684e-11	1.571e-11	-10.774	-10.804	-0.030	(0)
	PbF+	1.988e-12	1.854e-12	-11.702	-11.732	-0.030	(0)
	CrF+2	1.754e-12	1.329e-12	-11.756	-11.877	-0.121	(0)
	HF ₂ -	8.227e-13	7.708e-13	-12.085	-12.113	-0.028	(0)
	CdF+	7.835e-13	7.309e-13	-12.106	-12.136	-0.030	(0)
	AgF	7.503e-13	7.503e-13	-12.125	-12.125	0.000	(0)
	UO ₂ F+	7.244e-13	6.758e-13	-12.140	-12.170	-0.030	(0)
	UO ₂ F ₂	9.125e-14	9.125e-14	-13.040	-13.040	0.000	(0)
	FeF ₂ +	2.575e-14	2.417e-14	-13.589	-13.617	-0.028	(0)
	FeF+2	2.485e-14	1.929e-14	-13.605	-13.715	-0.110	(0)
	BF ₂ (OH) 2-	1.164e-14	1.089e-14	-13.934	-13.963	-0.029	(0)
	PbF ₂	1.709e-15	1.709e-15	-14.767	-14.767	0.000	(0)
	FeF ₃	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
	UO ₂ F ₃ -	1.150e-15	1.073e-15	-14.939	-14.969	-0.030	(0)
	VO ₂ F	7.836e-17	7.836e-17	-16.106	-16.106	0.000	(0)
	CdF ₂	6.828e-17	6.828e-17	-16.166	-16.166	0.000	(0)
	H ₂ F ₂	5.024e-17	5.024e-17	-16.299	-16.299	0.000	(0)
	VOF+	1.479e-18	1.380e-18	-17.830	-17.860	-0.030	(0)
	VO ₂ F ₂ -	1.428e-18	1.332e-18	-17.845	-17.875	-0.030	(0)
	UO ₂ F ₄ -2	5.270e-19	3.991e-19	-18.278	-18.399	-0.121	(0)
	PbF ₃ -	1.626e-19	1.517e-19	-18.789	-18.819	-0.030	(0)
	VOF ₂	2.423e-20	2.423e-20	-19.616	-19.616	0.000	(0)
	BF ₃ OH-	1.325e-20	1.240e-20	-19.878	-19.906	-0.029	(0)
	VO ₂ F ₃ -2	1.027e-21	7.780e-22	-20.988	-21.109	-0.121	(0)
	VOF ₃ -	4.314e-23	4.025e-23	-22.365	-22.395	-0.030	(0)
	PbF ₄ -2	4.490e-24	3.400e-24	-23.348	-23.468	-0.121	(0)
	Sb(OH) 2F	1.050e-24	1.050e-24	-23.979	-23.979	0.000	(0)
	SbOF	1.033e-24	1.033e-24	-23.986	-23.986	0.000	(0)
	BF ₄ -	1.909e-25	1.787e-25	-24.719	-24.748	-0.029	(0)
	VO ₂ F ₄ -3	3.350e-26	1.792e-26	-25.475	-25.747	-0.272	(0)
	HgF+	1.970e-26	1.838e-26	-25.705	-25.736	-0.030	(0)
	VOF ₄ -2	1.004e-26	7.606e-27	-25.998	-26.119	-0.121	(0)
	UF ₃ +	3.122e-34	2.912e-34	-33.506	-33.536	-0.030	(0)
	UF ₂ +2	5.182e-35	3.925e-35	-34.285	-34.406	-0.121	(0)
	UF ₄	1.495e-36	1.495e-36	-35.825	-35.825	0.000	(0)
	UF+3	1.244e-37	6.658e-38	-36.905	-37.177	-0.272	(0)
	UF ₅ -	2.974e-39	2.774e-39	-38.527	-38.557	-0.030	(0)
	UF ₆ -2	0.000e+00	0.000e+00	-40.286	-40.406	-0.121	(0)
Fe (2)	9.438e-08						
	Fe+2	8.796e-08	6.661e-08	-7.056	-7.176	-0.121	(0)
	FeSO ₄	4.905e-09	4.905e-09	-8.309	-8.309	0.000	(0)
	FeHCO ₃ +	1.066e-09	1.002e-09	-8.972	-8.999	-0.027	(0)
	FeOH+	4.549e-10	4.270e-10	-9.342	-9.370	-0.028	(0)
	Fe(OH) 2	5.462e-14	5.462e-14	-13.263	-13.263	0.000	(0)
	Fe(OH) 3-	2.963e-15	2.781e-15	-14.528	-14.556	-0.028	(0)

Fe (HS) 2	0.000e+00	0.000e+00	-144.157	-144.157	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.055	-215.085	-0.030	(0)
Fe (3)	3.037e-06					
Fe (OH) 2+	2.606e-06	2.448e-06	-5.584	-5.611	-0.027	(0)
Fe (OH) 3	4.233e-07	4.233e-07	-6.373	-6.373	0.000	(0)
Fe (OH) 4-	6.758e-09	6.346e-09	-8.170	-8.197	-0.027	(0)
FeOH+2	5.033e-11	3.907e-11	-10.298	-10.408	-0.110	(0)
FeF2+	2.575e-14	2.417e-14	-13.589	-13.617	-0.028	(0)
FeF+2	2.485e-14	1.929e-14	-13.605	-13.715	-0.110	(0)
FeF3	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
FeSO4+	1.348e-15	1.265e-15	-14.870	-14.898	-0.028	(0)
Fe+3	6.708e-16	3.758e-16	-15.173	-15.425	-0.252	(0)
Fe (SO4) 2-	8.696e-18	8.112e-18	-17.061	-17.091	-0.030	(0)
FeCl+2	2.770e-18	2.150e-18	-17.558	-17.668	-0.110	(0)
Fe2 (OH) 2+4	1.537e-19	5.054e-20	-18.813	-19.296	-0.483	(0)
FeHSeO3+2	6.136e-21	4.647e-21	-20.212	-20.333	-0.121	(0)
FeCl2+	1.938e-21	1.819e-21	-20.713	-20.740	-0.028	(0)
Fe3 (OH) 4+5	1.016e-23	1.788e-24	-22.993	-23.748	-0.755	(0)
FeCl3	3.446e-26	3.446e-26	-25.463	-25.463	0.000	(0)
H (0)	1.500e-27					
H2	7.499e-28	7.505e-28	-27.125	-27.125	0.000	(0)
Hg (0)	2.650e-11					
Hg	2.650e-11	2.650e-11	-10.577	-10.577	0.000	(0)
Hg (1)	5.032e-25					
Hg2+2	2.516e-25	1.905e-25	-24.599	-24.720	-0.121	(0)
Hg (2)	2.351e-15					
Hg (OH) 2	1.731e-15	1.733e-15	-14.762	-14.761	0.000	(0)
HgClOH	5.705e-16	5.705e-16	-15.244	-15.244	0.000	(0)
HgCl2	3.800e-17	3.800e-17	-16.420	-16.420	0.000	(0)
HgCO3	1.135e-17	1.135e-17	-16.945	-16.945	0.000	(0)
HgCl3-	7.716e-20	7.198e-20	-19.113	-19.143	-0.030	(0)
HgOH+	7.277e-20	6.789e-20	-19.138	-19.168	-0.030	(0)
HgCl+	4.291e-20	4.003e-20	-19.367	-19.398	-0.030	(0)
Hg (CO3) 2-2	4.243e-20	3.214e-20	-19.372	-19.493	-0.121	(0)
HgHCO3+	1.416e-20	1.321e-20	-19.849	-19.879	-0.030	(0)
HgCl4-2	7.168e-23	5.428e-23	-22.145	-22.265	-0.121	(0)
Hg (OH) 3-	3.765e-23	3.512e-23	-22.424	-22.454	-0.030	(0)
Hg+2	1.398e-23	1.059e-23	-22.854	-22.975	-0.121	(0)
HgSO4	8.317e-25	8.317e-25	-24.080	-24.080	0.000	(0)
HgF+	1.970e-26	1.838e-26	-25.705	-25.736	-0.030	(0)
HgHS2-	0.000e+00	0.000e+00	-129.744	-129.774	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.584	-130.584	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.157	-131.278	-0.121	(0)
K	8.612e-05					
K+	8.594e-05	8.058e-05	-4.066	-4.094	-0.028	(0)
KSO4-	1.822e-07	1.711e-07	-6.739	-6.767	-0.027	(0)
KCrO4-	6.252e-22	5.833e-22	-21.204	-21.234	-0.030	(0)
Mg	2.066e-04					
Mg+2	1.954e-04	1.510e-04	-3.709	-3.821	-0.112	(0)
MgSO4	8.245e-06	8.245e-06	-5.084	-5.084	0.000	(0)
MgHCO3+	1.969e-06	1.846e-06	-5.706	-5.734	-0.028	(0)
MgF+	8.458e-07	7.934e-07	-6.073	-6.100	-0.028	(0)
MgCO3	1.125e-07	1.125e-07	-6.949	-6.949	0.000	(0)
MgOH+	1.030e-08	9.682e-09	-7.987	-8.014	-0.027	(0)
MgH2BO3+	9.679e-11	9.058e-11	-10.014	-10.043	-0.029	(0)
Mn (2)	2.825e-06					
Mn+2	2.661e-06	2.015e-06	-5.575	-5.696	-0.121	(0)
MnSO4	1.075e-07	1.075e-07	-6.969	-6.969	0.000	(0)
MnHCO3+	5.116e-08	4.802e-08	-7.291	-7.319	-0.028	(0)
MnF+	4.002e-09	3.756e-09	-8.398	-8.425	-0.028	(0)
MnOH+	8.684e-10	8.151e-10	-9.061	-9.089	-0.028	(0)
MnCl+	5.120e-10	4.806e-10	-9.291	-9.318	-0.028	(0)
MnCl2	1.286e-13	1.286e-13	-12.891	-12.891	0.000	(0)
MnSeO4	1.884e-17	1.884e-17	-16.725	-16.725	0.000	(0)
MnCl3-	7.147e-18	6.708e-18	-17.146	-17.173	-0.028	(0)
Mn (OH) 3-	1.392e-19	1.306e-19	-18.857	-18.884	-0.028	(0)
Mn (OH) 4-2	8.748e-26	6.790e-26	-25.058	-25.168	-0.110	(0)
MnSe	5.365e-40	5.365e-40	-39.270	-39.270	0.000	(0)

Mn (3)	9.758e-27					
Mn+3	9.758e-27	5.466e-27	-26.011	-26.262	-0.252	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.243	-47.353	-0.110	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-51.913	-51.941	-0.029	(0)
Mo	6.637e-08					
MoO4-2	6.630e-08	5.125e-08	-7.178	-7.290	-0.112	(0)
HMoO4-	6.835e-11	6.376e-11	-10.165	-10.195	-0.030	(0)
H2MoO4	2.920e-14	2.920e-14	-13.535	-13.535	0.000	(0)
Ag2MoO4	7.895e-25	7.895e-25	-24.103	-24.103	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.146	-44.418	-0.272	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.587	-55.673	-1.087	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.736	-56.491	-0.755	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.429	-58.912	-0.483	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.599	-62.870	-0.272	(0)
Na	5.862e-04					
Na+	5.849e-04	5.484e-04	-3.233	-3.261	-0.028	(0)
NaSO4-	9.408e-07	8.835e-07	-6.027	-6.054	-0.027	(0)
NaHCO3	3.683e-07	3.683e-07	-6.434	-6.434	0.000	(0)
NaF	1.620e-08	1.620e-08	-7.790	-7.790	0.000	(0)
NaCO3-	9.738e-09	9.144e-09	-8.012	-8.039	-0.027	(0)
NaH2BO3	1.503e-11	1.503e-11	-10.823	-10.823	0.000	(0)
NaCrO4-	5.691e-21	5.309e-21	-20.245	-20.275	-0.030	(0)
Ni	2.498e-08					
Ni+2	2.086e-08	1.613e-08	-7.681	-7.792	-0.112	(0)
NiHCO3+	2.545e-09	2.375e-09	-8.594	-8.624	-0.030	(0)
NiSO4	9.653e-10	9.653e-10	-9.015	-9.015	0.000	(0)
NiCO3	5.388e-10	5.388e-10	-9.269	-9.269	0.000	(0)
NiOH+	3.505e-11	3.269e-11	-10.455	-10.486	-0.030	(0)
NiF+	2.033e-11	1.897e-11	-10.692	-10.722	-0.030	(0)
NiCl+	8.379e-12	7.816e-12	-11.077	-11.107	-0.030	(0)
Ni (OH) 2	4.182e-13	4.182e-13	-12.379	-12.379	0.000	(0)
Ni (SO4) 2-2	1.266e-14	9.588e-15	-13.898	-14.018	-0.121	(0)
Ni (OH) 3-	7.218e-17	6.734e-17	-16.142	-16.172	-0.030	(0)
NiCl2	7.455e-18	7.455e-18	-17.128	-17.128	0.000	(0)
NiSeO4	2.620e-19	2.620e-19	-18.582	-18.582	0.000	(0)
O (0)	1.798e-38					
O2	8.991e-39	8.999e-39	-38.046	-38.046	0.000	(0)
Pb	3.113e-09					
PbCO3	1.513e-09	1.513e-09	-8.820	-8.820	0.000	(0)
Pb+2	7.271e-10	5.620e-10	-9.138	-9.250	-0.112	(0)
PbHCO3+	5.346e-10	4.987e-10	-9.272	-9.302	-0.030	(0)
PbOH+	2.437e-10	2.273e-10	-9.613	-9.643	-0.030	(0)
PbSO4	8.257e-11	8.257e-11	-10.083	-10.083	0.000	(0)
Pb (CO3) 2-2	5.159e-12	3.907e-12	-11.287	-11.408	-0.121	(0)
PbCl+	4.049e-12	3.777e-12	-11.393	-11.423	-0.030	(0)
PbF+	1.988e-12	1.854e-12	-11.702	-11.732	-0.030	(0)
Pb (OH) 2	1.158e-12	1.158e-12	-11.936	-11.936	0.000	(0)
Pb (SO4) 2-2	1.971e-13	1.493e-13	-12.705	-12.826	-0.121	(0)
PbCl2	3.196e-15	3.196e-15	-14.495	-14.495	0.000	(0)
PbF2	1.709e-15	1.709e-15	-14.767	-14.767	0.000	(0)
Pb (OH) 3-	1.998e-16	1.864e-16	-15.699	-15.730	-0.030	(0)
Pb2OH+3	3.785e-18	2.025e-18	-17.422	-17.694	-0.272	(0)
PbCl3-	2.584e-19	2.410e-19	-18.588	-18.618	-0.030	(0)
PbF3-	1.626e-19	1.517e-19	-18.789	-18.819	-0.030	(0)
Pb (OH) 4-2	9.706e-21	7.351e-21	-20.013	-20.134	-0.121	(0)
PbCl4-2	2.756e-23	2.087e-23	-22.560	-22.680	-0.121	(0)
Pb3 (OH) 4+2	1.984e-23	1.503e-23	-22.702	-22.823	-0.121	(0)
PbF4-2	4.490e-24	3.400e-24	-23.348	-23.468	-0.121	(0)
Pb4 (OH) 4+4	2.039e-28	6.708e-29	-27.691	-28.173	-0.483	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.911	-139.911	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.546	-211.576	-0.030	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-67.346	-67.346	0.000	(0)
HS-	0.000e+00	0.000e+00	-72.935	-72.965	-0.030	(0)
H2S	0.000e+00	0.000e+00	-73.149	-73.149	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-73.934	-73.964	-0.030	(0)

S5-2	0.000e+00	0.000e+00	-75.006	-75.127	-0.121	(0)
S6-2	0.000e+00	0.000e+00	-75.522	-75.642	-0.121	(0)
S4-2	0.000e+00	0.000e+00	-75.601	-75.722	-0.121	(0)
S3-2	0.000e+00	0.000e+00	-76.407	-76.528	-0.121	(0)
S2-2	0.000e+00	0.000e+00	-77.423	-77.544	-0.121	(0)
S-2	0.000e+00	0.000e+00	-82.951	-83.061	-0.110	(0)
HgHS2-	0.000e+00	0.000e+00	-129.744	-129.774	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.584	-130.584	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.157	-131.278	-0.121	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.181	-136.211	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.397	-136.491	-0.093	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.840	-137.027	-0.188	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.575	-137.757	-0.183	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.727	-0.190	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.038	-0.185	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.916	-138.946	-0.030	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-139.725	-139.725	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-139.911	-139.911	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.140	-140.140	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-144.157	-144.157	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.768	-199.798	-0.030	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.795	-209.825	-0.030	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.760	-210.791	-0.030	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.546	-211.576	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.481	-212.601	-0.121	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.055	-215.085	-0.030	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-281.439	-281.560	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.130	-284.251	-0.121	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.038	-294.158	-0.121	(0)
S (6)	4.300e-04					
SO4-2	3.881e-04	3.000e-04	-3.411	-3.523	-0.112	(0)
CaSO4	3.238e-05	3.238e-05	-4.490	-4.490	0.000	(0)
MgSO4	8.245e-06	8.245e-06	-5.084	-5.084	0.000	(0)
NaSO4-	9.408e-07	8.835e-07	-6.027	-6.054	-0.027	(0)
KSO4-	1.822e-07	1.711e-07	-6.739	-6.767	-0.027	(0)
MnSO4	1.075e-07	1.075e-07	-6.969	-6.969	0.000	(0)
CuSO4	1.086e-08	1.086e-08	-7.964	-7.964	0.000	(0)
ZnSO4	6.136e-09	6.136e-09	-8.212	-8.212	0.000	(0)
FeSO4	4.905e-09	4.905e-09	-8.309	-8.309	0.000	(0)
HSO4-	1.954e-09	1.833e-09	-8.709	-8.737	-0.028	(0)
NiSO4	9.653e-10	9.653e-10	-9.015	-9.015	0.000	(0)
CoSO4	6.349e-10	6.349e-10	-9.197	-9.197	0.000	(0)
PbSO4	8.257e-11	8.257e-11	-10.083	-10.083	0.000	(0)
CdSO4	6.927e-11	6.927e-11	-10.159	-10.159	0.000	(0)
CrOHSO4	4.490e-11	4.490e-11	-10.348	-10.348	0.000	(0)
AgSO4-	4.093e-11	3.818e-11	-10.388	-10.418	-0.030	(0)
Zn (SO4) 2-2	2.117e-11	1.603e-11	-10.674	-10.795	-0.121	(0)
AlSO4+	8.913e-13	8.361e-13	-12.050	-12.078	-0.028	(0)
Cd (SO4) 2-2	3.701e-13	2.803e-13	-12.432	-12.552	-0.121	(0)
Pb (SO4) 2-2	1.971e-13	1.493e-13	-12.705	-12.826	-0.121	(0)
CrSO4+	1.344e-13	1.254e-13	-12.871	-12.902	-0.030	(0)
UO2SO4	4.747e-14	4.747e-14	-13.324	-13.324	0.000	(0)
Ni (SO4) 2-2	1.266e-14	9.588e-15	-13.898	-14.018	-0.121	(0)
Al (SO4) 2-	2.865e-15	2.687e-15	-14.543	-14.571	-0.028	(0)
FeSO4+	1.348e-15	1.265e-15	-14.870	-14.898	-0.028	(0)
UO2 (SO4) 2-2	2.479e-16	1.877e-16	-15.606	-15.726	-0.121	(0)
Fe (SO4) 2-	8.696e-18	8.112e-18	-17.061	-17.091	-0.030	(0)
VO2SO4-	7.327e-18	6.835e-18	-17.135	-17.165	-0.030	(0)
Cr2 (OH) 2SO4+2	3.380e-18	2.560e-18	-17.471	-17.592	-0.121	(0)
VOSO4	4.060e-19	4.060e-19	-18.391	-18.391	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.561e-20	4.561e-20	-19.341	-19.341	0.000	(0)
HgSO4	8.317e-25	8.317e-25	-24.080	-24.080	0.000	(0)
CrO3SO4-2	2.974e-27	2.252e-27	-26.527	-26.647	-0.121	(0)
VS04+	2.385e-32	2.225e-32	-31.623	-31.653	-0.030	(0)
U (SO4) 2	2.028e-39	2.028e-39	-38.693	-38.693	0.000	(0)
USO4+2	1.124e-39	8.511e-40	-38.949	-39.070	-0.121	(0)
Sb (3)	4.538e-19					
Sb (OH) 3	2.296e-19	2.296e-19	-18.639	-18.639	0.000	(0)

HSbO2	2.242e-19	2.242e-19	-18.649	-18.649	0.000	(0)
SbO2-	6.224e-24	5.806e-24	-23.206	-23.236	-0.030	(0)
Sb (OH) 4-	3.566e-24	3.327e-24	-23.448	-23.478	-0.030	(0)
Sb (OH) 2F	1.050e-24	1.050e-24	-23.979	-23.979	0.000	(0)
SbOF	1.033e-24	1.033e-24	-23.986	-23.986	0.000	(0)
Sb (OH) 2+	3.738e-25	3.487e-25	-24.427	-24.458	-0.030	(0)
SbO+	1.289e-25	1.202e-25	-24.890	-24.920	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.038	-294.158	-0.121	(0)
Sb (5)	1.557e-09					
SbO3-	1.555e-09	1.451e-09	-8.808	-8.838	-0.030	(0)
Sb (OH) 6-	1.809e-12	1.696e-12	-11.743	-11.770	-0.028	(0)
SbO2+	1.744e-24	1.627e-24	-23.759	-23.789	-0.030	(0)
Se (-2)	2.142e-10					
Ag2Se	2.142e-10	2.142e-10	-9.669	-9.669	0.000	(0)
HSe-	4.331e-36	4.040e-36	-35.363	-35.394	-0.030	(0)
H2Se	1.961e-39	1.961e-39	-38.708	-38.708	0.000	(0)
MnSe	5.365e-40	5.365e-40	-39.270	-39.270	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.069	-43.190	-0.121	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.397	-77.880	-0.483	(0)
Se (4)	5.410e-09					
HSeO3-	5.017e-09	4.680e-09	-8.300	-8.330	-0.030	(0)
SeO3-2	3.934e-10	2.980e-10	-9.405	-9.526	-0.121	(0)
H2SeO3	1.248e-13	1.248e-13	-12.904	-12.904	0.000	(0)
AgSeO3-	1.310e-15	1.222e-15	-14.883	-14.913	-0.030	(0)
FeHSeO3+2	6.136e-21	4.647e-21	-20.212	-20.333	-0.121	(0)
Cd (SeO3) 2-2	9.517e-23	7.207e-23	-22.022	-22.142	-0.121	(0)
Ag (SeO3) 2-3	6.092e-24	3.259e-24	-23.215	-23.487	-0.272	(0)
Se (6)	4.496e-14					
SeO4-2	4.494e-14	3.474e-14	-13.347	-13.459	-0.112	(0)
MnSeO4	1.884e-17	1.884e-17	-16.725	-16.725	0.000	(0)
ZnSeO4	5.030e-19	5.030e-19	-18.298	-18.298	0.000	(0)
NiSeO4	2.620e-19	2.620e-19	-18.582	-18.582	0.000	(0)
CoSeO4	1.847e-19	1.847e-19	-18.734	-18.734	0.000	(0)
HSeO4-	1.167e-19	1.089e-19	-18.933	-18.963	-0.030	(0)
CdSeO4	6.371e-21	6.371e-21	-20.196	-20.196	0.000	(0)
Zn (SeO4) 2-2	2.339e-32	1.772e-32	-31.631	-31.752	-0.121	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.455	-55.726	-0.272	(0)
U (4)	6.076e-20					
U (OH) 5-	6.061e-20	5.654e-20	-19.217	-19.248	-0.030	(0)
U (OH) 4	1.481e-22	1.481e-22	-21.830	-21.830	0.000	(0)
U (OH) 3+	3.629e-26	3.385e-26	-25.440	-25.470	-0.030	(0)
U (OH) 2+2	1.293e-30	9.788e-31	-29.889	-30.009	-0.121	(0)
UF3+	3.122e-34	2.912e-34	-33.506	-33.536	-0.030	(0)
UF2+2	5.182e-35	3.925e-35	-34.285	-34.406	-0.121	(0)
UOH+3	5.388e-36	2.883e-36	-35.269	-35.540	-0.272	(0)
UF4	1.495e-36	1.495e-36	-35.825	-35.825	0.000	(0)
UF+3	1.244e-37	6.658e-38	-36.905	-37.177	-0.272	(0)
UF5-	2.974e-39	2.774e-39	-38.527	-38.557	-0.030	(0)
U (SO4) 2	2.028e-39	2.028e-39	-38.693	-38.693	0.000	(0)
USO4+2	1.124e-39	8.511e-40	-38.949	-39.070	-0.121	(0)
UF6-2	0.000e+00	0.000e+00	-40.286	-40.406	-0.121	(0)
U+4	0.000e+00	0.000e+00	-41.664	-42.147	-0.483	(0)
UCl+3	0.000e+00	0.000e+00	-43.898	-44.170	-0.272	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.534	-161.979	-2.445	(0)
U (5)	1.125e-15					
UO2+	1.125e-15	1.049e-15	-14.949	-14.979	-0.030	(0)
U (6)	1.008e-08					
UO2 (CO3) 2-2	8.794e-09	6.659e-09	-8.056	-8.177	-0.121	(0)
UO2 (CO3) 3-4	9.086e-10	2.989e-10	-9.042	-9.525	-0.483	(0)
UO2CO3	3.727e-10	3.727e-10	-9.429	-9.429	0.000	(0)
UO2OH+	2.272e-12	2.120e-12	-11.644	-11.674	-0.030	(0)
UO2F+	7.244e-13	6.758e-13	-12.140	-12.170	-0.030	(0)
UO2+2	1.353e-13	1.046e-13	-12.869	-12.981	-0.112	(0)
UO2F2	9.125e-14	9.125e-14	-13.040	-13.040	0.000	(0)
UO2SO4	4.747e-14	4.747e-14	-13.324	-13.324	0.000	(0)
UO2F3-	1.150e-15	1.073e-15	-14.939	-14.969	-0.030	(0)
UO2 (SO4) 2-2	2.479e-16	1.877e-16	-15.606	-15.726	-0.121	(0)

UO2Cl+	3.443e-17	3.212e-17	-16.463	-16.493	-0.030	(0)
(UO2) 2 (OH) 2+2	9.845e-18	7.456e-18	-17.007	-17.127	-0.121	(0)
UO2F4-2	5.270e-19	3.991e-19	-18.278	-18.399	-0.121	(0)
(UO2) 3 (OH) 5+	3.332e-19	3.108e-19	-18.477	-18.507	-0.030	(0)
V (2)	8.750e-40					
VOH+	7.077e-40	6.602e-40	-39.150	-39.180	-0.030	(0)
V+2	1.673e-40	1.267e-40	-39.776	-39.897	-0.121	(0)
V (3)	5.292e-13					
V (OH) 3	5.292e-13	5.292e-13	-12.276	-12.276	0.000	(0)
V (OH) 2+	2.292e-23	2.138e-23	-22.640	-22.670	-0.030	(0)
VOH+2	1.674e-26	1.268e-26	-25.776	-25.897	-0.121	(0)
V+3	2.936e-31	1.571e-31	-30.532	-30.804	-0.272	(0)
VSO4+	2.385e-32	2.225e-32	-31.623	-31.653	-0.030	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.843	-50.115	-0.272	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.511	-50.994	-0.483	(0)
V (4)	1.776e-16					
V (OH) 3+	1.692e-16	1.579e-16	-15.772	-15.802	-0.030	(0)
VO+2	6.488e-18	4.914e-18	-17.188	-17.309	-0.121	(0)
VOF+	1.479e-18	1.380e-18	-17.830	-17.860	-0.030	(0)
VOSO4	4.060e-19	4.060e-19	-18.391	-18.391	0.000	(0)
VOF2	2.423e-20	2.423e-20	-19.616	-19.616	0.000	(0)
VOC1+	2.799e-21	2.611e-21	-20.553	-20.583	-0.030	(0)
VOF3-	4.314e-23	4.025e-23	-22.365	-22.395	-0.030	(0)
VOF4-2	1.004e-26	7.606e-27	-25.998	-26.119	-0.121	(0)
H2V2O4+2	1.649e-27	1.249e-27	-26.783	-26.903	-0.121	(0)
V (5)	1.377e-08					
H2VO4-	1.311e-08	1.223e-08	-7.882	-7.913	-0.030	(0)
HVO4-2	6.487e-10	4.913e-10	-9.188	-9.309	-0.121	(0)
H3VO4	7.647e-12	7.647e-12	-11.116	-11.116	0.000	(0)
H3V2O7-	6.474e-13	6.039e-13	-12.189	-12.219	-0.030	(0)
HV2O7-3	3.806e-15	2.036e-15	-14.420	-14.691	-0.272	(0)
VO2+	1.018e-15	9.542e-16	-14.992	-15.020	-0.028	(0)
VO2F	7.836e-17	7.836e-17	-16.106	-16.106	0.000	(0)
VO4-3	7.360e-17	3.938e-17	-16.133	-16.405	-0.272	(0)
VO2SO4-	7.327e-18	6.835e-18	-17.135	-17.165	-0.030	(0)
V3O9-3	3.581e-18	1.916e-18	-17.446	-17.718	-0.272	(0)
V2O7-4	2.665e-18	8.764e-19	-17.574	-18.057	-0.483	(0)
VO2F2-	1.428e-18	1.332e-18	-17.845	-17.875	-0.030	(0)
VO2F3-2	1.027e-21	7.780e-22	-20.988	-21.109	-0.121	(0)
V4O12-4	2.970e-23	9.768e-24	-22.527	-23.010	-0.483	(0)
VO2F4-3	3.350e-26	1.792e-26	-25.475	-25.747	-0.272	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.298	-58.053	-0.755	(0)
V10O28-6	0.000e+00	0.000e+00	-57.949	-59.035	-1.087	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.566	-60.049	-0.483	(0)
Zn	1.375e-07					
Zn+2	1.210e-07	9.349e-08	-6.917	-7.029	-0.112	(0)
ZnSO4	6.136e-09	6.136e-09	-8.212	-8.212	0.000	(0)
ZnCO3	4.817e-09	4.817e-09	-8.317	-8.317	0.000	(0)
ZnHCO3+	3.785e-09	3.531e-09	-8.422	-8.452	-0.030	(0)
ZnOH+	1.614e-09	1.505e-09	-8.792	-8.822	-0.030	(0)
ZnF+	9.363e-11	8.734e-11	-10.029	-10.059	-0.030	(0)
ZnCl+	4.745e-11	4.449e-11	-10.324	-10.352	-0.028	(0)
Zn (OH) 2	3.842e-11	3.842e-11	-10.415	-10.415	0.000	(0)
Zn (SO4) 2-2	2.117e-11	1.603e-11	-10.674	-10.795	-0.121	(0)
ZnOHC1	9.378e-12	9.378e-12	-11.028	-11.028	0.000	(0)
Zn (OH) 3-	3.324e-14	3.101e-14	-13.478	-13.509	-0.030	(0)
ZnCl2	1.336e-14	1.336e-14	-13.874	-13.874	0.000	(0)
ZnCl3-	2.143e-18	2.010e-18	-17.669	-17.697	-0.028	(0)
ZnSeO4	5.030e-19	5.030e-19	-18.298	-18.298	0.000	(0)
Zn (OH) 4-2	2.625e-19	1.988e-19	-18.581	-18.702	-0.121	(0)
ZnCl4-2	2.452e-22	1.903e-22	-21.610	-21.720	-0.110	(0)
Zn (SeO4) 2-2	2.339e-32	1.772e-32	-31.631	-31.752	-0.121	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.916	-138.946	-0.030	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.140	-140.140	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.795	-209.825	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.481	-212.601	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.130	-284.251	-0.121	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.93	-82.15	-36.22	Ag ₂ S
Ag ₂ CO ₃	-11.35	-22.44	-11.09	Ag ₂ CO ₃
Ag ₂ CrO ₄	-22.51	-34.10	-11.59	Ag ₂ CrO ₄
Ag ₂ HVO ₄	-11.28	-9.80	1.48	Ag ₂ HVO ₄
Ag ₂ MoO ₄	-12.13	-23.68	-11.55	Ag ₂ MoO ₄
Ag ₂ O	-14.56	-1.98	12.57	Ag ₂ O
Ag ₂ Se	4.12	-44.58	-48.70	Ag ₂ Se
Ag ₂ SeO ₃	-10.37	-17.52	-7.15	Ag ₂ SeO ₃
Ag ₂ SeO ₄	-20.94	-29.85	-8.91	Ag ₂ SeO ₄
Ag ₂ SO ₄	-15.09	-19.91	-4.82	Ag ₂ SO ₄
Ag ₃ AsO ₃	-24.02	-21.86	2.16	Ag ₃ AsO ₃
Ag ₃ AsO ₄	-14.00	-16.79	-2.79	Ag ₃ AsO ₄
Ag ₃ H ₂ VO ₅	-15.97	-10.79	5.18	Ag ₃ H ₂ VO ₅
AgF·4H ₂ O	-13.57	-12.52	1.05	AgF·4H ₂ O
Agmetal	0.53	-12.98	-13.51	Ag
AgVO ₃	-9.58	-8.81	0.77	AgVO ₃
Al(OH) ₃ (am)	-1.63	9.17	10.80	Al(OH) ₃
Al ₂ (MoO ₄) ₃	-49.13	-46.76	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	-1.32	18.33	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	-3.96	18.74	22.70	Al ₄ (OH) ₁₀ SO ₄
AlAsO ₄ ·2H ₂ O	-9.45	-4.65	4.80	AlAsO ₄ ·2H ₂ O
AlOHSO ₄	-5.53	-8.76	-3.23	AlOHSO ₄
AlSb	-147.02	-81.40	65.62	AlSb
Alunite	-3.85	-5.25	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-4.98	-12.77	-7.79	PbSO ₄
Anhydrite	-2.49	-6.85	-4.36	CaSO ₄
Anilite	-48.93	-80.80	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-3.90	4.89	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-1.07	-9.37	-8.30	CaCO ₃
Arsenolite	-72.80	-75.56	-2.76	As ₄ O ₆
Artinite	-8.88	0.72	9.60	MgCO ₃ ·Mg(OH) ₂ ·3H ₂ O
As ₂ O ₅	-34.33	-27.63	6.71	As ₂ O ₅
Atacamite	-3.10	4.29	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.19	-18.09	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-16.86	7.54	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-16.43	-0.56	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	3.89	-5.02	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-25.96	6.98	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-14.91	-24.58	-9.67	BaCrO ₄
BaF ₂	-9.71	-15.53	-5.82	BaF ₂
BaMoO ₄	-7.20	-14.16	-6.96	BaMoO ₄
Barite	-0.41	-10.39	-9.98	BaSO ₄
BaS	-88.81	-72.63	16.18	BaS
BaSeO ₃	-9.83	-8.00	1.83	BaSeO ₃
BaSeO ₄	-12.87	-20.33	-7.46	BaSeO ₄
Bianchite	-8.79	-10.55	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-10.75	7.34	18.09	MnO ₂
Bixbyite	-8.66	-9.30	-0.64	Mn ₂ O ₃
BlaubleiI	-49.50	-73.66	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-49.68	-76.96	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.59	9.17	8.58	AlOOH
Breithauptite	-53.44	-71.96	-18.52	NiSb
Brochantite	-2.73	12.50	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.26	10.59	16.84	Mg(OH) ₂
Bunsenite	-5.83	6.62	12.45	NiO
Ca(VO ₃) ₂	-10.21	-4.55	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.97	6.53	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-15.02	6.53	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-16.68	5.62	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-21.35	17.61	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-22.25	17.61	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-290.86	-147.88	142.97	Ca ₃ Sb ₂
CaCrO ₄	-18.77	-21.04	-2.27	CaCrO ₄
Calcite	-0.89	-9.37	-8.48	CaCO ₃

Calomel	-14.26	-32.17	-17.91	Hg2Cl2
CaMoO4	-2.67	-10.62	-7.95	CaMoO4
Carnotite	-3.51	-3.28	0.23	KUO2VO4
CaSeO3:2H2O	-7.27	-4.45	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.77	-16.79	-3.02	CaSeO4:2H2O
Cd(BO2)2	-15.90	-6.06	9.84	Cd(BO2)2
Cd(OH)2	-8.24	5.40	13.64	Cd(OH)2
Cd(OH)2(am)	-8.33	5.40	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-26.37	-19.66	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-24.29	-1.73	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-24.73	3.67	28.40	Cd4(OH)6SO4
CdCl2	-15.79	-16.45	-0.66	CdCl2
CdCl2:1H2O	-14.76	-16.45	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-14.54	-16.45	-1.91	CdCl2:2.5H2O
CdF2	-16.45	-17.67	-1.21	CdF2
Cdmetal(alpha)	-32.09	-18.57	13.51	Cd
Cdmetal(gamma)	-32.19	-18.57	13.62	Cd
CdMoO4	-2.15	-16.30	-14.15	CdMoO4
CdOHCl	-9.06	-5.53	3.54	CdOHCl
CdSb	-72.82	-73.17	-0.35	CdSb
CdSe	-17.00	-37.20	-20.20	CdSe
CdSeO4:2H2O	-20.62	-22.47	-1.85	CdSeO4:2H2O
CdSO4	-12.36	-12.53	-0.17	CdSO4
CdSO4:1H2O	-10.80	-12.53	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.66	-12.53	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.17	-11.92	-9.75	AgCl
Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4(g)	-75.31	-116.35	-41.05	CH4
Chalcanthite	-7.68	-10.32	-2.64	CuSO4:5H2O
Chalcocite	-48.63	-83.55	-34.92	Cu2S
Chalcopyrite	-110.23	-145.50	-35.27	CuFeS2
Cinnabar	-49.24	-94.93	-45.69	HgS
Claudetite	-72.50	-75.56	-3.06	As4O6
Clausthalite	-10.34	-37.44	-27.10	PbSe
Co(BO2)2	-32.10	-5.03	27.07	Co(BO2)2
Co(OH)2	-6.66	6.43	13.09	Co(OH)2
Co(OH)3	-11.67	-13.98	-2.31	Co(OH)3
CO2(g)	-2.31	-20.46	-18.15	CO2
Co3(AsO4)2	-21.36	-8.33	13.03	Co3(AsO4)2
Co3O4	-11.03	-21.53	-10.50	Co3O4
CoCl2	-23.69	-15.42	8.27	CoCl2
CoCl2:6H2O	-17.96	-15.42	2.54	CoCl2:6H2O
CoCO3	-4.04	-14.02	-9.98	CoCO3
CoF2	-15.04	-16.63	-1.60	CoF2
CoF3	-47.12	-48.58	-1.46	CoF3
CoFe2O4	22.33	18.81	-3.53	CoFe2O4
CoMoO4	-7.50	-15.26	-7.76	CoMoO4
CoO	-7.15	6.43	13.59	CoO
CoS(alpha)	-66.30	-73.74	-7.44	CoS
CoS(beta)	-62.67	-73.74	-11.07	CoS
CoSe	-19.96	-36.16	-16.20	CoSe
CoSeO3	-10.42	-9.10	1.32	CoSeO3
CoSeO4:6H2O	-19.90	-21.43	-1.53	CoSeO4:6H2O
CoSO4	-14.30	-11.50	2.80	CoSO4
CoSO4:6H2O	-9.02	-11.50	-2.47	CoSO4:6H2O
Cotunnite	-11.92	-16.70	-4.78	PbCl2
Covellite	-50.26	-72.56	-22.30	CuS
Cr(OH)2	-20.56	-9.74	10.82	Cr(OH)2
Cr(OH)3	-2.04	-0.70	1.34	Cr(OH)3
Cr(OH)3(am)	0.05	-0.70	-0.75	Cr(OH)3
Cr2O3	0.95	-1.41	-2.36	Cr2O3
CrCl2	-45.69	-31.60	14.09	CrCl2
CrCl3	-48.60	-33.48	15.11	CrCl3
CrF3	-23.97	-35.30	-11.34	CrF3
Crmetal	-64.20	-33.72	30.48	Cr
CrO3	-28.91	-32.12	-3.21	CrO3
Cryolite	-14.36	-48.20	-33.84	Na3AlF6
Cu(OH)2	-1.07	7.61	8.67	Cu(OH)2

Cu(SbO3)2	-26.93	18.28	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-49.76	-84.65	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-0.18	-45.98	-45.80	Cu2Se
Cu2SO4	-19.36	-21.31	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-10.91	-4.81	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-53.04	-95.63	-42.59	Cu3Sb
Cu3Se2	-17.48	-80.97	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.07	-24.51	-5.44	CuCrO4
CuF	-8.32	-13.22	-4.91	CuF
CuF2	-16.58	-15.46	1.12	CuF2
CuF2:2H2O	-10.91	-15.46	-4.55	CuF2:2H2O
Cumetal	-4.92	-13.68	-8.76	Cu
CuMoO4	-1.02	-14.09	-13.08	CuMoO4
CuOCuSO4	-13.02	-2.72	10.30	CuOCuSO4
Cupricferrite	13.99	19.98	5.99	CuFe2O4
Cuprite	-1.98	-3.38	-1.41	Cu2O
Cuprousferrite	13.41	4.50	-8.92	CuFeO2
CuSe	-1.89	-34.99	-33.10	CuSe
CuSe2	-20.25	-53.61	-33.37	CuSe2
CuSeO3:2H2O	-8.44	-7.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-17.82	-20.26	-2.44	CuSeO4:5H2O
CuSO4	-13.26	-10.32	2.94	CuSO4
Diaspore	2.29	9.17	6.87	AlOOH
Djurleite	-48.91	-82.83	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-2.70	-19.24	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.15	-19.24	-17.09	CaMg(CO3)2
Epsomite	-5.22	-7.34	-2.13	MgSO4:7H2O
Fe(OH)2	-6.33	7.23	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	5.95	2.91	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.68	-8.40	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-4.71	-3.16	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-13.60	-34.23	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.68	-41.42	-3.73	Fe2(SO4)3
Fe3(OH)8	-0.62	19.60	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.03	-7.63	0.40	FeAsO4:2H2O
FeCr2O4	-1.38	5.82	7.20	FeCr2O4
FeMoO4	-4.38	-14.47	-10.09	FeMoO4
Ferrihydrite	3.00	6.19	3.19	Fe(OH)3
Ferroselite	-35.39	-53.99	-18.60	FeSe2
FeS(ppt)	-69.99	-72.94	-2.95	FeS
FeSe	-24.37	-35.37	-11.00	FeSe
Fix_pe	-4.78	-4.78	0.00	e-
Fluorite	-1.49	-11.99	-10.50	CaF2
Galena	-61.04	-75.01	-13.97	PbS
Gibbsite	0.88	9.17	8.29	Al(OH)3
Goethite	5.70	6.19	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO4:7H2O
Greenockite	-60.41	-74.77	-14.36	CdS
Greigite	-256.04	-301.07	-45.03	Fe3S4
Gummite	-6.24	1.43	7.67	UO3
Gypsum	-2.24	-6.85	-4.61	CaSO4:2H2O
H-Jarosite	-5.20	-17.30	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.82	-21.70	-12.88	H2MoO4
H2S(g)	-72.16	-80.17	-8.01	H2S
H2Se(g)	-37.64	-42.60	-4.96	H2Se
Halite	-8.59	-6.98	1.60	NaCl
Hausmannite	-10.92	50.11	61.03	Mn3O4
Hematite	13.79	12.37	-1.42	Fe2O3
Hercynite	2.67	25.57	22.89	FeAl2O4
Hg(CH3)2(g)	-173.76	-247.47	-73.71	Hg(CH3)2
Hg(g)	-9.27	-17.14	-7.87	Hg
Hg(OH)2	-11.27	-14.76	-3.50	Hg(OH)2
Hg2(g)	-19.33	-34.29	-14.96	Hg2
Hg2(OH)2	-15.57	-10.31	5.26	Hg2(OH)2
Hg2CO3	-14.72	-30.77	-16.05	Hg2CO3
Hg2CrO4	-33.73	-42.43	-8.70	Hg2CrO4
Hg2F2	-23.02	-33.38	-10.36	Hg2F2

Hg2S	-78.80	-90.48	-11.68	Hg2S
Hg2SeO3	-21.19	-25.85	-4.66	Hg2SeO3
Hg2SO4	-22.11	-28.24	-6.13	Hg2SO4
Hg3O2CO3	-35.06	-64.74	-29.68	Hg3O2CO3
HgCl (g)	-35.58	-16.08	19.50	HgCl
HgCl2	-15.35	-36.61	-21.26	HgCl2
HgF (g)	-49.37	-16.69	32.68	HgF
HgF2 (g)	-50.39	-37.83	12.57	HgF2
Hgmetal (l)	-3.69	-17.14	-13.45	Hg
HgSe	-1.66	-57.36	-55.69	HgSe
HgSeO3	-17.86	-30.29	-12.43	HgSeO3
HgSO4	-23.27	-32.69	-9.42	HgSO4
Huntite	-9.01	-38.98	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-6.67	-25.44	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-20.12	-28.89	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-18.41	-23.58	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	0.61	-14.19	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-40.77	-58.02	-17.24	K2Cr2O7
K2CrO4	-25.38	-25.90	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.92	-21.65	-0.73	K2SeO4
Langite	-4.99	12.50	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-7.18	-7.62	-0.43	PbO : PbSO4
Laurionite	-6.39	-5.77	0.62	PbOHCl
Lepidocrocite	4.82	6.19	1.37	FeOOH
Lime	-21.62	11.08	32.70	CaO
Litharge	-7.54	5.16	12.69	PbO
Mackinawite	-69.34	-72.94	-3.60	FeS
Maghemite	5.99	12.37	6.39	Fe2O3
Magnesioferrite	6.10	22.96	16.86	Fe2MgO4
Magnesite	-2.41	-9.87	-7.46	MgCO3
Magnetite	16.20	19.60	3.40	Fe3O4
Malachite	0.06	-5.24	-5.31	Cu2 (OH) 2CO3
Manganite	-4.64	20.70	25.34	MnOOH
Massicot	-7.74	5.16	12.89	PbO
Matlockite	-8.33	-17.30	-8.97	PbClF
Melanothallite	-20.50	-14.25	6.26	CuCl2
Melanterite	-8.49	-10.70	-2.21	FeSO4 : 7H2O
Metacinnabar	-49.84	-94.93	-45.09	HgS
Mg (OH) 2 (active)	-8.21	10.59	18.79	Mg (OH) 2
Mg (VO3) 2	-16.33	-5.05	11.28	Mg (VO3) 2
Mg2Sb3	-265.26	-190.58	74.68	Mg2Sb3
Mg2V2O7	-20.82	5.54	26.36	Mg2V2O7
MgCr2O4	-7.02	9.18	16.20	MgCr2O4
MgCrO4	-26.91	-21.53	5.38	MgCrO4
MgF2	-4.35	-12.48	-8.13	MgF2
MgMoO4	-9.26	-11.11	-1.85	MgMoO4
MgSeO3 : 6H2O	-8.00	-4.95	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-16.08	-17.28	-1.20	MgSeO4 : 6H2O
Minium	-34.07	39.45	73.52	Pb3O4
Mirabilite	-8.93	-10.04	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.82	-6.92	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-57.38	-63.09	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.21	-85.13	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.99	-1.49	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-15.86	-13.14	2.72	MnCl2 : 4H2O
MnS (grn)	-71.63	-71.46	0.17	MnS
MnS (pnk)	-74.80	-71.46	3.34	MnS
MnSb	-92.30	-95.21	-2.91	MnSb
MnSe	-37.39	-33.89	3.50	MnSe
MnSeO3	-7.95	-6.82	1.13	MnSeO3
MnSeO3 : 2H2O	-7.80	-6.82	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-17.11	-19.16	-2.05	MnSeO4 : 5H2O
MnSO4	-11.80	-9.22	2.58	MnSO4
Monteponite	-9.70	5.40	15.10	CdO
Montroydite	-11.12	-14.76	-3.64	HgO
MoO3	-13.70	-21.70	-8.00	MoO3
Morenosite	-9.17	-11.32	-2.14	NiSO4 : 7H2O

MoS2	-135.75	-206.01	-70.26	MoS2
Na-Jarosite	-2.16	-13.36	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-46.46	-56.35	-9.90	Na2Cr2O7
Na2CrO4	-27.16	-24.23	2.93	Na2CrO4
Na2Mo2O7	-18.91	-35.51	-16.60	Na2Mo2O7
Na2MoO4	-15.30	-13.81	1.49	Na2MoO4
Na2MoO4·2H2O	-15.04	-13.81	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-17.95	-7.65	10.30	Na2SeO3·5H2O
Na2SeO4	-21.26	-19.98	1.28	Na2SeO4
Na3Sb	-173.19	-78.73	94.45	Na3Sb
Na3VO4	-32.67	4.01	36.68	Na3VO4
Na4V2O7	-37.26	0.14	37.40	Na4V2O7
Nantokite	-5.89	-12.62	-6.73	CuCl
NaSb	-85.81	-62.65	23.17	NaSb
Natron	-11.26	-12.57	-1.31	Na2CO3·10H2O
NaVO3	-7.73	-3.87	3.86	NaVO3
Nesquehonite	-5.20	-9.87	-4.67	MgCO3·3H2O
Ni(OH)2	-6.18	6.62	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-23.48	-7.78	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-23.47	8.53	32.00	Ni4(OH)6SO4
NiCO3	-6.97	-13.84	-6.87	NiCO3
NiMoO4	-3.94	-15.08	-11.14	NiMoO4
NiS(alpha)	-67.95	-73.55	-5.60	NiS
NiS(beta)	-62.45	-73.55	-11.10	NiS
NiS(gamma)	-60.75	-73.55	-12.80	NiS
NiSe	-18.28	-35.98	-17.70	NiSe
NiSeO3·2H2O	-11.73	-8.92	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-19.73	-21.25	-1.52	NiSeO4·6H2O
Nsutite	-10.17	7.34	17.50	MnO2
O2(g)	-35.14	47.95	83.09	O2
Orpiment	-217.22	-278.29	-61.07	As2S3
Otavite	-3.05	-15.05	-12.00	CdCO3
Pb(BO2)2	-12.82	-6.30	6.52	Pb(BO2)2
Pb(OH)2	-2.99	5.16	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.40	-71.16	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.40	-0.61	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.87	10.32	26.19	Pb2O(OH)2
Pb2O3	-26.75	34.29	61.04	Pb2O3
Pb2OCO3	-9.58	-10.14	-0.56	Pb2OCO3
Pb2V2O7	-3.42	-5.32	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.95	-12.15	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.30	-0.16	6.14	Pb3(VO4)2
Pb3O2CO3	-16.00	-4.98	11.02	Pb3O2CO3
Pb3O2SO4	-13.14	-2.46	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.40	2.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.18	2.70	21.88	Pb4O3SO4
PbCrO4	-14.36	-26.96	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.06	-18.82	4.25	Pb
PbMoO4	-0.92	-16.54	-15.62	PbMoO4
PbO·0.3H2O	-7.82	5.16	12.98	PbO·0.33H2O
PbSeO4	-15.87	-22.71	-6.84	PbSeO4
Periclase	-11.00	10.59	21.58	MgO
Phosgenite	-12.18	-31.99	-19.81	PbCl2:PbCO3
Plattnerite	-20.47	29.13	49.60	PbO2
Portlandite	-11.72	11.08	22.80	Ca(OH)2
Pyrite	-110.62	-129.13	-18.51	FeS2
Pyrochroite	-6.48	8.71	15.19	Mn(OH)2
Pyrolusite	-8.69	32.69	41.38	MnO2
Realgar	-91.30	-111.05	-19.75	AsS
Retgersite	-9.28	-11.32	-2.04	NiSO4·6H2O
Rhodochrosite	-1.16	-11.74	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-11.53	-18.64	-7.11	Sb(OH)3
Sb2O4	-16.71	-13.30	3.40	Sb2O4
Sb2O5	-28.28	-37.95	-9.67	Sb2O5
Sb2Se3	-97.31	-165.07	-67.76	Sb2Se3
Sb4O6(cubic)	-56.29	-74.56	-18.26	Sb4O6

Sb4O6(orth)	-56.65	-74.56	-17.90	Sb4O6
SbCl3	-51.99	-51.42	0.57	SbCl3
SbF3	-43.01	-53.24	-10.23	SbF3
Sbmetal	-42.91	-54.60	-11.69	Sb
SbO2	-3.14	-30.96	-27.82	SbO2
Schoepite	-4.57	1.43	5.99	UO2 (OH) 2:H2O
Semetal (am)	-11.51	-18.62	-7.11	Se
Semetal (hex)	-10.91	-18.62	-7.71	Se
Senarmontite	-24.91	-37.28	-12.37	Sb2O3
SeO2	-15.66	-15.53	0.12	SeO2
SeO3	-48.91	-27.87	21.04	SeO3
Siderite	-2.98	-13.22	-10.24	FeCO3
Smithsonite	-3.08	-13.08	-10.00	ZnCO3
Sphalerite	-61.34	-72.79	-11.45	ZnS
Spinel	-7.93	28.92	36.85	MgAl2O4
Stibnite	-227.33	-277.79	-50.46	Sb2S3
Sulfur	-54.05	-56.19	-2.14	S
Tenorite	-0.04	7.61	7.64	CuO
Thenardite	-10.37	-10.04	0.32	Na2SO4
Thermonatrite	-13.21	-12.57	0.64	Na2CO3:H2O
Tyuyamunite	-5.78	-1.70	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-13.13	7.95	21.08	U3O8
U3Sb4	-554.63	-402.25	152.38	U3Sb4
U4O9	-26.33	-29.35	-3.02	U4O9
UF4	-29.93	-59.47	-29.54	UF4
UF4:2.5H2O	-26.75	-59.47	-32.72	UF4:2.5H2O
UO2 (am)	-14.27	-13.33	0.93	UO2
UO2 (OH) 2 (beta)	-4.18	1.43	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.19	-26.44	-2.25	UO2SeO4:4H2O
UO3	-6.27	1.43	7.70	UO3
Uraninite	-8.66	-13.33	-4.67	UO2
USb2	-209.28	-179.70	29.58	USb2
V (OH) 3	-16.78	-9.19	7.59	V (OH) 3
V2O5	-14.27	-15.63	-1.36	V2O5
V3O5	-34.51	-32.68	1.84	V3O5
V4O7	-42.76	-35.58	7.19	V4O7
V6O13	-33.99	-94.85	-60.86	V6O13
Valentinite	-28.80	-37.28	-8.48	Sb2O3
VC12	-61.91	-43.03	18.87	VC12
VC13	-65.40	-41.97	23.43	VC13
VF4	-63.96	-49.03	14.93	VF4
Vmetal	-89.18	-45.15	44.03	V
VO	-35.94	-21.18	14.76	VO
VO (OH) 2	-8.05	-2.90	5.15	VO (OH) 2
VO2Cl	-21.58	-18.74	2.84	VO2Cl
VOC1	-31.27	-20.12	11.15	VOC1
VOC12	-37.51	-24.75	12.76	VOC12
VOSO4	-24.44	-20.83	3.61	VOSO4
Witherite	-4.35	-12.92	-8.57	BaCO3
Wurtzite	-63.84	-72.79	-8.95	ZnS
Zincite	-3.96	7.38	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO4
Zn (BO2) 2	-12.37	-4.08	8.29	Zn (BO2) 2
Zn (OH) 2	-4.82	7.38	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-5.10	7.38	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.38	7.38	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-4.16	7.38	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.36	7.38	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.67	-3.17	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.36	3.83	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.14	-5.49	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-32.64	-13.73	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-16.82	11.58	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-23.46	15.04	38.50	Zn5 (OH) 8Cl2
ZnCl2	-21.52	-14.47	7.05	ZnCl2
ZnCO3:1H2O	-2.82	-13.08	-10.26	ZnCO3:1H2O
ZnF2	-15.15	-15.69	-0.53	ZnF2
Znmetal	-42.38	-16.60	25.79	Zn

ZnMoO4	-4.19	-14.32	-10.13	ZnMoO4
ZnO(active)	-3.81	7.38	11.19	ZnO
ZnS(am)	-63.74	-72.79	-9.05	ZnS
ZnSb	-82.21	-71.20	11.01	ZnSb
ZnSe	-20.82	-35.22	-14.40	ZnSe
ZnSeO4:6H2O	-18.97	-20.49	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 133.

```

      REACTION 801
      H2O      -1
      418.1 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 801
      SAVE Solution 802
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 801. Solution after simulation 132.
Using reaction 801.

Reaction 801.

4.181e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.341e-08	8.350e-08
Al	4.693e-06	4.699e-06
As	4.080e-08	4.085e-08
B	1.602e-05	1.604e-05
Ba	1.499e-06	1.500e-06
C	1.241e-02	1.243e-02
Ca	5.574e-03	5.581e-03
Cd	1.183e-08	1.185e-08
Cl	1.722e-03	1.724e-03
Co	1.357e-07	1.359e-07
Cr	1.269e-07	1.270e-07
Cu	9.847e-06	9.858e-06
F	4.354e-04	4.358e-04
Fe	2.669e-05	2.672e-05
Hg	2.259e-10	2.262e-10

K	7.341e-04	7.349e-04
Mg	1.761e-03	1.763e-03
Mn	2.408e-05	2.411e-05
Mo	5.657e-07	5.664e-07
Na	4.997e-03	5.002e-03
Ni	2.129e-07	2.131e-07
Pb	2.654e-08	2.657e-08
S	3.665e-03	3.669e-03
Sb	1.327e-08	1.328e-08
Se	4.794e-08	4.800e-08
U	8.591e-08	8.600e-08
V	1.174e-07	1.175e-07
Zn	1.172e-06	1.173e-06

-----Description of solution-----

	pH	=	7.146	Charge balance
	pe	=	5.133	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	2.631e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	1.103e-02	
	Total CO2 (mol/kg)	=	1.241e-02	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	1.050e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	15	
	Total H	=	1.111522e+02	
	Total O	=	5.562120e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.652e-07	1.407e-07	-6.782	-6.852	-0.070	(0)
H+	8.348e-08	7.152e-08	-7.078	-7.146	-0.067	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.341e-08					
AgCl	5.338e-08	5.338e-08	-7.273	-7.273	0.000	(0)
Ag+	2.069e-08	1.772e-08	-7.684	-7.751	-0.067	(0)
AgCl2-	8.298e-09	6.859e-09	-8.081	-8.164	-0.083	(0)
AgSO4-	6.112e-10	5.052e-10	-9.214	-9.297	-0.083	(0)
Ag2Se	1.985e-10	1.985e-10	-9.702	-9.702	0.000	(0)
AgCl3-2	1.932e-11	9.018e-12	-10.714	-11.045	-0.331	(0)
AgF	1.455e-11	1.455e-11	-10.837	-10.837	0.000	(0)
AgOH	2.494e-13	2.494e-13	-12.603	-12.603	0.000	(0)
AgCl4-3	1.508e-13	2.716e-14	-12.821	-13.566	-0.745	(0)
AgH2BO3	3.636e-14	3.636e-14	-13.439	-13.439	0.000	(0)
AgSeO3-	2.755e-14	2.277e-14	-13.560	-13.643	-0.083	(0)
Ag (OH) 2-	4.149e-18	3.430e-18	-17.382	-17.465	-0.083	(0)
Ag (SeO3) 2-3	2.264e-21	4.077e-22	-20.645	-21.390	-0.745	(0)
Ag2MoO4	3.620e-23	3.620e-23	-22.441	-22.441	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.496	-68.496	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-78.012	-79.336	-1.324	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.872	-138.955	-0.083	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.109	-139.292	-0.184	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.244	-141.587	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.571	-141.898	-0.327	(0)
Al	4.693e-06					
AlF3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
Al (OH) 4-	1.204e-06	1.032e-06	-5.920	-5.986	-0.067	(0)
AlF2+	6.504e-07	5.610e-07	-6.187	-6.251	-0.064	(0)
AlF4-	4.408e-07	3.780e-07	-6.356	-6.422	-0.067	(0)
Al (OH) 3	5.826e-08	5.826e-08	-7.235	-7.235	0.000	(0)
Al (OH) 2+	2.406e-08	2.075e-08	-7.619	-7.683	-0.064	(0)
AlF+2	7.791e-09	4.311e-09	-8.108	-8.365	-0.257	(0)

AlOH+2	3.355e-10	1.856e-10	-9.474	-9.731	-0.257	(0)
AlSO4+	1.706e-11	1.463e-11	-10.768	-10.835	-0.067	(0)
Al+3	5.305e-12	1.319e-12	-11.275	-11.880	-0.604	(0)
Al (SO4) 2-	2.612e-13	2.240e-13	-12.583	-12.650	-0.067	(0)
AlMo6O21-3	7.692e-39	1.385e-39	-38.114	-38.858	-0.745	(0)
As (3)	2.495e-19					
H3AsO3	2.474e-19	2.474e-19	-18.607	-18.607	0.000	(0)
H2AsO3-	2.146e-21	1.774e-21	-20.668	-20.751	-0.083	(0)
HAsO3-2	4.846e-26	2.262e-26	-25.315	-25.646	-0.331	(0)
H4AsO3+	1.060e-26	8.765e-27	-25.975	-26.057	-0.083	(0)
AsO3-3	6.770e-32	1.219e-32	-31.169	-31.914	-0.745	(0)
As (5)	4.080e-08					
HAsO4-2	2.981e-08	1.392e-08	-7.526	-7.856	-0.331	(0)
H2AsO4-	1.098e-08	9.077e-09	-7.959	-8.042	-0.083	(0)
AsO4-3	3.417e-12	6.153e-13	-11.466	-12.211	-0.745	(0)
H3AsO4	1.121e-13	1.128e-13	-12.950	-12.948	0.003	(0)
B	1.602e-05					
H3BO3	1.584e-05	1.594e-05	-4.800	-4.798	0.003	(0)
H2BO3-	1.531e-07	1.294e-07	-6.815	-6.888	-0.073	(0)
CaH2BO3+	2.056e-08	1.738e-08	-7.687	-7.760	-0.073	(0)
MgH2BO3+	4.117e-09	3.480e-09	-8.385	-8.458	-0.073	(0)
BF (OH) 3-	2.459e-09	2.079e-09	-8.609	-8.682	-0.073	(0)
NaH2BO3	8.676e-10	8.676e-10	-9.062	-9.062	0.000	(0)
BF2 (OH) 2-	6.148e-12	5.197e-12	-11.211	-11.284	-0.073	(0)
BaH2BO3+	3.622e-12	3.062e-12	-11.441	-11.514	-0.073	(0)
H5 (BO3) 2-	2.077e-12	1.756e-12	-11.682	-11.755	-0.073	(0)
AgH2BO3	3.636e-14	3.636e-14	-13.439	-13.439	0.000	(0)
H8 (BO3) 3-	3.311e-15	2.799e-15	-14.480	-14.553	-0.073	(0)
BF3OH-	5.593e-17	4.728e-17	-16.252	-16.325	-0.073	(0)
BF4-	6.436e-21	5.440e-21	-20.191	-20.264	-0.073	(0)
Ba	1.499e-06					
Ba+2	1.421e-06	7.654e-07	-5.847	-6.116	-0.269	(0)
BaHCO3+	7.554e-08	6.539e-08	-7.122	-7.185	-0.063	(0)
BaCO3	2.302e-09	2.302e-09	-8.638	-8.638	0.000	(0)
BaH2BO3+	3.622e-12	3.062e-12	-11.441	-11.514	-0.073	(0)
BaOH+	5.465e-13	4.702e-13	-12.262	-12.328	-0.065	(0)
C (4)	1.241e-02					
HCO3-	1.037e-02	8.945e-03	-1.984	-2.048	-0.064	(0)
H2CO3	1.439e-03	1.439e-03	-2.842	-2.842	0.000	(0)
CaHCO3+	4.490e-04	3.886e-04	-3.348	-3.410	-0.063	(0)
MgHCO3+	8.304e-05	7.097e-05	-4.081	-4.149	-0.068	(0)
CaCO3	2.168e-05	2.168e-05	-4.664	-4.664	0.000	(0)
NaHCO3	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
CO3-2	1.088e-05	5.864e-06	-4.963	-5.232	-0.269	(0)
CuCO3	8.687e-06	8.687e-06	-5.061	-5.061	0.000	(0)
MgCO3	3.782e-06	3.782e-06	-5.422	-5.422	0.000	(0)
MnHCO3+	1.905e-06	1.639e-06	-5.720	-5.785	-0.065	(0)
NaCO3-	5.354e-07	4.618e-07	-6.271	-6.336	-0.064	(0)
Cu (CO3) 2-2	2.937e-07	1.371e-07	-6.532	-6.863	-0.331	(0)
CuHCO3+	1.718e-07	1.420e-07	-6.765	-6.848	-0.083	(0)
ZnHCO3+	1.390e-07	1.149e-07	-6.857	-6.940	-0.083	(0)
ZnCO3	1.370e-07	1.370e-07	-6.863	-6.863	0.000	(0)
NiHCO3+	7.655e-08	6.327e-08	-7.116	-7.199	-0.083	(0)
BaHCO3+	7.554e-08	6.539e-08	-7.122	-7.185	-0.063	(0)
UO2 (CO3) 3-4	6.376e-08	3.026e-09	-7.195	-8.519	-1.324	(0)
FeHCO3+	4.083e-08	3.534e-08	-7.389	-7.452	-0.063	(0)
CoHCO3+	3.369e-08	2.785e-08	-7.472	-7.555	-0.083	(0)
UO2 (CO3) 2-2	2.206e-08	1.030e-08	-7.656	-7.987	-0.331	(0)
PbCO3	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
NiCO3	1.255e-08	1.255e-08	-7.901	-7.901	0.000	(0)
PbHCO3+	7.259e-09	6.000e-09	-8.139	-8.222	-0.083	(0)
CoCO3	3.967e-09	3.967e-09	-8.402	-8.402	0.000	(0)
BaCO3	2.302e-09	2.302e-09	-8.638	-8.638	0.000	(0)
CdCO3	6.217e-10	6.217e-10	-9.206	-9.206	0.000	(0)
Pb (CO3) 2-2	5.765e-10	2.691e-10	-9.239	-9.570	-0.331	(0)
CdHCO3+	1.146e-10	9.473e-11	-9.941	-10.024	-0.083	(0)
UO2CO3	8.802e-11	8.802e-11	-10.055	-10.055	0.000	(0)
Cd (CO3) 2-2	5.789e-12	2.702e-12	-11.237	-11.568	-0.331	(0)

		HgCO ₃	3.165e-15	3.165e-15	-14.500	-14.500	0.000	(0)
		Hg (CO ₃) 2-2	1.257e-16	5.869e-17	-15.901	-16.231	-0.331	(0)
		HgHCO ₃ +	5.100e-18	4.215e-18	-17.292	-17.375	-0.083	(0)
Ca	5.574e-03							
		Ca+2	4.331e-03	2.333e-03	-2.363	-2.632	-0.269	(0)
		CaSO ₄	7.637e-04	7.637e-04	-3.117	-3.117	0.000	(0)
		CaHCO ₃ +	4.490e-04	3.886e-04	-3.348	-3.410	-0.063	(0)
		CaCO ₃	2.168e-05	2.168e-05	-4.664	-4.664	0.000	(0)
		CaF+	9.673e-06	8.322e-06	-5.014	-5.080	-0.065	(0)
		CaH ₂ BO ₃ +	2.056e-08	1.738e-08	-7.687	-7.760	-0.073	(0)
		CaOH+	7.568e-09	6.551e-09	-8.121	-8.184	-0.063	(0)
Cd	1.183e-08							
		Cd+2	8.634e-09	4.651e-09	-8.064	-8.332	-0.269	(0)
		CdSO ₄	1.558e-09	1.558e-09	-8.807	-8.807	0.000	(0)
		CdCl+	7.928e-10	6.553e-10	-9.101	-9.184	-0.083	(0)
		CdCO ₃	6.217e-10	6.217e-10	-9.206	-9.206	0.000	(0)
		CdHCO ₃ +	1.146e-10	9.473e-11	-9.941	-10.024	-0.083	(0)
		Cd (SO ₄) 2-2	6.433e-11	3.003e-11	-10.192	-10.522	-0.331	(0)
		CdF+	2.915e-11	2.409e-11	-10.535	-10.618	-0.083	(0)
		CdOH+	6.290e-12	5.199e-12	-11.201	-11.284	-0.083	(0)
		Cd (CO ₃) 2-2	5.789e-12	2.702e-12	-11.237	-11.568	-0.331	(0)
		CdCl ₂	4.030e-12	4.030e-12	-11.395	-11.395	0.000	(0)
		CdOHC1	3.783e-12	3.783e-12	-11.422	-11.422	0.000	(0)
		CdF ₂	1.571e-14	1.571e-14	-13.804	-13.804	0.000	(0)
		Cd (OH) 2	4.616e-15	4.616e-15	-14.336	-14.336	0.000	(0)
		CdCl ₃ -	4.538e-15	3.751e-15	-14.343	-14.426	-0.083	(0)
		CdSeO ₄	7.719e-19	7.719e-19	-18.112	-18.112	0.000	(0)
		Cd ₂ OH+3	6.730e-19	1.212e-19	-18.172	-18.916	-0.745	(0)
		Cd (OH) 3-	4.802e-20	3.969e-20	-19.319	-19.401	-0.083	(0)
		Cd (SeO ₃) 2-2	3.284e-20	1.533e-20	-19.484	-19.815	-0.331	(0)
		Cd (OH) 4-2	1.959e-27	9.142e-28	-26.708	-27.039	-0.331	(0)
		CdHS+	0.000e+00	0.000e+00	-74.800	-74.883	-0.083	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-142.238	-142.238	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-214.814	-214.897	-0.083	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-286.929	-287.260	-0.331	(0)
Cl	1.722e-03							
		Cl-	1.722e-03	1.475e-03	-2.764	-2.831	-0.067	(0)
		AgCl	5.338e-08	5.338e-08	-7.273	-7.273	0.000	(0)
		MnCl+	1.983e-08	1.706e-08	-7.703	-7.768	-0.065	(0)
		AgCl ₂ -	8.298e-09	6.859e-09	-8.081	-8.164	-0.083	(0)
		ZnCl+	1.760e-09	1.505e-09	-8.754	-8.823	-0.068	(0)
		CuCl	1.685e-09	1.685e-09	-8.773	-8.773	0.000	(0)
		CdCl+	7.928e-10	6.553e-10	-9.101	-9.184	-0.083	(0)
		CuCl+	6.882e-10	5.882e-10	-9.162	-9.230	-0.068	(0)
		CuCl ₂ -	6.075e-10	5.192e-10	-9.216	-9.285	-0.068	(0)
		ZnOHC1	2.772e-10	2.772e-10	-9.557	-9.557	0.000	(0)
		NiCl+	2.620e-10	2.166e-10	-9.582	-9.664	-0.083	(0)
		CoCl+	2.471e-10	2.043e-10	-9.607	-9.690	-0.083	(0)
		PbCl+	5.717e-11	4.725e-11	-10.243	-10.326	-0.083	(0)
		MnCl ₂	3.555e-11	3.555e-11	-10.449	-10.449	0.000	(0)
		AgCl ₃ -2	1.932e-11	9.018e-12	-10.714	-11.045	-0.331	(0)
		CdCl ₂	4.030e-12	4.030e-12	-11.395	-11.395	0.000	(0)
		CdOHC1	3.783e-12	3.783e-12	-11.422	-11.422	0.000	(0)
		ZnCl ₂	3.518e-12	3.518e-12	-11.454	-11.454	0.000	(0)
		PbCl ₂	3.114e-13	3.114e-13	-12.507	-12.507	0.000	(0)
		CuCl ₂	3.009e-13	3.009e-13	-12.522	-12.522	0.000	(0)
		CuCl ₃ -2	2.989e-13	1.638e-13	-12.524	-12.786	-0.261	(0)
		HgClOH	1.654e-13	1.654e-13	-12.782	-12.782	0.000	(0)
		AgCl ₄ -3	1.508e-13	2.716e-14	-12.821	-13.566	-0.745	(0)
		HgCl ₂	9.817e-14	9.817e-14	-13.008	-13.008	0.000	(0)
		MnCl ₃ -	1.679e-14	1.444e-14	-13.775	-13.840	-0.065	(0)
		CrCl+2	6.980e-15	3.258e-15	-14.156	-14.487	-0.331	(0)
		ZnCl ₃ -	4.823e-15	4.122e-15	-14.317	-14.385	-0.068	(0)
		CdCl ₃ -	4.538e-15	3.751e-15	-14.343	-14.426	-0.083	(0)
		HgCl ₃ -	1.752e-15	1.448e-15	-14.756	-14.839	-0.083	(0)
		NiCl ₂	1.609e-15	1.609e-15	-14.794	-14.794	0.000	(0)
		FeCl+2	3.220e-16	1.764e-16	-15.492	-15.753	-0.261	(0)
		PbCl ₃ -	2.213e-16	1.829e-16	-15.655	-15.738	-0.083	(0)

HgCl4-2	1.822e-17	8.506e-18	-16.739	-17.070	-0.331	(0)
HgCl+	1.606e-17	1.328e-17	-16.794	-16.877	-0.083	(0)
CrOHC12	1.285e-17	1.285e-17	-16.891	-16.891	0.000	(0)
UO2Cl+	1.091e-17	9.021e-18	-16.962	-17.045	-0.083	(0)
ZnCl4-2	5.550e-18	3.041e-18	-17.256	-17.517	-0.261	(0)
CuCl3-	4.847e-18	4.143e-18	-17.315	-17.383	-0.068	(0)
FeCl2+	1.351e-18	1.163e-18	-17.869	-17.935	-0.065	(0)
CrCl2+	5.517e-19	4.560e-19	-18.258	-18.341	-0.083	(0)
PbCl4-2	2.642e-19	1.233e-19	-18.578	-18.909	-0.331	(0)
VOCl+	1.406e-19	1.162e-19	-18.852	-18.935	-0.083	(0)
FeCl3	1.715e-22	1.715e-22	-21.766	-21.766	0.000	(0)
CuCl4-2	5.590e-23	3.063e-23	-22.253	-22.514	-0.261	(0)
CrO3Cl-	1.317e-26	1.088e-26	-25.881	-25.963	-0.083	(0)
CoCl+2	1.392e-35	6.497e-36	-34.856	-35.187	-0.331	(0)
UCl+3	0.000e+00	0.000e+00	-44.442	-45.187	-0.745	(0)
Co (2)	1.357e-07					
Co+2	8.575e-08	4.002e-08	-7.067	-7.398	-0.331	(0)
CoHCO3+	3.369e-08	2.785e-08	-7.472	-7.555	-0.083	(0)
CoSO4	1.141e-08	1.141e-08	-7.943	-7.943	0.000	(0)
CoCO3	3.967e-09	3.967e-09	-8.402	-8.402	0.000	(0)
CoF+	5.004e-10	4.136e-10	-9.301	-9.383	-0.083	(0)
CoCl+	2.471e-10	2.043e-10	-9.607	-9.690	-0.083	(0)
CoOH+	1.360e-10	1.124e-10	-9.867	-9.949	-0.083	(0)
Co (OH) 2	1.256e-12	1.256e-12	-11.901	-11.901	0.000	(0)
CoSeO4	1.788e-17	1.788e-17	-16.748	-16.748	0.000	(0)
Co (OH) 3-	4.267e-18	3.527e-18	-17.370	-17.453	-0.083	(0)
Co2OH+3	1.252e-18	2.254e-19	-17.902	-18.647	-0.745	(0)
CoOOH-	1.071e-18	8.854e-19	-17.970	-18.053	-0.083	(0)
Co (OH) 4-2	1.685e-25	7.866e-26	-24.773	-25.104	-0.331	(0)
Co4 (OH) 4+4	6.703e-31	3.182e-32	-30.174	-31.497	-1.324	(0)
Co (3)	3.316e-29					
CoOH+2	3.316e-29	1.548e-29	-28.479	-28.810	-0.331	(0)
Co+3	8.705e-35	2.165e-35	-34.060	-34.665	-0.604	(0)
CoCl+2	1.392e-35	6.497e-36	-34.856	-35.187	-0.331	(0)
Cr (2)	6.429e-24					
Cr+2	6.429e-24	3.001e-24	-23.192	-23.523	-0.331	(0)
Cr (3)	1.269e-07					
Cr (OH) 2+	1.088e-07	8.995e-08	-6.963	-7.046	-0.083	(0)
Cr (OH) +2	1.125e-08	5.253e-09	-7.949	-8.280	-0.331	(0)
Cr (OH) 3	4.755e-09	4.755e-09	-8.323	-8.323	0.000	(0)
CrOHSO4	1.781e-09	1.781e-09	-8.749	-8.749	0.000	(0)
CrF+2	1.894e-10	8.838e-11	-9.723	-10.054	-0.331	(0)
CrO2-	3.822e-11	3.159e-11	-10.418	-10.500	-0.083	(0)
Cr (OH) 4-	3.223e-11	2.664e-11	-10.492	-10.574	-0.083	(0)
Cr+3	9.475e-12	1.706e-12	-11.023	-11.768	-0.745	(0)
CrSO4+	6.888e-12	5.693e-12	-11.162	-11.245	-0.083	(0)
CrCl+2	6.980e-15	3.258e-15	-14.156	-14.487	-0.331	(0)
Cr2 (OH) 2SO4+2	1.812e-15	8.457e-16	-14.742	-15.073	-0.331	(0)
Cr2 (OH) 2 (SO4) 2	7.178e-17	7.178e-17	-16.144	-16.144	0.000	(0)
CrOHC12	1.285e-17	1.285e-17	-16.891	-16.891	0.000	(0)
CrCl2+	5.517e-19	4.560e-19	-18.258	-18.341	-0.083	(0)
Cr (6)	1.533e-16					
CrO4-2	1.315e-16	7.083e-17	-15.881	-16.150	-0.269	(0)
HCrO4-	1.983e-17	1.639e-17	-16.703	-16.785	-0.083	(0)
NaCrO4-	1.801e-18	1.489e-18	-17.745	-17.827	-0.083	(0)
KCrO4-	1.982e-19	1.639e-19	-18.703	-18.786	-0.083	(0)
CrO3SO4-2	1.094e-24	5.104e-25	-23.961	-24.292	-0.331	(0)
H2CrO4	9.502e-25	9.502e-25	-24.022	-24.022	0.000	(0)
CrO3Cl-	1.317e-26	1.088e-26	-25.881	-25.963	-0.083	(0)
Cr2O7-2	1.997e-32	9.321e-33	-31.700	-32.031	-0.331	(0)
Cu (1)	3.390e-09					
CuCl	1.685e-09	1.685e-09	-8.773	-8.773	0.000	(0)
Cu+	1.097e-09	9.071e-10	-8.960	-9.042	-0.083	(0)
CuCl2-	6.075e-10	5.192e-10	-9.216	-9.285	-0.068	(0)
CuCl3-2	2.989e-13	1.638e-13	-12.524	-12.786	-0.261	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.144	-140.479	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.889	-141.209	-0.319	(0)
Cu (2)	9.844e-06					

	CuCO3	8.687e-06	8.687e-06	-5.061	-5.061	0.000	(0)
	Cu+2	4.670e-07	2.516e-07	-6.331	-6.599	-0.269	(0)
	Cu (CO3) 2-2	2.937e-07	1.371e-07	-6.532	-6.863	-0.331	(0)
	CuHCO3+	1.718e-07	1.420e-07	-6.765	-6.848	-0.083	(0)
	CuOH+	1.310e-07	1.120e-07	-6.883	-6.951	-0.068	(0)
	CuSO4	8.235e-08	8.235e-08	-7.084	-7.084	0.000	(0)
	CuF+	6.276e-09	5.188e-09	-8.202	-8.285	-0.083	(0)
	Cu (OH) 2	3.143e-09	3.143e-09	-8.503	-8.503	0.000	(0)
	CuCl+	6.882e-10	5.882e-10	-9.162	-9.230	-0.068	(0)
	Cu2 (OH) 2+2	6.745e-10	3.148e-10	-9.171	-9.502	-0.331	(0)
	Cu (OH) 3-	1.098e-12	9.073e-13	-11.960	-12.042	-0.083	(0)
	CuCl2	3.009e-13	3.009e-13	-12.522	-12.522	0.000	(0)
	CuCl3-	4.847e-18	4.143e-18	-17.315	-17.383	-0.068	(0)
	Cu (OH) 4-2	2.153e-18	1.005e-18	-17.667	-17.998	-0.331	(0)
	CuCl4-2	5.590e-23	3.063e-23	-22.253	-22.514	-0.261	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-204.294	-204.377	-0.083	(0)
F	4.354e-04						
	F-	3.815e-04	3.268e-04	-3.419	-3.486	-0.067	(0)
	MgF+	3.316e-05	2.843e-05	-4.479	-4.546	-0.067	(0)
	CaF+	9.673e-06	8.322e-06	-5.014	-5.080	-0.065	(0)
	AlF3	2.308e-06	2.308e-06	-5.637	-5.637	0.000	(0)
	NaF	8.721e-07	8.721e-07	-6.059	-6.059	0.000	(0)
	AlF2+	6.504e-07	5.610e-07	-6.187	-6.251	-0.064	(0)
	AlF4-	4.408e-07	3.780e-07	-6.356	-6.422	-0.067	(0)
	MnF+	1.389e-07	1.195e-07	-6.857	-6.923	-0.065	(0)
	HF	3.457e-08	3.457e-08	-7.461	-7.461	0.000	(0)
	AlF+2	7.791e-09	4.311e-09	-8.108	-8.365	-0.257	(0)
	CuF+	6.276e-09	5.188e-09	-8.202	-8.285	-0.083	(0)
	ZnF+	3.203e-09	2.648e-09	-8.494	-8.577	-0.083	(0)
	BF (OH) 3-	2.459e-09	2.079e-09	-8.609	-8.682	-0.073	(0)
	NiF+	5.698e-10	4.710e-10	-9.244	-9.327	-0.083	(0)
	CoF+	5.004e-10	4.136e-10	-9.301	-9.383	-0.083	(0)
	CrF+2	1.894e-10	8.838e-11	-9.723	-10.054	-0.331	(0)
	HF2-	5.044e-11	4.296e-11	-10.297	-10.367	-0.070	(0)
	CdF+	2.915e-11	2.409e-11	-10.535	-10.618	-0.083	(0)
	PbF+	2.515e-11	2.079e-11	-10.599	-10.682	-0.083	(0)
	AgF	1.455e-11	1.455e-11	-10.837	-10.837	0.000	(0)
	FeF2+	1.443e-11	1.241e-11	-10.841	-10.906	-0.065	(0)
	BF2 (OH) 2-	6.148e-12	5.197e-12	-11.211	-11.284	-0.073	(0)
	FeF3	5.723e-12	5.723e-12	-11.242	-11.242	0.000	(0)
	FeF+2	2.590e-12	1.419e-12	-11.587	-11.848	-0.261	(0)
	UO2F+	2.058e-13	1.701e-13	-12.687	-12.769	-0.083	(0)
	UO2F2	1.603e-13	1.603e-13	-12.795	-12.795	0.000	(0)
	PbF2	1.337e-13	1.337e-13	-12.874	-12.874	0.000	(0)
	UO2F3-	1.592e-14	1.316e-14	-13.798	-13.881	-0.083	(0)
	CdF2	1.571e-14	1.571e-14	-13.804	-13.804	0.000	(0)
	VO2F	5.341e-15	5.341e-15	-14.272	-14.272	0.000	(0)
	H2F2	3.202e-15	3.202e-15	-14.495	-14.495	0.000	(0)
	VO2F2-	7.667e-16	6.337e-16	-15.115	-15.198	-0.083	(0)
	PbF3-	1.003e-16	8.289e-17	-15.999	-16.081	-0.083	(0)
	UO2F4-2	7.321e-17	3.417e-17	-16.135	-16.466	-0.331	(0)
	VOF+	6.658e-17	5.503e-17	-16.177	-16.259	-0.083	(0)
	BF3OH-	5.593e-17	4.728e-17	-16.252	-16.325	-0.073	(0)
	VOF2	6.744e-18	6.744e-18	-17.171	-17.171	0.000	(0)
	VO2F3-2	5.535e-18	2.583e-18	-17.257	-17.588	-0.331	(0)
	VOF3-	9.461e-20	7.820e-20	-19.024	-19.107	-0.083	(0)
	PbF4-2	2.778e-20	1.297e-20	-19.556	-19.887	-0.331	(0)
	BF4-	6.436e-21	5.440e-21	-20.191	-20.264	-0.073	(0)
	VO2F4-3	2.307e-21	4.154e-22	-20.637	-21.381	-0.745	(0)
	VOF4-2	2.210e-22	1.032e-22	-21.656	-21.986	-0.331	(0)
	Sb (OH) 2F	1.895e-23	1.895e-23	-22.722	-22.722	0.000	(0)
	SbOF	1.864e-23	1.864e-23	-22.730	-22.730	0.000	(0)
	HgF+	6.611e-24	5.465e-24	-23.180	-23.262	-0.083	(0)
	UF3+	1.479e-33	1.223e-33	-32.830	-32.913	-0.083	(0)
	UF2+2	5.057e-35	2.361e-35	-34.296	-34.627	-0.331	(0)
	UF4	4.382e-35	4.382e-35	-34.358	-34.358	0.000	(0)
	UF5-	6.866e-37	5.675e-37	-36.163	-36.246	-0.083	(0)
	UF6-2	1.200e-37	5.601e-38	-36.921	-37.252	-0.331	(0)

UF+3	3.186e-38	5.738e-39	-37.497	-38.241	-0.745	(0)
Fe (2)	8.252e-07					
Fe+2	6.723e-07	3.138e-07	-6.172	-6.503	-0.331	(0)
FeSO4	1.101e-07	1.101e-07	-6.958	-6.958	0.000	(0)
FeHCO3+	4.083e-08	3.534e-08	-7.389	-7.452	-0.063	(0)
FeOH+	2.043e-09	1.758e-09	-8.690	-8.755	-0.065	(0)
Fe (OH) 2	1.965e-13	1.965e-13	-12.707	-12.707	0.000	(0)
Fe (OH) 3-	1.016e-14	8.745e-15	-13.993	-14.058	-0.065	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.671	-146.671	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.110	-219.193	-0.083	(0)
Fe (3)	2.586e-05					
Fe (OH) 2+	2.284e-05	1.970e-05	-4.641	-4.706	-0.064	(0)
Fe (OH) 3	2.977e-06	2.977e-06	-5.526	-5.526	0.000	(0)
Fe (OH) 4-	4.523e-08	3.901e-08	-7.345	-7.409	-0.064	(0)
FeOH+2	6.567e-10	3.598e-10	-9.183	-9.444	-0.261	(0)
FeF2+	1.443e-11	1.241e-11	-10.841	-10.906	-0.065	(0)
FeF3	5.723e-12	5.723e-12	-11.242	-11.242	0.000	(0)
FeF+2	2.590e-12	1.419e-12	-11.587	-11.848	-0.261	(0)
FeSO4+	7.379e-14	6.349e-14	-13.132	-13.197	-0.065	(0)
Fe+3	1.593e-14	3.960e-15	-13.798	-14.402	-0.604	(0)
Fe (SO4) 2-	2.346e-15	1.939e-15	-14.630	-14.712	-0.083	(0)
FeCl+2	3.220e-16	1.764e-16	-15.492	-15.753	-0.261	(0)
Fe2 (OH) 2+4	9.031e-17	4.287e-18	-16.044	-17.368	-1.324	(0)
FeCl2+	1.351e-18	1.163e-18	-17.869	-17.935	-0.065	(0)
FeHSeO3+2	8.053e-19	3.759e-19	-18.094	-18.425	-0.331	(0)
Fe3 (OH) 4+5	1.428e-19	1.221e-21	-18.845	-20.913	-2.068	(0)
FeCl3	1.715e-22	1.715e-22	-21.766	-21.766	0.000	(0)
H (0)	3.901e-28					
H2	1.950e-28	1.962e-28	-27.710	-27.707	0.003	(0)
Hg (0)	2.256e-10					
Hg	2.256e-10	2.256e-10	-9.647	-9.647	0.000	(0)
Hg (1)	2.960e-22					
Hg2+2	1.480e-22	6.909e-23	-21.830	-22.161	-0.331	(0)
Hg (2)	3.247e-13					
HgClOH	1.654e-13	1.654e-13	-12.782	-12.782	0.000	(0)
HgCl2	9.817e-14	9.817e-14	-13.008	-13.008	0.000	(0)
Hg (OH) 2	5.602e-14	5.636e-14	-13.252	-13.249	0.003	(0)
HgCO3	3.165e-15	3.165e-15	-14.500	-14.500	0.000	(0)
HgCl3-	1.752e-15	1.448e-15	-14.756	-14.839	-0.083	(0)
Hg (CO3) 2-2	1.257e-16	5.869e-17	-15.901	-16.231	-0.331	(0)
HgCl4-2	1.822e-17	8.506e-18	-16.739	-17.070	-0.331	(0)
HgCl+	1.606e-17	1.328e-17	-16.794	-16.877	-0.083	(0)
HgHCO3+	5.100e-18	4.215e-18	-17.292	-17.375	-0.083	(0)
HgOH+	3.057e-18	2.527e-18	-17.515	-17.597	-0.083	(0)
Hg (OH) 3-	1.208e-21	9.985e-22	-20.918	-21.001	-0.083	(0)
Hg+2	9.664e-22	4.511e-22	-21.015	-21.346	-0.331	(0)
HgSO4	1.687e-22	1.687e-22	-21.773	-21.773	0.000	(0)
HgF+	6.611e-24	5.465e-24	-23.180	-23.262	-0.083	(0)
HgHS2-	0.000e+00	0.000e+00	-131.307	-131.390	-0.083	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.141	-132.141	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.621	-132.952	-0.331	(0)
K	7.341e-04					
K+	7.268e-04	6.227e-04	-3.139	-3.206	-0.067	(0)
KSO4-	7.303e-06	6.298e-06	-5.137	-5.201	-0.064	(0)
KCrO4-	1.982e-19	1.639e-19	-18.703	-18.786	-0.083	(0)
Mg	1.761e-03					
Mg+2	1.439e-03	7.754e-04	-2.842	-3.110	-0.269	(0)
MgSO4	2.016e-04	2.016e-04	-3.696	-3.696	0.000	(0)
MgHCO3+	8.304e-05	7.097e-05	-4.081	-4.149	-0.068	(0)
MgF+	3.316e-05	2.843e-05	-4.479	-4.546	-0.067	(0)
MgCO3	3.782e-06	3.782e-06	-5.422	-5.422	0.000	(0)
MgOH+	5.004e-08	4.344e-08	-7.301	-7.362	-0.061	(0)
MgH2BO3+	4.117e-09	3.480e-09	-8.385	-8.458	-0.073	(0)
Mn (2)	2.408e-05					
Mn+2	1.968e-05	9.185e-06	-4.706	-5.037	-0.331	(0)
MnSO4	2.334e-06	2.334e-06	-5.632	-5.632	0.000	(0)
MnHCO3+	1.905e-06	1.639e-06	-5.720	-5.785	-0.065	(0)
MnF+	1.389e-07	1.195e-07	-6.857	-6.923	-0.065	(0)

MnCl+	1.983e-08	1.706e-08	-7.703	-7.768	-0.065	(0)
MnOH+	3.774e-09	3.247e-09	-8.423	-8.489	-0.065	(0)
MnCl2	3.555e-11	3.555e-11	-10.449	-10.449	0.000	(0)
MnCl3-	1.679e-14	1.444e-14	-13.775	-13.840	-0.065	(0)
MnSeO4	2.203e-15	2.203e-15	-14.657	-14.657	0.000	(0)
Mn (OH) 3-	4.618e-19	3.973e-19	-18.336	-18.401	-0.065	(0)
Mn (OH) 4-2	3.295e-25	1.805e-25	-24.482	-24.743	-0.261	(0)
MnSe	2.937e-40	2.937e-40	-39.532	-39.532	0.000	(0)
Mn (3)	2.241e-25					
Mn+3	2.241e-25	5.573e-26	-24.649	-25.254	-0.604	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.502	-45.763	-0.261	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.931	-50.002	-0.071	(0)
Mo	5.657e-07					
MoO4-2	5.652e-07	3.045e-07	-6.248	-6.516	-0.269	(0)
HMoO4-	5.242e-10	4.333e-10	-9.280	-9.363	-0.083	(0)
H2MoO4	2.270e-13	2.270e-13	-12.644	-12.644	0.000	(0)
Ag2MoO4	3.620e-23	3.620e-23	-22.441	-22.441	0.000	(0)
AlMo6O21-3	7.692e-39	1.385e-39	-38.114	-38.858	-0.745	(0)
Mo7O24-6	0.000e+00	0.000e+00	-46.811	-49.789	-2.978	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.479	-50.547	-2.068	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.587	-52.911	-1.324	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.066	-56.810	-0.745	(0)
Na	4.997e-03					
Na+	4.936e-03	4.229e-03	-2.307	-2.374	-0.067	(0)
NaSO4-	3.762e-05	3.245e-05	-4.425	-4.489	-0.064	(0)
NaHCO3	2.127e-05	2.127e-05	-4.672	-4.672	0.000	(0)
NaF	8.721e-07	8.721e-07	-6.059	-6.059	0.000	(0)
NaCO3-	5.354e-07	4.618e-07	-6.271	-6.336	-0.064	(0)
NaH2BO3	8.676e-10	8.676e-10	-9.062	-9.062	0.000	(0)
NaCrO4-	1.801e-18	1.489e-18	-17.745	-17.827	-0.083	(0)
Ni	2.129e-07					
Ni+2	1.065e-07	5.737e-08	-6.973	-7.241	-0.269	(0)
NiHCO3+	7.655e-08	6.327e-08	-7.116	-7.199	-0.083	(0)
NiSO4	1.636e-08	1.636e-08	-7.786	-7.786	0.000	(0)
NiCO3	1.255e-08	1.255e-08	-7.901	-7.901	0.000	(0)
NiF+	5.698e-10	4.710e-10	-9.244	-9.327	-0.083	(0)
NiCl+	2.620e-10	2.166e-10	-9.582	-9.664	-0.083	(0)
NiOH+	1.230e-10	1.016e-10	-9.910	-9.993	-0.083	(0)
Ni (SO4) 2-2	1.658e-12	7.739e-13	-11.780	-12.111	-0.331	(0)
Ni (OH) 2	1.136e-12	1.136e-12	-11.945	-11.945	0.000	(0)
NiCl2	1.609e-15	1.609e-15	-14.794	-14.794	0.000	(0)
Ni (OH) 3-	1.934e-16	1.599e-16	-15.713	-15.796	-0.083	(0)
NiSeO4	2.392e-17	2.392e-17	-16.621	-16.621	0.000	(0)
O (0)	2.615e-37					
O2	1.307e-37	1.315e-37	-36.884	-36.881	0.003	(0)
Pb	2.654e-08					
PbCO3	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
PbHCO3+	7.259e-09	6.000e-09	-8.139	-8.222	-0.083	(0)
Pb+2	1.676e-09	9.028e-10	-8.776	-9.044	-0.269	(0)
PbSO4	6.318e-10	6.318e-10	-9.199	-9.199	0.000	(0)
Pb (CO3) 2-2	5.765e-10	2.691e-10	-9.239	-9.570	-0.331	(0)
PbOH+	3.861e-10	3.191e-10	-9.413	-9.496	-0.083	(0)
PbCl+	5.717e-11	4.725e-11	-10.243	-10.326	-0.083	(0)
PbF+	2.515e-11	2.079e-11	-10.599	-10.682	-0.083	(0)
Pb (SO4) 2-2	1.165e-11	5.439e-12	-10.934	-11.264	-0.331	(0)
Pb (OH) 2	1.420e-12	1.420e-12	-11.848	-11.848	0.000	(0)
PbCl2	3.114e-13	3.114e-13	-12.507	-12.507	0.000	(0)
PbF2	1.337e-13	1.337e-13	-12.874	-12.874	0.000	(0)
Pb (OH) 3-	2.418e-16	1.998e-16	-15.617	-15.699	-0.083	(0)
PbCl3-	2.213e-16	1.829e-16	-15.655	-15.738	-0.083	(0)
PbF3-	1.003e-16	8.289e-17	-15.999	-16.081	-0.083	(0)
Pb2OH+3	2.535e-17	4.566e-18	-16.596	-17.340	-0.745	(0)
PbCl4-2	2.642e-19	1.233e-19	-18.578	-18.909	-0.331	(0)
PbF4-2	2.778e-20	1.297e-20	-19.556	-19.887	-0.331	(0)
Pb (OH) 4-2	1.475e-20	6.887e-21	-19.831	-20.162	-0.331	(0)
Pb3 (OH) 4+2	7.782e-23	3.632e-23	-22.109	-22.440	-0.331	(0)

Pb4 (OH) 4+4	5.487e-27	2.605e-28	-26.261	-27.584	-1.324	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.892	-142.892	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.068	-216.151	-0.083	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-68.496	-68.496	0.000	(0)
HS-	0.000e+00	0.000e+00	-74.476	-74.559	-0.083	(0)
H2S	0.000e+00	0.000e+00	-74.684	-74.684	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-74.800	-74.883	-0.083	(0)
S5-2	0.000e+00	0.000e+00	-76.447	-76.778	-0.331	(0)
S6-2	0.000e+00	0.000e+00	-76.963	-77.294	-0.331	(0)
S4-2	0.000e+00	0.000e+00	-77.043	-77.374	-0.331	(0)
S3-2	0.000e+00	0.000e+00	-77.849	-78.180	-0.331	(0)
S2-2	0.000e+00	0.000e+00	-78.865	-79.196	-0.331	(0)
S-2	0.000e+00	0.000e+00	-84.452	-84.713	-0.261	(0)
HgHS2-	0.000e+00	0.000e+00	-131.307	-131.390	-0.083	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-132.141	-132.141	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-132.621	-132.952	-0.331	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.872	-138.955	-0.083	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.109	-139.292	-0.184	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-140.144	-140.479	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.889	-141.209	-0.319	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.244	-141.587	-0.343	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.471	-141.553	-0.083	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.571	-141.898	-0.327	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.238	-142.238	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.689	-142.689	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.892	-142.892	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.671	-146.671	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.294	-204.377	-0.083	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.885	-213.968	-0.083	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.814	-214.897	-0.083	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.068	-216.151	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.471	-216.802	-0.331	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.110	-219.193	-0.083	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.929	-287.260	-0.331	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.656	-289.987	-0.331	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.376	-299.707	-0.331	(0)
S (6)	3.665e-03					
SO4-2	2.652e-03	1.429e-03	-2.576	-2.845	-0.269	(0)
CaSO4	7.637e-04	7.637e-04	-3.117	-3.117	0.000	(0)
MgSO4	2.016e-04	2.016e-04	-3.696	-3.696	0.000	(0)
NaSO4-	3.762e-05	3.245e-05	-4.425	-4.489	-0.064	(0)
KSO4-	7.303e-06	6.298e-06	-5.137	-5.201	-0.064	(0)
MnSO4	2.334e-06	2.334e-06	-5.632	-5.632	0.000	(0)
ZnSO4	1.269e-07	1.269e-07	-6.896	-6.896	0.000	(0)
FeSO4	1.101e-07	1.101e-07	-6.958	-6.958	0.000	(0)
CuSO4	8.235e-08	8.235e-08	-7.084	-7.084	0.000	(0)
NiSO4	1.636e-08	1.636e-08	-7.786	-7.786	0.000	(0)
HSO4-	1.164e-08	9.986e-09	-7.934	-8.001	-0.067	(0)
CoSO4	1.141e-08	1.141e-08	-7.943	-7.943	0.000	(0)
Zn (SO4) 2-2	3.384e-09	1.579e-09	-8.471	-8.801	-0.331	(0)
CrOHSO4	1.781e-09	1.781e-09	-8.749	-8.749	0.000	(0)
CdSO4	1.558e-09	1.558e-09	-8.807	-8.807	0.000	(0)
PbSO4	6.318e-10	6.318e-10	-9.199	-9.199	0.000	(0)
AgSO4-	6.112e-10	5.052e-10	-9.214	-9.297	-0.083	(0)
Cd (SO4) 2-2	6.433e-11	3.003e-11	-10.192	-10.522	-0.331	(0)
AlSO4+	1.706e-11	1.463e-11	-10.768	-10.835	-0.067	(0)
Pb (SO4) 2-2	1.165e-11	5.439e-12	-10.934	-11.264	-0.331	(0)
CrSO4+	6.888e-12	5.693e-12	-11.162	-11.245	-0.083	(0)
Ni (SO4) 2-2	1.658e-12	7.739e-13	-11.780	-12.111	-0.331	(0)
Al (SO4) 2-	2.612e-13	2.240e-13	-12.583	-12.650	-0.067	(0)
FeSO4+	7.379e-14	6.349e-14	-13.132	-13.197	-0.065	(0)
UO2SO4	8.154e-15	8.154e-15	-14.089	-14.089	0.000	(0)
Fe (SO4) 2-	2.346e-15	1.939e-15	-14.630	-14.712	-0.083	(0)
Cr2 (OH) 2SO4+2	1.812e-15	8.457e-16	-14.742	-15.073	-0.331	(0)
VO2SO4-	3.846e-16	3.179e-16	-15.415	-15.498	-0.083	(0)
UO2 (SO4) 2-2	3.290e-16	1.536e-16	-15.483	-15.814	-0.331	(0)
Cr2 (OH) 2 (SO4) 2	7.178e-17	7.178e-17	-16.144	-16.144	0.000	(0)

VOSO4	1.105e-17	1.105e-17	-16.957	-16.957	0.000	(0)
HgSO4	1.687e-22	1.687e-22	-21.773	-21.773	0.000	(0)
CrO3SO4-2	1.094e-24	5.104e-25	-23.961	-24.292	-0.331	(0)
VSO4+	4.285e-31	3.542e-31	-30.368	-30.451	-0.083	(0)
U (SO4) 2	5.680e-40	5.680e-40	-39.246	-39.246	0.000	(0)
USO4+2	1.072e-40	0.000e+00	-39.970	-40.301	-0.331	(0)
Sb (3)	1.025e-18					
Sb (OH) 3	5.187e-19	5.187e-19	-18.285	-18.285	0.000	(0)
HSbo2	5.065e-19	5.065e-19	-18.295	-18.295	0.000	(0)
Sb (OH) 2F	1.895e-23	1.895e-23	-22.722	-22.722	0.000	(0)
SbOF	1.864e-23	1.864e-23	-22.730	-22.730	0.000	(0)
SbO2-	1.388e-23	1.147e-23	-22.858	-22.940	-0.083	(0)
Sb (OH) 4-	7.945e-24	6.567e-24	-23.100	-23.183	-0.083	(0)
Sb (OH) 2+	1.090e-24	9.012e-25	-23.962	-24.045	-0.083	(0)
SbO+	3.761e-25	3.108e-25	-24.425	-24.507	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.376	-299.707	-0.331	(0)
Sb (5)	1.327e-08					
SbO3-	1.325e-08	1.096e-08	-7.878	-7.960	-0.083	(0)
Sb (OH) 6-	1.494e-11	1.280e-11	-10.826	-10.893	-0.067	(0)
SbO2+	1.945e-23	1.608e-23	-22.711	-22.794	-0.083	(0)
Se (-2)	1.985e-10					
Ag2Se	1.985e-10	1.985e-10	-9.702	-9.702	0.000	(0)
HSe-	6.714e-37	5.549e-37	-36.173	-36.256	-0.083	(0)
H2Se	3.081e-40	3.081e-40	-39.511	-39.511	0.000	(0)
MnSe	2.937e-40	2.937e-40	-39.532	-39.532	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.779	-44.110	-0.331	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-78.012	-79.336	-1.324	(0)
Se (4)	4.774e-08					
HSeO3-	4.346e-08	3.592e-08	-7.362	-7.445	-0.083	(0)
SeO3-2	4.284e-09	2.000e-09	-8.368	-8.699	-0.331	(0)
H2SeO3	1.096e-12	1.096e-12	-11.960	-11.960	0.000	(0)
AgSeO3-	2.755e-14	2.277e-14	-13.560	-13.643	-0.083	(0)
FeHSeO3+2	8.053e-19	3.759e-19	-18.094	-18.425	-0.331	(0)
Cd (SeO3) 2-2	3.284e-20	1.533e-20	-19.484	-19.815	-0.331	(0)
Ag (SeO3) 2-3	2.264e-21	4.077e-22	-20.645	-21.390	-0.745	(0)
Se (6)	1.657e-12					
SeO4-2	1.654e-12	8.912e-13	-11.781	-12.050	-0.269	(0)
MnSeO4	2.203e-15	2.203e-15	-14.657	-14.657	0.000	(0)
ZnSeO4	5.604e-17	5.604e-17	-16.251	-16.251	0.000	(0)
NiSeO4	2.392e-17	2.392e-17	-16.621	-16.621	0.000	(0)
CoSeO4	1.788e-17	1.788e-17	-16.748	-16.748	0.000	(0)
HSeO4-	3.865e-18	3.194e-18	-17.413	-17.496	-0.083	(0)
CdSeO4	7.719e-19	7.719e-19	-18.112	-18.112	0.000	(0)
Zn (SeO4) 2-2	1.085e-28	5.064e-29	-27.965	-28.295	-0.331	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.240	-57.985	-0.745	(0)
U (4)	4.316e-22					
U (OH) 5-	4.305e-22	3.558e-22	-21.366	-21.449	-0.083	(0)
U (OH) 4	1.066e-24	1.066e-24	-23.972	-23.972	0.000	(0)
U (OH) 3+	3.375e-28	2.789e-28	-27.472	-27.554	-0.083	(0)
U (OH) 2+2	1.977e-32	9.229e-33	-31.704	-32.035	-0.331	(0)
UF3+	1.479e-33	1.223e-33	-32.830	-32.913	-0.083	(0)
UF2+2	5.057e-35	2.361e-35	-34.296	-34.627	-0.331	(0)
UF4	4.382e-35	4.382e-35	-34.358	-34.358	0.000	(0)
UF5-	6.866e-37	5.675e-37	-36.163	-36.246	-0.083	(0)
UOH+3	1.727e-37	3.110e-38	-36.763	-37.507	-0.745	(0)
UF6-2	1.200e-37	5.601e-38	-36.921	-37.252	-0.331	(0)
UF+3	3.186e-38	5.738e-39	-37.497	-38.241	-0.745	(0)
U (SO4) 2	5.680e-40	5.680e-40	-39.246	-39.246	0.000	(0)
USO4+2	1.072e-40	0.000e+00	-39.970	-40.301	-0.331	(0)
U+4	0.000e+00	0.000e+00	-42.732	-44.056	-1.324	(0)
UCl+3	0.000e+00	0.000e+00	-44.442	-45.187	-0.745	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.607	-174.308	-6.701	(0)
U (5)	2.047e-17					
UO2+	2.047e-17	1.692e-17	-16.689	-16.772	-0.083	(0)
U (6)	8.591e-08					
UO2 (CO3) 3-4	6.376e-08	3.026e-09	-7.195	-8.519	-1.324	(0)
UO2 (CO3) 2-2	2.206e-08	1.030e-08	-7.656	-7.987	-0.331	(0)

UO2CO3	8.802e-11	8.802e-11	-10.055	-10.055	0.000	(0)
UO2F+	2.058e-13	1.701e-13	-12.687	-12.769	-0.083	(0)
UO2F2	1.603e-13	1.603e-13	-12.795	-12.795	0.000	(0)
UO2OH+	8.081e-14	6.680e-14	-13.093	-13.175	-0.083	(0)
UO2F3-	1.592e-14	1.316e-14	-13.798	-13.881	-0.083	(0)
UO2SO4	8.154e-15	8.154e-15	-14.089	-14.089	0.000	(0)
UO2+2	6.999e-15	3.771e-15	-14.155	-14.424	-0.269	(0)
UO2 (SO4) 2-2	3.290e-16	1.536e-16	-15.483	-15.814	-0.331	(0)
UO2F4-2	7.321e-17	3.417e-17	-16.135	-16.466	-0.331	(0)
UO2Cl+	1.091e-17	9.021e-18	-16.962	-17.045	-0.083	(0)
(UO2) 2 (OH) 2+2	1.586e-20	7.405e-21	-19.800	-20.130	-0.331	(0)
(UO2) 3 (OH) 5+	8.990e-24	7.431e-24	-23.046	-23.129	-0.083	(0)
V (2)	1.449e-39					
VOH+	1.043e-39	8.622e-40	-38.982	-39.064	-0.083	(0)
V+2	4.056e-40	1.893e-40	-39.392	-39.723	-0.331	(0)
V (3)	1.181e-12					
V (OH) 3	1.181e-12	1.181e-12	-11.928	-11.928	0.000	(0)
V (OH) 2+	6.603e-23	5.458e-23	-22.180	-22.263	-0.083	(0)
VOH+2	7.935e-26	3.704e-26	-25.100	-25.431	-0.331	(0)
V+3	2.916e-30	5.252e-31	-29.535	-30.280	-0.745	(0)
VSO4+	4.285e-31	3.542e-31	-30.368	-30.451	-0.083	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.498	-49.242	-0.745	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.739	-50.063	-1.324	(0)
V (4)	1.098e-15					
V (OH) 3+	9.531e-16	7.878e-16	-15.021	-15.104	-0.083	(0)
VOF+	6.658e-17	5.503e-17	-16.177	-16.259	-0.083	(0)
VO+2	6.014e-17	2.807e-17	-16.221	-16.552	-0.331	(0)
VOSO4	1.105e-17	1.105e-17	-16.957	-16.957	0.000	(0)
VOF2	6.744e-18	6.744e-18	-17.171	-17.171	0.000	(0)
VOC1+	1.406e-19	1.162e-19	-18.852	-18.935	-0.083	(0)
VOF3-	9.461e-20	7.820e-20	-19.024	-19.107	-0.083	(0)
VOF4-2	2.210e-22	1.032e-22	-21.656	-21.986	-0.331	(0)
H2V2O4+2	6.671e-26	3.114e-26	-25.176	-25.507	-0.331	(0)
V (5)	1.174e-07					
H2VO4-	1.103e-07	9.120e-08	-6.957	-7.040	-0.083	(0)
HVO4-2	6.862e-09	3.203e-09	-8.164	-8.494	-0.331	(0)
H3VO4	6.523e-11	6.523e-11	-10.186	-10.186	0.000	(0)
H3V2O7-	4.649e-11	3.843e-11	-10.333	-10.415	-0.083	(0)
HV2O7-3	5.500e-13	9.904e-14	-12.260	-13.004	-0.745	(0)
VO2+	1.087e-14	9.317e-15	-13.964	-14.031	-0.067	(0)
VO2F	5.341e-15	5.341e-15	-14.272	-14.272	0.000	(0)
V3O9-3	4.418e-15	7.955e-16	-14.355	-15.099	-0.745	(0)
VO4-3	1.246e-15	2.245e-16	-14.904	-15.649	-0.745	(0)
V2O7-4	7.852e-16	3.727e-17	-15.105	-16.429	-1.324	(0)
VO2F2-	7.667e-16	6.337e-16	-15.115	-15.198	-0.083	(0)
VO2SO4-	3.846e-16	3.179e-16	-15.415	-15.498	-0.083	(0)
VO2F3-2	5.535e-18	2.583e-18	-17.257	-17.588	-0.331	(0)
V4O12-4	6.375e-19	3.026e-20	-18.196	-19.519	-1.324	(0)
VO2F4-3	2.307e-21	4.154e-22	-20.637	-21.381	-0.745	(0)
HV10O28-5	0.000e+00	0.000e+00	-46.965	-49.033	-2.068	(0)
V10O28-6	0.000e+00	0.000e+00	-47.096	-50.074	-2.978	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.647	-50.971	-1.324	(0)
Zn	1.172e-06					
Zn+2	7.536e-07	4.060e-07	-6.123	-6.391	-0.269	(0)
ZnHCO3+	1.390e-07	1.149e-07	-6.857	-6.940	-0.083	(0)
ZnCO3	1.370e-07	1.370e-07	-6.863	-6.863	0.000	(0)
ZnSO4	1.269e-07	1.269e-07	-6.896	-6.896	0.000	(0)
ZnOH+	6.913e-09	5.714e-09	-8.160	-8.243	-0.083	(0)
Zn (SO4) 2-2	3.384e-09	1.579e-09	-8.471	-8.801	-0.331	(0)
ZnF+	3.203e-09	2.648e-09	-8.494	-8.577	-0.083	(0)
ZnCl+	1.760e-09	1.505e-09	-8.754	-8.823	-0.068	(0)
ZnOHCl	2.772e-10	2.772e-10	-9.557	-9.557	0.000	(0)
Zn (OH) 2	1.274e-10	1.274e-10	-9.895	-9.895	0.000	(0)
ZnCl2	3.518e-12	3.518e-12	-11.454	-11.454	0.000	(0)
Zn (OH) 3-	1.087e-13	8.988e-14	-12.964	-13.046	-0.083	(0)
ZnCl3-	4.823e-15	4.122e-15	-14.317	-14.385	-0.068	(0)
ZnSeO4	5.604e-17	5.604e-17	-16.251	-16.251	0.000	(0)
ZnCl4-2	5.550e-18	3.041e-18	-17.256	-17.517	-0.261	(0)

Zn(OH) 4-2	1.079e-18	5.035e-19	-17.967	-18.298	-0.331	(0)
Zn(SeO4) 2-2	1.085e-28	5.064e-29	-27.965	-28.295	-0.331	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.471	-141.553	-0.083	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.689	-142.689	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.885	-213.968	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.471	-216.802	-0.331	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.656	-289.987	-0.331	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Acanthite	-46.70	-82.92	-36.22	Ag2S
Ag2CO3	-9.64	-20.73	-11.09	Ag2CO3
Ag2CrO4	-20.06	-31.65	-11.59	Ag2CrO4
Ag2HVO4	-9.58	-8.10	1.48	Ag2HVO4
Ag2MoO4	-10.47	-22.02	-11.55	Ag2MoO4
Ag2O	-13.79	-1.21	12.57	Ag2O
Ag2Se	4.09	-44.61	-48.70	Ag2Se
Ag2SeO3	-8.65	-15.80	-7.15	Ag2SeO3
Ag2SeO4	-18.64	-27.55	-8.91	Ag2SeO4
Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.58	-20.42	2.16	Ag3AsO3
Ag3AsO4	-11.98	-14.77	-2.79	Ag3AsO4
Ag3H2VO5	-13.88	-8.70	5.18	Ag3H2VO5
AgF:4H2O	-12.29	-11.24	1.05	AgF:4H2O
Agmetal	0.62	-12.88	-13.51	Ag
AgVO3	-8.26	-7.49	0.77	AgVO3
Al (OH) 3 (am)	-1.24	9.56	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.68	-43.31	2.37	Al2 (MoO4) 3
Al2O3	-0.54	19.11	19.65	Al2O3
Al4 (OH) 10SO4	-1.61	21.09	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-8.19	-3.39	4.80	AlAsO4:2H2O
AlOHSO4	-4.35	-7.58	-3.23	AlOHSO4
AlSb	-148.02	-82.40	65.62	AlSb
Alunite	-0.26	-1.66	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.10	-11.89	-7.79	PbSO4
Anhydrite	-1.12	-5.48	-4.36	CaSO4
Anilite	-50.75	-82.63	-31.88	Cu0.25Cu1.5S
Antlerite	-2.85	5.94	8.79	Cu3 (OH) 4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-71.67	-74.43	-2.76	As4O6
Artinite	-6.76	2.84	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-32.60	-25.89	6.71	As2O5
Atacamite	-1.98	5.41	7.39	Cu2 (OH) 3Cl
Azurite	0.94	-15.97	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.22	8.17	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-13.29	2.58	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.54	-1.37	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-22.19	10.75	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.60	-22.27	-9.67	BaCrO4
BaF2	-7.27	-13.09	-5.82	BaF2
BaMoO4	-5.67	-12.63	-6.96	BaMoO4
Barite	1.02	-8.96	-9.98	BaSO4
BaS	-89.71	-73.53	16.18	BaS
BaSeO3	-8.25	-6.42	1.83	BaSeO3
BaSeO4	-10.71	-18.17	-7.46	BaSeO4
Bianchite	-7.47	-9.24	-1.76	ZnSO4:6H2O
Birnessite	-9.63	8.46	18.09	MnO2
Bixbyite	-6.99	-7.63	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.33	-78.61	-27.28	Cu0.6Cu0.8S
Boehmite	0.98	9.56	8.58	AlOOH
Breithauptite	-54.11	-72.63	-18.52	NiSb
Brochantite	-1.59	13.63	15.22	Cu4 (OH) 6SO4
Brucite	-5.66	11.18	16.84	Mg (OH) 2
Bunsenite	-5.40	7.05	12.45	NiO
Ca (VO3) 2	-7.77	-2.11	5.66	Ca (VO3) 2

Ca2V2O7	-7.95	9.55	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.01	9.55	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.22	9.08	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.75	21.21	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.65	21.21	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-291.91	-148.94	142.97	Ca3Sb2
CaCrO4	-16.52	-18.78	-2.27	CaCrO4
Calcite	0.62	-7.86	-8.48	CaCO3
Calomel	-9.91	-27.82	-17.91	Hg2Cl2
CaMoO4	-1.20	-9.15	-7.95	CaMoO4
Carnotite	-3.31	-3.08	0.23	KUO2VO4
CaSeO3:2H2O	-5.75	-2.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.66	-14.68	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.48	-3.64	9.84	Cd(BO2)2
Cd(OH)2	-7.69	5.96	13.64	Cd(OH)2
Cd(OH)2(am)	-7.77	5.96	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.11	-16.40	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.82	0.74	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.70	6.70	28.40	Cd4(OH)6SO4
CdCl2	-13.34	-13.99	-0.66	CdCl2
CdCl2:1H2O	-12.30	-13.99	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.08	-14.00	-1.91	CdCl2:2.5H2O
CdF2	-14.09	-15.30	-1.21	CdF2
Cdmetal(alpha)	-32.11	-18.60	13.51	Cd
Cdmetal(gamma)	-32.22	-18.60	13.62	Cd
CdMoO4	-0.70	-14.85	-14.15	CdMoO4
CdOHCl	-7.56	-4.02	3.54	CdOHCl
CdSb	-73.37	-73.72	-0.35	CdSb
CdSe	-17.24	-37.44	-20.20	CdSe
CdSeO4:2H2O	-18.53	-20.38	-1.85	CdSeO4:2H2O
CdSO4	-11.01	-11.18	-0.17	CdSO4
CdSO4:1H2O	-9.45	-11.18	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.31	-11.18	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.15	-14.28	-13.13	PbCO3
CH4(g)	-76.71	-117.75	-41.05	CH4
Chalcanthite	-6.81	-9.45	-2.64	CuSO4:5H2O
Chalcocite	-50.58	-85.50	-34.92	Cu2S
Chalcopyrite	-112.66	-147.93	-35.27	CuFeS2
Cinnabar	-49.26	-94.95	-45.69	HgS
Claudetite	-71.36	-74.43	-3.06	As4O6
Clausthalite	-11.05	-38.15	-27.10	PbSe
Co(BO2)2	-29.77	-2.70	27.07	Co(BO2)2
Co(OH)2	-6.20	6.89	13.09	Co(OH)2
Co(OH)3	-10.92	-13.23	-2.31	Co(OH)3
CO2(g)	-1.38	-19.52	-18.15	CO2
Co3(AsO4)2	-18.25	-5.21	13.03	Co3(AsO4)2
Co3O4	-9.07	-19.56	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-2.65	-12.63	-9.98	CoCO3
CoF2	-12.77	-14.37	-1.60	CoF2
CoF3	-43.66	-45.12	-1.46	CoF3
CoFe2O4	24.49	20.96	-3.53	CoFe2O4
CoMoO4	-6.15	-13.91	-7.76	CoMoO4
CoO	-6.69	6.89	13.59	CoO
CoS(alpha)	-67.37	-74.81	-7.44	CoS
CoS(beta)	-63.74	-74.81	-11.07	CoS
CoSe	-20.31	-36.51	-16.20	CoSe
CoSeO3	-9.02	-7.70	1.32	CoSeO3
CoSeO4:6H2O	-17.92	-19.45	-1.53	CoSeO4:6H2O
CoSO4	-13.05	-10.24	2.80	CoSO4
CoSO4:6H2O	-7.77	-10.24	-2.47	CoSO4:6H2O
Cotunnite	-9.93	-14.71	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr(OH)2	-20.05	-9.23	10.82	Cr(OH)2
Cr(OH)3	-1.24	0.10	1.34	Cr(OH)3
Cr(OH)3(am)	0.85	0.10	-0.75	Cr(OH)3

Cr2O3	2.56	0.20	-2.36	Cr2O3
CrCl2	-43.28	-29.19	14.09	CrCl2
CrCl3	-44.94	-29.83	15.11	CrCl3
CrF3	-20.46	-31.79	-11.34	CrF3
Crmetal	-64.27	-33.79	30.48	Cr
CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.08	-39.92	-33.84	Na3AlF6
Cu(OH)2	-0.98	7.69	8.67	Cu(OH)2
Cu(SbO3)2	-24.97	20.24	45.21	Cu(SbO3)2
Cu2Sb:3H2O	-51.28	-86.16	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-1.39	-47.19	-45.80	Cu2Se
Cu2SO4	-18.98	-20.93	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-8.92	-2.82	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-55.05	-97.65	-42.59	Cu3Sb
Cu3Se2	-19.41	-82.90	-63.49	Cu3Se2
CuCO3	-0.33	-11.83	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.62	-12.53	-4.91	CuF
CuF2	-14.69	-13.57	1.12	CuF2
CuF2:2H2O	-9.02	-13.57	-4.55	CuF2:2H2O
Cumetal	-5.42	-14.18	-8.76	Cu
CuMoO4	-0.04	-13.12	-13.08	CuMoO4
CuOCuSO4	-12.06	-1.75	10.30	CuOCuSO4
Cupricferrite	15.77	21.76	5.99	CuFe2O4
Cuprite	-2.39	-3.79	-1.41	Cu2O
Cuprousferrite	14.05	5.14	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.55	-33.37	CuSe2
CuSeO3:2H2O	-7.41	-6.90	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.21	-18.65	-2.44	CuSeO4:5H2O
CuSO4	-12.38	-9.44	2.94	CuSO4
Diaspore	2.68	9.56	6.87	AlOOH
Djurleite	-50.82	-84.74	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.33	-16.21	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.88	-16.21	-17.09	CaMg(CO3)2
Epsomite	-3.83	-5.96	-2.13	MgSO4:7H2O
Fe(OH)2	-5.78	7.79	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	7.08	4.04	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-2.26	-5.98	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.08	-0.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-9.08	-29.70	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.61	-37.34	-3.73	Fe2(SO4)3
Fe3(OH)8	1.63	21.86	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.31	-5.91	0.40	FeAsO4:2H2O
FeCr2O4	0.79	7.99	7.20	FeCr2O4
FeMoO4	-2.93	-13.02	-10.09	FeMoO4
Ferrihydrite	3.84	7.03	3.19	Fe(OH)3
Ferroselite	-35.86	-54.46	-18.60	FeSe2
FeS(ppt)	-70.97	-73.92	-2.95	FeS
FeSe	-24.61	-35.61	-11.00	FeSe
Fix_pe	-5.13	-5.13	0.00	e-
Fluorite	0.90	-9.60	-10.50	CaF2
Galena	-62.49	-76.46	-13.97	PbS
Gibbsite	1.27	9.56	8.29	Al(OH)3
Goethite	6.54	7.03	0.49	FeOOH
Goslarite	-7.23	-9.24	-2.01	ZnSO4:7H2O
Greenockite	-61.39	-75.75	-14.36	CdS
Greigite	-259.93	-304.96	-45.03	Fe3S4
Gummite	-7.80	-0.13	7.67	UO3
Gypsum	-0.87	-5.48	-4.61	CaSO4:2H2O
H-Jarosite	-1.07	-13.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.93	-20.81	-12.88	H2MoO4
H2S(g)	-73.69	-81.70	-8.01	H2S
H2Se(g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.81	-5.20	1.60	NaCl
Hausmannite	-8.71	52.32	61.03	Mn3O4
Hematite	15.49	14.07	-1.42	Fe2O3
Hercynite	4.01	26.90	22.89	FeAl2O4

Hg (CH3) 2 (g)	-175.04	-248.75	-73.71	Hg (CH3) 2
Hg (g)	-8.34	-16.21	-7.87	Hg
Hg (OH) 2	-9.75	-13.25	-3.50	Hg (OH) 2
Hg2 (g)	-17.47	-32.43	-14.96	Hg2
Hg2 (OH) 2	-13.13	-7.87	5.26	Hg2 (OH) 2
Hg2CO3	-11.34	-27.39	-16.05	Hg2CO3
Hg2CrO4	-29.61	-38.31	-8.70	Hg2CrO4
Hg2F2	-18.77	-29.13	-10.36	Hg2F2
Hg2S	-77.90	-89.57	-11.68	Hg2S
Hg2SeO3	-17.80	-22.46	-4.66	Hg2SeO3
Hg2SO4	-18.88	-25.01	-6.13	Hg2SO4
Hg3O2CO3	-29.59	-59.27	-29.68	Hg3O2CO3
HgCl (g)	-33.41	-13.91	19.50	HgCl
HgCl2	-11.94	-33.20	-21.26	HgCl2
HgF (g)	-47.24	-14.57	32.68	HgF
HgF2 (g)	-47.08	-34.51	12.57	HgF2
Hgmetal (1)	-2.76	-16.21	-13.45	Hg
HgSe	-0.96	-56.65	-55.69	HgSe
HgSeO3	-15.41	-27.84	-12.43	HgSeO3
HgSO4	-20.97	-30.38	-9.42	HgSO4
Huntite	-2.92	-32.89	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.54	-23.31	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-13.42	-22.19	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.61	-20.78	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	5.57	-9.23	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-35.76	-53.00	-17.24	K2Cr2O7
K2CrO4	-22.05	-22.56	-0.51	K2CrO4
K2MoO4	-16.19	-12.93	3.26	K2MoO4
K2SeO4	-17.73	-18.46	-0.73	K2SeO4
Langite	-3.86	13.63	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-6.21	-6.64	-0.43	PbO : PbSO4
Laurionite	-5.35	-4.73	0.62	PbOHCl
Lepidocrocite	5.66	7.03	1.37	FeOOH
Lime	-21.04	11.66	32.70	CaO
Litharge	-7.45	5.25	12.69	PbO
Mackinawite	-70.32	-73.92	-3.60	FeS
Maghemite	7.68	14.07	6.39	Fe2O3
Magnesioferrite	8.39	25.25	16.86	Fe2MgO4
Magnesite	-0.88	-8.34	-7.46	MgCO3
Magnetite	18.45	21.86	3.40	Fe3O4
Malachite	1.17	-4.14	-5.31	Cu2 (OH) 2CO3
Manganite	-3.81	21.53	25.34	MnOOH
Massicot	-7.65	5.25	12.89	PbO
Matlockite	-6.39	-15.36	-8.97	PbClF
Melanothallite	-18.52	-12.26	6.26	CuCl2
Melanterite	-7.14	-9.35	-2.21	FeSO4 : 7H2O
Metacinnabar	-49.86	-94.95	-45.09	HgS
Mg (OH) 2 (active)	-7.61	11.18	18.79	Mg (OH) 2
Mg (VO3) 2	-13.87	-2.59	11.28	Mg (VO3) 2
Mg2Sb3	-266.80	-192.11	74.68	Mg2Sb3
Mg2V2O7	-17.77	8.59	26.36	Mg2V2O7
MgCr2O4	-4.82	11.38	16.20	MgCr2O4
MgCrO4	-24.64	-19.26	5.38	MgCrO4
MgF2	-1.95	-10.08	-8.13	MgF2
MgMoO4	-7.78	-9.63	-1.85	MgMoO4
MgSeO3 : 6H2O	-6.47	-3.41	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-13.96	-15.16	-1.20	MgSeO4 : 6H2O
Minium	-33.23	40.30	73.52	Pb3O4
Mirabilite	-6.48	-7.59	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-9.42	-4.52	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-53.33	-59.04	-5.71	Mn2 (SO4) 3
Mn2Sb	-146.81	-85.73	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.63	1.87	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-13.42	-10.70	2.72	MnCl2 : 4H2O
MnS (grn)	-72.62	-72.45	0.17	MnS
MnS (pnk)	-75.79	-72.45	3.34	MnS
MnSb	-92.86	-95.77	-2.91	MnSb
MnSe	-37.65	-34.15	3.50	MnSe

MnSeO3	-6.47	-5.34	1.13	MnSeO3
MnSeO3:2H2O	-6.32	-5.34	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-15.04	-17.09	-2.05	MnSeO4:5H2O
MnSO4	-10.47	-7.88	2.58	MnSO4
Montepontite	-9.14	5.96	15.10	CdO
Montroydite	-9.61	-13.25	-3.64	HgO
MoO3	-12.81	-20.81	-8.00	MoO3
Morenosite	-7.94	-10.09	-2.14	NiSO4:7H2O
MoS2	-138.51	-208.77	-70.26	MoS2
Na-Jarosite	2.80	-8.40	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.44	-51.34	-9.90	Na2Cr2O7
Na2CrO4	-23.83	-20.90	2.93	Na2CrO4
Na2Mo2O7	-15.47	-32.07	-16.60	Na2Mo2O7
Na2MoO4	-12.75	-11.26	1.49	Na2MoO4
Na2MoO4:2H2O	-12.49	-11.26	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.35	-5.05	10.30	Na2SeO3:5H2O
Na2SeO4	-18.08	-16.80	1.28	Na2SeO4
Na3Sb	-172.09	-77.64	94.45	Na3Sb
Na3VO4	-29.25	7.43	36.68	Na3VO4
Na4V2O7	-32.08	5.32	37.40	Na4V2O7
Nantokite	-5.14	-11.87	-6.73	CuCl
NaSb	-85.79	-62.63	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-5.97	-2.11	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-5.74	7.05	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.45	-4.75	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.94	11.06	32.00	Ni4(OH)6SO4
NiCO3	-5.60	-12.47	-6.87	NiCO3
NiMoO4	-2.62	-13.76	-11.14	NiMoO4
NiS(alpha)	-69.05	-74.65	-5.60	NiS
NiS(beta)	-63.55	-74.65	-11.10	NiS
NiS(gamma)	-61.85	-74.65	-12.80	NiS
NiSe	-18.65	-36.35	-17.70	NiSe
NiSeO3:2H2O	-10.36	-7.54	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.77	-19.29	-1.52	NiSeO4:6H2O
Nsutite	-9.04	8.46	17.50	MnO2
O2(g)	-33.98	49.11	83.09	O2
Orpiment	-221.26	-282.33	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.87	-4.35	6.52	Pb(BO2)2
Pb(OH)2	-2.90	5.25	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-55.91	-64.67	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.28	0.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.70	10.49	26.19	Pb2O(OH)2
Pb2O3	-25.99	35.05	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	-1.38	-3.28	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.96	-10.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.17	1.97	6.14	Pb3(VO4)2
Pb3O2CO3	-14.80	-3.78	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.25	3.85	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.03	3.85	21.88	Pb4O3SO4
PbCrO4	-12.59	-25.19	-12.60	PbCrO4
PbF2	-8.58	-16.02	-7.44	PbF2
Pbmetal	-23.56	-19.31	4.25	Pb
PbMoO4	0.06	-15.56	-15.62	PbMoO4
PbO:0.3H2O	-7.73	5.25	12.98	PbO:0.33H2O
PbSeO4	-14.25	-21.09	-6.84	PbSeO4
Periclase	-10.40	11.18	21.58	MgO
Phosgenite	-9.17	-28.98	-19.81	PbCl2:PbCO3
Plattnerite	-19.80	29.80	49.60	PbO2
Portlandite	-11.15	11.66	22.80	Ca(OH)2
Pyrite	-112.56	-131.06	-18.51	FeS2
Pyrochroite	-5.94	9.25	15.19	Mn(OH)2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-92.84	-112.59	-19.75	AsS

Retgersite	-8.05	-10.09	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.16	-19.66	-14.50	UO2CO3
Sb(OH)3	-11.18	-18.29	-7.11	Sb(OH)3
Sb2O4	-15.41	-12.01	3.40	Sb2O4
Sb2O5	-26.41	-36.08	-9.67	Sb2O5
Sb2Se3	-99.02	-166.77	-67.76	Sb2Se3
Sb4O6(cubic)	-54.88	-73.14	-18.26	Sb4O6
Sb4O6(orth)	-55.24	-73.14	-17.90	Sb4O6
SbCl3	-48.79	-48.21	0.57	SbCl3
SbF3	-39.95	-50.18	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.49	-30.32	-27.82	SbO2
Schoepite	-6.13	-0.13	5.99	UO2(OH)2:H2O
Semetal(am)	-11.73	-18.84	-7.11	Se
Semetal(hex)	-11.14	-18.84	-7.71	Se
Senarmontite	-24.20	-36.57	-12.37	Sb2O3
SeO2	-14.71	-14.59	0.12	SeO2
SeO3	-47.38	-26.34	21.04	SeO3
Siderite	-1.50	-11.74	-10.24	FeCO3
Smithsonite	-1.62	-11.62	-10.00	ZnCO3
Sphalerite	-62.35	-73.80	-11.45	ZnS
Spinel	-6.55	30.29	36.85	MgAl2O4
Stibnite	-231.22	-281.68	-50.46	Sb2S3
Sulfur	-55.00	-57.15	-2.14	S
Tenorite	0.05	7.69	7.64	CuO
Thenardite	-7.91	-7.59	0.32	Na2SO4
Thermonatrite	-10.62	-9.98	0.64	Na2CO3:H2O
Tyuyamunite	-6.46	-2.38	4.08	Ca(UO2)2(VO4)2
U3O8	-18.39	2.69	21.08	U3O8
U3Sb4	-566.63	-414.24	152.38	U3Sb4
U4O9	-34.32	-37.34	-3.02	U4O9
UF4	-28.46	-58.00	-29.54	UF4
UF4:2.5H2O	-25.28	-58.00	-32.72	UF4:2.5H2O
UO2(am)	-16.41	-15.47	0.93	UO2
UO2(OH)2(beta)	-5.74	-0.13	5.61	UO2(OH)2
UO2SeO4:4H2O	-24.22	-26.47	-2.25	UO2SeO4:4H2O
UO3	-7.83	-0.13	7.70	UO3
Uraninite	-10.80	-15.47	-4.67	UO2
USb2	-213.62	-184.04	29.58	USb2
V(OH)3	-16.43	-8.84	7.59	V(OH)3
V2O5	-12.41	-13.77	-1.36	V2O5
V3O5	-33.18	-31.34	1.84	V3O5
V4O7	-40.79	-33.60	7.19	V4O7
V6O13	-29.57	-90.43	-60.86	V6O13
Valentinite	-28.09	-36.57	-8.48	Sb2O3
VC12	-59.95	-41.08	18.87	VC12
VC13	-62.21	-38.77	23.43	VC13
VF4	-59.72	-44.79	14.93	VF4
Vmetal	-89.70	-45.68	44.03	V
VO	-35.88	-21.12	14.76	VO
VO(OH)2	-7.41	-2.26	5.15	VO(OH)2
VO2Cl	-19.70	-16.86	2.84	VO2Cl
VOC1	-29.97	-18.82	11.15	VOC1
VOC12	-34.97	-22.21	12.76	VOC12
VOSO4	-23.01	-19.40	3.61	VOSO4
Witherite	-2.78	-11.35	-8.57	BaCO3
Wurtzite	-64.85	-73.80	-8.95	ZnS
Zincite	-3.43	7.90	11.33	ZnO
Zincosite	-13.17	-9.24	3.93	ZnSO4
Zn(BO2)2	-9.98	-1.69	8.29	Zn(BO2)2
Zn(OH)2	-4.30	7.90	12.20	Zn(OH)2
Zn(OH)2(am)	-4.57	7.90	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.85	7.90	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.63	7.90	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.83	7.90	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.84	-1.34	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.37	5.82	15.19	Zn2(OH)3Cl

Zn3(AsO4)2:2.5H2O	-15.85	-2.20	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.49	-10.57	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.94	14.46	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.96	19.54	38.50	Zn5(OH)8Cl2
ZnCl2	-19.10	-12.05	7.05	ZnCl2
ZnCO3:1H2O	-1.36	-11.62	-10.26	ZnCO3:1H2O
ZnF2	-12.83	-13.36	-0.53	ZnF2
Znmetal	-42.45	-16.66	25.79	Zn
ZnMoO4	-2.78	-12.91	-10.13	ZnMoO4
ZnO(active)	-3.29	7.90	11.19	ZnO
ZnS(am)	-64.75	-73.80	-9.05	ZnS
ZnSb	-82.79	-71.78	11.01	ZnSb
ZnSe	-21.10	-35.50	-14.40	ZnSe
ZnSeO4:6H2O	-16.92	-18.44	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.60	-9.24	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 134.

Title Precipitate oversaturated phases in groundwater
PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 801

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -1.69 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

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Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 802
SAVE Solution 803 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 801
END

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TITLE
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Precipitate oversaturated phases in groundwater

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Beginning of batch-reaction calculations.
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Reaction step 1.

```

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 802. Solution after simulation 133.
Using pure phase assemblage 801.

```

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.536e-08	2.536e-08
Alunite	0.00	-1.40	-1.40	0.000e+00	9.244e-07	9.244e-07
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.029e-08	2.029e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.329e-06	1.329e-06
Brochantite	-0.40	14.82	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.662e-03
CaMoO4	-1.74	-9.69	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.36	-3.54	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.915e-03	2.915e-03
Carnotite	-2.33	-2.10	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.91	-15.06	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.029e-08	6.029e-08
Cu2Se(alpha)	-5.09	-50.89	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.575e-07	2.575e-07
Epsomite	-3.73	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.671e-05	2.671e-05

Fluorite	0.00	-10.50	-10.50	0.000e+00	1.120e-04	1.120e-04
Gummite	-6.84	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.25	-58.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.51	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.72	-5.59	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.17	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-24.35	-8.65	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.73	-13.87	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.691e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	5.251e-09	5.251e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.81	-0.73	4.08	0.000e+00	0	0.000e+00
U3O8	-16.50	4.59	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.78	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.95	-13.08	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.275e-08	3.279e-08
Al	1.923e-06	1.925e-06
As	2.728e-10	2.731e-10
B	1.602e-05	1.604e-05
Ba	1.100e-07	1.102e-07
C	5.842e-03	5.849e-03
Ca	2.550e-03	2.553e-03
Cd	1.183e-08	1.185e-08
Cl	1.722e-03	1.724e-03
Co	1.357e-07	1.359e-07
Cr	6.447e-09	6.455e-09
Cu	9.590e-06	9.601e-06
F	2.117e-04	2.119e-04
Fe	3.679e-09	3.684e-09
Hg	2.259e-10	2.262e-10
K	7.331e-04	7.340e-04
Mg	1.761e-03	1.763e-03
Mn	2.408e-05	2.411e-05
Mo	3.032e-07	3.036e-07
Na	4.996e-03	5.002e-03
Ni	2.129e-07	2.131e-07
Pb	2.129e-08	2.132e-08
S	3.662e-03	3.666e-03
Sb	1.327e-08	1.328e-08
Se	2.261e-08	2.264e-08
U	8.590e-08	8.600e-08
V	1.174e-07	1.175e-07
Zn	1.172e-06	1.173e-06

-----Description of solution-----

	pH	=	7.147	Charge balance
	pe	=	5.625	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.910e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	5.171e-03	
	Total CO2 (mol/kg)	=	5.842e-03	

Temperature (°C) = 25.00
 Electrical balance (eq) = 1.052e-15
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 10
 Total H = 1.111521e+02
 Total O = 5.560503e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.625e-07	1.413e-07	-6.789	-6.850	-0.061	(0)
H+	8.163e-08	7.126e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.275e-08					
AgCl	2.126e-08	2.126e-08	-7.673	-7.673	0.000	(0)
Ag+	7.934e-09	6.926e-09	-8.100	-8.160	-0.059	(0)
AgCl2-	3.273e-09	2.783e-09	-8.485	-8.556	-0.070	(0)
AgSO4-	2.739e-10	2.329e-10	-9.562	-9.633	-0.070	(0)
AgCl3-2	7.136e-12	3.728e-12	-11.147	-11.429	-0.282	(0)
AgF	2.878e-12	2.878e-12	-11.541	-11.541	0.000	(0)
AgOH	9.784e-14	9.784e-14	-13.009	-13.009	0.000	(0)
AgCl4-3	4.931e-14	1.144e-14	-13.307	-13.942	-0.634	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgH2BO3	1.425e-14	1.425e-14	-13.846	-13.846	0.000	(0)
AgSeO3-	5.153e-15	4.381e-15	-14.288	-14.358	-0.070	(0)
Ag (OH) 2-	1.589e-18	1.351e-18	-17.799	-17.869	-0.070	(0)
Ag (SeO3) 2-3	1.664e-22	3.861e-23	-21.779	-22.413	-0.634	(0)
Ag2MoO4	3.195e-24	3.195e-24	-23.496	-23.496	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.784	-72.784	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.156	-86.283	-1.128	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.053	-147.124	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.292	-147.460	-0.168	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.435	-149.753	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.760	-150.064	-0.304	(0)
Al	1.923e-06					
Al (OH) 4-	1.297e-06	1.134e-06	-5.887	-5.945	-0.059	(0)
AlF3	3.238e-07	3.238e-07	-6.490	-6.490	0.000	(0)
AlF2+	1.771e-07	1.555e-07	-6.752	-6.808	-0.057	(0)
Al (OH) 3	6.376e-08	6.376e-08	-7.195	-7.195	0.000	(0)
AlF4-	3.072e-08	2.684e-08	-7.513	-7.571	-0.059	(0)
Al (OH) 2+	2.577e-08	2.262e-08	-7.589	-7.645	-0.057	(0)
AlF+2	3.977e-09	2.361e-09	-8.400	-8.627	-0.226	(0)
AlOH+2	3.396e-10	2.016e-10	-9.469	-9.695	-0.226	(0)
AlSO4+	2.137e-11	1.867e-11	-10.670	-10.729	-0.059	(0)
Al+3	4.849e-12	1.427e-12	-11.314	-11.845	-0.531	(0)
Al (SO4) 2-	3.858e-13	3.372e-13	-12.414	-12.472	-0.059	(0)
AlMo6O21-3	2.349e-40	0.000e+00	-39.629	-40.264	-0.634	(0)
As (3)	1.864e-22					
H3AsO3	1.848e-22	1.848e-22	-21.733	-21.733	0.000	(0)
H2AsO3-	1.565e-24	1.330e-24	-23.806	-23.876	-0.070	(0)
HAsO3-2	3.259e-29	1.703e-29	-28.487	-28.769	-0.282	(0)
H4AsO3+	7.676e-30	6.526e-30	-29.115	-29.185	-0.070	(0)
AsO3-3	3.970e-35	9.211e-36	-34.401	-35.036	-0.634	(0)
As (5)	2.728e-10					
HAsO4-2	1.949e-10	1.018e-10	-9.710	-9.992	-0.282	(0)
H2AsO4-	7.784e-11	6.617e-11	-10.109	-10.179	-0.070	(0)
AsO4-3	1.947e-14	4.519e-15	-13.711	-14.345	-0.634	(0)
H3AsO4	8.158e-16	8.194e-16	-15.088	-15.086	0.002	(0)
B	1.602e-05					
H3BO3	1.586e-05	1.593e-05	-4.800	-4.798	0.002	(0)
H2BO3-	1.502e-07	1.298e-07	-6.823	-6.887	-0.063	(0)
CaH2BO3+	9.987e-09	8.632e-09	-8.001	-8.064	-0.063	(0)
MgH2BO3+	4.359e-09	3.767e-09	-8.361	-8.424	-0.063	(0)
BF (OH) 3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
NaH2BO3	8.873e-10	8.873e-10	-9.052	-9.052	0.000	(0)
H5 (BO3) 2-	2.036e-12	1.760e-12	-11.691	-11.755	-0.063	(0)

	BF2 (OH) 2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
	BaH2BO3+	2.884e-13	2.492e-13	-12.540	-12.603	-0.063	(0)
	AgH2BO3	1.425e-14	1.425e-14	-13.846	-13.846	0.000	(0)
	H8 (BO3) 3-	3.242e-15	2.802e-15	-14.489	-14.552	-0.063	(0)
	BF3OH-	7.034e-18	6.079e-18	-17.153	-17.216	-0.063	(0)
	BF4-	4.081e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
Ba	1.100e-07						
	Ba+2	1.070e-07	6.213e-08	-6.971	-7.207	-0.236	(0)
	BaHCO3+	2.936e-09	2.584e-09	-8.532	-8.588	-0.055	(0)
	BaCO3	9.131e-11	9.131e-11	-10.039	-10.039	0.000	(0)
	BaH2BO3+	2.884e-13	2.492e-13	-12.540	-12.603	-0.063	(0)
	BaOH+	4.373e-14	3.831e-14	-13.359	-13.417	-0.057	(0)
C (4)	5.842e-03						
	HCO3-	4.962e-03	4.355e-03	-2.304	-2.361	-0.057	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.065e-04	9.372e-05	-3.973	-4.028	-0.055	(0)
	MgHCO3+	4.280e-05	3.730e-05	-4.369	-4.428	-0.060	(0)
	NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)
	CuCO3	8.047e-06	8.047e-06	-5.094	-5.094	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.934e-06	2.865e-06	-5.307	-5.543	-0.236	(0)
	MgCO3	1.995e-06	1.995e-06	-5.700	-5.700	0.000	(0)
	MnHCO3+	1.028e-06	9.006e-07	-5.988	-6.045	-0.057	(0)
	NaCO3-	2.622e-07	2.301e-07	-6.581	-6.638	-0.057	(0)
	CuHCO3+	1.542e-07	1.311e-07	-6.812	-6.883	-0.070	(0)
	Cu (CO3) 2-2	1.188e-07	6.206e-08	-6.925	-7.207	-0.282	(0)
	ZnCO3	7.876e-08	7.876e-08	-7.104	-7.104	0.000	(0)
	ZnHCO3+	7.738e-08	6.579e-08	-7.111	-7.182	-0.070	(0)
	NiHCO3+	4.788e-08	4.070e-08	-7.320	-7.390	-0.070	(0)
	UO2 (CO3) 3-4	4.291e-08	3.196e-09	-7.367	-8.495	-1.128	(0)
	UO2 (CO3) 2-2	4.260e-08	2.226e-08	-7.371	-7.653	-0.282	(0)
	CoHCO3+	1.993e-08	1.694e-08	-7.700	-7.771	-0.070	(0)
	PbCO3	1.174e-08	1.174e-08	-7.930	-7.930	0.000	(0)
	NiCO3	8.104e-09	8.104e-09	-8.091	-8.091	0.000	(0)
	PbHCO3+	5.190e-09	4.412e-09	-8.285	-8.355	-0.070	(0)
	BaHCO3+	2.936e-09	2.584e-09	-8.532	-8.588	-0.055	(0)
	CoCO3	2.423e-09	2.423e-09	-8.616	-8.616	0.000	(0)
	UO2CO3	3.893e-10	3.893e-10	-9.410	-9.410	0.000	(0)
	CdCO3	3.238e-10	3.238e-10	-9.490	-9.490	0.000	(0)
	Pb (CO3) 2-2	1.858e-10	9.705e-11	-9.731	-10.013	-0.282	(0)
	BaCO3	9.131e-11	9.131e-11	-10.039	-10.039	0.000	(0)
	CdHCO3+	5.783e-11	4.916e-11	-10.238	-10.308	-0.070	(0)
	Cd (CO3) 2-2	1.317e-12	6.878e-13	-11.881	-12.163	-0.282	(0)
	FeHCO3+	8.935e-13	7.865e-13	-12.049	-12.104	-0.055	(0)
	HgCO3	1.473e-14	1.473e-14	-13.832	-13.832	0.000	(0)
	Hg (CO3) 2-2	2.556e-16	1.335e-16	-15.593	-15.874	-0.282	(0)
	HgHCO3+	2.300e-17	1.955e-17	-16.638	-16.709	-0.070	(0)
Ca	2.550e-03						
	Ca+2	1.990e-03	1.156e-03	-2.701	-2.937	-0.236	(0)
	CaSO4	4.462e-04	4.462e-04	-3.351	-3.351	0.000	(0)
	CaHCO3+	1.065e-04	9.372e-05	-3.973	-4.028	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.382e-06	2.086e-06	-5.623	-5.681	-0.057	(0)
	CaH2BO3+	9.987e-09	8.632e-09	-8.001	-8.064	-0.063	(0)
	CaOH+	3.700e-09	3.257e-09	-8.432	-8.487	-0.055	(0)
Cd	1.183e-08						
	Cd+2	8.539e-09	4.958e-09	-8.069	-8.305	-0.236	(0)
	CdSO4	1.959e-09	1.959e-09	-8.708	-8.708	0.000	(0)
	CdCl+	8.372e-10	7.118e-10	-9.077	-9.148	-0.070	(0)
	CdCO3	3.238e-10	3.238e-10	-9.490	-9.490	0.000	(0)
	Cd (SO4) 2-2	8.524e-11	4.453e-11	-10.069	-10.351	-0.282	(0)
	CdHCO3+	5.783e-11	4.916e-11	-10.238	-10.308	-0.070	(0)
	CdF+	1.529e-11	1.300e-11	-10.816	-10.886	-0.070	(0)
	CdOH+	6.544e-12	5.563e-12	-11.184	-11.255	-0.070	(0)
	CdCl2	4.460e-12	4.460e-12	-11.351	-11.351	0.000	(0)
	CdOHC1	4.124e-12	4.124e-12	-11.385	-11.385	0.000	(0)
	Cd (CO3) 2-2	1.317e-12	6.878e-13	-11.881	-12.163	-0.282	(0)
	CdCl3-	4.975e-15	4.230e-15	-14.303	-14.374	-0.070	(0)

	Cd(OH) 2	4.959e-15	4.959e-15	-14.305	-14.305	0.000	(0)
	CdF2	4.290e-15	4.290e-15	-14.367	-14.367	0.000	(0)
	CdSeO4	3.937e-18	3.937e-18	-17.405	-17.405	0.000	(0)
	Cd2OH+3	5.959e-19	1.383e-19	-18.225	-18.859	-0.634	(0)
	Cd(OH) 3-	5.033e-20	4.279e-20	-19.298	-19.369	-0.070	(0)
	Cd(SeO3) 2-2	7.578e-21	3.959e-21	-20.120	-20.402	-0.282	(0)
	Cd(OH) 4-2	1.894e-27	9.894e-28	-26.723	-27.005	-0.282	(0)
	CdHS+	0.000e+00	0.000e+00	-78.665	-78.736	-0.070	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-149.971	-149.971	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.440	-226.511	-0.070	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.472	-302.754	-0.282	(0)
C1	1.722e-03						
	Cl-	1.722e-03	1.503e-03	-2.764	-2.823	-0.059	(0)
	MnCl+	2.239e-08	1.961e-08	-7.650	-7.707	-0.057	(0)
	AgCl	2.126e-08	2.126e-08	-7.673	-7.673	0.000	(0)
	AgCl2-	3.273e-09	2.783e-09	-8.485	-8.556	-0.070	(0)
	ZnCl+	2.069e-09	1.803e-09	-8.684	-8.744	-0.060	(0)
	CuCl+	1.304e-09	1.136e-09	-8.885	-8.945	-0.060	(0)
	CuCl	1.048e-09	1.048e-09	-8.980	-8.980	0.000	(0)
	CdCl+	8.372e-10	7.118e-10	-9.077	-9.148	-0.070	(0)
	CuCl2-	3.774e-10	3.290e-10	-9.423	-9.483	-0.060	(0)
	NiCl+	3.429e-10	2.916e-10	-9.465	-9.535	-0.070	(0)
	ZnOHC1	3.335e-10	3.335e-10	-9.477	-9.477	0.000	(0)
	CoCl+	3.059e-10	2.601e-10	-9.514	-9.585	-0.070	(0)
	PbCl+	8.554e-11	7.272e-11	-10.068	-10.138	-0.070	(0)
	MnCl2	4.164e-11	4.164e-11	-10.380	-10.380	0.000	(0)
	AgCl3-2	7.136e-12	3.728e-12	-11.147	-11.429	-0.282	(0)
	CdCl2	4.460e-12	4.460e-12	-11.351	-11.351	0.000	(0)
	ZnCl2	4.296e-12	4.296e-12	-11.367	-11.367	0.000	(0)
	CdOHC1	4.124e-12	4.124e-12	-11.385	-11.385	0.000	(0)
	HgClOH	1.611e-12	1.611e-12	-11.793	-11.793	0.000	(0)
	HgCl2	9.709e-13	9.709e-13	-12.013	-12.013	0.000	(0)
	CuCl2	5.922e-13	5.922e-13	-12.228	-12.228	0.000	(0)
	PbCl2	4.883e-13	4.883e-13	-12.311	-12.311	0.000	(0)
	CuCl3-2	1.795e-13	1.057e-13	-12.746	-12.976	-0.230	(0)
	AgCl4-3	4.931e-14	1.144e-14	-13.307	-13.942	-0.634	(0)
	MnCl3-	1.968e-14	1.724e-14	-13.706	-13.763	-0.057	(0)
	HgCl3-	1.716e-14	1.459e-14	-13.765	-13.836	-0.070	(0)
	ZnCl3-	5.885e-15	5.130e-15	-14.230	-14.290	-0.060	(0)
	CdCl3-	4.975e-15	4.230e-15	-14.303	-14.374	-0.070	(0)
	NiCl2	2.207e-15	2.207e-15	-14.656	-14.656	0.000	(0)
	PbCl3-	3.437e-16	2.922e-16	-15.464	-15.534	-0.070	(0)
	CrCl+2	3.309e-16	1.729e-16	-15.480	-15.762	-0.282	(0)
	HgCl4-2	1.672e-16	8.733e-17	-15.777	-16.059	-0.282	(0)
	HgCl+	1.516e-16	1.289e-16	-15.819	-15.890	-0.070	(0)
	UO2Cl+	9.786e-17	8.319e-17	-16.009	-16.080	-0.070	(0)
	CuCl3-	9.530e-18	8.307e-18	-17.021	-17.081	-0.060	(0)
	ZnCl4-2	6.545e-18	3.856e-18	-17.184	-17.414	-0.230	(0)
	CrOHC12	6.977e-19	6.977e-19	-18.156	-18.156	0.000	(0)
	PbCl4-2	3.843e-19	2.007e-19	-18.415	-18.697	-0.282	(0)
	VOC1+	4.562e-20	3.879e-20	-19.341	-19.411	-0.070	(0)
	FeCl+2	4.333e-20	2.552e-20	-19.363	-19.593	-0.230	(0)
	CrCl2+	2.900e-20	2.466e-20	-19.538	-19.608	-0.070	(0)
	FeCl2+	1.956e-22	1.714e-22	-21.709	-21.766	-0.057	(0)
	CuCl4-2	1.062e-22	6.258e-23	-21.974	-22.204	-0.230	(0)
	FeCl3	2.576e-26	2.576e-26	-25.589	-25.589	0.000	(0)
	CrO3Cl1-	2.081e-26	1.769e-26	-25.682	-25.752	-0.070	(0)
	CoCl+2	4.919e-35	2.570e-35	-34.308	-34.590	-0.282	(0)
	UCl+3	0.000e+00	0.000e+00	-44.578	-45.213	-0.634	(0)
Co (2)	1.357e-07						
	Co+2	9.574e-08	5.002e-08	-7.019	-7.301	-0.282	(0)
	CoHCO3+	1.993e-08	1.694e-08	-7.700	-7.771	-0.070	(0)
	CoSO4	1.682e-08	1.682e-08	-7.774	-7.774	0.000	(0)
	CoCO3	2.423e-09	2.423e-09	-8.616	-8.616	0.000	(0)
	CoF+	3.077e-10	2.616e-10	-9.512	-9.582	-0.070	(0)
	CoCl+	3.059e-10	2.601e-10	-9.514	-9.585	-0.070	(0)
	CoOH+	1.658e-10	1.410e-10	-9.780	-9.851	-0.070	(0)
	Co(OH) 2	1.582e-12	1.582e-12	-11.801	-11.801	0.000	(0)

CoSeO4	1.069e-16	1.069e-16	-15.971	-15.971	0.000	(0)
Co(OH) 3-	5.244e-18	4.458e-18	-17.280	-17.351	-0.070	(0)
Co2OH+3	1.523e-18	3.534e-19	-17.817	-18.452	-0.634	(0)
CoOOH-	1.316e-18	1.119e-18	-17.881	-17.951	-0.070	(0)
Co(OH) 4-2	1.910e-25	9.980e-26	-24.719	-25.001	-0.282	(0)
Co4(OH) 4+4	1.058e-30	7.879e-32	-29.976	-31.104	-1.128	(0)
Co(3)	1.154e-28					
CoOH+2	1.154e-28	6.031e-29	-27.938	-28.220	-0.282	(0)
Co+3	2.854e-34	8.402e-35	-33.545	-34.076	-0.531	(0)
CoCl+2	4.919e-35	2.570e-35	-34.308	-34.590	-0.282	(0)
Cr(2)	9.631e-26					
Cr+2	9.631e-26	5.031e-26	-25.016	-25.298	-0.282	(0)
Cr(3)	6.447e-09					
Cr(OH) 2+	5.552e-09	4.720e-09	-8.256	-8.326	-0.070	(0)
Cr(OH) +2	5.257e-10	2.746e-10	-9.279	-9.561	-0.282	(0)
Cr(OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.098e-10	1.098e-10	-9.959	-9.959	0.000	(0)
CrF+2	4.460e-12	2.330e-12	-11.351	-11.633	-0.282	(0)
CrO2-	1.964e-12	1.670e-12	-11.707	-11.777	-0.070	(0)
Cr(OH) 4-	1.657e-12	1.409e-12	-11.781	-11.851	-0.070	(0)
CrSO4+	4.113e-13	3.497e-13	-12.386	-12.456	-0.070	(0)
Cr+3	3.830e-13	8.887e-14	-12.417	-13.051	-0.634	(0)
CrCl+2	3.309e-16	1.729e-16	-15.480	-15.762	-0.282	(0)
Cr2(OH) 2SO4+2	5.219e-18	2.726e-18	-17.282	-17.564	-0.282	(0)
CrOHC12	6.977e-19	6.977e-19	-18.156	-18.156	0.000	(0)
Cr2(OH) 2(SO4) 2	2.729e-19	2.729e-19	-18.564	-18.564	0.000	(0)
CrCl2+	2.900e-20	2.466e-20	-19.538	-19.608	-0.070	(0)
Cr(6)	2.302e-16					
CrO4-2	1.961e-16	1.139e-16	-15.708	-15.944	-0.236	(0)
HCrO4-	3.089e-17	2.626e-17	-16.510	-16.581	-0.070	(0)
NaCrO4-	2.871e-18	2.441e-18	-17.542	-17.613	-0.070	(0)
KCrO4-	3.147e-19	2.676e-19	-18.502	-18.573	-0.070	(0)
CrO3SO4-2	1.839e-24	9.608e-25	-23.735	-24.017	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.081e-26	1.769e-26	-25.682	-25.752	-0.070	(0)
Cr2O7-2	4.578e-32	2.392e-32	-31.339	-31.621	-0.282	(0)
Cu(1)	2.076e-09					
CuCl	1.048e-09	1.048e-09	-8.980	-8.980	0.000	(0)
Cu+	6.512e-10	5.536e-10	-9.186	-9.257	-0.070	(0)
CuCl2-	3.774e-10	3.290e-10	-9.423	-9.483	-0.060	(0)
CuCl3-2	1.795e-13	1.057e-13	-12.746	-12.976	-0.230	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-148.141	-148.451	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.884	-149.181	-0.297	(0)
Cu(2)	9.587e-06					
CuCO3	8.047e-06	8.047e-06	-5.094	-5.094	0.000	(0)
Cu+2	8.213e-07	4.769e-07	-6.085	-6.322	-0.236	(0)
CuOH+	2.444e-07	2.130e-07	-6.612	-6.672	-0.060	(0)
CuSO4	1.841e-07	1.841e-07	-6.735	-6.735	0.000	(0)
CuHCO3+	1.542e-07	1.311e-07	-6.812	-6.883	-0.070	(0)
Cu(CO3) 2-2	1.188e-07	6.206e-08	-6.925	-7.207	-0.282	(0)
Cu(OH) 2	6.005e-09	6.005e-09	-8.222	-8.222	0.000	(0)
CuF+	5.855e-09	4.978e-09	-8.232	-8.303	-0.070	(0)
Cu2(OH) 2+2	2.182e-09	1.140e-09	-8.661	-8.943	-0.282	(0)
CuCl+	1.304e-09	1.136e-09	-8.885	-8.945	-0.060	(0)
Cu(OH) 3-	2.046e-12	1.740e-12	-11.689	-11.760	-0.070	(0)
CuCl2	5.922e-13	5.922e-13	-12.228	-12.228	0.000	(0)
CuCl3-	9.530e-18	8.307e-18	-17.021	-17.081	-0.060	(0)
Cu(OH) 4-2	3.702e-18	1.934e-18	-17.432	-17.713	-0.282	(0)
CuCl4-2	1.062e-22	6.258e-23	-21.974	-22.204	-0.230	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-215.670	-215.740	-0.070	(0)
F	2.117e-04					
F-	1.895e-04	1.654e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.778e-05	1.554e-05	-4.750	-4.809	-0.059	(0)
CaF+	2.382e-06	2.086e-06	-5.623	-5.681	-0.057	(0)
NaF	4.502e-07	4.502e-07	-6.347	-6.347	0.000	(0)
AlF3	3.238e-07	3.238e-07	-6.490	-6.490	0.000	(0)
AlF2+	1.771e-07	1.555e-07	-6.752	-6.808	-0.057	(0)
MnF+	7.791e-08	6.825e-08	-7.108	-7.166	-0.057	(0)

AlF4-	3.072e-08	2.684e-08	-7.513	-7.571	-0.059	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	5.855e-09	4.978e-09	-8.232	-8.303	-0.070	(0)
AlF+2	3.977e-09	2.361e-09	-8.400	-8.627	-0.226	(0)
ZnF+	1.854e-09	1.577e-09	-8.732	-8.802	-0.070	(0)
BF(OH) 3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
NiF+	3.705e-10	3.150e-10	-9.431	-9.502	-0.070	(0)
CoF+	3.077e-10	2.616e-10	-9.512	-9.582	-0.070	(0)
PbF+	1.870e-11	1.589e-11	-10.728	-10.799	-0.070	(0)
CdF+	1.529e-11	1.300e-11	-10.816	-10.886	-0.070	(0)
HF2-	1.261e-11	1.097e-11	-10.899	-10.960	-0.061	(0)
CrF+2	4.460e-12	2.330e-12	-11.351	-11.633	-0.282	(0)
AgF	2.878e-12	2.878e-12	-11.541	-11.541	0.000	(0)
BF2(OH) 2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
UO2F+	9.166e-13	7.793e-13	-12.038	-12.108	-0.070	(0)
UO2F2	3.718e-13	3.718e-13	-12.430	-12.430	0.000	(0)
PbF2	5.174e-14	5.174e-14	-13.286	-13.286	0.000	(0)
UO2F3-	1.817e-14	1.545e-14	-13.741	-13.811	-0.070	(0)
CdF2	4.290e-15	4.290e-15	-14.367	-14.367	0.000	(0)
VO2F	2.772e-15	2.772e-15	-14.557	-14.557	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.153e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
VO2F2-	1.958e-16	1.665e-16	-15.708	-15.779	-0.070	(0)
FeF+2	1.731e-16	1.020e-16	-15.762	-15.991	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	3.885e-17	2.030e-17	-16.411	-16.693	-0.282	(0)
PbF3-	1.910e-17	1.623e-17	-16.719	-16.790	-0.070	(0)
VOF+	1.073e-17	9.126e-18	-16.969	-17.040	-0.070	(0)
BF3OH-	7.034e-18	6.079e-18	-17.153	-17.216	-0.063	(0)
VO2F3-2	6.575e-19	3.435e-19	-18.182	-18.464	-0.282	(0)
VOF2	5.661e-19	5.661e-19	-18.247	-18.247	0.000	(0)
VOF3-	3.908e-21	3.323e-21	-20.408	-20.479	-0.070	(0)
PbF4-2	2.460e-21	1.285e-21	-20.609	-20.891	-0.282	(0)
BF4-	4.081e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
VO2F4-3	1.205e-22	2.796e-23	-21.919	-22.554	-0.634	(0)
HgF+	3.099e-23	2.635e-23	-22.509	-22.579	-0.070	(0)
VOF4-2	4.247e-24	2.218e-24	-23.372	-23.654	-0.282	(0)
Sb(OH) 2F	1.007e-24	1.007e-24	-23.997	-23.997	0.000	(0)
SbOF	9.909e-25	9.909e-25	-24.004	-24.004	0.000	(0)
UF3+	1.724e-34	1.465e-34	-33.764	-33.834	-0.070	(0)
UF2+2	1.070e-35	5.590e-36	-34.971	-35.253	-0.282	(0)
UF4	2.658e-36	2.658e-36	-35.575	-35.575	0.000	(0)
UF5-	2.050e-38	1.742e-38	-37.688	-37.759	-0.070	(0)
UF+3	1.157e-38	2.684e-39	-37.937	-38.571	-0.634	(0)
UF6-2	1.666e-39	8.704e-40	-38.778	-39.060	-0.282	(0)
Fe (2)	3.438e-11					
Fe+2	2.746e-11	1.435e-11	-10.561	-10.843	-0.282	(0)
FeSO4	5.934e-12	5.934e-12	-11.227	-11.227	0.000	(0)
FeHCO3+	8.935e-13	7.865e-13	-12.049	-12.104	-0.055	(0)
FeOH+	9.208e-14	8.067e-14	-13.036	-13.093	-0.057	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.615e-19	4.043e-19	-18.336	-18.393	-0.057	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.772	-158.772	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.104	-235.174	-0.070	(0)
Fe (3)	3.645e-09					
Fe(OH) 2+	3.211e-09	2.818e-09	-8.493	-8.550	-0.057	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.407e-12	5.624e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.705e-14	5.128e-14	-13.060	-13.290	-0.230	(0)
FeF2+	5.153e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
FeF+2	1.731e-16	1.020e-16	-15.762	-15.991	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.214e-17	1.063e-17	-16.916	-16.973	-0.057	(0)
Fe+3	1.910e-18	5.623e-19	-17.719	-18.250	-0.531	(0)
Fe(SO4) 2-	4.506e-19	3.831e-19	-18.346	-18.417	-0.070	(0)
FeCl+2	4.333e-20	2.552e-20	-19.363	-19.593	-0.230	(0)
FeCl2+	1.956e-22	1.714e-22	-21.709	-21.766	-0.057	(0)
FeHSeO3+2	5.011e-23	2.618e-23	-22.300	-22.582	-0.282	(0)

	Fe2 (OH) 2+4	1.169e-24	8.709e-26	-23.932	-25.060	-1.128	(0)
	FeCl3	2.576e-26	2.576e-26	-25.589	-25.589	0.000	(0)
	Fe3 (OH) 4+5	2.053e-31	3.548e-33	-30.688	-32.450	-1.762	(0)
H (0)	4.020e-29						
	H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.228e-10						
	Hg	2.228e-10	2.228e-10	-9.652	-9.652	0.000	(0)
Hg (1)	2.488e-21						
	Hg2+2	1.244e-21	6.498e-22	-20.905	-21.187	-0.282	(0)
Hg (2)	3.153e-12						
	HgClOH	1.611e-12	1.611e-12	-11.793	-11.793	0.000	(0)
	HgCl2	9.709e-13	9.709e-13	-12.013	-12.013	0.000	(0)
	Hg (OH) 2	5.386e-13	5.410e-13	-12.269	-12.267	0.002	(0)
	HgCl3-	1.716e-14	1.459e-14	-13.765	-13.836	-0.070	(0)
	HgCO3	1.473e-14	1.473e-14	-13.832	-13.832	0.000	(0)
	Hg (CO3) 2-2	2.556e-16	1.335e-16	-15.593	-15.874	-0.282	(0)
	HgCl4-2	1.672e-16	8.733e-17	-15.777	-16.059	-0.282	(0)
	HgCl+	1.516e-16	1.289e-16	-15.819	-15.890	-0.070	(0)
	HgOH+	2.842e-17	2.416e-17	-16.546	-16.617	-0.070	(0)
	HgHCO3+	2.300e-17	1.955e-17	-16.638	-16.709	-0.070	(0)
	Hg (OH) 3-	1.132e-20	9.620e-21	-19.946	-20.017	-0.070	(0)
	Hg+2	8.225e-21	4.297e-21	-20.085	-20.367	-0.282	(0)
	HgSO4	1.896e-21	1.896e-21	-20.722	-20.722	0.000	(0)
	HgF+	3.099e-23	2.635e-23	-22.509	-22.579	-0.070	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.100	-138.170	-0.070	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.923	-138.923	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.449	-139.731	-0.282	(0)
K	7.331e-04						
	K+	7.245e-04	6.325e-04	-3.140	-3.199	-0.059	(0)
	KSO4-	8.597e-06	7.546e-06	-5.066	-5.122	-0.057	(0)
	KCrO4-	3.147e-19	2.676e-19	-18.502	-18.573	-0.070	(0)
Mg	1.761e-03						
	Mg+2	1.441e-03	8.370e-04	-2.841	-3.077	-0.236	(0)
	MgSO4	2.567e-04	2.567e-04	-3.591	-3.591	0.000	(0)
	MgHCO3+	4.280e-05	3.730e-05	-4.369	-4.428	-0.060	(0)
	MgF+	1.778e-05	1.554e-05	-4.750	-4.809	-0.059	(0)
	MgCO3	1.995e-06	1.995e-06	-5.700	-5.700	0.000	(0)
	MgOH+	5.336e-08	4.707e-08	-7.273	-7.327	-0.054	(0)
	MgH2BO3+	4.359e-09	3.767e-09	-8.361	-8.424	-0.063	(0)
Mn (2)	2.408e-05						
	Mn+2	1.984e-05	1.036e-05	-4.702	-4.984	-0.282	(0)
	MnSO4	3.106e-06	3.106e-06	-5.508	-5.508	0.000	(0)
	MnHCO3+	1.028e-06	9.006e-07	-5.988	-6.045	-0.057	(0)
	MnF+	7.791e-08	6.825e-08	-7.108	-7.166	-0.057	(0)
	MnCl+	2.239e-08	1.961e-08	-7.650	-7.707	-0.057	(0)
	MnOH+	4.198e-09	3.678e-09	-8.377	-8.434	-0.057	(0)
	MnCl2	4.164e-11	4.164e-11	-10.380	-10.380	0.000	(0)
	MnCl3-	1.968e-14	1.724e-14	-13.706	-13.763	-0.057	(0)
	MnSeO4	1.189e-14	1.189e-14	-13.925	-13.925	0.000	(0)
	Mn (OH) 3-	5.176e-19	4.535e-19	-18.286	-18.343	-0.057	(0)
	Mn (OH) 4-2	3.511e-25	2.068e-25	-24.455	-24.684	-0.230	(0)
	MnSe	0.000e+00	0.000e+00	-42.750	-42.750	0.000	(0)
Mn (3)	6.636e-25						
	Mn+3	6.636e-25	1.953e-25	-24.178	-24.709	-0.531	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-43.499	-43.729	-0.230	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-47.413	-47.475	-0.062	(0)
Mo	3.032e-07						
	MoO4-2	3.030e-07	1.759e-07	-6.519	-6.755	-0.236	(0)
	HMoO4-	2.934e-10	2.494e-10	-9.533	-9.603	-0.070	(0)
	H2MoO4	1.302e-13	1.302e-13	-12.885	-12.885	0.000	(0)
	Ag2MoO4	3.195e-24	3.195e-24	-23.496	-23.496	0.000	(0)
	AlMo6O21-3	2.349e-40	0.000e+00	-39.629	-40.264	-0.634	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-48.932	-51.469	-2.538	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.467	-52.230	-1.762	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.467	-54.595	-1.128	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-57.861	-58.496	-0.634	(0)

Na	4.996e-03					
Na+	4.941e-03	4.313e-03	-2.306	-2.365	-0.059	(0)
NaSO4-	4.447e-05	3.903e-05	-4.352	-4.409	-0.057	(0)
NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)
NaF	4.502e-07	4.502e-07	-6.347	-6.347	0.000	(0)
NaCO3-	2.622e-07	2.301e-07	-6.581	-6.638	-0.057	(0)
NaH2BO3	8.873e-10	8.873e-10	-9.052	-9.052	0.000	(0)
NaCrO4-	2.871e-18	2.441e-18	-17.542	-17.613	-0.070	(0)
Ni	2.129e-07					
Ni+2	1.305e-07	7.581e-08	-6.884	-7.120	-0.236	(0)
NiHCO3+	4.788e-08	4.070e-08	-7.320	-7.390	-0.070	(0)
NiSO4	2.549e-08	2.549e-08	-7.594	-7.594	0.000	(0)
NiCO3	8.104e-09	8.104e-09	-8.091	-8.091	0.000	(0)
NiF+	3.705e-10	3.150e-10	-9.431	-9.502	-0.070	(0)
NiCl+	3.429e-10	2.916e-10	-9.465	-9.535	-0.070	(0)
NiOH+	1.586e-10	1.348e-10	-9.800	-9.870	-0.070	(0)
Ni (SO4) 2-2	2.723e-12	1.423e-12	-11.565	-11.847	-0.282	(0)
Ni (OH) 2	1.513e-12	1.513e-12	-11.820	-11.820	0.000	(0)
NiCl2	2.207e-15	2.207e-15	-14.656	-14.656	0.000	(0)
Ni (OH) 3-	2.513e-16	2.137e-16	-15.600	-15.670	-0.070	(0)
NiSeO4	1.512e-16	1.512e-16	-15.820	-15.820	0.000	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.129e-08					
PbCO3	1.174e-08	1.174e-08	-7.930	-7.930	0.000	(0)
PbHCO3+	5.190e-09	4.412e-09	-8.285	-8.355	-0.070	(0)
Pb+2	2.348e-09	1.364e-09	-8.629	-8.865	-0.236	(0)
PbSO4	1.125e-09	1.125e-09	-8.949	-8.949	0.000	(0)
PbOH+	5.691e-10	4.838e-10	-9.245	-9.315	-0.070	(0)
Pb (CO3) 2-2	1.858e-10	9.705e-11	-9.731	-10.013	-0.282	(0)
PbCl+	8.554e-11	7.272e-11	-10.068	-10.138	-0.070	(0)
Pb (SO4) 2-2	2.188e-11	1.143e-11	-10.660	-10.942	-0.282	(0)
PbF+	1.870e-11	1.589e-11	-10.728	-10.799	-0.070	(0)
Pb (OH) 2	2.161e-12	2.161e-12	-11.665	-11.665	0.000	(0)
PbCl2	4.883e-13	4.883e-13	-12.311	-12.311	0.000	(0)
PbF2	5.174e-14	5.174e-14	-13.286	-13.286	0.000	(0)
Pb (OH) 3-	3.591e-16	3.053e-16	-15.445	-15.515	-0.070	(0)
PbCl3-	3.437e-16	2.922e-16	-15.464	-15.534	-0.070	(0)
Pb2OH+3	4.506e-17	1.046e-17	-16.346	-16.981	-0.634	(0)
PbF3-	1.910e-17	1.623e-17	-16.719	-16.790	-0.070	(0)
PbCl4-2	3.843e-19	2.007e-19	-18.415	-18.697	-0.282	(0)
Pb (OH) 4-2	2.022e-20	1.056e-20	-19.694	-19.976	-0.282	(0)
PbF4-2	2.460e-21	1.285e-21	-20.609	-20.891	-0.282	(0)
Pb3 (OH) 4+2	2.432e-22	1.271e-22	-21.614	-21.896	-0.282	(0)
Pb4 (OH) 4+4	1.848e-26	1.376e-27	-25.733	-26.861	-1.128	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.474	-150.474	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.543	-227.613	-0.070	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.784	-72.784	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.369	-78.439	-0.070	(0)
H2S	0.000e+00	0.000e+00	-78.566	-78.566	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.665	-78.736	-0.070	(0)
S5-2	0.000e+00	0.000e+00	-80.375	-80.657	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.891	-81.173	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.971	-81.253	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.777	-82.059	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.793	-83.075	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.362	-88.592	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.100	-138.170	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.923	-138.923	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.449	-139.731	-0.282	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.053	-147.124	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.292	-147.460	-0.168	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.141	-148.451	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.884	-149.181	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.172	-149.242	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.435	-149.753	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.760	-150.064	-0.304	(0)

Cd (HS) 2	0.000e+00	0.000e+00	-149.971	-149.971	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.379	-150.379	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.474	-150.474	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.772	-158.772	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.670	-215.740	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.468	-225.539	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.440	-226.511	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.543	-227.613	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.090	-228.372	-0.282	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.104	-235.174	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.472	-302.754	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.156	-305.438	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.904	-317.186	-0.282	(0)
S (6)	3.662e-03					
SO4-2	2.902e-03	1.685e-03	-2.537	-2.773	-0.236	(0)
CaSO4	4.462e-04	4.462e-04	-3.351	-3.351	0.000	(0)
MgSO4	2.567e-04	2.567e-04	-3.591	-3.591	0.000	(0)
NaSO4-	4.447e-05	3.903e-05	-4.352	-4.409	-0.057	(0)
KSO4-	8.597e-06	7.546e-06	-5.066	-5.122	-0.057	(0)
MnSO4	3.106e-06	3.106e-06	-5.508	-5.508	0.000	(0)
CuSO4	1.841e-07	1.841e-07	-6.735	-6.735	0.000	(0)
ZnSO4	1.761e-07	1.761e-07	-6.754	-6.754	0.000	(0)
NiSO4	2.549e-08	2.549e-08	-7.594	-7.594	0.000	(0)
CoSO4	1.682e-08	1.682e-08	-7.774	-7.774	0.000	(0)
HSO4-	1.343e-08	1.174e-08	-7.872	-7.930	-0.059	(0)
Zn (SO4) 2-2	4.948e-09	2.585e-09	-8.306	-8.588	-0.282	(0)
CdSO4	1.959e-09	1.959e-09	-8.708	-8.708	0.000	(0)
PbSO4	1.125e-09	1.125e-09	-8.949	-8.949	0.000	(0)
AgSO4-	2.739e-10	2.329e-10	-9.562	-9.633	-0.070	(0)
CrOHSO4	1.098e-10	1.098e-10	-9.959	-9.959	0.000	(0)
Cd (SO4) 2-2	8.524e-11	4.453e-11	-10.069	-10.351	-0.282	(0)
Pb (SO4) 2-2	2.188e-11	1.143e-11	-10.660	-10.942	-0.282	(0)
AlSO4+	2.137e-11	1.867e-11	-10.670	-10.729	-0.059	(0)
FeSO4	5.934e-12	5.934e-12	-11.227	-11.227	0.000	(0)
Ni (SO4) 2-2	2.723e-12	1.423e-12	-11.565	-11.847	-0.282	(0)
CrSO4+	4.113e-13	3.497e-13	-12.386	-12.456	-0.070	(0)
Al (SO4) 2-	3.858e-13	3.372e-13	-12.414	-12.472	-0.059	(0)
UO2SO4	8.705e-14	8.705e-14	-13.060	-13.060	0.000	(0)
UO2 (SO4) 2-2	3.702e-15	1.934e-15	-14.432	-14.714	-0.282	(0)
VO2SO4-	4.522e-16	3.844e-16	-15.345	-15.415	-0.070	(0)
FeSO4+	1.214e-17	1.063e-17	-16.916	-16.973	-0.057	(0)
Cr2 (OH) 2SO4+2	5.219e-18	2.726e-18	-17.282	-17.564	-0.282	(0)
VOSO4	4.270e-18	4.270e-18	-17.370	-17.370	0.000	(0)
Fe (SO4) 2-	4.506e-19	3.831e-19	-18.346	-18.417	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.729e-19	2.729e-19	-18.564	-18.564	0.000	(0)
HgSO4	1.896e-21	1.896e-21	-20.722	-20.722	0.000	(0)
CrO3SO4-2	1.839e-24	9.608e-25	-23.735	-24.017	-0.282	(0)
VSO4+	5.146e-32	4.375e-32	-31.289	-31.359	-0.070	(0)
U (SO4) 2	7.304e-40	7.304e-40	-39.136	-39.136	0.000	(0)
USO4+2	1.044e-40	0.000e+00	-39.981	-40.263	-0.282	(0)
Sb (3)	1.081e-19					
Sb (OH) 3	5.469e-20	5.469e-20	-19.262	-19.262	0.000	(0)
HSbO2	5.340e-20	5.340e-20	-19.272	-19.272	0.000	(0)
SbO2-	1.428e-24	1.214e-24	-23.845	-23.916	-0.070	(0)
Sb (OH) 2F	1.007e-24	1.007e-24	-23.997	-23.997	0.000	(0)
SbOF	9.909e-25	9.909e-25	-24.004	-24.004	0.000	(0)
Sb (OH) 4-	8.176e-25	6.951e-25	-24.087	-24.158	-0.070	(0)
Sb (OH) 2+	1.114e-25	9.467e-26	-24.953	-25.024	-0.070	(0)
SbO+	3.840e-26	3.265e-26	-25.416	-25.486	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.904	-317.186	-0.282	(0)
Sb (5)	1.327e-08					
SbO3-	1.325e-08	1.127e-08	-7.878	-7.948	-0.070	(0)
Sb (OH) 6-	1.508e-11	1.317e-11	-10.822	-10.881	-0.059	(0)
SbO2+	1.931e-23	1.642e-23	-22.714	-22.785	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.486e-40	2.964e-40	-39.458	-39.528	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.750	-42.750	0.000	(0)

H2Se	0.000e+00	0.000e+00	-42.785	-42.785	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.099	-47.381	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.156	-86.283	-1.128	(0)
Se (4)	2.261e-08					
HSeO3-	2.072e-08	1.762e-08	-7.684	-7.754	-0.070	(0)
SeO3-2	1.884e-09	9.843e-10	-8.725	-9.007	-0.282	(0)
H2SeO3	5.355e-13	5.355e-13	-12.271	-12.271	0.000	(0)
AgSeO3-	5.153e-15	4.381e-15	-14.288	-14.358	-0.070	(0)
Cd (SeO3) 2-2	7.578e-21	3.959e-21	-20.120	-20.402	-0.282	(0)
Ag (SeO3) 2-3	1.664e-22	3.861e-23	-21.779	-22.413	-0.634	(0)
FeHSeO3+2	5.011e-23	2.618e-23	-22.300	-22.582	-0.282	(0)
Se (6)	7.355e-12					
SeO4-2	7.343e-12	4.264e-12	-11.134	-11.370	-0.236	(0)
MnSeO4	1.189e-14	1.189e-14	-13.925	-13.925	0.000	(0)
ZnSeO4	3.154e-16	3.154e-16	-15.501	-15.501	0.000	(0)
NiSeO4	1.512e-16	1.512e-16	-15.820	-15.820	0.000	(0)
CoSeO4	1.069e-16	1.069e-16	-15.971	-15.971	0.000	(0)
HSeO4-	1.791e-17	1.523e-17	-16.747	-16.817	-0.070	(0)
CdSeO4	3.937e-18	3.937e-18	-17.405	-17.405	0.000	(0)
Zn (SeO4) 2-2	2.610e-27	1.364e-27	-26.583	-26.865	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.877	-58.511	-0.634	(0)
U (4)	3.952e-22					
U (OH) 5-	3.942e-22	3.352e-22	-21.404	-21.475	-0.070	(0)
U (OH) 4	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
U (OH) 3+	3.067e-28	2.608e-28	-27.513	-27.584	-0.070	(0)
U (OH) 2+2	1.645e-32	8.595e-33	-31.784	-32.066	-0.282	(0)
UF3+	1.724e-34	1.465e-34	-33.764	-33.834	-0.070	(0)
UF2+2	1.070e-35	5.590e-36	-34.971	-35.253	-0.282	(0)
UF4	2.658e-36	2.658e-36	-35.575	-35.575	0.000	(0)
UOH+3	1.244e-37	2.886e-38	-36.905	-37.540	-0.634	(0)
UF5-	2.050e-38	1.742e-38	-37.688	-37.759	-0.070	(0)
UF+3	1.157e-38	2.684e-39	-37.937	-38.571	-0.634	(0)
UF6-2	1.666e-39	8.704e-40	-38.778	-39.060	-0.282	(0)
U (SO4) 2	7.304e-40	7.304e-40	-39.136	-39.136	0.000	(0)
USO4+2	1.044e-40	0.000e+00	-39.981	-40.263	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.962	-44.090	-1.128	(0)
UCl+3	0.000e+00	0.000e+00	-44.578	-45.213	-0.634	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.778	-174.489	-5.710	(0)
U (5)	5.799e-17					
UO2+	5.799e-17	4.930e-17	-16.237	-16.307	-0.070	(0)
U (6)	8.590e-08					
UO2 (CO3) 3-4	4.291e-08	3.196e-09	-7.367	-8.495	-1.128	(0)
UO2 (CO3) 2-2	4.260e-08	2.226e-08	-7.371	-7.653	-0.282	(0)
UO2CO3	3.893e-10	3.893e-10	-9.410	-9.410	0.000	(0)
UO2F+	9.166e-13	7.793e-13	-12.038	-12.108	-0.070	(0)
UO2OH+	7.138e-13	6.069e-13	-12.146	-12.217	-0.070	(0)
UO2F2	3.718e-13	3.718e-13	-12.430	-12.430	0.000	(0)
UO2SO4	8.705e-14	8.705e-14	-13.060	-13.060	0.000	(0)
UO2+2	5.877e-14	3.413e-14	-13.231	-13.467	-0.236	(0)
UO2F3-	1.817e-14	1.545e-14	-13.741	-13.811	-0.070	(0)
UO2 (SO4) 2-2	3.702e-15	1.934e-15	-14.432	-14.714	-0.282	(0)
UO2Cl+	9.786e-17	8.319e-17	-16.009	-16.080	-0.070	(0)
UO2F4-2	3.885e-17	2.030e-17	-16.411	-16.693	-0.282	(0)
(UO2) 2 (OH) 2+2	1.170e-18	6.112e-19	-17.932	-18.214	-0.282	(0)
(UO2) 3 (OH) 5+	6.604e-21	5.615e-21	-20.180	-20.251	-0.070	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.464	-40.535	-0.070	(0)
V+2	0.000e+00	0.000e+00	-40.913	-41.195	-0.282	(0)
V (3)	1.250e-13					
V (OH) 3	1.250e-13	1.250e-13	-12.903	-12.903	0.000	(0)
V (OH) 2+	6.773e-24	5.758e-24	-23.169	-23.240	-0.070	(0)
VOH+2	7.452e-27	3.893e-27	-26.128	-26.410	-0.282	(0)
V+3	2.370e-31	5.499e-32	-30.625	-31.260	-0.634	(0)
VSO4+	5.146e-32	4.375e-32	-31.289	-31.359	-0.070	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.563	-51.198	-0.634	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.892	-52.019	-1.128	(0)
V (4)	3.381e-16					

V(OH) 3+	3.048e-16	2.592e-16	-15.516	-15.586	-0.070	(0)
VO+2	1.761e-17	9.198e-18	-16.754	-17.036	-0.282	(0)
VOF+	1.073e-17	9.126e-18	-16.969	-17.040	-0.070	(0)
VOSO4	4.270e-18	4.270e-18	-17.370	-17.370	0.000	(0)
VOF2	5.661e-19	5.661e-19	-18.247	-18.247	0.000	(0)
VOC1+	4.562e-20	3.879e-20	-19.341	-19.411	-0.070	(0)
VOF3-	3.908e-21	3.323e-21	-20.408	-20.479	-0.070	(0)
VOF4-2	4.247e-24	2.218e-24	-23.372	-23.654	-0.282	(0)
H2V2O4+2	6.448e-27	3.369e-27	-26.191	-26.473	-0.282	(0)
V (5)	1.174e-07					
H2VO4-	1.108e-07	9.423e-08	-6.955	-7.026	-0.070	(0)
HVO4-2	6.358e-09	3.321e-09	-8.197	-8.479	-0.282	(0)
H3VO4	6.714e-11	6.714e-11	-10.173	-10.173	0.000	(0)
H3V2O7-	4.806e-11	4.086e-11	-10.318	-10.389	-0.070	(0)
HV2O7-3	4.572e-13	1.061e-13	-12.340	-12.974	-0.634	(0)
VO2+	1.094e-14	9.553e-15	-13.961	-14.020	-0.059	(0)
V3O9-3	3.779e-15	8.769e-16	-14.423	-15.057	-0.634	(0)
VO2F	2.772e-15	2.772e-15	-14.557	-14.557	0.000	(0)
VO4-3	1.007e-15	2.336e-16	-14.997	-15.632	-0.634	(0)
V2O7-4	5.379e-16	4.007e-17	-15.269	-16.397	-1.128	(0)
VO2SO4-	4.522e-16	3.844e-16	-15.345	-15.415	-0.070	(0)
VO2F2-	1.958e-16	1.665e-16	-15.708	-15.779	-0.070	(0)
VO2F3-2	6.575e-19	3.435e-19	-18.182	-18.464	-0.282	(0)
V4O12-4	4.626e-19	3.446e-20	-18.335	-19.463	-1.128	(0)
VO2F4-3	1.205e-22	2.796e-23	-21.919	-22.554	-0.634	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.138	-48.900	-1.762	(0)
V10O28-6	0.000e+00	0.000e+00	-47.402	-49.939	-2.538	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.712	-50.839	-1.128	(0)
Zn	1.172e-06					
Zn+2	8.226e-07	4.777e-07	-6.085	-6.321	-0.236	(0)
ZnSO4	1.761e-07	1.761e-07	-6.754	-6.754	0.000	(0)
ZnCO3	7.876e-08	7.876e-08	-7.104	-7.104	0.000	(0)
ZnHCO3+	7.738e-08	6.579e-08	-7.111	-7.182	-0.070	(0)
ZnOH+	7.936e-09	6.747e-09	-8.100	-8.171	-0.070	(0)
Zn(SO4) 2-2	4.948e-09	2.585e-09	-8.306	-8.588	-0.282	(0)
ZnCl+	2.069e-09	1.803e-09	-8.684	-8.744	-0.060	(0)
ZnF+	1.854e-09	1.577e-09	-8.732	-8.802	-0.070	(0)
ZnOHC1	3.335e-10	3.335e-10	-9.477	-9.477	0.000	(0)
Zn(OH) 2	1.511e-10	1.511e-10	-9.821	-9.821	0.000	(0)
ZnCl2	4.296e-12	4.296e-12	-11.367	-11.367	0.000	(0)
Zn(OH) 3-	1.258e-13	1.069e-13	-12.900	-12.971	-0.070	(0)
ZnCl3-	5.885e-15	5.130e-15	-14.230	-14.290	-0.060	(0)
ZnSeO4	3.154e-16	3.154e-16	-15.501	-15.501	0.000	(0)
ZnCl4-2	6.545e-18	3.856e-18	-17.184	-17.414	-0.230	(0)
Zn(OH) 4-2	1.151e-18	6.014e-19	-17.939	-18.221	-0.282	(0)
Zn(SeO4) 2-2	2.610e-27	1.364e-27	-26.583	-26.865	-0.282	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-149.172	-149.242	-0.070	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.379	-150.379	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.468	-225.539	-0.070	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.090	-228.372	-0.282	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.156	-305.438	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-51.39	-87.61	-36.22	Ag2S
Ag2CO3	-10.77	-21.86	-11.09	Ag2CO3
Ag2CrO4	-20.67	-32.26	-11.59	Ag2CrO4
Ag2HVO4	-10.38	-8.90	1.48	Ag2HVO4
Ag2MoO4	-11.52	-23.07	-11.55	Ag2MoO4
Ag2O	-14.60	-2.02	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-26.93	-24.77	2.16	Ag3AsO3
Ag3AsO4	-15.34	-18.12	-2.79	Ag3AsO4

Ag3H2VO5	-15.09	-9.91	5.18	Ag3H2VO5
AgF:4H2O	-12.99	-11.94	1.05	AgF:4H2O
Agmetal	-0.28	-13.78	-13.51	Ag
AgVO3	-8.66	-7.89	0.77	AgVO3
Al(OH)3(am)	-1.20	9.60	10.80	Al(OH)3
Al2(MoO4)3	-46.32	-43.95	2.37	Al2(MoO4)3
Al2O3	-0.46	19.19	19.65	Al2O3
Al4(OH)10SO4	-1.39	21.31	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.29	-5.49	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.85	-11.64	-7.79	PbSO4
Anhydrite	-1.35	-5.71	-4.36	CaSO4
Anilite	-54.88	-86.76	-31.88	Cu0.25Cu1.5S
Antlerite	-1.94	6.85	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-84.17	-86.93	-2.76	As4O6
Artinite	-7.00	2.60	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-36.88	-30.17	6.71	As2O5
Atacamite	-1.42	5.97	7.39	Cu2(OH)3Cl
Azurite	1.15	-15.76	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-17.31	7.09	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-15.44	0.43	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-25.42	7.52	32.94	Ba3(VO4)2:4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-8.95	-14.77	-5.82	BaF2
BaMoO4	-7.00	-13.96	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.64	-7.81	1.83	BaSeO3
BaSeO4	-11.12	-18.58	-7.46	BaSeO4
Bianchite	-7.33	-9.10	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.89	-6.54	-0.64	Mn2O3
BlaubleiI	-54.67	-78.83	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.21	-82.49	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.60	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.40	14.82	15.22	Cu4(OH)6SO4
Brucite	-5.63	11.22	16.84	Mg(OH)2
Bunsenite	-5.27	7.17	12.45	NiO
Ca(VO3)2	-8.05	-2.39	5.66	Ca(VO3)2
Ca2V2O7	-8.53	8.97	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.58	8.97	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-18.40	3.90	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.63	20.33	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-19.54	20.32	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-300.69	-157.72	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.92	-26.83	-17.91	Hg2Cl2
CaMoO4	-1.74	-9.69	-7.95	CaMoO4
Carnotite	-2.33	-2.10	0.23	KUO2VO4
CaSeO3:2H2O	-6.36	-3.54	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.29	-14.31	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.45	-3.61	9.84	Cd(BO2)2
Cd(OH)2	-7.65	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.88	-16.17	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.66	0.90	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.51	6.89	28.40	Cd4(OH)6SO4
CdCl2	-13.29	-13.95	-0.66	CdCl2
CdCl2:1H2O	-12.26	-13.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.04	-13.95	-1.91	CdCl2:2.5H2O
CdF2	-14.66	-15.87	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd

Cdmetal (gamma)	-33.17	-19.56	13.62	Cd
CdMoO4	-0.91	-15.06	-14.15	CdMoO4
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.78	-77.13	-0.35	CdSb
CdSe	-20.49	-40.69	-20.20	CdSe
CdSeO4:2H2O	-17.83	-19.68	-1.85	CdSeO4:2H2O
CdSO4	-10.91	-11.08	-0.17	CdSO4
CdSO4:1H2O	-9.35	-11.08	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.21	-11.08	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.23	-10.98	-9.75	AgCl
Cerrusite	-1.28	-14.41	-13.13	PbCO3
CH4 (g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.46	-9.10	-2.64	CuSO4:5H2O
Chalcocite	-54.89	-89.81	-34.92	Cu2S
Chalcopyrite	-124.48	-159.75	-35.27	CuFeS2
Cinnabar	-52.16	-97.85	-45.69	HgS
Claudetite	-83.87	-86.93	-3.06	As4O6
Clausthalite	-14.15	-41.25	-27.10	PbSe
Co (BO2) 2	-29.67	-2.60	27.07	Co (BO2) 2
Co (OH) 2	-6.10	6.99	13.09	Co (OH) 2
Co (OH) 3	-10.33	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-22.23	-9.19	13.03	Co3 (AsO4) 2
Co3O4	-7.78	-18.28	-10.50	Co3O4
CoCl2	-21.21	-12.95	8.27	CoCl2
CoCl2:6H2O	-15.48	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.27	-14.86	-1.60	CoF2
CoF3	-43.96	-45.42	-1.46	CoF3
CoFe2O4	16.90	13.38	-3.53	CoFe2O4
CoMoO4	-6.29	-14.06	-7.76	CoMoO4
CoO	-6.59	6.99	13.59	CoO
CoS (alpha)	-71.15	-78.59	-7.44	CoS
CoS (beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.48	-39.68	-16.20	CoSe
CoSeO3	-9.23	-7.91	1.32	CoSeO3
CoSeO4:6H2O	-17.14	-18.67	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.07	2.80	CoSO4
CoSO4:6H2O	-7.60	-10.08	-2.47	CoSO4:6H2O
Cotunnite	-9.73	-14.51	-4.78	PbCl2
Covellite	-55.31	-77.61	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.04	-30.94	14.09	CrCl2
CrCl3	-46.20	-31.09	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu (OH) 2	-0.70	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.67	20.54	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-55.15	-90.03	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.09	-50.89	-45.80	Cu2Se
Cu2SO4	-19.34	-21.29	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.63	-102.23	-42.59	Cu3Sb
Cu3Se2	-26.11	-89.60	-63.49	Cu3Se2
CuCO3	-0.36	-11.86	-11.50	CuCO3
CuCrO4	-16.83	-22.27	-5.44	CuCrO4
CuF	-8.13	-13.04	-4.91	CuF
CuF2	-15.00	-13.88	1.12	CuF2
CuF2:2H2O	-9.33	-13.88	-4.55	CuF2:2H2O
Cumetal	-6.13	-14.88	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.43	-1.12	10.30	CuOCuSO4
Cupricferrite	8.37	14.36	5.99	CuFe2O4

Cuprite	-2.81	-4.22	-1.41	Cu2O
Cuprousferrite	10.00	1.08	-8.92	CuFeO2
CuSe	-5.60	-38.70	-33.10	CuSe
CuSe2	-26.47	-59.83	-33.37	CuSe2
CuSeO3:2H2O	-7.44	-6.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.25	-17.69	-2.44	CuSeO4:5H2O
CuSO4	-12.03	-9.09	2.94	CuSO4
Diaspore	2.72	9.60	6.87	AlOOH
Djurleite	-55.08	-89.00	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO3)2
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO3)2
Epsomite	-3.73	-5.85	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl1.3	3.24	0.20	-3.04	Fe(OH)2.7Cl1.3
Fe(VO3)2	-6.57	-10.29	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.07	-8.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.69	-38.32	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.09	-44.82	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.30	-11.90	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.51	-17.60	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.76	-64.35	-18.60	FeSe2
FeS(ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-5.63	-5.63	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.19	-80.16	-13.97	PbS
Gibbsite	1.30	9.60	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.08	-9.10	-2.01	ZnSO4:7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.48	-332.51	-45.03	Fe3S4
Gummite	-6.84	0.83	7.67	UO3
Gypsum	-1.10	-5.71	-4.61	CaSO4:2H2O
H-Jarosite	-12.46	-24.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.17	-21.05	-12.88	H2MoO4
H2S(g)	-77.58	-85.59	-8.01	H2S
H2Se(g)	-41.72	-46.68	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3)2(g)	-182.59	-256.30	-73.71	Hg(CH3)2
Hg(g)	-8.35	-16.22	-7.87	Hg
Hg(OH)2	-8.77	-12.27	-3.50	Hg(OH)2
Hg2(g)	-17.48	-32.44	-14.96	Hg2
Hg2(OH)2	-12.15	-6.89	5.26	Hg2(OH)2
Hg2CO3	-10.68	-26.73	-16.05	Hg2CO3
Hg2CrO4	-28.43	-37.13	-8.70	Hg2CrO4
Hg2F2	-18.39	-28.75	-10.36	Hg2F2
Hg2S	-80.80	-92.48	-11.68	Hg2S
Hg2SeO3	-17.14	-21.79	-4.66	Hg2SeO3
Hg2SO4	-17.83	-23.96	-6.13	Hg2SO4
Hg3O2CO3	-26.95	-56.64	-29.68	Hg3O2CO3
HgCl(g)	-32.91	-13.42	19.50	HgCl
HgCl2	-10.94	-32.21	-21.26	HgCl2
HgF(g)	-47.05	-14.38	32.68	HgF
HgF2(g)	-46.69	-34.12	12.57	HgF2
Hgmetal(l)	-2.77	-16.22	-13.45	Hg
HgSe	-3.25	-58.94	-55.69	HgSe
HgSeO3	-14.74	-27.17	-12.43	HgSeO3
HgSO4	-19.92	-29.33	-9.42	HgSO4
Huntite	-4.37	-34.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.62	-23.39	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.50	-23.26	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.42	-20.59	-5.17	KAl(SO4)2:12H2O

K-Jarosite	-5.81	-20.61	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.34	-52.58	-17.24	K2Cr2O7
K2CrO4	-21.83	-22.34	-0.51	K2CrO4
K2MoO4	-16.41	-13.15	3.26	K2MoO4
K2SeO4	-17.04	-17.77	-0.73	K2SeO4
Langite	-2.67	14.82	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.78	-6.21	-0.43	PbO:PbSO4
Laurionite	-5.16	-4.54	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.27	5.43	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.41	-3.89	-5.31	Cu2(OH)2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.47	5.43	12.89	PbO
Matlockite	-6.50	-15.47	-8.97	PbClF
Melanothallite	-18.22	-11.97	6.26	CuCl2
Melanterite	-11.41	-13.62	-2.21	FeSO4:7H2O
Metacinnabar	-52.76	-97.85	-45.09	HgS
Mg(OH)2(active)	-7.58	11.22	18.79	Mg(OH)2
Mg(VO3)2	-13.81	-2.53	11.28	Mg(VO3)2
Mg2Sb3	-276.08	-201.39	74.68	Mg2Sb3
Mg2V2O7	-17.67	8.69	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.98	-9.83	-1.85	MgMoO4
MgSeO3:6H2O	-6.74	-3.69	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.25	-14.45	-1.20	MgSeO4:6H2O
Minium	-31.69	41.83	73.52	Pb3O4
Mirabilite	-6.39	-7.51	-1.11	Na2SO4:10H2O
Mn(VO3)2	-9.34	-4.44	4.90	Mn(VO3)2
Mn2(SO4)3	-52.03	-57.74	-5.71	Mn2(SO4)3
Mn2Sb	-151.13	-90.05	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-14.74	-2.24	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-13.35	-10.63	2.72	MnCl2:4H2O
MnS(grn)	-76.45	-76.28	0.17	MnS
MnS(pnk)	-79.62	-76.28	3.34	MnS
MnSb	-96.25	-99.16	-2.91	MnSb
MnSe	-40.87	-37.37	3.50	MnSe
MnSeO3	-6.72	-5.59	1.13	MnSeO3
MnSeO3:2H2O	-6.57	-5.59	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-14.31	-16.36	-2.05	MnSeO4:5H2O
MnSO4	-10.34	-7.76	2.58	MnSO4
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO3	-13.05	-21.05	-8.00	MoO3
Morenosite	-7.75	-9.89	-2.14	NiSO4:7H2O
MoS2	-147.51	-217.77	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.60	-20.67	2.93	Na2CrO4
Na2Mo2O7	-15.94	-32.53	-16.60	Na2Mo2O7
Na2MoO4	-12.98	-11.49	1.49	Na2MoO4
Na2MoO4:2H2O	-12.71	-11.49	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.64	-5.34	10.30	Na2SeO3:5H2O
Na2SeO4	-17.38	-16.10	1.28	Na2SeO4
Na3Sb	-176.00	-81.55	94.45	Na3Sb
Na3VO4	-29.21	7.47	36.68	Na3VO4
Na4V2O7	-32.02	5.38	37.40	Na4V2O7
Nantokite	-5.35	-12.08	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.27	-1.31	Na2CO3:10H2O
NaVO3	-5.95	-2.09	3.86	NaVO3

Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.62	7.17	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.35	-8.65	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.73	-13.87	-11.14	NiMoO4
NiS(alpha)	-72.81	-78.41	-5.60	NiS
NiS(beta)	-67.31	-78.41	-11.10	NiS
NiS(gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.80	-39.50	-17.70	NiSe
NiSeO3:2H2O	-10.54	-7.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.97	-18.49	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-239.16	-300.22	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.69	-4.17	6.52	Pb(BO2)2
Pb(OH)2	-2.72	5.43	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.97	-64.73	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.91	0.89	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.33	10.86	26.19	Pb2O(OH)2
Pb2O3	-24.64	36.40	61.04	Pb2O3
Pb2OCO3	-8.42	-8.98	-0.56	Pb2OCO3
Pb2V2O7	-0.99	-2.89	-1.90	Pb2V2O7
Pb3(AsO4)2	-19.69	-13.89	5.80	Pb3(AsO4)2
Pb3(VO4)2	-3.60	2.54	6.14	Pb3(VO4)2
Pb3O2CO3	-14.57	-3.55	11.02	Pb3O2CO3
Pb3O2SO4	-11.47	-0.78	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.45	4.65	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.23	4.65	21.88	Pb4O3SO4
PbCrO4	-12.21	-24.81	-12.60	PbCrO4
PbF2	-8.99	-16.43	-7.44	PbF2
Pbmetal	-24.36	-20.12	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.55	5.43	12.98	PbO:0.33H2O
PbSeO4	-13.40	-20.24	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.11	-28.92	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.67	-142.18	-18.51	FeS2
Pyrochroite	-5.88	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.34	-120.09	-19.75	AsS
Retgersite	-7.85	-9.89	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.51	-19.01	-14.50	UO2CO3
Sb(OH)3	-12.15	-19.26	-7.11	Sb(OH)3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-26.39	-36.05	-9.67	Sb2O5
Sb2Se3	-110.79	-178.55	-67.76	Sb2Se3
Sb4O6(cubic)	-58.79	-77.05	-18.26	Sb4O6
Sb4O6(orth)	-59.15	-77.05	-17.90	Sb4O6
SbCl3	-49.74	-49.17	0.57	SbCl3
SbF3	-41.82	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-5.17	0.83	5.99	UO2(OH)2:H2O
Semetal(am)	-14.02	-21.13	-7.11	Se
Semetal(hex)	-13.42	-21.13	-7.71	Se
Senarmontite	-26.16	-38.52	-12.37	Sb2O3
SeO2	-15.03	-14.90	0.12	SeO2
SeO3	-46.71	-25.66	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.86	-11.86	-10.00	ZnCO3
Sphalerite	-66.16	-77.61	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.82	-295.28	-50.46	Sb2S3

Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.33	7.97	7.64	CuO
Thenardite	-7.83	-7.50	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-4.81	-0.73	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.50	4.59	21.08	U3O8
U3Sb4	-582.47	-430.09	152.38	U3Sb4
U4O9	-33.44	-36.46	-3.02	U4O9
UF4	-29.68	-59.22	-29.54	UF4
UF4:2.5H2O	-26.50	-59.22	-32.72	UF4:2.5H2O
UO2 (am)	-16.44	-15.50	0.93	UO2
UO2 (OH) 2 (beta)	-4.78	0.83	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.59	-24.84	-2.25	UO2SeO4:4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.96	29.58	USb2
V (OH) 3	-17.41	-9.82	7.59	V (OH) 3
V2O5	-12.39	-13.75	-1.36	V2O5
V3O5	-35.61	-33.77	1.84	V3O5
V4O7	-43.70	-36.51	7.19	V4O7
V6O13	-31.47	-92.33	-60.86	V6O13
Valentinite	-30.04	-38.52	-8.48	Sb2O3
VC12	-61.41	-42.53	18.87	VC12
VC13	-63.16	-39.73	23.43	VC13
VF4	-61.39	-46.46	14.93	VF4
Vmetal	-92.16	-48.14	44.03	V
VO	-37.35	-22.59	14.76	VO
VO (OH) 2	-7.89	-2.74	5.15	VO (OH) 2
VO2Cl	-19.68	-16.84	2.84	VO2Cl
VOC1	-30.94	-19.79	11.15	VOC1
VOC12	-35.44	-22.68	12.76	VOC12
VOSO4	-23.42	-19.81	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.66	-77.61	-8.95	ZnS
Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.02	-9.09	3.93	ZnSO4
Zn (BO2) 2	-9.91	-1.62	8.29	Zn (BO2) 2
Zn (OH) 2	-4.23	7.97	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.50	7.97	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.78	7.97	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.56	7.97	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.76	7.97	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.62	-1.12	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.21	5.98	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.90	-6.25	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.13	-10.22	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.57	14.83	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.57	19.93	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3:1H2O	-1.60	-11.86	-10.26	ZnCO3:1H2O
ZnF2	-13.35	-13.88	-0.53	ZnF2
Znmetal	-43.36	-17.57	25.79	Zn
ZnMoO4	-2.95	-13.08	-10.13	ZnMoO4
ZnO (active)	-3.22	7.97	11.19	ZnO
ZnS (am)	-68.56	-77.61	-9.05	ZnS
ZnSb	-86.16	-75.15	11.01	ZnSb
ZnSe	-24.30	-38.70	-14.40	ZnSe
ZnSeO4:6H2O	-16.17	-17.69	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.46	-9.09	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 135.

```
-----
Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 801
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 801
USE Surface 801
USE Solution 803
SAVE Solution 804 #Initial Stage 8 groundwater after Mineral Precipitation
and Sorption Loss
END
-----
```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 801.

Diffuse Double Layer Surface-Complexation Model

Hfo

```
1.135e-15  Surface + diffuse layer charge, eq
7.818e-08  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
1.715e+00  m² for 2.671e-05 moles of Ferrihydrite
```

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is

+1).

Element	Moles
C	4.3812e-11
Ca	5.4298e-13
Cl	8.7734e-10
H	1.2924e-10
K	8.6138e-13
Mg	8.4125e-14
N	3.5518e-09
Na	3.6496e-12
O	1.5831e-07
S	3.6888e-08

Hfo_s

1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.929e-08	0.668	8.929e-08	-7.049
Hfo_sOH	4.379e-08	0.328	4.379e-08	-7.359
Hfo_sO-	4.920e-10	0.004	4.920e-10	-9.308
Hfo_sOHCa+2	1.630e-12	0.000	1.630e-12	-11.788

Hfo_w

5.343e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.469e-06	0.462	2.469e-06	-5.608
Hfo_wOH	1.211e-06	0.227	1.211e-06	-5.917
Hfo_wSO4-	8.338e-07	0.156	8.338e-07	-6.079
Hfo_wOHSO4-2	8.159e-07	0.153	8.159e-07	-6.088
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.866
Hfo_wOMg+	1.923e-14	0.000	1.923e-14	-13.716
Hfo_wOCa+	6.523e-15	0.000	6.523e-15	-14.186

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 803. Solution after simulation 134.
Using surface 801.
Using pure phase assemblage 801. Pure-phase assemblage after simulation 134.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.536e-08	2.174e-08	-3.617e-09
Alunite	0.00	-1.40	-1.40	9.244e-07	9.246e-07	1.387e-10
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.04	-9.95	-8.91	2.029e-08	0	-2.029e-08
Barite	0.00	-9.98	-9.98	1.329e-06	1.390e-06	6.087e-08
Brochantite	-0.94	14.28	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.273e-06
CaMoO4	-1.61	-9.56	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.53	-3.72	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.915e-03	2.915e-03	-6.422e-07
Carnotite	-4.10	-3.87	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.45	-3.61	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.78	-14.93	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	6.029e-08	3.911e-08	-2.118e-08
Cu2Se(alpha)	-5.54	-51.34	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.575e-07	1.465e-07	-1.110e-07
Epsomite	-3.73	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	2.671e-05	2.671e-05	-5.083e-13
Fluorite	0.00	-10.50	-10.50	1.120e-04	1.120e-04	9.448e-09
Gummite	-6.84	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.42	-59.11	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.51	-1.11	0.000e+00	0	0.000e+00

MnSeO3	-6.89	-5.76	1.13	0.000e+00	0	0.000e+00
Ni (OH) 2	-5.62	7.17	12.79	0.000e+00	0	0.000e+00
Ni3 (AsO4) 2:8H2O	-25.39	-9.69	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.60	-13.74	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.318e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.251e-09	0	-5.251e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.98	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2 (am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.35	-4.27	4.08	0.000e+00	0	0.000e+00
U3O8	-16.50	4.59	21.08	0.000e+00	0	0.000e+00
UO2 (OH) 2 (beta)	-4.78	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.82	-12.94	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-2.318e-20 Surface + diffuse layer charge, eq
3.778e-07 Surface charge, eq
2.126e-02 sigma, C/m²
5.575e-02 psi, V
-2.170e+00 -F*psi/RT
1.142e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.328e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.964e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	6.6903e-13
Al	4.6929e-11
As	3.5339e-15
B	2.7646e-10
Ba	6.8427e-13
C	1.5685e-07
Ca	2.1002e-08
Cd	1.0480e-13
Cl	4.9513e-08
Co	1.1251e-12
Cr	6.6322e-14
Cu	1.1457e-10
F	5.6874e-09
Fe	4.0642e-14
H	1.6931e-07
Hg	3.8742e-15
K	7.6581e-09
Mg	1.3850e-08
Mn	1.8583e-10
Mo	1.9924e-11
N	8.3968e-14
Na	5.2011e-08
Ni	1.8670e-12
O	1.0860e-06
Pb	1.8508e-13
S	1.5358e-07
Sb	3.8153e-13

Se	4.6119e-13
U	7.8754e-12
V	5.9555e-14
Zn	1.0456e-11

Hfo_s

1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.761e-08	0.581	7.752e-08	-7.111
Hfo_sOCrOH+	4.235e-08	0.317	4.230e-08	-7.374
Hfo_sOPb+	1.056e-08	0.079	1.055e-08	-7.977
Hfo_sOZn+	1.322e-09	0.010	1.321e-09	-8.879
Hfo_sOMn+	1.179e-09	0.009	1.177e-09	-8.929
Hfo_sOHCa+2	2.508e-10	0.002	2.505e-10	-9.601
Hfo_sOH	1.784e-10	0.001	1.782e-10	-9.749
Hfo_sONi+	5.067e-11	0.000	5.061e-11	-10.296
Hfo_sOH2+	2.830e-11	0.000	2.827e-11	-10.549
Hfo_sO-	2.576e-11	0.000	2.573e-11	-10.590
Hfo_sOCO+	4.952e-12	0.000	4.947e-12	-11.306
Hfo_sOCd+	4.176e-12	0.000	4.171e-12	-11.380
Hfo_sOAg	4.032e-13	0.000	4.028e-13	-12.395
Hfo_sOHBa+2	4.166e-14	0.000	4.161e-14	-13.381
Hfo_sOFe+	2.055e-14	0.000	2.053e-14	-13.688
Hfo_sOHg+	7.002e-17	0.000	6.994e-17	-16.155

Hfo_w

5.343e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.594e-06	0.485	2.590e-06	-5.587
Hfo_wOH	1.162e-06	0.218	1.161e-06	-5.935
Hfo_wOHSO4-2	9.267e-07	0.173	9.256e-07	-6.034
Hfo_wOH2+	1.844e-07	0.035	1.842e-07	-6.735
Hfo_wO-	1.678e-07	0.031	1.676e-07	-6.776
Hfo_wOHVO4-3	1.155e-07	0.022	1.154e-07	-6.938
Hfo_wSO4-	7.371e-08	0.014	7.362e-08	-7.133
Hfo_wOHAsO4-3	4.074e-08	0.008	4.069e-08	-7.391
Hfo_wOMg+	3.915e-08	0.007	3.910e-08	-7.408
Hfo_wOZn+	9.021e-09	0.002	9.011e-09	-8.045
Hfo_wOHSeO3-2	8.713e-09	0.002	8.702e-09	-8.060
Hfo_wOMn+	6.101e-09	0.001	6.094e-09	-8.215
Hfo_wOHMoO4-2	5.372e-09	0.001	5.365e-09	-8.270
Hfo_wOPb+	3.074e-09	0.001	3.070e-09	-8.513
Hfo_wOCa+	3.040e-09	0.001	3.037e-09	-8.518
Hfo_wSeO3-	2.348e-09	0.000	2.345e-09	-8.630
Hfo_wMoO4-	5.504e-10	0.000	5.498e-10	-9.260
Hfo_wONi+	4.454e-10	0.000	4.448e-10	-9.352
Hfo_wOCO+	9.095e-11	0.000	9.084e-11	-10.042
Hfo_wH2BO3	7.720e-11	0.000	7.710e-11	-10.113
Hfo_wHAsO4-	2.296e-11	0.000	2.294e-11	-10.639
Hfo_wOCd+	1.161e-11	0.000	1.159e-11	-10.936
Hfo_wOAg	6.911e-13	0.000	6.903e-13	-12.161
Hfo_wH2AsO4	1.179e-13	0.000	1.178e-13	-12.929
Hfo_wOFe+	8.449e-14	0.000	8.439e-14	-13.074
Hfo_wOHg+	2.235e-14	0.000	2.232e-14	-13.651
Hfo_wOBa+	7.299e-15	0.000	7.291e-15	-14.137
Hfo_wOHSbO(OH) 4-	2.675e-15	0.000	2.672e-15	-14.573
Hfo_wOHSeO4-2	1.610e-15	0.000	1.608e-15	-14.794
Hfo_wSbO(OH) 4	2.741e-16	0.000	2.738e-16	-15.563
Hfo_wSeO4-	1.115e-16	0.000	1.114e-16	-15.953
Hfo_wOHCrO4-2	8.064e-17	0.000	8.054e-17	-16.094
Hfo_wCrO4-	5.850e-18	0.000	5.843e-18	-17.233
Hfo_wH2AsO3	1.678e-23	0.000	1.676e-23	-22.776

-----Solution composition-----

Elements	Molality	Moles
Ag	3.997e-08	4.002e-08
Al	1.923e-06	1.925e-06
As	8.283e-11	8.293e-11
B	1.602e-05	1.604e-05
Ba	1.100e-07	1.101e-07
C	5.839e-03	5.846e-03
Ca	2.551e-03	2.554e-03
Cd	1.182e-08	1.183e-08
Cl	1.722e-03	1.724e-03
Co	1.356e-07	1.358e-07
Cr	6.448e-09	6.455e-09
Cu	7.032e-06	7.041e-06
F	2.116e-04	2.119e-04
Fe	3.680e-09	3.684e-09
Hg	2.259e-10	2.262e-10
K	7.331e-04	7.340e-04
Mg	1.761e-03	1.763e-03
Mn	2.407e-05	2.410e-05
Mo	4.134e-07	4.139e-07
N	3.548e-09	3.552e-09
Na	4.996e-03	5.002e-03
Ni	2.124e-07	2.127e-07
Pb	1.292e-08	1.293e-08
S	3.662e-03	3.666e-03
Sb	1.327e-08	1.328e-08
Se	1.518e-08	1.520e-08
U	8.589e-08	8.599e-08
V	1.998e-09	2.001e-09
Zn	1.162e-06	1.163e-06

-----Description of solution-----

	pH	=	7.147	Charge balance
	pe	=	5.625	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.911e-02	
	Mass of water (kg)	=	1.001e+00	
	Total alkalinity (eq/kg)	=	5.166e-03	
	Total CO2 (mol/kg)	=	5.839e-03	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.191e-15	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.111521e+02	
	Total O	=	5.560503e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.625e-07	1.412e-07	-6.789	-6.850	-0.061	(0)
H+	8.164e-08	7.127e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.997e-01	1.744	-0.000	0.000	18.07
Ag	3.997e-08					
AgCl	2.595e-08	2.595e-08	-7.586	-7.586	0.000	(0)
Ag+	9.685e-09	8.454e-09	-8.014	-8.073	-0.059	(0)
AgCl2-	3.995e-09	3.397e-09	-8.398	-8.469	-0.070	(0)
AgSO4-	3.344e-10	2.843e-10	-9.476	-9.546	-0.070	(0)
AgCl3-2	8.710e-12	4.550e-12	-11.060	-11.342	-0.282	(0)
AgF	3.513e-12	3.513e-12	-11.454	-11.454	0.000	(0)
AgOH	1.194e-13	1.194e-13	-12.923	-12.923	0.000	(0)
AgCl4-3	6.018e-14	1.396e-14	-13.221	-13.855	-0.634	(0)
AgH2BO3	1.739e-14	1.739e-14	-13.760	-13.760	0.000	(0)

	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgSeO3-	4.222e-15	3.589e-15	-14.374	-14.445	-0.070	(0)
	AgNO2	3.907e-15	3.907e-15	-14.408	-14.408	0.000	(0)
	AgNH3+	1.361e-16	1.157e-16	-15.866	-15.937	-0.070	(0)
	Ag (OH) 2-	1.939e-18	1.648e-18	-17.712	-17.783	-0.070	(0)
	AgNO3	1.401e-20	1.401e-20	-19.853	-19.853	0.000	(0)
	Ag (SeO3) 2-3	9.150e-23	2.123e-23	-22.039	-22.673	-0.634	(0)
	Ag (NO2) 2-	1.574e-23	1.338e-23	-22.803	-22.873	-0.070	(0)
	Ag (NH3) 2+	7.419e-24	6.307e-24	-23.130	-23.200	-0.070	(0)
	Ag2MoO4	6.489e-24	6.489e-24	-23.188	-23.188	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.698	-72.698	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.415	-86.543	-1.128	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-146.966	-147.037	-0.070	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.205	-147.373	-0.168	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.349	-149.666	-0.317	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.673	-149.977	-0.304	(0)
Al		1.923e-06					
	Al (OH) 4-	1.297e-06	1.134e-06	-5.887	-5.946	-0.059	(0)
	AlF3	3.237e-07	3.237e-07	-6.490	-6.490	0.000	(0)
	AlF2+	1.771e-07	1.555e-07	-6.752	-6.808	-0.057	(0)
	Al (OH) 3	6.375e-08	6.375e-08	-7.196	-7.196	0.000	(0)
	AlF4-	3.071e-08	2.684e-08	-7.513	-7.571	-0.059	(0)
	Al (OH) 2+	2.577e-08	2.262e-08	-7.589	-7.645	-0.057	(0)
	AlF+2	3.977e-09	2.361e-09	-8.400	-8.627	-0.226	(0)
	AlOH+2	3.396e-10	2.016e-10	-9.469	-9.695	-0.226	(0)
	AlSO4+	2.137e-11	1.868e-11	-10.670	-10.729	-0.059	(0)
	Al+3	4.849e-12	1.428e-12	-11.314	-11.845	-0.531	(0)
	Al (SO4) 2-	3.860e-13	3.373e-13	-12.413	-12.472	-0.059	(0)
	AlMo6O21-3	1.509e-39	3.501e-40	-38.821	-39.456	-0.634	(0)
As (3)		5.662e-23					
	H3AsO3	5.615e-23	5.615e-23	-22.251	-22.251	0.000	(0)
	H2AsO3-	4.753e-25	4.040e-25	-24.323	-24.394	-0.070	(0)
	HAsO3-2	9.898e-30	5.171e-30	-29.004	-29.286	-0.282	(0)
	H4AsO3+	2.332e-30	1.982e-30	-29.632	-29.703	-0.070	(0)
	AsO3-3	1.205e-35	2.797e-36	-34.919	-35.553	-0.634	(0)
As (5)		8.283e-11					
	HAsO4-2	5.919e-11	3.092e-11	-10.228	-10.510	-0.282	(0)
	H2AsO4-	2.364e-11	2.010e-11	-10.626	-10.697	-0.070	(0)
	AsO4-3	5.913e-15	1.372e-15	-14.228	-14.863	-0.634	(0)
	H3AsO4	2.478e-16	2.489e-16	-15.606	-15.604	0.002	(0)
B		1.602e-05					
	H3BO3	1.586e-05	1.593e-05	-4.800	-4.798	0.002	(0)
	H2BO3-	1.502e-07	1.298e-07	-6.823	-6.887	-0.063	(0)
	CaH2BO3+	9.988e-09	8.633e-09	-8.001	-8.064	-0.063	(0)
	MgH2BO3+	4.358e-09	3.767e-09	-8.361	-8.424	-0.063	(0)
	BF (OH) 3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
	NaH2BO3	8.871e-10	8.871e-10	-9.052	-9.052	0.000	(0)
	H5 (BO3) 2-	2.035e-12	1.759e-12	-11.691	-11.755	-0.063	(0)
	BF2 (OH) 2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
	BaH2BO3+	2.883e-13	2.492e-13	-12.540	-12.603	-0.063	(0)
	AgH2BO3	1.739e-14	1.739e-14	-13.760	-13.760	0.000	(0)
	H8 (BO3) 3-	3.242e-15	2.802e-15	-14.489	-14.553	-0.063	(0)
	BF3OH-	7.033e-18	6.079e-18	-17.153	-17.216	-0.063	(0)
	BF4-	4.080e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
Ba		1.100e-07					
	Ba+2	1.070e-07	6.213e-08	-6.971	-7.207	-0.236	(0)
	BaHCO3+	2.935e-09	2.584e-09	-8.532	-8.588	-0.055	(0)
	BaCO3	9.128e-11	9.128e-11	-10.040	-10.040	0.000	(0)
	BaH2BO3+	2.883e-13	2.492e-13	-12.540	-12.603	-0.063	(0)
	BaOH+	4.372e-14	3.830e-14	-13.359	-13.417	-0.057	(0)
	BaNO3+	7.642e-19	6.497e-19	-18.117	-18.187	-0.070	(0)
	BaNH3+2	5.031e-19	2.628e-19	-18.298	-18.580	-0.282	(0)
C (4)		5.839e-03					
	HCO3-	4.961e-03	4.355e-03	-2.304	-2.361	-0.057	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.065e-04	9.373e-05	-3.973	-4.028	-0.055	(0)
	MgHCO3+	4.279e-05	3.730e-05	-4.369	-4.428	-0.060	(0)
	NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)

		CuCO3	5.902e-06	5.902e-06	-5.229	-5.229	0.000	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CO3-2	4.933e-06	2.865e-06	-5.307	-5.543	-0.236	(0)
		MgCO3	1.994e-06	1.994e-06	-5.700	-5.700	0.000	(0)
		MnHCO3+	1.028e-06	9.003e-07	-5.988	-6.046	-0.057	(0)
		NaCO3-	2.621e-07	2.301e-07	-6.582	-6.638	-0.057	(0)
		CuHCO3+	1.131e-07	9.613e-08	-6.947	-7.017	-0.070	(0)
		Cu (CO3) 2-2	8.710e-08	4.550e-08	-7.060	-7.342	-0.282	(0)
		ZnCO3	7.805e-08	7.805e-08	-7.108	-7.108	0.000	(0)
		ZnHCO3+	7.669e-08	6.520e-08	-7.115	-7.186	-0.070	(0)
		NiHCO3+	4.776e-08	4.060e-08	-7.321	-7.391	-0.070	(0)
		UO2 (CO3) 3-4	4.290e-08	3.195e-09	-7.368	-8.495	-1.128	(0)
		UO2 (CO3) 2-2	4.260e-08	2.226e-08	-7.371	-7.653	-0.282	(0)
		CoHCO3+	1.991e-08	1.693e-08	-7.701	-7.771	-0.070	(0)
		NiCO3	8.083e-09	8.083e-09	-8.092	-8.092	0.000	(0)
		PbCO3	7.125e-09	7.125e-09	-8.147	-8.147	0.000	(0)
		PbHCO3+	3.149e-09	2.677e-09	-8.502	-8.572	-0.070	(0)
		BaHCO3+	2.935e-09	2.584e-09	-8.532	-8.588	-0.055	(0)
		CoCO3	2.420e-09	2.420e-09	-8.616	-8.616	0.000	(0)
		UO2CO3	3.894e-10	3.894e-10	-9.410	-9.410	0.000	(0)
		CdCO3	3.233e-10	3.233e-10	-9.490	-9.490	0.000	(0)
		Pb (CO3) 2-2	1.127e-10	5.886e-11	-9.948	-10.230	-0.282	(0)
		BaCO3	9.128e-11	9.128e-11	-10.040	-10.040	0.000	(0)
		CdHCO3+	5.774e-11	4.909e-11	-10.238	-10.309	-0.070	(0)
		Cd (CO3) 2-2	1.314e-12	6.866e-13	-11.881	-12.163	-0.282	(0)
		FeHCO3+	8.936e-13	7.866e-13	-12.049	-12.104	-0.055	(0)
		HgCO3	1.473e-14	1.473e-14	-13.832	-13.832	0.000	(0)
		Hg (CO3) 2-2	2.555e-16	1.335e-16	-15.593	-15.875	-0.282	(0)
		HgHCO3+	2.300e-17	1.955e-17	-16.638	-16.709	-0.070	(0)
Ca	2.551e-03							
		Ca+2	1.991e-03	1.156e-03	-2.701	-2.937	-0.236	(0)
		CaSO4	4.463e-04	4.463e-04	-3.350	-3.350	0.000	(0)
		CaHCO3+	1.065e-04	9.373e-05	-3.973	-4.028	-0.055	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	2.382e-06	2.087e-06	-5.623	-5.681	-0.057	(0)
		CaH2BO3+	9.988e-09	8.633e-09	-8.001	-8.064	-0.063	(0)
		CaOH+	3.701e-09	3.258e-09	-8.432	-8.487	-0.055	(0)
		CaNH3+2	1.868e-14	9.757e-15	-13.729	-14.011	-0.282	(0)
		CaNO3+	8.971e-15	7.627e-15	-14.047	-14.118	-0.070	(0)
		Ca (NH3) 2+2	4.985e-26	2.604e-26	-25.302	-25.584	-0.282	(0)
Cd	1.182e-08							
		Cd+2	8.527e-09	4.952e-09	-8.069	-8.305	-0.236	(0)
		CdSO4	1.956e-09	1.956e-09	-8.709	-8.709	0.000	(0)
		CdCl+	8.360e-10	7.108e-10	-9.078	-9.148	-0.070	(0)
		CdCO3	3.233e-10	3.233e-10	-9.490	-9.490	0.000	(0)
		Cd (SO4) 2-2	8.515e-11	4.448e-11	-10.070	-10.352	-0.282	(0)
		CdHCO3+	5.774e-11	4.909e-11	-10.238	-10.309	-0.070	(0)
		CdF+	1.527e-11	1.298e-11	-10.816	-10.887	-0.070	(0)
		CdOH+	6.534e-12	5.555e-12	-11.185	-11.255	-0.070	(0)
		CdCl2	4.454e-12	4.454e-12	-11.351	-11.351	0.000	(0)
		CdOHC1	4.118e-12	4.118e-12	-11.385	-11.385	0.000	(0)
		Cd (CO3) 2-2	1.314e-12	6.866e-13	-11.881	-12.163	-0.282	(0)
		CdCl3-	4.968e-15	4.224e-15	-14.304	-14.374	-0.070	(0)
		Cd (OH) 2	4.951e-15	4.951e-15	-14.305	-14.305	0.000	(0)
		CdF2	4.284e-15	4.284e-15	-14.368	-14.368	0.000	(0)
		CdSeO4	2.639e-18	2.639e-18	-17.579	-17.579	0.000	(0)
		Cd2OH+3	5.942e-19	1.379e-19	-18.226	-18.861	-0.634	(0)
		Cd (OH) 3-	5.025e-20	4.272e-20	-19.299	-19.369	-0.070	(0)
		CdNO3+	3.843e-20	3.267e-20	-19.415	-19.486	-0.070	(0)
		Cd (SeO3) 2-2	3.409e-21	1.781e-21	-20.467	-20.749	-0.282	(0)
		Cd (OH) 4-2	1.891e-27	9.876e-28	-26.723	-27.005	-0.282	(0)
		Cd (NO3) 2	3.417e-32	3.417e-32	-31.466	-31.466	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.666	-78.736	-0.070	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-149.972	-149.972	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.440	-226.511	-0.070	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.472	-302.754	-0.282	(0)
Cl	1.722e-03							
		Cl-	1.722e-03	1.503e-03	-2.764	-2.823	-0.059	(0)

AgCl	2.595e-08	2.595e-08	-7.586	-7.586	0.000	(0)
MnCl+	2.238e-08	1.961e-08	-7.650	-7.708	-0.057	(0)
AgCl2-	3.995e-09	3.397e-09	-8.398	-8.469	-0.070	(0)
ZnCl+	2.051e-09	1.788e-09	-8.688	-8.748	-0.060	(0)
CuCl+	9.562e-10	8.334e-10	-9.019	-9.079	-0.060	(0)
CdCl+	8.360e-10	7.108e-10	-9.078	-9.148	-0.070	(0)
CuCl	7.684e-10	7.684e-10	-9.114	-9.114	0.000	(0)
NiCl+	3.421e-10	2.909e-10	-9.466	-9.536	-0.070	(0)
ZnOHC1	3.305e-10	3.305e-10	-9.481	-9.481	0.000	(0)
CoCl+	3.057e-10	2.599e-10	-9.515	-9.585	-0.070	(0)
CuCl2-	2.768e-10	2.413e-10	-9.558	-9.617	-0.060	(0)
PbCl+	5.190e-11	4.412e-11	-10.285	-10.355	-0.070	(0)
MnCl2	4.163e-11	4.163e-11	-10.381	-10.381	0.000	(0)
AgCl3-2	8.710e-12	4.550e-12	-11.060	-11.342	-0.282	(0)
CdCl2	4.454e-12	4.454e-12	-11.351	-11.351	0.000	(0)
ZnCl2	4.258e-12	4.258e-12	-11.371	-11.371	0.000	(0)
CdOHC1	4.118e-12	4.118e-12	-11.385	-11.385	0.000	(0)
HgClOH	1.611e-12	1.611e-12	-11.793	-11.793	0.000	(0)
HgCl2	9.709e-13	9.709e-13	-12.013	-12.013	0.000	(0)
CuCl2	4.344e-13	4.344e-13	-12.362	-12.362	0.000	(0)
PbCl2	2.962e-13	2.962e-13	-12.528	-12.528	0.000	(0)
CuCl3-2	1.316e-13	7.754e-14	-12.881	-13.110	-0.230	(0)
AgCl4-3	6.018e-14	1.396e-14	-13.221	-13.855	-0.634	(0)
MnCl3-	1.967e-14	1.723e-14	-13.706	-13.764	-0.057	(0)
HgCl3-	1.716e-14	1.459e-14	-13.765	-13.836	-0.070	(0)
ZnCl3-	5.833e-15	5.084e-15	-14.234	-14.294	-0.060	(0)
CdCl3-	4.968e-15	4.224e-15	-14.304	-14.374	-0.070	(0)
NiCl2	2.201e-15	2.201e-15	-14.657	-14.657	0.000	(0)
CrCl+2	3.310e-16	1.729e-16	-15.480	-15.762	-0.282	(0)
PbCl3-	2.085e-16	1.773e-16	-15.681	-15.751	-0.070	(0)
HgCl4-2	1.672e-16	8.732e-17	-15.777	-16.059	-0.282	(0)
HgCl+	1.516e-16	1.289e-16	-15.819	-15.890	-0.070	(0)
UO2Cl+	9.789e-17	8.323e-17	-16.009	-16.080	-0.070	(0)
CuCl3-	6.990e-18	6.093e-18	-17.156	-17.215	-0.060	(0)
ZnCl4-2	6.486e-18	3.821e-18	-17.188	-17.418	-0.230	(0)
CrOHC12	6.978e-19	6.978e-19	-18.156	-18.156	0.000	(0)
PbCl4-2	2.331e-19	1.218e-19	-18.632	-18.914	-0.282	(0)
FeCl+2	4.334e-20	2.553e-20	-19.363	-19.593	-0.230	(0)
CrCl2+	2.901e-20	2.466e-20	-19.537	-19.608	-0.070	(0)
VOCl+	7.777e-22	6.612e-22	-21.109	-21.180	-0.070	(0)
FeCl2+	1.957e-22	1.714e-22	-21.708	-21.766	-0.057	(0)
CuCl4-2	7.792e-23	4.590e-23	-22.108	-22.338	-0.230	(0)
FeCl3	2.577e-26	2.577e-26	-25.589	-25.589	0.000	(0)
CrO3Cl-	2.081e-26	1.769e-26	-25.682	-25.752	-0.070	(0)
CoCl+2	4.916e-35	2.568e-35	-34.308	-34.590	-0.282	(0)
UCl+3	0.000e+00	0.000e+00	-44.578	-45.213	-0.634	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.223	-64.505	-0.282	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.532	-68.814	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.113	-82.395	-0.282	(0)
Co (2)	1.356e-07					
Co+2	9.567e-08	4.998e-08	-7.019	-7.301	-0.282	(0)
CoHCO3+	1.991e-08	1.693e-08	-7.701	-7.771	-0.070	(0)
CoSO4	1.681e-08	1.681e-08	-7.774	-7.774	0.000	(0)
CoCO3	2.420e-09	2.420e-09	-8.616	-8.616	0.000	(0)
CoF+	3.075e-10	2.614e-10	-9.512	-9.583	-0.070	(0)
CoCl+	3.057e-10	2.599e-10	-9.515	-9.585	-0.070	(0)
CoOH+	1.657e-10	1.409e-10	-9.781	-9.851	-0.070	(0)
Co (OH) 2	1.580e-12	1.580e-12	-11.801	-11.801	0.000	(0)
CoNO2+	9.163e-16	7.790e-16	-15.038	-15.108	-0.070	(0)
Co (NH3) +2	7.712e-17	4.029e-17	-16.113	-16.395	-0.282	(0)
CoSeO4	7.168e-17	7.168e-17	-16.145	-16.145	0.000	(0)
Co (OH) 3-	5.238e-18	4.453e-18	-17.281	-17.351	-0.070	(0)
Co2OH+3	1.521e-18	3.528e-19	-17.818	-18.452	-0.634	(0)
CoOOH-	1.315e-18	1.118e-18	-17.881	-17.952	-0.070	(0)
CoNO3+	1.944e-19	1.653e-19	-18.711	-18.782	-0.070	(0)
Co (OH) 4-2	1.908e-25	9.969e-26	-24.719	-25.001	-0.282	(0)
Co (NH3) 2+2	2.206e-26	1.152e-26	-25.656	-25.938	-0.282	(0)
Co4 (OH) 4+4	1.054e-30	7.853e-32	-29.977	-31.105	-1.128	(0)

Co (NO3) 2	7.017e-31	7.017e-31	-30.154	-30.154	0.000	(0)
Co (NH3) 3+2	1.862e-36	9.726e-37	-35.730	-36.012	-0.282	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.184	-46.466	-0.282	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.137	-57.419	-0.282	(0)
Co (3)	1.154e-28					
CoOH+2	1.154e-28	6.027e-29	-27.938	-28.220	-0.282	(0)
Co+3	2.852e-34	8.397e-35	-33.545	-34.076	-0.531	(0)
CoCl+2	4.916e-35	2.568e-35	-34.308	-34.590	-0.282	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.223	-64.505	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.349	-77.420	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.939	-82.221	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.113	-82.395	-0.282	(0)
Cr (2)	9.633e-26					
Cr+2	9.633e-26	5.032e-26	-25.016	-25.298	-0.282	(0)
Cr (3)	6.448e-09					
Cr (OH) 2+	5.553e-09	4.721e-09	-8.255	-8.326	-0.070	(0)
Cr (OH) +2	5.258e-10	2.747e-10	-9.279	-9.561	-0.282	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.099e-10	1.099e-10	-9.959	-9.959	0.000	(0)
CrF+2	4.461e-12	2.330e-12	-11.351	-11.633	-0.282	(0)
CrO2-	1.964e-12	1.670e-12	-11.707	-11.777	-0.070	(0)
Cr (OH) 4-	1.657e-12	1.408e-12	-11.781	-11.851	-0.070	(0)
CrSO4+	4.115e-13	3.499e-13	-12.386	-12.456	-0.070	(0)
Cr+3	3.831e-13	8.890e-14	-12.417	-13.051	-0.634	(0)
CrCl+2	3.310e-16	1.729e-16	-15.480	-15.762	-0.282	(0)
Cr2 (OH) 2SO4+2	5.222e-18	2.728e-18	-17.282	-17.564	-0.282	(0)
CrOHC12	6.978e-19	6.978e-19	-18.156	-18.156	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.731e-19	2.731e-19	-18.564	-18.564	0.000	(0)
CrCl2+	2.901e-20	2.466e-20	-19.537	-19.608	-0.070	(0)
CrNO3+2	1.552e-26	8.108e-27	-25.809	-26.091	-0.282	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.115	-55.397	-0.282	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.458	-67.093	-0.634	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.532	-68.814	-0.282	(0)
Cr (6)	2.301e-16					
CrO4-2	1.961e-16	1.138e-16	-15.708	-15.944	-0.236	(0)
HCrO4-	3.088e-17	2.626e-17	-16.510	-16.581	-0.070	(0)
NaCrO4-	2.870e-18	2.440e-18	-17.542	-17.613	-0.070	(0)
KCrO4-	3.147e-19	2.675e-19	-18.502	-18.573	-0.070	(0)
CrO3SO4-2	1.839e-24	9.609e-25	-23.735	-24.017	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.081e-26	1.769e-26	-25.682	-25.752	-0.070	(0)
Cr2O7-2	4.577e-32	2.391e-32	-31.339	-31.621	-0.282	(0)
Cu (1)	1.523e-09					
CuCl	7.684e-10	7.684e-10	-9.114	-9.114	0.000	(0)
Cu+	4.776e-10	4.061e-10	-9.321	-9.391	-0.070	(0)
CuCl2-	2.768e-10	2.413e-10	-9.558	-9.617	-0.060	(0)
CuCl3-2	1.316e-13	7.754e-14	-12.881	-13.110	-0.230	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.275	-148.586	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.018	-149.316	-0.297	(0)
Cu (2)	7.031e-06					
CuCO3	5.902e-06	5.902e-06	-5.229	-5.229	0.000	(0)
Cu+2	6.025e-07	3.499e-07	-6.220	-6.456	-0.236	(0)
CuOH+	1.793e-07	1.563e-07	-6.746	-6.806	-0.060	(0)
CuSO4	1.351e-07	1.351e-07	-6.869	-6.869	0.000	(0)
CuHCO3+	1.131e-07	9.613e-08	-6.947	-7.017	-0.070	(0)
Cu (CO3) 2-2	8.710e-08	4.550e-08	-7.060	-7.342	-0.282	(0)
Cu (OH) 2	4.404e-09	4.404e-09	-8.356	-8.356	0.000	(0)
CuF+	4.295e-09	3.651e-09	-8.367	-8.438	-0.070	(0)
Cu2 (OH) 2+2	1.174e-09	6.134e-10	-8.930	-9.212	-0.282	(0)
CuCl+	9.562e-10	8.334e-10	-9.019	-9.079	-0.060	(0)
Cu (OH) 3-	1.501e-12	1.276e-12	-11.824	-11.894	-0.070	(0)
CuCl2	4.344e-13	4.344e-13	-12.362	-12.362	0.000	(0)
CuNO2+	9.531e-14	8.103e-14	-13.021	-13.091	-0.070	(0)
CuNH3+2	4.595e-14	2.400e-14	-13.338	-13.620	-0.282	(0)
CuCl3-	6.990e-18	6.093e-18	-17.156	-17.215	-0.060	(0)
CuNO3+	2.715e-18	2.309e-18	-17.566	-17.637	-0.070	(0)
Cu (OH) 4-2	2.715e-18	1.418e-18	-17.566	-17.848	-0.282	(0)
Cu (NO2) 2	1.834e-21	1.834e-21	-20.737	-20.737	0.000	(0)

	CuCl4-2	7.792e-23	4.590e-23	-22.108	-22.338	-0.230	(0)
	Cu (NO3) 2	6.064e-31	6.064e-31	-30.217	-30.217	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.804	-215.875	-0.070	(0)
F	2.116e-04						
	F-	1.895e-04	1.654e-04	-3.722	-3.781	-0.059	(0)
	MgF+	1.777e-05	1.553e-05	-4.750	-4.809	-0.059	(0)
	CaF+	2.382e-06	2.087e-06	-5.623	-5.681	-0.057	(0)
	NaF	4.501e-07	4.501e-07	-6.347	-6.347	0.000	(0)
	AlF3	3.237e-07	3.237e-07	-6.490	-6.490	0.000	(0)
	AlF2+	1.771e-07	1.555e-07	-6.752	-6.808	-0.057	(0)
	MnF+	7.787e-08	6.822e-08	-7.109	-7.166	-0.057	(0)
	AlF4-	3.071e-08	2.684e-08	-7.513	-7.571	-0.059	(0)
	HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
	CuF+	4.295e-09	3.651e-09	-8.367	-8.438	-0.070	(0)
	AlF+2	3.977e-09	2.361e-09	-8.400	-8.627	-0.226	(0)
	ZnF+	1.838e-09	1.562e-09	-8.736	-8.806	-0.070	(0)
	BF (OH) 3-	1.216e-09	1.051e-09	-8.915	-8.978	-0.063	(0)
	NiF+	3.696e-10	3.142e-10	-9.432	-9.503	-0.070	(0)
	CoF+	3.075e-10	2.614e-10	-9.512	-9.583	-0.070	(0)
	CdF+	1.527e-11	1.298e-11	-10.816	-10.887	-0.070	(0)
	HF2-	1.261e-11	1.096e-11	-10.899	-10.960	-0.061	(0)
	PbF+	1.134e-11	9.643e-12	-10.945	-11.016	-0.070	(0)
	CrF+2	4.461e-12	2.330e-12	-11.351	-11.633	-0.282	(0)
	AgF	3.513e-12	3.513e-12	-11.454	-11.454	0.000	(0)
	BF2 (OH) 2-	1.533e-12	1.325e-12	-11.814	-11.878	-0.063	(0)
	UO2F+	9.169e-13	7.795e-13	-12.038	-12.108	-0.070	(0)
	UO2F2	3.718e-13	3.718e-13	-12.430	-12.430	0.000	(0)
	PbF2	3.139e-14	3.139e-14	-13.503	-13.503	0.000	(0)
	UO2F3-	1.817e-14	1.545e-14	-13.741	-13.811	-0.070	(0)
	CdF2	4.284e-15	4.284e-15	-14.368	-14.368	0.000	(0)
	H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
	FeF2+	5.154e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
	FeF+2	1.732e-16	1.020e-16	-15.762	-15.991	-0.230	(0)
	FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
	VO2F	4.724e-17	4.724e-17	-16.326	-16.326	0.000	(0)
	UO2F4-2	3.885e-17	2.030e-17	-16.411	-16.693	-0.282	(0)
	PbF3-	1.158e-17	9.847e-18	-16.936	-17.007	-0.070	(0)
	BF3OH-	7.033e-18	6.079e-18	-17.153	-17.216	-0.063	(0)
	VO2F2-	3.337e-18	2.837e-18	-17.477	-17.547	-0.070	(0)
	VOF+	1.830e-19	1.556e-19	-18.738	-18.808	-0.070	(0)
	VO2F3-2	1.120e-20	5.853e-21	-19.951	-20.233	-0.282	(0)
	VOF2	9.648e-21	9.648e-21	-20.016	-20.016	0.000	(0)
	PbF4-2	1.492e-21	7.795e-22	-20.826	-21.108	-0.282	(0)
	BF4-	4.080e-22	3.527e-22	-21.389	-21.453	-0.063	(0)
	VOF3-	6.660e-23	5.662e-23	-22.177	-22.247	-0.070	(0)
	HgF+	3.099e-23	2.635e-23	-22.509	-22.579	-0.070	(0)
	VO2F4-3	2.053e-24	4.763e-25	-23.688	-24.322	-0.634	(0)
	Sb (OH) 2F	1.007e-24	1.007e-24	-23.997	-23.997	0.000	(0)
	SbOF	9.910e-25	9.910e-25	-24.004	-24.004	0.000	(0)
	VOF4-2	7.236e-26	3.780e-26	-25.141	-25.422	-0.282	(0)
	UF3+	1.724e-34	1.466e-34	-33.763	-33.834	-0.070	(0)
	UF2+2	1.070e-35	5.592e-36	-34.970	-35.252	-0.282	(0)
	UF4	2.659e-36	2.659e-36	-35.575	-35.575	0.000	(0)
	UF5-	2.050e-38	1.743e-38	-37.688	-37.759	-0.070	(0)
	UF+3	1.157e-38	2.686e-39	-37.936	-38.571	-0.634	(0)
	UF6-2	1.666e-39	8.704e-40	-38.778	-39.060	-0.282	(0)
Fe (2)	3.439e-11						
	Fe+2	2.747e-11	1.435e-11	-10.561	-10.843	-0.282	(0)
	FeSO4	5.936e-12	5.936e-12	-11.226	-11.226	0.000	(0)
	FeHCO3+	8.936e-13	7.866e-13	-12.049	-12.104	-0.055	(0)
	FeOH+	9.209e-14	8.068e-14	-13.036	-13.093	-0.057	(0)
	Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	4.615e-19	4.043e-19	-18.336	-18.393	-0.057	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-158.772	-158.772	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-235.103	-235.174	-0.070	(0)
Fe (3)	3.645e-09						
	Fe (OH) 2+	3.211e-09	2.819e-09	-8.493	-8.550	-0.057	(0)
	Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)

Fe (OH) 4-	6.406e-12	5.623e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.707e-14	5.129e-14	-13.060	-13.290	-0.230	(0)
FeF2+	5.154e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
FeF+2	1.732e-16	1.020e-16	-15.762	-15.991	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.214e-17	1.064e-17	-16.916	-16.973	-0.057	(0)
Fe+3	1.911e-18	5.625e-19	-17.719	-18.250	-0.531	(0)
Fe (SO4) 2-	4.509e-19	3.833e-19	-18.346	-18.416	-0.070	(0)
FeCl+2	4.334e-20	2.553e-20	-19.363	-19.593	-0.230	(0)
FeCl2+	1.957e-22	1.714e-22	-21.708	-21.766	-0.057	(0)
FeHSeO3+2	3.364e-23	1.758e-23	-22.473	-22.755	-0.282	(0)
Fe2 (OH) 2+4	1.170e-24	8.713e-26	-23.932	-25.060	-1.128	(0)
FeCl3	2.577e-26	2.577e-26	-25.589	-25.589	0.000	(0)
FeNO3+2	2.247e-29	1.174e-29	-28.648	-28.930	-0.282	(0)
Fe3 (OH) 4+5	2.054e-31	3.550e-33	-30.687	-32.450	-1.762	(0)
H (0)	4.020e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.227e-10					
Hg	2.227e-10	2.227e-10	-9.652	-9.652	0.000	(0)
Hg (1)	2.488e-21					
Hg2+2	1.244e-21	6.498e-22	-20.905	-21.187	-0.282	(0)
Hg (2)	3.153e-12					
HgClOH	1.611e-12	1.611e-12	-11.793	-11.793	0.000	(0)
HgCl2	9.709e-13	9.709e-13	-12.013	-12.013	0.000	(0)
Hg (OH) 2	5.385e-13	5.409e-13	-12.269	-12.267	0.002	(0)
HgCl3-	1.716e-14	1.459e-14	-13.765	-13.836	-0.070	(0)
HgCO3	1.473e-14	1.473e-14	-13.832	-13.832	0.000	(0)
Hg (CO3) 2-2	2.555e-16	1.335e-16	-15.593	-15.875	-0.282	(0)
HgCl4-2	1.672e-16	8.732e-17	-15.777	-16.059	-0.282	(0)
HgCl+	1.516e-16	1.289e-16	-15.819	-15.890	-0.070	(0)
HgOH+	2.842e-17	2.416e-17	-16.546	-16.617	-0.070	(0)
HgHCO3+	2.300e-17	1.955e-17	-16.638	-16.709	-0.070	(0)
Hg (OH) 3-	1.131e-20	9.618e-21	-19.946	-20.017	-0.070	(0)
Hg+2	8.226e-21	4.297e-21	-20.085	-20.367	-0.282	(0)
HgSO4	1.896e-21	1.896e-21	-20.722	-20.722	0.000	(0)
HgNH3+2	3.480e-23	1.818e-23	-22.458	-22.740	-0.282	(0)
HgF+	3.099e-23	2.635e-23	-22.509	-22.579	-0.070	(0)
Hg (NH3) 2+2	2.333e-25	1.219e-25	-24.632	-24.914	-0.282	(0)
HgNO3+	3.894e-33	3.311e-33	-32.410	-32.480	-0.070	(0)
Hg (NH3) 3+2	6.228e-36	3.253e-36	-35.206	-35.488	-0.282	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.542	-44.542	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.479	-45.761	-0.282	(0)
HgHS2-	0.000e+00	0.000e+00	-138.100	-138.170	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.923	-138.923	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.449	-139.731	-0.282	(0)
K	7.331e-04					
K+	7.245e-04	6.325e-04	-3.140	-3.199	-0.059	(0)
KSO4-	8.598e-06	7.547e-06	-5.066	-5.122	-0.057	(0)
KCrO4-	3.147e-19	2.675e-19	-18.502	-18.573	-0.070	(0)
Mg	1.761e-03					
Mg+2	1.441e-03	8.370e-04	-2.841	-3.077	-0.236	(0)
MgSO4	2.567e-04	2.567e-04	-3.591	-3.591	0.000	(0)
MgHCO3+	4.279e-05	3.730e-05	-4.369	-4.428	-0.060	(0)
MgF+	1.777e-05	1.553e-05	-4.750	-4.809	-0.059	(0)
MgCO3	1.994e-06	1.994e-06	-5.700	-5.700	0.000	(0)
MgOH+	5.335e-08	4.706e-08	-7.273	-7.327	-0.054	(0)
MgH2BO3+	4.358e-09	3.767e-09	-8.361	-8.424	-0.063	(0)
Mn (2)	2.407e-05					
Mn+2	1.983e-05	1.036e-05	-4.703	-4.985	-0.282	(0)
MnSO4	3.105e-06	3.105e-06	-5.508	-5.508	0.000	(0)
MnHCO3+	1.028e-06	9.003e-07	-5.988	-6.046	-0.057	(0)
MnF+	7.787e-08	6.822e-08	-7.109	-7.166	-0.057	(0)
MnCl+	2.238e-08	1.961e-08	-7.650	-7.708	-0.057	(0)
MnOH+	4.196e-09	3.676e-09	-8.377	-8.435	-0.057	(0)
MnCl2	4.163e-11	4.163e-11	-10.381	-10.381	0.000	(0)
MnCl3-	1.967e-14	1.723e-14	-13.706	-13.764	-0.057	(0)
MnSeO4	7.981e-15	7.981e-15	-14.098	-14.098	0.000	(0)
MnNO3+	4.030e-17	3.426e-17	-16.395	-16.465	-0.070	(0)

Mn (OH) 3-	5.173e-19	4.532e-19	-18.286	-18.344	-0.057	(0)
Mn (OH) 4-2	3.508e-25	2.067e-25	-24.455	-24.685	-0.230	(0)
Mn (NO3) 2	1.796e-28	1.796e-28	-27.746	-27.746	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.924	-42.924	0.000	(0)
Mn (3)	6.635e-25					
Mn+3	6.635e-25	1.953e-25	-24.178	-24.709	-0.531	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.499	-43.729	-0.230	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.414	-47.476	-0.062	(0)
Mo	4.134e-07					
MoO4-2	4.130e-07	2.398e-07	-6.384	-6.620	-0.236	(0)
HMoO4-	4.000e-10	3.401e-10	-9.398	-9.468	-0.070	(0)
H2MoO4	1.775e-13	1.775e-13	-12.751	-12.751	0.000	(0)
Ag2MoO4	6.489e-24	6.489e-24	-23.188	-23.188	0.000	(0)
AlMo6O21-3	1.509e-39	3.501e-40	-38.821	-39.456	-0.634	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.989	-50.527	-2.538	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.525	-51.287	-1.762	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.524	-53.652	-1.128	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.919	-57.553	-0.634	(0)
N (-3)	9.936e-10					
NH4+	9.696e-10	8.380e-10	-9.013	-9.077	-0.063	(0)
NH4SO4-	1.728e-11	1.513e-11	-10.763	-10.820	-0.057	(0)
NH3	6.705e-12	6.705e-12	-11.174	-11.174	0.000	(0)
CuNH3+2	4.595e-14	2.400e-14	-13.338	-13.620	-0.282	(0)
CaNH3+2	1.868e-14	9.757e-15	-13.729	-14.011	-0.282	(0)
NiNH3+2	5.213e-16	2.723e-16	-15.283	-15.565	-0.282	(0)
AgNH3+	1.361e-16	1.157e-16	-15.866	-15.937	-0.070	(0)
Co (NH3) +2	7.712e-17	4.029e-17	-16.113	-16.395	-0.282	(0)
BaNH3+2	5.031e-19	2.628e-19	-18.298	-18.580	-0.282	(0)
HgNH3+2	3.480e-23	1.818e-23	-22.458	-22.740	-0.282	(0)
Ag (NH3) 2+	7.419e-24	6.307e-24	-23.130	-23.200	-0.070	(0)
Ni (NH3) 2+2	5.052e-25	2.639e-25	-24.297	-24.579	-0.282	(0)
Hg (NH3) 2+2	2.333e-25	1.219e-25	-24.632	-24.914	-0.282	(0)
Ca (NH3) 2+2	4.985e-26	2.604e-26	-25.302	-25.584	-0.282	(0)
Co (NH3) 2+2	2.206e-26	1.152e-26	-25.656	-25.938	-0.282	(0)
Hg (NH3) 3+2	6.228e-36	3.253e-36	-35.206	-35.488	-0.282	(0)
Co (NH3) 3+2	1.862e-36	9.726e-37	-35.730	-36.012	-0.282	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.479	-45.761	-0.282	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.184	-46.466	-0.282	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.115	-55.397	-0.282	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.137	-57.419	-0.282	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.223	-64.505	-0.282	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.458	-67.093	-0.634	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.532	-68.814	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.349	-77.420	-0.070	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.939	-82.221	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.113	-82.395	-0.282	(0)
N (3)	2.552e-09					
NO2-	2.551e-09	2.212e-09	-8.593	-8.655	-0.062	(0)
CuNO2+	9.531e-14	8.103e-14	-13.021	-13.091	-0.070	(0)
AgNO2	3.907e-15	3.907e-15	-14.408	-14.408	0.000	(0)
CoNO2+	9.163e-16	7.790e-16	-15.038	-15.108	-0.070	(0)
Cu (NO2) 2	1.834e-21	1.834e-21	-20.737	-20.737	0.000	(0)
Ag (NO2) 2-	1.574e-23	1.338e-23	-22.803	-22.873	-0.070	(0)
N (5)	2.399e-12					
NO3-	2.390e-12	2.087e-12	-11.622	-11.681	-0.059	(0)
CaNO3+	8.971e-15	7.627e-15	-14.047	-14.118	-0.070	(0)
MnNO3+	4.030e-17	3.426e-17	-16.395	-16.465	-0.070	(0)
ZnNO3+	2.919e-18	2.481e-18	-17.535	-17.605	-0.070	(0)
CuNO3+	2.715e-18	2.309e-18	-17.566	-17.637	-0.070	(0)
BaNO3+	7.642e-19	6.497e-19	-18.117	-18.187	-0.070	(0)
NiNO3+	4.663e-19	3.964e-19	-18.331	-18.402	-0.070	(0)
CoNO3+	1.944e-19	1.653e-19	-18.711	-18.782	-0.070	(0)
CdNO3+	3.843e-20	3.267e-20	-19.415	-19.486	-0.070	(0)
PbNO3+	3.003e-20	2.553e-20	-19.522	-19.593	-0.070	(0)
AgNO3	1.401e-20	1.401e-20	-19.853	-19.853	0.000	(0)
UO2NO3+	1.672e-25	1.421e-25	-24.777	-24.847	-0.070	(0)

	CrNO3+2	1.552e-26	8.108e-27	-25.809	-26.091	-0.282	(0)
	Mn(NO3)2	1.796e-28	1.796e-28	-27.746	-27.746	0.000	(0)
	VO2NO3	1.719e-28	1.719e-28	-27.765	-27.765	0.000	(0)
	FeNO3+2	2.247e-29	1.174e-29	-28.648	-28.930	-0.282	(0)
	Zn(NO3)2	1.033e-30	1.033e-30	-29.986	-29.986	0.000	(0)
	Co(NO3)2	7.017e-31	7.017e-31	-30.154	-30.154	0.000	(0)
	Cu(NO3)2	6.064e-31	6.064e-31	-30.217	-30.217	0.000	(0)
	Pb(NO3)2	9.048e-32	9.048e-32	-31.043	-31.043	0.000	(0)
	Cd(NO3)2	3.417e-32	3.417e-32	-31.466	-31.466	0.000	(0)
	HgNO3+	3.894e-33	3.311e-33	-32.410	-32.480	-0.070	(0)
	Hg(NO3)2	0.000e+00	0.000e+00	-44.542	-44.542	0.000	(0)
Na		4.996e-03					
	Na+	4.941e-03	4.313e-03	-2.306	-2.365	-0.059	(0)
	NaSO4-	4.447e-05	3.904e-05	-4.352	-4.409	-0.057	(0)
	NaHCO3	1.056e-05	1.056e-05	-4.976	-4.976	0.000	(0)
	NaF	4.501e-07	4.501e-07	-6.347	-6.347	0.000	(0)
	NaCO3-	2.621e-07	2.301e-07	-6.582	-6.638	-0.057	(0)
	NaH2BO3	8.871e-10	8.871e-10	-9.052	-9.052	0.000	(0)
	NaCrO4-	2.870e-18	2.440e-18	-17.542	-17.613	-0.070	(0)
Ni		2.124e-07					
	Ni+2	1.302e-07	7.563e-08	-6.885	-7.121	-0.236	(0)
	NiHCO3+	4.776e-08	4.060e-08	-7.321	-7.391	-0.070	(0)
	NiSO4	2.543e-08	2.543e-08	-7.595	-7.595	0.000	(0)
	NiCO3	8.083e-09	8.083e-09	-8.092	-8.092	0.000	(0)
	NiF+	3.696e-10	3.142e-10	-9.432	-9.503	-0.070	(0)
	NiCl+	3.421e-10	2.909e-10	-9.466	-9.536	-0.070	(0)
	NiOH+	1.582e-10	1.345e-10	-9.801	-9.871	-0.070	(0)
	Ni(SO4)2-2	2.717e-12	1.420e-12	-11.566	-11.848	-0.282	(0)
	Ni(OH)2	1.509e-12	1.509e-12	-11.821	-11.821	0.000	(0)
	NiCl2	2.201e-15	2.201e-15	-14.657	-14.657	0.000	(0)
	NiNH3+2	5.213e-16	2.723e-16	-15.283	-15.565	-0.282	(0)
	Ni(OH)3-	2.507e-16	2.131e-16	-15.601	-15.671	-0.070	(0)
	NiSeO4	1.012e-16	1.012e-16	-15.995	-15.995	0.000	(0)
	NiNO3+	4.663e-19	3.964e-19	-18.331	-18.402	-0.070	(0)
	Ni(NH3)2+2	5.052e-25	2.639e-25	-24.297	-24.579	-0.282	(0)
O(0)		2.474e-35					
	O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb		1.292e-08					
	PbCO3	7.125e-09	7.125e-09	-8.147	-8.147	0.000	(0)
	PbHCO3+	3.149e-09	2.677e-09	-8.502	-8.572	-0.070	(0)
	Pb+2	1.425e-09	8.273e-10	-8.846	-9.082	-0.236	(0)
	PbSO4	6.830e-10	6.830e-10	-9.166	-9.166	0.000	(0)
	PbOH+	3.453e-10	2.935e-10	-9.462	-9.532	-0.070	(0)
	Pb(CO3)2-2	1.127e-10	5.886e-11	-9.948	-10.230	-0.282	(0)
	PbCl+	5.190e-11	4.412e-11	-10.285	-10.355	-0.070	(0)
	Pb(SO4)2-2	1.328e-11	6.936e-12	-10.877	-11.159	-0.282	(0)
	PbF+	1.134e-11	9.643e-12	-10.945	-11.016	-0.070	(0)
	Pb(OH)2	1.311e-12	1.311e-12	-11.882	-11.882	0.000	(0)
	PbCl2	2.962e-13	2.962e-13	-12.528	-12.528	0.000	(0)
	PbF2	3.139e-14	3.139e-14	-13.503	-13.503	0.000	(0)
	Pb(OH)3-	2.178e-16	1.852e-16	-15.662	-15.732	-0.070	(0)
	PbCl3-	2.085e-16	1.773e-16	-15.681	-15.751	-0.070	(0)
	Pb2OH+3	1.659e-17	3.849e-18	-16.780	-17.415	-0.634	(0)
	PbF3-	1.158e-17	9.847e-18	-16.936	-17.007	-0.070	(0)
	PbCl4-2	2.331e-19	1.218e-19	-18.632	-18.914	-0.282	(0)
	PbNO3+	3.003e-20	2.553e-20	-19.522	-19.593	-0.070	(0)
	Pb(OH)4-2	1.226e-20	6.405e-21	-19.911	-20.193	-0.282	(0)
	PbF4-2	1.492e-21	7.795e-22	-20.826	-21.108	-0.282	(0)
	Pb3(OH)4+2	5.431e-23	2.837e-23	-22.265	-22.547	-0.282	(0)
	Pb4(OH)4+4	2.503e-27	1.865e-28	-26.601	-27.729	-1.128	(0)
	Pb(NO3)2	9.048e-32	9.048e-32	-31.043	-31.043	0.000	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-150.691	-150.691	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-227.759	-227.830	-0.070	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-72.698	-72.698	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.369	-78.439	-0.070	(0)
	H2S	0.000e+00	0.000e+00	-78.566	-78.566	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.666	-78.736	-0.070	(0)

S5-2	0.000e+00	0.000e+00	-80.375	-80.657	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.891	-81.173	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.971	-81.253	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.777	-82.059	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.793	-83.075	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.362	-88.592	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.100	-138.170	-0.070	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.923	-138.923	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.449	-139.731	-0.282	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.966	-147.037	-0.070	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.205	-147.373	-0.168	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.275	-148.586	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.018	-149.316	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.176	-149.246	-0.070	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.349	-149.666	-0.317	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.673	-149.977	-0.304	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.972	-149.972	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.383	-150.383	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.691	-150.691	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.772	-158.772	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.804	-215.875	-0.070	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.472	-225.542	-0.070	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.440	-226.511	-0.070	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.759	-227.830	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.093	-228.375	-0.282	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.103	-235.174	-0.070	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.472	-302.754	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.160	-305.442	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.904	-317.186	-0.282	(0)
S (6)	3.662e-03					
SO4-2	2.902e-03	1.685e-03	-2.537	-2.773	-0.236	(0)
CaSO4	4.463e-04	4.463e-04	-3.350	-3.350	0.000	(0)
MgSO4	2.567e-04	2.567e-04	-3.591	-3.591	0.000	(0)
NaSO4-	4.447e-05	3.904e-05	-4.352	-4.409	-0.057	(0)
KSO4-	8.598e-06	7.547e-06	-5.066	-5.122	-0.057	(0)
MnSO4	3.105e-06	3.105e-06	-5.508	-5.508	0.000	(0)
ZnSO4	1.746e-07	1.746e-07	-6.758	-6.758	0.000	(0)
CuSO4	1.351e-07	1.351e-07	-6.869	-6.869	0.000	(0)
NiSO4	2.543e-08	2.543e-08	-7.595	-7.595	0.000	(0)
CoSO4	1.681e-08	1.681e-08	-7.774	-7.774	0.000	(0)
HSO4-	1.343e-08	1.174e-08	-7.872	-7.930	-0.059	(0)
Zn (SO4) 2-2	4.906e-09	2.563e-09	-8.309	-8.591	-0.282	(0)
CdSO4	1.956e-09	1.956e-09	-8.709	-8.709	0.000	(0)
PbSO4	6.830e-10	6.830e-10	-9.166	-9.166	0.000	(0)
AgSO4-	3.344e-10	2.843e-10	-9.476	-9.546	-0.070	(0)
CrOHSO4	1.099e-10	1.099e-10	-9.959	-9.959	0.000	(0)
Cd (SO4) 2-2	8.515e-11	4.448e-11	-10.070	-10.352	-0.282	(0)
AlSO4+	2.137e-11	1.868e-11	-10.670	-10.729	-0.059	(0)
NH4SO4-	1.728e-11	1.513e-11	-10.763	-10.820	-0.057	(0)
Pb (SO4) 2-2	1.328e-11	6.936e-12	-10.877	-11.159	-0.282	(0)
FeSO4	5.936e-12	5.936e-12	-11.226	-11.226	0.000	(0)
Ni (SO4) 2-2	2.717e-12	1.420e-12	-11.566	-11.848	-0.282	(0)
CrSO4+	4.115e-13	3.499e-13	-12.386	-12.456	-0.070	(0)
Al (SO4) 2-	3.860e-13	3.373e-13	-12.413	-12.472	-0.059	(0)
UO2SO4	8.710e-14	8.710e-14	-13.060	-13.060	0.000	(0)
UO2 (SO4) 2-2	3.704e-15	1.935e-15	-14.431	-14.713	-0.282	(0)
FeSO4+	1.214e-17	1.064e-17	-16.916	-16.973	-0.057	(0)
VO2SO4-	7.708e-18	6.553e-18	-17.113	-17.184	-0.070	(0)
Cr2 (OH) 2SO4+2	5.222e-18	2.728e-18	-17.282	-17.564	-0.282	(0)
Fe (SO4) 2-	4.509e-19	3.833e-19	-18.346	-18.416	-0.070	(0)
Cr2 (OH) 2 (SO4) 2	2.731e-19	2.731e-19	-18.564	-18.564	0.000	(0)
VOSO4	7.279e-20	7.279e-20	-19.138	-19.138	0.000	(0)
HgSO4	1.896e-21	1.896e-21	-20.722	-20.722	0.000	(0)
CrO3SO4-2	1.839e-24	9.609e-25	-23.735	-24.017	-0.282	(0)
VSO4+	8.774e-34	7.459e-34	-33.057	-33.127	-0.070	(0)
U (SO4) 2	7.310e-40	7.310e-40	-39.136	-39.136	0.000	(0)
USO4+2	1.045e-40	0.000e+00	-39.981	-40.263	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.349	-77.420	-0.070	(0)

Sb (3)	1.081e-19					
Sb (OH) 3	5.470e-20	5.470e-20	-19.262	-19.262	0.000	(0)
HSbO2	5.341e-20	5.341e-20	-19.272	-19.272	0.000	(0)
SbO2-	1.428e-24	1.214e-24	-23.845	-23.916	-0.070	(0)
Sb (OH) 2F	1.007e-24	1.007e-24	-23.997	-23.997	0.000	(0)
SbOF	9.910e-25	9.910e-25	-24.004	-24.004	0.000	(0)
Sb (OH) 4-	8.175e-25	6.950e-25	-24.087	-24.158	-0.070	(0)
Sb (OH) 2+	1.114e-25	9.469e-26	-24.953	-25.024	-0.070	(0)
SbO+	3.841e-26	3.265e-26	-25.416	-25.486	-0.070	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.904	-317.186	-0.282	(0)
Sb (5)	1.327e-08					
SbO3-	1.325e-08	1.127e-08	-7.878	-7.948	-0.070	(0)
Sb (OH) 6-	1.508e-11	1.317e-11	-10.822	-10.881	-0.059	(0)
SbO2+	1.931e-23	1.642e-23	-22.714	-22.785	-0.070	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.340e-40	1.989e-40	-39.631	-39.701	-0.070	(0)
MnSe	0.000e+00	0.000e+00	-42.924	-42.924	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.958	-42.958	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.272	-47.554	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.415	-86.543	-1.128	(0)
Se (4)	1.517e-08					
HSeO3-	1.391e-08	1.183e-08	-7.857	-7.927	-0.070	(0)
SeO3-2	1.264e-09	6.606e-10	-8.898	-9.180	-0.282	(0)
H2SeO3	3.595e-13	3.595e-13	-12.444	-12.444	0.000	(0)
AgSeO3-	4.222e-15	3.589e-15	-14.374	-14.445	-0.070	(0)
Cd (SeO3) 2-2	3.409e-21	1.781e-21	-20.467	-20.749	-0.282	(0)
Ag (SeO3) 2-3	9.150e-23	2.123e-23	-22.039	-22.673	-0.634	(0)
FeHSeO3+2	3.364e-23	1.758e-23	-22.473	-22.755	-0.282	(0)
Se (6)	4.936e-12					
SeO4-2	4.928e-12	2.862e-12	-11.307	-11.543	-0.236	(0)
MnSeO4	7.981e-15	7.981e-15	-14.098	-14.098	0.000	(0)
ZnSeO4	2.098e-16	2.098e-16	-15.678	-15.678	0.000	(0)
NiSeO4	1.012e-16	1.012e-16	-15.995	-15.995	0.000	(0)
CoSeO4	7.168e-17	7.168e-17	-16.145	-16.145	0.000	(0)
HSeO4-	1.202e-17	1.022e-17	-16.920	-16.990	-0.070	(0)
CdSeO4	2.639e-18	2.639e-18	-17.579	-17.579	0.000	(0)
Zn (SeO4) 2-2	1.166e-27	6.089e-28	-26.933	-27.215	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.876	-58.511	-0.634	(0)
U (4)	3.953e-22					
U (OH) 5-	3.943e-22	3.352e-22	-21.404	-21.475	-0.070	(0)
U (OH) 4	1.001e-24	1.001e-24	-24.000	-24.000	0.000	(0)
U (OH) 3+	3.068e-28	2.608e-28	-27.513	-27.584	-0.070	(0)
U (OH) 2+2	1.646e-32	8.599e-33	-31.784	-32.066	-0.282	(0)
UF3+	1.724e-34	1.466e-34	-33.763	-33.834	-0.070	(0)
UF2+2	1.070e-35	5.592e-36	-34.970	-35.252	-0.282	(0)
UF4	2.659e-36	2.659e-36	-35.575	-35.575	0.000	(0)
UOH+3	1.244e-37	2.887e-38	-36.905	-37.540	-0.634	(0)
UF5-	2.050e-38	1.743e-38	-37.688	-37.759	-0.070	(0)
UF+3	1.157e-38	2.686e-39	-37.936	-38.571	-0.634	(0)
UF6-2	1.666e-39	8.704e-40	-38.778	-39.060	-0.282	(0)
U (SO4) 2	7.310e-40	7.310e-40	-39.136	-39.136	0.000	(0)
USO4+2	1.045e-40	0.000e+00	-39.981	-40.263	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.962	-44.090	-1.128	(0)
UCl+3	0.000e+00	0.000e+00	-44.578	-45.213	-0.634	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.777	-174.488	-5.710	(0)
U (5)	5.800e-17					
UO2+	5.800e-17	4.931e-17	-16.237	-16.307	-0.070	(0)
U (6)	8.589e-08					
UO2 (CO3) 3-4	4.290e-08	3.195e-09	-7.368	-8.495	-1.128	(0)
UO2 (CO3) 2-2	4.260e-08	2.226e-08	-7.371	-7.653	-0.282	(0)
UO2CO3	3.894e-10	3.894e-10	-9.410	-9.410	0.000	(0)
UO2F+	9.169e-13	7.795e-13	-12.038	-12.108	-0.070	(0)
UO2OH+	7.141e-13	6.071e-13	-12.146	-12.217	-0.070	(0)
UO2F2	3.718e-13	3.718e-13	-12.430	-12.430	0.000	(0)
UO2SO4	8.710e-14	8.710e-14	-13.060	-13.060	0.000	(0)
UO2+2	5.879e-14	3.414e-14	-13.231	-13.467	-0.236	(0)

UO2F3-	1.817e-14	1.545e-14	-13.741	-13.811	-0.070	(0)
UO2(SO4) 2-2	3.704e-15	1.935e-15	-14.431	-14.713	-0.282	(0)
UO2Cl+	9.789e-17	8.323e-17	-16.009	-16.080	-0.070	(0)
UO2F4-2	3.885e-17	2.030e-17	-16.411	-16.693	-0.282	(0)
(UO2) 2 (OH) 2+2	1.171e-18	6.116e-19	-17.932	-18.214	-0.282	(0)
(UO2) 3 (OH) 5+	6.609e-21	5.619e-21	-20.180	-20.250	-0.070	(0)
UO2NO3+	1.672e-25	1.421e-25	-24.777	-24.847	-0.070	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.233	-42.303	-0.070	(0)
V+2	0.000e+00	0.000e+00	-42.681	-42.963	-0.282	(0)
V(3)	2.131e-15					
V(OH) 3	2.131e-15	2.131e-15	-14.671	-14.671	0.000	(0)
V(OH) 2+	1.154e-25	9.815e-26	-24.938	-25.008	-0.070	(0)
VOH+2	1.270e-28	6.636e-29	-27.896	-28.178	-0.282	(0)
V+3	4.040e-33	9.375e-34	-32.394	-33.028	-0.634	(0)
VSO4+	8.774e-34	7.459e-34	-33.057	-33.127	-0.070	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.100	-54.734	-0.634	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-54.428	-55.556	-1.128	(0)
V(4)	5.762e-18					
V(OH) 3+	5.196e-18	4.417e-18	-17.284	-17.355	-0.070	(0)
VO+2	3.002e-19	1.568e-19	-18.523	-18.805	-0.282	(0)
VOF+	1.830e-19	1.556e-19	-18.738	-18.808	-0.070	(0)
VOSO4	7.279e-20	7.279e-20	-19.138	-19.138	0.000	(0)
VOF2	9.648e-21	9.648e-21	-20.016	-20.016	0.000	(0)
VOC1+	7.777e-22	6.612e-22	-21.109	-21.180	-0.070	(0)
VOF3-	6.660e-23	5.662e-23	-22.177	-22.247	-0.070	(0)
VOF4-2	7.236e-26	3.780e-26	-25.141	-25.422	-0.282	(0)
H2V2O4+2	1.873e-30	9.787e-31	-29.727	-30.009	-0.282	(0)
V(5)	1.998e-09					
H2VO4-	1.889e-09	1.606e-09	-8.724	-8.794	-0.070	(0)
HVO4-2	1.083e-10	5.660e-11	-9.965	-10.247	-0.282	(0)
H3VO4	1.144e-12	1.144e-12	-11.941	-11.941	0.000	(0)
H3V2O7-	1.396e-14	1.187e-14	-13.855	-13.926	-0.070	(0)
VO2+	1.865e-16	1.628e-16	-15.729	-15.788	-0.059	(0)
HV2O7-3	1.328e-16	3.080e-17	-15.877	-16.511	-0.634	(0)
VO2F	4.724e-17	4.724e-17	-16.326	-16.326	0.000	(0)
VO4-3	1.715e-17	3.980e-18	-16.766	-17.400	-0.634	(0)
VO2SO4-	7.708e-18	6.553e-18	-17.113	-17.184	-0.070	(0)
VO2F2-	3.337e-18	2.837e-18	-17.477	-17.547	-0.070	(0)
V2O7-4	1.562e-19	1.163e-20	-18.806	-19.934	-1.128	(0)
V3O9-3	1.870e-20	4.340e-21	-19.728	-20.363	-0.634	(0)
VO2F3-2	1.120e-20	5.853e-21	-19.951	-20.233	-0.282	(0)
VO2F4-3	2.053e-24	4.763e-25	-23.688	-24.322	-0.634	(0)
V4O12-4	3.901e-26	2.906e-27	-25.409	-26.537	-1.128	(0)
VO2NO3	1.719e-28	1.719e-28	-27.765	-27.765	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-64.822	-66.585	-1.762	(0)
V10O28-6	0.000e+00	0.000e+00	-65.086	-67.624	-2.538	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.396	-68.524	-1.128	(0)
Zn	1.162e-06					
Zn+2	8.153e-07	4.734e-07	-6.089	-6.325	-0.236	(0)
ZnSO4	1.746e-07	1.746e-07	-6.758	-6.758	0.000	(0)
ZnCO3	7.805e-08	7.805e-08	-7.108	-7.108	0.000	(0)
ZnHCO3+	7.669e-08	6.520e-08	-7.115	-7.186	-0.070	(0)
ZnOH+	7.866e-09	6.687e-09	-8.104	-8.175	-0.070	(0)
Zn(SO4) 2-2	4.906e-09	2.563e-09	-8.309	-8.591	-0.282	(0)
ZnCl+	2.051e-09	1.788e-09	-8.688	-8.748	-0.060	(0)
ZnF+	1.838e-09	1.562e-09	-8.736	-8.806	-0.070	(0)
ZnOHCl	3.305e-10	3.305e-10	-9.481	-9.481	0.000	(0)
Zn(OH) 2	1.497e-10	1.497e-10	-9.825	-9.825	0.000	(0)
ZnCl2	4.258e-12	4.258e-12	-11.371	-11.371	0.000	(0)
Zn(OH) 3-	1.246e-13	1.060e-13	-12.904	-12.975	-0.070	(0)
ZnCl3-	5.833e-15	5.084e-15	-14.234	-14.294	-0.060	(0)
ZnSeO4	2.098e-16	2.098e-16	-15.678	-15.678	0.000	(0)
ZnCl4-2	6.486e-18	3.821e-18	-17.188	-17.418	-0.230	(0)
ZnNO3+	2.919e-18	2.481e-18	-17.535	-17.605	-0.070	(0)
Zn(OH) 4-2	1.141e-18	5.958e-19	-17.943	-18.225	-0.282	(0)
Zn(SeO4) 2-2	1.166e-27	6.089e-28	-26.933	-27.215	-0.282	(0)
Zn(NO3) 2	1.033e-30	1.033e-30	-29.986	-29.986	0.000	(0)

ZnS (HS) -	0.000e+00	0.000e+00	-149.176	-149.246	-0.070	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.383	-150.383	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.472	-225.542	-0.070	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.093	-228.375	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.160	-305.442	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-76.20	-69.91	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-56.70	-52.19	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-63.93	-52.19	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-98.63	-80.70	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-74.15	-54.12	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-34.50	-34.10	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-30.15	-29.70	0.45	(NH4) 2SeO4	
Acanthite	-51.22	-87.44	-36.22	Ag2S	
Ag2CO3	-10.60	-21.69	-11.09	Ag2CO3	
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4	
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4	
Ag2MoO4	-11.22	-22.77	-11.55	Ag2MoO4	
Ag2O	-14.43	-1.85	12.57	Ag2O	
Ag2Se	0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-14.10	-18.92	-4.82	Ag2SO4	
Ag3AsO3	-27.19	-25.03	2.16	Ag3AsO3	
Ag3AsO4	-15.59	-18.38	-2.79	Ag3AsO4	
Ag3H2VO5	-16.60	-11.42	5.18	Ag3H2VO5	
AgF:4H2O	-12.90	-11.85	1.05	AgF:4H2O	
Agmetal	-0.19	-13.70	-13.51	Ag	
AgVO3	-10.34	-9.57	0.77	AgVO3	
Al (OH) 3 (am)	-1.20	9.60	10.80	Al (OH) 3	
Al2 (MoO4) 3	-45.92	-43.55	2.37	Al2 (MoO4) 3	
Al2O3	-0.46	19.19	19.65	Al2O3	
Al4 (OH) 10SO4	-1.39	21.31	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-10.81	-6.01	4.80	AlAsO4:2H2O	
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4	
AlSb	-151.92	-86.30	65.62	AlSb	
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-4.07	-11.86	-7.79	PbSO4	
Anhydrite	-1.35	-5.71	-4.36	CaSO4	
Anilite	-55.12	-86.99	-31.88	Cu0.25Cu1.5S	
Antlerite	-2.34	6.45	8.79	Cu3 (OH) 4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-86.24	-89.00	-2.76	As4O6	
Artinite	-7.00	2.60	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-37.91	-31.21	6.71	As2O5	
Atacamite	-1.69	5.71	7.39	Cu2 (OH) 3Cl	
Azurite	0.75	-16.16	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-17.31	7.09	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-18.98	-3.11	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	-1.04	-9.95	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-28.96	3.98	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-13.48	-23.15	-9.67	BaCrO4	
BaF2	-8.95	-14.77	-5.82	BaF2	
BaMoO4	-6.87	-13.83	-6.96	BaMoO4	
Barite	0.00	-9.98	-9.98	BaSO4	
BaS	-94.68	-78.50	16.18	BaS	
BaSeO3	-9.82	-7.99	1.83	BaSeO3	
BaSeO4	-11.29	-18.75	-7.46	BaSeO4	
Bianchite	-7.33	-9.10	-1.76	ZnSO4:6H2O	
Birnessite	-8.59	9.50	18.09	MnO2	
Bixbyite	-5.89	-6.54	-0.64	Mn2O3	
BlaubleiI	-54.82	-78.98	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-55.40	-82.68	-27.28	Cu0.6Cu0.8S	
Boehmite	1.02	9.60	8.58	AlOOH	

Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.94	14.28	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-5.63	11.22	16.84	Mg(OH) ₂
Bunsenite	-5.27	7.17	12.45	NiO
Ca(VO ₃) ₂	-11.59	-5.93	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-12.07	5.43	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-16.12	5.43	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-19.44	2.86	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-22.17	16.79	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-23.07	16.79	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-300.69	-157.72	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.62	-18.88	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-8.92	-26.83	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.61	-9.56	-7.95	CaMoO ₄
Carnotite	-4.10	-3.87	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-6.53	-3.72	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-11.46	-14.48	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-13.45	-3.61	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.66	5.99	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.74	5.99	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.88	-16.17	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.66	0.90	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.51	6.89	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.29	-13.95	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.26	-13.95	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.04	-13.95	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.66	-15.87	-1.21	CdF ₂
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.17	-19.56	13.62	Cd
CdMoO ₄	-0.78	-14.93	-14.15	CdMoO ₄
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.78	-77.13	-0.35	CdSb
CdSe	-20.66	-40.86	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.00	-19.85	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.91	-11.08	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.35	-11.08	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.21	-11.08	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.15	-10.90	-9.75	AgCl
Cerrusite	-1.50	-14.63	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-6.59	-9.23	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.15	-90.07	-34.92	Cu ₂ S
Chalcopyrite	-124.61	-159.88	-35.27	CuFeS ₂
Cinnabar	-52.16	-97.85	-45.69	HgS
Claudetite	-85.94	-89.00	-3.06	As ₄ O ₆
Clausthalite	-14.54	-41.64	-27.10	PbSe
Co(BO ₂) ₂	-29.67	-2.60	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.10	6.99	13.09	Co(OH) ₂
Co(OH) ₃	-10.33	-12.64	-2.31	Co(OH) ₃
CO ₂ (g)	-1.69	-19.84	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-23.26	-10.23	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.78	-18.28	-10.50	Co ₃ O ₄
CoCl ₂	-21.21	-12.95	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.48	-12.95	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.86	-12.84	-9.98	CoCO ₃
CoF ₂	-13.27	-14.86	-1.60	CoF ₂
CoF ₃	-43.96	-45.42	-1.46	CoF ₃
CoFe ₂ O ₄	16.90	13.38	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.16	-13.92	-7.76	CoMoO ₄
CoO	-6.59	6.99	13.59	CoO
CoS(alpha)	-71.15	-78.59	-7.44	CoS
CoS(beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.66	-39.86	-16.20	CoSe
CoSeO ₃	-9.40	-8.08	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-17.32	-18.85	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.88	-10.07	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.60	-10.08	-2.47	CoSO ₄ :6H ₂ O

Cotunnite	-9.95	-14.73	-4.78	PbCl2
Covellite	-55.45	-77.75	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.04	-30.94	14.09	CrCl2
CrCl3	-46.20	-31.09	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu (OH) 2	-0.84	7.84	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.81	20.40	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-12.40	-3.15	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.42	-90.30	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.54	-51.34	-45.80	Cu2Se
Cu2SO4	-19.61	-21.56	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.79	-7.69	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.04	-102.63	-42.59	Cu3Sb
Cu3Se2	-26.86	-90.35	-63.49	Cu3Se2
CuCO3	-0.50	-12.00	-11.50	CuCO3
CuCrO4	-16.96	-22.40	-5.44	CuCrO4
CuF	-8.27	-13.17	-4.91	CuF
CuF2	-15.13	-14.02	1.12	CuF2
CuF2:2H2O	-9.47	-14.02	-4.55	CuF2:2H2O
Cumetal	-6.26	-15.02	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.69	-1.39	10.30	CuOCuSO4
Cupricferrite	8.23	14.22	5.99	CuFe2O4
Cuprite	-3.08	-4.49	-1.41	Cu2O
Cuprousferrite	9.86	0.95	-8.92	CuFeO2
CuSe	-5.91	-39.01	-33.10	CuSe
CuSe2	-26.95	-60.31	-33.37	CuSe2
CuSeO3:2H2O	-7.75	-7.24	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.56	-18.00	-2.44	CuSeO4:5H2O
CuSO4	-12.17	-9.23	2.94	CuSO4
Diaspore	2.72	9.60	6.87	AlOOH
Djurleite	-55.34	-89.26	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.56	-17.10	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.01	-17.10	-17.09	CaMg (CO3) 2
Epsomite	-3.73	-5.85	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.24	0.20	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.11	-13.83	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.25	-8.69	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.21	-38.84	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.09	-44.82	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-12.81	-12.41	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.37	-17.46	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.11	-64.70	-18.60	FeSe2
FeS (ppt)	-79.19	-82.14	-2.95	FeS
FeSe	-32.40	-43.40	-11.00	FeSe
Fix_pe	-5.63	-5.63	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.40	-80.37	-13.97	PbS
Gibbsite	1.30	9.60	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.09	-9.10	-2.01	ZnSO4:7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.48	-332.51	-45.03	Fe3S4
Gummite	-6.84	0.83	7.67	UO3
Gypsum	-1.10	-5.71	-4.61	CaSO4:2H2O
H-Jarosite	-12.46	-24.56	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.04	-20.91	-12.88	H2MoO4

H2S(g)	-77.58	-85.59	-8.01	H2S
H2Se(g)	-41.89	-46.85	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.56	53.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3)2(g)	-182.59	-256.30	-73.71	Hg(CH3)2
Hg(g)	-8.35	-16.22	-7.87	Hg
Hg(OH)2	-8.77	-12.27	-3.50	Hg(OH)2
Hg2(g)	-17.48	-32.44	-14.96	Hg2
Hg2(OH)2	-12.15	-6.89	5.26	Hg2(OH)2
Hg2CO3	-10.68	-26.73	-16.05	Hg2CO3
Hg2CrO4	-28.43	-37.13	-8.70	Hg2CrO4
Hg2F2	-18.39	-28.75	-10.36	Hg2F2
Hg2S	-80.80	-92.48	-11.68	Hg2S
Hg2SeO3	-17.31	-21.97	-4.66	Hg2SeO3
Hg2SO4	-17.83	-23.96	-6.13	Hg2SO4
Hg3O2CO3	-26.96	-56.64	-29.68	Hg3O2CO3
HgCl(g)	-32.91	-13.42	19.50	HgCl
HgCl2	-10.94	-32.21	-21.26	HgCl2
HgF(g)	-47.05	-14.38	32.68	HgF
HgF2(g)	-46.69	-34.12	12.57	HgF2
Hgmetal(1)	-2.77	-16.22	-13.45	Hg
HgSe	-3.42	-59.11	-55.69	HgSe
HgSeO3	-14.91	-27.34	-12.43	HgSeO3
HgSO4	-19.92	-29.33	-9.42	HgSO4
Huntite	-4.37	-34.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.27	-24.04	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.50	-23.26	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.42	-20.59	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.81	-20.61	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.34	-52.58	-17.24	K2Cr2O7
K2CrO4	-21.83	-22.34	-0.51	K2CrO4
K2MoO4	-16.28	-13.02	3.26	K2MoO4
K2SeO4	-17.21	-17.94	-0.73	K2SeO4
Langite	-3.20	14.28	17.49	Cu4(OH)6SO4:H2O
Larnakite	-6.21	-6.64	-0.43	PbO:PbSO4
Laurionite	-5.38	-4.76	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.48	5.21	12.69	PbO
Mackinawite	-78.54	-82.14	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesianoferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.14	-4.16	-5.31	Cu2(OH)2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.68	5.21	12.89	PbO
Matlockite	-6.71	-15.69	-8.97	PbClF
Melanothallite	-18.36	-12.10	6.26	CuCl2
Melanterite	-11.41	-13.62	-2.21	FeSO4:7H2O
Metacinnabar	-52.76	-97.85	-45.09	HgS
Mg(OH)2(active)	-7.58	11.22	18.79	Mg(OH)2
Mg(VO3)2	-17.35	-6.07	11.28	Mg(VO3)2
Mg2Sb3	-276.08	-201.39	74.68	Mg2Sb3
Mg2V2O7	-21.21	5.15	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.85	-9.70	-1.85	MgMoO4
MgSeO3:6H2O	-6.91	-3.86	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-13.42	-14.62	-1.20	MgSeO4:6H2O
Minium	-32.34	41.18	73.52	Pb3O4
Mirabilite	-6.39	-7.51	-1.11	Na2SO4:10H2O
Mn(VO3)2	-12.87	-7.97	4.90	Mn(VO3)2
Mn2(SO4)3	-52.03	-57.74	-5.71	Mn2(SO4)3
Mn2Sb	-151.13	-90.05	61.08	Mn2Sb

Mn3(AsO4)2·8H2O	-15.78	-3.28	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.35	-10.63	2.72	MnCl2·4H2O
MnS (grn)	-76.45	-76.28	0.17	MnS
MnS (pnk)	-79.62	-76.28	3.34	MnS
MnSb	-96.25	-99.16	-2.91	MnSb
MnSe	-41.04	-37.54	3.50	MnSe
MnSeO3	-6.89	-5.76	1.13	MnSeO3
MnSeO3·2H2O	-6.75	-5.76	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.48	-16.53	-2.05	MnSeO4·5H2O
MnSO4	-10.34	-7.76	2.58	MnSO4
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO3	-12.91	-20.91	-8.00	MoO3
Morenosite	-7.75	-9.90	-2.14	NiSO4·7H2O
MoS2	-147.37	-217.63	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.02	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.60	-20.67	2.93	Na2CrO4
Na2Mo2O7	-15.67	-32.26	-16.60	Na2Mo2O7
Na2MoO4	-12.84	-11.35	1.49	Na2MoO4
Na2MoO4·2H2O	-12.57	-11.35	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-15.81	-5.51	10.30	Na2SeO3·5H2O
Na2SeO4	-17.55	-16.27	1.28	Na2SeO4
Na3Sb	-176.00	-81.55	94.45	Na3Sb
Na3VO4	-30.98	5.70	36.68	Na3VO4
Na4V2O7	-35.56	1.84	37.40	Na4V2O7
Nantokite	-5.48	-12.21	-6.73	CuCl
NaSb	-88.74	-65.57	23.17	NaSb
Natron	-8.96	-10.27	-1.31	Na2CO3·10H2O
NaVO3	-7.72	-3.86	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3·3H2O
Ni(OH)2	-5.62	7.17	12.79	Ni(OH)2
Ni3(AsO4)2·8H2O	-25.39	-9.69	15.70	Ni3(AsO4)2·8H2O
Ni4(OH)6SO4	-20.38	11.62	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.60	-13.74	-11.14	NiMoO4
NiS (alpha)	-72.81	-78.41	-5.60	NiS
NiS (beta)	-67.31	-78.41	-11.10	NiS
NiS (gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.98	-39.68	-17.70	NiSe
NiSeO3·2H2O	-10.72	-7.90	2.81	NiSeO3·2H2O
NiSeO4·6H2O	-17.15	-18.67	-1.52	NiSeO4·6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-240.19	-301.26	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.90	-4.38	6.52	Pb(BO2)2
Pb(OH)2	-2.94	5.21	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.14	-66.90	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.34	0.45	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.76	10.42	26.19	Pb2O(OH)2
Pb2O3	-25.07	35.97	61.04	Pb2O3
Pb2OCO3	-8.86	-9.41	-0.56	Pb2OCO3
Pb2V2O7	-4.96	-6.86	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.37	-15.57	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.79	-1.65	6.14	Pb3(VO4)2
Pb3O2CO3	-15.22	-4.20	11.02	Pb3O2CO3
Pb3O2SO4	-12.12	-1.43	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.32	3.78	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.10	3.78	21.88	Pb4O3SO4
PbCrO4	-12.43	-25.03	-12.60	PbCrO4
PbF2	-9.21	-16.65	-7.44	PbF2
Pbmetal	-24.58	-20.33	4.25	Pb
PbMoO4	-0.08	-15.70	-15.62	PbMoO4
PbO·0.3H2O	-7.77	5.21	12.98	PbO·0.33H2O
PbSeO4	-13.79	-20.63	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.54	-29.35	-19.81	PbCl2·PbCO3

Plattnerite	-18.84	30.76	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.67	-142.18	-18.51	FeS2
Pyrochroite	-5.88	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-7.86	-9.90	-2.04	NiSO4·6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.51	-19.01	-14.50	UO2CO3
Sb(OH)3	-12.15	-19.26	-7.11	Sb(OH)3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-26.39	-36.05	-9.67	Sb2O5
Sb2Se3	-111.31	-179.07	-67.76	Sb2Se3
Sb4O6(cubic)	-58.79	-77.05	-18.26	Sb4O6
Sb4O6(orth)	-59.15	-77.05	-17.90	Sb4O6
SbCl3	-49.74	-49.17	0.57	SbCl3
SbF3	-41.82	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.98	-30.80	-27.82	SbO2
Schoepite	-5.17	0.83	5.99	UO2(OH)2·H2O
Semetal(am)	-14.19	-21.30	-7.11	Se
Semetal(hex)	-13.60	-21.30	-7.71	Se
Senarmontite	-26.16	-38.52	-12.37	Sb2O3
SeO2	-15.20	-15.07	0.12	SeO2
SeO3	-46.88	-25.84	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.17	-77.62	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.82	-295.28	-50.46	Sb2S3
Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.19	7.84	7.64	CuO
Thenardite	-7.83	-7.50	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3·H2O
Tyuyamunite	-8.35	-4.27	4.08	Ca(UO2)2(VO4)2
U3O8	-16.50	4.59	21.08	U3O8
U3Sb4	-582.47	-430.09	152.38	U3Sb4
U4O9	-33.44	-36.46	-3.02	U4O9
UF4	-29.68	-59.22	-29.54	UF4
UF4·2.5H2O	-26.50	-59.22	-32.72	UF4·2.5H2O
UO2(am)	-16.44	-15.50	0.93	UO2
UO2(NO3)2	-48.98	-36.83	12.15	UO2(NO3)2
UO2(NO3)2·2H2O	-41.68	-36.83	4.85	UO2(NO3)2·2H2O
UO2(NO3)2·3H2O	-40.22	-36.83	3.39	UO2(NO3)2·3H2O
UO2(NO3)2·6H2O	-38.88	-36.83	2.05	UO2(NO3)2·6H2O
UO2(OH)2(beta)	-4.78	0.83	5.61	UO2(OH)2
UO2SeO4·4H2O	-22.76	-25.01	-2.25	UO2SeO4·4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.96	29.58	USb2
V(OH)3	-19.18	-11.59	7.59	V(OH)3
V2O5	-15.92	-17.28	-1.36	V2O5
V3O5	-40.91	-39.08	1.84	V3O5
V4O7	-50.77	-43.59	7.19	V4O7
V6O13	-42.08	-102.94	-60.86	V6O13
Valentinite	-30.04	-38.52	-8.48	Sb2O3
VC12	-63.17	-44.30	18.87	VC12
VC13	-64.93	-41.50	23.43	VC13
VF4	-63.15	-48.22	14.93	VF4
Vmetal	-93.93	-49.90	44.03	V
VO	-39.12	-24.36	14.76	VO
VO(OH)2	-9.66	-4.51	5.15	VO(OH)2
VO2Cl	-21.45	-18.61	2.84	VO2Cl
VOC1	-32.71	-21.56	11.15	VOC1
VOC12	-37.21	-24.45	12.76	VOC12
VOSO4	-25.19	-21.58	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.67	-77.62	-8.95	ZnS

Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.03	-9.10	3.93	ZnSO4
Zn(BO2)2	-9.92	-1.63	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-33.00	-29.69	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.50	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.78	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.56	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.76	7.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.63	-1.13	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.22	5.97	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-20.95	-7.30	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.14	-10.23	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.59	14.81	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.59	19.91	38.50	Zn5(OH)8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.35	-13.89	-0.53	ZnF2
Znmetal	-43.36	-17.58	25.79	Zn
ZnMoO4	-2.82	-12.94	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO
ZnS(am)	-68.56	-77.62	-9.05	ZnS
ZnSb	-86.17	-75.15	11.01	ZnSb
ZnSe	-24.48	-38.88	-14.40	ZnSe
ZnSeO4:6H2O	-16.35	-17.87	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.46	-9.10	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 136.

```

Title Stage 8 Run-off mix
Mix 802
1      1
3      0.001878
4      0.019728
5      0.010705
6      0.000000
7      0.035891
8      0.000000
9      5.403801
10     8.456786
11     16.312381
12     87.438662
13     67.080111
14     27.117998
15     13.728500
Save solution 805
end

```

TITLE

Stage 8 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 802.

Mixture 802.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National Atmospheric Deposition Program.

1.878e-03 Solution 3 Average HCT data for andesite oxide material (cells SRK 0864 and SRK 0866)

1.973e-02 Solution 4 Average HCT data for biotite breccia - oxide/transitional (cells SRK 0854 and SRK 0872)

1.070e-02 Solution 5 Average HCT data for quartz monzonite - oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite - oxide/transitional (ore) (cell SRK 0867)

3.589e-02 Solution 7 Average HCT data for coarse crystalline porphyry - oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry - oxide/transitional (ore) (cell CF-11-02, 0-27)

5.404e+00 Solution 9 Average HCT data for andesite sulfide material (cells SRK 0864 and SRK 0866)

8.457e+00 Solution 10 Average HCT data for biotite breccia - sulfide (waste) (cells 604811, 604854, 604862, 604867 and 605033)

1.631e+01 Solution 11 Average HCT data for biotite breccia - sulfide (ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)

8.744e+01 Solution 12 Average HCT data for quartz monzonite - sulfide (waste) (cells 604673 and 605153)

6.708e+01 Solution 13 Average HCT data for quartz monzonite - sulfide (ore) (cells 604562, 604606, 604653, 604656 and 604669)

2.712e+01 Solution 14 Average HCT data for coarse crystalline porphyry - sulfide (waste) (cell CF-11-02, 367-408)

1.373e+01 Solution 15 Average HCT data for coarse crystalline porphyry - sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	9.843e-07	2.230e-04
As	4.527e-10	1.026e-07
B	4.445e-07	1.007e-04
Ba	1.334e-07	3.022e-05
C	7.225e-04	1.637e-01
Ca	3.123e-04	7.076e-02
Cd	1.168e-09	2.647e-07
Cl	3.741e-05	8.478e-03
Co	1.318e-11	2.987e-09
Cr	5.070e-12	1.149e-09
Cu	2.377e-06	5.387e-04
F	3.359e-05	7.611e-03
Fe	4.742e-08	1.074e-05
Hg	4.266e-11	9.667e-09
K	6.677e-05	1.513e-02
Mg	8.162e-05	1.849e-02
Mn	9.848e-07	2.232e-04
Mo	3.806e-08	8.624e-06
N	9.964e-08	2.258e-05
Na	1.197e-04	2.713e-02
Ni	2.146e-12	4.864e-10
Pb	3.331e-09	7.549e-07
S	2.505e-04	5.676e-02
Sb	3.998e-10	9.060e-08
Se	3.488e-09	7.904e-07
U	1.213e-08	2.750e-06
V	9.416e-09	2.134e-06
Zn	1.153e-07	2.613e-05

-----Description of solution-----

```

                                pH = 6.451      Charge balance
                                pe = 6.501      Adjusted to redox
equilibrium
                                Activity of water = 1.000
                                Ionic strength (mol/kgw) = 1.568e-03
                                Mass of water (kg) = 2.266e+02
                                Total alkalinity (eq/kg) = 4.124e-04
                                Total CO2 (mol/kg) = 7.225e-04
                                Temperature (°C) = 25.00
                                Pressure (atm) = 1.00
                                Electrical balance (eq) = 2.673e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
                                Iterations = 13
                                Total H = 2.515665e+04
                                Total O = 1.257893e+04

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.702e-07	3.542e-07	-6.432	-6.451	-0.019	0.00
OH-	2.972e-08	2.843e-08	-7.527	-7.546	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.843e-07					
AlF2+	4.685e-07	4.486e-07	-6.329	-6.348	-0.019	(0)
AlF3	1.715e-07	1.715e-07	-6.766	-6.766	0.000	(0)
Al (OH) 4-	1.664e-07	1.593e-07	-6.779	-6.798	-0.019	(0)
Al (OH) 2+	8.194e-08	7.846e-08	-7.087	-7.105	-0.019	(0)
Al (OH) 3	4.450e-08	4.450e-08	-7.352	-7.352	0.000	(0)
AlF+2	4.415e-08	3.711e-08	-7.355	-7.431	-0.075	(0)
AlOH+2	4.134e-09	3.474e-09	-8.384	-8.459	-0.075	(0)
AlF4-	2.727e-09	2.610e-09	-8.564	-8.583	-0.019	(0)
AlSO4+	1.964e-10	1.879e-10	-9.707	-9.726	-0.019	(0)
Al+3	1.819e-10	1.222e-10	-9.740	-9.913	-0.173	(0)
Al (SO4) 2-	4.169e-13	3.990e-13	-12.380	-12.399	-0.019	(0)
AlMo6O21-3	3.653e-39	2.404e-39	-38.437	-38.619	-0.182	(0)
As (3)	1.935e-21					
H3AsO3	1.932e-21	1.932e-21	-20.714	-20.714	0.000	(0)
H2AsO3-	2.931e-24	2.798e-24	-23.533	-23.553	-0.020	(0)
H4AsO3+	3.552e-28	3.391e-28	-27.449	-27.470	-0.020	(0)
HAsO3-2	8.679e-30	7.206e-30	-29.062	-29.142	-0.081	(0)
AsO3-3	1.192e-36	7.843e-37	-35.924	-36.106	-0.182	(0)
As (5)	4.527e-10					
H2AsO4-	3.338e-10	3.187e-10	-9.476	-9.497	-0.020	(0)
HAsO4-2	1.188e-10	9.865e-11	-9.925	-10.006	-0.081	(0)
H3AsO4	1.961e-14	1.961e-14	-13.708	-13.707	0.000	(0)
AsO4-3	1.339e-15	8.808e-16	-14.873	-15.055	-0.182	(0)
B	4.445e-07					
H3BO3	4.438e-07	4.439e-07	-6.353	-6.353	0.000	(0)
H2BO3-	7.615e-10	7.279e-10	-9.118	-9.138	-0.020	(0)
CaH2BO3+	1.098e-11	1.049e-11	-10.960	-10.979	-0.020	(0)
BF (OH) 3-	5.627e-12	5.379e-12	-11.250	-11.269	-0.020	(0)
MgH2BO3+	1.742e-12	1.665e-12	-11.759	-11.779	-0.020	(0)
NaH2BO3	1.320e-13	1.320e-13	-12.879	-12.879	0.000	(0)
BF2 (OH) 2-	6.469e-15	6.185e-15	-14.189	-14.209	-0.020	(0)
BaH2BO3+	2.621e-15	2.506e-15	-14.581	-14.601	-0.020	(0)
H5 (BO3) 2-	2.877e-16	2.750e-16	-15.541	-15.561	-0.020	(0)
BF3OH-	2.707e-20	2.588e-20	-19.568	-19.587	-0.020	(0)
H8 (BO3) 3-	1.277e-20	1.221e-20	-19.894	-19.913	-0.020	(0)
BF4-	1.432e-24	1.369e-24	-23.844	-23.863	-0.020	(0)
Ba	1.334e-07					
Ba+2	1.329e-07	1.114e-07	-6.876	-6.953	-0.077	(0)
BaHCO3+	4.342e-10	4.159e-10	-9.362	-9.381	-0.019	(0)
BaCO3	2.957e-12	2.957e-12	-11.529	-11.529	0.000	(0)
BaOH+	1.444e-14	1.382e-14	-13.840	-13.859	-0.019	(0)
BaH2BO3+	2.621e-15	2.506e-15	-14.581	-14.601	-0.020	(0)

BaNO ₃ +	6.741e-17	6.435e-17	-16.171	-16.191	-0.020	(0)
BaNH ₃ +2	5.673e-18	4.710e-18	-17.246	-17.327	-0.081	(0)
C (4)	7.225e-04					
HCO ₃ -	4.083e-04	3.910e-04	-3.389	-3.408	-0.019	(0)
H ₂ CO ₃	3.114e-04	3.114e-04	-3.507	-3.507	0.000	(0)
CaHCO ₃ +	1.904e-06	1.823e-06	-5.720	-5.739	-0.019	(0)
CuCO ₃	4.346e-07	4.346e-07	-6.362	-6.362	0.000	(0)
MgHCO ₃ +	2.759e-07	2.639e-07	-6.559	-6.579	-0.019	(0)
CO ₃ -2	6.175e-08	5.175e-08	-7.209	-7.286	-0.077	(0)
CuHCO ₃ +	3.686e-08	3.518e-08	-7.433	-7.454	-0.020	(0)
NaHCO ₃	2.515e-08	2.515e-08	-7.599	-7.599	0.000	(0)
CaCO ₃	2.054e-08	2.054e-08	-7.687	-7.687	0.000	(0)
UO ₂ (CO ₃) 2-2	6.567e-09	5.452e-09	-8.183	-8.263	-0.081	(0)
MnHCO ₃ +	6.424e-09	6.150e-09	-8.192	-8.211	-0.019	(0)
UO ₂ CO ₃	5.280e-09	5.280e-09	-8.277	-8.277	0.000	(0)
MgCO ₃	2.840e-09	2.840e-09	-8.547	-8.547	0.000	(0)
ZnHCO ₃ +	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
PbHCO ₃ +	5.543e-10	5.292e-10	-9.256	-9.276	-0.020	(0)
BaHCO ₃ +	4.342e-10	4.159e-10	-9.362	-9.381	-0.019	(0)
PbCO ₃	2.834e-10	2.834e-10	-9.548	-9.548	0.000	(0)
ZnCO ₃	2.733e-10	2.733e-10	-9.563	-9.563	0.000	(0)
NaCO ₃ -	1.151e-10	1.102e-10	-9.939	-9.958	-0.019	(0)
Cu (CO ₃) 2-2	7.292e-11	6.054e-11	-10.137	-10.218	-0.081	(0)
UO ₂ (CO ₃) 3-4	2.976e-11	1.414e-11	-10.526	-10.849	-0.323	(0)
FeHCO ₃ +	3.715e-12	3.558e-12	-11.430	-11.449	-0.019	(0)
BaCO ₃	2.957e-12	2.957e-12	-11.529	-11.529	0.000	(0)
CdCO ₃	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
CdHCO ₃ +	8.740e-13	8.343e-13	-12.058	-12.079	-0.020	(0)
CoHCO ₃ +	3.284e-13	3.135e-13	-12.484	-12.504	-0.020	(0)
NiHCO ₃ +	8.423e-14	8.041e-14	-13.075	-13.095	-0.020	(0)
Pb (CO ₃) 2-2	5.094e-14	4.229e-14	-13.293	-13.374	-0.081	(0)
CoCO ₃	9.019e-15	9.019e-15	-14.045	-14.045	0.000	(0)
NiCO ₃	3.221e-15	3.221e-15	-14.492	-14.492	0.000	(0)
HgCO ₃	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
Cd (CO ₃) 2-2	5.109e-17	4.242e-17	-16.292	-16.372	-0.081	(0)
HgHCO ₃ +	1.975e-17	1.886e-17	-16.704	-16.725	-0.020	(0)
Hg (CO ₃) 2-2	5.636e-19	4.679e-19	-18.249	-18.330	-0.081	(0)
Ca	3.123e-04					
Ca+2	2.989e-04	2.505e-04	-3.525	-3.601	-0.077	(0)
CaSO ₄	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
CaHCO ₃ +	1.904e-06	1.823e-06	-5.720	-5.739	-0.019	(0)
CaF+	8.672e-08	8.301e-08	-7.062	-7.081	-0.019	(0)
CaCO ₃	2.054e-08	2.054e-08	-7.687	-7.687	0.000	(0)
CaOH+	1.483e-10	1.421e-10	-9.829	-9.847	-0.019	(0)
CaH ₂ BO ₃ +	1.098e-11	1.049e-11	-10.960	-10.979	-0.020	(0)
CaNO ₃ +	9.563e-14	9.129e-14	-13.019	-13.040	-0.020	(0)
CaNH ₃ +2	2.545e-14	2.113e-14	-13.594	-13.675	-0.081	(0)
Ca (NH ₃) 2+2	6.790e-25	5.637e-25	-24.168	-24.249	-0.081	(0)
Cd	1.168e-09					
Cd+2	1.119e-09	9.373e-10	-8.951	-9.028	-0.077	(0)
CdSO ₄	4.354e-11	4.354e-11	-10.361	-10.361	0.000	(0)
CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
CdCO ₃	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
CdHCO ₃ +	8.740e-13	8.343e-13	-12.058	-12.079	-0.020	(0)
CdF+	4.726e-13	4.511e-13	-12.326	-12.346	-0.020	(0)
CdOH+	2.218e-13	2.117e-13	-12.654	-12.674	-0.020	(0)
Cd (SO ₄) 2-2	1.401e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
CdOHCl	3.737e-15	3.737e-15	-14.427	-14.427	0.000	(0)
CdCl ₂	4.782e-16	4.782e-16	-15.320	-15.320	0.000	(0)
Cd (CO ₃) 2-2	5.109e-17	4.242e-17	-16.292	-16.372	-0.081	(0)
Cd (OH) 2	3.797e-17	3.797e-17	-16.421	-16.421	0.000	(0)
CdF ₂	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
CdNO ₃ +	3.579e-19	3.416e-19	-18.446	-18.466	-0.020	(0)
CdSeO ₄	6.394e-20	6.394e-20	-19.194	-19.194	0.000	(0)
CdCl ₃ -	1.132e-20	1.080e-20	-19.946	-19.967	-0.020	(0)
Cd ₂ OH+3	1.511e-21	9.944e-22	-20.821	-21.002	-0.182	(0)
Cd (OH) 3-	6.909e-23	6.595e-23	-22.161	-22.181	-0.020	(0)
Cd (SeO ₃) 2-2	1.269e-24	1.054e-24	-23.896	-23.977	-0.081	(0)

	Cd(NO3)2	1.974e-29	1.974e-29	-28.705	-28.705	0.000	(0)
	Cd(OH)4-2	3.697e-31	3.069e-31	-30.432	-30.513	-0.081	(0)
	CdHS+	0.000e+00	0.000e+00	-81.111	-81.132	-0.020	(0)
	Cd(HS)2	0.000e+00	0.000e+00	-154.039	-154.039	0.000	(0)
	Cd(HS)3-	0.000e+00	0.000e+00	-232.231	-232.251	-0.020	(0)
	Cd(HS)4-2	0.000e+00	0.000e+00	-310.086	-310.166	-0.081	(0)
Cl		3.741e-05					
	Cl-	3.741e-05	3.580e-05	-4.427	-4.446	-0.019	(0)
	CuCl+	8.458e-11	8.092e-11	-10.073	-10.092	-0.019	(0)
	MnCl+	3.712e-11	3.553e-11	-10.430	-10.449	-0.019	(0)
	CuCl	9.923e-12	9.923e-12	-11.003	-11.003	0.000	(0)
	ZnCl+	8.625e-12	8.252e-12	-11.064	-11.083	-0.019	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	PbCl+	2.424e-12	2.314e-12	-11.615	-11.636	-0.020	(0)
	ZnOHCl	3.071e-13	3.071e-13	-12.513	-12.513	0.000	(0)
	HgClOH	8.298e-14	8.298e-14	-13.081	-13.081	0.000	(0)
	CuCl2-	7.757e-14	7.421e-14	-13.110	-13.130	-0.019	(0)
	HgCl2	5.916e-15	5.916e-15	-14.228	-14.228	0.000	(0)
	CdOHCl	3.737e-15	3.737e-15	-14.427	-14.427	0.000	(0)
	MnCl2	1.797e-15	1.797e-15	-14.746	-14.746	0.000	(0)
	UO2Cl+	1.559e-15	1.488e-15	-14.807	-14.827	-0.020	(0)
	CoCl+	1.337e-15	1.277e-15	-14.874	-14.894	-0.020	(0)
	CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)
	CdCl2	4.782e-16	4.782e-16	-15.320	-15.320	0.000	(0)
	ZnCl2	4.682e-16	4.682e-16	-15.330	-15.330	0.000	(0)
	PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
	NiCl+	1.601e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
	HgCl+	3.455e-17	3.298e-17	-16.462	-16.482	-0.020	(0)
	HgCl3-	2.219e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
	CuCl3-2	6.764e-19	5.680e-19	-18.170	-18.246	-0.076	(0)
	FeCl+2	2.743e-19	2.303e-19	-18.562	-18.638	-0.076	(0)
	CrCl+2	9.236e-20	7.669e-20	-19.035	-19.115	-0.081	(0)
	MnCl3-	1.850e-20	1.771e-20	-19.733	-19.752	-0.019	(0)
	ZnCl3-	1.391e-20	1.331e-20	-19.857	-19.876	-0.019	(0)
	CdCl3-	1.132e-20	1.080e-20	-19.946	-19.967	-0.020	(0)
	VOCl+	7.397e-21	7.060e-21	-20.131	-20.151	-0.020	(0)
	PbCl3-	5.524e-21	5.273e-21	-20.258	-20.278	-0.020	(0)
	HgCl4-2	3.635e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
	CuCl3-	3.507e-22	3.356e-22	-21.455	-21.474	-0.019	(0)
	FeCl2+	3.847e-23	3.683e-23	-22.415	-22.434	-0.019	(0)
	NiCl2	2.754e-23	2.754e-23	-22.560	-22.560	0.000	(0)
	CrOHCl2	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
	ZnCl4-2	2.838e-25	2.383e-25	-24.547	-24.623	-0.076	(0)
	CrCl2+	2.729e-25	2.605e-25	-24.564	-24.584	-0.020	(0)
	PbCl4-2	1.039e-25	8.628e-26	-24.983	-25.064	-0.081	(0)
	FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)
	CuCl4-2	7.169e-29	6.020e-29	-28.145	-28.220	-0.076	(0)
	CrO3Cl-	2.321e-31	2.216e-31	-30.634	-30.654	-0.020	(0)
	CoCl+2	1.142e-39	9.485e-40	-38.942	-39.023	-0.081	(0)
	UCl+3	0.000e+00	0.000e+00	-42.746	-42.927	-0.182	(0)
	Co(NH3)5Cl+2	0.000e+00	0.000e+00	-63.858	-63.939	-0.081	(0)
	Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-66.088	-66.168	-0.081	(0)
	Co(NH3)6Cl+2	0.000e+00	0.000e+00	-80.748	-80.828	-0.081	(0)
Co(2)		1.318e-11					
	Co+2	1.242e-11	1.031e-11	-10.906	-10.987	-0.081	(0)
	CoSO4	4.075e-13	4.075e-13	-12.390	-12.390	0.000	(0)
	CoHCO3+	3.284e-13	3.135e-13	-12.484	-12.504	-0.020	(0)
	CoF+	1.037e-14	9.900e-15	-13.984	-14.004	-0.020	(0)
	CoCO3	9.019e-15	9.019e-15	-14.045	-14.045	0.000	(0)
	CoOH+	6.126e-15	5.848e-15	-14.213	-14.233	-0.020	(0)
	CoCl+	1.337e-15	1.277e-15	-14.874	-14.894	-0.020	(0)
	Co(OH)2	1.321e-17	1.321e-17	-16.879	-16.879	0.000	(0)
	CoNO2+	4.061e-18	3.877e-18	-17.391	-17.412	-0.020	(0)
	Co(NH3)+2	1.000e-19	8.306e-20	-19.000	-19.081	-0.081	(0)
	CoNO3+	1.973e-21	1.883e-21	-20.705	-20.725	-0.020	(0)
	CoSeO4	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
	Co(OH)3-	7.848e-24	7.491e-24	-23.105	-23.125	-0.020	(0)
	CoOOH-	1.969e-24	1.880e-24	-23.706	-23.726	-0.020	(0)

Co2OH+3	4.592e-27	3.022e-27	-26.338	-26.520	-0.182	(0)
Co(NH3)2+2	2.860e-28	2.374e-28	-27.544	-27.624	-0.081	(0)
Co(NO3)2	4.416e-31	4.416e-31	-30.355	-30.355	0.000	(0)
Co(OH)4-2	4.066e-32	3.375e-32	-31.391	-31.472	-0.081	(0)
Co(NH3)3+2	2.413e-37	2.003e-37	-36.617	-36.698	-0.081	(0)
Co(NH3)4+2	0.000e+00	0.000e+00	-46.071	-46.152	-0.081	(0)
Co4(OH)4+4	0.000e+00	0.000e+00	-48.309	-48.632	-0.323	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-56.025	-56.106	-0.081	(0)
Co(3)	2.266e-32					
CoOH+2	2.266e-32	1.881e-32	-31.645	-31.726	-0.081	(0)
Co+3	1.938e-37	1.302e-37	-36.713	-36.885	-0.173	(0)
CoCl+2	1.142e-39	9.485e-40	-38.942	-39.023	-0.081	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-63.858	-63.939	-0.081	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-75.140	-75.160	-0.020	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-79.648	-79.728	-0.081	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-80.748	-80.828	-0.081	(0)
Cr(2)	1.501e-28					
Cr+2	1.501e-28	1.246e-28	-27.824	-27.904	-0.081	(0)
Cr(3)	5.070e-12					
Cr(OH)2+	3.731e-12	3.561e-12	-11.428	-11.448	-0.020	(0)
Cr(OH)+2	1.240e-12	1.030e-12	-11.907	-11.987	-0.081	(0)
CrOHSO4	4.840e-14	4.840e-14	-13.315	-13.315	0.000	(0)
Cr(OH)3	3.804e-14	3.804e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.595e-15	7.966e-15	-14.018	-14.099	-0.081	(0)
Cr+3	2.516e-15	1.655e-15	-14.599	-14.781	-0.182	(0)
CrSO4+	8.022e-16	7.658e-16	-15.096	-15.116	-0.020	(0)
CrO2-	5.343e-17	5.100e-17	-16.272	-16.292	-0.020	(0)
Cr(OH)4-	4.510e-17	4.305e-17	-16.346	-16.366	-0.020	(0)
CrCl+2	9.236e-20	7.669e-20	-19.035	-19.115	-0.081	(0)
Cr2(OH)2SO4+2	5.425e-24	4.504e-24	-23.266	-23.346	-0.081	(0)
CrOHC12	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
CrCl2+	2.729e-25	2.605e-25	-24.564	-24.584	-0.020	(0)
Cr2(OH)2(SO4)2	5.301e-26	5.301e-26	-25.276	-25.276	0.000	(0)
CrNO3+2	1.004e-26	8.339e-27	-25.998	-26.079	-0.081	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-52.743	-52.824	-0.081	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-62.642	-62.824	-0.182	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-66.088	-66.168	-0.081	(0)
Cr(6)	5.806e-21					
HCrO4-	2.911e-21	2.779e-21	-20.536	-20.556	-0.020	(0)
CrO4-2	2.893e-21	2.424e-21	-20.539	-20.615	-0.077	(0)
NaCrO4-	1.444e-24	1.378e-24	-23.840	-23.861	-0.020	(0)
KCrO4-	6.020e-25	5.747e-25	-24.220	-24.241	-0.020	(0)
H2CrO4	7.977e-28	7.977e-28	-27.098	-27.098	0.000	(0)
CrO3SO4-2	7.153e-29	5.939e-29	-28.146	-28.226	-0.081	(0)
CrO3Cl-	2.321e-31	2.216e-31	-30.634	-30.654	-0.020	(0)
Cr2O7-2	3.224e-40	2.677e-40	-39.492	-39.572	-0.081	(0)
Cu(1)	2.407e-10					
Cu+	2.307e-10	2.202e-10	-9.637	-9.657	-0.020	(0)
CuCl	9.923e-12	9.923e-12	-11.003	-11.003	0.000	(0)
CuCl2-	7.757e-14	7.421e-14	-13.110	-13.130	-0.019	(0)
CuCl3-2	6.764e-19	5.680e-19	-18.170	-18.246	-0.076	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.182	-154.319	-0.137	(0)
Cu(2)	2.377e-06					
Cu+2	1.702e-06	1.426e-06	-5.769	-5.846	-0.077	(0)
CuCO3	4.346e-07	4.346e-07	-6.362	-6.362	0.000	(0)
CuOH+	1.340e-07	1.282e-07	-6.873	-6.892	-0.019	(0)
CuSO4	6.474e-08	6.474e-08	-7.189	-7.189	0.000	(0)
CuHCO3+	3.686e-08	3.518e-08	-7.433	-7.454	-0.020	(0)
CuF+	2.863e-09	2.733e-09	-8.543	-8.563	-0.020	(0)
Cu(OH)2	7.274e-10	7.274e-10	-9.138	-9.138	0.000	(0)
Cu2(OH)2+2	4.974e-10	4.130e-10	-9.303	-9.384	-0.081	(0)
CuCl+	8.458e-11	8.092e-11	-10.073	-10.092	-0.019	(0)
Cu(CO3)2-2	7.292e-11	6.054e-11	-10.137	-10.218	-0.081	(0)
CuNO2+	8.349e-12	7.970e-12	-11.078	-11.099	-0.020	(0)
CuNH3+2	1.178e-12	9.781e-13	-11.929	-12.010	-0.081	(0)
Cu(OH)3-	4.444e-14	4.242e-14	-13.352	-13.372	-0.020	(0)
CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)

	CuNO3+	5.446e-16	5.198e-16	-15.264	-15.284	-0.020	(0)
	Cu (NO2) 2	4.352e-18	4.352e-18	-17.361	-17.361	0.000	(0)
	Cu (OH) 4-2	1.143e-20	9.491e-21	-19.942	-20.023	-0.081	(0)
	CuCl3-	3.507e-22	3.356e-22	-21.455	-21.474	-0.019	(0)
	Cu (NO3) 2	7.543e-27	7.543e-27	-26.122	-26.122	0.000	(0)
	CuCl4-2	7.169e-29	6.020e-29	-28.145	-28.220	-0.076	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-220.261	-220.281	-0.020	(0)
F		3.359e-05					
	F-	3.174e-05	3.037e-05	-4.498	-4.518	-0.019	(0)
	AlF2+	4.685e-07	4.486e-07	-6.329	-6.348	-0.019	(0)
	MgF+	2.349e-07	2.248e-07	-6.629	-6.648	-0.019	(0)
	AlF3	1.715e-07	1.715e-07	-6.766	-6.766	0.000	(0)
	CaF+	8.672e-08	8.301e-08	-7.062	-7.081	-0.019	(0)
	AlF+2	4.415e-08	3.711e-08	-7.355	-7.431	-0.075	(0)
	HF	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
	CuF+	2.863e-09	2.733e-09	-8.543	-8.563	-0.020	(0)
	AlF4-	2.727e-09	2.610e-09	-8.564	-8.583	-0.019	(0)
	NaF	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
	MnF+	9.956e-10	9.531e-10	-9.002	-9.021	-0.019	(0)
	UO2F+	1.125e-10	1.074e-10	-9.949	-9.969	-0.020	(0)
	ZnF+	5.825e-11	5.560e-11	-10.235	-10.255	-0.020	(0)
	UO2F2	9.409e-12	9.409e-12	-11.026	-11.026	0.000	(0)
	BF (OH) 3-	5.627e-12	5.379e-12	-11.250	-11.269	-0.020	(0)
	PbF+	4.084e-12	3.898e-12	-11.389	-11.409	-0.020	(0)
	HF2-	1.920e-12	1.836e-12	-11.717	-11.736	-0.019	(0)
	CdF+	4.726e-13	4.511e-13	-12.326	-12.346	-0.020	(0)
	UO2F3-	7.518e-14	7.177e-14	-13.124	-13.144	-0.020	(0)
	CoF+	1.037e-14	9.900e-15	-13.984	-14.004	-0.020	(0)
	CrF+2	9.595e-15	7.966e-15	-14.018	-14.099	-0.081	(0)
	FeF+2	8.447e-15	7.094e-15	-14.073	-14.149	-0.076	(0)
	BF2 (OH) 2-	6.469e-15	6.185e-15	-14.189	-14.209	-0.020	(0)
	FeF2+	6.022e-15	5.764e-15	-14.220	-14.239	-0.019	(0)
	PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
	NiF+	1.333e-15	1.272e-15	-14.875	-14.895	-0.020	(0)
	VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
	H2F2	6.779e-16	6.779e-16	-15.169	-15.169	0.000	(0)
	FeF3	2.470e-16	2.470e-16	-15.607	-15.607	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	UO2F4-2	2.085e-17	1.731e-17	-16.681	-16.762	-0.081	(0)
	VO2F2-	1.368e-17	1.305e-17	-16.864	-16.884	-0.020	(0)
	VOF+	1.341e-17	1.280e-17	-16.872	-16.893	-0.020	(0)
	VOF2	1.458e-19	1.458e-19	-18.836	-18.836	0.000	(0)
	PbF3-	1.405e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
	BF3OH-	2.707e-20	2.588e-20	-19.568	-19.587	-0.020	(0)
	VO2F3-2	5.956e-21	4.945e-21	-20.225	-20.306	-0.081	(0)
	VOF3-	1.646e-22	1.571e-22	-21.784	-21.804	-0.020	(0)
	HgF+	5.444e-23	5.197e-23	-22.264	-22.284	-0.020	(0)
	PbF4-2	2.349e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
	BF4-	1.432e-24	1.369e-24	-23.844	-23.863	-0.020	(0)
	VO2F4-3	1.123e-25	7.388e-26	-24.950	-25.131	-0.182	(0)
	Sb (OH) 2F	6.751e-26	6.751e-26	-25.171	-25.171	0.000	(0)
	SbOF	6.638e-26	6.638e-26	-25.178	-25.178	0.000	(0)
	VOF4-2	2.319e-26	1.925e-26	-25.635	-25.715	-0.081	(0)
	UF3+	7.694e-33	7.344e-33	-32.114	-32.134	-0.020	(0)
	UF2+2	1.838e-33	1.526e-33	-32.736	-32.816	-0.081	(0)
	UF4	2.445e-35	2.445e-35	-34.612	-34.612	0.000	(0)
	UF+3	6.066e-36	3.992e-36	-35.217	-35.399	-0.182	(0)
	UF5-	3.082e-38	2.942e-38	-37.511	-37.531	-0.020	(0)
	UF6-2	3.250e-40	2.698e-40	-39.488	-39.569	-0.081	(0)
Fe (2)		9.104e-10					
	Fe+2	8.706e-10	7.229e-10	-9.060	-9.141	-0.081	(0)
	FeSO4	3.516e-11	3.516e-11	-10.454	-10.454	0.000	(0)
	FeHCO3+	3.715e-12	3.558e-12	-11.430	-11.449	-0.019	(0)
	FeOH+	8.547e-13	8.181e-13	-12.068	-12.087	-0.019	(0)
	Fe (OH) 2	1.848e-17	1.848e-17	-16.733	-16.733	0.000	(0)
	Fe (OH) 3-	1.735e-19	1.661e-19	-18.761	-18.780	-0.019	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-160.414	-160.414	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-238.468	-238.489	-0.020	(0)

Fe (3)	4.651e-08					
Fe (OH) 2+	4.518e-08	4.326e-08	-7.345	-7.364	-0.019	(0)
Fe (OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
FeOH+2	4.657e-12	3.911e-12	-11.332	-11.408	-0.076	(0)
Fe (OH) 4-	3.651e-12	3.496e-12	-11.438	-11.456	-0.019	(0)
FeF+2	8.447e-15	7.094e-15	-14.073	-14.149	-0.076	(0)
FeF2+	6.022e-15	5.764e-15	-14.220	-14.239	-0.019	(0)
FeSO4+	4.948e-16	4.736e-16	-15.306	-15.325	-0.019	(0)
Fe+3	3.171e-16	2.131e-16	-15.499	-15.672	-0.173	(0)
FeF3	2.470e-16	2.470e-16	-15.607	-15.607	0.000	(0)
Fe (SO4) 2-	2.102e-18	2.006e-18	-17.677	-17.698	-0.020	(0)
FeCl+2	2.743e-19	2.303e-19	-18.562	-18.638	-0.076	(0)
FeHSeO3+2	2.228e-21	1.850e-21	-20.652	-20.733	-0.081	(0)
Fe2 (OH) 2+4	1.066e-21	5.064e-22	-20.972	-21.295	-0.323	(0)
FeCl2+	3.847e-23	3.683e-23	-22.415	-22.434	-0.019	(0)
FeNO3+2	2.958e-25	2.456e-25	-24.529	-24.610	-0.081	(0)
Fe3 (OH) 4+5	1.013e-27	3.166e-28	-26.995	-27.499	-0.505	(0)
FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)
H (0)	1.764e-29					
H2	8.819e-30	8.822e-30	-29.055	-29.054	0.000	(0)
Hg (0)	4.233e-11					
Hg	4.233e-11	4.233e-11	-10.373	-10.373	0.000	(0)
Hg (1)	3.196e-21					
Hg2+2	1.598e-21	1.327e-21	-20.796	-20.877	-0.081	(0)
Hg (2)	3.272e-13					
Hg (OH) 2	2.354e-13	2.354e-13	-12.628	-12.628	0.000	(0)
HgClOH	8.298e-14	8.298e-14	-13.081	-13.081	0.000	(0)
HgCl2	5.916e-15	5.916e-15	-14.228	-14.228	0.000	(0)
HgCO3	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
HgOH+	5.474e-17	5.225e-17	-16.262	-16.282	-0.020	(0)
HgCl+	3.455e-17	3.298e-17	-16.462	-16.482	-0.020	(0)
HgHCO3+	1.975e-17	1.886e-17	-16.704	-16.725	-0.020	(0)
HgCl3-	2.219e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
Hg (CO3) 2-2	5.636e-19	4.679e-19	-18.249	-18.330	-0.081	(0)
Hg+2	5.561e-20	4.617e-20	-19.255	-19.336	-0.081	(0)
HgSO4	2.395e-21	2.395e-21	-20.621	-20.621	0.000	(0)
HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.709	-0.081	(0)
Hg (OH) 3-	8.828e-22	8.427e-22	-21.054	-21.074	-0.020	(0)
HgCl4-2	3.635e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
Hg (NH3) 2+2	1.576e-22	1.308e-22	-21.803	-21.883	-0.081	(0)
HgF+	5.444e-23	5.197e-23	-22.264	-22.284	-0.020	(0)
HgNO3+	2.058e-30	1.965e-30	-29.686	-29.707	-0.020	(0)
Hg (NH3) 3+2	4.204e-32	3.490e-32	-31.376	-31.457	-0.081	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.026	-40.026	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.650	-40.731	-0.081	(0)
HgHS2-	0.000e+00	0.000e+00	-141.160	-141.180	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.356	-143.437	-0.081	(0)
K	6.677e-05					
K+	6.668e-05	6.380e-05	-4.176	-4.195	-0.019	(0)
KSO4-	9.346e-08	8.949e-08	-7.029	-7.048	-0.019	(0)
KCrO4-	6.020e-25	5.747e-25	-24.220	-24.241	-0.020	(0)
Mg	8.162e-05					
Mg+2	7.872e-05	6.597e-05	-4.104	-4.181	-0.077	(0)
MgSO4	2.379e-06	2.379e-06	-5.624	-5.624	0.000	(0)
MgHCO3+	2.759e-07	2.639e-07	-6.559	-6.579	-0.019	(0)
MgF+	2.349e-07	2.248e-07	-6.629	-6.648	-0.019	(0)
MgCO3	2.840e-09	2.840e-09	-8.547	-8.547	0.000	(0)
MgOH+	7.794e-10	7.467e-10	-9.108	-9.127	-0.019	(0)
MgH2BO3+	1.742e-12	1.665e-12	-11.759	-11.779	-0.020	(0)
Mn (2)	9.848e-07					
Mn+2	9.496e-07	7.884e-07	-6.022	-6.103	-0.081	(0)
MnSO4	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
MnHCO3+	6.424e-09	6.150e-09	-8.192	-8.211	-0.019	(0)
MnF+	9.956e-10	9.531e-10	-9.002	-9.021	-0.019	(0)
MnOH+	5.881e-11	5.630e-11	-10.231	-10.249	-0.019	(0)
MnCl+	3.712e-11	3.553e-11	-10.430	-10.449	-0.019	(0)
MnCl2	1.797e-15	1.797e-15	-14.746	-14.746	0.000	(0)

MnNO3+	1.509e-16	1.440e-16	-15.821	-15.842	-0.020	(0)
MnSeO4	7.774e-17	7.774e-17	-16.109	-16.109	0.000	(0)
MnCl3-	1.850e-20	1.771e-20	-19.733	-19.752	-0.019	(0)
Mn (OH) 3-	2.938e-22	2.812e-22	-21.532	-21.551	-0.019	(0)
Mn (NO3) 2	4.169e-26	4.169e-26	-25.380	-25.380	0.000	(0)
Mn (OH) 4-2	3.074e-29	2.581e-29	-28.512	-28.588	-0.076	(0)
MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Mn (3)	1.663e-25					
Mn+3	1.663e-25	1.117e-25	-24.779	-24.952	-0.173	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.837	-46.913	-0.076	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.764	-49.784	-0.019	(0)
Mo	3.806e-08					
MoO4-2	3.782e-08	3.170e-08	-7.422	-7.499	-0.077	(0)
HMoO4-	2.340e-10	2.234e-10	-9.631	-9.651	-0.020	(0)
H2MoO4	5.795e-13	5.795e-13	-12.237	-12.237	0.000	(0)
AlMo6O21-3	3.653e-39	2.404e-39	-38.437	-38.619	-0.182	(0)
Mo7O24-6	0.000e+00	0.000e+00	-50.382	-51.109	-0.727	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.668	-51.173	-0.505	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.519	-52.842	-0.323	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.865	-56.047	-0.182	(0)
N (-3)	4.371e-08					
NH4+	4.354e-08	4.163e-08	-7.361	-7.381	-0.020	(0)
NH4SO4-	9.232e-11	8.837e-11	-10.035	-10.054	-0.019	(0)
NH3	6.701e-11	6.701e-11	-10.174	-10.174	0.000	(0)
CuNH3+2	1.178e-12	9.781e-13	-11.929	-12.010	-0.081	(0)
CaNH3+2	2.545e-14	2.113e-14	-13.594	-13.675	-0.081	(0)
BaNH3+2	5.673e-18	4.710e-18	-17.246	-17.327	-0.081	(0)
Co (NH3) +2	1.000e-19	8.306e-20	-19.000	-19.081	-0.081	(0)
NiNH3+2	7.231e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.709	-0.081	(0)
Hg (NH3) 2+2	1.576e-22	1.308e-22	-21.803	-21.883	-0.081	(0)
Ca (NH3) 2+2	6.790e-25	5.637e-25	-24.168	-24.249	-0.081	(0)
Ni (NH3) 2+2	7.005e-28	5.816e-28	-27.155	-27.235	-0.081	(0)
Co (NH3) 2+2	2.860e-28	2.374e-28	-27.544	-27.624	-0.081	(0)
Hg (NH3) 3+2	4.204e-32	3.490e-32	-31.376	-31.457	-0.081	(0)
Co (NH3) 3+2	2.413e-37	2.003e-37	-36.617	-36.698	-0.081	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.650	-40.731	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.071	-46.152	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.743	-52.824	-0.081	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.025	-56.106	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.642	-62.824	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.858	-63.939	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.088	-66.168	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.140	-75.160	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.648	-79.728	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.748	-80.828	-0.081	(0)
N (3)	5.581e-08					
NO2-	5.581e-08	5.336e-08	-7.253	-7.273	-0.019	(0)
CuNO2+	8.349e-12	7.970e-12	-11.078	-11.099	-0.020	(0)
Cu (NO2) 2	4.352e-18	4.352e-18	-17.361	-17.361	0.000	(0)
CoNO2+	4.061e-18	3.877e-18	-17.391	-17.412	-0.020	(0)
N (5)	1.206e-10					
NO3-	1.205e-10	1.153e-10	-9.919	-9.938	-0.019	(0)
CaNO3+	9.563e-14	9.129e-14	-13.019	-13.040	-0.020	(0)
CuNO3+	5.446e-16	5.198e-16	-15.264	-15.284	-0.020	(0)
MnNO3+	1.509e-16	1.440e-16	-15.821	-15.842	-0.020	(0)
BaNO3+	6.741e-17	6.435e-17	-16.171	-16.191	-0.020	(0)
ZnNO3+	2.783e-17	2.657e-17	-16.555	-16.576	-0.020	(0)
PbNO3+	3.253e-18	3.106e-18	-17.488	-17.508	-0.020	(0)
CdNO3+	3.579e-19	3.416e-19	-18.446	-18.466	-0.020	(0)
UO2NO3+	6.175e-21	5.894e-21	-20.209	-20.230	-0.020	(0)
CoNO3+	1.973e-21	1.883e-21	-20.705	-20.725	-0.020	(0)
NiNO3+	5.060e-22	4.830e-22	-21.296	-21.316	-0.020	(0)
VO2NO3	1.296e-24	1.296e-24	-23.887	-23.887	0.000	(0)
FeNO3+2	2.958e-25	2.456e-25	-24.529	-24.610	-0.081	(0)
Mn (NO3) 2	4.169e-26	4.169e-26	-25.380	-25.380	0.000	(0)

	CrNO3+2	1.004e-26	8.339e-27	-25.998	-26.079	-0.081	(0)
	Cu (NO3) 2	7.543e-27	7.543e-27	-26.122	-26.122	0.000	(0)
	Zn (NO3) 2	6.110e-28	6.110e-28	-27.214	-27.214	0.000	(0)
	Pb (NO3) 2	6.079e-28	6.079e-28	-27.216	-27.216	0.000	(0)
	Cd (NO3) 2	1.974e-29	1.974e-29	-28.705	-28.705	0.000	(0)
	HgNO3+	2.058e-30	1.965e-30	-29.686	-29.707	-0.020	(0)
	Co (NO3) 2	4.416e-31	4.416e-31	-30.355	-30.355	0.000	(0)
	Hg (NO3) 2	0.000e+00	0.000e+00	-40.026	-40.026	0.000	(0)
Na		1.197e-04					
	Na+	1.196e-04	1.144e-04	-3.922	-3.942	-0.019	(0)
	NaSO4-	1.271e-07	1.217e-07	-6.896	-6.915	-0.019	(0)
	NaHCO3	2.515e-08	2.515e-08	-7.599	-7.599	0.000	(0)
	NaF	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
	NaCO3-	1.151e-10	1.102e-10	-9.939	-9.958	-0.019	(0)
	NaH2BO3	1.320e-13	1.320e-13	-12.879	-12.879	0.000	(0)
	NaCrO4-	1.444e-24	1.378e-24	-23.840	-23.861	-0.020	(0)
Ni		2.146e-12					
	Ni+2	1.991e-12	1.668e-12	-11.701	-11.778	-0.077	(0)
	NiHCO3+	8.423e-14	8.041e-14	-13.075	-13.095	-0.020	(0)
	NiSO4	6.595e-14	6.595e-14	-13.181	-13.181	0.000	(0)
	NiCO3	3.221e-15	3.221e-15	-14.492	-14.492	0.000	(0)
	NiF+	1.333e-15	1.272e-15	-14.875	-14.895	-0.020	(0)
	NiOH+	6.255e-16	5.971e-16	-15.204	-15.224	-0.020	(0)
	NiCl+	1.601e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
	Ni (OH) 2	1.348e-18	1.348e-18	-17.870	-17.870	0.000	(0)
	Ni (SO4) 2-2	5.211e-19	4.327e-19	-18.283	-18.364	-0.081	(0)
	NiNH3+2	7.231e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
	NiNO3+	5.060e-22	4.830e-22	-21.296	-21.316	-0.020	(0)
	NiSeO4	2.859e-22	2.859e-22	-21.544	-21.544	0.000	(0)
	Ni (OH) 3-	4.016e-23	3.834e-23	-22.396	-22.416	-0.020	(0)
	NiCl2	2.754e-23	2.754e-23	-22.560	-22.560	0.000	(0)
	Ni (NH3) 2+2	7.005e-28	5.816e-28	-27.155	-27.235	-0.081	(0)
O (0)		1.302e-34					
	O2	6.511e-35	6.513e-35	-34.186	-34.186	0.000	(0)
Pb		3.331e-09					
	Pb+2	2.174e-09	1.822e-09	-8.663	-8.740	-0.077	(0)
	PbHCO3+	5.543e-10	5.292e-10	-9.256	-9.276	-0.020	(0)
	PbCO3	2.834e-10	2.834e-10	-9.548	-9.548	0.000	(0)
	PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
	PbOH+	1.363e-10	1.301e-10	-9.866	-9.886	-0.020	(0)
	PbF+	4.084e-12	3.898e-12	-11.389	-11.409	-0.020	(0)
	PbCl+	2.424e-12	2.314e-12	-11.615	-11.636	-0.020	(0)
	Pb (SO4) 2-2	2.542e-13	2.110e-13	-12.595	-12.676	-0.081	(0)
	Pb (OH) 2	1.170e-13	1.170e-13	-12.932	-12.932	0.000	(0)
	Pb (CO3) 2-2	5.094e-14	4.229e-14	-13.293	-13.374	-0.081	(0)
	PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
	PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
	Pb2OH+3	5.708e-18	3.756e-18	-17.244	-17.425	-0.182	(0)
	Pb (OH) 3-	3.483e-18	3.325e-18	-17.458	-17.478	-0.020	(0)
	PbNO3+	3.253e-18	3.106e-18	-17.488	-17.508	-0.020	(0)
	PbF3-	1.405e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
	PbCl3-	5.524e-21	5.273e-21	-20.258	-20.278	-0.020	(0)
	Pb (OH) 4-2	2.788e-23	2.315e-23	-22.555	-22.635	-0.081	(0)
	PbF4-2	2.349e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
	Pb3 (OH) 4+2	5.988e-25	4.972e-25	-24.223	-24.304	-0.081	(0)
	PbCl4-2	1.039e-25	8.628e-26	-24.983	-25.064	-0.081	(0)
	Pb (NO3) 2	6.079e-28	6.079e-28	-27.216	-27.216	0.000	(0)
	Pb4 (OH) 4+4	1.514e-29	7.194e-30	-28.820	-29.143	-0.323	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-153.693	-153.693	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-232.484	-232.504	-0.020	(0)
S (-2)		0.000e+00					
	H2S	0.000e+00	0.000e+00	-79.542	-79.542	0.000	(0)
	HS-	0.000e+00	0.000e+00	-80.091	-80.112	-0.020	(0)
	CdHS+	0.000e+00	0.000e+00	-81.111	-81.132	-0.020	(0)
	S5-2	0.000e+00	0.000e+00	-82.945	-83.026	-0.081	(0)
	S6-2	0.000e+00	0.000e+00	-83.461	-83.542	-0.081	(0)
	S4-2	0.000e+00	0.000e+00	-83.541	-83.622	-0.081	(0)
	S3-2	0.000e+00	0.000e+00	-84.347	-84.427	-0.081	(0)

S2-2	0.000e+00	0.000e+00	-85.363	-85.444	-0.081	(0)
S-2	0.000e+00	0.000e+00	-90.885	-90.961	-0.076	(0)
HgHS2-	0.000e+00	0.000e+00	-141.160	-141.180	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.356	-143.437	-0.081	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.693	-153.693	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.979	-154.000	-0.020	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-154.039	-154.039	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.182	-154.319	-0.137	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.440	-154.440	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.414	-160.414	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.261	-220.281	-0.020	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.252	-231.272	-0.020	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.231	-232.251	-0.020	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.484	-232.504	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.720	-234.801	-0.081	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.468	-238.489	-0.020	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-310.086	-310.166	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.763	-312.843	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.670	-324.751	-0.081	(0)
S (6)	2.505e-04					
SO4-2	2.364e-04	1.981e-04	-3.626	-3.703	-0.077	(0)
CaSO4	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
MgSO4	2.379e-06	2.379e-06	-5.624	-5.624	0.000	(0)
NaSO4-	1.271e-07	1.217e-07	-6.896	-6.915	-0.019	(0)
KSO4-	9.346e-08	8.949e-08	-7.029	-7.048	-0.019	(0)
CuSO4	6.474e-08	6.474e-08	-7.189	-7.189	0.000	(0)
MnSO4	2.778e-08	2.778e-08	-7.556	-7.556	0.000	(0)
HSO4-	7.165e-09	6.857e-09	-8.145	-8.164	-0.019	(0)
ZnSO4	3.978e-09	3.978e-09	-8.400	-8.400	0.000	(0)
AlSO4+	1.964e-10	1.879e-10	-9.707	-9.726	-0.019	(0)
PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
NH4SO4-	9.232e-11	8.837e-11	-10.035	-10.054	-0.019	(0)
CdSO4	4.354e-11	4.354e-11	-10.361	-10.361	0.000	(0)
FeSO4	3.516e-11	3.516e-11	-10.454	-10.454	0.000	(0)
Zn (SO4) 2-2	8.268e-12	6.864e-12	-11.083	-11.163	-0.081	(0)
UO2SO4	7.686e-12	7.686e-12	-11.114	-11.114	0.000	(0)
Al (SO4) 2-	4.169e-13	3.990e-13	-12.380	-12.399	-0.019	(0)
CoSO4	4.075e-13	4.075e-13	-12.390	-12.390	0.000	(0)
Pb (SO4) 2-2	2.542e-13	2.110e-13	-12.595	-12.676	-0.081	(0)
Cd (SO4) 2-2	1.401e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
NiSO4	6.595e-14	6.595e-14	-13.181	-13.181	0.000	(0)
CrOHSO4	4.840e-14	4.840e-14	-13.315	-13.315	0.000	(0)
UO2 (SO4) 2-2	2.418e-14	2.008e-14	-13.617	-13.697	-0.081	(0)
CrSO4+	8.022e-16	7.658e-16	-15.096	-15.116	-0.020	(0)
FeSO4+	4.948e-16	4.736e-16	-15.306	-15.325	-0.019	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VOSO4	3.836e-18	3.836e-18	-17.416	-17.416	0.000	(0)
Fe (SO4) 2-	2.102e-18	2.006e-18	-17.677	-17.698	-0.020	(0)
Ni (SO4) 2-2	5.211e-19	4.327e-19	-18.283	-18.364	-0.081	(0)
HgSO4	2.395e-21	2.395e-21	-20.621	-20.621	0.000	(0)
Cr2 (OH) 2SO4+2	5.425e-24	4.504e-24	-23.266	-23.346	-0.081	(0)
Cr2 (OH) 2 (SO4) 2	5.301e-26	5.301e-26	-25.276	-25.276	0.000	(0)
CrO3SO4-2	7.153e-29	5.939e-29	-28.146	-28.226	-0.081	(0)
VSO4+	1.352e-31	1.291e-31	-30.869	-30.889	-0.020	(0)
U (SO4) 2	8.178e-38	8.178e-38	-37.087	-37.087	0.000	(0)
USO4+2	6.259e-38	5.197e-38	-37.203	-37.284	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.140	-75.160	-0.020	(0)
Sb (3)	7.941e-21					
Sb (OH) 3	4.018e-21	4.018e-21	-20.396	-20.396	0.000	(0)
HSbO2	3.922e-21	3.922e-21	-20.406	-20.406	0.000	(0)
Sb (OH) 2F	6.751e-26	6.751e-26	-25.171	-25.171	0.000	(0)
SbOF	6.638e-26	6.638e-26	-25.178	-25.178	0.000	(0)
Sb (OH) 2+	3.620e-26	3.456e-26	-25.441	-25.461	-0.020	(0)
SbO2-	1.879e-26	1.794e-26	-25.726	-25.746	-0.020	(0)
SbO+	1.248e-26	1.191e-26	-25.904	-25.924	-0.020	(0)
Sb (OH) 4-	1.077e-26	1.028e-26	-25.968	-25.988	-0.020	(0)

Sb2S4-2	0.000e+00	0.000e+00	-324.670	-324.751	-0.081	(0)
Sb (5)	3.998e-10					
SbO3-	3.994e-10	3.812e-10	-9.399	-9.419	-0.020	(0)
Sb (OH) 6-	4.660e-13	4.459e-13	-12.332	-12.351	-0.019	(0)
SbO2+	1.437e-23	1.372e-23	-22.843	-22.863	-0.020	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.316	-41.337	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.897	-43.897	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.805	-49.886	-0.081	(0)
Se (4)	3.487e-09					
HSeO3-	3.443e-09	3.286e-09	-8.463	-8.483	-0.020	(0)
SeO3-2	4.449e-11	3.694e-11	-10.352	-10.433	-0.081	(0)
H2SeO3	4.965e-13	4.965e-13	-12.304	-12.304	0.000	(0)
FeHSeO3+2	2.228e-21	1.850e-21	-20.652	-20.733	-0.081	(0)
Cd (SeO3) 2-2	1.269e-24	1.054e-24	-23.896	-23.977	-0.081	(0)
Se (6)	4.373e-13					
SeO4-2	4.372e-13	3.663e-13	-12.359	-12.436	-0.077	(0)
MnSeO4	7.774e-17	7.774e-17	-16.109	-16.109	0.000	(0)
HSeO4-	6.812e-18	6.503e-18	-17.167	-17.187	-0.020	(0)
ZnSeO4	5.207e-18	5.207e-18	-17.283	-17.283	0.000	(0)
CdSeO4	6.394e-20	6.394e-20	-19.194	-19.194	0.000	(0)
CoSeO4	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
NiSeO4	2.859e-22	2.859e-22	-21.544	-21.544	0.000	(0)
Zn (SeO4) 2-2	2.330e-30	1.934e-30	-29.633	-29.714	-0.081	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.297	-55.479	-0.182	(0)
U (4)	9.527e-22					
U (OH) 5-	9.394e-22	8.967e-22	-21.027	-21.047	-0.020	(0)
U (OH) 4	1.330e-23	1.330e-23	-22.876	-22.876	0.000	(0)
U (OH) 3+	1.804e-26	1.722e-26	-25.744	-25.764	-0.020	(0)
U (OH) 2+2	3.397e-30	2.820e-30	-29.469	-29.550	-0.081	(0)
UF3+	7.694e-33	7.344e-33	-32.114	-32.134	-0.020	(0)
UF2+2	1.838e-33	1.526e-33	-32.736	-32.816	-0.081	(0)
UOH+3	7.150e-35	4.705e-35	-34.146	-34.327	-0.182	(0)
UF4	2.445e-35	2.445e-35	-34.612	-34.612	0.000	(0)
UF+3	6.066e-36	3.992e-36	-35.217	-35.399	-0.182	(0)
U (SO4) 2	8.178e-38	8.178e-38	-37.087	-37.087	0.000	(0)
USO4+2	6.259e-38	5.197e-38	-37.203	-37.284	-0.081	(0)
UF5-	3.082e-38	2.942e-38	-37.511	-37.531	-0.020	(0)
UF6-2	3.250e-40	2.698e-40	-39.488	-39.569	-0.081	(0)
U+4	1.386e-40	0.000e+00	-39.858	-40.181	-0.323	(0)
UC1+3	0.000e+00	0.000e+00	-42.746	-42.927	-0.182	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.845	-161.481	-1.636	(0)
U (5)	5.159e-15					
UO2+	5.159e-15	4.924e-15	-14.287	-14.308	-0.020	(0)
U (6)	1.213e-08					
UO2 (CO3) 2-2	6.567e-09	5.452e-09	-8.183	-8.263	-0.081	(0)
UO2CO3	5.280e-09	5.280e-09	-8.277	-8.277	0.000	(0)
UO2F+	1.125e-10	1.074e-10	-9.949	-9.969	-0.020	(0)
UO2OH+	9.610e-11	9.174e-11	-10.017	-10.037	-0.020	(0)
UO2+2	3.059e-11	2.563e-11	-10.514	-10.591	-0.077	(0)
UO2 (CO3) 3-4	2.976e-11	1.414e-11	-10.526	-10.849	-0.323	(0)
UO2F2	9.409e-12	9.409e-12	-11.026	-11.026	0.000	(0)
UO2SO4	7.686e-12	7.686e-12	-11.114	-11.114	0.000	(0)
UO2F3-	7.518e-14	7.177e-14	-13.124	-13.144	-0.020	(0)
UO2 (SO4) 2-2	2.418e-14	2.008e-14	-13.617	-13.697	-0.081	(0)
(UO2) 2 (OH) 2+2	1.682e-14	1.397e-14	-13.774	-13.855	-0.081	(0)
UO2Cl+	1.559e-15	1.488e-15	-14.807	-14.827	-0.020	(0)
(UO2) 3 (OH) 5+	8.229e-16	7.855e-16	-15.085	-15.105	-0.020	(0)
UO2F4-2	2.085e-17	1.731e-17	-16.681	-16.762	-0.081	(0)
UO2NO3+	6.175e-21	5.894e-21	-20.209	-20.230	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.591	-40.671	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.687	-40.708	-0.020	(0)
V (3)	2.559e-14					
V (OH) 3	2.559e-14	2.559e-14	-13.592	-13.592	0.000	(0)
V (OH) 2+	6.134e-24	5.855e-24	-23.212	-23.232	-0.020	(0)

VOH+2	2.369e-26	1.967e-26	-25.625	-25.706	-0.081	(0)
V+3	2.098e-30	1.380e-30	-29.678	-29.860	-0.182	(0)
VSO4+	1.352e-31	1.291e-31	-30.869	-30.889	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.289	-50.612	-0.323	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.305	-50.487	-0.182	(0)
V (4)	5.199e-16					
V (OH) 3+	4.178e-16	3.988e-16	-15.379	-15.399	-0.020	(0)
VO+2	8.468e-17	7.030e-17	-16.072	-16.153	-0.081	(0)
VOF+	1.341e-17	1.280e-17	-16.872	-16.893	-0.020	(0)
VOSO4	3.836e-18	3.836e-18	-17.416	-17.416	0.000	(0)
VOF2	1.458e-19	1.458e-19	-18.836	-18.836	0.000	(0)
VOC1+	7.397e-21	7.060e-21	-20.131	-20.151	-0.020	(0)
VOF3-	1.646e-22	1.571e-22	-21.784	-21.804	-0.020	(0)
VOF4-2	2.319e-26	1.925e-26	-25.635	-25.715	-0.081	(0)
H2V2O4+2	9.601e-27	7.971e-27	-26.018	-26.098	-0.081	(0)
V (5)	9.416e-09					
H2VO4-	9.305e-09	8.882e-09	-8.031	-8.051	-0.020	(0)
HVO4-2	7.588e-11	6.300e-11	-10.120	-10.201	-0.081	(0)
H3VO4	3.146e-11	3.146e-11	-10.502	-10.502	0.000	(0)
H3V2O7-	1.890e-12	1.804e-12	-11.724	-11.744	-0.020	(0)
VO2+	2.324e-14	2.223e-14	-13.634	-13.653	-0.019	(0)
VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
HV2O7-3	2.882e-16	1.896e-16	-15.540	-15.722	-0.182	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VO2F2-	1.368e-17	1.305e-17	-16.864	-16.884	-0.020	(0)
VO4-3	1.355e-18	8.915e-19	-17.868	-18.050	-0.182	(0)
V3O9-3	1.115e-18	7.339e-19	-17.953	-18.134	-0.182	(0)
V2O7-4	3.032e-20	1.441e-20	-19.518	-19.841	-0.323	(0)
VO2F3-2	5.956e-21	4.945e-21	-20.225	-20.306	-0.081	(0)
V4O12-4	5.719e-24	2.717e-24	-23.243	-23.566	-0.323	(0)
VO2NO3	1.296e-24	1.296e-24	-23.887	-23.887	0.000	(0)
VO2F4-3	1.123e-25	7.388e-26	-24.950	-25.131	-0.182	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.171	-55.676	-0.505	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.596	-56.919	-0.323	(0)
V10O28-6	0.000e+00	0.000e+00	-56.685	-57.412	-0.727	(0)
Zn	1.153e-07					
Zn+2	1.095e-07	9.177e-08	-6.961	-7.037	-0.077	(0)
ZnSO4	3.978e-09	3.978e-09	-8.400	-8.400	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
ZnOH+	2.733e-10	2.609e-10	-9.563	-9.584	-0.020	(0)
ZnCO3	2.733e-10	2.733e-10	-9.563	-9.563	0.000	(0)
ZnF+	5.825e-11	5.560e-11	-10.235	-10.255	-0.020	(0)
ZnCl+	8.625e-12	8.252e-12	-11.064	-11.083	-0.019	(0)
Zn (SO4) 2-2	8.268e-12	6.864e-12	-11.083	-11.163	-0.081	(0)
Zn (OH) 2	1.176e-12	1.176e-12	-11.930	-11.930	0.000	(0)
ZnOHCl	3.071e-13	3.071e-13	-12.513	-12.513	0.000	(0)
ZnCl2	4.682e-16	4.682e-16	-15.330	-15.330	0.000	(0)
Zn (OH) 3-	1.755e-16	1.675e-16	-15.756	-15.776	-0.020	(0)
ZnNO3+	2.783e-17	2.657e-17	-16.555	-16.576	-0.020	(0)
ZnSeO4	5.207e-18	5.207e-18	-17.283	-17.283	0.000	(0)
ZnCl3-	1.391e-20	1.331e-20	-19.857	-19.876	-0.019	(0)
Zn (OH) 4-2	2.283e-22	1.896e-22	-21.641	-21.722	-0.081	(0)
ZnCl4-2	2.838e-25	2.383e-25	-24.547	-24.623	-0.076	(0)
Zn (NO3) 2	6.110e-28	6.110e-28	-27.214	-27.214	0.000	(0)
Zn (SeO4) 2-2	2.330e-30	1.934e-30	-29.633	-29.714	-0.081	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.979	-154.000	-0.020	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.440	-154.440	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.252	-231.272	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.720	-234.801	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.763	-312.843	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-72.15	-65.86	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-59.38	-54.87	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-66.61	-54.87	11.74	(Co (NH3) 5OH2) Cl3	

(Co(NH3)6)(NO3)3	-90.21	-72.28	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-75.83	-55.80	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-35.78	-35.38	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.65	-27.20	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.36	9.44	10.80	Al(OH)3
Al2(MoO4)3	-44.69	-42.32	2.37	Al2(MoO4)3
Al2O3	-0.77	18.88	19.65	Al2O3
Al4(OH)10SO4	-1.55	21.15	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-9.07	-4.27	4.80	AlAsO4:2H2O
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4
AlSb	-154.29	-88.67	65.62	AlSb
Alunite	-1.24	-2.64	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.65	-12.44	-7.79	PbSO4
Anhydrite	-2.94	-7.30	-4.36	CaSO4
Anilite	-57.73	-89.61	-31.88	Cu0.25Cu1.5S
Antlerite	-4.23	4.56	8.79	Cu3(OH)4SO4
Aragonite	-2.59	-10.89	-8.30	CaCO3
Arsenolite	-80.10	-82.86	-2.76	As4O6
Artinite	-12.35	-2.75	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-34.12	-27.41	6.71	As2O5
Atacamite	-4.18	3.21	7.39	Cu2(OH)3Cl
Azurite	-2.30	-19.21	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-18.45	5.95	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.38	-2.51	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.66	-9.57	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-29.50	3.44	32.94	Ba3(VO4)2:4H2O
BaCrO4	-17.90	-27.57	-9.67	BaCrO4
BaF2	-10.17	-15.99	-5.82	BaF2
BaMoO4	-7.49	-14.45	-6.96	BaMoO4
Barite	-0.68	-10.66	-9.98	BaSO4
BaS	-96.79	-80.61	16.18	BaS
BaSeO3	-10.82	-8.99	1.83	BaSeO3
BaSeO4	-11.93	-19.39	-7.46	BaSeO4
Bianchite	-8.98	-10.74	-1.76	ZnSO4:6H2O
Birnessite	-10.74	7.35	18.09	MnO2
Bixbyite	-10.55	-11.20	-0.64	Mn2O3
BlaubleiI	-56.69	-80.85	-24.16	Cu0.9Cu0.2S
BlaubleiII	-57.62	-84.89	-27.28	Cu0.6Cu0.8S
Boehmite	0.86	9.44	8.58	AlOOH
Breithauptite	-65.51	-84.03	-18.52	NiSb
Brochantite	-3.60	11.62	15.22	Cu4(OH)6SO4
Brucite	-8.12	8.72	16.84	Mg(OH)2
Bunsenite	-11.32	1.12	12.45	NiO
Ca(VO3)2	-10.76	-5.10	5.66	Ca(VO3)2
Ca2V2O7	-13.30	4.20	17.50	Ca2V2O7
Ca2V2O7:2H2O	-17.36	4.20	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-21.81	0.49	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-25.46	13.50	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-26.36	13.50	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-311.29	-168.32	142.97	Ca3Sb2
CaCrO4	-21.95	-24.22	-2.27	CaCrO4
Calcite	-2.41	-10.89	-8.48	CaCO3
Calomel	-11.86	-29.77	-17.91	Hg2Cl2
CaMoO4	-3.15	-11.10	-7.95	CaMoO4
Carnotite	-2.87	-2.64	0.23	KUO2VO4
CaSeO3:2H2O	-8.45	-5.63	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-13.02	-16.04	-3.02	CaSeO4:2H2O
Cd(BO2)2	-18.67	-8.83	9.84	Cd(BO2)2
Cd(OH)2	-9.77	3.87	13.64	Cd(OH)2
Cd(OH)2(am)	-9.86	3.87	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-28.30	-21.59	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-27.54	-4.98	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-29.51	-1.11	28.40	Cd4(OH)6SO4
CdCl2	-17.26	-17.92	-0.66	CdCl2
CdCl2:1H2O	-16.23	-17.92	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-16.01	-17.92	-1.91	CdCl2:2.5H2O
CdF2	-16.85	-18.06	-1.21	CdF2
Cdmetal(alpha)	-35.55	-22.03	13.51	Cd

Cdmetal (gamma)	-35.65	-22.03	13.62	Cd
CdMoO4	-2.38	-16.53	-14.15	CdMoO4
CdOHCl	-10.56	-7.02	3.54	CdOHCl
CdSb	-80.93	-81.28	-0.35	CdSb
CdSe	-23.71	-43.91	-20.20	CdSe
CdSeO4:2H2O	-19.61	-21.46	-1.85	CdSeO4:2H2O
CdSO4	-12.56	-12.73	-0.17	CdSO4
CdSO4:1H2O	-11.01	-12.73	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.86	-12.73	-1.87	CdSO4:2.67H2O
Cerrusite	-2.90	-16.03	-13.13	PbCO3
CH4 (g)	-82.76	-123.81	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcocite	-58.06	-92.98	-34.92	Cu2S
Chalcopyrite	-127.04	-162.31	-35.27	CuFeS2
Cinnabar	-53.50	-99.19	-45.69	HgS
Claudetite	-79.79	-82.86	-3.06	As4O6
Clausthalite	-16.53	-43.63	-27.10	PbSe
Co (BO2) 2	-37.86	-10.79	27.07	Co (BO2) 2
Co (OH) 2	-11.18	1.91	13.09	Co (OH) 2
Co (OH) 3	-15.22	-17.53	-2.31	Co (OH) 3
CO2 (g)	-2.04	-20.19	-18.15	CO2
Co3 (AsO4) 2	-34.70	-21.67	13.03	Co3 (AsO4) 2
Co3O4	-22.66	-33.15	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.43	-20.02	-1.60	CoF2
CoF3	-48.98	-50.44	-1.46	CoF3
CoFe2O4	12.80	9.28	-3.53	CoFe2O4
CoMoO4	-10.72	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS (alpha)	-77.21	-84.65	-7.44	CoS
CoS (beta)	-73.58	-84.65	-11.07	CoS
CoSe	-29.67	-45.87	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.89	-23.42	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.21	-79.51	-22.30	CuS
Cr (OH) 2	-25.82	-15.00	10.82	Cr (OH) 2
Cr (OH) 3	-6.33	-5.00	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-4.25	-5.00	-0.75	Cr (OH) 3
Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.89	-36.80	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.39	-40.91	30.48	Cr
CrO3	-30.31	-33.52	-3.21	CrO3
Cryolite	-15.00	-48.84	-33.84	Na3AlF6
Cu (OH) 2	-1.62	7.06	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.14	18.07	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.53	-2.28	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.38	-94.26	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.40	-54.20	-45.80	Cu2Se
Cu2SO4	-21.07	-23.02	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.13	-107.73	-42.59	Cu3Sb
Cu3Se2	-31.44	-94.93	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.02	-26.46	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.40	-16.16	-8.76	Cu
CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4

Cuprite	-5.01	-6.41	-1.41	Cu ₂ O
Cuprousferrite	9.39	0.47	-8.92	CuFeO ₂
CuSe	-7.63	-40.73	-33.10	CuSe
CuSe ₂	-29.25	-62.61	-33.37	CuSe ₂
CuSeO ₃ :2H ₂ O	-8.39	-7.88	0.51	CuSeO ₃ :2H ₂ O
CuSeO ₄ :5H ₂ O	-15.84	-18.28	-2.44	CuSeO ₄ :5H ₂ O
CuSO ₄	-12.49	-9.55	2.94	CuSO ₄
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.17	-92.09	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite (disordered)	-5.81	-22.35	-16.54	CaMg (CO ₃) ₂
Dolomite (ordered)	-5.26	-22.35	-17.09	CaMg (CO ₃) ₂
Epsomite	-5.76	-7.88	-2.13	MgSO ₄ :7H ₂ O
Fe (OH) ₂	-9.80	3.76	13.56	Fe (OH) ₂
Fe (OH) ₂ .7Cl _{1.3}	3.45	0.41	-3.04	Fe (OH) ₂ .7Cl _{1.3}
Fe (VO ₃) ₂	-6.92	-10.64	-3.72	Fe (VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.13	-7.57	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ :2H ₂ O	-16.81	-37.44	-20.63	Fe ₂ (SeO ₃) ₃ :2H ₂ O
Fe ₂ (SO ₄) ₃	-38.72	-42.45	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-9.10	11.12	20.22	Fe ₃ (OH) ₈
FeAsO ₄ :2H ₂ O	-10.43	-10.03	0.40	FeAsO ₄ :2H ₂ O
FeCr ₂ O ₄	-13.43	-6.23	7.20	FeCr ₂ O ₄
FeMoO ₄	-6.55	-16.64	-10.09	FeMoO ₄
Ferrihydrite	0.49	3.68	3.19	Fe (OH) ₃
Ferroselite	-47.31	-65.91	-18.60	FeSe ₂
FeS (ppt)	-79.85	-82.80	-2.95	FeS
FeSe	-33.03	-44.03	-11.00	FeSe
Fix_pe	-6.50	-6.50	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF ₂
Galena	-68.43	-82.40	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al (OH) ₃
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO ₄ :7H ₂ O
Greenockite	-68.33	-82.69	-14.36	CdS
Greigite	-290.09	-335.13	-45.03	Fe ₃ S ₄
Gummite	-5.36	2.31	7.67	UO ₃
Gypsum	-2.69	-7.30	-4.61	CaSO ₄ :2H ₂ O
H-Jarosite	-10.07	-22.17	-12.10	(H ₃ O) Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-7.52	-20.40	-12.88	H ₂ MoO ₄
H ₂ S (g)	-78.55	-86.56	-8.01	H ₂ S
H ₂ Se (g)	-42.83	-47.79	-4.96	H ₂ Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.73	46.30	61.03	Mn ₃ O ₄
Hematite	8.78	7.36	-1.42	Fe ₂ O ₃
Hercynite	-0.25	22.64	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-186.53	-260.24	-73.71	Hg (CH ₃) ₂
Hg (g)	-9.07	-16.94	-7.87	Hg
Hg (OH) ₂	-9.13	-12.63	-3.50	Hg (OH) ₂
Hg ₂ (g)	-18.92	-33.88	-14.96	Hg ₂
Hg ₂ (OH) ₂	-13.24	-7.98	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-12.11	-28.16	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-32.79	-41.49	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-19.55	-29.91	-10.36	Hg ₂ F ₂
Hg ₂ S	-82.86	-94.54	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-18.25	-22.91	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-18.45	-24.58	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-28.39	-58.07	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-34.38	-14.88	19.50	HgCl
HgCl ₂	-13.16	-34.42	-21.26	HgCl ₂
HgF (g)	-47.63	-14.96	32.68	HgF
HgF ₂ (g)	-47.13	-34.56	12.57	HgF ₂
Hgmetal (l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.72	-60.42	-55.69	HgSe
HgSeO ₃	-15.13	-27.56	-12.43	HgSeO ₃
HgSO ₄	-19.81	-29.23	-9.42	HgSO ₄
Huntite	-15.32	-45.29	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-9.12	-27.89	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-28.38	-37.15	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ :4H ₂ O
K-Alum	-16.34	-21.51	-5.17	KAl (SO ₄) ₂ :12H ₂ O

K-Jarosite	-5.11	-19.91	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-45.28	-62.52	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-28.49	-29.01	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-19.15	-15.89	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-20.10	-20.83	-0.73	K ₂ SeO ₄
Langite	-5.87	11.62	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-7.85	-8.28	-0.43	PbO·PbSO ₄
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.20	-82.80	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe ₂ O ₃
Magnesioferrite	-0.78	16.08	16.86	Fe ₂ MgO ₄
Magnesite	-4.01	-11.47	-7.46	MgCO ₃
Magnetite	7.72	11.12	3.40	Fe ₃ O ₄
Malachite	-0.77	-6.08	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-5.59	19.75	25.34	MnOOH
Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl ₂
Melanterite	-10.64	-12.84	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-54.10	-99.19	-45.09	HgS
Mg(OH) ₂ (active)	-10.07	8.72	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.96	-5.68	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-286.81	-212.12	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.32	3.04	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-17.47	-1.27	16.20	MgCr ₂ O ₄
MgCrO ₄	-30.18	-24.80	5.38	MgCrO ₄
MgF ₂	-5.09	-13.22	-8.13	MgF ₂
MgMoO ₄	-9.83	-11.68	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-9.27	-6.21	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-15.42	-16.62	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-35.13	38.39	73.52	Pb ₃ O ₄
Mirabilite	-10.47	-11.59	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.51	-7.61	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.30	-61.01	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-158.54	-97.46	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-19.52	-7.02	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-17.71	-15.00	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-79.93	-79.76	0.17	MnS
MnS (pnk)	-83.10	-79.76	3.34	MnS
MnSb	-100.80	-103.71	-2.91	MnSb
MnSe	-44.49	-40.99	3.50	MnSe
MnSeO ₃	-9.27	-8.14	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-9.12	-8.14	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.49	-18.54	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-12.39	-9.81	2.58	MnSO ₄
Monteponite	-11.23	3.87	15.10	CdO
Montroydite	-8.99	-12.63	-3.64	HgO
MoO ₃	-12.40	-20.40	-8.00	MoO ₃
Morenosite	-13.34	-15.48	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.17	-219.43	-70.26	MoS ₂
Na-Jarosite	-8.46	-19.66	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-52.12	-62.02	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-31.43	-28.50	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-19.19	-35.78	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.87	-15.38	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-16.61	-15.38	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-20.22	-9.92	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-21.60	-20.32	1.28	Na ₂ SeO ₄
Na ₃ Sb	-185.03	-90.58	94.45	Na ₃ Sb
Na ₃ VO ₄	-36.36	0.33	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-41.77	-4.37	37.40	Na ₄ V ₂ O ₇
Nantokite	-7.37	-14.10	-6.73	CuCl
NaSb	-92.86	-69.70	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.55	-4.69	3.86	NaVO ₃

Nesquehonite	-6.80	-11.47	-4.67	MgCO3:3H2O
Ni(OH)2	-11.67	1.12	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-39.74	-24.04	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-44.11	-12.11	32.00	Ni4(OH)6SO4
NiCO3	-12.19	-19.06	-6.87	NiCO3
NiMoO4	-8.13	-19.28	-11.14	NiMoO4
NiS(alpha)	-79.84	-85.44	-5.60	NiS
NiS(beta)	-74.34	-85.44	-11.10	NiS
NiS(gamma)	-72.64	-85.44	-12.80	NiS
NiSe	-28.96	-46.66	-17.70	NiSe
NiSeO3:2H2O	-16.62	-13.81	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-22.69	-24.21	-1.52	NiSeO4:6H2O
Nsutite	-10.15	7.35	17.50	MnO2
O2(g)	-31.28	51.81	83.09	O2
Orpiment	-240.05	-301.11	-61.07	As2S3
Otavite	-4.31	-16.31	-12.00	CdCO3
Pb(BO2)2	-15.06	-8.54	6.52	Pb(BO2)2
Pb(OH)2	-3.99	4.16	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-70.75	-79.51	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-11.37	-2.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.86	8.32	26.19	Pb2O(OH)2
Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.31	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.73	-14.93	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.06	-1.92	6.14	Pb3(VO4)2
Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.06	0.04	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.04	21.88	Pb4O3SO4
PbCrO4	-16.75	-29.35	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.34	-21.18	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.53	30.07	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-124.95	-143.46	-18.51	FeS2
Pyrochroite	-8.40	6.80	15.19	Mn(OH)2
Pyrolusite	-8.68	32.70	41.38	MnO2
Realgar	-100.48	-120.23	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb(OH)3	-13.29	-20.40	-7.11	Sb(OH)3
Sb2O4	-18.29	-14.89	3.40	Sb2O4
Sb2O5	-27.94	-37.60	-9.67	Sb2O5
Sb2Se3	-116.40	-184.15	-67.76	Sb2Se3
Sb4O6(cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6(orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.66	-53.09	0.57	SbCl3
SbF3	-43.08	-53.30	-10.23	SbF3
Sbmetal	-47.56	-59.25	-11.69	Sb
SbO2	-3.93	-31.75	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2(OH)2:H2O
Semetal(am)	-14.77	-21.88	-7.11	Se
Semetal(hex)	-14.17	-21.88	-7.71	Se
Senarmontite	-28.43	-40.79	-12.37	Sb2O3
SeO2	-15.06	-14.93	0.12	SeO2
SeO3	-46.38	-25.34	21.04	SeO3
Siderite	-6.19	-16.43	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3
Sphalerite	-69.25	-80.70	-11.45	ZnS
Spinel	-9.25	27.60	36.85	MgAl2O4
Stibnite	-250.02	-300.48	-50.46	Sb2S3

Sulfur	-58.51	-60.66	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na2SO4
Thermonatrite	-15.81	-15.17	0.64	Na2CO3:H2O
Tyuyamunite	-4.56	-0.48	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-587.95	-435.57	152.38	U3Sb4
U4O9	-28.59	-31.61	-3.02	U4O9
UF4	-28.71	-58.25	-29.54	UF4
UF4:2.5H2O	-25.53	-58.25	-32.72	UF4:2.5H2O
UO2 (am)	-15.31	-14.38	0.93	UO2
UO2 (NO3) 2	-42.62	-30.47	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-35.32	-30.47	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.86	-30.47	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.51	-30.47	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.30	2.31	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.78	-23.03	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3
Uraninite	-9.71	-14.38	-4.67	UO2
USb2	-223.49	-193.91	29.58	USb2
V (OH) 3	-18.10	-10.51	7.59	V (OH) 3
V2O5	-13.04	-14.40	-1.36	V2O5
V3O5	-37.49	-35.66	1.84	V3O5
V4O7	-46.10	-38.91	7.19	V4O7
V6O13	-34.16	-95.02	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VC12	-64.13	-45.25	18.87	VC12
VC13	-66.63	-43.20	23.43	VC13
VF4	-62.06	-47.13	14.93	VF4
Vmetal	-93.39	-49.36	44.03	V
VO	-38.22	-23.46	14.76	VO
VO (OH) 2	-8.40	-3.25	5.15	VO (OH) 2
VO2Cl	-20.94	-18.10	2.84	VO2Cl
VOC1	-32.56	-21.40	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO4	-23.47	-19.86	3.61	VOSO4
Witherite	-5.67	-14.24	-8.57	BaCO3
Wurtzite	-71.75	-80.70	-8.95	ZnS
Zincite	-5.47	5.86	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO4
Zn (BO2) 2	-15.13	-6.84	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-30.23	-26.91	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-6.34	5.86	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-6.61	5.86	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-5.89	5.86	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-5.67	5.86	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-5.87	5.86	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-12.38	-4.88	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-14.36	0.83	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-23.47	-9.82	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-34.53	-15.62	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-21.55	6.85	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-30.97	7.53	38.50	Zn5 (OH) 8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.83	-20.04	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO (active)	-5.32	5.86	11.19	ZnO
ZnS (am)	-71.65	-80.70	-9.05	ZnS
ZnSb	-90.31	-79.29	11.01	ZnSb
ZnSe	-27.52	-41.92	-14.40	ZnSe
ZnSeO4:6H2O	-17.95	-19.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 137.

REACTION 802
H2O -1
12522.6 moles ### Addition step. Removes HTC water but solute mass
remains
USE solution 805
SAVE Solution 806
End

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 805. Solution after simulation 136.
Using reaction 802.

Reaction 802.

1.252e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.226e-04	2.230e-04
As	1.024e-07	1.026e-07
B	1.006e-04	1.007e-04
Ba	3.017e-05	3.022e-05
C	1.634e-01	1.637e-01
Ca	7.063e-02	7.076e-02
Cd	2.643e-07	2.647e-07
Cl	8.463e-03	8.478e-03
Co	2.981e-09	2.987e-09
Cr	1.147e-09	1.149e-09
Cu	5.377e-04	5.387e-04
F	7.598e-03	7.611e-03
Fe	1.073e-05	1.074e-05
Hg	9.650e-09	9.667e-09
K	1.510e-02	1.513e-02
Mg	1.846e-02	1.849e-02
Mn	2.228e-04	2.232e-04
Mo	8.609e-06	8.624e-06
N	2.254e-05	2.258e-05
Na	2.708e-02	2.713e-02
Ni	4.855e-10	4.864e-10
Pb	7.536e-07	7.549e-07
S	5.666e-02	5.676e-02
Sb	9.044e-08	9.060e-08
Se	7.890e-07	7.904e-07
U	2.745e-06	2.750e-06

V	2.130e-06	2.134e-06
Zn	2.608e-05	2.613e-05

-----Description of solution-----

	pH	=	6.245	Charge balance
	pe	=	6.786	Adjusted to redox
equilibrium	Activity of water	=	0.995	
	Ionic strength (mol/kgw)	=	2.211e-01	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	9.328e-02	
	Total CO2 (mol/kg)	=	1.634e-01	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	33	
	Total H	=	1.114471e+02	
	Total O	=	5.632502e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	7.654e-07	5.683e-07	-6.116	-6.245	-0.129	0.00
OH-	2.522e-08	1.762e-08	-7.598	-7.754	-0.156	(0)
H2O	5.551e+01	9.946e-01	1.744	-0.002	0.000	18.07
Al	2.226e-04					
AlF4-	1.552e-04	1.121e-04	-3.809	-3.951	-0.141	(0)
AlF3	6.536e-05	6.536e-05	-4.185	-4.185	0.000	(0)
AlF2+	2.051e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
AlF+2	3.715e-09	1.114e-09	-8.430	-8.953	-0.523	(0)
Al(OH)2+	1.085e-11	8.032e-12	-10.964	-11.095	-0.131	(0)
Al(OH)4-	8.678e-12	6.265e-12	-11.062	-11.203	-0.141	(0)
AlSO4+	3.060e-12	2.209e-12	-11.514	-11.656	-0.141	(0)
Al(OH)3	2.824e-12	2.824e-12	-11.549	-11.549	0.000	(0)
AlOH+2	1.913e-12	5.738e-13	-11.718	-12.241	-0.523	(0)
Al+3	4.746e-13	3.256e-14	-12.324	-13.487	-1.164	(0)
Al(SO4)2-	2.866e-13	2.069e-13	-12.543	-12.684	-0.141	(0)
AlMo6O21-3	4.891e-28	3.395e-30	-27.311	-29.469	-2.159	(0)
As(3)	1.990e-19					
H3AsO3	1.987e-19	1.987e-19	-18.702	-18.702	0.000	(0)
H2AsO3-	3.115e-22	1.793e-22	-21.507	-21.746	-0.240	(0)
H4AsO3+	9.718e-26	5.594e-26	-25.012	-25.252	-0.240	(0)
HAsO3-2	2.620e-27	2.877e-28	-26.582	-27.541	-0.959	(0)
AsO3-3	2.812e-33	1.952e-35	-32.551	-34.710	-2.159	(0)
As(5)	1.024e-07					
HAsO4-2	5.148e-08	5.654e-09	-7.288	-8.248	-0.959	(0)
H2AsO4-	5.090e-08	2.930e-08	-7.293	-7.533	-0.240	(0)
AsO4-3	4.532e-12	3.146e-14	-11.344	-13.502	-2.159	(0)
H3AsO4	2.750e-12	2.894e-12	-11.561	-11.539	0.022	(0)
B	1.006e-04					
H3BO3	1.000e-04	1.052e-04	-4.000	-3.978	0.022	(0)
BF(OH)3-	2.140e-07	1.437e-07	-6.670	-6.843	-0.173	(0)
H2BO3-	1.602e-07	1.076e-07	-6.795	-6.968	-0.173	(0)
CaH2BO3+	9.686e-08	6.503e-08	-7.014	-7.187	-0.173	(0)
BF2(OH)2-	4.473e-08	3.003e-08	-7.349	-7.522	-0.173	(0)
MgH2BO3+	1.651e-08	1.108e-08	-7.782	-7.955	-0.173	(0)
NaH2BO3	3.198e-09	3.198e-09	-8.495	-8.495	0.000	(0)
BaH2BO3+	3.738e-11	2.509e-11	-10.427	-10.600	-0.173	(0)
BF3OH-	3.402e-11	2.284e-11	-10.468	-10.641	-0.173	(0)
H5(BO3)2-	1.435e-11	9.634e-12	-10.843	-11.016	-0.173	(0)
BF4-	3.272e-13	2.197e-13	-12.485	-12.658	-0.173	(0)
H8(BO3)3-	1.510e-13	1.014e-13	-12.821	-12.994	-0.173	(0)
Ba	3.017e-05					
Ba+2	2.484e-05	7.550e-06	-4.605	-5.122	-0.517	(0)

BaHCO3+	5.311e-06	3.987e-06	-5.275	-5.399	-0.124	(0)
BaCO3	1.767e-08	1.767e-08	-7.753	-7.753	0.000	(0)
BaH2BO3+	3.738e-11	2.509e-11	-10.427	-10.600	-0.173	(0)
BaNO3+	1.794e-12	1.033e-12	-11.746	-11.986	-0.240	(0)
BaOH+	7.931e-13	5.808e-13	-12.101	-12.236	-0.135	(0)
BaNH3+2	2.590e-13	2.844e-14	-12.587	-13.546	-0.959	(0)
C (4)	1.634e-01					
HCO3-	7.473e-02	5.530e-02	-1.126	-1.257	-0.131	(0)
H2CO3	7.068e-02	7.068e-02	-1.151	-1.151	0.000	(0)
CaHCO3+	1.441e-02	1.082e-02	-1.841	-1.966	-0.124	(0)
MgHCO3+	2.366e-03	1.682e-03	-2.626	-2.774	-0.148	(0)
NaHCO3	5.834e-04	5.834e-04	-3.234	-3.234	0.000	(0)
CuCO3	3.463e-04	3.463e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.814e-05	4.498e-05	-4.107	-4.347	-0.240	(0)
CaCO3	7.597e-05	7.597e-05	-4.119	-4.119	0.000	(0)
Cu (CO3) 2-2	3.872e-05	4.252e-06	-4.412	-5.371	-0.959	(0)
MnHCO3+	2.715e-05	1.988e-05	-4.566	-4.702	-0.135	(0)
CO3-2	1.501e-05	4.562e-06	-4.824	-5.341	-0.517	(0)
MgCO3	1.128e-05	1.128e-05	-4.948	-4.948	0.000	(0)
ZnHCO3+	7.945e-06	4.574e-06	-5.100	-5.340	-0.240	(0)
BaHCO3+	5.311e-06	3.987e-06	-5.275	-5.399	-0.124	(0)
UO2 (CO3) 3-4	2.729e-06	3.968e-10	-5.564	-9.401	-3.837	(0)
NaCO3-	2.154e-06	1.594e-06	-5.667	-5.798	-0.131	(0)
ZnCO3	6.866e-07	6.866e-07	-6.163	-6.163	0.000	(0)
PbHCO3+	5.530e-07	3.184e-07	-6.257	-6.497	-0.240	(0)
FeHCO3+	1.341e-07	1.007e-07	-6.872	-6.997	-0.124	(0)
PbCO3	1.062e-07	1.062e-07	-6.974	-6.974	0.000	(0)
BaCO3	1.767e-08	1.767e-08	-7.753	-7.753	0.000	(0)
UO2 (CO3) 2-2	1.581e-08	1.736e-09	-7.801	-8.761	-0.959	(0)
Pb (CO3) 2-2	1.273e-08	1.398e-09	-7.895	-8.855	-0.959	(0)
CdHCO3+	6.409e-09	3.689e-09	-8.193	-8.433	-0.240	(0)
CdCO3	3.047e-09	3.047e-09	-8.516	-8.516	0.000	(0)
CoHCO3+	1.196e-09	6.885e-10	-8.922	-9.162	-0.240	(0)
NiHCO3+	3.337e-10	1.921e-10	-9.477	-9.716	-0.240	(0)
Cd (CO3) 2-2	9.383e-11	1.030e-11	-10.028	-10.987	-0.959	(0)
UO2CO3	1.907e-11	1.907e-11	-10.720	-10.720	0.000	(0)
CoCO3	1.234e-11	1.234e-11	-10.909	-10.909	0.000	(0)
HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
NiCO3	4.796e-12	4.796e-12	-11.319	-11.319	0.000	(0)
Hg (CO3) 2-2	1.416e-12	1.555e-13	-11.849	-12.808	-0.959	(0)
HgHCO3+	1.982e-13	1.141e-13	-12.703	-12.943	-0.240	(0)
Ca	7.063e-02					
Ca+2	3.457e-02	1.051e-02	-1.461	-1.978	-0.517	(0)
CaSO4	2.104e-02	2.104e-02	-1.677	-1.677	0.000	(0)
CaHCO3+	1.441e-02	1.082e-02	-1.841	-1.966	-0.124	(0)
CaF+	5.358e-04	3.924e-04	-3.271	-3.406	-0.135	(0)
CaCO3	7.597e-05	7.597e-05	-4.119	-4.119	0.000	(0)
CaH2BO3+	9.686e-08	6.503e-08	-7.014	-7.187	-0.173	(0)
CaOH+	4.921e-09	3.695e-09	-8.308	-8.432	-0.124	(0)
CaNO3+	1.575e-09	9.069e-10	-8.803	-9.042	-0.240	(0)
CaNH3+2	7.192e-10	7.898e-11	-9.143	-10.102	-0.959	(0)
Ca (NH3) 2+2	1.709e-18	1.877e-19	-17.767	-18.726	-0.959	(0)
Cd	2.643e-07					
Cd+2	9.640e-08	2.930e-08	-7.016	-7.533	-0.517	(0)
Cd (SO4) 2-2	6.447e-08	7.079e-09	-7.191	-8.150	-0.959	(0)
CdSO4	6.004e-08	6.004e-08	-7.222	-7.222	0.000	(0)
CdCl+	3.055e-08	1.758e-08	-7.515	-7.755	-0.240	(0)
CdHCO3+	6.409e-09	3.689e-09	-8.193	-8.433	-0.240	(0)
CdCO3	3.047e-09	3.047e-09	-8.516	-8.516	0.000	(0)
CdF+	2.760e-09	1.589e-09	-8.559	-8.799	-0.240	(0)
CdCl2	4.606e-10	4.606e-10	-9.337	-9.337	0.000	(0)
Cd (CO3) 2-2	9.383e-11	1.030e-11	-10.028	-10.987	-0.959	(0)
CdOHC1	1.271e-11	1.271e-11	-10.896	-10.896	0.000	(0)
CdF2	1.085e-11	1.085e-11	-10.965	-10.965	0.000	(0)
CdOH+	7.125e-12	4.102e-12	-11.147	-11.387	-0.240	(0)
CdCl3-	3.173e-12	1.826e-12	-11.499	-11.738	-0.240	(0)
CdNO3+	4.393e-15	2.529e-15	-14.357	-14.597	-0.240	(0)
Cd (OH) 2	4.560e-16	4.560e-16	-15.341	-15.341	0.000	(0)

	CdSeO4	2.383e-16	2.383e-16	-15.623	-15.623	0.000	(0)
	Cd2OH+3	8.677e-17	6.024e-19	-16.062	-18.220	-2.159	(0)
	Cd (SeO3) 2-2	2.070e-18	2.273e-19	-17.684	-18.643	-0.959	(0)
	Cd (OH) 3-	8.529e-22	4.910e-22	-21.069	-21.309	-0.240	(0)
	Cd (NO3) 2	3.459e-23	3.459e-23	-22.461	-22.461	0.000	(0)
	Cd (OH) 4-2	1.290e-29	1.416e-30	-28.890	-29.849	-0.959	(0)
	CdHS+	0.000e+00	0.000e+00	-78.174	-78.414	-0.240	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.099	-150.099	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.849	-227.088	-0.240	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.822	-303.782	-0.959	(0)
Cl		8.463e-03					
	Cl-	8.463e-03	6.284e-03	-2.072	-2.202	-0.129	(0)
	MnCl+	1.946e-07	1.425e-07	-6.711	-6.846	-0.135	(0)
	CuCl+	1.806e-07	1.284e-07	-6.743	-6.891	-0.148	(0)
	ZnCl+	5.807e-08	4.128e-08	-7.236	-7.384	-0.148	(0)
	CdCl+	3.055e-08	1.758e-08	-7.515	-7.755	-0.240	(0)
	CuCl2-	1.509e-08	1.072e-08	-7.821	-7.970	-0.148	(0)
	CuCl	8.168e-09	8.168e-09	-8.088	-8.088	0.000	(0)
	HgCl2	7.797e-09	7.797e-09	-8.108	-8.108	0.000	(0)
	PbCl+	3.001e-09	1.727e-09	-8.523	-8.763	-0.240	(0)
	MnCl2	1.265e-09	1.265e-09	-8.898	-8.898	0.000	(0)
	ZnOHC1	9.523e-10	9.523e-10	-9.021	-9.021	0.000	(0)
	HgCl3-	8.511e-10	4.899e-10	-9.070	-9.310	-0.240	(0)
	CdCl2	4.606e-10	4.606e-10	-9.337	-9.337	0.000	(0)
	ZnCl2	4.111e-10	4.111e-10	-9.386	-9.386	0.000	(0)
	HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
	CuCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
	HgCl4-2	1.116e-10	1.226e-11	-9.952	-10.912	-0.959	(0)
	CuCl3-2	5.010e-11	1.441e-11	-10.300	-10.841	-0.541	(0)
	PbCl2	4.849e-11	4.849e-11	-10.314	-10.314	0.000	(0)
	CdOHC1	1.271e-11	1.271e-11	-10.896	-10.896	0.000	(0)
	CoCl+	6.044e-12	3.479e-12	-11.219	-11.459	-0.240	(0)
	CdCl3-	3.173e-12	1.826e-12	-11.499	-11.738	-0.240	(0)
	MnCl3-	2.990e-12	2.190e-12	-11.524	-11.660	-0.135	(0)
	ZnCl3-	2.887e-12	2.052e-12	-11.540	-11.688	-0.148	(0)
	NiCl+	7.870e-13	4.530e-13	-12.104	-12.344	-0.240	(0)
	HgCl+	4.301e-13	2.476e-13	-12.366	-12.606	-0.240	(0)
	PbCl3-	2.107e-13	1.213e-13	-12.676	-12.916	-0.240	(0)
	FeCl+2	5.424e-14	1.560e-14	-13.266	-13.807	-0.541	(0)
	CuCl3-	2.308e-14	1.641e-14	-13.637	-13.785	-0.148	(0)
	ZnCl4-2	2.242e-14	6.448e-15	-13.649	-14.191	-0.541	(0)
	CrCl+2	7.814e-15	8.581e-16	-14.107	-15.066	-0.959	(0)
	PbCl4-2	3.172e-15	3.484e-16	-14.499	-15.458	-0.959	(0)
	VOCl+	9.371e-16	5.394e-16	-15.028	-15.268	-0.240	(0)
	FeCl2+	5.978e-16	4.378e-16	-15.223	-15.359	-0.135	(0)
	UO2Cl+	1.859e-17	1.070e-17	-16.731	-16.971	-0.240	(0)
	NiCl2	1.433e-17	1.433e-17	-16.844	-16.844	0.000	(0)
	CrOHC12	1.806e-18	1.806e-18	-17.743	-17.743	0.000	(0)
	CuCl4-2	1.797e-18	5.167e-19	-17.746	-18.287	-0.541	(0)
	CrCl2+	8.888e-19	5.116e-19	-18.051	-18.291	-0.240	(0)
	FeCl3	2.751e-19	2.751e-19	-18.561	-18.561	0.000	(0)
	CrO3Cl-	1.778e-27	1.023e-27	-26.750	-26.990	-0.240	(0)
	CoCl+2	4.537e-35	4.982e-36	-34.343	-35.303	-0.959	(0)
	UCl+3	0.000e+00	0.000e+00	-42.656	-44.814	-2.159	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.461	-50.420	-0.959	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.510	-50.469	-0.959	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.450	-65.409	-0.959	(0)
Co (2)		2.981e-09					
	Co+2	1.458e-09	1.601e-10	-8.836	-9.796	-0.959	(0)
	CoHCO3+	1.196e-09	6.885e-10	-8.922	-9.162	-0.240	(0)
	CoSO4	2.791e-10	2.791e-10	-9.554	-9.554	0.000	(0)
	CoF+	3.008e-11	1.732e-11	-10.522	-10.762	-0.240	(0)
	CoCO3	1.234e-11	1.234e-11	-10.909	-10.909	0.000	(0)
	CoCl+	6.044e-12	3.479e-12	-11.219	-11.459	-0.240	(0)
	CoOH+	9.776e-14	5.628e-14	-13.010	-13.250	-0.240	(0)
	CoNO2+	1.725e-14	9.931e-15	-13.763	-14.003	-0.240	(0)
	Co (NH3) +2	1.046e-15	1.149e-16	-14.980	-15.940	-0.959	(0)
	Co (OH) 2	7.877e-17	7.877e-17	-16.104	-16.104	0.000	(0)

CoNO3+	1.203e-17	6.923e-18	-16.920	-17.160	-0.240	(0)
CoSeO4	3.503e-18	3.503e-18	-17.456	-17.456	0.000	(0)
Co (NH3) 2+2	2.665e-22	2.926e-23	-21.574	-22.534	-0.959	(0)
Co2OH+3	6.503e-23	4.514e-25	-22.187	-24.345	-2.159	(0)
Co (OH) 3-	4.811e-23	2.770e-23	-22.318	-22.558	-0.240	(0)
CoOOH-	1.214e-23	6.987e-24	-22.916	-23.156	-0.240	(0)
Co (NO3) 2	3.845e-25	3.845e-25	-24.415	-24.415	0.000	(0)
Co (NH3) 3+2	2.003e-29	2.199e-30	-28.698	-29.658	-0.959	(0)
Co (OH) 4-2	7.044e-31	7.735e-32	-30.152	-31.112	-0.959	(0)
Co (NH3) 4+2	6.275e-37	6.891e-38	-36.202	-37.162	-0.959	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.861	-44.699	-3.837	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.206	-45.166	-0.959	(0)
Co (3)	3.178e-30					
CoOH+2	3.178e-30	3.489e-31	-29.498	-30.457	-0.959	(0)
Co+3	5.680e-35	3.897e-36	-34.246	-35.409	-1.164	(0)
CoCl+2	4.537e-35	4.982e-36	-34.343	-35.303	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.510	-50.469	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.101	-60.340	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.450	-65.409	-0.959	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.802	-66.761	-0.959	(0)
Cr (2)	3.754e-26					
Cr+2	3.754e-26	4.122e-27	-25.426	-26.385	-0.959	(0)
Cr (3)	1.147e-09					
CrF+2	5.210e-10	5.722e-11	-9.283	-10.242	-0.959	(0)
Cr (OH) +2	3.704e-10	4.068e-11	-9.431	-10.391	-0.959	(0)
Cr (OH) 2+	1.515e-10	8.722e-11	-9.820	-10.059	-0.240	(0)
CrOHSO4	8.438e-11	8.438e-11	-10.074	-10.074	0.000	(0)
Cr+3	1.520e-11	1.055e-13	-10.818	-12.977	-2.159	(0)
CrSO4+	3.741e-12	2.154e-12	-11.427	-11.667	-0.240	(0)
Cr (OH) 3	5.774e-13	5.774e-13	-12.239	-12.239	0.000	(0)
CrCl+2	7.814e-15	8.581e-16	-14.107	-15.066	-0.959	(0)
CrO2-	8.427e-16	4.851e-16	-15.074	-15.314	-0.240	(0)
Cr (OH) 4-	7.037e-16	4.051e-16	-15.153	-15.392	-0.240	(0)
Cr2 (OH) 2SO4+2	2.825e-18	3.102e-19	-17.549	-18.508	-0.959	(0)
CrOHC12	1.806e-18	1.806e-18	-17.743	-17.743	0.000	(0)
CrCl2+	8.888e-19	5.116e-19	-18.051	-18.291	-0.240	(0)
Cr2 (OH) 2 (SO4) 2	1.611e-19	1.611e-19	-18.793	-18.793	0.000	(0)
CrNO3+2	1.146e-21	1.259e-22	-20.941	-21.900	-0.959	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.519	-41.478	-0.959	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.162	-49.321	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.461	-50.420	-0.959	(0)
Cr (6)	1.655e-19					
CrO4-2	8.107e-20	2.464e-20	-19.091	-19.608	-0.517	(0)
HCrO4-	7.872e-20	4.532e-20	-19.104	-19.344	-0.240	(0)
NaCrO4-	3.991e-21	2.297e-21	-20.399	-20.639	-0.240	(0)
KCrO4-	1.679e-21	9.667e-22	-20.775	-21.015	-0.240	(0)
CrO3SO4-2	6.277e-25	6.894e-26	-24.202	-25.162	-0.959	(0)
H2CrO4	2.088e-26	2.088e-26	-25.680	-25.680	0.000	(0)
CrO3Cl-	1.778e-27	1.023e-27	-26.750	-26.990	-0.240	(0)
Cr2O7-2	6.519e-37	7.159e-38	-36.186	-37.145	-0.959	(0)
Cu (1)	2.510e-08					
CuCl2-	1.509e-08	1.072e-08	-7.821	-7.970	-0.148	(0)
CuCl	8.168e-09	8.168e-09	-8.088	-8.088	0.000	(0)
Cu+	1.794e-09	1.033e-09	-8.746	-8.986	-0.240	(0)
CuCl3-2	5.010e-11	1.441e-11	-10.300	-10.841	-0.541	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.409	-150.884	-0.474	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Cu (2)	5.377e-04					
CuCO3	3.463e-04	3.463e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.814e-05	4.498e-05	-4.107	-4.347	-0.240	(0)
Cu+2	4.241e-05	1.289e-05	-4.373	-4.890	-0.517	(0)
Cu (CO3) 2-2	3.872e-05	4.252e-06	-4.412	-5.371	-0.959	(0)
CuSO4	2.581e-05	2.581e-05	-4.588	-4.588	0.000	(0)
CuF+	4.834e-06	2.783e-06	-5.316	-5.555	-0.240	(0)
CuOH+	1.011e-06	7.184e-07	-5.995	-6.144	-0.148	(0)
CuCl+	1.806e-07	1.284e-07	-6.743	-6.891	-0.148	(0)
Cu2 (OH) 2+2	1.181e-07	1.296e-08	-6.928	-7.887	-0.959	(0)
CuNO2+	2.065e-08	1.189e-08	-7.685	-7.925	-0.240	(0)

	CuNH3+2	7.172e-09	7.876e-10	-8.144	-9.104	-0.959	(0)
	Cu (OH) 2	2.526e-09	2.526e-09	-8.598	-8.598	0.000	(0)
	CuCl2	2.797e-10	2.797e-10	-9.553	-9.553	0.000	(0)
	CuNO3+	1.933e-12	1.113e-12	-11.714	-11.954	-0.240	(0)
	Cu (NO2) 2	1.071e-12	1.071e-12	-11.970	-11.970	0.000	(0)
	Cu (OH) 3-	1.586e-13	9.130e-14	-12.800	-13.040	-0.240	(0)
	CuCl3-	2.308e-14	1.641e-14	-13.637	-13.785	-0.148	(0)
	CuCl4-2	1.797e-18	5.167e-19	-17.746	-18.287	-0.541	(0)
	Cu (OH) 4-2	1.153e-19	1.266e-20	-18.938	-19.897	-0.959	(0)
	Cu (NO3) 2	3.823e-21	3.823e-21	-20.418	-20.418	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-215.418	-215.658	-0.240	(0)
F		7.598e-03					
	F-	4.608e-03	3.421e-03	-2.337	-2.466	-0.129	(0)
	MgF+	1.580e-03	1.141e-03	-2.801	-2.943	-0.141	(0)
	CaF+	5.358e-04	3.924e-04	-3.271	-3.406	-0.135	(0)
	AlF4-	1.552e-04	1.121e-04	-3.809	-3.951	-0.141	(0)
	AlF3	6.536e-05	6.536e-05	-4.185	-4.185	0.000	(0)
	NaF	4.050e-05	4.050e-05	-4.393	-4.393	0.000	(0)
	CuF+	4.834e-06	2.783e-06	-5.316	-5.555	-0.240	(0)
	MnF+	3.351e-06	2.454e-06	-5.475	-5.610	-0.135	(0)
	HF	2.876e-06	2.876e-06	-5.541	-5.541	0.000	(0)
	AlF2+	2.051e-06	1.517e-06	-5.688	-5.819	-0.131	(0)
	ZnF+	3.101e-07	1.785e-07	-6.508	-6.748	-0.240	(0)
	BF (OH) 3-	2.140e-07	1.437e-07	-6.670	-6.843	-0.173	(0)
	FeF3	1.363e-07	1.363e-07	-6.866	-6.866	0.000	(0)
	HF2-	5.353e-08	3.741e-08	-7.271	-7.427	-0.156	(0)
	BF2 (OH) 2-	4.473e-08	3.003e-08	-7.349	-7.522	-0.173	(0)
	FeF2+	3.855e-08	2.823e-08	-7.414	-7.549	-0.135	(0)
	AlF+2	3.715e-09	1.114e-09	-8.430	-8.953	-0.523	(0)
	PbF+	3.245e-09	1.868e-09	-8.489	-8.729	-0.240	(0)
	CdF+	2.760e-09	1.589e-09	-8.559	-8.799	-0.240	(0)
	FeF+2	1.072e-09	3.083e-10	-8.970	-9.511	-0.541	(0)
	CrF+2	5.210e-10	5.722e-11	-9.283	-10.242	-0.959	(0)
	PbF2	1.258e-10	1.258e-10	-9.900	-9.900	0.000	(0)
	VO2F2-	9.329e-11	5.370e-11	-10.030	-10.270	-0.240	(0)
	VO2F	4.323e-11	4.323e-11	-10.364	-10.364	0.000	(0)
	BF3OH-	3.402e-11	2.284e-11	-10.468	-10.641	-0.173	(0)
	CoF+	3.008e-11	1.732e-11	-10.522	-10.762	-0.240	(0)
	H2F2	2.216e-11	2.216e-11	-10.654	-10.654	0.000	(0)
	VO2F3-2	2.087e-11	2.292e-12	-10.680	-11.640	-0.959	(0)
	CdF2	1.085e-11	1.085e-11	-10.965	-10.965	0.000	(0)
	UO2F3-	7.304e-12	4.204e-12	-11.136	-11.376	-0.240	(0)
	UO2F2	4.892e-12	4.892e-12	-11.310	-11.310	0.000	(0)
	NiF+	4.207e-12	2.422e-12	-11.376	-11.616	-0.240	(0)
	PbF3-	1.418e-12	8.161e-13	-11.848	-12.088	-0.240	(0)
	VOF+	1.091e-12	6.279e-13	-11.962	-12.202	-0.240	(0)
	UO2F4-2	1.040e-12	1.143e-13	-11.983	-12.942	-0.959	(0)
	UO2F+	8.613e-13	4.958e-13	-12.065	-12.305	-0.240	(0)
	VOF2	8.056e-13	8.056e-13	-12.094	-12.094	0.000	(0)
	VO2F4-3	5.558e-13	3.858e-15	-12.255	-14.414	-2.159	(0)
	BF4-	3.272e-13	2.197e-13	-12.485	-12.658	-0.173	(0)
	VOF3-	1.699e-13	9.779e-14	-12.770	-13.010	-0.240	(0)
	VOF4-2	1.230e-14	1.350e-15	-13.910	-14.870	-0.959	(0)
	PbF4-2	1.217e-14	1.336e-15	-13.915	-14.874	-0.959	(0)
	HgF+	4.350e-19	2.504e-19	-18.361	-18.601	-0.240	(0)
	Sb (OH) 2F	1.862e-21	1.862e-21	-20.730	-20.730	0.000	(0)
	SbOF	1.841e-21	1.841e-21	-20.735	-20.735	0.000	(0)
	UF3+	1.348e-30	7.761e-31	-29.870	-30.110	-0.240	(0)
	UF6-2	3.714e-31	4.078e-32	-30.430	-31.390	-0.959	(0)
	UF4	2.912e-31	2.912e-31	-30.536	-30.536	0.000	(0)
	UF5-	6.857e-32	3.947e-32	-31.164	-31.404	-0.240	(0)
	UF2+2	1.303e-32	1.431e-33	-31.885	-32.844	-0.959	(0)
	UF+3	4.787e-36	3.323e-38	-35.320	-37.478	-2.159	(0)
Fe (2)		1.762e-06					
	Fe+2	1.317e-06	1.447e-07	-5.880	-6.840	-0.959	(0)
	FeSO4	3.104e-07	3.104e-07	-6.508	-6.508	0.000	(0)
	FeHCO3+	1.341e-07	1.007e-07	-6.872	-6.997	-0.124	(0)
	FeOH+	1.386e-10	1.015e-10	-9.858	-9.994	-0.135	(0)

Fe (OH) 2	1.421e-15	1.421e-15	-14.848	-14.848	0.000	(0)
Fe (OH) 3-	1.081e-17	7.916e-18	-16.966	-17.101	-0.135	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.668	-155.668	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.280	-232.520	-0.240	(0)
Fe (3)	8.963e-06					
Fe (OH) 2+	8.663e-06	6.410e-06	-5.062	-5.193	-0.131	(0)
FeF3	1.363e-07	1.363e-07	-6.866	-6.866	0.000	(0)
Fe (OH) 3	1.213e-07	1.213e-07	-6.916	-6.916	0.000	(0)
FeF2+	3.855e-08	2.823e-08	-7.414	-7.549	-0.135	(0)
FeOH+2	3.252e-09	9.351e-10	-8.488	-9.029	-0.541	(0)
FeF+2	1.072e-09	3.083e-10	-8.970	-9.511	-0.541	(0)
Fe (OH) 4-	2.690e-10	1.991e-10	-9.570	-9.701	-0.131	(0)
FeSO4+	1.101e-11	8.060e-12	-10.958	-11.094	-0.135	(0)
Fe (SO4) 2-	2.616e-12	1.506e-12	-11.582	-11.822	-0.240	(0)
Fe+3	1.198e-12	8.218e-14	-11.922	-13.085	-1.164	(0)
Fe2 (OH) 2+4	1.991e-13	2.895e-17	-12.701	-16.538	-3.837	(0)
FeCl+2	5.424e-14	1.560e-14	-13.266	-13.807	-0.541	(0)
Fe3 (OH) 4+5	2.657e-15	2.683e-21	-14.576	-20.571	-5.996	(0)
FeHSeO3+2	8.661e-16	9.511e-17	-15.062	-16.022	-0.959	(0)
FeCl2+	5.978e-16	4.378e-16	-15.223	-15.359	-0.135	(0)
FeCl3	2.751e-19	2.751e-19	-18.561	-18.561	0.000	(0)
FeNO3+2	2.043e-19	2.243e-20	-18.690	-19.649	-0.959	(0)
H (0)	1.162e-29					
H2	5.810e-30	6.114e-30	-29.236	-29.214	0.022	(0)
Hg (0)	4.873e-10					
Hg	4.873e-10	4.873e-10	-9.312	-9.312	0.000	(0)
Hg (1)	1.190e-17					
Hg2+2	5.949e-18	6.533e-19	-17.226	-18.185	-0.959	(0)
Hg (2)	9.162e-09					
HgCl2	7.797e-09	7.797e-09	-8.108	-8.108	0.000	(0)
HgCl3-	8.511e-10	4.899e-10	-9.070	-9.310	-0.240	(0)
HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
HgCl4-2	1.116e-10	1.226e-11	-9.952	-10.912	-0.959	(0)
HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
Hg (OH) 2	3.677e-12	3.869e-12	-11.435	-11.412	0.022	(0)
Hg (CO3) 2-2	1.416e-12	1.555e-13	-11.849	-12.808	-0.959	(0)
HgCl+	4.301e-13	2.476e-13	-12.366	-12.606	-0.240	(0)
HgHCO3+	1.982e-13	1.141e-13	-12.703	-12.943	-0.240	(0)
HgOH+	2.406e-15	1.385e-15	-14.619	-14.858	-0.240	(0)
Hg (NH3) 2+2	4.044e-16	4.441e-17	-15.393	-16.353	-0.959	(0)
HgNH3+2	6.774e-17	7.439e-18	-16.169	-17.129	-0.959	(0)
Hg+2	1.798e-17	1.975e-18	-16.745	-17.705	-0.959	(0)
HgSO4	4.519e-18	4.519e-18	-17.345	-17.345	0.000	(0)
HgF+	4.350e-19	2.504e-19	-18.361	-18.601	-0.240	(0)
Hg (OH) 3-	1.491e-20	8.583e-21	-19.827	-20.066	-0.240	(0)
Hg (NH3) 3+2	9.612e-24	1.056e-24	-23.017	-23.977	-0.959	(0)
HgNO3+	3.457e-26	1.990e-26	-25.461	-25.701	-0.240	(0)
Hg (NH3) 4+2	4.559e-31	5.006e-32	-30.341	-31.301	-0.959	(0)
Hg (NO3) 2	2.257e-34	2.257e-34	-33.646	-33.646	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.309	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.161	-137.161	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.959	(0)
K	1.510e-02					
K+	1.422e-02	1.056e-02	-1.847	-1.976	-0.129	(0)
KSO4-	8.830e-04	6.534e-04	-3.054	-3.185	-0.131	(0)
KCrO4-	1.679e-21	9.667e-22	-20.775	-21.015	-0.240	(0)
Mg	1.846e-02					
Mg+2	9.777e-03	2.972e-03	-2.010	-2.527	-0.517	(0)
MgSO4	4.727e-03	4.727e-03	-2.325	-2.325	0.000	(0)
MgHCO3+	2.366e-03	1.682e-03	-2.626	-2.774	-0.148	(0)
MgF+	1.580e-03	1.141e-03	-2.801	-2.943	-0.141	(0)
MgCO3	1.128e-05	1.128e-05	-4.948	-4.948	0.000	(0)
MgOH+	2.746e-08	2.085e-08	-7.561	-7.681	-0.120	(0)
MgH2BO3+	1.651e-08	1.108e-08	-7.782	-7.955	-0.173	(0)
Mn (2)	2.228e-04					
Mn+2	1.641e-04	1.802e-05	-3.785	-4.744	-0.959	(0)
MnSO4	2.800e-05	2.800e-05	-4.553	-4.553	0.000	(0)
MnHCO3+	2.715e-05	1.988e-05	-4.566	-4.702	-0.135	(0)

MnF+	3.351e-06	2.454e-06	-5.475	-5.610	-0.135	(0)
MnCl+	1.946e-07	1.425e-07	-6.711	-6.846	-0.135	(0)
MnCl2	1.265e-09	1.265e-09	-8.898	-8.898	0.000	(0)
MnOH+	1.089e-09	7.975e-10	-8.963	-9.098	-0.135	(0)
MnCl3-	2.990e-12	2.190e-12	-11.524	-11.660	-0.135	(0)
MnNO3+	1.354e-12	7.793e-13	-11.868	-12.108	-0.240	(0)
MnSeO4	2.118e-13	2.118e-13	-12.674	-12.674	0.000	(0)
Mn (NO3) 2	5.343e-20	5.343e-20	-19.272	-19.272	0.000	(0)
Mn (OH) 3-	2.090e-21	1.531e-21	-20.680	-20.815	-0.135	(0)
Mn (OH) 4-2	3.028e-28	8.707e-29	-27.519	-28.060	-0.541	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Mn (3)	7.174e-23					
Mn+3	7.174e-23	4.922e-24	-22.144	-23.308	-1.164	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-45.525	-46.067	-0.541	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-48.488	-48.652	-0.164	(0)
Mo	8.609e-06					
MoO4-2	8.557e-06	2.601e-06	-5.068	-5.585	-0.517	(0)
HMoO4-	5.110e-08	2.941e-08	-7.292	-7.531	-0.240	(0)
H2MoO4	1.224e-10	1.224e-10	-9.912	-9.912	0.000	(0)
AlMo6O21-3	4.891e-28	3.395e-30	-27.311	-29.469	-2.159	(0)
Mo7O24-6	3.771e-28	8.757e-37	-27.424	-36.058	-8.634	(0)
HMo7O24-5	1.201e-30	1.213e-36	-29.920	-35.916	-5.996	(0)
H2Mo7O24-4	2.870e-34	4.174e-38	-33.542	-37.379	-3.837	(0)
H3Mo7O24-3	6.020e-39	0.000e+00	-38.220	-40.379	-2.159	(0)
N (-3)	9.638e-06					
NH4+	8.863e-06	5.951e-06	-5.052	-5.225	-0.173	(0)
NH4SO4-	7.611e-07	5.574e-07	-6.119	-6.254	-0.135	(0)
CuNH3+2	7.172e-09	7.876e-10	-8.144	-9.104	-0.959	(0)
NH3	5.970e-09	5.970e-09	-8.224	-8.224	0.000	(0)
CaNH3+2	7.192e-10	7.898e-11	-9.143	-10.102	-0.959	(0)
BaNH3+2	2.590e-13	2.844e-14	-12.587	-13.546	-0.959	(0)
Co (NH3) +2	1.046e-15	1.149e-16	-14.980	-15.940	-0.959	(0)
NiNH3+2	8.227e-16	9.035e-17	-15.085	-16.044	-0.959	(0)
Hg (NH3) 2+2	4.044e-16	4.441e-17	-15.393	-16.353	-0.959	(0)
HgNH3+2	6.774e-17	7.439e-18	-16.169	-17.129	-0.959	(0)
Ca (NH3) 2+2	1.709e-18	1.877e-19	-17.767	-18.726	-0.959	(0)
Ni (NH3) 2+2	7.100e-22	7.797e-23	-21.149	-22.108	-0.959	(0)
Co (NH3) 2+2	2.665e-22	2.926e-23	-21.574	-22.534	-0.959	(0)
Hg (NH3) 3+2	9.612e-24	1.056e-24	-23.017	-23.977	-0.959	(0)
Co (NH3) 3+2	2.003e-29	2.199e-30	-28.698	-29.658	-0.959	(0)
Hg (NH3) 4+2	4.559e-31	5.006e-32	-30.341	-31.301	-0.959	(0)
Co (NH3) 4+2	6.275e-37	6.891e-38	-36.202	-37.162	-0.959	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.519	-41.478	-0.959	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.206	-45.166	-0.959	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.162	-49.321	-2.159	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.461	-50.420	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.510	-50.469	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.101	-60.340	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.450	-65.409	-0.959	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.802	-66.761	-0.959	(0)
N (3)	1.286e-05					
NO2-	1.284e-05	8.805e-06	-4.891	-5.055	-0.164	(0)
CuNO2+	2.065e-08	1.189e-08	-7.685	-7.925	-0.240	(0)
Cu (NO2) 2	1.071e-12	1.071e-12	-11.970	-11.970	0.000	(0)
CoNO2+	1.725e-14	9.931e-15	-13.763	-14.003	-0.240	(0)
N (5)	3.834e-08					
NO3-	3.676e-08	2.729e-08	-7.435	-7.564	-0.129	(0)
CaNO3+	1.575e-09	9.069e-10	-8.803	-9.042	-0.240	(0)
CuNO3+	1.933e-12	1.113e-12	-11.714	-11.954	-0.240	(0)
BaNO3+	1.794e-12	1.033e-12	-11.746	-11.986	-0.240	(0)
MnNO3+	1.354e-12	7.793e-13	-11.868	-12.108	-0.240	(0)
ZnNO3+	3.115e-13	1.793e-13	-12.507	-12.746	-0.240	(0)
PbNO3+	5.433e-15	3.128e-15	-14.265	-14.505	-0.240	(0)
CdNO3+	4.393e-15	2.529e-15	-14.357	-14.597	-0.240	(0)
CoNO3+	1.203e-17	6.923e-18	-16.920	-17.160	-0.240	(0)
NiNO3+	3.356e-18	1.932e-18	-17.474	-17.714	-0.240	(0)

	FeNO3+2	2.043e-19	2.243e-20	-18.690	-19.649	-0.959	(0)
	VO2NO3	9.946e-20	9.946e-20	-19.002	-19.002	0.000	(0)
	Mn (NO3) 2	5.343e-20	5.343e-20	-19.272	-19.272	0.000	(0)
	Cu (NO3) 2	3.823e-21	3.823e-21	-20.418	-20.418	0.000	(0)
	CrNO3+2	1.146e-21	1.259e-22	-20.941	-21.900	-0.959	(0)
	Zn (NO3) 2	9.763e-22	9.763e-22	-21.010	-21.010	0.000	(0)
	Pb (NO3) 2	1.450e-22	1.450e-22	-21.839	-21.839	0.000	(0)
	UO2NO3+	9.931e-23	5.717e-23	-22.003	-22.243	-0.240	(0)
	Cd (NO3) 2	3.459e-23	3.459e-23	-22.461	-22.461	0.000	(0)
	Co (NO3) 2	3.845e-25	3.845e-25	-24.415	-24.415	0.000	(0)
	HgNO3+	3.457e-26	1.990e-26	-25.461	-25.701	-0.240	(0)
	Hg (NO3) 2	2.257e-34	2.257e-34	-33.646	-33.646	0.000	(0)
Na	2.708e-02						
	Na+	2.527e-02	1.876e-02	-1.597	-1.727	-0.129	(0)
	NaSO4-	1.190e-03	8.806e-04	-2.924	-3.055	-0.131	(0)
	NaHCO3	5.834e-04	5.834e-04	-3.234	-3.234	0.000	(0)
	NaF	4.050e-05	4.050e-05	-4.393	-4.393	0.000	(0)
	NaCO3-	2.154e-06	1.594e-06	-5.667	-5.798	-0.131	(0)
	NaH2BO3	3.198e-09	3.198e-09	-8.495	-8.495	0.000	(0)
	NaCrO4-	3.991e-21	2.297e-21	-20.399	-20.639	-0.240	(0)
Ni	4.855e-10						
	NiHCO3+	3.337e-10	1.921e-10	-9.477	-9.716	-0.240	(0)
	Ni+2	9.270e-11	2.818e-11	-10.033	-10.550	-0.517	(0)
	NiSO4	4.914e-11	4.914e-11	-10.309	-10.309	0.000	(0)
	NiCO3	4.796e-12	4.796e-12	-11.319	-11.319	0.000	(0)
	NiF+	4.207e-12	2.422e-12	-11.376	-11.616	-0.240	(0)
	NiCl+	7.870e-13	4.530e-13	-12.104	-12.344	-0.240	(0)
	Ni (SO4) 2-2	1.295e-13	1.422e-14	-12.888	-13.847	-0.959	(0)
	NiOH+	1.086e-14	6.251e-15	-13.964	-14.204	-0.240	(0)
	NiNH3+2	8.227e-16	9.035e-17	-15.085	-16.044	-0.959	(0)
	NiCl2	1.433e-17	1.433e-17	-16.844	-16.844	0.000	(0)
	Ni (OH) 2	8.750e-18	8.750e-18	-17.058	-17.058	0.000	(0)
	NiNO3+	3.356e-18	1.932e-18	-17.474	-17.714	-0.240	(0)
	NiSeO4	5.755e-19	5.755e-19	-18.240	-18.240	0.000	(0)
	Ni (NH3) 2+2	7.100e-22	7.797e-23	-21.149	-22.108	-0.959	(0)
	Ni (OH) 3-	2.678e-22	1.542e-22	-21.572	-21.812	-0.240	(0)
O (0)	2.550e-34						
	O2	1.275e-34	1.341e-34	-33.895	-33.872	0.022	(0)
Pb	7.536e-07						
	PbHCO3+	5.530e-07	3.184e-07	-6.257	-6.497	-0.240	(0)
	PbCO3	1.062e-07	1.062e-07	-6.974	-6.974	0.000	(0)
	PbSO4	3.317e-08	3.317e-08	-7.479	-7.479	0.000	(0)
	Pb+2	2.549e-08	7.748e-09	-7.594	-8.111	-0.517	(0)
	Pb (SO4) 2-2	1.591e-08	1.747e-09	-7.798	-8.758	-0.959	(0)
	Pb (CO3) 2-2	1.273e-08	1.398e-09	-7.895	-8.855	-0.959	(0)
	PbF+	3.245e-09	1.868e-09	-8.489	-8.729	-0.240	(0)
	PbCl+	3.001e-09	1.727e-09	-8.523	-8.763	-0.240	(0)
	PbOH+	5.957e-10	3.429e-10	-9.225	-9.465	-0.240	(0)
	PbF2	1.258e-10	1.258e-10	-9.900	-9.900	0.000	(0)
	PbCl2	4.849e-11	4.849e-11	-10.314	-10.314	0.000	(0)
	PbF3-	1.418e-12	8.161e-13	-11.848	-12.088	-0.240	(0)
	PbCl3-	2.107e-13	1.213e-13	-12.676	-12.916	-0.240	(0)
	Pb (OH) 2	1.911e-13	1.911e-13	-12.719	-12.719	0.000	(0)
	PbF4-2	1.217e-14	1.336e-15	-13.915	-14.874	-0.959	(0)
	Pb2OH+3	6.066e-15	4.211e-17	-14.217	-16.376	-2.159	(0)
	PbNO3+	5.433e-15	3.128e-15	-14.265	-14.505	-0.240	(0)
	PbCl4-2	3.172e-15	3.484e-16	-14.499	-15.458	-0.959	(0)
	Pb (OH) 3-	5.850e-18	3.368e-18	-17.233	-17.473	-0.240	(0)
	Pb (NO3) 2	1.450e-22	1.450e-22	-21.839	-21.839	0.000	(0)
	Pb (OH) 4-2	1.323e-22	1.453e-23	-21.878	-22.838	-0.959	(0)
	Pb3 (OH) 4+2	5.141e-23	5.645e-24	-22.289	-23.248	-0.959	(0)
	Pb4 (OH) 4+4	2.389e-24	3.474e-28	-23.622	-27.459	-3.837	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.968	-228.208	-0.240	(0)
S (-2)	0.000e+00						
	H2S	0.000e+00	0.000e+00	-78.115	-78.115	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.174	-78.414	-0.240	(0)
	HS-	0.000e+00	0.000e+00	-78.649	-78.889	-0.240	(0)

S5-2	0.000e+00	0.000e+00	-81.049	-82.009	-0.959	(0)
S6-2	0.000e+00	0.000e+00	-81.565	-82.525	-0.959	(0)
S4-2	0.000e+00	0.000e+00	-81.645	-82.605	-0.959	(0)
S3-2	0.000e+00	0.000e+00	-82.451	-83.410	-0.959	(0)
S2-2	0.000e+00	0.000e+00	-83.467	-84.427	-0.959	(0)
S-2	0.000e+00	0.000e+00	-89.402	-89.944	-0.541	(0)
HgHS2-	0.000e+00	0.000e+00	-137.070	-137.309	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.161	-137.161	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.813	-139.772	-0.959	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.065	-150.305	-0.240	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.099	-150.099	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.409	-150.884	-0.474	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.541	-150.541	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.170	-151.614	-0.444	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.668	-155.668	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.418	-215.658	-0.240	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.910	-226.150	-0.240	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.849	-227.088	-0.240	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.968	-228.208	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.925	-229.884	-0.959	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.280	-232.520	-0.240	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.822	-303.782	-0.959	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.540	-306.499	-0.959	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.115	-315.074	-0.959	(0)
S (6)	5.666e-02					
SO4-2	2.875e-02	8.741e-03	-1.541	-2.058	-0.517	(0)
CaSO4	2.104e-02	2.104e-02	-1.677	-1.677	0.000	(0)
MgSO4	4.727e-03	4.727e-03	-2.325	-2.325	0.000	(0)
NaSO4-	1.190e-03	8.806e-04	-2.924	-3.055	-0.131	(0)
KSO4-	8.830e-04	6.534e-04	-3.054	-3.185	-0.131	(0)
MnSO4	2.800e-05	2.800e-05	-4.553	-4.553	0.000	(0)
CuSO4	2.581e-05	2.581e-05	-4.588	-4.588	0.000	(0)
ZnSO4	5.001e-06	5.001e-06	-5.301	-5.301	0.000	(0)
Zn (SO4) 2-2	3.467e-06	3.807e-07	-5.460	-6.419	-0.959	(0)
NH4SO4-	7.611e-07	5.574e-07	-6.119	-6.254	-0.135	(0)
HSO4-	6.724e-07	4.854e-07	-6.172	-6.314	-0.141	(0)
FeSO4	3.104e-07	3.104e-07	-6.508	-6.508	0.000	(0)
Cd (SO4) 2-2	6.447e-08	7.079e-09	-7.191	-8.150	-0.959	(0)
CdSO4	6.004e-08	6.004e-08	-7.222	-7.222	0.000	(0)
PbSO4	3.317e-08	3.317e-08	-7.479	-7.479	0.000	(0)
Pb (SO4) 2-2	1.591e-08	1.747e-09	-7.798	-8.758	-0.959	(0)
CoSO4	2.791e-10	2.791e-10	-9.554	-9.554	0.000	(0)
CrOHSO4	8.438e-11	8.438e-11	-10.074	-10.074	0.000	(0)
NiSO4	4.914e-11	4.914e-11	-10.309	-10.309	0.000	(0)
FeSO4+	1.101e-11	8.060e-12	-10.958	-11.094	-0.135	(0)
CrSO4+	3.741e-12	2.154e-12	-11.427	-11.667	-0.240	(0)
AlSO4+	3.060e-12	2.209e-12	-11.514	-11.656	-0.141	(0)
Fe (SO4) 2-	2.616e-12	1.506e-12	-11.582	-11.822	-0.240	(0)
VO2SO4-	2.612e-12	1.504e-12	-11.583	-11.823	-0.240	(0)
Al (SO4) 2-	2.866e-13	2.069e-13	-12.543	-12.684	-0.141	(0)
Ni (SO4) 2-2	1.295e-13	1.422e-14	-12.888	-13.847	-0.959	(0)
VOSO4	7.367e-14	7.367e-14	-13.133	-13.133	0.000	(0)
UO2 (SO4) 2-2	1.457e-14	1.600e-15	-13.836	-14.796	-0.959	(0)
UO2SO4	1.389e-14	1.389e-14	-13.857	-13.857	0.000	(0)
HgSO4	4.519e-18	4.519e-18	-17.345	-17.345	0.000	(0)
Cr2 (OH) 2SO4+2	2.825e-18	3.102e-19	-17.549	-18.508	-0.959	(0)
Cr2 (OH) 2 (SO4) 2	1.611e-19	1.611e-19	-18.793	-18.793	0.000	(0)
CrO3SO4-2	6.277e-25	6.894e-26	-24.202	-25.162	-0.959	(0)
VSO4+	5.784e-27	3.329e-27	-26.238	-26.478	-0.240	(0)
U (SO4) 2	1.176e-38	1.176e-38	-37.930	-37.930	0.000	(0)
USO4+2	1.543e-39	1.694e-40	-38.812	-39.771	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.101	-60.340	-0.240	(0)
Sb (3)	1.212e-18					
Sb (OH) 3	6.097e-19	6.097e-19	-18.215	-18.215	0.000	(0)
HSbO2	5.984e-19	5.984e-19	-18.223	-18.223	0.000	(0)
Sb (OH) 2F	1.862e-21	1.862e-21	-20.730	-20.730	0.000	(0)
SbOF	1.841e-21	1.841e-21	-20.735	-20.735	0.000	(0)

Sb(OH) 2+	1.470e-23	8.461e-24	-22.833	-23.073	-0.240	(0)
SbO+	5.095e-24	2.933e-24	-23.293	-23.533	-0.240	(0)
SbO2-	2.963e-24	1.705e-24	-23.528	-23.768	-0.240	(0)
Sb(OH) 4-	1.679e-24	9.667e-25	-23.775	-24.015	-0.240	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.115	-315.074	-0.959	(0)
Sb (5)	9.044e-08					
SbO3-	9.036e-08	5.202e-08	-7.044	-7.284	-0.240	(0)
Sb(OH) 6-	8.062e-11	5.986e-11	-10.094	-10.223	-0.129	(0)
SbO2+	8.416e-21	4.845e-21	-20.075	-20.315	-0.240	(0)
Se (-2)	3.608e-40					
HSe-	3.608e-40	2.077e-40	-39.443	-39.683	-0.240	(0)
H2Se	0.000e+00	0.000e+00	-42.038	-42.038	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.566	-43.566	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.478	-48.437	-0.959	(0)
Se (4)	7.888e-07					
HSeO3-	7.608e-07	4.380e-07	-6.119	-6.359	-0.240	(0)
SeO3-2	2.794e-08	3.068e-09	-7.554	-8.513	-0.959	(0)
H2SeO3	1.062e-10	1.062e-10	-9.974	-9.974	0.000	(0)
FeHSeO3+2	8.661e-16	9.511e-17	-15.062	-16.022	-0.959	(0)
Cd(SeO3) 2-2	2.070e-18	2.273e-19	-17.684	-18.643	-0.959	(0)
Se (6)	1.439e-10					
SeO4-2	1.437e-10	4.367e-11	-9.843	-10.360	-0.517	(0)
MnSeO4	2.118e-13	2.118e-13	-12.674	-12.674	0.000	(0)
ZnSeO4	1.769e-14	1.769e-14	-13.752	-13.752	0.000	(0)
HSeO4-	2.161e-15	1.244e-15	-14.665	-14.905	-0.240	(0)
CdSeO4	2.383e-16	2.383e-16	-15.623	-15.623	0.000	(0)
CoSeO4	3.503e-18	3.503e-18	-17.456	-17.456	0.000	(0)
NiSeO4	5.755e-19	5.755e-19	-18.240	-18.240	0.000	(0)
Zn(SeO4) 2-2	7.131e-24	7.831e-25	-23.147	-24.106	-0.959	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.737	-59.895	-2.159	(0)
U (4)	1.068e-26					
U(OH) 5-	1.053e-26	6.062e-27	-25.978	-26.217	-0.240	(0)
U(OH) 4	1.451e-28	1.451e-28	-27.838	-27.838	0.000	(0)
UF3+	1.348e-30	7.761e-31	-29.870	-30.110	-0.240	(0)
U(OH) 3+	5.264e-31	3.030e-31	-30.279	-30.518	-0.240	(0)
UF6-2	3.714e-31	4.078e-32	-30.430	-31.390	-0.959	(0)
UF4	2.912e-31	2.912e-31	-30.536	-30.536	0.000	(0)
UF5-	6.857e-32	3.947e-32	-31.164	-31.404	-0.240	(0)
UF2+2	1.303e-32	1.431e-33	-31.885	-32.844	-0.959	(0)
U(OH) 2+2	7.291e-34	8.007e-35	-33.137	-34.097	-0.959	(0)
UF+3	4.787e-36	3.323e-38	-35.320	-37.478	-2.159	(0)
UOH+3	3.104e-37	2.155e-39	-36.508	-38.667	-2.159	(0)
U(SO4) 2	1.176e-38	1.176e-38	-37.930	-37.930	0.000	(0)
USO4+2	1.543e-39	1.694e-40	-38.812	-39.771	-0.959	(0)
U+4	0.000e+00	0.000e+00	-40.475	-44.313	-3.837	(0)
UCl+3	0.000e+00	0.000e+00	-42.656	-44.814	-2.159	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-169.958	-189.385	-19.427	(0)
U (5)	1.818e-19					
UO2+	1.818e-19	1.046e-19	-18.740	-18.980	-0.240	(0)
U (6)	2.745e-06					
UO2(CO3) 3-4	2.729e-06	3.968e-10	-5.564	-9.401	-3.837	(0)
UO2(CO3) 2-2	1.581e-08	1.736e-09	-7.801	-8.761	-0.959	(0)
UO2CO3	1.907e-11	1.907e-11	-10.720	-10.720	0.000	(0)
UO2F3-	7.304e-12	4.204e-12	-11.136	-11.376	-0.240	(0)
UO2F2	4.892e-12	4.892e-12	-11.310	-11.310	0.000	(0)
UO2F4-2	1.040e-12	1.143e-13	-11.983	-12.942	-0.959	(0)
UO2F+	8.613e-13	4.958e-13	-12.065	-12.305	-0.240	(0)
UO2(SO4) 2-2	1.457e-14	1.600e-15	-13.836	-14.796	-0.959	(0)
UO2SO4	1.389e-14	1.389e-14	-13.857	-13.857	0.000	(0)
UO2OH+	4.046e-15	2.329e-15	-14.393	-14.633	-0.240	(0)
UO2+2	3.454e-15	1.050e-15	-14.462	-14.979	-0.517	(0)
UO2Cl+	1.859e-17	1.070e-17	-16.731	-16.971	-0.240	(0)
UO2NO3+	9.931e-23	5.717e-23	-22.003	-22.243	-0.240	(0)
(UO2) 2(OH) 2+2	8.198e-23	9.003e-24	-22.086	-23.046	-0.959	(0)
(UO2) 3(OH) 5+	8.580e-30	4.939e-30	-29.067	-29.306	-0.240	(0)
V (2)	6.525e-38					
V+2	5.885e-38	6.463e-39	-37.230	-38.190	-0.959	(0)

VOH+	6.402e-39	3.685e-39	-38.194	-38.434	-0.240	(0)
V(3)	3.562e-12					
V(OH) 3	3.562e-12	3.562e-12	-11.448	-11.448	0.000	(0)
V(OH) 2+	2.284e-21	1.315e-21	-20.641	-20.881	-0.240	(0)
VOH+2	6.490e-23	7.127e-24	-22.188	-23.147	-0.959	(0)
V+3	1.162e-25	8.069e-28	-24.935	-27.093	-2.159	(0)
VSO4+	5.784e-27	3.329e-27	-26.238	-26.478	-0.240	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-41.657	-45.494	-3.837	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-43.418	-45.576	-2.159	(0)
V(4)	2.618e-12					
VOF+	1.091e-12	6.279e-13	-11.962	-12.202	-0.240	(0)
VOF2	8.056e-13	8.056e-13	-12.094	-12.094	0.000	(0)
VO+2	2.787e-13	3.060e-14	-12.555	-13.514	-0.959	(0)
V(OH) 3+	1.859e-13	1.070e-13	-12.731	-12.971	-0.240	(0)
VOF3-	1.699e-13	9.779e-14	-12.770	-13.010	-0.240	(0)
VOSO4	7.367e-14	7.367e-14	-13.133	-13.133	0.000	(0)
VOF4-2	1.230e-14	1.350e-15	-13.910	-14.870	-0.959	(0)
VOC1+	9.371e-16	5.394e-16	-15.028	-15.268	-0.240	(0)
H2V2O4+2	5.283e-21	5.802e-22	-20.277	-21.236	-0.959	(0)
V(5)	2.130e-06					
H2VO4-	1.921e-06	1.106e-06	-5.716	-5.956	-0.240	(0)
H3V2O7-	7.838e-08	4.512e-08	-7.106	-7.346	-0.240	(0)
HVO4-2	4.451e-08	4.888e-09	-7.352	-8.311	-0.959	(0)
H3VO4	6.285e-09	6.285e-09	-8.202	-8.202	0.000	(0)
HV2O7-3	2.653e-10	1.842e-12	-9.576	-11.735	-2.159	(0)
V3O9-3	2.074e-10	1.440e-12	-9.683	-11.842	-2.159	(0)
VO2F2-	9.329e-11	5.370e-11	-10.030	-10.270	-0.240	(0)
VO2F	4.323e-11	4.323e-11	-10.364	-10.364	0.000	(0)
VO2F3-2	2.087e-11	2.292e-12	-10.680	-11.640	-0.959	(0)
VO2+	9.703e-12	7.205e-12	-11.013	-11.142	-0.129	(0)
V4O12-4	4.589e-12	6.673e-16	-11.338	-15.176	-3.837	(0)
VO2SO4-	2.612e-12	1.504e-12	-11.583	-11.823	-0.240	(0)
V2O7-4	5.998e-13	8.722e-17	-12.222	-16.059	-3.837	(0)
VO2F4-3	5.558e-13	3.858e-15	-12.255	-14.414	-2.159	(0)
VO4-3	6.210e-15	4.311e-17	-14.207	-16.365	-2.159	(0)
VO2NO3	9.946e-20	9.946e-20	-19.002	-19.002	0.000	(0)
V10O28-6	1.056e-27	2.452e-36	-26.976	-35.610	-8.634	(0)
HV10O28-5	2.122e-28	2.142e-34	-27.673	-33.669	-5.996	(0)
H2V10O28-4	1.350e-31	1.963e-35	-30.870	-34.707	-3.837	(0)
Zn	2.608e-05					
Zn+2	8.604e-06	2.615e-06	-5.065	-5.582	-0.517	(0)
ZnHCO3+	7.945e-06	4.574e-06	-5.100	-5.340	-0.240	(0)
ZnSO4	5.001e-06	5.001e-06	-5.301	-5.301	0.000	(0)
Zn(SO4) 2-2	3.467e-06	3.807e-07	-5.460	-6.419	-0.959	(0)
ZnCO3	6.866e-07	6.866e-07	-6.163	-6.163	0.000	(0)
ZnF+	3.101e-07	1.785e-07	-6.508	-6.748	-0.240	(0)
ZnCl+	5.807e-08	4.128e-08	-7.236	-7.384	-0.148	(0)
ZnOH+	8.006e-09	4.609e-09	-8.097	-8.336	-0.240	(0)
ZnOHCl	9.523e-10	9.523e-10	-9.021	-9.021	0.000	(0)
ZnCl2	4.111e-10	4.111e-10	-9.386	-9.386	0.000	(0)
Zn(OH) 2	1.287e-11	1.287e-11	-10.890	-10.890	0.000	(0)
ZnCl3-	2.887e-12	2.052e-12	-11.540	-11.688	-0.148	(0)
ZnNO3+	3.115e-13	1.793e-13	-12.507	-12.746	-0.240	(0)
ZnCl4-2	2.242e-14	6.448e-15	-13.649	-14.191	-0.541	(0)
ZnSeO4	1.769e-14	1.769e-14	-13.752	-13.752	0.000	(0)
Zn(OH) 3-	1.975e-15	1.137e-15	-14.705	-14.944	-0.240	(0)
Zn(OH) 4-2	7.262e-21	7.975e-22	-20.139	-21.098	-0.959	(0)
Zn(NO3) 2	9.763e-22	9.763e-22	-21.010	-21.010	0.000	(0)
Zn(SeO4) 2-2	7.131e-24	7.831e-25	-23.147	-24.106	-0.959	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-150.065	-150.305	-0.240	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.541	-150.541	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.910	-226.150	-0.240	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-228.925	-229.884	-0.959	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.540	-306.499	-0.959	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-53.93	-47.64	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.42	-36.91	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.65	-36.92	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-69.92	-51.98	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-55.93	-35.89	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-30.46	-30.06	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-21.26	-20.81	0.45	(NH4) 2SeO4
Al (OH) 3 (am)	-5.56	5.24	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.10	-43.73	2.37	Al2 (MoO4) 3
Al2O3	-9.16	10.49	19.65	Al2O3
Al4 (OH) 10SO4	-16.28	6.42	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.09	-6.29	4.80	AlAsO4:2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-156.77	-91.15	65.62	AlSb
Alunite	-7.70	-9.10	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-2.38	-10.17	-7.79	PbSO4
Anhydrite	0.32	-4.04	-4.36	CaSO4
Anilite	-55.47	-87.35	-31.88	Cu0.25Cu1.5S
Antlerite	-0.54	8.24	8.79	Cu3 (OH) 4SO4
Aragonite	0.98	-7.32	-8.30	CaCO3
Arsenolite	-72.03	-74.79	-2.76	As4O6
Artinite	-7.52	2.08	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-29.78	-23.07	6.71	As2O5
Atacamite	-0.64	6.75	7.39	Cu2 (OH) 3Cl
Azurite	4.04	-12.86	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.05	7.35	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-10.94	4.93	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	7.94	-0.97	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-20.65	12.29	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-15.06	-24.73	-9.67	BaCrO4
BaF2	-4.23	-10.05	-5.82	BaF2
BaMoO4	-3.75	-10.71	-6.96	BaMoO4
Barite	2.80	-7.18	-9.98	BaSO4
BaS	-93.95	-77.77	16.18	BaS
BaSeO3	-7.07	-5.24	1.83	BaSeO3
BaSeO4	-8.02	-15.48	-7.46	BaSeO4
Bianchite	-5.89	-7.66	-1.76	ZnSO4:6H2O
Birnessite	-9.64	8.46	18.09	MnO2
Bixbyite	-8.51	-9.15	-0.64	Mn2O3
BlaubleiI	-54.68	-78.84	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.49	-82.77	-27.28	Cu0.6Cu0.8S
Boehmite	-3.33	5.24	8.58	AlOOH
Breithauptite	-62.90	-81.43	-18.52	NiSb
Brochantite	0.62	15.84	15.22	Cu4 (OH) 6SO4
Brucite	-6.88	9.96	16.84	Mg (OH) 2
Bunsenite	-10.51	1.94	12.45	NiO
Ca (VO3) 2	-4.95	0.71	5.66	Ca (VO3) 2
Ca2V2O7	-6.28	11.22	17.50	Ca2V2O7
Ca2V2O7:2H2O	-10.33	11.22	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-13.85	8.45	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.23	21.73	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.14	21.72	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-304.23	-161.26	142.97	Ca3Sb2
CaCrO4	-19.32	-21.59	-2.27	CaCrO4
Calcite	1.16	-7.32	-8.48	CaCO3
Calomel	-4.68	-22.59	-17.91	Hg2Cl2
CaMoO4	0.39	-7.56	-7.95	CaMoO4
Carnotite	-3.35	-3.12	0.23	KUO2VO4
CaSeO3:2H2O	-4.91	-2.10	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.32	-12.34	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-12.83	-2.99	9.84	Cd (BO2) 2
Cd (OH) 2	-8.69	4.95	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-8.78	4.95	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.94	-14.23	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-22.25	0.31	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-23.13	5.27	28.40	Cd4 (OH) 6SO4
CdCl2	-11.28	-11.94	-0.66	CdCl2

CdCl2:1H2O	-10.25	-11.94	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.03	-11.94	-1.91	CdCl2:2.5H2O
CdF2	-11.25	-12.46	-1.21	CdF2
Cdmetal (alpha)	-34.62	-21.11	13.51	Cd
Cdmetal (gamma)	-34.72	-21.11	13.62	Cd
CdMoO4	1.03	-13.12	-14.15	CdMoO4
CdOHC1	-7.03	-3.49	3.54	CdOHC1
CdSb	-78.06	-78.41	-0.35	CdSb
CdSe	-20.77	-40.97	-20.20	CdSe
CdSeO4:2H2O	-16.05	-17.90	-1.85	CdSeO4:2H2O
CdSO4	-9.42	-9.59	-0.17	CdSO4
CdSO4:1H2O	-7.87	-9.59	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-7.72	-9.60	-1.87	CdSO4:2.67H2O
Cerrusite	-0.32	-13.45	-13.13	PbCO3
CH4 (g)	-81.03	-122.08	-41.05	CH4
Chalcanthite	-4.32	-6.96	-2.64	CuSO4:5H2O
Chalcocite	-55.70	-90.62	-34.92	Cu2S
Chalcopyrite	-121.75	-157.02	-35.27	CuFeS2
Cinnabar	-50.85	-96.54	-45.69	HgS
Claudetite	-71.73	-74.79	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co (BO2) 2	-32.33	-5.26	27.07	Co (BO2) 2
Co (OH) 2	-10.40	2.69	13.09	Co (OH) 2
Co (OH) 3	-14.37	-16.68	-2.31	Co (OH) 3
CO2 (g)	0.32	-17.83	-18.15	CO2
Co3 (AsO4) 2	-28.03	-14.99	13.03	Co3 (AsO4) 2
Co3O4	-20.16	-30.66	-10.50	Co3O4
CoCl2	-22.47	-14.20	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.21	2.54	CoCl2:6H2O
CoCO3	-5.16	-15.14	-9.98	CoCO3
CoF2	-13.13	-14.73	-1.60	CoF2
CoF3	-41.35	-42.81	-1.46	CoF3
CoFe2O4	17.52	13.99	-3.53	CoFe2O4
CoMoO4	-7.62	-15.38	-7.76	CoMoO4
CoO	-10.89	2.69	13.59	CoO
CoS (alpha)	-75.00	-82.44	-7.44	CoS
CoS (beta)	-71.37	-82.44	-11.07	CoS
CoSe	-27.03	-43.23	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-18.64	-20.17	-1.53	CoSeO4:6H2O
CoSO4	-14.66	-11.85	2.80	CoSO4
CoSO4:6H2O	-9.40	-11.87	-2.47	CoSO4:6H2O
Cotunnite	-7.73	-12.51	-4.78	PbCl2
Covellite	-55.23	-77.53	-22.30	CuS
Cr (OH) 2	-24.72	-13.90	10.82	Cr (OH) 2
Cr (OH) 3	-5.15	-3.82	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-3.07	-3.82	-0.75	Cr (OH) 3
Cr2O3	-5.27	-7.63	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-44.27	-29.15	15.11	CrCl3
CrF3	-18.61	-29.94	-11.34	CrF3
Crmetal	-70.44	-39.96	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	0.38	-33.46	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.60	8.67	Cu (OH) 2
Cu (SbO3) 2	-21.91	23.30	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.87	1.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.66	-91.55	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.38	-0.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.03	-104.62	-42.59	Cu3Sb
Cu3Se2	-26.24	-89.74	-63.49	Cu3Se2
CuCO3	1.27	-10.23	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-6.55	-11.45	-4.91	CuF
CuF2	-10.94	-9.82	1.12	CuF2
CuF2:2H2O	-5.28	-9.83	-4.55	CuF2:2H2O

Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.60	-10.47	-13.08	CuMoO4
CuOCuSO4	-9.65	0.65	10.30	CuOCuSO4
Cupricferrite	12.91	18.89	5.99	CuFe2O4
Cuprite	-4.08	-5.48	-1.41	Cu2O
Cuprousferrite	11.82	2.91	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-24.83	-58.19	-33.37	CuSe2
CuSeO3:2H2O	-5.52	-5.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.82	-15.26	-2.44	CuSeO4:5H2O
CuSO4	-9.89	-6.95	2.94	CuSO4
Diaspore	-1.63	5.24	6.87	AlOOH
Djurleite	-55.83	-89.75	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	1.35	-15.19	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.90	-15.19	-17.09	CaMg(CO3)2
Epsomite	-2.48	-4.60	-2.13	MgSO4:7H2O
Fe(OH)2	-7.92	5.65	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	6.15	3.11	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-0.43	-4.15	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.87	-1.31	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-5.89	-26.51	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-28.61	-32.35	-3.73	Fe2(SO4)3
Fe3(OH)8	-3.29	16.93	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.29	-5.89	0.40	FeAsO4:2H2O
FeCr2O4	-9.18	-1.98	7.20	FeCr2O4
FeMoO4	-2.33	-12.42	-10.09	FeMoO4
Ferrihydrite	2.45	5.64	3.19	Fe(OH)3
Ferroselite	-41.55	-60.14	-18.60	FeSe2
FeS(ppt)	-76.53	-79.48	-2.95	FeS
FeSe	-29.28	-40.28	-11.00	FeSe
Fix_pe	-6.79	-6.79	0.00	e-
Fluorite	3.59	-6.91	-10.50	CaF2
Galena	-66.78	-80.75	-13.97	PbS
Gibbsite	-3.05	5.24	8.29	Al(OH)3
Goethite	5.16	5.65	0.49	FeOOH
Goslarite	-5.65	-7.66	-2.01	ZnSO4:7H2O
Greenockite	-65.82	-80.18	-14.36	CdS
Greigite	-278.55	-323.58	-45.03	Fe3S4
Gummite	-10.16	-2.49	7.67	UO3
Gypsum	0.57	-4.04	-4.61	CaSO4:2H2O
H-Jarosite	-0.06	-12.16	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-5.20	-18.08	-12.88	H2MoO4
H2S(g)	-77.12	-85.13	-8.01	H2S
H2Se(g)	-40.97	-45.93	-4.96	H2Se
Halite	-5.53	-3.93	1.60	NaCl
Hausmannite	-11.74	49.29	61.03	Mn3O4
Hematite	12.71	11.29	-1.42	Fe2O3
Hercynite	-6.75	16.14	22.89	FeAl2O4
Hg(CH3)2(g)	-181.86	-255.57	-73.71	Hg(CH3)2
Hg(g)	-8.01	-15.88	-7.87	Hg
Hg(OH)2	-7.92	-11.41	-3.50	Hg(OH)2
Hg2(g)	-16.80	-31.76	-14.96	Hg2
Hg2(OH)2	-10.96	-5.70	5.26	Hg2(OH)2
Hg2CO3	-7.48	-23.53	-16.05	Hg2CO3
Hg2CrO4	-29.09	-37.79	-8.70	Hg2CrO4
Hg2F2	-12.75	-23.12	-10.36	Hg2F2
Hg2S	-79.15	-90.83	-11.68	Hg2S
Hg2SeO3	-13.64	-18.30	-4.66	Hg2SeO3
Hg2SO4	-14.11	-20.24	-6.13	Hg2SO4
Hg3O2CO3	-22.38	-52.06	-29.68	Hg3O2CO3
HgCl(g)	-30.79	-11.29	19.50	HgCl
HgCl2	-7.04	-28.30	-21.26	HgCl2
HgF(g)	-44.23	-11.56	32.68	HgF
HgF2(g)	-41.40	-28.83	12.57	HgF2
Hgmetal(l)	-2.43	-15.88	-13.45	Hg
HgSe	-1.64	-57.34	-55.69	HgSe
HgSeO3	-11.58	-24.01	-12.43	HgSeO3
HgSO4	-16.54	-25.96	-9.42	HgSO4

Huntite	-0.95	-30.92	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-3.76	-22.53	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-12.76	-21.52	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-14.44	-19.61	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	6.91	-7.89	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-38.42	-55.66	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-23.05	-23.56	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-12.80	-9.54	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-13.58	-14.31	-0.73	K ₂ SeO ₄
Langite	-1.65	15.84	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-5.36	-5.79	-0.43	PbO:PbSO ₄
Laurionite	-4.69	-4.07	0.62	PbOHCl
Lepidocrocite	4.28	5.65	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.32	4.38	12.69	PbO
Mackinawite	-75.88	-79.48	-3.60	FeS
Maghemite	4.91	11.29	6.39	Fe ₂ O ₃
Magnesioferrite	4.40	21.26	16.86	Fe ₂ MgO ₄
Magnesite	-0.41	-7.87	-7.46	MgCO ₃
Magnetite	13.54	16.94	3.40	Fe ₃ O ₄
Malachite	2.67	-2.63	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-4.57	20.77	25.34	MnOOH
Massicot	-8.52	4.38	12.89	PbO
Matlockite	-3.81	-12.78	-8.97	PbClF
Melanothallite	-15.55	-9.29	6.26	CuCl ₂
Melanterite	-6.71	-8.91	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.45	-96.54	-45.09	HgS
Mg(OH) ₂ (active)	-8.83	9.96	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-11.11	0.17	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-278.79	-204.11	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.23	10.13	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-13.86	2.34	16.20	MgCr ₂ O ₄
MgCrO ₄	-27.52	-22.14	5.38	MgCrO ₄
MgF ₂	0.67	-7.46	-8.13	MgF ₂
MgMoO ₄	-6.26	-8.11	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.71	-2.65	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.70	-12.90	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-34.33	39.19	73.52	Pb ₃ O ₄
Mirabilite	-4.42	-5.54	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-6.95	-2.05	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-47.08	-52.79	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-155.02	-93.94	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-12.36	0.14	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.87	-9.16	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-77.56	-77.39	0.17	MnS
MnS (pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.06	-100.97	-2.91	MnSb
MnSe	-41.68	-38.18	3.50	MnSe
MnSeO ₃	-5.99	-4.86	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.84	-4.86	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.07	-15.12	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.39	-6.80	2.58	MnSO ₄
Monteponite	-10.15	4.96	15.10	CdO
Montroydite	-7.77	-11.41	-3.64	HgO
MoO ₃	-10.07	-18.07	-8.00	MoO ₃
Morenosite	-10.48	-12.63	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-144.14	-214.40	-70.26	MoS ₂
Na-Jarosite	3.56	-7.64	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-45.26	-55.16	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-25.99	-23.06	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-10.52	-27.11	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.53	-9.04	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.27	-9.04	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-13.88	-3.58	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.09	-13.81	1.28	Na ₂ SeO ₄
Na ₃ Sb	-177.29	-82.84	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.03	8.65	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.13	8.27	37.40	Na ₄ V ₂ O ₇

Nantokite	-4.46	-11.19	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-4.24	-0.38	3.86	NaVO ₃
Nesquehonite	-3.20	-7.87	-4.67	MgCO ₃ ·3H ₂ O
Ni (OH) 2	-10.86	1.94	12.79	Ni (OH) 2
Ni ₃ (AsO ₄) 2·8H ₂ O	-32.97	-17.27	15.70	Ni ₃ (AsO ₄) 2·8H ₂ O
Ni ₄ (OH) 6SO ₄	-38.80	-6.80	32.00	Ni ₄ (OH) 6SO ₄
NiCO ₃	-9.02	-15.89	-6.87	NiCO ₃
NiMoO ₄	-4.99	-16.13	-11.14	NiMoO ₄
NiS (alpha)	-77.59	-83.19	-5.60	NiS
NiS (beta)	-72.09	-83.19	-11.10	NiS
NiS (gamma)	-70.39	-83.19	-12.80	NiS
NiSe	-26.29	-43.99	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-13.48	-10.67	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-19.40	-20.92	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-9.05	8.46	17.50	MnO ₂
O ₂ (g)	-30.97	52.12	83.09	O ₂
Orpiment	-231.73	-292.79	-61.07	As ₂ S ₃
Otavite	-0.87	-12.87	-12.00	CdCO ₃
Pb (BO ₂) 2	-10.09	-3.57	6.52	Pb (BO ₂) 2
Pb (OH) 2	-3.77	4.38	8.15	Pb (OH) 2
Pb ₁₀ (OH) 6O (CO ₃) 6	-54.45	-63.21	-8.76	Pb ₁₀ (OH) 6O (CO ₃) 6
Pb ₂ (OH) 3Cl	-8.49	0.31	8.79	Pb ₂ (OH) 3Cl
Pb ₂ O (OH) 2	-17.44	8.75	26.19	Pb ₂ O (OH) 2
Pb ₂ O ₃	-26.22	34.82	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-8.52	-9.07	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	0.86	-1.04	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) 2	-15.74	-9.94	5.80	Pb ₃ (AsO ₄) 2
Pb ₃ (VO ₄) 2	-2.80	3.34	6.14	Pb ₃ (VO ₄) 2
Pb ₃ O ₂ CO ₃	-15.72	-4.70	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-12.10	-1.41	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) 6SO ₄	-18.14	2.96	21.10	Pb ₄ (OH) 6SO ₄
Pb ₄ O ₃ SO ₄	-18.91	2.96	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-15.12	-27.72	-12.60	PbCrO ₄
PbF ₂	-5.60	-13.04	-7.44	PbF ₂
Pbmetal	-25.93	-21.68	4.25	Pb
PbMoO ₄	1.92	-13.70	-15.62	PbMoO ₄
PbO·0.3H ₂ O	-8.60	4.38	12.98	PbO·0.33H ₂ O
PbSeO ₄	-11.63	-18.47	-6.84	PbSeO ₄
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-6.16	-25.97	-19.81	PbCl ₂ ·PbCO ₃
Plattnerite	-19.16	30.44	49.60	PbO ₂
Portlandite	-12.30	10.51	22.80	Ca (OH) 2
Pyrite	-120.05	-138.55	-18.51	FeS ₂
Pyrochroite	-7.45	7.74	15.19	Mn (OH) 2
Pyrolusite	-7.57	33.81	41.38	MnO ₂
Realgar	-97.11	-116.86	-19.75	AsS
Retgersite	-10.58	-12.62	-2.04	NiSO ₄ ·6H ₂ O
Rhodochrosite	0.49	-10.09	-10.58	MnCO ₃
Rutherfordine	-5.82	-20.32	-14.50	UO ₂ CO ₃
Sb (OH) 3	-11.10	-18.21	-7.11	Sb (OH) 3
Sb ₂ O ₄	-13.76	-10.36	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-23.25	-32.92	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-106.44	-174.20	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-54.58	-72.85	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-54.94	-72.85	-17.90	Sb ₄ O ₆
SbCl ₃	-44.12	-43.55	0.57	SbCl ₃
SbF ₃	-34.12	-44.34	-10.23	SbF ₃
Sbmetal	-45.61	-57.30	-11.69	Sb
SbO ₂	-1.67	-29.49	-27.82	SbO ₂
Schoepite	-8.49	-2.50	5.99	UO ₂ (OH) 2·H ₂ O
Semetal (am)	-12.75	-19.86	-7.11	Se
Semetal (hex)	-12.16	-19.86	-7.71	Se
Senarmontite	-24.06	-36.42	-12.37	Sb ₂ O ₃
SeO ₂	-12.73	-12.60	0.12	SeO ₂
SeO ₃	-43.89	-22.85	21.04	SeO ₃
Siderite	-1.94	-12.18	-10.24	FeCO ₃

Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-66.78	-78.23	-11.45	ZnS
Spinel	-16.40	20.45	36.85	MgAl2O4
Stibnite	-241.36	-291.82	-50.46	Sb2S3
Sulfur	-56.93	-59.07	-2.14	S
Tenorite	-0.05	7.60	7.64	CuO
Thenardite	-5.83	-5.51	0.32	Na2SO4
Thermonatrite	-9.43	-8.80	0.64	Na2CO3:H2O
Tyuyamunite	-8.35	-4.27	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-26.97	-5.88	21.08	U3O8
U3Sb4	-595.97	-443.59	152.38	U3Sb4
U4O9	-48.26	-51.28	-3.02	U4O9
UF4	-24.64	-54.18	-29.54	UF4
UF4:2.5H2O	-21.46	-54.18	-32.72	UF4:2.5H2O
UO2 (am)	-20.27	-19.34	0.93	UO2
UO2 (NO3) 2	-42.25	-30.11	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.96	-30.11	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.50	-30.11	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-32.17	-30.12	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-8.10	-2.49	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-23.10	-25.35	-2.25	UO2SeO4:4H2O
UO3	-10.19	-2.49	7.70	UO3
Uraninite	-14.67	-19.34	-4.67	UO2
USb2	-224.86	-195.28	29.58	USb2
V (OH) 3	-15.96	-8.36	7.59	V (OH) 3
V2O5	-8.44	-9.80	-1.36	V2O5
V3O5	-30.97	-29.14	1.84	V3O5
V4O7	-37.35	-30.16	7.19	V4O7
V6O13	-20.65	-81.51	-60.86	V6O13
Valentinite	-27.94	-36.42	-8.48	Sb2O3
VCl2	-57.16	-38.28	18.87	VCl2
VCl3	-57.13	-33.70	23.43	VCl3
VF4	-50.80	-35.87	14.93	VF4
Vmetal	-91.48	-47.45	44.03	V
VO	-36.15	-21.39	14.76	VO
VO (OH) 2	-6.18	-1.03	5.15	VO (OH) 2
VO2Cl	-16.19	-13.34	2.84	VO2Cl
VOC1	-27.96	-16.81	11.15	VOC1
VOC12	-30.68	-17.92	12.76	VOC12
VOSO4	-19.18	-15.57	3.61	VOSO4
Witherite	-1.89	-10.46	-8.57	BaCO3
Wurtzite	-69.28	-78.23	-8.95	ZnS
Zincite	-4.43	6.91	11.33	ZnO
Zincosite	-11.57	-7.64	3.93	ZnSO4
Zn (BO2) 2	-9.33	-1.04	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.04	-20.72	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-5.30	6.90	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-5.57	6.90	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.85	6.90	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-4.63	6.90	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.83	6.90	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.24	-0.74	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.83	5.36	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.01	-2.36	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-27.29	-8.38	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-15.33	13.07	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-20.87	17.63	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.04	-9.99	7.05	ZnCl2
ZnCO3:1H2O	-0.67	-10.93	-10.26	ZnCO3:1H2O
ZnF2	-9.98	-10.51	-0.53	ZnF2
Znmetal	-44.94	-19.16	25.79	Zn
ZnMoO4	-1.04	-11.17	-10.13	ZnMoO4
ZnO (active)	-4.28	6.91	11.19	ZnO
ZnS (am)	-69.17	-78.23	-9.05	ZnS
ZnSb	-87.47	-76.46	11.01	ZnSb
ZnSe	-24.62	-39.02	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.01	-7.64	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 138.

Title Precipitate oversaturated phases
PHASES

Fix_pe

e==e-

log_k 0

EQUILIBRIUM_PHASES 802

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 806

SAVE Solution 807 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 802

END

TITLE

Precipitate oversaturated phases

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 806. Solution after simulation 137.
Using pure phase assemblage 802.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	-0.00	-1.40	-1.40	0.000e+00	7.249e-05	7.249e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	5.050e-08	5.050e-08
Barite	0.00	-9.98	-9.98	0.000e+00	3.004e-05	3.004e-05
Brochantite	-0.00	15.22	15.22	0.000e+00	1.345e-04	1.345e-04
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.012e+01	1.174e-01
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	4.578e-02	4.578e-02
Carnotite	-0.00	0.23	0.23	0.000e+00	2.086e-06	2.086e-06
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.00	-14.15	-14.15	0.000e+00	2.423e-07	2.423e-07
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-0.28	-2.63	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.074e-05	1.074e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	3.692e-03	3.692e-03
Gummite	-5.04	2.63	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	9.182e-03	9.182e-03
HgSe	-1.23	-56.92	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.34	-3.21	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-30.65	-14.95	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.99	-15.86	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.46	-15.61	-11.14	0.000e+00	0	0.000e+00

O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.448e-05
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	7.533e-07	7.533e-07
Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.37	2.63	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-11.09	9.99	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-2.98	2.63	5.61	0.000e+00	0	0.000e+00
UO3	-5.07	2.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.553e-06	5.573e-06
As	1.575e-09	1.581e-09
B	1.004e-04	1.007e-04
Ba	2.720e-08	2.730e-08
C	5.743e-04	5.764e-04
Ca	1.206e-02	1.211e-02
Cd	2.234e-08	2.242e-08
Cl	8.448e-03	8.478e-03
Co	2.976e-09	2.987e-09
Cr	1.145e-09	1.149e-09
Cu	4.981e-07	4.999e-07
F	2.258e-04	2.266e-04
Fe	1.103e-09	1.107e-09
Hg	9.633e-09	9.667e-09
K	1.500e-02	1.506e-02
Mg	1.843e-02	1.849e-02
Mn	2.224e-04	2.232e-04
Mo	7.601e-06	7.628e-06
N	2.250e-05	2.258e-05
Na	2.703e-02	2.713e-02
Ni	4.846e-10	4.864e-10
Pb	1.666e-09	1.672e-09
S	4.711e-02	4.727e-02
Sb	9.028e-08	9.060e-08
Se	7.876e-07	7.904e-07
U	6.614e-07	6.637e-07
V	4.774e-08	4.791e-08
Zn	2.603e-05	2.613e-05

-----Description of solution-----

	pH	=	7.908	Charge balance
	pe	=	4.864	Adjusted to redox
equilibrium				
	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.229e-01	
	Mass of water (kg)	=	1.004e+00	
	Total alkalinity (eq/kg)	=	6.148e-04	
	Total CO2 (mol/kg)	=	5.743e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	50	
	Total H	=	1.114091e+02	
	Total O	=	5.589535e+01	

-----Distribution of species-----

Log	Log	Log	mole V
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	Species	Molality	Activity	Molality	Activity	Gamma	cm ³ /mol
	OH-	1.091e-06	8.138e-07	-5.962	-6.089	-0.127	(0)
	H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
	H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al		5.553e-06					
	Al (OH) 4-	5.508e-06	4.200e-06	-5.259	-5.377	-0.118	(0)
	Al (OH) 3	4.099e-08	4.099e-08	-7.387	-7.387	0.000	(0)
	Al (OH) 2+	3.254e-09	2.524e-09	-8.488	-8.598	-0.110	(0)
	AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
	AlF2+	3.469e-10	2.692e-10	-9.460	-9.570	-0.110	(0)
	AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.572e-11	5.696e-12	-10.804	-11.244	-0.441	(0)
	AlOH+2	1.078e-11	3.905e-12	-10.967	-11.408	-0.441	(0)
	AlSO4+	5.363e-13	4.090e-13	-12.271	-12.388	-0.118	(0)
	Al (SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
	Al+3	5.050e-14	4.799e-15	-13.297	-14.319	-1.022	(0)
	AlMo6O21-3	2.478e-39	0.000e+00	-38.606	-40.215	-1.609	(0)
As (3)		1.700e-23					
	H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
	H2AsO3-	1.003e-24	6.644e-25	-23.999	-24.178	-0.179	(0)
	HAsO3-2	2.546e-28	4.907e-29	-27.594	-28.309	-0.715	(0)
	H4AsO3+	1.477e-31	9.788e-32	-30.831	-31.009	-0.179	(0)
	AsO3-3	6.223e-33	1.532e-34	-32.206	-33.815	-1.609	(0)
As (5)		1.575e-09					
	HAsO4-2	1.522e-09	2.934e-10	-8.817	-9.533	-0.715	(0)
	H2AsO4-	4.988e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
	AsO4-3	3.053e-12	7.514e-14	-11.515	-13.124	-1.609	(0)
	H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B		1.004e-04					
	H3BO3	9.247e-05	9.512e-05	-4.034	-4.022	0.012	(0)
	H2BO3-	6.158e-06	4.474e-06	-5.211	-5.349	-0.139	(0)
	MgH2BO3+	8.083e-07	5.871e-07	-6.092	-6.231	-0.139	(0)
	CaH2BO3+	7.954e-07	5.778e-07	-6.099	-6.238	-0.139	(0)
	NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
	BF (OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
	H5 (BO3) 2-	4.986e-10	3.622e-10	-9.302	-9.441	-0.139	(0)
	H8 (BO3) 3-	4.743e-12	3.445e-12	-11.324	-11.463	-0.139	(0)
	BaH2BO3+	1.815e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
	BF2 (OH) 2-	9.738e-13	7.074e-13	-12.012	-12.150	-0.139	(0)
	BF3OH-	5.564e-19	4.042e-19	-18.255	-18.393	-0.139	(0)
	BF4-	4.021e-24	2.921e-24	-23.396	-23.535	-0.139	(0)
Ba		2.720e-08					
	Ba+2	2.715e-08	9.537e-09	-7.566	-8.021	-0.454	(0)
	BaHCO3+	4.515e-11	3.540e-11	-10.345	-10.451	-0.106	(0)
	BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
	BaH2BO3+	1.815e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
	BaOH+	4.400e-14	3.388e-14	-13.357	-13.470	-0.113	(0)
	BaNO3+	1.112e-15	7.368e-16	-14.954	-15.133	-0.179	(0)
	BaNH3+2	2.676e-16	5.156e-17	-15.573	-16.288	-0.715	(0)
C (4)		5.743e-04					
	HCO3-	5.009e-04	3.886e-04	-3.300	-3.410	-0.110	(0)
	CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
	MgHCO3+	1.995e-05	1.505e-05	-4.700	-4.822	-0.122	(0)
	H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	4.645e-06	4.645e-06	-5.333	-5.333	0.000	(0)
	NaHCO3	4.296e-06	4.296e-06	-5.367	-5.367	0.000	(0)
	CO3-2	4.199e-06	1.475e-06	-5.377	-5.831	-0.454	(0)
	NaCO3-	6.961e-07	5.401e-07	-6.157	-6.268	-0.110	(0)
	UO2 (CO3) 3-4	6.026e-07	8.314e-10	-6.220	-9.080	-2.860	(0)
	ZnCO3	3.289e-07	3.289e-07	-6.483	-6.483	0.000	(0)
	MnHCO3+	3.123e-07	2.405e-07	-6.505	-6.619	-0.113	(0)
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	ZnHCO3+	7.186e-08	4.761e-08	-7.144	-7.322	-0.179	(0)
	UO2 (CO3) 2-2	5.834e-08	1.124e-08	-7.234	-7.949	-0.715	(0)
	Cu (CO3) 2-2	4.863e-09	9.372e-10	-8.313	-9.028	-0.715	(0)
	CuHCO3+	1.005e-09	6.662e-10	-8.998	-9.176	-0.179	(0)

	PbCO3	3.984e-10	3.984e-10	-9.400	-9.400	0.000	(0)
	UO2CO3	3.820e-10	3.820e-10	-9.418	-9.418	0.000	(0)
	CdCO3	8.922e-11	8.922e-11	-10.050	-10.050	0.000	(0)
	BaHCO3+	4.515e-11	3.540e-11	-10.345	-10.451	-0.106	(0)
	PbHCO3+	3.915e-11	2.594e-11	-10.407	-10.586	-0.179	(0)
	CoHCO3+	1.807e-11	1.197e-11	-10.743	-10.922	-0.179	(0)
	CoCO3	9.876e-12	9.876e-12	-11.005	-11.005	0.000	(0)
	Pb(CO3) 2-2	8.796e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
	BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
	NiHCO3+	6.721e-12	4.453e-12	-11.173	-11.351	-0.179	(0)
	NiCO3	5.116e-12	5.116e-12	-11.291	-11.291	0.000	(0)
	CdHCO3+	3.543e-12	2.347e-12	-11.451	-11.629	-0.179	(0)
	Cd(CO3) 2-2	5.063e-13	9.757e-14	-12.296	-13.011	-0.715	(0)
	HgCO3	9.766e-15	9.766e-15	-14.010	-14.010	0.000	(0)
	FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.674	-0.106	(0)
	Hg(CO3) 2-2	2.364e-16	4.556e-17	-15.626	-16.341	-0.715	(0)
	HgHCO3+	3.389e-18	2.246e-18	-17.470	-17.649	-0.179	(0)
Cd	1.206e-02						
	Ca+2	6.388e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
	CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
	CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.776e-06	2.908e-06	-5.423	-5.536	-0.113	(0)
	CaH2BO3+	7.954e-07	5.778e-07	-6.099	-6.238	-0.139	(0)
	CaOH+	4.649e-08	3.644e-08	-7.333	-7.438	-0.106	(0)
	CaNO3+	1.651e-10	1.094e-10	-9.782	-9.961	-0.179	(0)
	CaNH3+2	1.256e-10	2.421e-11	-9.901	-10.616	-0.715	(0)
	Ca (NH3) 2+2	4.285e-19	8.259e-20	-18.368	-19.083	-0.715	(0)
Cd	2.234e-08						
	Cd+2	7.552e-09	2.653e-09	-8.122	-8.576	-0.454	(0)
	CdSO4	6.828e-09	6.828e-09	-8.166	-8.166	0.000	(0)
	Cd(SO4) 2-2	5.247e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
	CdCl+	2.487e-09	1.648e-09	-8.604	-8.783	-0.179	(0)
	CdCO3	8.922e-11	8.922e-11	-10.050	-10.050	0.000	(0)
	CdOHC1	5.501e-11	5.501e-11	-10.260	-10.260	0.000	(0)
	CdCl2	4.468e-11	4.468e-11	-10.350	-10.350	0.000	(0)
	CdOH+	2.588e-11	1.715e-11	-10.587	-10.766	-0.179	(0)
	CdF+	7.533e-12	4.991e-12	-11.123	-11.302	-0.179	(0)
	CdHCO3+	3.543e-12	2.347e-12	-11.451	-11.629	-0.179	(0)
	Cd(CO3) 2-2	5.063e-13	9.757e-14	-12.296	-13.011	-0.715	(0)
	CdCl3-	2.767e-13	1.834e-13	-12.558	-12.737	-0.179	(0)
	Cd(OH) 2	8.807e-14	8.807e-14	-13.055	-13.055	0.000	(0)
	CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
	CdNO3+	1.952e-16	1.293e-16	-15.710	-15.888	-0.179	(0)
	CdSeO4	1.706e-16	1.706e-16	-15.768	-15.768	0.000	(0)
	Cd(SeO3) 2-2	7.205e-17	1.389e-17	-16.142	-16.857	-0.715	(0)
	Cd2OH+3	9.266e-18	2.280e-19	-17.033	-18.642	-1.609	(0)
	Cd(OH) 3-	6.608e-18	4.379e-18	-17.180	-17.359	-0.179	(0)
	Cd(OH) 4-2	3.026e-24	5.833e-25	-23.519	-24.234	-0.715	(0)
	Cd(NO3) 2	9.990e-25	9.990e-25	-24.000	-24.000	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Cl	8.448e-03						
	Cl-	8.448e-03	6.504e-03	-2.073	-2.187	-0.114	(0)
	MnCl+	3.297e-07	2.539e-07	-6.482	-6.595	-0.113	(0)
	ZnCl+	8.390e-08	6.330e-08	-7.076	-7.199	-0.122	(0)
	ZnOHC1	6.744e-08	6.744e-08	-7.171	-7.171	0.000	(0)
	CuCl2-	2.682e-09	2.023e-09	-8.572	-8.694	-0.122	(0)
	CdCl+	2.487e-09	1.648e-09	-8.604	-8.783	-0.179	(0)
	MnCl2	2.333e-09	2.333e-09	-8.632	-8.632	0.000	(0)
	CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
	ZnCl2	6.525e-10	6.525e-10	-9.185	-9.185	0.000	(0)
	CuCl+	3.712e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
	CdOHC1	5.501e-11	5.501e-11	-10.260	-10.260	0.000	(0)
	HgClOH	5.170e-11	5.170e-11	-10.286	-10.286	0.000	(0)
	CdCl2	4.468e-11	4.468e-11	-10.350	-10.350	0.000	(0)

PbCl+	3.129e-11	2.073e-11	-10.505	-10.683	-0.179	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
CoCl+	1.345e-11	8.910e-12	-10.871	-11.050	-0.179	(0)
CuCl3-2	7.999e-12	2.813e-12	-11.097	-11.551	-0.454	(0)
MnCl3-	5.427e-12	4.179e-12	-11.265	-11.379	-0.113	(0)
ZnCl3-	4.468e-12	3.371e-12	-11.350	-11.472	-0.122	(0)
NiCl+	2.334e-12	1.547e-12	-11.632	-11.811	-0.179	(0)
HgCl3-	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
CuCl2	6.316e-13	6.316e-13	-12.200	-12.200	0.000	(0)
PbCl2	6.023e-13	6.023e-13	-12.220	-12.220	0.000	(0)
CdCl3-	2.767e-13	1.834e-13	-12.558	-12.737	-0.179	(0)
HgCl4-2	2.045e-13	3.940e-14	-12.689	-13.404	-0.715	(0)
ZnCl4-2	3.117e-14	1.096e-14	-13.506	-13.960	-0.454	(0)
PbCl3-	2.354e-15	1.560e-15	-14.628	-14.807	-0.179	(0)
HgCl+	1.083e-15	7.178e-16	-14.965	-15.144	-0.179	(0)
UO2Cl+	1.035e-15	6.860e-16	-14.985	-15.164	-0.179	(0)
CuCl3-	5.082e-17	3.834e-17	-16.294	-16.416	-0.122	(0)
NiCl2	5.065e-17	5.065e-17	-16.295	-16.295	0.000	(0)
PbCl4-2	2.406e-17	4.636e-18	-16.619	-17.334	-0.715	(0)
CrCl+2	1.472e-17	2.837e-18	-16.832	-17.547	-0.715	(0)
CrOHCl2	2.854e-19	2.854e-19	-18.544	-18.544	0.000	(0)
CuCl4-2	3.553e-21	1.250e-21	-20.449	-20.903	-0.454	(0)
CrCl2+	2.643e-21	1.751e-21	-20.578	-20.757	-0.179	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
VOC1+	2.614e-22	1.732e-22	-21.583	-21.761	-0.179	(0)
FeCl2+	2.179e-23	1.678e-23	-22.662	-22.775	-0.113	(0)
CrO3Cl-	8.402e-26	5.567e-26	-25.076	-25.254	-0.179	(0)
FeCl3	1.091e-26	1.091e-26	-25.962	-25.962	0.000	(0)
CoCl+2	7.922e-37	1.527e-37	-36.101	-36.816	-0.715	(0)
UCl+3	0.000e+00	0.000e+00	-44.209	-45.818	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.483	-51.199	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.245	-51.960	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.266	-65.981	-0.715	(0)
Co (2)	2.976e-09					
Co+2	2.055e-09	3.960e-10	-8.687	-9.402	-0.715	(0)
CoSO4	8.675e-10	8.675e-10	-9.062	-9.062	0.000	(0)
CoHCO3+	1.807e-11	1.197e-11	-10.743	-10.922	-0.179	(0)
CoCl+	1.345e-11	8.910e-12	-10.871	-11.050	-0.179	(0)
CoCO3	9.876e-12	9.876e-12	-11.005	-11.005	0.000	(0)
CoOH+	9.705e-12	6.430e-12	-11.013	-11.192	-0.179	(0)
CoF+	2.243e-12	1.486e-12	-11.649	-11.828	-0.179	(0)
Co (OH) 2	4.157e-13	4.157e-13	-12.381	-12.381	0.000	(0)
CoNO2+	6.881e-14	4.559e-14	-13.162	-13.341	-0.179	(0)
Co (NH3) +2	2.117e-15	4.080e-16	-14.674	-15.389	-0.715	(0)
CoSeO4	6.852e-17	6.852e-17	-16.164	-16.164	0.000	(0)
CoNO3+	1.460e-17	9.674e-18	-16.836	-17.014	-0.179	(0)
Co (OH) 3-	1.019e-17	6.750e-18	-16.992	-17.171	-0.179	(0)
CoOOH-	2.561e-18	1.697e-18	-17.592	-17.770	-0.179	(0)
Co2OH+3	5.186e-21	1.276e-22	-20.285	-21.894	-1.609	(0)
Co (NH3) 2+2	7.737e-22	1.491e-22	-21.111	-21.826	-0.715	(0)
Co (OH) 4-2	4.517e-24	8.706e-25	-23.345	-24.060	-0.715	(0)
Co (NO3) 2	3.034e-25	3.034e-25	-24.518	-24.518	0.000	(0)
Co (NH3) 3+2	8.346e-29	1.609e-29	-28.078	-28.794	-0.715	(0)
Co4 (OH) 4+4	2.472e-34	3.411e-37	-33.607	-36.467	-2.860	(0)
Co (NH3) 4+2	3.753e-36	7.234e-37	-35.426	-36.141	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.273	-43.988	-0.715	(0)
Co (3)	2.476e-30					
CoOH+2	2.476e-30	4.771e-31	-29.606	-30.321	-0.715	(0)
Co+3	1.214e-36	1.154e-37	-35.916	-36.938	-1.022	(0)
CoCl+2	7.922e-37	1.527e-37	-36.101	-36.816	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.483	-51.199	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.828	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.266	-65.981	-0.715	(0)
Cr (2)	5.709e-27					
Cr+2	5.709e-27	1.100e-27	-26.243	-26.958	-0.715	(0)
Cr (3)	1.145e-09					
Cr (OH) 2+	8.969e-10	5.943e-10	-9.047	-9.226	-0.179	(0)

Cr(OH) 3	1.817e-10	1.817e-10	-9.741	-9.741	0.000	(0)
Cr(OH)+2	3.114e-11	6.001e-12	-10.507	-11.222	-0.715	(0)
CrOHSO4	1.564e-11	1.564e-11	-10.806	-10.806	0.000	(0)
CrO2-	1.057e-11	7.000e-12	-10.976	-11.155	-0.179	(0)
Cr(OH) 4-	8.884e-12	5.886e-12	-11.051	-11.230	-0.179	(0)
CrF+2	3.290e-14	6.341e-15	-13.483	-14.198	-0.715	(0)
Cr+3	1.370e-14	3.371e-16	-13.863	-15.472	-1.609	(0)
CrSO4+	1.304e-14	8.642e-15	-13.885	-14.063	-0.179	(0)
CrCl+2	1.472e-17	2.837e-18	-16.832	-17.547	-0.715	(0)
CrOHC12	2.854e-19	2.854e-19	-18.544	-18.544	0.000	(0)
Cr2(OH) 2SO4+2	4.401e-20	8.482e-21	-19.356	-20.072	-0.715	(0)
Cr2(OH) 2(SO4) 2	5.532e-21	5.532e-21	-20.257	-20.257	0.000	(0)
CrCl2+	2.643e-21	1.751e-21	-20.578	-20.757	-0.179	(0)
CrNO3+2	1.178e-24	2.271e-25	-23.929	-24.644	-0.715	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.810	-41.525	-0.715	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-49.266	-50.875	-1.609	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-51.245	-51.960	-0.715	(0)
Cr(6)	8.572e-15					
CrO4-2	7.834e-15	2.752e-15	-14.106	-14.560	-0.454	(0)
NaCrO4-	4.058e-16	2.689e-16	-15.392	-15.570	-0.179	(0)
HCrO4-	1.660e-16	1.100e-16	-15.780	-15.959	-0.179	(0)
KCrO4-	1.655e-16	1.097e-16	-15.781	-15.960	-0.179	(0)
CrO3SO4-2	2.361e-23	4.551e-24	-22.627	-23.342	-0.715	(0)
H2CrO4	1.101e-24	1.101e-24	-23.958	-23.958	0.000	(0)
CrO3Cl-	8.402e-26	5.567e-26	-25.076	-25.254	-0.179	(0)
Cr2O7-2	2.181e-30	4.203e-31	-29.661	-30.376	-0.715	(0)
Cu(1)	4.453e-09					
CuCl2-	2.682e-09	2.023e-09	-8.572	-8.694	-0.122	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	7.999e-12	2.813e-12	-11.097	-11.551	-0.454	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu(2)	4.937e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.268e-08	6.992e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.733e-08	2.717e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu(OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu(CO3) 2-2	4.863e-09	9.372e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.662e-10	-8.998	-9.176	-0.179	(0)
Cu2(OH) 2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.712e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
CuNO2+	7.015e-11	4.648e-11	-10.154	-10.333	-0.179	(0)
Cu(OH) 3-	2.860e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
CuNH3+2	1.236e-11	2.382e-12	-10.908	-11.623	-0.715	(0)
CuCl2	6.316e-13	6.316e-13	-12.200	-12.200	0.000	(0)
Cu(NO2) 2	7.771e-15	7.771e-15	-14.109	-14.109	0.000	(0)
CuNO3+	1.999e-15	1.324e-15	-14.699	-14.878	-0.179	(0)
Cu(OH) 4-2	6.299e-16	1.214e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.082e-17	3.834e-17	-16.294	-16.416	-0.122	(0)
CuCl4-2	3.553e-21	1.250e-21	-20.449	-20.903	-0.454	(0)
Cu(NO3) 2	2.570e-24	2.570e-24	-23.590	-23.590	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.258e-04					
F-	1.542e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.611e-05	5.041e-05	-4.180	-4.297	-0.118	(0)
CaF+	3.776e-06	2.908e-06	-5.423	-5.536	-0.113	(0)
NaF	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)
MnF+	1.903e-07	1.466e-07	-6.721	-6.834	-0.113	(0)
ZnF+	1.385e-08	9.176e-09	-7.859	-8.037	-0.179	(0)
BF(OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.692e-10	-9.460	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)

AlF+2	1.572e-11	5.696e-12	-10.804	-11.244	-0.441	(0)
CdF+	7.533e-12	4.991e-12	-11.123	-11.302	-0.179	(0)
CoF+	2.243e-12	1.486e-12	-11.649	-11.828	-0.179	(0)
UO2F+	1.608e-12	1.066e-12	-11.794	-11.972	-0.179	(0)
HF2-	1.312e-12	9.784e-13	-11.882	-12.009	-0.127	(0)
PbF+	1.134e-12	7.514e-13	-11.945	-12.124	-0.179	(0)
BF2(OH) 2-	9.738e-13	7.074e-13	-12.012	-12.150	-0.139	(0)
NiF+	4.183e-13	2.771e-13	-12.379	-12.557	-0.179	(0)
UO2F2	3.648e-13	3.648e-13	-12.438	-12.438	0.000	(0)
CrF+2	3.290e-14	6.341e-15	-13.483	-14.198	-0.715	(0)
UO2F3-	1.641e-14	1.088e-14	-13.785	-13.964	-0.179	(0)
PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
UO2F4-2	5.321e-17	1.025e-17	-16.274	-16.989	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	1.184e-17	1.184e-17	-16.927	-16.927	0.000	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.827e-19	-17.963	-18.417	-0.454	(0)
VO2F2-	7.698e-19	5.101e-19	-18.114	-18.292	-0.179	(0)
PbF3-	5.964e-19	3.952e-19	-18.224	-18.403	-0.179	(0)
BF3OH-	5.564e-19	4.042e-19	-18.255	-18.393	-0.139	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	1.020e-20	6.759e-21	-19.991	-20.170	-0.179	(0)
VO2F3-2	3.919e-21	7.552e-22	-20.407	-21.122	-0.715	(0)
VOF2	3.008e-22	3.008e-22	-21.522	-21.522	0.000	(0)
PbF4-2	1.165e-22	2.245e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.673e-23	2.434e-23	-22.435	-22.614	-0.179	(0)
BF4-	4.021e-24	2.921e-24	-23.396	-23.535	-0.139	(0)
VOF3-	1.912e-24	1.267e-24	-23.718	-23.897	-0.179	(0)
VO2F4-3	1.792e-24	4.411e-26	-23.747	-25.355	-1.609	(0)
Sb(OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
VOF4-2	3.150e-27	6.070e-28	-26.502	-27.217	-0.715	(0)
UF3+	4.684e-36	3.104e-36	-35.329	-35.508	-0.179	(0)
UF2+2	8.560e-37	1.650e-37	-36.068	-36.783	-0.715	(0)
UF4	4.039e-38	4.039e-38	-37.394	-37.394	0.000	(0)
UF+3	4.486e-39	1.104e-40	-38.348	-39.957	-1.609	(0)
UF5-	2.868e-40	1.900e-40	-39.542	-39.721	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.452	-41.167	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.325e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.401e-14	-13.740	-13.853	-0.113	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.674	-0.106	(0)
Fe(OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	3.027e-18	2.331e-18	-17.519	-17.632	-0.113	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe(OH) 2+	6.305e-10	4.892e-10	-9.200	-9.311	-0.110	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	4.176e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
FeOH+2	4.393e-15	1.545e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.827e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.704e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe(SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
Fe+3	3.094e-20	2.940e-21	-19.509	-20.532	-1.022	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
FeCl2+	2.179e-23	1.678e-23	-22.662	-22.775	-0.113	(0)
FeHSeO3+2	9.966e-24	1.921e-24	-23.001	-23.717	-0.715	(0)
Fe2(OH) 2+4	5.730e-26	7.905e-29	-25.242	-28.102	-2.860	(0)
FeCl3	1.091e-26	1.091e-26	-25.962	-25.962	0.000	(0)
FeNO3+2	2.352e-27	4.532e-28	-26.629	-27.344	-0.715	(0)
Fe3(OH) 4+5	1.646e-32	5.589e-37	-31.784	-36.253	-4.469	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)

Hg (0)	9.533e-09					
Hg	9.533e-09	9.533e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.715e-19					
Hg2+2	1.857e-19	3.580e-20	-18.731	-19.446	-0.715	(0)
Hg (2)	1.001e-10					
HgClOH	5.170e-11	5.170e-11	-10.286	-10.286	0.000	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
Hg (OH) 2	2.247e-11	2.311e-11	-10.648	-10.636	0.012	(0)
HgCl3-	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
HgCl4-2	2.045e-13	3.940e-14	-12.689	-13.404	-0.715	(0)
HgCO3	9.766e-15	9.766e-15	-14.010	-14.010	0.000	(0)
HgCl+	1.083e-15	7.178e-16	-14.965	-15.144	-0.179	(0)
HgOH+	2.705e-16	1.792e-16	-15.568	-15.747	-0.179	(0)
Hg (CO3) 2-2	2.364e-16	4.556e-17	-15.626	-16.341	-0.715	(0)
Hg (OH) 3-	3.574e-18	2.368e-18	-17.447	-17.626	-0.179	(0)
HgHCO3+	3.389e-18	2.246e-18	-17.470	-17.649	-0.179	(0)
Hg (NH3) 2+2	1.330e-18	2.562e-19	-17.876	-18.591	-0.715	(0)
HgNH3+2	1.552e-19	2.990e-20	-18.809	-19.524	-0.715	(0)
Hg+2	2.870e-20	5.531e-21	-19.542	-20.257	-0.715	(0)
HgSO4	1.590e-20	1.590e-20	-19.799	-19.799	0.000	(0)
HgF+	3.673e-23	2.434e-23	-22.435	-22.614	-0.179	(0)
Hg (NH3) 3+2	4.536e-26	8.741e-27	-25.343	-26.058	-0.715	(0)
HgNO3+	4.751e-29	3.148e-29	-28.323	-28.502	-0.179	(0)
Hg (NH3) 4+2	3.087e-33	5.950e-34	-32.510	-33.226	-0.715	(0)
Hg (NO3) 2	2.017e-37	2.017e-37	-36.695	-36.695	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
K	1.500e-02					
K+	1.393e-02	1.072e-02	-1.856	-1.970	-0.114	(0)
KSO4-	1.074e-03	8.335e-04	-2.969	-3.079	-0.110	(0)
KCrO4-	1.655e-16	1.097e-16	-15.781	-15.960	-0.179	(0)
Mg	1.843e-02					
Mg+2	1.077e-02	3.785e-03	-1.968	-2.422	-0.454	(0)
MgSO4	7.562e-03	7.562e-03	-2.121	-2.121	0.000	(0)
MgF+	6.611e-05	5.041e-05	-4.180	-4.297	-0.118	(0)
MgHCO3+	1.995e-05	1.505e-05	-4.700	-4.822	-0.122	(0)
MgCO3	4.645e-06	4.645e-06	-5.333	-5.333	0.000	(0)
MgOH+	1.552e-06	1.226e-06	-5.809	-5.911	-0.102	(0)
MgH2BO3+	8.083e-07	5.871e-07	-6.092	-6.231	-0.139	(0)
Mn (2)	2.224e-04					
Mn+2	1.609e-04	3.101e-05	-3.793	-4.508	-0.715	(0)
MnSO4	6.055e-05	6.055e-05	-4.218	-4.218	0.000	(0)
MnCl+	3.297e-07	2.539e-07	-6.482	-6.595	-0.113	(0)
MnHCO3+	3.123e-07	2.405e-07	-6.505	-6.619	-0.113	(0)
MnF+	1.903e-07	1.466e-07	-6.721	-6.834	-0.113	(0)
MnOH+	8.232e-08	6.340e-08	-7.084	-7.198	-0.113	(0)
MnCl2	2.333e-09	2.333e-09	-8.632	-8.632	0.000	(0)
MnCl3-	5.427e-12	4.179e-12	-11.265	-11.379	-0.113	(0)
MnSeO4	2.882e-12	2.882e-12	-11.540	-11.540	0.000	(0)
MnNO3+	1.143e-12	7.576e-13	-11.942	-12.121	-0.179	(0)
Mn (OH) 3-	3.370e-16	2.595e-16	-15.472	-15.586	-0.113	(0)
Mn (NO3) 2	2.933e-20	2.933e-20	-19.533	-19.533	0.000	(0)
Mn (OH) 4-2	1.938e-21	6.818e-22	-20.713	-21.166	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
Mn (3)	1.067e-24					
Mn+3	1.067e-24	1.014e-25	-23.972	-24.994	-1.022	(0)
Mn (6)	1.756e-40					
MnO4-2	1.756e-40	0.000e+00	-39.755	-40.209	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.584	-44.717	-0.133	(0)
Mo	7.601e-06					
MoO4-2	7.600e-06	2.670e-06	-5.119	-5.573	-0.454	(0)
HMoO4-	9.903e-10	6.561e-10	-9.004	-9.183	-0.179	(0)
H2MoO4	5.935e-14	5.935e-14	-13.227	-13.227	0.000	(0)
AlMo6O21-3	2.478e-39	0.000e+00	-38.606	-40.215	-1.609	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.852	-49.288	-6.436	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.340	-50.809	-4.469	(0)

	H2Mo7O24-4	0.000e+00	0.000e+00	-51.075	-53.935	-2.860	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.989	-58.598	-1.609	(0)
N (-3)	2.925e-07						
	NH4+	2.555e-07	1.856e-07	-6.593	-6.731	-0.139	(0)
	NH4SO4-	2.835e-08	2.183e-08	-7.547	-7.661	-0.113	(0)
	NH3	8.569e-09	8.569e-09	-8.067	-8.067	0.000	(0)
	CaNH3+2	1.256e-10	2.421e-11	-9.901	-10.616	-0.715	(0)
	CuNH3+2	1.236e-11	2.382e-12	-10.908	-11.623	-0.715	(0)
	NiNH3+2	2.219e-15	4.277e-16	-14.654	-15.369	-0.715	(0)
	Co (NH3) +2	2.117e-15	4.080e-16	-14.674	-15.389	-0.715	(0)
	BaNH3+2	2.676e-16	5.156e-17	-15.573	-16.288	-0.715	(0)
	Hg (NH3) 2+2	1.330e-18	2.562e-19	-17.876	-18.591	-0.715	(0)
	Ca (NH3) 2+2	4.285e-19	8.259e-20	-18.368	-19.083	-0.715	(0)
	HgNH3+2	1.552e-19	2.990e-20	-18.809	-19.524	-0.715	(0)
	Ni (NH3) 2+2	2.749e-21	5.297e-22	-20.561	-21.276	-0.715	(0)
	Co (NH3) 2+2	7.737e-22	1.491e-22	-21.111	-21.826	-0.715	(0)
	Hg (NH3) 3+2	4.536e-26	8.741e-27	-25.343	-26.058	-0.715	(0)
	Co (NH3) 3+2	8.346e-29	1.609e-29	-28.078	-28.794	-0.715	(0)
	Hg (NH3) 4+2	3.087e-33	5.950e-34	-32.510	-33.226	-0.715	(0)
	Co (NH3) 4+2	3.753e-36	7.234e-37	-35.426	-36.141	-0.715	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.810	-41.525	-0.715	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-43.273	-43.988	-0.715	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.266	-50.875	-1.609	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.483	-51.199	-0.715	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.245	-51.960	-0.715	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.828	-0.179	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.266	-65.981	-0.715	(0)
N (3)	2.219e-05						
	NO2-	2.219e-05	1.634e-05	-4.654	-4.787	-0.133	(0)
	CuNO2+	7.015e-11	4.648e-11	-10.154	-10.333	-0.179	(0)
	CoNO2+	6.881e-14	4.559e-14	-13.162	-13.341	-0.179	(0)
	Cu (NO2) 2	7.771e-15	7.771e-15	-14.109	-14.109	0.000	(0)
N (5)	2.019e-08						
	NO3-	2.002e-08	1.541e-08	-7.699	-7.812	-0.114	(0)
	CaNO3+	1.651e-10	1.094e-10	-9.782	-9.961	-0.179	(0)
	MnNO3+	1.143e-12	7.576e-13	-11.942	-12.121	-0.179	(0)
	ZnNO3+	2.264e-13	1.500e-13	-12.645	-12.824	-0.179	(0)
	CuNO3+	1.999e-15	1.324e-15	-14.699	-14.878	-0.179	(0)
	BaNO3+	1.112e-15	7.368e-16	-14.954	-15.133	-0.179	(0)
	CdNO3+	1.952e-16	1.293e-16	-15.710	-15.888	-0.179	(0)
	PbNO3+	3.091e-17	2.048e-17	-16.510	-16.689	-0.179	(0)
	CoNO3+	1.460e-17	9.674e-18	-16.836	-17.014	-0.179	(0)
	NiNO3+	5.431e-18	3.599e-18	-17.265	-17.444	-0.179	(0)
	Mn (NO3) 2	2.933e-20	2.933e-20	-19.533	-19.533	0.000	(0)
	UO2NO3+	3.019e-21	2.000e-21	-20.520	-20.699	-0.179	(0)
	Zn (NO3) 2	4.614e-22	4.614e-22	-21.336	-21.336	0.000	(0)
	Cu (NO3) 2	2.570e-24	2.570e-24	-23.590	-23.590	0.000	(0)
	CrNO3+2	1.178e-24	2.271e-25	-23.929	-24.644	-0.715	(0)
	Cd (NO3) 2	9.990e-25	9.990e-25	-24.000	-24.000	0.000	(0)
	Pb (NO3) 2	5.362e-25	5.362e-25	-24.271	-24.271	0.000	(0)
	VO2NO3	4.433e-25	4.433e-25	-24.353	-24.353	0.000	(0)
	Co (NO3) 2	3.034e-25	3.034e-25	-24.518	-24.518	0.000	(0)
	FeNO3+2	2.352e-27	4.532e-28	-26.629	-27.344	-0.715	(0)
	HgNO3+	4.751e-29	3.148e-29	-28.323	-28.502	-0.179	(0)
	Hg (NO3) 2	2.017e-37	2.017e-37	-36.695	-36.695	0.000	(0)
Na	2.703e-02						
	Na+	2.553e-02	1.966e-02	-1.593	-1.706	-0.114	(0)
	NaSO4-	1.494e-03	1.159e-03	-2.826	-2.936	-0.110	(0)
	NaHCO3	4.296e-06	4.296e-06	-5.367	-5.367	0.000	(0)
	NaF	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)
	NaCO3-	6.961e-07	5.401e-07	-6.157	-6.268	-0.110	(0)
	NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
	NaCrO4-	4.058e-16	2.689e-16	-15.392	-15.570	-0.179	(0)
Ni	4.846e-10						
	Ni+2	2.646e-10	9.295e-11	-9.577	-10.032	-0.454	(0)
	NiSO4	2.036e-10	2.036e-10	-9.691	-9.691	0.000	(0)
	NiHCO3+	6.721e-12	4.453e-12	-11.173	-11.351	-0.179	(0)

NiCO3	5.116e-12	5.116e-12	-11.291	-11.291	0.000	(0)
NiCl+	2.334e-12	1.547e-12	-11.632	-11.811	-0.179	(0)
NiOH+	1.437e-12	9.523e-13	-11.842	-12.021	-0.179	(0)
NiF+	4.183e-13	2.771e-13	-12.379	-12.557	-0.179	(0)
Ni(SO4)2-2	3.841e-13	7.402e-14	-12.416	-13.131	-0.715	(0)
Ni(OH)2	6.156e-14	6.156e-14	-13.211	-13.211	0.000	(0)
NiNH3+2	2.219e-15	4.277e-16	-14.654	-15.369	-0.715	(0)
Ni(OH)3-	7.561e-17	5.010e-17	-16.121	-16.300	-0.179	(0)
NiCl2	5.065e-17	5.065e-17	-16.295	-16.295	0.000	(0)
NiSeO4	1.501e-17	1.501e-17	-16.824	-16.824	0.000	(0)
NiNO3+	5.431e-18	3.599e-18	-17.265	-17.444	-0.179	(0)
Ni(NH3)2+2	2.749e-21	5.297e-22	-20.561	-21.276	-0.715	(0)
O(0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.666e-09					
PbSO4	4.831e-10	4.831e-10	-9.316	-9.316	0.000	(0)
PbCO3	3.984e-10	3.984e-10	-9.400	-9.400	0.000	(0)
PbOH+	2.772e-10	1.836e-10	-9.557	-9.736	-0.179	(0)
Pb+2	2.557e-10	8.984e-11	-9.592	-10.047	-0.454	(0)
Pb(SO4)2-2	1.658e-10	3.196e-11	-9.780	-10.495	-0.715	(0)
PbHCO3+	3.915e-11	2.594e-11	-10.407	-10.586	-0.179	(0)
PbCl+	3.129e-11	2.073e-11	-10.505	-10.683	-0.179	(0)
Pb(CO3)2-2	8.796e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
Pb(OH)2	4.726e-12	4.726e-12	-11.325	-11.325	0.000	(0)
PbF+	1.134e-12	7.514e-13	-11.945	-12.124	-0.179	(0)
PbCl2	6.023e-13	6.023e-13	-12.220	-12.220	0.000	(0)
Pb(OH)3-	5.805e-15	3.846e-15	-14.236	-14.415	-0.179	(0)
PbCl3-	2.354e-15	1.560e-15	-14.628	-14.807	-0.179	(0)
PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.091e-17	2.048e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.406e-17	4.636e-18	-16.619	-17.334	-0.715	(0)
Pb2OH+3	1.062e-17	2.615e-19	-16.974	-18.583	-1.609	(0)
Pb(OH)4-2	3.978e-18	7.666e-19	-17.400	-18.115	-0.715	(0)
PbF3-	5.964e-19	3.952e-19	-18.224	-18.403	-0.179	(0)
Pb3(OH)4+2	2.077e-22	4.004e-23	-21.682	-22.398	-0.715	(0)
PbF4-2	1.165e-22	2.245e-23	-21.934	-22.649	-0.715	(0)
Pb(NO3)2	5.362e-25	5.362e-25	-24.271	-24.271	0.000	(0)
Pb4(OH)4+4	2.071e-26	2.857e-29	-25.684	-28.544	-2.860	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg(HS)2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
Cu(S4)2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.288	-147.467	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Cd(HS)2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe(HS)2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu(HS)3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.293	-224.472	-0.179	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Cd(HS)3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd(HS)4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.603	-304.318	-0.715	(0)

Sb2S4-2	0.000e+00	0.000e+00	-317.853	-318.568	-0.715	(0)
S (6)	4.711e-02					
SO4-2	3.125e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.562e-03	7.562e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.494e-03	1.159e-03	-2.826	-2.936	-0.110	(0)
KSO4-	1.074e-03	8.335e-04	-2.969	-3.079	-0.110	(0)
MnSO4	6.055e-05	6.055e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.306e-06	9.306e-06	-5.031	-5.031	0.000	(0)
Zn (SO4) 2-2	4.617e-06	8.899e-07	-5.336	-6.051	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.835e-08	2.183e-08	-7.547	-7.661	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.828e-09	6.828e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.247e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CoSO4	8.675e-10	8.675e-10	-9.062	-9.062	0.000	(0)
PbSO4	4.831e-10	4.831e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.036e-10	2.036e-10	-9.691	-9.691	0.000	(0)
Pb (SO4) 2-2	1.658e-10	3.196e-11	-9.780	-10.495	-0.715	(0)
CrOHSO4	1.564e-11	1.564e-11	-10.806	-10.806	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2SO4	1.081e-12	1.081e-12	-11.966	-11.966	0.000	(0)
UO2 (SO4) 2-2	8.116e-13	1.564e-13	-12.091	-12.806	-0.715	(0)
AlSO4+	5.363e-13	4.090e-13	-12.271	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.841e-13	7.402e-14	-12.416	-13.131	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	1.304e-14	8.642e-15	-13.885	-14.063	-0.179	(0)
VO2SO4-	2.249e-17	1.490e-17	-16.648	-16.827	-0.179	(0)
FeSO4+	4.704e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
Fe (SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
Cr2 (OH) 2SO4+2	4.401e-20	8.482e-21	-19.356	-20.072	-0.715	(0)
VOSO4	2.871e-20	2.871e-20	-19.542	-19.542	0.000	(0)
HgSO4	1.590e-20	1.590e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.532e-21	5.532e-21	-20.257	-20.257	0.000	(0)
CrO3SO4-2	2.361e-23	4.551e-24	-22.627	-23.342	-0.715	(0)
VSO4+	7.700e-35	5.102e-35	-34.114	-34.292	-0.179	(0)
U (SO4) 2	1.777e-39	1.777e-39	-38.750	-38.750	0.000	(0)
USO4+2	1.057e-40	0.000e+00	-39.976	-40.691	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.828	-0.179	(0)
Sb (3)	9.929e-20					
Sb (OH) 3	5.019e-20	5.019e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.908e-20	4.908e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.716e-24	6.437e-24	-23.013	-23.191	-0.179	(0)
Sb (OH) 4-	5.546e-24	3.675e-24	-23.256	-23.435	-0.179	(0)
Sb (OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.276e-26	1.508e-26	-25.643	-25.822	-0.179	(0)
SbO+	7.861e-27	5.209e-27	-26.105	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.853	-318.568	-0.715	(0)
Sb (5)	9.028e-08					
SbO3-	9.019e-08	5.976e-08	-7.045	-7.224	-0.179	(0)
Sb (OH) 6-	9.028e-11	6.950e-11	-10.044	-10.158	-0.114	(0)
SbO2+	3.953e-24	2.619e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.277e-39					
HSe-	6.277e-39	4.159e-39	-38.202	-38.381	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.366	-40.366	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.399	-42.399	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.758	-45.473	-0.715	(0)
Se (4)	7.866e-07					
SeO3-2	4.135e-07	7.969e-08	-6.384	-7.099	-0.715	(0)
HSeO3-	3.731e-07	2.472e-07	-6.428	-6.607	-0.179	(0)
H2SeO3	1.302e-12	1.302e-12	-11.885	-11.885	0.000	(0)
Cd (SeO3) 2-2	7.205e-17	1.389e-17	-16.142	-16.857	-0.715	(0)
FeHSeO3+2	9.966e-24	1.921e-24	-23.001	-23.717	-0.715	(0)
Se (6)	9.858e-10					
SeO4-2	9.827e-10	3.452e-10	-9.008	-9.462	-0.454	(0)
MnSeO4	2.882e-12	2.882e-12	-11.540	-11.540	0.000	(0)
ZnSeO4	2.072e-13	2.072e-13	-12.684	-12.684	0.000	(0)

HSeO4-	3.225e-16	2.137e-16	-15.491	-15.670	-0.179	(0)
CdSeO4	1.706e-16	1.706e-16	-15.768	-15.768	0.000	(0)
CoSeO4	6.852e-17	6.852e-17	-16.164	-16.164	0.000	(0)
NiSeO4	1.501e-17	1.501e-17	-16.824	-16.824	0.000	(0)
Zn (SeO4) 2-2	3.763e-22	7.252e-23	-21.424	-22.140	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.383	-58.992	-1.609	(0)
U (4)	1.841e-19					
U (OH) 5-	1.841e-19	1.219e-19	-18.735	-18.914	-0.179	(0)
U (OH) 4	6.319e-23	6.319e-23	-22.199	-22.199	0.000	(0)
U (OH) 3+	4.314e-27	2.858e-27	-26.365	-26.544	-0.179	(0)
U (OH) 2+2	8.485e-32	1.635e-32	-31.071	-31.786	-0.715	(0)
UF3+	4.684e-36	3.104e-36	-35.329	-35.508	-0.179	(0)
UF2+2	8.560e-37	1.650e-37	-36.068	-36.783	-0.715	(0)
UOH+3	3.872e-37	9.529e-39	-36.412	-38.021	-1.609	(0)
UF4	4.039e-38	4.039e-38	-37.394	-37.394	0.000	(0)
UF+3	4.486e-39	1.104e-40	-38.348	-39.957	-1.609	(0)
U (SO4) 2	1.777e-39	1.777e-39	-38.750	-38.750	0.000	(0)
UF5-	2.868e-40	1.900e-40	-39.542	-39.721	-0.179	(0)
USO4+2	1.057e-40	0.000e+00	-39.976	-40.691	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.452	-41.167	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.471	-45.331	-2.860	(0)
UCl+3	0.000e+00	0.000e+00	-44.209	-45.818	-1.609	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-156.051	-170.531	-14.480	(0)
U (5)	8.175e-16					
UO2+	8.175e-16	5.417e-16	-15.088	-15.266	-0.179	(0)
U (6)	6.614e-07					
UO2 (CO3) 3-4	6.026e-07	8.314e-10	-6.220	-9.080	-2.860	(0)
UO2 (CO3) 2-2	5.834e-08	1.124e-08	-7.234	-7.949	-0.715	(0)
UO2CO3	3.820e-10	3.820e-10	-9.418	-9.418	0.000	(0)
UO2OH+	1.006e-11	6.663e-12	-10.998	-11.176	-0.179	(0)
UO2F+	1.608e-12	1.066e-12	-11.794	-11.972	-0.179	(0)
UO2SO4	1.081e-12	1.081e-12	-11.966	-11.966	0.000	(0)
UO2 (SO4) 2-2	8.116e-13	1.564e-13	-12.091	-12.806	-0.715	(0)
UO2F2	3.648e-13	3.648e-13	-12.438	-12.438	0.000	(0)
UO2+2	1.851e-13	6.503e-14	-12.733	-13.187	-0.454	(0)
UO2F3-	1.641e-14	1.088e-14	-13.785	-13.964	-0.179	(0)
UO2Cl+	1.035e-15	6.860e-16	-14.985	-15.164	-0.179	(0)
(UO2) 2 (OH) 2+2	3.823e-16	7.367e-17	-15.418	-16.133	-0.715	(0)
(UO2) 3 (OH) 5+	3.722e-16	2.466e-16	-15.429	-15.608	-0.179	(0)
UO2F4-2	5.321e-17	1.025e-17	-16.274	-16.989	-0.715	(0)
UO2NO3+	3.019e-21	2.000e-21	-20.520	-20.699	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.582	-42.761	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.466	-44.181	-0.715	(0)
V (3)	4.280e-15					
V (OH) 3	4.280e-15	4.280e-15	-14.369	-14.369	0.000	(0)
V (OH) 2+	5.164e-26	3.421e-26	-25.287	-25.466	-0.179	(0)
VOH+2	2.083e-29	4.015e-30	-28.681	-29.396	-0.715	(0)
V+3	4.000e-34	9.843e-36	-33.398	-35.007	-1.609	(0)
VSO4+	7.700e-35	5.102e-35	-34.114	-34.292	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.801	-56.410	-1.609	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.132	-57.993	-2.860	(0)
V (4)	2.411e-18					
V (OH) 3+	2.322e-18	1.539e-18	-17.634	-17.813	-0.179	(0)
VO+2	4.926e-20	9.494e-21	-19.308	-20.023	-0.715	(0)
VOSO4	2.871e-20	2.871e-20	-19.542	-19.542	0.000	(0)
VOF+	1.020e-20	6.759e-21	-19.991	-20.170	-0.179	(0)
VOF2	3.008e-22	3.008e-22	-21.522	-21.522	0.000	(0)
VOC1+	2.614e-22	1.732e-22	-21.583	-21.761	-0.179	(0)
VOF3-	1.912e-24	1.267e-24	-23.718	-23.897	-0.179	(0)
VOF4-2	3.150e-27	6.070e-28	-26.502	-27.217	-0.715	(0)
H2V2O4+2	6.180e-31	1.191e-31	-30.209	-30.924	-0.715	(0)
V (5)	4.774e-08					
H2VO4-	2.809e-08	1.861e-08	-7.551	-7.730	-0.179	(0)
HVO4-2	1.964e-08	3.786e-09	-7.707	-8.422	-0.715	(0)
H3VO4	2.298e-12	2.298e-12	-11.639	-11.639	0.000	(0)
HV2O7-3	9.720e-13	2.392e-14	-12.012	-13.621	-1.609	(0)

H3V2O7-	4.177e-13	2.767e-13	-12.379	-12.558	-0.179	(0)
VO4-3	6.243e-14	1.536e-15	-13.205	-14.813	-1.609	(0)
V2O7-4	3.779e-14	5.214e-17	-13.423	-16.283	-2.860	(0)
V3O9-3	2.759e-16	6.790e-18	-15.559	-17.168	-1.609	(0)
VO2+	7.384e-17	5.685e-17	-16.132	-16.245	-0.114	(0)
VO2SO4-	2.249e-17	1.490e-17	-16.648	-16.827	-0.179	(0)
VO2F	1.184e-17	1.184e-17	-16.927	-16.927	0.000	(0)
VO2F2-	7.698e-19	5.101e-19	-18.114	-18.292	-0.179	(0)
V4O12-4	3.826e-20	5.278e-23	-19.417	-22.277	-2.860	(0)
VO2F3-2	3.919e-21	7.552e-22	-20.407	-21.122	-0.715	(0)
VO2F4-3	1.792e-24	4.411e-26	-23.747	-25.355	-1.609	(0)
VO2NO3	4.433e-25	4.433e-25	-24.353	-24.353	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.584	-60.020	-6.436	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.272	-59.741	-4.469	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.582	-62.442	-2.860	(0)
Zn	2.603e-05					
Zn+2	1.103e-05	3.874e-06	-4.958	-5.412	-0.454	(0)
ZnSO4	9.306e-06	9.306e-06	-5.031	-5.031	0.000	(0)
Zn(SO4)2-2	4.617e-06	8.899e-07	-5.336	-6.051	-0.715	(0)
ZnOH+	4.759e-07	3.153e-07	-6.323	-6.501	-0.179	(0)
ZnCO3	3.289e-07	3.289e-07	-6.483	-6.483	0.000	(0)
ZnCl+	8.390e-08	6.330e-08	-7.076	-7.199	-0.122	(0)
ZnHCO3+	7.186e-08	4.761e-08	-7.144	-7.322	-0.179	(0)
ZnOHC1	6.744e-08	6.744e-08	-7.171	-7.171	0.000	(0)
Zn(OH)2	4.067e-08	4.067e-08	-7.391	-7.391	0.000	(0)
ZnF+	1.385e-08	9.176e-09	-7.859	-8.037	-0.179	(0)
ZnCl2	6.525e-10	6.525e-10	-9.185	-9.185	0.000	(0)
Zn(OH)3-	2.504e-10	1.659e-10	-9.601	-9.780	-0.179	(0)
ZnCl3-	4.468e-12	3.371e-12	-11.350	-11.472	-0.122	(0)
ZnNO3+	2.264e-13	1.500e-13	-12.645	-12.824	-0.179	(0)
ZnSeO4	2.072e-13	2.072e-13	-12.684	-12.684	0.000	(0)
ZnCl4-2	3.117e-14	1.096e-14	-13.506	-13.960	-0.454	(0)
Zn(OH)4-2	2.789e-14	5.374e-15	-13.555	-14.270	-0.715	(0)
Zn(NO3)2	4.614e-22	4.614e-22	-21.336	-21.336	0.000	(0)
Zn(SeO4)2-2	3.763e-22	7.252e-23	-21.424	-22.140	-0.715	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.288	-147.467	-0.179	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.365	-149.365	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.293	-224.472	-0.179	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.828	-226.543	-0.715	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.603	-304.318	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.15	-48.86	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-42.12	-37.61	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.35	-37.61	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.25	-53.31	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-56.47	-36.44	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.43	-28.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.37	-22.92	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3
Al2(MoO4)3	-47.73	-45.36	2.37	Al2(MoO4)3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5

Atacamite	-0.99	6.40	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.64	-18.54	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ ·8H ₂ O	-16.61	7.79	24.39	Ba(OH) ₂ ·8H ₂ O
Ba ₂ V ₂ O ₇ ·2H ₂ O	-16.96	-1.09	15.87	Ba ₂ V ₂ O ₇ ·2H ₂ O
Ba ₃ (AsO ₄) ₂	-0.00	-8.91	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ ·4H ₂ O	-26.23	6.71	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-12.91	-22.58	-9.67	BaCrO ₄
BaF ₂	-10.05	-15.87	-5.82	BaF ₂
BaMoO ₄	-6.63	-13.59	-6.96	BaMoO ₄
Barite	0.00	-9.98	-9.98	BaSO ₄
BaS	-94.68	-78.50	16.18	BaS
BaSeO ₃	-8.55	-6.72	1.83	BaSeO ₃
BaSeO ₄	-10.02	-17.48	-7.46	BaSeO ₄
Bianchite	-5.61	-7.38	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-6.59	11.50	18.09	MnO ₂
Bixbyite	-1.90	-2.54	-0.64	Mn ₂ O ₃
BlaubleiI	-55.07	-79.24	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.53	-82.81	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.85	-77.38	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-3.45	13.39	16.84	Mg(OH) ₂
Bunsenite	-6.66	5.78	12.45	NiO
Ca(VO ₃) ₂	-9.17	-3.51	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-7.84	9.66	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-11.89	9.66	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-15.10	7.20	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-16.13	22.83	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-17.04	22.82	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-295.34	-152.36	142.97	Ca ₃ Sb ₂
CaCrO ₄	-14.94	-17.21	-2.27	CaCrO ₄
Calcite	0.00	-8.48	-8.48	CaCO ₃
Calomel	-5.91	-23.82	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-0.27	-8.22	-7.95	CaMoO ₄
Carnotite	-0.00	0.23	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-4.16	-1.35	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-9.09	-12.11	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-10.64	-0.80	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-6.41	7.24	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-6.49	7.24	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.54	-13.83	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-18.62	3.94	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-17.22	11.18	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.29	-12.95	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-11.26	-12.95	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.04	-12.95	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.21	-16.43	-1.21	CdF ₂
Cdmetal(α)	-31.82	-18.31	13.51	Cd
Cdmetal(γ)	-31.92	-18.31	13.62	Cd
CdMoO ₄	-0.00	-14.15	-14.15	CdMoO ₄
CdOHC1	-6.39	-2.86	3.54	CdOHC1
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.19	-18.04	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.36	-10.54	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-8.81	-10.54	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-8.66	-10.54	-1.87	CdSO ₄ ·2.67H ₂ O
Cerrusite	-2.75	-15.88	-13.13	PbCO ₃
CH ₄ (g)	-82.78	-123.83	-41.05	CH ₄
Chalcanthite	-6.89	-9.53	-2.64	CuSO ₄ ·5H ₂ O
Chalcocite	-55.04	-89.96	-34.92	Cu ₂ S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS ₂
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As ₄ O ₆
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co(BO ₂) ₂	-28.70	-1.63	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.68	6.41	13.09	Co(OH) ₂
Co(OH) ₃	-10.91	-13.22	-2.31	Co(OH) ₃

CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-26.09	-13.06	13.03	Co3 (AsO4) 2
Co3O4	-9.52	-20.01	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.71	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.21	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.67	-39.87	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.34	-18.87	-1.53	CoSeO4:6H2O
CoSO4	-14.16	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.89	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.96	-11.14	10.82	Cr (OH) 2
Cr (OH) 3	-2.65	-1.32	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.57	-1.32	-0.75	Cr (OH) 3
Cr2O3	-0.28	-2.63	-2.36	Cr2O3
CrCl2	-45.42	-31.33	14.09	CrCl2
CrCl3	-46.72	-31.60	15.11	CrCl3
CrF3	-25.48	-36.82	-11.34	CrF3
Crmetal	-67.17	-36.69	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.50	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.69	-22.13	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.42	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.78	-6.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.50	-13.22	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.69	-8.13	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.53	-37.16	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O

FeCr2O4	-6.38	0.82	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-44.98	-63.58	-18.60	FeSe2
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.84	-42.84	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.55	-80.52	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummitite	-5.04	2.63	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S(g)	-78.28	-86.29	-8.01	H2S
H2Se(g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg(CH3)2(g)	-184.58	-258.29	-73.71	Hg(CH3)2
Hg(g)	-6.71	-14.59	-7.87	Hg
Hg(OH)2	-7.14	-10.64	-3.50	Hg(OH)2
Hg2(g)	-14.22	-29.17	-14.96	Hg2
Hg2(OH)2	-8.89	-3.63	5.26	Hg2(OH)2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.31	-34.01	-8.70	Hg2CrO4
Hg2F2	-16.93	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.92	-11.68	Hg2S
Hg2SeO3	-13.49	-18.14	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl(g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF(g)	-46.32	-13.65	32.68	HgF
HgF2(g)	-46.87	-34.30	12.57	HgF2
Hgmetal(l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.23	-56.92	-55.69	HgSe
HgSeO3	-12.72	-25.15	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3(CO3)4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.86	-19.62	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.05	-20.22	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-31.63	-48.88	-17.24	K2Cr2O7
K2CrO4	-17.99	-18.50	-0.51	K2CrO4
K2MoO4	-12.77	-9.51	3.26	K2MoO4
K2SeO4	-12.67	-13.40	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2(OH)2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF

Melanothallite	-18.20	-11.94	6.26	CuCl ₂
Melanterite	-12.12	-14.33	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg(OH) ₂ (active)	-5.40	13.39	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-14.56	-3.28	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-271.83	-197.15	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-16.25	10.11	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-5.44	10.76	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.36	-16.98	5.38	MgCrO ₄
MgF ₂	-2.14	-10.27	-8.13	MgF ₂
MgMoO ₄	-6.15	-8.00	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.18	-1.13	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-10.69	-11.89	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-30.67	42.85	73.52	Pb ₃ O ₄
Mirabilite	-4.27	-5.38	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-10.27	-5.37	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.16	-55.87	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.17	-86.09	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.88	1.62	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.60	-8.89	2.72	MnCl ₂ ·4H ₂ O
MnS(grn)	-75.16	-74.99	0.17	MnS
MnS(pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.48	-34.98	3.50	MnSe
MnSeO ₃	-4.34	-3.21	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.19	-3.21	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-11.92	-13.97	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.05	-6.47	2.58	MnSO ₄
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO ₃	-13.39	-21.39	-8.00	MoO ₃
Morenosite	-9.85	-12.00	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.26	-219.52	-70.26	MoS ₂
Na-Jarosite	-8.57	-19.77	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-38.45	-48.35	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.90	-17.97	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-13.78	-30.38	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.48	-8.99	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.21	-8.99	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-12.42	-2.12	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-14.15	-12.87	1.28	Na ₂ SeO ₄
Na ₃ Sb	-171.78	-77.33	94.45	Na ₃ Sb
Na ₃ VO ₄	-26.41	10.27	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-29.27	8.13	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-5.99	-2.14	3.86	NaVO ₃
Nesquehonite	-3.59	-8.26	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-7.01	5.78	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-30.65	-14.95	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-26.64	5.36	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-8.99	-15.86	-6.87	NiCO ₃
NiMoO ₄	-4.46	-15.61	-11.14	NiMoO ₄
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.80	-40.50	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-11.55	-8.73	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-17.98	-19.50	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-6.00	11.50	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-243.41	-304.47	-61.07	As ₂ S ₃
Otavite	-2.41	-14.41	-12.00	CdCO ₃
Pb(BO ₂) ₂	-8.79	-2.27	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.38	5.77	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-63.43	-72.19	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-7.35	1.44	8.79	Pb ₂ (OH) ₃ Cl

Pb2O(OH) 2	-14.65	11.54	26.19	Pb2O(OH) 2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.24	-5.14	-1.90	Pb2V2O7
Pb3(AsO4) 2	-20.79	-14.99	5.80	Pb3(AsO4) 2
Pb3(VO4) 2	-5.51	0.63	6.14	Pb3(VO4) 2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4(OH) 6SO4	-15.80	5.30	21.10	Pb4(OH) 6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb(OH) 3	-12.19	-19.30	-7.11	Sb(OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.70	-177.46	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.37	2.63	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.63	-20.74	-7.11	Se
Semetal(hex)	-13.04	-20.74	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.28	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.24	-11.24	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca(UO2) 2(VO4) 2
U3O8	-11.09	9.99	21.08	U3O8
U3Sb4	-577.21	-424.83	152.38	U3Sb4
U4O9	-26.23	-29.25	-3.02	U4O9
UF4	-31.50	-61.03	-29.54	UF4
UF4:2.5H2O	-28.32	-61.04	-32.72	UF4:2.5H2O
UO2(am)	-14.63	-13.70	0.93	UO2
UO2(NO3) 2	-40.96	-28.81	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-33.66	-28.81	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-32.20	-28.81	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-30.86	-28.82	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-2.98	2.63	5.61	UO2(OH) 2
UO2SeO4:4H2O	-20.40	-22.65	-2.25	UO2SeO4:4H2O
UO3	-5.07	2.63	7.70	UO3
Uraninite	-9.03	-13.70	-4.67	UO2
USb2	-218.81	-189.24	29.58	USb2

V(OH)3	-18.88	-11.28	7.59	V(OH)3
V2O5	-15.31	-16.67	-1.36	V2O5
V3O5	-40.00	-38.16	1.84	V3O5
V4O7	-49.56	-42.37	7.19	V4O7
V6O13	-40.25	-101.11	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VC12	-63.12	-44.24	18.87	VC12
VC13	-65.00	-41.57	23.43	VC13
VF4	-66.47	-51.54	14.93	VF4
Vmetal	-93.63	-49.60	44.03	V
VO	-38.81	-24.06	14.76	VO
VO(OH)2	-9.36	-4.21	5.15	VO(OH)2
VO2Cl	-21.27	-18.43	2.84	VO2Cl
VOC1	-32.53	-21.38	11.15	VOC1
VOC12	-37.16	-24.40	12.76	VOC12
VOSO4	-25.59	-21.98	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO4
Zn(BO2)2	-5.93	2.36	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.36	-21.04	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.80	10.40	12.20	Zn(OH)2
Zn(OH)2(am)	-2.07	10.40	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.35	10.40	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.13	10.40	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.33	10.40	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.47	3.03	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.48	10.71	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.74	-1.09	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.25	-4.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.56	23.84	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.67	31.83	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.98	-11.24	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.26	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.78	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.48	-35.88	-14.40	ZnSe
ZnSeO4:6H2O	-13.36	-14.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.73	-7.37	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 139.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 802
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 802
USE Surface 802
USE Solution 807
SAVE Solution 808 #Initial Stage 8 Run-off Water After Mineral
Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 802.

Diffuse Double Layer Surface-Complexation Model

Hfo

2.158e-19 Surface + diffuse layer charge, eq
3.144e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.897e-01 m² for 1.074e-05 moles of Ferrihydrite

Water in diffuse layer: 6.897e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is
+1).

Element	Moles
C	1.7620e-11
Ca	2.1837e-13
Cl	3.5284e-10
H	5.1978e-11
K	3.4642e-13
Mg	3.3833e-14
N	1.4285e-09
Na	1.4678e-12
O	6.3668e-08
S	1.4836e-08

Hfo_s

5.372e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.591e-08	0.668	3.591e-08	-7.445
Hfo_sOH	1.761e-08	0.328	1.761e-08	-7.754
Hfo_sO-	1.979e-10	0.004	1.979e-10	-9.704
Hfo_sOHCa+2	6.555e-13	0.000	6.555e-13	-12.183

Hfo_w

2.149e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	9.928e-07	0.462	9.928e-07	-6.003
Hfo_wOH	4.869e-07	0.227	4.869e-07	-6.313
Hfo_wSO4-	3.353e-07	0.156	3.353e-07	-6.475
Hfo_wOHSO4-2	3.281e-07	0.153	3.281e-07	-6.484
Hfo_wO-	5.471e-09	0.003	5.471e-09	-8.262
Hfo_wOMg+	7.732e-15	0.000	7.732e-15	-14.112
Hfo_wOCa+	2.623e-15	0.000	2.623e-15	-14.581

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 807. Solution after simulation 138.
Using surface 802.
Using pure phase assemblage 802. Pure-phase assemblage after simulation 138.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	7.249e-05	7.249e-05	6.099e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	5.050e-08	4.102e-08	-9.477e-09
Barite	0.00	-9.98	-9.98	3.004e-05	3.007e-05	2.843e-08
Brochantite	0.00	15.22	15.22	1.345e-04	1.344e-04	-1.506e-07
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.012e+01	1.012e+01	9.827e-07
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-4.18	-1.36	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	4.578e-02	4.578e-02	-1.731e-06
Carnotite	0.00	0.23	0.23	2.086e-06	1.827e-06	-2.590e-07
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	2.423e-07	2.423e-07	-1.678e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-1.22	-3.58	-2.36	0.000e+00	0	0.000e+00
Cu2Se(alpha)	-4.17	-49.97	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.074e-05	1.074e-05	-2.211e-14
Fluorite	0.00	-10.50	-10.50	3.692e-03	3.692e-03	1.249e-09
Gummite	-4.90	2.77	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	9.182e-03	9.184e-03	1.509e-06
HgSe	-1.24	-56.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.35	-3.22	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.99	-15.86	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.46	-15.61	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	7.572e-10
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	7.533e-07	7.495e-07	-3.774e-09
Rutherfordine	-4.37	-18.87	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.22	2.77	5.99	0.000e+00	0	0.000e+00

Sepiolite	Element not present.				0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.				0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00	
U3O8	-10.66	10.42	21.08	0.000e+00	0	0.000e+00	
UO2(OH)2(beta)	-2.84	2.77	5.61	0.000e+00	0	0.000e+00	
UO3	-4.93	2.77	7.70	0.000e+00	0	0.000e+00	
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00	

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

1.286e-20	Surface + diffuse layer charge, eq
1.782e-07	Surface charge, eq
2.493e-02	sigma, C/m ²
2.950e-02	psi, V
-1.148e+00	-F*psi/RT
3.171e-01	exp(-F*psi/RT)
6.420e+04	specific area, m ² /mol Ferrihydrite
6.897e-01	m ² for 1.074e-05 moles of Ferrihydrite

Water in diffuse layer: 6.897e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 2.640e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.024e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Al	4.2408e-11
As	1.3306e-14
B	6.9588e-10
Ba	1.5281e-13
C	4.3290e-09
Ca	7.5010e-08
Cd	1.5093e-13
Cl	6.4577e-08
Co	1.7852e-14
Cr	2.4487e-15
Cu	3.2808e-12
F	1.6249e-09
Fe	7.2134e-15
H	6.4961e-09
Hg	6.6442e-14
K	9.4906e-08
Mg	1.1325e-07
Mn	1.3267e-09
Mo	6.4409e-11
N	1.7162e-10
Na	1.7038e-07
Ni	2.9863e-15
O	1.5199e-06
Pb	1.1199e-14
S	3.7600e-07
Sb	6.9010e-13
Se	6.1450e-12
U	9.4061e-12
V	2.7416e-13
Zn	1.7069e-10

Hfo_s

5.372e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.619e-08	0.488	2.610e-08	-7.583
Hfo_sOCu+	1.473e-08	0.274	1.467e-08	-7.833

Hfo_sOMn+	8.618e-09	0.160	8.588e-09	-8.066
Hfo_sOPb+	2.801e-09	0.052	2.791e-09	-8.554
Hfo_sOCrOH+	7.618e-10	0.014	7.591e-10	-9.120
Hfo_sOHCa+2	5.728e-10	0.011	5.708e-10	-9.244
Hfo_sOH	2.719e-11	0.001	2.709e-11	-10.567
Hfo_sO-	8.156e-12	0.000	8.127e-12	-11.090
Hfo_sOCd+	5.465e-12	0.000	5.446e-12	-11.264
Hfo_sOH2+	2.076e-12	0.000	2.069e-12	-11.684
Hfo_sONi+	1.516e-13	0.000	1.511e-13	-12.821
Hfo_sOCo+	9.580e-14	0.000	9.547e-14	-13.020
Hfo_sOHBa+2	7.522e-15	0.000	7.496e-15	-14.125
Hfo_sOFe+	1.514e-15	0.000	1.508e-15	-14.822
Hfo_sOHg+	2.202e-16	0.000	2.194e-16	-15.659

Hfo_w

2.149e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	5.878e-07	0.274	5.858e-07	-6.232
Hfo_wOMg+	5.167e-07	0.240	5.149e-07	-6.288
Hfo_wOHVO4-3	2.724e-07	0.127	2.714e-07	-6.566
Hfo_wOZn+	2.135e-07	0.099	2.127e-07	-6.672
Hfo_wOH	2.116e-07	0.098	2.109e-07	-6.676
Hfo_wOHSeO4-2	1.424e-07	0.066	1.419e-07	-6.848
Hfo_wO-	6.348e-08	0.030	6.326e-08	-7.199
Hfo_wOMn+	5.328e-08	0.025	5.310e-08	-7.275
Hfo_wOHSeO3-2	2.395e-08	0.011	2.387e-08	-7.622
Hfo_wOHAsO4-3	1.895e-08	0.009	1.888e-08	-7.724
Hfo_wOCa+	1.723e-08	0.008	1.717e-08	-7.765
Hfo_wOH2+	1.616e-08	0.008	1.610e-08	-7.793
Hfo_wSO4-	5.462e-09	0.003	5.443e-09	-8.264
Hfo_wSeO3-	3.112e-09	0.001	3.101e-09	-8.508
Hfo_wOHMoO4-2	1.412e-09	0.001	1.407e-09	-8.852
Hfo_wOPb+	9.739e-10	0.000	9.704e-10	-9.013
Hfo_wH2BO3	8.408e-11	0.000	8.378e-11	-10.077
Hfo_wMoO4-	6.974e-11	0.000	6.949e-11	-10.158
Hfo_wOCd+	1.815e-11	0.000	1.808e-11	-10.743
Hfo_wHAsO4-	2.479e-12	0.000	2.470e-12	-11.607
Hfo_wOCo+	2.102e-12	0.000	2.094e-12	-11.679
Hfo_wONi+	1.592e-12	0.000	1.586e-12	-11.800
Hfo_wOHg+	8.395e-14	0.000	8.365e-14	-13.078
Hfo_wOFe+	7.434e-15	0.000	7.407e-15	-14.130
Hfo_wH2AsO4	6.126e-15	0.000	6.104e-15	-14.214
Hfo_wOHSeO4-2	4.426e-15	0.000	4.411e-15	-14.356
Hfo_wOBa+	3.271e-15	0.000	3.259e-15	-14.487
Hfo_wOHSbO(OH) 4-	9.271e-16	0.000	9.238e-16	-15.034
Hfo_wSeO4-	1.478e-16	0.000	1.473e-16	-15.832
Hfo_wSbO(OH) 4	4.580e-17	0.000	4.564e-17	-16.341
Hfo_wOHCrO4-2	1.550e-17	0.000	1.544e-17	-16.811
Hfo_wCrO4-	5.421e-19	0.000	5.401e-19	-18.267
Hfo_wH2AsO3	8.719e-25	0.000	8.688e-25	-24.061

-----Solution composition-----

Elements	Molality	Moles
Al	5.553e-06	5.573e-06
As	1.575e-09	1.581e-09
B	1.004e-04	1.007e-04
Ba	2.720e-08	2.730e-08
C	5.751e-04	5.771e-04
Ca	1.206e-02	1.211e-02
Cd	2.233e-08	2.241e-08
Cl	8.448e-03	8.478e-03
Co	2.974e-09	2.984e-09
Cr	3.858e-10	3.871e-10
Cu	4.981e-07	4.999e-07

F	2.257e-04	2.266e-04
Fe	1.103e-09	1.107e-09
Hg	9.633e-09	9.667e-09
K	1.500e-02	1.506e-02
Mg	1.843e-02	1.849e-02
Mn	2.223e-04	2.231e-04
Mo	7.604e-06	7.631e-06
N	2.250e-05	2.258e-05
Na	2.703e-02	2.713e-02
Ni	4.829e-10	4.846e-10
Pb	1.665e-09	1.671e-09
S	4.710e-02	4.727e-02
Sb	9.028e-08	9.060e-08
Se	7.606e-07	7.633e-07
U	9.194e-07	9.227e-07
V	3.434e-08	3.446e-08
Zn	2.580e-05	2.589e-05

-----Description of solution-----

equilibrium	pH	=	7.908	Charge balance
	pe	=	4.864	Adjusted to redox
Activity of water = 0.998				
Ionic strength (mol/kgw) = 1.229e-01				
Mass of water (kg) = 1.004e+00				
Total alkalinity (eq/kg) = 6.163e-04				
Total CO2 (mol/kg) = 5.751e-04				
Temperature (°C) = 25.00				
Pressure (atm) = 1.00				
Electrical balance (eq) = 2.673e-06				
Percent error, 100*(Cat- An)/(Cat+ An) = 0.00				
Iterations = 1				
Total H = 1.114091e+02				
Total O = 5.589535e+01				

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.091e-06	8.138e-07	-5.962	-6.089	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.553e-06					
Al(OH)4-	5.508e-06	4.200e-06	-5.259	-5.377	-0.118	(0)
Al(OH)3	4.099e-08	4.099e-08	-7.387	-7.387	0.000	(0)
Al(OH)2+	3.254e-09	2.524e-09	-8.488	-8.598	-0.110	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.692e-10	-9.460	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.572e-11	5.696e-12	-10.804	-11.244	-0.441	(0)
AlOH+2	1.078e-11	3.905e-12	-10.967	-11.408	-0.441	(0)
AlSO4+	5.363e-13	4.090e-13	-12.271	-12.388	-0.118	(0)
Al(SO4)2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.050e-14	4.799e-15	-13.297	-14.319	-1.022	(0)
AlMo6O21-3	2.483e-39	0.000e+00	-38.605	-40.214	-1.609	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.003e-24	6.644e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.546e-28	4.907e-29	-27.594	-28.309	-0.715	(0)
H4AsO3+	1.477e-31	9.788e-32	-30.831	-31.009	-0.179	(0)
AsO3-3	6.223e-33	1.532e-34	-32.206	-33.815	-1.609	(0)
As (5)	1.575e-09					
HAsO4-2	1.522e-09	2.934e-10	-8.817	-9.533	-0.715	(0)
H2AsO4-	4.987e-11	3.305e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.053e-12	7.513e-14	-11.515	-13.124	-1.609	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)

B	1.004e-04					
H3BO3	9.247e-05	9.512e-05	-4.034	-4.022	0.012	(0)
H2BO3-	6.158e-06	4.474e-06	-5.211	-5.349	-0.139	(0)
MgH2BO3+	8.082e-07	5.871e-07	-6.092	-6.231	-0.139	(0)
CaH2BO3+	7.954e-07	5.778e-07	-6.099	-6.238	-0.139	(0)
NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
BF(OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
H5(BO3) 2-	4.986e-10	3.622e-10	-9.302	-9.441	-0.139	(0)
H8(BO3) 3-	4.743e-12	3.445e-12	-11.324	-11.463	-0.139	(0)
BaH2BO3+	1.815e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
BF2(OH) 2-	9.738e-13	7.074e-13	-12.012	-12.150	-0.139	(0)
BF3OH-	5.564e-19	4.042e-19	-18.255	-18.393	-0.139	(0)
BF4-	4.021e-24	2.921e-24	-23.396	-23.535	-0.139	(0)
Ba	2.720e-08					
Ba+2	2.715e-08	9.538e-09	-7.566	-8.021	-0.454	(0)
BaHCO3+	4.515e-11	3.540e-11	-10.345	-10.451	-0.106	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
BaH2BO3+	1.815e-12	1.319e-12	-11.741	-11.880	-0.139	(0)
BaOH+	4.400e-14	3.388e-14	-13.357	-13.470	-0.113	(0)
BaNO3+	1.112e-15	7.369e-16	-14.954	-15.133	-0.179	(0)
BaNH3+2	2.676e-16	5.157e-17	-15.573	-16.288	-0.715	(0)
C(4)	5.751e-04					
HCO3-	5.009e-04	3.886e-04	-3.300	-3.410	-0.110	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
MgHCO3+	1.995e-05	1.505e-05	-4.700	-4.822	-0.122	(0)
H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
MgCO3	4.645e-06	4.645e-06	-5.333	-5.333	0.000	(0)
NaHCO3	4.296e-06	4.296e-06	-5.367	-5.367	0.000	(0)
CO3-2	4.199e-06	1.475e-06	-5.377	-5.831	-0.454	(0)
UO2(CO3) 3-4	8.377e-07	1.156e-09	-6.077	-8.937	-2.860	(0)
NaCO3-	6.961e-07	5.400e-07	-6.157	-6.268	-0.110	(0)
ZnCO3	3.259e-07	3.259e-07	-6.487	-6.487	0.000	(0)
MnHCO3+	3.122e-07	2.404e-07	-6.506	-6.619	-0.113	(0)
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
UO2(CO3) 2-2	8.110e-08	1.563e-08	-7.091	-7.806	-0.715	(0)
ZnHCO3+	7.120e-08	4.718e-08	-7.148	-7.326	-0.179	(0)
Cu(CO3) 2-2	4.863e-09	9.372e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.662e-10	-8.998	-9.176	-0.179	(0)
UO2CO3	5.310e-10	5.310e-10	-9.275	-9.275	0.000	(0)
PbCO3	3.983e-10	3.983e-10	-9.400	-9.400	0.000	(0)
CdCO3	8.919e-11	8.919e-11	-10.050	-10.050	0.000	(0)
BaHCO3+	4.515e-11	3.540e-11	-10.345	-10.451	-0.106	(0)
PbHCO3+	3.914e-11	2.593e-11	-10.407	-10.586	-0.179	(0)
CoHCO3+	1.805e-11	1.196e-11	-10.743	-10.922	-0.179	(0)
CoCO3	9.869e-12	9.869e-12	-11.006	-11.006	0.000	(0)
Pb(CO3) 2-2	8.793e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
BaCO3	7.216e-12	7.216e-12	-11.142	-11.142	0.000	(0)
NiHCO3+	6.697e-12	4.437e-12	-11.174	-11.353	-0.179	(0)
NiCO3	5.098e-12	5.098e-12	-11.293	-11.293	0.000	(0)
CdHCO3+	3.542e-12	2.347e-12	-11.451	-11.630	-0.179	(0)
Cd(CO3) 2-2	5.061e-13	9.754e-14	-12.296	-13.011	-0.715	(0)
HgCO3	9.766e-15	9.766e-15	-14.010	-14.010	0.000	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.674	-0.106	(0)
Hg(CO3) 2-2	2.364e-16	4.556e-17	-15.626	-16.341	-0.715	(0)
HgHCO3+	3.389e-18	2.246e-18	-17.470	-17.649	-0.179	(0)
Ca	1.206e-02					
Ca+2	6.389e-03	2.244e-03	-2.195	-2.649	-0.454	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
CaHCO3+	2.072e-05	1.624e-05	-4.684	-4.789	-0.106	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	3.776e-06	2.908e-06	-5.423	-5.536	-0.113	(0)
CaH2BO3+	7.954e-07	5.778e-07	-6.099	-6.238	-0.139	(0)
CaOH+	4.649e-08	3.645e-08	-7.333	-7.438	-0.106	(0)
CaNO3+	1.651e-10	1.094e-10	-9.782	-9.961	-0.179	(0)
CaNH3+2	1.256e-10	2.421e-11	-9.901	-10.616	-0.715	(0)
Ca(NH3) 2+2	4.286e-19	8.260e-20	-18.368	-19.083	-0.715	(0)
Cd	2.233e-08					

Cd+2	7.549e-09	2.652e-09	-8.122	-8.576	-0.454	(0)
CdSO4	6.826e-09	6.826e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.246e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CdCl+	2.486e-09	1.647e-09	-8.604	-8.783	-0.179	(0)
CdCO3	8.919e-11	8.919e-11	-10.050	-10.050	0.000	(0)
CdOHC1	5.499e-11	5.499e-11	-10.260	-10.260	0.000	(0)
CdCl2	4.467e-11	4.467e-11	-10.350	-10.350	0.000	(0)
CdOH+	2.588e-11	1.715e-11	-10.587	-10.766	-0.179	(0)
CdF+	7.531e-12	4.990e-12	-11.123	-11.302	-0.179	(0)
CdHCO3+	3.542e-12	2.347e-12	-11.451	-11.630	-0.179	(0)
Cd (CO3) 2-2	5.061e-13	9.754e-14	-12.296	-13.011	-0.715	(0)
CdCl3-	2.766e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
Cd (OH) 2	8.804e-14	8.804e-14	-13.055	-13.055	0.000	(0)
CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
CdNO3+	1.951e-16	1.293e-16	-15.710	-15.888	-0.179	(0)
CdSeO4	1.647e-16	1.647e-16	-15.783	-15.783	0.000	(0)
Cd (SeO3) 2-2	6.718e-17	1.295e-17	-16.173	-16.888	-0.715	(0)
Cd2OH+3	9.261e-18	2.279e-19	-17.033	-18.642	-1.609	(0)
Cd (OH) 3-	6.606e-18	4.377e-18	-17.180	-17.359	-0.179	(0)
Cd (OH) 4-2	3.025e-24	5.831e-25	-23.519	-24.234	-0.715	(0)
Cd (NO3) 2	9.989e-25	9.989e-25	-24.000	-24.000	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
C1	8.448e-03					
C1-	8.448e-03	6.504e-03	-2.073	-2.187	-0.114	(0)
MnCl+	3.296e-07	2.539e-07	-6.482	-6.595	-0.113	(0)
ZnCl+	8.313e-08	6.272e-08	-7.080	-7.203	-0.122	(0)
ZnOHC1	6.682e-08	6.682e-08	-7.175	-7.175	0.000	(0)
CuCl2-	2.682e-09	2.023e-09	-8.572	-8.694	-0.122	(0)
CdCl+	2.486e-09	1.647e-09	-8.604	-8.783	-0.179	(0)
MnCl2	2.332e-09	2.332e-09	-8.632	-8.632	0.000	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)
ZnCl2	6.465e-10	6.465e-10	-9.189	-9.189	0.000	(0)
CuCl+	3.712e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CdOHC1	5.499e-11	5.499e-11	-10.260	-10.260	0.000	(0)
HgClOH	5.170e-11	5.170e-11	-10.286	-10.286	0.000	(0)
CdCl2	4.467e-11	4.467e-11	-10.350	-10.350	0.000	(0)
PbCl+	3.128e-11	2.073e-11	-10.505	-10.684	-0.179	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
CoCl+	1.344e-11	8.903e-12	-10.872	-11.050	-0.179	(0)
CuCl3-2	7.998e-12	2.813e-12	-11.097	-11.551	-0.454	(0)
MnCl3-	5.425e-12	4.178e-12	-11.266	-11.379	-0.113	(0)
ZnCl3-	4.427e-12	3.340e-12	-11.354	-11.476	-0.122	(0)
NiCl+	2.326e-12	1.541e-12	-11.633	-11.812	-0.179	(0)
HgCl3-	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
CuCl2	6.316e-13	6.316e-13	-12.200	-12.200	0.000	(0)
PbCl2	6.021e-13	6.021e-13	-12.220	-12.220	0.000	(0)
CdCl3-	2.766e-13	1.833e-13	-12.558	-12.737	-0.179	(0)
HgCl4-2	2.045e-13	3.940e-14	-12.689	-13.404	-0.715	(0)
ZnCl4-2	3.088e-14	1.086e-14	-13.510	-13.964	-0.454	(0)
PbCl3-	2.353e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
UO2Cl+	1.439e-15	9.537e-16	-14.842	-15.021	-0.179	(0)
HgCl+	1.083e-15	7.178e-16	-14.965	-15.144	-0.179	(0)
CuCl3-	5.082e-17	3.834e-17	-16.294	-16.416	-0.122	(0)
NiCl2	5.047e-17	5.047e-17	-16.297	-16.297	0.000	(0)
PbCl4-2	2.405e-17	4.635e-18	-16.619	-17.334	-0.715	(0)
CrCl+2	4.961e-18	9.561e-19	-17.304	-18.020	-0.715	(0)
CrOHC12	9.618e-20	9.618e-20	-19.017	-19.017	0.000	(0)
CuCl4-2	3.553e-21	1.250e-21	-20.449	-20.903	-0.454	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
CrCl2+	8.905e-22	5.900e-22	-21.050	-21.229	-0.179	(0)
VOCl+	1.881e-22	1.246e-22	-21.726	-21.904	-0.179	(0)
FeCl2+	2.179e-23	1.678e-23	-22.662	-22.775	-0.113	(0)
CrO3Cl-	2.831e-26	1.876e-26	-25.548	-25.727	-0.179	(0)
FeCl3	1.091e-26	1.091e-26	-25.962	-25.962	0.000	(0)
CoCl+2	7.916e-37	1.526e-37	-36.101	-36.817	-0.715	(0)

UCl+3	0.000e+00	0.000e+00	-44.066	-45.675	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.484	-51.199	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.717	-52.432	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.266	-65.981	-0.715	(0)
Co (2)	2.974e-09					
Co+2	2.053e-09	3.957e-10	-8.688	-9.403	-0.715	(0)
CoSO4	8.668e-10	8.668e-10	-9.062	-9.062	0.000	(0)
CoHCO3+	1.805e-11	1.196e-11	-10.743	-10.922	-0.179	(0)
CoCl+	1.344e-11	8.903e-12	-10.872	-11.050	-0.179	(0)
CoCO3	9.869e-12	9.869e-12	-11.006	-11.006	0.000	(0)
CoOH+	9.698e-12	6.425e-12	-11.013	-11.192	-0.179	(0)
CoF+	2.242e-12	1.485e-12	-11.649	-11.828	-0.179	(0)
Co (OH) 2	4.154e-13	4.154e-13	-12.382	-12.382	0.000	(0)
CoNO2+	6.877e-14	4.556e-14	-13.163	-13.341	-0.179	(0)
Co (NH3) +2	2.115e-15	4.077e-16	-14.675	-15.390	-0.715	(0)
CoSeO4	6.612e-17	6.612e-17	-16.180	-16.180	0.000	(0)
CoNO3+	1.459e-17	9.668e-18	-16.836	-17.015	-0.179	(0)
Co (OH) 3-	1.018e-17	6.745e-18	-16.992	-17.171	-0.179	(0)
CoOOH-	2.559e-18	1.695e-18	-17.592	-17.771	-0.179	(0)
Co2OH+3	5.178e-21	1.274e-22	-20.286	-21.895	-1.609	(0)
Co (NH3) 2+2	7.733e-22	1.490e-22	-21.112	-21.827	-0.715	(0)
Co (OH) 4-2	4.514e-24	8.699e-25	-23.345	-24.061	-0.715	(0)
Co (NO3) 2	3.032e-25	3.032e-25	-24.518	-24.518	0.000	(0)
Co (NH3) 3+2	8.342e-29	1.608e-29	-28.079	-28.794	-0.715	(0)
Co4 (OH) 4+4	2.465e-34	3.401e-37	-33.608	-36.468	-2.860	(0)
Co (NH3) 4+2	3.752e-36	7.230e-37	-35.426	-36.141	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.273	-43.988	-0.715	(0)
Co (3)	2.474e-30					
CoOH+2	2.474e-30	4.768e-31	-29.607	-30.322	-0.715	(0)
Co+3	1.213e-36	1.153e-37	-35.916	-36.938	-1.022	(0)
CoCl+2	7.916e-37	1.526e-37	-36.101	-36.817	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.484	-51.199	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.266	-65.981	-0.715	(0)
Cr (2)	1.924e-27					
Cr+2	1.924e-27	3.708e-28	-26.716	-27.431	-0.715	(0)
Cr (3)	3.858e-10					
Cr (OH) 2+	3.022e-10	2.002e-10	-9.520	-9.698	-0.179	(0)
Cr (OH) 3	6.122e-11	6.122e-11	-10.213	-10.213	0.000	(0)
Cr (OH) +2	1.049e-11	2.022e-12	-10.979	-11.694	-0.715	(0)
CrOHSO4	5.269e-12	5.269e-12	-11.278	-11.278	0.000	(0)
CrO2-	3.560e-12	2.359e-12	-11.449	-11.627	-0.179	(0)
Cr (OH) 4-	2.993e-12	1.983e-12	-11.524	-11.703	-0.179	(0)
CrF+2	1.109e-14	2.137e-15	-13.955	-14.670	-0.715	(0)
Cr+3	4.615e-15	1.136e-16	-14.336	-15.945	-1.609	(0)
CrSO4+	4.395e-15	2.912e-15	-14.357	-14.536	-0.179	(0)
CrCl+2	4.961e-18	9.561e-19	-17.304	-18.020	-0.715	(0)
CrOHC12	9.618e-20	9.618e-20	-19.017	-19.017	0.000	(0)
Cr2 (OH) 2SO4+2	4.997e-21	9.630e-22	-20.301	-21.016	-0.715	(0)
CrCl2+	8.905e-22	5.900e-22	-21.050	-21.229	-0.179	(0)
Cr2 (OH) 2 (SO4) 2	6.280e-22	6.280e-22	-21.202	-21.202	0.000	(0)
CrNO3+2	3.971e-25	7.653e-26	-24.401	-25.116	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.282	-41.997	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.738	-51.347	-1.609	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.717	-52.432	-0.715	(0)
Cr (6)	2.888e-15					
CrO4-2	2.640e-15	9.274e-16	-14.578	-15.033	-0.454	(0)
NaCrO4-	1.367e-16	9.060e-17	-15.864	-16.043	-0.179	(0)
HCrO4-	5.593e-17	3.706e-17	-16.252	-16.431	-0.179	(0)
KCrO4-	5.577e-17	3.695e-17	-16.254	-16.432	-0.179	(0)
CrO3SO4-2	7.956e-24	1.533e-24	-23.099	-23.814	-0.715	(0)
H2CrO4	3.710e-25	3.710e-25	-24.431	-24.431	0.000	(0)
CrO3Cl-	2.831e-26	1.876e-26	-25.548	-25.727	-0.179	(0)
Cr2O7-2	2.476e-31	4.772e-32	-30.606	-31.321	-0.715	(0)
Cu (1)	4.453e-09					
CuCl2-	2.682e-09	2.023e-09	-8.572	-8.694	-0.122	(0)
CuCl	1.489e-09	1.489e-09	-8.827	-8.827	0.000	(0)

Cu+	2.744e-10	1.818e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	7.998e-12	2.813e-12	-11.097	-11.551	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu (2)	4.937e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.268e-08	6.992e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.733e-08	2.717e-08	-7.112	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.863e-09	9.372e-10	-8.313	-9.028	-0.715	(0)
CuHCO3+	1.005e-09	6.662e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.372e-10	1.228e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.712e-10	2.801e-10	-9.430	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
CuNO2+	7.016e-11	4.649e-11	-10.154	-10.333	-0.179	(0)
Cu (OH) 3-	2.860e-11	1.895e-11	-10.544	-10.722	-0.179	(0)
CuNH3+2	1.236e-11	2.382e-12	-10.908	-11.623	-0.715	(0)
CuCl2	6.316e-13	6.316e-13	-12.200	-12.200	0.000	(0)
Cu (NO2) 2	7.772e-15	7.772e-15	-14.109	-14.109	0.000	(0)
CuNO3+	1.999e-15	1.324e-15	-14.699	-14.878	-0.179	(0)
Cu (OH) 4-2	6.298e-16	1.214e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.082e-17	3.834e-17	-16.294	-16.416	-0.122	(0)
CuCl4-2	3.553e-21	1.250e-21	-20.449	-20.903	-0.454	(0)
Cu (NO3) 2	2.570e-24	2.570e-24	-23.590	-23.590	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.257e-04					
F-	1.542e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.611e-05	5.041e-05	-4.180	-4.297	-0.118	(0)
CaF+	3.776e-06	2.908e-06	-5.423	-5.536	-0.113	(0)
NaF	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)
MnF+	1.902e-07	1.465e-07	-6.721	-6.834	-0.113	(0)
ZnF+	1.372e-08	9.092e-09	-7.863	-8.041	-0.179	(0)
BF (OH) 3-	6.202e-09	4.505e-09	-8.207	-8.346	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.022e-10	4.022e-10	-9.396	-9.396	0.000	(0)
AlF2+	3.469e-10	2.692e-10	-9.460	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.572e-11	5.696e-12	-10.804	-11.244	-0.441	(0)
CdF+	7.531e-12	4.990e-12	-11.123	-11.302	-0.179	(0)
CoF+	2.242e-12	1.485e-12	-11.649	-11.828	-0.179	(0)
UO2F+	2.236e-12	1.481e-12	-11.651	-11.829	-0.179	(0)
HF2-	1.312e-12	9.784e-13	-11.882	-12.009	-0.127	(0)
PbF+	1.134e-12	7.512e-13	-11.945	-12.124	-0.179	(0)
BF2 (OH) 2-	9.738e-13	7.074e-13	-12.012	-12.150	-0.139	(0)
UO2F2	5.071e-13	5.071e-13	-12.295	-12.295	0.000	(0)
NiF+	4.168e-13	2.761e-13	-12.380	-12.559	-0.179	(0)
UO2F3-	2.282e-14	1.512e-14	-13.642	-13.820	-0.179	(0)
CrF+2	1.109e-14	2.137e-15	-13.955	-14.670	-0.715	(0)
PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)
CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
UO2F4-2	7.397e-17	1.426e-17	-16.131	-16.846	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	8.513e-18	8.513e-18	-17.070	-17.070	0.000	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.827e-19	-17.963	-18.417	-0.454	(0)
PbF3-	5.962e-19	3.950e-19	-18.225	-18.403	-0.179	(0)
BF3OH-	5.564e-19	4.042e-19	-18.255	-18.393	-0.139	(0)
VO2F2-	5.537e-19	3.669e-19	-18.257	-18.435	-0.179	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	7.338e-21	4.862e-21	-20.134	-20.313	-0.179	(0)
VO2F3-2	2.819e-21	5.432e-22	-20.550	-21.265	-0.715	(0)
VOF2	2.164e-22	2.164e-22	-21.665	-21.665	0.000	(0)
PbF4-2	1.165e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.673e-23	2.434e-23	-22.435	-22.614	-0.179	(0)
BF4-	4.021e-24	2.921e-24	-23.396	-23.535	-0.139	(0)
VOF3-	1.375e-24	9.114e-25	-23.862	-24.040	-0.179	(0)

VO2F4-3	1.289e-24	3.173e-26	-23.890	-25.499	-1.609	(0)
Sb(OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
VOF4-2	2.266e-27	4.367e-28	-26.645	-27.360	-0.715	(0)
UF3+	6.512e-36	4.315e-36	-35.186	-35.365	-0.179	(0)
UF2+2	1.190e-36	2.294e-37	-35.924	-36.639	-0.715	(0)
UF4	5.616e-38	5.616e-38	-37.251	-37.251	0.000	(0)
UF+3	6.237e-39	1.535e-40	-38.205	-39.814	-1.609	(0)
UF5-	3.987e-40	2.641e-40	-39.399	-39.578	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.309	-41.024	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.325e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.401e-14	-13.740	-13.853	-0.113	(0)
FeHCO3+	2.699e-15	2.116e-15	-14.569	-14.674	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.027e-18	2.331e-18	-17.519	-17.632	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.305e-10	4.892e-10	-9.200	-9.311	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.176e-11	3.240e-11	-10.379	-10.489	-0.110	(0)
FeOH+2	4.393e-15	1.545e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.088e-18	3.827e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.704e-19	3.622e-19	-18.328	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
Fe+3	3.094e-20	2.941e-21	-19.509	-20.532	-1.022	(0)
FeCl+2	1.642e-21	5.776e-22	-20.785	-21.238	-0.454	(0)
FeCl2+	2.179e-23	1.678e-23	-22.662	-22.775	-0.113	(0)
FeHSeO3+2	9.625e-24	1.855e-24	-23.017	-23.732	-0.715	(0)
Fe2 (OH) 2+4	5.730e-26	7.905e-29	-25.242	-28.102	-2.860	(0)
FeCl3	1.091e-26	1.091e-26	-25.962	-25.962	0.000	(0)
FeNO3+2	2.352e-27	4.533e-28	-26.629	-27.344	-0.715	(0)
Fe3 (OH) 4+5	1.646e-32	5.590e-37	-31.784	-36.253	-4.469	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.533e-09					
Hg	9.533e-09	9.533e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.715e-19					
Hg2+2	1.857e-19	3.580e-20	-18.731	-19.446	-0.715	(0)
Hg (2)	1.001e-10					
HgClOH	5.170e-11	5.170e-11	-10.286	-10.286	0.000	(0)
HgCl2	2.340e-11	2.340e-11	-10.631	-10.631	0.000	(0)
Hg (OH) 2	2.247e-11	2.311e-11	-10.648	-10.636	0.012	(0)
HgCl3-	2.297e-12	1.522e-12	-11.639	-11.818	-0.179	(0)
HgCl4-2	2.045e-13	3.940e-14	-12.689	-13.404	-0.715	(0)
HgCO3	9.766e-15	9.766e-15	-14.010	-14.010	0.000	(0)
HgCl+	1.083e-15	7.178e-16	-14.965	-15.144	-0.179	(0)
HgOH+	2.705e-16	1.792e-16	-15.568	-15.747	-0.179	(0)
Hg (CO3) 2-2	2.364e-16	4.556e-17	-15.626	-16.341	-0.715	(0)
Hg (OH) 3-	3.574e-18	2.368e-18	-17.447	-17.626	-0.179	(0)
HgHCO3+	3.389e-18	2.246e-18	-17.470	-17.649	-0.179	(0)
Hg (NH3) 2+2	1.330e-18	2.563e-19	-17.876	-18.591	-0.715	(0)
HgNH3+2	1.552e-19	2.991e-20	-18.809	-19.524	-0.715	(0)
Hg+2	2.870e-20	5.531e-21	-19.542	-20.257	-0.715	(0)
HgSO4	1.590e-20	1.590e-20	-19.799	-19.799	0.000	(0)
HgF+	3.673e-23	2.434e-23	-22.435	-22.614	-0.179	(0)
Hg (NH3) 3+2	4.536e-26	8.743e-27	-25.343	-26.058	-0.715	(0)
HgNO3+	4.752e-29	3.148e-29	-28.323	-28.502	-0.179	(0)
Hg (NH3) 4+2	3.088e-33	5.951e-34	-32.510	-33.225	-0.715	(0)
Hg (NO3) 2	2.017e-37	2.017e-37	-36.695	-36.695	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
K	1.500e-02					

K+	1.393e-02	1.072e-02	-1.856	-1.970	-0.114	(0)
KSO4-	1.074e-03	8.335e-04	-2.969	-3.079	-0.110	(0)
KCrO4-	5.577e-17	3.695e-17	-16.254	-16.432	-0.179	(0)
Mg	1.843e-02					
Mg+2	1.077e-02	3.785e-03	-1.968	-2.422	-0.454	(0)
MgSO4	7.562e-03	7.562e-03	-2.121	-2.121	0.000	(0)
MgF+	6.611e-05	5.041e-05	-4.180	-4.297	-0.118	(0)
MgHCO3+	1.995e-05	1.505e-05	-4.700	-4.822	-0.122	(0)
MgCO3	4.645e-06	4.645e-06	-5.333	-5.333	0.000	(0)
MgOH+	1.552e-06	1.226e-06	-5.809	-5.911	-0.102	(0)
MgH2BO3+	8.082e-07	5.871e-07	-6.092	-6.231	-0.139	(0)
Mn (2)	2.223e-04					
Mn+2	1.609e-04	3.100e-05	-3.794	-4.509	-0.715	(0)
MnSO4	6.053e-05	6.053e-05	-4.218	-4.218	0.000	(0)
MnCl+	3.296e-07	2.539e-07	-6.482	-6.595	-0.113	(0)
MnHCO3+	3.122e-07	2.404e-07	-6.506	-6.619	-0.113	(0)
MnF+	1.902e-07	1.465e-07	-6.721	-6.834	-0.113	(0)
MnOH+	8.230e-08	6.338e-08	-7.085	-7.198	-0.113	(0)
MnCl2	2.332e-09	2.332e-09	-8.632	-8.632	0.000	(0)
MnCl3-	5.425e-12	4.178e-12	-11.266	-11.379	-0.113	(0)
MnSeO4	2.782e-12	2.782e-12	-11.556	-11.556	0.000	(0)
MnNO3+	1.143e-12	7.575e-13	-11.942	-12.121	-0.179	(0)
Mn (OH) 3-	3.369e-16	2.594e-16	-15.473	-15.586	-0.113	(0)
Mn (NO3) 2	2.933e-20	2.933e-20	-19.533	-19.533	0.000	(0)
Mn (OH) 4-2	1.938e-21	6.816e-22	-20.713	-21.166	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
Mn (3)	1.067e-24					
Mn+3	1.067e-24	1.014e-25	-23.972	-24.994	-1.022	(0)
Mn (6)	1.755e-40					
MnO4-2	1.755e-40	0.000e+00	-39.756	-40.209	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.584	-44.717	-0.133	(0)
Mo	7.604e-06					
MoO4-2	7.603e-06	2.671e-06	-5.119	-5.573	-0.454	(0)
HMoO4-	9.906e-10	6.563e-10	-9.004	-9.183	-0.179	(0)
H2MoO4	5.937e-14	5.937e-14	-13.226	-13.226	0.000	(0)
AlMo6O21-3	2.483e-39	0.000e+00	-38.605	-40.214	-1.609	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.851	-49.287	-6.436	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.339	-50.808	-4.469	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.074	-53.935	-2.860	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.988	-58.597	-1.609	(0)
N (-3)	2.926e-07					
NH4+	2.555e-07	1.856e-07	-6.593	-6.731	-0.139	(0)
NH4SO4-	2.835e-08	2.183e-08	-7.547	-7.661	-0.113	(0)
NH3	8.569e-09	8.569e-09	-8.067	-8.067	0.000	(0)
CaNH3+2	1.256e-10	2.421e-11	-9.901	-10.616	-0.715	(0)
CuNH3+2	1.236e-11	2.382e-12	-10.908	-11.623	-0.715	(0)
NiNH3+2	2.211e-15	4.262e-16	-14.655	-15.370	-0.715	(0)
Co (NH3) +2	2.115e-15	4.077e-16	-14.675	-15.390	-0.715	(0)
BaNH3+2	2.676e-16	5.157e-17	-15.573	-16.288	-0.715	(0)
Hg (NH3) 2+2	1.330e-18	2.563e-19	-17.876	-18.591	-0.715	(0)
Ca (NH3) 2+2	4.286e-19	8.260e-20	-18.368	-19.083	-0.715	(0)
HgNH3+2	1.552e-19	2.991e-20	-18.809	-19.524	-0.715	(0)
Ni (NH3) 2+2	2.739e-21	5.279e-22	-20.562	-21.277	-0.715	(0)
Co (NH3) 2+2	7.733e-22	1.490e-22	-21.112	-21.827	-0.715	(0)
Hg (NH3) 3+2	4.536e-26	8.743e-27	-25.343	-26.058	-0.715	(0)
Co (NH3) 3+2	8.342e-29	1.608e-29	-28.079	-28.794	-0.715	(0)
Hg (NH3) 4+2	3.088e-33	5.951e-34	-32.510	-33.225	-0.715	(0)
Co (NH3) 4+2	3.752e-36	7.230e-37	-35.426	-36.141	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.282	-41.997	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.273	-43.988	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.738	-51.347	-1.609	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.484	-51.199	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.717	-52.432	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.969	-65.684	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.266	-65.981	-0.715	(0)
N (3)	2.219e-05					

	NO2-	2.219e-05	1.634e-05	-4.654	-4.787	-0.133	(0)
	CuNO2+	7.016e-11	4.649e-11	-10.154	-10.333	-0.179	(0)
	CoNO2+	6.877e-14	4.556e-14	-13.163	-13.341	-0.179	(0)
	Cu (NO2) 2	7.772e-15	7.772e-15	-14.109	-14.109	0.000	(0)
N (5)		2.019e-08					
	NO3-	2.002e-08	1.541e-08	-7.698	-7.812	-0.114	(0)
	CaNO3+	1.651e-10	1.094e-10	-9.782	-9.961	-0.179	(0)
	MnNO3+	1.143e-12	7.575e-13	-11.942	-12.121	-0.179	(0)
	ZnNO3+	2.243e-13	1.486e-13	-12.649	-12.828	-0.179	(0)
	CuNO3+	1.999e-15	1.324e-15	-14.699	-14.878	-0.179	(0)
	BaNO3+	1.112e-15	7.369e-16	-14.954	-15.133	-0.179	(0)
	CdNO3+	1.951e-16	1.293e-16	-15.710	-15.888	-0.179	(0)
	PbNO3+	3.090e-17	2.048e-17	-16.510	-16.689	-0.179	(0)
	CoNO3+	1.459e-17	9.668e-18	-16.836	-17.015	-0.179	(0)
	NiNO3+	5.412e-18	3.586e-18	-17.267	-17.445	-0.179	(0)
	Mn (NO3) 2	2.933e-20	2.933e-20	-19.533	-19.533	0.000	(0)
	UO2NO3+	4.197e-21	2.781e-21	-20.377	-20.556	-0.179	(0)
	Zn (NO3) 2	4.572e-22	4.572e-22	-21.340	-21.340	0.000	(0)
	Cu (NO3) 2	2.570e-24	2.570e-24	-23.590	-23.590	0.000	(0)
	Cd (NO3) 2	9.989e-25	9.989e-25	-24.000	-24.000	0.000	(0)
	Pb (NO3) 2	5.361e-25	5.361e-25	-24.271	-24.271	0.000	(0)
	CrNO3+2	3.971e-25	7.653e-26	-24.401	-25.116	-0.715	(0)
	VO2NO3	3.189e-25	3.189e-25	-24.496	-24.496	0.000	(0)
	Co (NO3) 2	3.032e-25	3.032e-25	-24.518	-24.518	0.000	(0)
	FeNO3+2	2.352e-27	4.533e-28	-26.629	-27.344	-0.715	(0)
	HgNO3+	4.752e-29	3.148e-29	-28.323	-28.502	-0.179	(0)
	Hg (NO3) 2	2.017e-37	2.017e-37	-36.695	-36.695	0.000	(0)
Na		2.703e-02					
	Na+	2.553e-02	1.966e-02	-1.593	-1.706	-0.114	(0)
	NaSO4-	1.494e-03	1.159e-03	-2.826	-2.936	-0.110	(0)
	NaHCO3	4.296e-06	4.296e-06	-5.367	-5.367	0.000	(0)
	NaF	1.472e-06	1.472e-06	-5.832	-5.832	0.000	(0)
	NaCO3-	6.961e-07	5.400e-07	-6.157	-6.268	-0.110	(0)
	NaH2BO3	1.394e-07	1.394e-07	-6.856	-6.856	0.000	(0)
	NaCrO4-	1.367e-16	9.060e-17	-15.864	-16.043	-0.179	(0)
Ni		4.829e-10					
	Ni+2	2.636e-10	9.261e-11	-9.579	-10.033	-0.454	(0)
	NiSO4	2.029e-10	2.029e-10	-9.693	-9.693	0.000	(0)
	NiHCO3+	6.697e-12	4.437e-12	-11.174	-11.353	-0.179	(0)
	NiCO3	5.098e-12	5.098e-12	-11.293	-11.293	0.000	(0)
	NiCl+	2.326e-12	1.541e-12	-11.633	-11.812	-0.179	(0)
	NiOH+	1.432e-12	9.488e-13	-11.844	-12.023	-0.179	(0)
	NiF+	4.168e-13	2.761e-13	-12.380	-12.559	-0.179	(0)
	Ni (SO4) 2-2	3.827e-13	7.376e-14	-12.417	-13.132	-0.715	(0)
	Ni (OH) 2	6.134e-14	6.134e-14	-13.212	-13.212	0.000	(0)
	NiNH3+2	2.211e-15	4.262e-16	-14.655	-15.370	-0.715	(0)
	Ni (OH) 3-	7.534e-17	4.992e-17	-16.123	-16.302	-0.179	(0)
	NiCl2	5.047e-17	5.047e-17	-16.297	-16.297	0.000	(0)
	NiSeO4	1.444e-17	1.444e-17	-16.840	-16.840	0.000	(0)
	NiNO3+	5.412e-18	3.586e-18	-17.267	-17.445	-0.179	(0)
	Ni (NH3) 2+2	2.739e-21	5.279e-22	-20.562	-21.277	-0.715	(0)
O (0)		2.416e-35					
	O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb		1.665e-09					
	PbSO4	4.829e-10	4.829e-10	-9.316	-9.316	0.000	(0)
	PbCO3	3.983e-10	3.983e-10	-9.400	-9.400	0.000	(0)
	PbOH+	2.771e-10	1.836e-10	-9.557	-9.736	-0.179	(0)
	Pb+2	2.556e-10	8.981e-11	-9.592	-10.047	-0.454	(0)
	Pb (SO4) 2-2	1.658e-10	3.195e-11	-9.781	-10.496	-0.715	(0)
	PbHCO3+	3.914e-11	2.593e-11	-10.407	-10.586	-0.179	(0)
	PbCl+	3.128e-11	2.073e-11	-10.505	-10.684	-0.179	(0)
	Pb (CO3) 2-2	8.793e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
	Pb (OH) 2	4.725e-12	4.725e-12	-11.326	-11.326	0.000	(0)
	PbF+	1.134e-12	7.512e-13	-11.945	-12.124	-0.179	(0)
	PbCl2	6.021e-13	6.021e-13	-12.220	-12.220	0.000	(0)
	Pb (OH) 3-	5.803e-15	3.845e-15	-14.236	-14.415	-0.179	(0)
	PbCl3-	2.353e-15	1.559e-15	-14.628	-14.807	-0.179	(0)
	PbF2	1.755e-15	1.755e-15	-14.756	-14.756	0.000	(0)

PbNO3+	3.090e-17	2.048e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.405e-17	4.635e-18	-16.619	-17.334	-0.715	(0)
Pb2OH+3	1.062e-17	2.613e-19	-16.974	-18.583	-1.609	(0)
Pb(OH) 4-2	3.976e-18	7.663e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.962e-19	3.950e-19	-18.225	-18.403	-0.179	(0)
Pb3(OH) 4+2	2.075e-22	4.000e-23	-21.683	-22.398	-0.715	(0)
PbF4-2	1.165e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
Pb(NO3) 2	5.361e-25	5.361e-25	-24.271	-24.271	0.000	(0)
Pb4(OH) 4+4	2.068e-26	2.854e-29	-25.684	-28.545	-2.860	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
S(-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.128	-79.843	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.644	-80.359	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.724	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.530	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.546	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.324	-87.778	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.015	-137.194	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.279	-137.994	-0.715	(0)
Hg(HS) 2	0.000e+00	0.000e+00	-138.708	-138.708	0.000	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.292	-147.471	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.138	-150.138	0.000	(0)
Pb(HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.297	-224.476	-0.179	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Pb(HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.853	-318.568	-0.715	(0)
S(6)	4.710e-02					
SO4-2	3.125e-02	1.098e-02	-1.505	-1.959	-0.454	(0)
MgSO4	7.562e-03	7.562e-03	-2.121	-2.121	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.494e-03	1.159e-03	-2.826	-2.936	-0.110	(0)
KSO4-	1.074e-03	8.335e-04	-2.969	-3.079	-0.110	(0)
MnSO4	6.053e-05	6.053e-05	-4.218	-4.218	0.000	(0)
ZnSO4	9.221e-06	9.221e-06	-5.035	-5.035	0.000	(0)
Zn(SO4) 2-2	4.575e-06	8.817e-07	-5.340	-6.055	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.835e-08	2.183e-08	-7.547	-7.661	-0.113	(0)
HSO4-	1.738e-08	1.325e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.826e-09	6.826e-09	-8.166	-8.166	0.000	(0)
Cd(SO4) 2-2	5.246e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CoSO4	8.668e-10	8.668e-10	-9.062	-9.062	0.000	(0)
PbSO4	4.829e-10	4.829e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.029e-10	2.029e-10	-9.693	-9.693	0.000	(0)
Pb(SO4) 2-2	1.658e-10	3.195e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	5.269e-12	5.269e-12	-11.278	-11.278	0.000	(0)
UO2SO4	1.502e-12	1.502e-12	-11.823	-11.823	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2(SO4) 2-2	1.128e-12	2.174e-13	-11.948	-12.663	-0.715	(0)
AlSO4+	5.363e-13	4.090e-13	-12.271	-12.388	-0.118	(0)
Ni(SO4) 2-2	3.827e-13	7.376e-14	-12.417	-13.132	-0.715	(0)
Al(SO4) 2-	6.310e-14	4.811e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	4.395e-15	2.912e-15	-14.357	-14.536	-0.179	(0)
VO2SO4-	1.618e-17	1.072e-17	-16.791	-16.970	-0.179	(0)
FeSO4+	4.704e-19	3.622e-19	-18.328	-18.441	-0.113	(0)

Fe (SO4) 2-	1.283e-19	8.503e-20	-18.892	-19.070	-0.179	(0)
VOSO4	2.065e-20	2.065e-20	-19.685	-19.685	0.000	(0)
HgSO4	1.590e-20	1.590e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2SO4+2	4.997e-21	9.630e-22	-20.301	-21.016	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	6.280e-22	6.280e-22	-21.202	-21.202	0.000	(0)
CrO3SO4-2	7.956e-24	1.533e-24	-23.099	-23.814	-0.715	(0)
VSO4+	5.539e-35	3.670e-35	-34.257	-34.435	-0.179	(0)
U (SO4) 2	2.470e-39	2.470e-39	-38.607	-38.607	0.000	(0)
USO4+2	1.470e-40	0.000e+00	-39.833	-40.548	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.650	-60.829	-0.179	(0)
Sb (3)	9.929e-20					
Sb (OH) 3	5.019e-20	5.019e-20	-19.299	-19.299	0.000	(0)
HSbO2	4.908e-20	4.908e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.716e-24	6.437e-24	-23.013	-23.191	-0.179	(0)
Sb (OH) 4-	5.546e-24	3.675e-24	-23.256	-23.435	-0.179	(0)
Sb (OH) 2F	1.151e-25	1.151e-25	-24.939	-24.939	0.000	(0)
SbOF	1.134e-25	1.134e-25	-24.945	-24.945	0.000	(0)
Sb (OH) 2+	2.276e-26	1.508e-26	-25.643	-25.822	-0.179	(0)
SbO+	7.861e-27	5.209e-27	-26.105	-26.283	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.853	-318.568	-0.715	(0)
Sb (5)	9.028e-08					
SbO3-	9.019e-08	5.976e-08	-7.045	-7.224	-0.179	(0)
Sb (OH) 6-	9.027e-11	6.950e-11	-10.044	-10.158	-0.114	(0)
SbO2+	3.953e-24	2.619e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.062e-39					
HSe-	6.062e-39	4.016e-39	-38.217	-38.396	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.381	-40.381	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.415	-42.415	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.773	-45.488	-0.715	(0)
Se (4)	7.597e-07					
SeO3-2	3.993e-07	7.696e-08	-6.399	-7.114	-0.715	(0)
HSeO3-	3.603e-07	2.387e-07	-6.443	-6.622	-0.179	(0)
H2SeO3	1.258e-12	1.258e-12	-11.900	-11.900	0.000	(0)
Cd (SeO3) 2-2	6.718e-17	1.295e-17	-16.173	-16.888	-0.715	(0)
FeHSeO3+2	9.625e-24	1.855e-24	-23.017	-23.732	-0.715	(0)
Se (6)	9.520e-10					
SeO4-2	9.490e-10	3.334e-10	-9.023	-9.477	-0.454	(0)
MnSeO4	2.782e-12	2.782e-12	-11.556	-11.556	0.000	(0)
ZnSeO4	1.982e-13	1.982e-13	-12.703	-12.703	0.000	(0)
HSeO4-	3.115e-16	2.064e-16	-15.507	-15.685	-0.179	(0)
CdSeO4	1.647e-16	1.647e-16	-15.783	-15.783	0.000	(0)
CoSeO4	6.612e-17	6.612e-17	-16.180	-16.180	0.000	(0)
NiSeO4	1.444e-17	1.444e-17	-16.840	-16.840	0.000	(0)
Zn (SeO4) 2-2	3.477e-22	6.702e-23	-21.459	-22.174	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.240	-58.849	-1.609	(0)
U (4)	2.560e-19					
U (OH) 5-	2.559e-19	1.695e-19	-18.592	-18.771	-0.179	(0)
U (OH) 4	8.785e-23	8.785e-23	-22.056	-22.056	0.000	(0)
U (OH) 3+	5.997e-27	3.974e-27	-26.222	-26.401	-0.179	(0)
U (OH) 2+2	1.180e-31	2.273e-32	-30.928	-31.643	-0.715	(0)
UF3+	6.512e-36	4.315e-36	-35.186	-35.365	-0.179	(0)
UF2+2	1.190e-36	2.294e-37	-35.924	-36.639	-0.715	(0)
UOH+3	5.383e-37	1.325e-38	-36.269	-37.878	-1.609	(0)
UF4	5.616e-38	5.616e-38	-37.251	-37.251	0.000	(0)
UF+3	6.237e-39	1.535e-40	-38.205	-39.814	-1.609	(0)
U (SO4) 2	2.470e-39	2.470e-39	-38.607	-38.607	0.000	(0)
UF5-	3.987e-40	2.641e-40	-39.399	-39.578	-0.179	(0)
USO4+2	1.470e-40	0.000e+00	-39.833	-40.548	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.309	-41.024	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.328	-45.188	-2.860	(0)
UCl+3	0.000e+00	0.000e+00	-44.066	-45.675	-1.609	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.192	-169.672	-14.480	(0)
U (5)	1.137e-15					
UO2+	1.137e-15	7.530e-16	-14.944	-15.123	-0.179	(0)
U (6)	9.194e-07					
UO2 (CO3) 3-4	8.377e-07	1.156e-09	-6.077	-8.937	-2.860	(0)
UO2 (CO3) 2-2	8.110e-08	1.563e-08	-7.091	-7.806	-0.715	(0)

UO2CO3	5.310e-10	5.310e-10	-9.275	-9.275	0.000	(0)
UO2OH+	1.398e-11	9.263e-12	-10.854	-11.033	-0.179	(0)
UO2F+	2.236e-12	1.481e-12	-11.651	-11.829	-0.179	(0)
UO2SO4	1.502e-12	1.502e-12	-11.823	-11.823	0.000	(0)
UO2 (SO4) 2-2	1.128e-12	2.174e-13	-11.948	-12.663	-0.715	(0)
UO2F2	5.071e-13	5.071e-13	-12.295	-12.295	0.000	(0)
UO2+2	2.573e-13	9.041e-14	-12.589	-13.044	-0.454	(0)
UO2F3-	2.282e-14	1.512e-14	-13.642	-13.820	-0.179	(0)
UO2Cl+	1.439e-15	9.537e-16	-14.842	-15.021	-0.179	(0)
(UO2) 3 (OH) 5+	1.000e-15	6.626e-16	-15.000	-15.179	-0.179	(0)
(UO2) 2 (OH) 2+2	7.388e-16	1.424e-16	-15.131	-15.847	-0.715	(0)
UO2F4-2	7.397e-17	1.426e-17	-16.131	-16.846	-0.715	(0)
UO2NO3+	4.197e-21	2.781e-21	-20.377	-20.556	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.725	-42.904	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.609	-44.324	-0.715	(0)
V (3)	3.079e-15					
V (OH) 3	3.079e-15	3.079e-15	-14.512	-14.512	0.000	(0)
V (OH) 2+	3.714e-26	2.461e-26	-25.430	-25.609	-0.179	(0)
VOH+2	1.498e-29	2.888e-30	-28.824	-29.539	-0.715	(0)
V+3	2.877e-34	7.081e-36	-33.541	-35.150	-1.609	(0)
VSO4+	5.539e-35	3.670e-35	-34.257	-34.435	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.088	-56.696	-1.609	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.419	-58.279	-2.860	(0)
V (4)	1.734e-18					
V (OH) 3+	1.670e-18	1.107e-18	-17.777	-17.956	-0.179	(0)
VO+2	3.543e-20	6.829e-21	-19.451	-20.166	-0.715	(0)
VOSO4	2.065e-20	2.065e-20	-19.685	-19.685	0.000	(0)
VOF+	7.338e-21	4.862e-21	-20.134	-20.313	-0.179	(0)
VOF2	2.164e-22	2.164e-22	-21.665	-21.665	0.000	(0)
VOCl+	1.881e-22	1.246e-22	-21.726	-21.904	-0.179	(0)
VOF3-	1.375e-24	9.114e-25	-23.862	-24.040	-0.179	(0)
VOF4-2	2.266e-27	4.367e-28	-26.645	-27.360	-0.715	(0)
H2V2O4+2	3.198e-31	6.163e-32	-30.495	-31.210	-0.715	(0)
V (5)	3.434e-08					
H2VO4-	2.021e-08	1.339e-08	-7.695	-7.873	-0.179	(0)
HVO4-2	1.413e-08	2.723e-09	-7.850	-8.565	-0.715	(0)
H3VO4	1.653e-12	1.653e-12	-11.782	-11.782	0.000	(0)
HV2O7-3	5.029e-13	1.238e-14	-12.299	-13.907	-1.609	(0)
H3V2O7-	2.161e-13	1.432e-13	-12.665	-12.844	-0.179	(0)
VO4-3	4.491e-14	1.105e-15	-13.348	-14.957	-1.609	(0)
V2O7-4	1.955e-14	2.698e-17	-13.709	-16.569	-2.860	(0)
V3O9-3	1.027e-16	2.527e-18	-15.988	-17.597	-1.609	(0)
VO2+	5.312e-17	4.089e-17	-16.275	-16.388	-0.114	(0)
VO2SO4-	1.618e-17	1.072e-17	-16.791	-16.970	-0.179	(0)
VO2F	8.513e-18	8.513e-18	-17.070	-17.070	0.000	(0)
VO2F2-	5.537e-19	3.669e-19	-18.257	-18.435	-0.179	(0)
V4O12-4	1.024e-20	1.413e-23	-19.990	-22.850	-2.860	(0)
VO2F3-2	2.819e-21	5.432e-22	-20.550	-21.265	-0.715	(0)
VO2F4-3	1.289e-24	3.173e-26	-23.890	-25.499	-1.609	(0)
VO2NO3	3.189e-25	3.189e-25	-24.496	-24.496	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.015	-61.451	-6.436	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.703	-61.172	-4.469	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.013	-63.873	-2.860	(0)
Zn	2.580e-05					
Zn+2	1.093e-05	3.839e-06	-4.962	-5.416	-0.454	(0)
ZnSO4	9.221e-06	9.221e-06	-5.035	-5.035	0.000	(0)
Zn (SO4) 2-2	4.575e-06	8.817e-07	-5.340	-6.055	-0.715	(0)
ZnOH+	4.715e-07	3.124e-07	-6.327	-6.505	-0.179	(0)
ZnCO3	3.259e-07	3.259e-07	-6.487	-6.487	0.000	(0)
ZnCl+	8.313e-08	6.272e-08	-7.080	-7.203	-0.122	(0)
ZnHCO3+	7.120e-08	4.718e-08	-7.148	-7.326	-0.179	(0)
ZnOHC1	6.682e-08	6.682e-08	-7.175	-7.175	0.000	(0)
Zn (OH) 2	4.030e-08	4.030e-08	-7.395	-7.395	0.000	(0)
ZnF+	1.372e-08	9.092e-09	-7.863	-8.041	-0.179	(0)
ZnCl2	6.465e-10	6.465e-10	-9.189	-9.189	0.000	(0)
Zn (OH) 3-	2.481e-10	1.644e-10	-9.605	-9.784	-0.179	(0)
ZnCl3-	4.427e-12	3.340e-12	-11.354	-11.476	-0.122	(0)

ZnNO3+	2.243e-13	1.486e-13	-12.649	-12.828	-0.179	(0)
ZnSeO4	1.982e-13	1.982e-13	-12.703	-12.703	0.000	(0)
ZnCl4-2	3.088e-14	1.086e-14	-13.510	-13.964	-0.454	(0)
Zn(OH)4-2	2.763e-14	5.325e-15	-13.559	-14.274	-0.715	(0)
Zn(NO3)2	4.572e-22	4.572e-22	-21.340	-21.340	0.000	(0)
Zn(SeO4)2-2	3.477e-22	6.702e-23	-21.459	-22.174	-0.715	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-147.292	-147.471	-0.179	(0)
Zn(HS)2	0.000e+00	0.000e+00	-149.369	-149.369	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-224.297	-224.476	-0.179	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-225.832	-226.547	-0.715	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-303.607	-304.322	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.15	-48.86	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-42.12	-37.61	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-49.35	-37.61	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-71.25	-53.31	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-56.47	-36.44	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-28.90	-28.50	0.40	(NH4)2CrO4	
(NH4)2SeO4	-23.39	-22.94	0.45	(NH4)2SeO4	
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3	
Al2(MoO4)3	-47.73	-45.36	2.37	Al2(MoO4)3	
Al2O3	-0.84	18.81	19.65	Al2O3	
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O	
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4	
AlSb	-152.15	-86.53	65.62	AlSb	
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.22	-12.01	-7.79	PbSO4	
Anhydrite	-0.25	-4.61	-4.36	CaSO4	
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S	
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-88.42	-91.18	-2.76	As4O6	
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O	
As2O5	-39.00	-32.30	6.71	As2O5	
Atacamite	-0.99	6.40	7.39	Cu2(OH)3Cl	
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2:8H2O	-16.61	7.79	24.39	Ba(OH)2:8H2O	
Ba2V2O7:2H2O	-17.24	-1.37	15.87	Ba2V2O7:2H2O	
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2	
Ba3(VO4)2:4H2O	-26.52	6.42	32.94	Ba3(VO4)2:4H2O	
BaCrO4	-13.38	-23.05	-9.67	BaCrO4	
BaF2	-10.05	-15.87	-5.82	BaF2	
BaMoO4	-6.63	-13.59	-6.96	BaMoO4	
Barite	0.00	-9.98	-9.98	BaSO4	
BaS	-94.68	-78.50	16.18	BaS	
BaSeO3	-8.56	-6.73	1.83	BaSeO3	
BaSeO4	-10.04	-17.50	-7.46	BaSeO4	
Bianchite	-5.62	-7.38	-1.76	ZnSO4:6H2O	
Birnessite	-6.59	11.50	18.09	MnO2	
Bixbyite	-1.90	-2.54	-0.64	Mn2O3	
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S	
Boehmite	0.83	9.40	8.58	AlOOH	
Breithauptite	-58.85	-77.38	-18.52	NiSb	
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4	
Brucite	-3.45	13.39	16.84	Mg(OH)2	
Bunsenite	-6.66	5.78	12.45	NiO	
Ca(VO3)2	-9.45	-3.79	5.66	Ca(VO3)2	
Ca2V2O7	-8.13	9.37	17.50	Ca2V2O7	
Ca2V2O7:2H2O	-12.18	9.37	21.55	Ca2V2O7:2H2O	
Ca3(AsO4)2:4H2O	-15.10	7.20	22.30	Ca3(AsO4)2:4H2O	
Ca3(VO4)2	-16.42	22.54	38.96	Ca3(VO4)2	
Ca3(VO4)2:4H2O	-17.32	22.54	39.86	Ca3(VO4)2:4H2O	

Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-15.42	-17.68	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.18	-1.36	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.11	-12.13	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.41	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.22	-16.43	-1.21	CdF2
Cdmetal(alpha)	-31.82	-18.31	13.51	Cd
Cdmetal(gamma)	-31.92	-18.31	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO4:2H2O	-16.21	-18.06	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.67	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.43	-40.53	-27.10	PbSe
Co(BO2)2	-28.70	-1.63	27.07	Co(BO2)2
Co(OH)2	-6.68	6.41	13.09	Co(OH)2
Co(OH)3	-10.91	-13.22	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-26.09	-13.06	13.03	Co3(AsO4)2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.71	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS(alpha)	-72.44	-79.88	-7.44	CoS
CoS(beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.69	-39.89	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.35	-18.88	-1.53	CoSeO4:6H2O
CoSO4	-14.16	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.89	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-22.43	-11.62	10.82	Cr(OH)2
Cr(OH)3	-3.13	-1.79	1.34	Cr(OH)3
Cr(OH)3(am)	-1.04	-1.79	-0.75	Cr(OH)3
Cr2O3	-1.22	-3.58	-2.36	Cr2O3
CrCl2	-45.90	-31.80	14.09	CrCl2
CrCl3	-47.19	-32.07	15.11	CrCl3
CrF3	-25.95	-37.29	-11.34	CrF3
Crmetal	-67.64	-37.16	30.48	Cr
CrO3	-27.64	-30.85	-3.21	CrO3

Cryolite	-9.15	-42.99	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.42	8.25	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-24.47	20.74	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-8.47	0.78	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb·3H ₂ O	-54.63	-89.52	-34.88	Cu ₂ Sb·3H ₂ O
Cu ₂ Se(alpha)	-4.17	-49.97	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.49	-21.44	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-13.65	-7.55	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-58.84	-101.43	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-24.53	-88.02	-63.49	Cu ₃ Se ₂
CuCO ₃	-1.90	-13.40	-11.50	CuCO ₃
CuCrO ₄	-17.16	-22.60	-5.44	CuCrO ₄
CuF	-8.76	-13.67	-4.91	CuF
CuF ₂	-16.53	-15.42	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-10.87	-15.42	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO ₄	-0.06	-13.14	-13.08	CuMoO ₄
CuOCuSO ₄	-11.58	-1.28	10.30	CuOCuSO ₄
Cupricferrite	8.65	14.63	5.99	CuFe ₂ O ₄
Cuprite	-2.26	-3.66	-1.41	Cu ₂ O
Cuprousferrite	10.28	1.36	-8.92	CuFeO ₂
CuSe	-4.95	-38.05	-33.10	CuSe
CuSe ₂	-25.45	-58.81	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-6.79	-6.28	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-14.61	-17.05	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.46	-9.53	2.94	CuSO ₄
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.19	-16.73	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	0.36	-16.73	-17.09	CaMg(CO ₃) ₂
Epsomite	-2.26	-4.39	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.11	3.45	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.20	0.16	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-9.79	-13.51	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.70	-8.15	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-16.58	-37.21	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-43.21	-46.94	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-13.36	-12.96	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-7.33	-0.13	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.85	-17.94	-10.09	FeMoO ₄
Ferrihydrite	-0.00	3.19	3.19	Fe(OH) ₃
Ferroselite	-45.01	-63.61	-18.60	FeSe ₂
FeS(ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.85	-42.85	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF ₂
Galena	-66.55	-80.52	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al(OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe ₃ S ₄
Gummite	-4.90	2.77	7.67	UO ₃
Gypsum	0.00	-4.61	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-13.88	-25.98	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.51	-21.39	-12.88	H ₂ MoO ₄
H ₂ S(g)	-78.28	-86.29	-8.01	H ₂ S
H ₂ Se(g)	-41.34	-46.30	-4.96	H ₂ Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-0.63	22.26	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-184.58	-258.29	-73.71	Hg(CH ₃) ₂
Hg(g)	-6.71	-14.59	-7.87	Hg
Hg(OH) ₂	-7.14	-10.64	-3.50	Hg(OH) ₂
Hg ₂ (g)	-14.22	-29.17	-14.96	Hg ₂
Hg ₂ (OH) ₂	-8.89	-3.63	5.26	Hg ₂ (OH) ₂

Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.78	-34.48	-8.70	Hg2CrO4
Hg2F2	-16.93	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.92	-11.68	Hg2S
Hg2SeO3	-13.50	-18.16	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.82	-21.26	HgCl2
HgF (g)	-46.32	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.24	-56.94	-55.69	HgSe
HgSeO3	-12.73	-25.16	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.86	-19.62	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.58	-49.82	-17.24	K2Cr2O7
K2CrO4	-18.46	-18.97	-0.51	K2CrO4
K2MoO4	-12.77	-9.51	3.26	K2MoO4
K2SeO4	-12.69	-13.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.80	-6.24	-0.43	PbO : PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.85	-3.57	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.53	9.83	26.36	Mg2V2O7
MgCr2O4	-6.39	9.81	16.20	MgCr2O4
MgCrO4	-22.83	-17.45	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.15	-8.00	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.20	-1.14	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.70	-11.90	-1.20	MgSeO4 : 6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.55	-5.65	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.16	-55.87	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.88	1.62	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.60	-8.89	2.72	MnCl2 : 4H2O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.50	-35.00	3.50	MnSe
MnSeO3	-4.35	-3.22	1.13	MnSeO3
MnSeO3 : 2H2O	-4.21	-3.22	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-11.94	-13.99	-2.05	MnSeO4 : 5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO

Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.57	-19.77	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.40	-49.29	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.45	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.43	-2.13	10.30	Na2SeO3:5H2O
Na2SeO4	-14.17	-12.89	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.56	10.12	36.68	Na3VO4
Na4V2O7	-29.55	7.85	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-6.14	-2.28	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni(OH)2	-7.01	5.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-26.65	5.35	32.00	Ni4(OH)6SO4
NiCO3	-8.99	-15.86	-6.87	NiCO3
NiMoO4	-4.46	-15.61	-11.14	NiMoO4
NiS(alpha)	-74.91	-80.51	-5.60	NiS
NiS(beta)	-69.41	-80.51	-11.10	NiS
NiS(gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.82	-40.52	-17.70	NiSe
NiSeO3:2H2O	-11.56	-8.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.00	-19.52	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb(BO2)2	-8.79	-2.27	6.52	Pb(BO2)2
Pb(OH)2	-2.38	5.77	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-63.43	-72.19	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.35	1.44	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.65	11.54	26.19	Pb2O(OH)2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.52	-5.42	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.79	0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.80	5.30	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.58	5.30	21.88	Pb4O3SO4
PbCrO4	-12.48	-25.08	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.37	-18.87	-14.50	UO2CO3
Sb(OH)3	-12.19	-19.30	-7.11	Sb(OH)3
Sb2O4	-16.45	-13.05	3.40	Sb2O4

Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.75	-177.51	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.15	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.22	2.77	5.99	UO2(OH) 2:H2O
Semetal(am)	-13.65	-20.76	-7.11	Se
Semetal(hex)	-13.05	-20.76	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.25	-11.25	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.69	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.24	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca(UO2) 2(VO4) 2
U3O8	-10.66	10.42	21.08	U3O8
U3Sb4	-576.78	-424.40	152.38	U3Sb4
U4O9	-25.66	-28.68	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.17	-60.89	-32.72	UF4:2.5H2O
UO2(am)	-14.49	-13.56	0.93	UO2
UO2(NO3) 2	-40.82	-28.67	12.15	UO2(NO3) 2
UO2(NO3) 2:2H2O	-33.52	-28.67	4.85	UO2(NO3) 2:2H2O
UO2(NO3) 2:3H2O	-32.06	-28.67	3.39	UO2(NO3) 2:3H2O
UO2(NO3) 2:6H2O	-30.72	-28.67	2.05	UO2(NO3) 2:6H2O
UO2(OH) 2(beta)	-2.84	2.77	5.61	UO2(OH) 2
UO2SeO4:4H2O	-20.27	-22.52	-2.25	UO2SeO4:4H2O
UO3	-4.93	2.77	7.70	UO3
Uraninite	-8.89	-13.56	-4.67	UO2
USb2	-218.67	-189.09	29.58	USb2
V(OH) 3	-19.02	-11.43	7.59	V(OH) 3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-40.43	-38.59	1.84	V3O5
V4O7	-50.13	-42.94	7.19	V4O7
V6O13	-41.11	-101.97	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VC12	-63.26	-44.39	18.87	VC12
VC13	-65.14	-41.71	23.43	VC13
VF4	-66.61	-51.68	14.93	VF4
Vmetal	-93.77	-49.74	44.03	V
VO	-38.95	-24.20	14.76	VO
VO(OH) 2	-9.50	-4.35	5.15	VO(OH) 2
VO2Cl	-21.42	-18.58	2.84	VO2Cl
VOC1	-32.67	-21.52	11.15	VOC1
VOC12	-37.30	-24.54	12.76	VOC12
VOSO4	-25.73	-22.13	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.38	3.93	ZnSO4
Zn(BO2) 2	-5.93	2.36	8.29	Zn(BO2) 2
Zn(NO3) 2:6H2O	-24.36	-21.04	3.32	Zn(NO3) 2:6H2O
Zn(OH) 2	-1.80	10.40	12.20	Zn(OH) 2
Zn(OH) 2(am)	-2.07	10.40	12.47	Zn(OH) 2
Zn(OH) 2(beta)	-1.35	10.40	11.75	Zn(OH) 2
Zn(OH) 2(epsilon)	-1.13	10.40	11.53	Zn(OH) 2
Zn(OH) 2(gamma)	-1.33	10.40	11.73	Zn(OH) 2
Zn2(OH) 2SO4	-4.48	3.02	7.50	Zn2(OH) 2SO4
Zn2(OH) 3Cl	-4.49	10.70	15.19	Zn2(OH) 3Cl

Zn3(AsO4)2:2.5H2O	-14.75	-1.10	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.26	-4.35	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.69	31.81	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.27	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.79	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.50	-35.90	-14.40	ZnSe
ZnSeO4:6H2O	-13.38	-14.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 140.

```
Title Stage 8 Pit lake Mix
Mix 803
804 0.194360
808 0.052140
1 0.126503
17 0.132485
16 0.000000
715 0.494512
Save solution 809
end
```

TITLE

Stage 8 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 803.

Mixture 803.

```
1.265e-01 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)
1.325e-01 Solution 17 Average water quality for Background Surface Water
SWQ-1 (representative of haul road and watershed run-off)
4.945e-01 Solution 715 Solution after simulation 130.
1.944e-01 Solution 804 Solution after simulation 135.
5.214e-02 Solution 808 Solution after simulation 139.
```

-----Solution composition-----

Elements	Molality	Moles
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Ag	1.638e-08	1.638e-08
Al	2.014e-06	2.014e-06
As	1.772e-10	1.772e-10
B	2.943e-05	2.943e-05
Ba	4.407e-08	4.407e-08
C	2.516e-03	2.516e-03
Ca	2.715e-03	2.715e-03
Cd	1.042e-08	1.042e-08
Cl	3.451e-03	3.451e-03
Co	8.005e-08	8.005e-08
Cr	1.721e-09	1.721e-09
Cu	1.658e-06	1.658e-06
F	2.028e-04	2.028e-04
Fe	1.185e-09	1.185e-09
Hg	1.644e-09	1.644e-09
K	2.844e-03	2.844e-03
Mg	4.371e-03	4.370e-03
Mn	4.903e-05	4.902e-05
Mo	1.439e-06	1.439e-06
N	1.204e-05	1.204e-05
Na	1.047e-02	1.047e-02
Ni	1.247e-07	1.247e-07
Pb	5.850e-09	5.850e-09
S	1.076e-02	1.076e-02
Sb	2.195e-08	2.195e-08
Se	1.248e-07	1.248e-07
Si	2.814e-05	2.813e-05
U	1.991e-07	1.991e-07
V	6.616e-09	6.616e-09
Zn	4.887e-06	4.887e-06

-----Description of solution-----

```

                                pH = 7.559      Charge balance
                                pe = 5.217      Adjusted to redox
equilibrium
      Activity of water = 0.999
      Ionic strength (mol/kgw) = 3.645e-02
      Mass of water (kg) = 9.999e-01
      Total alkalinity (eq/kg) = 2.424e-03
      Total CO2 (mol/kg) = 2.516e-03
      Temperature (°C) = 25.00
      Electrical balance (eq) = 1.425e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
      Iterations = 11
      Total H = 1.110105e+02
      Total O = 5.555463e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.377e-07	3.642e-07	-6.359	-6.439	-0.080	(0)
H+	3.293e-08	2.763e-08	-7.482	-7.559	-0.076	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.638e-08					
AgCl	1.066e-08	1.066e-08	-7.972	-7.972	0.000	(0)
AgCl2-	3.364e-09	2.689e-09	-8.473	-8.570	-0.097	(0)
Ag+	2.149e-09	1.803e-09	-8.668	-8.744	-0.076	(0)
AgSO4-	1.876e-10	1.499e-10	-9.727	-9.824	-0.097	(0)
AgCl3-2	1.701e-11	6.939e-12	-10.769	-11.159	-0.390	(0)
AgNO2	3.547e-12	3.547e-12	-11.450	-11.450	0.000	(0)
AgF	6.483e-13	6.483e-13	-12.188	-12.188	0.000	(0)
AgCl4-3	3.086e-13	4.102e-14	-12.511	-13.387	-0.876	(0)
AgOH	6.567e-14	6.567e-14	-13.183	-13.183	0.000	(0)
AgNH3+	4.866e-14	3.889e-14	-13.313	-13.410	-0.097	(0)
AgH2BO3	1.733e-14	1.733e-14	-13.761	-13.761	0.000	(0)

	AgSeO3-	1.623e-14	1.297e-14	-13.790	-13.887	-0.097	(0)
	Ag2Se	1.197e-14	1.197e-14	-13.922	-13.922	0.000	(0)
	Ag(NO2) 2-	6.471e-17	5.171e-17	-16.189	-16.286	-0.097	(0)
	AgNO3	1.292e-17	1.292e-17	-16.889	-16.889	0.000	(0)
	Ag(NH3) 2+	4.178e-18	3.338e-18	-17.379	-17.476	-0.097	(0)
	Ag(OH) 2-	2.925e-18	2.337e-18	-17.534	-17.631	-0.097	(0)
	Ag(SeO3) 2-3	9.782e-21	1.300e-21	-20.010	-20.886	-0.876	(0)
	Ag2MoO4	8.780e-25	8.780e-25	-24.057	-24.057	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.414	-73.414	0.000	(0)
	AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.827	-84.385	-1.558	(0)
	Ag(HS) S4-2	0.000e+00	0.000e+00	-147.522	-147.723	-0.201	(0)
	Ag(HS) 2-	0.000e+00	0.000e+00	-147.701	-147.798	-0.097	(0)
	Ag(S4) 2-3	0.000e+00	0.000e+00	-149.236	-149.605	-0.368	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.566	-149.916	-0.350	(0)
Al		2.014e-06					
	Al(OH) 4-	1.961e-06	1.646e-06	-5.708	-5.784	-0.076	(0)
	Al(OH) 3	3.590e-08	3.590e-08	-7.445	-7.445	0.000	(0)
	AlF3	6.890e-09	6.890e-09	-8.162	-8.162	0.000	(0)
	Al(OH) 2+	5.841e-09	4.940e-09	-8.234	-8.306	-0.073	(0)
	AlF2+	4.521e-09	3.824e-09	-8.345	-8.417	-0.073	(0)
	AlF4-	5.887e-10	4.943e-10	-9.230	-9.306	-0.076	(0)
	AlF+2	1.312e-10	6.711e-11	-9.882	-10.173	-0.291	(0)
	AlOH+2	3.337e-11	1.708e-11	-10.477	-10.768	-0.291	(0)
	AlSO4+	1.806e-12	1.516e-12	-11.743	-11.819	-0.076	(0)
	Al+3	2.274e-13	4.689e-14	-12.643	-13.329	-0.686	(0)
	Al(SO4) 2-	8.063e-14	6.769e-14	-13.094	-13.169	-0.076	(0)
	AlMo6O21-3	2.036e-40	0.000e+00	-39.691	-40.568	-0.876	(0)
As (3)		1.760e-23					
	H3AsO3	1.720e-23	1.720e-23	-22.764	-22.764	0.000	(0)
	H2AsO3-	3.996e-25	3.193e-25	-24.398	-24.496	-0.097	(0)
	HAsO3-2	2.584e-29	1.054e-29	-28.588	-28.977	-0.390	(0)
	H4AsO3+	2.947e-31	2.355e-31	-30.531	-30.628	-0.097	(0)
	AsO3-3	1.106e-34	1.470e-35	-33.956	-34.833	-0.876	(0)
As (5)		1.772e-10					
	HAsO4-2	1.569e-10	6.400e-11	-9.804	-10.194	-0.390	(0)
	H2AsO4-	2.018e-11	1.613e-11	-10.695	-10.792	-0.097	(0)
	AsO4-3	5.510e-14	7.324e-15	-13.259	-14.135	-0.876	(0)
	H3AsO4	7.680e-17	7.744e-17	-16.115	-16.111	0.004	(0)
B		2.943e-05					
	H3BO3	2.860e-05	2.885e-05	-4.544	-4.540	0.004	(0)
	H2BO3-	7.360e-07	6.063e-07	-6.133	-6.217	-0.084	(0)
	MgH2BO3+	3.953e-08	3.257e-08	-7.403	-7.487	-0.084	(0)
	CaH2BO3+	3.806e-08	3.135e-08	-7.420	-7.504	-0.084	(0)
	NaH2BO3	8.253e-09	8.253e-09	-8.083	-8.083	0.000	(0)
	BF(OH) 3-	2.000e-09	1.647e-09	-8.699	-8.783	-0.084	(0)
	H5(BO3) 2-	1.807e-11	1.489e-11	-10.743	-10.827	-0.084	(0)
	BF2(OH) 2-	8.460e-13	6.969e-13	-12.073	-12.157	-0.084	(0)
	BaH2BO3+	4.912e-13	4.046e-13	-12.309	-12.393	-0.084	(0)
	H8(BO3) 3-	5.212e-14	4.294e-14	-13.283	-13.367	-0.084	(0)
	AgH2BO3	1.733e-14	1.733e-14	-13.761	-13.761	0.000	(0)
	BF3OH-	1.302e-18	1.073e-18	-17.885	-17.969	-0.084	(0)
	BF4-	2.536e-23	2.089e-23	-22.596	-22.680	-0.084	(0)
Ba		4.407e-08					
	Ba+2	4.357e-08	2.160e-08	-7.361	-7.666	-0.305	(0)
	BaHCO3+	4.706e-10	3.999e-10	-9.327	-9.398	-0.071	(0)
	BaCO3	3.643e-11	3.643e-11	-10.438	-10.438	0.000	(0)
	BaH2BO3+	4.912e-13	4.046e-13	-12.309	-12.393	-0.084	(0)
	BaOH+	4.073e-14	3.433e-14	-13.390	-13.464	-0.074	(0)
	BaNO3+	1.222e-15	9.762e-16	-14.913	-15.010	-0.097	(0)
	BaNH3+2	3.529e-16	1.439e-16	-15.452	-15.842	-0.390	(0)
C (4)		2.516e-03					
	HCO3-	2.292e-03	1.939e-03	-2.640	-2.712	-0.073	(0)
	H2CO3	1.205e-04	1.205e-04	-3.919	-3.919	0.000	(0)
	CaHCO3+	3.818e-05	3.244e-05	-4.418	-4.489	-0.071	(0)
	MgHCO3+	3.677e-05	3.073e-05	-4.435	-4.512	-0.078	(0)
	NaHCO3	9.363e-06	9.363e-06	-5.029	-5.029	0.000	(0)
	CO3-2	6.635e-06	3.289e-06	-5.178	-5.483	-0.305	(0)
	CaCO3	4.685e-06	4.685e-06	-5.329	-5.329	0.000	(0)

	MgCO3	4.239e-06	4.239e-06	-5.373	-5.373	0.000	(0)
	CuCO3	1.315e-06	1.315e-06	-5.881	-5.881	0.000	(0)
	MnHCO3+	6.919e-07	5.834e-07	-6.160	-6.234	-0.074	(0)
	NaCO3-	6.220e-07	5.260e-07	-6.206	-6.279	-0.073	(0)
	ZnCO3	2.770e-07	2.770e-07	-6.557	-6.557	0.000	(0)
	UO2 (CO3) 3-4	1.408e-07	3.895e-09	-6.851	-8.409	-1.558	(0)
	ZnHCO3+	1.123e-07	8.973e-08	-6.950	-7.047	-0.097	(0)
	UO2 (CO3) 2-2	5.794e-08	2.363e-08	-7.237	-7.627	-0.390	(0)
	Cu (CO3) 2-2	2.854e-08	1.164e-08	-7.544	-7.934	-0.390	(0)
	NiHCO3+	1.134e-08	9.061e-09	-7.945	-8.043	-0.097	(0)
	CuHCO3+	1.039e-08	8.305e-09	-7.983	-8.081	-0.097	(0)
	NiCO3	4.652e-09	4.652e-09	-8.332	-8.332	0.000	(0)
	CoHCO3+	4.249e-09	3.396e-09	-8.372	-8.469	-0.097	(0)
	PbCO3	3.324e-09	3.324e-09	-8.478	-8.478	0.000	(0)
	CoCO3	1.252e-09	1.252e-09	-8.902	-8.902	0.000	(0)
	PbHCO3+	6.060e-10	4.843e-10	-9.218	-9.315	-0.097	(0)
	BaHCO3+	4.706e-10	3.999e-10	-9.327	-9.398	-0.071	(0)
	UO2CO3	3.600e-10	3.600e-10	-9.444	-9.444	0.000	(0)
	CdCO3	2.189e-10	2.189e-10	-9.660	-9.660	0.000	(0)
	Pb (CO3) 2-2	7.732e-11	3.154e-11	-10.112	-10.501	-0.390	(0)
	BaCO3	3.643e-11	3.643e-11	-10.438	-10.438	0.000	(0)
	CdHCO3+	1.612e-11	1.289e-11	-10.793	-10.890	-0.097	(0)
	Cd (CO3) 2-2	1.309e-12	5.337e-13	-11.883	-12.273	-0.390	(0)
	FeHCO3+	4.177e-14	3.549e-14	-13.379	-13.450	-0.071	(0)
	HgCO3	1.887e-14	1.887e-14	-13.724	-13.724	0.000	(0)
	Hg (CO3) 2-2	4.813e-16	1.963e-16	-15.318	-15.707	-0.390	(0)
	HgHCO3+	1.215e-17	9.710e-18	-16.915	-17.013	-0.097	(0)
Ca	2.715e-03						
	Ca+2	1.813e-03	8.987e-04	-2.742	-3.046	-0.305	(0)
	CaSO4	8.577e-04	8.577e-04	-3.067	-3.067	0.000	(0)
	CaHCO3+	3.818e-05	3.244e-05	-4.418	-4.489	-0.071	(0)
	CaCO3	4.685e-06	4.685e-06	-5.329	-5.329	0.000	(0)
	CaF+	1.665e-06	1.404e-06	-5.779	-5.853	-0.074	(0)
	CaH2BO3+	3.806e-08	3.135e-08	-7.420	-7.504	-0.084	(0)
	CaOH+	7.686e-09	6.530e-09	-8.114	-8.185	-0.071	(0)
	CaNO3+	3.207e-11	2.563e-11	-10.494	-10.591	-0.097	(0)
	CaNH3+2	2.930e-11	1.195e-11	-10.533	-10.923	-0.390	(0)
	Ca (NH3) 2+2	1.232e-19	5.025e-20	-18.909	-19.299	-0.390	(0)
Cd	1.042e-08						
	Cd+2	5.889e-09	2.919e-09	-8.230	-8.535	-0.305	(0)
	CdSO4	2.851e-09	2.851e-09	-8.545	-8.545	0.000	(0)
	CdCl+	1.010e-09	8.073e-10	-8.996	-9.093	-0.097	(0)
	Cd (SO4) 2-2	3.929e-10	1.602e-10	-9.406	-9.795	-0.390	(0)
	CdCO3	2.189e-10	2.189e-10	-9.660	-9.660	0.000	(0)
	CdHCO3+	1.612e-11	1.289e-11	-10.793	-10.890	-0.097	(0)
	CdOHC1	1.206e-11	1.206e-11	-10.919	-10.919	0.000	(0)
	CdOH+	1.057e-11	8.445e-12	-10.976	-11.073	-0.097	(0)
	CdCl2	9.745e-12	9.745e-12	-11.011	-11.011	0.000	(0)
	CdF+	8.287e-12	6.622e-12	-11.082	-11.179	-0.097	(0)
	Cd (CO3) 2-2	1.309e-12	5.337e-13	-11.883	-12.273	-0.390	(0)
	CdCl3-	2.228e-14	1.780e-14	-13.652	-13.749	-0.097	(0)
	Cd (OH) 2	1.941e-14	1.941e-14	-13.712	-13.712	0.000	(0)
	CdF2	1.891e-15	1.891e-15	-14.723	-14.723	0.000	(0)
	CdNO3+	1.042e-16	8.326e-17	-15.982	-16.080	-0.097	(0)
	CdSeO4	2.677e-17	2.677e-17	-16.572	-16.572	0.000	(0)
	Cd2OH+3	9.296e-19	1.236e-19	-18.032	-18.908	-0.876	(0)
	Cd (SeO3) 2-2	7.392e-19	3.015e-19	-18.131	-18.521	-0.390	(0)
	Cd (OH) 3-	5.403e-19	4.318e-19	-18.267	-18.365	-0.097	(0)
	Cd (NO3) 2	3.763e-25	3.763e-25	-24.424	-24.424	0.000	(0)
	Cd (OH) 4-2	6.312e-26	2.574e-26	-25.200	-25.589	-0.390	(0)
	CdHS+	0.000e+00	0.000e+00	-78.914	-79.011	-0.097	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.292	-150.292	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.779	-226.876	-0.097	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.775	-303.164	-0.390	(0)
Cl	3.451e-03						
	Cl-	3.451e-03	2.896e-03	-2.462	-2.538	-0.076	(0)
	MnCl+	6.521e-08	5.498e-08	-7.186	-7.260	-0.074	(0)
	ZnCl+	1.274e-08	1.065e-08	-7.895	-7.973	-0.078	(0)

AgCl	1.066e-08	1.066e-08	-7.972	-7.972	0.000	(0)
ZnOHC1	5.076e-09	5.076e-09	-8.294	-8.294	0.000	(0)
AgCl2-	3.364e-09	2.689e-09	-8.473	-8.570	-0.097	(0)
CdCl+	1.010e-09	8.073e-10	-8.996	-9.093	-0.097	(0)
CuCl	7.350e-10	7.350e-10	-9.134	-9.134	0.000	(0)
CuCl2-	5.320e-10	4.447e-10	-9.274	-9.352	-0.078	(0)
CuCl+	3.727e-10	3.116e-10	-9.429	-9.506	-0.078	(0)
NiCl+	3.515e-10	2.809e-10	-9.454	-9.552	-0.097	(0)
CoCl+	2.823e-10	2.256e-10	-9.549	-9.647	-0.097	(0)
MnCl2	2.249e-10	2.249e-10	-9.648	-9.648	0.000	(0)
ZnCl2	4.886e-11	4.886e-11	-10.311	-10.311	0.000	(0)
PbCl+	4.322e-11	3.454e-11	-10.364	-10.462	-0.097	(0)
AgCl3-2	1.701e-11	6.939e-12	-10.769	-11.159	-0.390	(0)
CdOHC1	1.206e-11	1.206e-11	-10.919	-10.919	0.000	(0)
CdCl2	9.745e-12	9.745e-12	-11.011	-11.011	0.000	(0)
HgClOH	8.929e-12	8.929e-12	-11.049	-11.049	0.000	(0)
HgCl2	4.020e-12	4.020e-12	-11.396	-11.396	0.000	(0)
CuCl3-2	5.449e-13	2.753e-13	-12.264	-12.560	-0.297	(0)
PbCl2	4.468e-13	4.468e-13	-12.350	-12.350	0.000	(0)
CuCl2	3.128e-13	3.128e-13	-12.505	-12.505	0.000	(0)
AgCl4-3	3.086e-13	4.102e-14	-12.511	-13.387	-0.876	(0)
MnCl3-	2.127e-13	1.793e-13	-12.672	-12.746	-0.074	(0)
HgCl3-	1.457e-13	1.164e-13	-12.837	-12.934	-0.097	(0)
ZnCl3-	1.344e-13	1.124e-13	-12.871	-12.949	-0.078	(0)
CdCl3-	2.228e-14	1.780e-14	-13.652	-13.749	-0.097	(0)
NiCl2	4.095e-15	4.095e-15	-14.388	-14.388	0.000	(0)
HgCl4-2	3.290e-15	1.342e-15	-14.483	-14.872	-0.390	(0)
PbCl3-	6.444e-16	5.150e-16	-15.191	-15.288	-0.097	(0)
HgCl+	3.466e-16	2.770e-16	-15.460	-15.558	-0.097	(0)
ZnCl4-2	3.221e-16	1.627e-16	-15.492	-15.789	-0.297	(0)
UO2Cl+	1.616e-16	1.291e-16	-15.792	-15.889	-0.097	(0)
CrCl+2	3.044e-17	1.242e-17	-16.517	-16.906	-0.390	(0)
CuCl3-	1.011e-17	8.453e-18	-16.995	-17.073	-0.078	(0)
PbCl4-2	1.671e-18	6.816e-19	-17.777	-18.166	-0.390	(0)
CrOHC12	2.489e-19	2.489e-19	-18.604	-18.604	0.000	(0)
CrCl2+	4.269e-21	3.411e-21	-20.370	-20.467	-0.097	(0)
FeCl+2	3.856e-21	1.948e-21	-20.414	-20.710	-0.297	(0)
VOC1+	2.578e-22	2.060e-22	-21.589	-21.686	-0.097	(0)
CuCl4-2	2.428e-22	1.227e-22	-21.615	-21.911	-0.297	(0)
FeCl2+	2.989e-23	2.520e-23	-22.525	-22.599	-0.074	(0)
CrO3Cl-	2.790e-26	2.230e-26	-25.554	-25.652	-0.097	(0)
FeCl3	7.296e-27	7.296e-27	-26.137	-26.137	0.000	(0)
CoCl+2	2.136e-35	8.709e-36	-34.670	-35.060	-0.390	(0)
UCl+3	0.000e+00	0.000e+00	-44.975	-45.851	-0.876	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.599	-48.988	-0.390	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.384	-50.774	-0.390	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.290	-63.680	-0.390	(0)
Co (2)	8.005e-08					
Co+2	5.521e-08	2.252e-08	-7.258	-7.647	-0.390	(0)
CoSO4	1.872e-08	1.872e-08	-7.728	-7.728	0.000	(0)
CoHCO3+	4.249e-09	3.396e-09	-8.372	-8.469	-0.097	(0)
CoCO3	1.252e-09	1.252e-09	-8.902	-8.902	0.000	(0)
CoCl+	2.823e-10	2.256e-10	-9.549	-9.647	-0.097	(0)
CoOH+	2.048e-10	1.636e-10	-9.689	-9.786	-0.097	(0)
CoF+	1.275e-10	1.019e-10	-9.894	-9.992	-0.097	(0)
Co (OH) 2	4.734e-12	4.734e-12	-11.325	-11.325	0.000	(0)
CoNO2+	1.869e-12	1.494e-12	-11.728	-11.826	-0.097	(0)
Co (NH3) +2	7.011e-14	2.859e-14	-13.154	-13.544	-0.390	(0)
CoSeO4	5.558e-16	5.558e-16	-15.255	-15.255	0.000	(0)
CoNO3+	4.028e-16	3.219e-16	-15.395	-15.492	-0.097	(0)
Co (OH) 3-	4.304e-17	3.440e-17	-16.366	-16.463	-0.097	(0)
CoOOH-	1.081e-17	8.635e-18	-16.966	-17.064	-0.097	(0)
Co2OH+3	1.389e-18	1.847e-19	-17.857	-18.734	-0.876	(0)
Co (NH3) 2+2	3.159e-20	1.288e-20	-19.500	-19.890	-0.390	(0)
Co (NO3) 2	5.906e-24	5.906e-24	-23.229	-23.229	0.000	(0)
Co (OH) 4-2	4.868e-24	1.985e-24	-23.313	-23.702	-0.390	(0)
Co (NH3) 3+2	4.200e-27	1.713e-27	-26.377	-26.766	-0.390	(0)
Co4 (OH) 4+4	5.170e-30	1.430e-31	-29.287	-30.845	-1.558	(0)

Co (NH3) 4+2	2.328e-34	9.495e-35	-33.633	-34.022	-0.390	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.389	-41.779	-0.390	(0)
Co (3)	6.708e-29					
CoOH+2	6.708e-29	2.736e-29	-28.173	-28.563	-0.390	(0)
Co+3	7.169e-35	1.478e-35	-34.145	-34.830	-0.686	(0)
CoCl+2	2.136e-35	8.709e-36	-34.670	-35.060	-0.390	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.599	-48.988	-0.390	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.499	-58.597	-0.097	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.991	-63.380	-0.390	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.290	-63.680	-0.390	(0)
Cr (2)	1.177e-26					
Cr+2	1.177e-26	4.800e-27	-25.929	-26.319	-0.390	(0)
Cr (3)	1.721e-09					
Cr (OH) 2+	1.464e-09	1.170e-09	-8.835	-8.932	-0.097	(0)
Cr (OH) 3	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
Cr (OH) +2	6.473e-11	2.640e-11	-10.189	-10.578	-0.390	(0)
CrOHSO4	2.610e-11	2.610e-11	-10.583	-10.583	0.000	(0)
CrO2-	3.444e-12	2.752e-12	-11.463	-11.560	-0.097	(0)
Cr (OH) 4-	2.904e-12	2.320e-12	-11.537	-11.634	-0.097	(0)
CrF+2	1.843e-13	7.515e-14	-12.735	-13.124	-0.390	(0)
CrSO4+	4.033e-14	3.223e-14	-13.394	-13.492	-0.097	(0)
Cr+3	2.493e-14	3.313e-15	-13.603	-14.480	-0.876	(0)
CrCl+2	3.044e-17	1.242e-17	-16.517	-16.906	-0.390	(0)
CrOHC12	2.489e-19	2.489e-19	-18.604	-18.604	0.000	(0)
Cr2 (OH) 2SO4+2	1.527e-19	6.227e-20	-18.816	-19.206	-0.390	(0)
Cr2 (OH) 2 (SO4) 2	1.541e-20	1.541e-20	-19.812	-19.812	0.000	(0)
CrCl2+	4.269e-21	3.411e-21	-20.370	-20.467	-0.097	(0)
CrNO3+2	3.203e-24	1.306e-24	-23.495	-23.884	-0.390	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.038	-40.427	-0.390	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.461	-49.337	-0.876	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.384	-50.774	-0.390	(0)
Cr (6)	1.086e-15					
CrO4-2	9.991e-16	4.953e-16	-15.000	-15.305	-0.305	(0)
HCrO4-	5.541e-17	4.428e-17	-16.256	-16.354	-0.097	(0)
NaCrO4-	2.645e-17	2.114e-17	-16.578	-16.675	-0.097	(0)
KCrO4-	5.338e-18	4.266e-18	-17.273	-17.370	-0.097	(0)
CrO3SO4-2	3.809e-24	1.554e-24	-23.419	-23.809	-0.390	(0)
H2CrO4	9.918e-25	9.918e-25	-24.004	-24.004	0.000	(0)
CrO3Cl-	2.790e-26	2.230e-26	-25.554	-25.652	-0.097	(0)
Cr2O7-2	1.668e-31	6.804e-32	-30.778	-31.167	-0.390	(0)
Cu (1)	1.520e-09					
CuCl	7.350e-10	7.350e-10	-9.134	-9.134	0.000	(0)
CuCl2-	5.320e-10	4.447e-10	-9.274	-9.352	-0.078	(0)
Cu+	2.523e-10	2.016e-10	-9.598	-9.695	-0.097	(0)
CuCl3-2	5.449e-13	2.753e-13	-12.264	-12.560	-0.297	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.798	-148.157	-0.359	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.546	-148.887	-0.341	(0)
Cu (2)	1.657e-06					
CuCO3	1.315e-06	1.315e-06	-5.881	-5.881	0.000	(0)
Cu+2	1.369e-07	6.789e-08	-6.863	-7.168	-0.305	(0)
CuOH+	9.354e-08	7.819e-08	-7.029	-7.107	-0.078	(0)
CuSO4	6.479e-08	6.479e-08	-7.188	-7.188	0.000	(0)
Cu (CO3) 2-2	2.854e-08	1.164e-08	-7.544	-7.934	-0.390	(0)
CuHCO3+	1.039e-08	8.305e-09	-7.983	-8.081	-0.097	(0)
Cu (OH) 2	5.682e-09	5.682e-09	-8.246	-8.246	0.000	(0)
CuF+	7.672e-10	6.131e-10	-9.115	-9.212	-0.097	(0)
Cu2 (OH) 2+2	3.765e-10	1.536e-10	-9.424	-9.814	-0.390	(0)
CuCl+	3.727e-10	3.116e-10	-9.429	-9.506	-0.078	(0)
CuNO2+	8.374e-11	6.692e-11	-10.077	-10.174	-0.097	(0)
CuNH3+2	1.799e-11	7.338e-12	-10.745	-11.134	-0.390	(0)
Cu (OH) 3-	5.311e-12	4.244e-12	-11.275	-11.372	-0.097	(0)
CuCl2	3.128e-13	3.128e-13	-12.505	-12.505	0.000	(0)
Cu (NO2) 2	6.446e-15	6.446e-15	-14.191	-14.191	0.000	(0)
CuNO3+	2.423e-15	1.936e-15	-14.616	-14.713	-0.097	(0)
Cu (OH) 4-2	2.983e-17	1.217e-17	-16.525	-16.915	-0.390	(0)
CuCl3-	1.011e-17	8.453e-18	-16.995	-17.073	-0.078	(0)
CuCl4-2	2.428e-22	1.227e-22	-21.615	-21.911	-0.297	(0)
Cu (NO3) 2	2.198e-24	2.198e-24	-23.658	-23.658	0.000	(0)

F	Cu (HS) 3-	0.000e+00	0.000e+00	-216.625	-216.722	-0.097	(0)
	2.028e-04						
	F-	1.706e-04	1.431e-04	-3.768	-3.844	-0.076	(0)
	MgF+	2.963e-05	2.488e-05	-4.528	-4.604	-0.076	(0)
	CaF+	1.665e-06	1.404e-06	-5.779	-5.853	-0.074	(0)
	NaF	7.756e-07	7.756e-07	-6.110	-6.110	0.000	(0)
	MnF+	1.019e-07	8.593e-08	-6.992	-7.066	-0.074	(0)
	AlF3	6.890e-09	6.890e-09	-8.162	-8.162	0.000	(0)
	HF	5.850e-09	5.850e-09	-8.233	-8.233	0.000	(0)
	ZnF+	5.230e-09	4.180e-09	-8.281	-8.379	-0.097	(0)
	AlF2+	4.521e-09	3.824e-09	-8.345	-8.417	-0.073	(0)
	BF(OH) 3-	2.000e-09	1.647e-09	-8.699	-8.783	-0.084	(0)
	CuF+	7.672e-10	6.131e-10	-9.115	-9.212	-0.097	(0)
	AlF4-	5.887e-10	4.943e-10	-9.230	-9.306	-0.076	(0)
	NiF+	1.705e-10	1.363e-10	-9.768	-9.866	-0.097	(0)
	AlF+2	1.312e-10	6.711e-11	-9.882	-10.173	-0.291	(0)
	CoF+	1.275e-10	1.019e-10	-9.894	-9.992	-0.097	(0)
	CdF+	8.287e-12	6.622e-12	-11.082	-11.179	-0.097	(0)
	PbF+	4.243e-12	3.391e-12	-11.372	-11.470	-0.097	(0)
	HF2-	3.826e-12	3.183e-12	-11.417	-11.497	-0.080	(0)
	BF2(OH) 2-	8.460e-13	6.969e-13	-12.073	-12.157	-0.084	(0)
	UO2F+	6.797e-13	5.432e-13	-12.168	-12.265	-0.097	(0)
	AgF	6.483e-13	6.483e-13	-12.188	-12.188	0.000	(0)
	UO2F2	2.242e-13	2.242e-13	-12.649	-12.649	0.000	(0)
	CrF+2	1.843e-13	7.515e-14	-12.735	-13.124	-0.390	(0)
	UO2F3-	1.009e-14	8.061e-15	-13.996	-14.094	-0.097	(0)
	PbF2	9.550e-15	9.550e-15	-14.020	-14.020	0.000	(0)
	CdF2	1.891e-15	1.891e-15	-14.723	-14.723	0.000	(0)
	H2F2	9.167e-17	9.167e-17	-16.038	-16.038	0.000	(0)
	UO2F4-2	2.247e-17	9.165e-18	-16.648	-17.038	-0.390	(0)
	VO2F	1.718e-17	1.718e-17	-16.765	-16.765	0.000	(0)
	FeF2+	1.588e-17	1.339e-17	-16.799	-16.873	-0.074	(0)
	FeF+2	6.920e-18	3.496e-18	-17.160	-17.456	-0.297	(0)
	PbF3-	3.244e-18	2.593e-18	-17.489	-17.586	-0.097	(0)
	FeF3	2.704e-18	2.704e-18	-17.568	-17.568	0.000	(0)
	BF3OH-	1.302e-18	1.073e-18	-17.885	-17.969	-0.084	(0)
	VO2F2-	1.117e-18	8.927e-19	-17.952	-18.049	-0.097	(0)
	VOF+	2.724e-20	2.177e-20	-19.565	-19.662	-0.097	(0)
	VO2F3-2	3.908e-21	1.594e-21	-20.408	-20.798	-0.390	(0)
	VOF2	1.168e-21	1.168e-21	-20.932	-20.932	0.000	(0)
	PbF4-2	4.355e-22	1.776e-22	-21.361	-21.751	-0.390	(0)
	HgF+	3.183e-23	2.543e-23	-22.497	-22.595	-0.097	(0)
	BF4-	2.536e-23	2.089e-23	-22.596	-22.680	-0.084	(0)
	VOF3-	7.424e-24	5.933e-24	-23.129	-23.227	-0.097	(0)
	VO2F4-3	8.445e-25	1.122e-25	-24.073	-24.950	-0.876	(0)
	Sb(OH) 2F	2.007e-25	2.007e-25	-24.697	-24.697	0.000	(0)
	SbOF	1.975e-25	1.975e-25	-24.705	-24.705	0.000	(0)
	VOF4-2	8.405e-27	3.428e-27	-26.075	-26.465	-0.390	(0)
	SiF6-2	4.243e-28	2.144e-28	-27.372	-27.669	-0.297	(0)
	UF3+	1.417e-35	1.133e-35	-34.849	-34.946	-0.097	(0)
	UF2+2	1.224e-36	4.993e-37	-35.912	-36.302	-0.390	(0)
	UF4	1.777e-37	1.777e-37	-36.750	-36.750	0.000	(0)
	UF+3	2.085e-39	2.771e-40	-38.681	-39.557	-0.876	(0)
	UF5-	1.262e-39	1.008e-39	-38.899	-38.996	-0.097	(0)
	UF6-2	1.068e-40	0.000e+00	-39.971	-40.361	-0.390	(0)
Fe (2)	5.120e-12						
	Fe+2	3.566e-12	1.454e-12	-11.448	-11.837	-0.390	(0)
	FeSO4	1.487e-12	1.487e-12	-11.828	-11.828	0.000	(0)
	FeHCO3+	4.177e-14	3.549e-14	-13.379	-13.450	-0.071	(0)
	FeOH+	2.501e-14	2.109e-14	-13.602	-13.676	-0.074	(0)
	Fe(OH) 2	6.100e-18	6.100e-18	-17.215	-17.215	0.000	(0)
	Fe(OH) 3-	8.333e-19	7.025e-19	-18.079	-18.153	-0.074	(0)
	Fe(HS) 2	0.000e+00	0.000e+00	-159.856	-159.856	0.000	(0)
	Fe(HS) 3-	0.000e+00	0.000e+00	-236.206	-236.304	-0.097	(0)
Fe (3)	1.180e-09						
	Fe(OH) 2+	8.776e-10	7.422e-10	-9.057	-9.129	-0.073	(0)
	Fe(OH) 3	2.903e-10	2.903e-10	-9.537	-9.537	0.000	(0)
	Fe(OH) 4-	1.164e-11	9.845e-12	-10.934	-11.007	-0.073	(0)

	FeOH+2	1.037e-14	5.239e-15	-13.984	-14.281	-0.297	(0)
	FeF2+	1.588e-17	1.339e-17	-16.799	-16.873	-0.074	(0)
	FeF+2	6.920e-18	3.496e-18	-17.160	-17.456	-0.297	(0)
	FeF3	2.704e-18	2.704e-18	-17.568	-17.568	0.000	(0)
	FeSO4+	1.235e-18	1.041e-18	-17.908	-17.982	-0.074	(0)
	Fe(SO4)2-	1.161e-19	9.275e-20	-18.935	-19.033	-0.097	(0)
	Fe+3	1.080e-19	2.228e-20	-18.966	-19.652	-0.686	(0)
	FeCl+2	3.856e-21	1.948e-21	-20.414	-20.710	-0.297	(0)
	FeCl2+	2.989e-23	2.520e-23	-22.525	-22.599	-0.074	(0)
	FeHSeO3+2	1.121e-23	4.574e-24	-22.950	-23.340	-0.390	(0)
	Fe2(OH)2+4	3.285e-26	9.087e-28	-25.484	-27.042	-1.558	(0)
	FeCl3	7.296e-27	7.296e-27	-26.137	-26.137	0.000	(0)
	FeNO3+2	4.927e-27	2.009e-27	-26.307	-26.697	-0.390	(0)
	Fe3(OH)4+5	2.651e-33	9.749e-36	-32.577	-35.011	-2.434	(0)
H(0)	3.942e-29						
	H2	1.971e-29	1.988e-29	-28.705	-28.702	0.004	(0)
Hg(0)	1.627e-09						
	Hg	1.627e-09	1.627e-09	-8.789	-8.789	0.000	(0)
Hg(1)	2.597e-20						
	Hg2+2	1.299e-20	5.296e-21	-19.887	-20.276	-0.390	(0)
Hg(2)	1.710e-11						
	HgClOH	8.929e-12	8.929e-12	-11.049	-11.049	0.000	(0)
	HgCl2	4.020e-12	4.020e-12	-11.396	-11.396	0.000	(0)
	Hg(OH)2	3.979e-12	4.012e-12	-11.400	-11.397	0.004	(0)
	HgCl3-	1.457e-13	1.164e-13	-12.837	-12.934	-0.097	(0)
	HgCO3	1.887e-14	1.887e-14	-13.724	-13.724	0.000	(0)
	HgCl4-2	3.290e-15	1.342e-15	-14.483	-14.872	-0.390	(0)
	Hg(CO3)2-2	4.813e-16	1.963e-16	-15.318	-15.707	-0.390	(0)
	HgCl+	3.466e-16	2.770e-16	-15.460	-15.558	-0.097	(0)
	HgOH+	8.698e-17	6.951e-17	-16.061	-16.158	-0.097	(0)
	HgHCO3+	1.215e-17	9.710e-18	-16.915	-17.013	-0.097	(0)
	Hg(NH3)2+2	8.274e-19	3.374e-19	-18.082	-18.472	-0.390	(0)
	Hg(OH)3-	2.302e-19	1.840e-19	-18.638	-18.735	-0.097	(0)
	HgNH3+2	7.834e-20	3.195e-20	-19.106	-19.496	-0.390	(0)
	Hg+2	1.176e-20	4.794e-21	-19.930	-20.319	-0.390	(0)
	HgSO4	5.229e-21	5.229e-21	-20.282	-20.282	0.000	(0)
	HgF+	3.183e-23	2.543e-23	-22.497	-22.595	-0.097	(0)
	Hg(NH3)3+2	3.479e-26	1.419e-26	-25.459	-25.848	-0.390	(0)
	HgNO3+	1.998e-29	1.596e-29	-28.699	-28.797	-0.097	(0)
	Hg(NH3)4+2	2.919e-33	1.190e-33	-32.535	-32.924	-0.390	(0)
	Hg(NO3)2	5.984e-38	5.984e-38	-37.223	-37.223	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.704	-137.802	-0.097	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.561	-138.951	-0.390	(0)
	Hg(HS)2	0.000e+00	0.000e+00	-138.966	-138.966	0.000	(0)
K	2.844e-03						
	K+	2.763e-03	2.318e-03	-2.559	-2.635	-0.076	(0)
	KSO4-	8.085e-05	6.838e-05	-4.092	-4.165	-0.073	(0)
	KCrO4-	5.338e-18	4.266e-18	-17.273	-17.370	-0.097	(0)
Mg	4.371e-03						
	Mg+2	3.125e-03	1.549e-03	-2.505	-2.810	-0.305	(0)
	MgSO4	1.174e-03	1.174e-03	-2.930	-2.930	0.000	(0)
	MgHCO3+	3.677e-05	3.073e-05	-4.435	-4.512	-0.078	(0)
	MgF+	2.963e-05	2.488e-05	-4.528	-4.604	-0.076	(0)
	MgCO3	4.239e-06	4.239e-06	-5.373	-5.373	0.000	(0)
	MgOH+	2.634e-07	2.246e-07	-6.579	-6.649	-0.069	(0)
	MgH2BO3+	3.953e-08	3.257e-08	-7.403	-7.487	-0.084	(0)
Mn(2)	4.903e-05						
	Mn+2	3.698e-05	1.508e-05	-4.432	-4.822	-0.390	(0)
	MnSO4	1.117e-05	1.117e-05	-4.952	-4.952	0.000	(0)
	MnHCO3+	6.919e-07	5.834e-07	-6.160	-6.234	-0.074	(0)
	MnF+	1.019e-07	8.593e-08	-6.992	-7.066	-0.074	(0)
	MnCl+	6.521e-08	5.498e-08	-7.186	-7.260	-0.074	(0)
	MnOH+	1.636e-08	1.380e-08	-7.786	-7.860	-0.074	(0)
	MnCl2	2.249e-10	2.249e-10	-9.648	-9.648	0.000	(0)
	MnNO3+	2.697e-13	2.156e-13	-12.569	-12.666	-0.097	(0)
	MnCl3-	2.127e-13	1.793e-13	-12.672	-12.746	-0.074	(0)
	MnSeO4	1.999e-13	1.999e-13	-12.699	-12.699	0.000	(0)
	Mn(OH)3-	1.341e-17	1.131e-17	-16.872	-16.947	-0.074	(0)

Mn (NO3) 2	4.883e-21	4.883e-21	-20.311	-20.311	0.000	(0)
Mn (OH) 4-2	2.632e-23	1.330e-23	-22.580	-22.876	-0.297	(0)
MnSe	0.000e+00	0.000e+00	-41.552	-41.552	0.000	(0)
Mn (3)	5.387e-25					
Mn+3	5.387e-25	1.111e-25	-24.269	-24.954	-0.686	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.610	-41.907	-0.297	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.980	-46.062	-0.082	(0)
Mo	1.439e-06					
MoO4-2	1.439e-06	7.133e-07	-5.842	-6.147	-0.305	(0)
HMoO4-	4.907e-10	3.922e-10	-9.309	-9.407	-0.097	(0)
H2MoO4	7.937e-14	7.937e-14	-13.100	-13.100	0.000	(0)
Ag2MoO4	8.780e-25	8.780e-25	-24.057	-24.057	0.000	(0)
AlMo6O21-3	2.036e-40	0.000e+00	-39.691	-40.568	-0.876	(0)
Mo7O24-6	0.000e+00	0.000e+00	-46.999	-50.505	-3.506	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.242	-51.677	-2.434	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.895	-54.453	-1.558	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.889	-58.766	-0.876	(0)
N (-3)	6.591e-07					
NH4+	6.213e-07	5.119e-07	-6.207	-6.291	-0.084	(0)
NH4SO4-	2.710e-08	2.285e-08	-7.567	-7.641	-0.074	(0)
NH3	1.056e-08	1.056e-08	-7.976	-7.976	0.000	(0)
CaNH3+2	2.930e-11	1.195e-11	-10.533	-10.923	-0.390	(0)
CuNH3+2	1.799e-11	7.338e-12	-10.745	-11.134	-0.390	(0)
NiNH3+2	5.272e-13	2.150e-13	-12.278	-12.668	-0.390	(0)
Co (NH3) +2	7.011e-14	2.859e-14	-13.154	-13.544	-0.390	(0)
AgNH3+	4.866e-14	3.889e-14	-13.313	-13.410	-0.097	(0)
BaNH3+2	3.529e-16	1.439e-16	-15.452	-15.842	-0.390	(0)
Ag (NH3) 2+	4.178e-18	3.338e-18	-17.379	-17.476	-0.097	(0)
Hg (NH3) 2+2	8.274e-19	3.374e-19	-18.082	-18.472	-0.390	(0)
Ni (NH3) 2+2	8.049e-19	3.283e-19	-18.094	-18.484	-0.390	(0)
Ca (NH3) 2+2	1.232e-19	5.025e-20	-18.909	-19.299	-0.390	(0)
HgNH3+2	7.834e-20	3.195e-20	-19.106	-19.496	-0.390	(0)
Co (NH3) 2+2	3.159e-20	1.288e-20	-19.500	-19.890	-0.390	(0)
Hg (NH3) 3+2	3.479e-26	1.419e-26	-25.459	-25.848	-0.390	(0)
Co (NH3) 3+2	4.200e-27	1.713e-27	-26.377	-26.766	-0.390	(0)
Hg (NH3) 4+2	2.919e-33	1.190e-33	-32.535	-32.924	-0.390	(0)
Co (NH3) 4+2	2.328e-34	9.495e-35	-33.633	-34.022	-0.390	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.038	-40.427	-0.390	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.389	-41.779	-0.390	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.461	-49.337	-0.876	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.599	-48.988	-0.390	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.384	-50.774	-0.390	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.499	-58.597	-0.097	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.991	-63.380	-0.390	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.290	-63.680	-0.390	(0)
N (3)	1.137e-05					
NO2-	1.137e-05	9.414e-06	-4.944	-5.026	-0.082	(0)
CuNO2+	8.374e-11	6.692e-11	-10.077	-10.174	-0.097	(0)
AgNO2	3.547e-12	3.547e-12	-11.450	-11.450	0.000	(0)
CoNO2+	1.869e-12	1.494e-12	-11.728	-11.826	-0.097	(0)
Cu (NO2) 2	6.446e-15	6.446e-15	-14.191	-14.191	0.000	(0)
Ag (NO2) 2-	6.471e-17	5.171e-17	-16.189	-16.286	-0.097	(0)
N (5)	1.078e-08					
NO3-	1.075e-08	9.019e-09	-7.969	-8.045	-0.076	(0)
CaNO3+	3.207e-11	2.563e-11	-10.494	-10.591	-0.097	(0)
MnNO3+	2.697e-13	2.156e-13	-12.569	-12.666	-0.097	(0)
ZnNO3+	4.149e-14	3.316e-14	-13.382	-13.479	-0.097	(0)
CuNO3+	2.423e-15	1.936e-15	-14.616	-14.713	-0.097	(0)
BaNO3+	1.222e-15	9.762e-16	-14.913	-15.010	-0.097	(0)
NiNO3+	1.075e-15	8.588e-16	-14.969	-15.066	-0.097	(0)
CoNO3+	4.028e-16	3.219e-16	-15.395	-15.492	-0.097	(0)
CdNO3+	1.042e-16	8.326e-17	-15.982	-16.080	-0.097	(0)
PbNO3+	5.612e-17	4.485e-17	-16.251	-16.348	-0.097	(0)
AgNO3	1.292e-17	1.292e-17	-16.889	-16.889	0.000	(0)
Mn (NO3) 2	4.883e-21	4.883e-21	-20.311	-20.311	0.000	(0)
UO2NO3+	6.191e-22	4.947e-22	-21.208	-21.306	-0.097	(0)

	Zn(NO3)2	5.967e-23	5.967e-23	-22.224	-22.224	0.000	(0)
	Co(NO3)2	5.906e-24	5.906e-24	-23.229	-23.229	0.000	(0)
	CrNO3+2	3.203e-24	1.306e-24	-23.495	-23.884	-0.390	(0)
	Cu(NO3)2	2.198e-24	2.198e-24	-23.658	-23.658	0.000	(0)
	Pb(NO3)2	6.869e-25	6.869e-25	-24.163	-24.163	0.000	(0)
	Cd(NO3)2	3.763e-25	3.763e-25	-24.424	-24.424	0.000	(0)
	VO2NO3	3.122e-25	3.122e-25	-24.506	-24.506	0.000	(0)
	FeNO3+2	4.927e-27	2.009e-27	-26.307	-26.697	-0.390	(0)
	HgNO3+	1.998e-29	1.596e-29	-28.699	-28.797	-0.097	(0)
	Hg(NO3)2	5.984e-38	5.984e-38	-37.223	-37.223	0.000	(0)
Na		1.047e-02					
	Na+	1.024e-02	8.589e-03	-1.990	-2.066	-0.076	(0)
	NaSO4-	2.272e-04	1.922e-04	-3.644	-3.716	-0.073	(0)
	NaHCO3	9.363e-06	9.363e-06	-5.029	-5.029	0.000	(0)
	NaF	7.756e-07	7.756e-07	-6.110	-6.110	0.000	(0)
	NaCO3-	6.220e-07	5.260e-07	-6.206	-6.279	-0.073	(0)
	NaH2BO3	8.253e-09	8.253e-09	-8.083	-8.083	0.000	(0)
	NaCrO4-	2.645e-17	2.114e-17	-16.578	-16.675	-0.097	(0)
Ni		1.247e-07					
	Ni+2	7.647e-08	3.791e-08	-7.116	-7.421	-0.305	(0)
	NiSO4	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
	NiHCO3+	1.134e-08	9.061e-09	-7.945	-8.043	-0.097	(0)
	NiCO3	4.652e-09	4.652e-09	-8.332	-8.332	0.000	(0)
	NiCl+	3.515e-10	2.809e-10	-9.454	-9.552	-0.097	(0)
	NiOH+	2.175e-10	1.738e-10	-9.663	-9.760	-0.097	(0)
	NiF+	1.705e-10	1.363e-10	-9.768	-9.866	-0.097	(0)
	Ni(SO4)2-2	1.066e-11	4.347e-12	-10.972	-11.362	-0.390	(0)
	Ni(OH)2	5.028e-12	5.028e-12	-11.299	-11.299	0.000	(0)
	NiNH3+2	5.272e-13	2.150e-13	-12.278	-12.668	-0.390	(0)
	NiCl2	4.095e-15	4.095e-15	-14.388	-14.388	0.000	(0)
	Ni(OH)3-	2.292e-15	1.831e-15	-14.640	-14.737	-0.097	(0)
	NiNO3+	1.075e-15	8.588e-16	-14.969	-15.066	-0.097	(0)
	NiSeO4	8.732e-16	8.732e-16	-15.059	-15.059	0.000	(0)
	Ni(NH3)2+2	8.049e-19	3.283e-19	-18.094	-18.484	-0.390	(0)
O(0)		2.541e-35					
	O2	1.271e-35	1.281e-35	-34.896	-34.892	0.004	(0)
Pb		5.850e-09					
	PbCO3	3.324e-09	3.324e-09	-8.478	-8.478	0.000	(0)
	PbSO4	6.860e-10	6.860e-10	-9.164	-9.164	0.000	(0)
	Pb+2	6.782e-10	3.362e-10	-9.169	-9.473	-0.305	(0)
	PbHCO3+	6.060e-10	4.843e-10	-9.218	-9.315	-0.097	(0)
	PbOH+	3.849e-10	3.076e-10	-9.415	-9.512	-0.097	(0)
	Pb(CO3)2-2	7.732e-11	3.154e-11	-10.112	-10.501	-0.390	(0)
	PbCl+	4.322e-11	3.454e-11	-10.364	-10.462	-0.097	(0)
	Pb(SO4)2-2	4.222e-11	1.722e-11	-10.374	-10.764	-0.390	(0)
	PbF+	4.243e-12	3.391e-12	-11.372	-11.470	-0.097	(0)
	Pb(OH)2	3.542e-12	3.542e-12	-11.451	-11.451	0.000	(0)
	PbCl2	4.468e-13	4.468e-13	-12.350	-12.350	0.000	(0)
	PbF2	9.550e-15	9.550e-15	-14.020	-14.020	0.000	(0)
	Pb(OH)3-	1.614e-15	1.290e-15	-14.792	-14.889	-0.097	(0)
	PbCl3-	6.444e-16	5.150e-16	-15.191	-15.288	-0.097	(0)
	PbNO3+	5.612e-17	4.485e-17	-16.251	-16.348	-0.097	(0)
	Pb2OH+3	1.233e-17	1.639e-18	-16.909	-17.785	-0.876	(0)
	PbF3-	3.244e-18	2.593e-18	-17.489	-17.586	-0.097	(0)
	PbCl4-2	1.671e-18	6.816e-19	-17.777	-18.166	-0.390	(0)
	Pb(OH)4-2	2.821e-19	1.151e-19	-18.550	-18.939	-0.390	(0)
	PbF4-2	4.355e-22	1.776e-22	-21.361	-21.751	-0.390	(0)
	Pb3(OH)4+2	2.064e-22	8.416e-23	-21.685	-22.075	-0.390	(0)
	Pb(NO3)2	6.869e-25	6.869e-25	-24.163	-24.163	0.000	(0)
	Pb4(OH)4+4	8.123e-27	2.247e-28	-26.090	-27.648	-1.558	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-151.172	-151.172	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-228.259	-228.357	-0.097	(0)
S(-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.414	-73.414	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.387	-78.484	-0.097	(0)
	CdHS+	0.000e+00	0.000e+00	-78.914	-79.011	-0.097	(0)
	H2S	0.000e+00	0.000e+00	-79.023	-79.023	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.901	-80.291	-0.390	(0)

S6-2	0.000e+00	0.000e+00	-80.417	-80.807	-0.390	(0)
S4-2	0.000e+00	0.000e+00	-80.497	-80.887	-0.390	(0)
S3-2	0.000e+00	0.000e+00	-81.303	-81.693	-0.390	(0)
S2-2	0.000e+00	0.000e+00	-82.319	-82.709	-0.390	(0)
S-2	0.000e+00	0.000e+00	-87.929	-88.226	-0.297	(0)
HgHS2-	0.000e+00	0.000e+00	-137.704	-137.802	-0.097	(0)
HgS2-2	0.000e+00	0.000e+00	-138.561	-138.951	-0.390	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.966	-138.966	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.522	-147.723	-0.201	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.701	-147.798	-0.097	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.798	-148.157	-0.359	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.337	-148.435	-0.097	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.546	-148.887	-0.341	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.236	-149.605	-0.368	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.566	-149.916	-0.350	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.983	-149.983	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.292	-150.292	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.172	-151.172	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.856	-159.856	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.625	-216.722	-0.097	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.090	-225.188	-0.097	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.779	-226.876	-0.097	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.220	-227.609	-0.390	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.259	-228.357	-0.097	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.206	-236.304	-0.097	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.775	-303.164	-0.390	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.743	-305.132	-0.390	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.252	-318.642	-0.390	(0)
S (6)	1.076e-02					
SO4-2	8.404e-03	4.166e-03	-2.076	-2.380	-0.305	(0)
MgSO4	1.174e-03	1.174e-03	-2.930	-2.930	0.000	(0)
CaSO4	8.577e-04	8.577e-04	-3.067	-3.067	0.000	(0)
NaSO4-	2.272e-04	1.922e-04	-3.644	-3.716	-0.073	(0)
KSO4-	8.085e-05	6.838e-05	-4.092	-4.165	-0.073	(0)
MnSO4	1.117e-05	1.117e-05	-4.952	-4.952	0.000	(0)
ZnSO4	1.334e-06	1.334e-06	-5.875	-5.875	0.000	(0)
Zn (SO4) 2-2	1.187e-07	4.840e-08	-6.926	-7.315	-0.390	(0)
CuSO4	6.479e-08	6.479e-08	-7.188	-7.188	0.000	(0)
NiSO4	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
NH4SO4-	2.710e-08	2.285e-08	-7.567	-7.641	-0.074	(0)
CoSO4	1.872e-08	1.872e-08	-7.728	-7.728	0.000	(0)
HSO4-	1.340e-08	1.125e-08	-7.873	-7.949	-0.076	(0)
CdSO4	2.851e-09	2.851e-09	-8.545	-8.545	0.000	(0)
PbSO4	6.860e-10	6.860e-10	-9.164	-9.164	0.000	(0)
Cd (SO4) 2-2	3.929e-10	1.602e-10	-9.406	-9.795	-0.390	(0)
AgSO4-	1.876e-10	1.499e-10	-9.727	-9.824	-0.097	(0)
Pb (SO4) 2-2	4.222e-11	1.722e-11	-10.374	-10.764	-0.390	(0)
CrOHSO4	2.610e-11	2.610e-11	-10.583	-10.583	0.000	(0)
Ni (SO4) 2-2	1.066e-11	4.347e-12	-10.972	-11.362	-0.390	(0)
AlSO4+	1.806e-12	1.516e-12	-11.743	-11.819	-0.076	(0)
FeSO4	1.487e-12	1.487e-12	-11.828	-11.828	0.000	(0)
UO2SO4	1.734e-13	1.734e-13	-12.761	-12.761	0.000	(0)
Al (SO4) 2-	8.063e-14	6.769e-14	-13.094	-13.169	-0.076	(0)
CrSO4+	4.033e-14	3.223e-14	-13.394	-13.492	-0.097	(0)
UO2 (SO4) 2-2	2.335e-14	9.521e-15	-13.632	-14.021	-0.390	(0)
VO2SO4-	8.519e-18	6.808e-18	-17.070	-17.167	-0.097	(0)
FeSO4+	1.235e-18	1.041e-18	-17.908	-17.982	-0.074	(0)
Cr2 (OH) 2SO4+2	1.527e-19	6.227e-20	-18.816	-19.206	-0.390	(0)
Fe (SO4) 2-	1.161e-19	9.275e-20	-18.935	-19.033	-0.097	(0)
VOSO4	2.910e-20	2.910e-20	-19.536	-19.536	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.541e-20	1.541e-20	-19.812	-19.812	0.000	(0)
HgSO4	5.229e-21	5.229e-21	-20.282	-20.282	0.000	(0)
CrO3SO4-2	3.809e-24	1.554e-24	-23.419	-23.809	-0.390	(0)
VS04+	1.436e-34	1.147e-34	-33.843	-33.940	-0.097	(0)
U (SO4) 2	5.326e-40	5.326e-40	-39.274	-39.274	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.404	-40.793	-0.390	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.499	-58.597	-0.097	(0)
Sb (3)	6.418e-20					

Sb(OH) 3	3.247e-20	3.247e-20	-19.489	-19.489	0.000	(0)
HSbo2	3.171e-20	3.171e-20	-19.499	-19.499	0.000	(0)
SbO2-	2.326e-24	1.859e-24	-23.633	-23.731	-0.097	(0)
Sb(OH) 4-	1.331e-24	1.064e-24	-23.876	-23.973	-0.097	(0)
Sb(OH) 2F	2.007e-25	2.007e-25	-24.697	-24.697	0.000	(0)
SbOF	1.975e-25	1.975e-25	-24.705	-24.705	0.000	(0)
Sb(OH) 2+	2.727e-26	2.180e-26	-25.564	-25.662	-0.097	(0)
SbO+	9.409e-27	7.519e-27	-26.026	-26.124	-0.097	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.252	-318.642	-0.390	(0)
Sb (5)	2.195e-08					
SbO3-	2.192e-08	1.752e-08	-7.659	-7.756	-0.097	(0)
Sb(OH) 6-	2.438e-11	2.046e-11	-10.613	-10.689	-0.076	(0)
SbO2+	4.804e-24	3.839e-24	-23.318	-23.416	-0.097	(0)
Se (-2)	1.197e-14					
Ag2Se	1.197e-14	1.197e-14	-13.922	-13.922	0.000	(0)
HSe-	1.562e-39	1.248e-39	-38.806	-38.904	-0.097	(0)
MnSe	0.000e+00	0.000e+00	-41.552	-41.552	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.572	-42.572	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.956	-46.345	-0.390	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.827	-84.385	-1.558	(0)
Se (4)	1.247e-07					
HSeO3-	9.722e-08	7.769e-08	-7.012	-7.110	-0.097	(0)
SeO3-2	2.745e-08	1.119e-08	-7.562	-7.951	-0.390	(0)
H2SeO3	9.158e-13	9.158e-13	-12.038	-12.038	0.000	(0)
AgSeO3-	1.623e-14	1.297e-14	-13.790	-13.887	-0.097	(0)
Cd(SeO3) 2-2	7.392e-19	3.015e-19	-18.131	-18.521	-0.390	(0)
Ag(SeO3) 2-3	9.782e-21	1.300e-21	-20.010	-20.886	-0.876	(0)
FeHSeO3+2	1.121e-23	4.574e-24	-22.950	-23.340	-0.390	(0)
Se (6)	9.955e-11					
SeO4-2	9.934e-11	4.925e-11	-10.003	-10.308	-0.305	(0)
MnSeO4	1.999e-13	1.999e-13	-12.699	-12.699	0.000	(0)
ZnSeO4	1.116e-14	1.116e-14	-13.952	-13.952	0.000	(0)
NiSeO4	8.732e-16	8.732e-16	-15.059	-15.059	0.000	(0)
CoSeO4	5.558e-16	5.558e-16	-15.255	-15.255	0.000	(0)
HSeO4-	8.534e-17	6.820e-17	-16.069	-16.166	-0.097	(0)
CdSeO4	2.677e-17	2.677e-17	-16.572	-16.572	0.000	(0)
Zn(SeO4) 2-2	1.367e-24	5.574e-25	-23.864	-24.254	-0.390	(0)
Si	2.814e-05					
H4SiO4	2.796e-05	2.820e-05	-4.553	-4.550	0.004	(0)
H3SiO4-	1.765e-07	1.475e-07	-6.753	-6.831	-0.078	(0)
H2SiO4-2	6.582e-13	3.368e-13	-12.182	-12.473	-0.291	(0)
UO2H3SiO4+	4.308e-13	3.443e-13	-12.366	-12.463	-0.097	(0)
SiF6-2	4.243e-28	2.144e-28	-27.372	-27.669	-0.297	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.150	-59.026	-0.876	(0)
U (4)	5.707e-21					
U(OH) 5-	5.701e-21	4.556e-21	-20.244	-20.341	-0.097	(0)
U(OH) 4	5.275e-24	5.275e-24	-23.278	-23.278	0.000	(0)
U(OH) 3+	6.673e-28	5.332e-28	-27.176	-27.273	-0.097	(0)
U(OH) 2+2	1.671e-32	6.817e-33	-31.777	-32.166	-0.390	(0)
UF3+	1.417e-35	1.133e-35	-34.849	-34.946	-0.097	(0)
UF2+2	1.224e-36	4.993e-37	-35.912	-36.302	-0.390	(0)
UF4	1.777e-37	1.777e-37	-36.750	-36.750	0.000	(0)
UOH+3	6.678e-38	8.877e-39	-37.175	-38.052	-0.876	(0)
UF+3	2.085e-39	2.771e-40	-38.681	-39.557	-0.876	(0)
UF5-	1.262e-39	1.008e-39	-38.899	-38.996	-0.097	(0)
U(SO4) 2	5.326e-40	5.326e-40	-39.274	-39.274	0.000	(0)
UF6-2	1.068e-40	0.000e+00	-39.971	-40.361	-0.390	(0)
USO4+2	0.000e+00	0.000e+00	-40.404	-40.793	-0.390	(0)
U+4	0.000e+00	0.000e+00	-43.455	-45.013	-1.558	(0)
UCl+3	0.000e+00	0.000e+00	-44.975	-45.851	-0.876	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-165.971	-173.858	-7.888	(0)
U (5)	1.272e-16					
UO2+	1.272e-16	1.016e-16	-15.896	-15.993	-0.097	(0)
U (6)	1.991e-07					
UO2(CO3) 3-4	1.408e-07	3.895e-09	-6.851	-8.409	-1.558	(0)
UO2(CO3) 2-2	5.794e-08	2.363e-08	-7.237	-7.627	-0.390	(0)
UO2CO3	3.600e-10	3.600e-10	-9.444	-9.444	0.000	(0)

UO2OH+	1.577e-12	1.261e-12	-11.802	-11.899	-0.097	(0)
UO2F+	6.797e-13	5.432e-13	-12.168	-12.265	-0.097	(0)
UO2H3SiO4+	4.308e-13	3.443e-13	-12.366	-12.463	-0.097	(0)
UO2F2	2.242e-13	2.242e-13	-12.649	-12.649	0.000	(0)
UO2SO4	1.734e-13	1.734e-13	-12.761	-12.761	0.000	(0)
UO2+2	5.546e-14	2.749e-14	-13.256	-13.561	-0.305	(0)
UO2 (SO4) 2-2	2.335e-14	9.521e-15	-13.632	-14.021	-0.390	(0)
UO2F3-	1.009e-14	8.061e-15	-13.996	-14.094	-0.097	(0)
UO2Cl+	1.616e-16	1.291e-16	-15.792	-15.889	-0.097	(0)
UO2F4-2	2.247e-17	9.165e-18	-16.648	-17.038	-0.390	(0)
(UO2) 2 (OH) 2+2	6.466e-18	2.637e-18	-17.189	-17.579	-0.390	(0)
(UO2) 3 (OH) 5+	4.186e-19	3.345e-19	-18.378	-18.476	-0.097	(0)
UO2NO3+	6.191e-22	4.947e-22	-21.208	-21.306	-0.097	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.593	-42.690	-0.097	(0)
V+2	0.000e+00	0.000e+00	-43.372	-43.761	-0.390	(0)
V (3)	2.273e-15					
V (OH) 3	2.273e-15	2.273e-15	-14.643	-14.643	0.000	(0)
V (OH) 2+	5.082e-26	4.061e-26	-25.294	-25.391	-0.097	(0)
VOH+2	2.611e-29	1.065e-29	-28.583	-28.973	-0.390	(0)
V+3	4.389e-34	5.834e-35	-33.358	-34.234	-0.876	(0)
VSO4+	1.436e-34	1.147e-34	-33.843	-33.940	-0.097	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.036	-55.912	-0.876	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.587	-57.145	-1.558	(0)
V (4)	2.425e-18					
V (OH) 3+	2.305e-18	1.842e-18	-17.637	-17.735	-0.097	(0)
VO+2	6.218e-20	2.536e-20	-19.206	-19.596	-0.390	(0)
VOSO4	2.910e-20	2.910e-20	-19.536	-19.536	0.000	(0)
VOF+	2.724e-20	2.177e-20	-19.565	-19.662	-0.097	(0)
VOF2	1.168e-21	1.168e-21	-20.932	-20.932	0.000	(0)
VOCl+	2.578e-22	2.060e-22	-21.589	-21.686	-0.097	(0)
VOF3-	7.424e-24	5.933e-24	-23.129	-23.227	-0.097	(0)
VOF4-2	8.405e-27	3.428e-27	-26.075	-26.465	-0.390	(0)
H2V2O4+2	4.173e-31	1.702e-31	-30.380	-30.769	-0.390	(0)
V (5)	6.616e-09					
H2VO4-	5.615e-09	4.487e-09	-8.251	-8.348	-0.097	(0)
HVO4-2	1.000e-09	4.079e-10	-9.000	-9.389	-0.390	(0)
H3VO4	1.240e-12	1.240e-12	-11.907	-11.907	0.000	(0)
H3V2O7-	4.497e-14	3.594e-14	-13.347	-13.444	-0.097	(0)
HV2O7-3	4.669e-15	6.205e-16	-14.331	-15.207	-0.876	(0)
VO4-3	5.566e-16	7.399e-17	-15.254	-16.131	-0.876	(0)
VO2+	8.156e-17	6.844e-17	-16.089	-16.165	-0.076	(0)
V2O7-4	2.185e-17	6.045e-19	-16.661	-18.219	-1.558	(0)
VO2F	1.718e-17	1.718e-17	-16.765	-16.765	0.000	(0)
VO2SO4-	8.519e-18	6.808e-18	-17.070	-17.167	-0.097	(0)
VO2F2-	1.117e-18	8.927e-19	-17.952	-18.049	-0.097	(0)
V3O9-3	7.130e-19	9.477e-20	-18.147	-19.023	-0.876	(0)
VO2F3-2	3.908e-21	1.594e-21	-20.408	-20.798	-0.390	(0)
V4O12-4	6.411e-24	1.774e-25	-23.193	-24.751	-1.558	(0)
VO2F4-3	8.445e-25	1.122e-25	-24.073	-24.950	-0.876	(0)
VO2NO3	3.122e-25	3.122e-25	-24.506	-24.506	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.300	-64.806	-3.506	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.743	-64.178	-2.434	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.971	-66.529	-1.558	(0)
Zn	4.887e-06					
Zn+2	2.953e-06	1.464e-06	-5.530	-5.835	-0.305	(0)
ZnSO4	1.334e-06	1.334e-06	-5.875	-5.875	0.000	(0)
ZnCO3	2.770e-07	2.770e-07	-6.557	-6.557	0.000	(0)
Zn (SO4) 2-2	1.187e-07	4.840e-08	-6.926	-7.315	-0.390	(0)
ZnHCO3+	1.123e-07	8.973e-08	-6.950	-7.047	-0.097	(0)
ZnOH+	6.670e-08	5.331e-08	-7.176	-7.273	-0.097	(0)
ZnCl+	1.274e-08	1.065e-08	-7.895	-7.973	-0.078	(0)
ZnF+	5.230e-09	4.180e-09	-8.281	-8.379	-0.097	(0)
ZnOHCl	5.076e-09	5.076e-09	-8.294	-8.294	0.000	(0)
Zn (OH) 2	3.077e-09	3.077e-09	-8.512	-8.512	0.000	(0)
ZnCl2	4.886e-11	4.886e-11	-10.311	-10.311	0.000	(0)
Zn (OH) 3-	7.028e-12	5.616e-12	-11.153	-11.251	-0.097	(0)
ZnCl3-	1.344e-13	1.124e-13	-12.871	-12.949	-0.078	(0)

ZnNO3+	4.149e-14	3.316e-14	-13.382	-13.479	-0.097	(0)
ZnSeO4	1.116e-14	1.116e-14	-13.952	-13.952	0.000	(0)
ZnCl4-2	3.221e-16	1.627e-16	-15.492	-15.789	-0.297	(0)
Zn(OH) 4-2	1.997e-16	8.143e-17	-15.700	-16.089	-0.390	(0)
Zn(NO3) 2	5.967e-23	5.967e-23	-22.224	-22.224	0.000	(0)
Zn(SeO4) 2-2	1.367e-24	5.574e-25	-23.864	-24.254	-0.390	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.337	-148.435	-0.097	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.983	-149.983	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.090	-225.188	-0.097	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.220	-227.609	-0.390	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.743	-305.132	-0.390	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-53.41	-47.12	6.29	(Co(NH3) 5Cl) (NO3) 2	
(Co(NH3) 5Cl) Cl2	-40.62	-36.11	4.51	(Co(NH3) 5Cl) Cl2	
(Co(NH3) 5OH2) Cl3	-47.84	-36.11	11.74	(Co(NH3) 5OH2) Cl3	
(Co(NH3) 6) (NO3) 3	-69.29	-51.36	17.93	(Co(NH3) 6) (NO3) 3	
(Co(NH3) 6) Cl3	-54.87	-34.84	20.03	(Co(NH3) 6) Cl3	
(NH4) 2CrO4	-28.29	-27.89	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-23.34	-22.89	0.45	(NH4) 2SeO4	
Acanthite	-52.19	-88.41	-36.22	Ag2S	
Ag2CO3	-11.88	-22.97	-11.09	Ag2CO3	
Ag2CrO4	-21.20	-32.79	-11.59	Ag2CrO4	
Ag2HVO4	-12.46	-10.98	1.48	Ag2HVO4	
Ag2MoO4	-12.08	-23.63	-11.55	Ag2MoO4	
Ag2O	-14.94	-2.37	12.57	Ag2O	
Ag2Se	-0.13	-48.83	-48.70	Ag2Se	
Ag2SeO3	-9.89	-17.04	-7.15	Ag2SeO3	
Ag2SeO4	-18.89	-27.80	-8.91	Ag2SeO4	
Ag2SO4	-15.05	-19.87	-4.82	Ag2SO4	
Ag3AsO3	-28.48	-26.32	2.16	Ag3AsO3	
Ag3AsO4	-16.88	-19.67	-2.79	Ag3AsO4	
Ag3H2VO5	-17.34	-12.16	5.18	Ag3H2VO5	
AgF:4H2O	-13.64	-12.59	1.05	AgF:4H2O	
Agmetal	-0.45	-13.96	-13.51	Ag	
AgVO3	-10.56	-9.79	0.77	AgVO3	
Al(OH) 3 (am)	-1.45	9.35	10.80	Al(OH) 3	
Al2(MoO4) 3	-47.47	-45.10	2.37	Al2(MoO4) 3	
Al2O3	-0.96	18.69	19.65	Al2O3	
Al4(OH) 10SO4	-2.81	19.89	22.70	Al4(OH) 10SO4	
AlAsO4:2H2O	-11.56	-6.76	4.80	AlAsO4:2H2O	
AlOHSO4	-4.92	-8.15	-3.23	AlOHSO4	
AlSb	-152.42	-86.80	65.62	AlSb	
Alunite	-0.63	-2.03	-1.40	KA13(SO4) 2 (OH) 6	
Anglesite	-4.06	-11.85	-7.79	PbSO4	
Anhydrite	-1.07	-5.43	-4.36	CaSO4	
Anilite	-55.38	-87.26	-31.88	Cu0.25Cu1.5S	
Antlerite	-2.44	6.35	8.79	Cu3(OH) 4SO4	
Aragonite	-0.23	-8.53	-8.30	CaCO3	
Arsenolite	-88.30	-91.06	-2.76	As4O6	
Artinite	-5.59	4.01	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5	-38.93	-32.22	6.71	As2O5	
Atacamite	-1.59	5.80	7.39	Cu2(OH) 3Cl	
Azurite	-0.45	-17.35	-16.91	Cu3(OH) 2 (CO3) 2	
Ba(OH) 2:8H2O	-16.95	7.45	24.39	Ba(OH) 2:8H2O	
Ba2V2O7:2H2O	-18.18	-2.31	15.87	Ba2V2O7:2H2O	
Ba3(AsO4) 2	-0.96	-9.87	-8.91	Ba3(AsO4) 2	
Ba3(VO4) 2:4H2O	-27.80	5.14	32.94	Ba3(VO4) 2:4H2O	
BaCrO4	-13.30	-22.97	-9.67	BaCrO4	
BaF2	-9.53	-15.35	-5.82	BaF2	
BaMoO4	-6.85	-13.81	-6.96	BaMoO4	
Barite	-0.07	-10.05	-9.98	BaSO4	
BaS	-94.77	-78.59	16.18	BaS	
BaSeO3	-9.05	-7.22	1.83	BaSeO3	
BaSeO4	-10.51	-17.97	-7.46	BaSeO4	

Bianchite	-6.45	-8.22	-1.76	ZnSO4:6H2O
Birnessite	-7.59	10.50	18.09	MnO2
Bixbyite	-3.91	-4.56	-0.64	Mn2O3
BlaubleiI	-55.15	-79.32	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.70	-82.98	-27.28	Cu0.6Cu0.8S
Boehmite	0.77	9.35	8.58	AlOOH
Breithauptite	-57.15	-75.67	-18.52	NiSb
Brochantite	-0.93	14.30	15.22	Cu4(OH)6SO4
Brucite	-4.54	12.31	16.84	Mg(OH)2
Bunsenite	-4.75	7.70	12.45	NiO
Ca(VO3)2	-10.80	-5.14	5.66	Ca(VO3)2
Ca2V2O7	-10.57	6.93	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.62	6.93	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-18.31	3.99	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.96	19.00	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.86	19.00	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-299.05	-156.07	142.97	Ca3Sb2
CaCrO4	-16.09	-18.35	-2.27	CaCrO4
Calcite	-0.05	-8.53	-8.48	CaCO3
Calomel	-7.44	-25.35	-17.91	Hg2Cl2
CaMoO4	-1.24	-9.19	-7.95	CaMoO4
Carnotite	-2.36	-2.13	0.23	KUO2VO4
CaSeO3:2H2O	-5.41	-2.60	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.33	-13.35	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.34	-2.50	9.84	Cd(BO2)2
Cd(OH)2	-7.06	6.58	13.64	Cd(OH)2
Cd(OH)2(am)	-7.15	6.58	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.96	-15.25	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.31	2.25	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.57	8.83	28.40	Cd4(OH)6SO4
CdCl2	-12.95	-13.61	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.61	-1.91	CdCl2:2.5H2O
CdF2	-15.01	-16.22	-1.21	CdF2
Cdmetal(alpha)	-32.48	-18.97	13.51	Cd
Cdmetal(gamma)	-32.59	-18.97	13.62	Cd
CdMoO4	-0.53	-14.68	-14.15	CdMoO4
CdOHC1	-7.05	-3.51	3.54	CdOHC1
CdSb	-76.43	-76.78	-0.35	CdSb
CdSe	-19.68	-39.88	-20.20	CdSe
CdSeO4:2H2O	-16.99	-18.84	-1.85	CdSeO4:2H2O
CdSO4	-10.74	-10.91	-0.17	CdSO4
CdSO4:1H2O	-9.19	-10.92	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.04	-10.92	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO3
CH4(g)	-81.76	-122.81	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcedony	-1.00	-4.55	-3.55	SiO2
Chalcocite	-55.40	-90.32	-34.92	Cu2S
Chalcopyrite	-125.59	-160.86	-35.27	CuFeS2
Chrysotile	-4.38	27.82	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.75	-97.44	-45.69	HgS
Claudetite	-87.99	-91.06	-3.06	As4O6
Clausthalite	-13.72	-40.82	-27.10	PbSe
Co(BO2)2	-28.68	-1.61	27.07	Co(BO2)2
Co(OH)2	-5.62	7.47	13.09	Co(OH)2
Co(OH)3	-9.85	-12.16	-2.31	Co(OH)3
CO2(g)	-2.45	-20.60	-18.15	CO2
Co3(AsO4)2	-22.85	-9.81	13.03	Co3(AsO4)2
Co3O4	-6.34	-16.84	-10.50	Co3O4
CoCl2	-20.99	-12.72	8.27	CoCl2
CoCl2:6H2O	-15.26	-12.73	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.74	-15.34	-1.60	CoF2
CoF3	-44.90	-46.36	-1.46	CoF3
CoFe2O4	17.04	13.52	-3.53	CoFe2O4
CoMoO4	-6.03	-13.79	-7.76	CoMoO4

CoO	-6.12	7.47	13.59	CoO
CoS (alpha)	-71.13	-78.57	-7.44	CoS
CoS (beta)	-67.50	-78.57	-11.07	CoS
CoSe	-22.79	-38.99	-16.20	CoSe
CoSeO3	-8.52	-7.20	1.32	CoSeO3
CoSeO4:6H2O	-16.43	-17.96	-1.53	CoSeO4:6H2O
CoSO4	-12.83	-10.03	2.80	CoSO4
CoSO4:6H2O	-7.56	-10.03	-2.47	CoSO4:6H2O
Cotunnite	-9.77	-14.55	-4.78	PbCl2
Covellite	-55.79	-78.09	-22.30	CuS
Cr (OH) 2	-22.02	-11.20	10.82	Cr (OH) 2
Cr (OH) 3	-2.71	-1.37	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.62	-1.37	-0.75	Cr (OH) 3
Cr2O3	-0.39	-2.75	-2.36	Cr2O3
CrCl2	-45.49	-31.40	14.09	CrCl2
CrCl3	-46.78	-31.66	15.11	CrCl3
CrF3	-24.24	-35.58	-11.34	CrF3
Cristobalite	-1.20	-4.55	-3.35	SiO2
Crmetal	-67.24	-36.75	30.48	Cr
CrO3	-27.21	-30.42	-3.21	CrO3
Cryolite	-8.75	-42.59	-33.84	Na3AlF6
Cu (OH) 2	-0.73	7.95	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.14	20.08	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.96	0.29	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.45	-90.33	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.94	-50.74	-45.80	Cu2Se
Cu2SO4	-19.82	-21.77	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.48	-8.38	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.96	-102.55	-42.59	Cu3Sb
Cu3Se2	-25.76	-89.25	-63.49	Cu3Se2
CuCO3	-1.15	-12.65	-11.50	CuCO3
CuCrO4	-17.03	-22.47	-5.44	CuCrO4
CuF	-8.63	-13.54	-4.91	CuF
CuF2	-15.97	-14.86	1.12	CuF2
CuF2:2H2O	-10.31	-14.86	-4.55	CuF2:2H2O
Cumetal	-6.16	-14.91	-8.76	Cu
CuMoO4	-0.24	-13.31	-13.08	CuMoO4
CuOCuSO4	-11.90	-1.60	10.30	CuOCuSO4
Cupricferrite	8.01	14.00	5.99	CuFe2O4
Cuprite	-2.87	-4.27	-1.41	Cu2O
Cuprousferrite	9.80	0.89	-8.92	CuFeO2
CuSe	-5.41	-38.51	-33.10	CuSe
CuSe2	-26.06	-59.42	-33.37	CuSe2
CuSeO3:2H2O	-7.23	-6.72	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.04	-17.48	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.47	9.35	6.87	AlOOH
Djurleite	-55.59	-89.51	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.28	-16.82	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.27	-16.82	-17.09	CaMg (CO3) 2
Epsomite	-3.07	-5.19	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.28	3.28	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.03	-0.01	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-10.21	-13.93	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.18	-8.62	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.33	-37.96	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-42.71	-46.45	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.90	9.33	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.49	-13.09	0.40	FeAsO4:2H2O
FeCr2O4	-6.67	0.53	7.20	FeCr2O4
FeMoO4	-7.89	-17.98	-10.09	FeMoO4
Ferrihydrite	-0.17	3.02	3.19	Fe (OH) 3
Ferroselite	-45.50	-64.09	-18.60	FeSe2
FeS (ppt)	-79.81	-82.76	-2.95	FeS
FeSe	-32.18	-43.18	-11.00	FeSe
Fix_pe	-5.22	-5.22	0.00	e-
Fluorite	-0.23	-10.73	-10.50	CaF2
Galena	-66.43	-80.40	-13.97	PbS

Gibbsite	1.06	9.35	8.29	Al (OH) 3
Goethite	2.53	3.02	0.49	FeOOH
Goslarite	-6.21	-8.22	-2.01	ZnSO4:7H2O
Greenalite	-20.07	0.74	20.81	Fe3Si2O5 (OH) 4
Greenockite	-65.10	-79.46	-14.36	CdS
Greigite	-289.81	-334.84	-45.03	Fe3S4
Gummite	-6.12	1.56	7.67	UO3
Gypsum	-0.82	-5.43	-4.61	CaSO4:2H2O
H-Jarosite	-13.83	-25.93	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.39	-21.26	-12.88	H2MoO4
H2S (g)	-78.03	-86.04	-8.01	H2S
H2Se (g)	-41.50	-46.46	-4.96	H2Se
Halite	-6.21	-4.60	1.60	NaCl
Halloysite	0.02	9.59	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.59	56.44	61.03	Mn3O4
Hematite	7.46	6.05	-1.42	Fe2O3
Hercynite	-0.92	21.97	22.89	FeAl2O4
Hg (CH3) 2 (g)	-183.30	-257.01	-73.71	Hg (CH3) 2
Hg (g)	-7.48	-15.36	-7.87	Hg
Hg (OH) 2	-7.90	-11.40	-3.50	Hg (OH) 2
Hg2 (g)	-15.76	-30.71	-14.96	Hg2
Hg2 (OH) 2	-10.42	-5.16	5.26	Hg2 (OH) 2
Hg2CO3	-9.71	-25.76	-16.05	Hg2CO3
Hg2CrO4	-26.88	-35.58	-8.70	Hg2CrO4
Hg2F2	-17.60	-27.96	-10.36	Hg2F2
Hg2S	-79.53	-91.20	-11.68	Hg2S
Hg2SeO3	-15.17	-19.83	-4.66	Hg2SeO3
Hg2SO4	-16.53	-22.66	-6.13	Hg2SO4
Hg3O2CO3	-25.11	-54.79	-29.68	Hg3O2CO3
HgCl (g)	-32.17	-12.68	19.50	HgCl
HgCl2	-10.33	-31.59	-21.26	HgCl2
HgF (g)	-46.66	-13.98	32.68	HgF
HgF2 (g)	-46.77	-34.20	12.57	HgF2
Hgmetal (l)	-1.90	-15.36	-13.45	Hg
HgSe	-2.16	-57.86	-55.69	HgSe
HgSeO3	-13.63	-26.06	-12.43	HgSeO3
HgSO4	-19.47	-28.89	-9.42	HgSO4
Huntite	-3.44	-33.41	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.50	-24.27	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.10	-20.87	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.56	-20.73	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.20	-21.00	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.75	-51.00	-17.24	K2Cr2O7
K2CrO4	-20.06	-20.57	-0.51	K2CrO4
K2MoO4	-14.68	-11.42	3.26	K2MoO4
K2SeO4	-14.85	-15.58	-0.73	K2SeO4
Kaolinite	2.16	9.59	7.43	Al2Si2O5 (OH) 4
Langite	-3.19	14.30	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.78	-6.21	-0.43	PbO:PbSO4
Laurionite	-5.08	-4.45	0.62	PbOHCl
Lepidocrocite	1.65	3.02	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.05	5.64	12.69	PbO
Mackinawite	-79.16	-82.76	-3.60	FeS
Maghemite	-0.34	6.05	6.39	Fe2O3
Magnesioferrite	1.49	18.35	16.86	Fe2MgO4
Magnesite	-0.83	-8.29	-7.46	MgCO3
Magnetite	5.92	9.33	3.40	Fe3O4
Malachite	0.60	-4.70	-5.31	Cu2 (OH) 2CO3
Manganite	-2.27	23.07	25.34	MnOOH
Massicot	-7.25	5.64	12.89	PbO
Matlockite	-6.88	-15.86	-8.97	PbClF
Melanothallite	-18.50	-12.24	6.26	CuCl2
Melanterite	-12.01	-14.22	-2.21	FeSO4:7H2O
Metacinnabar	-52.35	-97.44	-45.09	HgS
Mg (OH) 2 (active)	-6.49	12.31	18.79	Mg (OH) 2
Mg (VO3) 2	-16.19	-4.91	11.28	Mg (VO3) 2
Mg2Sb3	-274.62	-199.93	74.68	Mg2Sb3

Mg ₂ V ₂ O ₇	-18.96	7.40	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.64	9.56	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.50	-18.12	5.38	MgCrO ₄
MgF ₂	-2.37	-10.50	-8.13	MgF ₂
MgMoO ₄	-7.11	-8.96	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.42	-2.36	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.92	-13.12	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.04	42.48	73.52	Pb ₃ O ₄
Mirabilite	-5.40	-6.52	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.82	-6.92	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-51.34	-57.05	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-149.41	-88.33	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.84	-1.34	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.61	-9.90	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.92	-75.75	0.17	MnS
MnS (pnk)	-79.09	-75.75	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.67	-36.17	3.50	MnSe
MnSeO ₃	-5.50	-4.37	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.36	-4.37	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.08	-15.13	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.78	-7.20	2.58	MnSO ₄
Monteponite	-8.52	6.58	15.10	CdO
Montroydite	-7.76	-11.40	-3.64	HgO
MoO ₃	-13.26	-21.26	-8.00	MoO ₃
Morenosite	-7.66	-9.80	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-148.64	-218.90	-70.26	MoS ₂
Na-Jarosite	-9.23	-20.43	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.96	-49.86	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.37	-19.44	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.95	-31.54	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.77	-10.28	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.50	-10.28	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-13.98	-3.68	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.72	-14.44	1.28	Na ₂ SeO ₄
Na ₃ Sb	-174.12	-79.67	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.81	7.87	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.64	4.76	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.50	-12.23	-6.73	CuCl
NaSb	-88.26	-65.10	23.17	NaSb
Natron	-8.31	-9.62	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.97	-3.11	3.86	NaVO ₃
Nesquehonite	-3.62	-8.29	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.10	7.70	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-24.84	-9.14	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-18.72	13.28	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.03	-12.90	-6.87	NiCO ₃
NiMoO ₄	-2.43	-13.57	-11.14	NiMoO ₄
NiS (alpha)	-72.75	-78.35	-5.60	NiS
NiS (beta)	-67.25	-78.35	-11.10	NiS
NiS (gamma)	-65.55	-78.35	-12.80	NiS
NiSe	-21.07	-38.77	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-9.79	-6.97	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-16.21	-17.73	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-7.01	10.50	17.50	MnO ₂
O ₂ (g)	-31.99	51.10	83.09	O ₂
Orpiment	-242.59	-303.66	-61.07	As ₂ S ₃
Otavite	-2.02	-14.02	-12.00	CdCO ₃
Pb(BO ₂) ₂	-9.95	-3.44	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.51	5.64	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-58.40	-67.16	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-7.60	1.19	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂ O(OH) ₂	-14.90	11.29	26.19	Pb ₂ O(OH) ₂
Pb ₂ O ₃	-24.20	36.84	61.04	Pb ₂ O ₃
Pb ₂ OCO ₃	-8.75	-9.31	-0.56	Pb ₂ OCO ₃
Pb ₂ V ₂ O ₇	-4.03	-5.93	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-21.09	-15.29	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-6.42	-0.28	6.14	Pb ₃ (VO ₄) ₂

Pb3O2CO3	-14.69	-3.67	11.02	Pb3O2CO3
Pb3O2SO4	-11.25	-0.57	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.02	5.08	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.80	5.08	21.88	Pb4O3SO4
PbCrO4	-12.18	-24.78	-12.60	PbCrO4
PbF2	-9.72	-17.16	-7.44	PbF2
Pbmetal	-24.15	-19.91	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.34	5.64	12.98	PbO:0.33H2O
PbSeO4	-12.94	-19.78	-6.84	PbSeO4
Periclase	-9.28	12.31	21.58	MgO
Phosgenite	-9.70	-29.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.41	31.19	49.60	PbO2
Portlandite	-10.73	12.07	22.80	Ca (OH) 2
Pyrite	-124.75	-143.25	-18.51	FeS2
Pyrochroite	-4.90	10.30	15.19	Mn (OH) 2
Pyrolusite	-5.53	35.85	41.38	MnO2
Quartz	-0.55	-4.55	-4.00	SiO2
Realgar	-101.84	-121.58	-19.75	AsS
Retgersite	-7.76	-9.80	-2.04	NiSO4:6H2O
Rhodochrosite	0.28	-10.30	-10.58	MnCO3
Rutherfordine	-4.54	-19.04	-14.50	UO2CO3
Sb (OH) 3	-12.38	-19.49	-7.11	Sb (OH) 3
Sb2O4	-16.83	-13.43	3.40	Sb2O4
Sb2O5	-26.83	-36.49	-9.67	Sb2O5
Sb2Se3	-110.61	-178.36	-67.76	Sb2Se3
Sb4O6(cubic)	-59.69	-77.95	-18.26	Sb4O6
Sb4O6(orth)	-60.05	-77.95	-17.90	Sb4O6
SbCl3	-50.35	-49.78	0.57	SbCl3
SbF3	-43.47	-53.70	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.20	-31.02	-27.82	SbO2
Schoepite	-4.44	1.56	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.80	-20.91	-7.11	Se
Semetal (hex)	-13.20	-20.91	-7.71	Se
Senarmontite	-26.61	-38.98	-12.37	Sb2O3
SeO2	-14.79	-14.67	0.12	SeO2
SeO3	-46.47	-25.42	21.04	SeO3
Sepiolite	-4.79	10.97	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-7.81	10.97	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.08	-17.32	-10.24	FeCO3
SiO2 (am-gel)	-1.84	-4.55	-2.71	SiO2
SiO2 (am-ppt)	-1.81	-4.55	-2.74	SiO2
Smithsonite	-1.32	-11.32	-10.00	ZnCO3
Sphalerite	-65.31	-76.76	-11.45	ZnS
Spinel	-5.85	31.00	36.85	MgAl2O4
Stibnite	-246.64	-297.10	-50.46	Sb2S3
Sulfur	-58.35	-60.49	-2.14	S
Tenorite	0.30	7.95	7.64	CuO
Thenardite	-6.83	-6.51	0.32	Na2SO4
Thermonatrite	-10.25	-9.62	0.64	Na2CO3:H2O
Tyuyamunite	-6.11	-2.03	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-14.32	6.77	21.08	U3O8
U3Sb4	-581.29	-428.91	152.38	U3Sb4
U4O9	-30.55	-33.57	-3.02	U4O9
UF4	-30.85	-60.39	-29.54	UF4
UF4:2.5H2O	-27.67	-60.39	-32.72	UF4:2.5H2O
UO2 (am)	-15.71	-14.78	0.93	UO2
UO2 (NO3) 2	-41.80	-29.65	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.50	-29.65	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.04	-29.65	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.70	-29.65	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.06	1.56	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.62	-23.87	-2.25	UO2SeO4:4H2O
UO3	-6.14	1.56	7.70	UO3
Uraninite	-10.11	-14.78	-4.67	UO2
USb2	-220.31	-190.73	29.58	USb2
V (OH) 3	-19.15	-11.56	7.59	V (OH) 3

V2O5	-15.85	-17.21	-1.36	V2O5
V3O5	-40.82	-38.99	1.84	V3O5
V4O7	-50.65	-43.47	7.19	V4O7
V6O13	-41.88	-102.74	-60.86	V6O13
Valentinite	-30.50	-38.98	-8.48	Sb2O3
VC12	-63.40	-44.53	18.87	VC12
VC13	-65.28	-41.85	23.43	VC13
VF4	-65.02	-50.09	14.93	VF4
Vmetal	-93.91	-49.89	44.03	V
VO	-39.09	-24.33	14.76	VO
VO(OH)2	-9.63	-4.48	5.15	VO(OH)2
VO2Cl	-21.54	-18.70	2.84	VO2Cl
VOC1	-32.81	-21.66	11.15	VOC1
VOC12	-37.43	-24.67	12.76	VOC12
VOSO4	-25.59	-21.98	3.61	VOSO4
Witherite	-4.58	-13.15	-8.57	BaCO3
Wurtzite	-67.81	-76.76	-8.95	ZnS
Zincite	-2.05	9.28	11.33	ZnO
Zincosite	-12.14	-8.21	3.93	ZnSO4
Zn(BO2)2	-8.09	0.20	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.24	-21.93	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.92	9.28	12.20	Zn(OH)2
Zn(OH)2(am)	-3.19	9.28	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.47	9.28	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.25	9.28	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.45	9.28	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.43	1.07	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.72	8.47	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.02	-4.37	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.06	-7.15	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.77	19.63	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.28	26.22	38.50	Zn5(OH)8Cl2
ZnCl2	-17.96	-10.91	7.05	ZnCl2
ZnCO3:1H2O	-1.06	-11.32	-10.26	ZnCO3:1H2O
ZnF2	-12.99	-13.52	-0.53	ZnF2
Znmetal	-42.06	-16.27	25.79	Zn
ZnMoO4	-1.86	-11.98	-10.13	ZnMoO4
ZnO(active)	-1.91	9.28	11.19	ZnO
ZnS(am)	-67.71	-76.76	-9.05	ZnS
ZnSb	-85.10	-74.08	11.01	ZnSb
ZnSe	-22.78	-37.18	-14.40	ZnSe
ZnSeO4:6H2O	-14.62	-16.14	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.58	-8.22	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 141.

```

Title Stage 8 Pit wall interaction mix calculator
MIX 804
809 1
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0.000076
11 0.000617
12 0.000471

```

```

13      0.001108
14      0
15      0
Save solution 810
end
-----
TITLE
-----

Stage 8 Pit wall interaction mix calculator

-----
Beginning of batch-reaction calculations.
-----

Reaction step 1.

Using mix 804.

Mixture 804.

      0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
      0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
      0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
      0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
      0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
      0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
      0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
      7.600e-05 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
      6.170e-04 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
      4.710e-04 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
      1.108e-03 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
      0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
      0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
      1.000e+00 Solution 809    Solution after simulation 140.

-----Solution composition-----

      Elements              Molality              Moles
Ag              1.635e-08      1.638e-08
Al              2.011e-06      2.015e-06
As              1.798e-10      1.802e-10
B               2.936e-05      2.943e-05
Ba              4.423e-08      4.433e-08
C               2.512e-03      2.518e-03
Ca              2.710e-03      2.716e-03
Cd              1.040e-08      1.042e-08
Cl              3.443e-03      3.451e-03
Co              7.987e-08      8.005e-08
Cr              1.717e-09      1.721e-09
Cu              1.658e-06      1.661e-06
F               2.024e-04      2.029e-04
Fe              1.241e-09      1.244e-09
Hg              1.641e-09      1.644e-09

```

K	2.838e-03	2.844e-03
Mg	4.361e-03	4.371e-03
Mn	4.892e-05	4.903e-05
Mo	1.436e-06	1.439e-06
N	1.201e-05	1.204e-05
Na	1.045e-02	1.047e-02
Ni	1.244e-07	1.247e-07
Pb	5.841e-09	5.854e-09
S	1.073e-02	1.076e-02
Sb	2.190e-08	2.195e-08
Se	1.245e-07	1.248e-07
Si	2.807e-05	2.813e-05
U	1.987e-07	1.991e-07
V	6.631e-09	6.646e-09
Zn	4.877e-06	4.887e-06

-----Description of solution-----

	pH	=	7.558	Charge balance
	pe	=	5.218	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	3.638e-02	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	2.420e-03	
	Total CO2 (mol/kg)	=	2.512e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.425e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	4	
	Total H	=	1.112627e+02	
	Total O	=	5.568075e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.367e-07	3.634e-07	-6.360	-6.440	-0.080	(0)
H+	3.300e-08	2.769e-08	-7.482	-7.558	-0.076	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.635e-08					
AgCl	1.064e-08	1.064e-08	-7.973	-7.973	0.000	(0)
AgCl2-	3.350e-09	2.677e-09	-8.475	-8.572	-0.097	(0)
Ag+	2.149e-09	1.803e-09	-8.668	-8.744	-0.076	(0)
AgSO4-	1.873e-10	1.497e-10	-9.728	-9.825	-0.097	(0)
AgCl3-2	1.689e-11	6.895e-12	-10.772	-11.161	-0.389	(0)
AgNO2	3.539e-12	3.539e-12	-11.451	-11.451	0.000	(0)
AgF	6.474e-13	6.474e-13	-12.189	-12.189	0.000	(0)
AgCl4-3	3.054e-13	4.068e-14	-12.515	-13.391	-0.876	(0)
AgOH	6.553e-14	6.553e-14	-13.184	-13.184	0.000	(0)
AgNH3+	4.845e-14	3.873e-14	-13.315	-13.412	-0.097	(0)
AgH2BO3	1.725e-14	1.725e-14	-13.763	-13.763	0.000	(0)
AgSeO3-	1.617e-14	1.293e-14	-13.791	-13.888	-0.097	(0)
Ag2Se	1.187e-14	1.187e-14	-13.925	-13.925	0.000	(0)
Ag (NO2) 2-	6.442e-17	5.149e-17	-16.191	-16.288	-0.097	(0)
AgNO3	1.291e-17	1.291e-17	-16.889	-16.889	0.000	(0)
Ag (NH3) 2+	4.142e-18	3.311e-18	-17.383	-17.480	-0.097	(0)
Ag (OH) 2-	2.912e-18	2.327e-18	-17.536	-17.633	-0.097	(0)
Ag (SeO3) 2-3	9.694e-21	1.291e-21	-20.013	-20.889	-0.876	(0)
Ag2MoO4	8.766e-25	8.766e-25	-24.057	-24.057	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.416	-73.416	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.836	-84.393	-1.557	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.528	-147.728	-0.201	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.705	-147.803	-0.097	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.243	-149.611	-0.368	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.572	-149.922	-0.350	(0)

Al	2.011e-06					
Al (OH) 4-	1.957e-06	1.643e-06	-5.708	-5.784	-0.076	(0)
Al (OH) 3	3.592e-08	3.592e-08	-7.445	-7.445	0.000	(0)
AlF3	6.909e-09	6.909e-09	-8.161	-8.161	0.000	(0)
Al (OH) 2+	5.856e-09	4.954e-09	-8.232	-8.305	-0.073	(0)
AlF2+	4.540e-09	3.840e-09	-8.343	-8.416	-0.073	(0)
AlF4-	5.894e-10	4.949e-10	-9.230	-9.305	-0.076	(0)
AlF+2	1.318e-10	6.749e-11	-9.880	-10.171	-0.291	(0)
AlOH+2	3.352e-11	1.716e-11	-10.475	-10.765	-0.291	(0)
AlSO4+	1.816e-12	1.525e-12	-11.741	-11.817	-0.076	(0)
Al+3	2.287e-13	4.722e-14	-12.641	-13.326	-0.685	(0)
Al (SO4) 2-	8.094e-14	6.797e-14	-13.092	-13.168	-0.076	(0)
AlMo6O21-3	2.053e-40	0.000e+00	-39.688	-40.563	-0.876	(0)
As (3)	1.793e-23					
H3AsO3	1.752e-23	1.752e-23	-22.756	-22.756	0.000	(0)
H2AsO3-	4.060e-25	3.245e-25	-24.391	-24.489	-0.097	(0)
HAsO3-2	2.618e-29	1.069e-29	-28.582	-28.971	-0.389	(0)
H4AsO3+	3.008e-31	2.404e-31	-30.522	-30.619	-0.097	(0)
AsO3-3	1.117e-34	1.488e-35	-33.952	-34.827	-0.876	(0)
As (5)	1.798e-10					
HAsO4-2	1.592e-10	6.499e-11	-9.798	-10.187	-0.389	(0)
H2AsO4-	2.054e-11	1.641e-11	-10.688	-10.785	-0.097	(0)
AsO4-3	5.572e-14	7.422e-15	-13.254	-14.129	-0.876	(0)
H3AsO4	7.833e-17	7.899e-17	-16.106	-16.102	0.004	(0)
B	2.936e-05					
H3BO3	2.854e-05	2.878e-05	-4.544	-4.541	0.004	(0)
H2BO3-	7.326e-07	6.037e-07	-6.135	-6.219	-0.084	(0)
MgH2BO3+	3.930e-08	3.238e-08	-7.406	-7.490	-0.084	(0)
CaH2BO3+	3.785e-08	3.118e-08	-7.422	-7.506	-0.084	(0)
NaH2BO3	8.200e-09	8.200e-09	-8.086	-8.086	0.000	(0)
BF (OH) 3-	1.992e-09	1.641e-09	-8.701	-8.785	-0.084	(0)
H5 (BO3) 2-	1.795e-11	1.479e-11	-10.746	-10.830	-0.084	(0)
BF2 (OH) 2-	8.434e-13	6.949e-13	-12.074	-12.158	-0.084	(0)
BaH2BO3+	4.910e-13	4.045e-13	-12.309	-12.393	-0.084	(0)
H8 (BO3) 3-	5.166e-14	4.257e-14	-13.287	-13.371	-0.084	(0)
AgH2BO3	1.725e-14	1.725e-14	-13.763	-13.763	0.000	(0)
BF3OH-	1.299e-18	1.071e-18	-17.886	-17.970	-0.084	(0)
BF4-	2.532e-23	2.086e-23	-22.597	-22.681	-0.084	(0)
Ba	4.423e-08					
Ba+2	4.372e-08	2.169e-08	-7.359	-7.664	-0.305	(0)
BaHCO3+	4.718e-10	4.009e-10	-9.326	-9.397	-0.071	(0)
BaCO3	3.645e-11	3.645e-11	-10.438	-10.438	0.000	(0)
BaH2BO3+	4.910e-13	4.045e-13	-12.309	-12.393	-0.084	(0)
BaOH+	4.080e-14	3.440e-14	-13.389	-13.463	-0.074	(0)
BaNO3+	1.225e-15	9.795e-16	-14.912	-15.009	-0.097	(0)
BaNH3+2	3.526e-16	1.439e-16	-15.453	-15.842	-0.389	(0)
C (4)	2.512e-03					
HCO3-	2.288e-03	1.936e-03	-2.640	-2.713	-0.073	(0)
H2CO3	1.206e-04	1.206e-04	-3.919	-3.919	0.000	(0)
CaHCO3+	3.808e-05	3.236e-05	-4.419	-4.490	-0.071	(0)
MgHCO3+	3.666e-05	3.065e-05	-4.436	-4.514	-0.078	(0)
NaHCO3	9.330e-06	9.330e-06	-5.030	-5.030	0.000	(0)
CO3-2	6.607e-06	3.277e-06	-5.180	-5.484	-0.305	(0)
CaCO3	4.663e-06	4.663e-06	-5.331	-5.331	0.000	(0)
MgCO3	4.217e-06	4.217e-06	-5.375	-5.375	0.000	(0)
CuCO3	1.314e-06	1.314e-06	-5.881	-5.881	0.000	(0)
MnHCO3+	6.900e-07	5.818e-07	-6.161	-6.235	-0.074	(0)
NaCO3-	6.183e-07	5.230e-07	-6.209	-6.281	-0.073	(0)
ZnCO3	2.757e-07	2.757e-07	-6.560	-6.560	0.000	(0)
UO2 (CO3) 3-4	1.402e-07	3.894e-09	-6.853	-8.410	-1.557	(0)
ZnHCO3+	1.120e-07	8.950e-08	-6.951	-7.048	-0.097	(0)
UO2 (CO3) 2-2	5.807e-08	2.371e-08	-7.236	-7.625	-0.389	(0)
Cu (CO3) 2-2	2.839e-08	1.159e-08	-7.547	-7.936	-0.389	(0)
NiHCO3+	1.130e-08	9.035e-09	-7.947	-8.044	-0.097	(0)
CuHCO3+	1.040e-08	8.316e-09	-7.983	-8.080	-0.097	(0)
NiCO3	4.629e-09	4.629e-09	-8.335	-8.335	0.000	(0)
CoHCO3+	4.237e-09	3.387e-09	-8.373	-8.470	-0.097	(0)
PbCO3	3.316e-09	3.316e-09	-8.479	-8.479	0.000	(0)

	CoCO3	1.246e-09	1.246e-09	-8.904	-8.904	0.000	(0)
	PbHCO3+	6.057e-10	4.842e-10	-9.218	-9.315	-0.097	(0)
	BaHCO3+	4.718e-10	4.009e-10	-9.326	-9.397	-0.071	(0)
	UO2CO3	3.625e-10	3.625e-10	-9.441	-9.441	0.000	(0)
	CdCO3	2.179e-10	2.179e-10	-9.662	-9.662	0.000	(0)
	Pb (CO3) 2-2	7.679e-11	3.134e-11	-10.115	-10.504	-0.389	(0)
	BaCO3	3.645e-11	3.645e-11	-10.438	-10.438	0.000	(0)
	CdHCO3+	1.608e-11	1.285e-11	-10.794	-10.891	-0.097	(0)
	Cd (CO3) 2-2	1.297e-12	5.293e-13	-11.887	-12.276	-0.389	(0)
	FeHCO3+	4.378e-14	3.721e-14	-13.359	-13.429	-0.071	(0)
	HgCO3	1.887e-14	1.887e-14	-13.724	-13.724	0.000	(0)
	Hg (CO3) 2-2	4.790e-16	1.955e-16	-15.320	-15.709	-0.389	(0)
	HgHCO3+	1.217e-17	9.730e-18	-16.915	-17.012	-0.097	(0)
Ca	2.710e-03						
	Ca+2	1.810e-03	8.977e-04	-2.742	-3.047	-0.305	(0)
	CaSO4	8.555e-04	8.555e-04	-3.068	-3.068	0.000	(0)
	CaHCO3+	3.808e-05	3.236e-05	-4.419	-4.490	-0.071	(0)
	CaCO3	4.663e-06	4.663e-06	-5.331	-5.331	0.000	(0)
	CaF+	1.661e-06	1.400e-06	-5.780	-5.854	-0.074	(0)
	CaH2BO3+	3.785e-08	3.118e-08	-7.422	-7.506	-0.084	(0)
	CaOH+	7.660e-09	6.509e-09	-8.116	-8.186	-0.071	(0)
	CaNO3+	3.201e-11	2.559e-11	-10.495	-10.592	-0.097	(0)
	CaNH3+2	2.912e-11	1.189e-11	-10.536	-10.925	-0.389	(0)
	Ca (NH3) 2+2	1.219e-19	4.978e-20	-18.914	-19.303	-0.389	(0)
Cd	1.040e-08						
	Cd+2	5.880e-09	2.917e-09	-8.231	-8.535	-0.305	(0)
	CdSO4	2.844e-09	2.844e-09	-8.546	-8.546	0.000	(0)
	CdCl+	1.007e-09	8.048e-10	-8.997	-9.094	-0.097	(0)
	Cd (SO4) 2-2	3.910e-10	1.596e-10	-9.408	-9.797	-0.389	(0)
	CdCO3	2.179e-10	2.179e-10	-9.662	-9.662	0.000	(0)
	CdHCO3+	1.608e-11	1.285e-11	-10.794	-10.891	-0.097	(0)
	CdOHC1	1.200e-11	1.200e-11	-10.921	-10.921	0.000	(0)
	CdOH+	1.053e-11	8.419e-12	-10.977	-11.075	-0.097	(0)
	CdCl2	9.694e-12	9.694e-12	-11.013	-11.013	0.000	(0)
	CdF+	8.265e-12	6.606e-12	-11.083	-11.180	-0.097	(0)
	Cd (CO3) 2-2	1.297e-12	5.293e-13	-11.887	-12.276	-0.389	(0)
	CdCl3-	2.211e-14	1.767e-14	-13.655	-13.753	-0.097	(0)
	Cd (OH) 2	1.930e-14	1.930e-14	-13.714	-13.714	0.000	(0)
	CdF2	1.884e-15	1.884e-15	-14.725	-14.725	0.000	(0)
	CdNO3+	1.040e-16	8.312e-17	-15.983	-16.080	-0.097	(0)
	CdSeO4	2.669e-17	2.669e-17	-16.574	-16.574	0.000	(0)
	Cd2OH+3	9.240e-19	1.231e-19	-18.034	-18.910	-0.876	(0)
	Cd (SeO3) 2-2	7.326e-19	2.991e-19	-18.135	-18.524	-0.389	(0)
	Cd (OH) 3-	5.362e-19	4.286e-19	-18.271	-18.368	-0.097	(0)
	Cd (NO3) 2	3.754e-25	3.754e-25	-24.425	-24.425	0.000	(0)
	Cd (OH) 4-2	6.245e-26	2.549e-26	-25.204	-25.594	-0.389	(0)
	CdHS+	0.000e+00	0.000e+00	-78.916	-79.014	-0.097	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.296	-150.296	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.786	-226.883	-0.097	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.784	-303.173	-0.389	(0)
Cl	3.443e-03						
	Cl-	3.443e-03	2.890e-03	-2.463	-2.539	-0.076	(0)
	MnCl+	6.499e-08	5.480e-08	-7.187	-7.261	-0.074	(0)
	ZnCl+	1.269e-08	1.061e-08	-7.896	-7.974	-0.078	(0)
	AgCl	1.064e-08	1.064e-08	-7.973	-7.973	0.000	(0)
	ZnOHC1	5.049e-09	5.049e-09	-8.297	-8.297	0.000	(0)
	AgCl2-	3.350e-09	2.677e-09	-8.475	-8.572	-0.097	(0)
	CdCl+	1.007e-09	8.048e-10	-8.997	-9.094	-0.097	(0)
	CuCl	7.335e-10	7.335e-10	-9.135	-9.135	0.000	(0)
	CuCl2-	5.297e-10	4.428e-10	-9.276	-9.354	-0.078	(0)
	CuCl+	3.729e-10	3.118e-10	-9.428	-9.506	-0.078	(0)
	NiCl+	3.502e-10	2.799e-10	-9.456	-9.553	-0.097	(0)
	CoCl+	2.813e-10	2.248e-10	-9.551	-9.648	-0.097	(0)
	MnCl2	2.237e-10	2.237e-10	-9.650	-9.650	0.000	(0)
	ZnCl2	4.860e-11	4.860e-11	-10.313	-10.313	0.000	(0)
	PbCl+	4.318e-11	3.451e-11	-10.365	-10.462	-0.097	(0)
	AgCl3-2	1.689e-11	6.895e-12	-10.772	-11.161	-0.389	(0)
	CdOHC1	1.200e-11	1.200e-11	-10.921	-10.921	0.000	(0)

CdCl2	9.694e-12	9.694e-12	-11.013	-11.013	0.000	(0)
HgClOH	8.922e-12	8.922e-12	-11.050	-11.050	0.000	(0)
HgCl2	4.017e-12	4.017e-12	-11.396	-11.396	0.000	(0)
CuCl3-2	5.412e-13	2.735e-13	-12.267	-12.563	-0.296	(0)
PbCl2	4.455e-13	4.455e-13	-12.351	-12.351	0.000	(0)
CuCl2	3.124e-13	3.124e-13	-12.505	-12.505	0.000	(0)
AgCl4-3	3.054e-13	4.068e-14	-12.515	-13.391	-0.876	(0)
MnCl3-	2.111e-13	1.780e-13	-12.676	-12.750	-0.074	(0)
HgCl3-	1.452e-13	1.161e-13	-12.838	-12.935	-0.097	(0)
ZnCl3-	1.334e-13	1.115e-13	-12.875	-12.953	-0.078	(0)
CdCl3-	2.211e-14	1.767e-14	-13.655	-13.753	-0.097	(0)
NiCl2	4.072e-15	4.072e-15	-14.390	-14.390	0.000	(0)
HgCl4-2	3.271e-15	1.335e-15	-14.485	-14.874	-0.389	(0)
PbCl3-	6.411e-16	5.124e-16	-15.193	-15.290	-0.097	(0)
HgCl+	3.470e-16	2.774e-16	-15.460	-15.557	-0.097	(0)
ZnCl4-2	3.188e-16	1.612e-16	-15.496	-15.793	-0.296	(0)
UO2Cl+	1.629e-16	1.302e-16	-15.788	-15.885	-0.097	(0)
CrCl+2	3.043e-17	1.242e-17	-16.517	-16.906	-0.389	(0)
CuCl3-	1.008e-17	8.424e-18	-16.997	-17.074	-0.078	(0)
PbCl4-2	1.658e-18	6.768e-19	-17.780	-18.170	-0.389	(0)
CrOHC12	2.479e-19	2.479e-19	-18.606	-18.606	0.000	(0)
CrCl2+	4.260e-21	3.405e-21	-20.371	-20.468	-0.097	(0)
FeCl+2	4.049e-21	2.047e-21	-20.393	-20.689	-0.296	(0)
VOC1+	2.594e-22	2.074e-22	-21.586	-21.683	-0.097	(0)
CuCl4-2	2.413e-22	1.220e-22	-21.617	-21.914	-0.296	(0)
FeCl2+	3.133e-23	2.642e-23	-22.504	-22.578	-0.074	(0)
CrO3Cl-	2.778e-26	2.221e-26	-25.556	-25.654	-0.097	(0)
FeCl3	7.633e-27	7.633e-27	-26.117	-26.117	0.000	(0)
CoCl+2	2.133e-35	8.706e-36	-34.671	-35.060	-0.389	(0)
UCl+3	0.000e+00	0.000e+00	-44.971	-45.846	-0.876	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.608	-48.997	-0.389	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.395	-50.784	-0.389	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.302	-63.691	-0.389	(0)
Co (2)	7.987e-08					
Co+2	5.510e-08	2.249e-08	-7.259	-7.648	-0.389	(0)
CoSO4	1.867e-08	1.867e-08	-7.729	-7.729	0.000	(0)
CoHCO3+	4.237e-09	3.387e-09	-8.373	-8.470	-0.097	(0)
CoCO3	1.246e-09	1.246e-09	-8.904	-8.904	0.000	(0)
CoCl+	2.813e-10	2.248e-10	-9.551	-9.648	-0.097	(0)
CoOH+	2.040e-10	1.631e-10	-9.690	-9.788	-0.097	(0)
CoF+	1.272e-10	1.017e-10	-9.896	-9.993	-0.097	(0)
Co (OH) 2	4.708e-12	4.708e-12	-11.327	-11.327	0.000	(0)
CoNO2+	1.863e-12	1.489e-12	-11.730	-11.827	-0.097	(0)
Co (NH3) +2	6.968e-14	2.844e-14	-13.157	-13.546	-0.389	(0)
CoSeO4	5.539e-16	5.539e-16	-15.257	-15.257	0.000	(0)
CoNO3+	4.019e-16	3.213e-16	-15.396	-15.493	-0.097	(0)
Co (OH) 3-	4.270e-17	3.413e-17	-16.370	-16.467	-0.097	(0)
CoOOH-	1.072e-17	8.569e-18	-16.970	-17.067	-0.097	(0)
Co2OH+3	1.380e-18	1.838e-19	-17.860	-18.736	-0.876	(0)
Co (NH3) 2+2	3.126e-20	1.276e-20	-19.505	-19.894	-0.389	(0)
Co (NO3) 2	5.891e-24	5.891e-24	-23.230	-23.230	0.000	(0)
Co (OH) 4-2	4.816e-24	1.966e-24	-23.317	-23.706	-0.389	(0)
Co (NH3) 3+2	4.140e-27	1.690e-27	-26.383	-26.772	-0.389	(0)
Co4 (OH) 4+4	5.083e-30	1.411e-31	-29.294	-30.850	-1.557	(0)
Co (NH3) 4+2	2.285e-34	9.329e-35	-33.641	-34.030	-0.389	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.399	-41.788	-0.389	(0)
Co (3)	6.699e-29					
CoOH+2	6.699e-29	2.735e-29	-28.174	-28.563	-0.389	(0)
Co+3	7.173e-35	1.481e-35	-34.144	-34.829	-0.685	(0)
CoCl+2	2.133e-35	8.706e-36	-34.671	-35.060	-0.389	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.608	-48.997	-0.389	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.510	-58.607	-0.097	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.002	-63.391	-0.389	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.302	-63.691	-0.389	(0)
Cr (2)	1.175e-26					
Cr+2	1.175e-26	4.797e-27	-25.930	-26.319	-0.389	(0)
Cr (3)	1.717e-09					
Cr (OH) 2+	1.461e-09	1.168e-09	-8.835	-8.933	-0.097	(0)

Cr(OH) 3	1.594e-10	1.594e-10	-9.798	-9.798	0.000	(0)
Cr(OH)+2	6.469e-11	2.640e-11	-10.189	-10.578	-0.389	(0)
CrOHSO4	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
CrO2-	3.422e-12	2.735e-12	-11.466	-11.563	-0.097	(0)
Cr(OH) 4-	2.885e-12	2.306e-12	-11.540	-11.637	-0.097	(0)
CrF+2	1.843e-13	7.523e-14	-12.734	-13.124	-0.389	(0)
CrSO4+	4.036e-14	3.226e-14	-13.394	-13.491	-0.097	(0)
Cr+3	2.494e-14	3.321e-15	-13.603	-14.479	-0.876	(0)
CrCl+2	3.043e-17	1.242e-17	-16.517	-16.906	-0.389	(0)
CrOHC12	2.479e-19	2.479e-19	-18.606	-18.606	0.000	(0)
Cr2(OH) 2SO4+2	1.524e-19	6.221e-20	-18.817	-19.206	-0.389	(0)
Cr2(OH) 2(SO4) 2	1.537e-20	1.537e-20	-19.813	-19.813	0.000	(0)
CrCl2+	4.260e-21	3.405e-21	-20.371	-20.468	-0.097	(0)
CrNO3+2	3.205e-24	1.308e-24	-23.494	-23.883	-0.389	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.047	-40.436	-0.389	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-48.471	-49.347	-0.876	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-50.395	-50.784	-0.389	(0)
Cr(6)	1.079e-15					
CrO4-2	9.922e-16	4.921e-16	-15.003	-15.308	-0.305	(0)
HCrO4-	5.517e-17	4.410e-17	-16.258	-16.356	-0.097	(0)
NaCrO4-	2.622e-17	2.096e-17	-16.581	-16.679	-0.097	(0)
KCrO4-	5.293e-18	4.231e-18	-17.276	-17.374	-0.097	(0)
CrO3SO4-2	3.793e-24	1.548e-24	-23.421	-23.810	-0.389	(0)
H2CrO4	9.899e-25	9.899e-25	-24.004	-24.004	0.000	(0)
CrO3Cl-	2.778e-26	2.221e-26	-25.556	-25.654	-0.097	(0)
Cr2O7-2	1.653e-31	6.747e-32	-30.782	-31.171	-0.389	(0)
Cu(1)	1.516e-09					
CuCl	7.335e-10	7.335e-10	-9.135	-9.135	0.000	(0)
CuCl2-	5.297e-10	4.428e-10	-9.276	-9.354	-0.078	(0)
Cu+	2.523e-10	2.016e-10	-9.598	-9.695	-0.097	(0)
CuCl3-2	5.412e-13	2.735e-13	-12.267	-12.563	-0.296	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-147.805	-148.163	-0.359	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.552	-148.893	-0.341	(0)
Cu(2)	1.656e-06					
CuCO3	1.314e-06	1.314e-06	-5.881	-5.881	0.000	(0)
Cu+2	1.373e-07	6.808e-08	-6.862	-7.167	-0.305	(0)
CuOH+	9.359e-08	7.824e-08	-7.029	-7.107	-0.078	(0)
CuSO4	6.488e-08	6.488e-08	-7.188	-7.188	0.000	(0)
Cu(CO3) 2-2	2.839e-08	1.159e-08	-7.547	-7.936	-0.389	(0)
CuHCO3+	1.040e-08	8.316e-09	-7.983	-8.080	-0.097	(0)
Cu(OH) 2	5.673e-09	5.673e-09	-8.246	-8.246	0.000	(0)
CuF+	7.681e-10	6.139e-10	-9.115	-9.212	-0.097	(0)
Cu2(OH) 2+2	3.767e-10	1.538e-10	-9.424	-9.813	-0.389	(0)
CuCl+	3.729e-10	3.118e-10	-9.428	-9.506	-0.078	(0)
CuNO2+	8.378e-11	6.697e-11	-10.077	-10.174	-0.097	(0)
CuNH3+2	1.795e-11	7.328e-12	-10.746	-11.135	-0.389	(0)
Cu(OH) 3-	5.290e-12	4.229e-12	-11.277	-11.374	-0.097	(0)
CuCl2	3.124e-13	3.124e-13	-12.505	-12.505	0.000	(0)
Cu(NO2) 2	6.437e-15	6.437e-15	-14.191	-14.191	0.000	(0)
CuNO3+	2.427e-15	1.940e-15	-14.615	-14.712	-0.097	(0)
Cu(OH) 4-2	2.963e-17	1.209e-17	-16.528	-16.917	-0.389	(0)
CuCl3-	1.008e-17	8.424e-18	-16.997	-17.074	-0.078	(0)
CuCl4-2	2.413e-22	1.220e-22	-21.617	-21.914	-0.296	(0)
Cu(NO3) 2	2.201e-24	2.201e-24	-23.657	-23.657	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.630	-216.728	-0.097	(0)
F	2.024e-04					
F-	1.703e-04	1.429e-04	-3.769	-3.845	-0.076	(0)
MgF+	2.955e-05	2.481e-05	-4.530	-4.605	-0.076	(0)
CaF+	1.661e-06	1.400e-06	-5.780	-5.854	-0.074	(0)
NaF	7.729e-07	7.729e-07	-6.112	-6.112	0.000	(0)
MnF+	1.016e-07	8.571e-08	-6.993	-7.067	-0.074	(0)
AlF3	6.909e-09	6.909e-09	-8.161	-8.161	0.000	(0)
HF	5.854e-09	5.854e-09	-8.233	-8.233	0.000	(0)
ZnF+	5.216e-09	4.169e-09	-8.283	-8.380	-0.097	(0)
AlF2+	4.540e-09	3.840e-09	-8.343	-8.416	-0.073	(0)
BF(OH) 3-	1.992e-09	1.641e-09	-8.701	-8.785	-0.084	(0)
CuF+	7.681e-10	6.139e-10	-9.115	-9.212	-0.097	(0)
AlF4-	5.894e-10	4.949e-10	-9.230	-9.305	-0.076	(0)

NiF+	1.700e-10	1.359e-10	-9.769	-9.867	-0.097	(0)
AlF+2	1.318e-10	6.749e-11	-9.880	-10.171	-0.291	(0)
CoF+	1.272e-10	1.017e-10	-9.896	-9.993	-0.097	(0)
CdF+	8.265e-12	6.606e-12	-11.083	-11.180	-0.097	(0)
PbF+	4.242e-12	3.390e-12	-11.372	-11.470	-0.097	(0)
HF2-	3.822e-12	3.181e-12	-11.418	-11.497	-0.080	(0)
BF2(OH) 2-	8.434e-13	6.949e-13	-12.074	-12.158	-0.084	(0)
UO2F+	6.859e-13	5.482e-13	-12.164	-12.261	-0.097	(0)
AgF	6.474e-13	6.474e-13	-12.189	-12.189	0.000	(0)
UO2F2	2.260e-13	2.260e-13	-12.646	-12.646	0.000	(0)
CrF+2	1.843e-13	7.523e-14	-12.734	-13.124	-0.389	(0)
UO2F3-	1.015e-14	8.112e-15	-13.994	-14.091	-0.097	(0)
PbF2	9.536e-15	9.536e-15	-14.021	-14.021	0.000	(0)
CdF2	1.884e-15	1.884e-15	-14.725	-14.725	0.000	(0)
H2F2	9.181e-17	9.181e-17	-16.037	-16.037	0.000	(0)
UO2F4-2	2.256e-17	9.210e-18	-16.647	-17.036	-0.389	(0)
VO2F	1.728e-17	1.728e-17	-16.762	-16.762	0.000	(0)
FeF2+	1.667e-17	1.406e-17	-16.778	-16.852	-0.074	(0)
FeF+2	7.272e-18	3.676e-18	-17.138	-17.435	-0.296	(0)
PbF3-	3.234e-18	2.585e-18	-17.490	-17.588	-0.097	(0)
FeF3	2.835e-18	2.835e-18	-17.547	-17.547	0.000	(0)
BF3OH-	1.299e-18	1.071e-18	-17.886	-17.970	-0.084	(0)
VO2F2-	1.122e-18	8.967e-19	-17.950	-18.047	-0.097	(0)
VOF+	2.744e-20	2.193e-20	-19.562	-19.659	-0.097	(0)
VO2F3-2	3.916e-21	1.599e-21	-20.407	-20.796	-0.389	(0)
VOF2	1.175e-21	1.175e-21	-20.930	-20.930	0.000	(0)
PbF4-2	4.332e-22	1.768e-22	-21.363	-21.752	-0.389	(0)
HgF+	3.189e-23	2.549e-23	-22.496	-22.594	-0.097	(0)
BF4-	2.532e-23	2.086e-23	-22.597	-22.681	-0.084	(0)
VOF3-	7.456e-24	5.960e-24	-23.127	-23.225	-0.097	(0)
VO2F4-3	8.441e-25	1.124e-25	-24.074	-24.949	-0.876	(0)
Sb(OH) 2F	2.006e-25	2.006e-25	-24.698	-24.698	0.000	(0)
SbOF	1.974e-25	1.974e-25	-24.705	-24.705	0.000	(0)
VOF4-2	8.423e-27	3.438e-27	-26.075	-26.464	-0.389	(0)
SiF6-2	4.232e-28	2.139e-28	-27.373	-27.670	-0.296	(0)
UF3+	1.430e-35	1.143e-35	-34.845	-34.942	-0.097	(0)
UF2+2	1.236e-36	5.047e-37	-35.908	-36.297	-0.389	(0)
UF4	1.791e-37	1.791e-37	-36.747	-36.747	0.000	(0)
UF+3	2.106e-39	2.805e-40	-38.677	-39.552	-0.876	(0)
UF5-	1.269e-39	1.015e-39	-38.896	-38.994	-0.097	(0)
UF6-2	1.073e-40	0.000e+00	-39.969	-40.359	-0.389	(0)
Fe (2)	5.369e-12					
Fe+2	3.740e-12	1.527e-12	-11.427	-11.816	-0.389	(0)
FeSO4	1.559e-12	1.559e-12	-11.807	-11.807	0.000	(0)
FeHCO3+	4.378e-14	3.721e-14	-13.359	-13.429	-0.071	(0)
FeOH+	2.619e-14	2.209e-14	-13.582	-13.656	-0.074	(0)
Fe(OH) 2	6.376e-18	6.376e-18	-17.195	-17.195	0.000	(0)
Fe(OH) 3-	8.689e-19	7.327e-19	-18.061	-18.135	-0.074	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-159.839	-159.839	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.192	-236.289	-0.097	(0)
Fe (3)	1.236e-09					
Fe(OH) 2+	9.198e-10	7.780e-10	-9.036	-9.109	-0.073	(0)
Fe(OH) 3	3.037e-10	3.037e-10	-9.518	-9.518	0.000	(0)
Fe(OH) 4-	1.215e-11	1.028e-11	-10.916	-10.988	-0.073	(0)
FeOH+2	1.089e-14	5.503e-15	-13.963	-14.259	-0.296	(0)
FeF2+	1.667e-17	1.406e-17	-16.778	-16.852	-0.074	(0)
FeF+2	7.272e-18	3.676e-18	-17.138	-17.435	-0.296	(0)
FeF3	2.835e-18	2.835e-18	-17.547	-17.547	0.000	(0)
FeSO4+	1.298e-18	1.095e-18	-17.887	-17.961	-0.074	(0)
Fe(SO4) 2-	1.218e-19	9.736e-20	-18.914	-19.012	-0.097	(0)
Fe+3	1.136e-19	2.345e-20	-18.945	-19.630	-0.685	(0)
FeCl+2	4.049e-21	2.047e-21	-20.393	-20.689	-0.296	(0)
FeCl2+	3.133e-23	2.642e-23	-22.504	-22.578	-0.074	(0)
FeHSeO3+2	1.178e-23	4.809e-24	-22.929	-23.318	-0.389	(0)
Fe2(OH) 2+4	3.612e-26	1.003e-27	-25.442	-26.999	-1.557	(0)
FeCl3	7.633e-27	7.633e-27	-26.117	-26.117	0.000	(0)
FeNO3+2	5.178e-27	2.114e-27	-26.286	-26.675	-0.389	(0)
Fe3(OH) 4+5	3.050e-33	1.128e-35	-32.516	-34.948	-2.432	(0)

H (0)	3.937e-29					
H2	1.968e-29	1.985e-29	-28.706	-28.702	0.004	(0)
Hg (0)	1.624e-09					
Hg	1.624e-09	1.624e-09	-8.790	-8.790	0.000	(0)
Hg (1)	2.598e-20					
Hg2+2	1.299e-20	5.303e-21	-19.886	-20.275	-0.389	(0)
Hg (2)	1.708e-11					
HgClOH	8.922e-12	8.922e-12	-11.050	-11.050	0.000	(0)
HgCl2	4.017e-12	4.017e-12	-11.396	-11.396	0.000	(0)
Hg (OH) 2	3.975e-12	4.009e-12	-11.401	-11.397	0.004	(0)
HgCl3-	1.452e-13	1.161e-13	-12.838	-12.935	-0.097	(0)
HgCO3	1.887e-14	1.887e-14	-13.724	-13.724	0.000	(0)
HgCl4-2	3.271e-15	1.335e-15	-14.485	-14.874	-0.389	(0)
Hg (CO3) 2-2	4.790e-16	1.955e-16	-15.320	-15.709	-0.389	(0)
HgCl+	3.470e-16	2.774e-16	-15.460	-15.557	-0.097	(0)
HgOH+	8.708e-17	6.960e-17	-16.060	-16.157	-0.097	(0)
HgHCO3+	1.217e-17	9.730e-18	-16.915	-17.012	-0.097	(0)
Hg (NH3) 2+2	8.227e-19	3.358e-19	-18.085	-18.474	-0.389	(0)
Hg (OH) 3-	2.294e-19	1.834e-19	-18.639	-18.737	-0.097	(0)
HgNH3+2	7.822e-20	3.193e-20	-19.107	-19.496	-0.389	(0)
Hg+2	1.179e-20	4.811e-21	-19.929	-20.318	-0.389	(0)
HgSO4	5.240e-21	5.240e-21	-20.281	-20.281	0.000	(0)
HgF+	3.189e-23	2.549e-23	-22.496	-22.594	-0.097	(0)
Hg (NH3) 3+2	3.445e-26	1.406e-26	-25.463	-25.852	-0.389	(0)
HgNO3+	2.003e-29	1.601e-29	-28.698	-28.796	-0.097	(0)
Hg (NH3) 4+2	2.878e-33	1.175e-33	-32.541	-32.930	-0.389	(0)
Hg (NO3) 2	5.997e-38	5.997e-38	-37.222	-37.222	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.708	-137.805	-0.097	(0)
HgS2-2	0.000e+00	0.000e+00	-138.566	-138.956	-0.389	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.969	-138.969	0.000	(0)
K	2.838e-03					
K+	2.757e-03	2.314e-03	-2.560	-2.636	-0.076	(0)
KSO4-	8.055e-05	6.814e-05	-4.094	-4.167	-0.073	(0)
KCrO4-	5.293e-18	4.231e-18	-17.276	-17.374	-0.097	(0)
Mg	4.361e-03					
Mg+2	3.119e-03	1.547e-03	-2.506	-2.810	-0.305	(0)
MgSO4	1.171e-03	1.171e-03	-2.931	-2.931	0.000	(0)
MgHCO3+	3.666e-05	3.065e-05	-4.436	-4.514	-0.078	(0)
MgF+	2.955e-05	2.481e-05	-4.530	-4.605	-0.076	(0)
MgCO3	4.217e-06	4.217e-06	-5.375	-5.375	0.000	(0)
MgOH+	2.624e-07	2.238e-07	-6.581	-6.650	-0.069	(0)
MgH2BO3+	3.930e-08	3.238e-08	-7.406	-7.490	-0.084	(0)
Mn (2)	4.892e-05					
Mn+2	3.690e-05	1.506e-05	-4.433	-4.822	-0.389	(0)
MnSO4	1.114e-05	1.114e-05	-4.953	-4.953	0.000	(0)
MnHCO3+	6.900e-07	5.818e-07	-6.161	-6.235	-0.074	(0)
MnF+	1.016e-07	8.571e-08	-6.993	-7.067	-0.074	(0)
MnCl+	6.499e-08	5.480e-08	-7.187	-7.261	-0.074	(0)
MnOH+	1.631e-08	1.375e-08	-7.788	-7.862	-0.074	(0)
MnCl2	2.237e-10	2.237e-10	-9.650	-9.650	0.000	(0)
MnNO3+	2.692e-13	2.152e-13	-12.570	-12.667	-0.097	(0)
MnCl3-	2.111e-13	1.780e-13	-12.676	-12.750	-0.074	(0)
MnSeO4	1.992e-13	1.992e-13	-12.701	-12.701	0.000	(0)
Mn (OH) 3-	1.331e-17	1.122e-17	-16.876	-16.950	-0.074	(0)
Mn (NO3) 2	4.871e-21	4.871e-21	-20.312	-20.312	0.000	(0)
Mn (OH) 4-2	2.605e-23	1.317e-23	-22.584	-22.881	-0.296	(0)
MnSe	0.000e+00	0.000e+00	-41.556	-41.556	0.000	(0)
Mn (3)	5.390e-25					
Mn+3	5.390e-25	1.113e-25	-24.268	-24.954	-0.685	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.614	-41.910	-0.296	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.982	-46.064	-0.082	(0)
Mo	1.436e-06					
MoO4-2	1.436e-06	7.121e-07	-5.843	-6.147	-0.305	(0)
HMoO4-	4.909e-10	3.924e-10	-9.309	-9.406	-0.097	(0)
H2MoO4	7.959e-14	7.959e-14	-13.099	-13.099	0.000	(0)
Ag2MoO4	8.766e-25	8.766e-25	-24.057	-24.057	0.000	(0)

AlMo6O21-3	2.053e-40	0.000e+00	-39.688	-40.563	-0.876	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.000	-50.502	-3.502	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.241	-51.673	-2.432	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.892	-54.449	-1.557	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.885	-58.760	-0.876	(0)
N (-3)	6.576e-07					
NH4+	6.200e-07	5.109e-07	-6.208	-6.292	-0.084	(0)
NH4SO4-	2.701e-08	2.277e-08	-7.569	-7.643	-0.074	(0)
NH3	1.052e-08	1.052e-08	-7.978	-7.978	0.000	(0)
CaNH3+2	2.912e-11	1.189e-11	-10.536	-10.925	-0.389	(0)
CuNH3+2	1.795e-11	7.328e-12	-10.746	-11.135	-0.389	(0)
NiNH3+2	5.239e-13	2.139e-13	-12.281	-12.670	-0.389	(0)
Co (NH3) +2	6.968e-14	2.844e-14	-13.157	-13.546	-0.389	(0)
AgNH3+	4.845e-14	3.873e-14	-13.315	-13.412	-0.097	(0)
BaNH3+2	3.526e-16	1.439e-16	-15.453	-15.842	-0.389	(0)
Ag (NH3) 2+	4.142e-18	3.311e-18	-17.383	-17.480	-0.097	(0)
Hg (NH3) 2+2	8.227e-19	3.358e-19	-18.085	-18.474	-0.389	(0)
Ni (NH3) 2+2	7.966e-19	3.252e-19	-18.099	-18.488	-0.389	(0)
Ca (NH3) 2+2	1.219e-19	4.978e-20	-18.914	-19.303	-0.389	(0)
HgNH3+2	7.822e-20	3.193e-20	-19.107	-19.496	-0.389	(0)
Co (NH3) 2+2	3.126e-20	1.276e-20	-19.505	-19.894	-0.389	(0)
Hg (NH3) 3+2	3.445e-26	1.406e-26	-25.463	-25.852	-0.389	(0)
Co (NH3) 3+2	4.140e-27	1.690e-27	-26.383	-26.772	-0.389	(0)
Hg (NH3) 4+2	2.878e-33	1.175e-33	-32.541	-32.930	-0.389	(0)
Co (NH3) 4+2	2.285e-34	9.329e-35	-33.641	-34.030	-0.389	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.047	-40.436	-0.389	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.399	-41.788	-0.389	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.471	-49.347	-0.876	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.608	-48.997	-0.389	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.395	-50.784	-0.389	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.510	-58.607	-0.097	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.002	-63.391	-0.389	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.302	-63.691	-0.389	(0)
N (3)	1.134e-05					
NO2-	1.134e-05	9.394e-06	-4.945	-5.027	-0.082	(0)
CuNO2+	8.378e-11	6.697e-11	-10.077	-10.174	-0.097	(0)
AgNO2	3.539e-12	3.539e-12	-11.451	-11.451	0.000	(0)
CoNO2+	1.863e-12	1.489e-12	-11.730	-11.827	-0.097	(0)
Cu (NO2) 2	6.437e-15	6.437e-15	-14.191	-14.191	0.000	(0)
Ag (NO2) 2-	6.442e-17	5.149e-17	-16.191	-16.288	-0.097	(0)
N (5)	1.077e-08					
NO3-	1.074e-08	9.012e-09	-7.969	-8.045	-0.076	(0)
CaNO3+	3.201e-11	2.559e-11	-10.495	-10.592	-0.097	(0)
MnNO3+	2.692e-13	2.152e-13	-12.570	-12.667	-0.097	(0)
ZnNO3+	4.141e-14	3.310e-14	-13.383	-13.480	-0.097	(0)
CuNO3+	2.427e-15	1.940e-15	-14.615	-14.712	-0.097	(0)
BaNO3+	1.225e-15	9.795e-16	-14.912	-15.009	-0.097	(0)
NiNO3+	1.072e-15	8.571e-16	-14.970	-15.067	-0.097	(0)
CoNO3+	4.019e-16	3.213e-16	-15.396	-15.493	-0.097	(0)
CdNO3+	1.040e-16	8.312e-17	-15.983	-16.080	-0.097	(0)
PbNO3+	5.614e-17	4.487e-17	-16.251	-16.348	-0.097	(0)
AgNO3	1.291e-17	1.291e-17	-16.889	-16.889	0.000	(0)
Mn (NO3) 2	4.871e-21	4.871e-21	-20.312	-20.312	0.000	(0)
UO2NO3+	6.251e-22	4.997e-22	-21.204	-21.301	-0.097	(0)
Zn (NO3) 2	5.951e-23	5.951e-23	-22.225	-22.225	0.000	(0)
Co (NO3) 2	5.891e-24	5.891e-24	-23.230	-23.230	0.000	(0)
CrNO3+2	3.205e-24	1.308e-24	-23.494	-23.883	-0.389	(0)
Cu (NO3) 2	2.201e-24	2.201e-24	-23.657	-23.657	0.000	(0)
Pb (NO3) 2	6.868e-25	6.868e-25	-24.163	-24.163	0.000	(0)
Cd (NO3) 2	3.754e-25	3.754e-25	-24.425	-24.425	0.000	(0)
VO2NO3	3.143e-25	3.143e-25	-24.503	-24.503	0.000	(0)
FeNO3+2	5.178e-27	2.114e-27	-26.286	-26.675	-0.389	(0)
HgNO3+	2.003e-29	1.601e-29	-28.698	-28.796	-0.097	(0)
Hg (NO3) 2	5.997e-38	5.997e-38	-37.222	-37.222	0.000	(0)
Na	1.045e-02					
Na+	1.021e-02	8.571e-03	-1.991	-2.067	-0.076	(0)
NaSO4-	2.264e-04	1.915e-04	-3.645	-3.718	-0.073	(0)
NaHCO3	9.330e-06	9.330e-06	-5.030	-5.030	0.000	(0)

	NaF	7.729e-07	7.729e-07	-6.112	-6.112	0.000	(0)
	NaCO3-	6.183e-07	5.230e-07	-6.209	-6.281	-0.073	(0)
	NaH2BO3	8.200e-09	8.200e-09	-8.086	-8.086	0.000	(0)
	NaCrO4-	2.622e-17	2.096e-17	-16.581	-16.679	-0.097	(0)
Ni	1.244e-07						
	Ni+2	7.634e-08	3.786e-08	-7.117	-7.422	-0.305	(0)
	NiSO4	3.142e-08	3.142e-08	-7.503	-7.503	0.000	(0)
	NiHCO3+	1.130e-08	9.035e-09	-7.947	-8.044	-0.097	(0)
	NiCO3	4.629e-09	4.629e-09	-8.335	-8.335	0.000	(0)
	NiCl+	3.502e-10	2.799e-10	-9.456	-9.553	-0.097	(0)
	NiOH+	2.167e-10	1.732e-10	-9.664	-9.761	-0.097	(0)
	NiF+	1.700e-10	1.359e-10	-9.769	-9.867	-0.097	(0)
	Ni (SO4) 2-2	1.060e-11	4.329e-12	-10.975	-11.364	-0.389	(0)
	Ni (OH) 2	5.000e-12	5.000e-12	-11.301	-11.301	0.000	(0)
	NiNH3+2	5.239e-13	2.139e-13	-12.281	-12.670	-0.389	(0)
	NiCl2	4.072e-15	4.072e-15	-14.390	-14.390	0.000	(0)
	Ni (OH) 3-	2.273e-15	1.817e-15	-14.643	-14.741	-0.097	(0)
	NiNO3+	1.072e-15	8.571e-16	-14.970	-15.067	-0.097	(0)
	NiSeO4	8.702e-16	8.702e-16	-15.060	-15.060	0.000	(0)
	Ni (NH3) 2+2	7.966e-19	3.252e-19	-18.099	-18.488	-0.389	(0)
O (0)	2.549e-35						
	O2	1.274e-35	1.285e-35	-34.895	-34.891	0.004	(0)
Pb	5.841e-09						
	PbCO3	3.316e-09	3.316e-09	-8.479	-8.479	0.000	(0)
	PbSO4	6.859e-10	6.859e-10	-9.164	-9.164	0.000	(0)
	Pb+2	6.787e-10	3.366e-10	-9.168	-9.473	-0.305	(0)
	PbHCO3+	6.057e-10	4.842e-10	-9.218	-9.315	-0.097	(0)
	PbOH+	3.844e-10	3.073e-10	-9.415	-9.512	-0.097	(0)
	Pb (CO3) 2-2	7.679e-11	3.134e-11	-10.115	-10.504	-0.389	(0)
	PbCl+	4.318e-11	3.451e-11	-10.365	-10.462	-0.097	(0)
	Pb (SO4) 2-2	4.212e-11	1.719e-11	-10.376	-10.765	-0.389	(0)
	PbF+	4.242e-12	3.390e-12	-11.372	-11.470	-0.097	(0)
	Pb (OH) 2	3.531e-12	3.531e-12	-11.452	-11.452	0.000	(0)
	PbCl2	4.455e-13	4.455e-13	-12.351	-12.351	0.000	(0)
	PbF2	9.536e-15	9.536e-15	-14.021	-14.021	0.000	(0)
	Pb (OH) 3-	1.605e-15	1.283e-15	-14.794	-14.892	-0.097	(0)
	PbCl3-	6.411e-16	5.124e-16	-15.193	-15.290	-0.097	(0)
	PbNO3+	5.614e-17	4.487e-17	-16.251	-16.348	-0.097	(0)
	Pb2OH+3	1.231e-17	1.639e-18	-16.910	-17.785	-0.876	(0)
	PbF3-	3.234e-18	2.585e-18	-17.490	-17.588	-0.097	(0)
	PbCl4-2	1.658e-18	6.768e-19	-17.780	-18.170	-0.389	(0)
	Pb (OH) 4-2	2.798e-19	1.142e-19	-18.553	-18.942	-0.389	(0)
	PbF4-2	4.332e-22	1.768e-22	-21.363	-21.752	-0.389	(0)
	Pb3 (OH) 4+2	2.052e-22	8.376e-23	-21.688	-22.077	-0.389	(0)
	Pb (NO3) 2	6.868e-25	6.868e-25	-24.163	-24.163	0.000	(0)
	Pb4 (OH) 4+4	8.066e-27	2.240e-28	-26.093	-27.650	-1.557	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.176	-151.176	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.265	-228.363	-0.097	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.416	-73.416	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.389	-78.487	-0.097	(0)
	CdHS+	0.000e+00	0.000e+00	-78.916	-79.014	-0.097	(0)
	H2S	0.000e+00	0.000e+00	-79.024	-79.024	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.905	-80.294	-0.389	(0)
	S6-2	0.000e+00	0.000e+00	-80.421	-80.810	-0.389	(0)
	S4-2	0.000e+00	0.000e+00	-80.501	-80.890	-0.389	(0)
	S3-2	0.000e+00	0.000e+00	-81.306	-81.696	-0.389	(0)
	S2-2	0.000e+00	0.000e+00	-82.323	-82.712	-0.389	(0)
	S-2	0.000e+00	0.000e+00	-87.933	-88.229	-0.296	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.708	-137.805	-0.097	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.566	-138.956	-0.389	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.969	-138.969	0.000	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.528	-147.728	-0.201	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.705	-147.803	-0.097	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.805	-148.163	-0.359	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-148.343	-148.441	-0.097	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.552	-148.893	-0.341	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.243	-149.611	-0.368	(0)

AgS4S5-3	0.000e+00	0.000e+00	-149.572	-149.922	-0.350	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.988	-149.988	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.296	-150.296	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.176	-151.176	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.839	-159.839	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.630	-216.728	-0.097	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.097	-225.195	-0.097	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.786	-226.883	-0.097	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.228	-227.617	-0.389	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.265	-228.363	-0.097	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.192	-236.289	-0.097	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.784	-303.173	-0.389	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.752	-305.141	-0.389	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.260	-318.650	-0.389	(0)
S (6)	1.073e-02					
SO4-2	8.387e-03	4.160e-03	-2.076	-2.381	-0.305	(0)
MgSO4	1.171e-03	1.171e-03	-2.931	-2.931	0.000	(0)
CaSO4	8.555e-04	8.555e-04	-3.068	-3.068	0.000	(0)
NaSO4-	2.264e-04	1.915e-04	-3.645	-3.718	-0.073	(0)
KSO4-	8.055e-05	6.814e-05	-4.094	-4.167	-0.073	(0)
MnSO4	1.114e-05	1.114e-05	-4.953	-4.953	0.000	(0)
ZnSO4	1.331e-06	1.331e-06	-5.876	-5.876	0.000	(0)
Zn (SO4) 2-2	1.181e-07	4.821e-08	-6.928	-7.317	-0.389	(0)
CuSO4	6.488e-08	6.488e-08	-7.188	-7.188	0.000	(0)
NiSO4	3.142e-08	3.142e-08	-7.503	-7.503	0.000	(0)
NH4SO4-	2.701e-08	2.277e-08	-7.569	-7.643	-0.074	(0)
CoSO4	1.867e-08	1.867e-08	-7.729	-7.729	0.000	(0)
HSO4-	1.341e-08	1.126e-08	-7.873	-7.949	-0.076	(0)
CdSO4	2.844e-09	2.844e-09	-8.546	-8.546	0.000	(0)
PbSO4	6.859e-10	6.859e-10	-9.164	-9.164	0.000	(0)
Cd (SO4) 2-2	3.910e-10	1.596e-10	-9.408	-9.797	-0.389	(0)
AgSO4-	1.873e-10	1.497e-10	-9.728	-9.825	-0.097	(0)
Pb (SO4) 2-2	4.212e-11	1.719e-11	-10.376	-10.765	-0.389	(0)
CrOHSO4	2.606e-11	2.606e-11	-10.584	-10.584	0.000	(0)
Ni (SO4) 2-2	1.060e-11	4.329e-12	-10.975	-11.364	-0.389	(0)
AlSO4+	1.816e-12	1.525e-12	-11.741	-11.817	-0.076	(0)
FeSO4	1.559e-12	1.559e-12	-11.807	-11.807	0.000	(0)
UO2SO4	1.750e-13	1.750e-13	-12.757	-12.757	0.000	(0)
Al (SO4) 2-	8.094e-14	6.797e-14	-13.092	-13.168	-0.076	(0)
CrSO4+	4.036e-14	3.226e-14	-13.394	-13.491	-0.097	(0)
UO2 (SO4) 2-2	2.350e-14	9.594e-15	-13.629	-14.018	-0.389	(0)
VO2SO4-	8.567e-18	6.847e-18	-17.067	-17.164	-0.097	(0)
FeSO4+	1.298e-18	1.095e-18	-17.887	-17.961	-0.074	(0)
Cr2 (OH) 2SO4+2	1.524e-19	6.221e-20	-18.817	-19.206	-0.389	(0)
Fe (SO4) 2-	1.218e-19	9.736e-20	-18.914	-19.012	-0.097	(0)
VOSO4	2.931e-20	2.931e-20	-19.533	-19.533	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.537e-20	1.537e-20	-19.813	-19.813	0.000	(0)
HgSO4	5.240e-21	5.240e-21	-20.281	-20.281	0.000	(0)
CrO3SO4-2	3.793e-24	1.548e-24	-23.421	-23.810	-0.389	(0)
VSO4+	1.448e-34	1.157e-34	-33.839	-33.937	-0.097	(0)
U (SO4) 2	5.382e-40	5.382e-40	-39.269	-39.269	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.399	-40.788	-0.389	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.510	-58.607	-0.097	(0)
Sb (3)	6.410e-20					
Sb (OH) 3	3.243e-20	3.243e-20	-19.489	-19.489	0.000	(0)
HSbO2	3.167e-20	3.167e-20	-19.499	-19.499	0.000	(0)
SbO2-	2.317e-24	1.852e-24	-23.635	-23.732	-0.097	(0)
Sb (OH) 4-	1.326e-24	1.060e-24	-23.877	-23.975	-0.097	(0)
Sb (OH) 2F	2.006e-25	2.006e-25	-24.698	-24.698	0.000	(0)
SbOF	1.974e-25	1.974e-25	-24.705	-24.705	0.000	(0)
Sb (OH) 2+	2.730e-26	2.182e-26	-25.564	-25.661	-0.097	(0)
SbO+	9.416e-27	7.526e-27	-26.026	-26.123	-0.097	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.260	-318.650	-0.389	(0)
Sb (5)	2.190e-08					
SbO3-	2.188e-08	1.749e-08	-7.660	-7.757	-0.097	(0)
Sb (OH) 6-	2.433e-11	2.042e-11	-10.614	-10.690	-0.076	(0)
SbO2+	4.814e-24	3.848e-24	-23.317	-23.415	-0.097	(0)
Se (-2)	1.187e-14					

Ag ₂ Se	1.187e-14	1.187e-14	-13.925	-13.925	0.000	(0)
HSe-	1.553e-39	1.241e-39	-38.809	-38.906	-0.097	(0)
MnSe	0.000e+00	0.000e+00	-41.556	-41.556	0.000	(0)
H ₂ Se	0.000e+00	0.000e+00	-42.574	-42.574	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.959	-46.349	-0.389	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.836	-84.393	-1.557	(0)
Se (4)	1.244e-07					
HSeO ₃ -	9.707e-08	7.759e-08	-7.013	-7.110	-0.097	(0)
SeO ₃ -2	2.733e-08	1.115e-08	-7.563	-7.953	-0.389	(0)
H ₂ SeO ₃	9.165e-13	9.165e-13	-12.038	-12.038	0.000	(0)
AgSeO ₃ -	1.617e-14	1.293e-14	-13.791	-13.888	-0.097	(0)
Cd (SeO ₃) 2-2	7.326e-19	2.991e-19	-18.135	-18.524	-0.389	(0)
Ag (SeO ₃) 2-3	9.694e-21	1.291e-21	-20.013	-20.889	-0.876	(0)
FeHSeO ₃ +2	1.178e-23	4.809e-24	-22.929	-23.318	-0.389	(0)
Se (6)	9.929e-11					
SeO ₄ -2	9.908e-11	4.914e-11	-10.004	-10.309	-0.305	(0)
MnSeO ₄	1.992e-13	1.992e-13	-12.701	-12.701	0.000	(0)
ZnSeO ₄	1.113e-14	1.113e-14	-13.954	-13.954	0.000	(0)
NiSeO ₄	8.702e-16	8.702e-16	-15.060	-15.060	0.000	(0)
CoSeO ₄	5.539e-16	5.539e-16	-15.257	-15.257	0.000	(0)
HSeO ₄ -	8.532e-17	6.820e-17	-16.069	-16.166	-0.097	(0)
CdSeO ₄	2.669e-17	2.669e-17	-16.574	-16.574	0.000	(0)
Zn (SeO ₄) 2-2	1.358e-24	5.544e-25	-23.867	-24.256	-0.389	(0)
Si	2.807e-05					
H ₄ SiO ₄	2.790e-05	2.813e-05	-4.554	-4.551	0.004	(0)
H ₃ SiO ₄ -	1.756e-07	1.468e-07	-6.755	-6.833	-0.078	(0)
H ₂ SiO ₄ -2	6.535e-13	3.346e-13	-12.185	-12.476	-0.291	(0)
UO ₂ H ₃ SiO ₄ +	4.334e-13	3.464e-13	-12.363	-12.460	-0.097	(0)
SiF ₆ -2	4.232e-28	2.139e-28	-27.373	-27.670	-0.296	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.146	-59.022	-0.876	(0)
U (4)	5.721e-21					
U (OH) 5-	5.715e-21	4.568e-21	-20.243	-20.340	-0.097	(0)
U (OH) 4	5.301e-24	5.301e-24	-23.276	-23.276	0.000	(0)
U (OH) 3+	6.718e-28	5.370e-28	-27.173	-27.270	-0.097	(0)
U (OH) 2+2	1.685e-32	6.880e-33	-31.773	-32.162	-0.389	(0)
UF ₃ +	1.430e-35	1.143e-35	-34.845	-34.942	-0.097	(0)
UF ₂ +2	1.236e-36	5.047e-37	-35.908	-36.297	-0.389	(0)
UF ₄	1.791e-37	1.791e-37	-36.747	-36.747	0.000	(0)
UOH+3	6.741e-38	8.979e-39	-37.171	-38.047	-0.876	(0)
UF+3	2.106e-39	2.805e-40	-38.677	-39.552	-0.876	(0)
UF ₅ -	1.269e-39	1.015e-39	-38.896	-38.994	-0.097	(0)
U (SO ₄) 2	5.382e-40	5.382e-40	-39.269	-39.269	0.000	(0)
UF ₆ -2	1.073e-40	0.000e+00	-39.969	-40.359	-0.389	(0)
USO ₄ +2	0.000e+00	0.000e+00	-40.399	-40.788	-0.389	(0)
U+4	0.000e+00	0.000e+00	-43.451	-45.007	-1.557	(0)
UCl+3	0.000e+00	0.000e+00	-44.971	-45.846	-0.876	(0)
U ₆ (OH) 15+9	0.000e+00	0.000e+00	-165.957	-173.837	-7.880	(0)
U (5)	1.281e-16					
UO ₂ +	1.281e-16	1.024e-16	-15.892	-15.990	-0.097	(0)
U (6)	1.987e-07					
UO ₂ (CO ₃) 3-4	1.402e-07	3.894e-09	-6.853	-8.410	-1.557	(0)
UO ₂ (CO ₃) 2-2	5.807e-08	2.371e-08	-7.236	-7.625	-0.389	(0)
UO ₂ CO ₃	3.625e-10	3.625e-10	-9.441	-9.441	0.000	(0)
UO ₂ OH+	1.590e-12	1.271e-12	-11.798	-11.896	-0.097	(0)
UO ₂ F+	6.859e-13	5.482e-13	-12.164	-12.261	-0.097	(0)
UO ₂ H ₃ SiO ₄ +	4.334e-13	3.464e-13	-12.363	-12.460	-0.097	(0)
UO ₂ F ₂	2.260e-13	2.260e-13	-12.646	-12.646	0.000	(0)
UO ₂ SO ₄	1.750e-13	1.750e-13	-12.757	-12.757	0.000	(0)
UO ₂ +2	5.602e-14	2.779e-14	-13.252	-13.556	-0.305	(0)
UO ₂ (SO ₄) 2-2	2.350e-14	9.594e-15	-13.629	-14.018	-0.389	(0)
UO ₂ F ₃ -	1.015e-14	8.112e-15	-13.994	-14.091	-0.097	(0)
UO ₂ Cl+	1.629e-16	1.302e-16	-15.788	-15.885	-0.097	(0)
UO ₂ F ₄ -2	2.256e-17	9.210e-18	-16.647	-17.036	-0.389	(0)
(UO ₂) 2 (OH) 2+2	6.571e-18	2.682e-18	-17.182	-17.572	-0.389	(0)
(UO ₂) 3 (OH) 5+	4.273e-19	3.416e-19	-18.369	-18.467	-0.097	(0)
UO ₂ NO ₃ +	6.251e-22	4.997e-22	-21.204	-21.301	-0.097	(0)
V (2)	0.000e+00					

VOH+	0.000e+00	0.000e+00	-42.590	-42.688	-0.097	(0)
V+2	0.000e+00	0.000e+00	-43.369	-43.758	-0.389	(0)
V (3)	2.282e-15					
V (OH) 3	2.282e-15	2.282e-15	-14.642	-14.642	0.000	(0)
V (OH) 2+	5.111e-26	4.085e-26	-25.292	-25.389	-0.097	(0)
VOH+2	2.630e-29	1.074e-29	-28.580	-28.969	-0.389	(0)
V+3	4.425e-34	5.894e-35	-33.354	-34.230	-0.876	(0)
VSO4+	1.448e-34	1.157e-34	-33.839	-33.937	-0.097	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.031	-55.906	-0.876	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.582	-57.138	-1.557	(0)
V (4)	2.440e-18					
V (OH) 3+	2.319e-18	1.854e-18	-17.635	-17.732	-0.097	(0)
VO+2	6.267e-20	2.558e-20	-19.203	-19.592	-0.389	(0)
VOSO4	2.931e-20	2.931e-20	-19.533	-19.533	0.000	(0)
VOF+	2.744e-20	2.193e-20	-19.562	-19.659	-0.097	(0)
VOF2	1.175e-21	1.175e-21	-20.930	-20.930	0.000	(0)
VOC1+	2.594e-22	2.074e-22	-21.586	-21.683	-0.097	(0)
VOF3-	7.456e-24	5.960e-24	-23.127	-23.225	-0.097	(0)
VOF4-2	8.423e-27	3.438e-27	-26.075	-26.464	-0.389	(0)
H2V2O4+2	4.225e-31	1.724e-31	-30.374	-30.763	-0.389	(0)
V (5)	6.631e-09					
H2VO4-	5.630e-09	4.500e-09	-8.249	-8.347	-0.097	(0)
HVO4-2	1.000e-09	4.082e-10	-9.000	-9.389	-0.389	(0)
H3VO4	1.246e-12	1.246e-12	-11.904	-11.904	0.000	(0)
H3V2O7-	4.533e-14	3.623e-14	-13.344	-13.441	-0.097	(0)
HV2O7-3	4.676e-15	6.228e-16	-14.330	-15.206	-0.876	(0)
VO4-3	5.547e-16	7.388e-17	-15.256	-16.131	-0.876	(0)
VO2+	8.215e-17	6.894e-17	-16.085	-16.162	-0.076	(0)
V2O7-4	2.180e-17	6.054e-19	-16.661	-18.218	-1.557	(0)
VO2F	1.728e-17	1.728e-17	-16.762	-16.762	0.000	(0)
VO2SO4-	8.567e-18	6.847e-18	-17.067	-17.164	-0.097	(0)
VO2F2-	1.122e-18	8.967e-19	-17.950	-18.047	-0.097	(0)
V3O9-3	7.178e-19	9.560e-20	-18.144	-19.020	-0.876	(0)
VO2F3-2	3.916e-21	1.599e-21	-20.407	-20.796	-0.389	(0)
V4O12-4	6.463e-24	1.795e-25	-23.190	-24.746	-1.557	(0)
VO2F4-3	8.441e-25	1.124e-25	-24.074	-24.949	-0.876	(0)
VO2NO3	3.143e-25	3.143e-25	-24.503	-24.503	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.287	-64.790	-3.502	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.728	-64.160	-2.432	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.954	-66.510	-1.557	(0)
Zn	4.877e-06					
Zn+2	2.948e-06	1.462e-06	-5.531	-5.835	-0.305	(0)
ZnSO4	1.331e-06	1.331e-06	-5.876	-5.876	0.000	(0)
ZnCO3	2.757e-07	2.757e-07	-6.560	-6.560	0.000	(0)
Zn (SO4) 2-2	1.181e-07	4.821e-08	-6.928	-7.317	-0.389	(0)
ZnHCO3+	1.120e-07	8.950e-08	-6.951	-7.048	-0.097	(0)
ZnOH+	6.647e-08	5.313e-08	-7.177	-7.275	-0.097	(0)
ZnCl+	1.269e-08	1.061e-08	-7.896	-7.974	-0.078	(0)
ZnF+	5.216e-09	4.169e-09	-8.283	-8.380	-0.097	(0)
ZnOHC1	5.049e-09	5.049e-09	-8.297	-8.297	0.000	(0)
Zn (OH) 2	3.060e-09	3.060e-09	-8.514	-8.514	0.000	(0)
ZnCl2	4.860e-11	4.860e-11	-10.313	-10.313	0.000	(0)
Zn (OH) 3-	6.973e-12	5.573e-12	-11.157	-11.254	-0.097	(0)
ZnCl3-	1.334e-13	1.115e-13	-12.875	-12.953	-0.078	(0)
ZnNO3+	4.141e-14	3.310e-14	-13.383	-13.480	-0.097	(0)
ZnSeO4	1.113e-14	1.113e-14	-13.954	-13.954	0.000	(0)
ZnCl4-2	3.188e-16	1.612e-16	-15.496	-15.793	-0.296	(0)
Zn (OH) 4-2	1.975e-16	8.063e-17	-15.704	-16.093	-0.389	(0)
Zn (NO3) 2	5.951e-23	5.951e-23	-22.225	-22.225	0.000	(0)
Zn (SeO4) 2-2	1.358e-24	5.544e-25	-23.867	-24.256	-0.389	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.343	-148.441	-0.097	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.988	-149.988	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.097	-225.195	-0.097	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.228	-227.617	-0.389	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.752	-305.141	-0.389	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-53.42	-47.13	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-40.63	-36.12	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-47.85	-36.12	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-69.30	-51.37	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-54.88	-34.85	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.30	-27.89	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.34	-22.89	0.45	(NH4) 2SeO4
Acanthite	-52.20	-88.42	-36.22	Ag2S
Ag2CO3	-11.88	-22.97	-11.09	Ag2CO3
Ag2CrO4	-21.21	-32.80	-11.59	Ag2CrO4
Ag2HVO4	-12.46	-10.98	1.48	Ag2HVO4
Ag2MoO4	-12.09	-23.64	-11.55	Ag2MoO4
Ag2O	-14.95	-2.37	12.57	Ag2O
Ag2Se	-0.14	-48.84	-48.70	Ag2Se
Ag2SeO3	-9.89	-17.04	-7.15	Ag2SeO3
Ag2SeO4	-18.89	-27.80	-8.91	Ag2SeO4
Ag2SO4	-15.05	-19.87	-4.82	Ag2SO4
Ag3AsO3	-28.47	-26.32	2.16	Ag3AsO3
Ag3AsO4	-16.87	-19.66	-2.79	Ag3AsO4
Ag3H2VO5	-17.34	-12.16	5.18	Ag3H2VO5
AgF:4H2O	-13.64	-12.59	1.05	AgF:4H2O
Agmetal	-0.46	-13.96	-13.51	Ag
AgVO3	-10.56	-9.79	0.77	AgVO3
Al (OH) 3 (am)	-1.45	9.35	10.80	Al (OH) 3
Al2 (MoO4) 3	-47.46	-45.09	2.37	Al2 (MoO4) 3
Al2O3	-0.96	18.69	19.65	Al2O3
Al4 (OH) 10SO4	-2.81	19.89	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.56	-6.76	4.80	AlAsO4:2H2O
AlOHSO4	-4.92	-8.15	-3.23	AlOHSO4
AlSb	-152.42	-86.80	65.62	AlSb
Alunite	-0.63	-2.03	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.06	-11.85	-7.79	PbSO4
Anhydrite	-1.07	-5.43	-4.36	CaSO4
Anilite	-55.39	-87.26	-31.88	Cu0.25Cu1.5S
Antlerite	-2.44	6.35	8.79	Cu3 (OH) 4SO4
Aragonite	-0.23	-8.53	-8.30	CaCO3
Arsenolite	-88.26	-91.02	-2.76	As4O6
Artinite	-5.59	4.01	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.91	-32.20	6.71	As2O5
Atacamite	-1.59	5.80	7.39	Cu2 (OH) 3Cl
Azurite	-0.45	-17.36	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.95	7.45	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.18	-2.31	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.94	-9.85	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.80	5.14	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.30	-22.97	-9.67	BaCrO4
BaF2	-9.53	-15.35	-5.82	BaF2
BaMoO4	-6.85	-13.81	-6.96	BaMoO4
Barite	-0.06	-10.04	-9.98	BaSO4
BaS	-94.77	-78.59	16.18	BaS
BaSeO3	-9.05	-7.22	1.83	BaSeO3
BaSeO4	-10.51	-17.97	-7.46	BaSeO4
Bianchite	-6.45	-8.22	-1.76	ZnSO4:6H2O
Birnessite	-7.60	10.49	18.09	MnO2
Bixbyite	-3.92	-4.56	-0.64	Mn2O3
BlaubleiI	-55.16	-79.32	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.71	-82.99	-27.28	Cu0.6Cu0.8S
Boehmite	0.77	9.35	8.58	AlOOH
Breithauptite	-57.15	-75.68	-18.52	NiSb
Brochantite	-0.93	14.30	15.22	Cu4 (OH) 6SO4
Brucite	-4.54	12.30	16.84	Mg (OH) 2
Bunsenite	-4.75	7.69	12.45	NiO
Ca (VO3) 2	-10.80	-5.14	5.66	Ca (VO3) 2
Ca2V2O7	-10.57	6.93	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.62	6.93	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-18.30	4.00	22.30	Ca3 (AsO4) 2:4H2O

Ca3(VO4)2	-19.96	19.00	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.86	19.00	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-299.06	-156.08	142.97	Ca3Sb2
CaCrO4	-16.09	-18.35	-2.27	CaCrO4
Calcite	-0.05	-8.53	-8.48	CaCO3
Calomel	-7.44	-25.35	-17.91	Hg2Cl2
CaMoO4	-1.24	-9.19	-7.95	CaMoO4
Carnotite	-2.35	-2.12	0.23	KUO2VO4
CaSeO3:2H2O	-5.41	-2.60	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.34	-13.36	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.34	-2.50	9.84	Cd(BO2)2
Cd(OH)2	-7.06	6.58	13.64	Cd(OH)2
Cd(OH)2(am)	-7.15	6.58	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.96	-15.25	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.32	2.24	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.58	8.82	28.40	Cd4(OH)6SO4
CdCl2	-12.95	-13.61	-0.66	CdCl2
CdCl2:1H2O	-11.92	-13.61	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.70	-13.61	-1.91	CdCl2:2.5H2O
CdF2	-15.01	-16.22	-1.21	CdF2
Cdmetal(alpha)	-32.49	-18.97	13.51	Cd
Cdmetal(gamma)	-32.59	-18.97	13.62	Cd
CdMoO4	-0.53	-14.68	-14.15	CdMoO4
CdOHCl	-7.05	-3.52	3.54	CdOHCl
CdSb	-76.44	-76.79	-0.35	CdSb
CdSe	-19.68	-39.88	-20.20	CdSe
CdSeO4:2H2O	-16.99	-18.84	-1.85	CdSeO4:2H2O
CdSO4	-10.74	-10.92	-0.17	CdSO4
CdSO4:1H2O	-9.19	-10.92	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.04	-10.92	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO3
CH4(g)	-81.76	-122.81	-41.05	CH4
Chalcanthite	-6.91	-9.55	-2.64	CuSO4:5H2O
Chalcedony	-1.00	-4.55	-3.55	SiO2
Chalcocite	-55.40	-90.32	-34.92	Cu2S
Chalcopyrite	-125.57	-160.84	-35.27	CuFeS2
Chrysotile	-4.39	27.81	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.75	-97.44	-45.69	HgS
Claudetite	-87.96	-91.02	-3.06	As4O6
Clausthalite	-13.72	-40.82	-27.10	PbSe
Co(BO2)2	-28.68	-1.61	27.07	Co(BO2)2
Co(OH)2	-5.63	7.47	13.09	Co(OH)2
Co(OH)3	-9.85	-12.16	-2.31	Co(OH)3
CO2(g)	-2.45	-20.60	-18.15	CO2
Co3(AsO4)2	-22.84	-9.80	13.03	Co3(AsO4)2
Co3O4	-6.35	-16.85	-10.50	Co3O4
CoCl2	-20.99	-12.73	8.27	CoCl2
CoCl2:6H2O	-15.26	-12.73	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.74	-15.34	-1.60	CoF2
CoF3	-44.91	-46.36	-1.46	CoF3
CoFe2O4	17.08	13.55	-3.53	CoFe2O4
CoMoO4	-6.03	-13.80	-7.76	CoMoO4
CoO	-6.12	7.47	13.59	CoO
CoS(alpha)	-71.14	-78.58	-7.44	CoS
CoS(beta)	-67.51	-78.58	-11.07	CoS
CoSe	-22.80	-39.00	-16.20	CoSe
CoSeO3	-8.52	-7.20	1.32	CoSeO3
CoSeO4:6H2O	-16.43	-17.96	-1.53	CoSeO4:6H2O
CoSO4	-12.83	-10.03	2.80	CoSO4
CoSO4:6H2O	-7.56	-10.03	-2.47	CoSO4:6H2O
Cotunnite	-9.77	-14.55	-4.78	PbCl2
Covellite	-55.80	-78.10	-22.30	CuS
Cr(OH)2	-22.02	-11.20	10.82	Cr(OH)2
Cr(OH)3	-2.71	-1.38	1.34	Cr(OH)3
Cr(OH)3(am)	-0.63	-1.38	-0.75	Cr(OH)3
Cr2O3	-0.39	-2.75	-2.36	Cr2O3

CrCl2	-45.49	-31.40	14.09	CrCl2
CrCl3	-46.78	-31.67	15.11	CrCl3
CrF3	-24.25	-35.58	-11.34	CrF3
Cristobalite	-1.20	-4.55	-3.35	SiO2
Crmetal	-67.24	-36.76	30.48	Cr
CrO3	-27.21	-30.42	-3.21	CrO3
Cryolite	-8.76	-42.60	-33.84	Na3AlF6
Cu(OH)2	-0.73	7.95	8.67	Cu(OH)2
Cu(SbO3)2	-25.14	20.07	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.96	0.29	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.45	-90.34	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.94	-50.74	-45.80	Cu2Se
Cu2SO4	-19.82	-21.77	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.46	-8.36	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.96	-102.56	-42.59	Cu3Sb
Cu3Se2	-25.76	-89.25	-63.49	Cu3Se2
CuCO3	-1.15	-12.65	-11.50	CuCO3
CuCrO4	-17.03	-22.47	-5.44	CuCrO4
CuF	-8.63	-13.54	-4.91	CuF
CuF2	-15.97	-14.86	1.12	CuF2
CuF2:2H2O	-10.31	-14.86	-4.55	CuF2:2H2O
Cumetal	-6.16	-14.91	-8.76	Cu
CuMoO4	-0.24	-13.31	-13.08	CuMoO4
CuOCuSO4	-11.90	-1.60	10.30	CuOCuSO4
Cupricferrite	8.05	14.03	5.99	CuFe2O4
Cuprite	-2.87	-4.28	-1.41	Cu2O
Cuprousferrite	9.82	0.90	-8.92	CuFeO2
CuSe	-5.42	-38.52	-33.10	CuSe
CuSe2	-26.06	-59.43	-33.37	CuSe2
CuSeO3:2H2O	-7.23	-6.72	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.04	-17.48	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.47	9.35	6.87	AlOOH
Djurleite	-55.59	-89.51	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.29	-16.83	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.26	-16.83	-17.09	CaMg(CO3)2
Epsomite	-3.07	-5.19	-2.13	MgSO4:7H2O
Fe(OH)2	-10.27	3.30	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.05	0.01	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.19	-13.91	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.14	-8.58	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.29	-37.92	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.67	-46.40	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.84	9.38	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.46	-13.06	0.40	FeAsO4:2H2O
FeCr2O4	-6.65	0.55	7.20	FeCr2O4
FeMoO4	-7.87	-17.96	-10.09	FeMoO4
Ferrihydrite	-0.15	3.04	3.19	Fe(OH)3
Ferroselite	-45.48	-64.08	-18.60	FeSe2
FeS(ppt)	-79.80	-82.75	-2.95	FeS
FeSe	-32.16	-43.16	-11.00	FeSe
Fix_pe	-5.22	-5.22	0.00	e-
Fluorite	-0.24	-10.74	-10.50	CaF2
Galena	-66.43	-80.40	-13.97	PbS
Gibbsite	1.06	9.35	8.29	Al(OH)3
Goethite	2.55	3.04	0.49	FeOOH
Goslarite	-6.21	-8.22	-2.01	ZnSO4:7H2O
Greenalite	-20.01	0.80	20.81	Fe3Si2O5(OH)4
Greenockite	-65.10	-79.46	-14.36	CdS
Greigite	-289.76	-334.79	-45.03	Fe3S4
Gummite	-6.11	1.56	7.67	UO3
Gypsum	-0.82	-5.43	-4.61	CaSO4:2H2O
H-Jarosite	-13.76	-25.86	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.39	-21.26	-12.88	H2MoO4
H2S(g)	-78.03	-86.04	-8.01	H2S
H2Se(g)	-41.50	-46.46	-4.96	H2Se
Halite	-6.21	-4.61	1.60	NaCl
Halloysite	0.02	9.59	9.57	Al2Si2O5(OH)4

Hausmannite	-4.60	56.43	61.03	Mn3O4
Hematite	7.50	6.09	-1.42	Fe2O3
Hercynite	-0.90	21.99	22.89	FeAl2O4
Hg (CH3) 2 (g)	-183.31	-257.01	-73.71	Hg (CH3) 2
Hg (g)	-7.48	-15.36	-7.87	Hg
Hg (OH) 2	-7.90	-11.40	-3.50	Hg (OH) 2
Hg2 (g)	-15.76	-30.71	-14.96	Hg2
Hg2 (OH) 2	-10.42	-5.16	5.26	Hg2 (OH) 2
Hg2CO3	-9.71	-25.76	-16.05	Hg2CO3
Hg2CrO4	-26.88	-35.58	-8.70	Hg2CrO4
Hg2F2	-17.60	-27.97	-10.36	Hg2F2
Hg2S	-79.53	-91.20	-11.68	Hg2S
Hg2SeO3	-15.17	-19.83	-4.66	Hg2SeO3
Hg2SO4	-16.53	-22.66	-6.13	Hg2SO4
Hg3O2CO3	-25.11	-54.79	-29.68	Hg3O2CO3
HgCl (g)	-32.17	-12.68	19.50	HgCl
HgCl2	-10.33	-31.59	-21.26	HgCl2
HgF (g)	-46.66	-13.98	32.68	HgF
HgF2 (g)	-46.77	-34.20	12.57	HgF2
Hgmetal (l)	-1.90	-15.36	-13.45	Hg
HgSe	-2.17	-57.86	-55.69	HgSe
HgSeO3	-13.63	-26.06	-12.43	HgSeO3
HgSO4	-19.47	-28.89	-9.42	HgSO4
Huntite	-3.45	-33.42	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.50	-24.27	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.11	-20.88	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.56	-20.73	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-6.14	-20.94	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.76	-51.00	-17.24	K2Cr2O7
K2CrO4	-20.07	-20.58	-0.51	K2CrO4
K2MoO4	-14.68	-11.42	3.26	K2MoO4
K2SeO4	-14.85	-15.58	-0.73	K2SeO4
Kaolinite	2.16	9.59	7.43	Al2Si2O5 (OH) 4
Langite	-3.19	14.30	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.78	-6.21	-0.43	PbO : PbSO4
Laurionite	-5.08	-4.45	0.62	PbOHCl
Lepidocrocite	1.67	3.04	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.05	5.64	12.69	PbO
Mackinawite	-79.15	-82.75	-3.60	FeS
Maghemite	-0.30	6.09	6.39	Fe2O3
Magnesioferrite	1.53	18.39	16.86	Fe2MgO4
Magnesite	-0.83	-8.29	-7.46	MgCO3
Magnetite	5.98	9.38	3.40	Fe3O4
Malachite	0.60	-4.70	-5.31	Cu2 (OH) 2CO3
Manganite	-2.27	23.07	25.34	MnOOH
Massicot	-7.25	5.64	12.89	PbO
Matlockite	-6.88	-15.86	-8.97	PbClF
Melanothallite	-18.50	-12.25	6.26	CuCl2
Melanterite	-11.99	-14.20	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.35	-97.44	-45.09	HgS
Mg (OH) 2 (active)	-6.49	12.30	18.79	Mg (OH) 2
Mg (VO3) 2	-16.18	-4.90	11.28	Mg (VO3) 2
Mg2Sb3	-274.63	-199.95	74.68	Mg2Sb3
Mg2V2O7	-18.96	7.40	26.36	Mg2V2O7
MgCr2O4	-6.65	9.55	16.20	MgCr2O4
MgCrO4	-23.50	-18.12	5.38	MgCrO4
MgF2	-2.37	-10.50	-8.13	MgF2
MgMoO4	-7.11	-8.96	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.42	-2.36	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.92	-13.12	-1.20	MgSeO4 : 6H2O
Minium	-31.04	42.48	73.52	Pb3O4
Mirabilite	-5.40	-6.52	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.82	-6.92	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-51.34	-57.05	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.41	-88.33	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.83	-1.33	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.62	-9.90	2.72	MnCl2 : 4H2O

MnS (grn)	-75.92	-75.75	0.17	MnS
MnS (pnk)	-79.09	-75.75	3.34	MnS
MnSb	-95.52	-98.43	-2.91	MnSb
MnSe	-39.67	-36.17	3.50	MnSe
MnSeO3	-5.50	-4.37	1.13	MnSeO3
MnSeO3:2H2O	-5.36	-4.38	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.08	-15.13	-2.05	MnSeO4:5H2O
MnSO4	-9.79	-7.20	2.58	MnSO4
Monteponite	-8.52	6.58	15.10	CdO
Montroydite	-7.76	-11.40	-3.64	HgO
MoO3	-13.26	-21.26	-8.00	MoO3
Morenosite	-7.66	-9.80	-2.14	NiSO4:7H2O
MoS2	-148.64	-218.90	-70.26	MoS2
Na-Jarosite	-9.17	-20.37	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.97	-49.86	-9.90	Na2Cr2O7
Na2CrO4	-22.37	-19.44	2.93	Na2CrO4
Na2Mo2O7	-14.95	-31.54	-16.60	Na2Mo2O7
Na2MoO4	-11.77	-10.28	1.49	Na2MoO4
Na2MoO4:2H2O	-11.51	-10.28	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.99	-3.69	10.30	Na2SeO3:5H2O
Na2SeO4	-15.72	-14.44	1.28	Na2SeO4
Na3Sb	-174.12	-79.67	94.45	Na3Sb
Na3VO4	-28.81	7.87	36.68	Na3VO4
Na4V2O7	-32.65	4.75	37.40	Na4V2O7
Nantokite	-5.50	-12.23	-6.73	CuCl
NaSb	-88.27	-65.10	23.17	NaSb
Natron	-8.31	-9.62	-1.31	Na2CO3:10H2O
NaVO3	-6.97	-3.11	3.86	NaVO3
Nesquehonite	-3.63	-8.30	-4.67	MgCO3:3H2O
Ni(OH)2	-5.10	7.69	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.83	-9.13	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.72	13.28	32.00	Ni4(OH)6SO4
NiCO3	-6.04	-12.91	-6.87	NiCO3
NiMoO4	-2.43	-13.57	-11.14	NiMoO4
NiS(alpha)	-72.75	-78.35	-5.60	NiS
NiS(beta)	-67.25	-78.35	-11.10	NiS
NiS(gamma)	-65.55	-78.35	-12.80	NiS
NiSe	-21.07	-38.77	-17.70	NiSe
NiSeO3:2H2O	-9.79	-6.97	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-16.21	-17.73	-1.52	NiSeO4:6H2O
Nsutite	-7.01	10.49	17.50	MnO2
O2(g)	-31.99	51.10	83.09	O2
Orpiment	-242.58	-303.64	-61.07	As2S3
Otavite	-2.02	-14.02	-12.00	CdCO3
Pb(BO2)2	-9.96	-3.44	6.52	Pb(BO2)2
Pb(OH)2	-2.51	5.64	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.42	-67.18	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.61	1.19	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.90	11.28	26.19	Pb2O(OH)2
Pb2O3	-24.20	36.84	61.04	Pb2O3
Pb2OCO3	-8.76	-9.32	-0.56	Pb2OCO3
Pb2V2O7	-4.02	-5.92	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.08	-15.28	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.42	-0.28	6.14	Pb3(VO4)2
Pb3O2CO3	-14.69	-3.67	11.02	Pb3O2CO3
Pb3O2SO4	-11.26	-0.57	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.03	5.07	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.80	5.07	21.88	Pb4O3SO4
PbCrO4	-12.18	-24.78	-12.60	PbCrO4
PbF2	-9.72	-17.16	-7.44	PbF2
Pbmetal	-24.16	-19.91	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.34	5.64	12.98	PbO:0.33H2O
PbSeO4	-12.94	-19.78	-6.84	PbSeO4
Periclase	-9.28	12.30	21.58	MgO
Phosgenite	-9.70	-29.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.41	31.19	49.60	PbO2
Portlandite	-10.74	12.07	22.80	Ca(OH)2

Pyrite	-124.73	-143.24	-18.51	FeS2
Pyrochroite	-4.90	10.29	15.19	Mn(OH)2
Pyrolusite	-5.54	35.84	41.38	MnO2
Quartz	-0.55	-4.55	-4.00	SiO2
Realgar	-101.83	-121.58	-19.75	AsS
Retgersite	-7.76	-9.80	-2.04	NiSO4:6H2O
Rhodochrosite	0.27	-10.31	-10.58	MnCO3
Rutherfordine	-4.54	-19.04	-14.50	UO2CO3
Sb(OH)3	-12.38	-19.49	-7.11	Sb(OH)3
Sb2O4	-16.83	-13.43	3.40	Sb2O4
Sb2O5	-26.83	-36.49	-9.67	Sb2O5
Sb2Se3	-110.61	-178.37	-67.76	Sb2Se3
Sb4O6(cubic)	-59.69	-77.95	-18.26	Sb4O6
Sb4O6(orth)	-60.05	-77.95	-17.90	Sb4O6
SbCl3	-50.35	-49.78	0.57	SbCl3
SbF3	-43.47	-53.70	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.20	-31.02	-27.82	SbO2
Schoepite	-4.44	1.56	5.99	UO2(OH)2:H2O
Semetal(am)	-13.80	-20.91	-7.11	Se
Semetal(hex)	-13.20	-20.91	-7.71	Se
Senarmontite	-26.61	-38.98	-12.37	Sb2O3
SeO2	-14.79	-14.67	0.12	SeO2
SeO3	-46.47	-25.42	21.04	SeO3
Sepiolite	-4.80	10.96	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-7.82	10.96	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.06	-17.30	-10.24	FeCO3
SiO2(am-gel)	-1.84	-4.55	-2.71	SiO2
SiO2(am-ppt)	-1.81	-4.55	-2.74	SiO2
Smithsonite	-1.32	-11.32	-10.00	ZnCO3
Sphalerite	-65.31	-76.76	-11.45	ZnS
Spinel	-5.85	31.00	36.85	MgAl2O4
Stibnite	-246.65	-297.11	-50.46	Sb2S3
Sulfur	-58.35	-60.49	-2.14	S
Tenorite	0.30	7.95	7.64	CuO
Thenardite	-6.84	-6.51	0.32	Na2SO4
Thermonatrite	-10.26	-9.62	0.64	Na2CO3:H2O
Tyuyamunite	-6.10	-2.02	4.08	Ca(UO2)2(VO4)2
U3O8	-14.31	6.77	21.08	U3O8
U3Sb4	-581.29	-428.91	152.38	U3Sb4
U4O9	-30.54	-33.56	-3.02	U4O9
UF4	-30.85	-60.39	-29.54	UF4
UF4:2.5H2O	-27.67	-60.39	-32.72	UF4:2.5H2O
UO2(am)	-15.71	-14.78	0.93	UO2
UO2(NO3)2	-41.79	-29.65	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.50	-29.65	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.04	-29.65	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.69	-29.65	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.05	1.56	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.62	-23.87	-2.25	UO2SeO4:4H2O
UO3	-6.14	1.56	7.70	UO3
Uraninite	-10.11	-14.78	-4.67	UO2
USb2	-220.31	-190.73	29.58	USb2
V(OH)3	-19.15	-11.56	7.59	V(OH)3
V2O5	-15.85	-17.21	-1.36	V2O5
V3O5	-40.82	-38.98	1.84	V3O5
V4O7	-50.65	-43.46	7.19	V4O7
V6O13	-41.87	-102.73	-60.86	V6O13
Valentinite	-30.50	-38.98	-8.48	Sb2O3
VC12	-63.40	-44.53	18.87	VC12
VC13	-65.28	-41.85	23.43	VC13
VF4	-65.02	-50.09	14.93	VF4
Vmetal	-93.91	-49.89	44.03	V
VO	-39.09	-24.33	14.76	VO
VO(OH)2	-9.63	-4.48	5.15	VO(OH)2
VO2Cl	-21.54	-18.70	2.84	VO2Cl
VOC1	-32.81	-21.65	11.15	VOC1
VOC12	-37.43	-24.67	12.76	VOC12

VOSO4	-25.58	-21.97	3.61	VOSO4
Witherite	-4.58	-13.15	-8.57	BaCO3
Wurtzite	-67.81	-76.76	-8.95	ZnS
Zincite	-2.05	9.28	11.33	ZnO
Zincosite	-12.15	-8.22	3.93	ZnSO4
Zn(BO2)2	-8.09	0.20	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.24	-21.93	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.92	9.28	12.20	Zn(OH)2
Zn(OH)2(am)	-3.19	9.28	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.47	9.28	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.25	9.28	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.45	9.28	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.44	1.06	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.73	8.46	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.01	-4.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.07	-7.15	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.78	19.62	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.29	26.21	38.50	Zn5(OH)8Cl2
ZnCl2	-17.96	-10.91	7.05	ZnCl2
ZnCO3:1H2O	-1.06	-11.32	-10.26	ZnCO3:1H2O
ZnF2	-12.99	-13.52	-0.53	ZnF2
Znmetal	-42.06	-16.27	25.79	Zn
ZnMoO4	-1.86	-11.98	-10.13	ZnMoO4
ZnO(active)	-1.91	9.28	11.19	ZnO
ZnS(am)	-67.71	-76.76	-9.05	ZnS
ZnSb	-85.10	-74.09	11.01	ZnSb
ZnSe	-22.78	-37.18	-14.40	ZnSe
ZnSeO4:6H2O	-14.63	-16.15	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.58	-8.22	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 142.

```

      REACTION 804
        H2O      -1
        0.126204 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 810
      SAVE Solution 811
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 810. Solution after simulation 141.
Using reaction 804.

Reaction 804.

1.262e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
---------	----------------

H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.638e-08	1.638e-08
Al	2.016e-06	2.015e-06
As	1.802e-10	1.802e-10
B	2.943e-05	2.943e-05
Ba	4.433e-08	4.433e-08
C	2.518e-03	2.518e-03
Ca	2.716e-03	2.716e-03
Cd	1.042e-08	1.042e-08
Cl	3.451e-03	3.451e-03
Co	8.005e-08	8.005e-08
Cr	1.721e-09	1.721e-09
Cu	1.661e-06	1.661e-06
F	2.029e-04	2.029e-04
Fe	1.244e-09	1.244e-09
Hg	1.644e-09	1.644e-09
K	2.844e-03	2.844e-03
Mg	4.371e-03	4.371e-03
Mn	4.903e-05	4.903e-05
Mo	1.439e-06	1.439e-06
N	1.204e-05	1.204e-05
Na	1.047e-02	1.047e-02
Ni	1.247e-07	1.247e-07
Pb	5.855e-09	5.854e-09
S	1.076e-02	1.076e-02
Sb	2.195e-08	2.195e-08
Se	1.248e-07	1.248e-07
Si	2.814e-05	2.813e-05
U	1.991e-07	1.991e-07
V	6.646e-09	6.646e-09
Zn	4.888e-06	4.887e-06

-----Description of solution-----

	pH =	7.558	Charge balance
	pe =	5.219	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	3.646e-02	
	Mass of water (kg) =	9.999e-01	
	Total alkalinity (eq/kg) =	2.425e-03	
	Total CO2 (mol/kg) =	2.518e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	1.425e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	3	
	Total H =	1.110103e+02	
	Total O =	5.555455e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.366e-07	3.633e-07	-6.360	-6.440	-0.080	(0)
H+	3.301e-08	2.770e-08	-7.481	-7.558	-0.076	0.00
H2O	5.551e+01	9.994e-01	1.744	-0.000	0.000	18.07
Ag	1.638e-08					
AgCl	1.066e-08	1.066e-08	-7.972	-7.972	0.000	(0)
AgCl2-	3.365e-09	2.689e-09	-8.473	-8.570	-0.097	(0)
Ag+	2.149e-09	1.803e-09	-8.668	-8.744	-0.076	(0)

	AgSO4-	1.876e-10	1.499e-10	-9.727	-9.824	-0.097	(0)
	AgCl3-2	1.701e-11	6.939e-12	-10.769	-11.159	-0.390	(0)
	AgNO2	3.546e-12	3.546e-12	-11.450	-11.450	0.000	(0)
	AgF	6.486e-13	6.486e-13	-12.188	-12.188	0.000	(0)
	AgCl4-3	3.087e-13	4.102e-14	-12.510	-13.387	-0.876	(0)
	AgOH	6.551e-14	6.551e-14	-13.184	-13.184	0.000	(0)
	AgNH3+	4.854e-14	3.879e-14	-13.314	-13.411	-0.097	(0)
	AgH2BO3	1.729e-14	1.729e-14	-13.762	-13.762	0.000	(0)
	AgSeO3-	1.620e-14	1.295e-14	-13.790	-13.888	-0.097	(0)
	Ag2Se	1.189e-14	1.189e-14	-13.925	-13.925	0.000	(0)
	Ag (NO2) 2-	6.470e-17	5.171e-17	-16.189	-16.286	-0.097	(0)
	AgNO3	1.294e-17	1.294e-17	-16.888	-16.888	0.000	(0)
	Ag (NH3) 2+	4.158e-18	3.323e-18	-17.381	-17.479	-0.097	(0)
	Ag (OH) 2-	2.911e-18	2.326e-18	-17.536	-17.633	-0.097	(0)
	Ag (SeO3) 2-3	9.746e-21	1.295e-21	-20.011	-20.888	-0.876	(0)
	Ag2MoO4	8.780e-25	8.780e-25	-24.057	-24.057	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.416	-73.416	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.834	-84.392	-1.558	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.527	-147.728	-0.201	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.704	-147.802	-0.097	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.242	-149.610	-0.368	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.571	-149.921	-0.350	(0)
Al		2.016e-06					
	Al (OH) 4-	1.961e-06	1.647e-06	-5.707	-5.783	-0.076	(0)
	Al (OH) 3	3.600e-08	3.600e-08	-7.444	-7.444	0.000	(0)
	AlF3	6.971e-09	6.971e-09	-8.157	-8.157	0.000	(0)
	Al (OH) 2+	5.872e-09	4.967e-09	-8.231	-8.304	-0.073	(0)
	AlF2+	4.572e-09	3.867e-09	-8.340	-8.413	-0.073	(0)
	AlF4-	5.959e-10	5.003e-10	-9.225	-9.301	-0.076	(0)
	AlF+2	1.326e-10	6.783e-11	-9.878	-10.169	-0.291	(0)
	AlOH+2	3.363e-11	1.721e-11	-10.473	-10.764	-0.291	(0)
	AlSO4+	1.825e-12	1.532e-12	-11.739	-11.815	-0.076	(0)
	Al+3	2.297e-13	4.737e-14	-12.639	-13.324	-0.686	(0)
	Al (SO4) 2-	8.146e-14	6.839e-14	-13.089	-13.165	-0.076	(0)
	AlMo6O21-3	2.088e-40	0.000e+00	-39.680	-40.557	-0.876	(0)
As (3)		1.796e-23					
	H3AsO3	1.755e-23	1.755e-23	-22.756	-22.756	0.000	(0)
	H2AsO3-	4.067e-25	3.250e-25	-24.391	-24.488	-0.097	(0)
	HAsO3-2	2.624e-29	1.070e-29	-28.581	-28.971	-0.390	(0)
	H4AsO3+	3.014e-31	2.409e-31	-30.521	-30.618	-0.097	(0)
	AsO3-3	1.120e-34	1.489e-35	-33.951	-34.827	-0.876	(0)
As (5)		1.802e-10					
	HAsO4-2	1.596e-10	6.508e-11	-9.797	-10.187	-0.390	(0)
	H2AsO4-	2.057e-11	1.644e-11	-10.687	-10.784	-0.097	(0)
	AsO4-3	5.590e-14	7.430e-15	-13.253	-14.129	-0.876	(0)
	H3AsO4	7.848e-17	7.914e-17	-16.105	-16.102	0.004	(0)
B		2.943e-05					
	H3BO3	2.861e-05	2.885e-05	-4.544	-4.540	0.004	(0)
	H2BO3-	7.343e-07	6.049e-07	-6.134	-6.218	-0.084	(0)
	MgH2BO3+	3.944e-08	3.249e-08	-7.404	-7.488	-0.084	(0)
	CaH2BO3+	3.798e-08	3.129e-08	-7.420	-7.505	-0.084	(0)
	NaH2BO3	8.234e-09	8.234e-09	-8.084	-8.084	0.000	(0)
	BF (OH) 3-	2.001e-09	1.648e-09	-8.699	-8.783	-0.084	(0)
	H5 (BO3) 2-	1.803e-11	1.485e-11	-10.744	-10.828	-0.084	(0)
	BF2 (OH) 2-	8.490e-13	6.994e-13	-12.071	-12.155	-0.084	(0)
	BaH2BO3+	4.929e-13	4.060e-13	-12.307	-12.391	-0.084	(0)
	H8 (BO3) 3-	5.201e-14	4.285e-14	-13.284	-13.368	-0.084	(0)
	AgH2BO3	1.729e-14	1.729e-14	-13.762	-13.762	0.000	(0)
	BF3OH-	1.311e-18	1.080e-18	-17.882	-17.967	-0.084	(0)
	BF4-	2.560e-23	2.109e-23	-22.592	-22.676	-0.084	(0)
Ba		4.433e-08					
	Ba+2	4.382e-08	2.172e-08	-7.358	-7.663	-0.305	(0)
	BaHCO3+	4.736e-10	4.024e-10	-9.325	-9.395	-0.071	(0)
	BaCO3	3.658e-11	3.658e-11	-10.437	-10.437	0.000	(0)
	BaH2BO3+	4.929e-13	4.060e-13	-12.307	-12.391	-0.084	(0)
	BaOH+	4.086e-14	3.445e-14	-13.389	-13.463	-0.074	(0)
	BaNO3+	1.231e-15	9.834e-16	-14.910	-15.007	-0.097	(0)
	BaNH3+2	3.541e-16	1.444e-16	-15.451	-15.840	-0.390	(0)

C (4)	2.518e-03					
HCO3-	2.294e-03	1.940e-03	-2.639	-2.712	-0.073	(0)
H2CO3	1.208e-04	1.208e-04	-3.918	-3.918	0.000	(0)
CaHCO3+	3.822e-05	3.247e-05	-4.418	-4.488	-0.071	(0)
MgHCO3+	3.679e-05	3.075e-05	-4.434	-4.512	-0.078	(0)
NaHCO3	9.369e-06	9.369e-06	-5.028	-5.028	0.000	(0)
CO3-2	6.623e-06	3.283e-06	-5.179	-5.484	-0.305	(0)
CaCO3	4.678e-06	4.678e-06	-5.330	-5.330	0.000	(0)
MgCO3	4.231e-06	4.231e-06	-5.374	-5.374	0.000	(0)
CuCO3	1.317e-06	1.317e-06	-5.880	-5.880	0.000	(0)
MnHCO3+	6.924e-07	5.837e-07	-6.160	-6.234	-0.074	(0)
NaCO3-	6.208e-07	5.251e-07	-6.207	-6.280	-0.073	(0)
ZnCO3	2.766e-07	2.766e-07	-6.558	-6.558	0.000	(0)
UO2 (CO3) 3-4	1.407e-07	3.893e-09	-6.852	-8.410	-1.558	(0)
ZnHCO3+	1.124e-07	8.980e-08	-6.949	-7.047	-0.097	(0)
UO2 (CO3) 2-2	5.802e-08	2.366e-08	-7.236	-7.626	-0.390	(0)
Cu (CO3) 2-2	2.854e-08	1.164e-08	-7.545	-7.934	-0.390	(0)
NiHCO3+	1.134e-08	9.066e-09	-7.945	-8.043	-0.097	(0)
CuHCO3+	1.043e-08	8.338e-09	-7.982	-8.079	-0.097	(0)
NiCO3	4.643e-09	4.643e-09	-8.333	-8.333	0.000	(0)
CoHCO3+	4.252e-09	3.398e-09	-8.371	-8.469	-0.097	(0)
PbCO3	3.324e-09	3.324e-09	-8.478	-8.478	0.000	(0)
CoCO3	1.250e-09	1.250e-09	-8.903	-8.903	0.000	(0)
PbHCO3+	6.075e-10	4.855e-10	-9.216	-9.314	-0.097	(0)
BaHCO3+	4.736e-10	4.024e-10	-9.325	-9.395	-0.071	(0)
UO2CO3	3.612e-10	3.612e-10	-9.442	-9.442	0.000	(0)
CdCO3	2.185e-10	2.185e-10	-9.661	-9.661	0.000	(0)
Pb (CO3) 2-2	7.719e-11	3.148e-11	-10.112	-10.502	-0.390	(0)
BaCO3	3.658e-11	3.658e-11	-10.437	-10.437	0.000	(0)
CdHCO3+	1.614e-11	1.289e-11	-10.792	-10.890	-0.097	(0)
Cd (CO3) 2-2	1.304e-12	5.318e-13	-11.885	-12.274	-0.390	(0)
FeHCO3+	4.399e-14	3.737e-14	-13.357	-13.427	-0.071	(0)
HgCO3	1.896e-14	1.896e-14	-13.722	-13.722	0.000	(0)
Hg (CO3) 2-2	4.827e-16	1.968e-16	-15.316	-15.706	-0.390	(0)
HgHCO3+	1.224e-17	9.779e-18	-16.912	-17.010	-0.097	(0)
Ca	2.716e-03					
Ca+2	1.814e-03	8.990e-04	-2.741	-3.046	-0.305	(0)
CaSO4	8.580e-04	8.580e-04	-3.067	-3.067	0.000	(0)
CaHCO3+	3.822e-05	3.247e-05	-4.418	-4.488	-0.071	(0)
CaCO3	4.678e-06	4.678e-06	-5.330	-5.330	0.000	(0)
CaF+	1.667e-06	1.405e-06	-5.778	-5.852	-0.074	(0)
CaH2BO3+	3.798e-08	3.129e-08	-7.420	-7.505	-0.084	(0)
CaOH+	7.670e-09	6.517e-09	-8.115	-8.186	-0.071	(0)
CaNO3+	3.214e-11	2.568e-11	-10.493	-10.590	-0.097	(0)
CaNH3+2	2.924e-11	1.193e-11	-10.534	-10.924	-0.390	(0)
Ca (NH3) 2+2	1.227e-19	5.003e-20	-18.911	-19.301	-0.390	(0)
Cd	1.042e-08					
Cd+2	5.890e-09	2.920e-09	-8.230	-8.535	-0.305	(0)
CdSO4	2.852e-09	2.852e-09	-8.545	-8.545	0.000	(0)
CdCl+	1.010e-09	8.074e-10	-8.996	-9.093	-0.097	(0)
Cd (SO4) 2-2	3.930e-10	1.603e-10	-9.406	-9.795	-0.390	(0)
CdCO3	2.185e-10	2.185e-10	-9.661	-9.661	0.000	(0)
CdHCO3+	1.614e-11	1.289e-11	-10.792	-10.890	-0.097	(0)
CdOHC1	1.203e-11	1.203e-11	-10.920	-10.920	0.000	(0)
CdOH+	1.054e-11	8.426e-12	-10.977	-11.074	-0.097	(0)
CdCl2	9.747e-12	9.747e-12	-11.011	-11.011	0.000	(0)
CdF+	8.292e-12	6.626e-12	-11.081	-11.179	-0.097	(0)
Cd (CO3) 2-2	1.304e-12	5.318e-13	-11.885	-12.274	-0.390	(0)
CdCl3-	2.228e-14	1.781e-14	-13.652	-13.749	-0.097	(0)
Cd (OH) 2	1.932e-14	1.932e-14	-13.714	-13.714	0.000	(0)
CdF2	1.893e-15	1.893e-15	-14.723	-14.723	0.000	(0)
CdNO3+	1.044e-16	8.340e-17	-15.981	-16.079	-0.097	(0)
CdSeO4	2.677e-17	2.677e-17	-16.572	-16.572	0.000	(0)
Cd2OH+3	9.277e-19	1.233e-19	-18.033	-18.909	-0.876	(0)
Cd (SeO3) 2-2	7.366e-19	3.004e-19	-18.133	-18.522	-0.390	(0)
Cd (OH) 3-	5.365e-19	4.287e-19	-18.270	-18.368	-0.097	(0)
Cd (NO3) 2	3.776e-25	3.776e-25	-24.423	-24.423	0.000	(0)
Cd (OH) 4-2	6.251e-26	2.549e-26	-25.204	-25.594	-0.390	(0)

	CdHS+	0.000e+00	0.000e+00	-78.915	-79.013	-0.097	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.295	-150.295	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.784	-226.881	-0.097	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.782	-303.171	-0.390	(0)
C1		3.451e-03					
	Cl-	3.451e-03	2.896e-03	-2.462	-2.538	-0.076	(0)
	MnCl+	6.521e-08	5.498e-08	-7.186	-7.260	-0.074	(0)
	ZnCl+	1.274e-08	1.065e-08	-7.895	-7.973	-0.078	(0)
	AgCl	1.066e-08	1.066e-08	-7.972	-7.972	0.000	(0)
	ZnOHC1	5.064e-09	5.064e-09	-8.295	-8.295	0.000	(0)
	AgCl2-	3.365e-09	2.689e-09	-8.473	-8.570	-0.097	(0)
	CdCl+	1.010e-09	8.074e-10	-8.996	-9.093	-0.097	(0)
	CuCl	7.352e-10	7.352e-10	-9.134	-9.134	0.000	(0)
	CuCl2-	5.321e-10	4.448e-10	-9.274	-9.352	-0.078	(0)
	CuCl+	3.740e-10	3.127e-10	-9.427	-9.505	-0.078	(0)
	NiCl+	3.515e-10	2.809e-10	-9.454	-9.552	-0.097	(0)
	CoCl+	2.823e-10	2.256e-10	-9.549	-9.647	-0.097	(0)
	MnCl2	2.249e-10	2.249e-10	-9.648	-9.648	0.000	(0)
	ZnCl2	4.887e-11	4.887e-11	-10.311	-10.311	0.000	(0)
	PbCl+	4.331e-11	3.461e-11	-10.363	-10.461	-0.097	(0)
	AgCl3-2	1.701e-11	6.939e-12	-10.769	-11.159	-0.390	(0)
	CdOHC1	1.203e-11	1.203e-11	-10.920	-10.920	0.000	(0)
	CdCl2	9.747e-12	9.747e-12	-11.011	-11.011	0.000	(0)
	HgClOH	8.965e-12	8.965e-12	-11.047	-11.047	0.000	(0)
	HgCl2	4.046e-12	4.046e-12	-11.393	-11.393	0.000	(0)
	CuCl3-2	5.451e-13	2.754e-13	-12.264	-12.560	-0.297	(0)
	PbCl2	4.477e-13	4.477e-13	-12.349	-12.349	0.000	(0)
	CuCl2	3.139e-13	3.139e-13	-12.503	-12.503	0.000	(0)
	AgCl4-3	3.087e-13	4.102e-14	-12.510	-13.387	-0.876	(0)
	MnCl3-	2.127e-13	1.793e-13	-12.672	-12.746	-0.074	(0)
	HgCl3-	1.466e-13	1.172e-13	-12.834	-12.931	-0.097	(0)
	ZnCl3-	1.345e-13	1.124e-13	-12.871	-12.949	-0.078	(0)
	CdCl3-	2.228e-14	1.781e-14	-13.652	-13.749	-0.097	(0)
	NiCl2	4.095e-15	4.095e-15	-14.388	-14.388	0.000	(0)
	HgCl4-2	3.312e-15	1.351e-15	-14.480	-14.869	-0.390	(0)
	PbCl3-	6.458e-16	5.161e-16	-15.190	-15.287	-0.097	(0)
	HgCl+	3.489e-16	2.788e-16	-15.457	-15.555	-0.097	(0)
	ZnCl4-2	3.221e-16	1.627e-16	-15.492	-15.788	-0.297	(0)
	UO2Cl+	1.624e-16	1.298e-16	-15.789	-15.887	-0.097	(0)
	CrCl+2	3.060e-17	1.248e-17	-16.514	-16.904	-0.390	(0)
	CuCl3-	1.015e-17	8.483e-18	-16.994	-17.071	-0.078	(0)
	PbCl4-2	1.675e-18	6.830e-19	-17.776	-18.166	-0.390	(0)
	CrOHC12	2.495e-19	2.495e-19	-18.603	-18.603	0.000	(0)
	CrCl2+	4.290e-21	3.429e-21	-20.368	-20.465	-0.097	(0)
	FeCl+2	4.071e-21	2.057e-21	-20.390	-20.687	-0.297	(0)
	VOCl+	2.608e-22	2.084e-22	-21.584	-21.681	-0.097	(0)
	CuCl4-2	2.437e-22	1.231e-22	-21.613	-21.910	-0.297	(0)
	FeCl2+	3.156e-23	2.660e-23	-22.501	-22.575	-0.074	(0)
	CrO3Cl-	2.790e-26	2.230e-26	-25.554	-25.652	-0.097	(0)
	FeCl3	7.704e-27	7.704e-27	-26.113	-26.113	0.000	(0)
	CoCl+2	2.143e-35	8.738e-36	-34.669	-35.059	-0.390	(0)
	UCl+3	0.000e+00	0.000e+00	-44.971	-45.848	-0.876	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.602	-48.992	-0.390	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.388	-50.778	-0.390	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.295	-63.685	-0.390	(0)
Co (2)		8.005e-08					
	Co+2	5.521e-08	2.252e-08	-7.258	-7.647	-0.390	(0)
	CoSO4	1.872e-08	1.872e-08	-7.728	-7.728	0.000	(0)
	CoHCO3+	4.252e-09	3.398e-09	-8.371	-8.469	-0.097	(0)
	CoCO3	1.250e-09	1.250e-09	-8.903	-8.903	0.000	(0)
	CoCl+	2.823e-10	2.256e-10	-9.549	-9.647	-0.097	(0)
	CoOH+	2.042e-10	1.632e-10	-9.690	-9.787	-0.097	(0)
	CoF+	1.276e-10	1.020e-10	-9.894	-9.992	-0.097	(0)
	Co (OH) 2	4.710e-12	4.710e-12	-11.327	-11.327	0.000	(0)
	CoNO2+	1.869e-12	1.494e-12	-11.728	-11.826	-0.097	(0)
	Co (NH3) +2	6.995e-14	2.852e-14	-13.155	-13.545	-0.390	(0)
	CoSeO4	5.556e-16	5.556e-16	-15.255	-15.255	0.000	(0)
	CoNO3+	4.034e-16	3.224e-16	-15.394	-15.492	-0.097	(0)

Co (OH) 3-	4.273e-17	3.414e-17	-16.369	-16.467	-0.097	(0)
CoOH-	1.073e-17	8.572e-18	-16.970	-17.067	-0.097	(0)
Co2OH+3	1.386e-18	1.842e-19	-17.858	-18.735	-0.876	(0)
Co (NH3) 2+2	3.144e-20	1.282e-20	-19.503	-19.892	-0.390	(0)
Co (NO3) 2	5.925e-24	5.925e-24	-23.227	-23.227	0.000	(0)
Co (OH) 4-2	4.821e-24	1.966e-24	-23.317	-23.706	-0.390	(0)
Co (NH3) 3+2	4.171e-27	1.701e-27	-26.380	-26.769	-0.390	(0)
Co4 (OH) 4+4	5.120e-30	1.416e-31	-29.291	-30.849	-1.558	(0)
Co (NH3) 4+2	2.306e-34	9.405e-35	-33.637	-34.027	-0.390	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.394	-41.784	-0.390	(0)
Co (3)	6.714e-29					
CoOH+2	6.714e-29	2.738e-29	-28.173	-28.563	-0.390	(0)
Co+3	7.192e-35	1.483e-35	-34.143	-34.829	-0.686	(0)
CoCl+2	2.143e-35	8.738e-36	-34.669	-35.059	-0.390	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.602	-48.992	-0.390	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.504	-58.601	-0.097	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.997	-63.386	-0.390	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.295	-63.685	-0.390	(0)
Cr (2)	1.179e-26					
Cr+2	1.179e-26	4.808e-27	-25.929	-26.318	-0.390	(0)
Cr (3)	1.721e-09					
Cr (OH) 2+	1.464e-09	1.170e-09	-8.834	-8.932	-0.097	(0)
Cr (OH) 3	1.597e-10	1.597e-10	-9.797	-9.797	0.000	(0)
Cr (OH) +2	6.489e-11	2.647e-11	-10.188	-10.577	-0.390	(0)
CrOHSO4	2.616e-11	2.616e-11	-10.582	-10.582	0.000	(0)
CrO2-	3.428e-12	2.739e-12	-11.465	-11.562	-0.097	(0)
Cr (OH) 4-	2.890e-12	2.309e-12	-11.539	-11.637	-0.097	(0)
CrF+2	1.853e-13	7.557e-14	-12.732	-13.122	-0.390	(0)
CrSO4+	4.053e-14	3.239e-14	-13.392	-13.490	-0.097	(0)
Cr+3	2.505e-14	3.330e-15	-13.601	-14.478	-0.876	(0)
CrCl+2	3.060e-17	1.248e-17	-16.514	-16.904	-0.390	(0)
CrOHC12	2.495e-19	2.495e-19	-18.603	-18.603	0.000	(0)
Cr2 (OH) 2SO4+2	1.535e-19	6.259e-20	-18.814	-19.204	-0.390	(0)
Cr2 (OH) 2 (SO4) 2	1.549e-20	1.549e-20	-19.810	-19.810	0.000	(0)
CrCl2+	4.290e-21	3.429e-21	-20.368	-20.465	-0.097	(0)
CrNO3+2	3.224e-24	1.315e-24	-23.492	-23.881	-0.390	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.042	-40.431	-0.390	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.465	-49.341	-0.876	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.388	-50.778	-0.390	(0)
Cr (6)	1.081e-15					
CrO4-2	9.943e-16	4.929e-16	-15.003	-15.307	-0.305	(0)
HCrO4-	5.528e-17	4.418e-17	-16.257	-16.355	-0.097	(0)
NaCrO4-	2.632e-17	2.104e-17	-16.580	-16.677	-0.097	(0)
KCrO4-	5.313e-18	4.246e-18	-17.275	-17.372	-0.097	(0)
CrO3SO4-2	3.810e-24	1.554e-24	-23.419	-23.809	-0.390	(0)
H2CrO4	9.919e-25	9.919e-25	-24.004	-24.004	0.000	(0)
CrO3Cl-	2.790e-26	2.230e-26	-25.554	-25.652	-0.097	(0)
Cr2O7-2	1.660e-31	6.771e-32	-30.780	-31.169	-0.390	(0)
Cu (1)	1.520e-09					
CuCl	7.352e-10	7.352e-10	-9.134	-9.134	0.000	(0)
CuCl2-	5.321e-10	4.448e-10	-9.274	-9.352	-0.078	(0)
Cu+	2.524e-10	2.017e-10	-9.598	-9.695	-0.097	(0)
CuCl3-2	5.451e-13	2.754e-13	-12.264	-12.560	-0.297	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.804	-148.163	-0.359	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.551	-148.893	-0.341	(0)
Cu (2)	1.660e-06					
CuCO3	1.317e-06	1.317e-06	-5.880	-5.880	0.000	(0)
Cu+2	1.374e-07	6.813e-08	-6.862	-7.167	-0.305	(0)
CuOH+	9.364e-08	7.827e-08	-7.029	-7.106	-0.078	(0)
CuSO4	6.502e-08	6.502e-08	-7.187	-7.187	0.000	(0)
Cu (CO3) 2-2	2.854e-08	1.164e-08	-7.545	-7.934	-0.390	(0)
CuHCO3+	1.043e-08	8.338e-09	-7.982	-8.079	-0.097	(0)
Cu (OH) 2	5.674e-09	5.674e-09	-8.246	-8.246	0.000	(0)
CuF+	7.702e-10	6.155e-10	-9.113	-9.211	-0.097	(0)
Cu2 (OH) 2+2	3.773e-10	1.539e-10	-9.423	-9.813	-0.390	(0)
CuCl+	3.740e-10	3.127e-10	-9.427	-9.505	-0.078	(0)
CuNO2+	8.403e-11	6.715e-11	-10.076	-10.173	-0.097	(0)
CuNH3+2	1.801e-11	7.346e-12	-10.744	-11.134	-0.390	(0)

	Cu (OH) 3-	5.291e-12	4.228e-12	-11.276	-11.374	-0.097	(0)
	CuCl2	3.139e-13	3.139e-13	-12.503	-12.503	0.000	(0)
	Cu (NO2) 2	6.469e-15	6.469e-15	-14.189	-14.189	0.000	(0)
	CuNO3+	2.435e-15	1.946e-15	-14.613	-14.711	-0.097	(0)
	Cu (OH) 4-2	2.964e-17	1.209e-17	-16.528	-16.918	-0.390	(0)
	CuCl3-	1.015e-17	8.483e-18	-16.994	-17.071	-0.078	(0)
	CuCl4-2	2.437e-22	1.231e-22	-21.613	-21.910	-0.297	(0)
	Cu (NO3) 2	2.213e-24	2.213e-24	-23.655	-23.655	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.629	-216.726	-0.097	(0)
F	2.029e-04						
	F-	1.707e-04	1.432e-04	-3.768	-3.844	-0.076	(0)
	MgF+	2.965e-05	2.489e-05	-4.528	-4.604	-0.076	(0)
	CaF+	1.667e-06	1.405e-06	-5.778	-5.852	-0.074	(0)
	NaF	7.760e-07	7.760e-07	-6.110	-6.110	0.000	(0)
	MnF+	1.020e-07	8.597e-08	-6.992	-7.066	-0.074	(0)
	AlF3	6.971e-09	6.971e-09	-8.157	-8.157	0.000	(0)
	HF	5.867e-09	5.867e-09	-8.232	-8.232	0.000	(0)
	ZnF+	5.234e-09	4.182e-09	-8.281	-8.379	-0.097	(0)
	AlF2+	4.572e-09	3.867e-09	-8.340	-8.413	-0.073	(0)
	BF (OH) 3-	2.001e-09	1.648e-09	-8.699	-8.783	-0.084	(0)
	CuF+	7.702e-10	6.155e-10	-9.113	-9.211	-0.097	(0)
	AlF4-	5.959e-10	5.003e-10	-9.225	-9.301	-0.076	(0)
	NiF+	1.706e-10	1.364e-10	-9.768	-9.865	-0.097	(0)
	AlF+2	1.326e-10	6.783e-11	-9.878	-10.169	-0.291	(0)
	CoF+	1.276e-10	1.020e-10	-9.894	-9.992	-0.097	(0)
	CdF+	8.292e-12	6.626e-12	-11.081	-11.179	-0.097	(0)
	PbF+	4.253e-12	3.399e-12	-11.371	-11.469	-0.097	(0)
	HF2-	3.839e-12	3.194e-12	-11.416	-11.496	-0.080	(0)
	BF2 (OH) 2-	8.490e-13	6.994e-13	-12.071	-12.155	-0.084	(0)
	UO2F+	6.835e-13	5.462e-13	-12.165	-12.263	-0.097	(0)
	AgF	6.486e-13	6.486e-13	-12.188	-12.188	0.000	(0)
	UO2F2	2.256e-13	2.256e-13	-12.647	-12.647	0.000	(0)
	CrF+2	1.853e-13	7.557e-14	-12.732	-13.122	-0.390	(0)
	UO2F3-	1.015e-14	8.114e-15	-13.993	-14.091	-0.097	(0)
	PbF2	9.578e-15	9.578e-15	-14.019	-14.019	0.000	(0)
	CdF2	1.893e-15	1.893e-15	-14.723	-14.723	0.000	(0)
	H2F2	9.221e-17	9.221e-17	-16.035	-16.035	0.000	(0)
	UO2F4-2	2.263e-17	9.229e-18	-16.645	-17.035	-0.390	(0)
	VO2F	1.736e-17	1.736e-17	-16.761	-16.761	0.000	(0)
	FeF2+	1.678e-17	1.415e-17	-16.775	-16.849	-0.074	(0)
	FeF+2	7.310e-18	3.693e-18	-17.136	-17.433	-0.297	(0)
	PbF3-	3.255e-18	2.601e-18	-17.487	-17.585	-0.097	(0)
	FeF3	2.859e-18	2.859e-18	-17.544	-17.544	0.000	(0)
	BF3OH-	1.311e-18	1.080e-18	-17.882	-17.967	-0.084	(0)
	VO2F2-	1.129e-18	9.024e-19	-17.947	-18.045	-0.097	(0)
	VOF+	2.757e-20	2.203e-20	-19.560	-19.657	-0.097	(0)
	VO2F3-2	3.952e-21	1.612e-21	-20.403	-20.793	-0.390	(0)
	VOF2	1.183e-21	1.183e-21	-20.927	-20.927	0.000	(0)
	PbF4-2	4.372e-22	1.783e-22	-21.359	-21.749	-0.390	(0)
	HgF+	3.205e-23	2.561e-23	-22.494	-22.592	-0.097	(0)
	BF4-	2.560e-23	2.109e-23	-22.592	-22.676	-0.084	(0)
	VOF3-	7.521e-24	6.010e-24	-23.124	-23.221	-0.097	(0)
	VO2F4-3	8.544e-25	1.136e-25	-24.068	-24.945	-0.876	(0)
	Sb (OH) 2F	2.015e-25	2.015e-25	-24.696	-24.696	0.000	(0)
	SbOF	1.982e-25	1.982e-25	-24.703	-24.703	0.000	(0)
	VOF4-2	8.518e-27	3.474e-27	-26.070	-26.459	-0.390	(0)
	SiF6-2	4.297e-28	2.171e-28	-27.367	-27.663	-0.297	(0)
	UF3+	1.431e-35	1.144e-35	-34.844	-34.942	-0.097	(0)
	UF2+2	1.236e-36	5.040e-37	-35.908	-36.298	-0.390	(0)
	UF4	1.796e-37	1.796e-37	-36.746	-36.746	0.000	(0)
	UF+3	2.103e-39	2.796e-40	-38.677	-39.554	-0.876	(0)
	UF5-	1.275e-39	1.019e-39	-38.894	-38.992	-0.097	(0)
	UF6-2	1.081e-40	0.000e+00	-39.966	-40.356	-0.390	(0)
Fe (2)	5.388e-12						
	Fe+2	3.753e-12	1.530e-12	-11.426	-11.815	-0.390	(0)
	FeSO4	1.565e-12	1.565e-12	-11.805	-11.805	0.000	(0)
	FeHCO3+	4.399e-14	3.737e-14	-13.357	-13.427	-0.071	(0)
	FeOH+	2.625e-14	2.213e-14	-13.581	-13.655	-0.074	(0)

	Fe (OH) 2	6.388e-18	6.388e-18	-17.195	-17.195	0.000	(0)
	Fe (OH) 3-	8.705e-19	7.339e-19	-18.060	-18.134	-0.074	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-159.837	-159.837	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-236.189	-236.287	-0.097	(0)
Fe (3)	1.238e-09						
	Fe (OH) 2+	9.220e-10	7.798e-10	-9.035	-9.108	-0.073	(0)
	Fe (OH) 3	3.043e-10	3.043e-10	-9.517	-9.517	0.000	(0)
	Fe (OH) 4-	1.217e-11	1.029e-11	-10.915	-10.987	-0.073	(0)
	FeOH+2	1.092e-14	5.517e-15	-13.962	-14.258	-0.297	(0)
	FeF2+	1.678e-17	1.415e-17	-16.775	-16.849	-0.074	(0)
	FeF+2	7.310e-18	3.693e-18	-17.136	-17.433	-0.297	(0)
	FeF3	2.859e-18	2.859e-18	-17.544	-17.544	0.000	(0)
	FeSO4+	1.304e-18	1.099e-18	-17.885	-17.959	-0.074	(0)
	Fe (SO4) 2-	1.225e-19	9.793e-20	-18.912	-19.009	-0.097	(0)
	Fe+3	1.141e-19	2.352e-20	-18.943	-19.629	-0.686	(0)
	FeCl+2	4.071e-21	2.057e-21	-20.390	-20.687	-0.297	(0)
	FeCl2+	3.156e-23	2.660e-23	-22.501	-22.575	-0.074	(0)
	FeHSeO3+2	1.185e-23	4.831e-24	-22.926	-23.316	-0.390	(0)
	Fe2 (OH) 2+4	3.644e-26	1.008e-27	-25.438	-26.997	-1.558	(0)
	FeCl3	7.704e-27	7.704e-27	-26.113	-26.113	0.000	(0)
	FeNO3+2	5.210e-27	2.125e-27	-26.283	-26.673	-0.390	(0)
	Fe3 (OH) 4+5	3.090e-33	1.136e-35	-32.510	-34.945	-2.435	(0)
H (0)	3.936e-29						
	H2	1.968e-29	1.985e-29	-28.706	-28.702	0.004	(0)
Hg (0)	1.627e-09						
	Hg	1.627e-09	1.627e-09	-8.789	-8.789	0.000	(0)
Hg (1)	2.614e-20						
	Hg2+2	1.307e-20	5.331e-21	-19.884	-20.273	-0.390	(0)
Hg (2)	1.717e-11						
	HgClOH	8.965e-12	8.965e-12	-11.047	-11.047	0.000	(0)
	HgCl2	4.046e-12	4.046e-12	-11.393	-11.393	0.000	(0)
	Hg (OH) 2	3.985e-12	4.019e-12	-11.400	-11.396	0.004	(0)
	HgCl3-	1.466e-13	1.172e-13	-12.834	-12.931	-0.097	(0)
	HgCO3	1.896e-14	1.896e-14	-13.722	-13.722	0.000	(0)
	HgCl4-2	3.312e-15	1.351e-15	-14.480	-14.869	-0.390	(0)
	Hg (CO3) 2-2	4.827e-16	1.968e-16	-15.316	-15.706	-0.390	(0)
	HgCl+	3.489e-16	2.788e-16	-15.457	-15.555	-0.097	(0)
	HgOH+	8.733e-17	6.979e-17	-16.059	-16.156	-0.097	(0)
	HgHCO3+	1.224e-17	9.779e-18	-16.912	-17.010	-0.097	(0)
	Hg (NH3) 2+2	8.289e-19	3.380e-19	-18.081	-18.471	-0.390	(0)
	Hg (OH) 3-	2.300e-19	1.838e-19	-18.638	-18.736	-0.097	(0)
	HgNH3+2	7.867e-20	3.208e-20	-19.104	-19.494	-0.390	(0)
	Hg+2	1.183e-20	4.825e-21	-19.927	-20.316	-0.390	(0)
	HgSO4	5.263e-21	5.263e-21	-20.279	-20.279	0.000	(0)
	HgF+	3.205e-23	2.561e-23	-22.494	-22.592	-0.097	(0)
	Hg (NH3) 3+2	3.477e-26	1.418e-26	-25.459	-25.848	-0.390	(0)
	HgNO3+	2.014e-29	1.609e-29	-28.696	-28.793	-0.097	(0)
	Hg (NH3) 4+2	2.910e-33	1.187e-33	-32.536	-32.926	-0.390	(0)
	Hg (NO3) 2	6.042e-38	6.042e-38	-37.219	-37.219	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.706	-137.803	-0.097	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.564	-138.954	-0.390	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.967	-138.967	0.000	(0)
K	2.844e-03						
	K+	2.763e-03	2.319e-03	-2.559	-2.635	-0.076	(0)
	KSO4-	8.086e-05	6.839e-05	-4.092	-4.165	-0.073	(0)
	KCrO4-	5.313e-18	4.246e-18	-17.275	-17.372	-0.097	(0)
Mg	4.371e-03						
	Mg+2	3.125e-03	1.549e-03	-2.505	-2.810	-0.305	(0)
	MgSO4	1.175e-03	1.175e-03	-2.930	-2.930	0.000	(0)
	MgHCO3+	3.679e-05	3.075e-05	-4.434	-4.512	-0.078	(0)
	MgF+	2.965e-05	2.489e-05	-4.528	-4.604	-0.076	(0)
	MgCO3	4.231e-06	4.231e-06	-5.374	-5.374	0.000	(0)
	MgOH+	2.628e-07	2.241e-07	-6.580	-6.650	-0.069	(0)
	MgH2BO3+	3.944e-08	3.249e-08	-7.404	-7.488	-0.084	(0)
Mn (2)	4.903e-05						
	Mn+2	3.698e-05	1.508e-05	-4.432	-4.822	-0.390	(0)
	MnSO4	1.117e-05	1.117e-05	-4.952	-4.952	0.000	(0)
	MnHCO3+	6.924e-07	5.837e-07	-6.160	-6.234	-0.074	(0)

MnF+	1.020e-07	8.597e-08	-6.992	-7.066	-0.074	(0)
MnCl+	6.521e-08	5.498e-08	-7.186	-7.260	-0.074	(0)
MnOH+	1.632e-08	1.376e-08	-7.787	-7.861	-0.074	(0)
MnCl2	2.249e-10	2.249e-10	-9.648	-9.648	0.000	(0)
MnNO3+	2.702e-13	2.159e-13	-12.568	-12.666	-0.097	(0)
MnCl3-	2.127e-13	1.793e-13	-12.672	-12.746	-0.074	(0)
MnSeO4	1.998e-13	1.998e-13	-12.699	-12.699	0.000	(0)
Mn (OH) 3-	1.332e-17	1.123e-17	-16.876	-16.950	-0.074	(0)
Mn (NO3) 2	4.899e-21	4.899e-21	-20.310	-20.310	0.000	(0)
Mn (OH) 4-2	2.607e-23	1.317e-23	-22.584	-22.880	-0.297	(0)
MnSe	0.000e+00	0.000e+00	-41.555	-41.555	0.000	(0)
Mn (3)	5.405e-25					
Mn+3	5.405e-25	1.114e-25	-24.267	-24.953	-0.686	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.613	-41.910	-0.297	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.981	-46.063	-0.082	(0)
Mo	1.439e-06					
MoO4-2	1.439e-06	7.133e-07	-5.842	-6.147	-0.305	(0)
HMoO4-	4.920e-10	3.932e-10	-9.308	-9.405	-0.097	(0)
H2MoO4	7.977e-14	7.977e-14	-13.098	-13.098	0.000	(0)
Ag2MoO4	8.780e-25	8.780e-25	-24.057	-24.057	0.000	(0)
AlMo6O21-3	2.088e-40	0.000e+00	-39.680	-40.557	-0.876	(0)
Mo7O24-6	0.000e+00	0.000e+00	-46.990	-50.496	-3.506	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.232	-51.667	-2.435	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.884	-54.442	-1.558	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-57.877	-58.754	-0.876	(0)
N (-3)	6.591e-07					
NH4+	6.214e-07	5.119e-07	-6.207	-6.291	-0.084	(0)
NH4SO4-	2.711e-08	2.285e-08	-7.567	-7.641	-0.074	(0)
NH3	1.054e-08	1.054e-08	-7.977	-7.977	0.000	(0)
CaNH3+2	2.924e-11	1.193e-11	-10.534	-10.924	-0.390	(0)
CuNH3+2	1.801e-11	7.346e-12	-10.744	-11.134	-0.390	(0)
NiNH3+2	5.260e-13	2.145e-13	-12.279	-12.669	-0.390	(0)
Co (NH3) +2	6.995e-14	2.852e-14	-13.155	-13.545	-0.390	(0)
AgNH3+	4.854e-14	3.879e-14	-13.314	-13.411	-0.097	(0)
BaNH3+2	3.541e-16	1.444e-16	-15.451	-15.840	-0.390	(0)
Ag (NH3) 2+	4.158e-18	3.323e-18	-17.381	-17.479	-0.097	(0)
Hg (NH3) 2+2	8.289e-19	3.380e-19	-18.081	-18.471	-0.390	(0)
Ni (NH3) 2+2	8.012e-19	3.267e-19	-18.096	-18.486	-0.390	(0)
Ca (NH3) 2+2	1.227e-19	5.003e-20	-18.911	-19.301	-0.390	(0)
HgNH3+2	7.867e-20	3.208e-20	-19.104	-19.494	-0.390	(0)
Co (NH3) 2+2	3.144e-20	1.282e-20	-19.503	-19.892	-0.390	(0)
Hg (NH3) 3+2	3.477e-26	1.418e-26	-25.459	-25.848	-0.390	(0)
Co (NH3) 3+2	4.171e-27	1.701e-27	-26.380	-26.769	-0.390	(0)
Hg (NH3) 4+2	2.910e-33	1.187e-33	-32.536	-32.926	-0.390	(0)
Co (NH3) 4+2	2.306e-34	9.405e-35	-33.637	-34.027	-0.390	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.042	-40.431	-0.390	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.394	-41.784	-0.390	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.465	-49.341	-0.876	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.602	-48.992	-0.390	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.388	-50.778	-0.390	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.504	-58.601	-0.097	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.997	-63.386	-0.390	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.295	-63.685	-0.390	(0)
N (3)	1.137e-05					
NO2-	1.137e-05	9.414e-06	-4.944	-5.026	-0.082	(0)
CuNO2+	8.403e-11	6.715e-11	-10.076	-10.173	-0.097	(0)
AgNO2	3.546e-12	3.546e-12	-11.450	-11.450	0.000	(0)
CoNO2+	1.869e-12	1.494e-12	-11.728	-11.826	-0.097	(0)
Cu (NO2) 2	6.469e-15	6.469e-15	-14.189	-14.189	0.000	(0)
Ag (NO2) 2-	6.470e-17	5.171e-17	-16.189	-16.286	-0.097	(0)
N (5)	1.080e-08					
NO3-	1.077e-08	9.033e-09	-7.968	-8.044	-0.076	(0)
CaNO3+	3.214e-11	2.568e-11	-10.493	-10.590	-0.097	(0)
MnNO3+	2.702e-13	2.159e-13	-12.568	-12.666	-0.097	(0)
ZnNO3+	4.156e-14	3.322e-14	-13.381	-13.479	-0.097	(0)
CuNO3+	2.435e-15	1.946e-15	-14.613	-14.711	-0.097	(0)

	BaNO3+	1.231e-15	9.834e-16	-14.910	-15.007	-0.097	(0)
	NiNO3+	1.076e-15	8.602e-16	-14.968	-15.065	-0.097	(0)
	CoNO3+	4.034e-16	3.224e-16	-15.394	-15.492	-0.097	(0)
	CdNO3+	1.044e-16	8.340e-17	-15.981	-16.079	-0.097	(0)
	PbNO3+	5.632e-17	4.501e-17	-16.249	-16.347	-0.097	(0)
	AgNO3	1.294e-17	1.294e-17	-16.888	-16.888	0.000	(0)
	Mn (NO3) 2	4.899e-21	4.899e-21	-20.310	-20.310	0.000	(0)
	UO2NO3+	6.233e-22	4.981e-22	-21.205	-21.303	-0.097	(0)
	Zn (NO3) 2	5.987e-23	5.987e-23	-22.223	-22.223	0.000	(0)
	Co (NO3) 2	5.925e-24	5.925e-24	-23.227	-23.227	0.000	(0)
	CrNO3+2	3.224e-24	1.315e-24	-23.492	-23.881	-0.390	(0)
	Cu (NO3) 2	2.213e-24	2.213e-24	-23.655	-23.655	0.000	(0)
	Pb (NO3) 2	6.904e-25	6.904e-25	-24.161	-24.161	0.000	(0)
	Cd (NO3) 2	3.776e-25	3.776e-25	-24.423	-24.423	0.000	(0)
	VO2NO3	3.158e-25	3.158e-25	-24.501	-24.501	0.000	(0)
	FeNO3+2	5.210e-27	2.125e-27	-26.283	-26.673	-0.390	(0)
	HgNO3+	2.014e-29	1.609e-29	-28.696	-28.793	-0.097	(0)
	Hg (NO3) 2	6.042e-38	6.042e-38	-37.219	-37.219	0.000	(0)
Na	1.047e-02						
	Na+	1.024e-02	8.589e-03	-1.990	-2.066	-0.076	(0)
	NaSO4-	2.272e-04	1.922e-04	-3.644	-3.716	-0.073	(0)
	NaHCO3	9.369e-06	9.369e-06	-5.028	-5.028	0.000	(0)
	NaF	7.760e-07	7.760e-07	-6.110	-6.110	0.000	(0)
	NaCO3-	6.208e-07	5.251e-07	-6.207	-6.280	-0.073	(0)
	NaH2BO3	8.234e-09	8.234e-09	-8.084	-8.084	0.000	(0)
	NaCrO4-	2.632e-17	2.104e-17	-16.580	-16.677	-0.097	(0)
Ni	1.247e-07						
	Ni+2	7.647e-08	3.791e-08	-7.116	-7.421	-0.305	(0)
	NiSO4	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
	NiHCO3+	1.134e-08	9.066e-09	-7.945	-8.043	-0.097	(0)
	NiCO3	4.643e-09	4.643e-09	-8.333	-8.333	0.000	(0)
	NiCl+	3.515e-10	2.809e-10	-9.454	-9.552	-0.097	(0)
	NiOH+	2.170e-10	1.734e-10	-9.664	-9.761	-0.097	(0)
	NiF+	1.706e-10	1.364e-10	-9.768	-9.865	-0.097	(0)
	Ni (SO4) 2-2	1.066e-11	4.347e-12	-10.972	-11.362	-0.390	(0)
	Ni (OH) 2	5.004e-12	5.004e-12	-11.301	-11.301	0.000	(0)
	NiNH3+2	5.260e-13	2.145e-13	-12.279	-12.669	-0.390	(0)
	NiCl2	4.095e-15	4.095e-15	-14.388	-14.388	0.000	(0)
	Ni (OH) 3-	2.275e-15	1.818e-15	-14.643	-14.740	-0.097	(0)
	NiNO3+	1.076e-15	8.602e-16	-14.968	-15.065	-0.097	(0)
	NiSeO4	8.730e-16	8.730e-16	-15.059	-15.059	0.000	(0)
	Ni (NH3) 2+2	8.012e-19	3.267e-19	-18.096	-18.486	-0.390	(0)
O (0)	2.550e-35						
	O2	1.275e-35	1.286e-35	-34.895	-34.891	0.004	(0)
Pb	5.855e-09						
	PbCO3	3.324e-09	3.324e-09	-8.478	-8.478	0.000	(0)
	PbSO4	6.873e-10	6.873e-10	-9.163	-9.163	0.000	(0)
	Pb+2	6.795e-10	3.369e-10	-9.168	-9.473	-0.305	(0)
	PbHCO3+	6.075e-10	4.855e-10	-9.216	-9.314	-0.097	(0)
	PbOH+	3.847e-10	3.074e-10	-9.415	-9.512	-0.097	(0)
	Pb (CO3) 2-2	7.719e-11	3.148e-11	-10.112	-10.502	-0.390	(0)
	PbCl+	4.331e-11	3.461e-11	-10.363	-10.461	-0.097	(0)
	Pb (SO4) 2-2	4.231e-11	1.725e-11	-10.374	-10.763	-0.390	(0)
	PbF+	4.253e-12	3.399e-12	-11.371	-11.469	-0.097	(0)
	Pb (OH) 2	3.532e-12	3.532e-12	-11.452	-11.452	0.000	(0)
	PbCl2	4.477e-13	4.477e-13	-12.349	-12.349	0.000	(0)
	PbF2	9.578e-15	9.578e-15	-14.019	-14.019	0.000	(0)
	Pb (OH) 3-	1.606e-15	1.283e-15	-14.794	-14.892	-0.097	(0)
	PbCl3-	6.458e-16	5.161e-16	-15.190	-15.287	-0.097	(0)
	PbNO3+	5.632e-17	4.501e-17	-16.249	-16.347	-0.097	(0)
	Pb2OH+3	1.235e-17	1.641e-18	-16.908	-17.785	-0.876	(0)
	PbF3-	3.255e-18	2.601e-18	-17.487	-17.585	-0.097	(0)
	PbCl4-2	1.675e-18	6.830e-19	-17.776	-18.166	-0.390	(0)
	Pb (OH) 4-2	2.799e-19	1.142e-19	-18.553	-18.942	-0.390	(0)
	PbF4-2	4.372e-22	1.783e-22	-21.359	-21.749	-0.390	(0)
	Pb3 (OH) 4+2	2.056e-22	8.383e-23	-21.687	-22.077	-0.390	(0)
	Pb (NO3) 2	6.904e-25	6.904e-25	-24.161	-24.161	0.000	(0)
	Pb4 (OH) 4+4	8.109e-27	2.243e-28	-26.091	-27.649	-1.558	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-151.175	-151.175	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.264	-228.361	-0.097	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.416	-73.416	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.389	-78.486	-0.097	(0)
CdHS+	0.000e+00	0.000e+00	-78.915	-79.013	-0.097	(0)
H2S	0.000e+00	0.000e+00	-79.024	-79.024	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.904	-80.294	-0.390	(0)
S6-2	0.000e+00	0.000e+00	-80.420	-80.810	-0.390	(0)
S4-2	0.000e+00	0.000e+00	-80.500	-80.889	-0.390	(0)
S3-2	0.000e+00	0.000e+00	-81.306	-81.695	-0.390	(0)
S2-2	0.000e+00	0.000e+00	-82.322	-82.711	-0.390	(0)
S-2	0.000e+00	0.000e+00	-87.932	-88.229	-0.297	(0)
HgHS2-	0.000e+00	0.000e+00	-137.706	-137.803	-0.097	(0)
HgS2-2	0.000e+00	0.000e+00	-138.564	-138.954	-0.390	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.967	-138.967	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.527	-147.728	-0.201	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.704	-147.802	-0.097	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.804	-148.163	-0.359	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.342	-148.439	-0.097	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.551	-148.893	-0.341	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.242	-149.610	-0.368	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.571	-149.921	-0.350	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.987	-149.987	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.295	-150.295	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.175	-151.175	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.837	-159.837	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.629	-216.726	-0.097	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.095	-225.193	-0.097	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.784	-226.881	-0.097	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.226	-227.615	-0.390	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.264	-228.361	-0.097	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.189	-236.287	-0.097	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.782	-303.171	-0.390	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.749	-305.139	-0.390	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.256	-318.646	-0.390	(0)
S (6)	1.076e-02					
SO4-2	8.404e-03	4.166e-03	-2.075	-2.380	-0.305	(0)
MgSO4	1.175e-03	1.175e-03	-2.930	-2.930	0.000	(0)
CaSO4	8.580e-04	8.580e-04	-3.067	-3.067	0.000	(0)
NaSO4-	2.272e-04	1.922e-04	-3.644	-3.716	-0.073	(0)
KSO4-	8.086e-05	6.839e-05	-4.092	-4.165	-0.073	(0)
MnSO4	1.117e-05	1.117e-05	-4.952	-4.952	0.000	(0)
ZnSO4	1.334e-06	1.334e-06	-5.875	-5.875	0.000	(0)
Zn (SO4) 2-2	1.187e-07	4.841e-08	-6.925	-7.315	-0.390	(0)
CuSO4	6.502e-08	6.502e-08	-7.187	-7.187	0.000	(0)
NiSO4	3.151e-08	3.151e-08	-7.502	-7.502	0.000	(0)
NH4SO4-	2.711e-08	2.285e-08	-7.567	-7.641	-0.074	(0)
CoSO4	1.872e-08	1.872e-08	-7.728	-7.728	0.000	(0)
HSO4-	1.343e-08	1.128e-08	-7.872	-7.948	-0.076	(0)
CdSO4	2.852e-09	2.852e-09	-8.545	-8.545	0.000	(0)
PbSO4	6.873e-10	6.873e-10	-9.163	-9.163	0.000	(0)
Cd (SO4) 2-2	3.930e-10	1.603e-10	-9.406	-9.795	-0.390	(0)
AgSO4-	1.876e-10	1.499e-10	-9.727	-9.824	-0.097	(0)
Pb (SO4) 2-2	4.231e-11	1.725e-11	-10.374	-10.763	-0.390	(0)
CrOHSO4	2.616e-11	2.616e-11	-10.582	-10.582	0.000	(0)
Ni (SO4) 2-2	1.066e-11	4.347e-12	-10.972	-11.362	-0.390	(0)
AlSO4+	1.825e-12	1.532e-12	-11.739	-11.815	-0.076	(0)
FeSO4	1.565e-12	1.565e-12	-11.805	-11.805	0.000	(0)
UO2SO4	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
Al (SO4) 2-	8.146e-14	6.839e-14	-13.089	-13.165	-0.076	(0)
CrSO4+	4.053e-14	3.239e-14	-13.392	-13.490	-0.097	(0)
UO2 (SO4) 2-2	2.347e-14	9.570e-15	-13.630	-14.019	-0.390	(0)
VO2SO4-	8.603e-18	6.875e-18	-17.065	-17.163	-0.097	(0)
FeSO4+	1.304e-18	1.099e-18	-17.885	-17.959	-0.074	(0)
Cr2 (OH) 2SO4+2	1.535e-19	6.259e-20	-18.814	-19.204	-0.390	(0)
Fe (SO4) 2-	1.225e-19	9.793e-20	-18.912	-19.009	-0.097	(0)
VO2SO4	2.943e-20	2.943e-20	-19.531	-19.531	0.000	(0)

Cr2(OH)2(SO4)2	1.549e-20	1.549e-20	-19.810	-19.810	0.000	(0)
HgSO4	5.263e-21	5.263e-21	-20.279	-20.279	0.000	(0)
CrO3SO4-2	3.810e-24	1.554e-24	-23.419	-23.809	-0.390	(0)
VSO4+	1.455e-34	1.162e-34	-33.837	-33.935	-0.097	(0)
U(SO4)2	5.371e-40	5.371e-40	-39.270	-39.270	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.400	-40.790	-0.390	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-58.504	-58.601	-0.097	(0)
Sb(3)	6.424e-20					
Sb(OH)3	3.250e-20	3.250e-20	-19.488	-19.488	0.000	(0)
HSbO2	3.174e-20	3.174e-20	-19.498	-19.498	0.000	(0)
SbO2-	2.322e-24	1.856e-24	-23.634	-23.731	-0.097	(0)
Sb(OH)4-	1.329e-24	1.062e-24	-23.876	-23.974	-0.097	(0)
Sb(OH)2F	2.015e-25	2.015e-25	-24.696	-24.696	0.000	(0)
SbOF	1.982e-25	1.982e-25	-24.703	-24.703	0.000	(0)
Sb(OH)2+	2.737e-26	2.187e-26	-25.563	-25.660	-0.097	(0)
SbO+	9.440e-27	7.544e-27	-26.025	-26.122	-0.097	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.256	-318.646	-0.390	(0)
Sb(5)	2.195e-08					
SbO3-	2.193e-08	1.752e-08	-7.659	-7.756	-0.097	(0)
Sb(OH)6-	2.438e-11	2.046e-11	-10.613	-10.689	-0.076	(0)
SbO2+	4.828e-24	3.858e-24	-23.316	-23.414	-0.097	(0)
Se(-2)	1.189e-14					
Ag2Se	1.189e-14	1.189e-14	-13.925	-13.925	0.000	(0)
HSe-	1.555e-39	1.243e-39	-38.808	-38.906	-0.097	(0)
MnSe	0.000e+00	0.000e+00	-41.555	-41.555	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.573	-42.573	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.959	-46.348	-0.390	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.834	-84.392	-1.558	(0)
Se(4)	1.247e-07					
HSeO3-	9.728e-08	7.774e-08	-7.012	-7.109	-0.097	(0)
SeO3-2	2.740e-08	1.117e-08	-7.562	-7.952	-0.390	(0)
H2SeO3	9.186e-13	9.186e-13	-12.037	-12.037	0.000	(0)
AgSeO3-	1.620e-14	1.295e-14	-13.790	-13.888	-0.097	(0)
Cd(SeO3)2-2	7.366e-19	3.004e-19	-18.133	-18.522	-0.390	(0)
Ag(SeO3)2-3	9.746e-21	1.295e-21	-20.011	-20.888	-0.876	(0)
FeHSeO3+2	1.185e-23	4.831e-24	-22.926	-23.316	-0.390	(0)
Se(6)	9.953e-11					
SeO4-2	9.932e-11	4.923e-11	-10.003	-10.308	-0.305	(0)
MnSeO4	1.998e-13	1.998e-13	-12.699	-12.699	0.000	(0)
ZnSeO4	1.116e-14	1.116e-14	-13.952	-13.952	0.000	(0)
NiSeO4	8.730e-16	8.730e-16	-15.059	-15.059	0.000	(0)
CoSeO4	5.556e-16	5.556e-16	-15.255	-15.255	0.000	(0)
HSeO4-	8.553e-17	6.835e-17	-16.068	-16.165	-0.097	(0)
CdSeO4	2.677e-17	2.677e-17	-16.572	-16.572	0.000	(0)
Zn(SeO4)2-2	1.366e-24	5.572e-25	-23.864	-24.254	-0.390	(0)
Si	2.814e-05					
H4SiO4	2.796e-05	2.820e-05	-4.553	-4.550	0.004	(0)
H3SiO4-	1.760e-07	1.471e-07	-6.754	-6.832	-0.078	(0)
H2SiO4-2	6.550e-13	3.352e-13	-12.184	-12.475	-0.291	(0)
UO2H3SiO4+	4.320e-13	3.452e-13	-12.365	-12.462	-0.097	(0)
SiF6-2	4.297e-28	2.171e-28	-27.367	-27.663	-0.297	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.148	-59.024	-0.876	(0)
U(4)	5.685e-21					
U(OH)5-	5.679e-21	4.539e-21	-20.246	-20.343	-0.097	(0)
U(OH)4	5.268e-24	5.268e-24	-23.278	-23.278	0.000	(0)
U(OH)3+	6.680e-28	5.338e-28	-27.175	-27.273	-0.097	(0)
U(OH)2+2	1.677e-32	6.841e-33	-31.775	-32.165	-0.390	(0)
UF3+	1.431e-35	1.144e-35	-34.844	-34.942	-0.097	(0)
UF2+2	1.236e-36	5.040e-37	-35.908	-36.298	-0.390	(0)
UF4	1.796e-37	1.796e-37	-36.746	-36.746	0.000	(0)
UOH+3	6.719e-38	8.930e-39	-37.173	-38.049	-0.876	(0)
UF+3	2.103e-39	2.796e-40	-38.677	-39.554	-0.876	(0)
UF5-	1.275e-39	1.019e-39	-38.894	-38.992	-0.097	(0)
U(SO4)2	5.371e-40	5.371e-40	-39.270	-39.270	0.000	(0)
UF6-2	1.081e-40	0.000e+00	-39.966	-40.356	-0.390	(0)
USO4+2	0.000e+00	0.000e+00	-40.400	-40.790	-0.390	(0)
U+4	0.000e+00	0.000e+00	-43.451	-45.009	-1.558	(0)

UCl+3	0.000e+00	0.000e+00	-44.971	-45.848	-0.876	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.964	-173.853	-7.888	(0)
U (5)	1.274e-16					
UO2+	1.274e-16	1.018e-16	-15.895	-15.992	-0.097	(0)
U (6)	1.991e-07					
UO2 (CO3) 3-4	1.407e-07	3.893e-09	-6.852	-8.410	-1.558	(0)
UO2 (CO3) 2-2	5.802e-08	2.366e-08	-7.236	-7.626	-0.390	(0)
UO2CO3	3.612e-10	3.612e-10	-9.442	-9.442	0.000	(0)
UO2OH+	1.582e-12	1.264e-12	-11.801	-11.898	-0.097	(0)
UO2F+	6.835e-13	5.462e-13	-12.165	-12.263	-0.097	(0)
UO2H3SiO4+	4.320e-13	3.452e-13	-12.365	-12.462	-0.097	(0)
UO2F2	2.256e-13	2.256e-13	-12.647	-12.647	0.000	(0)
UO2SO4	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
UO2+2	5.575e-14	2.763e-14	-13.254	-13.559	-0.305	(0)
UO2 (SO4) 2-2	2.347e-14	9.570e-15	-13.630	-14.019	-0.390	(0)
UO2F3-	1.015e-14	8.114e-15	-13.993	-14.091	-0.097	(0)
UO2Cl+	1.624e-16	1.298e-16	-15.789	-15.887	-0.097	(0)
UO2F4-2	2.263e-17	9.229e-18	-16.645	-17.035	-0.390	(0)
(UO2) 2 (OH) 2+2	6.501e-18	2.651e-18	-17.187	-17.577	-0.390	(0)
(UO2) 3 (OH) 5+	4.198e-19	3.355e-19	-18.377	-18.474	-0.097	(0)
UO2NO3+	6.233e-22	4.981e-22	-21.205	-21.303	-0.097	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.589	-42.687	-0.097	(0)
V+2	0.000e+00	0.000e+00	-43.367	-43.757	-0.390	(0)
V (3)	2.287e-15					
V (OH) 3	2.287e-15	2.287e-15	-14.641	-14.641	0.000	(0)
V (OH) 2+	5.124e-26	4.094e-26	-25.290	-25.388	-0.097	(0)
VOH+2	2.639e-29	1.076e-29	-28.579	-28.968	-0.390	(0)
V+3	4.447e-34	5.911e-35	-33.352	-34.228	-0.876	(0)
VSO4+	1.455e-34	1.162e-34	-33.837	-33.935	-0.097	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.028	-55.904	-0.876	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.578	-57.136	-1.558	(0)
V (4)	2.447e-18					
V (OH) 3+	2.325e-18	1.858e-18	-17.634	-17.731	-0.097	(0)
VO+2	6.290e-20	2.565e-20	-19.201	-19.591	-0.390	(0)
VOSO4	2.943e-20	2.943e-20	-19.531	-19.531	0.000	(0)
VOF+	2.757e-20	2.203e-20	-19.560	-19.657	-0.097	(0)
VOF2	1.183e-21	1.183e-21	-20.927	-20.927	0.000	(0)
VOC1+	2.608e-22	2.084e-22	-21.584	-21.681	-0.097	(0)
VOF3-	7.521e-24	6.010e-24	-23.124	-23.221	-0.097	(0)
VOF4-2	8.518e-27	3.474e-27	-26.070	-26.459	-0.390	(0)
H2V2O4+2	4.249e-31	1.733e-31	-30.372	-30.761	-0.390	(0)
V (5)	6.646e-09					
H2VO4-	5.642e-09	4.509e-09	-8.249	-8.346	-0.097	(0)
HVO4-2	1.003e-09	4.089e-10	-8.999	-9.388	-0.390	(0)
H3VO4	1.249e-12	1.249e-12	-11.903	-11.903	0.000	(0)
H3V2O7-	4.553e-14	3.638e-14	-13.342	-13.439	-0.097	(0)
HV2O7-3	4.703e-15	6.251e-16	-14.328	-15.204	-0.876	(0)
VO4-3	5.567e-16	7.399e-17	-15.254	-16.131	-0.876	(0)
VO2+	8.236e-17	6.911e-17	-16.084	-16.160	-0.076	(0)
V2O7-4	2.196e-17	6.074e-19	-16.658	-18.217	-1.558	(0)
VO2F	1.736e-17	1.736e-17	-16.761	-16.761	0.000	(0)
VO2SO4-	8.603e-18	6.875e-18	-17.065	-17.163	-0.097	(0)
VO2F2-	1.129e-18	9.024e-19	-17.947	-18.045	-0.097	(0)
V3O9-3	7.236e-19	9.617e-20	-18.141	-19.017	-0.876	(0)
VO2F3-2	3.952e-21	1.612e-21	-20.403	-20.793	-0.390	(0)
V4O12-4	6.539e-24	1.809e-25	-23.184	-24.743	-1.558	(0)
VO2F4-3	8.544e-25	1.136e-25	-24.068	-24.945	-0.876	(0)
VO2NO3	3.158e-25	3.158e-25	-24.501	-24.501	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.275	-64.780	-3.506	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.717	-64.151	-2.435	(0)
H2V10O28-4	0.000e+00	0.000e+00	-64.943	-66.501	-1.558	(0)
Zn	4.888e-06					
Zn+2	2.953e-06	1.464e-06	-5.530	-5.834	-0.305	(0)
ZnSO4	1.334e-06	1.334e-06	-5.875	-5.875	0.000	(0)
ZnCO3	2.766e-07	2.766e-07	-6.558	-6.558	0.000	(0)
Zn (SO4) 2-2	1.187e-07	4.841e-08	-6.925	-7.315	-0.390	(0)
ZnHCO3+	1.124e-07	8.980e-08	-6.949	-7.047	-0.097	(0)

ZnOH+	6.655e-08	5.318e-08	-7.177	-7.274	-0.097	(0)
ZnCl+	1.274e-08	1.065e-08	-7.895	-7.973	-0.078	(0)
ZnF+	5.234e-09	4.182e-09	-8.281	-8.379	-0.097	(0)
ZnOHCl	5.064e-09	5.064e-09	-8.295	-8.295	0.000	(0)
Zn(OH) 2	3.062e-09	3.062e-09	-8.514	-8.514	0.000	(0)
ZnCl2	4.887e-11	4.887e-11	-10.311	-10.311	0.000	(0)
Zn(OH) 3-	6.977e-12	5.576e-12	-11.156	-11.254	-0.097	(0)
ZnCl3-	1.345e-13	1.124e-13	-12.871	-12.949	-0.078	(0)
ZnNO3+	4.156e-14	3.322e-14	-13.381	-13.479	-0.097	(0)
ZnSeO4	1.116e-14	1.116e-14	-13.952	-13.952	0.000	(0)
ZnCl4-2	3.221e-16	1.627e-16	-15.492	-15.788	-0.297	(0)
Zn(OH) 4-2	1.978e-16	8.065e-17	-15.704	-16.093	-0.390	(0)
Zn(NO3) 2	5.987e-23	5.987e-23	-22.223	-22.223	0.000	(0)
Zn(SeO4) 2-2	1.366e-24	5.572e-25	-23.864	-24.254	-0.390	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.342	-148.439	-0.097	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.987	-149.987	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.095	-225.193	-0.097	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.226	-227.615	-0.390	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.749	-305.139	-0.390	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.41	-47.12	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-40.62	-36.11	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-47.85	-36.11	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.30	-51.36	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-54.87	-34.84	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.29	-27.89	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.34	-22.89	0.45	(NH4)2SeO4
Acanthite	-52.20	-88.42	-36.22	Ag2S
Ag2CO3	-11.88	-22.97	-11.09	Ag2CO3
Ag2CrO4	-21.21	-32.80	-11.59	Ag2CrO4
Ag2HVO4	-12.46	-10.98	1.48	Ag2HVO4
Ag2MoO4	-12.08	-23.63	-11.55	Ag2MoO4
Ag2O	-14.95	-2.37	12.57	Ag2O
Ag2Se	-0.14	-48.84	-48.70	Ag2Se
Ag2SeO3	-9.89	-17.04	-7.15	Ag2SeO3
Ag2SeO4	-18.89	-27.80	-8.91	Ag2SeO4
Ag2SO4	-15.05	-19.87	-4.82	Ag2SO4
Ag3AsO3	-28.47	-26.31	2.16	Ag3AsO3
Ag3AsO4	-16.87	-19.66	-2.79	Ag3AsO4
Ag3H2VO5	-17.34	-12.16	5.18	Ag3H2VO5
AgF:4H2O	-13.64	-12.59	1.05	AgF:4H2O
Agmetal	-0.46	-13.96	-13.51	Ag
AgVO3	-10.56	-9.79	0.77	AgVO3
Al(OH)3(am)	-1.45	9.35	10.80	Al(OH)3
Al2(MoO4)3	-47.46	-45.09	2.37	Al2(MoO4)3
Al2O3	-0.96	18.70	19.65	Al2O3
Al4(OH)10SO4	-2.81	19.89	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.55	-6.75	4.80	AlAsO4:2H2O
AlOHSO4	-4.92	-8.15	-3.23	AlOHSO4
AlSb	-152.42	-86.80	65.62	AlSb
Alunite	-0.63	-2.03	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.06	-11.85	-7.79	PbSO4
Anhydrite	-1.07	-5.43	-4.36	CaSO4
Anilite	-55.39	-87.26	-31.88	Cu0.25Cu1.5S
Antlerite	-2.44	6.35	8.79	Cu3(OH)4SO4
Aragonite	-0.23	-8.53	-8.30	CaCO3
Arsenolite	-88.26	-91.02	-2.76	As4O6
Artinite	-5.59	4.01	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.91	-32.20	6.71	As2O5
Atacamite	-1.59	5.80	7.39	Cu2(OH)3Cl
Azurite	-0.45	-17.35	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.94	7.45	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-18.18	-2.30	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.94	-9.85	-8.91	Ba3(AsO4)2

Ba ₃ (VO ₄) ₂ ·4H ₂ O	-27.79	5.15	32.94	Ba ₃ (VO ₄) ₂ ·4H ₂ O
BaCrO ₄	-13.30	-22.97	-9.67	BaCrO ₄
BaF ₂	-9.53	-15.35	-5.82	BaF ₂
BaMoO ₄	-6.85	-13.81	-6.96	BaMoO ₄
Barite	-0.06	-10.04	-9.98	BaSO ₄
BaS	-94.77	-78.59	16.18	BaS
BaSeO ₃	-9.04	-7.21	1.83	BaSeO ₃
BaSeO ₄	-10.51	-17.97	-7.46	BaSeO ₄
Bianchite	-6.45	-8.22	-1.76	ZnSO ₄ ·6H ₂ O
Birnessite	-7.60	10.50	18.09	MnO ₂
Bixbyite	-3.92	-4.56	-0.64	Mn ₂ O ₃
BlaubleiI	-55.16	-79.32	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.71	-82.98	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.77	9.35	8.58	AlOOH
Breithauptite	-57.15	-75.67	-18.52	NiSb
Brochantite	-0.93	14.30	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.54	12.30	16.84	Mg(OH) ₂
Bunsenite	-4.75	7.69	12.45	NiO
Ca(VO ₃) ₂	-10.80	-5.14	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.57	6.93	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ ·2H ₂ O	-14.62	6.93	21.55	Ca ₂ V ₂ O ₇ ·2H ₂ O
Ca ₃ (AsO ₄) ₂ ·4H ₂ O	-18.30	4.00	22.30	Ca ₃ (AsO ₄) ₂ ·4H ₂ O
Ca ₃ (VO ₄) ₂	-19.96	19.00	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ ·4H ₂ O	-20.86	19.00	39.86	Ca ₃ (VO ₄) ₂ ·4H ₂ O
Ca ₃ Sb ₂	-299.06	-156.08	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.09	-18.35	-2.27	CaCrO ₄
Calcite	-0.05	-8.53	-8.48	CaCO ₃
Calomel	-7.44	-25.35	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.24	-9.19	-7.95	CaMoO ₄
Carnotite	-2.35	-2.12	0.23	KUO ₂ VO ₄
CaSeO ₃ ·2H ₂ O	-5.41	-2.60	2.81	CaSeO ₃ ·2H ₂ O
CaSeO ₄ ·2H ₂ O	-10.33	-13.35	-3.02	CaSeO ₄ ·2H ₂ O
Cd(BO ₂) ₂	-12.34	-2.50	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.06	6.58	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.15	6.58	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-21.96	-15.25	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.32	2.24	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-19.58	8.82	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.95	-13.61	-0.66	CdCl ₂
CdCl ₂ ·1H ₂ O	-11.92	-13.61	-1.69	CdCl ₂ ·1H ₂ O
CdCl ₂ ·2.5H ₂ O	-11.70	-13.61	-1.91	CdCl ₂ ·2.5H ₂ O
CdF ₂	-15.01	-16.22	-1.21	CdF ₂
Cdmetal(alpha)	-32.49	-18.97	13.51	Cd
Cdmetal(gamma)	-32.59	-18.97	13.62	Cd
CdMoO ₄	-0.53	-14.68	-14.15	CdMoO ₄
CdOHCl	-7.05	-3.52	3.54	CdOHCl
CdSb	-76.44	-76.79	-0.35	CdSb
CdSe	-19.68	-39.88	-20.20	CdSe
CdSeO ₄ ·2H ₂ O	-16.99	-18.84	-1.85	CdSeO ₄ ·2H ₂ O
CdSO ₄	-10.74	-10.91	-0.17	CdSO ₄
CdSO ₄ ·1H ₂ O	-9.19	-10.92	-1.73	CdSO ₄ ·1H ₂ O
CdSO ₄ ·2.67H ₂ O	-9.04	-10.92	-1.87	CdSO ₄ ·2.67H ₂ O
Cerargyrite	-1.53	-11.28	-9.75	AgCl
Cerrusite	-1.83	-14.96	-13.13	PbCO ₃
CH ₄ (g)	-81.76	-122.81	-41.05	CH ₄
Chalcanthite	-6.91	-9.55	-2.64	CuSO ₄ ·5H ₂ O
Chalcedony	-1.00	-4.55	-3.55	SiO ₂
Chalcocite	-55.40	-90.32	-34.92	Cu ₂ S
Chalcopyrite	-125.57	-160.84	-35.27	CuFeS ₂
Chrysotile	-4.38	27.82	32.20	Mg ₃ Si ₂ O ₅ (OH) ₄
Cinnabar	-51.75	-97.44	-45.69	HgS
Claudetite	-87.96	-91.02	-3.06	As ₄ O ₆
Clausthalite	-13.72	-40.82	-27.10	PbSe
Co(BO ₂) ₂	-28.68	-1.61	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.63	7.47	13.09	Co(OH) ₂
Co(OH) ₃	-9.85	-12.16	-2.31	Co(OH) ₃
CO ₂ (g)	-2.45	-20.60	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.83	-9.80	13.03	Co ₃ (AsO ₄) ₂

Co3O4	-6.35	-16.85	-10.50	Co3O4
CoCl2	-20.99	-12.72	8.27	CoCl2
CoCl2:6H2O	-15.26	-12.73	2.54	CoCl2:6H2O
CoCO3	-3.15	-13.13	-9.98	CoCO3
CoF2	-13.74	-15.34	-1.60	CoF2
CoF3	-44.90	-46.36	-1.46	CoF3
CoFe2O4	17.08	13.55	-3.53	CoFe2O4
CoMoO4	-6.03	-13.79	-7.76	CoMoO4
CoO	-6.12	7.47	13.59	CoO
CoS (alpha)	-71.14	-78.58	-7.44	CoS
CoS (beta)	-67.51	-78.58	-11.07	CoS
CoSe	-22.80	-39.00	-16.20	CoSe
CoSeO3	-8.52	-7.20	1.32	CoSeO3
CoSeO4:6H2O	-16.43	-17.96	-1.53	CoSeO4:6H2O
CoSO4	-12.83	-10.03	2.80	CoSO4
CoSO4:6H2O	-7.56	-10.03	-2.47	CoSO4:6H2O
Cotunnite	-9.77	-14.55	-4.78	PbCl2
Covellite	-55.80	-78.10	-22.30	CuS
Cr (OH) 2	-22.02	-11.20	10.82	Cr (OH) 2
Cr (OH) 3	-2.71	-1.37	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.62	-1.37	-0.75	Cr (OH) 3
Cr2O3	-0.39	-2.75	-2.36	Cr2O3
CrCl2	-45.49	-31.39	14.09	CrCl2
CrCl3	-46.78	-31.66	15.11	CrCl3
CrF3	-24.24	-35.58	-11.34	CrF3
Cristobalite	-1.20	-4.55	-3.35	SiO2
Crmetal	-67.24	-36.76	30.48	Cr
CrO3	-27.21	-30.42	-3.21	CrO3
Cryolite	-8.75	-42.59	-33.84	Na3AlF6
Cu (OH) 2	-0.73	7.95	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.13	20.08	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.96	0.29	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.45	-90.33	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.94	-50.74	-45.80	Cu2Se
Cu2SO4	-19.82	-21.77	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.46	-8.36	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.96	-102.56	-42.59	Cu3Sb
Cu3Se2	-25.76	-89.25	-63.49	Cu3Se2
CuCO3	-1.15	-12.65	-11.50	CuCO3
CuCrO4	-17.03	-22.47	-5.44	CuCrO4
CuF	-8.63	-13.54	-4.91	CuF
CuF2	-15.97	-14.85	1.12	CuF2
CuF2:2H2O	-10.31	-14.86	-4.55	CuF2:2H2O
Cumetal	-6.16	-14.91	-8.76	Cu
CuMoO4	-0.24	-13.31	-13.08	CuMoO4
CuOCuSO4	-11.90	-1.60	10.30	CuOCuSO4
Cupricferrite	8.05	14.04	5.99	CuFe2O4
Cuprite	-2.87	-4.28	-1.41	Cu2O
Cuprousferrite	9.82	0.91	-8.92	CuFeO2
CuSe	-5.41	-38.51	-33.10	CuSe
CuSe2	-26.06	-59.43	-33.37	CuSe2
CuSeO3:2H2O	-7.23	-6.72	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.04	-17.48	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.47	9.35	6.87	AlOOH
Djurleite	-55.59	-89.51	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.28	-16.82	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.27	-16.82	-17.09	CaMg (CO3) 2
Epsomite	-3.07	-5.19	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.26	3.30	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.05	0.01	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.19	-13.91	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.13	-8.58	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.29	-37.91	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-42.66	-46.40	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.84	9.39	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.46	-13.06	0.40	FeAsO4:2H2O
FeCr2O4	-6.65	0.55	7.20	FeCr2O4

FeMoO4	-7.87	-17.96	-10.09	FeMoO4
Ferrihydrite	-0.15	3.04	3.19	Fe (OH) 3
Ferroselite	-45.48	-64.07	-18.60	FeSe2
FeS (ppt)	-79.79	-82.74	-2.95	FeS
FeSe	-32.16	-43.16	-11.00	FeSe
Fix_pe	-5.22	-5.22	0.00	e-
Fluorite	-0.23	-10.73	-10.50	CaF2
Galena	-66.43	-80.40	-13.97	PbS
Gibbsite	1.06	9.35	8.29	Al (OH) 3
Goethite	2.55	3.04	0.49	FeOOH
Goslarite	-6.21	-8.22	-2.01	ZnSO4:7H2O
Greenalite	-20.01	0.80	20.81	Fe3Si2O5 (OH) 4
Greenockite	-65.10	-79.46	-14.36	CdS
Greigite	-289.75	-334.79	-45.03	Fe3S4
Gummite	-6.12	1.56	7.67	UO3
Gypsum	-0.82	-5.43	-4.61	CaSO4:2H2O
H-Jarosite	-13.76	-25.86	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.39	-21.26	-12.88	H2MoO4
H2S (g)	-78.03	-86.04	-8.01	H2S
H2Se (g)	-41.50	-46.46	-4.96	H2Se
Halite	-6.21	-4.60	1.60	NaCl
Halloysite	0.02	9.60	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.60	56.43	61.03	Mn3O4
Hematite	7.51	6.09	-1.42	Fe2O3
Hercynite	-0.90	22.00	22.89	FeAl2O4
Hg (CH3) 2 (g)	-183.30	-257.01	-73.71	Hg (CH3) 2
Hg (g)	-7.48	-15.36	-7.87	Hg
Hg (OH) 2	-7.90	-11.40	-3.50	Hg (OH) 2
Hg2 (g)	-15.76	-30.71	-14.96	Hg2
Hg2 (OH) 2	-10.42	-5.16	5.26	Hg2 (OH) 2
Hg2CO3	-9.71	-25.76	-16.05	Hg2CO3
Hg2CrO4	-26.88	-35.58	-8.70	Hg2CrO4
Hg2F2	-17.60	-27.96	-10.36	Hg2F2
Hg2S	-79.53	-91.20	-11.68	Hg2S
Hg2SeO3	-15.17	-19.83	-4.66	Hg2SeO3
Hg2SO4	-16.52	-22.65	-6.13	Hg2SO4
Hg3O2CO3	-25.10	-54.79	-29.68	Hg3O2CO3
HgCl (g)	-32.17	-12.67	19.50	HgCl
HgCl2	-10.32	-31.59	-21.26	HgCl2
HgF (g)	-46.66	-13.98	32.68	HgF
HgF2 (g)	-46.76	-34.20	12.57	HgF2
Hgmetal (l)	-1.90	-15.36	-13.45	Hg
HgSe	-2.16	-57.86	-55.69	HgSe
HgSeO3	-13.63	-26.06	-12.43	HgSeO3
HgSO4	-19.47	-28.89	-9.42	HgSO4
Huntite	-3.44	-33.41	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.50	-24.27	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.10	-20.87	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.55	-20.72	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.14	-20.94	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.76	-51.00	-17.24	K2Cr2O7
K2CrO4	-20.06	-20.58	-0.51	K2CrO4
K2MoO4	-14.68	-11.42	3.26	K2MoO4
K2SeO4	-14.85	-15.58	-0.73	K2SeO4
Kaolinite	2.16	9.60	7.43	Al2Si2O5 (OH) 4
Langite	-3.19	14.30	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.78	-6.21	-0.43	PbO:PbSO4
Laurionite	-5.08	-4.45	0.62	PbOHCl
Lepidocrocite	1.67	3.04	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.05	5.64	12.69	PbO
Mackinawite	-79.14	-82.74	-3.60	FeS
Maghemite	-0.30	6.09	6.39	Fe2O3
Magnesioferrite	1.53	18.39	16.86	Fe2MgO4
Magnesite	-0.83	-8.29	-7.46	MgCO3
Magnetite	5.98	9.39	3.40	Fe3O4
Malachite	0.60	-4.70	-5.31	Cu2 (OH) 2CO3
Manganite	-2.27	23.07	25.34	MnOOH

Massicot	-7.25	5.64	12.89	PbO
Matlockite	-6.88	-15.85	-8.97	PbClF
Melanothallite	-18.50	-12.24	6.26	CuCl ₂
Melanterite	-11.99	-14.20	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.35	-97.44	-45.09	HgS
Mg(OH) ₂ (active)	-6.49	12.30	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.18	-4.90	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-274.63	-199.94	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.96	7.40	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.64	9.56	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.50	-18.12	5.38	MgCrO ₄
MgF ₂	-2.37	-10.50	-8.13	MgF ₂
MgMoO ₄	-7.11	-8.96	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-5.42	-2.36	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.92	-13.12	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.04	42.48	73.52	Pb ₃ O ₄
Mirabilite	-5.40	-6.51	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.81	-6.91	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-51.34	-57.05	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-149.41	-88.33	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.82	-1.32	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-12.61	-9.90	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.92	-75.75	0.17	MnS
MnS (pnk)	-79.09	-75.75	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.67	-36.17	3.50	MnSe
MnSeO ₃	-5.50	-4.37	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-5.36	-4.37	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-13.08	-15.13	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.78	-7.20	2.58	MnSO ₄
Montepontite	-8.52	6.58	15.10	CdO
Montroydite	-7.76	-11.40	-3.64	HgO
MoO ₃	-13.26	-21.26	-8.00	MoO ₃
Morenosite	-7.66	-9.80	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-148.64	-218.90	-70.26	MoS ₂
Na-Jarosite	-9.17	-20.37	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-39.97	-49.86	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-22.37	-19.44	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-14.94	-31.54	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-11.77	-10.28	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-11.50	-10.28	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-13.99	-3.69	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-15.72	-14.44	1.28	Na ₂ SeO ₄
Na ₃ Sb	-174.12	-79.67	94.45	Na ₃ Sb
Na ₃ VO ₄	-28.81	7.87	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.64	4.76	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.50	-12.23	-6.73	CuCl
NaSb	-88.27	-65.10	23.17	NaSb
Natron	-8.31	-9.62	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.97	-3.11	3.86	NaVO ₃
Nesquehonite	-3.62	-8.29	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.10	7.69	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-24.82	-9.12	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-18.72	13.28	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.03	-12.90	-6.87	NiCO ₃
NiMoO ₄	-2.43	-13.57	-11.14	NiMoO ₄
NiS (alpha)	-72.75	-78.35	-5.60	NiS
NiS (beta)	-67.25	-78.35	-11.10	NiS
NiS (gamma)	-65.55	-78.35	-12.80	NiS
NiSe	-21.07	-38.77	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-9.79	-6.97	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-16.21	-17.73	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-7.01	10.50	17.50	MnO ₂
O ₂ (g)	-31.99	51.10	83.09	O ₂
Orpiment	-242.57	-303.64	-61.07	As ₂ S ₃
Otavite	-2.02	-14.02	-12.00	CdCO ₃
Pb(BO ₂) ₂	-9.96	-3.44	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.51	5.64	8.15	Pb(OH) ₂

Pb10(OH)6O(CO3)6	-58.41	-67.17	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.60	1.19	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.90	11.28	26.19	Pb2O(OH)2
Pb2O3	-24.20	36.84	61.04	Pb2O3
Pb2OCO3	-8.76	-9.31	-0.56	Pb2OCO3
Pb2V2O7	-4.02	-5.92	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.08	-15.28	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.42	-0.28	6.14	Pb3(VO4)2
Pb3O2CO3	-14.69	-3.67	11.02	Pb3O2CO3
Pb3O2SO4	-11.25	-0.57	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.03	5.07	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.80	5.07	21.88	Pb4O3SO4
PbCrO4	-12.18	-24.78	-12.60	PbCrO4
PbF2	-9.72	-17.16	-7.44	PbF2
Pbmetal	-24.16	-19.91	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.34	5.64	12.98	PbO:0.33H2O
PbSeO4	-12.94	-19.78	-6.84	PbSeO4
Periclase	-9.28	12.30	21.58	MgO
Phosgenite	-9.70	-29.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.41	31.19	49.60	PbO2
Portlandite	-10.74	12.07	22.80	Ca(OH)2
Pyrite	-124.73	-143.24	-18.51	FeS2
Pyrochroite	-4.90	10.29	15.19	Mn(OH)2
Pyrolusite	-5.53	35.85	41.38	MnO2
Quartz	-0.55	-4.55	-4.00	SiO2
Realgar	-101.83	-121.57	-19.75	AsS
Retgersite	-7.76	-9.80	-2.04	NiSO4:6H2O
Rhodochrosite	0.27	-10.31	-10.58	MnCO3
Rutherfordine	-4.54	-19.04	-14.50	UO2CO3
Sb(OH)3	-12.38	-19.49	-7.11	Sb(OH)3
Sb2O4	-16.83	-13.42	3.40	Sb2O4
Sb2O5	-26.82	-36.49	-9.67	Sb2O5
Sb2Se3	-110.61	-178.36	-67.76	Sb2Se3
Sb4O6(cubic)	-59.69	-77.95	-18.26	Sb4O6
Sb4O6(orth)	-60.05	-77.95	-17.90	Sb4O6
SbCl3	-50.35	-49.77	0.57	SbCl3
SbF3	-43.47	-53.69	-10.23	SbF3
Sbmetal	-46.13	-57.82	-11.69	Sb
SbO2	-3.20	-31.02	-27.82	SbO2
Schoepite	-4.44	1.56	5.99	UO2(OH)2:H2O
Semetal(am)	-13.80	-20.91	-7.11	Se
Semetal(hex)	-13.20	-20.91	-7.71	Se
Senarmontite	-26.61	-38.98	-12.37	Sb2O3
SeO2	-14.79	-14.67	0.12	SeO2
SeO3	-46.47	-25.42	21.04	SeO3
Sepiolite	-4.80	10.96	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-7.82	10.96	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.06	-17.30	-10.24	FeCO3
SiO2(am-gel)	-1.84	-4.55	-2.71	SiO2
SiO2(am-ppt)	-1.81	-4.55	-2.74	SiO2
Smithsonite	-1.32	-11.32	-10.00	ZnCO3
Sphalerite	-65.31	-76.76	-11.45	ZnS
Spinel	-5.85	31.00	36.85	MgAl2O4
Stibnite	-246.65	-297.11	-50.46	Sb2S3
Sulfur	-58.35	-60.49	-2.14	S
Tenorite	0.30	7.95	7.64	CuO
Thenardite	-6.83	-6.51	0.32	Na2SO4
Thermonatrite	-10.25	-9.62	0.64	Na2CO3:H2O
Tyuyamunite	-6.11	-2.03	4.08	Ca(UO2)2(VO4)2
U3O8	-14.32	6.76	21.08	U3O8
U3Sb4	-581.30	-428.92	152.38	U3Sb4
U4O9	-30.55	-33.57	-3.02	U4O9
UF4	-30.85	-60.39	-29.54	UF4
UF4:2.5H2O	-27.67	-60.39	-32.72	UF4:2.5H2O
UO2(am)	-15.71	-14.78	0.93	UO2
UO2(NO3)2	-41.79	-29.65	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.50	-29.65	4.85	UO2(NO3)2:2H2O

UO2(NO3)2:3H2O	-33.04	-29.65	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.69	-29.65	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.06	1.56	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.62	-23.87	-2.25	UO2SeO4:4H2O
UO3	-6.14	1.56	7.70	UO3
Uraninite	-10.11	-14.78	-4.67	UO2
USb2	-220.31	-190.73	29.58	USb2
V(OH)3	-19.15	-11.56	7.59	V(OH)3
V2O5	-15.85	-17.21	-1.36	V2O5
V3O5	-40.82	-38.98	1.84	V3O5
V4O7	-50.64	-43.46	7.19	V4O7
V6O13	-41.86	-102.72	-60.86	V6O13
Valentinite	-30.49	-38.98	-8.48	Sb2O3
VC12	-63.40	-44.52	18.87	VC12
VC13	-65.28	-41.84	23.43	VC13
VF4	-65.01	-50.08	14.93	VF4
Vmetal	-93.91	-49.88	44.03	V
VO	-39.09	-24.33	14.76	VO
VO(OH)2	-9.63	-4.48	5.15	VO(OH)2
VO2Cl	-21.54	-18.70	2.84	VO2Cl
VOC1	-32.80	-21.65	11.15	VOC1
VOC12	-37.43	-24.67	12.76	VOC12
VOSO4	-25.58	-21.97	3.61	VOSO4
Witherite	-4.58	-13.15	-8.57	BaCO3
Wurtzite	-67.81	-76.76	-8.95	ZnS
Zincite	-2.05	9.28	11.33	ZnO
Zincosite	-12.14	-8.21	3.93	ZnSO4
Zn(BO2)2	-8.09	0.20	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-25.24	-21.92	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.92	9.28	12.20	Zn(OH)2
Zn(OH)2(am)	-3.19	9.28	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.47	9.28	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.25	9.28	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.45	9.28	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.43	1.07	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.73	8.46	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-18.01	-4.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-26.06	-7.15	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.77	19.63	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-12.29	26.21	38.50	Zn5(OH)8Cl2
ZnCl2	-17.96	-10.91	7.05	ZnCl2
ZnCO3:1H2O	-1.06	-11.32	-10.26	ZnCO3:1H2O
ZnF2	-12.99	-13.52	-0.53	ZnF2
Znmetal	-42.06	-16.27	25.79	Zn
ZnMoO4	-1.86	-11.98	-10.13	ZnMoO4
ZnO(active)	-1.91	9.28	11.19	ZnO
ZnS(am)	-67.71	-76.76	-9.05	ZnS
ZnSb	-85.10	-74.09	11.01	ZnSb
ZnSe	-22.78	-37.18	-14.40	ZnSe
ZnSeO4:6H2O	-14.62	-16.14	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.58	-8.22	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 143.

Title Evaporate Stage 8 lake water to produce initial Stage 9 Lake water
REACTION 805
H2O -1
28.01 moles ## Removes x m3 water, but solute mass remains the
same

USE solution 811
Save Solution 812
END

TITLE

Evaporate Stage 8 lake water to produce initial Stage 9 Lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 811. Solution after simulation 142.
Using reaction 805.

Reaction 805.

2.801e+01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	3.307e-08	1.638e-08
Al	4.069e-06	2.015e-06
As	3.638e-10	1.802e-10
B	5.941e-05	2.943e-05
Ba	8.949e-08	4.433e-08
C	5.083e-03	2.518e-03
Ca	5.483e-03	2.716e-03
Cd	2.104e-08	1.042e-08
Cl	6.967e-03	3.451e-03
Co	1.616e-07	8.005e-08
Cr	3.475e-09	1.721e-09
Cu	3.354e-06	1.661e-06
F	4.096e-04	2.029e-04
Fe	2.511e-09	1.244e-09
Hg	3.320e-09	1.644e-09
K	5.742e-03	2.844e-03
Mg	8.824e-03	4.371e-03
Mn	9.898e-05	4.903e-05
Mo	2.906e-06	1.439e-06
N	2.430e-05	1.204e-05
Na	2.114e-02	1.047e-02
Ni	2.518e-07	1.247e-07
Pb	1.182e-08	5.854e-09
S	2.172e-02	1.076e-02
Sb	4.431e-08	2.195e-08
Se	2.519e-07	1.248e-07
Si	5.680e-05	2.813e-05
U	4.020e-07	1.991e-07
V	1.342e-08	6.646e-09
Zn	9.867e-06	4.887e-06

-----Description of solution-----

pH = 7.518 Charge balance
 pe = 5.273 Adjusted to redox
 equilibrium
 Activity of water = 0.999
 Ionic strength (mol/kgw) = 6.949e-02
 Mass of water (kg) = 4.953e-01
 Total alkalinity (eq/kg) = 4.896e-03
 Total CO2 (mol/kg) = 5.083e-03
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 1.425e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 7
 Total H = 5.499029e+01
 Total O = 2.754455e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.206e-07	3.317e-07	-6.376	-6.479	-0.103	(0)
H+	3.780e-08	3.032e-08	-7.422	-7.518	-0.096	0.00
H2O	5.551e+01	9.988e-01	1.744	-0.001	0.000	18.07
Ag	3.307e-08					
AgCl	1.840e-08	1.840e-08	-7.735	-7.735	0.000	(0)
AgCl2-	1.221e-08	8.956e-09	-7.913	-8.048	-0.134	(0)
Ag+	2.011e-09	1.613e-09	-8.697	-8.792	-0.096	(0)
AgSO4-	2.873e-10	2.108e-10	-9.542	-9.676	-0.134	(0)
AgCl3-2	1.539e-10	4.460e-11	-9.813	-10.351	-0.538	(0)
AgCl4-3	8.254e-12	5.089e-13	-11.083	-12.293	-1.210	(0)
AgNO2	6.048e-12	6.048e-12	-11.218	-11.218	0.000	(0)
AgF	1.029e-12	1.029e-12	-11.988	-11.988	0.000	(0)
AgNH3+	8.046e-14	5.904e-14	-13.094	-13.229	-0.134	(0)
AgOH	5.350e-14	5.350e-14	-13.272	-13.272	0.000	(0)
AgH2BO3	2.870e-14	2.870e-14	-13.542	-13.542	0.000	(0)
AgSeO3-	2.571e-14	1.886e-14	-13.590	-13.724	-0.134	(0)
Ag2Se	1.263e-14	1.263e-14	-13.899	-13.899	0.000	(0)
Ag (NO2) 2-	2.292e-16	1.681e-16	-15.640	-15.774	-0.134	(0)
AgNO3	2.362e-17	2.362e-17	-16.627	-16.627	0.000	(0)
Ag (NH3) 2+	1.172e-17	8.603e-18	-16.931	-17.065	-0.134	(0)
Ag (OH) 2-	2.363e-18	1.734e-18	-17.626	-17.761	-0.134	(0)
Ag (SeO3) 2-3	4.986e-20	3.074e-21	-19.302	-20.512	-1.210	(0)
Ag2MoO4	1.184e-24	1.184e-24	-23.927	-23.927	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.346	-73.346	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.082	-84.233	-2.151	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.346	-147.580	-0.234	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.480	-147.614	-0.134	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.085	-149.501	-0.417	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.419	-149.812	-0.393	(0)
Al	4.069e-06					
Al (OH) 4-	3.821e-06	3.058e-06	-5.418	-5.515	-0.097	(0)
AlF3	1.038e-07	1.038e-07	-6.984	-6.984	0.000	(0)
Al (OH) 3	7.322e-08	7.322e-08	-7.135	-7.135	0.000	(0)
AlF2+	4.012e-08	3.249e-08	-7.397	-7.488	-0.092	(0)
AlF4-	1.651e-08	1.321e-08	-7.782	-7.879	-0.097	(0)
Al (OH) 2+	1.366e-08	1.106e-08	-7.864	-7.956	-0.092	(0)
AlF+2	7.474e-10	3.214e-10	-9.126	-9.493	-0.366	(0)
AlOH+2	9.764e-11	4.199e-11	-10.010	-10.377	-0.366	(0)
AlSO4+	8.045e-12	6.439e-12	-11.094	-11.191	-0.097	(0)
Al+3	9.212e-13	1.266e-13	-12.036	-12.898	-0.862	(0)
Al (SO4) 2-	5.648e-13	4.520e-13	-12.248	-12.345	-0.097	(0)
AlMo6O21-3	4.759e-38	2.934e-39	-37.323	-38.533	-1.210	(0)
As (3)	2.935e-23					
H3AsO3	2.869e-23	2.869e-23	-22.542	-22.542	0.000	(0)
H2AsO3-	6.614e-25	4.853e-25	-24.180	-24.314	-0.134	(0)
HAsO3-2	5.036e-29	1.460e-29	-28.298	-28.836	-0.538	(0)

		H4AsO3+	5.875e-31	4.310e-31	-30.231	-30.365	-0.134	(0)
		AsO3-3	3.010e-34	1.856e-35	-33.521	-34.731	-1.210	(0)
As (5)	3.638e-10							
		HAsO4-2	3.278e-10	9.503e-11	-9.484	-10.022	-0.538	(0)
		H2AsO4-	3.581e-11	2.628e-11	-10.446	-10.580	-0.134	(0)
		AsO4-3	1.608e-13	9.911e-15	-12.794	-14.004	-1.210	(0)
		H3AsO4	1.363e-16	1.385e-16	-15.866	-15.859	0.007	(0)
B	5.941e-05							
		H3BO3	5.769e-05	5.862e-05	-4.239	-4.232	0.007	(0)
		H2BO3-	1.448e-06	1.123e-06	-5.839	-5.950	-0.111	(0)
		MgH2BO3+	1.199e-07	9.295e-08	-6.921	-7.032	-0.111	(0)
		CaH2BO3+	1.139e-07	8.829e-08	-6.944	-7.054	-0.111	(0)
		NaH2BO3	2.911e-08	2.911e-08	-7.536	-7.536	0.000	(0)
		BF(OH) 3-	7.660e-09	5.939e-09	-8.116	-8.226	-0.111	(0)
		H5 (BO3) 2-	7.226e-11	5.603e-11	-10.141	-10.252	-0.111	(0)
		BF2 (OH) 2-	6.312e-12	4.894e-12	-11.200	-11.310	-0.111	(0)
		BaH2BO3+	1.627e-12	1.261e-12	-11.789	-11.899	-0.111	(0)
		H8 (BO3) 3-	4.236e-13	3.285e-13	-12.373	-12.484	-0.111	(0)
		AgH2BO3	2.870e-14	2.870e-14	-13.542	-13.542	0.000	(0)
		BF3OH-	1.893e-17	1.467e-17	-16.723	-16.833	-0.111	(0)
		BF4-	7.178e-22	5.565e-22	-21.144	-21.255	-0.111	(0)
Ba	8.949e-08							
		Ba+2	8.783e-08	3.635e-08	-7.056	-7.439	-0.383	(0)
		BaHCO3+	1.560e-09	1.272e-09	-8.807	-8.895	-0.088	(0)
		BaCO3	1.057e-10	1.057e-10	-9.976	-9.976	0.000	(0)
		BaH2BO3+	1.627e-12	1.261e-12	-11.789	-11.899	-0.111	(0)
		BaOH+	6.533e-14	5.264e-14	-13.185	-13.279	-0.094	(0)
		BaNO3+	4.578e-15	3.359e-15	-14.339	-14.474	-0.134	(0)
		BaNH3+2	1.419e-15	4.112e-16	-14.848	-15.386	-0.538	(0)
C (4)	5.083e-03							
		HCO3-	4.526e-03	3.665e-03	-2.344	-2.436	-0.092	(0)
		H2CO3	2.499e-04	2.499e-04	-3.602	-3.602	0.000	(0)
		CaHCO3+	1.143e-04	9.325e-05	-3.942	-4.030	-0.088	(0)
		MgHCO3+	1.127e-04	8.954e-05	-3.948	-4.048	-0.100	(0)
		NaHCO3	3.372e-05	3.372e-05	-4.472	-4.472	0.000	(0)
		CO3-2	1.369e-05	5.667e-06	-4.864	-5.247	-0.383	(0)
		CaCO3	1.227e-05	1.227e-05	-4.911	-4.911	0.000	(0)
		MgCO3	1.125e-05	1.125e-05	-4.949	-4.949	0.000	(0)
		CuCO3	2.740e-06	2.740e-06	-5.562	-5.562	0.000	(0)
		NaCO3-	2.132e-06	1.726e-06	-5.671	-5.763	-0.092	(0)
		MnHCO3+	1.900e-06	1.531e-06	-5.721	-5.815	-0.094	(0)
		ZnCO3	6.856e-07	6.856e-07	-6.164	-6.164	0.000	(0)
		UO2 (CO3) 3-4	3.702e-07	2.613e-09	-6.432	-8.583	-2.151	(0)
		ZnHCO3+	3.321e-07	2.437e-07	-6.479	-6.613	-0.134	(0)
		Cu (CO3) 2-2	1.442e-07	4.179e-08	-6.841	-7.379	-0.538	(0)
		NiHCO3+	3.382e-08	2.481e-08	-7.471	-7.605	-0.134	(0)
		UO2 (CO3) 2-2	3.174e-08	9.201e-09	-7.498	-8.036	-0.538	(0)
		CuHCO3+	2.588e-08	1.899e-08	-7.587	-7.722	-0.134	(0)
		CoHCO3+	1.187e-08	8.713e-09	-7.925	-8.060	-0.134	(0)
		NiCO3	1.161e-08	1.161e-08	-7.935	-7.935	0.000	(0)
		PbCO3	6.892e-09	6.892e-09	-8.162	-8.162	0.000	(0)
		CoCO3	2.928e-09	2.928e-09	-8.533	-8.533	0.000	(0)
		BaHCO3+	1.560e-09	1.272e-09	-8.807	-8.895	-0.088	(0)
		PbHCO3+	1.502e-09	1.102e-09	-8.823	-8.958	-0.134	(0)
		CdCO3	5.109e-10	5.109e-10	-9.292	-9.292	0.000	(0)
		Pb (CO3) 2-2	3.886e-10	1.126e-10	-9.410	-9.948	-0.538	(0)
		BaCO3	1.057e-10	1.057e-10	-9.976	-9.976	0.000	(0)
		UO2CO3	8.138e-11	8.138e-11	-10.089	-10.089	0.000	(0)
		CdHCO3+	4.498e-11	3.301e-11	-10.347	-10.481	-0.134	(0)
		Cd (CO3) 2-2	7.405e-12	2.146e-12	-11.130	-11.668	-0.538	(0)
		FeHCO3+	1.828e-13	1.491e-13	-12.738	-12.827	-0.088	(0)
		HgCO3	8.334e-14	8.334e-14	-13.079	-13.079	0.000	(0)
		Hg (CO3) 2-2	5.153e-15	1.494e-15	-14.288	-14.826	-0.538	(0)
		HgHCO3+	6.413e-17	4.706e-17	-16.193	-16.327	-0.134	(0)
Ca	5.483e-03							
		Ca+2	3.301e-03	1.366e-03	-2.481	-2.864	-0.383	(0)
		CaSO4	2.051e-03	2.051e-03	-2.688	-2.688	0.000	(0)
		CaHCO3+	1.143e-04	9.325e-05	-3.942	-4.030	-0.088	(0)

	CaCO3	1.227e-05	1.227e-05	-4.911	-4.911	0.000	(0)
	CaF+	4.700e-06	3.786e-06	-5.328	-5.422	-0.094	(0)
	CaH2BO3+	1.139e-07	8.829e-08	-6.944	-7.054	-0.111	(0)
	CaOH+	1.109e-08	9.043e-09	-7.955	-8.044	-0.088	(0)
	CaNO3+	1.086e-10	7.965e-11	-9.964	-10.099	-0.134	(0)
	CaNH3+2	1.064e-10	3.084e-11	-9.973	-10.511	-0.538	(0)
	Ca (NH3) 2+2	7.593e-19	2.201e-19	-18.120	-18.657	-0.538	(0)
Cd		2.104e-08					
	Cd+2	9.556e-09	3.956e-09	-8.020	-8.403	-0.383	(0)
	CdSO4	6.076e-09	6.076e-09	-8.216	-8.216	0.000	(0)
	CdCl+	2.877e-09	2.111e-09	-8.541	-8.676	-0.134	(0)
	Cd (SO4) 2-2	1.852e-09	5.370e-10	-8.732	-9.270	-0.538	(0)
	CdCO3	5.109e-10	5.109e-10	-9.292	-9.292	0.000	(0)
	CdCl2	4.917e-11	4.917e-11	-10.308	-10.308	0.000	(0)
	CdHCO3+	4.498e-11	3.301e-11	-10.347	-10.481	-0.134	(0)
	CdOHC1	2.872e-11	2.872e-11	-10.542	-10.542	0.000	(0)
	CdF+	2.169e-11	1.592e-11	-10.664	-10.798	-0.134	(0)
	CdOH+	1.420e-11	1.042e-11	-10.848	-10.982	-0.134	(0)
	Cd (CO3) 2-2	7.405e-12	2.146e-12	-11.130	-11.668	-0.538	(0)
	CdCl3-	2.363e-13	1.734e-13	-12.627	-12.761	-0.134	(0)
	Cd (OH) 2	2.181e-14	2.181e-14	-13.661	-13.661	0.000	(0)
	CdF2	8.064e-15	8.064e-15	-14.093	-14.093	0.000	(0)
	CdNO3+	3.143e-16	2.306e-16	-15.503	-15.637	-0.134	(0)
	CdSeO4	6.322e-17	6.322e-17	-16.199	-16.199	0.000	(0)
	Cd (SeO3) 2-2	3.725e-18	1.080e-18	-17.429	-17.967	-0.538	(0)
	Cd2OH+3	3.352e-18	2.066e-19	-17.475	-18.685	-1.210	(0)
	Cd (OH) 3-	6.024e-19	4.420e-19	-18.220	-18.355	-0.134	(0)
	Cd (NO3) 2	2.131e-24	2.131e-24	-23.672	-23.672	0.000	(0)
	Cd (OH) 4-2	8.279e-26	2.400e-26	-25.082	-25.620	-0.538	(0)
	CdHS+	0.000e+00	0.000e+00	-78.629	-78.763	-0.134	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.927	-149.927	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.261	-226.395	-0.134	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.030	-302.568	-0.538	(0)
Cl		6.967e-03					
	Cl-	6.967e-03	5.588e-03	-2.157	-2.253	-0.096	(0)
	MnCl+	1.828e-07	1.473e-07	-6.738	-6.832	-0.094	(0)
	ZnCl+	3.714e-08	2.951e-08	-7.430	-7.530	-0.100	(0)
	AgCl	1.840e-08	1.840e-08	-7.735	-7.735	0.000	(0)
	ZnOHC1	1.281e-08	1.281e-08	-7.892	-7.892	0.000	(0)
	AgCl2-	1.221e-08	8.956e-09	-7.913	-8.048	-0.134	(0)
	CdCl+	2.877e-09	2.111e-09	-8.541	-8.676	-0.134	(0)
	CuCl2-	2.218e-09	1.762e-09	-8.654	-8.754	-0.100	(0)
	CuCl	1.510e-09	1.510e-09	-8.821	-8.821	0.000	(0)
	MnCl2	1.162e-09	1.162e-09	-8.935	-8.935	0.000	(0)
	NiCl+	1.070e-09	7.851e-10	-8.971	-9.105	-0.134	(0)
	CuCl+	9.152e-10	7.272e-10	-9.039	-9.138	-0.100	(0)
	CoCl+	8.051e-10	5.908e-10	-9.094	-9.229	-0.134	(0)
	ZnCl2	2.614e-10	2.614e-10	-9.583	-9.583	0.000	(0)
	AgCl3-2	1.539e-10	4.460e-11	-9.813	-10.351	-0.538	(0)
	PbCl+	1.093e-10	8.022e-11	-9.961	-10.096	-0.134	(0)
	CdCl2	4.917e-11	4.917e-11	-10.308	-10.308	0.000	(0)
	HgClOH	4.023e-11	4.023e-11	-10.395	-10.395	0.000	(0)
	HgCl2	3.838e-11	3.838e-11	-10.416	-10.416	0.000	(0)
	CdOHC1	2.872e-11	2.872e-11	-10.542	-10.542	0.000	(0)
	AgCl4-3	8.254e-12	5.089e-13	-11.083	-12.293	-1.210	(0)
	CuCl3-2	4.996e-12	2.106e-12	-11.301	-11.677	-0.375	(0)
	HgCl3-	2.923e-12	2.144e-12	-11.534	-11.669	-0.134	(0)
	MnCl3-	2.221e-12	1.789e-12	-11.654	-11.747	-0.094	(0)
	PbCl2	2.002e-12	2.002e-12	-11.698	-11.698	0.000	(0)
	ZnCl3-	1.460e-12	1.160e-12	-11.836	-11.936	-0.100	(0)
	CuCl2	1.409e-12	1.409e-12	-11.851	-11.851	0.000	(0)
	CdCl3-	2.363e-13	1.734e-13	-12.627	-12.761	-0.134	(0)
	HgCl4-2	1.646e-13	4.771e-14	-12.784	-13.321	-0.538	(0)
	NiCl2	2.209e-14	2.209e-14	-13.656	-13.656	0.000	(0)
	ZnCl4-2	7.692e-15	3.242e-15	-14.114	-14.489	-0.375	(0)
	PbCl3-	6.071e-15	4.454e-15	-14.217	-14.351	-0.134	(0)
	HgCl+	1.867e-15	1.370e-15	-14.729	-14.863	-0.134	(0)
	CrCl+2	1.831e-16	5.307e-17	-15.737	-16.275	-0.538	(0)

CuCl3-	9.247e-17	7.348e-17	-16.034	-16.134	-0.100	(0)
UO2Cl+	4.455e-17	3.269e-17	-16.351	-16.486	-0.134	(0)
PbCl4-2	3.925e-17	1.138e-17	-16.406	-16.944	-0.538	(0)
CrOHC12	1.869e-18	1.869e-18	-17.728	-17.728	0.000	(0)
CrCl2+	3.835e-20	2.814e-20	-19.416	-19.551	-0.134	(0)
FeCl+2	2.252e-20	9.492e-21	-19.647	-20.023	-0.375	(0)
CuCl4-2	4.883e-21	2.058e-21	-20.311	-20.687	-0.375	(0)
VOCl+	1.256e-21	9.214e-22	-20.901	-21.036	-0.134	(0)
FeCl2+	2.941e-22	2.369e-22	-21.532	-21.625	-0.094	(0)
FeCl3	1.324e-25	1.324e-25	-24.878	-24.878	0.000	(0)
CrO3Cl-	1.090e-25	7.998e-26	-24.963	-25.097	-0.134	(0)
CoCl+2	8.944e-35	2.592e-35	-34.048	-34.586	-0.538	(0)
UCl+3	0.000e+00	0.000e+00	-45.187	-46.397	-1.210	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.828	-47.366	-0.538	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.226	-48.764	-0.538	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.290	-61.828	-0.538	(0)
Co (2)	1.616e-07					
Co+2	1.054e-07	3.056e-08	-6.977	-7.515	-0.538	(0)
CoSO4	3.995e-08	3.995e-08	-7.398	-7.398	0.000	(0)
CoHCO3+	1.187e-08	8.713e-09	-7.925	-8.060	-0.134	(0)
CoCO3	2.928e-09	2.928e-09	-8.533	-8.533	0.000	(0)
CoCl+	8.051e-10	5.908e-10	-9.094	-9.229	-0.134	(0)
CoF+	3.344e-10	2.454e-10	-9.476	-9.610	-0.134	(0)
CoOH+	2.756e-10	2.023e-10	-9.560	-9.694	-0.134	(0)
Co (OH) 2	5.329e-12	5.329e-12	-11.273	-11.273	0.000	(0)
CoNO2+	5.268e-12	3.866e-12	-11.278	-11.413	-0.134	(0)
Co (NH3) +2	2.272e-13	6.587e-14	-12.644	-13.181	-0.538	(0)
CoSeO4	1.315e-15	1.315e-15	-14.881	-14.881	0.000	(0)
CoNO3+	1.217e-15	8.929e-16	-14.915	-15.049	-0.134	(0)
Co (OH) 3-	4.806e-17	3.527e-17	-16.318	-16.453	-0.134	(0)
CoOOH-	1.207e-17	8.859e-18	-16.918	-17.053	-0.134	(0)
Co2OH+3	5.025e-18	3.098e-19	-17.299	-18.509	-1.210	(0)
Co (NH3) 2+2	1.738e-19	5.037e-20	-18.760	-19.298	-0.538	(0)
Co (NO3) 2	3.349e-23	3.349e-23	-22.475	-22.475	0.000	(0)
Co (OH) 4-2	6.396e-24	1.854e-24	-23.194	-23.732	-0.538	(0)
Co (NH3) 3+2	3.922e-26	1.137e-26	-25.406	-25.944	-0.538	(0)
Co4 (OH) 4+4	4.729e-29	3.339e-31	-28.325	-30.476	-2.151	(0)
Co (NH3) 4+2	3.690e-33	1.070e-33	-32.433	-32.971	-0.538	(0)
Co (NH3) 5+2	1.098e-40	0.000e+00	-39.959	-40.497	-0.538	(0)
Co (3)	1.326e-28					
CoOH+2	1.326e-28	3.843e-29	-27.878	-28.415	-0.538	(0)
Co+3	1.659e-34	2.280e-35	-33.780	-34.642	-0.862	(0)
CoCl+2	8.944e-35	2.592e-35	-34.048	-34.586	-0.538	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.828	-47.366	-0.538	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.699	-56.833	-0.134	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.290	-61.828	-0.538	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.316	-61.854	-0.538	(0)
Cr (2)	3.227e-26					
Cr+2	3.227e-26	9.353e-27	-25.491	-26.029	-0.538	(0)
Cr (3)	3.475e-09					
Cr (OH) 2+	2.929e-09	2.149e-09	-8.533	-8.668	-0.134	(0)
Cr (OH) 3	2.678e-10	2.678e-10	-9.572	-9.572	0.000	(0)
Cr (OH) +2	1.837e-10	5.325e-11	-9.736	-10.274	-0.538	(0)
CrOHSO4	8.279e-11	8.279e-11	-10.082	-10.082	0.000	(0)
CrO2-	5.722e-12	4.199e-12	-11.242	-11.377	-0.134	(0)
Cr (OH) 4-	4.819e-12	3.536e-12	-11.317	-11.451	-0.134	(0)
CrF+2	1.019e-12	2.953e-13	-11.992	-12.530	-0.538	(0)
CrSO4+	1.530e-13	1.123e-13	-12.815	-12.950	-0.134	(0)
Cr+3	1.190e-13	7.338e-15	-12.924	-14.134	-1.210	(0)
CrCl+2	1.831e-16	5.307e-17	-15.737	-16.275	-0.538	(0)
CrOHC12	1.869e-18	1.869e-18	-17.728	-17.728	0.000	(0)
Cr2 (OH) 2SO4+2	1.375e-18	3.984e-19	-17.862	-18.400	-0.538	(0)
Cr2 (OH) 2 (SO4) 2	1.551e-19	1.551e-19	-18.809	-18.809	0.000	(0)
CrCl2+	3.835e-20	2.814e-20	-19.416	-19.551	-0.134	(0)
CrNO3+2	2.040e-23	5.913e-24	-22.690	-23.228	-0.538	(0)
Cr (NH3) 5OH+2	3.664e-39	1.062e-39	-38.436	-38.974	-0.538	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.403	-47.613	-1.210	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.226	-48.764	-0.538	(0)

Cr (6)	2.050e-15					
CrO4-2	1.846e-15	7.640e-16	-14.734	-15.117	-0.383	(0)
HCrO4-	1.022e-16	7.497e-17	-15.991	-16.125	-0.134	(0)
NaCrO4-	8.465e-17	6.211e-17	-16.072	-16.207	-0.134	(0)
KCrO4-	1.703e-17	1.250e-17	-16.769	-16.903	-0.134	(0)
CrO3SO4-2	1.567e-23	4.541e-24	-22.805	-23.343	-0.538	(0)
H2CrO4	1.843e-24	1.843e-24	-23.735	-23.735	0.000	(0)
CrO3Cl-	1.090e-25	7.998e-26	-24.963	-25.097	-0.134	(0)
Cr2O7-2	6.730e-31	1.951e-31	-30.172	-30.710	-0.538	(0)
Cu (1)	4.025e-09					
CuCl2-	2.218e-09	1.762e-09	-8.654	-8.754	-0.100	(0)
CuCl	1.510e-09	1.510e-09	-8.821	-8.821	0.000	(0)
Cu+	2.924e-10	2.146e-10	-9.534	-9.668	-0.134	(0)
CuCl3-2	4.996e-12	2.106e-12	-11.301	-11.677	-0.375	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.574	-147.978	-0.404	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.326	-148.708	-0.382	(0)
Cu (2)	3.350e-06					
CuCO3	2.740e-06	2.740e-06	-5.562	-5.562	0.000	(0)
Cu+2	1.984e-07	8.211e-08	-6.703	-7.086	-0.383	(0)
Cu (CO3) 2-2	1.442e-07	4.179e-08	-6.841	-7.379	-0.538	(0)
CuSO4	1.232e-07	1.232e-07	-6.909	-6.909	0.000	(0)
CuOH+	1.084e-07	8.612e-08	-6.965	-7.065	-0.100	(0)
CuHCO3+	2.588e-08	1.899e-08	-7.587	-7.722	-0.134	(0)
Cu (OH) 2	5.700e-09	5.700e-09	-8.244	-8.244	0.000	(0)
CuF+	1.793e-09	1.315e-09	-8.747	-8.881	-0.134	(0)
CuCl+	9.152e-10	7.272e-10	-9.039	-9.138	-0.100	(0)
Cu2 (OH) 2+2	6.427e-10	1.863e-10	-9.192	-9.730	-0.538	(0)
CuNO2+	2.103e-10	1.543e-10	-9.677	-9.812	-0.134	(0)
CuNH3+2	5.196e-11	1.506e-11	-10.284	-10.822	-0.538	(0)
Cu (OH) 3-	5.285e-12	3.878e-12	-11.277	-11.411	-0.134	(0)
CuCl2	1.409e-12	1.409e-12	-11.851	-11.851	0.000	(0)
Cu (NO2) 2	2.834e-14	2.834e-14	-13.548	-13.548	0.000	(0)
CuNO3+	6.523e-15	4.786e-15	-14.186	-14.320	-0.134	(0)
CuCl3-	9.247e-17	7.348e-17	-16.034	-16.134	-0.100	(0)
Cu (OH) 4-2	3.492e-17	1.012e-17	-16.457	-16.995	-0.538	(0)
CuCl4-2	4.883e-21	2.058e-21	-20.311	-20.687	-0.375	(0)
Cu (NO3) 2	1.111e-23	1.111e-23	-22.954	-22.954	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.157	-216.291	-0.134	(0)
F	4.096e-04					
F-	3.165e-04	2.539e-04	-3.500	-3.595	-0.096	(0)
MgF+	8.498e-05	6.801e-05	-4.071	-4.167	-0.097	(0)
CaF+	4.700e-06	3.786e-06	-5.328	-5.422	-0.094	(0)
NaF	2.621e-06	2.621e-06	-5.582	-5.582	0.000	(0)
MnF+	2.626e-07	2.116e-07	-6.581	-6.674	-0.094	(0)
AlF3	1.038e-07	1.038e-07	-6.984	-6.984	0.000	(0)
AlF2+	4.012e-08	3.249e-08	-7.397	-7.488	-0.092	(0)
AlF4-	1.651e-08	1.321e-08	-7.782	-7.879	-0.097	(0)
ZnF+	1.451e-08	1.065e-08	-7.838	-7.973	-0.134	(0)
HF	1.139e-08	1.139e-08	-7.944	-7.944	0.000	(0)
BF (OH) 3-	7.660e-09	5.939e-09	-8.116	-8.226	-0.111	(0)
CuF+	1.793e-09	1.315e-09	-8.747	-8.881	-0.134	(0)
AlF+2	7.474e-10	3.214e-10	-9.126	-9.493	-0.366	(0)
NiF+	4.773e-10	3.502e-10	-9.321	-9.456	-0.134	(0)
CoF+	3.344e-10	2.454e-10	-9.476	-9.610	-0.134	(0)
CdF+	2.169e-11	1.592e-11	-10.664	-10.798	-0.134	(0)
HF2-	1.394e-11	1.099e-11	-10.856	-10.959	-0.103	(0)
PbF+	9.865e-12	7.239e-12	-11.006	-11.140	-0.134	(0)
BF2 (OH) 2-	6.312e-12	4.894e-12	-11.200	-11.310	-0.111	(0)
AgF	1.029e-12	1.029e-12	-11.988	-11.988	0.000	(0)
CrF+2	1.019e-12	2.953e-13	-11.992	-12.530	-0.538	(0)
UO2F+	1.723e-13	1.264e-13	-12.764	-12.898	-0.134	(0)
UO2F2	9.257e-14	9.257e-14	-13.034	-13.034	0.000	(0)
PbF2	3.617e-14	3.617e-14	-13.442	-13.442	0.000	(0)
CdF2	8.064e-15	8.064e-15	-14.093	-14.093	0.000	(0)
UO2F3-	8.046e-15	5.904e-15	-14.094	-14.229	-0.134	(0)
H2F2	3.474e-16	3.474e-16	-15.459	-15.459	0.000	(0)
FeF2+	1.320e-16	1.064e-16	-15.879	-15.973	-0.094	(0)
VO2F	6.662e-17	6.662e-17	-16.176	-16.176	0.000	(0)

UO2F4-2	4.107e-17	1.191e-17	-16.386	-16.924	-0.538	(0)
FeF3	3.811e-17	3.811e-17	-16.419	-16.419	0.000	(0)
FeF+2	3.716e-17	1.566e-17	-16.430	-16.805	-0.375	(0)
PbF3-	2.374e-17	1.742e-17	-16.625	-16.759	-0.134	(0)
BF3OH-	1.893e-17	1.467e-17	-16.723	-16.833	-0.111	(0)
VO2F2-	8.370e-18	6.142e-18	-17.077	-17.212	-0.134	(0)
VOF+	1.220e-19	8.950e-20	-18.914	-19.048	-0.134	(0)
VO2F3-2	6.710e-20	1.945e-20	-19.173	-19.711	-0.538	(0)
VOF2	8.521e-21	8.521e-21	-20.070	-20.070	0.000	(0)
PbF4-2	7.302e-21	2.116e-21	-20.137	-20.674	-0.538	(0)
BF4-	7.178e-22	5.565e-22	-21.144	-21.255	-0.111	(0)
HgF+	1.576e-22	1.157e-22	-21.802	-21.937	-0.134	(0)
VOF3-	1.046e-22	7.676e-23	-21.980	-22.115	-0.134	(0)
VO2F4-3	3.941e-23	2.430e-24	-22.404	-23.614	-1.210	(0)
Sb(OH) 2F	7.413e-25	7.413e-25	-24.130	-24.130	0.000	(0)
SbOF	7.298e-25	7.298e-25	-24.137	-24.137	0.000	(0)
VOF4-2	2.714e-25	7.867e-26	-24.566	-25.104	-0.538	(0)
SiF6-2	4.687e-26	1.975e-26	-25.329	-25.704	-0.375	(0)
UF3+	1.271e-35	9.323e-36	-34.896	-35.030	-0.134	(0)
UF2+2	7.993e-37	2.317e-37	-36.097	-36.635	-0.538	(0)
UF4	2.595e-37	2.595e-37	-36.586	-36.586	0.000	(0)
UF5-	3.559e-39	2.611e-39	-38.449	-38.583	-0.134	(0)
UF+3	1.176e-39	0.000e+00	-38.930	-40.140	-1.210	(0)
UF6-2	6.907e-40	2.002e-40	-39.161	-39.699	-0.538	(0)
Fe (2)	1.658e-11					
Fe+2	1.115e-11	3.231e-12	-10.953	-11.491	-0.538	(0)
FeSO4	5.196e-12	5.196e-12	-11.284	-11.284	0.000	(0)
FeHCO3+	1.828e-13	1.491e-13	-12.738	-12.827	-0.088	(0)
FeOH+	5.295e-14	4.266e-14	-13.276	-13.370	-0.094	(0)
Fe (OH) 2	1.124e-17	1.124e-17	-16.949	-16.949	0.000	(0)
Fe (OH) 3-	1.463e-18	1.179e-18	-17.835	-17.928	-0.094	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.277	-159.277	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.474	-235.608	-0.134	(0)
Fe (3)	2.494e-09					
Fe (OH) 2+	1.920e-09	1.554e-09	-8.717	-8.808	-0.092	(0)
Fe (OH) 3	5.538e-10	5.538e-10	-9.257	-9.257	0.000	(0)
Fe (OH) 4-	2.112e-11	1.710e-11	-10.675	-10.767	-0.092	(0)
FeOH+2	2.859e-14	1.205e-14	-13.544	-13.919	-0.375	(0)
FeF2+	1.320e-16	1.064e-16	-15.879	-15.973	-0.094	(0)
FeF3	3.811e-17	3.811e-17	-16.419	-16.419	0.000	(0)
FeF+2	3.716e-17	1.566e-17	-16.430	-16.805	-0.375	(0)
FeSO4+	5.132e-18	4.135e-18	-17.290	-17.384	-0.094	(0)
Fe (SO4) 2-	7.894e-19	5.792e-19	-18.103	-18.237	-0.134	(0)
Fe+3	4.093e-19	5.625e-20	-18.388	-19.250	-0.862	(0)
FeCl+2	2.252e-20	9.492e-21	-19.647	-20.023	-0.375	(0)
FeCl2+	2.941e-22	2.369e-22	-21.532	-21.625	-0.094	(0)
FeHSeO3+2	7.107e-23	2.060e-23	-22.148	-22.686	-0.538	(0)
Fe2 (OH) 2+4	6.806e-25	4.805e-27	-24.167	-26.318	-2.151	(0)
FeCl3	1.324e-25	1.324e-25	-24.878	-24.878	0.000	(0)
FeNO3+2	3.577e-26	1.037e-26	-25.446	-25.984	-0.538	(0)
Fe3 (OH) 4+5	2.480e-31	1.080e-34	-30.605	-33.967	-3.361	(0)
H (0)	3.647e-29					
H2	1.824e-29	1.853e-29	-28.739	-28.732	0.007	(0)
Hg (0)	3.230e-09					
Hg	3.230e-09	3.230e-09	-8.491	-8.491	0.000	(0)
Hg (1)	1.859e-19					
Hg2+2	9.295e-20	2.694e-20	-19.032	-19.570	-0.538	(0)
Hg (2)	9.018e-11					
HgClOH	4.023e-11	4.023e-11	-10.395	-10.395	0.000	(0)
HgCl2	3.838e-11	3.838e-11	-10.416	-10.416	0.000	(0)
Hg (OH) 2	8.396e-12	8.531e-12	-11.076	-11.069	0.007	(0)
HgCl3-	2.923e-12	2.144e-12	-11.534	-11.669	-0.134	(0)
HgCl4-2	1.646e-13	4.771e-14	-12.784	-13.321	-0.538	(0)
HgCO3	8.334e-14	8.334e-14	-13.079	-13.079	0.000	(0)
Hg (CO3) 2-2	5.153e-15	1.494e-15	-14.288	-14.826	-0.538	(0)
HgCl+	1.867e-15	1.370e-15	-14.729	-14.863	-0.134	(0)
HgOH+	2.212e-16	1.623e-16	-15.655	-15.790	-0.134	(0)
HgHCO3+	6.413e-17	4.706e-17	-16.193	-16.327	-0.134	(0)

	Hg (NH3) 2+2	8.598e-18	2.492e-18	-17.066	-17.603	-0.538	(0)
	Hg (OH) 3-	4.855e-19	3.562e-19	-18.314	-18.448	-0.134	(0)
	HgNH3+2	4.796e-19	1.390e-19	-18.319	-18.857	-0.538	(0)
	Hg+2	4.240e-20	1.229e-20	-19.373	-19.910	-0.538	(0)
	HgSO4	2.108e-20	2.108e-20	-19.676	-19.676	0.000	(0)
	HgF+	1.576e-22	1.157e-22	-21.802	-21.937	-0.134	(0)
	Hg (NH3) 3+2	6.136e-25	1.779e-25	-24.212	-24.750	-0.538	(0)
	HgNO3+	1.140e-28	8.365e-29	-27.943	-28.078	-0.134	(0)
	Hg (NH3) 4+2	8.738e-32	2.533e-32	-31.059	-31.596	-0.538	(0)
	Hg (NO3) 2	6.409e-37	6.409e-37	-36.193	-36.193	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.066	-137.201	-0.134	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.853	-138.390	-0.538	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.325	-138.325	0.000	(0)
K	5.742e-03						
	K+	5.489e-03	4.403e-03	-2.260	-2.356	-0.096	(0)
	KSO4-	2.522e-04	2.042e-04	-3.598	-3.690	-0.092	(0)
	KCrO4-	1.703e-17	1.250e-17	-16.769	-16.903	-0.134	(0)
Mg	8.824e-03						
	Mg+2	5.768e-03	2.387e-03	-2.239	-2.622	-0.383	(0)
	MgSO4	2.846e-03	2.846e-03	-2.546	-2.546	0.000	(0)
	MgHCO3+	1.127e-04	8.954e-05	-3.948	-4.048	-0.100	(0)
	MgF+	8.498e-05	6.801e-05	-4.071	-4.167	-0.097	(0)
	MgCO3	1.125e-05	1.125e-05	-4.949	-4.949	0.000	(0)
	MgOH+	3.843e-07	3.153e-07	-6.415	-6.501	-0.086	(0)
	MgH2BO3+	1.199e-07	9.295e-08	-6.921	-7.032	-0.111	(0)
Mn (2)	9.898e-05						
	Mn+2	7.222e-05	2.093e-05	-4.141	-4.679	-0.538	(0)
	MnSO4	2.439e-05	2.439e-05	-4.613	-4.613	0.000	(0)
	MnHCO3+	1.900e-06	1.531e-06	-5.721	-5.815	-0.094	(0)
	MnF+	2.626e-07	2.116e-07	-6.581	-6.674	-0.094	(0)
	MnCl+	1.828e-07	1.473e-07	-6.738	-6.832	-0.094	(0)
	MnOH+	2.165e-08	1.744e-08	-7.665	-7.758	-0.094	(0)
	MnCl2	1.162e-09	1.162e-09	-8.935	-8.935	0.000	(0)
	MnCl3-	2.221e-12	1.789e-12	-11.654	-11.747	-0.094	(0)
	MnNO3+	8.336e-13	6.116e-13	-12.079	-12.214	-0.134	(0)
	MnSeO4	4.836e-13	4.836e-13	-12.316	-12.316	0.000	(0)
	Mn (OH) 3-	1.472e-17	1.186e-17	-16.832	-16.926	-0.094	(0)
	Mn (NO3) 2	2.832e-20	2.832e-20	-19.548	-19.548	0.000	(0)
	Mn (OH) 4-2	3.014e-23	1.270e-23	-22.521	-22.896	-0.375	(0)
	MnSe	0.000e+00	0.000e+00	-41.289	-41.289	0.000	(0)
Mn (3)	1.275e-24						
	Mn+3	1.275e-24	1.753e-25	-23.894	-24.756	-0.862	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-41.491	-41.866	-0.375	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-45.858	-45.965	-0.107	(0)
Mo	2.906e-06						
	MoO4-2	2.905e-06	1.202e-06	-5.537	-5.920	-0.383	(0)
	HMoO4-	9.887e-10	7.255e-10	-9.005	-9.139	-0.134	(0)
	H2MoO4	1.611e-13	1.611e-13	-12.793	-12.793	0.000	(0)
	Ag2MoO4	1.184e-24	1.184e-24	-23.927	-23.927	0.000	(0)
	AlMo6O21-3	4.759e-38	2.934e-39	-37.323	-38.533	-1.210	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-43.753	-48.593	-4.840	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-46.364	-49.725	-3.361	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-50.310	-52.461	-2.151	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-55.523	-56.733	-1.210	(0)
N (-3)	1.331e-06						
	NH4+	1.230e-06	9.534e-07	-5.910	-6.021	-0.111	(0)
	NH4SO4-	8.307e-08	6.693e-08	-7.081	-7.174	-0.094	(0)
	NH3	1.793e-08	1.793e-08	-7.746	-7.746	0.000	(0)
	CaNH3+2	1.064e-10	3.084e-11	-9.973	-10.511	-0.538	(0)
	CuNH3+2	5.196e-11	1.506e-11	-10.284	-10.822	-0.538	(0)
	NiNH3+2	1.824e-12	5.287e-13	-11.739	-12.277	-0.538	(0)
	Co (NH3) +2	2.272e-13	6.587e-14	-12.644	-13.181	-0.538	(0)
	AgNH3+	8.046e-14	5.904e-14	-13.094	-13.229	-0.134	(0)
	BaNH3+2	1.419e-15	4.112e-16	-14.848	-15.386	-0.538	(0)
	Ag (NH3) 2+	1.172e-17	8.603e-18	-16.931	-17.065	-0.134	(0)
	Hg (NH3) 2+2	8.598e-18	2.492e-18	-17.066	-17.603	-0.538	(0)

Ni (NH3) 2+2	4.726e-18	1.370e-18	-17.325	-17.863	-0.538	(0)
Ca (NH3) 2+2	7.593e-19	2.201e-19	-18.120	-18.657	-0.538	(0)
HgNH3+2	4.796e-19	1.390e-19	-18.319	-18.857	-0.538	(0)
Co (NH3) 2+2	1.738e-19	5.037e-20	-18.760	-19.298	-0.538	(0)
Hg (NH3) 3+2	6.136e-25	1.779e-25	-24.212	-24.750	-0.538	(0)
Co (NH3) 3+2	3.922e-26	1.137e-26	-25.406	-25.944	-0.538	(0)
Hg (NH3) 4+2	8.738e-32	2.533e-32	-31.059	-31.596	-0.538	(0)
Co (NH3) 4+2	3.690e-33	1.070e-33	-32.433	-32.971	-0.538	(0)
Cr (NH3) 5OH+2	3.664e-39	1.062e-39	-38.436	-38.974	-0.538	(0)
Co (NH3) 5+2	1.098e-40	0.000e+00	-39.959	-40.497	-0.538	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.403	-47.613	-1.210	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.828	-47.366	-0.538	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.226	-48.764	-0.538	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.699	-56.833	-0.134	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.290	-61.828	-0.538	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.316	-61.854	-0.538	(0)
N (3)	2.295e-05					
NO2-	2.295e-05	1.795e-05	-4.639	-4.746	-0.107	(0)
CuNO2+	2.103e-10	1.543e-10	-9.677	-9.812	-0.134	(0)
AgNO2	6.048e-12	6.048e-12	-11.218	-11.218	0.000	(0)
CoNO2+	5.268e-12	3.866e-12	-11.278	-11.413	-0.134	(0)
Cu (NO2) 2	2.834e-14	2.834e-14	-13.548	-13.548	0.000	(0)
Ag (NO2) 2-	2.292e-16	1.681e-16	-15.640	-15.774	-0.134	(0)
N (5)	2.309e-08					
NO3-	2.298e-08	1.843e-08	-7.639	-7.734	-0.096	(0)
CaNO3+	1.086e-10	7.965e-11	-9.964	-10.099	-0.134	(0)
MnNO3+	8.336e-13	6.116e-13	-12.079	-12.214	-0.134	(0)
ZnNO3+	1.327e-13	9.735e-14	-12.877	-13.012	-0.134	(0)
CuNO3+	6.523e-15	4.786e-15	-14.186	-14.320	-0.134	(0)
BaNO3+	4.578e-15	3.359e-15	-14.339	-14.474	-0.134	(0)
NiNO3+	3.466e-15	2.543e-15	-14.460	-14.595	-0.134	(0)
CoNO3+	1.217e-15	8.929e-16	-14.915	-15.049	-0.134	(0)
CdNO3+	3.143e-16	2.306e-16	-15.503	-15.637	-0.134	(0)
PbNO3+	1.503e-16	1.103e-16	-15.823	-15.957	-0.134	(0)
AgNO3	2.362e-17	2.362e-17	-16.627	-16.627	0.000	(0)
Mn (NO3) 2	2.832e-20	2.832e-20	-19.548	-19.548	0.000	(0)
Zn (NO3) 2	3.581e-22	3.581e-22	-21.446	-21.446	0.000	(0)
UO2NO3+	1.808e-22	1.327e-22	-21.743	-21.877	-0.134	(0)
Co (NO3) 2	3.349e-23	3.349e-23	-22.475	-22.475	0.000	(0)
CrNO3+2	2.040e-23	5.913e-24	-22.690	-23.228	-0.538	(0)
Cu (NO3) 2	1.111e-23	1.111e-23	-22.954	-22.954	0.000	(0)
Pb (NO3) 2	3.454e-24	3.454e-24	-23.462	-23.462	0.000	(0)
Cd (NO3) 2	2.131e-24	2.131e-24	-23.672	-23.672	0.000	(0)
VO2NO3	1.395e-24	1.395e-24	-23.855	-23.855	0.000	(0)
FeNO3+2	3.577e-26	1.037e-26	-25.446	-25.984	-0.538	(0)
HgNO3+	1.140e-28	8.365e-29	-27.943	-28.078	-0.134	(0)
Hg (NO3) 2	6.409e-37	6.409e-37	-36.193	-36.193	0.000	(0)
Na	2.114e-02					
Na+	2.039e-02	1.636e-02	-1.690	-1.786	-0.096	(0)
NaSO4-	7.108e-04	5.756e-04	-3.148	-3.240	-0.092	(0)
NaHCO3	3.372e-05	3.372e-05	-4.472	-4.472	0.000	(0)
NaF	2.621e-06	2.621e-06	-5.582	-5.582	0.000	(0)
NaCO3-	2.132e-06	1.726e-06	-5.671	-5.763	-0.092	(0)
NaH2BO3	2.911e-08	2.911e-08	-7.536	-7.536	0.000	(0)
NaCrO4-	8.465e-17	6.211e-17	-16.072	-16.207	-0.134	(0)
Ni	2.518e-07					
Ni+2	1.327e-07	5.491e-08	-6.877	-7.260	-0.383	(0)
NiSO4	7.179e-08	7.179e-08	-7.144	-7.144	0.000	(0)
NiHCO3+	3.382e-08	2.481e-08	-7.471	-7.605	-0.134	(0)
NiCO3	1.161e-08	1.161e-08	-7.935	-7.935	0.000	(0)
NiCl+	1.070e-09	7.851e-10	-8.971	-9.105	-0.134	(0)
NiF+	4.773e-10	3.502e-10	-9.321	-9.456	-0.134	(0)
NiOH+	3.125e-10	2.293e-10	-9.505	-9.640	-0.134	(0)
Ni (SO4) 2-2	5.373e-11	1.557e-11	-10.270	-10.808	-0.538	(0)
Ni (OH) 2	6.042e-12	6.042e-12	-11.219	-11.219	0.000	(0)
NiNH3+2	1.824e-12	5.287e-13	-11.739	-12.277	-0.538	(0)
NiCl2	2.209e-14	2.209e-14	-13.656	-13.656	0.000	(0)
NiNO3+	3.466e-15	2.543e-15	-14.460	-14.595	-0.134	(0)

Ni (OH) 3-	2.731e-15	2.004e-15	-14.564	-14.698	-0.134	(0)
NiSeO4	2.205e-15	2.205e-15	-14.657	-14.657	0.000	(0)
Ni (NH3) 2+2	4.726e-18	1.370e-18	-17.325	-17.863	-0.538	(0)
O (0)	2.899e-35					
O2	1.449e-35	1.473e-35	-34.839	-34.832	0.007	(0)
Pb	1.182e-08					
PbCO3	6.892e-09	6.892e-09	-8.162	-8.162	0.000	(0)
PbHCO3+	1.502e-09	1.102e-09	-8.823	-8.958	-0.134	(0)
PbSO4	1.298e-09	1.298e-09	-8.887	-8.887	0.000	(0)
Pb+2	9.774e-10	4.046e-10	-9.010	-9.393	-0.383	(0)
PbOH+	4.594e-10	3.371e-10	-9.338	-9.472	-0.134	(0)
Pb (CO3) 2-2	3.886e-10	1.126e-10	-9.410	-9.948	-0.538	(0)
Pb (SO4) 2-2	1.768e-10	5.126e-11	-9.752	-10.290	-0.538	(0)
PbCl+	1.093e-10	8.022e-11	-9.961	-10.096	-0.134	(0)
PbF+	9.865e-12	7.239e-12	-11.006	-11.140	-0.134	(0)
Pb (OH) 2	3.536e-12	3.536e-12	-11.452	-11.452	0.000	(0)
PbCl2	2.002e-12	2.002e-12	-11.698	-11.698	0.000	(0)
PbF2	3.617e-14	3.617e-14	-13.442	-13.442	0.000	(0)
PbCl3-	6.071e-15	4.454e-15	-14.217	-14.351	-0.134	(0)
Pb (OH) 3-	1.598e-15	1.173e-15	-14.796	-14.931	-0.134	(0)
PbNO3+	1.503e-16	1.103e-16	-15.823	-15.957	-0.134	(0)
PbCl4-2	3.925e-17	1.138e-17	-16.406	-16.944	-0.538	(0)
Pb2OH+3	3.506e-17	2.162e-18	-16.455	-17.665	-1.210	(0)
PbF3-	2.374e-17	1.742e-17	-16.625	-16.759	-0.134	(0)
Pb (OH) 4-2	3.287e-19	9.527e-20	-18.483	-19.021	-0.538	(0)
PbF4-2	7.302e-21	2.116e-21	-20.137	-20.674	-0.538	(0)
Pb3 (OH) 4+2	3.482e-22	1.009e-22	-21.458	-21.996	-0.538	(0)
Pb (NO3) 2	3.454e-24	3.454e-24	-23.462	-23.462	0.000	(0)
Pb4 (OH) 4+4	4.594e-26	3.244e-28	-25.338	-27.489	-2.151	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.859	-150.859	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.793	-227.928	-0.134	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.346	-73.346	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.234	-78.368	-0.134	(0)
CdHS+	0.000e+00	0.000e+00	-78.629	-78.763	-0.134	(0)
H2S	0.000e+00	0.000e+00	-78.866	-78.866	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.677	-80.215	-0.538	(0)
S6-2	0.000e+00	0.000e+00	-80.193	-80.731	-0.538	(0)
S4-2	0.000e+00	0.000e+00	-80.273	-80.811	-0.538	(0)
S3-2	0.000e+00	0.000e+00	-81.079	-81.617	-0.538	(0)
S2-2	0.000e+00	0.000e+00	-82.095	-82.633	-0.538	(0)
S-2	0.000e+00	0.000e+00	-87.775	-88.150	-0.375	(0)
HgHS2-	0.000e+00	0.000e+00	-137.066	-137.201	-0.134	(0)
HgS2-2	0.000e+00	0.000e+00	-137.853	-138.390	-0.538	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.325	-138.325	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.346	-147.580	-0.234	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.480	-147.614	-0.134	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.574	-147.978	-0.404	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.951	-148.086	-0.134	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.326	-148.708	-0.382	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.085	-149.501	-0.417	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.419	-149.812	-0.393	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.594	-149.594	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.927	-149.927	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.859	-150.859	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.277	-159.277	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.157	-216.291	-0.134	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.548	-224.682	-0.134	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.261	-226.395	-0.134	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.606	-227.144	-0.538	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.793	-227.928	-0.134	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.474	-235.608	-0.134	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.030	-302.568	-0.538	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.972	-304.510	-0.538	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.001	-317.539	-0.538	(0)
S (6)	2.172e-02					
SO4-2	1.583e-02	6.552e-03	-1.801	-2.184	-0.383	(0)
MgSO4	2.846e-03	2.846e-03	-2.546	-2.546	0.000	(0)

CaSO4	2.051e-03	2.051e-03	-2.688	-2.688	0.000	(0)
NaSO4-	7.108e-04	5.756e-04	-3.148	-3.240	-0.092	(0)
KSO4-	2.522e-04	2.042e-04	-3.598	-3.690	-0.092	(0)
MnSO4	2.439e-05	2.439e-05	-4.613	-4.613	0.000	(0)
ZnSO4	3.014e-06	3.014e-06	-5.521	-5.521	0.000	(0)
Zn(SO4) 2-2	5.933e-07	1.720e-07	-6.227	-6.765	-0.538	(0)
CuSO4	1.232e-07	1.232e-07	-6.909	-6.909	0.000	(0)
NH4SO4-	8.307e-08	6.693e-08	-7.081	-7.174	-0.094	(0)
NiSO4	7.179e-08	7.179e-08	-7.144	-7.144	0.000	(0)
CoSO4	3.995e-08	3.995e-08	-7.398	-7.398	0.000	(0)
HSO4-	2.426e-08	1.941e-08	-7.615	-7.712	-0.097	(0)
CdSO4	6.076e-09	6.076e-09	-8.216	-8.216	0.000	(0)
Cd(SO4) 2-2	1.852e-09	5.370e-10	-8.732	-9.270	-0.538	(0)
PbSO4	1.298e-09	1.298e-09	-8.887	-8.887	0.000	(0)
AgSO4-	2.873e-10	2.108e-10	-9.542	-9.676	-0.134	(0)
Pb(SO4) 2-2	1.768e-10	5.126e-11	-9.752	-10.290	-0.538	(0)
CrOHSO4	8.279e-11	8.279e-11	-10.082	-10.082	0.000	(0)
Ni(SO4) 2-2	5.373e-11	1.557e-11	-10.270	-10.808	-0.538	(0)
AlSO4+	8.045e-12	6.439e-12	-11.094	-11.191	-0.097	(0)
FeSO4	5.196e-12	5.196e-12	-11.284	-11.284	0.000	(0)
Al(SO4) 2-	5.648e-13	4.520e-13	-12.248	-12.345	-0.097	(0)
CrSO4+	1.530e-13	1.123e-13	-12.815	-12.950	-0.134	(0)
UO2SO4	3.577e-14	3.577e-14	-13.446	-13.446	0.000	(0)
UO2(SO4) 2-2	1.066e-14	3.090e-15	-13.972	-14.510	-0.538	(0)
VO2SO4-	3.190e-17	2.341e-17	-16.496	-16.631	-0.134	(0)
FeSO4+	5.132e-18	4.135e-18	-17.290	-17.384	-0.094	(0)
Cr2(OH) 2SO4+2	1.375e-18	3.984e-19	-17.862	-18.400	-0.538	(0)
Fe(SO4) 2-	7.894e-19	5.792e-19	-18.103	-18.237	-0.134	(0)
Cr2(OH) 2(SO4) 2	1.551e-19	1.551e-19	-18.809	-18.809	0.000	(0)
VOSO4	1.061e-19	1.061e-19	-18.974	-18.974	0.000	(0)
HgSO4	2.108e-20	2.108e-20	-19.676	-19.676	0.000	(0)
CrO3SO4-2	1.567e-23	4.541e-24	-22.805	-23.343	-0.538	(0)
VSO4+	6.042e-34	4.434e-34	-33.219	-33.353	-0.134	(0)
U(SO4) 2	1.942e-40	1.942e-40	-39.712	-39.712	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.890	-41.428	-0.538	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-56.699	-56.833	-0.134	(0)
Sb(3)	1.218e-19					
Sb(OH) 3	6.157e-20	6.157e-20	-19.211	-19.211	0.000	(0)
HSbO2	6.017e-20	6.017e-20	-19.221	-19.221	0.000	(0)
SbO2-	4.380e-24	3.214e-24	-23.359	-23.493	-0.134	(0)
Sb(OH) 4-	2.504e-24	1.837e-24	-23.601	-23.736	-0.134	(0)
Sb(OH) 2F	7.413e-25	7.413e-25	-24.130	-24.130	0.000	(0)
SbOF	7.298e-25	7.298e-25	-24.137	-24.137	0.000	(0)
Sb(OH) 2+	6.186e-26	4.539e-26	-25.209	-25.343	-0.134	(0)
SbO+	2.135e-26	1.567e-26	-25.671	-25.805	-0.134	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.001	-317.539	-0.538	(0)
Sb(5)	4.431e-08					
SbO3-	4.427e-08	3.248e-08	-7.354	-7.488	-0.134	(0)
Sb(OH) 6-	4.720e-11	3.786e-11	-10.326	-10.422	-0.096	(0)
SbO2+	1.169e-23	8.575e-24	-22.932	-23.067	-0.134	(0)
Se(-2)	1.263e-14					
Ag2Se	1.263e-14	1.263e-14	-13.899	-13.899	0.000	(0)
HSe-	2.463e-39	1.807e-39	-38.609	-38.743	-0.134	(0)
MnSe	0.000e+00	0.000e+00	-41.289	-41.289	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.371	-42.371	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.687	-46.225	-0.538	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.082	-84.233	-2.151	(0)
Se(4)	2.517e-07					
HSeO3-	1.889e-07	1.386e-07	-6.724	-6.858	-0.134	(0)
SeO3-2	6.278e-08	1.820e-08	-7.202	-7.740	-0.538	(0)
H2SeO3	1.793e-12	1.793e-12	-11.746	-11.746	0.000	(0)
AgSeO3-	2.571e-14	1.886e-14	-13.590	-13.724	-0.134	(0)
Cd(SeO3) 2-2	3.725e-18	1.080e-18	-17.429	-17.967	-0.538	(0)
Ag(SeO3) 2-3	4.986e-20	3.074e-21	-19.302	-20.512	-1.210	(0)
FeHSeO3+2	7.107e-23	2.060e-23	-22.148	-22.686	-0.538	(0)
Se(6)	2.079e-10					
SeO4-2	2.074e-10	8.583e-11	-9.683	-10.066	-0.383	(0)
MnSeO4	4.836e-13	4.836e-13	-12.316	-12.316	0.000	(0)

	ZnSeO4	2.795e-14	2.795e-14	-13.554	-13.554	0.000	(0)
	NiSeO4	2.205e-15	2.205e-15	-14.657	-14.657	0.000	(0)
	CoSeO4	1.315e-15	1.315e-15	-14.881	-14.881	0.000	(0)
	HSeO4-	1.778e-16	1.304e-16	-15.750	-15.885	-0.134	(0)
	CdSeO4	6.322e-17	6.322e-17	-16.199	-16.199	0.000	(0)
	Zn (SeO4) 2-2	8.390e-24	2.432e-24	-23.076	-23.614	-0.538	(0)
Si	5.680e-05						
	H4SiO4	5.646e-05	5.737e-05	-4.248	-4.241	0.007	(0)
	H3SiO4-	3.442e-07	2.735e-07	-6.463	-6.563	-0.100	(0)
	H2SiO4-2	1.323e-12	5.691e-13	-11.878	-12.245	-0.366	(0)
	UO2H3SiO4+	1.141e-13	8.375e-14	-12.943	-13.077	-0.134	(0)
	SiF6-2	4.687e-26	1.975e-26	-25.329	-25.704	-0.375	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-58.703	-59.913	-1.210	(0)
U (4)	5.743e-22						
	U (OH) 5-	5.738e-22	4.210e-22	-21.241	-21.376	-0.134	(0)
	U (OH) 4	5.352e-25	5.352e-25	-24.271	-24.271	0.000	(0)
	U (OH) 3+	8.096e-29	5.940e-29	-28.092	-28.226	-0.134	(0)
	U (OH) 2+2	2.877e-33	8.338e-34	-32.541	-33.079	-0.538	(0)
	UF3+	1.271e-35	9.323e-36	-34.896	-35.030	-0.134	(0)
	UF2+2	7.993e-37	2.317e-37	-36.097	-36.635	-0.538	(0)
	UF4	2.595e-37	2.595e-37	-36.586	-36.586	0.000	(0)
	UOH+3	1.934e-38	1.192e-39	-37.714	-38.924	-1.210	(0)
	UF5-	3.559e-39	2.611e-39	-38.449	-38.583	-0.134	(0)
	UF+3	1.176e-39	0.000e+00	-38.930	-40.140	-1.210	(0)
	UF6-2	6.907e-40	2.002e-40	-39.161	-39.699	-0.538	(0)
	U (SO4) 2	1.942e-40	1.942e-40	-39.712	-39.712	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-40.890	-41.428	-0.538	(0)
	U+4	0.000e+00	0.000e+00	-43.693	-45.844	-2.151	(0)
	UC1+3	0.000e+00	0.000e+00	-45.187	-46.397	-1.210	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-168.565	-179.455	-10.890	(0)
U (5)	1.599e-17						
	UO2+	1.599e-17	1.173e-17	-16.796	-16.931	-0.134	(0)
U (6)	4.020e-07						
	UO2 (CO3) 3-4	3.702e-07	2.613e-09	-6.432	-8.583	-2.151	(0)
	UO2 (CO3) 2-2	3.174e-08	9.201e-09	-7.498	-8.036	-0.538	(0)
	UO2CO3	8.138e-11	8.138e-11	-10.089	-10.089	0.000	(0)
	UO2OH+	2.053e-13	1.506e-13	-12.688	-12.822	-0.134	(0)
	UO2F+	1.723e-13	1.264e-13	-12.764	-12.898	-0.134	(0)
	UO2H3SiO4+	1.141e-13	8.375e-14	-12.943	-13.077	-0.134	(0)
	UO2F2	9.257e-14	9.257e-14	-13.034	-13.034	0.000	(0)
	UO2SO4	3.577e-14	3.577e-14	-13.446	-13.446	0.000	(0)
	UO2 (SO4) 2-2	1.066e-14	3.090e-15	-13.972	-14.510	-0.538	(0)
	UO2+2	8.715e-15	3.607e-15	-14.060	-14.443	-0.383	(0)
	UO2F3-	8.046e-15	5.904e-15	-14.094	-14.229	-0.134	(0)
	UO2Cl+	4.455e-17	3.269e-17	-16.351	-16.486	-0.134	(0)
	UO2F4-2	4.107e-17	1.191e-17	-16.386	-16.924	-0.538	(0)
	(UO2) 2 (OH) 2+2	1.299e-19	3.765e-20	-18.886	-19.424	-0.538	(0)
	(UO2) 3 (OH) 5+	6.451e-22	4.734e-22	-21.190	-21.325	-0.134	(0)
	UO2NO3+	1.808e-22	1.327e-22	-21.743	-21.877	-0.134	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-42.261	-42.396	-0.134	(0)
	V+2	0.000e+00	0.000e+00	-42.889	-43.426	-0.538	(0)
V (3)	4.220e-15						
	V (OH) 3	4.220e-15	4.220e-15	-14.375	-14.375	0.000	(0)
	V (OH) 2+	1.128e-25	8.277e-26	-24.948	-25.082	-0.134	(0)
	VOH+2	8.221e-29	2.383e-29	-28.085	-28.623	-0.538	(0)
	V+3	2.325e-33	1.434e-34	-32.634	-33.844	-1.210	(0)
	VSO4+	6.042e-34	4.434e-34	-33.219	-33.353	-0.134	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-54.043	-55.253	-1.210	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-54.295	-56.446	-2.151	(0)
V (4)	5.736e-18						
	V (OH) 3+	5.295e-18	3.885e-18	-17.276	-17.411	-0.134	(0)
	VO+2	2.028e-19	5.877e-20	-18.693	-19.231	-0.538	(0)
	VOF+	1.220e-19	8.950e-20	-18.914	-19.048	-0.134	(0)
	VOSO4	1.061e-19	1.061e-19	-18.974	-18.974	0.000	(0)
	VOF2	8.521e-21	8.521e-21	-20.070	-20.070	0.000	(0)
	VOC1+	1.256e-21	9.214e-22	-20.901	-21.036	-0.134	(0)

VOF3-	1.046e-22	7.676e-23	-21.980	-22.115	-0.134	(0)
VOF4-2	2.714e-25	7.867e-26	-24.566	-25.104	-0.538	(0)
H2V2O4+2	2.616e-30	7.583e-31	-29.582	-30.120	-0.538	(0)
V (5)	1.342e-08					
H2VO4-	1.109e-08	8.137e-09	-7.955	-8.090	-0.134	(0)
HVO4-2	2.325e-09	6.741e-10	-8.633	-9.171	-0.538	(0)
H3VO4	2.467e-12	2.467e-12	-11.608	-11.608	0.000	(0)
H3V2O7-	1.769e-13	1.298e-13	-12.752	-12.887	-0.134	(0)
HV2O7-3	3.018e-14	1.861e-15	-13.520	-14.730	-1.210	(0)
VO4-3	1.807e-15	1.114e-16	-14.743	-15.953	-1.210	(0)
V2O7-4	2.340e-16	1.652e-18	-15.631	-17.782	-2.151	(0)
VO2+	1.865e-16	1.496e-16	-15.729	-15.825	-0.096	(0)
VO2F	6.662e-17	6.662e-17	-16.176	-16.176	0.000	(0)
VO2SO4-	3.190e-17	2.341e-17	-16.496	-16.631	-0.134	(0)
V3O9-3	9.183e-18	5.661e-19	-17.037	-18.247	-1.210	(0)
VO2F2-	8.370e-18	6.142e-18	-17.077	-17.212	-0.134	(0)
VO2F3-2	6.710e-20	1.945e-20	-19.173	-19.711	-0.538	(0)
V4O12-4	2.723e-22	1.923e-24	-21.565	-23.716	-2.151	(0)
VO2F4-3	3.941e-23	2.430e-24	-22.404	-23.614	-1.210	(0)
VO2NO3	1.395e-24	1.395e-24	-23.855	-23.855	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-57.216	-62.057	-4.840	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.027	-61.388	-3.361	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.548	-63.699	-2.151	(0)
Zn	9.867e-06					
Zn+2	5.079e-06	2.102e-06	-5.294	-5.677	-0.383	(0)
ZnSO4	3.014e-06	3.014e-06	-5.521	-5.521	0.000	(0)
ZnCO3	6.856e-07	6.856e-07	-6.164	-6.164	0.000	(0)
Zn(SO4) 2-2	5.933e-07	1.720e-07	-6.227	-6.765	-0.538	(0)
ZnHCO3+	3.321e-07	2.437e-07	-6.479	-6.613	-0.134	(0)
ZnOH+	9.504e-08	6.974e-08	-7.022	-7.157	-0.134	(0)
ZnCl+	3.714e-08	2.951e-08	-7.430	-7.530	-0.100	(0)
ZnF+	1.451e-08	1.065e-08	-7.838	-7.973	-0.134	(0)
ZnOHCl	1.281e-08	1.281e-08	-7.892	-7.892	0.000	(0)
Zn(OH) 2	3.666e-09	3.666e-09	-8.436	-8.436	0.000	(0)
ZnCl2	2.614e-10	2.614e-10	-9.583	-9.583	0.000	(0)
Zn(OH) 3-	8.306e-12	6.094e-12	-11.081	-11.215	-0.134	(0)
ZnCl3-	1.460e-12	1.160e-12	-11.836	-11.936	-0.100	(0)
ZnNO3+	1.327e-13	9.735e-14	-12.877	-13.012	-0.134	(0)
ZnSeO4	2.795e-14	2.795e-14	-13.554	-13.554	0.000	(0)
ZnCl4-2	7.692e-15	3.242e-15	-14.114	-14.489	-0.375	(0)
Zn(OH) 4-2	2.776e-16	8.048e-17	-15.557	-16.094	-0.538	(0)
Zn(NO3) 2	3.581e-22	3.581e-22	-21.446	-21.446	0.000	(0)
Zn(SeO4) 2-2	8.390e-24	2.432e-24	-23.076	-23.614	-0.538	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.951	-148.086	-0.134	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.594	-149.594	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.548	-224.682	-0.134	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.606	-227.144	-0.538	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.972	-304.510	-0.538	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-51.16	-44.88	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-38.42	-33.91	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-45.65	-33.91	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-66.79	-48.86	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-52.45	-32.42	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-27.56	-27.16	0.40	(NH4)2CrO4
(NH4)2SeO4	-22.56	-22.11	0.45	(NH4)2SeO4
Acanthite	-52.21	-88.43	-36.22	Ag2S
Ag2CO3	-11.74	-22.83	-11.09	Ag2CO3
Ag2CrO4	-21.11	-32.70	-11.59	Ag2CrO4
Ag2HVO4	-12.34	-10.86	1.48	Ag2HVO4
Ag2MoO4	-11.95	-23.50	-11.55	Ag2MoO4
Ag2O	-15.12	-2.55	12.57	Ag2O
Ag2Se	-0.11	-48.81	-48.70	Ag2Se
Ag2SeO3	-9.77	-16.92	-7.15	Ag2SeO3

Ag2SeO4	-18.74	-27.65	-8.91	Ag2SeO4
Ag2SO4	-14.95	-19.77	-4.82	Ag2SO4
Ag3AsO3	-28.52	-26.36	2.16	Ag3AsO3
Ag3AsO4	-16.89	-19.68	-2.79	Ag3AsO4
Ag3H2VO5	-17.31	-12.13	5.18	Ag3H2VO5
AgF:4H2O	-13.44	-12.39	1.05	AgF:4H2O
Agmetal	-0.56	-14.07	-13.51	Ag
AgVO3	-10.35	-9.58	0.77	AgVO3
Al (OH) 3 (am)	-1.14	9.66	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.92	-43.55	2.37	Al2 (MoO4) 3
Al2O3	-0.34	19.31	19.65	Al2O3
Al4 (OH) 10SO4	-1.30	21.40	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.00	-6.20	4.80	AlAsO4:2H2O
AlOHSO4	-4.33	-7.56	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	1.09	-0.31	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.79	-11.58	-7.79	PbSO4
Anhydrite	-0.69	-5.05	-4.36	CaSO4
Anilite	-55.25	-87.12	-31.88	Cu0.25Cu1.5S
Antlerite	-2.16	6.63	8.79	Cu3 (OH) 4SO4
Aragonite	0.19	-8.11	-8.30	CaCO3
Arsenolite	-87.41	-90.17	-2.76	As4O6
Artinite	-5.06	4.54	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.42	-31.72	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2 (OH) 3Cl
Azurite	0.19	-16.71	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.80	7.59	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.29	-1.42	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.02	-8.93	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.77	6.17	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.89	-22.56	-9.67	BaCrO4
BaF2	-8.81	-14.63	-5.82	BaF2
BaMoO4	-6.40	-13.36	-6.96	BaMoO4
Barite	0.36	-9.62	-9.98	BaSO4
BaS	-94.47	-78.29	16.18	BaS
BaSeO3	-8.61	-6.78	1.83	BaSeO3
BaSeO4	-10.05	-17.51	-7.46	BaSeO4
Bianchite	-6.10	-7.86	-1.76	ZnSO4:6H2O
Birnessite	-7.50	10.59	18.09	MnO2
Bixbyite	-3.76	-4.40	-0.64	Mn2O3
BlaubleiI	-55.00	-79.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.56	-82.84	-27.28	Cu0.6Cu0.8S
Boehmite	1.08	9.66	8.58	AlOOH
Breithauptite	-56.87	-75.39	-18.52	NiSb
Brochantite	-0.64	14.58	15.22	Cu4 (OH) 6SO4
Brucite	-4.43	12.41	16.84	Mg (OH) 2
Bunsenite	-4.67	7.78	12.45	NiO
Ca (VO3) 2	-10.10	-4.44	5.66	Ca (VO3) 2
Ca2V2O7	-9.77	7.73	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.82	7.73	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.50	4.80	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.06	19.90	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-19.96	19.90	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-298.37	-155.39	142.97	Ca3Sb2
CaCrO4	-15.72	-17.98	-2.27	CaCrO4
Calcite	0.37	-8.11	-8.48	CaCO3
Calomel	-6.17	-24.08	-17.91	Hg2Cl2
CaMoO4	-0.83	-8.78	-7.95	CaMoO4
Carnotite	-2.78	-2.55	0.23	KUO2VO4
CaSeO3:2H2O	-5.02	-2.21	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.91	-12.93	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-11.67	-1.83	9.84	Cd (BO2) 2
Cd (OH) 2	-7.01	6.63	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-7.10	6.63	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-21.25	-14.54	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-19.88	2.68	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-19.09	9.31	28.40	Cd4 (OH) 6SO4
CdCl2	-12.25	-12.91	-0.66	CdCl2

CdCl2:1H2O	-11.22	-12.91	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.00	-12.91	-1.91	CdCl2:2.5H2O
CdF2	-14.38	-15.59	-1.21	CdF2
Cdmetal (alpha)	-32.46	-18.95	13.51	Cd
Cdmetal (gamma)	-32.57	-18.95	13.62	Cd
CdMoO4	-0.17	-14.32	-14.15	CdMoO4
CdOHC1	-6.68	-3.14	3.54	CdOHC1
CdSb	-76.18	-76.53	-0.35	CdSb
CdSe	-19.43	-39.63	-20.20	CdSe
CdSeO4:2H2O	-16.62	-18.47	-1.85	CdSeO4:2H2O
CdSO4	-10.41	-10.59	-0.17	CdSO4
CdSO4:1H2O	-8.86	-10.59	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.71	-10.59	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.30	-11.05	-9.75	AgCl
Cerrusite	-1.51	-14.64	-13.13	PbCO3
CH4 (g)	-81.56	-122.61	-41.05	CH4
Chalcanthite	-6.63	-9.27	-2.64	CuSO4:5H2O
Chalcedony	-0.69	-4.24	-3.55	SiO2
Chalcocite	-55.27	-90.19	-34.92	Cu2S
Chalcopyrite	-125.01	-160.28	-35.27	CuFeS2
Chrysotile	-3.44	28.76	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-51.26	-96.95	-45.69	HgS
Claudetite	-87.10	-90.17	-3.06	As4O6
Clausthalite	-13.52	-40.62	-27.10	PbSe
Co (BO2) 2	-28.01	-0.94	27.07	Co (BO2) 2
Co (OH) 2	-5.57	7.52	13.09	Co (OH) 2
Co (OH) 3	-9.78	-12.09	-2.31	Co (OH) 3
CO2 (g)	-2.14	-20.28	-18.15	CO2
Co3 (AsO4) 2	-22.19	-9.15	13.03	Co3 (AsO4) 2
Co3O4	-6.16	-16.65	-10.50	Co3O4
CoCl2	-20.29	-12.02	8.27	CoCl2
CoCl2:6H2O	-14.56	-12.02	2.54	CoCl2:6H2O
CoCO3	-2.78	-12.76	-9.98	CoCO3
CoF2	-13.11	-14.71	-1.60	CoF2
CoF3	-43.97	-45.43	-1.46	CoF3
CoFe2O4	17.66	14.13	-3.53	CoFe2O4
CoMoO4	-5.67	-13.43	-7.76	CoMoO4
CoO	-6.07	7.52	13.59	CoO
CoS (alpha)	-70.92	-78.36	-7.44	CoS
CoS (beta)	-67.29	-78.36	-11.07	CoS
CoSe	-22.54	-38.74	-16.20	CoSe
CoSeO3	-8.17	-6.85	1.32	CoSeO3
CoSeO4:6H2O	-16.05	-17.58	-1.53	CoSeO4:6H2O
CoSO4	-12.50	-9.70	2.80	CoSO4
CoSO4:6H2O	-7.23	-9.70	-2.47	CoSO4:6H2O
Cotunnite	-9.12	-13.90	-4.78	PbCl2
Covellite	-55.64	-77.94	-22.30	CuS
Cr (OH) 2	-21.81	-10.99	10.82	Cr (OH) 2
Cr (OH) 3	-2.49	-1.15	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.40	-1.15	-0.75	Cr (OH) 3
Cr2O3	0.06	-2.30	-2.36	Cr2O3
CrCl2	-44.63	-30.53	14.09	CrCl2
CrCl3	-45.58	-30.46	15.11	CrCl3
CrF3	-23.15	-34.49	-11.34	CrF3
Cristobalite	-0.89	-4.24	-3.35	SiO2
Crmetal	-67.06	-36.57	30.48	Cr
CrO3	-26.94	-30.15	-3.21	CrO3
Cryolite	-5.99	-39.83	-33.84	Na3AlF6
Cu (OH) 2	-0.72	7.95	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.52	20.69	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.60	0.65	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.27	-90.16	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.76	-50.56	-45.80	Cu2Se
Cu2SO4	-19.57	-21.52	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.97	-7.87	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.81	-102.41	-42.59	Cu3Sb
Cu3Se2	-25.38	-88.87	-63.49	Cu3Se2
CuCO3	-0.83	-12.33	-11.50	CuCO3

CuCrO4	-16.76	-22.20	-5.44	CuCrO4
CuF	-8.36	-13.26	-4.91	CuF
CuF2	-15.39	-14.28	1.12	CuF2
CuF2:2H2O	-9.73	-14.28	-4.55	CuF2:2H2O
Cumetal	-6.19	-14.94	-8.76	Cu
CuMoO4	0.07	-13.01	-13.08	CuMoO4
CuOCuSO4	-11.62	-1.32	10.30	CuOCuSO4
Cupricferrite	8.57	14.56	5.99	CuFe2O4
Cuprite	-2.89	-4.30	-1.41	Cu2O
Cuprousferrite	10.07	1.15	-8.92	CuFeO2
CuSe	-5.21	-38.31	-33.10	CuSe
CuSe2	-25.62	-58.99	-33.37	CuSe2
CuSeO3:2H2O	-6.94	-6.43	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.71	-17.15	-2.44	CuSeO4:5H2O
CuSO4	-12.21	-9.27	2.94	CuSO4
Diaspore	2.78	9.66	6.87	AlOOH
Djurleite	-55.46	-89.38	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.56	-15.98	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.11	-15.98	-17.09	CaMg(CO3)2
Epsomite	-2.68	-4.81	-2.13	MgSO4:7H2O
Fe(OH)2	-10.02	3.54	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.41	0.37	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.35	-13.07	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.32	-7.77	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.89	-36.52	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.32	-45.05	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.07	10.15	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.95	-12.55	0.40	FeAsO4:2H2O
FeCr2O4	-5.95	1.25	7.20	FeCr2O4
FeMoO4	-7.32	-17.41	-10.09	FeMoO4
Ferrihydrite	0.11	3.30	3.19	Fe(OH)3
Ferroselite	-44.80	-63.39	-18.60	FeSe2
FeS(ppt)	-79.39	-82.34	-2.95	FeS
FeSe	-31.72	-42.72	-11.00	FeSe
Fix_pe	-5.27	-5.27	0.00	e-
Fluorite	0.44	-10.06	-10.50	CaF2
Galena	-66.27	-80.24	-13.97	PbS
Gibbsite	1.36	9.66	8.29	Al(OH)3
Goethite	2.81	3.30	0.49	FeOOH
Goslarite	-5.85	-7.86	-2.01	ZnSO4:7H2O
Greenalite	-18.66	2.15	20.81	Fe3Si2O5(OH)4
Greenockite	-64.89	-79.25	-14.36	CdS
Greigite	-288.36	-333.39	-45.03	Fe3S4
Gummite	-7.08	0.59	7.67	UO3
Gypsum	-0.44	-5.05	-4.61	CaSO4:2H2O
H-Jarosite	-12.43	-24.53	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.08	-20.96	-12.88	H2MoO4
H2S(g)	-77.88	-85.89	-8.01	H2S
H2Se(g)	-41.30	-46.26	-4.96	H2Se
Halite	-5.64	-4.04	1.60	NaCl
Halloysite	1.26	10.83	9.57	Al2Si2O5(OH)4
Hausmannite	-4.38	56.65	61.03	Mn3O4
Hematite	8.03	6.61	-1.42	Fe2O3
Hercynite	-0.03	22.86	22.89	FeAl2O4
Hg(CH3)2(g)	-182.58	-256.29	-73.71	Hg(CH3)2
Hg(g)	-7.18	-15.06	-7.87	Hg
Hg(OH)2	-7.57	-11.07	-3.50	Hg(OH)2
Hg2(g)	-15.16	-30.12	-14.96	Hg2
Hg2(OH)2	-9.79	-4.53	5.26	Hg2(OH)2
Hg2CO3	-8.77	-24.82	-16.05	Hg2CO3
Hg2CrO4	-25.99	-34.69	-8.70	Hg2CrO4
Hg2F2	-16.40	-26.76	-10.36	Hg2F2
Hg2S	-78.74	-90.42	-11.68	Hg2S
Hg2SeO3	-14.25	-18.91	-4.66	Hg2SeO3
Hg2SO4	-15.62	-21.75	-6.13	Hg2SO4
Hg3O2CO3	-23.81	-53.49	-29.68	Hg3O2CO3
HgCl(g)	-31.53	-12.04	19.50	HgCl
HgCl2	-9.35	-30.61	-21.26	HgCl2

HgF(g)	-46.06	-13.38	32.68	HgF
HgF2(g)	-45.86	-33.30	12.57	HgF2
Hgmetal(l)	-1.61	-15.06	-13.45	Hg
HgSe	-1.64	-57.33	-55.69	HgSe
HgSeO3	-13.01	-25.44	-12.43	HgSeO3
HgSO4	-18.87	-28.29	-9.42	HgSO4
Huntite	-1.75	-31.72	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.87	-23.64	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-10.30	-19.06	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-14.46	-19.63	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-4.57	-19.37	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-32.74	-49.98	-17.24	K2Cr2O7
K2CrO4	-19.32	-19.83	-0.51	K2CrO4
K2MoO4	-13.89	-10.63	3.26	K2MoO4
K2SeO4	-14.05	-14.78	-0.73	K2SeO4
Kaolinite	3.40	10.83	7.43	Al2Si2O5(OH)4
Langite	-2.91	14.58	17.49	Cu4(OH)6SO4·H2O
Larnakite	-5.50	-5.93	-0.43	PbO:PbSO4
Laurionite	-4.75	-4.13	0.62	PbOHCl
Lepidocrocite	1.93	3.30	1.37	FeOOH
Lime	-20.53	12.17	32.70	CaO
Litharge	-7.05	5.64	12.69	PbO
Mackinawite	-78.74	-82.34	-3.60	FeS
Maghemite	0.22	6.61	6.39	Fe2O3
Magnesioferrite	2.16	19.02	16.86	Fe2MgO4
Magnesite	-0.41	-7.87	-7.46	MgCO3
Magnetite	6.75	10.15	3.40	Fe3O4
Malachite	0.92	-4.38	-5.31	Cu2(OH)2CO3
Manganite	-2.19	23.15	25.34	MnOOH
Massicot	-7.25	5.64	12.89	PbO
Matlockite	-6.27	-15.24	-8.97	PbClF
Melanothallite	-17.85	-11.59	6.26	CuCl2
Melanterite	-11.47	-13.68	-2.21	FeSO4·7H2O
Metacinnabar	-51.86	-96.95	-45.09	HgS
Mg(OH)2(active)	-6.38	12.41	18.79	Mg(OH)2
Mg(VO3)2	-15.48	-4.20	11.28	Mg(VO3)2
Mg2Sb3	-273.77	-199.08	74.68	Mg2Sb3
Mg2V2O7	-18.15	8.21	26.36	Mg2V2O7
MgCr2O4	-6.09	10.12	16.20	MgCr2O4
MgCrO4	-23.12	-17.74	5.38	MgCrO4
MgF2	-1.68	-9.81	-8.13	MgF2
MgMoO4	-6.69	-8.54	-1.85	MgMoO4
MgSeO3:6H2O	-5.02	-1.97	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.49	-12.69	-1.20	MgSeO4:6H2O
Minium	-31.01	42.51	73.52	Pb3O4
Mirabilite	-4.65	-5.76	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.16	-6.26	4.90	Mn(VO3)2
Mn2(SO4)3	-50.35	-56.06	-5.71	Mn2(SO4)3
Mn2Sb	-149.11	-88.03	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.15	-0.65	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.90	-9.19	2.72	MnCl2:4H2O
MnS(grn)	-75.70	-75.53	0.17	MnS
MnS(pnk)	-78.87	-75.53	3.34	MnS
MnSb	-95.25	-98.16	-2.91	MnSb
MnSe	-39.40	-35.90	3.50	MnSe
MnSeO3	-5.15	-4.02	1.13	MnSeO3
MnSeO3:2H2O	-5.00	-4.02	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.70	-14.75	-2.05	MnSeO4:5H2O
MnSO4	-9.45	-6.86	2.58	MnSO4
Monteponite	-8.47	6.63	15.10	CdO
Montroydite	-7.43	-11.07	-3.64	HgO
MoO3	-12.96	-20.96	-8.00	MoO3
Morenosite	-7.30	-9.45	-2.14	NiSO4:7H2O
MoS2	-148.05	-218.31	-70.26	MoS2
Na-Jarosite	-7.60	-18.80	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.95	-48.84	-9.90	Na2Cr2O7
Na2CrO4	-21.62	-18.69	2.93	Na2CrO4
Na2Mo2O7	-13.85	-30.45	-16.60	Na2Mo2O7

Na2MoO4	-10.98	-9.49	1.49	Na2MoO4
Na2MoO4:2H2O	-10.72	-9.49	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.22	-2.92	10.30	Na2SeO3:5H2O
Na2SeO4	-14.92	-13.64	1.28	Na2SeO4
Na3Sb	-173.21	-78.76	94.45	Na3Sb
Na3VO4	-27.79	8.89	36.68	Na3VO4
Na4V2O7	-31.09	6.31	37.40	Na4V2O7
Nantokite	-5.19	-11.92	-6.73	CuCl
NaSb	-87.81	-64.64	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-6.43	-2.58	3.86	NaVO3
Nesquehonite	-3.20	-7.87	-4.67	MgCO3:3H2O
Ni(OH)2	-5.02	7.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.09	-8.39	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.12	13.88	32.00	Ni4(OH)6SO4
NiCO3	-5.64	-12.51	-6.87	NiCO3
NiMoO4	-2.04	-13.18	-11.14	NiMoO4
NiS(alpha)	-72.51	-78.11	-5.60	NiS
NiS(beta)	-67.01	-78.11	-11.10	NiS
NiS(gamma)	-65.31	-78.11	-12.80	NiS
NiSe	-20.79	-38.49	-17.70	NiSe
NiSeO3:2H2O	-9.42	-6.60	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.81	-17.33	-1.52	NiSeO4:6H2O
Nsutite	-6.92	10.59	17.50	MnO2
O2(g)	-31.93	51.16	83.09	O2
Orpiment	-241.67	-302.74	-61.07	As2S3
Otavite	-1.65	-13.65	-12.00	CdCO3
Pb(BO2)2	-9.34	-2.82	6.52	Pb(BO2)2
Pb(OH)2	-2.51	5.64	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-56.51	-65.27	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.28	1.51	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.90	11.29	26.19	Pb2O(OH)2
Pb2O3	-24.17	36.87	61.04	Pb2O3
Pb2OCO3	-8.44	-9.00	-0.56	Pb2OCO3
Pb2V2O7	-3.43	-5.33	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.59	-14.79	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.83	0.31	6.14	Pb3(VO4)2
Pb3O2CO3	-14.37	-3.35	11.02	Pb3O2CO3
Pb3O2SO4	-10.98	-0.29	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.75	5.35	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.52	5.35	21.88	Pb4O3SO4
PbCrO4	-11.91	-24.51	-12.60	PbCrO4
PbF2	-9.14	-16.58	-7.44	PbF2
Pbmetal	-24.18	-19.94	4.25	Pb
PbMoO4	0.31	-15.31	-15.62	PbMoO4
PbO:0.3H2O	-7.34	5.64	12.98	PbO:0.33H2O
PbSeO4	-12.62	-19.46	-6.84	PbSeO4
Periclase	-9.17	12.41	21.58	MgO
Phosgenite	-8.73	-28.54	-19.81	PbCl2:PbCO3
Plattnerite	-18.38	31.22	49.60	PbO2
Portlandite	-10.63	12.17	22.80	Ca(OH)2
Pyrite	-124.14	-142.65	-18.51	FeS2
Pyrochroite	-4.84	10.36	15.19	Mn(OH)2
Pyrolusite	-5.44	35.94	41.38	MnO2
Quartz	-0.24	-4.24	-4.00	SiO2
Realgar	-101.47	-121.22	-19.75	AsS
Retgersite	-7.41	-9.45	-2.04	NiSO4:6H2O
Rhodochrosite	0.65	-9.93	-10.58	MnCO3
Rutherfordine	-5.19	-19.69	-14.50	UO2CO3
Sb(OH)3	-12.10	-19.21	-7.11	Sb(OH)3
Sb2O4	-16.24	-12.84	3.40	Sb2O4
Sb2O5	-26.21	-35.88	-9.67	Sb2O5
Sb2Se3	-109.44	-177.20	-67.76	Sb2Se3
Sb4O6(cubic)	-58.58	-76.84	-18.26	Sb4O6
Sb4O6(orth)	-58.94	-76.84	-17.90	Sb4O6
SbCl3	-49.09	-48.52	0.57	SbCl3
SbF3	-42.32	-52.55	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb

SbO2	-2.90	-30.73	-27.82	SbO2
Schoepite	-5.40	0.59	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.57	-20.68	-7.11	Se
Semetal (hex)	-12.97	-20.68	-7.71	Se
Senarmontite	-26.05	-38.42	-12.37	Sb2O3
SeO2	-14.50	-14.38	0.12	SeO2
SeO3	-46.15	-25.10	21.04	SeO3
Sepiolite	-3.65	12.11	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-6.67	12.11	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.50	-16.74	-10.24	FeCO3
SiO2 (am-gel)	-1.53	-4.24	-2.71	SiO2
SiO2 (am-ppt)	-1.50	-4.24	-2.74	SiO2
Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-65.08	-76.53	-11.45	ZnS
Spinel	-5.12	31.73	36.85	MgAl2O4
Stibnite	-245.62	-296.08	-50.46	Sb2S3
Sulfur	-58.16	-60.30	-2.14	S
Tenorite	0.31	7.95	7.64	CuO
Thenardite	-6.08	-5.76	0.32	Na2SO4
Thermonatrite	-9.46	-8.82	0.64	Na2CO3:H2O
Tyuyamunite	-7.34	-3.26	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-17.24	3.85	21.08	U3O8
U3Sb4	-583.52	-431.14	152.38	U3Sb4
U4O9	-34.49	-37.51	-3.02	U4O9
UF4	-30.69	-60.23	-29.54	UF4
UF4:2.5H2O	-27.51	-60.23	-32.72	UF4:2.5H2O
UO2 (am)	-16.71	-15.77	0.93	UO2
UO2 (NO3) 2	-42.06	-29.91	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.76	-29.91	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.30	-29.91	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.96	-29.91	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-5.02	0.59	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.26	-24.51	-2.25	UO2SeO4:4H2O
UO3	-7.11	0.59	7.70	UO3
Uraninite	-11.10	-15.77	-4.67	UO2
USb2	-220.89	-191.32	29.58	USb2
V (OH) 3	-18.88	-11.29	7.59	V (OH) 3
V2O5	-15.25	-16.61	-1.36	V2O5
V3O5	-40.00	-38.17	1.84	V3O5
V4O7	-49.55	-42.36	7.19	V4O7
V6O13	-40.15	-101.01	-60.86	V6O13
Valentinite	-29.94	-38.42	-8.48	Sb2O3
VC12	-62.50	-43.62	18.87	VC12
VC13	-64.03	-40.60	23.43	VC13
VF4	-63.58	-48.65	14.93	VF4
Vmetal	-93.69	-49.66	44.03	V
VO	-38.84	-24.08	14.76	VO
VO (OH) 2	-9.35	-4.20	5.15	VO (OH) 2
VO2Cl	-20.92	-18.08	2.84	VO2Cl
VOC1	-32.21	-21.06	11.15	VOC1
VOC12	-36.50	-23.74	12.76	VOC12
VOSO4	-25.02	-21.41	3.61	VOSO4
Witherite	-4.12	-12.69	-8.57	BaCO3
Wurtzite	-67.58	-76.53	-8.95	ZnS
Zincite	-1.98	9.36	11.33	ZnO
Zincosite	-11.79	-7.86	3.93	ZnSO4
Zn (BO2) 2	-7.39	0.90	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.46	-21.15	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-2.84	9.36	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-3.12	9.36	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-2.40	9.36	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-2.18	9.36	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-2.38	9.36	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-6.00	1.50	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-6.25	8.95	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-17.29	-3.64	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-25.28	-6.36	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-8.19	20.21	28.40	Zn4 (OH) 6SO4

Zn5(OH)8Cl2	-11.25	27.25	38.50	Zn5(OH)8Cl2
ZnCl2	-17.23	-10.18	7.05	ZnCl2
ZnCO3:1H2O	-0.66	-10.92	-10.26	ZnCO3:1H2O
ZnF2	-12.33	-12.87	-0.53	ZnF2
Znmetal	-42.01	-16.22	25.79	Zn
ZnMoO4	-1.47	-11.60	-10.13	ZnMoO4
ZnO(active)	-1.83	9.36	11.19	ZnO
ZnS(am)	-67.48	-76.53	-9.05	ZnS
ZnSb	-84.82	-73.81	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-14.23	-15.75	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.22	-7.86	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 144.

Title Return solution back to 1L
Mix 805
812 2.0167
save solution 813
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 805.

Mixture 805.

2.017e+00 Solution 812 Solution after simulation 143.

-----Solution composition-----

Elements	Molality	Moles
Ag	3.307e-08	3.304e-08
Al	4.069e-06	4.064e-06
As	3.638e-10	3.634e-10
B	5.941e-05	5.935e-05
Ba	8.949e-08	8.940e-08
C	5.083e-03	5.078e-03
Ca	5.483e-03	5.477e-03
Cd	2.104e-08	2.102e-08
Cl	6.967e-03	6.959e-03
Co	1.616e-07	1.614e-07
Cr	3.475e-09	3.471e-09
Cu	3.354e-06	3.350e-06
F	4.096e-04	4.092e-04
Fe	2.511e-09	2.508e-09
Hg	3.320e-09	3.316e-09
K	5.742e-03	5.735e-03
Mg	8.824e-03	8.814e-03

Mn	9.898e-05	9.887e-05
Mo	2.906e-06	2.903e-06
N	2.430e-05	2.428e-05
Na	2.114e-02	2.112e-02
Ni	2.518e-07	2.515e-07
Pb	1.182e-08	1.181e-08
S	2.172e-02	2.169e-02
Sb	4.431e-08	4.427e-08
Se	2.519e-07	2.516e-07
Si	5.680e-05	5.674e-05
U	4.020e-07	4.016e-07
V	1.342e-08	1.340e-08
Zn	9.867e-06	9.856e-06

-----Description of solution-----

	pH	=	7.518	Charge balance
	pe	=	5.273	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	6.949e-02	
	Mass of water (kg)	=	9.989e-01	
	Total alkalinity (eq/kg)	=	4.896e-03	
	Total CO2 (mol/kg)	=	5.083e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.873e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.108989e+02	
	Total O	=	5.554910e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.206e-07	3.317e-07	-6.376	-6.479	-0.103	(0)
H+	3.780e-08	3.032e-08	-7.422	-7.518	-0.096	0.00
H2O	5.551e+01	9.988e-01	1.744	-0.001	0.000	18.07
Ag	3.307e-08					
AgCl	1.840e-08	1.840e-08	-7.735	-7.735	0.000	(0)
AgCl2-	1.221e-08	8.956e-09	-7.913	-8.048	-0.134	(0)
Ag+	2.011e-09	1.613e-09	-8.697	-8.792	-0.096	(0)
AgSO4-	2.873e-10	2.108e-10	-9.542	-9.676	-0.134	(0)
AgCl3-2	1.539e-10	4.460e-11	-9.813	-10.351	-0.538	(0)
AgCl4-3	8.254e-12	5.089e-13	-11.083	-12.293	-1.210	(0)
AgNO2	6.048e-12	6.048e-12	-11.218	-11.218	0.000	(0)
AgF	1.029e-12	1.029e-12	-11.988	-11.988	0.000	(0)
AgNH3+	8.046e-14	5.904e-14	-13.094	-13.229	-0.134	(0)
AgOH	5.350e-14	5.350e-14	-13.272	-13.272	0.000	(0)
AgH2BO3	2.870e-14	2.870e-14	-13.542	-13.542	0.000	(0)
AgSeO3-	2.571e-14	1.886e-14	-13.590	-13.724	-0.134	(0)
Ag2Se	1.263e-14	1.263e-14	-13.899	-13.899	0.000	(0)
Ag(NO2)2-	2.292e-16	1.681e-16	-15.640	-15.774	-0.134	(0)
AgNO3	2.362e-17	2.362e-17	-16.627	-16.627	0.000	(0)
Ag(NH3)2+	1.172e-17	8.603e-18	-16.931	-17.065	-0.134	(0)
Ag(OH)2-	2.363e-18	1.734e-18	-17.626	-17.761	-0.134	(0)
Ag(SeO3)2-3	4.986e-20	3.074e-21	-19.302	-20.512	-1.210	(0)
Ag2MoO4	1.184e-24	1.184e-24	-23.927	-23.927	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.346	-73.346	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.082	-84.233	-2.151	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-147.346	-147.580	-0.234	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-147.480	-147.614	-0.134	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-149.085	-149.501	-0.417	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.419	-149.812	-0.393	(0)
Al	4.069e-06					
Al(OH)4-	3.821e-06	3.058e-06	-5.418	-5.515	-0.097	(0)

AlF3	1.038e-07	1.038e-07	-6.984	-6.984	0.000	(0)
Al(OH)3	7.322e-08	7.322e-08	-7.135	-7.135	0.000	(0)
AlF2+	4.012e-08	3.249e-08	-7.397	-7.488	-0.092	(0)
AlF4-	1.651e-08	1.321e-08	-7.782	-7.879	-0.097	(0)
Al(OH)2+	1.366e-08	1.106e-08	-7.864	-7.956	-0.092	(0)
AlF+2	7.474e-10	3.214e-10	-9.126	-9.493	-0.366	(0)
AlOH+2	9.764e-11	4.199e-11	-10.010	-10.377	-0.366	(0)
AlSO4+	8.045e-12	6.439e-12	-11.094	-11.191	-0.097	(0)
Al+3	9.212e-13	1.266e-13	-12.036	-12.898	-0.862	(0)
Al(SO4)2-	5.648e-13	4.520e-13	-12.248	-12.345	-0.097	(0)
AlMo6O21-3	4.759e-38	2.934e-39	-37.323	-38.533	-1.210	(0)
As (3)	2.935e-23					
H3AsO3	2.869e-23	2.869e-23	-22.542	-22.542	0.000	(0)
H2AsO3-	6.614e-25	4.853e-25	-24.180	-24.314	-0.134	(0)
HAsO3-2	5.036e-29	1.460e-29	-28.298	-28.836	-0.538	(0)
H4AsO3+	5.875e-31	4.310e-31	-30.231	-30.365	-0.134	(0)
AsO3-3	3.010e-34	1.856e-35	-33.521	-34.731	-1.210	(0)
As (5)	3.638e-10					
HAsO4-2	3.278e-10	9.503e-11	-9.484	-10.022	-0.538	(0)
H2AsO4-	3.581e-11	2.628e-11	-10.446	-10.580	-0.134	(0)
AsO4-3	1.608e-13	9.911e-15	-12.794	-14.004	-1.210	(0)
H3AsO4	1.363e-16	1.385e-16	-15.866	-15.859	0.007	(0)
B	5.941e-05					
H3BO3	5.769e-05	5.862e-05	-4.239	-4.232	0.007	(0)
H2BO3-	1.448e-06	1.123e-06	-5.839	-5.950	-0.111	(0)
MgH2BO3+	1.199e-07	9.295e-08	-6.921	-7.032	-0.111	(0)
CaH2BO3+	1.139e-07	8.829e-08	-6.944	-7.054	-0.111	(0)
NaH2BO3	2.911e-08	2.911e-08	-7.536	-7.536	0.000	(0)
BF(OH)3-	7.660e-09	5.939e-09	-8.116	-8.226	-0.111	(0)
H5(BO3)2-	7.226e-11	5.603e-11	-10.141	-10.252	-0.111	(0)
BF2(OH)2-	6.312e-12	4.894e-12	-11.200	-11.310	-0.111	(0)
BaH2BO3+	1.627e-12	1.261e-12	-11.789	-11.899	-0.111	(0)
H8(BO3)3-	4.236e-13	3.285e-13	-12.373	-12.484	-0.111	(0)
AgH2BO3	2.870e-14	2.870e-14	-13.542	-13.542	0.000	(0)
BF3OH-	1.893e-17	1.467e-17	-16.723	-16.833	-0.111	(0)
BF4-	7.178e-22	5.565e-22	-21.144	-21.255	-0.111	(0)
Ba	8.949e-08					
Ba+2	8.783e-08	3.635e-08	-7.056	-7.439	-0.383	(0)
BaHCO3+	1.560e-09	1.272e-09	-8.807	-8.895	-0.088	(0)
BaCO3	1.057e-10	1.057e-10	-9.976	-9.976	0.000	(0)
BaH2BO3+	1.627e-12	1.261e-12	-11.789	-11.899	-0.111	(0)
BaOH+	6.533e-14	5.264e-14	-13.185	-13.279	-0.094	(0)
BaNO3+	4.578e-15	3.359e-15	-14.339	-14.474	-0.134	(0)
BaNH3+2	1.419e-15	4.112e-16	-14.848	-15.386	-0.538	(0)
C (4)	5.083e-03					
HCO3-	4.526e-03	3.665e-03	-2.344	-2.436	-0.092	(0)
H2CO3	2.499e-04	2.499e-04	-3.602	-3.602	0.000	(0)
CaHCO3+	1.143e-04	9.325e-05	-3.942	-4.030	-0.088	(0)
MgHCO3+	1.127e-04	8.954e-05	-3.948	-4.048	-0.100	(0)
NaHCO3	3.372e-05	3.372e-05	-4.472	-4.472	0.000	(0)
CO3-2	1.369e-05	5.667e-06	-4.864	-5.247	-0.383	(0)
CaCO3	1.227e-05	1.227e-05	-4.911	-4.911	0.000	(0)
MgCO3	1.125e-05	1.125e-05	-4.949	-4.949	0.000	(0)
CuCO3	2.740e-06	2.740e-06	-5.562	-5.562	0.000	(0)
NaCO3-	2.132e-06	1.726e-06	-5.671	-5.763	-0.092	(0)
MnHCO3+	1.900e-06	1.531e-06	-5.721	-5.815	-0.094	(0)
ZnCO3	6.856e-07	6.856e-07	-6.164	-6.164	0.000	(0)
UO2(CO3)3-4	3.702e-07	2.613e-09	-6.432	-8.583	-2.151	(0)
ZnHCO3+	3.321e-07	2.437e-07	-6.479	-6.613	-0.134	(0)
Cu(CO3)2-2	1.442e-07	4.179e-08	-6.841	-7.379	-0.538	(0)
NiHCO3+	3.382e-08	2.481e-08	-7.471	-7.605	-0.134	(0)
UO2(CO3)2-2	3.174e-08	9.201e-09	-7.498	-8.036	-0.538	(0)
CuHCO3+	2.588e-08	1.899e-08	-7.587	-7.722	-0.134	(0)
CoHCO3+	1.187e-08	8.713e-09	-7.925	-8.060	-0.134	(0)
NiCO3	1.161e-08	1.161e-08	-7.935	-7.935	0.000	(0)
PbCO3	6.892e-09	6.892e-09	-8.162	-8.162	0.000	(0)
CoCO3	2.928e-09	2.928e-09	-8.533	-8.533	0.000	(0)
BaHCO3+	1.560e-09	1.272e-09	-8.807	-8.895	-0.088	(0)

	PbHCO3+	1.502e-09	1.102e-09	-8.823	-8.958	-0.134	(0)
	CdCO3	5.109e-10	5.109e-10	-9.292	-9.292	0.000	(0)
	Pb (CO3) 2-2	3.886e-10	1.126e-10	-9.410	-9.948	-0.538	(0)
	BaCO3	1.057e-10	1.057e-10	-9.976	-9.976	0.000	(0)
	UO2CO3	8.138e-11	8.138e-11	-10.089	-10.089	0.000	(0)
	CdHCO3+	4.498e-11	3.301e-11	-10.347	-10.481	-0.134	(0)
	Cd (CO3) 2-2	7.405e-12	2.146e-12	-11.130	-11.668	-0.538	(0)
	FeHCO3+	1.828e-13	1.491e-13	-12.738	-12.827	-0.088	(0)
	HgCO3	8.334e-14	8.334e-14	-13.079	-13.079	0.000	(0)
	Hg (CO3) 2-2	5.153e-15	1.494e-15	-14.288	-14.826	-0.538	(0)
	HgHCO3+	6.413e-17	4.706e-17	-16.193	-16.327	-0.134	(0)
Ca	5.483e-03						
	Ca+2	3.301e-03	1.366e-03	-2.481	-2.864	-0.383	(0)
	CaSO4	2.051e-03	2.051e-03	-2.688	-2.688	0.000	(0)
	CaHCO3+	1.143e-04	9.325e-05	-3.942	-4.030	-0.088	(0)
	CaCO3	1.227e-05	1.227e-05	-4.911	-4.911	0.000	(0)
	CaF+	4.700e-06	3.786e-06	-5.328	-5.422	-0.094	(0)
	CaH2BO3+	1.139e-07	8.829e-08	-6.944	-7.054	-0.111	(0)
	CaOH+	1.109e-08	9.043e-09	-7.955	-8.044	-0.088	(0)
	CaNO3+	1.086e-10	7.965e-11	-9.964	-10.099	-0.134	(0)
	CaNH3+2	1.064e-10	3.084e-11	-9.973	-10.511	-0.538	(0)
	Ca (NH3) 2+2	7.593e-19	2.201e-19	-18.120	-18.657	-0.538	(0)
Cd	2.104e-08						
	Cd+2	9.556e-09	3.956e-09	-8.020	-8.403	-0.383	(0)
	CdSO4	6.076e-09	6.076e-09	-8.216	-8.216	0.000	(0)
	CdCl+	2.877e-09	2.111e-09	-8.541	-8.676	-0.134	(0)
	Cd (SO4) 2-2	1.852e-09	5.370e-10	-8.732	-9.270	-0.538	(0)
	CdCO3	5.109e-10	5.109e-10	-9.292	-9.292	0.000	(0)
	CdCl2	4.917e-11	4.917e-11	-10.308	-10.308	0.000	(0)
	CdHCO3+	4.498e-11	3.301e-11	-10.347	-10.481	-0.134	(0)
	CdOHC1	2.872e-11	2.872e-11	-10.542	-10.542	0.000	(0)
	CdF+	2.169e-11	1.592e-11	-10.664	-10.798	-0.134	(0)
	CdOH+	1.420e-11	1.042e-11	-10.848	-10.982	-0.134	(0)
	Cd (CO3) 2-2	7.405e-12	2.146e-12	-11.130	-11.668	-0.538	(0)
	CdCl3-	2.363e-13	1.734e-13	-12.627	-12.761	-0.134	(0)
	Cd (OH) 2	2.181e-14	2.181e-14	-13.661	-13.661	0.000	(0)
	CdF2	8.064e-15	8.064e-15	-14.093	-14.093	0.000	(0)
	CdNO3+	3.143e-16	2.306e-16	-15.503	-15.637	-0.134	(0)
	CdSeO4	6.322e-17	6.322e-17	-16.199	-16.199	0.000	(0)
	Cd (SeO3) 2-2	3.725e-18	1.080e-18	-17.429	-17.967	-0.538	(0)
	Cd2OH+3	3.352e-18	2.066e-19	-17.475	-18.685	-1.210	(0)
	Cd (OH) 3-	6.024e-19	4.420e-19	-18.220	-18.355	-0.134	(0)
	Cd (NO3) 2	2.131e-24	2.131e-24	-23.672	-23.672	0.000	(0)
	Cd (OH) 4-2	8.279e-26	2.400e-26	-25.082	-25.620	-0.538	(0)
	CdHS+	0.000e+00	0.000e+00	-78.629	-78.763	-0.134	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.927	-149.927	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.261	-226.395	-0.134	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.030	-302.568	-0.538	(0)
Cl	6.967e-03						
	Cl-	6.967e-03	5.588e-03	-2.157	-2.253	-0.096	(0)
	MnCl+	1.828e-07	1.473e-07	-6.738	-6.832	-0.094	(0)
	ZnCl+	3.714e-08	2.951e-08	-7.430	-7.530	-0.100	(0)
	AgCl	1.840e-08	1.840e-08	-7.735	-7.735	0.000	(0)
	ZnOHC1	1.281e-08	1.281e-08	-7.892	-7.892	0.000	(0)
	AgCl2-	1.221e-08	8.956e-09	-7.913	-8.048	-0.134	(0)
	CdCl+	2.877e-09	2.111e-09	-8.541	-8.676	-0.134	(0)
	CuCl2-	2.218e-09	1.762e-09	-8.654	-8.754	-0.100	(0)
	CuCl	1.510e-09	1.510e-09	-8.821	-8.821	0.000	(0)
	MnCl2	1.162e-09	1.162e-09	-8.935	-8.935	0.000	(0)
	NiCl+	1.070e-09	7.851e-10	-8.971	-9.105	-0.134	(0)
	CuCl+	9.152e-10	7.272e-10	-9.039	-9.138	-0.100	(0)
	CoCl+	8.051e-10	5.908e-10	-9.094	-9.229	-0.134	(0)
	ZnCl2	2.614e-10	2.614e-10	-9.583	-9.583	0.000	(0)
	AgCl3-2	1.539e-10	4.460e-11	-9.813	-10.351	-0.538	(0)
	PbCl+	1.093e-10	8.022e-11	-9.961	-10.096	-0.134	(0)
	CdCl2	4.917e-11	4.917e-11	-10.308	-10.308	0.000	(0)
	HgClOH	4.023e-11	4.023e-11	-10.395	-10.395	0.000	(0)
	HgCl2	3.838e-11	3.838e-11	-10.416	-10.416	0.000	(0)

CdOHC1	2.872e-11	2.872e-11	-10.542	-10.542	0.000	(0)
AgCl4-3	8.254e-12	5.089e-13	-11.083	-12.293	-1.210	(0)
CuCl3-2	4.996e-12	2.106e-12	-11.301	-11.677	-0.375	(0)
HgCl3-	2.923e-12	2.144e-12	-11.534	-11.669	-0.134	(0)
MnCl3-	2.221e-12	1.789e-12	-11.654	-11.747	-0.094	(0)
PbCl2	2.002e-12	2.002e-12	-11.698	-11.698	0.000	(0)
ZnCl3-	1.460e-12	1.160e-12	-11.836	-11.936	-0.100	(0)
CuCl2	1.409e-12	1.409e-12	-11.851	-11.851	0.000	(0)
CdCl3-	2.363e-13	1.734e-13	-12.627	-12.761	-0.134	(0)
HgCl4-2	1.646e-13	4.771e-14	-12.784	-13.321	-0.538	(0)
NiCl2	2.209e-14	2.209e-14	-13.656	-13.656	0.000	(0)
ZnCl4-2	7.692e-15	3.242e-15	-14.114	-14.489	-0.375	(0)
PbCl3-	6.071e-15	4.454e-15	-14.217	-14.351	-0.134	(0)
HgCl+	1.867e-15	1.370e-15	-14.729	-14.863	-0.134	(0)
CrCl+2	1.831e-16	5.307e-17	-15.737	-16.275	-0.538	(0)
CuCl3-	9.247e-17	7.348e-17	-16.034	-16.134	-0.100	(0)
UO2Cl+	4.455e-17	3.269e-17	-16.351	-16.486	-0.134	(0)
PbCl4-2	3.925e-17	1.138e-17	-16.406	-16.944	-0.538	(0)
CrOHC12	1.869e-18	1.869e-18	-17.728	-17.728	0.000	(0)
CrCl2+	3.835e-20	2.814e-20	-19.416	-19.551	-0.134	(0)
FeCl+2	2.252e-20	9.492e-21	-19.647	-20.023	-0.375	(0)
CuCl4-2	4.883e-21	2.058e-21	-20.311	-20.687	-0.375	(0)
VOCl+	1.256e-21	9.214e-22	-20.901	-21.036	-0.134	(0)
FeCl2+	2.941e-22	2.369e-22	-21.532	-21.625	-0.094	(0)
FeCl3	1.324e-25	1.324e-25	-24.878	-24.878	0.000	(0)
CrO3Cl-	1.090e-25	7.998e-26	-24.963	-25.097	-0.134	(0)
CoCl+2	8.944e-35	2.592e-35	-34.048	-34.586	-0.538	(0)
UCl+3	0.000e+00	0.000e+00	-45.187	-46.397	-1.210	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.828	-47.366	-0.538	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.226	-48.764	-0.538	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.290	-61.828	-0.538	(0)
Co (2)	1.616e-07					
Co+2	1.054e-07	3.056e-08	-6.977	-7.515	-0.538	(0)
CoSO4	3.995e-08	3.995e-08	-7.398	-7.398	0.000	(0)
CoHCO3+	1.187e-08	8.713e-09	-7.925	-8.060	-0.134	(0)
CoCO3	2.928e-09	2.928e-09	-8.533	-8.533	0.000	(0)
CoCl+	8.051e-10	5.908e-10	-9.094	-9.229	-0.134	(0)
CoF+	3.344e-10	2.454e-10	-9.476	-9.610	-0.134	(0)
CoOH+	2.756e-10	2.023e-10	-9.560	-9.694	-0.134	(0)
Co (OH) 2	5.329e-12	5.329e-12	-11.273	-11.273	0.000	(0)
CoNO2+	5.268e-12	3.866e-12	-11.278	-11.413	-0.134	(0)
Co (NH3) +2	2.272e-13	6.587e-14	-12.644	-13.181	-0.538	(0)
CoSeO4	1.315e-15	1.315e-15	-14.881	-14.881	0.000	(0)
CoNO3+	1.217e-15	8.929e-16	-14.915	-15.049	-0.134	(0)
Co (OH) 3-	4.806e-17	3.527e-17	-16.318	-16.453	-0.134	(0)
CoOOH-	1.207e-17	8.859e-18	-16.918	-17.053	-0.134	(0)
Co2OH+3	5.025e-18	3.098e-19	-17.299	-18.509	-1.210	(0)
Co (NH3) 2+2	1.738e-19	5.037e-20	-18.760	-19.298	-0.538	(0)
Co (NO3) 2	3.349e-23	3.349e-23	-22.475	-22.475	0.000	(0)
Co (OH) 4-2	6.396e-24	1.854e-24	-23.194	-23.732	-0.538	(0)
Co (NH3) 3+2	3.922e-26	1.137e-26	-25.406	-25.944	-0.538	(0)
Co4 (OH) 4+4	4.729e-29	3.339e-31	-28.325	-30.476	-2.151	(0)
Co (NH3) 4+2	3.690e-33	1.070e-33	-32.433	-32.971	-0.538	(0)
Co (NH3) 5+2	1.098e-40	0.000e+00	-39.959	-40.497	-0.538	(0)
Co (3)	1.326e-28					
CoOH+2	1.326e-28	3.843e-29	-27.878	-28.415	-0.538	(0)
Co+3	1.659e-34	2.280e-35	-33.780	-34.642	-0.862	(0)
CoCl+2	8.944e-35	2.592e-35	-34.048	-34.586	-0.538	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.828	-47.366	-0.538	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.699	-56.833	-0.134	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.290	-61.828	-0.538	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.316	-61.854	-0.538	(0)
Cr (2)	3.227e-26					
Cr+2	3.227e-26	9.353e-27	-25.491	-26.029	-0.538	(0)
Cr (3)	3.475e-09					
Cr (OH) 2+	2.929e-09	2.149e-09	-8.533	-8.668	-0.134	(0)
Cr (OH) 3	2.678e-10	2.678e-10	-9.572	-9.572	0.000	(0)
Cr (OH) +2	1.837e-10	5.325e-11	-9.736	-10.274	-0.538	(0)

CrOHSO4	8.279e-11	8.279e-11	-10.082	-10.082	0.000	(0)
CrO2-	5.722e-12	4.199e-12	-11.242	-11.377	-0.134	(0)
Cr (OH) 4-	4.819e-12	3.536e-12	-11.317	-11.451	-0.134	(0)
CrF+2	1.019e-12	2.953e-13	-11.992	-12.530	-0.538	(0)
CrSO4+	1.530e-13	1.123e-13	-12.815	-12.950	-0.134	(0)
Cr+3	1.190e-13	7.338e-15	-12.924	-14.134	-1.210	(0)
CrCl+2	1.831e-16	5.307e-17	-15.737	-16.275	-0.538	(0)
CrOHC12	1.869e-18	1.869e-18	-17.728	-17.728	0.000	(0)
Cr2 (OH) 2SO4+2	1.375e-18	3.984e-19	-17.862	-18.400	-0.538	(0)
Cr2 (OH) 2 (SO4) 2	1.551e-19	1.551e-19	-18.809	-18.809	0.000	(0)
CrCl2+	3.835e-20	2.814e-20	-19.416	-19.551	-0.134	(0)
CrNO3+2	2.040e-23	5.913e-24	-22.690	-23.228	-0.538	(0)
Cr (NH3) 5OH+2	3.664e-39	1.062e-39	-38.436	-38.974	-0.538	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.403	-47.613	-1.210	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.226	-48.764	-0.538	(0)
Cr (6)	2.050e-15					
CrO4-2	1.846e-15	7.640e-16	-14.734	-15.117	-0.383	(0)
HCrO4-	1.022e-16	7.497e-17	-15.991	-16.125	-0.134	(0)
NaCrO4-	8.465e-17	6.211e-17	-16.072	-16.207	-0.134	(0)
KCrO4-	1.703e-17	1.250e-17	-16.769	-16.903	-0.134	(0)
CrO3SO4-2	1.567e-23	4.541e-24	-22.805	-23.343	-0.538	(0)
H2CrO4	1.843e-24	1.843e-24	-23.735	-23.735	0.000	(0)
CrO3Cl-	1.090e-25	7.998e-26	-24.963	-25.097	-0.134	(0)
Cr2O7-2	6.730e-31	1.951e-31	-30.172	-30.710	-0.538	(0)
Cu (1)	4.025e-09					
CuCl2-	2.218e-09	1.762e-09	-8.654	-8.754	-0.100	(0)
CuCl	1.510e-09	1.510e-09	-8.821	-8.821	0.000	(0)
Cu+	2.924e-10	2.146e-10	-9.534	-9.668	-0.134	(0)
CuCl3-2	4.996e-12	2.106e-12	-11.301	-11.677	-0.375	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.574	-147.978	-0.404	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.326	-148.708	-0.382	(0)
Cu (2)	3.350e-06					
CuCO3	2.740e-06	2.740e-06	-5.562	-5.562	0.000	(0)
Cu+2	1.984e-07	8.211e-08	-6.703	-7.086	-0.383	(0)
Cu (CO3) 2-2	1.442e-07	4.179e-08	-6.841	-7.379	-0.538	(0)
CuSO4	1.232e-07	1.232e-07	-6.909	-6.909	0.000	(0)
CuOH+	1.084e-07	8.612e-08	-6.965	-7.065	-0.100	(0)
CuHCO3+	2.588e-08	1.899e-08	-7.587	-7.722	-0.134	(0)
Cu (OH) 2	5.700e-09	5.700e-09	-8.244	-8.244	0.000	(0)
CuF+	1.793e-09	1.315e-09	-8.747	-8.881	-0.134	(0)
CuCl+	9.152e-10	7.272e-10	-9.039	-9.138	-0.100	(0)
Cu2 (OH) 2+2	6.427e-10	1.863e-10	-9.192	-9.730	-0.538	(0)
CuNO2+	2.103e-10	1.543e-10	-9.677	-9.812	-0.134	(0)
CuNH3+2	5.196e-11	1.506e-11	-10.284	-10.822	-0.538	(0)
Cu (OH) 3-	5.285e-12	3.878e-12	-11.277	-11.411	-0.134	(0)
CuCl2	1.409e-12	1.409e-12	-11.851	-11.851	0.000	(0)
Cu (NO2) 2	2.834e-14	2.834e-14	-13.548	-13.548	0.000	(0)
CuNO3+	6.523e-15	4.786e-15	-14.186	-14.320	-0.134	(0)
CuCl3-	9.247e-17	7.348e-17	-16.034	-16.134	-0.100	(0)
Cu (OH) 4-2	3.492e-17	1.012e-17	-16.457	-16.995	-0.538	(0)
CuCl4-2	4.883e-21	2.058e-21	-20.311	-20.687	-0.375	(0)
Cu (NO3) 2	1.111e-23	1.111e-23	-22.954	-22.954	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.157	-216.291	-0.134	(0)
F	4.096e-04					
F-	3.165e-04	2.539e-04	-3.500	-3.595	-0.096	(0)
MgF+	8.498e-05	6.801e-05	-4.071	-4.167	-0.097	(0)
CaF+	4.700e-06	3.786e-06	-5.328	-5.422	-0.094	(0)
NaF	2.621e-06	2.621e-06	-5.582	-5.582	0.000	(0)
MnF+	2.626e-07	2.116e-07	-6.581	-6.674	-0.094	(0)
AlF3	1.038e-07	1.038e-07	-6.984	-6.984	0.000	(0)
AlF2+	4.012e-08	3.249e-08	-7.397	-7.488	-0.092	(0)
AlF4-	1.651e-08	1.321e-08	-7.782	-7.879	-0.097	(0)
ZnF+	1.451e-08	1.065e-08	-7.838	-7.973	-0.134	(0)
HF	1.139e-08	1.139e-08	-7.944	-7.944	0.000	(0)
BF (OH) 3-	7.660e-09	5.939e-09	-8.116	-8.226	-0.111	(0)
CuF+	1.793e-09	1.315e-09	-8.747	-8.881	-0.134	(0)
AlF+2	7.474e-10	3.214e-10	-9.126	-9.493	-0.366	(0)
NiF+	4.773e-10	3.502e-10	-9.321	-9.456	-0.134	(0)

CoF+	3.344e-10	2.454e-10	-9.476	-9.610	-0.134	(0)
CdF+	2.169e-11	1.592e-11	-10.664	-10.798	-0.134	(0)
HF2-	1.394e-11	1.099e-11	-10.856	-10.959	-0.103	(0)
PbF+	9.865e-12	7.239e-12	-11.006	-11.140	-0.134	(0)
BF2 (OH) 2-	6.312e-12	4.894e-12	-11.200	-11.310	-0.111	(0)
AgF	1.029e-12	1.029e-12	-11.988	-11.988	0.000	(0)
CrF+2	1.019e-12	2.953e-13	-11.992	-12.530	-0.538	(0)
UO2F+	1.723e-13	1.264e-13	-12.764	-12.898	-0.134	(0)
UO2F2	9.257e-14	9.257e-14	-13.034	-13.034	0.000	(0)
PbF2	3.617e-14	3.617e-14	-13.442	-13.442	0.000	(0)
CdF2	8.064e-15	8.064e-15	-14.093	-14.093	0.000	(0)
UO2F3-	8.046e-15	5.904e-15	-14.094	-14.229	-0.134	(0)
H2F2	3.474e-16	3.474e-16	-15.459	-15.459	0.000	(0)
FeF2+	1.320e-16	1.064e-16	-15.879	-15.973	-0.094	(0)
VO2F	6.662e-17	6.662e-17	-16.176	-16.176	0.000	(0)
UO2F4-2	4.107e-17	1.191e-17	-16.386	-16.924	-0.538	(0)
FeF3	3.811e-17	3.811e-17	-16.419	-16.419	0.000	(0)
FeF+2	3.716e-17	1.566e-17	-16.430	-16.805	-0.375	(0)
PbF3-	2.374e-17	1.742e-17	-16.625	-16.759	-0.134	(0)
BF3OH-	1.893e-17	1.467e-17	-16.723	-16.833	-0.111	(0)
VO2F2-	8.370e-18	6.142e-18	-17.077	-17.212	-0.134	(0)
VOF+	1.220e-19	8.950e-20	-18.914	-19.048	-0.134	(0)
VO2F3-2	6.710e-20	1.945e-20	-19.173	-19.711	-0.538	(0)
VOF2	8.521e-21	8.521e-21	-20.070	-20.070	0.000	(0)
PbF4-2	7.302e-21	2.116e-21	-20.137	-20.674	-0.538	(0)
BF4-	7.178e-22	5.565e-22	-21.144	-21.255	-0.111	(0)
HgF+	1.576e-22	1.157e-22	-21.802	-21.937	-0.134	(0)
VOF3-	1.046e-22	7.676e-23	-21.980	-22.115	-0.134	(0)
VO2F4-3	3.941e-23	2.430e-24	-22.404	-23.614	-1.210	(0)
Sb (OH) 2F	7.413e-25	7.413e-25	-24.130	-24.130	0.000	(0)
SbOF	7.298e-25	7.298e-25	-24.137	-24.137	0.000	(0)
VOF4-2	2.714e-25	7.867e-26	-24.566	-25.104	-0.538	(0)
SiF6-2	4.687e-26	1.975e-26	-25.329	-25.704	-0.375	(0)
UF3+	1.271e-35	9.323e-36	-34.896	-35.030	-0.134	(0)
UF2+2	7.993e-37	2.317e-37	-36.097	-36.635	-0.538	(0)
UF4	2.595e-37	2.595e-37	-36.586	-36.586	0.000	(0)
UF5-	3.559e-39	2.611e-39	-38.449	-38.583	-0.134	(0)
UF+3	1.176e-39	0.000e+00	-38.930	-40.140	-1.210	(0)
UF6-2	6.907e-40	2.002e-40	-39.161	-39.699	-0.538	(0)
Fe (2)	1.658e-11					
Fe+2	1.115e-11	3.231e-12	-10.953	-11.491	-0.538	(0)
FeSO4	5.196e-12	5.196e-12	-11.284	-11.284	0.000	(0)
FeHCO3+	1.828e-13	1.491e-13	-12.738	-12.827	-0.088	(0)
FeOH+	5.295e-14	4.266e-14	-13.276	-13.370	-0.094	(0)
Fe (OH) 2	1.124e-17	1.124e-17	-16.949	-16.949	0.000	(0)
Fe (OH) 3-	1.463e-18	1.179e-18	-17.835	-17.928	-0.094	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.277	-159.277	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.474	-235.608	-0.134	(0)
Fe (3)	2.494e-09					
Fe (OH) 2+	1.920e-09	1.554e-09	-8.717	-8.808	-0.092	(0)
Fe (OH) 3	5.538e-10	5.538e-10	-9.257	-9.257	0.000	(0)
Fe (OH) 4-	2.112e-11	1.710e-11	-10.675	-10.767	-0.092	(0)
FeOH+2	2.859e-14	1.205e-14	-13.544	-13.919	-0.375	(0)
FeF2+	1.320e-16	1.064e-16	-15.879	-15.973	-0.094	(0)
FeF3	3.811e-17	3.811e-17	-16.419	-16.419	0.000	(0)
FeF+2	3.716e-17	1.566e-17	-16.430	-16.805	-0.375	(0)
FeSO4+	5.132e-18	4.135e-18	-17.290	-17.384	-0.094	(0)
Fe (SO4) 2-	7.894e-19	5.792e-19	-18.103	-18.237	-0.134	(0)
Fe+3	4.093e-19	5.625e-20	-18.388	-19.250	-0.862	(0)
FeCl+2	2.252e-20	9.492e-21	-19.647	-20.023	-0.375	(0)
FeCl2+	2.941e-22	2.369e-22	-21.532	-21.625	-0.094	(0)
FeHSeO3+2	7.107e-23	2.060e-23	-22.148	-22.686	-0.538	(0)
Fe2 (OH) 2+4	6.806e-25	4.805e-27	-24.167	-26.318	-2.151	(0)
FeCl3	1.324e-25	1.324e-25	-24.878	-24.878	0.000	(0)
FeNO3+2	3.577e-26	1.037e-26	-25.446	-25.984	-0.538	(0)
Fe3 (OH) 4+5	2.480e-31	1.080e-34	-30.605	-33.967	-3.361	(0)
H (0)	3.647e-29					
H2	1.824e-29	1.853e-29	-28.739	-28.732	0.007	(0)

Hg (0)	3.230e-09					
Hg	3.230e-09	3.230e-09	-8.491	-8.491	0.000	(0)
Hg (1)	1.859e-19					
Hg2+2	9.295e-20	2.694e-20	-19.032	-19.570	-0.538	(0)
Hg (2)	9.018e-11					
HgClOH	4.023e-11	4.023e-11	-10.395	-10.395	0.000	(0)
HgCl2	3.838e-11	3.838e-11	-10.416	-10.416	0.000	(0)
Hg (OH) 2	8.396e-12	8.531e-12	-11.076	-11.069	0.007	(0)
HgCl3-	2.923e-12	2.144e-12	-11.534	-11.669	-0.134	(0)
HgCl4-2	1.646e-13	4.771e-14	-12.784	-13.321	-0.538	(0)
HgCO3	8.334e-14	8.334e-14	-13.079	-13.079	0.000	(0)
Hg (CO3) 2-2	5.153e-15	1.494e-15	-14.288	-14.826	-0.538	(0)
HgCl+	1.867e-15	1.370e-15	-14.729	-14.863	-0.134	(0)
HgOH+	2.212e-16	1.623e-16	-15.655	-15.790	-0.134	(0)
HgHCO3+	6.413e-17	4.706e-17	-16.193	-16.327	-0.134	(0)
Hg (NH3) 2+2	8.598e-18	2.492e-18	-17.066	-17.603	-0.538	(0)
Hg (OH) 3-	4.855e-19	3.562e-19	-18.314	-18.448	-0.134	(0)
HgNH3+2	4.796e-19	1.390e-19	-18.319	-18.857	-0.538	(0)
Hg+2	4.240e-20	1.229e-20	-19.373	-19.910	-0.538	(0)
HgSO4	2.108e-20	2.108e-20	-19.676	-19.676	0.000	(0)
HgF+	1.576e-22	1.157e-22	-21.802	-21.937	-0.134	(0)
Hg (NH3) 3+2	6.136e-25	1.779e-25	-24.212	-24.750	-0.538	(0)
HgNO3+	1.140e-28	8.365e-29	-27.943	-28.078	-0.134	(0)
Hg (NH3) 4+2	8.738e-32	2.533e-32	-31.059	-31.596	-0.538	(0)
Hg (NO3) 2	6.409e-37	6.409e-37	-36.193	-36.193	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.066	-137.201	-0.134	(0)
HgS2-2	0.000e+00	0.000e+00	-137.853	-138.390	-0.538	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.325	-138.325	0.000	(0)
K	5.742e-03					
K+	5.489e-03	4.403e-03	-2.260	-2.356	-0.096	(0)
KSO4-	2.522e-04	2.042e-04	-3.598	-3.690	-0.092	(0)
KCrO4-	1.703e-17	1.250e-17	-16.769	-16.903	-0.134	(0)
Mg	8.824e-03					
Mg+2	5.768e-03	2.387e-03	-2.239	-2.622	-0.383	(0)
MgSO4	2.846e-03	2.846e-03	-2.546	-2.546	0.000	(0)
MgHCO3+	1.127e-04	8.954e-05	-3.948	-4.048	-0.100	(0)
MgF+	8.498e-05	6.801e-05	-4.071	-4.167	-0.097	(0)
MgCO3	1.125e-05	1.125e-05	-4.949	-4.949	0.000	(0)
MgOH+	3.843e-07	3.153e-07	-6.415	-6.501	-0.086	(0)
MgH2BO3+	1.199e-07	9.295e-08	-6.921	-7.032	-0.111	(0)
Mn (2)	9.898e-05					
Mn+2	7.222e-05	2.093e-05	-4.141	-4.679	-0.538	(0)
MnSO4	2.439e-05	2.439e-05	-4.613	-4.613	0.000	(0)
MnHCO3+	1.900e-06	1.531e-06	-5.721	-5.815	-0.094	(0)
MnF+	2.626e-07	2.116e-07	-6.581	-6.674	-0.094	(0)
MnCl+	1.828e-07	1.473e-07	-6.738	-6.832	-0.094	(0)
MnOH+	2.165e-08	1.744e-08	-7.665	-7.758	-0.094	(0)
MnCl2	1.162e-09	1.162e-09	-8.935	-8.935	0.000	(0)
MnCl3-	2.221e-12	1.789e-12	-11.654	-11.747	-0.094	(0)
MnNO3+	8.336e-13	6.116e-13	-12.079	-12.214	-0.134	(0)
MnSeO4	4.836e-13	4.836e-13	-12.316	-12.316	0.000	(0)
Mn (OH) 3-	1.472e-17	1.186e-17	-16.832	-16.926	-0.094	(0)
Mn (NO3) 2	2.832e-20	2.832e-20	-19.548	-19.548	0.000	(0)
Mn (OH) 4-2	3.014e-23	1.270e-23	-22.521	-22.896	-0.375	(0)
MnSe	0.000e+00	0.000e+00	-41.289	-41.289	0.000	(0)
Mn (3)	1.275e-24					
Mn+3	1.275e-24	1.753e-25	-23.894	-24.756	-0.862	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.491	-41.866	-0.375	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.858	-45.965	-0.107	(0)
Mo	2.906e-06					
MoO4-2	2.905e-06	1.202e-06	-5.537	-5.920	-0.383	(0)
HMoO4-	9.887e-10	7.255e-10	-9.005	-9.139	-0.134	(0)
H2MoO4	1.611e-13	1.611e-13	-12.793	-12.793	0.000	(0)
Ag2MoO4	1.184e-24	1.184e-24	-23.927	-23.927	0.000	(0)
AlMo6O21-3	4.759e-38	2.934e-39	-37.323	-38.533	-1.210	(0)
Mo7O24-6	0.000e+00	0.000e+00	-43.753	-48.593	-4.840	(0)

HMo7O24-5	0.000e+00	0.000e+00	-46.364	-49.725	-3.361	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-50.310	-52.461	-2.151	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.523	-56.733	-1.210	(0)
N (-3)	1.331e-06					
NH4+	1.230e-06	9.534e-07	-5.910	-6.021	-0.111	(0)
NH4SO4-	8.307e-08	6.693e-08	-7.081	-7.174	-0.094	(0)
NH3	1.793e-08	1.793e-08	-7.746	-7.746	0.000	(0)
CaNH3+2	1.064e-10	3.084e-11	-9.973	-10.511	-0.538	(0)
CuNH3+2	5.196e-11	1.506e-11	-10.284	-10.822	-0.538	(0)
NiNH3+2	1.824e-12	5.287e-13	-11.739	-12.277	-0.538	(0)
Co (NH3) +2	2.272e-13	6.587e-14	-12.644	-13.181	-0.538	(0)
AgNH3+	8.046e-14	5.904e-14	-13.094	-13.229	-0.134	(0)
BaNH3+2	1.419e-15	4.112e-16	-14.848	-15.386	-0.538	(0)
Ag (NH3) 2+	1.172e-17	8.603e-18	-16.931	-17.065	-0.134	(0)
Hg (NH3) 2+2	8.598e-18	2.492e-18	-17.066	-17.603	-0.538	(0)
Ni (NH3) 2+2	4.726e-18	1.370e-18	-17.325	-17.863	-0.538	(0)
Ca (NH3) 2+2	7.593e-19	2.201e-19	-18.120	-18.657	-0.538	(0)
HgNH3+2	4.796e-19	1.390e-19	-18.319	-18.857	-0.538	(0)
Co (NH3) 2+2	1.738e-19	5.037e-20	-18.760	-19.298	-0.538	(0)
Hg (NH3) 3+2	6.136e-25	1.779e-25	-24.212	-24.750	-0.538	(0)
Co (NH3) 3+2	3.922e-26	1.137e-26	-25.406	-25.944	-0.538	(0)
Hg (NH3) 4+2	8.738e-32	2.533e-32	-31.059	-31.596	-0.538	(0)
Co (NH3) 4+2	3.690e-33	1.070e-33	-32.433	-32.971	-0.538	(0)
Cr (NH3) 5OH+2	3.664e-39	1.062e-39	-38.436	-38.974	-0.538	(0)
Co (NH3) 5+2	1.098e-40	0.000e+00	-39.959	-40.497	-0.538	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.403	-47.613	-1.210	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.828	-47.366	-0.538	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.226	-48.764	-0.538	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.699	-56.833	-0.134	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.290	-61.828	-0.538	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.316	-61.854	-0.538	(0)
N (3)	2.295e-05					
NO2-	2.295e-05	1.795e-05	-4.639	-4.746	-0.107	(0)
CuNO2+	2.103e-10	1.543e-10	-9.677	-9.812	-0.134	(0)
AgNO2	6.048e-12	6.048e-12	-11.218	-11.218	0.000	(0)
CoNO2+	5.268e-12	3.866e-12	-11.278	-11.413	-0.134	(0)
Cu (NO2) 2	2.834e-14	2.834e-14	-13.548	-13.548	0.000	(0)
Ag (NO2) 2-	2.292e-16	1.681e-16	-15.640	-15.774	-0.134	(0)
N (5)	2.309e-08					
NO3-	2.298e-08	1.843e-08	-7.639	-7.734	-0.096	(0)
CaNO3+	1.086e-10	7.965e-11	-9.964	-10.099	-0.134	(0)
MnNO3+	8.336e-13	6.116e-13	-12.079	-12.214	-0.134	(0)
ZnNO3+	1.327e-13	9.735e-14	-12.877	-13.012	-0.134	(0)
CuNO3+	6.523e-15	4.786e-15	-14.186	-14.320	-0.134	(0)
BaNO3+	4.578e-15	3.359e-15	-14.339	-14.474	-0.134	(0)
NiNO3+	3.466e-15	2.543e-15	-14.460	-14.595	-0.134	(0)
CoNO3+	1.217e-15	8.929e-16	-14.915	-15.049	-0.134	(0)
CdNO3+	3.143e-16	2.306e-16	-15.503	-15.637	-0.134	(0)
PbNO3+	1.503e-16	1.103e-16	-15.823	-15.957	-0.134	(0)
AgNO3	2.362e-17	2.362e-17	-16.627	-16.627	0.000	(0)
Mn (NO3) 2	2.832e-20	2.832e-20	-19.548	-19.548	0.000	(0)
Zn (NO3) 2	3.581e-22	3.581e-22	-21.446	-21.446	0.000	(0)
UO2NO3+	1.808e-22	1.327e-22	-21.743	-21.877	-0.134	(0)
Co (NO3) 2	3.349e-23	3.349e-23	-22.475	-22.475	0.000	(0)
CrNO3+2	2.040e-23	5.913e-24	-22.690	-23.228	-0.538	(0)
Cu (NO3) 2	1.111e-23	1.111e-23	-22.954	-22.954	0.000	(0)
Pb (NO3) 2	3.454e-24	3.454e-24	-23.462	-23.462	0.000	(0)
Cd (NO3) 2	2.131e-24	2.131e-24	-23.672	-23.672	0.000	(0)
VO2NO3	1.395e-24	1.395e-24	-23.855	-23.855	0.000	(0)
FeNO3+2	3.577e-26	1.037e-26	-25.446	-25.984	-0.538	(0)
HgNO3+	1.140e-28	8.365e-29	-27.943	-28.078	-0.134	(0)
Hg (NO3) 2	6.409e-37	6.409e-37	-36.193	-36.193	0.000	(0)
Na	2.114e-02					
Na+	2.039e-02	1.636e-02	-1.690	-1.786	-0.096	(0)
NaSO4-	7.108e-04	5.756e-04	-3.148	-3.240	-0.092	(0)
NaHCO3	3.372e-05	3.372e-05	-4.472	-4.472	0.000	(0)
NaF	2.621e-06	2.621e-06	-5.582	-5.582	0.000	(0)
NaCO3-	2.132e-06	1.726e-06	-5.671	-5.763	-0.092	(0)

	NaH2BO3	2.911e-08	2.911e-08	-7.536	-7.536	0.000	(0)
	NaCrO4-	8.465e-17	6.211e-17	-16.072	-16.207	-0.134	(0)
Ni		2.518e-07					
	Ni+2	1.327e-07	5.491e-08	-6.877	-7.260	-0.383	(0)
	NiSO4	7.179e-08	7.179e-08	-7.144	-7.144	0.000	(0)
	NiHCO3+	3.382e-08	2.481e-08	-7.471	-7.605	-0.134	(0)
	NiCO3	1.161e-08	1.161e-08	-7.935	-7.935	0.000	(0)
	NiCl+	1.070e-09	7.851e-10	-8.971	-9.105	-0.134	(0)
	NiF+	4.773e-10	3.502e-10	-9.321	-9.456	-0.134	(0)
	NiOH+	3.125e-10	2.293e-10	-9.505	-9.640	-0.134	(0)
	Ni (SO4) 2-2	5.373e-11	1.557e-11	-10.270	-10.808	-0.538	(0)
	Ni (OH) 2	6.042e-12	6.042e-12	-11.219	-11.219	0.000	(0)
	NiNH3+2	1.824e-12	5.287e-13	-11.739	-12.277	-0.538	(0)
	NiCl2	2.209e-14	2.209e-14	-13.656	-13.656	0.000	(0)
	NiNO3+	3.466e-15	2.543e-15	-14.460	-14.595	-0.134	(0)
	Ni (OH) 3-	2.731e-15	2.004e-15	-14.564	-14.698	-0.134	(0)
	NiSeO4	2.205e-15	2.205e-15	-14.657	-14.657	0.000	(0)
	Ni (NH3) 2+2	4.726e-18	1.370e-18	-17.325	-17.863	-0.538	(0)
O (0)		2.899e-35					
	O2	1.449e-35	1.473e-35	-34.839	-34.832	0.007	(0)
Pb		1.182e-08					
	PbCO3	6.892e-09	6.892e-09	-8.162	-8.162	0.000	(0)
	PbHCO3+	1.502e-09	1.102e-09	-8.823	-8.958	-0.134	(0)
	PbSO4	1.298e-09	1.298e-09	-8.887	-8.887	0.000	(0)
	Pb+2	9.774e-10	4.046e-10	-9.010	-9.393	-0.383	(0)
	PbOH+	4.594e-10	3.371e-10	-9.338	-9.472	-0.134	(0)
	Pb (CO3) 2-2	3.886e-10	1.126e-10	-9.410	-9.948	-0.538	(0)
	Pb (SO4) 2-2	1.768e-10	5.126e-11	-9.752	-10.290	-0.538	(0)
	PbCl+	1.093e-10	8.022e-11	-9.961	-10.096	-0.134	(0)
	PbF+	9.865e-12	7.239e-12	-11.006	-11.140	-0.134	(0)
	Pb (OH) 2	3.536e-12	3.536e-12	-11.452	-11.452	0.000	(0)
	PbCl2	2.002e-12	2.002e-12	-11.698	-11.698	0.000	(0)
	PbF2	3.617e-14	3.617e-14	-13.442	-13.442	0.000	(0)
	PbCl3-	6.071e-15	4.454e-15	-14.217	-14.351	-0.134	(0)
	Pb (OH) 3-	1.598e-15	1.173e-15	-14.796	-14.931	-0.134	(0)
	PbNO3+	1.503e-16	1.103e-16	-15.823	-15.957	-0.134	(0)
	PbCl4-2	3.925e-17	1.138e-17	-16.406	-16.944	-0.538	(0)
	Pb2OH+3	3.506e-17	2.162e-18	-16.455	-17.665	-1.210	(0)
	PbF3-	2.374e-17	1.742e-17	-16.625	-16.759	-0.134	(0)
	Pb (OH) 4-2	3.287e-19	9.527e-20	-18.483	-19.021	-0.538	(0)
	PbF4-2	7.302e-21	2.116e-21	-20.137	-20.674	-0.538	(0)
	Pb3 (OH) 4+2	3.482e-22	1.009e-22	-21.458	-21.996	-0.538	(0)
	Pb (NO3) 2	3.454e-24	3.454e-24	-23.462	-23.462	0.000	(0)
	Pb4 (OH) 4+4	4.594e-26	3.244e-28	-25.338	-27.489	-2.151	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-150.859	-150.859	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-227.793	-227.928	-0.134	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.346	-73.346	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.234	-78.368	-0.134	(0)
	CdHS+	0.000e+00	0.000e+00	-78.629	-78.763	-0.134	(0)
	H2S	0.000e+00	0.000e+00	-78.866	-78.866	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.677	-80.215	-0.538	(0)
	S6-2	0.000e+00	0.000e+00	-80.193	-80.731	-0.538	(0)
	S4-2	0.000e+00	0.000e+00	-80.273	-80.811	-0.538	(0)
	S3-2	0.000e+00	0.000e+00	-81.079	-81.617	-0.538	(0)
	S2-2	0.000e+00	0.000e+00	-82.095	-82.633	-0.538	(0)
	S-2	0.000e+00	0.000e+00	-87.775	-88.150	-0.375	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.066	-137.201	-0.134	(0)
	HgS2-2	0.000e+00	0.000e+00	-137.853	-138.390	-0.538	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.325	-138.325	0.000	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.346	-147.580	-0.234	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.480	-147.614	-0.134	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-147.574	-147.978	-0.404	(0)
	ZnS (HS) -	0.000e+00	0.000e+00	-147.951	-148.086	-0.134	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-148.326	-148.708	-0.382	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.085	-149.501	-0.417	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.419	-149.812	-0.393	(0)
	Zn (HS) 2	0.000e+00	0.000e+00	-149.594	-149.594	0.000	(0)

Cd (HS) 2	0.000e+00	0.000e+00	-149.927	-149.927	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.859	-150.859	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.277	-159.277	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.157	-216.291	-0.134	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.548	-224.682	-0.134	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.261	-226.395	-0.134	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.606	-227.144	-0.538	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.793	-227.928	-0.134	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.474	-235.608	-0.134	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.030	-302.568	-0.538	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.972	-304.510	-0.538	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.001	-317.539	-0.538	(0)
S (6)	2.172e-02					
SO4-2	1.583e-02	6.552e-03	-1.801	-2.184	-0.383	(0)
MgSO4	2.846e-03	2.846e-03	-2.546	-2.546	0.000	(0)
CaSO4	2.051e-03	2.051e-03	-2.688	-2.688	0.000	(0)
NaSO4-	7.108e-04	5.756e-04	-3.148	-3.240	-0.092	(0)
KSO4-	2.522e-04	2.042e-04	-3.598	-3.690	-0.092	(0)
MnSO4	2.439e-05	2.439e-05	-4.613	-4.613	0.000	(0)
ZnSO4	3.014e-06	3.014e-06	-5.521	-5.521	0.000	(0)
Zn (SO4) 2-2	5.933e-07	1.720e-07	-6.227	-6.765	-0.538	(0)
CuSO4	1.232e-07	1.232e-07	-6.909	-6.909	0.000	(0)
NH4SO4-	8.307e-08	6.693e-08	-7.081	-7.174	-0.094	(0)
NiSO4	7.179e-08	7.179e-08	-7.144	-7.144	0.000	(0)
CoSO4	3.995e-08	3.995e-08	-7.398	-7.398	0.000	(0)
HSO4-	2.426e-08	1.941e-08	-7.615	-7.712	-0.097	(0)
CdSO4	6.076e-09	6.076e-09	-8.216	-8.216	0.000	(0)
Cd (SO4) 2-2	1.852e-09	5.370e-10	-8.732	-9.270	-0.538	(0)
PbSO4	1.298e-09	1.298e-09	-8.887	-8.887	0.000	(0)
AgSO4-	2.873e-10	2.108e-10	-9.542	-9.676	-0.134	(0)
Pb (SO4) 2-2	1.768e-10	5.126e-11	-9.752	-10.290	-0.538	(0)
CrOHSO4	8.279e-11	8.279e-11	-10.082	-10.082	0.000	(0)
Ni (SO4) 2-2	5.373e-11	1.557e-11	-10.270	-10.808	-0.538	(0)
AlSO4+	8.045e-12	6.439e-12	-11.094	-11.191	-0.097	(0)
FeSO4	5.196e-12	5.196e-12	-11.284	-11.284	0.000	(0)
Al (SO4) 2-	5.648e-13	4.520e-13	-12.248	-12.345	-0.097	(0)
CrSO4+	1.530e-13	1.123e-13	-12.815	-12.950	-0.134	(0)
UO2SO4	3.577e-14	3.577e-14	-13.446	-13.446	0.000	(0)
UO2 (SO4) 2-2	1.066e-14	3.090e-15	-13.972	-14.510	-0.538	(0)
VO2SO4-	3.190e-17	2.341e-17	-16.496	-16.631	-0.134	(0)
FeSO4+	5.132e-18	4.135e-18	-17.290	-17.384	-0.094	(0)
Cr2 (OH) 2SO4+2	1.375e-18	3.984e-19	-17.862	-18.400	-0.538	(0)
Fe (SO4) 2-	7.894e-19	5.792e-19	-18.103	-18.237	-0.134	(0)
Cr2 (OH) 2 (SO4) 2	1.551e-19	1.551e-19	-18.809	-18.809	0.000	(0)
VOSO4	1.061e-19	1.061e-19	-18.974	-18.974	0.000	(0)
HgSO4	2.108e-20	2.108e-20	-19.676	-19.676	0.000	(0)
CrO3SO4-2	1.567e-23	4.541e-24	-22.805	-23.343	-0.538	(0)
VSO4+	6.042e-34	4.434e-34	-33.219	-33.353	-0.134	(0)
U (SO4) 2	1.942e-40	1.942e-40	-39.712	-39.712	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.890	-41.428	-0.538	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.699	-56.833	-0.134	(0)
Sb (3)	1.218e-19					
Sb (OH) 3	6.157e-20	6.157e-20	-19.211	-19.211	0.000	(0)
HSbO2	6.017e-20	6.017e-20	-19.221	-19.221	0.000	(0)
SbO2-	4.380e-24	3.214e-24	-23.359	-23.493	-0.134	(0)
Sb (OH) 4-	2.504e-24	1.837e-24	-23.601	-23.736	-0.134	(0)
Sb (OH) 2F	7.413e-25	7.413e-25	-24.130	-24.130	0.000	(0)
SbOF	7.298e-25	7.298e-25	-24.137	-24.137	0.000	(0)
Sb (OH) 2+	6.186e-26	4.539e-26	-25.209	-25.343	-0.134	(0)
SbO+	2.135e-26	1.567e-26	-25.671	-25.805	-0.134	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.001	-317.539	-0.538	(0)
Sb (5)	4.431e-08					
SbO3-	4.427e-08	3.248e-08	-7.354	-7.488	-0.134	(0)
Sb (OH) 6-	4.720e-11	3.786e-11	-10.326	-10.422	-0.096	(0)
SbO2+	1.169e-23	8.575e-24	-22.932	-23.067	-0.134	(0)
Se (-2)	1.263e-14					
Ag2Se	1.263e-14	1.263e-14	-13.899	-13.899	0.000	(0)
HSe-	2.463e-39	1.807e-39	-38.609	-38.743	-0.134	(0)

MnSe	0.000e+00	0.000e+00	-41.289	-41.289	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.371	-42.371	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.687	-46.225	-0.538	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.082	-84.233	-2.151	(0)
Se (4)	2.517e-07					
HSeO3-	1.889e-07	1.386e-07	-6.724	-6.858	-0.134	(0)
SeO3-2	6.278e-08	1.820e-08	-7.202	-7.740	-0.538	(0)
H2SeO3	1.793e-12	1.793e-12	-11.746	-11.746	0.000	(0)
AgSeO3-	2.571e-14	1.886e-14	-13.590	-13.724	-0.134	(0)
Cd (SeO3) 2-2	3.725e-18	1.080e-18	-17.429	-17.967	-0.538	(0)
Ag (SeO3) 2-3	4.986e-20	3.074e-21	-19.302	-20.512	-1.210	(0)
FeHSeO3+2	7.107e-23	2.060e-23	-22.148	-22.686	-0.538	(0)
Se (6)	2.079e-10					
SeO4-2	2.074e-10	8.583e-11	-9.683	-10.066	-0.383	(0)
MnSeO4	4.836e-13	4.836e-13	-12.316	-12.316	0.000	(0)
ZnSeO4	2.795e-14	2.795e-14	-13.554	-13.554	0.000	(0)
NiSeO4	2.205e-15	2.205e-15	-14.657	-14.657	0.000	(0)
CoSeO4	1.315e-15	1.315e-15	-14.881	-14.881	0.000	(0)
HSeO4-	1.778e-16	1.304e-16	-15.750	-15.885	-0.134	(0)
CdSeO4	6.322e-17	6.322e-17	-16.199	-16.199	0.000	(0)
Zn (SeO4) 2-2	8.390e-24	2.432e-24	-23.076	-23.614	-0.538	(0)
Si	5.680e-05					
H4SiO4	5.646e-05	5.737e-05	-4.248	-4.241	0.007	(0)
H3SiO4-	3.442e-07	2.735e-07	-6.463	-6.563	-0.100	(0)
H2SiO4-2	1.323e-12	5.691e-13	-11.878	-12.245	-0.366	(0)
UO2H3SiO4+	1.141e-13	8.375e-14	-12.943	-13.077	-0.134	(0)
SiF6-2	4.687e-26	1.975e-26	-25.329	-25.704	-0.375	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.703	-59.913	-1.210	(0)
U (4)	5.743e-22					
U (OH) 5-	5.738e-22	4.210e-22	-21.241	-21.376	-0.134	(0)
U (OH) 4	5.352e-25	5.352e-25	-24.271	-24.271	0.000	(0)
U (OH) 3+	8.096e-29	5.940e-29	-28.092	-28.226	-0.134	(0)
U (OH) 2+2	2.877e-33	8.338e-34	-32.541	-33.079	-0.538	(0)
UF3+	1.271e-35	9.323e-36	-34.896	-35.030	-0.134	(0)
UF2+2	7.993e-37	2.317e-37	-36.097	-36.635	-0.538	(0)
UF4	2.595e-37	2.595e-37	-36.586	-36.586	0.000	(0)
UOH+3	1.934e-38	1.192e-39	-37.714	-38.924	-1.210	(0)
UF5-	3.559e-39	2.611e-39	-38.449	-38.583	-0.134	(0)
UF+3	1.176e-39	0.000e+00	-38.930	-40.140	-1.210	(0)
UF6-2	6.907e-40	2.002e-40	-39.161	-39.699	-0.538	(0)
U (SO4) 2	1.942e-40	1.942e-40	-39.712	-39.712	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.890	-41.428	-0.538	(0)
U+4	0.000e+00	0.000e+00	-43.693	-45.844	-2.151	(0)
UCl+3	0.000e+00	0.000e+00	-45.187	-46.397	-1.210	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.565	-179.455	-10.890	(0)
U (5)	1.599e-17					
UO2+	1.599e-17	1.173e-17	-16.796	-16.931	-0.134	(0)
U (6)	4.020e-07					
UO2 (CO3) 3-4	3.702e-07	2.613e-09	-6.432	-8.583	-2.151	(0)
UO2 (CO3) 2-2	3.174e-08	9.201e-09	-7.498	-8.036	-0.538	(0)
UO2CO3	8.138e-11	8.138e-11	-10.089	-10.089	0.000	(0)
UO2OH+	2.053e-13	1.506e-13	-12.688	-12.822	-0.134	(0)
UO2F+	1.723e-13	1.264e-13	-12.764	-12.898	-0.134	(0)
UO2H3SiO4+	1.141e-13	8.375e-14	-12.943	-13.077	-0.134	(0)
UO2F2	9.257e-14	9.257e-14	-13.034	-13.034	0.000	(0)
UO2SO4	3.577e-14	3.577e-14	-13.446	-13.446	0.000	(0)
UO2 (SO4) 2-2	1.066e-14	3.090e-15	-13.972	-14.510	-0.538	(0)
UO2+2	8.715e-15	3.607e-15	-14.060	-14.443	-0.383	(0)
UO2F3-	8.046e-15	5.904e-15	-14.094	-14.229	-0.134	(0)
UO2Cl+	4.455e-17	3.269e-17	-16.351	-16.486	-0.134	(0)
UO2F4-2	4.107e-17	1.191e-17	-16.386	-16.924	-0.538	(0)
(UO2) 2 (OH) 2+2	1.299e-19	3.765e-20	-18.886	-19.424	-0.538	(0)
(UO2) 3 (OH) 5+	6.451e-22	4.734e-22	-21.190	-21.325	-0.134	(0)
UO2NO3+	1.808e-22	1.327e-22	-21.743	-21.877	-0.134	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.261	-42.396	-0.134	(0)
V+2	0.000e+00	0.000e+00	-42.889	-43.426	-0.538	(0)

V (3)	4.220e-15					
V (OH) 3	4.220e-15	4.220e-15	-14.375	-14.375	0.000	(0)
V (OH) 2+	1.128e-25	8.277e-26	-24.948	-25.082	-0.134	(0)
VOH+2	8.221e-29	2.383e-29	-28.085	-28.623	-0.538	(0)
V+3	2.325e-33	1.434e-34	-32.634	-33.844	-1.210	(0)
VSO4+	6.042e-34	4.434e-34	-33.219	-33.353	-0.134	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.043	-55.253	-1.210	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.295	-56.446	-2.151	(0)
V (4)	5.736e-18					
V (OH) 3+	5.295e-18	3.885e-18	-17.276	-17.411	-0.134	(0)
VO+2	2.028e-19	5.877e-20	-18.693	-19.231	-0.538	(0)
VOF+	1.220e-19	8.950e-20	-18.914	-19.048	-0.134	(0)
VOSO4	1.061e-19	1.061e-19	-18.974	-18.974	0.000	(0)
VOF2	8.521e-21	8.521e-21	-20.070	-20.070	0.000	(0)
VOC1+	1.256e-21	9.214e-22	-20.901	-21.036	-0.134	(0)
VOF3-	1.046e-22	7.676e-23	-21.980	-22.115	-0.134	(0)
VOF4-2	2.714e-25	7.867e-26	-24.566	-25.104	-0.538	(0)
H2V2O4+2	2.616e-30	7.583e-31	-29.582	-30.120	-0.538	(0)
V (5)	1.342e-08					
H2VO4-	1.109e-08	8.137e-09	-7.955	-8.090	-0.134	(0)
HVO4-2	2.325e-09	6.741e-10	-8.633	-9.171	-0.538	(0)
H3VO4	2.467e-12	2.467e-12	-11.608	-11.608	0.000	(0)
H3V2O7-	1.769e-13	1.298e-13	-12.752	-12.887	-0.134	(0)
HV2O7-3	3.018e-14	1.861e-15	-13.520	-14.730	-1.210	(0)
VO4-3	1.807e-15	1.114e-16	-14.743	-15.953	-1.210	(0)
V2O7-4	2.340e-16	1.652e-18	-15.631	-17.782	-2.151	(0)
VO2+	1.865e-16	1.496e-16	-15.729	-15.825	-0.096	(0)
VO2F	6.662e-17	6.662e-17	-16.176	-16.176	0.000	(0)
VO2SO4-	3.190e-17	2.341e-17	-16.496	-16.631	-0.134	(0)
V3O9-3	9.183e-18	5.661e-19	-17.037	-18.247	-1.210	(0)
VO2F2-	8.370e-18	6.142e-18	-17.077	-17.212	-0.134	(0)
VO2F3-2	6.710e-20	1.945e-20	-19.173	-19.711	-0.538	(0)
V4O12-4	2.723e-22	1.923e-24	-21.565	-23.716	-2.151	(0)
VO2F4-3	3.941e-23	2.430e-24	-22.404	-23.614	-1.210	(0)
VO2NO3	1.395e-24	1.395e-24	-23.855	-23.855	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-57.216	-62.057	-4.840	(0)
HV10O28-5	0.000e+00	0.000e+00	-58.027	-61.388	-3.361	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.548	-63.699	-2.151	(0)
Zn	9.867e-06					
Zn+2	5.079e-06	2.102e-06	-5.294	-5.677	-0.383	(0)
ZnSO4	3.014e-06	3.014e-06	-5.521	-5.521	0.000	(0)
ZnCO3	6.856e-07	6.856e-07	-6.164	-6.164	0.000	(0)
Zn (SO4) 2-2	5.933e-07	1.720e-07	-6.227	-6.765	-0.538	(0)
ZnHCO3+	3.321e-07	2.437e-07	-6.479	-6.613	-0.134	(0)
ZnOH+	9.504e-08	6.974e-08	-7.022	-7.157	-0.134	(0)
ZnCl+	3.714e-08	2.951e-08	-7.430	-7.530	-0.100	(0)
ZnF+	1.451e-08	1.065e-08	-7.838	-7.973	-0.134	(0)
ZnOHCl	1.281e-08	1.281e-08	-7.892	-7.892	0.000	(0)
Zn (OH) 2	3.666e-09	3.666e-09	-8.436	-8.436	0.000	(0)
ZnCl2	2.614e-10	2.614e-10	-9.583	-9.583	0.000	(0)
Zn (OH) 3-	8.306e-12	6.094e-12	-11.081	-11.215	-0.134	(0)
ZnCl3-	1.460e-12	1.160e-12	-11.836	-11.936	-0.100	(0)
ZnNO3+	1.327e-13	9.735e-14	-12.877	-13.012	-0.134	(0)
ZnSeO4	2.795e-14	2.795e-14	-13.554	-13.554	0.000	(0)
ZnCl4-2	7.692e-15	3.242e-15	-14.114	-14.489	-0.375	(0)
Zn (OH) 4-2	2.776e-16	8.048e-17	-15.557	-16.094	-0.538	(0)
Zn (NO3) 2	3.581e-22	3.581e-22	-21.446	-21.446	0.000	(0)
Zn (SeO4) 2-2	8.390e-24	2.432e-24	-23.076	-23.614	-0.538	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.951	-148.086	-0.134	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.594	-149.594	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.548	-224.682	-0.134	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.606	-227.144	-0.538	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.972	-304.510	-0.538	(0)

-----Saturation indices-----

Phase SI** log IAP log K(298 K, 1 atm)

(Co (NH3) 5Cl) (NO3) 2	-51.16	-44.88	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-38.42	-33.91	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-45.65	-33.91	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-66.79	-48.86	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-52.45	-32.42	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-27.56	-27.16	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-22.56	-22.11	0.45	(NH4) 2SeO4
Acanthite	-52.21	-88.43	-36.22	Ag2S
Ag2CO3	-11.74	-22.83	-11.09	Ag2CO3
Ag2CrO4	-21.11	-32.70	-11.59	Ag2CrO4
Ag2HVO4	-12.34	-10.86	1.48	Ag2HVO4
Ag2MoO4	-11.95	-23.50	-11.55	Ag2MoO4
Ag2O	-15.12	-2.55	12.57	Ag2O
Ag2Se	-0.11	-48.81	-48.70	Ag2Se
Ag2SeO3	-9.77	-16.92	-7.15	Ag2SeO3
Ag2SeO4	-18.74	-27.65	-8.91	Ag2SeO4
Ag2SO4	-14.95	-19.77	-4.82	Ag2SO4
Ag3AsO3	-28.52	-26.36	2.16	Ag3AsO3
Ag3AsO4	-16.89	-19.68	-2.79	Ag3AsO4
Ag3H2VO5	-17.31	-12.13	5.18	Ag3H2VO5
AgF:4H2O	-13.44	-12.39	1.05	AgF:4H2O
Agmetal	-0.56	-14.07	-13.51	Ag
AgVO3	-10.35	-9.58	0.77	AgVO3
Al (OH) 3 (am)	-1.14	9.66	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.92	-43.55	2.37	Al2 (MoO4) 3
Al2O3	-0.34	19.31	19.65	Al2O3
Al4 (OH) 10SO4	-1.30	21.40	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.00	-6.20	4.80	AlAsO4:2H2O
AlOHSO4	-4.33	-7.56	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	1.09	-0.31	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.79	-11.58	-7.79	PbSO4
Anhydrite	-0.69	-5.05	-4.36	CaSO4
Anilite	-55.25	-87.12	-31.88	Cu0.25Cu1.5S
Antlerite	-2.16	6.63	8.79	Cu3 (OH) 4SO4
Aragonite	0.19	-8.11	-8.30	CaCO3
Arsenolite	-87.41	-90.17	-2.76	As4O6
Artinite	-5.06	4.54	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.42	-31.72	6.71	As2O5
Atacamite	-1.26	6.13	7.39	Cu2 (OH) 3Cl
Azurite	0.19	-16.71	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.80	7.59	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.29	-1.42	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.02	-8.93	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.77	6.17	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.89	-22.56	-9.67	BaCrO4
BaF2	-8.81	-14.63	-5.82	BaF2
BaMoO4	-6.40	-13.36	-6.96	BaMoO4
Barite	0.36	-9.62	-9.98	BaSO4
BaS	-94.47	-78.29	16.18	BaS
BaSeO3	-8.61	-6.78	1.83	BaSeO3
BaSeO4	-10.05	-17.51	-7.46	BaSeO4
Bianchite	-6.10	-7.86	-1.76	ZnSO4:6H2O
Birnessite	-7.50	10.59	18.09	MnO2
Bixbyite	-3.76	-4.40	-0.64	Mn2O3
BlaubleiI	-55.00	-79.16	-24.16	Cu0.9Cu0.2S
BlaubleiIII	-55.56	-82.84	-27.28	Cu0.6Cu0.8S
Boehmite	1.08	9.66	8.58	AlOOH
Breithauptite	-56.87	-75.39	-18.52	NiSb
Brochantite	-0.64	14.58	15.22	Cu4 (OH) 6SO4
Brucite	-4.43	12.41	16.84	Mg (OH) 2
Bunsenite	-4.67	7.78	12.45	NiO
Ca (VO3) 2	-10.10	-4.44	5.66	Ca (VO3) 2
Ca2V2O7	-9.77	7.73	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.82	7.73	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-17.50	4.80	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.06	19.90	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-19.96	19.90	39.86	Ca3 (VO4) 2:4H2O

Ca3Sb2	-298.37	-155.39	142.97	Ca3Sb2
CaCrO4	-15.72	-17.98	-2.27	CaCrO4
Calcite	0.37	-8.11	-8.48	CaCO3
Calomel	-6.17	-24.08	-17.91	Hg2Cl2
CaMoO4	-0.83	-8.78	-7.95	CaMoO4
Carnotite	-2.78	-2.55	0.23	KUO2VO4
CaSeO3:2H2O	-5.02	-2.21	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.91	-12.93	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.67	-1.83	9.84	Cd(BO2)2
Cd(OH)2	-7.01	6.63	13.64	Cd(OH)2
Cd(OH)2(am)	-7.10	6.63	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.25	-14.54	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-19.88	2.68	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.09	9.31	28.40	Cd4(OH)6SO4
CdCl2	-12.25	-12.91	-0.66	CdCl2
CdCl2:1H2O	-11.22	-12.91	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.00	-12.91	-1.91	CdCl2:2.5H2O
CdF2	-14.38	-15.59	-1.21	CdF2
Cdmetal(alpha)	-32.46	-18.95	13.51	Cd
Cdmetal(gamma)	-32.57	-18.95	13.62	Cd
CdMoO4	-0.17	-14.32	-14.15	CdMoO4
CdOHCl	-6.68	-3.14	3.54	CdOHCl
CdSb	-76.18	-76.53	-0.35	CdSb
CdSe	-19.43	-39.63	-20.20	CdSe
CdSeO4:2H2O	-16.62	-18.47	-1.85	CdSeO4:2H2O
CdSO4	-10.41	-10.59	-0.17	CdSO4
CdSO4:1H2O	-8.86	-10.59	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.71	-10.59	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.30	-11.05	-9.75	AgCl
Cerrusite	-1.51	-14.64	-13.13	PbCO3
CH4(g)	-81.56	-122.61	-41.05	CH4
Chalcanthite	-6.63	-9.27	-2.64	CuSO4:5H2O
Chalcedony	-0.69	-4.24	-3.55	SiO2
Chalcocite	-55.27	-90.19	-34.92	Cu2S
Chalcopyrite	-125.01	-160.28	-35.27	CuFeS2
Chrysotile	-3.44	28.76	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.26	-96.95	-45.69	HgS
Claudetite	-87.10	-90.17	-3.06	As4O6
Clausthalite	-13.52	-40.62	-27.10	PbSe
Co(BO2)2	-28.01	-0.94	27.07	Co(BO2)2
Co(OH)2	-5.57	7.52	13.09	Co(OH)2
Co(OH)3	-9.78	-12.09	-2.31	Co(OH)3
CO2(g)	-2.14	-20.28	-18.15	CO2
Co3(AsO4)2	-22.19	-9.15	13.03	Co3(AsO4)2
Co3O4	-6.16	-16.65	-10.50	Co3O4
CoCl2	-20.29	-12.02	8.27	CoCl2
CoCl2:6H2O	-14.56	-12.02	2.54	CoCl2:6H2O
CoCO3	-2.78	-12.76	-9.98	CoCO3
CoF2	-13.11	-14.71	-1.60	CoF2
CoF3	-43.97	-45.43	-1.46	CoF3
CoFe2O4	17.66	14.13	-3.53	CoFe2O4
CoMoO4	-5.67	-13.43	-7.76	CoMoO4
CoO	-6.07	7.52	13.59	CoO
CoS(alpha)	-70.92	-78.36	-7.44	CoS
CoS(beta)	-67.29	-78.36	-11.07	CoS
CoSe	-22.54	-38.74	-16.20	CoSe
CoSeO3	-8.17	-6.85	1.32	CoSeO3
CoSeO4:6H2O	-16.05	-17.58	-1.53	CoSeO4:6H2O
CoSO4	-12.50	-9.70	2.80	CoSO4
CoSO4:6H2O	-7.23	-9.70	-2.47	CoSO4:6H2O
Cotunnite	-9.12	-13.90	-4.78	PbCl2
Covellite	-55.64	-77.94	-22.30	CuS
Cr(OH)2	-21.81	-10.99	10.82	Cr(OH)2
Cr(OH)3	-2.49	-1.15	1.34	Cr(OH)3
Cr(OH)3(am)	-0.40	-1.15	-0.75	Cr(OH)3
Cr2O3	0.06	-2.30	-2.36	Cr2O3
CrCl2	-44.63	-30.53	14.09	CrCl2
CrCl3	-45.58	-30.46	15.11	CrCl3

CrF3	-23.15	-34.49	-11.34	CrF3
Cristobalite	-0.89	-4.24	-3.35	SiO2
Crmetal	-67.06	-36.57	30.48	Cr
CrO3	-26.94	-30.15	-3.21	CrO3
Cryolite	-5.99	-39.83	-33.84	Na3AlF6
Cu(OH)2	-0.72	7.95	8.67	Cu(OH)2
Cu(SbO3)2	-24.52	20.69	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.60	0.65	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.27	-90.16	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.76	-50.56	-45.80	Cu2Se
Cu2SO4	-19.57	-21.52	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-13.97	-7.87	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-59.81	-102.41	-42.59	Cu3Sb
Cu3Se2	-25.38	-88.87	-63.49	Cu3Se2
CuCO3	-0.83	-12.33	-11.50	CuCO3
CuCrO4	-16.76	-22.20	-5.44	CuCrO4
CuF	-8.36	-13.26	-4.91	CuF
CuF2	-15.39	-14.28	1.12	CuF2
CuF2:2H2O	-9.73	-14.28	-4.55	CuF2:2H2O
Cumetal	-6.19	-14.94	-8.76	Cu
CuMoO4	0.07	-13.01	-13.08	CuMoO4
CuOCuSO4	-11.62	-1.32	10.30	CuOCuSO4
Cupricferrite	8.57	14.56	5.99	CuFe2O4
Cuprite	-2.89	-4.30	-1.41	Cu2O
Cuprousferrite	10.07	1.15	-8.92	CuFeO2
CuSe	-5.21	-38.31	-33.10	CuSe
CuSe2	-25.62	-58.99	-33.37	CuSe2
CuSeO3:2H2O	-6.94	-6.43	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.71	-17.15	-2.44	CuSeO4:5H2O
CuSO4	-12.21	-9.27	2.94	CuSO4
Diaspore	2.78	9.66	6.87	AlOOH
Djurlite	-55.46	-89.38	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.56	-15.98	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.11	-15.98	-17.09	CaMg(CO3)2
Epsomite	-2.68	-4.81	-2.13	MgSO4:7H2O
Fe(OH)2	-10.02	3.54	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.41	0.37	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.35	-13.07	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.32	-7.77	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.89	-36.52	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.32	-45.05	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.07	10.15	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.95	-12.55	0.40	FeAsO4:2H2O
FeCr2O4	-5.95	1.25	7.20	FeCr2O4
FeMoO4	-7.32	-17.41	-10.09	FeMoO4
Ferrihydrite	0.11	3.30	3.19	Fe(OH)3
Ferroselite	-44.80	-63.39	-18.60	FeSe2
FeS(ppt)	-79.39	-82.34	-2.95	FeS
FeSe	-31.72	-42.72	-11.00	FeSe
Fix_pe	-5.27	-5.27	0.00	e-
Fluorite	0.44	-10.06	-10.50	CaF2
Galena	-66.27	-80.24	-13.97	PbS
Gibbsite	1.36	9.66	8.29	Al(OH)3
Goethite	2.81	3.30	0.49	FeOOH
Goslarite	-5.85	-7.86	-2.01	ZnSO4:7H2O
Greenalite	-18.66	2.15	20.81	Fe3Si2O5(OH)4
Greenockite	-64.89	-79.25	-14.36	CdS
Greigite	-288.36	-333.39	-45.03	Fe3S4
Gummite	-7.08	0.59	7.67	UO3
Gypsum	-0.44	-5.05	-4.61	CaSO4:2H2O
H-Jarosite	-12.43	-24.53	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.08	-20.96	-12.88	H2MoO4
H2S(g)	-77.88	-85.89	-8.01	H2S
H2Se(g)	-41.30	-46.26	-4.96	H2Se
Halite	-5.64	-4.04	1.60	NaCl
Halloysite	1.26	10.83	9.57	Al2Si2O5(OH)4
Hausmannite	-4.38	56.65	61.03	Mn3O4
Hematite	8.03	6.61	-1.42	Fe2O3

Hercynite	-0.03	22.86	22.89	FeAl ₂ O ₄
Hg (CH ₃) ₂ (g)	-182.58	-256.29	-73.71	Hg (CH ₃) ₂
Hg (g)	-7.18	-15.06	-7.87	Hg
Hg (OH) ₂	-7.57	-11.07	-3.50	Hg (OH) ₂
Hg ₂ (g)	-15.16	-30.12	-14.96	Hg ₂
Hg ₂ (OH) ₂	-9.79	-4.53	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-8.77	-24.82	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-25.99	-34.69	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-16.40	-26.76	-10.36	Hg ₂ F ₂
Hg ₂ S	-78.74	-90.42	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-14.25	-18.91	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-15.62	-21.75	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-23.81	-53.49	-29.68	Hg ₃ O ₂ CO ₃
HgCl (g)	-31.53	-12.04	19.50	HgCl
HgCl ₂	-9.35	-30.61	-21.26	HgCl ₂
HgF (g)	-46.06	-13.38	32.68	HgF
HgF ₂ (g)	-45.86	-33.30	12.57	HgF ₂
Hgmetal (l)	-1.61	-15.06	-13.45	Hg
HgSe	-1.64	-57.33	-55.69	HgSe
HgSeO ₃	-13.01	-25.44	-12.43	HgSeO ₃
HgSO ₄	-18.87	-28.29	-9.42	HgSO ₄
Huntite	-1.75	-31.72	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-4.87	-23.64	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-10.30	-19.06	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ : 4H ₂ O
K-Alum	-14.46	-19.63	-5.17	KAl (SO ₄) ₂ : 12H ₂ O
K-Jarosite	-4.57	-19.37	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-32.74	-49.98	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-19.32	-19.83	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-13.89	-10.63	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-14.05	-14.78	-0.73	K ₂ SeO ₄
Kaolinite	3.40	10.83	7.43	Al ₂ Si ₂ O ₅ (OH) ₄
Langite	-2.91	14.58	17.49	Cu ₄ (OH) ₆ SO ₄ : H ₂ O
Larnakite	-5.50	-5.93	-0.43	PbO : PbSO ₄
Laurionite	-4.75	-4.13	0.62	PbOHCl
Lepidocrocite	1.93	3.30	1.37	FeOOH
Lime	-20.53	12.17	32.70	CaO
Litharge	-7.05	5.64	12.69	PbO
Mackinawite	-78.74	-82.34	-3.60	FeS
Maghemite	0.22	6.61	6.39	Fe ₂ O ₃
Magnesioferrite	2.16	19.02	16.86	Fe ₂ MgO ₄
Magnesite	-0.41	-7.87	-7.46	MgCO ₃
Magnetite	6.75	10.15	3.40	Fe ₃ O ₄
Malachite	0.92	-4.38	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-2.19	23.15	25.34	MnOOH
Massicot	-7.25	5.64	12.89	PbO
Matlockite	-6.27	-15.24	-8.97	PbClF
Melanothallite	-17.85	-11.59	6.26	CuCl ₂
Melanterite	-11.47	-13.68	-2.21	FeSO ₄ : 7H ₂ O
Metacinnabar	-51.86	-96.95	-45.09	HgS
Mg (OH) ₂ (active)	-6.38	12.41	18.79	Mg (OH) ₂
Mg (VO ₃) ₂	-15.48	-4.20	11.28	Mg (VO ₃) ₂
Mg ₂ Sb ₃	-273.77	-199.08	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-18.15	8.21	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-6.09	10.12	16.20	MgCr ₂ O ₄
MgCrO ₄	-23.12	-17.74	5.38	MgCrO ₄
MgF ₂	-1.68	-9.81	-8.13	MgF ₂
MgMoO ₄	-6.69	-8.54	-1.85	MgMoO ₄
MgSeO ₃ : 6H ₂ O	-5.02	-1.97	3.06	MgSeO ₃ : 6H ₂ O
MgSeO ₄ : 6H ₂ O	-11.49	-12.69	-1.20	MgSeO ₄ : 6H ₂ O
Minium	-31.01	42.51	73.52	Pb ₃ O ₄
Mirabilite	-4.65	-5.76	-1.11	Na ₂ SO ₄ : 10H ₂ O
Mn (VO ₃) ₂	-11.16	-6.26	4.90	Mn (VO ₃) ₂
Mn ₂ (SO ₄) ₃	-50.35	-56.06	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-149.11	-88.03	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ : 8H ₂ O	-13.15	-0.65	12.50	Mn ₃ (AsO ₄) ₂ : 8H ₂ O
MnCl ₂ : 4H ₂ O	-11.90	-9.19	2.72	MnCl ₂ : 4H ₂ O
MnS (grn)	-75.70	-75.53	0.17	MnS
MnS (pnk)	-78.87	-75.53	3.34	MnS

MnSb	-95.25	-98.16	-2.91	MnSb
MnSe	-39.40	-35.90	3.50	MnSe
MnSeO3	-5.15	-4.02	1.13	MnSeO3
MnSeO3:2H2O	-5.00	-4.02	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.70	-14.75	-2.05	MnSeO4:5H2O
MnSO4	-9.45	-6.86	2.58	MnSO4
Monteponite	-8.47	6.63	15.10	CdO
Montroydite	-7.43	-11.07	-3.64	HgO
MoO3	-12.96	-20.96	-8.00	MoO3
Morenosite	-7.30	-9.45	-2.14	NiSO4:7H2O
MoS2	-148.05	-218.31	-70.26	MoS2
Na-Jarosite	-7.60	-18.80	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.95	-48.84	-9.90	Na2Cr2O7
Na2CrO4	-21.62	-18.69	2.93	Na2CrO4
Na2Mo2O7	-13.85	-30.45	-16.60	Na2Mo2O7
Na2MoO4	-10.98	-9.49	1.49	Na2MoO4
Na2MoO4:2H2O	-10.72	-9.49	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.22	-2.92	10.30	Na2SeO3:5H2O
Na2SeO4	-14.92	-13.64	1.28	Na2SeO4
Na3Sb	-173.21	-78.76	94.45	Na3Sb
Na3VO4	-27.79	8.89	36.68	Na3VO4
Na4V2O7	-31.09	6.31	37.40	Na4V2O7
Nantokite	-5.19	-11.92	-6.73	CuCl
NaSb	-87.81	-64.64	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-6.43	-2.58	3.86	NaVO3
Nesquehonite	-3.20	-7.87	-4.67	MgCO3:3H2O
Ni(OH)2	-5.02	7.78	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.09	-8.39	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.12	13.88	32.00	Ni4(OH)6SO4
NiCO3	-5.64	-12.51	-6.87	NiCO3
NiMoO4	-2.04	-13.18	-11.14	NiMoO4
NiS(alpha)	-72.51	-78.11	-5.60	NiS
NiS(beta)	-67.01	-78.11	-11.10	NiS
NiS(gamma)	-65.31	-78.11	-12.80	NiS
NiSe	-20.79	-38.49	-17.70	NiSe
NiSeO3:2H2O	-9.42	-6.60	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.81	-17.33	-1.52	NiSeO4:6H2O
Nsutite	-6.92	10.59	17.50	MnO2
O2(g)	-31.93	51.16	83.09	O2
Orpiment	-241.67	-302.74	-61.07	As2S3
Otavite	-1.65	-13.65	-12.00	CdCO3
Pb(BO2)2	-9.34	-2.82	6.52	Pb(BO2)2
Pb(OH)2	-2.51	5.64	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-56.51	-65.27	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.28	1.51	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-14.90	11.29	26.19	Pb2O(OH)2
Pb2O3	-24.17	36.87	61.04	Pb2O3
Pb2OCO3	-8.44	-9.00	-0.56	Pb2OCO3
Pb2V2O7	-3.43	-5.33	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.59	-14.79	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.83	0.31	6.14	Pb3(VO4)2
Pb3O2CO3	-14.37	-3.35	11.02	Pb3O2CO3
Pb3O2SO4	-10.98	-0.29	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.75	5.35	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.52	5.35	21.88	Pb4O3SO4
PbCrO4	-11.91	-24.51	-12.60	PbCrO4
PbF2	-9.14	-16.58	-7.44	PbF2
Pbmetal	-24.18	-19.94	4.25	Pb
PbMoO4	0.31	-15.31	-15.62	PbMoO4
PbO:0.3H2O	-7.34	5.64	12.98	PbO:0.33H2O
PbSeO4	-12.62	-19.46	-6.84	PbSeO4
Periclase	-9.17	12.41	21.58	MgO
Phosgenite	-8.73	-28.54	-19.81	PbCl2:PbCO3
Plattnerite	-18.38	31.22	49.60	PbO2
Portlandite	-10.63	12.17	22.80	Ca(OH)2
Pyrite	-124.14	-142.65	-18.51	FeS2
Pyrochroite	-4.84	10.36	15.19	Mn(OH)2

Pyrolusite	-5.44	35.94	41.38	MnO2
Quartz	-0.24	-4.24	-4.00	SiO2
Realgar	-101.47	-121.22	-19.75	AsS
Retgersite	-7.41	-9.45	-2.04	NiSO4:6H2O
Rhodochrosite	0.65	-9.93	-10.58	MnCO3
Rutherfordine	-5.19	-19.69	-14.50	UO2CO3
Sb(OH)3	-12.10	-19.21	-7.11	Sb(OH)3
Sb2O4	-16.24	-12.84	3.40	Sb2O4
Sb2O5	-26.21	-35.88	-9.67	Sb2O5
Sb2Se3	-109.44	-177.20	-67.76	Sb2Se3
Sb4O6(cubic)	-58.58	-76.84	-18.26	Sb4O6
Sb4O6(orth)	-58.94	-76.84	-17.90	Sb4O6
SbCl3	-49.09	-48.52	0.57	SbCl3
SbF3	-42.32	-52.55	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.90	-30.73	-27.82	SbO2
Schoepite	-5.40	0.59	5.99	UO2(OH)2:H2O
Semetal(am)	-13.57	-20.68	-7.11	Se
Semetal(hex)	-12.97	-20.68	-7.71	Se
Senarmontite	-26.05	-38.42	-12.37	Sb2O3
SeO2	-14.50	-14.38	0.12	SeO2
SeO3	-46.15	-25.10	21.04	SeO3
Sepiolite	-3.65	12.11	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-6.67	12.11	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.50	-16.74	-10.24	FeCO3
SiO2(am-gel)	-1.53	-4.24	-2.71	SiO2
SiO2(am-ppt)	-1.50	-4.24	-2.74	SiO2
Smithsonite	-0.92	-10.92	-10.00	ZnCO3
Sphalerite	-65.08	-76.53	-11.45	ZnS
Spinel	-5.12	31.73	36.85	MgAl2O4
Stibnite	-245.62	-296.08	-50.46	Sb2S3
Sulfur	-58.16	-60.30	-2.14	S
Tenorite	0.31	7.95	7.64	CuO
Thenardite	-6.08	-5.76	0.32	Na2SO4
Thermonatrite	-9.46	-8.82	0.64	Na2CO3:H2O
Tyuyamunite	-7.34	-3.26	4.08	Ca(UO2)2(VO4)2
U3O8	-17.24	3.85	21.08	U3O8
U3Sb4	-583.52	-431.14	152.38	U3Sb4
U4O9	-34.49	-37.51	-3.02	U4O9
UF4	-30.69	-60.23	-29.54	UF4
UF4:2.5H2O	-27.51	-60.23	-32.72	UF4:2.5H2O
UO2(am)	-16.71	-15.77	0.93	UO2
UO2(NO3)2	-42.06	-29.91	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.76	-29.91	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.30	-29.91	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.96	-29.91	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-5.02	0.59	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.26	-24.51	-2.25	UO2SeO4:4H2O
UO3	-7.11	0.59	7.70	UO3
Uraninite	-11.10	-15.77	-4.67	UO2
USb2	-220.89	-191.32	29.58	USb2
V(OH)3	-18.88	-11.29	7.59	V(OH)3
V2O5	-15.25	-16.61	-1.36	V2O5
V3O5	-40.00	-38.17	1.84	V3O5
V4O7	-49.55	-42.36	7.19	V4O7
V6O13	-40.15	-101.01	-60.86	V6O13
Valentinite	-29.94	-38.42	-8.48	Sb2O3
VC12	-62.50	-43.62	18.87	VC12
VC13	-64.03	-40.60	23.43	VC13
VF4	-63.58	-48.65	14.93	VF4
Vmetal	-93.69	-49.66	44.03	V
VO	-38.84	-24.08	14.76	VO
VO(OH)2	-9.35	-4.20	5.15	VO(OH)2
VO2Cl	-20.92	-18.08	2.84	VO2Cl
VOC1	-32.21	-21.06	11.15	VOC1
VOC12	-36.50	-23.74	12.76	VOC12
VOSO4	-25.02	-21.41	3.61	VOSO4
Witherite	-4.12	-12.69	-8.57	BaCO3

Wurtzite	-67.58	-76.53	-8.95	ZnS
Zincite	-1.98	9.36	11.33	ZnO
Zincosite	-11.79	-7.86	3.93	ZnSO4
Zn(BO2)2	-7.39	0.90	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.46	-21.15	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.84	9.36	12.20	Zn(OH)2
Zn(OH)2(am)	-3.12	9.36	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.40	9.36	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.18	9.36	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.38	9.36	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.00	1.50	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.25	8.95	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.29	-3.64	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.28	-6.36	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.19	20.21	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.25	27.25	38.50	Zn5(OH)8Cl2
ZnCl2	-17.23	-10.18	7.05	ZnCl2
ZnCO3:1H2O	-0.66	-10.92	-10.26	ZnCO3:1H2O
ZnF2	-12.33	-12.87	-0.53	ZnF2
Znmetal	-42.01	-16.22	25.79	Zn
ZnMoO4	-1.47	-11.60	-10.13	ZnMoO4
ZnO(active)	-1.83	9.36	11.19	ZnO
ZnS(am)	-67.48	-76.53	-9.05	ZnS
ZnSb	-84.82	-73.81	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-14.23	-15.75	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.22	-7.86	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 145.

Title Precipitate oversaturated phases

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 805

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -3.5 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

```

Gypsum      0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 813
SAVE Solution 814 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 805
END

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TITLE
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Precipitate oversaturated phases

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Beginning of batch-reaction calculations.
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Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 813. Solution after simulation 144.
Using pure phase assemblage 805.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	5.555e-09	5.555e-09
Alunite	-2.37	-3.77	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.87	-5.23	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-0.00	-8.91	-8.91	0.000e+00	2.700e-11	2.700e-11
Barite	0.00	-9.98	-9.98	0.000e+00	5.290e-08	5.290e-08
Brochantite	0.00	15.22	15.22	0.000e+00	7.112e-07	7.112e-07
Brucite	-3.23	13.61	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	2.247e-03
CaMoO4	-1.03	-8.98	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.86	-2.05	2.81	0.000e+00	0	0.000e+00
Calcite	-0.00	-8.48	-8.48	0.000e+00	1.987e-03	1.987e-03
Carnotite	-1.21	-0.98	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-10.55	-0.71	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.17	-14.32	-14.15	0.000e+00	0	0.000e+00
Chrysotile	-0.00	32.20	32.20	0.000e+00	4.029e-06	4.029e-06
Cr2O3	0.00	-2.36	-2.36	0.000e+00	1.240e-09	1.240e-09
Cu2Se(alpha)	-4.54	-50.34	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.66	-13.74	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.66	-4.79	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.643e-09	1.643e-09

Fluorite	0.00	-10.50	-10.50	0.000e+00	5.182e-05	5.182e-05
Gummite	-5.34	2.33	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.62	-5.23	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.39	-58.08	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.62	-5.74	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.78	-3.65	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.77	9.02	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-22.78	-7.08	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.75	-12.62	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-1.98	-13.12	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.805e-06
Otavite	-1.82	-13.82	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	7.161e-09	7.161e-09
Rutherfordine	-4.81	-19.31	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.48	-31.30	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.66	2.33	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.49	14.27	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.57	-4.31	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-4.39	-0.31	4.08	0.000e+00	0	0.000e+00
U3O8	-11.98	9.11	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.28	2.33	5.61	0.000e+00	0	0.000e+00
UO3	-5.37	2.33	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.46	-11.59	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	2.195e-08	2.193e-08
Al	4.069e-06	4.064e-06
As	3.097e-10	3.094e-10
B	5.941e-05	5.935e-05
Ba	3.646e-08	3.642e-08
C	8.438e-04	8.430e-04
Ca	3.442e-03	3.438e-03
Cd	2.104e-08	2.102e-08
Cl	6.967e-03	6.959e-03
Co	1.616e-07	1.614e-07
Cr	9.916e-10	9.906e-10
Cu	5.061e-07	5.055e-07
F	3.058e-04	3.055e-04
Fe	8.663e-10	8.654e-10
Hg	3.320e-09	3.316e-09
K	5.741e-03	5.735e-03
Mg	8.811e-03	8.802e-03
Mn	9.898e-05	9.887e-05
Mo	2.899e-06	2.896e-06
N	2.430e-05	2.428e-05
Na	2.114e-02	2.112e-02
Ni	2.518e-07	2.515e-07
Pb	4.651e-09	4.646e-09
S	2.172e-02	2.169e-02
Sb	4.431e-08	4.427e-08
Se	2.463e-07	2.461e-07
Si	4.873e-05	4.868e-05
U	4.020e-07	4.016e-07
V	1.342e-08	1.340e-08
Zn	9.867e-06	9.856e-06

-----Description of solution-----

	pH	=	8.115	Charge balance
	pe	=	4.658	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	6.587e-02	
	Mass of water (kg)	=	9.990e-01	

Total alkalinity (eq/kg) = 8.860e-04
 Total CO2 (mol/kg) = 8.438e-04
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 2.873e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 8
 Total H = 1.108989e+02
 Total O = 5.553860e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.654e-06	1.311e-06	-5.781	-5.883	-0.101	(0)
H+	9.532e-09	7.675e-09	-8.021	-8.115	-0.094	0.00
H2O	5.551e+01	9.989e-01	1.744	-0.000	0.000	18.07
Ag	2.195e-08					
AgCl	1.224e-08	1.224e-08	-7.912	-7.912	0.000	(0)
AgCl2-	8.081e-09	5.978e-09	-8.093	-8.223	-0.131	(0)
Ag+	1.327e-09	1.068e-09	-8.877	-8.971	-0.094	(0)
AgSO4-	1.977e-10	1.462e-10	-9.704	-9.835	-0.131	(0)
AgCl3-2	9.979e-11	2.989e-11	-10.001	-10.524	-0.524	(0)
AgCl4-3	5.158e-12	3.423e-13	-11.288	-12.466	-1.178	(0)
AgNO2	4.240e-12	4.240e-12	-11.373	-11.373	0.000	(0)
AgF	5.128e-13	5.128e-13	-12.290	-12.290	0.000	(0)
AgOH	1.400e-13	1.400e-13	-12.854	-12.854	0.000	(0)
AgH2BO3	6.939e-14	6.939e-14	-13.159	-13.159	0.000	(0)
AgSeO3-	3.839e-14	2.840e-14	-13.416	-13.547	-0.131	(0)
AgNH3+	1.827e-14	1.352e-14	-13.738	-13.869	-0.131	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	1.686e-16	1.247e-16	-15.773	-15.904	-0.131	(0)
Ag (OH) 2-	2.424e-17	1.793e-17	-16.615	-16.746	-0.131	(0)
AgNO3	1.521e-17	1.521e-17	-16.818	-16.818	0.000	(0)
Ag (NH3) 2+	9.202e-19	6.807e-19	-18.036	-18.167	-0.131	(0)
Ag (SeO3) 2-3	1.585e-19	1.052e-20	-18.800	-19.978	-1.178	(0)
Ag2MoO4	5.265e-25	5.265e-25	-24.279	-24.279	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.954	-73.954	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-80.786	-82.881	-2.094	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.789	-148.020	-0.231	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.521	-148.652	-0.131	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.933	-149.345	-0.413	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.267	-149.656	-0.390	(0)
Al	4.069e-06					
Al (OH) 4-	4.048e-06	3.253e-06	-5.393	-5.488	-0.095	(0)
Al (OH) 3	1.972e-08	1.972e-08	-7.705	-7.705	0.000	(0)
Al (OH) 2+	9.276e-10	7.541e-10	-9.033	-9.123	-0.090	(0)
AlF3	1.932e-10	1.932e-10	-9.714	-9.714	0.000	(0)
AlF2+	9.882e-11	8.033e-11	-10.005	-10.095	-0.090	(0)
AlF4-	2.302e-11	1.850e-11	-10.638	-10.733	-0.095	(0)
AlF+2	2.418e-12	1.056e-12	-11.617	-11.976	-0.360	(0)
AlOH+2	1.659e-12	7.244e-13	-11.780	-12.140	-0.360	(0)
AlSO4+	3.662e-14	2.943e-14	-13.436	-13.531	-0.095	(0)
Al+3	3.884e-15	5.527e-16	-14.411	-15.257	-0.847	(0)
Al (SO4) 2-	2.691e-15	2.163e-15	-14.570	-14.665	-0.095	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.260	-44.438	-1.178	(0)
As (3)	2.068e-24					
H3AsO3	1.897e-24	1.897e-24	-23.722	-23.722	0.000	(0)
H2AsO3-	1.713e-25	1.267e-25	-24.766	-24.897	-0.131	(0)
HAsO3-2	5.028e-29	1.506e-29	-28.299	-28.822	-0.524	(0)
H4AsO3+	9.748e-33	7.212e-33	-32.011	-32.142	-0.131	(0)
AsO3-3	1.140e-33	7.563e-35	-32.943	-34.121	-1.178	(0)
As (5)	3.097e-10					
HAsO4-2	3.007e-10	9.005e-11	-9.522	-10.046	-0.524	(0)
H2AsO4-	8.521e-12	6.303e-12	-11.070	-11.200	-0.131	(0)
AsO4-3	5.591e-13	3.710e-14	-12.253	-13.431	-1.178	(0)
H3AsO4	8.281e-18	8.407e-18	-17.082	-17.075	0.007	(0)

B	5.941e-05					
H3BO3	5.334e-05	5.416e-05	-4.273	-4.266	0.007	(0)
H2BO3-	5.256e-06	4.098e-06	-5.279	-5.387	-0.108	(0)
MgH2BO3+	4.381e-07	3.416e-07	-6.358	-6.467	-0.108	(0)
CaH2BO3+	2.620e-07	2.043e-07	-6.582	-6.690	-0.108	(0)
NaH2BO3	1.066e-07	1.066e-07	-6.972	-6.972	0.000	(0)
BF(OH) 3-	5.296e-09	4.129e-09	-8.276	-8.384	-0.108	(0)
H5(BO3) 2-	2.423e-10	1.889e-10	-9.616	-9.724	-0.108	(0)
BaH2BO3+	2.480e-12	1.933e-12	-11.606	-11.714	-0.108	(0)
H8(BO3) 3-	1.312e-12	1.023e-12	-11.882	-11.990	-0.108	(0)
BF2(OH) 2-	8.312e-13	6.480e-13	-12.080	-12.188	-0.108	(0)
AgH2BO3	6.939e-14	6.939e-14	-13.159	-13.159	0.000	(0)
BF3OH-	4.747e-19	3.701e-19	-18.324	-18.432	-0.108	(0)
BF4-	3.429e-24	2.673e-24	-23.465	-23.573	-0.108	(0)
Ba	3.646e-08					
Ba+2	3.631e-08	1.527e-08	-7.440	-7.816	-0.376	(0)
BaHCO3+	1.115e-10	9.124e-11	-9.953	-10.040	-0.087	(0)
BaCO3	2.993e-11	2.993e-11	-10.524	-10.524	0.000	(0)
BaH2BO3+	2.480e-12	1.933e-12	-11.606	-11.714	-0.108	(0)
BaOH+	1.080e-13	8.733e-14	-12.967	-13.059	-0.092	(0)
BaNO3+	1.853e-15	1.371e-15	-14.732	-14.863	-0.131	(0)
BaNH3+2	1.993e-16	5.968e-17	-15.701	-16.224	-0.524	(0)
C (4)	8.438e-04					
HCO3-	7.698e-04	6.258e-04	-3.114	-3.204	-0.090	(0)
MgHCO3+	1.929e-05	1.539e-05	-4.715	-4.813	-0.098	(0)
CaHCO3+	1.233e-05	1.009e-05	-4.909	-4.996	-0.087	(0)
H2CO3	1.080e-05	1.080e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.093e-06	3.823e-06	-5.041	-5.418	-0.376	(0)
MgCO3	7.643e-06	7.643e-06	-5.117	-5.117	0.000	(0)
NaHCO3	5.778e-06	5.778e-06	-5.238	-5.238	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaCO3-	1.438e-06	1.169e-06	-5.842	-5.932	-0.090	(0)
ZnCO3	4.640e-07	4.640e-07	-6.333	-6.333	0.000	(0)
UO2(CO3) 3-4	3.524e-07	2.836e-09	-6.453	-8.547	-2.094	(0)
CuCO3	3.366e-07	3.366e-07	-6.473	-6.473	0.000	(0)
MnHCO3+	3.324e-07	2.689e-07	-6.478	-6.570	-0.092	(0)
ZnHCO3+	5.643e-08	4.175e-08	-7.248	-7.379	-0.131	(0)
UO2(CO3) 2-2	4.942e-08	1.480e-08	-7.306	-7.830	-0.524	(0)
Cu(CO3) 2-2	1.156e-08	3.463e-09	-7.937	-8.461	-0.524	(0)
NiCO3	8.877e-09	8.877e-09	-8.052	-8.052	0.000	(0)
NiHCO3+	6.492e-09	4.802e-09	-8.188	-8.319	-0.131	(0)
PbCO3	2.262e-09	2.262e-09	-8.645	-8.645	0.000	(0)
CoHCO3+	2.166e-09	1.602e-09	-8.664	-8.795	-0.131	(0)
CoCO3	2.127e-09	2.127e-09	-8.672	-8.672	0.000	(0)
CuHCO3+	7.982e-10	5.905e-10	-9.098	-9.229	-0.131	(0)
CdCO3	3.422e-10	3.422e-10	-9.466	-9.466	0.000	(0)
UO2CO3	1.941e-10	1.941e-10	-9.712	-9.712	0.000	(0)
PbHCO3+	1.237e-10	9.154e-11	-9.907	-10.038	-0.131	(0)
BaHCO3+	1.115e-10	9.124e-11	-9.953	-10.040	-0.087	(0)
Pb(CO3) 2-2	8.327e-11	2.494e-11	-10.080	-10.603	-0.524	(0)
BaCO3	2.993e-11	2.993e-11	-10.524	-10.524	0.000	(0)
CdHCO3+	7.564e-12	5.595e-12	-11.121	-11.252	-0.131	(0)
Cd(CO3) 2-2	3.237e-12	9.697e-13	-11.490	-12.013	-0.524	(0)
HgCO3	3.380e-15	3.380e-15	-14.471	-14.471	0.000	(0)
FeHCO3+	1.605e-15	1.314e-15	-14.795	-14.882	-0.087	(0)
Hg(CO3) 2-2	1.364e-16	4.086e-17	-15.865	-16.389	-0.524	(0)
HgHCO3+	6.530e-19	4.831e-19	-18.185	-18.316	-0.131	(0)
Ca	3.442e-03					
Ca+2	2.060e-03	8.662e-04	-2.686	-3.062	-0.376	(0)
CaSO4	1.361e-03	1.361e-03	-2.866	-2.866	0.000	(0)
CaHCO3+	1.233e-05	1.009e-05	-4.909	-4.996	-0.087	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.233e-06	1.806e-06	-5.651	-5.743	-0.092	(0)
CaH2BO3+	2.620e-07	2.043e-07	-6.582	-6.690	-0.108	(0)
CaOH+	2.767e-08	2.265e-08	-7.558	-7.645	-0.087	(0)
CaNO3+	6.635e-11	4.908e-11	-10.178	-10.309	-0.131	(0)
CaNH3+2	2.256e-11	6.757e-12	-10.647	-11.170	-0.524	(0)
Ca(NH3) 2+2	5.565e-20	1.667e-20	-19.255	-19.778	-0.524	(0)

Cd	2.104e-08					
Cd+2	9.341e-09	3.927e-09	-8.030	-8.406	-0.376	(0)
CdSO4	6.315e-09	6.315e-09	-8.200	-8.200	0.000	(0)
CdCl+	2.844e-09	2.104e-09	-8.546	-8.677	-0.131	(0)
Cd (SO4) 2-2	1.951e-09	5.843e-10	-8.710	-9.233	-0.524	(0)
CdCO3	3.422e-10	3.422e-10	-9.466	-9.466	0.000	(0)
CdOHC1	1.131e-10	1.131e-10	-9.947	-9.947	0.000	(0)
CdOH+	5.526e-11	4.088e-11	-10.258	-10.388	-0.131	(0)
CdCl2	4.920e-11	4.920e-11	-10.308	-10.308	0.000	(0)
CdF+	1.608e-11	1.189e-11	-10.794	-10.925	-0.131	(0)
CdHCO3+	7.564e-12	5.595e-12	-11.121	-11.252	-0.131	(0)
Cd (CO3) 2-2	3.237e-12	9.697e-13	-11.490	-12.013	-0.524	(0)
Cd (OH) 2	3.380e-13	3.380e-13	-12.471	-12.471	0.000	(0)
CdCl3-	2.354e-13	1.741e-13	-12.628	-12.759	-0.131	(0)
CdF2	4.534e-15	4.534e-15	-14.344	-14.344	0.000	(0)
CdNO3+	3.008e-16	2.225e-16	-15.522	-15.653	-0.131	(0)
CdSeO4	1.310e-16	1.310e-16	-15.883	-15.883	0.000	(0)
Cd (OH) 3-	3.659e-17	2.707e-17	-16.437	-16.568	-0.131	(0)
Cd (SeO3) 2-2	1.849e-17	5.538e-18	-16.733	-17.257	-0.524	(0)
Cd2OH+3	1.212e-17	8.046e-19	-16.916	-18.094	-1.178	(0)
Cd (OH) 4-2	1.938e-23	5.806e-24	-22.713	-23.236	-0.524	(0)
Cd (NO3) 2	1.999e-24	1.999e-24	-23.699	-23.699	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.064	-79.195	-0.131	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.789	-150.789	0.000	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.555	-227.686	-0.131	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.764	-304.288	-0.524	(0)
Cl	6.967e-03					
Cl-	6.966e-03	5.610e-03	-2.157	-2.251	-0.094	(0)
MnCl+	1.880e-07	1.521e-07	-6.726	-6.818	-0.092	(0)
ZnOHC1	5.100e-08	5.100e-08	-7.292	-7.292	0.000	(0)
ZnCl+	3.724e-08	2.972e-08	-7.429	-7.527	-0.098	(0)
AgCl	1.224e-08	1.224e-08	-7.912	-7.912	0.000	(0)
AgCl2-	8.081e-09	5.978e-09	-8.093	-8.223	-0.131	(0)
CdCl+	2.844e-09	2.104e-09	-8.546	-8.677	-0.131	(0)
CuCl2-	1.670e-09	1.333e-09	-8.777	-8.875	-0.098	(0)
NiCl+	1.208e-09	8.934e-10	-8.918	-9.049	-0.131	(0)
MnCl2	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
CuCl	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
CoCl+	8.633e-10	6.386e-10	-9.064	-9.195	-0.131	(0)
ZnCl2	2.643e-10	2.643e-10	-9.578	-9.578	0.000	(0)
CuCl+	1.666e-10	1.329e-10	-9.778	-9.876	-0.098	(0)
CdOHC1	1.131e-10	1.131e-10	-9.947	-9.947	0.000	(0)
AgCl3-2	9.979e-11	2.989e-11	-10.001	-10.524	-0.524	(0)
PbCl+	5.296e-11	3.918e-11	-10.276	-10.407	-0.131	(0)
CdCl2	4.920e-11	4.920e-11	-10.308	-10.308	0.000	(0)
HgClOH	9.593e-12	9.593e-12	-11.018	-11.018	0.000	(0)
AgCl4-3	5.158e-12	3.423e-13	-11.288	-12.466	-1.178	(0)
CuCl3-2	3.734e-12	1.599e-12	-11.428	-11.796	-0.368	(0)
HgCl2	2.325e-12	2.325e-12	-11.634	-11.634	0.000	(0)
MnCl3-	2.301e-12	1.862e-12	-11.638	-11.730	-0.092	(0)
ZnCl3-	1.475e-12	1.178e-12	-11.831	-11.929	-0.098	(0)
PbCl2	9.818e-13	9.818e-13	-12.008	-12.008	0.000	(0)
CuCl2	2.586e-13	2.586e-13	-12.587	-12.587	0.000	(0)
CdCl3-	2.354e-13	1.741e-13	-12.628	-12.759	-0.131	(0)
HgCl3-	1.763e-13	1.304e-13	-12.754	-12.885	-0.131	(0)
NiCl2	2.523e-14	2.523e-14	-13.598	-13.598	0.000	(0)
HgCl4-2	9.724e-15	2.913e-15	-14.012	-14.536	-0.524	(0)
ZnCl4-2	7.713e-15	3.303e-15	-14.113	-14.481	-0.368	(0)
PbCl3-	2.964e-15	2.192e-15	-14.528	-14.659	-0.131	(0)
UO2Cl+	1.568e-16	1.160e-16	-15.805	-15.936	-0.131	(0)
HgCl+	1.118e-16	8.270e-17	-15.952	-16.082	-0.131	(0)
PbCl4-2	1.877e-17	5.622e-18	-16.727	-17.250	-0.524	(0)
CuCl3-	1.696e-17	1.354e-17	-16.771	-16.868	-0.098	(0)
CrCl+2	2.694e-18	8.070e-19	-17.570	-18.093	-0.524	(0)
CrOHC12	1.128e-19	1.128e-19	-18.948	-18.948	0.000	(0)
CuCl4-2	8.887e-22	3.806e-22	-21.051	-21.420	-0.368	(0)
CrCl2+	5.806e-22	4.295e-22	-21.236	-21.367	-0.131	(0)
FeCl+2	2.785e-22	1.193e-22	-21.555	-21.923	-0.368	(0)

VOC1+	1.427e-23	1.055e-23	-22.846	-22.977	-0.131	(0)
FeCl2+	3.695e-24	2.989e-24	-23.432	-23.525	-0.092	(0)
CrO3Cl-	8.926e-26	6.604e-26	-25.049	-25.180	-0.131	(0)
FeCl3	1.677e-27	1.677e-27	-26.776	-26.776	0.000	(0)
CoCl+2	2.270e-35	6.799e-36	-34.644	-35.168	-0.524	(0)
UCl+3	0.000e+00	0.000e+00	-45.826	-47.004	-1.178	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
Co (2)	1.616e-07					
Co+2	1.099e-07	3.291e-08	-6.959	-7.483	-0.524	(0)
CoSO4	4.504e-08	4.504e-08	-7.346	-7.346	0.000	(0)
CoHCO3+	2.166e-09	1.602e-09	-8.664	-8.795	-0.131	(0)
CoCO3	2.127e-09	2.127e-09	-8.672	-8.672	0.000	(0)
CoOH+	1.163e-09	8.606e-10	-8.934	-9.065	-0.131	(0)
CoCl+	8.633e-10	6.386e-10	-9.064	-9.195	-0.131	(0)
CoF+	2.688e-10	1.988e-10	-9.571	-9.701	-0.131	(0)
Co (OH) 2	8.958e-11	8.958e-11	-10.048	-10.048	0.000	(0)
CoNO2+	5.954e-12	4.405e-12	-11.225	-11.356	-0.131	(0)
Co (NH3) +2	8.185e-14	2.452e-14	-13.087	-13.611	-0.524	(0)
Co (OH) 3-	3.166e-15	2.342e-15	-14.499	-14.630	-0.131	(0)
CoSeO4	2.956e-15	2.956e-15	-14.529	-14.529	0.000	(0)
CoNO3+	1.263e-15	9.346e-16	-14.898	-15.029	-0.131	(0)
CoOOH-	7.953e-16	5.884e-16	-15.099	-15.230	-0.131	(0)
Co2OH+3	2.139e-17	1.419e-18	-16.670	-17.848	-1.178	(0)
Co (NH3) 2+2	2.163e-20	6.480e-21	-19.665	-20.188	-0.524	(0)
Co (OH) 4-2	1.624e-21	4.865e-22	-20.789	-21.313	-0.524	(0)
Co (NO3) 2	3.408e-23	3.408e-23	-22.468	-22.468	0.000	(0)
Co4 (OH) 4+4	1.360e-26	1.094e-28	-25.867	-27.961	-2.094	(0)
Co (NH3) 3+2	1.688e-27	5.055e-28	-26.773	-27.296	-0.524	(0)
Co (NH3) 4+2	5.488e-35	1.644e-35	-34.261	-34.784	-0.524	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.248	-42.772	-0.524	(0)
Co (3)	1.324e-28					
CoOH+2	1.324e-28	3.967e-29	-27.878	-28.402	-0.524	(0)
Co+3	4.186e-35	5.956e-36	-34.378	-35.225	-0.847	(0)
CoCl+2	2.270e-35	6.799e-36	-34.644	-35.168	-0.524	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.085	-64.609	-0.524	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
Cr (2)	1.950e-27					
Cr+2	1.950e-27	5.841e-28	-26.710	-27.234	-0.524	(0)
Cr (3)	9.916e-10					
Cr (OH) 2+	6.870e-10	5.082e-10	-9.163	-9.294	-0.131	(0)
Cr (OH) 3	2.502e-10	2.502e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.095e-11	1.550e-11	-10.679	-10.810	-0.131	(0)
Cr (OH) 4-	1.765e-11	1.305e-11	-10.753	-10.884	-0.131	(0)
Cr (OH) +2	1.064e-11	3.187e-12	-10.973	-11.497	-0.524	(0)
CrOHSO4	5.188e-12	5.188e-12	-11.285	-11.285	0.000	(0)
CrF+2	1.124e-14	3.366e-15	-13.949	-14.473	-0.524	(0)
CrSO4+	2.407e-15	1.780e-15	-14.619	-14.749	-0.131	(0)
Cr+3	1.675e-15	1.112e-16	-14.776	-15.954	-1.178	(0)
CrCl+2	2.694e-18	8.070e-19	-17.570	-18.093	-0.524	(0)
CrOHC12	1.128e-19	1.128e-19	-18.948	-18.948	0.000	(0)
Cr2 (OH) 2SO4+2	4.989e-21	1.494e-21	-20.302	-20.826	-0.524	(0)
Cr2 (OH) 2 (SO4) 2	6.089e-22	6.089e-22	-21.215	-21.215	0.000	(0)
CrCl2+	5.806e-22	4.295e-22	-21.236	-21.367	-0.131	(0)
CrNO3+2	2.907e-25	8.707e-26	-24.537	-25.060	-0.524	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.980	-42.504	-0.524	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.023	-52.201	-1.178	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
Cr (6)	2.496e-14					
CrO4-2	2.333e-14	9.809e-15	-13.632	-14.008	-0.376	(0)
NaCrO4-	1.082e-15	8.003e-16	-14.966	-15.097	-0.131	(0)
HCrO4-	3.293e-16	2.436e-16	-15.482	-15.613	-0.131	(0)
KCrO4-	2.173e-16	1.608e-16	-15.663	-15.794	-0.131	(0)
CrO3SO4-2	1.306e-23	3.910e-24	-22.884	-23.408	-0.524	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)

CrO3Cl-	8.926e-26	6.604e-26	-25.049	-25.180	-0.131	(0)
Cr2O7-2	6.878e-30	2.060e-30	-29.163	-29.686	-0.524	(0)
Cu (1)	3.030e-09					
CuCl2-	1.670e-09	1.333e-09	-8.777	-8.875	-0.098	(0)
CuCl	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
Cu+	2.178e-10	1.611e-10	-9.662	-9.793	-0.131	(0)
CuCl3-2	3.734e-12	1.599e-12	-11.428	-11.796	-0.368	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.367	-147.768	-0.401	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.119	-148.498	-0.379	(0)
Cu (2)	5.030e-07					
CuCO3	3.366e-07	3.366e-07	-6.473	-6.473	0.000	(0)
CuOH+	7.764e-08	6.197e-08	-7.110	-7.208	-0.098	(0)
Cu+2	3.557e-08	1.495e-08	-7.449	-7.825	-0.376	(0)
CuSO4	2.350e-08	2.350e-08	-7.629	-7.629	0.000	(0)
Cu (OH) 2	1.621e-08	1.621e-08	-7.790	-7.790	0.000	(0)
Cu (CO3) 2-2	1.156e-08	3.463e-09	-7.937	-8.461	-0.524	(0)
CuHCO3+	7.982e-10	5.905e-10	-9.098	-9.229	-0.131	(0)
Cu2 (OH) 2+2	3.221e-10	9.647e-11	-9.492	-10.016	-0.524	(0)
CuF+	2.437e-10	1.803e-10	-9.613	-9.744	-0.131	(0)
CuCl+	1.666e-10	1.329e-10	-9.778	-9.876	-0.098	(0)
Cu (OH) 3-	5.888e-11	4.356e-11	-10.230	-10.361	-0.131	(0)
CuNO2+	4.020e-11	2.974e-11	-10.396	-10.527	-0.131	(0)
CuNH3+2	3.166e-12	9.482e-13	-11.500	-12.023	-0.524	(0)
CuCl2	2.586e-13	2.586e-13	-12.587	-12.587	0.000	(0)
Cu (NO2) 2	5.781e-15	5.781e-15	-14.238	-14.238	0.000	(0)
Cu (OH) 4-2	1.500e-15	4.493e-16	-14.824	-15.347	-0.524	(0)
CuNO3+	1.145e-15	8.474e-16	-14.941	-15.072	-0.131	(0)
CuCl3-	1.696e-17	1.354e-17	-16.771	-16.868	-0.098	(0)
CuCl4-2	8.887e-22	3.806e-22	-21.051	-21.420	-0.368	(0)
Cu (NO3) 2	1.912e-24	1.912e-24	-23.719	-23.719	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.188	-218.319	-0.131	(0)
F	3.058e-04					
F-	2.373e-04	1.911e-04	-3.625	-3.719	-0.094	(0)
MgF+	6.412e-05	5.153e-05	-4.193	-4.288	-0.095	(0)
CaF+	2.233e-06	1.806e-06	-5.651	-5.743	-0.092	(0)
NaF	1.979e-06	1.979e-06	-5.703	-5.703	0.000	(0)
MnF+	2.025e-07	1.638e-07	-6.694	-6.786	-0.092	(0)
ZnF+	1.087e-08	8.042e-09	-7.964	-8.095	-0.131	(0)
BF (OH) 3-	5.296e-09	4.129e-09	-8.276	-8.384	-0.108	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
NiF+	4.038e-10	2.987e-10	-9.394	-9.525	-0.131	(0)
CoF+	2.688e-10	1.988e-10	-9.571	-9.701	-0.131	(0)
CuF+	2.437e-10	1.803e-10	-9.613	-9.744	-0.131	(0)
AlF3	1.932e-10	1.932e-10	-9.714	-9.714	0.000	(0)
AlF2+	9.882e-11	8.033e-11	-10.005	-10.095	-0.090	(0)
AlF4-	2.302e-11	1.850e-11	-10.638	-10.733	-0.095	(0)
CdF+	1.608e-11	1.189e-11	-10.794	-10.925	-0.131	(0)
PbF+	3.583e-12	2.651e-12	-11.446	-11.577	-0.131	(0)
AlF+2	2.418e-12	1.056e-12	-11.617	-11.976	-0.360	(0)
HF2-	1.988e-12	1.576e-12	-11.701	-11.803	-0.101	(0)
BF2 (OH) 2-	8.312e-13	6.480e-13	-12.080	-12.188	-0.108	(0)
AgF	5.128e-13	5.128e-13	-12.290	-12.290	0.000	(0)
UO2F+	4.546e-13	3.363e-13	-12.342	-12.473	-0.131	(0)
UO2F2	1.853e-13	1.853e-13	-12.732	-12.732	0.000	(0)
UO2F3-	1.202e-14	8.894e-15	-13.920	-14.051	-0.131	(0)
CrF+2	1.124e-14	3.366e-15	-13.949	-14.473	-0.524	(0)
PbF2	9.966e-15	9.966e-15	-14.001	-14.001	0.000	(0)
CdF2	4.534e-15	4.534e-15	-14.344	-14.344	0.000	(0)
UO2F4-2	4.507e-17	1.350e-17	-16.346	-16.870	-0.524	(0)
H2F2	1.260e-17	1.260e-17	-16.899	-16.899	0.000	(0)
PbF3-	4.882e-18	3.612e-18	-17.311	-17.442	-0.131	(0)
VO2F	2.166e-18	2.166e-18	-17.664	-17.664	0.000	(0)
FeF2+	9.324e-19	7.543e-19	-18.030	-18.122	-0.092	(0)
BF3OH-	4.747e-19	3.701e-19	-18.324	-18.432	-0.108	(0)
FeF+2	3.445e-19	1.475e-19	-18.463	-18.831	-0.368	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
VO2F2-	2.032e-19	1.503e-19	-18.692	-18.823	-0.131	(0)
VO2F3-2	1.196e-21	3.582e-22	-20.922	-21.446	-0.524	(0)

PbF4-2	1.103e-21	3.303e-22	-20.958	-21.481	-0.524	(0)
VOF+	1.039e-21	7.686e-22	-20.983	-21.114	-0.131	(0)
VOF2	5.507e-23	5.507e-23	-22.259	-22.259	0.000	(0)
HgF+	7.074e-24	5.233e-24	-23.150	-23.281	-0.131	(0)
BF4-	3.429e-24	2.673e-24	-23.465	-23.573	-0.108	(0)
VO2F4-3	5.074e-25	3.367e-26	-24.295	-25.473	-1.178	(0)
VOF3-	5.046e-25	3.733e-25	-24.297	-24.428	-0.131	(0)
Sb(OH) 2F	3.923e-26	3.923e-26	-25.406	-25.406	0.000	(0)
SbOF	3.862e-26	3.862e-26	-25.413	-25.413	0.000	(0)
VOF4-2	9.613e-28	2.879e-28	-27.017	-27.541	-0.524	(0)
SiF6-2	2.896e-29	1.240e-29	-28.538	-28.907	-0.368	(0)
UF3+	1.324e-36	9.796e-37	-35.878	-36.009	-0.131	(0)
UF2+2	1.080e-37	3.235e-38	-36.967	-37.490	-0.524	(0)
UF4	2.052e-38	2.052e-38	-37.688	-37.688	0.000	(0)
UF5-	2.100e-40	1.554e-40	-39.678	-39.809	-0.131	(0)
UF+3	2.026e-40	0.000e+00	-39.693	-40.871	-1.178	(0)
UF6-2	0.000e+00	0.000e+00	-40.524	-41.047	-0.524	(0)
Fe (2)	8.497e-13					
Fe+2	5.566e-13	1.667e-13	-12.254	-12.778	-0.524	(0)
FeSO4	2.807e-13	2.807e-13	-12.552	-12.552	0.000	(0)
FeOH+	1.075e-14	8.698e-15	-13.968	-14.061	-0.092	(0)
FeHCO3+	1.605e-15	1.314e-15	-14.795	-14.882	-0.087	(0)
Fe(OH) 2	9.055e-18	9.055e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.639e-18	3.753e-18	-17.334	-17.426	-0.092	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-161.423	-161.423	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.052	-238.183	-0.131	(0)
Fe (3)	8.654e-10					
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 2+	3.737e-10	3.038e-10	-9.428	-9.517	-0.090	(0)
Fe(OH) 4-	6.418e-11	5.217e-11	-10.193	-10.283	-0.090	(0)
FeOH+2	1.391e-15	5.958e-16	-14.857	-15.225	-0.368	(0)
FeF2+	9.324e-19	7.543e-19	-18.030	-18.122	-0.092	(0)
FeF+2	3.445e-19	1.475e-19	-18.463	-18.831	-0.368	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
FeSO4+	6.699e-20	5.419e-20	-19.174	-19.266	-0.092	(0)
Fe(SO4) 2-	1.074e-20	7.947e-21	-19.969	-20.100	-0.131	(0)
Fe+3	4.948e-21	7.041e-22	-20.306	-21.152	-0.847	(0)
FeCl+2	2.785e-22	1.193e-22	-21.555	-21.923	-0.368	(0)
FeCl2+	3.695e-24	2.989e-24	-23.432	-23.525	-0.092	(0)
FeHSeO3+2	4.954e-25	1.484e-25	-24.305	-24.829	-0.524	(0)
FeCl3	1.677e-27	1.677e-27	-26.776	-26.776	0.000	(0)
Fe2(OH) 2+4	1.461e-27	1.175e-29	-26.835	-28.930	-2.094	(0)
FeNO3+2	4.213e-28	1.262e-28	-27.375	-27.899	-0.524	(0)
Fe3(OH) 4+5	9.663e-35	5.161e-38	-34.015	-37.287	-3.272	(0)
H (0)	3.974e-29					
H2	1.987e-29	2.018e-29	-28.702	-28.695	0.007	(0)
Hg (0)	3.300e-09					
Hg	3.300e-09	3.300e-09	-8.482	-8.482	0.000	(0)
Hg (1)	1.105e-20					
Hg2+2	5.526e-21	1.655e-21	-20.258	-20.781	-0.524	(0)
Hg (2)	1.999e-11					
HgClOH	9.593e-12	9.593e-12	-11.018	-11.018	0.000	(0)
Hg(OH) 2	7.887e-12	8.007e-12	-11.103	-11.097	0.007	(0)
HgCl2	2.325e-12	2.325e-12	-11.634	-11.634	0.000	(0)
HgCl3-	1.763e-13	1.304e-13	-12.754	-12.885	-0.131	(0)
HgCl4-2	9.724e-15	2.913e-15	-14.012	-14.536	-0.524	(0)
HgCO3	3.380e-15	3.380e-15	-14.471	-14.471	0.000	(0)
Hg(CO3) 2-2	1.364e-16	4.086e-17	-15.865	-16.389	-0.524	(0)
HgCl+	1.118e-16	8.270e-17	-15.952	-16.082	-0.131	(0)
HgOH+	5.211e-17	3.855e-17	-16.283	-16.414	-0.131	(0)
Hg(OH) 3-	1.786e-18	1.321e-18	-17.748	-17.879	-0.131	(0)
HgHCO3+	6.530e-19	4.831e-19	-18.185	-18.316	-0.131	(0)
Hg(NH3) 2+2	5.976e-20	1.790e-20	-19.224	-19.747	-0.524	(0)
HgNH3+2	9.645e-21	2.889e-21	-20.016	-20.539	-0.524	(0)
Hg+2	2.467e-21	7.389e-22	-20.608	-21.131	-0.524	(0)
HgSO4	1.327e-21	1.327e-21	-20.877	-20.877	0.000	(0)
HgF+	7.074e-24	5.233e-24	-23.150	-23.281	-0.131	(0)
Hg(NH3) 3+2	1.474e-27	4.415e-28	-26.831	-27.355	-0.524	(0)

	HgNO3+	6.608e-30	4.889e-30	-29.180	-29.311	-0.131	(0)
	Hg (NH3) 4+2	7.255e-35	2.173e-35	-34.139	-34.663	-0.524	(0)
	Hg (NO3) 2	3.641e-38	3.641e-38	-37.439	-37.439	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.552	-138.683	-0.131	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.753	-139.276	-0.524	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.404	-140.404	0.000	(0)
K		5.741e-03					
	K+	5.478e-03	4.411e-03	-2.261	-2.355	-0.094	(0)
	KSO4-	2.635e-04	2.142e-04	-3.579	-3.669	-0.090	(0)
	KCrO4-	2.173e-16	1.608e-16	-15.663	-15.794	-0.131	(0)
Mg		8.811e-03					
	Mg+2	5.718e-03	2.404e-03	-2.243	-2.619	-0.376	(0)
	MgSO4	3.000e-03	3.000e-03	-2.523	-2.523	0.000	(0)
	MgF+	6.412e-05	5.153e-05	-4.193	-4.288	-0.095	(0)
	MgHCO3+	1.929e-05	1.539e-05	-4.715	-4.813	-0.098	(0)
	MgCO3	7.643e-06	7.643e-06	-5.117	-5.117	0.000	(0)
	MgOH+	1.524e-06	1.254e-06	-5.817	-5.902	-0.085	(0)
	MgH2BO3+	4.381e-07	3.416e-07	-6.358	-6.467	-0.108	(0)
Mn (2)		9.898e-05					
	Mn+2	7.190e-05	2.153e-05	-4.143	-4.667	-0.524	(0)
	MnSO4	2.627e-05	2.627e-05	-4.581	-4.581	0.000	(0)
	MnHCO3+	3.324e-07	2.689e-07	-6.478	-6.570	-0.092	(0)
	MnF+	2.025e-07	1.638e-07	-6.694	-6.786	-0.092	(0)
	MnCl+	1.880e-07	1.521e-07	-6.726	-6.818	-0.092	(0)
	MnOH+	8.763e-08	7.089e-08	-7.057	-7.149	-0.092	(0)
	MnCl2	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
	MnCl3-	2.301e-12	1.862e-12	-11.638	-11.730	-0.092	(0)
	MnSeO4	1.039e-12	1.039e-12	-11.984	-11.984	0.000	(0)
	MnNO3+	8.267e-13	6.116e-13	-12.083	-12.214	-0.131	(0)
	Mn (OH) 3-	9.302e-16	7.525e-16	-15.031	-15.124	-0.092	(0)
	Mn (NO3) 2	2.753e-20	2.753e-20	-19.560	-19.560	0.000	(0)
	Mn (OH) 4-2	7.435e-21	3.184e-21	-20.129	-20.497	-0.368	(0)
	MnSe	0.000e+00	0.000e+00	-40.809	-40.809	0.000	(0)
Mn (3)		3.073e-25					
	Mn+3	3.073e-25	4.373e-26	-24.512	-25.359	-0.847	(0)
Mn (6)		6.723e-40					
	MnO4-2	6.723e-40	2.879e-40	-39.172	-39.541	-0.368	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.151	-44.255	-0.104	(0)
Mo		2.899e-06					
	MoO4-2	2.898e-06	1.219e-06	-5.538	-5.914	-0.376	(0)
	HMoO4-	2.515e-10	1.861e-10	-9.599	-9.730	-0.131	(0)
	H2MoO4	1.046e-14	1.046e-14	-13.980	-13.980	0.000	(0)
	Ag2MoO4	5.265e-25	5.265e-25	-24.279	-24.279	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.260	-44.438	-1.178	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-48.614	-53.327	-4.712	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-51.782	-55.055	-3.272	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-56.293	-58.387	-2.094	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-62.078	-63.256	-1.178	(0)
N (-3)		1.208e-07					
	NH4+	1.070e-07	8.341e-08	-6.971	-7.079	-0.108	(0)
	NH4SO4-	7.578e-09	6.130e-09	-8.120	-8.213	-0.092	(0)
	NH3	6.196e-09	6.196e-09	-8.208	-8.208	0.000	(0)
	CaNH3+2	2.256e-11	6.757e-12	-10.647	-11.170	-0.524	(0)
	CuNH3+2	3.166e-12	9.482e-13	-11.500	-12.023	-0.524	(0)
	NiNH3+2	6.915e-13	2.071e-13	-12.160	-12.684	-0.524	(0)
	Co (NH3) +2	8.185e-14	2.452e-14	-13.087	-13.611	-0.524	(0)
	AgNH3+	1.827e-14	1.352e-14	-13.738	-13.869	-0.131	(0)
	BaNH3+2	1.993e-16	5.968e-17	-15.701	-16.224	-0.524	(0)
	Ag (NH3) 2+	9.202e-19	6.807e-19	-18.036	-18.167	-0.131	(0)
	Ni (NH3) 2+2	6.193e-19	1.855e-19	-18.208	-18.732	-0.524	(0)
	Hg (NH3) 2+2	5.976e-20	1.790e-20	-19.224	-19.747	-0.524	(0)
	Ca (NH3) 2+2	5.565e-20	1.667e-20	-19.255	-19.778	-0.524	(0)
	Co (NH3) 2+2	2.163e-20	6.480e-21	-19.665	-20.188	-0.524	(0)
	HgNH3+2	9.645e-21	2.889e-21	-20.016	-20.539	-0.524	(0)
	Co (NH3) 3+2	1.688e-27	5.055e-28	-26.773	-27.296	-0.524	(0)
	Hg (NH3) 3+2	1.474e-27	4.415e-28	-26.831	-27.355	-0.524	(0)
	Hg (NH3) 4+2	7.255e-35	2.173e-35	-34.139	-34.663	-0.524	(0)

	Co (NH3) 4+2	5.488e-35	1.644e-35	-34.261	-34.784	-0.524	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.980	-42.504	-0.524	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-42.248	-42.772	-0.524	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.023	-52.201	-1.178	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.085	-64.609	-0.524	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
N (3)	2.416e-05						
	NO2-	2.416e-05	1.899e-05	-4.617	-4.721	-0.104	(0)
	CuNO2+	4.020e-11	2.974e-11	-10.396	-10.527	-0.131	(0)
	CoNO2+	5.954e-12	4.405e-12	-11.225	-11.356	-0.131	(0)
	AgNO2	4.240e-12	4.240e-12	-11.373	-11.373	0.000	(0)
	Cu (NO2) 2	5.781e-15	5.781e-15	-14.238	-14.238	0.000	(0)
	Ag (NO2) 2-	1.686e-16	1.247e-16	-15.773	-15.904	-0.131	(0)
N (5)	2.232e-08						
	NO3-	2.225e-08	1.792e-08	-7.653	-7.747	-0.094	(0)
	CaNO3+	6.635e-11	4.908e-11	-10.178	-10.309	-0.131	(0)
	MnNO3+	8.267e-13	6.116e-13	-12.083	-12.214	-0.131	(0)
	ZnNO3+	1.284e-13	9.495e-14	-12.892	-13.022	-0.131	(0)
	NiNO3+	3.787e-15	2.802e-15	-14.422	-14.553	-0.131	(0)
	BaNO3+	1.853e-15	1.371e-15	-14.732	-14.863	-0.131	(0)
	CoNO3+	1.263e-15	9.346e-16	-14.898	-15.029	-0.131	(0)
	CuNO3+	1.145e-15	8.474e-16	-14.941	-15.072	-0.131	(0)
	CdNO3+	3.008e-16	2.225e-16	-15.522	-15.653	-0.131	(0)
	PbNO3+	7.053e-17	5.218e-17	-16.152	-16.283	-0.131	(0)
	AgNO3	1.521e-17	1.521e-17	-16.818	-16.818	0.000	(0)
	Mn (NO3) 2	2.753e-20	2.753e-20	-19.560	-19.560	0.000	(0)
	UO2NO3+	6.163e-22	4.559e-22	-21.210	-21.341	-0.131	(0)
	Zn (NO3) 2	3.395e-22	3.395e-22	-21.469	-21.469	0.000	(0)
	Co (NO3) 2	3.408e-23	3.408e-23	-22.468	-22.468	0.000	(0)
	Cd (NO3) 2	1.999e-24	1.999e-24	-23.699	-23.699	0.000	(0)
	Cu (NO3) 2	1.912e-24	1.912e-24	-23.719	-23.719	0.000	(0)
	Pb (NO3) 2	1.588e-24	1.588e-24	-23.799	-23.799	0.000	(0)
	CrNO3+2	2.907e-25	8.707e-26	-24.537	-25.060	-0.524	(0)
	VO2NO3	5.860e-26	5.860e-26	-25.232	-25.232	0.000	(0)
	FeNO3+2	4.213e-28	1.262e-28	-27.375	-27.899	-0.524	(0)
	HgNO3+	6.608e-30	4.889e-30	-29.180	-29.311	-0.131	(0)
	Hg (NO3) 2	3.641e-38	3.641e-38	-37.439	-37.439	0.000	(0)
Na	2.114e-02						
	Na+	2.039e-02	1.642e-02	-1.691	-1.785	-0.094	(0)
	NaSO4-	7.440e-04	6.048e-04	-3.128	-3.218	-0.090	(0)
	NaHCO3	5.778e-06	5.778e-06	-5.238	-5.238	0.000	(0)
	NaF	1.979e-06	1.979e-06	-5.703	-5.703	0.000	(0)
	NaCO3-	1.438e-06	1.169e-06	-5.842	-5.932	-0.090	(0)
	NaH2BO3	1.066e-07	1.066e-07	-6.972	-6.972	0.000	(0)
	NaCrO4-	1.082e-15	8.003e-16	-14.966	-15.097	-0.131	(0)
Ni	2.518e-07						
	Ni+2	1.481e-07	6.224e-08	-6.830	-7.206	-0.376	(0)
	NiSO4	8.519e-08	8.519e-08	-7.070	-7.070	0.000	(0)
	NiCO3	8.877e-09	8.877e-09	-8.052	-8.052	0.000	(0)
	NiHCO3+	6.492e-09	4.802e-09	-8.188	-8.319	-0.131	(0)
	NiOH+	1.388e-09	1.027e-09	-8.858	-8.988	-0.131	(0)
	NiCl+	1.208e-09	8.934e-10	-8.918	-9.049	-0.131	(0)
	NiF+	4.038e-10	2.987e-10	-9.394	-9.525	-0.131	(0)
	Ni (OH) 2	1.069e-10	1.069e-10	-9.971	-9.971	0.000	(0)
	Ni (SO4) 2-2	6.460e-11	1.935e-11	-10.190	-10.713	-0.524	(0)
	NiNH3+2	6.915e-13	2.071e-13	-12.160	-12.684	-0.524	(0)
	Ni (OH) 3-	1.894e-13	1.401e-13	-12.723	-12.854	-0.131	(0)
	NiCl2	2.523e-14	2.523e-14	-13.598	-13.598	0.000	(0)
	NiSeO4	5.217e-15	5.217e-15	-14.283	-14.283	0.000	(0)
	NiNO3+	3.787e-15	2.802e-15	-14.422	-14.553	-0.131	(0)
	Ni (NH3) 2+2	6.193e-19	1.855e-19	-18.208	-18.732	-0.524	(0)
O (0)	2.448e-35						
	O2	1.224e-35	1.243e-35	-34.912	-34.906	0.007	(0)
Pb	4.651e-09						
	PbCO3	2.262e-09	2.262e-09	-8.645	-8.645	0.000	(0)

PbOH+	8.760e-10	6.481e-10	-9.057	-9.188	-0.131	(0)
PbSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
Pb+2	4.683e-10	1.969e-10	-9.329	-9.706	-0.376	(0)
PbHCO3+	1.237e-10	9.154e-11	-9.907	-10.038	-0.131	(0)
Pb (SO4) 2-2	9.126e-11	2.734e-11	-10.040	-10.563	-0.524	(0)
Pb (CO3) 2-2	8.327e-11	2.494e-11	-10.080	-10.603	-0.524	(0)
PbCl+	5.296e-11	3.918e-11	-10.276	-10.407	-0.131	(0)
Pb (OH) 2	2.686e-11	2.686e-11	-10.571	-10.571	0.000	(0)
PbF+	3.583e-12	2.651e-12	-11.446	-11.577	-0.131	(0)
PbCl2	9.818e-13	9.818e-13	-12.008	-12.008	0.000	(0)
Pb (OH) 3-	4.758e-14	3.520e-14	-13.323	-13.453	-0.131	(0)
PbF2	9.966e-15	9.966e-15	-14.001	-14.001	0.000	(0)
PbCl3-	2.964e-15	2.192e-15	-14.528	-14.659	-0.131	(0)
PbNO3+	7.053e-17	5.218e-17	-16.152	-16.283	-0.131	(0)
Pb (OH) 4-2	3.772e-17	1.130e-17	-16.423	-16.947	-0.524	(0)
Pb2OH+3	3.047e-17	2.022e-18	-16.516	-17.694	-1.178	(0)
PbCl4-2	1.877e-17	5.622e-18	-16.727	-17.250	-0.524	(0)
PbF3-	4.882e-18	3.612e-18	-17.311	-17.442	-0.131	(0)
Pb3 (OH) 4+2	9.460e-21	2.833e-21	-20.024	-20.548	-0.524	(0)
PbF4-2	1.103e-21	3.303e-22	-20.958	-21.481	-0.524	(0)
Pb (NO3) 2	1.588e-24	1.588e-24	-23.799	-23.799	0.000	(0)
Pb4 (OH) 4+4	5.505e-25	4.431e-27	-24.259	-26.354	-2.094	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.031	-152.031	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.397	-229.528	-0.131	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.954	-73.954	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.667	-78.797	-0.131	(0)
CdHS+	0.000e+00	0.000e+00	-79.064	-79.195	-0.131	(0)
S5-2	0.000e+00	0.000e+00	-79.524	-80.048	-0.524	(0)
H2S	0.000e+00	0.000e+00	-79.892	-79.892	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.040	-80.564	-0.524	(0)
S4-2	0.000e+00	0.000e+00	-80.120	-80.643	-0.524	(0)
S3-2	0.000e+00	0.000e+00	-80.926	-81.449	-0.524	(0)
S2-2	0.000e+00	0.000e+00	-81.942	-82.465	-0.524	(0)
S-2	0.000e+00	0.000e+00	-87.614	-87.983	-0.368	(0)
HgHS2-	0.000e+00	0.000e+00	-138.552	-138.683	-0.131	(0)
HgS2-2	0.000e+00	0.000e+00	-138.753	-139.276	-0.524	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.404	-140.404	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.367	-147.768	-0.401	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.789	-148.020	-0.231	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.119	-148.498	-0.379	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.215	-148.346	-0.131	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.521	-148.652	-0.131	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.933	-149.345	-0.413	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.267	-149.656	-0.390	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.451	-150.451	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.789	-150.789	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.031	-152.031	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.423	-161.423	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.188	-218.319	-0.131	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.837	-225.968	-0.131	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.310	-227.833	-0.524	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.555	-227.686	-0.131	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.397	-229.528	-0.131	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.052	-238.183	-0.131	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.764	-304.288	-0.524	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.702	-306.226	-0.524	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.038	-321.562	-0.524	(0)
S (6)	2.172e-02					
SO4-2	1.632e-02	6.859e-03	-1.787	-2.164	-0.376	(0)
MgSO4	3.000e-03	3.000e-03	-2.523	-2.523	0.000	(0)
CaSO4	1.361e-03	1.361e-03	-2.866	-2.866	0.000	(0)
NaSO4-	7.440e-04	6.048e-04	-3.128	-3.218	-0.090	(0)
KSO4-	2.635e-04	2.142e-04	-3.579	-3.669	-0.090	(0)
MnSO4	2.627e-05	2.627e-05	-4.581	-4.581	0.000	(0)
ZnSO4	3.166e-06	3.166e-06	-5.500	-5.500	0.000	(0)
Zn (SO4) 2-2	6.314e-07	1.891e-07	-6.200	-6.723	-0.524	(0)
NiSO4	8.519e-08	8.519e-08	-7.070	-7.070	0.000	(0)

CoSO4	4.504e-08	4.504e-08	-7.346	-7.346	0.000	(0)
CuSO4	2.350e-08	2.350e-08	-7.629	-7.629	0.000	(0)
NH4SO4-	7.578e-09	6.130e-09	-8.120	-8.213	-0.092	(0)
HSO4-	6.401e-09	5.145e-09	-8.194	-8.289	-0.095	(0)
CdSO4	6.315e-09	6.315e-09	-8.200	-8.200	0.000	(0)
Cd(SO4) 2-2	1.951e-09	5.843e-10	-8.710	-9.233	-0.524	(0)
PbSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
AgSO4-	1.977e-10	1.462e-10	-9.704	-9.835	-0.131	(0)
Pb(SO4) 2-2	9.126e-11	2.734e-11	-10.040	-10.563	-0.524	(0)
Ni(SO4) 2-2	6.460e-11	1.935e-11	-10.190	-10.713	-0.524	(0)
CrOHSO4	5.188e-12	5.188e-12	-11.285	-11.285	0.000	(0)
FeSO4	2.807e-13	2.807e-13	-12.552	-12.552	0.000	(0)
UO2SO4	1.324e-13	1.324e-13	-12.878	-12.878	0.000	(0)
UO2(SO4) 2-2	3.997e-14	1.197e-14	-13.398	-13.922	-0.524	(0)
AlSO4+	3.662e-14	2.943e-14	-13.436	-13.531	-0.095	(0)
Al(SO4) 2-	2.691e-15	2.163e-15	-14.570	-14.665	-0.095	(0)
CrSO4+	2.407e-15	1.780e-15	-14.619	-14.749	-0.131	(0)
VO2SO4-	1.431e-18	1.059e-18	-17.844	-17.975	-0.131	(0)
FeSO4+	6.699e-20	5.419e-20	-19.174	-19.266	-0.092	(0)
Fe(SO4) 2-	1.074e-20	7.947e-21	-19.969	-20.100	-0.131	(0)
Cr2(OH) 2SO4+2	4.989e-21	1.494e-21	-20.302	-20.826	-0.524	(0)
HgSO4	1.327e-21	1.327e-21	-20.877	-20.877	0.000	(0)
VOSO4	1.267e-21	1.267e-21	-20.897	-20.897	0.000	(0)
Cr2(OH) 2(SO4) 2	6.089e-22	6.089e-22	-21.215	-21.215	0.000	(0)
CrO3SO4-2	1.306e-23	3.910e-24	-22.884	-23.408	-0.524	(0)
VSO4+	1.891e-36	1.399e-36	-35.723	-35.854	-0.131	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.280	-40.280	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.493	-42.016	-0.524	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Sb(3)	3.383e-20					
Sb(OH) 3	1.711e-20	1.711e-20	-19.767	-19.767	0.000	(0)
HSbO2	1.672e-20	1.672e-20	-19.777	-19.777	0.000	(0)
SbO2-	4.768e-24	3.527e-24	-23.322	-23.453	-0.131	(0)
Sb(OH) 4-	2.727e-24	2.017e-24	-23.564	-23.695	-0.131	(0)
Sb(OH) 2F	3.923e-26	3.923e-26	-25.406	-25.406	0.000	(0)
SbOF	3.862e-26	3.862e-26	-25.413	-25.413	0.000	(0)
Sb(OH) 2+	4.314e-27	3.192e-27	-26.365	-26.496	-0.131	(0)
SbO+	1.489e-27	1.102e-27	-26.827	-26.958	-0.131	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.038	-321.562	-0.524	(0)
Sb(5)	4.431e-08					
SbO3-	4.427e-08	3.275e-08	-7.354	-7.485	-0.131	(0)
Sb(OH) 6-	4.742e-11	3.818e-11	-10.324	-10.418	-0.094	(0)
SbO2+	7.487e-25	5.539e-25	-24.126	-24.257	-0.131	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.813e-39	1.342e-39	-38.741	-38.872	-0.131	(0)
MnSe	0.000e+00	0.000e+00	-40.809	-40.809	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.097	-43.097	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.234	-45.757	-0.524	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-80.786	-82.881	-2.094	(0)
Se(4)	2.459e-07					
SeO3-2	1.381e-07	4.136e-08	-6.860	-7.383	-0.524	(0)
HSeO3-	1.078e-07	7.975e-08	-6.967	-7.098	-0.131	(0)
H2SeO3	2.611e-13	2.611e-13	-12.583	-12.583	0.000	(0)
AgSeO3-	3.839e-14	2.840e-14	-13.416	-13.547	-0.131	(0)
Cd(SeO3) 2-2	1.849e-17	5.538e-18	-16.733	-17.257	-0.524	(0)
Ag(SeO3) 2-3	1.585e-19	1.052e-20	-18.800	-19.978	-1.178	(0)
FeHSeO3+2	4.954e-25	1.484e-25	-24.305	-24.829	-0.524	(0)
Se(6)	4.274e-10					
SeO4-2	4.263e-10	1.792e-10	-9.370	-9.747	-0.376	(0)
MnSeO4	1.039e-12	1.039e-12	-11.984	-11.984	0.000	(0)
ZnSeO4	5.855e-14	5.855e-14	-13.232	-13.232	0.000	(0)
NiSeO4	5.217e-15	5.217e-15	-14.283	-14.283	0.000	(0)
CoSeO4	2.956e-15	2.956e-15	-14.529	-14.529	0.000	(0)
CdSeO4	1.310e-16	1.310e-16	-15.883	-15.883	0.000	(0)
HSeO4-	9.318e-17	6.893e-17	-16.031	-16.162	-0.131	(0)
Zn(SeO4) 2-2	3.552e-23	1.064e-23	-22.450	-22.973	-0.524	(0)
Si	4.873e-05					

H4SiO4	4.759e-05	4.832e-05	-4.322	-4.316	0.007	(0)
H3SiO4-	1.140e-06	9.100e-07	-5.943	-6.041	-0.098	(0)
H2SiO4-2	1.713e-11	7.481e-12	-10.766	-11.126	-0.360	(0)
UO2H3SiO4+	1.332e-12	9.852e-13	-11.876	-12.006	-0.131	(0)
SiF6-2	2.896e-29	1.240e-29	-28.538	-28.907	-0.368	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.728	-59.906	-1.178	(0)
U (4)	1.351e-19					
U (OH) 5-	1.351e-19	9.994e-20	-18.869	-19.000	-0.131	(0)
U (OH) 4	3.216e-23	3.216e-23	-22.493	-22.493	0.000	(0)
U (OH) 3+	1.221e-27	9.033e-28	-26.913	-27.044	-0.131	(0)
U (OH) 2+2	1.071e-32	3.209e-33	-31.970	-32.494	-0.524	(0)
UF3+	1.324e-36	9.796e-37	-35.878	-36.009	-0.131	(0)
UF2+2	1.080e-37	3.235e-38	-36.967	-37.490	-0.524	(0)
UF4	2.052e-38	2.052e-38	-37.688	-37.688	0.000	(0)
UOH+3	1.750e-38	1.161e-39	-37.757	-38.935	-1.178	(0)
UF5-	2.100e-40	1.554e-40	-39.678	-39.809	-0.131	(0)
UF+3	2.026e-40	0.000e+00	-39.693	-40.871	-1.178	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.280	-40.280	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.524	-41.047	-0.524	(0)
USO4+2	0.000e+00	0.000e+00	-41.493	-42.016	-0.524	(0)
U+4	0.000e+00	0.000e+00	-44.358	-46.453	-2.094	(0)
UCl+3	0.000e+00	0.000e+00	-45.826	-47.004	-1.178	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-163.551	-174.153	-10.602	(0)
U (5)	2.311e-16					
UO2+	2.311e-16	1.710e-16	-15.636	-15.767	-0.131	(0)
U (6)	4.020e-07					
UO2 (CO3) 3-4	3.524e-07	2.836e-09	-6.453	-8.547	-2.094	(0)
UO2 (CO3) 2-2	4.942e-08	1.480e-08	-7.306	-7.830	-0.524	(0)
UO2CO3	1.941e-10	1.941e-10	-9.712	-9.712	0.000	(0)
UO2OH+	2.844e-12	2.104e-12	-11.546	-11.677	-0.131	(0)
UO2H3SiO4+	1.332e-12	9.852e-13	-11.876	-12.006	-0.131	(0)
UO2F+	4.546e-13	3.363e-13	-12.342	-12.473	-0.131	(0)
UO2F2	1.853e-13	1.853e-13	-12.732	-12.732	0.000	(0)
UO2SO4	1.324e-13	1.324e-13	-12.878	-12.878	0.000	(0)
UO2 (SO4) 2-2	3.997e-14	1.197e-14	-13.398	-13.922	-0.524	(0)
UO2+2	3.033e-14	1.275e-14	-13.518	-13.894	-0.376	(0)
UO2F3-	1.202e-14	8.894e-15	-13.920	-14.051	-0.131	(0)
UO2Cl+	1.568e-16	1.160e-16	-15.805	-15.936	-0.131	(0)
UO2F4-2	4.507e-17	1.350e-17	-16.346	-16.870	-0.524	(0)
(UO2) 3 (OH) 5+	2.722e-17	2.013e-17	-16.565	-16.696	-0.131	(0)
(UO2) 2 (OH) 2+2	2.452e-17	7.346e-18	-16.610	-17.134	-0.524	(0)
UO2NO3+	6.163e-22	4.559e-22	-21.210	-21.341	-0.131	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.574	-43.705	-0.131	(0)
V+2	0.000e+00	0.000e+00	-44.809	-45.332	-0.524	(0)
V (3)	7.844e-16					
V (OH) 3	7.844e-16	7.844e-16	-15.105	-15.105	0.000	(0)
V (OH) 2+	5.264e-27	3.894e-27	-26.279	-26.410	-0.131	(0)
VOH+2	9.474e-31	2.838e-31	-30.023	-30.547	-0.524	(0)
V+3	6.509e-36	4.320e-37	-35.186	-36.365	-1.178	(0)
VSO4+	1.891e-36	1.399e-36	-35.723	-35.854	-0.131	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-57.327	-58.505	-1.178	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-58.200	-60.294	-2.094	(0)
V (4)	2.414e-19					
V (OH) 3+	2.368e-19	1.752e-19	-18.626	-18.756	-0.131	(0)
VO+2	2.239e-21	6.707e-22	-20.650	-21.173	-0.524	(0)
VOSO4	1.267e-21	1.267e-21	-20.897	-20.897	0.000	(0)
VOF+	1.039e-21	7.686e-22	-20.983	-21.114	-0.131	(0)
VOF2	5.507e-23	5.507e-23	-22.259	-22.259	0.000	(0)
VOCl+	1.427e-23	1.055e-23	-22.846	-22.977	-0.131	(0)
VOF3-	5.046e-25	3.733e-25	-24.297	-24.428	-0.131	(0)
VOF4-2	9.613e-28	2.879e-28	-27.017	-27.541	-0.524	(0)
H2V2O4+2	5.147e-33	1.542e-33	-32.288	-32.812	-0.524	(0)
V (5)	1.342e-08					
H2VO4-	7.419e-09	5.489e-09	-8.130	-8.261	-0.131	(0)
HVO4-2	5.997e-09	1.796e-09	-8.222	-8.746	-0.524	(0)
H3VO4	4.213e-13	4.213e-13	-12.375	-12.375	0.000	(0)

HV2O7-3	5.039e-14	3.344e-15	-13.298	-14.476	-1.178	(0)
H3V2O7-	2.020e-14	1.494e-14	-13.695	-13.826	-0.131	(0)
VO4-3	1.767e-14	1.173e-15	-13.753	-14.931	-1.178	(0)
V2O7-4	1.457e-15	1.173e-17	-14.836	-16.931	-2.094	(0)
VO2+	8.029e-18	6.465e-18	-17.095	-17.189	-0.094	(0)
V3O9-3	2.617e-18	1.737e-19	-17.582	-18.760	-1.178	(0)
VO2F	2.166e-18	2.166e-18	-17.664	-17.664	0.000	(0)
VO2SO4-	1.431e-18	1.059e-18	-17.844	-17.975	-0.131	(0)
VO2F2-	2.032e-19	1.503e-19	-18.692	-18.823	-0.131	(0)
VO2F3-2	1.196e-21	3.582e-22	-20.922	-21.446	-0.524	(0)
V4O12-4	4.944e-23	3.979e-25	-22.306	-24.400	-2.094	(0)
VO2F4-3	5.074e-25	3.367e-26	-24.295	-25.473	-1.178	(0)
VO2NO3	5.860e-26	5.860e-26	-25.232	-25.232	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.441	-66.154	-4.712	(0)
HV10O28-5	0.000e+00	0.000e+00	-62.810	-66.082	-3.272	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.895	-68.989	-2.094	(0)
Zn	9.867e-06					
Zn+2	5.018e-06	2.110e-06	-5.299	-5.676	-0.376	(0)
ZnSO4	3.166e-06	3.166e-06	-5.500	-5.500	0.000	(0)
Zn (SO4) 2-2	6.314e-07	1.891e-07	-6.200	-6.723	-0.524	(0)
ZnCO3	4.640e-07	4.640e-07	-6.333	-6.333	0.000	(0)
ZnOH+	3.737e-07	2.765e-07	-6.427	-6.558	-0.131	(0)
Zn (OH) 2	5.742e-08	5.742e-08	-7.241	-7.241	0.000	(0)
ZnHCO3+	5.643e-08	4.175e-08	-7.248	-7.379	-0.131	(0)
ZnOHCl	5.100e-08	5.100e-08	-7.292	-7.292	0.000	(0)
ZnCl+	3.724e-08	2.972e-08	-7.429	-7.527	-0.098	(0)
ZnF+	1.087e-08	8.042e-09	-7.964	-8.095	-0.131	(0)
Zn (OH) 3-	5.098e-10	3.772e-10	-9.293	-9.423	-0.131	(0)
ZnCl2	2.643e-10	2.643e-10	-9.578	-9.578	0.000	(0)
ZnCl3-	1.475e-12	1.178e-12	-11.831	-11.929	-0.098	(0)
ZnNO3+	1.284e-13	9.495e-14	-12.892	-13.022	-0.131	(0)
Zn (OH) 4-2	6.570e-14	1.968e-14	-13.182	-13.706	-0.524	(0)
ZnSeO4	5.855e-14	5.855e-14	-13.232	-13.232	0.000	(0)
ZnCl4-2	7.713e-15	3.303e-15	-14.113	-14.481	-0.368	(0)
Zn (NO3) 2	3.395e-22	3.395e-22	-21.469	-21.469	0.000	(0)
Zn (SeO4) 2-2	3.552e-23	1.064e-23	-22.450	-22.973	-0.524	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.215	-148.346	-0.131	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.451	-150.451	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.837	-225.968	-0.131	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.310	-227.833	-0.524	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.702	-306.226	-0.524	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-54.08	-47.79	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-41.31	-36.80	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-48.53	-36.80	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-70.18	-52.25	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-55.79	-35.76	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.57	-28.17	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.35	-23.90	0.45	(NH4) 2SeO4
Acanthite	-52.41	-88.63	-36.22	Ag2S
Ag2CO3	-12.27	-23.36	-11.09	Ag2CO3
Ag2CrO4	-20.36	-31.95	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.31	-23.86	-11.55	Ag2MoO4
Ag2O	-14.29	-1.71	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.29	-20.11	-4.82	Ag2SO4
Ag3AsO3	-28.45	-26.29	2.16	Ag3AsO3
Ag3AsO4	-16.86	-19.64	-2.79	Ag3AsO4
Ag3H2VO5	-16.82	-11.64	5.18	Ag3H2VO5
AgF:4H2O	-13.74	-12.69	1.05	AgF:4H2O
Agmetal	-0.12	-13.63	-13.51	Ag

AgVO3	-10.70	-9.93	0.77	AgVO3
Al (OH) 3 (am)	-1.71	9.09	10.80	Al (OH) 3
Al2 (MoO4) 3	-50.62	-48.26	2.37	Al2 (MoO4) 3
Al2O3	-1.48	18.17	19.65	Al2O3
Al4 (OH) 10SO4	-4.75	17.95	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.79	-7.99	4.80	AlAsO4:2H2O
AlOHSO4	-6.08	-9.31	-3.23	AlOHSO4
AlSb	-152.94	-87.31	65.62	AlSb
Alunite	-2.37	-3.77	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.08	-11.87	-7.79	PbSO4
Anhydrite	-0.87	-5.23	-4.36	CaSO4
Anilite	-55.45	-87.33	-31.88	Cu0.25Cu1.5S
Antlerite	-1.97	6.82	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.13	-94.89	-2.76	As4O6
Artinite	-4.03	5.57	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.86	-34.15	6.71	As2O5
Atacamite	-0.95	6.44	7.39	Cu2 (OH) 3Cl
Azurite	-1.18	-18.08	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-15.99	8.41	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.20	-1.32	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-25.85	7.09	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.15	-21.82	-9.67	BaCrO4
BaF2	-9.43	-15.25	-5.82	BaF2
BaMoO4	-6.77	-13.73	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.63	-6.80	1.83	BaSeO3
BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-6.08	-7.84	-1.76	ZnSO4:6H2O
Birnessite	-6.33	11.76	18.09	MnO2
Bixbyite	-1.39	-2.03	-0.64	Mn2O3
BlaubleiI	-55.52	-79.68	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.93	-83.21	-27.28	Cu0.6Cu0.8S
Boehmite	0.51	9.09	8.58	AlOOH
Breithauptite	-56.08	-74.60	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.23	13.61	16.84	Mg (OH) 2
Bunsenite	-3.42	9.02	12.45	NiO
Ca (VO3) 2	-10.64	-4.98	5.66	Ca (VO3) 2
Ca2V2O7	-9.32	8.18	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.37	8.18	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-16.95	5.35	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.61	21.35	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.51	21.35	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-296.27	-153.30	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	-0.00	-8.48	-8.48	CaCO3
Calomel	-7.37	-25.28	-17.91	Hg2Cl2
CaMoO4	-1.03	-8.98	-7.95	CaMoO4
Carnotite	-1.21	-0.98	0.23	KUO2VO4
CaSeO3:2H2O	-4.86	-2.05	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.79	-12.81	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.55	-0.71	9.84	Cd (BO2) 2
Cd (OH) 2	-5.82	7.82	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-5.91	7.82	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.03	-13.32	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-17.48	5.08	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-15.50	12.90	28.40	Cd4 (OH) 6SO4
CdCl2	-12.25	-12.91	-0.66	CdCl2
CdCl2:1H2O	-11.22	-12.91	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.00	-12.91	-1.91	CdCl2:2.5H2O
CdF2	-14.63	-15.84	-1.21	CdF2
Cdmetal (alpha)	-31.24	-17.72	13.51	Cd
Cdmetal (gamma)	-31.34	-17.72	13.62	Cd
CdMoO4	-0.17	-14.32	-14.15	CdMoO4
CdOHCl	-6.08	-2.54	3.54	CdOHCl

CdSb	-75.45	-75.80	-0.35	CdSb
CdSe	-18.96	-39.16	-20.20	CdSe
CdSeO4:2H2O	-16.30	-18.15	-1.85	CdSeO4:2H2O
CdSO4	-10.40	-10.57	-0.17	CdSO4
CdSO4:1H2O	-8.84	-10.57	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.70	-10.57	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.47	-11.22	-9.75	AgCl
Cerrusite	-1.99	-15.12	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.35	-9.99	-2.64	CuSO4:5H2O
Chalcedony	-0.76	-4.31	-3.55	SiO2
Chalcocite	-55.35	-90.27	-34.92	Cu2S
Chalcopyrite	-126.70	-161.97	-35.27	CuFeS2
Chrysotile	-0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.31	-98.01	-45.69	HgS
Claudetite	-91.82	-94.89	-3.06	As4O6
Clausthalite	-13.36	-40.46	-27.10	PbSe
Co(BO2)2	-26.85	0.22	27.07	Co(BO2)2
Co(OH)2	-4.35	8.75	13.09	Co(OH)2
Co(OH)3	-8.57	-10.88	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.94	-7.91	13.03	Co3(AsO4)2
Co3O4	-2.52	-13.02	-10.50	Co3O4
CoCl2	-20.25	-11.98	8.27	CoCl2
CoCl2:6H2O	-14.52	-11.99	2.54	CoCl2:6H2O
CoCO3	-2.92	-12.90	-9.98	CoCO3
CoF2	-13.32	-14.92	-1.60	CoF2
CoF3	-44.92	-46.38	-1.46	CoF3
CoFe2O4	18.66	15.13	-3.53	CoFe2O4
CoMoO4	-5.64	-13.40	-7.76	CoMoO4
CoO	-4.84	8.75	13.59	CoO
CoS(alpha)	-70.73	-78.17	-7.44	CoS
CoS(beta)	-67.10	-78.17	-11.07	CoS
CoSe	-22.04	-38.24	-16.20	CoSe
CoSeO3	-7.79	-6.47	1.32	CoSeO3
CoSeO4:6H2O	-15.70	-17.23	-1.53	CoSeO4:6H2O
CoSO4	-12.45	-9.65	2.80	CoSO4
CoSO4:6H2O	-7.18	-9.65	-2.47	CoSO4:6H2O
Cotunnite	-9.43	-14.21	-4.78	PbCl2
Covellite	-56.21	-78.51	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.52	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.83	-31.74	14.09	CrCl2
CrCl3	-47.39	-32.28	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Cristobalite	-0.96	-4.31	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.08	-42.92	-33.84	Na3AlF6
Cu(OH)2	-0.27	8.40	8.67	Cu(OH)2
Cu(SbO3)2	-25.25	19.96	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.30	0.95	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.79	-89.68	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.54	-50.34	-45.80	Cu2Se
Cu2SO4	-19.80	-21.75	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-15.04	-8.94	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-25.43	-88.93	-63.49	Cu3Se2
CuCO3	-1.74	-13.24	-11.50	CuCO3
CuCrO4	-16.39	-21.83	-5.44	CuCrO4
CuF	-8.61	-13.51	-4.91	CuF
CuF2	-16.38	-15.26	1.12	CuF2
CuF2:2H2O	-10.71	-15.26	-4.55	CuF2:2H2O
Cumetal	-5.69	-14.45	-8.76	Cu
CuMoO4	-0.66	-13.74	-13.08	CuMoO4
CuOCuSO4	-11.89	-1.58	10.30	CuOCuSO4

Cupricferrite	8.80	14.79	5.99	CuFe2O4
Cuprite	-1.95	-3.36	-1.41	Cu2O
Cuprousferrite	10.43	1.51	-8.92	CuFeO2
CuSe	-5.48	-38.58	-33.10	CuSe
CuSe2	-26.66	-60.02	-33.37	CuSe2
CuSeO3:2H2O	-7.32	-6.81	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.13	-17.57	-2.44	CuSeO4:5H2O
CuSO4	-12.93	-9.99	2.94	CuSO4
Diaspore	2.21	9.09	6.87	AlOOH
Djurleite	-55.57	-89.49	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.02	-16.52	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.57	-16.52	-17.09	CaMg(CO3)2
Epsomite	-2.66	-4.79	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.12	0.08	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.98	-14.70	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.38	-8.83	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.63	-39.26	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.06	-48.80	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.28	-13.88	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.60	-18.69	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.38	-64.98	-18.60	FeSe2
FeS(ppt)	-80.51	-83.46	-2.95	FeS
FeSe	-32.54	-43.54	-11.00	FeSe
Fix_pe	-4.66	-4.66	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	0.79	9.09	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.83	-7.84	-2.01	ZnSO4:7H2O
Greenalite	-19.09	1.72	20.81	Fe3Si2O5(OH)4
Greenockite	-64.73	-79.09	-14.36	CdS
Greigite	-292.78	-337.81	-45.03	Fe3S4
Gummite	-5.34	2.33	7.67	UO3
Gypsum	-0.62	-5.23	-4.61	CaSO4:2H2O
H-Jarosite	-15.11	-27.21	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.27	-22.14	-12.88	H2MoO4
H2S(g)	-78.90	-86.91	-8.01	H2S
H2Se(g)	-42.03	-46.99	-4.96	H2Se
Halite	-5.64	-4.04	1.60	NaCl
Halloysite	-0.03	9.54	9.57	Al2Si2O5(OH)4
Hausmannite	-0.80	60.23	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.27	21.62	22.89	FeAl2O4
Hg(CH3)2(g)	-185.04	-258.75	-73.71	Hg(CH3)2
Hg(g)	-7.17	-15.05	-7.87	Hg
Hg(OH)2	-7.60	-11.10	-3.50	Hg(OH)2
Hg2(g)	-15.14	-30.10	-14.96	Hg2
Hg2(OH)2	-9.81	-4.55	5.26	Hg2(OH)2
Hg2CO3	-10.15	-26.20	-16.05	Hg2CO3
Hg2CrO4	-26.09	-34.79	-8.70	Hg2CrO4
Hg2F2	-17.86	-28.22	-10.36	Hg2F2
Hg2S	-79.79	-91.46	-11.68	Hg2S
Hg2SeO3	-15.11	-19.76	-4.66	Hg2SeO3
Hg2SO4	-16.81	-22.94	-6.13	Hg2SO4
Hg3O2CO3	-25.25	-54.94	-29.68	Hg3O2CO3
HgCl(g)	-32.14	-12.64	19.50	HgCl
HgCl2	-10.57	-31.83	-21.26	HgCl2
HgF(g)	-46.78	-14.11	32.68	HgF
HgF2(g)	-47.33	-34.76	12.57	HgF2
Hgmetal(l)	-1.60	-15.05	-13.45	Hg
HgSe	-2.39	-58.08	-55.69	HgSe
HgSeO3	-13.88	-26.31	-12.43	HgSeO3
HgSO4	-20.07	-29.49	-9.42	HgSO4
Huntite	-2.62	-32.59	-29.97	CaMg3(CO3)4

Hydrocerrusite	-4.95	-23.72	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.77	-18.54	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.78	-21.95	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-6.65	-21.45	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.71	-48.96	-17.24	K2Cr2O7
K2CrO4	-18.21	-18.72	-0.51	K2CrO4
K2MoO4	-13.89	-10.63	3.26	K2MoO4
K2SeO4	-13.73	-14.46	-0.73	K2SeO4
Kaolinite	2.11	9.54	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-4.91	-5.35	-0.43	PbO : PbSO4
Laurionite	-4.47	-3.84	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.17	6.52	12.69	PbO
Mackinawite	-79.86	-83.46	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.13	19.99	16.86	Fe2MgO4
Magnesite	-0.58	-8.04	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.47	-4.84	-5.31	Cu2 (OH) 2CO3
Manganite	-1.01	24.33	25.34	MnOOH
Massicot	-6.37	6.52	12.89	PbO
Matlockite	-6.70	-15.68	-8.97	PbClF
Melanothallite	-18.58	-12.33	6.26	CuCl2
Melanterite	-12.74	-14.95	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.91	-98.01	-45.09	HgS
Mg (OH) 2 (active)	-5.18	13.61	18.79	Mg (OH) 2
Mg (VO3) 2	-15.82	-4.54	11.28	Mg (VO3) 2
Mg2Sb3	-272.80	-198.12	74.68	Mg2Sb3
Mg2V2O7	-17.29	9.07	26.36	Mg2V2O7
MgCr2O4	-4.95	11.25	16.20	MgCr2O4
MgCrO4	-22.01	-16.63	5.38	MgCrO4
MgF2	-1.93	-10.06	-8.13	MgF2
MgMoO4	-6.68	-8.53	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.66	-1.61	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.17	-12.37	-1.20	MgSeO4 : 6H2O
Minium	-28.41	45.12	73.52	Pb3O4
Mirabilite	-4.62	-5.74	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.49	-6.59	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-51.50	-57.21	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.13	-86.05	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.97	0.53	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.89	-9.17	2.72	MnCl2 : 4H2O
MnS (grn)	-75.52	-75.35	0.17	MnS
MnS (pnk)	-78.69	-75.35	3.34	MnS
MnSb	-94.51	-97.42	-2.91	MnSb
MnSe	-38.92	-35.42	3.50	MnSe
MnSeO3	-4.78	-3.65	1.13	MnSeO3
MnSeO3 : 2H2O	-4.63	-3.65	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.37	-14.42	-2.05	MnSeO4 : 5H2O
MnSO4	-9.41	-6.83	2.58	MnSO4
Monteponite	-7.28	7.82	15.10	CdO
Montroydite	-7.46	-11.10	-3.64	HgO
MoO3	-14.14	-22.14	-8.00	MoO3
Morenosite	-7.23	-9.37	-2.14	NiSO4 : 7H2O
MoS2	-151.25	-221.51	-70.26	MoS2
Na-Jarosite	-9.68	-20.88	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-37.92	-47.82	-9.90	Na2Cr2O7
Na2CrO4	-20.51	-17.58	2.93	Na2CrO4
Na2Mo2O7	-15.03	-31.63	-16.60	Na2Mo2O7
Na2MoO4	-10.97	-9.48	1.49	Na2MoO4
Na2MoO4 : 2H2O	-10.71	-9.48	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-12.86	-2.56	10.30	Na2SeO3 : 5H2O
Na2SeO4	-14.60	-13.32	1.28	Na2SeO4
Na3Sb	-171.86	-77.41	94.45	Na3Sb
Na3VO4	-26.77	9.92	36.68	Na3VO4
Na4V2O7	-30.23	7.17	37.40	Na4V2O7

Nantokite	-5.31	-12.04	-6.73	CuCl
NaSb	-87.69	-64.53	23.17	NaSb
Natron	-7.68	-8.99	-1.31	Na2CO3:10H2O
NaVO3	-6.60	-2.74	3.86	NaVO3
Nesquehonite	-3.37	-8.04	-4.67	MgCO3:3H2O
Ni(OH)2	-3.77	9.02	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.78	-7.08	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.30	17.70	32.00	Ni4(OH)6SO4
NiCO3	-5.75	-12.62	-6.87	NiCO3
NiMoO4	-1.98	-13.12	-11.14	NiMoO4
NiS(alpha)	-72.29	-77.89	-5.60	NiS
NiS(beta)	-66.79	-77.89	-11.10	NiS
NiS(gamma)	-65.09	-77.89	-12.80	NiS
NiSe	-20.26	-37.96	-17.70	NiSe
NiSeO3:2H2O	-9.00	-6.19	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.44	-16.96	-1.52	NiSeO4:6H2O
Nsutite	-5.75	11.76	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-247.11	-308.18	-61.07	As2S3
Otavite	-1.82	-13.82	-12.00	CdCO3
Pb(BO2)2	-8.53	-2.01	6.52	Pb(BO2)2
Pb(OH)2	-1.63	6.52	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-55.89	-64.65	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-6.11	2.68	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.14	13.05	26.19	Pb2O(OH)2
Pb2O3	-22.45	38.59	61.04	Pb2O3
Pb2OCO3	-8.04	-8.60	-0.56	Pb2OCO3
Pb2V2O7	-3.20	-5.10	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.38	-14.58	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.72	1.42	6.14	Pb3(VO4)2
Pb3O2CO3	-13.10	-2.08	11.02	Pb3O2CO3
Pb3O2SO4	-9.51	1.18	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.40	7.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.18	7.70	21.88	Pb4O3SO4
PbCrO4	-11.11	-23.71	-12.60	PbCrO4
PbF2	-9.70	-17.14	-7.44	PbF2
Pbmetal	-23.27	-19.02	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.46	6.52	12.98	PbO:0.33H2O
PbSeO4	-12.61	-19.45	-6.84	PbSeO4
Periclase	-7.97	13.61	21.58	MgO
Phosgenite	-9.52	-29.33	-19.81	PbCl2:PbCO3
Plattnerite	-17.53	32.07	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-126.32	-144.83	-18.51	FeS2
Pyrochroite	-3.63	11.56	15.19	Mn(OH)2
Pyrolusite	-4.27	37.11	41.38	MnO2
Quartz	-0.31	-4.31	-4.00	SiO2
Realgar	-103.66	-123.41	-19.75	AsS
Retgersite	-7.33	-9.37	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-4.81	-19.31	-14.50	UO2CO3
Sb(OH)3	-12.66	-19.77	-7.11	Sb(OH)3
Sb2O4	-17.39	-13.99	3.40	Sb2O4
Sb2O5	-27.40	-37.06	-9.67	Sb2O5
Sb2Se3	-112.74	-180.49	-67.76	Sb2Se3
Sb4O6(cubic)	-60.80	-79.06	-18.26	Sb4O6
Sb4O6(orth)	-61.16	-79.06	-17.90	Sb4O6
SbCl3	-51.44	-50.86	0.57	SbCl3
SbF3	-45.04	-55.27	-10.23	SbF3
Sbmetal	-46.39	-58.08	-11.69	Sb
SbO2	-3.48	-31.30	-27.82	SbO2
Schoepite	-3.66	2.33	5.99	UO2(OH)2:H2O
Semetal(am)	-14.33	-21.44	-7.11	Se
Semetal(hex)	-13.73	-21.44	-7.71	Se
Senarmontite	-27.17	-39.53	-12.37	Sb2O3
SeO2	-15.34	-15.21	0.12	SeO2
SeO3	-47.02	-25.98	21.04	SeO3

Sepiolite	-1.49	14.27	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-4.51	14.27	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.96	-18.20	-10.24	FeCO ₃
SiO ₂ (am-gel)	-1.60	-4.31	-2.71	SiO ₂
SiO ₂ (am-ppt)	-1.57	-4.31	-2.74	SiO ₂
Smithsonite	-1.09	-11.09	-10.00	ZnCO ₃
Sphalerite	-64.91	-76.36	-11.45	ZnS
Spinel	-5.06	31.78	36.85	MgAl ₂ O ₄
Stibnite	-249.81	-300.27	-50.46	Sb ₂ S ₃
Sulfur	-59.22	-61.37	-2.14	S
Tenorite	0.76	8.40	7.64	CuO
Thenardite	-6.05	-5.73	0.32	Na ₂ SO ₄
Thermonatrite	-9.62	-8.99	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-4.39	-0.31	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-11.98	9.11	21.08	U ₃ O ₈
U ₃ Sb ₄	-579.97	-427.58	152.38	U ₃ Sb ₄
U ₄ O ₉	-27.41	-30.43	-3.02	U ₄ O ₉
UF ₄	-31.79	-61.33	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.61	-61.33	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.93	-13.99	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.54	-29.39	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.24	-29.39	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.78	-29.39	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.44	-29.39	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.28	2.33	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-21.39	-23.64	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-5.37	2.33	7.70	UO ₃
Uraninite	-9.32	-13.99	-4.67	UO ₂
USb ₂	-220.04	-190.47	29.58	USb ₂
V(OH) ₃	-19.61	-12.02	7.59	V(OH) ₃
V ₂ O ₅	-16.79	-18.15	-1.36	V ₂ O ₅
V ₃ O ₅	-42.21	-40.38	1.84	V ₃ O ₅
V ₄ O ₇	-52.51	-45.32	7.19	V ₄ O ₇
V ₆ O ₁₃	-44.68	-105.54	-60.86	V ₆ O ₁₃
Valentinite	-31.05	-39.53	-8.48	Sb ₂ O ₃
VC ₁₂	-64.40	-45.52	18.87	VC ₁₂
VC ₁₃	-66.55	-43.12	23.43	VC ₁₃
VF ₄	-67.21	-52.28	14.93	VF ₄
Vmetal	-94.36	-50.34	44.03	V
VO	-39.55	-24.79	14.76	VO
VO(OH) ₂	-10.10	-4.94	5.15	VO(OH) ₂
VO ₂ Cl	-22.28	-19.44	2.84	VO ₂ Cl
VOC ₁	-33.54	-22.39	11.15	VOC ₁
VOC ₁₂	-38.44	-25.68	12.76	VOC ₁₂
VOSO ₄	-26.95	-23.34	3.61	VOSO ₄
Witherite	-4.66	-13.23	-8.57	BaCO ₃
Wurtzite	-67.41	-76.36	-8.95	ZnS
Zincite	-0.78	10.55	11.33	ZnO
Zincosite	-11.77	-7.84	3.93	ZnSO ₄
Zn(BO ₂) ₂	-6.27	2.02	8.29	Zn(BO ₂) ₂
Zn(NO ₃) ₂ :6H ₂ O	-24.49	-21.17	3.32	Zn(NO ₃) ₂ :6H ₂ O
Zn(OH) ₂	-1.65	10.55	12.20	Zn(OH) ₂
Zn(OH) ₂ (am)	-1.92	10.55	12.47	Zn(OH) ₂
Zn(OH) ₂ (beta)	-1.20	10.55	11.75	Zn(OH) ₂
Zn(OH) ₂ (epsilon)	-0.98	10.55	11.53	Zn(OH) ₂
Zn(OH) ₂ (gamma)	-1.18	10.55	11.73	Zn(OH) ₂
Zn ₂ (OH) ₂ SO ₄	-4.79	2.71	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-4.45	10.74	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-16.14	-2.49	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O(SO ₄) ₂	-24.04	-5.13	18.91	Zn ₃ O(SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-4.58	23.82	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-6.47	32.03	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-17.23	-10.18	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-0.83	-11.09	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-12.58	-13.11	-0.53	ZnF ₂
Znmetal	-40.78	-14.99	25.79	Zn
ZnMoO ₄	-1.46	-11.59	-10.13	ZnMoO ₄
ZnO(active)	-0.63	10.55	11.19	ZnO

ZnS(am)	-67.31	-76.36	-9.05	ZnS
ZnSb	-84.09	-73.07	11.01	ZnSb
ZnSe	-22.03	-36.43	-14.40	ZnSe
ZnSeO4:6H2O	-13.91	-15.43	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.20	-7.84	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 146.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 805
    equilibrate with solution 1
    Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
    Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
    donnan 1e-008
USE EQUILIBRIUM_PHASES 805
USE Surface 805
USE Solution 814
SAVE Solution 815  #Initial Stage 9 Pit Water After Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 805.

Diffuse Double Layer Surface-Complexation Model

Hfo

```

8.683e-20  Surface + diffuse layer charge, eq
4.808e-12  Surface charge, eq
4.399e-03  sigma, C/m²
1.213e-01  psi, V
-4.722e+00 -F*psi/RT
8.900e-03  exp(-F*psi/RT)
6.420e+04  specific area, m²/mol Ferrihydrite
1.055e-04  m² for 1.643e-09 moles of Ferrihydrite

```

Water in diffuse layer: 1.055e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, $\exp(-\text{psi_DL} * F / RT) = 6.451e-02$ (= c_DL / c_free if z is +1).

Element	Moles
C	2.6944e-15
Ca	3.3393e-17
Cl	5.3956e-14
H	7.9484e-15
K	5.2975e-17
Mg	5.1737e-18
N	2.1844e-13

Na	2.2445e-16
O	9.7360e-12
S	2.2686e-12

Hfo_s

8.214e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	5.491e-12	0.668	5.491e-12	-11.260
Hfo_sOH	2.693e-12	0.328	2.693e-12	-11.570
Hfo_sO-	3.026e-14	0.004	3.026e-14	-13.519
Hfo_sOHCa+2	1.002e-16	0.000	1.002e-16	-15.999

Hfo_w

3.286e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.518e-10	0.462	1.518e-10	-9.819
Hfo_wOH	7.446e-11	0.227	7.446e-11	-10.128
Hfo_wSO4-	5.128e-11	0.156	5.128e-11	-10.290
Hfo_wOHSO4-2	5.018e-11	0.153	5.018e-11	-10.299
Hfo_wO-	8.366e-13	0.003	8.366e-13	-12.077
Hfo_wOMg+	1.182e-18	0.000	1.182e-18	-17.927
Hfo_wOCa+	4.011e-19	0.000	4.011e-19	-18.397

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 814. Solution after simulation 145.
Using surface 805.
Using pure phase assemblage 805. Pure-phase assemblage after simulation 145.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	5.555e-09	5.555e-09	-4.990e-14
Alunite	-2.37	-3.77	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.87	-5.23	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	2.700e-11	2.623e-11	-7.775e-13
Barite	0.00	-9.98	-9.98	5.290e-08	5.290e-08	2.333e-12
Brochantite	0.00	15.22	15.22	7.112e-07	7.111e-07	-2.122e-11
Brucite	-3.23	13.61	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.952e-10
CaMoO4	-1.03	-8.98	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.86	-2.05	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	1.987e-03	1.987e-03	-1.748e-10
Carnotite	-1.21	-0.98	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-10.55	-0.71	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.17	-14.32	-14.15	0.000e+00	0	0.000e+00
Chrysotile	-0.00	32.20	32.20	4.029e-06	4.029e-06	-2.124e-12
Cr2O3	-0.00	-2.36	-2.36	1.240e-09	1.240e-09	-1.366e-13
Cu2Se(alpha)	-4.54	-50.34	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.66	-13.74	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.66	-4.79	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.643e-09	1.643e-09	-9.110e-18
Fluorite	0.00	-10.50	-10.50	5.182e-05	5.182e-05	3.745e-12
Gummite	-5.34	2.33	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.62	-5.23	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.39	-58.08	-55.69	0.000e+00	0	0.000e+00

Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.62	-5.74	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.78	-3.65	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.77	9.02	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-22.78	-7.08	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.75	-12.62	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-1.98	-13.12	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	3.553e-14
Otavite	-1.82	-13.82	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	7.161e-09	7.159e-09	-1.942e-12
Rutherfordine	-4.81	-19.31	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.48	-31.30	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.66	2.33	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.49	14.27	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.57	-4.31	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-4.40	-0.32	4.08	0.000e+00	0	0.000e+00
U3O8	-11.98	9.11	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.28	2.33	5.61	0.000e+00	0	0.000e+00
UO3	-5.37	2.33	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.46	-11.59	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-2.221e-23 Surface + diffuse layer charge, eq
2.015e-11 Surface charge, eq
1.843e-02 sigma, C/m²
2.977e-02 psi, V
-1.159e+00 -F*psi/RT
3.139e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.055e-04 m² for 1.643e-09 moles of Ferrihydrite

Water in diffuse layer: 1.055e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 3.591e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.695e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	2.4318e-17
Al	4.9318e-15
As	4.3064e-19
B	6.3398e-14
Ba	2.9096e-17
C	1.0116e-12
Ca	3.0981e-12
Cd	2.0049e-17
Cl	8.4504e-12
Co	1.4157e-16
Cr	9.5477e-19
Cu	5.1778e-16
F	3.5097e-13
Fe	8.7228e-19
H	1.4045e-12
Hg	3.5013e-18
K	5.3437e-12
Mg	7.8110e-12
Mn	8.5788e-14
Mo	4.0435e-15
N	2.9446e-14
Na	1.9613e-11
Ni	2.2620e-16
O	1.1799e-10
Pb	4.6988e-18

S	2.8615e-11
Sb	5.3750e-17
Se	3.2399e-16
Si	5.1580e-14
U	7.1922e-16
V	1.7304e-17
Zn	9.2650e-15

Hfo_s

8.214e-12 moles [0.005 mol/(mol Ferrihydrite)]				
Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	3.275e-12	0.399	3.278e-12	-11.484
Hfo_sOCu+	1.844e-12	0.224	1.846e-12	-11.734
Hfo_sOPb+	1.397e-12	0.170	1.398e-12	-11.854
Hfo_sOMn+	1.362e-12	0.166	1.363e-12	-11.865
Hfo_sOCrOH+	2.731e-13	0.033	2.734e-13	-12.563
Hfo_sOHCa+2	3.094e-14	0.004	3.097e-14	-13.509
Hfo_sONi+	2.318e-14	0.003	2.320e-14	-13.634
Hfo_sOH	3.884e-15	0.000	3.888e-15	-14.410
Hfo_sO-	1.894e-15	0.000	1.896e-15	-14.722
Hfo_sOCd+	1.841e-15	0.000	1.843e-15	-14.734
Hfo_sOCu+	1.813e-15	0.000	1.815e-15	-14.741
Hfo_sOH2+	1.825e-16	0.000	1.826e-16	-15.738
Hfo_sOAg	1.030e-17	0.000	1.031e-17	-16.987
Hfo_sOHBa+2	1.685e-18	0.000	1.687e-18	-17.773
Hfo_sOFe+	1.327e-19	0.000	1.329e-19	-18.877
Hfo_sOHg+	6.692e-21	0.000	6.699e-21	-20.174

Hfo_w

3.286e-10 moles [0.2 mol/(mol Ferrihydrite)]				
Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOMg+	8.422e-11	0.256	8.431e-11	-10.074
Hfo_wOCu+	8.304e-11	0.253	8.312e-11	-10.080
Hfo_wOHVO4-3	4.787e-11	0.146	4.792e-11	-10.320
Hfo_wOH	3.410e-11	0.104	3.414e-11	-10.467
Hfo_wOZn+	3.011e-11	0.092	3.014e-11	-10.521
Hfo_wO-	1.663e-11	0.051	1.665e-11	-10.779
Hfo_wOHSO4-2	1.464e-11	0.045	1.465e-11	-10.834
Hfo_wOMn+	9.498e-12	0.029	9.508e-12	-11.022
Hfo_wOHSeO3-2	2.117e-12	0.006	2.119e-12	-11.674
Hfo_wOCa+	1.707e-12	0.005	1.708e-12	-11.767
Hfo_wOH2+	1.602e-12	0.005	1.604e-12	-11.795
Hfo_wOHasO4-3	1.555e-12	0.005	1.557e-12	-11.808
Hfo_wOPb+	5.479e-13	0.002	5.484e-13	-12.261
Hfo_wSO4-	3.450e-13	0.001	3.453e-13	-12.462
Hfo_wONi+	2.745e-13	0.001	2.748e-13	-12.561
Hfo_wSeO3-	1.691e-13	0.001	1.693e-13	-12.771
Hfo_wOHMoO4-2	1.059e-13	0.000	1.060e-13	-12.975
Hfo_wOCu+	4.486e-14	0.000	4.490e-14	-13.348
Hfo_wH2BO3	7.707e-15	0.000	7.715e-15	-14.113
Hfo_wOCd+	6.896e-15	0.000	6.903e-15	-14.161
Hfo_wMoO4-	3.216e-15	0.000	3.219e-15	-14.492
Hfo_wHAsO4-	7.691e-17	0.000	7.699e-17	-16.114
Hfo_wOAg	2.379e-17	0.000	2.382e-17	-16.623
Hfo_wOHg+	2.878e-18	0.000	2.881e-18	-17.540
Hfo_wOBa+	1.343e-18	0.000	1.345e-18	-17.871
Hfo_wOFe+	7.353e-19	0.000	7.361e-19	-18.133
Hfo_wOHSeO4-2	3.912e-19	0.000	3.916e-19	-18.407
Hfo_wH2AsO4	1.169e-19	0.000	1.170e-19	-18.932
Hfo_wOHSbO(OH) 4-	8.284e-20	0.000	8.293e-20	-19.081
Hfo_wOHCrO4-2	2.696e-20	0.000	2.699e-20	-19.569
Hfo_wSeO4-	8.032e-21	0.000	8.040e-21	-20.095
Hfo_wSbO(OH) 4	2.516e-21	0.000	2.518e-21	-20.599
Hfo_wCrO4-	5.796e-22	0.000	5.802e-22	-21.236

Hfo_wH2AsO3 1.664e-29 0.000 1.666e-29 -28.778

-----Solution composition-----

Elements	Molality	Moles
Ag	2.195e-08	2.193e-08
Al	4.069e-06	4.064e-06
As	3.097e-10	3.094e-10
B	5.941e-05	5.935e-05
Ba	3.646e-08	3.642e-08
C	8.438e-04	8.430e-04
Ca	3.442e-03	3.438e-03
Cd	2.104e-08	2.102e-08
Cl	6.967e-03	6.959e-03
Co	1.616e-07	1.614e-07
Cr	9.916e-10	9.906e-10
Cu	5.061e-07	5.055e-07
F	3.058e-04	3.055e-04
Fe	8.663e-10	8.654e-10
Hg	3.320e-09	3.316e-09
K	5.741e-03	5.735e-03
Mg	8.811e-03	8.802e-03
Mn	9.898e-05	9.887e-05
Mo	2.899e-06	2.896e-06
N	2.430e-05	2.428e-05
Na	2.114e-02	2.112e-02
Ni	2.518e-07	2.515e-07
Pb	4.651e-09	4.646e-09
S	2.172e-02	2.169e-02
Sb	4.431e-08	4.427e-08
Se	2.463e-07	2.461e-07
Si	4.873e-05	4.868e-05
U	4.020e-07	4.016e-07
V	1.337e-08	1.336e-08
Zn	9.867e-06	9.856e-06

-----Description of solution-----

	pH =	8.115	Charge balance
	pe =	4.658	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	6.587e-02	
	Mass of water (kg) =	9.990e-01	
	Total alkalinity (eq/kg) =	8.860e-04	
	Total CO2 (mol/kg) =	8.438e-04	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	2.873e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	1	
	Total H =	1.108989e+02	
	Total O =	5.553860e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.654e-06	1.311e-06	-5.781	-5.883	-0.101	(0)
H+	9.532e-09	7.675e-09	-8.021	-8.115	-0.094	0.00
H2O	5.551e+01	9.989e-01	1.744	-0.000	0.000	18.07
Ag	2.195e-08					
AgCl	1.224e-08	1.224e-08	-7.912	-7.912	0.000	(0)
AgCl2-	8.081e-09	5.978e-09	-8.093	-8.223	-0.131	(0)
Ag+	1.327e-09	1.068e-09	-8.877	-8.971	-0.094	(0)
AgSO4-	1.977e-10	1.462e-10	-9.704	-9.835	-0.131	(0)

	AgCl3-2	9.979e-11	2.989e-11	-10.001	-10.524	-0.524	(0)
	AgCl4-3	5.158e-12	3.423e-13	-11.288	-12.466	-1.178	(0)
	AgNO2	4.240e-12	4.240e-12	-11.373	-11.373	0.000	(0)
	AgF	5.128e-13	5.128e-13	-12.290	-12.290	0.000	(0)
	AgOH	1.400e-13	1.400e-13	-12.854	-12.854	0.000	(0)
	AgH2BO3	6.939e-14	6.939e-14	-13.159	-13.159	0.000	(0)
	AgSeO3-	3.839e-14	2.840e-14	-13.416	-13.547	-0.131	(0)
	AgNH3+	1.827e-14	1.352e-14	-13.738	-13.869	-0.131	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	Ag (NO2) 2-	1.686e-16	1.247e-16	-15.773	-15.904	-0.131	(0)
	Ag (OH) 2-	2.424e-17	1.793e-17	-16.615	-16.746	-0.131	(0)
	AgNO3	1.521e-17	1.521e-17	-16.818	-16.818	0.000	(0)
	Ag (NH3) 2+	9.202e-19	6.808e-19	-18.036	-18.167	-0.131	(0)
	Ag (SeO3) 2-3	1.585e-19	1.052e-20	-18.800	-19.978	-1.178	(0)
	Ag2MoO4	5.265e-25	5.265e-25	-24.279	-24.279	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.954	-73.954	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-80.786	-82.881	-2.094	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.789	-148.020	-0.231	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-148.521	-148.652	-0.131	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-148.933	-149.345	-0.413	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.267	-149.656	-0.390	(0)
Al		4.069e-06					
	Al (OH) 4-	4.048e-06	3.253e-06	-5.393	-5.488	-0.095	(0)
	Al (OH) 3	1.972e-08	1.972e-08	-7.705	-7.705	0.000	(0)
	Al (OH) 2+	9.276e-10	7.541e-10	-9.033	-9.123	-0.090	(0)
	AlF3	1.932e-10	1.932e-10	-9.714	-9.714	0.000	(0)
	AlF2+	9.882e-11	8.033e-11	-10.005	-10.095	-0.090	(0)
	AlF4-	2.302e-11	1.850e-11	-10.638	-10.733	-0.095	(0)
	AlF+2	2.418e-12	1.056e-12	-11.617	-11.976	-0.360	(0)
	AlOH+2	1.659e-12	7.244e-13	-11.780	-12.140	-0.360	(0)
	AlSO4+	3.662e-14	2.943e-14	-13.436	-13.531	-0.095	(0)
	Al+3	3.884e-15	5.527e-16	-14.411	-15.257	-0.847	(0)
	Al (SO4) 2-	2.691e-15	2.163e-15	-14.570	-14.665	-0.095	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.260	-44.438	-1.178	(0)
As (3)		2.068e-24					
	H3AsO3	1.897e-24	1.897e-24	-23.722	-23.722	0.000	(0)
	H2AsO3-	1.713e-25	1.267e-25	-24.766	-24.897	-0.131	(0)
	HAsO3-2	5.028e-29	1.506e-29	-28.299	-28.822	-0.524	(0)
	H4AsO3+	9.748e-33	7.212e-33	-32.011	-32.142	-0.131	(0)
	AsO3-3	1.140e-33	7.563e-35	-32.943	-34.121	-1.178	(0)
As (5)		3.097e-10					
	HAsO4-2	3.007e-10	9.005e-11	-9.522	-10.046	-0.524	(0)
	H2AsO4-	8.521e-12	6.303e-12	-11.070	-11.200	-0.131	(0)
	AsO4-3	5.591e-13	3.710e-14	-12.253	-13.431	-1.178	(0)
	H3AsO4	8.281e-18	8.407e-18	-17.082	-17.075	0.007	(0)
B		5.941e-05					
	H3BO3	5.334e-05	5.416e-05	-4.273	-4.266	0.007	(0)
	H2BO3-	5.256e-06	4.098e-06	-5.279	-5.387	-0.108	(0)
	MgH2BO3+	4.381e-07	3.416e-07	-6.358	-6.467	-0.108	(0)
	CaH2BO3+	2.620e-07	2.043e-07	-6.582	-6.690	-0.108	(0)
	NaH2BO3	1.066e-07	1.066e-07	-6.972	-6.972	0.000	(0)
	BF (OH) 3-	5.296e-09	4.129e-09	-8.276	-8.384	-0.108	(0)
	H5 (BO3) 2-	2.423e-10	1.889e-10	-9.616	-9.724	-0.108	(0)
	BaH2BO3+	2.480e-12	1.933e-12	-11.606	-11.714	-0.108	(0)
	H8 (BO3) 3-	1.312e-12	1.023e-12	-11.882	-11.990	-0.108	(0)
	BF2 (OH) 2-	8.312e-13	6.480e-13	-12.080	-12.188	-0.108	(0)
	AgH2BO3	6.939e-14	6.939e-14	-13.159	-13.159	0.000	(0)
	BF3OH-	4.747e-19	3.701e-19	-18.324	-18.432	-0.108	(0)
	BF4-	3.429e-24	2.673e-24	-23.465	-23.573	-0.108	(0)
Ba		3.646e-08					
	Ba+2	3.631e-08	1.527e-08	-7.440	-7.816	-0.376	(0)
	BaHCO3+	1.115e-10	9.124e-11	-9.953	-10.040	-0.087	(0)
	BaCO3	2.993e-11	2.993e-11	-10.524	-10.524	0.000	(0)
	BaH2BO3+	2.480e-12	1.933e-12	-11.606	-11.714	-0.108	(0)
	BaOH+	1.080e-13	8.733e-14	-12.967	-13.059	-0.092	(0)
	BaNO3+	1.853e-15	1.371e-15	-14.732	-14.863	-0.131	(0)
	BaNH3+2	1.993e-16	5.968e-17	-15.701	-16.224	-0.524	(0)
C (4)		8.438e-04					

HCO3-	7.698e-04	6.258e-04	-3.114	-3.204	-0.090	(0)
MgHCO3+	1.929e-05	1.539e-05	-4.715	-4.813	-0.098	(0)
CaHCO3+	1.233e-05	1.009e-05	-4.909	-4.996	-0.087	(0)
H2CO3	1.080e-05	1.080e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.093e-06	3.823e-06	-5.041	-5.418	-0.376	(0)
MgCO3	7.643e-06	7.643e-06	-5.117	-5.117	0.000	(0)
NaHCO3	5.778e-06	5.778e-06	-5.238	-5.238	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaCO3-	1.438e-06	1.169e-06	-5.842	-5.932	-0.090	(0)
ZnCO3	4.640e-07	4.640e-07	-6.333	-6.333	0.000	(0)
UO2 (CO3) 3-4	3.524e-07	2.836e-09	-6.453	-8.547	-2.094	(0)
CuCO3	3.366e-07	3.366e-07	-6.473	-6.473	0.000	(0)
MnHCO3+	3.324e-07	2.689e-07	-6.478	-6.570	-0.092	(0)
ZnHCO3+	5.643e-08	4.175e-08	-7.248	-7.379	-0.131	(0)
UO2 (CO3) 2-2	4.942e-08	1.480e-08	-7.306	-7.830	-0.524	(0)
Cu (CO3) 2-2	1.156e-08	3.463e-09	-7.937	-8.461	-0.524	(0)
NiCO3	8.877e-09	8.877e-09	-8.052	-8.052	0.000	(0)
NiHCO3+	6.492e-09	4.802e-09	-8.188	-8.319	-0.131	(0)
PbCO3	2.262e-09	2.262e-09	-8.645	-8.645	0.000	(0)
CoHCO3+	2.166e-09	1.602e-09	-8.664	-8.795	-0.131	(0)
CoCO3	2.127e-09	2.127e-09	-8.672	-8.672	0.000	(0)
CuHCO3+	7.982e-10	5.905e-10	-9.098	-9.229	-0.131	(0)
CdCO3	3.422e-10	3.422e-10	-9.466	-9.466	0.000	(0)
UO2CO3	1.941e-10	1.941e-10	-9.712	-9.712	0.000	(0)
PbHCO3+	1.237e-10	9.154e-11	-9.907	-10.038	-0.131	(0)
BaHCO3+	1.115e-10	9.124e-11	-9.953	-10.040	-0.087	(0)
Pb (CO3) 2-2	8.327e-11	2.494e-11	-10.080	-10.603	-0.524	(0)
BaCO3	2.993e-11	2.993e-11	-10.524	-10.524	0.000	(0)
CdHCO3+	7.564e-12	5.595e-12	-11.121	-11.252	-0.131	(0)
Cd (CO3) 2-2	3.237e-12	9.697e-13	-11.490	-12.013	-0.524	(0)
HgCO3	3.380e-15	3.380e-15	-14.471	-14.471	0.000	(0)
FeHCO3+	1.605e-15	1.314e-15	-14.795	-14.882	-0.087	(0)
Hg (CO3) 2-2	1.364e-16	4.086e-17	-15.865	-16.389	-0.524	(0)
HgHCO3+	6.530e-19	4.831e-19	-18.185	-18.316	-0.131	(0)
Ca	3.442e-03					
Ca+2	2.060e-03	8.662e-04	-2.686	-3.062	-0.376	(0)
CaSO4	1.361e-03	1.361e-03	-2.866	-2.866	0.000	(0)
CaHCO3+	1.233e-05	1.009e-05	-4.909	-4.996	-0.087	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.233e-06	1.806e-06	-5.651	-5.743	-0.092	(0)
CaH2BO3+	2.620e-07	2.043e-07	-6.582	-6.690	-0.108	(0)
CaOH+	2.767e-08	2.265e-08	-7.558	-7.645	-0.087	(0)
CaNO3+	6.635e-11	4.908e-11	-10.178	-10.309	-0.131	(0)
CaNH3+2	2.256e-11	6.757e-12	-10.647	-11.170	-0.524	(0)
Ca (NH3) 2+2	5.565e-20	1.667e-20	-19.255	-19.778	-0.524	(0)
Cd	2.104e-08					
Cd+2	9.341e-09	3.927e-09	-8.030	-8.406	-0.376	(0)
CdSO4	6.315e-09	6.315e-09	-8.200	-8.200	0.000	(0)
CdCl+	2.844e-09	2.104e-09	-8.546	-8.677	-0.131	(0)
Cd (SO4) 2-2	1.951e-09	5.843e-10	-8.710	-9.233	-0.524	(0)
CdCO3	3.422e-10	3.422e-10	-9.466	-9.466	0.000	(0)
CdOHC1	1.131e-10	1.131e-10	-9.947	-9.947	0.000	(0)
CdOH+	5.526e-11	4.088e-11	-10.258	-10.388	-0.131	(0)
CdCl2	4.920e-11	4.920e-11	-10.308	-10.308	0.000	(0)
CdF+	1.608e-11	1.189e-11	-10.794	-10.925	-0.131	(0)
CdHCO3+	7.564e-12	5.595e-12	-11.121	-11.252	-0.131	(0)
Cd (CO3) 2-2	3.237e-12	9.697e-13	-11.490	-12.013	-0.524	(0)
Cd (OH) 2	3.380e-13	3.380e-13	-12.471	-12.471	0.000	(0)
CdCl3-	2.354e-13	1.741e-13	-12.628	-12.759	-0.131	(0)
CdF2	4.534e-15	4.534e-15	-14.344	-14.344	0.000	(0)
CdNO3+	3.008e-16	2.225e-16	-15.522	-15.653	-0.131	(0)
CdSeO4	1.310e-16	1.310e-16	-15.883	-15.883	0.000	(0)
Cd (OH) 3-	3.659e-17	2.707e-17	-16.437	-16.568	-0.131	(0)
Cd (SeO3) 2-2	1.849e-17	5.538e-18	-16.733	-17.257	-0.524	(0)
Cd2OH+3	1.212e-17	8.046e-19	-16.916	-18.094	-1.178	(0)
Cd (OH) 4-2	1.938e-23	5.806e-24	-22.713	-23.236	-0.524	(0)
Cd (NO3) 2	1.999e-24	1.999e-24	-23.699	-23.699	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-79.064	-79.195	-0.131	(0)

	Cd (HS) 2	0.000e+00	0.000e+00	-150.789	-150.789	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-227.555	-227.686	-0.131	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-303.764	-304.288	-0.524	(0)
Cl	6.967e-03						
	Cl-	6.966e-03	5.610e-03	-2.157	-2.251	-0.094	(0)
	MnCl+	1.880e-07	1.521e-07	-6.726	-6.818	-0.092	(0)
	ZnOHC1	5.100e-08	5.100e-08	-7.292	-7.292	0.000	(0)
	ZnCl+	3.724e-08	2.972e-08	-7.429	-7.527	-0.098	(0)
	AgCl	1.224e-08	1.224e-08	-7.912	-7.912	0.000	(0)
	AgCl2-	8.081e-09	5.978e-09	-8.093	-8.223	-0.131	(0)
	CdCl+	2.844e-09	2.104e-09	-8.546	-8.677	-0.131	(0)
	CuCl2-	1.670e-09	1.333e-09	-8.777	-8.875	-0.098	(0)
	NiCl+	1.208e-09	8.934e-10	-8.918	-9.049	-0.131	(0)
	MnCl2	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
	CuCl	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
	CoCl+	8.633e-10	6.386e-10	-9.064	-9.195	-0.131	(0)
	ZnCl2	2.643e-10	2.643e-10	-9.578	-9.578	0.000	(0)
	CuCl+	1.666e-10	1.329e-10	-9.778	-9.876	-0.098	(0)
	CdOHC1	1.131e-10	1.131e-10	-9.947	-9.947	0.000	(0)
	AgCl3-2	9.979e-11	2.989e-11	-10.001	-10.524	-0.524	(0)
	PbCl+	5.296e-11	3.918e-11	-10.276	-10.407	-0.131	(0)
	CdCl2	4.920e-11	4.920e-11	-10.308	-10.308	0.000	(0)
	HgClOH	9.593e-12	9.593e-12	-11.018	-11.018	0.000	(0)
	AgCl4-3	5.158e-12	3.423e-13	-11.288	-12.466	-1.178	(0)
	CuCl3-2	3.734e-12	1.599e-12	-11.428	-11.796	-0.368	(0)
	HgCl2	2.325e-12	2.325e-12	-11.634	-11.634	0.000	(0)
	MnCl3-	2.301e-12	1.862e-12	-11.638	-11.730	-0.092	(0)
	ZnCl3-	1.475e-12	1.178e-12	-11.831	-11.929	-0.098	(0)
	PbCl2	9.818e-13	9.818e-13	-12.008	-12.008	0.000	(0)
	CuCl2	2.586e-13	2.586e-13	-12.587	-12.587	0.000	(0)
	CdCl3-	2.354e-13	1.741e-13	-12.628	-12.759	-0.131	(0)
	HgCl3-	1.763e-13	1.304e-13	-12.754	-12.885	-0.131	(0)
	NiCl2	2.523e-14	2.523e-14	-13.598	-13.598	0.000	(0)
	HgCl4-2	9.724e-15	2.913e-15	-14.012	-14.536	-0.524	(0)
	ZnCl4-2	7.713e-15	3.303e-15	-14.113	-14.481	-0.368	(0)
	PbCl3-	2.964e-15	2.192e-15	-14.528	-14.659	-0.131	(0)
	UO2Cl+	1.568e-16	1.160e-16	-15.805	-15.936	-0.131	(0)
	HgCl+	1.118e-16	8.270e-17	-15.952	-16.082	-0.131	(0)
	PbCl4-2	1.877e-17	5.622e-18	-16.727	-17.250	-0.524	(0)
	CuCl3-	1.696e-17	1.354e-17	-16.771	-16.868	-0.098	(0)
	CrCl+2	2.694e-18	8.070e-19	-17.570	-18.093	-0.524	(0)
	CrOHC12	1.128e-19	1.128e-19	-18.948	-18.948	0.000	(0)
	CuCl4-2	8.887e-22	3.806e-22	-21.051	-21.420	-0.368	(0)
	CrCl2+	5.806e-22	4.295e-22	-21.236	-21.367	-0.131	(0)
	FeCl+2	2.785e-22	1.193e-22	-21.555	-21.923	-0.368	(0)
	VOCl+	1.422e-23	1.052e-23	-22.847	-22.978	-0.131	(0)
	FeCl2+	3.695e-24	2.989e-24	-23.432	-23.525	-0.092	(0)
	CrO3Cl-	8.926e-26	6.604e-26	-25.049	-25.180	-0.131	(0)
	FeCl3	1.677e-27	1.677e-27	-26.776	-26.776	0.000	(0)
	CoCl+2	2.270e-35	6.799e-36	-34.644	-35.168	-0.524	(0)
	UCl+3	0.000e+00	0.000e+00	-45.826	-47.004	-1.178	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
Co (2)	1.616e-07						
	Co+2	1.099e-07	3.291e-08	-6.959	-7.483	-0.524	(0)
	CoSO4	4.504e-08	4.504e-08	-7.346	-7.346	0.000	(0)
	CoHCO3+	2.166e-09	1.602e-09	-8.664	-8.795	-0.131	(0)
	CoCO3	2.127e-09	2.127e-09	-8.672	-8.672	0.000	(0)
	CoOH+	1.163e-09	8.606e-10	-8.934	-9.065	-0.131	(0)
	CoCl+	8.633e-10	6.386e-10	-9.064	-9.195	-0.131	(0)
	CoF+	2.688e-10	1.988e-10	-9.571	-9.701	-0.131	(0)
	Co (OH) 2	8.958e-11	8.958e-11	-10.048	-10.048	0.000	(0)
	CoNO2+	5.954e-12	4.405e-12	-11.225	-11.356	-0.131	(0)
	Co (NH3) +2	8.185e-14	2.452e-14	-13.087	-13.611	-0.524	(0)
	Co (OH) 3-	3.166e-15	2.342e-15	-14.499	-14.630	-0.131	(0)
	CoSeO4	2.956e-15	2.956e-15	-14.529	-14.529	0.000	(0)
	CoNO3+	1.263e-15	9.346e-16	-14.898	-15.029	-0.131	(0)

CoOOH-	7.953e-16	5.884e-16	-15.099	-15.230	-0.131	(0)
Co2OH+3	2.139e-17	1.419e-18	-16.670	-17.848	-1.178	(0)
Co (NH3) 2+2	2.163e-20	6.480e-21	-19.665	-20.188	-0.524	(0)
Co (OH) 4-2	1.624e-21	4.865e-22	-20.789	-21.313	-0.524	(0)
Co (NO3) 2	3.408e-23	3.408e-23	-22.468	-22.468	0.000	(0)
Co4 (OH) 4+4	1.360e-26	1.094e-28	-25.867	-27.961	-2.094	(0)
Co (NH3) 3+2	1.688e-27	5.055e-28	-26.773	-27.296	-0.524	(0)
Co (NH3) 4+2	5.488e-35	1.644e-35	-34.261	-34.784	-0.524	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.248	-42.772	-0.524	(0)
Co (3)	1.324e-28					
CoOH+2	1.324e-28	3.967e-29	-27.878	-28.402	-0.524	(0)
Co+3	4.186e-35	5.956e-36	-34.378	-35.225	-0.847	(0)
CoCl+2	2.270e-35	6.799e-36	-34.644	-35.168	-0.524	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.085	-64.609	-0.524	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
Cr (2)	1.950e-27					
Cr+2	1.950e-27	5.841e-28	-26.710	-27.234	-0.524	(0)
Cr (3)	9.916e-10					
Cr (OH) 2+	6.870e-10	5.082e-10	-9.163	-9.294	-0.131	(0)
Cr (OH) 3	2.502e-10	2.502e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.095e-11	1.550e-11	-10.679	-10.810	-0.131	(0)
Cr (OH) 4-	1.765e-11	1.305e-11	-10.753	-10.884	-0.131	(0)
Cr (OH) +2	1.064e-11	3.187e-12	-10.973	-11.497	-0.524	(0)
CrOHSO4	5.188e-12	5.188e-12	-11.285	-11.285	0.000	(0)
CrF+2	1.124e-14	3.366e-15	-13.949	-14.473	-0.524	(0)
CrSO4+	2.407e-15	1.780e-15	-14.619	-14.749	-0.131	(0)
Cr+3	1.675e-15	1.112e-16	-14.776	-15.954	-1.178	(0)
CrCl+2	2.694e-18	8.070e-19	-17.570	-18.093	-0.524	(0)
CrOHC12	1.128e-19	1.128e-19	-18.948	-18.948	0.000	(0)
Cr2 (OH) 2SO4+2	4.989e-21	1.494e-21	-20.302	-20.826	-0.524	(0)
Cr2 (OH) 2 (SO4) 2	6.089e-22	6.089e-22	-21.215	-21.215	0.000	(0)
CrCl2+	5.806e-22	4.295e-22	-21.236	-21.367	-0.131	(0)
CrNO3+2	2.907e-25	8.707e-26	-24.537	-25.060	-0.524	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.980	-42.504	-0.524	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.023	-52.201	-1.178	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
Cr (6)	2.496e-14					
CrO4-2	2.333e-14	9.809e-15	-13.632	-14.008	-0.376	(0)
NaCrO4-	1.082e-15	8.003e-16	-14.966	-15.097	-0.131	(0)
HCrO4-	3.293e-16	2.436e-16	-15.482	-15.613	-0.131	(0)
KCrO4-	2.173e-16	1.608e-16	-15.663	-15.794	-0.131	(0)
CrO3SO4-2	1.306e-23	3.910e-24	-22.884	-23.408	-0.524	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	8.926e-26	6.604e-26	-25.049	-25.180	-0.131	(0)
Cr2O7-2	6.878e-30	2.060e-30	-29.163	-29.686	-0.524	(0)
Cu (1)	3.030e-09					
CuCl2-	1.670e-09	1.333e-09	-8.777	-8.875	-0.098	(0)
CuCl	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
Cu+	2.178e-10	1.611e-10	-9.662	-9.793	-0.131	(0)
CuCl3-2	3.734e-12	1.599e-12	-11.428	-11.796	-0.368	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.367	-147.768	-0.401	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.119	-148.498	-0.379	(0)
Cu (2)	5.030e-07					
CuCO3	3.366e-07	3.366e-07	-6.473	-6.473	0.000	(0)
CuOH+	7.764e-08	6.197e-08	-7.110	-7.208	-0.098	(0)
Cu+2	3.557e-08	1.495e-08	-7.449	-7.825	-0.376	(0)
CuSO4	2.350e-08	2.350e-08	-7.629	-7.629	0.000	(0)
Cu (OH) 2	1.621e-08	1.621e-08	-7.790	-7.790	0.000	(0)
Cu (CO3) 2-2	1.156e-08	3.463e-09	-7.937	-8.461	-0.524	(0)
CuHCO3+	7.982e-10	5.905e-10	-9.098	-9.229	-0.131	(0)
Cu2 (OH) 2+2	3.221e-10	9.647e-11	-9.492	-10.016	-0.524	(0)
CuF+	2.437e-10	1.803e-10	-9.613	-9.744	-0.131	(0)
CuCl+	1.666e-10	1.329e-10	-9.778	-9.876	-0.098	(0)
Cu (OH) 3-	5.888e-11	4.356e-11	-10.230	-10.361	-0.131	(0)
CuNO2+	4.020e-11	2.974e-11	-10.396	-10.527	-0.131	(0)
CuNH3+2	3.166e-12	9.482e-13	-11.500	-12.023	-0.524	(0)

	CuCl2	2.586e-13	2.586e-13	-12.587	-12.587	0.000	(0)
	Cu (NO2) 2	5.781e-15	5.781e-15	-14.238	-14.238	0.000	(0)
	Cu (OH) 4-2	1.500e-15	4.493e-16	-14.824	-15.347	-0.524	(0)
	CuNO3+	1.145e-15	8.474e-16	-14.941	-15.072	-0.131	(0)
	CuCl3-	1.696e-17	1.354e-17	-16.771	-16.868	-0.098	(0)
	CuCl4-2	8.887e-22	3.806e-22	-21.051	-21.420	-0.368	(0)
	Cu (NO3) 2	1.912e-24	1.912e-24	-23.719	-23.719	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-218.188	-218.319	-0.131	(0)
F		3.058e-04					
	F-	2.373e-04	1.911e-04	-3.625	-3.719	-0.094	(0)
	MgF+	6.412e-05	5.153e-05	-4.193	-4.288	-0.095	(0)
	CaF+	2.233e-06	1.806e-06	-5.651	-5.743	-0.092	(0)
	NaF	1.979e-06	1.979e-06	-5.703	-5.703	0.000	(0)
	MnF+	2.025e-07	1.638e-07	-6.694	-6.786	-0.092	(0)
	ZnF+	1.087e-08	8.042e-09	-7.964	-8.095	-0.131	(0)
	BF (OH) 3-	5.296e-09	4.129e-09	-8.276	-8.384	-0.108	(0)
	HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
	NiF+	4.038e-10	2.987e-10	-9.394	-9.525	-0.131	(0)
	CoF+	2.688e-10	1.988e-10	-9.571	-9.701	-0.131	(0)
	CuF+	2.437e-10	1.803e-10	-9.613	-9.744	-0.131	(0)
	AlF3	1.932e-10	1.932e-10	-9.714	-9.714	0.000	(0)
	AlF2+	9.882e-11	8.033e-11	-10.005	-10.095	-0.090	(0)
	AlF4-	2.302e-11	1.850e-11	-10.638	-10.733	-0.095	(0)
	CdF+	1.608e-11	1.189e-11	-10.794	-10.925	-0.131	(0)
	PbF+	3.583e-12	2.651e-12	-11.446	-11.577	-0.131	(0)
	AlF+2	2.418e-12	1.056e-12	-11.617	-11.976	-0.360	(0)
	HF2-	1.988e-12	1.576e-12	-11.701	-11.803	-0.101	(0)
	BF2 (OH) 2-	8.312e-13	6.480e-13	-12.080	-12.188	-0.108	(0)
	AgF	5.128e-13	5.128e-13	-12.290	-12.290	0.000	(0)
	UO2F+	4.546e-13	3.363e-13	-12.342	-12.473	-0.131	(0)
	UO2F2	1.853e-13	1.853e-13	-12.732	-12.732	0.000	(0)
	UO2F3-	1.202e-14	8.894e-15	-13.920	-14.051	-0.131	(0)
	CrF+2	1.124e-14	3.366e-15	-13.949	-14.473	-0.524	(0)
	PbF2	9.966e-15	9.966e-15	-14.001	-14.001	0.000	(0)
	CdF2	4.534e-15	4.534e-15	-14.344	-14.344	0.000	(0)
	UO2F4-2	4.507e-17	1.350e-17	-16.346	-16.870	-0.524	(0)
	H2F2	1.260e-17	1.260e-17	-16.899	-16.899	0.000	(0)
	PbF3-	4.882e-18	3.612e-18	-17.311	-17.442	-0.131	(0)
	VO2F	2.159e-18	2.159e-18	-17.666	-17.666	0.000	(0)
	FeF2+	9.324e-19	7.543e-19	-18.030	-18.122	-0.092	(0)
	BF3OH-	4.747e-19	3.701e-19	-18.324	-18.432	-0.108	(0)
	FeF+2	3.445e-19	1.475e-19	-18.463	-18.831	-0.368	(0)
	FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
	VO2F2-	2.024e-19	1.498e-19	-18.694	-18.825	-0.131	(0)
	VO2F3-2	1.192e-21	3.569e-22	-20.924	-21.447	-0.524	(0)
	PbF4-2	1.103e-21	3.303e-22	-20.958	-21.481	-0.524	(0)
	VOF+	1.035e-21	7.659e-22	-20.985	-21.116	-0.131	(0)
	VOF2	5.487e-23	5.487e-23	-22.261	-22.261	0.000	(0)
	HgF+	7.074e-24	5.233e-24	-23.150	-23.281	-0.131	(0)
	BF4-	3.429e-24	2.673e-24	-23.465	-23.573	-0.108	(0)
	VO2F4-3	5.056e-25	3.355e-26	-24.296	-25.474	-1.178	(0)
	VOF3-	5.028e-25	3.720e-25	-24.299	-24.429	-0.131	(0)
	Sb (OH) 2F	3.923e-26	3.923e-26	-25.406	-25.406	0.000	(0)
	SbOF	3.862e-26	3.862e-26	-25.413	-25.413	0.000	(0)
	VOF4-2	9.578e-28	2.869e-28	-27.019	-27.542	-0.524	(0)
	SiF6-2	2.896e-29	1.240e-29	-28.538	-28.907	-0.368	(0)
	UF3+	1.324e-36	9.796e-37	-35.878	-36.009	-0.131	(0)
	UF2+2	1.080e-37	3.235e-38	-36.967	-37.490	-0.524	(0)
	UF4	2.052e-38	2.052e-38	-37.688	-37.688	0.000	(0)
	UF5-	2.100e-40	1.554e-40	-39.678	-39.809	-0.131	(0)
	UF+3	2.026e-40	0.000e+00	-39.693	-40.871	-1.178	(0)
	UF6-2	0.000e+00	0.000e+00	-40.524	-41.047	-0.524	(0)
Fe (2)		8.497e-13					
	Fe+2	5.566e-13	1.667e-13	-12.254	-12.778	-0.524	(0)
	FeSO4	2.807e-13	2.807e-13	-12.552	-12.552	0.000	(0)
	FeOH+	1.075e-14	8.698e-15	-13.968	-14.061	-0.092	(0)
	FeHCO3+	1.605e-15	1.314e-15	-14.795	-14.882	-0.087	(0)
	Fe (OH) 2	9.055e-18	9.055e-18	-17.043	-17.043	0.000	(0)

Fe (OH) 3-	4.639e-18	3.753e-18	-17.334	-17.426	-0.092	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.423	-161.423	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.052	-238.183	-0.131	(0)
Fe (3)	8.654e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	3.737e-10	3.038e-10	-9.428	-9.517	-0.090	(0)
Fe (OH) 4-	6.418e-11	5.217e-11	-10.193	-10.283	-0.090	(0)
FeOH+2	1.391e-15	5.958e-16	-14.857	-15.225	-0.368	(0)
FeF2+	9.324e-19	7.543e-19	-18.030	-18.122	-0.092	(0)
FeF+2	3.445e-19	1.475e-19	-18.463	-18.831	-0.368	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
FeSO4+	6.699e-20	5.419e-20	-19.174	-19.266	-0.092	(0)
Fe (SO4) 2-	1.074e-20	7.947e-21	-19.969	-20.100	-0.131	(0)
Fe+3	4.948e-21	7.041e-22	-20.306	-21.152	-0.847	(0)
FeCl+2	2.785e-22	1.193e-22	-21.555	-21.923	-0.368	(0)
FeCl2+	3.695e-24	2.989e-24	-23.432	-23.525	-0.092	(0)
FeHSeO3+2	4.954e-25	1.484e-25	-24.305	-24.829	-0.524	(0)
FeCl3	1.677e-27	1.677e-27	-26.776	-26.776	0.000	(0)
Fe2 (OH) 2+4	1.461e-27	1.175e-29	-26.835	-28.930	-2.094	(0)
FeNO3+2	4.213e-28	1.262e-28	-27.375	-27.899	-0.524	(0)
Fe3 (OH) 4+5	9.663e-35	5.161e-38	-34.015	-37.287	-3.272	(0)
H (0)	3.974e-29					
H2	1.987e-29	2.018e-29	-28.702	-28.695	0.007	(0)
Hg (0)	3.300e-09					
Hg	3.300e-09	3.300e-09	-8.482	-8.482	0.000	(0)
Hg (1)	1.105e-20					
Hg2+2	5.526e-21	1.655e-21	-20.258	-20.781	-0.524	(0)
Hg (2)	1.999e-11					
HgClOH	9.593e-12	9.593e-12	-11.018	-11.018	0.000	(0)
Hg (OH) 2	7.887e-12	8.007e-12	-11.103	-11.097	0.007	(0)
HgCl2	2.325e-12	2.325e-12	-11.634	-11.634	0.000	(0)
HgCl3-	1.763e-13	1.304e-13	-12.754	-12.885	-0.131	(0)
HgCl4-2	9.724e-15	2.913e-15	-14.012	-14.536	-0.524	(0)
HgCO3	3.380e-15	3.380e-15	-14.471	-14.471	0.000	(0)
Hg (CO3) 2-2	1.364e-16	4.086e-17	-15.865	-16.389	-0.524	(0)
HgCl+	1.118e-16	8.270e-17	-15.952	-16.082	-0.131	(0)
HgOH+	5.211e-17	3.855e-17	-16.283	-16.414	-0.131	(0)
Hg (OH) 3-	1.786e-18	1.321e-18	-17.748	-17.879	-0.131	(0)
HgHCO3+	6.530e-19	4.831e-19	-18.185	-18.316	-0.131	(0)
Hg (NH3) 2+2	5.976e-20	1.790e-20	-19.224	-19.747	-0.524	(0)
HgNH3+2	9.645e-21	2.889e-21	-20.016	-20.539	-0.524	(0)
Hg+2	2.467e-21	7.389e-22	-20.608	-21.131	-0.524	(0)
HgSO4	1.327e-21	1.327e-21	-20.877	-20.877	0.000	(0)
HgF+	7.074e-24	5.233e-24	-23.150	-23.281	-0.131	(0)
Hg (NH3) 3+2	1.474e-27	4.415e-28	-26.831	-27.355	-0.524	(0)
HgNO3+	6.608e-30	4.889e-30	-29.180	-29.311	-0.131	(0)
Hg (NH3) 4+2	7.255e-35	2.173e-35	-34.139	-34.663	-0.524	(0)
Hg (NO3) 2	3.641e-38	3.641e-38	-37.439	-37.439	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.552	-138.683	-0.131	(0)
HgS2-2	0.000e+00	0.000e+00	-138.753	-139.276	-0.524	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.404	-140.404	0.000	(0)
K	5.741e-03					
K+	5.478e-03	4.411e-03	-2.261	-2.355	-0.094	(0)
KSO4-	2.635e-04	2.142e-04	-3.579	-3.669	-0.090	(0)
KCrO4-	2.173e-16	1.608e-16	-15.663	-15.794	-0.131	(0)
Mg	8.811e-03					
Mg+2	5.718e-03	2.404e-03	-2.243	-2.619	-0.376	(0)
MgSO4	3.000e-03	3.000e-03	-2.523	-2.523	0.000	(0)
MgF+	6.412e-05	5.153e-05	-4.193	-4.288	-0.095	(0)
MgHCO3+	1.929e-05	1.539e-05	-4.715	-4.813	-0.098	(0)
MgCO3	7.643e-06	7.643e-06	-5.117	-5.117	0.000	(0)
MgOH+	1.524e-06	1.254e-06	-5.817	-5.902	-0.085	(0)
MgH2BO3+	4.381e-07	3.416e-07	-6.358	-6.467	-0.108	(0)
Mn (2)	9.898e-05					
Mn+2	7.190e-05	2.153e-05	-4.143	-4.667	-0.524	(0)
MnSO4	2.627e-05	2.627e-05	-4.581	-4.581	0.000	(0)
MnHCO3+	3.324e-07	2.689e-07	-6.478	-6.570	-0.092	(0)
MnF+	2.025e-07	1.638e-07	-6.694	-6.786	-0.092	(0)

MnCl+	1.880e-07	1.521e-07	-6.726	-6.818	-0.092	(0)
MnOH+	8.763e-08	7.089e-08	-7.057	-7.149	-0.092	(0)
MnCl2	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
MnCl3-	2.301e-12	1.862e-12	-11.638	-11.730	-0.092	(0)
MnSeO4	1.039e-12	1.039e-12	-11.984	-11.984	0.000	(0)
MnNO3+	8.267e-13	6.116e-13	-12.083	-12.214	-0.131	(0)
Mn (OH) 3-	9.302e-16	7.525e-16	-15.031	-15.124	-0.092	(0)
Mn (NO3) 2	2.753e-20	2.753e-20	-19.560	-19.560	0.000	(0)
Mn (OH) 4-2	7.435e-21	3.184e-21	-20.129	-20.497	-0.368	(0)
MnSe	0.000e+00	0.000e+00	-40.809	-40.809	0.000	(0)
Mn (3)	3.073e-25					
Mn+3	3.073e-25	4.373e-26	-24.512	-25.359	-0.847	(0)
Mn (6)	6.723e-40					
MnO4-2	6.723e-40	2.879e-40	-39.172	-39.541	-0.368	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.151	-44.255	-0.104	(0)
Mo	2.899e-06					
MoO4-2	2.898e-06	1.219e-06	-5.538	-5.914	-0.376	(0)
HMoO4-	2.515e-10	1.861e-10	-9.599	-9.730	-0.131	(0)
H2MoO4	1.046e-14	1.046e-14	-13.980	-13.980	0.000	(0)
Ag2MoO4	5.265e-25	5.265e-25	-24.279	-24.279	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.260	-44.438	-1.178	(0)
Mo7O24-6	0.000e+00	0.000e+00	-48.614	-53.327	-4.712	(0)
HMo7O24-5	0.000e+00	0.000e+00	-51.782	-55.055	-3.272	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-56.293	-58.387	-2.094	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.078	-63.256	-1.178	(0)
N (-3)	1.208e-07					
NH4+	1.070e-07	8.341e-08	-6.971	-7.079	-0.108	(0)
NH4SO4-	7.578e-09	6.130e-09	-8.120	-8.213	-0.092	(0)
NH3	6.196e-09	6.196e-09	-8.208	-8.208	0.000	(0)
CaNH3+2	2.256e-11	6.757e-12	-10.647	-11.170	-0.524	(0)
CuNH3+2	3.166e-12	9.482e-13	-11.500	-12.023	-0.524	(0)
NiNH3+2	6.915e-13	2.071e-13	-12.160	-12.684	-0.524	(0)
Co (NH3) +2	8.185e-14	2.452e-14	-13.087	-13.611	-0.524	(0)
AgNH3+	1.827e-14	1.352e-14	-13.738	-13.869	-0.131	(0)
BaNH3+2	1.993e-16	5.968e-17	-15.701	-16.224	-0.524	(0)
Ag (NH3) 2+	9.202e-19	6.808e-19	-18.036	-18.167	-0.131	(0)
Ni (NH3) 2+2	6.193e-19	1.855e-19	-18.208	-18.732	-0.524	(0)
Hg (NH3) 2+2	5.976e-20	1.790e-20	-19.224	-19.747	-0.524	(0)
Ca (NH3) 2+2	5.565e-20	1.667e-20	-19.255	-19.778	-0.524	(0)
Co (NH3) 2+2	2.163e-20	6.480e-21	-19.665	-20.188	-0.524	(0)
HgNH3+2	9.645e-21	2.889e-21	-20.016	-20.539	-0.524	(0)
Co (NH3) 3+2	1.688e-27	5.055e-28	-26.773	-27.296	-0.524	(0)
Hg (NH3) 3+2	1.474e-27	4.415e-28	-26.831	-27.355	-0.524	(0)
Hg (NH3) 4+2	7.255e-35	2.173e-35	-34.139	-34.663	-0.524	(0)
Co (NH3) 4+2	5.488e-35	1.644e-35	-34.261	-34.784	-0.524	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.980	-42.504	-0.524	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.248	-42.772	-0.524	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.023	-52.201	-1.178	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.085	-64.609	-0.524	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
N (3)	2.416e-05					
NO2-	2.416e-05	1.899e-05	-4.617	-4.721	-0.104	(0)
CuNO2+	4.020e-11	2.974e-11	-10.396	-10.527	-0.131	(0)
CoNO2+	5.954e-12	4.405e-12	-11.225	-11.356	-0.131	(0)
AgNO2	4.240e-12	4.240e-12	-11.373	-11.373	0.000	(0)
Cu (NO2) 2	5.781e-15	5.781e-15	-14.238	-14.238	0.000	(0)
Ag (NO2) 2-	1.686e-16	1.247e-16	-15.773	-15.904	-0.131	(0)
N (5)	2.232e-08					
NO3-	2.225e-08	1.792e-08	-7.653	-7.747	-0.094	(0)
CaNO3+	6.635e-11	4.908e-11	-10.178	-10.309	-0.131	(0)
MnNO3+	8.267e-13	6.116e-13	-12.083	-12.214	-0.131	(0)
ZnNO3+	1.284e-13	9.495e-14	-12.892	-13.022	-0.131	(0)
NiNO3+	3.787e-15	2.802e-15	-14.422	-14.553	-0.131	(0)
BaNO3+	1.853e-15	1.371e-15	-14.732	-14.863	-0.131	(0)

CoNO3+	1.263e-15	9.346e-16	-14.898	-15.029	-0.131	(0)
CuNO3+	1.145e-15	8.474e-16	-14.941	-15.072	-0.131	(0)
CdNO3+	3.008e-16	2.225e-16	-15.522	-15.653	-0.131	(0)
PbNO3+	7.053e-17	5.218e-17	-16.152	-16.283	-0.131	(0)
AgNO3	1.521e-17	1.521e-17	-16.818	-16.818	0.000	(0)
Mn(NO3)2	2.753e-20	2.753e-20	-19.560	-19.560	0.000	(0)
UO2NO3+	6.163e-22	4.559e-22	-21.210	-21.341	-0.131	(0)
Zn(NO3)2	3.395e-22	3.395e-22	-21.469	-21.469	0.000	(0)
Co(NO3)2	3.408e-23	3.408e-23	-22.468	-22.468	0.000	(0)
Cd(NO3)2	1.999e-24	1.999e-24	-23.699	-23.699	0.000	(0)
Cu(NO3)2	1.912e-24	1.912e-24	-23.719	-23.719	0.000	(0)
Pb(NO3)2	1.588e-24	1.588e-24	-23.799	-23.799	0.000	(0)
CrNO3+2	2.907e-25	8.707e-26	-24.537	-25.060	-0.524	(0)
VO2NO3	5.839e-26	5.839e-26	-25.234	-25.234	0.000	(0)
FeNO3+2	4.213e-28	1.262e-28	-27.375	-27.899	-0.524	(0)
HgNO3+	6.608e-30	4.889e-30	-29.180	-29.311	-0.131	(0)
Hg(NO3)2	3.641e-38	3.641e-38	-37.439	-37.439	0.000	(0)
Na	2.114e-02					
Na+	2.039e-02	1.642e-02	-1.691	-1.785	-0.094	(0)
NaSO4-	7.440e-04	6.048e-04	-3.128	-3.218	-0.090	(0)
NaHCO3	5.778e-06	5.778e-06	-5.238	-5.238	0.000	(0)
NaF	1.979e-06	1.979e-06	-5.703	-5.703	0.000	(0)
NaCO3-	1.438e-06	1.169e-06	-5.842	-5.932	-0.090	(0)
NaH2BO3	1.066e-07	1.066e-07	-6.972	-6.972	0.000	(0)
NaCrO4-	1.082e-15	8.003e-16	-14.966	-15.097	-0.131	(0)
Ni	2.518e-07					
Ni+2	1.481e-07	6.224e-08	-6.830	-7.206	-0.376	(0)
NiSO4	8.519e-08	8.519e-08	-7.070	-7.070	0.000	(0)
NiCO3	8.877e-09	8.877e-09	-8.052	-8.052	0.000	(0)
NiHCO3+	6.492e-09	4.802e-09	-8.188	-8.319	-0.131	(0)
NiOH+	1.388e-09	1.027e-09	-8.858	-8.988	-0.131	(0)
NiCl+	1.208e-09	8.934e-10	-8.918	-9.049	-0.131	(0)
NiF+	4.038e-10	2.987e-10	-9.394	-9.525	-0.131	(0)
Ni(OH)2	1.069e-10	1.069e-10	-9.971	-9.971	0.000	(0)
Ni(SO4)2-2	6.460e-11	1.935e-11	-10.190	-10.713	-0.524	(0)
NiNH3+2	6.915e-13	2.071e-13	-12.160	-12.684	-0.524	(0)
Ni(OH)3-	1.894e-13	1.401e-13	-12.723	-12.854	-0.131	(0)
NiCl2	2.523e-14	2.523e-14	-13.598	-13.598	0.000	(0)
NiSeO4	5.217e-15	5.217e-15	-14.283	-14.283	0.000	(0)
NiNO3+	3.787e-15	2.802e-15	-14.422	-14.553	-0.131	(0)
Ni(NH3)2+2	6.193e-19	1.855e-19	-18.208	-18.732	-0.524	(0)
O(0)	2.448e-35					
O2	1.224e-35	1.243e-35	-34.912	-34.906	0.007	(0)
Pb	4.651e-09					
PbCO3	2.262e-09	2.262e-09	-8.645	-8.645	0.000	(0)
PbOH+	8.760e-10	6.481e-10	-9.057	-9.188	-0.131	(0)
PbSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
Pb+2	4.683e-10	1.969e-10	-9.329	-9.706	-0.376	(0)
PbHCO3+	1.237e-10	9.154e-11	-9.907	-10.038	-0.131	(0)
Pb(SO4)2-2	9.126e-11	2.734e-11	-10.040	-10.563	-0.524	(0)
Pb(CO3)2-2	8.327e-11	2.494e-11	-10.080	-10.603	-0.524	(0)
PbCl+	5.296e-11	3.918e-11	-10.276	-10.407	-0.131	(0)
Pb(OH)2	2.686e-11	2.686e-11	-10.571	-10.571	0.000	(0)
PbF+	3.583e-12	2.651e-12	-11.446	-11.577	-0.131	(0)
PbCl2	9.818e-13	9.818e-13	-12.008	-12.008	0.000	(0)
Pb(OH)3-	4.758e-14	3.520e-14	-13.323	-13.453	-0.131	(0)
PbF2	9.966e-15	9.966e-15	-14.001	-14.001	0.000	(0)
PbCl3-	2.964e-15	2.192e-15	-14.528	-14.659	-0.131	(0)
PbNO3+	7.053e-17	5.218e-17	-16.152	-16.283	-0.131	(0)
Pb(OH)4-2	3.772e-17	1.130e-17	-16.423	-16.947	-0.524	(0)
Pb2OH+3	3.047e-17	2.022e-18	-16.516	-17.694	-1.178	(0)
PbCl4-2	1.877e-17	5.622e-18	-16.727	-17.250	-0.524	(0)
PbF3-	4.882e-18	3.612e-18	-17.311	-17.442	-0.131	(0)
Pb3(OH)4+2	9.460e-21	2.833e-21	-20.024	-20.548	-0.524	(0)
PbF4-2	1.103e-21	3.303e-22	-20.958	-21.481	-0.524	(0)
Pb(NO3)2	1.588e-24	1.588e-24	-23.799	-23.799	0.000	(0)
Pb4(OH)4+4	5.505e-25	4.431e-27	-24.259	-26.354	-2.094	(0)
Pb(HS)2	0.000e+00	0.000e+00	-152.031	-152.031	0.000	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-229.397	-229.528	-0.131	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.954	-73.954	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.667	-78.797	-0.131	(0)
CdHS+	0.000e+00	0.000e+00	-79.064	-79.195	-0.131	(0)
S5-2	0.000e+00	0.000e+00	-79.524	-80.048	-0.524	(0)
H2S	0.000e+00	0.000e+00	-79.892	-79.892	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.040	-80.564	-0.524	(0)
S4-2	0.000e+00	0.000e+00	-80.120	-80.643	-0.524	(0)
S3-2	0.000e+00	0.000e+00	-80.926	-81.449	-0.524	(0)
S2-2	0.000e+00	0.000e+00	-81.942	-82.465	-0.524	(0)
S-2	0.000e+00	0.000e+00	-87.614	-87.983	-0.368	(0)
HgHS2-	0.000e+00	0.000e+00	-138.552	-138.683	-0.131	(0)
HgS2-2	0.000e+00	0.000e+00	-138.753	-139.276	-0.524	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.404	-140.404	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.367	-147.768	-0.401	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.789	-148.020	-0.231	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.119	-148.498	-0.379	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.215	-148.346	-0.131	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.521	-148.652	-0.131	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.933	-149.345	-0.413	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.267	-149.656	-0.390	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.451	-150.451	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.789	-150.789	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.031	-152.031	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.423	-161.423	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.188	-218.319	-0.131	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.837	-225.968	-0.131	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.310	-227.833	-0.524	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.555	-227.686	-0.131	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.397	-229.528	-0.131	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.052	-238.183	-0.131	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.764	-304.288	-0.524	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.702	-306.226	-0.524	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.038	-321.562	-0.524	(0)
S (6)	2.172e-02					
SO4-2	1.632e-02	6.859e-03	-1.787	-2.164	-0.376	(0)
MgSO4	3.000e-03	3.000e-03	-2.523	-2.523	0.000	(0)
CaSO4	1.361e-03	1.361e-03	-2.866	-2.866	0.000	(0)
NaSO4-	7.440e-04	6.048e-04	-3.128	-3.218	-0.090	(0)
KSO4-	2.635e-04	2.142e-04	-3.579	-3.669	-0.090	(0)
MnSO4	2.627e-05	2.627e-05	-4.581	-4.581	0.000	(0)
ZnSO4	3.166e-06	3.166e-06	-5.500	-5.500	0.000	(0)
Zn (SO4) 2-2	6.314e-07	1.891e-07	-6.200	-6.723	-0.524	(0)
NiSO4	8.519e-08	8.519e-08	-7.070	-7.070	0.000	(0)
CoSO4	4.504e-08	4.504e-08	-7.346	-7.346	0.000	(0)
CuSO4	2.350e-08	2.350e-08	-7.629	-7.629	0.000	(0)
NH4SO4-	7.578e-09	6.130e-09	-8.120	-8.213	-0.092	(0)
HSO4-	6.401e-09	5.145e-09	-8.194	-8.289	-0.095	(0)
CdSO4	6.315e-09	6.315e-09	-8.200	-8.200	0.000	(0)
Cd (SO4) 2-2	1.951e-09	5.843e-10	-8.710	-9.233	-0.524	(0)
PbSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
AgSO4-	1.977e-10	1.462e-10	-9.704	-9.835	-0.131	(0)
Pb (SO4) 2-2	9.126e-11	2.734e-11	-10.040	-10.563	-0.524	(0)
Ni (SO4) 2-2	6.460e-11	1.935e-11	-10.190	-10.713	-0.524	(0)
CrOHSO4	5.188e-12	5.188e-12	-11.285	-11.285	0.000	(0)
FeSO4	2.807e-13	2.807e-13	-12.552	-12.552	0.000	(0)
UO2SO4	1.324e-13	1.324e-13	-12.878	-12.878	0.000	(0)
UO2 (SO4) 2-2	3.997e-14	1.197e-14	-13.398	-13.922	-0.524	(0)
AlSO4+	3.662e-14	2.943e-14	-13.436	-13.531	-0.095	(0)
Al (SO4) 2-	2.691e-15	2.163e-15	-14.570	-14.665	-0.095	(0)
CrSO4+	2.407e-15	1.780e-15	-14.619	-14.749	-0.131	(0)
VO2SO4-	1.426e-18	1.055e-18	-17.846	-17.977	-0.131	(0)
FeSO4+	6.699e-20	5.419e-20	-19.174	-19.266	-0.092	(0)
Fe (SO4) 2-	1.074e-20	7.947e-21	-19.969	-20.100	-0.131	(0)
Cr2 (OH) 2SO4+2	4.989e-21	1.494e-21	-20.302	-20.826	-0.524	(0)
HgSO4	1.327e-21	1.327e-21	-20.877	-20.877	0.000	(0)
VO4SO4	1.263e-21	1.263e-21	-20.899	-20.899	0.000	(0)

Cr2(OH)2(SO4)2	6.089e-22	6.089e-22	-21.215	-21.215	0.000	(0)
CrO3SO4-2	1.306e-23	3.910e-24	-22.884	-23.408	-0.524	(0)
VSO4+	1.884e-36	1.394e-36	-35.725	-35.856	-0.131	(0)
U(SO4)2	0.000e+00	0.000e+00	-40.280	-40.280	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.493	-42.016	-0.524	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Sb(3)	3.383e-20					
Sb(OH)3	1.711e-20	1.711e-20	-19.767	-19.767	0.000	(0)
HSbO2	1.672e-20	1.672e-20	-19.777	-19.777	0.000	(0)
SbO2-	4.768e-24	3.527e-24	-23.322	-23.453	-0.131	(0)
Sb(OH)4-	2.727e-24	2.017e-24	-23.564	-23.695	-0.131	(0)
Sb(OH)2F	3.923e-26	3.923e-26	-25.406	-25.406	0.000	(0)
SbOF	3.862e-26	3.862e-26	-25.413	-25.413	0.000	(0)
Sb(OH)2+	4.314e-27	3.192e-27	-26.365	-26.496	-0.131	(0)
SbO+	1.489e-27	1.102e-27	-26.827	-26.958	-0.131	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.038	-321.562	-0.524	(0)
Sb(5)	4.431e-08					
SbO3-	4.427e-08	3.275e-08	-7.354	-7.485	-0.131	(0)
Sb(OH)6-	4.742e-11	3.818e-11	-10.324	-10.418	-0.094	(0)
SbO2+	7.487e-25	5.539e-25	-24.126	-24.257	-0.131	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.813e-39	1.342e-39	-38.742	-38.872	-0.131	(0)
MnSe	0.000e+00	0.000e+00	-40.809	-40.809	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.097	-43.097	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.234	-45.757	-0.524	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-80.786	-82.881	-2.094	(0)
Se(4)	2.459e-07					
SeO3-2	1.381e-07	4.136e-08	-6.860	-7.383	-0.524	(0)
HSeO3-	1.078e-07	7.974e-08	-6.967	-7.098	-0.131	(0)
H2SeO3	2.611e-13	2.611e-13	-12.583	-12.583	0.000	(0)
AgSeO3-	3.839e-14	2.840e-14	-13.416	-13.547	-0.131	(0)
Cd(SeO3)2-2	1.849e-17	5.538e-18	-16.733	-17.257	-0.524	(0)
Ag(SeO3)2-3	1.585e-19	1.052e-20	-18.800	-19.978	-1.178	(0)
FeHSeO3+2	4.954e-25	1.484e-25	-24.305	-24.829	-0.524	(0)
Se(6)	4.274e-10					
SeO4-2	4.262e-10	1.792e-10	-9.370	-9.747	-0.376	(0)
MnSeO4	1.039e-12	1.039e-12	-11.984	-11.984	0.000	(0)
ZnSeO4	5.855e-14	5.855e-14	-13.232	-13.232	0.000	(0)
NiSeO4	5.217e-15	5.217e-15	-14.283	-14.283	0.000	(0)
CoSeO4	2.956e-15	2.956e-15	-14.529	-14.529	0.000	(0)
CdSeO4	1.310e-16	1.310e-16	-15.883	-15.883	0.000	(0)
HSeO4-	9.317e-17	6.893e-17	-16.031	-16.162	-0.131	(0)
Zn(SeO4)2-2	3.552e-23	1.064e-23	-22.450	-22.973	-0.524	(0)
Si	4.873e-05					
H4SiO4	4.759e-05	4.832e-05	-4.322	-4.316	0.007	(0)
H3SiO4-	1.140e-06	9.100e-07	-5.943	-6.041	-0.098	(0)
H2SiO4-2	1.713e-11	7.481e-12	-10.766	-11.126	-0.360	(0)
UO2H3SiO4+	1.332e-12	9.852e-13	-11.876	-12.006	-0.131	(0)
SiF6-2	2.896e-29	1.240e-29	-28.538	-28.907	-0.368	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.728	-59.906	-1.178	(0)
U(4)	1.351e-19					
U(OH)5-	1.351e-19	9.994e-20	-18.869	-19.000	-0.131	(0)
U(OH)4	3.216e-23	3.216e-23	-22.493	-22.493	0.000	(0)
U(OH)3+	1.221e-27	9.033e-28	-26.913	-27.044	-0.131	(0)
U(OH)2+2	1.071e-32	3.209e-33	-31.970	-32.494	-0.524	(0)
UF3+	1.324e-36	9.796e-37	-35.878	-36.009	-0.131	(0)
UF2+2	1.080e-37	3.235e-38	-36.967	-37.490	-0.524	(0)
UF4	2.052e-38	2.052e-38	-37.688	-37.688	0.000	(0)
UOH+3	1.750e-38	1.161e-39	-37.757	-38.935	-1.178	(0)
UF5-	2.100e-40	1.554e-40	-39.678	-39.809	-0.131	(0)
UF+3	2.026e-40	0.000e+00	-39.693	-40.871	-1.178	(0)
U(SO4)2	0.000e+00	0.000e+00	-40.280	-40.280	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.524	-41.047	-0.524	(0)
USO4+2	0.000e+00	0.000e+00	-41.493	-42.016	-0.524	(0)
U+4	0.000e+00	0.000e+00	-44.358	-46.453	-2.094	(0)
UCl+3	0.000e+00	0.000e+00	-45.826	-47.004	-1.178	(0)

U6(OH) 15+9	0.000e+00	0.000e+00	-163.551	-174.153	-10.602	(0)
U(5)	2.311e-16					
UO2+	2.311e-16	1.710e-16	-15.636	-15.767	-0.131	(0)
U(6)	4.020e-07					
UO2(CO3) 3-4	3.524e-07	2.836e-09	-6.453	-8.547	-2.094	(0)
UO2(CO3) 2-2	4.942e-08	1.480e-08	-7.306	-7.830	-0.524	(0)
UO2CO3	1.941e-10	1.941e-10	-9.712	-9.712	0.000	(0)
UO2OH+	2.844e-12	2.104e-12	-11.546	-11.677	-0.131	(0)
UO2H3SiO4+	1.332e-12	9.852e-13	-11.876	-12.006	-0.131	(0)
UO2F+	4.546e-13	3.363e-13	-12.342	-12.473	-0.131	(0)
UO2F2	1.853e-13	1.853e-13	-12.732	-12.732	0.000	(0)
UO2SO4	1.324e-13	1.324e-13	-12.878	-12.878	0.000	(0)
UO2(SO4) 2-2	3.997e-14	1.197e-14	-13.398	-13.922	-0.524	(0)
UO2+2	3.033e-14	1.275e-14	-13.518	-13.894	-0.376	(0)
UO2F3-	1.202e-14	8.894e-15	-13.920	-14.051	-0.131	(0)
UO2Cl+	1.568e-16	1.160e-16	-15.805	-15.936	-0.131	(0)
UO2F4-2	4.507e-17	1.350e-17	-16.346	-16.870	-0.524	(0)
(UO2) 3(OH) 5+	2.722e-17	2.013e-17	-16.565	-16.696	-0.131	(0)
(UO2) 2(OH) 2+2	2.452e-17	7.346e-18	-16.610	-17.134	-0.524	(0)
UO2NO3+	6.163e-22	4.559e-22	-21.210	-21.341	-0.131	(0)
V(2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.575	-43.706	-0.131	(0)
V+2	0.000e+00	0.000e+00	-44.810	-45.334	-0.524	(0)
V(3)	7.816e-16					
V(OH) 3	7.816e-16	7.816e-16	-15.107	-15.107	0.000	(0)
V(OH) 2+	5.245e-27	3.880e-27	-26.280	-26.411	-0.131	(0)
VOH+2	9.440e-31	2.827e-31	-30.025	-30.549	-0.524	(0)
V+3	6.486e-36	4.305e-37	-35.188	-36.366	-1.178	(0)
VSO4+	1.884e-36	1.394e-36	-35.725	-35.856	-0.131	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-57.330	-58.508	-1.178	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-58.203	-60.297	-2.094	(0)
V(4)	2.406e-19					
V(OH) 3+	2.360e-19	1.746e-19	-18.627	-18.758	-0.131	(0)
VO+2	2.231e-21	6.683e-22	-20.651	-21.175	-0.524	(0)
VOSO4	1.263e-21	1.263e-21	-20.899	-20.899	0.000	(0)
VOF+	1.035e-21	7.659e-22	-20.985	-21.116	-0.131	(0)
VOF2	5.487e-23	5.487e-23	-22.261	-22.261	0.000	(0)
VOC1+	1.422e-23	1.052e-23	-22.847	-22.978	-0.131	(0)
VOF3-	5.028e-25	3.720e-25	-24.299	-24.429	-0.131	(0)
VOF4-2	9.578e-28	2.869e-28	-27.019	-27.542	-0.524	(0)
H2V2O4+2	5.110e-33	1.531e-33	-32.292	-32.815	-0.524	(0)
V(5)	1.337e-08					
H2VO4-	7.393e-09	5.469e-09	-8.131	-8.262	-0.131	(0)
HVO4-2	5.976e-09	1.790e-09	-8.224	-8.747	-0.524	(0)
H3VO4	4.197e-13	4.197e-13	-12.377	-12.377	0.000	(0)
HV2O7-3	5.003e-14	3.321e-15	-13.301	-14.479	-1.178	(0)
H3V2O7-	2.006e-14	1.484e-14	-13.698	-13.829	-0.131	(0)
VO4-3	1.761e-14	1.169e-15	-13.754	-14.932	-1.178	(0)
V2O7-4	1.447e-15	1.164e-17	-14.840	-16.934	-2.094	(0)
VO2+	8.000e-18	6.442e-18	-17.097	-17.191	-0.094	(0)
V3O9-3	2.589e-18	1.718e-19	-17.587	-18.765	-1.178	(0)
VO2F	2.159e-18	2.159e-18	-17.666	-17.666	0.000	(0)
VO2SO4-	1.426e-18	1.055e-18	-17.846	-17.977	-0.131	(0)
VO2F2-	2.024e-19	1.498e-19	-18.694	-18.825	-0.131	(0)
VO2F3-2	1.192e-21	3.569e-22	-20.924	-21.447	-0.524	(0)
V4O12-4	4.873e-23	3.922e-25	-22.312	-24.406	-2.094	(0)
VO2F4-3	5.056e-25	3.355e-26	-24.296	-25.474	-1.178	(0)
VO2NO3	5.839e-26	5.839e-26	-25.234	-25.234	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.457	-66.169	-4.712	(0)
HV10O28-5	0.000e+00	0.000e+00	-62.825	-66.097	-3.272	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.910	-69.005	-2.094	(0)
Zn	9.867e-06					
Zn+2	5.018e-06	2.110e-06	-5.299	-5.676	-0.376	(0)
ZnSO4	3.166e-06	3.166e-06	-5.500	-5.500	0.000	(0)
Zn(SO4) 2-2	6.314e-07	1.891e-07	-6.200	-6.723	-0.524	(0)
ZnCO3	4.640e-07	4.640e-07	-6.333	-6.333	0.000	(0)
ZnOH+	3.737e-07	2.765e-07	-6.427	-6.558	-0.131	(0)
Zn(OH) 2	5.742e-08	5.742e-08	-7.241	-7.241	0.000	(0)

ZnHCO3+	5.643e-08	4.175e-08	-7.248	-7.379	-0.131	(0)
ZnOHCl	5.100e-08	5.100e-08	-7.292	-7.292	0.000	(0)
ZnCl+	3.724e-08	2.972e-08	-7.429	-7.527	-0.098	(0)
ZnF+	1.087e-08	8.042e-09	-7.964	-8.095	-0.131	(0)
Zn(OH) 3-	5.098e-10	3.772e-10	-9.293	-9.423	-0.131	(0)
ZnCl2	2.643e-10	2.643e-10	-9.578	-9.578	0.000	(0)
ZnCl3-	1.475e-12	1.178e-12	-11.831	-11.929	-0.098	(0)
ZnNO3+	1.284e-13	9.495e-14	-12.892	-13.022	-0.131	(0)
Zn(OH) 4-2	6.570e-14	1.968e-14	-13.182	-13.706	-0.524	(0)
ZnSeO4	5.855e-14	5.855e-14	-13.232	-13.232	0.000	(0)
ZnCl4-2	7.713e-15	3.303e-15	-14.113	-14.481	-0.368	(0)
Zn(NO3) 2	3.395e-22	3.395e-22	-21.469	-21.469	0.000	(0)
Zn(SeO4) 2-2	3.552e-23	1.064e-23	-22.450	-22.973	-0.524	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.215	-148.346	-0.131	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.451	-150.451	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.837	-225.968	-0.131	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.310	-227.833	-0.524	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.702	-306.226	-0.524	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3) 5Cl) (NO3) 2	-54.08	-47.79	6.29	(Co(NH3) 5Cl) (NO3) 2
(Co(NH3) 5Cl) Cl2	-41.31	-36.80	4.51	(Co(NH3) 5Cl) Cl2
(Co(NH3) 5OH2) Cl3	-48.53	-36.80	11.74	(Co(NH3) 5OH2) Cl3
(Co(NH3) 6) (NO3) 3	-70.18	-52.25	17.93	(Co(NH3) 6) (NO3) 3
(Co(NH3) 6) Cl3	-55.79	-35.76	20.03	(Co(NH3) 6) Cl3
(NH4) 2CrO4	-28.57	-28.17	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-24.35	-23.90	0.45	(NH4) 2SeO4
Acanthite	-52.41	-88.63	-36.22	Ag2S
Ag2CO3	-12.27	-23.36	-11.09	Ag2CO3
Ag2CrO4	-20.36	-31.95	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.31	-23.86	-11.55	Ag2MoO4
Ag2O	-14.29	-1.71	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.29	-20.11	-4.82	Ag2SO4
Ag3AsO3	-28.45	-26.29	2.16	Ag3AsO3
Ag3AsO4	-16.86	-19.64	-2.79	Ag3AsO4
Ag3H2VO5	-16.83	-11.65	5.18	Ag3H2VO5
AgF:4H2O	-13.74	-12.69	1.05	AgF:4H2O
Agmetal	-0.12	-13.63	-13.51	Ag
AgVO3	-10.70	-9.93	0.77	AgVO3
Al(OH) 3 (am)	-1.71	9.09	10.80	Al(OH) 3
Al2(MoO4) 3	-50.62	-48.26	2.37	Al2(MoO4) 3
Al2O3	-1.48	18.17	19.65	Al2O3
Al4(OH) 10SO4	-4.75	17.95	22.70	Al4(OH) 10SO4
AlAsO4:2H2O	-12.79	-7.99	4.80	AlAsO4:2H2O
AlOHSO4	-6.08	-9.31	-3.23	AlOHSO4
AlSb	-152.94	-87.31	65.62	AlSb
Alunite	-2.37	-3.77	-1.40	KAl3(SO4) 2 (OH) 6
Anglesite	-4.08	-11.87	-7.79	PbSO4
Anhydrite	-0.87	-5.23	-4.36	CaSO4
Anilite	-55.45	-87.33	-31.88	Cu0.25Cu1.5S
Antlerite	-1.97	6.82	8.79	Cu3(OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.13	-94.89	-2.76	As4O6
Artinite	-4.03	5.57	9.60	MgCO3:Mg(OH) 2:3H2O
As2O5	-40.86	-34.15	6.71	As2O5
Atacamite	-0.95	6.44	7.39	Cu2(OH) 3Cl
Azurite	-1.18	-18.08	-16.91	Cu3(OH) 2 (CO3) 2
Ba(OH) 2:8H2O	-15.99	8.41	24.39	Ba(OH) 2:8H2O
Ba2V2O7:2H2O	-17.20	-1.33	15.87	Ba2V2O7:2H2O
Ba3(AsO4) 2	0.00	-8.91	-8.91	Ba3(AsO4) 2
Ba3(VO4) 2:4H2O	-25.86	7.08	32.94	Ba3(VO4) 2:4H2O

BaCrO4	-12.15	-21.82	-9.67	BaCrO4
BaF2	-9.43	-15.25	-5.82	BaF2
BaMoO4	-6.77	-13.73	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.63	-6.80	1.83	BaSeO3
BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-6.08	-7.84	-1.76	ZnSO4:6H2O
Birnessite	-6.33	11.76	18.09	MnO2
Bixbyite	-1.39	-2.03	-0.64	Mn2O3
BlaubleiI	-55.52	-79.68	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.93	-83.21	-27.28	Cu0.6Cu0.8S
Boehmite	0.51	9.09	8.58	AlOOH
Breithauptite	-56.08	-74.60	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.23	13.61	16.84	Mg(OH)2
Bunsenite	-3.42	9.02	12.45	NiO
Ca(VO3)2	-10.65	-4.99	5.66	Ca(VO3)2
Ca2V2O7	-9.32	8.18	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.37	8.18	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.95	5.35	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.61	21.35	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.51	21.35	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.27	-153.30	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-7.37	-25.28	-17.91	Hg2Cl2
CaMoO4	-1.03	-8.98	-7.95	CaMoO4
Carnotite	-1.21	-0.98	0.23	KUO2VO4
CaSeO3:2H2O	-4.86	-2.05	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.79	-12.81	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.55	-0.71	9.84	Cd(BO2)2
Cd(OH)2	-5.82	7.82	13.64	Cd(OH)2
Cd(OH)2(am)	-5.91	7.82	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.03	-13.32	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.48	5.08	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.50	12.90	28.40	Cd4(OH)6SO4
CdCl2	-12.25	-12.91	-0.66	CdCl2
CdCl2:1H2O	-11.22	-12.91	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.00	-12.91	-1.91	CdCl2:2.5H2O
CdF2	-14.63	-15.84	-1.21	CdF2
Cdmetal(alpha)	-31.24	-17.72	13.51	Cd
Cdmetal(gamma)	-31.34	-17.72	13.62	Cd
CdMoO4	-0.17	-14.32	-14.15	CdMoO4
CdOHCl	-6.08	-2.54	3.54	CdOHCl
CdSb	-75.45	-75.80	-0.35	CdSb
CdSe	-18.96	-39.16	-20.20	CdSe
CdSeO4:2H2O	-16.30	-18.15	-1.85	CdSeO4:2H2O
CdSO4	-10.40	-10.57	-0.17	CdSO4
CdSO4:1H2O	-8.84	-10.57	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.70	-10.57	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.47	-11.22	-9.75	AgCl
Cerrusite	-1.99	-15.12	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.35	-9.99	-2.64	CuSO4:5H2O
Chalcedony	-0.76	-4.31	-3.55	SiO2
Chalcocite	-55.35	-90.27	-34.92	Cu2S
Chalcopyrite	-126.70	-161.97	-35.27	CuFeS2
Chrysotile	-0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.31	-98.01	-45.69	HgS
Claudetite	-91.82	-94.89	-3.06	As4O6
Clausthalite	-13.36	-40.46	-27.10	PbSe
Co(BO2)2	-26.85	0.22	27.07	Co(BO2)2
Co(OH)2	-4.35	8.75	13.09	Co(OH)2
Co(OH)3	-8.57	-10.88	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.94	-7.91	13.03	Co3(AsO4)2
Co3O4	-2.52	-13.02	-10.50	Co3O4

CoCl2	-20.25	-11.98	8.27	CoCl2
CoCl2:6H2O	-14.52	-11.99	2.54	CoCl2:6H2O
CoCO3	-2.92	-12.90	-9.98	CoCO3
CoF2	-13.32	-14.92	-1.60	CoF2
CoF3	-44.92	-46.38	-1.46	CoF3
CoFe2O4	18.66	15.13	-3.53	CoFe2O4
CoMoO4	-5.64	-13.40	-7.76	CoMoO4
CoO	-4.84	8.75	13.59	CoO
CoS (alpha)	-70.73	-78.17	-7.44	CoS
CoS (beta)	-67.10	-78.17	-11.07	CoS
CoSe	-22.04	-38.24	-16.20	CoSe
CoSeO3	-7.79	-6.47	1.32	CoSeO3
CoSeO4:6H2O	-15.70	-17.23	-1.53	CoSeO4:6H2O
CoSO4	-12.45	-9.65	2.80	CoSO4
CoSO4:6H2O	-7.18	-9.65	-2.47	CoSO4:6H2O
Cotunnite	-9.43	-14.21	-4.78	PbCl2
Covellite	-56.21	-78.51	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.83	-31.74	14.09	CrCl2
CrCl3	-47.39	-32.28	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Cristobalite	-0.96	-4.31	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.08	-42.92	-33.84	Na3AlF6
Cu (OH) 2	-0.27	8.40	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.25	19.96	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.30	0.95	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.79	-89.68	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.54	-50.34	-45.80	Cu2Se
Cu2SO4	-19.80	-21.75	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.04	-8.94	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-25.43	-88.93	-63.49	Cu3Se2
CuCO3	-1.74	-13.24	-11.50	CuCO3
CuCrO4	-16.39	-21.83	-5.44	CuCrO4
CuF	-8.61	-13.51	-4.91	CuF
CuF2	-16.38	-15.26	1.12	CuF2
CuF2:2H2O	-10.71	-15.26	-4.55	CuF2:2H2O
Cumetal	-5.69	-14.45	-8.76	Cu
CuMoO4	-0.66	-13.74	-13.08	CuMoO4
CuOCuSO4	-11.89	-1.58	10.30	CuOCuSO4
Cupricferrite	8.80	14.79	5.99	CuFe2O4
Cuprite	-1.95	-3.36	-1.41	Cu2O
Cuprousferrite	10.43	1.51	-8.92	CuFeO2
CuSe	-5.48	-38.58	-33.10	CuSe
CuSe2	-26.66	-60.02	-33.37	CuSe2
CuSeO3:2H2O	-7.32	-6.81	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.13	-17.57	-2.44	CuSeO4:5H2O
CuSO4	-12.93	-9.99	2.94	CuSO4
Diaspore	2.21	9.09	6.87	AlOOH
Djurleite	-55.57	-89.49	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.02	-16.52	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.57	-16.52	-17.09	CaMg (CO3) 2
Epsomite	-2.66	-4.79	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.12	0.08	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.98	-14.70	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.38	-8.83	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.63	-39.26	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-45.06	-48.80	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-14.28	-13.88	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.60	-18.69	-10.09	FeMoO4

Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.38	-64.98	-18.60	FeSe2
FeS (ppt)	-80.51	-83.46	-2.95	FeS
FeSe	-32.54	-43.54	-11.00	FeSe
Fix_pe	-4.66	-4.66	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	0.79	9.09	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.83	-7.84	-2.01	ZnSO4:7H2O
Greenalite	-19.09	1.72	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.73	-79.09	-14.36	CdS
Greigite	-292.78	-337.81	-45.03	Fe3S4
Gummite	-5.34	2.33	7.67	UO3
Gypsum	-0.62	-5.23	-4.61	CaSO4:2H2O
H-Jarosite	-15.11	-27.21	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.27	-22.14	-12.88	H2MoO4
H2S (g)	-78.90	-86.91	-8.01	H2S
H2Se (g)	-42.03	-46.99	-4.96	H2Se
Halite	-5.64	-4.04	1.60	NaCl
Halloysite	-0.03	9.54	9.57	Al2Si2O5 (OH) 4
Hausmannite	-0.80	60.23	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.27	21.62	22.89	FeAl2O4
Hg (CH3) 2 (g)	-185.04	-258.75	-73.71	Hg (CH3) 2
Hg (g)	-7.17	-15.05	-7.87	Hg
Hg (OH) 2	-7.60	-11.10	-3.50	Hg (OH) 2
Hg2 (g)	-15.14	-30.10	-14.96	Hg2
Hg2 (OH) 2	-9.81	-4.55	5.26	Hg2 (OH) 2
Hg2CO3	-10.15	-26.20	-16.05	Hg2CO3
Hg2CrO4	-26.09	-34.79	-8.70	Hg2CrO4
Hg2F2	-17.86	-28.22	-10.36	Hg2F2
Hg2S	-79.79	-91.46	-11.68	Hg2S
Hg2SeO3	-15.11	-19.76	-4.66	Hg2SeO3
Hg2SO4	-16.81	-22.94	-6.13	Hg2SO4
Hg3O2CO3	-25.25	-54.94	-29.68	Hg3O2CO3
HgCl (g)	-32.14	-12.64	19.50	HgCl
HgCl2	-10.57	-31.83	-21.26	HgCl2
HgF (g)	-46.78	-14.11	32.68	HgF
HgF2 (g)	-47.33	-34.76	12.57	HgF2
Hgmetal (l)	-1.60	-15.05	-13.45	Hg
HgSe	-2.39	-58.08	-55.69	HgSe
HgSeO3	-13.88	-26.31	-12.43	HgSeO3
HgSO4	-20.07	-29.49	-9.42	HgSO4
Huntite	-2.62	-32.59	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.95	-23.72	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.77	-18.54	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.78	-21.95	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.65	-21.45	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.71	-48.96	-17.24	K2Cr2O7
K2CrO4	-18.21	-18.72	-0.51	K2CrO4
K2MoO4	-13.89	-10.63	3.26	K2MoO4
K2SeO4	-13.73	-14.46	-0.73	K2SeO4
Kaolinite	2.11	9.54	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-4.91	-5.35	-0.43	PbO:PbSO4
Laurionite	-4.47	-3.84	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.17	6.52	12.69	PbO
Mackinawite	-79.86	-83.46	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.13	19.99	16.86	Fe2MgO4
Magnesite	-0.58	-8.04	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.47	-4.84	-5.31	Cu2 (OH) 2CO3
Manganite	-1.01	24.33	25.34	MnOOH
Massicot	-6.37	6.52	12.89	PbO

Matlockite	-6.70	-15.68	-8.97	PbClF
Melanothallite	-18.58	-12.33	6.26	CuCl ₂
Melanterite	-12.74	-14.95	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.91	-98.01	-45.09	HgS
Mg(OH) ₂ (active)	-5.18	13.61	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-15.82	-4.54	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-272.80	-198.12	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-17.29	9.07	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-4.95	11.25	16.20	MgCr ₂ O ₄
MgCrO ₄	-22.01	-16.63	5.38	MgCrO ₄
MgF ₂	-1.93	-10.06	-8.13	MgF ₂
MgMoO ₄	-6.68	-8.53	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-4.66	-1.61	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-11.17	-12.37	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-28.41	45.12	73.52	Pb ₃ O ₄
Mirabilite	-4.62	-5.74	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.49	-6.59	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-51.50	-57.21	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-147.13	-86.05	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-11.97	0.53	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-11.89	-9.17	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-75.52	-75.35	0.17	MnS
MnS (pnk)	-78.69	-75.35	3.34	MnS
MnSb	-94.51	-97.42	-2.91	MnSb
MnSe	-38.92	-35.42	3.50	MnSe
MnSeO ₃	-4.78	-3.65	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-4.63	-3.65	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-12.37	-14.42	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-9.41	-6.83	2.58	MnSO ₄
Monteponite	-7.28	7.82	15.10	CdO
Montroydite	-7.46	-11.10	-3.64	HgO
MoO ₃	-14.14	-22.14	-8.00	MoO ₃
Morenosite	-7.23	-9.37	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-151.25	-221.51	-70.26	MoS ₂
Na-Jarosite	-9.68	-20.88	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-37.92	-47.82	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-20.51	-17.58	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.03	-31.63	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-10.97	-9.48	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-10.71	-9.48	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-12.86	-2.56	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-14.60	-13.32	1.28	Na ₂ SeO ₄
Na ₃ Sb	-171.86	-77.41	94.45	Na ₃ Sb
Na ₃ VO ₄	-26.77	9.91	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-30.23	7.17	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.31	-12.04	-6.73	CuCl
NaSb	-87.69	-64.53	23.17	NaSb
Natron	-7.68	-8.99	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-6.60	-2.75	3.86	NaVO ₃
Nesquehonite	-3.37	-8.04	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-3.77	9.02	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-22.78	-7.08	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-14.30	17.70	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.75	-12.62	-6.87	NiCO ₃
NiMoO ₄	-1.98	-13.12	-11.14	NiMoO ₄
NiS (alpha)	-72.29	-77.89	-5.60	NiS
NiS (beta)	-66.79	-77.89	-11.10	NiS
NiS (gamma)	-65.09	-77.89	-12.80	NiS
NiSe	-20.26	-37.96	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-9.00	-6.19	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-15.44	-16.96	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-5.75	11.76	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-247.11	-308.18	-61.07	As ₂ S ₃
Otavite	-1.82	-13.82	-12.00	CdCO ₃
Pb(BO ₂) ₂	-8.53	-2.01	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-1.63	6.52	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-55.89	-64.65	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆

Pb2 (OH) 3Cl	-6.11	2.68	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.14	13.05	26.19	Pb2O (OH) 2
Pb2O3	-22.45	38.59	61.04	Pb2O3
Pb2OCO3	-8.04	-8.60	-0.56	Pb2OCO3
Pb2V2O7	-3.21	-5.11	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.38	-14.58	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.72	1.42	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.10	-2.08	11.02	Pb3O2CO3
Pb3O2SO4	-9.51	1.18	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-13.40	7.70	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-14.18	7.70	21.88	Pb4O3SO4
PbCrO4	-11.11	-23.71	-12.60	PbCrO4
PbF2	-9.70	-17.14	-7.44	PbF2
Pbmetal	-23.27	-19.02	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.46	6.52	12.98	PbO:0.33H2O
PbSeO4	-12.61	-19.45	-6.84	PbSeO4
Periclase	-7.97	13.61	21.58	MgO
Phosgenite	-9.52	-29.33	-19.81	PbCl2:PbCO3
Plattnerite	-17.53	32.07	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.32	-144.83	-18.51	FeS2
Pyrochroite	-3.63	11.56	15.19	Mn (OH) 2
Pyrolusite	-4.27	37.11	41.38	MnO2
Quartz	-0.31	-4.31	-4.00	SiO2
Realgar	-103.66	-123.41	-19.75	AsS
Retgersite	-7.33	-9.37	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-4.81	-19.31	-14.50	UO2CO3
Sb (OH) 3	-12.66	-19.77	-7.11	Sb (OH) 3
Sb2O4	-17.39	-13.99	3.40	Sb2O4
Sb2O5	-27.40	-37.06	-9.67	Sb2O5
Sb2Se3	-112.74	-180.49	-67.76	Sb2Se3
Sb4O6(cubic)	-60.80	-79.06	-18.26	Sb4O6
Sb4O6(orth)	-61.16	-79.06	-17.90	Sb4O6
SbCl3	-51.44	-50.86	0.57	SbCl3
SbF3	-45.04	-55.27	-10.23	SbF3
Sbmetal	-46.39	-58.08	-11.69	Sb
SbO2	-3.48	-31.30	-27.82	SbO2
Schoepite	-3.66	2.33	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.33	-21.44	-7.11	Se
Semetal (hex)	-13.73	-21.44	-7.71	Se
Senarmontite	-27.17	-39.53	-12.37	Sb2O3
SeO2	-15.34	-15.21	0.12	SeO2
SeO3	-47.02	-25.98	21.04	SeO3
Sepiolite	-1.49	14.27	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-4.51	14.27	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2 (am-gel)	-1.60	-4.31	-2.71	SiO2
SiO2 (am-ppt)	-1.57	-4.31	-2.74	SiO2
Smithsonite	-1.09	-11.09	-10.00	ZnCO3
Sphalerite	-64.91	-76.36	-11.45	ZnS
Spinel	-5.06	31.78	36.85	MgAl2O4
Stibnite	-249.81	-300.27	-50.46	Sb2S3
Sulfur	-59.22	-61.37	-2.14	S
Tenorite	0.76	8.40	7.64	CuO
Thenardite	-6.05	-5.73	0.32	Na2SO4
Thermonatrite	-9.62	-8.99	0.64	Na2CO3:H2O
Tyuyamunite	-4.40	-0.32	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.98	9.11	21.08	U3O8
U3Sb4	-579.97	-427.58	152.38	U3Sb4
U4O9	-27.41	-30.43	-3.02	U4O9
UF4	-31.79	-61.33	-29.54	UF4
UF4:2.5H2O	-28.61	-61.33	-32.72	UF4:2.5H2O
UO2 (am)	-14.93	-13.99	0.93	UO2
UO2 (NO3) 2	-41.54	-29.39	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.24	-29.39	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.78	-29.39	3.39	UO2 (NO3) 2:3H2O

UO2(NO3)2:6H2O	-31.44	-29.39	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.28	2.33	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.39	-23.64	-2.25	UO2SeO4:4H2O
UO3	-5.37	2.33	7.70	UO3
Uraninite	-9.32	-13.99	-4.67	UO2
USb2	-220.04	-190.47	29.58	USb2
V(OH)3	-19.61	-12.02	7.59	V(OH)3
V2O5	-16.79	-18.15	-1.36	V2O5
V3O5	-42.22	-40.38	1.84	V3O5
V4O7	-52.51	-45.33	7.19	V4O7
V6O13	-44.69	-105.55	-60.86	V6O13
Valentinite	-31.05	-39.53	-8.48	Sb2O3
VC12	-64.40	-45.53	18.87	VC12
VC13	-66.55	-43.12	23.43	VC13
VF4	-67.21	-52.28	14.93	VF4
Vmetal	-94.36	-50.34	44.03	V
VO	-39.55	-24.79	14.76	VO
VO(OH)2	-10.10	-4.95	5.15	VO(OH)2
VO2Cl	-22.28	-19.44	2.84	VO2Cl
VOC1	-33.54	-22.39	11.15	VOC1
VOC12	-38.44	-25.68	12.76	VOC12
VOSO4	-26.95	-23.34	3.61	VOSO4
Witherite	-4.66	-13.23	-8.57	BaCO3
Wurtzite	-67.41	-76.36	-8.95	ZnS
Zincite	-0.78	10.55	11.33	ZnO
Zincosite	-11.77	-7.84	3.93	ZnSO4
Zn(BO2)2	-6.27	2.02	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.49	-21.17	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.65	10.55	12.20	Zn(OH)2
Zn(OH)2(am)	-1.92	10.55	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.20	10.55	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-0.98	10.55	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.18	10.55	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.79	2.71	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.45	10.74	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.14	-2.49	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.04	-5.13	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.58	23.82	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.47	32.03	38.50	Zn5(OH)8Cl2
ZnCl2	-17.23	-10.18	7.05	ZnCl2
ZnCO3:1H2O	-0.83	-11.09	-10.26	ZnCO3:1H2O
ZnF2	-12.58	-13.11	-0.53	ZnF2
Znmetal	-40.78	-14.99	25.79	Zn
ZnMoO4	-1.46	-11.59	-10.13	ZnMoO4
ZnO(active)	-0.63	10.55	11.19	ZnO
ZnS(am)	-67.31	-76.36	-9.05	ZnS
ZnSb	-84.09	-73.07	11.01	ZnSb
ZnSe	-22.03	-36.43	-14.40	ZnSe
ZnSeO4:6H2O	-13.91	-15.43	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.20	-7.84	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 147.

Title Use solution to allow model output
REACTION 806
H2O -0.0
0 moles
USE solution 815
End

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 815. Solution after simulation 146.
Using reaction 806.

Reaction 806.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.195e-08	2.193e-08
Al	4.069e-06	4.064e-06
As	3.097e-10	3.094e-10
B	5.941e-05	5.935e-05
Ba	3.646e-08	3.642e-08
C	8.438e-04	8.430e-04
Ca	3.442e-03	3.438e-03
Cd	2.104e-08	2.102e-08
Cl	6.967e-03	6.959e-03
Co	1.616e-07	1.614e-07
Cr	9.916e-10	9.906e-10
Cu	5.061e-07	5.055e-07
F	3.058e-04	3.055e-04
Fe	8.663e-10	8.654e-10
Hg	3.320e-09	3.316e-09
K	5.741e-03	5.735e-03
Mg	8.811e-03	8.802e-03
Mn	9.898e-05	9.887e-05
Mo	2.899e-06	2.896e-06
N	2.430e-05	2.428e-05
Na	2.114e-02	2.112e-02
Ni	2.518e-07	2.515e-07
Pb	4.651e-09	4.646e-09
S	2.172e-02	2.169e-02
Sb	4.431e-08	4.427e-08
Se	2.463e-07	2.461e-07
Si	4.873e-05	4.868e-05
U	4.020e-07	4.016e-07
V	1.337e-08	1.336e-08
Zn	9.867e-06	9.856e-06

-----Description of solution-----

pH = 8.115 Charge balance

```

equilibrium
pe = 4.658 Adjusted to redox
Activity of water = 0.999
Ionic strength (mol/kgw) = 6.587e-02
Mass of water (kg) = 9.990e-01
Total alkalinity (eq/kg) = 8.860e-04
Total CO2 (mol/kg) = 8.438e-04
Temperature (°C) = 25.00
Pressure (atm) = 1.00
Electrical balance (eq) = 2.873e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 0
Total H = 1.108989e+02
Total O = 5.553860e+01

```

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.654e-06	1.311e-06	-5.781	-5.883	-0.101	(0)
H+	9.532e-09	7.675e-09	-8.021	-8.115	-0.094	0.00
H2O	5.551e+01	9.989e-01	1.744	-0.000	0.000	18.07
Ag	2.195e-08					
AgCl	1.224e-08	1.224e-08	-7.912	-7.912	0.000	(0)
AgCl2-	8.081e-09	5.978e-09	-8.093	-8.223	-0.131	(0)
Ag+	1.327e-09	1.068e-09	-8.877	-8.971	-0.094	(0)
AgSO4-	1.977e-10	1.462e-10	-9.704	-9.835	-0.131	(0)
AgCl3-2	9.979e-11	2.989e-11	-10.001	-10.524	-0.524	(0)
AgCl4-3	5.158e-12	3.423e-13	-11.288	-12.466	-1.178	(0)
AgNO2	4.240e-12	4.240e-12	-11.373	-11.373	0.000	(0)
AgF	5.128e-13	5.128e-13	-12.290	-12.290	0.000	(0)
AgOH	1.400e-13	1.400e-13	-12.854	-12.854	0.000	(0)
AgH2BO3	6.939e-14	6.939e-14	-13.159	-13.159	0.000	(0)
AgSeO3-	3.839e-14	2.840e-14	-13.416	-13.547	-0.131	(0)
AgNH3+	1.827e-14	1.352e-14	-13.738	-13.869	-0.131	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	1.686e-16	1.247e-16	-15.773	-15.904	-0.131	(0)
Ag (OH) 2-	2.424e-17	1.793e-17	-16.615	-16.746	-0.131	(0)
AgNO3	1.521e-17	1.521e-17	-16.818	-16.818	0.000	(0)
Ag (NH3) 2+	9.202e-19	6.808e-19	-18.036	-18.167	-0.131	(0)
Ag (SeO3) 2-3	1.585e-19	1.052e-20	-18.800	-19.978	-1.178	(0)
Ag2MoO4	5.265e-25	5.265e-25	-24.279	-24.279	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.954	-73.954	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-80.786	-82.881	-2.094	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.789	-148.020	-0.231	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.521	-148.652	-0.131	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.933	-149.345	-0.413	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.267	-149.656	-0.390	(0)
Al	4.069e-06					
Al (OH) 4-	4.048e-06	3.253e-06	-5.393	-5.488	-0.095	(0)
Al (OH) 3	1.972e-08	1.972e-08	-7.705	-7.705	0.000	(0)
Al (OH) 2+	9.276e-10	7.541e-10	-9.033	-9.123	-0.090	(0)
AlF3	1.932e-10	1.932e-10	-9.714	-9.714	0.000	(0)
AlF2+	9.882e-11	8.033e-11	-10.005	-10.095	-0.090	(0)
AlF4-	2.302e-11	1.850e-11	-10.638	-10.733	-0.095	(0)
AlF+2	2.418e-12	1.056e-12	-11.617	-11.976	-0.360	(0)
AlOH+2	1.659e-12	7.244e-13	-11.780	-12.140	-0.360	(0)
AlSO4+	3.662e-14	2.943e-14	-13.436	-13.531	-0.095	(0)
Al+3	3.884e-15	5.527e-16	-14.411	-15.257	-0.847	(0)
Al (SO4) 2-	2.691e-15	2.163e-15	-14.570	-14.665	-0.095	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-43.260	-44.438	-1.178	(0)
As (3)	2.068e-24					
H3AsO3	1.897e-24	1.897e-24	-23.722	-23.722	0.000	(0)
H2AsO3-	1.713e-25	1.267e-25	-24.766	-24.897	-0.131	(0)
HAsO3-2	5.028e-29	1.506e-29	-28.299	-28.822	-0.524	(0)
H4AsO3+	9.748e-33	7.212e-33	-32.011	-32.142	-0.131	(0)
AsO3-3	1.140e-33	7.563e-35	-32.943	-34.121	-1.178	(0)

As (5)	3.097e-10					
HAsO4-2	3.007e-10	9.005e-11	-9.522	-10.046	-0.524	(0)
H2AsO4-	8.521e-12	6.303e-12	-11.070	-11.200	-0.131	(0)
AsO4-3	5.591e-13	3.710e-14	-12.253	-13.431	-1.178	(0)
H3AsO4	8.281e-18	8.407e-18	-17.082	-17.075	0.007	(0)
B	5.941e-05					
H3BO3	5.334e-05	5.416e-05	-4.273	-4.266	0.007	(0)
H2BO3-	5.256e-06	4.098e-06	-5.279	-5.387	-0.108	(0)
MgH2BO3+	4.381e-07	3.416e-07	-6.358	-6.467	-0.108	(0)
CaH2BO3+	2.620e-07	2.043e-07	-6.582	-6.690	-0.108	(0)
NaH2BO3	1.066e-07	1.066e-07	-6.972	-6.972	0.000	(0)
BF (OH) 3-	5.296e-09	4.129e-09	-8.276	-8.384	-0.108	(0)
H5 (BO3) 2-	2.423e-10	1.889e-10	-9.616	-9.724	-0.108	(0)
BaH2BO3+	2.480e-12	1.933e-12	-11.606	-11.714	-0.108	(0)
H8 (BO3) 3-	1.312e-12	1.023e-12	-11.882	-11.990	-0.108	(0)
BF2 (OH) 2-	8.312e-13	6.480e-13	-12.080	-12.188	-0.108	(0)
AgH2BO3	6.939e-14	6.939e-14	-13.159	-13.159	0.000	(0)
BF3OH-	4.747e-19	3.701e-19	-18.324	-18.432	-0.108	(0)
BF4-	3.429e-24	2.673e-24	-23.465	-23.573	-0.108	(0)
Ba	3.646e-08					
Ba+2	3.631e-08	1.527e-08	-7.440	-7.816	-0.376	(0)
BaHCO3+	1.115e-10	9.124e-11	-9.953	-10.040	-0.087	(0)
BaCO3	2.993e-11	2.993e-11	-10.524	-10.524	0.000	(0)
BaH2BO3+	2.480e-12	1.933e-12	-11.606	-11.714	-0.108	(0)
BaOH+	1.080e-13	8.733e-14	-12.967	-13.059	-0.092	(0)
BaNO3+	1.853e-15	1.371e-15	-14.732	-14.863	-0.131	(0)
BaNH3+2	1.993e-16	5.968e-17	-15.701	-16.224	-0.524	(0)
C (4)	8.438e-04					
HCO3-	7.698e-04	6.258e-04	-3.114	-3.204	-0.090	(0)
MgHCO3+	1.929e-05	1.539e-05	-4.715	-4.813	-0.098	(0)
CaHCO3+	1.233e-05	1.009e-05	-4.909	-4.996	-0.087	(0)
H2CO3	1.080e-05	1.080e-05	-4.966	-4.966	0.000	(0)
CO3-2	9.093e-06	3.823e-06	-5.041	-5.418	-0.376	(0)
MgCO3	7.643e-06	7.643e-06	-5.117	-5.117	0.000	(0)
NaHCO3	5.778e-06	5.778e-06	-5.238	-5.238	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaCO3-	1.438e-06	1.169e-06	-5.842	-5.932	-0.090	(0)
ZnCO3	4.640e-07	4.640e-07	-6.333	-6.333	0.000	(0)
UO2 (CO3) 3-4	3.524e-07	2.836e-09	-6.453	-8.547	-2.094	(0)
CuCO3	3.366e-07	3.366e-07	-6.473	-6.473	0.000	(0)
MnHCO3+	3.324e-07	2.689e-07	-6.478	-6.570	-0.092	(0)
ZnHCO3+	5.643e-08	4.175e-08	-7.248	-7.379	-0.131	(0)
UO2 (CO3) 2-2	4.942e-08	1.480e-08	-7.306	-7.830	-0.524	(0)
Cu (CO3) 2-2	1.156e-08	3.463e-09	-7.937	-8.461	-0.524	(0)
NiCO3	8.877e-09	8.877e-09	-8.052	-8.052	0.000	(0)
NiHCO3+	6.492e-09	4.802e-09	-8.188	-8.319	-0.131	(0)
PbCO3	2.262e-09	2.262e-09	-8.645	-8.645	0.000	(0)
CoHCO3+	2.166e-09	1.602e-09	-8.664	-8.795	-0.131	(0)
CoCO3	2.127e-09	2.127e-09	-8.672	-8.672	0.000	(0)
CuHCO3+	7.982e-10	5.905e-10	-9.098	-9.229	-0.131	(0)
CdCO3	3.422e-10	3.422e-10	-9.466	-9.466	0.000	(0)
UO2CO3	1.941e-10	1.941e-10	-9.712	-9.712	0.000	(0)
PbHCO3+	1.237e-10	9.154e-11	-9.907	-10.038	-0.131	(0)
BaHCO3+	1.115e-10	9.124e-11	-9.953	-10.040	-0.087	(0)
Pb (CO3) 2-2	8.327e-11	2.494e-11	-10.080	-10.603	-0.524	(0)
BaCO3	2.993e-11	2.993e-11	-10.524	-10.524	0.000	(0)
CdHCO3+	7.564e-12	5.595e-12	-11.121	-11.252	-0.131	(0)
Cd (CO3) 2-2	3.237e-12	9.697e-13	-11.490	-12.013	-0.524	(0)
HgCO3	3.380e-15	3.380e-15	-14.471	-14.471	0.000	(0)
FeHCO3+	1.605e-15	1.314e-15	-14.795	-14.882	-0.087	(0)
Hg (CO3) 2-2	1.364e-16	4.086e-17	-15.865	-16.389	-0.524	(0)
HgHCO3+	6.530e-19	4.831e-19	-18.185	-18.316	-0.131	(0)
Ca	3.442e-03					
Ca+2	2.060e-03	8.662e-04	-2.686	-3.062	-0.376	(0)
CaSO4	1.361e-03	1.361e-03	-2.866	-2.866	0.000	(0)
CaHCO3+	1.233e-05	1.009e-05	-4.909	-4.996	-0.087	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.233e-06	1.806e-06	-5.651	-5.743	-0.092	(0)

	CaH ₂ BO ₃ +	2.620e-07	2.043e-07	-6.582	-6.690	-0.108	(0)
	CaOH+	2.767e-08	2.265e-08	-7.558	-7.645	-0.087	(0)
	CaNO ₃ +	6.635e-11	4.908e-11	-10.178	-10.309	-0.131	(0)
	CaNH ₃ +2	2.256e-11	6.757e-12	-10.647	-11.170	-0.524	(0)
	Ca (NH ₃) 2+2	5.565e-20	1.667e-20	-19.255	-19.778	-0.524	(0)
Cd		2.104e-08					
	Cd+2	9.341e-09	3.927e-09	-8.030	-8.406	-0.376	(0)
	CdSO ₄	6.315e-09	6.315e-09	-8.200	-8.200	0.000	(0)
	CdCl+	2.844e-09	2.104e-09	-8.546	-8.677	-0.131	(0)
	Cd (SO ₄) 2-2	1.951e-09	5.843e-10	-8.710	-9.233	-0.524	(0)
	CdCO ₃	3.422e-10	3.422e-10	-9.466	-9.466	0.000	(0)
	CdOHC1	1.131e-10	1.131e-10	-9.947	-9.947	0.000	(0)
	CdOH+	5.526e-11	4.088e-11	-10.258	-10.388	-0.131	(0)
	CdCl ₂	4.920e-11	4.920e-11	-10.308	-10.308	0.000	(0)
	CdF+	1.608e-11	1.189e-11	-10.794	-10.925	-0.131	(0)
	CdHCO ₃ +	7.564e-12	5.595e-12	-11.121	-11.252	-0.131	(0)
	Cd (CO ₃) 2-2	3.237e-12	9.697e-13	-11.490	-12.013	-0.524	(0)
	Cd (OH) 2	3.380e-13	3.380e-13	-12.471	-12.471	0.000	(0)
	CdCl ₃ -	2.354e-13	1.741e-13	-12.628	-12.759	-0.131	(0)
	CdF ₂	4.534e-15	4.534e-15	-14.344	-14.344	0.000	(0)
	CdNO ₃ +	3.008e-16	2.225e-16	-15.522	-15.653	-0.131	(0)
	CdSeO ₄	1.310e-16	1.310e-16	-15.883	-15.883	0.000	(0)
	Cd (OH) 3-	3.659e-17	2.707e-17	-16.437	-16.568	-0.131	(0)
	Cd (SeO ₃) 2-2	1.849e-17	5.538e-18	-16.733	-17.257	-0.524	(0)
	Cd ₂ OH+3	1.212e-17	8.046e-19	-16.916	-18.094	-1.178	(0)
	Cd (OH) 4-2	1.938e-23	5.806e-24	-22.713	-23.236	-0.524	(0)
	Cd (NO ₃) 2	1.999e-24	1.999e-24	-23.699	-23.699	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-79.064	-79.195	-0.131	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.789	-150.789	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-227.555	-227.686	-0.131	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-303.764	-304.288	-0.524	(0)
Cl		6.967e-03					
	Cl-	6.966e-03	5.610e-03	-2.157	-2.251	-0.094	(0)
	MnCl+	1.880e-07	1.521e-07	-6.726	-6.818	-0.092	(0)
	ZnOHC1	5.100e-08	5.100e-08	-7.292	-7.292	0.000	(0)
	ZnCl+	3.724e-08	2.972e-08	-7.429	-7.527	-0.098	(0)
	AgCl	1.224e-08	1.224e-08	-7.912	-7.912	0.000	(0)
	AgCl ₂ -	8.081e-09	5.978e-09	-8.093	-8.223	-0.131	(0)
	CdCl+	2.844e-09	2.104e-09	-8.546	-8.677	-0.131	(0)
	CuCl ₂ -	1.670e-09	1.333e-09	-8.777	-8.875	-0.098	(0)
	NiCl+	1.208e-09	8.934e-10	-8.918	-9.049	-0.131	(0)
	MnCl ₂	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
	CuCl	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
	CoCl+	8.633e-10	6.386e-10	-9.064	-9.195	-0.131	(0)
	ZnCl ₂	2.643e-10	2.643e-10	-9.578	-9.578	0.000	(0)
	CuCl+	1.666e-10	1.329e-10	-9.778	-9.876	-0.098	(0)
	CdOHC1	1.131e-10	1.131e-10	-9.947	-9.947	0.000	(0)
	AgCl ₃ -2	9.979e-11	2.989e-11	-10.001	-10.524	-0.524	(0)
	PbCl+	5.296e-11	3.918e-11	-10.276	-10.407	-0.131	(0)
	CdCl ₂	4.920e-11	4.920e-11	-10.308	-10.308	0.000	(0)
	HgClOH	9.593e-12	9.593e-12	-11.018	-11.018	0.000	(0)
	AgCl ₄ -3	5.158e-12	3.423e-13	-11.288	-12.466	-1.178	(0)
	CuCl ₃ -2	3.734e-12	1.599e-12	-11.428	-11.796	-0.368	(0)
	HgCl ₂	2.325e-12	2.325e-12	-11.634	-11.634	0.000	(0)
	MnCl ₃ -	2.301e-12	1.862e-12	-11.638	-11.730	-0.092	(0)
	ZnCl ₃ -	1.475e-12	1.178e-12	-11.831	-11.929	-0.098	(0)
	PbCl ₂	9.818e-13	9.818e-13	-12.008	-12.008	0.000	(0)
	CuCl ₂	2.586e-13	2.586e-13	-12.587	-12.587	0.000	(0)
	CdCl ₃ -	2.354e-13	1.741e-13	-12.628	-12.759	-0.131	(0)
	HgCl ₃ -	1.763e-13	1.304e-13	-12.754	-12.885	-0.131	(0)
	NiCl ₂	2.523e-14	2.523e-14	-13.598	-13.598	0.000	(0)
	HgCl ₄ -2	9.724e-15	2.913e-15	-14.012	-14.536	-0.524	(0)
	ZnCl ₄ -2	7.713e-15	3.303e-15	-14.113	-14.481	-0.368	(0)
	PbCl ₃ -	2.964e-15	2.192e-15	-14.528	-14.659	-0.131	(0)
	UO ₂ Cl+	1.568e-16	1.160e-16	-15.805	-15.936	-0.131	(0)
	HgCl+	1.118e-16	8.270e-17	-15.952	-16.082	-0.131	(0)
	PbCl ₄ -2	1.877e-17	5.622e-18	-16.727	-17.250	-0.524	(0)
	CuCl ₃ -	1.696e-17	1.354e-17	-16.771	-16.868	-0.098	(0)

CrCl+2	2.694e-18	8.070e-19	-17.570	-18.093	-0.524	(0)
CrOHC12	1.128e-19	1.128e-19	-18.948	-18.948	0.000	(0)
CuCl4-2	8.887e-22	3.806e-22	-21.051	-21.420	-0.368	(0)
CrCl2+	5.806e-22	4.295e-22	-21.236	-21.367	-0.131	(0)
FeCl+2	2.785e-22	1.193e-22	-21.555	-21.923	-0.368	(0)
VOCl+	1.422e-23	1.052e-23	-22.847	-22.978	-0.131	(0)
FeCl2+	3.695e-24	2.989e-24	-23.432	-23.525	-0.092	(0)
CrO3Cl-	8.926e-26	6.604e-26	-25.049	-25.180	-0.131	(0)
FeCl3	1.677e-27	1.677e-27	-26.776	-26.776	0.000	(0)
CoCl+2	2.270e-35	6.799e-36	-34.644	-35.168	-0.524	(0)
UCl+3	0.000e+00	0.000e+00	-45.826	-47.004	-1.178	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
Co (2)	1.616e-07					
Co+2	1.099e-07	3.291e-08	-6.959	-7.483	-0.524	(0)
CoSO4	4.504e-08	4.504e-08	-7.346	-7.346	0.000	(0)
CoHCO3+	2.166e-09	1.602e-09	-8.664	-8.795	-0.131	(0)
CoCO3	2.127e-09	2.127e-09	-8.672	-8.672	0.000	(0)
CoOH+	1.163e-09	8.606e-10	-8.934	-9.065	-0.131	(0)
CoCl+	8.633e-10	6.386e-10	-9.064	-9.195	-0.131	(0)
CoF+	2.688e-10	1.988e-10	-9.571	-9.701	-0.131	(0)
Co (OH) 2	8.958e-11	8.958e-11	-10.048	-10.048	0.000	(0)
CoNO2+	5.954e-12	4.405e-12	-11.225	-11.356	-0.131	(0)
Co (NH3) +2	8.185e-14	2.452e-14	-13.087	-13.611	-0.524	(0)
Co (OH) 3-	3.166e-15	2.342e-15	-14.499	-14.630	-0.131	(0)
CoSeO4	2.956e-15	2.956e-15	-14.529	-14.529	0.000	(0)
CoNO3+	1.263e-15	9.346e-16	-14.898	-15.029	-0.131	(0)
CoOOH-	7.953e-16	5.884e-16	-15.099	-15.230	-0.131	(0)
Co2OH+3	2.139e-17	1.419e-18	-16.670	-17.848	-1.178	(0)
Co (NH3) 2+2	2.163e-20	6.480e-21	-19.665	-20.188	-0.524	(0)
Co (OH) 4-2	1.624e-21	4.865e-22	-20.789	-21.313	-0.524	(0)
Co (NO3) 2	3.408e-23	3.408e-23	-22.468	-22.468	0.000	(0)
Co4 (OH) 4+4	1.360e-26	1.094e-28	-25.867	-27.961	-2.094	(0)
Co (NH3) 3+2	1.688e-27	5.055e-28	-26.773	-27.296	-0.524	(0)
Co (NH3) 4+2	5.488e-35	1.644e-35	-34.261	-34.784	-0.524	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.248	-42.772	-0.524	(0)
Co (3)	1.324e-28					
CoOH+2	1.324e-28	3.967e-29	-27.878	-28.402	-0.524	(0)
Co+3	4.186e-35	5.956e-36	-34.378	-35.225	-0.847	(0)
CoCl+2	2.270e-35	6.799e-36	-34.644	-35.168	-0.524	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.085	-64.609	-0.524	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
Cr (2)	1.950e-27					
Cr+2	1.950e-27	5.841e-28	-26.710	-27.234	-0.524	(0)
Cr (3)	9.916e-10					
Cr (OH) 2+	6.870e-10	5.082e-10	-9.163	-9.294	-0.131	(0)
Cr (OH) 3	2.502e-10	2.502e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.095e-11	1.550e-11	-10.679	-10.810	-0.131	(0)
Cr (OH) 4-	1.765e-11	1.305e-11	-10.753	-10.884	-0.131	(0)
Cr (OH) +2	1.064e-11	3.187e-12	-10.973	-11.497	-0.524	(0)
CrOHSO4	5.188e-12	5.188e-12	-11.285	-11.285	0.000	(0)
CrF+2	1.124e-14	3.366e-15	-13.949	-14.473	-0.524	(0)
CrSO4+	2.407e-15	1.780e-15	-14.619	-14.749	-0.131	(0)
Cr+3	1.675e-15	1.112e-16	-14.776	-15.954	-1.178	(0)
CrCl+2	2.694e-18	8.070e-19	-17.570	-18.093	-0.524	(0)
CrOHC12	1.128e-19	1.128e-19	-18.948	-18.948	0.000	(0)
Cr2 (OH) 2SO4+2	4.989e-21	1.494e-21	-20.302	-20.826	-0.524	(0)
Cr2 (OH) 2 (SO4) 2	6.089e-22	6.089e-22	-21.215	-21.215	0.000	(0)
CrCl2+	5.806e-22	4.295e-22	-21.236	-21.367	-0.131	(0)
CrNO3+2	2.907e-25	8.707e-26	-24.537	-25.060	-0.524	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.980	-42.504	-0.524	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.023	-52.201	-1.178	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
Cr (6)	2.496e-14					
CrO4-2	2.333e-14	9.809e-15	-13.632	-14.008	-0.376	(0)

NaCrO4-	1.082e-15	8.003e-16	-14.966	-15.097	-0.131	(0)
HCrO4-	3.293e-16	2.436e-16	-15.482	-15.613	-0.131	(0)
KCrO4-	2.173e-16	1.608e-16	-15.663	-15.794	-0.131	(0)
CrO3SO4-2	1.306e-23	3.910e-24	-22.884	-23.408	-0.524	(0)
H2CrO4	1.516e-24	1.516e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	8.926e-26	6.604e-26	-25.049	-25.180	-0.131	(0)
Cr2O7-2	6.878e-30	2.060e-30	-29.163	-29.686	-0.524	(0)
Cu (1)	3.030e-09					
CuCl2-	1.670e-09	1.333e-09	-8.777	-8.875	-0.098	(0)
CuCl	1.138e-09	1.138e-09	-8.944	-8.944	0.000	(0)
Cu+	2.178e-10	1.611e-10	-9.662	-9.793	-0.131	(0)
CuCl3-2	3.734e-12	1.599e-12	-11.428	-11.796	-0.368	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.367	-147.768	-0.401	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.119	-148.498	-0.379	(0)
Cu (2)	5.030e-07					
CuCO3	3.366e-07	3.366e-07	-6.473	-6.473	0.000	(0)
CuOH+	7.764e-08	6.197e-08	-7.110	-7.208	-0.098	(0)
Cu+2	3.557e-08	1.495e-08	-7.449	-7.825	-0.376	(0)
CuSO4	2.350e-08	2.350e-08	-7.629	-7.629	0.000	(0)
Cu (OH) 2	1.621e-08	1.621e-08	-7.790	-7.790	0.000	(0)
Cu (CO3) 2-2	1.156e-08	3.463e-09	-7.937	-8.461	-0.524	(0)
CuHCO3+	7.982e-10	5.905e-10	-9.098	-9.229	-0.131	(0)
Cu2 (OH) 2+2	3.221e-10	9.647e-11	-9.492	-10.016	-0.524	(0)
CuF+	2.437e-10	1.803e-10	-9.613	-9.744	-0.131	(0)
CuCl+	1.666e-10	1.329e-10	-9.778	-9.876	-0.098	(0)
Cu (OH) 3-	5.888e-11	4.356e-11	-10.230	-10.361	-0.131	(0)
CuNO2+	4.020e-11	2.974e-11	-10.396	-10.527	-0.131	(0)
CuNH3+2	3.166e-12	9.482e-13	-11.500	-12.023	-0.524	(0)
CuCl2	2.586e-13	2.586e-13	-12.587	-12.587	0.000	(0)
Cu (NO2) 2	5.781e-15	5.781e-15	-14.238	-14.238	0.000	(0)
Cu (OH) 4-2	1.500e-15	4.493e-16	-14.824	-15.347	-0.524	(0)
CuNO3+	1.145e-15	8.474e-16	-14.941	-15.072	-0.131	(0)
CuCl3-	1.696e-17	1.354e-17	-16.771	-16.868	-0.098	(0)
CuCl4-2	8.887e-22	3.806e-22	-21.051	-21.420	-0.368	(0)
Cu (NO3) 2	1.912e-24	1.912e-24	-23.719	-23.719	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.188	-218.319	-0.131	(0)
F	3.058e-04					
F-	2.373e-04	1.911e-04	-3.625	-3.719	-0.094	(0)
MgF+	6.412e-05	5.153e-05	-4.193	-4.288	-0.095	(0)
CaF+	2.233e-06	1.806e-06	-5.651	-5.743	-0.092	(0)
NaF	1.979e-06	1.979e-06	-5.703	-5.703	0.000	(0)
MnF+	2.025e-07	1.638e-07	-6.694	-6.786	-0.092	(0)
ZnF+	1.087e-08	8.042e-09	-7.964	-8.095	-0.131	(0)
BF (OH) 3-	5.296e-09	4.129e-09	-8.276	-8.384	-0.108	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
NiF+	4.038e-10	2.987e-10	-9.394	-9.525	-0.131	(0)
CoF+	2.688e-10	1.988e-10	-9.571	-9.701	-0.131	(0)
CuF+	2.437e-10	1.803e-10	-9.613	-9.744	-0.131	(0)
AlF3	1.932e-10	1.932e-10	-9.714	-9.714	0.000	(0)
AlF2+	9.882e-11	8.033e-11	-10.005	-10.095	-0.090	(0)
AlF4-	2.302e-11	1.850e-11	-10.638	-10.733	-0.095	(0)
CdF+	1.608e-11	1.189e-11	-10.794	-10.925	-0.131	(0)
PbF+	3.583e-12	2.651e-12	-11.446	-11.577	-0.131	(0)
AlF+2	2.418e-12	1.056e-12	-11.617	-11.976	-0.360	(0)
HF2-	1.988e-12	1.576e-12	-11.701	-11.803	-0.101	(0)
BF2 (OH) 2-	8.312e-13	6.480e-13	-12.080	-12.188	-0.108	(0)
AgF	5.128e-13	5.128e-13	-12.290	-12.290	0.000	(0)
UO2F+	4.546e-13	3.363e-13	-12.342	-12.473	-0.131	(0)
UO2F2	1.853e-13	1.853e-13	-12.732	-12.732	0.000	(0)
UO2F3-	1.202e-14	8.894e-15	-13.920	-14.051	-0.131	(0)
CrF+2	1.124e-14	3.366e-15	-13.949	-14.473	-0.524	(0)
PbF2	9.966e-15	9.966e-15	-14.001	-14.001	0.000	(0)
CdF2	4.534e-15	4.534e-15	-14.344	-14.344	0.000	(0)
UO2F4-2	4.507e-17	1.350e-17	-16.346	-16.870	-0.524	(0)
H2F2	1.260e-17	1.260e-17	-16.899	-16.899	0.000	(0)
PbF3-	4.882e-18	3.612e-18	-17.311	-17.442	-0.131	(0)
VO2F	2.159e-18	2.159e-18	-17.666	-17.666	0.000	(0)
FeF2+	9.324e-19	7.543e-19	-18.030	-18.122	-0.092	(0)

BF3OH-	4.747e-19	3.701e-19	-18.324	-18.432	-0.108	(0)
FeF+2	3.445e-19	1.475e-19	-18.463	-18.831	-0.368	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
VO2F2-	2.024e-19	1.498e-19	-18.694	-18.825	-0.131	(0)
VO2F3-2	1.192e-21	3.569e-22	-20.924	-21.447	-0.524	(0)
PbF4-2	1.103e-21	3.303e-22	-20.958	-21.481	-0.524	(0)
VOF+	1.035e-21	7.659e-22	-20.985	-21.116	-0.131	(0)
VOF2	5.487e-23	5.487e-23	-22.261	-22.261	0.000	(0)
HgF+	7.074e-24	5.233e-24	-23.150	-23.281	-0.131	(0)
BF4-	3.429e-24	2.673e-24	-23.465	-23.573	-0.108	(0)
VO2F4-3	5.056e-25	3.355e-26	-24.296	-25.474	-1.178	(0)
VOF3-	5.028e-25	3.720e-25	-24.299	-24.429	-0.131	(0)
Sb(OH)2F	3.923e-26	3.923e-26	-25.406	-25.406	0.000	(0)
SbOF	3.862e-26	3.862e-26	-25.413	-25.413	0.000	(0)
VOF4-2	9.578e-28	2.869e-28	-27.019	-27.542	-0.524	(0)
SiF6-2	2.896e-29	1.240e-29	-28.538	-28.907	-0.368	(0)
UF3+	1.324e-36	9.796e-37	-35.878	-36.009	-0.131	(0)
UF2+2	1.080e-37	3.235e-38	-36.967	-37.490	-0.524	(0)
UF4	2.052e-38	2.052e-38	-37.688	-37.688	0.000	(0)
UF5-	2.100e-40	1.554e-40	-39.678	-39.809	-0.131	(0)
UF+3	2.026e-40	0.000e+00	-39.693	-40.871	-1.178	(0)
UF6-2	0.000e+00	0.000e+00	-40.524	-41.047	-0.524	(0)
Fe (2)	8.497e-13					
Fe+2	5.566e-13	1.667e-13	-12.254	-12.778	-0.524	(0)
FeSO4	2.807e-13	2.807e-13	-12.552	-12.552	0.000	(0)
FeOH+	1.075e-14	8.698e-15	-13.968	-14.061	-0.092	(0)
FeHCO3+	1.605e-15	1.314e-15	-14.795	-14.882	-0.087	(0)
Fe(OH)2	9.055e-18	9.055e-18	-17.043	-17.043	0.000	(0)
Fe(OH)3-	4.639e-18	3.753e-18	-17.334	-17.426	-0.092	(0)
Fe(HS)2	0.000e+00	0.000e+00	-161.423	-161.423	0.000	(0)
Fe(HS)3-	0.000e+00	0.000e+00	-238.052	-238.183	-0.131	(0)
Fe (3)	8.654e-10					
Fe(OH)3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH)2+	3.737e-10	3.038e-10	-9.428	-9.517	-0.090	(0)
Fe(OH)4-	6.418e-11	5.217e-11	-10.193	-10.283	-0.090	(0)
FeOH+2	1.391e-15	5.958e-16	-14.857	-15.225	-0.368	(0)
FeF2+	9.324e-19	7.543e-19	-18.030	-18.122	-0.092	(0)
FeF+2	3.445e-19	1.475e-19	-18.463	-18.831	-0.368	(0)
FeF3	2.033e-19	2.033e-19	-18.692	-18.692	0.000	(0)
FeSO4+	6.699e-20	5.419e-20	-19.174	-19.266	-0.092	(0)
Fe(SO4)2-	1.074e-20	7.947e-21	-19.969	-20.100	-0.131	(0)
Fe+3	4.948e-21	7.041e-22	-20.306	-21.152	-0.847	(0)
FeCl+2	2.785e-22	1.193e-22	-21.555	-21.923	-0.368	(0)
FeCl2+	3.695e-24	2.989e-24	-23.432	-23.525	-0.092	(0)
FeHSeO3+2	4.954e-25	1.484e-25	-24.305	-24.829	-0.524	(0)
FeCl3	1.677e-27	1.677e-27	-26.776	-26.776	0.000	(0)
Fe2(OH)2+4	1.461e-27	1.175e-29	-26.835	-28.930	-2.094	(0)
FeNO3+2	4.213e-28	1.262e-28	-27.375	-27.899	-0.524	(0)
Fe3(OH)4+5	9.663e-35	5.161e-38	-34.015	-37.287	-3.272	(0)
H (0)	3.974e-29					
H2	1.987e-29	2.018e-29	-28.702	-28.695	0.007	(0)
Hg (0)	3.300e-09					
Hg	3.300e-09	3.300e-09	-8.482	-8.482	0.000	(0)
Hg (1)	1.105e-20					
Hg2+2	5.526e-21	1.655e-21	-20.258	-20.781	-0.524	(0)
Hg (2)	1.999e-11					
HgClOH	9.593e-12	9.593e-12	-11.018	-11.018	0.000	(0)
Hg(OH)2	7.887e-12	8.007e-12	-11.103	-11.097	0.007	(0)
HgCl2	2.325e-12	2.325e-12	-11.634	-11.634	0.000	(0)
HgCl3-	1.763e-13	1.304e-13	-12.754	-12.885	-0.131	(0)
HgCl4-2	9.724e-15	2.913e-15	-14.012	-14.536	-0.524	(0)
HgCO3	3.380e-15	3.380e-15	-14.471	-14.471	0.000	(0)
Hg(CO3)2-2	1.364e-16	4.086e-17	-15.865	-16.389	-0.524	(0)
HgCl+	1.118e-16	8.270e-17	-15.952	-16.082	-0.131	(0)
HgOH+	5.211e-17	3.855e-17	-16.283	-16.414	-0.131	(0)
Hg(OH)3-	1.786e-18	1.321e-18	-17.748	-17.879	-0.131	(0)
HgHCO3+	6.530e-19	4.831e-19	-18.185	-18.316	-0.131	(0)
Hg(NH3)2+2	5.976e-20	1.790e-20	-19.224	-19.747	-0.524	(0)

	HgNH3+2	9.645e-21	2.889e-21	-20.016	-20.539	-0.524	(0)
	Hg+2	2.467e-21	7.389e-22	-20.608	-21.131	-0.524	(0)
	HgSO4	1.327e-21	1.327e-21	-20.877	-20.877	0.000	(0)
	HgF+	7.074e-24	5.233e-24	-23.150	-23.281	-0.131	(0)
	Hg (NH3) 3+2	1.474e-27	4.415e-28	-26.831	-27.355	-0.524	(0)
	HgNO3+	6.608e-30	4.889e-30	-29.180	-29.311	-0.131	(0)
	Hg (NH3) 4+2	7.255e-35	2.173e-35	-34.139	-34.663	-0.524	(0)
	Hg (NO3) 2	3.641e-38	3.641e-38	-37.439	-37.439	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.552	-138.683	-0.131	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.753	-139.276	-0.524	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.404	-140.404	0.000	(0)
K	5.741e-03						
	K+	5.478e-03	4.411e-03	-2.261	-2.355	-0.094	(0)
	KSO4-	2.635e-04	2.142e-04	-3.579	-3.669	-0.090	(0)
	KCrO4-	2.173e-16	1.608e-16	-15.663	-15.794	-0.131	(0)
Mg	8.811e-03						
	Mg+2	5.718e-03	2.404e-03	-2.243	-2.619	-0.376	(0)
	MgSO4	3.000e-03	3.000e-03	-2.523	-2.523	0.000	(0)
	MgF+	6.412e-05	5.153e-05	-4.193	-4.288	-0.095	(0)
	MgHCO3+	1.929e-05	1.539e-05	-4.715	-4.813	-0.098	(0)
	MgCO3	7.643e-06	7.643e-06	-5.117	-5.117	0.000	(0)
	MgOH+	1.524e-06	1.254e-06	-5.817	-5.902	-0.085	(0)
	MgH2BO3+	4.381e-07	3.416e-07	-6.358	-6.467	-0.108	(0)
Mn (2)	9.898e-05						
	Mn+2	7.190e-05	2.153e-05	-4.143	-4.667	-0.524	(0)
	MnSO4	2.627e-05	2.627e-05	-4.581	-4.581	0.000	(0)
	MnHCO3+	3.324e-07	2.689e-07	-6.478	-6.570	-0.092	(0)
	MnF+	2.025e-07	1.638e-07	-6.694	-6.786	-0.092	(0)
	MnCl+	1.880e-07	1.521e-07	-6.726	-6.818	-0.092	(0)
	MnOH+	8.763e-08	7.089e-08	-7.057	-7.149	-0.092	(0)
	MnCl2	1.205e-09	1.205e-09	-8.919	-8.919	0.000	(0)
	MnCl3-	2.301e-12	1.862e-12	-11.638	-11.730	-0.092	(0)
	MnSeO4	1.039e-12	1.039e-12	-11.984	-11.984	0.000	(0)
	MnNO3+	8.267e-13	6.116e-13	-12.083	-12.214	-0.131	(0)
	Mn (OH) 3-	9.302e-16	7.525e-16	-15.031	-15.124	-0.092	(0)
	Mn (NO3) 2	2.753e-20	2.753e-20	-19.560	-19.560	0.000	(0)
	Mn (OH) 4-2	7.435e-21	3.184e-21	-20.129	-20.497	-0.368	(0)
	MnSe	0.000e+00	0.000e+00	-40.809	-40.809	0.000	(0)
Mn (3)	3.073e-25						
	Mn+3	3.073e-25	4.373e-26	-24.512	-25.359	-0.847	(0)
Mn (6)	6.723e-40						
	MnO4-2	6.723e-40	2.879e-40	-39.172	-39.541	-0.368	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.151	-44.255	-0.104	(0)
Mo	2.899e-06						
	MoO4-2	2.898e-06	1.219e-06	-5.538	-5.914	-0.376	(0)
	HMoO4-	2.515e-10	1.861e-10	-9.599	-9.730	-0.131	(0)
	H2MoO4	1.046e-14	1.046e-14	-13.980	-13.980	0.000	(0)
	Ag2MoO4	5.265e-25	5.265e-25	-24.279	-24.279	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-43.260	-44.438	-1.178	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-48.614	-53.327	-4.712	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-51.782	-55.055	-3.272	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-56.293	-58.387	-2.094	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-62.078	-63.256	-1.178	(0)
N (-3)	1.208e-07						
	NH4+	1.070e-07	8.341e-08	-6.971	-7.079	-0.108	(0)
	NH4SO4-	7.578e-09	6.130e-09	-8.120	-8.213	-0.092	(0)
	NH3	6.196e-09	6.196e-09	-8.208	-8.208	0.000	(0)
	CaNH3+2	2.256e-11	6.757e-12	-10.647	-11.170	-0.524	(0)
	CuNH3+2	3.166e-12	9.482e-13	-11.500	-12.023	-0.524	(0)
	NiNH3+2	6.915e-13	2.071e-13	-12.160	-12.684	-0.524	(0)
	Co (NH3) +2	8.185e-14	2.452e-14	-13.087	-13.611	-0.524	(0)
	AgNH3+	1.827e-14	1.352e-14	-13.738	-13.869	-0.131	(0)
	BaNH3+2	1.993e-16	5.968e-17	-15.701	-16.224	-0.524	(0)
	Ag (NH3) 2+	9.202e-19	6.808e-19	-18.036	-18.167	-0.131	(0)
	Ni (NH3) 2+2	6.193e-19	1.855e-19	-18.208	-18.732	-0.524	(0)
	Hg (NH3) 2+2	5.976e-20	1.790e-20	-19.224	-19.747	-0.524	(0)
	Ca (NH3) 2+2	5.565e-20	1.667e-20	-19.255	-19.778	-0.524	(0)

Co (NH3) 2+2	2.163e-20	6.480e-21	-19.665	-20.188	-0.524	(0)
HgNH3+2	9.645e-21	2.889e-21	-20.016	-20.539	-0.524	(0)
Co (NH3) 3+2	1.688e-27	5.055e-28	-26.773	-27.296	-0.524	(0)
Hg (NH3) 3+2	1.474e-27	4.415e-28	-26.831	-27.355	-0.524	(0)
Hg (NH3) 4+2	7.255e-35	2.173e-35	-34.139	-34.663	-0.524	(0)
Co (NH3) 4+2	5.488e-35	1.644e-35	-34.261	-34.784	-0.524	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.980	-42.504	-0.524	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-42.248	-42.772	-0.524	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.730	-50.254	-0.524	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-51.023	-52.201	-1.178	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-52.827	-53.350	-0.524	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.085	-64.609	-0.524	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.654	-65.177	-0.524	(0)
N (3)	2.416e-05					
NO2-	2.416e-05	1.899e-05	-4.617	-4.721	-0.104	(0)
CuNO2+	4.020e-11	2.974e-11	-10.396	-10.527	-0.131	(0)
CoNO2+	5.954e-12	4.405e-12	-11.225	-11.356	-0.131	(0)
AgNO2	4.240e-12	4.240e-12	-11.373	-11.373	0.000	(0)
Cu (NO2) 2	5.781e-15	5.781e-15	-14.238	-14.238	0.000	(0)
Ag (NO2) 2-	1.686e-16	1.247e-16	-15.773	-15.904	-0.131	(0)
N (5)	2.232e-08					
NO3-	2.225e-08	1.792e-08	-7.653	-7.747	-0.094	(0)
CaNO3+	6.635e-11	4.908e-11	-10.178	-10.309	-0.131	(0)
MnNO3+	8.267e-13	6.116e-13	-12.083	-12.214	-0.131	(0)
ZnNO3+	1.284e-13	9.495e-14	-12.892	-13.022	-0.131	(0)
NiNO3+	3.787e-15	2.802e-15	-14.422	-14.553	-0.131	(0)
BaNO3+	1.853e-15	1.371e-15	-14.732	-14.863	-0.131	(0)
CoNO3+	1.263e-15	9.346e-16	-14.898	-15.029	-0.131	(0)
CuNO3+	1.145e-15	8.474e-16	-14.941	-15.072	-0.131	(0)
CdNO3+	3.008e-16	2.225e-16	-15.522	-15.653	-0.131	(0)
PbNO3+	7.053e-17	5.218e-17	-16.152	-16.283	-0.131	(0)
AgNO3	1.521e-17	1.521e-17	-16.818	-16.818	0.000	(0)
Mn (NO3) 2	2.753e-20	2.753e-20	-19.560	-19.560	0.000	(0)
UO2NO3+	6.163e-22	4.559e-22	-21.210	-21.341	-0.131	(0)
Zn (NO3) 2	3.395e-22	3.395e-22	-21.469	-21.469	0.000	(0)
Co (NO3) 2	3.408e-23	3.408e-23	-22.468	-22.468	0.000	(0)
Cd (NO3) 2	1.999e-24	1.999e-24	-23.699	-23.699	0.000	(0)
Cu (NO3) 2	1.912e-24	1.912e-24	-23.719	-23.719	0.000	(0)
Pb (NO3) 2	1.588e-24	1.588e-24	-23.799	-23.799	0.000	(0)
CrNO3+2	2.907e-25	8.707e-26	-24.537	-25.060	-0.524	(0)
VO2NO3	5.839e-26	5.839e-26	-25.234	-25.234	0.000	(0)
FeNO3+2	4.213e-28	1.262e-28	-27.375	-27.899	-0.524	(0)
HgNO3+	6.608e-30	4.889e-30	-29.180	-29.311	-0.131	(0)
Hg (NO3) 2	3.641e-38	3.641e-38	-37.439	-37.439	0.000	(0)
Na	2.114e-02					
Na+	2.039e-02	1.642e-02	-1.691	-1.785	-0.094	(0)
NaSO4-	7.440e-04	6.048e-04	-3.128	-3.218	-0.090	(0)
NaHCO3	5.778e-06	5.778e-06	-5.238	-5.238	0.000	(0)
NaF	1.979e-06	1.979e-06	-5.703	-5.703	0.000	(0)
NaCO3-	1.438e-06	1.169e-06	-5.842	-5.932	-0.090	(0)
NaH2BO3	1.066e-07	1.066e-07	-6.972	-6.972	0.000	(0)
NaCrO4-	1.082e-15	8.003e-16	-14.966	-15.097	-0.131	(0)
Ni	2.518e-07					
Ni+2	1.481e-07	6.224e-08	-6.830	-7.206	-0.376	(0)
NiSO4	8.519e-08	8.519e-08	-7.070	-7.070	0.000	(0)
NiCO3	8.877e-09	8.877e-09	-8.052	-8.052	0.000	(0)
NiHCO3+	6.492e-09	4.802e-09	-8.188	-8.319	-0.131	(0)
NiOH+	1.388e-09	1.027e-09	-8.858	-8.988	-0.131	(0)
NiCl+	1.208e-09	8.934e-10	-8.918	-9.049	-0.131	(0)
NiF+	4.038e-10	2.987e-10	-9.394	-9.525	-0.131	(0)
Ni (OH) 2	1.069e-10	1.069e-10	-9.971	-9.971	0.000	(0)
Ni (SO4) 2-2	6.460e-11	1.935e-11	-10.190	-10.713	-0.524	(0)
NiNH3+2	6.915e-13	2.071e-13	-12.160	-12.684	-0.524	(0)
Ni (OH) 3-	1.894e-13	1.401e-13	-12.723	-12.854	-0.131	(0)
NiCl2	2.523e-14	2.523e-14	-13.598	-13.598	0.000	(0)
NiSeO4	5.217e-15	5.217e-15	-14.283	-14.283	0.000	(0)
NiNO3+	3.787e-15	2.802e-15	-14.422	-14.553	-0.131	(0)

Ni (NH3) 2+2	6.193e-19	1.855e-19	-18.208	-18.732	-0.524	(0)
O (0)	2.448e-35					
O2	1.224e-35	1.243e-35	-34.912	-34.906	0.007	(0)
Pb	4.651e-09					
PbCO3	2.262e-09	2.262e-09	-8.645	-8.645	0.000	(0)
PbOH+	8.760e-10	6.481e-10	-9.057	-9.188	-0.131	(0)
PbSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
Pb+2	4.683e-10	1.969e-10	-9.329	-9.706	-0.376	(0)
PbHCO3+	1.237e-10	9.154e-11	-9.907	-10.038	-0.131	(0)
Pb (SO4) 2-2	9.126e-11	2.734e-11	-10.040	-10.563	-0.524	(0)
Pb (CO3) 2-2	8.327e-11	2.494e-11	-10.080	-10.603	-0.524	(0)
PbCl+	5.296e-11	3.918e-11	-10.276	-10.407	-0.131	(0)
Pb (OH) 2	2.686e-11	2.686e-11	-10.571	-10.571	0.000	(0)
PbF+	3.583e-12	2.651e-12	-11.446	-11.577	-0.131	(0)
PbCl2	9.818e-13	9.818e-13	-12.008	-12.008	0.000	(0)
Pb (OH) 3-	4.758e-14	3.520e-14	-13.323	-13.453	-0.131	(0)
PbF2	9.966e-15	9.966e-15	-14.001	-14.001	0.000	(0)
PbCl3-	2.964e-15	2.192e-15	-14.528	-14.659	-0.131	(0)
PbNO3+	7.053e-17	5.218e-17	-16.152	-16.283	-0.131	(0)
Pb (OH) 4-2	3.772e-17	1.130e-17	-16.423	-16.947	-0.524	(0)
Pb2OH+3	3.047e-17	2.022e-18	-16.516	-17.694	-1.178	(0)
PbCl4-2	1.877e-17	5.622e-18	-16.727	-17.250	-0.524	(0)
PbF3-	4.882e-18	3.612e-18	-17.311	-17.442	-0.131	(0)
Pb3 (OH) 4+2	9.460e-21	2.833e-21	-20.024	-20.548	-0.524	(0)
PbF4-2	1.103e-21	3.303e-22	-20.958	-21.481	-0.524	(0)
Pb (NO3) 2	1.588e-24	1.588e-24	-23.799	-23.799	0.000	(0)
Pb4 (OH) 4+4	5.505e-25	4.431e-27	-24.259	-26.354	-2.094	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.031	-152.031	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.397	-229.528	-0.131	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.954	-73.954	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.667	-78.797	-0.131	(0)
CdHS+	0.000e+00	0.000e+00	-79.064	-79.195	-0.131	(0)
S5-2	0.000e+00	0.000e+00	-79.524	-80.048	-0.524	(0)
H2S	0.000e+00	0.000e+00	-79.892	-79.892	0.000	(0)
S6-2	0.000e+00	0.000e+00	-80.040	-80.564	-0.524	(0)
S4-2	0.000e+00	0.000e+00	-80.120	-80.643	-0.524	(0)
S3-2	0.000e+00	0.000e+00	-80.926	-81.449	-0.524	(0)
S2-2	0.000e+00	0.000e+00	-81.942	-82.465	-0.524	(0)
S-2	0.000e+00	0.000e+00	-87.614	-87.983	-0.368	(0)
HgHS2-	0.000e+00	0.000e+00	-138.552	-138.683	-0.131	(0)
HgS2-2	0.000e+00	0.000e+00	-138.753	-139.276	-0.524	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.404	-140.404	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.367	-147.768	-0.401	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.789	-148.020	-0.231	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.119	-148.498	-0.379	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.215	-148.346	-0.131	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.521	-148.652	-0.131	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.933	-149.345	-0.413	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.267	-149.656	-0.390	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.451	-150.451	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.789	-150.789	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-152.031	-152.031	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.423	-161.423	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-218.188	-218.319	-0.131	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.837	-225.968	-0.131	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.310	-227.833	-0.524	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.555	-227.686	-0.131	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.397	-229.528	-0.131	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.052	-238.183	-0.131	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.764	-304.288	-0.524	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.702	-306.226	-0.524	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.038	-321.562	-0.524	(0)
S (6)	2.172e-02					
SO4-2	1.632e-02	6.859e-03	-1.787	-2.164	-0.376	(0)
MgSO4	3.000e-03	3.000e-03	-2.523	-2.523	0.000	(0)
CaSO4	1.361e-03	1.361e-03	-2.866	-2.866	0.000	(0)
NaSO4-	7.440e-04	6.048e-04	-3.128	-3.218	-0.090	(0)

KSO4-	2.635e-04	2.142e-04	-3.579	-3.669	-0.090	(0)
MnSO4	2.627e-05	2.627e-05	-4.581	-4.581	0.000	(0)
ZnSO4	3.166e-06	3.166e-06	-5.500	-5.500	0.000	(0)
Zn (SO4) 2-2	6.314e-07	1.891e-07	-6.200	-6.723	-0.524	(0)
NiSO4	8.519e-08	8.519e-08	-7.070	-7.070	0.000	(0)
CoSO4	4.504e-08	4.504e-08	-7.346	-7.346	0.000	(0)
CuSO4	2.350e-08	2.350e-08	-7.629	-7.629	0.000	(0)
NH4SO4-	7.578e-09	6.130e-09	-8.120	-8.213	-0.092	(0)
HSO4-	6.401e-09	5.145e-09	-8.194	-8.289	-0.095	(0)
CdSO4	6.315e-09	6.315e-09	-8.200	-8.200	0.000	(0)
Cd (SO4) 2-2	1.951e-09	5.843e-10	-8.710	-9.233	-0.524	(0)
PbSO4	6.614e-10	6.614e-10	-9.180	-9.180	0.000	(0)
AgSO4-	1.977e-10	1.462e-10	-9.704	-9.835	-0.131	(0)
Pb (SO4) 2-2	9.126e-11	2.734e-11	-10.040	-10.563	-0.524	(0)
Ni (SO4) 2-2	6.460e-11	1.935e-11	-10.190	-10.713	-0.524	(0)
CrOHSO4	5.188e-12	5.188e-12	-11.285	-11.285	0.000	(0)
FeSO4	2.807e-13	2.807e-13	-12.552	-12.552	0.000	(0)
UO2SO4	1.324e-13	1.324e-13	-12.878	-12.878	0.000	(0)
UO2 (SO4) 2-2	3.997e-14	1.197e-14	-13.398	-13.922	-0.524	(0)
AlSO4+	3.662e-14	2.943e-14	-13.436	-13.531	-0.095	(0)
Al (SO4) 2-	2.691e-15	2.163e-15	-14.570	-14.665	-0.095	(0)
CrSO4+	2.407e-15	1.780e-15	-14.619	-14.749	-0.131	(0)
VO2SO4-	1.426e-18	1.055e-18	-17.846	-17.977	-0.131	(0)
FeSO4+	6.699e-20	5.419e-20	-19.174	-19.266	-0.092	(0)
Fe (SO4) 2-	1.074e-20	7.947e-21	-19.969	-20.100	-0.131	(0)
Cr2 (OH) 2SO4+2	4.989e-21	1.494e-21	-20.302	-20.826	-0.524	(0)
HgSO4	1.327e-21	1.327e-21	-20.877	-20.877	0.000	(0)
VOSO4	1.263e-21	1.263e-21	-20.899	-20.899	0.000	(0)
Cr2 (OH) 2 (SO4) 2	6.089e-22	6.089e-22	-21.215	-21.215	0.000	(0)
CrO3SO4-2	1.306e-23	3.910e-24	-22.884	-23.408	-0.524	(0)
VS04+	1.884e-36	1.394e-36	-35.725	-35.856	-0.131	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.280	-40.280	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.493	-42.016	-0.524	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.034	-60.165	-0.131	(0)
Sb (3)	3.383e-20					
Sb (OH) 3	1.711e-20	1.711e-20	-19.767	-19.767	0.000	(0)
HSbO2	1.672e-20	1.672e-20	-19.777	-19.777	0.000	(0)
SbO2-	4.768e-24	3.527e-24	-23.322	-23.453	-0.131	(0)
Sb (OH) 4-	2.727e-24	2.017e-24	-23.564	-23.695	-0.131	(0)
Sb (OH) 2F	3.923e-26	3.923e-26	-25.406	-25.406	0.000	(0)
SbOF	3.862e-26	3.862e-26	-25.413	-25.413	0.000	(0)
Sb (OH) 2+	4.314e-27	3.192e-27	-26.365	-26.496	-0.131	(0)
SbO+	1.489e-27	1.102e-27	-26.827	-26.958	-0.131	(0)
Sb2S4-2	0.000e+00	0.000e+00	-321.038	-321.562	-0.524	(0)
Sb (5)	4.431e-08					
SbO3-	4.427e-08	3.275e-08	-7.354	-7.485	-0.131	(0)
Sb (OH) 6-	4.742e-11	3.818e-11	-10.324	-10.418	-0.094	(0)
SbO2+	7.487e-25	5.539e-25	-24.126	-24.257	-0.131	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	1.813e-39	1.342e-39	-38.742	-38.872	-0.131	(0)
MnSe	0.000e+00	0.000e+00	-40.809	-40.809	0.000	(0)
H2Se	0.000e+00	0.000e+00	-43.097	-43.097	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.234	-45.757	-0.524	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-80.786	-82.881	-2.094	(0)
Se (4)	2.459e-07					
SeO3-2	1.381e-07	4.136e-08	-6.860	-7.383	-0.524	(0)
HSeO3-	1.078e-07	7.974e-08	-6.967	-7.098	-0.131	(0)
H2SeO3	2.611e-13	2.611e-13	-12.583	-12.583	0.000	(0)
AgSeO3-	3.839e-14	2.840e-14	-13.416	-13.547	-0.131	(0)
Cd (SeO3) 2-2	1.849e-17	5.538e-18	-16.733	-17.257	-0.524	(0)
Ag (SeO3) 2-3	1.585e-19	1.052e-20	-18.800	-19.978	-1.178	(0)
FeHSeO3+2	4.954e-25	1.484e-25	-24.305	-24.829	-0.524	(0)
Se (6)	4.274e-10					
SeO4-2	4.262e-10	1.792e-10	-9.370	-9.747	-0.376	(0)
MnSeO4	1.039e-12	1.039e-12	-11.984	-11.984	0.000	(0)
ZnSeO4	5.855e-14	5.855e-14	-13.232	-13.232	0.000	(0)
NiSeO4	5.217e-15	5.217e-15	-14.283	-14.283	0.000	(0)

	CoSeO4	2.956e-15	2.956e-15	-14.529	-14.529	0.000	(0)
	CdSeO4	1.310e-16	1.310e-16	-15.883	-15.883	0.000	(0)
	HSeO4-	9.317e-17	6.893e-17	-16.031	-16.162	-0.131	(0)
	Zn (SeO4) 2-2	3.552e-23	1.064e-23	-22.450	-22.973	-0.524	(0)
Si	4.873e-05						
	H4SiO4	4.759e-05	4.832e-05	-4.322	-4.316	0.007	(0)
	H3SiO4-	1.140e-06	9.100e-07	-5.943	-6.041	-0.098	(0)
	H2SiO4-2	1.713e-11	7.481e-12	-10.766	-11.126	-0.360	(0)
	UO2H3SiO4+	1.332e-12	9.852e-13	-11.876	-12.006	-0.131	(0)
	SiF6-2	2.896e-29	1.240e-29	-28.538	-28.907	-0.368	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-58.728	-59.906	-1.178	(0)
U (4)	1.351e-19						
	U (OH) 5-	1.351e-19	9.994e-20	-18.869	-19.000	-0.131	(0)
	U (OH) 4	3.216e-23	3.216e-23	-22.493	-22.493	0.000	(0)
	U (OH) 3+	1.221e-27	9.033e-28	-26.913	-27.044	-0.131	(0)
	U (OH) 2+2	1.071e-32	3.209e-33	-31.970	-32.494	-0.524	(0)
	UF3+	1.324e-36	9.796e-37	-35.878	-36.009	-0.131	(0)
	UF2+2	1.080e-37	3.235e-38	-36.967	-37.490	-0.524	(0)
	UF4	2.052e-38	2.052e-38	-37.688	-37.688	0.000	(0)
	UOH+3	1.750e-38	1.161e-39	-37.757	-38.935	-1.178	(0)
	UF5-	2.100e-40	1.554e-40	-39.678	-39.809	-0.131	(0)
	UF+3	2.026e-40	0.000e+00	-39.693	-40.871	-1.178	(0)
	U (SO4) 2	0.000e+00	0.000e+00	-40.280	-40.280	0.000	(0)
	UF6-2	0.000e+00	0.000e+00	-40.524	-41.047	-0.524	(0)
	USO4+2	0.000e+00	0.000e+00	-41.493	-42.016	-0.524	(0)
	U+4	0.000e+00	0.000e+00	-44.358	-46.453	-2.094	(0)
	UCl+3	0.000e+00	0.000e+00	-45.826	-47.004	-1.178	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-163.551	-174.153	-10.602	(0)
U (5)	2.311e-16						
	UO2+	2.311e-16	1.710e-16	-15.636	-15.767	-0.131	(0)
U (6)	4.020e-07						
	UO2 (CO3) 3-4	3.524e-07	2.836e-09	-6.453	-8.547	-2.094	(0)
	UO2 (CO3) 2-2	4.942e-08	1.480e-08	-7.306	-7.830	-0.524	(0)
	UO2CO3	1.941e-10	1.941e-10	-9.712	-9.712	0.000	(0)
	UO2OH+	2.844e-12	2.104e-12	-11.546	-11.677	-0.131	(0)
	UO2H3SiO4+	1.332e-12	9.852e-13	-11.876	-12.006	-0.131	(0)
	UO2F+	4.546e-13	3.363e-13	-12.342	-12.473	-0.131	(0)
	UO2F2	1.853e-13	1.853e-13	-12.732	-12.732	0.000	(0)
	UO2SO4	1.324e-13	1.324e-13	-12.878	-12.878	0.000	(0)
	UO2 (SO4) 2-2	3.997e-14	1.197e-14	-13.398	-13.922	-0.524	(0)
	UO2+2	3.033e-14	1.275e-14	-13.518	-13.894	-0.376	(0)
	UO2F3-	1.202e-14	8.894e-15	-13.920	-14.051	-0.131	(0)
	UO2Cl+	1.568e-16	1.160e-16	-15.805	-15.936	-0.131	(0)
	UO2F4-2	4.507e-17	1.350e-17	-16.346	-16.870	-0.524	(0)
	(UO2) 3 (OH) 5+	2.722e-17	2.013e-17	-16.565	-16.696	-0.131	(0)
	(UO2) 2 (OH) 2+2	2.452e-17	7.346e-18	-16.610	-17.134	-0.524	(0)
	UO2NO3+	6.163e-22	4.559e-22	-21.210	-21.341	-0.131	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-43.575	-43.706	-0.131	(0)
	V+2	0.000e+00	0.000e+00	-44.810	-45.334	-0.524	(0)
V (3)	7.816e-16						
	V (OH) 3	7.816e-16	7.816e-16	-15.107	-15.107	0.000	(0)
	V (OH) 2+	5.245e-27	3.880e-27	-26.280	-26.411	-0.131	(0)
	VOH+2	9.440e-31	2.827e-31	-30.025	-30.549	-0.524	(0)
	V+3	6.486e-36	4.305e-37	-35.188	-36.366	-1.178	(0)
	VSO4+	1.884e-36	1.394e-36	-35.725	-35.856	-0.131	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-57.330	-58.508	-1.178	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-58.203	-60.297	-2.094	(0)
V (4)	2.406e-19						
	V (OH) 3+	2.360e-19	1.746e-19	-18.627	-18.758	-0.131	(0)
	VO+2	2.231e-21	6.683e-22	-20.651	-21.175	-0.524	(0)
	VOSO4	1.263e-21	1.263e-21	-20.899	-20.899	0.000	(0)
	VOF+	1.035e-21	7.659e-22	-20.985	-21.116	-0.131	(0)
	VOF2	5.487e-23	5.487e-23	-22.261	-22.261	0.000	(0)
	VOC1+	1.422e-23	1.052e-23	-22.847	-22.978	-0.131	(0)
	VOF3-	5.028e-25	3.720e-25	-24.299	-24.429	-0.131	(0)
	VOF4-2	9.578e-28	2.869e-28	-27.019	-27.542	-0.524	(0)

H2V2O4+2	5.110e-33	1.531e-33	-32.292	-32.815	-0.524	(0)
V(5)	1.337e-08					
H2VO4-	7.393e-09	5.469e-09	-8.131	-8.262	-0.131	(0)
HVO4-2	5.976e-09	1.790e-09	-8.224	-8.747	-0.524	(0)
H3VO4	4.197e-13	4.197e-13	-12.377	-12.377	0.000	(0)
HV2O7-3	5.003e-14	3.321e-15	-13.301	-14.479	-1.178	(0)
H3V2O7-	2.006e-14	1.484e-14	-13.698	-13.829	-0.131	(0)
VO4-3	1.761e-14	1.169e-15	-13.754	-14.932	-1.178	(0)
V2O7-4	1.447e-15	1.164e-17	-14.840	-16.934	-2.094	(0)
VO2+	8.000e-18	6.442e-18	-17.097	-17.191	-0.094	(0)
V3O9-3	2.589e-18	1.718e-19	-17.587	-18.765	-1.178	(0)
VO2F	2.159e-18	2.159e-18	-17.666	-17.666	0.000	(0)
VO2SO4-	1.426e-18	1.055e-18	-17.846	-17.977	-0.131	(0)
VO2F2-	2.024e-19	1.498e-19	-18.694	-18.825	-0.131	(0)
VO2F3-2	1.192e-21	3.569e-22	-20.924	-21.447	-0.524	(0)
V4O12-4	4.873e-23	3.922e-25	-22.312	-24.406	-2.094	(0)
VO2F4-3	5.056e-25	3.355e-26	-24.296	-25.474	-1.178	(0)
VO2NO3	5.839e-26	5.839e-26	-25.234	-25.234	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-61.457	-66.169	-4.712	(0)
HV10O28-5	0.000e+00	0.000e+00	-62.825	-66.097	-3.272	(0)
H2V10O28-4	0.000e+00	0.000e+00	-66.910	-69.005	-2.094	(0)
Zn	9.867e-06					
Zn+2	5.018e-06	2.110e-06	-5.299	-5.676	-0.376	(0)
ZnSO4	3.166e-06	3.166e-06	-5.500	-5.500	0.000	(0)
Zn(SO4) 2-2	6.314e-07	1.891e-07	-6.200	-6.723	-0.524	(0)
ZnCO3	4.640e-07	4.640e-07	-6.333	-6.333	0.000	(0)
ZnOH+	3.737e-07	2.765e-07	-6.427	-6.558	-0.131	(0)
Zn(OH) 2	5.742e-08	5.742e-08	-7.241	-7.241	0.000	(0)
ZnHCO3+	5.643e-08	4.175e-08	-7.248	-7.379	-0.131	(0)
ZnOHC1	5.100e-08	5.100e-08	-7.292	-7.292	0.000	(0)
ZnCl+	3.724e-08	2.972e-08	-7.429	-7.527	-0.098	(0)
ZnF+	1.087e-08	8.042e-09	-7.964	-8.095	-0.131	(0)
Zn(OH) 3-	5.098e-10	3.772e-10	-9.293	-9.423	-0.131	(0)
ZnCl2	2.643e-10	2.643e-10	-9.578	-9.578	0.000	(0)
ZnCl3-	1.475e-12	1.178e-12	-11.831	-11.929	-0.098	(0)
ZnNO3+	1.284e-13	9.495e-14	-12.892	-13.022	-0.131	(0)
Zn(OH) 4-2	6.570e-14	1.968e-14	-13.182	-13.706	-0.524	(0)
ZnSeO4	5.855e-14	5.855e-14	-13.232	-13.232	0.000	(0)
ZnCl4-2	7.713e-15	3.303e-15	-14.113	-14.481	-0.368	(0)
Zn(NO3) 2	3.395e-22	3.395e-22	-21.469	-21.469	0.000	(0)
Zn(SeO4) 2-2	3.552e-23	1.064e-23	-22.450	-22.973	-0.524	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.215	-148.346	-0.131	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.451	-150.451	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.837	-225.968	-0.131	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.310	-227.833	-0.524	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.702	-306.226	-0.524	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-54.08	-47.79	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.31	-36.80	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.53	-36.80	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-70.18	-52.25	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.79	-35.76	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.57	-28.17	0.40	(NH4)2CrO4
(NH4)2SeO4	-24.35	-23.90	0.45	(NH4)2SeO4
Acanthite	-52.41	-88.63	-36.22	Ag2S
Ag2CO3	-12.27	-23.36	-11.09	Ag2CO3
Ag2CrO4	-20.36	-31.95	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.31	-23.86	-11.55	Ag2MoO4
Ag2O	-14.29	-1.71	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.29	-20.11	-4.82	Ag2SO4

Ag3AsO3	-28.45	-26.29	2.16	Ag3AsO3
Ag3AsO4	-16.86	-19.64	-2.79	Ag3AsO4
Ag3H2VO5	-16.83	-11.65	5.18	Ag3H2VO5
AgF·4H2O	-13.74	-12.69	1.05	AgF·4H2O
Agmetal	-0.12	-13.63	-13.51	Ag
AgVO3	-10.70	-9.93	0.77	AgVO3
Al (OH) 3 (am)	-1.71	9.09	10.80	Al (OH) 3
Al2 (MoO4) 3	-50.62	-48.26	2.37	Al2 (MoO4) 3
Al2O3	-1.48	18.17	19.65	Al2O3
Al4 (OH) 10SO4	-4.75	17.95	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-12.79	-7.99	4.80	AlAsO4·2H2O
AlOHSO4	-6.08	-9.31	-3.23	AlOHSO4
AlSb	-152.94	-87.31	65.62	AlSb
Alunite	-2.37	-3.77	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.08	-11.87	-7.79	PbSO4
Anhydrite	-0.87	-5.23	-4.36	CaSO4
Anilite	-55.45	-87.33	-31.88	Cu0.25Cu1.5S
Antlerite	-1.97	6.82	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-92.13	-94.89	-2.76	As4O6
Artinite	-4.03	5.57	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.86	-34.15	6.71	As2O5
Atacamite	-0.95	6.44	7.39	Cu2 (OH) 3Cl
Azurite	-1.18	-18.08	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-15.99	8.41	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-17.20	-1.33	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-25.86	7.08	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-12.15	-21.82	-9.67	BaCrO4
BaF2	-9.43	-15.25	-5.82	BaF2
BaMoO4	-6.77	-13.73	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.63	-6.80	1.83	BaSeO3
BaSeO4	-10.10	-17.56	-7.46	BaSeO4
Bianchite	-6.08	-7.84	-1.76	ZnSO4·6H2O
Birnessite	-6.33	11.76	18.09	MnO2
Bixbyite	-1.39	-2.03	-0.64	Mn2O3
BlaubleiI	-55.52	-79.68	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.93	-83.21	-27.28	Cu0.6Cu0.8S
Boehmite	0.51	9.09	8.58	AlOOH
Breithauptite	-56.08	-74.60	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.23	13.61	16.84	Mg (OH) 2
Bunsenite	-3.42	9.02	12.45	NiO
Ca (VO3) 2	-10.65	-4.99	5.66	Ca (VO3) 2
Ca2V2O7	-9.32	8.18	17.50	Ca2V2O7
Ca2V2O7·2H2O	-13.37	8.18	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-16.95	5.35	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-17.61	21.35	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-18.51	21.35	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-296.27	-153.30	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-7.37	-25.28	-17.91	Hg2Cl2
CaMoO4	-1.03	-8.98	-7.95	CaMoO4
Carnotite	-1.21	-0.98	0.23	KUO2VO4
CaSeO3·2H2O	-4.86	-2.05	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.79	-12.81	-3.02	CaSeO4·2H2O
Cd (BO2) 2	-10.55	-0.71	9.84	Cd (BO2) 2
Cd (OH) 2	-5.82	7.82	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-5.91	7.82	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-20.03	-13.32	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-17.48	5.08	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-15.50	12.90	28.40	Cd4 (OH) 6SO4
CdCl2	-12.25	-12.91	-0.66	CdCl2
CdCl2·1H2O	-11.22	-12.91	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.00	-12.91	-1.91	CdCl2·2.5H2O

CdF2	-14.63	-15.84	-1.21	CdF2
Cdmetal (alpha)	-31.24	-17.72	13.51	Cd
Cdmetal (gamma)	-31.34	-17.72	13.62	Cd
CdMoO4	-0.17	-14.32	-14.15	CdMoO4
CdOHCl	-6.08	-2.54	3.54	CdOHCl
CdSb	-75.45	-75.80	-0.35	CdSb
CdSe	-18.96	-39.16	-20.20	CdSe
CdSeO4:2H2O	-16.30	-18.15	-1.85	CdSeO4:2H2O
CdSO4	-10.40	-10.57	-0.17	CdSO4
CdSO4:1H2O	-8.84	-10.57	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.70	-10.57	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.47	-11.22	-9.75	AgCl
Cerrusite	-1.99	-15.12	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.35	-9.99	-2.64	CuSO4:5H2O
Chalcedony	-0.76	-4.31	-3.55	SiO2
Chalcocite	-55.35	-90.27	-34.92	Cu2S
Chalcopyrite	-126.70	-161.97	-35.27	CuFeS2
Chrysotile	-0.00	32.20	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-52.31	-98.01	-45.69	HgS
Claudetite	-91.82	-94.89	-3.06	As4O6
Clausthalite	-13.36	-40.46	-27.10	PbSe
Co (BO2) 2	-26.85	0.22	27.07	Co (BO2) 2
Co (OH) 2	-4.35	8.75	13.09	Co (OH) 2
Co (OH) 3	-8.57	-10.88	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-20.94	-7.91	13.03	Co3 (AsO4) 2
Co3O4	-2.52	-13.02	-10.50	Co3O4
CoCl2	-20.25	-11.98	8.27	CoCl2
CoCl2:6H2O	-14.52	-11.99	2.54	CoCl2:6H2O
CoCO3	-2.92	-12.90	-9.98	CoCO3
CoF2	-13.32	-14.92	-1.60	CoF2
CoF3	-44.92	-46.38	-1.46	CoF3
CoFe2O4	18.66	15.13	-3.53	CoFe2O4
CoMoO4	-5.64	-13.40	-7.76	CoMoO4
CoO	-4.84	8.75	13.59	CoO
CoS (alpha)	-70.73	-78.17	-7.44	CoS
CoS (beta)	-67.10	-78.17	-11.07	CoS
CoSe	-22.04	-38.24	-16.20	CoSe
CoSeO3	-7.79	-6.47	1.32	CoSeO3
CoSeO4:6H2O	-15.70	-17.23	-1.53	CoSeO4:6H2O
CoSO4	-12.45	-9.65	2.80	CoSO4
CoSO4:6H2O	-7.18	-9.65	-2.47	CoSO4:6H2O
Cotunnite	-9.43	-14.21	-4.78	PbCl2
Covellite	-56.21	-78.51	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.83	-31.74	14.09	CrCl2
CrCl3	-47.39	-32.28	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Cristobalite	-0.96	-4.31	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-9.08	-42.92	-33.84	Na3AlF6
Cu (OH) 2	-0.27	8.40	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.25	19.96	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.30	0.95	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.79	-89.68	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.54	-50.34	-45.80	Cu2Se
Cu2SO4	-19.80	-21.75	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-15.04	-8.94	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-25.43	-88.93	-63.49	Cu3Se2
CuCO3	-1.74	-13.24	-11.50	CuCO3
CuCrO4	-16.39	-21.83	-5.44	CuCrO4
CuF	-8.61	-13.51	-4.91	CuF

CuF2	-16.38	-15.26	1.12	CuF2
CuF2:2H2O	-10.71	-15.26	-4.55	CuF2:2H2O
Cumetal	-5.69	-14.45	-8.76	Cu
CuMoO4	-0.66	-13.74	-13.08	CuMoO4
CuOCuSO4	-11.89	-1.58	10.30	CuOCuSO4
Cupricferrite	8.80	14.79	5.99	CuFe2O4
Cuprite	-1.95	-3.36	-1.41	Cu2O
Cuprousferrite	10.43	1.51	-8.92	CuFeO2
CuSe	-5.48	-38.58	-33.10	CuSe
CuSe2	-26.66	-60.02	-33.37	CuSe2
CuSeO3:2H2O	-7.32	-6.81	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.13	-17.57	-2.44	CuSeO4:5H2O
CuSO4	-12.93	-9.99	2.94	CuSO4
Diaspore	2.21	9.09	6.87	AlOOH
Djurleite	-55.57	-89.49	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.02	-16.52	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.57	-16.52	-17.09	CaMg(CO3)2
Epsomite	-2.66	-4.79	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.12	0.08	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.98	-14.70	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.38	-8.83	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.63	-39.26	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-45.06	-48.80	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.28	-13.88	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.60	-18.69	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.38	-64.98	-18.60	FeSe2
FeS(ppt)	-80.51	-83.46	-2.95	FeS
FeSe	-32.54	-43.54	-11.00	FeSe
Fix_pe	-4.66	-4.66	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.42	-80.39	-13.97	PbS
Gibbsite	0.79	9.09	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.83	-7.84	-2.01	ZnSO4:7H2O
Greenalite	-19.09	1.72	20.81	Fe3Si2O5(OH)4
Greenockite	-64.73	-79.09	-14.36	CdS
Greigite	-292.78	-337.81	-45.03	Fe3S4
Gummite	-5.34	2.33	7.67	UO3
Gypsum	-0.62	-5.23	-4.61	CaSO4:2H2O
H-Jarosite	-15.11	-27.21	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.27	-22.14	-12.88	H2MoO4
H2S(g)	-78.90	-86.91	-8.01	H2S
H2Se(g)	-42.03	-46.99	-4.96	H2Se
Halite	-5.64	-4.04	1.60	NaCl
Halloysite	-0.03	9.54	9.57	Al2Si2O5(OH)4
Hausmannite	-0.80	60.23	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-1.27	21.62	22.89	FeAl2O4
Hg(CH3)2(g)	-185.04	-258.75	-73.71	Hg(CH3)2
Hg(g)	-7.17	-15.05	-7.87	Hg
Hg(OH)2	-7.60	-11.10	-3.50	Hg(OH)2
Hg2(g)	-15.14	-30.10	-14.96	Hg2
Hg2(OH)2	-9.81	-4.55	5.26	Hg2(OH)2
Hg2CO3	-10.15	-26.20	-16.05	Hg2CO3
Hg2CrO4	-26.09	-34.79	-8.70	Hg2CrO4
Hg2F2	-17.86	-28.22	-10.36	Hg2F2
Hg2S	-79.79	-91.46	-11.68	Hg2S
Hg2SeO3	-15.11	-19.76	-4.66	Hg2SeO3
Hg2SO4	-16.81	-22.94	-6.13	Hg2SO4
Hg3O2CO3	-25.25	-54.94	-29.68	Hg3O2CO3
HgCl(g)	-32.14	-12.64	19.50	HgCl
HgCl2	-10.57	-31.83	-21.26	HgCl2
HgF(g)	-46.78	-14.11	32.68	HgF
HgF2(g)	-47.33	-34.76	12.57	HgF2

Hgmetal (1)	-1.60	-15.05	-13.45	Hg
HgSe	-2.39	-58.08	-55.69	HgSe
HgSeO3	-13.88	-26.31	-12.43	HgSeO3
HgSO4	-20.07	-29.49	-9.42	HgSO4
Huntite	-2.62	-32.59	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-4.95	-23.72	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.77	-18.54	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.78	-21.95	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-6.65	-21.45	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.71	-48.96	-17.24	K2Cr2O7
K2CrO4	-18.21	-18.72	-0.51	K2CrO4
K2MoO4	-13.89	-10.63	3.26	K2MoO4
K2SeO4	-13.73	-14.46	-0.73	K2SeO4
Kaolinite	2.11	9.54	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-4.91	-5.35	-0.43	PbO : PbSO4
Laurionite	-4.47	-3.84	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.17	6.52	12.69	PbO
Mackinawite	-79.86	-83.46	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.13	19.99	16.86	Fe2MgO4
Magnesite	-0.58	-8.04	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	0.47	-4.84	-5.31	Cu2 (OH) 2CO3
Manganite	-1.01	24.33	25.34	MnOOH
Massicot	-6.37	6.52	12.89	PbO
Matlockite	-6.70	-15.68	-8.97	PbClF
Melanothallite	-18.58	-12.33	6.26	CuCl2
Melanterite	-12.74	-14.95	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.91	-98.01	-45.09	HgS
Mg (OH) 2 (active)	-5.18	13.61	18.79	Mg (OH) 2
Mg (VO3) 2	-15.82	-4.54	11.28	Mg (VO3) 2
Mg2Sb3	-272.80	-198.12	74.68	Mg2Sb3
Mg2V2O7	-17.29	9.07	26.36	Mg2V2O7
MgCr2O4	-4.95	11.25	16.20	MgCr2O4
MgCrO4	-22.01	-16.63	5.38	MgCrO4
MgF2	-1.93	-10.06	-8.13	MgF2
MgMoO4	-6.68	-8.53	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.66	-1.61	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.17	-12.37	-1.20	MgSeO4 : 6H2O
Minium	-28.41	45.12	73.52	Pb3O4
Mirabilite	-4.62	-5.74	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.49	-6.59	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-51.50	-57.21	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.13	-86.05	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.97	0.53	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.89	-9.17	2.72	MnCl2 : 4H2O
MnS (grn)	-75.52	-75.35	0.17	MnS
MnS (pnk)	-78.69	-75.35	3.34	MnS
MnSb	-94.51	-97.42	-2.91	MnSb
MnSe	-38.92	-35.42	3.50	MnSe
MnSeO3	-4.78	-3.65	1.13	MnSeO3
MnSeO3 : 2H2O	-4.63	-3.65	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.37	-14.42	-2.05	MnSeO4 : 5H2O
MnSO4	-9.41	-6.83	2.58	MnSO4
Monteponite	-7.28	7.82	15.10	CdO
Montroydite	-7.46	-11.10	-3.64	HgO
MoO3	-14.14	-22.14	-8.00	MoO3
Morenosite	-7.23	-9.37	-2.14	NiSO4 : 7H2O
MoS2	-151.25	-221.51	-70.26	MoS2
Na-Jarosite	-9.68	-20.88	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-37.92	-47.82	-9.90	Na2Cr2O7
Na2CrO4	-20.51	-17.58	2.93	Na2CrO4
Na2Mo2O7	-15.03	-31.63	-16.60	Na2Mo2O7
Na2MoO4	-10.97	-9.48	1.49	Na2MoO4
Na2MoO4 : 2H2O	-10.71	-9.48	1.22	Na2MoO4 : 2H2O

Na2SeO3:5H2O	-12.86	-2.56	10.30	Na2SeO3:5H2O
Na2SeO4	-14.60	-13.32	1.28	Na2SeO4
Na3Sb	-171.86	-77.41	94.45	Na3Sb
Na3VO4	-26.77	9.91	36.68	Na3VO4
Na4V2O7	-30.23	7.17	37.40	Na4V2O7
Nantokite	-5.31	-12.04	-6.73	CuCl
NaSb	-87.69	-64.53	23.17	NaSb
Natron	-7.68	-8.99	-1.31	Na2CO3:10H2O
NaVO3	-6.60	-2.75	3.86	NaVO3
Nesquehonite	-3.37	-8.04	-4.67	MgCO3:3H2O
Ni(OH)2	-3.77	9.02	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.78	-7.08	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.30	17.70	32.00	Ni4(OH)6SO4
NiCO3	-5.75	-12.62	-6.87	NiCO3
NiMoO4	-1.98	-13.12	-11.14	NiMoO4
NiS(alpha)	-72.29	-77.89	-5.60	NiS
NiS(beta)	-66.79	-77.89	-11.10	NiS
NiS(gamma)	-65.09	-77.89	-12.80	NiS
NiSe	-20.26	-37.96	-17.70	NiSe
NiSeO3:2H2O	-9.00	-6.19	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.44	-16.96	-1.52	NiSeO4:6H2O
Nsutite	-5.75	11.76	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-247.11	-308.18	-61.07	As2S3
Otavite	-1.82	-13.82	-12.00	CdCO3
Pb(BO2)2	-8.53	-2.01	6.52	Pb(BO2)2
Pb(OH)2	-1.63	6.52	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-55.89	-64.65	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.11	2.68	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.14	13.05	26.19	Pb2O(OH)2
Pb2O3	-22.45	38.59	61.04	Pb2O3
Pb2OCO3	-8.04	-8.60	-0.56	Pb2OCO3
Pb2V2O7	-3.21	-5.11	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.38	-14.58	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.72	1.42	6.14	Pb3(VO4)2
Pb3O2CO3	-13.10	-2.08	11.02	Pb3O2CO3
Pb3O2SO4	-9.51	1.18	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.40	7.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.18	7.70	21.88	Pb4O3SO4
PbCrO4	-11.11	-23.71	-12.60	PbCrO4
PbF2	-9.70	-17.14	-7.44	PbF2
Pbmetal	-23.27	-19.02	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.46	6.52	12.98	PbO:0.33H2O
PbSeO4	-12.61	-19.45	-6.84	PbSeO4
Periclase	-7.97	13.61	21.58	MgO
Phosgenite	-9.52	-29.33	-19.81	PbCl2:PbCO3
Plattnerite	-17.53	32.07	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-126.32	-144.83	-18.51	FeS2
Pyrochroite	-3.63	11.56	15.19	Mn(OH)2
Pyrolusite	-4.27	37.11	41.38	MnO2
Quartz	-0.31	-4.31	-4.00	SiO2
Realgar	-103.66	-123.41	-19.75	AsS
Retgersite	-7.33	-9.37	-2.04	NiSO4:6H2O
Rhodochrosite	0.50	-10.08	-10.58	MnCO3
Rutherfordine	-4.81	-19.31	-14.50	UO2CO3
Sb(OH)3	-12.66	-19.77	-7.11	Sb(OH)3
Sb2O4	-17.39	-13.99	3.40	Sb2O4
Sb2O5	-27.40	-37.06	-9.67	Sb2O5
Sb2Se3	-112.74	-180.49	-67.76	Sb2Se3
Sb4O6(cubic)	-60.80	-79.06	-18.26	Sb4O6
Sb4O6(orth)	-61.16	-79.06	-17.90	Sb4O6
SbCl3	-51.44	-50.86	0.57	SbCl3
SbF3	-45.04	-55.27	-10.23	SbF3
Sbmetal	-46.39	-58.08	-11.69	Sb
SbO2	-3.48	-31.30	-27.82	SbO2
Schoepite	-3.66	2.33	5.99	UO2(OH)2:H2O

Semetal (am)	-14.33	-21.44	-7.11	Se
Semetal (hex)	-13.73	-21.44	-7.71	Se
Senarmontite	-27.17	-39.53	-12.37	Sb2O3
SeO2	-15.34	-15.21	0.12	SeO2
SeO3	-47.02	-25.98	21.04	SeO3
Sepiolite	-1.49	14.27	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-4.51	14.27	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2 (am-gel)	-1.60	-4.31	-2.71	SiO2
SiO2 (am-ppt)	-1.57	-4.31	-2.74	SiO2
Smithsonite	-1.09	-11.09	-10.00	ZnCO3
Sphalerite	-64.91	-76.36	-11.45	ZnS
Spinel	-5.06	31.78	36.85	MgAl2O4
Stibnite	-249.81	-300.27	-50.46	Sb2S3
Sulfur	-59.22	-61.37	-2.14	S
Tenorite	0.76	8.40	7.64	CuO
Thenardite	-6.05	-5.73	0.32	Na2SO4
Thermonatrite	-9.62	-8.99	0.64	Na2CO3:H2O
Tyuyamunite	-4.40	-0.32	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-11.98	9.11	21.08	U3O8
U3Sb4	-579.97	-427.58	152.38	U3Sb4
U4O9	-27.41	-30.43	-3.02	U4O9
UF4	-31.79	-61.33	-29.54	UF4
UF4:2.5H2O	-28.61	-61.33	-32.72	UF4:2.5H2O
UO2 (am)	-14.93	-13.99	0.93	UO2
UO2 (NO3) 2	-41.54	-29.39	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.24	-29.39	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.78	-29.39	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.44	-29.39	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.28	2.33	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.39	-23.64	-2.25	UO2SeO4:4H2O
UO3	-5.37	2.33	7.70	UO3
Uraninite	-9.32	-13.99	-4.67	UO2
USb2	-220.04	-190.47	29.58	USb2
V (OH) 3	-19.61	-12.02	7.59	V (OH) 3
V2O5	-16.79	-18.15	-1.36	V2O5
V3O5	-42.22	-40.38	1.84	V3O5
V4O7	-52.51	-45.33	7.19	V4O7
V6O13	-44.69	-105.55	-60.86	V6O13
Valentinite	-31.05	-39.53	-8.48	Sb2O3
VC12	-64.40	-45.53	18.87	VC12
VC13	-66.55	-43.12	23.43	VC13
VF4	-67.21	-52.28	14.93	VF4
Vmetal	-94.36	-50.34	44.03	V
VO	-39.55	-24.79	14.76	VO
VO (OH) 2	-10.10	-4.95	5.15	VO (OH) 2
VO2Cl	-22.28	-19.44	2.84	VO2Cl
VOC1	-33.54	-22.39	11.15	VOC1
VOC12	-38.44	-25.68	12.76	VOC12
VOSO4	-26.95	-23.34	3.61	VOSO4
Witherite	-4.66	-13.23	-8.57	BaCO3
Wurtzite	-67.41	-76.36	-8.95	ZnS
Zincite	-0.78	10.55	11.33	ZnO
Zincosite	-11.77	-7.84	3.93	ZnSO4
Zn (BO2) 2	-6.27	2.02	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.49	-21.17	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.65	10.55	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-1.92	10.55	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.20	10.55	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-0.98	10.55	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.18	10.55	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.79	2.71	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.45	10.74	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-16.14	-2.49	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-24.04	-5.13	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.58	23.82	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.47	32.03	38.50	Zn5 (OH) 8Cl2
ZnCl2	-17.23	-10.18	7.05	ZnCl2

ZnCO3:1H2O	-0.83	-11.09	-10.26	ZnCO3:1H2O
ZnF2	-12.58	-13.11	-0.53	ZnF2
Znmetal	-40.78	-14.99	25.79	Zn
ZnMoO4	-1.46	-11.59	-10.13	ZnMoO4
ZnO(active)	-0.63	10.55	11.19	ZnO
ZnS(am)	-67.31	-76.36	-9.05	ZnS
ZnSb	-84.09	-73.07	11.01	ZnSb
ZnSe	-22.03	-36.43	-14.40	ZnSe
ZnSeO4:6H2O	-13.91	-15.43	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.20	-7.84	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 148.

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Title Stage 9 pit lake GW inflow
Title Stage 9 Groundwater mix
MIX 901
2      1
3      0
4      0
5      0
6      0
7      0
8      0
9      0
10     0.252297
11     2.047419
12     1.565236
13     3.681966
14     0
15     0
Save solution 901
end

```

TITLE

Stage 9 Groundwater mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 901.

Mixture 901.

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1.000e+00 Solution 2      JSAI September 2015 average groundwater chemistry
for wells GWQ96-22A, GWQ96-22B, GWQ96-23A and GWQ96-23B for samples collected
between 1996 and 2013
0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

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0.000e+00 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
2.523e-01 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
2.047e+00 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
1.565e+00 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
3.682e+00 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Ag	9.770e-09	8.350e-08
Al	5.506e-07	4.706e-06
As	4.780e-09	4.086e-08
B	1.878e-06	1.605e-05
Ba	1.757e-07	1.502e-06
C	1.455e-03	1.244e-02
Ca	6.536e-04	5.587e-03
Cd	1.387e-09	1.186e-08
Cl	2.018e-04	1.725e-03
Co	1.589e-08	1.359e-07
Cr	1.486e-08	1.270e-07
Cu	1.156e-06	9.878e-06
F	5.106e-05	4.364e-04
Fe	3.126e-06	2.672e-05
Hg	2.652e-11	2.266e-10
K	8.612e-05	7.361e-04
Mg	2.064e-04	1.764e-03
Mn	2.823e-06	2.413e-05
Mo	6.636e-08	5.672e-07
Na	5.855e-04	5.004e-03
Ni	2.494e-08	2.131e-07
Pb	3.112e-09	2.660e-08
S	4.299e-04	3.674e-03
Sb	1.555e-09	1.329e-08
Se	5.622e-09	4.805e-08
U	1.008e-08	8.614e-08
V	1.377e-08	1.177e-07
Zn	1.375e-07	1.175e-06

-----Description of solution-----

	pH	=	7.203	Charge balance
	pe	=	4.784	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	3.500e-03	
	Mass of water (kg)	=	8.547e+00	
	Total alkalinity (eq/kg)	=	1.293e-03	
	Total CO2 (mol/kg)	=	1.455e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.190e-17	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	13	
	Total H	=	9.488387e+02	

Total O = 4.744645e+02

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.717e-07	1.608e-07	-6.765	-6.794	-0.028	(0)
H+	6.676e-08	6.260e-08	-7.175	-7.203	-0.028	0.00
H2O	5.551e+01	9.999e-01	1.744	-0.000	0.000	18.07
Ag	9.770e-09					
Ag+	6.796e-09	6.372e-09	-8.168	-8.196	-0.028	(0)
AgCl	2.462e-09	2.462e-09	-8.609	-8.609	0.000	(0)
Ag2Se	2.136e-10	2.136e-10	-9.670	-9.670	0.000	(0)
AgCl2-	4.348e-11	4.056e-11	-10.362	-10.392	-0.030	(0)
AgSO4-	4.088e-11	3.813e-11	-10.389	-10.419	-0.030	(0)
AgF	7.492e-13	7.492e-13	-12.125	-12.125	0.000	(0)
AgOH	1.025e-13	1.025e-13	-12.989	-12.989	0.000	(0)
AgCl3-2	9.031e-15	6.840e-15	-14.044	-14.165	-0.121	(0)
AgH2BO3	1.743e-15	1.743e-15	-14.759	-14.759	0.000	(0)
AgSeO3-	1.306e-15	1.219e-15	-14.884	-14.914	-0.030	(0)
AgCl4-3	4.938e-18	2.642e-18	-17.306	-17.578	-0.272	(0)
Ag (OH) 2-	1.727e-18	1.611e-18	-17.763	-17.793	-0.030	(0)
Ag (SeO3) 2-3	6.066e-24	3.246e-24	-23.217	-23.489	-0.272	(0)
Ag2MoO4	7.876e-25	7.876e-25	-24.104	-24.104	0.000	(0)
AgHS	0.000e+00	0.000e+00	-67.346	-67.346	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.399	-77.881	-0.483	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-136.180	-136.210	-0.030	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-136.397	-136.490	-0.093	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.727	-0.190	(0)
AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.038	-0.185	(0)
Al	5.506e-07					
Al (OH) 4-	5.133e-07	4.816e-07	-6.290	-6.317	-0.028	(0)
Al (OH) 3	2.378e-08	2.378e-08	-7.624	-7.624	0.000	(0)
Al (OH) 2+	7.891e-09	7.410e-09	-8.103	-8.130	-0.027	(0)
AlF2+	3.349e-09	3.145e-09	-8.475	-8.502	-0.027	(0)
AlF3	1.853e-09	1.853e-09	-8.732	-8.732	0.000	(0)
AlF+2	2.171e-10	1.688e-10	-9.663	-9.773	-0.109	(0)
AlOH+2	7.459e-11	5.800e-11	-10.127	-10.237	-0.109	(0)
AlF4-	4.635e-11	4.348e-11	-10.334	-10.362	-0.028	(0)
AlSO4+	8.950e-13	8.396e-13	-12.048	-12.076	-0.028	(0)
Al+3	6.436e-13	3.606e-13	-12.191	-12.443	-0.252	(0)
Al (SO4) 2-	2.876e-15	2.698e-15	-14.541	-14.569	-0.028	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.142	-44.413	-0.272	(0)
As (3)	1.299e-19					
H3AsO3	1.288e-19	1.288e-19	-18.890	-18.890	0.000	(0)
H2AsO3-	1.131e-21	1.055e-21	-20.946	-20.977	-0.030	(0)
HAsO3-2	2.030e-26	1.538e-26	-25.692	-25.813	-0.121	(0)
H4AsO3+	4.282e-27	3.995e-27	-26.368	-26.398	-0.030	(0)
AsO3-3	1.769e-32	9.468e-33	-31.752	-32.024	-0.272	(0)
As (5)	4.780e-09					
HAsO4-2	3.266e-09	2.474e-09	-8.486	-8.607	-0.121	(0)
H2AsO4-	1.514e-09	1.412e-09	-8.820	-8.850	-0.030	(0)
AsO4-3	2.335e-13	1.250e-13	-12.632	-12.903	-0.272	(0)
H3AsO4	1.535e-14	1.536e-14	-13.814	-13.814	0.000	(0)
B	1.878e-06					
H3BO3	1.859e-06	1.860e-06	-5.731	-5.730	0.000	(0)
H2BO3-	1.844e-08	1.726e-08	-7.734	-7.763	-0.029	(0)
CaH2BO3+	4.997e-10	4.677e-10	-9.301	-9.330	-0.029	(0)
MgH2BO3+	9.651e-11	9.033e-11	-10.015	-10.044	-0.029	(0)
BF (OH) 3-	3.712e-11	3.474e-11	-10.430	-10.459	-0.029	(0)
NaH2BO3	1.498e-11	1.498e-11	-10.824	-10.824	0.000	(0)
BaH2BO3+	7.666e-14	7.174e-14	-13.115	-13.144	-0.029	(0)
H5 (BO3) 2-	2.919e-14	2.732e-14	-13.535	-13.563	-0.029	(0)
BF2 (OH) 2-	1.163e-14	1.088e-14	-13.934	-13.963	-0.029	(0)
AgH2BO3	1.743e-15	1.743e-15	-14.759	-14.759	0.000	(0)
H8 (BO3) 3-	5.430e-18	5.082e-18	-17.265	-17.294	-0.029	(0)
BF3OH-	1.326e-20	1.241e-20	-19.878	-19.906	-0.029	(0)

BF4-	1.911e-25	1.789e-25	-24.719	-24.747	-0.029	(0)
Ba	1.757e-07					
Ba+2	1.740e-07	1.345e-07	-6.759	-6.871	-0.112	(0)
BaHCO3+	1.631e-09	1.533e-09	-8.787	-8.814	-0.027	(0)
BaCO3	6.166e-11	6.166e-11	-10.210	-10.210	0.000	(0)
BaOH+	1.006e-13	9.445e-14	-12.997	-13.025	-0.028	(0)
BaH2BO3+	7.666e-14	7.174e-14	-13.115	-13.144	-0.029	(0)
C (4)	1.455e-03					
HCO3-	1.271e-03	1.193e-03	-2.896	-2.923	-0.027	(0)
H2CO3	1.680e-04	1.680e-04	-3.775	-3.775	0.000	(0)
CaHCO3+	1.114e-05	1.046e-05	-4.953	-4.980	-0.027	(0)
MgHCO3+	1.966e-06	1.843e-06	-5.706	-5.734	-0.028	(0)
CO3-2	1.156e-06	8.937e-07	-5.937	-6.049	-0.112	(0)
CuCO3	8.334e-07	8.334e-07	-6.079	-6.079	0.000	(0)
CaCO3	6.670e-07	6.670e-07	-6.176	-6.176	0.000	(0)
NaHCO3	3.676e-07	3.676e-07	-6.435	-6.435	0.000	(0)
MgCO3	1.122e-07	1.122e-07	-6.950	-6.950	0.000	(0)
MnHCO3+	5.109e-08	4.795e-08	-7.292	-7.319	-0.028	(0)
CuHCO3+	1.278e-08	1.192e-08	-7.893	-7.924	-0.030	(0)
NaCO3-	9.707e-09	9.115e-09	-8.013	-8.040	-0.027	(0)
UO2 (CO3) 2-2	8.795e-09	6.661e-09	-8.056	-8.176	-0.121	(0)
ZnCO3	4.807e-09	4.807e-09	-8.318	-8.318	0.000	(0)
ZnHCO3+	3.781e-09	3.527e-09	-8.422	-8.453	-0.030	(0)
Cu (CO3) 2-2	2.647e-09	2.005e-09	-8.577	-8.698	-0.121	(0)
NiHCO3+	2.540e-09	2.369e-09	-8.595	-8.625	-0.030	(0)
BaHCO3+	1.631e-09	1.533e-09	-8.787	-8.814	-0.027	(0)
PbCO3	1.511e-09	1.511e-09	-8.821	-8.821	0.000	(0)
FeHCO3+	1.065e-09	1.000e-09	-8.973	-9.000	-0.027	(0)
CoHCO3+	1.054e-09	9.832e-10	-8.977	-9.007	-0.030	(0)
UO2 (CO3) 3-4	9.067e-10	2.983e-10	-9.043	-9.525	-0.483	(0)
NiCO3	5.370e-10	5.370e-10	-9.270	-9.270	0.000	(0)
PbHCO3+	5.346e-10	4.987e-10	-9.272	-9.302	-0.030	(0)
UO2CO3	3.736e-10	3.736e-10	-9.428	-9.428	0.000	(0)
CoCO3	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
BaCO3	6.166e-11	6.166e-11	-10.210	-10.210	0.000	(0)
CdCO3	2.005e-11	2.005e-11	-10.698	-10.698	0.000	(0)
Pb (CO3) 2-2	5.142e-12	3.894e-12	-11.289	-11.410	-0.121	(0)
CdHCO3+	2.867e-12	2.674e-12	-11.543	-11.573	-0.030	(0)
Cd (CO3) 2-2	1.754e-14	1.328e-14	-13.756	-13.877	-0.121	(0)
HgCO3	1.135e-17	1.135e-17	-16.945	-16.945	0.000	(0)
Hg (CO3) 2-2	4.236e-20	3.208e-20	-19.373	-19.494	-0.121	(0)
HgHCO3+	1.419e-20	1.323e-20	-19.848	-19.878	-0.030	(0)
Ca	6.536e-04					
Ca+2	6.092e-04	4.709e-04	-3.215	-3.327	-0.112	(0)
CaSO4	3.236e-05	3.236e-05	-4.490	-4.490	0.000	(0)
CaHCO3+	1.114e-05	1.046e-05	-4.953	-4.980	-0.027	(0)
CaCO3	6.670e-07	6.670e-07	-6.176	-6.176	0.000	(0)
CaF+	2.563e-07	2.406e-07	-6.591	-6.619	-0.028	(0)
CaOH+	1.608e-09	1.511e-09	-8.794	-8.821	-0.027	(0)
CaH2BO3+	4.997e-10	4.677e-10	-9.301	-9.330	-0.029	(0)
Cd	1.387e-09					
Cd+2	1.273e-09	9.844e-10	-8.895	-9.007	-0.112	(0)
CdSO4	6.921e-11	6.921e-11	-10.160	-10.160	0.000	(0)
CdCO3	2.005e-11	2.005e-11	-10.698	-10.698	0.000	(0)
CdCl+	1.907e-11	1.779e-11	-10.720	-10.750	-0.030	(0)
CdHCO3+	2.867e-12	2.674e-12	-11.543	-11.573	-0.030	(0)
CdOH+	1.348e-12	1.258e-12	-11.870	-11.900	-0.030	(0)
CdF+	7.828e-13	7.303e-13	-12.106	-12.137	-0.030	(0)
Cd (SO4) 2-2	3.697e-13	2.800e-13	-12.432	-12.553	-0.121	(0)
CdOHC1	1.174e-13	1.174e-13	-12.931	-12.931	0.000	(0)
Cd (CO3) 2-2	1.754e-14	1.328e-14	-13.756	-13.877	-0.121	(0)
CdCl2	1.403e-14	1.403e-14	-13.853	-13.853	0.000	(0)
Cd (OH) 2	1.276e-15	1.276e-15	-14.894	-14.894	0.000	(0)
CdF2	6.820e-17	6.820e-17	-16.166	-16.166	0.000	(0)
CdCl3-	1.795e-18	1.675e-18	-17.746	-17.776	-0.030	(0)
Cd (OH) 3-	1.344e-20	1.254e-20	-19.871	-19.902	-0.030	(0)
Cd2OH+3	1.160e-20	6.205e-21	-19.936	-20.207	-0.272	(0)
CdSeO4	6.357e-21	6.357e-21	-20.197	-20.197	0.000	(0)

	Cd (SeO3) 2-2	9.483e-23	7.182e-23	-22.023	-22.144	-0.121	(0)
	Cd (OH) 4-2	4.360e-28	3.302e-28	-27.361	-27.481	-0.121	(0)
	CdHS+	0.000e+00	0.000e+00	-73.933	-73.963	-0.030	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-139.724	-139.724	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-210.758	-210.788	-0.030	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-281.436	-281.557	-0.121	(0)
Cl	2.018e-04						
	Cl-	2.018e-04	1.892e-04	-3.695	-3.723	-0.028	(0)
	AgCl	2.462e-09	2.462e-09	-8.609	-8.609	0.000	(0)
	MnCl+	5.111e-10	4.797e-10	-9.292	-9.319	-0.028	(0)
	CuCl	3.039e-10	3.039e-10	-9.517	-9.517	0.000	(0)
	CuCl+	5.065e-11	4.749e-11	-10.295	-10.323	-0.028	(0)
	ZnCl+	4.738e-11	4.442e-11	-10.324	-10.352	-0.028	(0)
	AgCl2-	4.348e-11	4.056e-11	-10.362	-10.392	-0.030	(0)
	CdCl+	1.907e-11	1.779e-11	-10.720	-10.750	-0.030	(0)
	CuCl2-	1.281e-11	1.201e-11	-10.892	-10.920	-0.028	(0)
	ZnOHCl	9.354e-12	9.354e-12	-11.029	-11.029	0.000	(0)
	NiCl+	8.357e-12	7.796e-12	-11.078	-11.108	-0.030	(0)
	CoCl+	7.432e-12	6.933e-12	-11.129	-11.159	-0.030	(0)
	PbCl+	4.047e-12	3.776e-12	-11.393	-11.423	-0.030	(0)
	MnCl2	1.282e-13	1.282e-13	-12.892	-12.892	0.000	(0)
	CdOHCl	1.174e-13	1.174e-13	-12.931	-12.931	0.000	(0)
	CdCl2	1.403e-14	1.403e-14	-13.853	-13.853	0.000	(0)
	ZnCl2	1.332e-14	1.332e-14	-13.875	-13.875	0.000	(0)
	AgCl3-2	9.031e-15	6.840e-15	-14.044	-14.165	-0.121	(0)
	PbCl2	3.191e-15	3.191e-15	-14.496	-14.496	0.000	(0)
	CuCl2	3.115e-15	3.115e-15	-14.506	-14.506	0.000	(0)
	CuCl3-2	6.260e-16	4.860e-16	-15.203	-15.313	-0.110	(0)
	HgClOH	5.705e-16	5.705e-16	-15.244	-15.244	0.000	(0)
	CrCl+2	5.793e-17	4.387e-17	-16.237	-16.358	-0.121	(0)
	HgCl2	3.800e-17	3.800e-17	-16.420	-16.420	0.000	(0)
	UO2Cl+	3.454e-17	3.222e-17	-16.462	-16.492	-0.030	(0)
	NiCl2	7.427e-18	7.427e-18	-17.129	-17.129	0.000	(0)
	MnCl3-	7.118e-18	6.681e-18	-17.148	-17.175	-0.028	(0)
	AgCl4-3	4.938e-18	2.642e-18	-17.306	-17.578	-0.272	(0)
	FeCl+2	2.768e-18	2.149e-18	-17.558	-17.668	-0.110	(0)
	ZnCl3-	2.135e-18	2.002e-18	-17.671	-17.699	-0.028	(0)
	CdCl3-	1.795e-18	1.675e-18	-17.746	-17.776	-0.030	(0)
	PbCl3-	2.576e-19	2.404e-19	-18.589	-18.619	-0.030	(0)
	HgCl3-	7.707e-20	7.190e-20	-19.113	-19.143	-0.030	(0)
	HgCl+	4.296e-20	4.007e-20	-19.367	-19.397	-0.030	(0)
	CrOHCl2	2.538e-20	2.538e-20	-19.596	-19.596	0.000	(0)
	CuCl3-	5.867e-21	5.501e-21	-20.232	-20.260	-0.028	(0)
	VOCl+	2.805e-21	2.617e-21	-20.552	-20.582	-0.030	(0)
	FeCl2+	1.935e-21	1.816e-21	-20.713	-20.741	-0.028	(0)
	CrCl2+	8.443e-22	7.876e-22	-21.074	-21.104	-0.030	(0)
	ZnCl4-2	2.440e-22	1.894e-22	-21.613	-21.723	-0.110	(0)
	HgCl4-2	7.150e-23	5.415e-23	-22.146	-22.266	-0.121	(0)
	PbCl4-2	2.745e-23	2.079e-23	-22.562	-22.682	-0.121	(0)
	FeCl3	3.436e-26	3.436e-26	-25.464	-25.464	0.000	(0)
	CuCl4-2	6.720e-27	5.216e-27	-26.173	-26.283	-0.110	(0)
	CrO3Cl-	3.135e-29	2.924e-29	-28.504	-28.534	-0.030	(0)
	CoCl+2	1.303e-37	9.869e-38	-36.885	-37.006	-0.121	(0)
	UCl+3	0.000e+00	0.000e+00	-43.896	-44.167	-0.272	(0)
Co (2)	1.589e-08						
	Co+2	1.399e-08	1.059e-08	-7.854	-7.975	-0.121	(0)
	CoHCO3+	1.054e-09	9.832e-10	-8.977	-9.007	-0.030	(0)
	CoSO4	6.339e-10	6.339e-10	-9.198	-9.198	0.000	(0)
	CoCO3	1.600e-10	1.600e-10	-9.796	-9.796	0.000	(0)
	CoOH+	3.644e-11	3.399e-11	-10.438	-10.469	-0.030	(0)
	CoF+	1.681e-11	1.568e-11	-10.775	-10.805	-0.030	(0)
	CoCl+	7.432e-12	6.933e-12	-11.129	-11.159	-0.030	(0)
	Co (OH) 2	4.343e-13	4.343e-13	-12.362	-12.362	0.000	(0)
	Co (OH) 3-	1.494e-18	1.394e-18	-17.826	-17.856	-0.030	(0)
	CoOOH-	3.749e-19	3.497e-19	-18.426	-18.456	-0.030	(0)
	CoSeO4	1.841e-19	1.841e-19	-18.735	-18.735	0.000	(0)
	Co2OH+3	3.373e-20	1.805e-20	-19.472	-19.744	-0.272	(0)
	Co (OH) 4-2	4.692e-26	3.553e-26	-25.329	-25.449	-0.121	(0)

Co4 (OH) 4+4	8.098e-34	2.665e-34	-33.092	-33.574	-0.483	(0)
Co (3)	2.767e-30					
CoOH+2	2.767e-30	2.095e-30	-29.558	-29.679	-0.121	(0)
Co+3	4.575e-36	2.564e-36	-35.340	-35.591	-0.252	(0)
CoCl+2	1.303e-37	9.869e-38	-36.885	-37.006	-0.121	(0)
Cr (2)	9.296e-25					
Cr+2	9.296e-25	7.041e-25	-24.032	-24.152	-0.121	(0)
Cr (3)	1.486e-08					
Cr (OH) 2+	1.323e-08	1.234e-08	-7.879	-7.909	-0.030	(0)
Cr (OH) +2	8.324e-10	6.305e-10	-9.080	-9.200	-0.121	(0)
Cr (OH) 3	7.456e-10	7.456e-10	-9.128	-9.128	0.000	(0)
CrOHSO4	4.487e-11	4.487e-11	-10.348	-10.348	0.000	(0)
CrO2-	6.063e-12	5.656e-12	-11.217	-11.247	-0.030	(0)
Cr (OH) 4-	5.118e-12	4.774e-12	-11.291	-11.321	-0.030	(0)
CrF+2	1.755e-12	1.329e-12	-11.756	-11.876	-0.121	(0)
Cr+3	3.348e-13	1.792e-13	-12.475	-12.747	-0.272	(0)
CrSO4+	1.345e-13	1.255e-13	-12.871	-12.901	-0.030	(0)
CrCl+2	5.793e-17	4.387e-17	-16.237	-16.358	-0.121	(0)
Cr2 (OH) 2SO4+2	3.376e-18	2.557e-18	-17.472	-17.592	-0.121	(0)
Cr2 (OH) 2 (SO4) 2	4.556e-20	4.556e-20	-19.341	-19.341	0.000	(0)
CrOHCl2	2.538e-20	2.538e-20	-19.596	-19.596	0.000	(0)
CrCl2+	8.443e-22	7.876e-22	-21.074	-21.104	-0.030	(0)
Cr (6)	2.934e-18					
CrO4-2	2.507e-18	1.938e-18	-17.601	-17.713	-0.112	(0)
HCrO4-	4.208e-19	3.926e-19	-18.376	-18.406	-0.030	(0)
NaCrO4-	5.655e-21	5.275e-21	-20.248	-20.278	-0.030	(0)
KCrO4-	6.220e-22	5.802e-22	-21.206	-21.236	-0.030	(0)
H2CrO4	1.992e-26	1.992e-26	-25.701	-25.701	0.000	(0)
CrO3SO4-2	2.964e-27	2.245e-27	-26.528	-26.649	-0.121	(0)
CrO3Cl-	3.135e-29	2.924e-29	-28.504	-28.534	-0.030	(0)
Cr2O7-2	7.056e-36	5.344e-36	-35.151	-35.272	-0.121	(0)
Cu (1)	1.684e-09					
Cu+	1.368e-09	1.276e-09	-8.864	-8.894	-0.030	(0)
CuCl	3.039e-10	3.039e-10	-9.517	-9.517	0.000	(0)
CuCl2-	1.281e-11	1.201e-11	-10.892	-10.920	-0.028	(0)
CuCl3-2	6.260e-16	4.860e-16	-15.203	-15.313	-0.110	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-136.839	-137.026	-0.188	(0)
CuS4S5-3	0.000e+00	0.000e+00	-137.574	-137.756	-0.183	(0)
Cu (2)	1.154e-06					
CuCO3	8.334e-07	8.334e-07	-6.079	-6.079	0.000	(0)
Cu+2	2.049e-07	1.584e-07	-6.689	-6.800	-0.112	(0)
CuOH+	8.592e-08	8.055e-08	-7.066	-7.094	-0.028	(0)
CuHCO3+	1.278e-08	1.192e-08	-7.893	-7.924	-0.030	(0)
CuSO4	1.088e-08	1.088e-08	-7.963	-7.963	0.000	(0)
Cu (CO3) 2-2	2.647e-09	2.005e-09	-8.577	-8.698	-0.121	(0)
Cu (OH) 2	2.585e-09	2.585e-09	-8.588	-8.588	0.000	(0)
CuF+	5.014e-10	4.677e-10	-9.300	-9.330	-0.030	(0)
Cu2 (OH) 2+2	2.152e-10	1.630e-10	-9.667	-9.788	-0.121	(0)
CuCl+	5.065e-11	4.749e-11	-10.295	-10.323	-0.028	(0)
Cu (OH) 3-	9.142e-13	8.529e-13	-12.039	-12.069	-0.030	(0)
CuCl2	3.115e-15	3.115e-15	-14.506	-14.506	0.000	(0)
Cu (OH) 4-2	1.426e-18	1.080e-18	-17.846	-17.967	-0.121	(0)
CuCl3-	5.867e-21	5.501e-21	-20.232	-20.260	-0.028	(0)
CuCl4-2	6.720e-27	5.216e-27	-26.173	-26.283	-0.110	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-199.765	-199.795	-0.030	(0)
F	5.106e-05					
F-	4.992e-05	4.681e-05	-4.302	-4.330	-0.028	(0)
MgF+	8.451e-07	7.928e-07	-6.073	-6.101	-0.028	(0)
CaF+	2.563e-07	2.406e-07	-6.591	-6.619	-0.028	(0)
NaF	1.618e-08	1.618e-08	-7.791	-7.791	0.000	(0)
HF	4.334e-09	4.334e-09	-8.363	-8.363	0.000	(0)
MnF+	3.998e-09	3.753e-09	-8.398	-8.426	-0.028	(0)
AlF2+	3.349e-09	3.145e-09	-8.475	-8.502	-0.027	(0)
AlF3	1.853e-09	1.853e-09	-8.732	-8.732	0.000	(0)
CuF+	5.014e-10	4.677e-10	-9.300	-9.330	-0.030	(0)
AlF+2	2.171e-10	1.688e-10	-9.663	-9.773	-0.109	(0)
ZnF+	9.358e-11	8.730e-11	-10.029	-10.059	-0.030	(0)
AlF4-	4.635e-11	4.348e-11	-10.334	-10.362	-0.028	(0)

BF(OH) 3-	3.712e-11	3.474e-11	-10.430	-10.459	-0.029	(0)
NiF+	2.030e-11	1.894e-11	-10.693	-10.723	-0.030	(0)
CoF+	1.681e-11	1.568e-11	-10.775	-10.805	-0.030	(0)
PbF+	1.989e-12	1.855e-12	-11.701	-11.732	-0.030	(0)
CrF+2	1.755e-12	1.329e-12	-11.756	-11.876	-0.121	(0)
HF2-	8.231e-13	7.713e-13	-12.085	-12.113	-0.028	(0)
CdF+	7.828e-13	7.303e-13	-12.106	-12.137	-0.030	(0)
AgF	7.492e-13	7.492e-13	-12.125	-12.125	0.000	(0)
UO2F+	7.272e-13	6.784e-13	-12.138	-12.168	-0.030	(0)
UO2F2	9.158e-14	9.158e-14	-13.038	-13.038	0.000	(0)
FeF2+	2.576e-14	2.418e-14	-13.589	-13.617	-0.028	(0)
FeF+2	2.487e-14	1.930e-14	-13.604	-13.714	-0.110	(0)
BF2(OH) 2-	1.163e-14	1.088e-14	-13.934	-13.963	-0.029	(0)
PbF2	1.709e-15	1.709e-15	-14.767	-14.767	0.000	(0)
FeF3	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
UO2F3-	1.154e-15	1.077e-15	-14.938	-14.968	-0.030	(0)
VO2F	7.850e-17	7.850e-17	-16.105	-16.105	0.000	(0)
CdF2	6.820e-17	6.820e-17	-16.166	-16.166	0.000	(0)
H2F2	5.032e-17	5.032e-17	-16.298	-16.298	0.000	(0)
VOF+	1.484e-18	1.384e-18	-17.829	-17.859	-0.030	(0)
VO2F2-	1.430e-18	1.334e-18	-17.845	-17.875	-0.030	(0)
UO2F4-2	5.286e-19	4.004e-19	-18.277	-18.398	-0.121	(0)
PbF3-	1.626e-19	1.517e-19	-18.789	-18.819	-0.030	(0)
VOF2	2.429e-20	2.429e-20	-19.614	-19.614	0.000	(0)
BF3OH-	1.326e-20	1.241e-20	-19.878	-19.906	-0.029	(0)
VO2F3-2	1.028e-21	7.789e-22	-20.988	-21.108	-0.121	(0)
VOF3-	4.325e-23	4.035e-23	-22.364	-22.394	-0.030	(0)
PbF4-2	4.488e-24	3.399e-24	-23.348	-23.469	-0.121	(0)
Sb(OH) 2F	1.052e-24	1.052e-24	-23.978	-23.978	0.000	(0)
SbOF	1.034e-24	1.034e-24	-23.985	-23.985	0.000	(0)
BF4-	1.911e-25	1.789e-25	-24.719	-24.747	-0.029	(0)
VO2F4-3	3.353e-26	1.794e-26	-25.475	-25.746	-0.272	(0)
HgF+	1.974e-26	1.842e-26	-25.705	-25.735	-0.030	(0)
VOF4-2	1.007e-26	7.623e-27	-25.997	-26.118	-0.121	(0)
UF3+	3.140e-34	2.929e-34	-33.503	-33.533	-0.030	(0)
UF2+2	5.214e-35	3.949e-35	-34.283	-34.404	-0.121	(0)
UF4	1.503e-36	1.503e-36	-35.823	-35.823	0.000	(0)
UF+3	1.252e-37	6.701e-38	-36.902	-37.174	-0.272	(0)
UF5-	2.989e-39	2.789e-39	-38.524	-38.555	-0.030	(0)
UF6-2	0.000e+00	0.000e+00	-40.284	-40.404	-0.121	(0)
Fe (2)	9.435e-08					
Fe+2	8.793e-08	6.660e-08	-7.056	-7.177	-0.121	(0)
FeSO4	4.903e-09	4.903e-09	-8.310	-8.310	0.000	(0)
FeHCO3+	1.065e-09	1.000e-09	-8.973	-9.000	-0.027	(0)
FeOH+	4.543e-10	4.264e-10	-9.343	-9.370	-0.028	(0)
Fe(OH) 2	5.448e-14	5.448e-14	-13.264	-13.264	0.000	(0)
Fe(OH) 3-	2.952e-15	2.771e-15	-14.530	-14.557	-0.028	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-144.156	-144.156	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-215.053	-215.083	-0.030	(0)
Fe (3)	3.032e-06					
Fe(OH) 2+	2.603e-06	2.444e-06	-5.585	-5.612	-0.027	(0)
Fe(OH) 3	4.222e-07	4.222e-07	-6.374	-6.374	0.000	(0)
Fe(OH) 4-	6.733e-09	6.323e-09	-8.172	-8.199	-0.027	(0)
FeOH+2	5.032e-11	3.906e-11	-10.298	-10.408	-0.110	(0)
FeF2+	2.576e-14	2.418e-14	-13.589	-13.617	-0.028	(0)
FeF+2	2.487e-14	1.930e-14	-13.604	-13.714	-0.110	(0)
FeF3	1.597e-15	1.597e-15	-14.797	-14.797	0.000	(0)
FeSO4+	1.348e-15	1.266e-15	-14.870	-14.898	-0.028	(0)
Fe+3	6.712e-16	3.761e-16	-15.173	-15.425	-0.252	(0)
Fe(SO4) 2-	8.700e-18	8.116e-18	-17.060	-17.091	-0.030	(0)
FeCl+2	2.768e-18	2.149e-18	-17.558	-17.668	-0.110	(0)
Fe2(OH) 2+4	1.535e-19	5.051e-20	-18.814	-19.297	-0.483	(0)
FeHSeO3+2	6.139e-21	4.650e-21	-20.212	-20.333	-0.121	(0)
FeCl2+	1.935e-21	1.816e-21	-20.713	-20.741	-0.028	(0)
Fe3(OH) 4+5	1.014e-23	1.785e-24	-22.994	-23.748	-0.754	(0)
FeCl3	3.436e-26	3.436e-26	-25.464	-25.464	0.000	(0)
H (0)	1.500e-27					
H2	7.501e-28	7.507e-28	-27.125	-27.125	0.000	(0)

Hg (0)	2.651e-11					
Hg	2.651e-11	2.651e-11	-10.577	-10.577	0.000	(0)
Hg (1)	5.046e-25					
Hg2+2	2.523e-25	1.911e-25	-24.598	-24.719	-0.121	(0)
Hg (2)	2.352e-15					
Hg (OH) 2	1.731e-15	1.733e-15	-14.762	-14.761	0.000	(0)
HgClOH	5.705e-16	5.705e-16	-15.244	-15.244	0.000	(0)
HgCl2	3.800e-17	3.800e-17	-16.420	-16.420	0.000	(0)
HgCO3	1.135e-17	1.135e-17	-16.945	-16.945	0.000	(0)
HgCl3-	7.707e-20	7.190e-20	-19.113	-19.143	-0.030	(0)
HgOH+	7.287e-20	6.798e-20	-19.137	-19.168	-0.030	(0)
HgCl+	4.296e-20	4.007e-20	-19.367	-19.397	-0.030	(0)
Hg (CO3) 2-2	4.236e-20	3.208e-20	-19.373	-19.494	-0.121	(0)
HgHCO3+	1.419e-20	1.323e-20	-19.848	-19.878	-0.030	(0)
HgCl4-2	7.150e-23	5.415e-23	-22.146	-22.266	-0.121	(0)
Hg (OH) 3-	3.761e-23	3.509e-23	-22.425	-22.455	-0.030	(0)
Hg+2	1.402e-23	1.062e-23	-22.853	-22.974	-0.121	(0)
HgSO4	8.336e-25	8.336e-25	-24.079	-24.079	0.000	(0)
HgF+	1.974e-26	1.842e-26	-25.705	-25.735	-0.030	(0)
HgHS2-	0.000e+00	0.000e+00	-129.742	-129.772	-0.030	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-130.581	-130.581	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-131.156	-131.276	-0.121	(0)
K	8.612e-05					
K+	8.594e-05	8.058e-05	-4.066	-4.094	-0.028	(0)
KSO4-	1.822e-07	1.711e-07	-6.739	-6.767	-0.027	(0)
KCrO4-	6.220e-22	5.802e-22	-21.206	-21.236	-0.030	(0)
Mg	2.064e-04					
Mg+2	1.953e-04	1.510e-04	-3.709	-3.821	-0.112	(0)
MgSO4	8.239e-06	8.239e-06	-5.084	-5.084	0.000	(0)
MgHCO3+	1.966e-06	1.843e-06	-5.706	-5.734	-0.028	(0)
MgF+	8.451e-07	7.928e-07	-6.073	-6.101	-0.028	(0)
MgCO3	1.122e-07	1.122e-07	-6.950	-6.950	0.000	(0)
MgOH+	1.028e-08	9.666e-09	-7.988	-8.015	-0.027	(0)
MgH2BO3+	9.651e-11	9.033e-11	-10.015	-10.044	-0.029	(0)
Mn (2)	2.823e-06					
Mn+2	2.659e-06	2.014e-06	-5.575	-5.696	-0.121	(0)
MnSO4	1.074e-07	1.074e-07	-6.969	-6.969	0.000	(0)
MnHCO3+	5.109e-08	4.795e-08	-7.292	-7.319	-0.028	(0)
MnF+	3.998e-09	3.753e-09	-8.398	-8.426	-0.028	(0)
MnOH+	8.669e-10	8.137e-10	-9.062	-9.090	-0.028	(0)
MnCl+	5.111e-10	4.797e-10	-9.292	-9.319	-0.028	(0)
MnCl2	1.282e-13	1.282e-13	-12.892	-12.892	0.000	(0)
MnSeO4	1.880e-17	1.880e-17	-16.726	-16.726	0.000	(0)
MnCl3-	7.118e-18	6.681e-18	-17.148	-17.175	-0.028	(0)
Mn (OH) 3-	1.386e-19	1.301e-19	-18.858	-18.886	-0.028	(0)
Mn (OH) 4-2	8.704e-26	6.756e-26	-25.060	-25.170	-0.110	(0)
MnSe	5.358e-40	5.358e-40	-39.271	-39.271	0.000	(0)
Mn (3)	9.761e-27					
Mn+3	9.761e-27	5.469e-27	-26.011	-26.262	-0.252	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-47.245	-47.355	-0.110	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-51.915	-51.943	-0.029	(0)
Mo	6.636e-08					
MoO4-2	6.629e-08	5.124e-08	-7.179	-7.290	-0.112	(0)
HMoO4-	6.842e-11	6.383e-11	-10.165	-10.195	-0.030	(0)
H2MoO4	2.927e-14	2.927e-14	-13.534	-13.534	0.000	(0)
Ag2MoO4	7.876e-25	7.876e-25	-24.104	-24.104	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-44.142	-44.413	-0.272	(0)
Mo7O24-6	0.000e+00	0.000e+00	-54.584	-55.670	-1.086	(0)
HMo7O24-5	0.000e+00	0.000e+00	-55.732	-56.487	-0.754	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-58.425	-58.908	-0.483	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-62.594	-62.865	-0.272	(0)
Na	5.855e-04					
Na+	5.842e-04	5.478e-04	-3.233	-3.261	-0.028	(0)
NaSO4-	9.395e-07	8.823e-07	-6.027	-6.054	-0.027	(0)
NaHCO3	3.676e-07	3.676e-07	-6.435	-6.435	0.000	(0)
NaF	1.618e-08	1.618e-08	-7.791	-7.791	0.000	(0)

	NaCO3-	9.707e-09	9.115e-09	-8.013	-8.040	-0.027	(0)
	NaH2BO3	1.498e-11	1.498e-11	-10.824	-10.824	0.000	(0)
	NaCrO4-	5.655e-21	5.275e-21	-20.248	-20.278	-0.030	(0)
Ni	2.494e-08						
	Ni+2	2.083e-08	1.611e-08	-7.681	-7.793	-0.112	(0)
	NiHCO3+	2.540e-09	2.369e-09	-8.595	-8.625	-0.030	(0)
	NiSO4	9.638e-10	9.638e-10	-9.016	-9.016	0.000	(0)
	NiCO3	5.370e-10	5.370e-10	-9.270	-9.270	0.000	(0)
	NiOH+	3.496e-11	3.261e-11	-10.456	-10.487	-0.030	(0)
	NiF+	2.030e-11	1.894e-11	-10.693	-10.723	-0.030	(0)
	NiCl+	8.357e-12	7.796e-12	-11.078	-11.108	-0.030	(0)
	Ni(OH) 2	4.167e-13	4.167e-13	-12.380	-12.380	0.000	(0)
	Ni(SO4) 2-2	1.264e-14	9.572e-15	-13.898	-14.019	-0.121	(0)
	Ni(OH) 3-	7.184e-17	6.702e-17	-16.144	-16.174	-0.030	(0)
	NiCl2	7.427e-18	7.427e-18	-17.129	-17.129	0.000	(0)
	NiSeO4	2.612e-19	2.612e-19	-18.583	-18.583	0.000	(0)
O(0)	1.797e-38						
	O2	8.987e-39	8.995e-39	-38.046	-38.046	0.000	(0)
Pb	3.112e-09						
	PbCO3	1.511e-09	1.511e-09	-8.821	-8.821	0.000	(0)
	Pb+2	7.276e-10	5.625e-10	-9.138	-9.250	-0.112	(0)
	PbHCO3+	5.346e-10	4.987e-10	-9.272	-9.302	-0.030	(0)
	PbOH+	2.436e-10	2.272e-10	-9.613	-9.644	-0.030	(0)
	PbSO4	8.262e-11	8.262e-11	-10.083	-10.083	0.000	(0)
	Pb(CO3) 2-2	5.142e-12	3.894e-12	-11.289	-11.410	-0.121	(0)
	PbCl+	4.047e-12	3.776e-12	-11.393	-11.423	-0.030	(0)
	PbF+	1.989e-12	1.855e-12	-11.701	-11.732	-0.030	(0)
	Pb(OH) 2	1.156e-12	1.156e-12	-11.937	-11.937	0.000	(0)
	Pb(SO4) 2-2	1.972e-13	1.493e-13	-12.705	-12.826	-0.121	(0)
	PbCl2	3.191e-15	3.191e-15	-14.496	-14.496	0.000	(0)
	PbF2	1.709e-15	1.709e-15	-14.767	-14.767	0.000	(0)
	Pb(OH) 3-	1.993e-16	1.859e-16	-15.701	-15.731	-0.030	(0)
	Pb2OH+3	3.786e-18	2.026e-18	-17.422	-17.693	-0.272	(0)
	PbCl3-	2.576e-19	2.404e-19	-18.589	-18.619	-0.030	(0)
	PbF3-	1.626e-19	1.517e-19	-18.789	-18.819	-0.030	(0)
	Pb(OH) 4-2	9.670e-21	7.323e-21	-20.015	-20.135	-0.121	(0)
	PbCl4-2	2.745e-23	2.079e-23	-22.562	-22.682	-0.121	(0)
	Pb3(OH) 4+2	1.980e-23	1.499e-23	-22.703	-22.824	-0.121	(0)
	PbF4-2	4.488e-24	3.399e-24	-23.348	-23.469	-0.121	(0)
	Pb4(OH) 4+4	2.036e-28	6.698e-29	-27.691	-28.174	-0.483	(0)
	Pb(HS) 2	0.000e+00	0.000e+00	-139.909	-139.909	0.000	(0)
	Pb(HS) 3-	0.000e+00	0.000e+00	-211.543	-211.574	-0.030	(0)
S(-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-67.346	-67.346	0.000	(0)
	HS-	0.000e+00	0.000e+00	-72.934	-72.965	-0.030	(0)
	H2S	0.000e+00	0.000e+00	-73.148	-73.148	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-73.933	-73.963	-0.030	(0)
	S5-2	0.000e+00	0.000e+00	-75.006	-75.126	-0.121	(0)
	S6-2	0.000e+00	0.000e+00	-75.521	-75.642	-0.121	(0)
	S4-2	0.000e+00	0.000e+00	-75.601	-75.722	-0.121	(0)
	S3-2	0.000e+00	0.000e+00	-76.407	-76.528	-0.121	(0)
	S2-2	0.000e+00	0.000e+00	-77.423	-77.544	-0.121	(0)
	S-2	0.000e+00	0.000e+00	-82.951	-83.061	-0.110	(0)
	HgHS2-	0.000e+00	0.000e+00	-129.742	-129.772	-0.030	(0)
	Hg(HS) 2	0.000e+00	0.000e+00	-130.581	-130.581	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-131.156	-131.276	-0.121	(0)
	Ag(HS) 2-	0.000e+00	0.000e+00	-136.180	-136.210	-0.030	(0)
	Ag(HS) S4-2	0.000e+00	0.000e+00	-136.397	-136.490	-0.093	(0)
	Cu(S4) 2-3	0.000e+00	0.000e+00	-136.839	-137.026	-0.188	(0)
	CuS4S5-3	0.000e+00	0.000e+00	-137.574	-137.756	-0.183	(0)
	Ag(S4) 2-3	0.000e+00	0.000e+00	-138.537	-138.727	-0.190	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-138.853	-139.038	-0.185	(0)
	ZnS(HS) -	0.000e+00	0.000e+00	-138.915	-138.945	-0.030	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-139.724	-139.724	0.000	(0)
	Pb(HS) 2	0.000e+00	0.000e+00	-139.909	-139.909	0.000	(0)
	Zn(HS) 2	0.000e+00	0.000e+00	-140.138	-140.138	0.000	(0)
	Fe(HS) 2	0.000e+00	0.000e+00	-144.156	-144.156	0.000	(0)
	Cu(HS) 3-	0.000e+00	0.000e+00	-199.765	-199.795	-0.030	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-209.793	-209.823	-0.030	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-210.758	-210.788	-0.030	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-211.543	-211.574	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.479	-212.599	-0.121	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-215.053	-215.083	-0.030	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-281.436	-281.557	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.127	-284.247	-0.121	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.033	-294.154	-0.121	(0)
S (6)	4.299e-04					
SO4-2	3.880e-04	2.999e-04	-3.411	-3.523	-0.112	(0)
CaSO4	3.236e-05	3.236e-05	-4.490	-4.490	0.000	(0)
MgSO4	8.239e-06	8.239e-06	-5.084	-5.084	0.000	(0)
NaSO4-	9.395e-07	8.823e-07	-6.027	-6.054	-0.027	(0)
KSO4-	1.822e-07	1.711e-07	-6.739	-6.767	-0.027	(0)
MnSO4	1.074e-07	1.074e-07	-6.969	-6.969	0.000	(0)
CuSO4	1.088e-08	1.088e-08	-7.963	-7.963	0.000	(0)
ZnSO4	6.134e-09	6.134e-09	-8.212	-8.212	0.000	(0)
FeSO4	4.903e-09	4.903e-09	-8.310	-8.310	0.000	(0)
HSO4-	1.956e-09	1.835e-09	-8.709	-8.736	-0.028	(0)
NiSO4	9.638e-10	9.638e-10	-9.016	-9.016	0.000	(0)
CoSO4	6.339e-10	6.339e-10	-9.198	-9.198	0.000	(0)
PbSO4	8.262e-11	8.262e-11	-10.083	-10.083	0.000	(0)
CdSO4	6.921e-11	6.921e-11	-10.160	-10.160	0.000	(0)
CrOHSO4	4.487e-11	4.487e-11	-10.348	-10.348	0.000	(0)
AgSO4-	4.088e-11	3.813e-11	-10.389	-10.419	-0.030	(0)
Zn (SO4) 2-2	2.116e-11	1.602e-11	-10.675	-10.795	-0.121	(0)
AlSO4+	8.950e-13	8.396e-13	-12.048	-12.076	-0.028	(0)
Cd (SO4) 2-2	3.697e-13	2.800e-13	-12.432	-12.553	-0.121	(0)
Pb (SO4) 2-2	1.972e-13	1.493e-13	-12.705	-12.826	-0.121	(0)
CrSO4+	1.345e-13	1.255e-13	-12.871	-12.901	-0.030	(0)
UO2SO4	4.767e-14	4.767e-14	-13.322	-13.322	0.000	(0)
Ni (SO4) 2-2	1.264e-14	9.572e-15	-13.898	-14.019	-0.121	(0)
Al (SO4) 2-	2.876e-15	2.698e-15	-14.541	-14.569	-0.028	(0)
FeSO4+	1.348e-15	1.266e-15	-14.870	-14.898	-0.028	(0)
UO2 (SO4) 2-2	2.488e-16	1.885e-16	-15.604	-15.725	-0.121	(0)
Fe (SO4) 2-	8.700e-18	8.116e-18	-17.060	-17.091	-0.030	(0)
VO2SO4-	7.341e-18	6.848e-18	-17.134	-17.164	-0.030	(0)
Cr2 (OH) 2SO4+2	3.376e-18	2.557e-18	-17.472	-17.592	-0.121	(0)
VOSO4	4.073e-19	4.073e-19	-18.390	-18.390	0.000	(0)
Cr2 (OH) 2 (SO4) 2	4.556e-20	4.556e-20	-19.341	-19.341	0.000	(0)
HgSO4	8.336e-25	8.336e-25	-24.079	-24.079	0.000	(0)
CrO3SO4-2	2.964e-27	2.245e-27	-26.528	-26.649	-0.121	(0)
VSO4+	2.395e-32	2.235e-32	-31.621	-31.651	-0.030	(0)
U (SO4) 2	2.041e-39	2.041e-39	-38.690	-38.690	0.000	(0)
USO4+2	1.131e-39	8.567e-40	-38.946	-39.067	-0.121	(0)
Sb (3)	4.541e-19					
Sb (OH) 3	2.298e-19	2.298e-19	-18.639	-18.639	0.000	(0)
HSbO2	2.243e-19	2.243e-19	-18.649	-18.649	0.000	(0)
SbO2-	6.220e-24	5.803e-24	-23.206	-23.236	-0.030	(0)
Sb (OH) 4-	3.564e-24	3.325e-24	-23.448	-23.478	-0.030	(0)
Sb (OH) 2F	1.052e-24	1.052e-24	-23.978	-23.978	0.000	(0)
SbOF	1.034e-24	1.034e-24	-23.985	-23.985	0.000	(0)
Sb (OH) 2+	3.744e-25	3.493e-25	-24.427	-24.457	-0.030	(0)
SbO+	1.291e-25	1.204e-25	-24.889	-24.919	-0.030	(0)
Sb2S4-2	0.000e+00	0.000e+00	-294.033	-294.154	-0.121	(0)
Sb (5)	1.555e-09					
SbO3-	1.554e-09	1.449e-09	-8.809	-8.839	-0.030	(0)
Sb (OH) 6-	1.808e-12	1.695e-12	-11.743	-11.771	-0.028	(0)
SbO2+	1.746e-24	1.629e-24	-23.758	-23.788	-0.030	(0)
Se (-2)	2.136e-10					
Ag2Se	2.136e-10	2.136e-10	-9.670	-9.670	0.000	(0)
HSe-	4.332e-36	4.041e-36	-35.363	-35.393	-0.030	(0)
H2Se	1.964e-39	1.964e-39	-38.707	-38.707	0.000	(0)
MnSe	5.358e-40	5.358e-40	-39.271	-39.271	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.069	-43.190	-0.121	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-77.399	-77.881	-0.483	(0)
Se (4)	5.408e-09					
HSeO3-	5.015e-09	4.679e-09	-8.300	-8.330	-0.030	(0)

SeO3-2	3.929e-10	2.975e-10	-9.406	-9.526	-0.121	(0)
H2SeO3	1.249e-13	1.249e-13	-12.903	-12.903	0.000	(0)
AgSeO3-	1.306e-15	1.219e-15	-14.884	-14.914	-0.030	(0)
FeHSeO3+2	6.139e-21	4.650e-21	-20.212	-20.333	-0.121	(0)
Cd (SeO3) 2-2	9.483e-23	7.182e-23	-22.023	-22.144	-0.121	(0)
Ag (SeO3) 2-3	6.066e-24	3.246e-24	-23.217	-23.489	-0.272	(0)
Se (6)	4.488e-14					
SeO4-2	4.486e-14	3.468e-14	-13.348	-13.460	-0.112	(0)
MnSeO4	1.880e-17	1.880e-17	-16.726	-16.726	0.000	(0)
ZnSeO4	5.021e-19	5.021e-19	-18.299	-18.299	0.000	(0)
NiSeO4	2.612e-19	2.612e-19	-18.583	-18.583	0.000	(0)
CoSeO4	1.841e-19	1.841e-19	-18.735	-18.735	0.000	(0)
HSeO4-	1.166e-19	1.088e-19	-18.933	-18.963	-0.030	(0)
CdSeO4	6.357e-21	6.357e-21	-20.197	-20.197	0.000	(0)
Zn (SeO4) 2-2	2.331e-32	1.765e-32	-31.632	-31.753	-0.121	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.452	-55.724	-0.272	(0)
U (4)	6.083e-20					
U (OH) 5-	6.068e-20	5.660e-20	-19.217	-19.247	-0.030	(0)
U (OH) 4	1.484e-22	1.484e-22	-21.829	-21.829	0.000	(0)
U (OH) 3+	3.641e-26	3.397e-26	-25.439	-25.469	-0.030	(0)
U (OH) 2+2	1.298e-30	9.832e-31	-29.887	-30.007	-0.121	(0)
UF3+	3.140e-34	2.929e-34	-33.503	-33.533	-0.030	(0)
UF2+2	5.214e-35	3.949e-35	-34.283	-34.404	-0.121	(0)
UOH+3	5.417e-36	2.899e-36	-35.266	-35.538	-0.272	(0)
UF4	1.503e-36	1.503e-36	-35.823	-35.823	0.000	(0)
UF+3	1.252e-37	6.701e-38	-36.902	-37.174	-0.272	(0)
UF5-	2.989e-39	2.789e-39	-38.524	-38.555	-0.030	(0)
U (SO4) 2	2.041e-39	2.041e-39	-38.690	-38.690	0.000	(0)
USO4+2	1.131e-39	8.567e-40	-38.946	-39.067	-0.121	(0)
UF6-2	0.000e+00	0.000e+00	-40.284	-40.404	-0.121	(0)
U+4	0.000e+00	0.000e+00	-41.661	-42.144	-0.483	(0)
UCl+3	0.000e+00	0.000e+00	-43.896	-44.167	-0.272	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.525	-161.969	-2.444	(0)
U (5)	1.129e-15					
UO2+	1.129e-15	1.053e-15	-14.947	-14.978	-0.030	(0)
U (6)	1.008e-08					
UO2 (CO3) 2-2	8.795e-09	6.661e-09	-8.056	-8.176	-0.121	(0)
UO2 (CO3) 3-4	9.067e-10	2.983e-10	-9.043	-9.525	-0.483	(0)
UO2CO3	3.736e-10	3.736e-10	-9.428	-9.428	0.000	(0)
UO2OH+	2.279e-12	2.126e-12	-11.642	-11.672	-0.030	(0)
UO2F+	7.272e-13	6.784e-13	-12.138	-12.168	-0.030	(0)
UO2+2	1.358e-13	1.050e-13	-12.867	-12.979	-0.112	(0)
UO2F2	9.158e-14	9.158e-14	-13.038	-13.038	0.000	(0)
UO2SO4	4.767e-14	4.767e-14	-13.322	-13.322	0.000	(0)
UO2F3-	1.154e-15	1.077e-15	-14.938	-14.968	-0.030	(0)
UO2 (SO4) 2-2	2.488e-16	1.885e-16	-15.604	-15.725	-0.121	(0)
UO2Cl+	3.454e-17	3.222e-17	-16.462	-16.492	-0.030	(0)
(UO2) 2 (OH) 2+2	9.905e-18	7.502e-18	-17.004	-17.125	-0.121	(0)
UO2F4-2	5.286e-19	4.004e-19	-18.277	-18.398	-0.121	(0)
(UO2) 3 (OH) 5+	3.356e-19	3.130e-19	-18.474	-18.504	-0.030	(0)
V (2)	8.773e-40					
VOH+	7.094e-40	6.618e-40	-39.149	-39.179	-0.030	(0)
V+2	1.679e-40	1.272e-40	-39.775	-39.896	-0.121	(0)
V (3)	5.298e-13					
V (OH) 3	5.298e-13	5.298e-13	-12.276	-12.276	0.000	(0)
V (OH) 2+	2.297e-23	2.143e-23	-22.639	-22.669	-0.030	(0)
VOH+2	1.680e-26	1.272e-26	-25.775	-25.895	-0.121	(0)
V+3	2.949e-31	1.578e-31	-30.530	-30.802	-0.272	(0)
VSO4+	2.395e-32	2.235e-32	-31.621	-31.651	-0.030	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-49.841	-50.113	-0.272	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.508	-50.991	-0.483	(0)
V (4)	1.780e-16					
V (OH) 3+	1.696e-16	1.582e-16	-15.771	-15.801	-0.030	(0)
VO+2	6.510e-18	4.930e-18	-17.186	-17.307	-0.121	(0)
VOF+	1.484e-18	1.384e-18	-17.829	-17.859	-0.030	(0)
VOSO4	4.073e-19	4.073e-19	-18.390	-18.390	0.000	(0)
VOF2	2.429e-20	2.429e-20	-19.614	-19.614	0.000	(0)

VOC1+	2.805e-21	2.617e-21	-20.552	-20.582	-0.030	(0)
VOF3-	4.325e-23	4.035e-23	-22.364	-22.394	-0.030	(0)
VOF4-2	1.007e-26	7.623e-27	-25.997	-26.118	-0.121	(0)
H2V2O4+2	1.657e-27	1.255e-27	-26.781	-26.901	-0.121	(0)
V (5)	1.377e-08					
H2VO4-	1.311e-08	1.223e-08	-7.882	-7.913	-0.030	(0)
HVO4-2	6.479e-10	4.907e-10	-9.189	-9.309	-0.121	(0)
H3VO4	7.655e-12	7.655e-12	-11.116	-11.116	0.000	(0)
H3V2O7-	6.479e-13	6.044e-13	-12.188	-12.219	-0.030	(0)
HV2O7-3	3.800e-15	2.033e-15	-14.420	-14.692	-0.272	(0)
VO2+	1.020e-15	9.562e-16	-14.991	-15.019	-0.028	(0)
VO2F	7.850e-17	7.850e-17	-16.105	-16.105	0.000	(0)
VO4-3	7.342e-17	3.929e-17	-16.134	-16.406	-0.272	(0)
VO2SO4-	7.341e-18	6.848e-18	-17.134	-17.164	-0.030	(0)
V3O9-3	3.579e-18	1.915e-18	-17.446	-17.718	-0.272	(0)
V2O7-4	2.657e-18	8.743e-19	-17.576	-18.058	-0.483	(0)
VO2F2-	1.430e-18	1.334e-18	-17.845	-17.875	-0.030	(0)
VO2F3-2	1.028e-21	7.789e-22	-20.988	-21.108	-0.121	(0)
V4O12-4	2.967e-23	9.763e-24	-22.528	-23.010	-0.483	(0)
VO2F4-3	3.353e-26	1.794e-26	-25.475	-25.746	-0.272	(0)
HV10O28-5	0.000e+00	0.000e+00	-57.296	-58.051	-0.754	(0)
V10O28-6	0.000e+00	0.000e+00	-57.948	-59.034	-1.086	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.564	-60.047	-0.483	(0)
Zn	1.375e-07					
Zn+2	1.209e-07	9.347e-08	-6.918	-7.029	-0.112	(0)
ZnSO4	6.134e-09	6.134e-09	-8.212	-8.212	0.000	(0)
ZnCO3	4.807e-09	4.807e-09	-8.318	-8.318	0.000	(0)
ZnHCO3+	3.781e-09	3.527e-09	-8.422	-8.453	-0.030	(0)
ZnOH+	1.612e-09	1.503e-09	-8.793	-8.823	-0.030	(0)
ZnF+	9.358e-11	8.730e-11	-10.029	-10.059	-0.030	(0)
ZnCl+	4.738e-11	4.442e-11	-10.324	-10.352	-0.028	(0)
Zn (OH) 2	3.833e-11	3.833e-11	-10.416	-10.416	0.000	(0)
Zn (SO4) 2-2	2.116e-11	1.602e-11	-10.675	-10.795	-0.121	(0)
ZnOHCl	9.354e-12	9.354e-12	-11.029	-11.029	0.000	(0)
Zn (OH) 3-	3.312e-14	3.090e-14	-13.480	-13.510	-0.030	(0)
ZnCl2	1.332e-14	1.332e-14	-13.875	-13.875	0.000	(0)
ZnCl3-	2.135e-18	2.002e-18	-17.671	-17.699	-0.028	(0)
ZnSeO4	5.021e-19	5.021e-19	-18.299	-18.299	0.000	(0)
Zn (OH) 4-2	2.612e-19	1.978e-19	-18.583	-18.704	-0.121	(0)
ZnCl4-2	2.440e-22	1.894e-22	-21.613	-21.723	-0.110	(0)
Zn (SeO4) 2-2	2.331e-32	1.765e-32	-31.632	-31.753	-0.121	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-138.915	-138.945	-0.030	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-140.138	-140.138	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-209.793	-209.823	-0.030	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-212.479	-212.599	-0.121	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-284.127	-284.247	-0.121	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-45.93	-82.15	-36.22	Ag2S
Ag2CO3	-11.35	-22.44	-11.09	Ag2CO3
Ag2CrO4	-22.51	-34.10	-11.59	Ag2CrO4
Ag2HVO4	-11.28	-9.80	1.48	Ag2HVO4
Ag2MoO4	-12.13	-23.68	-11.55	Ag2MoO4
Ag2O	-14.56	-1.98	12.57	Ag2O
Ag2Se	4.12	-44.58	-48.70	Ag2Se
Ag2SeO3	-10.37	-17.52	-7.15	Ag2SeO3
Ag2SeO4	-20.94	-29.85	-8.91	Ag2SeO4
Ag2SO4	-15.09	-19.91	-4.82	Ag2SO4
Ag3AsO3	-24.02	-21.87	2.16	Ag3AsO3
Ag3AsO4	-14.00	-16.79	-2.79	Ag3AsO4
Ag3H2VO5	-15.97	-10.79	5.18	Ag3H2VO5
AgF:4H2O	-13.57	-12.53	1.05	AgF:4H2O
Agmetal	0.53	-12.98	-13.51	Ag
AgVO3	-9.58	-8.81	0.77	AgVO3
Al (OH) 3 (am)	-1.63	9.17	10.80	Al (OH) 3

Al ₂ (MoO ₄) ₃	-49.12	-46.76	2.37	Al ₂ (MoO ₄) ₃
Al ₂ O ₃	-1.32	18.33	19.65	Al ₂ O ₃
Al ₄ (OH) ₁₀ SO ₄	-3.96	18.74	22.70	Al ₄ (OH) ₁₀ SO ₄
AlAsO ₄ :2H ₂ O	-9.45	-4.65	4.80	AlAsO ₄ :2H ₂ O
AlOHSO ₄	-5.53	-8.76	-3.23	AlOHSO ₄
AlSb	-147.02	-81.39	65.62	AlSb
Alunite	-3.85	-5.25	-1.40	KAl ₃ (SO ₄) ₂ (OH) ₆
Anglesite	-4.98	-12.77	-7.79	PbSO ₄
Anhydrite	-2.49	-6.85	-4.36	CaSO ₄
Anilite	-48.92	-80.80	-31.88	Cu _{0.25} Cu _{1.5} S
Antlerite	-3.90	4.89	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	-1.08	-9.38	-8.30	CaCO ₃
Arsenolite	-72.80	-75.56	-2.76	As ₄ O ₆
Artinite	-8.88	0.72	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-34.33	-27.63	6.71	As ₂ O ₅
Atacamite	-3.10	4.29	7.39	Cu ₂ (OH) ₃ Cl
Azurite	-1.19	-18.09	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-16.86	7.54	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-16.43	-0.56	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	3.89	-5.02	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-25.97	6.97	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-14.91	-24.58	-9.67	BaCrO ₄
BaF ₂	-9.71	-15.53	-5.82	BaF ₂
BaMoO ₄	-7.20	-14.16	-6.96	BaMoO ₄
Barite	-0.41	-10.39	-9.98	BaSO ₄
BaS	-88.81	-72.63	16.18	BaS
BaSeO ₃	-9.83	-8.00	1.83	BaSeO ₃
BaSeO ₄	-12.87	-20.33	-7.46	BaSeO ₄
Bianchite	-8.79	-10.55	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-10.76	7.34	18.09	MnO ₂
Bixbyite	-8.66	-9.30	-0.64	Mn ₂ O ₃
BlaubleiI	-49.50	-73.66	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-49.68	-76.96	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.59	9.17	8.58	AlOOH
Breithauptite	-53.44	-71.96	-18.52	NiSb
Brochantite	-2.73	12.50	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.26	10.59	16.84	Mg(OH) ₂
Bunsenite	-5.83	6.61	12.45	NiO
Ca(VO ₃) ₂	-10.21	-4.55	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.97	6.53	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-15.02	6.53	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-16.69	5.61	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-21.35	17.61	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-22.25	17.61	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-290.86	-147.89	142.97	Ca ₃ Sb ₂
CaCrO ₄	-18.77	-21.04	-2.27	CaCrO ₄
Calcite	-0.90	-9.38	-8.48	CaCO ₃
Calomel	-14.25	-32.16	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-2.67	-10.62	-7.95	CaMoO ₄
Carnotite	-3.51	-3.28	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-7.27	-4.45	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-13.77	-16.79	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-15.90	-6.06	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.24	5.40	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.33	5.40	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-26.37	-19.66	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-24.29	-1.73	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-24.73	3.67	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-15.79	-16.45	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-14.76	-16.45	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-14.54	-16.45	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.45	-17.67	-1.21	CdF ₂
Cdmetal(alpha)	-32.09	-18.57	13.51	Cd
Cdmetal(gamma)	-32.19	-18.57	13.62	Cd
CdMoO ₄	-2.15	-16.30	-14.15	CdMoO ₄
CdOHC1	-9.06	-5.53	3.54	CdOHC1
CdSb	-72.82	-73.17	-0.35	CdSb
CdSe	-17.00	-37.20	-20.20	CdSe

CdSeO4:2H2O	-20.62	-22.47	-1.85	CdSeO4:2H2O
CdSO4	-12.36	-12.53	-0.17	CdSO4
CdSO4:1H2O	-10.80	-12.53	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-10.66	-12.53	-1.87	CdSO4:2.67H2O
Cerargyrite	-2.17	-11.92	-9.75	AgCl
Cerrusite	-2.17	-15.30	-13.13	PbCO3
CH4 (g)	-75.31	-116.35	-41.05	CH4
Chalcanthite	-7.68	-10.32	-2.64	CuSO4:5H2O
Chalcocite	-48.63	-83.55	-34.92	Cu2S
Chalcopyrite	-110.23	-145.50	-35.27	CuFeS2
Cinnabar	-49.24	-94.93	-45.69	HgS
Claudetite	-72.50	-75.56	-3.06	As4O6
Clausthalite	-10.34	-37.44	-27.10	PbSe
Co (BO2) 2	-32.10	-5.03	27.07	Co (BO2) 2
Co (OH) 2	-6.66	6.43	13.09	Co (OH) 2
Co (OH) 3	-11.67	-13.98	-2.31	Co (OH) 3
CO2 (g)	-2.31	-20.46	-18.15	CO2
Co3 (AsO4) 2	-21.37	-8.33	13.03	Co3 (AsO4) 2
Co3O4	-11.03	-21.53	-10.50	Co3O4
CoCl2	-23.69	-15.42	8.27	CoCl2
CoCl2:6H2O	-17.96	-15.42	2.54	CoCl2:6H2O
CoCO3	-4.04	-14.02	-9.98	CoCO3
CoF2	-15.04	-16.63	-1.60	CoF2
CoF3	-47.12	-48.58	-1.46	CoF3
CoFe2O4	22.33	18.80	-3.53	CoFe2O4
CoMoO4	-7.50	-15.27	-7.76	CoMoO4
CoO	-7.15	6.43	13.59	CoO
CoS (alpha)	-66.30	-73.74	-7.44	CoS
CoS (beta)	-62.67	-73.74	-11.07	CoS
CoSe	-19.97	-36.17	-16.20	CoSe
CoSeO3	-10.42	-9.10	1.32	CoSeO3
CoSeO4:6H2O	-19.91	-21.44	-1.53	CoSeO4:6H2O
CoSO4	-14.30	-11.50	2.80	CoSO4
CoSO4:6H2O	-9.03	-11.50	-2.47	CoSO4:6H2O
Cotunnite	-11.92	-16.70	-4.78	PbCl2
Covellite	-50.26	-72.56	-22.30	CuS
Cr (OH) 2	-20.56	-9.75	10.82	Cr (OH) 2
Cr (OH) 3	-2.04	-0.71	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.04	-0.71	-0.75	Cr (OH) 3
Cr2O3	0.95	-1.41	-2.36	Cr2O3
CrCl2	-45.69	-31.60	14.09	CrCl2
CrCl3	-48.60	-33.48	15.11	CrCl3
CrF3	-23.97	-35.30	-11.34	CrF3
Crmetal	-64.20	-33.72	30.48	Cr
CrO3	-28.91	-32.12	-3.21	CrO3
Cryolite	-14.37	-48.21	-33.84	Na3AlF6
Cu (OH) 2	-1.07	7.61	8.67	Cu (OH) 2
Cu (SbO3) 2	-26.93	18.28	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-49.76	-84.65	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-0.18	-45.98	-45.80	Cu2Se
Cu2SO4	-19.36	-21.31	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-10.91	-4.81	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-53.04	-95.63	-42.59	Cu3Sb
Cu3Se2	-17.48	-80.97	-63.49	Cu3Se2
CuCO3	-1.35	-12.85	-11.50	CuCO3
CuCrO4	-19.07	-24.51	-5.44	CuCrO4
CuF	-8.32	-13.22	-4.91	CuF
CuF2	-16.57	-15.46	1.12	CuF2
CuF2:2H2O	-10.91	-15.46	-4.55	CuF2:2H2O
Cumetal	-4.92	-13.68	-8.76	Cu
CuMoO4	-1.01	-14.09	-13.08	CuMoO4
CuOCuSO4	-13.02	-2.72	10.30	CuOCuSO4
Cupricferrite	13.99	19.98	5.99	CuFe2O4
Cuprite	-1.98	-3.38	-1.41	Cu2O
Cuprousferrite	13.41	4.49	-8.92	CuFeO2
CuSe	-1.89	-34.99	-33.10	CuSe
CuSe2	-20.25	-53.61	-33.37	CuSe2
CuSeO3:2H2O	-8.44	-7.93	0.51	CuSeO3:2H2O

CuSeO4:5H2O	-17.82	-20.26	-2.44	CuSeO4:5H2O
CuSO4	-13.26	-10.32	2.94	CuSO4
Diaspore	2.29	9.17	6.87	AlOOH
Djurleite	-48.90	-82.82	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-2.71	-19.25	-16.54	CaMg(CO3)2
Dolomite(ordered)	-2.16	-19.25	-17.09	CaMg(CO3)2
Epsomite	-5.22	-7.34	-2.13	MgSO4:7H2O
Fe(OH)2	-6.33	7.23	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	5.95	2.91	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-4.68	-8.40	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-4.72	-3.16	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-13.60	-34.23	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-37.68	-41.42	-3.73	Fe2(SO4)3
Fe3(OH)8	-0.62	19.60	20.22	Fe3(OH)8
FeAsO4:2H2O	-8.03	-7.63	0.40	FeAsO4:2H2O
FeCr2O4	-1.38	5.82	7.20	FeCr2O4
FeMoO4	-4.38	-14.47	-10.09	FeMoO4
Ferrihydrite	2.99	6.19	3.19	Fe(OH)3
Ferroselite	-35.39	-53.99	-18.60	FeSe2
FeS(ppt)	-69.99	-72.94	-2.95	FeS
FeSe	-24.37	-35.37	-11.00	FeSe
Fix_pe	-4.78	-4.78	0.00	e-
Fluorite	-1.49	-11.99	-10.50	CaF2
Galena	-61.04	-75.01	-13.97	PbS
Gibbsite	0.88	9.17	8.29	Al(OH)3
Goethite	5.69	6.19	0.49	FeOOH
Goslarite	-8.54	-10.55	-2.01	ZnSO4:7H2O
Greenockite	-60.41	-74.77	-14.36	CdS
Greigite	-256.04	-301.07	-45.03	Fe3S4
Gummite	-6.24	1.43	7.67	UO3
Gypsum	-2.24	-6.85	-4.61	CaSO4:2H2O
H-Jarosite	-5.20	-17.30	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.82	-21.70	-12.88	H2MoO4
H2S(g)	-72.16	-80.17	-8.01	H2S
H2Se(g)	-37.64	-42.60	-4.96	H2Se
Halite	-8.59	-6.98	1.60	NaCl
Hausmannite	-10.92	50.11	61.03	Mn3O4
Hematite	13.79	12.37	-1.42	Fe2O3
Hercynite	2.67	25.56	22.89	FeAl2O4
Hg(CH3)2(g)	-173.76	-247.47	-73.71	Hg(CH3)2
Hg(g)	-9.27	-17.14	-7.87	Hg
Hg(OH)2	-11.26	-14.76	-3.50	Hg(OH)2
Hg2(g)	-19.33	-34.29	-14.96	Hg2
Hg2(OH)2	-15.57	-10.31	5.26	Hg2(OH)2
Hg2CO3	-14.72	-30.77	-16.05	Hg2CO3
Hg2CrO4	-33.73	-42.43	-8.70	Hg2CrO4
Hg2F2	-23.02	-33.38	-10.36	Hg2F2
Hg2S	-78.80	-90.48	-11.68	Hg2S
Hg2SeO3	-21.19	-25.85	-4.66	Hg2SeO3
Hg2SO4	-22.11	-28.24	-6.13	Hg2SO4
Hg3O2CO3	-35.06	-64.74	-29.68	Hg3O2CO3
HgCl(g)	-35.58	-16.08	19.50	HgCl
HgCl2	-15.35	-36.61	-21.26	HgCl2
HgF(g)	-49.36	-16.69	32.68	HgF
HgF2(g)	-50.39	-37.83	12.57	HgF2
Hgmetal(1)	-3.69	-17.14	-13.45	Hg
HgSe	-1.66	-57.36	-55.69	HgSe
HgSeO3	-17.86	-30.29	-12.43	HgSeO3
HgSO4	-23.27	-32.69	-9.42	HgSO4
Huntite	-9.02	-38.99	-29.97	CaMg3(CO3)4
Hydrocerrusite	-6.67	-25.44	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-20.13	-28.89	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-18.41	-23.58	-5.17	KAl(SO4)2:12H2O
K-Jarosite	0.61	-14.19	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-40.78	-58.02	-17.24	K2Cr2O7
K2CrO4	-25.39	-25.90	-0.51	K2CrO4
K2MoO4	-18.74	-15.48	3.26	K2MoO4
K2SeO4	-20.92	-21.65	-0.73	K2SeO4

Langite	-4.99	12.50	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-7.18	-7.62	-0.43	PbO:PbSO ₄
Laurionite	-6.39	-5.77	0.62	PbOHCl
Lepidocrocite	4.81	6.19	1.37	FeOOH
Lime	-21.62	11.08	32.70	CaO
Litharge	-7.54	5.16	12.69	PbO
Mackinawite	-69.34	-72.94	-3.60	FeS
Maghemite	5.99	12.37	6.39	Fe ₂ O ₃
Magnesioferrite	6.10	22.96	16.86	Fe ₂ MgO ₄
Magnesite	-2.41	-9.87	-7.46	MgCO ₃
Magnetite	16.20	19.60	3.40	Fe ₃ O ₄
Malachite	0.06	-5.24	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-4.64	20.70	25.34	MnOOH
Massicot	-7.74	5.16	12.89	PbO
Matlockite	-8.33	-17.30	-8.97	PbClF
Melanothallite	-20.50	-14.25	6.26	CuCl ₂
Melanterite	-8.49	-10.70	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-49.84	-94.93	-45.09	HgS
Mg(OH) ₂ (active)	-8.21	10.59	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.33	-5.05	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-265.26	-190.58	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-20.82	5.54	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.03	9.18	16.20	MgCr ₂ O ₄
MgCrO ₄	-26.91	-21.53	5.38	MgCrO ₄
MgF ₂	-4.35	-12.48	-8.13	MgF ₂
MgMoO ₄	-9.26	-11.11	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-8.00	-4.95	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-16.08	-17.28	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-34.08	39.45	73.52	Pb ₃ O ₄
Mirabilite	-8.93	-10.05	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-11.82	-6.92	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-57.38	-63.09	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.21	-85.13	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-13.99	-1.49	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-15.86	-13.14	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-71.63	-71.46	0.17	MnS
MnS (pnk)	-74.80	-71.46	3.34	MnS
MnSb	-92.30	-95.21	-2.91	MnSb
MnSe	-37.39	-33.89	3.50	MnSe
MnSeO ₃	-7.95	-6.82	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-7.80	-6.82	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-17.11	-19.16	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-11.80	-9.22	2.58	MnSO ₄
Monteponite	-9.70	5.40	15.10	CdO
Montroydite	-11.12	-14.76	-3.64	HgO
MoO ₃	-13.70	-21.70	-8.00	MoO ₃
Morenosite	-9.17	-11.32	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-135.75	-206.01	-70.26	MoS ₂
Na-Jarosite	-2.16	-13.36	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-46.46	-56.35	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-27.17	-24.24	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-18.91	-35.51	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-15.30	-13.81	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-15.04	-13.81	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-17.95	-7.65	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-21.26	-19.98	1.28	Na ₂ SeO ₄
Na ₃ Sb	-173.19	-78.74	94.45	Na ₃ Sb
Na ₃ VO ₄	-32.67	4.01	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-37.26	0.14	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.89	-12.62	-6.73	CuCl
NaSb	-85.81	-62.65	23.17	NaSb
Natron	-11.26	-12.57	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-7.73	-3.87	3.86	NaVO ₃
Nesquehonite	-5.20	-9.87	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-6.18	6.61	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-23.49	-7.79	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-23.47	8.53	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-6.97	-13.84	-6.87	NiCO ₃

NiMoO4	-3.94	-15.08	-11.14	NiMoO4
NiS(alpha)	-67.95	-73.55	-5.60	NiS
NiS(beta)	-62.45	-73.55	-11.10	NiS
NiS(gamma)	-60.75	-73.55	-12.80	NiS
NiSe	-18.28	-35.98	-17.70	NiSe
NiSeO3:2H2O	-11.73	-8.92	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.73	-21.25	-1.52	NiSeO4:6H2O
Nsutite	-10.17	7.34	17.50	MnO2
O2(g)	-35.14	47.95	83.09	O2
Orpiment	-217.22	-278.28	-61.07	As2S3
Otavite	-3.06	-15.06	-12.00	CdCO3
Pb(BO2)2	-12.82	-6.30	6.52	Pb(BO2)2
Pb(OH)2	-2.99	5.16	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-62.40	-71.16	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-9.41	-0.61	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.87	10.31	26.19	Pb2O(OH)2
Pb2O3	-26.75	34.29	61.04	Pb2O3
Pb2OCO3	-9.58	-10.14	-0.56	Pb2OCO3
Pb2V2O7	-3.42	-5.32	-1.90	Pb2V2O7
Pb3(AsO4)2	-17.96	-12.16	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.30	-0.16	6.14	Pb3(VO4)2
Pb3O2CO3	-16.00	-4.98	11.02	Pb3O2CO3
Pb3O2SO4	-13.15	-2.46	10.69	Pb3O2SO4
Pb4(OH)6SO4	-18.40	2.70	21.10	Pb4(OH)6SO4
Pb4O3SO4	-19.18	2.70	21.88	Pb4O3SO4
PbCrO4	-14.36	-26.96	-12.60	PbCrO4
PbF2	-10.47	-17.91	-7.44	PbF2
Pbmetal	-23.06	-18.82	4.25	Pb
PbMoO4	-0.92	-16.54	-15.62	PbMoO4
PbO:0.3H2O	-7.82	5.16	12.98	PbO:0.33H2O
PbSeO4	-15.87	-22.71	-6.84	PbSeO4
Periclase	-11.00	10.59	21.58	MgO
Phosgenite	-12.18	-31.99	-19.81	PbCl2:PbCO3
Plattnerite	-20.47	29.13	49.60	PbO2
Portlandite	-11.72	11.08	22.80	Ca(OH)2
Pyrite	-110.62	-129.13	-18.51	FeS2
Pyrochroite	-6.48	8.71	15.19	Mn(OH)2
Pyrolusite	-8.69	32.69	41.38	MnO2
Realgar	-91.30	-111.05	-19.75	AsS
Retgersite	-9.28	-11.32	-2.04	NiSO4:6H2O
Rhodochrosite	-1.16	-11.74	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-11.53	-18.64	-7.11	Sb(OH)3
Sb2O4	-16.70	-13.30	3.40	Sb2O4
Sb2O5	-28.28	-37.95	-9.67	Sb2O5
Sb2Se3	-97.31	-165.07	-67.76	Sb2Se3
Sb4O6(cubic)	-56.29	-74.55	-18.26	Sb4O6
Sb4O6(orth)	-56.65	-74.55	-17.90	Sb4O6
SbCl3	-51.99	-51.42	0.57	SbCl3
SbF3	-43.01	-53.24	-10.23	SbF3
Sbmetal	-42.91	-54.60	-11.69	Sb
SbO2	-3.14	-30.96	-27.82	SbO2
Schoepite	-4.57	1.43	5.99	UO2(OH)2:H2O
Semetal(am)	-11.51	-18.62	-7.11	Se
Semetal(hex)	-10.91	-18.62	-7.71	Se
Senarmontite	-24.91	-37.28	-12.37	Sb2O3
SeO2	-15.66	-15.53	0.12	SeO2
SeO3	-48.91	-27.87	21.04	SeO3
Siderite	-2.99	-13.23	-10.24	FeCO3
Smithsonite	-3.08	-13.08	-10.00	ZnCO3
Sphalerite	-61.34	-72.79	-11.45	ZnS
Spinel	-7.93	28.92	36.85	MgAl2O4
Stibnite	-227.32	-277.78	-50.46	Sb2S3
Sulfur	-54.05	-56.19	-2.14	S
Tenorite	-0.04	7.61	7.64	CuO
Thenardite	-10.37	-10.05	0.32	Na2SO4
Thermonatrite	-13.21	-12.57	0.64	Na2CO3:H2O
Tyuyamunite	-5.78	-1.70	4.08	Ca(UO2)2(VO4)2

U3O8	-13.13	7.96	21.08	U3O8
U3Sb4	-554.62	-402.24	152.38	U3Sb4
U4O9	-26.33	-29.35	-3.02	U4O9
UF4	-29.93	-59.46	-29.54	UF4
UF4:2.5H2O	-26.75	-59.46	-32.72	UF4:2.5H2O
UO2 (am)	-14.26	-13.33	0.93	UO2
UO2 (OH) 2 (beta)	-4.18	1.43	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.19	-26.44	-2.25	UO2SeO4:4H2O
UO3	-6.27	1.43	7.70	UO3
Uraninite	-8.66	-13.33	-4.67	UO2
USb2	-209.27	-179.70	29.58	USb2
V (OH) 3	-16.78	-9.19	7.59	V (OH) 3
V2O5	-14.27	-15.63	-1.36	V2O5
V3O5	-34.51	-32.68	1.84	V3O5
V4O7	-42.76	-35.58	7.19	V4O7
V6O13	-33.99	-94.85	-60.86	V6O13
Valentinite	-28.80	-37.28	-8.48	Sb2O3
VC12	-61.91	-43.03	18.87	VC12
VC13	-65.40	-41.97	23.43	VC13
VF4	-63.96	-49.03	14.93	VF4
Vmetal	-89.18	-45.15	44.03	V
VO	-35.94	-21.18	14.76	VO
VO (OH) 2	-8.05	-2.90	5.15	VO (OH) 2
VO2Cl	-21.58	-18.74	2.84	VO2Cl
VOC1	-31.27	-20.12	11.15	VOC1
VOC12	-37.51	-24.75	12.76	VOC12
VOSO4	-24.44	-20.83	3.61	VOSO4
Witherite	-4.35	-12.92	-8.57	BaCO3
Wurtzite	-63.84	-72.79	-8.95	ZnS
Zincite	-3.96	7.38	11.33	ZnO
Zincosite	-14.48	-10.55	3.93	ZnSO4
Zn (BO2) 2	-12.37	-4.08	8.29	Zn (BO2) 2
Zn (OH) 2	-4.82	7.38	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-5.10	7.38	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-4.38	7.38	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-4.16	7.38	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-4.36	7.38	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-10.67	-3.17	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-11.36	3.83	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-19.14	-5.49	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-32.64	-13.73	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-16.82	11.58	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-23.47	15.03	38.50	Zn5 (OH) 8Cl2
ZnCl2	-21.53	-14.48	7.05	ZnCl2
ZnCO3:1H2O	-2.82	-13.08	-10.26	ZnCO3:1H2O
ZnF2	-15.15	-15.69	-0.53	ZnF2
Znmetal	-42.39	-16.60	25.79	Zn
ZnMoO4	-4.19	-14.32	-10.13	ZnMoO4
ZnO (active)	-3.81	7.38	11.19	ZnO
ZnS (am)	-63.74	-72.79	-9.05	ZnS
ZnSb	-82.21	-71.20	11.01	ZnSb
ZnSe	-20.82	-35.22	-14.40	ZnSe
ZnSeO4:6H2O	-18.97	-20.49	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-9.91	-10.55	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 149.

REACTION 901

H2O

-1

418.9332 moles ### Addition step. Removes HTC water but solute mass remains
 USE solution 901
 SAVE Solution 902
 End

 Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 901. Solution after simulation 148.
 Using reaction 901.

Reaction 901.

4.189e+02 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	8.354e-08	8.350e-08
Al	4.708e-06	4.706e-06
As	4.088e-08	4.086e-08
B	1.606e-05	1.605e-05
Ba	1.503e-06	1.502e-06
C	1.244e-02	1.244e-02
Ca	5.589e-03	5.587e-03
Cd	1.186e-08	1.186e-08
Cl	1.725e-03	1.725e-03
Co	1.359e-07	1.359e-07
Cr	1.271e-07	1.270e-07
Cu	9.883e-06	9.878e-06
F	4.366e-04	4.364e-04
Fe	2.673e-05	2.672e-05
Hg	2.267e-10	2.266e-10
K	7.364e-04	7.361e-04
Mg	1.765e-03	1.764e-03
Mn	2.414e-05	2.413e-05
Mo	5.674e-07	5.672e-07
Na	5.007e-03	5.004e-03
Ni	2.133e-07	2.131e-07
Pb	2.661e-08	2.660e-08
S	3.676e-03	3.674e-03
Sb	1.330e-08	1.329e-08
Se	4.807e-08	4.805e-08
U	8.618e-08	8.614e-08
V	1.177e-07	1.177e-07
Zn	1.175e-06	1.175e-06

-----Description of solution-----

	pH =	7.145	Charge balance
	pe =	5.134	Adjusted to redox
equilibrium	Activity of water =	0.999	
	Ionic strength (mol/kgw) =	2.637e-02	

Mass of water (kg) = 9.995e-01
 Total alkalinity (eq/kg) = 1.105e-02
 Total CO2 (mol/kg) = 1.244e-02
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 1.297e-15
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 15
 Total H = 1.109723e+02
 Total O = 5.553129e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.650e-07	1.405e-07	-6.782	-6.852	-0.070	(0)
H+	8.360e-08	7.161e-08	-7.078	-7.145	-0.067	0.00
H2O	5.551e+01	9.995e-01	1.744	-0.000	0.000	18.07
Ag	8.354e-08					
AgCl	5.348e-08	5.348e-08	-7.272	-7.272	0.000	(0)
Ag+	2.069e-08	1.772e-08	-7.684	-7.751	-0.067	(0)
AgCl2-	8.331e-09	6.884e-09	-8.079	-8.162	-0.083	(0)
AgSO4-	6.126e-10	5.063e-10	-9.213	-9.296	-0.083	(0)
Ag2Se	1.974e-10	1.974e-10	-9.705	-9.705	0.000	(0)
AgCl3-2	1.945e-11	9.068e-12	-10.711	-11.042	-0.331	(0)
AgF	1.458e-11	1.458e-11	-10.836	-10.836	0.000	(0)
AgOH	2.491e-13	2.491e-13	-12.604	-12.604	0.000	(0)
AgCl4-3	1.523e-13	2.737e-14	-12.817	-13.563	-0.745	(0)
AgH2BO3	3.638e-14	3.638e-14	-13.439	-13.439	0.000	(0)
AgSeO3-	2.759e-14	2.280e-14	-13.559	-13.642	-0.083	(0)
Ag (OH) 2-	4.139e-18	3.420e-18	-17.383	-17.466	-0.083	(0)
Ag (SeO3) 2-3	2.274e-21	4.087e-22	-20.643	-21.389	-0.745	(0)
Ag2MoO4	3.629e-23	3.629e-23	-22.440	-22.440	0.000	(0)
AgHS	0.000e+00	0.000e+00	-68.498	-68.498	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-78.016	-79.341	-1.325	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-138.877	-138.960	-0.083	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-139.114	-139.298	-0.184	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.250	-141.593	-0.343	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.577	-141.904	-0.327	(0)
Al	4.708e-06					
AlF3	2.323e-06	2.323e-06	-5.634	-5.634	0.000	(0)
Al (OH) 4-	1.196e-06	1.026e-06	-5.922	-5.989	-0.067	(0)
AlF2+	6.532e-07	5.633e-07	-6.185	-6.249	-0.064	(0)
AlF4-	4.449e-07	3.815e-07	-6.352	-6.419	-0.067	(0)
Al (OH) 3	5.798e-08	5.798e-08	-7.237	-7.237	0.000	(0)
Al (OH) 2+	2.398e-08	2.068e-08	-7.620	-7.684	-0.064	(0)
AlF+2	7.808e-09	4.319e-09	-8.107	-8.365	-0.257	(0)
AlOH+2	3.349e-10	1.852e-10	-9.475	-9.732	-0.257	(0)
AlSO4+	1.708e-11	1.465e-11	-10.767	-10.834	-0.067	(0)
Al+3	5.308e-12	1.318e-12	-11.275	-11.880	-0.605	(0)
Al (SO4) 2-	2.621e-13	2.247e-13	-12.582	-12.648	-0.067	(0)
AlMo6O21-3	7.878e-39	1.416e-39	-38.104	-38.849	-0.745	(0)
As (3)	2.498e-19					
H3AsO3	2.476e-19	2.476e-19	-18.606	-18.606	0.000	(0)
H2AsO3-	2.146e-21	1.773e-21	-20.668	-20.751	-0.083	(0)
HAsO3-2	4.843e-26	2.259e-26	-25.315	-25.646	-0.331	(0)
H4AsO3+	1.063e-26	8.787e-27	-25.973	-26.056	-0.083	(0)
AsO3-3	6.764e-32	1.216e-32	-31.170	-31.915	-0.745	(0)
As (5)	4.088e-08					
HAsO4-2	2.987e-08	1.393e-08	-7.525	-7.856	-0.331	(0)
H2AsO4-	1.101e-08	9.097e-09	-7.958	-8.041	-0.083	(0)
AsO4-3	3.422e-12	6.150e-13	-11.466	-12.211	-0.745	(0)
H3AsO4	1.125e-13	1.132e-13	-12.949	-12.946	0.003	(0)
B	1.606e-05					
H3BO3	1.588e-05	1.597e-05	-4.799	-4.797	0.003	(0)
H2BO3-	1.533e-07	1.295e-07	-6.815	-6.888	-0.073	(0)
CaH2BO3+	2.061e-08	1.742e-08	-7.686	-7.759	-0.073	(0)

	MgH2BO3+	4.128e-09	3.488e-09	-8.384	-8.457	-0.073	(0)
	BF(OH) 3-	2.471e-09	2.088e-09	-8.607	-8.680	-0.073	(0)
	NaH2BO3	8.698e-10	8.698e-10	-9.061	-9.061	0.000	(0)
	BF2(OH) 2-	6.200e-12	5.240e-12	-11.208	-11.281	-0.073	(0)
	BaH2BO3+	3.633e-12	3.070e-12	-11.440	-11.513	-0.073	(0)
	H5(BO3) 2-	2.083e-12	1.761e-12	-11.681	-11.754	-0.073	(0)
	AgH2BO3	3.638e-14	3.638e-14	-13.439	-13.439	0.000	(0)
	H8(BO3) 3-	3.328e-15	2.812e-15	-14.478	-14.551	-0.073	(0)
	BF3OH-	5.663e-17	4.786e-17	-16.247	-16.320	-0.073	(0)
	BF4-	6.541e-21	5.528e-21	-20.184	-20.257	-0.073	(0)
Ba	1.503e-06						
	Ba+2	1.424e-06	7.670e-07	-5.846	-6.115	-0.269	(0)
	BaHCO3+	7.586e-08	6.566e-08	-7.120	-7.183	-0.063	(0)
	BaCO3	2.308e-09	2.308e-09	-8.637	-8.637	0.000	(0)
	BaH2BO3+	3.633e-12	3.070e-12	-11.440	-11.513	-0.073	(0)
	BaOH+	5.469e-13	4.705e-13	-12.262	-12.327	-0.065	(0)
C(4)	1.244e-02						
	HCO3-	1.039e-02	8.964e-03	-1.983	-2.048	-0.064	(0)
	H2CO3	1.444e-03	1.444e-03	-2.841	-2.841	0.000	(0)
	CaHCO3+	4.507e-04	3.901e-04	-3.346	-3.409	-0.063	(0)
	MgHCO3+	8.337e-05	7.124e-05	-4.079	-4.147	-0.068	(0)
	CaCO3	2.174e-05	2.174e-05	-4.663	-4.663	0.000	(0)
	NaHCO3	2.136e-05	2.136e-05	-4.670	-4.670	0.000	(0)
	CO3-2	1.090e-05	5.868e-06	-4.963	-5.232	-0.269	(0)
	CuCO3	8.717e-06	8.717e-06	-5.060	-5.060	0.000	(0)
	MgCO3	3.791e-06	3.791e-06	-5.421	-5.421	0.000	(0)
	MnHCO3+	1.912e-06	1.645e-06	-5.718	-5.784	-0.065	(0)
	NaCO3-	5.368e-07	4.630e-07	-6.270	-6.334	-0.064	(0)
	Cu(CO3) 2-2	2.952e-07	1.377e-07	-6.530	-6.861	-0.331	(0)
	CuHCO3+	1.727e-07	1.427e-07	-6.763	-6.846	-0.083	(0)
	ZnHCO3+	1.395e-07	1.153e-07	-6.855	-6.938	-0.083	(0)
	ZnCO3	1.374e-07	1.374e-07	-6.862	-6.862	0.000	(0)
	NiHCO3+	7.675e-08	6.342e-08	-7.115	-7.198	-0.083	(0)
	BaHCO3+	7.586e-08	6.566e-08	-7.120	-7.183	-0.063	(0)
	UO2(CO3) 3-4	6.402e-08	3.028e-09	-7.194	-8.519	-1.325	(0)
	FeHCO3+	4.099e-08	3.548e-08	-7.387	-7.450	-0.063	(0)
	CoHCO3+	3.378e-08	2.791e-08	-7.471	-7.554	-0.083	(0)
	UO2(CO3) 2-2	2.208e-08	1.030e-08	-7.656	-7.987	-0.331	(0)
	PbCO3	1.595e-08	1.595e-08	-7.797	-7.797	0.000	(0)
	NiCO3	1.256e-08	1.256e-08	-7.901	-7.901	0.000	(0)
	PbHCO3+	7.287e-09	6.022e-09	-8.137	-8.220	-0.083	(0)
	CoCO3	3.971e-09	3.971e-09	-8.401	-8.401	0.000	(0)
	BaCO3	2.308e-09	2.308e-09	-8.637	-8.637	0.000	(0)
	CdCO3	6.230e-10	6.230e-10	-9.205	-9.205	0.000	(0)
	Pb(CO3) 2-2	5.788e-10	2.699e-10	-9.237	-9.569	-0.331	(0)
	CdHCO3+	1.150e-10	9.506e-11	-9.939	-10.022	-0.083	(0)
	UO2CO3	8.793e-11	8.793e-11	-10.056	-10.056	0.000	(0)
	Cd(CO3) 2-2	5.812e-12	2.710e-12	-11.236	-11.567	-0.331	(0)
	HgCO3	3.195e-15	3.195e-15	-14.496	-14.496	0.000	(0)
	Hg(CO3) 2-2	1.271e-16	5.929e-17	-15.896	-16.227	-0.331	(0)
	HgHCO3+	5.156e-18	4.261e-18	-17.288	-17.371	-0.083	(0)
Ca	5.589e-03						
	Ca+2	4.341e-03	2.337e-03	-2.362	-2.631	-0.269	(0)
	CaSO4	7.665e-04	7.665e-04	-3.115	-3.115	0.000	(0)
	CaHCO3+	4.507e-04	3.901e-04	-3.346	-3.409	-0.063	(0)
	CaCO3	2.174e-05	2.174e-05	-4.663	-4.663	0.000	(0)
	CaF+	9.715e-06	8.357e-06	-5.013	-5.078	-0.065	(0)
	CaH2BO3+	2.061e-08	1.742e-08	-7.686	-7.759	-0.073	(0)
	CaOH+	7.572e-09	6.553e-09	-8.121	-8.184	-0.063	(0)
Cd	1.186e-08						
	Cd+2	8.652e-09	4.658e-09	-8.063	-8.332	-0.269	(0)
	CdSO4	1.563e-09	1.563e-09	-8.806	-8.806	0.000	(0)
	CdCl+	7.956e-10	6.575e-10	-9.099	-9.182	-0.083	(0)
	CdCO3	6.230e-10	6.230e-10	-9.205	-9.205	0.000	(0)
	CdHCO3+	1.150e-10	9.506e-11	-9.939	-10.022	-0.083	(0)
	Cd(SO4) 2-2	6.475e-11	3.020e-11	-10.189	-10.520	-0.331	(0)
	CdF+	2.927e-11	2.419e-11	-10.534	-10.616	-0.083	(0)
	CdOH+	6.293e-12	5.200e-12	-11.201	-11.284	-0.083	(0)

Cd(CO3) 2-2	5.812e-12	2.710e-12	-11.236	-11.567	-0.331	(0)
CdCl2	4.051e-12	4.051e-12	-11.392	-11.392	0.000	(0)
CdOHCl	3.790e-12	3.790e-12	-11.421	-11.421	0.000	(0)
CdF2	1.581e-14	1.581e-14	-13.801	-13.801	0.000	(0)
Cd(OH) 2	4.611e-15	4.611e-15	-14.336	-14.336	0.000	(0)
CdCl3-	4.571e-15	3.778e-15	-14.340	-14.423	-0.083	(0)
CdSeO4	7.758e-19	7.758e-19	-18.110	-18.110	0.000	(0)
Cd2OH+3	6.755e-19	1.214e-19	-18.170	-18.916	-0.745	(0)
Cd(OH) 3-	4.791e-20	3.959e-20	-19.320	-19.402	-0.083	(0)
Cd(SeO3) 2-2	3.299e-20	1.539e-20	-19.482	-19.813	-0.331	(0)
Cd(OH) 4-2	1.953e-27	9.107e-28	-26.709	-27.041	-0.331	(0)
CdHS+	0.000e+00	0.000e+00	-74.802	-74.885	-0.083	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-142.243	-142.243	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-214.821	-214.904	-0.083	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-286.938	-287.269	-0.331	(0)
C1	1.725e-03					
Cl-	1.725e-03	1.478e-03	-2.763	-2.830	-0.067	(0)
AgCl	5.348e-08	5.348e-08	-7.272	-7.272	0.000	(0)
MnCl+	1.990e-08	1.711e-08	-7.701	-7.767	-0.065	(0)
AgCl2-	8.331e-09	6.884e-09	-8.079	-8.162	-0.083	(0)
ZnCl+	1.767e-09	1.510e-09	-8.753	-8.821	-0.068	(0)
CuCl	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
CdCl+	7.956e-10	6.575e-10	-9.099	-9.182	-0.083	(0)
CuCl+	6.915e-10	5.910e-10	-9.160	-9.228	-0.068	(0)
CuCl2-	6.100e-10	5.213e-10	-9.215	-9.283	-0.068	(0)
ZnOHCl	2.778e-10	2.778e-10	-9.556	-9.556	0.000	(0)
NiCl+	2.626e-10	2.170e-10	-9.581	-9.663	-0.083	(0)
CoCl+	2.477e-10	2.047e-10	-9.606	-9.689	-0.083	(0)
PbCl+	5.738e-11	4.741e-11	-10.241	-10.324	-0.083	(0)
MnCl2	3.573e-11	3.573e-11	-10.447	-10.447	0.000	(0)
AgCl3-2	1.945e-11	9.068e-12	-10.711	-11.042	-0.331	(0)
CdCl2	4.051e-12	4.051e-12	-11.392	-11.392	0.000	(0)
CdOHCl	3.790e-12	3.790e-12	-11.421	-11.421	0.000	(0)
ZnCl2	3.537e-12	3.537e-12	-11.451	-11.451	0.000	(0)
PbCl2	3.130e-13	3.130e-13	-12.504	-12.504	0.000	(0)
CuCl2	3.029e-13	3.029e-13	-12.519	-12.519	0.000	(0)
CuCl3-2	3.008e-13	1.647e-13	-12.522	-12.783	-0.262	(0)
HgClOH	1.669e-13	1.669e-13	-12.778	-12.778	0.000	(0)
AgCl4-3	1.523e-13	2.737e-14	-12.817	-13.563	-0.745	(0)
HgCl2	9.938e-14	9.938e-14	-13.003	-13.003	0.000	(0)
MnCl3-	1.691e-14	1.454e-14	-13.772	-13.837	-0.065	(0)
CrCl+2	7.026e-15	3.277e-15	-14.153	-14.485	-0.331	(0)
ZnCl3-	4.860e-15	4.153e-15	-14.313	-14.382	-0.068	(0)
CdCl3-	4.571e-15	3.778e-15	-14.340	-14.423	-0.083	(0)
HgCl3-	1.777e-15	1.469e-15	-14.750	-14.833	-0.083	(0)
NiCl2	1.615e-15	1.615e-15	-14.792	-14.792	0.000	(0)
FeCl+2	3.242e-16	1.775e-16	-15.489	-15.751	-0.262	(0)
PbCl3-	2.229e-16	1.842e-16	-15.652	-15.735	-0.083	(0)
HgCl4-2	1.853e-17	8.643e-18	-16.732	-17.063	-0.331	(0)
HgCl+	1.624e-17	1.342e-17	-16.790	-16.872	-0.083	(0)
CrOHCl2	1.294e-17	1.294e-17	-16.888	-16.888	0.000	(0)
UO2Cl+	1.092e-17	9.023e-18	-16.962	-17.045	-0.083	(0)
ZnCl4-2	5.605e-18	3.069e-18	-17.251	-17.513	-0.262	(0)
CuCl3-	4.888e-18	4.177e-18	-17.311	-17.379	-0.068	(0)
FeCl2+	1.362e-18	1.172e-18	-17.866	-17.931	-0.065	(0)
CrCl2+	5.561e-19	4.595e-19	-18.255	-18.338	-0.083	(0)
PbCl4-2	2.668e-19	1.244e-19	-18.574	-18.905	-0.331	(0)
VOCl+	1.416e-19	1.171e-19	-18.849	-18.932	-0.083	(0)
FeCl3	1.732e-22	1.732e-22	-21.761	-21.761	0.000	(0)
CuCl4-2	5.651e-23	3.094e-23	-22.248	-22.509	-0.262	(0)
CrO3Cl-	1.324e-26	1.094e-26	-25.878	-25.961	-0.083	(0)
CoCl+2	1.400e-35	6.527e-36	-34.854	-35.185	-0.331	(0)
UCl+3	0.000e+00	0.000e+00	-44.441	-45.187	-0.745	(0)
Co(2)	1.359e-07					
Co+2	8.585e-08	4.003e-08	-7.066	-7.398	-0.331	(0)
CoHCO3+	3.378e-08	2.791e-08	-7.471	-7.554	-0.083	(0)
CoSO4	1.144e-08	1.144e-08	-7.942	-7.942	0.000	(0)
CoCO3	3.971e-09	3.971e-09	-8.401	-8.401	0.000	(0)

CoF+	5.019e-10	4.148e-10	-9.299	-9.382	-0.083	(0)
CoCl+	2.477e-10	2.047e-10	-9.606	-9.689	-0.083	(0)
CoOH+	1.358e-10	1.123e-10	-9.867	-9.950	-0.083	(0)
Co(OH) 2	1.253e-12	1.253e-12	-11.902	-11.902	0.000	(0)
CoSeO4	1.795e-17	1.795e-17	-16.746	-16.746	0.000	(0)
Co(OH) 3-	4.252e-18	3.514e-18	-17.371	-17.454	-0.083	(0)
Co2OH+3	1.253e-18	2.252e-19	-17.902	-18.647	-0.745	(0)
CoOOH-	1.067e-18	8.821e-19	-17.972	-18.054	-0.083	(0)
Co(OH) 4-2	1.678e-25	7.826e-26	-24.775	-25.106	-0.331	(0)
Co4(OH) 4+4	6.699e-31	3.169e-32	-30.174	-31.499	-1.325	(0)
Co(3)	3.324e-29					
CoOH+2	3.324e-29	1.550e-29	-28.478	-28.810	-0.331	(0)
Co+3	8.740e-35	2.171e-35	-34.058	-34.663	-0.605	(0)
CoCl+2	1.400e-35	6.527e-36	-34.854	-35.185	-0.331	(0)
Cr(2)	6.443e-24					
Cr+2	6.443e-24	3.005e-24	-23.191	-23.522	-0.331	(0)
Cr(3)	1.271e-07					
Cr(OH) 2+	1.090e-07	9.006e-08	-6.963	-7.045	-0.083	(0)
Cr(OH) +2	1.129e-08	5.267e-09	-7.947	-8.278	-0.331	(0)
Cr(OH) 3	4.755e-09	4.755e-09	-8.323	-8.323	0.000	(0)
CrOHSO4	1.789e-09	1.789e-09	-8.747	-8.747	0.000	(0)
CrF+2	1.907e-10	8.895e-11	-9.720	-10.051	-0.331	(0)
CrO2-	3.817e-11	3.154e-11	-10.418	-10.501	-0.083	(0)
Cr(OH) 4-	3.219e-11	2.660e-11	-10.492	-10.575	-0.083	(0)
Cr+3	9.531e-12	1.713e-12	-11.021	-11.766	-0.745	(0)
CrSO4+	6.930e-12	5.727e-12	-11.159	-11.242	-0.083	(0)
CrCl+2	7.026e-15	3.277e-15	-14.153	-14.485	-0.331	(0)
Cr2(OH) 2SO4+2	1.827e-15	8.518e-16	-14.738	-15.070	-0.331	(0)
Cr2(OH) 2(SO4) 2	7.244e-17	7.244e-17	-16.140	-16.140	0.000	(0)
CrOHC12	1.294e-17	1.294e-17	-16.888	-16.888	0.000	(0)
CrCl2+	5.561e-19	4.595e-19	-18.255	-18.338	-0.083	(0)
Cr(6)	1.535e-16					
CrO4-2	1.316e-16	7.088e-17	-15.881	-16.149	-0.269	(0)
HCrO4-	1.988e-17	1.643e-17	-16.702	-16.784	-0.083	(0)
NaCrO4-	1.806e-18	1.492e-18	-17.743	-17.826	-0.083	(0)
KCrO4-	1.990e-19	1.645e-19	-18.701	-18.784	-0.083	(0)
CrO3SO4-2	1.100e-24	5.132e-25	-23.958	-24.290	-0.331	(0)
H2CrO4	9.535e-25	9.535e-25	-24.021	-24.021	0.000	(0)
CrO3Cl-	1.324e-26	1.094e-26	-25.878	-25.961	-0.083	(0)
Cr2O7-2	2.007e-32	9.360e-33	-31.697	-32.029	-0.331	(0)
Cu(1)	3.396e-09					
CuCl	1.688e-09	1.688e-09	-8.773	-8.773	0.000	(0)
Cu+	1.098e-09	9.073e-10	-8.959	-9.042	-0.083	(0)
CuCl2-	6.100e-10	5.213e-10	-9.215	-9.283	-0.068	(0)
CuCl3-2	3.008e-13	1.647e-13	-12.522	-12.783	-0.262	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-140.150	-140.485	-0.335	(0)
CuS4S5-3	0.000e+00	0.000e+00	-140.896	-141.215	-0.319	(0)
Cu(2)	9.879e-06					
CuCO3	8.717e-06	8.717e-06	-5.060	-5.060	0.000	(0)
Cu+2	4.686e-07	2.523e-07	-6.329	-6.598	-0.269	(0)
Cu(CO3) 2-2	2.952e-07	1.377e-07	-6.530	-6.861	-0.331	(0)
CuHCO3+	1.727e-07	1.427e-07	-6.763	-6.846	-0.083	(0)
CuOH+	1.312e-07	1.121e-07	-6.882	-6.950	-0.068	(0)
CuSO4	8.275e-08	8.275e-08	-7.082	-7.082	0.000	(0)
CuF+	6.311e-09	5.215e-09	-8.200	-8.283	-0.083	(0)
Cu(OH) 2	3.144e-09	3.144e-09	-8.503	-8.503	0.000	(0)
CuCl+	6.915e-10	5.910e-10	-9.160	-9.228	-0.068	(0)
Cu2(OH) 2+2	6.771e-10	3.158e-10	-9.169	-9.501	-0.331	(0)
Cu(OH) 3-	1.097e-12	9.062e-13	-11.960	-12.043	-0.083	(0)
CuCl2	3.029e-13	3.029e-13	-12.519	-12.519	0.000	(0)
CuCl3-	4.888e-18	4.177e-18	-17.311	-17.379	-0.068	(0)
Cu(OH) 4-2	2.149e-18	1.002e-18	-17.668	-17.999	-0.331	(0)
CuCl4-2	5.651e-23	3.094e-23	-22.248	-22.509	-0.262	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-204.301	-204.383	-0.083	(0)
F	4.366e-04					
F-	3.825e-04	3.276e-04	-3.417	-3.485	-0.067	(0)
MgF+	3.330e-05	2.855e-05	-4.478	-4.544	-0.067	(0)
CaF+	9.715e-06	8.357e-06	-5.013	-5.078	-0.065	(0)

AlF3	2.323e-06	2.323e-06	-5.634	-5.634	0.000	(0)
NaF	8.759e-07	8.759e-07	-6.058	-6.058	0.000	(0)
AlF2+	6.532e-07	5.633e-07	-6.185	-6.249	-0.064	(0)
AlF4-	4.449e-07	3.815e-07	-6.352	-6.419	-0.067	(0)
MnF+	1.395e-07	1.200e-07	-6.856	-6.921	-0.065	(0)
HF	3.470e-08	3.470e-08	-7.460	-7.460	0.000	(0)
AlF+2	7.808e-09	4.319e-09	-8.107	-8.365	-0.257	(0)
CuF+	6.311e-09	5.215e-09	-8.200	-8.283	-0.083	(0)
ZnF+	3.218e-09	2.659e-09	-8.492	-8.575	-0.083	(0)
BF(OH) 3-	2.471e-09	2.088e-09	-8.607	-8.680	-0.073	(0)
NiF+	5.715e-10	4.723e-10	-9.243	-9.326	-0.083	(0)
CoF+	5.019e-10	4.148e-10	-9.299	-9.382	-0.083	(0)
CrF+2	1.907e-10	8.895e-11	-9.720	-10.051	-0.331	(0)
HF2-	5.076e-11	4.323e-11	-10.294	-10.364	-0.070	(0)
CdF+	2.927e-11	2.419e-11	-10.534	-10.616	-0.083	(0)
PbF+	2.526e-11	2.087e-11	-10.598	-10.680	-0.083	(0)
AgF	1.458e-11	1.458e-11	-10.836	-10.836	0.000	(0)
FeF2+	1.456e-11	1.253e-11	-10.837	-10.902	-0.065	(0)
BF2(OH) 2-	6.200e-12	5.240e-12	-11.208	-11.281	-0.073	(0)
FeF3	5.791e-12	5.791e-12	-11.237	-11.237	0.000	(0)
FeF+2	2.609e-12	1.429e-12	-11.584	-11.845	-0.262	(0)
UO2F+	2.060e-13	1.702e-13	-12.686	-12.769	-0.083	(0)
UO2F2	1.609e-13	1.609e-13	-12.794	-12.794	0.000	(0)
PbF2	1.346e-13	1.346e-13	-12.871	-12.871	0.000	(0)
UO2F3-	1.602e-14	1.324e-14	-13.795	-13.878	-0.083	(0)
CdF2	1.581e-14	1.581e-14	-13.801	-13.801	0.000	(0)
VO2F	5.383e-15	5.383e-15	-14.269	-14.269	0.000	(0)
H2F2	3.227e-15	3.227e-15	-14.491	-14.491	0.000	(0)
VO2F2-	7.749e-16	6.403e-16	-15.111	-15.194	-0.083	(0)
PbF3-	1.012e-16	8.363e-17	-15.995	-16.078	-0.083	(0)
UO2F4-2	7.387e-17	3.445e-17	-16.132	-16.463	-0.331	(0)
VOF+	6.713e-17	5.548e-17	-16.173	-16.256	-0.083	(0)
BF3OH-	5.663e-17	4.786e-17	-16.247	-16.320	-0.073	(0)
VOF2	6.815e-18	6.815e-18	-17.167	-17.167	0.000	(0)
VO2F3-2	5.612e-18	2.617e-18	-17.251	-17.582	-0.331	(0)
VOF3-	9.587e-20	7.923e-20	-19.018	-19.101	-0.083	(0)
PbF4-2	2.812e-20	1.311e-20	-19.551	-19.882	-0.331	(0)
BF4-	6.541e-21	5.528e-21	-20.184	-20.257	-0.073	(0)
VO2F4-3	2.347e-21	4.219e-22	-20.629	-21.375	-0.745	(0)
VOF4-2	2.247e-22	1.048e-22	-21.648	-21.980	-0.331	(0)
Sb(OH) 2F	1.904e-23	1.904e-23	-22.720	-22.720	0.000	(0)
SbOF	1.873e-23	1.873e-23	-22.727	-22.727	0.000	(0)
HgF+	6.686e-24	5.525e-24	-23.175	-23.258	-0.083	(0)
UF3+	1.489e-33	1.230e-33	-32.827	-32.910	-0.083	(0)
UF2+2	5.080e-35	2.369e-35	-34.294	-34.625	-0.331	(0)
UF4	4.419e-35	4.419e-35	-34.355	-34.355	0.000	(0)
UF5-	6.943e-37	5.738e-37	-36.158	-36.241	-0.083	(0)
UF6-2	1.217e-37	5.677e-38	-36.915	-37.246	-0.331	(0)
UF+3	3.196e-38	5.744e-39	-37.495	-38.241	-0.745	(0)
Fe (2)	8.276e-07					
Fe+2	6.741e-07	3.144e-07	-6.171	-6.503	-0.331	(0)
FeSO4	1.105e-07	1.105e-07	-6.957	-6.957	0.000	(0)
FeHCO3+	4.099e-08	3.548e-08	-7.387	-7.450	-0.063	(0)
FeOH+	2.045e-09	1.759e-09	-8.689	-8.755	-0.065	(0)
Fe(OH) 2	1.963e-13	1.963e-13	-12.707	-12.707	0.000	(0)
Fe(OH) 3-	1.014e-14	8.726e-15	-13.994	-14.059	-0.065	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-146.675	-146.675	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-219.117	-219.200	-0.083	(0)
Fe (3)	2.590e-05					
Fe(OH) 2+	2.288e-05	1.973e-05	-4.641	-4.705	-0.064	(0)
Fe(OH) 3	2.978e-06	2.978e-06	-5.526	-5.526	0.000	(0)
Fe(OH) 4-	4.519e-08	3.897e-08	-7.345	-7.409	-0.064	(0)
FeOH+2	6.590e-10	3.609e-10	-9.181	-9.443	-0.262	(0)
FeF2+	1.456e-11	1.253e-11	-10.837	-10.902	-0.065	(0)
FeF3	5.791e-12	5.791e-12	-11.237	-11.237	0.000	(0)
FeF+2	2.609e-12	1.429e-12	-11.584	-11.845	-0.262	(0)
FeSO4+	7.427e-14	6.389e-14	-13.129	-13.195	-0.065	(0)
Fe+3	1.602e-14	3.977e-15	-13.795	-14.400	-0.605	(0)

	Fe (SO4) 2-	2.367e-15	1.956e-15	-14.626	-14.709	-0.083	(0)
	FeCl+2	3.242e-16	1.775e-16	-15.489	-15.751	-0.262	(0)
	Fe2 (OH) 2+4	9.117e-17	4.313e-18	-16.040	-17.365	-1.325	(0)
	FeCl2+	1.362e-18	1.172e-18	-17.866	-17.931	-0.065	(0)
	FeHSeO3+2	8.116e-19	3.785e-19	-18.091	-18.422	-0.331	(0)
	Fe3 (OH) 4+5	1.447e-19	1.230e-21	-18.840	-20.910	-2.071	(0)
	FeCl3	1.732e-22	1.732e-22	-21.761	-21.761	0.000	(0)
H (0)		3.891e-28					
	H2	1.946e-28	1.958e-28	-27.711	-27.708	0.003	(0)
Hg (0)		2.264e-10					
	Hg	2.264e-10	2.264e-10	-9.645	-9.645	0.000	(0)
Hg (1)		2.999e-22					
	Hg2+2	1.500e-22	6.993e-23	-21.824	-22.155	-0.331	(0)
Hg (2)		3.278e-13					
	HgClOH	1.669e-13	1.669e-13	-12.778	-12.778	0.000	(0)
	HgCl2	9.938e-14	9.938e-14	-13.003	-13.003	0.000	(0)
	Hg (OH) 2	5.635e-14	5.669e-14	-13.249	-13.246	0.003	(0)
	HgCO3	3.195e-15	3.195e-15	-14.496	-14.496	0.000	(0)
	HgCl3-	1.777e-15	1.469e-15	-14.750	-14.833	-0.083	(0)
	Hg (CO3) 2-2	1.271e-16	5.929e-17	-15.896	-16.227	-0.331	(0)
	HgCl4-2	1.853e-17	8.643e-18	-16.732	-17.063	-0.331	(0)
	HgCl+	1.624e-17	1.342e-17	-16.790	-16.872	-0.083	(0)
	HgHCO3+	5.156e-18	4.261e-18	-17.288	-17.371	-0.083	(0)
	HgOH+	3.080e-18	2.545e-18	-17.511	-17.594	-0.083	(0)
	Hg (OH) 3-	1.214e-21	1.003e-21	-20.916	-20.999	-0.083	(0)
	Hg+2	9.756e-22	4.550e-22	-21.011	-21.342	-0.331	(0)
	HgSO4	1.705e-22	1.705e-22	-21.768	-21.768	0.000	(0)
	HgF+	6.686e-24	5.525e-24	-23.175	-23.258	-0.083	(0)
	HgHS2-	0.000e+00	0.000e+00	-131.309	-131.392	-0.083	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-132.143	-132.143	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-132.624	-132.955	-0.331	(0)
K		7.364e-04					
	K+	7.291e-04	6.246e-04	-3.137	-3.204	-0.067	(0)
	KSO4-	7.341e-06	6.330e-06	-5.134	-5.199	-0.064	(0)
	KCrO4-	1.990e-19	1.645e-19	-18.701	-18.784	-0.083	(0)
Mg		1.765e-03					
	Mg+2	1.443e-03	7.767e-04	-2.841	-3.110	-0.269	(0)
	MgSO4	2.024e-04	2.024e-04	-3.694	-3.694	0.000	(0)
	MgHCO3+	8.337e-05	7.124e-05	-4.079	-4.147	-0.068	(0)
	MgF+	3.330e-05	2.855e-05	-4.478	-4.544	-0.067	(0)
	MgCO3	3.791e-06	3.791e-06	-5.421	-5.421	0.000	(0)
	MgOH+	5.006e-08	4.345e-08	-7.300	-7.362	-0.061	(0)
	MgH2BO3+	4.128e-09	3.488e-09	-8.384	-8.457	-0.073	(0)
Mn (2)		2.414e-05					
	Mn+2	1.972e-05	9.198e-06	-4.705	-5.036	-0.331	(0)
	MnSO4	2.342e-06	2.342e-06	-5.630	-5.630	0.000	(0)
	MnHCO3+	1.912e-06	1.645e-06	-5.718	-5.784	-0.065	(0)
	MnF+	1.395e-07	1.200e-07	-6.856	-6.921	-0.065	(0)
	MnCl+	1.990e-08	1.711e-08	-7.701	-7.767	-0.065	(0)
	MnOH+	3.775e-09	3.247e-09	-8.423	-8.489	-0.065	(0)
	MnCl2	3.573e-11	3.573e-11	-10.447	-10.447	0.000	(0)
	MnCl3-	1.691e-14	1.454e-14	-13.772	-13.837	-0.065	(0)
	MnSeO4	2.214e-15	2.214e-15	-14.655	-14.655	0.000	(0)
	Mn (OH) 3-	4.607e-19	3.963e-19	-18.337	-18.402	-0.065	(0)
	Mn (OH) 4-2	3.284e-25	1.798e-25	-24.484	-24.745	-0.262	(0)
	MnSe	2.924e-40	2.924e-40	-39.534	-39.534	0.000	(0)
Mn (3)		2.253e-25					
	Mn+3	2.253e-25	5.596e-26	-24.647	-25.252	-0.605	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-45.501	-45.763	-0.262	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-49.929	-50.000	-0.071	(0)
Mo		5.674e-07					
	MoO4-2	5.669e-07	3.053e-07	-6.246	-6.515	-0.269	(0)
	HMoO4-	5.264e-10	4.350e-10	-9.279	-9.362	-0.083	(0)
	H2MoO4	2.282e-13	2.282e-13	-12.642	-12.642	0.000	(0)
	Ag2MoO4	3.629e-23	3.629e-23	-22.440	-22.440	0.000	(0)
	AlMo6O21-3	7.878e-39	1.416e-39	-38.104	-38.849	-0.745	(0)

	Mo7O24-6	0.000e+00	0.000e+00	-46.795	-49.777	-2.982	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-48.464	-50.535	-2.071	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-51.572	-52.898	-1.325	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-56.051	-56.797	-0.745	(0)
Na	5.007e-03						
	Na+	4.946e-03	4.237e-03	-2.306	-2.373	-0.067	(0)
	NaSO4-	3.778e-05	3.258e-05	-4.423	-4.487	-0.064	(0)
	NaHCO3	2.136e-05	2.136e-05	-4.670	-4.670	0.000	(0)
	NaF	8.759e-07	8.759e-07	-6.058	-6.058	0.000	(0)
	NaCO3-	5.368e-07	4.630e-07	-6.270	-6.334	-0.064	(0)
	NaH2BO3	8.698e-10	8.698e-10	-9.061	-9.061	0.000	(0)
	NaCrO4-	1.806e-18	1.492e-18	-17.743	-17.826	-0.083	(0)
Ni	2.133e-07						
	Ni+2	1.066e-07	5.739e-08	-6.972	-7.241	-0.269	(0)
	NiHCO3+	7.675e-08	6.342e-08	-7.115	-7.198	-0.083	(0)
	NiSO4	1.639e-08	1.639e-08	-7.785	-7.785	0.000	(0)
	NiCO3	1.256e-08	1.256e-08	-7.901	-7.901	0.000	(0)
	NiF+	5.715e-10	4.723e-10	-9.243	-9.326	-0.083	(0)
	NiCl+	2.626e-10	2.170e-10	-9.581	-9.663	-0.083	(0)
	NiOH+	1.229e-10	1.015e-10	-9.911	-9.993	-0.083	(0)
	Ni (SO4) 2-2	1.667e-12	7.772e-13	-11.778	-12.109	-0.331	(0)
	Ni (OH) 2	1.133e-12	1.133e-12	-11.946	-11.946	0.000	(0)
	NiCl2	1.615e-15	1.615e-15	-14.792	-14.792	0.000	(0)
	Ni (OH) 3-	1.928e-16	1.593e-16	-15.715	-15.798	-0.083	(0)
	NiSeO4	2.401e-17	2.401e-17	-16.620	-16.620	0.000	(0)
O (0)	2.627e-37						
	O2	1.313e-37	1.321e-37	-36.882	-36.879	0.003	(0)
Pb	2.661e-08						
	PbCO3	1.595e-08	1.595e-08	-7.797	-7.797	0.000	(0)
	PbHCO3+	7.287e-09	6.022e-09	-8.137	-8.220	-0.083	(0)
	Pb+2	1.679e-09	9.041e-10	-8.775	-9.044	-0.269	(0)
	PbSO4	6.340e-10	6.340e-10	-9.198	-9.198	0.000	(0)
	Pb (CO3) 2-2	5.788e-10	2.699e-10	-9.237	-9.569	-0.331	(0)
	PbOH+	3.862e-10	3.192e-10	-9.413	-9.496	-0.083	(0)
	PbCl+	5.738e-11	4.741e-11	-10.241	-10.324	-0.083	(0)
	PbF+	2.526e-11	2.087e-11	-10.598	-10.680	-0.083	(0)
	Pb (SO4) 2-2	1.173e-11	5.469e-12	-10.931	-11.262	-0.331	(0)
	Pb (OH) 2	1.418e-12	1.418e-12	-11.848	-11.848	0.000	(0)
	PbCl2	3.130e-13	3.130e-13	-12.504	-12.504	0.000	(0)
	PbF2	1.346e-13	1.346e-13	-12.871	-12.871	0.000	(0)
	Pb (OH) 3-	2.412e-16	1.993e-16	-15.618	-15.700	-0.083	(0)
	PbCl3-	2.229e-16	1.842e-16	-15.652	-15.735	-0.083	(0)
	PbF3-	1.012e-16	8.363e-17	-15.995	-16.078	-0.083	(0)
	Pb2OH+3	2.545e-17	4.574e-18	-16.594	-17.340	-0.745	(0)
	PbCl4-2	2.668e-19	1.244e-19	-18.574	-18.905	-0.331	(0)
	PbF4-2	2.812e-20	1.311e-20	-19.551	-19.882	-0.331	(0)
	Pb (OH) 4-2	1.471e-20	6.861e-21	-19.832	-20.164	-0.331	(0)
	Pb3 (OH) 4+2	7.783e-23	3.629e-23	-22.109	-22.440	-0.331	(0)
	Pb4 (OH) 4+4	5.511e-27	2.607e-28	-26.259	-27.584	-1.325	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-142.897	-142.897	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-216.075	-216.158	-0.083	(0)
S (-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-68.498	-68.498	0.000	(0)
	HS-	0.000e+00	0.000e+00	-74.479	-74.561	-0.083	(0)
	H2S	0.000e+00	0.000e+00	-74.686	-74.686	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-74.802	-74.885	-0.083	(0)
	S5-2	0.000e+00	0.000e+00	-76.450	-76.782	-0.331	(0)
	S6-2	0.000e+00	0.000e+00	-76.966	-77.297	-0.331	(0)
	S4-2	0.000e+00	0.000e+00	-77.046	-77.377	-0.331	(0)
	S3-2	0.000e+00	0.000e+00	-77.852	-78.183	-0.331	(0)
	S2-2	0.000e+00	0.000e+00	-78.868	-79.199	-0.331	(0)
	S-2	0.000e+00	0.000e+00	-84.455	-84.716	-0.262	(0)
	HgHS2-	0.000e+00	0.000e+00	-131.309	-131.392	-0.083	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-132.143	-132.143	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-132.624	-132.955	-0.331	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-138.877	-138.960	-0.083	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-139.114	-139.298	-0.184	(0)
	Cu (S4) 2-3	0.000e+00	0.000e+00	-140.150	-140.485	-0.335	(0)

CuS4S5-3	0.000e+00	0.000e+00	-140.896	-141.215	-0.319	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-141.250	-141.593	-0.343	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.476	-141.558	-0.083	(0)
AgS4S5-3	0.000e+00	0.000e+00	-141.577	-141.904	-0.327	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-142.243	-142.243	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.693	-142.693	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-142.897	-142.897	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-146.675	-146.675	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-204.301	-204.383	-0.083	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.892	-213.975	-0.083	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-214.821	-214.904	-0.083	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-216.075	-216.158	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.479	-216.810	-0.331	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-219.117	-219.200	-0.083	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-286.938	-287.269	-0.331	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.665	-289.996	-0.331	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.384	-299.715	-0.331	(0)
S (6)	3.676e-03					
SO4-2	2.659e-03	1.432e-03	-2.575	-2.844	-0.269	(0)
CaSO4	7.665e-04	7.665e-04	-3.115	-3.115	0.000	(0)
MgSO4	2.024e-04	2.024e-04	-3.694	-3.694	0.000	(0)
NaSO4-	3.778e-05	3.258e-05	-4.423	-4.487	-0.064	(0)
KSO4-	7.341e-06	6.330e-06	-5.134	-5.199	-0.064	(0)
MnSO4	2.342e-06	2.342e-06	-5.630	-5.630	0.000	(0)
ZnSO4	1.274e-07	1.274e-07	-6.895	-6.895	0.000	(0)
FeSO4	1.105e-07	1.105e-07	-6.957	-6.957	0.000	(0)
CuSO4	8.275e-08	8.275e-08	-7.082	-7.082	0.000	(0)
NiSO4	1.639e-08	1.639e-08	-7.785	-7.785	0.000	(0)
HSO4-	1.169e-08	1.002e-08	-7.932	-7.999	-0.067	(0)
CoSO4	1.144e-08	1.144e-08	-7.942	-7.942	0.000	(0)
Zn (SO4) 2-2	3.407e-09	1.589e-09	-8.468	-8.799	-0.331	(0)
CrOHSO4	1.789e-09	1.789e-09	-8.747	-8.747	0.000	(0)
CdSO4	1.563e-09	1.563e-09	-8.806	-8.806	0.000	(0)
PbSO4	6.340e-10	6.340e-10	-9.198	-9.198	0.000	(0)
AgSO4-	6.126e-10	5.063e-10	-9.213	-9.296	-0.083	(0)
Cd (SO4) 2-2	6.475e-11	3.020e-11	-10.189	-10.520	-0.331	(0)
AlSO4+	1.708e-11	1.465e-11	-10.767	-10.834	-0.067	(0)
Pb (SO4) 2-2	1.173e-11	5.469e-12	-10.931	-11.262	-0.331	(0)
CrSO4+	6.930e-12	5.727e-12	-11.159	-11.242	-0.083	(0)
Ni (SO4) 2-2	1.667e-12	7.772e-13	-11.778	-12.109	-0.331	(0)
Al (SO4) 2-	2.621e-13	2.247e-13	-12.582	-12.648	-0.067	(0)
FeSO4+	7.427e-14	6.389e-14	-13.129	-13.195	-0.065	(0)
UO2SO4	8.157e-15	8.157e-15	-14.088	-14.088	0.000	(0)
Fe (SO4) 2-	2.367e-15	1.956e-15	-14.626	-14.709	-0.083	(0)
Cr2 (OH) 2SO4+2	1.827e-15	8.518e-16	-14.738	-15.070	-0.331	(0)
VO2SO4-	3.875e-16	3.203e-16	-15.412	-15.494	-0.083	(0)
UO2 (SO4) 2-2	3.301e-16	1.539e-16	-15.481	-15.813	-0.331	(0)
Cr2 (OH) 2 (SO4) 2	7.244e-17	7.244e-17	-16.140	-16.140	0.000	(0)
VOSO4	1.113e-17	1.113e-17	-16.953	-16.953	0.000	(0)
HgSO4	1.705e-22	1.705e-22	-21.768	-21.768	0.000	(0)
CrO3SO4-2	1.100e-24	5.132e-25	-23.958	-24.290	-0.331	(0)
VSO4+	4.320e-31	3.570e-31	-30.365	-30.447	-0.083	(0)
U (SO4) 2	5.695e-40	5.695e-40	-39.244	-39.244	0.000	(0)
USO4+2	1.074e-40	0.000e+00	-39.969	-40.300	-0.331	(0)
Sb (3)	1.026e-18					
Sb (OH) 3	5.193e-19	5.193e-19	-18.285	-18.285	0.000	(0)
HSbO2	5.071e-19	5.071e-19	-18.295	-18.295	0.000	(0)
Sb (OH) 2F	1.904e-23	1.904e-23	-22.720	-22.720	0.000	(0)
SbOF	1.873e-23	1.873e-23	-22.727	-22.727	0.000	(0)
SbO2-	1.388e-23	1.147e-23	-22.858	-22.940	-0.083	(0)
Sb (OH) 4-	7.945e-24	6.565e-24	-23.100	-23.183	-0.083	(0)
Sb (OH) 2+	1.093e-24	9.034e-25	-23.961	-24.044	-0.083	(0)
SbO+	3.771e-25	3.116e-25	-24.424	-24.506	-0.083	(0)
Sb2S4-2	0.000e+00	0.000e+00	-299.384	-299.715	-0.331	(0)
Sb (5)	1.330e-08					
SbO3-	1.329e-08	1.098e-08	-7.877	-7.959	-0.083	(0)
Sb (OH) 6-	1.497e-11	1.282e-11	-10.825	-10.892	-0.067	(0)
SbO2+	1.955e-23	1.616e-23	-22.709	-22.792	-0.083	(0)

Se (-2)	1.974e-10					
Ag2Se	1.974e-10	1.974e-10	-9.705	-9.705	0.000	(0)
HSe-	6.685e-37	5.524e-37	-36.175	-36.258	-0.083	(0)
H2Se	3.071e-40	3.071e-40	-39.513	-39.513	0.000	(0)
MnSe	2.924e-40	2.924e-40	-39.534	-39.534	0.000	(0)
Se-2	0.000e+00	0.000e+00	-43.781	-44.113	-0.331	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-78.016	-79.341	-1.325	(0)
Se (4)	4.787e-08					
HSeO3-	4.358e-08	3.601e-08	-7.361	-7.444	-0.083	(0)
SeO3-2	4.293e-09	2.002e-09	-8.367	-8.699	-0.331	(0)
H2SeO3	1.100e-12	1.100e-12	-11.959	-11.959	0.000	(0)
AgSeO3-	2.759e-14	2.280e-14	-13.559	-13.642	-0.083	(0)
FeHSeO3+2	8.116e-19	3.785e-19	-18.091	-18.422	-0.331	(0)
Cd (SeO3) 2-2	3.299e-20	1.539e-20	-19.482	-19.813	-0.331	(0)
Ag (SeO3) 2-3	2.274e-21	4.087e-22	-20.643	-21.389	-0.745	(0)
Se (6)	1.663e-12					
SeO4-2	1.661e-12	8.944e-13	-11.780	-12.048	-0.269	(0)
MnSeO4	2.214e-15	2.214e-15	-14.655	-14.655	0.000	(0)
ZnSeO4	5.635e-17	5.635e-17	-16.249	-16.249	0.000	(0)
NiSeO4	2.401e-17	2.401e-17	-16.620	-16.620	0.000	(0)
CoSeO4	1.795e-17	1.795e-17	-16.746	-16.746	0.000	(0)
HSeO4-	3.885e-18	3.210e-18	-17.411	-17.493	-0.083	(0)
CdSeO4	7.758e-19	7.758e-19	-18.110	-18.110	0.000	(0)
Zn (SeO4) 2-2	1.096e-28	5.110e-29	-27.960	-28.292	-0.331	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.241	-57.986	-0.745	(0)
U (4)	4.282e-22					
U (OH) 5-	4.271e-22	3.530e-22	-21.369	-21.452	-0.083	(0)
U (OH) 4	1.059e-24	1.059e-24	-23.975	-23.975	0.000	(0)
U (OH) 3+	3.357e-28	2.774e-28	-27.474	-27.557	-0.083	(0)
U (OH) 2+2	1.971e-32	9.191e-33	-31.705	-32.037	-0.331	(0)
UF3+	1.489e-33	1.230e-33	-32.827	-32.910	-0.083	(0)
UF2+2	5.080e-35	2.369e-35	-34.294	-34.625	-0.331	(0)
UF4	4.419e-35	4.419e-35	-34.355	-34.355	0.000	(0)
UF5-	6.943e-37	5.738e-37	-36.158	-36.241	-0.083	(0)
UOH+3	1.726e-37	3.102e-38	-36.763	-37.508	-0.745	(0)
UF6-2	1.217e-37	5.677e-38	-36.915	-37.246	-0.331	(0)
UF+3	3.196e-38	5.744e-39	-37.495	-38.241	-0.745	(0)
U (SO4) 2	5.695e-40	5.695e-40	-39.244	-39.244	0.000	(0)
USO4+2	1.074e-40	0.000e+00	-39.969	-40.300	-0.331	(0)
U+4	0.000e+00	0.000e+00	-42.731	-44.056	-1.325	(0)
UCl+3	0.000e+00	0.000e+00	-44.441	-45.187	-0.745	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.612	-174.320	-6.709	(0)
U (5)	2.039e-17					
UO2+	2.039e-17	1.685e-17	-16.691	-16.773	-0.083	(0)
U (6)	8.618e-08					
UO2 (CO3) 3-4	6.402e-08	3.028e-09	-7.194	-8.519	-1.325	(0)
UO2 (CO3) 2-2	2.208e-08	1.030e-08	-7.656	-7.987	-0.331	(0)
UO2CO3	8.793e-11	8.793e-11	-10.056	-10.056	0.000	(0)
UO2F+	2.060e-13	1.702e-13	-12.686	-12.769	-0.083	(0)
UO2F2	1.609e-13	1.609e-13	-12.794	-12.794	0.000	(0)
UO2OH+	8.059e-14	6.660e-14	-13.094	-13.177	-0.083	(0)
UO2F3-	1.602e-14	1.324e-14	-13.795	-13.878	-0.083	(0)
UO2SO4	8.157e-15	8.157e-15	-14.088	-14.088	0.000	(0)
UO2+2	6.991e-15	3.764e-15	-14.155	-14.424	-0.269	(0)
UO2 (SO4) 2-2	3.301e-16	1.539e-16	-15.481	-15.813	-0.331	(0)
UO2F4-2	7.387e-17	3.445e-17	-16.132	-16.463	-0.331	(0)
UO2Cl+	1.092e-17	9.023e-18	-16.962	-17.045	-0.083	(0)
(UO2) 2 (OH) 2+2	1.578e-20	7.360e-21	-19.802	-20.133	-0.331	(0)
(UO2) 3 (OH) 5+	8.887e-24	7.344e-24	-23.051	-23.134	-0.083	(0)
V (2)	1.453e-39					
VOH+	1.045e-39	8.639e-40	-38.981	-39.064	-0.083	(0)
V+2	4.073e-40	1.900e-40	-39.390	-39.721	-0.331	(0)
V (3)	1.183e-12					
V (OH) 3	1.183e-12	1.183e-12	-11.927	-11.927	0.000	(0)
V (OH) 2+	6.625e-23	5.475e-23	-22.179	-22.262	-0.083	(0)
VOH+2	7.978e-26	3.720e-26	-25.098	-25.429	-0.331	(0)
V+3	2.939e-30	5.282e-31	-29.532	-30.277	-0.745	(0)

VSO4+	4.320e-31	3.570e-31	-30.365	-30.447	-0.083	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-48.494	-49.239	-0.745	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-48.734	-50.059	-1.325	(0)
V (4)	1.103e-15					
V (OH) 3+	9.574e-16	7.912e-16	-15.019	-15.102	-0.083	(0)
VOF+	6.713e-17	5.548e-17	-16.173	-16.256	-0.083	(0)
VO+2	6.054e-17	2.823e-17	-16.218	-16.549	-0.331	(0)
VOSO4	1.113e-17	1.113e-17	-16.953	-16.953	0.000	(0)
VOF2	6.815e-18	6.815e-18	-17.167	-17.167	0.000	(0)
VOC1+	1.416e-19	1.171e-19	-18.849	-18.932	-0.083	(0)
VOF3-	9.587e-20	7.923e-20	-19.018	-19.101	-0.083	(0)
VOF4-2	2.247e-22	1.048e-22	-21.648	-21.980	-0.331	(0)
H2V2O4+2	6.734e-26	3.141e-26	-25.172	-25.503	-0.331	(0)
V (5)	1.177e-07					
H2VO4-	1.107e-07	9.146e-08	-6.956	-7.039	-0.083	(0)
HVO4-2	6.879e-09	3.208e-09	-8.162	-8.494	-0.331	(0)
H3VO4	6.550e-11	6.550e-11	-10.184	-10.184	0.000	(0)
H3V2O7-	4.682e-11	3.869e-11	-10.330	-10.412	-0.083	(0)
HV2O7-3	5.534e-13	9.946e-14	-12.257	-13.002	-0.745	(0)
VO2+	1.094e-14	9.368e-15	-13.961	-14.028	-0.067	(0)
VO2F	5.383e-15	5.383e-15	-14.269	-14.269	0.000	(0)
V3O9-3	4.464e-15	8.023e-16	-14.350	-15.096	-0.745	(0)
VO4-3	1.249e-15	2.245e-16	-14.903	-15.649	-0.745	(0)
V2O7-4	7.903e-16	3.738e-17	-15.102	-16.427	-1.325	(0)
VO2F2-	7.749e-16	6.403e-16	-15.111	-15.194	-0.083	(0)
VO2SO4-	3.875e-16	3.203e-16	-15.412	-15.494	-0.083	(0)
VO2F3-2	5.612e-18	2.617e-18	-17.251	-17.582	-0.331	(0)
V4O12-4	6.470e-19	3.060e-20	-18.189	-19.514	-1.325	(0)
VO2F4-3	2.347e-21	4.219e-22	-20.629	-21.375	-0.745	(0)
HV10O28-5	0.000e+00	0.000e+00	-46.947	-49.018	-2.071	(0)
V10O28-6	0.000e+00	0.000e+00	-47.078	-50.060	-2.982	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.630	-50.955	-1.325	(0)
Zn	1.175e-06					
Zn+2	7.555e-07	4.068e-07	-6.122	-6.391	-0.269	(0)
ZnHCO3+	1.395e-07	1.153e-07	-6.855	-6.938	-0.083	(0)
ZnCO3	1.374e-07	1.374e-07	-6.862	-6.862	0.000	(0)
ZnSO4	1.274e-07	1.274e-07	-6.895	-6.895	0.000	(0)
ZnOH+	6.917e-09	5.716e-09	-8.160	-8.243	-0.083	(0)
Zn (SO4) 2-2	3.407e-09	1.589e-09	-8.468	-8.799	-0.331	(0)
ZnF+	3.218e-09	2.659e-09	-8.492	-8.575	-0.083	(0)
ZnCl+	1.767e-09	1.510e-09	-8.753	-8.821	-0.068	(0)
ZnOHC1	2.778e-10	2.778e-10	-9.556	-9.556	0.000	(0)
Zn (OH) 2	1.273e-10	1.273e-10	-9.895	-9.895	0.000	(0)
ZnCl2	3.537e-12	3.537e-12	-11.451	-11.451	0.000	(0)
Zn (OH) 3-	1.085e-13	8.968e-14	-12.964	-13.047	-0.083	(0)
ZnCl3-	4.860e-15	4.153e-15	-14.313	-14.382	-0.068	(0)
ZnSeO4	5.635e-17	5.635e-17	-16.249	-16.249	0.000	(0)
ZnCl4-2	5.605e-18	3.069e-18	-17.251	-17.513	-0.262	(0)
Zn (OH) 4-2	1.076e-18	5.017e-19	-17.968	-18.300	-0.331	(0)
Zn (SeO4) 2-2	1.096e-28	5.110e-29	-27.960	-28.292	-0.331	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-141.476	-141.558	-0.083	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-142.693	-142.693	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-213.892	-213.975	-0.083	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-216.479	-216.810	-0.331	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-289.665	-289.996	-0.331	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
Acanthite	-46.70	-82.92	-36.22	Ag2S
Ag2CO3	-9.64	-20.73	-11.09	Ag2CO3
Ag2CrO4	-20.06	-31.65	-11.59	Ag2CrO4
Ag2HVO4	-9.58	-8.10	1.48	Ag2HVO4
Ag2MoO4	-10.47	-22.02	-11.55	Ag2MoO4
Ag2O	-13.79	-1.21	12.57	Ag2O
Ag2Se	4.08	-44.62	-48.70	Ag2Se
Ag2SeO3	-8.65	-15.80	-7.15	Ag2SeO3

Ag2SeO4	-18.64	-27.55	-8.91	Ag2SeO4
Ag2SO4	-13.53	-18.35	-4.82	Ag2SO4
Ag3AsO3	-22.58	-20.43	2.16	Ag3AsO3
Ag3AsO4	-11.98	-14.77	-2.79	Ag3AsO4
Ag3H2VO5	-13.88	-8.70	5.18	Ag3H2VO5
AgF:4H2O	-12.29	-11.24	1.05	AgF:4H2O
Agmetal	0.62	-12.89	-13.51	Ag
AgVO3	-8.26	-7.49	0.77	AgVO3
Al(OH)3(am)	-1.25	9.55	10.80	Al(OH)3
Al2(MoO4)3	-45.67	-43.31	2.37	Al2(MoO4)3
Al2O3	-0.54	19.11	19.65	Al2O3
Al4(OH)10SO4	-1.62	21.08	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-8.19	-3.39	4.80	AlAsO4:2H2O
AlOHSO4	-4.35	-7.58	-3.23	AlOHSO4
AlSb	-148.03	-82.40	65.62	AlSb
Alunite	-0.26	-1.66	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.10	-11.89	-7.79	PbSO4
Anhydrite	-1.12	-5.48	-4.36	CaSO4
Anilite	-50.75	-82.63	-31.88	Cu0.25Cu1.5S
Antlerite	-2.85	5.94	8.79	Cu3(OH)4SO4
Aragonite	0.44	-7.86	-8.30	CaCO3
Arsenolite	-71.66	-74.42	-2.76	As4O6
Artinite	-6.76	2.84	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-32.60	-25.89	6.71	As2O5
Atacamite	-1.98	5.41	7.39	Cu2(OH)3Cl
Azurite	0.94	-15.97	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.22	8.17	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-13.29	2.58	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	7.54	-1.37	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-22.18	10.76	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.59	-22.26	-9.67	BaCrO4
BaF2	-7.26	-13.08	-5.82	BaF2
BaMoO4	-5.67	-12.63	-6.96	BaMoO4
Barite	1.02	-8.96	-9.98	BaSO4
BaS	-89.71	-73.53	16.18	BaS
BaSeO3	-8.24	-6.41	1.83	BaSeO3
BaSeO4	-10.70	-18.16	-7.46	BaSeO4
Bianchite	-7.47	-9.24	-1.76	ZnSO4:6H2O
Birnessite	-9.63	8.46	18.09	MnO2
Bixbyite	-6.99	-7.63	-0.64	Mn2O3
BlaubleiI	-51.00	-75.16	-24.16	Cu0.9Cu0.2S
BlaubleiII	-51.33	-78.61	-27.28	Cu0.6Cu0.8S
Boehmite	0.98	9.55	8.58	AlOOH
Breithauptite	-54.11	-72.63	-18.52	NiSb
Brochantite	-1.59	13.63	15.22	Cu4(OH)6SO4
Brucite	-5.66	11.18	16.84	Mg(OH)2
Bunsenite	-5.40	7.05	12.45	NiO
Ca(VO3)2	-7.77	-2.11	5.66	Ca(VO3)2
Ca2V2O7	-7.95	9.55	17.50	Ca2V2O7
Ca2V2O7:2H2O	-12.00	9.55	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-13.22	9.08	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.75	21.21	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.65	21.21	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-291.92	-148.94	142.97	Ca3Sb2
CaCrO4	-16.52	-18.78	-2.27	CaCrO4
Calcite	0.62	-7.86	-8.48	CaCO3
Calomel	-9.91	-27.82	-17.91	Hg2Cl2
CaMoO4	-1.20	-9.15	-7.95	CaMoO4
Carnotite	-3.31	-3.08	0.23	KUO2VO4
CaSeO3:2H2O	-5.74	-2.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.66	-14.68	-3.02	CaSeO4:2H2O
Cd(BO2)2	-13.47	-3.63	9.84	Cd(BO2)2
Cd(OH)2	-7.69	5.96	13.64	Cd(OH)2
Cd(OH)2(am)	-7.77	5.96	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-23.10	-16.39	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.82	0.74	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.70	6.70	28.40	Cd4(OH)6SO4
CdCl2	-13.33	-13.99	-0.66	CdCl2

CdCl2:1H2O	-12.30	-13.99	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-12.08	-13.99	-1.91	CdCl2:2.5H2O
CdF2	-14.09	-15.30	-1.21	CdF2
Cdmetal (alpha)	-32.11	-18.60	13.51	Cd
Cdmetal (gamma)	-32.22	-18.60	13.62	Cd
CdMoO4	-0.70	-14.85	-14.15	CdMoO4
CdOHCl	-7.55	-4.02	3.54	CdOHCl
CdSb	-73.37	-73.72	-0.35	CdSb
CdSe	-17.24	-37.44	-20.20	CdSe
CdSeO4:2H2O	-18.53	-20.38	-1.85	CdSeO4:2H2O
CdSO4	-11.00	-11.18	-0.17	CdSO4
CdSO4:1H2O	-9.45	-11.18	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-9.30	-11.18	-1.87	CdSO4:2.67H2O
Cerargyrite	-0.83	-10.58	-9.75	AgCl
Cerrusite	-1.15	-14.28	-13.13	PbCO3
CH4 (g)	-76.71	-117.75	-41.05	CH4
Chalcanthite	-6.80	-9.44	-2.64	CuSO4:5H2O
Chalcocite	-50.58	-85.50	-34.92	Cu2S
Chalcopyrite	-112.66	-147.93	-35.27	CuFeS2
Cinnabar	-49.26	-94.95	-45.69	HgS
Claudetite	-71.36	-74.42	-3.06	As4O6
Clausthalite	-11.06	-38.16	-27.10	PbSe
Co (BO2) 2	-29.77	-2.70	27.07	Co (BO2) 2
Co (OH) 2	-6.20	6.89	13.09	Co (OH) 2
Co (OH) 3	-10.92	-13.23	-2.31	Co (OH) 3
CO2 (g)	-1.37	-19.52	-18.15	CO2
Co3 (AsO4) 2	-18.25	-5.21	13.03	Co3 (AsO4) 2
Co3O4	-9.07	-19.57	-10.50	Co3O4
CoCl2	-21.33	-13.06	8.27	CoCl2
CoCl2:6H2O	-15.60	-13.06	2.54	CoCl2:6H2O
CoCO3	-2.65	-12.63	-9.98	CoCO3
CoF2	-12.77	-14.37	-1.60	CoF2
CoF3	-43.66	-45.12	-1.46	CoF3
CoFe2O4	24.49	20.96	-3.53	CoFe2O4
CoMoO4	-6.15	-13.91	-7.76	CoMoO4
CoO	-6.69	6.89	13.59	CoO
CoS (alpha)	-67.37	-74.81	-7.44	CoS
CoS (beta)	-63.74	-74.81	-11.07	CoS
CoSe	-20.31	-36.51	-16.20	CoSe
CoSeO3	-9.02	-7.70	1.32	CoSeO3
CoSeO4:6H2O	-17.92	-19.45	-1.53	CoSeO4:6H2O
CoSO4	-13.04	-10.24	2.80	CoSO4
CoSO4:6H2O	-7.77	-10.24	-2.47	CoSO4:6H2O
Cotunnite	-9.92	-14.70	-4.78	PbCl2
Covellite	-51.71	-74.01	-22.30	CuS
Cr (OH) 2	-20.05	-9.23	10.82	Cr (OH) 2
Cr (OH) 3	-1.24	0.10	1.34	Cr (OH) 3
Cr (OH) 3 (am)	0.85	0.10	-0.75	Cr (OH) 3
Cr2O3	2.56	0.20	-2.36	Cr2O3
CrCl2	-43.27	-29.18	14.09	CrCl2
CrCl3	-44.94	-29.83	15.11	CrCl3
CrF3	-20.45	-31.79	-11.34	CrF3
Crmetal	-64.27	-33.79	30.48	Cr
CrO3	-27.23	-30.44	-3.21	CrO3
Cryolite	-6.07	-39.91	-33.84	Na3AlF6
Cu (OH) 2	-0.98	7.69	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.97	20.24	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-51.28	-86.16	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-1.40	-47.20	-45.80	Cu2Se
Cu2SO4	-18.98	-20.93	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-8.92	-2.82	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-55.06	-97.65	-42.59	Cu3Sb
Cu3Se2	-19.42	-82.91	-63.49	Cu3Se2
CuCO3	-0.33	-11.83	-11.50	CuCO3
CuCrO4	-17.31	-22.75	-5.44	CuCrO4
CuF	-7.62	-12.53	-4.91	CuF
CuF2	-14.68	-13.57	1.12	CuF2
CuF2:2H2O	-9.02	-13.57	-4.55	CuF2:2H2O

Cumetal	-5.42	-14.18	-8.76	Cu
CuMoO4	-0.04	-13.11	-13.08	CuMoO4
CuOCuSO4	-12.05	-1.75	10.30	CuOCuSO4
Cupricferrite	15.77	21.76	5.99	CuFe2O4
Cuprite	-2.39	-3.79	-1.41	Cu2O
Cuprousferrite	14.05	5.14	-8.92	CuFeO2
CuSe	-2.61	-35.71	-33.10	CuSe
CuSe2	-21.19	-54.56	-33.37	CuSe2
CuSeO3:2H2O	-7.41	-6.90	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-16.21	-18.65	-2.44	CuSeO4:5H2O
CuSO4	-12.38	-9.44	2.94	CuSO4
Diaspore	2.68	9.55	6.87	AlOOH
Djurleite	-50.82	-84.74	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.34	-16.20	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.89	-16.20	-17.09	CaMg(CO3)2
Epsomite	-3.83	-5.96	-2.13	MgSO4:7H2O
Fe(OH)2	-5.78	7.79	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	7.08	4.04	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-2.26	-5.98	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-2.07	-0.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-9.07	-29.70	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-33.60	-37.33	-3.73	Fe2(SO4)3
Fe3(OH)8	1.63	21.85	20.22	Fe3(OH)8
FeAsO4:2H2O	-6.31	-5.91	0.40	FeAsO4:2H2O
FeCr2O4	0.79	7.99	7.20	FeCr2O4
FeMoO4	-2.93	-13.02	-10.09	FeMoO4
Ferrihydrite	3.84	7.03	3.19	Fe(OH)3
Ferroselite	-35.86	-54.46	-18.60	FeSe2
FeS(ppt)	-70.97	-73.92	-2.95	FeS
FeSe	-24.62	-35.62	-11.00	FeSe
Fix_pe	-5.13	-5.13	0.00	e-
Fluorite	0.90	-9.60	-10.50	CaF2
Galena	-62.49	-76.46	-13.97	PbS
Gibbsite	1.26	9.55	8.29	Al(OH)3
Goethite	6.54	7.03	0.49	FeOOH
Goslarite	-7.23	-9.24	-2.01	ZnSO4:7H2O
Greenockite	-61.39	-75.75	-14.36	CdS
Greigite	-259.93	-304.97	-45.03	Fe3S4
Gummite	-7.81	-0.13	7.67	UO3
Gypsum	-0.87	-5.48	-4.61	CaSO4:2H2O
H-Jarosite	-1.07	-13.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.93	-20.81	-12.88	H2MoO4
H2S(g)	-73.70	-81.71	-8.01	H2S
H2Se(g)	-38.44	-43.40	-4.96	H2Se
Halite	-6.81	-5.20	1.60	NaCl
Hausmannite	-8.71	52.32	61.03	Mn3O4
Hematite	15.49	14.07	-1.42	Fe2O3
Hercynite	4.00	26.90	22.89	FeAl2O4
Hg(CH3)2(g)	-175.05	-248.75	-73.71	Hg(CH3)2
Hg(g)	-8.34	-16.21	-7.87	Hg
Hg(OH)2	-9.75	-13.25	-3.50	Hg(OH)2
Hg2(g)	-17.47	-32.42	-14.96	Hg2
Hg2(OH)2	-13.13	-7.87	5.26	Hg2(OH)2
Hg2CO3	-11.34	-27.39	-16.05	Hg2CO3
Hg2CrO4	-29.60	-38.30	-8.70	Hg2CrO4
Hg2F2	-18.76	-29.12	-10.36	Hg2F2
Hg2S	-77.90	-89.57	-11.68	Hg2S
Hg2SeO3	-17.80	-22.45	-4.66	Hg2SeO3
Hg2SO4	-18.87	-25.00	-6.13	Hg2SO4
Hg3O2CO3	-29.58	-59.26	-29.68	Hg3O2CO3
HgCl(g)	-33.40	-13.91	19.50	HgCl
HgCl2	-11.93	-33.20	-21.26	HgCl2
HgF(g)	-47.24	-14.56	32.68	HgF
HgF2(g)	-47.07	-34.51	12.57	HgF2
Hgmetal(l)	-2.76	-16.21	-13.45	Hg
HgSe	-0.95	-56.65	-55.69	HgSe
HgSeO3	-15.40	-27.83	-12.43	HgSeO3
HgSO4	-20.96	-30.38	-9.42	HgSO4

Huntite	-2.92	-32.89	-29.97	CaMg ₃ (CO ₃) ₄
Hydrocerrusite	-4.53	-23.30	-18.77	Pb ₃ (OH) ₂ (CO ₃) ₂
Hydromagnesite	-13.42	-22.19	-8.77	Mg ₅ (CO ₃) ₄ (OH) ₂ ·4H ₂ O
K-Alum	-15.61	-20.78	-5.17	KAl(SO ₄) ₂ ·12H ₂ O
K-Jarosite	5.57	-9.23	-14.80	KFe ₃ (SO ₄) ₂ (OH) ₆
K ₂ Cr ₂ O ₇	-35.76	-53.00	-17.24	K ₂ Cr ₂ O ₇
K ₂ CrO ₄	-22.04	-22.56	-0.51	K ₂ CrO ₄
K ₂ MoO ₄	-16.19	-12.92	3.26	K ₂ MoO ₄
K ₂ SeO ₄	-17.73	-18.46	-0.73	K ₂ SeO ₄
Langite	-3.86	13.63	17.49	Cu ₄ (OH) ₆ SO ₄ ·H ₂ O
Larnakite	-6.21	-6.64	-0.43	PbO:PbSO ₄
Laurionite	-5.35	-4.73	0.62	PbOHCl
Lepidocrocite	5.66	7.03	1.37	FeOOH
Lime	-21.04	11.66	32.70	CaO
Litharge	-7.45	5.25	12.69	PbO
Mackinawite	-70.32	-73.92	-3.60	FeS
Maghemite	7.68	14.07	6.39	Fe ₂ O ₃
Magnesioferrite	8.39	25.25	16.86	Fe ₂ MgO ₄
Magnesite	-0.88	-8.34	-7.46	MgCO ₃
Magnetite	18.45	21.86	3.40	Fe ₃ O ₄
Malachite	1.17	-4.14	-5.31	Cu ₂ (OH) ₂ CO ₃
Manganite	-3.81	21.53	25.34	MnOOH
Massicot	-7.65	5.25	12.89	PbO
Matlockite	-6.39	-15.36	-8.97	PbClF
Melanothallite	-18.52	-12.26	6.26	CuCl ₂
Melanterite	-7.14	-9.35	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-49.86	-94.95	-45.09	HgS
Mg(OH) ₂ (active)	-7.61	11.18	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-13.87	-2.59	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-266.80	-192.12	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-17.77	8.59	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-4.82	11.38	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.64	-19.26	5.38	MgCrO ₄
MgF ₂	-1.95	-10.08	-8.13	MgF ₂
MgMoO ₄	-7.78	-9.63	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.47	-3.41	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-13.96	-15.16	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-33.23	40.30	73.52	Pb ₃ O ₄
Mirabilite	-6.48	-7.59	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-9.41	-4.51	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-53.33	-59.04	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-146.81	-85.73	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-10.63	1.87	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.41	-10.70	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-72.62	-72.45	0.17	MnS
MnS (pnk)	-75.79	-72.45	3.34	MnS
MnSb	-92.87	-95.78	-2.91	MnSb
MnSe	-37.65	-34.15	3.50	MnSe
MnSeO ₃	-6.46	-5.33	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.32	-5.34	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-15.04	-17.09	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.46	-7.88	2.58	MnSO ₄
Monteponite	-9.15	5.96	15.10	CdO
Montroydite	-9.61	-13.25	-3.64	HgO
MoO ₃	-12.81	-20.81	-8.00	MoO ₃
Morenosite	-7.94	-10.09	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-138.52	-208.78	-70.26	MoS ₂
Na-Jarosite	2.81	-8.39	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.44	-51.33	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.83	-20.90	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.47	-32.07	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.75	-11.26	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.49	-11.26	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.35	-5.05	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-18.07	-16.79	1.28	Na ₂ SeO ₄
Na ₃ Sb	-172.09	-77.64	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.25	7.43	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.08	5.32	37.40	Na ₄ V ₂ O ₇

Nantokite	-5.14	-11.87	-6.73	CuCl
NaSb	-85.79	-62.63	23.17	NaSb
Natron	-8.67	-9.98	-1.31	Na2CO3:10H2O
NaVO3	-5.97	-2.11	3.86	NaVO3
Nesquehonite	-3.67	-8.34	-4.67	MgCO3:3H2O
Ni(OH)2	-5.75	7.05	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-20.45	-4.75	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.94	11.06	32.00	Ni4(OH)6SO4
NiCO3	-5.60	-12.47	-6.87	NiCO3
NiMoO4	-2.61	-13.76	-11.14	NiMoO4
NiS(alpha)	-69.06	-74.66	-5.60	NiS
NiS(beta)	-63.56	-74.66	-11.10	NiS
NiS(gamma)	-61.86	-74.66	-12.80	NiS
NiSe	-18.65	-36.35	-17.70	NiSe
NiSeO3:2H2O	-10.35	-7.54	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.77	-19.29	-1.52	NiSeO4:6H2O
Nsutite	-9.04	8.46	17.50	MnO2
O2(g)	-33.97	49.12	83.09	O2
Orpiment	-221.26	-282.33	-61.07	As2S3
Otavite	-1.56	-13.56	-12.00	CdCO3
Pb(BO2)2	-10.87	-4.35	6.52	Pb(BO2)2
Pb(OH)2	-2.90	5.25	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-55.91	-64.67	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-8.28	0.52	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.70	10.49	26.19	Pb2O(OH)2
Pb2O3	-25.99	35.05	61.04	Pb2O3
Pb2OCO3	-8.47	-9.03	-0.56	Pb2OCO3
Pb2V2O7	-1.37	-3.27	-1.90	Pb2V2O7
Pb3(AsO4)2	-15.95	-10.15	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.17	1.97	6.14	Pb3(VO4)2
Pb3O2CO3	-14.80	-3.78	11.02	Pb3O2CO3
Pb3O2SO4	-12.08	-1.40	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.25	3.85	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.03	3.85	21.88	Pb4O3SO4
PbCrO4	-12.59	-25.19	-12.60	PbCrO4
PbF2	-8.57	-16.01	-7.44	PbF2
Pbmetal	-23.56	-19.31	4.25	Pb
PbMoO4	0.06	-15.56	-15.62	PbMoO4
PbO:0.3H2O	-7.73	5.25	12.98	PbO:0.33H2O
PbSeO4	-14.25	-21.09	-6.84	PbSeO4
Periclase	-10.40	11.18	21.58	MgO
Phosgenite	-9.17	-28.98	-19.81	PbCl2:PbCO3
Plattnerite	-19.80	29.80	49.60	PbO2
Portlandite	-11.15	11.66	22.80	Ca(OH)2
Pyrite	-112.56	-131.07	-18.51	FeS2
Pyrochroite	-5.94	9.25	15.19	Mn(OH)2
Pyrolusite	-7.57	33.81	41.38	MnO2
Realgar	-92.84	-112.59	-19.75	AsS
Retgersite	-8.05	-10.09	-2.04	NiSO4:6H2O
Rhodochrosite	0.31	-10.27	-10.58	MnCO3
Rutherfordine	-5.16	-19.66	-14.50	UO2CO3
Sb(OH)3	-11.17	-18.28	-7.11	Sb(OH)3
Sb2O4	-15.41	-12.01	3.40	Sb2O4
Sb2O5	-26.41	-36.07	-9.67	Sb2O5
Sb2Se3	-99.02	-166.78	-67.76	Sb2Se3
Sb4O6(cubic)	-54.88	-73.14	-18.26	Sb4O6
Sb4O6(orth)	-55.24	-73.14	-17.90	Sb4O6
SbCl3	-48.78	-48.21	0.57	SbCl3
SbF3	-39.95	-50.17	-10.23	SbF3
Sbmetal	-43.43	-55.12	-11.69	Sb
SbO2	-2.49	-30.32	-27.82	SbO2
Schoepite	-6.13	-0.13	5.99	UO2(OH)2:H2O
Semetal(am)	-11.73	-18.84	-7.11	Se
Semetal(hex)	-11.14	-18.84	-7.71	Se
Senarmontite	-24.20	-36.57	-12.37	Sb2O3
SeO2	-14.71	-14.59	0.12	SeO2
SeO3	-47.38	-26.34	21.04	SeO3
Siderite	-1.49	-11.73	-10.24	FeCO3

Smithsonite	-1.62	-11.62	-10.00	ZnCO3
Sphalerite	-62.36	-73.81	-11.45	ZnS
Spinel	-6.56	30.29	36.85	MgAl2O4
Stibnite	-231.23	-281.69	-50.46	Sb2S3
Sulfur	-55.00	-57.15	-2.14	S
Tenorite	0.05	7.69	7.64	CuO
Thenardite	-7.91	-7.59	0.32	Na2SO4
Thermonatrite	-10.61	-9.98	0.64	Na2CO3:H2O
Tyuyamunite	-6.46	-2.38	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-18.40	2.69	21.08	U3O8
U3Sb4	-566.65	-414.26	152.38	U3Sb4
U4O9	-34.33	-37.35	-3.02	U4O9
UF4	-28.46	-57.99	-29.54	UF4
UF4:2.5H2O	-25.28	-58.00	-32.72	UF4:2.5H2O
UO2 (am)	-16.41	-15.48	0.93	UO2
UO2 (OH) 2 (beta)	-5.75	-0.13	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-24.22	-26.47	-2.25	UO2SeO4:4H2O
UO3	-7.83	-0.13	7.70	UO3
Uraninite	-10.81	-15.48	-4.67	UO2
USb2	-213.63	-184.05	29.58	USb2
V (OH) 3	-16.43	-8.84	7.59	V (OH) 3
V2O5	-12.41	-13.77	-1.36	V2O5
V3O5	-33.17	-31.34	1.84	V3O5
V4O7	-40.78	-33.60	7.19	V4O7
V6O13	-29.56	-90.42	-60.86	V6O13
Valentinite	-28.09	-36.57	-8.48	Sb2O3
VC12	-59.95	-41.07	18.87	VC12
VC13	-62.20	-38.77	23.43	VC13
VF4	-59.71	-44.78	14.93	VF4
Vmetal	-89.70	-45.68	44.03	V
VO	-35.88	-21.12	14.76	VO
VO (OH) 2	-7.41	-2.26	5.15	VO (OH) 2
VO2Cl	-19.70	-16.86	2.84	VO2Cl
VOC1	-29.97	-18.82	11.15	VOC1
VOC12	-34.97	-22.21	12.76	VOC12
VOSO4	-23.00	-19.39	3.61	VOSO4
Witherite	-2.78	-11.35	-8.57	BaCO3
Wurtzite	-64.86	-73.81	-8.95	ZnS
Zincite	-3.43	7.90	11.33	ZnO
Zincosite	-13.16	-9.23	3.93	ZnSO4
Zn (BO2) 2	-9.98	-1.69	8.29	Zn (BO2) 2
Zn (OH) 2	-4.30	7.90	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.58	7.90	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.86	7.90	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.64	7.90	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.84	7.90	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.84	-1.34	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.37	5.82	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-15.84	-2.19	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.48	-10.57	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.94	14.46	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.96	19.54	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.10	-12.05	7.05	ZnCl2
ZnCO3:1H2O	-1.36	-11.62	-10.26	ZnCO3:1H2O
ZnF2	-12.83	-13.36	-0.53	ZnF2
Znmetal	-42.45	-16.66	25.79	Zn
ZnMoO4	-2.78	-12.91	-10.13	ZnMoO4
ZnO (active)	-3.29	7.90	11.19	ZnO
ZnS (am)	-64.76	-73.81	-9.05	ZnS
ZnSb	-82.79	-71.78	11.01	ZnSb
ZnSe	-21.10	-35.50	-14.40	ZnSe
ZnSeO4:6H2O	-16.92	-18.44	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.60	-9.24	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 150.

Title Precipitate oversaturated phases in groundwater

PHASES

Fix_pe

e--e-

log_k 0

EQUILIBRIUM_PHASES 901

Ag2Se 0 0

Alunite 0 0

Anhydrite 0 0

Alunite 0 0

Ba3(AsO4)2 0 0

Barite 0 0

Brochantite 0 0

Brucite 0 0

Calcite 0 0

CaMoO4 0 0

CaSeO3:2H2O 0 0

Carnotite 0 0

Cd(BO2)2 0 0

CdMoO4 0 0

Chrysotile 0 0

CO2(g) -1.69 10

Cr2O3 0 0

CuMoO4 0 0

Cu2Se(alpha) 0 0

Epsomite 0 0

Ferrihydrite 0 0

Fluorite 0 0

Gummite 0 0

Gypsum 0 0

HgSe 0 0

Mg3(PO4)2 0 0

Mirabilite 0 0

MnSeO3 0 0

O2(g) -32 10

Otavite 0 0

NiCO3 0 0

NiMoO4 0 0

Ni(OH)2 0 0

Ni3(AsO4)2:8H2O 0 0

PbMoO4 0 0

Rutherfordine 0 0

SbO2 0 0

Schoepite 0 0

Sepiolite 0 0

SiO2(am-ppt) 0 0

Tyuyamunite 0 0

U3O8 0 0

UO3 0 0

UO2(OH)2(beta) 0 0

ZnMoO4 0 0

USE solution 902

SAVE Solution 903 Initial Pit Water after Mineral Precipitation

SAVE EQUILIBRIUM_PHASES 901

END

TITLE

Precipitate oversaturated phases in groundwater

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 902. Solution after simulation 149.
Using pure phase assemblage 901.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	0.000e+00	2.538e-08	2.538e-08
Alunite	0.00	-1.40	-1.40	0.000e+00	9.295e-07	9.295e-07
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.029e-08	2.029e-08
Barite	0.00	-9.98	-9.98	0.000e+00	1.331e-06	1.331e-06
Brochantite	-0.39	14.83	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.673e-03
CaMoO4	-1.74	-9.69	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-6.36	-3.54	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	2.923e-03	2.923e-03
Carnotite	-2.32	-2.09	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.44	-3.60	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.91	-15.06	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	0.00	-2.36	-2.36	0.000e+00	6.029e-08	6.029e-08
Cu2Se(alpha)	-5.09	-50.89	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	0.000e+00	2.597e-07	2.597e-07
Epsomite	-3.72	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	2.671e-05	2.671e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	1.124e-04	1.124e-04
Gummite	-6.84	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.25	-58.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.50	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.72	-5.59	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.17	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-24.35	-8.65	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.73	-13.88	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.694e-07
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	5.239e-09	5.239e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.97	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-4.81	-0.73	4.08	0.000e+00	0	0.000e+00

U3O8	-16.50	4.59	21.08	0.000e+00	0	0.000e+00
UO2 (OH) 2 (beta)	-4.78	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.95	-13.08	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	3.276e-08	3.274e-08
Al	1.918e-06	1.917e-06
As	2.739e-10	2.738e-10
B	1.606e-05	1.605e-05
Ba	1.098e-07	1.098e-07
C	5.842e-03	5.840e-03
Ca	2.552e-03	2.551e-03
Cd	1.186e-08	1.186e-08
Cl	1.725e-03	1.725e-03
Co	1.359e-07	1.359e-07
Cr	6.448e-09	6.446e-09
Cu	9.622e-06	9.618e-06
F	2.117e-04	2.116e-04
Fe	3.680e-09	3.678e-09
Hg	2.267e-10	2.266e-10
K	7.355e-04	7.351e-04
Mg	1.765e-03	1.764e-03
Mn	2.414e-05	2.413e-05
Mo	3.024e-07	3.022e-07
Na	5.006e-03	5.004e-03
Ni	2.132e-07	2.131e-07
Pb	2.137e-08	2.136e-08
S	3.672e-03	3.671e-03
Sb	1.330e-08	1.329e-08
Se	2.268e-08	2.267e-08
U	8.617e-08	8.614e-08
V	1.177e-07	1.177e-07
Zn	1.175e-06	1.175e-06

-----Description of solution-----

	pH =	7.147	Charge balance
	pe =	5.625	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.914e-02	
	Mass of water (kg) =	9.996e-01	
	Total alkalinity (eq/kg) =	5.171e-03	
	Total CO2 (mol/kg) =	5.842e-03	
	Temperature (°C) =	25.00	
	Pressure (atm) =	1.00	
	Electrical balance (eq) =	1.297e-15	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	11	
	Total H =	1.109722e+02	
	Total O =	5.551507e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.625e-07	1.413e-07	-6.789	-6.850	-0.061	(0)
H+	8.164e-08	7.126e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	3.276e-08					
AgCl	2.127e-08	2.127e-08	-7.672	-7.672	0.000	(0)
Ag+	7.924e-09	6.917e-09	-8.101	-8.160	-0.059	(0)
AgCl2-	3.282e-09	2.790e-09	-8.484	-8.554	-0.071	(0)

	AgSO4-	2.743e-10	2.331e-10	-9.562	-9.632	-0.071	(0)
	AgCl3-2	7.171e-12	3.744e-12	-11.144	-11.427	-0.282	(0)
	AgF	2.874e-12	2.874e-12	-11.542	-11.542	0.000	(0)
	AgOH	9.770e-14	9.770e-14	-13.010	-13.010	0.000	(0)
	AgCl4-3	4.968e-14	1.151e-14	-13.304	-13.939	-0.635	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	AgH2BO3	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
	AgSeO3-	5.161e-15	4.387e-15	-14.287	-14.358	-0.071	(0)
	Ag (OH) 2-	1.587e-18	1.349e-18	-17.800	-17.870	-0.071	(0)
	Ag (SeO3) 2-3	1.673e-22	3.877e-23	-21.777	-22.412	-0.635	(0)
	Ag2MoO4	3.175e-24	3.175e-24	-23.498	-23.498	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-72.784	-72.784	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.153	-86.282	-1.129	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.051	-147.122	-0.071	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.291	-147.458	-0.168	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.434	-149.751	-0.318	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.758	-150.062	-0.304	(0)
Al	1.918e-06						
	Al (OH) 4-	1.294e-06	1.131e-06	-5.888	-5.947	-0.059	(0)
	AlF3	3.229e-07	3.229e-07	-6.491	-6.491	0.000	(0)
	AlF2+	1.767e-07	1.551e-07	-6.753	-6.809	-0.057	(0)
	Al (OH) 3	6.359e-08	6.359e-08	-7.197	-7.197	0.000	(0)
	AlF4-	3.064e-08	2.677e-08	-7.514	-7.572	-0.059	(0)
	Al (OH) 2+	2.571e-08	2.256e-08	-7.590	-7.647	-0.057	(0)
	AlF+2	3.968e-09	2.355e-09	-8.401	-8.628	-0.227	(0)
	AlOH+2	3.388e-10	2.011e-10	-9.470	-9.697	-0.227	(0)
	AlSO4+	2.136e-11	1.867e-11	-10.670	-10.729	-0.059	(0)
	Al+3	4.840e-12	1.424e-12	-11.315	-11.847	-0.531	(0)
	Al (SO4) 2-	3.867e-13	3.379e-13	-12.413	-12.471	-0.059	(0)
	AlMo6O21-3	2.300e-40	0.000e+00	-39.638	-40.273	-0.635	(0)
As (3)	1.871e-22						
	H3AsO3	1.855e-22	1.855e-22	-21.732	-21.732	0.000	(0)
	H2AsO3-	1.571e-24	1.335e-24	-23.804	-23.874	-0.071	(0)
	HAsO3-2	3.273e-29	1.709e-29	-28.485	-28.767	-0.282	(0)
	H4AsO3+	7.706e-30	6.550e-30	-29.113	-29.184	-0.071	(0)
	AsO3-3	3.989e-35	9.245e-36	-34.399	-35.034	-0.635	(0)
As (5)	2.739e-10						
	HAsO4-2	1.957e-10	1.022e-10	-9.708	-9.991	-0.282	(0)
	H2AsO4-	7.813e-11	6.642e-11	-10.107	-10.178	-0.071	(0)
	AsO4-3	1.957e-14	4.535e-15	-13.708	-14.343	-0.635	(0)
	H3AsO4	8.189e-16	8.225e-16	-15.087	-15.085	0.002	(0)
B	1.606e-05						
	H3BO3	1.589e-05	1.596e-05	-4.799	-4.797	0.002	(0)
	H2BO3-	1.505e-07	1.301e-07	-6.822	-6.886	-0.063	(0)
	CaH2BO3+	1.001e-08	8.650e-09	-8.000	-8.063	-0.063	(0)
	MgH2BO3+	4.376e-09	3.782e-09	-8.359	-8.422	-0.063	(0)
	BF (OH) 3-	1.219e-09	1.053e-09	-8.914	-8.977	-0.063	(0)
	NaH2BO3	8.907e-10	8.907e-10	-9.050	-9.050	0.000	(0)
	H5 (BO3) 2-	2.044e-12	1.767e-12	-11.689	-11.753	-0.063	(0)
	BF2 (OH) 2-	1.536e-12	1.328e-12	-11.813	-11.877	-0.063	(0)
	BaH2BO3+	2.883e-13	2.491e-13	-12.540	-12.604	-0.063	(0)
	AgH2BO3	1.426e-14	1.426e-14	-13.846	-13.846	0.000	(0)
	H8 (BO3) 3-	3.262e-15	2.819e-15	-14.486	-14.550	-0.063	(0)
	BF3OH-	7.048e-18	6.092e-18	-17.152	-17.215	-0.063	(0)
	BF4-	4.089e-22	3.534e-22	-21.388	-21.452	-0.063	(0)
Ba	1.098e-07						
	Ba+2	1.068e-07	6.198e-08	-6.972	-7.208	-0.236	(0)
	BaHCO3+	2.929e-09	2.578e-09	-8.533	-8.589	-0.055	(0)
	BaCO3	9.108e-11	9.108e-11	-10.041	-10.041	0.000	(0)
	BaH2BO3+	2.883e-13	2.491e-13	-12.540	-12.604	-0.063	(0)
	BaOH+	4.363e-14	3.822e-14	-13.360	-13.418	-0.057	(0)
C (4)	5.842e-03						
	HCO3-	4.962e-03	4.355e-03	-2.304	-2.361	-0.057	(0)
	H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
	CaHCO3+	1.065e-04	9.372e-05	-3.973	-4.028	-0.055	(0)
	MgHCO3+	4.288e-05	3.737e-05	-4.368	-4.427	-0.060	(0)
	NaHCO3	1.058e-05	1.058e-05	-4.975	-4.975	0.000	(0)
	CuCO3	8.074e-06	8.074e-06	-5.093	-5.093	0.000	(0)

	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CO3-2	4.936e-06	2.865e-06	-5.307	-5.543	-0.236	(0)
	MgCO3	1.999e-06	1.999e-06	-5.699	-5.699	0.000	(0)
	MnHCO3+	1.030e-06	9.022e-07	-5.987	-6.045	-0.057	(0)
	NaCO3-	2.627e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
	CuHCO3+	1.547e-07	1.315e-07	-6.811	-6.881	-0.071	(0)
	Cu (CO3) 2-2	1.193e-07	6.226e-08	-6.924	-7.206	-0.282	(0)
	ZnCO3	7.892e-08	7.892e-08	-7.103	-7.103	0.000	(0)
	ZnHCO3+	7.755e-08	6.592e-08	-7.110	-7.181	-0.071	(0)
	NiHCO3+	4.793e-08	4.075e-08	-7.319	-7.390	-0.071	(0)
	UO2 (CO3) 3-4	4.308e-08	3.202e-09	-7.366	-8.495	-1.129	(0)
	UO2 (CO3) 2-2	4.270e-08	2.230e-08	-7.370	-7.652	-0.282	(0)
	CoHCO3+	1.995e-08	1.696e-08	-7.700	-7.771	-0.071	(0)
	PbCO3	1.178e-08	1.178e-08	-7.929	-7.929	0.000	(0)
	NiCO3	8.112e-09	8.112e-09	-8.091	-8.091	0.000	(0)
	PbHCO3+	5.208e-09	4.427e-09	-8.283	-8.354	-0.071	(0)
	BaHCO3+	2.929e-09	2.578e-09	-8.533	-8.589	-0.055	(0)
	CoCO3	2.425e-09	2.425e-09	-8.615	-8.615	0.000	(0)
	UO2CO3	3.900e-10	3.900e-10	-9.409	-9.409	0.000	(0)
	CdCO3	3.243e-10	3.243e-10	-9.489	-9.489	0.000	(0)
	Pb (CO3) 2-2	1.865e-10	9.737e-11	-9.729	-10.012	-0.282	(0)
	BaCO3	9.108e-11	9.108e-11	-10.041	-10.041	0.000	(0)
	CdHCO3+	5.793e-11	4.924e-11	-10.237	-10.308	-0.071	(0)
	Cd (CO3) 2-2	1.319e-12	6.889e-13	-11.880	-12.162	-0.282	(0)
	FeHCO3+	8.936e-13	7.865e-13	-12.049	-12.104	-0.055	(0)
	HgCO3	1.479e-14	1.479e-14	-13.830	-13.830	0.000	(0)
	Hg (CO3) 2-2	2.566e-16	1.340e-16	-15.591	-15.873	-0.282	(0)
	HgHCO3+	2.308e-17	1.962e-17	-16.637	-16.707	-0.071	(0)
Ca	2.552e-03						
	Ca+2	1.991e-03	1.156e-03	-2.701	-2.937	-0.236	(0)
	CaSO4	4.473e-04	4.473e-04	-3.349	-3.349	0.000	(0)
	CaHCO3+	1.065e-04	9.372e-05	-3.973	-4.028	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.382e-06	2.087e-06	-5.623	-5.681	-0.057	(0)
	CaH2BO3+	1.001e-08	8.650e-09	-8.000	-8.063	-0.063	(0)
	CaOH+	3.701e-09	3.257e-09	-8.432	-8.487	-0.055	(0)
Cd	1.186e-08						
	Cd+2	8.555e-09	4.966e-09	-8.068	-8.304	-0.236	(0)
	CdSO4	1.967e-09	1.967e-09	-8.706	-8.706	0.000	(0)
	CdCl+	8.402e-10	7.142e-10	-9.076	-9.146	-0.071	(0)
	CdCO3	3.243e-10	3.243e-10	-9.489	-9.489	0.000	(0)
	Cd (SO4) 2-2	8.584e-11	4.482e-11	-10.066	-10.349	-0.282	(0)
	CdHCO3+	5.793e-11	4.924e-11	-10.237	-10.308	-0.071	(0)
	CdF+	1.532e-11	1.302e-11	-10.815	-10.885	-0.071	(0)
	CdOH+	6.555e-12	5.572e-12	-11.183	-11.254	-0.071	(0)
	CdCl2	4.484e-12	4.484e-12	-11.348	-11.348	0.000	(0)
	CdOHCl	4.138e-12	4.138e-12	-11.383	-11.383	0.000	(0)
	Cd (CO3) 2-2	1.319e-12	6.889e-13	-11.880	-12.162	-0.282	(0)
	CdCl3-	5.012e-15	4.260e-15	-14.300	-14.371	-0.071	(0)
	Cd (OH) 2	4.966e-15	4.966e-15	-14.304	-14.304	0.000	(0)
	CdF2	4.297e-15	4.297e-15	-14.367	-14.367	0.000	(0)
	CdSeO4	3.954e-18	3.954e-18	-17.403	-17.403	0.000	(0)
	Cd2OH+3	5.985e-19	1.387e-19	-18.223	-18.858	-0.635	(0)
	Cd (OH) 3-	5.042e-20	4.286e-20	-19.297	-19.368	-0.071	(0)
	Cd (SeO3) 2-2	7.635e-21	3.987e-21	-20.117	-20.399	-0.282	(0)
	Cd (OH) 4-2	1.898e-27	9.909e-28	-26.722	-27.004	-0.282	(0)
	CdHS+	0.000e+00	0.000e+00	-78.664	-78.734	-0.071	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.968	-149.968	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.436	-226.507	-0.071	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.467	-302.749	-0.282	(0)
Cl	1.725e-03						
	Cl-	1.725e-03	1.506e-03	-2.763	-2.822	-0.059	(0)
	MnCl+	2.247e-08	1.968e-08	-7.648	-7.706	-0.057	(0)
	AgCl	2.127e-08	2.127e-08	-7.672	-7.672	0.000	(0)
	AgCl2-	3.282e-09	2.790e-09	-8.484	-8.554	-0.071	(0)
	ZnCl+	2.078e-09	1.811e-09	-8.682	-8.742	-0.060	(0)
	CuCl+	1.310e-09	1.142e-09	-8.883	-8.942	-0.060	(0)
	CuCl	1.053e-09	1.053e-09	-8.978	-8.978	0.000	(0)

CdCl+	8.402e-10	7.142e-10	-9.076	-9.146	-0.071	(0)
CuCl2-	3.802e-10	3.313e-10	-9.420	-9.480	-0.060	(0)
NiCl+	3.440e-10	2.924e-10	-9.463	-9.534	-0.071	(0)
ZnOHC1	3.349e-10	3.349e-10	-9.475	-9.475	0.000	(0)
CoCl+	3.068e-10	2.608e-10	-9.513	-9.584	-0.071	(0)
PbCl+	8.600e-11	7.310e-11	-10.066	-10.136	-0.071	(0)
MnCl2	4.187e-11	4.187e-11	-10.378	-10.378	0.000	(0)
AgCl3-2	7.171e-12	3.744e-12	-11.144	-11.427	-0.282	(0)
CdCl2	4.484e-12	4.484e-12	-11.348	-11.348	0.000	(0)
ZnCl2	4.322e-12	4.322e-12	-11.364	-11.364	0.000	(0)
CdOHC1	4.138e-12	4.138e-12	-11.383	-11.383	0.000	(0)
HgClOH	1.620e-12	1.620e-12	-11.790	-11.790	0.000	(0)
HgCl2	9.780e-13	9.780e-13	-12.010	-12.010	0.000	(0)
CuCl2	5.964e-13	5.964e-13	-12.224	-12.224	0.000	(0)
PbCl2	4.917e-13	4.917e-13	-12.308	-12.308	0.000	(0)
CuCl3-2	1.812e-13	1.067e-13	-12.742	-12.972	-0.230	(0)
AgCl4-3	4.968e-14	1.151e-14	-13.304	-13.939	-0.635	(0)
MnCl3-	1.983e-14	1.737e-14	-13.703	-13.760	-0.057	(0)
HgCl3-	1.733e-14	1.473e-14	-13.761	-13.832	-0.071	(0)
ZnCl3-	5.932e-15	5.170e-15	-14.227	-14.287	-0.060	(0)
CdCl3-	5.012e-15	4.260e-15	-14.300	-14.371	-0.071	(0)
NiCl2	2.217e-15	2.217e-15	-14.654	-14.654	0.000	(0)
PbCl3-	3.468e-16	2.948e-16	-15.460	-15.530	-0.071	(0)
CrCl+2	3.317e-16	1.732e-16	-15.479	-15.761	-0.282	(0)
HgCl4-2	1.691e-16	8.830e-17	-15.772	-16.054	-0.282	(0)
HgCl+	1.524e-16	1.296e-16	-15.817	-15.887	-0.071	(0)
UO2Cl+	9.824e-17	8.351e-17	-16.008	-16.078	-0.071	(0)
CuCl3-	9.617e-18	8.382e-18	-17.017	-17.077	-0.060	(0)
ZnCl4-2	6.611e-18	3.893e-18	-17.180	-17.410	-0.230	(0)
CrOHC12	7.003e-19	7.003e-19	-18.155	-18.155	0.000	(0)
PbCl4-2	3.887e-19	2.029e-19	-18.410	-18.693	-0.282	(0)
VOCl+	4.585e-20	3.897e-20	-19.339	-19.409	-0.071	(0)
FeCl+2	4.343e-20	2.557e-20	-19.362	-19.592	-0.230	(0)
CrCl2+	2.912e-20	2.475e-20	-19.536	-19.606	-0.071	(0)
FeCl2+	1.964e-22	1.720e-22	-21.707	-21.764	-0.057	(0)
CuCl4-2	1.074e-22	6.327e-23	-21.969	-22.199	-0.230	(0)
FeCl3	2.591e-26	2.591e-26	-25.587	-25.587	0.000	(0)
CrO3Cl-	2.086e-26	1.773e-26	-25.681	-25.751	-0.071	(0)
CoCl+2	4.935e-35	2.577e-35	-34.307	-34.589	-0.282	(0)
UCl+3	0.000e+00	0.000e+00	-44.576	-45.211	-0.635	(0)
Co (2)	1.359e-07					
Co+2	9.588e-08	5.006e-08	-7.018	-7.301	-0.282	(0)
CoHCO3+	1.995e-08	1.696e-08	-7.700	-7.771	-0.071	(0)
CoSO4	1.687e-08	1.687e-08	-7.773	-7.773	0.000	(0)
CoCO3	2.425e-09	2.425e-09	-8.615	-8.615	0.000	(0)
CoF+	3.081e-10	2.619e-10	-9.511	-9.582	-0.071	(0)
CoCl+	3.068e-10	2.608e-10	-9.513	-9.584	-0.071	(0)
CoOH+	1.660e-10	1.411e-10	-9.780	-9.850	-0.071	(0)
Co (OH) 2	1.583e-12	1.583e-12	-11.800	-11.800	0.000	(0)
CoSeO4	1.073e-16	1.073e-16	-15.970	-15.970	0.000	(0)
Co (OH) 3-	5.249e-18	4.462e-18	-17.280	-17.350	-0.071	(0)
Co2OH+3	1.528e-18	3.540e-19	-17.816	-18.451	-0.635	(0)
CoOOH-	1.317e-18	1.120e-18	-17.880	-17.951	-0.071	(0)
Co (OH) 4-2	1.913e-25	9.989e-26	-24.718	-25.000	-0.282	(0)
Co4 (OH) 4+4	1.064e-30	7.907e-32	-29.973	-31.102	-1.129	(0)
Co (3)	1.156e-28					
CoOH+2	1.156e-28	6.036e-29	-27.937	-28.219	-0.282	(0)
Co+3	2.859e-34	8.409e-35	-33.544	-34.075	-0.531	(0)
CoCl+2	4.935e-35	2.577e-35	-34.307	-34.589	-0.282	(0)
Cr (2)	9.636e-26					
Cr+2	9.636e-26	5.031e-26	-25.016	-25.298	-0.282	(0)
Cr (3)	6.448e-09					
Cr (OH) 2+	5.553e-09	4.720e-09	-8.255	-8.326	-0.071	(0)
Cr (OH) +2	5.260e-10	2.746e-10	-9.279	-9.561	-0.282	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)
CrOHSO4	1.101e-10	1.101e-10	-9.958	-9.958	0.000	(0)
CrF+2	4.462e-12	2.330e-12	-11.350	-11.633	-0.282	(0)
CrO2-	1.964e-12	1.670e-12	-11.707	-11.777	-0.071	(0)

Cr(OH) 4-	1.657e-12	1.409e-12	-11.781	-11.851	-0.071	(0)
CrSO4+	4.124e-13	3.506e-13	-12.385	-12.455	-0.071	(0)
Cr+3	3.835e-13	8.887e-14	-12.416	-13.051	-0.635	(0)
CrCl+2	3.317e-16	1.732e-16	-15.479	-15.761	-0.282	(0)
Cr2(OH) 2SO4+2	5.235e-18	2.733e-18	-17.281	-17.563	-0.282	(0)
CrOHC12	7.003e-19	7.003e-19	-18.155	-18.155	0.000	(0)
Cr2(OH) 2(SO4) 2	2.743e-19	2.743e-19	-18.562	-18.562	0.000	(0)
CrCl2+	2.912e-20	2.475e-20	-19.536	-19.606	-0.071	(0)
Cr (6)	2.302e-16					
CrO4-2	1.962e-16	1.139e-16	-15.707	-15.944	-0.236	(0)
HCrO4-	3.089e-17	2.626e-17	-16.510	-16.581	-0.071	(0)
NaCrO4-	2.876e-18	2.445e-18	-17.541	-17.612	-0.071	(0)
KCrO4-	3.157e-19	2.684e-19	-18.501	-18.571	-0.071	(0)
CrO3SO4-2	1.845e-24	9.631e-25	-23.734	-24.016	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.086e-26	1.773e-26	-25.681	-25.751	-0.071	(0)
Cr2O7-2	4.580e-32	2.391e-32	-31.339	-31.621	-0.282	(0)
Cu (1)	2.087e-09					
CuCl	1.053e-09	1.053e-09	-8.978	-8.978	0.000	(0)
Cu+	6.534e-10	5.555e-10	-9.185	-9.255	-0.071	(0)
CuCl2-	3.802e-10	3.313e-10	-9.420	-9.480	-0.060	(0)
CuCl3-2	1.812e-13	1.067e-13	-12.742	-12.972	-0.230	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.137	-148.447	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.880	-149.177	-0.297	(0)
Cu (2)	9.620e-06					
CuCO3	8.074e-06	8.074e-06	-5.093	-5.093	0.000	(0)
Cu+2	8.244e-07	4.785e-07	-6.084	-6.320	-0.236	(0)
CuOH+	2.453e-07	2.138e-07	-6.610	-6.670	-0.060	(0)
CuSO4	1.852e-07	1.852e-07	-6.732	-6.732	0.000	(0)
CuHCO3+	1.547e-07	1.315e-07	-6.811	-6.881	-0.071	(0)
Cu (CO3) 2-2	1.193e-07	6.226e-08	-6.924	-7.206	-0.282	(0)
Cu (OH) 2	6.025e-09	6.025e-09	-8.220	-8.220	0.000	(0)
CuF+	5.876e-09	4.995e-09	-8.231	-8.302	-0.071	(0)
Cu2(OH) 2+2	2.198e-09	1.148e-09	-8.658	-8.940	-0.282	(0)
CuCl+	1.310e-09	1.142e-09	-8.883	-8.942	-0.060	(0)
Cu (OH) 3-	2.053e-12	1.746e-12	-11.688	-11.758	-0.071	(0)
CuCl2	5.964e-13	5.964e-13	-12.224	-12.224	0.000	(0)
CuCl3-	9.617e-18	8.382e-18	-17.017	-17.077	-0.060	(0)
Cu (OH) 4-2	3.717e-18	1.941e-18	-17.430	-17.712	-0.282	(0)
CuCl4-2	1.074e-22	6.327e-23	-21.969	-22.199	-0.230	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.665	-215.736	-0.071	(0)
F	2.117e-04					
F-	1.895e-04	1.654e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.781e-05	1.556e-05	-4.749	-4.808	-0.059	(0)
CaF+	2.382e-06	2.087e-06	-5.623	-5.681	-0.057	(0)
NaF	4.510e-07	4.510e-07	-6.346	-6.346	0.000	(0)
AlF3	3.229e-07	3.229e-07	-6.491	-6.491	0.000	(0)
AlF2+	1.767e-07	1.551e-07	-6.753	-6.809	-0.057	(0)
MnF+	7.805e-08	6.837e-08	-7.108	-7.165	-0.057	(0)
AlF4-	3.064e-08	2.677e-08	-7.514	-7.572	-0.059	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	5.876e-09	4.995e-09	-8.231	-8.302	-0.071	(0)
AlF+2	3.968e-09	2.355e-09	-8.401	-8.628	-0.227	(0)
ZnF+	1.859e-09	1.580e-09	-8.731	-8.801	-0.071	(0)
BF(OH) 3-	1.219e-09	1.053e-09	-8.914	-8.977	-0.063	(0)
NiF+	3.710e-10	3.153e-10	-9.431	-9.501	-0.071	(0)
CoF+	3.081e-10	2.619e-10	-9.511	-9.582	-0.071	(0)
PbF+	1.876e-11	1.595e-11	-10.727	-10.797	-0.071	(0)
CdF+	1.532e-11	1.302e-11	-10.815	-10.885	-0.071	(0)
HF2-	1.261e-11	1.096e-11	-10.899	-10.960	-0.061	(0)
CrF+2	4.462e-12	2.330e-12	-11.350	-11.633	-0.282	(0)
AgF	2.874e-12	2.874e-12	-11.542	-11.542	0.000	(0)
BF2(OH) 2-	1.536e-12	1.328e-12	-11.813	-11.877	-0.063	(0)
UO2F+	9.184e-13	7.807e-13	-12.037	-12.108	-0.071	(0)
UO2F2	3.724e-13	3.724e-13	-12.429	-12.429	0.000	(0)
PbF2	5.191e-14	5.191e-14	-13.285	-13.285	0.000	(0)
UO2F3-	1.821e-14	1.548e-14	-13.740	-13.810	-0.071	(0)
CdF2	4.297e-15	4.297e-15	-14.367	-14.367	0.000	(0)

VO2F	2.779e-15	2.779e-15	-14.556	-14.556	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.154e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
VO2F2-	1.964e-16	1.669e-16	-15.707	-15.777	-0.071	(0)
FeF+2	1.732e-16	1.020e-16	-15.761	-15.991	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
UO2F4-2	3.894e-17	2.033e-17	-16.410	-16.692	-0.282	(0)
PbF3-	1.916e-17	1.629e-17	-16.718	-16.788	-0.071	(0)
VOF+	1.077e-17	9.152e-18	-16.968	-17.038	-0.071	(0)
BF3OH-	7.048e-18	6.092e-18	-17.152	-17.215	-0.063	(0)
VO2F3-2	6.597e-19	3.444e-19	-18.181	-18.463	-0.282	(0)
VOF2	5.677e-19	5.677e-19	-18.246	-18.246	0.000	(0)
VOF3-	3.920e-21	3.332e-21	-20.407	-20.477	-0.071	(0)
PbF4-2	2.470e-21	1.290e-21	-20.607	-20.890	-0.282	(0)
BF4-	4.089e-22	3.534e-22	-21.388	-21.452	-0.063	(0)
VO2F4-3	1.210e-22	2.804e-23	-21.917	-22.552	-0.635	(0)
HgF+	3.111e-23	2.644e-23	-22.507	-22.578	-0.071	(0)
VOF4-2	4.261e-24	2.225e-24	-23.371	-23.653	-0.282	(0)
Sb (OH) 2F	1.010e-24	1.010e-24	-23.996	-23.996	0.000	(0)
SbOF	9.932e-25	9.932e-25	-24.003	-24.003	0.000	(0)
UF3+	1.727e-34	1.468e-34	-33.763	-33.833	-0.071	(0)
UF2+2	1.073e-35	5.600e-36	-34.970	-35.252	-0.282	(0)
UF4	2.663e-36	2.663e-36	-35.575	-35.575	0.000	(0)
UF5-	2.054e-38	1.746e-38	-37.687	-37.758	-0.071	(0)
UF+3	1.160e-38	2.689e-39	-37.935	-38.570	-0.635	(0)
UF6-2	1.670e-39	8.720e-40	-38.777	-39.059	-0.282	(0)
Fe (2)	3.441e-11					
Fe+2	2.748e-11	1.435e-11	-10.561	-10.843	-0.282	(0)
FeSO4	5.949e-12	5.949e-12	-11.226	-11.226	0.000	(0)
FeHCO3+	8.936e-13	7.865e-13	-12.049	-12.104	-0.055	(0)
FeOH+	9.209e-14	8.067e-14	-13.036	-13.093	-0.057	(0)
Fe (OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.616e-19	4.043e-19	-18.336	-18.393	-0.057	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.770	-158.770	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.100	-235.171	-0.071	(0)
Fe (3)	3.645e-09					
Fe (OH) 2+	3.211e-09	2.818e-09	-8.493	-8.550	-0.057	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	6.407e-12	5.623e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.709e-14	5.129e-14	-13.060	-13.290	-0.230	(0)
FeF2+	5.154e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
FeF+2	1.732e-16	1.020e-16	-15.761	-15.991	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.217e-17	1.066e-17	-16.915	-16.972	-0.057	(0)
Fe+3	1.912e-18	5.623e-19	-17.719	-18.250	-0.531	(0)
Fe (SO4) 2-	4.529e-19	3.850e-19	-18.344	-18.415	-0.071	(0)
FeCl+2	4.343e-20	2.557e-20	-19.362	-19.592	-0.230	(0)
FeCl2+	1.964e-22	1.720e-22	-21.707	-21.764	-0.057	(0)
FeHSeO3+2	5.027e-23	2.625e-23	-22.299	-22.581	-0.282	(0)
Fe2 (OH) 2+4	1.172e-24	8.709e-26	-23.931	-25.060	-1.129	(0)
FeCl3	2.591e-26	2.591e-26	-25.587	-25.587	0.000	(0)
Fe3 (OH) 4+5	2.060e-31	3.548e-33	-30.686	-32.450	-1.764	(0)
H (0)	4.020e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.235e-10					
Hg	2.235e-10	2.235e-10	-9.651	-9.651	0.000	(0)
Hg (1)	2.507e-21					
Hg2+2	1.253e-21	6.545e-22	-20.902	-21.184	-0.282	(0)
Hg (2)	3.171e-12					
HgClOH	1.620e-12	1.620e-12	-11.790	-11.790	0.000	(0)
HgCl2	9.780e-13	9.780e-13	-12.010	-12.010	0.000	(0)
Hg (OH) 2	5.405e-13	5.429e-13	-12.267	-12.265	0.002	(0)
HgCl3-	1.733e-14	1.473e-14	-13.761	-13.832	-0.071	(0)
HgCO3	1.479e-14	1.479e-14	-13.830	-13.830	0.000	(0)
Hg (CO3) 2-2	2.566e-16	1.340e-16	-15.591	-15.873	-0.282	(0)
HgCl4-2	1.691e-16	8.830e-17	-15.772	-16.054	-0.282	(0)
HgCl+	1.524e-16	1.296e-16	-15.817	-15.887	-0.071	(0)
HgOH+	2.853e-17	2.425e-17	-16.545	-16.615	-0.071	(0)

	HgHCO3+	2.308e-17	1.962e-17	-16.637	-16.707	-0.071	(0)
	Hg (OH) 3-	1.136e-20	9.654e-21	-19.945	-20.015	-0.071	(0)
	Hg+2	8.259e-21	4.312e-21	-20.083	-20.365	-0.282	(0)
	HgSO4	1.907e-21	1.907e-21	-20.720	-20.720	0.000	(0)
	HgF+	3.111e-23	2.644e-23	-22.507	-22.578	-0.071	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.096	-138.167	-0.071	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-138.920	-138.920	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-139.445	-139.727	-0.282	(0)
K		7.355e-04					
	K+	7.268e-04	6.344e-04	-3.139	-3.198	-0.059	(0)
	KSO4-	8.645e-06	7.588e-06	-5.063	-5.120	-0.057	(0)
	KCrO4-	3.157e-19	2.684e-19	-18.501	-18.571	-0.071	(0)
Mg		1.765e-03					
	Mg+2	1.445e-03	8.386e-04	-2.840	-3.076	-0.236	(0)
	MgSO4	2.578e-04	2.578e-04	-3.589	-3.589	0.000	(0)
	MgHCO3+	4.288e-05	3.737e-05	-4.368	-4.427	-0.060	(0)
	MgF+	1.781e-05	1.556e-05	-4.749	-4.808	-0.059	(0)
	MgCO3	1.999e-06	1.999e-06	-5.699	-5.699	0.000	(0)
	MgOH+	5.346e-08	4.716e-08	-7.272	-7.326	-0.054	(0)
	MgH2BO3+	4.376e-09	3.782e-09	-8.359	-8.422	-0.063	(0)
Mn (2)		2.414e-05					
	Mn+2	1.989e-05	1.038e-05	-4.701	-4.984	-0.282	(0)
	MnSO4	3.119e-06	3.119e-06	-5.506	-5.506	0.000	(0)
	MnHCO3+	1.030e-06	9.022e-07	-5.987	-6.045	-0.057	(0)
	MnF+	7.805e-08	6.837e-08	-7.108	-7.165	-0.057	(0)
	MnCl+	2.247e-08	1.968e-08	-7.648	-7.706	-0.057	(0)
	MnOH+	4.205e-09	3.684e-09	-8.376	-8.434	-0.057	(0)
	MnCl2	4.187e-11	4.187e-11	-10.378	-10.378	0.000	(0)
	MnCl3-	1.983e-14	1.737e-14	-13.703	-13.760	-0.057	(0)
	MnSeO4	1.195e-14	1.195e-14	-13.923	-13.923	0.000	(0)
	Mn (OH) 3-	5.186e-19	4.543e-19	-18.285	-18.343	-0.057	(0)
	Mn (OH) 4-2	3.518e-25	2.072e-25	-24.454	-24.684	-0.230	(0)
	MnSe	0.000e+00	0.000e+00	-42.748	-42.748	0.000	(0)
Mn (3)		6.654e-25					
	Mn+3	6.654e-25	1.957e-25	-24.177	-24.708	-0.531	(0)
Mn (6)		0.000e+00					
	MnO4-2	0.000e+00	0.000e+00	-43.498	-43.728	-0.230	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-47.413	-47.475	-0.062	(0)
Mo		3.024e-07					
	MoO4-2	3.021e-07	1.753e-07	-6.520	-6.756	-0.236	(0)
	HMoO4-	2.925e-10	2.486e-10	-9.534	-9.604	-0.071	(0)
	H2MoO4	1.298e-13	1.298e-13	-12.887	-12.887	0.000	(0)
	Ag2MoO4	3.175e-24	3.175e-24	-23.498	-23.498	0.000	(0)
	AlMo6O21-3	2.300e-40	0.000e+00	-39.638	-40.273	-0.635	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-48.939	-51.479	-2.540	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.476	-52.240	-1.764	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-53.476	-54.605	-1.129	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-57.871	-58.506	-0.635	(0)
Na		5.006e-03					
	Na+	4.950e-03	4.321e-03	-2.305	-2.364	-0.059	(0)
	NaSO4-	4.467e-05	3.920e-05	-4.350	-4.407	-0.057	(0)
	NaHCO3	1.058e-05	1.058e-05	-4.975	-4.975	0.000	(0)
	NaF	4.510e-07	4.510e-07	-6.346	-6.346	0.000	(0)
	NaCO3-	2.627e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
	NaH2BO3	8.907e-10	8.907e-10	-9.050	-9.050	0.000	(0)
	NaCrO4-	2.876e-18	2.445e-18	-17.541	-17.612	-0.071	(0)
Ni		2.132e-07					
	Ni+2	1.307e-07	7.589e-08	-6.884	-7.120	-0.236	(0)
	NiHCO3+	4.793e-08	4.075e-08	-7.319	-7.390	-0.071	(0)
	NiSO4	2.558e-08	2.558e-08	-7.592	-7.592	0.000	(0)
	NiCO3	8.112e-09	8.112e-09	-8.091	-8.091	0.000	(0)
	NiF+	3.710e-10	3.153e-10	-9.431	-9.501	-0.071	(0)
	NiCl+	3.440e-10	2.924e-10	-9.463	-9.534	-0.071	(0)
	NiOH+	1.588e-10	1.350e-10	-9.799	-9.870	-0.071	(0)
	Ni (SO4) 2-2	2.741e-12	1.431e-12	-11.562	-11.844	-0.282	(0)
	Ni (OH) 2	1.514e-12	1.514e-12	-11.820	-11.820	0.000	(0)
	NiCl2	2.217e-15	2.217e-15	-14.654	-14.654	0.000	(0)

Ni (OH) 3-	2.516e-16	2.139e-16	-15.599	-15.670	-0.071	(0)
NiSeO4	1.518e-16	1.518e-16	-15.819	-15.819	0.000	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	2.137e-08					
PbCO3	1.178e-08	1.178e-08	-7.929	-7.929	0.000	(0)
PbHCO3+	5.208e-09	4.427e-09	-8.283	-8.354	-0.071	(0)
Pb+2	2.357e-09	1.368e-09	-8.628	-8.864	-0.236	(0)
PbSO4	1.132e-09	1.132e-09	-8.946	-8.946	0.000	(0)
PbOH+	5.711e-10	4.854e-10	-9.243	-9.314	-0.071	(0)
Pb (CO3) 2-2	1.865e-10	9.737e-11	-9.729	-10.012	-0.282	(0)
PbCl+	8.600e-11	7.310e-11	-10.066	-10.136	-0.071	(0)
Pb (SO4) 2-2	2.207e-11	1.152e-11	-10.656	-10.938	-0.282	(0)
PbF+	1.876e-11	1.595e-11	-10.727	-10.797	-0.071	(0)
Pb (OH) 2	2.168e-12	2.168e-12	-11.664	-11.664	0.000	(0)
PbCl2	4.917e-13	4.917e-13	-12.308	-12.308	0.000	(0)
PbF2	5.191e-14	5.191e-14	-13.285	-13.285	0.000	(0)
Pb (OH) 3-	3.603e-16	3.063e-16	-15.443	-15.514	-0.071	(0)
PbCl3-	3.468e-16	2.948e-16	-15.460	-15.530	-0.071	(0)
Pb2OH+3	4.542e-17	1.053e-17	-16.343	-16.978	-0.635	(0)
PbF3-	1.916e-17	1.629e-17	-16.718	-16.788	-0.071	(0)
PbCl4-2	3.887e-19	2.029e-19	-18.410	-18.693	-0.282	(0)
Pb (OH) 4-2	2.029e-20	1.060e-20	-19.693	-19.975	-0.282	(0)
PbF4-2	2.470e-21	1.290e-21	-20.607	-20.890	-0.282	(0)
Pb3 (OH) 4+2	2.458e-22	1.283e-22	-21.609	-21.892	-0.282	(0)
Pb4 (OH) 4+4	1.877e-26	1.395e-27	-25.727	-26.856	-1.129	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.470	-150.470	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.538	-227.609	-0.071	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.784	-72.784	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.368	-78.438	-0.071	(0)
H2S	0.000e+00	0.000e+00	-78.565	-78.565	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.664	-78.734	-0.071	(0)
S5-2	0.000e+00	0.000e+00	-80.374	-80.656	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.890	-81.172	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.970	-81.252	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.776	-82.058	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.792	-83.074	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.361	-88.591	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.096	-138.167	-0.071	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.920	-138.920	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.445	-139.727	-0.282	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.051	-147.122	-0.071	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.291	-147.458	-0.168	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.137	-148.447	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.880	-149.177	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.169	-149.239	-0.071	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.434	-149.751	-0.318	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.758	-150.062	-0.304	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.968	-149.968	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.376	-150.376	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.470	-150.470	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.770	-158.770	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.665	-215.736	-0.071	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.464	-225.535	-0.071	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.436	-226.507	-0.071	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.538	-227.609	-0.071	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.085	-228.367	-0.282	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.100	-235.171	-0.071	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.467	-302.749	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.151	-305.433	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.898	-317.180	-0.282	(0)
S (6)	3.672e-03					
SO4-2	2.910e-03	1.689e-03	-2.536	-2.772	-0.236	(0)
CaSO4	4.473e-04	4.473e-04	-3.349	-3.349	0.000	(0)
MgSO4	2.578e-04	2.578e-04	-3.589	-3.589	0.000	(0)
NaSO4-	4.467e-05	3.920e-05	-4.350	-4.407	-0.057	(0)
KSO4-	8.645e-06	7.588e-06	-5.063	-5.120	-0.057	(0)

MnSO4	3.119e-06	3.119e-06	-5.506	-5.506	0.000	(0)
CuSO4	1.852e-07	1.852e-07	-6.732	-6.732	0.000	(0)
ZnSO4	1.769e-07	1.769e-07	-6.752	-6.752	0.000	(0)
NiSO4	2.558e-08	2.558e-08	-7.592	-7.592	0.000	(0)
CoSO4	1.687e-08	1.687e-08	-7.773	-7.773	0.000	(0)
HSO4-	1.346e-08	1.176e-08	-7.871	-7.929	-0.059	(0)
Zn (SO4) 2-2	4.986e-09	2.603e-09	-8.302	-8.584	-0.282	(0)
CdSO4	1.967e-09	1.967e-09	-8.706	-8.706	0.000	(0)
PbSO4	1.132e-09	1.132e-09	-8.946	-8.946	0.000	(0)
AgSO4-	2.743e-10	2.331e-10	-9.562	-9.632	-0.071	(0)
CrOHSO4	1.101e-10	1.101e-10	-9.958	-9.958	0.000	(0)
Cd (SO4) 2-2	8.584e-11	4.482e-11	-10.066	-10.349	-0.282	(0)
Pb (SO4) 2-2	2.207e-11	1.152e-11	-10.656	-10.938	-0.282	(0)
AlSO4+	2.136e-11	1.867e-11	-10.670	-10.729	-0.059	(0)
FeSO4	5.949e-12	5.949e-12	-11.226	-11.226	0.000	(0)
Ni (SO4) 2-2	2.741e-12	1.431e-12	-11.562	-11.844	-0.282	(0)
CrSO4+	4.124e-13	3.506e-13	-12.385	-12.455	-0.071	(0)
Al (SO4) 2-	3.867e-13	3.379e-13	-12.413	-12.471	-0.059	(0)
UO2SO4	8.743e-14	8.743e-14	-13.058	-13.058	0.000	(0)
UO2 (SO4) 2-2	3.729e-15	1.947e-15	-14.428	-14.711	-0.282	(0)
VO2SO4-	4.546e-16	3.865e-16	-15.342	-15.413	-0.071	(0)
FeSO4+	1.217e-17	1.066e-17	-16.915	-16.972	-0.057	(0)
Cr2 (OH) 2SO4+2	5.235e-18	2.733e-18	-17.281	-17.563	-0.282	(0)
VOSO4	4.292e-18	4.292e-18	-17.367	-17.367	0.000	(0)
Fe (SO4) 2-	4.529e-19	3.850e-19	-18.344	-18.415	-0.071	(0)
Cr2 (OH) 2 (SO4) 2	2.743e-19	2.743e-19	-18.562	-18.562	0.000	(0)
HgSO4	1.907e-21	1.907e-21	-20.720	-20.720	0.000	(0)
CrO3SO4-2	1.845e-24	9.631e-25	-23.734	-24.016	-0.282	(0)
VSO4+	5.174e-32	4.398e-32	-31.286	-31.357	-0.071	(0)
U (SO4) 2	7.354e-40	7.354e-40	-39.133	-39.133	0.000	(0)
USO4+2	1.050e-40	0.000e+00	-39.979	-40.261	-0.282	(0)
Sb (3)	1.083e-19					
Sb (OH) 3	5.481e-20	5.481e-20	-19.261	-19.261	0.000	(0)
HSbO2	5.352e-20	5.352e-20	-19.271	-19.271	0.000	(0)
SbO2-	1.431e-24	1.216e-24	-23.844	-23.915	-0.071	(0)
Sb (OH) 2F	1.010e-24	1.010e-24	-23.996	-23.996	0.000	(0)
SbOF	9.932e-25	9.932e-25	-24.003	-24.003	0.000	(0)
Sb (OH) 4-	8.195e-25	6.966e-25	-24.086	-24.157	-0.071	(0)
Sb (OH) 2+	1.116e-25	9.488e-26	-24.952	-25.023	-0.071	(0)
SbO+	3.849e-26	3.272e-26	-25.415	-25.485	-0.071	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.898	-317.180	-0.282	(0)
Sb (5)	1.330e-08					
SbO3-	1.328e-08	1.129e-08	-7.877	-7.947	-0.071	(0)
Sb (OH) 6-	1.512e-11	1.320e-11	-10.820	-10.880	-0.059	(0)
SbO2+	1.936e-23	1.645e-23	-22.713	-22.784	-0.071	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	3.496e-40	2.972e-40	-39.456	-39.527	-0.071	(0)
MnSe	0.000e+00	0.000e+00	-42.748	-42.748	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.784	-42.784	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.098	-47.380	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.153	-86.282	-1.129	(0)
Se (4)	2.267e-08					
HSeO3-	2.078e-08	1.767e-08	-7.682	-7.753	-0.071	(0)
SeO3-2	1.890e-09	9.870e-10	-8.723	-9.006	-0.282	(0)
H2SeO3	5.370e-13	5.370e-13	-12.270	-12.270	0.000	(0)
AgSeO3-	5.161e-15	4.387e-15	-14.287	-14.358	-0.071	(0)
Cd (SeO3) 2-2	7.635e-21	3.987e-21	-20.117	-20.399	-0.282	(0)
Ag (SeO3) 2-3	1.673e-22	3.877e-23	-21.777	-22.412	-0.635	(0)
FeHSeO3+2	5.027e-23	2.625e-23	-22.299	-22.581	-0.282	(0)
Se (6)	7.378e-12					
SeO4-2	7.366e-12	4.276e-12	-11.133	-11.369	-0.236	(0)
MnSeO4	1.195e-14	1.195e-14	-13.923	-13.923	0.000	(0)
ZnSeO4	3.170e-16	3.170e-16	-15.499	-15.499	0.000	(0)
NiSeO4	1.518e-16	1.518e-16	-15.819	-15.819	0.000	(0)
CoSeO4	1.073e-16	1.073e-16	-15.970	-15.970	0.000	(0)
HSeO4-	1.796e-17	1.527e-17	-16.746	-16.816	-0.071	(0)
CdSeO4	3.954e-18	3.954e-18	-17.403	-17.403	0.000	(0)

Zn(SeO4) 2-2	2.632e-27	1.374e-27	-26.580	-26.862	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.875	-58.510	-0.635	(0)
U (4)	3.960e-22					
U (OH) 5-	3.950e-22	3.358e-22	-21.403	-21.474	-0.071	(0)
U (OH) 4	1.002e-24	1.002e-24	-23.999	-23.999	0.000	(0)
U (OH) 3+	3.073e-28	2.612e-28	-27.512	-27.583	-0.071	(0)
U (OH) 2+2	1.649e-32	8.611e-33	-31.783	-32.065	-0.282	(0)
UF3+	1.727e-34	1.468e-34	-33.763	-33.833	-0.071	(0)
UF2+2	1.073e-35	5.600e-36	-34.970	-35.252	-0.282	(0)
UF4	2.663e-36	2.663e-36	-35.575	-35.575	0.000	(0)
UOH+3	1.248e-37	2.891e-38	-36.904	-37.539	-0.635	(0)
UF5-	2.054e-38	1.746e-38	-37.687	-37.758	-0.071	(0)
UF+3	1.160e-38	2.689e-39	-37.935	-38.570	-0.635	(0)
UF6-2	1.670e-39	8.720e-40	-38.777	-39.059	-0.282	(0)
U (SO4) 2	7.354e-40	7.354e-40	-39.133	-39.133	0.000	(0)
USO4+2	1.050e-40	0.000e+00	-39.979	-40.261	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.960	-44.089	-1.129	(0)
UCl+3	0.000e+00	0.000e+00	-44.576	-45.211	-0.635	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.769	-174.484	-5.715	(0)
U (5)	5.810e-17					
UO2+	5.810e-17	4.939e-17	-16.236	-16.306	-0.071	(0)
U (6)	8.617e-08					
UO2 (CO3) 3-4	4.308e-08	3.202e-09	-7.366	-8.495	-1.129	(0)
UO2 (CO3) 2-2	4.270e-08	2.230e-08	-7.370	-7.652	-0.282	(0)
UO2CO3	3.900e-10	3.900e-10	-9.409	-9.409	0.000	(0)
UO2F+	9.184e-13	7.807e-13	-12.037	-12.108	-0.071	(0)
UO2OH+	7.153e-13	6.080e-13	-12.146	-12.216	-0.071	(0)
UO2F2	3.724e-13	3.724e-13	-12.429	-12.429	0.000	(0)
UO2SO4	8.743e-14	8.743e-14	-13.058	-13.058	0.000	(0)
UO2+2	5.890e-14	3.419e-14	-13.230	-13.466	-0.236	(0)
UO2F3-	1.821e-14	1.548e-14	-13.740	-13.810	-0.071	(0)
UO2 (SO4) 2-2	3.729e-15	1.947e-15	-14.428	-14.711	-0.282	(0)
UO2Cl+	9.824e-17	8.351e-17	-16.008	-16.078	-0.071	(0)
UO2F4-2	3.894e-17	2.033e-17	-16.410	-16.692	-0.282	(0)
(UO2) 2 (OH) 2+2	1.175e-18	6.135e-19	-17.930	-18.212	-0.282	(0)
(UO2) 3 (OH) 5+	6.642e-21	5.646e-21	-20.178	-20.248	-0.071	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-40.463	-40.534	-0.071	(0)
V+2	0.000e+00	0.000e+00	-40.912	-41.194	-0.282	(0)
V (3)	1.254e-13					
V (OH) 3	1.254e-13	1.254e-13	-12.902	-12.902	0.000	(0)
V (OH) 2+	6.793e-24	5.775e-24	-23.168	-23.238	-0.071	(0)
VOH+2	7.477e-27	3.904e-27	-26.126	-26.408	-0.282	(0)
V+3	2.380e-31	5.515e-32	-30.623	-31.258	-0.635	(0)
VSO4+	5.174e-32	4.398e-32	-31.286	-31.357	-0.071	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.560	-51.195	-0.635	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.888	-52.017	-1.129	(0)
V (4)	3.391e-16					
V (OH) 3+	3.057e-16	2.599e-16	-15.515	-15.585	-0.071	(0)
VO+2	1.767e-17	9.225e-18	-16.753	-17.035	-0.282	(0)
VOF+	1.077e-17	9.152e-18	-16.968	-17.038	-0.071	(0)
VOSO4	4.292e-18	4.292e-18	-17.367	-17.367	0.000	(0)
VOF2	5.677e-19	5.677e-19	-18.246	-18.246	0.000	(0)
VOC1+	4.585e-20	3.897e-20	-19.339	-19.409	-0.071	(0)
VOF3-	3.920e-21	3.332e-21	-20.407	-20.477	-0.071	(0)
VOF4-2	4.261e-24	2.225e-24	-23.371	-23.653	-0.282	(0)
H2V2O4+2	6.488e-27	3.388e-27	-26.188	-26.470	-0.282	(0)
V (5)	1.177e-07					
H2VO4-	1.112e-07	9.449e-08	-6.954	-7.025	-0.071	(0)
HVO4-2	6.379e-09	3.331e-09	-8.195	-8.477	-0.282	(0)
H3VO4	6.733e-11	6.733e-11	-10.172	-10.172	0.000	(0)
H3V2O7-	4.834e-11	4.109e-11	-10.316	-10.386	-0.071	(0)
HV2O7-3	4.604e-13	1.067e-13	-12.337	-12.972	-0.635	(0)
VO2+	1.098e-14	9.580e-15	-13.960	-14.019	-0.059	(0)
V3O9-3	3.816e-15	8.844e-16	-14.418	-15.053	-0.635	(0)
VO2F	2.779e-15	2.779e-15	-14.556	-14.556	0.000	(0)
VO4-3	1.011e-15	2.343e-16	-14.995	-15.630	-0.635	(0)

V2O7-4	5.422e-16	4.029e-17	-15.266	-16.395	-1.129	(0)
VO2SO4-	4.546e-16	3.865e-16	-15.342	-15.413	-0.071	(0)
VO2F2-	1.964e-16	1.669e-16	-15.707	-15.777	-0.071	(0)
VO2F3-2	6.597e-19	3.444e-19	-18.181	-18.463	-0.282	(0)
V4O12-4	4.689e-19	3.485e-20	-18.329	-19.458	-1.129	(0)
VO2F4-3	1.210e-22	2.804e-23	-21.917	-22.552	-0.635	(0)
HV10O28-5	0.000e+00	0.000e+00	-47.124	-48.888	-1.764	(0)
V10O28-6	0.000e+00	0.000e+00	-47.387	-49.927	-2.540	(0)
H2V10O28-4	0.000e+00	0.000e+00	-49.698	-50.827	-1.129	(0)
Zn	1.175e-06					
Zn+2	8.246e-07	4.787e-07	-6.084	-6.320	-0.236	(0)
ZnSO4	1.769e-07	1.769e-07	-6.752	-6.752	0.000	(0)
ZnCO3	7.892e-08	7.892e-08	-7.103	-7.103	0.000	(0)
ZnHCO3+	7.755e-08	6.592e-08	-7.110	-7.181	-0.071	(0)
ZnOH+	7.954e-09	6.762e-09	-8.099	-8.170	-0.071	(0)
Zn (SO4) 2-2	4.986e-09	2.603e-09	-8.302	-8.584	-0.282	(0)
ZnCl+	2.078e-09	1.811e-09	-8.682	-8.742	-0.060	(0)
ZnF+	1.859e-09	1.580e-09	-8.731	-8.801	-0.071	(0)
ZnOHCl	3.349e-10	3.349e-10	-9.475	-9.475	0.000	(0)
Zn (OH) 2	1.514e-10	1.514e-10	-9.820	-9.820	0.000	(0)
ZnCl2	4.322e-12	4.322e-12	-11.364	-11.364	0.000	(0)
Zn (OH) 3-	1.261e-13	1.072e-13	-12.899	-12.970	-0.071	(0)
ZnCl3-	5.932e-15	5.170e-15	-14.227	-14.287	-0.060	(0)
ZnSeO4	3.170e-16	3.170e-16	-15.499	-15.499	0.000	(0)
ZnCl4-2	6.611e-18	3.893e-18	-17.180	-17.410	-0.230	(0)
Zn (OH) 4-2	1.154e-18	6.026e-19	-17.938	-18.220	-0.282	(0)
Zn (SeO4) 2-2	2.632e-27	1.374e-27	-26.580	-26.862	-0.282	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.169	-149.239	-0.071	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.376	-150.376	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.464	-225.535	-0.071	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.085	-228.367	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.151	-305.433	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
Acanthite	-51.39	-87.61	-36.22	Ag2S
Ag2CO3	-10.77	-21.86	-11.09	Ag2CO3
Ag2CrO4	-20.67	-32.26	-11.59	Ag2CrO4
Ag2HVO4	-10.38	-8.90	1.48	Ag2HVO4
Ag2MoO4	-11.53	-23.08	-11.55	Ag2MoO4
Ag2O	-14.60	-2.03	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.27	-19.09	-4.82	Ag2SO4
Ag3AsO3	-26.93	-24.77	2.16	Ag3AsO3
Ag3AsO4	-15.34	-18.12	-2.79	Ag3AsO4
Ag3H2VO5	-15.09	-9.91	5.18	Ag3H2VO5
AgF:4H2O	-12.99	-11.94	1.05	AgF:4H2O
Agmetal	-0.28	-13.79	-13.51	Ag
AgVO3	-8.65	-7.88	0.77	AgVO3
Al (OH) 3 (am)	-1.21	9.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.33	-43.96	2.37	Al2 (MoO4) 3
Al2O3	-0.46	19.19	19.65	Al2O3
Al4 (OH) 10SO4	-1.39	21.31	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.29	-5.49	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-3.85	-11.64	-7.79	PbSO4
Anhydrite	-1.35	-5.71	-4.36	CaSO4
Anilite	-54.88	-86.75	-31.88	Cu0.25Cu1.5S
Antlerite	-1.93	6.86	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-84.17	-86.93	-2.76	As4O6
Artinite	-7.00	2.60	9.60	MgCO3:Mg (OH) 2:3H2O

As2O5	-36.88	-30.17	6.71	As2O5
Atacamite	-1.41	5.98	7.39	Cu2(OH)3Cl
Azurite	1.15	-15.75	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2·8H2O	-17.31	7.09	24.39	Ba(OH)2·8H2O
Ba2V2O7·2H2O	-15.44	0.43	15.87	Ba2V2O7·2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-25.42	7.52	32.94	Ba3(VO4)2·4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-8.95	-14.77	-5.82	BaF2
BaMoO4	-7.00	-13.96	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.64	-7.81	1.83	BaSeO3
BaSeO4	-11.12	-18.58	-7.46	BaSeO4
Bianchite	-7.33	-9.09	-1.76	ZnSO4·6H2O
Birnessite	-8.59	9.51	18.09	MnO2
Bixbyite	-5.89	-6.53	-0.64	Mn2O3
BlaubleiI	-54.67	-78.83	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.21	-82.49	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.59	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.39	14.83	15.22	Cu4(OH)6SO4
Brucite	-5.63	11.22	16.84	Mg(OH)2
Bunsenite	-5.27	7.17	12.45	NiO
Ca(VO3)2	-8.05	-2.39	5.66	Ca(VO3)2
Ca2V2O7	-8.53	8.97	17.50	Ca2V2O7
Ca2V2O7·2H2O	-12.58	8.97	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-18.40	3.90	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-18.63	20.33	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-19.53	20.33	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-300.69	-157.72	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.92	-26.83	-17.91	Hg2Cl2
CaMoO4	-1.74	-9.69	-7.95	CaMoO4
Carnotite	-2.32	-2.09	0.23	KUO2VO4
CaSeO3·2H2O	-6.36	-3.54	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-11.29	-14.31	-3.02	CaSeO4·2H2O
Cd(BO2)2	-13.44	-3.60	9.84	Cd(BO2)2
Cd(OH)2	-7.65	5.99	13.64	Cd(OH)2
Cd(OH)2(am)	-7.74	5.99	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-22.87	-16.16	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-21.66	0.90	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-21.51	6.89	28.40	Cd4(OH)6SO4
CdCl2	-13.29	-13.95	-0.66	CdCl2
CdCl2·1H2O	-12.26	-13.95	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-12.04	-13.95	-1.91	CdCl2·2.5H2O
CdF2	-14.65	-15.87	-1.21	CdF2
Cdmetal(alpha)	-33.07	-19.55	13.51	Cd
Cdmetal(gamma)	-33.17	-19.55	13.62	Cd
CdMoO4	-0.91	-15.06	-14.15	CdMoO4
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.78	-77.13	-0.35	CdSb
CdSe	-20.48	-40.68	-20.20	CdSe
CdSeO4·2H2O	-17.82	-19.67	-1.85	CdSeO4·2H2O
CdSO4	-10.90	-11.08	-0.17	CdSO4
CdSO4·1H2O	-9.35	-11.08	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-9.20	-11.08	-1.87	CdSO4·2.67H2O
Cerargyrite	-1.23	-10.98	-9.75	AgCl
Cerrusite	-1.28	-14.41	-13.13	PbCO3
CH4(g)	-80.97	-122.02	-41.05	CH4
Chalcanthite	-6.45	-9.09	-2.64	CuSO4·5H2O
Chalcocite	-54.88	-89.80	-34.92	Cu2S
Chalcopyrite	-124.48	-159.75	-35.27	CuFeS2
Cinnabar	-52.16	-97.85	-45.69	HgS
Claudetite	-83.86	-86.93	-3.06	As4O6
Clausthalite	-14.14	-41.24	-27.10	PbSe
Co(BO2)2	-29.67	-2.60	27.07	Co(BO2)2

Co (OH) 2	-6.10	6.99	13.09	Co (OH) 2
Co (OH) 3	-10.33	-12.63	-2.31	Co (OH) 3
CO2 (g)	-1.69	-19.84	-18.15	CO2
Co3 (AsO4) 2	-22.22	-9.19	13.03	Co3 (AsO4) 2
Co3O4	-7.78	-18.27	-10.50	Co3O4
CoCl2	-21.21	-12.94	8.27	CoCl2
CoCl2:6H2O	-15.48	-12.95	2.54	CoCl2:6H2O
CoCO3	-2.86	-12.84	-9.98	CoCO3
CoF2	-13.27	-14.86	-1.60	CoF2
CoF3	-43.96	-45.42	-1.46	CoF3
CoFe2O4	16.90	13.38	-3.53	CoFe2O4
CoMoO4	-6.30	-14.06	-7.76	CoMoO4
CoO	-6.59	6.99	13.59	CoO
CoS (alpha)	-71.15	-78.59	-7.44	CoS
CoS (beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.48	-39.68	-16.20	CoSe
CoSeO3	-9.23	-7.91	1.32	CoSeO3
CoSeO4:6H2O	-17.14	-18.67	-1.53	CoSeO4:6H2O
CoSO4	-12.88	-10.07	2.80	CoSO4
CoSO4:6H2O	-7.60	-10.07	-2.47	CoSO4:6H2O
Cotunnite	-9.73	-14.51	-4.78	PbCl2
Covellite	-55.31	-77.61	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.03	-30.94	14.09	CrCl2
CrCl3	-46.20	-31.09	15.11	CrCl3
CrF3	-22.63	-33.96	-11.34	CrF3
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-7.79	-41.63	-33.84	Na3AlF6
Cu (OH) 2	-0.70	7.97	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.67	20.54	45.21	Cu (SbO3) 2
Cu2Sb:3H2O	-55.15	-90.03	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.09	-50.89	-45.80	Cu2Se
Cu2SO4	-19.33	-21.28	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-59.63	-102.22	-42.59	Cu3Sb
Cu3Se2	-26.10	-89.59	-63.49	Cu3Se2
CuCO3	-0.36	-11.86	-11.50	CuCO3
CuCrO4	-16.82	-22.26	-5.44	CuCrO4
CuF	-8.13	-13.04	-4.91	CuF
CuF2	-15.00	-13.88	1.12	CuF2
CuF2:2H2O	-9.33	-13.88	-4.55	CuF2:2H2O
Cumetal	-6.12	-14.88	-8.76	Cu
CuMoO4	0.00	-13.08	-13.08	CuMoO4
CuOCuSO4	-11.42	-1.12	10.30	CuOCuSO4
Cupricferrite	8.37	14.36	5.99	CuFe2O4
Cuprite	-2.81	-4.22	-1.41	Cu2O
Cuprousferrite	10.00	1.08	-8.92	CuFeO2
CuSe	-5.60	-38.70	-33.10	CuSe
CuSe2	-26.46	-59.83	-33.37	CuSe2
CuSeO3:2H2O	-7.44	-6.93	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.25	-17.69	-2.44	CuSeO4:5H2O
CuSO4	-12.03	-9.09	2.94	CuSO4
Diaspore	2.72	9.59	6.87	AlOOH
Djurleite	-55.08	-89.00	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.56	-17.10	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-0.01	-17.10	-17.09	CaMg (CO3) 2
Epsomite	-3.72	-5.85	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.24	0.20	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-6.57	-10.29	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.07	-8.52	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-17.69	-38.32	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-41.08	-44.82	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8

FeAsO4:2H2O	-12.29	-11.89	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-7.51	-17.60	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-45.76	-64.35	-18.60	FeSe2
FeS (ppt)	-79.18	-82.13	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-5.63	-5.63	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.18	-80.15	-13.97	PbS
Gibbsite	1.30	9.59	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.08	-9.09	-2.01	ZnSO4:7H2O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.47	-332.51	-45.03	Fe3S4
Gummite	-6.84	0.83	7.67	UO3
Gypsum	-1.10	-5.71	-4.61	CaSO4:2H2O
H-Jarosite	-12.46	-24.56	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.17	-21.05	-12.88	H2MoO4
H2S (g)	-77.58	-85.59	-8.01	H2S
H2Se (g)	-41.71	-46.67	-4.96	H2Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.55	53.48	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3)2 (g)	-182.59	-256.30	-73.71	Hg(CH3)2
Hg (g)	-8.34	-16.22	-7.87	Hg
Hg(OH)2	-8.77	-12.27	-3.50	Hg(OH)2
Hg2 (g)	-17.48	-32.43	-14.96	Hg2
Hg2(OH)2	-12.15	-6.89	5.26	Hg2(OH)2
Hg2CO3	-10.68	-26.73	-16.05	Hg2CO3
Hg2CrO4	-28.43	-37.13	-8.70	Hg2CrO4
Hg2F2	-18.38	-28.75	-10.36	Hg2F2
Hg2S	-80.80	-92.48	-11.68	Hg2S
Hg2SeO3	-17.13	-21.79	-4.66	Hg2SeO3
Hg2SO4	-17.83	-23.96	-6.13	Hg2SO4
Hg3O2CO3	-26.95	-56.63	-29.68	Hg3O2CO3
HgCl (g)	-32.91	-13.41	19.50	HgCl
HgCl2	-10.94	-32.20	-21.26	HgCl2
HgF (g)	-47.05	-14.37	32.68	HgF
HgF2 (g)	-46.69	-34.12	12.57	HgF2
Hgmetal (l)	-2.77	-16.22	-13.45	Hg
HgSe	-3.25	-58.94	-55.69	HgSe
HgSeO3	-14.73	-27.16	-12.43	HgSeO3
HgSO4	-19.91	-29.33	-9.42	HgSO4
Huntite	-4.37	-34.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-4.61	-23.38	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.49	-23.26	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.42	-20.59	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.81	-20.61	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.33	-52.58	-17.24	K2Cr2O7
K2CrO4	-21.83	-22.34	-0.51	K2CrO4
K2MoO4	-16.41	-13.15	3.26	K2MoO4
K2SeO4	-17.03	-17.76	-0.73	K2SeO4
Langite	-2.66	14.83	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.77	-6.21	-0.43	PbO:PbSO4
Laurionite	-5.16	-4.54	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.26	5.43	12.69	PbO
Mackinawite	-78.53	-82.13	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnetite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.42	-3.89	-5.31	Cu2(OH)2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.46	5.43	12.89	PbO

Matlockite	-6.49	-15.47	-8.97	PbClF
Melanothallite	-18.22	-11.96	6.26	CuCl ₂
Melanterite	-11.41	-13.62	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-52.76	-97.85	-45.09	HgS
Mg(OH) ₂ (active)	-7.58	11.22	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-13.81	-2.53	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-276.07	-201.39	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-17.67	8.69	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-7.34	8.86	16.20	MgCr ₂ O ₄
MgCrO ₄	-24.40	-19.02	5.38	MgCrO ₄
MgF ₂	-2.51	-10.64	-8.13	MgF ₂
MgMoO ₄	-7.98	-9.83	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-6.74	-3.68	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-13.25	-14.45	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-31.69	41.84	73.52	Pb ₃ O ₄
Mirabilite	-6.39	-7.50	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-9.33	-4.43	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-52.02	-57.73	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-151.13	-90.05	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-14.74	-2.24	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-13.34	-10.63	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-76.44	-76.27	0.17	MnS
MnS (pnk)	-79.61	-76.27	3.34	MnS
MnSb	-96.25	-99.16	-2.91	MnSb
MnSe	-40.86	-37.36	3.50	MnSe
MnSeO ₃	-6.72	-5.59	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-6.57	-5.59	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-14.30	-16.35	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-10.34	-7.76	2.58	MnSO ₄
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO ₃	-13.05	-21.05	-8.00	MoO ₃
Morenosite	-7.75	-9.89	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-147.51	-217.77	-70.26	MoS ₂
Na-Jarosite	-8.58	-19.78	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-41.01	-50.91	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-23.60	-20.67	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-15.94	-32.54	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-12.98	-11.48	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-12.71	-11.49	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-15.64	-5.34	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-17.38	-16.10	1.28	Na ₂ SeO ₄
Na ₃ Sb	-176.00	-81.55	94.45	Na ₃ Sb
Na ₃ VO ₄	-29.20	7.48	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-32.01	5.39	37.40	Na ₄ V ₂ O ₇
Nantokite	-5.35	-12.08	-6.73	CuCl
NaSb	-88.73	-65.57	23.17	NaSb
Natron	-8.96	-10.27	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-5.95	-2.09	3.86	NaVO ₃
Nesquehonite	-3.95	-8.62	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-5.62	7.17	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-24.35	-8.65	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-20.37	11.63	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-5.79	-12.66	-6.87	NiCO ₃
NiMoO ₄	-2.73	-13.88	-11.14	NiMoO ₄
NiS (alpha)	-72.81	-78.41	-5.60	NiS
NiS (beta)	-67.31	-78.41	-11.10	NiS
NiS (gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.80	-39.50	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-10.54	-7.73	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-16.97	-18.49	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-8.00	9.51	17.50	MnO ₂
O ₂ (g)	-32.00	51.09	83.09	O ₂
Orpiment	-239.15	-300.22	-61.07	As ₂ S ₃
Otavite	-1.85	-13.85	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.68	-4.16	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-2.72	5.43	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-55.96	-64.72	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆

Pb2 (OH) 3Cl	-7.90	0.89	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-15.33	10.86	26.19	Pb2O (OH) 2
Pb2O3	-24.63	36.41	61.04	Pb2O3
Pb2OCO3	-8.42	-8.98	-0.56	Pb2OCO3
Pb2V2O7	-0.98	-2.88	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-19.68	-13.88	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-3.59	2.55	6.14	Pb3 (VO4) 2
Pb3O2CO3	-14.57	-3.55	11.02	Pb3O2CO3
Pb3O2SO4	-11.46	-0.78	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-16.45	4.65	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-17.22	4.65	21.88	Pb4O3SO4
PbCrO4	-12.21	-24.81	-12.60	PbCrO4
PbF2	-8.99	-16.43	-7.44	PbF2
Pbmetal	-24.36	-20.11	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.55	5.43	12.98	PbO:0.33H2O
PbSeO4	-13.39	-20.23	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.10	-28.91	-19.81	PbCl2:PbCO3
Plattnerite	-18.63	30.97	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca (OH) 2
Pyrite	-123.67	-142.17	-18.51	FeS2
Pyrochroite	-5.88	9.31	15.19	Mn (OH) 2
Pyrolusite	-6.52	34.86	41.38	MnO2
Realgar	-100.34	-120.09	-19.75	AsS
Retgersite	-7.85	-9.89	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.51	-19.01	-14.50	UO2CO3
Sb (OH) 3	-12.15	-19.26	-7.11	Sb (OH) 3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-26.38	-36.05	-9.67	Sb2O5
Sb2Se3	-110.79	-178.54	-67.76	Sb2Se3
Sb4O6(cubic)	-58.78	-77.04	-18.26	Sb4O6
Sb4O6(orth)	-59.14	-77.04	-17.90	Sb4O6
SbCl3	-49.74	-49.17	0.57	SbCl3
SbF3	-41.82	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.97	-30.80	-27.82	SbO2
Schoepite	-5.17	0.83	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.02	-21.13	-7.11	Se
Semetal (hex)	-13.42	-21.13	-7.71	Se
Senarmontite	-26.16	-38.52	-12.37	Sb2O3
SeO2	-15.02	-14.90	0.12	SeO2
SeO3	-46.71	-25.66	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.86	-11.86	-10.00	ZnCO3
Sphalerite	-66.16	-77.61	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.82	-295.28	-50.46	Sb2S3
Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.33	7.97	7.64	CuO
Thenardite	-7.82	-7.50	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-4.81	-0.73	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.50	4.59	21.08	U3O8
U3Sb4	-582.46	-430.08	152.38	U3Sb4
U4O9	-33.44	-36.46	-3.02	U4O9
UF4	-29.68	-59.21	-29.54	UF4
UF4:2.5H2O	-26.50	-59.22	-32.72	UF4:2.5H2O
UO2 (am)	-16.43	-15.50	0.93	UO2
UO2 (OH) 2 (beta)	-4.78	0.83	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.59	-24.84	-2.25	UO2SeO4:4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.96	29.58	USb2
V (OH) 3	-17.41	-9.82	7.59	V (OH) 3
V2O5	-12.38	-13.74	-1.36	V2O5
V3O5	-35.60	-33.77	1.84	V3O5

V4O7	-43.69	-36.51	7.19	V4O7
V6O13	-31.46	-92.32	-60.86	V6O13
Valentinite	-30.04	-38.52	-8.48	Sb2O3
VC12	-61.40	-42.53	18.87	VC12
VC13	-63.16	-39.73	23.43	VC13
VF4	-61.38	-46.45	14.93	VF4
Vmetal	-92.16	-48.13	44.03	V
VO	-37.35	-22.59	14.76	VO
VO(OH)2	-7.89	-2.74	5.15	VO(OH)2
VO2Cl	-19.68	-16.84	2.84	VO2Cl
VOC1	-30.94	-19.79	11.15	VOC1
VOC12	-35.44	-22.68	12.76	VOC12
VOSO4	-23.42	-19.81	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.66	-77.61	-8.95	ZnS
Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.02	-9.09	3.93	ZnSO4
Zn(BO2)2	-9.91	-1.62	8.29	Zn(BO2)2
Zn(OH)2	-4.23	7.97	12.20	Zn(OH)2
Zn(OH)2(am)	-4.50	7.97	12.47	Zn(OH)2
Zn(OH)2(beta)	-3.78	7.97	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-3.56	7.97	11.53	Zn(OH)2
Zn(OH)2(gamma)	-3.76	7.97	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.62	-1.12	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.21	5.98	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-19.90	-6.25	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-29.12	-10.21	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-13.57	14.83	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-18.57	19.93	38.50	Zn5(OH)8Cl2
ZnCl2	-19.01	-11.96	7.05	ZnCl2
ZnCO3:1H2O	-1.60	-11.86	-10.26	ZnCO3:1H2O
ZnF2	-13.35	-13.88	-0.53	ZnF2
Znmetal	-43.36	-17.57	25.79	Zn
ZnMoO4	-2.95	-13.08	-10.13	ZnMoO4
ZnO(active)	-3.21	7.97	11.19	ZnO
ZnS(am)	-68.56	-77.61	-9.05	ZnS
ZnSb	-86.16	-75.15	11.01	ZnSb
ZnSe	-24.30	-38.70	-14.40	ZnSe
ZnSeO4:6H2O	-16.17	-17.69	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.45	-9.09	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 151.

```

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 901
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite      equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite      equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 901
USE Surface 901
USE Solution 903
SAVE Solution 904 #Initial Stage 9 groundwater after Mineral Precipitation
and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 901.

Diffuse Double Layer Surface-Complexation Model

Hfo

1.135e-15 Surface + diffuse layer charge, eq
7.818e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is
+1).

Element	Moles
C	4.3813e-11
Ca	5.4299e-13
Cl	8.7736e-10
H	1.2925e-10
K	8.6139e-13
Mg	8.4127e-14
N	3.5519e-09
Na	3.6496e-12
O	1.5831e-07
S	3.6889e-08

Hfo_s

1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	8.929e-08	0.668	8.929e-08	-7.049
Hfo_sOH	4.379e-08	0.328	4.379e-08	-7.359
Hfo_sO-	4.920e-10	0.004	4.920e-10	-9.308
Hfo_sOHCa+2	1.630e-12	0.000	1.630e-12	-11.788

Hfo_w

5.343e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	2.469e-06	0.462	2.469e-06	-5.608
Hfo_wOH	1.211e-06	0.227	1.211e-06	-5.917
Hfo_wSO4-	8.338e-07	0.156	8.338e-07	-6.079
Hfo_wHSO4-2	8.159e-07	0.153	8.159e-07	-6.088
Hfo_wO-	1.360e-08	0.003	1.360e-08	-7.866
Hfo_wOMg+	1.923e-14	0.000	1.923e-14	-13.716
Hfo_wOCa+	6.523e-15	0.000	6.523e-15	-14.186

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 903. Solution after simulation 150.
Using surface 901.
Using pure phase assemblage 901. Pure-phase assemblage after simulation 150.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	2.538e-08	2.176e-08	-3.614e-09
Alunite	-0.00	-1.40	-1.40	9.295e-07	9.296e-07	1.379e-10
Anhydrite	-1.35	-5.71	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	-1.04	-9.95	-8.91	2.029e-08	0	-2.029e-08
Barite	0.00	-9.98	-9.98	1.331e-06	1.392e-06	6.089e-08
Brochantite	-0.93	14.29	15.22	0.000e+00	0	0.000e+00
Brucite	-5.63	11.22	16.84	0.000e+00	0	0.000e+00
CO2(g)	-1.69	-19.84	-18.15	1.000e+01	1.000e+01	3.274e-06
CaMoO4	-1.61	-9.56	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-6.53	-3.72	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	2.923e-03	2.922e-03	-6.415e-07
Carnotite	-4.09	-3.86	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-13.44	-3.60	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.78	-14.93	-14.15	0.000e+00	0	0.000e+00
Chrysotile	Element not present.			0.000e+00	0	0.000e+00
Cr2O3	-0.00	-2.36	-2.36	6.029e-08	3.916e-08	-2.113e-08
Cu2Se(alpha)	-5.53	-51.33	-45.80	0.000e+00	0	0.000e+00
CuMoO4	0.00	-13.08	-13.08	2.597e-07	1.493e-07	-1.104e-07
Epsomite	-3.72	-5.85	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	2.671e-05	2.671e-05	-5.075e-13
Fluorite	0.00	-10.50	-10.50	1.124e-04	1.124e-04	9.433e-09
Gummite	-6.84	0.83	7.67	0.000e+00	0	0.000e+00
Gypsum	-1.10	-5.71	-4.61	0.000e+00	0	0.000e+00
HgSe	-3.42	-59.11	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-6.39	-7.50	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-6.89	-5.76	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-5.62	7.17	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-25.39	-9.69	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.79	-12.66	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-2.60	-13.74	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-2.313e-09
Otavite	-1.85	-13.85	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.08	-15.70	-15.62	5.239e-09	0	-5.239e-09
Rutherfordine	-4.51	-19.01	-14.50	0.000e+00	0	0.000e+00
SbO2	-2.97	-30.80	-27.82	0.000e+00	0	0.000e+00
Schoepite	-5.17	0.83	5.99	0.000e+00	0	0.000e+00
Sepiolite	Element not present.			0.000e+00	0	0.000e+00
SiO2(am-ppt)	Element not present.			0.000e+00	0	0.000e+00
Tyuyamunite	-8.35	-4.27	4.08	0.000e+00	0	0.000e+00
U3O8	-16.50	4.59	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-4.78	0.83	5.61	0.000e+00	0	0.000e+00
UO3	-6.87	0.83	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-2.82	-12.95	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-1.090e-19 Surface + diffuse layer charge, eq
 3.782e-07 Surface charge, eq
 2.128e-02 sigma, C/m²
 5.576e-02 psi, V
 -2.170e+00 -F*psi/RT
 1.141e-01 exp(-F*psi/RT)
 6.420e+04 specific area, m²/mol Ferrihydrite
 1.715e+00 m² for 2.671e-05 moles of Ferrihydrite

Water in diffuse layer: 1.715e-05 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 1.327e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 5.966e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Ag	6.6950e-13
Al	4.6795e-11
As	3.5391e-15
B	2.7701e-10
Ba	6.8336e-13
C	1.5682e-07
Ca	2.1035e-08
Cd	1.0515e-13
Cl	4.9594e-08
Co	1.1277e-12
Cr	6.6362e-14
Cu	1.1498e-10
F	5.6863e-09
Fe	4.0659e-14
H	1.6927e-07
Hg	3.8881e-15
K	7.6857e-09
Mg	1.3897e-08
Mn	1.8646e-10
Mo	1.9847e-11
N	8.4082e-14
Na	5.2137e-08
Ni	1.8712e-12
O	1.0872e-06
Pb	1.8570e-13
S	1.5392e-07
Sb	3.8230e-13
Se	4.6228e-13
U	7.8936e-12
V	5.9705e-14
Zn	1.0493e-11

Hfo_s

1.336e-07 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOCu+	7.771e-08	0.582	7.774e-08	-7.109
Hfo_sOCrOH+	4.226e-08	0.316	4.227e-08	-7.374
Hfo_sOPb+	1.057e-08	0.079	1.057e-08	-7.976
Hfo_sOZn+	1.322e-09	0.010	1.323e-09	-8.879
Hfo_sOMn+	1.178e-09	0.009	1.179e-09	-8.929
Hfo_sOHCa+2	2.502e-10	0.002	2.503e-10	-9.602
Hfo_sOH	1.780e-10	0.001	1.781e-10	-9.749
Hfo_sONi+	5.061e-11	0.000	5.063e-11	-10.296
Hfo_sOH2+	2.824e-11	0.000	2.825e-11	-10.549

Hfo_sO-	2.571e-11	0.000	2.572e-11	-10.590
Hfo_sOCo+	4.945e-12	0.000	4.948e-12	-11.306
Hfo_sOCd+	4.173e-12	0.000	4.175e-12	-11.379
Hfo_sOAg	4.019e-13	0.000	4.021e-13	-12.396
Hfo_sOHBa+2	4.145e-14	0.000	4.147e-14	-13.382
Hfo_sOFe+	2.050e-14	0.000	2.051e-14	-13.688
Hfo_sOHg+	7.011e-17	0.000	7.014e-17	-16.154

Hfo_w

5.343e-06 moles [0.2 mol/(mol Ferrihydrite)]				
Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	2.596e-06	0.486	2.597e-06	-5.585
Hfo_wOH	1.160e-06	0.217	1.160e-06	-5.935
Hfo_wOHSO4-2	9.274e-07	0.174	9.278e-07	-6.033
Hfo_wOH2+	1.839e-07	0.034	1.840e-07	-6.735
Hfo_wO-	1.675e-07	0.031	1.676e-07	-6.776
Hfo_wOHVO4-3	1.157e-07	0.022	1.157e-07	-6.937
Hfo_wSO4-	7.375e-08	0.014	7.378e-08	-7.132
Hfo_wOHAsO4-3	4.075e-08	0.008	4.077e-08	-7.390
Hfo_wOMg+	3.912e-08	0.007	3.914e-08	-7.407
Hfo_wOZn+	9.018e-09	0.002	9.022e-09	-8.045
Hfo_wOHSeO3-2	8.720e-09	0.002	8.724e-09	-8.059
Hfo_wOMn+	6.096e-09	0.001	6.099e-09	-8.215
Hfo_wOHMoO4-2	5.344e-09	0.001	5.346e-09	-8.272
Hfo_wOPb+	3.075e-09	0.001	3.077e-09	-8.512
Hfo_wOCa+	3.033e-09	0.001	3.034e-09	-8.518
Hfo_wSeO3-	2.350e-09	0.000	2.351e-09	-8.629
Hfo_wMoO4-	5.474e-10	0.000	5.477e-10	-9.261
Hfo_wONi+	4.447e-10	0.000	4.449e-10	-9.352
Hfo_wOCo+	9.080e-11	0.000	9.084e-11	-10.042
Hfo_wH2BO3	7.718e-11	0.000	7.721e-11	-10.112
Hfo_wHAsO4-	2.296e-11	0.000	2.297e-11	-10.639
Hfo_wOCd+	1.160e-11	0.000	1.160e-11	-10.935
Hfo_wOAg	6.886e-13	0.000	6.889e-13	-12.162
Hfo_wH2AsO4	1.178e-13	0.000	1.179e-13	-12.929
Hfo_wOFe+	8.428e-14	0.000	8.431e-14	-13.074
Hfo_wOHg+	2.237e-14	0.000	2.238e-14	-13.650
Hfo_wOBa+	7.263e-15	0.000	7.266e-15	-14.139
Hfo_wOHSbO(OH) 4-	2.676e-15	0.000	2.677e-15	-14.572
Hfo_wOHSeO4-2	1.612e-15	0.000	1.612e-15	-14.793
Hfo_wSbO(OH) 4	2.741e-16	0.000	2.743e-16	-15.562
Hfo_wSeO4-	1.116e-16	0.000	1.117e-16	-15.952
Hfo_wOHCrO4-2	8.050e-17	0.000	8.054e-17	-16.094
Hfo_wCrO4-	5.838e-18	0.000	5.841e-18	-17.234
Hfo_wH2AsO3	1.677e-23	0.000	1.678e-23	-22.775

-----Solution composition-----

Elements	Molality	Moles
Ag	3.999e-08	3.997e-08
Al	1.918e-06	1.917e-06
As	8.301e-11	8.297e-11
B	1.606e-05	1.605e-05
Ba	1.098e-07	1.097e-07
C	5.840e-03	5.837e-03
Ca	2.553e-03	2.552e-03
Cd	1.185e-08	1.184e-08
Cl	1.725e-03	1.725e-03
Co	1.358e-07	1.358e-07
Cr	6.449e-09	6.446e-09
Cu	7.058e-06	7.055e-06
F	2.117e-04	2.116e-04
Fe	3.680e-09	3.678e-09
Hg	2.267e-10	2.266e-10
K	7.355e-04	7.351e-04

Mg	1.765e-03	1.764e-03
Mn	2.413e-05	2.412e-05
Mo	4.121e-07	4.119e-07
N	3.553e-09	3.552e-09
Na	5.006e-03	5.004e-03
Ni	2.127e-07	2.127e-07
Pb	1.296e-08	1.295e-08
S	3.673e-03	3.671e-03
Sb	1.330e-08	1.329e-08
Se	1.522e-08	1.521e-08
U	8.617e-08	8.613e-08
V	2.004e-09	2.003e-09
Zn	1.165e-06	1.165e-06

-----Description of solution-----

	pH	=	7.147	Charge balance
	pe	=	5.625	Adjusted to redox
equilibrium				
	Activity of water	=	1.000	
	Ionic strength (mol/kgw)	=	1.914e-02	
	Mass of water (kg)	=	9.996e-01	
	Total alkalinity (eq/kg)	=	5.166e-03	
	Total CO2 (mol/kg)	=	5.840e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	2.434e-15	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	1	
	Total H	=	1.109722e+02	
	Total O	=	5.551507e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.625e-07	1.412e-07	-6.789	-6.850	-0.061	(0)
H+	8.165e-08	7.127e-08	-7.088	-7.147	-0.059	0.00
H2O	5.551e+01	9.996e-01	1.744	-0.000	0.000	18.07
Ag	3.999e-08					
AgCl	2.596e-08	2.596e-08	-7.586	-7.586	0.000	(0)
Ag+	9.673e-09	8.444e-09	-8.014	-8.073	-0.059	(0)
AgCl2-	4.006e-09	3.405e-09	-8.397	-8.468	-0.071	(0)
AgSO4-	3.349e-10	2.846e-10	-9.475	-9.546	-0.071	(0)
AgCl3-2	8.753e-12	4.570e-12	-11.058	-11.340	-0.282	(0)
AgF	3.508e-12	3.508e-12	-11.455	-11.455	0.000	(0)
AgOH	1.193e-13	1.193e-13	-12.924	-12.924	0.000	(0)
AgCl4-3	6.064e-14	1.405e-14	-13.217	-13.852	-0.635	(0)
AgH2BO3	1.740e-14	1.740e-14	-13.759	-13.759	0.000	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
AgSeO3-	4.228e-15	3.594e-15	-14.374	-14.444	-0.071	(0)
AgNO2	3.908e-15	3.908e-15	-14.408	-14.408	0.000	(0)
AgNH3+	1.362e-16	1.158e-16	-15.866	-15.936	-0.071	(0)
Ag (OH) 2-	1.936e-18	1.646e-18	-17.713	-17.784	-0.071	(0)
AgNO3	1.402e-20	1.402e-20	-19.853	-19.853	0.000	(0)
Ag (SeO3) 2-3	9.197e-23	2.131e-23	-22.036	-22.671	-0.635	(0)
Ag (NO2) 2-	1.577e-23	1.341e-23	-22.802	-22.873	-0.071	(0)
Ag (NH3) 2+	7.433e-24	6.318e-24	-23.129	-23.199	-0.071	(0)
Ag2MoO4	6.450e-24	6.450e-24	-23.190	-23.190	0.000	(0)
AgHS	0.000e+00	0.000e+00	-72.697	-72.697	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.413	-86.542	-1.129	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.965	-147.035	-0.071	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.204	-147.372	-0.168	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.347	-149.665	-0.318	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.672	-149.976	-0.304	(0)
Al	1.918e-06					
Al (OH) 4-	1.294e-06	1.131e-06	-5.888	-5.947	-0.059	(0)

AlF3	3.229e-07	3.229e-07	-6.491	-6.491	0.000	(0)
AlF2+	1.767e-07	1.551e-07	-6.753	-6.809	-0.057	(0)
Al (OH) 3	6.358e-08	6.358e-08	-7.197	-7.197	0.000	(0)
AlF4-	3.063e-08	2.677e-08	-7.514	-7.572	-0.059	(0)
Al (OH) 2+	2.570e-08	2.256e-08	-7.590	-7.647	-0.057	(0)
AlF+2	3.968e-09	2.355e-09	-8.401	-8.628	-0.227	(0)
AlOH+2	3.389e-10	2.011e-10	-9.470	-9.697	-0.227	(0)
AlSO4+	2.137e-11	1.867e-11	-10.670	-10.729	-0.059	(0)
Al+3	4.841e-12	1.424e-12	-11.315	-11.847	-0.531	(0)
Al (SO4) 2-	3.869e-13	3.381e-13	-12.412	-12.471	-0.059	(0)
AlMo6O21-3	1.476e-39	3.420e-40	-38.831	-39.466	-0.635	(0)
As (3)	5.672e-23					
H3AsO3	5.624e-23	5.624e-23	-22.250	-22.250	0.000	(0)
H2AsO3-	4.761e-25	4.047e-25	-24.322	-24.393	-0.071	(0)
HAsO3-2	9.920e-30	5.179e-30	-29.004	-29.286	-0.282	(0)
H4AsO3+	2.336e-30	1.986e-30	-29.632	-29.702	-0.071	(0)
AsO3-3	1.209e-35	2.801e-36	-34.918	-35.553	-0.635	(0)
As (5)	8.301e-11					
HAsO4-2	5.932e-11	3.097e-11	-10.227	-10.509	-0.282	(0)
H2AsO4-	2.368e-11	2.013e-11	-10.626	-10.696	-0.071	(0)
AsO4-3	5.930e-15	1.374e-15	-14.227	-14.862	-0.635	(0)
H3AsO4	2.482e-16	2.493e-16	-15.605	-15.603	0.002	(0)
B	1.606e-05					
H3BO3	1.589e-05	1.596e-05	-4.799	-4.797	0.002	(0)
H2BO3-	1.505e-07	1.300e-07	-6.823	-6.886	-0.063	(0)
CaH2BO3+	1.001e-08	8.650e-09	-8.000	-8.063	-0.063	(0)
MgH2BO3+	4.375e-09	3.781e-09	-8.359	-8.422	-0.063	(0)
BF (OH) 3-	1.219e-09	1.053e-09	-8.914	-8.977	-0.063	(0)
NaH2BO3	8.906e-10	8.906e-10	-9.050	-9.050	0.000	(0)
H5 (BO3) 2-	2.044e-12	1.766e-12	-11.690	-11.753	-0.063	(0)
BF2 (OH) 2-	1.536e-12	1.328e-12	-11.814	-11.877	-0.063	(0)
BaH2BO3+	2.882e-13	2.491e-13	-12.540	-12.604	-0.063	(0)
AgH2BO3	1.740e-14	1.740e-14	-13.759	-13.759	0.000	(0)
H8 (BO3) 3-	3.262e-15	2.819e-15	-14.487	-14.550	-0.063	(0)
BF3OH-	7.047e-18	6.091e-18	-17.152	-17.215	-0.063	(0)
BF4-	4.089e-22	3.534e-22	-21.388	-21.452	-0.063	(0)
Ba	1.098e-07					
Ba+2	1.068e-07	6.198e-08	-6.972	-7.208	-0.236	(0)
BaHCO3+	2.928e-09	2.577e-09	-8.533	-8.589	-0.055	(0)
BaCO3	9.105e-11	9.105e-11	-10.041	-10.041	0.000	(0)
BaH2BO3+	2.882e-13	2.491e-13	-12.540	-12.604	-0.063	(0)
BaOH+	4.362e-14	3.821e-14	-13.360	-13.418	-0.057	(0)
BaNO3+	7.636e-19	6.491e-19	-18.117	-18.188	-0.071	(0)
BaNH3+2	5.029e-19	2.626e-19	-18.299	-18.581	-0.282	(0)
C (4)	5.840e-03					
HCO3-	4.961e-03	4.355e-03	-2.304	-2.361	-0.057	(0)
H2CO3	6.980e-04	6.980e-04	-3.156	-3.156	0.000	(0)
CaHCO3+	1.065e-04	9.373e-05	-3.973	-4.028	-0.055	(0)
MgHCO3+	4.287e-05	3.737e-05	-4.368	-4.428	-0.060	(0)
NaHCO3	1.058e-05	1.058e-05	-4.975	-4.975	0.000	(0)
CuCO3	5.922e-06	5.922e-06	-5.228	-5.228	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CO3-2	4.935e-06	2.865e-06	-5.307	-5.543	-0.236	(0)
MgCO3	1.998e-06	1.998e-06	-5.699	-5.699	0.000	(0)
MnHCO3+	1.029e-06	9.018e-07	-5.987	-6.045	-0.057	(0)
NaCO3-	2.626e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
CuHCO3+	1.135e-07	9.647e-08	-6.945	-7.016	-0.071	(0)
Cu (CO3) 2-2	8.746e-08	4.566e-08	-7.058	-7.340	-0.282	(0)
ZnCO3	7.821e-08	7.821e-08	-7.107	-7.107	0.000	(0)
ZnHCO3+	7.686e-08	6.534e-08	-7.114	-7.185	-0.071	(0)
NiHCO3+	4.782e-08	4.065e-08	-7.320	-7.391	-0.071	(0)
UO2 (CO3) 3-4	4.307e-08	3.201e-09	-7.366	-8.495	-1.129	(0)
UO2 (CO3) 2-2	4.270e-08	2.230e-08	-7.370	-7.652	-0.282	(0)
CoHCO3+	1.993e-08	1.695e-08	-7.700	-7.771	-0.071	(0)
NiCO3	8.092e-09	8.092e-09	-8.092	-8.092	0.000	(0)
PbCO3	7.146e-09	7.146e-09	-8.146	-8.146	0.000	(0)
PbHCO3+	3.159e-09	2.685e-09	-8.500	-8.571	-0.071	(0)
BaHCO3+	2.928e-09	2.577e-09	-8.533	-8.589	-0.055	(0)

	CoCO3	2.422e-09	2.422e-09	-8.616	-8.616	0.000	(0)
	UO2CO3	3.901e-10	3.901e-10	-9.409	-9.409	0.000	(0)
	CdCO3	3.238e-10	3.238e-10	-9.490	-9.490	0.000	(0)
	Pb (CO3) 2-2	1.131e-10	5.904e-11	-9.947	-10.229	-0.282	(0)
	BaCO3	9.105e-11	9.105e-11	-10.041	-10.041	0.000	(0)
	CdHCO3+	5.784e-11	4.917e-11	-10.238	-10.308	-0.071	(0)
	Cd (CO3) 2-2	1.317e-12	6.876e-13	-11.880	-12.163	-0.282	(0)
	FeHCO3+	8.937e-13	7.866e-13	-12.049	-12.104	-0.055	(0)
	HgCO3	1.479e-14	1.479e-14	-13.830	-13.830	0.000	(0)
	Hg (CO3) 2-2	2.565e-16	1.339e-16	-15.591	-15.873	-0.282	(0)
	HgHCO3+	2.308e-17	1.962e-17	-16.637	-16.707	-0.071	(0)
Ca	2.553e-03						
	Ca+2	1.991e-03	1.156e-03	-2.701	-2.937	-0.236	(0)
	CaSO4	4.474e-04	4.474e-04	-3.349	-3.349	0.000	(0)
	CaHCO3+	1.065e-04	9.373e-05	-3.973	-4.028	-0.055	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.382e-06	2.087e-06	-5.623	-5.681	-0.057	(0)
	CaH2BO3+	1.001e-08	8.650e-09	-8.000	-8.063	-0.063	(0)
	CaOH+	3.701e-09	3.258e-09	-8.432	-8.487	-0.055	(0)
	CaNH3+2	1.872e-14	9.772e-15	-13.728	-14.010	-0.282	(0)
	CaNO3+	8.986e-15	7.639e-15	-14.046	-14.117	-0.071	(0)
	Ca (NH3) 2+2	5.003e-26	2.612e-26	-25.301	-25.583	-0.282	(0)
Cd	1.185e-08						
	Cd+2	8.544e-09	4.959e-09	-8.068	-8.305	-0.236	(0)
	CdSO4	1.964e-09	1.964e-09	-8.707	-8.707	0.000	(0)
	CdCl+	8.390e-10	7.132e-10	-9.076	-9.147	-0.071	(0)
	CdCO3	3.238e-10	3.238e-10	-9.490	-9.490	0.000	(0)
	Cd (SO4) 2-2	8.575e-11	4.477e-11	-10.067	-10.349	-0.282	(0)
	CdHCO3+	5.784e-11	4.917e-11	-10.238	-10.308	-0.071	(0)
	CdF+	1.529e-11	1.300e-11	-10.815	-10.886	-0.071	(0)
	CdOH+	6.545e-12	5.564e-12	-11.184	-11.255	-0.071	(0)
	CdCl2	4.477e-12	4.477e-12	-11.349	-11.349	0.000	(0)
	CdOHC1	4.132e-12	4.132e-12	-11.384	-11.384	0.000	(0)
	Cd (CO3) 2-2	1.317e-12	6.876e-13	-11.880	-12.163	-0.282	(0)
	CdCl3-	5.005e-15	4.254e-15	-14.301	-14.371	-0.071	(0)
	Cd (OH) 2	4.958e-15	4.958e-15	-14.305	-14.305	0.000	(0)
	CdF2	4.290e-15	4.290e-15	-14.368	-14.368	0.000	(0)
	CdSeO4	2.650e-18	2.650e-18	-17.577	-17.577	0.000	(0)
	Cd2OH+3	5.968e-19	1.383e-19	-18.224	-18.859	-0.635	(0)
	Cd (OH) 3-	5.033e-20	4.279e-20	-19.298	-19.369	-0.071	(0)
	CdNO3+	3.855e-20	3.277e-20	-19.414	-19.484	-0.071	(0)
	Cd (SeO3) 2-2	3.433e-21	1.793e-21	-20.464	-20.746	-0.282	(0)
	Cd (OH) 4-2	1.894e-27	9.891e-28	-26.723	-27.005	-0.282	(0)
	Cd (NO3) 2	3.433e-32	3.433e-32	-31.464	-31.464	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.664	-78.735	-0.071	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-149.969	-149.969	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.436	-226.507	-0.071	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.467	-302.749	-0.282	(0)
Cl	1.725e-03						
	Cl-	1.725e-03	1.506e-03	-2.763	-2.822	-0.059	(0)
	AgCl	2.596e-08	2.596e-08	-7.586	-7.586	0.000	(0)
	MnCl+	2.246e-08	1.968e-08	-7.649	-7.706	-0.057	(0)
	AgCl2-	4.006e-09	3.405e-09	-8.397	-8.468	-0.071	(0)
	ZnCl+	2.059e-09	1.795e-09	-8.686	-8.746	-0.060	(0)
	CuCl+	9.615e-10	8.380e-10	-9.017	-9.077	-0.060	(0)
	CdCl+	8.390e-10	7.132e-10	-9.076	-9.147	-0.071	(0)
	CuCl	7.725e-10	7.725e-10	-9.112	-9.112	0.000	(0)
	NiCl+	3.432e-10	2.917e-10	-9.464	-9.535	-0.071	(0)
	ZnOHC1	3.319e-10	3.319e-10	-9.479	-9.479	0.000	(0)
	CoCl+	3.066e-10	2.606e-10	-9.513	-9.584	-0.071	(0)
	CuCl2-	2.789e-10	2.431e-10	-9.555	-9.614	-0.060	(0)
	PbCl+	5.216e-11	4.434e-11	-10.283	-10.353	-0.071	(0)
	MnCl2	4.186e-11	4.186e-11	-10.378	-10.378	0.000	(0)
	AgCl3-2	8.753e-12	4.570e-12	-11.058	-11.340	-0.282	(0)
	CdCl2	4.477e-12	4.477e-12	-11.349	-11.349	0.000	(0)
	ZnCl2	4.283e-12	4.283e-12	-11.368	-11.368	0.000	(0)
	CdOHC1	4.132e-12	4.132e-12	-11.384	-11.384	0.000	(0)
	HgClOH	1.620e-12	1.620e-12	-11.790	-11.790	0.000	(0)

HgCl ₂	9.780e-13	9.780e-13	-12.010	-12.010	0.000	(0)
CuCl ₂	4.375e-13	4.375e-13	-12.359	-12.359	0.000	(0)
PbCl ₂	2.983e-13	2.983e-13	-12.525	-12.525	0.000	(0)
CuCl ₃ -2	1.329e-13	7.825e-14	-12.877	-13.106	-0.230	(0)
AgCl ₄ -3	6.064e-14	1.405e-14	-13.217	-13.852	-0.635	(0)
MnCl ₃ -	1.982e-14	1.736e-14	-13.703	-13.760	-0.057	(0)
HgCl ₃ -	1.733e-14	1.473e-14	-13.761	-13.832	-0.071	(0)
ZnCl ₃ -	5.879e-15	5.124e-15	-14.231	-14.290	-0.060	(0)
CdCl ₃ -	5.005e-15	4.254e-15	-14.301	-14.371	-0.071	(0)
NiCl ₂	2.212e-15	2.212e-15	-14.655	-14.655	0.000	(0)
CrCl+2	3.318e-16	1.733e-16	-15.479	-15.761	-0.282	(0)
PbCl ₃ -	2.103e-16	1.788e-16	-15.677	-15.748	-0.071	(0)
HgCl ₄ -2	1.691e-16	8.830e-17	-15.772	-16.054	-0.282	(0)
HgCl+	1.524e-16	1.296e-16	-15.817	-15.887	-0.071	(0)
UO ₂ Cl+	9.827e-17	8.354e-17	-16.008	-16.078	-0.071	(0)
CuCl ₃ -	7.056e-18	6.149e-18	-17.151	-17.211	-0.060	(0)
ZnCl ₄ -2	6.552e-18	3.858e-18	-17.184	-17.414	-0.230	(0)
CrOHCl ₂	7.004e-19	7.004e-19	-18.155	-18.155	0.000	(0)
PbCl ₄ -2	2.357e-19	1.231e-19	-18.628	-18.910	-0.282	(0)
FeCl+2	4.344e-20	2.558e-20	-19.362	-19.592	-0.230	(0)
CrCl ₂ +	2.912e-20	2.476e-20	-19.536	-19.606	-0.071	(0)
VOCl+	7.815e-22	6.643e-22	-21.107	-21.178	-0.071	(0)
FeCl ₂ +	1.964e-22	1.721e-22	-21.707	-21.764	-0.057	(0)
CuCl ₄ -2	7.881e-23	4.641e-23	-22.103	-22.333	-0.230	(0)
FeCl ₃	2.591e-26	2.591e-26	-25.586	-25.586	0.000	(0)
CrO ₃ Cl-	2.085e-26	1.773e-26	-25.681	-25.751	-0.071	(0)
CoCl+2	4.932e-35	2.575e-35	-34.307	-34.589	-0.282	(0)
UCl+3	0.000e+00	0.000e+00	-44.576	-45.211	-0.635	(0)
Co (NH ₃) 5Cl+2	0.000e+00	0.000e+00	-64.219	-64.501	-0.282	(0)
Cr (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-68.527	-68.809	-0.282	(0)
Co (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-82.107	-82.389	-0.282	(0)
Co (2)	1.358e-07					
Co+2	9.581e-08	5.002e-08	-7.019	-7.301	-0.282	(0)
CoHCO ₃ +	1.993e-08	1.695e-08	-7.700	-7.771	-0.071	(0)
CoSO ₄	1.686e-08	1.686e-08	-7.773	-7.773	0.000	(0)
CoCO ₃	2.422e-09	2.422e-09	-8.616	-8.616	0.000	(0)
CoF+	3.078e-10	2.616e-10	-9.512	-9.582	-0.071	(0)
CoCl+	3.066e-10	2.606e-10	-9.513	-9.584	-0.071	(0)
CoOH+	1.658e-10	1.410e-10	-9.780	-9.851	-0.071	(0)
Co (OH) 2	1.582e-12	1.582e-12	-11.801	-11.801	0.000	(0)
CoNO ₂ +	9.186e-16	7.809e-16	-15.037	-15.107	-0.071	(0)
Co (NH ₃) +2	7.735e-17	4.039e-17	-16.112	-16.394	-0.282	(0)
CoSeO ₄	7.193e-17	7.193e-17	-16.143	-16.143	0.000	(0)
Co (OH) 3-	5.243e-18	4.457e-18	-17.280	-17.351	-0.071	(0)
Co ₂ OH+3	1.525e-18	3.535e-19	-17.817	-18.452	-0.635	(0)
CoOOH-	1.316e-18	1.119e-18	-17.881	-17.951	-0.071	(0)
CoNO ₃ +	1.949e-19	1.657e-19	-18.710	-18.781	-0.071	(0)
Co (OH) 4-2	1.911e-25	9.977e-26	-24.719	-25.001	-0.282	(0)
Co (NH ₃) 2+2	2.216e-26	1.157e-26	-25.655	-25.937	-0.282	(0)
Co ₄ (OH) 4+4	1.060e-30	7.881e-32	-29.975	-31.103	-1.129	(0)
Co (NO ₃) 2	7.045e-31	7.045e-31	-30.152	-30.152	0.000	(0)
Co (NH ₃) 3+2	1.873e-36	9.779e-37	-35.727	-36.010	-0.282	(0)
Co (NH ₃) 4+2	0.000e+00	0.000e+00	-46.180	-46.463	-0.282	(0)
Co (NH ₃) 5+2	0.000e+00	0.000e+00	-57.133	-57.416	-0.282	(0)
Co (3)	1.155e-28					
CoOH+2	1.155e-28	6.032e-29	-27.937	-28.220	-0.282	(0)
Co+3	2.858e-34	8.404e-35	-33.544	-34.075	-0.531	(0)
CoCl+2	4.932e-35	2.575e-35	-34.307	-34.589	-0.282	(0)
Co (NH ₃) 5Cl+2	0.000e+00	0.000e+00	-64.219	-64.501	-0.282	(0)
Co (NH ₃) 6SO ₄ +	0.000e+00	0.000e+00	-77.344	-77.414	-0.071	(0)
Co (NH ₃) 6OH+2	0.000e+00	0.000e+00	-81.935	-82.217	-0.282	(0)
Co (NH ₃) 6Cl+2	0.000e+00	0.000e+00	-82.107	-82.389	-0.282	(0)
Cr (2)	9.639e-26					
Cr+2	9.639e-26	5.032e-26	-25.016	-25.298	-0.282	(0)
Cr (3)	6.449e-09					
Cr (OH) 2+	5.554e-09	4.721e-09	-8.255	-8.326	-0.071	(0)
Cr (OH) +2	5.261e-10	2.747e-10	-9.279	-9.561	-0.282	(0)
Cr (OH) 3	2.505e-10	2.505e-10	-9.601	-9.601	0.000	(0)

CrOHSO4	1.101e-10	1.101e-10	-9.958	-9.958	0.000	(0)
CrF+2	4.463e-12	2.330e-12	-11.350	-11.633	-0.282	(0)
CrO2-	1.964e-12	1.670e-12	-11.707	-11.777	-0.071	(0)
Cr (OH) 4-	1.657e-12	1.408e-12	-11.781	-11.851	-0.071	(0)
CrSO4+	4.126e-13	3.507e-13	-12.384	-12.455	-0.071	(0)
Cr+3	3.836e-13	8.890e-14	-12.416	-13.051	-0.635	(0)
CrCl+2	3.318e-16	1.733e-16	-15.479	-15.761	-0.282	(0)
Cr2 (OH) 2SO4+2	5.238e-18	2.735e-18	-17.281	-17.563	-0.282	(0)
CrOHC12	7.004e-19	7.004e-19	-18.155	-18.155	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.745e-19	2.745e-19	-18.562	-18.562	0.000	(0)
CrCl2+	2.912e-20	2.476e-20	-19.536	-19.606	-0.071	(0)
CrNO3+2	1.555e-26	8.121e-27	-25.808	-26.090	-0.282	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.111	-55.394	-0.282	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.454	-67.089	-0.635	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.527	-68.809	-0.282	(0)
Cr (6)	2.302e-16					
CrO4-2	1.961e-16	1.138e-16	-15.707	-15.944	-0.236	(0)
HCrO4-	3.089e-17	2.625e-17	-16.510	-16.581	-0.071	(0)
NaCrO4-	2.876e-18	2.445e-18	-17.541	-17.612	-0.071	(0)
KCrO4-	3.157e-19	2.683e-19	-18.501	-18.571	-0.071	(0)
CrO3SO4-2	1.845e-24	9.632e-25	-23.734	-24.016	-0.282	(0)
H2CrO4	1.517e-24	1.517e-24	-23.819	-23.819	0.000	(0)
CrO3Cl-	2.085e-26	1.773e-26	-25.681	-25.751	-0.071	(0)
Cr2O7-2	4.579e-32	2.391e-32	-31.339	-31.621	-0.282	(0)
Cu (1)	1.531e-09					
CuCl	7.725e-10	7.725e-10	-9.112	-9.112	0.000	(0)
Cu+	4.794e-10	4.075e-10	-9.319	-9.390	-0.071	(0)
CuCl2-	2.789e-10	2.431e-10	-9.555	-9.614	-0.060	(0)
CuCl3-2	1.329e-13	7.825e-14	-12.877	-13.106	-0.230	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.271	-148.582	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.015	-149.312	-0.297	(0)
Cu (2)	7.056e-06					
CuCO3	5.922e-06	5.922e-06	-5.228	-5.228	0.000	(0)
Cu+2	6.048e-07	3.511e-07	-6.218	-6.455	-0.236	(0)
CuOH+	1.799e-07	1.568e-07	-6.745	-6.805	-0.060	(0)
CuSO4	1.359e-07	1.359e-07	-6.867	-6.867	0.000	(0)
CuHCO3+	1.135e-07	9.647e-08	-6.945	-7.016	-0.071	(0)
Cu (CO3) 2-2	8.746e-08	4.566e-08	-7.058	-7.340	-0.282	(0)
Cu (OH) 2	4.419e-09	4.419e-09	-8.355	-8.355	0.000	(0)
CuF+	4.310e-09	3.664e-09	-8.365	-8.436	-0.071	(0)
Cu2 (OH) 2+2	1.183e-09	6.177e-10	-8.927	-9.209	-0.282	(0)
CuCl+	9.615e-10	8.380e-10	-9.017	-9.077	-0.060	(0)
Cu (OH) 3-	1.506e-12	1.280e-12	-11.822	-11.893	-0.071	(0)
CuCl2	4.375e-13	4.375e-13	-12.359	-12.359	0.000	(0)
CuNO2+	9.580e-14	8.144e-14	-13.019	-13.089	-0.071	(0)
CuNH3+2	4.621e-14	2.412e-14	-13.335	-13.618	-0.282	(0)
CuCl3-	7.056e-18	6.149e-18	-17.151	-17.211	-0.060	(0)
CuNO3+	2.730e-18	2.320e-18	-17.564	-17.634	-0.071	(0)
Cu (OH) 4-2	2.726e-18	1.423e-18	-17.565	-17.847	-0.282	(0)
Cu (NO2) 2	1.846e-21	1.846e-21	-20.734	-20.734	0.000	(0)
CuCl4-2	7.881e-23	4.641e-23	-22.103	-22.333	-0.230	(0)
Cu (NO3) 2	6.104e-31	6.104e-31	-30.214	-30.214	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.799	-215.870	-0.071	(0)
F	2.117e-04					
F-	1.895e-04	1.654e-04	-3.722	-3.781	-0.059	(0)
MgF+	1.781e-05	1.556e-05	-4.749	-4.808	-0.059	(0)
CaF+	2.382e-06	2.087e-06	-5.623	-5.681	-0.057	(0)
NaF	4.509e-07	4.509e-07	-6.346	-6.346	0.000	(0)
AlF3	3.229e-07	3.229e-07	-6.491	-6.491	0.000	(0)
AlF2+	1.767e-07	1.551e-07	-6.753	-6.809	-0.057	(0)
MnF+	7.802e-08	6.834e-08	-7.108	-7.165	-0.057	(0)
AlF4-	3.063e-08	2.677e-08	-7.514	-7.572	-0.059	(0)
HF	1.744e-08	1.744e-08	-7.759	-7.759	0.000	(0)
CuF+	4.310e-09	3.664e-09	-8.365	-8.436	-0.071	(0)
AlF+2	3.968e-09	2.355e-09	-8.401	-8.628	-0.227	(0)
ZnF+	1.842e-09	1.566e-09	-8.735	-8.805	-0.071	(0)
BF (OH) 3-	1.219e-09	1.053e-09	-8.914	-8.977	-0.063	(0)
NiF+	3.701e-10	3.146e-10	-9.432	-9.502	-0.071	(0)

CoF+	3.078e-10	2.616e-10	-9.512	-9.582	-0.071	(0)
CdF+	1.529e-11	1.300e-11	-10.815	-10.886	-0.071	(0)
HF2-	1.261e-11	1.096e-11	-10.899	-10.960	-0.061	(0)
PbF+	1.138e-11	9.672e-12	-10.944	-11.014	-0.071	(0)
CrF+2	4.463e-12	2.330e-12	-11.350	-11.633	-0.282	(0)
AgF	3.508e-12	3.508e-12	-11.455	-11.455	0.000	(0)
BF2(OH) 2-	1.536e-12	1.328e-12	-11.814	-11.877	-0.063	(0)
UO2F+	9.187e-13	7.809e-13	-12.037	-12.107	-0.071	(0)
UO2F2	3.725e-13	3.725e-13	-12.429	-12.429	0.000	(0)
PbF2	3.148e-14	3.148e-14	-13.502	-13.502	0.000	(0)
UO2F3-	1.821e-14	1.548e-14	-13.740	-13.810	-0.071	(0)
CdF2	4.290e-15	4.290e-15	-14.368	-14.368	0.000	(0)
H2F2	8.144e-16	8.144e-16	-15.089	-15.089	0.000	(0)
FeF2+	5.155e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
FeF+2	1.732e-16	1.020e-16	-15.761	-15.991	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
VO2F	4.737e-17	4.737e-17	-16.325	-16.325	0.000	(0)
UO2F4-2	3.894e-17	2.033e-17	-16.410	-16.692	-0.282	(0)
PbF3-	1.162e-17	9.876e-18	-16.935	-17.005	-0.071	(0)
BF3OH-	7.047e-18	6.091e-18	-17.152	-17.215	-0.063	(0)
VO2F2-	3.346e-18	2.845e-18	-17.475	-17.546	-0.071	(0)
VOF+	1.835e-19	1.560e-19	-18.736	-18.807	-0.071	(0)
VO2F3-2	1.124e-20	5.869e-21	-19.949	-20.231	-0.282	(0)
VOF2	9.675e-21	9.675e-21	-20.014	-20.014	0.000	(0)
PbF4-2	1.497e-21	7.818e-22	-20.825	-21.107	-0.282	(0)
BF4-	4.089e-22	3.534e-22	-21.388	-21.452	-0.063	(0)
VOF3-	6.679e-23	5.678e-23	-22.175	-22.246	-0.071	(0)
HgF+	3.111e-23	2.644e-23	-22.507	-22.578	-0.071	(0)
VO2F4-3	2.061e-24	4.776e-25	-23.686	-24.321	-0.635	(0)
Sb(OH) 2F	1.010e-24	1.010e-24	-23.996	-23.996	0.000	(0)
SbOF	9.932e-25	9.932e-25	-24.003	-24.003	0.000	(0)
VOF4-2	7.260e-26	3.790e-26	-25.139	-25.421	-0.282	(0)
UF3+	1.728e-34	1.469e-34	-33.763	-33.833	-0.071	(0)
UF2+2	1.073e-35	5.603e-36	-34.969	-35.252	-0.282	(0)
UF4	2.664e-36	2.664e-36	-35.575	-35.575	0.000	(0)
UF5-	2.054e-38	1.746e-38	-37.687	-37.758	-0.071	(0)
UF+3	1.161e-38	2.691e-39	-37.935	-38.570	-0.635	(0)
UF6-2	1.670e-39	8.720e-40	-38.777	-39.059	-0.282	(0)
Fe (2)	3.442e-11					
Fe+2	2.748e-11	1.435e-11	-10.561	-10.843	-0.282	(0)
FeSO4	5.951e-12	5.951e-12	-11.225	-11.225	0.000	(0)
FeHCO3+	8.937e-13	7.866e-13	-12.049	-12.104	-0.055	(0)
FeOH+	9.210e-14	8.068e-14	-13.036	-13.093	-0.057	(0)
Fe(OH) 2	9.052e-18	9.052e-18	-17.043	-17.043	0.000	(0)
Fe(OH) 3-	4.615e-19	4.043e-19	-18.336	-18.393	-0.057	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-158.769	-158.769	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-235.100	-235.171	-0.071	(0)
Fe (3)	3.645e-09					
Fe(OH) 2+	3.211e-09	2.819e-09	-8.493	-8.550	-0.057	(0)
Fe(OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe(OH) 4-	6.406e-12	5.623e-12	-11.193	-11.250	-0.057	(0)
FeOH+2	8.711e-14	5.130e-14	-13.060	-13.290	-0.230	(0)
FeF2+	5.155e-16	4.515e-16	-15.288	-15.345	-0.057	(0)
FeF+2	1.732e-16	1.020e-16	-15.761	-15.991	-0.230	(0)
FeF3	1.054e-16	1.054e-16	-15.977	-15.977	0.000	(0)
FeSO4+	1.217e-17	1.066e-17	-16.915	-16.972	-0.057	(0)
Fe+3	1.913e-18	5.625e-19	-17.718	-18.250	-0.531	(0)
Fe(SO4) 2-	4.532e-19	3.852e-19	-18.344	-18.414	-0.071	(0)
FeCl+2	4.344e-20	2.558e-20	-19.362	-19.592	-0.230	(0)
FeCl2+	1.964e-22	1.721e-22	-21.707	-21.764	-0.057	(0)
FeHSeO3+2	3.375e-23	1.762e-23	-22.472	-22.754	-0.282	(0)
Fe2(OH) 2+4	1.172e-24	8.713e-26	-23.931	-25.060	-1.129	(0)
FeCl3	2.591e-26	2.591e-26	-25.586	-25.586	0.000	(0)
FeNO3+2	2.251e-29	1.176e-29	-28.648	-28.930	-0.282	(0)
Fe3(OH) 4+5	2.061e-31	3.550e-33	-30.686	-32.450	-1.764	(0)
H (0)	4.020e-29					
H2	2.010e-29	2.019e-29	-28.697	-28.695	0.002	(0)
Hg (0)	2.235e-10					

Hg	2.235e-10	2.235e-10	-9.651	-9.651	0.000	(0)
Hg (1)	2.507e-21					
Hg2+2	1.253e-21	6.545e-22	-20.902	-21.184	-0.282	(0)
Hg (2)	3.171e-12					
HgClOH	1.620e-12	1.620e-12	-11.790	-11.790	0.000	(0)
HgCl2	9.780e-13	9.780e-13	-12.010	-12.010	0.000	(0)
Hg (OH) 2	5.405e-13	5.428e-13	-12.267	-12.265	0.002	(0)
HgCl3-	1.733e-14	1.473e-14	-13.761	-13.832	-0.071	(0)
HgCO3	1.479e-14	1.479e-14	-13.830	-13.830	0.000	(0)
Hg (CO3) 2-2	2.565e-16	1.339e-16	-15.591	-15.873	-0.282	(0)
HgCl4-2	1.691e-16	8.830e-17	-15.772	-16.054	-0.282	(0)
HgCl+	1.524e-16	1.296e-16	-15.817	-15.887	-0.071	(0)
HgOH+	2.853e-17	2.425e-17	-16.545	-16.615	-0.071	(0)
HgHCO3+	2.308e-17	1.962e-17	-16.637	-16.707	-0.071	(0)
Hg (OH) 3-	1.135e-20	9.652e-21	-19.945	-20.015	-0.071	(0)
Hg+2	8.260e-21	4.313e-21	-20.083	-20.365	-0.282	(0)
HgSO4	1.908e-21	1.908e-21	-20.719	-20.719	0.000	(0)
HgNH3+2	3.500e-23	1.827e-23	-22.456	-22.738	-0.282	(0)
HgF+	3.111e-23	2.644e-23	-22.507	-22.578	-0.071	(0)
Hg (NH3) 2+2	2.350e-25	1.227e-25	-24.629	-24.911	-0.282	(0)
HgNO3+	3.915e-33	3.328e-33	-32.407	-32.478	-0.071	(0)
Hg (NH3) 3+2	6.282e-36	3.280e-36	-35.202	-35.484	-0.282	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.539	-44.539	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.475	-45.757	-0.282	(0)
HgHS2-	0.000e+00	0.000e+00	-138.096	-138.166	-0.071	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.920	-138.920	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.445	-139.727	-0.282	(0)
K	7.355e-04					
K+	7.268e-04	6.344e-04	-3.139	-3.198	-0.059	(0)
KSO4-	8.646e-06	7.588e-06	-5.063	-5.120	-0.057	(0)
KCrO4-	3.157e-19	2.683e-19	-18.501	-18.571	-0.071	(0)
Mg	1.765e-03					
Mg+2	1.445e-03	8.386e-04	-2.840	-3.076	-0.236	(0)
MgSO4	2.578e-04	2.578e-04	-3.589	-3.589	0.000	(0)
MgHCO3+	4.287e-05	3.737e-05	-4.368	-4.428	-0.060	(0)
MgF+	1.781e-05	1.556e-05	-4.749	-4.808	-0.059	(0)
MgCO3	1.998e-06	1.998e-06	-5.699	-5.699	0.000	(0)
MgOH+	5.345e-08	4.715e-08	-7.272	-7.327	-0.054	(0)
MgH2BO3+	4.375e-09	3.781e-09	-8.359	-8.422	-0.063	(0)
Mn (2)	2.413e-05					
Mn+2	1.988e-05	1.038e-05	-4.702	-4.984	-0.282	(0)
MnSO4	3.119e-06	3.119e-06	-5.506	-5.506	0.000	(0)
MnHCO3+	1.029e-06	9.018e-07	-5.987	-6.045	-0.057	(0)
MnF+	7.802e-08	6.834e-08	-7.108	-7.165	-0.057	(0)
MnCl+	2.246e-08	1.968e-08	-7.649	-7.706	-0.057	(0)
MnOH+	4.204e-09	3.682e-09	-8.376	-8.434	-0.057	(0)
MnCl2	4.186e-11	4.186e-11	-10.378	-10.378	0.000	(0)
MnCl3-	1.982e-14	1.736e-14	-13.703	-13.760	-0.057	(0)
MnSeO4	8.015e-15	8.015e-15	-14.096	-14.096	0.000	(0)
MnNO3+	4.044e-17	3.438e-17	-16.393	-16.464	-0.071	(0)
Mn (OH) 3-	5.182e-19	4.540e-19	-18.285	-18.343	-0.057	(0)
Mn (OH) 4-2	3.515e-25	2.070e-25	-24.454	-24.684	-0.230	(0)
Mn (NO3) 2	1.805e-28	1.805e-28	-27.744	-27.744	0.000	(0)
MnSe	0.000e+00	0.000e+00	-42.922	-42.922	0.000	(0)
Mn (3)	6.652e-25					
Mn+3	6.652e-25	1.957e-25	-24.177	-24.709	-0.531	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-43.498	-43.728	-0.230	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-47.413	-47.475	-0.062	(0)
Mo	4.121e-07					
MoO4-2	4.117e-07	2.390e-07	-6.385	-6.622	-0.236	(0)
HMoO4-	3.987e-10	3.389e-10	-9.399	-9.470	-0.071	(0)
H2MoO4	1.769e-13	1.769e-13	-12.752	-12.752	0.000	(0)
Ag2MoO4	6.450e-24	6.450e-24	-23.190	-23.190	0.000	(0)
AlMo6O21-3	1.476e-39	3.420e-40	-38.831	-39.466	-0.635	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.998	-50.538	-2.540	(0)
HMo7O24-5	0.000e+00	0.000e+00	-49.534	-51.298	-1.764	(0)

H2Mo7O24-4	0.000e+00	0.000e+00	-52.534	-53.663	-1.129	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.929	-57.564	-0.635	(0)
N (-3)	9.953e-10					
NH4+	9.711e-10	8.393e-10	-9.013	-9.076	-0.063	(0)
NH4SO4-	1.735e-11	1.520e-11	-10.761	-10.818	-0.057	(0)
NH3	6.715e-12	6.715e-12	-11.173	-11.173	0.000	(0)
CuNH3+2	4.621e-14	2.412e-14	-13.335	-13.618	-0.282	(0)
CaNH3+2	1.872e-14	9.772e-15	-13.728	-14.010	-0.282	(0)
NiNH3+2	5.229e-16	2.730e-16	-15.282	-15.564	-0.282	(0)
AgNH3+	1.362e-16	1.158e-16	-15.866	-15.936	-0.071	(0)
Co (NH3) +2	7.735e-17	4.039e-17	-16.112	-16.394	-0.282	(0)
BaNH3+2	5.029e-19	2.626e-19	-18.299	-18.581	-0.282	(0)
HgNH3+2	3.500e-23	1.827e-23	-22.456	-22.738	-0.282	(0)
Ag (NH3) 2+	7.433e-24	6.318e-24	-23.129	-23.199	-0.071	(0)
Ni (NH3) 2+2	5.075e-25	2.650e-25	-24.295	-24.577	-0.282	(0)
Hg (NH3) 2+2	2.350e-25	1.227e-25	-24.629	-24.911	-0.282	(0)
Ca (NH3) 2+2	5.003e-26	2.612e-26	-25.301	-25.583	-0.282	(0)
Co (NH3) 2+2	2.216e-26	1.157e-26	-25.655	-25.937	-0.282	(0)
Hg (NH3) 3+2	6.282e-36	3.280e-36	-35.202	-35.484	-0.282	(0)
Co (NH3) 3+2	1.873e-36	9.779e-37	-35.727	-36.010	-0.282	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-45.475	-45.757	-0.282	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.180	-46.463	-0.282	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-55.111	-55.394	-0.282	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-57.133	-57.416	-0.282	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-64.219	-64.501	-0.282	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-66.454	-67.089	-0.635	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-68.527	-68.809	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.344	-77.414	-0.071	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-81.935	-82.217	-0.282	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-82.107	-82.389	-0.282	(0)
N (3)	2.556e-09					
NO2-	2.556e-09	2.215e-09	-8.593	-8.655	-0.062	(0)
CuNO2+	9.580e-14	8.144e-14	-13.019	-13.089	-0.071	(0)
AgNO2	3.908e-15	3.908e-15	-14.408	-14.408	0.000	(0)
CoNO2+	9.186e-16	7.809e-16	-15.037	-15.107	-0.071	(0)
Cu (NO2) 2	1.846e-21	1.846e-21	-20.734	-20.734	0.000	(0)
Ag (NO2) 2-	1.577e-23	1.341e-23	-22.802	-22.873	-0.071	(0)
N (5)	2.403e-12					
NO3-	2.394e-12	2.090e-12	-11.621	-11.680	-0.059	(0)
CaNO3+	8.986e-15	7.639e-15	-14.046	-14.117	-0.071	(0)
MnNO3+	4.044e-17	3.438e-17	-16.393	-16.464	-0.071	(0)
ZnNO3+	2.930e-18	2.491e-18	-17.533	-17.604	-0.071	(0)
CuNO3+	2.730e-18	2.320e-18	-17.564	-17.634	-0.071	(0)
BaNO3+	7.636e-19	6.491e-19	-18.117	-18.188	-0.071	(0)
NiNO3+	4.675e-19	3.974e-19	-18.330	-18.401	-0.071	(0)
CoNO3+	1.949e-19	1.657e-19	-18.710	-18.781	-0.071	(0)
CdNO3+	3.855e-20	3.277e-20	-19.414	-19.484	-0.071	(0)
PbNO3+	3.017e-20	2.565e-20	-19.520	-19.591	-0.071	(0)
AgNO3	1.402e-20	1.402e-20	-19.853	-19.853	0.000	(0)
UO2NO3+	1.678e-25	1.426e-25	-24.775	-24.846	-0.071	(0)
CrNO3+2	1.555e-26	8.121e-27	-25.808	-26.090	-0.282	(0)
Mn (NO3) 2	1.805e-28	1.805e-28	-27.744	-27.744	0.000	(0)
VO2NO3	1.726e-28	1.726e-28	-27.763	-27.763	0.000	(0)
FeNO3+2	2.251e-29	1.176e-29	-28.648	-28.930	-0.282	(0)
Zn (NO3) 2	1.038e-30	1.038e-30	-29.984	-29.984	0.000	(0)
Co (NO3) 2	7.045e-31	7.045e-31	-30.152	-30.152	0.000	(0)
Cu (NO3) 2	6.104e-31	6.104e-31	-30.214	-30.214	0.000	(0)
Pb (NO3) 2	9.103e-32	9.103e-32	-31.041	-31.041	0.000	(0)
Cd (NO3) 2	3.433e-32	3.433e-32	-31.464	-31.464	0.000	(0)
HgNO3+	3.915e-33	3.328e-33	-32.407	-32.478	-0.071	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-44.539	-44.539	0.000	(0)
Na	5.006e-03					
Na+	4.950e-03	4.321e-03	-2.305	-2.364	-0.059	(0)
NaSO4-	4.467e-05	3.921e-05	-4.350	-4.407	-0.057	(0)
NaHCO3	1.058e-05	1.058e-05	-4.975	-4.975	0.000	(0)
NaF	4.509e-07	4.509e-07	-6.346	-6.346	0.000	(0)
NaCO3-	2.626e-07	2.305e-07	-6.581	-6.637	-0.057	(0)
NaH2BO3	8.906e-10	8.906e-10	-9.050	-9.050	0.000	(0)

NaCrO4-	2.876e-18	2.445e-18	-17.541	-17.612	-0.071	(0)
Ni	2.127e-07					
Ni+2	1.304e-07	7.571e-08	-6.885	-7.121	-0.236	(0)
NiHCO3+	4.782e-08	4.065e-08	-7.320	-7.391	-0.071	(0)
NiSO4	2.552e-08	2.552e-08	-7.593	-7.593	0.000	(0)
NiCO3	8.092e-09	8.092e-09	-8.092	-8.092	0.000	(0)
NiF+	3.701e-10	3.146e-10	-9.432	-9.502	-0.071	(0)
NiCl+	3.432e-10	2.917e-10	-9.464	-9.535	-0.071	(0)
NiOH+	1.584e-10	1.346e-10	-9.800	-9.871	-0.071	(0)
Ni (SO4) 2-2	2.735e-12	1.428e-12	-11.563	-11.845	-0.282	(0)
Ni (OH) 2	1.510e-12	1.510e-12	-11.821	-11.821	0.000	(0)
NiCl2	2.212e-15	2.212e-15	-14.655	-14.655	0.000	(0)
NiNH3+2	5.229e-16	2.730e-16	-15.282	-15.564	-0.282	(0)
Ni (OH) 3-	2.510e-16	2.133e-16	-15.600	-15.671	-0.071	(0)
NiSeO4	1.016e-16	1.016e-16	-15.993	-15.993	0.000	(0)
NiNO3+	4.675e-19	3.974e-19	-18.330	-18.401	-0.071	(0)
Ni (NH3) 2+2	5.075e-25	2.650e-25	-24.295	-24.577	-0.282	(0)
O (0)	2.474e-35					
O2	1.237e-35	1.243e-35	-34.908	-34.906	0.002	(0)
Pb	1.296e-08					
PbCO3	7.146e-09	7.146e-09	-8.146	-8.146	0.000	(0)
PbHCO3+	3.159e-09	2.685e-09	-8.500	-8.571	-0.071	(0)
Pb+2	1.430e-09	8.298e-10	-8.845	-9.081	-0.236	(0)
PbSO4	6.867e-10	6.867e-10	-9.163	-9.163	0.000	(0)
PbOH+	3.463e-10	2.944e-10	-9.460	-9.531	-0.071	(0)
Pb (CO3) 2-2	1.131e-10	5.904e-11	-9.947	-10.229	-0.282	(0)
PbCl+	5.216e-11	4.434e-11	-10.283	-10.353	-0.071	(0)
Pb (SO4) 2-2	1.339e-11	6.991e-12	-10.873	-11.155	-0.282	(0)
PbF+	1.138e-11	9.672e-12	-10.944	-11.014	-0.071	(0)
Pb (OH) 2	1.315e-12	1.315e-12	-11.881	-11.881	0.000	(0)
PbCl2	2.983e-13	2.983e-13	-12.525	-12.525	0.000	(0)
PbF2	3.148e-14	3.148e-14	-13.502	-13.502	0.000	(0)
Pb (OH) 3-	2.185e-16	1.857e-16	-15.661	-15.731	-0.071	(0)
PbCl3-	2.103e-16	1.788e-16	-15.677	-15.748	-0.071	(0)
Pb2OH+3	1.671e-17	3.872e-18	-16.777	-17.412	-0.635	(0)
PbF3-	1.162e-17	9.876e-18	-16.935	-17.005	-0.071	(0)
PbCl4-2	2.357e-19	1.231e-19	-18.628	-18.910	-0.282	(0)
PbNO3+	3.017e-20	2.565e-20	-19.520	-19.591	-0.071	(0)
Pb (OH) 4-2	1.230e-20	6.424e-21	-19.910	-20.192	-0.282	(0)
PbF4-2	1.497e-21	7.818e-22	-20.825	-21.107	-0.282	(0)
Pb3 (OH) 4+2	5.483e-23	2.863e-23	-22.261	-22.543	-0.282	(0)
Pb4 (OH) 4+4	2.539e-27	1.887e-28	-26.595	-27.724	-1.129	(0)
Pb (NO3) 2	9.103e-32	9.103e-32	-31.041	-31.041	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.687	-150.687	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.755	-227.825	-0.071	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-72.697	-72.697	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.368	-78.438	-0.071	(0)
H2S	0.000e+00	0.000e+00	-78.565	-78.565	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.664	-78.735	-0.071	(0)
S5-2	0.000e+00	0.000e+00	-80.374	-80.656	-0.282	(0)
S6-2	0.000e+00	0.000e+00	-80.890	-81.172	-0.282	(0)
S4-2	0.000e+00	0.000e+00	-80.970	-81.252	-0.282	(0)
S3-2	0.000e+00	0.000e+00	-81.775	-82.058	-0.282	(0)
S2-2	0.000e+00	0.000e+00	-82.792	-83.074	-0.282	(0)
S-2	0.000e+00	0.000e+00	-88.361	-88.591	-0.230	(0)
HgHS2-	0.000e+00	0.000e+00	-138.096	-138.166	-0.071	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.920	-138.920	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-139.445	-139.727	-0.282	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-146.965	-147.035	-0.071	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.204	-147.372	-0.168	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.271	-148.582	-0.310	(0)
CuS4S5-3	0.000e+00	0.000e+00	-149.015	-149.312	-0.297	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.172	-149.243	-0.071	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.347	-149.665	-0.318	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.672	-149.976	-0.304	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-149.969	-149.969	0.000	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.380	-150.380	0.000	(0)

Pb (HS) 2	0.000e+00	0.000e+00	-150.687	-150.687	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-158.769	-158.769	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.799	-215.870	-0.071	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.468	-225.538	-0.071	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.436	-226.507	-0.071	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.755	-227.825	-0.071	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.089	-228.371	-0.282	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.100	-235.171	-0.071	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.467	-302.749	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.154	-305.436	-0.282	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.897	-317.179	-0.282	(0)
S (6)	3.673e-03					
SO4-2	2.911e-03	1.690e-03	-2.536	-2.772	-0.236	(0)
CaSO4	4.474e-04	4.474e-04	-3.349	-3.349	0.000	(0)
MgSO4	2.578e-04	2.578e-04	-3.589	-3.589	0.000	(0)
NaSO4-	4.467e-05	3.921e-05	-4.350	-4.407	-0.057	(0)
KSO4-	8.646e-06	7.588e-06	-5.063	-5.120	-0.057	(0)
MnSO4	3.119e-06	3.119e-06	-5.506	-5.506	0.000	(0)
ZnSO4	1.754e-07	1.754e-07	-6.756	-6.756	0.000	(0)
CuSO4	1.359e-07	1.359e-07	-6.867	-6.867	0.000	(0)
NiSO4	2.552e-08	2.552e-08	-7.593	-7.593	0.000	(0)
CoSO4	1.686e-08	1.686e-08	-7.773	-7.773	0.000	(0)
HSO4-	1.347e-08	1.177e-08	-7.871	-7.929	-0.059	(0)
Zn (SO4) 2-2	4.943e-09	2.581e-09	-8.306	-8.588	-0.282	(0)
CdSO4	1.964e-09	1.964e-09	-8.707	-8.707	0.000	(0)
PbSO4	6.867e-10	6.867e-10	-9.163	-9.163	0.000	(0)
AgSO4-	3.349e-10	2.846e-10	-9.475	-9.546	-0.071	(0)
CrOHSO4	1.101e-10	1.101e-10	-9.958	-9.958	0.000	(0)
Cd (SO4) 2-2	8.575e-11	4.477e-11	-10.067	-10.349	-0.282	(0)
AlSO4+	2.137e-11	1.867e-11	-10.670	-10.729	-0.059	(0)
NH4SO4-	1.735e-11	1.520e-11	-10.761	-10.818	-0.057	(0)
Pb (SO4) 2-2	1.339e-11	6.991e-12	-10.873	-11.155	-0.282	(0)
FeSO4	5.951e-12	5.951e-12	-11.225	-11.225	0.000	(0)
Ni (SO4) 2-2	2.735e-12	1.428e-12	-11.563	-11.845	-0.282	(0)
CrSO4+	4.126e-13	3.507e-13	-12.384	-12.455	-0.071	(0)
Al (SO4) 2-	3.869e-13	3.381e-13	-12.412	-12.471	-0.059	(0)
UO2SO4	8.747e-14	8.747e-14	-13.058	-13.058	0.000	(0)
UO2 (SO4) 2-2	3.731e-15	1.948e-15	-14.428	-14.710	-0.282	(0)
FeSO4+	1.217e-17	1.066e-17	-16.915	-16.972	-0.057	(0)
VO2SO4-	7.750e-18	6.588e-18	-17.111	-17.181	-0.071	(0)
Cr2 (OH) 2SO4+2	5.238e-18	2.735e-18	-17.281	-17.563	-0.282	(0)
Fe (SO4) 2-	4.532e-19	3.852e-19	-18.344	-18.414	-0.071	(0)
Cr2 (OH) 2 (SO4) 2	2.745e-19	2.745e-19	-18.562	-18.562	0.000	(0)
VOSO4	7.317e-20	7.317e-20	-19.136	-19.136	0.000	(0)
HgSO4	1.908e-21	1.908e-21	-20.719	-20.719	0.000	(0)
CrO3SO4-2	1.845e-24	9.632e-25	-23.734	-24.016	-0.282	(0)
VSO4+	8.821e-34	7.498e-34	-33.054	-33.125	-0.071	(0)
U (SO4) 2	7.360e-40	7.360e-40	-39.133	-39.133	0.000	(0)
USO4+2	1.050e-40	0.000e+00	-39.979	-40.261	-0.282	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-77.344	-77.414	-0.071	(0)
Sb (3)	1.084e-19					
Sb (OH) 3	5.482e-20	5.482e-20	-19.261	-19.261	0.000	(0)
HSbO2	5.353e-20	5.353e-20	-19.271	-19.271	0.000	(0)
SbO2-	1.431e-24	1.216e-24	-23.844	-23.915	-0.071	(0)
Sb (OH) 2F	1.010e-24	1.010e-24	-23.996	-23.996	0.000	(0)
SbOF	9.932e-25	9.932e-25	-24.003	-24.003	0.000	(0)
Sb (OH) 4-	8.195e-25	6.966e-25	-24.086	-24.157	-0.071	(0)
Sb (OH) 2+	1.116e-25	9.490e-26	-24.952	-25.023	-0.071	(0)
SbO+	3.850e-26	3.273e-26	-25.415	-25.485	-0.071	(0)
Sb2S4-2	0.000e+00	0.000e+00	-316.897	-317.179	-0.282	(0)
Sb (5)	1.330e-08					
SbO3-	1.328e-08	1.129e-08	-7.877	-7.947	-0.071	(0)
Sb (OH) 6-	1.512e-11	1.320e-11	-10.821	-10.880	-0.059	(0)
SbO2+	1.936e-23	1.646e-23	-22.713	-22.784	-0.071	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.346e-40	1.994e-40	-39.630	-39.700	-0.071	(0)
MnSe	0.000e+00	0.000e+00	-42.922	-42.922	0.000	(0)

H2Se	0.000e+00	0.000e+00	-42.957	-42.957	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.271	-47.553	-0.282	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-85.413	-86.542	-1.129	(0)
Se (4)	1.522e-08					
HSeO3-	1.395e-08	1.186e-08	-7.856	-7.926	-0.071	(0)
SeO3-2	1.268e-09	6.623e-10	-8.897	-9.179	-0.282	(0)
H2SeO3	3.604e-13	3.604e-13	-12.443	-12.443	0.000	(0)
AgSeO3-	4.228e-15	3.594e-15	-14.374	-14.444	-0.071	(0)
Cd (SeO3) 2-2	3.433e-21	1.793e-21	-20.464	-20.746	-0.282	(0)
Ag (SeO3) 2-3	9.197e-23	2.131e-23	-22.036	-22.671	-0.635	(0)
FeHSeO3+2	3.375e-23	1.762e-23	-22.472	-22.754	-0.282	(0)
Se (6)	4.951e-12					
SeO4-2	4.943e-12	2.869e-12	-11.306	-11.542	-0.236	(0)
MnSeO4	8.015e-15	8.015e-15	-14.096	-14.096	0.000	(0)
ZnSeO4	2.108e-16	2.108e-16	-15.676	-15.676	0.000	(0)
NiSeO4	1.016e-16	1.016e-16	-15.993	-15.993	0.000	(0)
CoSeO4	7.193e-17	7.193e-17	-16.143	-16.143	0.000	(0)
HSeO4-	1.206e-17	1.025e-17	-16.919	-16.989	-0.071	(0)
CdSeO4	2.650e-18	2.650e-18	-17.577	-17.577	0.000	(0)
Zn (SeO4) 2-2	1.175e-27	6.133e-28	-26.930	-27.212	-0.282	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.875	-58.510	-0.635	(0)
U (4)	3.961e-22					
U (OH) 5-	3.951e-22	3.358e-22	-21.403	-21.474	-0.071	(0)
U (OH) 4	1.003e-24	1.003e-24	-23.999	-23.999	0.000	(0)
U (OH) 3+	3.074e-28	2.613e-28	-27.512	-27.583	-0.071	(0)
U (OH) 2+2	1.650e-32	8.615e-33	-31.783	-32.065	-0.282	(0)
UF3+	1.728e-34	1.469e-34	-33.763	-33.833	-0.071	(0)
UF2+2	1.073e-35	5.603e-36	-34.969	-35.252	-0.282	(0)
UF4	2.664e-36	2.664e-36	-35.575	-35.575	0.000	(0)
UOH+3	1.248e-37	2.893e-38	-36.904	-37.539	-0.635	(0)
UF5-	2.054e-38	1.746e-38	-37.687	-37.758	-0.071	(0)
UF+3	1.161e-38	2.691e-39	-37.935	-38.570	-0.635	(0)
UF6-2	1.670e-39	8.720e-40	-38.777	-39.059	-0.282	(0)
U (SO4) 2	7.360e-40	7.360e-40	-39.133	-39.133	0.000	(0)
USO4+2	1.050e-40	0.000e+00	-39.979	-40.261	-0.282	(0)
U+4	0.000e+00	0.000e+00	-42.960	-44.089	-1.129	(0)
UCl+3	0.000e+00	0.000e+00	-44.576	-45.211	-0.635	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-168.768	-174.483	-5.715	(0)
U (5)	5.812e-17					
UO2+	5.812e-17	4.940e-17	-16.236	-16.306	-0.071	(0)
U (6)	8.617e-08					
UO2 (CO3) 3-4	4.307e-08	3.201e-09	-7.366	-8.495	-1.129	(0)
UO2 (CO3) 2-2	4.270e-08	2.230e-08	-7.370	-7.652	-0.282	(0)
UO2CO3	3.901e-10	3.901e-10	-9.409	-9.409	0.000	(0)
UO2F+	9.187e-13	7.809e-13	-12.037	-12.107	-0.071	(0)
UO2OH+	7.155e-13	6.082e-13	-12.145	-12.216	-0.071	(0)
UO2F2	3.725e-13	3.725e-13	-12.429	-12.429	0.000	(0)
UO2SO4	8.747e-14	8.747e-14	-13.058	-13.058	0.000	(0)
UO2+2	5.893e-14	3.420e-14	-13.230	-13.466	-0.236	(0)
UO2F3-	1.821e-14	1.548e-14	-13.740	-13.810	-0.071	(0)
UO2 (SO4) 2-2	3.731e-15	1.948e-15	-14.428	-14.710	-0.282	(0)
UO2Cl+	9.827e-17	8.354e-17	-16.008	-16.078	-0.071	(0)
UO2F4-2	3.894e-17	2.033e-17	-16.410	-16.692	-0.282	(0)
(UO2) 2 (OH) 2+2	1.176e-18	6.139e-19	-17.930	-18.212	-0.282	(0)
(UO2) 3 (OH) 5+	6.647e-21	5.650e-21	-20.177	-20.248	-0.071	(0)
UO2NO3+	1.678e-25	1.426e-25	-24.775	-24.846	-0.071	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.232	-42.302	-0.071	(0)
V+2	0.000e+00	0.000e+00	-42.680	-42.962	-0.282	(0)
V (3)	2.137e-15					
V (OH) 3	2.137e-15	2.137e-15	-14.670	-14.670	0.000	(0)
V (OH) 2+	1.158e-25	9.842e-26	-24.936	-25.007	-0.071	(0)
VOH+2	1.275e-28	6.655e-29	-27.895	-28.177	-0.282	(0)
V+3	4.057e-33	9.401e-34	-32.392	-33.027	-0.635	(0)
VSO4+	8.821e-34	7.498e-34	-33.054	-33.125	-0.071	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.097	-54.732	-0.635	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-54.425	-55.554	-1.129	(0)

V (4)	5.779e-18					
V (OH) 3+	5.211e-18	4.430e-18	-17.283	-17.354	-0.071	(0)
VO+2	3.012e-19	1.572e-19	-18.521	-18.803	-0.282	(0)
VOF+	1.835e-19	1.560e-19	-18.736	-18.807	-0.071	(0)
VOSO4	7.317e-20	7.317e-20	-19.136	-19.136	0.000	(0)
VOF2	9.675e-21	9.675e-21	-20.014	-20.014	0.000	(0)
VOC1+	7.815e-22	6.643e-22	-21.107	-21.178	-0.071	(0)
VOF3-	6.679e-23	5.678e-23	-22.175	-22.246	-0.071	(0)
VOF4-2	7.260e-26	3.790e-26	-25.139	-25.421	-0.282	(0)
H2V2O4+2	1.885e-30	9.841e-31	-29.725	-30.007	-0.282	(0)
V (5)	2.004e-09					
H2VO4-	1.894e-09	1.610e-09	-8.723	-8.793	-0.071	(0)
HVO4-2	1.087e-10	5.675e-11	-9.964	-10.246	-0.282	(0)
H3VO4	1.147e-12	1.147e-12	-11.940	-11.940	0.000	(0)
H3V2O7-	1.404e-14	1.193e-14	-13.853	-13.923	-0.071	(0)
VO2+	1.871e-16	1.633e-16	-15.728	-15.787	-0.059	(0)
HV2O7-3	1.337e-16	3.097e-17	-15.874	-16.509	-0.635	(0)
VO2F	4.737e-17	4.737e-17	-16.325	-16.325	0.000	(0)
VO4-3	1.722e-17	3.991e-18	-16.764	-17.399	-0.635	(0)
VO2SO4-	7.750e-18	6.588e-18	-17.111	-17.181	-0.071	(0)
VO2F2-	3.346e-18	2.845e-18	-17.475	-17.546	-0.071	(0)
V2O7-4	1.574e-19	1.170e-20	-18.803	-19.932	-1.129	(0)
V3O9-3	1.888e-20	4.376e-21	-19.724	-20.359	-0.635	(0)
VO2F3-2	1.124e-20	5.869e-21	-19.949	-20.231	-0.282	(0)
VO2F4-3	2.061e-24	4.776e-25	-23.686	-24.321	-0.635	(0)
V4O12-4	3.953e-26	2.938e-27	-25.403	-26.532	-1.129	(0)
VO2NO3	1.726e-28	1.726e-28	-27.763	-27.763	0.000	(0)
HV10O28-5	0.000e+00	0.000e+00	-64.809	-66.573	-1.764	(0)
V10O28-6	0.000e+00	0.000e+00	-65.072	-67.612	-2.540	(0)
H2V10O28-4	0.000e+00	0.000e+00	-67.383	-68.512	-1.129	(0)
Zn	1.165e-06					
Zn+2	8.174e-07	4.745e-07	-6.088	-6.324	-0.236	(0)
ZnSO4	1.754e-07	1.754e-07	-6.756	-6.756	0.000	(0)
ZnCO3	7.821e-08	7.821e-08	-7.107	-7.107	0.000	(0)
ZnHCO3+	7.686e-08	6.534e-08	-7.114	-7.185	-0.071	(0)
ZnOH+	7.883e-09	6.701e-09	-8.103	-8.174	-0.071	(0)
Zn (SO4) 2-2	4.943e-09	2.581e-09	-8.306	-8.588	-0.282	(0)
ZnCl+	2.059e-09	1.795e-09	-8.686	-8.746	-0.060	(0)
ZnF+	1.842e-09	1.566e-09	-8.735	-8.805	-0.071	(0)
ZnOHCl	3.319e-10	3.319e-10	-9.479	-9.479	0.000	(0)
Zn (OH) 2	1.500e-10	1.500e-10	-9.824	-9.824	0.000	(0)
ZnCl2	4.283e-12	4.283e-12	-11.368	-11.368	0.000	(0)
Zn (OH) 3-	1.249e-13	1.062e-13	-12.903	-12.974	-0.071	(0)
ZnCl3-	5.879e-15	5.124e-15	-14.231	-14.290	-0.060	(0)
ZnSeO4	2.108e-16	2.108e-16	-15.676	-15.676	0.000	(0)
ZnCl4-2	6.552e-18	3.858e-18	-17.184	-17.414	-0.230	(0)
ZnNO3+	2.930e-18	2.491e-18	-17.533	-17.604	-0.071	(0)
Zn (OH) 4-2	1.144e-18	5.971e-19	-17.942	-18.224	-0.282	(0)
Zn (SeO4) 2-2	1.175e-27	6.133e-28	-26.930	-27.212	-0.282	(0)
Zn (NO3) 2	1.038e-30	1.038e-30	-29.984	-29.984	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-149.172	-149.243	-0.071	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.380	-150.380	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.468	-225.538	-0.071	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.089	-228.371	-0.282	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.154	-305.436	-0.282	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-76.19	-69.90	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-56.70	-52.19	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-63.92	-52.19	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-98.62	-80.69	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-74.15	-54.12	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-34.50	-34.10	0.40	(NH4)2CrO4
(NH4)2SeO4	-30.14	-29.69	0.45	(NH4)2SeO4
Acanthite	-51.22	-87.44	-36.22	Ag2S

Ag2CO3	-10.60	-21.69	-11.09	Ag2CO3
Ag2CrO4	-20.50	-32.09	-11.59	Ag2CrO4
Ag2HVO4	-11.97	-10.49	1.48	Ag2HVO4
Ag2MoO4	-11.22	-22.77	-11.55	Ag2MoO4
Ag2O	-14.43	-1.85	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-14.10	-18.92	-4.82	Ag2SO4
Ag3AsO3	-27.19	-25.03	2.16	Ag3AsO3
Ag3AsO4	-15.60	-18.38	-2.79	Ag3AsO4
Ag3H2VO5	-16.60	-11.42	5.18	Ag3H2VO5
AgF:4H2O	-12.90	-11.86	1.05	AgF:4H2O
Agmetal	-0.19	-13.70	-13.51	Ag
AgVO3	-10.34	-9.57	0.77	AgVO3
Al (OH) 3 (am)	-1.21	9.59	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.93	-43.56	2.37	Al2 (MoO4) 3
Al2O3	-0.46	19.19	19.65	Al2O3
Al4 (OH) 10SO4	-1.39	21.31	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-10.81	-6.01	4.80	AlAsO4:2H2O
AlOHSO4	-4.24	-7.47	-3.23	AlOHSO4
AlSb	-151.92	-86.30	65.62	AlSb
Alunite	-0.00	-1.40	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-4.06	-11.85	-7.79	PbSO4
Anhydrite	-1.35	-5.71	-4.36	CaSO4
Anilite	-55.11	-86.99	-31.88	Cu0.25Cu1.5S
Antlerite	-2.34	6.45	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-86.24	-89.00	-2.76	As4O6
Artinite	-7.00	2.60	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-37.91	-31.21	6.71	As2O5
Atacamite	-1.68	5.71	7.39	Cu2 (OH) 3Cl
Azurite	0.75	-16.16	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.31	7.08	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.98	-3.11	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-1.04	-9.95	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-28.96	3.98	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.48	-23.15	-9.67	BaCrO4
BaF2	-8.95	-14.77	-5.82	BaF2
BaMoO4	-6.87	-13.83	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-9.82	-7.99	1.83	BaSeO3
BaSeO4	-11.29	-18.75	-7.46	BaSeO4
Bianchite	-7.33	-9.10	-1.76	ZnSO4:6H2O
Birnessite	-8.59	9.50	18.09	MnO2
Bixbyite	-5.89	-6.53	-0.64	Mn2O3
BlaubleiI	-54.82	-78.98	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.40	-82.68	-27.28	Cu0.6Cu0.8S
Boehmite	1.02	9.59	8.58	AlOOH
Breithauptite	-57.43	-75.95	-18.52	NiSb
Brochantite	-0.93	14.29	15.22	Cu4 (OH) 6SO4
Brucite	-5.63	11.22	16.84	Mg (OH) 2
Bunsenite	-5.27	7.17	12.45	NiO
Ca (VO3) 2	-11.58	-5.92	5.66	Ca (VO3) 2
Ca2V2O7	-12.07	5.43	17.50	Ca2V2O7
Ca2V2O7:2H2O	-16.12	5.43	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-19.44	2.86	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-22.17	16.79	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-23.07	16.79	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-300.69	-157.72	142.97	Ca3Sb2
CaCrO4	-16.62	-18.88	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-8.92	-26.83	-17.91	Hg2Cl2
CaMoO4	-1.61	-9.56	-7.95	CaMoO4
Carnotite	-4.09	-3.86	0.23	KUO2VO4
CaSeO3:2H2O	-6.53	-3.72	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-11.46	-14.48	-3.02	CaSeO4:2H2O

Cd(BO ₂) ₂	-13.44	-3.60	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.65	5.99	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.74	5.99	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-22.87	-16.16	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-21.66	0.90	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-21.51	6.89	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-13.29	-13.95	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-12.26	-13.95	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-12.04	-13.95	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.66	-15.87	-1.21	CdF ₂
Cdmetal(alpha)	-33.07	-19.56	13.51	Cd
Cdmetal(gamma)	-33.17	-19.56	13.62	Cd
CdMoO ₄	-0.78	-14.93	-14.15	CdMoO ₄
CdOHCl	-7.52	-3.98	3.54	CdOHCl
CdSb	-76.78	-77.13	-0.35	CdSb
CdSe	-20.66	-40.86	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-18.00	-19.85	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.90	-11.08	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.35	-11.08	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-9.20	-11.08	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.15	-10.90	-9.75	AgCl
Cerrusite	-1.49	-14.62	-13.13	PbCO ₃
CH ₄ (g)	-80.97	-122.02	-41.05	CH ₄
Chalcanthite	-6.59	-9.23	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.15	-90.07	-34.92	Cu ₂ S
Chalcopyrite	-124.61	-159.88	-35.27	CuFeS ₂
Cinnabar	-52.16	-97.85	-45.69	HgS
Claudetite	-85.93	-89.00	-3.06	As ₄ O ₆
Clausthalite	-14.53	-41.63	-27.10	PbSe
Co(BO ₂) ₂	-29.67	-2.60	27.07	Co(BO ₂) ₂
Co(OH) ₂	-6.10	6.99	13.09	Co(OH) ₂
Co(OH) ₃	-10.33	-12.63	-2.31	Co(OH) ₃
CO ₂ (g)	-1.69	-19.84	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-23.26	-10.23	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-7.78	-18.28	-10.50	Co ₃ O ₄
CoCl ₂	-21.21	-12.95	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.48	-12.95	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-2.86	-12.84	-9.98	CoCO ₃
CoF ₂	-13.27	-14.86	-1.60	CoF ₂
CoF ₃	-43.96	-45.42	-1.46	CoF ₃
CoFe ₂ O ₄	16.90	13.38	-3.53	CoFe ₂ O ₄
CoMoO ₄	-6.16	-13.92	-7.76	CoMoO ₄
CoO	-6.59	6.99	13.59	CoO
CoS(alpha)	-71.15	-78.59	-7.44	CoS
CoS(beta)	-67.52	-78.59	-11.07	CoS
CoSe	-23.65	-39.85	-16.20	CoSe
CoSeO ₃	-9.40	-8.08	1.32	CoSeO ₃
CoSeO ₄ :6H ₂ O	-17.31	-18.84	-1.53	CoSeO ₄ :6H ₂ O
CoSO ₄	-12.88	-10.07	2.80	CoSO ₄
CoSO ₄ :6H ₂ O	-7.60	-10.07	-2.47	CoSO ₄ :6H ₂ O
Cotunnite	-9.95	-14.73	-4.78	PbCl ₂
Covellite	-55.45	-77.75	-22.30	CuS
Cr(OH) ₂	-21.82	-11.00	10.82	Cr(OH) ₂
Cr(OH) ₃	-2.51	-1.18	1.34	Cr(OH) ₃
Cr(OH) ₃ (am)	-0.43	-1.18	-0.75	Cr(OH) ₃
Cr ₂ O ₃	-0.00	-2.36	-2.36	Cr ₂ O ₃
CrCl ₂	-45.03	-30.94	14.09	CrCl ₂
CrCl ₃	-46.20	-31.09	15.11	CrCl ₃
CrF ₃	-22.63	-33.96	-11.34	CrF ₃
Crmetal	-67.03	-36.55	30.48	Cr
CrO ₃	-27.03	-30.24	-3.21	CrO ₃
Cryolite	-7.79	-41.63	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.83	7.84	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-24.80	20.41	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-12.40	-3.15	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb:3H ₂ O	-55.42	-90.30	-34.88	Cu ₂ Sb:3H ₂ O
Cu ₂ Se(alpha)	-5.53	-51.33	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.60	-21.55	-1.95	Cu ₂ SO ₄

Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-13.79	-7.69	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-60.03	-102.62	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-26.85	-90.34	-63.49	Cu ₃ Se ₂
CuCO ₃	-0.50	-12.00	-11.50	CuCO ₃
CuCrO ₄	-16.96	-22.40	-5.44	CuCrO ₄
CuF	-8.27	-13.17	-4.91	CuF
CuF ₂	-15.13	-14.02	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-9.47	-14.02	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-6.26	-15.02	-8.76	Cu
CuMoO ₄	0.00	-13.08	-13.08	CuMoO ₄
CuOCuSO ₄	-11.69	-1.39	10.30	CuOCuSO ₄
Cupricferrite	8.23	14.22	5.99	CuFe ₂ O ₄
Cuprite	-3.08	-4.49	-1.41	Cu ₂ O
Cuprousferrite	9.87	0.95	-8.92	CuFeO ₂
CuSe	-5.91	-39.01	-33.10	CuSe
CuSe ₂	-26.94	-60.31	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-7.75	-7.23	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-15.56	-18.00	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.17	-9.23	2.94	CuSO ₄
Diaspore	2.72	9.59	6.87	AlOOH
Djurleite	-55.34	-89.26	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	-0.56	-17.10	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	-0.01	-17.10	-17.09	CaMg(CO ₃) ₂
Epsomite	-3.72	-5.85	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.11	3.45	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.24	0.20	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-10.11	-13.83	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-10.24	-8.69	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-18.21	-38.84	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-41.08	-44.82	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.39	9.83	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-12.81	-12.41	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.11	1.09	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.37	-17.46	-10.09	FeMoO ₄
Ferrihydrite	0.00	3.19	3.19	Fe(OH) ₃
Ferroselite	-46.10	-64.70	-18.60	FeSe ₂
FeS(ppt)	-79.18	-82.13	-2.95	FeS
FeSe	-32.40	-43.40	-11.00	FeSe
Fix_pe	-5.63	-5.63	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF ₂
Galena	-66.40	-80.37	-13.97	PbS
Gibbsite	1.30	9.59	8.29	Al(OH) ₃
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-7.09	-9.10	-2.01	ZnSO ₄ ·7H ₂ O
Greenockite	-65.24	-79.60	-14.36	CdS
Greigite	-287.47	-332.51	-45.03	Fe ₃ S ₄
Gummite	-6.84	0.83	7.67	UO ₃
Gypsum	-1.10	-5.71	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-12.46	-24.56	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-8.04	-20.92	-12.88	H ₂ MoO ₄
H ₂ S(g)	-77.58	-85.59	-8.01	H ₂ S
H ₂ Se(g)	-41.89	-46.85	-4.96	H ₂ Se
Halite	-6.79	-5.19	1.60	NaCl
Hausmannite	-7.55	53.48	61.03	Mn ₃ O ₄
Hematite	7.80	6.38	-1.42	Fe ₂ O ₃
Hercynite	-0.25	22.64	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-182.59	-256.30	-73.71	Hg(CH ₃) ₂
Hg(g)	-8.34	-16.22	-7.87	Hg
Hg(OH) ₂	-8.77	-12.27	-3.50	Hg(OH) ₂
Hg ₂ (g)	-17.48	-32.43	-14.96	Hg ₂
Hg ₂ (OH) ₂	-12.15	-6.89	5.26	Hg ₂ (OH) ₂
Hg ₂ CO ₃	-10.68	-26.73	-16.05	Hg ₂ CO ₃
Hg ₂ CrO ₄	-28.43	-37.13	-8.70	Hg ₂ CrO ₄
Hg ₂ F ₂	-18.38	-28.75	-10.36	Hg ₂ F ₂
Hg ₂ S	-80.80	-92.48	-11.68	Hg ₂ S
Hg ₂ SeO ₃	-17.31	-21.96	-4.66	Hg ₂ SeO ₃
Hg ₂ SO ₄	-17.83	-23.96	-6.13	Hg ₂ SO ₄
Hg ₃ O ₂ CO ₃	-26.95	-56.63	-29.68	Hg ₃ O ₂ CO ₃

HgCl(g)	-32.91	-13.41	19.50	HgCl
HgCl2	-10.94	-32.20	-21.26	HgCl2
HgF(g)	-47.05	-14.37	32.68	HgF
HgF2(g)	-46.69	-34.12	12.57	HgF2
Hgmetal(l)	-2.77	-16.22	-13.45	Hg
HgSe	-3.42	-59.11	-55.69	HgSe
HgSeO3	-14.91	-27.34	-12.43	HgSeO3
HgSO4	-19.91	-29.33	-9.42	HgSO4
Huntite	-4.37	-34.34	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.26	-24.03	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-14.49	-23.26	-8.77	Mg5(CO3)4(OH)2·4H2O
K-Alum	-15.42	-20.59	-5.17	KAl(SO4)2·12H2O
K-Jarosite	-5.81	-20.61	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-35.33	-52.58	-17.24	K2Cr2O7
K2CrO4	-21.83	-22.34	-0.51	K2CrO4
K2MoO4	-16.28	-13.02	3.26	K2MoO4
K2SeO4	-17.21	-17.94	-0.73	K2SeO4
Langite	-3.20	14.29	17.49	Cu4(OH)6SO4·H2O
Larnakite	-6.21	-6.64	-0.43	PbO:PbSO4
Laurionite	-5.38	-4.76	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-21.34	11.36	32.70	CaO
Litharge	-7.48	5.21	12.69	PbO
Mackinawite	-78.53	-82.13	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	0.74	17.60	16.86	Fe2MgO4
Magnesite	-1.16	-8.62	-7.46	MgCO3
Magnetite	6.43	9.83	3.40	Fe3O4
Malachite	1.15	-4.16	-5.31	Cu2(OH)2CO3
Manganite	-3.26	22.08	25.34	MnOOH
Massicot	-7.68	5.21	12.89	PbO
Matlockite	-6.71	-15.68	-8.97	PbClF
Melanothallite	-18.36	-12.10	6.26	CuCl2
Melanterite	-11.41	-13.62	-2.21	FeSO4·7H2O
Metacinnabar	-52.76	-97.85	-45.09	HgS
Mg(OH)2(active)	-7.58	11.22	18.79	Mg(OH)2
Mg(VO3)2	-17.34	-6.06	11.28	Mg(VO3)2
Mg2Sb3	-276.07	-201.39	74.68	Mg2Sb3
Mg2V2O7	-21.20	5.16	26.36	Mg2V2O7
MgCr2O4	-7.34	8.86	16.20	MgCr2O4
MgCrO4	-24.40	-19.02	5.38	MgCrO4
MgF2	-2.51	-10.64	-8.13	MgF2
MgMoO4	-7.85	-9.70	-1.85	MgMoO4
MgSeO3·6H2O	-6.91	-3.86	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-13.42	-14.62	-1.20	MgSeO4·6H2O
Minium	-32.34	41.18	73.52	Pb3O4
Mirabilite	-6.39	-7.50	-1.11	Na2SO4·10H2O
Mn(VO3)2	-12.87	-7.97	4.90	Mn(VO3)2
Mn2(SO4)3	-52.02	-57.73	-5.71	Mn2(SO4)3
Mn2Sb	-151.13	-90.05	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-15.78	-3.28	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-13.34	-10.63	2.72	MnCl2·4H2O
MnS(grn)	-76.44	-76.27	0.17	MnS
MnS(pnk)	-79.61	-76.27	3.34	MnS
MnSb	-96.25	-99.16	-2.91	MnSb
MnSe	-41.04	-37.54	3.50	MnSe
MnSeO3	-6.89	-5.76	1.13	MnSeO3
MnSeO3·2H2O	-6.75	-5.76	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-14.48	-16.53	-2.05	MnSeO4·5H2O
MnSO4	-10.34	-7.76	2.58	MnSO4
Monteponite	-9.11	5.99	15.10	CdO
Montroydite	-8.63	-12.27	-3.64	HgO
MoO3	-12.92	-20.92	-8.00	MoO3
Morenosite	-7.75	-9.89	-2.14	NiSO4·7H2O
MoS2	-147.37	-217.63	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-41.01	-50.91	-9.90	Na2Cr2O7
Na2CrO4	-23.60	-20.67	2.93	Na2CrO4

Na2Mo2O7	-15.67	-32.27	-16.60	Na2Mo2O7
Na2MoO4	-12.84	-11.35	1.49	Na2MoO4
Na2MoO4:2H2O	-12.57	-11.35	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-15.81	-5.51	10.30	Na2SeO3:5H2O
Na2SeO4	-17.55	-16.27	1.28	Na2SeO4
Na3Sb	-176.00	-81.55	94.45	Na3Sb
Na3VO4	-30.97	5.71	36.68	Na3VO4
Na4V2O7	-35.55	1.85	37.40	Na4V2O7
Nantokite	-5.48	-12.21	-6.73	CuCl
NaSb	-88.73	-65.57	23.17	NaSb
Natron	-8.96	-10.27	-1.31	Na2CO3:10H2O
NaVO3	-7.72	-3.86	3.86	NaVO3
Nesquehonite	-3.95	-8.62	-4.67	MgCO3:3H2O
Ni(OH)2	-5.62	7.17	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-25.39	-9.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-20.37	11.63	32.00	Ni4(OH)6SO4
NiCO3	-5.79	-12.66	-6.87	NiCO3
NiMoO4	-2.60	-13.74	-11.14	NiMoO4
NiS(alpha)	-72.81	-78.41	-5.60	NiS
NiS(beta)	-67.31	-78.41	-11.10	NiS
NiS(gamma)	-65.61	-78.41	-12.80	NiS
NiSe	-21.97	-39.67	-17.70	NiSe
NiSeO3:2H2O	-10.71	-7.90	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.14	-18.66	-1.52	NiSeO4:6H2O
Nsutite	-8.00	9.50	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-240.19	-301.25	-61.07	As2S3
Otavite	-1.85	-13.85	-12.00	CdCO3
Pb(BO2)2	-10.90	-4.38	6.52	Pb(BO2)2
Pb(OH)2	-2.94	5.21	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-58.13	-66.89	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-8.34	0.46	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.76	10.43	26.19	Pb2O(OH)2
Pb2O3	-25.07	35.97	61.04	Pb2O3
Pb2OCO3	-8.85	-9.41	-0.56	Pb2OCO3
Pb2V2O7	-4.95	-6.85	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.37	-15.57	5.80	Pb3(AsO4)2
Pb3(VO4)2	-7.78	-1.64	6.14	Pb3(VO4)2
Pb3O2CO3	-15.22	-4.20	11.02	Pb3O2CO3
Pb3O2SO4	-12.11	-1.43	10.69	Pb3O2SO4
Pb4(OH)6SO4	-17.31	3.79	21.10	Pb4(OH)6SO4
Pb4O3SO4	-18.09	3.79	21.88	Pb4O3SO4
PbCrO4	-12.42	-25.02	-12.60	PbCrO4
PbF2	-9.20	-16.64	-7.44	PbF2
Pbmetal	-24.58	-20.33	4.25	Pb
PbMoO4	-0.08	-15.70	-15.62	PbMoO4
PbO:0.3H2O	-7.77	5.21	12.98	PbO:0.33H2O
PbSeO4	-13.78	-20.62	-6.84	PbSeO4
Periclase	-10.37	11.22	21.58	MgO
Phosgenite	-9.54	-29.35	-19.81	PbCl2:PbCO3
Plattnerite	-18.84	30.76	49.60	PbO2
Portlandite	-11.45	11.36	22.80	Ca(OH)2
Pyrite	-123.67	-142.17	-18.51	FeS2
Pyrochroite	-5.88	9.31	15.19	Mn(OH)2
Pyrolusite	-6.53	34.85	41.38	MnO2
Realgar	-100.86	-120.61	-19.75	AsS
Retgersite	-7.85	-9.89	-2.04	NiSO4:6H2O
Rhodochrosite	0.05	-10.53	-10.58	MnCO3
Rutherfordine	-4.51	-19.01	-14.50	UO2CO3
Sb(OH)3	-12.15	-19.26	-7.11	Sb(OH)3
Sb2O4	-16.38	-12.98	3.40	Sb2O4
Sb2O5	-26.38	-36.05	-9.67	Sb2O5
Sb2Se3	-111.31	-179.06	-67.76	Sb2Se3
Sb4O6(cubic)	-58.78	-77.04	-18.26	Sb4O6
Sb4O6(orth)	-59.14	-77.04	-17.90	Sb4O6
SbCl3	-49.74	-49.17	0.57	SbCl3
SbF3	-41.82	-52.05	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb

SbO2	-2.97	-30.80	-27.82	SbO2
Schoepite	-5.17	0.83	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.19	-21.30	-7.11	Se
Semetal (hex)	-13.59	-21.30	-7.71	Se
Senarmontite	-26.16	-38.52	-12.37	Sb2O3
SeO2	-15.20	-15.07	0.12	SeO2
SeO3	-46.88	-25.84	21.04	SeO3
Siderite	-6.15	-16.39	-10.24	FeCO3
Smithsonite	-1.87	-11.87	-10.00	ZnCO3
Sphalerite	-66.16	-77.61	-11.45	ZnS
Spinel	-6.44	30.41	36.85	MgAl2O4
Stibnite	-244.82	-295.28	-50.46	Sb2S3
Sulfur	-57.90	-60.04	-2.14	S
Tenorite	0.20	7.84	7.64	CuO
Thenardite	-7.82	-7.50	0.32	Na2SO4
Thermonatrite	-10.91	-10.27	0.64	Na2CO3:H2O
Tyuyamunite	-8.35	-4.27	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-16.50	4.59	21.08	U3O8
U3Sb4	-582.46	-430.08	152.38	U3Sb4
U4O9	-33.44	-36.46	-3.02	U4O9
UF4	-29.68	-59.21	-29.54	UF4
UF4:2.5H2O	-26.50	-59.21	-32.72	UF4:2.5H2O
UO2 (am)	-16.43	-15.50	0.93	UO2
UO2 (NO3) 2	-48.97	-36.83	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-41.68	-36.83	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-40.22	-36.83	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-38.87	-36.83	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-4.78	0.83	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.76	-25.01	-2.25	UO2SeO4:4H2O
UO3	-6.87	0.83	7.70	UO3
Uraninite	-10.83	-15.50	-4.67	UO2
USb2	-220.54	-190.96	29.58	USb2
V (OH) 3	-19.18	-11.59	7.59	V (OH) 3
V2O5	-15.92	-17.28	-1.36	V2O5
V3O5	-40.91	-39.07	1.84	V3O5
V4O7	-50.77	-43.58	7.19	V4O7
V6O13	-42.07	-102.93	-60.86	V6O13
Valentinite	-30.04	-38.52	-8.48	Sb2O3
VC12	-63.17	-44.30	18.87	VC12
VC13	-64.93	-41.49	23.43	VC13
VF4	-63.15	-48.22	14.93	VF4
Vmetal	-93.93	-49.90	44.03	V
VO	-39.11	-24.36	14.76	VO
VO (OH) 2	-9.66	-4.51	5.15	VO (OH) 2
VO2Cl	-21.45	-18.61	2.84	VO2Cl
VOC1	-32.71	-21.55	11.15	VOC1
VOC12	-37.21	-24.45	12.76	VOC12
VOSO4	-25.19	-21.58	3.61	VOSO4
Witherite	-4.18	-12.75	-8.57	BaCO3
Wurtzite	-68.66	-77.61	-8.95	ZnS
Zincite	-3.36	7.97	11.33	ZnO
Zincosite	-13.03	-9.10	3.93	ZnSO4
Zn (BO2) 2	-9.91	-1.62	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-33.00	-29.68	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-4.23	7.97	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-4.50	7.97	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-3.78	7.97	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-3.56	7.97	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-3.76	7.97	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-8.63	-1.13	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-9.22	5.97	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-20.95	-7.30	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-29.14	-10.22	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-13.59	14.81	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-18.59	19.91	38.50	Zn5 (OH) 8Cl2
ZnCl2	-19.02	-11.97	7.05	ZnCl2
ZnCO3:1H2O	-1.61	-11.87	-10.26	ZnCO3:1H2O
ZnF2	-13.35	-13.89	-0.53	ZnF2

Znmetal	-43.36	-17.57	25.79	Zn
ZnMoO4	-2.82	-12.95	-10.13	ZnMoO4
ZnO(active)	-3.22	7.97	11.19	ZnO
ZnS(am)	-68.56	-77.61	-9.05	ZnS
ZnSb	-86.17	-75.15	11.01	ZnSb
ZnSe	-24.48	-38.88	-14.40	ZnSe
ZnSeO4:6H2O	-16.35	-17.87	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-8.46	-9.10	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 152.

```

Title Stage 9 Run-off mix
Mix 902
1      1
3      0.001879
4      0.019735
5      0.010709
6      0.000000
7      0.035904
8      0.000000
9      5.405758
10     8.459738
11     16.317235
12     87.464526
13     67.089950
14     27.127819
15     13.733471
Save solution 905
end

```

TITLE

Stage 9 Run-off mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 902.

Mixture 902.

1.000e+00 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.

1.879e-03 Solution 3 Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)

1.973e-02 Solution 4 Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)

1.071e-02 Solution 5 Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)

0.000e+00 Solution 6 Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)

3.590e-02 Solution 7 Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)

0.000e+00 Solution 8 Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
5.406e+00 Solution 9 Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
8.460e+00 Solution 10 Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
1.632e+01 Solution 11 Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
8.746e+01 Solution 12 Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
6.709e+01 Solution 13 Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
2.713e+01 Solution 14 Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
1.373e+01 Solution 15 Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)

-----Solution composition-----

Elements	Molality	Moles
Al	9.843e-07	2.231e-04
As	4.527e-10	1.026e-07
B	4.445e-07	1.008e-04
Ba	1.334e-07	3.023e-05
C	7.225e-04	1.638e-01
Ca	3.123e-04	7.078e-02
Cd	1.168e-09	2.648e-07
Cl	3.741e-05	8.481e-03
Co	1.318e-11	2.988e-09
Cr	5.071e-12	1.149e-09
Cu	2.377e-06	5.389e-04
F	3.359e-05	7.613e-03
Fe	4.742e-08	1.075e-05
Hg	4.266e-11	9.670e-09
K	6.677e-05	1.514e-02
Mg	8.161e-05	1.850e-02
Mn	9.848e-07	2.232e-04
Mo	3.806e-08	8.626e-06
N	9.961e-08	2.258e-05
Na	1.197e-04	2.714e-02
Ni	2.147e-12	4.865e-10
Pb	3.332e-09	7.552e-07
S	2.505e-04	5.678e-02
Sb	3.998e-10	9.062e-08
Se	3.488e-09	7.906e-07
U	1.213e-08	2.750e-06
V	9.416e-09	2.134e-06
Zn	1.153e-07	2.613e-05

-----Description of solution-----

	pH =	6.451	Charge balance
	pe =	6.501	Adjusted to redox
equilibrium	Activity of water =	1.000	
	Ionic strength (mol/kgw) =	1.568e-03	
	Mass of water (kg) =	2.267e+02	
	Total alkalinity (eq/kg) =	4.124e-04	
	Total CO2 (mol/kg) =	7.225e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An) =		0.00	
	Iterations =	13	
	Total H =	2.516334e+04	
	Total O =	1.258227e+04	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	3.702e-07	3.542e-07	-6.432	-6.451	-0.019	0.00
OH-	2.972e-08	2.843e-08	-7.527	-7.546	-0.019	(0)
H2O	5.551e+01	1.000e+00	1.744	-0.000	0.000	18.07
Al	9.843e-07					
AlF2+	4.685e-07	4.486e-07	-6.329	-6.348	-0.019	(0)
AlF3	1.715e-07	1.715e-07	-6.766	-6.766	0.000	(0)
Al(OH) 4-	1.664e-07	1.593e-07	-6.779	-6.798	-0.019	(0)
Al(OH) 2+	8.194e-08	7.846e-08	-7.086	-7.105	-0.019	(0)
Al(OH) 3	4.450e-08	4.450e-08	-7.352	-7.352	0.000	(0)
AlF+2	4.416e-08	3.711e-08	-7.355	-7.430	-0.075	(0)
AlOH+2	4.134e-09	3.474e-09	-8.384	-8.459	-0.075	(0)
AlF4-	2.727e-09	2.610e-09	-8.564	-8.583	-0.019	(0)
AlSO4+	1.964e-10	1.880e-10	-9.707	-9.726	-0.019	(0)
Al+3	1.819e-10	1.222e-10	-9.740	-9.913	-0.173	(0)
Al(SO4) 2-	4.169e-13	3.990e-13	-12.380	-12.399	-0.019	(0)
AlMo6O21-3	3.653e-39	2.404e-39	-38.437	-38.619	-0.182	(0)
As (3)	1.936e-21					
H3AsO3	1.933e-21	1.933e-21	-20.714	-20.714	0.000	(0)
H2AsO3-	2.932e-24	2.799e-24	-23.533	-23.553	-0.020	(0)
H4AsO3+	3.553e-28	3.392e-28	-27.449	-27.470	-0.020	(0)
HAsO3-2	8.679e-30	7.206e-30	-29.062	-29.142	-0.081	(0)
AsO3-3	1.192e-36	7.843e-37	-35.924	-36.106	-0.182	(0)
As (5)	4.527e-10					
H2AsO4-	3.338e-10	3.187e-10	-9.476	-9.497	-0.020	(0)
HAsO4-2	1.188e-10	9.865e-11	-9.925	-10.006	-0.081	(0)
H3AsO4	1.961e-14	1.961e-14	-13.708	-13.707	0.000	(0)
AsO4-3	1.339e-15	8.808e-16	-14.873	-15.055	-0.182	(0)
B	4.445e-07					
H3BO3	4.438e-07	4.439e-07	-6.353	-6.353	0.000	(0)
H2BO3-	7.614e-10	7.279e-10	-9.118	-9.138	-0.020	(0)
CaH2BO3+	1.097e-11	1.049e-11	-10.960	-10.979	-0.020	(0)
BF(OH) 3-	5.627e-12	5.379e-12	-11.250	-11.269	-0.020	(0)
MgH2BO3+	1.742e-12	1.665e-12	-11.759	-11.779	-0.020	(0)
NaH2BO3	1.320e-13	1.320e-13	-12.879	-12.879	0.000	(0)
BF2(OH) 2-	6.470e-15	6.185e-15	-14.189	-14.209	-0.020	(0)
BaH2BO3+	2.621e-15	2.506e-15	-14.581	-14.601	-0.020	(0)
H5(BO3) 2-	2.877e-16	2.750e-16	-15.541	-15.561	-0.020	(0)
BF3OH-	2.707e-20	2.588e-20	-19.567	-19.587	-0.020	(0)
H8(BO3) 3-	1.277e-20	1.221e-20	-19.894	-19.913	-0.020	(0)
BF4-	1.433e-24	1.370e-24	-23.844	-23.863	-0.020	(0)
Ba	1.334e-07					
Ba+2	1.329e-07	1.114e-07	-6.876	-6.953	-0.077	(0)
BaHCO3+	4.342e-10	4.159e-10	-9.362	-9.381	-0.019	(0)
BaCO3	2.956e-12	2.956e-12	-11.529	-11.529	0.000	(0)
BaOH+	1.444e-14	1.382e-14	-13.840	-13.859	-0.019	(0)
BaH2BO3+	2.621e-15	2.506e-15	-14.581	-14.601	-0.020	(0)
BaNO3+	6.738e-17	6.432e-17	-16.171	-16.192	-0.020	(0)
BaNH3+2	5.672e-18	4.709e-18	-17.246	-17.327	-0.081	(0)
C (4)	7.225e-04					
HCO3-	4.083e-04	3.909e-04	-3.389	-3.408	-0.019	(0)
H2CO3	3.114e-04	3.114e-04	-3.507	-3.507	0.000	(0)
CaHCO3+	1.904e-06	1.823e-06	-5.720	-5.739	-0.019	(0)
CuCO3	4.346e-07	4.346e-07	-6.362	-6.362	0.000	(0)
MgHCO3+	2.758e-07	2.639e-07	-6.559	-6.579	-0.019	(0)
CO3-2	6.175e-08	5.175e-08	-7.209	-7.286	-0.077	(0)
CuHCO3+	3.686e-08	3.518e-08	-7.433	-7.454	-0.020	(0)
NaHCO3	2.515e-08	2.515e-08	-7.599	-7.599	0.000	(0)
CaCO3	2.054e-08	2.054e-08	-7.687	-7.687	0.000	(0)
UO2(CO3) 2-2	6.567e-09	5.452e-09	-8.183	-8.263	-0.081	(0)
MnHCO3+	6.424e-09	6.149e-09	-8.192	-8.211	-0.019	(0)
UO2CO3	5.281e-09	5.281e-09	-8.277	-8.277	0.000	(0)
MgCO3	2.839e-09	2.839e-09	-8.547	-8.547	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
PbHCO3+	5.544e-10	5.292e-10	-9.256	-9.276	-0.020	(0)

	BaHCO3+	4.342e-10	4.159e-10	-9.362	-9.381	-0.019	(0)
	PbCO3	2.834e-10	2.834e-10	-9.548	-9.548	0.000	(0)
	ZnCO3	2.733e-10	2.733e-10	-9.563	-9.563	0.000	(0)
	NaCO3-	1.151e-10	1.102e-10	-9.939	-9.958	-0.019	(0)
	Cu (CO3) 2-2	7.291e-11	6.053e-11	-10.137	-10.218	-0.081	(0)
	UO2 (CO3) 3-4	2.976e-11	1.414e-11	-10.526	-10.850	-0.323	(0)
	FeHCO3+	3.715e-12	3.558e-12	-11.430	-11.449	-0.019	(0)
	BaCO3	2.956e-12	2.956e-12	-11.529	-11.529	0.000	(0)
	CdCO3	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
	CdHCO3+	8.740e-13	8.343e-13	-12.058	-12.079	-0.020	(0)
	CoHCO3+	3.285e-13	3.135e-13	-12.484	-12.504	-0.020	(0)
	NiHCO3+	8.424e-14	8.041e-14	-13.074	-13.095	-0.020	(0)
	Pb (CO3) 2-2	5.094e-14	4.229e-14	-13.293	-13.374	-0.081	(0)
	CoCO3	9.019e-15	9.019e-15	-14.045	-14.045	0.000	(0)
	NiCO3	3.221e-15	3.221e-15	-14.492	-14.492	0.000	(0)
	HgCO3	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
	Cd (CO3) 2-2	5.108e-17	4.241e-17	-16.292	-16.373	-0.081	(0)
	HgHCO3+	1.975e-17	1.886e-17	-16.704	-16.725	-0.020	(0)
	Hg (CO3) 2-2	5.635e-19	4.679e-19	-18.249	-18.330	-0.081	(0)
Ca		3.123e-04					
	Ca+2	2.989e-04	2.505e-04	-3.525	-3.601	-0.077	(0)
	CaSO4	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
	CaHCO3+	1.904e-06	1.823e-06	-5.720	-5.739	-0.019	(0)
	CaF+	8.671e-08	8.301e-08	-7.062	-7.081	-0.019	(0)
	CaCO3	2.054e-08	2.054e-08	-7.687	-7.687	0.000	(0)
	CaOH+	1.483e-10	1.421e-10	-9.829	-9.848	-0.019	(0)
	CaH2BO3+	1.097e-11	1.049e-11	-10.960	-10.979	-0.020	(0)
	CaNO3+	9.559e-14	9.125e-14	-13.020	-13.040	-0.020	(0)
	CaNH3+2	2.545e-14	2.113e-14	-13.594	-13.675	-0.081	(0)
	Ca (NH3) 2+2	6.788e-25	5.635e-25	-24.168	-24.249	-0.081	(0)
Cd		1.168e-09					
	Cd+2	1.119e-09	9.374e-10	-8.951	-9.028	-0.077	(0)
	CdSO4	4.354e-11	4.354e-11	-10.361	-10.361	0.000	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	CdCO3	1.106e-12	1.106e-12	-11.956	-11.956	0.000	(0)
	CdHCO3+	8.740e-13	8.343e-13	-12.058	-12.079	-0.020	(0)
	CdF+	4.726e-13	4.511e-13	-12.326	-12.346	-0.020	(0)
	CdOH+	2.218e-13	2.117e-13	-12.654	-12.674	-0.020	(0)
	Cd (SO4) 2-2	1.401e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
	CdOHC1	3.737e-15	3.737e-15	-14.427	-14.427	0.000	(0)
	CdCl2	4.782e-16	4.782e-16	-15.320	-15.320	0.000	(0)
	Cd (CO3) 2-2	5.108e-17	4.241e-17	-16.292	-16.373	-0.081	(0)
	Cd (OH) 2	3.797e-17	3.797e-17	-16.421	-16.421	0.000	(0)
	CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
	CdNO3+	3.578e-19	3.415e-19	-18.446	-18.467	-0.020	(0)
	CdSeO4	6.394e-20	6.394e-20	-19.194	-19.194	0.000	(0)
	CdCl3-	1.131e-20	1.080e-20	-19.946	-19.967	-0.020	(0)
	Cd2OH+3	1.511e-21	9.945e-22	-20.821	-21.002	-0.182	(0)
	Cd (OH) 3-	6.908e-23	6.594e-23	-22.161	-22.181	-0.020	(0)
	Cd (SeO3) 2-2	1.269e-24	1.054e-24	-23.896	-23.977	-0.081	(0)
	Cd (NO3) 2	1.972e-29	1.972e-29	-28.705	-28.705	0.000	(0)
	Cd (OH) 4-2	3.696e-31	3.069e-31	-30.432	-30.513	-0.081	(0)
	CdHS+	0.000e+00	0.000e+00	-81.111	-81.132	-0.020	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-154.039	-154.039	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-232.230	-232.250	-0.020	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-310.085	-310.166	-0.081	(0)
Cl		3.741e-05					
	Cl-	3.741e-05	3.580e-05	-4.427	-4.446	-0.019	(0)
	CuCl+	8.458e-11	8.092e-11	-10.073	-10.092	-0.019	(0)
	MnCl+	3.711e-11	3.553e-11	-10.430	-10.449	-0.019	(0)
	CuCl	9.923e-12	9.923e-12	-11.003	-11.003	0.000	(0)
	ZnCl+	8.625e-12	8.252e-12	-11.064	-11.083	-0.019	(0)
	CdCl+	3.357e-12	3.204e-12	-11.474	-11.494	-0.020	(0)
	PbCl+	2.424e-12	2.314e-12	-11.615	-11.636	-0.020	(0)
	ZnOHC1	3.071e-13	3.071e-13	-12.513	-12.513	0.000	(0)
	HgClOH	8.298e-14	8.298e-14	-13.081	-13.081	0.000	(0)
	CuCl2-	7.757e-14	7.421e-14	-13.110	-13.130	-0.019	(0)
	HgCl2	5.916e-15	5.916e-15	-14.228	-14.228	0.000	(0)

CdOHC1	3.737e-15	3.737e-15	-14.427	-14.427	0.000	(0)
MnCl2	1.796e-15	1.796e-15	-14.746	-14.746	0.000	(0)
UO2Cl+	1.559e-15	1.488e-15	-14.807	-14.827	-0.020	(0)
CoCl+	1.338e-15	1.277e-15	-14.874	-14.894	-0.020	(0)
CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)
CdCl2	4.782e-16	4.782e-16	-15.320	-15.320	0.000	(0)
ZnCl2	4.682e-16	4.682e-16	-15.330	-15.330	0.000	(0)
PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
NiCl+	1.601e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
HgCl+	3.455e-17	3.298e-17	-16.462	-16.482	-0.020	(0)
HgCl3-	2.219e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
CuCl3-2	6.764e-19	5.680e-19	-18.170	-18.246	-0.076	(0)
FeCl+2	2.743e-19	2.304e-19	-18.562	-18.638	-0.076	(0)
CrCl+2	9.238e-20	7.670e-20	-19.034	-19.115	-0.081	(0)
MnCl3-	1.850e-20	1.771e-20	-19.733	-19.752	-0.019	(0)
ZnCl3-	1.391e-20	1.331e-20	-19.857	-19.876	-0.019	(0)
CdCl3-	1.131e-20	1.080e-20	-19.946	-19.967	-0.020	(0)
VOCl+	7.398e-21	7.062e-21	-20.131	-20.151	-0.020	(0)
PbCl3-	5.523e-21	5.272e-21	-20.258	-20.278	-0.020	(0)
HgCl4-2	3.635e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
CuCl3-	3.507e-22	3.356e-22	-21.455	-21.474	-0.019	(0)
FeCl2+	3.848e-23	3.683e-23	-22.415	-22.434	-0.019	(0)
NiCl2	2.754e-23	2.754e-23	-22.560	-22.560	0.000	(0)
CrOHC12	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
ZnCl4-2	2.838e-25	2.383e-25	-24.547	-24.623	-0.076	(0)
CrCl2+	2.729e-25	2.605e-25	-24.564	-24.584	-0.020	(0)
PbCl4-2	1.039e-25	8.627e-26	-24.983	-25.064	-0.081	(0)
FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)
CuCl4-2	7.169e-29	6.020e-29	-28.145	-28.220	-0.076	(0)
CrO3Cl-	2.321e-31	2.215e-31	-30.634	-30.655	-0.020	(0)
CoCl+2	1.142e-39	9.486e-40	-38.942	-39.023	-0.081	(0)
UCl+3	0.000e+00	0.000e+00	-42.745	-42.927	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.859	-63.939	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.088	-66.169	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.748	-80.829	-0.081	(0)
Co (2)	1.318e-11					
Co+2	1.242e-11	1.031e-11	-10.906	-10.987	-0.081	(0)
CoSO4	4.076e-13	4.076e-13	-12.390	-12.390	0.000	(0)
CoHCO3+	3.285e-13	3.135e-13	-12.484	-12.504	-0.020	(0)
CoF+	1.037e-14	9.900e-15	-13.984	-14.004	-0.020	(0)
CoCO3	9.019e-15	9.019e-15	-14.045	-14.045	0.000	(0)
CoOH+	6.127e-15	5.848e-15	-14.213	-14.233	-0.020	(0)
CoCl+	1.338e-15	1.277e-15	-14.874	-14.894	-0.020	(0)
Co (OH) 2	1.321e-17	1.321e-17	-16.879	-16.879	0.000	(0)
CoNO2+	4.060e-18	3.876e-18	-17.391	-17.412	-0.020	(0)
Co (NH3) +2	1.000e-19	8.306e-20	-19.000	-19.081	-0.081	(0)
CoNO3+	1.972e-21	1.883e-21	-20.705	-20.725	-0.020	(0)
CoSeO4	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
Co (OH) 3-	7.848e-24	7.491e-24	-23.105	-23.125	-0.020	(0)
CoOOH-	1.969e-24	1.880e-24	-23.706	-23.726	-0.020	(0)
Co2OH+3	4.593e-27	3.022e-27	-26.338	-26.520	-0.182	(0)
Co (NH3) 2+2	2.859e-28	2.374e-28	-27.544	-27.625	-0.081	(0)
Co (NO3) 2	4.413e-31	4.413e-31	-30.355	-30.355	0.000	(0)
Co (OH) 4-2	4.065e-32	3.375e-32	-31.391	-31.472	-0.081	(0)
Co (NH3) 3+2	2.412e-37	2.002e-37	-36.618	-36.698	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.072	-46.152	-0.081	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-48.309	-48.632	-0.323	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.025	-56.106	-0.081	(0)
Co (3)	2.266e-32					
CoOH+2	2.266e-32	1.881e-32	-31.645	-31.726	-0.081	(0)
Co+3	1.938e-37	1.302e-37	-36.713	-36.885	-0.173	(0)
CoCl+2	1.142e-39	9.486e-40	-38.942	-39.023	-0.081	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.859	-63.939	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.140	-75.160	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.648	-79.729	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.748	-80.829	-0.081	(0)
Cr (2)	1.501e-28					
Cr+2	1.501e-28	1.247e-28	-27.824	-27.904	-0.081	(0)

Cr (3)	5.071e-12					
Cr (OH) 2+	3.731e-12	3.562e-12	-11.428	-11.448	-0.020	(0)
Cr (OH) +2	1.240e-12	1.030e-12	-11.907	-11.987	-0.081	(0)
CrOHSO4	4.841e-14	4.841e-14	-13.315	-13.315	0.000	(0)
Cr (OH) 3	3.804e-14	3.804e-14	-13.420	-13.420	0.000	(0)
CrF+2	9.596e-15	7.967e-15	-14.018	-14.099	-0.081	(0)
Cr+3	2.516e-15	1.656e-15	-14.599	-14.781	-0.182	(0)
CrSO4+	8.024e-16	7.659e-16	-15.096	-15.116	-0.020	(0)
CrO2-	5.343e-17	5.100e-17	-16.272	-16.292	-0.020	(0)
Cr (OH) 4-	4.510e-17	4.305e-17	-16.346	-16.366	-0.020	(0)
CrCl+2	9.238e-20	7.670e-20	-19.034	-19.115	-0.081	(0)
Cr2 (OH) 2SO4+2	5.426e-24	4.505e-24	-23.265	-23.346	-0.081	(0)
CrOHC12	1.483e-24	1.483e-24	-23.829	-23.829	0.000	(0)
CrCl2+	2.729e-25	2.605e-25	-24.564	-24.584	-0.020	(0)
Cr2 (OH) 2 (SO4) 2	5.302e-26	5.302e-26	-25.276	-25.276	0.000	(0)
CrNO3+2	1.004e-26	8.337e-27	-25.998	-26.079	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.744	-52.825	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.643	-62.824	-0.182	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.088	-66.169	-0.081	(0)
Cr (6)	5.805e-21					
HCrO4-	2.911e-21	2.778e-21	-20.536	-20.556	-0.020	(0)
CrO4-2	2.893e-21	2.424e-21	-20.539	-20.615	-0.077	(0)
NaCrO4-	1.444e-24	1.378e-24	-23.841	-23.861	-0.020	(0)
KCrO4-	6.019e-25	5.746e-25	-24.220	-24.241	-0.020	(0)
H2CrO4	7.977e-28	7.977e-28	-27.098	-27.098	0.000	(0)
CrO3SO4-2	7.152e-29	5.938e-29	-28.146	-28.226	-0.081	(0)
CrO3Cl-	2.321e-31	2.215e-31	-30.634	-30.655	-0.020	(0)
Cr2O7-2	3.224e-40	2.677e-40	-39.492	-39.572	-0.081	(0)
Cu (1)	2.407e-10					
Cu+	2.307e-10	2.202e-10	-9.637	-9.657	-0.020	(0)
CuCl	9.923e-12	9.923e-12	-11.003	-11.003	0.000	(0)
CuCl2-	7.757e-14	7.421e-14	-13.110	-13.130	-0.019	(0)
CuCl3-2	6.764e-19	5.680e-19	-18.170	-18.246	-0.076	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.181	-154.319	-0.137	(0)
Cu (2)	2.377e-06					
Cu+2	1.702e-06	1.426e-06	-5.769	-5.846	-0.077	(0)
CuCO3	4.346e-07	4.346e-07	-6.362	-6.362	0.000	(0)
CuOH+	1.340e-07	1.282e-07	-6.873	-6.892	-0.019	(0)
CuSO4	6.474e-08	6.474e-08	-7.189	-7.189	0.000	(0)
CuHCO3+	3.686e-08	3.518e-08	-7.433	-7.454	-0.020	(0)
CuF+	2.863e-09	2.733e-09	-8.543	-8.563	-0.020	(0)
Cu (OH) 2	7.273e-10	7.273e-10	-9.138	-9.138	0.000	(0)
Cu2 (OH) 2+2	4.974e-10	4.130e-10	-9.303	-9.384	-0.081	(0)
CuCl+	8.458e-11	8.092e-11	-10.073	-10.092	-0.019	(0)
Cu (CO3) 2-2	7.291e-11	6.053e-11	-10.137	-10.218	-0.081	(0)
CuNO2+	8.346e-12	7.967e-12	-11.078	-11.099	-0.020	(0)
CuNH3+2	1.178e-12	9.780e-13	-11.929	-12.010	-0.081	(0)
Cu (OH) 3-	4.443e-14	4.241e-14	-13.352	-13.373	-0.020	(0)
CuCl2	1.004e-15	1.004e-15	-14.998	-14.998	0.000	(0)
CuNO3+	5.444e-16	5.196e-16	-15.264	-15.284	-0.020	(0)
Cu (NO2) 2	4.349e-18	4.349e-18	-17.362	-17.362	0.000	(0)
Cu (OH) 4-2	1.143e-20	9.490e-21	-19.942	-20.023	-0.081	(0)
CuCl3-	3.507e-22	3.356e-22	-21.455	-21.474	-0.019	(0)
Cu (NO3) 2	7.537e-27	7.537e-27	-26.123	-26.123	0.000	(0)
CuCl4-2	7.169e-29	6.020e-29	-28.145	-28.220	-0.076	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.261	-220.281	-0.020	(0)
F	3.359e-05					
F-	3.174e-05	3.037e-05	-4.498	-4.518	-0.019	(0)
AlF2+	4.685e-07	4.486e-07	-6.329	-6.348	-0.019	(0)
MgF+	2.349e-07	2.248e-07	-6.629	-6.648	-0.019	(0)
AlF3	1.715e-07	1.715e-07	-6.766	-6.766	0.000	(0)
CaF+	8.671e-08	8.301e-08	-7.062	-7.081	-0.019	(0)
AlF+2	4.416e-08	3.711e-08	-7.355	-7.430	-0.075	(0)
HF	1.591e-08	1.591e-08	-7.798	-7.798	0.000	(0)
CuF+	2.863e-09	2.733e-09	-8.543	-8.563	-0.020	(0)
AlF4-	2.727e-09	2.610e-09	-8.564	-8.583	-0.019	(0)
NaF	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)

MnF+	9.955e-10	9.530e-10	-9.002	-9.021	-0.019	(0)
UO2F+	1.126e-10	1.074e-10	-9.949	-9.969	-0.020	(0)
ZnF+	5.825e-11	5.560e-11	-10.235	-10.255	-0.020	(0)
UO2F2	9.410e-12	9.410e-12	-11.026	-11.026	0.000	(0)
BF(OH) 3-	5.627e-12	5.379e-12	-11.250	-11.269	-0.020	(0)
PbF+	4.084e-12	3.898e-12	-11.389	-11.409	-0.020	(0)
HF2-	1.920e-12	1.837e-12	-11.717	-11.736	-0.019	(0)
CdF+	4.726e-13	4.511e-13	-12.326	-12.346	-0.020	(0)
UO2F3-	7.519e-14	7.177e-14	-13.124	-13.144	-0.020	(0)
CoF+	1.037e-14	9.900e-15	-13.984	-14.004	-0.020	(0)
CrF+2	9.596e-15	7.967e-15	-14.018	-14.099	-0.081	(0)
FeF+2	8.448e-15	7.095e-15	-14.073	-14.149	-0.076	(0)
BF2(OH) 2-	6.470e-15	6.185e-15	-14.189	-14.209	-0.020	(0)
FeF2+	6.022e-15	5.765e-15	-14.220	-14.239	-0.019	(0)
PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
NiF+	1.333e-15	1.273e-15	-14.875	-14.895	-0.020	(0)
VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
H2F2	6.780e-16	6.780e-16	-15.169	-15.169	0.000	(0)
FeF3	2.470e-16	2.470e-16	-15.607	-15.607	0.000	(0)
CdF2	2.733e-17	2.733e-17	-16.563	-16.563	0.000	(0)
UO2F4-2	2.085e-17	1.731e-17	-16.681	-16.762	-0.081	(0)
VO2F2-	1.368e-17	1.305e-17	-16.864	-16.884	-0.020	(0)
VOF+	1.342e-17	1.281e-17	-16.872	-16.893	-0.020	(0)
VOF2	1.458e-19	1.458e-19	-18.836	-18.836	0.000	(0)
PbF3-	1.405e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
BF3OH-	2.707e-20	2.588e-20	-19.567	-19.587	-0.020	(0)
VO2F3-2	5.956e-21	4.945e-21	-20.225	-20.306	-0.081	(0)
VOF3-	1.646e-22	1.571e-22	-21.784	-21.804	-0.020	(0)
HgF+	5.444e-23	5.197e-23	-22.264	-22.284	-0.020	(0)
PbF4-2	2.348e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
BF4-	1.433e-24	1.370e-24	-23.844	-23.863	-0.020	(0)
VO2F4-3	1.123e-25	7.388e-26	-24.950	-25.131	-0.182	(0)
Sb(OH) 2F	6.751e-26	6.751e-26	-25.171	-25.171	0.000	(0)
SbOF	6.639e-26	6.639e-26	-25.178	-25.178	0.000	(0)
VOF4-2	2.319e-26	1.926e-26	-25.635	-25.715	-0.081	(0)
UF3+	7.695e-33	7.346e-33	-32.114	-32.134	-0.020	(0)
UF2+2	1.838e-33	1.526e-33	-32.736	-32.816	-0.081	(0)
UF4	2.446e-35	2.446e-35	-34.612	-34.612	0.000	(0)
UF+3	6.068e-36	3.993e-36	-35.217	-35.399	-0.182	(0)
UF5-	3.083e-38	2.943e-38	-37.511	-37.531	-0.020	(0)
UF6-2	3.251e-40	2.699e-40	-39.488	-39.569	-0.081	(0)
Fe (2)	9.105e-10					
Fe+2	8.707e-10	7.229e-10	-9.060	-9.141	-0.081	(0)
FeSO4	3.516e-11	3.516e-11	-10.454	-10.454	0.000	(0)
FeHCO3+	3.715e-12	3.558e-12	-11.430	-11.449	-0.019	(0)
FeOH+	8.547e-13	8.182e-13	-12.068	-12.087	-0.019	(0)
Fe(OH) 2	1.848e-17	1.848e-17	-16.733	-16.733	0.000	(0)
Fe(OH) 3-	1.735e-19	1.661e-19	-18.761	-18.780	-0.019	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.414	-160.414	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-238.468	-238.488	-0.020	(0)
Fe (3)	4.651e-08					
Fe(OH) 2+	4.518e-08	4.326e-08	-7.345	-7.364	-0.019	(0)
Fe(OH) 3	1.321e-09	1.321e-09	-8.879	-8.879	0.000	(0)
FeOH+2	4.657e-12	3.911e-12	-11.332	-11.408	-0.076	(0)
Fe(OH) 4-	3.651e-12	3.496e-12	-11.438	-11.456	-0.019	(0)
FeF+2	8.448e-15	7.095e-15	-14.073	-14.149	-0.076	(0)
FeF2+	6.022e-15	5.765e-15	-14.220	-14.239	-0.019	(0)
FeSO4+	4.948e-16	4.737e-16	-15.306	-15.325	-0.019	(0)
Fe+3	3.171e-16	2.131e-16	-15.499	-15.671	-0.173	(0)
FeF3	2.470e-16	2.470e-16	-15.607	-15.607	0.000	(0)
Fe(SO4) 2-	2.102e-18	2.006e-18	-17.677	-17.698	-0.020	(0)
FeCl+2	2.743e-19	2.304e-19	-18.562	-18.638	-0.076	(0)
FeHSeO3+2	2.228e-21	1.850e-21	-20.652	-20.733	-0.081	(0)
Fe2(OH) 2+4	1.066e-21	5.065e-22	-20.972	-21.295	-0.323	(0)
FeCl2+	3.848e-23	3.683e-23	-22.415	-22.434	-0.019	(0)
FeNO3+2	2.957e-25	2.455e-25	-24.529	-24.610	-0.081	(0)
Fe3(OH) 4+5	1.013e-27	3.167e-28	-26.994	-27.499	-0.505	(0)
FeCl3	1.318e-28	1.318e-28	-27.880	-27.880	0.000	(0)

H (0)	1.764e-29					
H2	8.819e-30	8.822e-30	-29.055	-29.054	0.000	(0)
Hg (0)	4.233e-11					
Hg	4.233e-11	4.233e-11	-10.373	-10.373	0.000	(0)
Hg (1)	3.196e-21					
Hg2+2	1.598e-21	1.327e-21	-20.796	-20.877	-0.081	(0)
Hg (2)	3.272e-13					
Hg (OH) 2	2.354e-13	2.354e-13	-12.628	-12.628	0.000	(0)
HgClOH	8.298e-14	8.298e-14	-13.081	-13.081	0.000	(0)
HgCl2	5.916e-15	5.916e-15	-14.228	-14.228	0.000	(0)
HgCO3	2.859e-15	2.859e-15	-14.544	-14.544	0.000	(0)
HgOH+	5.474e-17	5.225e-17	-16.262	-16.282	-0.020	(0)
HgCl+	3.455e-17	3.298e-17	-16.462	-16.482	-0.020	(0)
HgHCO3+	1.975e-17	1.886e-17	-16.704	-16.725	-0.020	(0)
HgCl3-	2.219e-18	2.118e-18	-17.654	-17.674	-0.020	(0)
Hg (CO3) 2-2	5.635e-19	4.679e-19	-18.249	-18.330	-0.081	(0)
Hg+2	5.561e-20	4.617e-20	-19.255	-19.336	-0.081	(0)
HgSO4	2.395e-21	2.395e-21	-20.621	-20.621	0.000	(0)
HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.710	-0.081	(0)
Hg (OH) 3-	8.827e-22	8.426e-22	-21.054	-21.074	-0.020	(0)
HgCl4-2	3.635e-22	3.018e-22	-21.439	-21.520	-0.081	(0)
Hg (NH3) 2+2	1.575e-22	1.308e-22	-21.803	-21.883	-0.081	(0)
HgF+	5.444e-23	5.197e-23	-22.264	-22.284	-0.020	(0)
HgNO3+	2.058e-30	1.964e-30	-29.687	-29.707	-0.020	(0)
Hg (NH3) 3+2	4.202e-32	3.489e-32	-31.377	-31.457	-0.081	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.027	-40.027	0.000	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.650	-40.731	-0.081	(0)
HgHS2-	0.000e+00	0.000e+00	-141.160	-141.180	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.356	-143.437	-0.081	(0)
K	6.677e-05					
K+	6.668e-05	6.380e-05	-4.176	-4.195	-0.019	(0)
KSO4-	9.346e-08	8.948e-08	-7.029	-7.048	-0.019	(0)
KCrO4-	6.019e-25	5.746e-25	-24.220	-24.241	-0.020	(0)
Mg	8.161e-05					
Mg+2	7.872e-05	6.597e-05	-4.104	-4.181	-0.077	(0)
MgSO4	2.378e-06	2.378e-06	-5.624	-5.624	0.000	(0)
MgHCO3+	2.758e-07	2.639e-07	-6.559	-6.579	-0.019	(0)
MgF+	2.349e-07	2.248e-07	-6.629	-6.648	-0.019	(0)
MgCO3	2.839e-09	2.839e-09	-8.547	-8.547	0.000	(0)
MgOH+	7.793e-10	7.466e-10	-9.108	-9.127	-0.019	(0)
MgH2BO3+	1.742e-12	1.665e-12	-11.759	-11.779	-0.020	(0)
Mn (2)	9.848e-07					
Mn+2	9.495e-07	7.883e-07	-6.023	-6.103	-0.081	(0)
MnSO4	2.777e-08	2.777e-08	-7.556	-7.556	0.000	(0)
MnHCO3+	6.424e-09	6.149e-09	-8.192	-8.211	-0.019	(0)
MnF+	9.955e-10	9.530e-10	-9.002	-9.021	-0.019	(0)
MnOH+	5.881e-11	5.629e-11	-10.231	-10.250	-0.019	(0)
MnCl+	3.711e-11	3.553e-11	-10.430	-10.449	-0.019	(0)
MnCl2	1.796e-15	1.796e-15	-14.746	-14.746	0.000	(0)
MnNO3+	1.508e-16	1.439e-16	-15.822	-15.842	-0.020	(0)
MnSeO4	7.772e-17	7.772e-17	-16.109	-16.109	0.000	(0)
MnCl3-	1.850e-20	1.771e-20	-19.733	-19.752	-0.019	(0)
Mn (OH) 3-	2.937e-22	2.812e-22	-21.532	-21.551	-0.019	(0)
Mn (NO3) 2	4.165e-26	4.165e-26	-25.380	-25.380	0.000	(0)
Mn (OH) 4-2	3.073e-29	2.581e-29	-28.512	-28.588	-0.076	(0)
MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Mn (3)	1.663e-25					
Mn+3	1.663e-25	1.117e-25	-24.779	-24.952	-0.173	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-46.838	-46.913	-0.076	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-49.765	-49.784	-0.019	(0)
Mo	3.806e-08					
MoO4-2	3.782e-08	3.169e-08	-7.422	-7.499	-0.077	(0)
HMoO4-	2.340e-10	2.234e-10	-9.631	-9.651	-0.020	(0)
H2MoO4	5.795e-13	5.795e-13	-12.237	-12.237	0.000	(0)
AlMo6O21-3	3.653e-39	2.404e-39	-38.437	-38.619	-0.182	(0)

Mo7O24-6	0.000e+00	0.000e+00	-50.382	-51.109	-0.727	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.668	-51.173	-0.505	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-52.519	-52.842	-0.323	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-55.865	-56.047	-0.182	(0)
N (-3)	4.370e-08					
NH4+	4.354e-08	4.162e-08	-7.361	-7.381	-0.020	(0)
NH4SO4-	9.231e-11	8.836e-11	-10.035	-10.054	-0.019	(0)
NH3	6.700e-11	6.700e-11	-10.174	-10.174	0.000	(0)
CuNH3+2	1.178e-12	9.780e-13	-11.929	-12.010	-0.081	(0)
CaNH3+2	2.545e-14	2.113e-14	-13.594	-13.675	-0.081	(0)
BaNH3+2	5.672e-18	4.709e-18	-17.246	-17.327	-0.081	(0)
Co (NH3) +2	1.000e-19	8.306e-20	-19.000	-19.081	-0.081	(0)
NiNH3+2	7.231e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
HgNH3+2	2.351e-21	1.952e-21	-20.629	-20.710	-0.081	(0)
Hg (NH3) 2+2	1.575e-22	1.308e-22	-21.803	-21.883	-0.081	(0)
Ca (NH3) 2+2	6.788e-25	5.635e-25	-24.168	-24.249	-0.081	(0)
Ni (NH3) 2+2	7.003e-28	5.814e-28	-27.155	-27.235	-0.081	(0)
Co (NH3) 2+2	2.859e-28	2.374e-28	-27.544	-27.625	-0.081	(0)
Hg (NH3) 3+2	4.202e-32	3.489e-32	-31.377	-31.457	-0.081	(0)
Co (NH3) 3+2	2.412e-37	2.002e-37	-36.618	-36.698	-0.081	(0)
Hg (NH3) 4+2	0.000e+00	0.000e+00	-40.650	-40.731	-0.081	(0)
Co (NH3) 4+2	0.000e+00	0.000e+00	-46.072	-46.152	-0.081	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-52.744	-52.825	-0.081	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-56.025	-56.106	-0.081	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-62.643	-62.824	-0.182	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-63.859	-63.939	-0.081	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-66.088	-66.169	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.140	-75.160	-0.020	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-79.648	-79.729	-0.081	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-80.748	-80.829	-0.081	(0)
N (3)	5.579e-08					
NO2-	5.579e-08	5.334e-08	-7.253	-7.273	-0.019	(0)
CuNO2+	8.346e-12	7.967e-12	-11.078	-11.099	-0.020	(0)
Cu (NO2) 2	4.349e-18	4.349e-18	-17.362	-17.362	0.000	(0)
CoNO2+	4.060e-18	3.876e-18	-17.391	-17.412	-0.020	(0)
N (5)	1.205e-10					
NO3-	1.204e-10	1.152e-10	-9.919	-9.939	-0.019	(0)
CaNO3+	9.559e-14	9.125e-14	-13.020	-13.040	-0.020	(0)
CuNO3+	5.444e-16	5.196e-16	-15.264	-15.284	-0.020	(0)
MnNO3+	1.508e-16	1.439e-16	-15.822	-15.842	-0.020	(0)
BaNO3+	6.738e-17	6.432e-17	-16.171	-16.192	-0.020	(0)
ZnNO3+	2.782e-17	2.656e-17	-16.556	-16.576	-0.020	(0)
PbNO3+	3.252e-18	3.104e-18	-17.488	-17.508	-0.020	(0)
CdNO3+	3.578e-19	3.415e-19	-18.446	-18.467	-0.020	(0)
UO2NO3+	6.173e-21	5.893e-21	-20.210	-20.230	-0.020	(0)
CoNO3+	1.972e-21	1.883e-21	-20.705	-20.725	-0.020	(0)
NiNO3+	5.058e-22	4.828e-22	-21.296	-21.316	-0.020	(0)
VO2NO3	1.296e-24	1.296e-24	-23.888	-23.888	0.000	(0)
FeNO3+2	2.957e-25	2.455e-25	-24.529	-24.610	-0.081	(0)
Mn (NO3) 2	4.165e-26	4.165e-26	-25.380	-25.380	0.000	(0)
CrNO3+2	1.004e-26	8.337e-27	-25.998	-26.079	-0.081	(0)
Cu (NO3) 2	7.537e-27	7.537e-27	-26.123	-26.123	0.000	(0)
Zn (NO3) 2	6.105e-28	6.105e-28	-27.214	-27.214	0.000	(0)
Pb (NO3) 2	6.074e-28	6.074e-28	-27.217	-27.217	0.000	(0)
Cd (NO3) 2	1.972e-29	1.972e-29	-28.705	-28.705	0.000	(0)
HgNO3+	2.058e-30	1.964e-30	-29.687	-29.707	-0.020	(0)
Co (NO3) 2	4.413e-31	4.413e-31	-30.355	-30.355	0.000	(0)
Hg (NO3) 2	0.000e+00	0.000e+00	-40.027	-40.027	0.000	(0)
Na	1.197e-04					
Na+	1.196e-04	1.144e-04	-3.922	-3.942	-0.019	(0)
NaSO4-	1.271e-07	1.217e-07	-6.896	-6.915	-0.019	(0)
NaHCO3	2.515e-08	2.515e-08	-7.599	-7.599	0.000	(0)
NaF	2.192e-09	2.192e-09	-8.659	-8.659	0.000	(0)
NaCO3-	1.151e-10	1.102e-10	-9.939	-9.958	-0.019	(0)
NaH2BO3	1.320e-13	1.320e-13	-12.879	-12.879	0.000	(0)
NaCrO4-	1.444e-24	1.378e-24	-23.841	-23.861	-0.020	(0)
Ni	2.147e-12					
Ni+2	1.991e-12	1.668e-12	-11.701	-11.778	-0.077	(0)

NiHCO3+	8.424e-14	8.041e-14	-13.074	-13.095	-0.020	(0)
NiSO4	6.596e-14	6.596e-14	-13.181	-13.181	0.000	(0)
NiCO3	3.221e-15	3.221e-15	-14.492	-14.492	0.000	(0)
NiF+	1.333e-15	1.273e-15	-14.875	-14.895	-0.020	(0)
NiOH+	6.256e-16	5.971e-16	-15.204	-15.224	-0.020	(0)
NiCl+	1.601e-16	1.528e-16	-15.796	-15.816	-0.020	(0)
Ni (OH) 2	1.348e-18	1.348e-18	-17.870	-17.870	0.000	(0)
Ni (SO4) 2-2	5.212e-19	4.327e-19	-18.283	-18.364	-0.081	(0)
NiNH3+2	7.231e-20	6.004e-20	-19.141	-19.222	-0.081	(0)
NiNO3+	5.058e-22	4.828e-22	-21.296	-21.316	-0.020	(0)
NiSeO4	2.859e-22	2.859e-22	-21.544	-21.544	0.000	(0)
Ni (OH) 3-	4.016e-23	3.833e-23	-22.396	-22.416	-0.020	(0)
NiCl2	2.754e-23	2.754e-23	-22.560	-22.560	0.000	(0)
Ni (NH3) 2+2	7.003e-28	5.814e-28	-27.155	-27.235	-0.081	(0)
O (0)	1.302e-34					
O2	6.510e-35	6.512e-35	-34.186	-34.186	0.000	(0)
Pb	3.332e-09					
Pb+2	2.174e-09	1.822e-09	-8.663	-8.740	-0.077	(0)
PbHCO3+	5.544e-10	5.292e-10	-9.256	-9.276	-0.020	(0)
PbCO3	2.834e-10	2.834e-10	-9.548	-9.548	0.000	(0)
PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
PbOH+	1.363e-10	1.301e-10	-9.866	-9.886	-0.020	(0)
PbF+	4.084e-12	3.898e-12	-11.389	-11.409	-0.020	(0)
PbCl+	2.424e-12	2.314e-12	-11.615	-11.636	-0.020	(0)
Pb (SO4) 2-2	2.542e-13	2.110e-13	-12.595	-12.676	-0.081	(0)
Pb (OH) 2	1.169e-13	1.169e-13	-12.932	-12.932	0.000	(0)
Pb (CO3) 2-2	5.094e-14	4.229e-14	-13.293	-13.374	-0.081	(0)
PbF2	2.329e-15	2.329e-15	-14.633	-14.633	0.000	(0)
PbCl2	3.700e-16	3.700e-16	-15.432	-15.432	0.000	(0)
Pb2OH+3	5.708e-18	3.756e-18	-17.244	-17.425	-0.182	(0)
Pb (OH) 3-	3.483e-18	3.325e-18	-17.458	-17.478	-0.020	(0)
PbNO3+	3.252e-18	3.104e-18	-17.488	-17.508	-0.020	(0)
PbF3-	1.405e-19	1.342e-19	-18.852	-18.872	-0.020	(0)
PbCl3-	5.523e-21	5.272e-21	-20.258	-20.278	-0.020	(0)
Pb (OH) 4-2	2.788e-23	2.315e-23	-22.555	-22.635	-0.081	(0)
PbF4-2	2.348e-24	1.950e-24	-23.629	-23.710	-0.081	(0)
Pb3 (OH) 4+2	5.987e-25	4.971e-25	-24.223	-24.304	-0.081	(0)
PbCl4-2	1.039e-25	8.627e-26	-24.983	-25.064	-0.081	(0)
Pb (NO3) 2	6.074e-28	6.074e-28	-27.217	-27.217	0.000	(0)
Pb4 (OH) 4+4	1.514e-29	7.193e-30	-28.820	-29.143	-0.323	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.692	-153.692	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.484	-232.504	-0.020	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-79.542	-79.542	0.000	(0)
HS-	0.000e+00	0.000e+00	-80.091	-80.111	-0.020	(0)
CdHS+	0.000e+00	0.000e+00	-81.111	-81.132	-0.020	(0)
S5-2	0.000e+00	0.000e+00	-82.945	-83.026	-0.081	(0)
S6-2	0.000e+00	0.000e+00	-83.461	-83.542	-0.081	(0)
S4-2	0.000e+00	0.000e+00	-83.541	-83.621	-0.081	(0)
S3-2	0.000e+00	0.000e+00	-84.347	-84.427	-0.081	(0)
S2-2	0.000e+00	0.000e+00	-85.363	-85.443	-0.081	(0)
S-2	0.000e+00	0.000e+00	-90.885	-90.961	-0.076	(0)
HgHS2-	0.000e+00	0.000e+00	-141.160	-141.180	-0.020	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-141.237	-141.237	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-143.356	-143.437	-0.081	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-153.449	-153.589	-0.140	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-153.692	-153.692	0.000	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-153.979	-153.999	-0.020	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-154.039	-154.039	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-154.181	-154.319	-0.137	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-154.440	-154.440	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.414	-160.414	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-220.261	-220.281	-0.020	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-231.251	-231.272	-0.020	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-232.230	-232.250	-0.020	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-232.484	-232.504	-0.020	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-234.720	-234.801	-0.081	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-238.468	-238.488	-0.020	(0)

Cd (HS) 4-2	0.000e+00	0.000e+00	-310.085	-310.166	-0.081	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-312.762	-312.843	-0.081	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.670	-324.750	-0.081	(0)
S (6)	2.505e-04					
SO4-2	2.364e-04	1.981e-04	-3.626	-3.703	-0.077	(0)
CaSO4	1.137e-05	1.137e-05	-4.944	-4.944	0.000	(0)
MgSO4	2.378e-06	2.378e-06	-5.624	-5.624	0.000	(0)
NaSO4-	1.271e-07	1.217e-07	-6.896	-6.915	-0.019	(0)
KSO4-	9.346e-08	8.948e-08	-7.029	-7.048	-0.019	(0)
CuSO4	6.474e-08	6.474e-08	-7.189	-7.189	0.000	(0)
MnSO4	2.777e-08	2.777e-08	-7.556	-7.556	0.000	(0)
HSO4-	7.166e-09	6.858e-09	-8.145	-8.164	-0.019	(0)
ZnSO4	3.978e-09	3.978e-09	-8.400	-8.400	0.000	(0)
AlSO4+	1.964e-10	1.880e-10	-9.707	-9.726	-0.019	(0)
PbSO4	1.768e-10	1.768e-10	-9.753	-9.753	0.000	(0)
NH4SO4-	9.231e-11	8.836e-11	-10.035	-10.054	-0.019	(0)
CdSO4	4.354e-11	4.354e-11	-10.361	-10.361	0.000	(0)
FeSO4	3.516e-11	3.516e-11	-10.454	-10.454	0.000	(0)
Zn (SO4) 2-2	8.267e-12	6.864e-12	-11.083	-11.163	-0.081	(0)
UO2SO4	7.687e-12	7.687e-12	-11.114	-11.114	0.000	(0)
Al (SO4) 2-	4.169e-13	3.990e-13	-12.380	-12.399	-0.019	(0)
CoSO4	4.076e-13	4.076e-13	-12.390	-12.390	0.000	(0)
Pb (SO4) 2-2	2.542e-13	2.110e-13	-12.595	-12.676	-0.081	(0)
Cd (SO4) 2-2	1.401e-13	1.164e-13	-12.853	-12.934	-0.081	(0)
NiSO4	6.596e-14	6.596e-14	-13.181	-13.181	0.000	(0)
CrOHSO4	4.841e-14	4.841e-14	-13.315	-13.315	0.000	(0)
UO2 (SO4) 2-2	2.418e-14	2.008e-14	-13.617	-13.697	-0.081	(0)
CrSO4+	8.024e-16	7.659e-16	-15.096	-15.116	-0.020	(0)
FeSO4+	4.948e-16	4.737e-16	-15.306	-15.325	-0.019	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VOSO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
Fe (SO4) 2-	2.102e-18	2.006e-18	-17.677	-17.698	-0.020	(0)
Ni (SO4) 2-2	5.212e-19	4.327e-19	-18.283	-18.364	-0.081	(0)
HgSO4	2.395e-21	2.395e-21	-20.621	-20.621	0.000	(0)
Cr2 (OH) 2SO4+2	5.426e-24	4.505e-24	-23.265	-23.346	-0.081	(0)
Cr2 (OH) 2 (SO4) 2	5.302e-26	5.302e-26	-25.276	-25.276	0.000	(0)
CrO3SO4-2	7.152e-29	5.938e-29	-28.146	-28.226	-0.081	(0)
VSO4+	1.353e-31	1.291e-31	-30.869	-30.889	-0.020	(0)
U (SO4) 2	8.180e-38	8.180e-38	-37.087	-37.087	0.000	(0)
USO4+2	6.261e-38	5.198e-38	-37.203	-37.284	-0.081	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-75.140	-75.160	-0.020	(0)
Sb (3)	7.941e-21					
Sb (OH) 3	4.018e-21	4.018e-21	-20.396	-20.396	0.000	(0)
HSbO2	3.923e-21	3.923e-21	-20.406	-20.406	0.000	(0)
Sb (OH) 2F	6.751e-26	6.751e-26	-25.171	-25.171	0.000	(0)
SbOF	6.639e-26	6.639e-26	-25.178	-25.178	0.000	(0)
Sb (OH) 2+	3.621e-26	3.456e-26	-25.441	-25.461	-0.020	(0)
SbO2-	1.879e-26	1.794e-26	-25.726	-25.746	-0.020	(0)
SbO+	1.248e-26	1.192e-26	-25.904	-25.924	-0.020	(0)
Sb (OH) 4-	1.077e-26	1.028e-26	-25.968	-25.988	-0.020	(0)
Sb2S4-2	0.000e+00	0.000e+00	-324.670	-324.750	-0.081	(0)
Sb (5)	3.998e-10					
SbO3-	3.993e-10	3.812e-10	-9.399	-9.419	-0.020	(0)
Sb (OH) 6-	4.660e-13	4.459e-13	-12.332	-12.351	-0.019	(0)
SbO2+	1.437e-23	1.372e-23	-22.843	-22.863	-0.020	(0)
Se (-2)	0.000e+00					
HSe-	0.000e+00	0.000e+00	-41.316	-41.337	-0.020	(0)
H2Se	0.000e+00	0.000e+00	-43.897	-43.897	0.000	(0)
MnSe	0.000e+00	0.000e+00	-46.374	-46.374	0.000	(0)
Se-2	0.000e+00	0.000e+00	-49.805	-49.886	-0.081	(0)
Se (4)	3.487e-09					
HSeO3-	3.442e-09	3.286e-09	-8.463	-8.483	-0.020	(0)
SeO3-2	4.449e-11	3.694e-11	-10.352	-10.433	-0.081	(0)
H2SeO3	4.965e-13	4.965e-13	-12.304	-12.304	0.000	(0)
FeHSeO3+2	2.228e-21	1.850e-21	-20.652	-20.733	-0.081	(0)
Cd (SeO3) 2-2	1.269e-24	1.054e-24	-23.896	-23.977	-0.081	(0)
Se (6)	4.372e-13					
SeO4-2	4.371e-13	3.663e-13	-12.359	-12.436	-0.077	(0)

MnSeO4	7.772e-17	7.772e-17	-16.109	-16.109	0.000	(0)
HSeO4-	6.812e-18	6.502e-18	-17.167	-17.187	-0.020	(0)
ZnSeO4	5.207e-18	5.207e-18	-17.283	-17.283	0.000	(0)
CdSeO4	6.394e-20	6.394e-20	-19.194	-19.194	0.000	(0)
CoSeO4	1.893e-21	1.893e-21	-20.723	-20.723	0.000	(0)
NiSeO4	2.859e-22	2.859e-22	-21.544	-21.544	0.000	(0)
Zn (SeO4) 2-2	2.329e-30	1.934e-30	-29.633	-29.714	-0.081	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-55.297	-55.479	-0.182	(0)
U (4)	9.528e-22					
U (OH) 5-	9.394e-22	8.967e-22	-21.027	-21.047	-0.020	(0)
U (OH) 4	1.330e-23	1.330e-23	-22.876	-22.876	0.000	(0)
U (OH) 3+	1.805e-26	1.723e-26	-25.744	-25.764	-0.020	(0)
U (OH) 2+2	3.398e-30	2.821e-30	-29.469	-29.550	-0.081	(0)
UF3+	7.695e-33	7.346e-33	-32.114	-32.134	-0.020	(0)
UF2+2	1.838e-33	1.526e-33	-32.736	-32.816	-0.081	(0)
UOH+3	7.152e-35	4.706e-35	-34.146	-34.327	-0.182	(0)
UF4	2.446e-35	2.446e-35	-34.612	-34.612	0.000	(0)
UF+3	6.068e-36	3.993e-36	-35.217	-35.399	-0.182	(0)
U (SO4) 2	8.180e-38	8.180e-38	-37.087	-37.087	0.000	(0)
USO4+2	6.261e-38	5.198e-38	-37.203	-37.284	-0.081	(0)
UF5-	3.083e-38	2.943e-38	-37.511	-37.531	-0.020	(0)
UF6-2	3.251e-40	2.699e-40	-39.488	-39.569	-0.081	(0)
U+4	1.387e-40	0.000e+00	-39.858	-40.181	-0.323	(0)
UC1+3	0.000e+00	0.000e+00	-42.745	-42.927	-0.182	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-159.844	-161.480	-1.636	(0)
U (5)	5.159e-15					
UO2+	5.159e-15	4.925e-15	-14.287	-14.308	-0.020	(0)
U (6)	1.213e-08					
UO2 (CO3) 2-2	6.567e-09	5.452e-09	-8.183	-8.263	-0.081	(0)
UO2CO3	5.281e-09	5.281e-09	-8.277	-8.277	0.000	(0)
UO2F+	1.126e-10	1.074e-10	-9.949	-9.969	-0.020	(0)
UO2OH+	9.611e-11	9.174e-11	-10.017	-10.037	-0.020	(0)
UO2+2	3.059e-11	2.563e-11	-10.514	-10.591	-0.077	(0)
UO2 (CO3) 3-4	2.976e-11	1.414e-11	-10.526	-10.850	-0.323	(0)
UO2F2	9.410e-12	9.410e-12	-11.026	-11.026	0.000	(0)
UO2SO4	7.687e-12	7.687e-12	-11.114	-11.114	0.000	(0)
UO2F3-	7.519e-14	7.177e-14	-13.124	-13.144	-0.020	(0)
UO2 (SO4) 2-2	2.418e-14	2.008e-14	-13.617	-13.697	-0.081	(0)
(UO2) 2 (OH) 2+2	1.682e-14	1.397e-14	-13.774	-13.855	-0.081	(0)
UO2C1+	1.559e-15	1.488e-15	-14.807	-14.827	-0.020	(0)
(UO2) 3 (OH) 5+	8.231e-16	7.857e-16	-15.085	-15.105	-0.020	(0)
UO2F4-2	2.085e-17	1.731e-17	-16.681	-16.762	-0.081	(0)
UO2NO3+	6.173e-21	5.893e-21	-20.210	-20.230	-0.020	(0)
V (2)	0.000e+00					
V+2	0.000e+00	0.000e+00	-40.591	-40.671	-0.081	(0)
VOH+	0.000e+00	0.000e+00	-40.687	-40.708	-0.020	(0)
V (3)	2.559e-14					
V (OH) 3	2.559e-14	2.559e-14	-13.592	-13.592	0.000	(0)
V (OH) 2+	6.135e-24	5.856e-24	-23.212	-23.232	-0.020	(0)
VOH+2	2.369e-26	1.967e-26	-25.625	-25.706	-0.081	(0)
V+3	2.098e-30	1.381e-30	-29.678	-29.860	-0.182	(0)
VSO4+	1.353e-31	1.291e-31	-30.869	-30.889	-0.020	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-50.289	-50.612	-0.323	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-50.305	-50.487	-0.182	(0)
V (4)	5.199e-16					
V (OH) 3+	4.178e-16	3.988e-16	-15.379	-15.399	-0.020	(0)
VO+2	8.469e-17	7.032e-17	-16.072	-16.153	-0.081	(0)
VOF+	1.342e-17	1.281e-17	-16.872	-16.893	-0.020	(0)
VOSO4	3.837e-18	3.837e-18	-17.416	-17.416	0.000	(0)
VOF2	1.458e-19	1.458e-19	-18.836	-18.836	0.000	(0)
VOC1+	7.398e-21	7.062e-21	-20.131	-20.151	-0.020	(0)
VOF3-	1.646e-22	1.571e-22	-21.784	-21.804	-0.020	(0)
VOF4-2	2.319e-26	1.926e-26	-25.635	-25.715	-0.081	(0)
H2V2O4+2	9.603e-27	7.973e-27	-26.018	-26.098	-0.081	(0)
V (5)	9.416e-09					
H2VO4-	9.305e-09	8.882e-09	-8.031	-8.051	-0.020	(0)
HVO4-2	7.587e-11	6.299e-11	-10.120	-10.201	-0.081	(0)

H3VO4	3.146e-11	3.146e-11	-10.502	-10.502	0.000	(0)
H3V2O7-	1.890e-12	1.804e-12	-11.724	-11.744	-0.020	(0)
VO2+	2.324e-14	2.223e-14	-13.634	-13.653	-0.019	(0)
VO2F	1.184e-15	1.184e-15	-14.927	-14.927	0.000	(0)
HV2O7-3	2.881e-16	1.896e-16	-15.540	-15.722	-0.182	(0)
VO2SO4-	1.102e-16	1.052e-16	-15.958	-15.978	-0.020	(0)
VO2F2-	1.368e-17	1.305e-17	-16.864	-16.884	-0.020	(0)
VO4-3	1.355e-18	8.914e-19	-17.868	-18.050	-0.182	(0)
V3O9-3	1.115e-18	7.339e-19	-17.953	-18.134	-0.182	(0)
V2O7-4	3.032e-20	1.441e-20	-19.518	-19.841	-0.323	(0)
VO2F3-2	5.956e-21	4.945e-21	-20.225	-20.306	-0.081	(0)
V4O12-4	5.719e-24	2.717e-24	-23.243	-23.566	-0.323	(0)
VO2NO3	1.296e-24	1.296e-24	-23.888	-23.888	0.000	(0)
VO2F4-3	1.123e-25	7.388e-26	-24.950	-25.131	-0.182	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.171	-55.676	-0.505	(0)
H2V10O28-4	0.000e+00	0.000e+00	-56.596	-56.919	-0.323	(0)
V10O28-6	0.000e+00	0.000e+00	-56.685	-57.412	-0.727	(0)
Zn	1.153e-07					
Zn+2	1.095e-07	9.177e-08	-6.961	-7.037	-0.077	(0)
ZnSO4	3.978e-09	3.978e-09	-8.400	-8.400	0.000	(0)
ZnHCO3+	1.189e-09	1.135e-09	-8.925	-8.945	-0.020	(0)
ZnOH+	2.733e-10	2.609e-10	-9.563	-9.584	-0.020	(0)
ZnCO3	2.733e-10	2.733e-10	-9.563	-9.563	0.000	(0)
ZnF+	5.825e-11	5.560e-11	-10.235	-10.255	-0.020	(0)
ZnCl+	8.625e-12	8.252e-12	-11.064	-11.083	-0.019	(0)
Zn(SO4)2-2	8.267e-12	6.864e-12	-11.083	-11.163	-0.081	(0)
Zn(OH)2	1.175e-12	1.175e-12	-11.930	-11.930	0.000	(0)
ZnOHCl	3.071e-13	3.071e-13	-12.513	-12.513	0.000	(0)
ZnCl2	4.682e-16	4.682e-16	-15.330	-15.330	0.000	(0)
Zn(OH)3-	1.755e-16	1.675e-16	-15.756	-15.776	-0.020	(0)
ZnNO3+	2.782e-17	2.656e-17	-16.556	-16.576	-0.020	(0)
ZnSeO4	5.207e-18	5.207e-18	-17.283	-17.283	0.000	(0)
ZnCl3-	1.391e-20	1.331e-20	-19.857	-19.876	-0.019	(0)
Zn(OH)4-2	2.283e-22	1.896e-22	-21.641	-21.722	-0.081	(0)
ZnCl4-2	2.838e-25	2.383e-25	-24.547	-24.623	-0.076	(0)
Zn(NO3)2	6.105e-28	6.105e-28	-27.214	-27.214	0.000	(0)
Zn(SeO4)2-2	2.329e-30	1.934e-30	-29.633	-29.714	-0.081	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-153.979	-153.999	-0.020	(0)
Zn(HS)2	0.000e+00	0.000e+00	-154.440	-154.440	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-231.251	-231.272	-0.020	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-234.720	-234.801	-0.081	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-312.762	-312.843	-0.081	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co(NH3)5Cl)(NO3)2	-72.15	-65.86	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-59.38	-54.87	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-66.61	-54.87	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-90.21	-72.28	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-75.83	-55.80	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-35.78	-35.38	0.40	(NH4)2CrO4
(NH4)2SeO4	-27.65	-27.20	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.36	9.44	10.80	Al(OH)3
Al2(MoO4)3	-44.69	-42.32	2.37	Al2(MoO4)3
Al2O3	-0.77	18.88	19.65	Al2O3
Al4(OH)10SO4	-1.55	21.15	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-9.07	-4.27	4.80	AlAsO4:2H2O
AlOHSO4	-3.94	-7.17	-3.23	AlOHSO4
AlSb	-154.29	-88.67	65.62	AlSb
Alunite	-1.24	-2.64	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.65	-12.44	-7.79	PbSO4
Anhydrite	-2.94	-7.30	-4.36	CaSO4
Anilite	-57.73	-89.61	-31.88	Cu0.25Cu1.5S
Antlerite	-4.23	4.56	8.79	Cu3(OH)4SO4
Aragonite	-2.59	-10.89	-8.30	CaCO3
Arsenolite	-80.10	-82.86	-2.76	As4O6

Artinite	-12.35	-2.75	9.60	MgCO ₃ :Mg (OH) 2:3H ₂ O
As ₂ O ₅	-34.12	-27.41	6.71	As ₂ O ₅
Atacamite	-4.18	3.21	7.39	Cu ₂ (OH) 3Cl
Azurite	-2.30	-19.21	-16.91	Cu ₃ (OH) 2 (CO ₃) 2
Ba (OH) 2:8H ₂ O	-18.45	5.95	24.39	Ba (OH) 2:8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-18.38	-2.51	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) 2	-0.66	-9.57	-8.91	Ba ₃ (AsO ₄) 2
Ba ₃ (VO ₄) 2:4H ₂ O	-29.50	3.44	32.94	Ba ₃ (VO ₄) 2:4H ₂ O
BaCrO ₄	-17.90	-27.57	-9.67	BaCrO ₄
BaF ₂	-10.17	-15.99	-5.82	BaF ₂
BaMoO ₄	-7.49	-14.45	-6.96	BaMoO ₄
Barite	-0.68	-10.66	-9.98	BaSO ₄
BaS	-96.79	-80.61	16.18	BaS
BaSeO ₃	-10.82	-8.99	1.83	BaSeO ₃
BaSeO ₄	-11.93	-19.39	-7.46	BaSeO ₄
Bianchite	-8.98	-10.74	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-10.74	7.35	18.09	MnO ₂
Bixbyite	-10.55	-11.20	-0.64	Mn ₂ O ₃
BlaubleiI	-56.69	-80.85	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-57.61	-84.89	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.86	9.44	8.58	AlOOH
Breithauptite	-65.51	-84.03	-18.52	NiSb
Brochantite	-3.60	11.62	15.22	Cu ₄ (OH) 6SO ₄
Brucite	-8.12	8.72	16.84	Mg (OH) 2
Bunsenite	-11.32	1.12	12.45	NiO
Ca (VO ₃) 2	-10.76	-5.10	5.66	Ca (VO ₃) 2
Ca ₂ V ₂ O ₇	-13.30	4.20	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-17.36	4.20	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) 2:4H ₂ O	-21.81	0.49	22.30	Ca ₃ (AsO ₄) 2:4H ₂ O
Ca ₃ (VO ₄) 2	-25.46	13.50	38.96	Ca ₃ (VO ₄) 2
Ca ₃ (VO ₄) 2:4H ₂ O	-26.36	13.50	39.86	Ca ₃ (VO ₄) 2:4H ₂ O
Ca ₃ Sb ₂	-311.29	-168.32	142.97	Ca ₃ Sb ₂
CaCrO ₄	-21.95	-24.22	-2.27	CaCrO ₄
Calcite	-2.41	-10.89	-8.48	CaCO ₃
Calomel	-11.86	-29.77	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-3.15	-11.10	-7.95	CaMoO ₄
Carnotite	-2.87	-2.64	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-8.45	-5.63	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-13.02	-16.04	-3.02	CaSeO ₄ :2H ₂ O
Cd (BO ₂) 2	-18.67	-8.83	9.84	Cd (BO ₂) 2
Cd (OH) 2	-9.77	3.87	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-9.86	3.87	13.73	Cd (OH) 2
Cd ₃ (OH) 2 (SO ₄) 2	-28.30	-21.59	6.71	Cd ₃ (OH) 2 (SO ₄) 2
Cd ₃ (OH) 4SO ₄	-27.54	-4.98	22.56	Cd ₃ (OH) 4SO ₄
Cd ₄ (OH) 6SO ₄	-29.51	-1.11	28.40	Cd ₄ (OH) 6SO ₄
CdCl ₂	-17.26	-17.92	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-16.23	-17.92	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-16.01	-17.92	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-16.85	-18.06	-1.21	CdF ₂
Cdmetal (alpha)	-35.55	-22.03	13.51	Cd
Cdmetal (gamma)	-35.65	-22.03	13.62	Cd
CdMoO ₄	-2.38	-16.53	-14.15	CdMoO ₄
CdOHC1	-10.56	-7.02	3.54	CdOHC1
CdSb	-80.93	-81.28	-0.35	CdSb
CdSe	-23.71	-43.91	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-19.61	-21.46	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-12.56	-12.73	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-11.01	-12.73	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-10.86	-12.73	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-2.90	-16.03	-13.13	PbCO ₃
CH ₄ (g)	-82.76	-123.81	-41.05	CH ₄
Chalcanthite	-6.91	-9.55	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-58.06	-92.98	-34.92	Cu ₂ S
Chalcopyrite	-127.04	-162.31	-35.27	CuFeS ₂
Cinnabar	-53.50	-99.19	-45.69	HgS
Claudetite	-79.79	-82.86	-3.06	As ₄ O ₆
Clausthalite	-16.53	-43.63	-27.10	PbSe
Co (BO ₂) 2	-37.86	-10.79	27.07	Co (BO ₂) 2

Co (OH) 2	-11.18	1.91	13.09	Co (OH) 2
Co (OH) 3	-15.22	-17.53	-2.31	Co (OH) 3
CO2 (g)	-2.04	-20.19	-18.15	CO2
Co3 (AsO4) 2	-34.70	-21.67	13.03	Co3 (AsO4) 2
Co3O4	-22.66	-33.15	-10.50	Co3O4
CoCl2	-28.15	-19.88	8.27	CoCl2
CoCl2:6H2O	-22.42	-19.88	2.54	CoCl2:6H2O
CoCO3	-8.29	-18.27	-9.98	CoCO3
CoF2	-18.43	-20.02	-1.60	CoF2
CoF3	-48.98	-50.44	-1.46	CoF3
CoFe2O4	12.80	9.28	-3.53	CoFe2O4
CoMoO4	-10.72	-18.49	-7.76	CoMoO4
CoO	-11.67	1.91	13.59	CoO
CoS (alpha)	-77.21	-84.65	-7.44	CoS
CoS (beta)	-73.58	-84.65	-11.07	CoS
CoSe	-29.67	-45.87	-16.20	CoSe
CoSeO3	-14.34	-13.02	1.32	CoSeO3
CoSeO4:6H2O	-21.89	-23.42	-1.53	CoSeO4:6H2O
CoSO4	-17.49	-14.69	2.80	CoSO4
CoSO4:6H2O	-12.22	-14.69	-2.47	CoSO4:6H2O
Cotunnite	-12.85	-17.63	-4.78	PbCl2
Covellite	-57.21	-79.51	-22.30	CuS
Cr (OH) 2	-25.82	-15.00	10.82	Cr (OH) 2
Cr (OH) 3	-6.33	-5.00	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-4.25	-5.00	-0.75	Cr (OH) 3
Cr2O3	-7.64	-10.00	-2.36	Cr2O3
CrCl2	-50.89	-36.80	14.09	CrCl2
CrCl3	-52.80	-37.69	15.11	CrCl3
CrF3	-26.57	-37.90	-11.34	CrF3
Crmetal	-71.39	-40.91	30.48	Cr
CrO3	-30.31	-33.52	-3.21	CrO3
Cryolite	-15.00	-48.84	-33.84	Na3AlF6
Cu (OH) 2	-1.62	7.06	8.67	Cu (OH) 2
Cu (SbO3) 2	-27.14	18.07	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-11.53	-2.28	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-59.38	-94.26	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-8.40	-54.20	-45.80	Cu2Se
Cu2SO4	-21.07	-23.02	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-12.35	-6.25	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-65.13	-107.73	-42.59	Cu3Sb
Cu3Se2	-31.44	-94.93	-63.49	Cu3Se2
CuCO3	-1.63	-13.13	-11.50	CuCO3
CuCrO4	-21.02	-26.46	-5.44	CuCrO4
CuF	-9.27	-14.17	-4.91	CuF
CuF2	-16.00	-14.88	1.12	CuF2
CuF2:2H2O	-10.33	-14.88	-4.55	CuF2:2H2O
Cumetal	-7.40	-16.16	-8.76	Cu
CuMoO4	-0.27	-13.34	-13.08	CuMoO4
CuOCuSO4	-12.80	-2.49	10.30	CuOCuSO4
Cupricferrite	8.43	14.42	5.99	CuFe2O4
Cuprite	-5.01	-6.41	-1.41	Cu2O
Cuprousferrite	9.39	0.47	-8.92	CuFeO2
CuSe	-7.63	-40.73	-33.10	CuSe
CuSe2	-29.25	-62.61	-33.37	CuSe2
CuSeO3:2H2O	-8.39	-7.88	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.84	-18.28	-2.44	CuSeO4:5H2O
CuSO4	-12.49	-9.55	2.94	CuSO4
Diaspore	2.57	9.44	6.87	AlOOH
Djurleite	-58.17	-92.09	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-5.81	-22.35	-16.54	CaMg (CO3) 2
Dolomite (ordered)	-5.26	-22.35	-17.09	CaMg (CO3) 2
Epsomite	-5.76	-7.88	-2.13	MgSO4:7H2O
Fe (OH) 2	-9.80	3.76	13.56	Fe (OH) 2
Fe (OH) 2.7Cl1.3	3.45	0.41	-3.04	Fe (OH) 2.7Cl1.3
Fe (VO3) 2	-6.92	-10.64	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.13	-7.57	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.81	-37.44	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-38.72	-42.45	-3.73	Fe2 (SO4) 3

Fe3(OH)8	-9.10	11.12	20.22	Fe3(OH)8
FeAsO4:2H2O	-10.43	-10.03	0.40	FeAsO4:2H2O
FeCr2O4	-13.43	-6.23	7.20	FeCr2O4
FeMoO4	-6.55	-16.64	-10.09	FeMoO4
Ferrihydrite	0.49	3.68	3.19	Fe(OH)3
Ferroselite	-47.31	-65.91	-18.60	FeSe2
FeS(ppt)	-79.85	-82.80	-2.95	FeS
FeSe	-33.03	-44.03	-11.00	FeSe
Fix_pe	-6.50	-6.50	0.00	e-
Fluorite	-2.14	-12.64	-10.50	CaF2
Galena	-68.43	-82.40	-13.97	PbS
Gibbsite	1.15	9.44	8.29	Al(OH)3
Goethite	3.19	3.68	0.49	FeOOH
Goslarite	-8.73	-10.74	-2.01	ZnSO4:7H2O
Greenockite	-68.33	-82.69	-14.36	CdS
Greigite	-290.09	-335.13	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-2.69	-7.30	-4.61	CaSO4:2H2O
H-Jarosite	-10.07	-22.17	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.52	-20.40	-12.88	H2MoO4
H2S(g)	-78.55	-86.56	-8.01	H2S
H2Se(g)	-42.83	-47.79	-4.96	H2Se
Halite	-9.99	-8.39	1.60	NaCl
Hausmannite	-14.73	46.30	61.03	Mn3O4
Hematite	8.78	7.36	-1.42	Fe2O3
Hercynite	-0.25	22.64	22.89	FeAl2O4
Hg(CH3)2(g)	-186.53	-260.24	-73.71	Hg(CH3)2
Hg(g)	-9.07	-16.94	-7.87	Hg
Hg(OH)2	-9.13	-12.63	-3.50	Hg(OH)2
Hg2(g)	-18.92	-33.88	-14.96	Hg2
Hg2(OH)2	-13.24	-7.98	5.26	Hg2(OH)2
Hg2CO3	-12.11	-28.16	-16.05	Hg2CO3
Hg2CrO4	-32.79	-41.49	-8.70	Hg2CrO4
Hg2F2	-19.55	-29.91	-10.36	Hg2F2
Hg2S	-82.86	-94.54	-11.68	Hg2S
Hg2SeO3	-18.25	-22.91	-4.66	Hg2SeO3
Hg2SO4	-18.45	-24.58	-6.13	Hg2SO4
Hg3O2CO3	-28.39	-58.07	-29.68	Hg3O2CO3
HgCl(g)	-34.38	-14.88	19.50	HgCl
HgCl2	-13.16	-34.42	-21.26	HgCl2
HgF(g)	-47.63	-14.96	32.68	HgF
HgF2(g)	-47.13	-34.56	12.57	HgF2
Hgmetal(l)	-3.49	-16.94	-13.45	Hg
HgSe	-4.72	-60.42	-55.69	HgSe
HgSeO3	-15.13	-27.56	-12.43	HgSeO3
HgSO4	-19.81	-29.23	-9.42	HgSO4
Huntite	-15.32	-45.29	-29.97	CaMg3(CO3)4
Hydrocerrusite	-9.12	-27.89	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-28.38	-37.15	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.34	-21.51	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.11	-19.91	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-45.28	-62.52	-17.24	K2Cr2O7
K2CrO4	-28.49	-29.01	-0.51	K2CrO4
K2MoO4	-19.15	-15.89	3.26	K2MoO4
K2SeO4	-20.10	-20.83	-0.73	K2SeO4
Langite	-5.87	11.62	17.49	Cu4(OH)6SO4:H2O
Larnakite	-7.85	-8.28	-0.43	PbO:PbSO4
Laurionite	-7.36	-6.73	0.62	PbOHCl
Lepidocrocite	2.31	3.68	1.37	FeOOH
Lime	-23.40	9.30	32.70	CaO
Litharge	-8.53	4.16	12.69	PbO
Mackinawite	-79.20	-82.80	-3.60	FeS
Maghemite	0.98	7.36	6.39	Fe2O3
Magnesianoferrite	-0.78	16.08	16.86	Fe2MgO4
Magnesite	-4.01	-11.47	-7.46	MgCO3
Magnetite	7.72	11.12	3.40	Fe3O4
Malachite	-0.77	-6.08	-5.31	Cu2(OH)2CO3
Manganite	-5.59	19.75	25.34	MnOOH

Massicot	-8.73	4.16	12.89	PbO
Matlockite	-8.73	-17.70	-8.97	PbClF
Melanothallite	-21.00	-14.74	6.26	CuCl ₂
Melanterite	-10.64	-12.84	-2.21	FeSO ₄ ·7H ₂ O
Metacinnabar	-54.10	-99.19	-45.09	HgS
Mg(OH) ₂ (active)	-10.07	8.72	18.79	Mg(OH) ₂
Mg(VO ₃) ₂	-16.96	-5.68	11.28	Mg(VO ₃) ₂
Mg ₂ Sb ₃	-286.81	-212.12	74.68	Mg ₂ Sb ₃
Mg ₂ V ₂ O ₇	-23.32	3.04	26.36	Mg ₂ V ₂ O ₇
MgCr ₂ O ₄	-17.47	-1.27	16.20	MgCr ₂ O ₄
MgCrO ₄	-30.18	-24.80	5.38	MgCrO ₄
MgF ₂	-5.09	-13.22	-8.13	MgF ₂
MgMoO ₄	-9.83	-11.68	-1.85	MgMoO ₄
MgSeO ₃ ·6H ₂ O	-9.27	-6.21	3.06	MgSeO ₃ ·6H ₂ O
MgSeO ₄ ·6H ₂ O	-15.42	-16.62	-1.20	MgSeO ₄ ·6H ₂ O
Minium	-35.13	38.39	73.52	Pb ₃ O ₄
Mirabilite	-10.47	-11.59	-1.11	Na ₂ SO ₄ ·10H ₂ O
Mn(VO ₃) ₂	-12.51	-7.61	4.90	Mn(VO ₃) ₂
Mn ₂ (SO ₄) ₃	-55.30	-61.01	-5.71	Mn ₂ (SO ₄) ₃
Mn ₂ Sb	-158.54	-97.46	61.08	Mn ₂ Sb
Mn ₃ (AsO ₄) ₂ ·8H ₂ O	-19.52	-7.02	12.50	Mn ₃ (AsO ₄) ₂ ·8H ₂ O
MnCl ₂ ·4H ₂ O	-17.71	-15.00	2.72	MnCl ₂ ·4H ₂ O
MnS (grn)	-79.93	-79.76	0.17	MnS
MnS (pnk)	-83.10	-79.76	3.34	MnS
MnSb	-100.80	-103.71	-2.91	MnSb
MnSe	-44.49	-40.99	3.50	MnSe
MnSeO ₃	-9.27	-8.14	1.13	MnSeO ₃
MnSeO ₃ ·2H ₂ O	-9.12	-8.14	0.98	MnSeO ₃ ·2H ₂ O
MnSeO ₄ ·5H ₂ O	-16.49	-18.54	-2.05	MnSeO ₄ ·5H ₂ O
MnSO ₄	-12.39	-9.81	2.58	MnSO ₄
Montepontite	-11.23	3.87	15.10	CdO
Montroydite	-8.99	-12.63	-3.64	HgO
MoO ₃	-12.40	-20.40	-8.00	MoO ₃
Morenosite	-13.34	-15.48	-2.14	NiSO ₄ ·7H ₂ O
MoS ₂	-149.17	-219.43	-70.26	MoS ₂
Na-Jarosite	-8.46	-19.66	-11.20	NaFe ₃ (SO ₄) ₂ (OH) ₆
Na ₂ Cr ₂ O ₇	-52.12	-62.02	-9.90	Na ₂ Cr ₂ O ₇
Na ₂ CrO ₄	-31.43	-28.50	2.93	Na ₂ CrO ₄
Na ₂ Mo ₂ O ₇	-19.19	-35.78	-16.60	Na ₂ Mo ₂ O ₇
Na ₂ MoO ₄	-16.87	-15.38	1.49	Na ₂ MoO ₄
Na ₂ MoO ₄ ·2H ₂ O	-16.61	-15.38	1.22	Na ₂ MoO ₄ ·2H ₂ O
Na ₂ SeO ₃ ·5H ₂ O	-20.22	-9.92	10.30	Na ₂ SeO ₃ ·5H ₂ O
Na ₂ SeO ₄	-21.60	-20.32	1.28	Na ₂ SeO ₄
Na ₃ Sb	-185.03	-90.58	94.45	Na ₃ Sb
Na ₃ VO ₄	-36.36	0.33	36.68	Na ₃ VO ₄
Na ₄ V ₂ O ₇	-41.77	-4.37	37.40	Na ₄ V ₂ O ₇
Nantokite	-7.37	-14.10	-6.73	CuCl
NaSb	-92.86	-69.70	23.17	NaSb
Natron	-13.86	-15.17	-1.31	Na ₂ CO ₃ ·10H ₂ O
NaVO ₃	-8.55	-4.69	3.86	NaVO ₃
Nesquehonite	-6.80	-11.47	-4.67	MgCO ₃ ·3H ₂ O
Ni(OH) ₂	-11.67	1.12	12.79	Ni(OH) ₂
Ni ₃ (AsO ₄) ₂ ·8H ₂ O	-39.74	-24.04	15.70	Ni ₃ (AsO ₄) ₂ ·8H ₂ O
Ni ₄ (OH) ₆ SO ₄	-44.11	-12.11	32.00	Ni ₄ (OH) ₆ SO ₄
NiCO ₃	-12.19	-19.06	-6.87	NiCO ₃
NiMoO ₄	-8.13	-19.28	-11.14	NiMoO ₄
NiS (alpha)	-79.84	-85.44	-5.60	NiS
NiS (beta)	-74.34	-85.44	-11.10	NiS
NiS (gamma)	-72.64	-85.44	-12.80	NiS
NiSe	-28.96	-46.66	-17.70	NiSe
NiSeO ₃ ·2H ₂ O	-16.62	-13.81	2.81	NiSeO ₃ ·2H ₂ O
NiSeO ₄ ·6H ₂ O	-22.69	-24.21	-1.52	NiSeO ₄ ·6H ₂ O
Nsutite	-10.15	7.35	17.50	MnO ₂
O ₂ (g)	-31.28	51.81	83.09	O ₂
Orpiment	-240.05	-301.11	-61.07	As ₂ S ₃
Otavite	-4.31	-16.31	-12.00	CdCO ₃
Pb(BO ₂) ₂	-15.06	-8.54	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.99	4.16	8.15	Pb(OH) ₂

Pb10(OH)6O(CO3)6	-70.75	-79.51	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-11.37	-2.57	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-17.86	8.32	26.19	Pb2O(OH)2
Pb2O3	-26.81	34.23	61.04	Pb2O3
Pb2OCO3	-11.31	-11.86	-0.56	Pb2OCO3
Pb2V2O7	-4.18	-6.08	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.73	-14.93	5.80	Pb3(AsO4)2
Pb3(VO4)2	-8.06	-1.92	6.14	Pb3(VO4)2
Pb3O2CO3	-18.72	-7.70	11.02	Pb3O2CO3
Pb3O2SO4	-14.80	-4.12	10.69	Pb3O2SO4
Pb4(OH)6SO4	-21.06	0.04	21.10	Pb4(OH)6SO4
Pb4O3SO4	-21.83	0.04	21.88	Pb4O3SO4
PbCrO4	-16.75	-29.35	-12.60	PbCrO4
PbF2	-10.33	-17.77	-7.44	PbF2
Pbmetal	-25.99	-21.74	4.25	Pb
PbMoO4	-0.62	-16.24	-15.62	PbMoO4
PbO:0.3H2O	-8.82	4.16	12.98	PbO:0.33H2O
PbSeO4	-14.34	-21.18	-6.84	PbSeO4
Periclase	-12.86	8.72	21.58	MgO
Phosgenite	-13.85	-33.66	-19.81	PbCl2:PbCO3
Plattnerite	-19.53	30.07	49.60	PbO2
Portlandite	-13.50	9.30	22.80	Ca(OH)2
Pyrite	-124.95	-143.46	-18.51	FeS2
Pyrochroite	-8.40	6.80	15.19	Mn(OH)2
Pyrolusite	-8.68	32.70	41.38	MnO2
Realgar	-100.48	-120.23	-19.75	AsS
Retgersite	-13.44	-15.48	-2.04	NiSO4:6H2O
Rhodochrosite	-2.81	-13.39	-10.58	MnCO3
Rutherfordine	-3.38	-17.88	-14.50	UO2CO3
Sb(OH)3	-13.29	-20.40	-7.11	Sb(OH)3
Sb2O4	-18.29	-14.89	3.40	Sb2O4
Sb2O5	-27.94	-37.60	-9.67	Sb2O5
Sb2Se3	-116.40	-184.15	-67.76	Sb2Se3
Sb4O6(cubic)	-63.32	-81.58	-18.26	Sb4O6
Sb4O6(orth)	-63.68	-81.58	-17.90	Sb4O6
SbCl3	-53.66	-53.09	0.57	SbCl3
SbF3	-43.08	-53.30	-10.23	SbF3
Sbmetal	-47.56	-59.25	-11.69	Sb
SbO2	-3.93	-31.75	-27.82	SbO2
Schoepite	-3.68	2.31	5.99	UO2(OH)2:H2O
Semetal(am)	-14.77	-21.88	-7.11	Se
Semetal(hex)	-14.17	-21.88	-7.71	Se
Senarmontite	-28.43	-40.79	-12.37	Sb2O3
SeO2	-15.06	-14.93	0.12	SeO2
SeO3	-46.38	-25.34	21.04	SeO3
Siderite	-6.19	-16.43	-10.24	FeCO3
Smithsonite	-4.32	-14.32	-10.00	ZnCO3
Sphalerite	-69.25	-80.70	-11.45	ZnS
Spinel	-9.25	27.60	36.85	MgAl2O4
Stibnite	-250.02	-300.48	-50.46	Sb2S3
Sulfur	-58.51	-60.66	-2.14	S
Tenorite	-0.59	7.06	7.64	CuO
Thenardite	-11.91	-11.59	0.32	Na2SO4
Thermonatrite	-15.81	-15.17	0.64	Na2CO3:H2O
Tyuyamunite	-4.56	-0.48	4.08	Ca(UO2)2(VO4)2
U3O8	-12.41	8.67	21.08	U3O8
U3Sb4	-587.95	-435.57	152.38	U3Sb4
U4O9	-28.59	-31.61	-3.02	U4O9
UF4	-28.71	-58.25	-29.54	UF4
UF4:2.5H2O	-25.53	-58.25	-32.72	UF4:2.5H2O
UO2(am)	-15.31	-14.38	0.93	UO2
UO2(NO3)2	-42.62	-30.47	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-35.32	-30.47	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.86	-30.47	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-32.51	-30.47	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.30	2.31	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.78	-23.03	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3

Uraninite	-9.71	-14.38	-4.67	UO2
USb2	-223.49	-193.91	29.58	USb2
V(OH)3	-18.10	-10.51	7.59	V(OH)3
V2O5	-13.04	-14.40	-1.36	V2O5
V3O5	-37.49	-35.66	1.84	V3O5
V4O7	-46.10	-38.91	7.19	V4O7
V6O13	-34.16	-95.02	-60.86	V6O13
Valentinite	-32.31	-40.79	-8.48	Sb2O3
VCl2	-64.13	-45.25	18.87	VCl2
VCl3	-66.63	-43.20	23.43	VCl3
VF4	-62.05	-47.12	14.93	VF4
Vmetal	-93.39	-49.36	44.03	V
VO	-38.22	-23.46	14.76	VO
VO(OH)2	-8.40	-3.25	5.15	VO(OH)2
VO2Cl	-20.94	-18.10	2.84	VO2Cl
VOC1	-32.56	-21.40	11.15	VOC1
VOC12	-37.81	-25.05	12.76	VOC12
VOSO4	-23.47	-19.86	3.61	VOSO4
Witherite	-5.67	-14.24	-8.57	BaCO3
Wurtzite	-71.75	-80.70	-8.95	ZnS
Zincite	-5.47	5.86	11.33	ZnO
Zincosite	-14.67	-10.74	3.93	ZnSO4
Zn(BO2)2	-15.13	-6.84	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-30.23	-26.91	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-6.34	5.86	12.20	Zn(OH)2
Zn(OH)2(am)	-6.61	5.86	12.47	Zn(OH)2
Zn(OH)2(beta)	-5.89	5.86	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-5.67	5.86	11.53	Zn(OH)2
Zn(OH)2(gamma)	-5.87	5.86	11.73	Zn(OH)2
Zn2(OH)2SO4	-12.38	-4.88	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-14.36	0.83	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-23.47	-9.82	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-34.53	-15.62	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-21.55	6.85	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-30.97	7.53	38.50	Zn5(OH)8Cl2
ZnCl2	-22.98	-15.93	7.05	ZnCl2
ZnCO3:1H2O	-4.06	-14.32	-10.26	ZnCO3:1H2O
ZnF2	-15.54	-16.07	-0.53	ZnF2
Znmetal	-45.83	-20.04	25.79	Zn
ZnMoO4	-4.41	-14.54	-10.13	ZnMoO4
ZnO(active)	-5.32	5.86	11.19	ZnO
ZnS(am)	-71.65	-80.70	-9.05	ZnS
ZnSb	-90.31	-79.29	11.01	ZnSb
ZnSe	-27.52	-41.92	-14.40	ZnSe
ZnSeO4:6H2O	-17.95	-19.47	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-10.10	-10.74	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 153.

```

      REACTION 902
      H2O      -1
      12525.85 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 905
      SAVE Solution 906
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 905. Solution after simulation 152.

Using reaction 902.

Reaction 902.

1.253e+04 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Al	2.223e-04	2.231e-04
As	1.022e-07	1.026e-07
B	1.004e-04	1.008e-04
Ba	3.012e-05	3.023e-05
C	1.632e-01	1.638e-01
Ca	7.053e-02	7.078e-02
Cd	2.639e-07	2.648e-07
Cl	8.451e-03	8.481e-03
Co	2.977e-09	2.988e-09
Cr	1.145e-09	1.149e-09
Cu	5.370e-04	5.389e-04
F	7.586e-03	7.613e-03
Fe	1.071e-05	1.075e-05
Hg	9.636e-09	9.670e-09
K	1.508e-02	1.514e-02
Mg	1.843e-02	1.850e-02
Mn	2.224e-04	2.232e-04
Mo	8.596e-06	8.626e-06
N	2.250e-05	2.258e-05
Na	2.704e-02	2.714e-02
Ni	4.848e-10	4.865e-10
Pb	7.525e-07	7.552e-07
S	5.658e-02	5.678e-02
Sb	9.030e-08	9.062e-08
Se	7.878e-07	7.906e-07
U	2.741e-06	2.750e-06
V	2.127e-06	2.134e-06
Zn	2.604e-05	2.613e-05

-----Description of solution-----

	pH	=	6.246	Charge balance
	pe	=	6.786	Adjusted to redox
equilibrium	Activity of water	=	0.995	
	Ionic strength (mol/kgw)	=	2.209e-01	
	Mass of water (kg)	=	1.004e+00	
	Total alkalinity (eq/kg)	=	9.315e-02	
	Total CO2 (mol/kg)	=	1.632e-01	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	33	
	Total H	=	1.116394e+02	

Total O = 5.642133e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
H+	7.652e-07	5.682e-07	-6.116	-6.246	-0.129	0.00
OH-	2.522e-08	1.763e-08	-7.598	-7.754	-0.156	(0)
H2O	5.551e+01	9.946e-01	1.744	-0.002	0.000	18.07
Al	2.223e-04					
AlF4-	1.550e-04	1.119e-04	-3.810	-3.951	-0.141	(0)
AlF3	6.532e-05	6.532e-05	-4.185	-4.185	0.000	(0)
AlF2+	2.051e-06	1.518e-06	-5.688	-5.819	-0.131	(0)
AlF+2	3.720e-09	1.116e-09	-8.429	-8.952	-0.523	(0)
Al (OH) 2+	1.089e-11	8.058e-12	-10.963	-11.094	-0.131	(0)
Al (OH) 4-	8.709e-12	6.288e-12	-11.060	-11.201	-0.141	(0)
AlSO4+	3.066e-12	2.213e-12	-11.513	-11.655	-0.141	(0)
Al (OH) 3	2.834e-12	2.834e-12	-11.548	-11.548	0.000	(0)
AlOH+2	1.918e-12	5.756e-13	-11.717	-12.240	-0.523	(0)
Al+3	4.757e-13	3.265e-14	-12.323	-13.486	-1.163	(0)
Al (SO4) 2-	2.868e-13	2.071e-13	-12.542	-12.684	-0.141	(0)
AlMo6O21-3	4.846e-28	3.375e-30	-27.315	-29.472	-2.157	(0)
As (3)	1.989e-19					
H3AsO3	1.986e-19	1.986e-19	-18.702	-18.702	0.000	(0)
H2AsO3-	3.112e-22	1.792e-22	-21.507	-21.747	-0.240	(0)
H4AsO3+	9.707e-26	5.590e-26	-25.013	-25.253	-0.240	(0)
HAsO3-2	2.616e-27	2.877e-28	-26.582	-27.541	-0.959	(0)
AsO3-3	2.803e-33	1.952e-35	-32.552	-34.710	-2.157	(0)
As (5)	1.022e-07					
HAsO4-2	5.139e-08	5.651e-09	-7.289	-8.248	-0.959	(0)
H2AsO4-	5.085e-08	2.928e-08	-7.294	-7.533	-0.240	(0)
AsO4-3	4.517e-12	3.145e-14	-11.345	-13.502	-2.157	(0)
H3AsO4	2.748e-12	2.891e-12	-11.561	-11.539	0.022	(0)
B	1.004e-04					
H3BO3	9.988e-05	1.051e-04	-4.001	-3.978	0.022	(0)
BF (OH) 3-	2.134e-07	1.433e-07	-6.671	-6.844	-0.173	(0)
H2BO3-	1.600e-07	1.074e-07	-6.796	-6.969	-0.173	(0)
CaH2BO3+	9.664e-08	6.490e-08	-7.015	-7.188	-0.173	(0)
BF2 (OH) 2-	4.454e-08	2.991e-08	-7.351	-7.524	-0.173	(0)
MgH2BO3+	1.647e-08	1.106e-08	-7.783	-7.956	-0.173	(0)
NaH2BO3	3.189e-09	3.189e-09	-8.496	-8.496	0.000	(0)
BaH2BO3+	3.728e-11	2.504e-11	-10.428	-10.601	-0.173	(0)
BF3OH-	3.383e-11	2.272e-11	-10.471	-10.644	-0.173	(0)
H5 (BO3) 2-	1.431e-11	9.607e-12	-10.844	-11.017	-0.173	(0)
BF4-	3.250e-13	2.182e-13	-12.488	-12.661	-0.173	(0)
H8 (BO3) 3-	1.503e-13	1.010e-13	-12.823	-12.996	-0.173	(0)
Ba	3.012e-05					
Ba+2	2.481e-05	7.543e-06	-4.605	-5.122	-0.517	(0)
BaHCO3+	5.299e-06	3.979e-06	-5.276	-5.400	-0.124	(0)
BaCO3	1.763e-08	1.763e-08	-7.754	-7.754	0.000	(0)
BaH2BO3+	3.728e-11	2.504e-11	-10.428	-10.601	-0.173	(0)
BaNO3+	1.788e-12	1.030e-12	-11.748	-11.987	-0.240	(0)
BaOH+	7.924e-13	5.803e-13	-12.101	-12.236	-0.135	(0)
BaNH3+2	2.581e-13	2.838e-14	-12.588	-13.547	-0.959	(0)
C (4)	1.632e-01					
HCO3-	7.463e-02	5.523e-02	-1.127	-1.258	-0.131	(0)
H2CO3	7.058e-02	7.058e-02	-1.151	-1.151	0.000	(0)
CaHCO3+	1.438e-02	1.080e-02	-1.842	-1.967	-0.124	(0)
MgHCO3+	2.361e-03	1.678e-03	-2.627	-2.775	-0.148	(0)
NaHCO3	5.819e-04	5.819e-04	-3.235	-3.235	0.000	(0)
CuCO3	3.459e-04	3.459e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.800e-05	4.492e-05	-4.108	-4.348	-0.240	(0)
CaCO3	7.584e-05	7.584e-05	-4.120	-4.120	0.000	(0)
Cu (CO3) 2-2	3.858e-05	4.243e-06	-4.414	-5.372	-0.959	(0)
MnHCO3+	2.711e-05	1.985e-05	-4.567	-4.702	-0.135	(0)
CO3-2	1.499e-05	4.557e-06	-4.824	-5.341	-0.517	(0)
MgCO3	1.126e-05	1.126e-05	-4.949	-4.949	0.000	(0)

		ZnHCO3+	7.931e-06	4.567e-06	-5.101	-5.340	-0.240	(0)
		BaHCO3+	5.299e-06	3.979e-06	-5.276	-5.400	-0.124	(0)
		UO2 (CO3) 3-4	2.725e-06	3.984e-10	-5.565	-9.400	-3.835	(0)
		NaCO3-	2.148e-06	1.590e-06	-5.668	-5.799	-0.131	(0)
		ZnCO3	6.857e-07	6.857e-07	-6.164	-6.164	0.000	(0)
		PbHCO3+	5.522e-07	3.180e-07	-6.258	-6.498	-0.240	(0)
		FeHCO3+	1.338e-07	1.005e-07	-6.873	-6.998	-0.124	(0)
		PbCO3	1.061e-07	1.061e-07	-6.974	-6.974	0.000	(0)
		BaCO3	1.763e-08	1.763e-08	-7.754	-7.754	0.000	(0)
		UO2 (CO3) 2-2	1.586e-08	1.744e-09	-7.800	-8.758	-0.959	(0)
		Pb (CO3) 2-2	1.269e-08	1.395e-09	-7.897	-8.855	-0.959	(0)
		CdHCO3+	6.398e-09	3.685e-09	-8.194	-8.434	-0.240	(0)
		CdCO3	3.044e-09	3.044e-09	-8.517	-8.517	0.000	(0)
		CoHCO3+	1.194e-09	6.877e-10	-8.923	-9.163	-0.240	(0)
		NiHCO3+	3.332e-10	1.919e-10	-9.477	-9.717	-0.240	(0)
		Cd (CO3) 2-2	9.351e-11	1.028e-11	-10.029	-10.988	-0.959	(0)
		UO2CO3	1.918e-11	1.918e-11	-10.717	-10.717	0.000	(0)
		CoCO3	1.233e-11	1.233e-11	-10.909	-10.909	0.000	(0)
		HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
		NiCO3	4.790e-12	4.790e-12	-11.320	-11.320	0.000	(0)
		Hg (CO3) 2-2	1.413e-12	1.554e-13	-11.850	-12.808	-0.959	(0)
		HgHCO3+	1.981e-13	1.141e-13	-12.703	-12.943	-0.240	(0)
Ca	7.053e-02							
		Ca+2	3.453e-02	1.050e-02	-1.462	-1.979	-0.517	(0)
		CaSO4	2.100e-02	2.100e-02	-1.678	-1.678	0.000	(0)
		CaHCO3+	1.438e-02	1.080e-02	-1.842	-1.967	-0.124	(0)
		CaF+	5.347e-04	3.916e-04	-3.272	-3.407	-0.135	(0)
		CaCO3	7.584e-05	7.584e-05	-4.120	-4.120	0.000	(0)
		CaH2BO3+	9.664e-08	6.490e-08	-7.015	-7.188	-0.173	(0)
		CaOH+	4.917e-09	3.692e-09	-8.308	-8.433	-0.124	(0)
		CaNO3+	1.570e-09	9.044e-10	-8.804	-9.044	-0.240	(0)
		CaNH3+2	7.169e-10	7.883e-11	-9.145	-10.103	-0.959	(0)
		Ca (NH3) 2+2	1.702e-18	1.872e-19	-17.769	-18.728	-0.959	(0)
Cd	2.639e-07							
		Cd+2	9.637e-08	2.930e-08	-7.016	-7.533	-0.517	(0)
		Cd (SO4) 2-2	6.425e-08	7.066e-09	-7.192	-8.151	-0.959	(0)
		CdSO4	5.998e-08	5.998e-08	-7.222	-7.222	0.000	(0)
		CdCl+	3.049e-08	1.756e-08	-7.516	-7.756	-0.240	(0)
		CdHCO3+	6.398e-09	3.685e-09	-8.194	-8.434	-0.240	(0)
		CdCO3	3.044e-09	3.044e-09	-8.517	-8.517	0.000	(0)
		CdF+	2.756e-09	1.587e-09	-8.560	-8.799	-0.240	(0)
		CdCl2	4.593e-10	4.593e-10	-9.338	-9.338	0.000	(0)
		Cd (CO3) 2-2	9.351e-11	1.028e-11	-10.029	-10.988	-0.959	(0)
		CdOHC1	1.269e-11	1.269e-11	-10.896	-10.896	0.000	(0)
		CdF2	1.082e-11	1.082e-11	-10.966	-10.966	0.000	(0)
		CdOH+	7.124e-12	4.102e-12	-11.147	-11.387	-0.240	(0)
		CdCl3-	3.158e-12	1.818e-12	-11.501	-11.740	-0.240	(0)
		CdNO3+	4.383e-15	2.524e-15	-14.358	-14.598	-0.240	(0)
		Cd (OH) 2	4.562e-16	4.562e-16	-15.341	-15.341	0.000	(0)
		CdSeO4	2.380e-16	2.380e-16	-15.623	-15.623	0.000	(0)
		Cd2OH+3	8.652e-17	6.024e-19	-16.063	-18.220	-2.157	(0)
		Cd (SeO3) 2-2	2.063e-18	2.269e-19	-17.685	-18.644	-0.959	(0)
		Cd (OH) 3-	8.531e-22	4.913e-22	-21.069	-21.309	-0.240	(0)
		Cd (NO3) 2	3.445e-23	3.445e-23	-22.463	-22.463	0.000	(0)
		Cd (OH) 4-2	1.289e-29	1.417e-30	-28.890	-29.849	-0.959	(0)
		CdHS+	0.000e+00	0.000e+00	-78.175	-78.414	-0.240	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.099	-150.099	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.849	-227.089	-0.240	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.823	-303.782	-0.959	(0)
Cl	8.451e-03							
		Cl-	8.450e-03	6.275e-03	-2.073	-2.202	-0.129	(0)
		MnCl+	1.943e-07	1.423e-07	-6.712	-6.847	-0.135	(0)
		CuCl+	1.803e-07	1.282e-07	-6.744	-6.892	-0.148	(0)
		ZnCl+	5.797e-08	4.121e-08	-7.237	-7.385	-0.148	(0)
		CdCl+	3.049e-08	1.756e-08	-7.516	-7.756	-0.240	(0)
		CuCl2-	1.504e-08	1.069e-08	-7.823	-7.971	-0.148	(0)
		CuCl	8.157e-09	8.157e-09	-8.088	-8.088	0.000	(0)
		HgCl2	7.785e-09	7.785e-09	-8.109	-8.109	0.000	(0)

PbCl+	2.996e-09	1.725e-09	-8.524	-8.763	-0.240	(0)
MnCl2	1.261e-09	1.261e-09	-8.899	-8.899	0.000	(0)
ZnOHC1	9.509e-10	9.509e-10	-9.022	-9.022	0.000	(0)
HgCl3-	8.483e-10	4.885e-10	-9.071	-9.311	-0.240	(0)
CdCl2	4.593e-10	4.593e-10	-9.338	-9.338	0.000	(0)
ZnCl2	4.098e-10	4.098e-10	-9.387	-9.387	0.000	(0)
HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
CuCl2	2.789e-10	2.789e-10	-9.555	-9.555	0.000	(0)
HgCl4-2	1.110e-10	1.220e-11	-9.955	-10.914	-0.959	(0)
CuCl3-2	4.987e-11	1.435e-11	-10.302	-10.843	-0.541	(0)
PbCl2	4.835e-11	4.835e-11	-10.316	-10.316	0.000	(0)
CdOHC1	1.269e-11	1.269e-11	-10.896	-10.896	0.000	(0)
CoCl+	6.034e-12	3.475e-12	-11.219	-11.459	-0.240	(0)
CdCl3-	3.158e-12	1.818e-12	-11.501	-11.740	-0.240	(0)
MnCl3-	2.976e-12	2.180e-12	-11.526	-11.662	-0.135	(0)
ZnCl3-	2.873e-12	2.043e-12	-11.542	-11.690	-0.148	(0)
NiCl+	7.855e-13	4.523e-13	-12.105	-12.345	-0.240	(0)
HgCl+	4.299e-13	2.476e-13	-12.367	-12.606	-0.240	(0)
PbCl3-	2.097e-13	1.208e-13	-12.678	-12.918	-0.240	(0)
FeCl+2	5.405e-14	1.555e-14	-13.267	-13.808	-0.541	(0)
CuCl3-	2.297e-14	1.633e-14	-13.639	-13.787	-0.148	(0)
ZnCl4-2	2.228e-14	6.409e-15	-13.652	-14.193	-0.541	(0)
CrCl+2	7.794e-15	8.571e-16	-14.108	-15.067	-0.959	(0)
PbCl4-2	3.150e-15	3.464e-16	-14.502	-15.460	-0.959	(0)
VOCl+	9.340e-16	5.378e-16	-15.030	-15.269	-0.240	(0)
FeCl2+	5.951e-16	4.359e-16	-15.225	-15.361	-0.135	(0)
UO2Cl+	1.868e-17	1.076e-17	-16.729	-16.968	-0.240	(0)
NiCl2	1.429e-17	1.429e-17	-16.845	-16.845	0.000	(0)
CrOHC12	1.802e-18	1.802e-18	-17.744	-17.744	0.000	(0)
CuCl4-2	1.785e-18	5.136e-19	-17.748	-18.289	-0.541	(0)
CrCl2+	8.862e-19	5.103e-19	-18.052	-18.292	-0.240	(0)
FeCl3	2.735e-19	2.735e-19	-18.563	-18.563	0.000	(0)
CrO3Cl-	1.775e-27	1.022e-27	-26.751	-26.990	-0.240	(0)
CoCl+2	4.523e-35	4.974e-36	-34.345	-35.303	-0.959	(0)
UCl+3	0.000e+00	0.000e+00	-42.655	-44.812	-2.157	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.465	-50.424	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.514	-50.473	-0.959	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.454	-65.413	-0.959	(0)
Co (2)	2.977e-09					
Co+2	1.456e-09	1.601e-10	-8.837	-9.796	-0.959	(0)
CoHCO3+	1.194e-09	6.877e-10	-8.923	-9.163	-0.240	(0)
CoSO4	2.789e-10	2.789e-10	-9.555	-9.555	0.000	(0)
CoF+	3.004e-11	1.730e-11	-10.522	-10.762	-0.240	(0)
CoCO3	1.233e-11	1.233e-11	-10.909	-10.909	0.000	(0)
CoCl+	6.034e-12	3.475e-12	-11.219	-11.459	-0.240	(0)
CoOH+	9.775e-14	5.629e-14	-13.010	-13.250	-0.240	(0)
CoNO2+	1.722e-14	9.915e-15	-13.764	-14.004	-0.240	(0)
Co (NH3) +2	1.044e-15	1.148e-16	-14.981	-15.940	-0.959	(0)
Co (OH) 2	7.881e-17	7.881e-17	-16.103	-16.103	0.000	(0)
CoNO3+	1.200e-17	6.910e-18	-16.921	-17.161	-0.240	(0)
CoSeO4	3.499e-18	3.499e-18	-17.456	-17.456	0.000	(0)
Co (NH3) 2+2	2.655e-22	2.920e-23	-21.576	-22.535	-0.959	(0)
Co2OH+3	6.485e-23	4.516e-25	-22.188	-24.345	-2.157	(0)
Co (OH) 3-	4.813e-23	2.772e-23	-22.318	-22.557	-0.240	(0)
CoOOH-	1.214e-23	6.992e-24	-22.916	-23.155	-0.240	(0)
Co (NO3) 2	3.830e-25	3.830e-25	-24.417	-24.417	0.000	(0)
Co (NH3) 3+2	1.994e-29	2.192e-30	-28.700	-29.659	-0.959	(0)
Co (OH) 4-2	7.041e-31	7.742e-32	-30.152	-31.111	-0.959	(0)
Co (NH3) 4+2	6.240e-37	6.861e-38	-36.205	-37.164	-0.959	(0)
Co4 (OH) 4+4	0.000e+00	0.000e+00	-40.863	-44.698	-3.835	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.209	-45.168	-0.959	(0)
Co (3)	3.173e-30					
CoOH+2	3.173e-30	3.489e-31	-29.499	-30.457	-0.959	(0)
Co+3	5.675e-35	3.896e-36	-34.246	-35.409	-1.163	(0)
CoCl+2	4.523e-35	4.974e-36	-34.345	-35.303	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.514	-50.473	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.104	-60.344	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.454	-65.413	-0.959	(0)

Co(NH3) 6OH+2	0.000e+00	0.000e+00	-65.805	-66.764	-0.959	(0)
Cr (2)	3.751e-26					
Cr+2	3.751e-26	4.124e-27	-25.426	-26.385	-0.959	(0)
Cr (3)	1.145e-09					
CrF+2	5.199e-10	5.717e-11	-9.284	-10.243	-0.959	(0)
Cr (OH) +2	3.701e-10	4.070e-11	-9.432	-10.390	-0.959	(0)
Cr (OH) 2+	1.516e-10	8.728e-11	-9.819	-10.059	-0.240	(0)
CrOHSO4	8.434e-11	8.434e-11	-10.074	-10.074	0.000	(0)
Cr+3	1.516e-11	1.055e-13	-10.819	-12.977	-2.157	(0)
CrSO4+	3.737e-12	2.152e-12	-11.427	-11.667	-0.240	(0)
Cr (OH) 3	5.779e-13	5.779e-13	-12.238	-12.238	0.000	(0)
CrCl+2	7.794e-15	8.571e-16	-14.108	-15.067	-0.959	(0)
CrO2-	8.434e-16	4.857e-16	-15.074	-15.314	-0.240	(0)
Cr (OH) 4-	7.042e-16	4.055e-16	-15.152	-15.392	-0.240	(0)
Cr2 (OH) 2SO4+2	2.821e-18	3.102e-19	-17.550	-18.508	-0.959	(0)
CrOHC12	1.802e-18	1.802e-18	-17.744	-17.744	0.000	(0)
CrCl2+	8.862e-19	5.103e-19	-18.052	-18.292	-0.240	(0)
Cr2 (OH) 2 (SO4) 2	1.609e-19	1.609e-19	-18.793	-18.793	0.000	(0)
CrNO3+2	1.143e-21	1.257e-22	-20.942	-21.901	-0.959	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.522	-41.480	-0.959	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.166	-49.323	-2.157	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.465	-50.424	-0.959	(0)
Cr (6)	1.655e-19					
CrO4-2	8.112e-20	2.466e-20	-19.091	-19.608	-0.517	(0)
HCrO4-	7.875e-20	4.535e-20	-19.104	-19.343	-0.240	(0)
NaCrO4-	3.987e-21	2.296e-21	-20.399	-20.639	-0.240	(0)
KCrO4-	1.678e-21	9.663e-22	-20.775	-21.015	-0.240	(0)
CrO3SO4-2	6.266e-25	6.890e-26	-24.203	-25.162	-0.959	(0)
H2CrO4	2.089e-26	2.089e-26	-25.680	-25.680	0.000	(0)
CrO3Cl-	1.775e-27	1.022e-27	-26.751	-26.990	-0.240	(0)
Cr2O7-2	6.519e-37	7.169e-38	-36.186	-37.145	-0.959	(0)
Cu (1)	2.504e-08					
CuCl2-	1.504e-08	1.069e-08	-7.823	-7.971	-0.148	(0)
CuCl	8.157e-09	8.157e-09	-8.088	-8.088	0.000	(0)
Cu+	1.793e-09	1.033e-09	-8.746	-8.986	-0.240	(0)
CuCl3-2	4.987e-11	1.435e-11	-10.302	-10.843	-0.541	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.409	-150.883	-0.474	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.169	-151.613	-0.444	(0)
Cu (2)	5.369e-04					
CuCO3	3.459e-04	3.459e-04	-3.461	-3.461	0.000	(0)
CuHCO3+	7.800e-05	4.492e-05	-4.108	-4.348	-0.240	(0)
Cu+2	4.239e-05	1.289e-05	-4.373	-4.890	-0.517	(0)
Cu (CO3) 2-2	3.858e-05	4.243e-06	-4.414	-5.372	-0.959	(0)
CuSO4	2.578e-05	2.578e-05	-4.589	-4.589	0.000	(0)
CuF+	4.826e-06	2.779e-06	-5.316	-5.556	-0.240	(0)
CuOH+	1.011e-06	7.184e-07	-5.995	-6.144	-0.148	(0)
CuCl+	1.803e-07	1.282e-07	-6.744	-6.892	-0.148	(0)
Cu2 (OH) 2+2	1.179e-07	1.296e-08	-6.929	-7.887	-0.959	(0)
CuNO2+	2.060e-08	1.186e-08	-7.686	-7.926	-0.240	(0)
CuNH3+2	7.153e-09	7.866e-10	-8.146	-9.104	-0.959	(0)
Cu (OH) 2	2.526e-09	2.526e-09	-8.597	-8.597	0.000	(0)
CuCl2	2.789e-10	2.789e-10	-9.555	-9.555	0.000	(0)
CuNO3+	1.928e-12	1.110e-12	-11.715	-11.955	-0.240	(0)
Cu (NO2) 2	1.067e-12	1.067e-12	-11.972	-11.972	0.000	(0)
Cu (OH) 3-	1.586e-13	9.134e-14	-12.800	-13.039	-0.240	(0)
CuCl3-	2.297e-14	1.633e-14	-13.639	-13.787	-0.148	(0)
CuCl4-2	1.785e-18	5.136e-19	-17.748	-18.289	-0.541	(0)
Cu (OH) 4-2	1.152e-19	1.267e-20	-18.938	-19.897	-0.959	(0)
Cu (NO3) 2	3.807e-21	3.807e-21	-20.419	-20.419	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.419	-215.658	-0.240	(0)
F	7.586e-03					
F-	4.602e-03	3.417e-03	-2.337	-2.466	-0.129	(0)
MgF+	1.577e-03	1.139e-03	-2.802	-2.944	-0.141	(0)
CaF+	5.347e-04	3.916e-04	-3.272	-3.407	-0.135	(0)
AlF4-	1.550e-04	1.119e-04	-3.810	-3.951	-0.141	(0)
AlF3	6.532e-05	6.532e-05	-4.185	-4.185	0.000	(0)
NaF	4.040e-05	4.040e-05	-4.394	-4.394	0.000	(0)
CuF+	4.826e-06	2.779e-06	-5.316	-5.556	-0.240	(0)

MnF+	3.346e-06	2.451e-06	-5.475	-5.611	-0.135	(0)
HF	2.872e-06	2.872e-06	-5.542	-5.542	0.000	(0)
AlF2+	2.051e-06	1.518e-06	-5.688	-5.819	-0.131	(0)
ZnF+	3.096e-07	1.783e-07	-6.509	-6.749	-0.240	(0)
BF(OH) 3-	2.134e-07	1.433e-07	-6.671	-6.844	-0.173	(0)
FeF3	1.356e-07	1.356e-07	-6.868	-6.868	0.000	(0)
HF2-	5.340e-08	3.732e-08	-7.272	-7.428	-0.156	(0)
BF2(OH) 2-	4.454e-08	2.991e-08	-7.351	-7.524	-0.173	(0)
FeF2+	3.840e-08	2.812e-08	-7.416	-7.551	-0.135	(0)
AlF+2	3.720e-09	1.116e-09	-8.429	-8.952	-0.523	(0)
PbF+	3.240e-09	1.866e-09	-8.489	-8.729	-0.240	(0)
CdF+	2.756e-09	1.587e-09	-8.560	-8.799	-0.240	(0)
FeF+2	1.069e-09	3.075e-10	-8.971	-9.512	-0.541	(0)
CrF+2	5.199e-10	5.717e-11	-9.284	-10.243	-0.959	(0)
PbF2	1.255e-10	1.255e-10	-9.901	-9.901	0.000	(0)
VO2F2-	9.291e-11	5.350e-11	-10.032	-10.272	-0.240	(0)
VO2F	4.312e-11	4.312e-11	-10.365	-10.365	0.000	(0)
BF3OH-	3.383e-11	2.272e-11	-10.471	-10.644	-0.173	(0)
CoF+	3.004e-11	1.730e-11	-10.522	-10.762	-0.240	(0)
H2F2	2.210e-11	2.210e-11	-10.656	-10.656	0.000	(0)
VO2F3-2	2.074e-11	2.281e-12	-10.683	-11.642	-0.959	(0)
CdF2	1.082e-11	1.082e-11	-10.966	-10.966	0.000	(0)
UO2F3-	7.328e-12	4.220e-12	-11.135	-11.375	-0.240	(0)
UO2F2	4.916e-12	4.916e-12	-11.308	-11.308	0.000	(0)
NiF+	4.200e-12	2.419e-12	-11.377	-11.616	-0.240	(0)
PbF3-	1.412e-12	8.134e-13	-11.850	-12.090	-0.240	(0)
VOF+	1.088e-12	6.263e-13	-11.964	-12.203	-0.240	(0)
UO2F4-2	1.042e-12	1.146e-13	-11.982	-12.941	-0.959	(0)
UO2F+	8.661e-13	4.988e-13	-12.062	-12.302	-0.240	(0)
VOF2	8.025e-13	8.025e-13	-12.096	-12.096	0.000	(0)
VO2F4-3	5.508e-13	3.835e-15	-12.259	-14.416	-2.157	(0)
BF4-	3.250e-13	2.182e-13	-12.488	-12.661	-0.173	(0)
VOF3-	1.690e-13	9.731e-14	-12.772	-13.012	-0.240	(0)
VOF4-2	1.221e-14	1.342e-15	-13.913	-14.872	-0.959	(0)
PbF4-2	1.210e-14	1.330e-15	-13.917	-14.876	-0.959	(0)
HgF+	4.350e-19	2.505e-19	-18.362	-18.601	-0.240	(0)
Sb(OH) 2F	1.857e-21	1.857e-21	-20.731	-20.731	0.000	(0)
SbOF	1.836e-21	1.836e-21	-20.736	-20.736	0.000	(0)
UF3+	1.353e-30	7.789e-31	-29.869	-30.109	-0.240	(0)
UF6-2	3.710e-31	4.079e-32	-30.431	-31.389	-0.959	(0)
UF4	2.918e-31	2.918e-31	-30.535	-30.535	0.000	(0)
UF5-	6.864e-32	3.952e-32	-31.163	-31.403	-0.240	(0)
UF2+2	1.308e-32	1.438e-33	-31.883	-32.842	-0.959	(0)
UF+3	4.800e-36	3.342e-38	-35.319	-37.476	-2.157	(0)
Fe (2)	1.758e-06					
Fe+2	1.314e-06	1.445e-07	-5.881	-6.840	-0.959	(0)
FeSO4	3.097e-07	3.097e-07	-6.509	-6.509	0.000	(0)
FeHCO3+	1.338e-07	1.005e-07	-6.873	-6.998	-0.124	(0)
FeOH+	1.384e-10	1.014e-10	-9.859	-9.994	-0.135	(0)
Fe (OH) 2	1.420e-15	1.420e-15	-14.848	-14.848	0.000	(0)
Fe (OH) 3-	1.080e-17	7.912e-18	-16.966	-17.102	-0.135	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.668	-155.668	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.281	-232.521	-0.240	(0)
Fe (3)	8.952e-06					
Fe (OH) 2+	8.653e-06	6.404e-06	-5.063	-5.194	-0.131	(0)
FeF3	1.356e-07	1.356e-07	-6.868	-6.868	0.000	(0)
Fe (OH) 3	1.212e-07	1.212e-07	-6.916	-6.916	0.000	(0)
FeF2+	3.840e-08	2.812e-08	-7.416	-7.551	-0.135	(0)
FeOH+2	3.246e-09	9.339e-10	-8.489	-9.030	-0.541	(0)
FeF+2	1.069e-09	3.075e-10	-8.971	-9.512	-0.541	(0)
Fe (OH) 4-	2.688e-10	1.989e-10	-9.571	-9.701	-0.131	(0)
FeSO4+	1.098e-11	8.040e-12	-10.959	-11.095	-0.135	(0)
Fe (SO4) 2-	2.607e-12	1.501e-12	-11.584	-11.824	-0.240	(0)
Fe+3	1.195e-12	8.206e-14	-11.922	-13.086	-1.163	(0)
Fe2 (OH) 2+4	1.975e-13	2.888e-17	-12.704	-16.539	-3.835	(0)
FeCl+2	5.405e-14	1.555e-14	-13.267	-13.808	-0.541	(0)
Fe3(OH) 4+5	2.625e-15	2.673e-21	-14.581	-20.573	-5.992	(0)
FeHSeO3+2	8.627e-16	9.486e-17	-15.064	-16.023	-0.959	(0)

	FeCl2+	5.951e-16	4.359e-16	-15.225	-15.361	-0.135	(0)
	FeCl3	2.735e-19	2.735e-19	-18.563	-18.563	0.000	(0)
	FeNO3+2	2.033e-19	2.235e-20	-18.692	-19.651	-0.959	(0)
H (0)	1.162e-29						
	H2	5.812e-30	6.116e-30	-29.236	-29.214	0.022	(0)
Hg (0)	4.884e-10						
	Hg	4.884e-10	4.884e-10	-9.311	-9.311	0.000	(0)
Hg (1)	1.192e-17						
	Hg2+2	5.962e-18	6.556e-19	-17.225	-18.183	-0.959	(0)
Hg (2)	9.147e-09						
	HgCl2	7.785e-09	7.785e-09	-8.109	-8.109	0.000	(0)
	HgCl3-	8.483e-10	4.885e-10	-9.071	-9.311	-0.240	(0)
	HgClOH	3.862e-10	3.862e-10	-9.413	-9.413	0.000	(0)
	HgCl4-2	1.110e-10	1.220e-11	-9.955	-10.914	-0.959	(0)
	HgCO3	1.078e-11	1.078e-11	-10.967	-10.967	0.000	(0)
	Hg (OH) 2	3.684e-12	3.876e-12	-11.434	-11.412	0.022	(0)
	Hg (CO3) 2-2	1.413e-12	1.554e-13	-11.850	-12.808	-0.959	(0)
	HgCl+	4.299e-13	2.476e-13	-12.367	-12.606	-0.240	(0)
	HgHCO3+	1.981e-13	1.141e-13	-12.703	-12.943	-0.240	(0)
	HgOH+	2.409e-15	1.387e-15	-14.618	-14.858	-0.240	(0)
	Hg (NH3) 2+2	4.035e-16	4.437e-17	-15.394	-16.353	-0.959	(0)
	HgNH3+2	6.766e-17	7.441e-18	-16.170	-17.128	-0.959	(0)
	Hg+2	1.798e-17	1.977e-18	-16.745	-17.704	-0.959	(0)
	HgSO4	4.521e-18	4.521e-18	-17.345	-17.345	0.000	(0)
	HgF+	4.350e-19	2.505e-19	-18.362	-18.601	-0.240	(0)
	Hg (OH) 3-	1.493e-20	8.600e-21	-19.826	-20.065	-0.240	(0)
	Hg (NH3) 3+2	9.581e-24	1.054e-24	-23.019	-23.977	-0.959	(0)
	HgNO3+	3.453e-26	1.989e-26	-25.462	-25.701	-0.240	(0)
	Hg (NH3) 4+2	4.539e-31	4.991e-32	-30.343	-31.302	-0.959	(0)
	Hg (NO3) 2	2.251e-34	2.251e-34	-33.648	-33.648	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-137.069	-137.309	-0.240	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-137.160	-137.160	0.000	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.812	-139.771	-0.959	(0)
K	1.508e-02						
	K+	1.420e-02	1.055e-02	-1.848	-1.977	-0.129	(0)
	KSO4-	8.809e-04	6.519e-04	-3.055	-3.186	-0.131	(0)
	KCrO4-	1.678e-21	9.663e-22	-20.775	-21.015	-0.240	(0)
Mg	1.843e-02						
	Mg+2	9.766e-03	2.969e-03	-2.010	-2.527	-0.517	(0)
	MgSO4	4.719e-03	4.719e-03	-2.326	-2.326	0.000	(0)
	MgHCO3+	2.361e-03	1.678e-03	-2.627	-2.775	-0.148	(0)
	MgF+	1.577e-03	1.139e-03	-2.802	-2.944	-0.141	(0)
	MgCO3	1.126e-05	1.126e-05	-4.949	-4.949	0.000	(0)
	MgOH+	2.744e-08	2.084e-08	-7.562	-7.681	-0.120	(0)
	MgH2BO3+	1.647e-08	1.106e-08	-7.783	-7.956	-0.173	(0)
Mn (2)	2.224e-04						
	Mn+2	1.638e-04	1.801e-05	-3.786	-4.744	-0.959	(0)
	MnSO4	2.797e-05	2.797e-05	-4.553	-4.553	0.000	(0)
	MnHCO3+	2.711e-05	1.985e-05	-4.567	-4.702	-0.135	(0)
	MnF+	3.346e-06	2.451e-06	-5.475	-5.611	-0.135	(0)
	MnCl+	1.943e-07	1.423e-07	-6.712	-6.847	-0.135	(0)
	MnCl2	1.261e-09	1.261e-09	-8.899	-8.899	0.000	(0)
	MnOH+	1.089e-09	7.975e-10	-8.963	-9.098	-0.135	(0)
	MnCl3-	2.976e-12	2.180e-12	-11.526	-11.662	-0.135	(0)
	MnNO3+	1.350e-12	7.776e-13	-11.870	-12.109	-0.240	(0)
	MnSeO4	2.115e-13	2.115e-13	-12.675	-12.675	0.000	(0)
	Mn (NO3) 2	5.320e-20	5.320e-20	-19.274	-19.274	0.000	(0)
	Mn (OH) 3-	2.091e-21	1.531e-21	-20.680	-20.815	-0.135	(0)
	Mn (OH) 4-2	3.029e-28	8.713e-29	-27.519	-28.060	-0.541	(0)
	MnSe	0.000e+00	0.000e+00	-43.567	-43.567	0.000	(0)
Mn (3)	7.166e-23						
	Mn+3	7.166e-23	4.919e-24	-22.145	-23.308	-1.163	(0)
Mn (6)	0.000e+00						
	MnO4-2	0.000e+00	0.000e+00	-45.526	-46.067	-0.541	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-48.489	-48.652	-0.164	(0)
Mo	8.596e-06						
	MoO4-2	8.544e-06	2.598e-06	-5.068	-5.585	-0.517	(0)

HM04-	5.100e-08	2.937e-08	-7.292	-7.532	-0.240	(0)
H2MoO4	1.222e-10	1.222e-10	-9.913	-9.913	0.000	(0)
AlMo6O21-3	4.846e-28	3.375e-30	-27.315	-29.472	-2.157	(0)
Mo7O24-6	3.685e-28	8.664e-37	-27.434	-36.062	-8.629	(0)
HM07O24-5	1.178e-30	1.200e-36	-29.929	-35.921	-5.992	(0)
H2Mo7O24-4	2.823e-34	4.128e-38	-33.549	-37.384	-3.835	(0)
H3Mo7O24-3	5.935e-39	0.000e+00	-38.227	-40.384	-2.157	(0)
N (-3)	9.624e-06					
NH4+	8.850e-06	5.943e-06	-5.053	-5.226	-0.173	(0)
NH4SO4-	7.593e-07	5.561e-07	-6.120	-6.255	-0.135	(0)
CuNH3+2	7.153e-09	7.866e-10	-8.146	-9.104	-0.959	(0)
NH3	5.964e-09	5.964e-09	-8.224	-8.224	0.000	(0)
CaNH3+2	7.169e-10	7.883e-11	-9.145	-10.103	-0.959	(0)
BaNH3+2	2.581e-13	2.838e-14	-12.588	-13.547	-0.959	(0)
Co (NH3) +2	1.044e-15	1.148e-16	-14.981	-15.940	-0.959	(0)
NiNH3+2	8.206e-16	9.024e-17	-15.086	-16.045	-0.959	(0)
Hg (NH3) 2+2	4.035e-16	4.437e-17	-15.394	-16.353	-0.959	(0)
HgNH3+2	6.766e-17	7.441e-18	-16.170	-17.128	-0.959	(0)
Ca (NH3) 2+2	1.702e-18	1.872e-19	-17.769	-18.728	-0.959	(0)
Ni (NH3) 2+2	7.074e-22	7.779e-23	-21.150	-22.109	-0.959	(0)
Co (NH3) 2+2	2.655e-22	2.920e-23	-21.576	-22.535	-0.959	(0)
Hg (NH3) 3+2	9.581e-24	1.054e-24	-23.019	-23.977	-0.959	(0)
Co (NH3) 3+2	1.994e-29	2.192e-30	-28.700	-29.659	-0.959	(0)
Hg (NH3) 4+2	4.539e-31	4.991e-32	-30.343	-31.302	-0.959	(0)
Co (NH3) 4+2	6.240e-37	6.861e-38	-36.205	-37.164	-0.959	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.522	-41.480	-0.959	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-44.209	-45.168	-0.959	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-47.166	-49.323	-2.157	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-49.465	-50.424	-0.959	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-49.514	-50.473	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.104	-60.344	-0.240	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-64.454	-65.413	-0.959	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-65.805	-66.764	-0.959	(0)
N (3)	1.284e-05					
NO2-	1.282e-05	8.790e-06	-4.892	-5.056	-0.164	(0)
CuNO2+	2.060e-08	1.186e-08	-7.686	-7.926	-0.240	(0)
Cu (NO2) 2	1.067e-12	1.067e-12	-11.972	-11.972	0.000	(0)
CoNO2+	1.722e-14	9.915e-15	-13.764	-14.004	-0.240	(0)
N (5)	3.826e-08					
NO3-	3.668e-08	2.724e-08	-7.436	-7.565	-0.129	(0)
CaNO3+	1.570e-09	9.044e-10	-8.804	-9.044	-0.240	(0)
CuNO3+	1.928e-12	1.110e-12	-11.715	-11.955	-0.240	(0)
BaNO3+	1.788e-12	1.030e-12	-11.748	-11.987	-0.240	(0)
MnNO3+	1.350e-12	7.776e-13	-11.870	-12.109	-0.240	(0)
ZnNO3+	3.107e-13	1.789e-13	-12.508	-12.747	-0.240	(0)
PbNO3+	5.421e-15	3.122e-15	-14.266	-14.506	-0.240	(0)
CdNO3+	4.383e-15	2.524e-15	-14.358	-14.598	-0.240	(0)
CoNO3+	1.200e-17	6.910e-18	-16.921	-17.161	-0.240	(0)
NiNO3+	3.348e-18	1.928e-18	-17.475	-17.715	-0.240	(0)
FeNO3+2	2.033e-19	2.235e-20	-18.692	-19.651	-0.959	(0)
VO2NO3	9.912e-20	9.912e-20	-19.004	-19.004	0.000	(0)
Mn (NO3) 2	5.320e-20	5.320e-20	-19.274	-19.274	0.000	(0)
Cu (NO3) 2	3.807e-21	3.807e-21	-20.419	-20.419	0.000	(0)
CrNO3+2	1.143e-21	1.257e-22	-20.942	-21.901	-0.959	(0)
Zn (NO3) 2	9.722e-22	9.722e-22	-21.012	-21.012	0.000	(0)
Pb (NO3) 2	1.444e-22	1.444e-22	-21.840	-21.840	0.000	(0)
UO2NO3+	9.978e-23	5.746e-23	-22.001	-22.241	-0.240	(0)
Cd (NO3) 2	3.445e-23	3.445e-23	-22.463	-22.463	0.000	(0)
Co (NO3) 2	3.830e-25	3.830e-25	-24.417	-24.417	0.000	(0)
HgNO3+	3.453e-26	1.989e-26	-25.462	-25.701	-0.240	(0)
Hg (NO3) 2	2.251e-34	2.251e-34	-33.648	-33.648	0.000	(0)
Na	2.704e-02					
Na+	2.523e-02	1.874e-02	-1.598	-1.727	-0.129	(0)
NaSO4-	1.187e-03	8.786e-04	-2.925	-3.056	-0.131	(0)
NaHCO3	5.819e-04	5.819e-04	-3.235	-3.235	0.000	(0)
NaF	4.040e-05	4.040e-05	-4.394	-4.394	0.000	(0)
NaCO3-	2.148e-06	1.590e-06	-5.668	-5.799	-0.131	(0)
NaH2BO3	3.189e-09	3.189e-09	-8.496	-8.496	0.000	(0)

NaCrO4-	3.987e-21	2.296e-21	-20.399	-20.639	-0.240	(0)
Ni	4.848e-10					
NiHCO3+	3.332e-10	1.919e-10	-9.477	-9.717	-0.240	(0)
Ni+2	9.267e-11	2.817e-11	-10.033	-10.550	-0.517	(0)
NiSO4	4.909e-11	4.909e-11	-10.309	-10.309	0.000	(0)
NiCO3	4.790e-12	4.790e-12	-11.320	-11.320	0.000	(0)
NiF+	4.200e-12	2.419e-12	-11.377	-11.616	-0.240	(0)
NiCl+	7.855e-13	4.523e-13	-12.105	-12.345	-0.240	(0)
Ni (SO4) 2-2	1.291e-13	1.419e-14	-12.889	-13.848	-0.959	(0)
NiOH+	1.086e-14	6.252e-15	-13.964	-14.204	-0.240	(0)
NiNH3+2	8.206e-16	9.024e-17	-15.086	-16.045	-0.959	(0)
NiCl2	1.429e-17	1.429e-17	-16.845	-16.845	0.000	(0)
Ni (OH) 2	8.753e-18	8.753e-18	-17.058	-17.058	0.000	(0)
NiNO3+	3.348e-18	1.928e-18	-17.475	-17.715	-0.240	(0)
NiSeO4	5.748e-19	5.748e-19	-18.240	-18.240	0.000	(0)
Ni (NH3) 2+2	7.074e-22	7.779e-23	-21.150	-22.109	-0.959	(0)
Ni (OH) 3-	2.679e-22	1.543e-22	-21.572	-21.812	-0.240	(0)
O (0)	2.548e-34					
O2	1.274e-34	1.341e-34	-33.895	-33.873	0.022	(0)
Pb	7.525e-07					
PbHCO3+	5.522e-07	3.180e-07	-6.258	-6.498	-0.240	(0)
PbCO3	1.061e-07	1.061e-07	-6.974	-6.974	0.000	(0)
PbSO4	3.314e-08	3.314e-08	-7.480	-7.480	0.000	(0)
Pb+2	2.548e-08	7.748e-09	-7.594	-8.111	-0.517	(0)
Pb (SO4) 2-2	1.586e-08	1.744e-09	-7.800	-8.759	-0.959	(0)
Pb (CO3) 2-2	1.269e-08	1.395e-09	-7.897	-8.855	-0.959	(0)
PbF+	3.240e-09	1.866e-09	-8.489	-8.729	-0.240	(0)
PbCl+	2.996e-09	1.725e-09	-8.524	-8.763	-0.240	(0)
PbOH+	5.957e-10	3.430e-10	-9.225	-9.465	-0.240	(0)
PbF2	1.255e-10	1.255e-10	-9.901	-9.901	0.000	(0)
PbCl2	4.835e-11	4.835e-11	-10.316	-10.316	0.000	(0)
PbF3-	1.412e-12	8.134e-13	-11.850	-12.090	-0.240	(0)
PbCl3-	2.097e-13	1.208e-13	-12.678	-12.918	-0.240	(0)
Pb (OH) 2	1.912e-13	1.912e-13	-12.719	-12.719	0.000	(0)
PbF4-2	1.210e-14	1.330e-15	-13.917	-14.876	-0.959	(0)
Pb2OH+3	6.049e-15	4.212e-17	-14.218	-16.375	-2.157	(0)
PbNO3+	5.421e-15	3.122e-15	-14.266	-14.506	-0.240	(0)
PbCl4-2	3.150e-15	3.464e-16	-14.502	-15.460	-0.959	(0)
Pb (OH) 3-	5.852e-18	3.370e-18	-17.233	-17.472	-0.240	(0)
Pb (NO3) 2	1.444e-22	1.444e-22	-21.840	-21.840	0.000	(0)
Pb (OH) 4-2	1.323e-22	1.455e-23	-21.878	-22.837	-0.959	(0)
Pb3 (OH) 4+2	5.139e-23	5.651e-24	-22.289	-23.248	-0.959	(0)
Pb4 (OH) 4+4	2.379e-24	3.478e-28	-23.624	-27.459	-3.835	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-227.969	-228.208	-0.240	(0)
S (-2)	0.000e+00					
H2S	0.000e+00	0.000e+00	-78.115	-78.115	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.175	-78.414	-0.240	(0)
HS-	0.000e+00	0.000e+00	-78.649	-78.889	-0.240	(0)
S5-2	0.000e+00	0.000e+00	-81.050	-82.009	-0.959	(0)
S6-2	0.000e+00	0.000e+00	-81.566	-82.525	-0.959	(0)
S4-2	0.000e+00	0.000e+00	-81.646	-82.604	-0.959	(0)
S3-2	0.000e+00	0.000e+00	-82.452	-83.410	-0.959	(0)
S2-2	0.000e+00	0.000e+00	-83.468	-84.426	-0.959	(0)
S-2	0.000e+00	0.000e+00	-89.403	-89.944	-0.541	(0)
HgHS2-	0.000e+00	0.000e+00	-137.069	-137.309	-0.240	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-137.160	-137.160	0.000	(0)
HgS2-2	0.000e+00	0.000e+00	-138.812	-139.771	-0.959	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-150.066	-150.305	-0.240	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.099	-150.099	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-150.409	-150.883	-0.474	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.541	-150.541	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-150.619	-150.619	0.000	(0)
CuS4S5-3	0.000e+00	0.000e+00	-151.169	-151.613	-0.444	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-155.668	-155.668	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-215.419	-215.658	-0.240	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.910	-226.150	-0.240	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.849	-227.089	-0.240	(0)

Pb (HS) 3-	0.000e+00	0.000e+00	-227.969	-228.208	-0.240	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-228.926	-229.885	-0.959	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-232.281	-232.521	-0.240	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.823	-303.782	-0.959	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.540	-306.499	-0.959	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.117	-315.076	-0.959	(0)
S (6)	5.658e-02					
SO4-2	2.872e-02	8.732e-03	-1.542	-2.059	-0.517	(0)
CaSO4	2.100e-02	2.100e-02	-1.678	-1.678	0.000	(0)
MgSO4	4.719e-03	4.719e-03	-2.326	-2.326	0.000	(0)
NaSO4-	1.187e-03	8.786e-04	-2.925	-3.056	-0.131	(0)
KSO4-	8.809e-04	6.519e-04	-3.055	-3.186	-0.131	(0)
MnSO4	2.797e-05	2.797e-05	-4.553	-4.553	0.000	(0)
CuSO4	2.578e-05	2.578e-05	-4.589	-4.589	0.000	(0)
ZnSO4	4.995e-06	4.995e-06	-5.301	-5.301	0.000	(0)
Zn (SO4) 2-2	3.455e-06	3.799e-07	-5.462	-6.420	-0.959	(0)
NH4SO4-	7.593e-07	5.561e-07	-6.120	-6.255	-0.135	(0)
HSO4-	6.715e-07	4.849e-07	-6.173	-6.314	-0.141	(0)
FeSO4	3.097e-07	3.097e-07	-6.509	-6.509	0.000	(0)
Cd (SO4) 2-2	6.425e-08	7.066e-09	-7.192	-8.151	-0.959	(0)
CdSO4	5.998e-08	5.998e-08	-7.222	-7.222	0.000	(0)
PbSO4	3.314e-08	3.314e-08	-7.480	-7.480	0.000	(0)
Pb (SO4) 2-2	1.586e-08	1.744e-09	-7.800	-8.759	-0.959	(0)
CoSO4	2.789e-10	2.789e-10	-9.555	-9.555	0.000	(0)
CrOHSO4	8.434e-11	8.434e-11	-10.074	-10.074	0.000	(0)
NiSO4	4.909e-11	4.909e-11	-10.309	-10.309	0.000	(0)
FeSO4+	1.098e-11	8.040e-12	-10.959	-11.095	-0.135	(0)
CrSO4+	3.737e-12	2.152e-12	-11.427	-11.667	-0.240	(0)
AlSO4+	3.066e-12	2.213e-12	-11.513	-11.655	-0.141	(0)
Fe (SO4) 2-	2.607e-12	1.501e-12	-11.584	-11.824	-0.240	(0)
VO2SO4-	2.605e-12	1.500e-12	-11.584	-11.824	-0.240	(0)
Al (SO4) 2-	2.868e-13	2.071e-13	-12.542	-12.684	-0.141	(0)
Ni (SO4) 2-2	1.291e-13	1.419e-14	-12.889	-13.848	-0.959	(0)
VOSO4	7.348e-14	7.348e-14	-13.134	-13.134	0.000	(0)
UO2 (SO4) 2-2	1.463e-14	1.609e-15	-13.835	-14.794	-0.959	(0)
UO2SO4	1.397e-14	1.397e-14	-13.855	-13.855	0.000	(0)
HgSO4	4.521e-18	4.521e-18	-17.345	-17.345	0.000	(0)
Cr2 (OH) 2SO4+2	2.821e-18	3.102e-19	-17.550	-18.508	-0.959	(0)
Cr2 (OH) 2 (SO4) 2	1.609e-19	1.609e-19	-18.793	-18.793	0.000	(0)
CrO3SO4-2	6.266e-25	6.890e-26	-24.203	-25.162	-0.959	(0)
VSO4+	5.767e-27	3.321e-27	-26.239	-26.479	-0.240	(0)
U (SO4) 2	1.182e-38	1.182e-38	-37.927	-37.927	0.000	(0)
USO4+2	1.550e-39	1.704e-40	-38.810	-39.769	-0.959	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.104	-60.344	-0.240	(0)
Sb (3)	1.211e-18					
Sb (OH) 3	6.091e-19	6.091e-19	-18.215	-18.215	0.000	(0)
HSbO2	5.978e-19	5.978e-19	-18.223	-18.223	0.000	(0)
Sb (OH) 2F	1.857e-21	1.857e-21	-20.731	-20.731	0.000	(0)
SbOF	1.836e-21	1.836e-21	-20.736	-20.736	0.000	(0)
Sb (OH) 2+	1.467e-23	8.449e-24	-22.833	-23.073	-0.240	(0)
SbO+	5.086e-24	2.929e-24	-23.294	-23.533	-0.240	(0)
SbO2-	2.959e-24	1.704e-24	-23.529	-23.769	-0.240	(0)
Sb (OH) 4-	1.677e-24	9.658e-25	-23.775	-24.015	-0.240	(0)
Sb2S4-2	0.000e+00	0.000e+00	-314.117	-315.076	-0.959	(0)
Sb (5)	9.030e-08					
SbO3-	9.022e-08	5.196e-08	-7.045	-7.284	-0.240	(0)
Sb (OH) 6-	8.052e-11	5.979e-11	-10.094	-10.223	-0.129	(0)
SbO2+	8.400e-21	4.837e-21	-20.076	-20.315	-0.240	(0)
Se (-2)	3.606e-40					
HSe-	3.606e-40	2.077e-40	-39.443	-39.683	-0.240	(0)
H2Se	0.000e+00	0.000e+00	-42.038	-42.038	0.000	(0)
MnSe	0.000e+00	0.000e+00	-43.567	-43.567	0.000	(0)
Se-2	0.000e+00	0.000e+00	-47.478	-48.437	-0.959	(0)
Se (4)	7.877e-07					
HSeO3-	7.597e-07	4.375e-07	-6.119	-6.359	-0.240	(0)
SeO3-2	2.787e-08	3.065e-09	-7.555	-8.514	-0.959	(0)
H2SeO3	1.060e-10	1.060e-10	-9.975	-9.975	0.000	(0)
FeHSeO3+2	8.627e-16	9.486e-17	-15.064	-16.023	-0.959	(0)

Cd(SeO3) 2-2	2.063e-18	2.269e-19	-17.685	-18.644	-0.959	(0)
Se (6)	1.437e-10					
SeO4-2	1.435e-10	4.362e-11	-9.843	-10.360	-0.517	(0)
MnSeO4	2.115e-13	2.115e-13	-12.675	-12.675	0.000	(0)
ZnSeO4	1.766e-14	1.766e-14	-13.753	-13.753	0.000	(0)
HSeO4-	2.157e-15	1.242e-15	-14.666	-14.906	-0.240	(0)
CdSeO4	2.380e-16	2.380e-16	-15.623	-15.623	0.000	(0)
CoSeO4	3.499e-18	3.499e-18	-17.456	-17.456	0.000	(0)
NiSeO4	5.748e-19	5.748e-19	-18.240	-18.240	0.000	(0)
Zn (SeO4) 2-2	7.103e-24	7.811e-25	-23.149	-24.107	-0.959	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.735	-59.892	-2.157	(0)
U (4)	1.076e-26					
U (OH) 5-	1.061e-26	6.110e-27	-25.974	-26.214	-0.240	(0)
U (OH) 4	1.462e-28	1.462e-28	-27.835	-27.835	0.000	(0)
UF3+	1.353e-30	7.789e-31	-29.869	-30.109	-0.240	(0)
U (OH) 3+	5.302e-31	3.053e-31	-30.276	-30.515	-0.240	(0)
UF6-2	3.710e-31	4.079e-32	-30.431	-31.389	-0.959	(0)
UF4	2.918e-31	2.918e-31	-30.535	-30.535	0.000	(0)
UF5-	6.864e-32	3.952e-32	-31.163	-31.403	-0.240	(0)
UF2+2	1.308e-32	1.438e-33	-31.883	-32.842	-0.959	(0)
U (OH) 2+2	7.335e-34	8.066e-35	-33.135	-34.093	-0.959	(0)
UF+3	4.800e-36	3.342e-38	-35.319	-37.476	-2.157	(0)
UOH+3	3.117e-37	2.170e-39	-36.506	-38.664	-2.157	(0)
U (SO4) 2	1.182e-38	1.182e-38	-37.927	-37.927	0.000	(0)
USO4+2	1.550e-39	1.704e-40	-38.810	-39.769	-0.959	(0)
U+4	0.000e+00	0.000e+00	-40.475	-44.310	-3.835	(0)
UCl+3	0.000e+00	0.000e+00	-42.655	-44.812	-2.157	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-169.951	-189.366	-19.415	(0)
U (5)	1.831e-19					
UO2+	1.831e-19	1.054e-19	-18.737	-18.977	-0.240	(0)
U (6)	2.741e-06					
UO2 (CO3) 3-4	2.725e-06	3.984e-10	-5.565	-9.400	-3.835	(0)
UO2 (CO3) 2-2	1.586e-08	1.744e-09	-7.800	-8.758	-0.959	(0)
UO2CO3	1.918e-11	1.918e-11	-10.717	-10.717	0.000	(0)
UO2F3-	7.328e-12	4.220e-12	-11.135	-11.375	-0.240	(0)
UO2F2	4.916e-12	4.916e-12	-11.308	-11.308	0.000	(0)
UO2F4-2	1.042e-12	1.146e-13	-11.982	-12.941	-0.959	(0)
UO2F+	8.661e-13	4.988e-13	-12.062	-12.302	-0.240	(0)
UO2 (SO4) 2-2	1.463e-14	1.609e-15	-13.835	-14.794	-0.959	(0)
UO2SO4	1.397e-14	1.397e-14	-13.855	-13.855	0.000	(0)
UO2OH+	4.074e-15	2.346e-15	-14.390	-14.630	-0.240	(0)
UO2+2	3.477e-15	1.057e-15	-14.459	-14.976	-0.517	(0)
UO2Cl+	1.868e-17	1.076e-17	-16.729	-16.968	-0.240	(0)
UO2NO3+	9.978e-23	5.746e-23	-22.001	-22.241	-0.240	(0)
(UO2) 2 (OH) 2+2	8.307e-23	9.134e-24	-22.081	-23.039	-0.959	(0)
(UO2) 3 (OH) 5+	8.770e-30	5.050e-30	-29.057	-29.297	-0.240	(0)
V (2)	6.509e-38					
V+2	5.870e-38	6.454e-39	-37.231	-38.190	-0.959	(0)
VOH+	6.393e-39	3.681e-39	-38.194	-38.434	-0.240	(0)
V (3)	3.558e-12					
V (OH) 3	3.558e-12	3.558e-12	-11.449	-11.449	0.000	(0)
V (OH) 2+	2.281e-21	1.313e-21	-20.642	-20.882	-0.240	(0)
VOH+2	6.472e-23	7.117e-24	-22.189	-23.148	-0.959	(0)
V+3	1.157e-25	8.056e-28	-24.937	-27.094	-2.157	(0)
VSO4+	5.767e-27	3.321e-27	-26.239	-26.479	-0.240	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-41.660	-45.495	-3.835	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-43.420	-45.577	-2.157	(0)
V (4)	2.609e-12					
VOF+	1.088e-12	6.263e-13	-11.964	-12.203	-0.240	(0)
VOF2	8.025e-13	8.025e-13	-12.096	-12.096	0.000	(0)
VO+2	2.778e-13	3.055e-14	-12.556	-13.515	-0.959	(0)
V (OH) 3+	1.856e-13	1.069e-13	-12.731	-12.971	-0.240	(0)
VOF3-	1.690e-13	9.731e-14	-12.772	-13.012	-0.240	(0)
VOSO4	7.348e-14	7.348e-14	-13.134	-13.134	0.000	(0)
VOF4-2	1.221e-14	1.342e-15	-13.913	-14.872	-0.959	(0)
VOCl+	9.340e-16	5.378e-16	-15.030	-15.269	-0.240	(0)
H2V2O4+2	5.262e-21	5.786e-22	-20.279	-21.238	-0.959	(0)

V(5)	2.127e-06					
H2VO4-	1.918e-06	1.105e-06	-5.717	-5.957	-0.240	(0)
H3VO7-	7.818e-08	4.502e-08	-7.107	-7.347	-0.240	(0)
HVO4-2	4.441e-08	4.884e-09	-7.352	-8.311	-0.959	(0)
H3VO4	6.277e-09	6.277e-09	-8.202	-8.202	0.000	(0)
HV2O7-3	2.640e-10	1.838e-12	-9.578	-11.736	-2.157	(0)
V3O9-3	2.061e-10	1.435e-12	-9.686	-11.843	-2.157	(0)
VO2F2-	9.291e-11	5.350e-11	-10.032	-10.272	-0.240	(0)
VO2F	4.312e-11	4.312e-11	-10.365	-10.365	0.000	(0)
VO2F3-2	2.074e-11	2.281e-12	-10.683	-11.642	-0.959	(0)
VO2+	9.688e-12	7.194e-12	-11.014	-11.143	-0.129	(0)
V4O12-4	4.545e-12	6.646e-16	-11.342	-15.177	-3.835	(0)
VO2SO4-	2.605e-12	1.500e-12	-11.584	-11.824	-0.240	(0)
V2O7-4	5.955e-13	8.708e-17	-12.225	-16.060	-3.835	(0)
VO2F4-3	5.508e-13	3.835e-15	-12.259	-14.416	-2.157	(0)
VO4-3	6.187e-15	4.308e-17	-14.209	-16.366	-2.157	(0)
VO2NO3	9.912e-20	9.912e-20	-19.004	-19.004	0.000	(0)
V10O28-6	1.032e-27	2.425e-36	-26.987	-35.615	-8.629	(0)
HV10O28-5	2.080e-28	2.118e-34	-27.682	-33.674	-5.992	(0)
H2V10O28-4	1.327e-31	1.941e-35	-30.877	-34.712	-3.835	(0)
Zn	2.604e-05					
Zn+2	8.600e-06	2.615e-06	-5.066	-5.583	-0.517	(0)
ZnHCO3+	7.931e-06	4.567e-06	-5.101	-5.340	-0.240	(0)
ZnSO4	4.995e-06	4.995e-06	-5.301	-5.301	0.000	(0)
Zn(SO4)2-2	3.455e-06	3.799e-07	-5.462	-6.420	-0.959	(0)
ZnCO3	6.857e-07	6.857e-07	-6.164	-6.164	0.000	(0)
ZnF+	3.096e-07	1.783e-07	-6.509	-6.749	-0.240	(0)
ZnCl+	5.797e-08	4.121e-08	-7.237	-7.385	-0.148	(0)
ZnOH+	8.003e-09	4.608e-09	-8.097	-8.336	-0.240	(0)
ZnOHCl	9.509e-10	9.509e-10	-9.022	-9.022	0.000	(0)
ZnCl2	4.098e-10	4.098e-10	-9.387	-9.387	0.000	(0)
Zn(OH)2	1.287e-11	1.287e-11	-10.890	-10.890	0.000	(0)
ZnCl3-	2.873e-12	2.043e-12	-11.542	-11.690	-0.148	(0)
ZnNO3+	3.107e-13	1.789e-13	-12.508	-12.747	-0.240	(0)
ZnCl4-2	2.228e-14	6.409e-15	-13.652	-14.193	-0.541	(0)
ZnSeO4	1.766e-14	1.766e-14	-13.753	-13.753	0.000	(0)
Zn(OH)3-	1.975e-15	1.137e-15	-14.704	-14.944	-0.240	(0)
Zn(OH)4-2	7.257e-21	7.980e-22	-20.139	-21.098	-0.959	(0)
Zn(NO3)2	9.722e-22	9.722e-22	-21.012	-21.012	0.000	(0)
Zn(SeO4)2-2	7.103e-24	7.811e-25	-23.149	-24.107	-0.959	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-150.066	-150.305	-0.240	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.541	-150.541	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.910	-226.150	-0.240	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-228.926	-229.885	-0.959	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-305.540	-306.499	-0.959	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-53.93	-47.64	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-41.43	-36.92	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-48.66	-36.92	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-69.92	-51.99	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-55.93	-35.90	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-30.46	-30.06	0.40	(NH4)2CrO4
(NH4)2SeO4	-21.26	-20.81	0.45	(NH4)2SeO4
Al(OH)3(am)	-5.56	5.24	10.80	Al(OH)3
Al2(MoO4)3	-46.10	-43.73	2.37	Al2(MoO4)3
Al2O3	-9.16	10.49	19.65	Al2O3
Al4(OH)10SO4	-16.27	6.43	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.09	-6.29	4.80	AlAsO4:2H2O
AlOHSO4	-6.07	-9.30	-3.23	AlOHSO4
AlSb	-156.77	-91.15	65.62	AlSb
Alunite	-7.69	-9.09	-1.40	KAl3(SO4)2(OH)6
Anglesite	-2.38	-10.17	-7.79	PbSO4
Anhydrite	0.32	-4.04	-4.36	CaSO4
Anilite	-55.47	-87.35	-31.88	Cu0.25Cu1.5S

Antlerite	-0.54	8.24	8.79	Cu ₃ (OH) ₄ SO ₄
Aragonite	0.98	-7.32	-8.30	CaCO ₃
Arsenolite	-72.03	-74.79	-2.76	As ₄ O ₆
Artinite	-7.52	2.08	9.60	MgCO ₃ :Mg(OH) ₂ :3H ₂ O
As ₂ O ₅	-29.78	-23.07	6.71	As ₂ O ₅
Atacamite	-0.64	6.75	7.39	Cu ₂ (OH) ₃ Cl
Azurite	4.04	-12.87	-16.91	Cu ₃ (OH) ₂ (CO ₃) ₂
Ba(OH) ₂ :8H ₂ O	-17.05	7.34	24.39	Ba(OH) ₂ :8H ₂ O
Ba ₂ V ₂ O ₇ :2H ₂ O	-10.94	4.93	15.87	Ba ₂ V ₂ O ₇ :2H ₂ O
Ba ₃ (AsO ₄) ₂	7.94	-0.97	-8.91	Ba ₃ (AsO ₄) ₂
Ba ₃ (VO ₄) ₂ :4H ₂ O	-20.65	12.29	32.94	Ba ₃ (VO ₄) ₂ :4H ₂ O
BaCrO ₄	-15.06	-24.73	-9.67	BaCrO ₄
BaF ₂	-4.24	-10.06	-5.82	BaF ₂
BaMoO ₄	-3.75	-10.71	-6.96	BaMoO ₄
Barite	2.80	-7.18	-9.98	BaSO ₄
BaS	-93.95	-77.77	16.18	BaS
BaSeO ₃	-7.07	-5.24	1.83	BaSeO ₃
BaSeO ₄	-8.02	-15.48	-7.46	BaSeO ₄
Bianchite	-5.89	-7.66	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-9.64	8.46	18.09	MnO ₂
Bixbyite	-8.51	-9.15	-0.64	Mn ₂ O ₃
BlaubleiI	-54.68	-78.84	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.49	-82.77	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	-3.33	5.25	8.58	AlOOH
Breithauptite	-62.90	-81.43	-18.52	NiSb
Brochantite	0.62	15.84	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-6.89	9.96	16.84	Mg(OH) ₂
Bunsenite	-10.51	1.94	12.45	NiO
Ca(VO ₃) ₂	-4.95	0.71	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-6.28	11.22	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-10.33	11.22	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-13.85	8.45	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-17.23	21.73	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-18.14	21.72	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-304.24	-161.26	142.97	Ca ₃ Sb ₂
CaCrO ₄	-19.32	-21.59	-2.27	CaCrO ₄
Calcite	1.16	-7.32	-8.48	CaCO ₃
Calomel	-4.68	-22.59	-17.91	Hg ₂ Cl ₂
CaMoO ₄	0.39	-7.56	-7.95	CaMoO ₄
Carnotite	-3.35	-3.12	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-4.91	-2.10	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-9.32	-12.34	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.83	-2.99	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-8.69	4.95	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-8.78	4.95	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-20.94	-14.23	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-22.25	0.31	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-23.13	5.27	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-11.28	-11.94	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-10.25	-11.94	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-10.03	-11.94	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-11.25	-12.47	-1.21	CdF ₂
Cdmetal(alpha)	-34.62	-21.11	13.51	Cd
Cdmetal(gamma)	-34.72	-21.11	13.62	Cd
CdMoO ₄	1.03	-13.12	-14.15	CdMoO ₄
CdOHCl	-7.03	-3.49	3.54	CdOHCl
CdSb	-78.06	-78.41	-0.35	CdSb
CdSe	-20.77	-40.97	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.05	-17.90	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-9.42	-9.59	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-7.87	-9.59	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-7.73	-9.60	-1.87	CdSO ₄ :2.67H ₂ O
Cerrusite	-0.32	-13.45	-13.13	PbCO ₃
CH ₄ (g)	-81.03	-122.08	-41.05	CH ₄
Chalcanthite	-4.32	-6.96	-2.64	CuSO ₄ :5H ₂ O
Chalcocite	-55.70	-90.62	-34.92	Cu ₂ S
Chalcopyrite	-121.75	-157.02	-35.27	CuFeS ₂
Cinnabar	-50.85	-96.54	-45.69	HgS

Claudetite	-71.73	-74.79	-3.06	As4O6
Clausthalite	-14.45	-41.55	-27.10	PbSe
Co (BO2) 2	-32.33	-5.26	27.07	Co (BO2) 2
Co (OH) 2	-10.40	2.69	13.09	Co (OH) 2
Co (OH) 3	-14.37	-16.68	-2.31	Co (OH) 3
CO2 (g)	0.32	-17.83	-18.15	CO2
Co3 (AsO4) 2	-28.03	-14.99	13.03	Co3 (AsO4) 2
Co3O4	-20.16	-30.66	-10.50	Co3O4
CoCl2	-22.47	-14.20	8.27	CoCl2
CoCl2:6H2O	-16.75	-14.21	2.54	CoCl2:6H2O
CoCO3	-5.16	-15.14	-9.98	CoCO3
CoF2	-13.13	-14.73	-1.60	CoF2
CoF3	-41.35	-42.81	-1.46	CoF3
CoFe2O4	17.52	13.99	-3.53	CoFe2O4
CoMoO4	-7.62	-15.38	-7.76	CoMoO4
CoO	-10.89	2.69	13.59	CoO
CoS (alpha)	-75.00	-82.44	-7.44	CoS
CoS (beta)	-71.37	-82.44	-11.07	CoS
CoSe	-27.03	-43.23	-16.20	CoSe
CoSeO3	-11.23	-9.91	1.32	CoSeO3
CoSeO4:6H2O	-18.64	-20.17	-1.53	CoSeO4:6H2O
CoSO4	-14.66	-11.85	2.80	CoSO4
CoSO4:6H2O	-9.40	-11.87	-2.47	CoSO4:6H2O
Cotunnite	-7.74	-12.52	-4.78	PbCl2
Covellite	-55.23	-77.53	-22.30	CuS
Cr (OH) 2	-24.72	-13.90	10.82	Cr (OH) 2
Cr (OH) 3	-5.15	-3.82	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-3.07	-3.82	-0.75	Cr (OH) 3
Cr2O3	-5.27	-7.62	-2.36	Cr2O3
CrCl2	-44.88	-30.79	14.09	CrCl2
CrCl3	-44.27	-29.15	15.11	CrCl3
CrF3	-18.61	-29.94	-11.34	CrF3
Crmetal	-70.44	-39.96	30.48	Cr
CrO3	-28.89	-32.10	-3.21	CrO3
Cryolite	0.37	-33.47	-33.84	Na3AlF6
Cu (OH) 2	-1.08	7.60	8.67	Cu (OH) 2
Cu (SbO3) 2	-21.91	23.30	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-7.87	1.39	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-56.66	-91.55	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.61	-51.41	-45.80	Cu2Se
Cu2SO4	-18.08	-20.03	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-6.38	-0.28	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-62.03	-104.62	-42.59	Cu3Sb
Cu3Se2	-26.25	-89.74	-63.49	Cu3Se2
CuCO3	1.27	-10.23	-11.50	CuCO3
CuCrO4	-19.06	-24.50	-5.44	CuCrO4
CuF	-6.55	-11.45	-4.91	CuF
CuF2	-10.94	-9.82	1.12	CuF2
CuF2:2H2O	-5.28	-9.83	-4.55	CuF2:2H2O
Cumetal	-7.02	-15.77	-8.76	Cu
CuMoO4	2.60	-10.48	-13.08	CuMoO4
CuOCuSO4	-9.65	0.65	10.30	CuOCuSO4
Cupricferrite	12.90	18.89	5.99	CuFe2O4
Cuprite	-4.08	-5.48	-1.41	Cu2O
Cuprousferrite	11.82	2.91	-8.92	CuFeO2
CuSe	-5.23	-38.33	-33.10	CuSe
CuSe2	-24.83	-58.19	-33.37	CuSe2
CuSeO3:2H2O	-5.52	-5.01	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-12.82	-15.26	-2.44	CuSeO4:5H2O
CuSO4	-9.89	-6.95	2.94	CuSO4
Diaspore	-1.63	5.25	6.87	AlOOH
Djurleite	-55.83	-89.75	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	1.35	-15.19	-16.54	CaMg (CO3) 2
Dolomite (ordered)	1.90	-15.19	-17.09	CaMg (CO3) 2
Epsomite	-2.48	-4.60	-2.13	MgSO4:7H2O
Fe (OH) 2	-7.92	5.65	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	6.15	3.11	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-0.43	-4.15	-3.72	Fe (VO3) 2

Fe2 (OH) 4SeO3	-2.87	-1.31	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-5.89	-26.52	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-28.61	-32.35	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-3.29	16.93	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-6.29	-5.89	0.40	FeAsO4:2H2O
FeCr2O4	-9.18	-1.98	7.20	FeCr2O4
FeMoO4	-2.33	-12.43	-10.09	FeMoO4
Ferrihydrite	2.45	5.64	3.19	Fe (OH) 3
Ferroselite	-41.55	-60.14	-18.60	FeSe2
FeS (ppt)	-76.53	-79.48	-2.95	FeS
FeSe	-29.28	-40.28	-11.00	FeSe
Fix_pe	-6.79	-6.79	0.00	e-
Fluorite	3.59	-6.91	-10.50	CaF2
Galena	-66.78	-80.75	-13.97	PbS
Gibbsite	-3.05	5.24	8.29	Al (OH) 3
Goethite	5.15	5.65	0.49	FeOOH
Goslarite	-5.65	-7.66	-2.01	ZnSO4:7H2O
Greenockite	-65.82	-80.18	-14.36	CdS
Greigite	-278.55	-323.59	-45.03	Fe3S4
Gummite	-10.16	-2.49	7.67	UO3
Gypsum	0.57	-4.04	-4.61	CaSO4:2H2O
H-Jarosite	-0.06	-12.16	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-5.20	-18.08	-12.88	H2MoO4
H2S (g)	-77.12	-85.13	-8.01	H2S
H2Se (g)	-40.97	-45.93	-4.96	H2Se
Halite	-5.53	-3.93	1.60	NaCl
Hausmannite	-11.74	49.29	61.03	Mn3O4
Hematite	12.71	11.29	-1.42	Fe2O3
Hercynite	-6.75	16.14	22.89	FeAl2O4
Hg (CH3) 2 (g)	-181.86	-255.57	-73.71	Hg (CH3) 2
Hg (g)	-8.00	-15.88	-7.87	Hg
Hg (OH) 2	-7.92	-11.41	-3.50	Hg (OH) 2
Hg2 (g)	-16.80	-31.76	-14.96	Hg2
Hg2 (OH) 2	-10.96	-5.70	5.26	Hg2 (OH) 2
Hg2CO3	-7.47	-23.52	-16.05	Hg2CO3
Hg2CrO4	-29.09	-37.79	-8.70	Hg2CrO4
Hg2F2	-12.75	-23.12	-10.36	Hg2F2
Hg2S	-79.15	-90.83	-11.68	Hg2S
Hg2SeO3	-13.64	-18.30	-4.66	Hg2SeO3
Hg2SO4	-14.11	-20.24	-6.13	Hg2SO4
Hg3O2CO3	-22.38	-52.06	-29.68	Hg3O2CO3
HgCl (g)	-30.79	-11.29	19.50	HgCl
HgCl2	-7.04	-28.30	-21.26	HgCl2
HgF (g)	-44.23	-11.56	32.68	HgF
HgF2 (g)	-41.40	-28.83	12.57	HgF2
Hgmetal (l)	-2.43	-15.88	-13.45	Hg
HgSe	-1.64	-57.34	-55.69	HgSe
HgSeO3	-11.58	-24.01	-12.43	HgSeO3
HgSO4	-16.54	-25.96	-9.42	HgSO4
Huntite	-0.96	-30.93	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-3.76	-22.53	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-12.76	-21.52	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-14.44	-19.61	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	6.91	-7.89	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-38.42	-55.66	-17.24	K2Cr2O7
K2CrO4	-23.05	-23.56	-0.51	K2CrO4
K2MoO4	-12.80	-9.54	3.26	K2MoO4
K2SeO4	-13.58	-14.31	-0.73	K2SeO4
Langite	-1.65	15.84	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.36	-5.79	-0.43	PbO:PbSO4
Laurionite	-4.69	-4.07	0.62	PbOHCl
Lepidocrocite	4.27	5.65	1.37	FeOOH
Lime	-22.19	10.51	32.70	CaO
Litharge	-8.32	4.38	12.69	PbO
Mackinawite	-75.88	-79.48	-3.60	FeS
Maghemite	4.91	11.29	6.39	Fe2O3
Magnesioferrite	4.40	21.26	16.86	Fe2MgO4
Magnesite	-0.41	-7.87	-7.46	MgCO3

Magnetite	13.54	16.94	3.40	Fe3O4
Malachite	2.67	-2.63	-5.31	Cu2(OH)2CO3
Manganite	-4.57	20.77	25.34	MnOOH
Massicot	-8.52	4.38	12.89	PbO
Matlockite	-3.81	-12.78	-8.97	PbClF
Melanothallite	-15.55	-9.29	6.26	CuCl2
Melanterite	-6.71	-8.92	-2.21	FeSO4:7H2O
Metacinnabar	-51.45	-96.54	-45.09	HgS
Mg(OH)2(active)	-8.84	9.96	18.79	Mg(OH)2
Mg(VO3)2	-11.12	0.16	11.28	Mg(VO3)2
Mg2Sb3	-278.79	-204.11	74.68	Mg2Sb3
Mg2V2O7	-16.23	10.13	26.36	Mg2V2O7
MgCr2O4	-13.86	2.34	16.20	MgCr2O4
MgCrO4	-27.52	-22.14	5.38	MgCrO4
MgF2	0.67	-7.46	-8.13	MgF2
MgMoO4	-6.26	-8.11	-1.85	MgMoO4
MgSeO3:6H2O	-5.71	-2.66	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.70	-12.90	-1.20	MgSeO4:6H2O
Minium	-34.33	39.19	73.52	Pb3O4
Mirabilite	-4.42	-5.54	-1.11	Na2SO4:10H2O
Mn(VO3)2	-6.95	-2.05	4.90	Mn(VO3)2
Mn2(SO4)3	-47.08	-52.79	-5.71	Mn2(SO4)3
Mn2Sb	-155.02	-93.94	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-12.36	0.14	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.87	-9.16	2.72	MnCl2:4H2O
MnS(grn)	-77.56	-77.39	0.17	MnS
MnS(pnk)	-80.73	-77.39	3.34	MnS
MnSb	-98.06	-100.97	-2.91	MnSb
MnSe	-41.68	-38.18	3.50	MnSe
MnSeO3	-5.99	-4.86	1.13	MnSeO3
MnSeO3:2H2O	-5.84	-4.86	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-13.07	-15.12	-2.05	MnSeO4:5H2O
MnSO4	-9.39	-6.80	2.58	MnSO4
Monteponite	-10.15	4.96	15.10	CdO
Montroydite	-7.77	-11.41	-3.64	HgO
MoO3	-10.07	-18.07	-8.00	MoO3
Morenosite	-10.48	-12.63	-2.14	NiSO4:7H2O
MoS2	-144.14	-214.40	-70.26	MoS2
Na-Jarosite	3.56	-7.64	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-45.26	-55.16	-9.90	Na2Cr2O7
Na2CrO4	-25.99	-23.06	2.93	Na2CrO4
Na2Mo2O7	-10.52	-27.11	-16.60	Na2Mo2O7
Na2MoO4	-10.53	-9.04	1.49	Na2MoO4
Na2MoO4:2H2O	-10.27	-9.04	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.88	-3.58	10.30	Na2SeO3:5H2O
Na2SeO4	-15.10	-13.82	1.28	Na2SeO4
Na3Sb	-177.30	-82.84	94.45	Na3Sb
Na3VO4	-28.03	8.65	36.68	Na3VO4
Na4V2O7	-29.13	8.27	37.40	Na4V2O7
Nantokite	-4.46	-11.19	-6.73	CuCl
NaSb	-88.98	-65.82	23.17	NaSb
Natron	-7.51	-8.82	-1.31	Na2CO3:10H2O
NaVO3	-4.24	-0.38	3.86	NaVO3
Nesquehonite	-3.21	-7.88	-4.67	MgCO3:3H2O
Ni(OH)2	-10.86	1.94	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-32.97	-17.27	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-38.80	-6.80	32.00	Ni4(OH)6SO4
NiCO3	-9.02	-15.89	-6.87	NiCO3
NiMoO4	-4.99	-16.14	-11.14	NiMoO4
NiS(alpha)	-77.59	-83.19	-5.60	NiS
NiS(beta)	-72.09	-83.19	-11.10	NiS
NiS(gamma)	-70.39	-83.19	-12.80	NiS
NiSe	-26.29	-43.99	-17.70	NiSe
NiSeO3:2H2O	-13.48	-10.67	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-19.40	-20.92	-1.52	NiSeO4:6H2O
Nsutite	-9.05	8.46	17.50	MnO2
O2(g)	-30.97	52.12	83.09	O2
Orpiment	-231.73	-292.79	-61.07	As2S3

Otavite	-0.87	-12.87	-12.00	CdCO ₃
Pb(BO ₂) ₂	-10.09	-3.57	6.52	Pb(BO ₂) ₂
Pb(OH) ₂	-3.77	4.38	8.15	Pb(OH) ₂
Pb ₁₀ (OH) ₆₀ (CO ₃) ₆	-54.45	-63.21	-8.76	Pb ₁₀ (OH) ₆₀ (CO ₃) ₆
Pb ₂ (OH) ₃ Cl	-8.49	0.31	8.79	Pb ₂ (OH) ₃ Cl
Pb ₂₀ (OH) ₂	-17.43	8.75	26.19	Pb ₂₀ (OH) ₂
Pb ₂ O ₃	-26.22	34.82	61.04	Pb ₂ O ₃
Pb ₂ OC ₃	-8.52	-9.07	-0.56	Pb ₂ OC ₃
Pb ₂ V ₂ O ₇	0.86	-1.04	-1.90	Pb ₂ V ₂ O ₇
Pb ₃ (AsO ₄) ₂	-15.74	-9.94	5.80	Pb ₃ (AsO ₄) ₂
Pb ₃ (VO ₄) ₂	-2.80	3.34	6.14	Pb ₃ (VO ₄) ₂
Pb ₃ O ₂ CO ₃	-15.72	-4.70	11.02	Pb ₃ O ₂ CO ₃
Pb ₃ O ₂ SO ₄	-12.10	-1.41	10.69	Pb ₃ O ₂ SO ₄
Pb ₄ (OH) ₆ SO ₄	-18.14	2.96	21.10	Pb ₄ (OH) ₆ SO ₄
Pb ₄ O ₃ SO ₄	-18.91	2.96	21.88	Pb ₄ O ₃ SO ₄
PbCrO ₄	-15.12	-27.72	-12.60	PbCrO ₄
PbF ₂	-5.60	-13.04	-7.44	PbF ₂
Pbmetal	-25.93	-21.68	4.25	Pb
PbMoO ₄	1.92	-13.70	-15.62	PbMoO ₄
PbO:0.3H ₂ O	-8.60	4.38	12.98	PbO:0.33H ₂ O
PbSeO ₄	-11.63	-18.47	-6.84	PbSeO ₄
Periclase	-11.62	9.96	21.58	MgO
Phosgenite	-6.16	-25.97	-19.81	PbCl ₂ :PbCO ₃
Plattnerite	-19.16	30.44	49.60	PbO ₂
Portlandite	-12.30	10.51	22.80	Ca(OH) ₂
Pyrite	-120.05	-138.55	-18.51	FeS ₂
Pyrochroite	-7.45	7.74	15.19	Mn(OH) ₂
Pyrolusite	-7.57	33.81	41.38	MnO ₂
Realgar	-97.11	-116.86	-19.75	AsS
Retgersite	-10.58	-12.62	-2.04	NiSO ₄ :6H ₂ O
Rhodochrosite	0.49	-10.09	-10.58	MnCO ₃
Rutherfordine	-5.82	-20.32	-14.50	UO ₂ CO ₃
Sb(OH) ₃	-11.11	-18.22	-7.11	Sb(OH) ₃
Sb ₂ O ₄	-13.76	-10.36	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-23.25	-32.92	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-106.44	-174.20	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-54.59	-72.85	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-54.95	-72.85	-17.90	Sb ₄ O ₆
SbCl ₃	-44.12	-43.55	0.57	SbCl ₃
SbF ₃	-34.12	-44.34	-10.23	SbF ₃
Sbmetal	-45.61	-57.30	-11.69	Sb
SbO ₂	-1.67	-29.49	-27.82	SbO ₂
Schoepite	-8.49	-2.49	5.99	UO ₂ (OH) ₂ :H ₂ O
Semetal(am)	-12.75	-19.86	-7.11	Se
Semetal(hex)	-12.16	-19.86	-7.71	Se
Senarmontite	-24.06	-36.42	-12.37	Sb ₂ O ₃
SeO ₂	-12.73	-12.60	0.12	SeO ₂
SeO ₃	-43.89	-22.85	21.04	SeO ₃
Siderite	-1.94	-12.18	-10.24	FeCO ₃
Smithsonite	-0.92	-10.92	-10.00	ZnCO ₃
Sphalerite	-66.78	-78.23	-11.45	ZnS
Spinel	-16.39	20.46	36.85	MgAl ₂ O ₄
Stibnite	-241.36	-291.82	-50.46	Sb ₂ S ₃
Sulfur	-56.93	-59.07	-2.14	S
Tenorite	-0.05	7.60	7.64	CuO
Thenardite	-5.84	-5.51	0.32	Na ₂ SO ₄
Thermonatrite	-9.44	-8.80	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-8.34	-4.26	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-26.96	-5.87	21.08	U ₃ O ₈
U ₃ Sb ₄	-595.96	-443.58	152.38	U ₃ Sb ₄
U ₄ O ₉	-48.25	-51.27	-3.02	U ₄ O ₉
UF ₄	-24.64	-54.17	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-21.46	-54.18	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-20.27	-19.33	0.93	UO ₂
UO ₂ (NO ₃) ₂	-42.25	-30.11	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-34.96	-30.11	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-33.50	-30.11	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-32.17	-30.12	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O

UO2(OH)2(beta)	-8.10	-2.49	5.61	UO2(OH)2
UO2SeO4:4H2O	-23.10	-25.35	-2.25	UO2SeO4:4H2O
UO3	-10.19	-2.49	7.70	UO3
Uraninite	-14.66	-19.33	-4.67	UO2
USb2	-224.86	-195.28	29.58	USb2
V(OH)3	-15.96	-8.36	7.59	V(OH)3
V2O5	-8.44	-9.80	-1.36	V2O5
V3O5	-30.98	-29.14	1.84	V3O5
V4O7	-37.35	-30.17	7.19	V4O7
V6O13	-20.65	-81.51	-60.86	V6O13
Valentinite	-27.94	-36.42	-8.48	Sb2O3
VC12	-57.16	-38.28	18.87	VC12
VC13	-57.13	-33.70	23.43	VC13
VF4	-50.80	-35.87	14.93	VF4
Vmetal	-91.48	-47.45	44.03	V
VO	-36.15	-21.39	14.76	VO
VO(OH)2	-6.18	-1.03	5.15	VO(OH)2
VO2Cl	-16.19	-13.35	2.84	VO2Cl
VOC1	-27.96	-16.81	11.15	VOC1
VOC12	-30.68	-17.92	12.76	VOC12
VOSO4	-19.18	-15.57	3.61	VOSO4
Witherite	-1.89	-10.46	-8.57	BaCO3
Wurtzite	-69.28	-78.23	-8.95	ZnS
Zincite	-4.43	6.91	11.33	ZnO
Zincosite	-11.57	-7.64	3.93	ZnSO4
Zn(BO2)2	-9.33	-1.04	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.04	-20.73	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-5.30	6.90	12.20	Zn(OH)2
Zn(OH)2(am)	-5.57	6.90	12.47	Zn(OH)2
Zn(OH)2(beta)	-4.85	6.90	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-4.63	6.90	11.53	Zn(OH)2
Zn(OH)2(gamma)	-4.83	6.90	11.73	Zn(OH)2
Zn2(OH)2SO4	-8.24	-0.74	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-9.83	5.36	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.01	-2.36	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-27.29	-8.38	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-15.33	13.07	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-20.87	17.63	38.50	Zn5(OH)8Cl2
ZnCl2	-17.04	-9.99	7.05	ZnCl2
ZnCO3:1H2O	-0.67	-10.93	-10.26	ZnCO3:1H2O
ZnF2	-9.98	-10.52	-0.53	ZnF2
Znmetal	-44.94	-19.16	25.79	Zn
ZnMoO4	-1.04	-11.17	-10.13	ZnMoO4
ZnO(active)	-4.28	6.91	11.19	ZnO
ZnS(am)	-69.17	-78.23	-9.05	ZnS
ZnSb	-87.47	-76.46	11.01	ZnSb
ZnSe	-24.62	-39.02	-14.40	ZnSe
ZnSeO4:6H2O	-14.44	-15.96	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.01	-7.64	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 154.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e--e-
  log_k      0
EQUILIBRIUM_PHASES 902
Ag2Se 0 0

```

```

Alunite 0 0
Anhydrite 0 0
Alunite 0 0
Ba3(AsO4)2 0 0
Barite 0 0
Brochantite 0 0
Brucite 0 0
Calcite 0 0
CaMoO4 0 0
CaSeO3:2H2O 0 0
Carnotite 0 0
Cd(BO2)2 0 0
CdMoO4 0 0
Chrysotile 0 0
CO2(g) -3.5 10
Cr2O3 0 0
CuMoO4 0 0
Cu2Se(alpha) 0 0
Epsomite 0 0
Ferrihydrite 0 0
Fluorite 0 0
Gummite 0 0
Gypsum 0 0
HgSe 0 0
Mg3(PO4)2 0 0
Mirabilite 0 0
MnSeO3 0 0
O2(g) -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 906
SAVE Solution 907 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 902
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
-----

```

Reaction step 1.

```

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.

```

WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Maximum iterations exceeded, 10000

WARNING: Numerical method failed with this set of convergence parameters.

WARNING: Trying smaller step size, pe step size 10, 5 ...

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
Using solution 906. Solution after simulation 153.
Using pure phase assemblage 902.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	0.000e+00	7.251e-05	7.251e-05
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	5.051e-08	5.051e-08
Barite	0.00	-9.98	-9.98	0.000e+00	3.005e-05	3.005e-05
Brochantite	0.00	15.22	15.22	0.000e+00	1.346e-04	1.346e-04
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.000e+01	1.012e+01	1.174e-01
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3·2H2O	-4.16	-1.35	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	4.579e-02	4.579e-02
Carnotite	0.00	0.23	0.23	0.000e+00	2.086e-06	2.086e-06
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	0.000e+00	2.423e-07	2.423e-07
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-0.28	-2.64	-2.36	0.000e+00	0	0.000e+00
Cu2Se (alpha)	-4.15	-49.95	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.075e-05	1.075e-05
Fluorite	0.00	-10.50	-10.50	0.000e+00	3.693e-03	3.693e-03
Gummite	-5.04	2.63	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	0.000e+00	9.164e-03	9.164e-03
HgSe	-1.23	-56.92	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.34	-3.21	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-30.65	-14.95	15.70	0.000e+00	0	0.000e+00
NiCO3	-8.99	-15.86	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.46	-15.61	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.448e-05
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	0.000e+00	7.535e-07	7.535e-07

Rutherfordine	-4.52	-19.02	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.37	2.63	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2 (am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-11.09	9.99	21.08	0.000e+00	0	0.000e+00
UO2 (OH)2 (beta)	-2.98	2.63	5.61	0.000e+00	0	0.000e+00
UO3	-5.07	2.63	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Al	5.554e-06	5.583e-06
As	1.573e-09	1.581e-09
B	1.002e-04	1.008e-04
Ba	2.721e-08	2.736e-08
C	5.741e-04	5.771e-04
Ca	1.207e-02	1.213e-02
Cd	2.235e-08	2.246e-08
Cl	8.436e-03	8.481e-03
Co	2.972e-09	2.988e-09
Cr	1.143e-09	1.149e-09
Cu	4.981e-07	5.008e-07
F	2.256e-04	2.268e-04
Fe	1.103e-09	1.109e-09
Hg	9.619e-09	9.670e-09
K	1.498e-02	1.506e-02
Mg	1.840e-02	1.850e-02
Mn	2.220e-04	2.232e-04
Mo	7.590e-06	7.630e-06
N	2.246e-05	2.258e-05
Na	2.699e-02	2.714e-02
Ni	4.840e-10	4.865e-10
Pb	1.667e-09	1.675e-09
S	4.706e-02	4.730e-02
Sb	9.015e-08	9.062e-08
Se	7.864e-07	7.906e-07
U	6.604e-07	6.639e-07
V	4.763e-08	4.788e-08
Zn	2.600e-05	2.613e-05

-----Description of solution-----

	pH =	7.908	Charge balance
	pe =	4.865	Adjusted to redox
equilibrium	Activity of water =	0.998	
	Ionic strength (mol/kgw) =	1.227e-01	
	Mass of water (kg) =	1.005e+00	
	Total alkalinity (eq/kg) =	6.145e-04	
	Total CO2 (mol/kg) =	5.741e-04	
	Temperature (°C) =	25.00	
	Electrical balance (eq) =	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations =	14	
	Total H =	1.116015e+02	
	Total O =	5.599166e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm³/mol
OH-	1.091e-06	8.135e-07	-5.962	-6.090	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00

	H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al		5.554e-06					
	Al (OH) 4-	5.509e-06	4.201e-06	-5.259	-5.377	-0.118	(0)
	Al (OH) 3	4.102e-08	4.102e-08	-7.387	-7.387	0.000	(0)
	Al (OH) 2+	3.257e-09	2.527e-09	-8.487	-8.597	-0.110	(0)
	AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
	AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
	AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
	AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
	AlOH+2	1.079e-11	3.910e-12	-10.967	-11.408	-0.441	(0)
	AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
	Al (SO4) 2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
	Al+3	5.055e-14	4.806e-15	-13.296	-14.318	-1.022	(0)
	AlMo6O21-3	2.464e-39	0.000e+00	-38.608	-40.216	-1.608	(0)
As (3)		1.700e-23					
	H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
	H2AsO3-	1.002e-24	6.642e-25	-23.999	-24.178	-0.179	(0)
	HAsO3-2	2.542e-28	4.903e-29	-27.595	-28.310	-0.715	(0)
	H4AsO3+	1.477e-31	9.791e-32	-30.830	-31.009	-0.179	(0)
	AsO3-3	6.205e-33	1.530e-34	-32.207	-33.815	-1.608	(0)
As (5)		1.573e-09					
	HAsO4-2	1.520e-09	2.932e-10	-8.818	-9.533	-0.715	(0)
	H2AsO4-	4.985e-11	3.303e-11	-10.302	-10.481	-0.179	(0)
	AsO4-3	3.044e-12	7.506e-14	-11.517	-13.125	-1.608	(0)
	H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B		1.002e-04					
	H3BO3	9.234e-05	9.499e-05	-4.035	-4.022	0.012	(0)
	H2BO3-	6.147e-06	4.466e-06	-5.211	-5.350	-0.139	(0)
	MgH2BO3+	8.059e-07	5.855e-07	-6.094	-6.232	-0.139	(0)
	CaH2BO3+	7.944e-07	5.772e-07	-6.100	-6.239	-0.139	(0)
	NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
	BF (OH) 3-	6.190e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
	H5 (BO3) 2-	4.969e-10	3.610e-10	-9.304	-9.442	-0.139	(0)
	H8 (BO3) 3-	4.720e-12	3.429e-12	-11.326	-11.465	-0.139	(0)
	BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
	BF2 (OH) 2-	9.719e-13	7.061e-13	-12.012	-12.151	-0.139	(0)
	BF3OH-	5.553e-19	4.035e-19	-18.255	-18.394	-0.139	(0)
	BF4-	4.013e-24	2.916e-24	-23.397	-23.535	-0.139	(0)
Ba		2.721e-08					
	Ba+2	2.716e-08	9.544e-09	-7.566	-8.020	-0.454	(0)
	BaHCO3+	4.517e-11	3.541e-11	-10.345	-10.451	-0.106	(0)
	BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
	BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
	BaOH+	4.401e-14	3.389e-14	-13.356	-13.470	-0.113	(0)
	BaNO3+	1.111e-15	7.361e-16	-14.954	-15.133	-0.179	(0)
	BaNH3+2	2.672e-16	5.154e-17	-15.573	-16.288	-0.715	(0)
C (4)		5.741e-04					
	HCO3-	5.007e-04	3.885e-04	-3.300	-3.411	-0.110	(0)
	CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)
	MgHCO3+	1.992e-05	1.503e-05	-4.701	-4.823	-0.122	(0)
	H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	4.637e-06	4.637e-06	-5.334	-5.334	0.000	(0)
	NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
	CO3-2	4.195e-06	1.474e-06	-5.377	-5.831	-0.454	(0)
	NaCO3-	6.946e-07	5.389e-07	-6.158	-6.268	-0.110	(0)
	UO2 (CO3) 3-4	6.016e-07	8.327e-10	-6.221	-9.079	-2.859	(0)
	ZnCO3	3.285e-07	3.285e-07	-6.483	-6.483	0.000	(0)
	MnHCO3+	3.119e-07	2.402e-07	-6.506	-6.619	-0.113	(0)
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	ZnHCO3+	7.177e-08	4.757e-08	-7.144	-7.323	-0.179	(0)
	UO2 (CO3) 2-2	5.843e-08	1.127e-08	-7.233	-7.948	-0.715	(0)
	Cu (CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
	CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
	PbCO3	3.986e-10	3.986e-10	-9.399	-9.399	0.000	(0)
	UO2CO3	3.831e-10	3.831e-10	-9.417	-9.417	0.000	(0)
	CdCO3	8.926e-11	8.926e-11	-10.049	-10.049	0.000	(0)
	BaHCO3+	4.517e-11	3.541e-11	-10.345	-10.451	-0.106	(0)

		PbHCO3+	3.918e-11	2.596e-11	-10.407	-10.586	-0.179	(0)
		CoHCO3+	1.805e-11	1.196e-11	-10.744	-10.922	-0.179	(0)
		CoCO3	9.864e-12	9.864e-12	-11.006	-11.006	0.000	(0)
		Pb (CO3) 2-2	8.787e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
		BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
		NiHCO3+	6.711e-12	4.448e-12	-11.173	-11.352	-0.179	(0)
		NiCO3	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
		CdHCO3+	3.545e-12	2.349e-12	-11.450	-11.629	-0.179	(0)
		Cd (CO3) 2-2	5.058e-13	9.756e-14	-12.296	-13.011	-0.715	(0)
		HgCO3	9.752e-15	9.752e-15	-14.011	-14.011	0.000	(0)
		FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
		Hg (CO3) 2-2	2.357e-16	4.547e-17	-15.628	-16.342	-0.715	(0)
		HgHCO3+	3.385e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
Ca	1.207e-02							
		Ca+2	6.391e-03	2.246e-03	-2.194	-2.649	-0.454	(0)
		CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
		CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)
		CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
		CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
		CaH2BO3+	7.944e-07	5.772e-07	-6.100	-6.239	-0.139	(0)
		CaOH+	4.650e-08	3.646e-08	-7.333	-7.438	-0.106	(0)
		CaNO3+	1.649e-10	1.093e-10	-9.783	-9.961	-0.179	(0)
		CaNH3+2	1.255e-10	2.420e-11	-9.902	-10.616	-0.715	(0)
		Ca (NH3) 2+2	4.274e-19	8.244e-20	-18.369	-19.084	-0.715	(0)
Cd	2.235e-08							
		Cd+2	7.559e-09	2.656e-09	-8.122	-8.576	-0.454	(0)
		CdSO4	6.832e-09	6.832e-09	-8.165	-8.165	0.000	(0)
		Cd (SO4) 2-2	5.242e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
		CdCl+	2.486e-09	1.648e-09	-8.604	-8.783	-0.179	(0)
		CdCO3	8.926e-11	8.926e-11	-10.049	-10.049	0.000	(0)
		CdOHC1	5.498e-11	5.498e-11	-10.260	-10.260	0.000	(0)
		CdCl2	4.461e-11	4.461e-11	-10.351	-10.351	0.000	(0)
		CdOH+	2.590e-11	1.717e-11	-10.587	-10.765	-0.179	(0)
		CdF+	7.538e-12	4.996e-12	-11.123	-11.301	-0.179	(0)
		CdHCO3+	3.545e-12	2.349e-12	-11.450	-11.629	-0.179	(0)
		Cd (CO3) 2-2	5.058e-13	9.756e-14	-12.296	-13.011	-0.715	(0)
		CdCl3-	2.758e-13	1.828e-13	-12.559	-12.738	-0.179	(0)
		Cd (OH) 2	8.811e-14	8.811e-14	-13.055	-13.055	0.000	(0)
		CdF2	1.183e-15	1.183e-15	-14.927	-14.927	0.000	(0)
		CdNO3+	1.951e-16	1.293e-16	-15.710	-15.888	-0.179	(0)
		CdSeO4	1.706e-16	1.706e-16	-15.768	-15.768	0.000	(0)
		Cd (SeO3) 2-2	7.192e-17	1.387e-17	-16.143	-16.858	-0.715	(0)
		Cd2OH+3	9.269e-18	2.285e-19	-17.033	-18.641	-1.608	(0)
		Cd (OH) 3-	6.608e-18	4.379e-18	-17.180	-17.359	-0.179	(0)
		Cd (OH) 4-2	3.023e-24	5.832e-25	-23.520	-24.234	-0.715	(0)
		Cd (NO3) 2	9.971e-25	9.971e-25	-24.001	-24.001	0.000	(0)
		CdHS+	0.000e+00	0.000e+00	-78.776	-78.954	-0.179	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Cl	8.436e-03							
		Cl-	8.435e-03	6.495e-03	-2.074	-2.187	-0.114	(0)
		MnCl+	3.290e-07	2.534e-07	-6.483	-6.596	-0.113	(0)
		ZnCl+	8.372e-08	6.317e-08	-7.077	-7.200	-0.122	(0)
		ZnOHC1	6.728e-08	6.728e-08	-7.172	-7.172	0.000	(0)
		CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
		CdCl+	2.486e-09	1.648e-09	-8.604	-8.783	-0.179	(0)
		MnCl2	2.325e-09	2.325e-09	-8.634	-8.634	0.000	(0)
		CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
		ZnCl2	6.502e-10	6.502e-10	-9.187	-9.187	0.000	(0)
		CuCl+	3.709e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
		CdOHC1	5.498e-11	5.498e-11	-10.260	-10.260	0.000	(0)
		HgClOH	5.158e-11	5.158e-11	-10.288	-10.288	0.000	(0)
		CdCl2	4.461e-11	4.461e-11	-10.351	-10.351	0.000	(0)
		PbCl+	3.128e-11	2.073e-11	-10.505	-10.683	-0.179	(0)
		HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
		CoCl+	1.342e-11	8.892e-12	-10.872	-11.051	-0.179	(0)
		CuCl3-2	7.965e-12	2.802e-12	-11.099	-11.552	-0.454	(0)

MnCl3-	5.399e-12	4.158e-12	-11.268	-11.381	-0.113	(0)
ZnCl3-	4.446e-12	3.354e-12	-11.352	-11.474	-0.122	(0)
NiCl+	2.329e-12	1.543e-12	-11.633	-11.812	-0.179	(0)
HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
CuCl2	6.302e-13	6.302e-13	-12.200	-12.200	0.000	(0)
PbCl2	6.013e-13	6.013e-13	-12.221	-12.221	0.000	(0)
CdCl3-	2.758e-13	1.828e-13	-12.559	-12.738	-0.179	(0)
HgCl4-2	2.030e-13	3.915e-14	-12.693	-13.407	-0.715	(0)
ZnCl4-2	3.096e-14	1.089e-14	-13.509	-13.963	-0.454	(0)
PbCl3-	2.346e-15	1.555e-15	-14.630	-14.808	-0.179	(0)
HgCl+	1.081e-15	7.163e-16	-14.966	-15.145	-0.179	(0)
UO2Cl+	1.037e-15	6.876e-16	-14.984	-15.163	-0.179	(0)
CuCl3-	5.063e-17	3.820e-17	-16.296	-16.418	-0.122	(0)
NiCl2	5.046e-17	5.046e-17	-16.297	-16.297	0.000	(0)
PbCl4-2	2.393e-17	4.616e-18	-16.621	-17.336	-0.715	(0)
CrCl+2	1.468e-17	2.832e-18	-16.833	-17.548	-0.715	(0)
CrOHC12	2.844e-19	2.844e-19	-18.546	-18.546	0.000	(0)
CuCl4-2	3.534e-21	1.243e-21	-20.452	-20.905	-0.454	(0)
CrCl2+	2.634e-21	1.745e-21	-20.579	-20.758	-0.179	(0)
FeCl+2	1.641e-21	5.773e-22	-20.785	-21.239	-0.454	(0)
VOCl+	2.609e-22	1.729e-22	-21.584	-21.762	-0.179	(0)
FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
CrO3Cl-	8.376e-26	5.551e-26	-25.077	-25.256	-0.179	(0)
FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
CoCl+2	7.903e-37	1.524e-37	-36.102	-36.817	-0.715	(0)
UCl+3	0.000e+00	0.000e+00	-44.209	-45.817	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.249	-51.964	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.985	-0.715	(0)
Co (2)	2.972e-09					
Co+2	2.052e-09	3.958e-10	-8.688	-9.403	-0.715	(0)
CoSO4	8.664e-10	8.664e-10	-9.062	-9.062	0.000	(0)
CoHCO3+	1.805e-11	1.196e-11	-10.744	-10.922	-0.179	(0)
CoCl+	1.342e-11	8.892e-12	-10.872	-11.051	-0.179	(0)
CoCO3	9.864e-12	9.864e-12	-11.006	-11.006	0.000	(0)
CoOH+	9.694e-12	6.424e-12	-11.013	-11.192	-0.179	(0)
CoF+	2.241e-12	1.485e-12	-11.650	-11.828	-0.179	(0)
Co (OH) 2	4.151e-13	4.151e-13	-12.382	-12.382	0.000	(0)
CoNO2+	6.865e-14	4.550e-14	-13.163	-13.342	-0.179	(0)
Co (NH3) +2	2.111e-15	4.072e-16	-14.675	-15.390	-0.715	(0)
CoSeO4	6.841e-17	6.841e-17	-16.165	-16.165	0.000	(0)
CoNO3+	1.457e-17	9.653e-18	-16.837	-17.015	-0.179	(0)
Co (OH) 3-	1.017e-17	6.739e-18	-16.993	-17.171	-0.179	(0)
CoOOH-	2.556e-18	1.694e-18	-17.592	-17.771	-0.179	(0)
Co2OH+3	5.168e-21	1.274e-22	-20.287	-21.895	-1.608	(0)
Co (NH3) 2+2	7.707e-22	1.487e-22	-21.113	-21.828	-0.715	(0)
Co (OH) 4-2	4.505e-24	8.689e-25	-23.346	-24.061	-0.715	(0)
Co (NO3) 2	3.023e-25	3.023e-25	-24.520	-24.520	0.000	(0)
Co (NH3) 3+2	8.303e-29	1.602e-29	-28.081	-28.795	-0.715	(0)
Co4 (OH) 4+4	2.455e-34	3.399e-37	-33.610	-36.469	-2.859	(0)
Co (NH3) 4+2	3.729e-36	7.193e-37	-35.428	-36.143	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.991	-0.715	(0)
Co (3)	2.472e-30					
CoOH+2	2.472e-30	4.769e-31	-29.607	-30.322	-0.715	(0)
Co+3	1.213e-36	1.153e-37	-35.916	-36.938	-1.022	(0)
CoCl+2	7.903e-37	1.524e-37	-36.102	-36.817	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.653	-60.832	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.973	-65.687	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.985	-0.715	(0)
Cr (2)	5.700e-27					
Cr+2	5.700e-27	1.100e-27	-26.244	-26.959	-0.715	(0)
Cr (3)	1.143e-09					
Cr (OH) 2+	8.957e-10	5.936e-10	-9.048	-9.226	-0.179	(0)
Cr (OH) 3	1.814e-10	1.814e-10	-9.741	-9.741	0.000	(0)
Cr (OH) +2	3.109e-11	5.997e-12	-10.507	-11.222	-0.715	(0)
CrOHSO4	1.561e-11	1.561e-11	-10.807	-10.807	0.000	(0)
CrO2-	1.054e-11	6.988e-12	-10.977	-11.156	-0.179	(0)

Cr(OH) 4-	8.866e-12	5.876e-12	-11.052	-11.231	-0.179	(0)
CrF+2	3.285e-14	6.336e-15	-13.483	-14.198	-0.715	(0)
Cr+3	1.367e-14	3.369e-16	-13.864	-15.472	-1.608	(0)
CrSO4+	1.303e-14	8.632e-15	-13.885	-14.064	-0.179	(0)
CrCl+2	1.468e-17	2.832e-18	-16.833	-17.548	-0.715	(0)
CrOHC12	2.844e-19	2.844e-19	-18.546	-18.546	0.000	(0)
Cr2(OH) 2SO4+2	4.388e-20	8.463e-21	-19.358	-20.072	-0.715	(0)
Cr2(OH) 2(SO4) 2	5.515e-21	5.515e-21	-20.258	-20.258	0.000	(0)
CrCl2+	2.634e-21	1.745e-21	-20.579	-20.758	-0.179	(0)
CrNO3+2	1.175e-24	2.267e-25	-23.930	-24.645	-0.715	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.813	-41.528	-0.715	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-49.270	-50.878	-1.608	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-51.249	-51.964	-0.715	(0)
Cr(6)	8.550e-15					
CrO4-2	7.815e-15	2.746e-15	-14.107	-14.561	-0.454	(0)
NaCrO4-	4.043e-16	2.679e-16	-15.393	-15.572	-0.179	(0)
HCrO4-	1.657e-16	1.098e-16	-15.781	-15.959	-0.179	(0)
KCrO4-	1.649e-16	1.093e-16	-15.783	-15.961	-0.179	(0)
CrO3SO4-2	2.354e-23	4.541e-24	-22.628	-23.343	-0.715	(0)
H2CrO4	1.099e-24	1.099e-24	-23.959	-23.959	0.000	(0)
CrO3Cl-	8.376e-26	5.551e-26	-25.077	-25.256	-0.179	(0)
Cr2O7-2	2.171e-30	4.188e-31	-29.663	-30.378	-0.715	(0)
Cu(1)	4.445e-09					
CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
Cu+	2.745e-10	1.819e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	7.965e-12	2.802e-12	-11.099	-11.552	-0.454	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Cu(2)	4.937e-07					
CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.270e-08	6.994e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.736e-08	2.719e-08	-7.111	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu(OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu(CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
Cu2(OH) 2+2	6.371e-10	1.229e-10	-9.196	-9.911	-0.715	(0)
CuCl+	3.709e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
CuNO2+	7.007e-11	4.644e-11	-10.154	-10.333	-0.179	(0)
Cu(OH) 3-	2.859e-11	1.895e-11	-10.544	-10.723	-0.179	(0)
CuNH3+2	1.234e-11	2.381e-12	-10.909	-11.623	-0.715	(0)
CuCl2	6.302e-13	6.302e-13	-12.200	-12.200	0.000	(0)
Cu(NO2) 2	7.752e-15	7.752e-15	-14.111	-14.111	0.000	(0)
CuNO3+	1.996e-15	1.323e-15	-14.700	-14.878	-0.179	(0)
Cu(OH) 4-2	6.289e-16	1.213e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.063e-17	3.820e-17	-16.296	-16.418	-0.122	(0)
CuCl4-2	3.534e-21	1.243e-21	-20.452	-20.905	-0.454	(0)
Cu(NO3) 2	2.563e-24	2.563e-24	-23.591	-23.591	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.256e-04					
F-	1.541e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.602e-05	5.034e-05	-4.180	-4.298	-0.118	(0)
CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
MnF+	1.901e-07	1.464e-07	-6.721	-6.834	-0.113	(0)
ZnF+	1.383e-08	9.167e-09	-7.859	-8.038	-0.179	(0)
BF(OH) 3-	6.190e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
CdF+	7.538e-12	4.996e-12	-11.123	-11.301	-0.179	(0)
CoF+	2.241e-12	1.485e-12	-11.650	-11.828	-0.179	(0)
UO2F+	1.613e-12	1.069e-12	-11.792	-11.971	-0.179	(0)

HF2-	1.311e-12	9.781e-13	-11.882	-12.010	-0.127	(0)
PbF+	1.135e-12	7.521e-13	-11.945	-12.124	-0.179	(0)
BF2 (OH) 2-	9.719e-13	7.061e-13	-12.012	-12.151	-0.139	(0)
NiF+	4.177e-13	2.768e-13	-12.379	-12.558	-0.179	(0)
UO2F2	3.659e-13	3.659e-13	-12.437	-12.437	0.000	(0)
CrF+2	3.285e-14	6.336e-15	-13.483	-14.198	-0.715	(0)
UO2F3-	1.646e-14	1.091e-14	-13.784	-13.962	-0.179	(0)
PbF2	1.756e-15	1.756e-15	-14.755	-14.755	0.000	(0)
CdF2	1.183e-15	1.183e-15	-14.927	-14.927	0.000	(0)
UO2F4-2	5.329e-17	1.028e-17	-16.273	-16.988	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	1.182e-17	1.182e-17	-16.927	-16.927	0.000	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.089e-18	3.830e-19	-17.963	-18.417	-0.454	(0)
VO2F2-	7.684e-19	5.092e-19	-18.114	-18.293	-0.179	(0)
PbF3-	5.964e-19	3.952e-19	-18.224	-18.403	-0.179	(0)
BF3OH-	5.553e-19	4.035e-19	-18.255	-18.394	-0.139	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	1.019e-20	6.753e-21	-19.992	-20.171	-0.179	(0)
VO2F3-2	3.907e-21	7.537e-22	-20.408	-21.123	-0.715	(0)
VOF2	3.004e-22	3.004e-22	-21.522	-21.522	0.000	(0)
PbF4-2	1.164e-22	2.245e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.668e-23	2.431e-23	-22.436	-22.614	-0.179	(0)
BF4-	4.013e-24	2.916e-24	-23.397	-23.535	-0.139	(0)
VOF3-	1.909e-24	1.265e-24	-23.719	-23.898	-0.179	(0)
VO2F4-3	1.785e-24	4.400e-26	-23.748	-25.357	-1.608	(0)
Sb (OH) 2F	1.150e-25	1.150e-25	-24.939	-24.939	0.000	(0)
SbOF	1.133e-25	1.133e-25	-24.946	-24.946	0.000	(0)
VOF4-2	3.141e-27	6.058e-28	-26.503	-27.218	-0.715	(0)
UF3+	4.699e-36	3.114e-36	-35.328	-35.507	-0.179	(0)
UF2+2	8.585e-37	1.656e-37	-36.066	-36.781	-0.715	(0)
UF4	4.052e-38	4.052e-38	-37.392	-37.392	0.000	(0)
UF+3	4.496e-39	1.109e-40	-38.347	-39.955	-1.608	(0)
UF5-	2.875e-40	1.905e-40	-39.541	-39.720	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.451	-41.166	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.328e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.402e-14	-13.740	-13.853	-0.113	(0)
FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.026e-18	2.330e-18	-17.519	-17.633	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.307e-10	4.894e-10	-9.200	-9.310	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.174e-11	3.239e-11	-10.379	-10.490	-0.110	(0)
FeOH+2	4.395e-15	1.546e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.089e-18	3.830e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.705e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.283e-19	8.499e-20	-18.892	-19.071	-0.179	(0)
Fe+3	3.096e-20	2.944e-21	-19.509	-20.531	-1.022	(0)
FeCl+2	1.641e-21	5.773e-22	-20.785	-21.239	-0.454	(0)
FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
FeHSeO3+2	9.961e-24	1.921e-24	-23.002	-23.716	-0.715	(0)
Fe2 (OH) 2+4	5.719e-26	7.916e-29	-25.243	-28.102	-2.859	(0)
FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
FeNO3+2	2.348e-27	4.530e-28	-26.629	-27.344	-0.715	(0)
Fe3 (OH) 4+5	1.641e-32	5.599e-37	-31.785	-36.252	-4.467	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.519e-09					
Hg	9.519e-09	9.519e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.704e-19					
Hg2+2	1.852e-19	3.572e-20	-18.732	-19.447	-0.715	(0)

Hg (2)	9.983e-11					
HgClOH	5.158e-11	5.158e-11	-10.288	-10.288	0.000	(0)
HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
Hg (OH) 2	2.244e-11	2.308e-11	-10.649	-10.637	0.012	(0)
HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
HgCl4-2	2.030e-13	3.915e-14	-12.693	-13.407	-0.715	(0)
HgCO3	9.752e-15	9.752e-15	-14.011	-14.011	0.000	(0)
HgCl+	1.081e-15	7.163e-16	-14.966	-15.145	-0.179	(0)
HgOH+	2.701e-16	1.790e-16	-15.568	-15.747	-0.179	(0)
Hg (CO3) 2-2	2.357e-16	4.547e-17	-15.628	-16.342	-0.715	(0)
Hg (OH) 3-	3.567e-18	2.364e-18	-17.448	-17.626	-0.179	(0)
HgHCO3+	3.385e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
Hg (NH3) 2+2	1.324e-18	2.554e-19	-17.878	-18.593	-0.715	(0)
HgNH3+2	1.547e-19	2.985e-20	-18.810	-19.525	-0.715	(0)
Hg+2	2.866e-20	5.527e-21	-19.543	-20.257	-0.715	(0)
HgSO4	1.588e-20	1.588e-20	-19.799	-19.799	0.000	(0)
HgF+	3.668e-23	2.431e-23	-22.436	-22.614	-0.179	(0)
Hg (NH3) 3+2	4.511e-26	8.702e-27	-25.346	-26.060	-0.715	(0)
HgNO3+	4.739e-29	3.141e-29	-28.324	-28.503	-0.179	(0)
Hg (NH3) 4+2	3.067e-33	5.915e-34	-32.513	-33.228	-0.715	(0)
Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K	1.498e-02					
K+	1.391e-02	1.071e-02	-1.857	-1.970	-0.114	(0)
KSO4-	1.072e-03	8.318e-04	-2.970	-3.080	-0.110	(0)
KCrO4-	1.649e-16	1.093e-16	-15.783	-15.961	-0.179	(0)
Mg	1.840e-02					
Mg+2	1.076e-02	3.781e-03	-1.968	-2.422	-0.454	(0)
MgSO4	7.549e-03	7.549e-03	-2.122	-2.122	0.000	(0)
MgF+	6.602e-05	5.034e-05	-4.180	-4.298	-0.118	(0)
MgHCO3+	1.992e-05	1.503e-05	-4.701	-4.823	-0.122	(0)
MgCO3	4.637e-06	4.637e-06	-5.334	-5.334	0.000	(0)
MgOH+	1.550e-06	1.225e-06	-5.810	-5.912	-0.102	(0)
MgH2BO3+	8.059e-07	5.855e-07	-6.094	-6.232	-0.139	(0)
Mn (2)	2.220e-04					
Mn+2	1.607e-04	3.099e-05	-3.794	-4.509	-0.715	(0)
MnSO4	6.046e-05	6.046e-05	-4.219	-4.219	0.000	(0)
MnCl+	3.290e-07	2.534e-07	-6.483	-6.596	-0.113	(0)
MnHCO3+	3.119e-07	2.402e-07	-6.506	-6.619	-0.113	(0)
MnF+	1.901e-07	1.464e-07	-6.721	-6.834	-0.113	(0)
MnOH+	8.223e-08	6.333e-08	-7.085	-7.198	-0.113	(0)
MnCl2	2.325e-09	2.325e-09	-8.634	-8.634	0.000	(0)
MnCl3-	5.399e-12	4.158e-12	-11.268	-11.381	-0.113	(0)
MnSeO4	2.876e-12	2.876e-12	-11.541	-11.541	0.000	(0)
MnNO3+	1.141e-12	7.558e-13	-11.943	-12.122	-0.179	(0)
Mn (OH) 3-	3.363e-16	2.590e-16	-15.473	-15.587	-0.113	(0)
Mn (NO3) 2	2.922e-20	2.922e-20	-19.534	-19.534	0.000	(0)
Mn (OH) 4-2	1.934e-21	6.803e-22	-20.714	-21.167	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.367	-40.367	0.000	(0)
Mn (3)	1.066e-24					
Mn+3	1.066e-24	1.013e-25	-23.972	-24.994	-1.022	(0)
Mn (6)	1.752e-40					
MnO4-2	1.752e-40	0.000e+00	-39.757	-40.210	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.585	-44.718	-0.133	(0)
Mo	7.590e-06					
MoO4-2	7.589e-06	2.667e-06	-5.120	-5.574	-0.454	(0)
HMoO4-	9.892e-10	6.555e-10	-9.005	-9.183	-0.179	(0)
H2MoO4	5.932e-14	5.932e-14	-13.227	-13.227	0.000	(0)
AlMo6O21-3	2.464e-39	0.000e+00	-38.608	-40.216	-1.608	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.858	-49.290	-6.432	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.345	-50.812	-4.467	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.079	-53.938	-2.859	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.992	-58.600	-1.608	(0)
N (-3)	2.922e-07					
NH4+	2.552e-07	1.854e-07	-6.593	-6.732	-0.139	(0)

NH4SO4-	2.830e-08	2.180e-08	-7.548	-7.662	-0.113	(0)
NH3	8.558e-09	8.558e-09	-8.068	-8.068	0.000	(0)
CaNH3+2	1.255e-10	2.420e-11	-9.902	-10.616	-0.715	(0)
CuNH3+2	1.234e-11	2.381e-12	-10.909	-11.623	-0.715	(0)
NiNH3+2	2.213e-15	4.268e-16	-14.655	-15.370	-0.715	(0)
Co (NH3) +2	2.111e-15	4.072e-16	-14.675	-15.390	-0.715	(0)
BaNH3+2	2.672e-16	5.154e-17	-15.573	-16.288	-0.715	(0)
Hg (NH3) 2+2	1.324e-18	2.554e-19	-17.878	-18.593	-0.715	(0)
Ca (NH3) 2+2	4.274e-19	8.244e-20	-18.369	-19.084	-0.715	(0)
HgNH3+2	1.547e-19	2.985e-20	-18.810	-19.525	-0.715	(0)
Ni (NH3) 2+2	2.737e-21	5.279e-22	-20.563	-21.277	-0.715	(0)
Co (NH3) 2+2	7.707e-22	1.487e-22	-21.113	-21.828	-0.715	(0)
Hg (NH3) 3+2	4.511e-26	8.702e-27	-25.346	-26.060	-0.715	(0)
Co (NH3) 3+2	8.303e-29	1.602e-29	-28.081	-28.795	-0.715	(0)
Hg (NH3) 4+2	3.067e-33	5.915e-34	-32.513	-33.228	-0.715	(0)
Co (NH3) 4+2	3.729e-36	7.193e-37	-35.428	-36.143	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.813	-41.528	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.991	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.270	-50.878	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.249	-51.964	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.653	-60.832	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.973	-65.687	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.270	-65.985	-0.715	(0)
N (3)	2.215e-05					
NO2-	2.215e-05	1.631e-05	-4.655	-4.787	-0.133	(0)
CuNO2+	7.007e-11	4.644e-11	-10.154	-10.333	-0.179	(0)
CoNO2+	6.865e-14	4.550e-14	-13.163	-13.342	-0.179	(0)
Cu (NO2) 2	7.752e-15	7.752e-15	-14.111	-14.111	0.000	(0)
N (5)	2.015e-08					
NO3-	1.999e-08	1.539e-08	-7.699	-7.813	-0.114	(0)
CaNO3+	1.649e-10	1.093e-10	-9.783	-9.961	-0.179	(0)
MnNO3+	1.141e-12	7.558e-13	-11.943	-12.122	-0.179	(0)
ZnNO3+	2.258e-13	1.497e-13	-12.646	-12.825	-0.179	(0)
CuNO3+	1.996e-15	1.323e-15	-14.700	-14.878	-0.179	(0)
BaNO3+	1.111e-15	7.361e-16	-14.954	-15.133	-0.179	(0)
CdNO3+	1.951e-16	1.293e-16	-15.710	-15.888	-0.179	(0)
PbNO3+	3.089e-17	2.047e-17	-16.510	-16.689	-0.179	(0)
CoNO3+	1.457e-17	9.653e-18	-16.837	-17.015	-0.179	(0)
NiNO3+	5.417e-18	3.590e-18	-17.266	-17.445	-0.179	(0)
Mn (NO3) 2	2.922e-20	2.922e-20	-19.534	-19.534	0.000	(0)
UO2NO3+	3.024e-21	2.004e-21	-20.519	-20.698	-0.179	(0)
Zn (NO3) 2	4.596e-22	4.596e-22	-21.338	-21.338	0.000	(0)
Cu (NO3) 2	2.563e-24	2.563e-24	-23.591	-23.591	0.000	(0)
CrNO3+2	1.175e-24	2.267e-25	-23.930	-24.645	-0.715	(0)
Cd (NO3) 2	9.971e-25	9.971e-25	-24.001	-24.001	0.000	(0)
Pb (NO3) 2	5.351e-25	5.351e-25	-24.272	-24.272	0.000	(0)
VO2NO3	4.421e-25	4.421e-25	-24.354	-24.354	0.000	(0)
Co (NO3) 2	3.023e-25	3.023e-25	-24.520	-24.520	0.000	(0)
FeNO3+2	2.348e-27	4.530e-28	-26.629	-27.344	-0.715	(0)
HgNO3+	4.739e-29	3.141e-29	-28.324	-28.503	-0.179	(0)
Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
Na	2.699e-02					
Na+	2.550e-02	1.963e-02	-1.594	-1.707	-0.114	(0)
NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
NaCO3-	6.946e-07	5.389e-07	-6.158	-6.268	-0.110	(0)
NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
NaCrO4-	4.043e-16	2.679e-16	-15.393	-15.572	-0.179	(0)
Ni	4.840e-10					
Ni+2	2.642e-10	9.286e-11	-9.578	-10.032	-0.454	(0)
NiSO4	2.033e-10	2.033e-10	-9.692	-9.692	0.000	(0)
NiHCO3+	6.711e-12	4.448e-12	-11.173	-11.352	-0.179	(0)
NiCO3	5.108e-12	5.108e-12	-11.292	-11.292	0.000	(0)
NiCl+	2.329e-12	1.543e-12	-11.633	-11.812	-0.179	(0)
NiOH+	1.435e-12	9.511e-13	-11.843	-12.022	-0.179	(0)
NiF+	4.177e-13	2.768e-13	-12.379	-12.558	-0.179	(0)

Ni (SO4) 2-2	3.829e-13	7.385e-14	-12.417	-13.132	-0.715	(0)
Ni (OH) 2	6.146e-14	6.146e-14	-13.211	-13.211	0.000	(0)
NiNH3+2	2.213e-15	4.268e-16	-14.655	-15.370	-0.715	(0)
Ni (OH) 3-	7.545e-17	5.000e-17	-16.122	-16.301	-0.179	(0)
NiCl2	5.046e-17	5.046e-17	-16.297	-16.297	0.000	(0)
NiSeO4	1.498e-17	1.498e-17	-16.825	-16.825	0.000	(0)
NiNO3+	5.417e-18	3.590e-18	-17.266	-17.445	-0.179	(0)
Ni (NH3) 2+2	2.737e-21	5.279e-22	-20.563	-21.277	-0.715	(0)
O (0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.667e-09					
PbSO4	4.833e-10	4.833e-10	-9.316	-9.316	0.000	(0)
PbCO3	3.986e-10	3.986e-10	-9.399	-9.399	0.000	(0)
PbOH+	2.774e-10	1.838e-10	-9.557	-9.736	-0.179	(0)
Pb+2	2.559e-10	8.995e-11	-9.592	-10.046	-0.454	(0)
Pb (SO4) 2-2	1.657e-10	3.195e-11	-9.781	-10.495	-0.715	(0)
PbHCO3+	3.918e-11	2.596e-11	-10.407	-10.586	-0.179	(0)
PbCl+	3.128e-11	2.073e-11	-10.505	-10.683	-0.179	(0)
Pb (CO3) 2-2	8.787e-12	1.695e-12	-11.056	-11.771	-0.715	(0)
Pb (OH) 2	4.729e-12	4.729e-12	-11.325	-11.325	0.000	(0)
PbF+	1.135e-12	7.521e-13	-11.945	-12.124	-0.179	(0)
PbCl2	6.013e-13	6.013e-13	-12.221	-12.221	0.000	(0)
Pb (OH) 3-	5.805e-15	3.847e-15	-14.236	-14.415	-0.179	(0)
PbCl3-	2.346e-15	1.555e-15	-14.630	-14.808	-0.179	(0)
PbF2	1.756e-15	1.756e-15	-14.755	-14.755	0.000	(0)
PbNO3+	3.089e-17	2.047e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.393e-17	4.616e-18	-16.621	-17.336	-0.715	(0)
Pb2OH+3	1.063e-17	2.620e-19	-16.974	-18.582	-1.608	(0)
Pb (OH) 4-2	3.974e-18	7.665e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.964e-19	3.952e-19	-18.224	-18.403	-0.179	(0)
Pb3 (OH) 4+2	2.080e-22	4.013e-23	-21.682	-22.397	-0.715	(0)
PbF4-2	1.164e-22	2.245e-23	-21.934	-22.649	-0.715	(0)
Pb (NO3) 2	5.351e-25	5.351e-25	-24.272	-24.272	0.000	(0)
Pb4 (OH) 4+4	2.071e-26	2.867e-29	-25.684	-28.543	-2.859	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.954	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.129	-79.844	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.645	-80.360	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.725	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.531	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.547	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.325	-87.779	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.289	-147.467	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.622	-148.037	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.366	-149.366	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.294	-224.472	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.829	-226.544	-0.715	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.604	-304.319	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.855	-318.569	-0.715	(0)
S (6)	4.706e-02					
SO4-2	3.122e-02	1.097e-02	-1.506	-1.960	-0.454	(0)
MgSO4	7.549e-03	7.549e-03	-2.122	-2.122	0.000	(0)

CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
KSO4-	1.072e-03	8.318e-04	-2.970	-3.080	-0.110	(0)
MnSO4	6.046e-05	6.046e-05	-4.219	-4.219	0.000	(0)
ZnSO4	9.294e-06	9.294e-06	-5.032	-5.032	0.000	(0)
Zn (SO4) 2-2	4.604e-06	8.881e-07	-5.337	-6.052	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.830e-08	2.180e-08	-7.548	-7.662	-0.113	(0)
HSO4-	1.737e-08	1.324e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.832e-09	6.832e-09	-8.165	-8.165	0.000	(0)
Cd (SO4) 2-2	5.242e-09	1.011e-09	-8.280	-8.995	-0.715	(0)
CoSO4	8.664e-10	8.664e-10	-9.062	-9.062	0.000	(0)
PbSO4	4.833e-10	4.833e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.033e-10	2.033e-10	-9.692	-9.692	0.000	(0)
Pb (SO4) 2-2	1.657e-10	3.195e-11	-9.781	-10.495	-0.715	(0)
CrOHSO4	1.561e-11	1.561e-11	-10.807	-10.807	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2SO4	1.084e-12	1.084e-12	-11.965	-11.965	0.000	(0)
UO2 (SO4) 2-2	8.128e-13	1.568e-13	-12.090	-12.805	-0.715	(0)
AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.829e-13	7.385e-14	-12.417	-13.132	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	1.303e-14	8.632e-15	-13.885	-14.064	-0.179	(0)
VO2SO4-	2.245e-17	1.488e-17	-16.649	-16.827	-0.179	(0)
FeSO4+	4.705e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
Fe (SO4) 2-	1.283e-19	8.499e-20	-18.892	-19.071	-0.179	(0)
Cr2 (OH) 2SO4+2	4.388e-20	8.463e-21	-19.358	-20.072	-0.715	(0)
VOSO4	2.867e-20	2.867e-20	-19.543	-19.543	0.000	(0)
HgSO4	1.588e-20	1.588e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2 (SO4) 2	5.515e-21	5.515e-21	-20.258	-20.258	0.000	(0)
CrO3SO4-2	2.354e-23	4.541e-24	-22.628	-23.343	-0.715	(0)
VSO4+	7.691e-35	5.097e-35	-34.114	-34.293	-0.179	(0)
U (SO4) 2	1.782e-39	1.782e-39	-38.749	-38.749	0.000	(0)
USO4+2	1.060e-40	0.000e+00	-39.975	-40.689	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.653	-60.832	-0.179	(0)
Sb (3)	9.919e-20					
Sb (OH) 3	5.014e-20	5.014e-20	-19.300	-19.300	0.000	(0)
HSbO2	4.904e-20	4.904e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.701e-24	6.429e-24	-23.013	-23.192	-0.179	(0)
Sb (OH) 4-	5.538e-24	3.670e-24	-23.257	-23.435	-0.179	(0)
Sb (OH) 2F	1.150e-25	1.150e-25	-24.939	-24.939	0.000	(0)
SbOF	1.133e-25	1.133e-25	-24.946	-24.946	0.000	(0)
Sb (OH) 2+	2.274e-26	1.507e-26	-25.643	-25.822	-0.179	(0)
SbO+	7.855e-27	5.205e-27	-26.105	-26.284	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.855	-318.569	-0.715	(0)
Sb (5)	9.015e-08					
SbO3-	9.006e-08	5.968e-08	-7.045	-7.224	-0.179	(0)
Sb (OH) 6-	9.015e-11	6.941e-11	-10.045	-10.159	-0.114	(0)
SbO2+	3.949e-24	2.617e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.271e-39					
HSe-	6.271e-39	4.156e-39	-38.203	-38.381	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.367	-40.367	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.400	-42.400	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.758	-45.473	-0.715	(0)
Se (4)	7.855e-07					
SeO3-2	4.127e-07	7.961e-08	-6.384	-7.099	-0.715	(0)
HSeO3-	3.727e-07	2.470e-07	-6.429	-6.607	-0.179	(0)
H2SeO3	1.302e-12	1.302e-12	-11.885	-11.885	0.000	(0)
Cd (SeO3) 2-2	7.192e-17	1.387e-17	-16.143	-16.858	-0.715	(0)
FeHSeO3+2	9.961e-24	1.921e-24	-23.002	-23.716	-0.715	(0)
Se (6)	9.844e-10					
SeO4-2	9.813e-10	3.449e-10	-9.008	-9.462	-0.454	(0)
MnSeO4	2.876e-12	2.876e-12	-11.541	-11.541	0.000	(0)
ZnSeO4	2.068e-13	2.068e-13	-12.684	-12.684	0.000	(0)
HSeO4-	3.222e-16	2.135e-16	-15.492	-15.671	-0.179	(0)
CdSeO4	1.706e-16	1.706e-16	-15.768	-15.768	0.000	(0)
CoSeO4	6.841e-17	6.841e-17	-16.165	-16.165	0.000	(0)
NiSeO4	1.498e-17	1.498e-17	-16.825	-16.825	0.000	(0)

Zn(SeO4) 2-2	3.749e-22	7.231e-23	-21.426	-22.141	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.382	-58.990	-1.608	(0)
U (4)	1.846e-19					
U (OH) 5-	1.845e-19	1.223e-19	-18.734	-18.913	-0.179	(0)
U (OH) 4	6.338e-23	6.338e-23	-22.198	-22.198	0.000	(0)
U (OH) 3+	4.328e-27	2.868e-27	-26.364	-26.542	-0.179	(0)
U (OH) 2+2	8.510e-32	1.641e-32	-31.070	-31.785	-0.715	(0)
UF3+	4.699e-36	3.114e-36	-35.328	-35.507	-0.179	(0)
UF2+2	8.585e-37	1.656e-37	-36.066	-36.781	-0.715	(0)
UOH+3	3.881e-37	9.568e-39	-36.411	-38.019	-1.608	(0)
UF4	4.052e-38	4.052e-38	-37.392	-37.392	0.000	(0)
UF+3	4.496e-39	1.109e-40	-38.347	-39.955	-1.608	(0)
U (SO4) 2	1.782e-39	1.782e-39	-38.749	-38.749	0.000	(0)
UF5-	2.875e-40	1.905e-40	-39.541	-39.720	-0.179	(0)
USO4+2	1.060e-40	0.000e+00	-39.975	-40.689	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.451	-41.166	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.471	-45.330	-2.859	(0)
UCl+3	0.000e+00	0.000e+00	-44.209	-45.817	-1.608	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-156.049	-170.522	-14.473	(0)
U (5)	8.201e-16					
UO2+	8.201e-16	5.435e-16	-15.086	-15.265	-0.179	(0)
U (6)	6.604e-07					
UO2 (CO3) 3-4	6.016e-07	8.327e-10	-6.221	-9.079	-2.859	(0)
UO2 (CO3) 2-2	5.843e-08	1.127e-08	-7.233	-7.948	-0.715	(0)
UO2CO3	3.831e-10	3.831e-10	-9.417	-9.417	0.000	(0)
UO2OH+	1.009e-11	6.685e-12	-10.996	-11.175	-0.179	(0)
UO2F+	1.613e-12	1.069e-12	-11.792	-11.971	-0.179	(0)
UO2SO4	1.084e-12	1.084e-12	-11.965	-11.965	0.000	(0)
UO2 (SO4) 2-2	8.128e-13	1.568e-13	-12.090	-12.805	-0.715	(0)
UO2F2	3.659e-13	3.659e-13	-12.437	-12.437	0.000	(0)
UO2+2	1.857e-13	6.528e-14	-12.731	-13.185	-0.454	(0)
UO2F3-	1.646e-14	1.091e-14	-13.784	-13.962	-0.179	(0)
UO2Cl+	1.037e-15	6.876e-16	-14.984	-15.163	-0.179	(0)
(UO2) 2 (OH) 2+2	3.845e-16	7.417e-17	-15.415	-16.130	-0.715	(0)
(UO2) 3 (OH) 5+	3.757e-16	2.490e-16	-15.425	-15.604	-0.179	(0)
UO2F4-2	5.329e-17	1.028e-17	-16.273	-16.988	-0.715	(0)
UO2NO3+	3.024e-21	2.004e-21	-20.519	-20.698	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.582	-42.761	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.467	-44.182	-0.715	(0)
V (3)	4.274e-15					
V (OH) 3	4.274e-15	4.274e-15	-14.369	-14.369	0.000	(0)
V (OH) 2+	5.158e-26	3.418e-26	-25.288	-25.466	-0.179	(0)
VOH+2	2.080e-29	4.012e-30	-28.682	-29.397	-0.715	(0)
V+3	3.991e-34	9.841e-36	-33.399	-35.007	-1.608	(0)
VSO4+	7.691e-35	5.097e-35	-34.114	-34.293	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.803	-56.411	-1.608	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.134	-57.993	-2.859	(0)
V (4)	2.408e-18					
V (OH) 3+	2.319e-18	1.537e-18	-17.635	-17.813	-0.179	(0)
VO+2	4.919e-20	9.488e-21	-19.308	-20.023	-0.715	(0)
VOSO4	2.867e-20	2.867e-20	-19.543	-19.543	0.000	(0)
VOF+	1.019e-20	6.753e-21	-19.992	-20.171	-0.179	(0)
VOF2	3.004e-22	3.004e-22	-21.522	-21.522	0.000	(0)
VOC1+	2.609e-22	1.729e-22	-21.584	-21.762	-0.179	(0)
VOF3-	1.909e-24	1.265e-24	-23.719	-23.898	-0.179	(0)
VOF4-2	3.141e-27	6.058e-28	-26.503	-27.218	-0.715	(0)
H2V2O4+2	6.163e-31	1.189e-31	-30.210	-30.925	-0.715	(0)
V (5)	4.763e-08					
H2VO4-	2.804e-08	1.858e-08	-7.552	-7.731	-0.179	(0)
HVO4-2	1.959e-08	3.778e-09	-7.708	-8.423	-0.715	(0)
H3VO4	2.295e-12	2.295e-12	-11.639	-11.639	0.000	(0)
HV2O7-3	9.666e-13	2.383e-14	-12.015	-13.623	-1.608	(0)
H3V2O7-	4.163e-13	2.759e-13	-12.381	-12.559	-0.179	(0)
VO4-3	6.217e-14	1.533e-15	-13.206	-14.815	-1.608	(0)
V2O7-4	3.751e-14	5.193e-17	-13.426	-16.285	-2.859	(0)
V3O9-3	2.740e-16	6.756e-18	-15.562	-17.170	-1.608	(0)

VO2+	7.377e-17	5.680e-17	-16.132	-16.246	-0.114	(0)
VO2SO4-	2.245e-17	1.488e-17	-16.649	-16.827	-0.179	(0)
VO2F	1.182e-17	1.182e-17	-16.927	-16.927	0.000	(0)
VO2F2-	7.684e-19	5.092e-19	-18.114	-18.293	-0.179	(0)
V4O12-4	3.788e-20	5.243e-23	-19.422	-22.280	-2.859	(0)
VO2F3-2	3.907e-21	7.537e-22	-20.408	-21.123	-0.715	(0)
VO2F4-3	1.785e-24	4.400e-26	-23.748	-25.357	-1.608	(0)
VO2NO3	4.421e-25	4.421e-25	-24.354	-24.354	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-53.594	-60.026	-6.432	(0)
HV10O28-5	0.000e+00	0.000e+00	-55.281	-59.748	-4.467	(0)
H2V10O28-4	0.000e+00	0.000e+00	-59.590	-62.449	-2.859	(0)
Zn	2.600e-05					
Zn+2	1.102e-05	3.872e-06	-4.958	-5.412	-0.454	(0)
ZnSO4	9.294e-06	9.294e-06	-5.032	-5.032	0.000	(0)
Zn(SO4) 2-2	4.604e-06	8.881e-07	-5.337	-6.052	-0.715	(0)
ZnOH+	4.753e-07	3.150e-07	-6.323	-6.502	-0.179	(0)
ZnCO3	3.285e-07	3.285e-07	-6.483	-6.483	0.000	(0)
ZnCl+	8.372e-08	6.317e-08	-7.077	-7.200	-0.122	(0)
ZnHCO3+	7.177e-08	4.757e-08	-7.144	-7.323	-0.179	(0)
ZnOHCl	6.728e-08	6.728e-08	-7.172	-7.172	0.000	(0)
Zn(OH) 2	4.061e-08	4.061e-08	-7.391	-7.391	0.000	(0)
ZnF+	1.383e-08	9.167e-09	-7.859	-8.038	-0.179	(0)
ZnCl2	6.502e-10	6.502e-10	-9.187	-9.187	0.000	(0)
Zn(OH) 3-	2.499e-10	1.656e-10	-9.602	-9.781	-0.179	(0)
ZnCl3-	4.446e-12	3.354e-12	-11.352	-11.474	-0.122	(0)
ZnNO3+	2.258e-13	1.497e-13	-12.646	-12.825	-0.179	(0)
ZnSeO4	2.068e-13	2.068e-13	-12.684	-12.684	0.000	(0)
ZnCl4-2	3.096e-14	1.089e-14	-13.509	-13.963	-0.454	(0)
Zn(OH) 4-2	2.781e-14	5.363e-15	-13.556	-14.271	-0.715	(0)
Zn(NO3) 2	4.596e-22	4.596e-22	-21.338	-21.338	0.000	(0)
Zn(SeO4) 2-2	3.749e-22	7.231e-23	-21.426	-22.141	-0.715	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.289	-147.467	-0.179	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-149.366	-149.366	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-224.294	-224.472	-0.179	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-225.829	-226.544	-0.715	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-303.604	-304.319	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co(NH3)5Cl)(NO3)2	-55.16	-48.87	6.29	(Co(NH3)5Cl)(NO3)2
(Co(NH3)5Cl)Cl2	-42.13	-37.62	4.51	(Co(NH3)5Cl)Cl2
(Co(NH3)5OH2)Cl3	-49.35	-37.62	11.74	(Co(NH3)5OH2)Cl3
(Co(NH3)6)(NO3)3	-71.25	-53.32	17.93	(Co(NH3)6)(NO3)3
(Co(NH3)6)Cl3	-56.47	-36.44	20.03	(Co(NH3)6)Cl3
(NH4)2CrO4	-28.43	-28.02	0.40	(NH4)2CrO4
(NH4)2SeO4	-23.38	-22.93	0.45	(NH4)2SeO4
Al(OH)3(am)	-1.40	9.40	10.80	Al(OH)3
Al2(MoO4)3	-47.73	-45.36	2.37	Al2(MoO4)3
Al2O3	-0.84	18.81	19.65	Al2O3
Al4(OH)10SO4	-2.86	19.84	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4
AlSb	-152.15	-86.53	65.62	AlSb
Alunite	0.00	-1.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.22	-12.01	-7.79	PbSO4
Anhydrite	-0.25	-4.61	-4.36	CaSO4
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S
Antlerite	-1.82	6.97	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-88.42	-91.18	-2.76	As4O6
Artinite	-4.46	5.14	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-39.00	-32.30	6.71	As2O5
Atacamite	-0.99	6.40	7.39	Cu2(OH)3Cl
Azurite	-1.64	-18.54	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.61	7.79	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-16.96	-1.09	15.87	Ba2V2O7:2H2O

Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2·4H2O	-26.23	6.71	32.94	Ba3(VO4)2·4H2O
BaCrO4	-12.91	-22.58	-9.67	BaCrO4
BaF2	-10.05	-15.87	-5.82	BaF2
BaMoO4	-6.63	-13.59	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.55	-6.72	1.83	BaSeO3
BaSeO4	-10.02	-17.48	-7.46	BaSeO4
Bianchite	-5.61	-7.38	-1.76	ZnSO4·6H2O
Birnessite	-6.59	11.50	18.09	MnO2
Bixbyite	-1.90	-2.54	-0.64	Mn2O3
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S
Boehmite	0.83	9.40	8.58	AlOOH
Breithauptite	-58.85	-77.38	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.45	13.39	16.84	Mg(OH)2
Bunsenite	-6.66	5.78	12.45	NiO
Ca(VO3)2	-9.17	-3.51	5.66	Ca(VO3)2
Ca2V2O7	-7.84	9.66	17.50	Ca2V2O7
Ca2V2O7·2H2O	-11.90	9.66	21.55	Ca2V2O7·2H2O
Ca3(AsO4)2·4H2O	-15.10	7.20	22.30	Ca3(AsO4)2·4H2O
Ca3(VO4)2	-16.13	22.83	38.96	Ca3(VO4)2
Ca3(VO4)2·4H2O	-17.04	22.82	39.86	Ca3(VO4)2·4H2O
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2
CaCrO4	-14.94	-17.21	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-5.91	-23.82	-17.91	Hg2Cl2
CaMoO4	-0.27	-8.22	-7.95	CaMoO4
Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3·2H2O	-4.16	-1.35	2.81	CaSeO3·2H2O
CaSeO4·2H2O	-9.09	-12.11	-3.02	CaSeO4·2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.40	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2·1H2O	-11.26	-12.95	-1.69	CdCl2·1H2O
CdCl2·2.5H2O	-11.04	-12.95	-1.91	CdCl2·2.5H2O
CdF2	-15.21	-16.43	-1.21	CdF2
Cdmetal(alpha)	-31.82	-18.30	13.51	Cd
Cdmetal(gamma)	-31.92	-18.30	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHCl	-6.39	-2.86	3.54	CdOHCl
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4·2H2O	-16.19	-18.04	-1.85	CdSeO4·2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4·1H2O	-8.81	-10.54	-1.73	CdSO4·1H2O
CdSO4·2.67H2O	-8.66	-10.54	-1.87	CdSO4·2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4·5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.42	-40.52	-27.10	PbSe
Co(BO2)2	-28.70	-1.63	27.07	Co(BO2)2
Co(OH)2	-6.68	6.41	13.09	Co(OH)2
Co(OH)3	-10.91	-13.22	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-26.09	-13.06	13.03	Co3(AsO4)2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2

CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS (alpha)	-72.44	-79.88	-7.44	CoS
CoS (beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.68	-39.88	-16.20	CoSe
CoSeO3	-9.42	-8.10	1.32	CoSeO3
CoSeO4:6H2O	-17.34	-18.87	-1.53	CoSeO4:6H2O
CoSO4	-14.16	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.89	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr (OH) 2	-21.96	-11.14	10.82	Cr (OH) 2
Cr (OH) 3	-2.65	-1.32	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.57	-1.32	-0.75	Cr (OH) 3
Cr2O3	-0.28	-2.64	-2.36	Cr2O3
CrCl2	-45.43	-31.33	14.09	CrCl2
CrCl3	-46.72	-31.60	15.11	CrCl3
CrF3	-25.48	-36.82	-11.34	CrF3
Crmetal	-67.17	-36.69	30.48	Cr
CrO3	-27.17	-30.38	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu (OH) 2	-0.42	8.25	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.47	20.74	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.47	0.78	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.15	-49.95	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.50	-87.99	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-16.69	-22.13	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.94	-38.04	-33.10	CuSe
CuSe2	-25.42	-58.78	-33.37	CuSe2
CuSeO3:2H2O	-6.78	-6.27	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.59	-17.03	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.50	-13.22	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.69	-8.13	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.53	-37.16	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-6.38	0.82	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-44.98	-63.58	-18.60	FeSe2

FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.84	-42.84	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.55	-80.52	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-5.04	2.63	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.33	-46.29	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.56	59.47	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.58	-258.29	-73.71	Hg (CH3) 2
Hg (g)	-6.71	-14.59	-7.87	Hg
Hg (OH) 2	-7.14	-10.64	-3.50	Hg (OH) 2
Hg2 (g)	-14.22	-29.18	-14.96	Hg2
Hg2 (OH) 2	-8.89	-3.63	5.26	Hg2 (OH) 2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.31	-34.01	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.49	-18.15	-4.66	Hg2SeO3
Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.83	-21.26	HgCl2
HgF (g)	-46.32	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.23	-56.92	-55.69	HgSe
HgSeO3	-12.72	-25.15	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.86	-19.63	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.64	-48.88	-17.24	K2Cr2O7
K2CrO4	-17.99	-18.50	-0.51	K2CrO4
K2MoO4	-12.78	-9.51	3.26	K2MoO4
K2SeO4	-12.67	-13.40	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.80	-6.24	-0.43	PbO:PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4:7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2

Mg (VO3) 2	-14.56	-3.28	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.25	10.11	26.36	Mg2V2O7
MgCr2O4	-5.44	10.76	16.20	MgCr2O4
MgCrO4	-22.36	-16.98	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.15	-8.00	-1.85	MgMoO4
MgSeO3:6H2O	-4.18	-1.13	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-10.69	-11.89	-1.20	MgSeO4:6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4:10H2O
Mn (VO3) 2	-10.27	-5.37	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.16	-55.87	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3 (AsO4) 2:8H2O	-10.88	1.62	12.50	Mn3 (AsO4) 2:8H2O
MnCl2:4H2O	-11.60	-8.89	2.72	MnCl2:4H2O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.48	-34.98	3.50	MnSe
MnSeO3	-4.34	-3.21	1.13	MnSeO3
MnSeO3:2H2O	-4.19	-3.21	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-11.93	-13.98	-2.05	MnSeO4:5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4:7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.46	-48.35	-9.90	Na2Cr2O7
Na2CrO4	-20.91	-17.98	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.42	-2.12	10.30	Na2SeO3:5H2O
Na2SeO4	-14.16	-12.88	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.42	10.26	36.68	Na3VO4
Na4V2O7	-29.27	8.13	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-6.00	-2.14	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.01	5.78	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-30.65	-14.95	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-26.64	5.36	32.00	Ni4 (OH) 6SO4
NiCO3	-8.99	-15.86	-6.87	NiCO3
NiMoO4	-4.46	-15.61	-11.14	NiMoO4
NiS (alpha)	-74.91	-80.51	-5.60	NiS
NiS (beta)	-69.41	-80.51	-11.10	NiS
NiS (gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.81	-40.51	-17.70	NiSe
NiSeO3:2H2O	-11.55	-8.73	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-17.98	-19.50	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb (BO2) 2	-8.79	-2.27	6.52	Pb (BO2) 2
Pb (OH) 2	-2.38	5.77	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-63.43	-72.19	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-7.35	1.44	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.65	11.54	26.19	Pb2O (OH) 2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.24	-5.14	-1.90	Pb2V2O7

Pb3(AsO4)2	-20.79	-14.99	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.51	0.63	6.14	Pb3(VO4)2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4(OH)6SO4	-15.80	5.30	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.57	5.30	21.88	Pb4O3SO4
PbCrO4	-12.01	-24.61	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.67	-19.51	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn(OH)2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.52	-19.02	-14.50	UO2CO3
Sb(OH)3	-12.19	-19.30	-7.11	Sb(OH)3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.71	-177.46	-67.76	Sb2Se3
Sb4O6(cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6(orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.16	-49.58	0.57	SbCl3
SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.37	2.63	5.99	UO2(OH)2:H2O
Semetal(am)	-13.63	-20.74	-7.11	Se
Semetal(hex)	-13.04	-20.74	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.64	-14.51	0.12	SeO2
SeO3	-46.32	-25.28	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.24	-11.24	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.70	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.25	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca(UO2)2(VO4)2
U3O8	-11.09	9.99	21.08	U3O8
U3Sb4	-577.21	-424.83	152.38	U3Sb4
U4O9	-26.23	-29.25	-3.02	U4O9
UF4	-31.50	-61.03	-29.54	UF4
UF4:2.5H2O	-28.32	-61.03	-32.72	UF4:2.5H2O
UO2(am)	-14.63	-13.70	0.93	UO2
UO2(NO3)2	-40.96	-28.81	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.66	-28.81	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.20	-28.81	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-30.86	-28.82	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-2.98	2.63	5.61	UO2(OH)2
UO2SeO4:4H2O	-20.40	-22.65	-2.25	UO2SeO4:4H2O
UO3	-5.07	2.63	7.70	UO3
Uraninite	-9.03	-13.70	-4.67	UO2
USb2	-218.81	-189.23	29.58	USb2
V(OH)3	-18.88	-11.28	7.59	V(OH)3
V2O5	-15.32	-16.68	-1.36	V2O5
V3O5	-40.00	-38.17	1.84	V3O5
V4O7	-49.56	-42.37	7.19	V4O7

V6O13	-40.26	-101.12	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VCl2	-63.12	-44.25	18.87	VCl2
VCl3	-65.00	-41.57	23.43	VCl3
VF4	-66.47	-51.54	14.93	VF4
Vmetal	-93.63	-49.60	44.03	V
VO	-38.81	-24.06	14.76	VO
VO(OH)2	-9.36	-4.21	5.15	VO(OH)2
VO2Cl	-21.27	-18.43	2.84	VO2Cl
VOC1	-32.53	-21.38	11.15	VOC1
VOC12	-37.16	-24.40	12.76	VOC12
VOSO4	-25.59	-21.98	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.30	-7.37	3.93	ZnSO4
Zn(BO2)2	-5.93	2.36	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.36	-21.04	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.80	10.40	12.20	Zn(OH)2
Zn(OH)2(am)	-2.07	10.40	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.35	10.40	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-1.13	10.40	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.33	10.40	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.47	3.03	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.48	10.71	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-14.74	-1.09	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.25	-4.34	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.56	23.84	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.68	31.82	38.50	Zn5(OH)8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2
ZnCO3:1H2O	-0.98	-11.24	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.26	-0.53	ZnF2
Znmetal	-40.93	-15.14	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.78	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.49	-35.89	-14.40	ZnSe
ZnSeO4:6H2O	-13.36	-14.88	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.73	-7.37	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 155.

```

Title  Determine loss of metals due to HFO sorption and sedimentation
SURFACE 902
  equilibrate with solution 1
  Hfo_sOH Ferrihydrite    equilibrium_phase 0.005 64200
  Hfo_wOH Ferrihydrite    equilibrium_phase 0.2
  donnan 1e-008
USE EQUILIBRIUM_PHASES 902
USE Surface 902
USE Solution 907
SAVE Solution 908 #Initial Stage 9 Run-off Water After Mineral
Precipitation and Sorption Loss
END

```

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 902.

Diffuse Double Layer Surface-Complexation Model

Hfo

2.179e-19 Surface + diffuse layer charge, eq
3.145e-08 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
6.899e-01 m² for 1.075e-05 moles of Ferrihydrite

Water in diffuse layer: 6.899e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is

+1).

Element	Moles
C	1.7625e-11
Ca	2.1844e-13
Cl	3.5295e-10
H	5.1994e-11
K	3.4653e-13
Mg	3.3843e-14
N	1.4289e-09
Na	1.4682e-12
O	6.3687e-08
S	1.4840e-08

Hfo_s

5.373e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	3.592e-08	0.668	3.592e-08	-7.445
Hfo_sOH	1.762e-08	0.328	1.762e-08	-7.754
Hfo_sO-	1.979e-10	0.004	1.979e-10	-9.703
Hfo_sOHCa+2	6.557e-13	0.000	6.557e-13	-12.183

Hfo_w

2.149e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	9.931e-07	0.462	9.931e-07	-6.003
Hfo_wOH	4.871e-07	0.227	4.871e-07	-6.312
Hfo_wSO4-	3.354e-07	0.156	3.354e-07	-6.474
Hfo_wOHSO4-2	3.282e-07	0.153	3.282e-07	-6.484
Hfo_wO-	5.472e-09	0.003	5.472e-09	-8.262
Hfo_wOMg+	7.735e-15	0.000	7.735e-15	-14.112
Hfo_wOCa+	2.624e-15	0.000	2.624e-15	-14.581

Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element Ag is contained in Ag2Se (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Chrysotile (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in Sepiolite (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element Si is contained in SiO2(am-ppt) (which has 0.0 mass),
but is not in solution or other phases.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
WARNING: Element in phase, Ag2Se, is not in model.
WARNING: Element in phase, Chrysotile, is not in model.
WARNING: Element in phase, Sepiolite, is not in model.
WARNING: Element in phase, SiO2(am-ppt), is not in model.
Using solution 907. Solution after simulation 154.
Using surface 902.
Using pure phase assemblage 902. Pure-phase assemblage after simulation 154.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se		Element not present.		0.000e+00	0	0.000e+00
Alunite	0.00	-1.40	-1.40	7.251e-05	7.251e-05	6.112e-12
Anhydrite	-0.25	-4.61	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	5.051e-08	4.103e-08	-9.485e-09
Barite	0.00	-9.98	-9.98	3.005e-05	3.008e-05	2.846e-08
Brochantite	-0.00	15.22	15.22	1.346e-04	1.344e-04	-1.508e-07
Brucite	-3.45	13.39	16.84	0.000e+00	0	0.000e+00
CO2 (g)	-3.50	-21.65	-18.15	1.012e+01	1.012e+01	9.826e-07
CaMoO4	-0.27	-8.22	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.18	-1.36	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	4.579e-02	4.579e-02	-1.731e-06
Carnotite	0.00	0.23	0.23	2.086e-06	1.828e-06	-2.589e-07
Cd(BO2)2	-10.64	-0.80	9.84	0.000e+00	0	0.000e+00
CdMoO4	0.00	-14.15	-14.15	2.423e-07	2.423e-07	-1.679e-11
Chrysotile		Element not present.		0.000e+00	0	0.000e+00
Cr2O3	-1.22	-3.58	-2.36	0.000e+00	0	0.000e+00
Cu2Se (alpha)	-4.17	-49.97	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.06	-13.14	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.26	-4.39	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	1.075e-05	1.075e-05	-2.213e-14
Fluorite	0.00	-10.50	-10.50	3.693e-03	3.693e-03	1.248e-09
Gummite	-4.90	2.77	7.67	0.000e+00	0	0.000e+00
Gypsum	0.00	-4.61	-4.61	9.164e-03	9.166e-03	1.508e-06
HgSe	-1.25	-56.94	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.27	-5.38	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.35	-3.22	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-7.01	5.78	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2:8H2O	-30.66	-14.96	15.70	0.000e+00	0	0.000e+00
NiCO3	-9.00	-15.87	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-4.47	-15.61	-11.14	0.000e+00	0	0.000e+00
O2 (g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	7.575e-10
Otavite	-2.41	-14.41	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	7.535e-07	7.497e-07	-3.781e-09
Rutherfordine	-4.37	-18.87	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.01	-30.84	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.22	2.77	5.99	0.000e+00	0	0.000e+00
Sepiolite		Element not present.		0.000e+00	0	0.000e+00
SiO2 (am-ppt)		Element not present.		0.000e+00	0	0.000e+00
Tyuyamunite	-2.33	1.75	4.08	0.000e+00	0	0.000e+00
U3O8	-10.66	10.42	21.08	0.000e+00	0	0.000e+00

UO2 (OH) 2 (beta)	-2.84	2.77	5.61	0.000e+00	0	0.000e+00
UO3	-4.93	2.77	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-0.86	-10.99	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

1.490e-20	Surface + diffuse layer charge, eq
1.782e-07	Surface charge, eq
2.493e-02	sigma, C/m ²
2.951e-02	psi, V
-1.149e+00	-F*psi/RT
3.170e-01	exp(-F*psi/RT)
6.420e+04	specific area, m ² /mol Ferrihydrite
6.899e-01	m ² for 1.075e-05 moles of Ferrihydrite

Water in diffuse layer: 6.899e-06 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 2.642e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 9.023e-01 (= c_DL / c_free if z is

+1).

Element	Moles
Al	4.2431e-11
As	1.3292e-14
B	6.9507e-10
Ba	1.5289e-13
C	4.3286e-09
Ca	7.5042e-08
Cd	1.5099e-13
Cl	6.4506e-08
Co	1.7831e-14
Cr	2.4471e-15
Cu	3.2819e-12
F	1.6244e-09
Fe	7.2162e-15
H	6.4936e-09
Hg	6.6366e-14
K	9.4787e-08
Mg	1.1310e-07
Mn	1.3249e-09
Mo	6.4341e-11
N	1.7139e-10
Na	1.7017e-07
Ni	2.9828e-15
O	1.5189e-06
Pb	1.1207e-14
S	3.7576e-07
Sb	6.8931e-13
Se	6.1385e-12
U	9.3968e-12
V	2.7369e-13
Zn	1.7048e-10

Hfo_s

5.373e-08 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	2.619e-08	0.487	2.605e-08	-7.584
Hfo_sOCu+	1.474e-08	0.274	1.467e-08	-7.834
Hfo_sOMn+	8.616e-09	0.160	8.571e-09	-8.067
Hfo_sOPb+	2.806e-09	0.052	2.791e-09	-8.554
Hfo_sOCrOH+	7.619e-10	0.014	7.579e-10	-9.120
Hfo_sOHCa+2	5.735e-10	0.011	5.705e-10	-9.244

Hfo_sOH	2.722e-11	0.001	2.708e-11	-10.567
Hfo_sO-	8.165e-12	0.000	8.122e-12	-11.090
Hfo_sOCd+	5.475e-12	0.000	5.446e-12	-11.264
Hfo_sOH2+	2.079e-12	0.000	2.068e-12	-11.684
Hfo_sONi+	1.515e-13	0.000	1.507e-13	-12.822
Hfo_sOCco+	9.580e-14	0.000	9.529e-14	-13.021
Hfo_sOHBa+2	7.531e-15	0.000	7.492e-15	-14.125
Hfo_sOFe+	1.515e-15	0.000	1.507e-15	-14.822
Hfo_sOHg+	2.202e-16	0.000	2.190e-16	-15.660

Hfo_w

2.149e-06 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOCu+	5.885e-07	0.274	5.854e-07	-6.233
Hfo_wOMg+	5.164e-07	0.240	5.137e-07	-6.289
Hfo_wOHVO4-3	2.723e-07	0.127	2.709e-07	-6.567
Hfo_wOZn+	2.134e-07	0.099	2.123e-07	-6.673
Hfo_wOH	2.118e-07	0.099	2.107e-07	-6.676
Hfo_wOHSO4-2	1.426e-07	0.066	1.418e-07	-6.848
Hfo_wO-	6.355e-08	0.030	6.321e-08	-7.199
Hfo_wOMn+	5.327e-08	0.025	5.299e-08	-7.276
Hfo_wOHSeO3-2	2.396e-08	0.011	2.384e-08	-7.623
Hfo_wOHAsO4-3	1.897e-08	0.009	1.887e-08	-7.724
Hfo_wOCa+	1.725e-08	0.008	1.716e-08	-7.766
Hfo_wOH2+	1.618e-08	0.008	1.609e-08	-7.793
Hfo_wSO4-	5.467e-09	0.003	5.439e-09	-8.265
Hfo_wSeO3-	3.114e-09	0.001	3.098e-09	-8.509
Hfo_wOHMoO4-2	1.412e-09	0.001	1.405e-09	-8.852
Hfo_wOPb+	9.755e-10	0.000	9.703e-10	-9.013
Hfo_wH2BO3	8.405e-11	0.000	8.360e-11	-10.078
Hfo_wMoO4-	6.977e-11	0.000	6.940e-11	-10.159
Hfo_wOCd+	1.818e-11	0.000	1.808e-11	-10.743
Hfo_wHAsO4-	2.481e-12	0.000	2.468e-12	-11.608
Hfo_wOCco+	2.101e-12	0.000	2.090e-12	-11.680
Hfo_wONi+	1.591e-12	0.000	1.583e-12	-11.801
Hfo_wOHg+	8.392e-14	0.000	8.348e-14	-13.078
Hfo_wOFe+	7.442e-15	0.000	7.403e-15	-14.131
Hfo_wH2AsO4	6.132e-15	0.000	6.100e-15	-14.215
Hfo_wOHSeO4-2	4.429e-15	0.000	4.405e-15	-14.356
Hfo_wOBa+	3.274e-15	0.000	3.257e-15	-14.487
Hfo_wOHSbO(OH) 4-	9.272e-16	0.000	9.223e-16	-15.035
Hfo_wSeO4-	1.479e-16	0.000	1.471e-16	-15.832
Hfo_wSbO(OH) 4	4.580e-17	0.000	4.556e-17	-16.341
Hfo_wOHCrO4-2	1.550e-17	0.000	1.542e-17	-16.812
Hfo_wCrO4-	5.421e-19	0.000	5.392e-19	-18.268
Hfo_wH2AsO3	8.728e-25	0.000	8.682e-25	-24.061

-----Solution composition-----

Elements	Molality	Moles
Al	5.554e-06	5.583e-06
As	1.573e-09	1.581e-09
B	1.002e-04	1.008e-04
Ba	2.721e-08	2.736e-08
C	5.748e-04	5.779e-04
Ca	1.207e-02	1.213e-02
Cd	2.234e-08	2.246e-08
Cl	8.436e-03	8.480e-03
Co	2.970e-09	2.986e-09
Cr	3.854e-10	3.875e-10
Cu	4.982e-07	5.008e-07
F	2.256e-04	2.268e-04
Fe	1.103e-09	1.109e-09
Hg	9.619e-09	9.670e-09
K	1.498e-02	1.506e-02

Mg	1.840e-02	1.850e-02
Mn	2.220e-04	2.232e-04
Mo	7.592e-06	7.632e-06
N	2.246e-05	2.258e-05
Na	2.699e-02	2.714e-02
Ni	4.822e-10	4.848e-10
Pb	1.666e-09	1.675e-09
S	4.705e-02	4.730e-02
Sb	9.014e-08	9.062e-08
Se	7.595e-07	7.635e-07
U	9.180e-07	9.228e-07
V	3.427e-08	3.445e-08
Zn	2.576e-05	2.589e-05

-----Description of solution-----

	pH	=	7.908	Charge balance
	pe	=	4.865	Adjusted to redox
equilibrium	Activity of water	=	0.998	
	Ionic strength (mol/kgw)	=	1.227e-01	
	Mass of water (kg)	=	1.005e+00	
	Total alkalinity (eq/kg)	=	6.160e-04	
	Total CO2 (mol/kg)	=	5.748e-04	
	Temperature (°C)	=	25.00	
	Electrical balance (eq)	=	2.673e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.116015e+02	
	Total O	=	5.599166e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.091e-06	8.135e-07	-5.962	-6.090	-0.127	(0)
H+	1.604e-08	1.235e-08	-7.795	-7.908	-0.114	0.00
H2O	5.551e+01	9.981e-01	1.744	-0.001	0.000	18.07
Al	5.554e-06					
Al(OH) 4-	5.509e-06	4.201e-06	-5.259	-5.377	-0.118	(0)
Al(OH) 3	4.102e-08	4.102e-08	-7.387	-7.387	0.000	(0)
Al(OH) 2+	3.257e-09	2.527e-09	-8.487	-8.597	-0.110	(0)
AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
AlOH+2	1.079e-11	3.910e-12	-10.967	-11.408	-0.441	(0)
AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
Al(SO4) 2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
Al+3	5.055e-14	4.807e-15	-13.296	-14.318	-1.022	(0)
AlMo6O21-3	2.469e-39	0.000e+00	-38.607	-40.216	-1.608	(0)
As (3)	1.700e-23					
H3AsO3	1.600e-23	1.600e-23	-22.796	-22.796	0.000	(0)
H2AsO3-	1.002e-24	6.641e-25	-23.999	-24.178	-0.179	(0)
HAsO3-2	2.542e-28	4.903e-29	-27.595	-28.310	-0.715	(0)
H4AsO3+	1.477e-31	9.791e-32	-30.830	-31.009	-0.179	(0)
AsO3-3	6.205e-33	1.530e-34	-32.207	-33.815	-1.608	(0)
As (5)	1.573e-09					
HAsO4-2	1.520e-09	2.932e-10	-8.818	-9.533	-0.715	(0)
H2AsO4-	4.985e-11	3.303e-11	-10.302	-10.481	-0.179	(0)
AsO4-3	3.044e-12	7.505e-14	-11.517	-13.125	-1.608	(0)
H3AsO4	6.894e-17	7.092e-17	-16.162	-16.149	0.012	(0)
B	1.002e-04					
H3BO3	9.234e-05	9.499e-05	-4.035	-4.022	0.012	(0)
H2BO3-	6.146e-06	4.466e-06	-5.211	-5.350	-0.139	(0)
MgH2BO3+	8.058e-07	5.855e-07	-6.094	-6.233	-0.139	(0)
CaH2BO3+	7.944e-07	5.772e-07	-6.100	-6.239	-0.139	(0)

	NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
	BF(OH) 3-	6.190e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
	H5 (BO3) 2-	4.969e-10	3.610e-10	-9.304	-9.442	-0.139	(0)
	H8 (BO3) 3-	4.720e-12	3.429e-12	-11.326	-11.465	-0.139	(0)
	BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
	BF2(OH) 2-	9.719e-13	7.061e-13	-12.012	-12.151	-0.139	(0)
	BF3OH-	5.553e-19	4.034e-19	-18.255	-18.394	-0.139	(0)
	BF4-	4.013e-24	2.915e-24	-23.397	-23.535	-0.139	(0)
Ba	2.721e-08						
	Ba+2	2.716e-08	9.544e-09	-7.566	-8.020	-0.454	(0)
	BaHCO3+	4.517e-11	3.541e-11	-10.345	-10.451	-0.106	(0)
	BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
	BaH2BO3+	1.813e-12	1.317e-12	-11.742	-11.880	-0.139	(0)
	BaOH+	4.401e-14	3.389e-14	-13.356	-13.470	-0.113	(0)
	BaNO3+	1.111e-15	7.362e-16	-14.954	-15.133	-0.179	(0)
	BaNH3+2	2.672e-16	5.154e-17	-15.573	-16.288	-0.715	(0)
C (4)	5.748e-04						
	HCO3-	5.007e-04	3.885e-04	-3.300	-3.411	-0.110	(0)
	CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)
	MgHCO3+	1.992e-05	1.503e-05	-4.701	-4.823	-0.122	(0)
	H2CO3	1.079e-05	1.079e-05	-4.967	-4.967	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	MgCO3	4.637e-06	4.637e-06	-5.334	-5.334	0.000	(0)
	NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
	CO3-2	4.195e-06	1.474e-06	-5.377	-5.831	-0.454	(0)
	UO2 (CO3) 3-4	8.362e-07	1.157e-09	-6.078	-8.936	-2.859	(0)
	NaCO3-	6.946e-07	5.389e-07	-6.158	-6.268	-0.110	(0)
	ZnCO3	3.255e-07	3.255e-07	-6.487	-6.487	0.000	(0)
	MnHCO3+	3.118e-07	2.401e-07	-6.506	-6.620	-0.113	(0)
	CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
	UO2 (CO3) 2-2	8.121e-08	1.567e-08	-7.090	-7.805	-0.715	(0)
	ZnHCO3+	7.112e-08	4.713e-08	-7.148	-7.327	-0.179	(0)
	Cu (CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
	CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
	UO2CO3	5.325e-10	5.325e-10	-9.274	-9.274	0.000	(0)
	PbCO3	3.985e-10	3.985e-10	-9.400	-9.400	0.000	(0)
	CdCO3	8.924e-11	8.924e-11	-10.049	-10.049	0.000	(0)
	BaHCO3+	4.517e-11	3.541e-11	-10.345	-10.451	-0.106	(0)
	PbHCO3+	3.917e-11	2.596e-11	-10.407	-10.586	-0.179	(0)
	CoHCO3+	1.803e-11	1.195e-11	-10.744	-10.923	-0.179	(0)
	CoCO3	9.856e-12	9.856e-12	-11.006	-11.006	0.000	(0)
	Pb (CO3) 2-2	8.784e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
	BaCO3	7.217e-12	7.217e-12	-11.142	-11.142	0.000	(0)
	NiHCO3+	6.687e-12	4.432e-12	-11.175	-11.353	-0.179	(0)
	NiCO3	5.089e-12	5.089e-12	-11.293	-11.293	0.000	(0)
	CdHCO3+	3.544e-12	2.349e-12	-11.450	-11.629	-0.179	(0)
	Cd (CO3) 2-2	5.056e-13	9.753e-14	-12.296	-13.011	-0.715	(0)
	HgCO3	9.752e-15	9.752e-15	-14.011	-14.011	0.000	(0)
	FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
	Hg (CO3) 2-2	2.357e-16	4.546e-17	-15.628	-16.342	-0.715	(0)
	HgHCO3+	3.385e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
Ca	1.207e-02						
	Ca+2	6.391e-03	2.246e-03	-2.194	-2.649	-0.454	(0)
	CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
	CaHCO3+	2.072e-05	1.625e-05	-4.684	-4.789	-0.106	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
	CaH2BO3+	7.944e-07	5.772e-07	-6.100	-6.239	-0.139	(0)
	CaOH+	4.650e-08	3.646e-08	-7.333	-7.438	-0.106	(0)
	CaNO3+	1.649e-10	1.093e-10	-9.783	-9.961	-0.179	(0)
	CaNH3+2	1.255e-10	2.420e-11	-9.901	-10.616	-0.715	(0)
	Ca (NH3) 2+2	4.275e-19	8.245e-20	-18.369	-19.084	-0.715	(0)
Cd	2.234e-08						
	Cd+2	7.557e-09	2.656e-09	-8.122	-8.576	-0.454	(0)
	CdSO4	6.830e-09	6.830e-09	-8.166	-8.166	0.000	(0)
	Cd (SO4) 2-2	5.240e-09	1.011e-09	-8.281	-8.995	-0.715	(0)
	CdCl+	2.485e-09	1.647e-09	-8.605	-8.783	-0.179	(0)
	CdCO3	8.924e-11	8.924e-11	-10.049	-10.049	0.000	(0)

	CdOHC1	5.497e-11	5.497e-11	-10.260	-10.260	0.000	(0)
	CdCl2	4.459e-11	4.459e-11	-10.351	-10.351	0.000	(0)
	CdOH+	2.589e-11	1.716e-11	-10.587	-10.765	-0.179	(0)
	CdF+	7.536e-12	4.994e-12	-11.123	-11.302	-0.179	(0)
	CdHCO3+	3.544e-12	2.349e-12	-11.450	-11.629	-0.179	(0)
	Cd (CO3) 2-2	5.056e-13	9.753e-14	-12.296	-13.011	-0.715	(0)
	CdCl3-	2.758e-13	1.827e-13	-12.559	-12.738	-0.179	(0)
	Cd (OH) 2	8.808e-14	8.808e-14	-13.055	-13.055	0.000	(0)
	CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
	CdNO3+	1.950e-16	1.292e-16	-15.710	-15.889	-0.179	(0)
	CdSeO4	1.647e-16	1.647e-16	-15.783	-15.783	0.000	(0)
	Cd (SeO3) 2-2	6.706e-17	1.293e-17	-16.174	-16.888	-0.715	(0)
	Cd2OH+3	9.263e-18	2.284e-19	-17.033	-18.641	-1.608	(0)
	Cd (OH) 3-	6.606e-18	4.378e-18	-17.180	-17.359	-0.179	(0)
	Cd (OH) 4-2	3.022e-24	5.830e-25	-23.520	-24.234	-0.715	(0)
	Cd (NO3) 2	9.969e-25	9.969e-25	-24.001	-24.001	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
C1		8.436e-03					
	Cl-	8.435e-03	6.495e-03	-2.074	-2.187	-0.114	(0)
	MnCl+	3.289e-07	2.533e-07	-6.483	-6.596	-0.113	(0)
	ZnCl+	8.295e-08	6.259e-08	-7.081	-7.204	-0.122	(0)
	ZnOHC1	6.666e-08	6.666e-08	-7.176	-7.176	0.000	(0)
	CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
	CdCl+	2.485e-09	1.647e-09	-8.605	-8.783	-0.179	(0)
	MnCl2	2.324e-09	2.324e-09	-8.634	-8.634	0.000	(0)
	CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
	ZnCl2	6.442e-10	6.442e-10	-9.191	-9.191	0.000	(0)
	CuCl+	3.709e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
	CdOHC1	5.497e-11	5.497e-11	-10.260	-10.260	0.000	(0)
	HgClOH	5.158e-11	5.158e-11	-10.288	-10.288	0.000	(0)
	CdCl2	4.459e-11	4.459e-11	-10.351	-10.351	0.000	(0)
	PbCl+	3.127e-11	2.072e-11	-10.505	-10.684	-0.179	(0)
	HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
	CoCl+	1.341e-11	8.886e-12	-10.873	-11.051	-0.179	(0)
	CuCl3-2	7.965e-12	2.802e-12	-11.099	-11.552	-0.454	(0)
	MnCl3-	5.398e-12	4.157e-12	-11.268	-11.381	-0.113	(0)
	ZnCl3-	4.405e-12	3.324e-12	-11.356	-11.478	-0.122	(0)
	NiCl+	2.320e-12	1.538e-12	-11.634	-11.813	-0.179	(0)
	HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
	CuCl2	6.302e-13	6.302e-13	-12.200	-12.200	0.000	(0)
	PbCl2	6.011e-13	6.011e-13	-12.221	-12.221	0.000	(0)
	CdCl3-	2.758e-13	1.827e-13	-12.559	-12.738	-0.179	(0)
	HgCl4-2	2.030e-13	3.915e-14	-12.693	-13.407	-0.715	(0)
	ZnCl4-2	3.068e-14	1.079e-14	-13.513	-13.967	-0.454	(0)
	PbCl3-	2.345e-15	1.554e-15	-14.630	-14.808	-0.179	(0)
	UO2Cl+	1.442e-15	9.557e-16	-14.841	-15.020	-0.179	(0)
	HgCl+	1.081e-15	7.163e-16	-14.966	-15.145	-0.179	(0)
	CuCl3-	5.063e-17	3.820e-17	-16.296	-16.418	-0.122	(0)
	NiCl2	5.028e-17	5.028e-17	-16.299	-16.299	0.000	(0)
	PbCl4-2	2.392e-17	4.614e-18	-16.621	-17.336	-0.715	(0)
	CrCl+2	4.950e-18	9.547e-19	-17.305	-18.020	-0.715	(0)
	CrOHC12	9.588e-20	9.588e-20	-19.018	-19.018	0.000	(0)
	CuCl4-2	3.534e-21	1.243e-21	-20.452	-20.905	-0.454	(0)
	FeCl+2	1.641e-21	5.774e-22	-20.785	-21.239	-0.454	(0)
	CrCl2+	8.878e-22	5.884e-22	-21.052	-21.230	-0.179	(0)
	VOCl+	1.877e-22	1.244e-22	-21.727	-21.905	-0.179	(0)
	FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
	CrO3Cl-	2.823e-26	1.871e-26	-25.549	-25.728	-0.179	(0)
	FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
	CoCl+2	7.897e-37	1.523e-37	-36.103	-36.817	-0.715	(0)
	UCl+3	0.000e+00	0.000e+00	-44.066	-45.674	-1.608	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.715	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.721	-52.436	-0.715	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.271	-65.985	-0.715	(0)
Co (2)		2.970e-09					

Co+2	2.050e-09	3.955e-10	-8.688	-9.403	-0.715	(0)
CoSO4	8.657e-10	8.657e-10	-9.063	-9.063	0.000	(0)
CoHCO3+	1.803e-11	1.195e-11	-10.744	-10.923	-0.179	(0)
CoCl+	1.341e-11	8.886e-12	-10.873	-11.051	-0.179	(0)
CoCO3	9.856e-12	9.856e-12	-11.006	-11.006	0.000	(0)
CoOH+	9.687e-12	6.420e-12	-11.014	-11.192	-0.179	(0)
CoF+	2.239e-12	1.484e-12	-11.650	-11.829	-0.179	(0)
Co (OH) 2	4.148e-13	4.148e-13	-12.382	-12.382	0.000	(0)
CoNO2+	6.860e-14	4.546e-14	-13.164	-13.342	-0.179	(0)
Co (NH3) +2	2.110e-15	4.069e-16	-14.676	-15.390	-0.715	(0)
CoSeO4	6.601e-17	6.601e-17	-16.180	-16.180	0.000	(0)
CoNO3+	1.456e-17	9.647e-18	-16.837	-17.016	-0.179	(0)
Co (OH) 3-	1.016e-17	6.734e-18	-16.993	-17.172	-0.179	(0)
CoOOH-	2.554e-18	1.693e-18	-17.593	-17.771	-0.179	(0)
Co2OH+3	5.161e-21	1.272e-22	-20.287	-21.895	-1.608	(0)
Co (NH3) 2+2	7.702e-22	1.486e-22	-21.113	-21.828	-0.715	(0)
Co (OH) 4-2	4.501e-24	8.682e-25	-23.347	-24.061	-0.715	(0)
Co (NO3) 2	3.021e-25	3.021e-25	-24.520	-24.520	0.000	(0)
Co (NH3) 3+2	8.299e-29	1.601e-29	-28.081	-28.796	-0.715	(0)
Co4 (OH) 4+4	2.448e-34	3.389e-37	-33.611	-36.470	-2.859	(0)
Co (NH3) 4+2	3.728e-36	7.190e-37	-35.429	-36.143	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.991	-0.715	(0)
Co (3)	2.470e-30					
CoOH+2	2.470e-30	4.765e-31	-29.607	-30.322	-0.715	(0)
Co+3	1.212e-36	1.153e-37	-35.916	-36.938	-1.022	(0)
CoCl+2	7.897e-37	1.523e-37	-36.103	-36.817	-0.715	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.654	-60.832	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.973	-65.687	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.271	-65.985	-0.715	(0)
Cr (2)	1.922e-27					
Cr+2	1.922e-27	3.707e-28	-26.716	-27.431	-0.715	(0)
Cr (3)	3.854e-10					
Cr (OH) 2+	3.020e-10	2.001e-10	-9.520	-9.699	-0.179	(0)
Cr (OH) 3	6.116e-11	6.116e-11	-10.214	-10.214	0.000	(0)
Cr (OH) +2	1.048e-11	2.022e-12	-10.980	-11.694	-0.715	(0)
CrOHSO4	5.263e-12	5.263e-12	-11.279	-11.279	0.000	(0)
CrO2-	3.554e-12	2.356e-12	-11.449	-11.628	-0.179	(0)
Cr (OH) 4-	2.989e-12	1.981e-12	-11.525	-11.703	-0.179	(0)
CrF+2	1.107e-14	2.136e-15	-13.956	-14.670	-0.715	(0)
Cr+3	4.607e-15	1.136e-16	-14.337	-15.945	-1.608	(0)
CrSO4+	4.391e-15	2.910e-15	-14.357	-14.536	-0.179	(0)
CrCl+2	4.950e-18	9.547e-19	-17.305	-18.020	-0.715	(0)
CrOHC12	9.588e-20	9.588e-20	-19.018	-19.018	0.000	(0)
Cr2 (OH) 2SO4+2	4.986e-21	9.617e-22	-20.302	-21.017	-0.715	(0)
CrCl2+	8.878e-22	5.884e-22	-21.052	-21.230	-0.179	(0)
Cr2 (OH) 2 (SO4) 2	6.268e-22	6.268e-22	-21.203	-21.203	0.000	(0)
CrNO3+2	3.962e-25	7.641e-26	-24.402	-25.117	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.285	-42.000	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.742	-51.350	-1.608	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.721	-52.436	-0.715	(0)
Cr (6)	2.882e-15					
CrO4-2	2.634e-15	9.258e-16	-14.579	-15.033	-0.454	(0)
NaCrO4-	1.363e-16	9.032e-17	-15.866	-16.044	-0.179	(0)
HCrO4-	5.585e-17	3.701e-17	-16.253	-16.432	-0.179	(0)
KCrO4-	5.559e-17	3.684e-17	-16.255	-16.434	-0.179	(0)
CrO3SO4-2	7.936e-24	1.531e-24	-23.100	-23.815	-0.715	(0)
H2CrO4	3.706e-25	3.706e-25	-24.431	-24.431	0.000	(0)
CrO3Cl-	2.823e-26	1.871e-26	-25.549	-25.728	-0.179	(0)
Cr2O7-2	2.467e-31	4.758e-32	-30.608	-31.323	-0.715	(0)
Cu (1)	4.444e-09					
CuCl2-	2.675e-09	2.018e-09	-8.573	-8.695	-0.122	(0)
CuCl	1.487e-09	1.487e-09	-8.828	-8.828	0.000	(0)
Cu+	2.745e-10	1.819e-10	-9.562	-9.740	-0.179	(0)
CuCl3-2	7.965e-12	2.802e-12	-11.099	-11.552	-0.454	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.623	-148.037	-0.415	(0)
Cu (2)	4.937e-07					

CuCO3	2.360e-07	2.360e-07	-6.627	-6.627	0.000	(0)
CuOH+	9.271e-08	6.994e-08	-7.033	-7.155	-0.122	(0)
Cu+2	7.737e-08	2.719e-08	-7.111	-7.566	-0.454	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
Cu (OH) 2	1.135e-08	1.135e-08	-7.945	-7.945	0.000	(0)
Cu (CO3) 2-2	4.856e-09	9.366e-10	-8.314	-9.028	-0.715	(0)
CuHCO3+	1.006e-09	6.664e-10	-8.998	-9.176	-0.179	(0)
Cu2 (OH) 2+2	6.371e-10	1.229e-10	-9.196	-9.910	-0.715	(0)
CuCl+	3.709e-10	2.799e-10	-9.431	-9.553	-0.122	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
CuNO2+	7.008e-11	4.644e-11	-10.154	-10.333	-0.179	(0)
Cu (OH) 3-	2.859e-11	1.894e-11	-10.544	-10.723	-0.179	(0)
CuNH3+2	1.234e-11	2.381e-12	-10.909	-11.623	-0.715	(0)
CuCl2	6.302e-13	6.302e-13	-12.200	-12.200	0.000	(0)
Cu (NO2) 2	7.753e-15	7.753e-15	-14.111	-14.111	0.000	(0)
CuNO3+	1.997e-15	1.323e-15	-14.700	-14.878	-0.179	(0)
Cu (OH) 4-2	6.289e-16	1.213e-16	-15.201	-15.916	-0.715	(0)
CuCl3-	5.063e-17	3.820e-17	-16.296	-16.418	-0.122	(0)
CuCl4-2	3.534e-21	1.243e-21	-20.452	-20.905	-0.454	(0)
Cu (NO3) 2	2.564e-24	2.564e-24	-23.591	-23.591	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
F	2.256e-04					
F-	1.541e-04	1.187e-04	-3.812	-3.926	-0.114	(0)
MgF+	6.601e-05	5.034e-05	-4.180	-4.298	-0.118	(0)
CaF+	3.777e-06	2.909e-06	-5.423	-5.536	-0.113	(0)
NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
MnF+	1.900e-07	1.463e-07	-6.721	-6.835	-0.113	(0)
ZnF+	1.371e-08	9.083e-09	-7.863	-8.042	-0.179	(0)
BF (OH) 3-	6.190e-09	4.497e-09	-8.208	-8.347	-0.139	(0)
HF	2.168e-09	2.168e-09	-8.664	-8.664	0.000	(0)
AlF3	4.024e-10	4.024e-10	-9.395	-9.395	0.000	(0)
AlF2+	3.472e-10	2.694e-10	-9.459	-9.570	-0.110	(0)
CuF+	3.071e-10	2.035e-10	-9.513	-9.691	-0.179	(0)
AlF4-	3.138e-11	2.393e-11	-10.503	-10.621	-0.118	(0)
AlF+2	1.574e-11	5.703e-12	-10.803	-11.244	-0.441	(0)
CdF+	7.536e-12	4.994e-12	-11.123	-11.302	-0.179	(0)
UO2F+	2.243e-12	1.486e-12	-11.649	-11.828	-0.179	(0)
CoF+	2.239e-12	1.484e-12	-11.650	-11.829	-0.179	(0)
HF2-	1.311e-12	9.781e-13	-11.882	-12.010	-0.127	(0)
PbF+	1.135e-12	7.519e-13	-11.945	-12.124	-0.179	(0)
BF2 (OH) 2-	9.719e-13	7.061e-13	-12.012	-12.151	-0.139	(0)
UO2F2	5.086e-13	5.086e-13	-12.294	-12.294	0.000	(0)
NiF+	4.162e-13	2.758e-13	-12.381	-12.559	-0.179	(0)
UO2F3-	2.287e-14	1.516e-14	-13.641	-13.819	-0.179	(0)
CrF+2	1.107e-14	2.136e-15	-13.956	-14.670	-0.715	(0)
PbF2	1.756e-15	1.756e-15	-14.756	-14.756	0.000	(0)
CdF2	1.182e-15	1.182e-15	-14.927	-14.927	0.000	(0)
UO2F4-2	7.407e-17	1.429e-17	-16.130	-16.845	-0.715	(0)
H2F2	1.259e-17	1.259e-17	-16.900	-16.900	0.000	(0)
VO2F	8.503e-18	8.503e-18	-17.070	-17.070	0.000	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.089e-18	3.830e-19	-17.963	-18.417	-0.454	(0)
PbF3-	5.962e-19	3.951e-19	-18.225	-18.403	-0.179	(0)
BF3OH-	5.553e-19	4.034e-19	-18.255	-18.394	-0.139	(0)
VO2F2-	5.528e-19	3.663e-19	-18.257	-18.436	-0.179	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
VOF+	7.330e-21	4.858e-21	-20.135	-20.314	-0.179	(0)
VO2F3-2	2.811e-21	5.422e-22	-20.551	-21.266	-0.715	(0)
VOF2	2.161e-22	2.161e-22	-21.665	-21.665	0.000	(0)
PbF4-2	1.163e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
HgF+	3.668e-23	2.431e-23	-22.436	-22.614	-0.179	(0)
BF4-	4.013e-24	2.915e-24	-23.397	-23.535	-0.139	(0)
VOF3-	1.373e-24	9.100e-25	-23.862	-24.041	-0.179	(0)
VO2F4-3	1.284e-24	3.166e-26	-23.891	-25.500	-1.608	(0)
Sb (OH) 2F	1.150e-25	1.150e-25	-24.939	-24.939	0.000	(0)
SbOF	1.133e-25	1.133e-25	-24.946	-24.946	0.000	(0)
VOF4-2	2.260e-27	4.358e-28	-26.646	-27.361	-0.715	(0)
UF3+	6.532e-36	4.329e-36	-35.185	-35.364	-0.179	(0)

UF2+2	1.193e-36	2.302e-37	-35.923	-36.638	-0.715	(0)
UF4	5.632e-38	5.632e-38	-37.249	-37.249	0.000	(0)
UF+3	6.250e-39	1.541e-40	-38.204	-39.812	-1.608	(0)
UF5-	3.996e-40	2.648e-40	-39.398	-39.577	-0.179	(0)
UF6-2	0.000e+00	0.000e+00	-40.308	-41.023	-0.715	(0)
Fe (2)	3.431e-12					
Fe+2	2.244e-12	4.328e-13	-11.649	-12.364	-0.715	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
FeOH+	1.820e-14	1.402e-14	-13.740	-13.853	-0.113	(0)
FeHCO3+	2.700e-15	2.117e-15	-14.569	-14.674	-0.106	(0)
Fe (OH) 2	9.059e-18	9.059e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	3.026e-18	2.330e-18	-17.519	-17.633	-0.113	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Fe (3)	1.100e-09					
Fe (OH) 2+	6.307e-10	4.894e-10	-9.200	-9.310	-0.110	(0)
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 4-	4.174e-11	3.239e-11	-10.379	-10.490	-0.110	(0)
FeOH+2	4.395e-15	1.546e-15	-14.357	-14.811	-0.454	(0)
FeF2+	1.579e-18	1.216e-18	-17.802	-17.915	-0.113	(0)
FeF+2	1.089e-18	3.830e-19	-17.963	-18.417	-0.454	(0)
FeSO4+	4.705e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
FeF3	2.036e-19	2.036e-19	-18.691	-18.691	0.000	(0)
Fe (SO4) 2-	1.283e-19	8.499e-20	-18.892	-19.071	-0.179	(0)
Fe+3	3.096e-20	2.944e-21	-19.509	-20.531	-1.022	(0)
FeCl+2	1.641e-21	5.774e-22	-20.785	-21.239	-0.454	(0)
FeCl2+	2.175e-23	1.675e-23	-22.663	-22.776	-0.113	(0)
FeHSeO3+2	9.620e-24	1.856e-24	-23.017	-23.732	-0.715	(0)
Fe2 (OH) 2+4	5.719e-26	7.916e-29	-25.243	-28.101	-2.859	(0)
FeCl3	1.088e-26	1.088e-26	-25.963	-25.963	0.000	(0)
FeNO3+2	2.349e-27	4.530e-28	-26.629	-27.344	-0.715	(0)
Fe3 (OH) 4+5	1.641e-32	5.599e-37	-31.785	-36.252	-4.467	(0)
H (0)	3.919e-29					
H2	1.960e-29	2.016e-29	-28.708	-28.696	0.012	(0)
Hg (0)	9.519e-09					
Hg	9.519e-09	9.519e-09	-8.021	-8.021	0.000	(0)
Hg (1)	3.704e-19					
Hg2+2	1.852e-19	3.572e-20	-18.732	-19.447	-0.715	(0)
Hg (2)	9.983e-11					
HgClOH	5.158e-11	5.158e-11	-10.288	-10.288	0.000	(0)
HgCl2	2.331e-11	2.331e-11	-10.632	-10.632	0.000	(0)
Hg (OH) 2	2.244e-11	2.308e-11	-10.649	-10.637	0.012	(0)
HgCl3-	2.285e-12	1.514e-12	-11.641	-11.820	-0.179	(0)
HgCl4-2	2.030e-13	3.915e-14	-12.693	-13.407	-0.715	(0)
HgCO3	9.752e-15	9.752e-15	-14.011	-14.011	0.000	(0)
HgCl+	1.081e-15	7.163e-16	-14.966	-15.145	-0.179	(0)
HgOH+	2.701e-16	1.790e-16	-15.568	-15.747	-0.179	(0)
Hg (CO3) 2-2	2.357e-16	4.546e-17	-15.628	-16.342	-0.715	(0)
Hg (OH) 3-	3.567e-18	2.364e-18	-17.448	-17.626	-0.179	(0)
HgHCO3+	3.385e-18	2.243e-18	-17.470	-17.649	-0.179	(0)
Hg (NH3) 2+2	1.324e-18	2.554e-19	-17.878	-18.593	-0.715	(0)
HgNH3+2	1.547e-19	2.985e-20	-18.810	-19.525	-0.715	(0)
Hg+2	2.866e-20	5.527e-21	-19.543	-20.257	-0.715	(0)
HgSO4	1.588e-20	1.588e-20	-19.799	-19.799	0.000	(0)
HgF+	3.668e-23	2.431e-23	-22.436	-22.614	-0.179	(0)
Hg (NH3) 3+2	4.512e-26	8.704e-27	-25.346	-26.060	-0.715	(0)
HgNO3+	4.739e-29	3.141e-29	-28.324	-28.503	-0.179	(0)
Hg (NH3) 4+2	3.068e-33	5.917e-34	-32.513	-33.228	-0.715	(0)
Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
K	1.498e-02					
K+	1.391e-02	1.071e-02	-1.857	-1.970	-0.114	(0)
KSO4-	1.072e-03	8.318e-04	-2.970	-3.080	-0.110	(0)
KCrO4-	5.559e-17	3.684e-17	-16.255	-16.434	-0.179	(0)
Mg	1.840e-02					
Mg+2	1.076e-02	3.781e-03	-1.968	-2.422	-0.454	(0)

MgSO4	7.549e-03	7.549e-03	-2.122	-2.122	0.000	(0)
MgF+	6.601e-05	5.034e-05	-4.180	-4.298	-0.118	(0)
MgHCO3+	1.992e-05	1.503e-05	-4.701	-4.823	-0.122	(0)
MgCO3	4.637e-06	4.637e-06	-5.334	-5.334	0.000	(0)
MgOH+	1.550e-06	1.225e-06	-5.810	-5.912	-0.102	(0)
MgH2BO3+	8.058e-07	5.855e-07	-6.094	-6.233	-0.139	(0)
Mn (2)	2.220e-04					
Mn+2	1.606e-04	3.098e-05	-3.794	-4.509	-0.715	(0)
MnSO4	6.044e-05	6.044e-05	-4.219	-4.219	0.000	(0)
MnCl+	3.289e-07	2.533e-07	-6.483	-6.596	-0.113	(0)
MnHCO3+	3.118e-07	2.401e-07	-6.506	-6.620	-0.113	(0)
MnF+	1.900e-07	1.463e-07	-6.721	-6.835	-0.113	(0)
MnOH+	8.220e-08	6.331e-08	-7.085	-7.199	-0.113	(0)
MnCl2	2.324e-09	2.324e-09	-8.634	-8.634	0.000	(0)
MnCl3-	5.398e-12	4.157e-12	-11.268	-11.381	-0.113	(0)
MnSeO4	2.777e-12	2.777e-12	-11.556	-11.556	0.000	(0)
MnNO3+	1.140e-12	7.557e-13	-11.943	-12.122	-0.179	(0)
Mn (OH) 3-	3.362e-16	2.589e-16	-15.473	-15.587	-0.113	(0)
Mn (NO3) 2	2.921e-20	2.921e-20	-19.534	-19.534	0.000	(0)
Mn (OH) 4-2	1.933e-21	6.801e-22	-20.714	-21.167	-0.454	(0)
MnSe	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
Mn (3)	1.065e-24					
Mn+3	1.065e-24	1.013e-25	-23.972	-24.994	-1.022	(0)
Mn (6)	1.751e-40					
MnO4-2	1.751e-40	0.000e+00	-39.757	-40.210	-0.454	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.585	-44.718	-0.133	(0)
Mo	7.592e-06					
MoO4-2	7.591e-06	2.668e-06	-5.120	-5.574	-0.454	(0)
HMoO4-	9.895e-10	6.557e-10	-9.005	-9.183	-0.179	(0)
H2MoO4	5.934e-14	5.934e-14	-13.227	-13.227	0.000	(0)
AlMo6O21-3	2.469e-39	0.000e+00	-38.607	-40.216	-1.608	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.857	-49.289	-6.432	(0)
HMo7O24-5	0.000e+00	0.000e+00	-46.344	-50.811	-4.467	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.078	-53.937	-2.859	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.991	-58.599	-1.608	(0)
N (-3)	2.922e-07					
NH4+	2.552e-07	1.854e-07	-6.593	-6.732	-0.139	(0)
NH4SO4-	2.830e-08	2.180e-08	-7.548	-7.662	-0.113	(0)
NH3	8.558e-09	8.558e-09	-8.068	-8.068	0.000	(0)
CaNH3+2	1.255e-10	2.420e-11	-9.901	-10.616	-0.715	(0)
CuNH3+2	1.234e-11	2.381e-12	-10.909	-11.623	-0.715	(0)
NiNH3+2	2.205e-15	4.253e-16	-14.657	-15.371	-0.715	(0)
Co (NH3) +2	2.110e-15	4.069e-16	-14.676	-15.390	-0.715	(0)
BaNH3+2	2.672e-16	5.154e-17	-15.573	-16.288	-0.715	(0)
Hg (NH3) 2+2	1.324e-18	2.554e-19	-17.878	-18.593	-0.715	(0)
Ca (NH3) 2+2	4.275e-19	8.245e-20	-18.369	-19.084	-0.715	(0)
HgNH3+2	1.547e-19	2.985e-20	-18.810	-19.525	-0.715	(0)
Ni (NH3) 2+2	2.728e-21	5.261e-22	-20.564	-21.279	-0.715	(0)
Co (NH3) 2+2	7.702e-22	1.486e-22	-21.113	-21.828	-0.715	(0)
Hg (NH3) 3+2	4.512e-26	8.704e-27	-25.346	-26.060	-0.715	(0)
Co (NH3) 3+2	8.299e-29	1.601e-29	-28.081	-28.796	-0.715	(0)
Hg (NH3) 4+2	3.068e-33	5.917e-34	-32.513	-33.228	-0.715	(0)
Co (NH3) 4+2	3.728e-36	7.190e-37	-35.429	-36.143	-0.715	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.285	-42.000	-0.715	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-43.276	-43.991	-0.715	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.742	-51.350	-1.608	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-50.487	-51.202	-0.715	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.721	-52.436	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.654	-60.832	-0.179	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-64.973	-65.687	-0.715	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-65.271	-65.985	-0.715	(0)
N (3)	2.215e-05					
NO2-	2.215e-05	1.631e-05	-4.655	-4.787	-0.133	(0)
CuNO2+	7.008e-11	4.644e-11	-10.154	-10.333	-0.179	(0)
CoNO2+	6.860e-14	4.546e-14	-13.164	-13.342	-0.179	(0)
Cu (NO2) 2	7.753e-15	7.753e-15	-14.111	-14.111	0.000	(0)
N (5)	2.015e-08					

NO3-	1.999e-08	1.539e-08	-7.699	-7.813	-0.114	(0)
CaNO3+	1.649e-10	1.093e-10	-9.783	-9.961	-0.179	(0)
MnNO3+	1.140e-12	7.557e-13	-11.943	-12.122	-0.179	(0)
ZnNO3+	2.238e-13	1.483e-13	-12.650	-12.829	-0.179	(0)
CuNO3+	1.997e-15	1.323e-15	-14.700	-14.878	-0.179	(0)
BaNO3+	1.111e-15	7.362e-16	-14.954	-15.133	-0.179	(0)
CdNO3+	1.950e-16	1.292e-16	-15.710	-15.889	-0.179	(0)
PbNO3+	3.089e-17	2.047e-17	-16.510	-16.689	-0.179	(0)
CoNO3+	1.456e-17	9.647e-18	-16.837	-17.016	-0.179	(0)
NiNO3+	5.398e-18	3.577e-18	-17.268	-17.446	-0.179	(0)
Mn (NO3) 2	2.921e-20	2.921e-20	-19.534	-19.534	0.000	(0)
UO2NO3+	4.204e-21	2.786e-21	-20.376	-20.555	-0.179	(0)
Zn (NO3) 2	4.554e-22	4.554e-22	-21.342	-21.342	0.000	(0)
Cu (NO3) 2	2.564e-24	2.564e-24	-23.591	-23.591	0.000	(0)
Cd (NO3) 2	9.969e-25	9.969e-25	-24.001	-24.001	0.000	(0)
Pb (NO3) 2	5.350e-25	5.350e-25	-24.272	-24.272	0.000	(0)
CrNO3+2	3.962e-25	7.641e-26	-24.402	-25.117	-0.715	(0)
VO2NO3	3.181e-25	3.181e-25	-24.497	-24.497	0.000	(0)
Co (NO3) 2	3.021e-25	3.021e-25	-24.520	-24.520	0.000	(0)
FeNO3+2	2.349e-27	4.530e-28	-26.629	-27.344	-0.715	(0)
HgNO3+	4.739e-29	3.141e-29	-28.324	-28.503	-0.179	(0)
Hg (NO3) 2	2.009e-37	2.009e-37	-36.697	-36.697	0.000	(0)
Na	2.699e-02					
Na+	2.550e-02	1.963e-02	-1.594	-1.707	-0.114	(0)
NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
NaHCO3	4.289e-06	4.289e-06	-5.368	-5.368	0.000	(0)
NaF	1.470e-06	1.470e-06	-5.833	-5.833	0.000	(0)
NaCO3-	6.946e-07	5.389e-07	-6.158	-6.268	-0.110	(0)
NaH2BO3	1.389e-07	1.389e-07	-6.857	-6.857	0.000	(0)
NaCrO4-	1.363e-16	9.032e-17	-15.866	-16.044	-0.179	(0)
Ni	4.822e-10					
Ni+2	2.633e-10	9.253e-11	-9.580	-10.034	-0.454	(0)
NiSO4	2.026e-10	2.026e-10	-9.693	-9.693	0.000	(0)
NiHCO3+	6.687e-12	4.432e-12	-11.175	-11.353	-0.179	(0)
NiCO3	5.089e-12	5.089e-12	-11.293	-11.293	0.000	(0)
NiCl+	2.320e-12	1.538e-12	-11.634	-11.813	-0.179	(0)
NiOH+	1.430e-12	9.477e-13	-11.845	-12.023	-0.179	(0)
NiF+	4.162e-13	2.758e-13	-12.381	-12.559	-0.179	(0)
Ni (SO4) 2-2	3.815e-13	7.359e-14	-12.419	-13.133	-0.715	(0)
Ni (OH) 2	6.124e-14	6.124e-14	-13.213	-13.213	0.000	(0)
NiNH3+2	2.205e-15	4.253e-16	-14.657	-15.371	-0.715	(0)
Ni (OH) 3-	7.518e-17	4.982e-17	-16.124	-16.303	-0.179	(0)
NiCl2	5.028e-17	5.028e-17	-16.299	-16.299	0.000	(0)
NiSeO4	1.441e-17	1.441e-17	-16.841	-16.841	0.000	(0)
NiNO3+	5.398e-18	3.577e-18	-17.268	-17.446	-0.179	(0)
Ni (NH3) 2+2	2.728e-21	5.261e-22	-20.564	-21.279	-0.715	(0)
O (0)	2.416e-35					
O2	1.208e-35	1.243e-35	-34.918	-34.906	0.012	(0)
Pb	1.666e-09					
PbSO4	4.832e-10	4.832e-10	-9.316	-9.316	0.000	(0)
PbCO3	3.985e-10	3.985e-10	-9.400	-9.400	0.000	(0)
PbOH+	2.773e-10	1.838e-10	-9.557	-9.736	-0.179	(0)
Pb+2	2.559e-10	8.992e-11	-9.592	-10.046	-0.454	(0)
Pb (SO4) 2-2	1.656e-10	3.194e-11	-9.781	-10.496	-0.715	(0)
PbHCO3+	3.917e-11	2.596e-11	-10.407	-10.586	-0.179	(0)
PbCl+	3.127e-11	2.072e-11	-10.505	-10.684	-0.179	(0)
Pb (CO3) 2-2	8.784e-12	1.694e-12	-11.056	-11.771	-0.715	(0)
Pb (OH) 2	4.727e-12	4.727e-12	-11.325	-11.325	0.000	(0)
PbF+	1.135e-12	7.519e-13	-11.945	-12.124	-0.179	(0)
PbCl2	6.011e-13	6.011e-13	-12.221	-12.221	0.000	(0)
Pb (OH) 3-	5.803e-15	3.846e-15	-14.236	-14.415	-0.179	(0)
PbCl3-	2.345e-15	1.554e-15	-14.630	-14.808	-0.179	(0)
PbF2	1.756e-15	1.756e-15	-14.756	-14.756	0.000	(0)
PbNO3+	3.089e-17	2.047e-17	-16.510	-16.689	-0.179	(0)
PbCl4-2	2.392e-17	4.614e-18	-16.621	-17.336	-0.715	(0)
Pb2OH+3	1.062e-17	2.619e-19	-16.974	-18.582	-1.608	(0)
Pb (OH) 4-2	3.972e-18	7.662e-19	-17.401	-18.116	-0.715	(0)
PbF3-	5.962e-19	3.951e-19	-18.225	-18.403	-0.179	(0)

Pb3 (OH) 4+2	2.079e-22	4.009e-23	-21.682	-22.397	-0.715	(0)
PbF4-2	1.163e-22	2.244e-23	-21.934	-22.649	-0.715	(0)
Pb (NO3) 2	5.350e-25	5.350e-25	-24.272	-24.272	0.000	(0)
Pb4 (OH) 4+4	2.069e-26	2.864e-29	-25.684	-28.543	-2.859	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
S (-2)	0.000e+00					
HS-	0.000e+00	0.000e+00	-78.208	-78.387	-0.179	(0)
CdHS+	0.000e+00	0.000e+00	-78.776	-78.955	-0.179	(0)
S5-2	0.000e+00	0.000e+00	-79.129	-79.844	-0.715	(0)
H2S	0.000e+00	0.000e+00	-79.275	-79.275	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.645	-80.360	-0.715	(0)
S4-2	0.000e+00	0.000e+00	-79.725	-80.439	-0.715	(0)
S3-2	0.000e+00	0.000e+00	-80.531	-81.245	-0.715	(0)
S2-2	0.000e+00	0.000e+00	-81.547	-82.261	-0.715	(0)
S-2	0.000e+00	0.000e+00	-87.325	-87.779	-0.454	(0)
HgHS2-	0.000e+00	0.000e+00	-137.016	-137.195	-0.179	(0)
HgS2-2	0.000e+00	0.000e+00	-137.280	-137.995	-0.715	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.709	-138.709	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-146.866	-147.307	-0.441	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.293	-147.471	-0.179	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.623	-148.037	-0.415	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.370	-149.370	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.137	-150.137	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.550	-151.550	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.187	-160.187	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.648	-216.827	-0.179	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.298	-224.476	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.833	-226.548	-0.715	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.445	-226.624	-0.179	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.458	-228.636	-0.179	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.358	-236.537	-0.179	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.100	-302.815	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.608	-304.323	-0.715	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.855	-318.569	-0.715	(0)
S (6)	4.705e-02					
SO4-2	3.122e-02	1.097e-02	-1.506	-1.960	-0.454	(0)
MgSO4	7.549e-03	7.549e-03	-2.122	-2.122	0.000	(0)
CaSO4	5.645e-03	5.645e-03	-2.248	-2.248	0.000	(0)
NaSO4-	1.491e-03	1.157e-03	-2.827	-2.937	-0.110	(0)
KSO4-	1.072e-03	8.318e-04	-2.970	-3.080	-0.110	(0)
MnSO4	6.044e-05	6.044e-05	-4.219	-4.219	0.000	(0)
ZnSO4	9.208e-06	9.208e-06	-5.036	-5.036	0.000	(0)
Zn (SO4) 2-2	4.562e-06	8.799e-07	-5.341	-6.056	-0.715	(0)
CuSO4	6.833e-08	6.833e-08	-7.165	-7.165	0.000	(0)
NH4SO4-	2.830e-08	2.180e-08	-7.548	-7.662	-0.113	(0)
HSO4-	1.737e-08	1.324e-08	-7.760	-7.878	-0.118	(0)
CdSO4	6.830e-09	6.830e-09	-8.166	-8.166	0.000	(0)
Cd (SO4) 2-2	5.240e-09	1.011e-09	-8.281	-8.995	-0.715	(0)
CoSO4	8.657e-10	8.657e-10	-9.063	-9.063	0.000	(0)
PbSO4	4.832e-10	4.832e-10	-9.316	-9.316	0.000	(0)
NiSO4	2.026e-10	2.026e-10	-9.693	-9.693	0.000	(0)
Pb (SO4) 2-2	1.656e-10	3.194e-11	-9.781	-10.496	-0.715	(0)
CrOHSO4	5.263e-12	5.263e-12	-11.279	-11.279	0.000	(0)
UO2SO4	1.507e-12	1.507e-12	-11.822	-11.822	0.000	(0)
FeSO4	1.166e-12	1.166e-12	-11.933	-11.933	0.000	(0)
UO2 (SO4) 2-2	1.130e-12	2.179e-13	-11.947	-12.662	-0.715	(0)
AlSO4+	5.368e-13	4.093e-13	-12.270	-12.388	-0.118	(0)
Ni (SO4) 2-2	3.815e-13	7.359e-14	-12.419	-13.133	-0.715	(0)
Al (SO4) 2-	6.310e-14	4.812e-14	-13.200	-13.318	-0.118	(0)
CrSO4+	4.391e-15	2.910e-15	-14.357	-14.536	-0.179	(0)
VO2SO4-	1.615e-17	1.070e-17	-16.792	-16.970	-0.179	(0)
FeSO4+	4.705e-19	3.624e-19	-18.327	-18.441	-0.113	(0)
Fe (SO4) 2-	1.283e-19	8.499e-20	-18.892	-19.071	-0.179	(0)
VOSO4	2.063e-20	2.063e-20	-19.686	-19.686	0.000	(0)
HgSO4	1.588e-20	1.588e-20	-19.799	-19.799	0.000	(0)
Cr2 (OH) 2SO4+2	4.986e-21	9.617e-22	-20.302	-21.017	-0.715	(0)
Cr2 (OH) 2 (SO4) 2	6.268e-22	6.268e-22	-21.203	-21.203	0.000	(0)

CrO3SO4-2	7.936e-24	1.531e-24	-23.100	-23.815	-0.715	(0)
VS04+	5.533e-35	3.667e-35	-34.257	-34.436	-0.179	(0)
U(SO4) 2	2.477e-39	2.477e-39	-38.606	-38.606	0.000	(0)
USO4+2	1.474e-40	0.000e+00	-39.832	-40.546	-0.715	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-60.654	-60.832	-0.179	(0)
Sb (3)	9.919e-20					
Sb (OH) 3	5.014e-20	5.014e-20	-19.300	-19.300	0.000	(0)
HSbO2	4.904e-20	4.904e-20	-19.309	-19.309	0.000	(0)
SbO2-	9.701e-24	6.429e-24	-23.013	-23.192	-0.179	(0)
Sb (OH) 4-	5.538e-24	3.670e-24	-23.257	-23.435	-0.179	(0)
Sb (OH) 2F	1.150e-25	1.150e-25	-24.939	-24.939	0.000	(0)
SbOF	1.133e-25	1.133e-25	-24.946	-24.946	0.000	(0)
Sb (OH) 2+	2.274e-26	1.507e-26	-25.643	-25.822	-0.179	(0)
SbO+	7.855e-27	5.205e-27	-26.105	-26.284	-0.179	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.855	-318.569	-0.715	(0)
Sb (5)	9.014e-08					
SbO3-	9.005e-08	5.968e-08	-7.045	-7.224	-0.179	(0)
Sb (OH) 6-	9.015e-11	6.941e-11	-10.045	-10.159	-0.114	(0)
SbO2+	3.949e-24	2.617e-24	-23.403	-23.582	-0.179	(0)
Se (-2)	6.056e-39					
HSe-	6.056e-39	4.013e-39	-38.218	-38.397	-0.179	(0)
MnSe	0.000e+00	0.000e+00	-40.382	-40.382	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.415	-42.415	0.000	(0)
Se-2	0.000e+00	0.000e+00	-44.774	-45.488	-0.715	(0)
Se (4)	7.585e-07					
SeO3-2	3.986e-07	7.688e-08	-6.399	-7.114	-0.715	(0)
HSeO3-	3.600e-07	2.386e-07	-6.444	-6.622	-0.179	(0)
H2SeO3	1.257e-12	1.257e-12	-11.901	-11.901	0.000	(0)
Cd (SeO3) 2-2	6.706e-17	1.293e-17	-16.174	-16.888	-0.715	(0)
FeHSeO3+2	9.620e-24	1.856e-24	-23.017	-23.732	-0.715	(0)
Se (6)	9.507e-10					
SeO4-2	9.477e-10	3.330e-10	-9.023	-9.477	-0.454	(0)
MnSeO4	2.777e-12	2.777e-12	-11.556	-11.556	0.000	(0)
ZnSeO4	1.979e-13	1.979e-13	-12.704	-12.704	0.000	(0)
HSeO4-	3.111e-16	2.062e-16	-15.507	-15.686	-0.179	(0)
CdSeO4	1.647e-16	1.647e-16	-15.783	-15.783	0.000	(0)
CoSeO4	6.601e-17	6.601e-17	-16.180	-16.180	0.000	(0)
NiSeO4	1.441e-17	1.441e-17	-16.841	-16.841	0.000	(0)
Zn (SeO4) 2-2	3.464e-22	6.682e-23	-21.460	-22.175	-0.715	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-57.239	-58.847	-1.608	(0)
U (4)	2.566e-19					
U (OH) 5-	2.565e-19	1.700e-19	-18.591	-18.770	-0.179	(0)
U (OH) 4	8.810e-23	8.810e-23	-22.055	-22.055	0.000	(0)
U (OH) 3+	6.016e-27	3.987e-27	-26.221	-26.399	-0.179	(0)
U (OH) 2+2	1.183e-31	2.282e-32	-30.927	-31.642	-0.715	(0)
UF3+	6.532e-36	4.329e-36	-35.185	-35.364	-0.179	(0)
UF2+2	1.193e-36	2.302e-37	-35.923	-36.638	-0.715	(0)
UOH+3	5.394e-37	1.330e-38	-36.268	-37.876	-1.608	(0)
UF4	5.632e-38	5.632e-38	-37.249	-37.249	0.000	(0)
UF+3	6.250e-39	1.541e-40	-38.204	-39.812	-1.608	(0)
U(SO4) 2	2.477e-39	2.477e-39	-38.606	-38.606	0.000	(0)
UF5-	3.996e-40	2.648e-40	-39.398	-39.577	-0.179	(0)
USO4+2	1.474e-40	0.000e+00	-39.832	-40.546	-0.715	(0)
UF6-2	0.000e+00	0.000e+00	-40.308	-41.023	-0.715	(0)
U+4	0.000e+00	0.000e+00	-42.328	-45.187	-2.859	(0)
UCl+3	0.000e+00	0.000e+00	-44.066	-45.674	-1.608	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-155.191	-169.663	-14.473	(0)
U (5)	1.140e-15					
UO2+	1.140e-15	7.555e-16	-14.943	-15.122	-0.179	(0)
U (6)	9.180e-07					
UO2 (CO3) 3-4	8.362e-07	1.157e-09	-6.078	-8.936	-2.859	(0)
UO2 (CO3) 2-2	8.121e-08	1.567e-08	-7.090	-7.805	-0.715	(0)
UO2CO3	5.325e-10	5.325e-10	-9.274	-9.274	0.000	(0)
UO2OH+	1.402e-11	9.293e-12	-10.853	-11.032	-0.179	(0)
UO2F+	2.243e-12	1.486e-12	-11.649	-11.828	-0.179	(0)
UO2SO4	1.507e-12	1.507e-12	-11.822	-11.822	0.000	(0)
UO2 (SO4) 2-2	1.130e-12	2.179e-13	-11.947	-12.662	-0.715	(0)

UO2F2	5.086e-13	5.086e-13	-12.294	-12.294	0.000	(0)
UO2+2	2.582e-13	9.073e-14	-12.588	-13.042	-0.454	(0)
UO2F3-	2.287e-14	1.516e-14	-13.641	-13.819	-0.179	(0)
UO2Cl+	1.442e-15	9.557e-16	-14.841	-15.020	-0.179	(0)
(UO2) 3 (OH) 5+	1.009e-15	6.686e-16	-14.996	-15.175	-0.179	(0)
(UO2) 2 (OH) 2+2	7.430e-16	1.433e-16	-15.129	-15.844	-0.715	(0)
UO2F4-2	7.407e-17	1.429e-17	-16.130	-16.845	-0.715	(0)
UO2NO3+	4.204e-21	2.786e-21	-20.376	-20.555	-0.179	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.725	-42.904	-0.179	(0)
V+2	0.000e+00	0.000e+00	-43.610	-44.325	-0.715	(0)
V (3)	3.075e-15					
V (OH) 3	3.075e-15	3.075e-15	-14.512	-14.512	0.000	(0)
V (OH) 2+	3.711e-26	2.459e-26	-25.431	-25.609	-0.179	(0)
VOH+2	1.497e-29	2.887e-30	-28.825	-29.540	-0.715	(0)
V+3	2.871e-34	7.080e-36	-33.542	-35.150	-1.608	(0)
VSO4+	5.533e-35	3.667e-35	-34.257	-34.436	-0.179	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-55.089	-56.697	-1.608	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.420	-58.279	-2.859	(0)
V (4)	1.732e-18					
V (OH) 3+	1.669e-18	1.106e-18	-17.778	-17.956	-0.179	(0)
VO+2	3.539e-20	6.826e-21	-19.451	-20.166	-0.715	(0)
VOSO4	2.063e-20	2.063e-20	-19.686	-19.686	0.000	(0)
VOF+	7.330e-21	4.858e-21	-20.135	-20.314	-0.179	(0)
VOF2	2.161e-22	2.161e-22	-21.665	-21.665	0.000	(0)
VOC1+	1.877e-22	1.244e-22	-21.727	-21.905	-0.179	(0)
VOF3-	1.373e-24	9.100e-25	-23.862	-24.041	-0.179	(0)
VOF4-2	2.260e-27	4.358e-28	-26.646	-27.361	-0.715	(0)
H2V2O4+2	3.190e-31	6.153e-32	-30.496	-31.211	-0.715	(0)
V (5)	3.427e-08					
H2VO4-	2.017e-08	1.337e-08	-7.695	-7.874	-0.179	(0)
HVO4-2	1.409e-08	2.718e-09	-7.851	-8.566	-0.715	(0)
H3VO4	1.651e-12	1.651e-12	-11.782	-11.782	0.000	(0)
HV2O7-3	5.003e-13	1.233e-14	-12.301	-13.909	-1.608	(0)
H3V2O7-	2.155e-13	1.428e-13	-12.667	-12.845	-0.179	(0)
VO4-3	4.472e-14	1.103e-15	-13.349	-14.958	-1.608	(0)
V2O7-4	1.942e-14	2.687e-17	-13.712	-16.571	-2.859	(0)
V3O9-3	1.020e-16	2.516e-18	-15.991	-17.599	-1.608	(0)
VO2+	5.307e-17	4.086e-17	-16.275	-16.389	-0.114	(0)
VO2SO4-	1.615e-17	1.070e-17	-16.792	-16.970	-0.179	(0)
VO2F	8.503e-18	8.503e-18	-17.070	-17.070	0.000	(0)
VO2F2-	5.528e-19	3.663e-19	-18.257	-18.436	-0.179	(0)
V4O12-4	1.015e-20	1.405e-23	-19.994	-22.852	-2.859	(0)
VO2F3-2	2.811e-21	5.422e-22	-20.551	-21.266	-0.715	(0)
VO2F4-3	1.284e-24	3.166e-26	-23.891	-25.500	-1.608	(0)
VO2NO3	3.181e-25	3.181e-25	-24.497	-24.497	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.024	-61.457	-6.432	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.711	-61.178	-4.467	(0)
H2V10O28-4	0.000e+00	0.000e+00	-61.020	-63.879	-2.859	(0)
Zn	2.576e-05					
Zn+2	1.092e-05	3.836e-06	-4.962	-5.416	-0.454	(0)
ZnSO4	9.208e-06	9.208e-06	-5.036	-5.036	0.000	(0)
Zn (SO4) 2-2	4.562e-06	8.799e-07	-5.341	-6.056	-0.715	(0)
ZnOH+	4.709e-07	3.121e-07	-6.327	-6.506	-0.179	(0)
ZnCO3	3.255e-07	3.255e-07	-6.487	-6.487	0.000	(0)
ZnCl+	8.295e-08	6.259e-08	-7.081	-7.204	-0.122	(0)
ZnHCO3+	7.112e-08	4.713e-08	-7.148	-7.327	-0.179	(0)
ZnOHCl	6.666e-08	6.666e-08	-7.176	-7.176	0.000	(0)
Zn (OH) 2	4.024e-08	4.024e-08	-7.395	-7.395	0.000	(0)
ZnF+	1.371e-08	9.083e-09	-7.863	-8.042	-0.179	(0)
ZnCl2	6.442e-10	6.442e-10	-9.191	-9.191	0.000	(0)
Zn (OH) 3-	2.476e-10	1.641e-10	-9.606	-9.785	-0.179	(0)
ZnCl3-	4.405e-12	3.324e-12	-11.356	-11.478	-0.122	(0)
ZnNO3+	2.238e-13	1.483e-13	-12.650	-12.829	-0.179	(0)
ZnSeO4	1.979e-13	1.979e-13	-12.704	-12.704	0.000	(0)
ZnCl4-2	3.068e-14	1.079e-14	-13.513	-13.967	-0.454	(0)
Zn (OH) 4-2	2.755e-14	5.314e-15	-13.560	-14.275	-0.715	(0)
Zn (NO3) 2	4.554e-22	4.554e-22	-21.342	-21.342	0.000	(0)

Zn(SeO4) 2-2	3.464e-22	6.682e-23	-21.460	-22.175	-0.715	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.293	-147.471	-0.179	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.370	-149.370	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.298	-224.476	-0.179	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-225.833	-226.548	-0.715	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-303.608	-304.323	-0.715	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-55.16	-48.87	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-42.13	-37.62	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-49.35	-37.62	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-71.25	-53.32	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-56.47	-36.44	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-28.90	-28.50	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-23.39	-22.94	0.45	(NH4) 2SeO4	
Al (OH) 3 (am)	-1.40	9.40	10.80	Al (OH) 3	
Al2 (MoO4) 3	-47.73	-45.36	2.37	Al2 (MoO4) 3	
Al2O3	-0.84	18.81	19.65	Al2O3	
Al4 (OH) 10SO4	-2.86	19.84	22.70	Al4 (OH) 10SO4	
AlAsO4:2H2O	-11.54	-6.74	4.80	AlAsO4:2H2O	
AlOHSO4	-5.14	-8.37	-3.23	AlOHSO4	
AlSb	-152.15	-86.53	65.62	AlSb	
Alunite	0.00	-1.40	-1.40	KAl3 (SO4) 2 (OH) 6	
Anglesite	-4.22	-12.01	-7.79	PbSO4	
Anhydrite	-0.25	-4.61	-4.36	CaSO4	
Anilite	-55.10	-86.98	-31.88	Cu0.25Cu1.5S	
Antlerite	-1.82	6.97	8.79	Cu3 (OH) 4SO4	
Aragonite	-0.18	-8.48	-8.30	CaCO3	
Arsenolite	-88.42	-91.18	-2.76	As4O6	
Artinite	-4.46	5.14	9.60	MgCO3:Mg (OH) 2:3H2O	
As2O5	-39.00	-32.30	6.71	As2O5	
Atacamite	-0.99	6.40	7.39	Cu2 (OH) 3Cl	
Azurite	-1.64	-18.54	-16.91	Cu3 (OH) 2 (CO3) 2	
Ba (OH) 2:8H2O	-16.61	7.79	24.39	Ba (OH) 2:8H2O	
Ba2V2O7:2H2O	-17.24	-1.37	15.87	Ba2V2O7:2H2O	
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2	
Ba3 (VO4) 2:4H2O	-26.52	6.42	32.94	Ba3 (VO4) 2:4H2O	
BaCrO4	-13.38	-23.05	-9.67	BaCrO4	
BaF2	-10.05	-15.87	-5.82	BaF2	
BaMoO4	-6.63	-13.59	-6.96	BaMoO4	
Barite	0.00	-9.98	-9.98	BaSO4	
BaS	-94.68	-78.50	16.18	BaS	
BaSeO3	-8.56	-6.73	1.83	BaSeO3	
BaSeO4	-10.04	-17.50	-7.46	BaSeO4	
Bianchite	-5.62	-7.38	-1.76	ZnSO4:6H2O	
Birnessite	-6.59	11.50	18.09	MnO2	
Bixbyite	-1.90	-2.54	-0.64	Mn2O3	
BlaubleiI	-55.07	-79.24	-24.16	Cu0.9Cu0.2S	
BlaubleiII	-55.53	-82.81	-27.28	Cu0.6Cu0.8S	
Boehmite	0.83	9.40	8.58	AlOOH	
Breithauptite	-58.86	-77.38	-18.52	NiSb	
Brochantite	-0.00	15.22	15.22	Cu4 (OH) 6SO4	
Brucite	-3.45	13.39	16.84	Mg (OH) 2	
Bunsenite	-6.66	5.78	12.45	NiO	
Ca (VO3) 2	-9.45	-3.79	5.66	Ca (VO3) 2	
Ca2V2O7	-8.13	9.37	17.50	Ca2V2O7	
Ca2V2O7:2H2O	-12.18	9.37	21.55	Ca2V2O7:2H2O	
Ca3 (AsO4) 2:4H2O	-15.10	7.20	22.30	Ca3 (AsO4) 2:4H2O	
Ca3 (VO4) 2	-16.42	22.54	38.96	Ca3 (VO4) 2	
Ca3 (VO4) 2:4H2O	-17.32	22.54	39.86	Ca3 (VO4) 2:4H2O	
Ca3Sb2	-295.34	-152.36	142.97	Ca3Sb2	
CaCrO4	-15.42	-17.68	-2.27	CaCrO4	
Calcite	0.00	-8.48	-8.48	CaCO3	
Calomel	-5.91	-23.82	-17.91	Hg2Cl2	
CaMoO4	-0.27	-8.22	-7.95	CaMoO4	

Carnotite	0.00	0.23	0.23	KUO2VO4
CaSeO3:2H2O	-4.18	-1.36	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.11	-12.13	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.64	-0.80	9.84	Cd(BO2)2
Cd(OH)2	-6.41	7.24	13.64	Cd(OH)2
Cd(OH)2(am)	-6.49	7.24	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.54	-13.83	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-18.62	3.94	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-17.22	11.18	28.40	Cd4(OH)6SO4
CdCl2	-12.29	-12.95	-0.66	CdCl2
CdCl2:1H2O	-11.26	-12.95	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.04	-12.95	-1.91	CdCl2:2.5H2O
CdF2	-15.21	-16.43	-1.21	CdF2
Cdmetal(alpha)	-31.82	-18.30	13.51	Cd
Cdmetal(gamma)	-31.92	-18.30	13.62	Cd
CdMoO4	0.00	-14.15	-14.15	CdMoO4
CdOHC1	-6.39	-2.86	3.54	CdOHC1
CdSb	-75.57	-75.92	-0.35	CdSb
CdSe	-18.86	-39.06	-20.20	CdSe
CdSeO4:2H2O	-16.21	-18.06	-1.85	CdSeO4:2H2O
CdSO4	-10.36	-10.54	-0.17	CdSO4
CdSO4:1H2O	-8.81	-10.54	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.66	-10.54	-1.87	CdSO4:2.67H2O
Cerrusite	-2.75	-15.88	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-6.89	-9.53	-2.64	CuSO4:5H2O
Chalcocite	-55.04	-89.96	-34.92	Cu2S
Chalcopyrite	-125.62	-160.89	-35.27	CuFeS2
Cinnabar	-51.24	-96.93	-45.69	HgS
Claudetite	-88.11	-91.18	-3.06	As4O6
Clausthalite	-13.43	-40.53	-27.10	PbSe
Co(BO2)2	-28.70	-1.63	27.07	Co(BO2)2
Co(OH)2	-6.68	6.41	13.09	Co(OH)2
Co(OH)3	-10.91	-13.22	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-26.09	-13.06	13.03	Co3(AsO4)2
Co3O4	-9.52	-20.02	-10.50	Co3O4
CoCl2	-22.04	-13.78	8.27	CoCl2
CoCl2:6H2O	-16.32	-13.78	2.54	CoCl2:6H2O
CoCO3	-5.25	-15.23	-9.98	CoCO3
CoF2	-15.66	-17.25	-1.60	CoF2
CoF3	-47.26	-48.72	-1.46	CoF3
CoFe2O4	16.33	12.80	-3.53	CoFe2O4
CoMoO4	-7.22	-14.98	-7.76	CoMoO4
CoO	-7.17	6.41	13.59	CoO
CoS(alpha)	-72.44	-79.88	-7.44	CoS
CoS(beta)	-68.81	-79.88	-11.07	CoS
CoSe	-23.69	-39.89	-16.20	CoSe
CoSeO3	-9.44	-8.12	1.32	CoSeO3
CoSeO4:6H2O	-17.36	-18.89	-1.53	CoSeO4:6H2O
CoSO4	-14.17	-11.36	2.80	CoSO4
CoSO4:6H2O	-8.90	-11.37	-2.47	CoSO4:6H2O
Cotunnite	-9.64	-14.42	-4.78	PbCl2
Covellite	-55.74	-78.04	-22.30	CuS
Cr(OH)2	-22.44	-11.62	10.82	Cr(OH)2
Cr(OH)3	-3.13	-1.79	1.34	Cr(OH)3
Cr(OH)3(am)	-1.04	-1.79	-0.75	Cr(OH)3
Cr2O3	-1.22	-3.58	-2.36	Cr2O3
CrCl2	-45.90	-31.81	14.09	CrCl2
CrCl3	-47.19	-32.08	15.11	CrCl3
CrF3	-25.95	-37.29	-11.34	CrF3
Crmetal	-67.64	-37.16	30.48	Cr
CrO3	-27.64	-30.85	-3.21	CrO3
Cryolite	-9.15	-42.99	-33.84	Na3AlF6
Cu(OH)2	-0.42	8.25	8.67	Cu(OH)2
Cu(SbO3)2	-24.47	20.74	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.47	0.78	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.63	-89.52	-34.88	Cu2Sb:3H2O

Cu2Se (alpha)	-4.17	-49.97	-45.80	Cu2Se
Cu2SO4	-19.49	-21.44	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.65	-7.55	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.84	-101.43	-42.59	Cu3Sb
Cu3Se2	-24.53	-88.02	-63.49	Cu3Se2
CuCO3	-1.90	-13.40	-11.50	CuCO3
CuCrO4	-17.16	-22.60	-5.44	CuCrO4
CuF	-8.76	-13.67	-4.91	CuF
CuF2	-16.53	-15.42	1.12	CuF2
CuF2:2H2O	-10.87	-15.42	-4.55	CuF2:2H2O
Cumetal	-5.85	-14.60	-8.76	Cu
CuMoO4	-0.06	-13.14	-13.08	CuMoO4
CuOCuSO4	-11.58	-1.28	10.30	CuOCuSO4
Cupricferrite	8.65	14.63	5.99	CuFe2O4
Cuprite	-2.26	-3.66	-1.41	Cu2O
Cuprousferrite	10.28	1.36	-8.92	CuFeO2
CuSe	-4.95	-38.05	-33.10	CuSe
CuSe2	-25.45	-58.81	-33.37	CuSe2
CuSeO3:2H2O	-6.79	-6.28	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.61	-17.05	-2.44	CuSeO4:5H2O
CuSO4	-12.46	-9.53	2.94	CuSO4
Diaspore	2.53	9.40	6.87	AlOOH
Djurleite	-55.25	-89.17	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.19	-16.73	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.36	-16.73	-17.09	CaMg (CO3) 2
Epsomite	-2.26	-4.39	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.20	0.16	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.79	-13.51	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-9.70	-8.15	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.58	-37.21	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-43.21	-46.94	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.36	-12.96	0.40	FeAsO4:2H2O
FeCr2O4	-7.33	-0.13	7.20	FeCr2O4
FeMoO4	-7.85	-17.94	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-45.02	-63.61	-18.60	FeSe2
FeS (ppt)	-79.89	-82.84	-2.95	FeS
FeSe	-31.85	-42.85	-11.00	FeSe
Fix_pe	-4.86	-4.86	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.55	-80.52	-13.97	PbS
Gibbsite	1.11	9.40	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.37	-7.38	-2.01	ZnSO4:7H2O
Greenockite	-64.69	-79.05	-14.36	CdS
Greigite	-290.31	-335.34	-45.03	Fe3S4
Gummite	-4.90	2.77	7.67	UO3
Gypsum	0.00	-4.61	-4.61	CaSO4:2H2O
H-Jarosite	-13.88	-25.98	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.51	-21.39	-12.88	H2MoO4
H2S (g)	-78.28	-86.29	-8.01	H2S
H2Se (g)	-41.34	-46.30	-4.96	H2Se
Halite	-5.50	-3.89	1.60	NaCl
Hausmannite	-1.57	59.46	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.63	22.26	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.58	-258.29	-73.71	Hg (CH3) 2
Hg (g)	-6.71	-14.59	-7.87	Hg
Hg (OH) 2	-7.14	-10.64	-3.50	Hg (OH) 2
Hg2 (g)	-14.22	-29.18	-14.96	Hg2
Hg2 (OH) 2	-8.89	-3.63	5.26	Hg2 (OH) 2
Hg2CO3	-9.23	-25.28	-16.05	Hg2CO3
Hg2CrO4	-25.78	-34.48	-8.70	Hg2CrO4
Hg2F2	-16.94	-27.30	-10.36	Hg2F2
Hg2S	-78.25	-89.93	-11.68	Hg2S
Hg2SeO3	-13.50	-18.16	-4.66	Hg2SeO3

Hg2SO4	-15.28	-21.41	-6.13	Hg2SO4
Hg3O2CO3	-23.87	-53.55	-29.68	Hg3O2CO3
HgCl (g)	-31.41	-11.91	19.50	HgCl
HgCl2	-9.56	-30.83	-21.26	HgCl2
HgF (g)	-46.32	-13.65	32.68	HgF
HgF2 (g)	-46.87	-34.30	12.57	HgF2
Hgmetal (l)	-1.14	-14.59	-13.45	Hg
HgSe	-1.25	-56.94	-55.69	HgSe
HgSeO3	-12.74	-25.17	-12.43	HgSeO3
HgSO4	-18.99	-28.41	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-7.22	-25.99	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.86	-19.63	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.05	-20.22	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.24	-20.04	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.58	-49.82	-17.24	K2Cr2O7
K2CrO4	-18.46	-18.97	-0.51	K2CrO4
K2MoO4	-12.78	-9.51	3.26	K2MoO4
K2SeO4	-12.69	-13.42	-0.73	K2SeO4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.80	-6.24	-0.43	PbO : PbSO4
Laurionite	-4.95	-4.33	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.92	5.77	12.69	PbO
Mackinawite	-79.24	-82.84	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	2.92	19.78	16.86	Fe2MgO4
Magnesite	-0.79	-8.25	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.16	-5.15	-5.31	Cu2 (OH) 2CO3
Manganite	-1.26	24.08	25.34	MnOOH
Massicot	-7.12	5.77	12.89	PbO
Matlockite	-7.19	-16.16	-8.97	PbClF
Melanothallite	-18.20	-11.94	6.26	CuCl2
Melanterite	-12.12	-14.33	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.84	-96.93	-45.09	HgS
Mg (OH) 2 (active)	-5.40	13.39	18.79	Mg (OH) 2
Mg (VO3) 2	-14.85	-3.57	11.28	Mg (VO3) 2
Mg2Sb3	-271.83	-197.15	74.68	Mg2Sb3
Mg2V2O7	-16.54	9.82	26.36	Mg2V2O7
MgCr2O4	-6.39	9.81	16.20	MgCr2O4
MgCrO4	-22.84	-17.46	5.38	MgCrO4
MgF2	-2.14	-10.27	-8.13	MgF2
MgMoO4	-6.15	-8.00	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.20	-1.14	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-10.70	-11.90	-1.20	MgSeO4 : 6H2O
Minium	-30.67	42.85	73.52	Pb3O4
Mirabilite	-4.27	-5.38	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.56	-5.66	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.16	-55.87	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.17	-86.09	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-10.88	1.62	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.60	-8.89	2.72	MnCl2 : 4H2O
MnS (grn)	-75.16	-74.99	0.17	MnS
MnS (pnk)	-78.33	-74.99	3.34	MnS
MnSb	-94.29	-97.20	-2.91	MnSb
MnSe	-38.50	-35.00	3.50	MnSe
MnSeO3	-4.35	-3.22	1.13	MnSeO3
MnSeO3 : 2H2O	-4.21	-3.22	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-11.94	-13.99	-2.05	MnSeO4 : 5H2O
MnSO4	-9.05	-6.47	2.58	MnSO4
Monteponite	-7.86	7.24	15.10	CdO
Montroydite	-7.00	-10.64	-3.64	HgO
MoO3	-13.39	-21.39	-8.00	MoO3
Morenosite	-9.85	-12.00	-2.14	NiSO4 : 7H2O
MoS2	-149.26	-219.52	-70.26	MoS2
Na-Jarosite	-8.58	-19.78	-11.20	NaFe3 (SO4) 2 (OH) 6

Na2Cr2O7	-39.40	-49.30	-9.90	Na2Cr2O7
Na2CrO4	-21.38	-18.45	2.93	Na2CrO4
Na2Mo2O7	-13.78	-30.38	-16.60	Na2Mo2O7
Na2MoO4	-10.48	-8.99	1.49	Na2MoO4
Na2MoO4:2H2O	-10.21	-8.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.43	-2.13	10.30	Na2SeO3:5H2O
Na2SeO4	-14.17	-12.89	1.28	Na2SeO4
Na3Sb	-171.78	-77.33	94.45	Na3Sb
Na3VO4	-26.56	10.12	36.68	Na3VO4
Na4V2O7	-29.56	7.84	37.40	Na4V2O7
Nantokite	-5.20	-11.93	-6.73	CuCl
NaSb	-87.35	-64.19	23.17	NaSb
Natron	-7.94	-9.25	-1.31	Na2CO3:10H2O
NaVO3	-6.14	-2.28	3.86	NaVO3
Nesquehonite	-3.59	-8.26	-4.67	MgCO3:3H2O
Ni (OH) 2	-7.01	5.78	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-30.66	-14.96	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-26.65	5.35	32.00	Ni4 (OH) 6SO4
NiCO3	-9.00	-15.87	-6.87	NiCO3
NiMoO4	-4.47	-15.61	-11.14	NiMoO4
NiS (alpha)	-74.91	-80.51	-5.60	NiS
NiS (beta)	-69.41	-80.51	-11.10	NiS
NiS (gamma)	-67.71	-80.51	-12.80	NiS
NiSe	-22.82	-40.52	-17.70	NiSe
NiSeO3:2H2O	-11.56	-8.75	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-18.00	-19.52	-1.52	NiSeO4:6H2O
Nsutite	-6.00	11.50	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-243.41	-304.47	-61.07	As2S3
Otavite	-2.41	-14.41	-12.00	CdCO3
Pb (BO2) 2	-8.79	-2.27	6.52	Pb (BO2) 2
Pb (OH) 2	-2.38	5.77	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-63.43	-72.19	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-7.35	1.44	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-14.65	11.54	26.19	Pb2O (OH) 2
Pb2O3	-23.96	37.08	61.04	Pb2O3
Pb2OCO3	-9.55	-10.11	-0.56	Pb2OCO3
Pb2V2O7	-3.52	-5.42	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.79	-14.99	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-5.79	0.35	6.14	Pb3 (VO4) 2
Pb3O2CO3	-15.36	-4.34	11.02	Pb3O2CO3
Pb3O2SO4	-11.15	-0.47	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-15.80	5.30	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-16.57	5.30	21.88	Pb4O3SO4
PbCrO4	-12.48	-25.08	-12.60	PbCrO4
PbF2	-10.46	-17.90	-7.44	PbF2
Pbmetal	-24.02	-19.78	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-7.21	5.77	12.98	PbO:0.33H2O
PbSeO4	-12.68	-19.52	-6.84	PbSeO4
Periclase	-8.19	13.39	21.58	MgO
Phosgenite	-10.49	-30.30	-19.81	PbCl2:PbCO3
Plattnerite	-18.29	31.31	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-125.08	-143.59	-18.51	FeS2
Pyrochroite	-3.89	11.31	15.19	Mn (OH) 2
Pyrolusite	-4.53	36.85	41.38	MnO2
Realgar	-102.11	-121.86	-19.75	AsS
Retgersite	-9.96	-12.00	-2.04	NiSO4:6H2O
Rhodochrosite	0.24	-10.34	-10.58	MnCO3
Rutherfordine	-4.37	-18.87	-14.50	UO2CO3
Sb (OH) 3	-12.19	-19.30	-7.11	Sb (OH) 3
Sb2O4	-16.45	-13.05	3.40	Sb2O4
Sb2O5	-26.46	-36.13	-9.67	Sb2O5
Sb2Se3	-109.75	-177.51	-67.76	Sb2Se3
Sb4O6 (cubic)	-58.93	-77.19	-18.26	Sb4O6
Sb4O6 (orth)	-59.29	-77.19	-17.90	Sb4O6
SbCl3	-50.16	-49.58	0.57	SbCl3

SbF3	-44.57	-54.80	-10.23	SbF3
Sbmetal	-45.93	-57.62	-11.69	Sb
SbO2	-3.01	-30.84	-27.82	SbO2
Schoepite	-3.22	2.77	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.65	-20.76	-7.11	Se
Semetal (hex)	-13.05	-20.76	-7.71	Se
Senarmontite	-26.23	-38.60	-12.37	Sb2O3
SeO2	-14.65	-14.53	0.12	SeO2
SeO3	-46.34	-25.29	21.04	SeO3
Siderite	-7.96	-18.20	-10.24	FeCO3
Smithsonite	-1.25	-11.25	-10.00	ZnCO3
Sphalerite	-64.44	-75.89	-11.45	ZnS
Spinel	-4.64	32.20	36.85	MgAl2O4
Stibnite	-247.02	-297.48	-50.46	Sb2S3
Sulfur	-58.60	-60.75	-2.14	S
Tenorite	0.61	8.25	7.64	CuO
Thenardite	-5.70	-5.37	0.32	Na2SO4
Thermonatrite	-9.88	-9.25	0.64	Na2CO3:H2O
Tyuyamunite	-2.33	1.75	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-10.66	10.42	21.08	U3O8
U3Sb4	-576.78	-424.40	152.38	U3Sb4
U4O9	-25.66	-28.68	-3.02	U4O9
UF4	-31.35	-60.89	-29.54	UF4
UF4:2.5H2O	-28.17	-60.89	-32.72	UF4:2.5H2O
UO2 (am)	-14.49	-13.56	0.93	UO2
UO2 (NO3) 2	-40.82	-28.67	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.52	-28.67	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.06	-28.67	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-30.72	-28.67	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-2.84	2.77	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-20.27	-22.52	-2.25	UO2SeO4:4H2O
UO3	-4.93	2.77	7.70	UO3
Uraninite	-8.89	-13.56	-4.67	UO2
USb2	-218.67	-189.09	29.58	USb2
V (OH) 3	-19.02	-11.43	7.59	V (OH) 3
V2O5	-15.60	-16.96	-1.36	V2O5
V3O5	-40.43	-38.60	1.84	V3O5
V4O7	-50.13	-42.95	7.19	V4O7
V6O13	-41.11	-101.97	-60.86	V6O13
Valentinite	-30.12	-38.60	-8.48	Sb2O3
VC12	-63.26	-44.39	18.87	VC12
VC13	-65.14	-41.71	23.43	VC13
VF4	-66.61	-51.68	14.93	VF4
Vmetal	-93.77	-49.74	44.03	V
VO	-38.96	-24.20	14.76	VO
VO (OH) 2	-9.50	-4.35	5.15	VO (OH) 2
VO2Cl	-21.42	-18.58	2.84	VO2Cl
VOC1	-32.67	-21.52	11.15	VOC1
VOC12	-37.30	-24.54	12.76	VOC12
VOSO4	-25.74	-22.13	3.61	VOSO4
Witherite	-5.28	-13.85	-8.57	BaCO3
Wurtzite	-66.94	-75.89	-8.95	ZnS
Zincite	-0.93	10.40	11.33	ZnO
Zincosite	-11.31	-7.38	3.93	ZnSO4
Zn (BO2) 2	-5.93	2.36	8.29	Zn (BO2) 2
Zn (NO3) 2:6H2O	-24.36	-21.05	3.32	Zn (NO3) 2:6H2O
Zn (OH) 2	-1.80	10.40	12.20	Zn (OH) 2
Zn (OH) 2 (am)	-2.08	10.40	12.47	Zn (OH) 2
Zn (OH) 2 (beta)	-1.36	10.40	11.75	Zn (OH) 2
Zn (OH) 2 (epsilon)	-1.14	10.40	11.53	Zn (OH) 2
Zn (OH) 2 (gamma)	-1.34	10.40	11.73	Zn (OH) 2
Zn2 (OH) 2SO4	-4.48	3.02	7.50	Zn2 (OH) 2SO4
Zn2 (OH) 3Cl	-4.49	10.70	15.19	Zn2 (OH) 3Cl
Zn3 (AsO4) 2:2.5H2O	-14.75	-1.10	13.65	Zn3 (AsO4) 2:2.5H2O
Zn3O (SO4) 2	-23.27	-4.35	18.91	Zn3O (SO4) 2
Zn4 (OH) 6SO4	-4.58	23.82	28.40	Zn4 (OH) 6SO4
Zn5 (OH) 8Cl2	-6.70	31.80	38.50	Zn5 (OH) 8Cl2
ZnCl2	-16.84	-9.79	7.05	ZnCl2

ZnCO3:1H2O	-0.99	-11.25	-10.26	ZnCO3:1H2O
ZnF2	-12.73	-13.27	-0.53	ZnF2
Znmetal	-40.93	-15.15	25.79	Zn
ZnMoO4	-0.86	-10.99	-10.13	ZnMoO4
ZnO(active)	-0.79	10.40	11.19	ZnO
ZnS(am)	-66.84	-75.89	-9.05	ZnS
ZnSb	-83.77	-72.76	11.01	ZnSb
ZnSe	-21.50	-35.90	-14.40	ZnSe
ZnSeO4:6H2O	-13.38	-14.90	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-6.74	-7.38	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 156.

Title Stage 9 Pit lake Mix
Mix 903
904 0.193915
908 0.052055
1 0.126523
17 0.132288
16 0.000000
815 0.495218
Save solution 909
end

TITLE

Stage 9 Pit lake Mix

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 903.

Mixture 903.

1.265e-01 Solution 1 Average rainwater chemistry (1985-2011) - Station
NM01 (Gila Cliff Dwellings National Monument), SW New Mexico. Data from National
Atmospheric Deposition Program.
0.000e+00 Solution 16 Average water quality for Water Supply Wells PW-1
and PW-3 (representative of water used to rapidly re-fill pit)
1.323e-01 Solution 17 Average water quality for Background Surface Water
SWQ-1 (representative of haul road and watershed run-off)
4.952e-01 Solution 815 Solution after simulation 146.
1.939e-01 Solution 904 Solution after simulation 151.
5.205e-02 Solution 908 Solution after simulation 155.

-----Solution composition-----

Elements	Molality	Moles
Ag	1.862e-08	1.861e-08
Al	2.676e-06	2.675e-06
As	2.517e-10	2.516e-10
B	3.800e-05	3.799e-05
Ba	4.075e-08	4.074e-08

C	2.491e-03	2.490e-03
Ca	3.191e-03	3.190e-03
Cd	1.388e-08	1.387e-08
Cl	4.304e-03	4.303e-03
Co	1.065e-07	1.064e-07
Cr	1.761e-09	1.761e-09
Cu	1.645e-06	1.644e-06
F	2.063e-04	2.062e-04
Fe	1.200e-09	1.200e-09
Hg	2.190e-09	2.189e-09
K	3.774e-03	3.773e-03
Mg	5.862e-03	5.860e-03
Mn	6.528e-05	6.526e-05
Mo	1.912e-06	1.911e-06
N	1.606e-05	1.606e-05
Na	1.346e-02	1.346e-02
Ni	1.659e-07	1.658e-07
Pb	4.901e-09	4.900e-09
S	1.428e-02	1.428e-02
Sb	2.923e-08	2.922e-08
Se	1.646e-07	1.646e-07
Si	2.412e-05	2.411e-05
U	2.637e-07	2.636e-07
V	8.798e-09	8.795e-09
Zn	6.457e-06	6.455e-06

-----Description of solution-----

	pH	=	7.547	Charge balance
	pe	=	5.253	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.621e-02	
	Mass of water (kg)	=	9.997e-01	
	Total alkalinity (eq/kg)	=	2.403e-03	
	Total CO2 (mol/kg)	=	2.491e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.900e-06	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	11	
	Total H	=	1.109802e+02	
	Total O	=	5.555353e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.338e-07	3.543e-07	-6.363	-6.451	-0.088	(0)
H+	3.439e-08	2.840e-08	-7.464	-7.547	-0.083	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	1.862e-08					
AgCl	1.173e-08	1.173e-08	-7.931	-7.931	0.000	(0)
AgCl2-	4.675e-09	3.632e-09	-8.330	-8.440	-0.110	(0)
Ag+	1.958e-09	1.617e-09	-8.708	-8.791	-0.083	(0)
AgSO4-	2.112e-10	1.641e-10	-9.675	-9.785	-0.110	(0)
AgCl3-2	3.158e-11	1.151e-11	-10.501	-10.939	-0.439	(0)
AgNO2	4.213e-12	4.213e-12	-11.375	-11.375	0.000	(0)
AgCl4-3	8.097e-13	8.349e-14	-12.092	-13.078	-0.987	(0)
AgF	5.636e-13	5.636e-13	-12.249	-12.249	0.000	(0)
AgOH	5.730e-14	5.730e-14	-13.242	-13.242	0.000	(0)
AgNH3+	4.420e-14	3.434e-14	-13.355	-13.464	-0.110	(0)
AgH2BO3	1.957e-14	1.957e-14	-13.709	-13.709	0.000	(0)
AgSeO3-	1.845e-14	1.433e-14	-13.734	-13.844	-0.110	(0)
Ag2Se	8.576e-15	8.576e-15	-14.067	-14.067	0.000	(0)
Ag(NO2)2-	1.047e-16	8.137e-17	-15.980	-16.090	-0.110	(0)
AgNO3	1.709e-17	1.709e-17	-16.767	-16.767	0.000	(0)

	Ag (NH3) 2+	3.736e-18	2.903e-18	-17.428	-17.537	-0.110	(0)
	Ag (OH) 2-	2.554e-18	1.984e-18	-17.593	-17.702	-0.110	(0)
	Ag (SeO3) 2-3	1.716e-20	1.770e-21	-19.765	-20.752	-0.987	(0)
	Ag2MoO4	8.795e-25	8.795e-25	-24.056	-24.056	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.550	-73.550	0.000	(0)
	AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.790	-84.544	-1.754	(0)
	Ag (HS) S4-2	0.000e+00	0.000e+00	-147.748	-147.961	-0.213	(0)
	Ag (HS) 2-	0.000e+00	0.000e+00	-147.914	-148.024	-0.110	(0)
	Ag (S4) 2-3	0.000e+00	0.000e+00	-149.467	-149.854	-0.386	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.799	-150.165	-0.366	(0)
Al	2.676e-06						
	Al (OH) 4-	2.603e-06	2.149e-06	-5.584	-5.668	-0.083	(0)
	Al (OH) 3	4.818e-08	4.818e-08	-7.317	-7.317	0.000	(0)
	AlF3	9.147e-09	9.147e-09	-8.039	-8.039	0.000	(0)
	Al (OH) 2+	8.182e-09	6.815e-09	-8.087	-8.167	-0.079	(0)
	AlF2+	6.287e-09	5.237e-09	-8.202	-8.281	-0.079	(0)
	AlF4-	7.704e-10	6.361e-10	-9.113	-9.197	-0.083	(0)
	AlF+2	1.969e-10	9.481e-11	-9.706	-10.023	-0.317	(0)
	AlOH+2	5.030e-11	2.421e-11	-10.298	-10.616	-0.317	(0)
	AlSO4+	3.266e-12	2.697e-12	-11.486	-11.569	-0.083	(0)
	Al+3	3.829e-13	6.833e-14	-12.417	-13.165	-0.749	(0)
	Al (SO4) 2-	1.780e-13	1.469e-13	-12.750	-12.833	-0.083	(0)
	AlMo6O21-3	1.683e-39	1.735e-40	-38.774	-39.761	-0.987	(0)
As (3)	2.131e-23						
	H3AsO3	2.083e-23	2.083e-23	-22.681	-22.681	0.000	(0)
	H2AsO3-	4.843e-25	3.762e-25	-24.315	-24.425	-0.110	(0)
	HAsO3-2	3.317e-29	1.208e-29	-28.479	-28.918	-0.439	(0)
	H4AsO3+	3.772e-31	2.931e-31	-30.423	-30.533	-0.110	(0)
	AsO3-3	1.591e-34	1.640e-35	-33.798	-34.785	-0.987	(0)
As (5)	2.517e-10						
	HAsO4-2	2.244e-10	8.174e-11	-9.649	-10.088	-0.439	(0)
	H2AsO4-	2.725e-11	2.117e-11	-10.565	-10.674	-0.110	(0)
	AsO4-3	8.829e-14	9.103e-15	-13.054	-14.041	-0.987	(0)
	H3AsO4	1.034e-16	1.045e-16	-15.986	-15.981	0.005	(0)
B	3.800e-05						
	H3BO3	3.693e-05	3.732e-05	-4.433	-4.428	0.005	(0)
	H2BO3-	9.461e-07	7.634e-07	-6.024	-6.117	-0.093	(0)
	MgH2BO3+	6.161e-08	4.971e-08	-7.210	-7.304	-0.093	(0)
	CaH2BO3+	5.163e-08	4.166e-08	-7.287	-7.380	-0.093	(0)
	NaH2BO3	1.308e-08	1.308e-08	-7.883	-7.883	0.000	(0)
	BF (OH) 3-	2.561e-09	2.066e-09	-8.592	-8.685	-0.093	(0)
	H5 (BO3) 2-	3.006e-11	2.425e-11	-10.522	-10.615	-0.093	(0)
	BF2 (OH) 2-	1.079e-12	8.710e-13	-11.967	-12.060	-0.093	(0)
	BaH2BO3+	5.480e-13	4.422e-13	-12.261	-12.354	-0.093	(0)
	H8 (BO3) 3-	1.122e-13	9.052e-14	-12.950	-13.043	-0.093	(0)
	AgH2BO3	1.957e-14	1.957e-14	-13.709	-13.709	0.000	(0)
	BF3OH-	1.656e-18	1.336e-18	-17.781	-17.874	-0.093	(0)
	BF4-	3.212e-23	2.592e-23	-22.493	-22.586	-0.093	(0)
Ba	4.075e-08						
	Ba+2	4.032e-08	1.874e-08	-7.394	-7.727	-0.333	(0)
	BaHCO3+	4.016e-10	3.364e-10	-9.396	-9.473	-0.077	(0)
	BaCO3	2.982e-11	2.982e-11	-10.525	-10.525	0.000	(0)
	BaH2BO3+	5.480e-13	4.422e-13	-12.261	-12.354	-0.093	(0)
	BaOH+	3.494e-14	2.899e-14	-13.457	-13.538	-0.081	(0)
	BaNO3+	1.609e-15	1.250e-15	-14.793	-14.903	-0.110	(0)
	BaNH3+2	3.376e-16	1.230e-16	-15.472	-15.910	-0.439	(0)
C (4)	2.491e-03						
	HCO3-	2.256e-03	1.879e-03	-2.647	-2.726	-0.079	(0)
	H2CO3	1.200e-04	1.200e-04	-3.921	-3.921	0.000	(0)
	MgHCO3+	4.397e-05	3.611e-05	-4.357	-4.442	-0.085	(0)
	CaHCO3+	3.962e-05	3.318e-05	-4.402	-4.479	-0.077	(0)
	NaHCO3	1.143e-05	1.143e-05	-4.942	-4.942	0.000	(0)
	CO3-2	6.674e-06	3.102e-06	-5.176	-5.508	-0.333	(0)
	MgCO3	4.846e-06	4.846e-06	-5.315	-5.315	0.000	(0)
	CaCO3	4.663e-06	4.663e-06	-5.331	-5.331	0.000	(0)
	CuCO3	1.270e-06	1.270e-06	-5.896	-5.896	0.000	(0)
	MnHCO3+	7.955e-07	6.601e-07	-6.099	-6.180	-0.081	(0)
	NaCO3-	7.500e-07	6.247e-07	-6.125	-6.204	-0.079	(0)

	ZnCO3	3.099e-07	3.099e-07	-6.509	-6.509	0.000	(0)
	UO2 (CO3) 3-4	2.009e-07	3.538e-09	-6.697	-8.451	-1.754	(0)
	ZnHCO3+	1.328e-07	1.031e-07	-6.877	-6.987	-0.110	(0)
	UO2 (CO3) 2-2	6.246e-08	2.275e-08	-7.204	-7.643	-0.439	(0)
	Cu (CO3) 2-2	2.911e-08	1.061e-08	-7.536	-7.974	-0.439	(0)
	NiHCO3+	1.373e-08	1.067e-08	-7.862	-7.972	-0.110	(0)
	CuHCO3+	1.061e-08	8.244e-09	-7.974	-8.084	-0.110	(0)
	NiCO3	5.330e-09	5.330e-09	-8.273	-8.273	0.000	(0)
	CoHCO3+	4.969e-09	3.860e-09	-8.304	-8.413	-0.110	(0)
	PbCO3	2.607e-09	2.607e-09	-8.584	-8.584	0.000	(0)
	CoCO3	1.385e-09	1.385e-09	-8.859	-8.859	0.000	(0)
	PbHCO3+	5.023e-10	3.902e-10	-9.299	-9.409	-0.110	(0)
	BaHCO3+	4.016e-10	3.364e-10	-9.396	-9.473	-0.077	(0)
	UO2CO3	3.676e-10	3.676e-10	-9.435	-9.435	0.000	(0)
	CdCO3	2.395e-10	2.395e-10	-9.621	-9.621	0.000	(0)
	Pb (CO3) 2-2	6.402e-11	2.332e-11	-10.194	-10.632	-0.439	(0)
	BaCO3	2.982e-11	2.982e-11	-10.525	-10.525	0.000	(0)
	CdHCO3+	1.865e-11	1.449e-11	-10.729	-10.839	-0.110	(0)
	Cd (CO3) 2-2	1.512e-12	5.508e-13	-11.820	-12.259	-0.439	(0)
	FeHCO3+	4.032e-14	3.377e-14	-13.394	-13.471	-0.077	(0)
	HgCO3	2.777e-14	2.777e-14	-13.556	-13.556	0.000	(0)
	Hg (CO3) 2-2	7.479e-16	2.724e-16	-15.126	-15.565	-0.439	(0)
	HgHCO3+	1.890e-17	1.468e-17	-16.724	-16.833	-0.110	(0)
Ca	3.191e-03						
	Ca+2	2.040e-03	9.484e-04	-2.690	-3.023	-0.333	(0)
	CaSO4	1.105e-03	1.105e-03	-2.957	-2.957	0.000	(0)
	CaHCO3+	3.962e-05	3.318e-05	-4.402	-4.479	-0.077	(0)
	CaCO3	4.663e-06	4.663e-06	-5.331	-5.331	0.000	(0)
	CaF+	1.731e-06	1.436e-06	-5.762	-5.843	-0.081	(0)
	CaH2BO3+	5.163e-08	4.166e-08	-7.287	-7.380	-0.093	(0)
	CaOH+	8.006e-09	6.705e-09	-8.097	-8.174	-0.077	(0)
	CaNO3+	5.137e-11	3.991e-11	-10.289	-10.399	-0.110	(0)
	CaNH3+2	3.408e-11	1.242e-11	-10.467	-10.906	-0.439	(0)
	Ca (NH3) 2+2	1.411e-19	5.141e-20	-18.850	-19.289	-0.439	(0)
Cd	1.388e-08						
	Cd+2	7.285e-09	3.387e-09	-8.138	-8.470	-0.333	(0)
	CdSO4	4.037e-09	4.037e-09	-8.394	-8.394	0.000	(0)
	CdCl+	1.480e-09	1.150e-09	-8.830	-8.939	-0.110	(0)
	Cd (SO4) 2-2	7.600e-10	2.769e-10	-9.119	-9.558	-0.439	(0)
	CdCO3	2.395e-10	2.395e-10	-9.621	-9.621	0.000	(0)
	CdHCO3+	1.865e-11	1.449e-11	-10.729	-10.839	-0.110	(0)
	CdCl2	1.703e-11	1.703e-11	-10.769	-10.769	0.000	(0)
	CdOHC1	1.671e-11	1.671e-11	-10.777	-10.777	0.000	(0)
	CdOH+	1.227e-11	9.533e-12	-10.911	-11.021	-0.110	(0)
	CdF+	9.586e-12	7.447e-12	-11.018	-11.128	-0.110	(0)
	Cd (CO3) 2-2	1.512e-12	5.508e-13	-11.820	-12.259	-0.439	(0)
	CdCl3-	4.916e-14	3.819e-14	-13.308	-13.418	-0.110	(0)
	Cd (OH) 2	2.131e-14	2.131e-14	-13.671	-13.671	0.000	(0)
	CdF2	2.062e-15	2.062e-15	-14.686	-14.686	0.000	(0)
	CdNO3+	1.835e-16	1.425e-16	-15.736	-15.846	-0.110	(0)
	CdSeO4	4.262e-17	4.262e-17	-16.370	-16.370	0.000	(0)
	Cd2OH+3	1.569e-18	1.618e-19	-17.804	-18.791	-0.987	(0)
	Cd (SeO3) 2-2	1.457e-18	5.308e-19	-17.837	-18.275	-0.439	(0)
	Cd (OH) 3-	5.939e-19	4.614e-19	-18.226	-18.336	-0.110	(0)
	Cd (NO3) 2	9.507e-25	9.507e-25	-24.022	-24.022	0.000	(0)
	Cd (OH) 4-2	7.345e-26	2.676e-26	-25.134	-25.573	-0.439	(0)
	CdHS+	0.000e+00	0.000e+00	-78.926	-79.036	-0.110	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.405	-150.405	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.969	-227.079	-0.110	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-303.018	-303.456	-0.439	(0)
Cl	4.304e-03						
	Cl-	4.304e-03	3.554e-03	-2.366	-2.449	-0.083	(0)
	MnCl+	9.494e-08	7.878e-08	-7.023	-7.104	-0.081	(0)
	ZnCl+	1.887e-08	1.550e-08	-7.724	-7.810	-0.085	(0)
	AgCl	1.173e-08	1.173e-08	-7.931	-7.931	0.000	(0)
	ZnOHC1	7.188e-09	7.188e-09	-8.143	-8.143	0.000	(0)
	AgCl2-	4.675e-09	3.632e-09	-8.330	-8.440	-0.110	(0)
	CdCl+	1.480e-09	1.150e-09	-8.830	-8.939	-0.110	(0)

CuCl	8.518e-10	8.518e-10	-9.070	-9.070	0.000	(0)
CuCl2-	7.701e-10	6.325e-10	-9.113	-9.199	-0.085	(0)
NiCl+	5.390e-10	4.187e-10	-9.268	-9.378	-0.110	(0)
CuCl+	4.769e-10	3.916e-10	-9.322	-9.407	-0.085	(0)
CoCl+	4.180e-10	3.247e-10	-9.379	-9.489	-0.110	(0)
MnCl2	3.955e-10	3.955e-10	-9.403	-9.403	0.000	(0)
ZnCl2	8.728e-11	8.728e-11	-10.059	-10.059	0.000	(0)
PbCl+	4.537e-11	3.525e-11	-10.343	-10.453	-0.110	(0)
AgCl3-2	3.158e-11	1.151e-11	-10.501	-10.939	-0.439	(0)
CdCl2	1.703e-11	1.703e-11	-10.769	-10.769	0.000	(0)
CdOHC1	1.671e-11	1.671e-11	-10.777	-10.777	0.000	(0)
HgClOH	1.664e-11	1.664e-11	-10.779	-10.779	0.000	(0)
HgCl2	9.448e-12	9.448e-12	-11.025	-11.025	0.000	(0)
CuCl3-2	1.014e-12	4.806e-13	-11.994	-12.318	-0.324	(0)
AgCl4-3	8.097e-13	8.349e-14	-12.092	-13.078	-0.987	(0)
PbCl2	5.595e-13	5.595e-13	-12.252	-12.252	0.000	(0)
CuCl2	4.826e-13	4.826e-13	-12.316	-12.316	0.000	(0)
MnCl3-	4.665e-13	3.871e-13	-12.331	-12.412	-0.081	(0)
HgCl3-	4.322e-13	3.358e-13	-12.364	-12.474	-0.110	(0)
ZnCl3-	3.000e-13	2.464e-13	-12.523	-12.608	-0.085	(0)
CdCl3-	4.916e-14	3.819e-14	-13.308	-13.418	-0.110	(0)
HgCl4-2	1.304e-14	4.751e-15	-13.885	-14.323	-0.439	(0)
NiCl2	7.493e-15	7.493e-15	-14.125	-14.125	0.000	(0)
PbCl3-	1.019e-15	7.917e-16	-14.992	-15.101	-0.110	(0)
ZnCl4-2	9.236e-16	4.379e-16	-15.035	-15.359	-0.324	(0)
HgCl+	6.827e-16	5.304e-16	-15.166	-15.275	-0.110	(0)
UO2Cl+	2.208e-16	1.715e-16	-15.656	-15.766	-0.110	(0)
CrCl+2	4.385e-17	1.597e-17	-16.358	-16.797	-0.439	(0)
CuCl3-	1.949e-17	1.601e-17	-16.710	-16.796	-0.085	(0)
PbCl4-2	3.530e-18	1.286e-18	-17.452	-17.891	-0.439	(0)
CrOHC12	3.823e-19	3.823e-19	-18.418	-18.418	0.000	(0)
CrCl2+	6.934e-21	5.387e-21	-20.159	-20.269	-0.110	(0)
FeCl+2	5.370e-21	2.546e-21	-20.270	-20.594	-0.324	(0)
CuCl4-2	6.014e-22	2.851e-22	-21.221	-21.545	-0.324	(0)
VOCl+	4.290e-22	3.333e-22	-21.368	-21.477	-0.110	(0)
FeCl2+	4.871e-23	4.042e-23	-22.312	-22.393	-0.081	(0)
CrO3Cl-	3.999e-26	3.107e-26	-25.398	-25.508	-0.110	(0)
FeCl3	1.437e-26	1.437e-26	-25.843	-25.843	0.000	(0)
CoCl+2	3.733e-35	1.360e-35	-34.428	-34.866	-0.439	(0)
UCl+3	0.000e+00	0.000e+00	-44.764	-45.751	-0.987	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.390	-48.828	-0.439	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.266	-50.704	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.088	-63.527	-0.439	(0)
Co (2)	1.065e-07					
Co+2	7.250e-08	2.641e-08	-7.140	-7.578	-0.439	(0)
CoSO4	2.679e-08	2.679e-08	-7.572	-7.572	0.000	(0)
CoHCO3+	4.969e-09	3.860e-09	-8.304	-8.413	-0.110	(0)
CoCO3	1.385e-09	1.385e-09	-8.859	-8.859	0.000	(0)
CoCl+	4.180e-10	3.247e-10	-9.379	-9.489	-0.110	(0)
CoOH+	2.403e-10	1.867e-10	-9.619	-9.729	-0.110	(0)
CoF+	1.492e-10	1.159e-10	-9.826	-9.936	-0.110	(0)
Co (OH) 2	5.255e-12	5.255e-12	-11.279	-11.279	0.000	(0)
CoNO2+	2.987e-12	2.321e-12	-11.525	-11.634	-0.110	(0)
Co (NH3) +2	9.065e-14	3.302e-14	-13.043	-13.481	-0.439	(0)
CoSeO4	8.945e-16	8.945e-16	-15.048	-15.048	0.000	(0)
CoNO3+	7.170e-16	5.571e-16	-15.144	-15.254	-0.110	(0)
Co (OH) 3-	4.783e-17	3.716e-17	-16.320	-16.430	-0.110	(0)
CoOOH-	1.201e-17	9.330e-18	-16.921	-17.030	-0.110	(0)
Co2OH+3	2.397e-18	2.472e-19	-17.620	-18.607	-0.987	(0)
Co (NH3) 2+2	4.021e-20	1.465e-20	-19.396	-19.834	-0.439	(0)
Co (NO3) 2	1.508e-23	1.508e-23	-22.821	-22.821	0.000	(0)
Co (OH) 4-2	5.728e-24	2.087e-24	-23.242	-23.681	-0.439	(0)
Co (NH3) 3+2	5.265e-27	1.918e-27	-26.279	-26.717	-0.439	(0)
Co4 (OH) 4+4	1.377e-29	2.425e-31	-28.861	-30.615	-1.754	(0)
Co (NH3) 4+2	2.874e-34	1.047e-34	-33.542	-33.980	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.305	-41.743	-0.439	(0)
Co (3)	9.296e-29					
CoOH+2	9.296e-29	3.386e-29	-28.032	-28.470	-0.439	(0)

Co+3	1.054e-34	1.881e-35	-33.977	-34.726	-0.749	(0)
CoCl+2	3.733e-35	1.360e-35	-34.428	-34.866	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.390	-48.828	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.336	-58.446	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.889	-63.328	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.088	-63.527	-0.439	(0)
Cr (2)	1.273e-26					
Cr+2	1.273e-26	4.638e-27	-25.895	-26.334	-0.439	(0)
Cr (3)	1.761e-09					
Cr (OH) 2+	1.494e-09	1.161e-09	-8.826	-8.935	-0.110	(0)
Cr (OH) 3	1.545e-10	1.545e-10	-9.811	-9.811	0.000	(0)
Cr (OH) +2	7.390e-11	2.692e-11	-10.131	-10.570	-0.439	(0)
CrOHSO4	3.248e-11	3.248e-11	-10.488	-10.488	0.000	(0)
CrO2-	3.329e-12	2.586e-12	-11.478	-11.587	-0.110	(0)
Cr (OH) 4-	2.805e-12	2.180e-12	-11.552	-11.662	-0.110	(0)
CrF+2	2.096e-13	7.637e-14	-12.679	-13.117	-0.439	(0)
CrSO4+	5.307e-14	4.123e-14	-13.275	-13.385	-0.110	(0)
Cr+3	3.368e-14	3.473e-15	-13.473	-14.459	-0.987	(0)
CrCl+2	4.385e-17	1.597e-17	-16.358	-16.797	-0.439	(0)
CrOHC12	3.823e-19	3.823e-19	-18.418	-18.418	0.000	(0)
Cr2 (OH) 2SO4+2	2.170e-19	7.904e-20	-18.664	-19.102	-0.439	(0)
Cr2 (OH) 2 (SO4) 2	2.387e-20	2.387e-20	-19.622	-19.622	0.000	(0)
CrCl2+	6.934e-21	5.387e-21	-20.159	-20.269	-0.110	(0)
CrNO3+2	5.546e-24	2.020e-24	-23.256	-23.695	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.014	-40.452	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.370	-49.357	-0.987	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.266	-50.704	-0.439	(0)
Cr (6)	1.253e-15					
CrO4-2	1.145e-15	5.323e-16	-14.941	-15.274	-0.333	(0)
HCrO4-	6.296e-17	4.891e-17	-16.201	-16.311	-0.110	(0)
NaCrO4-	3.682e-17	2.861e-17	-16.434	-16.544	-0.110	(0)
KCrO4-	7.660e-18	5.951e-18	-17.116	-17.225	-0.110	(0)
CrO3SO4-2	5.909e-24	2.153e-24	-23.228	-23.667	-0.439	(0)
H2CrO4	1.126e-24	1.126e-24	-23.949	-23.949	0.000	(0)
CrO3Cl-	3.999e-26	3.107e-26	-25.398	-25.508	-0.110	(0)
Cr2O7-2	2.279e-31	8.302e-32	-30.642	-31.081	-0.439	(0)
Cu (1)	1.868e-09					
CuCl	8.518e-10	8.518e-10	-9.070	-9.070	0.000	(0)
CuCl2-	7.701e-10	6.325e-10	-9.113	-9.199	-0.085	(0)
Cu+	2.451e-10	1.904e-10	-9.611	-9.720	-0.110	(0)
CuCl3-2	1.014e-12	4.806e-13	-11.994	-12.318	-0.324	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.008	-148.384	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.757	-149.114	-0.357	(0)
Cu (2)	1.643e-06					
CuCO3	1.270e-06	1.270e-06	-5.896	-5.896	0.000	(0)
Cu+2	1.496e-07	6.953e-08	-6.825	-7.158	-0.333	(0)
CuOH+	9.486e-08	7.791e-08	-7.023	-7.108	-0.085	(0)
CuSO4	8.099e-08	8.099e-08	-7.092	-7.092	0.000	(0)
Cu (CO3) 2-2	2.911e-08	1.061e-08	-7.536	-7.974	-0.439	(0)
CuHCO3+	1.061e-08	8.244e-09	-7.974	-8.084	-0.110	(0)
Cu (OH) 2	5.508e-09	5.508e-09	-8.259	-8.259	0.000	(0)
CuF+	7.835e-10	6.087e-10	-9.106	-9.216	-0.110	(0)
CuCl+	4.769e-10	3.916e-10	-9.322	-9.407	-0.085	(0)
Cu2 (OH) 2+2	4.185e-10	1.525e-10	-9.378	-9.817	-0.439	(0)
CuNO2+	1.169e-10	9.079e-11	-9.932	-10.042	-0.110	(0)
CuNH3+2	2.031e-11	7.399e-12	-10.692	-11.131	-0.439	(0)
Cu (OH) 3-	5.153e-12	4.003e-12	-11.288	-11.398	-0.110	(0)
CuCl2	4.826e-13	4.826e-13	-12.316	-12.316	0.000	(0)
Cu (NO2) 2	1.159e-14	1.159e-14	-13.936	-13.936	0.000	(0)
CuNO3+	3.766e-15	2.926e-15	-14.424	-14.534	-0.110	(0)
Cu (OH) 4-2	3.065e-17	1.116e-17	-16.514	-16.952	-0.439	(0)
CuCl3-	1.949e-17	1.601e-17	-16.710	-16.796	-0.085	(0)
CuCl4-2	6.014e-22	2.851e-22	-21.221	-21.545	-0.324	(0)
Cu (NO3) 2	4.903e-24	4.903e-24	-23.310	-23.310	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.870	-216.979	-0.110	(0)
F	2.063e-04					
F-	1.680e-04	1.387e-04	-3.775	-3.858	-0.083	(0)
MgF+	3.541e-05	2.924e-05	-4.451	-4.534	-0.083	(0)

CaF+	1.731e-06	1.436e-06	-5.762	-5.843	-0.081	(0)
NaF	9.467e-07	9.467e-07	-6.024	-6.024	0.000	(0)
MnF+	1.172e-07	9.725e-08	-6.931	-7.012	-0.081	(0)
AlF3	9.147e-09	9.147e-09	-8.039	-8.039	0.000	(0)
AlF2+	6.287e-09	5.237e-09	-8.202	-8.281	-0.079	(0)
ZnF+	6.185e-09	4.805e-09	-8.209	-8.318	-0.110	(0)
HF	5.827e-09	5.827e-09	-8.235	-8.235	0.000	(0)
BF(OH) 3-	2.561e-09	2.066e-09	-8.592	-8.685	-0.093	(0)
CuF+	7.835e-10	6.087e-10	-9.106	-9.216	-0.110	(0)
AlF4-	7.704e-10	6.361e-10	-9.113	-9.197	-0.083	(0)
NiF+	2.066e-10	1.605e-10	-9.685	-9.795	-0.110	(0)
AlF+2	1.969e-10	9.481e-11	-9.706	-10.023	-0.317	(0)
CoF+	1.492e-10	1.159e-10	-9.826	-9.936	-0.110	(0)
CdF+	9.586e-12	7.447e-12	-11.018	-11.128	-0.110	(0)
HF2-	3.764e-12	3.074e-12	-11.424	-11.512	-0.088	(0)
PbF+	3.518e-12	2.733e-12	-11.454	-11.563	-0.110	(0)
BF2(OH) 2-	1.079e-12	8.710e-13	-11.967	-12.060	-0.093	(0)
UO2F+	7.337e-13	5.700e-13	-12.134	-12.244	-0.110	(0)
AgF	5.636e-13	5.636e-13	-12.249	-12.249	0.000	(0)
UO2F2	2.281e-13	2.281e-13	-12.642	-12.642	0.000	(0)
CrF+2	2.096e-13	7.637e-14	-12.679	-13.117	-0.439	(0)
UO2F3-	1.023e-14	7.949e-15	-13.990	-14.100	-0.110	(0)
PbF2	7.461e-15	7.461e-15	-14.127	-14.127	0.000	(0)
CdF2	2.062e-15	2.062e-15	-14.686	-14.686	0.000	(0)
H2F2	9.098e-17	9.098e-17	-16.041	-16.041	0.000	(0)
UO2F4-2	2.405e-17	8.760e-18	-16.619	-17.057	-0.439	(0)
VO2F	2.254e-17	2.254e-17	-16.647	-16.647	0.000	(0)
FeF2+	1.615e-17	1.340e-17	-16.792	-16.873	-0.081	(0)
FeF+2	7.612e-18	3.609e-18	-17.119	-17.443	-0.324	(0)
FeF3	2.623e-18	2.623e-18	-17.581	-17.581	0.000	(0)
PbF3-	2.527e-18	1.964e-18	-17.597	-17.707	-0.110	(0)
BF3OH-	1.656e-18	1.336e-18	-17.781	-17.874	-0.093	(0)
VO2F2-	1.462e-18	1.136e-18	-17.835	-17.945	-0.110	(0)
VOF+	3.580e-20	2.782e-20	-19.446	-19.556	-0.110	(0)
VO2F3-2	5.395e-21	1.965e-21	-20.268	-20.707	-0.439	(0)
VOF2	1.447e-21	1.447e-21	-20.839	-20.839	0.000	(0)
PbF4-2	3.579e-22	1.304e-22	-21.446	-21.885	-0.439	(0)
HgF+	4.952e-23	3.847e-23	-22.305	-22.415	-0.110	(0)
BF4-	3.212e-23	2.592e-23	-22.493	-22.586	-0.093	(0)
VOF3-	9.170e-24	7.124e-24	-23.038	-23.147	-0.110	(0)
VO2F4-3	1.301e-24	1.342e-25	-23.886	-24.872	-0.987	(0)
Sb(OH) 2F	2.387e-25	2.387e-25	-24.622	-24.622	0.000	(0)
SbOF	2.349e-25	2.349e-25	-24.629	-24.629	0.000	(0)
VOF4-2	1.095e-26	3.990e-27	-25.961	-26.399	-0.439	(0)
SiF6-2	3.597e-28	1.705e-28	-27.444	-27.768	-0.324	(0)
UF3+	1.363e-35	1.059e-35	-34.865	-34.975	-0.110	(0)
UF2+2	1.322e-36	4.816e-37	-35.879	-36.317	-0.439	(0)
UF4	1.611e-37	1.611e-37	-36.793	-36.793	0.000	(0)
UF+3	2.674e-39	2.757e-40	-38.573	-39.560	-0.987	(0)
UF5-	1.140e-39	8.858e-40	-38.943	-39.053	-0.110	(0)
UF6-2	1.019e-40	0.000e+00	-39.992	-40.430	-0.439	(0)
Fe (2)	5.765e-12					
Fe+2	3.919e-12	1.428e-12	-11.407	-11.845	-0.439	(0)
FeSO4	1.782e-12	1.782e-12	-11.749	-11.749	0.000	(0)
FeHCO3+	4.032e-14	3.377e-14	-13.394	-13.471	-0.077	(0)
FeOH+	2.427e-14	2.014e-14	-13.615	-13.696	-0.081	(0)
Fe(OH) 2	5.668e-18	5.668e-18	-17.247	-17.247	0.000	(0)
Fe(OH) 3-	7.654e-19	6.351e-19	-18.116	-18.197	-0.081	(0)
Fe(HS) 2	0.000e+00	0.000e+00	-160.042	-160.042	0.000	(0)
Fe(HS) 3-	0.000e+00	0.000e+00	-236.469	-236.579	-0.110	(0)
Fe (3)	1.194e-09					
Fe(OH) 2+	8.982e-10	7.482e-10	-9.047	-9.126	-0.079	(0)
Fe(OH) 3	2.847e-10	2.847e-10	-9.546	-9.546	0.000	(0)
Fe(OH) 4-	1.128e-11	9.394e-12	-10.948	-11.027	-0.079	(0)
FeOH+2	1.145e-14	5.427e-15	-13.941	-14.265	-0.324	(0)
FeF2+	1.615e-17	1.340e-17	-16.792	-16.873	-0.081	(0)
FeF+2	7.612e-18	3.609e-18	-17.119	-17.443	-0.324	(0)
FeF3	2.623e-18	2.623e-18	-17.581	-17.581	0.000	(0)

FeSO4+	1.631e-18	1.353e-18	-17.788	-17.869	-0.081	(0)
Fe (SO4) 2-	1.894e-19	1.471e-19	-18.723	-18.832	-0.110	(0)
Fe+3	1.329e-19	2.372e-20	-18.876	-19.625	-0.749	(0)
FeCl+2	5.370e-21	2.546e-21	-20.270	-20.594	-0.324	(0)
FeCl2+	4.871e-23	4.042e-23	-22.312	-22.393	-0.081	(0)
FeHSeO3+2	1.692e-23	6.166e-24	-22.771	-23.210	-0.439	(0)
Fe2 (OH) 2+4	5.537e-26	9.753e-28	-25.257	-27.011	-1.754	(0)
FeCl3	1.437e-26	1.437e-26	-25.843	-25.843	0.000	(0)
FeNO3+2	8.666e-27	3.157e-27	-26.062	-26.501	-0.439	(0)
Fe3 (OH) 4+5	5.808e-33	1.055e-35	-32.236	-34.977	-2.741	(0)
H (0)	3.530e-29					
H2	1.765e-29	1.784e-29	-28.753	-28.749	0.005	(0)
Hg (0)	2.158e-09					
Hg	2.158e-09	2.158e-09	-8.666	-8.666	0.000	(0)
Hg (1)	6.015e-20					
Hg2+2	3.008e-20	1.096e-20	-19.522	-19.960	-0.439	(0)
Hg (2)	3.242e-11					
HgClOH	1.664e-11	1.664e-11	-10.779	-10.779	0.000	(0)
HgCl2	9.448e-12	9.448e-12	-11.025	-11.025	0.000	(0)
Hg (OH) 2	5.863e-12	5.926e-12	-11.232	-11.227	0.005	(0)
HgCl3-	4.322e-13	3.358e-13	-12.364	-12.474	-0.110	(0)
HgCO3	2.777e-14	2.777e-14	-13.556	-13.556	0.000	(0)
HgCl4-2	1.304e-14	4.751e-15	-13.885	-14.323	-0.439	(0)
Hg (CO3) 2-2	7.479e-16	2.724e-16	-15.126	-15.565	-0.439	(0)
HgCl+	6.827e-16	5.304e-16	-15.166	-15.275	-0.110	(0)
HgOH+	1.358e-16	1.055e-16	-15.867	-15.977	-0.110	(0)
HgHCO3+	1.890e-17	1.468e-17	-16.724	-16.833	-0.110	(0)
Hg (NH3) 2+2	1.401e-18	5.105e-19	-17.854	-18.292	-0.439	(0)
Hg (OH) 3-	3.402e-19	2.643e-19	-18.468	-18.578	-0.110	(0)
HgNH3+2	1.347e-19	4.908e-20	-18.871	-19.309	-0.439	(0)
Hg+2	2.053e-20	7.480e-21	-19.688	-20.126	-0.439	(0)
HgSO4	9.957e-21	9.957e-21	-20.002	-20.002	0.000	(0)
HgF+	4.952e-23	3.847e-23	-22.305	-22.415	-0.110	(0)
Hg (NH3) 3+2	5.801e-26	2.113e-26	-25.236	-25.675	-0.439	(0)
HgNO3+	4.731e-29	3.676e-29	-28.325	-28.435	-0.110	(0)
Hg (NH3) 4+2	4.792e-33	1.746e-33	-32.319	-32.758	-0.439	(0)
Hg (NO3) 2	2.033e-37	2.033e-37	-36.692	-36.692	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.689	-137.798	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-138.521	-138.960	-0.439	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.951	-138.951	0.000	(0)
K	3.774e-03					
K+	3.644e-03	3.009e-03	-2.438	-2.522	-0.083	(0)
KSO4-	1.300e-04	1.083e-04	-3.886	-3.965	-0.079	(0)
KCrO4-	7.660e-18	5.951e-18	-17.116	-17.225	-0.110	(0)
Mg	5.862e-03					
Mg+2	4.040e-03	1.878e-03	-2.394	-2.726	-0.333	(0)
MgSO4	1.738e-03	1.738e-03	-2.760	-2.760	0.000	(0)
MgHCO3+	4.397e-05	3.611e-05	-4.357	-4.442	-0.085	(0)
MgF+	3.541e-05	2.924e-05	-4.451	-4.534	-0.083	(0)
MgCO3	4.846e-06	4.846e-06	-5.315	-5.315	0.000	(0)
MgOH+	3.150e-07	2.649e-07	-6.502	-6.577	-0.075	(0)
MgH2BO3+	6.161e-08	4.971e-08	-7.210	-7.304	-0.093	(0)
Mn (2)	6.528e-05					
Mn+2	4.833e-05	1.761e-05	-4.316	-4.754	-0.439	(0)
MnSO4	1.592e-05	1.592e-05	-4.798	-4.798	0.000	(0)
MnHCO3+	7.955e-07	6.601e-07	-6.099	-6.180	-0.081	(0)
MnF+	1.172e-07	9.725e-08	-6.931	-7.012	-0.081	(0)
MnCl+	9.494e-08	7.878e-08	-7.023	-7.104	-0.081	(0)
MnOH+	1.889e-08	1.567e-08	-7.724	-7.805	-0.081	(0)
MnCl2	3.955e-10	3.955e-10	-9.403	-9.403	0.000	(0)
MnNO3+	4.780e-13	3.714e-13	-12.321	-12.430	-0.110	(0)
MnCl3-	4.665e-13	3.871e-13	-12.331	-12.412	-0.081	(0)
MnSeO4	3.203e-13	3.203e-13	-12.494	-12.494	0.000	(0)
Mn (OH) 3-	1.465e-17	1.216e-17	-16.834	-16.915	-0.081	(0)
Mn (NO3) 2	1.241e-20	1.241e-20	-19.906	-19.906	0.000	(0)
Mn (OH) 4-2	2.934e-23	1.391e-23	-22.533	-22.857	-0.324	(0)
MnSe	0.000e+00	0.000e+00	-41.535	-41.535	0.000	(0)
Mn (3)	7.884e-25					

Mn+3	7.884e-25	1.407e-25	-24.103	-24.852	-0.749	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.469	-41.793	-0.324	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.822	-45.913	-0.090	(0)
Mo	1.912e-06					
MoO4-2	1.911e-06	8.884e-07	-5.719	-6.051	-0.333	(0)
HMoO4-	6.461e-10	5.020e-10	-9.190	-9.299	-0.110	(0)
H2MoO4	1.044e-13	1.044e-13	-12.981	-12.981	0.000	(0)
Ag2MoO4	8.795e-25	8.795e-25	-24.056	-24.056	0.000	(0)
AlMo6O21-3	1.683e-39	1.735e-40	-38.774	-39.761	-0.987	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.795	-49.742	-3.947	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.161	-50.902	-2.741	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.913	-53.667	-1.754	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.981	-57.967	-0.987	(0)
N (-3)	6.864e-07					
NH4+	6.419e-07	5.179e-07	-6.193	-6.286	-0.093	(0)
NH4SO4-	3.401e-08	2.822e-08	-7.468	-7.549	-0.081	(0)
NH3	1.040e-08	1.040e-08	-7.983	-7.983	0.000	(0)
CaNH3+2	3.408e-11	1.242e-11	-10.467	-10.906	-0.439	(0)
CuNH3+2	2.031e-11	7.399e-12	-10.692	-11.131	-0.439	(0)
NiNH3+2	7.060e-13	2.572e-13	-12.151	-12.590	-0.439	(0)
Co (NH3) +2	9.065e-14	3.302e-14	-13.043	-13.481	-0.439	(0)
AgNH3+	4.420e-14	3.434e-14	-13.355	-13.464	-0.110	(0)
BaNH3+2	3.376e-16	1.230e-16	-15.472	-15.910	-0.439	(0)
Ag (NH3) 2+	3.736e-18	2.903e-18	-17.428	-17.537	-0.110	(0)
Hg (NH3) 2+2	1.401e-18	5.105e-19	-17.854	-18.292	-0.439	(0)
Ni (NH3) 2+2	1.061e-18	3.866e-19	-17.974	-18.413	-0.439	(0)
Ca (NH3) 2+2	1.411e-19	5.141e-20	-18.850	-19.289	-0.439	(0)
HgNH3+2	1.347e-19	4.908e-20	-18.871	-19.309	-0.439	(0)
Co (NH3) 2+2	4.021e-20	1.465e-20	-19.396	-19.834	-0.439	(0)
Hg (NH3) 3+2	5.801e-26	2.113e-26	-25.236	-25.675	-0.439	(0)
Co (NH3) 3+2	5.265e-27	1.918e-27	-26.279	-26.717	-0.439	(0)
Hg (NH3) 4+2	4.792e-33	1.746e-33	-32.319	-32.758	-0.439	(0)
Co (NH3) 4+2	2.874e-34	1.047e-34	-33.542	-33.980	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.014	-40.452	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.305	-41.743	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.370	-49.357	-0.987	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.390	-48.828	-0.439	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.266	-50.704	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.336	-58.446	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.889	-63.328	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.088	-63.527	-0.439	(0)
N (3)	1.536e-05					
NO2-	1.536e-05	1.247e-05	-4.814	-4.904	-0.090	(0)
CuNO2+	1.169e-10	9.079e-11	-9.932	-10.042	-0.110	(0)
AgNO2	4.213e-12	4.213e-12	-11.375	-11.375	0.000	(0)
CoNO2+	2.987e-12	2.321e-12	-11.525	-11.634	-0.110	(0)
Cu (NO2) 2	1.159e-14	1.159e-14	-13.936	-13.936	0.000	(0)
Ag (NO2) 2-	1.047e-16	8.137e-17	-15.980	-16.090	-0.110	(0)
N (5)	1.617e-08					
NO3-	1.612e-08	1.331e-08	-7.793	-7.876	-0.083	(0)
CaNO3+	5.137e-11	3.991e-11	-10.289	-10.399	-0.110	(0)
MnNO3+	4.780e-13	3.714e-13	-12.321	-12.430	-0.110	(0)
ZnNO3+	7.469e-14	5.802e-14	-13.127	-13.236	-0.110	(0)
CuNO3+	3.766e-15	2.926e-15	-14.424	-14.534	-0.110	(0)
NiNO3+	1.981e-15	1.539e-15	-14.703	-14.813	-0.110	(0)
BaNO3+	1.609e-15	1.250e-15	-14.793	-14.903	-0.110	(0)
CoNO3+	7.170e-16	5.571e-16	-15.144	-15.254	-0.110	(0)
CdNO3+	1.835e-16	1.425e-16	-15.736	-15.846	-0.110	(0)
PbNO3+	7.082e-17	5.502e-17	-16.150	-16.259	-0.110	(0)
AgNO3	1.709e-17	1.709e-17	-16.767	-16.767	0.000	(0)
Mn (NO3) 2	1.241e-20	1.241e-20	-19.906	-19.906	0.000	(0)
UO2NO3+	1.017e-21	7.903e-22	-20.993	-21.102	-0.110	(0)
Zn (NO3) 2	1.541e-22	1.541e-22	-21.812	-21.812	0.000	(0)
Co (NO3) 2	1.508e-23	1.508e-23	-22.821	-22.821	0.000	(0)
CrNO3+2	5.546e-24	2.020e-24	-23.256	-23.695	-0.439	(0)
Cu (NO3) 2	4.903e-24	4.903e-24	-23.310	-23.310	0.000	(0)

	Pb(NO3)2	1.243e-24	1.243e-24	-23.905	-23.905	0.000	(0)
	Cd(NO3)2	9.507e-25	9.507e-25	-24.022	-24.022	0.000	(0)
	VO2NO3	6.236e-25	6.236e-25	-24.205	-24.205	0.000	(0)
	FeNO3+2	8.666e-27	3.157e-27	-26.062	-26.501	-0.439	(0)
	HgNO3+	4.731e-29	3.676e-29	-28.325	-28.435	-0.110	(0)
	Hg(NO3)2	2.033e-37	2.033e-37	-36.692	-36.692	0.000	(0)
Na	1.346e-02						
	Na+	1.310e-02	1.081e-02	-1.883	-1.966	-0.083	(0)
	NaSO4-	3.545e-04	2.953e-04	-3.450	-3.530	-0.079	(0)
	NaHCO3	1.143e-05	1.143e-05	-4.942	-4.942	0.000	(0)
	NaF	9.467e-07	9.467e-07	-6.024	-6.024	0.000	(0)
	NaCO3-	7.500e-07	6.247e-07	-6.125	-6.204	-0.079	(0)
	NaH2BO3	1.308e-08	1.308e-08	-7.883	-7.883	0.000	(0)
	NaCrO4-	3.682e-17	2.861e-17	-16.434	-16.544	-0.110	(0)
Ni	1.659e-07						
	Ni+2	9.906e-08	4.605e-08	-7.004	-7.337	-0.333	(0)
	NiSO4	4.672e-08	4.672e-08	-7.331	-7.331	0.000	(0)
	NiHCO3+	1.373e-08	1.067e-08	-7.862	-7.972	-0.110	(0)
	NiCO3	5.330e-09	5.330e-09	-8.273	-8.273	0.000	(0)
	NiCl+	5.390e-10	4.187e-10	-9.268	-9.378	-0.110	(0)
	NiOH+	2.644e-10	2.054e-10	-9.578	-9.687	-0.110	(0)
	NiF+	2.066e-10	1.605e-10	-9.685	-9.795	-0.110	(0)
	Ni(SO4)2-2	2.159e-11	7.865e-12	-10.666	-11.104	-0.439	(0)
	Ni(OH)2	5.782e-12	5.782e-12	-11.238	-11.238	0.000	(0)
	NiNH3+2	7.060e-13	2.572e-13	-12.151	-12.590	-0.439	(0)
	NiCl2	7.493e-15	7.493e-15	-14.125	-14.125	0.000	(0)
	Ni(OH)3-	2.637e-15	2.049e-15	-14.579	-14.689	-0.110	(0)
	NiNO3+	1.981e-15	1.539e-15	-14.703	-14.813	-0.110	(0)
	NiSeO4	1.456e-15	1.456e-15	-14.837	-14.837	0.000	(0)
	Ni(NH3)2+2	1.061e-18	3.866e-19	-17.974	-18.413	-0.439	(0)
O(0)	3.147e-35						
	O2	1.573e-35	1.590e-35	-34.803	-34.799	0.005	(0)
Pb	4.901e-09						
	PbCO3	2.607e-09	2.607e-09	-8.584	-8.584	0.000	(0)
	PbSO4	6.960e-10	6.960e-10	-9.157	-9.157	0.000	(0)
	Pb+2	6.013e-10	2.795e-10	-9.221	-9.554	-0.333	(0)
	PbHCO3+	5.023e-10	3.902e-10	-9.299	-9.409	-0.110	(0)
	PbOH+	3.202e-10	2.488e-10	-9.495	-9.604	-0.110	(0)
	Pb(CO3)2-2	6.402e-11	2.332e-11	-10.194	-10.632	-0.439	(0)
	Pb(SO4)2-2	5.854e-11	2.132e-11	-10.233	-10.671	-0.439	(0)
	PbCl+	4.537e-11	3.525e-11	-10.343	-10.453	-0.110	(0)
	PbF+	3.518e-12	2.733e-12	-11.454	-11.563	-0.110	(0)
	Pb(OH)2	2.788e-12	2.788e-12	-11.555	-11.555	0.000	(0)
	PbCl2	5.595e-13	5.595e-13	-12.252	-12.252	0.000	(0)
	PbF2	7.461e-15	7.461e-15	-14.127	-14.127	0.000	(0)
	Pb(OH)3-	1.271e-15	9.877e-16	-14.896	-15.005	-0.110	(0)
	PbCl3-	1.019e-15	7.917e-16	-14.992	-15.101	-0.110	(0)
	PbNO3+	7.082e-17	5.502e-17	-16.150	-16.259	-0.110	(0)
	Pb2OH+3	1.069e-17	1.102e-18	-16.971	-17.958	-0.987	(0)
	PbCl4-2	3.530e-18	1.286e-18	-17.452	-17.891	-0.439	(0)
	PbF3-	2.527e-18	1.964e-18	-17.597	-17.707	-0.110	(0)
	Pb(OH)4-2	2.353e-19	8.572e-20	-18.628	-19.067	-0.439	(0)
	PbF4-2	3.579e-22	1.304e-22	-21.446	-21.885	-0.439	(0)
	Pb3(OH)4+2	1.190e-22	4.334e-23	-21.925	-22.363	-0.439	(0)
	Pb(NO3)2	1.243e-24	1.243e-24	-23.905	-23.905	0.000	(0)
	Pb4(OH)4+4	5.462e-27	9.621e-29	-26.263	-28.017	-1.754	(0)
	Pb(HS)2	0.000e+00	0.000e+00	-151.431	-151.431	0.000	(0)
	Pb(HS)3-	0.000e+00	0.000e+00	-228.595	-228.704	-0.110	(0)
S(-2)	0.000e+00						
	AgHS	0.000e+00	0.000e+00	-73.550	-73.550	0.000	(0)
	HS-	0.000e+00	0.000e+00	-78.464	-78.574	-0.110	(0)
	CdHS+	0.000e+00	0.000e+00	-78.926	-79.036	-0.110	(0)
	H2S	0.000e+00	0.000e+00	-79.100	-79.100	0.000	(0)
	S5-2	0.000e+00	0.000e+00	-79.953	-80.392	-0.439	(0)
	S6-2	0.000e+00	0.000e+00	-80.469	-80.908	-0.439	(0)
	S4-2	0.000e+00	0.000e+00	-80.549	-80.988	-0.439	(0)
	S3-2	0.000e+00	0.000e+00	-81.355	-81.793	-0.439	(0)
	S2-2	0.000e+00	0.000e+00	-82.371	-82.810	-0.439	(0)

S-2	0.000e+00	0.000e+00	-88.003	-88.327	-0.324	(0)
HgHS2-	0.000e+00	0.000e+00	-137.689	-137.798	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-138.521	-138.960	-0.439	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.951	-138.951	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.748	-147.961	-0.213	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.914	-148.024	-0.110	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.008	-148.384	-0.376	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.441	-148.551	-0.110	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.757	-149.114	-0.357	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.467	-149.854	-0.386	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.799	-150.165	-0.366	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.088	-150.088	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.405	-150.405	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.431	-151.431	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.042	-160.042	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.870	-216.979	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.271	-225.381	-0.110	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.969	-227.079	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.376	-227.814	-0.439	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.595	-228.704	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.469	-236.579	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.018	-303.456	-0.439	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.976	-305.415	-0.439	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.382	-318.820	-0.439	(0)
S (6)	1.428e-02					
SO4-2	1.094e-02	5.084e-03	-1.961	-2.294	-0.333	(0)
MgSO4	1.738e-03	1.738e-03	-2.760	-2.760	0.000	(0)
CaSO4	1.105e-03	1.105e-03	-2.957	-2.957	0.000	(0)
NaSO4-	3.545e-04	2.953e-04	-3.450	-3.530	-0.079	(0)
KSO4-	1.300e-04	1.083e-04	-3.886	-3.965	-0.079	(0)
MnSO4	1.592e-05	1.592e-05	-4.798	-4.798	0.000	(0)
ZnSO4	1.931e-06	1.931e-06	-5.714	-5.714	0.000	(0)
Zn (SO4) 2-2	2.347e-07	8.550e-08	-6.629	-7.068	-0.439	(0)
CuSO4	8.099e-08	8.099e-08	-7.092	-7.092	0.000	(0)
NiSO4	4.672e-08	4.672e-08	-7.331	-7.331	0.000	(0)
NH4SO4-	3.401e-08	2.822e-08	-7.468	-7.549	-0.081	(0)
CoSO4	2.679e-08	2.679e-08	-7.572	-7.572	0.000	(0)
HSO4-	1.709e-08	1.411e-08	-7.767	-7.850	-0.083	(0)
CdSO4	4.037e-09	4.037e-09	-8.394	-8.394	0.000	(0)
Cd (SO4) 2-2	7.600e-10	2.769e-10	-9.119	-9.558	-0.439	(0)
PbSO4	6.960e-10	6.960e-10	-9.157	-9.157	0.000	(0)
AgSO4-	2.112e-10	1.641e-10	-9.675	-9.785	-0.110	(0)
Pb (SO4) 2-2	5.854e-11	2.132e-11	-10.233	-10.671	-0.439	(0)
CrOHSO4	3.248e-11	3.248e-11	-10.488	-10.488	0.000	(0)
Ni (SO4) 2-2	2.159e-11	7.865e-12	-10.666	-11.104	-0.439	(0)
AlSO4+	3.266e-12	2.697e-12	-11.486	-11.569	-0.083	(0)
FeSO4	1.782e-12	1.782e-12	-11.749	-11.749	0.000	(0)
UO2SO4	2.290e-13	2.290e-13	-12.640	-12.640	0.000	(0)
Al (SO4) 2-	1.780e-13	1.469e-13	-12.750	-12.833	-0.083	(0)
CrSO4+	5.307e-14	4.123e-14	-13.275	-13.385	-0.110	(0)
UO2 (SO4) 2-2	4.214e-14	1.535e-14	-13.375	-13.814	-0.439	(0)
VO2SO4-	1.448e-17	1.125e-17	-16.839	-16.949	-0.110	(0)
FeSO4+	1.631e-18	1.353e-18	-17.788	-17.869	-0.081	(0)
Cr2 (OH) 2SO4+2	2.170e-19	7.904e-20	-18.664	-19.102	-0.439	(0)
Fe (SO4) 2-	1.894e-19	1.471e-19	-18.723	-18.832	-0.110	(0)
VOSO4	4.681e-20	4.681e-20	-19.330	-19.330	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.387e-20	2.387e-20	-19.622	-19.622	0.000	(0)
HgSO4	9.957e-21	9.957e-21	-20.002	-20.002	0.000	(0)
CrO3SO4-2	5.909e-24	2.153e-24	-23.228	-23.667	-0.439	(0)
VSO4+	2.313e-34	1.797e-34	-33.636	-33.745	-0.110	(0)
U (SO4) 2	8.142e-40	8.142e-40	-39.089	-39.089	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.257	-40.696	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.336	-58.446	-0.110	(0)
Sb (3)	7.664e-20					
Sb (OH) 3	3.876e-20	3.876e-20	-19.412	-19.412	0.000	(0)
HSbO2	3.787e-20	3.787e-20	-19.422	-19.422	0.000	(0)
SbO2-	2.780e-24	2.160e-24	-23.556	-23.666	-0.110	(0)
Sb (OH) 4-	1.591e-24	1.236e-24	-23.798	-23.908	-0.110	(0)

Sb(OH) 2F	2.387e-25	2.387e-25	-24.622	-24.622	0.000	(0)
SbOF	2.349e-25	2.349e-25	-24.629	-24.629	0.000	(0)
Sb(OH) 2+	3.443e-26	2.675e-26	-25.463	-25.573	-0.110	(0)
SbO+	1.188e-26	9.229e-27	-25.925	-26.035	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.382	-318.820	-0.439	(0)
Sb(5)	2.923e-08					
SbO3-	2.919e-08	2.268e-08	-7.535	-7.644	-0.110	(0)
Sb(OH) 6-	3.206e-11	2.647e-11	-10.494	-10.577	-0.083	(0)
SbO2+	6.757e-24	5.249e-24	-23.170	-23.280	-0.110	(0)
Se(-2)	8.576e-15					
Ag2Se	8.576e-15	8.576e-15	-14.067	-14.067	0.000	(0)
HSe-	1.471e-39	1.143e-39	-38.832	-38.942	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-41.535	-41.535	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.599	-42.599	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.957	-46.395	-0.439	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.790	-84.544	-1.754	(0)
Se(4)	1.645e-07					
HSeO3-	1.266e-07	9.836e-08	-6.898	-7.007	-0.110	(0)
SeO3-2	3.785e-08	1.379e-08	-7.422	-7.860	-0.439	(0)
H2SeO3	1.191e-12	1.191e-12	-11.924	-11.924	0.000	(0)
AgSeO3-	1.845e-14	1.433e-14	-13.734	-13.844	-0.110	(0)
Cd(SeO3) 2-2	1.457e-18	5.308e-19	-17.837	-18.275	-0.439	(0)
Ag(SeO3) 2-3	1.716e-20	1.770e-21	-19.765	-20.752	-0.987	(0)
FeHSeO3+2	1.692e-23	6.166e-24	-22.771	-23.210	-0.439	(0)
Se(6)	1.457e-10					
SeO4-2	1.454e-10	6.758e-11	-9.838	-10.170	-0.333	(0)
MnSeO4	3.203e-13	3.203e-13	-12.494	-12.494	0.000	(0)
ZnSeO4	1.817e-14	1.817e-14	-13.741	-13.741	0.000	(0)
NiSeO4	1.456e-15	1.456e-15	-14.837	-14.837	0.000	(0)
CoSeO4	8.945e-16	8.945e-16	-15.048	-15.048	0.000	(0)
HSeO4-	1.238e-16	9.618e-17	-15.907	-16.017	-0.110	(0)
CdSeO4	4.262e-17	4.262e-17	-16.370	-16.370	0.000	(0)
Zn(SeO4) 2-2	3.417e-24	1.245e-24	-23.466	-23.905	-0.439	(0)
Si	2.412e-05					
H4SiO4	2.397e-05	2.422e-05	-4.620	-4.616	0.005	(0)
H3SiO4-	1.501e-07	1.233e-07	-6.824	-6.909	-0.085	(0)
H2SiO4-2	5.691e-13	2.740e-13	-12.245	-12.562	-0.317	(0)
UO2H3SiO4+	4.010e-13	3.115e-13	-12.397	-12.506	-0.110	(0)
SiF6-2	3.597e-28	1.705e-28	-27.444	-27.768	-0.324	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.064	-59.050	-0.987	(0)
U(4)	5.252e-21					
U(OH) 5-	5.248e-21	4.077e-21	-20.280	-20.390	-0.110	(0)
U(OH) 4	4.852e-24	4.852e-24	-23.314	-23.314	0.000	(0)
U(OH) 3+	6.488e-28	5.041e-28	-27.188	-27.298	-0.110	(0)
U(OH) 2+2	1.818e-32	6.623e-33	-31.740	-32.179	-0.439	(0)
UF3+	1.363e-35	1.059e-35	-34.865	-34.975	-0.110	(0)
UF2+2	1.322e-36	4.816e-37	-35.879	-36.317	-0.439	(0)
UF4	1.611e-37	1.611e-37	-36.793	-36.793	0.000	(0)
UOH+3	8.597e-38	8.865e-39	-37.066	-38.052	-0.987	(0)
UF+3	2.674e-39	2.757e-40	-38.573	-39.560	-0.987	(0)
UF5-	1.140e-39	8.858e-40	-38.943	-39.053	-0.110	(0)
U(SO4) 2	8.142e-40	8.142e-40	-39.089	-39.089	0.000	(0)
UF6-2	1.019e-40	0.000e+00	-39.992	-40.430	-0.439	(0)
USO4+2	0.000e+00	0.000e+00	-40.257	-40.696	-0.439	(0)
U+4	0.000e+00	0.000e+00	-43.248	-45.002	-1.754	(0)
UCl+3	0.000e+00	0.000e+00	-44.764	-45.751	-0.987	(0)
U6(OH) 15+9	0.000e+00	0.000e+00	-165.089	-173.969	-8.880	(0)
U(5)	1.305e-16					
UO2+	1.305e-16	1.014e-16	-15.884	-15.994	-0.110	(0)
U(6)	2.637e-07					
UO2(CO3) 3-4	2.009e-07	3.538e-09	-6.697	-8.451	-1.754	(0)
UO2(CO3) 2-2	6.246e-08	2.275e-08	-7.204	-7.643	-0.439	(0)
UO2CO3	3.676e-10	3.676e-10	-9.435	-9.435	0.000	(0)
UO2OH+	1.709e-12	1.328e-12	-11.767	-11.877	-0.110	(0)
UO2F+	7.337e-13	5.700e-13	-12.134	-12.244	-0.110	(0)
UO2H3SiO4+	4.010e-13	3.115e-13	-12.397	-12.506	-0.110	(0)
UO2SO4	2.290e-13	2.290e-13	-12.640	-12.640	0.000	(0)

UO2F2	2.281e-13	2.281e-13	-12.642	-12.642	0.000	(0)
UO2+2	6.402e-14	2.976e-14	-13.194	-13.526	-0.333	(0)
UO2 (SO4) 2-2	4.214e-14	1.535e-14	-13.375	-13.814	-0.439	(0)
UO2F3-	1.023e-14	7.949e-15	-13.990	-14.100	-0.110	(0)
UO2Cl+	2.208e-16	1.715e-16	-15.656	-15.766	-0.110	(0)
UO2F4-2	2.405e-17	8.760e-18	-16.619	-17.057	-0.439	(0)
(UO2) 2 (OH) 2+2	8.029e-18	2.925e-18	-17.095	-17.534	-0.439	(0)
(UO2) 3 (OH) 5+	4.761e-19	3.699e-19	-18.322	-18.432	-0.110	(0)
UO2NO3+	1.017e-21	7.903e-22	-20.993	-21.102	-0.110	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.519	-42.629	-0.110	(0)
V+2	0.000e+00	0.000e+00	-43.250	-43.688	-0.439	(0)
V (3)	2.687e-15					
V (OH) 3	2.687e-15	2.687e-15	-14.571	-14.571	0.000	(0)
V (OH) 2+	6.351e-26	4.934e-26	-25.197	-25.307	-0.110	(0)
VOH+2	3.650e-29	1.330e-29	-28.438	-28.876	-0.439	(0)
V+3	7.262e-34	7.488e-35	-33.139	-34.126	-0.987	(0)
VSO4+	2.313e-34	1.797e-34	-33.636	-33.745	-0.110	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.744	-55.731	-0.987	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.198	-56.952	-1.754	(0)
V (4)	3.216e-18					
V (OH) 3+	3.039e-18	2.361e-18	-17.517	-17.627	-0.110	(0)
VO+2	9.175e-20	3.342e-20	-19.037	-19.476	-0.439	(0)
VOSO4	4.681e-20	4.681e-20	-19.330	-19.330	0.000	(0)
VOF+	3.580e-20	2.782e-20	-19.446	-19.556	-0.110	(0)
VOF2	1.447e-21	1.447e-21	-20.839	-20.839	0.000	(0)
VOC1+	4.290e-22	3.333e-22	-21.368	-21.477	-0.110	(0)
VOF3-	9.170e-24	7.124e-24	-23.038	-23.147	-0.110	(0)
VOF4-2	1.095e-26	3.990e-27	-25.961	-26.399	-0.439	(0)
H2V2O4+2	7.683e-31	2.799e-31	-30.114	-30.553	-0.439	(0)
V (5)	8.798e-09					
H2VO4-	7.400e-09	5.749e-09	-8.131	-8.240	-0.110	(0)
HVO4-2	1.396e-09	5.086e-10	-8.855	-9.294	-0.439	(0)
H3VO4	1.633e-12	1.633e-12	-11.787	-11.787	0.000	(0)
H3V2O7-	7.806e-14	6.065e-14	-13.108	-13.217	-0.110	(0)
HV2O7-3	9.617e-15	9.915e-16	-14.017	-15.004	-0.987	(0)
VO4-3	8.706e-16	8.977e-17	-15.060	-16.047	-0.987	(0)
VO2+	1.122e-16	9.264e-17	-15.950	-16.033	-0.083	(0)
V2O7-4	5.336e-17	9.398e-19	-16.273	-18.027	-1.754	(0)
VO2F	2.254e-17	2.254e-17	-16.647	-16.647	0.000	(0)
VO2SO4-	1.448e-17	1.125e-17	-16.839	-16.949	-0.110	(0)
V3O9-3	1.934e-18	1.994e-19	-17.713	-18.700	-0.987	(0)
VO2F2-	1.462e-18	1.136e-18	-17.835	-17.945	-0.110	(0)
VO2F3-2	5.395e-21	1.965e-21	-20.268	-20.707	-0.439	(0)
V4O12-4	2.716e-23	4.784e-25	-22.566	-24.320	-1.754	(0)
VO2F4-3	1.301e-24	1.342e-25	-23.886	-24.872	-0.987	(0)
VO2NO3	6.236e-25	6.236e-25	-24.205	-24.205	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.734	-63.681	-3.947	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.300	-63.041	-2.741	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.626	-65.380	-1.754	(0)
Zn	6.457e-06					
Zn+2	3.734e-06	1.736e-06	-5.428	-5.761	-0.333	(0)
ZnSO4	1.931e-06	1.931e-06	-5.714	-5.714	0.000	(0)
ZnCO3	3.099e-07	3.099e-07	-6.509	-6.509	0.000	(0)
Zn (SO4) 2-2	2.347e-07	8.550e-08	-6.629	-7.068	-0.439	(0)
ZnHCO3+	1.328e-07	1.031e-07	-6.877	-6.987	-0.110	(0)
ZnOH+	7.917e-08	6.150e-08	-7.101	-7.211	-0.110	(0)
ZnCl+	1.887e-08	1.550e-08	-7.724	-7.810	-0.085	(0)
ZnOHCl	7.188e-09	7.188e-09	-8.143	-8.143	0.000	(0)
ZnF+	6.185e-09	4.805e-09	-8.209	-8.318	-0.110	(0)
Zn (OH) 2	3.454e-09	3.454e-09	-8.462	-8.462	0.000	(0)
ZnCl2	8.728e-11	8.728e-11	-10.059	-10.059	0.000	(0)
Zn (OH) 3-	7.895e-12	6.134e-12	-11.103	-11.212	-0.110	(0)
ZnCl3-	3.000e-13	2.464e-13	-12.523	-12.608	-0.085	(0)
ZnNO3+	7.469e-14	5.802e-14	-13.127	-13.236	-0.110	(0)
ZnSeO4	1.817e-14	1.817e-14	-13.741	-13.741	0.000	(0)
ZnCl4-2	9.236e-16	4.379e-16	-15.035	-15.359	-0.324	(0)
Zn (OH) 4-2	2.375e-16	8.653e-17	-15.624	-16.063	-0.439	(0)

Zn(NO3)2	1.541e-22	1.541e-22	-21.812	-21.812	0.000	(0)
Zn(SeO4)2-2	3.417e-24	1.245e-24	-23.466	-23.905	-0.439	(0)
ZnS(HS)-	0.000e+00	0.000e+00	-148.441	-148.551	-0.110	(0)
Zn(HS)2	0.000e+00	0.000e+00	-150.088	-150.088	0.000	(0)
Zn(HS)3-	0.000e+00	0.000e+00	-225.271	-225.381	-0.110	(0)
ZnS(HS)2-2	0.000e+00	0.000e+00	-227.376	-227.814	-0.439	(0)
Zn(HS)4-2	0.000e+00	0.000e+00	-304.976	-305.415	-0.439	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-52.91	-46.62	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-40.28	-35.77	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-47.50	-35.77	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3)3	-68.72	-50.79	17.93	(Co(NH3)6)(NO3)3	
(Co(NH3)6)Cl3	-54.54	-34.51	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-28.25	-27.85	0.40	(NH4)2CrO4	
(NH4)2SeO4	-23.19	-22.74	0.45	(NH4)2SeO4	
Acanthite	-52.39	-88.61	-36.22	Ag2S	
Ag2CO3	-12.00	-23.09	-11.09	Ag2CO3	
Ag2CrO4	-21.27	-32.86	-11.59	Ag2CrO4	
Ag2HVO4	-12.46	-10.98	1.48	Ag2HVO4	
Ag2MoO4	-12.08	-23.63	-11.55	Ag2MoO4	
Ag2O	-15.06	-2.49	12.57	Ag2O	
Ag2Se	-0.28	-48.98	-48.70	Ag2Se	
Ag2SeO3	-9.89	-17.04	-7.15	Ag2SeO3	
Ag2SeO4	-18.84	-27.75	-8.91	Ag2SeO4	
Ag2SO4	-15.06	-19.88	-4.82	Ag2SO4	
Ag3AsO3	-28.57	-26.41	2.16	Ag3AsO3	
Ag3AsO4	-16.93	-19.71	-2.79	Ag3AsO4	
Ag3H2VO5	-17.40	-12.22	5.18	Ag3H2VO5	
AgF:4H2O	-13.70	-12.65	1.05	AgF:4H2O	
Agmetal	-0.54	-14.04	-13.51	Ag	
AgVO3	-10.50	-9.73	0.77	AgVO3	
Al(OH)3(am)	-1.33	9.47	10.80	Al(OH)3	
Al2(MoO4)3	-46.85	-44.48	2.37	Al2(MoO4)3	
Al2O3	-0.70	18.95	19.65	Al2O3	
Al4(OH)10SO4	-2.19	20.51	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-11.31	-6.51	4.80	AlAsO4:2H2O	
AlOHSO4	-4.68	-7.91	-3.23	AlOHSO4	
AlSb	-152.36	-86.73	65.62	AlSb	
Alunite	0.07	-1.33	-1.40	KAl3(SO4)2(OH)6	
Anglesite	-4.06	-11.85	-7.79	PbSO4	
Anhydrite	-0.96	-5.32	-4.36	CaSO4	
Anilite	-55.52	-87.40	-31.88	Cu0.25Cu1.5S	
Antlerite	-2.37	6.42	8.79	Cu3(OH)4SO4	
Aragonite	-0.23	-8.53	-8.30	CaCO3	
Arsenolite	-87.96	-90.72	-2.76	As4O6	
Artinite	-5.47	4.13	9.60	MgCO3:Mg(OH)2:3H2O	
As2O5	-38.67	-31.96	6.71	As2O5	
Atacamite	-1.52	5.87	7.39	Cu2(OH)3Cl	
Azurite	-0.49	-17.40	-16.91	Cu3(OH)2(CO3)2	
Ba(OH)2:8H2O	-17.03	7.36	24.39	Ba(OH)2:8H2O	
Ba2V2O7:2H2O	-18.11	-2.24	15.87	Ba2V2O7:2H2O	
Ba3(AsO4)2	-0.95	-9.86	-8.91	Ba3(AsO4)2	
Ba3(VO4)2:4H2O	-27.82	5.12	32.94	Ba3(VO4)2:4H2O	
BaCrO4	-13.33	-23.00	-9.67	BaCrO4	
BaF2	-9.62	-15.44	-5.82	BaF2	
BaMoO4	-6.82	-13.78	-6.96	BaMoO4	
Barite	-0.04	-10.02	-9.98	BaSO4	
BaS	-94.93	-78.75	16.18	BaS	
BaSeO3	-9.02	-7.19	1.83	BaSeO3	
BaSeO4	-10.44	-17.90	-7.46	BaSeO4	
Bianchite	-6.29	-8.06	-1.76	ZnSO4:6H2O	
Birnessite	-7.50	10.59	18.09	MnO2	
Bixbyite	-3.78	-4.42	-0.64	Mn2O3	
BlaubleiI	-55.25	-79.41	-24.16	Cu0.9Cu0.2S	

BlaubleiII	-55.82	-83.10	-27.28	Cu0.6Cu0.8S
Boehmite	0.90	9.47	8.58	AlOOH
Breithauptite	-57.13	-75.65	-18.52	NiSb
Brochantite	-0.87	14.35	15.22	Cu4(OH)6SO4
Brucite	-4.48	12.37	16.84	Mg(OH)2
Bunsenite	-4.69	7.76	12.45	NiO
Ca(VO3)2	-10.56	-4.90	5.66	Ca(VO3)2
Ca2V2O7	-10.33	7.17	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.39	7.17	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-18.05	4.25	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-19.72	19.24	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-20.62	19.24	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-299.18	-156.20	142.97	Ca3Sb2
CaCrO4	-16.03	-18.30	-2.27	CaCrO4
Calcite	-0.05	-8.53	-8.48	CaCO3
Calomel	-6.95	-24.86	-17.91	Hg2Cl2
CaMoO4	-1.12	-9.07	-7.95	CaMoO4
Carnotite	-2.12	-1.89	0.23	KUO2VO4
CaSeO3:2H2O	-5.30	-2.48	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.17	-13.19	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.07	-2.23	9.84	Cd(BO2)2
Cd(OH)2	-7.02	6.62	13.64	Cd(OH)2
Cd(OH)2(am)	-7.11	6.62	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.62	-14.91	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.08	2.48	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.30	9.10	28.40	Cd4(OH)6SO4
CdCl2	-12.71	-13.37	-0.66	CdCl2
CdCl2:1H2O	-11.68	-13.37	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.46	-13.37	-1.91	CdCl2:2.5H2O
CdF2	-14.97	-16.19	-1.21	CdF2
Cdmetal(alpha)	-32.49	-18.98	13.51	Cd
Cdmetal(gamma)	-32.59	-18.98	13.62	Cd
CdMoO4	-0.37	-14.52	-14.15	CdMoO4
CdOHCl	-6.91	-3.37	3.54	CdOHCl
CdSb	-76.43	-76.78	-0.35	CdSb
CdSe	-19.67	-39.87	-20.20	CdSe
CdSeO4:2H2O	-16.79	-18.64	-1.85	CdSeO4:2H2O
CdSO4	-10.59	-10.76	-0.17	CdSO4
CdSO4:1H2O	-9.04	-10.76	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.89	-10.76	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-1.93	-15.06	-13.13	PbCO3
CH4(g)	-81.95	-123.00	-41.05	CH4
Chalcanthite	-6.81	-9.45	-2.64	CuSO4:5H2O
Chalcedony	-1.07	-4.62	-3.55	SiO2
Chalcocite	-55.55	-90.47	-34.92	Cu2S
Chalcopyrite	-125.79	-161.06	-35.27	CuFeS2
Chrysotile	-4.33	27.87	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.65	-97.35	-45.69	HgS
Claudetite	-87.66	-90.72	-3.06	As4O6
Clausthalite	-13.85	-40.95	-27.10	PbSe
Co(BO2)2	-28.41	-1.34	27.07	Co(BO2)2
Co(OH)2	-5.58	7.51	13.09	Co(OH)2
Co(OH)3	-9.78	-12.09	-2.31	Co(OH)3
CO2(g)	-2.45	-20.60	-18.15	CO2
Co3(AsO4)2	-22.45	-9.42	13.03	Co3(AsO4)2
Co3O4	-6.16	-16.66	-10.50	Co3O4
CoCl2	-20.74	-12.48	8.27	CoCl2
CoCl2:6H2O	-15.02	-12.48	2.54	CoCl2:6H2O
CoCO3	-3.11	-13.09	-9.98	CoCO3
CoF2	-13.70	-15.29	-1.60	CoF2
CoF3	-44.84	-46.30	-1.46	CoF3
CoFe2O4	17.07	13.54	-3.53	CoFe2O4
CoMoO4	-5.87	-13.63	-7.76	CoMoO4
CoO	-6.07	7.51	13.59	CoO
CoS(alpha)	-71.16	-78.60	-7.44	CoS
CoS(beta)	-67.53	-78.60	-11.07	CoS
CoSe	-22.77	-38.97	-16.20	CoSe

CoSeO3	-8.36	-7.04	1.32	CoSeO3
CoSeO4:6H2O	-16.22	-17.75	-1.53	CoSeO4:6H2O
CoSO4	-12.67	-9.87	2.80	CoSO4
CoSO4:6H2O	-7.40	-9.87	-2.47	CoSO4:6H2O
Cotunnite	-9.67	-14.45	-4.78	PbCl2
Covellite	-55.88	-78.18	-22.30	CuS
Cr(OH)2	-22.06	-11.24	10.82	Cr(OH)2
Cr(OH)3	-2.72	-1.39	1.34	Cr(OH)3
Cr(OH)3(am)	-0.64	-1.39	-0.75	Cr(OH)3
Cr2O3	-0.42	-2.78	-2.36	Cr2O3
CrCl2	-45.32	-31.23	14.09	CrCl2
CrCl3	-46.49	-31.38	15.11	CrCl3
CrF3	-24.26	-35.60	-11.34	CrF3
Cristobalite	-1.27	-4.62	-3.35	SiO2
Crmetal	-67.32	-36.84	30.48	Cr
CrO3	-27.16	-30.37	-3.21	CrO3
Cryolite	-8.37	-42.21	-33.84	Na3AlF6
Cu(OH)2	-0.74	7.94	8.67	Cu(OH)2
Cu(SbO3)2	-24.90	20.31	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.80	0.45	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.56	-90.45	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.04	-50.84	-45.80	Cu2Se
Cu2SO4	-19.78	-21.73	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.26	-8.16	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-60.13	-102.73	-42.59	Cu3Sb
Cu3Se2	-25.90	-89.39	-63.49	Cu3Se2
CuCO3	-1.17	-12.67	-11.50	CuCO3
CuCrO4	-16.99	-22.43	-5.44	CuCrO4
CuF	-8.67	-13.58	-4.91	CuF
CuF2	-15.99	-14.87	1.12	CuF2
CuF2:2H2O	-10.32	-14.87	-4.55	CuF2:2H2O
Cumetal	-6.22	-14.97	-8.76	Cu
CuMoO4	-0.13	-13.21	-13.08	CuMoO4
CuOCuSO4	-11.82	-1.52	10.30	CuOCuSO4
Cupricferrite	7.98	13.97	5.99	CuFe2O4
Cuprite	-2.94	-4.35	-1.41	Cu2O
Cuprousferrite	9.76	0.84	-8.92	CuFeO2
CuSe	-5.45	-38.55	-33.10	CuSe
CuSe2	-26.08	-59.44	-33.37	CuSe2
CuSeO3:2H2O	-7.13	-6.62	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.89	-17.33	-2.44	CuSeO4:5H2O
CuSO4	-12.39	-9.45	2.94	CuSO4
Diaspore	2.60	9.47	6.87	AlOOH
Djurleite	-55.74	-89.66	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.23	-16.77	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.32	-16.77	-17.09	CaMg(CO3)2
Epsomite	-2.90	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.32	3.25	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.06	0.02	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.01	-13.73	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.08	-8.52	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-17.01	-37.63	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.40	-46.13	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.95	9.28	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.37	-12.97	0.40	FeAsO4:2H2O
FeCr2O4	-6.73	0.47	7.20	FeCr2O4
FeMoO4	-7.81	-17.90	-10.09	FeMoO4
Ferrihydrite	-0.18	3.01	3.19	Fe(OH)3
Ferroselite	-45.53	-64.13	-18.60	FeSe2
FeS(ppt)	-79.92	-82.87	-2.95	FeS
FeSe	-32.24	-43.24	-11.00	FeSe
Fix_pe	-5.25	-5.25	0.00	e-
Fluorite	-0.24	-10.74	-10.50	CaF2
Galena	-66.61	-80.58	-13.97	PbS
Gibbsite	1.18	9.47	8.29	Al(OH)3
Goethite	2.52	3.01	0.49	FeOOH
Goslarite	-6.05	-8.06	-2.01	ZnSO4:7H2O
Greenalite	-20.30	0.51	20.81	Fe3Si2O5(OH)4

Greenockite	-65.14	-79.50	-14.36	CdS
Greigite	-290.17	-335.20	-45.03	Fe3S4
Gummite	-6.10	1.57	7.67	UO3
Gypsum	-0.71	-5.32	-4.61	CaSO4:2H2O
H-Jarosite	-13.63	-25.73	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-8.27	-21.14	-12.88	H2MoO4
H2S (g)	-78.11	-86.12	-8.01	H2S
H2Se (g)	-41.53	-46.49	-4.96	H2Se
Halite	-6.02	-4.42	1.60	NaCl
Halloysite	0.14	9.72	9.57	Al2Si2O5 (OH) 4
Hausmannite	-4.42	56.61	61.03	Mn3O4
Hematite	7.45	6.03	-1.42	Fe2O3
Hercynite	-0.70	22.20	22.89	FeAl2O4
Hg (CH3) 2 (g)	-183.51	-257.22	-73.71	Hg (CH3) 2
Hg (g)	-7.36	-15.23	-7.87	Hg
Hg (OH) 2	-7.73	-11.23	-3.50	Hg (OH) 2
Hg2 (g)	-15.51	-30.47	-14.96	Hg2
Hg2 (OH) 2	-10.13	-4.87	5.26	Hg2 (OH) 2
Hg2CO3	-9.42	-25.47	-16.05	Hg2CO3
Hg2CrO4	-26.53	-35.23	-8.70	Hg2CrO4
Hg2F2	-17.31	-27.68	-10.36	Hg2F2
Hg2S	-79.31	-90.99	-11.68	Hg2S
Hg2SeO3	-14.76	-19.42	-4.66	Hg2SeO3
Hg2SO4	-16.12	-22.25	-6.13	Hg2SO4
Hg3O2CO3	-24.60	-54.28	-29.68	Hg3O2CO3
HgCl (g)	-31.93	-12.43	19.50	HgCl
HgCl2	-9.96	-31.22	-21.26	HgCl2
HgF (g)	-46.51	-13.84	32.68	HgF
HgF2 (g)	-46.60	-34.04	12.57	HgF2
Hgmetal (l)	-1.78	-15.23	-13.45	Hg
HgSe	-2.02	-57.72	-55.69	HgSe
HgSeO3	-13.35	-25.78	-12.43	HgSeO3
HgSO4	-19.19	-28.61	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.81	-24.58	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.81	-20.57	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-15.11	-20.28	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-5.91	-20.71	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.44	-50.68	-17.24	K2Cr2O7
K2CrO4	-19.80	-20.32	-0.51	K2CrO4
K2MoO4	-14.36	-11.09	3.26	K2MoO4
K2SeO4	-14.48	-15.21	-0.73	K2SeO4
Kaolinite	2.28	9.72	7.43	Al2Si2O5 (OH) 4
Langite	-3.14	14.35	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.87	-6.31	-0.43	PbO:PbSO4
Laurionite	-5.08	-4.46	0.62	PbOHCl
Lepidocrocite	1.64	3.01	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.15	5.54	12.69	PbO
Mackinawite	-79.27	-82.87	-3.60	FeS
Maghemite	-0.36	6.03	6.39	Fe2O3
Magnesioferrite	1.54	18.40	16.86	Fe2MgO4
Magnesite	-0.77	-8.23	-7.46	MgCO3
Magnetite	5.87	9.28	3.40	Fe3O4
Malachite	0.57	-4.73	-5.31	Cu2 (OH) 2CO3
Manganite	-2.20	23.14	25.34	MnOOH
Massicot	-7.35	5.54	12.89	PbO
Matlockite	-6.89	-15.86	-8.97	PbClF
Melanothallite	-18.31	-12.06	6.26	CuCl2
Melanterite	-11.93	-14.14	-2.21	FeSO4:7H2O
Metacinnabar	-52.25	-97.35	-45.09	HgS
Mg (OH) 2 (active)	-6.43	12.37	18.79	Mg (OH) 2
Mg (VO3) 2	-15.89	-4.61	11.28	Mg (VO3) 2
Mg2Sb3	-274.57	-199.89	74.68	Mg2Sb3
Mg2V2O7	-18.60	7.76	26.36	Mg2V2O7
MgCr2O4	-6.61	9.59	16.20	MgCr2O4
MgCrO4	-23.38	-18.00	5.38	MgCrO4
MgF2	-2.31	-10.44	-8.13	MgF2

MgMoO4	-6.93	-8.78	-1.85	MgMoO4
MgSeO3:6H2O	-5.24	-2.19	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.70	-12.90	-1.20	MgSeO4:6H2O
Minium	-31.30	42.22	73.52	Pb3O4
Mirabilite	-5.12	-6.23	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.53	-6.63	4.90	Mn(VO3)2
Mn2(SO4)3	-50.87	-56.58	-5.71	Mn2(SO4)3
Mn2Sb	-149.41	-88.33	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.45	-0.95	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.37	-9.65	2.72	MnCl2:4H2O
MnS(grn)	-75.95	-75.78	0.17	MnS
MnS(pnk)	-79.12	-75.78	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.65	-36.15	3.50	MnSe
MnSeO3	-5.34	-4.21	1.13	MnSeO3
MnSeO3:2H2O	-5.20	-4.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.88	-14.93	-2.05	MnSeO4:5H2O
MnSO4	-9.63	-7.05	2.58	MnSO4
Monteponite	-8.48	6.62	15.10	CdO
Montroydite	-7.59	-11.23	-3.64	HgO
MoO3	-13.14	-21.14	-8.00	MoO3
Morenosite	-7.49	-9.63	-2.14	NiSO4:7H2O
MoS2	-148.72	-218.98	-70.26	MoS2
Na-Jarosite	-8.95	-20.15	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.68	-49.57	-9.90	Na2Cr2O7
Na2CrO4	-22.14	-19.21	2.93	Na2CrO4
Na2Mo2O7	-14.53	-31.13	-16.60	Na2Mo2O7
Na2MoO4	-11.47	-9.98	1.49	Na2MoO4
Na2MoO4:2H2O	-11.21	-9.98	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.69	-3.39	10.30	Na2SeO3:5H2O
Na2SeO4	-15.38	-14.10	1.28	Na2SeO4
Na3Sb	-173.92	-79.46	94.45	Na3Sb
Na3VO4	-28.43	8.26	36.68	Na3VO4
Na4V2O7	-32.05	5.35	37.40	Na4V2O7
Nantokite	-5.44	-12.17	-6.73	CuCl
NaSb	-88.19	-65.03	23.17	NaSb
Natron	-8.13	-9.44	-1.31	Na2CO3:10H2O
NaVO3	-6.76	-2.91	3.86	NaVO3
Nesquehonite	-3.57	-8.24	-4.67	MgCO3:3H2O
Ni(OH)2	-5.04	7.76	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.39	-8.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.36	13.64	32.00	Ni4(OH)6SO4
NiCO3	-5.98	-12.85	-6.87	NiCO3
NiMoO4	-2.25	-13.39	-11.14	NiMoO4
NiS(alpha)	-72.76	-78.36	-5.60	NiS
NiS(beta)	-67.26	-78.36	-11.10	NiS
NiS(gamma)	-65.56	-78.36	-12.80	NiS
NiSe	-21.03	-38.73	-17.70	NiSe
NiSeO3:2H2O	-9.61	-6.80	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.99	-17.51	-1.52	NiSeO4:6H2O
Nsutite	-6.92	10.59	17.50	MnO2
O2(g)	-31.89	51.20	83.09	O2
Orpiment	-242.66	-303.72	-61.07	As2S3
Otavite	-1.98	-13.98	-12.00	CdCO3
Pb(BO2)2	-9.83	-3.32	6.52	Pb(BO2)2
Pb(OH)2	-2.61	5.54	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-59.45	-68.21	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.71	1.08	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.11	11.08	26.19	Pb2O(OH)2
Pb2O3	-24.36	36.68	61.04	Pb2O3
Pb2OCO3	-8.96	-9.52	-0.56	Pb2OCO3
Pb2V2O7	-3.99	-5.89	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.14	-15.34	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.49	-0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.00	-3.98	11.02	Pb3O2CO3
Pb3O2SO4	-11.45	-0.77	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.33	4.77	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.11	4.77	21.88	Pb4O3SO4

PbCrO4	-12.23	-24.83	-12.60	PbCrO4
PbF2	-9.83	-17.27	-7.44	PbF2
Pbmetal	-24.30	-20.06	4.25	Pb
PbMoO4	0.02	-15.60	-15.62	PbMoO4
PbO:0.3H2O	-7.44	5.54	12.98	PbO:0.33H2O
PbSeO4	-12.88	-19.72	-6.84	PbSeO4
Periclase	-9.22	12.37	21.58	MgO
Phosgenite	-9.70	-29.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.46	31.14	49.60	PbO2
Portlandite	-10.73	12.07	22.80	Ca(OH)2
Pyrite	-124.89	-143.39	-18.51	FeS2
Pyrochroite	-4.86	10.34	15.19	Mn(OH)2
Pyrolusite	-5.44	35.94	41.38	MnO2
Quartz	-0.62	-4.62	-4.00	SiO2
Realgar	-101.85	-121.60	-19.75	AsS
Retgersite	-7.59	-9.63	-2.04	NiSO4:6H2O
Rhodochrosite	0.32	-10.26	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-12.30	-19.41	-7.11	Sb(OH)3
Sb2O4	-16.63	-13.22	3.40	Sb2O4
Sb2O5	-26.58	-36.25	-9.67	Sb2O5
Sb2Se3	-110.53	-178.29	-67.76	Sb2Se3
Sb4O6(cubic)	-59.38	-77.64	-18.26	Sb4O6
Sb4O6(orth)	-59.74	-77.64	-17.90	Sb4O6
SbCl3	-49.97	-49.40	0.57	SbCl3
SbF3	-43.40	-53.62	-10.23	SbF3
Sbmetal	-46.12	-57.81	-11.69	Sb
SbO2	-3.10	-30.92	-27.82	SbO2
Schoepite	-4.43	1.57	5.99	UO2(OH)2:H2O
Semetal(am)	-13.78	-20.89	-7.11	Se
Semetal(hex)	-13.18	-20.89	-7.71	Se
Senarmontite	-26.46	-38.82	-12.37	Sb2O3
SeO2	-14.68	-14.55	0.12	SeO2
SeO3	-46.31	-25.26	21.04	SeO3
Sepiolite	-4.87	10.89	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-7.89	10.89	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.11	-17.35	-10.24	FeCO3
SiO2(am-gel)	-1.91	-4.62	-2.71	SiO2
SiO2(am-ppt)	-1.88	-4.62	-2.74	SiO2
Smithsonite	-1.27	-11.27	-10.00	ZnCO3
Sphalerite	-65.34	-76.79	-11.45	ZnS
Spinel	-5.53	31.32	36.85	MgAl2O4
Stibnite	-246.72	-297.18	-50.46	Sb2S3
Sulfur	-58.38	-60.52	-2.14	S
Tenorite	0.29	7.94	7.64	CuO
Thenardite	-6.55	-6.23	0.32	Na2SO4
Thermonatrite	-10.08	-9.44	0.64	Na2CO3:H2O
Tyuyamunite	-5.85	-1.77	4.08	Ca(UO2)2(VO4)2
U3O8	-14.33	6.75	21.08	U3O8
U3Sb4	-581.65	-429.27	152.38	U3Sb4
U4O9	-30.64	-33.66	-3.02	U4O9
UF4	-30.90	-60.43	-29.54	UF4
UF4:2.5H2O	-27.72	-60.43	-32.72	UF4:2.5H2O
UO2(am)	-15.75	-14.82	0.93	UO2
UO2(NO3)2	-41.43	-29.28	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.13	-29.28	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.67	-29.28	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.33	-29.28	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.05	1.57	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.45	-23.70	-2.25	UO2SeO4:4H2O
UO3	-6.13	1.57	7.70	UO3
Uraninite	-10.15	-14.82	-4.67	UO2
USb2	-220.42	-190.84	29.58	USb2
V(OH)3	-19.08	-11.49	7.59	V(OH)3
V2O5	-15.61	-16.97	-1.36	V2O5
V3O5	-40.58	-38.75	1.84	V3O5
V4O7	-50.32	-43.13	7.19	V4O7
V6O13	-41.26	-102.12	-60.86	V6O13

Valentinite	-30.34	-38.82	-8.48	Sb2O3
VC12	-63.15	-44.28	18.87	VC12
VC13	-64.91	-41.47	23.43	VC13
VF4	-64.93	-50.00	14.93	VF4
Vmetal	-93.91	-49.88	44.03	V
VO	-39.04	-24.29	14.76	VO
VO(OH)2	-9.53	-4.38	5.15	VO(OH)2
VO2Cl	-21.32	-18.48	2.84	VO2Cl
VOC1	-32.63	-21.48	11.15	VOC1
VOC12	-37.13	-24.37	12.76	VOC12
VOSO4	-25.38	-21.77	3.61	VOSO4
Witherite	-4.67	-13.24	-8.57	BaCO3
Wurtzite	-67.84	-76.79	-8.95	ZnS
Zincite	-2.00	9.33	11.33	ZnO
Zincosite	-11.98	-8.05	3.93	ZnSO4
Zn(BO2)2	-7.81	0.48	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.83	-21.51	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.87	9.33	12.20	Zn(OH)2
Zn(OH)2(am)	-3.14	9.33	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.42	9.33	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.20	9.33	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.40	9.33	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.22	1.28	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.52	8.67	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.61	-3.96	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.69	-6.78	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.46	19.94	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.83	26.67	38.50	Zn5(OH)8Cl2
ZnCl2	-17.71	-10.66	7.05	ZnCl2
ZnCO3:1H2O	-1.01	-11.27	-10.26	ZnCO3:1H2O
ZnF2	-12.94	-13.48	-0.53	ZnF2
Znmetal	-42.05	-16.27	25.79	Zn
ZnMoO4	-1.69	-11.81	-10.13	ZnMoO4
ZnO(active)	-1.86	9.33	11.19	ZnO
ZnS(am)	-67.74	-76.79	-9.05	ZnS
ZnSb	-85.09	-74.07	11.01	ZnSb
ZnSe	-22.76	-37.16	-14.40	ZnSe
ZnSeO4:6H2O	-14.41	-15.93	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.42	-8.05	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 157.

```

Title Stage 9 Pit wall interaction mix calculator
MIX 904
909      1
3         0
4         0
5         0
6         0
7         0
8         0
9         0
10        0.000076
11        0.000616
12        0.000471
13        0.001108
14         0
15         0
Save solution 910

```

```

end
-----
TITLE
-----

Stage 9 Pit wall interaction mix calculator

-----
Beginning of batch-reaction calculations.
-----

Reaction step 1.

Using mix 904.

Mixture 904.

0.000e+00 Solution 3      Average HCT data for andesite oxide material
(cells SRK 0864 and SRK 0866)
0.000e+00 Solution 4      Average HCT data for biotite breccia -
oxide/transitional (cells SRK 0854 and SRK 0872)
0.000e+00 Solution 5      Average HCT data for quartz monzonite -
oxide/transitional (waste) (cells SRK 0858 and 604569)
0.000e+00 Solution 6      Average HCT data for quartz monzonite -
oxide/transitional (ore) (cell SRK 0867)
0.000e+00 Solution 7      Average HCT data for coarse crystalline porphyry -
oxide/transitional (waste) (cell CF-11-02, 0-27)
0.000e+00 Solution 8      Average HCT data for coarse crystalline porphyry -
oxide/transitional (ore) (cell CF-11-02, 0-27)
0.000e+00 Solution 9      Average HCT data for andesite sulfide material
(cells SRK 0864 and SRK 0866)
7.600e-05 Solution 10     Average HCT data for biotite breccia - sulfide
(waste) (cells 604811, 604854, 604862, 604867 and 605033)
6.160e-04 Solution 11     Average HCT data for biotite breccia - sulfide
(ore) (cells 604767, 604797, 604811, 604854, 604862, 604867 and 605033)
4.710e-04 Solution 12     Average HCT data for quartz monzonite - sulfide
(waste) (cells 604673 and 605153)
1.108e-03 Solution 13     Average HCT data for quartz monzonite - sulfide
(ore) (cells 604562, 604606, 604653, 604656 and 604669)
0.000e+00 Solution 14     Average HCT data for coarse crystalline porphyry -
sulfide (waste) (cell CF-11-02, 367-408)
0.000e+00 Solution 15     Average HCT data for coarse crystalline porphyry -
sulfide (ore) (cell CF-11-02, 367-408)
1.000e+00 Solution 909    Solution after simulation 156.

-----Solution composition-----

Elements          Molality          Moles
Ag                1.857e-08         1.861e-08
Al                2.671e-06         2.676e-06
As                2.542e-10         2.547e-10
B                 3.792e-05         3.799e-05
Ba                4.092e-08         4.100e-08
C                 2.487e-03         2.492e-03
Ca                3.185e-03         3.191e-03
Cd                1.385e-08         1.387e-08
Cl                4.295e-03         4.303e-03
Co                1.062e-07         1.064e-07
Cr                1.757e-09         1.761e-09
Cu                1.644e-06         1.647e-06
F                 2.059e-04         2.063e-04
Fe                1.256e-09         1.259e-09
Hg                2.185e-09         2.190e-09
K                 3.766e-03         3.773e-03
Mg                5.849e-03         5.861e-03
Mn                6.513e-05         6.526e-05
Mo                1.908e-06         1.911e-06

```

N	1.602e-05	1.606e-05
Na	1.343e-02	1.346e-02
Ni	1.655e-07	1.658e-07
Pb	4.895e-09	4.904e-09
S	1.425e-02	1.428e-02
Sb	2.916e-08	2.922e-08
Se	1.642e-07	1.646e-07
Si	2.406e-05	2.411e-05
U	2.631e-07	2.636e-07
V	8.808e-09	8.825e-09
Zn	6.442e-06	6.455e-06

-----Description of solution-----

equilibrium	pH	=	7.546	Charge balance
	pe	=	5.254	Adjusted to redox
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.611e-02	
	Mass of water (kg)	=	1.002e+00	
	Total alkalinity (eq/kg)	=	2.399e-03	
	Total CO2 (mol/kg)	=	2.487e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.900e-06	
	Percent error, 100*(Cat- An)/(Cat+ An)	=	0.00	
	Iterations	=	4	
	Total H	=	1.112323e+02	
	Total O	=	5.567959e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.328e-07	3.536e-07	-6.364	-6.452	-0.088	(0)
H+	3.446e-08	2.846e-08	-7.463	-7.546	-0.083	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	1.857e-08					
AgCl	1.171e-08	1.171e-08	-7.931	-7.931	0.000	(0)
AgCl2-	4.656e-09	3.618e-09	-8.332	-8.442	-0.110	(0)
Ag+	1.959e-09	1.617e-09	-8.708	-8.791	-0.083	(0)
AgSO4-	2.109e-10	1.639e-10	-9.676	-9.786	-0.110	(0)
AgCl3-2	3.136e-11	1.144e-11	-10.504	-10.942	-0.438	(0)
AgNO2	4.205e-12	4.205e-12	-11.376	-11.376	0.000	(0)
AgCl4-3	8.013e-13	8.281e-14	-12.096	-13.082	-0.986	(0)
AgF	5.629e-13	5.629e-13	-12.250	-12.250	0.000	(0)
AgOH	5.719e-14	5.719e-14	-13.243	-13.243	0.000	(0)
AgNH3+	4.402e-14	3.421e-14	-13.356	-13.466	-0.110	(0)
AgH2BO3	1.948e-14	1.948e-14	-13.710	-13.710	0.000	(0)
AgSeO3-	1.838e-14	1.429e-14	-13.736	-13.845	-0.110	(0)
Ag2Se	8.515e-15	8.515e-15	-14.070	-14.070	0.000	(0)
Ag(NO2)2-	1.043e-16	8.105e-17	-15.982	-16.091	-0.110	(0)
AgNO3	1.709e-17	1.709e-17	-16.767	-16.767	0.000	(0)
Ag(NH3)2+	3.706e-18	2.880e-18	-17.431	-17.541	-0.110	(0)
Ag(OH)2-	2.543e-18	1.976e-18	-17.595	-17.704	-0.110	(0)
Ag(SeO3)2-3	1.701e-20	1.758e-21	-19.769	-20.755	-0.986	(0)
Ag2MoO4	8.784e-25	8.784e-25	-24.056	-24.056	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.552	-73.552	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.799	-84.552	-1.752	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-147.753	-147.966	-0.213	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-147.918	-148.028	-0.110	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-149.473	-149.860	-0.386	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.805	-150.171	-0.366	(0)
Al	2.671e-06					
Al(OH)4-	2.598e-06	2.145e-06	-5.585	-5.668	-0.083	(0)
Al(OH)3	4.820e-08	4.820e-08	-7.317	-7.317	0.000	(0)
AlF3	9.171e-09	9.171e-09	-8.038	-8.038	0.000	(0)

Al(OH) 2+	8.201e-09	6.832e-09	-8.086	-8.165	-0.079	(0)
AlF2+	6.311e-09	5.258e-09	-8.200	-8.279	-0.079	(0)
AlF4-	7.712e-10	6.368e-10	-9.113	-9.196	-0.083	(0)
AlF+2	1.979e-10	9.532e-11	-9.704	-10.021	-0.317	(0)
AlOH+2	5.050e-11	2.433e-11	-10.297	-10.614	-0.317	(0)
AlSO4+	3.283e-12	2.711e-12	-11.484	-11.567	-0.083	(0)
Al+3	3.851e-13	6.880e-14	-12.414	-13.162	-0.748	(0)
Al(SO4) 2-	1.786e-13	1.475e-13	-12.748	-12.831	-0.083	(0)
AlMo6O21-3	1.696e-39	1.753e-40	-38.771	-39.756	-0.986	(0)
As (3)	2.160e-23					
H3AsO3	2.111e-23	2.111e-23	-22.675	-22.675	0.000	(0)
H2AsO3-	4.896e-25	3.805e-25	-24.310	-24.420	-0.110	(0)
HAsO3-2	3.344e-29	1.219e-29	-28.476	-28.914	-0.438	(0)
H4AsO3+	3.830e-31	2.976e-31	-30.417	-30.526	-0.110	(0)
AsO3-3	1.598e-34	1.652e-35	-33.796	-34.782	-0.986	(0)
As (5)	2.542e-10					
HAsO4-2	2.265e-10	8.260e-11	-9.645	-10.083	-0.438	(0)
H2AsO4-	2.759e-11	2.144e-11	-10.559	-10.669	-0.110	(0)
AsO4-3	8.882e-14	9.179e-15	-13.051	-14.037	-0.986	(0)
H3AsO4	1.049e-16	1.060e-16	-15.979	-15.975	0.005	(0)
B	3.792e-05					
H3BO3	3.685e-05	3.724e-05	-4.434	-4.429	0.005	(0)
H2BO3-	9.418e-07	7.601e-07	-6.026	-6.119	-0.093	(0)
MgH2BO3+	6.125e-08	4.943e-08	-7.213	-7.306	-0.093	(0)
CaH2BO3+	5.134e-08	4.144e-08	-7.290	-7.383	-0.093	(0)
NaH2BO3	1.300e-08	1.300e-08	-7.886	-7.886	0.000	(0)
BF(OH) 3-	2.551e-09	2.059e-09	-8.593	-8.686	-0.093	(0)
H5(BO3) 2-	2.985e-11	2.409e-11	-10.525	-10.618	-0.093	(0)
BF2(OH) 2-	1.076e-12	8.685e-13	-11.968	-12.061	-0.093	(0)
BaH2BO3+	5.480e-13	4.423e-13	-12.261	-12.354	-0.093	(0)
H8(BO3) 3-	1.112e-13	8.973e-14	-12.954	-13.047	-0.093	(0)
AgH2BO3	1.948e-14	1.948e-14	-13.710	-13.710	0.000	(0)
BF3OH-	1.652e-18	1.333e-18	-17.782	-17.875	-0.093	(0)
BF4-	3.207e-23	2.588e-23	-22.494	-22.587	-0.093	(0)
Ba	4.092e-08					
Ba+2	4.048e-08	1.883e-08	-7.393	-7.725	-0.332	(0)
BaHCO3+	4.028e-10	3.374e-10	-9.395	-9.472	-0.077	(0)
BaCO3	2.985e-11	2.985e-11	-10.525	-10.525	0.000	(0)
BaH2BO3+	5.480e-13	4.423e-13	-12.261	-12.354	-0.093	(0)
BaOH+	3.502e-14	2.906e-14	-13.456	-13.537	-0.081	(0)
BaNO3+	1.615e-15	1.255e-15	-14.792	-14.901	-0.110	(0)
BaNH3+2	3.374e-16	1.231e-16	-15.472	-15.910	-0.438	(0)
C (4)	2.487e-03					
HCO3-	2.252e-03	1.876e-03	-2.647	-2.727	-0.079	(0)
H2CO3	1.201e-04	1.201e-04	-3.921	-3.921	0.000	(0)
MgHCO3+	4.384e-05	3.601e-05	-4.358	-4.444	-0.085	(0)
CaHCO3+	3.952e-05	3.310e-05	-4.403	-4.480	-0.077	(0)
NaHCO3	1.139e-05	1.139e-05	-4.944	-4.944	0.000	(0)
CO3-2	6.646e-06	3.091e-06	-5.177	-5.510	-0.332	(0)
MgCO3	4.822e-06	4.822e-06	-5.317	-5.317	0.000	(0)
CaCO3	4.641e-06	4.641e-06	-5.333	-5.333	0.000	(0)
CuCO3	1.269e-06	1.269e-06	-5.897	-5.897	0.000	(0)
MnHCO3+	7.934e-07	6.584e-07	-6.101	-6.181	-0.081	(0)
NaCO3-	7.456e-07	6.211e-07	-6.127	-6.207	-0.079	(0)
ZnCO3	3.084e-07	3.084e-07	-6.511	-6.511	0.000	(0)
UO2(CO3) 3-4	2.001e-07	3.539e-09	-6.699	-8.451	-1.752	(0)
ZnHCO3+	1.324e-07	1.029e-07	-6.878	-6.988	-0.110	(0)
UO2(CO3) 2-2	6.264e-08	2.284e-08	-7.203	-7.641	-0.438	(0)
Cu(CO3) 2-2	2.895e-08	1.056e-08	-7.538	-7.976	-0.438	(0)
NiHCO3+	1.369e-08	1.064e-08	-7.864	-7.973	-0.110	(0)
CuHCO3+	1.062e-08	8.254e-09	-7.974	-8.083	-0.110	(0)
NiCO3	5.304e-09	5.304e-09	-8.275	-8.275	0.000	(0)
CoHCO3+	4.955e-09	3.850e-09	-8.305	-8.414	-0.110	(0)
PbCO3	2.601e-09	2.601e-09	-8.585	-8.585	0.000	(0)
CoCO3	1.379e-09	1.379e-09	-8.861	-8.861	0.000	(0)
PbHCO3+	5.021e-10	3.902e-10	-9.299	-9.409	-0.110	(0)
BaHCO3+	4.028e-10	3.374e-10	-9.395	-9.472	-0.077	(0)
UO2CO3	3.704e-10	3.704e-10	-9.431	-9.431	0.000	(0)

	CdCO3	2.384e-10	2.384e-10	-9.623	-9.623	0.000	(0)
	Pb (CO3) 2-2	6.358e-11	2.318e-11	-10.197	-10.635	-0.438	(0)
	BaCO3	2.985e-11	2.985e-11	-10.525	-10.525	0.000	(0)
	CdHCO3+	1.860e-11	1.445e-11	-10.730	-10.840	-0.110	(0)
	Cd (CO3) 2-2	1.498e-12	5.463e-13	-11.824	-12.263	-0.438	(0)
	FeHCO3+	4.224e-14	3.538e-14	-13.374	-13.451	-0.077	(0)
	HgCO3	2.776e-14	2.776e-14	-13.557	-13.557	0.000	(0)
	Hg (CO3) 2-2	7.442e-16	2.714e-16	-15.128	-15.566	-0.438	(0)
HgHCO3+	1.893e-17	1.471e-17	-16.723	-16.832	-0.110	(0)	
Ca	3.185e-03						
	Ca+2	2.037e-03	9.474e-04	-2.691	-3.023	-0.332	(0)
	CaSO4	1.102e-03	1.102e-03	-2.958	-2.958	0.000	(0)
	CaHCO3+	3.952e-05	3.310e-05	-4.403	-4.480	-0.077	(0)
	CaCO3	4.641e-06	4.641e-06	-5.333	-5.333	0.000	(0)
	CaF+	1.726e-06	1.433e-06	-5.763	-5.844	-0.081	(0)
	CaH2BO3+	5.134e-08	4.144e-08	-7.290	-7.383	-0.093	(0)
	CaOH+	7.979e-09	6.683e-09	-8.098	-8.175	-0.077	(0)
	CaNO3+	5.127e-11	3.984e-11	-10.290	-10.400	-0.110	(0)
CaNH3+2	3.387e-11	1.235e-11	-10.470	-10.908	-0.438	(0)	
Ca (NH3) 2+2	1.397e-19	5.094e-20	-18.855	-19.293	-0.438	(0)	
Cd	1.385e-08						
	Cd+2	7.275e-09	3.384e-09	-8.138	-8.471	-0.332	(0)
	CdSO4	4.027e-09	4.027e-09	-8.395	-8.395	0.000	(0)
	CdCl+	1.475e-09	1.146e-09	-8.831	-8.941	-0.110	(0)
	Cd (SO4) 2-2	7.563e-10	2.758e-10	-9.121	-9.559	-0.438	(0)
	CdCO3	2.384e-10	2.384e-10	-9.623	-9.623	0.000	(0)
	CdHCO3+	1.860e-11	1.445e-11	-10.730	-10.840	-0.110	(0)
	CdCl2	1.694e-11	1.694e-11	-10.771	-10.771	0.000	(0)
	CdOHC1	1.662e-11	1.662e-11	-10.779	-10.779	0.000	(0)
	CdOH+	1.223e-11	9.503e-12	-10.913	-11.022	-0.110	(0)
	CdF+	9.562e-12	7.430e-12	-11.019	-11.129	-0.110	(0)
	Cd (CO3) 2-2	1.498e-12	5.463e-13	-11.824	-12.263	-0.438	(0)
	CdCl3-	4.879e-14	3.792e-14	-13.312	-13.421	-0.110	(0)
	Cd (OH) 2	2.120e-14	2.120e-14	-13.674	-13.674	0.000	(0)
	CdF2	2.054e-15	2.054e-15	-14.687	-14.687	0.000	(0)
	CdNO3+	1.831e-16	1.423e-16	-15.737	-15.847	-0.110	(0)
	CdSeO4	4.249e-17	4.249e-17	-16.372	-16.372	0.000	(0)
	Cd2OH+3	1.560e-18	1.612e-19	-17.807	-18.793	-0.986	(0)
	Cd (SeO3) 2-2	1.444e-18	5.267e-19	-17.840	-18.278	-0.438	(0)
	Cd (OH) 3-	5.894e-19	4.580e-19	-18.230	-18.339	-0.110	(0)
	Cd (NO3) 2	9.484e-25	9.484e-25	-24.023	-24.023	0.000	(0)
Cd (OH) 4-2	7.268e-26	2.651e-26	-25.139	-25.577	-0.438	(0)	
CdHS+	0.000e+00	0.000e+00	-78.929	-79.038	-0.110	(0)	
Cd (HS) 2	0.000e+00	0.000e+00	-150.410	-150.410	0.000	(0)	
Cd (HS) 3-	0.000e+00	0.000e+00	-226.976	-227.085	-0.110	(0)	
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.027	-303.465	-0.438	(0)	
Cl	4.295e-03						
	Cl-	4.295e-03	3.547e-03	-2.367	-2.450	-0.083	(0)
	MnCl+	9.462e-08	7.853e-08	-7.024	-7.105	-0.081	(0)
	ZnCl+	1.880e-08	1.545e-08	-7.726	-7.811	-0.085	(0)
	AgCl	1.171e-08	1.171e-08	-7.931	-7.931	0.000	(0)
	ZnOHC1	7.150e-09	7.150e-09	-8.146	-8.146	0.000	(0)
	AgCl2-	4.656e-09	3.618e-09	-8.332	-8.442	-0.110	(0)
	CdCl+	1.475e-09	1.146e-09	-8.831	-8.941	-0.110	(0)
	CuCl	8.500e-10	8.500e-10	-9.071	-9.071	0.000	(0)
	CuCl2-	7.667e-10	6.298e-10	-9.115	-9.201	-0.085	(0)
	NiCl+	5.371e-10	4.173e-10	-9.270	-9.380	-0.110	(0)
	CuCl+	4.771e-10	3.919e-10	-9.321	-9.407	-0.085	(0)
	CoCl+	4.165e-10	3.237e-10	-9.380	-9.490	-0.110	(0)
	MnCl2	3.934e-10	3.934e-10	-9.405	-9.405	0.000	(0)
	ZnCl2	8.682e-11	8.682e-11	-10.061	-10.061	0.000	(0)
	PbCl+	4.532e-11	3.522e-11	-10.344	-10.453	-0.110	(0)
	AgCl3-2	3.136e-11	1.144e-11	-10.504	-10.942	-0.438	(0)
	CdCl2	1.694e-11	1.694e-11	-10.771	-10.771	0.000	(0)
	CdOHC1	1.662e-11	1.662e-11	-10.779	-10.779	0.000	(0)
	HgClOH	1.662e-11	1.662e-11	-10.779	-10.779	0.000	(0)
	HgCl2	9.440e-12	9.440e-12	-11.025	-11.025	0.000	(0)
CuCl3-2	1.007e-12	4.775e-13	-11.997	-12.321	-0.324	(0)	

AgCl4-3	8.013e-13	8.281e-14	-12.096	-13.082	-0.986	(0)
PbCl2	5.579e-13	5.579e-13	-12.253	-12.253	0.000	(0)
CuCl2	4.819e-13	4.819e-13	-12.317	-12.317	0.000	(0)
MnCl3-	4.630e-13	3.843e-13	-12.334	-12.415	-0.081	(0)
HgCl3-	4.308e-13	3.348e-13	-12.366	-12.475	-0.110	(0)
ZnCl3-	2.978e-13	2.446e-13	-12.526	-12.612	-0.085	(0)
CdCl3-	4.879e-14	3.792e-14	-13.312	-13.421	-0.110	(0)
HgCl4-2	1.296e-14	4.727e-15	-13.887	-14.325	-0.438	(0)
NiCl2	7.452e-15	7.452e-15	-14.128	-14.128	0.000	(0)
PbCl3-	1.014e-15	7.878e-16	-14.994	-15.104	-0.110	(0)
ZnCl4-2	9.143e-16	4.338e-16	-15.039	-15.363	-0.324	(0)
HgCl+	6.835e-16	5.311e-16	-15.165	-15.275	-0.110	(0)
UO2Cl+	2.228e-16	1.731e-16	-15.652	-15.762	-0.110	(0)
CrCl+2	4.382e-17	1.598e-17	-16.358	-16.796	-0.438	(0)
CuCl3-	1.942e-17	1.595e-17	-16.712	-16.797	-0.085	(0)
PbCl4-2	3.502e-18	1.277e-18	-17.456	-17.894	-0.438	(0)
CrOHC12	3.808e-19	3.808e-19	-18.419	-18.419	0.000	(0)
CrCl2+	6.919e-21	5.377e-21	-20.160	-20.269	-0.110	(0)
FeCl+2	5.635e-21	2.673e-21	-20.249	-20.573	-0.324	(0)
CuCl4-2	5.977e-22	2.835e-22	-21.224	-21.547	-0.324	(0)
VOCl+	4.312e-22	3.351e-22	-21.365	-21.475	-0.110	(0)
FeCl2+	5.103e-23	4.235e-23	-22.292	-22.373	-0.081	(0)
CrO3Cl-	3.982e-26	3.094e-26	-25.400	-25.509	-0.110	(0)
FeCl3	1.502e-26	1.502e-26	-25.823	-25.823	0.000	(0)
CoCl+2	3.728e-35	1.360e-35	-34.429	-34.867	-0.438	(0)
UCl+3	0.000e+00	0.000e+00	-44.760	-45.746	-0.986	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.399	-48.837	-0.438	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.277	-50.715	-0.438	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.099	-63.537	-0.438	(0)
Co (2)	1.062e-07					
Co+2	7.235e-08	2.638e-08	-7.141	-7.579	-0.438	(0)
CoSO4	2.673e-08	2.673e-08	-7.573	-7.573	0.000	(0)
CoHCO3+	4.955e-09	3.850e-09	-8.305	-8.414	-0.110	(0)
CoCO3	1.379e-09	1.379e-09	-8.861	-8.861	0.000	(0)
CoCl+	4.165e-10	3.237e-10	-9.380	-9.490	-0.110	(0)
CoOH+	2.395e-10	1.861e-10	-9.621	-9.730	-0.110	(0)
CoF+	1.487e-10	1.156e-10	-9.828	-9.937	-0.110	(0)
Co (OH) 2	5.227e-12	5.227e-12	-11.282	-11.282	0.000	(0)
CoNO2+	2.977e-12	2.313e-12	-11.526	-11.636	-0.110	(0)
Co (NH3) +2	9.009e-14	3.285e-14	-13.045	-13.483	-0.438	(0)
CoSeO4	8.917e-16	8.917e-16	-15.050	-15.050	0.000	(0)
CoNO3+	7.156e-16	5.561e-16	-15.145	-15.255	-0.110	(0)
Co (OH) 3-	4.746e-17	3.688e-17	-16.324	-16.433	-0.110	(0)
CoOOH-	1.192e-17	9.260e-18	-16.924	-17.033	-0.110	(0)
Co2OH+3	2.381e-18	2.461e-19	-17.623	-18.609	-0.986	(0)
Co (NH3) 2+2	3.980e-20	1.452e-20	-19.400	-19.838	-0.438	(0)
Co (NO3) 2	1.505e-23	1.505e-23	-22.823	-22.823	0.000	(0)
Co (OH) 4-2	5.667e-24	2.067e-24	-23.247	-23.685	-0.438	(0)
Co (NH3) 3+2	5.190e-27	1.893e-27	-26.285	-26.723	-0.438	(0)
Co4 (OH) 4+4	1.354e-29	2.394e-31	-28.868	-30.621	-1.752	(0)
Co (NH3) 4+2	2.821e-34	1.029e-34	-33.550	-33.988	-0.438	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.314	-41.752	-0.438	(0)
Co (3)	9.283e-29					
CoOH+2	9.283e-29	3.385e-29	-28.032	-28.470	-0.438	(0)
Co+3	1.055e-34	1.884e-35	-33.977	-34.725	-0.748	(0)
CoCl+2	3.728e-35	1.360e-35	-34.429	-34.867	-0.438	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.399	-48.837	-0.438	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.347	-58.456	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.901	-63.339	-0.438	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.099	-63.537	-0.438	(0)
Cr (2)	1.271e-26					
Cr+2	1.271e-26	4.636e-27	-25.896	-26.334	-0.438	(0)
Cr (3)	1.757e-09					
Cr (OH) 2+	1.491e-09	1.159e-09	-8.827	-8.936	-0.110	(0)
Cr (OH) 3	1.539e-10	1.539e-10	-9.813	-9.813	0.000	(0)
Cr (OH) +2	7.384e-11	2.693e-11	-10.132	-10.570	-0.438	(0)
CrOHSO4	3.244e-11	3.244e-11	-10.489	-10.489	0.000	(0)
CrO2-	3.307e-12	2.570e-12	-11.481	-11.590	-0.110	(0)

Cr(OH) 4-	2.787e-12	2.166e-12	-11.555	-11.664	-0.110	(0)
CrF+2	2.096e-13	7.644e-14	-12.679	-13.117	-0.438	(0)
CrSO4+	5.311e-14	4.127e-14	-13.275	-13.384	-0.110	(0)
Cr+3	3.369e-14	3.481e-15	-13.473	-14.458	-0.986	(0)
CrCl+2	4.382e-17	1.598e-17	-16.358	-16.796	-0.438	(0)
CrOHC12	3.808e-19	3.808e-19	-18.419	-18.419	0.000	(0)
Cr2(OH) 2SO4+2	2.165e-19	7.897e-20	-18.664	-19.103	-0.438	(0)
Cr2(OH) 2(SO4) 2	2.381e-20	2.381e-20	-19.623	-19.623	0.000	(0)
CrCl2+	6.919e-21	5.377e-21	-20.160	-20.269	-0.110	(0)
CrNO3+2	5.549e-24	2.024e-24	-23.256	-23.694	-0.438	(0)
Cr(NH3) 5OH+2	0.000e+00	0.000e+00	-40.023	-40.461	-0.438	(0)
Cr(NH3) 6+3	0.000e+00	0.000e+00	-48.381	-49.367	-0.986	(0)
Cr(NH3) 6Cl+2	0.000e+00	0.000e+00	-50.277	-50.715	-0.438	(0)
Cr(6)	1.244e-15					
CrO4-2	1.137e-15	5.290e-16	-14.944	-15.277	-0.332	(0)
HCrO4-	6.269e-17	4.871e-17	-16.203	-16.312	-0.110	(0)
NaCrO4-	3.651e-17	2.837e-17	-16.438	-16.547	-0.110	(0)
KCrO4-	7.595e-18	5.902e-18	-17.119	-17.229	-0.110	(0)
CrO3SO4-2	5.883e-24	2.145e-24	-23.230	-23.669	-0.438	(0)
H2CrO4	1.124e-24	1.124e-24	-23.949	-23.949	0.000	(0)
CrO3Cl-	3.982e-26	3.094e-26	-25.400	-25.509	-0.110	(0)
Cr2O7-2	2.258e-31	8.234e-32	-30.646	-31.084	-0.438	(0)
Cu(1)	1.863e-09					
CuCl	8.500e-10	8.500e-10	-9.071	-9.071	0.000	(0)
CuCl2-	7.667e-10	6.298e-10	-9.115	-9.201	-0.085	(0)
Cu+	2.450e-10	1.904e-10	-9.611	-9.720	-0.110	(0)
CuCl3-2	1.007e-12	4.775e-13	-11.997	-12.321	-0.324	(0)
Cu(S4) 2-3	0.000e+00	0.000e+00	-148.014	-148.390	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.763	-149.120	-0.357	(0)
Cu(2)	1.642e-06					
CuCO3	1.269e-06	1.269e-06	-5.897	-5.897	0.000	(0)
Cu+2	1.499e-07	6.972e-08	-6.824	-7.157	-0.332	(0)
CuOH+	9.490e-08	7.796e-08	-7.023	-7.108	-0.085	(0)
CuSO4	8.109e-08	8.109e-08	-7.091	-7.091	0.000	(0)
Cu(CO3) 2-2	2.895e-08	1.056e-08	-7.538	-7.976	-0.438	(0)
CuHCO3+	1.062e-08	8.254e-09	-7.974	-8.083	-0.110	(0)
Cu(OH) 2	5.500e-09	5.500e-09	-8.260	-8.260	0.000	(0)
CuF+	7.843e-10	6.095e-10	-9.105	-9.215	-0.110	(0)
CuCl+	4.771e-10	3.919e-10	-9.321	-9.407	-0.085	(0)
Cu2(OH) 2+2	4.186e-10	1.527e-10	-9.378	-9.816	-0.438	(0)
CuNO2+	1.169e-10	9.085e-11	-9.932	-10.042	-0.110	(0)
CuNH3+2	2.026e-11	7.390e-12	-10.693	-11.131	-0.438	(0)
Cu(OH) 3-	5.133e-12	3.989e-12	-11.290	-11.399	-0.110	(0)
CuCl2	4.819e-13	4.819e-13	-12.317	-12.317	0.000	(0)
Cu(NO2) 2	1.157e-14	1.157e-14	-13.937	-13.937	0.000	(0)
CuNO3+	3.773e-15	2.932e-15	-14.423	-14.533	-0.110	(0)
Cu(OH) 4-2	3.044e-17	1.110e-17	-16.517	-16.955	-0.438	(0)
CuCl3-	1.942e-17	1.595e-17	-16.712	-16.797	-0.085	(0)
CuCl4-2	5.977e-22	2.835e-22	-21.224	-21.547	-0.324	(0)
Cu(NO3) 2	4.909e-24	4.909e-24	-23.309	-23.309	0.000	(0)
Cu(HS) 3-	0.000e+00	0.000e+00	-216.875	-216.984	-0.110	(0)
F	2.059e-04					
F-	1.678e-04	1.386e-04	-3.775	-3.858	-0.083	(0)
MgF+	3.531e-05	2.916e-05	-4.452	-4.535	-0.083	(0)
CaF+	1.726e-06	1.433e-06	-5.763	-5.844	-0.081	(0)
NaF	9.434e-07	9.434e-07	-6.025	-6.025	0.000	(0)
MnF+	1.169e-07	9.701e-08	-6.932	-7.013	-0.081	(0)
AlF3	9.171e-09	9.171e-09	-8.038	-8.038	0.000	(0)
AlF2+	6.311e-09	5.258e-09	-8.200	-8.279	-0.079	(0)
ZnF+	6.168e-09	4.793e-09	-8.210	-8.319	-0.110	(0)
HF	5.832e-09	5.832e-09	-8.234	-8.234	0.000	(0)
BF(OH) 3-	2.551e-09	2.059e-09	-8.593	-8.686	-0.093	(0)
CuF+	7.843e-10	6.095e-10	-9.105	-9.215	-0.110	(0)
AlF4-	7.712e-10	6.368e-10	-9.113	-9.196	-0.083	(0)
NiF+	2.060e-10	1.601e-10	-9.686	-9.796	-0.110	(0)
AlF+2	1.979e-10	9.532e-11	-9.704	-10.021	-0.317	(0)
CoF+	1.487e-10	1.156e-10	-9.828	-9.937	-0.110	(0)
CdF+	9.562e-12	7.430e-12	-11.019	-11.129	-0.110	(0)

HF2-	3.760e-12	3.072e-12	-11.425	-11.513	-0.088	(0)
PbF+	3.516e-12	2.733e-12	-11.454	-11.563	-0.110	(0)
BF2 (OH) 2-	1.076e-12	8.685e-13	-11.968	-12.061	-0.093	(0)
UO2F+	7.407e-13	5.756e-13	-12.130	-12.240	-0.110	(0)
AgF	5.629e-13	5.629e-13	-12.250	-12.250	0.000	(0)
UO2F2	2.300e-13	2.300e-13	-12.638	-12.638	0.000	(0)
CrF+2	2.096e-13	7.644e-14	-12.679	-13.117	-0.438	(0)
UO2F3-	1.030e-14	8.005e-15	-13.987	-14.097	-0.110	(0)
PbF2	7.451e-15	7.451e-15	-14.128	-14.128	0.000	(0)
CdF2	2.054e-15	2.054e-15	-14.687	-14.687	0.000	(0)
H2F2	9.112e-17	9.112e-17	-16.040	-16.040	0.000	(0)
UO2F4-2	2.416e-17	8.810e-18	-16.617	-17.055	-0.438	(0)
VO2F	2.265e-17	2.265e-17	-16.645	-16.645	0.000	(0)
FeF2+	1.694e-17	1.406e-17	-16.771	-16.852	-0.081	(0)
FeF+2	7.993e-18	3.792e-18	-17.097	-17.421	-0.324	(0)
FeF3	2.748e-18	2.748e-18	-17.561	-17.561	0.000	(0)
PbF3-	2.520e-18	1.958e-18	-17.599	-17.708	-0.110	(0)
BF3OH-	1.652e-18	1.333e-18	-17.782	-17.875	-0.093	(0)
VO2F2-	1.466e-18	1.139e-18	-17.834	-17.943	-0.110	(0)
VOF+	3.602e-20	2.799e-20	-19.443	-19.553	-0.110	(0)
VO2F3-2	5.400e-21	1.969e-21	-20.268	-20.706	-0.438	(0)
VOF2	1.454e-21	1.454e-21	-20.837	-20.837	0.000	(0)
PbF4-2	3.560e-22	1.298e-22	-21.448	-21.887	-0.438	(0)
HgF+	4.960e-23	3.855e-23	-22.304	-22.414	-0.110	(0)
BF4-	3.207e-23	2.588e-23	-22.494	-22.587	-0.093	(0)
VOF3-	9.199e-24	7.148e-24	-23.036	-23.146	-0.110	(0)
VO2F4-3	1.299e-24	1.342e-25	-23.886	-24.872	-0.986	(0)
Sb (OH) 2F	2.386e-25	2.386e-25	-24.622	-24.622	0.000	(0)
SbOF	2.348e-25	2.348e-25	-24.629	-24.629	0.000	(0)
VOF4-2	1.096e-26	3.998e-27	-25.960	-26.398	-0.438	(0)
SiF6-2	3.588e-28	1.702e-28	-27.445	-27.769	-0.324	(0)
UF3+	1.376e-35	1.070e-35	-34.861	-34.971	-0.110	(0)
UF2+2	1.336e-36	4.871e-37	-35.874	-36.312	-0.438	(0)
UF4	1.625e-37	1.625e-37	-36.789	-36.789	0.000	(0)
UF+3	2.702e-39	2.792e-40	-38.568	-39.554	-0.986	(0)
UF5-	1.148e-39	8.921e-40	-38.940	-39.050	-0.110	(0)
UF6-2	1.024e-40	0.000e+00	-39.990	-40.428	-0.438	(0)
Fe (2)	6.041e-12					
Fe+2	4.107e-12	1.498e-12	-11.386	-11.825	-0.438	(0)
FeSO4	1.867e-12	1.867e-12	-11.729	-11.729	0.000	(0)
FeHCO3+	4.224e-14	3.538e-14	-13.374	-13.451	-0.077	(0)
FeOH+	2.540e-14	2.108e-14	-13.595	-13.676	-0.081	(0)
Fe (OH) 2	5.921e-18	5.921e-18	-17.228	-17.228	0.000	(0)
Fe (OH) 3-	7.977e-19	6.621e-19	-18.098	-18.179	-0.081	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.026	-160.026	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.455	-236.564	-0.110	(0)
Fe (3)	1.250e-09					
Fe (OH) 2+	9.408e-10	7.838e-10	-9.027	-9.106	-0.079	(0)
Fe (OH) 3	2.976e-10	2.976e-10	-9.526	-9.526	0.000	(0)
Fe (OH) 4-	1.176e-11	9.798e-12	-10.930	-11.009	-0.079	(0)
FeOH+2	1.201e-14	5.698e-15	-13.920	-14.244	-0.324	(0)
FeF2+	1.694e-17	1.406e-17	-16.771	-16.852	-0.081	(0)
FeF+2	7.993e-18	3.792e-18	-17.097	-17.421	-0.324	(0)
FeF3	2.748e-18	2.748e-18	-17.561	-17.561	0.000	(0)
FeSO4+	1.713e-18	1.422e-18	-17.766	-17.847	-0.081	(0)
Fe (SO4) 2-	1.986e-19	1.543e-19	-18.702	-18.812	-0.110	(0)
Fe+3	1.397e-19	2.496e-20	-18.855	-19.603	-0.748	(0)
FeCl+2	5.635e-21	2.673e-21	-20.249	-20.573	-0.324	(0)
FeCl2+	5.103e-23	4.235e-23	-22.292	-22.373	-0.081	(0)
FeHSeO3+2	1.777e-23	6.478e-24	-22.750	-23.189	-0.438	(0)
Fe2 (OH) 2+4	6.078e-26	1.075e-27	-25.216	-26.969	-1.752	(0)
FeCl3	1.502e-26	1.502e-26	-25.823	-25.823	0.000	(0)
FeNO3+2	9.102e-27	3.319e-27	-26.041	-26.479	-0.438	(0)
Fe3 (OH) 4+5	6.663e-33	1.218e-35	-32.176	-34.914	-2.738	(0)
H (0)	3.526e-29					
H2	1.763e-29	1.782e-29	-28.754	-28.749	0.005	(0)
Hg (0)	2.153e-09					
Hg	2.153e-09	2.153e-09	-8.667	-8.667	0.000	(0)

Hg (1)	6.016e-20					
Hg2+2	3.008e-20	1.097e-20	-19.522	-19.960	-0.438	(0)
Hg (2)	3.239e-11					
HgClOH	1.662e-11	1.662e-11	-10.779	-10.779	0.000	(0)
HgCl2	9.440e-12	9.440e-12	-11.025	-11.025	0.000	(0)
Hg (OH) 2	5.858e-12	5.920e-12	-11.232	-11.228	0.005	(0)
HgCl3-	4.308e-13	3.348e-13	-12.366	-12.475	-0.110	(0)
HgCO3	2.776e-14	2.776e-14	-13.557	-13.557	0.000	(0)
HgCl4-2	1.296e-14	4.727e-15	-13.887	-14.325	-0.438	(0)
Hg (CO3) 2-2	7.442e-16	2.714e-16	-15.128	-15.566	-0.438	(0)
HgCl+	6.835e-16	5.311e-16	-15.165	-15.275	-0.110	(0)
HgOH+	1.360e-16	1.056e-16	-15.867	-15.976	-0.110	(0)
HgHCO3+	1.893e-17	1.471e-17	-16.723	-16.832	-0.110	(0)
Hg (NH3) 2+2	1.393e-18	5.080e-19	-17.856	-18.294	-0.438	(0)
Hg (OH) 3-	3.391e-19	2.635e-19	-18.470	-18.579	-0.110	(0)
HgNH3+2	1.345e-19	4.905e-20	-18.871	-19.309	-0.438	(0)
Hg+2	2.058e-20	7.505e-21	-19.687	-20.125	-0.438	(0)
HgSO4	9.977e-21	9.977e-21	-20.001	-20.001	0.000	(0)
HgF+	4.960e-23	3.855e-23	-22.304	-22.414	-0.110	(0)
Hg (NH3) 3+2	5.744e-26	2.095e-26	-25.241	-25.679	-0.438	(0)
HgNO3+	4.743e-29	3.685e-29	-28.324	-28.434	-0.110	(0)
Hg (NH3) 4+2	4.726e-33	1.723e-33	-32.326	-32.764	-0.438	(0)
Hg (NO3) 2	2.037e-37	2.037e-37	-36.691	-36.691	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.693	-137.802	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-138.526	-138.964	-0.438	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.954	-138.954	0.000	(0)
K	3.766e-03					
K+	3.636e-03	3.003e-03	-2.439	-2.522	-0.083	(0)
KSO4-	1.296e-04	1.079e-04	-3.888	-3.967	-0.079	(0)
KCrO4-	7.595e-18	5.902e-18	-17.119	-17.229	-0.110	(0)
Mg	5.849e-03					
Mg+2	4.032e-03	1.875e-03	-2.394	-2.727	-0.332	(0)
MgSO4	1.733e-03	1.733e-03	-2.761	-2.761	0.000	(0)
MgHCO3+	4.384e-05	3.601e-05	-4.358	-4.444	-0.085	(0)
MgF+	3.531e-05	2.916e-05	-4.452	-4.535	-0.083	(0)
MgCO3	4.822e-06	4.822e-06	-5.317	-5.317	0.000	(0)
MgOH+	3.138e-07	2.640e-07	-6.503	-6.578	-0.075	(0)
MgH2BO3+	6.125e-08	4.943e-08	-7.213	-7.306	-0.093	(0)
Mn (2)	6.513e-05					
Mn+2	4.823e-05	1.759e-05	-4.317	-4.755	-0.438	(0)
MnSO4	1.588e-05	1.588e-05	-4.799	-4.799	0.000	(0)
MnHCO3+	7.934e-07	6.584e-07	-6.101	-6.181	-0.081	(0)
MnF+	1.169e-07	9.701e-08	-6.932	-7.013	-0.081	(0)
MnCl+	9.462e-08	7.853e-08	-7.024	-7.105	-0.081	(0)
MnOH+	1.882e-08	1.562e-08	-7.725	-7.806	-0.081	(0)
MnCl2	3.934e-10	3.934e-10	-9.405	-9.405	0.000	(0)
MnNO3+	4.770e-13	3.707e-13	-12.321	-12.431	-0.110	(0)
MnCl3-	4.630e-13	3.843e-13	-12.334	-12.415	-0.081	(0)
MnSeO4	3.193e-13	3.193e-13	-12.496	-12.496	0.000	(0)
Mn (OH) 3-	1.454e-17	1.207e-17	-16.837	-16.918	-0.081	(0)
Mn (NO3) 2	1.238e-20	1.238e-20	-19.907	-19.907	0.000	(0)
Mn (OH) 4-2	2.904e-23	1.378e-23	-22.537	-22.861	-0.324	(0)
MnSe	0.000e+00	0.000e+00	-41.538	-41.538	0.000	(0)
Mn (3)	7.888e-25					
Mn+3	7.888e-25	1.409e-25	-24.103	-24.851	-0.748	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.473	-41.796	-0.324	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.824	-45.915	-0.090	(0)
Mo	1.908e-06					
MoO4-2	1.907e-06	8.870e-07	-5.720	-6.052	-0.332	(0)
HMoO4-	6.463e-10	5.022e-10	-9.190	-9.299	-0.110	(0)
H2MoO4	1.047e-13	1.047e-13	-12.980	-12.980	0.000	(0)
Ag2MoO4	8.784e-25	8.784e-25	-24.056	-24.056	0.000	(0)
AlMo6O21-3	1.696e-39	1.753e-40	-38.771	-39.756	-0.986	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.797	-49.740	-3.943	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.161	-50.899	-2.738	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.910	-53.662	-1.752	(0)

H3Mo7O24-3	0.000e+00	0.000e+00	-56.976	-57.962	-0.986	(0)
N(-3)	6.848e-07					
NH4+	6.405e-07	5.169e-07	-6.193	-6.287	-0.093	(0)
NH4SO4-	3.389e-08	2.812e-08	-7.470	-7.551	-0.081	(0)
NH3	1.036e-08	1.036e-08	-7.985	-7.985	0.000	(0)
CaNH3+2	3.387e-11	1.235e-11	-10.470	-10.908	-0.438	(0)
CuNH3+2	2.026e-11	7.390e-12	-10.693	-11.131	-0.438	(0)
NiNH3+2	7.015e-13	2.558e-13	-12.154	-12.592	-0.438	(0)
Co(NH3)+2	9.009e-14	3.285e-14	-13.045	-13.483	-0.438	(0)
AgNH3+	4.402e-14	3.421e-14	-13.356	-13.466	-0.110	(0)
BaNH3+2	3.374e-16	1.231e-16	-15.472	-15.910	-0.438	(0)
Ag(NH3)2+	3.706e-18	2.880e-18	-17.431	-17.541	-0.110	(0)
Hg(NH3)2+2	1.393e-18	5.080e-19	-17.856	-18.294	-0.438	(0)
Ni(NH3)2+2	1.050e-18	3.830e-19	-17.979	-18.417	-0.438	(0)
Ca(NH3)2+2	1.397e-19	5.094e-20	-18.855	-19.293	-0.438	(0)
HgNH3+2	1.345e-19	4.905e-20	-18.871	-19.309	-0.438	(0)
Co(NH3)2+2	3.980e-20	1.452e-20	-19.400	-19.838	-0.438	(0)
Hg(NH3)3+2	5.744e-26	2.095e-26	-25.241	-25.679	-0.438	(0)
Co(NH3)3+2	5.190e-27	1.893e-27	-26.285	-26.723	-0.438	(0)
Hg(NH3)4+2	4.726e-33	1.723e-33	-32.326	-32.764	-0.438	(0)
Co(NH3)4+2	2.821e-34	1.029e-34	-33.550	-33.988	-0.438	(0)
Cr(NH3)5OH+2	0.000e+00	0.000e+00	-40.023	-40.461	-0.438	(0)
Co(NH3)5+2	0.000e+00	0.000e+00	-41.314	-41.752	-0.438	(0)
Cr(NH3)6+3	0.000e+00	0.000e+00	-48.381	-49.367	-0.986	(0)
Co(NH3)5Cl+2	0.000e+00	0.000e+00	-48.399	-48.837	-0.438	(0)
Cr(NH3)6Cl+2	0.000e+00	0.000e+00	-50.277	-50.715	-0.438	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-58.347	-58.456	-0.110	(0)
Co(NH3)6OH+2	0.000e+00	0.000e+00	-62.901	-63.339	-0.438	(0)
Co(NH3)6Cl+2	0.000e+00	0.000e+00	-63.099	-63.537	-0.438	(0)
N(3)	1.532e-05					
NO2-	1.532e-05	1.244e-05	-4.815	-4.905	-0.090	(0)
CuNO2+	1.169e-10	9.085e-11	-9.932	-10.042	-0.110	(0)
AgNO2	4.205e-12	4.205e-12	-11.376	-11.376	0.000	(0)
CoNO2+	2.977e-12	2.313e-12	-11.526	-11.636	-0.110	(0)
Cu(NO2)2	1.157e-14	1.157e-14	-13.937	-13.937	0.000	(0)
Ag(NO2)2-	1.043e-16	8.105e-17	-15.982	-16.091	-0.110	(0)
N(5)	1.616e-08					
NO3-	1.610e-08	1.330e-08	-7.793	-7.876	-0.083	(0)
CaNO3+	5.127e-11	3.984e-11	-10.290	-10.400	-0.110	(0)
MnNO3+	4.770e-13	3.707e-13	-12.321	-12.431	-0.110	(0)
ZnNO3+	7.453e-14	5.792e-14	-13.128	-13.237	-0.110	(0)
CuNO3+	3.773e-15	2.932e-15	-14.423	-14.533	-0.110	(0)
NiNO3+	1.977e-15	1.536e-15	-14.704	-14.814	-0.110	(0)
BaNO3+	1.615e-15	1.255e-15	-14.792	-14.901	-0.110	(0)
CoNO3+	7.156e-16	5.561e-16	-15.145	-15.255	-0.110	(0)
CdNO3+	1.831e-16	1.423e-16	-15.737	-15.847	-0.110	(0)
PbNO3+	7.084e-17	5.505e-17	-16.150	-16.259	-0.110	(0)
AgNO3	1.709e-17	1.709e-17	-16.767	-16.767	0.000	(0)
Mn(NO3)2	1.238e-20	1.238e-20	-19.907	-19.907	0.000	(0)
UO2NO3+	1.028e-21	7.986e-22	-20.988	-21.098	-0.110	(0)
Zn(NO3)2	1.537e-22	1.537e-22	-21.813	-21.813	0.000	(0)
Co(NO3)2	1.505e-23	1.505e-23	-22.823	-22.823	0.000	(0)
CrNO3+2	5.549e-24	2.024e-24	-23.256	-23.694	-0.438	(0)
Cu(NO3)2	4.909e-24	4.909e-24	-23.309	-23.309	0.000	(0)
Pb(NO3)2	1.243e-24	1.243e-24	-23.905	-23.905	0.000	(0)
Cd(NO3)2	9.484e-25	9.484e-25	-24.023	-24.023	0.000	(0)
VO2NO3	6.270e-25	6.270e-25	-24.203	-24.203	0.000	(0)
FeNO3+2	9.102e-27	3.319e-27	-26.041	-26.479	-0.438	(0)
HgNO3+	4.743e-29	3.685e-29	-28.324	-28.434	-0.110	(0)
Hg(NO3)2	2.037e-37	2.037e-37	-36.691	-36.691	0.000	(0)
Na	1.343e-02					
Na+	1.307e-02	1.079e-02	-1.884	-1.967	-0.083	(0)
NaSO4-	3.532e-04	2.942e-04	-3.452	-3.531	-0.079	(0)
NaHCO3	1.139e-05	1.139e-05	-4.944	-4.944	0.000	(0)
NaF	9.434e-07	9.434e-07	-6.025	-6.025	0.000	(0)
NaCO3-	7.456e-07	6.211e-07	-6.127	-6.207	-0.079	(0)
NaH2BO3	1.300e-08	1.300e-08	-7.886	-7.886	0.000	(0)
NaCrO4-	3.651e-17	2.837e-17	-16.438	-16.547	-0.110	(0)

Ni	1.655e-07					
Ni+2	9.888e-08	4.599e-08	-7.005	-7.337	-0.332	(0)
NiSO4	4.659e-08	4.659e-08	-7.332	-7.332	0.000	(0)
NiHCO3+	1.369e-08	1.064e-08	-7.864	-7.973	-0.110	(0)
NiCO3	5.304e-09	5.304e-09	-8.275	-8.275	0.000	(0)
NiCl+	5.371e-10	4.173e-10	-9.270	-9.380	-0.110	(0)
NiOH+	2.634e-10	2.047e-10	-9.579	-9.689	-0.110	(0)
NiF+	2.060e-10	1.601e-10	-9.686	-9.796	-0.110	(0)
Ni (SO4) 2-2	2.148e-11	7.833e-12	-10.668	-11.106	-0.438	(0)
Ni (OH) 2	5.750e-12	5.750e-12	-11.240	-11.240	0.000	(0)
NiNH3+2	7.015e-13	2.558e-13	-12.154	-12.592	-0.438	(0)
NiCl2	7.452e-15	7.452e-15	-14.128	-14.128	0.000	(0)
Ni (OH) 3-	2.616e-15	2.033e-15	-14.582	-14.692	-0.110	(0)
NiNO3+	1.977e-15	1.536e-15	-14.704	-14.814	-0.110	(0)
NiSeO4	1.451e-15	1.451e-15	-14.838	-14.838	0.000	(0)
Ni (NH3) 2+2	1.050e-18	3.830e-19	-17.979	-18.417	-0.438	(0)
O (0)	3.155e-35					
O2	1.578e-35	1.595e-35	-34.802	-34.797	0.005	(0)
Pb	4.895e-09					
PbCO3	2.601e-09	2.601e-09	-8.585	-8.585	0.000	(0)
PbSO4	6.960e-10	6.960e-10	-9.157	-9.157	0.000	(0)
Pb+2	6.017e-10	2.799e-10	-9.221	-9.553	-0.332	(0)
PbHCO3+	5.021e-10	3.902e-10	-9.299	-9.409	-0.110	(0)
PbOH+	3.199e-10	2.486e-10	-9.495	-9.605	-0.110	(0)
Pb (CO3) 2-2	6.358e-11	2.318e-11	-10.197	-10.635	-0.438	(0)
Pb (SO4) 2-2	5.838e-11	2.129e-11	-10.234	-10.672	-0.438	(0)
PbCl+	4.532e-11	3.522e-11	-10.344	-10.453	-0.110	(0)
PbF+	3.516e-12	2.733e-12	-11.454	-11.563	-0.110	(0)
Pb (OH) 2	2.779e-12	2.779e-12	-11.556	-11.556	0.000	(0)
PbCl2	5.579e-13	5.579e-13	-12.253	-12.253	0.000	(0)
PbF2	7.451e-15	7.451e-15	-14.128	-14.128	0.000	(0)
Pb (OH) 3-	1.265e-15	9.827e-16	-14.898	-15.008	-0.110	(0)
PbCl3-	1.014e-15	7.878e-16	-14.994	-15.104	-0.110	(0)
PbNO3+	7.084e-17	5.505e-17	-16.150	-16.259	-0.110	(0)
Pb2OH+3	1.067e-17	1.103e-18	-16.972	-17.958	-0.986	(0)
PbCl4-2	3.502e-18	1.277e-18	-17.456	-17.894	-0.438	(0)
PbF3-	2.520e-18	1.958e-18	-17.599	-17.708	-0.110	(0)
Pb (OH) 4-2	2.334e-19	8.510e-20	-18.632	-19.070	-0.438	(0)
PbF4-2	3.560e-22	1.298e-22	-21.448	-21.887	-0.438	(0)
Pb3 (OH) 4+2	1.183e-22	4.314e-23	-21.927	-22.365	-0.438	(0)
Pb (NO3) 2	1.243e-24	1.243e-24	-23.905	-23.905	0.000	(0)
Pb4 (OH) 4+4	5.423e-27	9.591e-29	-26.266	-28.018	-1.752	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.434	-151.434	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.600	-228.710	-0.110	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.552	-73.552	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.466	-78.576	-0.110	(0)
CdHS+	0.000e+00	0.000e+00	-78.929	-79.038	-0.110	(0)
H2S	0.000e+00	0.000e+00	-79.101	-79.101	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.957	-80.395	-0.438	(0)
S6-2	0.000e+00	0.000e+00	-80.473	-80.911	-0.438	(0)
S4-2	0.000e+00	0.000e+00	-80.553	-80.991	-0.438	(0)
S3-2	0.000e+00	0.000e+00	-81.358	-81.797	-0.438	(0)
S2-2	0.000e+00	0.000e+00	-82.375	-82.813	-0.438	(0)
S-2	0.000e+00	0.000e+00	-88.006	-88.330	-0.324	(0)
HgHS2-	0.000e+00	0.000e+00	-137.693	-137.802	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-138.526	-138.964	-0.438	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.954	-138.954	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.753	-147.966	-0.213	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.918	-148.028	-0.110	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.014	-148.390	-0.376	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.447	-148.556	-0.110	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.763	-149.120	-0.357	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.473	-149.860	-0.386	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.805	-150.171	-0.366	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.092	-150.092	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.410	-150.410	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.434	-151.434	0.000	(0)

Fe (HS) 2	0.000e+00	0.000e+00	-160.026	-160.026	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.875	-216.984	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.278	-225.388	-0.110	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.976	-227.085	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.384	-227.822	-0.438	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.600	-228.710	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.455	-236.564	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.027	-303.465	-0.438	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.985	-305.423	-0.438	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.390	-318.828	-0.438	(0)
S (6)	1.425e-02					
SO4-2	1.092e-02	5.077e-03	-1.962	-2.294	-0.332	(0)
MgSO4	1.733e-03	1.733e-03	-2.761	-2.761	0.000	(0)
CaSO4	1.102e-03	1.102e-03	-2.958	-2.958	0.000	(0)
NaSO4-	3.532e-04	2.942e-04	-3.452	-3.531	-0.079	(0)
KSO4-	1.296e-04	1.079e-04	-3.888	-3.967	-0.079	(0)
MnSO4	1.588e-05	1.588e-05	-4.799	-4.799	0.000	(0)
ZnSO4	1.926e-06	1.926e-06	-5.715	-5.715	0.000	(0)
Zn (SO4) 2-2	2.335e-07	8.516e-08	-6.632	-7.070	-0.438	(0)
CuSO4	8.109e-08	8.109e-08	-7.091	-7.091	0.000	(0)
NiSO4	4.659e-08	4.659e-08	-7.332	-7.332	0.000	(0)
NH4SO4-	3.389e-08	2.812e-08	-7.470	-7.551	-0.081	(0)
CoSO4	2.673e-08	2.673e-08	-7.573	-7.573	0.000	(0)
HSO4-	1.710e-08	1.412e-08	-7.767	-7.850	-0.083	(0)
CdSO4	4.027e-09	4.027e-09	-8.395	-8.395	0.000	(0)
Cd (SO4) 2-2	7.563e-10	2.758e-10	-9.121	-9.559	-0.438	(0)
PbSO4	6.960e-10	6.960e-10	-9.157	-9.157	0.000	(0)
AgSO4-	2.109e-10	1.639e-10	-9.676	-9.786	-0.110	(0)
Pb (SO4) 2-2	5.838e-11	2.129e-11	-10.234	-10.672	-0.438	(0)
CrOHSO4	3.244e-11	3.244e-11	-10.489	-10.489	0.000	(0)
Ni (SO4) 2-2	2.148e-11	7.833e-12	-10.668	-11.106	-0.438	(0)
AlSO4+	3.283e-12	2.711e-12	-11.484	-11.567	-0.083	(0)
FeSO4	1.867e-12	1.867e-12	-11.729	-11.729	0.000	(0)
UO2SO4	2.313e-13	2.313e-13	-12.636	-12.636	0.000	(0)
Al (SO4) 2-	1.786e-13	1.475e-13	-12.748	-12.831	-0.083	(0)
CrSO4+	5.311e-14	4.127e-14	-13.275	-13.384	-0.110	(0)
UO2 (SO4) 2-2	4.245e-14	1.548e-14	-13.372	-13.810	-0.438	(0)
VO2SO4-	1.454e-17	1.130e-17	-16.837	-16.947	-0.110	(0)
FeSO4+	1.713e-18	1.422e-18	-17.766	-17.847	-0.081	(0)
Cr2 (OH) 2SO4+2	2.165e-19	7.897e-20	-18.664	-19.103	-0.438	(0)
Fe (SO4) 2-	1.986e-19	1.543e-19	-18.702	-18.812	-0.110	(0)
VOSO4	4.710e-20	4.710e-20	-19.327	-19.327	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.381e-20	2.381e-20	-19.623	-19.623	0.000	(0)
HgSO4	9.977e-21	9.977e-21	-20.001	-20.001	0.000	(0)
CrO3SO4-2	5.883e-24	2.145e-24	-23.230	-23.669	-0.438	(0)
VSO4+	2.330e-34	1.811e-34	-33.633	-33.742	-0.110	(0)
U (SO4) 2	8.234e-40	8.234e-40	-39.084	-39.084	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.252	-40.690	-0.438	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.347	-58.456	-0.110	(0)
Sb (3)	7.655e-20					
Sb (OH) 3	3.872e-20	3.872e-20	-19.412	-19.412	0.000	(0)
HSbO2	3.782e-20	3.782e-20	-19.422	-19.422	0.000	(0)
SbO2-	2.770e-24	2.153e-24	-23.558	-23.667	-0.110	(0)
Sb (OH) 4-	1.585e-24	1.232e-24	-23.800	-23.909	-0.110	(0)
Sb (OH) 2F	2.386e-25	2.386e-25	-24.622	-24.622	0.000	(0)
SbOF	2.348e-25	2.348e-25	-24.629	-24.629	0.000	(0)
Sb (OH) 2+	3.446e-26	2.678e-26	-25.463	-25.572	-0.110	(0)
SbO+	1.189e-26	9.238e-27	-25.925	-26.034	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.390	-318.828	-0.438	(0)
Sb (5)	2.916e-08					
SbO3-	2.913e-08	2.264e-08	-7.536	-7.645	-0.110	(0)
Sb (OH) 6-	3.199e-11	2.642e-11	-10.495	-10.578	-0.083	(0)
SbO2+	6.771e-24	5.262e-24	-23.169	-23.279	-0.110	(0)
Se (-2)	8.515e-15					
Ag2Se	8.515e-15	8.515e-15	-14.070	-14.070	0.000	(0)
HSe-	1.463e-39	1.137e-39	-38.835	-38.944	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-41.538	-41.538	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.600	-42.600	0.000	(0)

Se-2	0.000e+00	0.000e+00	-45.960	-46.398	-0.438	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.799	-84.552	-1.752	(0)
Se (4)	1.641e-07					
HSeO3-	1.264e-07	9.823e-08	-6.898	-7.008	-0.110	(0)
SeO3-2	3.768e-08	1.374e-08	-7.424	-7.862	-0.438	(0)
H2SeO3	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
AgSeO3-	1.838e-14	1.429e-14	-13.736	-13.845	-0.110	(0)
Cd (SeO3) 2-2	1.444e-18	5.267e-19	-17.840	-18.278	-0.438	(0)
Ag (SeO3) 2-3	1.701e-20	1.758e-21	-19.769	-20.755	-0.986	(0)
FeHSeO3+2	1.777e-23	6.478e-24	-22.750	-23.189	-0.438	(0)
Se (6)	1.453e-10					
SeO4-2	1.450e-10	6.744e-11	-9.839	-10.171	-0.332	(0)
MnSeO4	3.193e-13	3.193e-13	-12.496	-12.496	0.000	(0)
ZnSeO4	1.811e-14	1.811e-14	-13.742	-13.742	0.000	(0)
NiSeO4	1.451e-15	1.451e-15	-14.838	-14.838	0.000	(0)
CoSeO4	8.917e-16	8.917e-16	-15.050	-15.050	0.000	(0)
HSeO4-	1.238e-16	9.619e-17	-15.907	-16.017	-0.110	(0)
CdSeO4	4.249e-17	4.249e-17	-16.372	-16.372	0.000	(0)
Zn (SeO4) 2-2	3.396e-24	1.238e-24	-23.469	-23.907	-0.438	(0)
Si	2.406e-05					
H4SiO4	2.391e-05	2.417e-05	-4.621	-4.617	0.005	(0)
H3SiO4-	1.494e-07	1.228e-07	-6.826	-6.911	-0.085	(0)
H2SiO4-2	5.651e-13	2.722e-13	-12.248	-12.565	-0.317	(0)
UO2H3SiO4+	4.036e-13	3.137e-13	-12.394	-12.504	-0.110	(0)
SiF6-2	3.588e-28	1.702e-28	-27.445	-27.769	-0.324	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.060	-59.045	-0.986	(0)
U (4)	5.269e-21					
U (OH) 5-	5.264e-21	4.091e-21	-20.279	-20.388	-0.110	(0)
U (OH) 4	4.879e-24	4.879e-24	-23.312	-23.312	0.000	(0)
U (OH) 3+	6.537e-28	5.080e-28	-27.185	-27.294	-0.110	(0)
U (OH) 2+2	1.834e-32	6.689e-33	-31.737	-32.175	-0.438	(0)
UF3+	1.376e-35	1.070e-35	-34.861	-34.971	-0.110	(0)
UF2+2	1.336e-36	4.871e-37	-35.874	-36.312	-0.438	(0)
UF4	1.625e-37	1.625e-37	-36.789	-36.789	0.000	(0)
UOH+3	8.681e-38	8.971e-39	-37.061	-38.047	-0.986	(0)
UF+3	2.702e-39	2.792e-40	-38.568	-39.554	-0.986	(0)
UF5-	1.148e-39	8.921e-40	-38.940	-39.050	-0.110	(0)
U (SO4) 2	8.234e-40	8.234e-40	-39.084	-39.084	0.000	(0)
UF6-2	1.024e-40	0.000e+00	-39.990	-40.428	-0.438	(0)
USO4+2	0.000e+00	0.000e+00	-40.252	-40.690	-0.438	(0)
U+4	0.000e+00	0.000e+00	-43.243	-44.996	-1.752	(0)
UC1+3	0.000e+00	0.000e+00	-44.760	-45.746	-0.986	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-165.075	-173.947	-8.871	(0)
U (5)	1.316e-16					
UO2+	1.316e-16	1.023e-16	-15.881	-15.990	-0.110	(0)
U (6)	2.631e-07					
UO2 (CO3) 3-4	2.001e-07	3.539e-09	-6.699	-8.451	-1.752	(0)
UO2 (CO3) 2-2	6.264e-08	2.284e-08	-7.203	-7.641	-0.438	(0)
UO2CO3	3.704e-10	3.704e-10	-9.431	-9.431	0.000	(0)
UO2OH+	1.724e-12	1.340e-12	-11.763	-11.873	-0.110	(0)
UO2F+	7.407e-13	5.756e-13	-12.130	-12.240	-0.110	(0)
UO2H3SiO4+	4.036e-13	3.137e-13	-12.394	-12.504	-0.110	(0)
UO2SO4	2.313e-13	2.313e-13	-12.636	-12.636	0.000	(0)
UO2F2	2.300e-13	2.300e-13	-12.638	-12.638	0.000	(0)
UO2+2	6.471e-14	3.010e-14	-13.189	-13.521	-0.332	(0)
UO2 (SO4) 2-2	4.245e-14	1.548e-14	-13.372	-13.810	-0.438	(0)
UO2F3-	1.030e-14	8.005e-15	-13.987	-14.097	-0.110	(0)
UO2Cl+	2.228e-16	1.731e-16	-15.652	-15.762	-0.110	(0)
UO2F4-2	2.416e-17	8.810e-18	-16.617	-17.055	-0.438	(0)
(UO2) 2 (OH) 2+2	8.168e-18	2.979e-18	-17.088	-17.526	-0.438	(0)
(UO2) 3 (OH) 5+	4.870e-19	3.784e-19	-18.312	-18.422	-0.110	(0)
UO2NO3+	1.028e-21	7.986e-22	-20.988	-21.098	-0.110	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.517	-42.627	-0.110	(0)
V+2	0.000e+00	0.000e+00	-43.247	-43.685	-0.438	(0)
V (3)	2.694e-15					
V (OH) 3	2.694e-15	2.694e-15	-14.570	-14.570	0.000	(0)

V(OH) 2+	6.380e-26	4.958e-26	-25.195	-25.305	-0.110	(0)
VOH+2	3.672e-29	1.339e-29	-28.435	-28.873	-0.438	(0)
V+3	7.312e-34	7.556e-35	-33.136	-34.122	-0.986	(0)
VSO4+	2.330e-34	1.811e-34	-33.633	-33.742	-0.110	(0)
V2(OH) 3+3	0.000e+00	0.000e+00	-54.740	-55.726	-0.986	(0)
V2(OH) 2+4	0.000e+00	0.000e+00	-55.194	-56.946	-1.752	(0)
V(4)	3.233e-18					
V(OH) 3+	3.055e-18	2.374e-18	-17.515	-17.624	-0.110	(0)
VO+2	9.236e-20	3.368e-20	-19.035	-19.473	-0.438	(0)
VOSO4	4.710e-20	4.710e-20	-19.327	-19.327	0.000	(0)
VOF+	3.602e-20	2.799e-20	-19.443	-19.553	-0.110	(0)
VOF2	1.454e-21	1.454e-21	-20.837	-20.837	0.000	(0)
VOC1+	4.312e-22	3.351e-22	-21.365	-21.475	-0.110	(0)
VOF3-	9.199e-24	7.148e-24	-23.036	-23.146	-0.110	(0)
VOF4-2	1.096e-26	3.998e-27	-25.960	-26.398	-0.438	(0)
H2V2O4+2	7.759e-31	2.830e-31	-30.110	-30.548	-0.438	(0)
V(5)	8.808e-09					
H2VO4-	7.412e-09	5.760e-09	-8.130	-8.240	-0.110	(0)
HVO4-2	1.394e-09	5.084e-10	-8.856	-9.294	-0.438	(0)
H3VO4	1.639e-12	1.639e-12	-11.785	-11.785	0.000	(0)
H3V2O7-	7.850e-14	6.100e-14	-13.105	-13.215	-0.110	(0)
HV2O7-3	9.610e-15	9.931e-16	-14.017	-15.003	-0.986	(0)
VO4-3	8.665e-16	8.955e-17	-15.062	-16.048	-0.986	(0)
VO2+	1.129e-16	9.321e-17	-15.947	-16.031	-0.083	(0)
V2O7-4	5.311e-17	9.393e-19	-16.275	-18.027	-1.752	(0)
VO2F	2.265e-17	2.265e-17	-16.645	-16.645	0.000	(0)
VO2SO4-	1.454e-17	1.130e-17	-16.837	-16.947	-0.110	(0)
V3O9-3	1.941e-18	2.006e-19	-17.712	-18.698	-0.986	(0)
VO2F2-	1.466e-18	1.139e-18	-17.834	-17.943	-0.110	(0)
VO2F3-2	5.400e-21	1.969e-21	-20.268	-20.706	-0.438	(0)
V4O12-4	2.725e-23	4.820e-25	-22.565	-24.317	-1.752	(0)
VO2F4-3	1.299e-24	1.342e-25	-23.886	-24.872	-0.986	(0)
VO2NO3	6.270e-25	6.270e-25	-24.203	-24.203	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.726	-63.669	-3.943	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.290	-63.028	-2.738	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.614	-65.367	-1.752	(0)
Zn	6.442e-06					
Zn+2	3.728e-06	1.734e-06	-5.429	-5.761	-0.332	(0)
ZnSO4	1.926e-06	1.926e-06	-5.715	-5.715	0.000	(0)
ZnCO3	3.084e-07	3.084e-07	-6.511	-6.511	0.000	(0)
Zn(SO4) 2-2	2.335e-07	8.516e-08	-6.632	-7.070	-0.438	(0)
ZnHCO3+	1.324e-07	1.029e-07	-6.878	-6.988	-0.110	(0)
ZnOH+	7.889e-08	6.131e-08	-7.103	-7.212	-0.110	(0)
ZnCl+	1.880e-08	1.545e-08	-7.726	-7.811	-0.085	(0)
ZnOHCl	7.150e-09	7.150e-09	-8.146	-8.146	0.000	(0)
ZnF+	6.168e-09	4.793e-09	-8.210	-8.319	-0.110	(0)
Zn(OH) 2	3.435e-09	3.435e-09	-8.464	-8.464	0.000	(0)
ZnCl2	8.682e-11	8.682e-11	-10.061	-10.061	0.000	(0)
Zn(OH) 3-	7.834e-12	6.088e-12	-11.106	-11.216	-0.110	(0)
ZnCl3-	2.978e-13	2.446e-13	-12.526	-12.612	-0.085	(0)
ZnNO3+	7.453e-14	5.792e-14	-13.128	-13.237	-0.110	(0)
ZnSeO4	1.811e-14	1.811e-14	-13.742	-13.742	0.000	(0)
ZnCl4-2	9.143e-16	4.338e-16	-15.039	-15.363	-0.324	(0)
Zn(OH) 4-2	2.350e-16	8.570e-17	-15.629	-16.067	-0.438	(0)
Zn(NO3) 2	1.537e-22	1.537e-22	-21.813	-21.813	0.000	(0)
Zn(SeO4) 2-2	3.396e-24	1.238e-24	-23.469	-23.907	-0.438	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.447	-148.556	-0.110	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.092	-150.092	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.278	-225.388	-0.110	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.384	-227.822	-0.438	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.985	-305.423	-0.438	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3)2	-52.92	-46.63	6.29	(Co(NH3)5Cl)(NO3)2	
(Co(NH3)5Cl)Cl2	-40.29	-35.78	4.51	(Co(NH3)5Cl)Cl2	

(Co (NH3) 5OH2) Cl3	-47.51	-35.78	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-68.73	-50.80	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-54.55	-34.52	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.25	-27.85	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.19	-22.74	0.45	(NH4) 2SeO4
Acanthite	-52.39	-88.61	-36.22	Ag2S
Ag2CO3	-12.00	-23.09	-11.09	Ag2CO3
Ag2CrO4	-21.27	-32.86	-11.59	Ag2CrO4
Ag2HVO4	-12.46	-10.98	1.48	Ag2HVO4
Ag2MoO4	-12.08	-23.63	-11.55	Ag2MoO4
Ag2O	-15.07	-2.49	12.57	Ag2O
Ag2Se	-0.28	-48.98	-48.70	Ag2Se
Ag2SeO3	-9.89	-17.04	-7.15	Ag2SeO3
Ag2SeO4	-18.84	-27.75	-8.91	Ag2SeO4
Ag2SO4	-15.06	-19.88	-4.82	Ag2SO4
Ag3AsO3	-28.57	-26.41	2.16	Ag3AsO3
Ag3AsO4	-16.92	-19.71	-2.79	Ag3AsO4
Ag3H2VO5	-17.40	-12.22	5.18	Ag3H2VO5
AgF:4H2O	-13.70	-12.65	1.05	AgF:4H2O
Agmetal	-0.54	-14.04	-13.51	Ag
AgVO3	-10.50	-9.73	0.77	AgVO3
Al (OH) 3 (am)	-1.33	9.47	10.80	Al (OH) 3
Al2 (MoO4) 3	-46.85	-44.48	2.37	Al2 (MoO4) 3
Al2O3	-0.70	18.95	19.65	Al2O3
Al4 (OH) 10SO4	-2.19	20.51	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-11.30	-6.50	4.80	AlAsO4:2H2O
AlOHSO4	-4.68	-7.91	-3.23	AlOHSO4
AlSb	-152.36	-86.73	65.62	AlSb
Alunite	0.07	-1.33	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.06	-11.85	-7.79	PbSO4
Anhydrite	-0.96	-5.32	-4.36	CaSO4
Anilite	-55.52	-87.40	-31.88	Cu0.25Cu1.5S
Antlerite	-2.37	6.42	8.79	Cu3 (OH) 4SO4
Aragonite	-0.23	-8.53	-8.30	CaCO3
Arsenolite	-87.94	-90.70	-2.76	As4O6
Artinite	-5.47	4.13	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.65	-31.95	6.71	As2O5
Atacamite	-1.52	5.87	7.39	Cu2 (OH) 3Cl
Azurite	-0.49	-17.40	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-17.03	7.36	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-18.11	-2.24	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	-0.94	-9.85	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-27.81	5.13	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-13.33	-23.00	-9.67	BaCrO4
BaF2	-9.62	-15.44	-5.82	BaF2
BaMoO4	-6.82	-13.78	-6.96	BaMoO4
Barite	-0.04	-10.02	-9.98	BaSO4
BaS	-94.93	-78.75	16.18	BaS
BaSeO3	-9.02	-7.19	1.83	BaSeO3
BaSeO4	-10.44	-17.90	-7.46	BaSeO4
Bianchite	-6.29	-8.06	-1.76	ZnSO4:6H2O
Birnessite	-7.51	10.59	18.09	MnO2
Bixbyite	-3.78	-4.43	-0.64	Mn2O3
BlaubleiI	-55.25	-79.41	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.82	-83.10	-27.28	Cu0.6Cu0.8S
Boehmite	0.90	9.47	8.58	AlOOH
Breithauptite	-57.13	-75.65	-18.52	NiSb
Brochantite	-0.87	14.35	15.22	Cu4 (OH) 6SO4
Brucite	-4.48	12.36	16.84	Mg (OH) 2
Bunsenite	-4.69	7.75	12.45	NiO
Ca (VO3) 2	-10.56	-4.90	5.66	Ca (VO3) 2
Ca2V2O7	-10.33	7.17	17.50	Ca2V2O7
Ca2V2O7:2H2O	-14.39	7.17	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-18.05	4.25	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-19.73	19.23	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-20.63	19.23	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-299.19	-156.21	142.97	Ca3Sb2
CaCrO4	-16.03	-18.30	-2.27	CaCrO4

Calcite	-0.05	-8.53	-8.48	CaCO3
Calomel	-6.95	-24.86	-17.91	Hg2Cl2
CaMoO4	-1.13	-9.08	-7.95	CaMoO4
Carnotite	-2.12	-1.89	0.23	KUO2VO4
CaSeO3:2H2O	-5.30	-2.49	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-10.18	-13.20	-3.02	CaSeO4:2H2O
Cd(BO2)2	-12.08	-2.24	9.84	Cd(BO2)2
Cd(OH)2	-7.02	6.62	13.64	Cd(OH)2
Cd(OH)2(am)	-7.11	6.62	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-21.62	-14.91	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-20.08	2.48	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-19.30	9.10	28.40	Cd4(OH)6SO4
CdCl2	-12.71	-13.37	-0.66	CdCl2
CdCl2:1H2O	-11.68	-13.37	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-11.46	-13.37	-1.91	CdCl2:2.5H2O
CdF2	-14.97	-16.19	-1.21	CdF2
Cdmetal(alpha)	-32.49	-18.98	13.51	Cd
Cdmetal(gamma)	-32.60	-18.98	13.62	Cd
CdMoO4	-0.37	-14.52	-14.15	CdMoO4
CdOHCl	-6.91	-3.38	3.54	CdOHCl
CdSb	-76.44	-76.79	-0.35	CdSb
CdSe	-19.67	-39.87	-20.20	CdSe
CdSeO4:2H2O	-16.79	-18.64	-1.85	CdSeO4:2H2O
CdSO4	-10.59	-10.76	-0.17	CdSO4
CdSO4:1H2O	-9.04	-10.77	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.89	-10.77	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-1.93	-15.06	-13.13	PbCO3
CH4(g)	-81.95	-123.00	-41.05	CH4
Chalcanthite	-6.81	-9.45	-2.64	CuSO4:5H2O
Chalcedony	-1.07	-4.62	-3.55	SiO2
Chalcocite	-55.55	-90.47	-34.92	Cu2S
Chalcopyrite	-125.77	-161.04	-35.27	CuFeS2
Chrysotile	-4.34	27.86	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.65	-97.35	-45.69	HgS
Claudetite	-87.63	-90.70	-3.06	As4O6
Clausthalite	-13.85	-40.95	-27.10	PbSe
Co(BO2)2	-28.41	-1.34	27.07	Co(BO2)2
Co(OH)2	-5.58	7.51	13.09	Co(OH)2
Co(OH)3	-9.78	-12.09	-2.31	Co(OH)3
CO2(g)	-2.45	-20.60	-18.15	CO2
Co3(AsO4)2	-22.44	-9.41	13.03	Co3(AsO4)2
Co3O4	-6.17	-16.66	-10.50	Co3O4
CoCl2	-20.75	-12.48	8.27	CoCl2
CoCl2:6H2O	-15.02	-12.48	2.54	CoCl2:6H2O
CoCO3	-3.11	-13.09	-9.98	CoCO3
CoF2	-13.70	-15.30	-1.60	CoF2
CoF3	-44.84	-46.30	-1.46	CoF3
CoFe2O4	17.11	13.58	-3.53	CoFe2O4
CoMoO4	-5.87	-13.63	-7.76	CoMoO4
CoO	-6.07	7.51	13.59	CoO
CoS(alpha)	-71.17	-78.61	-7.44	CoS
CoS(beta)	-67.54	-78.61	-11.07	CoS
CoSe	-22.78	-38.98	-16.20	CoSe
CoSeO3	-8.36	-7.04	1.32	CoSeO3
CoSeO4:6H2O	-16.22	-17.75	-1.53	CoSeO4:6H2O
CoSO4	-12.68	-9.87	2.80	CoSO4
CoSO4:6H2O	-7.40	-9.88	-2.47	CoSO4:6H2O
Cotunnite	-9.67	-14.45	-4.78	PbCl2
Covellite	-55.89	-78.19	-22.30	CuS
Cr(OH)2	-22.06	-11.24	10.82	Cr(OH)2
Cr(OH)3	-2.73	-1.39	1.34	Cr(OH)3
Cr(OH)3(am)	-0.64	-1.39	-0.75	Cr(OH)3
Cr2O3	-0.42	-2.78	-2.36	Cr2O3
CrCl2	-45.33	-31.23	14.09	CrCl2
CrCl3	-46.49	-31.38	15.11	CrCl3
CrF3	-24.27	-35.60	-11.34	CrF3
Cristobalite	-1.27	-4.62	-3.35	SiO2

Crmetal	-67.32	-36.84	30.48	Cr
CrO3	-27.16	-30.37	-3.21	CrO3
Cryolite	-8.37	-42.21	-33.84	Na3AlF6
Cu(OH)2	-0.74	7.93	8.67	Cu(OH)2
Cu(SbO3)2	-24.90	20.31	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.80	0.45	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-55.57	-90.45	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-5.04	-50.84	-45.80	Cu2Se
Cu2SO4	-19.79	-21.74	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.24	-8.14	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-60.14	-102.73	-42.59	Cu3Sb
Cu3Se2	-25.90	-89.39	-63.49	Cu3Se2
CuCO3	-1.17	-12.67	-11.50	CuCO3
CuCrO4	-16.99	-22.43	-5.44	CuCrO4
CuF	-8.67	-13.58	-4.91	CuF
CuF2	-15.99	-14.87	1.12	CuF2
CuF2:2H2O	-10.32	-14.87	-4.55	CuF2:2H2O
Cumetal	-6.22	-14.97	-8.76	Cu
CuMoO4	-0.13	-13.21	-13.08	CuMoO4
CuOCuSO4	-11.82	-1.52	10.30	CuOCuSO4
Cupricferrite	8.01	14.00	5.99	CuFe2O4
Cuprite	-2.94	-4.35	-1.41	Cu2O
Cuprousferrite	9.78	0.86	-8.92	CuFeO2
CuSe	-5.46	-38.56	-33.10	CuSe
CuSe2	-26.08	-59.45	-33.37	CuSe2
CuSeO3:2H2O	-7.13	-6.62	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.89	-17.33	-2.44	CuSeO4:5H2O
CuSO4	-12.39	-9.45	2.94	CuSO4
Diaspore	2.60	9.47	6.87	AlOOH
Djurleite	-55.74	-89.66	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	-0.23	-16.77	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.32	-16.77	-17.09	CaMg(CO3)2
Epsomite	-2.90	-5.02	-2.13	MgSO4:7H2O
Fe(OH)2	-10.30	3.27	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.07	0.03	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.98	-13.70	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.04	-8.49	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-16.97	-37.59	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-42.35	-46.09	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.89	9.33	20.22	Fe3(OH)8
FeAsO4:2H2O	-13.34	-12.94	0.40	FeAsO4:2H2O
FeCr2O4	-6.71	0.49	7.20	FeCr2O4
FeMoO4	-7.79	-17.88	-10.09	FeMoO4
Ferrihydrite	-0.16	3.03	3.19	Fe(OH)3
Ferroselite	-45.52	-64.11	-18.60	FeSe2
FeS(ppt)	-79.90	-82.85	-2.95	FeS
FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-5.25	-5.25	0.00	e-
Fluorite	-0.24	-10.74	-10.50	CaF2
Galena	-66.61	-80.58	-13.97	PbS
Gibbsite	1.18	9.47	8.29	Al(OH)3
Goethite	2.54	3.03	0.49	FeOOH
Goslarite	-6.05	-8.06	-2.01	ZnSO4:7H2O
Greenalite	-20.24	0.57	20.81	Fe3Si2O5(OH)4
Greenockite	-65.14	-79.50	-14.36	CdS
Greigite	-290.11	-335.15	-45.03	Fe3S4
Gummite	-6.10	1.57	7.67	UO3
Gypsum	-0.71	-5.32	-4.61	CaSO4:2H2O
H-Jarosite	-13.57	-25.67	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.27	-21.14	-12.88	H2MoO4
H2S(g)	-78.11	-86.12	-8.01	H2S
H2Se(g)	-41.53	-46.49	-4.96	H2Se
Halite	-6.02	-4.42	1.60	NaCl
Halloysite	0.14	9.72	9.57	Al2Si2O5(OH)4
Hausmannite	-4.42	56.61	61.03	Mn3O4
Hematite	7.49	6.07	-1.42	Fe2O3
Hercynite	-0.68	22.22	22.89	FeAl2O4
Hg(CH3)2(g)	-183.51	-257.22	-73.71	Hg(CH3)2

Hg (g)	-7.36	-15.23	-7.87	Hg
Hg (OH) 2	-7.73	-11.23	-3.50	Hg (OH) 2
Hg2 (g)	-15.51	-30.47	-14.96	Hg2
Hg2 (OH) 2	-10.13	-4.87	5.26	Hg2 (OH) 2
Hg2CO3	-9.42	-25.47	-16.05	Hg2CO3
Hg2CrO4	-26.54	-35.24	-8.70	Hg2CrO4
Hg2F2	-17.31	-27.68	-10.36	Hg2F2
Hg2S	-79.31	-90.99	-11.68	Hg2S
Hg2SeO3	-14.76	-19.42	-4.66	Hg2SeO3
Hg2SO4	-16.12	-22.25	-6.13	Hg2SO4
Hg3O2CO3	-24.60	-54.28	-29.68	Hg3O2CO3
HgCl (g)	-31.93	-12.43	19.50	HgCl
HgCl2	-9.96	-31.22	-21.26	HgCl2
HgF (g)	-46.51	-13.84	32.68	HgF
HgF2 (g)	-46.60	-34.04	12.57	HgF2
Hgmetal (l)	-1.78	-15.23	-13.45	Hg
HgSe	-2.02	-57.72	-55.69	HgSe
HgSeO3	-13.35	-25.78	-12.43	HgSeO3
HgSO4	-19.19	-28.61	-9.42	HgSO4
Huntite	-3.28	-33.24	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.82	-24.59	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-11.82	-20.58	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-15.11	-20.28	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-5.85	-20.65	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-33.45	-50.69	-17.24	K2Cr2O7
K2CrO4	-19.81	-20.32	-0.51	K2CrO4
K2MoO4	-14.36	-11.10	3.26	K2MoO4
K2SeO4	-14.49	-15.22	-0.73	K2SeO4
Kaolinite	2.28	9.72	7.43	Al2Si2O5 (OH) 4
Langite	-3.14	14.35	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.87	-6.31	-0.43	PbO : PbSO4
Laurionite	-5.08	-4.46	0.62	PbOHCl
Lepidocrocite	1.66	3.03	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.16	5.54	12.69	PbO
Mackinawite	-79.25	-82.85	-3.60	FeS
Maghemite	-0.32	6.07	6.39	Fe2O3
Magnesioferrite	1.57	18.43	16.86	Fe2MgO4
Magnesite	-0.78	-8.24	-7.46	MgCO3
Magnetite	5.93	9.34	3.40	Fe3O4
Malachite	0.57	-4.73	-5.31	Cu2 (OH) 2CO3
Manganite	-2.20	23.14	25.34	MnOOH
Massicot	-7.36	5.54	12.89	PbO
Matlockite	-6.89	-15.86	-8.97	PbClF
Melanothallite	-18.31	-12.06	6.26	CuCl2
Melanterite	-11.91	-14.12	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.25	-97.35	-45.09	HgS
Mg (OH) 2 (active)	-6.43	12.36	18.79	Mg (OH) 2
Mg (VO3) 2	-15.89	-4.61	11.28	Mg (VO3) 2
Mg2Sb3	-274.58	-199.90	74.68	Mg2Sb3
Mg2V2O7	-18.60	7.76	26.36	Mg2V2O7
MgCr2O4	-6.62	9.58	16.20	MgCr2O4
MgCrO4	-23.38	-18.00	5.38	MgCrO4
MgF2	-2.31	-10.44	-8.13	MgF2
MgMoO4	-6.93	-8.78	-1.85	MgMoO4
MgSeO3 : 6H2O	-5.25	-2.19	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.70	-12.90	-1.20	MgSeO4 : 6H2O
Minium	-31.31	42.21	73.52	Pb3O4
Mirabilite	-5.12	-6.23	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.53	-6.63	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-50.87	-56.59	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.41	-88.33	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-13.44	-0.94	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-12.37	-9.66	2.72	MnCl2 : 4H2O
MnS (grn)	-75.95	-75.78	0.17	MnS
MnS (pnk)	-79.12	-75.78	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.65	-36.15	3.50	MnSe

MnSeO3	-5.35	-4.22	1.13	MnSeO3
MnSeO3:2H2O	-5.20	-4.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.88	-14.93	-2.05	MnSeO4:5H2O
MnSO4	-9.63	-7.05	2.58	MnSO4
Montepontite	-8.48	6.62	15.10	CdO
Montroydite	-7.59	-11.23	-3.64	HgO
MoO3	-13.14	-21.14	-8.00	MoO3
Morenosite	-7.49	-9.63	-2.14	NiSO4:7H2O
MoS2	-148.72	-218.98	-70.26	MoS2
Na-Jarosite	-8.89	-20.09	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.68	-49.58	-9.90	Na2Cr2O7
Na2CrO4	-22.14	-19.21	2.93	Na2CrO4
Na2Mo2O7	-14.53	-31.13	-16.60	Na2Mo2O7
Na2MoO4	-11.48	-9.99	1.49	Na2MoO4
Na2MoO4:2H2O	-11.21	-9.99	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.70	-3.40	10.30	Na2SeO3:5H2O
Na2SeO4	-15.38	-14.10	1.28	Na2SeO4
Na3Sb	-173.92	-79.47	94.45	Na3Sb
Na3VO4	-28.43	8.25	36.68	Na3VO4
Na4V2O7	-32.05	5.35	37.40	Na4V2O7
Nantokite	-5.44	-12.17	-6.73	CuCl
NaSb	-88.20	-65.03	23.17	NaSb
Natron	-8.14	-9.45	-1.31	Na2CO3:10H2O
NaVO3	-6.76	-2.91	3.86	NaVO3
Nesquehonite	-3.57	-8.24	-4.67	MgCO3:3H2O
Ni(OH)2	-5.04	7.75	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.39	-8.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.37	13.63	32.00	Ni4(OH)6SO4
NiCO3	-5.98	-12.85	-6.87	NiCO3
NiMoO4	-2.25	-13.39	-11.14	NiMoO4
NiS(alpha)	-72.77	-78.37	-5.60	NiS
NiS(beta)	-67.27	-78.37	-11.10	NiS
NiS(gamma)	-65.57	-78.37	-12.80	NiS
NiSe	-21.04	-38.74	-17.70	NiSe
NiSeO3:2H2O	-9.61	-6.80	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.99	-17.51	-1.52	NiSeO4:6H2O
Nsutite	-6.92	10.59	17.50	MnO2
O2(g)	-31.89	51.20	83.09	O2
Orpiment	-242.65	-303.71	-61.07	As2S3
Otavite	-1.98	-13.98	-12.00	CdCO3
Pb(BO2)2	-9.84	-3.32	6.52	Pb(BO2)2
Pb(OH)2	-2.61	5.54	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-59.47	-68.23	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.71	1.08	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.11	11.08	26.19	Pb2O(OH)2
Pb2O3	-24.36	36.68	61.04	Pb2O3
Pb2OCO3	-8.97	-9.52	-0.56	Pb2OCO3
Pb2V2O7	-3.99	-5.89	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.13	-15.33	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.49	-0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.01	-3.99	11.02	Pb3O2CO3
Pb3O2SO4	-11.46	-0.77	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.33	4.77	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.11	4.77	21.88	Pb4O3SO4
PbCrO4	-12.23	-24.83	-12.60	PbCrO4
PbF2	-9.83	-17.27	-7.44	PbF2
Pbmetal	-24.31	-20.06	4.25	Pb
PbMoO4	0.01	-15.61	-15.62	PbMoO4
PbO:0.3H2O	-7.44	5.54	12.98	PbO:0.33H2O
PbSeO4	-12.88	-19.72	-6.84	PbSeO4
Periclase	-9.22	12.36	21.58	MgO
Phosgenite	-9.71	-29.52	-19.81	PbCl2:PbCO3
Plattnerite	-18.46	31.14	49.60	PbO2
Portlandite	-10.74	12.07	22.80	Ca(OH)2
Pyrite	-124.87	-143.38	-18.51	FeS2
Pyrochroite	-4.86	10.34	15.19	Mn(OH)2
Pyrolusite	-5.44	35.94	41.38	MnO2
Quartz	-0.62	-4.62	-4.00	SiO2

Realgar	-101.85	-121.60	-19.75	AsS
Retgersite	-7.59	-9.63	-2.04	NiSO ₄ ·6H ₂ O
Rhodochrosite	0.32	-10.26	-10.58	MnCO ₃
Rutherfordine	-4.53	-19.03	-14.50	UO ₂ CO ₃
Sb(OH)3	-12.30	-19.41	-7.11	Sb(OH)3
Sb ₂ O ₄	-16.63	-13.22	3.40	Sb ₂ O ₄
Sb ₂ O ₅	-26.58	-36.25	-9.67	Sb ₂ O ₅
Sb ₂ Se ₃	-110.54	-178.29	-67.76	Sb ₂ Se ₃
Sb ₄ O ₆ (cubic)	-59.39	-77.65	-18.26	Sb ₄ O ₆
Sb ₄ O ₆ (orth)	-59.75	-77.65	-17.90	Sb ₄ O ₆
SbCl ₃	-49.97	-49.40	0.57	SbCl ₃
SbF ₃	-43.40	-53.62	-10.23	SbF ₃
Sbmetal	-46.12	-57.81	-11.69	Sb
SbO ₂	-3.10	-30.92	-27.82	SbO ₂
Schoepite	-4.42	1.57	5.99	UO ₂ (OH)2·H ₂ O
Semetal(am)	-13.78	-20.89	-7.11	Se
Semetal(hex)	-13.18	-20.89	-7.71	Se
Senarmontite	-26.46	-38.82	-12.37	Sb ₂ O ₃
SeO ₂	-14.68	-14.55	0.12	SeO ₂
SeO ₃	-46.31	-25.26	21.04	SeO ₃
Sepiolite	-4.88	10.88	15.76	Mg ₂ Si ₃ O ₇ ·5OH·3H ₂ O
Sepiolite(A)	-7.90	10.88	18.78	Mg ₂ Si ₃ O ₇ ·5OH·3H ₂ O
Siderite	-7.09	-17.33	-10.24	FeCO ₃
SiO ₂ (am-gel)	-1.91	-4.62	-2.71	SiO ₂
SiO ₂ (am-ppt)	-1.88	-4.62	-2.74	SiO ₂
Smithsonite	-1.27	-11.27	-10.00	ZnCO ₃
Sphalerite	-65.34	-76.79	-11.45	ZnS
Spinel	-5.53	31.31	36.85	MgAl ₂ O ₄
Stibnite	-246.73	-297.19	-50.46	Sb ₂ S ₃
Sulfur	-58.38	-60.52	-2.14	S
Tenorite	0.29	7.93	7.64	CuO
Thenardite	-6.55	-6.23	0.32	Na ₂ SO ₄
Thermonatrite	-10.08	-9.44	0.64	Na ₂ CO ₃ ·H ₂ O
Tyuyamunite	-5.84	-1.76	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-14.32	6.76	21.08	U ₃ O ₈
U ₃ Sb ₄	-581.65	-429.27	152.38	U ₃ Sb ₄
U ₄ O ₉	-30.63	-33.65	-3.02	U ₄ O ₉
UF ₄	-30.89	-60.43	-29.54	UF ₄
UF ₄ ·2.5H ₂ O	-27.71	-60.43	-32.72	UF ₄ ·2.5H ₂ O
UO ₂ (am)	-15.75	-14.81	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.42	-29.27	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ ·2H ₂ O	-34.13	-29.27	4.85	UO ₂ (NO ₃) ₂ ·2H ₂ O
UO ₂ (NO ₃) ₂ ·3H ₂ O	-32.66	-29.27	3.39	UO ₂ (NO ₃) ₂ ·3H ₂ O
UO ₂ (NO ₃) ₂ ·6H ₂ O	-31.32	-29.28	2.05	UO ₂ (NO ₃) ₂ ·6H ₂ O
UO ₂ (OH) ₂ (beta)	-4.04	1.57	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ ·4H ₂ O	-21.44	-23.69	-2.25	UO ₂ SeO ₄ ·4H ₂ O
UO ₃	-6.13	1.57	7.70	UO ₃
Uraninite	-10.14	-14.81	-4.67	UO ₂
USb ₂	-220.42	-190.85	29.58	USb ₂
V(OH)3	-19.08	-11.49	7.59	V(OH)3
V ₂ O ₅	-15.61	-16.97	-1.36	V ₂ O ₅
V ₃ O ₅	-40.58	-38.74	1.84	V ₃ O ₅
V ₄ O ₇	-50.31	-43.12	7.19	V ₄ O ₇
V ₆ O ₁₃	-41.25	-102.11	-60.86	V ₆ O ₁₃
Valentinite	-30.34	-38.82	-8.48	Sb ₂ O ₃
VC12	-63.15	-44.28	18.87	VC12
VC13	-64.90	-41.47	23.43	VC13
VF ₄	-64.93	-50.00	14.93	VF ₄
Vmetal	-93.91	-49.88	44.03	V
VO	-39.04	-24.28	14.76	VO
VO(OH)2	-9.53	-4.38	5.15	VO(OH)2
VO ₂ Cl	-21.32	-18.48	2.84	VO ₂ Cl
VOC1	-32.63	-21.48	11.15	VOC1
VOC12	-37.13	-24.37	12.76	VOC12
VOSO ₄	-25.38	-21.77	3.61	VOSO ₄
Witherite	-4.67	-13.24	-8.57	BaCO ₃
Wurtzite	-67.84	-76.79	-8.95	ZnS
Zincite	-2.00	9.33	11.33	ZnO

Zincosite	-11.99	-8.06	3.93	ZnSO4
Zn(BO2)2	-7.82	0.47	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.83	-21.52	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.87	9.33	12.20	Zn(OH)2
Zn(OH)2(am)	-3.14	9.33	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.42	9.33	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.20	9.33	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.40	9.33	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.23	1.27	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.53	8.66	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.61	-3.96	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.69	-6.78	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.47	19.93	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.84	26.66	38.50	Zn5(OH)8Cl2
ZnCl2	-17.71	-10.66	7.05	ZnCl2
ZnCO3:1H2O	-1.01	-11.27	-10.26	ZnCO3:1H2O
ZnF2	-12.94	-13.48	-0.53	ZnF2
Znmetal	-42.06	-16.27	25.79	Zn
ZnMoO4	-1.69	-11.81	-10.13	ZnMoO4
ZnO(active)	-1.86	9.33	11.19	ZnO
ZnS(am)	-67.74	-76.79	-9.05	ZnS
ZnSb	-85.09	-74.08	11.01	ZnSb
ZnSe	-22.76	-37.16	-14.40	ZnSe
ZnSeO4:6H2O	-14.41	-15.93	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.42	-8.06	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 158.

```

      REACTION 904
        H2O      -1
        0.126157 moles ### Addition step. Removes HTC water but solute mass
remains
      USE solution 910
      SAVE Solution 911
      End

```

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 910. Solution after simulation 157.
Using reaction 904.

Reaction 904.

1.262e-01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	1.862e-08	1.861e-08
Al	2.677e-06	2.676e-06
As	2.548e-10	2.547e-10
B	3.801e-05	3.799e-05
Ba	4.101e-08	4.100e-08
C	2.493e-03	2.492e-03
Ca	3.192e-03	3.191e-03
Cd	1.388e-08	1.387e-08
Cl	4.304e-03	4.303e-03
Co	1.065e-07	1.064e-07
Cr	1.761e-09	1.761e-09
Cu	1.648e-06	1.647e-06
F	2.064e-04	2.063e-04
Fe	1.259e-09	1.259e-09
Hg	2.190e-09	2.190e-09
K	3.774e-03	3.773e-03
Mg	5.863e-03	5.861e-03
Mn	6.528e-05	6.526e-05
Mo	1.912e-06	1.911e-06
N	1.606e-05	1.606e-05
Na	1.346e-02	1.346e-02
Ni	1.659e-07	1.658e-07
Pb	4.906e-09	4.904e-09
S	1.428e-02	1.428e-02
Sb	2.923e-08	2.922e-08
Se	1.646e-07	1.646e-07
Si	2.412e-05	2.411e-05
U	2.637e-07	2.636e-07
V	8.828e-09	8.825e-09
Zn	6.457e-06	6.455e-06

-----Description of solution-----

	pH	=	7.546	Charge balance
	pe	=	5.254	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	4.621e-02	
	Mass of water (kg)	=	9.997e-01	
	Total alkalinity (eq/kg)	=	2.405e-03	
	Total CO2 (mol/kg)	=	2.493e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	1.900e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	3	
	Total H	=	1.109800e+02	
	Total O	=	5.555343e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.328e-07	3.535e-07	-6.364	-6.452	-0.088	(0)
H+	3.447e-08	2.846e-08	-7.463	-7.546	-0.083	0.00
H2O	5.551e+01	9.992e-01	1.744	-0.000	0.000	18.07
Ag	1.862e-08					
AgCl	1.173e-08	1.173e-08	-7.931	-7.931	0.000	(0)
AgCl2-	4.676e-09	3.632e-09	-8.330	-8.440	-0.110	(0)
Ag+	1.958e-09	1.617e-09	-8.708	-8.791	-0.083	(0)
AgSO4-	2.112e-10	1.641e-10	-9.675	-9.785	-0.110	(0)
AgCl3-2	3.158e-11	1.151e-11	-10.501	-10.939	-0.439	(0)
AgNO2	4.213e-12	4.213e-12	-11.375	-11.375	0.000	(0)
AgCl4-3	8.099e-13	8.349e-14	-12.092	-13.078	-0.987	(0)

	AgF	5.638e-13	5.638e-13	-12.249	-12.249	0.000	(0)
	AgOH	5.716e-14	5.716e-14	-13.243	-13.243	0.000	(0)
	AgNH3+	4.409e-14	3.426e-14	-13.356	-13.465	-0.110	(0)
	AgH2BO3	1.952e-14	1.952e-14	-13.710	-13.710	0.000	(0)
	AgSeO3-	1.841e-14	1.431e-14	-13.735	-13.844	-0.110	(0)
	Ag2Se	8.519e-15	8.519e-15	-14.070	-14.070	0.000	(0)
	Ag(NO2) 2-	1.047e-16	8.137e-17	-15.980	-16.090	-0.110	(0)
	AgNO3	1.712e-17	1.712e-17	-16.766	-16.766	0.000	(0)
	Ag(NH3) 2+	3.719e-18	2.889e-18	-17.430	-17.539	-0.110	(0)
	Ag(OH) 2-	2.542e-18	1.975e-18	-17.595	-17.705	-0.110	(0)
	Ag(SeO3) 2-3	1.710e-20	1.763e-21	-19.767	-20.754	-0.987	(0)
	Ag2MoO4	8.795e-25	8.795e-25	-24.056	-24.056	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.552	-73.552	0.000	(0)
	AgOH(Se) 2-4	0.000e+00	0.000e+00	-82.797	-84.551	-1.754	(0)
	Ag(HS) S4-2	0.000e+00	0.000e+00	-147.752	-147.965	-0.213	(0)
	Ag(HS) 2-	0.000e+00	0.000e+00	-147.918	-148.027	-0.110	(0)
	Ag(S4) 2-3	0.000e+00	0.000e+00	-149.473	-149.859	-0.386	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.804	-150.170	-0.366	(0)
Al		2.677e-06					
	Al(OH) 4-	2.604e-06	2.150e-06	-5.584	-5.668	-0.083	(0)
	Al(OH) 3	4.831e-08	4.831e-08	-7.316	-7.316	0.000	(0)
	AlF3	9.252e-09	9.252e-09	-8.034	-8.034	0.000	(0)
	Al(OH) 2+	8.224e-09	6.850e-09	-8.085	-8.164	-0.079	(0)
	AlF2+	6.356e-09	5.294e-09	-8.197	-8.276	-0.079	(0)
	AlF4-	7.796e-10	6.436e-10	-9.108	-9.191	-0.083	(0)
	AlF+2	1.990e-10	9.581e-11	-9.701	-10.019	-0.317	(0)
	AlOH+2	5.068e-11	2.440e-11	-10.295	-10.613	-0.317	(0)
	AlSO4+	3.299e-12	2.724e-12	-11.482	-11.565	-0.083	(0)
	Al+3	3.868e-13	6.902e-14	-12.412	-13.161	-0.749	(0)
	Al(SO4) 2-	1.798e-13	1.484e-13	-12.745	-12.829	-0.083	(0)
	AlMo6O21-3	1.726e-39	1.779e-40	-38.763	-39.750	-0.987	(0)
As (3)		2.164e-23					
	H3AsO3	2.115e-23	2.115e-23	-22.675	-22.675	0.000	(0)
	H2AsO3-	4.904e-25	3.810e-25	-24.309	-24.419	-0.110	(0)
	HAsO3-2	3.351e-29	1.221e-29	-28.475	-28.913	-0.439	(0)
	H4AsO3+	3.839e-31	2.982e-31	-30.416	-30.525	-0.110	(0)
	AsO3-3	1.603e-34	1.653e-35	-33.795	-34.782	-0.987	(0)
As (5)		2.548e-10					
	HAsO4-2	2.270e-10	8.271e-11	-9.644	-10.082	-0.439	(0)
	H2AsO4-	2.764e-11	2.147e-11	-10.559	-10.668	-0.110	(0)
	AsO4-3	8.912e-14	9.188e-15	-13.050	-14.037	-0.987	(0)
	H3AsO4	1.051e-16	1.062e-16	-15.978	-15.974	0.005	(0)
B		3.801e-05					
	H3BO3	3.693e-05	3.733e-05	-4.433	-4.428	0.005	(0)
	H2BO3-	9.439e-07	7.616e-07	-6.025	-6.118	-0.093	(0)
	MgH2BO3+	6.147e-08	4.960e-08	-7.211	-7.305	-0.093	(0)
	CaH2BO3+	5.153e-08	4.158e-08	-7.288	-7.381	-0.093	(0)
	NaH2BO3	1.305e-08	1.305e-08	-7.884	-7.884	0.000	(0)
	BF(OH) 3-	2.562e-09	2.068e-09	-8.591	-8.685	-0.093	(0)
	H5(BO3) 2-	2.999e-11	2.420e-11	-10.523	-10.616	-0.093	(0)
	BF2(OH) 2-	1.083e-12	8.740e-13	-11.965	-12.058	-0.093	(0)
	BaH2BO3+	5.502e-13	4.439e-13	-12.260	-12.353	-0.093	(0)
	H8(BO3) 3-	1.119e-13	9.033e-14	-12.951	-13.044	-0.093	(0)
	AgH2BO3	1.952e-14	1.952e-14	-13.710	-13.710	0.000	(0)
	BF3OH-	1.666e-18	1.345e-18	-17.778	-17.871	-0.093	(0)
	BF4-	3.242e-23	2.616e-23	-22.489	-22.582	-0.093	(0)
Ba		4.101e-08					
	Ba+2	4.057e-08	1.886e-08	-7.392	-7.724	-0.333	(0)
	BaHCO3+	4.044e-10	3.387e-10	-9.393	-9.470	-0.077	(0)
	BaCO3	2.995e-11	2.995e-11	-10.524	-10.524	0.000	(0)
	BaH2BO3+	5.502e-13	4.439e-13	-12.260	-12.353	-0.093	(0)
	BaOH+	3.507e-14	2.910e-14	-13.455	-13.536	-0.081	(0)
	BaNO3+	1.622e-15	1.260e-15	-14.790	-14.900	-0.110	(0)
	BaNH3+2	3.390e-16	1.235e-16	-15.470	-15.908	-0.439	(0)
C (4)		2.493e-03					
	HCO3-	2.257e-03	1.880e-03	-2.646	-2.726	-0.079	(0)
	H2CO3	1.204e-04	1.204e-04	-3.919	-3.919	0.000	(0)
	MgHCO3+	4.400e-05	3.613e-05	-4.357	-4.442	-0.085	(0)

		CaHCO3+	3.966e-05	3.321e-05	-4.402	-4.479	-0.077	(0)
		NaHCO3	1.143e-05	1.143e-05	-4.942	-4.942	0.000	(0)
		CO3-2	6.661e-06	3.097e-06	-5.176	-5.509	-0.333	(0)
		MgCO3	4.837e-06	4.837e-06	-5.315	-5.315	0.000	(0)
		CaCO3	4.656e-06	4.656e-06	-5.332	-5.332	0.000	(0)
		CuCO3	1.272e-06	1.272e-06	-5.895	-5.895	0.000	(0)
		MnHCO3+	7.960e-07	6.605e-07	-6.099	-6.180	-0.081	(0)
		NaCO3-	7.486e-07	6.235e-07	-6.126	-6.205	-0.079	(0)
		ZnCO3	3.093e-07	3.093e-07	-6.510	-6.510	0.000	(0)
		UO2 (CO3) 3-4	2.008e-07	3.536e-09	-6.697	-8.451	-1.754	(0)
		ZnHCO3+	1.329e-07	1.032e-07	-6.877	-6.986	-0.110	(0)
		UO2 (CO3) 2-2	6.255e-08	2.278e-08	-7.204	-7.642	-0.439	(0)
		Cu (CO3) 2-2	2.911e-08	1.060e-08	-7.536	-7.975	-0.439	(0)
		NiHCO3+	1.374e-08	1.067e-08	-7.862	-7.972	-0.110	(0)
		CuHCO3+	1.065e-08	8.277e-09	-7.972	-8.082	-0.110	(0)
		NiCO3	5.320e-09	5.320e-09	-8.274	-8.274	0.000	(0)
		CoHCO3+	4.972e-09	3.862e-09	-8.303	-8.413	-0.110	(0)
		PbCO3	2.607e-09	2.607e-09	-8.584	-8.584	0.000	(0)
		CoCO3	1.382e-09	1.382e-09	-8.859	-8.859	0.000	(0)
		PbHCO3+	5.036e-10	3.913e-10	-9.298	-9.408	-0.110	(0)
		BaHCO3+	4.044e-10	3.387e-10	-9.393	-9.470	-0.077	(0)
		UO2CO3	3.688e-10	3.688e-10	-9.433	-9.433	0.000	(0)
		CdCO3	2.391e-10	2.391e-10	-9.621	-9.621	0.000	(0)
		Pb (CO3) 2-2	6.391e-11	2.328e-11	-10.194	-10.633	-0.439	(0)
		BaCO3	2.995e-11	2.995e-11	-10.524	-10.524	0.000	(0)
		CdHCO3+	1.866e-11	1.450e-11	-10.729	-10.839	-0.110	(0)
		Cd (CO3) 2-2	1.506e-12	5.488e-13	-11.822	-12.261	-0.439	(0)
		FeHCO3+	4.243e-14	3.554e-14	-13.372	-13.449	-0.077	(0)
		HgCO3	2.790e-14	2.790e-14	-13.554	-13.554	0.000	(0)
		Hg (CO3) 2-2	7.499e-16	2.732e-16	-15.125	-15.564	-0.439	(0)
		HgHCO3+	1.903e-17	1.479e-17	-16.720	-16.830	-0.110	(0)
Ca	3.192e-03							
		Ca+2	2.041e-03	9.486e-04	-2.690	-3.023	-0.333	(0)
		CaSO4	1.105e-03	1.105e-03	-2.957	-2.957	0.000	(0)
		CaHCO3+	3.966e-05	3.321e-05	-4.402	-4.479	-0.077	(0)
		CaCO3	4.656e-06	4.656e-06	-5.332	-5.332	0.000	(0)
		CaF+	1.732e-06	1.437e-06	-5.761	-5.842	-0.081	(0)
		CaH2BO3+	5.153e-08	4.158e-08	-7.288	-7.381	-0.093	(0)
		CaOH+	7.989e-09	6.691e-09	-8.098	-8.175	-0.077	(0)
		CaNO3+	5.147e-11	3.999e-11	-10.288	-10.398	-0.110	(0)
		CaNH3+2	3.401e-11	1.239e-11	-10.468	-10.907	-0.439	(0)
		Ca (NH3) 2+2	1.405e-19	5.118e-20	-18.852	-19.291	-0.439	(0)
Cd	1.388e-08							
		Cd+2	7.286e-09	3.387e-09	-8.137	-8.470	-0.333	(0)
		CdSO4	4.037e-09	4.037e-09	-8.394	-8.394	0.000	(0)
		CdCl+	1.480e-09	1.150e-09	-8.830	-8.939	-0.110	(0)
		Cd (SO4) 2-2	7.602e-10	2.769e-10	-9.119	-9.558	-0.439	(0)
		CdCO3	2.391e-10	2.391e-10	-9.621	-9.621	0.000	(0)
		CdHCO3+	1.866e-11	1.450e-11	-10.729	-10.839	-0.110	(0)
		CdCl2	1.703e-11	1.703e-11	-10.769	-10.769	0.000	(0)
		CdOHC1	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
		CdOH+	1.224e-11	9.510e-12	-10.912	-11.022	-0.110	(0)
		CdF+	9.592e-12	7.452e-12	-11.018	-11.128	-0.110	(0)
		Cd (CO3) 2-2	1.506e-12	5.488e-13	-11.822	-12.261	-0.439	(0)
		CdCl3-	4.917e-14	3.820e-14	-13.308	-13.418	-0.110	(0)
		Cd (OH) 2	2.121e-14	2.121e-14	-13.673	-13.673	0.000	(0)
		CdF2	2.064e-15	2.064e-15	-14.685	-14.685	0.000	(0)
		CdNO3+	1.838e-16	1.428e-16	-15.736	-15.845	-0.110	(0)
		CdSeO4	4.261e-17	4.261e-17	-16.370	-16.370	0.000	(0)
		Cd2OH+3	1.566e-18	1.615e-19	-17.805	-18.792	-0.987	(0)
		Cd (SeO3) 2-2	1.452e-18	5.289e-19	-17.838	-18.277	-0.439	(0)
		Cd (OH) 3-	5.896e-19	4.581e-19	-18.229	-18.339	-0.110	(0)
		Cd (NO3) 2	9.538e-25	9.538e-25	-24.021	-24.021	0.000	(0)
		Cd (OH) 4-2	7.275e-26	2.650e-26	-25.138	-25.577	-0.439	(0)
		CdHS+	0.000e+00	0.000e+00	-78.928	-79.037	-0.110	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.409	-150.409	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.974	-227.084	-0.110	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-303.024	-303.463	-0.439	(0)

C1	4.304e-03					
Cl-	4.304e-03	3.554e-03	-2.366	-2.449	-0.083	(0)
MnCl+	9.494e-08	7.878e-08	-7.023	-7.104	-0.081	(0)
ZnCl+	1.887e-08	1.550e-08	-7.724	-7.810	-0.085	(0)
AgCl	1.173e-08	1.173e-08	-7.931	-7.931	0.000	(0)
ZnOHCl	7.172e-09	7.172e-09	-8.144	-8.144	0.000	(0)
AgCl2-	4.676e-09	3.632e-09	-8.330	-8.440	-0.110	(0)
CdCl+	1.480e-09	1.150e-09	-8.830	-8.939	-0.110	(0)
CuCl	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
CuCl2-	7.703e-10	6.327e-10	-9.113	-9.199	-0.085	(0)
NiCl+	5.390e-10	4.188e-10	-9.268	-9.378	-0.110	(0)
CuCl+	4.785e-10	3.930e-10	-9.320	-9.406	-0.085	(0)
CoCl+	4.180e-10	3.247e-10	-9.379	-9.489	-0.110	(0)
MnCl2	3.955e-10	3.955e-10	-9.403	-9.403	0.000	(0)
ZnCl2	8.730e-11	8.730e-11	-10.059	-10.059	0.000	(0)
PbCl+	4.546e-11	3.532e-11	-10.342	-10.452	-0.110	(0)
AgCl3-2	3.158e-11	1.151e-11	-10.501	-10.939	-0.439	(0)
CdCl2	1.703e-11	1.703e-11	-10.769	-10.769	0.000	(0)
HgClOH	1.670e-11	1.670e-11	-10.777	-10.777	0.000	(0)
CdOHCl	1.667e-11	1.667e-11	-10.778	-10.778	0.000	(0)
HgCl2	9.509e-12	9.509e-12	-11.022	-11.022	0.000	(0)
CuCl3-2	1.014e-12	4.807e-13	-11.994	-12.318	-0.324	(0)
AgCl4-3	8.099e-13	8.349e-14	-12.092	-13.078	-0.987	(0)
PbCl2	5.607e-13	5.607e-13	-12.251	-12.251	0.000	(0)
CuCl2	4.843e-13	4.843e-13	-12.315	-12.315	0.000	(0)
MnCl3-	4.666e-13	3.872e-13	-12.331	-12.412	-0.081	(0)
HgCl3-	4.350e-13	3.380e-13	-12.361	-12.471	-0.110	(0)
ZnCl3-	3.001e-13	2.465e-13	-12.523	-12.608	-0.085	(0)
CdCl3-	4.917e-14	3.820e-14	-13.308	-13.418	-0.110	(0)
HgCl4-2	1.313e-14	4.782e-15	-13.882	-14.320	-0.439	(0)
NiCl2	7.494e-15	7.494e-15	-14.125	-14.125	0.000	(0)
PbCl3-	1.021e-15	7.933e-16	-14.991	-15.101	-0.110	(0)
ZnCl4-2	9.238e-16	4.380e-16	-15.034	-15.359	-0.324	(0)
HgCl+	6.872e-16	5.338e-16	-15.163	-15.273	-0.110	(0)
UO2Cl+	2.219e-16	1.724e-16	-15.654	-15.763	-0.110	(0)
CrCl+2	4.407e-17	1.605e-17	-16.356	-16.794	-0.439	(0)
CuCl3-	1.956e-17	1.606e-17	-16.709	-16.794	-0.085	(0)
PbCl4-2	3.538e-18	1.289e-18	-17.451	-17.890	-0.439	(0)
CrOHCl2	3.833e-19	3.833e-19	-18.416	-18.416	0.000	(0)
CrCl2+	6.968e-21	5.414e-21	-20.157	-20.267	-0.110	(0)
FeCl+2	5.666e-21	2.686e-21	-20.247	-20.571	-0.324	(0)
CuCl4-2	6.035e-22	2.861e-22	-21.219	-21.543	-0.324	(0)
VOCl+	4.334e-22	3.367e-22	-21.363	-21.473	-0.110	(0)
FeCl2+	5.139e-23	4.265e-23	-22.289	-22.370	-0.081	(0)
CrO3Cl-	3.999e-26	3.107e-26	-25.398	-25.508	-0.110	(0)
FeCl3	1.516e-26	1.516e-26	-25.819	-25.819	0.000	(0)
CoCl+2	3.745e-35	1.364e-35	-34.427	-34.865	-0.439	(0)
UCl+3	0.000e+00	0.000e+00	-44.761	-45.747	-0.987	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.393	-48.832	-0.439	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.270	-50.708	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.093	-63.531	-0.439	(0)
Co (2)	1.065e-07					
Co+2	7.250e-08	2.641e-08	-7.140	-7.578	-0.439	(0)
CoSO4	2.679e-08	2.679e-08	-7.572	-7.572	0.000	(0)
CoHCO3+	4.972e-09	3.862e-09	-8.303	-8.413	-0.110	(0)
CoCO3	1.382e-09	1.382e-09	-8.859	-8.859	0.000	(0)
CoCl+	4.180e-10	3.247e-10	-9.379	-9.489	-0.110	(0)
CoOH+	2.398e-10	1.863e-10	-9.620	-9.730	-0.110	(0)
CoF+	1.492e-10	1.159e-10	-9.826	-9.936	-0.110	(0)
Co (OH) 2	5.230e-12	5.230e-12	-11.282	-11.282	0.000	(0)
CoNO2+	2.987e-12	2.321e-12	-11.525	-11.634	-0.110	(0)
Co (NH3) +2	9.043e-14	3.294e-14	-13.044	-13.482	-0.439	(0)
CoSeO4	8.943e-16	8.943e-16	-15.049	-15.049	0.000	(0)
CoNO3+	7.181e-16	5.579e-16	-15.144	-15.253	-0.110	(0)
Co (OH) 3-	4.748e-17	3.689e-17	-16.324	-16.433	-0.110	(0)
CoOOH-	1.192e-17	9.261e-18	-16.924	-17.033	-0.110	(0)
Co2OH+3	2.391e-18	2.465e-19	-17.621	-18.608	-0.987	(0)
Co (NH3) 2+2	4.003e-20	1.458e-20	-19.398	-19.836	-0.439	(0)

Co (NO3) 2	1.513e-23	1.513e-23	-22.820	-22.820	0.000	(0)
Co (OH) 4-2	5.672e-24	2.066e-24	-23.246	-23.685	-0.439	(0)
Co (NH3) 3+2	5.228e-27	1.905e-27	-26.282	-26.720	-0.439	(0)
Co4 (OH) 4+4	1.364e-29	2.402e-31	-28.865	-30.619	-1.754	(0)
Co (NH3) 4+2	2.847e-34	1.037e-34	-33.546	-33.984	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.310	-41.748	-0.439	(0)
Co (3)	9.303e-29					
CoOH+2	9.303e-29	3.389e-29	-28.031	-28.470	-0.439	(0)
Co+3	1.057e-34	1.887e-35	-33.976	-34.724	-0.749	(0)
CoCl+2	3.745e-35	1.364e-35	-34.427	-34.865	-0.439	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.393	-48.832	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.341	-58.451	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.895	-63.334	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.093	-63.531	-0.439	(0)
Cr (2)	1.275e-26					
Cr+2	1.275e-26	4.646e-27	-25.894	-26.333	-0.439	(0)
Cr (3)	1.761e-09					
Cr (OH) 2+	1.494e-09	1.161e-09	-8.826	-8.935	-0.110	(0)
Cr (OH) 3	1.541e-10	1.541e-10	-9.812	-9.812	0.000	(0)
Cr (OH) +2	7.409e-11	2.699e-11	-10.130	-10.569	-0.439	(0)
CrOHSO4	3.256e-11	3.256e-11	-10.487	-10.487	0.000	(0)
CrO2-	3.313e-12	2.574e-12	-11.480	-11.589	-0.110	(0)
Cr (OH) 4-	2.792e-12	2.169e-12	-11.554	-11.664	-0.110	(0)
CrF+2	2.108e-13	7.678e-14	-12.676	-13.115	-0.439	(0)
CrSO4+	5.334e-14	4.144e-14	-13.273	-13.383	-0.110	(0)
Cr+3	3.385e-14	3.490e-15	-13.470	-14.457	-0.987	(0)
CrCl+2	4.407e-17	1.605e-17	-16.356	-16.794	-0.439	(0)
CrOHC12	3.833e-19	3.833e-19	-18.416	-18.416	0.000	(0)
Cr2 (OH) 2SO4+2	2.181e-19	7.944e-20	-18.661	-19.100	-0.439	(0)
Cr2 (OH) 2 (SO4) 2	2.399e-20	2.399e-20	-19.620	-19.620	0.000	(0)
CrCl2+	6.968e-21	5.414e-21	-20.157	-20.267	-0.110	(0)
CrNO3+2	5.582e-24	2.034e-24	-23.253	-23.692	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.018	-40.456	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.374	-49.361	-0.987	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.270	-50.708	-0.439	(0)
Cr (6)	1.247e-15					
CrO4-2	1.140e-15	5.298e-16	-14.943	-15.276	-0.333	(0)
HCro4-	6.281e-17	4.880e-17	-16.202	-16.312	-0.110	(0)
NaCrO4-	3.664e-17	2.847e-17	-16.436	-16.546	-0.110	(0)
KCrO4-	7.624e-18	5.923e-18	-17.118	-17.227	-0.110	(0)
CrO3SO4-2	5.909e-24	2.153e-24	-23.228	-23.667	-0.439	(0)
H2CrO4	1.126e-24	1.126e-24	-23.948	-23.948	0.000	(0)
CrO3Cl-	3.999e-26	3.107e-26	-25.398	-25.508	-0.110	(0)
Cr2O7-2	2.268e-31	8.263e-32	-30.644	-31.083	-0.439	(0)
Cu (1)	1.868e-09					
CuCl	8.520e-10	8.520e-10	-9.070	-9.070	0.000	(0)
CuCl2-	7.703e-10	6.327e-10	-9.113	-9.199	-0.085	(0)
Cu+	2.451e-10	1.904e-10	-9.611	-9.720	-0.110	(0)
CuCl3-2	1.014e-12	4.807e-13	-11.994	-12.318	-0.324	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.013	-148.389	-0.376	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.763	-149.119	-0.357	(0)
Cu (2)	1.646e-06					
CuCO3	1.272e-06	1.272e-06	-5.895	-5.895	0.000	(0)
Cu+2	1.501e-07	6.977e-08	-6.824	-7.156	-0.333	(0)
CuOH+	9.496e-08	7.799e-08	-7.022	-7.108	-0.085	(0)
CuSO4	8.127e-08	8.127e-08	-7.090	-7.090	0.000	(0)
Cu (CO3) 2-2	2.911e-08	1.060e-08	-7.536	-7.975	-0.439	(0)
CuHCO3+	1.065e-08	8.277e-09	-7.972	-8.082	-0.110	(0)
Cu (OH) 2	5.500e-09	5.500e-09	-8.260	-8.260	0.000	(0)
CuF+	7.865e-10	6.111e-10	-9.104	-9.214	-0.110	(0)
CuCl+	4.785e-10	3.930e-10	-9.320	-9.406	-0.085	(0)
Cu2 (OH) 2+2	4.194e-10	1.528e-10	-9.377	-9.816	-0.439	(0)
CuNO2+	1.173e-10	9.110e-11	-9.931	-10.040	-0.110	(0)
CuNH3+2	2.033e-11	7.408e-12	-10.692	-11.130	-0.439	(0)
Cu (OH) 3-	5.133e-12	3.988e-12	-11.290	-11.399	-0.110	(0)
CuCl2	4.843e-13	4.843e-13	-12.315	-12.315	0.000	(0)
Cu (NO2) 2	1.163e-14	1.163e-14	-13.935	-13.935	0.000	(0)
CuNO3+	3.785e-15	2.941e-15	-14.422	-14.532	-0.110	(0)

	Cu (OH) 4-2	3.046e-17	1.109e-17	-16.516	-16.955	-0.439	(0)
	CuCl3-	1.956e-17	1.606e-17	-16.709	-16.794	-0.085	(0)
	CuCl4-2	6.035e-22	2.861e-22	-21.219	-21.543	-0.324	(0)
	Cu (NO3) 2	4.935e-24	4.935e-24	-23.307	-23.307	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-216.873	-216.983	-0.110	(0)
F	2.064e-04						
	F-	1.681e-04	1.388e-04	-3.774	-3.858	-0.083	(0)
	MgF+	3.543e-05	2.925e-05	-4.451	-4.534	-0.083	(0)
	CaF+	1.732e-06	1.437e-06	-5.761	-5.842	-0.081	(0)
	NaF	9.471e-07	9.471e-07	-6.024	-6.024	0.000	(0)
	MnF+	1.173e-07	9.730e-08	-6.931	-7.012	-0.081	(0)
	AlF3	9.252e-09	9.252e-09	-8.034	-8.034	0.000	(0)
	AlF2+	6.356e-09	5.294e-09	-8.197	-8.276	-0.079	(0)
	ZnF+	6.189e-09	4.808e-09	-8.208	-8.318	-0.110	(0)
	HF	5.844e-09	5.844e-09	-8.233	-8.233	0.000	(0)
	BF (OH) 3-	2.562e-09	2.068e-09	-8.591	-8.685	-0.093	(0)
	CuF+	7.865e-10	6.111e-10	-9.104	-9.214	-0.110	(0)
	AlF4-	7.796e-10	6.436e-10	-9.108	-9.191	-0.083	(0)
	NiF+	2.067e-10	1.606e-10	-9.685	-9.794	-0.110	(0)
	AlF+2	1.990e-10	9.581e-11	-9.701	-10.019	-0.317	(0)
	CoF+	1.492e-10	1.159e-10	-9.826	-9.936	-0.110	(0)
	CdF+	9.592e-12	7.452e-12	-11.018	-11.128	-0.110	(0)
	HF2-	3.776e-12	3.084e-12	-11.423	-11.511	-0.088	(0)
	PbF+	3.526e-12	2.740e-12	-11.453	-11.562	-0.110	(0)
	BF2 (OH) 2-	1.083e-12	8.740e-13	-11.965	-12.058	-0.093	(0)
	UO2F+	7.378e-13	5.732e-13	-12.132	-12.242	-0.110	(0)
	AgF	5.638e-13	5.638e-13	-12.249	-12.249	0.000	(0)
	UO2F2	2.295e-13	2.295e-13	-12.639	-12.639	0.000	(0)
	CrF+2	2.108e-13	7.678e-14	-12.676	-13.115	-0.439	(0)
	UO2F3-	1.030e-14	8.001e-15	-13.987	-14.097	-0.110	(0)
	PbF2	7.483e-15	7.483e-15	-14.126	-14.126	0.000	(0)
	CdF2	2.064e-15	2.064e-15	-14.685	-14.685	0.000	(0)
	H2F2	9.151e-17	9.151e-17	-16.039	-16.039	0.000	(0)
	UO2F4-2	2.422e-17	8.821e-18	-16.616	-17.054	-0.439	(0)
	VO2F	2.275e-17	2.275e-17	-16.643	-16.643	0.000	(0)
	FeF2+	1.705e-17	1.415e-17	-16.768	-16.849	-0.081	(0)
	FeF+2	8.035e-18	3.809e-18	-17.095	-17.419	-0.324	(0)
	FeF3	2.771e-18	2.771e-18	-17.557	-17.557	0.000	(0)
	PbF3-	2.536e-18	1.970e-18	-17.596	-17.705	-0.110	(0)
	BF3OH-	1.666e-18	1.345e-18	-17.778	-17.871	-0.093	(0)
	VO2F2-	1.476e-18	1.146e-18	-17.831	-17.941	-0.110	(0)
	VOF+	3.619e-20	2.812e-20	-19.441	-19.551	-0.110	(0)
	VO2F3-2	5.449e-21	1.985e-21	-20.264	-20.702	-0.439	(0)
	VOF2	1.463e-21	1.463e-21	-20.835	-20.835	0.000	(0)
	PbF4-2	3.593e-22	1.309e-22	-21.445	-21.883	-0.439	(0)
	HgF+	4.986e-23	3.874e-23	-22.302	-22.412	-0.110	(0)
	BF4-	3.242e-23	2.616e-23	-22.489	-22.582	-0.093	(0)
	VOF3-	9.278e-24	7.208e-24	-23.033	-23.142	-0.110	(0)
	VO2F4-3	1.315e-24	1.356e-25	-23.881	-24.868	-0.987	(0)
	Sb (OH) 2F	2.396e-25	2.396e-25	-24.620	-24.620	0.000	(0)
	SbOF	2.358e-25	2.358e-25	-24.627	-24.627	0.000	(0)
	VOF4-2	1.109e-26	4.038e-27	-25.955	-26.394	-0.439	(0)
	SiF6-2	3.642e-28	1.727e-28	-27.439	-27.763	-0.324	(0)
	UF3+	1.376e-35	1.069e-35	-34.861	-34.971	-0.110	(0)
	UF2+2	1.334e-36	4.861e-37	-35.875	-36.313	-0.439	(0)
	UF4	1.628e-37	1.628e-37	-36.788	-36.788	0.000	(0)
	UF+3	2.698e-39	2.782e-40	-38.569	-39.556	-0.987	(0)
	UF5-	1.152e-39	8.953e-40	-38.938	-39.048	-0.110	(0)
	UF6-2	1.030e-40	0.000e+00	-39.987	-40.426	-0.439	(0)
Fe (2)	6.063e-12						
	Fe+2	4.121e-12	1.501e-12	-11.385	-11.824	-0.439	(0)
	FeSO4	1.874e-12	1.874e-12	-11.727	-11.727	0.000	(0)
	FeHCO3+	4.243e-14	3.554e-14	-13.372	-13.449	-0.077	(0)
	FeOH+	2.546e-14	2.113e-14	-13.594	-13.675	-0.081	(0)
	Fe (OH) 2	5.932e-18	5.932e-18	-17.227	-17.227	0.000	(0)
	Fe (OH) 3-	7.991e-19	6.631e-19	-18.097	-18.178	-0.081	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-160.024	-160.024	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-236.453	-236.562	-0.110	(0)

Fe (3)	1.253e-09					
Fe (OH) 2+	9.430e-10	7.855e-10	-9.025	-9.105	-0.079	(0)
Fe (OH) 3	2.982e-10	2.982e-10	-9.525	-9.525	0.000	(0)
Fe (OH) 4-	1.178e-11	9.815e-12	-10.929	-11.008	-0.079	(0)
FeOH+2	1.205e-14	5.712e-15	-13.919	-14.243	-0.324	(0)
FeF2+	1.705e-17	1.415e-17	-16.768	-16.849	-0.081	(0)
FeF+2	8.035e-18	3.809e-18	-17.095	-17.419	-0.324	(0)
FeF3	2.771e-18	2.771e-18	-17.557	-17.557	0.000	(0)
FeSO4+	1.721e-18	1.428e-18	-17.764	-17.845	-0.081	(0)
Fe (SO4) 2-	1.998e-19	1.552e-19	-18.699	-18.809	-0.110	(0)
Fe+3	1.403e-19	2.503e-20	-18.853	-19.602	-0.749	(0)
FeCl+2	5.666e-21	2.686e-21	-20.247	-20.571	-0.324	(0)
FeCl2+	5.139e-23	4.265e-23	-22.289	-22.370	-0.081	(0)
FeHSeO3+2	1.787e-23	6.509e-24	-22.748	-23.186	-0.439	(0)
Fe2 (OH) 2+4	6.135e-26	1.080e-27	-25.212	-26.966	-1.754	(0)
FeCl3	1.516e-26	1.516e-26	-25.819	-25.819	0.000	(0)
FeNO3+2	9.158e-27	3.336e-27	-26.038	-26.477	-0.439	(0)
Fe3 (OH) 4+5	6.756e-33	1.227e-35	-32.170	-34.911	-2.741	(0)
H (0)	3.525e-29					
H2	1.762e-29	1.781e-29	-28.754	-28.749	0.005	(0)
Hg (0)	2.158e-09					
Hg	2.158e-09	2.158e-09	-8.666	-8.666	0.000	(0)
Hg (1)	6.054e-20					
Hg2+2	3.027e-20	1.103e-20	-19.519	-19.958	-0.439	(0)
Hg (2)	3.256e-11					
HgClOH	1.670e-11	1.670e-11	-10.777	-10.777	0.000	(0)
HgCl2	9.509e-12	9.509e-12	-11.022	-11.022	0.000	(0)
Hg (OH) 2	5.872e-12	5.935e-12	-11.231	-11.227	0.005	(0)
HgCl3-	4.350e-13	3.380e-13	-12.361	-12.471	-0.110	(0)
HgCO3	2.790e-14	2.790e-14	-13.554	-13.554	0.000	(0)
HgCl4-2	1.313e-14	4.782e-15	-13.882	-14.320	-0.439	(0)
Hg (CO3) 2-2	7.499e-16	2.732e-16	-15.125	-15.564	-0.439	(0)
HgCl+	6.872e-16	5.338e-16	-15.163	-15.273	-0.110	(0)
HgOH+	1.364e-16	1.059e-16	-15.865	-15.975	-0.110	(0)
HgHCO3+	1.903e-17	1.479e-17	-16.720	-16.830	-0.110	(0)
Hg (NH3) 2+2	1.404e-18	5.113e-19	-17.853	-18.291	-0.439	(0)
Hg (OH) 3-	3.399e-19	2.641e-19	-18.469	-18.578	-0.110	(0)
HgNH3+2	1.353e-19	4.928e-20	-18.869	-19.307	-0.439	(0)
Hg+2	2.067e-20	7.528e-21	-19.685	-20.123	-0.439	(0)
HgSO4	1.002e-20	1.002e-20	-19.999	-19.999	0.000	(0)
HgF+	4.986e-23	3.874e-23	-22.302	-22.412	-0.110	(0)
Hg (NH3) 3+2	5.798e-26	2.112e-26	-25.237	-25.675	-0.439	(0)
HgNO3+	4.769e-29	3.705e-29	-28.322	-28.431	-0.110	(0)
Hg (NH3) 4+2	4.778e-33	1.741e-33	-32.321	-32.759	-0.439	(0)
Hg (NO3) 2	2.053e-37	2.053e-37	-36.688	-36.688	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.690	-137.800	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-138.524	-138.962	-0.439	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.952	-138.952	0.000	(0)
K	3.774e-03					
K+	3.644e-03	3.009e-03	-2.438	-2.522	-0.083	(0)
KSO4-	1.300e-04	1.083e-04	-3.886	-3.965	-0.079	(0)
KCrO4-	7.624e-18	5.923e-18	-17.118	-17.227	-0.110	(0)
Mg	5.863e-03					
Mg+2	4.040e-03	1.878e-03	-2.394	-2.726	-0.333	(0)
MgSO4	1.738e-03	1.738e-03	-2.760	-2.760	0.000	(0)
MgHCO3+	4.400e-05	3.613e-05	-4.357	-4.442	-0.085	(0)
MgF+	3.543e-05	2.925e-05	-4.451	-4.534	-0.083	(0)
MgCO3	4.837e-06	4.837e-06	-5.315	-5.315	0.000	(0)
MgOH+	3.142e-07	2.643e-07	-6.503	-6.578	-0.075	(0)
MgH2BO3+	6.147e-08	4.960e-08	-7.211	-7.305	-0.093	(0)
Mn (2)	6.528e-05					
Mn+2	4.833e-05	1.761e-05	-4.316	-4.754	-0.439	(0)
MnSO4	1.592e-05	1.592e-05	-4.798	-4.798	0.000	(0)
MnHCO3+	7.960e-07	6.605e-07	-6.099	-6.180	-0.081	(0)
MnF+	1.173e-07	9.730e-08	-6.931	-7.012	-0.081	(0)
MnCl+	9.494e-08	7.878e-08	-7.023	-7.104	-0.081	(0)
MnOH+	1.884e-08	1.563e-08	-7.725	-7.806	-0.081	(0)
MnCl2	3.955e-10	3.955e-10	-9.403	-9.403	0.000	(0)

MnNO3+	4.788e-13	3.720e-13	-12.320	-12.429	-0.110	(0)
MnCl3-	4.666e-13	3.872e-13	-12.331	-12.412	-0.081	(0)
MnSeO4	3.202e-13	3.202e-13	-12.495	-12.495	0.000	(0)
Mn (OH) 3-	1.455e-17	1.207e-17	-16.837	-16.918	-0.081	(0)
Mn (NO3) 2	1.245e-20	1.245e-20	-19.905	-19.905	0.000	(0)
Mn (OH) 4-2	2.906e-23	1.378e-23	-22.537	-22.861	-0.324	(0)
MnSe	0.000e+00	0.000e+00	-41.537	-41.537	0.000	(0)
Mn (3)	7.910e-25					
Mn+3	7.910e-25	1.411e-25	-24.102	-24.850	-0.749	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.472	-41.796	-0.324	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.824	-45.914	-0.090	(0)
Mo	1.912e-06					
MoO4-2	1.911e-06	8.885e-07	-5.719	-6.051	-0.333	(0)
HMoO4-	6.477e-10	5.032e-10	-9.189	-9.298	-0.110	(0)
H2MoO4	1.049e-13	1.049e-13	-12.979	-12.979	0.000	(0)
Ag2MoO4	8.795e-25	8.795e-25	-24.056	-24.056	0.000	(0)
AlMo6O21-3	1.726e-39	1.779e-40	-38.763	-39.750	-0.987	(0)
Mo7O24-6	0.000e+00	0.000e+00	-45.787	-49.734	-3.947	(0)
HMo7O24-5	0.000e+00	0.000e+00	-48.152	-50.893	-2.741	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-51.902	-53.656	-1.754	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-56.969	-57.956	-0.987	(0)
N (-3)	6.864e-07					
NH4+	6.420e-07	5.180e-07	-6.192	-6.286	-0.093	(0)
NH4SO4-	3.401e-08	2.822e-08	-7.468	-7.549	-0.081	(0)
NH3	1.038e-08	1.038e-08	-7.984	-7.984	0.000	(0)
CaNH3+2	3.401e-11	1.239e-11	-10.468	-10.907	-0.439	(0)
CuNH3+2	2.033e-11	7.408e-12	-10.692	-11.130	-0.439	(0)
NiNH3+2	7.044e-13	2.566e-13	-12.152	-12.591	-0.439	(0)
Co (NH3) +2	9.043e-14	3.294e-14	-13.044	-13.482	-0.439	(0)
AgNH3+	4.409e-14	3.426e-14	-13.356	-13.465	-0.110	(0)
BaNH3+2	3.390e-16	1.235e-16	-15.470	-15.908	-0.439	(0)
Ag (NH3) 2+	3.719e-18	2.889e-18	-17.430	-17.539	-0.110	(0)
Hg (NH3) 2+2	1.404e-18	5.113e-19	-17.853	-18.291	-0.439	(0)
Ni (NH3) 2+2	1.056e-18	3.848e-19	-17.976	-18.415	-0.439	(0)
Ca (NH3) 2+2	1.405e-19	5.118e-20	-18.852	-19.291	-0.439	(0)
HgNH3+2	1.353e-19	4.928e-20	-18.869	-19.307	-0.439	(0)
Co (NH3) 2+2	4.003e-20	1.458e-20	-19.398	-19.836	-0.439	(0)
Hg (NH3) 3+2	5.798e-26	2.112e-26	-25.237	-25.675	-0.439	(0)
Co (NH3) 3+2	5.228e-27	1.905e-27	-26.282	-26.720	-0.439	(0)
Hg (NH3) 4+2	4.778e-33	1.741e-33	-32.321	-32.759	-0.439	(0)
Co (NH3) 4+2	2.847e-34	1.037e-34	-33.546	-33.984	-0.439	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-40.018	-40.456	-0.439	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.310	-41.748	-0.439	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-48.374	-49.361	-0.987	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.393	-48.832	-0.439	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-50.270	-50.708	-0.439	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-58.341	-58.451	-0.110	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-62.895	-63.334	-0.439	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.093	-63.531	-0.439	(0)
N (3)	1.536e-05					
NO2-	1.536e-05	1.247e-05	-4.814	-4.904	-0.090	(0)
CuNO2+	1.173e-10	9.110e-11	-9.931	-10.040	-0.110	(0)
AgNO2	4.213e-12	4.213e-12	-11.375	-11.375	0.000	(0)
CoNO2+	2.987e-12	2.321e-12	-11.525	-11.634	-0.110	(0)
Cu (NO2) 2	1.163e-14	1.163e-14	-13.935	-13.935	0.000	(0)
Ag (NO2) 2-	1.047e-16	8.137e-17	-15.980	-16.090	-0.110	(0)
N (5)	1.619e-08					
NO3-	1.614e-08	1.333e-08	-7.792	-7.875	-0.083	(0)
CaNO3+	5.147e-11	3.999e-11	-10.288	-10.398	-0.110	(0)
MnNO3+	4.788e-13	3.720e-13	-12.320	-12.429	-0.110	(0)
ZnNO3+	7.482e-14	5.812e-14	-13.126	-13.236	-0.110	(0)
CuNO3+	3.785e-15	2.941e-15	-14.422	-14.532	-0.110	(0)
NiNO3+	1.985e-15	1.542e-15	-14.702	-14.812	-0.110	(0)
BaNO3+	1.622e-15	1.260e-15	-14.790	-14.900	-0.110	(0)
CoNO3+	7.181e-16	5.579e-16	-15.144	-15.253	-0.110	(0)
CdNO3+	1.838e-16	1.428e-16	-15.736	-15.845	-0.110	(0)

	PbNO3+	7.107e-17	5.522e-17	-16.148	-16.258	-0.110	(0)
	AgNO3	1.712e-17	1.712e-17	-16.766	-16.766	0.000	(0)
	Mn (NO3) 2	1.245e-20	1.245e-20	-19.905	-19.905	0.000	(0)
	UO2NO3+	1.024e-21	7.956e-22	-20.990	-21.099	-0.110	(0)
	Zn (NO3) 2	1.546e-22	1.546e-22	-21.811	-21.811	0.000	(0)
	Co (NO3) 2	1.513e-23	1.513e-23	-22.820	-22.820	0.000	(0)
	CrNO3+2	5.582e-24	2.034e-24	-23.253	-23.692	-0.439	(0)
	Cu (NO3) 2	4.935e-24	4.935e-24	-23.307	-23.307	0.000	(0)
	Pb (NO3) 2	1.250e-24	1.250e-24	-23.903	-23.903	0.000	(0)
	Cd (NO3) 2	9.538e-25	9.538e-25	-24.021	-24.021	0.000	(0)
	VO2NO3	6.300e-25	6.300e-25	-24.201	-24.201	0.000	(0)
	FeNO3+2	9.158e-27	3.336e-27	-26.038	-26.477	-0.439	(0)
	HgNO3+	4.769e-29	3.705e-29	-28.322	-28.431	-0.110	(0)
	Hg (NO3) 2	2.053e-37	2.053e-37	-36.688	-36.688	0.000	(0)
Na		1.346e-02					
	Na+	1.310e-02	1.081e-02	-1.883	-1.966	-0.083	(0)
	NaSO4-	3.545e-04	2.953e-04	-3.450	-3.530	-0.079	(0)
	NaHCO3	1.143e-05	1.143e-05	-4.942	-4.942	0.000	(0)
	NaF	9.471e-07	9.471e-07	-6.024	-6.024	0.000	(0)
	NaCO3-	7.486e-07	6.235e-07	-6.126	-6.205	-0.079	(0)
	NaH2BO3	1.305e-08	1.305e-08	-7.884	-7.884	0.000	(0)
	NaCrO4-	3.664e-17	2.847e-17	-16.436	-16.546	-0.110	(0)
Ni		1.659e-07					
	Ni+2	9.906e-08	4.605e-08	-7.004	-7.337	-0.333	(0)
	NiSO4	4.672e-08	4.672e-08	-7.331	-7.331	0.000	(0)
	NiHCO3+	1.374e-08	1.067e-08	-7.862	-7.972	-0.110	(0)
	NiCO3	5.320e-09	5.320e-09	-8.274	-8.274	0.000	(0)
	NiCl+	5.390e-10	4.188e-10	-9.268	-9.378	-0.110	(0)
	NiOH+	2.638e-10	2.049e-10	-9.579	-9.688	-0.110	(0)
	NiF+	2.067e-10	1.606e-10	-9.685	-9.794	-0.110	(0)
	Ni (SO4) 2-2	2.159e-11	7.866e-12	-10.666	-11.104	-0.439	(0)
	Ni (OH) 2	5.754e-12	5.754e-12	-11.240	-11.240	0.000	(0)
	NiNH3+2	7.044e-13	2.566e-13	-12.152	-12.591	-0.439	(0)
	NiCl2	7.494e-15	7.494e-15	-14.125	-14.125	0.000	(0)
	Ni (OH) 3-	2.618e-15	2.034e-15	-14.582	-14.692	-0.110	(0)
	NiNO3+	1.985e-15	1.542e-15	-14.702	-14.812	-0.110	(0)
	NiSeO4	1.455e-15	1.455e-15	-14.837	-14.837	0.000	(0)
	Ni (NH3) 2+2	1.056e-18	3.848e-19	-17.976	-18.415	-0.439	(0)
O (0)		3.157e-35					
	O2	1.578e-35	1.595e-35	-34.802	-34.797	0.005	(0)
Pb		4.906e-09					
	PbCO3	2.607e-09	2.607e-09	-8.584	-8.584	0.000	(0)
	PbSO4	6.975e-10	6.975e-10	-9.156	-9.156	0.000	(0)
	Pb+2	6.025e-10	2.801e-10	-9.220	-9.553	-0.333	(0)
	PbHCO3+	5.036e-10	3.913e-10	-9.298	-9.408	-0.110	(0)
	PbOH+	3.201e-10	2.487e-10	-9.495	-9.604	-0.110	(0)
	Pb (CO3) 2-2	6.391e-11	2.328e-11	-10.194	-10.633	-0.439	(0)
	Pb (SO4) 2-2	5.866e-11	2.137e-11	-10.232	-10.670	-0.439	(0)
	PbCl+	4.546e-11	3.532e-11	-10.342	-10.452	-0.110	(0)
	PbF+	3.526e-12	2.740e-12	-11.453	-11.562	-0.110	(0)
	Pb (OH) 2	2.780e-12	2.780e-12	-11.556	-11.556	0.000	(0)
	PbCl2	5.607e-13	5.607e-13	-12.251	-12.251	0.000	(0)
	PbF2	7.483e-15	7.483e-15	-14.126	-14.126	0.000	(0)
	Pb (OH) 3-	1.265e-15	9.825e-16	-14.898	-15.008	-0.110	(0)
	PbCl3-	1.021e-15	7.933e-16	-14.991	-15.101	-0.110	(0)
	PbNO3+	7.107e-17	5.522e-17	-16.148	-16.258	-0.110	(0)
	Pb2OH+3	1.071e-17	1.104e-18	-16.970	-17.957	-0.987	(0)
	PbCl4-2	3.538e-18	1.289e-18	-17.451	-17.890	-0.439	(0)
	PbF3-	2.536e-18	1.970e-18	-17.596	-17.705	-0.110	(0)
	Pb (OH) 4-2	2.335e-19	8.506e-20	-18.632	-19.070	-0.439	(0)
	PbF4-2	3.593e-22	1.309e-22	-21.445	-21.883	-0.439	(0)
	Pb3 (OH) 4+2	1.185e-22	4.318e-23	-21.926	-22.365	-0.439	(0)
	Pb (NO3) 2	1.250e-24	1.250e-24	-23.903	-23.903	0.000	(0)
	Pb4 (OH) 4+4	5.454e-27	9.606e-29	-26.263	-28.017	-1.754	(0)
	Pb (HS) 2	0.000e+00	0.000e+00	-151.433	-151.433	0.000	(0)
	Pb (HS) 3-	0.000e+00	0.000e+00	-228.599	-228.708	-0.110	(0)
S (-2)		0.000e+00					
	AgHS	0.000e+00	0.000e+00	-73.552	-73.552	0.000	(0)

HS-	0.000e+00	0.000e+00	-78.466	-78.575	-0.110	(0)
CdHS+	0.000e+00	0.000e+00	-78.928	-79.037	-0.110	(0)
H2S	0.000e+00	0.000e+00	-79.101	-79.101	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.956	-80.395	-0.439	(0)
S6-2	0.000e+00	0.000e+00	-80.472	-80.911	-0.439	(0)
S4-2	0.000e+00	0.000e+00	-80.552	-80.990	-0.439	(0)
S3-2	0.000e+00	0.000e+00	-81.358	-81.796	-0.439	(0)
S2-2	0.000e+00	0.000e+00	-82.374	-82.812	-0.439	(0)
S-2	0.000e+00	0.000e+00	-88.005	-88.330	-0.324	(0)
HgHS2-	0.000e+00	0.000e+00	-137.690	-137.800	-0.110	(0)
HgS2-2	0.000e+00	0.000e+00	-138.524	-138.962	-0.439	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.952	-138.952	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.752	-147.965	-0.213	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.918	-148.027	-0.110	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-148.013	-148.389	-0.376	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.446	-148.555	-0.110	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.763	-149.119	-0.357	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.473	-149.859	-0.386	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.804	-150.170	-0.366	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.091	-150.091	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.409	-150.409	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.433	-151.433	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-160.024	-160.024	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.873	-216.983	-0.110	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.276	-225.386	-0.110	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.974	-227.084	-0.110	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-227.382	-227.820	-0.439	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.599	-228.708	-0.110	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-236.453	-236.562	-0.110	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.024	-303.463	-0.439	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.983	-305.421	-0.439	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.386	-318.824	-0.439	(0)
S (6)	1.428e-02					
SO4-2	1.094e-02	5.085e-03	-1.961	-2.294	-0.333	(0)
MgSO4	1.738e-03	1.738e-03	-2.760	-2.760	0.000	(0)
CaSO4	1.105e-03	1.105e-03	-2.957	-2.957	0.000	(0)
NaSO4-	3.545e-04	2.953e-04	-3.450	-3.530	-0.079	(0)
KSO4-	1.300e-04	1.083e-04	-3.886	-3.965	-0.079	(0)
MnSO4	1.592e-05	1.592e-05	-4.798	-4.798	0.000	(0)
ZnSO4	1.931e-06	1.931e-06	-5.714	-5.714	0.000	(0)
Zn (SO4) 2-2	2.347e-07	8.552e-08	-6.629	-7.068	-0.439	(0)
CuSO4	8.127e-08	8.127e-08	-7.090	-7.090	0.000	(0)
NiSO4	4.672e-08	4.672e-08	-7.331	-7.331	0.000	(0)
NH4SO4-	3.401e-08	2.822e-08	-7.468	-7.549	-0.081	(0)
CoSO4	2.679e-08	2.679e-08	-7.572	-7.572	0.000	(0)
HSO4-	1.713e-08	1.414e-08	-7.766	-7.849	-0.083	(0)
CdSO4	4.037e-09	4.037e-09	-8.394	-8.394	0.000	(0)
Cd (SO4) 2-2	7.602e-10	2.769e-10	-9.119	-9.558	-0.439	(0)
PbSO4	6.975e-10	6.975e-10	-9.156	-9.156	0.000	(0)
AgSO4-	2.112e-10	1.641e-10	-9.675	-9.785	-0.110	(0)
Pb (SO4) 2-2	5.866e-11	2.137e-11	-10.232	-10.670	-0.439	(0)
CrOHSO4	3.256e-11	3.256e-11	-10.487	-10.487	0.000	(0)
Ni (SO4) 2-2	2.159e-11	7.866e-12	-10.666	-11.104	-0.439	(0)
AlSO4+	3.299e-12	2.724e-12	-11.482	-11.565	-0.083	(0)
FeSO4	1.874e-12	1.874e-12	-11.727	-11.727	0.000	(0)
UO2SO4	2.302e-13	2.302e-13	-12.638	-12.638	0.000	(0)
Al (SO4) 2-	1.798e-13	1.484e-13	-12.745	-12.829	-0.083	(0)
CrSO4+	5.334e-14	4.144e-14	-13.273	-13.383	-0.110	(0)
UO2 (SO4) 2-2	4.236e-14	1.543e-14	-13.373	-13.812	-0.439	(0)
VO2SO4-	1.460e-17	1.134e-17	-16.836	-16.945	-0.110	(0)
FeSO4+	1.721e-18	1.428e-18	-17.764	-17.845	-0.081	(0)
Cr2 (OH) 2SO4+2	2.181e-19	7.944e-20	-18.661	-19.100	-0.439	(0)
Fe (SO4) 2-	1.998e-19	1.552e-19	-18.699	-18.809	-0.110	(0)
VOSO4	4.729e-20	4.729e-20	-19.325	-19.325	0.000	(0)
Cr2 (OH) 2 (SO4) 2	2.399e-20	2.399e-20	-19.620	-19.620	0.000	(0)
HgSO4	1.002e-20	1.002e-20	-19.999	-19.999	0.000	(0)
CrO3SO4-2	5.909e-24	2.153e-24	-23.228	-23.667	-0.439	(0)
VSO4+	2.341e-34	1.819e-34	-33.631	-33.740	-0.110	(0)

U(SO4)2	8.211e-40	8.211e-40	-39.086	-39.086	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.253	-40.692	-0.439	(0)
Co(NH3)6SO4+	0.000e+00	0.000e+00	-58.341	-58.451	-0.110	(0)
Sb(3)	7.670e-20					
Sb(OH)3	3.880e-20	3.880e-20	-19.411	-19.411	0.000	(0)
HSbO2	3.790e-20	3.790e-20	-19.421	-19.421	0.000	(0)
SbO2-	2.776e-24	2.156e-24	-23.557	-23.666	-0.110	(0)
Sb(OH)4-	1.588e-24	1.234e-24	-23.799	-23.909	-0.110	(0)
Sb(OH)2F	2.396e-25	2.396e-25	-24.620	-24.620	0.000	(0)
SbOF	2.358e-25	2.358e-25	-24.627	-24.627	0.000	(0)
Sb(OH)2+	3.455e-26	2.684e-26	-25.462	-25.571	-0.110	(0)
SbO+	1.192e-26	9.259e-27	-25.924	-26.033	-0.110	(0)
Sb2S4-2	0.000e+00	0.000e+00	-318.386	-318.824	-0.439	(0)
Sb(5)	2.923e-08					
SbO3-	2.920e-08	2.268e-08	-7.535	-7.644	-0.110	(0)
Sb(OH)6-	3.206e-11	2.647e-11	-10.494	-10.577	-0.083	(0)
SbO2+	6.790e-24	5.275e-24	-23.168	-23.278	-0.110	(0)
Se(-2)	8.519e-15					
Ag2Se	8.519e-15	8.519e-15	-14.070	-14.070	0.000	(0)
HSe-	1.465e-39	1.138e-39	-38.834	-38.944	-0.110	(0)
MnSe	0.000e+00	0.000e+00	-41.537	-41.537	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.599	-42.599	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.960	-46.398	-0.439	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.797	-84.551	-1.754	(0)
Se(4)	1.645e-07					
HSeO3-	1.267e-07	9.842e-08	-6.897	-7.007	-0.110	(0)
SeO3-2	3.779e-08	1.376e-08	-7.423	-7.861	-0.439	(0)
H2SeO3	1.195e-12	1.195e-12	-11.923	-11.923	0.000	(0)
AgSeO3-	1.841e-14	1.431e-14	-13.735	-13.844	-0.110	(0)
Cd(SeO3)2-2	1.452e-18	5.289e-19	-17.838	-18.277	-0.439	(0)
Ag(SeO3)2-3	1.710e-20	1.763e-21	-19.767	-20.754	-0.987	(0)
FeHSeO3+2	1.787e-23	6.509e-24	-22.748	-23.186	-0.439	(0)
Se(6)	1.457e-10					
SeO4-2	1.453e-10	6.756e-11	-9.838	-10.170	-0.333	(0)
MnSeO4	3.202e-13	3.202e-13	-12.495	-12.495	0.000	(0)
ZnSeO4	1.817e-14	1.817e-14	-13.741	-13.741	0.000	(0)
NiSeO4	1.455e-15	1.455e-15	-14.837	-14.837	0.000	(0)
CoSeO4	8.943e-16	8.943e-16	-15.049	-15.049	0.000	(0)
HSeO4-	1.241e-16	9.639e-17	-15.906	-16.016	-0.110	(0)
CdSeO4	4.261e-17	4.261e-17	-16.370	-16.370	0.000	(0)
Zn(SeO4)2-2	3.416e-24	1.244e-24	-23.466	-23.905	-0.439	(0)
Si	2.412e-05					
H4SiO4	2.397e-05	2.422e-05	-4.620	-4.616	0.005	(0)
H3SiO4-	1.498e-07	1.230e-07	-6.825	-6.910	-0.085	(0)
H2SiO4-2	5.664e-13	2.726e-13	-12.247	-12.564	-0.317	(0)
UO2H3SiO4+	4.021e-13	3.124e-13	-12.396	-12.505	-0.110	(0)
SiF6-2	3.642e-28	1.727e-28	-27.439	-27.763	-0.324	(0)
U(3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.061	-59.048	-0.987	(0)
U(4)	5.233e-21					
U(OH)5-	5.228e-21	4.061e-21	-20.282	-20.391	-0.110	(0)
U(OH)4	4.845e-24	4.845e-24	-23.315	-23.315	0.000	(0)
U(OH)3+	6.495e-28	5.046e-28	-27.187	-27.297	-0.110	(0)
U(OH)2+2	1.825e-32	6.647e-33	-31.739	-32.177	-0.439	(0)
UF3+	1.376e-35	1.069e-35	-34.861	-34.971	-0.110	(0)
UF2+2	1.334e-36	4.861e-37	-35.875	-36.313	-0.439	(0)
UF4	1.628e-37	1.628e-37	-36.788	-36.788	0.000	(0)
UOH+3	8.649e-38	8.917e-39	-37.063	-38.050	-0.987	(0)
UF+3	2.698e-39	2.782e-40	-38.569	-39.556	-0.987	(0)
UF5-	1.152e-39	8.953e-40	-38.938	-39.048	-0.110	(0)
U(SO4)2	8.211e-40	8.211e-40	-39.086	-39.086	0.000	(0)
UF6-2	1.030e-40	0.000e+00	-39.987	-40.426	-0.439	(0)
USO4+2	0.000e+00	0.000e+00	-40.253	-40.692	-0.439	(0)
U+4	0.000e+00	0.000e+00	-43.244	-44.998	-1.754	(0)
UCl+3	0.000e+00	0.000e+00	-44.761	-45.747	-0.987	(0)
U6(OH)15+9	0.000e+00	0.000e+00	-165.083	-173.963	-8.881	(0)
U(5)	1.308e-16					
UO2+	1.308e-16	1.016e-16	-15.883	-15.993	-0.110	(0)

U (6)	2.637e-07					
UO2 (CO3) 3-4	2.008e-07	3.536e-09	-6.697	-8.451	-1.754	(0)
UO2 (CO3) 2-2	6.255e-08	2.278e-08	-7.204	-7.642	-0.439	(0)
UO2CO3	3.688e-10	3.688e-10	-9.433	-9.433	0.000	(0)
UO2OH+	1.713e-12	1.331e-12	-11.766	-11.876	-0.110	(0)
UO2F+	7.378e-13	5.732e-13	-12.132	-12.242	-0.110	(0)
UO2H3SiO4+	4.021e-13	3.124e-13	-12.396	-12.505	-0.110	(0)
UO2SO4	2.302e-13	2.302e-13	-12.638	-12.638	0.000	(0)
UO2F2	2.295e-13	2.295e-13	-12.639	-12.639	0.000	(0)
UO2+2	6.435e-14	2.991e-14	-13.191	-13.524	-0.333	(0)
UO2 (SO4) 2-2	4.236e-14	1.543e-14	-13.373	-13.812	-0.439	(0)
UO2F3-	1.030e-14	8.001e-15	-13.987	-14.097	-0.110	(0)
UO2Cl+	2.219e-16	1.724e-16	-15.654	-15.763	-0.110	(0)
UO2F4-2	2.422e-17	8.821e-18	-16.616	-17.054	-0.439	(0)
(UO2) 2 (OH) 2+2	8.073e-18	2.941e-18	-17.093	-17.532	-0.439	(0)
(UO2) 3 (OH) 5+	4.776e-19	3.710e-19	-18.321	-18.431	-0.110	(0)
UO2NO3+	1.024e-21	7.956e-22	-20.990	-21.099	-0.110	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.516	-42.626	-0.110	(0)
V+2	0.000e+00	0.000e+00	-43.246	-43.684	-0.439	(0)
V (3)	2.700e-15					
V (OH) 3	2.700e-15	2.700e-15	-14.569	-14.569	0.000	(0)
V (OH) 2+	6.396e-26	4.969e-26	-25.194	-25.304	-0.110	(0)
VOH+2	3.685e-29	1.342e-29	-28.434	-28.872	-0.439	(0)
V+3	7.350e-34	7.578e-35	-33.134	-34.120	-0.987	(0)
VSO4+	2.341e-34	1.819e-34	-33.631	-33.740	-0.110	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-54.737	-55.724	-0.987	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-55.190	-56.944	-1.754	(0)
V (4)	3.242e-18					
V (OH) 3+	3.063e-18	2.380e-18	-17.514	-17.623	-0.110	(0)
VO+2	9.270e-20	3.377e-20	-19.033	-19.471	-0.439	(0)
VOSO4	4.729e-20	4.729e-20	-19.325	-19.325	0.000	(0)
VOF+	3.619e-20	2.812e-20	-19.441	-19.551	-0.110	(0)
VOF2	1.463e-21	1.463e-21	-20.835	-20.835	0.000	(0)
VOC1+	4.334e-22	3.367e-22	-21.363	-21.473	-0.110	(0)
VOF3-	9.278e-24	7.208e-24	-23.033	-23.142	-0.110	(0)
VOF4-2	1.109e-26	4.038e-27	-25.955	-26.394	-0.439	(0)
H2V2O4+2	7.805e-31	2.843e-31	-30.108	-30.546	-0.439	(0)
V (5)	8.828e-09					
H2VO4-	7.429e-09	5.771e-09	-8.129	-8.239	-0.110	(0)
HVO4-2	1.398e-09	5.093e-10	-8.854	-9.293	-0.439	(0)
H3VO4	1.643e-12	1.643e-12	-11.784	-11.784	0.000	(0)
H3V2O7-	7.885e-14	6.126e-14	-13.103	-13.213	-0.110	(0)
HV2O7-3	9.667e-15	9.966e-16	-14.015	-15.001	-0.987	(0)
VO4-3	8.697e-16	8.967e-17	-15.061	-16.047	-0.987	(0)
VO2+	1.132e-16	9.344e-17	-15.946	-16.029	-0.083	(0)
V2O7-4	5.351e-17	9.424e-19	-16.272	-18.026	-1.754	(0)
VO2F	2.275e-17	2.275e-17	-16.643	-16.643	0.000	(0)
VO2SO4-	1.460e-17	1.134e-17	-16.836	-16.945	-0.110	(0)
V3O9-3	1.957e-18	2.017e-19	-17.708	-18.695	-0.987	(0)
VO2F2-	1.476e-18	1.146e-18	-17.831	-17.941	-0.110	(0)
VO2F3-2	5.449e-21	1.985e-21	-20.264	-20.702	-0.439	(0)
V4O12-4	2.758e-23	4.857e-25	-22.559	-24.314	-1.754	(0)
VO2F4-3	1.315e-24	1.356e-25	-23.881	-24.868	-0.987	(0)
VO2NO3	6.300e-25	6.300e-25	-24.201	-24.201	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.714	-63.661	-3.947	(0)
HV10O28-5	0.000e+00	0.000e+00	-60.279	-63.019	-2.741	(0)
H2V10O28-4	0.000e+00	0.000e+00	-63.603	-65.358	-1.754	(0)
Zn	6.457e-06					
Zn+2	3.734e-06	1.736e-06	-5.428	-5.760	-0.333	(0)
ZnSO4	1.931e-06	1.931e-06	-5.714	-5.714	0.000	(0)
ZnCO3	3.093e-07	3.093e-07	-6.510	-6.510	0.000	(0)
Zn (SO4) 2-2	2.347e-07	8.552e-08	-6.629	-7.068	-0.439	(0)
ZnHCO3+	1.329e-07	1.032e-07	-6.877	-6.986	-0.110	(0)
ZnOH+	7.898e-08	6.136e-08	-7.102	-7.212	-0.110	(0)
ZnCl+	1.887e-08	1.550e-08	-7.724	-7.810	-0.085	(0)
ZnOHCl	7.172e-09	7.172e-09	-8.144	-8.144	0.000	(0)
ZnF+	6.189e-09	4.808e-09	-8.208	-8.318	-0.110	(0)

Zn(OH) 2	3.438e-09	3.438e-09	-8.464	-8.464	0.000	(0)
ZnCl2	8.730e-11	8.730e-11	-10.059	-10.059	0.000	(0)
Zn(OH) 3-	7.839e-12	6.090e-12	-11.106	-11.215	-0.110	(0)
ZnCl3-	3.001e-13	2.465e-13	-12.523	-12.608	-0.085	(0)
ZnNO3+	7.482e-14	5.812e-14	-13.126	-13.236	-0.110	(0)
ZnSeO4	1.817e-14	1.817e-14	-13.741	-13.741	0.000	(0)
ZnCl4-2	9.238e-16	4.380e-16	-15.034	-15.359	-0.324	(0)
Zn(OH) 4-2	2.353e-16	8.570e-17	-15.628	-16.067	-0.439	(0)
Zn(NO3) 2	1.546e-22	1.546e-22	-21.811	-21.811	0.000	(0)
Zn(SeO4) 2-2	3.416e-24	1.244e-24	-23.466	-23.905	-0.439	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-148.446	-148.555	-0.110	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.091	-150.091	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.276	-225.386	-0.110	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-227.382	-227.820	-0.439	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-304.983	-305.421	-0.439	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3) 2	-52.91	-46.62	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2	-40.28	-35.77	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-47.51	-35.77	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3	-68.72	-50.79	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3	-54.54	-34.51	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-28.25	-27.85	0.40	(NH4)2CrO4	
(NH4)2SeO4	-23.19	-22.74	0.45	(NH4)2SeO4	
Acanthite	-52.39	-88.61	-36.22	Ag2S	
Ag2CO3	-12.00	-23.09	-11.09	Ag2CO3	
Ag2CrO4	-21.27	-32.86	-11.59	Ag2CrO4	
Ag2HVO4	-12.46	-10.98	1.48	Ag2HVO4	
Ag2MoO4	-12.08	-23.63	-11.55	Ag2MoO4	
Ag2O	-15.07	-2.49	12.57	Ag2O	
Ag2Se	-0.28	-48.98	-48.70	Ag2Se	
Ag2SeO3	-9.89	-17.04	-7.15	Ag2SeO3	
Ag2SeO4	-18.84	-27.75	-8.91	Ag2SeO4	
Ag2SO4	-15.06	-19.88	-4.82	Ag2SO4	
Ag3AsO3	-28.57	-26.41	2.16	Ag3AsO3	
Ag3AsO4	-16.92	-19.71	-2.79	Ag3AsO4	
Ag3H2VO5	-17.40	-12.22	5.18	Ag3H2VO5	
AgF:4H2O	-13.70	-12.65	1.05	AgF:4H2O	
Agmetal	-0.54	-14.05	-13.51	Ag	
AgVO3	-10.50	-9.73	0.77	AgVO3	
Al(OH) 3(am)	-1.32	9.48	10.80	Al(OH) 3	
Al2(MoO4) 3	-46.84	-44.48	2.37	Al2(MoO4) 3	
Al2O3	-0.70	18.95	19.65	Al2O3	
Al4(OH)10SO4	-2.18	20.52	22.70	Al4(OH)10SO4	
AlAsO4:2H2O	-11.30	-6.50	4.80	AlAsO4:2H2O	
AlOHSO4	-4.68	-7.91	-3.23	AlOHSO4	
AlSb	-152.36	-86.73	65.62	AlSb	
Alunite	0.08	-1.32	-1.40	KAl3(SO4) 2 (OH) 6	
Anglesite	-4.06	-11.85	-7.79	PbSO4	
Anhydrite	-0.96	-5.32	-4.36	CaSO4	
Anilite	-55.52	-87.40	-31.88	Cu0.25Cu1.5S	
Antlerite	-2.37	6.42	8.79	Cu3(OH) 4SO4	
Aragonite	-0.23	-8.53	-8.30	CaCO3	
Arsenolite	-87.94	-90.70	-2.76	As4O6	
Artinite	-5.47	4.13	9.60	MgCO3:Mg(OH) 2:3H2O	
As2O5	-38.65	-31.95	6.71	As2O5	
Atacamite	-1.52	5.87	7.39	Cu2(OH) 3Cl	
Azurite	-0.49	-17.40	-16.91	Cu3(OH) 2 (CO3) 2	
Ba(OH) 2:8H2O	-17.03	7.36	24.39	Ba(OH) 2:8H2O	
Ba2V2O7:2H2O	-18.11	-2.24	15.87	Ba2V2O7:2H2O	
Ba3(AsO4) 2	-0.94	-9.85	-8.91	Ba3(AsO4) 2	
Ba3(VO4) 2:4H2O	-27.81	5.13	32.94	Ba3(VO4) 2:4H2O	
BaCrO4	-13.33	-23.00	-9.67	BaCrO4	
BaF2	-9.62	-15.44	-5.82	BaF2	
BaMoO4	-6.82	-13.78	-6.96	BaMoO4	

Barite	-0.04	-10.02	-9.98	BaSO ₄
BaS	-94.93	-78.75	16.18	BaS
BaSeO ₃	-9.02	-7.19	1.83	BaSeO ₃
BaSeO ₄	-10.43	-17.89	-7.46	BaSeO ₄
Bianchite	-6.29	-8.06	-1.76	ZnSO ₄ :6H ₂ O
Birnessite	-7.51	10.59	18.09	MnO ₂
Bixbyite	-3.78	-4.43	-0.64	Mn ₂ O ₃
BlaubleiI	-55.25	-79.41	-24.16	Cu _{0.9} Cu _{0.2} S
BlaubleiII	-55.82	-83.10	-27.28	Cu _{0.6} Cu _{0.8} S
Boehmite	0.90	9.48	8.58	AlOOH
Breithauptite	-57.13	-75.65	-18.52	NiSb
Brochantite	-0.87	14.35	15.22	Cu ₄ (OH) ₆ SO ₄
Brucite	-4.48	12.36	16.84	Mg(OH) ₂
Bunsenite	-4.69	7.75	12.45	NiO
Ca(VO ₃) ₂	-10.56	-4.90	5.66	Ca(VO ₃) ₂
Ca ₂ V ₂ O ₇	-10.33	7.17	17.50	Ca ₂ V ₂ O ₇
Ca ₂ V ₂ O ₇ :2H ₂ O	-14.38	7.17	21.55	Ca ₂ V ₂ O ₇ :2H ₂ O
Ca ₃ (AsO ₄) ₂ :4H ₂ O	-18.04	4.26	22.30	Ca ₃ (AsO ₄) ₂ :4H ₂ O
Ca ₃ (VO ₄) ₂	-19.72	19.24	38.96	Ca ₃ (VO ₄) ₂
Ca ₃ (VO ₄) ₂ :4H ₂ O	-20.62	19.24	39.86	Ca ₃ (VO ₄) ₂ :4H ₂ O
Ca ₃ Sb ₂	-299.18	-156.21	142.97	Ca ₃ Sb ₂
CaCrO ₄	-16.03	-18.30	-2.27	CaCrO ₄
Calcite	-0.05	-8.53	-8.48	CaCO ₃
Calomel	-6.95	-24.86	-17.91	Hg ₂ Cl ₂
CaMoO ₄	-1.12	-9.07	-7.95	CaMoO ₄
Carnotite	-2.12	-1.89	0.23	KUO ₂ VO ₄
CaSeO ₃ :2H ₂ O	-5.30	-2.48	2.81	CaSeO ₃ :2H ₂ O
CaSeO ₄ :2H ₂ O	-10.17	-13.19	-3.02	CaSeO ₄ :2H ₂ O
Cd(BO ₂) ₂	-12.07	-2.23	9.84	Cd(BO ₂) ₂
Cd(OH) ₂	-7.02	6.62	13.64	Cd(OH) ₂
Cd(OH) ₂ (am)	-7.11	6.62	13.73	Cd(OH) ₂
Cd ₃ (OH) ₂ (SO ₄) ₂	-21.62	-14.91	6.71	Cd ₃ (OH) ₂ (SO ₄) ₂
Cd ₃ (OH) ₄ SO ₄	-20.08	2.48	22.56	Cd ₃ (OH) ₄ SO ₄
Cd ₄ (OH) ₆ SO ₄	-19.30	9.10	28.40	Cd ₄ (OH) ₆ SO ₄
CdCl ₂	-12.71	-13.37	-0.66	CdCl ₂
CdCl ₂ :1H ₂ O	-11.68	-13.37	-1.69	CdCl ₂ :1H ₂ O
CdCl ₂ :2.5H ₂ O	-11.46	-13.37	-1.91	CdCl ₂ :2.5H ₂ O
CdF ₂	-14.97	-16.19	-1.21	CdF ₂
Cdmetal(alpha)	-32.49	-18.98	13.51	Cd
Cdmetal(gamma)	-32.60	-18.98	13.62	Cd
CdMoO ₄	-0.37	-14.52	-14.15	CdMoO ₄
CdOHCl	-6.91	-3.37	3.54	CdOHCl
CdSb	-76.44	-76.79	-0.35	CdSb
CdSe	-19.67	-39.87	-20.20	CdSe
CdSeO ₄ :2H ₂ O	-16.79	-18.64	-1.85	CdSeO ₄ :2H ₂ O
CdSO ₄	-10.59	-10.76	-0.17	CdSO ₄
CdSO ₄ :1H ₂ O	-9.04	-10.76	-1.73	CdSO ₄ :1H ₂ O
CdSO ₄ :2.67H ₂ O	-8.89	-10.76	-1.87	CdSO ₄ :2.67H ₂ O
Cerargyrite	-1.49	-11.24	-9.75	AgCl
Cerrusite	-1.93	-15.06	-13.13	PbCO ₃
CH ₄ (g)	-81.95	-123.00	-41.05	CH ₄
Chalcanthite	-6.81	-9.45	-2.64	CuSO ₄ :5H ₂ O
Chalcedony	-1.07	-4.62	-3.55	SiO ₂
Chalcocite	-55.55	-90.47	-34.92	Cu ₂ S
Chalcopyrite	-125.77	-161.04	-35.27	CuFeS ₂
Chrysotile	-4.34	27.86	32.20	Mg ₃ Si ₂ O ₅ (OH) ₄
Cinnabar	-51.65	-97.35	-45.69	HgS
Claudetite	-87.63	-90.70	-3.06	As ₄ O ₆
Clausthalite	-13.85	-40.95	-27.10	PbSe
Co(BO ₂) ₂	-28.41	-1.34	27.07	Co(BO ₂) ₂
Co(OH) ₂	-5.58	7.51	13.09	Co(OH) ₂
Co(OH) ₃	-9.78	-12.09	-2.31	Co(OH) ₃
CO ₂ (g)	-2.45	-20.60	-18.15	CO ₂
Co ₃ (AsO ₄) ₂	-22.44	-9.41	13.03	Co ₃ (AsO ₄) ₂
Co ₃ O ₄	-6.17	-16.66	-10.50	Co ₃ O ₄
CoCl ₂	-20.74	-12.48	8.27	CoCl ₂
CoCl ₂ :6H ₂ O	-15.02	-12.48	2.54	CoCl ₂ :6H ₂ O
CoCO ₃	-3.11	-13.09	-9.98	CoCO ₃

CoF2	-13.70	-15.29	-1.60	CoF2
CoF3	-44.84	-46.30	-1.46	CoF3
CoFe2O4	17.11	13.58	-3.53	CoFe2O4
CoMoO4	-5.87	-13.63	-7.76	CoMoO4
CoO	-6.07	7.51	13.59	CoO
CoS (alpha)	-71.17	-78.61	-7.44	CoS
CoS (beta)	-67.54	-78.61	-11.07	CoS
CoSe	-22.78	-38.98	-16.20	CoSe
CoSeO3	-8.36	-7.04	1.32	CoSeO3
CoSeO4:6H2O	-16.22	-17.75	-1.53	CoSeO4:6H2O
CoSO4	-12.67	-9.87	2.80	CoSO4
CoSO4:6H2O	-7.40	-9.87	-2.47	CoSO4:6H2O
Cotunnite	-9.67	-14.45	-4.78	PbCl2
Covellite	-55.89	-78.19	-22.30	CuS
Cr (OH) 2	-22.06	-11.24	10.82	Cr (OH) 2
Cr (OH) 3	-2.73	-1.39	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.64	-1.39	-0.75	Cr (OH) 3
Cr2O3	-0.42	-2.78	-2.36	Cr2O3
CrCl2	-45.32	-31.23	14.09	CrCl2
CrCl3	-46.49	-31.37	15.11	CrCl3
CrF3	-24.26	-35.60	-11.34	CrF3
Cristobalite	-1.27	-4.62	-3.35	SiO2
Crmetal	-67.32	-36.84	30.48	Cr
CrO3	-27.16	-30.37	-3.21	CrO3
Cryolite	-8.36	-42.20	-33.84	Na3AlF6
Cu (OH) 2	-0.74	7.93	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.90	20.31	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.80	0.45	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.57	-90.45	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-5.04	-50.84	-45.80	Cu2Se
Cu2SO4	-19.78	-21.73	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.24	-8.14	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.14	-102.73	-42.59	Cu3Sb
Cu3Se2	-25.90	-89.39	-63.49	Cu3Se2
CuCO3	-1.17	-12.67	-11.50	CuCO3
CuCrO4	-16.99	-22.43	-5.44	CuCrO4
CuF	-8.67	-13.58	-4.91	CuF
CuF2	-15.99	-14.87	1.12	CuF2
CuF2:2H2O	-10.32	-14.87	-4.55	CuF2:2H2O
Cumetal	-6.22	-14.97	-8.76	Cu
CuMoO4	-0.13	-13.21	-13.08	CuMoO4
CuOCuSO4	-11.82	-1.52	10.30	CuOCuSO4
Cupricferrite	8.02	14.00	5.99	CuFe2O4
Cuprite	-2.94	-4.35	-1.41	Cu2O
Cuprousferrite	9.78	0.86	-8.92	CuFeO2
CuSe	-5.45	-38.55	-33.10	CuSe
CuSe2	-26.08	-59.44	-33.37	CuSe2
CuSeO3:2H2O	-7.13	-6.62	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.89	-17.33	-2.44	CuSeO4:5H2O
CuSO4	-12.39	-9.45	2.94	CuSO4
Diaspore	2.60	9.48	6.87	AlOOH
Djurleite	-55.74	-89.66	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	-0.23	-16.77	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.32	-16.77	-17.09	CaMg (CO3) 2
Epsomite	-2.90	-5.02	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.30	3.27	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.08	0.04	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-9.98	-13.70	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.04	-8.48	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-16.96	-37.59	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-42.35	-46.08	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.89	9.34	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-13.34	-12.94	0.40	FeAsO4:2H2O
FeCr2O4	-6.71	0.49	7.20	FeCr2O4
FeMoO4	-7.78	-17.87	-10.09	FeMoO4
Ferrihydrite	-0.16	3.03	3.19	Fe (OH) 3
Ferroselite	-45.52	-64.11	-18.60	FeSe2
FeS (ppt)	-79.90	-82.85	-2.95	FeS

FeSe	-32.22	-43.22	-11.00	FeSe
Fix_pe	-5.25	-5.25	0.00	e-
Fluorite	-0.24	-10.74	-10.50	CaF2
Galena	-66.61	-80.58	-13.97	PbS
Gibbsite	1.18	9.48	8.29	Al(OH)3
Goethite	2.54	3.03	0.49	FeOOH
Goslarite	-6.05	-8.06	-2.01	ZnSO4:7H2O
Greenalite	-20.24	0.57	20.81	Fe3Si2O5(OH)4
Greenockite	-65.14	-79.50	-14.36	CdS
Greigite	-290.11	-335.14	-45.03	Fe3S4
Gummite	-6.10	1.57	7.67	UO3
Gypsum	-0.71	-5.32	-4.61	CaSO4:2H2O
H-Jarosite	-13.57	-25.67	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-8.27	-21.14	-12.88	H2MoO4
H2S(g)	-78.11	-86.12	-8.01	H2S
H2Se(g)	-41.53	-46.49	-4.96	H2Se
Halite	-6.02	-4.42	1.60	NaCl
Halloysite	0.15	9.72	9.57	Al2Si2O5(OH)4
Hausmannite	-4.42	56.61	61.03	Mn3O4
Hematite	7.49	6.07	-1.42	Fe2O3
Hercynite	-0.67	22.22	22.89	FeAl2O4
Hg(CH3)2(g)	-183.51	-257.22	-73.71	Hg(CH3)2
Hg(g)	-7.36	-15.23	-7.87	Hg
Hg(OH)2	-7.73	-11.23	-3.50	Hg(OH)2
Hg2(g)	-15.51	-30.47	-14.96	Hg2
Hg2(OH)2	-10.13	-4.87	5.26	Hg2(OH)2
Hg2CO3	-9.42	-25.47	-16.05	Hg2CO3
Hg2CrO4	-26.53	-35.23	-8.70	Hg2CrO4
Hg2F2	-17.31	-27.67	-10.36	Hg2F2
Hg2S	-79.31	-90.99	-11.68	Hg2S
Hg2SeO3	-14.76	-19.42	-4.66	Hg2SeO3
Hg2SO4	-16.12	-22.25	-6.13	Hg2SO4
Hg3O2CO3	-24.60	-54.28	-29.68	Hg3O2CO3
HgCl(g)	-31.92	-12.43	19.50	HgCl
HgCl2	-9.95	-31.22	-21.26	HgCl2
HgF(g)	-46.51	-13.84	32.68	HgF
HgF2(g)	-46.60	-34.03	12.57	HgF2
Hgmetal(l)	-1.78	-15.23	-13.45	Hg
HgSe	-2.02	-57.72	-55.69	HgSe
HgSeO3	-13.35	-25.78	-12.43	HgSeO3
HgSO4	-19.19	-28.61	-9.42	HgSO4
Huntite	-3.27	-33.24	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.82	-24.59	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-11.81	-20.58	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-15.10	-20.27	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-5.84	-20.64	-14.80	KFe3(SO4)2(OH)6
K2Cr2O7	-33.44	-50.69	-17.24	K2Cr2O7
K2CrO4	-19.81	-20.32	-0.51	K2CrO4
K2MoO4	-14.36	-11.09	3.26	K2MoO4
K2SeO4	-14.48	-15.21	-0.73	K2SeO4
Kaolinite	2.29	9.72	7.43	Al2Si2O5(OH)4
Langite	-3.14	14.35	17.49	Cu4(OH)6SO4:H2O
Larnakite	-5.87	-6.31	-0.43	PbO:PbSO4
Laurionite	-5.08	-4.46	0.62	PbOHCl
Lepidocrocite	1.66	3.03	1.37	FeOOH
Lime	-20.63	12.07	32.70	CaO
Litharge	-7.16	5.54	12.69	PbO
Mackinawite	-79.25	-82.85	-3.60	FeS
Maghemite	-0.32	6.07	6.39	Fe2O3
Magnesioferrite	1.58	18.43	16.86	Fe2MgO4
Magnesite	-0.78	-8.24	-7.46	MgCO3
Magnetite	5.93	9.34	3.40	Fe3O4
Malachite	0.57	-4.73	-5.31	Cu2(OH)2CO3
Manganite	-2.20	23.14	25.34	MnOOH
Massicot	-7.36	5.54	12.89	PbO
Matlockite	-6.89	-15.86	-8.97	PbClF
Melanothallite	-18.31	-12.05	6.26	CuCl2
Melanterite	-11.91	-14.12	-2.21	FeSO4:7H2O

Metacinnabar	-52.25	-97.35	-45.09	HgS
Mg(OH)2 (active)	-6.43	12.36	18.79	Mg(OH)2
Mg(VO3)2	-15.88	-4.60	11.28	Mg(VO3)2
Mg2Sb3	-274.58	-199.90	74.68	Mg2Sb3
Mg2V2O7	-18.60	7.76	26.36	Mg2V2O7
MgCr2O4	-6.61	9.59	16.20	MgCr2O4
MgCrO4	-23.38	-18.00	5.38	MgCrO4
MgF2	-2.31	-10.44	-8.13	MgF2
MgMoO4	-6.93	-8.78	-1.85	MgMoO4
MgSeO3:6H2O	-5.24	-2.19	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.70	-12.90	-1.20	MgSeO4:6H2O
Minium	-31.31	42.21	73.52	Pb3O4
Mirabilite	-5.12	-6.23	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.53	-6.63	4.90	Mn(VO3)2
Mn2(SO4)3	-50.87	-56.58	-5.71	Mn2(SO4)3
Mn2Sb	-149.41	-88.33	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-13.44	-0.94	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-12.37	-9.65	2.72	MnCl2:4H2O
MnS (grn)	-75.95	-75.78	0.17	MnS
MnS (pnk)	-79.12	-75.78	3.34	MnS
MnSb	-95.51	-98.42	-2.91	MnSb
MnSe	-39.65	-36.15	3.50	MnSe
MnSeO3	-5.35	-4.22	1.13	MnSeO3
MnSeO3:2H2O	-5.20	-4.22	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.88	-14.93	-2.05	MnSeO4:5H2O
MnSO4	-9.63	-7.05	2.58	MnSO4
Monteponite	-8.48	6.62	15.10	CdO
Montroydite	-7.59	-11.23	-3.64	HgO
MoO3	-13.14	-21.14	-8.00	MoO3
Morenosite	-7.49	-9.63	-2.14	NiSO4:7H2O
MoS2	-148.72	-218.98	-70.26	MoS2
Na-Jarosite	-8.89	-20.09	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-39.68	-49.57	-9.90	Na2Cr2O7
Na2CrO4	-22.14	-19.21	2.93	Na2CrO4
Na2Mo2O7	-14.53	-31.13	-16.60	Na2Mo2O7
Na2MoO4	-11.47	-9.98	1.49	Na2MoO4
Na2MoO4:2H2O	-11.21	-9.98	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-13.69	-3.39	10.30	Na2SeO3:5H2O
Na2SeO4	-15.38	-14.10	1.28	Na2SeO4
Na3Sb	-173.92	-79.47	94.45	Na3Sb
Na3VO4	-28.43	8.25	36.68	Na3VO4
Na4V2O7	-32.05	5.35	37.40	Na4V2O7
Nantokite	-5.44	-12.17	-6.73	CuCl
NaSb	-88.19	-65.03	23.17	NaSb
Natron	-8.13	-9.44	-1.31	Na2CO3:10H2O
NaVO3	-6.76	-2.90	3.86	NaVO3
Nesquehonite	-3.57	-8.24	-4.67	MgCO3:3H2O
Ni(OH)2	-5.04	7.75	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-24.39	-8.69	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-18.37	13.63	32.00	Ni4(OH)6SO4
NiCO3	-5.98	-12.85	-6.87	NiCO3
NiMoO4	-2.25	-13.39	-11.14	NiMoO4
NiS (alpha)	-72.77	-78.37	-5.60	NiS
NiS (beta)	-67.27	-78.37	-11.10	NiS
NiS (gamma)	-65.57	-78.37	-12.80	NiS
NiSe	-21.03	-38.73	-17.70	NiSe
NiSeO3:2H2O	-9.61	-6.80	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.99	-17.51	-1.52	NiSeO4:6H2O
Nsutite	-6.92	10.59	17.50	MnO2
O2 (g)	-31.89	51.20	83.09	O2
Orpiment	-242.64	-303.71	-61.07	As2S3
Otavite	-1.98	-13.98	-12.00	CdCO3
Pb(BO2)2	-9.84	-3.32	6.52	Pb(BO2)2
Pb(OH)2	-2.61	5.54	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-59.46	-68.22	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-7.71	1.08	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.11	11.08	26.19	Pb2O(OH)2
Pb2O3	-24.36	36.68	61.04	Pb2O3

Pb2OCO3	-8.97	-9.52	-0.56	Pb2OCO3
Pb2V2O7	-3.99	-5.89	-1.90	Pb2V2O7
Pb3(AsO4)2	-21.13	-15.33	5.80	Pb3(AsO4)2
Pb3(VO4)2	-6.49	-0.35	6.14	Pb3(VO4)2
Pb3O2CO3	-15.01	-3.99	11.02	Pb3O2CO3
Pb3O2SO4	-11.46	-0.77	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.33	4.77	21.10	Pb4(OH)6SO4
Pb4O3SO4	-17.11	4.77	21.88	Pb4O3SO4
PbCrO4	-12.23	-24.83	-12.60	PbCrO4
PbF2	-9.83	-17.27	-7.44	PbF2
Pbmetal	-24.31	-20.06	4.25	Pb
PbMoO4	0.02	-15.60	-15.62	PbMoO4
PbO:0.3H2O	-7.44	5.54	12.98	PbO:0.33H2O
PbSeO4	-12.88	-19.72	-6.84	PbSeO4
Periclase	-9.22	12.36	21.58	MgO
Phosgenite	-9.70	-29.51	-19.81	PbCl2:PbCO3
Plattnerite	-18.46	31.14	49.60	PbO2
Portlandite	-10.74	12.07	22.80	Ca(OH)2
Pyrite	-124.87	-143.37	-18.51	FeS2
Pyrochroite	-4.86	10.34	15.19	Mn(OH)2
Pyrolusite	-5.44	35.94	41.38	MnO2
Quartz	-0.62	-4.62	-4.00	SiO2
Realgar	-101.85	-121.59	-19.75	AsS
Retgersite	-7.59	-9.63	-2.04	NiSO4:6H2O
Rhodochrosite	0.32	-10.26	-10.58	MnCO3
Rutherfordine	-4.53	-19.03	-14.50	UO2CO3
Sb(OH)3	-12.30	-19.41	-7.11	Sb(OH)3
Sb2O4	-16.62	-13.22	3.40	Sb2O4
Sb2O5	-26.58	-36.24	-9.67	Sb2O5
Sb2Se3	-110.53	-178.29	-67.76	Sb2Se3
Sb4O6(cubic)	-59.38	-77.64	-18.26	Sb4O6
Sb4O6(orth)	-59.74	-77.64	-17.90	Sb4O6
SbCl3	-49.97	-49.40	0.57	SbCl3
SbF3	-43.39	-53.62	-10.23	SbF3
Sbmetal	-46.12	-57.81	-11.69	Sb
SbO2	-3.10	-30.92	-27.82	SbO2
Schoepite	-4.43	1.57	5.99	UO2(OH)2:H2O
Semetal(am)	-13.78	-20.89	-7.11	Se
Semetal(hex)	-13.18	-20.89	-7.71	Se
Senarmontite	-26.46	-38.82	-12.37	Sb2O3
SeO2	-14.68	-14.55	0.12	SeO2
SeO3	-46.31	-25.26	21.04	SeO3
Sepiolite	-4.88	10.88	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-7.90	10.88	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.09	-17.33	-10.24	FeCO3
SiO2(am-gel)	-1.91	-4.62	-2.71	SiO2
SiO2(am-ppt)	-1.88	-4.62	-2.74	SiO2
Smithsonite	-1.27	-11.27	-10.00	ZnCO3
Sphalerite	-65.34	-76.79	-11.45	ZnS
Spinel	-5.53	31.32	36.85	MgAl2O4
Stibnite	-246.72	-297.18	-50.46	Sb2S3
Sulfur	-58.38	-60.52	-2.14	S
Tenorite	0.29	7.93	7.64	CuO
Thenardite	-6.55	-6.23	0.32	Na2SO4
Thermonatrite	-10.08	-9.44	0.64	Na2CO3:H2O
Tyuyamunite	-5.85	-1.77	4.08	Ca(UO2)2(VO4)2
U3O8	-14.33	6.75	21.08	U3O8
U3Sb4	-581.66	-429.28	152.38	U3Sb4
U4O9	-30.65	-33.67	-3.02	U4O9
UF4	-30.89	-60.43	-29.54	UF4
UF4:2.5H2O	-27.71	-60.43	-32.72	UF4:2.5H2O
UO2(am)	-15.75	-14.82	0.93	UO2
UO2(NO3)2	-41.42	-29.27	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.13	-29.28	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.67	-29.28	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.32	-29.28	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-4.05	1.57	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.45	-23.70	-2.25	UO2SeO4:4H2O

UO3	-6.13	1.57	7.70	UO3
Uraninite	-10.15	-14.82	-4.67	UO2
USb2	-220.43	-190.85	29.58	USb2
V(OH)3	-19.08	-11.48	7.59	V(OH)3
V2O5	-15.61	-16.97	-1.36	V2O5
V3O5	-40.58	-38.74	1.84	V3O5
V4O7	-50.31	-43.12	7.19	V4O7
V6O13	-41.24	-102.10	-60.86	V6O13
Valentinite	-30.34	-38.82	-8.48	Sb2O3
VC12	-63.15	-44.27	18.87	VC12
VC13	-64.90	-41.47	23.43	VC13
VF4	-64.92	-49.99	14.93	VF4
Vmetal	-93.91	-49.88	44.03	V
VO	-39.04	-24.28	14.76	VO
VO(OH)2	-9.53	-4.38	5.15	VO(OH)2
VO2Cl	-21.32	-18.48	2.84	VO2Cl
VOC1	-32.63	-21.48	11.15	VOC1
VOC12	-37.13	-24.37	12.76	VOC12
VOSO4	-25.37	-21.77	3.61	VOSO4
Witherite	-4.66	-13.23	-8.57	BaCO3
Wurtzite	-67.84	-76.79	-8.95	ZnS
Zincite	-2.00	9.33	11.33	ZnO
Zincosite	-11.98	-8.05	3.93	ZnSO4
Zn(BO2)2	-7.81	0.48	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.83	-21.51	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.87	9.33	12.20	Zn(OH)2
Zn(OH)2(am)	-3.14	9.33	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.42	9.33	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.20	9.33	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.40	9.33	11.73	Zn(OH)2
Zn2(OH)2SO4	-6.22	1.28	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.53	8.67	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-17.61	-3.96	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-25.69	-6.78	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-8.46	19.94	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-11.84	26.66	38.50	Zn5(OH)8Cl2
ZnCl2	-17.71	-10.66	7.05	ZnCl2
ZnCO3:1H2O	-1.01	-11.27	-10.26	ZnCO3:1H2O
ZnF2	-12.94	-13.48	-0.53	ZnF2
Znmetal	-42.06	-16.27	25.79	Zn
ZnMoO4	-1.69	-11.81	-10.13	ZnMoO4
ZnO(active)	-1.86	9.33	11.19	ZnO
ZnS(am)	-67.74	-76.79	-9.05	ZnS
ZnSb	-85.09	-74.08	11.01	ZnSb
ZnSe	-22.76	-37.16	-14.40	ZnSe
ZnSeO4:6H2O	-14.41	-15.93	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.42	-8.05	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 159.

```

Title Evaporate Stage 9 lake water
REACTION 905
      H2O      -1
      28.01 moles      ## Removes x m3 water, but solute mass remains the
same
      USE solution 911
      Save Solution 912
      END
-----

```

TITLE

Evaporate Stage 9 lake water

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 911. Solution after simulation 158.

Using reaction 905.

Reaction 905.

2.801e+01 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-1.00000

Element	Relative moles
H	-2.00000
O	-1.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	3.759e-08	1.861e-08
Al	5.406e-06	2.676e-06
As	5.145e-10	2.547e-10
B	7.675e-05	3.799e-05
Ba	8.281e-08	4.100e-08
C	5.034e-03	2.492e-03
Ca	6.445e-03	3.191e-03
Cd	2.803e-08	1.387e-08
Cl	8.692e-03	4.303e-03
Co	2.150e-07	1.064e-07
Cr	3.557e-09	1.761e-09
Cu	3.328e-06	1.647e-06
F	4.168e-04	2.063e-04
Fe	2.543e-09	1.259e-09
Hg	4.423e-09	2.190e-09
K	7.622e-03	3.773e-03
Mg	1.184e-02	5.861e-03
Mn	1.318e-04	6.526e-05
Mo	3.861e-06	1.911e-06
N	3.243e-05	1.606e-05
Na	2.719e-02	1.346e-02
Ni	3.350e-07	1.658e-07
Pb	9.906e-09	4.904e-09
S	2.884e-02	1.428e-02
Sb	5.902e-08	2.922e-08
Se	3.324e-07	1.646e-07
Si	4.870e-05	2.411e-05
U	5.325e-07	2.636e-07
V	1.783e-08	8.825e-09
Zn	1.304e-05	6.455e-06

-----Description of solution-----

	pH = 7.505	Charge balance
equilibrium	pe = 5.311	Adjusted to redox

Activity of water = 0.999
 Ionic strength (mol/kgw) = 8.792e-02
 Mass of water (kg) = 4.950e-01
 Total alkalinity (eq/kg) = 4.856e-03
 Total CO2 (mol/kg) = 5.034e-03
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 1.900e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 7
 Total H = 5.495998e+01
 Total O = 2.754343e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.165e-07	3.213e-07	-6.380	-6.493	-0.113	(0)
H+	3.969e-08	3.130e-08	-7.401	-7.505	-0.103	0.00
H2O	5.551e+01	9.985e-01	1.744	-0.001	0.000	18.07
Ag	3.759e-08					
AgCl	1.910e-08	1.910e-08	-7.719	-7.719	0.000	(0)
AgCl2-	1.615e-08	1.140e-08	-7.792	-7.943	-0.151	(0)
Ag+	1.731e-09	1.365e-09	-8.762	-8.865	-0.103	(0)
AgSO4-	3.063e-10	2.162e-10	-9.514	-9.665	-0.151	(0)
AgCl3-2	2.804e-10	6.963e-11	-9.552	-10.157	-0.605	(0)
AgCl4-3	2.238e-11	9.744e-13	-10.650	-12.011	-1.361	(0)
AgNO2	6.754e-12	6.754e-12	-11.170	-11.170	0.000	(0)
AgF	8.328e-13	8.328e-13	-12.079	-12.079	0.000	(0)
AgNH3+	6.881e-14	4.858e-14	-13.162	-13.314	-0.151	(0)
AgOH	4.385e-14	4.385e-14	-13.358	-13.358	0.000	(0)
AgH2BO3	3.051e-14	3.051e-14	-13.516	-13.516	0.000	(0)
AgSeO3-	2.722e-14	1.921e-14	-13.565	-13.716	-0.151	(0)
Ag2Se	7.775e-15	7.775e-15	-14.109	-14.109	0.000	(0)
Ag(NO2)2-	3.510e-16	2.478e-16	-15.455	-15.606	-0.151	(0)
AgNO3	2.950e-17	2.950e-17	-16.530	-16.530	0.000	(0)
Ag(NH3)2+	9.750e-18	6.883e-18	-17.011	-17.162	-0.151	(0)
Ag(OH)2-	1.950e-18	1.377e-18	-17.710	-17.861	-0.151	(0)
Ag(SeO3)2-3	8.654e-20	3.768e-21	-19.063	-20.424	-1.361	(0)
Ag2MoO4	1.052e-24	1.052e-24	-23.978	-23.978	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.516	-73.516	0.000	(0)
AgOH(Se)2-4	0.000e+00	0.000e+00	-82.031	-84.451	-2.420	(0)
Ag(HS)S4-2	0.000e+00	0.000e+00	-147.616	-147.861	-0.246	(0)
Ag(HS)2-	0.000e+00	0.000e+00	-147.731	-147.882	-0.151	(0)
Ag(S4)2-3	0.000e+00	0.000e+00	-149.364	-149.797	-0.433	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.700	-150.108	-0.408	(0)
Al	5.406e-06					
Al(OH)4-	5.076e-06	3.984e-06	-5.294	-5.400	-0.105	(0)
AlF3	1.347e-07	1.347e-07	-6.871	-6.871	0.000	(0)
Al(OH)3	9.851e-08	9.851e-08	-7.007	-7.007	0.000	(0)
AlF2+	5.532e-08	4.403e-08	-7.257	-7.356	-0.099	(0)
AlF4-	2.089e-08	1.639e-08	-7.680	-7.785	-0.105	(0)
Al(OH)2+	1.931e-08	1.537e-08	-7.714	-7.813	-0.099	(0)
AlF+2	1.134e-09	4.553e-10	-8.945	-9.342	-0.396	(0)
AlOH+2	1.500e-10	6.022e-11	-9.824	-10.220	-0.396	(0)
AlSO4+	1.472e-11	1.155e-11	-10.832	-10.937	-0.105	(0)
Al+3	1.591e-12	1.874e-13	-11.798	-12.727	-0.929	(0)
Al(SO4)2-	1.252e-12	9.831e-13	-11.902	-12.007	-0.105	(0)
AlMo6O21-3	4.404e-37	1.918e-38	-36.356	-37.717	-1.361	(0)
As(3)	3.414e-23					
H3AsO3	3.336e-23	3.336e-23	-22.477	-22.477	0.000	(0)
H2AsO3-	7.745e-25	5.468e-25	-24.111	-24.262	-0.151	(0)
HAsO3-2	6.416e-29	1.593e-29	-28.193	-28.798	-0.605	(0)
H4AsO3+	7.328e-31	5.173e-31	-30.135	-30.286	-0.151	(0)
AsO3-3	4.507e-34	1.963e-35	-33.346	-34.707	-1.361	(0)
As(5)	5.145e-10					
HAsO4-2	4.673e-10	1.161e-10	-9.330	-9.935	-0.605	(0)

	H2AsO4-	4.692e-11	3.312e-11	-10.329	-10.480	-0.151	(0)
	AsO4-3	2.693e-13	1.173e-14	-12.570	-13.931	-1.361	(0)
	H3AsO4	1.765e-16	1.801e-16	-15.753	-15.744	0.009	(0)
B	7.675e-05						
	H3BO3	7.448e-05	7.601e-05	-4.128	-4.119	0.009	(0)
	H2BO3-	1.866e-06	1.411e-06	-5.729	-5.851	-0.122	(0)
	MgH2BO3+	1.861e-07	1.406e-07	-6.730	-6.852	-0.122	(0)
	CaH2BO3+	1.538e-07	1.163e-07	-6.813	-6.935	-0.122	(0)
	NaH2BO3	4.591e-08	4.591e-08	-7.338	-7.338	0.000	(0)
	BF(OH) 3-	9.748e-09	7.367e-09	-8.011	-8.133	-0.122	(0)
	H5(BO3) 2-	1.207e-10	9.125e-11	-9.918	-10.040	-0.122	(0)
	BF2(OH) 2-	7.934e-12	5.997e-12	-11.100	-11.222	-0.122	(0)
	BaH2BO3+	1.815e-12	1.372e-12	-11.741	-11.863	-0.122	(0)
	H8(BO3) 3-	9.177e-13	6.936e-13	-12.037	-12.159	-0.122	(0)
	AgH2BO3	3.051e-14	3.051e-14	-13.516	-13.516	0.000	(0)
	BF3OH-	2.350e-17	1.776e-17	-16.629	-16.751	-0.122	(0)
	BF4-	8.804e-22	6.654e-22	-21.055	-21.177	-0.122	(0)
Ba	8.281e-08						
	Ba+2	8.140e-08	3.147e-08	-7.089	-7.502	-0.413	(0)
	BaHCO3+	1.324e-09	1.063e-09	-8.878	-8.973	-0.095	(0)
	BaCO3	8.552e-11	8.552e-11	-10.068	-10.068	0.000	(0)
	BaH2BO3+	1.815e-12	1.372e-12	-11.741	-11.863	-0.122	(0)
	BaOH+	5.578e-14	4.413e-14	-13.254	-13.355	-0.102	(0)
	BaNO3+	6.080e-15	4.292e-15	-14.216	-14.367	-0.151	(0)
	BaNH3+2	1.394e-15	3.461e-16	-14.856	-15.461	-0.605	(0)
C (4)	5.034e-03						
	HCO3-	4.444e-03	3.537e-03	-2.352	-2.451	-0.099	(0)
	H2CO3	2.490e-04	2.490e-04	-3.604	-3.604	0.000	(0)
	MgHCO3+	1.337e-04	1.041e-04	-3.874	-3.983	-0.109	(0)
	CaHCO3+	1.175e-04	9.435e-05	-3.930	-4.025	-0.095	(0)
	NaHCO3	4.085e-05	4.085e-05	-4.389	-4.389	0.000	(0)
	CO3-2	1.371e-05	5.299e-06	-4.863	-5.276	-0.413	(0)
	MgCO3	1.267e-05	1.267e-05	-4.897	-4.897	0.000	(0)
	CaCO3	1.203e-05	1.203e-05	-4.920	-4.920	0.000	(0)
	CuCO3	2.648e-06	2.648e-06	-5.577	-5.577	0.000	(0)
	NaCO3-	2.546e-06	2.026e-06	-5.594	-5.693	-0.099	(0)
	MnHCO3+	2.118e-06	1.676e-06	-5.674	-5.776	-0.102	(0)
	ZnCO3	7.425e-07	7.425e-07	-6.129	-6.129	0.000	(0)
	UO2(CO3) 3-4	5.034e-07	1.915e-09	-6.298	-8.718	-2.420	(0)
	ZnHCO3+	3.859e-07	2.724e-07	-6.414	-6.565	-0.151	(0)
	Cu(CO3) 2-2	1.521e-07	3.777e-08	-6.818	-7.423	-0.605	(0)
	NiHCO3+	4.116e-08	2.905e-08	-7.386	-7.537	-0.151	(0)
	UO2(CO3) 2-2	2.904e-08	7.212e-09	-7.537	-8.142	-0.605	(0)
	CuHCO3+	2.683e-08	1.894e-08	-7.571	-7.723	-0.151	(0)
	CoHCO3+	1.364e-08	9.628e-09	-7.865	-8.016	-0.151	(0)
	NiCO3	1.317e-08	1.317e-08	-7.880	-7.880	0.000	(0)
	PbCO3	5.370e-09	5.370e-09	-8.270	-8.270	0.000	(0)
	CoCO3	3.134e-09	3.134e-09	-8.504	-8.504	0.000	(0)
	BaHCO3+	1.324e-09	1.063e-09	-8.878	-8.973	-0.095	(0)
	PbHCO3+	1.255e-09	8.860e-10	-8.901	-9.053	-0.151	(0)
	CdCO3	5.332e-10	5.332e-10	-9.273	-9.273	0.000	(0)
	Pb(CO3) 2-2	3.304e-10	8.207e-11	-9.481	-10.086	-0.605	(0)
	BaCO3	8.552e-11	8.552e-11	-10.068	-10.068	0.000	(0)
	UO2CO3	6.821e-11	6.821e-11	-10.166	-10.166	0.000	(0)
	CdHCO3+	5.036e-11	3.555e-11	-10.298	-10.449	-0.151	(0)
	Cd(CO3) 2-2	8.433e-12	2.094e-12	-11.074	-11.679	-0.605	(0)
	FeHCO3+	1.760e-13	1.412e-13	-12.755	-12.850	-0.095	(0)
	HgCO3	1.219e-13	1.219e-13	-12.914	-12.914	0.000	(0)
	Hg(CO3) 2-2	8.222e-15	2.042e-15	-14.085	-14.690	-0.605	(0)
	HgHCO3+	1.006e-16	7.102e-17	-15.997	-16.149	-0.151	(0)
Ca	6.445e-03						
	Ca+2	3.705e-03	1.432e-03	-2.431	-2.844	-0.413	(0)
	CaSO4	2.606e-03	2.606e-03	-2.584	-2.584	0.000	(0)
	CaHCO3+	1.175e-04	9.435e-05	-3.930	-4.025	-0.095	(0)
	CaCO3	1.203e-05	1.203e-05	-4.920	-4.920	0.000	(0)
	CaF+	4.800e-06	3.798e-06	-5.319	-5.420	-0.102	(0)
	CaH2BO3+	1.538e-07	1.163e-07	-6.813	-6.935	-0.122	(0)
	CaOH+	1.144e-08	9.182e-09	-7.942	-8.037	-0.095	(0)

		CaNO3+	1.746e-10	1.233e-10	-9.758	-9.909	-0.151	(0)
		CaNH3+2	1.266e-10	3.143e-11	-9.898	-10.503	-0.605	(0)
		Ca (NH3) 2+2	8.783e-19	2.181e-19	-18.056	-18.661	-0.605	(0)
Cd	2.803e-08							
		Cd+2	1.142e-08	4.414e-09	-7.942	-8.355	-0.413	(0)
		CdSO4	8.217e-09	8.217e-09	-8.085	-8.085	0.000	(0)
		CdCl+	4.093e-09	2.889e-09	-8.388	-8.539	-0.151	(0)
		Cd (SO4) 2-2	3.544e-09	8.802e-10	-8.451	-9.055	-0.605	(0)
		CdCO3	5.332e-10	5.332e-10	-9.273	-9.273	0.000	(0)
		CdCl2	8.254e-11	8.254e-11	-10.083	-10.083	0.000	(0)
		CdHCO3+	5.036e-11	3.555e-11	-10.298	-10.449	-0.151	(0)
		CdOHC1	3.808e-11	3.808e-11	-10.419	-10.419	0.000	(0)
		CdF+	2.407e-11	1.699e-11	-10.618	-10.770	-0.151	(0)
		CdOH+	1.596e-11	1.127e-11	-10.797	-10.948	-0.151	(0)
		Cd (CO3) 2-2	8.433e-12	2.094e-12	-11.074	-11.679	-0.605	(0)
		CdCl3-	5.056e-13	3.569e-13	-12.296	-12.447	-0.151	(0)
		Cd (OH) 2	2.284e-14	2.284e-14	-13.641	-13.641	0.000	(0)
		CdF2	8.237e-15	8.237e-15	-14.084	-14.084	0.000	(0)
		CdNO3+	5.381e-16	3.799e-16	-15.269	-15.420	-0.151	(0)
		CdSeO4	9.500e-17	9.500e-17	-16.022	-16.022	0.000	(0)
		Cd (SeO3) 2-2	7.028e-18	1.746e-18	-17.153	-17.758	-0.605	(0)
		Cd2OH+3	5.723e-18	2.492e-19	-17.242	-18.603	-1.361	(0)
		Cd (OH) 3-	6.349e-19	4.482e-19	-18.197	-18.349	-0.151	(0)
		Cd (NO3) 2	5.182e-24	5.182e-24	-23.286	-23.286	0.000	(0)
		Cd (OH) 4-2	9.490e-26	2.357e-26	-25.023	-25.628	-0.605	(0)
		CdHS+	0.000e+00	0.000e+00	-78.662	-78.813	-0.151	(0)
		Cd (HS) 2	0.000e+00	0.000e+00	-150.075	-150.075	0.000	(0)
		Cd (HS) 3-	0.000e+00	0.000e+00	-226.490	-226.641	-0.151	(0)
		Cd (HS) 4-2	0.000e+00	0.000e+00	-302.306	-302.911	-0.605	(0)
Cl	8.692e-03							
		Cl-	8.692e-03	6.854e-03	-2.061	-2.164	-0.103	(0)
		MnCl+	2.589e-07	2.049e-07	-6.587	-6.689	-0.102	(0)
		ZnCl+	5.386e-08	4.192e-08	-7.269	-7.378	-0.109	(0)
		AgCl	1.910e-08	1.910e-08	-7.719	-7.719	0.000	(0)
		ZnOHC1	1.763e-08	1.763e-08	-7.754	-7.754	0.000	(0)
		AgCl2-	1.615e-08	1.140e-08	-7.792	-7.943	-0.151	(0)
		CdCl+	4.093e-09	2.889e-09	-8.388	-8.539	-0.151	(0)
		CuCl2-	3.224e-09	2.510e-09	-8.492	-8.600	-0.109	(0)
		MnCl2	1.983e-09	1.983e-09	-8.703	-8.703	0.000	(0)
		CuCl	1.753e-09	1.753e-09	-8.756	-8.756	0.000	(0)
		NiCl+	1.655e-09	1.168e-09	-8.781	-8.932	-0.151	(0)
		CuCl+	1.184e-09	9.219e-10	-8.926	-9.035	-0.109	(0)
		CoCl+	1.175e-09	8.296e-10	-8.930	-9.081	-0.151	(0)
		ZnCl2	4.553e-10	4.553e-10	-9.342	-9.342	0.000	(0)
		AgCl3-2	2.804e-10	6.963e-11	-9.552	-10.157	-0.605	(0)
		PbCl+	1.161e-10	8.198e-11	-9.935	-10.086	-0.151	(0)
		HgCl2	9.026e-11	9.026e-11	-10.044	-10.044	0.000	(0)
		CdCl2	8.254e-11	8.254e-11	-10.083	-10.083	0.000	(0)
		HgClOH	7.473e-11	7.473e-11	-10.127	-10.127	0.000	(0)
		CdOHC1	3.808e-11	3.808e-11	-10.419	-10.419	0.000	(0)
		AgCl4-3	2.238e-11	9.744e-13	-10.650	-12.011	-1.361	(0)
		CuCl3-2	9.383e-12	3.677e-12	-11.028	-11.434	-0.407	(0)
		HgCl3-	8.763e-12	6.186e-12	-11.057	-11.209	-0.151	(0)
		MnCl3-	4.732e-12	3.744e-12	-11.325	-11.427	-0.102	(0)
		ZnCl3-	3.185e-12	2.479e-12	-11.497	-11.606	-0.109	(0)
		PbCl2	2.510e-12	2.510e-12	-11.600	-11.600	0.000	(0)
		CuCl2	2.191e-12	2.191e-12	-11.659	-11.659	0.000	(0)
		HgCl4-2	6.796e-13	1.688e-13	-12.168	-12.773	-0.605	(0)
		CdCl3-	5.056e-13	3.569e-13	-12.296	-12.447	-0.151	(0)
		NiCl2	4.031e-14	4.031e-14	-13.395	-13.395	0.000	(0)
		ZnCl4-2	2.168e-14	8.495e-15	-13.664	-14.071	-0.407	(0)
		PbCl3-	9.699e-15	6.847e-15	-14.013	-14.164	-0.151	(0)
		HgCl+	3.722e-15	2.628e-15	-14.429	-14.580	-0.151	(0)
		CrCl+2	2.729e-16	6.778e-17	-15.564	-16.169	-0.605	(0)
		CuCl3-	1.800e-16	1.401e-16	-15.745	-15.853	-0.109	(0)
		PbCl4-2	8.636e-17	2.145e-17	-16.064	-16.669	-0.605	(0)
		UO2Cl+	5.091e-17	3.594e-17	-16.293	-16.444	-0.151	(0)
		CrOHC12	2.837e-18	2.837e-18	-17.547	-17.547	0.000	(0)

CrCl2+	6.244e-20	4.408e-20	-19.205	-19.356	-0.151	(0)
FeCl+2	3.184e-20	1.248e-20	-19.497	-19.904	-0.407	(0)
CuCl4-2	1.228e-20	4.813e-21	-19.911	-20.318	-0.407	(0)
VOCl+	2.097e-21	1.480e-21	-20.678	-20.830	-0.151	(0)
FeCl2+	4.828e-22	3.820e-22	-21.316	-21.418	-0.102	(0)
FeCl3	2.618e-25	2.618e-25	-24.582	-24.582	0.000	(0)
CrO3Cl-	1.557e-25	1.099e-25	-24.808	-24.959	-0.151	(0)
CoCl+2	1.600e-34	3.975e-35	-33.796	-34.401	-0.605	(0)
UCl+3	0.000e+00	0.000e+00	-45.016	-46.377	-1.361	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.636	-47.241	-0.605	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.126	-48.731	-0.605	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.110	-61.715	-0.605	(0)
Co (2)	2.150e-07					
Co+2	1.409e-07	3.499e-08	-6.851	-7.456	-0.605	(0)
CoSO4	5.544e-08	5.544e-08	-7.256	-7.256	0.000	(0)
CoHCO3+	1.364e-08	9.628e-09	-7.865	-8.016	-0.151	(0)
CoCO3	3.134e-09	3.134e-09	-8.504	-8.504	0.000	(0)
CoCl+	1.175e-09	8.296e-10	-8.930	-9.081	-0.151	(0)
CoF+	3.807e-10	2.688e-10	-9.419	-9.571	-0.151	(0)
CoOH+	3.177e-10	2.243e-10	-9.498	-9.649	-0.151	(0)
CoNO2+	8.273e-12	5.840e-12	-11.082	-11.234	-0.151	(0)
Co (OH) 2	5.724e-12	5.724e-12	-11.242	-11.242	0.000	(0)
Co (NH3) +2	2.953e-13	7.333e-14	-12.530	-13.135	-0.605	(0)
CoNO3+	2.138e-15	1.509e-15	-14.670	-14.821	-0.151	(0)
CoSeO4	2.027e-15	2.027e-15	-14.693	-14.693	0.000	(0)
Co (OH) 3-	5.198e-17	3.669e-17	-16.284	-16.435	-0.151	(0)
CoOOH-	1.306e-17	9.220e-18	-16.884	-17.035	-0.151	(0)
Co2OH+3	9.032e-18	3.933e-19	-17.044	-18.405	-1.361	(0)
Co (NH3) 2+2	2.196e-19	5.453e-20	-18.658	-19.263	-0.605	(0)
Co (NO3) 2	8.357e-23	8.357e-23	-22.078	-22.078	0.000	(0)
Co (OH) 4-2	7.522e-24	1.868e-24	-23.124	-23.729	-0.605	(0)
Co (NH3) 3+2	4.818e-26	1.197e-26	-25.317	-25.922	-0.605	(0)
Co4 (OH) 4+4	1.327e-28	5.050e-31	-27.877	-30.297	-2.420	(0)
Co (NH3) 4+2	4.408e-33	1.095e-33	-32.356	-32.961	-0.605	(0)
Co (NH3) 5+2	1.275e-40	0.000e+00	-39.894	-40.499	-0.605	(0)
Co (3)	1.874e-28					
CoOH+2	1.874e-28	4.653e-29	-27.727	-28.332	-0.605	(0)
Co+3	2.419e-34	2.850e-35	-33.616	-34.545	-0.929	(0)
CoCl+2	1.600e-34	3.975e-35	-33.796	-34.401	-0.605	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.636	-47.241	-0.605	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.575	-56.726	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.110	-61.715	-0.605	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.239	-61.844	-0.605	(0)
Cr (2)	3.592e-26					
Cr+2	3.592e-26	8.922e-27	-25.445	-26.050	-0.605	(0)
Cr (3)	3.557e-09					
Cr (OH) 2+	2.974e-09	2.100e-09	-8.527	-8.678	-0.151	(0)
Cr (OH) 3	2.534e-10	2.534e-10	-9.596	-9.596	0.000	(0)
Cr (OH) +2	2.163e-10	5.371e-11	-9.665	-10.270	-0.605	(0)
CrOHSO4	1.012e-10	1.012e-10	-9.995	-9.995	0.000	(0)
CrO2-	5.455e-12	3.851e-12	-11.263	-11.414	-0.151	(0)
Cr (OH) 4-	4.591e-12	3.241e-12	-11.338	-11.489	-0.151	(0)
CrF+2	1.185e-12	2.942e-13	-11.926	-12.531	-0.605	(0)
CrSO4+	2.007e-13	1.417e-13	-12.697	-12.849	-0.151	(0)
Cr+3	1.755e-13	7.642e-15	-12.756	-14.117	-1.361	(0)
CrCl+2	2.729e-16	6.778e-17	-15.564	-16.169	-0.605	(0)
CrOHCl2	2.837e-18	2.837e-18	-17.547	-17.547	0.000	(0)
Cr2 (OH) 2SO4+2	1.978e-18	4.914e-19	-17.704	-18.309	-0.605	(0)
Cr2 (OH) 2 (SO4) 2	2.318e-19	2.318e-19	-18.635	-18.635	0.000	(0)
CrCl2+	6.244e-20	4.408e-20	-19.205	-19.356	-0.151	(0)
CrNO3+2	3.660e-23	9.091e-24	-22.436	-23.041	-0.605	(0)
Cr (NH3) 5OH+2	3.750e-39	9.313e-40	-38.426	-39.031	-0.605	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.308	-47.669	-1.361	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.126	-48.731	-0.605	(0)
Cr (6)	2.333e-15					
CrO4-2	2.078e-15	8.033e-16	-14.682	-15.095	-0.413	(0)
NaCrO4-	1.161e-16	8.197e-17	-15.935	-16.086	-0.151	(0)
HCrO4-	1.152e-16	8.135e-17	-15.938	-16.090	-0.151	(0)

KCrO4-	2.407e-17	1.699e-17	-16.619	-16.770	-0.151	(0)
CrO3SO4-2	2.483e-23	6.166e-24	-22.605	-23.210	-0.605	(0)
H2CrO4	2.064e-24	2.064e-24	-23.685	-23.685	0.000	(0)
CrO3Cl-	1.557e-25	1.099e-25	-24.808	-24.959	-0.151	(0)
Cr2O7-2	9.253e-31	2.298e-31	-30.034	-30.639	-0.605	(0)
Cu (1)	5.274e-09					
CuCl2-	3.224e-09	2.510e-09	-8.492	-8.600	-0.109	(0)
CuCl	1.753e-09	1.753e-09	-8.756	-8.756	0.000	(0)
Cu+	2.878e-10	2.031e-10	-9.541	-9.692	-0.151	(0)
CuCl3-2	9.383e-12	3.677e-12	-11.028	-11.434	-0.407	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.805	-148.225	-0.420	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.559	-148.955	-0.396	(0)
Cu (2)	3.322e-06					
CuCO3	2.648e-06	2.648e-06	-5.577	-5.577	0.000	(0)
Cu+2	2.195e-07	8.487e-08	-6.658	-7.071	-0.413	(0)
CuSO4	1.544e-07	1.544e-07	-6.811	-6.811	0.000	(0)
Cu (CO3) 2-2	1.521e-07	3.777e-08	-6.818	-7.423	-0.605	(0)
CuOH+	1.108e-07	8.623e-08	-6.956	-7.064	-0.109	(0)
CuHCO3+	2.683e-08	1.894e-08	-7.571	-7.723	-0.151	(0)
Cu (OH) 2	5.527e-09	5.527e-09	-8.257	-8.257	0.000	(0)
CuF+	1.843e-09	1.301e-09	-8.735	-8.886	-0.151	(0)
CuCl+	1.184e-09	9.219e-10	-8.926	-9.035	-0.109	(0)
Cu2 (OH) 2+2	7.520e-10	1.868e-10	-9.124	-9.729	-0.605	(0)
CuNO2+	2.982e-10	2.105e-10	-9.526	-9.677	-0.151	(0)
CuNH3+2	6.096e-11	1.514e-11	-10.215	-10.820	-0.605	(0)
Cu (OH) 3-	5.160e-12	3.642e-12	-11.287	-11.439	-0.151	(0)
CuCl2	2.191e-12	2.191e-12	-11.659	-11.659	0.000	(0)
Cu (NO2) 2	5.102e-14	5.102e-14	-13.292	-13.292	0.000	(0)
CuNO3+	1.035e-14	7.304e-15	-13.985	-14.136	-0.151	(0)
CuCl3-	1.800e-16	1.401e-16	-15.745	-15.853	-0.109	(0)
Cu (OH) 4-2	3.708e-17	9.210e-18	-16.431	-17.036	-0.605	(0)
CuCl4-2	1.228e-20	4.813e-21	-19.911	-20.318	-0.407	(0)
Cu (NO3) 2	2.502e-23	2.502e-23	-22.602	-22.602	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.419	-216.570	-0.151	(0)
F	4.168e-04					
F-	3.081e-04	2.429e-04	-3.511	-3.615	-0.103	(0)
MgF+	9.983e-05	7.836e-05	-4.001	-4.106	-0.105	(0)
CaF+	4.800e-06	3.798e-06	-5.319	-5.420	-0.102	(0)
NaF	3.147e-06	3.147e-06	-5.502	-5.502	0.000	(0)
MnF+	2.902e-07	2.296e-07	-6.537	-6.639	-0.102	(0)
AlF3	1.347e-07	1.347e-07	-6.871	-6.871	0.000	(0)
AlF2+	5.532e-08	4.403e-08	-7.257	-7.356	-0.099	(0)
AlF4-	2.089e-08	1.639e-08	-7.680	-7.785	-0.105	(0)
ZnF+	1.672e-08	1.180e-08	-7.777	-7.928	-0.151	(0)
HF	1.124e-08	1.124e-08	-7.949	-7.949	0.000	(0)
BF (OH) 3-	9.748e-09	7.367e-09	-8.011	-8.133	-0.122	(0)
CuF+	1.843e-09	1.301e-09	-8.735	-8.886	-0.151	(0)
AlF+2	1.134e-09	4.553e-10	-8.945	-9.342	-0.396	(0)
NiF+	5.759e-10	4.065e-10	-9.240	-9.391	-0.151	(0)
CoF+	3.807e-10	2.688e-10	-9.419	-9.571	-0.151	(0)
CdF+	2.407e-11	1.699e-11	-10.618	-10.770	-0.151	(0)
HF2-	1.346e-11	1.038e-11	-10.871	-10.984	-0.113	(0)
PbF+	8.174e-12	5.771e-12	-11.088	-11.239	-0.151	(0)
BF2 (OH) 2-	7.934e-12	5.997e-12	-11.100	-11.222	-0.122	(0)
CrF+2	1.185e-12	2.942e-13	-11.926	-12.531	-0.605	(0)
AgF	8.328e-13	8.328e-13	-12.079	-12.079	0.000	(0)
UO2F+	1.536e-13	1.084e-13	-12.814	-12.965	-0.151	(0)
UO2F2	7.596e-14	7.596e-14	-13.119	-13.119	0.000	(0)
PbF2	2.759e-14	2.759e-14	-13.559	-13.559	0.000	(0)
CdF2	8.237e-15	8.237e-15	-14.084	-14.084	0.000	(0)
UO2F3-	6.566e-15	4.635e-15	-14.183	-14.334	-0.151	(0)
H2F2	3.387e-16	3.387e-16	-15.470	-15.470	0.000	(0)
FeF2+	1.319e-16	1.044e-16	-15.880	-15.981	-0.102	(0)
VO2F	8.555e-17	8.555e-17	-16.068	-16.068	0.000	(0)
FeF+2	4.097e-17	1.606e-17	-16.388	-16.794	-0.407	(0)
UO2F4-2	3.601e-17	8.943e-18	-16.444	-17.049	-0.605	(0)
FeF3	3.578e-17	3.578e-17	-16.446	-16.446	0.000	(0)
BF3OH-	2.350e-17	1.776e-17	-16.629	-16.751	-0.122	(0)

PbF3-	1.800e-17	1.271e-17	-16.745	-16.896	-0.151	(0)
VO2F2-	1.069e-17	7.545e-18	-16.971	-17.122	-0.151	(0)
VOF+	1.589e-19	1.122e-19	-18.799	-18.950	-0.151	(0)
VO2F3-2	9.206e-20	2.286e-20	-19.036	-19.641	-0.605	(0)
VOF2	1.022e-20	1.022e-20	-19.991	-19.991	0.000	(0)
PbF4-2	5.950e-21	1.478e-21	-20.225	-20.830	-0.605	(0)
BF4-	8.804e-22	6.654e-22	-21.055	-21.177	-0.122	(0)
HgF+	2.451e-22	1.730e-22	-21.611	-21.762	-0.151	(0)
VOF3-	1.247e-22	8.806e-23	-21.904	-22.055	-0.151	(0)
VO2F4-3	6.275e-23	2.733e-24	-22.202	-23.563	-1.361	(0)
Sb(OH) 2F	8.654e-25	8.654e-25	-24.063	-24.063	0.000	(0)
SbOF	8.522e-25	8.522e-25	-24.069	-24.069	0.000	(0)
VOF4-2	3.477e-25	8.634e-26	-24.459	-25.064	-0.605	(0)
SiF6-2	3.782e-26	1.482e-26	-25.422	-25.829	-0.407	(0)
UF3+	9.875e-36	6.971e-36	-35.005	-35.157	-0.151	(0)
UF2+2	7.291e-37	1.811e-37	-36.137	-36.742	-0.605	(0)
UF4	1.857e-37	1.857e-37	-36.731	-36.731	0.000	(0)
UF5-	2.532e-39	1.787e-39	-38.597	-38.748	-0.151	(0)
UF+3	1.360e-39	0.000e+00	-38.867	-40.228	-1.361	(0)
UF6-2	5.280e-40	1.311e-40	-39.277	-39.882	-0.605	(0)
Fe (2)	1.918e-11					
Fe+2	1.277e-11	3.172e-12	-10.894	-11.499	-0.605	(0)
FeSO4	6.182e-12	6.182e-12	-11.209	-11.209	0.000	(0)
FeHCO3+	1.760e-13	1.412e-13	-12.755	-12.850	-0.095	(0)
FeOH+	5.127e-14	4.056e-14	-13.290	-13.392	-0.102	(0)
Fe (OH) 2	1.035e-17	1.035e-17	-16.985	-16.985	0.000	(0)
Fe (OH) 3-	1.329e-18	1.052e-18	-17.876	-17.978	-0.102	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.481	-159.481	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.758	-235.910	-0.151	(0)
Fe (3)	2.523e-09					
Fe (OH) 2+	1.964e-09	1.563e-09	-8.707	-8.806	-0.099	(0)
Fe (OH) 3	5.393e-10	5.393e-10	-9.268	-9.268	0.000	(0)
Fe (OH) 4-	2.027e-11	1.613e-11	-10.693	-10.792	-0.099	(0)
FeOH+2	3.191e-14	1.251e-14	-13.496	-13.903	-0.407	(0)
FeF2+	1.319e-16	1.044e-16	-15.880	-15.981	-0.102	(0)
FeF+2	4.097e-17	1.606e-17	-16.388	-16.794	-0.407	(0)
FeF3	3.578e-17	3.578e-17	-16.446	-16.446	0.000	(0)
FeSO4+	6.789e-18	5.371e-18	-17.168	-17.270	-0.102	(0)
Fe (SO4) 2-	1.292e-18	9.119e-19	-17.889	-18.040	-0.151	(0)
Fe+3	5.116e-19	6.029e-20	-18.291	-19.220	-0.929	(0)
FeCl+2	3.184e-20	1.248e-20	-19.497	-19.904	-0.407	(0)
FeCl2+	4.828e-22	3.820e-22	-21.316	-21.418	-0.102	(0)
FeHSeO3+2	1.104e-22	2.743e-23	-21.957	-22.562	-0.605	(0)
Fe2 (OH) 2+4	1.361e-24	5.179e-27	-23.866	-26.286	-2.420	(0)
FeCl3	2.618e-25	2.618e-25	-24.582	-24.582	0.000	(0)
FeNO3+2	6.606e-26	1.641e-26	-25.180	-25.785	-0.605	(0)
Fe3 (OH) 4+5	7.061e-31	1.170e-34	-30.151	-33.932	-3.781	(0)
H (0)	3.245e-29					
H2	1.623e-29	1.656e-29	-28.790	-28.781	0.009	(0)
Hg (0)	4.236e-09					
Hg	4.236e-09	4.236e-09	-8.373	-8.373	0.000	(0)
Hg (1)	4.450e-19					
Hg2+2	2.225e-19	5.526e-20	-18.653	-19.258	-0.605	(0)
Hg (2)	1.868e-10					
HgCl2	9.026e-11	9.026e-11	-10.044	-10.044	0.000	(0)
HgClOH	7.473e-11	7.473e-11	-10.127	-10.127	0.000	(0)
Hg (OH) 2	1.226e-11	1.252e-11	-10.911	-10.903	0.009	(0)
HgCl3-	8.763e-12	6.186e-12	-11.057	-11.209	-0.151	(0)
HgCl4-2	6.796e-13	1.688e-13	-12.168	-12.773	-0.605	(0)
HgCO3	1.219e-13	1.219e-13	-12.914	-12.914	0.000	(0)
Hg (CO3) 2-2	8.222e-15	2.042e-15	-14.085	-14.690	-0.605	(0)
HgCl+	3.722e-15	2.628e-15	-14.429	-14.580	-0.151	(0)
HgOH+	3.482e-16	2.458e-16	-15.458	-15.609	-0.151	(0)
HgHCO3+	1.006e-16	7.102e-17	-15.997	-16.149	-0.151	(0)
Hg (NH3) 2+2	1.483e-17	3.684e-18	-16.829	-17.434	-0.605	(0)
HgNH3+2	8.510e-19	2.114e-19	-18.070	-18.675	-0.605	(0)
Hg (OH) 3-	7.170e-19	5.062e-19	-18.144	-18.296	-0.151	(0)
Hg+2	7.737e-20	1.922e-20	-19.111	-19.716	-0.605	(0)

		HgSO4	3.995e-20	3.995e-20	-19.398	-19.398	0.000	(0)
		HgF+	2.451e-22	1.730e-22	-21.611	-21.762	-0.151	(0)
		Hg (NH3) 3+2	1.030e-24	2.557e-25	-23.987	-24.592	-0.605	(0)
		HgNO3+	2.735e-28	1.931e-28	-27.563	-27.714	-0.151	(0)
		Hg (NH3) 4+2	1.426e-31	3.541e-32	-30.846	-31.451	-0.605	(0)
		Hg (NO3) 2	2.184e-36	2.184e-36	-35.661	-35.661	0.000	(0)
		HgHS2-	0.000e+00	0.000e+00	-137.064	-137.216	-0.151	(0)
		HgS2-2	0.000e+00	0.000e+00	-137.814	-138.419	-0.605	(0)
		Hg (HS) 2	0.000e+00	0.000e+00	-138.326	-138.326	0.000	(0)
K	7.622e-03							
		K+	7.220e-03	5.693e-03	-2.141	-2.245	-0.103	(0)
		KSO4-	4.021e-04	3.200e-04	-3.396	-3.495	-0.099	(0)
		KCrO4-	2.407e-17	1.699e-17	-16.619	-16.770	-0.151	(0)
Mg	1.184e-02							
		Mg+2	7.437e-03	2.875e-03	-2.129	-2.541	-0.413	(0)
		MgSO4	4.154e-03	4.154e-03	-2.381	-2.381	0.000	(0)
		MgHCO3+	1.337e-04	1.041e-04	-3.874	-3.983	-0.109	(0)
		MgF+	9.983e-05	7.836e-05	-4.001	-4.106	-0.105	(0)
		MgCO3	1.267e-05	1.267e-05	-4.897	-4.897	0.000	(0)
		MgOH+	4.551e-07	3.677e-07	-6.342	-6.434	-0.093	(0)
		MgH2BO3+	1.861e-07	1.406e-07	-6.730	-6.852	-0.122	(0)
Mn (2)	1.318e-04							
		Mn+2	9.560e-05	2.374e-05	-4.020	-4.624	-0.605	(0)
		MnSO4	3.353e-05	3.353e-05	-4.475	-4.475	0.000	(0)
		MnHCO3+	2.118e-06	1.676e-06	-5.674	-5.776	-0.102	(0)
		MnF+	2.902e-07	2.296e-07	-6.537	-6.639	-0.102	(0)
		MnCl+	2.589e-07	2.049e-07	-6.587	-6.689	-0.102	(0)
		MnOH+	2.422e-08	1.916e-08	-7.616	-7.718	-0.102	(0)
		MnCl2	1.983e-09	1.983e-09	-8.703	-8.703	0.000	(0)
		MnCl3-	4.732e-12	3.744e-12	-11.325	-11.427	-0.102	(0)
		MnNO3+	1.451e-12	1.024e-12	-11.838	-11.990	-0.151	(0)
		MnSeO4	7.386e-13	7.386e-13	-12.132	-12.132	0.000	(0)
		Mn (OH) 3-	1.545e-17	1.222e-17	-16.811	-16.913	-0.102	(0)
		Mn (NO3) 2	7.001e-20	7.001e-20	-19.155	-19.155	0.000	(0)
		Mn (OH) 4-2	3.235e-23	1.268e-23	-22.490	-22.897	-0.407	(0)
		MnSe	0.000e+00	0.000e+00	-41.300	-41.300	0.000	(0)
Mn (3)	1.842e-24							
		Mn+3	1.842e-24	2.170e-25	-23.735	-24.663	-0.929	(0)
Mn (6)	0.000e+00							
		MnO4-2	0.000e+00	0.000e+00	-41.362	-41.769	-0.407	(0)
Mn (7)	0.000e+00							
		MnO4-	0.000e+00	0.000e+00	-45.713	-45.830	-0.117	(0)
Mo	3.861e-06							
		MoO4-2	3.860e-06	1.492e-06	-5.413	-5.826	-0.413	(0)
		HMoO4-	1.316e-09	9.291e-10	-8.881	-9.032	-0.151	(0)
		H2MoO4	2.130e-13	2.130e-13	-12.672	-12.672	0.000	(0)
		Ag2MoO4	1.052e-24	1.052e-24	-23.978	-23.978	0.000	(0)
		AlMo6O21-3	4.404e-37	1.918e-38	-36.356	-37.717	-1.361	(0)
		Mo7O24-6	0.000e+00	0.000e+00	-42.383	-47.827	-5.444	(0)
		HMo7O24-5	0.000e+00	0.000e+00	-45.164	-48.945	-3.781	(0)
		H2Mo7O24-4	0.000e+00	0.000e+00	-49.248	-51.667	-2.420	(0)
		H3Mo7O24-3	0.000e+00	0.000e+00	-54.565	-55.926	-1.361	(0)
N (-3)	1.387e-06							
		NH4+	1.266e-06	9.568e-07	-5.898	-6.019	-0.122	(0)
		NH4SO4-	1.029e-07	8.141e-08	-6.988	-7.089	-0.102	(0)
		NH3	1.743e-08	1.743e-08	-7.759	-7.759	0.000	(0)
		CaNH3+2	1.266e-10	3.143e-11	-9.898	-10.503	-0.605	(0)
		CuNH3+2	6.096e-11	1.514e-11	-10.215	-10.820	-0.605	(0)
		NiNH3+2	2.511e-12	6.237e-13	-11.600	-12.205	-0.605	(0)
		Co (NH3) +2	2.953e-13	7.333e-14	-12.530	-13.135	-0.605	(0)
		AgNH3+	6.881e-14	4.858e-14	-13.162	-13.314	-0.151	(0)
		BaNH3+2	1.394e-15	3.461e-16	-14.856	-15.461	-0.605	(0)
		Hg (NH3) 2+2	1.483e-17	3.684e-18	-16.829	-17.434	-0.605	(0)
		Ag (NH3) 2+	9.750e-18	6.883e-18	-17.011	-17.162	-0.151	(0)
		Ni (NH3) 2+2	6.328e-18	1.572e-18	-17.199	-17.804	-0.605	(0)
		Ca (NH3) 2+2	8.783e-19	2.181e-19	-18.056	-18.661	-0.605	(0)
		HgNH3+2	8.510e-19	2.114e-19	-18.070	-18.675	-0.605	(0)
		Co (NH3) 2+2	2.196e-19	5.453e-20	-18.658	-19.263	-0.605	(0)

	Hg (NH3) 3+2	1.030e-24	2.557e-25	-23.987	-24.592	-0.605	(0)
	Co (NH3) 3+2	4.818e-26	1.197e-26	-25.317	-25.922	-0.605	(0)
	Hg (NH3) 4+2	1.426e-31	3.541e-32	-30.846	-31.451	-0.605	(0)
	Co (NH3) 4+2	4.408e-33	1.095e-33	-32.356	-32.961	-0.605	(0)
	Cr (NH3) 5OH+2	3.750e-39	9.313e-40	-38.426	-39.031	-0.605	(0)
	Co (NH3) 5+2	1.275e-40	0.000e+00	-39.894	-40.499	-0.605	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.308	-47.669	-1.361	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.636	-47.241	-0.605	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.126	-48.731	-0.605	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.575	-56.726	-0.151	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.110	-61.715	-0.605	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.239	-61.844	-0.605	(0)
N (3)	3.101e-05						
	NO2-	3.101e-05	2.369e-05	-4.508	-4.626	-0.117	(0)
	CuNO2+	2.982e-10	2.105e-10	-9.526	-9.677	-0.151	(0)
	CoNO2+	8.273e-12	5.840e-12	-11.082	-11.234	-0.151	(0)
	AgNO2	6.754e-12	6.754e-12	-11.170	-11.170	0.000	(0)
	Cu (NO2) 2	5.102e-14	5.102e-14	-13.292	-13.292	0.000	(0)
	Ag (NO2) 2-	3.510e-16	2.478e-16	-15.455	-15.606	-0.151	(0)
N (5)	3.469e-08						
	NO3-	3.451e-08	2.721e-08	-7.462	-7.565	-0.103	(0)
	CaNO3+	1.746e-10	1.233e-10	-9.758	-9.909	-0.151	(0)
	MnNO3+	1.451e-12	1.024e-12	-11.838	-11.990	-0.151	(0)
	ZnNO3+	2.358e-13	1.665e-13	-12.627	-12.779	-0.151	(0)
	CuNO3+	1.035e-14	7.304e-15	-13.985	-14.136	-0.151	(0)
	NiNO3+	6.451e-15	4.554e-15	-14.190	-14.342	-0.151	(0)
	BaNO3+	6.080e-15	4.292e-15	-14.216	-14.367	-0.151	(0)
	CoNO3+	2.138e-15	1.509e-15	-14.670	-14.821	-0.151	(0)
	CdNO3+	5.381e-16	3.799e-16	-15.269	-15.420	-0.151	(0)
	PbNO3+	1.922e-16	1.357e-16	-15.716	-15.867	-0.151	(0)
	AgNO3	2.950e-17	2.950e-17	-16.530	-16.530	0.000	(0)
	Mn (NO3) 2	7.001e-20	7.001e-20	-19.155	-19.155	0.000	(0)
	Zn (NO3) 2	9.039e-22	9.039e-22	-21.044	-21.044	0.000	(0)
	UO2NO3+	2.487e-22	1.756e-22	-21.604	-21.756	-0.151	(0)
	Co (NO3) 2	8.357e-23	8.357e-23	-22.078	-22.078	0.000	(0)
	CrNO3+2	3.660e-23	9.091e-24	-22.436	-23.041	-0.605	(0)
	Cu (NO3) 2	2.502e-23	2.502e-23	-22.602	-22.602	0.000	(0)
	Pb (NO3) 2	6.271e-24	6.271e-24	-23.203	-23.203	0.000	(0)
	Cd (NO3) 2	5.182e-24	5.182e-24	-23.286	-23.286	0.000	(0)
	VO2NO3	2.764e-24	2.764e-24	-23.558	-23.558	0.000	(0)
	FeNO3+2	6.606e-26	1.641e-26	-25.180	-25.785	-0.605	(0)
	HgNO3+	2.735e-28	1.931e-28	-27.563	-27.714	-0.151	(0)
	Hg (NO3) 2	2.184e-36	2.184e-36	-35.661	-35.661	0.000	(0)
Na	2.719e-02						
	Na+	2.604e-02	2.053e-02	-1.584	-1.688	-0.103	(0)
	NaSO4-	1.100e-03	8.757e-04	-2.959	-3.058	-0.099	(0)
	NaHCO3	4.085e-05	4.085e-05	-4.389	-4.389	0.000	(0)
	NaF	3.147e-06	3.147e-06	-5.502	-5.502	0.000	(0)
	NaCO3-	2.546e-06	2.026e-06	-5.594	-5.693	-0.099	(0)
	NaH2BO3	4.591e-08	4.591e-08	-7.338	-7.338	0.000	(0)
	NaCrO4-	1.161e-16	8.197e-17	-15.935	-16.086	-0.151	(0)
Ni	3.350e-07						
	Ni+2	1.723e-07	6.662e-08	-6.764	-7.176	-0.413	(0)
	NiSO4	1.056e-07	1.056e-07	-6.977	-6.977	0.000	(0)
	NiHCO3+	4.116e-08	2.905e-08	-7.386	-7.537	-0.151	(0)
	NiCO3	1.317e-08	1.317e-08	-7.880	-7.880	0.000	(0)
	NiCl+	1.655e-09	1.168e-09	-8.781	-8.932	-0.151	(0)
	NiF+	5.759e-10	4.065e-10	-9.240	-9.391	-0.151	(0)
	NiOH+	3.817e-10	2.695e-10	-9.418	-9.569	-0.151	(0)
	Ni (SO4) 2-2	1.118e-10	2.776e-11	-9.952	-10.557	-0.605	(0)
	Ni (OH) 2	6.877e-12	6.877e-12	-11.163	-11.163	0.000	(0)
	NiNH3+2	2.511e-12	6.237e-13	-11.600	-12.205	-0.605	(0)
	NiCl2	4.031e-14	4.031e-14	-13.395	-13.395	0.000	(0)
	NiNO3+	6.451e-15	4.554e-15	-14.190	-14.342	-0.151	(0)
	NiSeO4	3.602e-15	3.602e-15	-14.444	-14.444	0.000	(0)
	Ni (OH) 3-	3.130e-15	2.209e-15	-14.505	-14.656	-0.151	(0)
	Ni (NH3) 2+2	6.328e-18	1.572e-18	-17.199	-17.804	-0.605	(0)
O (0)	3.612e-35						

O2	1.806e-35	1.843e-35	-34.743	-34.734	0.009	(0)
Pb	9.906e-09					
PbCO3	5.370e-09	5.370e-09	-8.270	-8.270	0.000	(0)
PbSO4	1.311e-09	1.311e-09	-8.882	-8.882	0.000	(0)
PbHCO3+	1.255e-09	8.860e-10	-8.901	-9.053	-0.151	(0)
Pb+2	8.720e-10	3.371e-10	-9.059	-9.472	-0.413	(0)
PbOH+	3.854e-10	2.720e-10	-9.414	-9.565	-0.151	(0)
Pb (CO3) 2-2	3.304e-10	8.207e-11	-9.481	-10.086	-0.605	(0)
Pb (SO4) 2-2	2.526e-10	6.273e-11	-9.598	-10.203	-0.605	(0)
PbCl+	1.161e-10	8.198e-11	-9.935	-10.086	-0.151	(0)
PbF+	8.174e-12	5.771e-12	-11.088	-11.239	-0.151	(0)
Pb (OH) 2	2.764e-12	2.764e-12	-11.558	-11.558	0.000	(0)
PbCl2	2.510e-12	2.510e-12	-11.600	-11.600	0.000	(0)
PbF2	2.759e-14	2.759e-14	-13.559	-13.559	0.000	(0)
PbCl3-	9.699e-15	6.847e-15	-14.013	-14.164	-0.151	(0)
Pb (OH) 3-	1.258e-15	8.880e-16	-14.900	-15.052	-0.151	(0)
PbNO3+	1.922e-16	1.357e-16	-15.716	-15.867	-0.151	(0)
PbCl4-2	8.636e-17	2.145e-17	-16.064	-16.669	-0.605	(0)
Pb2OH+3	3.338e-17	1.454e-18	-16.477	-17.838	-1.361	(0)
PbF3-	1.800e-17	1.271e-17	-16.745	-16.896	-0.151	(0)
Pb (OH) 4-2	2.813e-19	6.987e-20	-18.551	-19.156	-0.605	(0)
PbF4-2	5.950e-21	1.478e-21	-20.225	-20.830	-0.605	(0)
Pb3 (OH) 4+2	2.069e-22	5.138e-23	-21.684	-22.289	-0.605	(0)
Pb (NO3) 2	6.271e-24	6.271e-24	-23.203	-23.203	0.000	(0)
Pb4 (OH) 4+4	3.616e-26	1.376e-28	-25.442	-27.861	-2.420	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.134	-151.134	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.149	-228.300	-0.151	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.516	-73.516	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.315	-78.466	-0.151	(0)
CdHS+	0.000e+00	0.000e+00	-78.662	-78.813	-0.151	(0)
H2S	0.000e+00	0.000e+00	-78.950	-78.950	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.722	-80.327	-0.605	(0)
S6-2	0.000e+00	0.000e+00	-80.238	-80.842	-0.605	(0)
S4-2	0.000e+00	0.000e+00	-80.317	-80.922	-0.605	(0)
S3-2	0.000e+00	0.000e+00	-81.123	-81.728	-0.605	(0)
S2-2	0.000e+00	0.000e+00	-82.139	-82.744	-0.605	(0)
S-2	0.000e+00	0.000e+00	-87.855	-88.261	-0.407	(0)
HgHS2-	0.000e+00	0.000e+00	-137.064	-137.216	-0.151	(0)
HgS2-2	0.000e+00	0.000e+00	-137.814	-138.419	-0.605	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.326	-138.326	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.616	-147.861	-0.246	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.731	-147.882	-0.151	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.805	-148.225	-0.420	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.080	-148.231	-0.151	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.559	-148.955	-0.396	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.364	-149.797	-0.433	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.700	-150.108	-0.408	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.725	-149.725	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.075	-150.075	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.134	-151.134	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.481	-159.481	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.419	-216.570	-0.151	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.760	-224.911	-0.151	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.490	-226.641	-0.151	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.782	-227.387	-0.605	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.149	-228.300	-0.151	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.758	-235.910	-0.151	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.306	-302.911	-0.605	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.232	-304.837	-0.605	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.152	-317.756	-0.605	(0)
S (6)	2.884e-02					
SO4-2	2.054e-02	7.941e-03	-1.687	-2.100	-0.413	(0)
MgSO4	4.154e-03	4.154e-03	-2.381	-2.381	0.000	(0)
CaSO4	2.606e-03	2.606e-03	-2.584	-2.584	0.000	(0)
NaSO4-	1.100e-03	8.757e-04	-2.959	-3.058	-0.099	(0)
KSO4-	4.021e-04	3.200e-04	-3.396	-3.495	-0.099	(0)
MnSO4	3.353e-05	3.353e-05	-4.475	-4.475	0.000	(0)

ZnSO4	4.230e-06	4.230e-06	-5.374	-5.374	0.000	(0)
Zn (SO4) 2-2	1.178e-06	2.926e-07	-5.929	-6.534	-0.605	(0)
CuSO4	1.544e-07	1.544e-07	-6.811	-6.811	0.000	(0)
NiSO4	1.056e-07	1.056e-07	-6.977	-6.977	0.000	(0)
NH4SO4-	1.029e-07	8.141e-08	-6.988	-7.089	-0.102	(0)
CoSO4	5.544e-08	5.544e-08	-7.256	-7.256	0.000	(0)
HSO4-	3.094e-08	2.428e-08	-7.510	-7.615	-0.105	(0)
CdSO4	8.217e-09	8.217e-09	-8.085	-8.085	0.000	(0)
Cd (SO4) 2-2	3.544e-09	8.802e-10	-8.451	-9.055	-0.605	(0)
PbSO4	1.311e-09	1.311e-09	-8.882	-8.882	0.000	(0)
AgSO4-	3.063e-10	2.162e-10	-9.514	-9.665	-0.151	(0)
Pb (SO4) 2-2	2.526e-10	6.273e-11	-9.598	-10.203	-0.605	(0)
Ni (SO4) 2-2	1.118e-10	2.776e-11	-9.952	-10.557	-0.605	(0)
CrOHSO4	1.012e-10	1.012e-10	-9.995	-9.995	0.000	(0)
AlSO4+	1.472e-11	1.155e-11	-10.832	-10.937	-0.105	(0)
FeSO4	6.182e-12	6.182e-12	-11.209	-11.209	0.000	(0)
Al (SO4) 2-	1.252e-12	9.831e-13	-11.902	-12.007	-0.105	(0)
CrSO4+	2.007e-13	1.417e-13	-12.697	-12.849	-0.151	(0)
UO2SO4	3.886e-14	3.886e-14	-13.410	-13.410	0.000	(0)
UO2 (SO4) 2-2	1.638e-14	4.068e-15	-13.786	-14.391	-0.605	(0)
VO2SO4-	5.393e-17	3.807e-17	-16.268	-16.419	-0.151	(0)
FeSO4+	6.789e-18	5.371e-18	-17.168	-17.270	-0.102	(0)
Cr2 (OH) 2SO4+2	1.978e-18	4.914e-19	-17.704	-18.309	-0.605	(0)
Fe (SO4) 2-	1.292e-18	9.119e-19	-17.889	-18.040	-0.151	(0)
Cr2 (OH) 2 (SO4) 2	2.318e-19	2.318e-19	-18.635	-18.635	0.000	(0)
VOSO4	1.684e-19	1.684e-19	-18.774	-18.774	0.000	(0)
HgSO4	3.995e-20	3.995e-20	-19.398	-19.398	0.000	(0)
CrO3SO4-2	2.483e-23	6.166e-24	-22.605	-23.210	-0.605	(0)
VSO4+	9.730e-34	6.869e-34	-33.012	-33.163	-0.151	(0)
U (SO4) 2	2.436e-40	2.436e-40	-39.613	-39.613	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.808	-41.413	-0.605	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.575	-56.726	-0.151	(0)
Sb (3)	1.439e-19					
Sb (OH) 3	7.277e-20	7.277e-20	-19.138	-19.138	0.000	(0)
HSbo2	7.114e-20	7.114e-20	-19.148	-19.148	0.000	(0)
Sbo2-	5.215e-24	3.681e-24	-23.283	-23.434	-0.151	(0)
Sb (OH) 4-	2.979e-24	2.103e-24	-23.526	-23.677	-0.151	(0)
Sb (OH) 2F	8.654e-25	8.654e-25	-24.063	-24.063	0.000	(0)
SbOF	8.522e-25	8.522e-25	-24.069	-24.069	0.000	(0)
Sb (OH) 2+	7.845e-26	5.538e-26	-25.105	-25.257	-0.151	(0)
Sbo+	2.709e-26	1.912e-26	-25.567	-25.718	-0.151	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.152	-317.756	-0.605	(0)
Sb (5)	5.902e-08					
Sbo3-	5.896e-08	4.162e-08	-7.229	-7.381	-0.151	(0)
Sb (OH) 6-	6.147e-11	4.847e-11	-10.211	-10.315	-0.103	(0)
Sbo2+	1.659e-23	1.171e-23	-22.780	-22.931	-0.151	(0)
Se (-2)	7.775e-15					
Ag2Se	7.775e-15	7.775e-15	-14.109	-14.109	0.000	(0)
HSe-	2.271e-39	1.603e-39	-38.644	-38.795	-0.151	(0)
MnSe	0.000e+00	0.000e+00	-41.300	-41.300	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.409	-42.409	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.686	-46.290	-0.605	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.031	-84.451	-2.420	(0)
Se (4)	3.321e-07					
HSeO3-	2.439e-07	1.722e-07	-6.613	-6.764	-0.151	(0)
SeO3-2	8.820e-08	2.190e-08	-7.055	-7.659	-0.605	(0)
H2SeO3	2.299e-12	2.299e-12	-11.639	-11.639	0.000	(0)
AgSeO3-	2.722e-14	1.921e-14	-13.565	-13.716	-0.151	(0)
Cd (SeO3) 2-2	7.028e-18	1.746e-18	-17.153	-17.758	-0.605	(0)
Ag (SeO3) 2-3	8.654e-20	3.768e-21	-19.063	-20.424	-1.361	(0)
FeHSeO3+2	1.104e-22	2.743e-23	-21.957	-22.562	-0.605	(0)
Se (6)	2.998e-10					
SeO4-2	2.990e-10	1.156e-10	-9.524	-9.937	-0.413	(0)
MnSeO4	7.386e-13	7.386e-13	-12.132	-12.132	0.000	(0)
ZnSeO4	4.359e-14	4.359e-14	-13.361	-13.361	0.000	(0)
NiSeO4	3.602e-15	3.602e-15	-14.444	-14.444	0.000	(0)
CoSeO4	2.027e-15	2.027e-15	-14.693	-14.693	0.000	(0)
HSeO4-	2.568e-16	1.813e-16	-15.590	-15.742	-0.151	(0)

	CdSeO4	9.500e-17	9.500e-17	-16.022	-16.022	0.000	(0)
	Zn (SeO4) 2-2	2.057e-23	5.108e-24	-22.687	-23.292	-0.605	(0)
Si	4.870e-05						
	H4SiO4	4.840e-05	4.939e-05	-4.315	-4.306	0.009	(0)
	H3SiO4-	2.931e-07	2.281e-07	-6.533	-6.642	-0.109	(0)
	H2SiO4-2	1.146e-12	4.600e-13	-11.941	-12.337	-0.396	(0)
	UO2H3SiO4+	8.872e-14	6.263e-14	-13.052	-13.203	-0.151	(0)
	SiF6-2	3.782e-26	1.482e-26	-25.422	-25.829	-0.407	(0)
U (3)	0.000e+00						
	U+3	0.000e+00	0.000e+00	-58.659	-60.020	-1.361	(0)
U (4)	4.345e-22						
	U (OH) 5-	4.341e-22	3.064e-22	-21.362	-21.514	-0.151	(0)
	U (OH) 4	4.022e-25	4.022e-25	-24.396	-24.396	0.000	(0)
	U (OH) 3+	6.528e-29	4.609e-29	-28.185	-28.336	-0.151	(0)
	U (OH) 2+2	2.689e-33	6.679e-34	-32.570	-33.175	-0.605	(0)
	UF3+	9.875e-36	6.971e-36	-35.005	-35.157	-0.151	(0)
	UF2+2	7.291e-37	1.811e-37	-36.137	-36.742	-0.605	(0)
	UF4	1.857e-37	1.857e-37	-36.731	-36.731	0.000	(0)
	UOH+3	2.264e-38	9.859e-40	-37.645	-39.006	-1.361	(0)
	UF5-	2.532e-39	1.787e-39	-38.597	-38.748	-0.151	(0)
	UF+3	1.360e-39	0.000e+00	-38.867	-40.228	-1.361	(0)
	UF6-2	5.280e-40	1.311e-40	-39.277	-39.882	-0.605	(0)
	U (SO4) 2	2.436e-40	2.436e-40	-39.613	-39.613	0.000	(0)
	USO4+2	0.000e+00	0.000e+00	-40.808	-41.413	-0.605	(0)
	U+4	0.000e+00	0.000e+00	-43.493	-45.913	-2.420	(0)
	UCl+3	0.000e+00	0.000e+00	-45.016	-46.377	-1.361	(0)
	U6 (OH) 15+9	0.000e+00	0.000e+00	-167.826	-180.075	-12.249	(0)
U (5)	1.364e-17						
	UO2+	1.364e-17	9.632e-18	-16.865	-17.016	-0.151	(0)
U (6)	5.325e-07						
	UO2 (CO3) 3-4	5.034e-07	1.915e-09	-6.298	-8.718	-2.420	(0)
	UO2 (CO3) 2-2	2.904e-08	7.212e-09	-7.537	-8.142	-0.605	(0)
	UO2CO3	6.821e-11	6.821e-11	-10.166	-10.166	0.000	(0)
	UO2OH+	1.853e-13	1.308e-13	-12.732	-12.883	-0.151	(0)
	UO2F+	1.536e-13	1.084e-13	-12.814	-12.965	-0.151	(0)
	UO2H3SiO4+	8.872e-14	6.263e-14	-13.052	-13.203	-0.151	(0)
	UO2F2	7.596e-14	7.596e-14	-13.119	-13.119	0.000	(0)
	UO2SO4	3.886e-14	3.886e-14	-13.410	-13.410	0.000	(0)
	UO2 (SO4) 2-2	1.638e-14	4.068e-15	-13.786	-14.391	-0.605	(0)
	UO2+2	8.364e-15	3.233e-15	-14.078	-14.490	-0.413	(0)
	UO2F3-	6.566e-15	4.635e-15	-14.183	-14.334	-0.151	(0)
	UO2Cl+	5.091e-17	3.594e-17	-16.293	-16.444	-0.151	(0)
	UO2F4-2	3.601e-17	8.943e-18	-16.444	-17.049	-0.605	(0)
	(UO2) 2 (OH) 2+2	1.143e-19	2.838e-20	-18.942	-19.547	-0.605	(0)
	(UO2) 3 (OH) 5+	4.117e-22	2.907e-22	-21.385	-21.537	-0.151	(0)
	UO2NO3+	2.487e-22	1.756e-22	-21.604	-21.756	-0.151	(0)
V (2)	0.000e+00						
	VOH+	0.000e+00	0.000e+00	-42.190	-42.341	-0.151	(0)
	V+2	0.000e+00	0.000e+00	-42.753	-43.358	-0.605	(0)
V (3)	4.902e-15						
	V (OH) 3	4.902e-15	4.902e-15	-14.310	-14.310	0.000	(0)
	V (OH) 2+	1.406e-25	9.926e-26	-24.852	-25.003	-0.151	(0)
	VOH+2	1.188e-28	2.951e-29	-27.925	-28.530	-0.605	(0)
	V+3	4.208e-33	1.832e-34	-32.376	-33.737	-1.361	(0)
	VSO4+	9.730e-34	6.869e-34	-33.012	-33.163	-0.151	(0)
	V2 (OH) 3+3	0.000e+00	0.000e+00	-53.720	-55.081	-1.361	(0)
	V2 (OH) 2+4	0.000e+00	0.000e+00	-53.841	-56.260	-2.420	(0)
V (4)	7.630e-18						
	V (OH) 3+	6.980e-18	4.928e-18	-17.156	-17.307	-0.151	(0)
	VO+2	3.100e-19	7.698e-20	-18.509	-19.114	-0.605	(0)
	VOSO4	1.684e-19	1.684e-19	-18.774	-18.774	0.000	(0)
	VOF+	1.589e-19	1.122e-19	-18.799	-18.950	-0.151	(0)
	VOF2	1.022e-20	1.022e-20	-19.991	-19.991	0.000	(0)
	VOC1+	2.097e-21	1.480e-21	-20.678	-20.830	-0.151	(0)
	VOF3-	1.247e-22	8.806e-23	-21.904	-22.055	-0.151	(0)
	VOF4-2	3.477e-25	8.634e-26	-24.459	-25.064	-0.605	(0)
	H2V2O4+2	4.914e-30	1.221e-30	-29.309	-29.913	-0.605	(0)
V (5)	1.783e-08						

H2VO4-	1.451e-08	1.025e-08	-7.838	-7.989	-0.151	(0)
HVO4-2	3.311e-09	8.223e-10	-8.480	-9.085	-0.605	(0)
H3VO4	3.206e-12	3.206e-12	-11.494	-11.494	0.000	(0)
H3V2O7-	3.009e-13	2.124e-13	-12.522	-12.673	-0.151	(0)
HV2O7-3	6.565e-14	2.859e-15	-13.183	-14.544	-1.361	(0)
VO4-3	3.024e-15	1.317e-16	-14.519	-15.880	-1.361	(0)
V2O7-4	6.462e-16	2.459e-18	-15.190	-17.609	-2.420	(0)
VO2+	2.547e-16	2.008e-16	-15.594	-15.697	-0.103	(0)
VO2F	8.555e-17	8.555e-17	-16.068	-16.068	0.000	(0)
VO2SO4-	5.393e-17	3.807e-17	-16.268	-16.419	-0.151	(0)
V3O9-3	2.597e-17	1.131e-18	-16.585	-17.947	-1.361	(0)
VO2F2-	1.069e-17	7.545e-18	-16.971	-17.122	-0.151	(0)
VO2F3-2	9.206e-20	2.286e-20	-19.036	-19.641	-0.605	(0)
V4O12-4	1.271e-21	4.838e-24	-20.896	-23.315	-2.420	(0)
VO2F4-3	6.275e-23	2.733e-24	-22.202	-23.563	-1.361	(0)
VO2NO3	2.764e-24	2.764e-24	-23.558	-23.558	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.555	-60.999	-5.444	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.537	-60.317	-3.781	(0)
H2V10O28-4	0.000e+00	0.000e+00	-60.195	-62.614	-2.420	(0)
Zn	1.304e-05					
Zn+2	6.299e-06	2.435e-06	-5.201	-5.613	-0.413	(0)
ZnSO4	4.230e-06	4.230e-06	-5.374	-5.374	0.000	(0)
Zn (SO4) 2-2	1.178e-06	2.926e-07	-5.929	-6.534	-0.605	(0)
ZnCO3	7.425e-07	7.425e-07	-6.129	-6.129	0.000	(0)
ZnHCO3+	3.859e-07	2.724e-07	-6.414	-6.565	-0.151	(0)
ZnOH+	1.108e-07	7.823e-08	-6.955	-7.107	-0.151	(0)
ZnCl+	5.386e-08	4.192e-08	-7.269	-7.378	-0.109	(0)
ZnOHCl	1.763e-08	1.763e-08	-7.754	-7.754	0.000	(0)
ZnF+	1.672e-08	1.180e-08	-7.777	-7.928	-0.151	(0)
Zn (OH) 2	3.983e-09	3.983e-09	-8.400	-8.400	0.000	(0)
ZnCl2	4.553e-10	4.553e-10	-9.342	-9.342	0.000	(0)
Zn (OH) 3-	9.086e-12	6.414e-12	-11.042	-11.193	-0.151	(0)
ZnCl3-	3.185e-12	2.479e-12	-11.497	-11.606	-0.109	(0)
ZnNO3+	2.358e-13	1.665e-13	-12.627	-12.779	-0.151	(0)
ZnSeO4	4.359e-14	4.359e-14	-13.361	-13.361	0.000	(0)
ZnCl4-2	2.168e-14	8.495e-15	-13.664	-14.071	-0.407	(0)
Zn (OH) 4-2	3.303e-16	8.204e-17	-15.481	-16.086	-0.605	(0)
Zn (NO3) 2	9.039e-22	9.039e-22	-21.044	-21.044	0.000	(0)
Zn (SeO4) 2-2	2.057e-23	5.108e-24	-22.687	-23.292	-0.605	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.080	-148.231	-0.151	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.725	-149.725	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.760	-224.911	-0.151	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.782	-227.387	-0.605	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.232	-304.837	-0.605	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-50.70	-44.41	6.29	(Co (NH3) 5Cl) (NO3) 2	
(Co (NH3) 5Cl) Cl2	-38.12	-33.61	4.51	(Co (NH3) 5Cl) Cl2	
(Co (NH3) 5OH2) Cl3	-45.35	-33.61	11.74	(Co (NH3) 5OH2) Cl3	
(Co (NH3) 6) (NO3) 3	-66.26	-48.33	17.93	(Co (NH3) 6) (NO3) 3	
(Co (NH3) 6) Cl3	-52.16	-32.13	20.03	(Co (NH3) 6) Cl3	
(NH4) 2CrO4	-27.54	-27.13	0.40	(NH4) 2CrO4	
(NH4) 2SeO4	-22.43	-21.98	0.45	(NH4) 2SeO4	
Acanthite	-52.47	-88.69	-36.22	Ag2S	
Ag2CO3	-11.92	-23.01	-11.09	Ag2CO3	
Ag2CrO4	-21.23	-32.82	-11.59	Ag2CrO4	
Ag2HVO4	-12.39	-10.91	1.48	Ag2HVO4	
Ag2MoO4	-12.01	-23.56	-11.55	Ag2MoO4	
Ag2O	-15.30	-2.72	12.57	Ag2O	
Ag2Se	-0.32	-49.02	-48.70	Ag2Se	
Ag2SeO3	-9.84	-16.99	-7.15	Ag2SeO3	
Ag2SeO4	-18.76	-27.67	-8.91	Ag2SeO4	
Ag2SO4	-15.01	-19.83	-4.82	Ag2SO4	
Ag3AsO3	-28.72	-26.56	2.16	Ag3AsO3	
Ag3AsO4	-17.04	-19.83	-2.79	Ag3AsO4	

Ag3H2VO5	-17.46	-12.28	5.18	Ag3H2VO5
AgF:4H2O	-13.53	-12.48	1.05	AgF:4H2O
Agmetal	-0.67	-14.18	-13.51	Ag
AgVO3	-10.32	-9.55	0.77	AgVO3
Al(OH)3(am)	-1.02	9.78	10.80	Al(OH)3
Al2(MoO4)3	-45.30	-42.93	2.37	Al2(MoO4)3
Al2O3	-0.08	19.57	19.65	Al2O3
Al4(OH)10SO4	-0.67	22.03	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-10.76	-5.96	4.80	AlAsO4:2H2O
AlOHSO4	-4.09	-7.32	-3.23	AlOHSO4
AlSb	-151.87	-86.24	65.62	AlSb
Alunite	1.80	0.40	-1.40	KAl3(SO4)2(OH)6
Anglesite	-3.78	-11.57	-7.79	PbSO4
Anhydrite	-0.58	-4.94	-4.36	CaSO4
Anilite	-55.39	-87.27	-31.88	Cu0.25Cu1.5S
Antlerite	-2.09	6.70	8.79	Cu3(OH)4SO4
Aragonite	0.18	-8.12	-8.30	CaCO3
Arsenolite	-87.14	-89.90	-2.76	As4O6
Artinite	-4.95	4.65	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-38.19	-31.49	6.71	As2O5
Atacamite	-1.19	6.21	7.39	Cu2(OH)3Cl
Azurite	0.15	-16.76	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.89	7.50	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.25	-1.37	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	-0.06	-8.97	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.81	6.13	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.93	-22.60	-9.67	BaCrO4
BaF2	-8.91	-14.73	-5.82	BaF2
BaMoO4	-6.37	-13.33	-6.96	BaMoO4
Barite	0.38	-9.60	-9.98	BaSO4
BaS	-94.64	-78.46	16.18	BaS
BaSeO3	-8.59	-6.76	1.83	BaSeO3
BaSeO4	-9.98	-17.44	-7.46	BaSeO4
Bianchite	-5.95	-7.72	-1.76	ZnSO4:6H2O
Birnessite	-7.43	10.66	18.09	MnO2
Bixbyite	-3.66	-4.30	-0.64	Mn2O3
BlaubleiI	-55.10	-79.26	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.68	-82.96	-27.28	Cu0.6Cu0.8S
Boehmite	1.21	9.79	8.58	AlOOH
Breithauptite	-56.86	-75.38	-18.52	NiSb
Brochantite	-0.58	14.64	15.22	Cu4(OH)6SO4
Brucite	-4.38	12.47	16.84	Mg(OH)2
Bunsenite	-4.61	7.83	12.45	NiO
Ca(VO3)2	-9.88	-4.22	5.66	Ca(VO3)2
Ca2V2O7	-9.56	7.94	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.61	7.94	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-17.30	5.00	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-18.85	20.11	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-19.76	20.10	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-298.54	-155.56	142.97	Ca3Sb2
CaCrO4	-15.67	-17.94	-2.27	CaCrO4
Calcite	0.36	-8.12	-8.48	CaCO3
Calomel	-5.68	-23.59	-17.91	Hg2Cl2
CaMoO4	-0.72	-8.67	-7.95	CaMoO4
Carnotite	-2.65	-2.42	0.23	KUO2VO4
CaSeO3:2H2O	-4.92	-2.10	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.76	-12.78	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.42	-1.58	9.84	Cd(BO2)2
Cd(OH)2	-6.99	6.65	13.64	Cd(OH)2
Cd(OH)2(am)	-7.08	6.65	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.97	-14.26	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-19.71	2.85	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-18.90	9.50	28.40	Cd4(OH)6SO4
CdCl2	-12.02	-12.68	-0.66	CdCl2
CdCl2:1H2O	-10.99	-12.68	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.77	-12.68	-1.91	CdCl2:2.5H2O
CdF2	-14.37	-15.58	-1.21	CdF2
Cdmetal(alpha)	-32.49	-18.98	13.51	Cd

Cdmetal (gamma)	-32.60	-18.98	13.62	Cd
CdMoO4	-0.03	-14.18	-14.15	CdMoO4
CdOHCl	-6.55	-3.02	3.54	CdOHCl
CdSb	-76.21	-76.56	-0.35	CdSb
CdSe	-19.45	-39.65	-20.20	CdSe
CdSeO4:2H2O	-16.44	-18.29	-1.85	CdSeO4:2H2O
CdSO4	-10.28	-10.46	-0.17	CdSO4
CdSO4:1H2O	-8.73	-10.46	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.58	-10.46	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.28	-11.03	-9.75	AgCl
Cerrusite	-1.62	-14.75	-13.13	PbCO3
CH4 (g)	-81.76	-122.81	-41.05	CH4
Chalcanthite	-6.53	-9.17	-2.64	CuSO4:5H2O
Chalcedony	-0.76	-4.31	-3.55	SiO2
Chalcocite	-55.43	-90.35	-34.92	Cu2S
Chalcopyrite	-125.22	-160.49	-35.27	CuFeS2
Chrysotile	-3.41	28.79	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-51.18	-96.87	-45.69	HgS
Claudetite	-86.84	-89.90	-3.06	As4O6
Clausthalite	-13.66	-40.76	-27.10	PbSe
Co (BO2) 2	-27.75	-0.68	27.07	Co (BO2) 2
Co (OH) 2	-5.54	7.55	13.09	Co (OH) 2
Co (OH) 3	-9.72	-12.03	-2.31	Co (OH) 3
CO2 (g)	-2.14	-20.28	-18.15	CO2
Co3 (AsO4) 2	-21.86	-8.83	13.03	Co3 (AsO4) 2
Co3O4	-6.02	-16.51	-10.50	Co3O4
CoCl2	-20.05	-11.78	8.27	CoCl2
CoCl2:6H2O	-14.32	-11.79	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-13.09	-14.69	-1.60	CoF2
CoF3	-43.93	-45.39	-1.46	CoF3
CoFe2O4	17.67	14.14	-3.53	CoFe2O4
CoMoO4	-5.52	-13.28	-7.76	CoMoO4
CoO	-6.03	7.55	13.59	CoO
CoS (alpha)	-70.98	-78.42	-7.44	CoS
CoS (beta)	-67.35	-78.42	-11.07	CoS
CoSe	-22.55	-38.75	-16.20	CoSe
CoSeO3	-8.04	-6.72	1.32	CoSeO3
CoSeO4:6H2O	-15.87	-17.40	-1.53	CoSeO4:6H2O
CoSO4	-12.36	-9.56	2.80	CoSO4
CoSO4:6H2O	-7.09	-9.56	-2.47	CoSO4:6H2O
Cotunnite	-9.02	-13.80	-4.78	PbCl2
Covellite	-55.73	-78.03	-22.30	CuS
Cr (OH) 2	-21.86	-11.04	10.82	Cr (OH) 2
Cr (OH) 3	-2.51	-1.17	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.42	-1.17	-0.75	Cr (OH) 3
Cr2O3	0.01	-2.35	-2.36	Cr2O3
CrCl2	-44.47	-30.38	14.09	CrCl2
CrCl3	-45.29	-30.18	15.11	CrCl3
CrF3	-23.19	-34.53	-11.34	CrF3
Cristobalite	-0.96	-4.31	-3.35	SiO2
Crmetal	-67.15	-36.67	30.48	Cr
CrO3	-26.89	-30.10	-3.21	CrO3
Cryolite	-5.64	-39.48	-33.84	Na3AlF6
Cu (OH) 2	-0.74	7.94	8.67	Cu (OH) 2
Cu (SbO3) 2	-24.29	20.92	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.45	0.80	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-55.40	-90.28	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.87	-50.67	-45.80	Cu2Se
Cu2SO4	-19.53	-21.48	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-13.78	-7.68	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-60.00	-102.59	-42.59	Cu3Sb
Cu3Se2	-25.55	-89.04	-63.49	Cu3Se2
CuCO3	-0.85	-12.35	-11.50	CuCO3
CuCrO4	-16.73	-22.17	-5.44	CuCrO4
CuF	-8.40	-13.31	-4.91	CuF
CuF2	-15.42	-14.30	1.12	CuF2
CuF2:2H2O	-9.75	-14.30	-4.55	CuF2:2H2O

Cumetal	-6.25	-15.00	-8.76	Cu
CuMoO4	0.18	-12.90	-13.08	CuMoO4
CuOCuSO4	-11.54	-1.23	10.30	CuOCuSO4
Cupricferrite	8.53	14.52	5.99	CuFe2O4
Cuprite	-2.97	-4.38	-1.41	Cu2O
Cuprousferrite	10.02	1.10	-8.92	CuFeO2
CuSe	-5.26	-38.36	-33.10	CuSe
CuSe2	-25.66	-59.03	-33.37	CuSe2
CuSeO3:2H2O	-6.84	-6.33	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-14.57	-17.01	-2.44	CuSeO4:5H2O
CuSO4	-12.11	-9.17	2.94	CuSO4
Diaspore	2.91	9.79	6.87	AlOOH
Djurleite	-55.61	-89.53	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.60	-15.94	-16.54	CaMg(CO3)2
Dolomite(ordered)	1.15	-15.94	-17.09	CaMg(CO3)2
Epsomite	-2.52	-4.65	-2.13	MgSO4:7H2O
Fe(OH)2	-10.05	3.51	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.43	0.39	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-9.16	-12.88	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-9.24	-7.68	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-15.59	-36.22	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-41.01	-44.74	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.13	10.09	20.22	Fe3(OH)8
FeAsO4:2H2O	-12.85	-12.45	0.40	FeAsO4:2H2O
FeCr2O4	-6.04	1.16	7.20	FeCr2O4
FeMoO4	-7.23	-17.32	-10.09	FeMoO4
Ferrihydrite	0.10	3.29	3.19	Fe(OH)3
Ferroselite	-44.86	-63.46	-18.60	FeSe2
FeS(ppt)	-79.51	-82.46	-2.95	FeS
FeSe	-31.79	-42.79	-11.00	FeSe
Fix_pe	-5.31	-5.31	0.00	e-
Fluorite	0.43	-10.07	-10.50	CaF2
Galena	-66.46	-80.43	-13.97	PbS
Gibbsite	1.49	9.78	8.29	Al(OH)3
Goethite	2.80	3.29	0.49	FeOOH
Goslarite	-5.71	-7.72	-2.01	ZnSO4:7H2O
Greenalite	-18.89	1.92	20.81	Fe3Si2O5(OH)4
Greenockite	-64.96	-79.32	-14.36	CdS
Greigite	-288.75	-333.78	-45.03	Fe3S4
Gummite	-7.15	0.52	7.67	UO3
Gypsum	-0.34	-4.95	-4.61	CaSO4:2H2O
H-Jarosite	-12.24	-24.34	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-7.96	-20.84	-12.88	H2MoO4
H2S(g)	-77.96	-85.97	-8.01	H2S
H2Se(g)	-41.34	-46.30	-4.96	H2Se
Halite	-5.45	-3.85	1.60	NaCl
Halloysite	1.38	10.96	9.57	Al2Si2O5(OH)4
Hausmannite	-4.25	56.78	61.03	Mn3O4
Hematite	8.00	6.59	-1.42	Fe2O3
Hercynite	0.19	23.08	22.89	FeAl2O4
Hg(CH3)2(g)	-182.81	-256.51	-73.71	Hg(CH3)2
Hg(g)	-7.07	-14.94	-7.87	Hg
Hg(OH)2	-7.41	-10.90	-3.50	Hg(OH)2
Hg2(g)	-14.92	-29.88	-14.96	Hg2
Hg2(OH)2	-9.51	-4.25	5.26	Hg2(OH)2
Hg2CO3	-8.48	-24.53	-16.05	Hg2CO3
Hg2CrO4	-25.65	-34.35	-8.70	Hg2CrO4
Hg2F2	-16.12	-26.49	-10.36	Hg2F2
Hg2S	-78.54	-90.22	-11.68	Hg2S
Hg2SeO3	-13.86	-18.52	-4.66	Hg2SeO3
Hg2SO4	-15.23	-21.36	-6.13	Hg2SO4
Hg3O2CO3	-23.31	-52.99	-29.68	Hg3O2CO3
HgCl(g)	-31.29	-11.79	19.50	HgCl
HgCl2	-8.98	-30.24	-21.26	HgCl2
HgF(g)	-45.92	-13.24	32.68	HgF
HgF2(g)	-45.70	-33.14	12.57	HgF2
Hgmetal(1)	-1.49	-14.94	-13.45	Hg
HgSe	-1.51	-57.20	-55.69	HgSe

HgSeO3	-12.74	-25.17	-12.43	HgSeO3
HgSO4	-18.59	-28.01	-9.42	HgSO4
Huntite	-1.60	-31.57	-29.97	CaMg3 (CO3) 4
Hydrocerussite	-5.19	-23.96	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.04	-18.80	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.01	-19.18	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.28	-19.08	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.45	-49.69	-17.24	K2Cr2O7
K2CrO4	-19.07	-19.58	-0.51	K2CrO4
K2MoO4	-13.58	-10.32	3.26	K2MoO4
K2SeO4	-13.70	-14.43	-0.73	K2SeO4
Kaolinite	3.52	10.96	7.43	Al2Si2O5 (OH) 4
Langite	-2.85	14.64	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.60	-6.04	-0.43	PbO : PbSO4
Laurionite	-4.76	-4.13	0.62	PbOHCl
Lepidocrocite	1.92	3.29	1.37	FeOOH
Lime	-20.53	12.16	32.70	CaO
Litharge	-7.16	5.54	12.69	PbO
Mackinawite	-78.86	-82.46	-3.60	FeS
Maghemite	0.20	6.59	6.39	Fe2O3
Magnesioferrite	2.19	19.05	16.86	Fe2MgO4
Magnesite	-0.36	-7.82	-7.46	MgCO3
Magnetite	6.69	10.10	3.40	Fe3O4
Malachite	0.90	-4.41	-5.31	Cu2 (OH) 2CO3
Manganite	-2.14	23.20	25.34	MnOOH
Massicot	-7.36	5.54	12.89	PbO
Matlockite	-6.28	-15.25	-8.97	PbClF
Melanothallite	-17.66	-11.40	6.26	CuCl2
Melanterite	-11.39	-13.60	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.78	-96.87	-45.09	HgS
Mg (OH) 2 (active)	-6.33	12.47	18.79	Mg (OH) 2
Mg (VO3) 2	-15.20	-3.92	11.28	Mg (VO3) 2
Mg2Sb3	-273.76	-199.07	74.68	Mg2Sb3
Mg2V2O7	-17.81	8.55	26.36	Mg2V2O7
MgCr2O4	-6.08	10.12	16.20	MgCr2O4
MgCrO4	-23.02	-17.64	5.38	MgCrO4
MgF2	-1.64	-9.77	-8.13	MgF2
MgMoO4	-6.52	-8.37	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.86	-1.80	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.28	-12.48	-1.20	MgSeO4 : 6H2O
Minium	-31.28	42.24	73.52	Pb3O4
Mirabilite	-4.37	-5.48	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.90	-6.00	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.92	-55.63	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.15	-88.08	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.84	-0.34	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.67	-8.96	2.72	MnCl2 : 4H2O
MnS (grn)	-75.76	-75.59	0.17	MnS
MnS (pnk)	-78.93	-75.59	3.34	MnS
MnSb	-95.27	-98.18	-2.91	MnSb
MnSe	-39.41	-35.91	3.50	MnSe
MnSeO3	-5.01	-3.88	1.13	MnSeO3
MnSeO3 : 2H2O	-4.87	-3.89	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.51	-14.56	-2.05	MnSeO4 : 5H2O
MnSO4	-9.31	-6.72	2.58	MnSO4
Monteponite	-8.45	6.65	15.10	CdO
Montroydite	-7.26	-10.90	-3.64	HgO
MoO3	-12.83	-20.83	-8.00	MoO3
Morenosite	-7.14	-9.28	-2.14	NiSO4 : 7H2O
MoS2	-148.14	-218.40	-70.26	MoS2
Na-Jarosite	-7.32	-18.52	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-38.68	-48.57	-9.90	Na2Cr2O7
Na2CrO4	-21.40	-18.47	2.93	Na2CrO4
Na2Mo2O7	-13.44	-30.04	-16.60	Na2Mo2O7
Na2MoO4	-10.69	-9.20	1.49	Na2MoO4
Na2MoO4 : 2H2O	-10.43	-9.20	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-12.94	-2.64	10.30	Na2SeO3 : 5H2O
Na2SeO4	-14.59	-13.31	1.28	Na2SeO4

Na3Sb	-173.03	-78.58	94.45	Na3Sb
Na3VO4	-27.42	9.26	36.68	Na3VO4
Na4V2O7	-30.52	6.88	37.40	Na4V2O7
Nantokite	-5.13	-11.86	-6.73	CuCl
NaSb	-87.75	-64.58	23.17	NaSb
Natron	-7.35	-8.66	-1.31	Na2CO3:10H2O
NaVO3	-6.23	-2.38	3.86	NaVO3
Nesquehonite	-3.15	-7.82	-4.67	MgCO3:3H2O
Ni(OH)2	-4.96	7.83	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.70	-8.00	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.78	14.22	32.00	Ni4(OH)6SO4
NiCO3	-5.58	-12.45	-6.87	NiCO3
NiMoO4	-1.86	-13.00	-11.14	NiMoO4
NiS(alpha)	-72.54	-78.14	-5.60	NiS
NiS(beta)	-67.04	-78.14	-11.10	NiS
NiS(gamma)	-65.34	-78.14	-12.80	NiS
NiSe	-20.77	-38.47	-17.70	NiSe
NiSeO3:2H2O	-9.25	-6.44	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.60	-17.12	-1.52	NiSeO4:6H2O
Nsutite	-6.84	10.66	17.50	MnO2
O2(g)	-31.83	51.26	83.09	O2
Orpiment	-241.79	-302.86	-61.07	As2S3
Otavite	-1.63	-13.63	-12.00	CdCO3
Pb(BO2)2	-9.22	-2.70	6.52	Pb(BO2)2
Pb(OH)2	-2.61	5.54	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.59	-66.35	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.39	1.40	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.12	11.07	26.19	Pb2O(OH)2
Pb2O3	-24.34	36.70	61.04	Pb2O3
Pb2OCO3	-8.65	-9.21	-0.56	Pb2OCO3
Pb2V2O7	-3.41	-5.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.68	-14.88	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.92	0.22	6.14	Pb3(VO4)2
Pb3O2CO3	-14.70	-3.68	11.02	Pb3O2CO3
Pb3O2SO4	-11.19	-0.50	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.07	5.03	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.84	5.04	21.88	Pb4O3SO4
PbCrO4	-11.97	-24.57	-12.60	PbCrO4
PbF2	-9.26	-16.70	-7.44	PbF2
Pbmetal	-24.34	-20.09	4.25	Pb
PbMoO4	0.32	-15.30	-15.62	PbMoO4
PbO:0.3H2O	-7.44	5.54	12.98	PbO:0.33H2O
PbSeO4	-12.57	-19.41	-6.84	PbSeO4
Periclase	-9.12	12.47	21.58	MgO
Phosgenite	-8.74	-28.55	-19.81	PbCl2:PbCO3
Plattnerite	-18.43	31.17	49.60	PbO2
Portlandite	-10.64	12.16	22.80	Ca(OH)2
Pyrite	-124.29	-142.80	-18.51	FeS2
Pyrochroite	-4.81	10.38	15.19	Mn(OH)2
Pyrolusite	-5.37	36.01	41.38	MnO2
Quartz	-0.31	-4.31	-4.00	SiO2
Realgar	-101.51	-121.26	-19.75	AsS
Retgersite	-7.24	-9.28	-2.04	NiSO4:6H2O
Rhodochromite	0.68	-9.90	-10.58	MnCO3
Rutherfordine	-5.27	-19.77	-14.50	UO2CO3
Sb(OH)3	-12.03	-19.14	-7.11	Sb(OH)3
Sb2O4	-16.05	-12.64	3.40	Sb2O4
Sb2O5	-25.97	-35.63	-9.67	Sb2O5
Sb2Se3	-109.41	-177.17	-67.76	Sb2Se3
Sb4O6(cubic)	-58.29	-76.55	-18.26	Sb4O6
Sb4O6(orth)	-58.65	-76.55	-17.90	Sb4O6
SbCl3	-48.71	-48.14	0.57	SbCl3
SbF3	-42.27	-52.49	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.81	-30.63	-27.82	SbO2
Schoepite	-5.48	0.52	5.99	UO2(OH)2:H2O
Semetal(am)	-13.56	-20.67	-7.11	Se
Semetal(hex)	-12.96	-20.67	-7.71	Se

Senarmontite	-25.91	-38.27	-12.37	Sb2O3
SeO2	-14.39	-14.27	0.12	SeO2
SeO3	-45.99	-24.95	21.04	SeO3
Sepiolite	-3.74	12.02	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-6.76	12.02	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.53	-16.77	-10.24	FeCO3
SiO2(am-gel)	-1.60	-4.31	-2.71	SiO2
SiO2(am-ppt)	-1.57	-4.31	-2.74	SiO2
Smithsonite	-0.89	-10.89	-10.00	ZnCO3
Sphalerite	-65.12	-76.57	-11.45	ZnS
Spinel	-4.81	32.04	36.85	MgAl2O4
Stibnite	-245.72	-296.18	-50.46	Sb2S3
Sulfur	-58.19	-60.34	-2.14	S
Tenorite	0.29	7.94	7.64	CuO
Thenardite	-5.80	-5.48	0.32	Na2SO4
Thermonatrite	-9.29	-8.65	0.64	Na2CO3:H2O
Tyuyamunite	-7.27	-3.19	4.08	Ca(UO2)2(VO4)2
U3O8	-17.51	3.57	21.08	U3O8
U3Sb4	-584.18	-431.80	152.38	U3Sb4
U4O9	-34.93	-37.95	-3.02	U4O9
UF4	-30.83	-60.37	-29.54	UF4
UF4:2.5H2O	-27.65	-60.37	-32.72	UF4:2.5H2O
UO2(am)	-16.83	-15.90	0.93	UO2
UO2(NO3)2	-41.77	-29.62	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-34.47	-29.62	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-33.01	-29.62	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.67	-29.62	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-5.09	0.52	5.61	UO2(OH)2
UO2SeO4:4H2O	-22.18	-24.43	-2.25	UO2SeO4:4H2O
UO3	-7.18	0.52	7.70	UO3
Uraninite	-11.23	-15.90	-4.67	UO2
USb2	-221.12	-191.54	29.58	USb2
V(OH)3	-18.82	-11.23	7.59	V(OH)3
V2O5	-15.03	-16.39	-1.36	V2O5
V3O5	-39.78	-37.95	1.84	V3O5
V4O7	-49.24	-42.05	7.19	V4O7
V6O13	-39.56	-100.42	-60.86	V6O13
Valentinite	-29.79	-38.27	-8.48	Sb2O3
VC12	-62.25	-43.38	18.87	VC12
VC13	-63.66	-40.23	23.43	VC13
VF4	-63.51	-48.58	14.93	VF4
Vmetal	-93.70	-49.67	44.03	V
VO	-38.80	-24.04	14.76	VO
VO(OH)2	-9.26	-4.11	5.15	VO(OH)2
VO2Cl	-20.70	-17.86	2.84	VO2Cl
VOC1	-32.05	-20.89	11.15	VOC1
VOC12	-36.20	-23.44	12.76	VOC12
VOSO4	-24.82	-21.21	3.61	VOSO4
Witherite	-4.21	-12.78	-8.57	BaCO3
Wurtzite	-67.62	-76.57	-8.95	ZnS
Zincite	-1.94	9.39	11.33	ZnO
Zincosite	-11.64	-7.71	3.93	ZnSO4
Zn(BO2)2	-7.13	1.16	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.06	-20.75	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.81	9.39	12.20	Zn(OH)2
Zn(OH)2(am)	-3.08	9.39	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.36	9.39	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.14	9.39	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.34	9.39	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.82	1.68	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.07	9.12	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.95	-3.30	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.95	-6.03	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.93	20.47	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.86	27.64	38.50	Zn5(OH)8Cl2
ZnCl2	-16.99	-9.94	7.05	ZnCl2
ZnCO3:1H2O	-0.63	-10.89	-10.26	ZnCO3:1H2O
ZnF2	-12.31	-12.84	-0.53	ZnF2

Znmetal	-42.02	-16.24	25.79	Zn
ZnMoO4	-1.31	-11.44	-10.13	ZnMoO4
ZnO(active)	-1.79	9.39	11.19	ZnO
ZnS(am)	-67.52	-76.57	-9.05	ZnS
ZnSb	-84.83	-73.82	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-14.03	-15.55	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.08	-7.71	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 160.

Title Return solution back to 1L
Mix 905
912 2.0170
save solution 913
end

TITLE

Return solution back to 1L

Beginning of batch-reaction calculations.

Reaction step 1.

Using mix 905.

Mixture 905.

2.017e+00 Solution 912 Solution after simulation 159.

-----Solution composition-----

Elements	Molality	Moles
Ag	3.759e-08	3.754e-08
Al	5.406e-06	5.398e-06
As	5.145e-10	5.137e-10
B	7.675e-05	7.663e-05
Ba	8.281e-08	8.269e-08
C	5.034e-03	5.026e-03
Ca	6.445e-03	6.436e-03
Cd	2.803e-08	2.798e-08
Cl	8.692e-03	8.679e-03
Co	2.150e-07	2.147e-07
Cr	3.557e-09	3.552e-09
Cu	3.328e-06	3.323e-06
F	4.168e-04	4.162e-04
Fe	2.543e-09	2.539e-09
Hg	4.423e-09	4.416e-09
K	7.622e-03	7.611e-03
Mg	1.184e-02	1.182e-02
Mn	1.318e-04	1.316e-04
Mo	3.861e-06	3.855e-06
N	3.243e-05	3.238e-05
Na	2.719e-02	2.715e-02

Ni	3.350e-07	3.345e-07
Pb	9.906e-09	9.891e-09
S	2.884e-02	2.880e-02
Sb	5.902e-08	5.893e-08
Se	3.324e-07	3.319e-07
Si	4.870e-05	4.863e-05
U	5.325e-07	5.317e-07
V	1.783e-08	1.780e-08
Zn	1.304e-05	1.302e-05

-----Description of solution-----

	pH	=	7.505	Charge balance
	pe	=	5.311	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	8.792e-02	
	Mass of water (kg)	=	9.985e-01	
	Total alkalinity (eq/kg)	=	4.856e-03	
	Total CO2 (mol/kg)	=	5.034e-03	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.832e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	0	
	Total H	=	1.108543e+02	
	Total O	=	5.55510e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	4.165e-07	3.213e-07	-6.380	-6.493	-0.113	(0)
H+	3.969e-08	3.130e-08	-7.401	-7.505	-0.103	0.00
H2O	5.551e+01	9.985e-01	1.744	-0.001	0.000	18.07
Ag	3.759e-08					
AgCl	1.910e-08	1.910e-08	-7.719	-7.719	0.000	(0)
AgCl2-	1.615e-08	1.140e-08	-7.792	-7.943	-0.151	(0)
Ag+	1.731e-09	1.365e-09	-8.762	-8.865	-0.103	(0)
AgSO4-	3.063e-10	2.162e-10	-9.514	-9.665	-0.151	(0)
AgCl3-2	2.804e-10	6.963e-11	-9.552	-10.157	-0.605	(0)
AgCl4-3	2.238e-11	9.744e-13	-10.650	-12.011	-1.361	(0)
AgNO2	6.754e-12	6.754e-12	-11.170	-11.170	0.000	(0)
AgF	8.328e-13	8.328e-13	-12.079	-12.079	0.000	(0)
AgNH3+	6.881e-14	4.858e-14	-13.162	-13.314	-0.151	(0)
AgOH	4.385e-14	4.385e-14	-13.358	-13.358	0.000	(0)
AgH2BO3	3.051e-14	3.051e-14	-13.516	-13.516	0.000	(0)
AgSeO3-	2.722e-14	1.921e-14	-13.565	-13.716	-0.151	(0)
Ag2Se	7.775e-15	7.775e-15	-14.109	-14.109	0.000	(0)
Ag (NO2) 2-	3.510e-16	2.478e-16	-15.455	-15.606	-0.151	(0)
AgNO3	2.950e-17	2.950e-17	-16.530	-16.530	0.000	(0)
Ag (NH3) 2+	9.750e-18	6.883e-18	-17.011	-17.162	-0.151	(0)
Ag (OH) 2-	1.950e-18	1.377e-18	-17.710	-17.861	-0.151	(0)
Ag (SeO3) 2-3	8.654e-20	3.768e-21	-19.063	-20.424	-1.361	(0)
Ag2MoO4	1.052e-24	1.052e-24	-23.978	-23.978	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.516	-73.516	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.031	-84.451	-2.420	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.616	-147.861	-0.246	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.731	-147.882	-0.151	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.364	-149.797	-0.433	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.700	-150.108	-0.408	(0)
Al	5.406e-06					
Al (OH) 4-	5.076e-06	3.984e-06	-5.294	-5.400	-0.105	(0)
AlF3	1.347e-07	1.347e-07	-6.871	-6.871	0.000	(0)
Al (OH) 3	9.851e-08	9.851e-08	-7.007	-7.007	0.000	(0)
AlF2+	5.532e-08	4.403e-08	-7.257	-7.356	-0.099	(0)
AlF4-	2.089e-08	1.639e-08	-7.680	-7.785	-0.105	(0)

Al (OH) 2+	1.931e-08	1.537e-08	-7.714	-7.813	-0.099	(0)
AlF+2	1.134e-09	4.553e-10	-8.945	-9.342	-0.396	(0)
AlOH+2	1.500e-10	6.022e-11	-9.824	-10.220	-0.396	(0)
AlSO4+	1.472e-11	1.155e-11	-10.832	-10.937	-0.105	(0)
Al+3	1.591e-12	1.874e-13	-11.798	-12.727	-0.929	(0)
Al (SO4) 2-	1.252e-12	9.831e-13	-11.902	-12.007	-0.105	(0)
AlMo6O21-3	4.404e-37	1.918e-38	-36.356	-37.717	-1.361	(0)
As (3)	3.414e-23					
H3AsO3	3.336e-23	3.336e-23	-22.477	-22.477	0.000	(0)
H2AsO3-	7.745e-25	5.468e-25	-24.111	-24.262	-0.151	(0)
HAsO3-2	6.416e-29	1.593e-29	-28.193	-28.798	-0.605	(0)
H4AsO3+	7.328e-31	5.173e-31	-30.135	-30.286	-0.151	(0)
AsO3-3	4.507e-34	1.963e-35	-33.346	-34.707	-1.361	(0)
As (5)	5.145e-10					
HAsO4-2	4.673e-10	1.161e-10	-9.330	-9.935	-0.605	(0)
H2AsO4-	4.692e-11	3.312e-11	-10.329	-10.480	-0.151	(0)
AsO4-3	2.693e-13	1.173e-14	-12.570	-13.931	-1.361	(0)
H3AsO4	1.765e-16	1.801e-16	-15.753	-15.744	0.009	(0)
B	7.675e-05					
H3BO3	7.448e-05	7.601e-05	-4.128	-4.119	0.009	(0)
H2BO3-	1.866e-06	1.411e-06	-5.729	-5.851	-0.122	(0)
MgH2BO3+	1.861e-07	1.406e-07	-6.730	-6.852	-0.122	(0)
CaH2BO3+	1.538e-07	1.163e-07	-6.813	-6.935	-0.122	(0)
NaH2BO3	4.591e-08	4.591e-08	-7.338	-7.338	0.000	(0)
BF (OH) 3-	9.748e-09	7.367e-09	-8.011	-8.133	-0.122	(0)
H5 (BO3) 2-	1.207e-10	9.125e-11	-9.918	-10.040	-0.122	(0)
BF2 (OH) 2-	7.934e-12	5.997e-12	-11.100	-11.222	-0.122	(0)
BaH2BO3+	1.815e-12	1.372e-12	-11.741	-11.863	-0.122	(0)
H8 (BO3) 3-	9.177e-13	6.936e-13	-12.037	-12.159	-0.122	(0)
AgH2BO3	3.051e-14	3.051e-14	-13.516	-13.516	0.000	(0)
BF3OH-	2.350e-17	1.776e-17	-16.629	-16.751	-0.122	(0)
BF4-	8.804e-22	6.654e-22	-21.055	-21.177	-0.122	(0)
Ba	8.281e-08					
Ba+2	8.140e-08	3.147e-08	-7.089	-7.502	-0.413	(0)
BaHCO3+	1.324e-09	1.063e-09	-8.878	-8.973	-0.095	(0)
BaCO3	8.552e-11	8.552e-11	-10.068	-10.068	0.000	(0)
BaH2BO3+	1.815e-12	1.372e-12	-11.741	-11.863	-0.122	(0)
BaOH+	5.578e-14	4.413e-14	-13.254	-13.355	-0.102	(0)
BaNO3+	6.080e-15	4.292e-15	-14.216	-14.367	-0.151	(0)
BaNH3+2	1.394e-15	3.461e-16	-14.856	-15.461	-0.605	(0)
C (4)	5.034e-03					
HCO3-	4.444e-03	3.537e-03	-2.352	-2.451	-0.099	(0)
H2CO3	2.490e-04	2.490e-04	-3.604	-3.604	0.000	(0)
MgHCO3+	1.337e-04	1.041e-04	-3.874	-3.983	-0.109	(0)
CaHCO3+	1.175e-04	9.435e-05	-3.930	-4.025	-0.095	(0)
NaHCO3	4.085e-05	4.085e-05	-4.389	-4.389	0.000	(0)
CO3-2	1.371e-05	5.299e-06	-4.863	-5.276	-0.413	(0)
MgCO3	1.267e-05	1.267e-05	-4.897	-4.897	0.000	(0)
CaCO3	1.203e-05	1.203e-05	-4.920	-4.920	0.000	(0)
CuCO3	2.648e-06	2.648e-06	-5.577	-5.577	0.000	(0)
NaCO3-	2.546e-06	2.026e-06	-5.594	-5.693	-0.099	(0)
MnHCO3+	2.118e-06	1.676e-06	-5.674	-5.776	-0.102	(0)
ZnCO3	7.425e-07	7.425e-07	-6.129	-6.129	0.000	(0)
UO2 (CO3) 3-4	5.034e-07	1.915e-09	-6.298	-8.718	-2.420	(0)
ZnHCO3+	3.859e-07	2.724e-07	-6.414	-6.565	-0.151	(0)
Cu (CO3) 2-2	1.521e-07	3.777e-08	-6.818	-7.423	-0.605	(0)
NiHCO3+	4.116e-08	2.905e-08	-7.386	-7.537	-0.151	(0)
UO2 (CO3) 2-2	2.904e-08	7.212e-09	-7.537	-8.142	-0.605	(0)
CuHCO3+	2.683e-08	1.894e-08	-7.571	-7.723	-0.151	(0)
CoHCO3+	1.364e-08	9.628e-09	-7.865	-8.016	-0.151	(0)
NiCO3	1.317e-08	1.317e-08	-7.880	-7.880	0.000	(0)
PbCO3	5.370e-09	5.370e-09	-8.270	-8.270	0.000	(0)
CoCO3	3.134e-09	3.134e-09	-8.504	-8.504	0.000	(0)
BaHCO3+	1.324e-09	1.063e-09	-8.878	-8.973	-0.095	(0)
PbHCO3+	1.255e-09	8.860e-10	-8.901	-9.053	-0.151	(0)
CdCO3	5.332e-10	5.332e-10	-9.273	-9.273	0.000	(0)
Pb (CO3) 2-2	3.304e-10	8.207e-11	-9.481	-10.086	-0.605	(0)
BaCO3	8.552e-11	8.552e-11	-10.068	-10.068	0.000	(0)

	UO ₂ CO ₃	6.821e-11	6.821e-11	-10.166	-10.166	0.000	(0)
	CdHCO ₃ +	5.036e-11	3.555e-11	-10.298	-10.449	-0.151	(0)
	Cd (CO ₃) 2-2	8.433e-12	2.094e-12	-11.074	-11.679	-0.605	(0)
	FeHCO ₃ +	1.760e-13	1.412e-13	-12.755	-12.850	-0.095	(0)
	HgCO ₃	1.219e-13	1.219e-13	-12.914	-12.914	0.000	(0)
	Hg (CO ₃) 2-2	8.222e-15	2.042e-15	-14.085	-14.690	-0.605	(0)
	HgHCO ₃ +	1.006e-16	7.102e-17	-15.997	-16.149	-0.151	(0)
Ca		6.445e-03					
	Ca+2	3.705e-03	1.432e-03	-2.431	-2.844	-0.413	(0)
	CaSO ₄	2.606e-03	2.606e-03	-2.584	-2.584	0.000	(0)
	CaHCO ₃ +	1.175e-04	9.435e-05	-3.930	-4.025	-0.095	(0)
	CaCO ₃	1.203e-05	1.203e-05	-4.920	-4.920	0.000	(0)
	CaF+	4.800e-06	3.798e-06	-5.319	-5.420	-0.102	(0)
	CaH ₂ BO ₃ +	1.538e-07	1.163e-07	-6.813	-6.935	-0.122	(0)
	CaOH+	1.144e-08	9.182e-09	-7.942	-8.037	-0.095	(0)
	CaNO ₃ +	1.746e-10	1.233e-10	-9.758	-9.909	-0.151	(0)
	CaNH ₃ 2	1.266e-10	3.143e-11	-9.898	-10.503	-0.605	(0)
	Ca (NH ₃) 2+2	8.783e-19	2.181e-19	-18.056	-18.661	-0.605	(0)
Cd		2.803e-08					
	Cd+2	1.142e-08	4.414e-09	-7.942	-8.355	-0.413	(0)
	CdSO ₄	8.217e-09	8.217e-09	-8.085	-8.085	0.000	(0)
	CdCl+	4.093e-09	2.889e-09	-8.388	-8.539	-0.151	(0)
	Cd (SO ₄) 2-2	3.544e-09	8.802e-10	-8.451	-9.055	-0.605	(0)
	CdCO ₃	5.332e-10	5.332e-10	-9.273	-9.273	0.000	(0)
	CdCl ₂	8.254e-11	8.254e-11	-10.083	-10.083	0.000	(0)
	CdHCO ₃ +	5.036e-11	3.555e-11	-10.298	-10.449	-0.151	(0)
	CdOHC1	3.808e-11	3.808e-11	-10.419	-10.419	0.000	(0)
	CdF+	2.407e-11	1.699e-11	-10.618	-10.770	-0.151	(0)
	CdOH+	1.596e-11	1.127e-11	-10.797	-10.948	-0.151	(0)
	Cd (CO ₃) 2-2	8.433e-12	2.094e-12	-11.074	-11.679	-0.605	(0)
	CdCl ₃ -	5.056e-13	3.569e-13	-12.296	-12.447	-0.151	(0)
	Cd (OH) 2	2.284e-14	2.284e-14	-13.641	-13.641	0.000	(0)
	CdF ₂	8.237e-15	8.237e-15	-14.084	-14.084	0.000	(0)
	CdNO ₃ +	5.381e-16	3.799e-16	-15.269	-15.420	-0.151	(0)
	CdSeO ₄	9.500e-17	9.500e-17	-16.022	-16.022	0.000	(0)
	Cd (SeO ₃) 2-2	7.028e-18	1.746e-18	-17.153	-17.758	-0.605	(0)
	Cd2OH+3	5.723e-18	2.492e-19	-17.242	-18.603	-1.361	(0)
	Cd (OH) 3-	6.349e-19	4.482e-19	-18.197	-18.349	-0.151	(0)
	Cd (NO ₃) 2	5.182e-24	5.182e-24	-23.286	-23.286	0.000	(0)
	Cd (OH) 4-2	9.490e-26	2.357e-26	-25.023	-25.628	-0.605	(0)
	CdHS+	0.000e+00	0.000e+00	-78.662	-78.813	-0.151	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.075	-150.075	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-226.490	-226.641	-0.151	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-302.306	-302.911	-0.605	(0)
Cl		8.692e-03					
	Cl-	8.692e-03	6.854e-03	-2.061	-2.164	-0.103	(0)
	MnCl+	2.589e-07	2.049e-07	-6.587	-6.689	-0.102	(0)
	ZnCl+	5.386e-08	4.192e-08	-7.269	-7.378	-0.109	(0)
	AgCl	1.910e-08	1.910e-08	-7.719	-7.719	0.000	(0)
	ZnOHC1	1.763e-08	1.763e-08	-7.754	-7.754	0.000	(0)
	AgCl ₂ -	1.615e-08	1.140e-08	-7.792	-7.943	-0.151	(0)
	CdCl+	4.093e-09	2.889e-09	-8.388	-8.539	-0.151	(0)
	CuCl ₂ -	3.224e-09	2.510e-09	-8.492	-8.600	-0.109	(0)
	MnCl ₂	1.983e-09	1.983e-09	-8.703	-8.703	0.000	(0)
	CuCl	1.753e-09	1.753e-09	-8.756	-8.756	0.000	(0)
	NiCl+	1.655e-09	1.168e-09	-8.781	-8.932	-0.151	(0)
	CuCl+	1.184e-09	9.219e-10	-8.926	-9.035	-0.109	(0)
	CoCl+	1.175e-09	8.296e-10	-8.930	-9.081	-0.151	(0)
	ZnCl ₂	4.553e-10	4.553e-10	-9.342	-9.342	0.000	(0)
	AgCl ₃ -2	2.804e-10	6.963e-11	-9.552	-10.157	-0.605	(0)
	PbCl+	1.161e-10	8.198e-11	-9.935	-10.086	-0.151	(0)
	HgCl ₂	9.026e-11	9.026e-11	-10.044	-10.044	0.000	(0)
	CdCl ₂	8.254e-11	8.254e-11	-10.083	-10.083	0.000	(0)
	HgClOH	7.473e-11	7.473e-11	-10.127	-10.127	0.000	(0)
	CdOHC1	3.808e-11	3.808e-11	-10.419	-10.419	0.000	(0)
	AgCl ₄ -3	2.238e-11	9.744e-13	-10.650	-12.011	-1.361	(0)
	CuCl ₃ -2	9.383e-12	3.677e-12	-11.028	-11.434	-0.407	(0)
	HgCl ₃ -	8.763e-12	6.186e-12	-11.057	-11.209	-0.151	(0)

MnCl3-	4.732e-12	3.744e-12	-11.325	-11.427	-0.102	(0)
ZnCl3-	3.185e-12	2.479e-12	-11.497	-11.606	-0.109	(0)
PbCl2	2.510e-12	2.510e-12	-11.600	-11.600	0.000	(0)
CuCl2	2.191e-12	2.191e-12	-11.659	-11.659	0.000	(0)
HgCl4-2	6.796e-13	1.688e-13	-12.168	-12.773	-0.605	(0)
CdCl3-	5.056e-13	3.569e-13	-12.296	-12.447	-0.151	(0)
NiCl2	4.031e-14	4.031e-14	-13.395	-13.395	0.000	(0)
ZnCl4-2	2.168e-14	8.495e-15	-13.664	-14.071	-0.407	(0)
PbCl3-	9.699e-15	6.847e-15	-14.013	-14.164	-0.151	(0)
HgCl+	3.722e-15	2.628e-15	-14.429	-14.580	-0.151	(0)
CrCl+2	2.729e-16	6.778e-17	-15.564	-16.169	-0.605	(0)
CuCl3-	1.800e-16	1.401e-16	-15.745	-15.853	-0.109	(0)
PbCl4-2	8.636e-17	2.145e-17	-16.064	-16.669	-0.605	(0)
UO2Cl+	5.091e-17	3.594e-17	-16.293	-16.444	-0.151	(0)
CrOHC12	2.837e-18	2.837e-18	-17.547	-17.547	0.000	(0)
CrCl2+	6.244e-20	4.408e-20	-19.205	-19.356	-0.151	(0)
FeCl+2	3.184e-20	1.248e-20	-19.497	-19.904	-0.407	(0)
CuCl4-2	1.228e-20	4.813e-21	-19.911	-20.318	-0.407	(0)
VOCl+	2.097e-21	1.480e-21	-20.678	-20.830	-0.151	(0)
FeCl2+	4.828e-22	3.820e-22	-21.316	-21.418	-0.102	(0)
FeCl3	2.618e-25	2.618e-25	-24.582	-24.582	0.000	(0)
CrO3Cl-	1.557e-25	1.099e-25	-24.808	-24.959	-0.151	(0)
CoCl+2	1.600e-34	3.975e-35	-33.796	-34.401	-0.605	(0)
UCl+3	0.000e+00	0.000e+00	-45.016	-46.377	-1.361	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.636	-47.241	-0.605	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.126	-48.731	-0.605	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.110	-61.715	-0.605	(0)
Co (2)	2.150e-07					
Co+2	1.409e-07	3.499e-08	-6.851	-7.456	-0.605	(0)
CoSO4	5.544e-08	5.544e-08	-7.256	-7.256	0.000	(0)
CoHCO3+	1.364e-08	9.628e-09	-7.865	-8.016	-0.151	(0)
CoCO3	3.134e-09	3.134e-09	-8.504	-8.504	0.000	(0)
CoCl+	1.175e-09	8.296e-10	-8.930	-9.081	-0.151	(0)
CoF+	3.807e-10	2.688e-10	-9.419	-9.571	-0.151	(0)
CoOH+	3.177e-10	2.243e-10	-9.498	-9.649	-0.151	(0)
CoNO2+	8.273e-12	5.840e-12	-11.082	-11.234	-0.151	(0)
Co (OH) 2	5.724e-12	5.724e-12	-11.242	-11.242	0.000	(0)
Co (NH3) +2	2.953e-13	7.333e-14	-12.530	-13.135	-0.605	(0)
CoNO3+	2.138e-15	1.509e-15	-14.670	-14.821	-0.151	(0)
CoSeO4	2.027e-15	2.027e-15	-14.693	-14.693	0.000	(0)
Co (OH) 3-	5.198e-17	3.669e-17	-16.284	-16.435	-0.151	(0)
CoOOH-	1.306e-17	9.220e-18	-16.884	-17.035	-0.151	(0)
Co2OH+3	9.032e-18	3.933e-19	-17.044	-18.405	-1.361	(0)
Co (NH3) 2+2	2.196e-19	5.453e-20	-18.658	-19.263	-0.605	(0)
Co (NO3) 2	8.357e-23	8.357e-23	-22.078	-22.078	0.000	(0)
Co (OH) 4-2	7.522e-24	1.868e-24	-23.124	-23.729	-0.605	(0)
Co (NH3) 3+2	4.818e-26	1.197e-26	-25.317	-25.922	-0.605	(0)
Co4 (OH) 4+4	1.327e-28	5.050e-31	-27.877	-30.297	-2.420	(0)
Co (NH3) 4+2	4.408e-33	1.095e-33	-32.356	-32.961	-0.605	(0)
Co (NH3) 5+2	1.275e-40	0.000e+00	-39.894	-40.499	-0.605	(0)
Co (3)	1.874e-28					
CoOH+2	1.874e-28	4.653e-29	-27.727	-28.332	-0.605	(0)
Co+3	2.419e-34	2.850e-35	-33.616	-34.545	-0.929	(0)
CoCl+2	1.600e-34	3.975e-35	-33.796	-34.401	-0.605	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.636	-47.241	-0.605	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.575	-56.726	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.110	-61.715	-0.605	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.239	-61.844	-0.605	(0)
Cr (2)	3.592e-26					
Cr+2	3.592e-26	8.922e-27	-25.445	-26.050	-0.605	(0)
Cr (3)	3.557e-09					
Cr (OH) 2+	2.974e-09	2.100e-09	-8.527	-8.678	-0.151	(0)
Cr (OH) 3	2.534e-10	2.534e-10	-9.596	-9.596	0.000	(0)
Cr (OH) +2	2.163e-10	5.371e-11	-9.665	-10.270	-0.605	(0)
CrOHSO4	1.012e-10	1.012e-10	-9.995	-9.995	0.000	(0)
CrO2-	5.455e-12	3.851e-12	-11.263	-11.414	-0.151	(0)
Cr (OH) 4-	4.591e-12	3.241e-12	-11.338	-11.489	-0.151	(0)
CrF+2	1.185e-12	2.942e-13	-11.926	-12.531	-0.605	(0)

CrSO4+	2.007e-13	1.417e-13	-12.697	-12.849	-0.151	(0)
Cr+3	1.755e-13	7.642e-15	-12.756	-14.117	-1.361	(0)
CrCl+2	2.729e-16	6.778e-17	-15.564	-16.169	-0.605	(0)
CrOHC12	2.837e-18	2.837e-18	-17.547	-17.547	0.000	(0)
Cr2 (OH) 2SO4+2	1.978e-18	4.914e-19	-17.704	-18.309	-0.605	(0)
Cr2 (OH) 2 (SO4) 2	2.318e-19	2.318e-19	-18.635	-18.635	0.000	(0)
CrCl2+	6.244e-20	4.408e-20	-19.205	-19.356	-0.151	(0)
CrNO3+2	3.660e-23	9.091e-24	-22.436	-23.041	-0.605	(0)
Cr (NH3) 5OH+2	3.750e-39	9.313e-40	-38.426	-39.031	-0.605	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.308	-47.669	-1.361	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.126	-48.731	-0.605	(0)
Cr (6)	2.333e-15					
CrO4-2	2.078e-15	8.033e-16	-14.682	-15.095	-0.413	(0)
NaCrO4-	1.161e-16	8.197e-17	-15.935	-16.086	-0.151	(0)
HCrO4-	1.152e-16	8.135e-17	-15.938	-16.090	-0.151	(0)
KCrO4-	2.407e-17	1.699e-17	-16.619	-16.770	-0.151	(0)
CrO3SO4-2	2.483e-23	6.166e-24	-22.605	-23.210	-0.605	(0)
H2CrO4	2.064e-24	2.064e-24	-23.685	-23.685	0.000	(0)
CrO3Cl-	1.557e-25	1.099e-25	-24.808	-24.959	-0.151	(0)
Cr2O7-2	9.253e-31	2.298e-31	-30.034	-30.639	-0.605	(0)
Cu (1)	5.274e-09					
CuCl2-	3.224e-09	2.510e-09	-8.492	-8.600	-0.109	(0)
CuCl	1.753e-09	1.753e-09	-8.756	-8.756	0.000	(0)
Cu+	2.878e-10	2.031e-10	-9.541	-9.692	-0.151	(0)
CuCl3-2	9.383e-12	3.677e-12	-11.028	-11.434	-0.407	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.805	-148.225	-0.420	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.559	-148.955	-0.396	(0)
Cu (2)	3.322e-06					
CuCO3	2.648e-06	2.648e-06	-5.577	-5.577	0.000	(0)
Cu+2	2.195e-07	8.487e-08	-6.658	-7.071	-0.413	(0)
CuSO4	1.544e-07	1.544e-07	-6.811	-6.811	0.000	(0)
Cu (CO3) 2-2	1.521e-07	3.777e-08	-6.818	-7.423	-0.605	(0)
CuOH+	1.108e-07	8.623e-08	-6.956	-7.064	-0.109	(0)
CuHCO3+	2.683e-08	1.894e-08	-7.571	-7.723	-0.151	(0)
Cu (OH) 2	5.527e-09	5.527e-09	-8.257	-8.257	0.000	(0)
CuF+	1.843e-09	1.301e-09	-8.735	-8.886	-0.151	(0)
CuCl+	1.184e-09	9.219e-10	-8.926	-9.035	-0.109	(0)
Cu2 (OH) 2+2	7.520e-10	1.868e-10	-9.124	-9.729	-0.605	(0)
CuNO2+	2.982e-10	2.105e-10	-9.526	-9.677	-0.151	(0)
CuNH3+2	6.096e-11	1.514e-11	-10.215	-10.820	-0.605	(0)
Cu (OH) 3-	5.160e-12	3.642e-12	-11.287	-11.439	-0.151	(0)
CuCl2	2.191e-12	2.191e-12	-11.659	-11.659	0.000	(0)
Cu (NO2) 2	5.102e-14	5.102e-14	-13.292	-13.292	0.000	(0)
CuNO3+	1.035e-14	7.304e-15	-13.985	-14.136	-0.151	(0)
CuCl3-	1.800e-16	1.401e-16	-15.745	-15.853	-0.109	(0)
Cu (OH) 4-2	3.708e-17	9.210e-18	-16.431	-17.036	-0.605	(0)
CuCl4-2	1.228e-20	4.813e-21	-19.911	-20.318	-0.407	(0)
Cu (NO3) 2	2.502e-23	2.502e-23	-22.602	-22.602	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.419	-216.570	-0.151	(0)
F	4.168e-04					
F-	3.081e-04	2.429e-04	-3.511	-3.615	-0.103	(0)
MgF+	9.983e-05	7.836e-05	-4.001	-4.106	-0.105	(0)
CaF+	4.800e-06	3.798e-06	-5.319	-5.420	-0.102	(0)
NaF	3.147e-06	3.147e-06	-5.502	-5.502	0.000	(0)
MnF+	2.902e-07	2.296e-07	-6.537	-6.639	-0.102	(0)
AlF3	1.347e-07	1.347e-07	-6.871	-6.871	0.000	(0)
AlF2+	5.532e-08	4.403e-08	-7.257	-7.356	-0.099	(0)
AlF4-	2.089e-08	1.639e-08	-7.680	-7.785	-0.105	(0)
ZnF+	1.672e-08	1.180e-08	-7.777	-7.928	-0.151	(0)
HF	1.124e-08	1.124e-08	-7.949	-7.949	0.000	(0)
BF (OH) 3-	9.748e-09	7.367e-09	-8.011	-8.133	-0.122	(0)
CuF+	1.843e-09	1.301e-09	-8.735	-8.886	-0.151	(0)
AlF+2	1.134e-09	4.553e-10	-8.945	-9.342	-0.396	(0)
NiF+	5.759e-10	4.065e-10	-9.240	-9.391	-0.151	(0)
CoF+	3.807e-10	2.688e-10	-9.419	-9.571	-0.151	(0)
CdF+	2.407e-11	1.699e-11	-10.618	-10.770	-0.151	(0)
HF2-	1.346e-11	1.038e-11	-10.871	-10.984	-0.113	(0)
PbF+	8.174e-12	5.771e-12	-11.088	-11.239	-0.151	(0)

BF2 (OH) 2-	7.934e-12	5.997e-12	-11.100	-11.222	-0.122	(0)
CrF+2	1.185e-12	2.942e-13	-11.926	-12.531	-0.605	(0)
AgF	8.328e-13	8.328e-13	-12.079	-12.079	0.000	(0)
UO2F+	1.536e-13	1.084e-13	-12.814	-12.965	-0.151	(0)
UO2F2	7.596e-14	7.596e-14	-13.119	-13.119	0.000	(0)
PbF2	2.759e-14	2.759e-14	-13.559	-13.559	0.000	(0)
CdF2	8.237e-15	8.237e-15	-14.084	-14.084	0.000	(0)
UO2F3-	6.566e-15	4.635e-15	-14.183	-14.334	-0.151	(0)
H2F2	3.387e-16	3.387e-16	-15.470	-15.470	0.000	(0)
FeF2+	1.319e-16	1.044e-16	-15.880	-15.981	-0.102	(0)
VO2F	8.555e-17	8.555e-17	-16.068	-16.068	0.000	(0)
FeF+2	4.097e-17	1.606e-17	-16.388	-16.794	-0.407	(0)
UO2F4-2	3.601e-17	8.943e-18	-16.444	-17.049	-0.605	(0)
FeF3	3.578e-17	3.578e-17	-16.446	-16.446	0.000	(0)
BF3OH-	2.350e-17	1.776e-17	-16.629	-16.751	-0.122	(0)
PbF3-	1.800e-17	1.271e-17	-16.745	-16.896	-0.151	(0)
VO2F2-	1.069e-17	7.545e-18	-16.971	-17.122	-0.151	(0)
VOF+	1.589e-19	1.122e-19	-18.799	-18.950	-0.151	(0)
VO2F3-2	9.206e-20	2.286e-20	-19.036	-19.641	-0.605	(0)
VOF2	1.022e-20	1.022e-20	-19.991	-19.991	0.000	(0)
PbF4-2	5.950e-21	1.478e-21	-20.225	-20.830	-0.605	(0)
BF4-	8.804e-22	6.654e-22	-21.055	-21.177	-0.122	(0)
HgF+	2.451e-22	1.730e-22	-21.611	-21.762	-0.151	(0)
VOF3-	1.247e-22	8.806e-23	-21.904	-22.055	-0.151	(0)
VO2F4-3	6.275e-23	2.733e-24	-22.202	-23.563	-1.361	(0)
Sb (OH) 2F	8.654e-25	8.654e-25	-24.063	-24.063	0.000	(0)
SbOF	8.522e-25	8.522e-25	-24.069	-24.069	0.000	(0)
VOF4-2	3.477e-25	8.634e-26	-24.459	-25.064	-0.605	(0)
SiF6-2	3.782e-26	1.482e-26	-25.422	-25.829	-0.407	(0)
UF3+	9.875e-36	6.971e-36	-35.005	-35.157	-0.151	(0)
UF2+2	7.291e-37	1.811e-37	-36.137	-36.742	-0.605	(0)
UF4	1.857e-37	1.857e-37	-36.731	-36.731	0.000	(0)
UF5-	2.532e-39	1.787e-39	-38.597	-38.748	-0.151	(0)
UF+3	1.360e-39	0.000e+00	-38.867	-40.228	-1.361	(0)
UF6-2	5.280e-40	1.311e-40	-39.277	-39.882	-0.605	(0)
Fe (2)	1.918e-11					
Fe+2	1.277e-11	3.172e-12	-10.894	-11.499	-0.605	(0)
FeSO4	6.182e-12	6.182e-12	-11.209	-11.209	0.000	(0)
FeHCO3+	1.760e-13	1.412e-13	-12.755	-12.850	-0.095	(0)
FeOH+	5.127e-14	4.056e-14	-13.290	-13.392	-0.102	(0)
Fe (OH) 2	1.035e-17	1.035e-17	-16.985	-16.985	0.000	(0)
Fe (OH) 3-	1.329e-18	1.052e-18	-17.876	-17.978	-0.102	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.481	-159.481	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.758	-235.910	-0.151	(0)
Fe (3)	2.523e-09					
Fe (OH) 2+	1.964e-09	1.563e-09	-8.707	-8.806	-0.099	(0)
Fe (OH) 3	5.393e-10	5.393e-10	-9.268	-9.268	0.000	(0)
Fe (OH) 4-	2.027e-11	1.613e-11	-10.693	-10.792	-0.099	(0)
FeOH+2	3.191e-14	1.251e-14	-13.496	-13.903	-0.407	(0)
FeF2+	1.319e-16	1.044e-16	-15.880	-15.981	-0.102	(0)
FeF+2	4.097e-17	1.606e-17	-16.388	-16.794	-0.407	(0)
FeF3	3.578e-17	3.578e-17	-16.446	-16.446	0.000	(0)
FeSO4+	6.789e-18	5.371e-18	-17.168	-17.270	-0.102	(0)
Fe (SO4) 2-	1.292e-18	9.119e-19	-17.889	-18.040	-0.151	(0)
Fe+3	5.116e-19	6.029e-20	-18.291	-19.220	-0.929	(0)
FeCl+2	3.184e-20	1.248e-20	-19.497	-19.904	-0.407	(0)
FeCl2+	4.828e-22	3.820e-22	-21.316	-21.418	-0.102	(0)
FeHSeO3+2	1.104e-22	2.743e-23	-21.957	-22.562	-0.605	(0)
Fe2 (OH) 2+4	1.361e-24	5.179e-27	-23.866	-26.286	-2.420	(0)
FeCl3	2.618e-25	2.618e-25	-24.582	-24.582	0.000	(0)
FeNO3+2	6.606e-26	1.641e-26	-25.180	-25.785	-0.605	(0)
Fe3 (OH) 4+5	7.061e-31	1.170e-34	-30.151	-33.932	-3.781	(0)
H (0)	3.245e-29					
H2	1.623e-29	1.656e-29	-28.790	-28.781	0.009	(0)
Hg (0)	4.236e-09					
Hg	4.236e-09	4.236e-09	-8.373	-8.373	0.000	(0)
Hg (1)	4.450e-19					
Hg2+2	2.225e-19	5.526e-20	-18.653	-19.258	-0.605	(0)

Hg (2)	1.868e-10					
HgCl2	9.026e-11	9.026e-11	-10.044	-10.044	0.000	(0)
HgClOH	7.473e-11	7.473e-11	-10.127	-10.127	0.000	(0)
Hg (OH) 2	1.226e-11	1.252e-11	-10.911	-10.903	0.009	(0)
HgCl3-	8.763e-12	6.186e-12	-11.057	-11.209	-0.151	(0)
HgCl4-2	6.796e-13	1.688e-13	-12.168	-12.773	-0.605	(0)
HgCO3	1.219e-13	1.219e-13	-12.914	-12.914	0.000	(0)
Hg (CO3) 2-2	8.222e-15	2.042e-15	-14.085	-14.690	-0.605	(0)
HgCl+	3.722e-15	2.628e-15	-14.429	-14.580	-0.151	(0)
HgOH+	3.482e-16	2.458e-16	-15.458	-15.609	-0.151	(0)
HgHCO3+	1.006e-16	7.102e-17	-15.997	-16.149	-0.151	(0)
Hg (NH3) 2+2	1.483e-17	3.684e-18	-16.829	-17.434	-0.605	(0)
HgNH3+2	8.510e-19	2.114e-19	-18.070	-18.675	-0.605	(0)
Hg (OH) 3-	7.170e-19	5.062e-19	-18.144	-18.296	-0.151	(0)
Hg+2	7.737e-20	1.922e-20	-19.111	-19.716	-0.605	(0)
HgSO4	3.995e-20	3.995e-20	-19.398	-19.398	0.000	(0)
HgF+	2.451e-22	1.730e-22	-21.611	-21.762	-0.151	(0)
Hg (NH3) 3+2	1.030e-24	2.557e-25	-23.987	-24.592	-0.605	(0)
HgNO3+	2.735e-28	1.931e-28	-27.563	-27.714	-0.151	(0)
Hg (NH3) 4+2	1.426e-31	3.541e-32	-30.846	-31.451	-0.605	(0)
Hg (NO3) 2	2.184e-36	2.184e-36	-35.661	-35.661	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-137.064	-137.216	-0.151	(0)
HgS2-2	0.000e+00	0.000e+00	-137.814	-138.419	-0.605	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.326	-138.326	0.000	(0)
K	7.622e-03					
K+	7.220e-03	5.693e-03	-2.141	-2.245	-0.103	(0)
KSO4-	4.021e-04	3.200e-04	-3.396	-3.495	-0.099	(0)
KCrO4-	2.407e-17	1.699e-17	-16.619	-16.770	-0.151	(0)
Mg	1.184e-02					
Mg+2	7.437e-03	2.875e-03	-2.129	-2.541	-0.413	(0)
MgSO4	4.154e-03	4.154e-03	-2.381	-2.381	0.000	(0)
MgHCO3+	1.337e-04	1.041e-04	-3.874	-3.983	-0.109	(0)
MgF+	9.983e-05	7.836e-05	-4.001	-4.106	-0.105	(0)
MgCO3	1.267e-05	1.267e-05	-4.897	-4.897	0.000	(0)
MgOH+	4.551e-07	3.677e-07	-6.342	-6.434	-0.093	(0)
MgH2BO3+	1.861e-07	1.406e-07	-6.730	-6.852	-0.122	(0)
Mn (2)	1.318e-04					
Mn+2	9.560e-05	2.374e-05	-4.020	-4.624	-0.605	(0)
MnSO4	3.353e-05	3.353e-05	-4.475	-4.475	0.000	(0)
MnHCO3+	2.118e-06	1.676e-06	-5.674	-5.776	-0.102	(0)
MnF+	2.902e-07	2.296e-07	-6.537	-6.639	-0.102	(0)
MnCl+	2.589e-07	2.049e-07	-6.587	-6.689	-0.102	(0)
MnOH+	2.422e-08	1.916e-08	-7.616	-7.718	-0.102	(0)
MnCl2	1.983e-09	1.983e-09	-8.703	-8.703	0.000	(0)
MnCl3-	4.732e-12	3.744e-12	-11.325	-11.427	-0.102	(0)
MnNO3+	1.451e-12	1.024e-12	-11.838	-11.990	-0.151	(0)
MnSeO4	7.386e-13	7.386e-13	-12.132	-12.132	0.000	(0)
Mn (OH) 3-	1.545e-17	1.222e-17	-16.811	-16.913	-0.102	(0)
Mn (NO3) 2	7.001e-20	7.001e-20	-19.155	-19.155	0.000	(0)
Mn (OH) 4-2	3.235e-23	1.268e-23	-22.490	-22.897	-0.407	(0)
MnSe	0.000e+00	0.000e+00	-41.300	-41.300	0.000	(0)
Mn (3)	1.842e-24					
Mn+3	1.842e-24	2.170e-25	-23.735	-24.663	-0.929	(0)
Mn (6)	0.000e+00					
MnO4-2	0.000e+00	0.000e+00	-41.362	-41.769	-0.407	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-45.713	-45.830	-0.117	(0)
Mo	3.861e-06					
MoO4-2	3.860e-06	1.492e-06	-5.413	-5.826	-0.413	(0)
HMoO4-	1.316e-09	9.291e-10	-8.881	-9.032	-0.151	(0)
H2MoO4	2.130e-13	2.130e-13	-12.672	-12.672	0.000	(0)
Ag2MoO4	1.052e-24	1.052e-24	-23.978	-23.978	0.000	(0)
AlMo6O21-3	4.404e-37	1.918e-38	-36.356	-37.717	-1.361	(0)
Mo7O24-6	0.000e+00	0.000e+00	-42.383	-47.827	-5.444	(0)
HMo7O24-5	0.000e+00	0.000e+00	-45.164	-48.945	-3.781	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-49.248	-51.667	-2.420	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-54.565	-55.926	-1.361	(0)
N (-3)	1.387e-06					

NH4+	1.266e-06	9.568e-07	-5.898	-6.019	-0.122	(0)
NH4SO4-	1.029e-07	8.141e-08	-6.988	-7.089	-0.102	(0)
NH3	1.743e-08	1.743e-08	-7.759	-7.759	0.000	(0)
CaNH3+2	1.266e-10	3.143e-11	-9.898	-10.503	-0.605	(0)
CuNH3+2	6.096e-11	1.514e-11	-10.215	-10.820	-0.605	(0)
NiNH3+2	2.511e-12	6.237e-13	-11.600	-12.205	-0.605	(0)
Co (NH3) +2	2.953e-13	7.333e-14	-12.530	-13.135	-0.605	(0)
AgNH3+	6.881e-14	4.858e-14	-13.162	-13.314	-0.151	(0)
BaNH3+2	1.394e-15	3.461e-16	-14.856	-15.461	-0.605	(0)
Hg (NH3) 2+2	1.483e-17	3.684e-18	-16.829	-17.434	-0.605	(0)
Ag (NH3) 2+	9.750e-18	6.883e-18	-17.011	-17.162	-0.151	(0)
Ni (NH3) 2+2	6.328e-18	1.572e-18	-17.199	-17.804	-0.605	(0)
Ca (NH3) 2+2	8.783e-19	2.181e-19	-18.056	-18.661	-0.605	(0)
HgNH3+2	8.510e-19	2.114e-19	-18.070	-18.675	-0.605	(0)
Co (NH3) 2+2	2.196e-19	5.453e-20	-18.658	-19.263	-0.605	(0)
Hg (NH3) 3+2	1.030e-24	2.557e-25	-23.987	-24.592	-0.605	(0)
Co (NH3) 3+2	4.818e-26	1.197e-26	-25.317	-25.922	-0.605	(0)
Hg (NH3) 4+2	1.426e-31	3.541e-32	-30.846	-31.451	-0.605	(0)
Co (NH3) 4+2	4.408e-33	1.095e-33	-32.356	-32.961	-0.605	(0)
Cr (NH3) 5OH+2	3.750e-39	9.313e-40	-38.426	-39.031	-0.605	(0)
Co (NH3) 5+2	1.275e-40	0.000e+00	-39.894	-40.499	-0.605	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-46.308	-47.669	-1.361	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-46.636	-47.241	-0.605	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-48.126	-48.731	-0.605	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.575	-56.726	-0.151	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-61.110	-61.715	-0.605	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-61.239	-61.844	-0.605	(0)
N (3)	3.101e-05					
NO2-	3.101e-05	2.369e-05	-4.508	-4.626	-0.117	(0)
CuNO2+	2.982e-10	2.105e-10	-9.526	-9.677	-0.151	(0)
CoNO2+	8.273e-12	5.840e-12	-11.082	-11.234	-0.151	(0)
AgNO2	6.754e-12	6.754e-12	-11.170	-11.170	0.000	(0)
Cu (NO2) 2	5.102e-14	5.102e-14	-13.292	-13.292	0.000	(0)
Ag (NO2) 2-	3.510e-16	2.478e-16	-15.455	-15.606	-0.151	(0)
N (5)	3.469e-08					
NO3-	3.451e-08	2.721e-08	-7.462	-7.565	-0.103	(0)
CaNO3+	1.746e-10	1.233e-10	-9.758	-9.909	-0.151	(0)
MnNO3+	1.451e-12	1.024e-12	-11.838	-11.990	-0.151	(0)
ZnNO3+	2.358e-13	1.665e-13	-12.627	-12.779	-0.151	(0)
CuNO3+	1.035e-14	7.304e-15	-13.985	-14.136	-0.151	(0)
NiNO3+	6.451e-15	4.554e-15	-14.190	-14.342	-0.151	(0)
BaNO3+	6.080e-15	4.292e-15	-14.216	-14.367	-0.151	(0)
CoNO3+	2.138e-15	1.509e-15	-14.670	-14.821	-0.151	(0)
CdNO3+	5.381e-16	3.799e-16	-15.269	-15.420	-0.151	(0)
PbNO3+	1.922e-16	1.357e-16	-15.716	-15.867	-0.151	(0)
AgNO3	2.950e-17	2.950e-17	-16.530	-16.530	0.000	(0)
Mn (NO3) 2	7.001e-20	7.001e-20	-19.155	-19.155	0.000	(0)
Zn (NO3) 2	9.039e-22	9.039e-22	-21.044	-21.044	0.000	(0)
UO2NO3+	2.487e-22	1.756e-22	-21.604	-21.756	-0.151	(0)
Co (NO3) 2	8.357e-23	8.357e-23	-22.078	-22.078	0.000	(0)
CrNO3+2	3.660e-23	9.091e-24	-22.436	-23.041	-0.605	(0)
Cu (NO3) 2	2.502e-23	2.502e-23	-22.602	-22.602	0.000	(0)
Pb (NO3) 2	6.271e-24	6.271e-24	-23.203	-23.203	0.000	(0)
Cd (NO3) 2	5.182e-24	5.182e-24	-23.286	-23.286	0.000	(0)
VO2NO3	2.764e-24	2.764e-24	-23.558	-23.558	0.000	(0)
FeNO3+2	6.606e-26	1.641e-26	-25.180	-25.785	-0.605	(0)
HgNO3+	2.735e-28	1.931e-28	-27.563	-27.714	-0.151	(0)
Hg (NO3) 2	2.184e-36	2.184e-36	-35.661	-35.661	0.000	(0)
Na	2.719e-02					
Na+	2.604e-02	2.053e-02	-1.584	-1.688	-0.103	(0)
NaSO4-	1.100e-03	8.757e-04	-2.959	-3.058	-0.099	(0)
NaHCO3	4.085e-05	4.085e-05	-4.389	-4.389	0.000	(0)
NaF	3.147e-06	3.147e-06	-5.502	-5.502	0.000	(0)
NaCO3-	2.546e-06	2.026e-06	-5.594	-5.693	-0.099	(0)
NaH2BO3	4.591e-08	4.591e-08	-7.338	-7.338	0.000	(0)
NaCrO4-	1.161e-16	8.197e-17	-15.935	-16.086	-0.151	(0)
Ni	3.350e-07					
Ni+2	1.723e-07	6.662e-08	-6.764	-7.176	-0.413	(0)

NiSO4	1.056e-07	1.056e-07	-6.977	-6.977	0.000	(0)
NiHCO3+	4.116e-08	2.905e-08	-7.386	-7.537	-0.151	(0)
NiCO3	1.317e-08	1.317e-08	-7.880	-7.880	0.000	(0)
NiCl+	1.655e-09	1.168e-09	-8.781	-8.932	-0.151	(0)
NiF+	5.759e-10	4.065e-10	-9.240	-9.391	-0.151	(0)
NiOH+	3.817e-10	2.695e-10	-9.418	-9.569	-0.151	(0)
Ni (SO4) 2-2	1.118e-10	2.776e-11	-9.952	-10.557	-0.605	(0)
Ni (OH) 2	6.877e-12	6.877e-12	-11.163	-11.163	0.000	(0)
NiNH3+2	2.511e-12	6.237e-13	-11.600	-12.205	-0.605	(0)
NiCl2	4.031e-14	4.031e-14	-13.395	-13.395	0.000	(0)
NiNO3+	6.451e-15	4.554e-15	-14.190	-14.342	-0.151	(0)
NiSeO4	3.602e-15	3.602e-15	-14.444	-14.444	0.000	(0)
Ni (OH) 3-	3.130e-15	2.209e-15	-14.505	-14.656	-0.151	(0)
Ni (NH3) 2+2	6.328e-18	1.572e-18	-17.199	-17.804	-0.605	(0)
O (0)	3.612e-35					
O2	1.806e-35	1.843e-35	-34.743	-34.734	0.009	(0)
Pb	9.906e-09					
PbCO3	5.370e-09	5.370e-09	-8.270	-8.270	0.000	(0)
PbSO4	1.311e-09	1.311e-09	-8.882	-8.882	0.000	(0)
PbHCO3+	1.255e-09	8.860e-10	-8.901	-9.053	-0.151	(0)
Pb+2	8.720e-10	3.371e-10	-9.059	-9.472	-0.413	(0)
PbOH+	3.854e-10	2.720e-10	-9.414	-9.565	-0.151	(0)
Pb (CO3) 2-2	3.304e-10	8.207e-11	-9.481	-10.086	-0.605	(0)
Pb (SO4) 2-2	2.526e-10	6.273e-11	-9.598	-10.203	-0.605	(0)
PbCl+	1.161e-10	8.198e-11	-9.935	-10.086	-0.151	(0)
PbF+	8.174e-12	5.771e-12	-11.088	-11.239	-0.151	(0)
Pb (OH) 2	2.764e-12	2.764e-12	-11.558	-11.558	0.000	(0)
PbCl2	2.510e-12	2.510e-12	-11.600	-11.600	0.000	(0)
PbF2	2.759e-14	2.759e-14	-13.559	-13.559	0.000	(0)
PbCl3-	9.699e-15	6.847e-15	-14.013	-14.164	-0.151	(0)
Pb (OH) 3-	1.258e-15	8.880e-16	-14.900	-15.052	-0.151	(0)
PbNO3+	1.922e-16	1.357e-16	-15.716	-15.867	-0.151	(0)
PbCl4-2	8.636e-17	2.145e-17	-16.064	-16.669	-0.605	(0)
Pb2OH+3	3.338e-17	1.454e-18	-16.477	-17.838	-1.361	(0)
PbF3-	1.800e-17	1.271e-17	-16.745	-16.896	-0.151	(0)
Pb (OH) 4-2	2.813e-19	6.987e-20	-18.551	-19.156	-0.605	(0)
PbF4-2	5.950e-21	1.478e-21	-20.225	-20.830	-0.605	(0)
Pb3 (OH) 4+2	2.069e-22	5.138e-23	-21.684	-22.289	-0.605	(0)
Pb (NO3) 2	6.271e-24	6.271e-24	-23.203	-23.203	0.000	(0)
Pb4 (OH) 4+4	3.616e-26	1.376e-28	-25.442	-27.861	-2.420	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.134	-151.134	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.149	-228.300	-0.151	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.516	-73.516	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.315	-78.466	-0.151	(0)
CdHS+	0.000e+00	0.000e+00	-78.662	-78.813	-0.151	(0)
H2S	0.000e+00	0.000e+00	-78.950	-78.950	0.000	(0)
S5-2	0.000e+00	0.000e+00	-79.722	-80.327	-0.605	(0)
S6-2	0.000e+00	0.000e+00	-80.238	-80.842	-0.605	(0)
S4-2	0.000e+00	0.000e+00	-80.317	-80.922	-0.605	(0)
S3-2	0.000e+00	0.000e+00	-81.123	-81.728	-0.605	(0)
S2-2	0.000e+00	0.000e+00	-82.139	-82.744	-0.605	(0)
S-2	0.000e+00	0.000e+00	-87.855	-88.261	-0.407	(0)
HgHS2-	0.000e+00	0.000e+00	-137.064	-137.216	-0.151	(0)
HgS2-2	0.000e+00	0.000e+00	-137.814	-138.419	-0.605	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-138.326	-138.326	0.000	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.616	-147.861	-0.246	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-147.731	-147.882	-0.151	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.805	-148.225	-0.420	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.080	-148.231	-0.151	(0)
CuS4S5-3	0.000e+00	0.000e+00	-148.559	-148.955	-0.396	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-149.364	-149.797	-0.433	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.700	-150.108	-0.408	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.725	-149.725	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.075	-150.075	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.134	-151.134	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-159.481	-159.481	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-216.419	-216.570	-0.151	(0)

Zn (HS) 3-	0.000e+00	0.000e+00	-224.760	-224.911	-0.151	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-226.490	-226.641	-0.151	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.782	-227.387	-0.605	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-228.149	-228.300	-0.151	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-235.758	-235.910	-0.151	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-302.306	-302.911	-0.605	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.232	-304.837	-0.605	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.152	-317.756	-0.605	(0)
S (6)	2.884e-02					
SO4-2	2.054e-02	7.941e-03	-1.687	-2.100	-0.413	(0)
MgSO4	4.154e-03	4.154e-03	-2.381	-2.381	0.000	(0)
CaSO4	2.606e-03	2.606e-03	-2.584	-2.584	0.000	(0)
NaSO4-	1.100e-03	8.757e-04	-2.959	-3.058	-0.099	(0)
KSO4-	4.021e-04	3.200e-04	-3.396	-3.495	-0.099	(0)
MnSO4	3.353e-05	3.353e-05	-4.475	-4.475	0.000	(0)
ZnSO4	4.230e-06	4.230e-06	-5.374	-5.374	0.000	(0)
Zn (SO4) 2-2	1.178e-06	2.926e-07	-5.929	-6.534	-0.605	(0)
CuSO4	1.544e-07	1.544e-07	-6.811	-6.811	0.000	(0)
NiSO4	1.056e-07	1.056e-07	-6.977	-6.977	0.000	(0)
NH4SO4-	1.029e-07	8.141e-08	-6.988	-7.089	-0.102	(0)
CoSO4	5.544e-08	5.544e-08	-7.256	-7.256	0.000	(0)
HSO4-	3.094e-08	2.428e-08	-7.510	-7.615	-0.105	(0)
CdSO4	8.217e-09	8.217e-09	-8.085	-8.085	0.000	(0)
Cd (SO4) 2-2	3.544e-09	8.802e-10	-8.451	-9.055	-0.605	(0)
PbSO4	1.311e-09	1.311e-09	-8.882	-8.882	0.000	(0)
AgSO4-	3.063e-10	2.162e-10	-9.514	-9.665	-0.151	(0)
Pb (SO4) 2-2	2.526e-10	6.273e-11	-9.598	-10.203	-0.605	(0)
Ni (SO4) 2-2	1.118e-10	2.776e-11	-9.952	-10.557	-0.605	(0)
CrOHSO4	1.012e-10	1.012e-10	-9.995	-9.995	0.000	(0)
AlSO4+	1.472e-11	1.155e-11	-10.832	-10.937	-0.105	(0)
FeSO4	6.182e-12	6.182e-12	-11.209	-11.209	0.000	(0)
Al (SO4) 2-	1.252e-12	9.831e-13	-11.902	-12.007	-0.105	(0)
CrSO4+	2.007e-13	1.417e-13	-12.697	-12.849	-0.151	(0)
UO2SO4	3.886e-14	3.886e-14	-13.410	-13.410	0.000	(0)
UO2 (SO4) 2-2	1.638e-14	4.068e-15	-13.786	-14.391	-0.605	(0)
VO2SO4-	5.393e-17	3.807e-17	-16.268	-16.419	-0.151	(0)
FeSO4+	6.789e-18	5.371e-18	-17.168	-17.270	-0.102	(0)
Cr2 (OH) 2SO4+2	1.978e-18	4.914e-19	-17.704	-18.309	-0.605	(0)
Fe (SO4) 2-	1.292e-18	9.119e-19	-17.889	-18.040	-0.151	(0)
Cr2 (OH) 2 (SO4) 2	2.318e-19	2.318e-19	-18.635	-18.635	0.000	(0)
VOSO4	1.684e-19	1.684e-19	-18.774	-18.774	0.000	(0)
HgSO4	3.995e-20	3.995e-20	-19.398	-19.398	0.000	(0)
CrO3SO4-2	2.483e-23	6.166e-24	-22.605	-23.210	-0.605	(0)
VSO4+	9.730e-34	6.869e-34	-33.012	-33.163	-0.151	(0)
U (SO4) 2	2.436e-40	2.436e-40	-39.613	-39.613	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.808	-41.413	-0.605	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-56.575	-56.726	-0.151	(0)
Sb (3)	1.439e-19					
Sb (OH) 3	7.277e-20	7.277e-20	-19.138	-19.138	0.000	(0)
HSbO2	7.114e-20	7.114e-20	-19.148	-19.148	0.000	(0)
SbO2-	5.215e-24	3.681e-24	-23.283	-23.434	-0.151	(0)
Sb (OH) 4-	2.979e-24	2.103e-24	-23.526	-23.677	-0.151	(0)
Sb (OH) 2F	8.654e-25	8.654e-25	-24.063	-24.063	0.000	(0)
SbOF	8.522e-25	8.522e-25	-24.069	-24.069	0.000	(0)
Sb (OH) 2+	7.845e-26	5.538e-26	-25.105	-25.257	-0.151	(0)
SbO+	2.709e-26	1.912e-26	-25.567	-25.718	-0.151	(0)
Sb2S4-2	0.000e+00	0.000e+00	-317.152	-317.756	-0.605	(0)
Sb (5)	5.902e-08					
SbO3-	5.896e-08	4.162e-08	-7.229	-7.381	-0.151	(0)
Sb (OH) 6-	6.147e-11	4.847e-11	-10.211	-10.315	-0.103	(0)
SbO2+	1.659e-23	1.171e-23	-22.780	-22.931	-0.151	(0)
Se (-2)	7.775e-15					
Ag2Se	7.775e-15	7.775e-15	-14.109	-14.109	0.000	(0)
HSe-	2.271e-39	1.603e-39	-38.644	-38.795	-0.151	(0)
MnSe	0.000e+00	0.000e+00	-41.300	-41.300	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.409	-42.409	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.686	-46.290	-0.605	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-82.031	-84.451	-2.420	(0)

Se (4)	3.321e-07					
HSeO3-	2.439e-07	1.722e-07	-6.613	-6.764	-0.151	(0)
SeO3-2	8.820e-08	2.190e-08	-7.055	-7.659	-0.605	(0)
H2SeO3	2.299e-12	2.299e-12	-11.639	-11.639	0.000	(0)
AgSeO3-	2.722e-14	1.921e-14	-13.565	-13.716	-0.151	(0)
Cd (SeO3) 2-2	7.028e-18	1.746e-18	-17.153	-17.758	-0.605	(0)
Ag (SeO3) 2-3	8.654e-20	3.768e-21	-19.063	-20.424	-1.361	(0)
FeHSeO3+2	1.104e-22	2.743e-23	-21.957	-22.562	-0.605	(0)
Se (6)	2.998e-10					
SeO4-2	2.990e-10	1.156e-10	-9.524	-9.937	-0.413	(0)
MnSeO4	7.386e-13	7.386e-13	-12.132	-12.132	0.000	(0)
ZnSeO4	4.359e-14	4.359e-14	-13.361	-13.361	0.000	(0)
NiSeO4	3.602e-15	3.602e-15	-14.444	-14.444	0.000	(0)
CoSeO4	2.027e-15	2.027e-15	-14.693	-14.693	0.000	(0)
HSeO4-	2.568e-16	1.813e-16	-15.590	-15.742	-0.151	(0)
CdSeO4	9.500e-17	9.500e-17	-16.022	-16.022	0.000	(0)
Zn (SeO4) 2-2	2.057e-23	5.108e-24	-22.687	-23.292	-0.605	(0)
Si	4.870e-05					
H4SiO4	4.840e-05	4.939e-05	-4.315	-4.306	0.009	(0)
H3SiO4-	2.931e-07	2.281e-07	-6.533	-6.642	-0.109	(0)
H2SiO4-2	1.146e-12	4.600e-13	-11.941	-12.337	-0.396	(0)
UO2H3SiO4+	8.872e-14	6.263e-14	-13.052	-13.203	-0.151	(0)
SiF6-2	3.782e-26	1.482e-26	-25.422	-25.829	-0.407	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.659	-60.020	-1.361	(0)
U (4)	4.345e-22					
U (OH) 5-	4.341e-22	3.064e-22	-21.362	-21.514	-0.151	(0)
U (OH) 4	4.022e-25	4.022e-25	-24.396	-24.396	0.000	(0)
U (OH) 3+	6.528e-29	4.609e-29	-28.185	-28.336	-0.151	(0)
U (OH) 2+2	2.689e-33	6.679e-34	-32.570	-33.175	-0.605	(0)
UF3+	9.875e-36	6.971e-36	-35.005	-35.157	-0.151	(0)
UF2+2	7.291e-37	1.811e-37	-36.137	-36.742	-0.605	(0)
UF4	1.857e-37	1.857e-37	-36.731	-36.731	0.000	(0)
UOH+3	2.264e-38	9.859e-40	-37.645	-39.006	-1.361	(0)
UF5-	2.532e-39	1.787e-39	-38.597	-38.748	-0.151	(0)
UF+3	1.360e-39	0.000e+00	-38.867	-40.228	-1.361	(0)
UF6-2	5.280e-40	1.311e-40	-39.277	-39.882	-0.605	(0)
U (SO4) 2	2.436e-40	2.436e-40	-39.613	-39.613	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-40.808	-41.413	-0.605	(0)
U+4	0.000e+00	0.000e+00	-43.493	-45.913	-2.420	(0)
UCl+3	0.000e+00	0.000e+00	-45.016	-46.377	-1.361	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-167.826	-180.075	-12.249	(0)
U (5)	1.364e-17					
UO2+	1.364e-17	9.632e-18	-16.865	-17.016	-0.151	(0)
U (6)	5.325e-07					
UO2 (CO3) 3-4	5.034e-07	1.915e-09	-6.298	-8.718	-2.420	(0)
UO2 (CO3) 2-2	2.904e-08	7.212e-09	-7.537	-8.142	-0.605	(0)
UO2CO3	6.821e-11	6.821e-11	-10.166	-10.166	0.000	(0)
UO2OH+	1.853e-13	1.308e-13	-12.732	-12.883	-0.151	(0)
UO2F+	1.536e-13	1.084e-13	-12.814	-12.965	-0.151	(0)
UO2H3SiO4+	8.872e-14	6.263e-14	-13.052	-13.203	-0.151	(0)
UO2F2	7.596e-14	7.596e-14	-13.119	-13.119	0.000	(0)
UO2SO4	3.886e-14	3.886e-14	-13.410	-13.410	0.000	(0)
UO2 (SO4) 2-2	1.638e-14	4.068e-15	-13.786	-14.391	-0.605	(0)
UO2+2	8.364e-15	3.233e-15	-14.078	-14.490	-0.413	(0)
UO2F3-	6.566e-15	4.635e-15	-14.183	-14.334	-0.151	(0)
UO2Cl+	5.091e-17	3.594e-17	-16.293	-16.444	-0.151	(0)
UO2F4-2	3.601e-17	8.943e-18	-16.444	-17.049	-0.605	(0)
(UO2) 2 (OH) 2+2	1.143e-19	2.838e-20	-18.942	-19.547	-0.605	(0)
(UO2) 3 (OH) 5+	4.117e-22	2.907e-22	-21.385	-21.537	-0.151	(0)
UO2NO3+	2.487e-22	1.756e-22	-21.604	-21.756	-0.151	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-42.190	-42.341	-0.151	(0)
V+2	0.000e+00	0.000e+00	-42.753	-43.358	-0.605	(0)
V (3)	4.902e-15					
V (OH) 3	4.902e-15	4.902e-15	-14.310	-14.310	0.000	(0)
V (OH) 2+	1.406e-25	9.926e-26	-24.852	-25.003	-0.151	(0)
VOH+2	1.188e-28	2.951e-29	-27.925	-28.530	-0.605	(0)

V+3	4.208e-33	1.832e-34	-32.376	-33.737	-1.361	(0)
VSO4+	9.730e-34	6.869e-34	-33.012	-33.163	-0.151	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-53.720	-55.081	-1.361	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-53.841	-56.260	-2.420	(0)
V (4)	7.630e-18					
V (OH) 3+	6.980e-18	4.928e-18	-17.156	-17.307	-0.151	(0)
VO+2	3.100e-19	7.698e-20	-18.509	-19.114	-0.605	(0)
VOSO4	1.684e-19	1.684e-19	-18.774	-18.774	0.000	(0)
VOF+	1.589e-19	1.122e-19	-18.799	-18.950	-0.151	(0)
VOF2	1.022e-20	1.022e-20	-19.991	-19.991	0.000	(0)
VOC1+	2.097e-21	1.480e-21	-20.678	-20.830	-0.151	(0)
VOF3-	1.247e-22	8.806e-23	-21.904	-22.055	-0.151	(0)
VOF4-2	3.477e-25	8.634e-26	-24.459	-25.064	-0.605	(0)
H2V2O4+2	4.914e-30	1.221e-30	-29.309	-29.913	-0.605	(0)
V (5)	1.783e-08					
H2VO4-	1.451e-08	1.025e-08	-7.838	-7.989	-0.151	(0)
HVO4-2	3.311e-09	8.223e-10	-8.480	-9.085	-0.605	(0)
H3VO4	3.206e-12	3.206e-12	-11.494	-11.494	0.000	(0)
H3V2O7-	3.009e-13	2.124e-13	-12.522	-12.673	-0.151	(0)
HV2O7-3	6.565e-14	2.859e-15	-13.183	-14.544	-1.361	(0)
VO4-3	3.024e-15	1.317e-16	-14.519	-15.880	-1.361	(0)
V2O7-4	6.462e-16	2.459e-18	-15.190	-17.609	-2.420	(0)
VO2+	2.547e-16	2.008e-16	-15.594	-15.697	-0.103	(0)
VO2F	8.555e-17	8.555e-17	-16.068	-16.068	0.000	(0)
VO2SO4-	5.393e-17	3.807e-17	-16.268	-16.419	-0.151	(0)
V3O9-3	2.597e-17	1.131e-18	-16.585	-17.947	-1.361	(0)
VO2F2-	1.069e-17	7.545e-18	-16.971	-17.122	-0.151	(0)
VO2F3-2	9.206e-20	2.286e-20	-19.036	-19.641	-0.605	(0)
V4O12-4	1.271e-21	4.838e-24	-20.896	-23.315	-2.420	(0)
VO2F4-3	6.275e-23	2.733e-24	-22.202	-23.563	-1.361	(0)
VO2NO3	2.764e-24	2.764e-24	-23.558	-23.558	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-55.555	-60.999	-5.444	(0)
HV10O28-5	0.000e+00	0.000e+00	-56.537	-60.317	-3.781	(0)
H2V10O28-4	0.000e+00	0.000e+00	-60.195	-62.614	-2.420	(0)
Zn	1.304e-05					
Zn+2	6.299e-06	2.435e-06	-5.201	-5.613	-0.413	(0)
ZnSO4	4.230e-06	4.230e-06	-5.374	-5.374	0.000	(0)
Zn (SO4) 2-2	1.178e-06	2.926e-07	-5.929	-6.534	-0.605	(0)
ZnCO3	7.425e-07	7.425e-07	-6.129	-6.129	0.000	(0)
ZnHCO3+	3.859e-07	2.724e-07	-6.414	-6.565	-0.151	(0)
ZnOH+	1.108e-07	7.823e-08	-6.955	-7.107	-0.151	(0)
ZnCl+	5.386e-08	4.192e-08	-7.269	-7.378	-0.109	(0)
ZnOHC1	1.763e-08	1.763e-08	-7.754	-7.754	0.000	(0)
ZnF+	1.672e-08	1.180e-08	-7.777	-7.928	-0.151	(0)
Zn (OH) 2	3.983e-09	3.983e-09	-8.400	-8.400	0.000	(0)
ZnCl2	4.553e-10	4.553e-10	-9.342	-9.342	0.000	(0)
Zn (OH) 3-	9.086e-12	6.414e-12	-11.042	-11.193	-0.151	(0)
ZnCl3-	3.185e-12	2.479e-12	-11.497	-11.606	-0.109	(0)
ZnNO3+	2.358e-13	1.665e-13	-12.627	-12.779	-0.151	(0)
ZnSeO4	4.359e-14	4.359e-14	-13.361	-13.361	0.000	(0)
ZnCl4-2	2.168e-14	8.495e-15	-13.664	-14.071	-0.407	(0)
Zn (OH) 4-2	3.303e-16	8.204e-17	-15.481	-16.086	-0.605	(0)
Zn (NO3) 2	9.039e-22	9.039e-22	-21.044	-21.044	0.000	(0)
Zn (SeO4) 2-2	2.057e-23	5.108e-24	-22.687	-23.292	-0.605	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-148.080	-148.231	-0.151	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-149.725	-149.725	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-224.760	-224.911	-0.151	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.782	-227.387	-0.605	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-304.232	-304.837	-0.605	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-50.70	-44.41	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-38.12	-33.61	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-45.35	-33.61	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-66.26	-48.33	17.93	(Co (NH3) 6) (NO3) 3

(Co (NH3) 6) Cl3	-52.16	-32.13	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-27.54	-27.13	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-22.43	-21.98	0.45	(NH4) 2SeO4
Acanthite	-52.47	-88.69	-36.22	Ag2S
Ag2CO3	-11.92	-23.01	-11.09	Ag2CO3
Ag2CrO4	-21.23	-32.82	-11.59	Ag2CrO4
Ag2HVO4	-12.39	-10.91	1.48	Ag2HVO4
Ag2MoO4	-12.01	-23.56	-11.55	Ag2MoO4
Ag2O	-15.30	-2.72	12.57	Ag2O
Ag2Se	-0.32	-49.02	-48.70	Ag2Se
Ag2SeO3	-9.84	-16.99	-7.15	Ag2SeO3
Ag2SeO4	-18.76	-27.67	-8.91	Ag2SeO4
Ag2SO4	-15.01	-19.83	-4.82	Ag2SO4
Ag3AsO3	-28.72	-26.56	2.16	Ag3AsO3
Ag3AsO4	-17.04	-19.83	-2.79	Ag3AsO4
Ag3H2VO5	-17.46	-12.28	5.18	Ag3H2VO5
AgF·4H2O	-13.53	-12.48	1.05	AgF·4H2O
Agmetal	-0.67	-14.18	-13.51	Ag
AgVO3	-10.32	-9.55	0.77	AgVO3
Al (OH) 3 (am)	-1.02	9.78	10.80	Al (OH) 3
Al2 (MoO4) 3	-45.30	-42.93	2.37	Al2 (MoO4) 3
Al2O3	-0.08	19.57	19.65	Al2O3
Al4 (OH) 10SO4	-0.67	22.03	22.70	Al4 (OH) 10SO4
AlAsO4·2H2O	-10.76	-5.96	4.80	AlAsO4·2H2O
AlOHSO4	-4.09	-7.32	-3.23	AlOHSO4
AlSb	-151.87	-86.24	65.62	AlSb
Alunite	1.80	0.40	-1.40	KA13 (SO4) 2 (OH) 6
Anglesite	-3.78	-11.57	-7.79	PbSO4
Anhydrite	-0.58	-4.94	-4.36	CaSO4
Anilite	-55.39	-87.27	-31.88	Cu0.25Cu1.5S
Antlerite	-2.09	6.70	8.79	Cu3 (OH) 4SO4
Aragonite	0.18	-8.12	-8.30	CaCO3
Arsenolite	-87.14	-89.90	-2.76	As4O6
Artinite	-4.95	4.65	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-38.19	-31.49	6.71	As2O5
Atacamite	-1.19	6.21	7.39	Cu2 (OH) 3Cl
Azurite	0.15	-16.76	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2·8H2O	-16.89	7.50	24.39	Ba (OH) 2·8H2O
Ba2V2O7·2H2O	-17.25	-1.37	15.87	Ba2V2O7·2H2O
Ba3 (AsO4) 2	-0.06	-8.97	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2·4H2O	-26.81	6.13	32.94	Ba3 (VO4) 2·4H2O
BaCrO4	-12.93	-22.60	-9.67	BaCrO4
BaF2	-8.91	-14.73	-5.82	BaF2
BaMoO4	-6.37	-13.33	-6.96	BaMoO4
Barite	0.38	-9.60	-9.98	BaSO4
BaS	-94.64	-78.46	16.18	BaS
BaSeO3	-8.59	-6.76	1.83	BaSeO3
BaSeO4	-9.98	-17.44	-7.46	BaSeO4
Bianchite	-5.95	-7.72	-1.76	ZnSO4·6H2O
Birnessite	-7.43	10.66	18.09	MnO2
Bixbyite	-3.66	-4.30	-0.64	Mn2O3
BlaubleiI	-55.10	-79.26	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.68	-82.96	-27.28	Cu0.6Cu0.8S
Boehmite	1.21	9.79	8.58	AlOOH
Breithauptite	-56.86	-75.38	-18.52	NiSb
Brochantite	-0.58	14.64	15.22	Cu4 (OH) 6SO4
Brucite	-4.38	12.47	16.84	Mg (OH) 2
Bunsenite	-4.61	7.83	12.45	NiO
Ca (VO3) 2	-9.88	-4.22	5.66	Ca (VO3) 2
Ca2V2O7	-9.56	7.94	17.50	Ca2V2O7
Ca2V2O7·2H2O	-13.61	7.94	21.55	Ca2V2O7·2H2O
Ca3 (AsO4) 2·4H2O	-17.30	5.00	22.30	Ca3 (AsO4) 2·4H2O
Ca3 (VO4) 2	-18.85	20.11	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2·4H2O	-19.76	20.10	39.86	Ca3 (VO4) 2·4H2O
Ca3Sb2	-298.54	-155.56	142.97	Ca3Sb2
CaCrO4	-15.67	-17.94	-2.27	CaCrO4
Calcite	0.36	-8.12	-8.48	CaCO3
Calomel	-5.68	-23.59	-17.91	Hg2Cl2

CaMoO4	-0.72	-8.67	-7.95	CaMoO4
Carnotite	-2.65	-2.42	0.23	KUO2VO4
CaSeO3:2H2O	-4.92	-2.10	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.76	-12.78	-3.02	CaSeO4:2H2O
Cd(BO2)2	-11.42	-1.58	9.84	Cd(BO2)2
Cd(OH)2	-6.99	6.65	13.64	Cd(OH)2
Cd(OH)2(am)	-7.08	6.65	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-20.97	-14.26	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-19.71	2.85	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-18.90	9.50	28.40	Cd4(OH)6SO4
CdCl2	-12.02	-12.68	-0.66	CdCl2
CdCl2:1H2O	-10.99	-12.68	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.77	-12.68	-1.91	CdCl2:2.5H2O
CdF2	-14.37	-15.58	-1.21	CdF2
Cdmetal(alpha)	-32.49	-18.98	13.51	Cd
Cdmetal(gamma)	-32.60	-18.98	13.62	Cd
CdMoO4	-0.03	-14.18	-14.15	CdMoO4
CdOHCl	-6.55	-3.02	3.54	CdOHCl
CdSb	-76.21	-76.56	-0.35	CdSb
CdSe	-19.45	-39.65	-20.20	CdSe
CdSeO4:2H2O	-16.44	-18.29	-1.85	CdSeO4:2H2O
CdSO4	-10.28	-10.46	-0.17	CdSO4
CdSO4:1H2O	-8.73	-10.46	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.58	-10.46	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.28	-11.03	-9.75	AgCl
Cerrusite	-1.62	-14.75	-13.13	PbCO3
CH4(g)	-81.76	-122.81	-41.05	CH4
Chalcanthite	-6.53	-9.17	-2.64	CuSO4:5H2O
Chalcedony	-0.76	-4.31	-3.55	SiO2
Chalcocite	-55.43	-90.35	-34.92	Cu2S
Chalcopyrite	-125.22	-160.49	-35.27	CuFeS2
Chrysotile	-3.41	28.79	32.20	Mg3Si2O5(OH)4
Cinnabar	-51.18	-96.87	-45.69	HgS
Claudetite	-86.84	-89.90	-3.06	As4O6
Clausthalite	-13.66	-40.76	-27.10	PbSe
Co(BO2)2	-27.75	-0.68	27.07	Co(BO2)2
Co(OH)2	-5.54	7.55	13.09	Co(OH)2
Co(OH)3	-9.72	-12.03	-2.31	Co(OH)3
CO2(g)	-2.14	-20.28	-18.15	CO2
Co3(AsO4)2	-21.86	-8.83	13.03	Co3(AsO4)2
Co3O4	-6.02	-16.51	-10.50	Co3O4
CoCl2	-20.05	-11.78	8.27	CoCl2
CoCl2:6H2O	-14.32	-11.79	2.54	CoCl2:6H2O
CoCO3	-2.75	-12.73	-9.98	CoCO3
CoF2	-13.09	-14.69	-1.60	CoF2
CoF3	-43.93	-45.39	-1.46	CoF3
CoFe2O4	17.67	14.14	-3.53	CoFe2O4
CoMoO4	-5.52	-13.28	-7.76	CoMoO4
CoO	-6.03	7.55	13.59	CoO
CoS(alpha)	-70.98	-78.42	-7.44	CoS
CoS(beta)	-67.35	-78.42	-11.07	CoS
CoSe	-22.55	-38.75	-16.20	CoSe
CoSeO3	-8.04	-6.72	1.32	CoSeO3
CoSeO4:6H2O	-15.87	-17.40	-1.53	CoSeO4:6H2O
CoSO4	-12.36	-9.56	2.80	CoSO4
CoSO4:6H2O	-7.09	-9.56	-2.47	CoSO4:6H2O
Cotunnite	-9.02	-13.80	-4.78	PbCl2
Covellite	-55.73	-78.03	-22.30	CuS
Cr(OH)2	-21.86	-11.04	10.82	Cr(OH)2
Cr(OH)3	-2.51	-1.17	1.34	Cr(OH)3
Cr(OH)3(am)	-0.42	-1.17	-0.75	Cr(OH)3
Cr2O3	0.01	-2.35	-2.36	Cr2O3
CrCl2	-44.47	-30.38	14.09	CrCl2
CrCl3	-45.29	-30.18	15.11	CrCl3
CrF3	-23.19	-34.53	-11.34	CrF3
Cristobalite	-0.96	-4.31	-3.35	SiO2
Crmetal	-67.15	-36.67	30.48	Cr
CrO3	-26.89	-30.10	-3.21	CrO3

Cryolite	-5.64	-39.48	-33.84	Na ₃ AlF ₆
Cu(OH) ₂	-0.74	7.94	8.67	Cu(OH) ₂
Cu(SbO ₃) ₂	-24.29	20.92	45.21	Cu(SbO ₃) ₂
Cu ₂ (OH) ₃ NO ₃	-8.45	0.80	9.25	Cu ₂ (OH) ₃ NO ₃
Cu ₂ Sb·3H ₂ O	-55.40	-90.28	-34.88	Cu ₂ Sb·3H ₂ O
Cu ₂ Se(alpha)	-4.87	-50.67	-45.80	Cu ₂ Se
Cu ₂ SO ₄	-19.53	-21.48	-1.95	Cu ₂ SO ₄
Cu ₃ (AsO ₄) ₂ ·2H ₂ O	-13.78	-7.68	6.10	Cu ₃ (AsO ₄) ₂ ·2H ₂ O
Cu ₃ Sb	-60.00	-102.59	-42.59	Cu ₃ Sb
Cu ₃ Se ₂	-25.55	-89.04	-63.49	Cu ₃ Se ₂
CuCO ₃	-0.85	-12.35	-11.50	CuCO ₃
CuCrO ₄	-16.73	-22.17	-5.44	CuCrO ₄
CuF	-8.40	-13.31	-4.91	CuF
CuF ₂	-15.42	-14.30	1.12	CuF ₂
CuF ₂ ·2H ₂ O	-9.75	-14.30	-4.55	CuF ₂ ·2H ₂ O
Cumetal	-6.25	-15.00	-8.76	Cu
CuMoO ₄	0.18	-12.90	-13.08	CuMoO ₄
CuOCuSO ₄	-11.54	-1.23	10.30	CuOCuSO ₄
Cupricferrite	8.53	14.52	5.99	CuFe ₂ O ₄
Cuprite	-2.97	-4.38	-1.41	Cu ₂ O
Cuprousferrite	10.02	1.10	-8.92	CuFeO ₂
CuSe	-5.26	-38.36	-33.10	CuSe
CuSe ₂	-25.66	-59.03	-33.37	CuSe ₂
CuSeO ₃ ·2H ₂ O	-6.84	-6.33	0.51	CuSeO ₃ ·2H ₂ O
CuSeO ₄ ·5H ₂ O	-14.57	-17.01	-2.44	CuSeO ₄ ·5H ₂ O
CuSO ₄	-12.11	-9.17	2.94	CuSO ₄
Diaspore	2.91	9.79	6.87	AlOOH
Djurleite	-55.61	-89.53	-33.92	Cu _{0.066} Cu _{1.868} S
Dolomite(disordered)	0.60	-15.94	-16.54	CaMg(CO ₃) ₂
Dolomite(ordered)	1.15	-15.94	-17.09	CaMg(CO ₃) ₂
Epsomite	-2.52	-4.65	-2.13	MgSO ₄ ·7H ₂ O
Fe(OH) ₂	-10.05	3.51	13.56	Fe(OH) ₂
Fe(OH) ₂ ·7Cl _{1.3}	3.43	0.39	-3.04	Fe(OH) ₂ ·7Cl _{1.3}
Fe(VO ₃) ₂	-9.16	-12.88	-3.72	Fe(VO ₃) ₂
Fe ₂ (OH) ₄ SeO ₃	-9.24	-7.68	1.55	Fe ₂ (OH) ₄ SeO ₃
Fe ₂ (SeO ₃) ₃ ·2H ₂ O	-15.59	-36.22	-20.63	Fe ₂ (SeO ₃) ₃ ·2H ₂ O
Fe ₂ (SO ₄) ₃	-41.01	-44.74	-3.73	Fe ₂ (SO ₄) ₃
Fe ₃ (OH) ₈	-10.13	10.09	20.22	Fe ₃ (OH) ₈
FeAsO ₄ ·2H ₂ O	-12.85	-12.45	0.40	FeAsO ₄ ·2H ₂ O
FeCr ₂ O ₄	-6.04	1.16	7.20	FeCr ₂ O ₄
FeMoO ₄	-7.23	-17.32	-10.09	FeMoO ₄
Ferrihydrite	0.10	3.29	3.19	Fe(OH) ₃
Ferroselite	-44.86	-63.46	-18.60	FeSe ₂
FeS(ppt)	-79.51	-82.46	-2.95	FeS
FeSe	-31.79	-42.79	-11.00	FeSe
Fix_pe	-5.31	-5.31	0.00	e-
Fluorite	0.43	-10.07	-10.50	CaF ₂
Galena	-66.46	-80.43	-13.97	PbS
Gibbsite	1.49	9.78	8.29	Al(OH) ₃
Goethite	2.80	3.29	0.49	FeOOH
Goslarite	-5.71	-7.72	-2.01	ZnSO ₄ ·7H ₂ O
Greenalite	-18.89	1.92	20.81	Fe ₃ Si ₂ O ₅ (OH) ₄
Greenockite	-64.96	-79.32	-14.36	CdS
Greigite	-288.75	-333.78	-45.03	Fe ₃ S ₄
Gummit	-7.15	0.52	7.67	UO ₃
Gypsum	-0.34	-4.95	-4.61	CaSO ₄ ·2H ₂ O
H-Jarosite	-12.24	-24.34	-12.10	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆
H ₂ MoO ₄	-7.96	-20.84	-12.88	H ₂ MoO ₄
H ₂ S(g)	-77.96	-85.97	-8.01	H ₂ S
H ₂ Se(g)	-41.34	-46.30	-4.96	H ₂ Se
Halite	-5.45	-3.85	1.60	NaCl
Halloysite	1.38	10.96	9.57	Al ₂ Si ₂ O ₅ (OH) ₄
Hausmannite	-4.25	56.78	61.03	Mn ₃ O ₄
Hematite	8.00	6.59	-1.42	Fe ₂ O ₃
Hercynite	0.19	23.08	22.89	FeAl ₂ O ₄
Hg(CH ₃) ₂ (g)	-182.81	-256.51	-73.71	Hg(CH ₃) ₂
Hg(g)	-7.07	-14.94	-7.87	Hg
Hg(OH) ₂	-7.41	-10.90	-3.50	Hg(OH) ₂

Hg2 (g)	-14.92	-29.88	-14.96	Hg2
Hg2 (OH) 2	-9.51	-4.25	5.26	Hg2 (OH) 2
Hg2CO3	-8.48	-24.53	-16.05	Hg2CO3
Hg2CrO4	-25.65	-34.35	-8.70	Hg2CrO4
Hg2F2	-16.12	-26.49	-10.36	Hg2F2
Hg2S	-78.54	-90.22	-11.68	Hg2S
Hg2SeO3	-13.86	-18.52	-4.66	Hg2SeO3
Hg2SO4	-15.23	-21.36	-6.13	Hg2SO4
Hg3O2CO3	-23.31	-52.99	-29.68	Hg3O2CO3
HgCl (g)	-31.29	-11.79	19.50	HgCl
HgCl2	-8.98	-30.24	-21.26	HgCl2
HgF (g)	-45.92	-13.24	32.68	HgF
HgF2 (g)	-45.70	-33.14	12.57	HgF2
Hgmetal (l)	-1.49	-14.94	-13.45	Hg
HgSe	-1.51	-57.20	-55.69	HgSe
HgSeO3	-12.74	-25.17	-12.43	HgSeO3
HgSO4	-18.59	-28.01	-9.42	HgSO4
Huntite	-1.60	-31.57	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.19	-23.96	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-10.04	-18.80	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-14.01	-19.18	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-4.28	-19.08	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-32.45	-49.69	-17.24	K2Cr2O7
K2CrO4	-19.07	-19.58	-0.51	K2CrO4
K2MoO4	-13.58	-10.32	3.26	K2MoO4
K2SeO4	-13.70	-14.43	-0.73	K2SeO4
Kaolinite	3.52	10.96	7.43	Al2Si2O5 (OH) 4
Langite	-2.85	14.64	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.60	-6.04	-0.43	PbO : PbSO4
Laurionite	-4.76	-4.13	0.62	PbOHCl
Lepidocrocite	1.92	3.29	1.37	FeOOH
Lime	-20.53	12.16	32.70	CaO
Litharge	-7.16	5.54	12.69	PbO
Mackinawite	-78.86	-82.46	-3.60	FeS
Maghemite	0.20	6.59	6.39	Fe2O3
Magnesioferrite	2.19	19.05	16.86	Fe2MgO4
Magnesite	-0.36	-7.82	-7.46	MgCO3
Magnetite	6.69	10.10	3.40	Fe3O4
Malachite	0.90	-4.41	-5.31	Cu2 (OH) 2CO3
Manganite	-2.14	23.20	25.34	MnOOH
Massicot	-7.36	5.54	12.89	PbO
Matlockite	-6.28	-15.25	-8.97	PbClF
Melanothallite	-17.66	-11.40	6.26	CuCl2
Melanterite	-11.39	-13.60	-2.21	FeSO4 : 7H2O
Metacinnabar	-51.78	-96.87	-45.09	HgS
Mg (OH) 2 (active)	-6.33	12.47	18.79	Mg (OH) 2
Mg (VO3) 2	-15.20	-3.92	11.28	Mg (VO3) 2
Mg2Sb3	-273.76	-199.07	74.68	Mg2Sb3
Mg2V2O7	-17.81	8.55	26.36	Mg2V2O7
MgCr2O4	-6.08	10.12	16.20	MgCr2O4
MgCrO4	-23.02	-17.64	5.38	MgCrO4
MgF2	-1.64	-9.77	-8.13	MgF2
MgMoO4	-6.52	-8.37	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.86	-1.80	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.28	-12.48	-1.20	MgSeO4 : 6H2O
Minium	-31.28	42.24	73.52	Pb3O4
Mirabilite	-4.37	-5.48	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-10.90	-6.00	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-49.92	-55.63	-5.71	Mn2 (SO4) 3
Mn2Sb	-149.15	-88.08	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-12.84	-0.34	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.67	-8.96	2.72	MnCl2 : 4H2O
MnS (grn)	-75.76	-75.59	0.17	MnS
MnS (pnk)	-78.93	-75.59	3.34	MnS
MnSb	-95.27	-98.18	-2.91	MnSb
MnSe	-39.41	-35.91	3.50	MnSe
MnSeO3	-5.01	-3.88	1.13	MnSeO3
MnSeO3 : 2H2O	-4.87	-3.89	0.98	MnSeO3 : 2H2O

MnSeO4:5H2O	-12.51	-14.56	-2.05	MnSeO4:5H2O
MnSO4	-9.31	-6.72	2.58	MnSO4
Monteponite	-8.45	6.65	15.10	CdO
Montroydite	-7.26	-10.90	-3.64	HgO
MoO3	-12.83	-20.83	-8.00	MoO3
Morenosite	-7.14	-9.28	-2.14	NiSO4:7H2O
MoS2	-148.14	-218.40	-70.26	MoS2
Na-Jarosite	-7.32	-18.52	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-38.68	-48.57	-9.90	Na2Cr2O7
Na2CrO4	-21.40	-18.47	2.93	Na2CrO4
Na2Mo2O7	-13.44	-30.04	-16.60	Na2Mo2O7
Na2MoO4	-10.69	-9.20	1.49	Na2MoO4
Na2MoO4:2H2O	-10.43	-9.20	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.94	-2.64	10.30	Na2SeO3:5H2O
Na2SeO4	-14.59	-13.31	1.28	Na2SeO4
Na3Sb	-173.03	-78.58	94.45	Na3Sb
Na3VO4	-27.42	9.26	36.68	Na3VO4
Na4V2O7	-30.52	6.88	37.40	Na4V2O7
Nantokite	-5.13	-11.86	-6.73	CuCl
NaSb	-87.75	-64.58	23.17	NaSb
Natron	-7.35	-8.66	-1.31	Na2CO3:10H2O
NaVO3	-6.23	-2.38	3.86	NaVO3
Nesquehonite	-3.15	-7.82	-4.67	MgCO3:3H2O
Ni(OH)2	-4.96	7.83	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-23.70	-8.00	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-17.78	14.22	32.00	Ni4(OH)6SO4
NiCO3	-5.58	-12.45	-6.87	NiCO3
NiMoO4	-1.86	-13.00	-11.14	NiMoO4
NiS(alpha)	-72.54	-78.14	-5.60	NiS
NiS(beta)	-67.04	-78.14	-11.10	NiS
NiS(gamma)	-65.34	-78.14	-12.80	NiS
NiSe	-20.77	-38.47	-17.70	NiSe
NiSeO3:2H2O	-9.25	-6.44	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.60	-17.12	-1.52	NiSeO4:6H2O
Nsutite	-6.84	10.66	17.50	MnO2
O2(g)	-31.83	51.26	83.09	O2
Orpiment	-241.79	-302.86	-61.07	As2S3
Otavite	-1.63	-13.63	-12.00	CdCO3
Pb(BO2)2	-9.22	-2.70	6.52	Pb(BO2)2
Pb(OH)2	-2.61	5.54	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.59	-66.35	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-7.39	1.40	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-15.12	11.07	26.19	Pb2O(OH)2
Pb2O3	-24.34	36.70	61.04	Pb2O3
Pb2OCO3	-8.65	-9.21	-0.56	Pb2OCO3
Pb2V2O7	-3.41	-5.31	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.68	-14.88	5.80	Pb3(AsO4)2
Pb3(VO4)2	-5.92	0.22	6.14	Pb3(VO4)2
Pb3O2CO3	-14.70	-3.68	11.02	Pb3O2CO3
Pb3O2SO4	-11.19	-0.50	10.69	Pb3O2SO4
Pb4(OH)6SO4	-16.07	5.03	21.10	Pb4(OH)6SO4
Pb4O3SO4	-16.84	5.04	21.88	Pb4O3SO4
PbCrO4	-11.97	-24.57	-12.60	PbCrO4
PbF2	-9.26	-16.70	-7.44	PbF2
Pbmetal	-24.34	-20.09	4.25	Pb
PbMoO4	0.32	-15.30	-15.62	PbMoO4
PbO:0.3H2O	-7.44	5.54	12.98	PbO:0.33H2O
PbSeO4	-12.57	-19.41	-6.84	PbSeO4
Periclase	-9.12	12.47	21.58	MgO
Phosgenite	-8.74	-28.55	-19.81	PbCl2:PbCO3
Plattnerite	-18.43	31.17	49.60	PbO2
Portlandite	-10.64	12.16	22.80	Ca(OH)2
Pyrite	-124.29	-142.80	-18.51	FeS2
Pyrochroite	-4.81	10.38	15.19	Mn(OH)2
Pyrolusite	-5.37	36.01	41.38	MnO2
Quartz	-0.31	-4.31	-4.00	SiO2
Realgar	-101.51	-121.26	-19.75	AsS
Retgersite	-7.24	-9.28	-2.04	NiSO4:6H2O

Rhodochrosite	0.68	-9.90	-10.58	MnCO3
Rutherfordine	-5.27	-19.77	-14.50	UO2CO3
Sb (OH) 3	-12.03	-19.14	-7.11	Sb (OH) 3
Sb2O4	-16.05	-12.64	3.40	Sb2O4
Sb2O5	-25.97	-35.63	-9.67	Sb2O5
Sb2Se3	-109.41	-177.17	-67.76	Sb2Se3
Sb4O6(cubic)	-58.29	-76.55	-18.26	Sb4O6
Sb4O6(orth)	-58.65	-76.55	-17.90	Sb4O6
SbCl3	-48.71	-48.14	0.57	SbCl3
SbF3	-42.27	-52.49	-10.23	SbF3
Sbmetal	-45.89	-57.58	-11.69	Sb
SbO2	-2.81	-30.63	-27.82	SbO2
Schoepite	-5.48	0.52	5.99	UO2 (OH) 2:H2O
Semetal (am)	-13.56	-20.67	-7.11	Se
Semetal (hex)	-12.96	-20.67	-7.71	Se
Senarmontite	-25.91	-38.27	-12.37	Sb2O3
SeO2	-14.39	-14.27	0.12	SeO2
SeO3	-45.99	-24.95	21.04	SeO3
Sepiolite	-3.74	12.02	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-6.76	12.02	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-6.53	-16.77	-10.24	FeCO3
SiO2 (am-gel)	-1.60	-4.31	-2.71	SiO2
SiO2 (am-ppt)	-1.57	-4.31	-2.74	SiO2
Smithsonite	-0.89	-10.89	-10.00	ZnCO3
Sphalerite	-65.12	-76.57	-11.45	ZnS
Spinel	-4.81	32.04	36.85	MgAl2O4
Stibnite	-245.72	-296.18	-50.46	Sb2S3
Sulfur	-58.19	-60.34	-2.14	S
Tenorite	0.29	7.94	7.64	CuO
Thenardite	-5.80	-5.48	0.32	Na2SO4
Thermonatrite	-9.29	-8.65	0.64	Na2CO3:H2O
Tyuyamunite	-7.27	-3.19	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-17.51	3.57	21.08	U3O8
U3Sb4	-584.18	-431.80	152.38	U3Sb4
U4O9	-34.93	-37.95	-3.02	U4O9
UF4	-30.83	-60.37	-29.54	UF4
UF4:2.5H2O	-27.65	-60.37	-32.72	UF4:2.5H2O
UO2 (am)	-16.83	-15.90	0.93	UO2
UO2 (NO3) 2	-41.77	-29.62	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-34.47	-29.62	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-33.01	-29.62	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.67	-29.62	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-5.09	0.52	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-22.18	-24.43	-2.25	UO2SeO4:4H2O
UO3	-7.18	0.52	7.70	UO3
Uraninite	-11.23	-15.90	-4.67	UO2
USb2	-221.12	-191.54	29.58	USb2
V (OH) 3	-18.82	-11.23	7.59	V (OH) 3
V2O5	-15.03	-16.39	-1.36	V2O5
V3O5	-39.78	-37.95	1.84	V3O5
V4O7	-49.24	-42.05	7.19	V4O7
V6O13	-39.56	-100.42	-60.86	V6O13
Valentinite	-29.79	-38.27	-8.48	Sb2O3
VC12	-62.25	-43.38	18.87	VC12
VC13	-63.66	-40.23	23.43	VC13
VF4	-63.51	-48.58	14.93	VF4
Vmetal	-93.70	-49.67	44.03	V
VO	-38.80	-24.04	14.76	VO
VO (OH) 2	-9.26	-4.11	5.15	VO (OH) 2
VO2Cl	-20.70	-17.86	2.84	VO2Cl
VOC1	-32.05	-20.89	11.15	VOC1
VOC12	-36.20	-23.44	12.76	VOC12
VOSO4	-24.82	-21.21	3.61	VOSO4
Witherite	-4.21	-12.78	-8.57	BaCO3
Wurtzite	-67.62	-76.57	-8.95	ZnS
Zincite	-1.94	9.39	11.33	ZnO
Zincosite	-11.64	-7.71	3.93	ZnSO4
Zn (BO2) 2	-7.13	1.16	8.29	Zn (BO2) 2

Zn(NO3)2:6H2O	-24.06	-20.75	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-2.81	9.39	12.20	Zn(OH)2
Zn(OH)2(am)	-3.08	9.39	12.47	Zn(OH)2
Zn(OH)2(beta)	-2.36	9.39	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-2.14	9.39	11.53	Zn(OH)2
Zn(OH)2(gamma)	-2.34	9.39	11.73	Zn(OH)2
Zn2(OH)2SO4	-5.82	1.68	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-6.07	9.12	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-16.95	-3.30	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-24.95	-6.03	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-7.93	20.47	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-10.86	27.64	38.50	Zn5(OH)8Cl2
ZnCl2	-16.99	-9.94	7.05	ZnCl2
ZnCO3:1H2O	-0.63	-10.89	-10.26	ZnCO3:1H2O
ZnF2	-12.31	-12.84	-0.53	ZnF2
Znmetal	-42.02	-16.24	25.79	Zn
ZnMoO4	-1.31	-11.44	-10.13	ZnMoO4
ZnO(active)	-1.79	9.39	11.19	ZnO
ZnS(am)	-67.52	-76.57	-9.05	ZnS
ZnSb	-84.83	-73.82	11.01	ZnSb
ZnSe	-22.50	-36.90	-14.40	ZnSe
ZnSeO4:6H2O	-14.03	-15.55	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.08	-7.71	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 161.

```

Title Precipitate oversaturated phases
PHASES
Fix_pe
  e==e-
  log_k      0
EQUILIBRIUM_PHASES 905
  Ag2Se 0 0
  Alunite 0 0
  Anhydrite 0 0
  Alunite 0 0
  Ba3(AsO4)2 0 0
  Barite 0 0
  Brochantite 0 0
  Brucite 0 0
  Calcite 0 0
  CaMoO4 0 0
  CaSeO3:2H2O 0 0
  Carnotite 0 0
  Cd(BO2)2 0 0
  CdMoO4 0 0
  Chrysotile 0 0
  CO2(g) -3.5 10
  Cr2O3 0 0
  CuMoO4 0 0
  Cu2Se(alpha) 0 0
  Epsomite 0 0
  Ferrihydrite 0 0
  Fluorite 0 0
  Gummite 0 0
  Gypsum 0 0
  HgSe 0 0
  Mg3(PO4)2 0 0
  Mirabilite 0 0

```

```

MnSeO3 0 0
O2(g)      -32 10
Otavite 0 0
NiCO3 0 0
NiMoO4 0 0
Ni(OH)2 0 0
Ni3(AsO4)2:8H2O 0 0
PbMoO4 0 0
Rutherfordine 0 0
SbO2 0 0
Schoepite 0 0
Sepiolite 0 0
SiO2(am-ppt) 0 0
Tyuyamunite 0 0
U3O8 0 0
UO3 0 0
UO2(OH)2(beta) 0 0
ZnMoO4 0 0
USE solution 913
SAVE Solution 914 Initial Pit Water after Mineral Precipitation
SAVE EQUILIBRIUM_PHASES 905
END

```

```

-----
TITLE
-----

```

Precipitate oversaturated phases

```

-----
Beginning of batch-reaction calculations.
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```

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
but is not in solution or other phases.
Using solution 913. Solution after simulation 160.
Using pure phase assemblage 905.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	-0.00	-48.70	-48.70	0.000e+00	5.114e-09	5.114e-09
Alunite	-1.59	-2.99	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.73	-5.09	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	0.000e+00	2.646e-12	2.646e-12
Barite	0.00	-9.98	-9.98	0.000e+00	5.009e-08	5.009e-08
Brochantite	-0.00	15.22	15.22	0.000e+00	7.079e-07	7.079e-07
Brucite	-3.21	13.63	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	2.230e-03
CaMoO4	-0.88	-8.83	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.74	-1.93	2.81	0.000e+00	0	0.000e+00
Calcite	0.00	-8.48	-8.48	0.000e+00	1.983e-03	1.983e-03
Carnotite	-1.03	-0.80	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-10.33	-0.49	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.03	-14.18	-14.15	0.000e+00	0	0.000e+00
Chrysotile	-0.00	32.20	32.20	0.000e+00	2.033e-06	2.033e-06
Cr2O3	-0.00	-2.36	-2.36	0.000e+00	1.241e-09	1.241e-09
Cu2Se(alpha)	-4.49	-50.29	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.55	-13.62	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.50	-4.63	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	-0.00	3.19	3.19	0.000e+00	1.644e-09	1.644e-09
Fluorite	0.00	-10.50	-10.50	0.000e+00	5.570e-05	5.570e-05
Gummite	-5.36	2.31	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.48	-5.09	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.14	-57.84	-55.69	0.000e+00	0	0.000e+00

Mg3(PO4)2	Element not present.			0.000e+00	0	0.000e+00
Mirabilite	-4.35	-5.46	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.66	-3.53	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.75	9.05	12.79	0.000e+00	0	0.000e+00
Ni3(AsO4)2·8H2O	-22.31	-6.61	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.73	-12.60	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-1.81	-12.95	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	-1.790e-06
Otavite	-1.83	-13.83	-12.00	0.000e+00	0	0.000e+00
PbMoO4	0.00	-15.62	-15.62	0.000e+00	6.190e-09	6.190e-09
Rutherfordine	-4.84	-19.34	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.34	-31.17	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.69	2.31	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.55	14.21	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.61	-4.35	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-4.20	-0.12	4.08	0.000e+00	0	0.000e+00
U3O8	-12.06	9.03	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.30	2.31	5.61	0.000e+00	0	0.000e+00
UO3	-5.39	2.31	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.31	-11.43	-10.13	0.000e+00	0	0.000e+00

-----Solution composition-----

Elements	Molality	Moles
Ag	2.735e-08	2.731e-08
Al	5.406e-06	5.398e-06
As	5.091e-10	5.084e-10
B	7.674e-05	7.663e-05
Ba	3.263e-08	3.259e-08
C	8.141e-04	8.129e-04
Ca	4.403e-03	4.397e-03
Cd	2.802e-08	2.798e-08
Cl	8.692e-03	8.679e-03
Co	2.150e-07	2.147e-07
Cr	1.072e-09	1.070e-09
Cu	4.920e-07	4.913e-07
F	3.052e-04	3.048e-04
Fe	8.960e-10	8.947e-10
Hg	4.423e-09	4.416e-09
K	7.622e-03	7.611e-03
Mg	1.183e-02	1.181e-02
Mn	1.318e-04	1.316e-04
Mo	3.855e-06	3.849e-06
N	3.243e-05	3.238e-05
Na	2.719e-02	2.715e-02
Ni	3.349e-07	3.345e-07
Pb	3.706e-09	3.701e-09
S	2.884e-02	2.880e-02
Sb	5.902e-08	5.893e-08
Se	3.273e-07	3.268e-07
Si	4.462e-05	4.456e-05
U	5.325e-07	5.317e-07
V	1.783e-08	1.780e-08
Zn	1.304e-05	1.302e-05

-----Description of solution-----

	pH	=	8.087	Charge balance
	pe	=	4.686	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	8.447e-02	
	Mass of water (kg)	=	9.986e-01	
	Total alkalinity (eq/kg)	=	8.639e-04	
	Total CO2 (mol/kg)	=	8.141e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	

Electrical balance (eq) = 3.832e-06
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
Iterations = 22
Total H = 1.108543e+02
Total O = 5.554467e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.586e-06	1.228e-06	-5.800	-5.911	-0.111	(0)
H+	1.035e-08	8.188e-09	-7.985	-8.087	-0.102	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Ag	2.735e-08					
AgCl	1.392e-08	1.392e-08	-7.856	-7.856	0.000	(0)
AgCl2-	1.172e-08	8.334e-09	-7.931	-8.079	-0.148	(0)
Ag+	1.254e-09	9.920e-10	-8.902	-9.003	-0.102	(0)
AgSO4-	2.293e-10	1.630e-10	-9.640	-9.788	-0.148	(0)
AgCl3-2	2.000e-10	5.105e-11	-9.699	-10.292	-0.593	(0)
AgCl4-3	1.546e-11	7.164e-13	-10.811	-12.145	-1.334	(0)
AgNO2	5.121e-12	5.121e-12	-11.291	-11.291	0.000	(0)
AgF	4.462e-13	4.462e-13	-12.350	-12.350	0.000	(0)
AgOH	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
AgH2BO3	7.843e-14	7.843e-14	-13.106	-13.106	0.000	(0)
AgSeO3-	4.303e-14	3.059e-14	-13.366	-13.514	-0.148	(0)
AgNH3+	2.449e-14	1.741e-14	-13.611	-13.759	-0.148	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	2.757e-16	1.960e-16	-15.560	-15.708	-0.148	(0)
Ag (OH) 2-	2.057e-17	1.462e-17	-16.687	-16.835	-0.148	(0)
AgNO3	1.837e-17	1.837e-17	-16.736	-16.736	0.000	(0)
Ag (NH3) 2+	1.712e-18	1.217e-18	-17.767	-17.915	-0.148	(0)
Ag (SeO3) 2-3	2.836e-19	1.314e-20	-18.547	-19.881	-1.334	(0)
Ag2MoO4	5.615e-25	5.615e-25	-24.251	-24.251	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.879	-73.879	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-80.441	-82.812	-2.372	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.622	-147.866	-0.244	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.321	-148.469	-0.148	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.789	-149.219	-0.430	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.125	-149.530	-0.405	(0)
Al	5.406e-06					
Al (OH) 4-	5.376e-06	4.235e-06	-5.270	-5.373	-0.104	(0)
Al (OH) 3	2.739e-08	2.739e-08	-7.562	-7.562	0.000	(0)
Al (OH) 2+	1.400e-09	1.118e-09	-8.854	-8.952	-0.098	(0)
AlF3	2.685e-10	2.685e-10	-9.571	-9.571	0.000	(0)
AlF2+	1.492e-10	1.191e-10	-9.826	-9.924	-0.098	(0)
AlF4-	3.060e-11	2.410e-11	-10.514	-10.618	-0.104	(0)
AlF+2	4.113e-12	1.671e-12	-11.386	-11.777	-0.391	(0)
AlOH+2	2.821e-12	1.146e-12	-11.550	-11.941	-0.391	(0)
AlSO4+	7.571e-14	5.963e-14	-13.121	-13.225	-0.104	(0)
Al+3	7.714e-15	9.331e-16	-14.113	-15.030	-0.917	(0)
Al (SO4) 2-	6.679e-15	5.260e-15	-14.175	-14.279	-0.104	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-42.153	-43.487	-1.334	(0)
As (3)	3.295e-24					
H3AsO3	3.028e-24	3.028e-24	-23.519	-23.519	0.000	(0)
H2AsO3-	2.668e-25	1.897e-25	-24.574	-24.722	-0.148	(0)
HAsO3-2	8.275e-29	2.112e-29	-28.082	-28.675	-0.593	(0)
H4AsO3+	1.728e-32	1.228e-32	-31.762	-31.911	-0.148	(0)
AsO3-3	2.147e-33	9.945e-35	-32.668	-34.002	-1.334	(0)
As (5)	5.091e-10					
HAsO4-2	4.948e-10	1.263e-10	-9.306	-9.899	-0.593	(0)
H2AsO4-	1.327e-11	9.433e-12	-10.877	-11.025	-0.148	(0)
AsO4-3	1.053e-12	4.879e-14	-11.978	-13.312	-1.334	(0)
H3AsO4	1.316e-17	1.342e-17	-16.881	-16.872	0.008	(0)
B	7.674e-05					
H3BO3	6.897e-05	7.033e-05	-4.161	-4.153	0.008	(0)
H2BO3-	6.571e-06	4.988e-06	-5.182	-5.302	-0.120	(0)
MgH2BO3+	6.588e-07	5.001e-07	-6.181	-6.301	-0.120	(0)

Ba	CaH2BO3+	3.729e-07	2.831e-07	-6.428	-6.548	-0.120	(0)
	NaH2BO3	1.628e-07	1.628e-07	-6.788	-6.788	0.000	(0)
	BF(OH) 3-	6.619e-09	5.025e-09	-8.179	-8.299	-0.120	(0)
	H5(BO3) 2-	3.933e-10	2.986e-10	-9.405	-9.525	-0.120	(0)
	H8(BO3) 3-	2.766e-12	2.100e-12	-11.558	-11.678	-0.120	(0)
	BaH2BO3+	2.583e-12	1.961e-12	-11.588	-11.708	-0.120	(0)
	BF2(OH) 2-	1.039e-12	7.888e-13	-11.983	-12.103	-0.120	(0)
	AgH2BO3	7.843e-14	7.843e-14	-13.106	-13.106	0.000	(0)
	BF3OH-	5.935e-19	4.506e-19	-18.227	-18.346	-0.120	(0)
BF4-	4.288e-24	3.255e-24	-23.368	-23.487	-0.120	(0)	
C(4)	Ba	3.263e-08					
	Ba+2	3.252e-08	1.272e-08	-7.488	-7.896	-0.408	(0)
	BaHCO3+	8.849e-11	7.123e-11	-10.053	-10.147	-0.094	(0)
	BaCO3	2.190e-11	2.190e-11	-10.660	-10.660	0.000	(0)
	BaH2BO3+	2.583e-12	1.961e-12	-11.588	-11.708	-0.120	(0)
	BaOH+	8.590e-14	6.818e-14	-13.066	-13.166	-0.100	(0)
	BaNO3+	2.090e-15	1.486e-15	-14.680	-14.828	-0.148	(0)
	BaNH3+2	2.702e-16	6.899e-17	-15.568	-16.161	-0.593	(0)
Ca	HCO3-	7.346e-04	5.864e-04	-3.134	-3.232	-0.098	(0)
	MgHCO3+	2.221e-05	1.735e-05	-4.653	-4.761	-0.107	(0)
	CaHCO3+	1.338e-05	1.077e-05	-4.874	-4.968	-0.094	(0)
	H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
	CO3-2	8.585e-06	3.358e-06	-5.066	-5.474	-0.408	(0)
	MgCO3	8.076e-06	8.076e-06	-5.093	-5.093	0.000	(0)
	NaHCO3	6.790e-06	6.790e-06	-5.168	-5.168	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	NaCO3-	1.613e-06	1.287e-06	-5.792	-5.890	-0.098	(0)
	UO2(CO3) 3-4	4.844e-07	2.058e-09	-6.315	-8.687	-2.372	(0)
	ZnCO3	4.722e-07	4.722e-07	-6.326	-6.326	0.000	(0)
	MnHCO3+	3.586e-07	2.846e-07	-6.445	-6.546	-0.100	(0)
	CuCO3	3.114e-07	3.114e-07	-6.507	-6.507	0.000	(0)
	ZnHCO3+	6.376e-08	4.532e-08	-7.195	-7.344	-0.148	(0)
	UO2(CO3) 2-2	4.790e-08	1.223e-08	-7.320	-7.913	-0.593	(0)
	Cu(CO3) 2-2	1.102e-08	2.814e-09	-7.958	-8.551	-0.593	(0)
	NiCO3	9.360e-09	9.360e-09	-8.029	-8.029	0.000	(0)
	NiHCO3+	7.600e-09	5.402e-09	-8.119	-8.267	-0.148	(0)
	CoHCO3+	2.395e-09	1.703e-09	-8.621	-8.769	-0.148	(0)
	CoCO3	2.119e-09	2.119e-09	-8.674	-8.674	0.000	(0)
	PbCO3	1.606e-09	1.606e-09	-8.794	-8.794	0.000	(0)
	CuHCO3+	8.199e-10	5.828e-10	-9.086	-9.234	-0.148	(0)
	CdCO3	3.352e-10	3.352e-10	-9.475	-9.475	0.000	(0)
	UO2CO3	1.825e-10	1.825e-10	-9.739	-9.739	0.000	(0)
	PbHCO3+	9.755e-11	6.934e-11	-10.011	-10.159	-0.148	(0)
	BaHCO3+	8.849e-11	7.123e-11	-10.053	-10.147	-0.094	(0)
	Pb(CO3) 2-2	6.093e-11	1.556e-11	-10.215	-10.808	-0.593	(0)
	BaCO3	2.190e-11	2.190e-11	-10.660	-10.660	0.000	(0)
	CdHCO3+	8.226e-12	5.847e-12	-11.085	-11.233	-0.148	(0)
	Cd(CO3) 2-2	3.268e-12	8.343e-13	-11.486	-12.079	-0.593	(0)
	HgCO3	4.497e-15	4.497e-15	-14.347	-14.347	0.000	(0)
	FeHCO3+	1.742e-15	1.402e-15	-14.759	-14.853	-0.094	(0)
Hg(CO3) 2-2	1.870e-16	4.775e-17	-15.728	-16.321	-0.593	(0)	
HgHCO3+	9.646e-19	6.857e-19	-18.016	-18.164	-0.148	(0)	
Cd	Ca	4.403e-03					
	Ca+2	2.522e-03	9.862e-04	-2.598	-3.006	-0.408	(0)
	CaSO4	1.860e-03	1.860e-03	-2.730	-2.730	0.000	(0)
	CaHCO3+	1.338e-05	1.077e-05	-4.874	-4.968	-0.094	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.428e-06	1.927e-06	-5.615	-5.715	-0.100	(0)
	CaH2BO3+	3.729e-07	2.831e-07	-6.428	-6.548	-0.120	(0)
	CaOH+	3.002e-08	2.416e-08	-7.523	-7.617	-0.094	(0)
	CaNO3+	1.023e-10	7.269e-11	-9.990	-10.139	-0.148	(0)
	CaNH3+2	4.180e-11	1.067e-11	-10.379	-10.972	-0.593	(0)
	Ca(NH3) 2+2	1.431e-19	3.652e-20	-18.844	-19.437	-0.593	(0)
Cd	Cd	2.802e-08					
	Cd+2	1.120e-08	4.380e-09	-7.951	-8.359	-0.408	(0)
	CdSO4	8.453e-09	8.453e-09	-8.073	-8.073	0.000	(0)
	CdCl+	4.044e-09	2.875e-09	-8.393	-8.541	-0.148	(0)

	Cd(SO4) 2-2	3.677e-09	9.387e-10	-8.435	-9.027	-0.593	(0)
	CdCO3	3.352e-10	3.352e-10	-9.475	-9.475	0.000	(0)
	CdOHCl	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
	CdCl2	8.237e-11	8.237e-11	-10.084	-10.084	0.000	(0)
	CdOH+	6.010e-11	4.272e-11	-10.221	-10.369	-0.148	(0)
	CdF+	1.749e-11	1.243e-11	-10.757	-10.906	-0.148	(0)
	CdHCO3+	8.226e-12	5.847e-12	-11.085	-11.233	-0.148	(0)
	Cd(CO3) 2-2	3.268e-12	8.343e-13	-11.486	-12.079	-0.593	(0)
	CdCl3-	5.025e-13	3.572e-13	-12.299	-12.447	-0.148	(0)
	Cd(OH) 2	3.310e-13	3.310e-13	-12.480	-12.480	0.000	(0)
	CdF2	4.441e-15	4.441e-15	-14.353	-14.353	0.000	(0)
	CdNO3+	4.542e-16	3.228e-16	-15.343	-15.491	-0.148	(0)
	CdSeO4	1.695e-16	1.695e-16	-15.771	-15.771	0.000	(0)
	Cd(OH) 3-	3.494e-17	2.484e-17	-16.457	-16.605	-0.148	(0)
	Cd(SeO3) 2-2	3.254e-17	8.309e-18	-16.488	-17.080	-0.593	(0)
	Cd2OH+3	2.024e-17	9.378e-19	-16.694	-18.028	-1.334	(0)
	Cd(OH) 4-2	1.956e-23	4.993e-24	-22.709	-23.302	-0.593	(0)
	Cd(NO3) 2	3.772e-24	3.772e-24	-23.423	-23.423	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.892	-79.041	-0.148	(0)
	Cd(HS) 2	0.000e+00	0.000e+00	-150.527	-150.527	0.000	(0)
	Cd(HS) 3-	0.000e+00	0.000e+00	-227.169	-227.317	-0.148	(0)
	Cd(HS) 4-2	0.000e+00	0.000e+00	-303.218	-303.811	-0.593	(0)
C1		8.692e-03					
	Cl-	8.691e-03	6.873e-03	-2.061	-2.163	-0.102	(0)
	MnCl+	2.652e-07	2.105e-07	-6.576	-6.677	-0.100	(0)
	ZnOHCl	6.784e-08	6.784e-08	-7.169	-7.169	0.000	(0)
	ZnCl+	5.401e-08	4.219e-08	-7.267	-7.375	-0.107	(0)
	AgCl	1.392e-08	1.392e-08	-7.856	-7.856	0.000	(0)
	AgCl2-	1.172e-08	8.334e-09	-7.931	-8.079	-0.148	(0)
	CdCl+	4.044e-09	2.875e-09	-8.393	-8.541	-0.148	(0)
	CuCl2-	2.530e-09	1.976e-09	-8.597	-8.704	-0.107	(0)
	MnCl2	2.043e-09	2.043e-09	-8.690	-8.690	0.000	(0)
	NiCl+	1.849e-09	1.314e-09	-8.733	-8.881	-0.148	(0)
	CuCl	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
	CoCl+	1.249e-09	8.875e-10	-8.904	-9.052	-0.148	(0)
	ZnCl2	4.596e-10	4.596e-10	-9.338	-9.338	0.000	(0)
	CuCl+	2.196e-10	1.716e-10	-9.658	-9.766	-0.107	(0)
	AgCl3-2	2.000e-10	5.105e-11	-9.699	-10.292	-0.593	(0)
	CdOHCl	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
	CdCl2	8.237e-11	8.237e-11	-10.084	-10.084	0.000	(0)
	PbCl+	5.460e-11	3.881e-11	-10.263	-10.411	-0.148	(0)
	HgClOH	1.668e-11	1.668e-11	-10.778	-10.778	0.000	(0)
	AgCl4-3	1.546e-11	7.164e-13	-10.811	-12.145	-1.334	(0)
	CuCl3-2	7.316e-12	2.904e-12	-11.136	-11.537	-0.401	(0)
	HgCl2	5.287e-12	5.287e-12	-11.277	-11.277	0.000	(0)
	MnCl3-	4.873e-12	3.868e-12	-11.312	-11.413	-0.100	(0)
	ZnCl3-	3.212e-12	2.509e-12	-11.493	-11.600	-0.107	(0)
	PbCl2	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
	HgCl3-	5.112e-13	3.634e-13	-12.291	-12.440	-0.148	(0)
	CdCl3-	5.025e-13	3.572e-13	-12.299	-12.447	-0.148	(0)
	CuCl2	4.089e-13	4.089e-13	-12.388	-12.388	0.000	(0)
	NiCl2	4.547e-14	4.547e-14	-13.342	-13.342	0.000	(0)
	HgCl4-2	3.895e-14	9.943e-15	-13.410	-14.002	-0.593	(0)
	ZnCl4-2	2.173e-14	8.624e-15	-13.663	-14.064	-0.401	(0)
	PbCl3-	4.587e-15	3.260e-15	-14.339	-14.487	-0.148	(0)
	HgCl+	2.159e-16	1.535e-16	-15.666	-15.814	-0.148	(0)
	UO2Cl+	2.141e-16	1.522e-16	-15.669	-15.818	-0.148	(0)
	PbCl4-2	4.012e-17	1.024e-17	-16.397	-16.990	-0.593	(0)
	CuCl3-	3.358e-17	2.623e-17	-16.474	-16.581	-0.107	(0)
	CrCl+2	4.705e-18	1.201e-18	-17.327	-17.920	-0.593	(0)
	CrOHCl2	1.927e-19	1.927e-19	-18.715	-18.715	0.000	(0)
	CuCl4-2	2.276e-21	9.034e-22	-20.643	-21.044	-0.401	(0)
	CrCl2+	1.102e-21	7.833e-22	-20.958	-21.106	-0.148	(0)
	FeCl+2	4.476e-22	1.776e-22	-21.349	-21.751	-0.401	(0)
	VOCl+	2.753e-23	1.957e-23	-22.560	-22.708	-0.148	(0)
	FeCl2+	6.870e-24	5.453e-24	-23.163	-23.263	-0.100	(0)
	CrO3Cl-	1.138e-25	8.091e-26	-24.944	-25.092	-0.148	(0)
	FeCl3	3.748e-27	3.748e-27	-26.426	-26.426	0.000	(0)

CoCl+2	3.949e-35	1.008e-35	-34.404	-34.996	-0.593	(0)
UCl+3	0.000e+00	0.000e+00	-45.495	-46.829	-1.334	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
Co (2)	2.150e-07					
Co+2	1.462e-07	3.733e-08	-6.835	-7.428	-0.593	(0)
CoSO4	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
CoHCO3+	2.395e-09	1.703e-09	-8.621	-8.769	-0.148	(0)
CoCO3	2.119e-09	2.119e-09	-8.674	-8.674	0.000	(0)
CoOH+	1.287e-09	9.146e-10	-8.891	-9.039	-0.148	(0)
CoCl+	1.249e-09	8.875e-10	-8.904	-9.052	-0.148	(0)
CoF+	2.974e-10	2.114e-10	-9.527	-9.675	-0.148	(0)
Co (OH) 2	8.922e-11	8.922e-11	-10.050	-10.050	0.000	(0)
CoNO2+	9.143e-12	6.499e-12	-11.039	-11.187	-0.148	(0)
Co (NH3) +2	1.511e-13	3.858e-14	-12.821	-13.414	-0.593	(0)
CoSeO4	3.888e-15	3.888e-15	-14.410	-14.410	0.000	(0)
Co (OH) 3-	3.076e-15	2.186e-15	-14.512	-14.660	-0.148	(0)
CoNO3+	1.940e-15	1.379e-15	-14.712	-14.860	-0.148	(0)
CoOOH-	7.727e-16	5.493e-16	-15.112	-15.260	-0.148	(0)
Co2OH+3	3.693e-17	1.711e-18	-16.433	-17.767	-1.334	(0)
Co (NH3) 2+2	5.541e-20	1.415e-20	-19.256	-19.849	-0.593	(0)
Co (OH) 4-2	1.667e-21	4.255e-22	-20.778	-21.371	-0.593	(0)
Co (NO3) 2	6.540e-23	6.540e-23	-22.184	-22.184	0.000	(0)
Co4 (OH) 4+4	3.287e-26	1.396e-28	-25.483	-27.855	-2.372	(0)
Co (NH3) 3+2	5.997e-27	1.531e-27	-26.222	-26.815	-0.593	(0)
Co (NH3) 4+2	2.705e-34	6.907e-35	-33.568	-34.161	-0.593	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.413	-42.006	-0.593	(0)
Co (3)	1.762e-28					
CoOH+2	1.762e-28	4.499e-29	-27.754	-28.347	-0.593	(0)
Co+3	5.960e-35	7.209e-36	-34.225	-35.142	-0.917	(0)
CoCl+2	3.949e-35	1.008e-35	-34.404	-34.996	-0.593	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.108	-63.701	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
Cr (2)	2.605e-27					
Cr+2	2.605e-27	6.650e-28	-26.584	-27.177	-0.593	(0)
Cr (3)	1.072e-09					
Cr (OH) 2+	7.626e-10	5.421e-10	-9.118	-9.266	-0.148	(0)
Cr (OH) 3	2.501e-10	2.501e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.043e-11	1.453e-11	-10.690	-10.838	-0.148	(0)
Cr (OH) 4-	1.720e-11	1.223e-11	-10.764	-10.913	-0.148	(0)
Cr (OH) +2	1.421e-11	3.628e-12	-10.847	-11.440	-0.593	(0)
CrOHSO4	7.088e-12	7.088e-12	-11.150	-11.150	0.000	(0)
CrF+2	1.501e-14	3.832e-15	-13.824	-14.417	-0.593	(0)
CrSO4+	3.652e-15	2.596e-15	-14.437	-14.586	-0.148	(0)
Cr+3	2.914e-15	1.350e-16	-14.535	-15.870	-1.334	(0)
CrCl+2	4.705e-18	1.201e-18	-17.327	-17.920	-0.593	(0)
CrOHC12	1.927e-19	1.927e-19	-18.715	-18.715	0.000	(0)
Cr2 (OH) 2SO4+2	9.103e-21	2.324e-21	-20.041	-20.634	-0.593	(0)
Cr2 (OH) 2 (SO4) 2	1.137e-21	1.137e-21	-20.944	-20.944	0.000	(0)
CrCl2+	1.102e-21	7.833e-22	-20.958	-21.106	-0.148	(0)
CrNO3+2	5.389e-25	1.376e-25	-24.268	-24.861	-0.593	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.144	-41.737	-0.593	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.930	-51.264	-1.334	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Cr (6)	2.385e-14					
CrO4-2	2.203e-14	8.616e-15	-13.657	-14.065	-0.408	(0)
NaCrO4-	1.240e-15	8.816e-16	-14.907	-15.055	-0.148	(0)
HCrO4-	3.211e-16	2.283e-16	-15.493	-15.642	-0.148	(0)
KCrO4-	2.566e-16	1.824e-16	-15.591	-15.739	-0.148	(0)
CrO3SO4-2	1.838e-23	4.694e-24	-22.736	-23.329	-0.593	(0)
H2CrO4	1.515e-24	1.515e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	1.138e-25	8.091e-26	-24.944	-25.092	-0.148	(0)
Cr2O7-2	7.087e-30	1.809e-30	-29.150	-29.742	-0.593	(0)
Cu (1)	4.137e-09					
CuCl2-	2.530e-09	1.976e-09	-8.597	-8.704	-0.107	(0)

CuCl	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
Cu+	2.237e-10	1.590e-10	-9.650	-9.799	-0.148	(0)
CuCl3-2	7.316e-12	2.904e-12	-11.136	-11.537	-0.401	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.198	-147.615	-0.417	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.951	-148.345	-0.394	(0)
Cu (2)	4.878e-07					
CuCO3	3.114e-07	3.114e-07	-6.507	-6.507	0.000	(0)
CuOH+	7.830e-08	6.116e-08	-7.106	-7.213	-0.107	(0)
Cu+2	4.027e-08	1.575e-08	-7.395	-7.803	-0.408	(0)
CuSO4	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
Cu (OH) 2	1.499e-08	1.499e-08	-7.824	-7.824	0.000	(0)
Cu (CO3) 2-2	1.102e-08	2.814e-09	-7.958	-8.551	-0.593	(0)
CuHCO3+	8.199e-10	5.828e-10	-9.086	-9.234	-0.148	(0)
Cu2 (OH) 2+2	3.681e-10	9.397e-11	-9.434	-10.027	-0.593	(0)
CuF+	2.503e-10	1.780e-10	-9.601	-9.750	-0.148	(0)
CuCl+	2.196e-10	1.716e-10	-9.658	-9.766	-0.107	(0)
CuNO2+	5.733e-11	4.075e-11	-10.242	-10.390	-0.148	(0)
Cu (OH) 3-	5.311e-11	3.775e-11	-10.275	-10.423	-0.148	(0)
CuNH3+2	5.427e-12	1.385e-12	-11.265	-11.858	-0.593	(0)
CuCl2	4.089e-13	4.089e-13	-12.388	-12.388	0.000	(0)
Cu (NO2) 2	1.030e-14	1.030e-14	-13.987	-13.987	0.000	(0)
CuNO3+	1.633e-15	1.161e-15	-14.787	-14.935	-0.148	(0)
Cu (OH) 4-2	1.429e-15	3.649e-16	-14.845	-15.438	-0.593	(0)
CuCl3-	3.358e-17	2.623e-17	-16.474	-16.581	-0.107	(0)
CuCl4-2	2.276e-21	9.034e-22	-20.643	-21.044	-0.401	(0)
Cu (NO3) 2	3.407e-24	3.407e-24	-23.468	-23.468	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.826	-217.974	-0.148	(0)
F	3.052e-04					
F-	2.264e-04	1.791e-04	-3.645	-3.747	-0.102	(0)
MgF+	7.376e-05	5.810e-05	-4.132	-4.236	-0.104	(0)
CaF+	2.428e-06	1.927e-06	-5.615	-5.715	-0.100	(0)
NaF	2.326e-06	2.326e-06	-5.633	-5.633	0.000	(0)
MnF+	2.185e-07	1.734e-07	-6.661	-6.761	-0.100	(0)
ZnF+	1.228e-08	8.732e-09	-7.911	-8.059	-0.148	(0)
BF (OH) 3-	6.619e-09	5.025e-09	-8.179	-8.299	-0.120	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
NiF+	4.728e-10	3.361e-10	-9.325	-9.474	-0.148	(0)
CoF+	2.974e-10	2.114e-10	-9.527	-9.675	-0.148	(0)
AlF3	2.685e-10	2.685e-10	-9.571	-9.571	0.000	(0)
CuF+	2.503e-10	1.780e-10	-9.601	-9.750	-0.148	(0)
AlF2+	1.492e-10	1.191e-10	-9.826	-9.924	-0.098	(0)
AlF4-	3.060e-11	2.410e-11	-10.514	-10.618	-0.104	(0)
CdF+	1.749e-11	1.243e-11	-10.757	-10.906	-0.148	(0)
AlF+2	4.113e-12	1.671e-12	-11.386	-11.777	-0.391	(0)
PbF+	2.825e-12	2.008e-12	-11.549	-11.697	-0.148	(0)
HF2-	1.907e-12	1.476e-12	-11.720	-11.831	-0.111	(0)
BF2 (OH) 2-	1.039e-12	7.888e-13	-11.983	-12.103	-0.120	(0)
UO2F+	4.748e-13	3.375e-13	-12.323	-12.472	-0.148	(0)
AgF	4.462e-13	4.462e-13	-12.350	-12.350	0.000	(0)
UO2F2	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
CrF+2	1.501e-14	3.832e-15	-13.824	-14.417	-0.593	(0)
UO2F3-	1.103e-14	7.841e-15	-13.957	-14.106	-0.148	(0)
PbF2	7.077e-15	7.077e-15	-14.150	-14.150	0.000	(0)
CdF2	4.441e-15	4.441e-15	-14.353	-14.353	0.000	(0)
UO2F4-2	4.368e-17	1.115e-17	-16.360	-16.953	-0.593	(0)
H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
PbF3-	3.381e-18	2.404e-18	-17.471	-17.619	-0.148	(0)
VO2F	2.879e-18	2.879e-18	-17.541	-17.541	0.000	(0)
FeF2+	1.014e-18	8.052e-19	-17.994	-18.094	-0.100	(0)
BF3OH-	5.935e-19	4.506e-19	-18.227	-18.346	-0.120	(0)
FeF+2	4.234e-19	1.680e-19	-18.373	-18.775	-0.401	(0)
VO2F2-	2.633e-19	1.872e-19	-18.579	-18.728	-0.148	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
VO2F3-2	1.638e-21	4.181e-22	-20.786	-21.379	-0.593	(0)
VOF+	1.533e-21	1.090e-21	-20.814	-20.963	-0.148	(0)
PbF4-2	8.069e-22	2.060e-22	-21.093	-21.686	-0.593	(0)
VOF2	7.318e-23	7.318e-23	-22.136	-22.136	0.000	(0)
HgF+	1.045e-23	7.429e-24	-22.981	-23.129	-0.148	(0)

BF4-	4.288e-24	3.255e-24	-23.368	-23.487	-0.120	(0)
VO2F4-3	7.951e-25	3.684e-26	-24.100	-25.434	-1.334	(0)
VOF3-	6.541e-25	4.650e-25	-24.184	-24.333	-0.148	(0)
Sb(OH) 2F	5.355e-26	5.355e-26	-25.271	-25.271	0.000	(0)
SbOF	5.273e-26	5.273e-26	-25.278	-25.278	0.000	(0)
VOF4-2	1.316e-27	3.361e-28	-26.881	-27.474	-0.593	(0)
SiF6-2	2.528e-29	1.003e-29	-28.597	-28.999	-0.401	(0)
UF3+	1.383e-36	9.831e-37	-35.859	-36.007	-0.148	(0)
UF2+2	1.357e-37	3.464e-38	-36.867	-37.460	-0.593	(0)
UF4	1.930e-38	1.930e-38	-37.714	-37.714	0.000	(0)
UF+3	3.317e-40	0.000e+00	-39.479	-40.813	-1.334	(0)
UF5-	1.927e-40	1.370e-40	-39.715	-39.863	-0.148	(0)
UF6-2	0.000e+00	0.000e+00	-40.537	-41.130	-0.593	(0)
Fe (2)	1.141e-12					
Fe+2	7.438e-13	1.899e-13	-12.129	-12.721	-0.593	(0)
FeSO4	3.838e-13	3.838e-13	-12.416	-12.416	0.000	(0)
FeOH+	1.170e-14	9.284e-15	-13.932	-14.032	-0.100	(0)
FeHCO3+	1.742e-15	1.402e-15	-14.759	-14.853	-0.094	(0)
Fe (OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.431e-18	3.517e-18	-17.353	-17.454	-0.100	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.152	-161.152	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.656	-237.805	-0.148	(0)
Fe (3)	8.949e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	4.061e-10	3.242e-10	-9.391	-9.489	-0.098	(0)
Fe (OH) 4-	6.124e-11	4.889e-11	-10.213	-10.311	-0.098	(0)
FeOH+2	1.710e-15	6.785e-16	-14.767	-15.168	-0.401	(0)
FeF2+	1.014e-18	8.052e-19	-17.994	-18.094	-0.100	(0)
FeF+2	4.234e-19	1.680e-19	-18.373	-18.775	-0.401	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
FeSO4+	9.959e-20	7.905e-20	-19.002	-19.102	-0.100	(0)
Fe (SO4) 2-	1.957e-20	1.391e-20	-19.708	-19.857	-0.148	(0)
Fe+3	7.075e-21	8.557e-22	-20.150	-21.068	-0.917	(0)
FeCl+2	4.476e-22	1.776e-22	-21.349	-21.751	-0.401	(0)
FeCl2+	6.870e-24	5.453e-24	-23.163	-23.263	-0.100	(0)
FeHSeO3+2	8.740e-25	2.231e-25	-24.059	-24.651	-0.593	(0)
FeCl3	3.748e-27	3.748e-27	-26.426	-26.426	0.000	(0)
Fe2 (OH) 2+4	3.588e-27	1.524e-29	-26.445	-28.817	-2.372	(0)
FeNO3+2	7.813e-28	1.995e-28	-27.107	-27.700	-0.593	(0)
Fe3 (OH) 4+5	3.629e-34	7.143e-38	-33.440	-37.146	-3.706	(0)
H (0)	3.956e-29					
H2	1.978e-29	2.017e-29	-28.704	-28.695	0.008	(0)
Hg (0)	4.390e-09					
Hg	4.390e-09	4.390e-09	-8.358	-8.358	0.000	(0)
Hg (1)	2.613e-20					
Hg2+2	1.306e-20	3.335e-21	-19.884	-20.477	-0.593	(0)
Hg (2)	3.297e-11					
HgClOH	1.668e-11	1.668e-11	-10.778	-10.778	0.000	(0)
Hg (OH) 2	1.044e-11	1.065e-11	-10.981	-10.973	0.008	(0)
HgCl2	5.287e-12	5.287e-12	-11.277	-11.277	0.000	(0)
HgCl3-	5.112e-13	3.634e-13	-12.291	-12.440	-0.148	(0)
HgCl4-2	3.895e-14	9.943e-15	-13.410	-14.002	-0.593	(0)
HgCO3	4.497e-15	4.497e-15	-14.347	-14.347	0.000	(0)
HgCl+	2.159e-16	1.535e-16	-15.666	-15.814	-0.148	(0)
Hg (CO3) 2-2	1.870e-16	4.775e-17	-15.728	-16.321	-0.593	(0)
HgOH+	7.697e-17	5.472e-17	-16.114	-16.262	-0.148	(0)
Hg (OH) 3-	2.316e-18	1.646e-18	-17.635	-17.783	-0.148	(0)
HgHCO3+	9.646e-19	6.857e-19	-18.016	-18.164	-0.148	(0)
Hg (NH3) 2+2	2.044e-19	5.218e-20	-18.690	-19.282	-0.593	(0)
HgNH3+2	2.378e-20	6.070e-21	-19.624	-20.217	-0.593	(0)
Hg+2	4.384e-21	1.119e-21	-20.358	-20.951	-0.593	(0)
HgSO4	2.412e-21	2.412e-21	-20.618	-20.618	0.000	(0)
HgF+	1.045e-23	7.429e-24	-22.981	-23.129	-0.148	(0)
Hg (NH3) 3+2	6.995e-27	1.786e-27	-26.155	-26.748	-0.593	(0)
HgNO3+	1.355e-29	9.632e-30	-28.868	-29.016	-0.148	(0)
Hg (NH3) 4+2	4.776e-34	1.219e-34	-33.321	-33.914	-0.593	(0)
Hg (NO3) 2	9.332e-38	9.332e-38	-37.030	-37.030	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.168	-138.316	-0.148	(0)

	HgS2-2	0.000e+00	0.000e+00	-138.345	-138.938	-0.593	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.009	-140.009	0.000	(0)
K		7.622e-03					
	K+	7.206e-03	5.698e-03	-2.142	-2.244	-0.102	(0)
	KSO4-	4.160e-04	3.321e-04	-3.381	-3.479	-0.098	(0)
	KCrO4-	2.566e-16	1.824e-16	-15.591	-15.739	-0.148	(0)
Mg		1.183e-02					
	Mg+2	7.393e-03	2.892e-03	-2.131	-2.539	-0.408	(0)
	MgSO4	4.332e-03	4.332e-03	-2.363	-2.363	0.000	(0)
	MgF+	7.376e-05	5.810e-05	-4.132	-4.236	-0.104	(0)
	MgHCO3+	2.221e-05	1.735e-05	-4.653	-4.761	-0.107	(0)
	MgCO3	8.076e-06	8.076e-06	-5.093	-5.093	0.000	(0)
	MgOH+	1.745e-06	1.414e-06	-5.758	-5.850	-0.091	(0)
	MgH2BO3+	6.588e-07	5.001e-07	-6.181	-6.301	-0.120	(0)
Mn (2)		1.318e-04					
	Mn+2	9.527e-05	2.432e-05	-4.021	-4.614	-0.593	(0)
	MnSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
	MnHCO3+	3.586e-07	2.846e-07	-6.445	-6.546	-0.100	(0)
	MnCl+	2.652e-07	2.105e-07	-6.576	-6.677	-0.100	(0)
	MnF+	2.185e-07	1.734e-07	-6.661	-6.761	-0.100	(0)
	MnOH+	9.453e-08	7.503e-08	-7.024	-7.125	-0.100	(0)
	MnCl2	2.043e-09	2.043e-09	-8.690	-8.690	0.000	(0)
	MnCl3-	4.873e-12	3.868e-12	-11.312	-11.413	-0.100	(0)
	MnSeO4	1.361e-12	1.361e-12	-11.866	-11.866	0.000	(0)
	MnNO3+	1.264e-12	8.986e-13	-11.898	-12.046	-0.148	(0)
	Mn (OH) 3-	8.811e-16	6.993e-16	-15.055	-15.155	-0.100	(0)
	Mn (NO3) 2	5.261e-20	5.261e-20	-19.279	-19.279	0.000	(0)
	Mn (OH) 4-2	6.986e-21	2.773e-21	-20.156	-20.557	-0.401	(0)
	MnSe	0.000e+00	0.000e+00	-40.692	-40.692	0.000	(0)
Mn (3)		4.357e-25					
	Mn+3	4.357e-25	5.270e-26	-24.361	-25.278	-0.917	(0)
Mn (6)		6.322e-40					
	MnO4-2	6.322e-40	2.509e-40	-39.199	-39.600	-0.401	(0)
Mn (7)		0.000e+00					
	MnO4-	0.000e+00	0.000e+00	-44.171	-44.287	-0.115	(0)
Mo		3.855e-06					
	MoO4-2	3.854e-06	1.507e-06	-5.414	-5.822	-0.408	(0)
	HMoO4-	3.455e-10	2.456e-10	-9.462	-9.610	-0.148	(0)
	H2MoO4	1.473e-14	1.473e-14	-13.832	-13.832	0.000	(0)
	Ag2MoO4	5.615e-25	5.615e-25	-24.251	-24.251	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-42.153	-43.487	-1.334	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-47.118	-52.455	-5.337	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.449	-54.155	-3.706	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-55.088	-57.459	-2.372	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-60.966	-62.300	-1.334	(0)
N (-3)		1.850e-07					
	NH4+	1.626e-07	1.234e-07	-6.789	-6.909	-0.120	(0)
	NH4SO4-	1.372e-08	1.089e-08	-7.863	-7.963	-0.100	(0)
	NH3	8.596e-09	8.596e-09	-8.066	-8.066	0.000	(0)
	CaNH3+2	4.180e-11	1.067e-11	-10.379	-10.972	-0.593	(0)
	CuNH3+2	5.427e-12	1.385e-12	-11.265	-11.858	-0.593	(0)
	NiNH3+2	1.351e-12	3.449e-13	-11.869	-12.462	-0.593	(0)
	Co (NH3) +2	1.511e-13	3.858e-14	-12.821	-13.414	-0.593	(0)
	AgNH3+	2.449e-14	1.741e-14	-13.611	-13.759	-0.148	(0)
	BaNH3+2	2.702e-16	6.899e-17	-15.568	-16.161	-0.593	(0)
	Ag (NH3) 2+	1.712e-18	1.217e-18	-17.767	-17.915	-0.148	(0)
	Ni (NH3) 2+2	1.679e-18	4.286e-19	-17.775	-18.368	-0.593	(0)
	Hg (NH3) 2+2	2.044e-19	5.218e-20	-18.690	-19.282	-0.593	(0)
	Ca (NH3) 2+2	1.431e-19	3.652e-20	-18.844	-19.437	-0.593	(0)
	Co (NH3) 2+2	5.541e-20	1.415e-20	-19.256	-19.849	-0.593	(0)
	HgNH3+2	2.378e-20	6.070e-21	-19.624	-20.217	-0.593	(0)
	Hg (NH3) 3+2	6.995e-27	1.786e-27	-26.155	-26.748	-0.593	(0)
	Co (NH3) 3+2	5.997e-27	1.531e-27	-26.222	-26.815	-0.593	(0)
	Hg (NH3) 4+2	4.776e-34	1.219e-34	-33.321	-33.914	-0.593	(0)
	Co (NH3) 4+2	2.705e-34	6.907e-35	-33.568	-34.161	-0.593	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.144	-41.737	-0.593	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-41.413	-42.006	-0.593	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)

Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.930	-51.264	-1.334	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.108	-63.701	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
N (3)	3.222e-05					
NO2-	3.222e-05	2.471e-05	-4.492	-4.607	-0.115	(0)
CuNO2+	5.733e-11	4.075e-11	-10.242	-10.390	-0.148	(0)
CoNO2+	9.143e-12	6.499e-12	-11.039	-11.187	-0.148	(0)
AgNO2	5.121e-12	5.121e-12	-11.291	-11.291	0.000	(0)
Cu (NO2) 2	1.030e-14	1.030e-14	-13.987	-13.987	0.000	(0)
Ag (NO2) 2-	2.757e-16	1.960e-16	-15.560	-15.708	-0.148	(0)
N (5)	2.958e-08					
NO3-	2.948e-08	2.331e-08	-7.531	-7.632	-0.102	(0)
CaNO3+	1.023e-10	7.269e-11	-9.990	-10.139	-0.148	(0)
MnNO3+	1.264e-12	8.986e-13	-11.898	-12.046	-0.148	(0)
ZnNO3+	2.013e-13	1.431e-13	-12.696	-12.844	-0.148	(0)
NiNO3+	6.155e-15	4.375e-15	-14.211	-14.359	-0.148	(0)
BaNO3+	2.090e-15	1.486e-15	-14.680	-14.828	-0.148	(0)
CoNO3+	1.940e-15	1.379e-15	-14.712	-14.860	-0.148	(0)
CuNO3+	1.633e-15	1.161e-15	-14.787	-14.935	-0.148	(0)
CdNO3+	4.542e-16	3.228e-16	-15.343	-15.491	-0.148	(0)
PbNO3+	7.719e-17	5.487e-17	-16.112	-16.261	-0.148	(0)
AgNO3	1.837e-17	1.837e-17	-16.736	-16.736	0.000	(0)
Mn (NO3) 2	5.261e-20	5.261e-20	-19.279	-19.279	0.000	(0)
UO2NO3+	8.935e-22	6.351e-22	-21.049	-21.197	-0.148	(0)
Zn (NO3) 2	6.655e-22	6.655e-22	-21.177	-21.177	0.000	(0)
Co (NO3) 2	6.540e-23	6.540e-23	-22.184	-22.184	0.000	(0)
Cd (NO3) 2	3.772e-24	3.772e-24	-23.423	-23.423	0.000	(0)
Cu (NO3) 2	3.407e-24	3.407e-24	-23.468	-23.468	0.000	(0)
Pb (NO3) 2	2.172e-24	2.172e-24	-23.663	-23.663	0.000	(0)
CrNO3+2	5.389e-25	1.376e-25	-24.268	-24.861	-0.593	(0)
VO2NO3	1.081e-25	1.081e-25	-24.966	-24.966	0.000	(0)
FeNO3+2	7.813e-28	1.995e-28	-27.107	-27.700	-0.593	(0)
HgNO3+	1.355e-29	9.632e-30	-28.868	-29.016	-0.148	(0)
Hg (NO3) 2	9.332e-38	9.332e-38	-37.030	-37.030	0.000	(0)
Na	2.719e-02					
Na+	2.604e-02	2.059e-02	-1.584	-1.686	-0.102	(0)
NaSO4-	1.140e-03	9.103e-04	-2.943	-3.041	-0.098	(0)
NaHCO3	6.790e-06	6.790e-06	-5.168	-5.168	0.000	(0)
NaF	2.326e-06	2.326e-06	-5.633	-5.633	0.000	(0)
NaCO3-	1.613e-06	1.287e-06	-5.792	-5.890	-0.098	(0)
NaH2BO3	1.628e-07	1.628e-07	-6.788	-6.788	0.000	(0)
NaCrO4-	1.240e-15	8.816e-16	-14.907	-15.055	-0.148	(0)
Ni	3.349e-07					
Ni+2	1.911e-07	7.472e-08	-6.719	-7.127	-0.408	(0)
NiSO4	1.227e-07	1.227e-07	-6.911	-6.911	0.000	(0)
NiCO3	9.360e-09	9.360e-09	-8.029	-8.029	0.000	(0)
NiHCO3+	7.600e-09	5.402e-09	-8.119	-8.267	-0.148	(0)
NiCl+	1.849e-09	1.314e-09	-8.733	-8.881	-0.148	(0)
NiOH+	1.625e-09	1.155e-09	-8.789	-8.937	-0.148	(0)
NiF+	4.728e-10	3.361e-10	-9.325	-9.474	-0.148	(0)
Ni (SO4) 2-2	1.311e-10	3.346e-11	-9.883	-10.475	-0.593	(0)
Ni (OH) 2	1.127e-10	1.127e-10	-9.948	-9.948	0.000	(0)
NiNH3+2	1.351e-12	3.449e-13	-11.869	-12.462	-0.593	(0)
Ni (OH) 3-	1.947e-13	1.384e-13	-12.711	-12.859	-0.148	(0)
NiCl2	4.547e-14	4.547e-14	-13.342	-13.342	0.000	(0)
NiSeO4	7.264e-15	7.264e-15	-14.139	-14.139	0.000	(0)
NiNO3+	6.155e-15	4.375e-15	-14.211	-14.359	-0.148	(0)
Ni (NH3) 2+2	1.679e-18	4.286e-19	-17.775	-18.368	-0.593	(0)
O (0)	2.437e-35					
O2	1.219e-35	1.243e-35	-34.914	-34.906	0.008	(0)
Pb	3.706e-09					
PbCO3	1.606e-09	1.606e-09	-8.794	-8.794	0.000	(0)
PbOH+	6.906e-10	4.909e-10	-9.161	-9.309	-0.148	(0)
PbSO4	6.417e-10	6.417e-10	-9.193	-9.193	0.000	(0)
Pb+2	4.069e-10	1.591e-10	-9.390	-9.798	-0.408	(0)
Pb (SO4) 2-2	1.247e-10	3.183e-11	-9.904	-10.497	-0.593	(0)

PbHCO3+	9.755e-11	6.934e-11	-10.011	-10.159	-0.148	(0)
Pb (CO3) 2-2	6.093e-11	1.556e-11	-10.215	-10.808	-0.593	(0)
PbCl+	5.460e-11	3.881e-11	-10.263	-10.411	-0.148	(0)
Pb (OH) 2	1.906e-11	1.906e-11	-10.720	-10.720	0.000	(0)
PbF+	2.825e-12	2.008e-12	-11.549	-11.697	-0.148	(0)
PbCl2	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
Pb (OH) 3-	3.294e-14	2.341e-14	-13.482	-13.631	-0.148	(0)
PbF2	7.077e-15	7.077e-15	-14.150	-14.150	0.000	(0)
PbCl3-	4.587e-15	3.260e-15	-14.339	-14.487	-0.148	(0)
PbNO3+	7.719e-17	5.487e-17	-16.112	-16.261	-0.148	(0)
PbCl4-2	4.012e-17	1.024e-17	-16.397	-16.990	-0.593	(0)
Pb (OH) 4-2	2.758e-17	7.042e-18	-16.559	-17.152	-0.593	(0)
Pb2OH+3	2.673e-17	1.238e-18	-16.573	-17.907	-1.334	(0)
PbF3-	3.381e-18	2.404e-18	-17.471	-17.619	-0.148	(0)
Pb3 (OH) 4+2	4.520e-21	1.154e-21	-20.345	-20.938	-0.593	(0)
PbF4-2	8.069e-22	2.060e-22	-21.093	-21.686	-0.593	(0)
Pb (NO3) 2	2.172e-24	2.172e-24	-23.663	-23.663	0.000	(0)
Pb4 (OH) 4+4	3.434e-25	1.459e-27	-24.464	-26.836	-2.372	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.908	-151.908	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.150	-229.298	-0.148	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.879	-73.879	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.542	-78.690	-0.148	(0)
CdHS+	0.000e+00	0.000e+00	-78.892	-79.041	-0.148	(0)
S5-2	0.000e+00	0.000e+00	-79.375	-79.968	-0.593	(0)
H2S	0.000e+00	0.000e+00	-79.757	-79.757	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.891	-80.484	-0.593	(0)
S4-2	0.000e+00	0.000e+00	-79.971	-80.564	-0.593	(0)
S3-2	0.000e+00	0.000e+00	-80.777	-81.370	-0.593	(0)
S2-2	0.000e+00	0.000e+00	-81.793	-82.386	-0.593	(0)
S-2	0.000e+00	0.000e+00	-87.502	-87.903	-0.401	(0)
HgHS2-	0.000e+00	0.000e+00	-138.168	-138.316	-0.148	(0)
HgS2-2	0.000e+00	0.000e+00	-138.345	-138.938	-0.593	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.009	-140.009	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.198	-147.615	-0.417	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.622	-147.866	-0.244	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.947	-148.095	-0.148	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.951	-148.345	-0.394	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.321	-148.469	-0.148	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.789	-149.219	-0.430	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.125	-149.530	-0.405	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.172	-150.172	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.527	-150.527	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.908	-151.908	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.152	-161.152	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.826	-217.974	-0.148	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.434	-225.582	-0.148	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.882	-227.475	-0.593	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.169	-227.317	-0.148	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.150	-229.298	-0.148	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.656	-237.805	-0.148	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.218	-303.811	-0.593	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.139	-305.732	-0.593	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.212	-320.805	-0.593	(0)
S (6)	2.884e-02					
SO4-2	2.105e-02	8.233e-03	-1.677	-2.084	-0.408	(0)
MgSO4	4.332e-03	4.332e-03	-2.363	-2.363	0.000	(0)
CaSO4	1.860e-03	1.860e-03	-2.730	-2.730	0.000	(0)
NaSO4-	1.140e-03	9.103e-04	-2.943	-3.041	-0.098	(0)
KSO4-	4.160e-04	3.321e-04	-3.381	-3.479	-0.098	(0)
MnSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
ZnSO4	4.402e-06	4.402e-06	-5.356	-5.356	0.000	(0)
Zn (SO4) 2-2	1.236e-06	3.156e-07	-5.908	-6.501	-0.593	(0)
NiSO4	1.227e-07	1.227e-07	-6.911	-6.911	0.000	(0)
CoSO4	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
CuSO4	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
NH4SO4-	1.372e-08	1.089e-08	-7.863	-7.963	-0.100	(0)
CdSO4	8.453e-09	8.453e-09	-8.073	-8.073	0.000	(0)

HSO4-	8.364e-09	6.588e-09	-8.078	-8.181	-0.104	(0)
Cd(SO4) 2-2	3.677e-09	9.387e-10	-8.435	-9.027	-0.593	(0)
PbSO4	6.417e-10	6.417e-10	-9.193	-9.193	0.000	(0)
AgSO4-	2.293e-10	1.630e-10	-9.640	-9.788	-0.148	(0)
Ni(SO4) 2-2	1.311e-10	3.346e-11	-9.883	-10.475	-0.593	(0)
Pb(SO4) 2-2	1.247e-10	3.183e-11	-9.904	-10.497	-0.593	(0)
CrOHSO4	7.088e-12	7.088e-12	-11.150	-11.150	0.000	(0)
FeSO4	3.838e-13	3.838e-13	-12.416	-12.416	0.000	(0)
UO2SO4	1.702e-13	1.702e-13	-12.769	-12.769	0.000	(0)
AlSO4+	7.571e-14	5.963e-14	-13.121	-13.225	-0.104	(0)
UO2(SO4) 2-2	7.233e-14	1.847e-14	-13.141	-13.734	-0.593	(0)
Al(SO4) 2-	6.679e-15	5.260e-15	-14.175	-14.279	-0.104	(0)
CrSO4+	3.652e-15	2.596e-15	-14.437	-14.586	-0.148	(0)
VO2SO4-	2.535e-18	1.802e-18	-17.596	-17.744	-0.148	(0)
FeSO4+	9.959e-20	7.905e-20	-19.002	-19.102	-0.100	(0)
Fe(SO4) 2-	1.957e-20	1.391e-20	-19.708	-19.857	-0.148	(0)
Cr2(OH) 2SO4+2	9.103e-21	2.324e-21	-20.041	-20.634	-0.593	(0)
HgSO4	2.412e-21	2.412e-21	-20.618	-20.618	0.000	(0)
VOSO4	2.301e-21	2.301e-21	-20.638	-20.638	0.000	(0)
Cr2(OH) 2(SO4) 2	1.137e-21	1.137e-21	-20.944	-20.944	0.000	(0)
CrO3SO4-2	1.838e-23	4.694e-24	-22.736	-23.329	-0.593	(0)
VS04+	3.813e-36	2.710e-36	-35.419	-35.567	-0.148	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.035	-40.035	0.000	(0)
UO4+2	0.000e+00	0.000e+00	-41.258	-41.851	-0.593	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Sb(3)	4.618e-20					
Sb(OH) 3	2.335e-20	2.335e-20	-19.632	-19.632	0.000	(0)
HSbO2	2.282e-20	2.282e-20	-19.642	-19.642	0.000	(0)
SbO2-	6.351e-24	4.514e-24	-23.197	-23.345	-0.148	(0)
Sb(OH) 4-	3.629e-24	2.580e-24	-23.440	-23.588	-0.148	(0)
Sb(OH) 2F	5.355e-26	5.355e-26	-25.271	-25.271	0.000	(0)
SbOF	5.273e-26	5.273e-26	-25.278	-25.278	0.000	(0)
Sb(OH) 2+	6.540e-27	4.649e-27	-26.184	-26.333	-0.148	(0)
SbO+	2.258e-27	1.605e-27	-26.646	-26.795	-0.148	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.212	-320.805	-0.593	(0)
Sb(5)	5.902e-08					
SbO3-	5.896e-08	4.191e-08	-7.229	-7.378	-0.148	(0)
Sb(OH) 6-	6.173e-11	4.882e-11	-10.209	-10.311	-0.102	(0)
SbO2+	1.135e-24	8.070e-25	-23.945	-24.093	-0.148	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.335e-39	1.660e-39	-38.632	-38.780	-0.148	(0)
MnSe	0.000e+00	0.000e+00	-40.692	-40.692	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.977	-42.977	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.100	-45.693	-0.593	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-80.441	-82.812	-2.372	(0)
Se(4)	3.267e-07					
SeO3-2	1.879e-07	4.798e-08	-6.726	-7.319	-0.593	(0)
HSeO3-	1.388e-07	9.868e-08	-6.858	-7.006	-0.148	(0)
H2SeO3	3.447e-13	3.447e-13	-12.463	-12.463	0.000	(0)
AgSeO3-	4.303e-14	3.059e-14	-13.366	-13.514	-0.148	(0)
Cd(SeO3) 2-2	3.254e-17	8.309e-18	-16.488	-17.080	-0.593	(0)
Ag(SeO3) 2-3	2.836e-19	1.314e-20	-18.547	-19.881	-1.334	(0)
FeHSeO3+2	8.740e-25	2.231e-25	-24.059	-24.651	-0.593	(0)
Se(6)	5.329e-10					
SeO4-2	5.314e-10	2.078e-10	-9.275	-9.682	-0.408	(0)
MnSeO4	1.361e-12	1.361e-12	-11.866	-11.866	0.000	(0)
ZnSeO4	7.867e-14	7.867e-14	-13.104	-13.104	0.000	(0)
NiSeO4	7.264e-15	7.264e-15	-14.139	-14.139	0.000	(0)
CoSeO4	3.888e-15	3.888e-15	-14.410	-14.410	0.000	(0)
CdSeO4	1.695e-16	1.695e-16	-15.771	-15.771	0.000	(0)
HSeO4-	1.200e-16	8.529e-17	-15.921	-16.069	-0.148	(0)
Zn(SeO4) 2-2	6.494e-23	1.658e-23	-22.187	-22.780	-0.593	(0)
Si	4.462e-05					
H4SiO4	4.362e-05	4.448e-05	-4.360	-4.352	0.008	(0)
H3SiO4-	1.005e-06	7.852e-07	-5.998	-6.105	-0.107	(0)
H2SiO4-2	1.489e-11	6.050e-12	-10.827	-11.218	-0.391	(0)
UO2H3SiO4+	1.281e-12	9.102e-13	-11.893	-12.041	-0.148	(0)

SiF6-2	2.528e-29	1.003e-29	-28.597	-28.999	-0.401	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.514	-59.848	-1.334	(0)
U (4)	1.239e-19					
U (OH) 5-	1.238e-19	8.803e-20	-18.907	-19.055	-0.148	(0)
U (OH) 4	3.023e-23	3.023e-23	-22.520	-22.520	0.000	(0)
U (OH) 3+	1.275e-27	9.062e-28	-26.895	-27.043	-0.148	(0)
U (OH) 2+2	1.346e-32	3.435e-33	-31.871	-32.464	-0.593	(0)
UF3+	1.383e-36	9.831e-37	-35.859	-36.007	-0.148	(0)
UF2+2	1.357e-37	3.464e-38	-36.867	-37.460	-0.593	(0)
UOH+3	2.863e-38	1.327e-39	-37.543	-38.877	-1.334	(0)
UF4	1.930e-38	1.930e-38	-37.714	-37.714	0.000	(0)
UF+3	3.317e-40	0.000e+00	-39.479	-40.813	-1.334	(0)
UF5-	1.927e-40	1.370e-40	-39.715	-39.863	-0.148	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.035	-40.035	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.537	-41.130	-0.593	(0)
USO4+2	0.000e+00	0.000e+00	-41.258	-41.851	-0.593	(0)
U+4	0.000e+00	0.000e+00	-43.995	-46.366	-2.372	(0)
UCl+3	0.000e+00	0.000e+00	-45.495	-46.829	-1.334	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-162.053	-174.060	-12.007	(0)
U (5)	2.414e-16					
UO2+	2.414e-16	1.716e-16	-15.617	-15.766	-0.148	(0)
U (6)	5.325e-07					
UO2 (CO3) 3-4	4.844e-07	2.058e-09	-6.315	-8.687	-2.372	(0)
UO2 (CO3) 2-2	4.790e-08	1.223e-08	-7.320	-7.913	-0.593	(0)
UO2CO3	1.825e-10	1.825e-10	-9.739	-9.739	0.000	(0)
UO2OH+	2.970e-12	2.111e-12	-11.527	-11.675	-0.148	(0)
UO2H3SiO4+	1.281e-12	9.102e-13	-11.893	-12.041	-0.148	(0)
UO2F+	4.748e-13	3.375e-13	-12.323	-12.472	-0.148	(0)
UO2F2	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
UO2SO4	1.702e-13	1.702e-13	-12.769	-12.769	0.000	(0)
UO2 (SO4) 2-2	7.233e-14	1.847e-14	-13.141	-13.734	-0.593	(0)
UO2+2	3.491e-14	1.365e-14	-13.457	-13.865	-0.408	(0)
UO2F3-	1.103e-14	7.841e-15	-13.957	-14.106	-0.148	(0)
UO2Cl+	2.141e-16	1.522e-16	-15.669	-15.818	-0.148	(0)
UO2F4-2	4.368e-17	1.115e-17	-16.360	-16.953	-0.593	(0)
(UO2) 2 (OH) 2+2	2.897e-17	7.396e-18	-16.538	-17.131	-0.593	(0)
(UO2) 3 (OH) 5+	2.513e-17	1.786e-17	-16.600	-16.748	-0.148	(0)
UO2NO3+	8.935e-22	6.351e-22	-21.049	-21.197	-0.148	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.405	-43.553	-0.148	(0)
V+2	0.000e+00	0.000e+00	-44.559	-45.152	-0.593	(0)
V (3)	1.042e-15					
V (OH) 3	1.042e-15	1.042e-15	-14.982	-14.982	0.000	(0)
V (OH) 2+	7.765e-27	5.520e-27	-26.110	-26.258	-0.148	(0)
VOH+2	1.681e-30	4.292e-31	-29.774	-30.367	-0.593	(0)
V+3	1.505e-35	6.974e-37	-34.822	-36.157	-1.334	(0)
VSO4+	3.813e-36	2.710e-36	-35.419	-35.567	-0.148	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-56.839	-58.173	-1.334	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-57.563	-59.935	-2.372	(0)
V (4)	3.572e-19					
V (OH) 3+	3.493e-19	2.483e-19	-18.457	-18.605	-0.148	(0)
VO+2	3.975e-21	1.015e-21	-20.401	-20.994	-0.593	(0)
VOSO4	2.301e-21	2.301e-21	-20.638	-20.638	0.000	(0)
VOF+	1.533e-21	1.090e-21	-20.814	-20.963	-0.148	(0)
VOF2	7.318e-23	7.318e-23	-22.136	-22.136	0.000	(0)
VOC1+	2.753e-23	1.957e-23	-22.560	-22.708	-0.148	(0)
VOF3-	6.541e-25	4.650e-25	-24.184	-24.333	-0.148	(0)
VOF4-2	1.316e-27	3.361e-28	-26.881	-27.474	-0.593	(0)
H2V2O4+2	1.214e-32	3.098e-33	-31.916	-32.509	-0.593	(0)
V (5)	1.783e-08					
H2VO4-	9.614e-09	6.834e-09	-8.017	-8.165	-0.148	(0)
HVO4-2	8.212e-09	2.096e-09	-8.086	-8.679	-0.593	(0)
H3VO4	5.596e-13	5.596e-13	-12.252	-12.252	0.000	(0)
HV2O7-3	1.049e-13	4.861e-15	-12.979	-14.313	-1.334	(0)
H3V2O7-	3.478e-14	2.472e-14	-13.459	-13.607	-0.148	(0)
VO4-3	2.770e-14	1.283e-15	-13.558	-14.892	-1.334	(0)
V2O7-4	3.762e-15	1.598e-17	-14.425	-16.796	-2.372	(0)

VO2+	1.159e-17	9.167e-18	-16.936	-17.038	-0.102	(0)
V3O9-3	7.243e-18	3.356e-19	-17.140	-18.474	-1.334	(0)
VO2F	2.879e-18	2.879e-18	-17.541	-17.541	0.000	(0)
VO2SO4-	2.535e-18	1.802e-18	-17.596	-17.744	-0.148	(0)
VO2F2-	2.633e-19	1.872e-19	-18.579	-18.728	-0.148	(0)
VO2F3-2	1.638e-21	4.181e-22	-20.786	-21.379	-0.593	(0)
V4O12-4	2.254e-22	9.574e-25	-21.647	-24.019	-2.372	(0)
VO2F4-3	7.951e-25	3.684e-26	-24.100	-25.434	-1.334	(0)
VO2NO3	1.081e-25	1.081e-25	-24.966	-24.966	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.751	-65.088	-5.337	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.282	-64.988	-3.706	(0)
H2V10O28-4	0.000e+00	0.000e+00	-65.495	-67.867	-2.372	(0)
Zn	1.304e-05					
Zn+2	6.249e-06	2.444e-06	-5.204	-5.612	-0.408	(0)
ZnSO4	4.402e-06	4.402e-06	-5.356	-5.356	0.000	(0)
Zn(SO4) 2-2	1.236e-06	3.156e-07	-5.908	-6.501	-0.593	(0)
ZnCO3	4.722e-07	4.722e-07	-6.326	-6.326	0.000	(0)
ZnOH+	4.222e-07	3.001e-07	-6.374	-6.523	-0.148	(0)
ZnOHCl	6.784e-08	6.784e-08	-7.169	-7.169	0.000	(0)
ZnHCO3+	6.376e-08	4.532e-08	-7.195	-7.344	-0.148	(0)
Zn(OH) 2	5.841e-08	5.841e-08	-7.233	-7.233	0.000	(0)
ZnCl+	5.401e-08	4.219e-08	-7.267	-7.375	-0.107	(0)
ZnF+	1.228e-08	8.732e-09	-7.911	-8.059	-0.148	(0)
Zn(OH) 3-	5.058e-10	3.595e-10	-9.296	-9.444	-0.148	(0)
ZnCl2	4.596e-10	4.596e-10	-9.338	-9.338	0.000	(0)
ZnCl3-	3.212e-12	2.509e-12	-11.493	-11.600	-0.107	(0)
ZnNO3+	2.013e-13	1.431e-13	-12.696	-12.844	-0.148	(0)
ZnSeO4	7.867e-14	7.867e-14	-13.104	-13.104	0.000	(0)
Zn(OH) 4-2	6.885e-14	1.758e-14	-13.162	-13.755	-0.593	(0)
ZnCl4-2	2.173e-14	8.624e-15	-13.663	-14.064	-0.401	(0)
Zn(NO3) 2	6.655e-22	6.655e-22	-21.177	-21.177	0.000	(0)
Zn(SeO4) 2-2	6.494e-23	1.658e-23	-22.187	-22.780	-0.593	(0)
ZnS(HS) -	0.000e+00	0.000e+00	-147.947	-148.095	-0.148	(0)
Zn(HS) 2	0.000e+00	0.000e+00	-150.172	-150.172	0.000	(0)
Zn(HS) 3-	0.000e+00	0.000e+00	-225.434	-225.582	-0.148	(0)
ZnS(HS) 2-2	0.000e+00	0.000e+00	-226.882	-227.475	-0.593	(0)
Zn(HS) 4-2	0.000e+00	0.000e+00	-305.139	-305.732	-0.593	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)	
(Co(NH3)5Cl)(NO3) 2	-52.97	-46.68	6.29	(Co(NH3)5Cl)(NO3) 2	
(Co(NH3)5Cl)Cl2	-40.25	-35.74	4.51	(Co(NH3)5Cl)Cl2	
(Co(NH3)5OH2)Cl3	-47.47	-35.74	11.74	(Co(NH3)5OH2)Cl3	
(Co(NH3)6)(NO3) 3	-68.90	-50.97	17.93	(Co(NH3)6)(NO3) 3	
(Co(NH3)6)Cl3	-54.59	-34.56	20.03	(Co(NH3)6)Cl3	
(NH4)2CrO4	-28.29	-27.88	0.40	(NH4)2CrO4	
(NH4)2SeO4	-23.95	-23.50	0.45	(NH4)2SeO4	
Acanthite	-52.39	-88.61	-36.22	Ag2S	
Ag2CO3	-12.39	-23.48	-11.09	Ag2CO3	
Ag2CrO4	-20.48	-32.07	-11.59	Ag2CrO4	
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4	
Ag2MoO4	-12.28	-23.83	-11.55	Ag2MoO4	
Ag2O	-14.41	-1.83	12.57	Ag2O	
Ag2Se	-0.00	-48.70	-48.70	Ag2Se	
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3	
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4	
Ag2SO4	-15.27	-20.09	-4.82	Ag2SO4	
Ag3AsO3	-28.43	-26.27	2.16	Ag3AsO3	
Ag3AsO4	-16.84	-19.62	-2.79	Ag3AsO4	
Ag3H2VO5	-16.88	-11.70	5.18	Ag3H2VO5	
AgF·4H2O	-13.80	-12.75	1.05	AgF·4H2O	
Agmetal	-0.18	-13.69	-13.51	Ag	
AgVO3	-10.64	-9.87	0.77	AgVO3	
Al(OH) 3 (am)	-1.57	9.23	10.80	Al(OH) 3	
Al2(MoO4) 3	-49.89	-47.53	2.37	Al2(MoO4) 3	
Al2O3	-1.19	18.46	19.65	Al2O3	

Al4(OH)10SO4	-4.04	18.66	22.70	Al4(OH)10SO4
AlAsO4:2H2O	-12.44	-7.64	4.80	AlAsO4:2H2O
AlOHSO4	-5.80	-9.03	-3.23	AlOHSO4
AlSb	-152.66	-87.04	65.62	AlSb
Alunite	-1.59	-2.99	-1.40	KAl3(SO4)2(OH)6
Anglesite	-4.09	-11.88	-7.79	PbSO4
Anhydrite	-0.73	-5.09	-4.36	CaSO4
Anilite	-55.37	-87.25	-31.88	Cu0.25Cu1.5S
Antlerite	-1.94	6.85	8.79	Cu3(OH)4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-91.31	-94.07	-2.76	As4O6
Artinite	-3.98	5.62	9.60	MgCO3:Mg(OH)2:3H2O
As2O5	-40.45	-33.74	6.71	As2O5
Atacamite	-0.90	6.49	7.39	Cu2(OH)3Cl
Azurite	-1.28	-18.18	-16.91	Cu3(OH)2(CO3)2
Ba(OH)2:8H2O	-16.12	8.27	24.39	Ba(OH)2:8H2O
Ba2V2O7:2H2O	-17.22	-1.35	15.87	Ba2V2O7:2H2O
Ba3(AsO4)2	0.00	-8.91	-8.91	Ba3(AsO4)2
Ba3(VO4)2:4H2O	-26.01	6.93	32.94	Ba3(VO4)2:4H2O
BaCrO4	-12.29	-21.96	-9.67	BaCrO4
BaF2	-9.57	-15.39	-5.82	BaF2
BaMoO4	-6.76	-13.72	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.64	-6.81	1.83	BaSeO3
BaSeO4	-10.12	-17.58	-7.46	BaSeO4
Bianchite	-5.94	-7.70	-1.76	ZnSO4:6H2O
Birnessite	-6.34	11.75	18.09	MnO2
Bixbyite	-1.39	-2.04	-0.64	Mn2O3
BlaubleiI	-55.42	-79.59	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.84	-83.12	-27.28	Cu0.6Cu0.8S
Boehmite	0.65	9.23	8.58	AlOOH
Breithauptite	-55.92	-74.45	-18.52	NiSb
Brochantite	-0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.21	13.63	16.84	Mg(OH)2
Bunsenite	-3.40	9.05	12.45	NiO
Ca(VO3)2	-10.40	-4.74	5.66	Ca(VO3)2
Ca2V2O7	-9.07	8.43	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.12	8.43	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.54	5.76	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.36	21.60	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.26	21.60	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.00	-153.03	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-6.89	-24.80	-17.91	Hg2Cl2
CaMoO4	-0.88	-8.83	-7.95	CaMoO4
Carnotite	-1.03	-0.80	0.23	KUO2VO4
CaSeO3:2H2O	-4.74	-1.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.67	-12.69	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.33	-0.49	9.84	Cd(BO2)2
Cd(OH)2	-5.83	7.81	13.64	Cd(OH)2
Cd(OH)2(am)	-5.92	7.81	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-19.78	-13.07	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.38	5.18	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.40	13.00	28.40	Cd4(OH)6SO4
CdCl2	-12.03	-12.68	-0.66	CdCl2
CdCl2:1H2O	-10.99	-12.68	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.77	-12.69	-1.91	CdCl2:2.5H2O
CdF2	-14.64	-15.85	-1.21	CdF2
Cdmetal(alpha)	-31.24	-17.73	13.51	Cd
Cdmetal(gamma)	-31.35	-17.73	13.62	Cd
CdMoO4	-0.03	-14.18	-14.15	CdMoO4
CdOHCl	-5.97	-2.44	3.54	CdOHCl
CdSb	-75.33	-75.68	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4:2H2O	-16.19	-18.04	-1.85	CdSeO4:2H2O
CdSO4	-10.27	-10.44	-0.17	CdSO4

CdSO4:1H2O	-8.72	-10.44	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.57	-10.44	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.42	-11.17	-9.75	AgCl
Cerrusite	-2.14	-15.27	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.25	-9.89	-2.64	CuSO4:5H2O
Chalcedony	-0.80	-4.35	-3.55	SiO2
Chalcocite	-55.28	-90.20	-34.92	Cu2S
Chalcopyrite	-126.46	-161.73	-35.27	CuFeS2
Chrysotile	-0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.05	-97.75	-45.69	HgS
Claudetite	-91.01	-94.07	-3.06	As4O6
Clausthalite	-13.39	-40.49	-27.10	PbSe
Co(BO2)2	-26.63	0.44	27.07	Co(BO2)2
Co(OH)2	-4.35	8.74	13.09	Co(OH)2
Co(OH)3	-8.57	-10.88	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.54	-7.51	13.03	Co3(AsO4)2
Co3O4	-2.52	-13.02	-10.50	Co3O4
CoCl2	-20.02	-11.75	8.27	CoCl2
CoCl2:6H2O	-14.29	-11.76	2.54	CoCl2:6H2O
CoCO3	-2.92	-12.90	-9.98	CoCO3
CoF2	-13.33	-14.92	-1.60	CoF2
CoF3	-44.92	-46.38	-1.46	CoF3
CoFe2O4	18.66	15.13	-3.53	CoFe2O4
CoMoO4	-5.49	-13.25	-7.76	CoMoO4
CoO	-4.84	8.75	13.59	CoO
CoS(alpha)	-70.59	-78.03	-7.44	CoS
CoS(beta)	-66.96	-78.03	-11.07	CoS
CoSe	-21.92	-38.12	-16.20	CoSe
CoSeO3	-7.67	-6.35	1.32	CoSeO3
CoSeO4:6H2O	-15.58	-17.11	-1.53	CoSeO4:6H2O
CoSO4	-12.31	-9.51	2.80	CoSO4
CoSO4:6H2O	-7.04	-9.52	-2.47	CoSO4:6H2O
Cotunnite	-9.34	-14.12	-4.78	PbCl2
Covellite	-56.11	-78.41	-22.30	CuS
Cr(OH)2	-21.82	-11.00	10.82	Cr(OH)2
Cr(OH)3	-2.52	-1.18	1.34	Cr(OH)3
Cr(OH)3(am)	-0.43	-1.18	-0.75	Cr(OH)3
Cr2O3	-0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.59	-31.50	14.09	CrCl2
CrCl3	-47.04	-31.93	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Cristobalite	-1.00	-4.35	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.73	-42.57	-33.84	Na3AlF6
Cu(OH)2	-0.30	8.37	8.67	Cu(OH)2
Cu(SbO3)2	-25.01	20.20	45.21	Cu(SbO3)2
Cu2(OH)3NO3	-8.23	1.02	9.25	Cu2(OH)3NO3
Cu2Sb:3H2O	-54.73	-89.61	-34.88	Cu2Sb:3H2O
Cu2Se(alpha)	-4.49	-50.29	-45.80	Cu2Se
Cu2SO4	-19.73	-21.68	-1.95	Cu2SO4
Cu3(AsO4)2:2H2O	-14.73	-8.63	6.10	Cu3(AsO4)2:2H2O
Cu3Sb	-58.81	-101.40	-42.59	Cu3Sb
Cu3Se2	-25.29	-88.79	-63.49	Cu3Se2
CuCO3	-1.78	-13.28	-11.50	CuCO3
CuCrO4	-16.43	-21.87	-5.44	CuCrO4
CuF	-8.64	-13.55	-4.91	CuF
CuF2	-16.41	-15.30	1.12	CuF2
CuF2:2H2O	-10.75	-15.30	-4.55	CuF2:2H2O
Cumetal	-5.73	-14.48	-8.76	Cu
CuMoO4	-0.55	-13.62	-13.08	CuMoO4
CuOCuSO4	-11.82	-1.52	10.30	CuOCuSO4
Cupricferrite	8.77	14.75	5.99	CuFe2O4
Cuprite	-2.02	-3.42	-1.41	Cu2O
Cuprousferrite	10.40	1.48	-8.92	CuFeO2
CuSe	-5.40	-38.50	-33.10	CuSe

CuSe2	-26.45	-59.82	-33.37	CuSe2
CuSeO3:2H2O	-7.23	-6.72	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.05	-17.49	-2.44	CuSeO4:5H2O
CuSO4	-12.83	-9.89	2.94	CuSO4
Diaspore	2.36	9.23	6.87	AlOOH
Djurleite	-55.50	-89.42	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.05	-16.49	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.60	-16.49	-17.09	CaMg(CO3)2
Epsomite	-2.50	-4.63	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.16	0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.73	-14.45	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.26	-8.71	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.27	-38.89	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-44.65	-48.39	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.08	-13.68	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.45	-18.54	-10.09	FeMoO4
Ferrihydrite	-0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.14	-64.74	-18.60	FeSe2
FeS(ppt)	-80.37	-83.32	-2.95	FeS
FeSe	-32.41	-43.41	-11.00	FeSe
Fix_pe	-4.69	-4.69	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.43	-80.40	-13.97	PbS
Gibbsite	0.94	9.23	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.69	-7.70	-2.01	ZnSO4:7H2O
Greenalite	-19.16	1.65	20.81	Fe3Si2O5(OH)4
Greenockite	-64.60	-78.96	-14.36	CdS
Greigite	-292.23	-337.27	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-0.48	-5.09	-4.61	CaSO4:2H2O
H-Jarosite	-14.84	-26.94	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.12	-22.00	-12.88	H2MoO4
H2S(g)	-78.77	-86.78	-8.01	H2S
H2Se(g)	-41.91	-46.87	-4.96	H2Se
Halite	-5.45	-3.85	1.60	NaCl
Halloysite	0.18	9.76	9.57	Al2Si2O5(OH)4
Hausmannite	-0.81	60.22	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.98	21.91	22.89	FeAl2O4
Hg(CH3)2(g)	-184.92	-258.63	-73.71	Hg(CH3)2
Hg(g)	-7.05	-14.92	-7.87	Hg
Hg(OH)2	-7.48	-10.97	-3.50	Hg(OH)2
Hg2(g)	-14.89	-29.85	-14.96	Hg2
Hg2(OH)2	-9.56	-4.30	5.26	Hg2(OH)2
Hg2CO3	-9.90	-25.95	-16.05	Hg2CO3
Hg2CrO4	-25.84	-34.54	-8.70	Hg2CrO4
Hg2F2	-17.61	-27.97	-10.36	Hg2F2
Hg2S	-79.40	-91.08	-11.68	Hg2S
Hg2SeO3	-14.74	-19.40	-4.66	Hg2SeO3
Hg2SO4	-16.43	-22.56	-6.13	Hg2SO4
Hg3O2CO3	-24.88	-54.56	-29.68	Hg3O2CO3
HgCl(g)	-31.90	-12.40	19.50	HgCl
HgCl2	-10.21	-31.47	-21.26	HgCl2
HgF(g)	-46.66	-13.99	32.68	HgF
HgF2(g)	-47.20	-34.64	12.57	HgF2
Hgmetal(l)	-1.47	-14.92	-13.45	Hg
HgSe	-2.14	-57.84	-55.69	HgSe
HgSeO3	-13.63	-26.06	-12.43	HgSeO3
HgSO4	-19.81	-29.23	-9.42	HgSO4
Huntite	-2.55	-32.52	-29.97	CaMg3(CO3)4
Hydrocerrusite	-5.40	-24.17	-18.77	Pb3(OH)2(CO3)2
Hydromagnesite	-9.65	-18.42	-8.77	Mg5(CO3)4(OH)2:4H2O
K-Alum	-16.28	-21.45	-5.17	KAl(SO4)2:12H2O
K-Jarosite	-6.30	-21.10	-14.80	KFe3(SO4)2(OH)6

K2Cr2O7	-31.55	-48.79	-17.24	K2Cr2O7
K2CrO4	-18.04	-18.55	-0.51	K2CrO4
K2MoO4	-13.57	-10.31	3.26	K2MoO4
K2SeO4	-13.44	-14.17	-0.73	K2SeO4
Kaolinite	2.32	9.76	7.43	Al2Si2O5(OH)4
Langite	-2.27	15.22	17.49	Cu4(OH)6SO4·H2O
Larnakite	-5.07	-5.51	-0.43	PbO:PbSO4
Laurionite	-4.50	-3.87	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.32	6.37	12.69	PbO
Mackinawite	-79.72	-83.32	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.16	20.02	16.86	Fe2MgO4
Magnesite	-0.55	-8.01	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.40	-4.91	-5.31	Cu2(OH)2CO3
Manganite	-1.01	24.33	25.34	MnOOH
Massicot	-6.52	6.37	12.89	PbO
Matlockite	-6.73	-15.71	-8.97	PbClF
Melanothallite	-18.39	-12.13	6.26	CuCl2
Melanterite	-12.60	-14.81	-2.21	FeSO4·7H2O
Metacinnabar	-52.65	-97.75	-45.09	HgS
Mg(OH)2 (active)	-5.16	13.63	18.79	Mg(OH)2
Mg(VO3)2	-15.55	-4.27	11.28	Mg(VO3)2
Mg2Sb3	-272.35	-197.66	74.68	Mg2Sb3
Mg2V2O7	-16.99	9.37	26.36	Mg2V2O7
MgCr2O4	-4.92	11.28	16.20	MgCr2O4
MgCrO4	-21.98	-16.60	5.38	MgCrO4
MgF2	-1.90	-10.03	-8.13	MgF2
MgMoO4	-6.51	-8.36	-1.85	MgMoO4
MgSeO3·6H2O	-4.52	-1.46	3.06	MgSeO3·6H2O
MgSeO4·6H2O	-11.02	-12.22	-1.20	MgSeO4·6H2O
Minium	-28.85	44.67	73.52	Pb3O4
Mirabilite	-4.35	-5.46	-1.11	Na2SO4·10H2O
Mn(VO3)2	-11.24	-6.34	4.90	Mn(VO3)2
Mn2(SO4)3	-51.10	-56.81	-5.71	Mn2(SO4)3
Mn2Sb	-147.00	-85.92	61.08	Mn2Sb
Mn3(AsO4)2·8H2O	-11.57	0.93	12.50	Mn3(AsO4)2·8H2O
MnCl2·4H2O	-11.66	-8.94	2.72	MnCl2·4H2O
MnS (grn)	-75.39	-75.22	0.17	MnS
MnS (pnk)	-78.56	-75.22	3.34	MnS
MnSb	-94.37	-97.28	-2.91	MnSb
MnSe	-38.81	-35.31	3.50	MnSe
MnSeO3	-4.66	-3.53	1.13	MnSeO3
MnSeO3·2H2O	-4.52	-3.53	0.98	MnSeO3·2H2O
MnSeO4·5H2O	-12.25	-14.30	-2.05	MnSeO4·5H2O
MnSO4	-9.28	-6.70	2.58	MnSO4
Monteponite	-7.29	7.81	15.10	CdO
Montroydite	-7.33	-10.97	-3.64	HgO
MoO3	-13.99	-21.99	-8.00	MoO3
Morenosite	-7.07	-9.22	-2.14	NiSO4·7H2O
MoS2	-150.83	-221.09	-70.26	MoS2
Na-Jarosite	-9.34	-20.54	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-37.78	-47.68	-9.90	Na2Cr2O7
Na2CrO4	-20.37	-17.44	2.93	Na2CrO4
Na2Mo2O7	-14.59	-31.19	-16.60	Na2Mo2O7
Na2MoO4	-10.68	-9.19	1.49	Na2MoO4
Na2MoO4·2H2O	-10.42	-9.20	1.22	Na2MoO4·2H2O
Na2SeO3·5H2O	-12.59	-2.29	10.30	Na2SeO3·5H2O
Na2SeO4	-14.33	-13.05	1.28	Na2SeO4
Na3Sb	-171.52	-77.06	94.45	Na3Sb
Na3VO4	-26.43	10.25	36.68	Na3VO4
Na4V2O7	-29.70	7.70	37.40	Na4V2O7
Nantokite	-5.23	-11.96	-6.73	CuCl
NaSb	-87.49	-64.32	23.17	NaSb
Natron	-7.54	-8.85	-1.31	Na2CO3·10H2O
NaVO3	-6.41	-2.55	3.86	NaVO3

Nesquehonite	-3.34	-8.01	-4.67	MgCO3:3H2O
Ni(OH)2	-3.75	9.05	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.31	-6.61	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.07	17.93	32.00	Ni4(OH)6SO4
NiCO3	-5.73	-12.60	-6.87	NiCO3
NiMoO4	-1.81	-12.95	-11.14	NiMoO4
NiS(alpha)	-72.13	-77.73	-5.60	NiS
NiS(beta)	-66.63	-77.73	-11.10	NiS
NiS(gamma)	-64.93	-77.73	-12.80	NiS
NiSe	-20.12	-37.82	-17.70	NiSe
NiSeO3:2H2O	-8.86	-6.05	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.29	-16.81	-1.52	NiSeO4:6H2O
Nsutite	-5.75	11.75	17.50	MnO2
O2(g)	-32.00	51.09	83.09	O2
Orpiment	-246.30	-307.36	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb(BO2)2	-8.45	-1.93	6.52	Pb(BO2)2
Pb(OH)2	-1.78	6.37	8.15	Pb(OH)2
Pb10(OH)60(CO3)6	-57.38	-66.14	-8.76	Pb10(OH)60(CO3)6
Pb2(OH)3Cl	-6.29	2.50	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.44	12.75	26.19	Pb2O(OH)2
Pb2O3	-22.75	38.29	61.04	Pb2O3
Pb2OCO3	-8.34	-8.90	-0.56	Pb2OCO3
Pb2V2O7	-3.25	-5.15	-1.90	Pb2V2O7
Pb3(AsO4)2	-20.42	-14.62	5.80	Pb3(AsO4)2
Pb3(VO4)2	-4.92	1.22	6.14	Pb3(VO4)2
Pb3O2CO3	-13.54	-2.52	11.02	Pb3O2CO3
Pb3O2SO4	-9.82	0.87	10.69	Pb3O2SO4
Pb4(OH)6SO4	-13.86	7.24	21.10	Pb4(OH)6SO4
Pb4O3SO4	-14.64	7.24	21.88	Pb4O3SO4
PbCrO4	-11.26	-23.86	-12.60	PbCrO4
PbF2	-9.85	-17.29	-7.44	PbF2
Pbmetal	-23.42	-19.17	4.25	Pb
PbMoO4	0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.61	6.37	12.98	PbO:0.33H2O
PbSeO4	-12.64	-19.48	-6.84	PbSeO4
Periclase	-7.95	13.63	21.58	MgO
Phosgenite	-9.59	-29.40	-19.81	PbCl2:PbCO3
Plattnerite	-17.68	31.92	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca(OH)2
Pyrite	-126.05	-144.56	-18.51	FeS2
Pyrochroite	-3.64	11.56	15.19	Mn(OH)2
Pyrolusite	-4.28	37.10	41.38	MnO2
Quartz	-0.35	-4.35	-4.00	SiO2
Realgar	-103.32	-123.07	-19.75	AsS
Retgersite	-7.17	-9.21	-2.04	NiSO4:6H2O
Rhodochrosite	0.49	-10.09	-10.58	MnCO3
Rutherfordine	-4.84	-19.34	-14.50	UO2CO3
Sb(OH)3	-12.52	-19.63	-7.11	Sb(OH)3
Sb2O4	-17.12	-13.72	3.40	Sb2O4
Sb2O5	-27.12	-36.79	-9.67	Sb2O5
Sb2Se3	-112.10	-179.86	-67.76	Sb2Se3
Sb4O6(cubic)	-60.26	-78.52	-18.26	Sb4O6
Sb4O6(orth)	-60.62	-78.52	-17.90	Sb4O6
SbCl3	-50.95	-50.38	0.57	SbCl3
SbF3	-44.91	-55.13	-10.23	SbF3
Sbmetal	-46.26	-57.95	-11.69	Sb
SbO2	-3.34	-31.17	-27.82	SbO2
Schoepite	-3.69	2.31	5.99	UO2(OH)2:H2O
Semetal(am)	-14.21	-21.32	-7.11	Se
Semetal(hex)	-13.61	-21.32	-7.71	Se
Senarmontite	-26.90	-39.26	-12.37	Sb2O3
SeO2	-15.22	-15.09	0.12	SeO2
SeO3	-46.90	-25.86	21.04	SeO3
Sepiolite	-1.55	14.21	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite(A)	-4.57	14.21	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-1.64	-4.35	-2.71	SiO2

SiO2(am-ppt)	-1.61	-4.35	-2.74	SiO2
Smithsonite	-1.09	-11.09	-10.00	ZnCO3
Sphalerite	-64.77	-76.22	-11.45	ZnS
Spinel	-4.75	32.09	36.85	MgAl2O4
Stibnite	-249.13	-299.59	-50.46	Sb2S3
Sulfur	-59.09	-61.23	-2.14	S
Tenorite	0.73	8.37	7.64	CuO
Thenardite	-5.78	-5.46	0.32	Na2SO4
Thermonatrite	-9.48	-8.85	0.64	Na2CO3:H2O
Tyuyamunite	-4.20	-0.12	4.08	Ca(UO2)2(VO4)2
U3O8	-12.06	9.03	21.08	U3O8
U3Sb4	-579.50	-427.12	152.38	U3Sb4
U4O9	-27.52	-30.54	-3.02	U4O9
UF4	-31.82	-61.35	-29.54	UF4
UF4:2.5H2O	-28.64	-61.36	-32.72	UF4:2.5H2O
UO2(am)	-14.95	-14.02	0.93	UO2
UO2(NO3)2	-41.28	-29.13	12.15	UO2(NO3)2
UO2(NO3)2:2H2O	-33.98	-29.13	4.85	UO2(NO3)2:2H2O
UO2(NO3)2:3H2O	-32.52	-29.13	3.39	UO2(NO3)2:3H2O
UO2(NO3)2:6H2O	-31.18	-29.13	2.05	UO2(NO3)2:6H2O
UO2(OH)2(beta)	-3.30	2.31	5.61	UO2(OH)2
UO2SeO4:4H2O	-21.30	-23.55	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3
Uraninite	-9.35	-14.02	-4.67	UO2
USb2	-219.80	-190.22	29.58	USb2
V(OH)3	-19.49	-11.90	7.59	V(OH)3
V2O5	-16.54	-17.90	-1.36	V2O5
V3O5	-41.84	-40.01	1.84	V3O5
V4O7	-52.01	-44.83	7.19	V4O7
V6O13	-43.94	-104.80	-60.86	V6O13
Valentinite	-30.78	-39.26	-8.48	Sb2O3
VC12	-64.04	-45.17	18.87	VC12
VC13	-66.08	-42.65	23.43	VC13
VF4	-67.08	-52.15	14.93	VF4
Vmetal	-94.24	-50.21	44.03	V
VO	-39.43	-24.67	14.76	VO
VO(OH)2	-9.97	-4.82	5.15	VO(OH)2
VO2Cl	-22.04	-19.20	2.84	VO2Cl
VOC1	-33.30	-22.15	11.15	VOC1
VOC12	-38.08	-25.32	12.76	VOC12
VOSO4	-26.69	-23.08	3.61	VOSO4
Witherite	-4.80	-13.37	-8.57	BaCO3
Wurtzite	-67.27	-76.22	-8.95	ZnS
Zincite	-0.77	10.56	11.33	ZnO
Zincosite	-11.63	-7.70	3.93	ZnSO4
Zn(BO2)2	-6.03	2.26	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.20	-20.88	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.64	10.56	12.20	Zn(OH)2
Zn(OH)2(am)	-1.91	10.56	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.19	10.56	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-0.97	10.56	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.17	10.56	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.64	2.86	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.32	10.87	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.71	-2.06	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.75	-4.83	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.41	23.99	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.20	32.30	38.50	Zn5(OH)8Cl2
ZnCl2	-16.99	-9.94	7.05	ZnCl2
ZnCO3:1H2O	-0.83	-11.09	-10.26	ZnCO3:1H2O
ZnF2	-12.57	-13.11	-0.53	ZnF2
Znmetal	-40.77	-14.98	25.79	Zn
ZnMoO4	-1.31	-11.43	-10.13	ZnMoO4
ZnO(active)	-0.63	10.56	11.19	ZnO
ZnS(am)	-67.16	-76.22	-9.05	ZnS
ZnSb	-83.95	-72.93	11.01	ZnSb
ZnSe	-21.90	-36.30	-14.40	ZnSe
ZnSeO4:6H2O	-13.78	-15.30	-1.52	ZnSeO4:6H2O

ZnSO4:1H2O -7.06 -7.70 -0.64 ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 162.

Title Determine loss of metals due to HFO sorption and sedimentation
SURFACE 905
 equilibrate with solution 1
 Hfo_sOH Ferrihydrite equilibrium_phase 0.005 64200
 Hfo_wOH Ferrihydrite equilibrium_phase 0.2
 donnan 1e-008
USE EQUILIBRIUM_PHASES 905
USE Surface 905
USE Solution 914
SAVE Solution 915 #Final Stage 9 Pit Water After Mineral Precipitation and
Sorption Loss
END

TITLE

Determine loss of metals due to HFO sorption and sedimentation

Beginning of initial surface-composition calculations.

Surface 905.

Diffuse Double Layer Surface-Complexation Model

Hfo

8.696e-20 Surface + diffuse layer charge, eq
4.811e-12 Surface charge, eq
4.399e-03 sigma, C/m²
1.213e-01 psi, V
-4.722e+00 -F*psi/RT
8.900e-03 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.055e-04 m² for 1.644e-09 moles of Ferrihydrite

Water in diffuse layer: 1.055e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 7.042e-02 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 6.451e-02 (= c_DL / c_free if z is
+1).

Element	Moles
C	2.6963e-15
Ca	3.3417e-17
Cl	5.3994e-14
H	7.9540e-15
K	5.3012e-17
Mg	5.1773e-18
N	2.1859e-13
Na	2.2460e-16
O	9.7428e-12
S	2.2702e-12

Hfo_s
 8.220e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOH2+	5.495e-12	0.668	5.495e-12	-11.260
Hfo_sOH	2.695e-12	0.328	2.695e-12	-11.569
Hfo_sO-	3.028e-14	0.004	3.028e-14	-13.519
Hfo_sOHCa+2	1.003e-16	0.000	1.003e-16	-15.999

Hfo_w
 3.288e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOH2+	1.519e-10	0.462	1.519e-10	-9.818
Hfo_wOH	7.451e-11	0.227	7.451e-11	-10.128
Hfo_wSO4-	5.132e-11	0.156	5.132e-11	-10.290
Hfo_wOHSO4-2	5.022e-11	0.153	5.022e-11	-10.299
Hfo_wO-	8.372e-13	0.003	8.372e-13	-12.077
Hfo_wOMg+	1.183e-18	0.000	1.183e-18	-17.927
Hfo_wOCa+	4.014e-19	0.000	4.014e-19	-18.396

 Beginning of batch-reaction calculations.

Reaction step 1.

WARNING: Element P is contained in Mg3(PO4)2 (which has 0.0 mass),
 but is not in solution or other phases.
 Using solution 914. Solution after simulation 161.
 Using surface 905.
 Using pure phase assemblage 905. Pure-phase assemblage after simulation 161.

-----Phase assemblage-----

Phase	SI	log IAP	log K(T, P)	Moles in assemblage		
				Initial	Final	Delta
Ag2Se	0.00	-48.70	-48.70	5.114e-09	5.113e-09	-5.009e-14
Alunite	-1.59	-2.99	-1.40	0.000e+00	0	0.000e+00
Anhydrite	-0.73	-5.09	-4.36	0.000e+00	0	0.000e+00
Ba3(AsO4)2	0.00	-8.91	-8.91	2.646e-12	1.722e-12	-9.238e-13
Barite	0.00	-9.98	-9.98	5.009e-08	5.010e-08	2.771e-12
Brochantite	0.00	15.22	15.22	7.079e-07	7.078e-07	-2.003e-11
Brucite	-3.21	13.63	16.84	0.000e+00	0	0.000e+00
CO2(g)	-3.50	-21.65	-18.15	1.000e+01	1.000e+01	1.982e-10
CaMoO4	-0.88	-8.83	-7.95	0.000e+00	0	0.000e+00
CaSeO3:2H2O	-4.74	-1.93	2.81	0.000e+00	0	0.000e+00
Calcite	-0.00	-8.48	-8.48	1.983e-03	1.983e-03	-1.821e-10
Carnotite	-1.03	-0.80	0.23	0.000e+00	0	0.000e+00
Cd(BO2)2	-10.33	-0.49	9.84	0.000e+00	0	0.000e+00
CdMoO4	-0.03	-14.18	-14.15	0.000e+00	0	0.000e+00
Chrysotile	0.00	32.20	32.20	2.033e-06	2.033e-06	-1.598e-12
Cr2O3	0.00	-2.36	-2.36	1.241e-09	1.241e-09	-1.454e-13
Cu2Se(alpha)	-4.49	-50.29	-45.80	0.000e+00	0	0.000e+00
CuMoO4	-0.55	-13.62	-13.08	0.000e+00	0	0.000e+00
Epsomite	-2.50	-4.63	-2.13	0.000e+00	0	0.000e+00
Ferrihydrite	0.00	3.19	3.19	1.644e-09	1.644e-09	-8.505e-18
Fluorite	0.00	-10.50	-10.50	5.570e-05	5.570e-05	3.075e-12
Gummite	-5.36	2.31	7.67	0.000e+00	0	0.000e+00
Gypsum	-0.48	-5.09	-4.61	0.000e+00	0	0.000e+00
HgSe	-2.14	-57.84	-55.69	0.000e+00	0	0.000e+00
Mg3(PO4)2		Element not present.		0.000e+00	0	0.000e+00
Mirabilite	-4.35	-5.46	-1.11	0.000e+00	0	0.000e+00
MnSeO3	-4.66	-3.53	1.13	0.000e+00	0	0.000e+00
Ni(OH)2	-3.75	9.05	12.79	0.000e+00	0	0.000e+00

Ni3(AsO4)2·8H2O	-22.31	-6.61	15.70	0.000e+00	0	0.000e+00
NiCO3	-5.73	-12.60	-6.87	0.000e+00	0	0.000e+00
NiMoO4	-1.81	-12.95	-11.14	0.000e+00	0	0.000e+00
O2(g)	-32.00	51.09	83.09	1.000e+01	1.000e+01	2.842e-14
Otavite	-1.83	-13.83	-12.00	0.000e+00	0	0.000e+00
PbMoO4	-0.00	-15.62	-15.62	6.190e-09	6.189e-09	-1.451e-12
Rutherfordine	-4.84	-19.34	-14.50	0.000e+00	0	0.000e+00
SbO2	-3.34	-31.17	-27.82	0.000e+00	0	0.000e+00
Schoepite	-3.69	2.31	5.99	0.000e+00	0	0.000e+00
Sepiolite	-1.55	14.21	15.76	0.000e+00	0	0.000e+00
SiO2(am-ppt)	-1.61	-4.35	-2.74	0.000e+00	0	0.000e+00
Tyuyamunite	-4.20	-0.12	4.08	0.000e+00	0	0.000e+00
U3O8	-12.06	9.03	21.08	0.000e+00	0	0.000e+00
UO2(OH)2(beta)	-3.30	2.31	5.61	0.000e+00	0	0.000e+00
UO3	-5.39	2.31	7.70	0.000e+00	0	0.000e+00
ZnMoO4	-1.31	-11.43	-10.13	0.000e+00	0	0.000e+00

-----Surface composition-----

Diffuse Double Layer Surface-Complexation Model

Hfo

-3.114e-24 Surface + diffuse layer charge, eq
2.253e-11 Surface charge, eq
2.060e-02 sigma, C/m²
2.941e-02 psi, V
-1.145e+00 -F*psi/RT
3.183e-01 exp(-F*psi/RT)
6.420e+04 specific area, m²/mol Ferrihydrite
1.055e-04 m² for 1.644e-09 moles of Ferrihydrite

Water in diffuse layer: 1.055e-09 kg, 100.0% of total DDL-water.

Total moles in diffuse layer (excluding water), Donnan calculation.

Donnan Layer potential, psi_DL = 3.146e-03 V.

Boltzmann factor, exp(-psi_DL * F / RT) = 8.848e-01 (= c_DL / c_free if z is +1).

Element	Moles
Ag	3.0424e-17
Al	6.4446e-15
As	6.8462e-19
B	8.1780e-14
Ba	2.6978e-17
C	9.5958e-13
Ca	4.0672e-12
Cd	2.7587e-17
Cl	1.0369e-11
Co	1.9274e-16
Cr	1.0403e-18
Cu	5.0374e-16
F	3.4397e-13
Fe	9.0457e-19
H	1.3950e-12
Hg	4.6681e-18
K	7.2251e-12
Mg	1.0781e-11
Mn	1.1718e-13
Mo	5.1972e-15
N	3.8645e-14
Na	2.5686e-11
Ni	3.0836e-16
O	1.5073e-10
Pb	3.7703e-18
S	3.6821e-11
Sb	7.0407e-17
Se	4.1971e-16
Si	4.7238e-14

U	8.9917e-16
V	2.2483e-17
Zn	1.2624e-14

Hfo_s

8.220e-12 moles [0.005 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_sOZn+	3.548e-12	0.432	3.553e-12	-11.449
Hfo_sOCu+	1.816e-12	0.221	1.819e-12	-11.740
Hfo_sOMn+	1.438e-12	0.175	1.441e-12	-11.841
Hfo_sOPb+	1.056e-12	0.128	1.058e-12	-11.976
Hfo_sOCrOH+	2.907e-13	0.035	2.912e-13	-12.536
Hfo_sOHCa+2	3.563e-14	0.004	3.568e-14	-13.448
Hfo_sONi+	2.602e-14	0.003	2.606e-14	-13.584
Hfo_sOH	3.821e-15	0.000	3.827e-15	-14.417
Hfo_sOCu+	1.923e-15	0.000	1.925e-15	-14.715
Hfo_sOCd+	1.920e-15	0.000	1.923e-15	-14.716
Hfo_sO-	1.723e-15	0.000	1.725e-15	-14.763
Hfo_sOH2+	1.942e-16	0.000	1.945e-16	-15.711
Hfo_sOAg	8.822e-18	0.000	8.835e-18	-17.054
Hfo_sOHBa+2	1.420e-18	0.000	1.422e-18	-17.847
Hfo_sOFe+	1.414e-19	0.000	1.416e-19	-18.849
Hfo_sOHg+	9.479e-21	0.000	9.493e-21	-20.023

Hfo_w

3.288e-10 moles [0.2 mol/(mol Ferrihydrite)]

Species	Moles	Mole Fraction	Molality	Log Molality
Hfo_wOMg+	9.069e-11	0.276	9.082e-11	-10.042
Hfo_wOCu+	7.829e-11	0.238	7.840e-11	-10.106
Hfo_wOHVO4-3	4.736e-11	0.144	4.743e-11	-10.324
Hfo_wOH	3.212e-11	0.098	3.217e-11	-10.493
Hfo_wOZn+	3.122e-11	0.095	3.127e-11	-10.505
Hfo_wOHSO4-2	1.609e-11	0.049	1.612e-11	-10.793
Hfo_wO-	1.448e-11	0.044	1.450e-11	-10.839
Hfo_wOMn+	9.604e-12	0.029	9.618e-12	-11.017
Hfo_wOHSeO3-2	2.250e-12	0.007	2.253e-12	-11.647
Hfo_wOHAsO4-3	1.847e-12	0.006	1.850e-12	-11.733
Hfo_wOCa+	1.739e-12	0.005	1.742e-12	-11.759
Hfo_wOH2+	1.632e-12	0.005	1.635e-12	-11.787
Hfo_wSO4-	4.104e-13	0.001	4.110e-13	-12.386
Hfo_wOPb+	3.965e-13	0.001	3.970e-13	-12.401
Hfo_wONi+	2.950e-13	0.001	2.955e-13	-12.530
Hfo_wSeO3-	1.944e-13	0.001	1.947e-13	-12.711
Hfo_wOHMoO4-2	1.200e-13	0.000	1.202e-13	-12.920
Hfo_wOCu+	4.555e-14	0.000	4.561e-14	-13.341
Hfo_wH2BO3	9.429e-15	0.000	9.443e-15	-14.025
Hfo_wOCd+	6.884e-15	0.000	6.894e-15	-14.162
Hfo_wMoO4-	3.944e-15	0.000	3.950e-15	-14.403
Hfo_wHAsO4-	1.070e-16	0.000	1.071e-16	-15.970
Hfo_wOAg	1.950e-17	0.000	1.953e-17	-16.709
Hfo_wOHg+	3.902e-18	0.000	3.908e-18	-17.408
Hfo_wOBa+	1.002e-18	0.000	1.003e-18	-17.998
Hfo_wOFe+	7.498e-19	0.000	7.509e-19	-18.124
Hfo_wOHSeO4-2	4.157e-19	0.000	4.163e-19	-18.381
Hfo_wH2AsO4	1.759e-19	0.000	1.761e-19	-18.754
Hfo_wOHSbO(OH) 4-	9.843e-20	0.000	9.857e-20	-19.006
Hfo_wOHCrO4-2	2.170e-20	0.000	2.173e-20	-19.663
Hfo_wSeO4-	9.235e-21	0.000	9.248e-21	-20.034
Hfo_wSbO(OH) 4	3.234e-21	0.000	3.239e-21	-20.490
Hfo_wCrO4-	5.047e-22	0.000	5.054e-22	-21.296
Hfo_wH2AsO3	2.503e-29	0.000	2.507e-29	-28.601

-----Solution composition-----

Elements	Molality	Moles
Ag	2.735e-08	2.731e-08
Al	5.406e-06	5.398e-06
As	5.091e-10	5.084e-10
B	7.674e-05	7.663e-05
Ba	3.263e-08	3.259e-08
C	8.141e-04	8.129e-04
Ca	4.403e-03	4.397e-03
Cd	2.802e-08	2.798e-08
Cl	8.692e-03	8.679e-03
Co	2.150e-07	2.147e-07
Cr	1.072e-09	1.070e-09
Cu	4.920e-07	4.913e-07
F	3.052e-04	3.048e-04
Fe	8.960e-10	8.947e-10
Hg	4.423e-09	4.416e-09
K	7.622e-03	7.611e-03
Mg	1.183e-02	1.181e-02
Mn	1.318e-04	1.316e-04
Mo	3.855e-06	3.849e-06
N	3.243e-05	3.238e-05
Na	2.719e-02	2.715e-02
Ni	3.349e-07	3.345e-07
Pb	3.706e-09	3.701e-09
S	2.884e-02	2.880e-02
Sb	5.902e-08	5.893e-08
Se	3.273e-07	3.268e-07
Si	4.462e-05	4.456e-05
U	5.325e-07	5.317e-07
V	1.778e-08	1.775e-08
Zn	1.304e-05	1.302e-05

-----Description of solution-----

	pH	=	8.087	Charge balance
	pe	=	4.686	Adjusted to redox
equilibrium				
	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	8.447e-02	
	Mass of water (kg)	=	9.986e-01	
	Total alkalinity (eq/kg)	=	8.639e-04	
	Total CO2 (mol/kg)	=	8.141e-04	
	Temperature (°C)	=	25.00	
	Pressure (atm)	=	1.00	
	Electrical balance (eq)	=	3.832e-06	
Percent error, 100*(Cat- An)/(Cat+ An)		=	0.00	
	Iterations	=	1	
	Total H	=	1.108543e+02	
	Total O	=	5.554467e+01	

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.586e-06	1.228e-06	-5.800	-5.911	-0.111	(0)
H+	1.035e-08	8.188e-09	-7.985	-8.087	-0.102	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Ag	2.735e-08					
AgCl	1.392e-08	1.392e-08	-7.856	-7.856	0.000	(0)
AgCl2-	1.172e-08	8.334e-09	-7.931	-8.079	-0.148	(0)
Ag+	1.254e-09	9.920e-10	-8.902	-9.003	-0.102	(0)
AgSO4-	2.293e-10	1.630e-10	-9.640	-9.788	-0.148	(0)
AgCl3-2	2.000e-10	5.105e-11	-9.699	-10.292	-0.593	(0)
AgCl4-3	1.546e-11	7.164e-13	-10.811	-12.145	-1.334	(0)
AgNO2	5.121e-12	5.121e-12	-11.291	-11.291	0.000	(0)
AgF	4.462e-13	4.462e-13	-12.350	-12.350	0.000	(0)

	AgOH	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
	AgH2BO3	7.843e-14	7.843e-14	-13.106	-13.106	0.000	(0)
	AgSeO3-	4.303e-14	3.059e-14	-13.366	-13.514	-0.148	(0)
	AgNH3+	2.449e-14	1.741e-14	-13.611	-13.759	-0.148	(0)
	Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
	Ag(NO2) 2-	2.757e-16	1.960e-16	-15.560	-15.708	-0.148	(0)
	Ag(OH) 2-	2.057e-17	1.462e-17	-16.687	-16.835	-0.148	(0)
	AgNO3	1.837e-17	1.837e-17	-16.736	-16.736	0.000	(0)
	Ag(NH3) 2+	1.712e-18	1.217e-18	-17.767	-17.915	-0.148	(0)
	Ag(SeO3) 2-3	2.836e-19	1.314e-20	-18.547	-19.881	-1.334	(0)
	Ag2MoO4	5.615e-25	5.615e-25	-24.251	-24.251	0.000	(0)
	AgHS	0.000e+00	0.000e+00	-73.879	-73.879	0.000	(0)
	AgOH(Se) 2-4	0.000e+00	0.000e+00	-80.441	-82.812	-2.372	(0)
	Ag(HS) S4-2	0.000e+00	0.000e+00	-147.622	-147.866	-0.244	(0)
	Ag(HS) 2-	0.000e+00	0.000e+00	-148.321	-148.469	-0.148	(0)
	Ag(S4) 2-3	0.000e+00	0.000e+00	-148.789	-149.219	-0.430	(0)
	AgS4S5-3	0.000e+00	0.000e+00	-149.125	-149.530	-0.405	(0)
Al	5.406e-06						
	Al(OH) 4-	5.376e-06	4.235e-06	-5.270	-5.373	-0.104	(0)
	Al(OH) 3	2.739e-08	2.739e-08	-7.562	-7.562	0.000	(0)
	Al(OH) 2+	1.400e-09	1.118e-09	-8.854	-8.952	-0.098	(0)
	AlF3	2.685e-10	2.685e-10	-9.571	-9.571	0.000	(0)
	AlF2+	1.492e-10	1.191e-10	-9.826	-9.924	-0.098	(0)
	AlF4-	3.060e-11	2.410e-11	-10.514	-10.618	-0.104	(0)
	AlF+2	4.113e-12	1.671e-12	-11.386	-11.777	-0.391	(0)
	AlOH+2	2.821e-12	1.146e-12	-11.550	-11.941	-0.391	(0)
	AlSO4+	7.571e-14	5.963e-14	-13.121	-13.225	-0.104	(0)
	Al+3	7.714e-15	9.331e-16	-14.113	-15.030	-0.917	(0)
	Al(SO4) 2-	6.679e-15	5.260e-15	-14.175	-14.279	-0.104	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-42.153	-43.487	-1.334	(0)
As (3)	3.295e-24						
	H3AsO3	3.028e-24	3.028e-24	-23.519	-23.519	0.000	(0)
	H2AsO3-	2.668e-25	1.897e-25	-24.574	-24.722	-0.148	(0)
	HAsO3-2	8.275e-29	2.112e-29	-28.082	-28.675	-0.593	(0)
	H4AsO3+	1.728e-32	1.228e-32	-31.762	-31.911	-0.148	(0)
	AsO3-3	2.147e-33	9.945e-35	-32.668	-34.002	-1.334	(0)
As (5)	5.091e-10						
	HAsO4-2	4.948e-10	1.263e-10	-9.306	-9.899	-0.593	(0)
	H2AsO4-	1.327e-11	9.433e-12	-10.877	-11.025	-0.148	(0)
	AsO4-3	1.053e-12	4.879e-14	-11.978	-13.312	-1.334	(0)
	H3AsO4	1.316e-17	1.342e-17	-16.881	-16.872	0.008	(0)
B	7.674e-05						
	H3BO3	6.897e-05	7.033e-05	-4.161	-4.153	0.008	(0)
	H2BO3-	6.571e-06	4.988e-06	-5.182	-5.302	-0.120	(0)
	MgH2BO3+	6.588e-07	5.001e-07	-6.181	-6.301	-0.120	(0)
	CaH2BO3+	3.729e-07	2.831e-07	-6.428	-6.548	-0.120	(0)
	NaH2BO3	1.628e-07	1.628e-07	-6.788	-6.788	0.000	(0)
	BF(OH) 3-	6.619e-09	5.025e-09	-8.179	-8.299	-0.120	(0)
	H5(BO3) 2-	3.933e-10	2.986e-10	-9.405	-9.525	-0.120	(0)
	H8(BO3) 3-	2.766e-12	2.100e-12	-11.558	-11.678	-0.120	(0)
	BaH2BO3+	2.583e-12	1.961e-12	-11.588	-11.708	-0.120	(0)
	BF2(OH) 2-	1.039e-12	7.888e-13	-11.983	-12.103	-0.120	(0)
	AgH2BO3	7.843e-14	7.843e-14	-13.106	-13.106	0.000	(0)
	BF3OH-	5.935e-19	4.506e-19	-18.227	-18.346	-0.120	(0)
	BF4-	4.288e-24	3.255e-24	-23.368	-23.487	-0.120	(0)
Ba	3.263e-08						
	Ba+2	3.252e-08	1.272e-08	-7.488	-7.896	-0.408	(0)
	BaHCO3+	8.849e-11	7.123e-11	-10.053	-10.147	-0.094	(0)
	BaCO3	2.190e-11	2.190e-11	-10.660	-10.660	0.000	(0)
	BaH2BO3+	2.583e-12	1.961e-12	-11.588	-11.708	-0.120	(0)
	BaOH+	8.590e-14	6.818e-14	-13.066	-13.166	-0.100	(0)
	BaNO3+	2.090e-15	1.486e-15	-14.680	-14.828	-0.148	(0)
	BaNH3+2	2.702e-16	6.899e-17	-15.568	-16.161	-0.593	(0)
C (4)	8.141e-04						
	HCO3-	7.346e-04	5.864e-04	-3.134	-3.232	-0.098	(0)
	MgHCO3+	2.221e-05	1.735e-05	-4.653	-4.761	-0.107	(0)
	CaHCO3+	1.338e-05	1.077e-05	-4.874	-4.968	-0.094	(0)
	H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)

	CO3-2	8.585e-06	3.358e-06	-5.066	-5.474	-0.408	(0)
	MgCO3	8.076e-06	8.076e-06	-5.093	-5.093	0.000	(0)
	NaHCO3	6.790e-06	6.790e-06	-5.168	-5.168	0.000	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	NaCO3-	1.613e-06	1.287e-06	-5.792	-5.890	-0.098	(0)
	UO2 (CO3) 3-4	4.844e-07	2.058e-09	-6.315	-8.687	-2.372	(0)
	ZnCO3	4.722e-07	4.722e-07	-6.326	-6.326	0.000	(0)
	MnHCO3+	3.586e-07	2.846e-07	-6.445	-6.546	-0.100	(0)
	CuCO3	3.114e-07	3.114e-07	-6.507	-6.507	0.000	(0)
	ZnHCO3+	6.376e-08	4.532e-08	-7.195	-7.344	-0.148	(0)
	UO2 (CO3) 2-2	4.790e-08	1.223e-08	-7.320	-7.913	-0.593	(0)
	Cu (CO3) 2-2	1.102e-08	2.814e-09	-7.958	-8.551	-0.593	(0)
	NiCO3	9.360e-09	9.360e-09	-8.029	-8.029	0.000	(0)
	NiHCO3+	7.600e-09	5.402e-09	-8.119	-8.267	-0.148	(0)
	CoHCO3+	2.395e-09	1.703e-09	-8.621	-8.769	-0.148	(0)
	CoCO3	2.119e-09	2.119e-09	-8.674	-8.674	0.000	(0)
	PbCO3	1.606e-09	1.606e-09	-8.794	-8.794	0.000	(0)
	CuHCO3+	8.199e-10	5.828e-10	-9.086	-9.234	-0.148	(0)
	CdCO3	3.352e-10	3.352e-10	-9.475	-9.475	0.000	(0)
	UO2CO3	1.825e-10	1.825e-10	-9.739	-9.739	0.000	(0)
	PbHCO3+	9.755e-11	6.934e-11	-10.011	-10.159	-0.148	(0)
	BaHCO3+	8.849e-11	7.123e-11	-10.053	-10.147	-0.094	(0)
	Pb (CO3) 2-2	6.093e-11	1.556e-11	-10.215	-10.808	-0.593	(0)
	BaCO3	2.190e-11	2.190e-11	-10.660	-10.660	0.000	(0)
	CdHCO3+	8.226e-12	5.847e-12	-11.085	-11.233	-0.148	(0)
	Cd (CO3) 2-2	3.268e-12	8.343e-13	-11.486	-12.079	-0.593	(0)
	HgCO3	4.497e-15	4.497e-15	-14.347	-14.347	0.000	(0)
	FeHCO3+	1.742e-15	1.402e-15	-14.759	-14.853	-0.094	(0)
	Hg (CO3) 2-2	1.870e-16	4.775e-17	-15.728	-16.321	-0.593	(0)
	HgHCO3+	9.646e-19	6.857e-19	-18.016	-18.164	-0.148	(0)
Ca	4.403e-03						
	Ca+2	2.522e-03	9.862e-04	-2.598	-3.006	-0.408	(0)
	CaSO4	1.860e-03	1.860e-03	-2.730	-2.730	0.000	(0)
	CaHCO3+	1.338e-05	1.077e-05	-4.874	-4.968	-0.094	(0)
	CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
	CaF+	2.428e-06	1.927e-06	-5.615	-5.715	-0.100	(0)
	CaH2BO3+	3.729e-07	2.831e-07	-6.428	-6.548	-0.120	(0)
	CaOH+	3.002e-08	2.416e-08	-7.523	-7.617	-0.094	(0)
	CaNO3+	1.023e-10	7.269e-11	-9.990	-10.139	-0.148	(0)
	CaNH3+2	4.180e-11	1.067e-11	-10.379	-10.972	-0.593	(0)
	Ca (NH3) 2+2	1.431e-19	3.652e-20	-18.844	-19.437	-0.593	(0)
Cd	2.802e-08						
	Cd+2	1.120e-08	4.380e-09	-7.951	-8.359	-0.408	(0)
	CdSO4	8.453e-09	8.453e-09	-8.073	-8.073	0.000	(0)
	CdCl+	4.044e-09	2.875e-09	-8.393	-8.541	-0.148	(0)
	Cd (SO4) 2-2	3.677e-09	9.387e-10	-8.435	-9.027	-0.593	(0)
	CdCO3	3.352e-10	3.352e-10	-9.475	-9.475	0.000	(0)
	CdOHC1	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
	CdCl2	8.237e-11	8.237e-11	-10.084	-10.084	0.000	(0)
	CdOH+	6.010e-11	4.272e-11	-10.221	-10.369	-0.148	(0)
	CdF+	1.749e-11	1.243e-11	-10.757	-10.906	-0.148	(0)
	CdHCO3+	8.226e-12	5.847e-12	-11.085	-11.233	-0.148	(0)
	Cd (CO3) 2-2	3.268e-12	8.343e-13	-11.486	-12.079	-0.593	(0)
	CdCl3-	5.025e-13	3.572e-13	-12.299	-12.447	-0.148	(0)
	Cd (OH) 2	3.310e-13	3.310e-13	-12.480	-12.480	0.000	(0)
	CdF2	4.441e-15	4.441e-15	-14.353	-14.353	0.000	(0)
	CdNO3+	4.542e-16	3.228e-16	-15.343	-15.491	-0.148	(0)
	CdSeO4	1.695e-16	1.695e-16	-15.771	-15.771	0.000	(0)
	Cd (OH) 3-	3.494e-17	2.484e-17	-16.457	-16.605	-0.148	(0)
	Cd (SeO3) 2-2	3.254e-17	8.308e-18	-16.488	-17.080	-0.593	(0)
	Cd2OH+3	2.024e-17	9.378e-19	-16.694	-18.028	-1.334	(0)
	Cd (OH) 4-2	1.956e-23	4.993e-24	-22.709	-23.302	-0.593	(0)
	Cd (NO3) 2	3.772e-24	3.772e-24	-23.423	-23.423	0.000	(0)
	CdHS+	0.000e+00	0.000e+00	-78.892	-79.041	-0.148	(0)
	Cd (HS) 2	0.000e+00	0.000e+00	-150.527	-150.527	0.000	(0)
	Cd (HS) 3-	0.000e+00	0.000e+00	-227.169	-227.317	-0.148	(0)
	Cd (HS) 4-2	0.000e+00	0.000e+00	-303.218	-303.811	-0.593	(0)
Cl	8.692e-03						

Cl-	8.691e-03	6.873e-03	-2.061	-2.163	-0.102	(0)
MnCl+	2.652e-07	2.105e-07	-6.576	-6.677	-0.100	(0)
ZnOHCl	6.784e-08	6.784e-08	-7.169	-7.169	0.000	(0)
ZnCl+	5.401e-08	4.219e-08	-7.267	-7.375	-0.107	(0)
AgCl	1.392e-08	1.392e-08	-7.856	-7.856	0.000	(0)
AgCl2-	1.172e-08	8.334e-09	-7.931	-8.079	-0.148	(0)
CdCl+	4.044e-09	2.875e-09	-8.393	-8.541	-0.148	(0)
CuCl2-	2.530e-09	1.976e-09	-8.597	-8.704	-0.107	(0)
MnCl2	2.043e-09	2.043e-09	-8.690	-8.690	0.000	(0)
NiCl+	1.849e-09	1.314e-09	-8.733	-8.881	-0.148	(0)
CuCl	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
CoCl+	1.249e-09	8.875e-10	-8.904	-9.052	-0.148	(0)
ZnCl2	4.596e-10	4.596e-10	-9.338	-9.338	0.000	(0)
CuCl+	2.196e-10	1.716e-10	-9.658	-9.766	-0.107	(0)
AgCl3-2	2.000e-10	5.105e-11	-9.699	-10.292	-0.593	(0)
CdOHCl	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
CdCl2	8.237e-11	8.237e-11	-10.084	-10.084	0.000	(0)
PbCl+	5.460e-11	3.881e-11	-10.263	-10.411	-0.148	(0)
HgClOH	1.668e-11	1.668e-11	-10.778	-10.778	0.000	(0)
AgCl4-3	1.546e-11	7.164e-13	-10.811	-12.145	-1.334	(0)
CuCl3-2	7.316e-12	2.904e-12	-11.136	-11.537	-0.401	(0)
HgCl2	5.287e-12	5.287e-12	-11.277	-11.277	0.000	(0)
MnCl3-	4.873e-12	3.868e-12	-11.312	-11.413	-0.100	(0)
ZnCl3-	3.212e-12	2.509e-12	-11.493	-11.600	-0.107	(0)
PbCl2	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
HgCl3-	5.112e-13	3.634e-13	-12.291	-12.440	-0.148	(0)
CdCl3-	5.025e-13	3.572e-13	-12.299	-12.447	-0.148	(0)
CuCl2	4.089e-13	4.089e-13	-12.388	-12.388	0.000	(0)
NiCl2	4.547e-14	4.547e-14	-13.342	-13.342	0.000	(0)
HgCl4-2	3.895e-14	9.943e-15	-13.410	-14.002	-0.593	(0)
ZnCl4-2	2.173e-14	8.624e-15	-13.663	-14.064	-0.401	(0)
PbCl3-	4.587e-15	3.260e-15	-14.339	-14.487	-0.148	(0)
HgCl+	2.159e-16	1.535e-16	-15.666	-15.814	-0.148	(0)
UO2Cl+	2.141e-16	1.522e-16	-15.669	-15.818	-0.148	(0)
PbCl4-2	4.012e-17	1.024e-17	-16.397	-16.990	-0.593	(0)
CuCl3-	3.358e-17	2.623e-17	-16.474	-16.581	-0.107	(0)
CrCl+2	4.705e-18	1.201e-18	-17.327	-17.920	-0.593	(0)
CrOHCl2	1.927e-19	1.927e-19	-18.715	-18.715	0.000	(0)
CuCl4-2	2.276e-21	9.034e-22	-20.643	-21.044	-0.401	(0)
CrCl2+	1.102e-21	7.833e-22	-20.958	-21.106	-0.148	(0)
FeCl+2	4.476e-22	1.776e-22	-21.349	-21.751	-0.401	(0)
VOCl+	2.745e-23	1.951e-23	-22.561	-22.710	-0.148	(0)
FeCl2+	6.870e-24	5.453e-24	-23.163	-23.263	-0.100	(0)
CrO3Cl-	1.138e-25	8.091e-26	-24.944	-25.092	-0.148	(0)
FeCl3	3.748e-27	3.748e-27	-26.426	-26.426	0.000	(0)
CoCl+2	3.949e-35	1.008e-35	-34.404	-34.996	-0.593	(0)
UCl+3	0.000e+00	0.000e+00	-45.495	-46.829	-1.334	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
Co (2)	2.150e-07					
Co+2	1.462e-07	3.733e-08	-6.835	-7.428	-0.593	(0)
CoSO4	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
CoHCO3+	2.395e-09	1.703e-09	-8.621	-8.769	-0.148	(0)
CoCO3	2.119e-09	2.119e-09	-8.674	-8.674	0.000	(0)
CoOH+	1.287e-09	9.146e-10	-8.891	-9.039	-0.148	(0)
CoCl+	1.249e-09	8.875e-10	-8.904	-9.052	-0.148	(0)
CoF+	2.974e-10	2.114e-10	-9.527	-9.675	-0.148	(0)
Co (OH) 2	8.922e-11	8.922e-11	-10.050	-10.050	0.000	(0)
CoNO2+	9.143e-12	6.499e-12	-11.039	-11.187	-0.148	(0)
Co (NH3) +2	1.511e-13	3.858e-14	-12.821	-13.414	-0.593	(0)
CoSeO4	3.888e-15	3.888e-15	-14.410	-14.410	0.000	(0)
Co (OH) 3-	3.076e-15	2.186e-15	-14.512	-14.660	-0.148	(0)
CoNO3+	1.940e-15	1.379e-15	-14.712	-14.860	-0.148	(0)
CoOOH-	7.727e-16	5.493e-16	-15.112	-15.260	-0.148	(0)
Co2OH+3	3.693e-17	1.711e-18	-16.433	-17.767	-1.334	(0)
Co (NH3) 2+2	5.541e-20	1.415e-20	-19.256	-19.849	-0.593	(0)
Co (OH) 4-2	1.667e-21	4.255e-22	-20.778	-21.371	-0.593	(0)

Co (NO3) 2	6.540e-23	6.540e-23	-22.184	-22.184	0.000	(0)
Co4 (OH) 4+4	3.287e-26	1.396e-28	-25.483	-27.855	-2.372	(0)
Co (NH3) 3+2	5.997e-27	1.531e-27	-26.222	-26.815	-0.593	(0)
Co (NH3) 4+2	2.705e-34	6.907e-35	-33.568	-34.161	-0.593	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.413	-42.006	-0.593	(0)
Co (3)	1.762e-28					
CoOH+2	1.762e-28	4.499e-29	-27.754	-28.347	-0.593	(0)
Co+3	5.960e-35	7.209e-36	-34.225	-35.142	-0.917	(0)
CoCl+2	3.949e-35	1.008e-35	-34.404	-34.996	-0.593	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.108	-63.701	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
Cr (2)	2.605e-27					
Cr+2	2.605e-27	6.650e-28	-26.584	-27.177	-0.593	(0)
Cr (3)	1.072e-09					
Cr (OH) 2+	7.626e-10	5.421e-10	-9.118	-9.266	-0.148	(0)
Cr (OH) 3	2.501e-10	2.501e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.043e-11	1.453e-11	-10.690	-10.838	-0.148	(0)
Cr (OH) 4-	1.720e-11	1.223e-11	-10.764	-10.913	-0.148	(0)
Cr (OH) +2	1.421e-11	3.628e-12	-10.847	-11.440	-0.593	(0)
CrOHSO4	7.088e-12	7.088e-12	-11.150	-11.150	0.000	(0)
CrF+2	1.501e-14	3.832e-15	-13.824	-14.417	-0.593	(0)
CrSO4+	3.652e-15	2.596e-15	-14.437	-14.586	-0.148	(0)
Cr+3	2.914e-15	1.350e-16	-14.535	-15.870	-1.334	(0)
CrCl+2	4.705e-18	1.201e-18	-17.327	-17.920	-0.593	(0)
CrOHC12	1.927e-19	1.927e-19	-18.715	-18.715	0.000	(0)
Cr2 (OH) 2SO4+2	9.103e-21	2.324e-21	-20.041	-20.634	-0.593	(0)
Cr2 (OH) 2 (SO4) 2	1.137e-21	1.137e-21	-20.944	-20.944	0.000	(0)
CrCl2+	1.102e-21	7.833e-22	-20.958	-21.106	-0.148	(0)
CrNO3+2	5.389e-25	1.376e-25	-24.268	-24.861	-0.593	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.144	-41.737	-0.593	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.930	-51.264	-1.334	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Cr (6)	2.385e-14					
CrO4-2	2.203e-14	8.616e-15	-13.657	-14.065	-0.408	(0)
NaCrO4-	1.240e-15	8.816e-16	-14.907	-15.055	-0.148	(0)
HCrO4-	3.211e-16	2.283e-16	-15.493	-15.642	-0.148	(0)
KCrO4-	2.566e-16	1.824e-16	-15.591	-15.739	-0.148	(0)
CrO3SO4-2	1.838e-23	4.694e-24	-22.736	-23.329	-0.593	(0)
H2CrO4	1.515e-24	1.515e-24	-23.820	-23.820	0.000	(0)
CrO3Cl-	1.138e-25	8.091e-26	-24.944	-25.092	-0.148	(0)
Cr2O7-2	7.087e-30	1.809e-30	-29.150	-29.742	-0.593	(0)
Cu (1)	4.137e-09					
CuCl2-	2.530e-09	1.976e-09	-8.597	-8.704	-0.107	(0)
CuCl	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
Cu+	2.237e-10	1.590e-10	-9.650	-9.799	-0.148	(0)
CuCl3-2	7.316e-12	2.904e-12	-11.136	-11.537	-0.401	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.198	-147.615	-0.417	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.951	-148.345	-0.394	(0)
Cu (2)	4.878e-07					
CuCO3	3.114e-07	3.114e-07	-6.507	-6.507	0.000	(0)
CuOH+	7.830e-08	6.116e-08	-7.106	-7.213	-0.107	(0)
Cu+2	4.027e-08	1.575e-08	-7.395	-7.803	-0.408	(0)
CuSO4	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
Cu (OH) 2	1.499e-08	1.499e-08	-7.824	-7.824	0.000	(0)
Cu (CO3) 2-2	1.102e-08	2.814e-09	-7.958	-8.551	-0.593	(0)
CuHCO3+	8.199e-10	5.828e-10	-9.086	-9.234	-0.148	(0)
Cu2 (OH) 2+2	3.681e-10	9.397e-11	-9.434	-10.027	-0.593	(0)
CuF+	2.503e-10	1.780e-10	-9.601	-9.750	-0.148	(0)
CuCl+	2.196e-10	1.716e-10	-9.658	-9.766	-0.107	(0)
CuNO2+	5.733e-11	4.075e-11	-10.242	-10.390	-0.148	(0)
Cu (OH) 3-	5.311e-11	3.775e-11	-10.275	-10.423	-0.148	(0)
CuNH3+2	5.427e-12	1.385e-12	-11.265	-11.858	-0.593	(0)
CuCl2	4.089e-13	4.089e-13	-12.388	-12.388	0.000	(0)
Cu (NO2) 2	1.030e-14	1.030e-14	-13.987	-13.987	0.000	(0)
CuNO3+	1.633e-15	1.161e-15	-14.787	-14.935	-0.148	(0)
Cu (OH) 4-2	1.429e-15	3.649e-16	-14.845	-15.438	-0.593	(0)

	CuCl3-	3.358e-17	2.623e-17	-16.474	-16.581	-0.107	(0)
	CuCl4-2	2.276e-21	9.034e-22	-20.643	-21.044	-0.401	(0)
	Cu (NO3) 2	3.407e-24	3.407e-24	-23.468	-23.468	0.000	(0)
	Cu (HS) 3-	0.000e+00	0.000e+00	-217.826	-217.974	-0.148	(0)
F		3.052e-04					
	F-	2.264e-04	1.791e-04	-3.645	-3.747	-0.102	(0)
	MgF+	7.376e-05	5.810e-05	-4.132	-4.236	-0.104	(0)
	CaF+	2.428e-06	1.927e-06	-5.615	-5.715	-0.100	(0)
	NaF	2.326e-06	2.326e-06	-5.633	-5.633	0.000	(0)
	MnF+	2.185e-07	1.734e-07	-6.661	-6.761	-0.100	(0)
	ZnF+	1.228e-08	8.732e-09	-7.911	-8.059	-0.148	(0)
	BF (OH) 3-	6.619e-09	5.025e-09	-8.179	-8.299	-0.120	(0)
	HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
	NiF+	4.728e-10	3.361e-10	-9.325	-9.474	-0.148	(0)
	CoF+	2.974e-10	2.114e-10	-9.527	-9.675	-0.148	(0)
	AlF3	2.685e-10	2.685e-10	-9.571	-9.571	0.000	(0)
	CuF+	2.503e-10	1.780e-10	-9.601	-9.750	-0.148	(0)
	AlF2+	1.492e-10	1.191e-10	-9.826	-9.924	-0.098	(0)
	AlF4-	3.060e-11	2.410e-11	-10.514	-10.618	-0.104	(0)
	CdF+	1.749e-11	1.243e-11	-10.757	-10.906	-0.148	(0)
	AlF+2	4.113e-12	1.671e-12	-11.386	-11.777	-0.391	(0)
	PbF+	2.825e-12	2.008e-12	-11.549	-11.697	-0.148	(0)
	HF2-	1.907e-12	1.476e-12	-11.720	-11.831	-0.111	(0)
	BF2 (OH) 2-	1.039e-12	7.888e-13	-11.983	-12.103	-0.120	(0)
	UO2F+	4.748e-13	3.375e-13	-12.323	-12.472	-0.148	(0)
	AgF	4.462e-13	4.462e-13	-12.350	-12.350	0.000	(0)
	UO2F2	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
	CrF+2	1.501e-14	3.832e-15	-13.824	-14.417	-0.593	(0)
	UO2F3-	1.103e-14	7.841e-15	-13.957	-14.106	-0.148	(0)
	PbF2	7.077e-15	7.077e-15	-14.150	-14.150	0.000	(0)
	CdF2	4.441e-15	4.441e-15	-14.353	-14.353	0.000	(0)
	UO2F4-2	4.368e-17	1.115e-17	-16.360	-16.953	-0.593	(0)
	H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
	PbF3-	3.381e-18	2.404e-18	-17.471	-17.619	-0.148	(0)
	VO2F	2.871e-18	2.871e-18	-17.542	-17.542	0.000	(0)
	FeF2+	1.014e-18	8.052e-19	-17.994	-18.094	-0.100	(0)
	BF3OH-	5.935e-19	4.506e-19	-18.227	-18.346	-0.120	(0)
	FeF+2	4.234e-19	1.680e-19	-18.373	-18.775	-0.401	(0)
	VO2F2-	2.626e-19	1.867e-19	-18.581	-18.729	-0.148	(0)
	FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
	VO2F3-2	1.633e-21	4.170e-22	-20.787	-21.380	-0.593	(0)
	VOF+	1.529e-21	1.087e-21	-20.816	-20.964	-0.148	(0)
	PbF4-2	8.069e-22	2.060e-22	-21.093	-21.686	-0.593	(0)
	VOF2	7.299e-23	7.299e-23	-22.137	-22.137	0.000	(0)
	HgF+	1.045e-23	7.429e-24	-22.981	-23.129	-0.148	(0)
	BF4-	4.288e-24	3.255e-24	-23.368	-23.487	-0.120	(0)
	VO2F4-3	7.930e-25	3.674e-26	-24.101	-25.435	-1.334	(0)
	VOF3-	6.524e-25	4.637e-25	-24.185	-24.334	-0.148	(0)
	Sb (OH) 2F	5.355e-26	5.355e-26	-25.271	-25.271	0.000	(0)
	SbOF	5.273e-26	5.273e-26	-25.278	-25.278	0.000	(0)
	VOF4-2	1.313e-27	3.352e-28	-26.882	-27.475	-0.593	(0)
	SiF6-2	2.528e-29	1.003e-29	-28.597	-28.999	-0.401	(0)
	UF3+	1.383e-36	9.831e-37	-35.859	-36.007	-0.148	(0)
	UF2+2	1.357e-37	3.464e-38	-36.867	-37.460	-0.593	(0)
	UF4	1.930e-38	1.930e-38	-37.714	-37.714	0.000	(0)
	UF+3	3.317e-40	0.000e+00	-39.479	-40.813	-1.334	(0)
	UF5-	1.927e-40	1.370e-40	-39.715	-39.863	-0.148	(0)
	UF6-2	0.000e+00	0.000e+00	-40.537	-41.130	-0.593	(0)
Fe (2)		1.141e-12					
	Fe+2	7.438e-13	1.899e-13	-12.129	-12.721	-0.593	(0)
	FeSO4	3.838e-13	3.838e-13	-12.416	-12.416	0.000	(0)
	FeOH+	1.170e-14	9.284e-15	-13.932	-14.032	-0.100	(0)
	FeHCO3+	1.742e-15	1.402e-15	-14.759	-14.853	-0.094	(0)
	Fe (OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
	Fe (OH) 3-	4.431e-18	3.517e-18	-17.353	-17.454	-0.100	(0)
	Fe (HS) 2	0.000e+00	0.000e+00	-161.152	-161.152	0.000	(0)
	Fe (HS) 3-	0.000e+00	0.000e+00	-237.656	-237.805	-0.148	(0)
Fe (3)		8.949e-10					

Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	4.061e-10	3.242e-10	-9.391	-9.489	-0.098	(0)
Fe (OH) 4-	6.124e-11	4.889e-11	-10.213	-10.311	-0.098	(0)
FeOH+2	1.710e-15	6.785e-16	-14.767	-15.168	-0.401	(0)
FeF2+	1.014e-18	8.052e-19	-17.994	-18.094	-0.100	(0)
FeF+2	4.234e-19	1.680e-19	-18.373	-18.775	-0.401	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
FeSO4+	9.959e-20	7.905e-20	-19.002	-19.102	-0.100	(0)
Fe (SO4) 2-	1.957e-20	1.391e-20	-19.708	-19.857	-0.148	(0)
Fe+3	7.075e-21	8.557e-22	-20.150	-21.068	-0.917	(0)
FeCl+2	4.476e-22	1.776e-22	-21.349	-21.751	-0.401	(0)
FeCl2+	6.870e-24	5.453e-24	-23.163	-23.263	-0.100	(0)
FeHSeO3+2	8.740e-25	2.231e-25	-24.059	-24.651	-0.593	(0)
FeCl3	3.748e-27	3.748e-27	-26.426	-26.426	0.000	(0)
Fe2 (OH) 2+4	3.588e-27	1.524e-29	-26.445	-28.817	-2.372	(0)
FeNO3+2	7.813e-28	1.995e-28	-27.107	-27.700	-0.593	(0)
Fe3 (OH) 4+5	3.629e-34	7.143e-38	-33.440	-37.146	-3.706	(0)
H (0)	3.956e-29					
H2	1.978e-29	2.017e-29	-28.704	-28.695	0.008	(0)
Hg (0)	4.390e-09					
Hg	4.390e-09	4.390e-09	-8.358	-8.358	0.000	(0)
Hg (1)	2.613e-20					
Hg2+2	1.306e-20	3.335e-21	-19.884	-20.477	-0.593	(0)
Hg (2)	3.297e-11					
HgClOH	1.668e-11	1.668e-11	-10.778	-10.778	0.000	(0)
Hg (OH) 2	1.044e-11	1.065e-11	-10.981	-10.973	0.008	(0)
HgCl2	5.287e-12	5.287e-12	-11.277	-11.277	0.000	(0)
HgCl3-	5.112e-13	3.634e-13	-12.291	-12.440	-0.148	(0)
HgCl4-2	3.895e-14	9.943e-15	-13.410	-14.002	-0.593	(0)
HgCO3	4.497e-15	4.497e-15	-14.347	-14.347	0.000	(0)
HgCl+	2.159e-16	1.535e-16	-15.666	-15.814	-0.148	(0)
Hg (CO3) 2-2	1.870e-16	4.775e-17	-15.728	-16.321	-0.593	(0)
HgOH+	7.697e-17	5.472e-17	-16.114	-16.262	-0.148	(0)
Hg (OH) 3-	2.316e-18	1.646e-18	-17.635	-17.783	-0.148	(0)
HgHCO3+	9.646e-19	6.857e-19	-18.016	-18.164	-0.148	(0)
Hg (NH3) 2+2	2.044e-19	5.218e-20	-18.690	-19.282	-0.593	(0)
HgNH3+2	2.378e-20	6.070e-21	-19.624	-20.217	-0.593	(0)
Hg+2	4.384e-21	1.119e-21	-20.358	-20.951	-0.593	(0)
HgSO4	2.412e-21	2.412e-21	-20.618	-20.618	0.000	(0)
HgF+	1.045e-23	7.429e-24	-22.981	-23.129	-0.148	(0)
Hg (NH3) 3+2	6.995e-27	1.786e-27	-26.155	-26.748	-0.593	(0)
HgNO3+	1.355e-29	9.632e-30	-28.868	-29.016	-0.148	(0)
Hg (NH3) 4+2	4.776e-34	1.219e-34	-33.321	-33.914	-0.593	(0)
Hg (NO3) 2	9.332e-38	9.332e-38	-37.030	-37.030	0.000	(0)
HgHS2-	0.000e+00	0.000e+00	-138.168	-138.316	-0.148	(0)
HgS2-2	0.000e+00	0.000e+00	-138.345	-138.938	-0.593	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.009	-140.009	0.000	(0)
K	7.622e-03					
K+	7.206e-03	5.698e-03	-2.142	-2.244	-0.102	(0)
KSO4-	4.160e-04	3.321e-04	-3.381	-3.479	-0.098	(0)
KCrO4-	2.566e-16	1.824e-16	-15.591	-15.739	-0.148	(0)
Mg	1.183e-02					
Mg+2	7.393e-03	2.892e-03	-2.131	-2.539	-0.408	(0)
MgSO4	4.332e-03	4.332e-03	-2.363	-2.363	0.000	(0)
MgF+	7.376e-05	5.810e-05	-4.132	-4.236	-0.104	(0)
MgHCO3+	2.221e-05	1.735e-05	-4.653	-4.761	-0.107	(0)
MgCO3	8.076e-06	8.076e-06	-5.093	-5.093	0.000	(0)
MgOH+	1.745e-06	1.414e-06	-5.758	-5.850	-0.091	(0)
MgH2BO3+	6.588e-07	5.001e-07	-6.181	-6.301	-0.120	(0)
Mn (2)	1.318e-04					
Mn+2	9.527e-05	2.432e-05	-4.021	-4.614	-0.593	(0)
MnSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
MnHCO3+	3.586e-07	2.846e-07	-6.445	-6.546	-0.100	(0)
MnCl+	2.652e-07	2.105e-07	-6.576	-6.677	-0.100	(0)
MnF+	2.185e-07	1.734e-07	-6.661	-6.761	-0.100	(0)
MnOH+	9.453e-08	7.503e-08	-7.024	-7.125	-0.100	(0)
MnCl2	2.043e-09	2.043e-09	-8.690	-8.690	0.000	(0)
MnCl3-	4.873e-12	3.868e-12	-11.312	-11.413	-0.100	(0)

MnSeO4	1.361e-12	1.361e-12	-11.866	-11.866	0.000	(0)
MnNO3+	1.264e-12	8.986e-13	-11.898	-12.046	-0.148	(0)
Mn (OH) 3-	8.811e-16	6.993e-16	-15.055	-15.155	-0.100	(0)
Mn (NO3) 2	5.261e-20	5.261e-20	-19.279	-19.279	0.000	(0)
Mn (OH) 4-2	6.986e-21	2.773e-21	-20.156	-20.557	-0.401	(0)
MnSe	0.000e+00	0.000e+00	-40.692	-40.692	0.000	(0)
Mn (3)	4.357e-25					
Mn+3	4.357e-25	5.270e-26	-24.361	-25.278	-0.917	(0)
Mn (6)	6.322e-40					
MnO4-2	6.322e-40	2.509e-40	-39.199	-39.600	-0.401	(0)
Mn (7)	0.000e+00					
MnO4-	0.000e+00	0.000e+00	-44.171	-44.287	-0.115	(0)
Mo	3.855e-06					
MoO4-2	3.854e-06	1.507e-06	-5.414	-5.822	-0.408	(0)
HMoO4-	3.455e-10	2.456e-10	-9.462	-9.610	-0.148	(0)
H2MoO4	1.473e-14	1.473e-14	-13.832	-13.832	0.000	(0)
Ag2MoO4	5.615e-25	5.615e-25	-24.251	-24.251	0.000	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-42.153	-43.487	-1.334	(0)
Mo7O24-6	0.000e+00	0.000e+00	-47.118	-52.455	-5.337	(0)
HMo7O24-5	0.000e+00	0.000e+00	-50.449	-54.155	-3.706	(0)
H2Mo7O24-4	0.000e+00	0.000e+00	-55.088	-57.459	-2.372	(0)
H3Mo7O24-3	0.000e+00	0.000e+00	-60.966	-62.300	-1.334	(0)
N (-3)	1.850e-07					
NH4+	1.626e-07	1.234e-07	-6.789	-6.909	-0.120	(0)
NH4SO4-	1.372e-08	1.089e-08	-7.863	-7.963	-0.100	(0)
NH3	8.596e-09	8.596e-09	-8.066	-8.066	0.000	(0)
CaNH3+2	4.180e-11	1.067e-11	-10.379	-10.972	-0.593	(0)
CuNH3+2	5.427e-12	1.385e-12	-11.265	-11.858	-0.593	(0)
NiNH3+2	1.351e-12	3.449e-13	-11.869	-12.462	-0.593	(0)
Co (NH3) +2	1.511e-13	3.858e-14	-12.821	-13.414	-0.593	(0)
AgNH3+	2.449e-14	1.741e-14	-13.611	-13.759	-0.148	(0)
BaNH3+2	2.702e-16	6.899e-17	-15.568	-16.161	-0.593	(0)
Ag (NH3) 2+	1.712e-18	1.217e-18	-17.767	-17.915	-0.148	(0)
Ni (NH3) 2+2	1.679e-18	4.286e-19	-17.775	-18.368	-0.593	(0)
Hg (NH3) 2+2	2.044e-19	5.218e-20	-18.690	-19.282	-0.593	(0)
Ca (NH3) 2+2	1.431e-19	3.652e-20	-18.844	-19.437	-0.593	(0)
Co (NH3) 2+2	5.541e-20	1.415e-20	-19.256	-19.849	-0.593	(0)
HgNH3+2	2.378e-20	6.070e-21	-19.624	-20.217	-0.593	(0)
Hg (NH3) 3+2	6.995e-27	1.786e-27	-26.155	-26.748	-0.593	(0)
Co (NH3) 3+2	5.997e-27	1.531e-27	-26.222	-26.815	-0.593	(0)
Hg (NH3) 4+2	4.776e-34	1.219e-34	-33.321	-33.914	-0.593	(0)
Co (NH3) 4+2	2.705e-34	6.907e-35	-33.568	-34.161	-0.593	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.144	-41.737	-0.593	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.413	-42.006	-0.593	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.930	-51.264	-1.334	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.108	-63.701	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
N (3)	3.222e-05					
NO2-	3.222e-05	2.471e-05	-4.492	-4.607	-0.115	(0)
CuNO2+	5.733e-11	4.075e-11	-10.242	-10.390	-0.148	(0)
CoNO2+	9.143e-12	6.499e-12	-11.039	-11.187	-0.148	(0)
AgNO2	5.121e-12	5.121e-12	-11.291	-11.291	0.000	(0)
Cu (NO2) 2	1.030e-14	1.030e-14	-13.987	-13.987	0.000	(0)
Ag (NO2) 2-	2.757e-16	1.960e-16	-15.560	-15.708	-0.148	(0)
N (5)	2.958e-08					
NO3-	2.948e-08	2.331e-08	-7.531	-7.632	-0.102	(0)
CaNO3+	1.023e-10	7.269e-11	-9.990	-10.139	-0.148	(0)
MnNO3+	1.264e-12	8.986e-13	-11.898	-12.046	-0.148	(0)
ZnNO3+	2.013e-13	1.431e-13	-12.696	-12.844	-0.148	(0)
NiNO3+	6.155e-15	4.375e-15	-14.211	-14.359	-0.148	(0)
BaNO3+	2.090e-15	1.486e-15	-14.680	-14.828	-0.148	(0)
CoNO3+	1.940e-15	1.379e-15	-14.712	-14.860	-0.148	(0)
CuNO3+	1.633e-15	1.161e-15	-14.787	-14.935	-0.148	(0)
CdNO3+	4.542e-16	3.228e-16	-15.343	-15.491	-0.148	(0)
PbNO3+	7.719e-17	5.487e-17	-16.112	-16.261	-0.148	(0)

AgNO3	1.837e-17	1.837e-17	-16.736	-16.736	0.000	(0)
Mn(NO3)2	5.261e-20	5.261e-20	-19.279	-19.279	0.000	(0)
UO2NO3+	8.935e-22	6.351e-22	-21.049	-21.197	-0.148	(0)
Zn(NO3)2	6.655e-22	6.655e-22	-21.177	-21.177	0.000	(0)
Co(NO3)2	6.540e-23	6.540e-23	-22.184	-22.184	0.000	(0)
Cd(NO3)2	3.772e-24	3.772e-24	-23.423	-23.423	0.000	(0)
Cu(NO3)2	3.407e-24	3.407e-24	-23.468	-23.468	0.000	(0)
Pb(NO3)2	2.172e-24	2.172e-24	-23.663	-23.663	0.000	(0)
CrNO3+2	5.389e-25	1.376e-25	-24.268	-24.861	-0.593	(0)
VO2NO3	1.078e-25	1.078e-25	-24.967	-24.967	0.000	(0)
FeNO3+2	7.813e-28	1.995e-28	-27.107	-27.700	-0.593	(0)
HgNO3+	1.355e-29	9.632e-30	-28.868	-29.016	-0.148	(0)
Hg(NO3)2	9.332e-38	9.332e-38	-37.030	-37.030	0.000	(0)
Na	2.719e-02					
Na+	2.604e-02	2.059e-02	-1.584	-1.686	-0.102	(0)
NaSO4-	1.140e-03	9.103e-04	-2.943	-3.041	-0.098	(0)
NaHCO3	6.790e-06	6.790e-06	-5.168	-5.168	0.000	(0)
NaF	2.326e-06	2.326e-06	-5.633	-5.633	0.000	(0)
NaCO3-	1.613e-06	1.287e-06	-5.792	-5.890	-0.098	(0)
NaH2BO3	1.628e-07	1.628e-07	-6.788	-6.788	0.000	(0)
NaCrO4-	1.240e-15	8.816e-16	-14.907	-15.055	-0.148	(0)
Ni	3.349e-07					
Ni+2	1.911e-07	7.472e-08	-6.719	-7.127	-0.408	(0)
NiSO4	1.227e-07	1.227e-07	-6.911	-6.911	0.000	(0)
NiCO3	9.360e-09	9.360e-09	-8.029	-8.029	0.000	(0)
NiHCO3+	7.600e-09	5.402e-09	-8.119	-8.267	-0.148	(0)
NiCl+	1.849e-09	1.314e-09	-8.733	-8.881	-0.148	(0)
NiOH+	1.625e-09	1.155e-09	-8.789	-8.937	-0.148	(0)
NiF+	4.728e-10	3.361e-10	-9.325	-9.474	-0.148	(0)
Ni(SO4)2-2	1.311e-10	3.346e-11	-9.883	-10.475	-0.593	(0)
Ni(OH)2	1.127e-10	1.127e-10	-9.948	-9.948	0.000	(0)
NiNH3+2	1.351e-12	3.449e-13	-11.869	-12.462	-0.593	(0)
Ni(OH)3-	1.947e-13	1.384e-13	-12.711	-12.859	-0.148	(0)
NiCl2	4.547e-14	4.547e-14	-13.342	-13.342	0.000	(0)
NiSeO4	7.264e-15	7.264e-15	-14.139	-14.139	0.000	(0)
NiNO3+	6.155e-15	4.375e-15	-14.211	-14.359	-0.148	(0)
Ni(NH3)2+2	1.679e-18	4.286e-19	-17.775	-18.368	-0.593	(0)
O(0)	2.437e-35					
O2	1.219e-35	1.243e-35	-34.914	-34.906	0.008	(0)
Pb	3.706e-09					
PbCO3	1.606e-09	1.606e-09	-8.794	-8.794	0.000	(0)
PbOH+	6.906e-10	4.909e-10	-9.161	-9.309	-0.148	(0)
PbSO4	6.417e-10	6.417e-10	-9.193	-9.193	0.000	(0)
Pb+2	4.069e-10	1.591e-10	-9.390	-9.798	-0.408	(0)
Pb(SO4)2-2	1.247e-10	3.183e-11	-9.904	-10.497	-0.593	(0)
PbHCO3+	9.755e-11	6.934e-11	-10.011	-10.159	-0.148	(0)
Pb(CO3)2-2	6.093e-11	1.556e-11	-10.215	-10.808	-0.593	(0)
PbCl+	5.460e-11	3.881e-11	-10.263	-10.411	-0.148	(0)
Pb(OH)2	1.906e-11	1.906e-11	-10.720	-10.720	0.000	(0)
PbF+	2.825e-12	2.008e-12	-11.549	-11.697	-0.148	(0)
PbCl2	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
Pb(OH)3-	3.294e-14	2.341e-14	-13.482	-13.631	-0.148	(0)
PbF2	7.077e-15	7.077e-15	-14.150	-14.150	0.000	(0)
PbCl3-	4.587e-15	3.260e-15	-14.339	-14.487	-0.148	(0)
PbNO3+	7.719e-17	5.487e-17	-16.112	-16.261	-0.148	(0)
PbCl4-2	4.012e-17	1.024e-17	-16.397	-16.990	-0.593	(0)
Pb(OH)4-2	2.758e-17	7.042e-18	-16.559	-17.152	-0.593	(0)
Pb2OH+3	2.673e-17	1.238e-18	-16.573	-17.907	-1.334	(0)
PbF3-	3.381e-18	2.404e-18	-17.471	-17.619	-0.148	(0)
Pb3(OH)4+2	4.520e-21	1.154e-21	-20.345	-20.938	-0.593	(0)
PbF4-2	8.069e-22	2.060e-22	-21.093	-21.686	-0.593	(0)
Pb(NO3)2	2.172e-24	2.172e-24	-23.663	-23.663	0.000	(0)
Pb4(OH)4+4	3.434e-25	1.459e-27	-24.464	-26.836	-2.372	(0)
Pb(HS)2	0.000e+00	0.000e+00	-151.908	-151.908	0.000	(0)
Pb(HS)3-	0.000e+00	0.000e+00	-229.150	-229.298	-0.148	(0)
S(-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.879	-73.879	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.542	-78.690	-0.148	(0)

CdHS+	0.000e+00	0.000e+00	-78.892	-79.041	-0.148	(0)
S5-2	0.000e+00	0.000e+00	-79.375	-79.968	-0.593	(0)
H2S	0.000e+00	0.000e+00	-79.757	-79.757	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.891	-80.484	-0.593	(0)
S4-2	0.000e+00	0.000e+00	-79.971	-80.564	-0.593	(0)
S3-2	0.000e+00	0.000e+00	-80.777	-81.370	-0.593	(0)
S2-2	0.000e+00	0.000e+00	-81.793	-82.386	-0.593	(0)
S-2	0.000e+00	0.000e+00	-87.502	-87.903	-0.401	(0)
HgHS2-	0.000e+00	0.000e+00	-138.168	-138.316	-0.148	(0)
HgS2-2	0.000e+00	0.000e+00	-138.345	-138.938	-0.593	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.009	-140.009	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.198	-147.615	-0.417	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.622	-147.866	-0.244	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.947	-148.095	-0.148	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.951	-148.345	-0.394	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.321	-148.469	-0.148	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.789	-149.219	-0.430	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.125	-149.530	-0.405	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.172	-150.172	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.527	-150.527	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.908	-151.908	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.152	-161.152	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.826	-217.974	-0.148	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.434	-225.582	-0.148	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.882	-227.475	-0.593	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.169	-227.317	-0.148	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.150	-229.298	-0.148	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.656	-237.805	-0.148	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.218	-303.811	-0.593	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.139	-305.732	-0.593	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.212	-320.805	-0.593	(0)
S (6)	2.884e-02					
SO4-2	2.105e-02	8.233e-03	-1.677	-2.084	-0.408	(0)
MgSO4	4.332e-03	4.332e-03	-2.363	-2.363	0.000	(0)
CaSO4	1.860e-03	1.860e-03	-2.730	-2.730	0.000	(0)
NaSO4-	1.140e-03	9.103e-04	-2.943	-3.041	-0.098	(0)
KSO4-	4.160e-04	3.321e-04	-3.381	-3.479	-0.098	(0)
MnSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
ZnSO4	4.402e-06	4.402e-06	-5.356	-5.356	0.000	(0)
Zn (SO4) 2-2	1.236e-06	3.156e-07	-5.908	-6.501	-0.593	(0)
NiSO4	1.227e-07	1.227e-07	-6.911	-6.911	0.000	(0)
CoSO4	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
CuSO4	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
NH4SO4-	1.372e-08	1.089e-08	-7.863	-7.963	-0.100	(0)
CdSO4	8.453e-09	8.453e-09	-8.073	-8.073	0.000	(0)
HSO4-	8.364e-09	6.588e-09	-8.078	-8.181	-0.104	(0)
Cd (SO4) 2-2	3.677e-09	9.387e-10	-8.435	-9.027	-0.593	(0)
PbSO4	6.417e-10	6.417e-10	-9.193	-9.193	0.000	(0)
AgSO4-	2.293e-10	1.630e-10	-9.640	-9.788	-0.148	(0)
Ni (SO4) 2-2	1.311e-10	3.346e-11	-9.883	-10.475	-0.593	(0)
Pb (SO4) 2-2	1.247e-10	3.183e-11	-9.904	-10.497	-0.593	(0)
CrOHSO4	7.088e-12	7.088e-12	-11.150	-11.150	0.000	(0)
FeSO4	3.838e-13	3.838e-13	-12.416	-12.416	0.000	(0)
UO2SO4	1.702e-13	1.702e-13	-12.769	-12.769	0.000	(0)
AlSO4+	7.571e-14	5.963e-14	-13.121	-13.225	-0.104	(0)
UO2 (SO4) 2-2	7.233e-14	1.847e-14	-13.141	-13.734	-0.593	(0)
Al (SO4) 2-	6.679e-15	5.260e-15	-14.175	-14.279	-0.104	(0)
CrSO4+	3.652e-15	2.596e-15	-14.437	-14.586	-0.148	(0)
VO2SO4-	2.528e-18	1.797e-18	-17.597	-17.745	-0.148	(0)
FeSO4+	9.959e-20	7.905e-20	-19.002	-19.102	-0.100	(0)
Fe (SO4) 2-	1.957e-20	1.391e-20	-19.708	-19.857	-0.148	(0)
Cr2 (OH) 2SO4+2	9.103e-21	2.324e-21	-20.041	-20.634	-0.593	(0)
HgSO4	2.412e-21	2.412e-21	-20.618	-20.618	0.000	(0)
VOSO4	2.295e-21	2.295e-21	-20.639	-20.639	0.000	(0)
Cr2 (OH) 2 (SO4) 2	1.137e-21	1.137e-21	-20.944	-20.944	0.000	(0)
CrO3SO4-2	1.838e-23	4.694e-24	-22.736	-23.329	-0.593	(0)
VSO4+	3.803e-36	2.703e-36	-35.420	-35.568	-0.148	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.035	-40.035	0.000	(0)

USO4+2	0.000e+00	0.000e+00	-41.258	-41.851	-0.593	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Sb (3)	4.618e-20					
Sb (OH) 3	2.335e-20	2.335e-20	-19.632	-19.632	0.000	(0)
HSbO2	2.282e-20	2.282e-20	-19.642	-19.642	0.000	(0)
SbO2-	6.351e-24	4.514e-24	-23.197	-23.345	-0.148	(0)
Sb (OH) 4-	3.629e-24	2.580e-24	-23.440	-23.588	-0.148	(0)
Sb (OH) 2F	5.355e-26	5.355e-26	-25.271	-25.271	0.000	(0)
SbOF	5.273e-26	5.273e-26	-25.278	-25.278	0.000	(0)
Sb (OH) 2+	6.540e-27	4.649e-27	-26.184	-26.333	-0.148	(0)
SbO+	2.258e-27	1.605e-27	-26.646	-26.795	-0.148	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.212	-320.805	-0.593	(0)
Sb (5)	5.902e-08					
SbO3-	5.896e-08	4.191e-08	-7.229	-7.378	-0.148	(0)
Sb (OH) 6-	6.173e-11	4.882e-11	-10.209	-10.311	-0.102	(0)
SbO2+	1.135e-24	8.070e-25	-23.945	-24.093	-0.148	(0)
Se (-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.335e-39	1.660e-39	-38.632	-38.780	-0.148	(0)
MnSe	0.000e+00	0.000e+00	-40.692	-40.692	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.977	-42.977	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.100	-45.693	-0.593	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-80.441	-82.812	-2.372	(0)
Se (4)	3.267e-07					
SeO3-2	1.879e-07	4.798e-08	-6.726	-7.319	-0.593	(0)
HSeO3-	1.388e-07	9.868e-08	-6.858	-7.006	-0.148	(0)
H2SeO3	3.447e-13	3.447e-13	-12.463	-12.463	0.000	(0)
AgSeO3-	4.303e-14	3.059e-14	-13.366	-13.514	-0.148	(0)
Cd (SeO3) 2-2	3.254e-17	8.308e-18	-16.488	-17.080	-0.593	(0)
Ag (SeO3) 2-3	2.836e-19	1.314e-20	-18.547	-19.881	-1.334	(0)
FeHSeO3+2	8.740e-25	2.231e-25	-24.059	-24.651	-0.593	(0)
Se (6)	5.329e-10					
SeO4-2	5.314e-10	2.078e-10	-9.275	-9.682	-0.408	(0)
MnSeO4	1.361e-12	1.361e-12	-11.866	-11.866	0.000	(0)
ZnSeO4	7.867e-14	7.867e-14	-13.104	-13.104	0.000	(0)
NiSeO4	7.264e-15	7.264e-15	-14.139	-14.139	0.000	(0)
CoSeO4	3.888e-15	3.888e-15	-14.410	-14.410	0.000	(0)
CdSeO4	1.695e-16	1.695e-16	-15.771	-15.771	0.000	(0)
HSeO4-	1.200e-16	8.529e-17	-15.921	-16.069	-0.148	(0)
Zn (SeO4) 2-2	6.494e-23	1.658e-23	-22.187	-22.780	-0.593	(0)
Si	4.462e-05					
H4SiO4	4.362e-05	4.448e-05	-4.360	-4.352	0.008	(0)
H3SiO4-	1.005e-06	7.852e-07	-5.998	-6.105	-0.107	(0)
H2SiO4-2	1.489e-11	6.050e-12	-10.827	-11.218	-0.391	(0)
UO2H3SiO4+	1.281e-12	9.102e-13	-11.893	-12.041	-0.148	(0)
SiF6-2	2.528e-29	1.003e-29	-28.597	-28.999	-0.401	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.514	-59.848	-1.334	(0)
U (4)	1.239e-19					
U (OH) 5-	1.238e-19	8.803e-20	-18.907	-19.055	-0.148	(0)
U (OH) 4	3.023e-23	3.023e-23	-22.520	-22.520	0.000	(0)
U (OH) 3+	1.275e-27	9.062e-28	-26.895	-27.043	-0.148	(0)
U (OH) 2+2	1.346e-32	3.435e-33	-31.871	-32.464	-0.593	(0)
UF3+	1.383e-36	9.831e-37	-35.859	-36.007	-0.148	(0)
UF2+2	1.357e-37	3.464e-38	-36.867	-37.460	-0.593	(0)
UOH+3	2.863e-38	1.327e-39	-37.543	-38.877	-1.334	(0)
UF4	1.930e-38	1.930e-38	-37.714	-37.714	0.000	(0)
UF+3	3.317e-40	0.000e+00	-39.479	-40.813	-1.334	(0)
UF5-	1.927e-40	1.370e-40	-39.715	-39.863	-0.148	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.035	-40.035	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.537	-41.130	-0.593	(0)
USO4+2	0.000e+00	0.000e+00	-41.258	-41.851	-0.593	(0)
U+4	0.000e+00	0.000e+00	-43.995	-46.366	-2.372	(0)
UCl+3	0.000e+00	0.000e+00	-45.495	-46.829	-1.334	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-162.053	-174.060	-12.007	(0)
U (5)	2.414e-16					
UO2+	2.414e-16	1.716e-16	-15.617	-15.766	-0.148	(0)
U (6)	5.325e-07					

UO2 (CO3) 3-4	4.844e-07	2.058e-09	-6.315	-8.687	-2.372	(0)
UO2 (CO3) 2-2	4.790e-08	1.223e-08	-7.320	-7.913	-0.593	(0)
UO2CO3	1.825e-10	1.825e-10	-9.739	-9.739	0.000	(0)
UO2OH+	2.970e-12	2.111e-12	-11.527	-11.675	-0.148	(0)
UO2H3SiO4+	1.281e-12	9.102e-13	-11.893	-12.041	-0.148	(0)
UO2F+	4.748e-13	3.375e-13	-12.323	-12.472	-0.148	(0)
UO2F2	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
UO2SO4	1.702e-13	1.702e-13	-12.769	-12.769	0.000	(0)
UO2 (SO4) 2-2	7.233e-14	1.847e-14	-13.141	-13.734	-0.593	(0)
UO2+2	3.491e-14	1.365e-14	-13.457	-13.865	-0.408	(0)
UO2F3-	1.103e-14	7.841e-15	-13.957	-14.106	-0.148	(0)
UO2Cl+	2.141e-16	1.522e-16	-15.669	-15.818	-0.148	(0)
UO2F4-2	4.368e-17	1.115e-17	-16.360	-16.953	-0.593	(0)
(UO2) 2 (OH) 2+2	2.897e-17	7.396e-18	-16.538	-17.131	-0.593	(0)
(UO2) 3 (OH) 5+	2.513e-17	1.786e-17	-16.600	-16.748	-0.148	(0)
UO2NO3+	8.935e-22	6.351e-22	-21.049	-21.197	-0.148	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.406	-43.554	-0.148	(0)
V+2	0.000e+00	0.000e+00	-44.561	-45.154	-0.593	(0)
V (3)	1.039e-15					
V (OH) 3	1.039e-15	1.039e-15	-14.983	-14.983	0.000	(0)
V (OH) 2+	7.745e-27	5.505e-27	-26.111	-26.259	-0.148	(0)
VOH+2	1.677e-30	4.281e-31	-29.776	-30.368	-0.593	(0)
V+3	1.501e-35	6.955e-37	-34.824	-36.158	-1.334	(0)
VS04+	3.803e-36	2.703e-36	-35.420	-35.568	-0.148	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-56.842	-58.176	-1.334	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-57.565	-59.937	-2.372	(0)
V (4)	3.563e-19					
V (OH) 3+	3.484e-19	2.476e-19	-18.458	-18.606	-0.148	(0)
VO+2	3.964e-21	1.012e-21	-20.402	-20.995	-0.593	(0)
VOSO4	2.295e-21	2.295e-21	-20.639	-20.639	0.000	(0)
VOF+	1.529e-21	1.087e-21	-20.816	-20.964	-0.148	(0)
VOF2	7.299e-23	7.299e-23	-22.137	-22.137	0.000	(0)
VOC1+	2.745e-23	1.951e-23	-22.561	-22.710	-0.148	(0)
VOF3-	6.524e-25	4.637e-25	-24.185	-24.334	-0.148	(0)
VOF4-2	1.313e-27	3.352e-28	-26.882	-27.475	-0.593	(0)
H2V2O4+2	1.207e-32	3.082e-33	-31.918	-32.511	-0.593	(0)
V (5)	1.778e-08					
H2VO4-	9.588e-09	6.816e-09	-8.018	-8.166	-0.148	(0)
HVO4-2	8.190e-09	2.091e-09	-8.087	-8.680	-0.593	(0)
H3VO4	5.581e-13	5.581e-13	-12.253	-12.253	0.000	(0)
HV2O7-3	1.044e-13	4.836e-15	-12.981	-14.316	-1.334	(0)
H3V2O7-	3.460e-14	2.459e-14	-13.461	-13.609	-0.148	(0)
VO4-3	2.762e-14	1.280e-15	-13.559	-14.893	-1.334	(0)
V2O7-4	3.742e-15	1.590e-17	-14.427	-16.799	-2.372	(0)
VO2+	1.156e-17	9.143e-18	-16.937	-17.039	-0.102	(0)
V3O9-3	7.186e-18	3.329e-19	-17.144	-18.478	-1.334	(0)
VO2F	2.871e-18	2.871e-18	-17.542	-17.542	0.000	(0)
VO2SO4-	2.528e-18	1.797e-18	-17.597	-17.745	-0.148	(0)
VO2F2-	2.626e-19	1.867e-19	-18.581	-18.729	-0.148	(0)
VO2F3-2	1.633e-21	4.170e-22	-20.787	-21.380	-0.593	(0)
V4O12-4	2.230e-22	9.473e-25	-21.652	-24.024	-2.372	(0)
VO2F4-3	7.930e-25	3.674e-26	-24.101	-25.435	-1.334	(0)
VO2NO3	1.078e-25	1.078e-25	-24.967	-24.967	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.763	-65.099	-5.337	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.293	-64.999	-3.706	(0)
H2V10O28-4	0.000e+00	0.000e+00	-65.507	-67.879	-2.372	(0)
Zn	1.304e-05					
Zn+2	6.249e-06	2.444e-06	-5.204	-5.612	-0.408	(0)
ZnSO4	4.402e-06	4.402e-06	-5.356	-5.356	0.000	(0)
Zn (SO4) 2-2	1.236e-06	3.156e-07	-5.908	-6.501	-0.593	(0)
ZnCO3	4.722e-07	4.722e-07	-6.326	-6.326	0.000	(0)
ZnOH+	4.222e-07	3.001e-07	-6.374	-6.523	-0.148	(0)
ZnOHC1	6.784e-08	6.784e-08	-7.169	-7.169	0.000	(0)
ZnHCO3+	6.376e-08	4.532e-08	-7.195	-7.344	-0.148	(0)
Zn (OH) 2	5.841e-08	5.841e-08	-7.233	-7.233	0.000	(0)
ZnCl+	5.401e-08	4.219e-08	-7.267	-7.375	-0.107	(0)
ZnF+	1.228e-08	8.732e-09	-7.911	-8.059	-0.148	(0)

Zn(OH) 3-	5.058e-10	3.595e-10	-9.296	-9.444	-0.148	(0)
ZnCl2	4.596e-10	4.596e-10	-9.338	-9.338	0.000	(0)
ZnCl3-	3.212e-12	2.509e-12	-11.493	-11.600	-0.107	(0)
ZnNO3+	2.013e-13	1.431e-13	-12.696	-12.844	-0.148	(0)
ZnSeO4	7.867e-14	7.867e-14	-13.104	-13.104	0.000	(0)
Zn(OH) 4-2	6.885e-14	1.758e-14	-13.162	-13.755	-0.593	(0)
ZnCl4-2	2.173e-14	8.624e-15	-13.663	-14.064	-0.401	(0)
Zn(NO3) 2	6.655e-22	6.655e-22	-21.177	-21.177	0.000	(0)
Zn(SeO4) 2-2	6.494e-23	1.658e-23	-22.187	-22.780	-0.593	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.947	-148.095	-0.148	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.172	-150.172	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.434	-225.582	-0.148	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.882	-227.475	-0.593	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.139	-305.732	-0.593	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K,	1 atm)
(Co (NH3) 5Cl) (NO3) 2	-52.97	-46.68	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-40.25	-35.74	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-47.47	-35.74	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-68.90	-50.97	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-54.59	-34.56	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.29	-27.88	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.95	-23.50	0.45	(NH4) 2SeO4
Acanthite	-52.39	-88.61	-36.22	Ag2S
Ag2CO3	-12.39	-23.48	-11.09	Ag2CO3
Ag2CrO4	-20.48	-32.07	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.28	-23.83	-11.55	Ag2MoO4
Ag2O	-14.41	-1.83	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.27	-20.09	-4.82	Ag2SO4
Ag3AsO3	-28.43	-26.27	2.16	Ag3AsO3
Ag3AsO4	-16.84	-19.62	-2.79	Ag3AsO4
Ag3H2VO5	-16.88	-11.70	5.18	Ag3H2VO5
AgF:4H2O	-13.80	-12.75	1.05	AgF:4H2O
Agmetal	-0.18	-13.69	-13.51	Ag
AgVO3	-10.64	-9.87	0.77	AgVO3
Al (OH) 3 (am)	-1.57	9.23	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.89	-47.53	2.37	Al2 (MoO4) 3
Al2O3	-1.19	18.46	19.65	Al2O3
Al4 (OH) 10SO4	-4.04	18.66	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.44	-7.64	4.80	AlAsO4:2H2O
AlOHSO4	-5.80	-9.03	-3.23	AlOHSO4
AlSb	-152.66	-87.04	65.62	AlSb
Alunite	-1.59	-2.99	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.09	-11.88	-7.79	PbSO4
Anhydrite	-0.73	-5.09	-4.36	CaSO4
Anilite	-55.37	-87.25	-31.88	Cu0.25Cu1.5S
Antlerite	-1.94	6.85	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-91.31	-94.07	-2.76	As4O6
Artinite	-3.98	5.62	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.45	-33.74	6.71	As2O5
Atacamite	-0.90	6.49	7.39	Cu2 (OH) 3Cl
Azurite	-1.28	-18.18	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.12	8.27	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.22	-1.35	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.01	6.93	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.29	-21.96	-9.67	BaCrO4
BaF2	-9.57	-15.39	-5.82	BaF2
BaMoO4	-6.76	-13.72	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4

BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.64	-6.81	1.83	BaSeO3
BaSeO4	-10.12	-17.58	-7.46	BaSeO4
Bianchite	-5.94	-7.70	-1.76	ZnSO4:6H2O
Birnessite	-6.34	11.75	18.09	MnO2
Bixbyite	-1.39	-2.04	-0.64	Mn2O3
BlaubleiI	-55.42	-79.59	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.84	-83.12	-27.28	Cu0.6Cu0.8S
Boehmite	0.65	9.23	8.58	AlOOH
Breithauptite	-55.92	-74.45	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4(OH)6SO4
Brucite	-3.21	13.63	16.84	Mg(OH)2
Bunsenite	-3.40	9.05	12.45	NiO
Ca(VO3)2	-10.40	-4.74	5.66	Ca(VO3)2
Ca2V2O7	-9.07	8.43	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.12	8.43	21.55	Ca2V2O7:2H2O
Ca3(AsO4)2:4H2O	-16.54	5.76	22.30	Ca3(AsO4)2:4H2O
Ca3(VO4)2	-17.36	21.60	38.96	Ca3(VO4)2
Ca3(VO4)2:4H2O	-18.27	21.59	39.86	Ca3(VO4)2:4H2O
Ca3Sb2	-296.00	-153.03	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	-0.00	-8.48	-8.48	CaCO3
Calomel	-6.89	-24.80	-17.91	Hg2Cl2
CaMoO4	-0.88	-8.83	-7.95	CaMoO4
Carnotite	-1.03	-0.80	0.23	KUO2VO4
CaSeO3:2H2O	-4.74	-1.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.67	-12.69	-3.02	CaSeO4:2H2O
Cd(BO2)2	-10.33	-0.49	9.84	Cd(BO2)2
Cd(OH)2	-5.83	7.81	13.64	Cd(OH)2
Cd(OH)2(am)	-5.92	7.81	13.73	Cd(OH)2
Cd3(OH)2(SO4)2	-19.78	-13.07	6.71	Cd3(OH)2(SO4)2
Cd3(OH)4SO4	-17.38	5.18	22.56	Cd3(OH)4SO4
Cd4(OH)6SO4	-15.40	13.00	28.40	Cd4(OH)6SO4
CdCl2	-12.03	-12.68	-0.66	CdCl2
CdCl2:1H2O	-10.99	-12.68	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.77	-12.69	-1.91	CdCl2:2.5H2O
CdF2	-14.64	-15.85	-1.21	CdF2
Cdmetal(alpha)	-31.24	-17.73	13.51	Cd
Cdmetal(gamma)	-31.35	-17.73	13.62	Cd
CdMoO4	-0.03	-14.18	-14.15	CdMoO4
CdOHCl	-5.97	-2.44	3.54	CdOHCl
CdSb	-75.33	-75.68	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4:2H2O	-16.19	-18.04	-1.85	CdSeO4:2H2O
CdSO4	-10.27	-10.44	-0.17	CdSO4
CdSO4:1H2O	-8.72	-10.44	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.57	-10.44	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.42	-11.17	-9.75	AgCl
Cerrusite	-2.14	-15.27	-13.13	PbCO3
CH4(g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.25	-9.89	-2.64	CuSO4:5H2O
Chalcedony	-0.80	-4.35	-3.55	SiO2
Chalcocite	-55.28	-90.20	-34.92	Cu2S
Chalcopyrite	-126.46	-161.73	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5(OH)4
Cinnabar	-52.05	-97.75	-45.69	HgS
Claudetite	-91.01	-94.07	-3.06	As4O6
Clausthalite	-13.39	-40.49	-27.10	PbSe
Co(BO2)2	-26.63	0.44	27.07	Co(BO2)2
Co(OH)2	-4.35	8.74	13.09	Co(OH)2
Co(OH)3	-8.57	-10.88	-2.31	Co(OH)3
CO2(g)	-3.50	-21.65	-18.15	CO2
Co3(AsO4)2	-20.54	-7.51	13.03	Co3(AsO4)2
Co3O4	-2.52	-13.02	-10.50	Co3O4
CoCl2	-20.02	-11.75	8.27	CoCl2
CoCl2:6H2O	-14.29	-11.76	2.54	CoCl2:6H2O
CoCO3	-2.92	-12.90	-9.98	CoCO3
CoF2	-13.33	-14.92	-1.60	CoF2

CoF3	-44.92	-46.38	-1.46	CoF3
CoFe2O4	18.66	15.13	-3.53	CoFe2O4
CoMoO4	-5.49	-13.25	-7.76	CoMoO4
CoO	-4.84	8.75	13.59	CoO
CoS (alpha)	-70.59	-78.03	-7.44	CoS
CoS (beta)	-66.96	-78.03	-11.07	CoS
CoSe	-21.92	-38.12	-16.20	CoSe
CoSeO3	-7.67	-6.35	1.32	CoSeO3
CoSeO4:6H2O	-15.58	-17.11	-1.53	CoSeO4:6H2O
CoSO4	-12.31	-9.51	2.80	CoSO4
CoSO4:6H2O	-7.04	-9.52	-2.47	CoSO4:6H2O
Cotunnite	-9.34	-14.12	-4.78	PbCl2
Covellite	-56.11	-78.41	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.59	-31.50	14.09	CrCl2
CrCl3	-47.04	-31.93	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Cristobalite	-1.00	-4.35	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.73	-42.57	-33.84	Na3AlF6
Cu (OH) 2	-0.30	8.37	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.01	20.20	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.23	1.02	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.73	-89.61	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.49	-50.29	-45.80	Cu2Se
Cu2SO4	-19.73	-21.68	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.73	-8.63	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.81	-101.40	-42.59	Cu3Sb
Cu3Se2	-25.29	-88.79	-63.49	Cu3Se2
CuCO3	-1.78	-13.28	-11.50	CuCO3
CuCrO4	-16.43	-21.87	-5.44	CuCrO4
CuF	-8.64	-13.55	-4.91	CuF
CuF2	-16.41	-15.30	1.12	CuF2
CuF2:2H2O	-10.75	-15.30	-4.55	CuF2:2H2O
Cumetal	-5.73	-14.48	-8.76	Cu
CuMoO4	-0.55	-13.62	-13.08	CuMoO4
CuOCuSO4	-11.82	-1.52	10.30	CuOCuSO4
Cupricferrite	8.77	14.75	5.99	CuFe2O4
Cuprite	-2.02	-3.42	-1.41	Cu2O
Cuprousferrite	10.40	1.48	-8.92	CuFeO2
CuSe	-5.40	-38.50	-33.10	CuSe
CuSe2	-26.45	-59.82	-33.37	CuSe2
CuSeO3:2H2O	-7.23	-6.72	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.05	-17.49	-2.44	CuSeO4:5H2O
CuSO4	-12.83	-9.89	2.94	CuSO4
Diaspore	2.36	9.23	6.87	AlOOH
Djurleite	-55.50	-89.42	-33.92	Cu0.066Cu1.868S
Dolomite (disordered)	0.05	-16.49	-16.54	CaMg (CO3) 2
Dolomite (ordered)	0.60	-16.49	-17.09	CaMg (CO3) 2
Epsomite	-2.50	-4.63	-2.13	MgSO4:7H2O
Fe (OH) 2	-10.11	3.45	13.56	Fe (OH) 2
Fe (OH) 2.7Cl.3	3.16	0.12	-3.04	Fe (OH) 2.7Cl.3
Fe (VO3) 2	-10.73	-14.45	-3.72	Fe (VO3) 2
Fe2 (OH) 4SeO3	-10.26	-8.71	1.55	Fe2 (OH) 4SeO3
Fe2 (SeO3) 3:2H2O	-18.27	-38.89	-20.63	Fe2 (SeO3) 3:2H2O
Fe2 (SO4) 3	-44.65	-48.39	-3.73	Fe2 (SO4) 3
Fe3 (OH) 8	-10.39	9.83	20.22	Fe3 (OH) 8
FeAsO4:2H2O	-14.08	-13.68	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.45	-18.54	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe (OH) 3
Ferroselite	-46.14	-64.74	-18.60	FeSe2
FeS (ppt)	-80.37	-83.32	-2.95	FeS
FeSe	-32.41	-43.41	-11.00	FeSe

Fix_pe	-4.69	-4.69	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.43	-80.40	-13.97	PbS
Gibbsite	0.94	9.23	8.29	Al (OH) 3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.69	-7.70	-2.01	ZnSO4:7H2O
Greenalite	-19.16	1.65	20.81	Fe3Si2O5 (OH) 4
Greenockite	-64.60	-78.96	-14.36	CdS
Greigite	-292.23	-337.27	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-0.48	-5.09	-4.61	CaSO4:2H2O
H-Jarosite	-14.84	-26.94	-12.10	(H3O) Fe3 (SO4) 2 (OH) 6
H2MoO4	-9.12	-22.00	-12.88	H2MoO4
H2S (g)	-78.77	-86.78	-8.01	H2S
H2Se (g)	-41.91	-46.87	-4.96	H2Se
Halite	-5.45	-3.85	1.60	NaCl
Halloysite	0.18	9.76	9.57	Al2Si2O5 (OH) 4
Hausmannite	-0.81	60.22	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.98	21.91	22.89	FeAl2O4
Hg (CH3) 2 (g)	-184.92	-258.63	-73.71	Hg (CH3) 2
Hg (g)	-7.05	-14.92	-7.87	Hg
Hg (OH) 2	-7.48	-10.97	-3.50	Hg (OH) 2
Hg2 (g)	-14.89	-29.85	-14.96	Hg2
Hg2 (OH) 2	-9.56	-4.30	5.26	Hg2 (OH) 2
Hg2CO3	-9.90	-25.95	-16.05	Hg2CO3
Hg2CrO4	-25.84	-34.54	-8.70	Hg2CrO4
Hg2F2	-17.61	-27.97	-10.36	Hg2F2
Hg2S	-79.40	-91.08	-11.68	Hg2S
Hg2SeO3	-14.74	-19.40	-4.66	Hg2SeO3
Hg2SO4	-16.43	-22.56	-6.13	Hg2SO4
Hg3O2CO3	-24.88	-54.56	-29.68	Hg3O2CO3
HgCl (g)	-31.90	-12.40	19.50	HgCl
HgCl2	-10.21	-31.47	-21.26	HgCl2
HgF (g)	-46.66	-13.99	32.68	HgF
HgF2 (g)	-47.20	-34.64	12.57	HgF2
Hgmetal (l)	-1.47	-14.92	-13.45	Hg
HgSe	-2.14	-57.84	-55.69	HgSe
HgSeO3	-13.63	-26.06	-12.43	HgSeO3
HgSO4	-19.81	-29.23	-9.42	HgSO4
Huntite	-2.55	-32.52	-29.97	CaMg3 (CO3) 4
Hydrocerrusite	-5.40	-24.17	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.65	-18.42	-8.77	Mg5 (CO3) 4 (OH) 2:4H2O
K-Alum	-16.28	-21.45	-5.17	KAl (SO4) 2:12H2O
K-Jarosite	-6.30	-21.10	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.55	-48.79	-17.24	K2Cr2O7
K2CrO4	-18.04	-18.55	-0.51	K2CrO4
K2MoO4	-13.57	-10.31	3.26	K2MoO4
K2SeO4	-13.44	-14.17	-0.73	K2SeO4
Kaolinite	2.32	9.76	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4:H2O
Larnakite	-5.07	-5.51	-0.43	PbO:PbSO4
Laurionite	-4.50	-3.87	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.32	6.37	12.69	PbO
Mackinawite	-79.72	-83.32	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.16	20.02	16.86	Fe2MgO4
Magnesite	-0.55	-8.01	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.40	-4.91	-5.31	Cu2 (OH) 2CO3
Manganite	-1.01	24.33	25.34	MnOOH
Massicot	-6.52	6.37	12.89	PbO
Matlockite	-6.73	-15.71	-8.97	PbClF
Melanothallite	-18.39	-12.13	6.26	CuCl2
Melanterite	-12.60	-14.81	-2.21	FeSO4:7H2O
Metacinnabar	-52.65	-97.75	-45.09	HgS

Mg(OH)2 (active)	-5.16	13.63	18.79	Mg(OH)2
Mg(VO3)2	-15.55	-4.27	11.28	Mg(VO3)2
Mg2Sb3	-272.35	-197.66	74.68	Mg2Sb3
Mg2V2O7	-17.00	9.36	26.36	Mg2V2O7
MgCr2O4	-4.92	11.28	16.20	MgCr2O4
MgCrO4	-21.98	-16.60	5.38	MgCrO4
MgF2	-1.90	-10.03	-8.13	MgF2
MgMoO4	-6.51	-8.36	-1.85	MgMoO4
MgSeO3:6H2O	-4.52	-1.46	3.06	MgSeO3:6H2O
MgSeO4:6H2O	-11.02	-12.22	-1.20	MgSeO4:6H2O
Minium	-28.85	44.67	73.52	Pb3O4
Mirabilite	-4.35	-5.46	-1.11	Na2SO4:10H2O
Mn(VO3)2	-11.25	-6.35	4.90	Mn(VO3)2
Mn2(SO4)3	-51.10	-56.81	-5.71	Mn2(SO4)3
Mn2Sb	-147.00	-85.92	61.08	Mn2Sb
Mn3(AsO4)2:8H2O	-11.57	0.93	12.50	Mn3(AsO4)2:8H2O
MnCl2:4H2O	-11.66	-8.94	2.72	MnCl2:4H2O
MnS (grn)	-75.39	-75.22	0.17	MnS
MnS (pnk)	-78.56	-75.22	3.34	MnS
MnSb	-94.37	-97.28	-2.91	MnSb
MnSe	-38.81	-35.31	3.50	MnSe
MnSeO3	-4.66	-3.53	1.13	MnSeO3
MnSeO3:2H2O	-4.52	-3.53	0.98	MnSeO3:2H2O
MnSeO4:5H2O	-12.25	-14.30	-2.05	MnSeO4:5H2O
MnSO4	-9.28	-6.70	2.58	MnSO4
Monteponite	-7.29	7.81	15.10	CdO
Montroydite	-7.33	-10.97	-3.64	HgO
MoO3	-13.99	-21.99	-8.00	MoO3
Morenosite	-7.07	-9.22	-2.14	NiSO4:7H2O
MoS2	-150.83	-221.09	-70.26	MoS2
Na-Jarosite	-9.34	-20.54	-11.20	NaFe3(SO4)2(OH)6
Na2Cr2O7	-37.78	-47.68	-9.90	Na2Cr2O7
Na2CrO4	-20.37	-17.44	2.93	Na2CrO4
Na2Mo2O7	-14.59	-31.19	-16.60	Na2Mo2O7
Na2MoO4	-10.68	-9.19	1.49	Na2MoO4
Na2MoO4:2H2O	-10.42	-9.20	1.22	Na2MoO4:2H2O
Na2SeO3:5H2O	-12.59	-2.29	10.30	Na2SeO3:5H2O
Na2SeO4	-14.33	-13.05	1.28	Na2SeO4
Na3Sb	-171.52	-77.06	94.45	Na3Sb
Na3VO4	-26.43	10.25	36.68	Na3VO4
Na4V2O7	-29.70	7.70	37.40	Na4V2O7
Nantokite	-5.23	-11.96	-6.73	CuCl
NaSb	-87.49	-64.32	23.17	NaSb
Natron	-7.54	-8.85	-1.31	Na2CO3:10H2O
NaVO3	-6.41	-2.55	3.86	NaVO3
Nesquehonite	-3.34	-8.01	-4.67	MgCO3:3H2O
Ni(OH)2	-3.75	9.05	12.79	Ni(OH)2
Ni3(AsO4)2:8H2O	-22.31	-6.61	15.70	Ni3(AsO4)2:8H2O
Ni4(OH)6SO4	-14.07	17.93	32.00	Ni4(OH)6SO4
NiCO3	-5.73	-12.60	-6.87	NiCO3
NiMoO4	-1.81	-12.95	-11.14	NiMoO4
NiS (alpha)	-72.13	-77.73	-5.60	NiS
NiS (beta)	-66.63	-77.73	-11.10	NiS
NiS (gamma)	-64.93	-77.73	-12.80	NiS
NiSe	-20.12	-37.82	-17.70	NiSe
NiSeO3:2H2O	-8.86	-6.05	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.29	-16.81	-1.52	NiSeO4:6H2O
Nsutite	-5.75	11.75	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-246.30	-307.36	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb(BO2)2	-8.45	-1.93	6.52	Pb(BO2)2
Pb(OH)2	-1.78	6.37	8.15	Pb(OH)2
Pb10(OH)6O(CO3)6	-57.38	-66.14	-8.76	Pb10(OH)6O(CO3)6
Pb2(OH)3Cl	-6.29	2.50	8.79	Pb2(OH)3Cl
Pb2O(OH)2	-13.44	12.75	26.19	Pb2O(OH)2
Pb2O3	-22.75	38.29	61.04	Pb2O3
Pb2OCO3	-8.34	-8.90	-0.56	Pb2OCO3

Pb2V2O7	-3.26	-5.16	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.42	-14.62	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.92	1.22	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.54	-2.52	11.02	Pb3O2CO3
Pb3O2SO4	-9.82	0.87	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-13.86	7.24	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-14.64	7.24	21.88	Pb4O3SO4
PbCrO4	-11.26	-23.86	-12.60	PbCrO4
PbF2	-9.85	-17.29	-7.44	PbF2
Pbmetal	-23.42	-19.17	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.61	6.37	12.98	PbO:0.33H2O
PbSeO4	-12.64	-19.48	-6.84	PbSeO4
Periclase	-7.95	13.63	21.58	MgO
Phosgenite	-9.59	-29.40	-19.81	PbCl2:PbCO3
Plattnerite	-17.68	31.92	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.05	-144.56	-18.51	FeS2
Pyrochroite	-3.64	11.56	15.19	Mn (OH) 2
Pyrolusite	-4.28	37.10	41.38	MnO2
Quartz	-0.35	-4.35	-4.00	SiO2
Realgar	-103.32	-123.07	-19.75	AsS
Retgersite	-7.17	-9.21	-2.04	NiSO4:6H2O
Rhodochrosite	0.49	-10.09	-10.58	MnCO3
Rutherfordine	-4.84	-19.34	-14.50	UO2CO3
Sb (OH) 3	-12.52	-19.63	-7.11	Sb (OH) 3
Sb2O4	-17.12	-13.72	3.40	Sb2O4
Sb2O5	-27.12	-36.79	-9.67	Sb2O5
Sb2Se3	-112.10	-179.86	-67.76	Sb2Se3
Sb4O6(cubic)	-60.26	-78.52	-18.26	Sb4O6
Sb4O6(orth)	-60.62	-78.52	-17.90	Sb4O6
SbCl3	-50.95	-50.38	0.57	SbCl3
SbF3	-44.91	-55.13	-10.23	SbF3
Sbmetal	-46.26	-57.95	-11.69	Sb
SbO2	-3.34	-31.17	-27.82	SbO2
Schoepite	-3.69	2.31	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.21	-21.32	-7.11	Se
Semetal (hex)	-13.61	-21.32	-7.71	Se
Senarmontite	-26.90	-39.26	-12.37	Sb2O3
SeO2	-15.22	-15.09	0.12	SeO2
SeO3	-46.90	-25.86	21.04	SeO3
Sepiolite	-1.55	14.21	15.76	Mg2Si3O7.5OH:3H2O
Sepiolite (A)	-4.57	14.21	18.78	Mg2Si3O7.5OH:3H2O
Siderite	-7.96	-18.20	-10.24	FeCO3
SiO2(am-gel)	-1.64	-4.35	-2.71	SiO2
SiO2(am-ppt)	-1.61	-4.35	-2.74	SiO2
Smithsonite	-1.09	-11.09	-10.00	ZnCO3
Sphalerite	-64.77	-76.22	-11.45	ZnS
Spinel	-4.75	32.09	36.85	MgAl2O4
Stibnite	-249.13	-299.59	-50.46	Sb2S3
Sulfur	-59.09	-61.23	-2.14	S
Tenorite	0.73	8.37	7.64	CuO
Thenardite	-5.78	-5.46	0.32	Na2SO4
Thermonatrite	-9.48	-8.85	0.64	Na2CO3:H2O
Tyuyamunite	-4.20	-0.12	4.08	Ca (UO2) 2 (VO4) 2
U3O8	-12.06	9.03	21.08	U3O8
U3Sb4	-579.50	-427.12	152.38	U3Sb4
U4O9	-27.52	-30.54	-3.02	U4O9
UF4	-31.82	-61.35	-29.54	UF4
UF4:2.5H2O	-28.64	-61.36	-32.72	UF4:2.5H2O
UO2 (am)	-14.95	-14.02	0.93	UO2
UO2 (NO3) 2	-41.28	-29.13	12.15	UO2 (NO3) 2
UO2 (NO3) 2:2H2O	-33.98	-29.13	4.85	UO2 (NO3) 2:2H2O
UO2 (NO3) 2:3H2O	-32.52	-29.13	3.39	UO2 (NO3) 2:3H2O
UO2 (NO3) 2:6H2O	-31.18	-29.13	2.05	UO2 (NO3) 2:6H2O
UO2 (OH) 2 (beta)	-3.30	2.31	5.61	UO2 (OH) 2
UO2SeO4:4H2O	-21.30	-23.55	-2.25	UO2SeO4:4H2O
UO3	-5.39	2.31	7.70	UO3

Uraninite	-9.35	-14.02	-4.67	UO2
USb2	-219.80	-190.22	29.58	USb2
V(OH)3	-19.49	-11.90	7.59	V(OH)3
V2O5	-16.54	-17.90	-1.36	V2O5
V3O5	-41.85	-40.01	1.84	V3O5
V4O7	-52.02	-44.83	7.19	V4O7
V6O13	-43.94	-104.80	-60.86	V6O13
Valentinite	-30.78	-39.26	-8.48	Sb2O3
VC12	-64.04	-45.17	18.87	VC12
VC13	-66.08	-42.65	23.43	VC13
VF4	-67.09	-52.16	14.93	VF4
Vmetal	-94.24	-50.22	44.03	V
VO	-39.43	-24.67	14.76	VO
VO(OH)2	-9.97	-4.82	5.15	VO(OH)2
VO2Cl	-22.04	-19.20	2.84	VO2Cl
VOC1	-33.30	-22.15	11.15	VOC1
VOC12	-38.08	-25.32	12.76	VOC12
VOSO4	-26.69	-23.08	3.61	VOSO4
Witherite	-4.80	-13.37	-8.57	BaCO3
Wurtzite	-67.27	-76.22	-8.95	ZnS
Zincite	-0.77	10.56	11.33	ZnO
Zincosite	-11.63	-7.70	3.93	ZnSO4
Zn(BO2)2	-6.03	2.26	8.29	Zn(BO2)2
Zn(NO3)2:6H2O	-24.20	-20.88	3.32	Zn(NO3)2:6H2O
Zn(OH)2	-1.64	10.56	12.20	Zn(OH)2
Zn(OH)2(am)	-1.91	10.56	12.47	Zn(OH)2
Zn(OH)2(beta)	-1.19	10.56	11.75	Zn(OH)2
Zn(OH)2(epsilon)	-0.97	10.56	11.53	Zn(OH)2
Zn(OH)2(gamma)	-1.17	10.56	11.73	Zn(OH)2
Zn2(OH)2SO4	-4.64	2.86	7.50	Zn2(OH)2SO4
Zn2(OH)3Cl	-4.32	10.87	15.19	Zn2(OH)3Cl
Zn3(AsO4)2:2.5H2O	-15.71	-2.06	13.65	Zn3(AsO4)2:2.5H2O
Zn3O(SO4)2	-23.75	-4.83	18.91	Zn3O(SO4)2
Zn4(OH)6SO4	-4.41	23.99	28.40	Zn4(OH)6SO4
Zn5(OH)8Cl2	-6.20	32.30	38.50	Zn5(OH)8Cl2
ZnCl2	-16.99	-9.94	7.05	ZnCl2
ZnCO3:1H2O	-0.83	-11.09	-10.26	ZnCO3:1H2O
ZnF2	-12.57	-13.11	-0.53	ZnF2
Znmetal	-40.77	-14.98	25.79	Zn
ZnMoO4	-1.31	-11.43	-10.13	ZnMoO4
ZnO(active)	-0.63	10.56	11.19	ZnO
ZnS(am)	-67.16	-76.22	-9.05	ZnS
ZnSb	-83.95	-72.93	11.01	ZnSb
ZnSe	-21.90	-36.30	-14.40	ZnSe
ZnSeO4:6H2O	-13.78	-15.30	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.06	-7.70	-0.64	ZnSO4:1H2O

**For a gas, SI = log10(fugacity). Fugacity = pressure * phi / 1 atm.
For ideal gases, phi = 1.

End of simulation.

Reading input data for simulation 163.

```

Title Use solution to allow model output
REACTION 906
      H2O      -0.0
      0 moles
USE solution 915
End

```

TITLE

Use solution to allow model output

Beginning of batch-reaction calculations.

Reaction step 1.

Using solution 915. Solution after simulation 162.

Using reaction 906.

Reaction 906.

0.000e+00 moles of the following reaction have been added:

Reactant	Relative moles
H2O	-0.00000

Element	Relative moles
H	-0.00000
O	-0.00000

-----Solution composition-----

Elements	Molality	Moles
Ag	2.735e-08	2.731e-08
Al	5.406e-06	5.398e-06
As	5.091e-10	5.084e-10
B	7.674e-05	7.663e-05
Ba	3.263e-08	3.259e-08
C	8.141e-04	8.129e-04
Ca	4.403e-03	4.397e-03
Cd	2.802e-08	2.798e-08
Cl	8.692e-03	8.679e-03
Co	2.150e-07	2.147e-07
Cr	1.072e-09	1.070e-09
Cu	4.920e-07	4.913e-07
F	3.052e-04	3.048e-04
Fe	8.960e-10	8.947e-10
Hg	4.423e-09	4.416e-09
K	7.622e-03	7.611e-03
Mg	1.183e-02	1.181e-02
Mn	1.318e-04	1.316e-04
Mo	3.855e-06	3.849e-06
N	3.243e-05	3.238e-05
Na	2.719e-02	2.715e-02
Ni	3.349e-07	3.345e-07
Pb	3.706e-09	3.701e-09
S	2.884e-02	2.880e-02
Sb	5.902e-08	5.893e-08
Se	3.273e-07	3.268e-07
Si	4.462e-05	4.456e-05
U	5.325e-07	5.317e-07
V	1.778e-08	1.775e-08
Zn	1.304e-05	1.302e-05

-----Description of solution-----

	pH	=	8.087	Charge balance
	pe	=	4.686	Adjusted to redox
equilibrium	Activity of water	=	0.999	
	Ionic strength (mol/kgw)	=	8.447e-02	
	Mass of water (kg)	=	9.986e-01	

Total alkalinity (eq/kg) = 8.639e-04
 Total CO2 (mol/kg) = 8.141e-04
 Temperature (°C) = 25.00
 Pressure (atm) = 1.00
 Electrical balance (eq) = 3.832e-06
 Percent error, 100*(Cat-|An|)/(Cat+|An|) = 0.00
 Iterations = 0
 Total H = 1.108543e+02
 Total O = 5.554467e+01

-----Distribution of species-----

Species	Molality	Activity	Log Molality	Log Activity	Log Gamma	mole V cm ³ /mol
OH-	1.586e-06	1.228e-06	-5.800	-5.911	-0.111	(0)
H+	1.035e-08	8.188e-09	-7.985	-8.087	-0.102	0.00
H2O	5.551e+01	9.986e-01	1.744	-0.001	0.000	18.07
Ag	2.735e-08					
AgCl	1.392e-08	1.392e-08	-7.856	-7.856	0.000	(0)
AgCl2-	1.172e-08	8.334e-09	-7.931	-8.079	-0.148	(0)
Ag+	1.254e-09	9.920e-10	-8.902	-9.003	-0.102	(0)
AgSO4-	2.293e-10	1.630e-10	-9.640	-9.788	-0.148	(0)
AgCl3-2	2.000e-10	5.105e-11	-9.699	-10.292	-0.593	(0)
AgCl4-3	1.546e-11	7.164e-13	-10.811	-12.145	-1.334	(0)
AgNO2	5.121e-12	5.121e-12	-11.291	-11.291	0.000	(0)
AgF	4.462e-13	4.462e-13	-12.350	-12.350	0.000	(0)
AgOH	1.218e-13	1.218e-13	-12.914	-12.914	0.000	(0)
AgH2BO3	7.843e-14	7.843e-14	-13.106	-13.106	0.000	(0)
AgSeO3-	4.303e-14	3.059e-14	-13.366	-13.514	-0.148	(0)
AgNH3+	2.449e-14	1.741e-14	-13.611	-13.759	-0.148	(0)
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
Ag (NO2) 2-	2.757e-16	1.960e-16	-15.560	-15.708	-0.148	(0)
Ag (OH) 2-	2.057e-17	1.462e-17	-16.687	-16.835	-0.148	(0)
AgNO3	1.837e-17	1.837e-17	-16.736	-16.736	0.000	(0)
Ag (NH3) 2+	1.712e-18	1.217e-18	-17.767	-17.915	-0.148	(0)
Ag (SeO3) 2-3	2.836e-19	1.314e-20	-18.547	-19.881	-1.334	(0)
Ag2MoO4	5.615e-25	5.615e-25	-24.251	-24.251	0.000	(0)
AgHS	0.000e+00	0.000e+00	-73.879	-73.879	0.000	(0)
AgOH (Se) 2-4	0.000e+00	0.000e+00	-80.441	-82.812	-2.372	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.622	-147.866	-0.244	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.321	-148.469	-0.148	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.789	-149.219	-0.430	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.125	-149.530	-0.405	(0)
Al	5.406e-06					
Al (OH) 4-	5.376e-06	4.235e-06	-5.270	-5.373	-0.104	(0)
Al (OH) 3	2.739e-08	2.739e-08	-7.562	-7.562	0.000	(0)
Al (OH) 2+	1.400e-09	1.118e-09	-8.854	-8.952	-0.098	(0)
AlF3	2.685e-10	2.685e-10	-9.571	-9.571	0.000	(0)
AlF2+	1.492e-10	1.191e-10	-9.826	-9.924	-0.098	(0)
AlF4-	3.060e-11	2.410e-11	-10.514	-10.618	-0.104	(0)
AlF+2	4.113e-12	1.671e-12	-11.386	-11.777	-0.391	(0)
AlOH+2	2.821e-12	1.146e-12	-11.550	-11.941	-0.391	(0)
AlSO4+	7.571e-14	5.963e-14	-13.121	-13.225	-0.104	(0)
Al+3	7.714e-15	9.331e-16	-14.113	-15.030	-0.917	(0)
Al (SO4) 2-	6.679e-15	5.260e-15	-14.175	-14.279	-0.104	(0)
AlMo6O21-3	0.000e+00	0.000e+00	-42.153	-43.487	-1.334	(0)
As (3)	3.295e-24					
H3AsO3	3.028e-24	3.028e-24	-23.519	-23.519	0.000	(0)
H2AsO3-	2.668e-25	1.897e-25	-24.574	-24.722	-0.148	(0)
HAsO3-2	8.275e-29	2.112e-29	-28.082	-28.675	-0.593	(0)
H4AsO3+	1.728e-32	1.228e-32	-31.762	-31.911	-0.148	(0)
AsO3-3	2.147e-33	9.945e-35	-32.668	-34.002	-1.334	(0)
As (5)	5.091e-10					
HAsO4-2	4.948e-10	1.263e-10	-9.306	-9.899	-0.593	(0)
H2AsO4-	1.327e-11	9.433e-12	-10.877	-11.025	-0.148	(0)
AsO4-3	1.053e-12	4.879e-14	-11.978	-13.312	-1.334	(0)
H3AsO4	1.316e-17	1.342e-17	-16.881	-16.872	0.008	(0)

B	7.674e-05					
H3BO3	6.897e-05	7.033e-05	-4.161	-4.153	0.008	(0)
H2BO3-	6.571e-06	4.988e-06	-5.182	-5.302	-0.120	(0)
MgH2BO3+	6.588e-07	5.001e-07	-6.181	-6.301	-0.120	(0)
CaH2BO3+	3.729e-07	2.831e-07	-6.428	-6.548	-0.120	(0)
NaH2BO3	1.628e-07	1.628e-07	-6.788	-6.788	0.000	(0)
BF(OH) 3-	6.619e-09	5.025e-09	-8.179	-8.299	-0.120	(0)
H5(BO3) 2-	3.933e-10	2.986e-10	-9.405	-9.525	-0.120	(0)
H8(BO3) 3-	2.766e-12	2.100e-12	-11.558	-11.678	-0.120	(0)
BaH2BO3+	2.583e-12	1.961e-12	-11.588	-11.708	-0.120	(0)
BF2(OH) 2-	1.039e-12	7.888e-13	-11.983	-12.103	-0.120	(0)
AgH2BO3	7.843e-14	7.843e-14	-13.106	-13.106	0.000	(0)
BF3OH-	5.935e-19	4.506e-19	-18.227	-18.346	-0.120	(0)
BF4-	4.288e-24	3.255e-24	-23.368	-23.487	-0.120	(0)
Ba	3.263e-08					
Ba+2	3.252e-08	1.272e-08	-7.488	-7.896	-0.408	(0)
BaHCO3+	8.849e-11	7.123e-11	-10.053	-10.147	-0.094	(0)
BaCO3	2.190e-11	2.190e-11	-10.660	-10.660	0.000	(0)
BaH2BO3+	2.583e-12	1.961e-12	-11.588	-11.708	-0.120	(0)
BaOH+	8.590e-14	6.818e-14	-13.066	-13.166	-0.100	(0)
BaNO3+	2.090e-15	1.486e-15	-14.680	-14.828	-0.148	(0)
BaNH3+2	2.702e-16	6.899e-17	-15.568	-16.161	-0.593	(0)
C (4)	8.141e-04					
HCO3-	7.346e-04	5.864e-04	-3.134	-3.232	-0.098	(0)
MgHCO3+	2.221e-05	1.735e-05	-4.653	-4.761	-0.107	(0)
CaHCO3+	1.338e-05	1.077e-05	-4.874	-4.968	-0.094	(0)
H2CO3	1.080e-05	1.080e-05	-4.967	-4.967	0.000	(0)
CO3-2	8.585e-06	3.358e-06	-5.066	-5.474	-0.408	(0)
MgCO3	8.076e-06	8.076e-06	-5.093	-5.093	0.000	(0)
NaHCO3	6.790e-06	6.790e-06	-5.168	-5.168	0.000	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
NaCO3-	1.613e-06	1.287e-06	-5.792	-5.890	-0.098	(0)
UO2(CO3) 3-4	4.844e-07	2.058e-09	-6.315	-8.687	-2.372	(0)
ZnCO3	4.722e-07	4.722e-07	-6.326	-6.326	0.000	(0)
MnHCO3+	3.586e-07	2.846e-07	-6.445	-6.546	-0.100	(0)
CuCO3	3.114e-07	3.114e-07	-6.507	-6.507	0.000	(0)
ZnHCO3+	6.376e-08	4.532e-08	-7.195	-7.344	-0.148	(0)
UO2(CO3) 2-2	4.790e-08	1.223e-08	-7.320	-7.913	-0.593	(0)
Cu(CO3) 2-2	1.102e-08	2.814e-09	-7.958	-8.551	-0.593	(0)
NiCO3	9.360e-09	9.360e-09	-8.029	-8.029	0.000	(0)
NiHCO3+	7.600e-09	5.402e-09	-8.119	-8.267	-0.148	(0)
CoHCO3+	2.395e-09	1.703e-09	-8.621	-8.769	-0.148	(0)
CoCO3	2.119e-09	2.119e-09	-8.674	-8.674	0.000	(0)
PbCO3	1.606e-09	1.606e-09	-8.794	-8.794	0.000	(0)
CuHCO3+	8.199e-10	5.828e-10	-9.086	-9.234	-0.148	(0)
CdCO3	3.352e-10	3.352e-10	-9.475	-9.475	0.000	(0)
UO2CO3	1.825e-10	1.825e-10	-9.739	-9.739	0.000	(0)
PbHCO3+	9.755e-11	6.934e-11	-10.011	-10.159	-0.148	(0)
BaHCO3+	8.849e-11	7.123e-11	-10.053	-10.147	-0.094	(0)
Pb(CO3) 2-2	6.093e-11	1.556e-11	-10.215	-10.808	-0.593	(0)
BaCO3	2.190e-11	2.190e-11	-10.660	-10.660	0.000	(0)
CdHCO3+	8.226e-12	5.847e-12	-11.085	-11.233	-0.148	(0)
Cd(CO3) 2-2	3.268e-12	8.343e-13	-11.486	-12.079	-0.593	(0)
HgCO3	4.497e-15	4.497e-15	-14.347	-14.347	0.000	(0)
FeHCO3+	1.742e-15	1.402e-15	-14.759	-14.853	-0.094	(0)
Hg(CO3) 2-2	1.870e-16	4.775e-17	-15.728	-16.321	-0.593	(0)
HgHCO3+	9.646e-19	6.857e-19	-18.016	-18.164	-0.148	(0)
Ca	4.403e-03					
Ca+2	2.522e-03	9.862e-04	-2.598	-3.006	-0.408	(0)
CaSO4	1.860e-03	1.860e-03	-2.730	-2.730	0.000	(0)
CaHCO3+	1.338e-05	1.077e-05	-4.874	-4.968	-0.094	(0)
CaCO3	5.248e-06	5.248e-06	-5.280	-5.280	0.000	(0)
CaF+	2.428e-06	1.927e-06	-5.615	-5.715	-0.100	(0)
CaH2BO3+	3.729e-07	2.831e-07	-6.428	-6.548	-0.120	(0)
CaOH+	3.002e-08	2.416e-08	-7.523	-7.617	-0.094	(0)
CaNO3+	1.023e-10	7.269e-11	-9.990	-10.139	-0.148	(0)
CaNH3+2	4.180e-11	1.067e-11	-10.379	-10.972	-0.593	(0)
Ca(NH3) 2+2	1.431e-19	3.652e-20	-18.844	-19.437	-0.593	(0)

Cd	2.802e-08					
Cd+2	1.120e-08	4.380e-09	-7.951	-8.359	-0.408	(0)
CdSO4	8.453e-09	8.453e-09	-8.073	-8.073	0.000	(0)
CdCl+	4.044e-09	2.875e-09	-8.393	-8.541	-0.148	(0)
Cd(SO4) 2-2	3.677e-09	9.387e-10	-8.435	-9.027	-0.593	(0)
CdCO3	3.352e-10	3.352e-10	-9.475	-9.475	0.000	(0)
CdOHC1	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
CdCl2	8.237e-11	8.237e-11	-10.084	-10.084	0.000	(0)
CdOH+	6.010e-11	4.272e-11	-10.221	-10.369	-0.148	(0)
CdF+	1.749e-11	1.243e-11	-10.757	-10.906	-0.148	(0)
CdHCO3+	8.226e-12	5.847e-12	-11.085	-11.233	-0.148	(0)
Cd(CO3) 2-2	3.268e-12	8.343e-13	-11.486	-12.079	-0.593	(0)
CdCl3-	5.025e-13	3.572e-13	-12.299	-12.447	-0.148	(0)
Cd(OH) 2	3.310e-13	3.310e-13	-12.480	-12.480	0.000	(0)
CdF2	4.441e-15	4.441e-15	-14.353	-14.353	0.000	(0)
CdNO3+	4.542e-16	3.228e-16	-15.343	-15.491	-0.148	(0)
CdSeO4	1.695e-16	1.695e-16	-15.771	-15.771	0.000	(0)
Cd(OH) 3-	3.494e-17	2.484e-17	-16.457	-16.605	-0.148	(0)
Cd(SeO3) 2-2	3.254e-17	8.308e-18	-16.488	-17.080	-0.593	(0)
Cd2OH+3	2.024e-17	9.378e-19	-16.694	-18.028	-1.334	(0)
Cd(OH) 4-2	1.956e-23	4.993e-24	-22.709	-23.302	-0.593	(0)
Cd(NO3) 2	3.772e-24	3.772e-24	-23.423	-23.423	0.000	(0)
CdHS+	0.000e+00	0.000e+00	-78.892	-79.041	-0.148	(0)
Cd(HS) 2	0.000e+00	0.000e+00	-150.527	-150.527	0.000	(0)
Cd(HS) 3-	0.000e+00	0.000e+00	-227.169	-227.317	-0.148	(0)
Cd(HS) 4-2	0.000e+00	0.000e+00	-303.218	-303.811	-0.593	(0)
Cl	8.692e-03					
Cl-	8.691e-03	6.873e-03	-2.061	-2.163	-0.102	(0)
MnCl+	2.652e-07	2.105e-07	-6.576	-6.677	-0.100	(0)
ZnOHC1	6.784e-08	6.784e-08	-7.169	-7.169	0.000	(0)
ZnCl+	5.401e-08	4.219e-08	-7.267	-7.375	-0.107	(0)
AgCl	1.392e-08	1.392e-08	-7.856	-7.856	0.000	(0)
AgCl2-	1.172e-08	8.334e-09	-7.931	-8.079	-0.148	(0)
CdCl+	4.044e-09	2.875e-09	-8.393	-8.541	-0.148	(0)
CuCl2-	2.530e-09	1.976e-09	-8.597	-8.704	-0.107	(0)
MnCl2	2.043e-09	2.043e-09	-8.690	-8.690	0.000	(0)
NiCl+	1.849e-09	1.314e-09	-8.733	-8.881	-0.148	(0)
CuCl	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
CoCl+	1.249e-09	8.875e-10	-8.904	-9.052	-0.148	(0)
ZnCl2	4.596e-10	4.596e-10	-9.338	-9.338	0.000	(0)
CuCl+	2.196e-10	1.716e-10	-9.658	-9.766	-0.107	(0)
AgCl3-2	2.000e-10	5.105e-11	-9.699	-10.292	-0.593	(0)
CdOHC1	1.448e-10	1.448e-10	-9.839	-9.839	0.000	(0)
CdCl2	8.237e-11	8.237e-11	-10.084	-10.084	0.000	(0)
PbCl+	5.460e-11	3.881e-11	-10.263	-10.411	-0.148	(0)
HgClOH	1.668e-11	1.668e-11	-10.778	-10.778	0.000	(0)
AgCl4-3	1.546e-11	7.164e-13	-10.811	-12.145	-1.334	(0)
CuCl3-2	7.316e-12	2.904e-12	-11.136	-11.537	-0.401	(0)
HgCl2	5.287e-12	5.287e-12	-11.277	-11.277	0.000	(0)
MnCl3-	4.873e-12	3.868e-12	-11.312	-11.413	-0.100	(0)
ZnCl3-	3.212e-12	2.509e-12	-11.493	-11.600	-0.107	(0)
PbCl2	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
HgCl3-	5.112e-13	3.634e-13	-12.291	-12.440	-0.148	(0)
CdCl3-	5.025e-13	3.572e-13	-12.299	-12.447	-0.148	(0)
CuCl2	4.089e-13	4.089e-13	-12.388	-12.388	0.000	(0)
NiCl2	4.547e-14	4.547e-14	-13.342	-13.342	0.000	(0)
HgCl4-2	3.895e-14	9.943e-15	-13.410	-14.002	-0.593	(0)
ZnCl4-2	2.173e-14	8.624e-15	-13.663	-14.064	-0.401	(0)
PbCl3-	4.587e-15	3.260e-15	-14.339	-14.487	-0.148	(0)
HgCl+	2.159e-16	1.535e-16	-15.666	-15.814	-0.148	(0)
UO2Cl+	2.141e-16	1.522e-16	-15.669	-15.818	-0.148	(0)
PbCl4-2	4.012e-17	1.024e-17	-16.397	-16.990	-0.593	(0)
CuCl3-	3.358e-17	2.623e-17	-16.474	-16.581	-0.107	(0)
CrCl+2	4.705e-18	1.201e-18	-17.327	-17.920	-0.593	(0)
CrOHC12	1.927e-19	1.927e-19	-18.715	-18.715	0.000	(0)
CuCl4-2	2.276e-21	9.034e-22	-20.643	-21.044	-0.401	(0)
CrCl2+	1.102e-21	7.833e-22	-20.958	-21.106	-0.148	(0)
FeCl+2	4.476e-22	1.776e-22	-21.349	-21.751	-0.401	(0)

VOC1+	2.745e-23	1.951e-23	-22.561	-22.710	-0.148	(0)
FeCl2+	6.870e-24	5.453e-24	-23.163	-23.263	-0.100	(0)
CrO3Cl-	1.138e-25	8.091e-26	-24.944	-25.092	-0.148	(0)
FeCl3	3.748e-27	3.748e-27	-26.426	-26.426	0.000	(0)
CoCl+2	3.949e-35	1.008e-35	-34.404	-34.996	-0.593	(0)
UCl+3	0.000e+00	0.000e+00	-45.495	-46.829	-1.334	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
Co (2)	2.150e-07					
Co+2	1.462e-07	3.733e-08	-6.835	-7.428	-0.593	(0)
CoSO4	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
CoHCO3+	2.395e-09	1.703e-09	-8.621	-8.769	-0.148	(0)
CoCO3	2.119e-09	2.119e-09	-8.674	-8.674	0.000	(0)
CoOH+	1.287e-09	9.146e-10	-8.891	-9.039	-0.148	(0)
CoCl+	1.249e-09	8.875e-10	-8.904	-9.052	-0.148	(0)
CoF+	2.974e-10	2.114e-10	-9.527	-9.675	-0.148	(0)
Co (OH) 2	8.922e-11	8.922e-11	-10.050	-10.050	0.000	(0)
CoNO2+	9.143e-12	6.499e-12	-11.039	-11.187	-0.148	(0)
Co (NH3) +2	1.511e-13	3.858e-14	-12.821	-13.414	-0.593	(0)
CoSeO4	3.888e-15	3.888e-15	-14.410	-14.410	0.000	(0)
Co (OH) 3-	3.076e-15	2.186e-15	-14.512	-14.660	-0.148	(0)
CoNO3+	1.940e-15	1.379e-15	-14.712	-14.860	-0.148	(0)
CoOOH-	7.727e-16	5.493e-16	-15.112	-15.260	-0.148	(0)
Co2OH+3	3.693e-17	1.711e-18	-16.433	-17.767	-1.334	(0)
Co (NH3) 2+2	5.541e-20	1.415e-20	-19.256	-19.849	-0.593	(0)
Co (OH) 4-2	1.667e-21	4.255e-22	-20.778	-21.371	-0.593	(0)
Co (NO3) 2	6.540e-23	6.540e-23	-22.184	-22.184	0.000	(0)
Co4 (OH) 4+4	3.287e-26	1.396e-28	-25.483	-27.855	-2.372	(0)
Co (NH3) 3+2	5.997e-27	1.531e-27	-26.222	-26.815	-0.593	(0)
Co (NH3) 4+2	2.705e-34	6.907e-35	-33.568	-34.161	-0.593	(0)
Co (NH3) 5+2	0.000e+00	0.000e+00	-41.413	-42.006	-0.593	(0)
Co (3)	1.762e-28					
CoOH+2	1.762e-28	4.499e-29	-27.754	-28.347	-0.593	(0)
Co+3	5.960e-35	7.209e-36	-34.225	-35.142	-0.917	(0)
CoCl+2	3.949e-35	1.008e-35	-34.404	-34.996	-0.593	(0)
Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.108	-63.701	-0.593	(0)
Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
Cr (2)	2.605e-27					
Cr+2	2.605e-27	6.650e-28	-26.584	-27.177	-0.593	(0)
Cr (3)	1.072e-09					
Cr (OH) 2+	7.626e-10	5.421e-10	-9.118	-9.266	-0.148	(0)
Cr (OH) 3	2.501e-10	2.501e-10	-9.602	-9.602	0.000	(0)
CrO2-	2.043e-11	1.453e-11	-10.690	-10.838	-0.148	(0)
Cr (OH) 4-	1.720e-11	1.223e-11	-10.764	-10.913	-0.148	(0)
Cr (OH) +2	1.421e-11	3.628e-12	-10.847	-11.440	-0.593	(0)
CrOHSO4	7.088e-12	7.088e-12	-11.150	-11.150	0.000	(0)
CrF+2	1.501e-14	3.832e-15	-13.824	-14.417	-0.593	(0)
CrSO4+	3.652e-15	2.596e-15	-14.437	-14.586	-0.148	(0)
Cr+3	2.914e-15	1.350e-16	-14.535	-15.870	-1.334	(0)
CrCl+2	4.705e-18	1.201e-18	-17.327	-17.920	-0.593	(0)
CrOHC12	1.927e-19	1.927e-19	-18.715	-18.715	0.000	(0)
Cr2 (OH) 2SO4+2	9.103e-21	2.324e-21	-20.041	-20.634	-0.593	(0)
Cr2 (OH) 2 (SO4) 2	1.137e-21	1.137e-21	-20.944	-20.944	0.000	(0)
CrCl2+	1.102e-21	7.833e-22	-20.958	-21.106	-0.148	(0)
CrNO3+2	5.389e-25	1.376e-25	-24.268	-24.861	-0.593	(0)
Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.144	-41.737	-0.593	(0)
Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.930	-51.264	-1.334	(0)
Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
Cr (6)	2.385e-14					
CrO4-2	2.203e-14	8.616e-15	-13.657	-14.065	-0.408	(0)
NaCrO4-	1.240e-15	8.816e-16	-14.907	-15.055	-0.148	(0)
HCrO4-	3.211e-16	2.283e-16	-15.493	-15.642	-0.148	(0)
KCrO4-	2.566e-16	1.824e-16	-15.591	-15.739	-0.148	(0)
CrO3SO4-2	1.838e-23	4.694e-24	-22.736	-23.329	-0.593	(0)
H2CrO4	1.515e-24	1.515e-24	-23.820	-23.820	0.000	(0)

CrO3Cl-	1.138e-25	8.091e-26	-24.944	-25.092	-0.148	(0)
Cr2O7-2	7.087e-30	1.809e-30	-29.150	-29.742	-0.593	(0)
Cu (1)	4.137e-09					
CuCl2-	2.530e-09	1.976e-09	-8.597	-8.704	-0.107	(0)
CuCl	1.376e-09	1.376e-09	-8.861	-8.861	0.000	(0)
Cu+	2.237e-10	1.590e-10	-9.650	-9.799	-0.148	(0)
CuCl3-2	7.316e-12	2.904e-12	-11.136	-11.537	-0.401	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.198	-147.615	-0.417	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.951	-148.345	-0.394	(0)
Cu (2)	4.878e-07					
CuCO3	3.114e-07	3.114e-07	-6.507	-6.507	0.000	(0)
CuOH+	7.830e-08	6.116e-08	-7.106	-7.213	-0.107	(0)
Cu+2	4.027e-08	1.575e-08	-7.395	-7.803	-0.408	(0)
CuSO4	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
Cu (OH) 2	1.499e-08	1.499e-08	-7.824	-7.824	0.000	(0)
Cu (CO3) 2-2	1.102e-08	2.814e-09	-7.958	-8.551	-0.593	(0)
CuHCO3+	8.199e-10	5.828e-10	-9.086	-9.234	-0.148	(0)
Cu2 (OH) 2+2	3.681e-10	9.397e-11	-9.434	-10.027	-0.593	(0)
CuF+	2.503e-10	1.780e-10	-9.601	-9.750	-0.148	(0)
CuCl+	2.196e-10	1.716e-10	-9.658	-9.766	-0.107	(0)
CuNO2+	5.733e-11	4.075e-11	-10.242	-10.390	-0.148	(0)
Cu (OH) 3-	5.311e-11	3.775e-11	-10.275	-10.423	-0.148	(0)
CuNH3+2	5.427e-12	1.385e-12	-11.265	-11.858	-0.593	(0)
CuCl2	4.089e-13	4.089e-13	-12.388	-12.388	0.000	(0)
Cu (NO2) 2	1.030e-14	1.030e-14	-13.987	-13.987	0.000	(0)
CuNO3+	1.633e-15	1.161e-15	-14.787	-14.935	-0.148	(0)
Cu (OH) 4-2	1.429e-15	3.649e-16	-14.845	-15.438	-0.593	(0)
CuCl3-	3.358e-17	2.623e-17	-16.474	-16.581	-0.107	(0)
CuCl4-2	2.276e-21	9.034e-22	-20.643	-21.044	-0.401	(0)
Cu (NO3) 2	3.407e-24	3.407e-24	-23.468	-23.468	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.826	-217.974	-0.148	(0)
F	3.052e-04					
F-	2.264e-04	1.791e-04	-3.645	-3.747	-0.102	(0)
MgF+	7.376e-05	5.810e-05	-4.132	-4.236	-0.104	(0)
CaF+	2.428e-06	1.927e-06	-5.615	-5.715	-0.100	(0)
NaF	2.326e-06	2.326e-06	-5.633	-5.633	0.000	(0)
MnF+	2.185e-07	1.734e-07	-6.661	-6.761	-0.100	(0)
ZnF+	1.228e-08	8.732e-09	-7.911	-8.059	-0.148	(0)
BF (OH) 3-	6.619e-09	5.025e-09	-8.179	-8.299	-0.120	(0)
HF	2.169e-09	2.169e-09	-8.664	-8.664	0.000	(0)
NiF+	4.728e-10	3.361e-10	-9.325	-9.474	-0.148	(0)
CoF+	2.974e-10	2.114e-10	-9.527	-9.675	-0.148	(0)
AlF3	2.685e-10	2.685e-10	-9.571	-9.571	0.000	(0)
CuF+	2.503e-10	1.780e-10	-9.601	-9.750	-0.148	(0)
AlF2+	1.492e-10	1.191e-10	-9.826	-9.924	-0.098	(0)
AlF4-	3.060e-11	2.410e-11	-10.514	-10.618	-0.104	(0)
CdF+	1.749e-11	1.243e-11	-10.757	-10.906	-0.148	(0)
AlF+2	4.113e-12	1.671e-12	-11.386	-11.777	-0.391	(0)
PbF+	2.825e-12	2.008e-12	-11.549	-11.697	-0.148	(0)
HF2-	1.907e-12	1.476e-12	-11.720	-11.831	-0.111	(0)
BF2 (OH) 2-	1.039e-12	7.888e-13	-11.983	-12.103	-0.120	(0)
UO2F+	4.748e-13	3.375e-13	-12.323	-12.472	-0.148	(0)
AgF	4.462e-13	4.462e-13	-12.350	-12.350	0.000	(0)
UO2F2	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
CrF+2	1.501e-14	3.832e-15	-13.824	-14.417	-0.593	(0)
UO2F3-	1.103e-14	7.841e-15	-13.957	-14.106	-0.148	(0)
PbF2	7.077e-15	7.077e-15	-14.150	-14.150	0.000	(0)
CdF2	4.441e-15	4.441e-15	-14.353	-14.353	0.000	(0)
UO2F4-2	4.368e-17	1.115e-17	-16.360	-16.953	-0.593	(0)
H2F2	1.260e-17	1.260e-17	-16.900	-16.900	0.000	(0)
PbF3-	3.381e-18	2.404e-18	-17.471	-17.619	-0.148	(0)
VO2F	2.871e-18	2.871e-18	-17.542	-17.542	0.000	(0)
FeF2+	1.014e-18	8.052e-19	-17.994	-18.094	-0.100	(0)
BF3OH-	5.935e-19	4.506e-19	-18.227	-18.346	-0.120	(0)
FeF+2	4.234e-19	1.680e-19	-18.373	-18.775	-0.401	(0)
VO2F2-	2.626e-19	1.867e-19	-18.581	-18.729	-0.148	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
VO2F3-2	1.633e-21	4.170e-22	-20.787	-21.380	-0.593	(0)

VOF+	1.529e-21	1.087e-21	-20.816	-20.964	-0.148	(0)
PbF4-2	8.069e-22	2.060e-22	-21.093	-21.686	-0.593	(0)
VOF2	7.299e-23	7.299e-23	-22.137	-22.137	0.000	(0)
HgF+	1.045e-23	7.429e-24	-22.981	-23.129	-0.148	(0)
BF4-	4.288e-24	3.255e-24	-23.368	-23.487	-0.120	(0)
VO2F4-3	7.930e-25	3.674e-26	-24.101	-25.435	-1.334	(0)
VOF3-	6.524e-25	4.637e-25	-24.185	-24.334	-0.148	(0)
Sb(OH) 2F	5.355e-26	5.355e-26	-25.271	-25.271	0.000	(0)
SbOF	5.273e-26	5.273e-26	-25.278	-25.278	0.000	(0)
VOF4-2	1.313e-27	3.352e-28	-26.882	-27.475	-0.593	(0)
SiF6-2	2.528e-29	1.003e-29	-28.597	-28.999	-0.401	(0)
UF3+	1.383e-36	9.831e-37	-35.859	-36.007	-0.148	(0)
UF2+2	1.357e-37	3.464e-38	-36.867	-37.460	-0.593	(0)
UF4	1.930e-38	1.930e-38	-37.714	-37.714	0.000	(0)
UF+3	3.317e-40	0.000e+00	-39.479	-40.813	-1.334	(0)
UF5-	1.927e-40	1.370e-40	-39.715	-39.863	-0.148	(0)
UF6-2	0.000e+00	0.000e+00	-40.537	-41.130	-0.593	(0)
Fe (2)	1.141e-12					
Fe+2	7.438e-13	1.899e-13	-12.129	-12.721	-0.593	(0)
FeSO4	3.838e-13	3.838e-13	-12.416	-12.416	0.000	(0)
FeOH+	1.170e-14	9.284e-15	-13.932	-14.032	-0.100	(0)
FeHCO3+	1.742e-15	1.402e-15	-14.759	-14.853	-0.094	(0)
Fe (OH) 2	9.056e-18	9.056e-18	-17.043	-17.043	0.000	(0)
Fe (OH) 3-	4.431e-18	3.517e-18	-17.353	-17.454	-0.100	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.152	-161.152	0.000	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.656	-237.805	-0.148	(0)
Fe (3)	8.949e-10					
Fe (OH) 3	4.276e-10	4.276e-10	-9.369	-9.369	0.000	(0)
Fe (OH) 2+	4.061e-10	3.242e-10	-9.391	-9.489	-0.098	(0)
Fe (OH) 4-	6.124e-11	4.889e-11	-10.213	-10.311	-0.098	(0)
FeOH+2	1.710e-15	6.785e-16	-14.767	-15.168	-0.401	(0)
FeF2+	1.014e-18	8.052e-19	-17.994	-18.094	-0.100	(0)
FeF+2	4.234e-19	1.680e-19	-18.373	-18.775	-0.401	(0)
FeF3	2.034e-19	2.034e-19	-18.692	-18.692	0.000	(0)
FeSO4+	9.959e-20	7.905e-20	-19.002	-19.102	-0.100	(0)
Fe (SO4) 2-	1.957e-20	1.391e-20	-19.708	-19.857	-0.148	(0)
Fe+3	7.075e-21	8.557e-22	-20.150	-21.068	-0.917	(0)
FeCl+2	4.476e-22	1.776e-22	-21.349	-21.751	-0.401	(0)
FeCl2+	6.870e-24	5.453e-24	-23.163	-23.263	-0.100	(0)
FeHSeO3+2	8.740e-25	2.231e-25	-24.059	-24.651	-0.593	(0)
FeCl3	3.748e-27	3.748e-27	-26.426	-26.426	0.000	(0)
Fe2 (OH) 2+4	3.588e-27	1.524e-29	-26.445	-28.817	-2.372	(0)
FeNO3+2	7.813e-28	1.995e-28	-27.107	-27.700	-0.593	(0)
Fe3 (OH) 4+5	3.629e-34	7.143e-38	-33.440	-37.146	-3.706	(0)
H (0)	3.956e-29					
H2	1.978e-29	2.017e-29	-28.704	-28.695	0.008	(0)
Hg (0)	4.390e-09					
Hg	4.390e-09	4.390e-09	-8.358	-8.358	0.000	(0)
Hg (1)	2.613e-20					
Hg2+2	1.306e-20	3.335e-21	-19.884	-20.477	-0.593	(0)
Hg (2)	3.297e-11					
HgClOH	1.668e-11	1.668e-11	-10.778	-10.778	0.000	(0)
Hg (OH) 2	1.044e-11	1.065e-11	-10.981	-10.973	0.008	(0)
HgCl2	5.287e-12	5.287e-12	-11.277	-11.277	0.000	(0)
HgCl3-	5.112e-13	3.634e-13	-12.291	-12.440	-0.148	(0)
HgCl4-2	3.895e-14	9.943e-15	-13.410	-14.002	-0.593	(0)
HgCO3	4.497e-15	4.497e-15	-14.347	-14.347	0.000	(0)
HgCl+	2.159e-16	1.535e-16	-15.666	-15.814	-0.148	(0)
Hg (CO3) 2-2	1.870e-16	4.775e-17	-15.728	-16.321	-0.593	(0)
HgOH+	7.697e-17	5.472e-17	-16.114	-16.262	-0.148	(0)
Hg (OH) 3-	2.316e-18	1.646e-18	-17.635	-17.783	-0.148	(0)
HgHCO3+	9.646e-19	6.857e-19	-18.016	-18.164	-0.148	(0)
Hg (NH3) 2+2	2.044e-19	5.218e-20	-18.690	-19.282	-0.593	(0)
HgNH3+2	2.378e-20	6.070e-21	-19.624	-20.217	-0.593	(0)
Hg+2	4.384e-21	1.119e-21	-20.358	-20.951	-0.593	(0)
HgSO4	2.412e-21	2.412e-21	-20.618	-20.618	0.000	(0)
HgF+	1.045e-23	7.429e-24	-22.981	-23.129	-0.148	(0)
Hg (NH3) 3+2	6.995e-27	1.786e-27	-26.155	-26.748	-0.593	(0)

	HgNO3+	1.355e-29	9.632e-30	-28.868	-29.016	-0.148	(0)
	Hg (NH3) 4+2	4.776e-34	1.219e-34	-33.321	-33.914	-0.593	(0)
	Hg (NO3) 2	9.332e-38	9.332e-38	-37.030	-37.030	0.000	(0)
	HgHS2-	0.000e+00	0.000e+00	-138.168	-138.316	-0.148	(0)
	HgS2-2	0.000e+00	0.000e+00	-138.345	-138.938	-0.593	(0)
	Hg (HS) 2	0.000e+00	0.000e+00	-140.009	-140.009	0.000	(0)
K	7.622e-03						
	K+	7.206e-03	5.698e-03	-2.142	-2.244	-0.102	(0)
	KSO4-	4.160e-04	3.321e-04	-3.381	-3.479	-0.098	(0)
	KCrO4-	2.566e-16	1.824e-16	-15.591	-15.739	-0.148	(0)
Mg	1.183e-02						
	Mg+2	7.393e-03	2.892e-03	-2.131	-2.539	-0.408	(0)
	MgSO4	4.332e-03	4.332e-03	-2.363	-2.363	0.000	(0)
	MgF+	7.376e-05	5.810e-05	-4.132	-4.236	-0.104	(0)
	MgHCO3+	2.221e-05	1.735e-05	-4.653	-4.761	-0.107	(0)
	MgCO3	8.076e-06	8.076e-06	-5.093	-5.093	0.000	(0)
	MgOH+	1.745e-06	1.414e-06	-5.758	-5.850	-0.091	(0)
	MgH2BO3+	6.588e-07	5.001e-07	-6.181	-6.301	-0.120	(0)
Mn (2)	1.318e-04						
	Mn+2	9.527e-05	2.432e-05	-4.021	-4.614	-0.593	(0)
	MnSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
	MnHCO3+	3.586e-07	2.846e-07	-6.445	-6.546	-0.100	(0)
	MnCl+	2.652e-07	2.105e-07	-6.576	-6.677	-0.100	(0)
	MnF+	2.185e-07	1.734e-07	-6.661	-6.761	-0.100	(0)
	MnOH+	9.453e-08	7.503e-08	-7.024	-7.125	-0.100	(0)
	MnCl2	2.043e-09	2.043e-09	-8.690	-8.690	0.000	(0)
	MnCl3-	4.873e-12	3.868e-12	-11.312	-11.413	-0.100	(0)
	MnSeO4	1.361e-12	1.361e-12	-11.866	-11.866	0.000	(0)
	MnNO3+	1.264e-12	8.986e-13	-11.898	-12.046	-0.148	(0)
	Mn (OH) 3-	8.811e-16	6.993e-16	-15.055	-15.155	-0.100	(0)
	Mn (NO3) 2	5.261e-20	5.261e-20	-19.279	-19.279	0.000	(0)
	Mn (OH) 4-2	6.986e-21	2.773e-21	-20.156	-20.557	-0.401	(0)
	MnSe	0.000e+00	0.000e+00	-40.692	-40.692	0.000	(0)
Mn (3)	4.357e-25						
	Mn+3	4.357e-25	5.270e-26	-24.361	-25.278	-0.917	(0)
Mn (6)	6.322e-40						
	MnO4-2	6.322e-40	2.509e-40	-39.199	-39.600	-0.401	(0)
Mn (7)	0.000e+00						
	MnO4-	0.000e+00	0.000e+00	-44.171	-44.287	-0.115	(0)
Mo	3.855e-06						
	MoO4-2	3.854e-06	1.507e-06	-5.414	-5.822	-0.408	(0)
	HMoO4-	3.455e-10	2.456e-10	-9.462	-9.610	-0.148	(0)
	H2MoO4	1.473e-14	1.473e-14	-13.832	-13.832	0.000	(0)
	Ag2MoO4	5.615e-25	5.615e-25	-24.251	-24.251	0.000	(0)
	AlMo6O21-3	0.000e+00	0.000e+00	-42.153	-43.487	-1.334	(0)
	Mo7O24-6	0.000e+00	0.000e+00	-47.118	-52.455	-5.337	(0)
	HMo7O24-5	0.000e+00	0.000e+00	-50.449	-54.155	-3.706	(0)
	H2Mo7O24-4	0.000e+00	0.000e+00	-55.088	-57.459	-2.372	(0)
	H3Mo7O24-3	0.000e+00	0.000e+00	-60.966	-62.300	-1.334	(0)
N (-3)	1.850e-07						
	NH4+	1.626e-07	1.234e-07	-6.789	-6.909	-0.120	(0)
	NH4SO4-	1.372e-08	1.089e-08	-7.863	-7.963	-0.100	(0)
	NH3	8.596e-09	8.596e-09	-8.066	-8.066	0.000	(0)
	CaNH3+2	4.180e-11	1.067e-11	-10.379	-10.972	-0.593	(0)
	CuNH3+2	5.427e-12	1.385e-12	-11.265	-11.858	-0.593	(0)
	NiNH3+2	1.351e-12	3.449e-13	-11.869	-12.462	-0.593	(0)
	Co (NH3) +2	1.511e-13	3.858e-14	-12.821	-13.414	-0.593	(0)
	AgNH3+	2.449e-14	1.741e-14	-13.611	-13.759	-0.148	(0)
	BaNH3+2	2.702e-16	6.899e-17	-15.568	-16.161	-0.593	(0)
	Ag (NH3) 2+	1.712e-18	1.217e-18	-17.767	-17.915	-0.148	(0)
	Ni (NH3) 2+2	1.679e-18	4.286e-19	-17.775	-18.368	-0.593	(0)
	Hg (NH3) 2+2	2.044e-19	5.218e-20	-18.690	-19.282	-0.593	(0)
	Ca (NH3) 2+2	1.431e-19	3.652e-20	-18.844	-19.437	-0.593	(0)
	Co (NH3) 2+2	5.541e-20	1.415e-20	-19.256	-19.849	-0.593	(0)
	HgNH3+2	2.378e-20	6.070e-21	-19.624	-20.217	-0.593	(0)
	Hg (NH3) 3+2	6.995e-27	1.786e-27	-26.155	-26.748	-0.593	(0)
	Co (NH3) 3+2	5.997e-27	1.531e-27	-26.222	-26.815	-0.593	(0)
	Hg (NH3) 4+2	4.776e-34	1.219e-34	-33.321	-33.914	-0.593	(0)

	Co (NH3) 4+2	2.705e-34	6.907e-35	-33.568	-34.161	-0.593	(0)
	Cr (NH3) 5OH+2	0.000e+00	0.000e+00	-41.144	-41.737	-0.593	(0)
	Co (NH3) 5+2	0.000e+00	0.000e+00	-41.413	-42.006	-0.593	(0)
	Co (NH3) 5Cl+2	0.000e+00	0.000e+00	-48.779	-49.372	-0.593	(0)
	Cr (NH3) 6+3	0.000e+00	0.000e+00	-49.930	-51.264	-1.334	(0)
	Cr (NH3) 6Cl+2	0.000e+00	0.000e+00	-51.732	-52.325	-0.593	(0)
	Co (NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
	Co (NH3) 6OH+2	0.000e+00	0.000e+00	-63.108	-63.701	-0.593	(0)
	Co (NH3) 6Cl+2	0.000e+00	0.000e+00	-63.560	-64.153	-0.593	(0)
N (3)	3.222e-05						
	NO2-	3.222e-05	2.471e-05	-4.492	-4.607	-0.115	(0)
	CuNO2+	5.733e-11	4.075e-11	-10.242	-10.390	-0.148	(0)
	CoNO2+	9.143e-12	6.499e-12	-11.039	-11.187	-0.148	(0)
	AgNO2	5.121e-12	5.121e-12	-11.291	-11.291	0.000	(0)
	Cu (NO2) 2	1.030e-14	1.030e-14	-13.987	-13.987	0.000	(0)
	Ag (NO2) 2-	2.757e-16	1.960e-16	-15.560	-15.708	-0.148	(0)
N (5)	2.958e-08						
	NO3-	2.948e-08	2.331e-08	-7.531	-7.632	-0.102	(0)
	CaNO3+	1.023e-10	7.269e-11	-9.990	-10.139	-0.148	(0)
	MnNO3+	1.264e-12	8.986e-13	-11.898	-12.046	-0.148	(0)
	ZnNO3+	2.013e-13	1.431e-13	-12.696	-12.844	-0.148	(0)
	NiNO3+	6.155e-15	4.375e-15	-14.211	-14.359	-0.148	(0)
	BaNO3+	2.090e-15	1.486e-15	-14.680	-14.828	-0.148	(0)
	CoNO3+	1.940e-15	1.379e-15	-14.712	-14.860	-0.148	(0)
	CuNO3+	1.633e-15	1.161e-15	-14.787	-14.935	-0.148	(0)
	CdNO3+	4.542e-16	3.228e-16	-15.343	-15.491	-0.148	(0)
	PbNO3+	7.719e-17	5.487e-17	-16.112	-16.261	-0.148	(0)
	AgNO3	1.837e-17	1.837e-17	-16.736	-16.736	0.000	(0)
	Mn (NO3) 2	5.261e-20	5.261e-20	-19.279	-19.279	0.000	(0)
	UO2NO3+	8.935e-22	6.351e-22	-21.049	-21.197	-0.148	(0)
	Zn (NO3) 2	6.655e-22	6.655e-22	-21.177	-21.177	0.000	(0)
	Co (NO3) 2	6.540e-23	6.540e-23	-22.184	-22.184	0.000	(0)
	Cd (NO3) 2	3.772e-24	3.772e-24	-23.423	-23.423	0.000	(0)
	Cu (NO3) 2	3.407e-24	3.407e-24	-23.468	-23.468	0.000	(0)
	Pb (NO3) 2	2.172e-24	2.172e-24	-23.663	-23.663	0.000	(0)
	CrNO3+2	5.389e-25	1.376e-25	-24.268	-24.861	-0.593	(0)
	VO2NO3	1.078e-25	1.078e-25	-24.967	-24.967	0.000	(0)
	FeNO3+2	7.813e-28	1.995e-28	-27.107	-27.700	-0.593	(0)
	HgNO3+	1.355e-29	9.632e-30	-28.868	-29.016	-0.148	(0)
	Hg (NO3) 2	9.332e-38	9.332e-38	-37.030	-37.030	0.000	(0)
Na	2.719e-02						
	Na+	2.604e-02	2.059e-02	-1.584	-1.686	-0.102	(0)
	NaSO4-	1.140e-03	9.103e-04	-2.943	-3.041	-0.098	(0)
	NaHCO3	6.790e-06	6.790e-06	-5.168	-5.168	0.000	(0)
	NaF	2.326e-06	2.326e-06	-5.633	-5.633	0.000	(0)
	NaCO3-	1.613e-06	1.287e-06	-5.792	-5.890	-0.098	(0)
	NaH2BO3	1.628e-07	1.628e-07	-6.788	-6.788	0.000	(0)
	NaCrO4-	1.240e-15	8.816e-16	-14.907	-15.055	-0.148	(0)
Ni	3.349e-07						
	Ni+2	1.911e-07	7.472e-08	-6.719	-7.127	-0.408	(0)
	NiSO4	1.227e-07	1.227e-07	-6.911	-6.911	0.000	(0)
	NiCO3	9.360e-09	9.360e-09	-8.029	-8.029	0.000	(0)
	NiHCO3+	7.600e-09	5.402e-09	-8.119	-8.267	-0.148	(0)
	NiCl+	1.849e-09	1.314e-09	-8.733	-8.881	-0.148	(0)
	NiOH+	1.625e-09	1.155e-09	-8.789	-8.937	-0.148	(0)
	NiF+	4.728e-10	3.361e-10	-9.325	-9.474	-0.148	(0)
	Ni (SO4) 2-2	1.311e-10	3.346e-11	-9.883	-10.475	-0.593	(0)
	Ni (OH) 2	1.127e-10	1.127e-10	-9.948	-9.948	0.000	(0)
	NiNH3+2	1.351e-12	3.449e-13	-11.869	-12.462	-0.593	(0)
	Ni (OH) 3-	1.947e-13	1.384e-13	-12.711	-12.859	-0.148	(0)
	NiCl2	4.547e-14	4.547e-14	-13.342	-13.342	0.000	(0)
	NiSeO4	7.264e-15	7.264e-15	-14.139	-14.139	0.000	(0)
	NiNO3+	6.155e-15	4.375e-15	-14.211	-14.359	-0.148	(0)
	Ni (NH3) 2+2	1.679e-18	4.286e-19	-17.775	-18.368	-0.593	(0)
O (0)	2.437e-35						
	O2	1.219e-35	1.243e-35	-34.914	-34.906	0.008	(0)
Pb	3.706e-09						
	PbCO3	1.606e-09	1.606e-09	-8.794	-8.794	0.000	(0)

PbOH+	6.906e-10	4.909e-10	-9.161	-9.309	-0.148	(0)
PbSO4	6.417e-10	6.417e-10	-9.193	-9.193	0.000	(0)
Pb+2	4.069e-10	1.591e-10	-9.390	-9.798	-0.408	(0)
Pb (SO4) 2-2	1.247e-10	3.183e-11	-9.904	-10.497	-0.593	(0)
PbHCO3+	9.755e-11	6.934e-11	-10.011	-10.159	-0.148	(0)
Pb (CO3) 2-2	6.093e-11	1.556e-11	-10.215	-10.808	-0.593	(0)
PbCl+	5.460e-11	3.881e-11	-10.263	-10.411	-0.148	(0)
Pb (OH) 2	1.906e-11	1.906e-11	-10.720	-10.720	0.000	(0)
PbF+	2.825e-12	2.008e-12	-11.549	-11.697	-0.148	(0)
PbCl2	1.192e-12	1.192e-12	-11.924	-11.924	0.000	(0)
Pb (OH) 3-	3.294e-14	2.341e-14	-13.482	-13.631	-0.148	(0)
PbF2	7.077e-15	7.077e-15	-14.150	-14.150	0.000	(0)
PbCl3-	4.587e-15	3.260e-15	-14.339	-14.487	-0.148	(0)
PbNO3+	7.719e-17	5.487e-17	-16.112	-16.261	-0.148	(0)
PbCl4-2	4.012e-17	1.024e-17	-16.397	-16.990	-0.593	(0)
Pb (OH) 4-2	2.758e-17	7.042e-18	-16.559	-17.152	-0.593	(0)
Pb2OH+3	2.673e-17	1.238e-18	-16.573	-17.907	-1.334	(0)
PbF3-	3.381e-18	2.404e-18	-17.471	-17.619	-0.148	(0)
Pb3 (OH) 4+2	4.520e-21	1.154e-21	-20.345	-20.938	-0.593	(0)
PbF4-2	8.069e-22	2.060e-22	-21.093	-21.686	-0.593	(0)
Pb (NO3) 2	2.172e-24	2.172e-24	-23.663	-23.663	0.000	(0)
Pb4 (OH) 4+4	3.434e-25	1.459e-27	-24.464	-26.836	-2.372	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.908	-151.908	0.000	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.150	-229.298	-0.148	(0)
S (-2)	0.000e+00					
AgHS	0.000e+00	0.000e+00	-73.879	-73.879	0.000	(0)
HS-	0.000e+00	0.000e+00	-78.542	-78.690	-0.148	(0)
CdHS+	0.000e+00	0.000e+00	-78.892	-79.041	-0.148	(0)
S5-2	0.000e+00	0.000e+00	-79.375	-79.968	-0.593	(0)
H2S	0.000e+00	0.000e+00	-79.757	-79.757	0.000	(0)
S6-2	0.000e+00	0.000e+00	-79.891	-80.484	-0.593	(0)
S4-2	0.000e+00	0.000e+00	-79.971	-80.564	-0.593	(0)
S3-2	0.000e+00	0.000e+00	-80.777	-81.370	-0.593	(0)
S2-2	0.000e+00	0.000e+00	-81.793	-82.386	-0.593	(0)
S-2	0.000e+00	0.000e+00	-87.502	-87.903	-0.401	(0)
HgHS2-	0.000e+00	0.000e+00	-138.168	-138.316	-0.148	(0)
HgS2-2	0.000e+00	0.000e+00	-138.345	-138.938	-0.593	(0)
Hg (HS) 2	0.000e+00	0.000e+00	-140.009	-140.009	0.000	(0)
Cu (S4) 2-3	0.000e+00	0.000e+00	-147.198	-147.615	-0.417	(0)
Ag (HS) S4-2	0.000e+00	0.000e+00	-147.622	-147.866	-0.244	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.947	-148.095	-0.148	(0)
CuS4S5-3	0.000e+00	0.000e+00	-147.951	-148.345	-0.394	(0)
Ag (HS) 2-	0.000e+00	0.000e+00	-148.321	-148.469	-0.148	(0)
Ag (S4) 2-3	0.000e+00	0.000e+00	-148.789	-149.219	-0.430	(0)
AgS4S5-3	0.000e+00	0.000e+00	-149.125	-149.530	-0.405	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.172	-150.172	0.000	(0)
Cd (HS) 2	0.000e+00	0.000e+00	-150.527	-150.527	0.000	(0)
Pb (HS) 2	0.000e+00	0.000e+00	-151.908	-151.908	0.000	(0)
Fe (HS) 2	0.000e+00	0.000e+00	-161.152	-161.152	0.000	(0)
Cu (HS) 3-	0.000e+00	0.000e+00	-217.826	-217.974	-0.148	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.434	-225.582	-0.148	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.882	-227.475	-0.593	(0)
Cd (HS) 3-	0.000e+00	0.000e+00	-227.169	-227.317	-0.148	(0)
Pb (HS) 3-	0.000e+00	0.000e+00	-229.150	-229.298	-0.148	(0)
Fe (HS) 3-	0.000e+00	0.000e+00	-237.656	-237.805	-0.148	(0)
Cd (HS) 4-2	0.000e+00	0.000e+00	-303.218	-303.811	-0.593	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.139	-305.732	-0.593	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.212	-320.805	-0.593	(0)
S (6)	2.884e-02					
SO4-2	2.105e-02	8.233e-03	-1.677	-2.084	-0.408	(0)
MgSO4	4.332e-03	4.332e-03	-2.363	-2.363	0.000	(0)
CaSO4	1.860e-03	1.860e-03	-2.730	-2.730	0.000	(0)
NaSO4-	1.140e-03	9.103e-04	-2.943	-3.041	-0.098	(0)
KSO4-	4.160e-04	3.321e-04	-3.381	-3.479	-0.098	(0)
MnSO4	3.561e-05	3.561e-05	-4.448	-4.448	0.000	(0)
ZnSO4	4.402e-06	4.402e-06	-5.356	-5.356	0.000	(0)
Zn (SO4) 2-2	1.236e-06	3.156e-07	-5.908	-6.501	-0.593	(0)
NiSO4	1.227e-07	1.227e-07	-6.911	-6.911	0.000	(0)

CoSO4	6.132e-08	6.132e-08	-7.212	-7.212	0.000	(0)
CuSO4	2.971e-08	2.971e-08	-7.527	-7.527	0.000	(0)
NH4SO4-	1.372e-08	1.089e-08	-7.863	-7.963	-0.100	(0)
CdSO4	8.453e-09	8.453e-09	-8.073	-8.073	0.000	(0)
HSO4-	8.364e-09	6.588e-09	-8.078	-8.181	-0.104	(0)
Cd(SO4) 2-2	3.677e-09	9.387e-10	-8.435	-9.027	-0.593	(0)
PbSO4	6.417e-10	6.417e-10	-9.193	-9.193	0.000	(0)
AgSO4-	2.293e-10	1.630e-10	-9.640	-9.788	-0.148	(0)
Ni(SO4) 2-2	1.311e-10	3.346e-11	-9.883	-10.475	-0.593	(0)
Pb(SO4) 2-2	1.247e-10	3.183e-11	-9.904	-10.497	-0.593	(0)
CrOHSO4	7.088e-12	7.088e-12	-11.150	-11.150	0.000	(0)
FeSO4	3.838e-13	3.838e-13	-12.416	-12.416	0.000	(0)
UO2SO4	1.702e-13	1.702e-13	-12.769	-12.769	0.000	(0)
AlSO4+	7.571e-14	5.963e-14	-13.121	-13.225	-0.104	(0)
UO2(SO4) 2-2	7.233e-14	1.847e-14	-13.141	-13.734	-0.593	(0)
Al(SO4) 2-	6.679e-15	5.260e-15	-14.175	-14.279	-0.104	(0)
CrSO4+	3.652e-15	2.596e-15	-14.437	-14.586	-0.148	(0)
VO2SO4-	2.528e-18	1.797e-18	-17.597	-17.745	-0.148	(0)
FeSO4+	9.959e-20	7.905e-20	-19.002	-19.102	-0.100	(0)
Fe(SO4) 2-	1.957e-20	1.391e-20	-19.708	-19.857	-0.148	(0)
Cr2(OH) 2SO4+2	9.103e-21	2.324e-21	-20.041	-20.634	-0.593	(0)
HgSO4	2.412e-21	2.412e-21	-20.618	-20.618	0.000	(0)
VOSO4	2.295e-21	2.295e-21	-20.639	-20.639	0.000	(0)
Cr2(OH) 2(SO4) 2	1.137e-21	1.137e-21	-20.944	-20.944	0.000	(0)
CrO3SO4-2	1.838e-23	4.694e-24	-22.736	-23.329	-0.593	(0)
VSO4+	3.803e-36	2.703e-36	-35.420	-35.568	-0.148	(0)
U(SO4) 2	0.000e+00	0.000e+00	-40.035	-40.035	0.000	(0)
USO4+2	0.000e+00	0.000e+00	-41.258	-41.851	-0.593	(0)
Co(NH3) 6SO4+	0.000e+00	0.000e+00	-59.001	-59.149	-0.148	(0)
Sb(3)	4.618e-20					
Sb(OH) 3	2.335e-20	2.335e-20	-19.632	-19.632	0.000	(0)
HSbO2	2.282e-20	2.282e-20	-19.642	-19.642	0.000	(0)
SbO2-	6.351e-24	4.514e-24	-23.197	-23.345	-0.148	(0)
Sb(OH) 4-	3.629e-24	2.580e-24	-23.440	-23.588	-0.148	(0)
Sb(OH) 2F	5.355e-26	5.355e-26	-25.271	-25.271	0.000	(0)
SbOF	5.273e-26	5.273e-26	-25.278	-25.278	0.000	(0)
Sb(OH) 2+	6.540e-27	4.649e-27	-26.184	-26.333	-0.148	(0)
SbO+	2.258e-27	1.605e-27	-26.646	-26.795	-0.148	(0)
Sb2S4-2	0.000e+00	0.000e+00	-320.212	-320.805	-0.593	(0)
Sb(5)	5.902e-08					
SbO3-	5.896e-08	4.191e-08	-7.229	-7.378	-0.148	(0)
Sb(OH) 6-	6.173e-11	4.882e-11	-10.209	-10.311	-0.102	(0)
SbO2+	1.135e-24	8.070e-25	-23.945	-24.093	-0.148	(0)
Se(-2)	1.626e-14					
Ag2Se	1.626e-14	1.626e-14	-13.789	-13.789	0.000	(0)
HSe-	2.335e-39	1.660e-39	-38.632	-38.780	-0.148	(0)
MnSe	0.000e+00	0.000e+00	-40.692	-40.692	0.000	(0)
H2Se	0.000e+00	0.000e+00	-42.977	-42.977	0.000	(0)
Se-2	0.000e+00	0.000e+00	-45.100	-45.693	-0.593	(0)
AgOH(Se) 2-4	0.000e+00	0.000e+00	-80.441	-82.812	-2.372	(0)
Se(4)	3.267e-07					
SeO3-2	1.879e-07	4.798e-08	-6.726	-7.319	-0.593	(0)
HSeO3-	1.388e-07	9.868e-08	-6.858	-7.006	-0.148	(0)
H2SeO3	3.447e-13	3.447e-13	-12.463	-12.463	0.000	(0)
AgSeO3-	4.303e-14	3.059e-14	-13.366	-13.514	-0.148	(0)
Cd(SeO3) 2-2	3.254e-17	8.308e-18	-16.488	-17.080	-0.593	(0)
Ag(SeO3) 2-3	2.836e-19	1.314e-20	-18.547	-19.881	-1.334	(0)
FeHSeO3+2	8.740e-25	2.231e-25	-24.059	-24.651	-0.593	(0)
Se(6)	5.329e-10					
SeO4-2	5.314e-10	2.078e-10	-9.275	-9.682	-0.408	(0)
MnSeO4	1.361e-12	1.361e-12	-11.866	-11.866	0.000	(0)
ZnSeO4	7.867e-14	7.867e-14	-13.104	-13.104	0.000	(0)
NiSeO4	7.264e-15	7.264e-15	-14.139	-14.139	0.000	(0)
CoSeO4	3.888e-15	3.888e-15	-14.410	-14.410	0.000	(0)
CdSeO4	1.695e-16	1.695e-16	-15.771	-15.771	0.000	(0)
HSeO4-	1.200e-16	8.529e-17	-15.921	-16.069	-0.148	(0)
Zn(SeO4) 2-2	6.494e-23	1.658e-23	-22.187	-22.780	-0.593	(0)
Si	4.462e-05					

H4SiO4	4.362e-05	4.448e-05	-4.360	-4.352	0.008	(0)
H3SiO4-	1.005e-06	7.852e-07	-5.998	-6.105	-0.107	(0)
H2SiO4-2	1.489e-11	6.050e-12	-10.827	-11.218	-0.391	(0)
UO2H3SiO4+	1.281e-12	9.102e-13	-11.893	-12.041	-0.148	(0)
SiF6-2	2.528e-29	1.003e-29	-28.597	-28.999	-0.401	(0)
U (3)	0.000e+00					
U+3	0.000e+00	0.000e+00	-58.514	-59.848	-1.334	(0)
U (4)	1.239e-19					
U (OH) 5-	1.238e-19	8.803e-20	-18.907	-19.055	-0.148	(0)
U (OH) 4	3.023e-23	3.023e-23	-22.520	-22.520	0.000	(0)
U (OH) 3+	1.275e-27	9.062e-28	-26.895	-27.043	-0.148	(0)
U (OH) 2+2	1.346e-32	3.435e-33	-31.871	-32.464	-0.593	(0)
UF3+	1.383e-36	9.831e-37	-35.859	-36.007	-0.148	(0)
UF2+2	1.357e-37	3.464e-38	-36.867	-37.460	-0.593	(0)
UOH+3	2.863e-38	1.327e-39	-37.543	-38.877	-1.334	(0)
UF4	1.930e-38	1.930e-38	-37.714	-37.714	0.000	(0)
UF+3	3.317e-40	0.000e+00	-39.479	-40.813	-1.334	(0)
UF5-	1.927e-40	1.370e-40	-39.715	-39.863	-0.148	(0)
U (SO4) 2	0.000e+00	0.000e+00	-40.035	-40.035	0.000	(0)
UF6-2	0.000e+00	0.000e+00	-40.537	-41.130	-0.593	(0)
USO4+2	0.000e+00	0.000e+00	-41.258	-41.851	-0.593	(0)
U+4	0.000e+00	0.000e+00	-43.995	-46.366	-2.372	(0)
UCl+3	0.000e+00	0.000e+00	-45.495	-46.829	-1.334	(0)
U6 (OH) 15+9	0.000e+00	0.000e+00	-162.053	-174.060	-12.007	(0)
U (5)	2.414e-16					
UO2+	2.414e-16	1.716e-16	-15.617	-15.766	-0.148	(0)
U (6)	5.325e-07					
UO2 (CO3) 3-4	4.844e-07	2.058e-09	-6.315	-8.687	-2.372	(0)
UO2 (CO3) 2-2	4.790e-08	1.223e-08	-7.320	-7.913	-0.593	(0)
UO2CO3	1.825e-10	1.825e-10	-9.739	-9.739	0.000	(0)
UO2OH+	2.970e-12	2.111e-12	-11.527	-11.675	-0.148	(0)
UO2H3SiO4+	1.281e-12	9.102e-13	-11.893	-12.041	-0.148	(0)
UO2F+	4.748e-13	3.375e-13	-12.323	-12.472	-0.148	(0)
UO2F2	1.743e-13	1.743e-13	-12.759	-12.759	0.000	(0)
UO2SO4	1.702e-13	1.702e-13	-12.769	-12.769	0.000	(0)
UO2 (SO4) 2-2	7.233e-14	1.847e-14	-13.141	-13.734	-0.593	(0)
UO2+2	3.491e-14	1.365e-14	-13.457	-13.865	-0.408	(0)
UO2F3-	1.103e-14	7.841e-15	-13.957	-14.106	-0.148	(0)
UO2Cl+	2.141e-16	1.522e-16	-15.669	-15.818	-0.148	(0)
UO2F4-2	4.368e-17	1.115e-17	-16.360	-16.953	-0.593	(0)
(UO2) 2 (OH) 2+2	2.897e-17	7.396e-18	-16.538	-17.131	-0.593	(0)
(UO2) 3 (OH) 5+	2.513e-17	1.786e-17	-16.600	-16.748	-0.148	(0)
UO2NO3+	8.935e-22	6.351e-22	-21.049	-21.197	-0.148	(0)
V (2)	0.000e+00					
VOH+	0.000e+00	0.000e+00	-43.406	-43.554	-0.148	(0)
V+2	0.000e+00	0.000e+00	-44.561	-45.154	-0.593	(0)
V (3)	1.039e-15					
V (OH) 3	1.039e-15	1.039e-15	-14.983	-14.983	0.000	(0)
V (OH) 2+	7.745e-27	5.505e-27	-26.111	-26.259	-0.148	(0)
VOH+2	1.677e-30	4.281e-31	-29.776	-30.368	-0.593	(0)
V+3	1.501e-35	6.955e-37	-34.824	-36.158	-1.334	(0)
VSO4+	3.803e-36	2.703e-36	-35.420	-35.568	-0.148	(0)
V2 (OH) 3+3	0.000e+00	0.000e+00	-56.842	-58.176	-1.334	(0)
V2 (OH) 2+4	0.000e+00	0.000e+00	-57.565	-59.937	-2.372	(0)
V (4)	3.563e-19					
V (OH) 3+	3.484e-19	2.476e-19	-18.458	-18.606	-0.148	(0)
VO+2	3.964e-21	1.012e-21	-20.402	-20.995	-0.593	(0)
VOSO4	2.295e-21	2.295e-21	-20.639	-20.639	0.000	(0)
VOF+	1.529e-21	1.087e-21	-20.816	-20.964	-0.148	(0)
VOF2	7.299e-23	7.299e-23	-22.137	-22.137	0.000	(0)
VOCl+	2.745e-23	1.951e-23	-22.561	-22.710	-0.148	(0)
VOF3-	6.524e-25	4.637e-25	-24.185	-24.334	-0.148	(0)
VOF4-2	1.313e-27	3.352e-28	-26.882	-27.475	-0.593	(0)
H2V2O4+2	1.207e-32	3.082e-33	-31.918	-32.511	-0.593	(0)
V (5)	1.778e-08					
H2VO4-	9.588e-09	6.816e-09	-8.018	-8.166	-0.148	(0)
HVO4-2	8.190e-09	2.091e-09	-8.087	-8.680	-0.593	(0)
H3VO4	5.581e-13	5.581e-13	-12.253	-12.253	0.000	(0)

HV2O7-3	1.044e-13	4.836e-15	-12.981	-14.316	-1.334	(0)
H3V2O7-	3.460e-14	2.459e-14	-13.461	-13.609	-0.148	(0)
VO4-3	2.762e-14	1.280e-15	-13.559	-14.893	-1.334	(0)
V2O7-4	3.742e-15	1.590e-17	-14.427	-16.799	-2.372	(0)
VO2+	1.156e-17	9.143e-18	-16.937	-17.039	-0.102	(0)
V3O9-3	7.186e-18	3.329e-19	-17.144	-18.478	-1.334	(0)
VO2F	2.871e-18	2.871e-18	-17.542	-17.542	0.000	(0)
VO2SO4-	2.528e-18	1.797e-18	-17.597	-17.745	-0.148	(0)
VO2F2-	2.626e-19	1.867e-19	-18.581	-18.729	-0.148	(0)
VO2F3-2	1.633e-21	4.170e-22	-20.787	-21.380	-0.593	(0)
V4O12-4	2.230e-22	9.473e-25	-21.652	-24.024	-2.372	(0)
VO2F4-3	7.930e-25	3.674e-26	-24.101	-25.435	-1.334	(0)
VO2NO3	1.078e-25	1.078e-25	-24.967	-24.967	0.000	(0)
V10O28-6	0.000e+00	0.000e+00	-59.763	-65.099	-5.337	(0)
HV10O28-5	0.000e+00	0.000e+00	-61.293	-64.999	-3.706	(0)
H2V10O28-4	0.000e+00	0.000e+00	-65.507	-67.879	-2.372	(0)
Zn	1.304e-05					
Zn+2	6.249e-06	2.444e-06	-5.204	-5.612	-0.408	(0)
ZnSO4	4.402e-06	4.402e-06	-5.356	-5.356	0.000	(0)
Zn (SO4) 2-2	1.236e-06	3.156e-07	-5.908	-6.501	-0.593	(0)
ZnCO3	4.722e-07	4.722e-07	-6.326	-6.326	0.000	(0)
ZnOH+	4.222e-07	3.001e-07	-6.374	-6.523	-0.148	(0)
ZnOHC1	6.784e-08	6.784e-08	-7.169	-7.169	0.000	(0)
ZnHCO3+	6.376e-08	4.532e-08	-7.195	-7.344	-0.148	(0)
Zn (OH) 2	5.841e-08	5.841e-08	-7.233	-7.233	0.000	(0)
ZnCl+	5.401e-08	4.219e-08	-7.267	-7.375	-0.107	(0)
ZnF+	1.228e-08	8.732e-09	-7.911	-8.059	-0.148	(0)
Zn (OH) 3-	5.058e-10	3.595e-10	-9.296	-9.444	-0.148	(0)
ZnCl2	4.596e-10	4.596e-10	-9.338	-9.338	0.000	(0)
ZnCl3-	3.212e-12	2.509e-12	-11.493	-11.600	-0.107	(0)
ZnNO3+	2.013e-13	1.431e-13	-12.696	-12.844	-0.148	(0)
ZnSeO4	7.867e-14	7.867e-14	-13.104	-13.104	0.000	(0)
Zn (OH) 4-2	6.885e-14	1.758e-14	-13.162	-13.755	-0.593	(0)
ZnCl4-2	2.173e-14	8.624e-15	-13.663	-14.064	-0.401	(0)
Zn (NO3) 2	6.655e-22	6.655e-22	-21.177	-21.177	0.000	(0)
Zn (SeO4) 2-2	6.494e-23	1.658e-23	-22.187	-22.780	-0.593	(0)
ZnS (HS) -	0.000e+00	0.000e+00	-147.947	-148.095	-0.148	(0)
Zn (HS) 2	0.000e+00	0.000e+00	-150.172	-150.172	0.000	(0)
Zn (HS) 3-	0.000e+00	0.000e+00	-225.434	-225.582	-0.148	(0)
ZnS (HS) 2-2	0.000e+00	0.000e+00	-226.882	-227.475	-0.593	(0)
Zn (HS) 4-2	0.000e+00	0.000e+00	-305.139	-305.732	-0.593	(0)

-----Saturation indices-----

Phase	SI**	log IAP	log K(298 K, 1 atm)	
(Co (NH3) 5Cl) (NO3) 2	-52.97	-46.68	6.29	(Co (NH3) 5Cl) (NO3) 2
(Co (NH3) 5Cl) Cl2	-40.25	-35.74	4.51	(Co (NH3) 5Cl) Cl2
(Co (NH3) 5OH2) Cl3	-47.47	-35.74	11.74	(Co (NH3) 5OH2) Cl3
(Co (NH3) 6) (NO3) 3	-68.90	-50.97	17.93	(Co (NH3) 6) (NO3) 3
(Co (NH3) 6) Cl3	-54.59	-34.56	20.03	(Co (NH3) 6) Cl3
(NH4) 2CrO4	-28.29	-27.88	0.40	(NH4) 2CrO4
(NH4) 2SeO4	-23.95	-23.50	0.45	(NH4) 2SeO4
Acanthite	-52.39	-88.61	-36.22	Ag2S
Ag2CO3	-12.39	-23.48	-11.09	Ag2CO3
Ag2CrO4	-20.48	-32.07	-11.59	Ag2CrO4
Ag2HVO4	-12.27	-10.79	1.48	Ag2HVO4
Ag2MoO4	-12.28	-23.83	-11.55	Ag2MoO4
Ag2O	-14.41	-1.83	12.57	Ag2O
Ag2Se	0.00	-48.70	-48.70	Ag2Se
Ag2SeO3	-9.78	-16.93	-7.15	Ag2SeO3
Ag2SeO4	-18.78	-27.69	-8.91	Ag2SeO4
Ag2SO4	-15.27	-20.09	-4.82	Ag2SO4
Ag3AsO3	-28.43	-26.27	2.16	Ag3AsO3
Ag3AsO4	-16.84	-19.62	-2.79	Ag3AsO4
Ag3H2VO5	-16.88	-11.70	5.18	Ag3H2VO5
AgF:4H2O	-13.80	-12.75	1.05	AgF:4H2O
Agmetal	-0.18	-13.69	-13.51	Ag

AgVO3	-10.64	-9.87	0.77	AgVO3
Al (OH) 3 (am)	-1.57	9.23	10.80	Al (OH) 3
Al2 (MoO4) 3	-49.89	-47.53	2.37	Al2 (MoO4) 3
Al2O3	-1.19	18.46	19.65	Al2O3
Al4 (OH) 10SO4	-4.04	18.66	22.70	Al4 (OH) 10SO4
AlAsO4:2H2O	-12.44	-7.64	4.80	AlAsO4:2H2O
AlOHSO4	-5.80	-9.03	-3.23	AlOHSO4
AlSb	-152.66	-87.04	65.62	AlSb
Alunite	-1.59	-2.99	-1.40	KAl3 (SO4) 2 (OH) 6
Anglesite	-4.09	-11.88	-7.79	PbSO4
Anhydrite	-0.73	-5.09	-4.36	CaSO4
Anilite	-55.37	-87.25	-31.88	Cu0.25Cu1.5S
Antlerite	-1.94	6.85	8.79	Cu3 (OH) 4SO4
Aragonite	-0.18	-8.48	-8.30	CaCO3
Arsenolite	-91.31	-94.07	-2.76	As4O6
Artinite	-3.98	5.62	9.60	MgCO3:Mg (OH) 2:3H2O
As2O5	-40.45	-33.74	6.71	As2O5
Atacamite	-0.90	6.49	7.39	Cu2 (OH) 3Cl
Azurite	-1.28	-18.18	-16.91	Cu3 (OH) 2 (CO3) 2
Ba (OH) 2:8H2O	-16.12	8.27	24.39	Ba (OH) 2:8H2O
Ba2V2O7:2H2O	-17.22	-1.35	15.87	Ba2V2O7:2H2O
Ba3 (AsO4) 2	0.00	-8.91	-8.91	Ba3 (AsO4) 2
Ba3 (VO4) 2:4H2O	-26.01	6.93	32.94	Ba3 (VO4) 2:4H2O
BaCrO4	-12.29	-21.96	-9.67	BaCrO4
BaF2	-9.57	-15.39	-5.82	BaF2
BaMoO4	-6.76	-13.72	-6.96	BaMoO4
Barite	0.00	-9.98	-9.98	BaSO4
BaS	-94.68	-78.50	16.18	BaS
BaSeO3	-8.64	-6.81	1.83	BaSeO3
BaSeO4	-10.12	-17.58	-7.46	BaSeO4
Bianchite	-5.94	-7.70	-1.76	ZnSO4:6H2O
Birnessite	-6.34	11.75	18.09	MnO2
Bixbyite	-1.39	-2.04	-0.64	Mn2O3
BlaubleiI	-55.42	-79.59	-24.16	Cu0.9Cu0.2S
BlaubleiII	-55.84	-83.12	-27.28	Cu0.6Cu0.8S
Boehmite	0.65	9.23	8.58	AlOOH
Breithauptite	-55.92	-74.45	-18.52	NiSb
Brochantite	0.00	15.22	15.22	Cu4 (OH) 6SO4
Brucite	-3.21	13.63	16.84	Mg (OH) 2
Bunsenite	-3.40	9.05	12.45	NiO
Ca (VO3) 2	-10.40	-4.74	5.66	Ca (VO3) 2
Ca2V2O7	-9.07	8.43	17.50	Ca2V2O7
Ca2V2O7:2H2O	-13.12	8.43	21.55	Ca2V2O7:2H2O
Ca3 (AsO4) 2:4H2O	-16.54	5.76	22.30	Ca3 (AsO4) 2:4H2O
Ca3 (VO4) 2	-17.36	21.60	38.96	Ca3 (VO4) 2
Ca3 (VO4) 2:4H2O	-18.27	21.59	39.86	Ca3 (VO4) 2:4H2O
Ca3Sb2	-296.00	-153.03	142.97	Ca3Sb2
CaCrO4	-14.81	-17.07	-2.27	CaCrO4
Calcite	0.00	-8.48	-8.48	CaCO3
Calomel	-6.89	-24.80	-17.91	Hg2Cl2
CaMoO4	-0.88	-8.83	-7.95	CaMoO4
Carnotite	-1.03	-0.80	0.23	KUO2VO4
CaSeO3:2H2O	-4.74	-1.93	2.81	CaSeO3:2H2O
CaSeO4:2H2O	-9.67	-12.69	-3.02	CaSeO4:2H2O
Cd (BO2) 2	-10.33	-0.49	9.84	Cd (BO2) 2
Cd (OH) 2	-5.83	7.81	13.64	Cd (OH) 2
Cd (OH) 2 (am)	-5.92	7.81	13.73	Cd (OH) 2
Cd3 (OH) 2 (SO4) 2	-19.78	-13.07	6.71	Cd3 (OH) 2 (SO4) 2
Cd3 (OH) 4SO4	-17.38	5.18	22.56	Cd3 (OH) 4SO4
Cd4 (OH) 6SO4	-15.40	13.00	28.40	Cd4 (OH) 6SO4
CdCl2	-12.03	-12.68	-0.66	CdCl2
CdCl2:1H2O	-10.99	-12.68	-1.69	CdCl2:1H2O
CdCl2:2.5H2O	-10.77	-12.69	-1.91	CdCl2:2.5H2O
CdF2	-14.64	-15.85	-1.21	CdF2
Cdmetal (alpha)	-31.24	-17.73	13.51	Cd
Cdmetal (gamma)	-31.35	-17.73	13.62	Cd
CdMoO4	-0.03	-14.18	-14.15	CdMoO4
CdOHCl	-5.97	-2.44	3.54	CdOHCl

CdSb	-75.33	-75.68	-0.35	CdSb
CdSe	-18.85	-39.05	-20.20	CdSe
CdSeO4:2H2O	-16.19	-18.04	-1.85	CdSeO4:2H2O
CdSO4	-10.27	-10.44	-0.17	CdSO4
CdSO4:1H2O	-8.72	-10.44	-1.73	CdSO4:1H2O
CdSO4:2.67H2O	-8.57	-10.44	-1.87	CdSO4:2.67H2O
Cerargyrite	-1.42	-11.17	-9.75	AgCl
Cerrusite	-2.14	-15.27	-13.13	PbCO3
CH4 (g)	-82.78	-123.83	-41.05	CH4
Chalcanthite	-7.25	-9.89	-2.64	CuSO4:5H2O
Chalcedony	-0.80	-4.35	-3.55	SiO2
Chalcocite	-55.28	-90.20	-34.92	Cu2S
Chalcopyrite	-126.46	-161.73	-35.27	CuFeS2
Chrysotile	0.00	32.20	32.20	Mg3Si2O5 (OH) 4
Cinnabar	-52.05	-97.75	-45.69	HgS
Claudetite	-91.01	-94.07	-3.06	As4O6
Clausthalite	-13.39	-40.49	-27.10	PbSe
Co (BO2) 2	-26.63	0.44	27.07	Co (BO2) 2
Co (OH) 2	-4.35	8.74	13.09	Co (OH) 2
Co (OH) 3	-8.57	-10.88	-2.31	Co (OH) 3
CO2 (g)	-3.50	-21.65	-18.15	CO2
Co3 (AsO4) 2	-20.54	-7.51	13.03	Co3 (AsO4) 2
Co3O4	-2.52	-13.02	-10.50	Co3O4
CoCl2	-20.02	-11.75	8.27	CoCl2
CoCl2:6H2O	-14.29	-11.76	2.54	CoCl2:6H2O
CoCO3	-2.92	-12.90	-9.98	CoCO3
CoF2	-13.33	-14.92	-1.60	CoF2
CoF3	-44.92	-46.38	-1.46	CoF3
CoFe2O4	18.66	15.13	-3.53	CoFe2O4
CoMoO4	-5.49	-13.25	-7.76	CoMoO4
CoO	-4.84	8.75	13.59	CoO
CoS (alpha)	-70.59	-78.03	-7.44	CoS
CoS (beta)	-66.96	-78.03	-11.07	CoS
CoSe	-21.92	-38.12	-16.20	CoSe
CoSeO3	-7.67	-6.35	1.32	CoSeO3
CoSeO4:6H2O	-15.58	-17.11	-1.53	CoSeO4:6H2O
CoSO4	-12.31	-9.51	2.80	CoSO4
CoSO4:6H2O	-7.04	-9.52	-2.47	CoSO4:6H2O
Cotunnite	-9.34	-14.12	-4.78	PbCl2
Covellite	-56.11	-78.41	-22.30	CuS
Cr (OH) 2	-21.82	-11.00	10.82	Cr (OH) 2
Cr (OH) 3	-2.52	-1.18	1.34	Cr (OH) 3
Cr (OH) 3 (am)	-0.43	-1.18	-0.75	Cr (OH) 3
Cr2O3	0.00	-2.36	-2.36	Cr2O3
CrCl2	-45.59	-31.50	14.09	CrCl2
CrCl3	-47.04	-31.93	15.11	CrCl3
CrF3	-25.34	-36.68	-11.34	CrF3
Cristobalite	-1.00	-4.35	-3.35	SiO2
Crmetal	-67.03	-36.55	30.48	Cr
CrO3	-27.03	-30.24	-3.21	CrO3
Cryolite	-8.73	-42.57	-33.84	Na3AlF6
Cu (OH) 2	-0.30	8.37	8.67	Cu (OH) 2
Cu (SbO3) 2	-25.01	20.20	45.21	Cu (SbO3) 2
Cu2 (OH) 3NO3	-8.23	1.02	9.25	Cu2 (OH) 3NO3
Cu2Sb:3H2O	-54.73	-89.61	-34.88	Cu2Sb:3H2O
Cu2Se (alpha)	-4.49	-50.29	-45.80	Cu2Se
Cu2SO4	-19.73	-21.68	-1.95	Cu2SO4
Cu3 (AsO4) 2:2H2O	-14.73	-8.63	6.10	Cu3 (AsO4) 2:2H2O
Cu3Sb	-58.81	-101.40	-42.59	Cu3Sb
Cu3Se2	-25.29	-88.79	-63.49	Cu3Se2
CuCO3	-1.78	-13.28	-11.50	CuCO3
CuCrO4	-16.43	-21.87	-5.44	CuCrO4
CuF	-8.64	-13.55	-4.91	CuF
CuF2	-16.41	-15.30	1.12	CuF2
CuF2:2H2O	-10.75	-15.30	-4.55	CuF2:2H2O
Cumetal	-5.73	-14.48	-8.76	Cu
CuMoO4	-0.55	-13.62	-13.08	CuMoO4
CuOCuSO4	-11.82	-1.52	10.30	CuOCuSO4

Cupricferrite	8.77	14.75	5.99	CuFe2O4
Cuprite	-2.02	-3.42	-1.41	Cu2O
Cuprousferrite	10.40	1.48	-8.92	CuFeO2
CuSe	-5.40	-38.50	-33.10	CuSe
CuSe2	-26.45	-59.82	-33.37	CuSe2
CuSeO3:2H2O	-7.23	-6.72	0.51	CuSeO3:2H2O
CuSeO4:5H2O	-15.05	-17.49	-2.44	CuSeO4:5H2O
CuSO4	-12.83	-9.89	2.94	CuSO4
Diaspore	2.36	9.23	6.87	AlOOH
Djurleite	-55.50	-89.42	-33.92	Cu0.066Cu1.868S
Dolomite(disordered)	0.05	-16.49	-16.54	CaMg(CO3)2
Dolomite(ordered)	0.60	-16.49	-17.09	CaMg(CO3)2
Epsomite	-2.50	-4.63	-2.13	MgSO4:7H2O
Fe(OH)2	-10.11	3.45	13.56	Fe(OH)2
Fe(OH)2.7Cl.3	3.16	0.12	-3.04	Fe(OH)2.7Cl.3
Fe(VO3)2	-10.73	-14.45	-3.72	Fe(VO3)2
Fe2(OH)4SeO3	-10.26	-8.71	1.55	Fe2(OH)4SeO3
Fe2(SeO3)3:2H2O	-18.27	-38.89	-20.63	Fe2(SeO3)3:2H2O
Fe2(SO4)3	-44.65	-48.39	-3.73	Fe2(SO4)3
Fe3(OH)8	-10.39	9.83	20.22	Fe3(OH)8
FeAsO4:2H2O	-14.08	-13.68	0.40	FeAsO4:2H2O
FeCr2O4	-6.11	1.09	7.20	FeCr2O4
FeMoO4	-8.45	-18.54	-10.09	FeMoO4
Ferrihydrite	0.00	3.19	3.19	Fe(OH)3
Ferroselite	-46.14	-64.74	-18.60	FeSe2
FeS(ppt)	-80.37	-83.32	-2.95	FeS
FeSe	-32.41	-43.41	-11.00	FeSe
Fix_pe	-4.69	-4.69	0.00	e-
Fluorite	0.00	-10.50	-10.50	CaF2
Galena	-66.43	-80.40	-13.97	PbS
Gibbsite	0.94	9.23	8.29	Al(OH)3
Goethite	2.70	3.19	0.49	FeOOH
Goslarite	-5.69	-7.70	-2.01	ZnSO4:7H2O
Greenalite	-19.16	1.65	20.81	Fe3Si2O5(OH)4
Greenockite	-64.60	-78.96	-14.36	CdS
Greigite	-292.23	-337.27	-45.03	Fe3S4
Gummite	-5.36	2.31	7.67	UO3
Gypsum	-0.48	-5.09	-4.61	CaSO4:2H2O
H-Jarosite	-14.84	-26.94	-12.10	(H3O)Fe3(SO4)2(OH)6
H2MoO4	-9.12	-22.00	-12.88	H2MoO4
H2S(g)	-78.77	-86.78	-8.01	H2S
H2Se(g)	-41.91	-46.87	-4.96	H2Se
Halite	-5.45	-3.85	1.60	NaCl
Halloysite	0.18	9.76	9.57	Al2Si2O5(OH)4
Hausmannite	-0.81	60.22	61.03	Mn3O4
Hematite	7.80	6.38	-1.42	Fe2O3
Hercynite	-0.98	21.91	22.89	FeAl2O4
Hg(CH3)2(g)	-184.92	-258.63	-73.71	Hg(CH3)2
Hg(g)	-7.05	-14.92	-7.87	Hg
Hg(OH)2	-7.48	-10.97	-3.50	Hg(OH)2
Hg2(g)	-14.89	-29.85	-14.96	Hg2
Hg2(OH)2	-9.56	-4.30	5.26	Hg2(OH)2
Hg2CO3	-9.90	-25.95	-16.05	Hg2CO3
Hg2CrO4	-25.84	-34.54	-8.70	Hg2CrO4
Hg2F2	-17.61	-27.97	-10.36	Hg2F2
Hg2S	-79.40	-91.08	-11.68	Hg2S
Hg2SeO3	-14.74	-19.40	-4.66	Hg2SeO3
Hg2SO4	-16.43	-22.56	-6.13	Hg2SO4
Hg3O2CO3	-24.88	-54.56	-29.68	Hg3O2CO3
HgCl(g)	-31.90	-12.40	19.50	HgCl
HgCl2	-10.21	-31.47	-21.26	HgCl2
HgF(g)	-46.66	-13.99	32.68	HgF
HgF2(g)	-47.20	-34.64	12.57	HgF2
Hgmetal(l)	-1.47	-14.92	-13.45	Hg
HgSe	-2.14	-57.84	-55.69	HgSe
HgSeO3	-13.63	-26.06	-12.43	HgSeO3
HgSO4	-19.81	-29.23	-9.42	HgSO4
Huntite	-2.55	-32.52	-29.97	CaMg3(CO3)4

Hydrocerrusite	-5.40	-24.17	-18.77	Pb3 (OH) 2 (CO3) 2
Hydromagnesite	-9.65	-18.42	-8.77	Mg5 (CO3) 4 (OH) 2 : 4H2O
K-Alum	-16.28	-21.45	-5.17	KAl (SO4) 2 : 12H2O
K-Jarosite	-6.30	-21.10	-14.80	KFe3 (SO4) 2 (OH) 6
K2Cr2O7	-31.55	-48.79	-17.24	K2Cr2O7
K2CrO4	-18.04	-18.55	-0.51	K2CrO4
K2MoO4	-13.57	-10.31	3.26	K2MoO4
K2SeO4	-13.44	-14.17	-0.73	K2SeO4
Kaolinite	2.32	9.76	7.43	Al2Si2O5 (OH) 4
Langite	-2.27	15.22	17.49	Cu4 (OH) 6SO4 : H2O
Larnakite	-5.07	-5.51	-0.43	PbO : PbSO4
Laurionite	-4.50	-3.87	0.62	PbOHCl
Lepidocrocite	1.82	3.19	1.37	FeOOH
Lime	-19.53	13.17	32.70	CaO
Litharge	-6.32	6.37	12.69	PbO
Mackinawite	-79.72	-83.32	-3.60	FeS
Maghemite	-0.00	6.38	6.39	Fe2O3
Magnesioferrite	3.16	20.02	16.86	Fe2MgO4
Magnesite	-0.55	-8.01	-7.46	MgCO3
Magnetite	6.43	9.84	3.40	Fe3O4
Malachite	0.40	-4.91	-5.31	Cu2 (OH) 2CO3
Manganite	-1.01	24.33	25.34	MnOOH
Massicot	-6.52	6.37	12.89	PbO
Matlockite	-6.73	-15.71	-8.97	PbClF
Melanothallite	-18.39	-12.13	6.26	CuCl2
Melanterite	-12.60	-14.81	-2.21	FeSO4 : 7H2O
Metacinnabar	-52.65	-97.75	-45.09	HgS
Mg (OH) 2 (active)	-5.16	13.63	18.79	Mg (OH) 2
Mg (VO3) 2	-15.55	-4.27	11.28	Mg (VO3) 2
Mg2Sb3	-272.35	-197.66	74.68	Mg2Sb3
Mg2V2O7	-17.00	9.36	26.36	Mg2V2O7
MgCr2O4	-4.92	11.28	16.20	MgCr2O4
MgCrO4	-21.98	-16.60	5.38	MgCrO4
MgF2	-1.90	-10.03	-8.13	MgF2
MgMoO4	-6.51	-8.36	-1.85	MgMoO4
MgSeO3 : 6H2O	-4.52	-1.46	3.06	MgSeO3 : 6H2O
MgSeO4 : 6H2O	-11.02	-12.22	-1.20	MgSeO4 : 6H2O
Minium	-28.85	44.67	73.52	Pb3O4
Mirabilite	-4.35	-5.46	-1.11	Na2SO4 : 10H2O
Mn (VO3) 2	-11.25	-6.35	4.90	Mn (VO3) 2
Mn2 (SO4) 3	-51.10	-56.81	-5.71	Mn2 (SO4) 3
Mn2Sb	-147.00	-85.92	61.08	Mn2Sb
Mn3 (AsO4) 2 : 8H2O	-11.57	0.93	12.50	Mn3 (AsO4) 2 : 8H2O
MnCl2 : 4H2O	-11.66	-8.94	2.72	MnCl2 : 4H2O
MnS (grn)	-75.39	-75.22	0.17	MnS
MnS (pnk)	-78.56	-75.22	3.34	MnS
MnSb	-94.37	-97.28	-2.91	MnSb
MnSe	-38.81	-35.31	3.50	MnSe
MnSeO3	-4.66	-3.53	1.13	MnSeO3
MnSeO3 : 2H2O	-4.52	-3.53	0.98	MnSeO3 : 2H2O
MnSeO4 : 5H2O	-12.25	-14.30	-2.05	MnSeO4 : 5H2O
MnSO4	-9.28	-6.70	2.58	MnSO4
Monteponite	-7.29	7.81	15.10	CdO
Montroydite	-7.33	-10.97	-3.64	HgO
MoO3	-13.99	-21.99	-8.00	MoO3
Morenosite	-7.07	-9.22	-2.14	NiSO4 : 7H2O
MoS2	-150.83	-221.09	-70.26	MoS2
Na-Jarosite	-9.34	-20.54	-11.20	NaFe3 (SO4) 2 (OH) 6
Na2Cr2O7	-37.78	-47.68	-9.90	Na2Cr2O7
Na2CrO4	-20.37	-17.44	2.93	Na2CrO4
Na2Mo2O7	-14.59	-31.19	-16.60	Na2Mo2O7
Na2MoO4	-10.68	-9.19	1.49	Na2MoO4
Na2MoO4 : 2H2O	-10.42	-9.20	1.22	Na2MoO4 : 2H2O
Na2SeO3 : 5H2O	-12.59	-2.29	10.30	Na2SeO3 : 5H2O
Na2SeO4	-14.33	-13.05	1.28	Na2SeO4
Na3Sb	-171.52	-77.06	94.45	Na3Sb
Na3VO4	-26.43	10.25	36.68	Na3VO4
Na4V2O7	-29.70	7.70	37.40	Na4V2O7

Nantokite	-5.23	-11.96	-6.73	CuCl
NaSb	-87.49	-64.32	23.17	NaSb
Natron	-7.54	-8.85	-1.31	Na2CO3:10H2O
NaVO3	-6.41	-2.55	3.86	NaVO3
Nesquehonite	-3.34	-8.01	-4.67	MgCO3:3H2O
Ni (OH) 2	-3.75	9.05	12.79	Ni (OH) 2
Ni3 (AsO4) 2:8H2O	-22.31	-6.61	15.70	Ni3 (AsO4) 2:8H2O
Ni4 (OH) 6SO4	-14.07	17.93	32.00	Ni4 (OH) 6SO4
NiCO3	-5.73	-12.60	-6.87	NiCO3
NiMoO4	-1.81	-12.95	-11.14	NiMoO4
NiS (alpha)	-72.13	-77.73	-5.60	NiS
NiS (beta)	-66.63	-77.73	-11.10	NiS
NiS (gamma)	-64.93	-77.73	-12.80	NiS
NiSe	-20.12	-37.82	-17.70	NiSe
NiSeO3:2H2O	-8.86	-6.05	2.81	NiSeO3:2H2O
NiSeO4:6H2O	-15.29	-16.81	-1.52	NiSeO4:6H2O
Nsutite	-5.75	11.75	17.50	MnO2
O2 (g)	-32.00	51.09	83.09	O2
Orpiment	-246.30	-307.36	-61.07	As2S3
Otavite	-1.83	-13.83	-12.00	CdCO3
Pb (BO2) 2	-8.45	-1.93	6.52	Pb (BO2) 2
Pb (OH) 2	-1.78	6.37	8.15	Pb (OH) 2
Pb10 (OH) 6O (CO3) 6	-57.38	-66.14	-8.76	Pb10 (OH) 6O (CO3) 6
Pb2 (OH) 3Cl	-6.29	2.50	8.79	Pb2 (OH) 3Cl
Pb2O (OH) 2	-13.44	12.75	26.19	Pb2O (OH) 2
Pb2O3	-22.75	38.29	61.04	Pb2O3
Pb2OCO3	-8.34	-8.90	-0.56	Pb2OCO3
Pb2V2O7	-3.26	-5.16	-1.90	Pb2V2O7
Pb3 (AsO4) 2	-20.42	-14.62	5.80	Pb3 (AsO4) 2
Pb3 (VO4) 2	-4.92	1.22	6.14	Pb3 (VO4) 2
Pb3O2CO3	-13.54	-2.52	11.02	Pb3O2CO3
Pb3O2SO4	-9.82	0.87	10.69	Pb3O2SO4
Pb4 (OH) 6SO4	-13.86	7.24	21.10	Pb4 (OH) 6SO4
Pb4O3SO4	-14.64	7.24	21.88	Pb4O3SO4
PbCrO4	-11.26	-23.86	-12.60	PbCrO4
PbF2	-9.85	-17.29	-7.44	PbF2
Pbmetal	-23.42	-19.17	4.25	Pb
PbMoO4	-0.00	-15.62	-15.62	PbMoO4
PbO:0.3H2O	-6.61	6.37	12.98	PbO:0.33H2O
PbSeO4	-12.64	-19.48	-6.84	PbSeO4
Periclase	-7.95	13.63	21.58	MgO
Phosgenite	-9.59	-29.40	-19.81	PbCl2:PbCO3
Plattnerite	-17.68	31.92	49.60	PbO2
Portlandite	-9.64	13.17	22.80	Ca (OH) 2
Pyrite	-126.05	-144.56	-18.51	FeS2
Pyrochroite	-3.64	11.56	15.19	Mn (OH) 2
Pyrolusite	-4.28	37.10	41.38	MnO2
Quartz	-0.35	-4.35	-4.00	SiO2
Realgar	-103.32	-123.07	-19.75	AsS
Retgersite	-7.17	-9.21	-2.04	NiSO4:6H2O
Rhodochrosite	0.49	-10.09	-10.58	MnCO3
Rutherfordine	-4.84	-19.34	-14.50	UO2CO3
Sb (OH) 3	-12.52	-19.63	-7.11	Sb (OH) 3
Sb2O4	-17.12	-13.72	3.40	Sb2O4
Sb2O5	-27.12	-36.79	-9.67	Sb2O5
Sb2Se3	-112.10	-179.86	-67.76	Sb2Se3
Sb4O6 (cubic)	-60.26	-78.52	-18.26	Sb4O6
Sb4O6 (orth)	-60.62	-78.52	-17.90	Sb4O6
SbCl3	-50.95	-50.38	0.57	SbCl3
SbF3	-44.91	-55.13	-10.23	SbF3
Sbmetal	-46.26	-57.95	-11.69	Sb
SbO2	-3.34	-31.17	-27.82	SbO2
Schoepite	-3.69	2.31	5.99	UO2 (OH) 2:H2O
Semetal (am)	-14.21	-21.32	-7.11	Se
Semetal (hex)	-13.61	-21.32	-7.71	Se
Senarmontite	-26.90	-39.26	-12.37	Sb2O3
SeO2	-15.22	-15.09	0.12	SeO2
SeO3	-46.90	-25.86	21.04	SeO3

Sepiolite	-1.55	14.21	15.76	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Sepiolite(A)	-4.57	14.21	18.78	Mg ₂ Si ₃ O ₇ .5OH:3H ₂ O
Siderite	-7.96	-18.20	-10.24	FeCO ₃
SiO ₂ (am-gel)	-1.64	-4.35	-2.71	SiO ₂
SiO ₂ (am-ppt)	-1.61	-4.35	-2.74	SiO ₂
Smithsonite	-1.09	-11.09	-10.00	ZnCO ₃
Sphalerite	-64.77	-76.22	-11.45	ZnS
Spinel	-4.75	32.09	36.85	MgAl ₂ O ₄
Stibnite	-249.13	-299.59	-50.46	Sb ₂ S ₃
Sulfur	-59.09	-61.23	-2.14	S
Tenorite	0.73	8.37	7.64	CuO
Thenardite	-5.78	-5.46	0.32	Na ₂ SO ₄
Thermonatrite	-9.48	-8.85	0.64	Na ₂ CO ₃ :H ₂ O
Tyuyamunite	-4.20	-0.12	4.08	Ca(UO ₂) ₂ (VO ₄) ₂
U ₃ O ₈	-12.06	9.03	21.08	U ₃ O ₈
U ₃ Sb ₄	-579.50	-427.12	152.38	U ₃ Sb ₄
U ₄ O ₉	-27.52	-30.54	-3.02	U ₄ O ₉
UF ₄	-31.82	-61.35	-29.54	UF ₄
UF ₄ :2.5H ₂ O	-28.64	-61.36	-32.72	UF ₄ :2.5H ₂ O
UO ₂ (am)	-14.95	-14.02	0.93	UO ₂
UO ₂ (NO ₃) ₂	-41.28	-29.13	12.15	UO ₂ (NO ₃) ₂
UO ₂ (NO ₃) ₂ :2H ₂ O	-33.98	-29.13	4.85	UO ₂ (NO ₃) ₂ :2H ₂ O
UO ₂ (NO ₃) ₂ :3H ₂ O	-32.52	-29.13	3.39	UO ₂ (NO ₃) ₂ :3H ₂ O
UO ₂ (NO ₃) ₂ :6H ₂ O	-31.18	-29.13	2.05	UO ₂ (NO ₃) ₂ :6H ₂ O
UO ₂ (OH) ₂ (beta)	-3.30	2.31	5.61	UO ₂ (OH) ₂
UO ₂ SeO ₄ :4H ₂ O	-21.30	-23.55	-2.25	UO ₂ SeO ₄ :4H ₂ O
UO ₃	-5.39	2.31	7.70	UO ₃
Uraninite	-9.35	-14.02	-4.67	UO ₂
USb ₂	-219.80	-190.22	29.58	USb ₂
V(OH) ₃	-19.49	-11.90	7.59	V(OH) ₃
V ₂ O ₅	-16.54	-17.90	-1.36	V ₂ O ₅
V ₃ O ₅	-41.85	-40.01	1.84	V ₃ O ₅
V ₄ O ₇	-52.02	-44.83	7.19	V ₄ O ₇
V ₆ O ₁₃	-43.94	-104.80	-60.86	V ₆ O ₁₃
Valentinite	-30.78	-39.26	-8.48	Sb ₂ O ₃
VC ₁₂	-64.04	-45.17	18.87	VC ₁₂
VC ₁₃	-66.08	-42.65	23.43	VC ₁₃
VF ₄	-67.09	-52.16	14.93	VF ₄
Vmetal	-94.24	-50.22	44.03	V
VO	-39.43	-24.67	14.76	VO
VO(OH) ₂	-9.97	-4.82	5.15	VO(OH) ₂
VO ₂ Cl	-22.04	-19.20	2.84	VO ₂ Cl
VOC ₁	-33.30	-22.15	11.15	VOC ₁
VOC ₁₂	-38.08	-25.32	12.76	VOC ₁₂
VOSO ₄	-26.69	-23.08	3.61	VOSO ₄
Witherite	-4.80	-13.37	-8.57	BaCO ₃
Wurtzite	-67.27	-76.22	-8.95	ZnS
Zincite	-0.77	10.56	11.33	ZnO
Zincosite	-11.63	-7.70	3.93	ZnSO ₄
Zn(BO ₂) ₂	-6.03	2.26	8.29	Zn(BO ₂) ₂
Zn(NO ₃) ₂ :6H ₂ O	-24.20	-20.88	3.32	Zn(NO ₃) ₂ :6H ₂ O
Zn(OH) ₂	-1.64	10.56	12.20	Zn(OH) ₂
Zn(OH) ₂ (am)	-1.91	10.56	12.47	Zn(OH) ₂
Zn(OH) ₂ (beta)	-1.19	10.56	11.75	Zn(OH) ₂
Zn(OH) ₂ (epsilon)	-0.97	10.56	11.53	Zn(OH) ₂
Zn(OH) ₂ (gamma)	-1.17	10.56	11.73	Zn(OH) ₂
Zn ₂ (OH) ₂ SO ₄	-4.64	2.86	7.50	Zn ₂ (OH) ₂ SO ₄
Zn ₂ (OH) ₃ Cl	-4.32	10.87	15.19	Zn ₂ (OH) ₃ Cl
Zn ₃ (AsO ₄) ₂ :2.5H ₂ O	-15.71	-2.06	13.65	Zn ₃ (AsO ₄) ₂ :2.5H ₂ O
Zn ₃ O(SO ₄) ₂	-23.75	-4.83	18.91	Zn ₃ O(SO ₄) ₂
Zn ₄ (OH) ₆ SO ₄	-4.41	23.99	28.40	Zn ₄ (OH) ₆ SO ₄
Zn ₅ (OH) ₈ Cl ₂	-6.20	32.30	38.50	Zn ₅ (OH) ₈ Cl ₂
ZnCl ₂	-16.99	-9.94	7.05	ZnCl ₂
ZnCO ₃ :1H ₂ O	-0.83	-11.09	-10.26	ZnCO ₃ :1H ₂ O
ZnF ₂	-12.57	-13.11	-0.53	ZnF ₂
Znmetal	-40.77	-14.98	25.79	Zn
ZnMoO ₄	-1.31	-11.43	-10.13	ZnMoO ₄
ZnO(active)	-0.63	10.56	11.19	ZnO

ZnS(am)	-67.16	-76.22	-9.05	ZnS
ZnSb	-83.95	-72.93	11.01	ZnSb
ZnSe	-21.90	-36.30	-14.40	ZnSe
ZnSeO4:6H2O	-13.78	-15.30	-1.52	ZnSeO4:6H2O
ZnSO4:1H2O	-7.06	-7.70	-0.64	ZnSO4:1H2O

**For a gas, $SI = \log_{10}(\text{fugacity})$. Fugacity = pressure * phi / 1 atm.
 For ideal gases, phi = 1.

 End of simulation.

 Reading input data for simulation 164.

 End of Run after 58.985 Seconds.

Appendix J – Aquatic Consultants Inc. Biological Assessment of the Existing Copper Flat Pit Lake

Copper Flat Mine

Biological Assessment
November 2014



AquaticConsultants Inc.

"Your Lake & Stream Experts"

Copper Flat Mine – Biological Assessment

METHODS

All samples were collected and field measurements were completed on 06 November 2014. All testing was conducted by Aquatic Consulting & Testing, Inc. (Arizona Laboratory License No. AZ0004). Measurements and samples were collected from three locations (coordinates shown below) except where otherwise described.

Location 1: N 32°58'11.97" W 107°32'03.52"
Location 2: N 32°58'15.24" W 107°32'03.08"
Location 3: N 32°58'14.48" W 107°32'00.80"

Light transmission was measured using an Apogee MQ300 quantum meter and remote sensor. Transparency was measured using a standard Secchi Disk.

Temperature and oxygen profiles were measured using a YSI Model 550A dissolved oxygen meter with remote sensor. Light extinction coefficient was calculated using the quantum meter data and the following formula:

Light extinction coefficient $k = (\ln I_o - \ln I_d) \times 1/z$

Where k = extinction coefficient

I_o = light intensity at surface

I_d = light intensity at depth $\mu\text{mol}/\text{m}^2/\text{s}$ [or μE]

Z = depth (m)

Water samples were collected from a depth of 0.5 meter at the three sampling locations and composited into a single sample. Depth-integrated samples were not required because the water was not vertically stratified. Sample preservation and chemical analyses were performed using EPA or APHA (Standard Methods) procedures licensed by Arizona Department of Health Services. Specific test methods are referenced in the attached laboratory reports. Algae identification and counts were made using a Nikon Diaphot phase/contrast inverted microscope. Samples were concentrated using an Utermohl settling chamber. Identifications were made using the following taxonomic references:

Baker, A.L. Algae, PS (Protista), Cyanobacteria, and Other Aquatic Objects. University of New Hampshire PhycoKey. <http://www.cfb.unh.edu/phycokey/phycokey.htm>.

Benson, C.E. and S.R. Rutherford. 1975. The Algal Flora of Huntington Canyon, Utah, U.S.A. A.R. Gantner Verlag, Germany. 177 pp.

Copper Flat Mine – Biological Assessment

Bold, H. and M.J. Wynne. 1985. Introduction to the Algae. Prentice Hall, Inc., Englewood, Cliffs, NJ. 720 pp.

Chapman, V.J. 1964. The Algae. St. Martin's Press, New York, NY. 472 pp.

Crawford, R.M., D.G. Mann, and F.E. Round. 1990. The Diatoms: Biology and Morphology of the Genera. Cambridge University Press, Cambridge, England. 747 pp.

Czarnecki, D.B. and D.W. Blinn. 1978. The Diatoms of the Colorado River. Strauss and Kramer. 181 pp.

Dillard, G.E. 1989. Freshwater Algae of the Southeastern United States. Vol. 1-6. J. Cramer, Berlin, Germany. 163 pp.

Dodd, J.F. 1987. Diatoms. Southern Illinois Press, Carbondale, IL. 477 pp.

Hein, M.K. 1990. Flora of Adak Island, Alaska: Bacillariophyceae (diatoms). J. Cramer. Stuttgart. 133 pp.

Patrick, R. and C.W. Reimer. 1966. The Diatoms of the United States. Monographs ANS No. 13, Vol. 1. Academy of Natural Sciences, Philadelphia, PA.

Patrick, R. and C.W. Reimer. 1975. The Diatoms of the United States. Monographs ANS No. 13, Vol. 2. Academy of Natural Sciences, Philadelphia, PA.

Prescott, G.W. 1978. How to Know the Freshwater Algae. William C. Brown Publishers, Dubuque, IA. 348 pp.

Prescott, G.W. 1962. Algae of the Western Great Lakes. William C. Brown Publishers, Dubuque, IA. 977 pp.

Rivers, I. 1978. Algae of the Western Great Basin. Desert Research Institute, Pub. 50008. University of Nevada, Las Vegas, NV. 390 pp.

Smith, G.M. 1950. Freshwater Algae of the United States. McGraw-Hill Book Company, Toronto, Canada. 719 pp.

Sze, P. 1986. The Biology of the Algae. William C. Brown Publishers, Dubuque, IA. 251 pp.

Tilden, J. The Myxophyceae of North America. Verlag Von J. Cramer, New York, NY. 328 pp.

University of Colorado. Diatoms of the United States. Diatom identification guide and ecological resource.

<http://westerndiatoms.colorado.edu/>

Warner, D. 1977. The Biology of the Diatoms. University of California Press, Berkeley, CA. 498 pp.

Copper Flat Mine – Biological Assessment

Zooplankton was collected using an 80-um Wisconsin plankton net. A vertical tow from the bottom to top of the water column was made at each location and combined to produce a composite. At the laboratory, the concentrated sample volume was measured and recorded, an aliquot was transferred to a counting chamber, and the sub-sample was observed using a dissecting microscope. Zooplankton forms were identified and counted.

Benthic (sediment) samples were collected with a stainless steel Ponar dredge. The sediment was hand sorted and screened in the laboratory to retrieve and isolate macroinvertebrates. Particle size analysis was conducted using an ATM Arrow shaker equipped with stacked U.S. standard sieves.

Fish sampling was conducted using an 18' Smith-Root Electro-fishing Boat. Running Direct Current (DC) at 15 pulses per second. Percent of range selected was 40% with output at approximately 200 volts. Pulse width at 40% produced a pulse duration of 2.4 milliseconds. Electro-fishing amperage was between 8 and 10. Electro-fishing effort was continuous at 1800 seconds during daylight and 1800 seconds after dark. Additionally, three experimental mesh gill nets were deployed for 21 hours over night. Two sets were shoreline sets and one in the middle of the pit. Each net was 120ft long and made up of six monofilament 20ft sections with the following mesh sizes $\frac{1}{2}$ ", 1", 1 $\frac{1}{2}$ ", 2", 2 $\frac{1}{2}$ ", and 3".

RESULTS AND DISCUSSION

Physical Conditions

Stratification

Temperature and oxygen profiles are presented below. Water temperature measurements varied from 12.6 to 13.7 C and dissolved oxygen concentrations ranged from 8.9 to 9.4 mg/L. At the time of sampling, the pit water was vertically mixed. The greatest change in temperature with depth occurred at Location 2, with a change of only 0.7 C from top to bottom (7.5 m) of the water column. Accordingly, dissolved oxygen was essentially unchanged through the water column at each location, with only a 0.2 mg/L maximum change from surface to pit bottom. Raw data and profiles are presented in Figure 1.

Copper Flat Mine – Biological Assessment

The temperature and oxygen data, aside from other limiting factors, indicate the water should be supportive of a warm water or possibly a cold water fishery (summertime profiles were not available).

Transparency and Solar Radiation

The Secchi disk depth was approximately 4.0 m. PAR measurements indicated penetration through the entire water column. Approximately 110 $\mu\text{mol}/\text{m}^2/\text{s}$ PAR was available at the pit bottom (extinction coefficient 0.35). Sufficient light existed to support a phytoplankton population. Light intensity at the pit bottom was similar to the recommended light intensity for algae cultures (Lavens and Sorgeloos 1996) and possibly benthic algae, although the minimum light requirement for benthic algae is poorly understood (Stevenson et al 1996). Light extinction data and graph are presented in Figure 2.

Sedimentation and Substrate Type

The amount of compacted sediment on the pit bottom ranged from 4 to 6 inches, with up to a 20-inch covering of iron floc. The sediment contained a very low (0.21%) organic carbon concentration, but did contain organic nitrogen (2160 mg/kg) and phosphorus (880 mg/kg). These data indicate that benthic algae or even submerged rooted macrophytes could only exist in areas where the iron floc was limited (littoral zone).

Seive analysis (see Figure 3) indicated that all particles were less than 1.18 mm and 89 percent was finer than 0.6 mm. The sediment is classified as silt (all particles less than 2 mm). The silt provides little to no substrate for diversity in a macroinvertebrate population.

The sieve analysis is presented on the following page. Sediment chemistry data are presented as part of laboratory report package presented at the end of the narrative.

Nutrients

Low nutrient concentrations, typical of oligotrophic lakes, were measured. An available N:P ratio of 3:1 was found. Because of the low pH (4.6 SU) and reported (Hall Environmental Analysis Laboratory) acidity of the water (180 mg/L as CaCO_3), bicarbonate and carbonate ions would be essentially absent (Geller et al.). Sufficient inorganic carbon would be available to algae through the equilibrium reactions of absorbed atmospheric carbon dioxide and carbonic acid (University of Montana).

Copper Flat Mine – Biological Assessment

Biologically-available phosphorus (0.018 mg/L phosphate-P), nitrogen (0.24 mg/L NO₃-N and 0.03 NH₃-N) would be adequate to support a modest phytoplankton population. This projection was supported by the very low chlorophyll-a concentration measurement of 0.8 ug/L. At measured pH, no ammonia toxicity could exist. The low pH would be detrimental to cyanobacteria (blue-green algae growth, but not eukaryotic algae species (Brock 1973). The complete water quality report is provided at the end of the report narrative.

Biological Conditions

The pit waters contained a depauperate algal assemblage composed of only six genera of algae. The six consisted of the diatoms (Bacillariophyta) *Diatoma*, *Cymbella*, *Synedra*, and *Navicula*; the cryptomonad, *Cryptomonas*; and the blue-green (Cyanophyta) alga *Chroococcus*. *Cryptomonas* was the dominant organism and is common in cold, acidic waters (Holopaenin 1992; Ojala and Jones 1993). Diatoms have also been found in a number of acidic environments, especially where high concentrations of iron exist as in some pit water environments (Nicola 2000). *Chroococcus* has been reported to dominate acidified Canadian lakes (Seckbach 2007). The total cell count was 603 cells per mL. However, many of the diatoms were frustules only (no protoplasm or chlorophyll observed), suggesting that these were dead and settling cells. The viable cell count is estimated at 312 cells/mL. The algae composition is summarized below (Table 1).

Table 1. Algae composition of Copper Flat pit water 11/06/14

Genus	Division/ form	Count per mL	Percent Comp.
<i>Diatoma</i>	Bacillariophyta (diatom) unicell	22	3.7
<i>Cryptomonas</i>	Cryptophyta (cryptophytes) flagellate	223	37.0
<i>Cymbella</i>	Bacillariophyta (diatom) unicell	34	5.6
<i>Synedra</i>	Bacillariophyta (diatom) unicell	212	35.2
<i>Navicula</i>	Bacillariophyta (diatom) unicell	22	3.7
<i>Chroococcus</i>	Cyanophyta (blue-green) colony	89	14.8

Sediment samples, primarily in the littoral zone, contained diatom frustules (most void of protoplasm or chlorophyll) and a very small number of *Hormidium* (Chlorophyta) filaments. *Hormidium* grows in acid environments as low as pH 3.5 and is least susceptible to copper and zinc toxicity at the pH range of 3.5 to 4.0 SU (Hargraves and Whitton 1976).

No zooplankton were recovered from multiple vertical tows at each location.

Copper Flat Mine – Biological Assessment

No macroinvertebrates were recovered from the sediment.

No fish species were recovered from either electro-fishing or gill nets.

A very small stand (20 sq ft) of cattail (*Typha* sp.) was found along the lake edge, in the dampened soil. No floating or submerged macrophytes were present.

Integrated Conditions and Biological Integrity

Because of the limited variety of organisms recovered from the sampling activities, only a few basic indices were calculated to characterize the pit water. The indices typically characterize the pit water as oligotrophic, with insignificant amounts of organic pollution, but with one or more other water quality variables reducing productivity.

Carlson Trophic Index (Carlson 1976) uses chlorophyll-a, transparency and phosphorus concentration to quantitatively categorize the status of a lake ranging from oligotrophic (unproductive) to highly eutrophic (productive). The range of TSI was 28-69. Transparency and chlorophyll were indicative of an oligotrophic lake, but total phosphorus was characteristic of a eutrophic lake.

Nygaard Trophic Index (Nygaard 1976) proposed five indices to evaluate the organic pollution of water bodies based on the tolerance of various groups of planktonic algae occurring in them. These indices include Cyanophycean or Myxophycean index, Chlorophycean index, Bacillariophycean or Myxophycean index, Chlorophycean index, Bacillariophycean index, Euglenophycean index and a combination of these called compound coefficient index. Because of the paucity of phytoplankton, only the diatom index was appropriate. The Index value was 0, indicating oligotrophic conditions.

Palmer Organic pollution Index (Person 1989). The metric evaluates the degree of organic pollution based on pollution tolerance of key algal genera. The pit water score was 5 indicating minimal or no organic pollution, or that another variable is interfering with algae growth.

Copper Flat Mine – Biological Assessment

CONCLUSION

The collected and historic data demonstrate that the pit waters do not and cannot support a balanced ecosystem. Higher aquatic life forms are absent because of likely chemical toxicity, lack of suitable habitat, and lack of food resources.

The pH of the water is below the range (6.5 to 9.0 SU) typically considered supportive of aquatic ecosystems (EPA 1986). pH has been considered the most important determinant of water quality in a pit environment (Miller 2002), impacting divalent metals solubility and creating toxicity. Groundwater interaction with the walls and surrounding host rock of the pit create oxidation reactions that release sulfate, acid, and metals into the lake. Copper Flat Pit water pH (4.6 SU) is well below the typical tolerance range of most aquatic organisms and the copper concentration (18 mg/L) is well above minimum phytotoxic concentrations.

Although adequate light and some nutrients are available, there is a paucity of primary producers in the pit water. Without available food, zooplankton species are essentially absent. A high concentration of copper in the water and low pH appear likely factors limiting algal growth and survival.

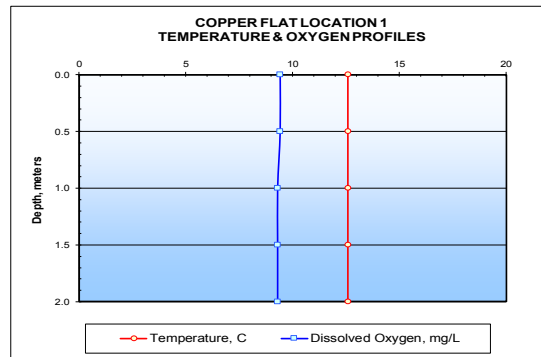
Macroinvertebrates are absent, including those typically considered tolerant of pollution. Habitat availability and diversity is limited. Most of the pit bottom and edge is composed of fine particulates; rocks and rubble are essentially absent. Organic matter is limited. The layer of precipitated iron covering a layer extremely fine silt is not suitable habitat for most benthic organisms. Food reserves for shredders and scrapers is highly limited, as the depauperate and sparse periphyton consisted of a single species of filamentous algae.

FIGURE 1

Copper Flat - 11/06/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 1

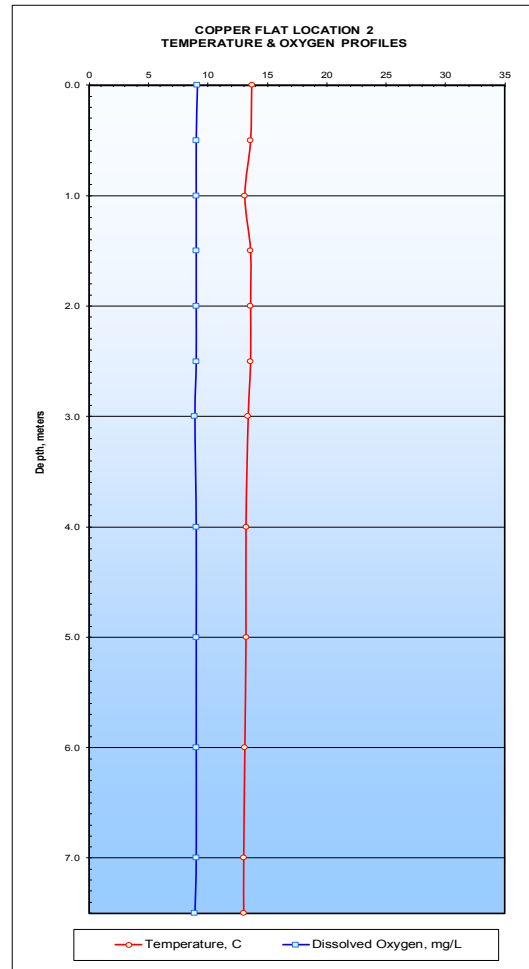
Depth_m	Temp_C	O2_mg/L
0.0	12.6	9.4
0.5	12.6	9.4
1.0	12.6	9.3
1.5	12.6	9.3
2.0	12.6	9.3



Copper Flat - 11/06/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 2

Depth_m	Temp_C	O2_mg/L
0.0	13.7	9.1
0.5	13.6	9.0
1.0	13.1	9.0
1.5	13.6	9.0
2.0	13.6	9.0
2.5	13.6	9.0
3.0	13.4	8.9
4.0	13.2	9.0
5.0	13.2	9.0
6.0	13.1	9.0
7.0	13.0	9.0
7.5	13.0	8.9



Copper Flat - 11/06/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 3

Depth_m	Temp_C	O2_mg/L
0.0	13.6	9.1
0.5	13.6	9.0
1.0	13.6	9.0
1.5	13.6	8.9
2.0	13.5	9.0
2.5	13.4	9.0
3.0	13.4	9.0
3.5	13.2	9.0
4.0	13.2	9.0

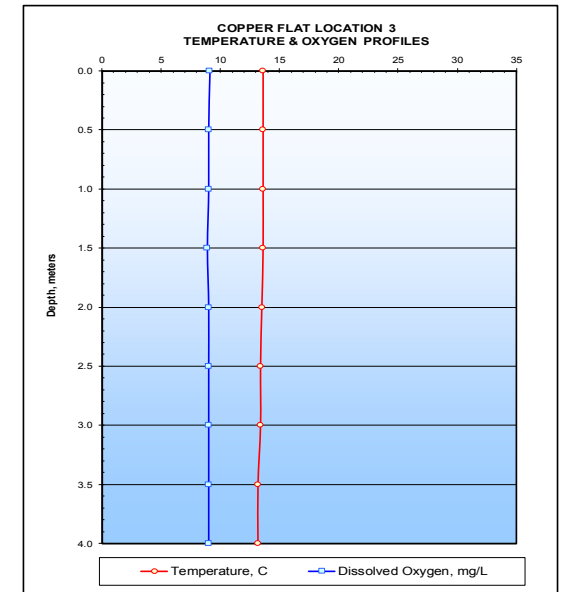
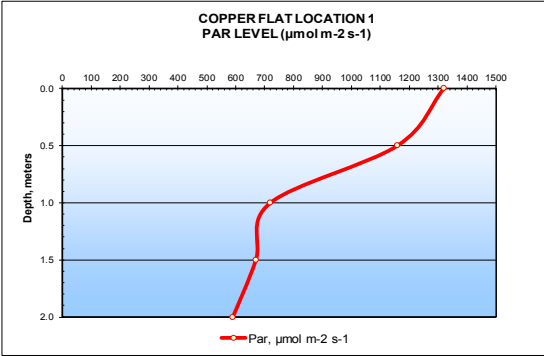


FIGURE 2

Copper Flat - 11/6/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 1

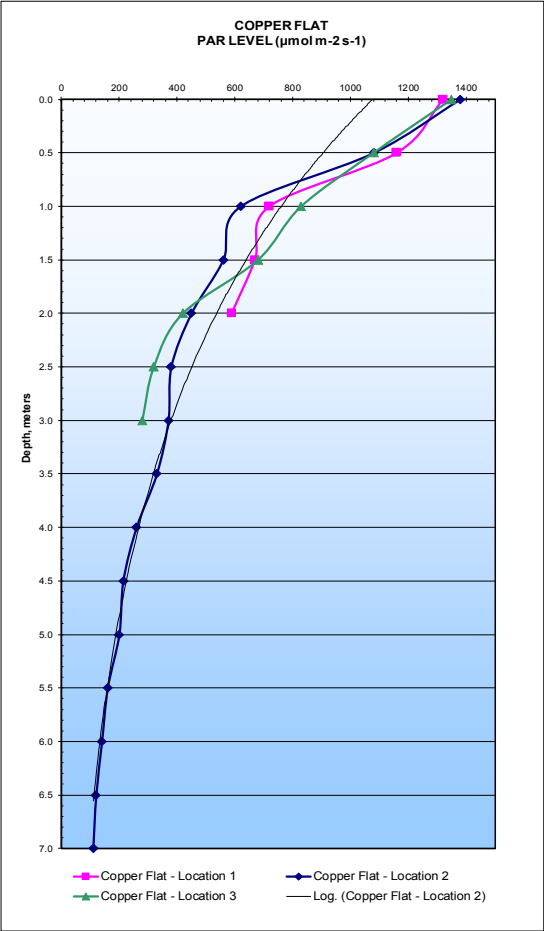
Depth_m	Par_μmol m-2 s-1
0.0	1320.0
0.5	1160.0
1.0	720.0
1.5	670.0
2.0	590.0



Copper Flat - 11/6/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 2

Depth_m	Par_μmol m-2 s-1
0.0	1380.0
0.5	1080.0
1.0	620.0
1.5	560.0
2.0	450.0
2.5	380.0
3.0	370.0
3.5	330.0
4.0	260.0
4.5	214.0
5.0	200.0
5.5	160.0
6.0	140.0
6.5	120.0
7.0	110.0



Copper Flat - 11/6/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 3

Depth_m	Par_μmol m-2 s-1
0.0	1350.0
0.5	1080.0
1.0	830.0
1.5	680.0
2.0	420.0
2.5	320.0
3.0	280.0

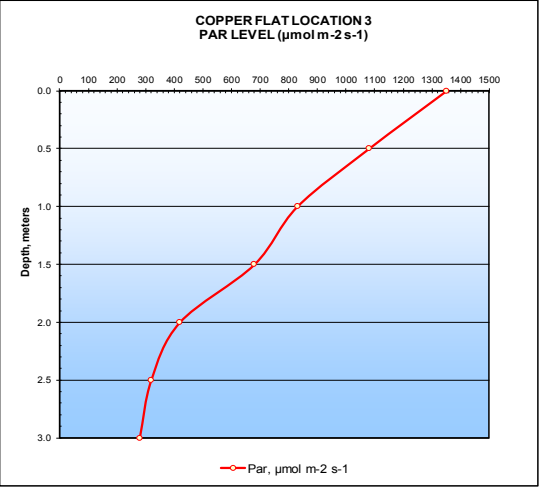
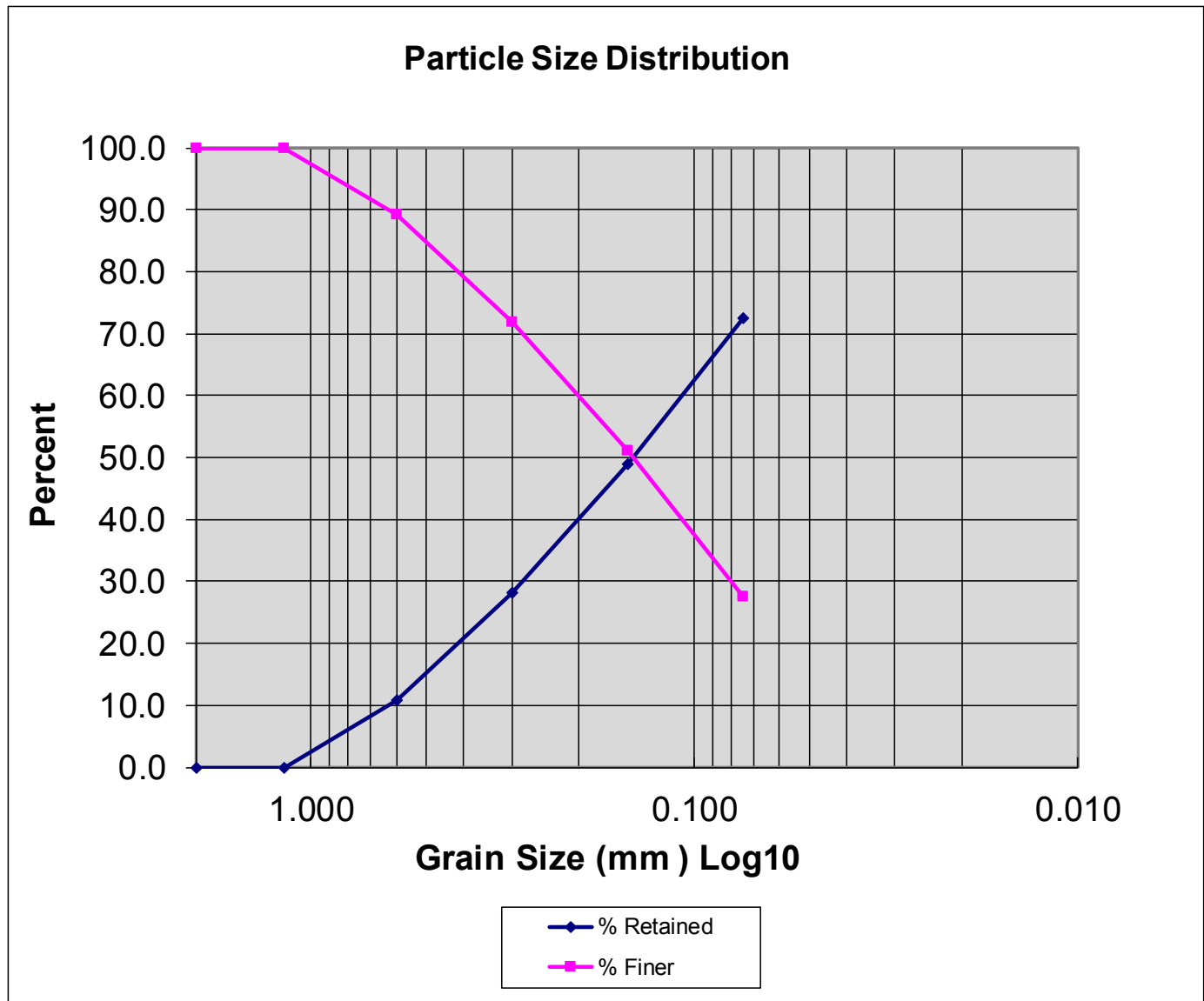


FIGURE 3

Laboratory ID: BW10543

Client ID: Aquatic Consultants - Copper Flat New Mexico

Mesh Size	Nominal Opening (inches)	Grain Size (mm)	Grams retained	Each sieve % Retained	Cumulative % Retained	% Finer
8	0.0937	2.360	0	0.0	0.0	100.0
10	0.0787	2.000	0	0.0	0.0	100.0
16	0.0469	1.180	0	0.0	0.0	100.0
30	0.0234	0.600	34.52	10.8	10.8	89.2
50	0.0117	0.300	55.01	17.3	28.1	71.9
100	0.0059	0.150	66.72	20.9	49.0	51.0
200	0.0029	0.075	74.76	23.5	72.5	27.5
	<0.0029		87.64	27.5	100.0	0.0





AQUATIC CONSULTING & TESTING, INC.

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Lic. No. AZ0003

LABORATORY REPORT

Client: Aquatic Consultants
4421 Irving Blvd. NW
Albuquerque, NM 87114

Date Submitted: 11/07/14
Date Reported: 12/02/14

Attn: Paul Cassidy

Project: Copper Flat

RESULTS

Client ID: H2O Comp. Loc 1-3
ACT Lab No.: BW10542

Sample Type: Surface Water
Sample Time: 11/08/14 14:30

Parameter	Analysis Date		Method No.	Result	Unit
	Start	End			
Total Organic Carbon	11/24/14	11/24/14	SM 5310 C	0.7	mg/L
Algae Count	12/01/14	12/01/14	SM 10200 F	See Attached	cells/mL
Algae Identification	12/01/14	12/01/14		See Attached	
ChlPheo Ratio	11/25/14	11/25/14	SM10200 H	1.14	
Chlorophyll a	11/25/14	11/25/14	SM10200 H	0.80	ug/L
Pheophytin a	11/25/14	11/25/14	SM10200 H	3.12	ug/L
Zooplankton	11/20/14	11/20/14	SM10200 G	<10.	#/cu. meter
Oxygen, Dissolved Field	11/08/14	11/08/14	SM4500 O G	9.0	mg/L as O ₂
pH, Field	11/08/14	11/08/14	SM4500H+ B	4.8	BU
Secchi Disk Depth	11/08/14	11/08/14	NALMS	4.0	meters
Temperature, Field	11/08/14	11/08/14	SM2580 B	13.6	C
Ammonia - N	11/20/14	11/20/14	SM4500NH ₃ D	0.03	mg/L as N
Nitrate + Nitrite - N	11/25/14	11/25/14	SM4500NO ₃ E	0.24	mg/L as N
Phosphate, ortho	11/07/14	11/07/14	385.3	0.018 *	mg/L as P
Phosphorus, Total	11/25/14	11/25/14	385.3	0.087	mg/L as P
Total Inorganic Carbon	11/24/14	11/24/14	SM 5310 C	0.9	mg/L
Total Kjeldahl Nitrogen	11/20/14	11/20/14	SMNorg C,NH ₃ C/D	0.3	mg/L as N

* R12-RP07080 exceeded the method acceptance limit. Result <3 times the PQL.

RESULTS

Client ID: Sed Comp. Loc 1-3
ACT Lab No.: BW10543

Sample Type: Sediment
Sample Time: 11/08/14 14:30

<u>Parameter</u>	<u>Analysis Date</u>		<u>Method No.</u>	<u>Result</u>	<u>Unit</u>
	<u>Start</u>	<u>End</u>			
Soil TOC	11/19/14	11/19/14	WalkleyBlack	0.21	% Org-C
Sieve Test	11/25/14	11/25/14	ASTM	See Attached	
Kjeldahl Nitrogen - Soil	11/19/14	11/19/14	SM4500NargC mod.	2160.	mg/kg as N
Nitrate + Nitrite - N	11/18/14	11/18/14	SM4500NO3E mod.	<1.	mg/kg as N
Phosphorus, Total	11/23/14	11/24/14	385.3 mod.	880. *	mg/kg as P
Total Solids	11/10/14	11/14/14	SM2540 G	10.8	%

* R9-Sample RPD exceeded the method acceptance limit.

Client ID: Sed Floc
ACT Lab No.: BW10544

Sample Type: Sediment
Sample Time: 11/08/14 14:30

<u>Parameter</u>	<u>Analysis Date</u>		<u>Method No.</u>	<u>Result</u>	<u>Unit</u>
	<u>Start</u>	<u>End</u>			
Microscopic Identification	12/01/14	12/01/14		See Attached	

Reviewed by


Frederick A. Ansell, Ph.D.
Laboratory Director

[illegible]

By signing this chain of custody, the designated client and agent agree to pay Aquatic Consulting & Testing, Inc. for all services rendered in conjunction with the submitted samples within 30 days of invoice. It is the client's responsibility to note purchase order numbers or other responsible parties on the form and failure to do so does not constitute justification for non-payment.

Sample delivery group # : Pink-Client
Yellow-Report
White-Laboratory
-023